2254, 2256, 2258, 2264 and 2266 Combines (Standard and Hillmaster) - Part 2

(210 to 340)

For complete service information also see:

John Deere Werke Zweibrücken
TM4544 (27DEC00)
Printed in Germany
ENGLISCH

FOREWORD

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

This is the safety-alert symbol. When you see this symbol on the machine or in this manual, be alert to the potential for personal injury.

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and tests sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Technical Manuals are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

“Right-hand” and “left-hand” refer to the machine as seen in forward travel.

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

ZX,TMIFC -19-22MAY92

Note

TECHNICAL MANUAL TM4544 (JULY-98)
2254, 2256, 2258, 2264 AND 2266 COMBINES
(STANDARD AND HILLMASTER)

This Technical Manual is divided into two parts.

This part includes Sections 05 to 140.

Sections 210 to 340 are included in Part 2.

ZX,DLR1,TM4543 -19-10JUL98

Note

Note

TECHNICAL MANUAL TM4544 (JULY-98)
2254, 2256, 2258, 2264 AND 2266 COMBINES
(STANDARD AND HILLMASTER)

This Technical Manual is divided into two parts.

This part includes Sections 210 to 340.

Sections 05 to 140 are included in Part 1.

ZX,DLR2,TM4543 -19-10JUL98

Note

Contents

Continued on next page

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

TM4544-19-27DEC00

Section 05
Safety

Contents

LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

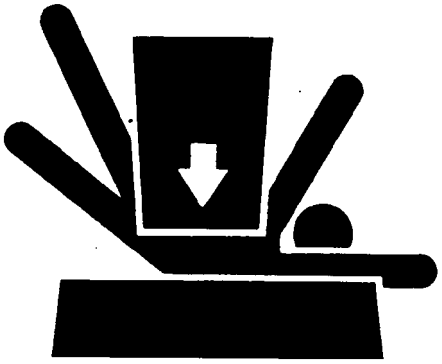
TS231 -19-07OCT88

DX,LIVE -19-15APR98

SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



TS229 -UN-23AUG88

DX,LOWER -19-04JUN90

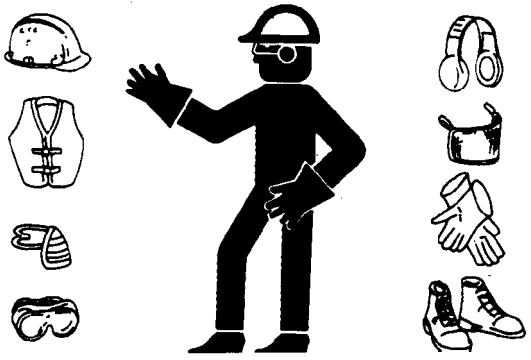
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



TS206 -UN-23AUG88

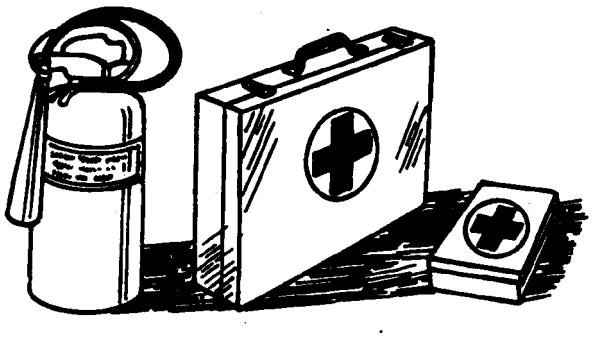
DX,WEAR -19-10SEP90

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

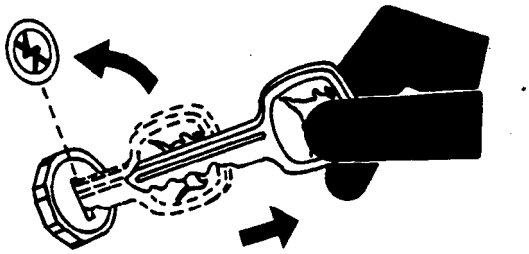


TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93

PARK MACHINE SAFELY

Before working on the machine:
- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a “DO NOT OPERATE” tag in operator station.



TS230 -UN-24MAY89

DX,PARK -19-04JUN90

USE PROPER TOOLS

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.

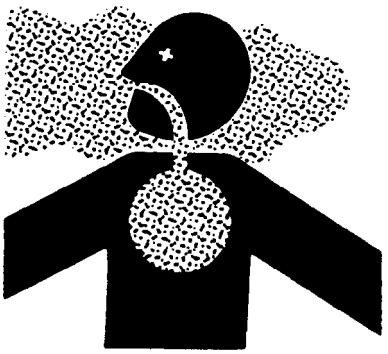
TS779 -UN-08NOV89

DX,REPAIR -19-04JUN90

WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

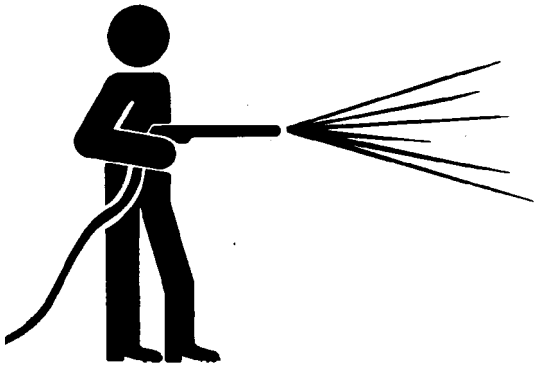


TS220 -UN-23AUG88

DX,AIR -19-04JUN90

WORK IN CLEAN AREA

Before starting a job:
- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



T6642EJ -UN-18OCT88

DX,CLEAN -19-04JUN90

HANDLE FLUIDS SAFELY—AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

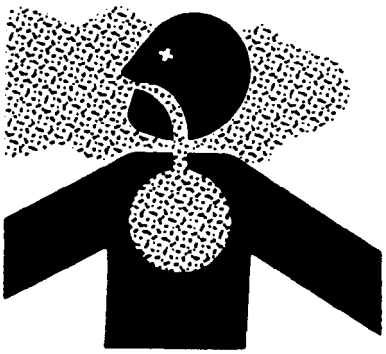
Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.

TS227 -UN-23AUG88

DX,FLAME -19-04JUN90

REMOVE PAINT BEFORE WELDING OR HEATING



TS220 -UN-23AUG88

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

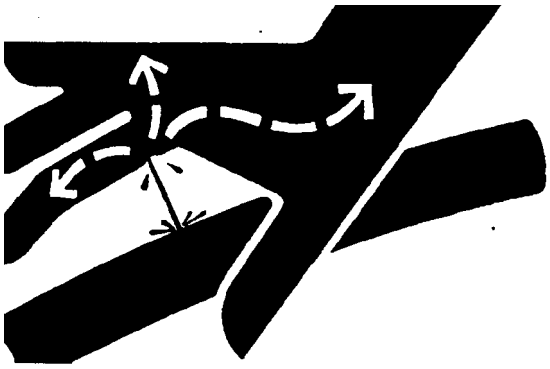
Remove paint before welding or heating:

• If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.

• If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

DX,PAINT -19-03MAR93

AVOID HIGH-PRESSURE FLUIDS



X9811 -UN-23AUG88

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

DX,FLUID -19-03MAR93

PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16˚C (60˚F).

TS204 -UN-23AUG88

DX,SPARKS -19-03MAR93

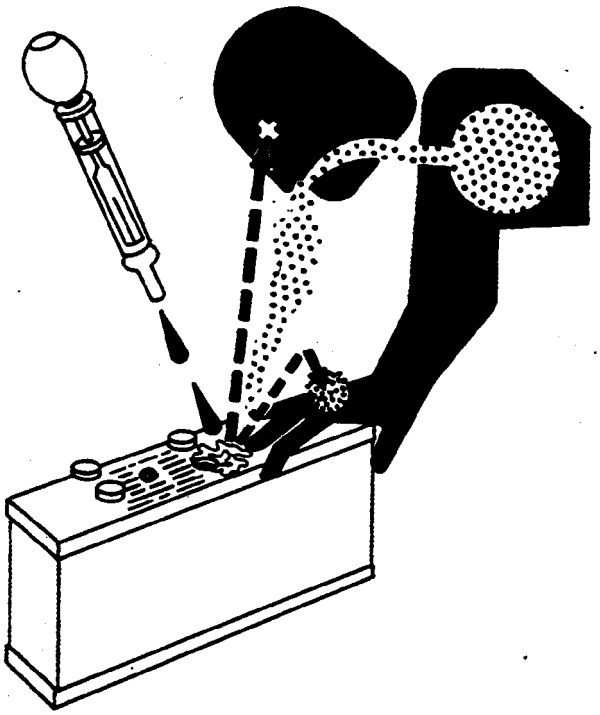
PREVENT ACID BURNS

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:
1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 -UN-23AUG88

DX,POISON -19-21APR93

AVOID HEATING NEAR PRESSURIZED FLUID LINES

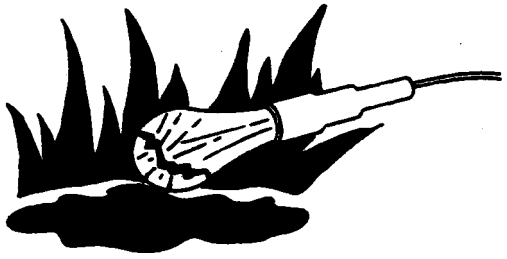
Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

TS953 -UN-15MAY90

DX,TORCH -19-03MAR93

ILLUMINATE WORK AREA SAFELY

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

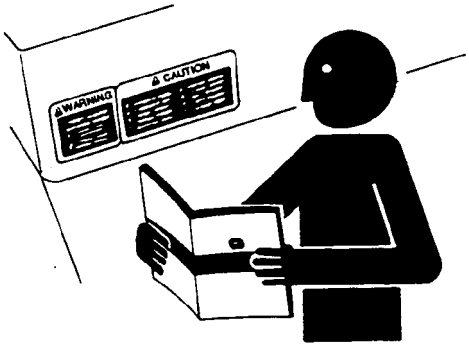


TS223 -UN-23AUG88

DX,LIGHT -19-04JUN90

REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



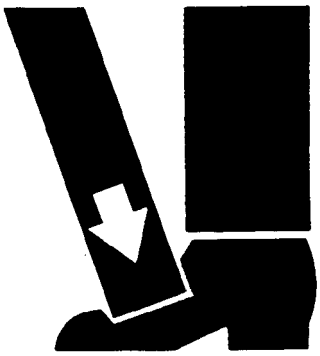
TS201 -UN-23AUG88

DX,SIGNS1 -19-04JUN90

USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



TS226 -UN-23AUG88

DX,LIFT -19-04JUN90

SERVICE TIRES SAFELY

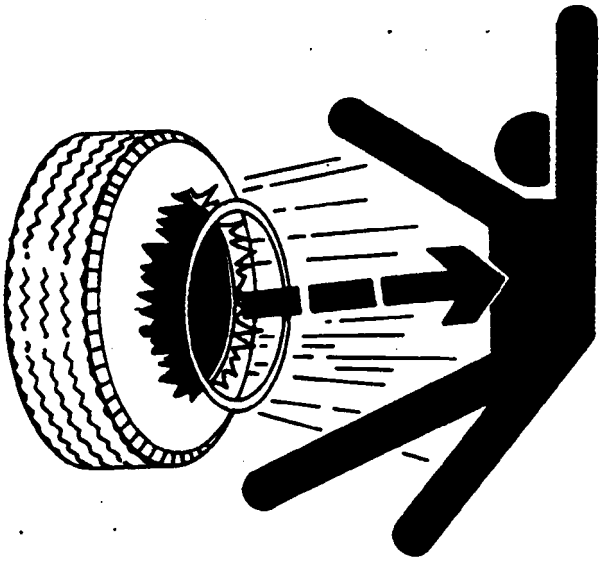
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



-UN-23AUG88

TS211

DX,RIM -19-24AUG90

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet , and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

-UN-23AUG88

TS218

DX,SERV -19-03MAR93

DISPOSE OF WASTE PROPERLY

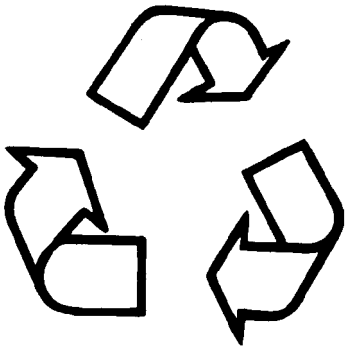
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



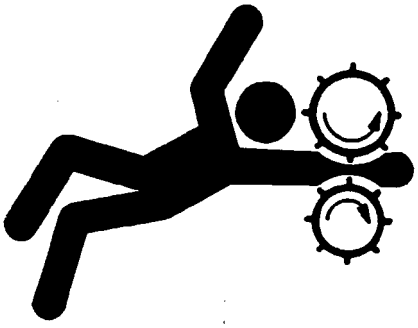
TS1133 -UN-26NOV90

DX,DRAIN -19-03MAR93

SERVICE MACHINES SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



TS228 -UN-23AUG88

DX,LOOSE -19-04JUN90

Section 10
General

Contents

DIESEL ENGINE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oil is preferred.

• John Deere PLUS-50®

The following oil is also recommended:

• John Deere TORQ-GARD SUPREME®

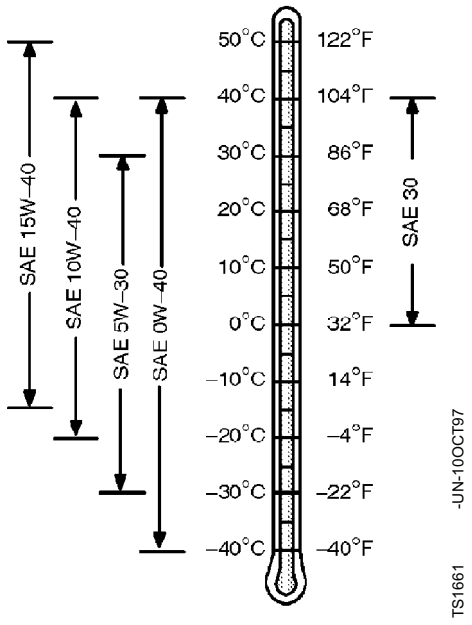
Other oils may be used if they meet one or more of the following:

• API Service Classification CG-4
• API Service Classification CF-4
• ACEA Specification E3
• ACEA Specification E2

Multi-viscosity diesel engine oils are preferred.

If diesel fuel with sulfur content greater than 0.5% is used, reduce the service interval by 50%.

Extended service intervals may apply when John Deere preferred engine oils are used. Consult your John Deere dealer for more information.



DX,ENOIL -19-10OCT97

TRANSMISSION AND HYDRAULIC OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

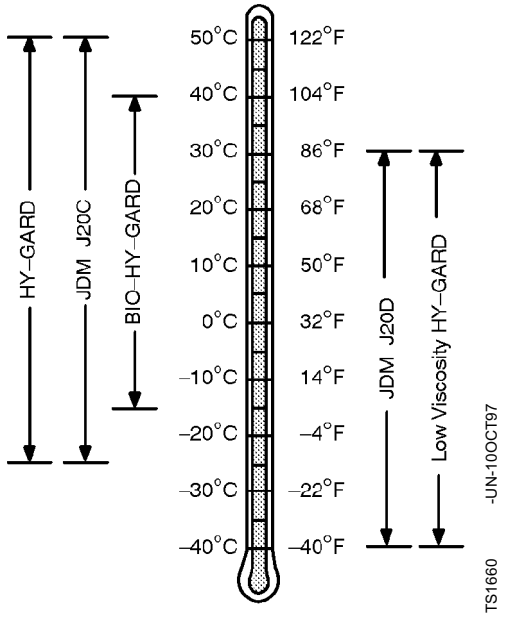
- John Deere HY-GARD®
- John Deere Low Viscosity HY-GARD®

Other oils may be used if they meet one of the following:

- John Deere Standard JDM J20C
- John Deere Standard JDM J20D

Use the following oil when a biodegradable fluid is required:

- John Deere BIO-HY-GARD™[1]



[1]BIO-HY-GARD meets or exceeds the minimum biodegradability of 80% within 21 days according to CEC-L-33-T-82 test method. BIO-HY-GARD should not be mixed with mineral oils because this reduces the biodegradability and makes proper oil recycling impossible.

DX,ANTI -19-10OCT97

TRANSMISSION OIL

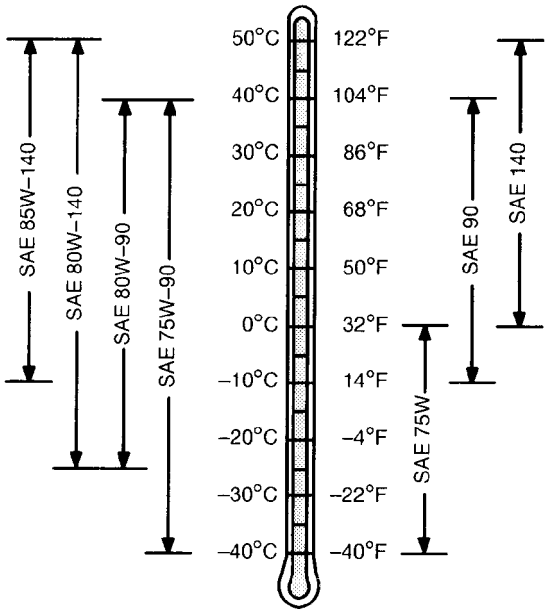
Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere EXTREME-GARD™
- John Deere GL-5 GEAR LUBRICANT

Other oils may be used if they meet the following:

- API Service Classification GL-5



ZX,DX,GEOIL -19-01JUL96

GREASE

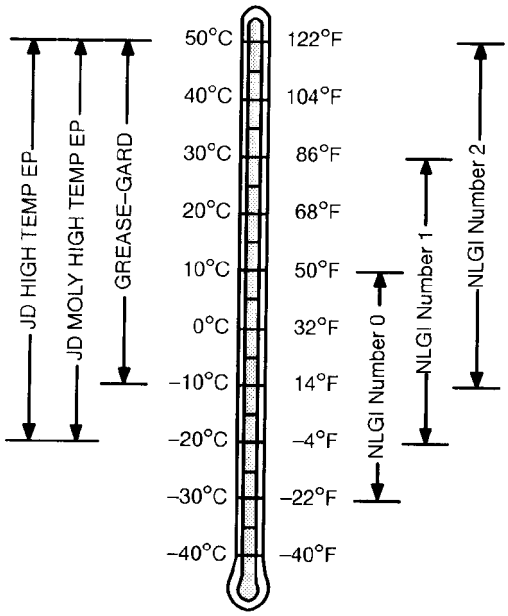
Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are preferred:

- John Deere HIGH TEMPERATURE EP GREASE
- John Deere MOLY HIGH TEMPERATURE EP GREASE
- John Deere GREASE-GARD™

Other greases may be used if they meet one of the following:

- NLGI Performance Classification GC-LB



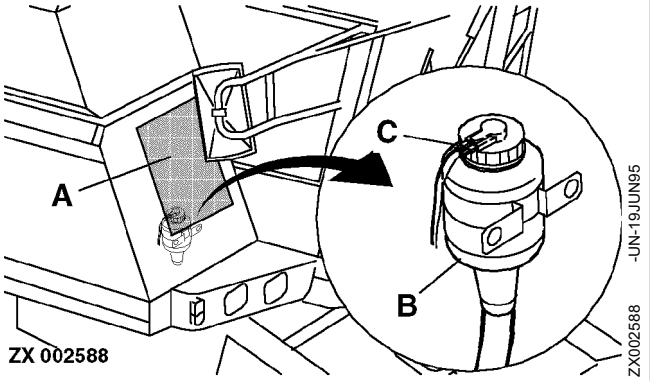
DX,GREA1 -19-18MAR96

BRAKE FLUID FOR BRAKE SYSTEM

IMPORTANT: Use only brake fluid that meets SAE Standard J 1703 (DOT 4).

Capacity:

- Complete system 1.0 L (0.26 U.S. gal)
- Reservoir 0.5 L (0.13 U.S. gal)



A—Service flap, vehicle electrics
B—Brake fluid reservoir
C—Reservoir cap with float

ZX,OMXZCO002385-19-04DEC92

ALTERNATIVE AND SYNTHETIC LUBRICANTS

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

DX,ALTER -19-18MAR96

MIXING OF LUBRICANTS

In general, avoid mixing different brands or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements.

Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

Consult your John Deere dealer to obtain specific information and recommendations.

DX,LUBMIX -19-18MAR96

LUBRICANT STORAGE

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

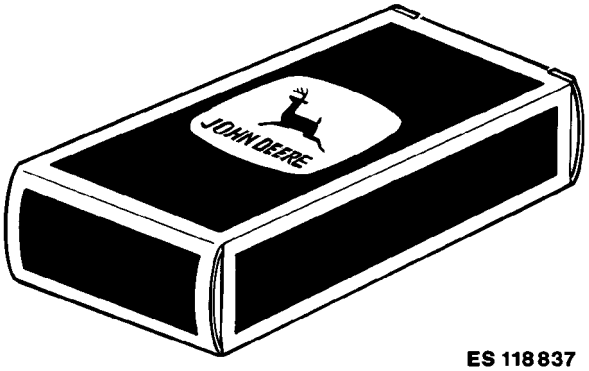
DX,LUBST -19-18MAR96

USE GENUINE JOHN DEERE PARTS

Genuine John Deere parts have been specifically designed for John Deere machines.

Other parts are neither examined nor released by John Deere. Installation and use of such products could have negative effects upon the design characteristics of the machine and thereby affect its safety.

Avoid this risk by using only genuine John Deere parts.



ES 118837

ES1118837 -UN-04APR95

FX,ORI -19-04DEC90

ENGINE COOLANT

John Deere COOL-GARD is filled into the cooling system at the factory. It protects against corrosion and against frost down to —37˚C (—34˚F).

IMPORTANT: Use only John Deere COOL-GARD in the cooling system, independent of the season. Drain system and refill with fresh coolant every 2 years.

If no John Deere COOL-GARD is available, use independent of the season a mixture of 50% ethylene-glycol antifreeze/corrosion inhibitor and 50% clear, soft water. This mixture also provides protection against corrosion and against frost down to —37˚C (—34˚F).

Never use any cooling system sealing additives.

Operating in Tropical Conditions

If no John Deere COOL-GARD or antifreeze is available, use the following mixture when refilling the cooling system: Use clean soft water and add 3% John Deere ENGINE COOLANT CONDITIONER TY16004 (30 ml per liter of water).

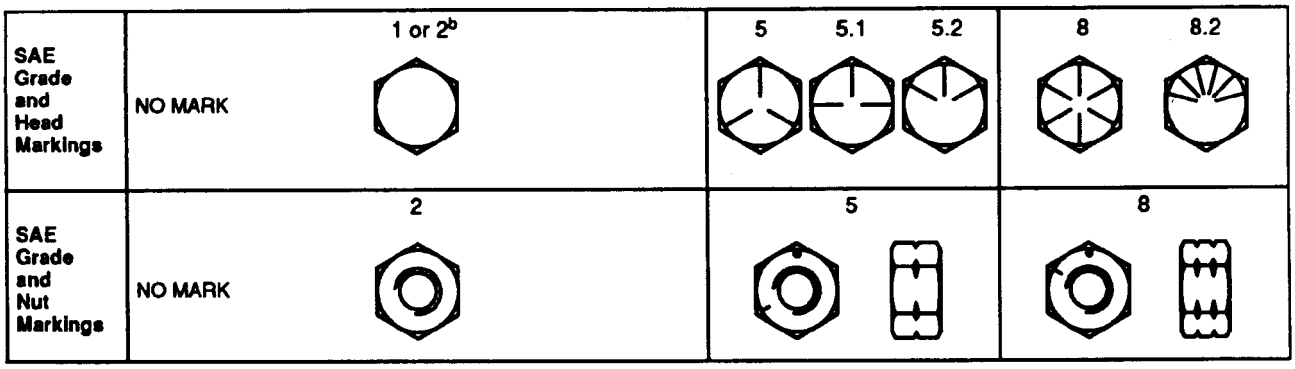
IMPORTANT: Drain system and refill with fresh coolant mixture every year. This coolant mixture protects the system against corrosion, but not against frost.

ES111859 -UN-05JAN89

RG4690 -UN-14DEC88

FX,COOLG -19-29SEP94

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



TS1162 -19-04MAR91

Size	Grade 1				Grade 2[b]				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	240	175	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	400	300	510	375	400	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

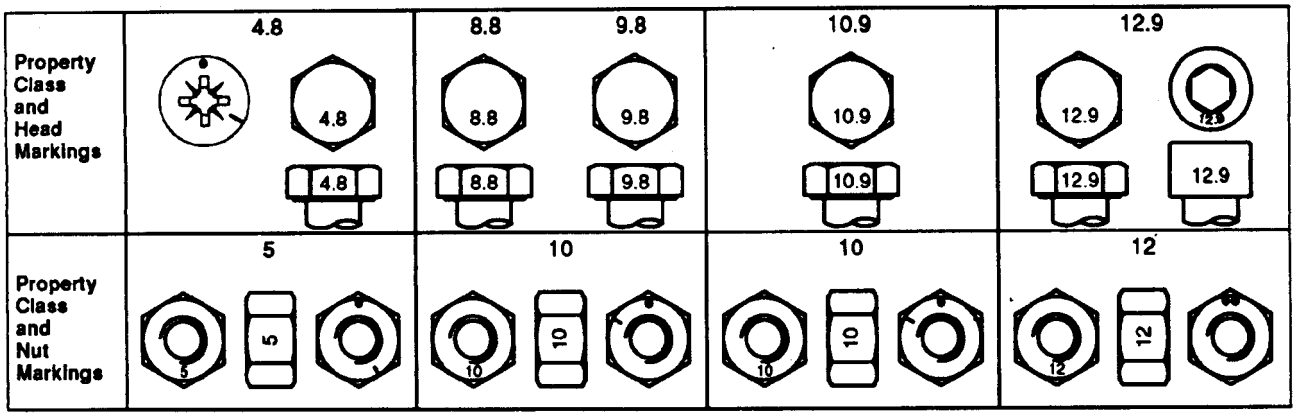
Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[b] Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

DX,TORQ1 -19-20JUL94

METRIC BOLT AND CAP SCREW TORQUE VALUES



TS1163 -19-04MAR91

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

DX,TORQ2 -19-20JUL94

TYPE PLATES

Serial numbers identifying combine harvester components or assemblies are stamped on components or factory serial number plates.

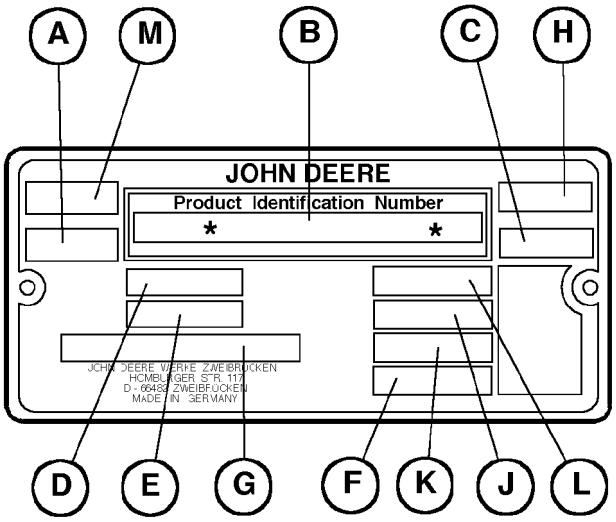
These numbers and letters are required when ordering parts or components for the combine harvester.

To ensure that you always have these numbers at hand, enter the appropriate serial numbers in the spaces provided in each illustration.

ZX,OMXZCO002360-19-05OCT92

COMBINE TYPE PLATE

A—Model
B—Product identification number
C—Absorption coefficient
D—Permissible trailer load
E—Permissible drawbar load
F—Engine power
G—Homologation number (in certain countries only)
H—Version (in certain countries only)
J—Permissible front axle load
K—Permissible rear axle load
L—Permissible total weight
M—Year of production



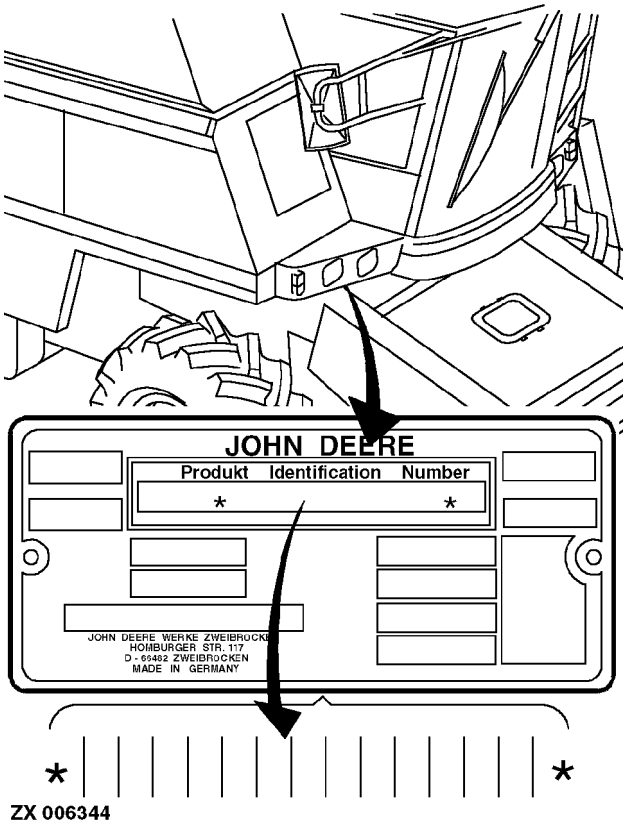
ZX008582

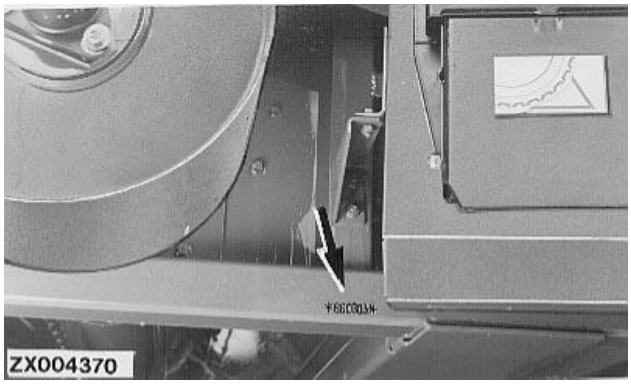
ZX,OMXZCO003401-19-02MAY96

PRODUCT IDENTIFICATION NUMBER

The product identification number is located on the front right-hand side of the operator's platform.

NOTE: In addition, the last six figures of the product identification number are stamped into right-hand frame near the clean grain elevator.

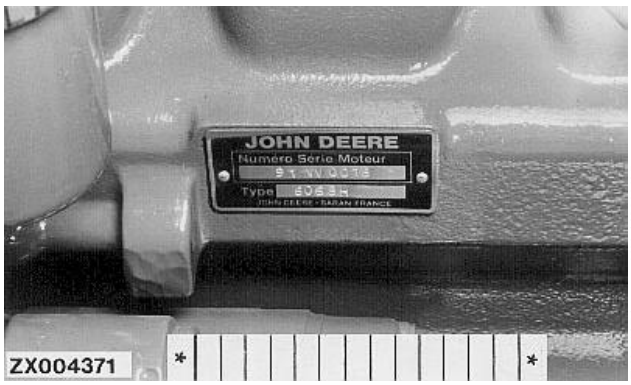




ZX,OMXZCO003411-19-01JUL94

ENGINE SERIAL NUMBER — ENGINE TYPE 6068

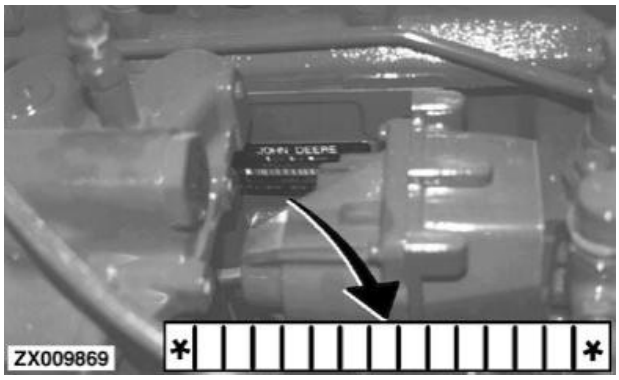
The engine serial number is located near the fuel filter.



ZX,OMXZCO002362-19-04DEC92

ENGINE SERIAL NUMBER — ENGINE TYPE 6081

The engine serial number is located on the engine block between the oil filter and the injection pump.

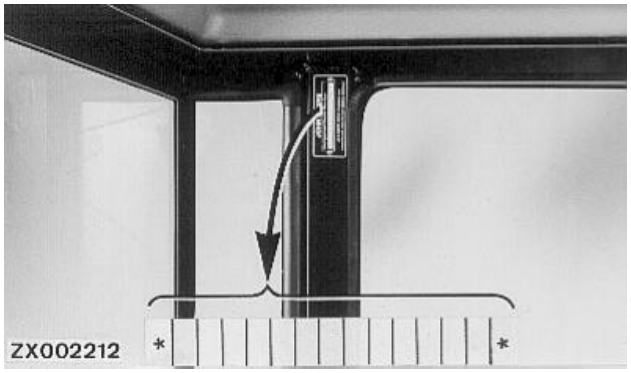


ZX,OMXZCO007000-19-01NOV96

OPERATOR'S CAB SERIAL NUMBER

The operator's cab serial number is located on the inside of the left-hand side panel.

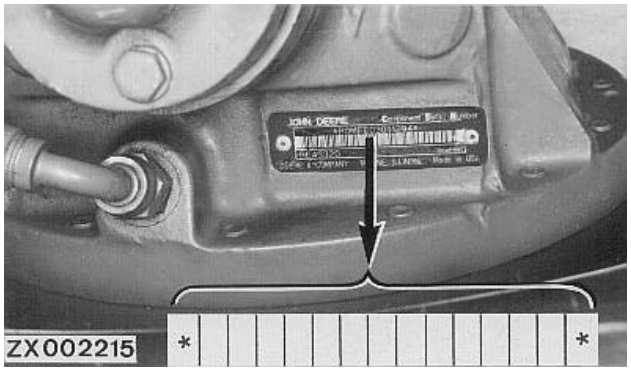
NOTE: The operator's cab serial number is the same as that for the air conditioning system.



ZX,OMSPFH001431-19-01NOV91

FOUR WHEEL DRIVE MOTOR SERIAL NUMBER

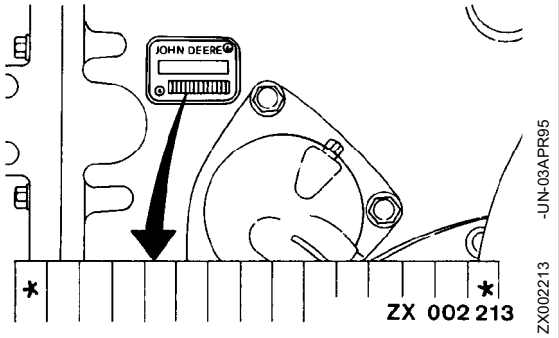
The serial number of the four wheel drive motor is located on top of the motor.



ZX,OMSPFH001434-19-01NOV91

THREE-SPEED TRANSMISSION SERIAL NUMBER

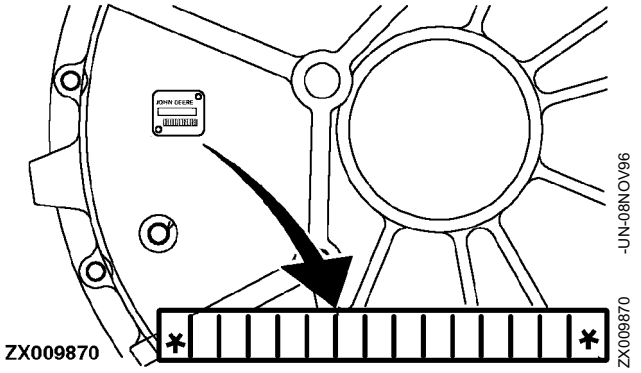
The three-speed transmission serial number is located on right-hand side of transmission.



ZX,OMSPFH001927-19-22MAY92

FINAL DRIVE SERIAL NUMBER

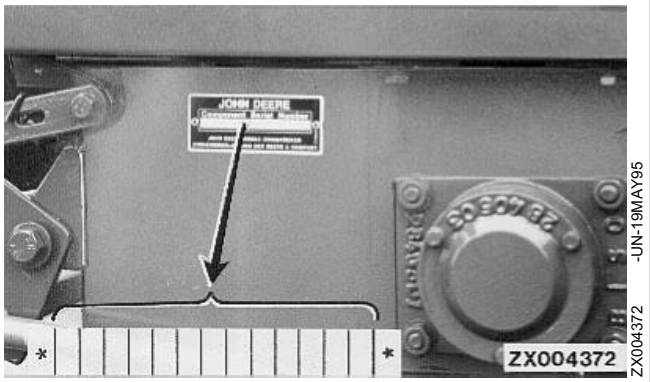
The final drive serial number is located on the transmission housing opposite the input shaft.



ZX,OMXZCO007001-19-01NOV96

STRAW CHOPPER SERIAL NUMBER

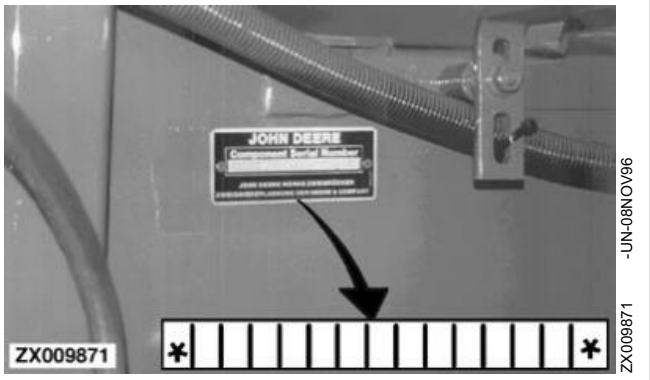
The straw chopper serial number is located on the outside of the chopper, on the right.



ZX,OMXZCO002363-19-05OCT92

FEEDER HOUSE SERIAL NUMBER

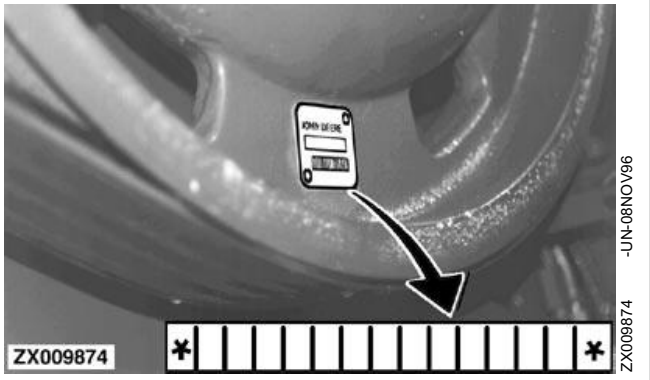
The feeder house serial number is located on the outside of the feeder house, on the left-hand side.



ZX,OMXZCO007002-19-01NOV96

SERIAL NUMBER OF THRESHING CYLINDER REDUCTION GEAR

The serial number of the cylinder reduction gear is located on the outside of the gear cover at the right-hand side.



ZX,OMXZCO007005-19-01NOV96

Section 20
Engine

Contents

Page

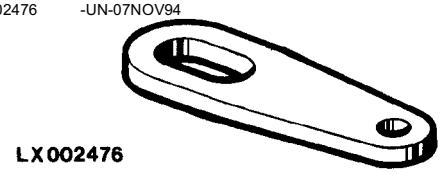
SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Lifting eye JD-244-1

LX002476 -UN-07NOV94

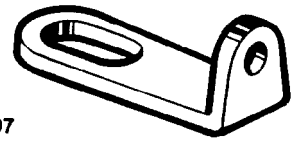


LX002476

ZX,TMXZCO003887-19-15FEB95

Lifting eye JD-244-2

LX002297 -UN-07NOV94

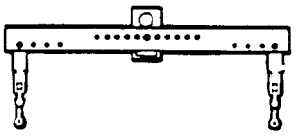


LX002297

ZX,TMXZCO003888-19-15FEB95

Lifting sling JDG23

ZX005462 -UN-28APR95



ZX005462

ZX,TMXZCO003889-19-15FEB95

ENGINES ON 2200 SERIES COMBINES

Combine Model	Engine Type	kW	hp
2254	CD 6068 H Z 001	132	180
2256	RG 6081 H Z 003	154	210
2258	RG 6081 H Z 005	173	235
2264	RG 6081 H Z 002	184	250
2266	RG 6081 H Z 001	199	270

ZX,TMXZCO009436-19-01AUG97

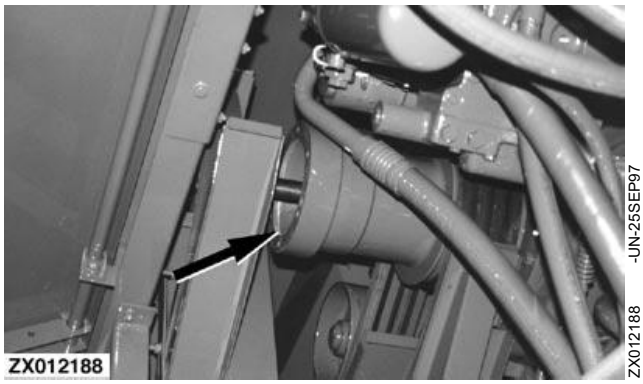
ENGINE DESIGNATION CODES

CD	- Saran
RG	- Engine Works
6	- Number of cylinders
068	- Displacement = 6.8 liters
081	- Displacement = 8.1 liters
H	- Turbocharged, air-to-air intercooled
A	- Turbocharged, air-to-water intercooled
000000	- Serial number
Z	- Engine user (Zweibrücken factory)
001	- Engine version
002	- Engine version
003	- Engine version
005	- Engine version

ZX,TMXZCO009437-19-01AUG97

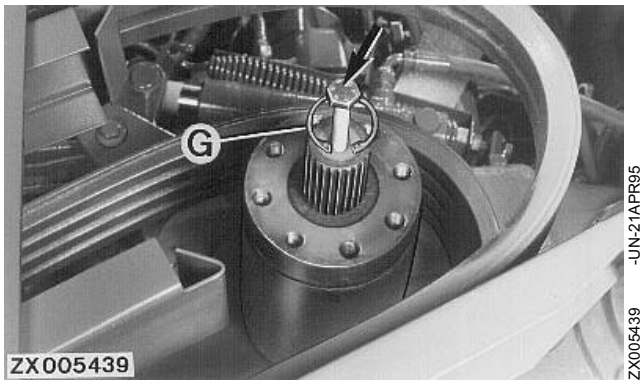
PREPARATIONS FOR ENGINE REMOVAL

— Swing unloading auger to the side
— Drain coolant
— Disconnect battery
— Remove the muffler system
— Remove the air intake system
— Disconnect the fuel lines
— On 2264 and 2266, unbolt the additional belt pulley



ZX,TMXZCO009438-19-01AUG97

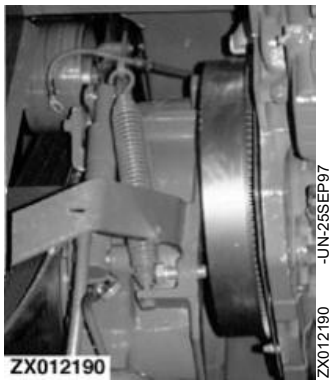
Remove snap ring (G) from hollow shaft and use an M10x50 screw to pull the drive shaft out of the hollow shaft.

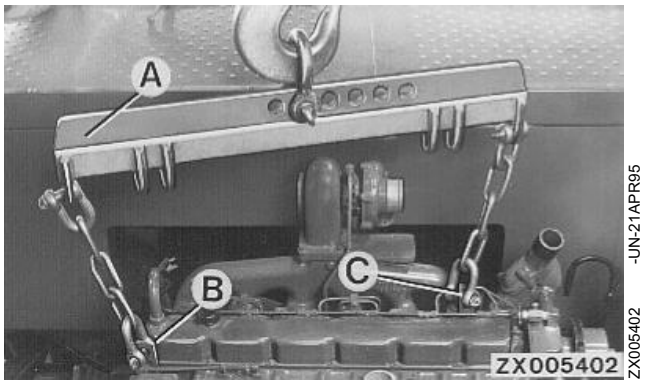


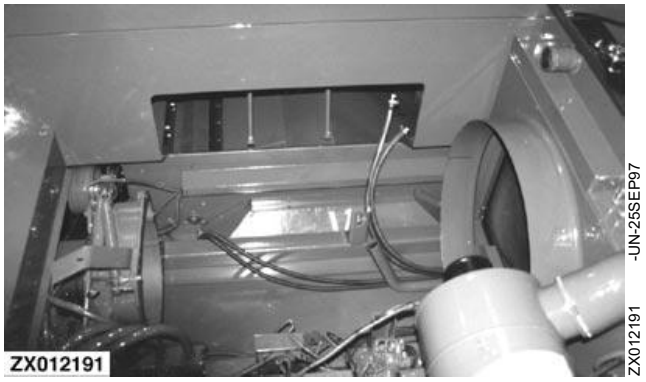
ZX,TMXZCO009439-19-01AUG97

— Unbolt the intermediate transmission from the engine
— Unbolt the fan and alternator
— Remove attaching screws at engine mountings
— Attch lifting device (A) to existing brackets (B) and (C) and lift out the engine

CAUTION: Depending on model, the engine weighs between 600 and 816 kg (1323 and 1799 lb).







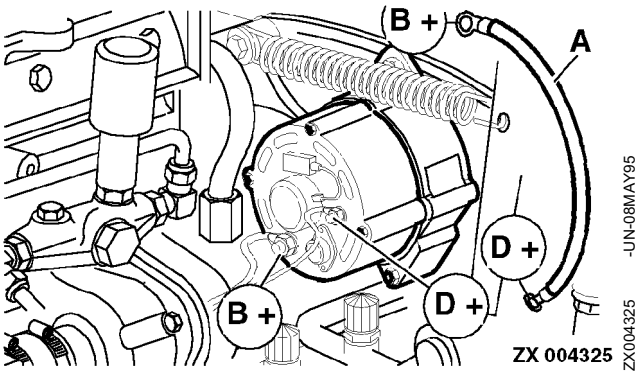
ZX,TMXZCO009440-19-01AUG97

INSTALLING THE ENGINE

Install engine. Same as removal procedure, but in reverse order.

ZX,TMXZCO009441-19-01AUG97

PREPARATIONS FOR ADJUSTING BELT GUIDES ON MAIN COUNTERSHAFT AND UNLOADING DRIVE



Start the engine and allow pressure to build up in the hydraulic system.

Shut off engine.

Attach bridge (A).

Put road safety switch in field position.

Switch on ignition.

To adjust the belt guide on the main countershaft, press the separator switch on the switch console.

To adjust the belt guide on the unloading drive, press the unloading drive switch on the switch console.

ZX,OMXZCO002250-19-05OCT92

ADJUSTING THE BELT GUIDES

— Adjust belt guides until 4 - 6 mm (0.16 - 0.24 in.) clearance is obtained in relation to the belt (when the belt is tensioned).

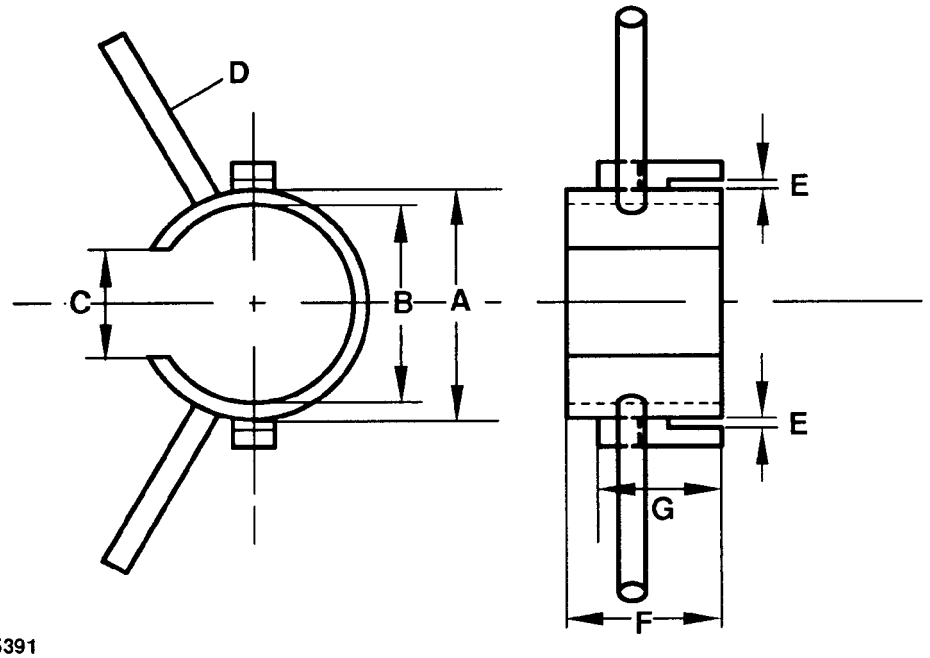
— Once adjustment is completed, remove the bridge from the alternator.

ZX,TMXZCO009442-19-01AUG97

Section 30
Fuel, Air Intake and Cooling Systems

Contents

SPECIAL TOOL (SELF-MANUFACTURED)



A—75 mm (2.95 in.) dia.
B—65 mm (2.56 in.) dia.
C—35 mm (1.38 in.)
D—8 mm (0.3 in.) dia., length 100 mm (3.94 in.)
E—3 mm (0.12 in.)
F—50 mm (1.97 in.)
G—30 mm (1.20 in.)

Tool for removal and installation of fuel gauge sending unit

ZX,TMXZCO003912-19-15FEB95

GENERAL INFORMATION

CAUTION: When repairing the fuel system, never permit smoking, naked flames or playing with fire.

Fuel Tank Capacity

2254 - 2264 . . . . . 450 L (119 U.S. gal)
2266 . . . . . 550 L (145.3 U.S. gal)

ZX,TMXZCO009443-19-01AUG97

REMOVING FUEL TANK

IMPORTANT: Drain fuel from tank before removal.

Loosen fuel line at filter (A).

Loosen fuel return line at tank (B).

Disconnect electrical cable from fuel gauge sending unit (C).

Remove rear panel (D).

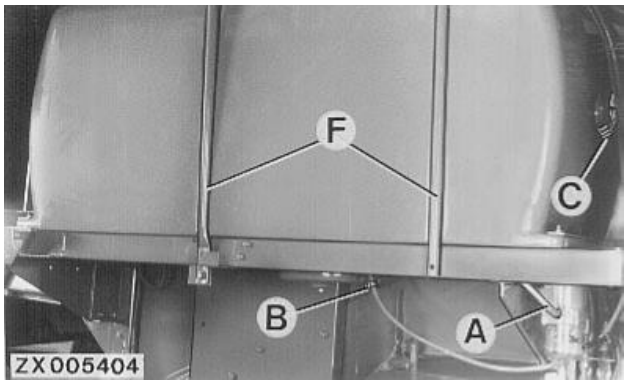
Remove rear handrails (E).

Remove stays (F).

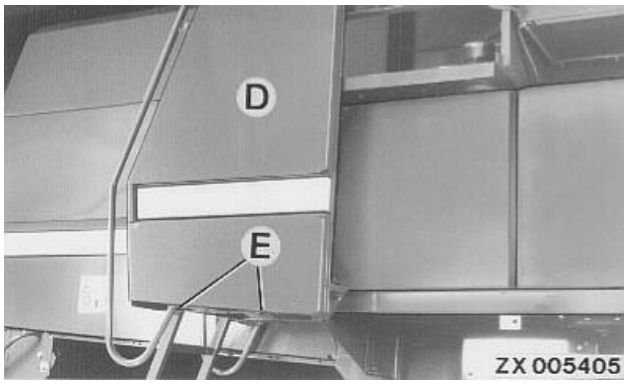
Remove filter assembly.

Remove two screws from hood.

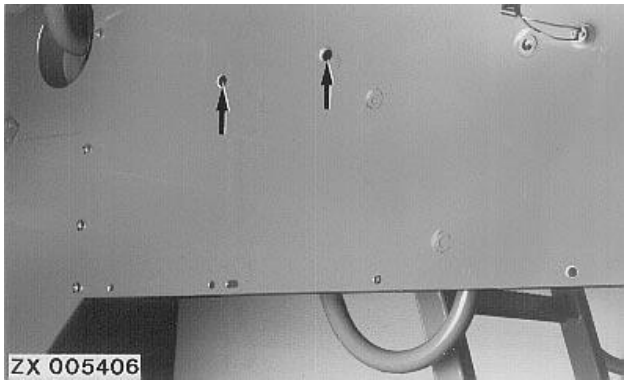
A—Filter
B—Tank
C—Fuel gauge sending unit
D—Panel
E—Handrails
F—Stays



-UN-21APR95 ZX005404



-UN-21APR95 ZX005405



-UN-21APR95 ZX005406

ZX,TMXZCO003914-19-15FEB95

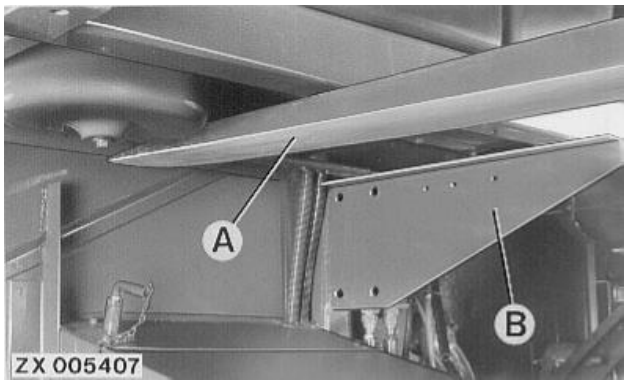
REMOVING TANK SUPPORT

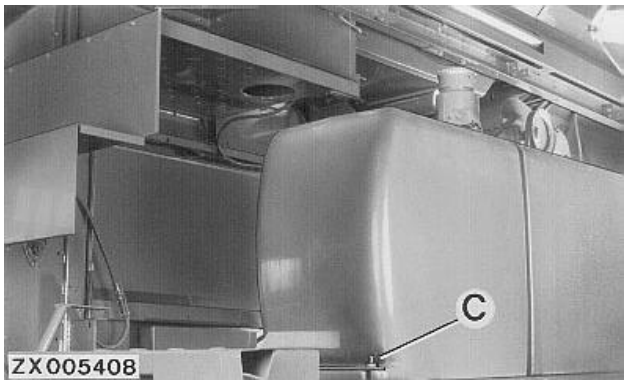
Place lift fork (A) below tank support.

Remove four screws from the two supports (B) and lower tank until tank filler neck is clear of floor plate.

Remove tank sideways.

Remove straps (C) from lower tank attaching points on right and left-hand side.





ZX,TMXZCO003917-19-15FEB95

INSTALLING FUEL TANK

Install fuel tank, reversing removal procedure.

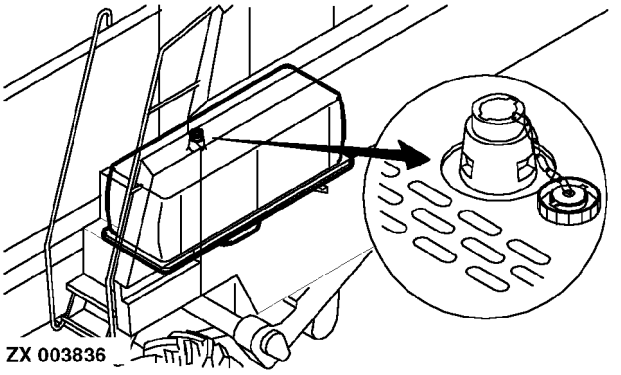
ZX,TMXZCO003919-19-15FEB95

FUEL TANK FILLER NECK

The fuel tank filler neck is closed with a tank cap.

The fuel tank is vented through an opening in the cap.

Clean dust and chaff from the surrounding area before removing tank cap.



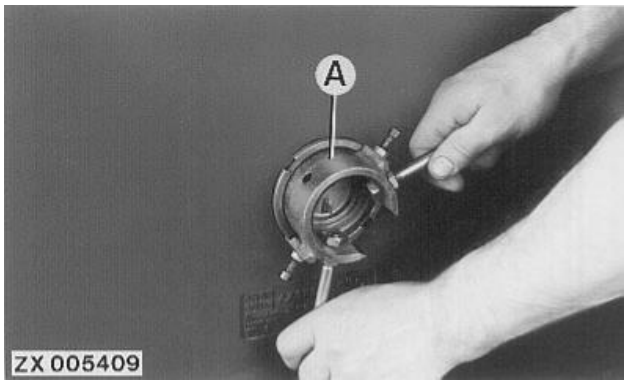
ZX,OMXZCO002089-19-13NOV92

REMOVING FUEL GAUGE SENDING UNIT

Drain fuel until fuel level is well below the fuel gauge sending unit.

Disconnect the three cable connectors.

Using special tool (A), turn the sending unit all the way counter-clockwise and remove it.



ZX,TMXZCO003920-19-15FEB95

INSTALLING FUEL GAUGE SENDING UNIT

Install fuel gauge sending unit with O-ring.

Using special tool, turn the sending unit clockwise until contacts (A) and (B) are in vertical position.

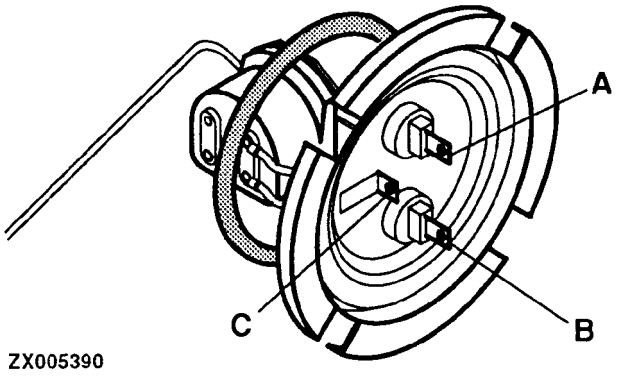
ZX,TMXZCO003921-19-15FEB95

CONNECTING CABLES

Connect brown cable (031) to red connection “A”.

Connect red cable (033) to white connection “B”.

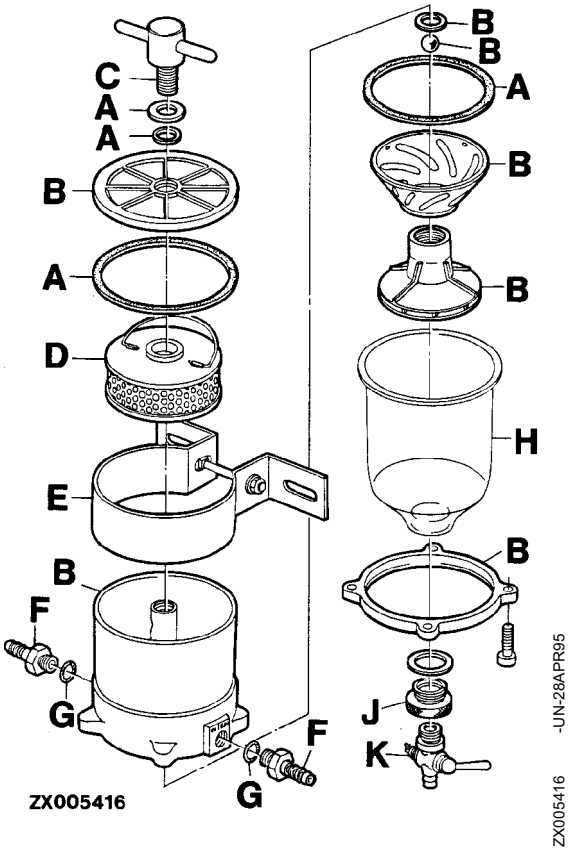
Connect black cable to ground “C”.



ZX,TMXZCO003922-19-15FEB95

FUEL FILTER WITH WATER TRAP, EXPLODED VIEW

A—Gasket set
B—Repair set
C—Special screw
D—Filter element
E—Holding strap
F—Hose connection
G—O-ring
H—Sight glass
J—Knurled nut
K—Drain tap



ZX,TMXZCO009444-19-01AUG97

WATER TRAP IN FUEL SYSTEM

The fuel system has an integral water trap (A). This filter operates as follows:

1st stage:

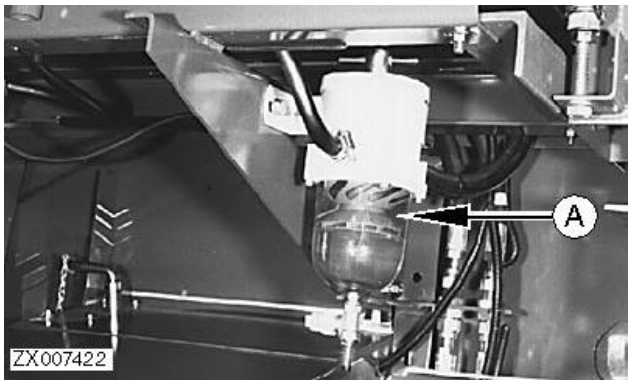
Solid foreign matter is separated out by centrifugal force.

2nd stage:

Tiny particles float up with the fuel into the cone-shaped insert, where they accumulate on the oblique surfaces. This sediment gradually becomes heavier and the larger particles fall slowly into the 1st stage on the base of the sight-glass.

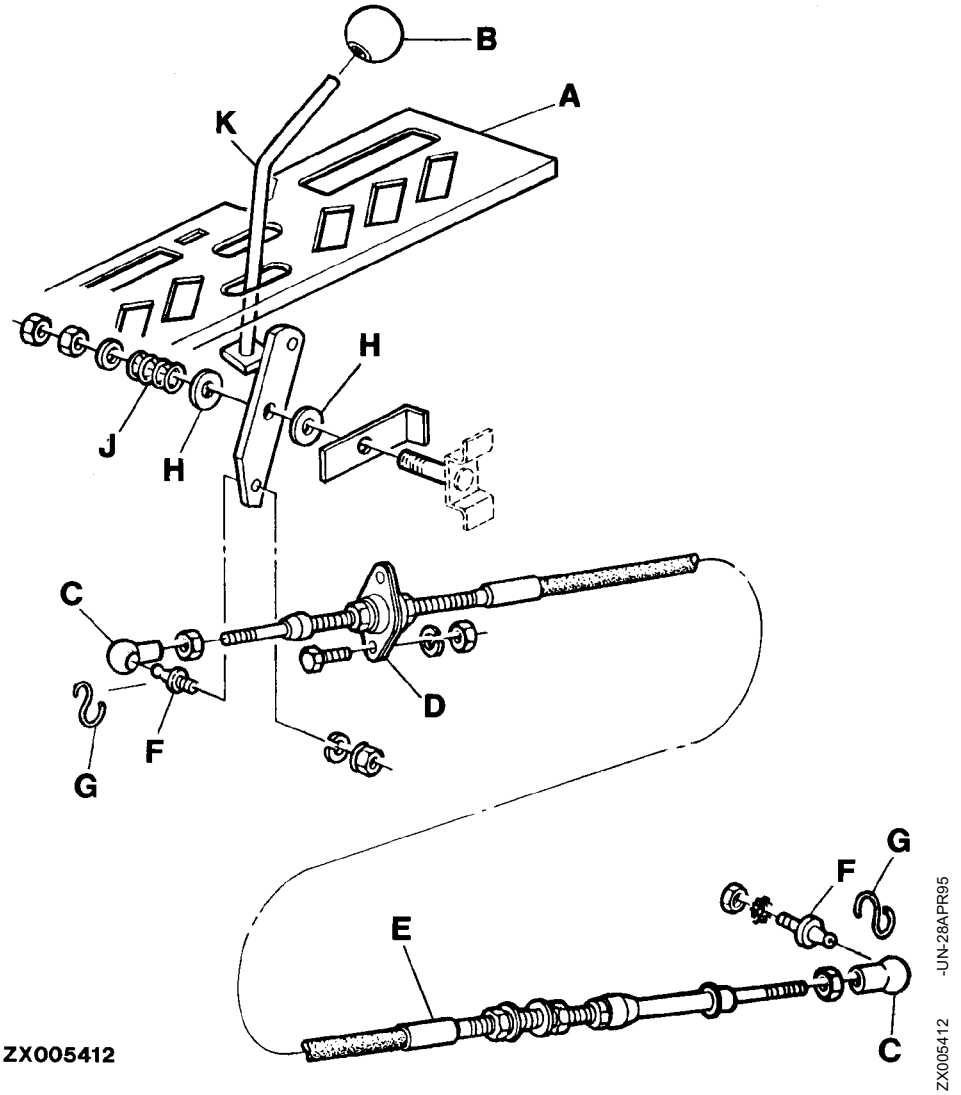
3rd stage:

The finest fuel filter stage takes place in the filter insert. This insert can be removed and replaced.



ZX,OMXZCO004144-19-01MAR95

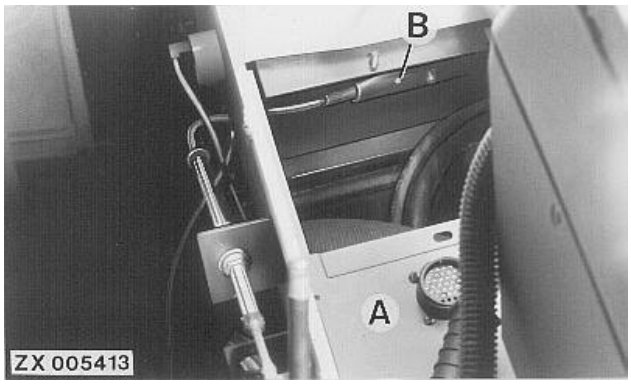
BOWDEN CABLE FOR SPEED ADJUSTMENT



A—Console
B—Handle
C—Ball joint
D—Joint
E—Bowden cable
F—Ball socket
G—Retainer
H—Special washer
J—Spring
K—Throttle lever

ZX,TMXZCO003924-19-15FEB95

REPLACING BOWDEN CABLE FOR SPEED ADJUSTMENT



IMPORTANT: Do not bend the bowden cable.

Remove console.

Disconnect throttle lever at thread and remove together with rubber boot. Remove handle from lever.

Remove right-hand cover (A). Remove plastic clamping device (B) from bowden cable.

Disconnect ball joint at throttle lever and remove together with cable joint.

Slacken feeder house drive idler.

Remove all clamps from bowden cable.

Disconnect bowden cable at fuel injection pump bracket. Disconnect ball joint.

Pull bowden cable to the rear out of retainers.

Bowden cable installation is the same, but in reverse order.

ZX,TMXZCO009445-19-01AUG97

ADJUSTING BOWDEN CABLE

Adjust bowden cable so that speed control lever at injection pump contacts adjusting screw stop (at full throttle position).

ZX,TMXZCO003927-19-15FEB95

ADJUSTING ENGINE SPEEDS

Slow idle . . . . . 1250 ± 50 rpm
Fast idle . . . . . 2350 + 50 rpm
Rated speed . . . . . 2200 rpm

Check engine speeds with separator engaged.

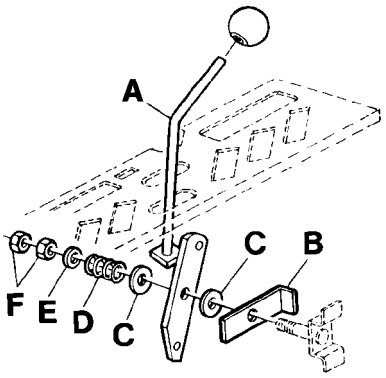
ZX,TMXZCO009446-19-01AUG97

ADJUSTING THROTTLE LEVER

Tighten throttle lever (A) by means of nut (F) so that lever does not move out of full throttle position.

Secure nut (F).

A—Throttle lever
B—Retaining strap
C—Special washers
D—Spring
E—Washer
F—Nut

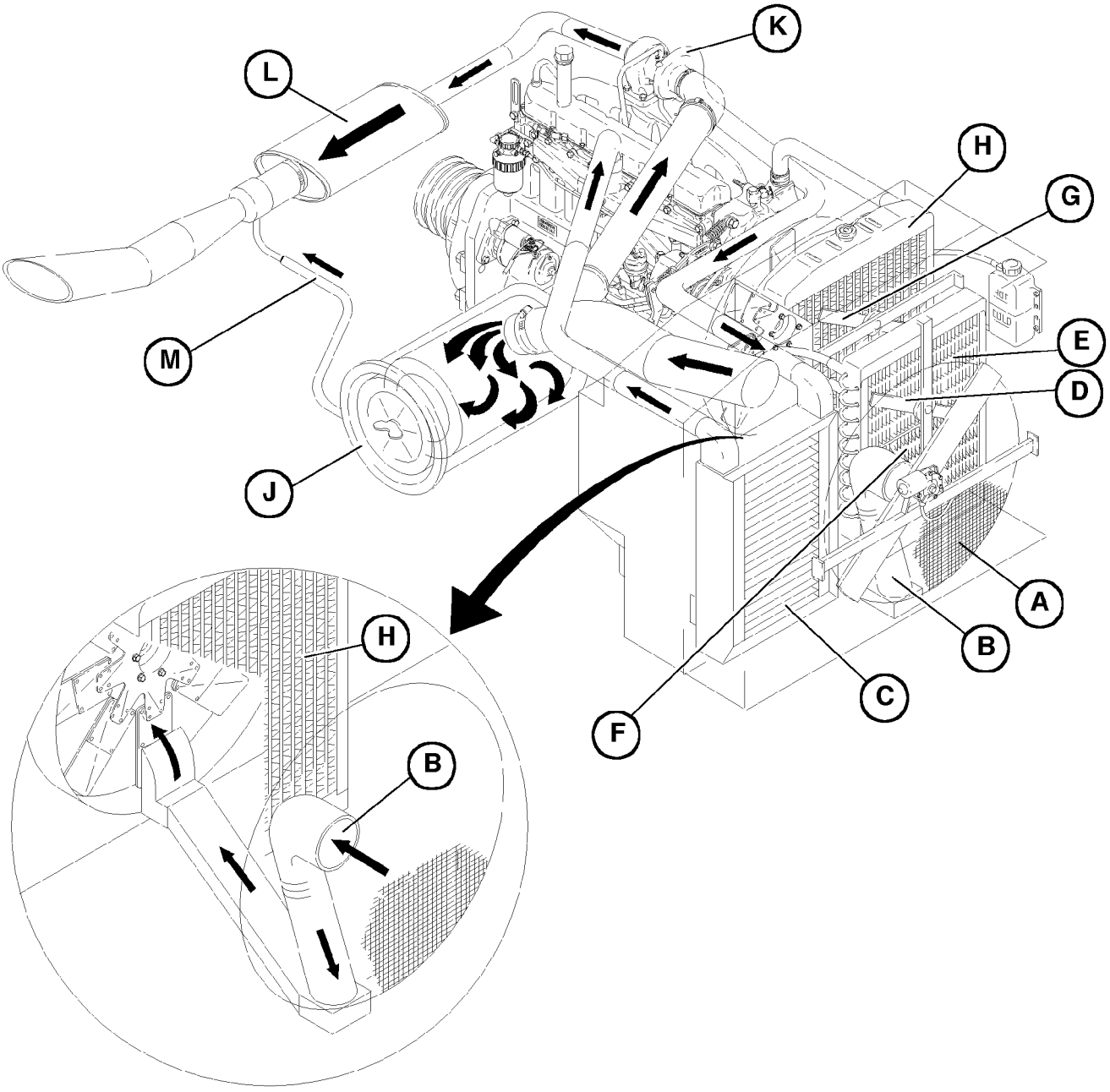


ZX005414

ZX005414 -UN-28APR95

ZX,TMXZCO003929-19-15FEB95

AIR INTAKE SYSTEM WITH AIR-TO-AIR AFTERCOOLER (6.8-L ENGINE)



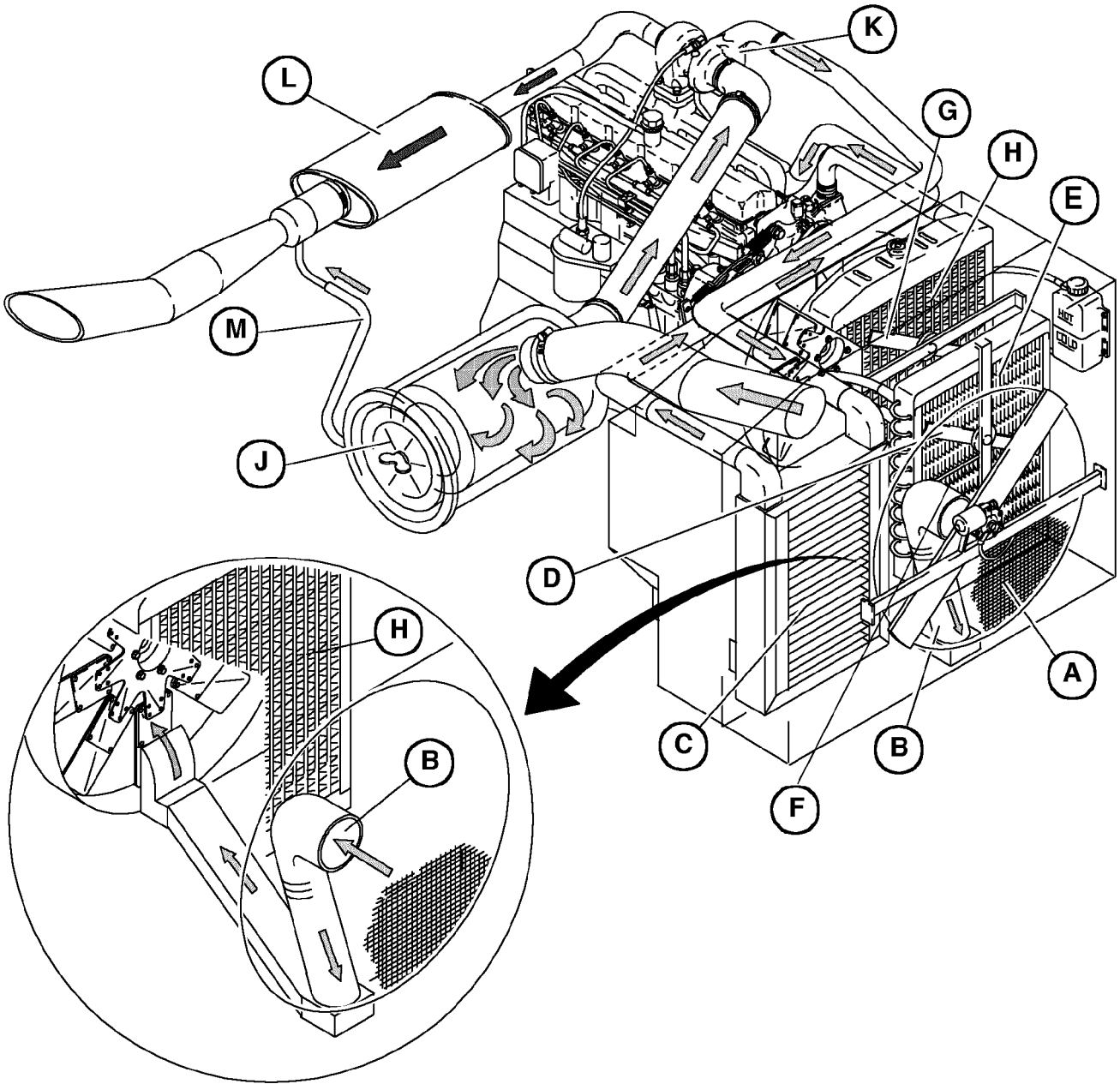
ZX007416

ZX007416 -UN-20JUN95

A—Stationary radiator screen with driven cleaning fan
B—Suction pipe and channel from stationary radiator screen
C—Air-to-air aftercooler
D—Eddy fan for oil cooler/condenser
E—Hydraulic oil cooler
F—Air conditioning condenser (if equipped)
G—Eddy fan for radiator
H—Radiator
J—Air cleaner with safety element
K—Turbocharger
L—Muffler
M—Air cleaner suction pipe

ZX,OMXZCO002115-19-01NOV96

AIR INTAKE SYSTEM WITH AIR-TO-AIR AFTERCOOLER (8.1-L ENGINE)



ZX009866

-UN-15NOV96

ZX009866

A—Stationary radiator screen with driven cleaning fan
B—Suction pipe and channel from stationary radiator screen
C—Air-to-air aftercooler
D—Eddy fan for hydraulic oil cooler/condenser
E—Hydraulic oil cooler
F—Air conditioning condenser (if equipped)
G—Eddy fan for radiator
H—Radiator
J—Air cleaner with safety element
K—Turbocharger
L—Muffler
M—Air cleaner suction pipe

ZX,OMXZCO002116-19-01NOV96

ENGINE COOLANT

John Deere COOL-GARD is filled into the cooling system at the factory. It protects against corrosion and against frost down to —37˚C (—34˚F).

IMPORTANT: Use only John Deere COOL-GARD in the cooling system, independent of the season. Drain system and refill with fresh coolant every 2 years.

If no John Deere COOL-GARD is available, use independent of the season a mixture of 50% ethylene-glycol antifreeze/corrosion inhibitor and 50% clear, soft water. This mixture also provides protection against corrosion and against frost down to —37˚C (—34˚F).

Never use any cooling system sealing additives.

Operating in Tropical Conditions

If no John Deere COOL-GARD or antifreeze is available, use the following mixture when refilling the cooling system: Use clean soft water and add 3% John Deere ENGINE COOLANT CONDITIONER TY16004 (30 ml per liter of water).

IMPORTANT: Drain system and refill with fresh coolant mixture every year. This coolant mixture protects the system against corrosion, but not against frost.

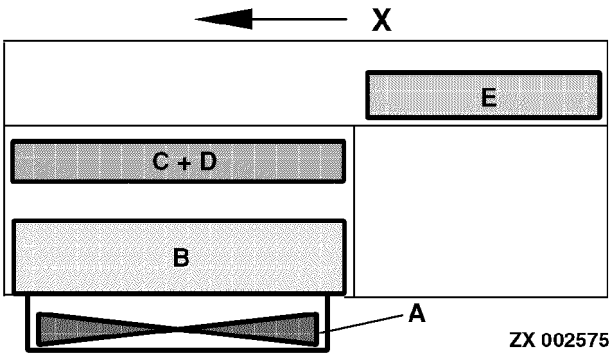
ES111859 -UN-05JAN89

RG4690 -UN-14DEC88

FX,COOLG -19-29SEP94

LAYOUT OF COOLING ELEMENTS (2254 — 2266)

A—Fan
B—Radiator
C—Hydraulic oil cooler (top)
D—Air conditioning condenser (below, when equipped)
E—Intercooler
X—Direction of travel



ZX002575 -UN-19JUN95

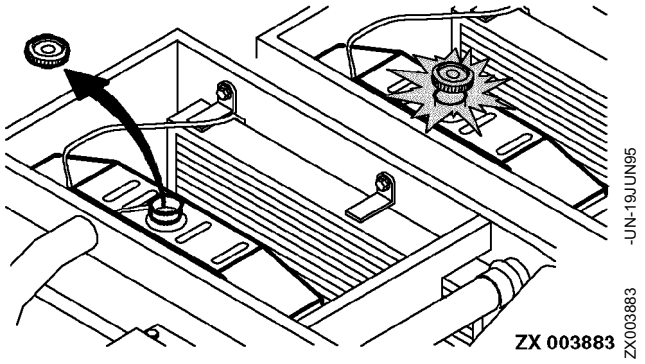
ZX,OMXZCO002105-19-01NOV96

ENGINE COOLANT

CAUTION: Danger of scalding. Do not loosen or remove the radiator filler cap when coolant temperature is near or above boiling point. Always loosen the cap slightly to relieve pressure before removing cap completely.

Add coolant only when the engine is shut off.

When the engine is cool, the coolant level should be up to the “COLD” mark.

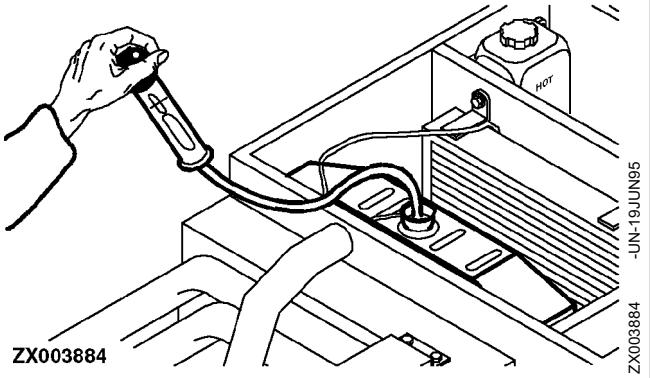


Checking coolant quality

IMPORTANT: Regardless of the season, use only John Deere COOL-GARD in the cooling system. Drain cooling system and refill with fresh coolant every 2 years.

Check condition of coolant mixture before the winter season. Coolant should protect engine against frost down to —36˚C (—35˚F).

Never use any cooling system sealing additives.



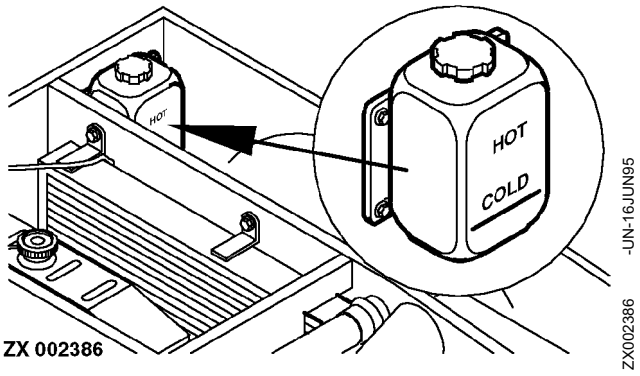
ZX,OMXZCO002107-19-01AUG92

ADDING COOLANT

CAUTION: Danger of scalding. Do not loosen or remove the radiator filler cap when coolant temperature is near or above boiling point. Always loosen the cap slightly to relieve pressure before removing cap completely.

IMPORTANT: Add a recommended coolant. Never use a cooling system sealing additive. Never pour cold liquid into a hot engine, as this may crack the cylinder head or block. Never operate engine without coolant.

When the system is cool, coolant level should be up to the “COLD” mark on the expansion tank.



ZX,TMXZCO009447-19-01AUG97

FLUSHING SEQUENCE — COOLING SYSTEM

Drain and flush the cooling system at least every two years.

Having drained off all coolant, close drain tap or replace plug. Fill system with clean water.

Start engine and run until it reaches operating temperature.

Turn cab heater on and leave on until cleaning of cooling system is finished.

Stop engine and drain system immediately before rust and sediment deposits settle.

Close drain tap or replace plug. Clean system with commercial cooling system cleaner, following the instructions supplied with the cleaner.

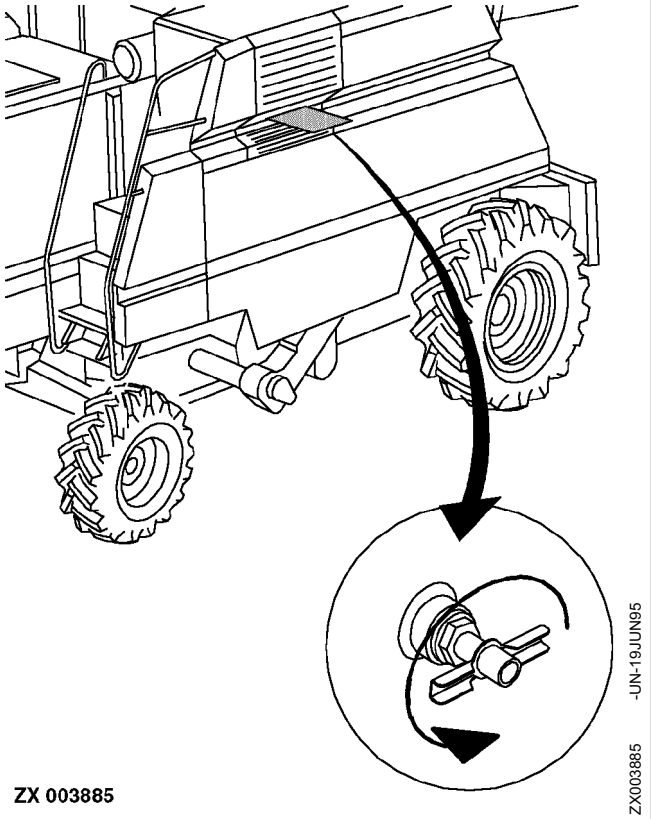
Drain cooling system cleaner and refill system again with clean water. Shut off engine when water reaches operating temperature and drain system again.

Refill system with the specified coolant (see “Engine Coolant”).

IMPORTANT: The cooling system must always be filled with John Deere COOL-GARD, irrespective of the season.

ZX,OMSPFH001283-19-01NOV91

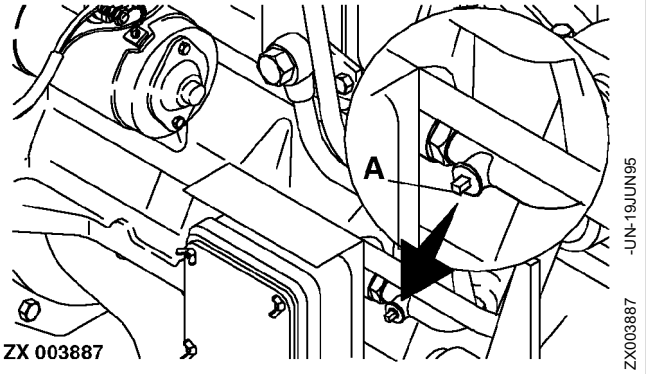
DRAIN VALVE FOR ENGINE COOLANT AT RADIATOR



ZX,OMXZCO002109-19-01AUG92

DRAIN PLUG FOR ENGINE COOLANT (6.8-L ENGINE)

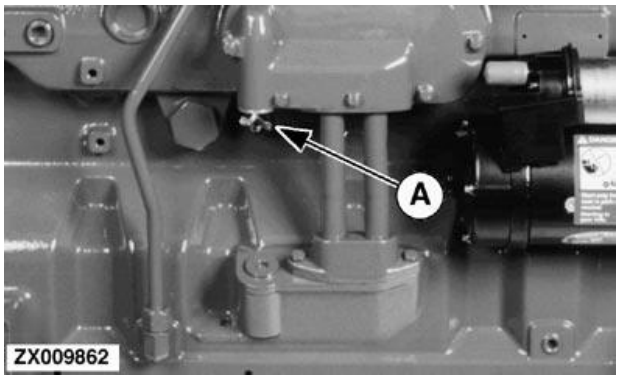
A—In oil cooler inlet line



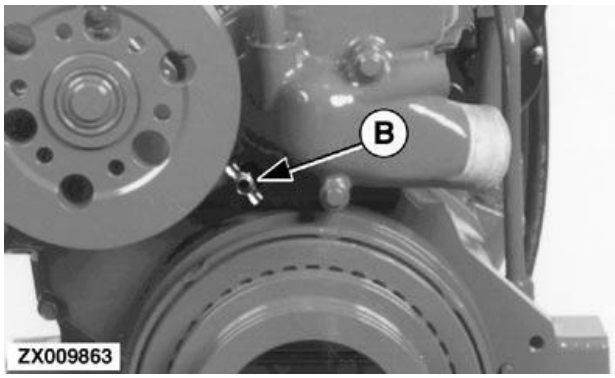
ZX,OMXZCO002110-19-01AUG92

DRAIN VALVES FOR ENGINE COOLANT (8.1-L ENGINE)

A—At r.h. side of cylinder block
B—At coolant pump



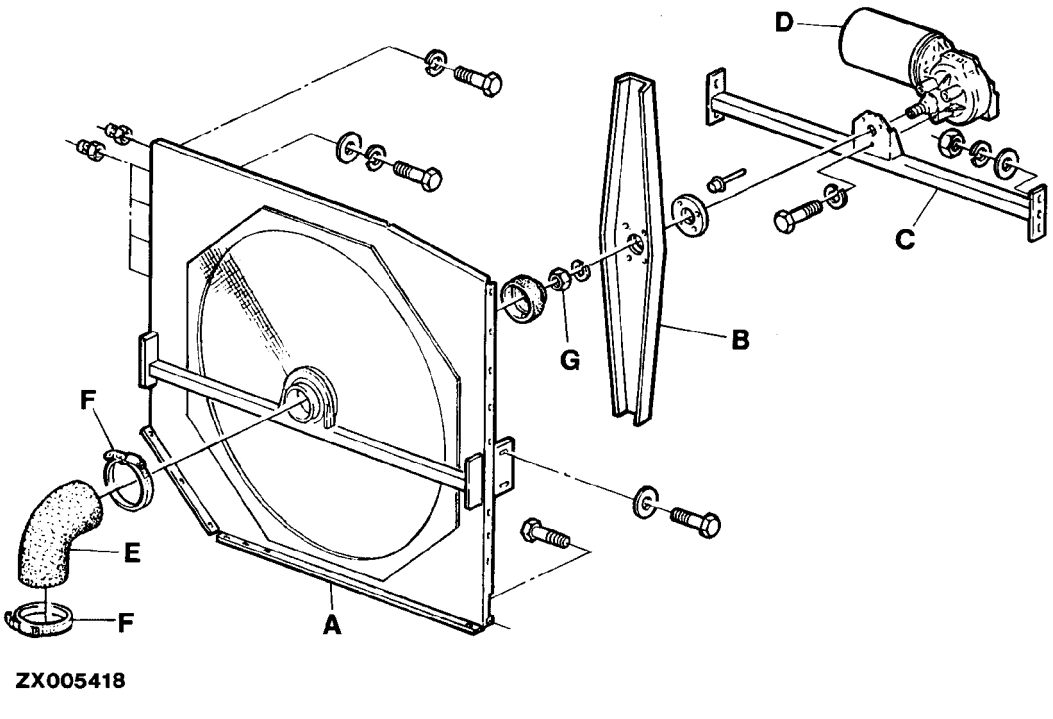
-UN-08NOV96 ZX009862



-UN-08NOV96 ZX009863

ZX,OMXZCO002111-19-01NOV96

SUCTION SYSTEM, EXPLODED VIEW



A—Suction screen
B—Suction blade
C—Crossbeam
D—Electric motor
E—Suction hose
F—Hose clamp
G—Nut

ZX,TMXZCO003934-19-15FEB95

REPLACING SUCTION BLADE

Remove crossbeam.

Remove nut and lift off suction blade.

For installation, reverse removal procedure.

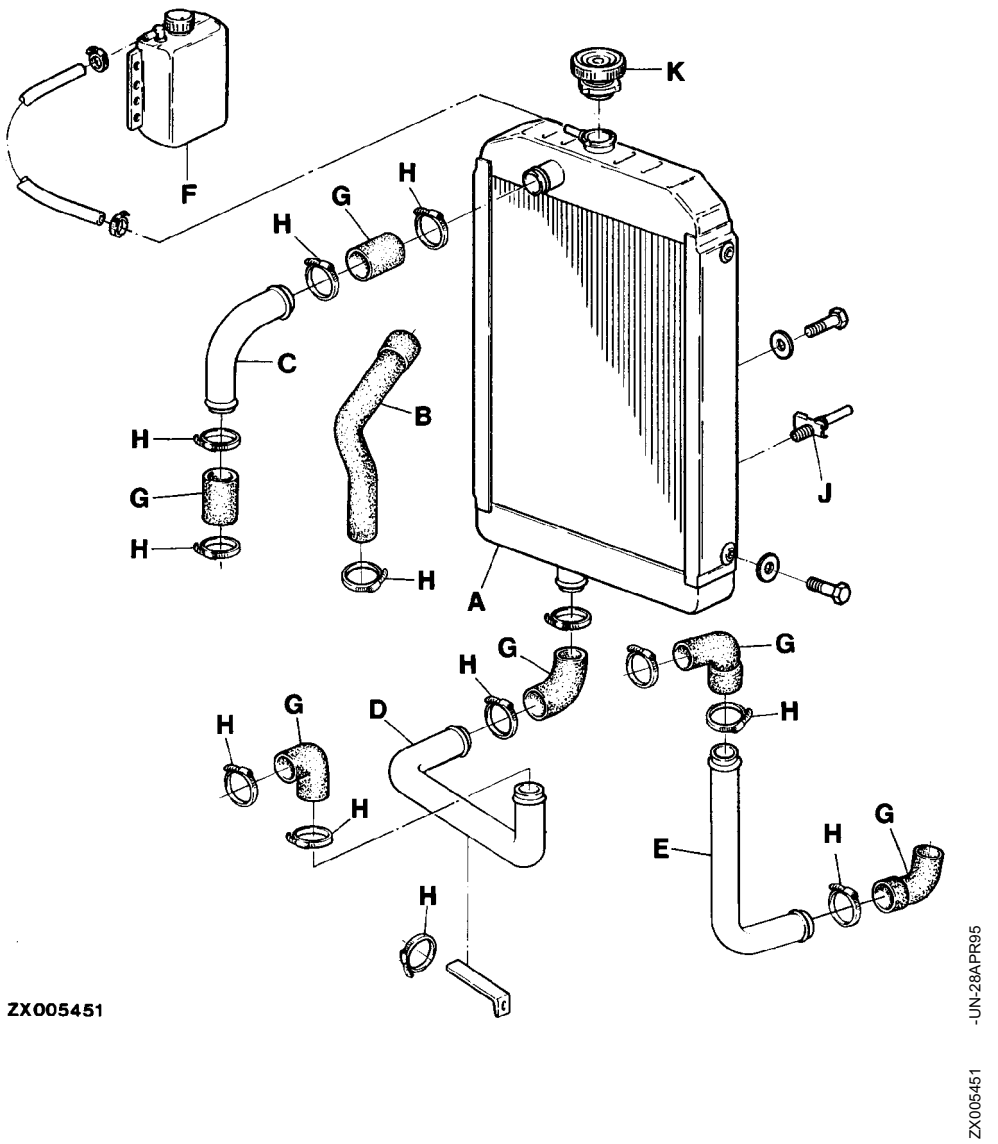
ZX,TMXZCO003935-19-15FEB95

ADJUSTING SUCTION BLADE

Adjust suction blade at crossbeam until a clearance of 7 - 8 mm (0.27 - 0.31 in.) is obtained between blade and suction screen (measured at outer ends of blade).

ZX,TMXZCO003936-19-15FEB95

RADIATOR, EXPLODED VIEW



A—Radiator
B—Hose (2254)
C—Pipe (2256 - 2266)
D—Pipe (2256 - 2266)
E—Pipe (2254)
F—Expansion tank
G—Rubber hose sections
H—Hose clamps
J—Drain tap
K—Radiator cap

ZX,TMXZCO009448-19-01AUG97

REMOVING RADIATOR

Drain coolant.

Disconnect engine coolant connection.

Remove support with fan.

Remove lateral radiator attaching screws (bottom and top).

Pull out radiator from the top.

ZX,TMXZCO003938-19-15FEB95

INSTALLING RADIATOR

For installation, reverse removal procedure.

Check if seals are in good condition. Replace, if necessary.

ZX,TMXZCO003939-19-15FEB95

Section 40
Electrical System

Contents

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Repair kit AZ50578

Connector repair

AZ50578 -UN-12JAN96

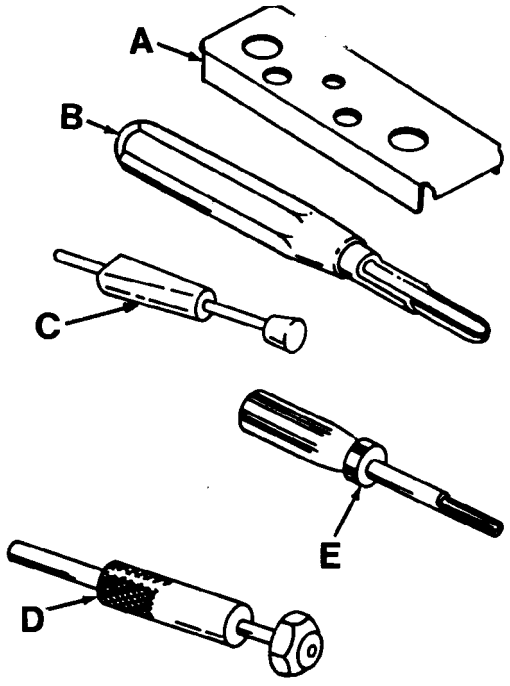
ZX,TMSPFH004747-19-31JAN96

ELECTRICAL REPAIR TOOL KIT

Holding plate for SURE-SEAL™ connectors (A) JDG107
Contact insertion tool (B) JDG139
Contact extraction tool (C) JDG140
Contact extraction tool (D) JDG142
Contact extraction tool (E) JDG143

NOTE: All tools are part of electrical repair tool kit JDG155.

NOTE: SURE-SEAL™ is a trade name of the ITT Cannon company.



Z106569 -UN-28APR95

ZX,TMSPFH000369-19-22SEP95

Connectors/Electrical repair tool kit

T6606AB -UN-23AUG88

Electrical repair tool kit JDG359

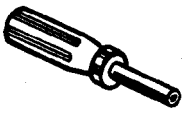
Repairing DEUTSCH connectors

ZX,53T,JDG359 -19-31JAN96

T6606AC -UN-23AUG88

Weatherpack Extraction Tool JDG364

Used to remove contacts from Weatherpack electrical connectors.

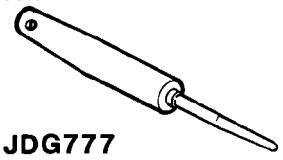


53T,JDG364 -19-20OCT92

JDG777 -UN-12OCT94

Extraction tool JDG777

Removing METRI PACK male or female connectors

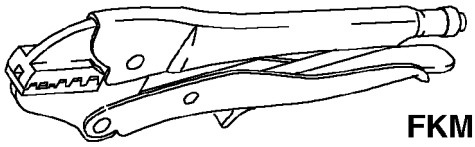


ZX,TMSPFH004748-19-31JAN96

FKM10467 -UN-12JAN96

Crimping pliers FKM10467

For non-insulated electrical connectors

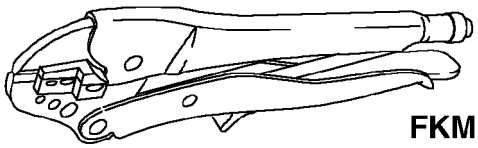


ZX,TMSPFH004749-19-31JAN96

FKM10468 -UN-12JAN96

Crimping pliers FKM10468

For insulated electrical connectors

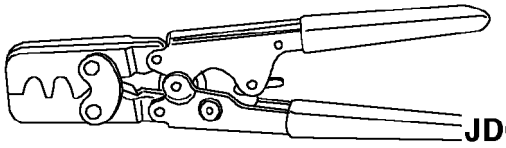


ZX,TMSPFH004750-19-31JAN96

JDG783 -UN-12JAN96

Crimping pliers . . . . . JDG783 or JDG707

For WEATHER PACK connectors

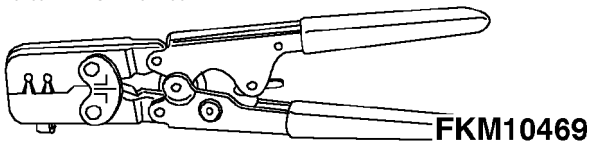


ZX,TMSPFH004751-19-31JAN96

FKM10469 -UN-12JAN96

Crimping pliers FKM10469

For METRI PACK connectors

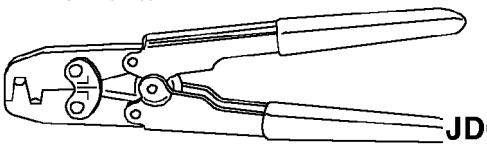


ZX,TMSPFH004752-19-31JAN96

JDG707 -UN-12JAN96

Crimping pliers JDG707

For Schlemmer connectors with a diameter of 3.5 mm (0.14 in.).



ZX,TMSPFH004759-19-31JAN96

ELECTRICAL CONNECTOR HANDLING

Electrical connectors must not be forcibly mated or unmated. All are designed to be mated easily. If you have to use tools, you may be doing something wrong. Prying or forcing connectors may cause permanent damage to the locking mechanism, contacts, or both.

When working on connectors, make sure you are working on the correct terminal. Remember that male and female halves are mirror images of each other. Look for the terminal number on the connector body. The connection of improper electrical circuits can cause unusual electrical symptoms.

When an electrical connector is repaired, it is important that the proper terminals are used. In some of these connectors, different terminals are used to carry different currents. If contacts of different materials are mated, corrosion may develop that could affect performance.

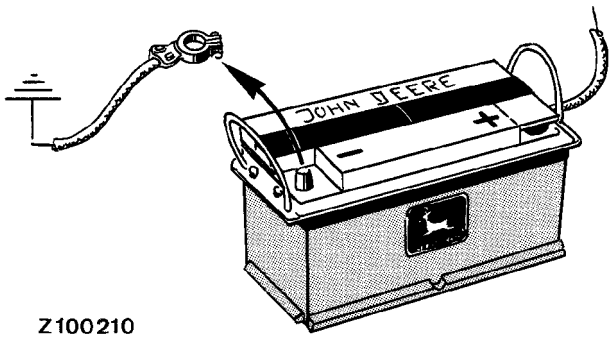
When removing terminals from connectors, it is very important to use the correct extraction tool and gently remove the terminal. The connector body can be damaged if terminals are just “jerked” out of it. The damage caused will prevent the new terminal from staying in the connector, making replacement of the connector body necessary.

When installing a new terminal on a wire, make sure the insulation crimp and wire crimp are both made properly. Each part of the terminal crimps is designed for a specific purpose. Failure to properly crimp the wire contact area can result in poor or no electrical contact. Failure to crimp the insulation support properly can result in problems getting the terminal into the connector body, thus causing premature failure.

HX,1401,4020,H -19-20OCT92

DISCONNECTING ELECTRICAL CIRCUIT

Disconnect battery ground strap before carrying out any electrical repairs on the machine.



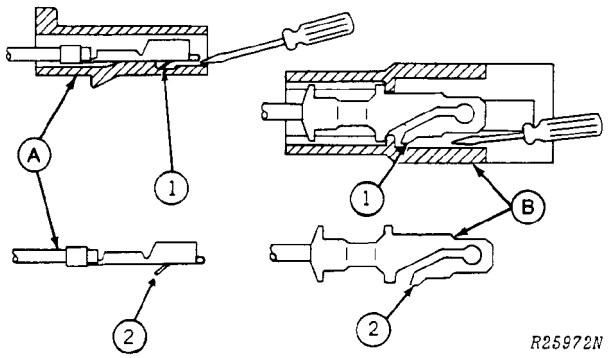
ZX,TMSPFH000370-19-01FEB91

REPLACING CONNECTORS

1. Using a small screwdriver, depress locking tang on terminal. Remove wire from connector.

2. Bend locking tang back in original position before installing new connector body.

A—Female terminal
B—Male terminal



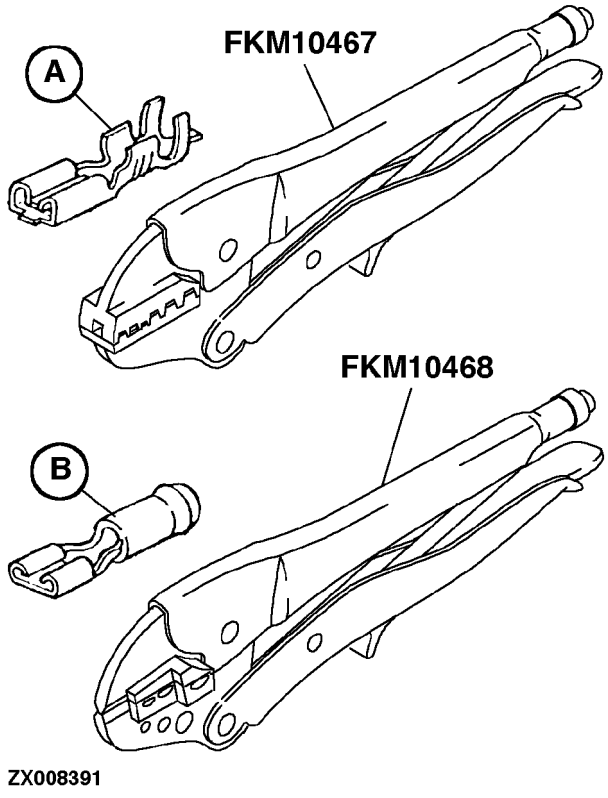
ZX,TMSPFH000371-19-22JUL91

INSULATED AND NON-INSULATED CONNECTORS

1. Remove insulation from end of wire.

2. Install non-insulated connector (A) on wire end, using crimping pliers FKM10467.

3. Install insulated connector (B) on wire end, using crimping pliers FKM10468.



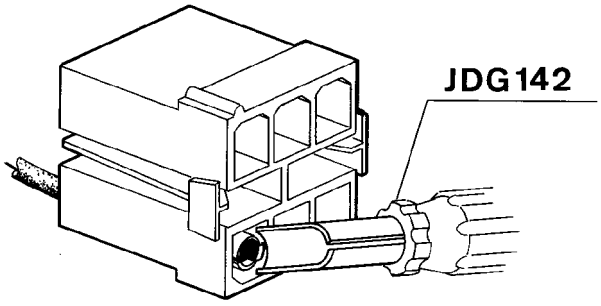
ZX,TMSPFH004753-19-31JAN96

REPLACING SMALL MATE-N-LOK™ CONTACTS IN CONNECTOR HOUSINGS

1. Using extraction tool JDG142, press contact (A) out of connector. Position tool JDG142 opposite the contact slot.

2. Push new contact in connector.

NOTE: MATE-N-LOK™ is a trade name of the AMP company.



-UN-27APR95
ZX001706

ZX,TMSPFH000373-19-22FEB92

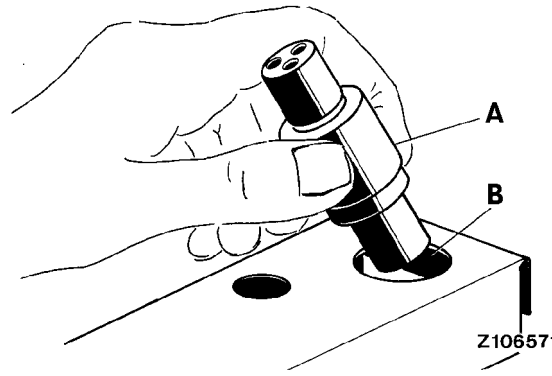
REPLACING SURE-SEAL™ CONNECTOR BODIES

1. Pull out all wires from defective connector body.

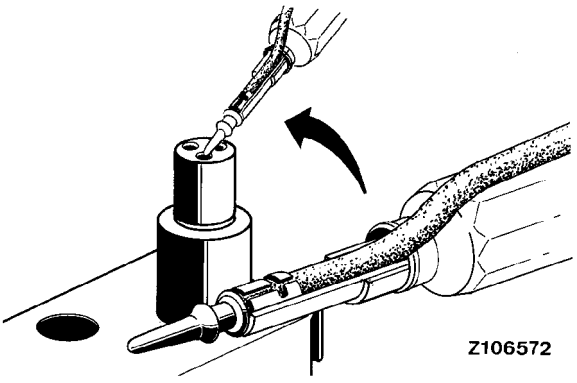
2. Put both new connector body halves together.

3. Place connector body (A) in relevant bore (B) of holding plate JDG107.

4. Using insertion tool JDG139, press individual contacts into connector body.



-UN-27APR95
Z106571



-UN-27APR95
Z106572

ZX,TMSPFH000374-19-22FEB92

REPLACING MATE-N-LOK™ AND CPC™ PIN AND SOCKET CONTACTS

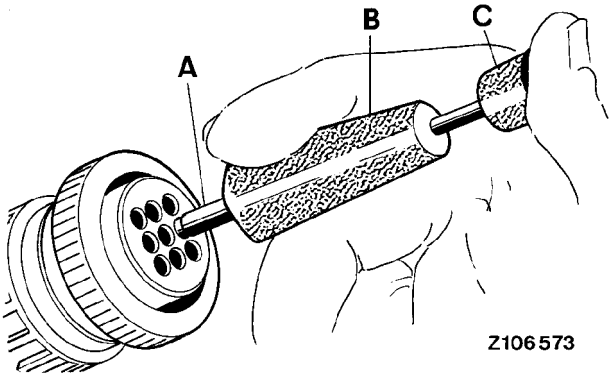
1. Depending upon type of connector, select correct extraction tool (JDG140 or JDG143).

2. Slide sleeve (A) of extraction tool over contact.

3. Turn hand grip (B) to disconnect contact and press out by means of knob (C).

4. Install new contact in plug.

NOTE: MATE-N-LOK™ AND CPC™ are trade names of the AMP company.



ZX,TMSPFH000375-19-22FEB92

REPLACING DEUTSCH™ CONNECTORS

1. Select an extraction tool suitable for the size of the cable to be removed.

a. Extraction tool JDG361 for size 2.5 mm^2 (12 to 14 AWG).
b. Extraction tool JDG362 for size 1.0 mm^2 (16 to 18 AWG).
c. Extraction tool JDG363 for size 0.5 mm^2 (20 AWG).

2. Position extraction tool against cable as shown in illustration.

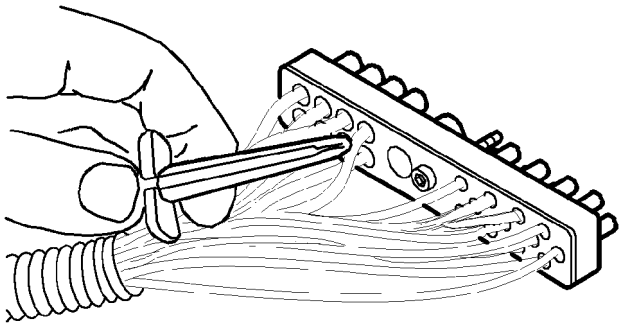
3. Slide extraction tool to the rear along the cable until the tip of the tool engages in the cable.

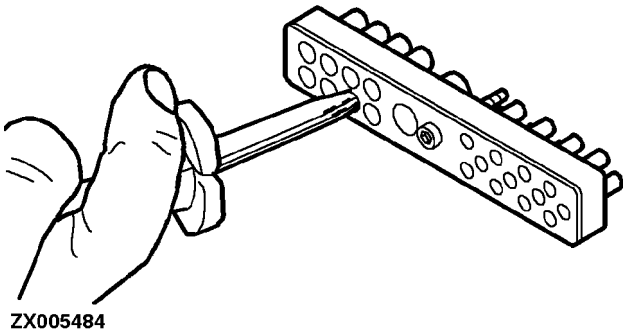
IMPORTANT: When inserting the tool into the connector, take care NOT to twist the tool.

4. Slide the extraction tool along the cable into the connector until it is located over the contact.

5. Remove the cable from the connector using the extraction tool.

NOTE: DEUTSCH is a trade name of DEUTSCH CO.





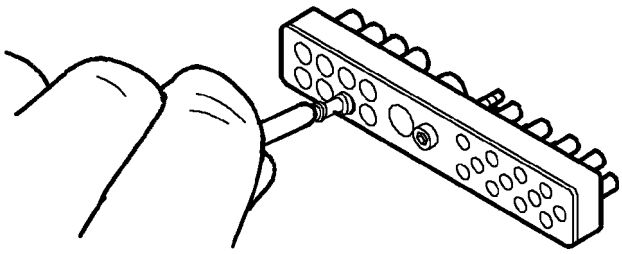
ZX,TMXZCO003994-19-31JAN96

IMPORTANT: Using a sleeve of the appropriate size, insert the contact at the correct location.

6. Slide contact into the pin-and-socket contact until resistance is encountered.

7. Check that the contact is seated firmly in the pin-and-socket contact by pulling gently on the cable.

8. In the same way, insert the remaining cables into the new pin-and-socket contact.



ZX005485

ZX005485 -UN-03MAY95

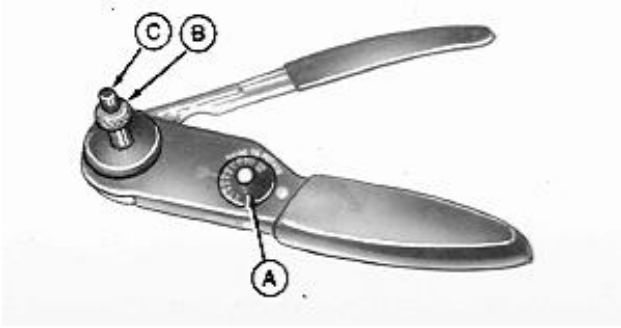
ZX,TMXZCO003995-19-28FEB95

INSTALL DEUTSCH CONTACT

1. Strip 6 mm (1/4 in.) insulation from wire.

2. Adjust selector (A) on JDG360 Crimper for correct wire size.

3. Loosen lock nut (B) and turn adjusting screw (C) in until it stops.



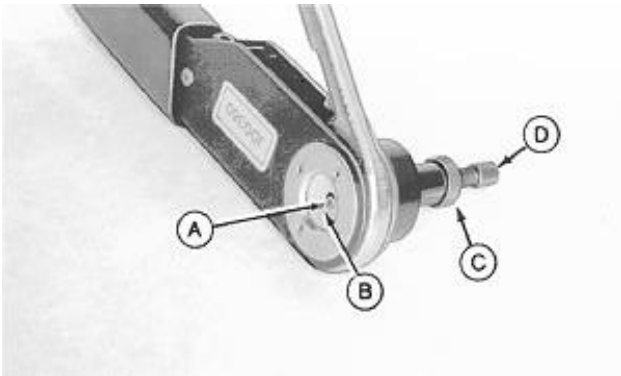
TS117 -UN-23AUG88

DX,ECONN,W -19-04JUN90

IMPORTANT: Select proper size contact "sleeve" or "pin" to fit connector body.

4. Insert contact (A) and turn adjusting screw (D) until contact is flush with cover (B).

5. Tighten lock nut (C).



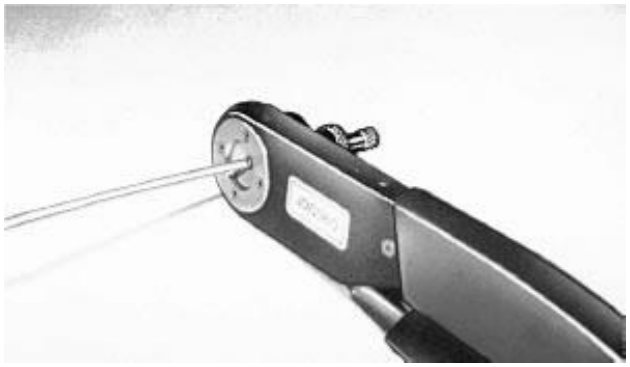
TS0134 -UN-23AUG88

DX,ECONN,X -19-04JUN90

IMPORTANT: Contact must remain centered between indentors while crimping.

6. Insert wire in contact and crimp until handle touches stop.

7. Release handle and remove contact.



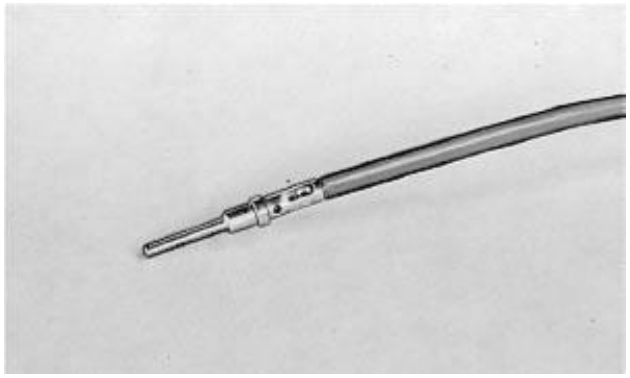
TS118 -UN-23AUG88

DX,ECONN,Y -19-04JUN90

IMPORTANT: If all wire strands are not crimped into contact, cut off wire at contact and repeat contact installation procedures.

NOTE: Readjust crimping tool for each crimping procedure.

8. Inspect contact to be certain all wires are in crimped barrel.



TS0135 -UN-23AUG88

DX,ECONN,Z -19-04JUN90

REPLACE WEATHER PACK™ CONNECTOR

IMPORTANT: Identify wire color locations with connector terminal letters.

1. Open connector body.

2. Insert JDG364 Extraction Tool over terminal contact in connector body.

3. Hold extractor tool fully seated and pull wire from connector body.

NOTE: If terminal cannot be removed, insert wire or nail through extractor tool handle and push terminal contact from connector.

TS0128 -UN-23AUG88

WEATHER PACK is a trademark of PACKARD ELECTRIC

DX,ECONN,O -19-03NOV94

IMPORTANT: Carefully spread contact lances to assure good seating on connector body.

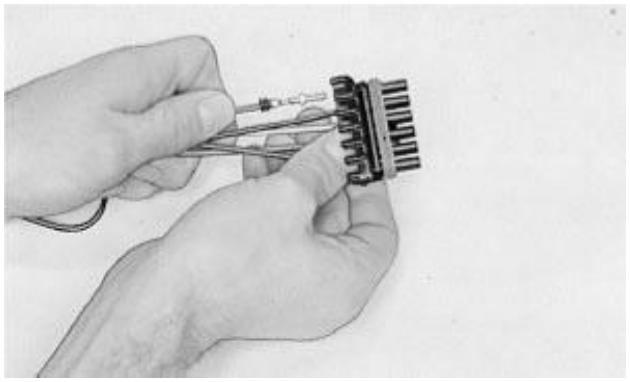
NOTE: Connector bodies are "keyed" for proper contact mating. Be sure contacts are in proper alignment.

4. Push contact into new connector body until fully seated.

5. Pull on wire slightly to be certain contact is locked in place.

6. Transfer remaining wires to correct terminal in new connector.

7. Close connector body.



TS0130 -UN-23AUG88

DX,ECONN,R -19-04JUN90

WEATHER PACK MALE AND FEMALE CONNECTORS

NOTE: Wire seals are color coded for three sizes of wire:

- Green - Wire size 0.75 mm^2 (18 to 20 AWG)
- Grey - Wire size 1.5 mm^2 (14 to 16 AWG)
- Blue - Wire size 4.0-6.0 mm^2 (10 to 12 AWG)

1. Slip correct size seal on wire.

IMPORTANT: The seal must fit snug over the wire insulation, without a gap between the seal and the insulation.

2. Strip insulation from wire to expose 6 mm (1/4 in.) length of wire. Align seal with edge of insulation.

TS0136 -UN-23AUG88

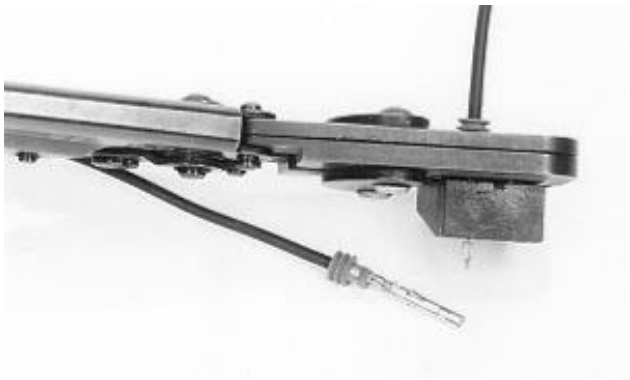
ZX,15004005,3 -19-31JAN96

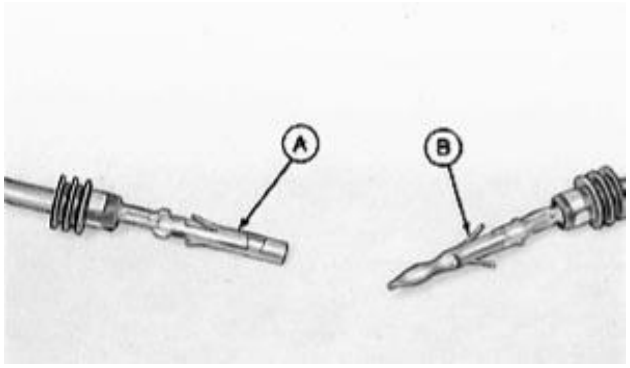
3. Put proper size contact on wire and crimp in place, using crimping pliers JDG783.

4. Seal is crimped in place together with the wire in a one-step action, using crimping pliers JDG783.

NOTE: When using crimping pliers JDG707, crimping is a two-step action. Use lower recess to crimp wire and upper recess to crimp seal.

IMPORTANT: The illustration shows proper installation of sleeve (A) and pin (B).


TS1623 -UN-02NOV94



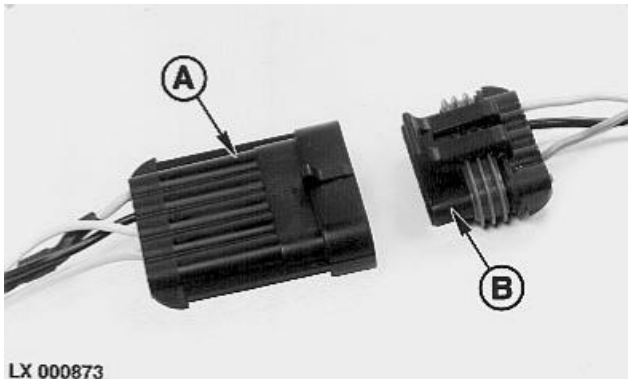
TS0139 -UN-02DEC88

ZX,ECONN,AB -19-31JAN96

REPLACING METRI PACK CONNECTORS[1]

NOTE: 4 to 6-pin connectors are installed on the machines.

A—Male terminal
B—Female terminal



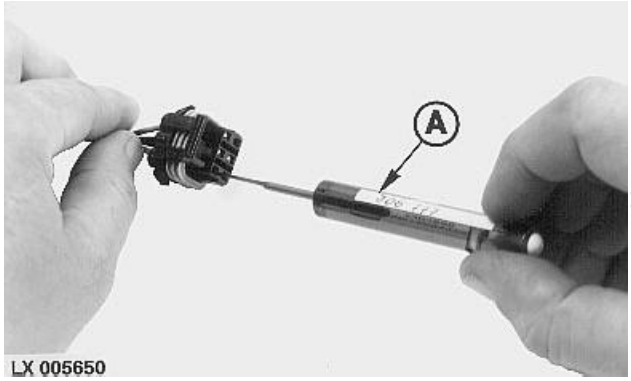
LX000873 -UN-26APR95

[1] METRI PACK is a trade name of the PACKARD ELECTRIC company

ZX,TMXZCO004127-19-22SEP95

Removing Male or Female Terminal

A—JDG777[1]



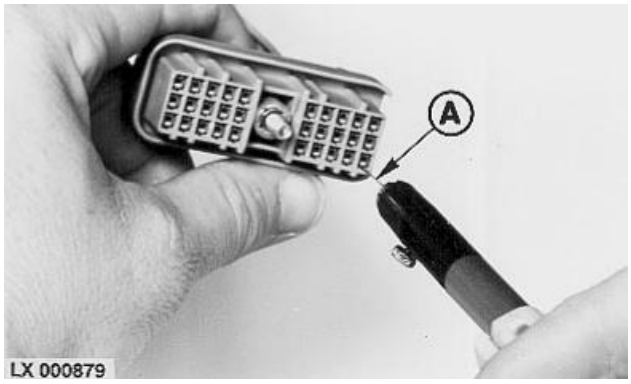
LX005650 -UN-12OCT94

[1] For METRI PACK connectors, 150 series

LX,40,05004247 -19-01MAR93

Removing a Female Terminal on Multiple-Pin Connectors for Electronic Units

Using a pointed tool (A), depress locking tang and pull out terminal.



-UN-26APR95
LX000879

ZX,TMSPFH004761-19-31JAN96

Installing METRI PACK Male or Female Terminal

NOTE: Wire seals are color coded for three sizes of wire:

- Green - Wire size 0.75 mm^2 (18 to 20 AWG)
- Grey - Wire size 1.5 mm^2 (14 to 16 AWG)
- Blue - Wire size 4.0-6.0 mm^2 (10 to 12 AWG)

NOTE: On multiple-pin connectors of electronic units, seal is installed in connector housing.

1. Slip correct size seal on wire.

IMPORTANT: The seal must fit snug over the wire insulation, without a gap between the seal and the insulation.

2. Strip insulation from wire to expose 6 mm (1/4 in.) length of wire. Align seal with edge of insulation.

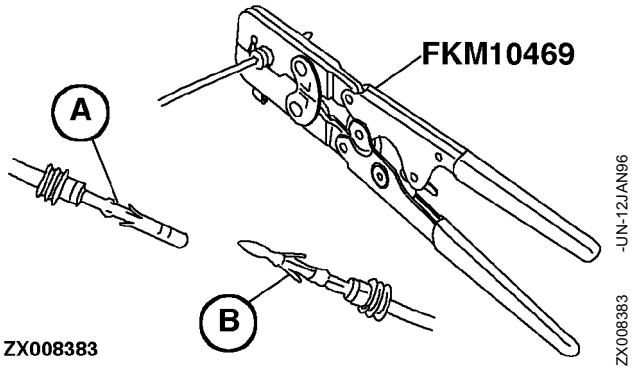
-UN-23AUG88
TS0136

ZX,TMSPFH004754-19-31JAN96

NOTE: On multiple-pin connectors of electronic units, first insert wire through connector housing before crimping contact.

3. Put proper size contact (A) or (B) on wire and crimp in place, using crimping pliers FKM10469.

4. Seal is crimped in place together with the wire in a one-step action, using crimping pliers FKM10469.



ZX,TMSPFH004760-19-31JAN96

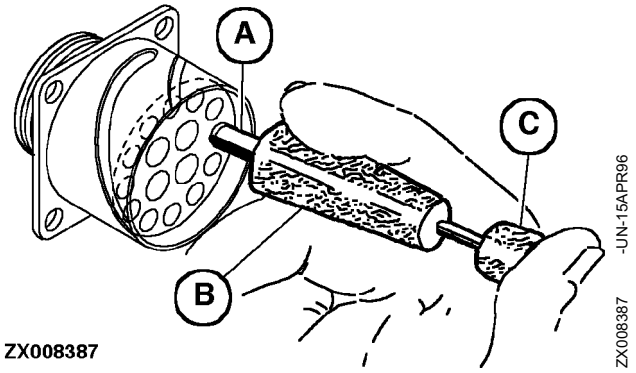
REPLACING SCHLEMMER™ CONNECTORS

1. Depending on contact used, select proper extraction tool (JDG140 or JDG143).

2. Slide sleeve (A) of extraction tool over contact.

3. Loosen contact by turning handle (B) and push it out, using button (C).

NOTE: SCHLEMMER is a trade name of Josef Schlemmer GmbH.

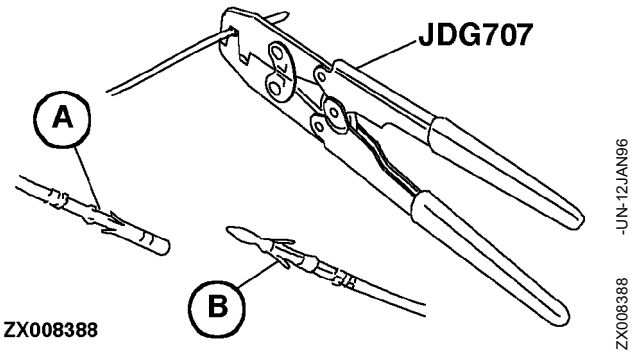


ZX,TMSPFH004762-19-31JAN96

4. Put a new proper size contact (A) or (B) on wire and crimp in place, using crimping pliers (JDG707 or FKM10467):

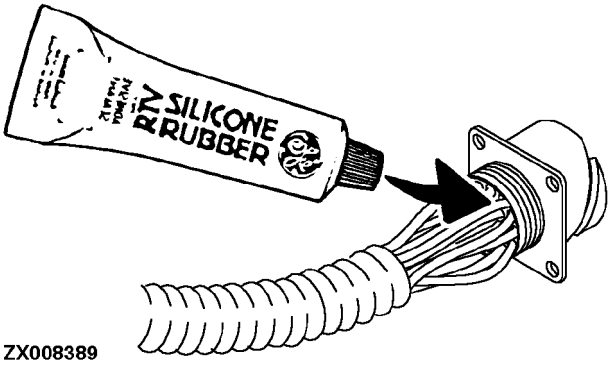
- JDG707 for contact with 3.5 mm (0.14 in.) dia.
- FKM10467 for contact with 1.6 mm (0.06 in.) dia.

5. Install contact in connector housing.



ZX,TMSPFH004763-19-31JAN96

6. Apply sealant at locations where wires enter connector housing.



ZX,TMSPFH004764-19-31JAN96

GENERAL INFORMATION

CAUTION: Before working on the electrical system, always disconnect the battery ground cable.

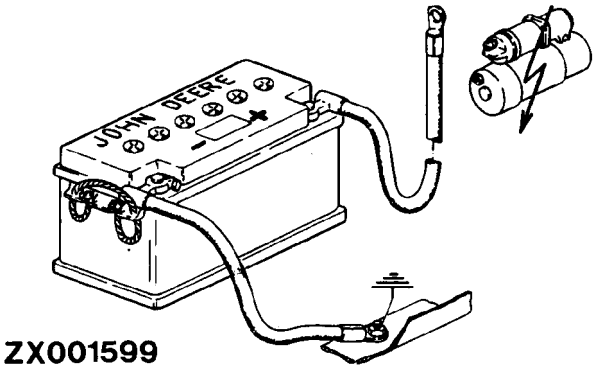
NOTE: Refer to relevant component manual for information on repairing the alternator and starting motor.

ZX,TMXZCO003940-19-15FEB95

INSTALLING BATTERIES AND CONNECTING TO CORRECT POLES

IMPORTANT: Make sure batteries are connected to the correct poles. The positive cable (from starter motor) to the positive (+) poles, the negative cable (from ground) to the negative (—) poles.

Reversed polarity will result in permanent damage to the electrical system.



ZX001599

ZX001599 -UN-04APR95

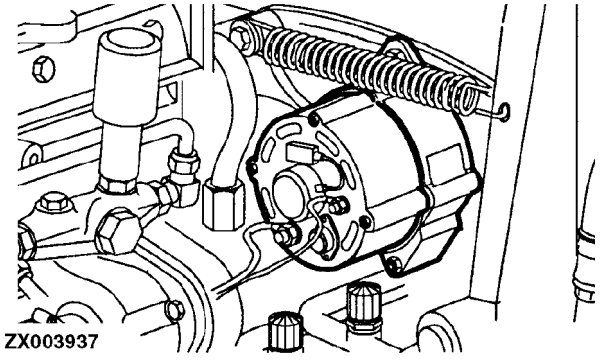
ZX,OMXZCO002185-19-05OCT92

REMOVING THE ALTERNATOR

Disconnect ground cable from battery.

Disconnect cables “B+” and “D+”.

Loosen attaching screws and lift out alternator.


ZX003937

ZX003937 -UN-08MAY95

ZX,TMXZCO003941-19-15FEB95

REPAIRING THE ALTERNATOR

NOTE: Refer to relevant component manual for information on repairing the alternator.

ZX,TMXZCO003942-19-15FEB95

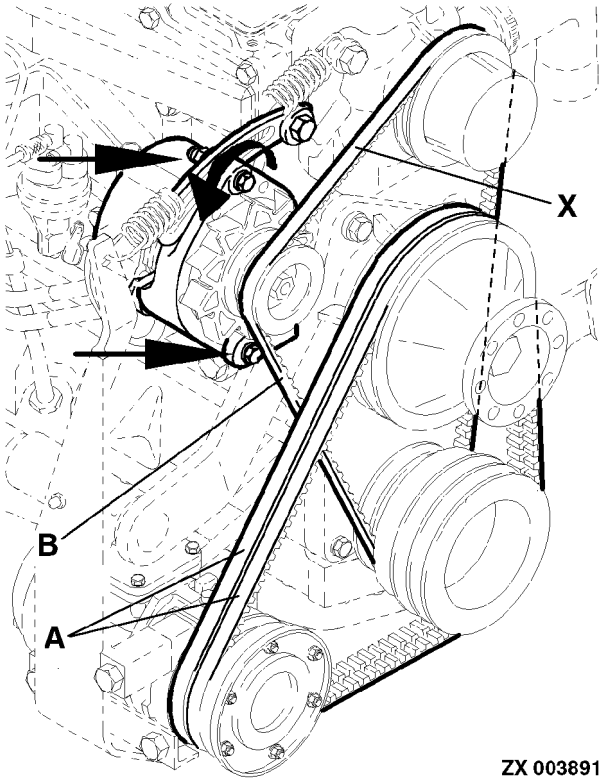
DRIVE BELTS (6.8-L ENGINE)

IMPORTANT: Belts must be cool when tension is adjusted. Exert pressure on mounting brackets only.

To retension, slacken off attaching and adjusting screws. Pull alternator outwards. Tighten screws.

Check tension of belt (B) at point (X). Flexion on the belt should not exceed 5 mm (0.2 in.).

A—Drive belts for fan (2 x) and air conditioning compressor (if equipped)
B—Drive belts for coolant pump and alternator



ZX,OMXZCO002113-19-02MAR95

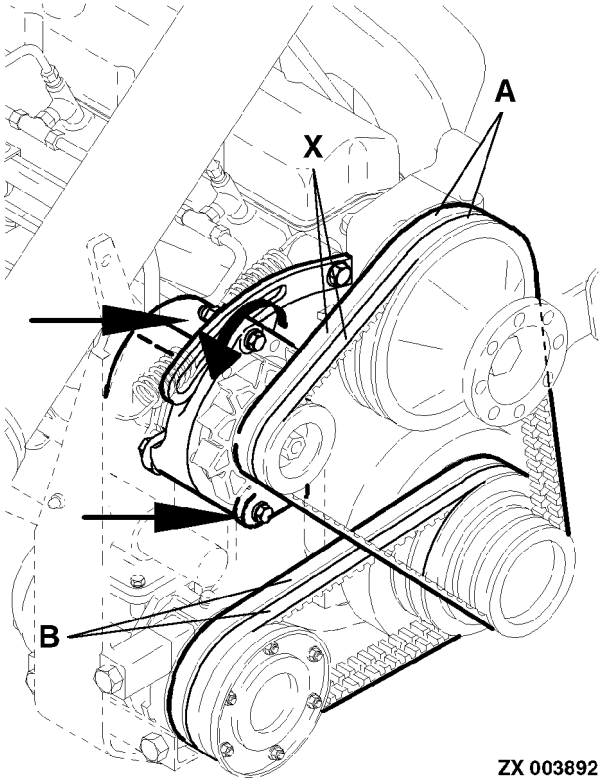
DRIVE BELTS (8.1-L ENGINE)

IMPORTANT: Belts must be cool when tension is adjusted. Exert pressure on mounting brackets only.

To retension, slacken off attaching and adjusting screws. Pull alternator outwards. Tighten screws.

Check tension of belt (A) at point (X). Flexion on the belt should not exceed 5 mm (0.2 in.).

A—Drive belt for fan and alternator
B—Drive belt for air conditioning compressor (if equipped)



ZX,OMXZCO002114-19-01NOV96

STARTING MOTOR

IMPORTANT: When working on the electrical system, always disconnect the ground cable. This prevents damage from occurring.

If the starting motor does not function or operates only sluggishly, the fault may lie not in the starting motor but in one of the causes suggested below.

Loose, dirty or corroded connections: Clean and tighten all connections.

Low battery output: Check electrolyte level and specific gravity of batteries. Recharge batteries if necessary.

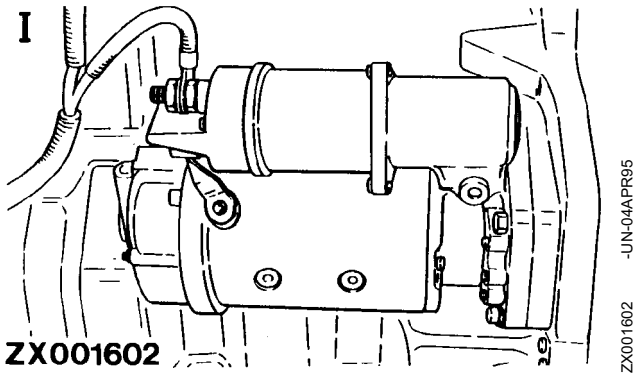
Run down battery: Recharge battery.

Engine crankcase oil of wrong viscosity: Drain and refill crankcase with specified oil.

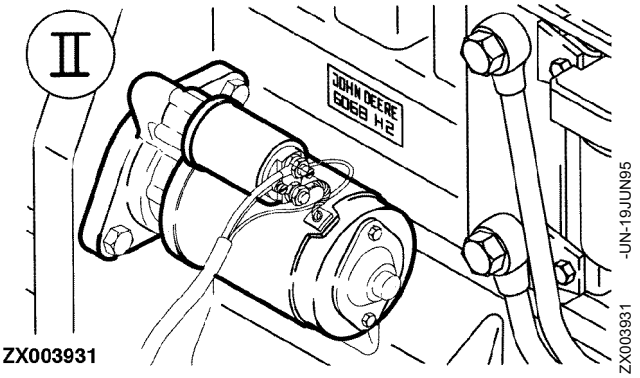
Low ambient temperature: Use cold-weather starting aid.

Defective start safety relay: Replace relay.

If the remedies suggested above fail to improve starting motor operation, remove motor and replace it with a new one.



From front, looking back



From rear, looking forward

I—8.1-L engine (495 cu in.)
II—6.8-L engine (414 cu in.)

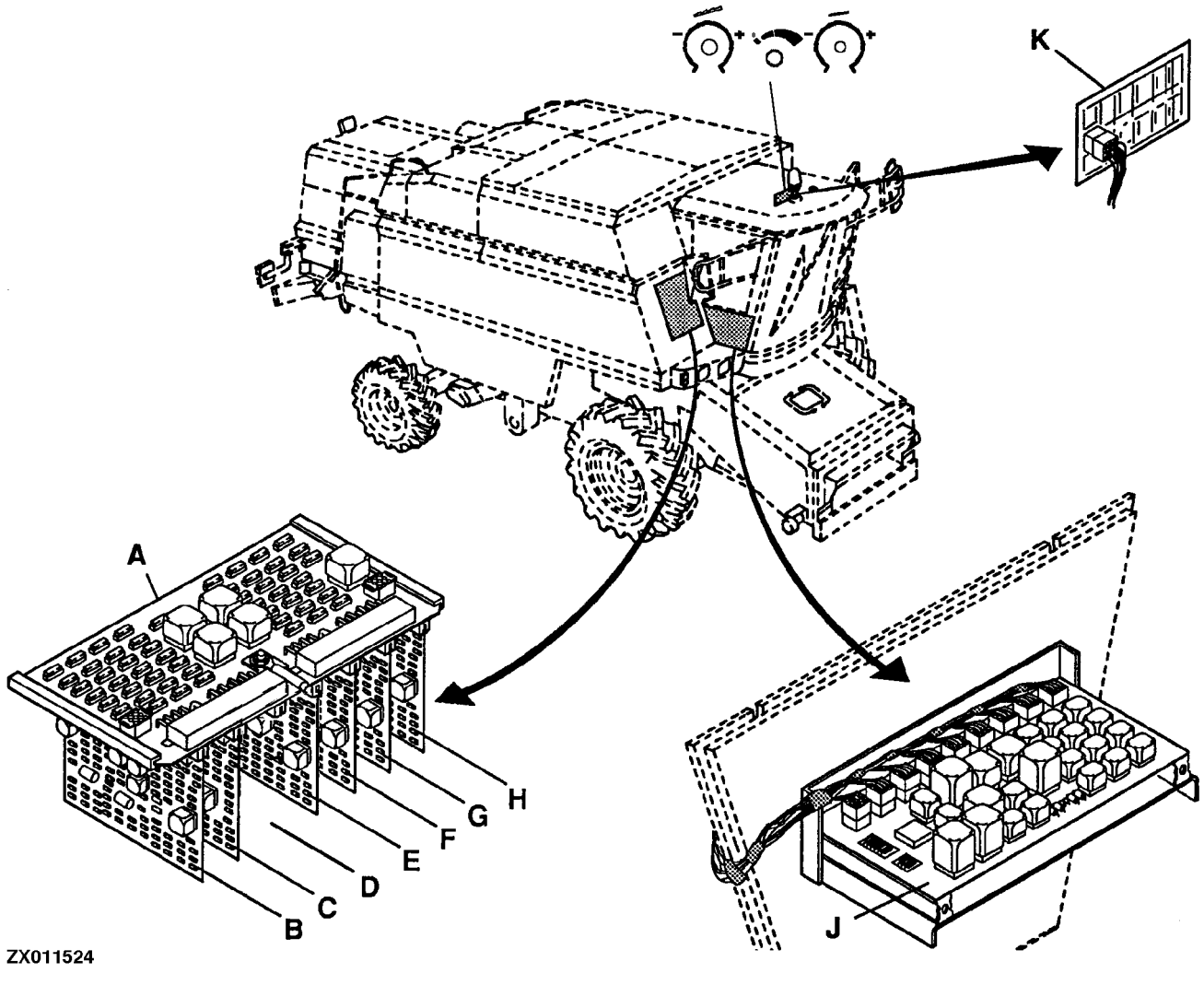
ZX,TMXZCO009449-19-01AUG97

REPAIRING THE STARTING MOTOR

NOTE: For instructions on how to repair the starting motor, refer to Component Technical Manual.

ZX,TMXZCO009450-19-01AUG97

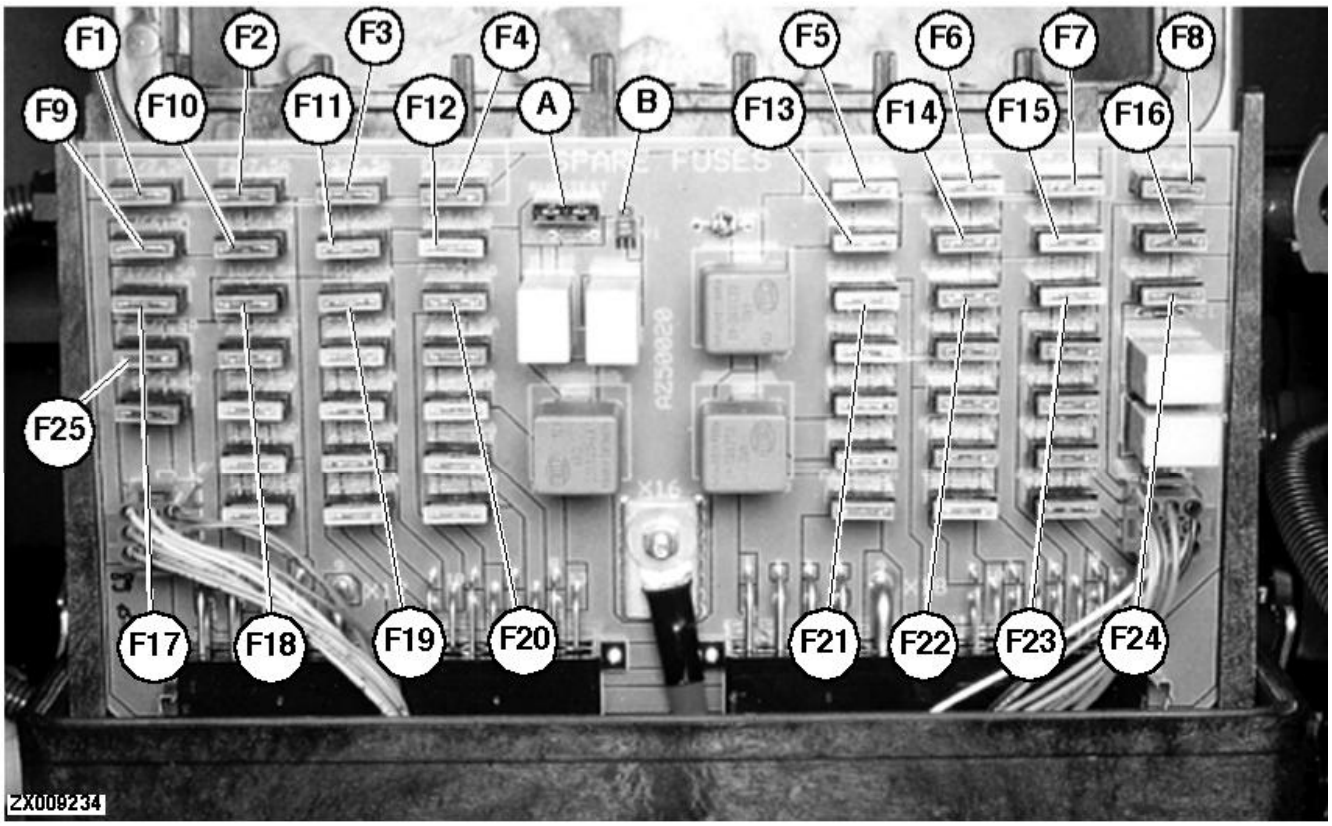
ELECTRONIC BOARDS



A—Fuse board
B—Speed monitoring board
C—Reel function resume control board
D—Not used
E—ContourMaster control board
F—Reel speed board
G—Combine data center control board
H—Relay board
J—Relay diode board
K—Harvest performance monitor board

ZX,OMXZCO002188-19-01NOV97

FUSES ON FUSE BOARD



A—Fuse tester

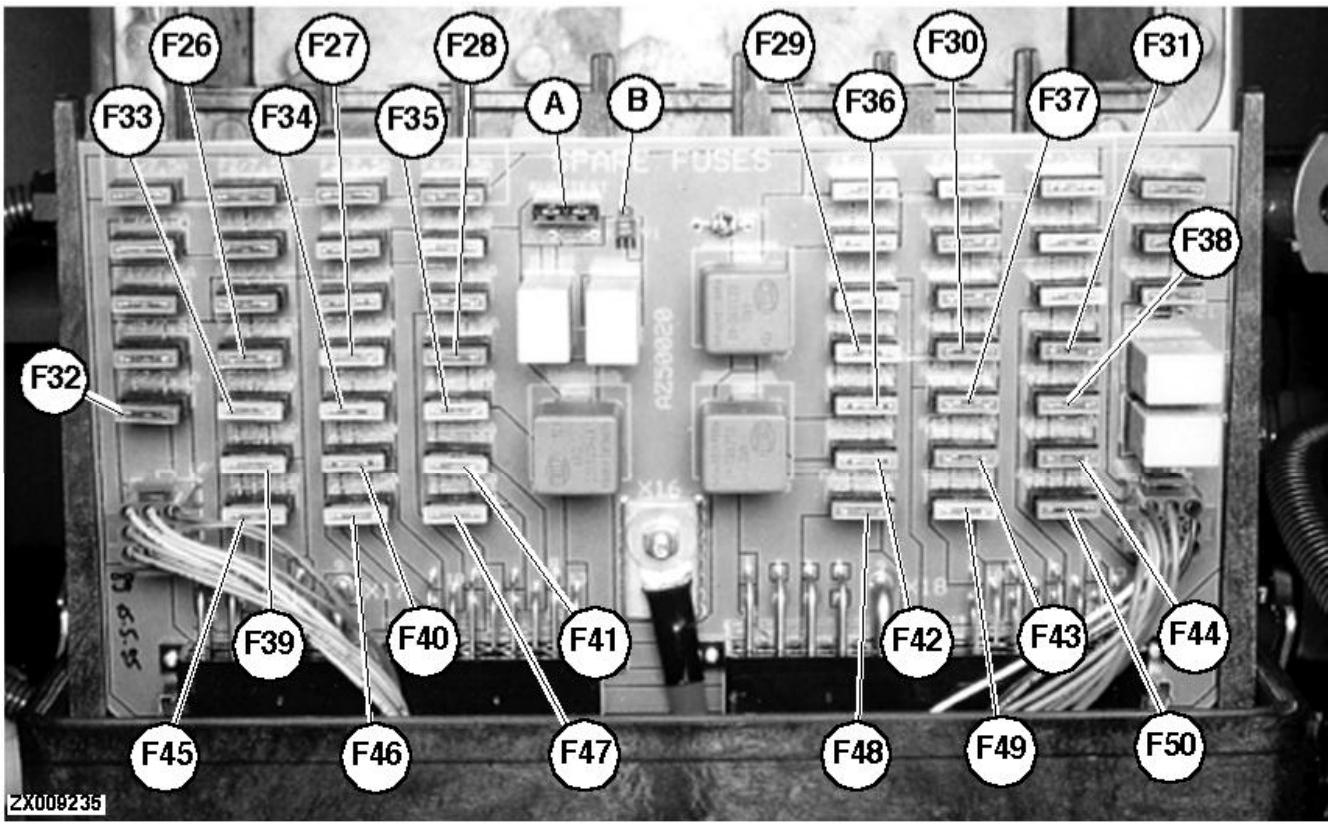
B—Luminous diode

F 1 — 7.5 A fuse, spare
F 2 — 7.5 A fuse, spare
F 3 — 7.5 A fuse, spare
F 4 — 7.5 A fuse, spare
F 5 — 15 A fuse, spare
F 6 — 15 A fuse, spare
F 7 — 30 A fuse, spare
F 8 — 7.5 A fuse, fan and cylinder speed adjustment
F 9 — 7.5 A, fuse, right parking light
F 10 — 7.5 A fuse, left parking light
F 11 — 30 A fuse, fan adjustment
F 12 — 15 A fuse, brake lights, reel speed adjustment
F 13 — 30 A fuse, work lights on cab roof
F 14 — 7.5 A, fuse, straw warning device, electronic infotrak monitor
F 15 — 15 A fuse, chopper distributor adjustment
F 16 — 7.5 A fuse, engine shut-off solenoid
F 17 — 7.5 A fuse, dash panel lighting
F 18 — 7.5 A fuse, radio, CB, clock
F 19 — 30 A fuse, work lights on platform and rear lights
F 20 — 7.5 A fuse, turn signals
F 21 — 15 A fuse, radiator cleaner
F 22 — 7.5 A fuse, radio, CB, clock
F 23 — 15 A fuse, separator and header clutch
F 24 — 7.5 A fuse, indicator lights, temperature gauge
F 25 — 7.5 A fuse, left low-beam

IMPORTANT: Never use fuses stronger than those specified. If fuses keep blowing in one circuit, have the electrical system inspected by your John Deere dealer.

ZX,OMXZCO002189-19-02MAY96

FUSES ON FUSE BOARD (CONTINUED)



A—Fuse tester

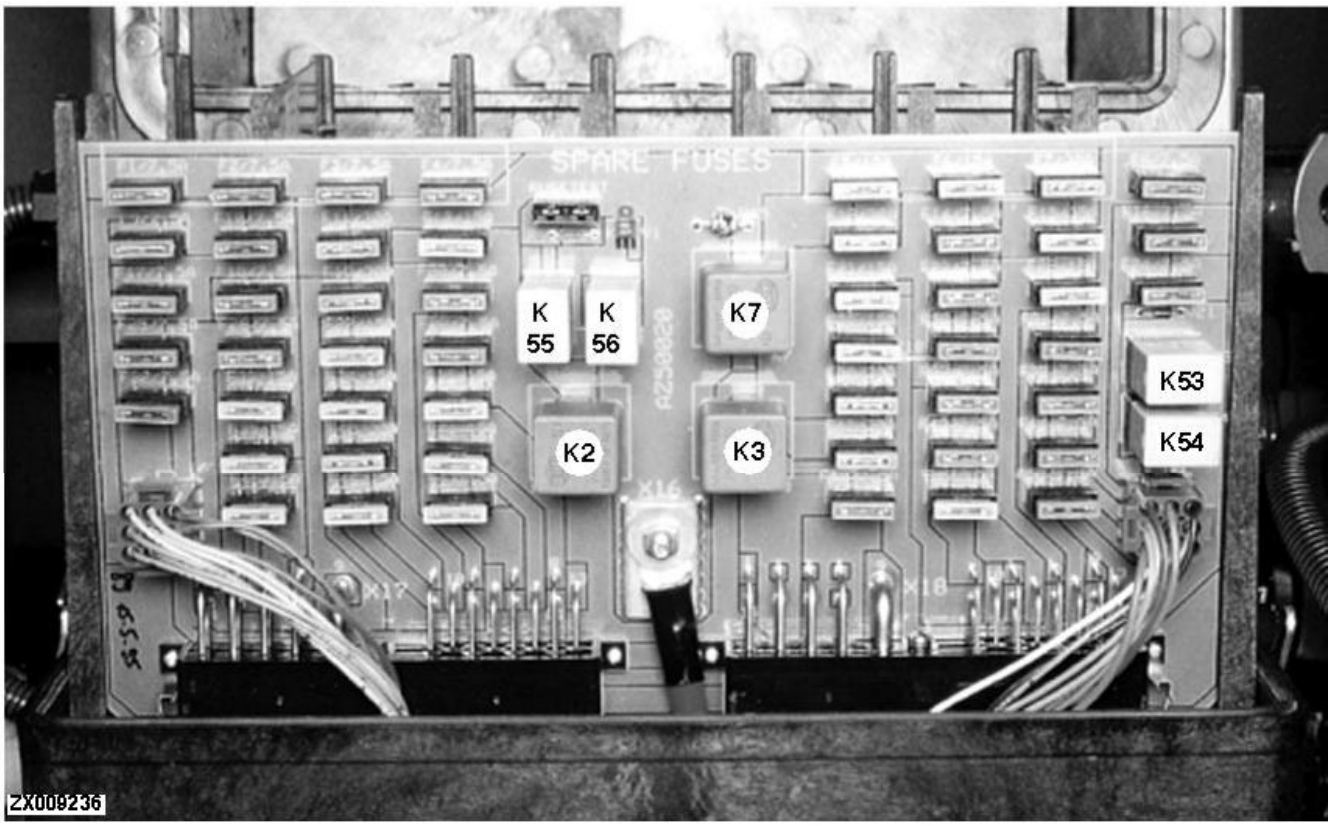
B—Luminous diode

F 26 — 7.5 A fuse, cutting platform controls
F 27 — 15 A fuse, horn
F 28 — 7.5 A fuse, combine data center
F 29 — 15 A fuse, combine leveling system
F 30 — 7.5 A fuse, four-wheel drive
F 31 — 7.5 A fuse, speed monitoring system
F 32 — 7.5 A fuse, right-hand low beam
F 33 — 15 A fuse, raising/lowering header
F 34 — 15 A fuse, hazard warning flashers
F 35 — 15 A fuse, beacon lights
F 36 — 30 A fuse, windshield wipers, grain tank light
F 37 — 7.5 A fuse, adjustable mirror
F 38 — 7.5 A fuse, harvest performance monitor
F 39 — 15 A fuse, grain tank unloading system
F 40 — 30 A fuse, starter switch
F 41 — 15 A fuse, concave adjustment
F 42 — 30 A fuse, air conditioning system
F 43 — 7.5 A fuse, DIAL-A-MATIC™
F 44 — 7.5 A fuse, left-hand high beam
F 45 — 15 A fuse, reel control
F 46 — 15 A fuse, starting aid
F 47 — 15 A fuse, spare
F 48 — 7.5 A fuse, D+ alternator
F 49 — 15 A fuse, cigarette lighter, power outlets, seat compressor
F 50 — 7.5 A fuse, right-hand high beam

IMPORTANT: Never use fuses stronger than those specified. If fuses keep blowing in one circuit, have the electrical system inspected by your John Deere dealer.

ZX,OMXZCO002190-19-02MAY96

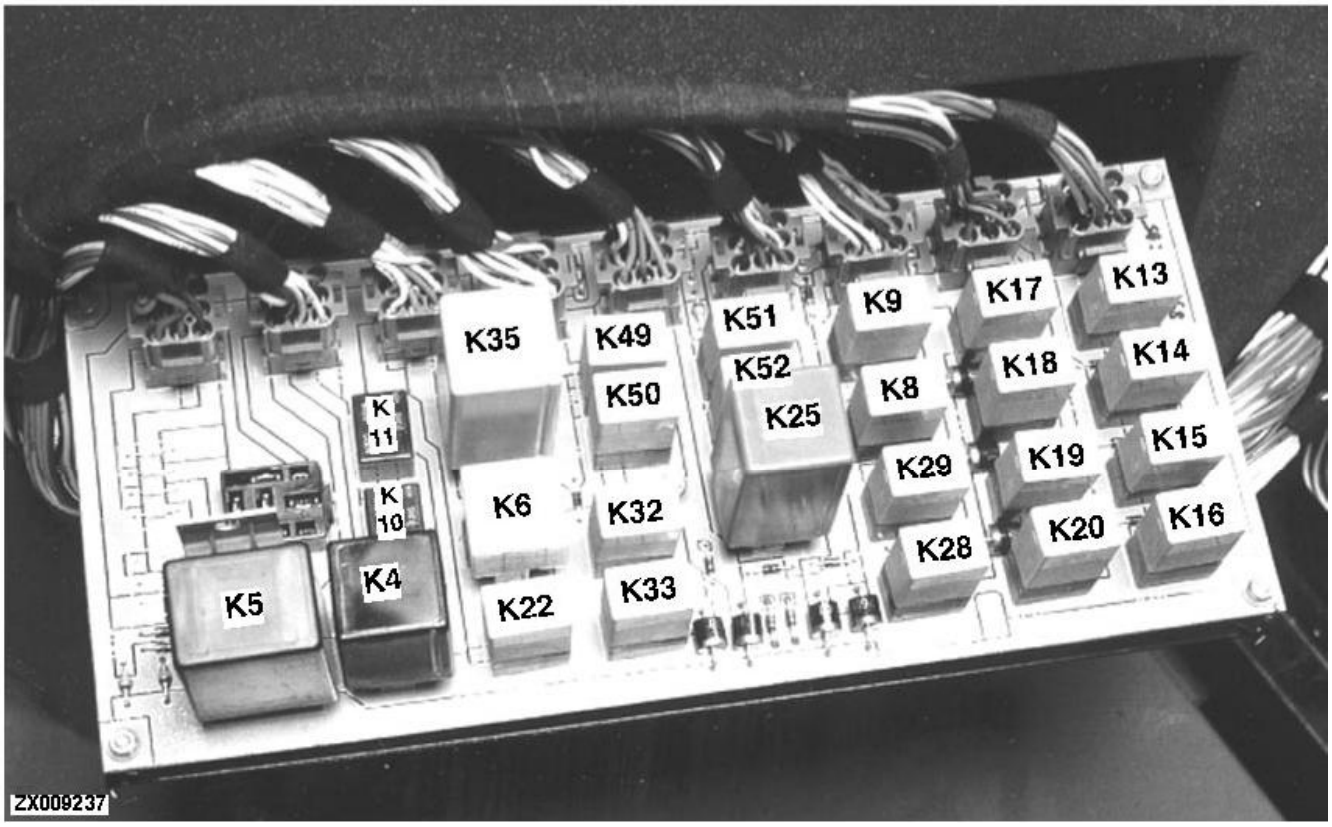
RELAYS ON FUSE BOARD, FROM SERIAL NO. 064253



K 2 — Basic relay
K 3 — Basic relay
K 7 — Work light relay
K 53 — Field/road relay
K 54 — Field/road relay
K 55 — Separator clutch relay
K 56 — Separator clutch relay

ZX,OMXZCO002191-19-01SEP96

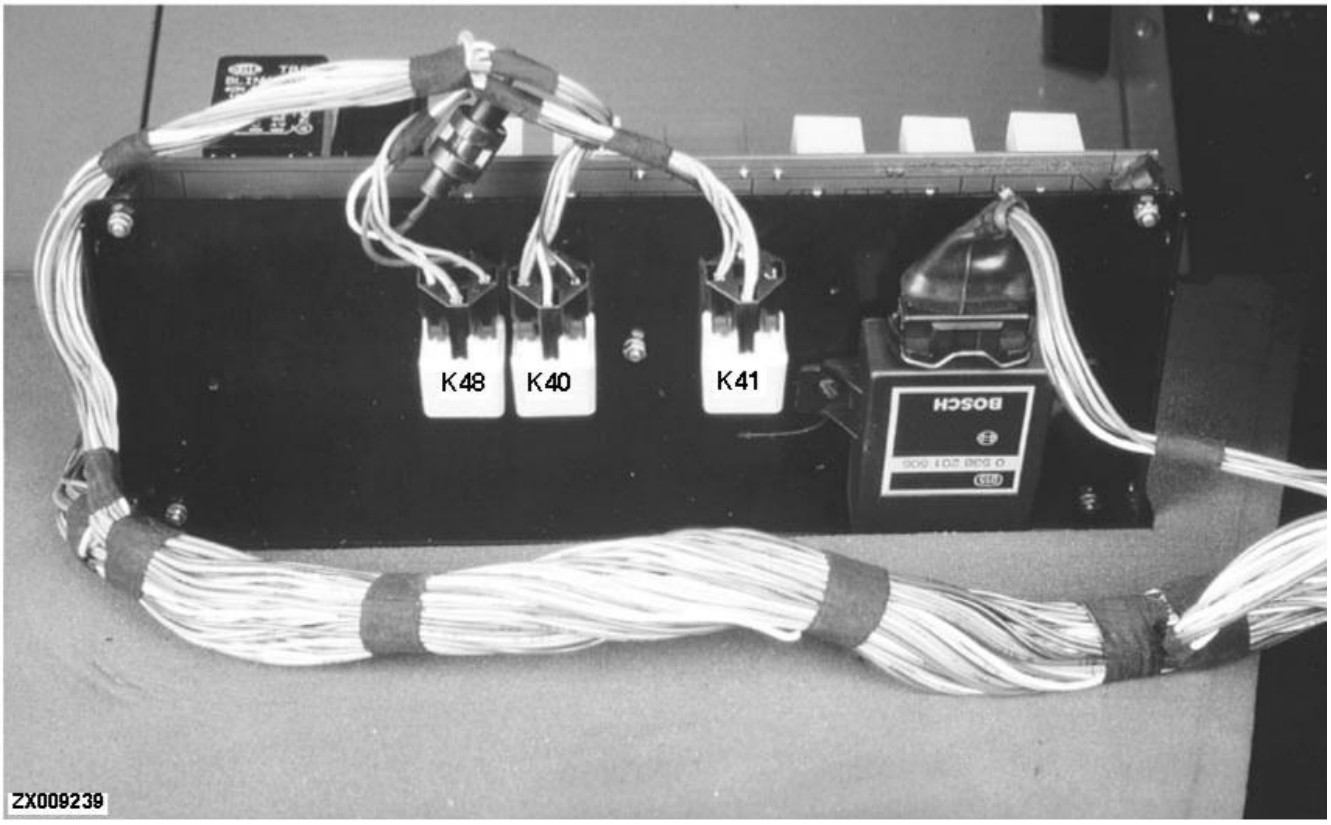
RELAY AND DIODE BOARD FROM SERIAL NUMBER 064253



K 4 — Buzzer timer relay
K 5 — Flasher
K 6 — Relay, straw warning device
K 8 — Relay, float control
K 9 — Hillmaster relay
K 10 — Relay, fan speed alarm
K 11 — Relay, cylinder speed alarm
K 13 — Relay, lower header quickly
K 14 — Relay, lower header slowly
K 15 — Relay, raise header quickly
K 16 — Relay, raise header slowly
K 17 — Relay, lower reel
K 18 — Relay, raise reel
K 19 — Relay, move reel to the rear
K 20 — Relay, move reel to the front
K 22 — Relay, straw warning device
K 25 — Timer relay, unloading auger swing
K 28 — Relay, reducing feeder house speed
K 29 — Relay, increasing feeder house speed
K 32 — Relay, increasing reel speed
K 33 — Relay, reducing reel speed
K 35 — Timer relay, header drive
K 49 — Header relay
K 50 — Header relay
K 51 — Unloading auger drive relay
K 52 — Unloading auger drive relay

ZX,OMXZCO002192-19-01SEP96

RELAY AND DIODE BOARD (CONTINUED)



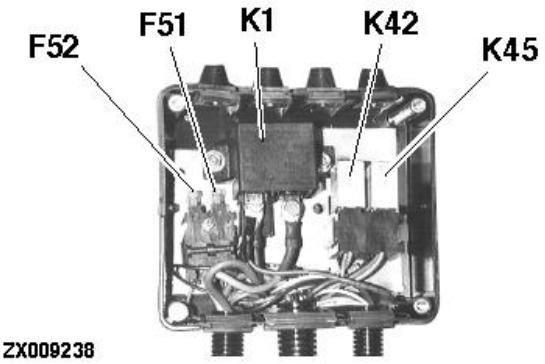
ZX009239 -UN-22MAY96

A 10 — Harvesting unit float control
K 40 — Relay, leveling header to left
K 41 — Relay, leveling header to right
K 48 — Relay, beacon light when grain tank is 3/4 full

ZX,OMXZCO006512-19-01SEP96

ELECTRICAL BOX IN ENGINE COMPARTMENT

F 51 — 7.5 A fuse, header electrical clutch
F 52 — 7.5 A fuse, reverse travel alarm
K 01 — Starting motor relay
K 42 — Relay, header electrical clutch
K 45 — Relay D+

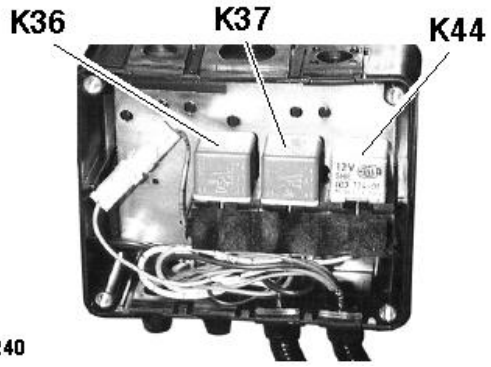


ZX009238 -UN-22MAY96

ZX,OMXZCO006511-19-01APR98

ELECTRICAL BOX FOR FAN ADJUSTMENT

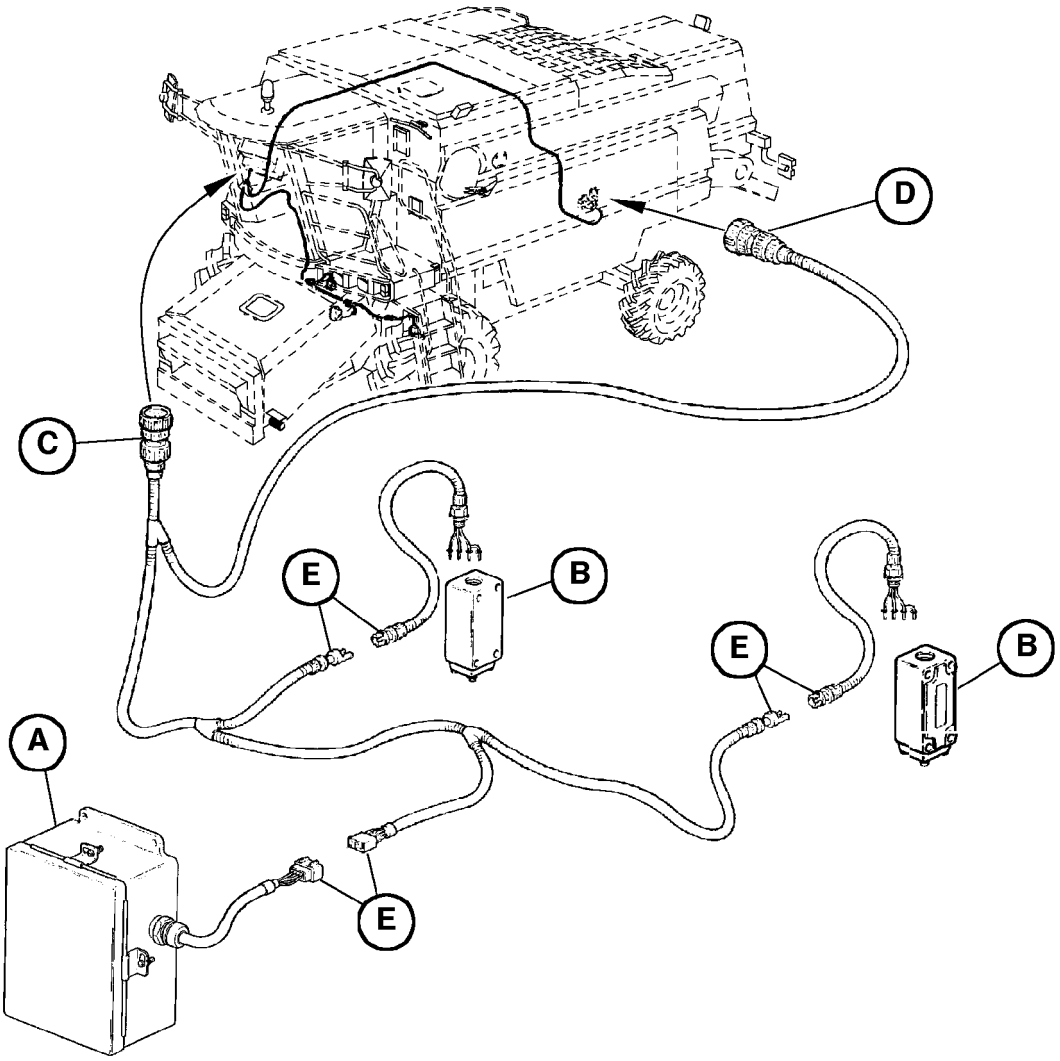
K 36 — Relay, increasing speed of fan
K 37 — Relay, decreasing speed of fan
K 44 — Timer relay



ZX009240 -UN-23MAY96

ZX,OMXZCO006513-19-02MAY96

WIRING HARNESS, HILLMASTER CONTROL



ZX012210 -UN-25SEP97

ZX012210

A—Control box
B—Tilt limit switches
C—Cable connection to main electronic control box
D—Cable connection to electric valve
E—Plug connection

ZX,TMXZCO009451-19-01AUG97

REPAIRING THE CONTROL BOX

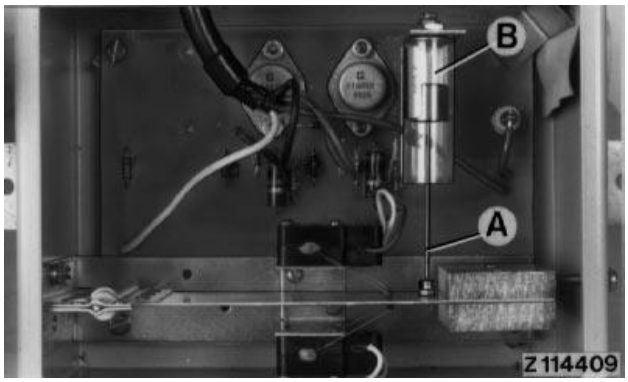
IMPORTANT: Repair work inside the control box should be performed only with the control box removed from the machine. The utmost cleanliness is essential.

ZX,TMXZCO009452-19-01AUG97

REPLACING THE DASHPOT

Disconnect piston rod (A) at pendulum. Remove dashpot cylinder and take out dashpot (B).

Install new dashpot and tighten screw connections.



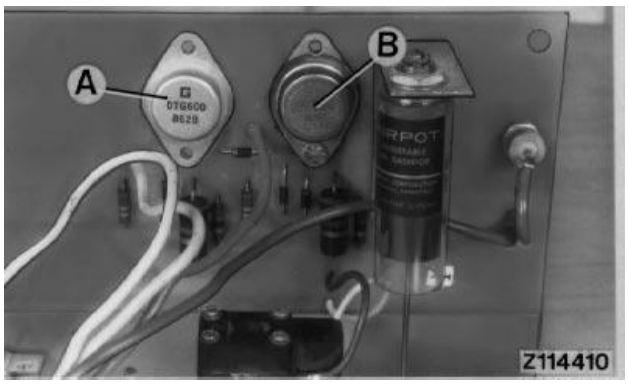
-UN-26FEB98
Z114409

ZX,TMXZCO009453-19-01AUG97

REPLACING THE TRANSISTOR

Remove circuit board and pendulum from control box housing.

Take out the screws and unsolder transistors (A) or (B) as required. Solder on new transistor(s) using a soldering iron with a rating of 20 - 30 W.



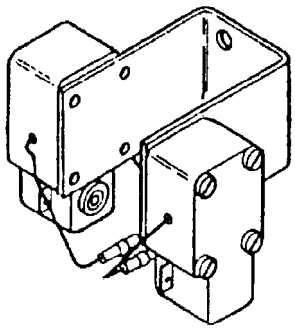
-UN-26FEB98
Z114410

ZX,TMXZCO009454-19-01AUG97

REPLACING THE SWITCH ELEMENT

Disconnect piston rod at pendulum. Remove the pendulum.

Replace the switch element and re-install the pendulum.



ZX012211

-UN-25SEP97
ZX012211

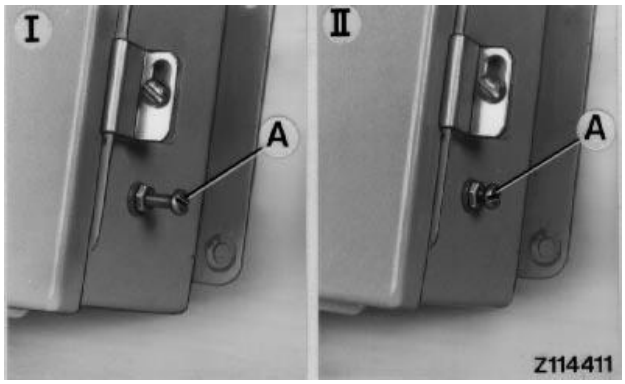
ZX,TMXZCO009455-19-01AUG97

REPLACING THE CONTROL BOX ASSEMBLY

When installing a new control box, unscrew screw (A) by 15 mm (0.6 in.) and tighten the locknut.

The screw is a transport safety device.

I—Operating position
II—Transport position



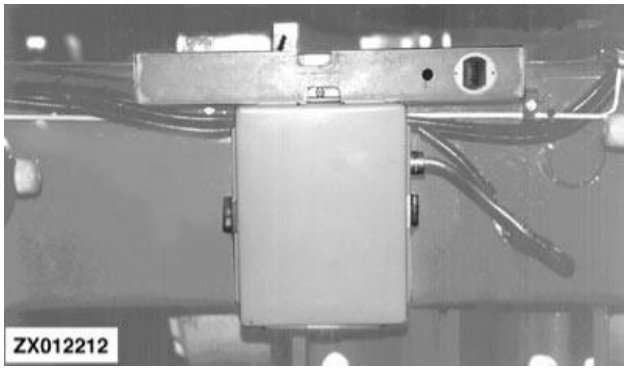
-UN-26FEB98
Z114411

ZX,TMXZCO009456-19-01AUG97

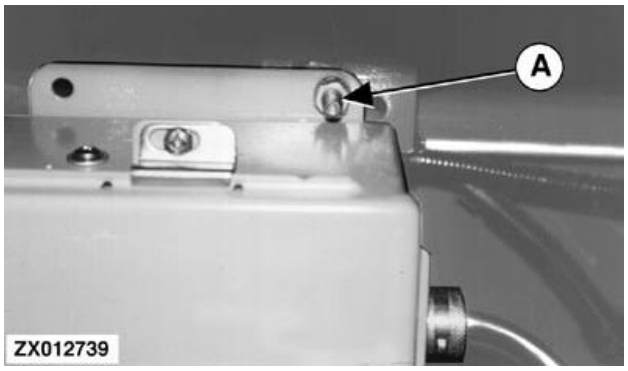
ALIGNING THE CONTROL BOX

Park the combine on a level surface and use a spirit level to align the control box.

Tighten screw (A) on the control box.



-UN-25SEP97
ZX012212



-UN-27SEP97
ZX012739

ZX,TMXZCO009457-19-01AUG97

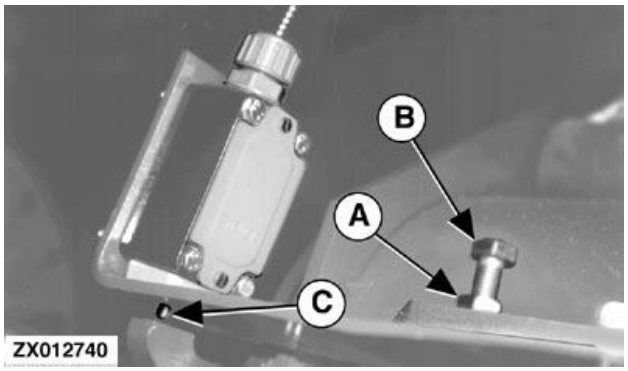
TILT LIMIT SWITCHES

R.h. and l.h. tilt limit switches are located in front of the switch levers. When one cylinder is fully extended, the tilt limit switch shuts off current to the solenoid on the levelling control valve, stopping the levelling action.

A defective tilt limit switch cannot be repaired; it must be replaced with a new one.

ZX,TMXZCO009459-19-01AUG97

ADJUSTING THE TILT LIMIT SWITCHES



1. Start the engine and move the tumbler switch for automatic levelling control to the “manual” position.

IMPORTANT: Make sure that the transmission is in neutral and the parking brake released before actuating the manual levelling control switch.

2. Push manual levelling control switch at “L” until combine reaches its levelling limit (l.h. levelling cylinder fully retracted, r.h. levelling cylinder fully extended). Hold switch in “L” position for approx. 15 seconds to make sure that r.h. levelling cylinder is fully extended.

3. Loosen lock nut (A) and turn adjusting screw (B) until tilt limit switch (C) just touches the extended switch lever.

4. Turn adjusting screw (B) an additional 1-1/2 turns and tighten lock nut (A).

5. Adjust r.h. tilt limit switch in the same way.

ZX,TMXZCO009460-19-01AUG97

GENERAL INFORMATION

Automatic header control (lateral tilt) is available as an option with 818 - 825 cutting platforms.

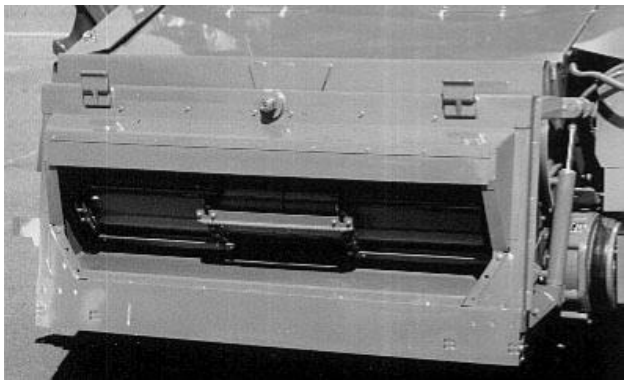
ZX,TMXZCO009461-19-01AUG97

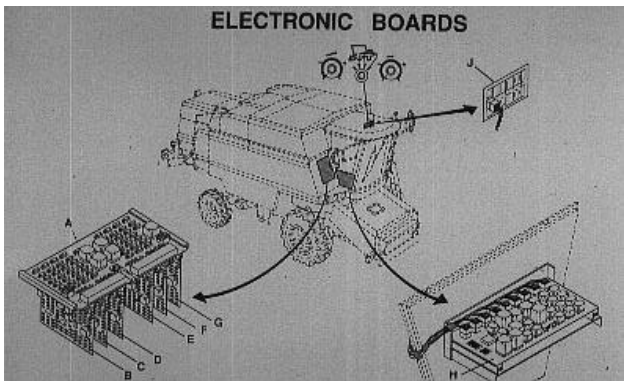
COMPONENTS, AUTOMATIC LATERAL CONTROL

— Feeder house with pivoting shield
— Electronic board (A7)

This board is inserted between boards (D) and (E).

A—Fuse board (A15)
B—Speed monitor (A3)
C—Cutting platform control board (A6)
D—Dial-A-Matic (A2)
E—Reel speed control (A1)
F—On-board computer (A9)
G—Board relay (A11)
H—Relay for hydraulic function (A14)
J—Board for performance monitor (A4)


ZX009882 -UN-13NOV96



ZX009881 -UN-14NOV96

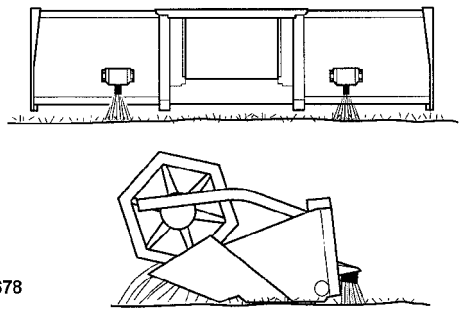
ZX,TMXZCO009462-19-01AUG97

Sensors

The sensors operate between 350 mm and 900 mm (13.78 and 35.43 in.) above the ground.

If the sensors are raised above 900 mm (35.43 in.) by means of the cutting platform, the system switches itself off automatically.

The system is activated again when the operating height comes in range again. It can also be activated by pressing the “header float control” switch on the multi-function lever.



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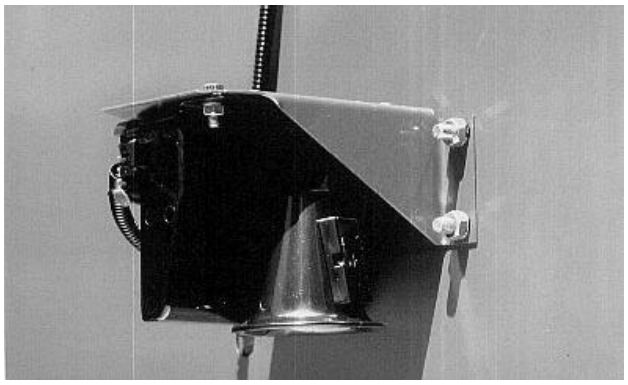
ZX014678



-UN-13NOV96

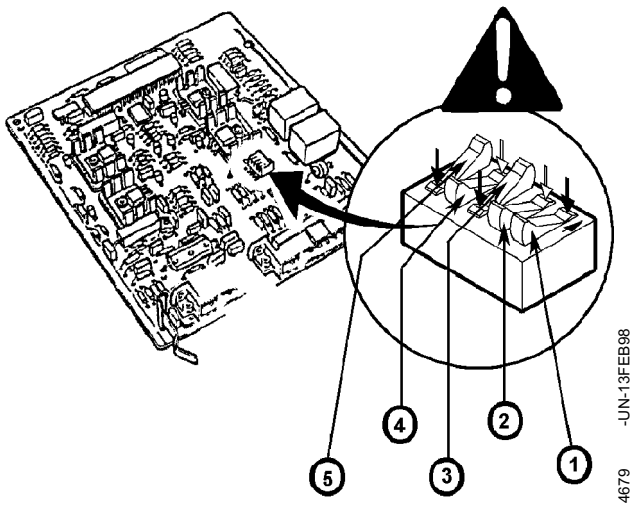
ZX009883

ZX,TMXZCO009463-19-02AUG97

SETTINGS ON THE ELECTRONIC BOARD (A7)

NOTE: These settings are appropriate for most operating conditions.

1—OFF
2—OFF
3—ON
4—OFF
5—ON



ZX014679

-UN-13FEB98

ZX014679

ZX,TMXZCO009464-19-02AUG97

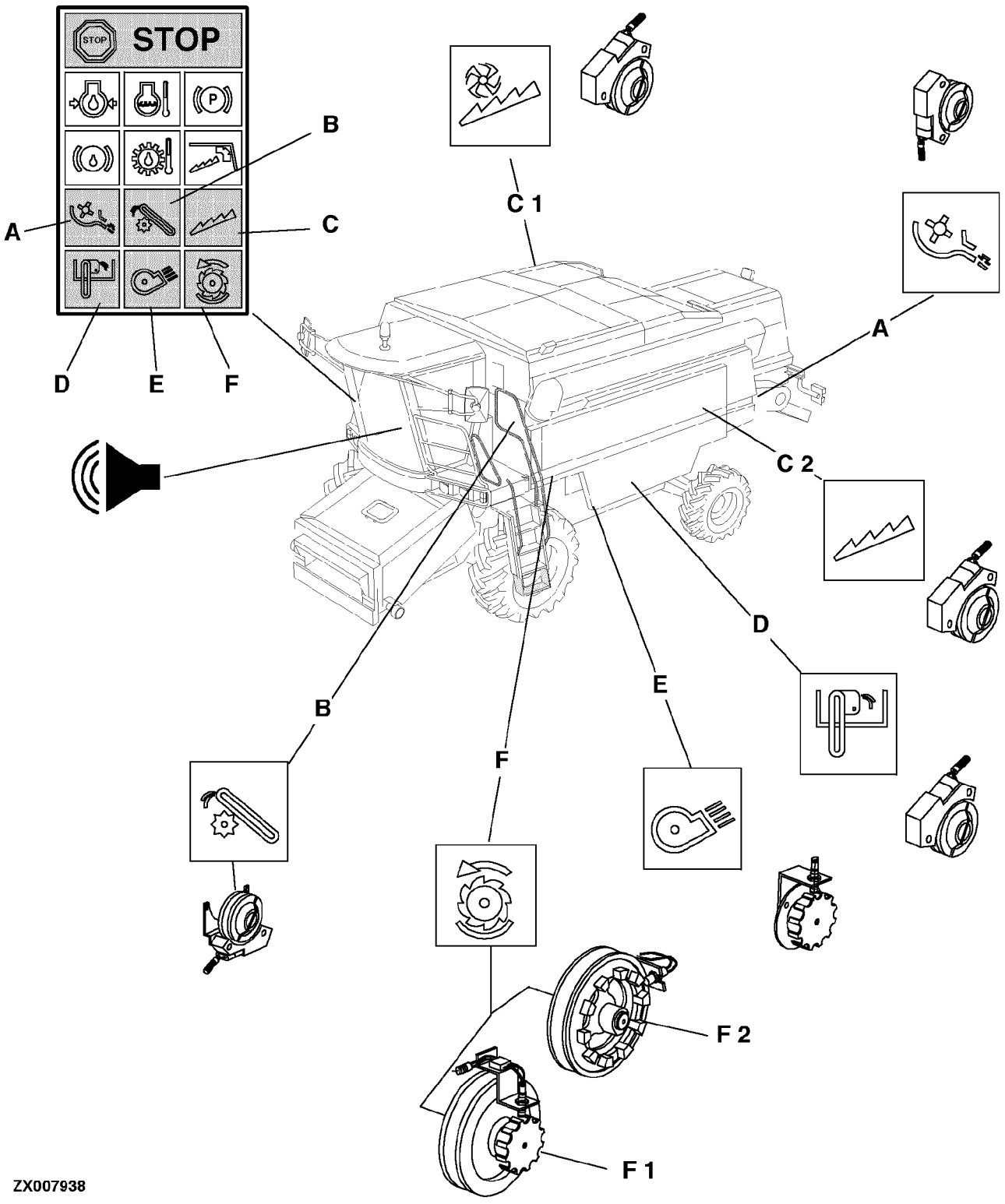
SUMMARY OF POSSIBLE SETTINGS

Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Sensitivity
OFF	OFF	OFF	OFF	ON	low
OFF	ON	OFF	OFF	ON	low
OFF	OFF	ON	OFF	ON	medium
OFF	OFF	OFF	ON	ON	high
OFF	ON	ON	ON	ON	high

ZX,TMXZCO010096-19-01AUG97

Group 30
Low Shaft Speed Monitor System

LOW SHAFT SPEED MONITOR SYSTEM — PROTECTED COMPONENTS



ZX,OMXZCO001971-19-02MAY96

A—Straw chopper/chaff spreader (option)
B—Tailings elevator
C—Straw walkers
C1—With cross-shaker
C2—Without cross-shaker
D—Clean grain elevator
E—Fan
F—Threshing cylinder
F1—Second cylinder with constant speed
F2—Second cylinder with variable speed

In the event of a malfunction, the low shaft speed monitor system activates corner post indicator lights and a continuous acoustic warning signal.

With engine shut off, electrical circuit on and separator engaged, all five or six indicator lights must glow and the warning signal must sound. With engine running (at fast idle) and separator engaged, all indicator lights should go out and the warning signal cease.

NOTE: Reset the alarm threshold at the infotrak monitor every time the threshing cylinder and/or fan speed are altered.

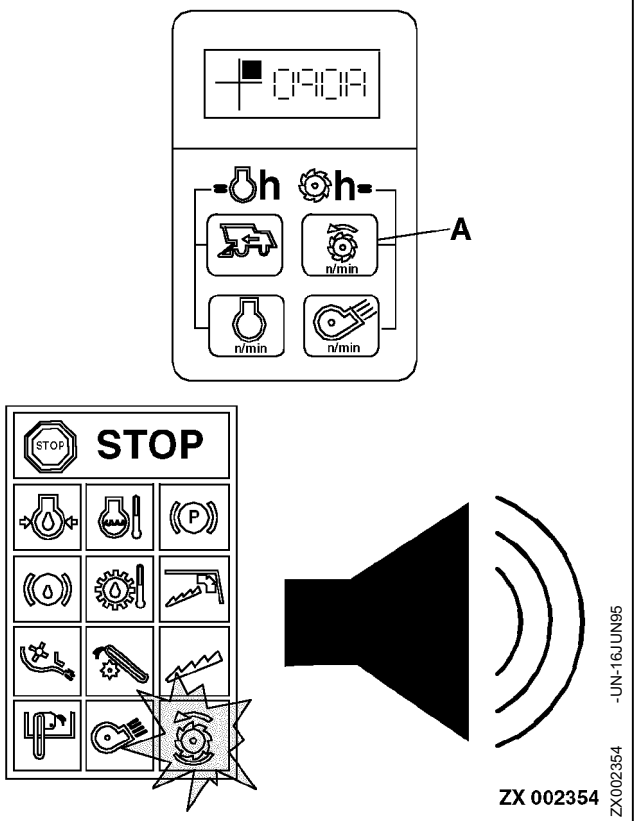
ZX,OMXZCO001988-19-13NOV92

SETTING THRESHING CYLINDER ALARM SPEED

With engine running, engage separator.

Press key (A) to display cylinder speed. Continue to press key (A) (for approx. 2 seconds) until an “A” appears at the last digit of the displayed speed. Now alarm speed is 75% of the displayed speed.

If cylinder speed drops below alarm speed during operation, the cylinder speed indicator light will glow and a continuous warning signal will be heard.



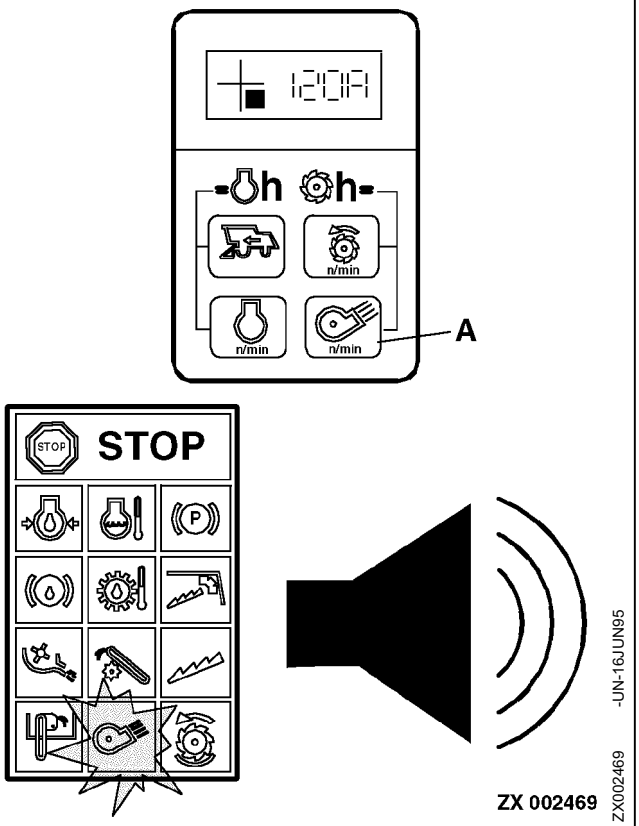
ZX,OMXZCO001520-19-14NOV92

SETTING FAN ALARM SPEED

With engine running, engage separator.

Press key (A) to display fan speed. Continue to press key (A) (for approx. 2 seconds) until an “A” appears at the last digit of the displayed speed. Now alarm speed is 75% of the displayed speed.

If fan speed drops below alarm speed during operation, the fan speed indicator light will glow and a continuous warning signal will be heard.



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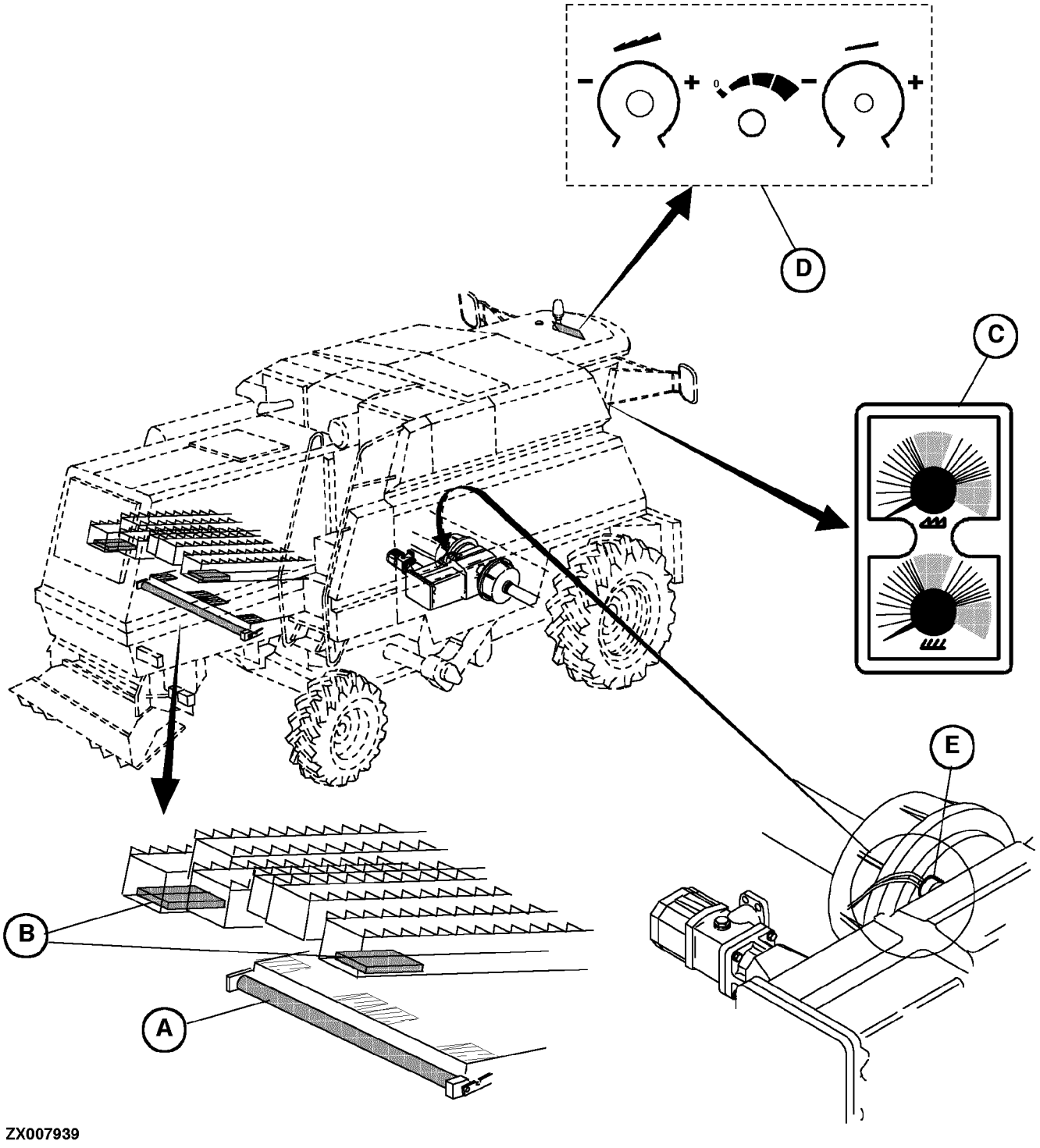
HARVEST PERFORMANCE MONITOR



A—Cleaning shoe sensor
B—Straw walker sensors
C—Display unit
D—Adjusting/selecting unit
E—Ground speed sensor

ZX,OMXZCO001973-19-02MAY96

General Description

The harvest performance monitor records the amount of grains that hit its sensors at the cleaning shoe (A) and straw walkers (B). Ground speed is measured via sensor (E). Once this factor has been taken into account, the loss rate is displayed at display unit (C). Display unit (C) indicates the loss level that is acceptable to the user in relation to the area harvested.

The performance monitor enables the operator to use maximum combine capacity within the performance range selected by him. After the operator has adjusted the combine and cutting platform to suit the harvesting conditions, he must set the monitor to these conditions by means of the adjusting/selecting unit (D).

Incorrect adjustment and inadequate servicing of the combine always result in grain loss and reduced harvester performance. The causes of grain loss are dealt with in detail in the “Preparations and Field Operation” section. Particular attention should be paid to the information provided on “Determining Grain Losses” and “Prevention of Grain Losses — General”.

ZX,OMXZCO001974-19-02MAY96

PRELIMINARY ADJUSTMENTS ON COMBINE HARVESTER

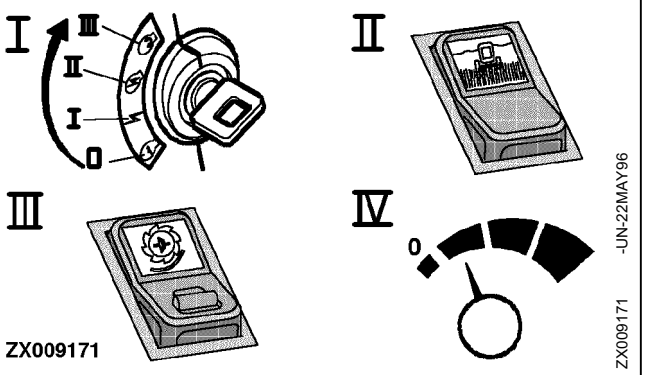
Before performing any adjustments on the harvest performance monitor, adjust the combine so that it is operating at peak efficiency. The adjustments must correspond to the relevant crop and field conditions.

ZX,TMXZCO010097-19-01AUG97

SWITCHING ON THE HARVEST PERFORMANCE MONITOR

The system can operate only when the

- engine is running (I)
- road safety switch is in the field position (II)
- threshing unit is engaged (III)
- harvest performance monitor is switched on (IV)



ZX,OMXZCO001976-19-02MAY96

OPERATIONAL ADJUSTMENT OF HARVEST PERFORMANCE MONITOR

Precondition: combine harvester is adjusted to peak efficiency.

While threshing, adjust potentiometers (A) and (B) one after the other so that the needle on display unit (C) moves to the center of the green sector (X) when there are grain losses.

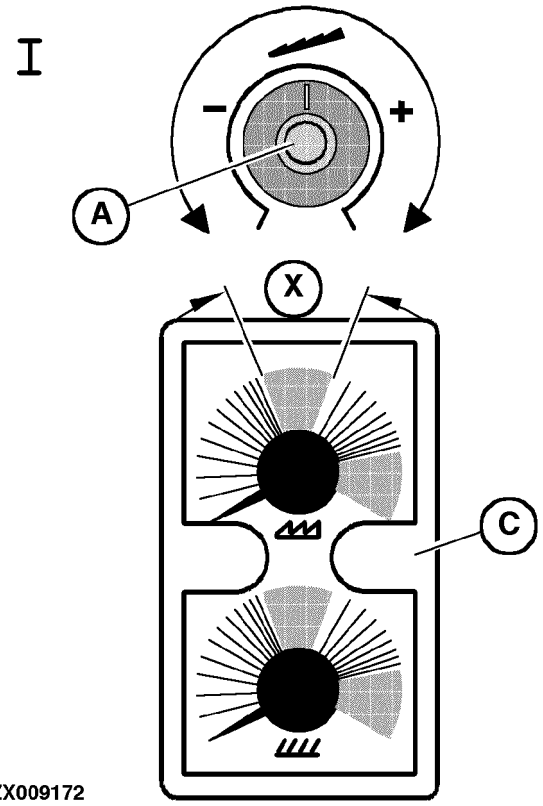
I — Set potentiometer for straw walker losses:
• Use potentiometer (A) to bring the needle into the green sector (X).

II — Set potentiometer for cleaning shoe losses:
• Use potentiometer (B) to bring the needle into the green sector (X).

Grain losses vary all the time. This means that the sensors on the cleaning shoe and straw walkers will transmit signals of varying intensity to the display unit. If these signals rise or fall in relation to the preset value, the needle on the display unit will swing to the left or right.

NOTE: If no losses occur (and therefore none are displayed) even at maximum sensitivity, leave the two potentiometers (A) and (B) set no higher than the "two o'clock" position.

A—Potentiometer for straw walker sensitivity
B—Potentiometer for cleaning shoe sensitivity
C—Display unit
X—Green sector



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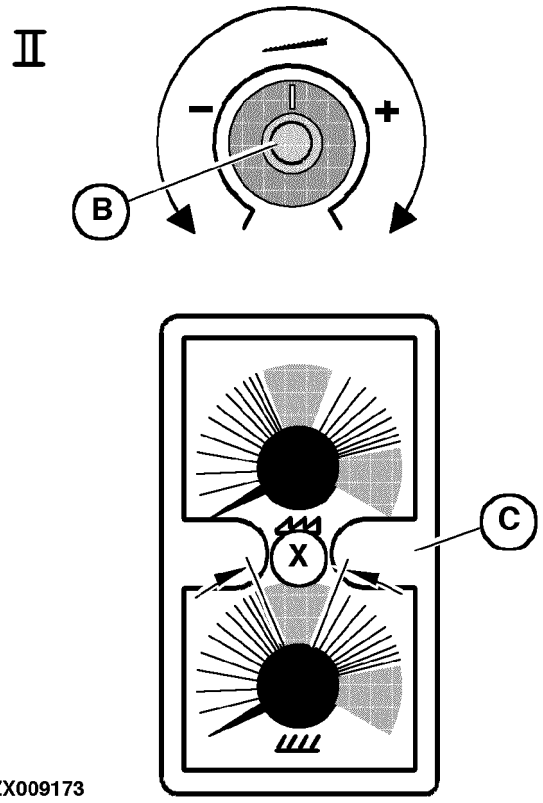
ZX009172



ZX009173 -UN-22MAY96

ZX009173

ZX,OMXZCO001980-19-02MAY96

OPERATIONAL ADJUSTMENT OF HARVEST PERFORMANCE MONITOR (CONTINUED)

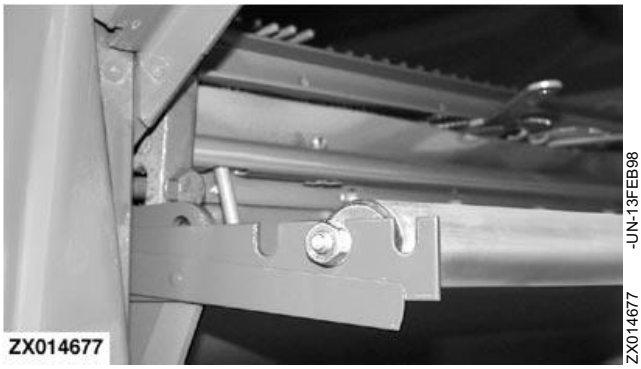
1. If the needle moves towards "—" and stays there for more than 20 seconds, the combine harvester's ground speed is too low, i.e the harvester is not working hard enough. In this case, increase the combine harvester's ground speed until the needle returns to the center of the green sector.

2. If the needle moves towards "+" and stays there for more than 20 seconds, the combine harvester's ground speed is too high and grain losses are increasing. Reduce the combine harvester's ground speed until the needle returns to the green sector.

3. If the needle remains in the "+" sector even after ground speed has been reduced, this may be due to plugging at the straw walkers or sieve (cleaning shoe). In this case, check which of these components is causing the blockage by selecting them with the selector switch. If necessary, clean the relevant component. Once an acceptable performance level has been achieved, adjust the potentiometers of the display unit as described above.

4. If the harvesting conditions change during the course of the day (straw lying down or damp), or if the machine adjustment changes (fan speed), re-adjust the performance monitor. The sieve sensors may be moved fore-and-aft to any one of the three cut-outs in the sensor mountings (on right and left sides of combine).

5. Measure the losses from time to time to determine whether the combine harvester needs to be re-adjusted.

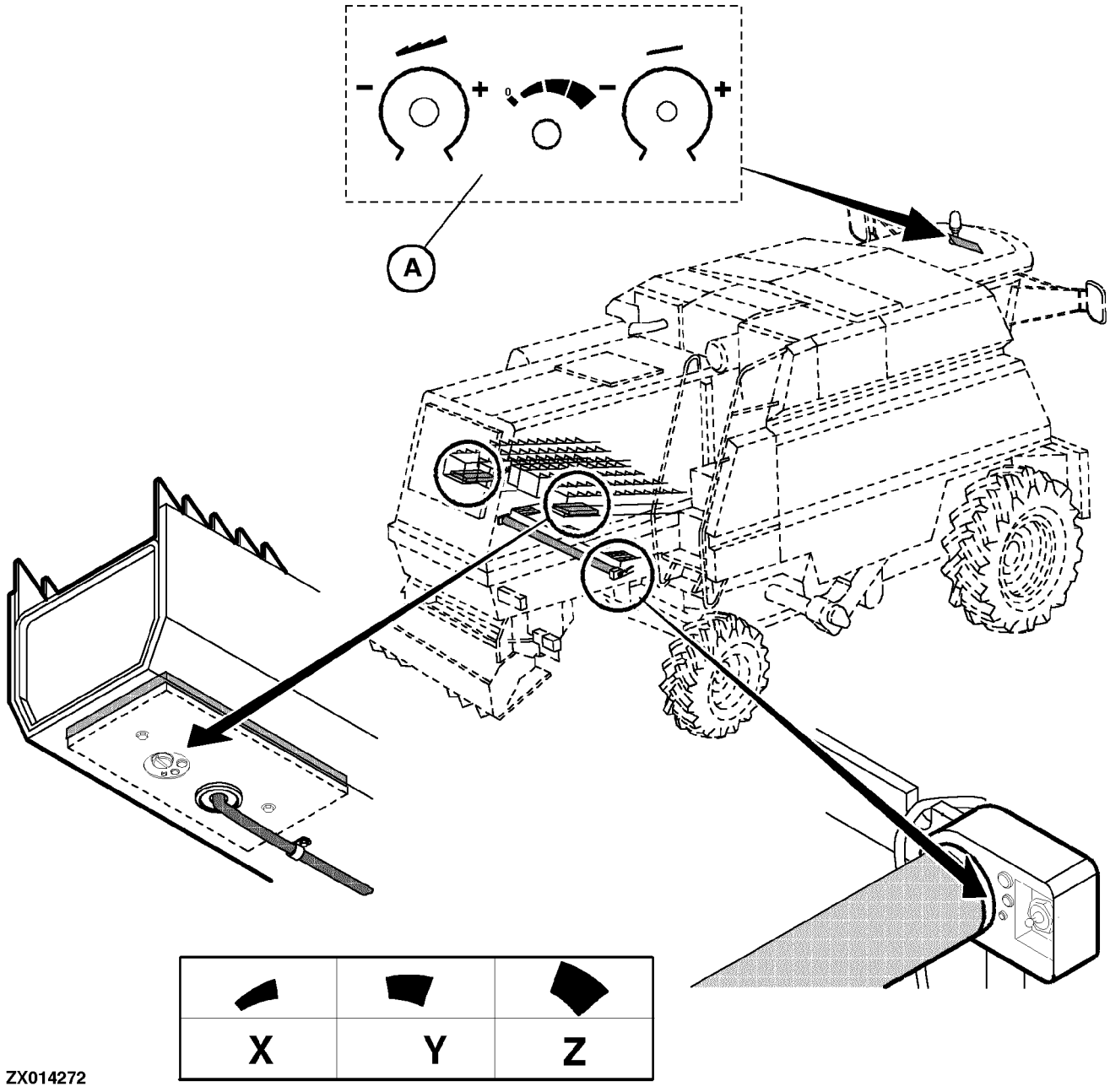


Sensor mounting, left

Sensor mounting, right

ZX,OMXZCO001981-19-01APR98

SETTING SENSOR SENSITIVITY



Sensor sensitivity is preselected in the cab at the adjusting/selecting unit of harvest performance monitor (A).

X — Higher sensor sensitivity for finer grain crops

Y — Medium sensor sensitivity for medium grain crops (covers a wide range of standard crops)

Z — Lower sensor sensitivity for coarse grain crops

NOTE: Always leave the sieve and straw walker sensors at a medium setting.

ZX,OMXZCO001978-19-01APR98

OPERATIONAL CHECK OF HARVEST PERFORMANCE MONITOR

CAUTION: Before carrying out the operational check, remove fuse F23. This prevents the cylinder from being switched on while at the same time ensuring that the harvest performance monitor is supplied with power.

Start the engine.
Put road safety switch in field position.
Switch threshing unit to ON position.

I — Check straw walker sensors:

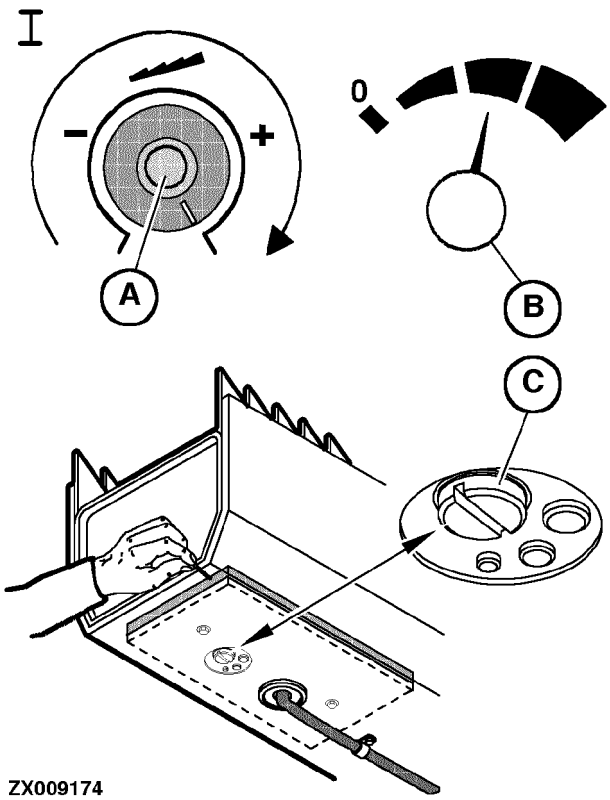
• Turn potentiometer (A) clockwise as far as it will go.
• Set selector switch (B) to the position for medium-sized grains.
• Rotary switch (C) should be in the medium position at both sides.
• Actuate the left and right straw walker sensors by tapping them lightly with a hard object or by dropping kernels on them. A second person is required to observe the needle at the display. The needle must be seen to move.

II — Check cleaning shoe sensor:

• Turn potentiometer (D) clockwise as far as it will go.
• Set selector switch (B) to the position for medium-sized grains.
• Tumbler switch (E) should be in the middle position.
• Check cleaning shoe sensor in the same way as the straw walker sensors.
• Switch on the parking light and check whether the display light is on.
• Switch off the parking light. Disengage the threshing unit and remove the switch key.
• If a fault occurs during the check described above, have the fault rectified by your John Deere dealer.

NOTE: Once the operational check is completed, put fuse F23 back in place.

A—Potentiometer for straw walker sensitivity
B—Selector switch
C—Rotary switch
D—Potentiometer for cleaning shoe sensitivity
E—Tumbler switch



ZX009174

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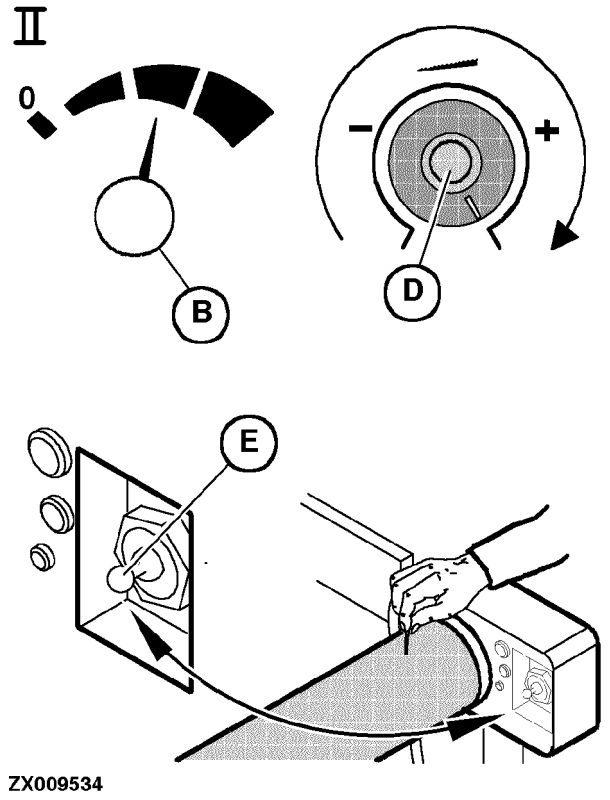


ZX009534

ZX009534 -UN-08NOV96

ZX,OMXZCO001982-19-01NOV96

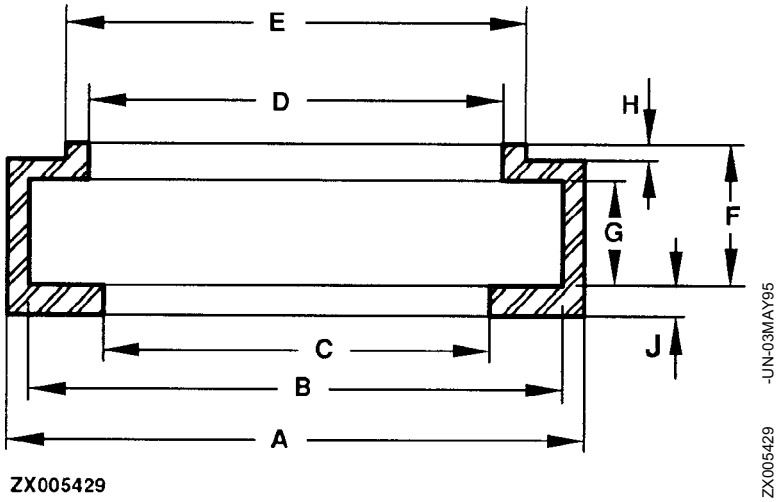
Section 50
Power Train

Contents

Continued on next page

Page

SPECIAL TOOL (SELF-MANUFACTURE)

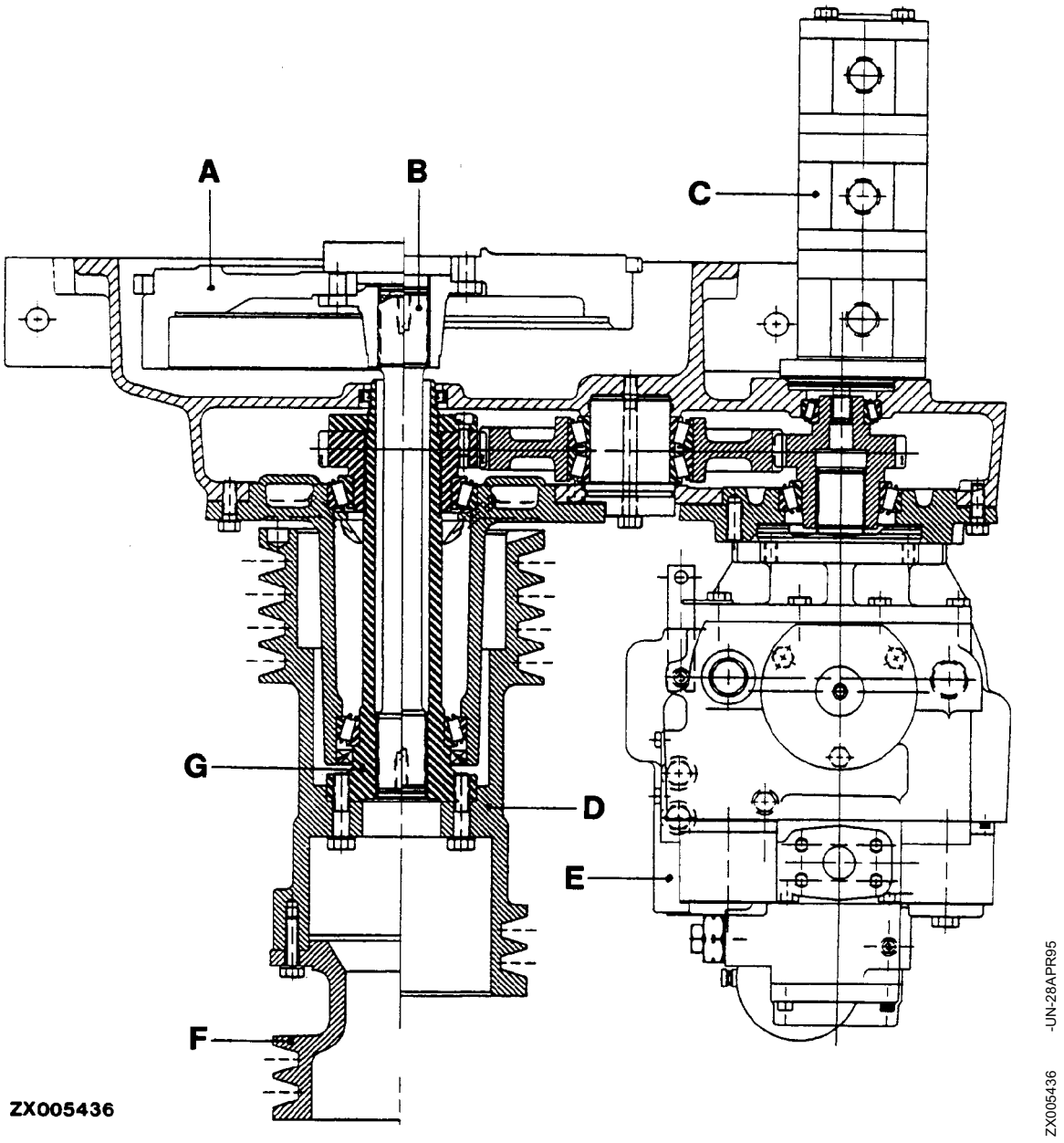


A—125 mm (4.9 in.) dia.
B—116 mm (4.6 in.)
C—85 mm (3.35 in.) dia.
D—91 mm (3.6 in.) dia.
E—99 mm (3.9 in.) dia.
F—30 mm (1.2 in.)
G—23 mm (0.9 in.)
H—3 mm (0.12 in.)
J—6 mm (0.24 in.)

Tool for pulling sealing ring into input housing

ZX,TMXZCO003945-19-15FEB95

INTERMEDIATE TRANSMISSION AND COMPONENTS



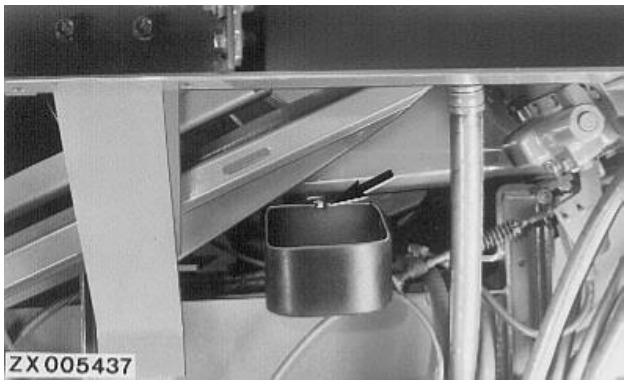
A—Engine flywheel
B—Input shaft
C—Triple hydraulic pump
D—Countershaft pulley
E—Hydrostatic pump
F—Additional pulley
G—Hollow shaft

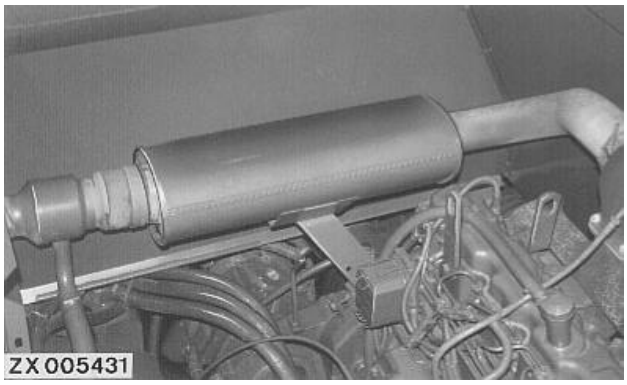
ZX,TMXZCO003946-19-15FEB95

REMOVING THE INTERMEDIATE TRANSMISSION

Drain oil. Capacity is 2.4 liter (0.63 US gal.).

Remove muffler assembly.





ZX,TMXZCO003947-19-15FEB95

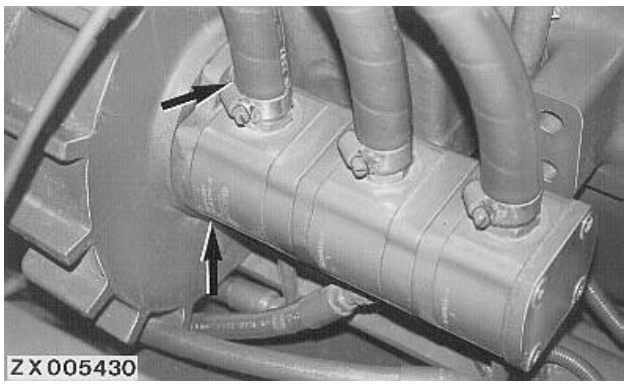
IMPORTANT: Do not disconnect any pressure hoses.

Remove hydrostatic pump and secure it so that it cannot fall.

ZX,TMXZCO003949-19-15FEB95

IMPORTANT: Do NOT disconnect the suction lines and the two pressure lines.

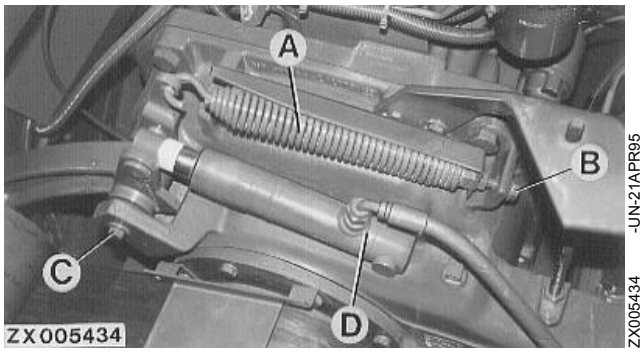
Remove the triple hydraulic pump. Disconnect one pressure hose to gain access to the attaching nut.



ZX,TMXZCO003950-19-15FEB95

Remove tensioning screw (B) and take off spring (A).

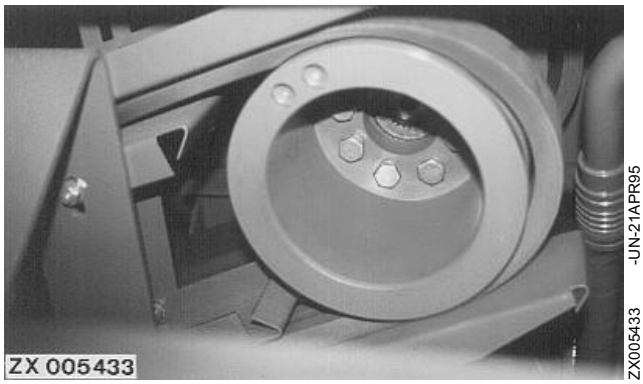
Remove tensioning roller by taking out screw (C), and disengage cylinder (D).



ZX,TMXZCO003951-19-15FEB95

Remove engine pulley.

On 2264 and 2266 combines, first remove the additional pulley.

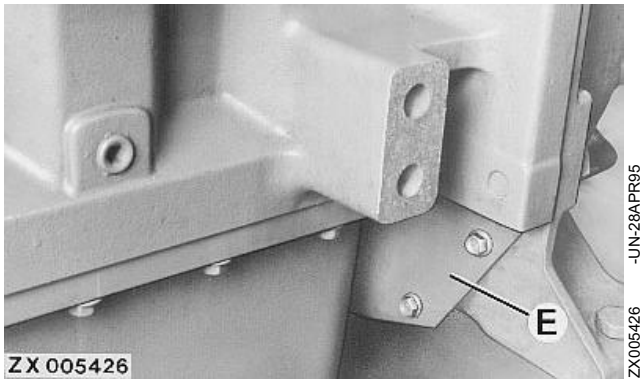


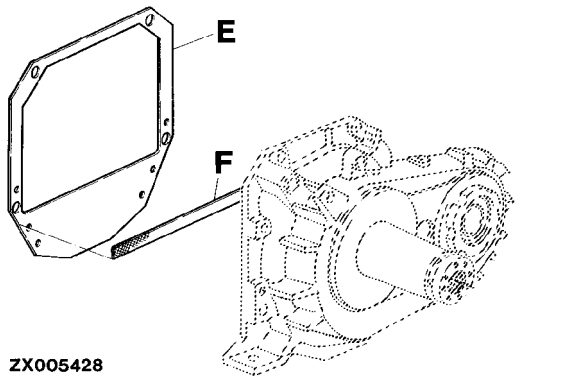
ZXTMXZCO 011381-19-05MAR98

Unbolt intermediate transmission from engine.

Unbolt sealing plate (E) at both ends of the intermediate transmission.

E—Sealing plate
F—Sealing strip

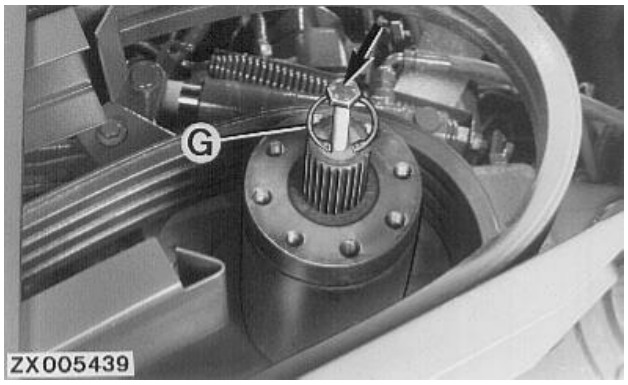




ZX,TMXZCO003953-19-15FEB95

Remove snap ring (G) from hollow shaft and use an M10x50 screw to pull the drive shaft out of the hollow shaft.

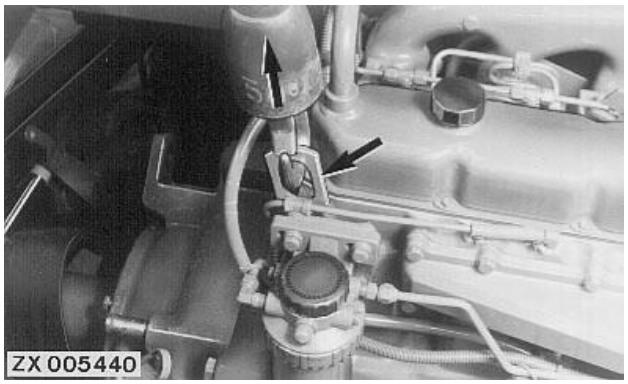
Take the two screws out of the engine mounting.



ZX,TMXZCO003954-19-15FEB95

Raise engine slightly at the intermediate transmission end to relieve pressure.

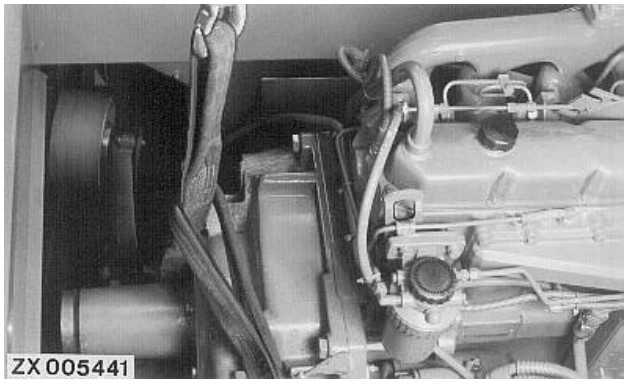
Place wooden blocks under the engine at left and right, and lower engine onto them.



ZX,TMXZCO003955-19-15FEB95

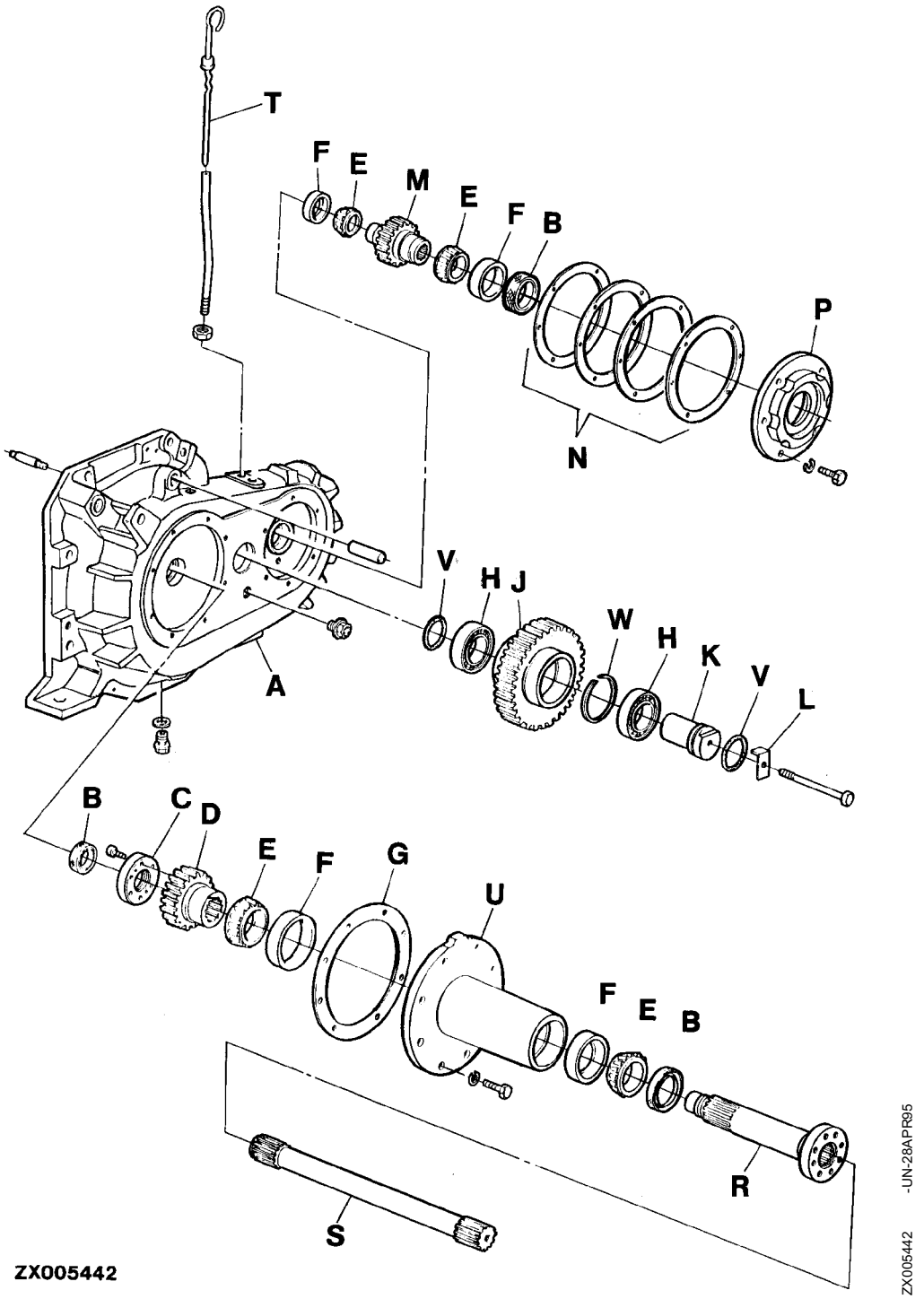
CAUTION: Intermediate transmission box weighs 130 kg (286.6 lb).

Secure the intermediate transmission with a wire rope and use a hoist to lift it out.



ZX,TMXZCO003956-19-15FEB95

COMPONENTS OF INTERMEDIATE TRANSMISSION



A—Housing	F—Bearing ring	L—Retainer	S—Drive shaft
B—Seal ring	G—Seal	M—Pinion	T—Oil dipstick
C—Locking plate	H—Taper roller bearing	N—Shims	U—Housing
D—Gear	J—Gear	P—Cover	V—O-ring
E—Taper roller bearing	K—Shaft	R—Hollow shaft	W—Steel ring

ZX,TMXZCO003957-19-15FEB95

GENERAL ASSEMBLY INSTRUCTIONS

Before assembling, coat all bearings with SAE 90 oil.

Before assembling, coat the lips of the seal rings with FWA 160 grease.

ZX,TMXZCO003958-19-15FEB95

INSTALLING 62-TOOTH CENTRAL GEAR

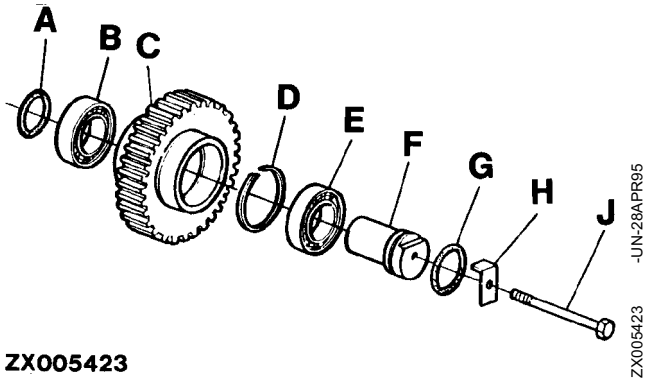
Install steel ring (D) in gear (C).

Insert taper roller bearings (B) and (E).

Place O-ring (A) in housing and O-ring (G) on shaft (F). Apply grease to both O-rings.

Insert gear (C) and install it together with shaft (F) and screw (J). Tighten to 54 N·m (40 lb-ft) and secure with retainer (H).

Turn shaft so that end of shaft can engage in input housing.



ZX005423

A—O-ring
B—Taper roller bearing
C—Gear (62-tooth)
D—Steel ring
E—Taper roller bearing
F—Shaft
G—O-ring
H—Retainer
J—M10x110 screw

ZX,TMXZCO003959-19-15FEB95

ADJUSTING AXIAL PLAY OF HOLLOW SHAFT

Insert hollow shaft (L) with seal ring (K) and two taper roller bearings (D) and (J), plus the 36-tooth gear (C) into input housing (G).

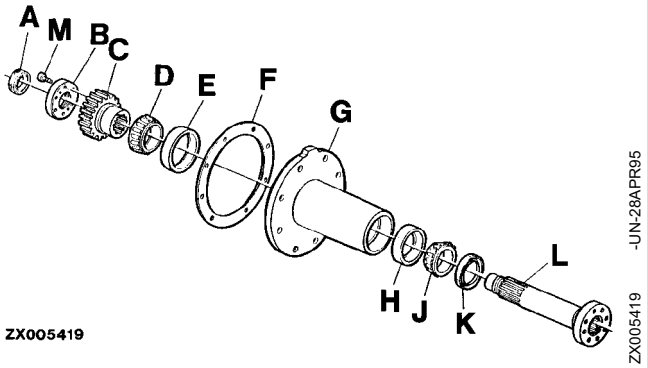
Use locking plate (B) to press the assembly together.

The self-made special tool is required to press seal ring (K) into the housing.

Slacken off locking plate and retighten it until there is a clearance of 0.03 - 0.08 mm (0.0012 - 0.0031 in).

Use hex. socket screw (M) to secure the locking plate. Coat screw with Loctite 243 and tighten it to 30 N·m (22 lb-ft).

A—Seal ring
B—Locking plate
C—Gear (36-tooth)
D—Taper roller bearing
E—Bearing ring
F—Seal
G—Housing
H—Bearing ring
J—Taper roller bearing
K—Seal ring
L—Hollow shaft
M—M8x25 hex. socket screw



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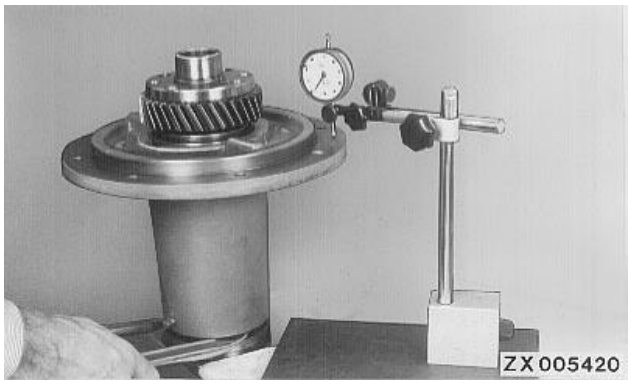
ZX005419



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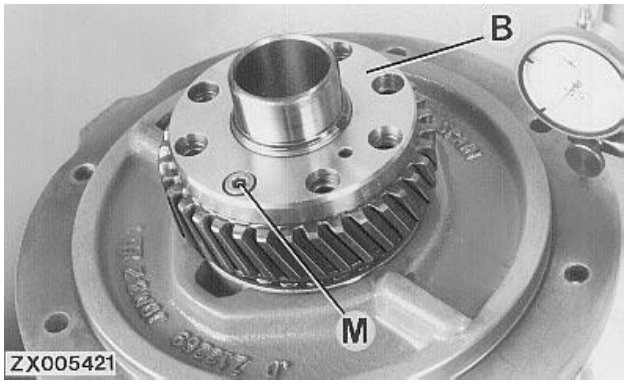

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ZX005421

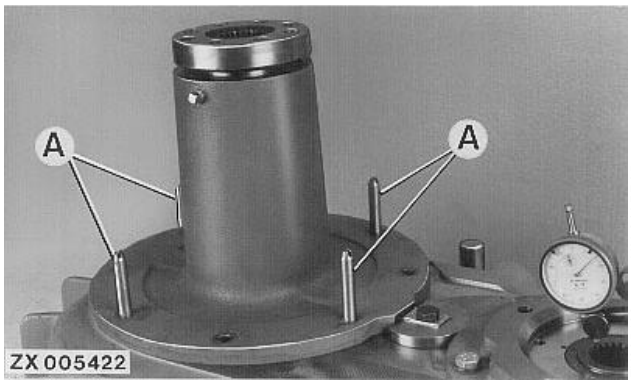
ZX,TMXZCO003960-19-15FEB95

INSTALLING THE INPUT HOUSING ASSEMBLY

IMPORTANT: Four guide pins (A) must be installed to prevent the seal ring being damaged during installation. (Make the guide pins yourself).

Slide the assembly evenly over the guide pins and onto the housing.

Bolt the assembly to the housing. Coat the bolts with Loctite 243, and tighten them to 54 N·m (40 lb-ft).



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ZX005422

ZX,TMXZCO003961-19-15FEB95

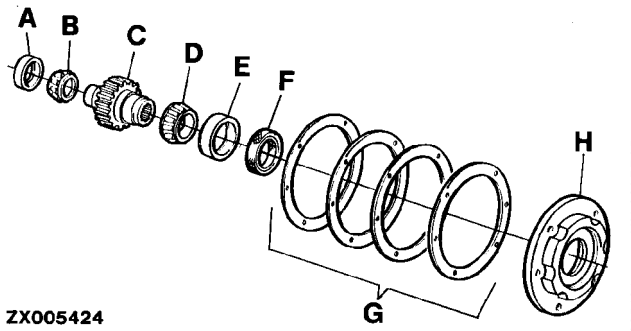
INSTALLING 25-TOOTH PINION

Install bearing ring (A) in housing.

Install the two taper roller bearings (B) and (D) on the pinion, and insert into housing.

Install bearing ring (E) and seal ring (F) on the cover. Install cover with the word “TOP” facing upward.

Coat screws with Loctite 243 and tighten them to 54 N·m (40 lb-ft).



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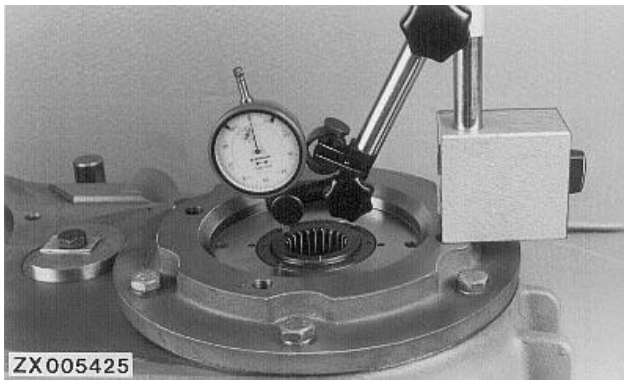
ZX005424

A—Bearing ring
B—Taper roller bearing
C—Pinion (25-tooth)
D—Taper roller bearing
E—Bearing ring
F—Seal ring
G—Shims 0.10; 0.15; 0.25; 0.5 mm (0.004; 0.006; 0.01; 0.02 in.)
H—Cover

ZX,TMXZCO003962-19-15FEB95

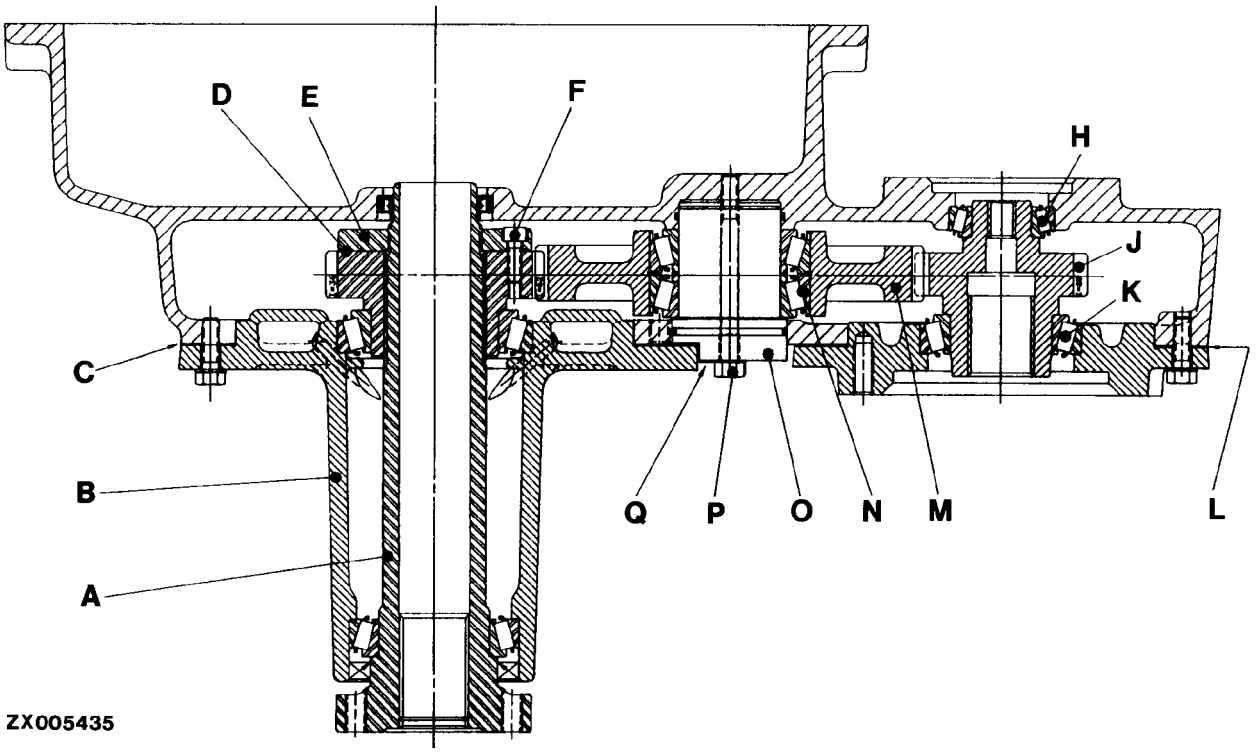
ADJUSTING AXIAL PLAY AT PINION

Install cover with shims so that there is a clearance of 0.05 - 0.13 mm (0.002 - 0.005 in).



ZX,TMXZCO003963-19-15FEB95

ASSEMBLY OF INTERMEDIATE TRANSMISSION



A—Hollow shaft
B—Input housing
C—Seal
D—36-tooth gear
E—Locking plate
F—Hex. socket screw
H—Taper roller bearing
J—25-tooth pinion
K—Taper roller bearing
L—Shims
M—62-tooth gear
N—Taper roller bearing
O—Shaft
P—M10x110 screw
Q—Retainer

ZX,TMXZCO003964-19-15FEB95

INSTALLING THE INTERMEDIATE TRANSMISSION

To install, follow the removal procedure in reverse.

Fill with oil. Capacity is 2.4 liter (0.63 US gal.) Oil must meet SAE 90 SCL. Check level at dispstick.

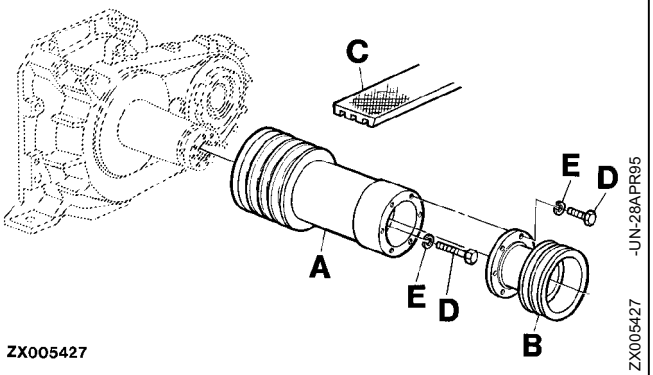
ZX,TMXZCO003965-19-15FEB95

INSTALLING BELT PULLEY

To facilitate installation, screw two M12x120 studs into the hollow shaft.

Put on pulley, and locate it centrally. Then remove studs and tighten the attaching screws.

A—Engine pulley
B—Additional pulley for 2264 and 2266
C—Drive belt
D—Screw
E—Spring washer



ZXTMXZCO 011382-19-05MAR98

ADJUSTING BELT GUIDE

See description in Section 20-05.

ZX,TMXZCO003967-19-15FEB95

OTHER MATERIAL

Number	Name	Use
TY15130	Form-In-Place Gasket	To seal hydrostatic adapter and front cover to transmission
T43512	Thread Lock and Sealer (medium strength)	To coat threads of cap screws on differential ring gear and on pump housing
TY9374	Thread Sealer	To coat threads of lube pump, bearing cap and differential cradle

ZX,TMSPFH000054-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Brake assembly-to-transmission cap screws	Torque	620 N·m (460 lb-ft)
Hydrostatic transmission adapter-to-transmission cap screws	Torque	320 N·m (235 lb-ft)
Transmission mounting cap screws	Torque	320 N·m (235 lb-ft)
Differential cradle-to-transmission cap screws	Torque	320 N·m (235 lb-ft)
Ring gear-to-differential cap screws	Torque	130 N·m (97 lb-ft)
Transmission cover-to-transmission cap screws	Torque	75 N·m (55 lb-ft)
Transmission lube pump-to-transmission cap screws	Torque	75 N·m (55 lb-ft)
Input and pinion shaft orifices	Torque	17 N·m (12 lb-ft)
Shifter cam	End play	0.00—0.25 mm (0.00—0.01 in.)
Differential	Preload	0.08—0.25 mm (0.003—0.010 in.)
Pinion shaft	Preload	0.127 mm (0.005 in.)
Input shaft	End play	0.01—0.20 mm (0.0005—0.008 in.)

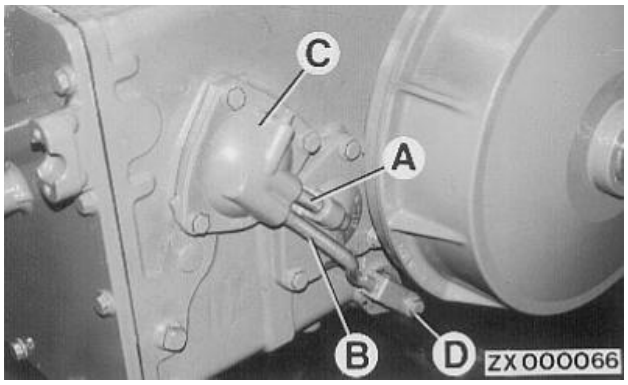
ZX,TMXZCO010113-19-01AUG97

DRAIN OIL, REMOVE SUCTION SCREEN

Slide tubes (A) and (B) towards pump (C).

Loosen screw (D) und pull out suction screen.

Catch escaping oil in a suitable container.



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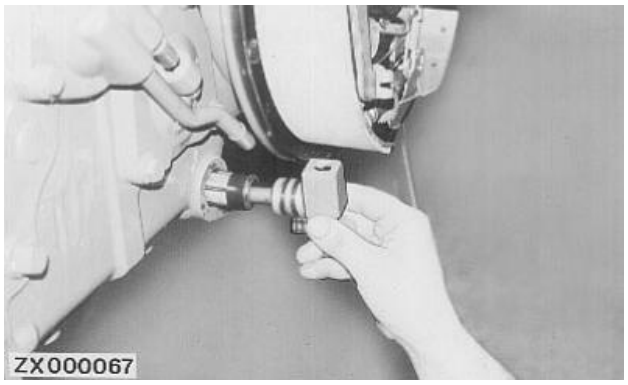

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ZX,TMSPFH000263-19-22JAN91

REMOVE TRANSMISSION

CAUTION: The transmission is heavy (300 kg; 675 lb). Danger of accidents!

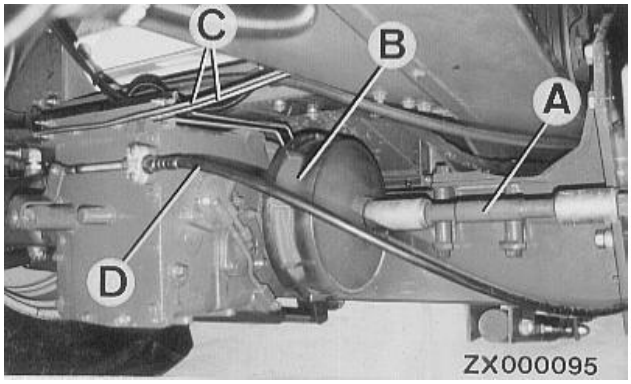
1. Remove drive shafts (A).

2. Remove brake drums (B). Disconnect parking brake cable and brake line (C).

3. Disconnect shift cable (D) from transmission. Disconnect electrical cable to speed sensor.

4. Remove hydrostatic motor and suspend on machine frame.

5. Safely support transmission using a trolley jack. Loosen four attaching screws and roll transmission away from bottom of machine.



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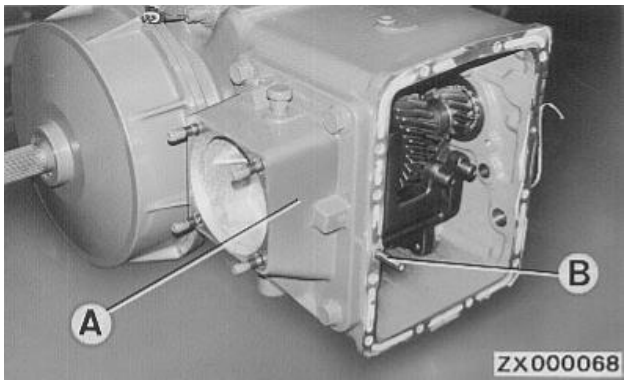
ZX,TMSPFH000264-19-22JUL91

REMOVE AND REPAIR SHIFTER FORKS AND SHIFTER CAM

NOTE: Shifter fork and shifter cam can be replaced without removing transmission.

1. Remove front cover and hydrostatic transmission adapter (A).

2. Remove dowel pin (B).



ZX000068 -UN-21APR95

ZX,TMSPFH000056-19-22JUL91

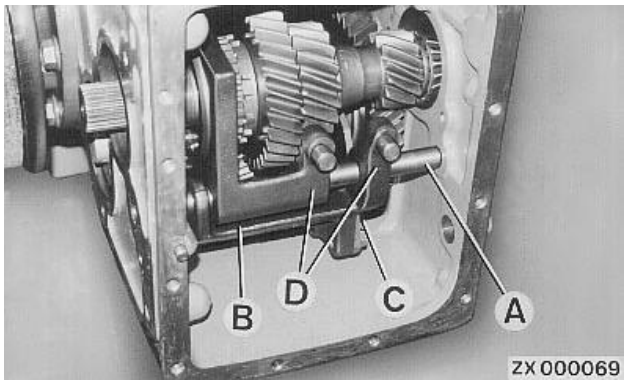
3. Remove rail (A) and shifter forks (B) and (C).

4. Inspect shifter cam to be certain grooves are free of burrs and there are no flat spots. Also inspect mating shifting surfaces on shifter rail.

Replace shifter forks or rollers (D) if they appear damaged or worn.

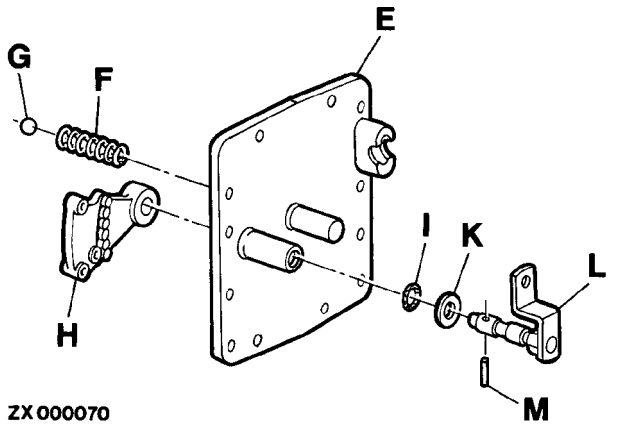
5. When replacing a roller (D) or pin, press pin flush with roller. Roller must be able to turn freely on pin. The usual cause for a roller pin to break is clash shifting.

6. Inspect all shift collars in the transmission for wear. They can cause the transmission to “jump” out of gear damaging shift forks. Incorrectly adjusted shift linkage can cause excessive wear to shift collars.



ZX000069 -UN-21APR95

A—Rail
B—Shifter Fork
C—Shifter Fork
D—Rollers
E—Front Cover
F—Spring
G—Detent Ball
H—Shifter Cam
I—O-Ring
K—Washer
L—Lever
M—Spring Pin



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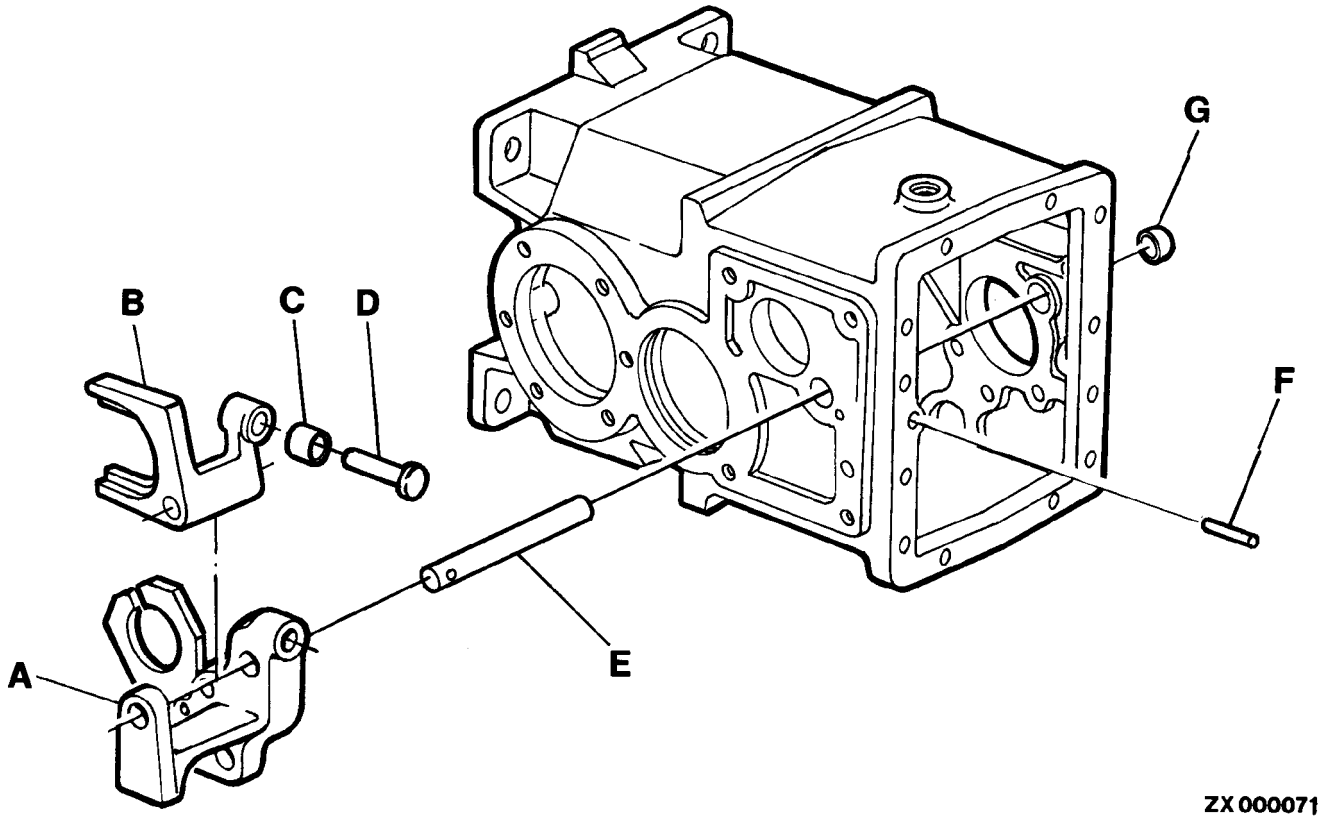
ZX,TMSPFH000057-19-22JAN91

INSTALL SHIFTER FORKS



A—Shifter Fork
B—Shifter Fork
C—Roller (2 used)
D—Pin (2 used)
E—Rail
F—Dowel Pin
G—Cap

1. Install rollers and pins (C) and (D).
Roller must turn freely on pin and pin must be flush with top of roller.

2. Install shifter forks (A) and (B) on shifter rail (E) and install dowel pin (F).

3. Check for adequate shifter fork movement. All gears must turn freely when transmission is turned by hand.

NOTE: Apply 1.5 mm (0.06 in.) bead flexible sealant to counterbore of housing when installing cap (G).

ZX,TMSPFH000058-19-22JUL91

INSTALL FRONT COVER WITH SHIFTER CAM

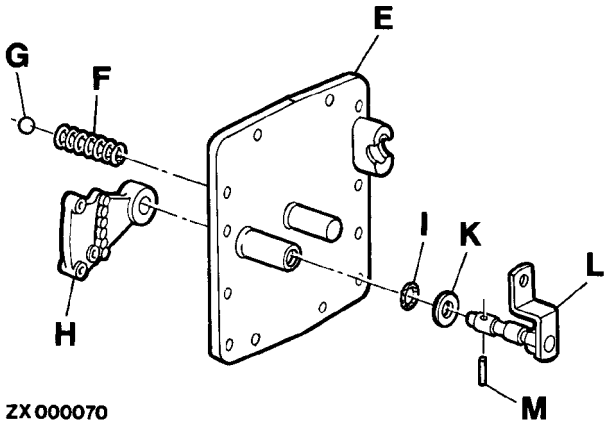
1. Install detent ball (G). Ball must rest against spring (F). Install lever (L) with washer and O-ring. Install spring pin (M).

2. Adjust cam and arm to 0.00—0.25 mm (0.00—0.01 in.) endplay.

3. Apply a continuous 1.5 mm (0.06 in.) wide bead of form-in-place gasket to transmission housing. Install front cover (E) and tighten cap screws to 75 N·m (55 lb-ft).

4. Fill transmission with 9.6 l (2.5 US gal.) of recommended lubricant.

E—Front Cover
F—Spring
G—Detent Ball
H—Shifter Cam
I—O-Ring
K—Washer
L—Lever
M—Spring Pin



ZX000070 -UN-28APR95

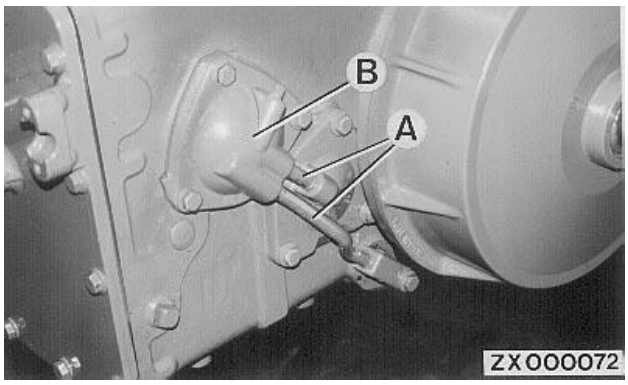
ZX,TMSPFH000059-19-22JUL91

REMOVE AND INSTALL TRANSMISSION LUBE PUMP

NOTE: If pump is not delivering at least 100 kPa (1.0 bar) (15 psi) oil pressure, it must be repaired.

1. Slide tubes (A) out of pinion carrier and block.

2. Remove three cap screws to remove pump (B).



ZX000072 -UN-21APR95

ZX,TMSPFH000060-19-22JUL91

3. Carefully pull pump away from transmission to catch drive pin which usually will fall from drive shaft. Be careful not to disturb shim pack.

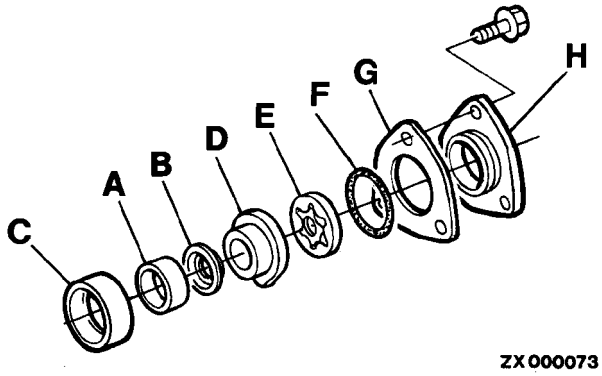
4. Repair or replace pump as necessary. If a new pump housing is installed, the shim pack must be checked. If necessary, remove or add shims (see Transmission Assembly in this Group).

5. Install shim pack (G) with lube pump housing. Tighten cap screws to 75 N·m (55 lb-ft).

6. Install O-ring. Install lube pump with shim pack determined previously.

7. Apply thread lock and sealer (T43512) to cap screw threads. Install cap screws and tighten to 75 N·m (55 lb-ft).

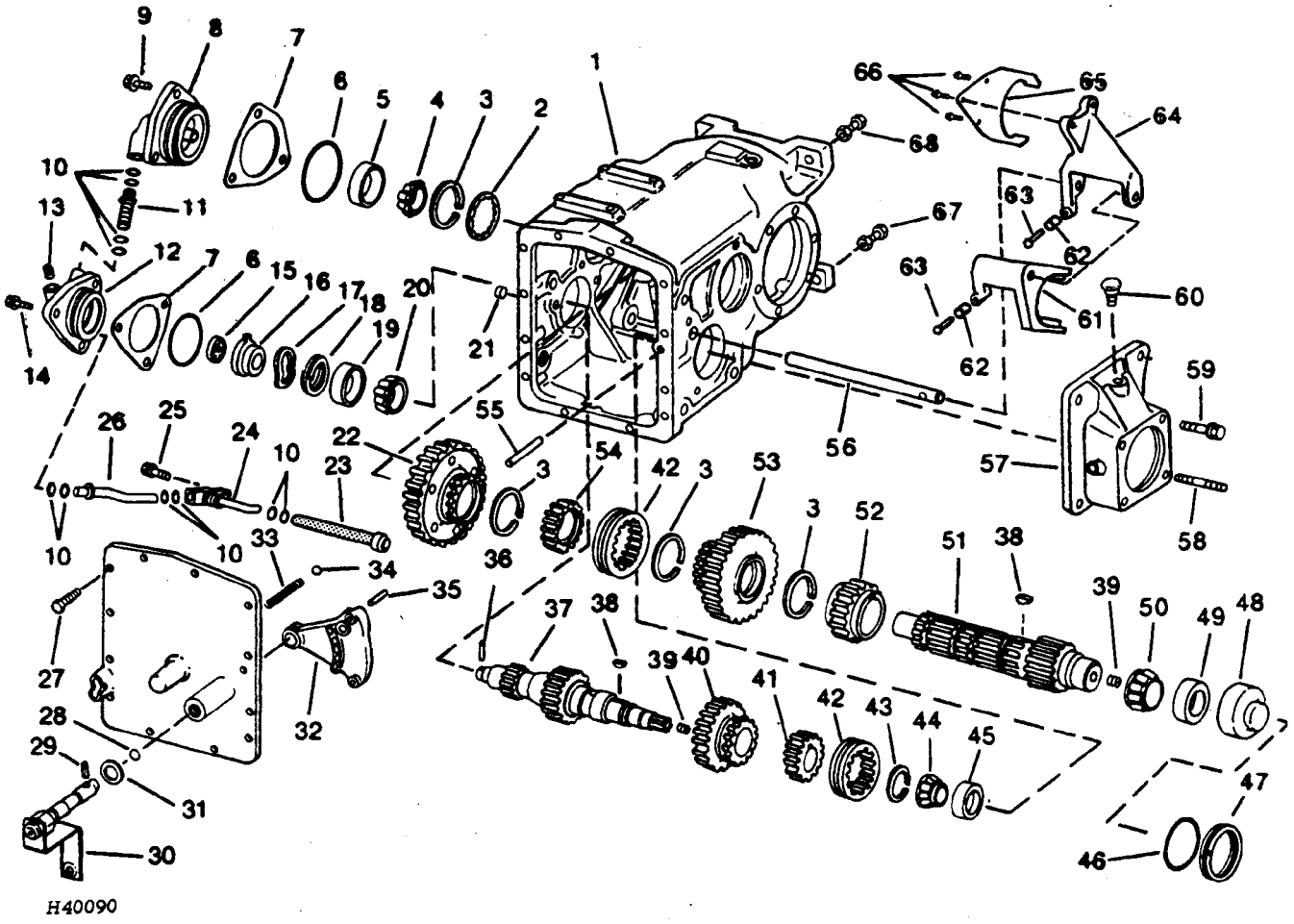
8. Slide oil tubes into pinion carrier and block.



A—Bearing Cap
B—Spring Washer
C—Bushing
D—Liner
E—Gear Pump
F—O-Ring
G—Shim
H—Pump Housing

ZX,TMSPFH000277-19-01AUG97

TRANSMISSION COMPONENTS



1401,5005,O -19-12SEP91

1—Housing
2—Washer
3—Snap Ring (4 used)
4—Bearing
5—Cup
6—O-Ring (2 used)
7—Shim (as required)
8—Pinion Carrier
9—Cap Screw, M10 x 30 (3 used)
10—O-Ring (8 used)
11—Oil Tube
12—Cap
13—Plug
14—Cap Screw, M10 x 30 (3 used)
15—Gear
16—Plate
17—Washer
18—Snap Ring
19—Cup
20—Bearing
21—Cap
22—Gear
23—Screen
24—Fitting
25—Cap Screw, M10 x 40
26—Oil Tube
27—Cap Screw, M10 x 30 (12 used)
28—O-Ring
29—Spring Pin
30—Shift Arm
31—Washer
32—Shift Cam
33—Spring
34—Detent Ball
35—Pin (2 used)
36—Pin
37—Input Shaft
38—Key (2 used)
39—Orifice (2 used)
40—Gear
41—Gear
42—Shift Collar (2 used)
43—Snap Ring
44—Bearing
45—Cup
46—O-Ring
47—Snap Ring
48—Cap
49—Cup
50—Bearing
51—Pinion
52—Gear
53—Gear
54—Gear
55—Pin
56—Shift Rail
57—Hydrostatic Motor Mount
58—Stud (4 used)
59—Cap Screw M16 x 45 (4 used)
60—Breather
61—Shift Fork
62—Roller (2 used)
63—Pin (2 used)
64—Shifter
65—Yoke
66—Cap Screw, M10 x 25 (3 used)
67—Cap Screw, M16, with nut (2 used)
68—Cap Screw, M16, with nut (2 used)

Legend for Transmission Components

1401,HX,5005,B -19-11DEC92

TRANSMISSION RECONDITION

Transmission recondition includes the input shaft and the pinion shaft.

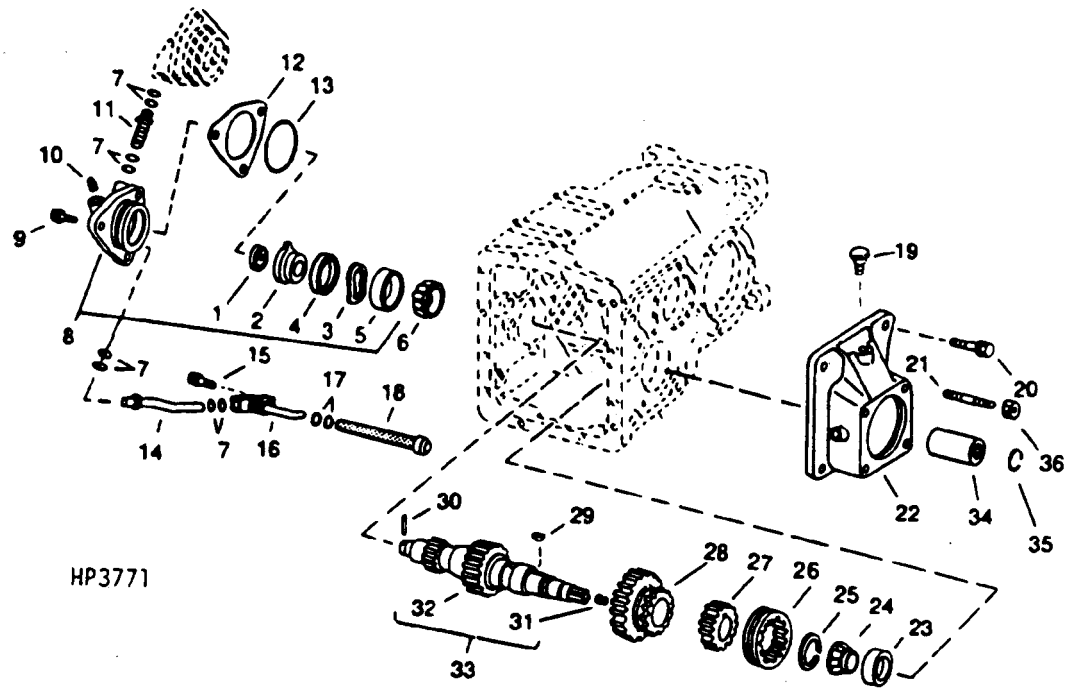
Refer to shifter forks and shifter cam for removal.

Refer to transmission lube pump for its removal. Remove oil screen.

Remove the remaining bearing carrier on the side of transmission.

1401,5005,Q -19-12SEP91

DISASSEMBLE AND REPAIR TRANSMISSION



1—Rotor	10—Plug	19—Breather	28—Gear
2—Plate	11—Tube	20—Screw (4 used)	29—Key
3—Washer	12—Shim (as required)	21—Stud (4 used)	30—Dowel Pin
4—Bushing	13—O-Ring	22—Rail	31—Orifice
5—Bearing	14—Tube	23—Bearing Cup	32—Shaft
6—Bearing cone	15—Cap Screw	24—Bearing Cone	33—Input Shaft
7—O-Ring (8 used)	16—Fitting	25—Snap Ring	34—Coupling
8—Oil Pump	17—O-Ring (2 used)	26—Shift Collar	35—Snap Ring (2 used)
9—Screw (3 used)	18—Screen	27—Shift Collar	36—Flange Nut (4 used)

Input Shaft Assembly

HX,1401,5005,H -19-11DEC92

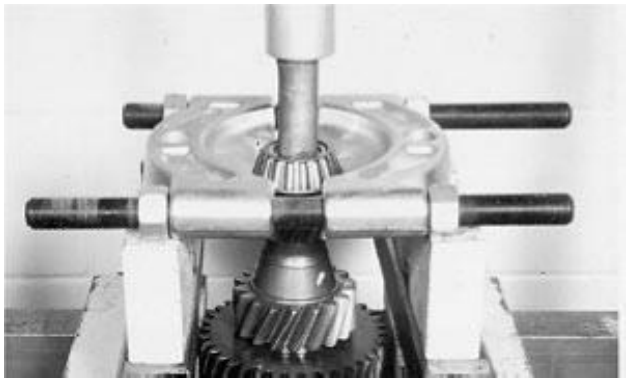
1. Remove shifter forks. (See procedure in this group.)

2. Remove lube pump. (See procedure in this group.)

3. Remove hydrostatic motor. (See procedure in this group.)

4. Remove input shaft assembly.

5. Press bearings off both ends of shaft.



H40167 -UN-13JAN89

ZX,1401,5005,S -19-01AUG97

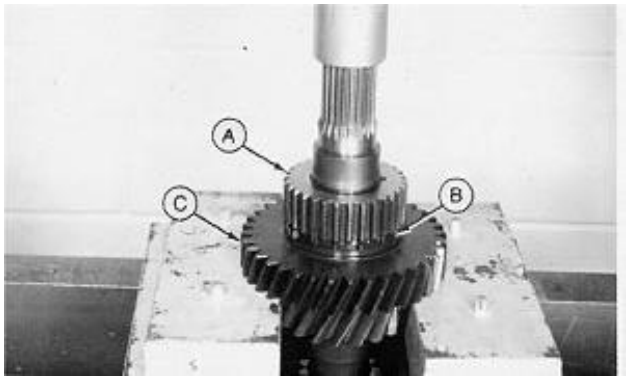
6. Remove snap ring from shift collar end of shaft.

7. Press (A) off shaft and slide gear (C) and shift collar (B) off shaft.

8. Check orifice (31) and oil passage through input shaft for restriction. Clean thoroughly. Torque orifice to 17 N·m (12 lb-ft).

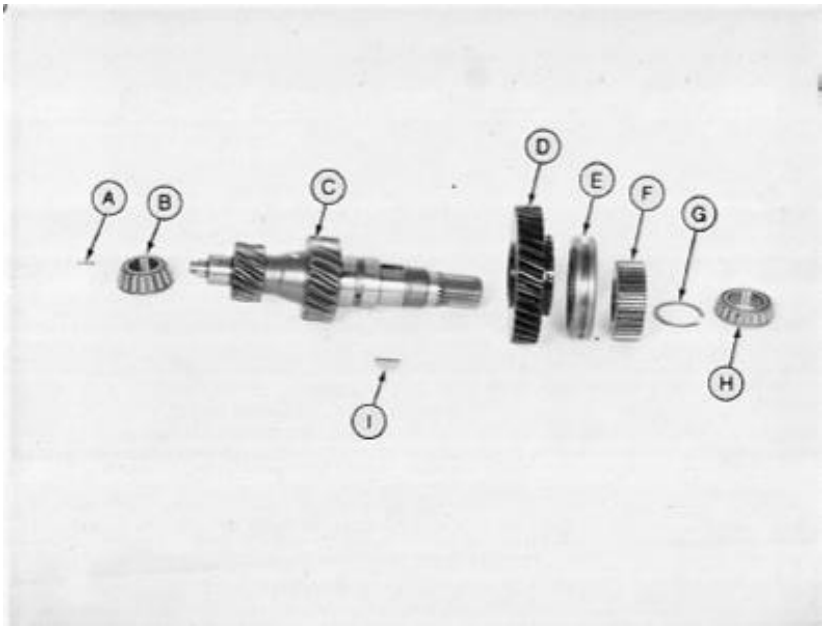
9. Replace parts as necessary.

10. Assemble input shaft parts.



H40168 -UN-13JAN89

HX1401,5005,E -19-13SEP94



-UN-13JAN89
H40169

A—Lube Pump Drive Pin
B—Bearing Cone
C—Input Shaft
D—Gear
E—Shift Collar
F—Gear
G—Snap Ring
H—Bearing Cone
I—Key

1401,5005,U -19-12SEP91

REMOVE PINION SHAFT

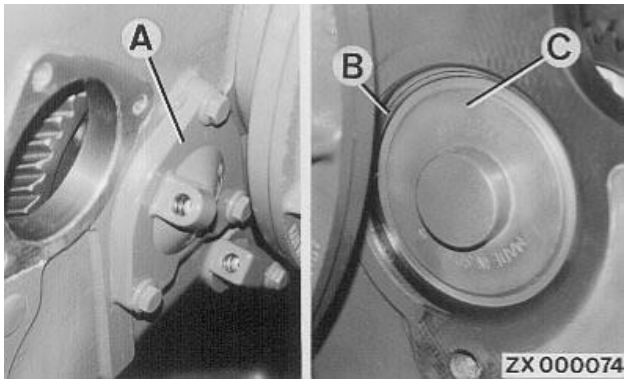
Remove attaching screws and lift off bearing cap (A).

Remove snap ring (B).

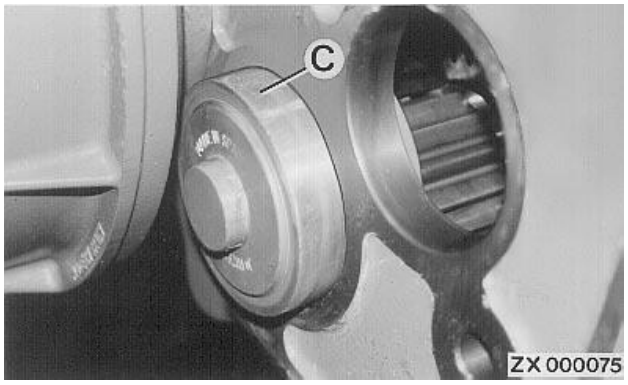
Drive out bearing cap (C) by tapping lightly on shaft with a lead hammer.

NOTE: For pinion shaft removal and installation, bearing supports of differential must be removed.

Slightly turn differential to the side.

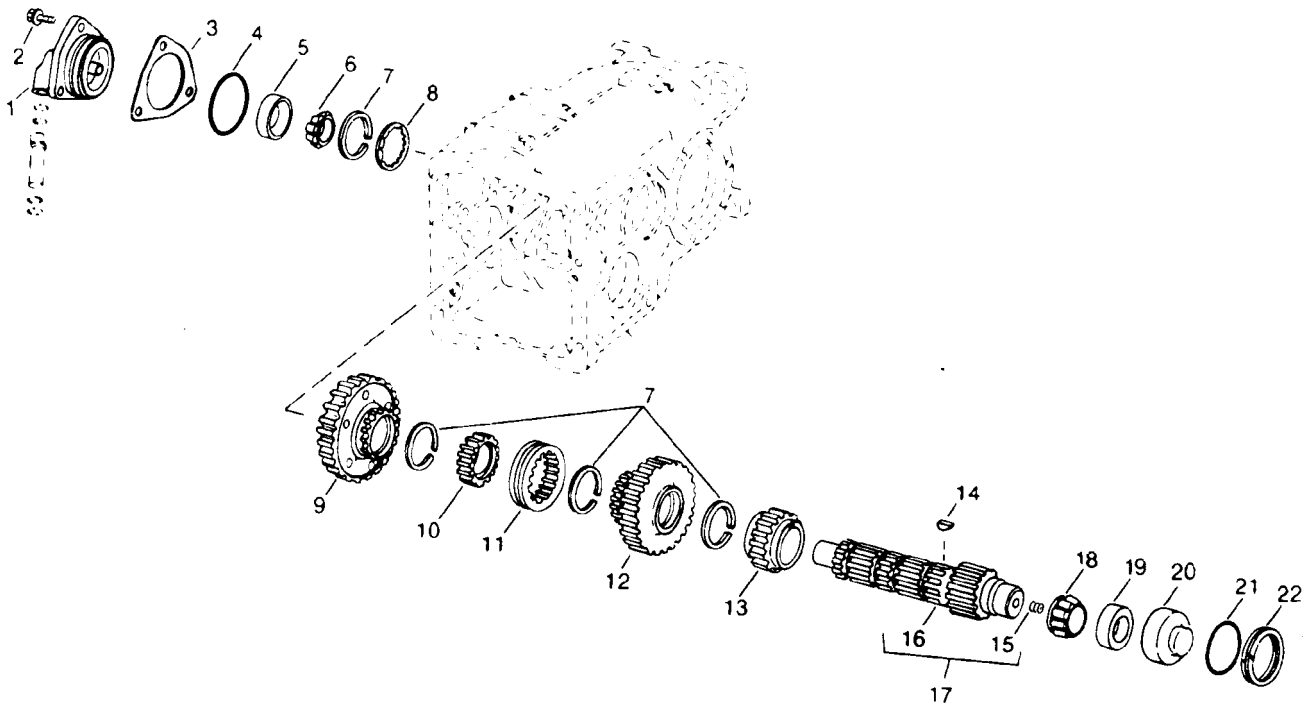


-UN-21APR95
ZX000074



-UN-21APR95
ZX000075

ZX,TMSPFH000265-19-01AUG97



1—Pinion Carrier	**7—Snap Ring (4 used)**	**13—Gear**	**18—Bearing Cone**
2—Cap Screw (3 used)	**8—Washer**	**14—Key**	**19—Bearing Cup**
3—Shim (as required)	**9—Gear**	**15—Orifice**	**20—Bearing Cup**
4—O-Ring	**10—Gear**	**16—Pinion**	**21—O-Ring**
5—Bearing Cup	**11—Shift Collar**	**17—Pinion Shaft**	**22—Snap Ring**
6—Bearing Cone	**12—Gear**		

Pinion Shaft Assembly

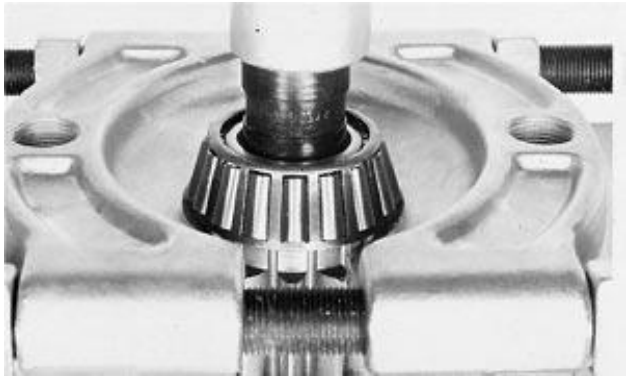
1401,5005,V -19-12SEP91

1. Remove right hand differential bearing carrier to allow removal of the pinion shaft.

NOTE: Move gear end of differential toward rear of transmission.

2. Press bearings off both ends of shaft.

3. Remove snap rings (7) to remove gears.



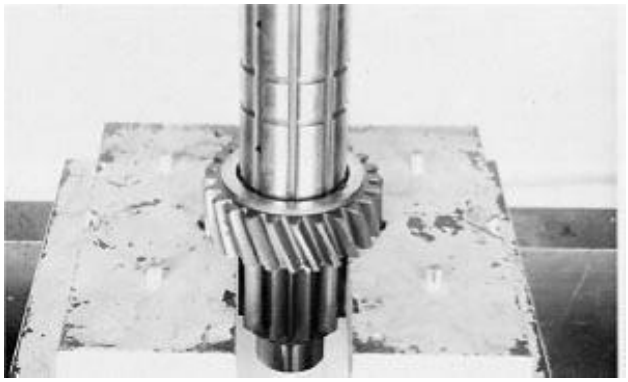
ZX,1401,5005,F -19-01AUG97

4. Press gear off shaft.

5. Check orifice (15) and oil passage through pinion shaft (16) for restriction. Clean thoroughly. Torque orifice to 17 N·m (12 lb-ft).

6. Replace parts as necessary.

7. Assemble parts on shaft.



H40171 -UN-13JAN89

ZX,1401,5005,G -19-01AUG97

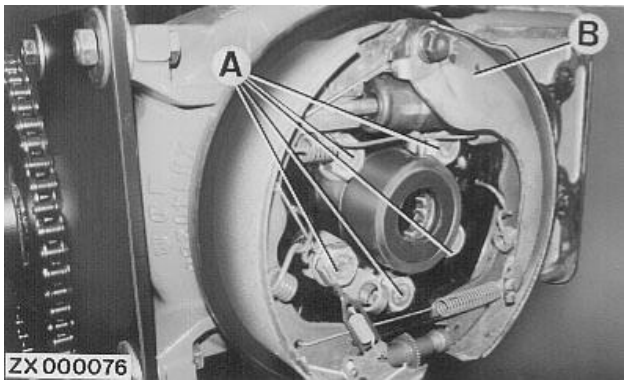
REMOVE DIFFERENTIAL

Remove screws (A) and anchor plate (B) on both sides. Turn out sensor (E).

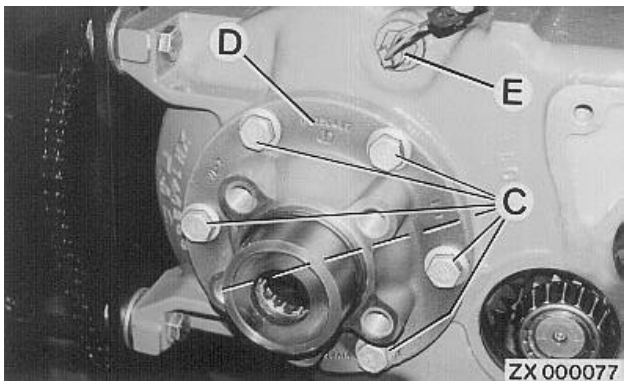
Remove screws (C) and bearing support (D) on both sides.

Remove countershaft and differential from transmission case.

A—Anchor plate attaching screws
B—Anchor plate
C—Bearing support attaching screws
D—Differential bearing supports
E—Ground speed sensor

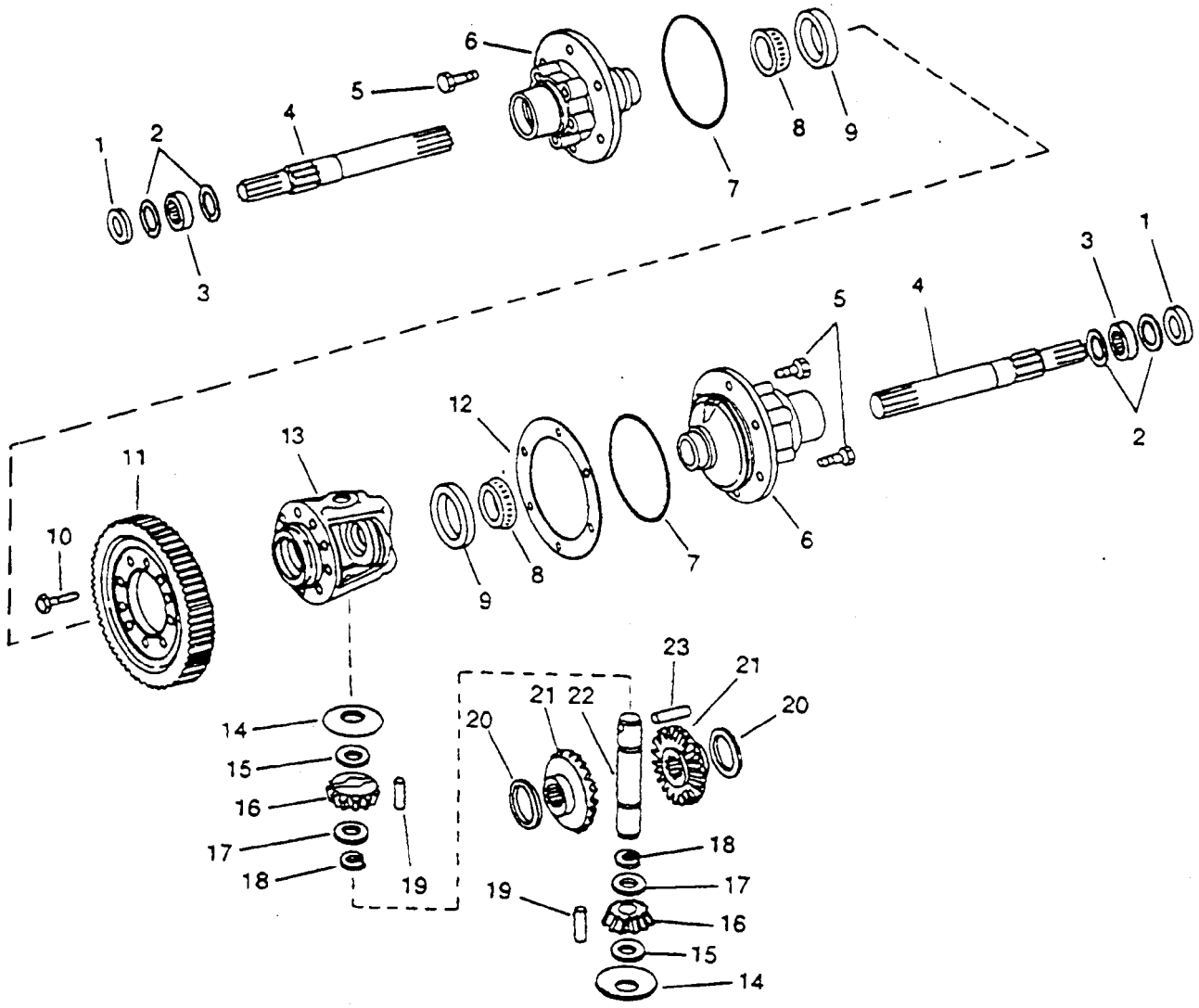


ZX000076 -UN-21APR95



ZX000077 -UN-21APR95

ZX,TMXZCO010114-19-01AUG97



1—Seal (2 used)
2—Snap Ring (4 used)
3—Roller Bearing (2 used)
4—Drive Shaft (2 used)
5—Cap Screw, M16 x 45 (12 used)
6—Cradle (2 used)
7—O-Ring (2 used)
8—Bearing Cone (2 used)
9—Cup (2 used)
10—Cap Screw, M12 x 35 (14 used)
11—Ring Gear
12—Shim (as required)
13—Housing
14—Thrust Washer (2 used)
15—Thrust Washer (2 used)
16—Pinion (2 used)
17—Thrust Washer (2 used)
18—Snap Ring (2 used)
19—Needle Bearing (52 used)
20—Washer (2 used)
21—Gear (2 used)
22—Pin
23—Spring Pin

Differential

1401,5005,Y -19-12SEP91

CAUTION: Use a lifting device for heavy components.

IMPORTANT: Do not damage plastic or aluminum shims between transmission case and cradles.

— Remove drive shafts and remove cradles.

— Remove snap ring (B) to remove bearing (A).

H40176 -UN-13JAN89

ZX,1401,5005,H -19-01AUG97

DISASSEMBLE DIFFERENTIAL

Remove ring gear.

H40175 -UN-15MAR89

ZX,TMXZCO010115-19-01AUG97

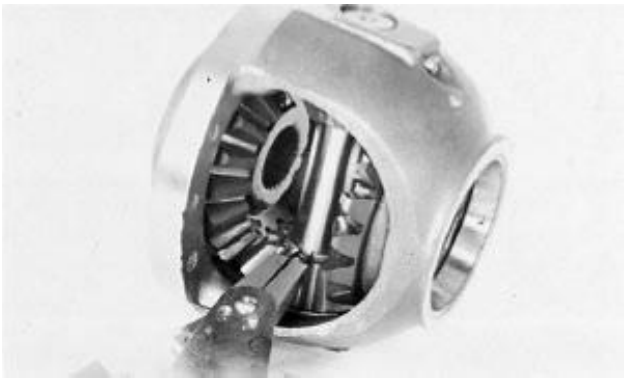
Drive out spring pin.

H40177 -UN-13JAN89

ZX,TMSPFH000270-19-22JAN91

Remove snap rings.

Take out differential components.



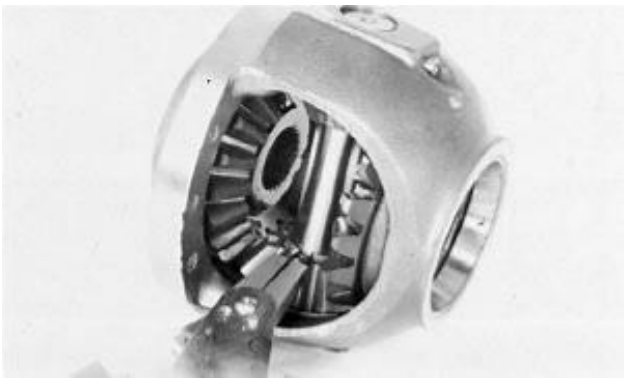
ZX,TMSPFH000271-19-22JAN91

ASSEMBLE DIFFERENTIAL

1. Pack all bearings with grease. Apply a light coat of grease to housing before pressing in bearing cups.

2. Coat thrust surfaces and bores of bevel gears and pinion gears with oil. Thrust washers must be tabbed into housing on early differentials. On later differentials, no tabbing is required.

3. Install bevel gears, pinion gears, thrust washers, and differential pins. Install snap rings. All gears must rotate freely.



ZX,1401,5005,L -19-01AUG97

4. Install ring gear. Apply thread lock and sealer (medium strength) to cap screw threads. Install cap screws and tighten to 130 N·m (97 lb-ft).

ZX,1401,5005,M -19-01AUG97

5. Install inner snap ring and press bearing cone (A) into cradle. Install outer snap ring (B) and install shaft seal. Press flush with housing. Apply multipurpose grease to seal lip.

H40176 -UN-13JAN89

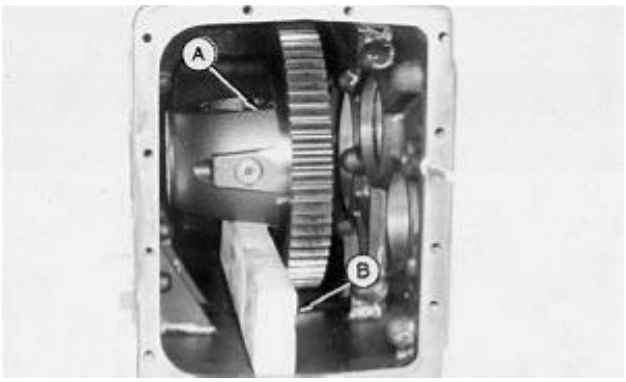
ZX,1401,5005,N -19-01AUG97

ASSEMBLE TRANSMISSION

CAUTION: Use a lifting device for heavy components.

1. Install differential (A) in transmission case. Use a board (B) to position differential.

NOTE: Move the gear end of differential toward rear of transmission to allow installation of pinion assembly.



H40221 -UN-17APR89

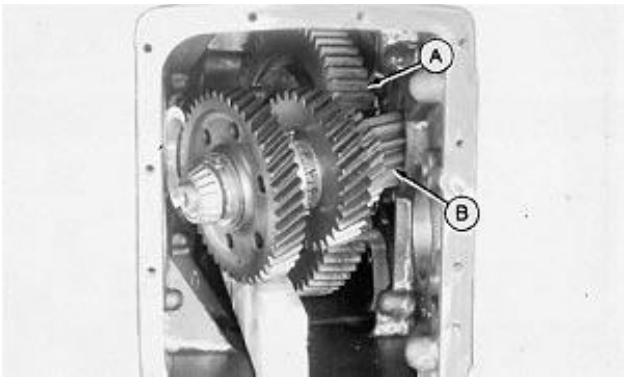
ZX1401,5005,AG -19-12SEP91

2. Install pinion assembly. Be sure pinion shaft gear (B) meshes with differential gear (A).

3. If old shims (behind cradle) were not damaged, they may be used. Otherwise, assemble a new pack. Start with several shims to ensure end play.

4. Install cradles. Tighten to 320 N·m (235 lb-ft).

5. Check differential for 0,08-0,25 mm (0.003-0.01 in.) preload. Add or remove shims as needed. Apply thread lock and sealer (medium strength) to cap screw threads. Install cradles. Tighten cap screws to 320 N·m (235 lb-ft).



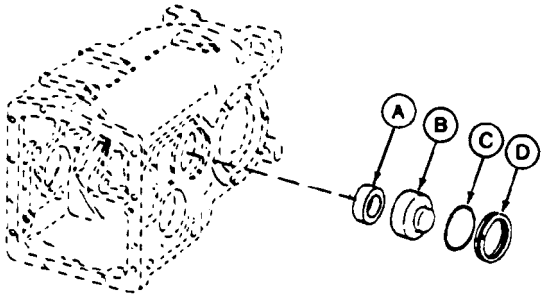
H40222 -UN-17APR89

ZX,1401,5005,AH-19-01AUG97

6. Install bearing cup, cap, O-ring, and retaining ring (A-D).

IMPORTANT: The following procedure must be followed when determining required shim pack for the pinion shaft. This prevents false endplay readings caused by retaining ring (D).

A—Bearing Cup
B—Cap
C—O-Ring
D—Retaining Ring



HX,1401,5005,K -19-11DEC92

7. Install bearing cap (B). Leave O-ring (D) off at this time.

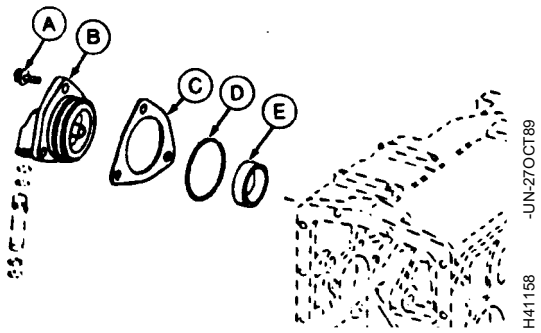
8. Evenly tighten cap screws to 2.2 N·m (20 lb-in.)

9. Rotate pinion shaft at least two complete revolutions. Again evenly tighten cap screws to 2.2 N·m (20 lb-in.).

10. Measure gap between bearing cap (B) and housing at two places exactly 180˚ apart. Install shim pack (C) equal to average of these two readings. This shim pack will provide 0.127 mm (0.005 in.) preload.

11. Install O-ring on cap and install shim pack and cap.

12. Apply Thread Lock and Sealer (Medium Strength) to cap screw threads. Install cap screws and tighten to 73 N·m (55 lb-ft).



A—Cap Screw (3 used)
B—Bearing Cap
C—Shim (as required)
D—O-Ring
E—Bearing Cap

ZXHX1401,5005,L-19-08APR92

13. Install input shaft assembly in transmission.

14. Apply form-in-place gasket to face of hydrostatic motor mount. Install on transmission. Tighten cap screws to 320 N·m (235 lb-ft).

15. Install transmission oil pump.

16. Adjust transmission oil pump shim pack to provide 0.01 to 0.2 mm (0.0005 to 0.008 in.) axial end play of input shaft assembly.

17. Install hydrostatic motor.

ZXHX1401,5005,O-19-01AUG97

INSTALL TRANSMISSION

Using a trolley jack, roll transmission under machine and attach to front axle.

Connect mechanical parts such as parking brake cables, drive shafts, shift cable as well as hydrostatic motor.

Connect electrical ground speed sensor.

Connect brake line and bleed brake system (see Section 60).

Adjust parking brake.

Fill transmission with specified oil.

ZX,TMSPFH000275-19-22FEB92

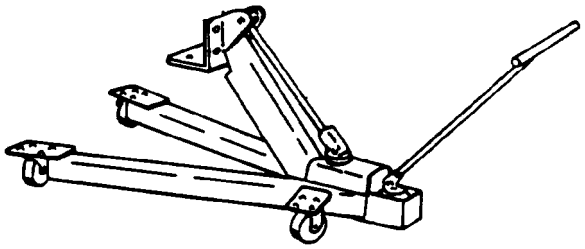
SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Service Jack D05070ST

To remove and install final drives.

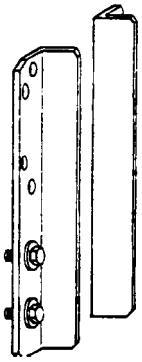


H40598 -UN-14SEP89

ZX,TMXZCO002386-19-25NOV92

Final Drive Adapter JT05874

Use with D05070ST Service Jack to remove and install final drives.



H40599 -UN-05SEP89

1401,5010,AD -19-12SEP91

SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools from your SERVICE-GARD™ Catalog. Some tools may be available from a local supplier.

Name	Use
17-1/2 and 30 Ton Puller Set	To remove and install bearings and seals.
Bushing, Bearing, and Seal Driver Set	To remove and install bearings and seals.
Service Jack Adapter	To remove and install final drive.

1401,5015,A -19-12SEP91

OTHER MATERIALS

Number	Name	Use
TY6333	Multipurpose Grease	Pack Bearings
. . . . .	Masking Tape	Wrap shaft splines to prevent damage to seals during assembly.
TY15130	Form-in-Place Gasket	Seal inner and outer halves.
AR41870	Corrosion Inhibitor	Protect components in storage.
TY6304	Flexible Sealant	Seal spindle cap.

1401,5015,B -19-12SEP91

SPECIFICATIONS

Item	Measurement	Specification
Front Tire and Wheel	Approximate Weight	340 kg (750 lb)
Final Drive	Capacity	6.2 L (6.5 qt.)
	Approximate Weight	252 kg (555 lb)
Final Drive-to-Axle Top Two Cap Screws	Torque	405 N·m (300 lb-ft)
Final Drive-to-Axle Bottom Two Rearward Middle Cap Screws	Torque	200 N·m + 90° (148 lb-ft)
Final Drive-to-Axle Forward Middle Cap Screws	Torque	200 N·m + 180° (148 lb-ft)
Front Wheel Bolts	Torque	200 N·m (150 lb-ft) + 1/4 turn.
Quill-to-Inner Housing Cap Screws	Torque	73 N·m (55 lb-ft)
Pinion Shaft	End play	0.02—0.2 mm (0.0008—0.008 in.)
Axle Shaft Bearing Cap Screw	Torque	900 N·m (660 lb-ft) and additionally tighten to align locking plate
Inner Housing-to-Outer Housing Cap Screws	Torque	305 N·m (225 lb-ft)

1401,5015,C -19-12SEP91

REMOVE AND INSTALL FINAL DRIVE

NOTE: It is not necessary to remove the entire final drive to service the outer half of drive unit.

CAUTION: Grain tank must be empty and header removed.

1. Loosen wheel bolts one turn. Do not remove at this time.

CAUTION: Block up front axle before removing wheels.

CAUTION: Jack must have a minimum rating of 5443 kg (6 ton).

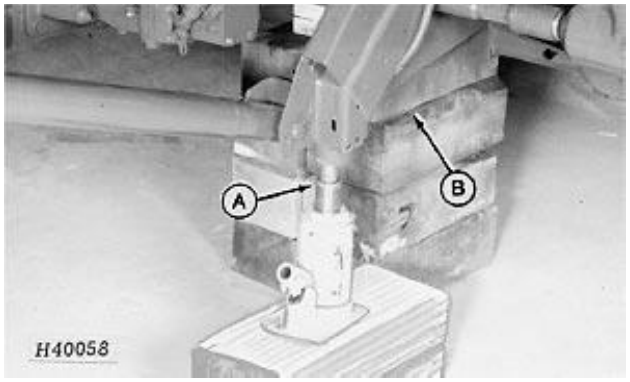
2. Raise combine with jack (A).

3. Block up front axle (B).

CAUTION: The approximate weight of tire and wheel is 340 kg (750 lb) (without liquid ballast).

4. Support tire and wheel and remove wheel bolts to remove front tire and wheel.

5. Drain final drive. Approximate capacity is 6.2 L (6.5 qt.)

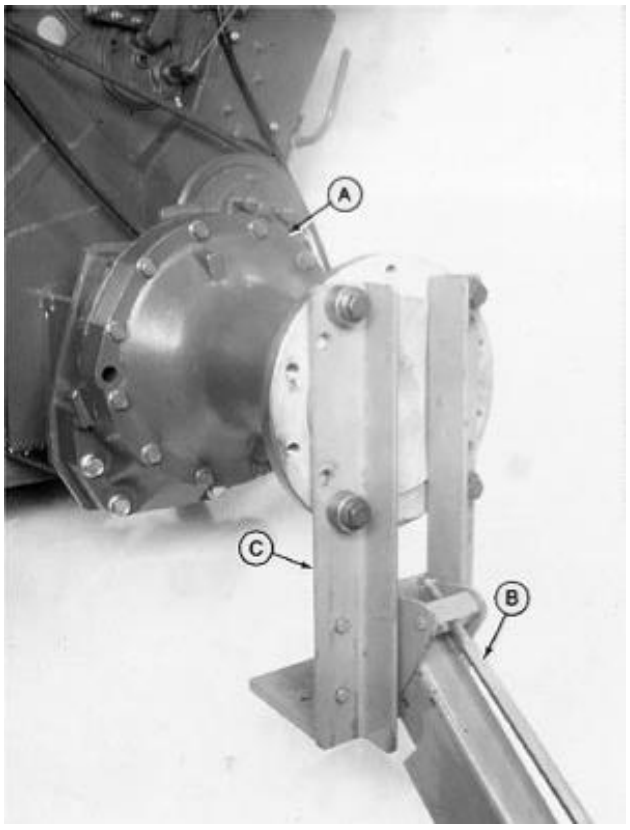


H40058 -UN-10OCT88

1401,5015,E -19-12SEP91

CAUTION: The approximate weight of final drive is 252 kg (555 lb).

6. Use D05070ST Service Jack with JT05874 Final Drive Adapter (C) to remove final drive (A).



H41336 -UN-25AUG89

1401,5015,J -19-12SEP91

7. Remove spiral snap ring (D).

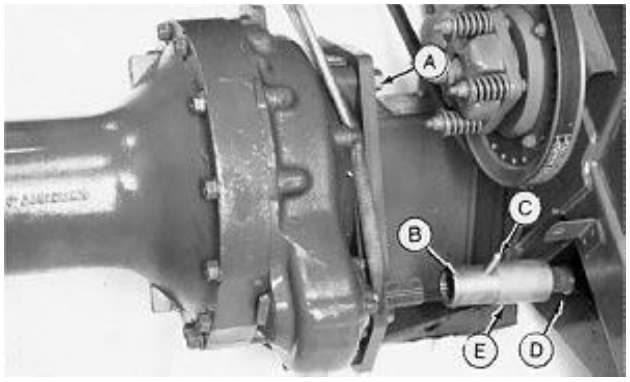
8. Slide sleeve (E) inward.

9. Remove pin (C).

10. Drive coupler (B) inward.

11. Remove cap screws (A).

12. Repair final drive. (See Disassemble and Assemble Final Drive in this group.)



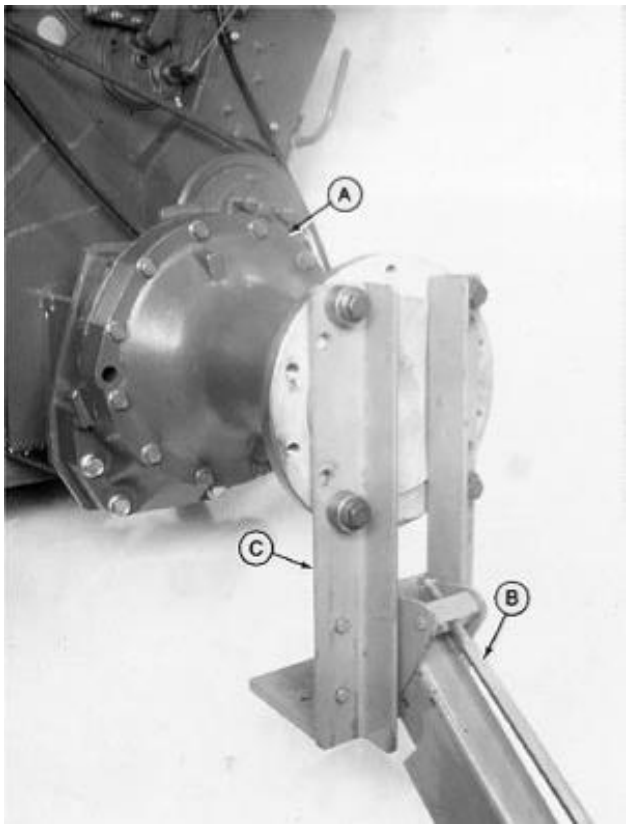
H40579 -UN-20APR89

A—Cap Screw (6 used)
B—Coupling
C—Pin
D—Spiral Snap Ring
E—Sleeve

1401,5015,G -19-12SEP91

CAUTION: The approximate weight of final drive is 252 kg (555 lb).

13. Use D05070ST Service Jack (B) with JT05874 Final Drive Adapter (C) to install final drive (A).



-UN-25AUG89
H41336

1401,5015,K -19-12SEP91

14. Install final drive with cap screws (A). (See Specifications in Section 50, Group 15.)

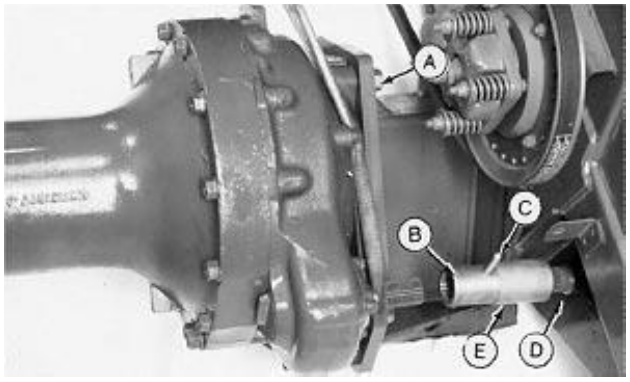
15. Apply multipurpose grease to drive shaft splines and couplers.

16. Drive coupler (B) toward final drive and drive in pin (C).

17. Slide sleeve (E) over coupler and install spiral snap ring (D).

18. Fill final drive with 6.2 L (6.5 qt.) of recommended lubricant. (See Section 10, Group 20.)

19. Install wheel. Tighten bolts to 200 N·m (150 lb-ft) plus 1/4 turn.

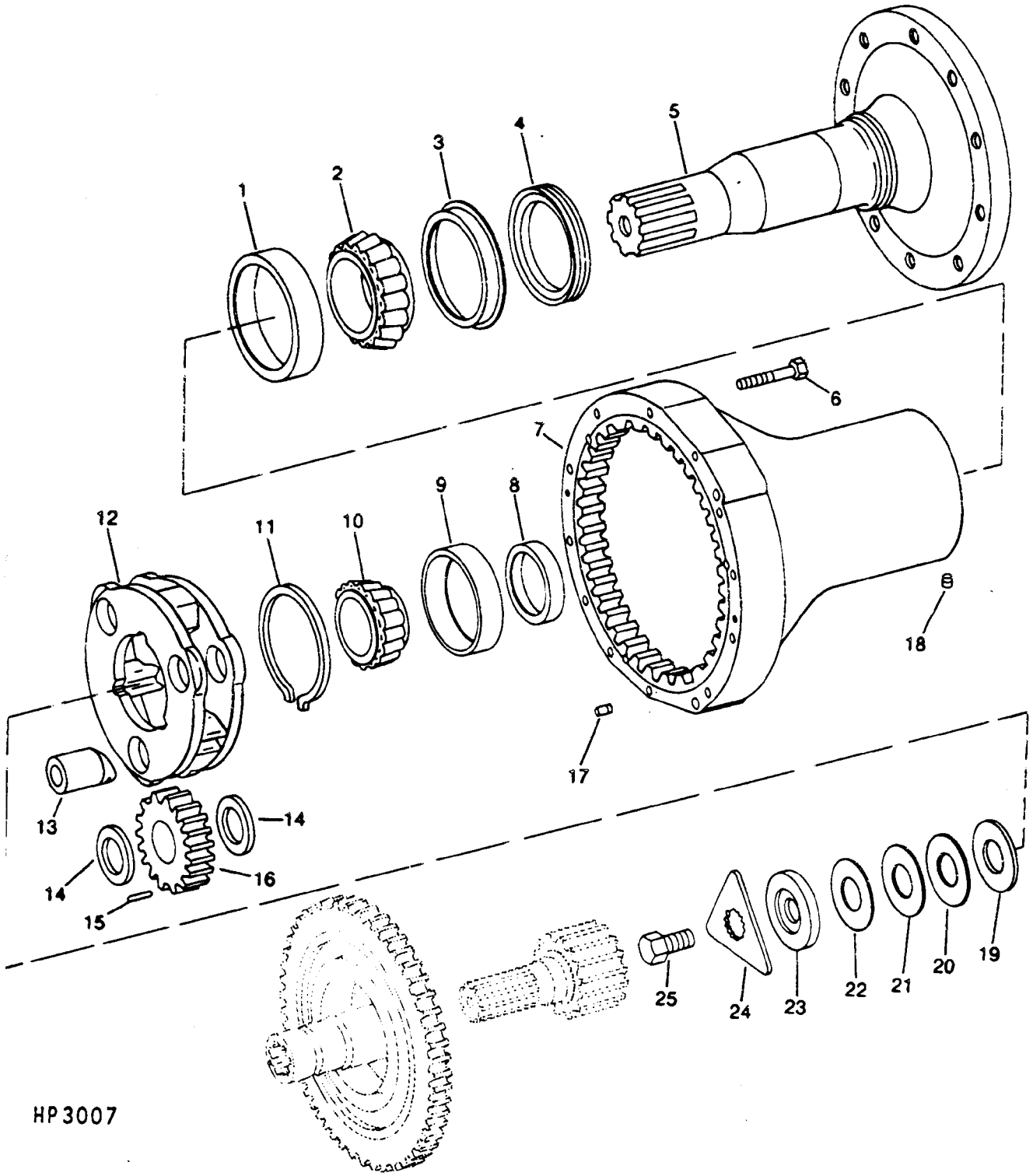


-UN-20APR89
H40579

A—Cap Screw (6 used)
B—Coupling
C—Pin
D—Spiral Snap Ring
E—Sleeve

1401,5015,H -19-12SEP91

DISASSEMBLE AND ASSEMBLE FINAL DRIVE

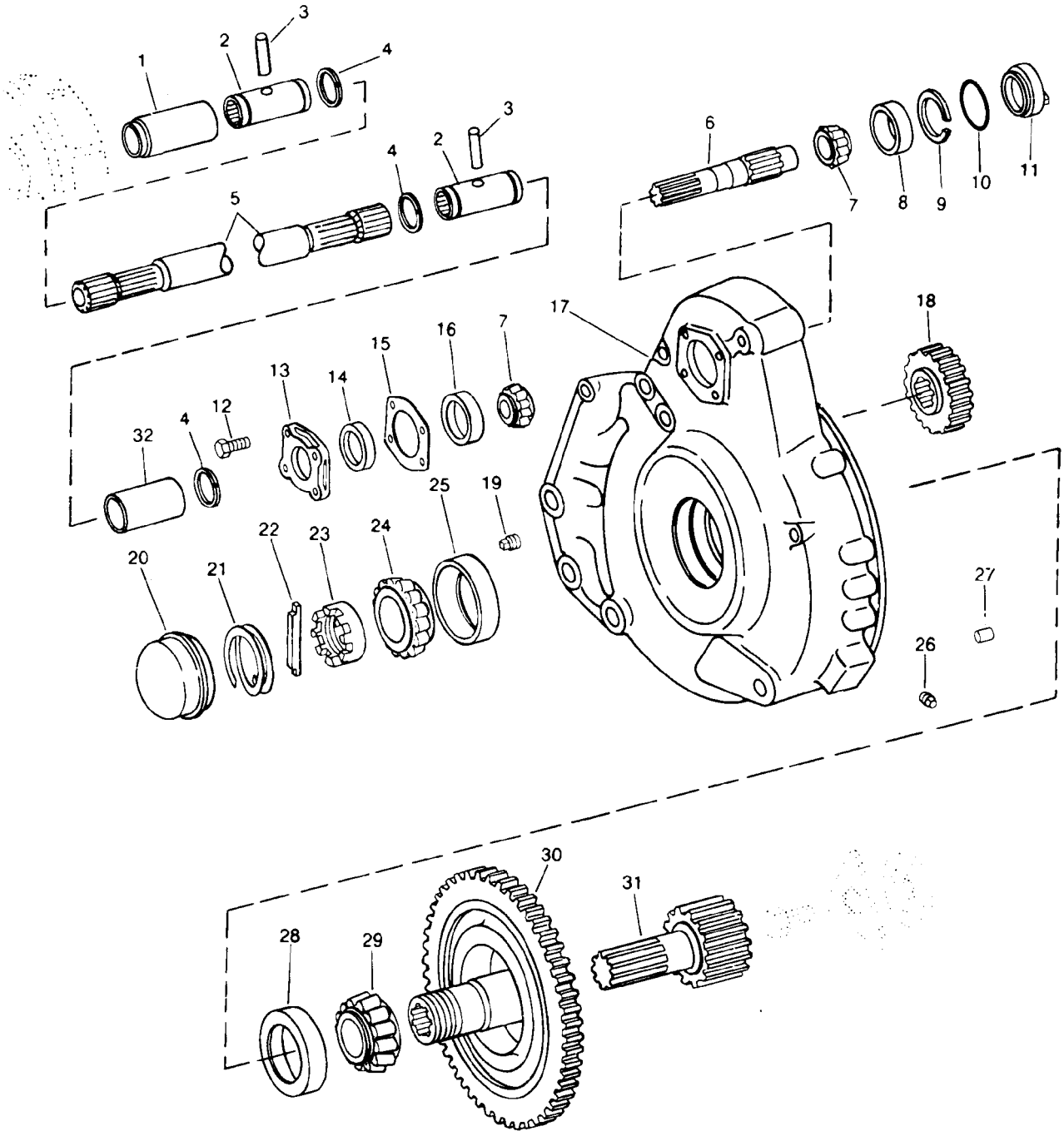


ZX,TMXZCO002504-19-01DEC92

1—Bearing Cup
2—Bearing Cone
3—Oil Cup
4—Seal
5—Spindle
6—Cap Screw (12 used)
7—Housing
8—Seal
9—Bearing Cup
10—Bearing Cone
11—Snap Ring
12—Pinion Carrier
13—Shaft (3 used)
14—Thrust Washer (6 used)
15—Needle Bearing (72 used)
16—Pinion (3 used)
17—Dowel Pin (3 used)
18—Lube Fitting
19—Thrust Washer (2 used)
20—Shim (as required)
21—Shim (as required)
22—Shim (as required)
23—Washer
24—Lock Plate
25—Self-Locking Screw

Legend for Planetary Final Drive

1401,5015,AP -19-12SEP91



1—Sleeve
2—Coupling (2 used)
3—Pin (2 used)
4—Snap Ring (3 used)
5—Drive Shaft
6—Pinion Shaft
7—Bearing Cone (2 used)
8—Bearing Cup
9—Snap Ring
10—O-Ring
11—Cap
12—Cap Screw (4 used)
13—Quill
14—Seal
15—Shim (as required)
16—Bearing Cup
17—Inner Housing
18—Pinion
19—Plug
20—Dust Cap
21—Retaining Ring
22—Key
23—Nut
24—Bearing Cone
25—Bearing Cup
26—Pipe Plug (2 used)
27—Dowel Pin (2 used)
28—Bearing Cup
29—Bearing Cone
30—Gear
31—Pinion
32—Sleeve

1401,5015,AR -19-12SEP91

CAUTION: The approximate weight of planetary final drive is 252 kg (555 lb).

1. Stand final drive on axle flange.

2. Remove 12 cap screws. Lift off inner housing.

H40305 -UN-15MAR89

1401,5015,L -19-12SEP91

3. Remove sun gear (A).

4. Install two bolts (D). Place bar between them to hold final drive when removing cap screw and lock plate (C).

5. Remove cap screw, lock plate, washer, and shims (C).

6. Remove pinion carrier (B).

A—Sun Gear
B—Pinion Carrier
C—Cap Screw and Lock Plate
D—Install two Bolts

H40306 -UN-15MAR89

1401,5015,M -19-12SEP91

7. Hoist final drive 25 mm (1 in.) from surface and tap out axle. Hoist housing away from axle.

NOTE: Lay final drive on its side if hoist is not available to tap axle out of housing using a mallet.

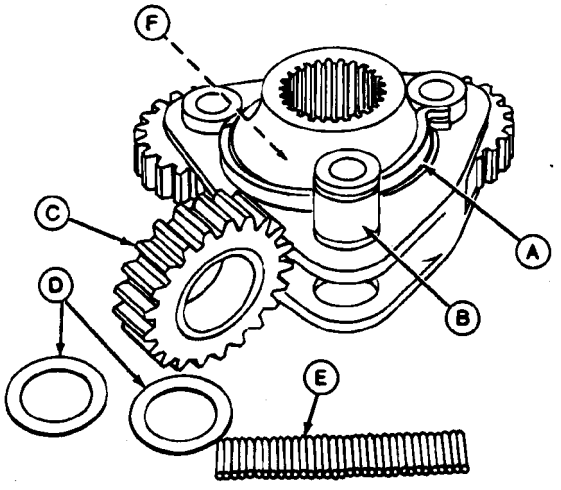
H40307 -UN-15MAR89

1401,5015,N -19-12SEP91

8. Remove snap ring (A) to remove shafts (B), pinions (C), thrust washers (D), needle bearings (E), and shims (F).

9. Inspect parts for wear or damage. Replace as necessary.

A—Snap Ring
B—Shaft (3 used)
C—Pinion (3 used)
D—Thrust Washer (6 used)
E—Needle Bearing (72 used)
F—Shims (as required)



H41130 -UN-07SEP89

1401,5015,O -19-12SEP91

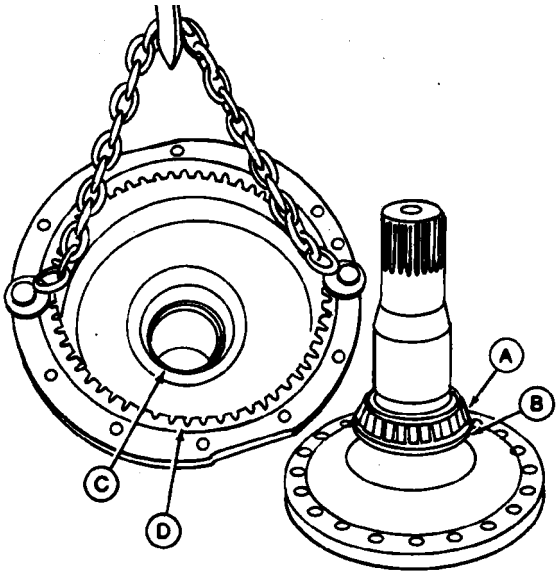
10. Inspect bearing, seals, and ring gear (A-D) for wear or damage.

11. Use a suitable puller to remove bearing (A) if required. Replace seal with cup (C) if bearing is replaced.

NOTE: Seals may need to be replaced but bearing may not.

NOTE: Ring gear (D) is pressed into housing and cannot be replaced without replacing housing.

12. Wash all parts in a clean, safe solvent.



H41131 -UN-07SEP89

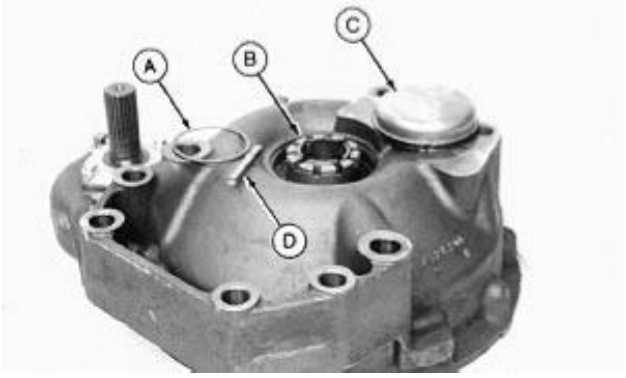
1401,5015,P -19-12SEP91

13. Pry off cap (C). Remove retaining ring (A), and key (D). Use JDG528 wrench to remove nut (B).

14. Remove bearing cone.

CAUTION: Use a lifting device for heavy components.

15. Lift inner housing off gear.



H40309 -UN-15MAR89

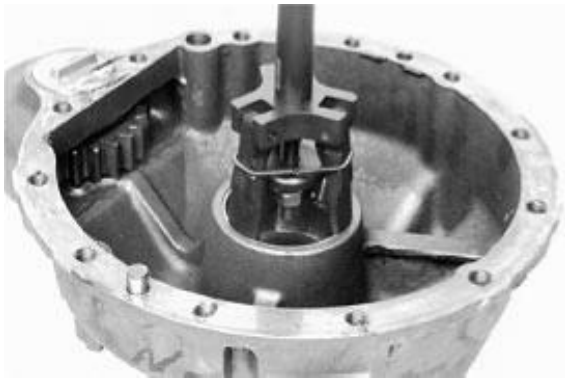
1401,5015,Q -19-12SEP91

16. Inspect bearing cups (A).If necessary to replace, drive bearing cups from inner housing using a brass drift.

H40310 -UN-15MAR89

1401,5015,R -19-12SEP91

17. Remove bearing cups in inner housing bore.

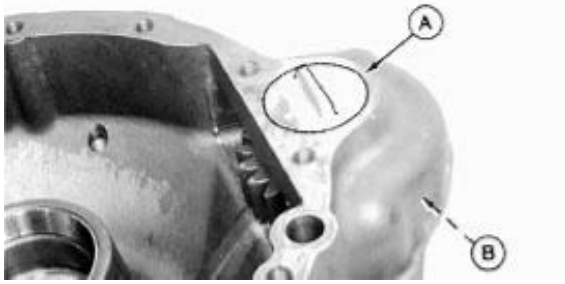


H40311 -UN-15MAR89

1401,5015,S -19-12SEP91

18. Remove cap with O-ring (A).

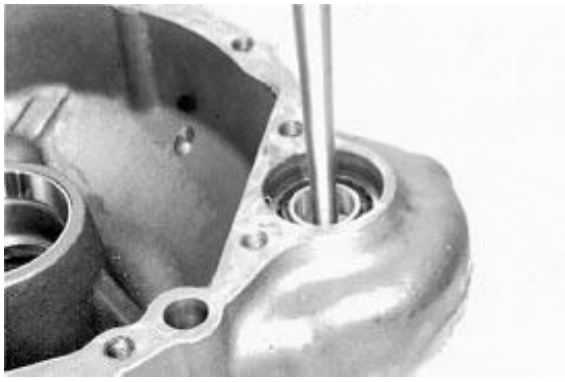
19. Remove quill and shims (B).



H40312 -UN-15MAR89

1401,5015,T -19-12SEP91

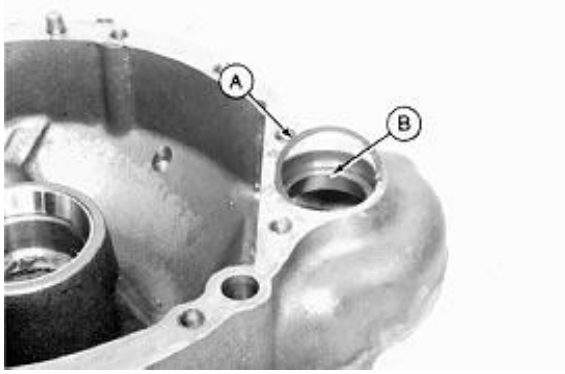
20. Remove pinion shaft with bearing cone, bearing cup, and seal. Remove gear.



H40313 -UN-15MAR89

1401,5015,U -19-12SEP91

21. Remove snap ring (A) and bearing cup (B) if needed to replace.

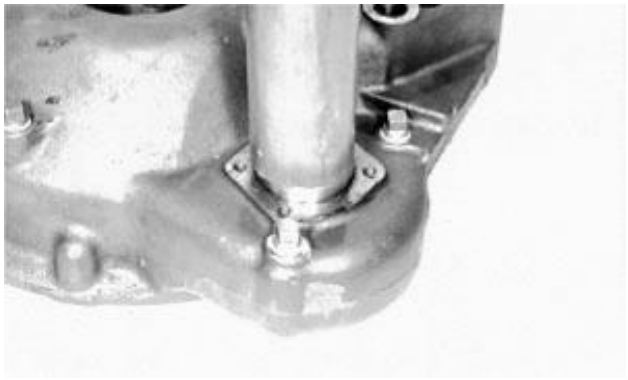


H40314 -UN-15MAR89

1401,5015,V -19-12SEP91

22. Apply a light coating of multipurpose grease (or equivalent) to pinion shaft bore.

23. Install bearing cup and seal.

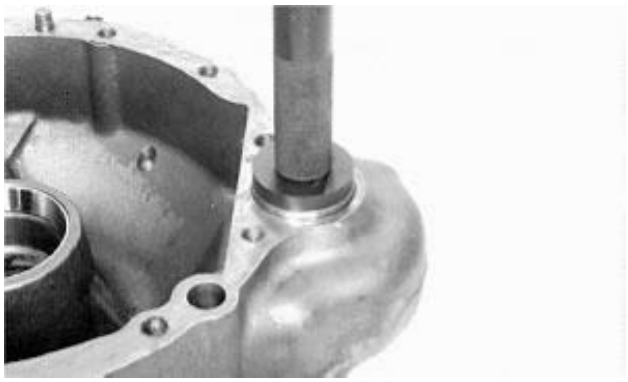


H40315 -UN-15MAR89

1401,5015,W -19-12SEP91

24. Apply a light coating of multipurpose grease (or equivalent) to pinion shaft bore.

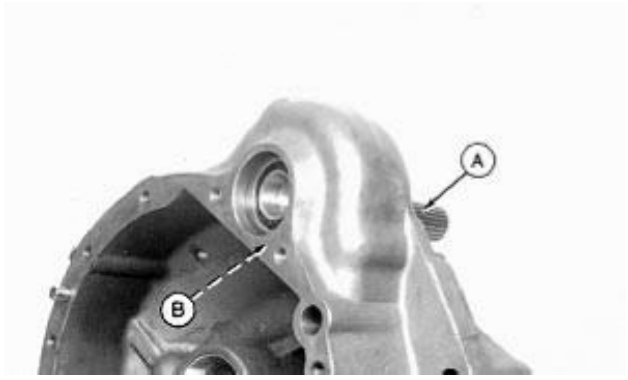
25. Install bearing cup and snap ring.



H40316 -UN-15MAR89

1401,5015,X -19-12SEP91

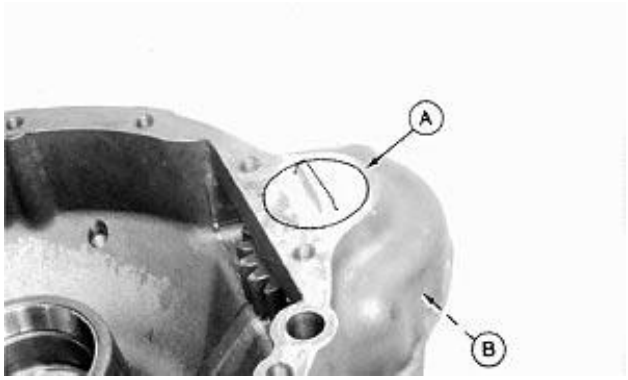
26. Place gear (B) in position in inner housing. Install pinion shaft (A).



H40317 -UN-15MAR89

1401,5015,Y -19-12SEP91

27. Be sure gear (B) turns freely. Coat new O-ring with multipurpose grease and install on pinion bearing cap. Install cap (A), indexed as shown.



H40312 -UN-15MAR89

1401,5015,Z -19-12SEP91

28. Install oil seal (A) in quill. Grease seal to aid in assembly.

29. Install old shims (B) if not damaged. If damaged, assemble a new pack as follows:

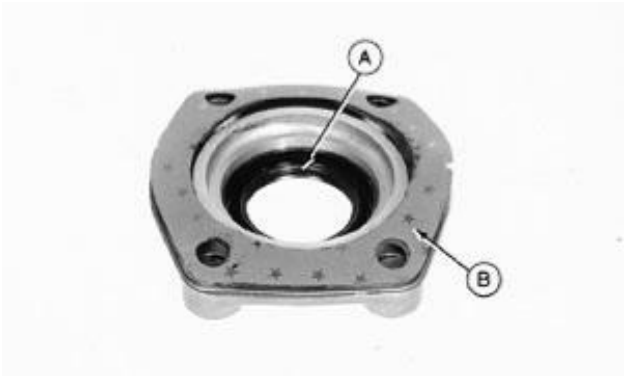
0.13 mm (0.005 in.), 2 used, plastic
0.25 mm (0.010 in.), 1 used, steel
0.51 mm (0.020 in.), 1 used, steel

IMPORTANT: Place plastic shims against each cast surface.

30. Place strips of masking tape over pinion shaft splines to protect seal in quill. Bring tape ends together at end of shaft.

31. Install shim pack on quill. Install quill carefully over pinion shaft. Tighten cap screws to 73 N·m (55 lb-ft). Remove tape.

IMPORTANT: Quill is aluminum. Do not overtighten cap screws.



H40318 -UN-15MAR89

1401,5015,AA -19-12SEP91

32. Mount dial indicator on housing and check pinion shaft for 0.02—0.2 mm (0.0008—0.008 in.) end play.

33. Remove or add shims to get correct end play. Tighten cap screws to 73 N·m (55 lb-ft).

H40319 -UN-15MAR89

1401,5015,AB -19-12SEP91

34. Remove bearing cone (A) from gear shaft if necessary to replace.

H40320 -UN-15MAR89

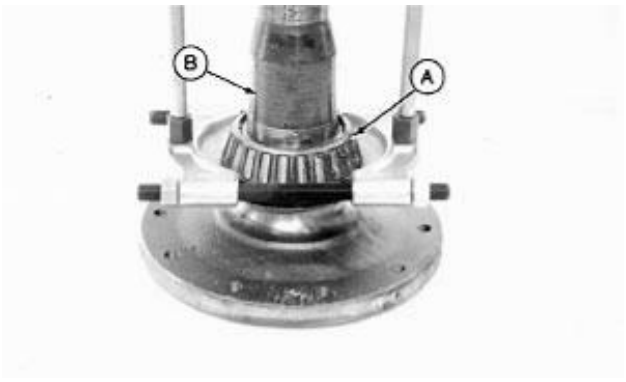
1401,5015,AC -19-12SEP91

35. Hand pack bearing cone with multipurpose grease.

36. Install bearing cone on gear. Bearing cone is a press fit.

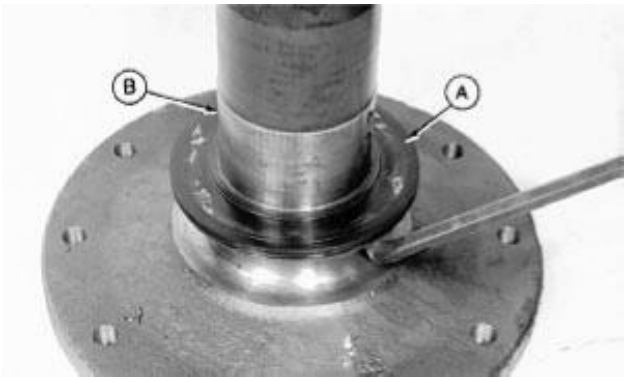
1401,5015,AD -19-12SEP91

37. Inspect bearing cone (A). If necessary to replace, remove bearing cone from axle (B).



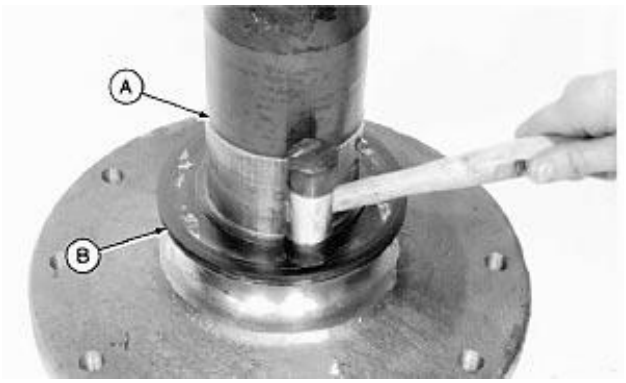
1401,5015,AE -19-12SEP91

38. Remove seal (A) from axle (B).



1401,5015,AF -19-12SEP91

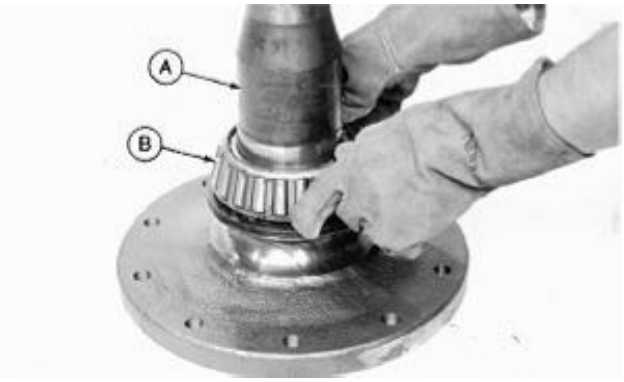
39. Install oil seal (B) with flanged metal portion of seal facing toward axle flange on axle (A). Coat lips of seal with multipurpose grease (or equivalent).



1401,5015,AG -19-12SEP91

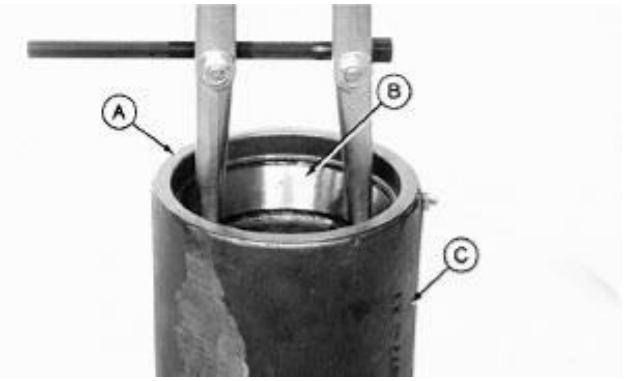
40. Pack bearing cone with multipurpose grease.

41. Install bearing cone (B) on axle (A).



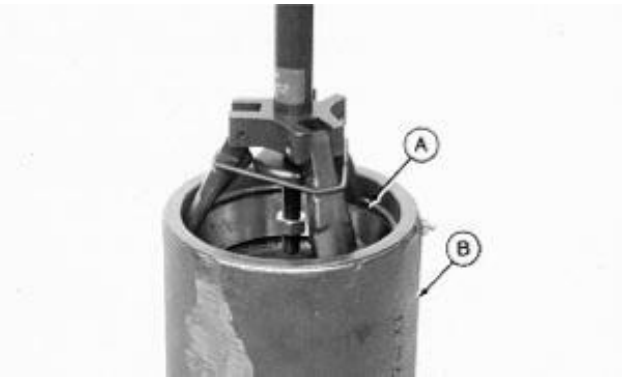
1401,5015,AH -19-12SEP91

42. Remove oil cup (A) and bearing cup (B) from outer housing (C).



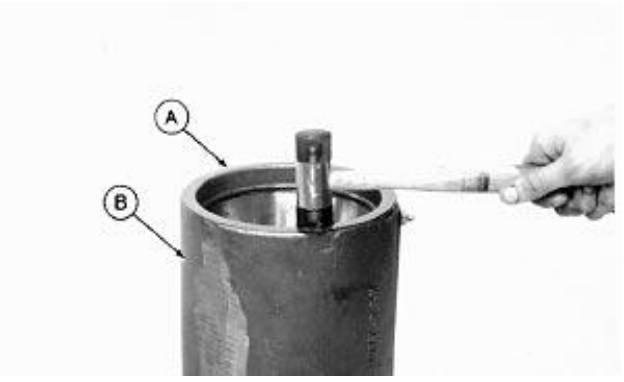
1401,5015,AI -19-12SEP91

43. Apply a light coating of multipurpose grease (or equivalent) to bore of outer housing (B). Install bearing cup (A).



1401,5015,AJ -19-12SEP91

44. Install oil cup (A) on outer housing (B) using a mallet.



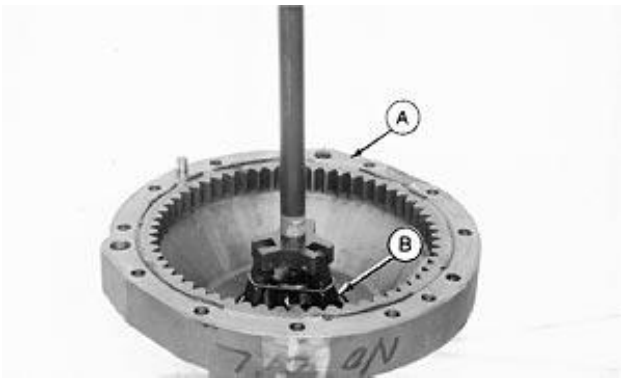
1401,5015,AK -19-12SEP91

45. Remove bearing cup (A) from outer housing (B).

-UN-15MAR89
H40329

1401,5015,AL -19-12SEP91

46. Apply a light coating of multipurpose grease (or equivalent) to bore of outer housing (A). Install bearing cup (B).



-UN-15MAR89
H40330

1401,5015,AM -19-12SEP91

47. Install axle (C) in outer housing.

48. Install two lead balls (6—8 mm [0.24—0.31 in.] diameter) on end of spindle 180˚ apart. Use grease or flatten slightly to hold in place.

49. Install carrier assembly (A) on top of lead balls.

50. Install cap screw (B). Tighten to 550 N·m (400 lb-ft) while rotating housing.

51. Remove carrier and lead balls. Measure thickness of each lead. Install shim pack equal to average of lead balls measurements. Shim pack must include thrust washer.

Shims available:

0.76 mm (0.003 in.) steel
0.127 mm (0.005 in.) steel
0.508 mm (0.02 in.) steel

52 Install shim pack, carrier and cap screw.

53. Tighten cap screw to 900 N·m (664 lb-ft) while rotating housing.

54. Install lock plate. If plate does not align, turn over or tighten as required.

H40331 -UN-15MAR89

1401,5015,AN -19-12SEP91

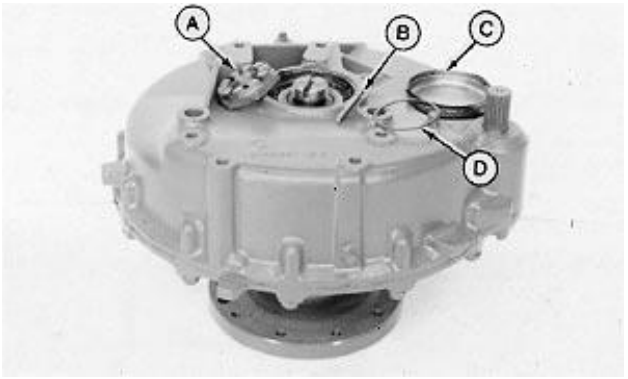
CAUTION: Use a lifting device for heavy components.

55. Install gear. Align gear teeth with pinion shaft gear teeth.

56. Apply a continuous bead of Form-in-Place Gasket to outer housing. It must be applied around all cap screw holes.

57. Attach inner housing to outer housing. Tighten 12 cap screws (E) to 305 N·m (225 lb-ft).

58. Install nut (A). Tighten nut until bearing end play is removed. Do not overtighten (preload) bearings. Install key (B), retaining ring (D). Apply 1.5 mm bead of flexible sealant around cap (C). Install cap (C).



H40228 -UN-06JUL89

A—Nut
B—Key
C—Cover
D—Retaining Ring
E—Cap Screw (12 used)

1401,5015,AO -19-12SEP91

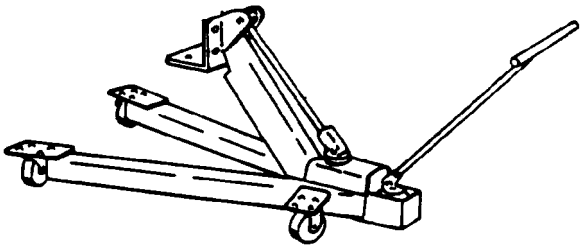
SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Service Jack D05070ST

To remove and install final drives.

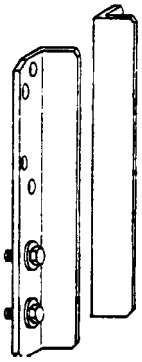


H40598 -UN-14SEP89

ZX,TMXZCO002386-19-25NOV92

Final Drive Adapter JT05874

Use with D05070ST Service Jack to remove and install final drives.

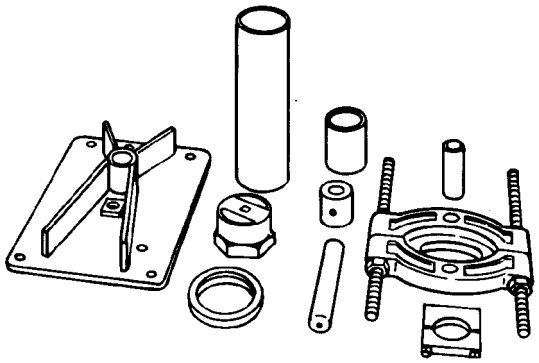


H40599 -UN-05SEP89

1401,5010,AD -19-12SEP91

Final Drive Repair Kit JDG690

To repair final drive.

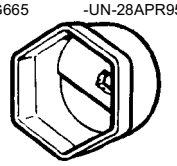


H44021 -UN-23FEB92

HX,1401,5010A -19-02MAR92

Axle nut socket JDG665

JDG665 -UN-28APR95



JDG665

ZX,TMSPFH000286-19-01MAR94

SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools from the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

Name	Use
17-1/2 and 30-Ton Puller Set	To remove and install bearings and seals.
Bushing, Bearing, and Seal Driver Set	To remove and install bearings and seals.

1401,5010,A -19-12SEP91

OTHER MATERIALS

Number	Name	Use
TY6333	Multipurpose Grease	Pack bearings.
AR41870	Corrosion Inhibitor	Protect components in storage.
. . . . .	Masking Tape	Wrap shaft splines to prevent damage to seals during assembly.
TY6304	Flexible Sealant	Seal final drive end cap and final drive pinion cap.
TY15130	Form-in-Place Gasket	Seal inner and outer housings.
TY9374	Thread Sealer	Breather and fill plug.

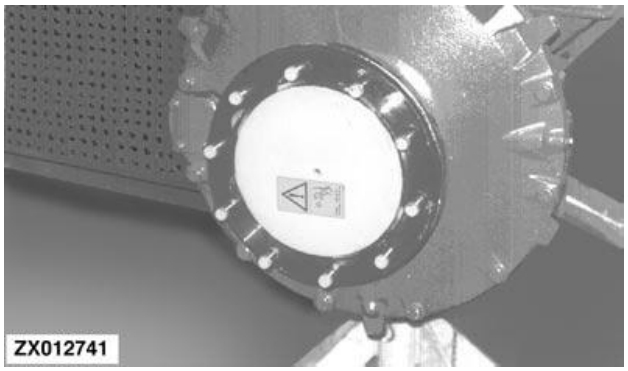
HX,1401,5010,B -19-02MAR92

SPECIFICATIONS

Item	Measurement	Specification
Front Tire and Wheel	Approximate Weight (without ballast)	340 kg (750 lb)
Final Drive	Capacity	6 L (1.6 U.S. gal)
	Approximate Weight	218 kg (480 lb)
Final Drive-to-Axle Cap Screws (top two)	Torque	430 N·m (317 lb-ft)
Front Wheel Bolts	Torque	720 +0/-60 N·m (531 +0/-55 lb-ft)
Inner Housing-to-Outer Housing Cap Screws	Torque	320 N·m (235 lb-ft)
Pinion Gear Shaft Adjustment	Preload/Endplay	0—0.1 mm (0—0.004 in.) Preload to 0—0.05 mm (0—0.002 in.) Endplay
Bearing Cap Screws	Torque	73 N·m (55 lb-ft)
Spindle Bearing	Housing Deflection	0.30—0.36 mm (0.012—0.014 in.)
Nut to Axle Bearing	Torque	300 N·m (221 lb-ft)
Tie Rod (wheels off ground)		Finger tight plus two turns (one side only)
Tie Rod Locknut (both ends)	Torque	660 N·m (450 lb-ft)

ZX,TMXZCO009465-19-01AUG97

REMOVE AND INSTALL FINAL DRIVE



CAUTION: Grain tank must be empty and header removed.

1. Loosen wheel bolts one turn. Do not remove at this time.

CAUTION: Block up front axle before removing wheels.

CAUTION: Jack must have a minimum rating of 5443 kg (6 ton).

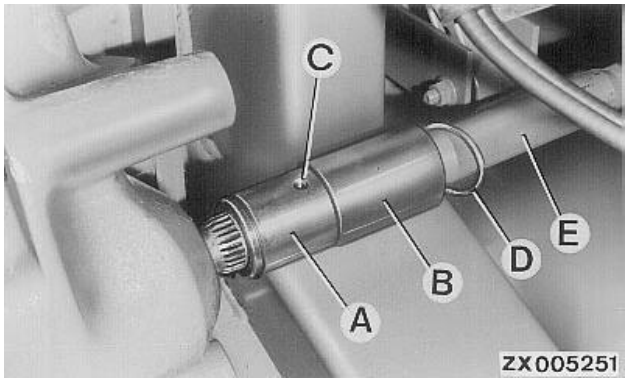
2. Raise combine with a jack.

3. Block up the front axle.

CAUTION: The approximate weight of tire and wheel is 340 kg (750 lb) (without liquid ballast).

4. Support tire and wheel and remove wheel bolts to remove front tire and wheel.

ZX,TMXZCO009466-19-01AUG97



5. Pry out spiral snap ring (D) and slide sleeve (B) inward.

6. Drive out pin (C) and drive coupler (A) inward.

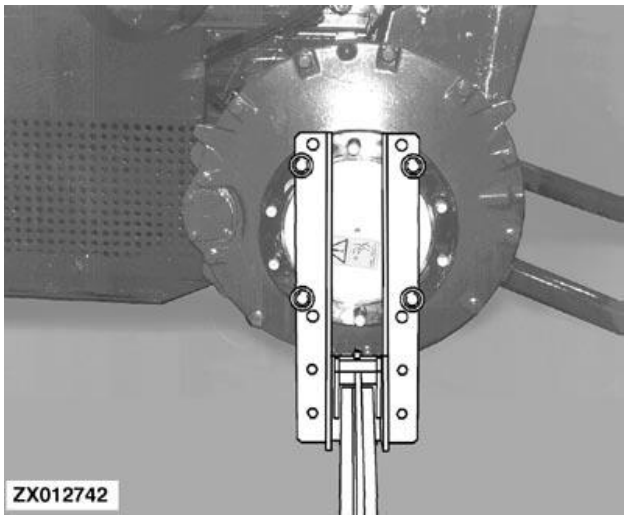
7. Drain final drive. Approximate capacity is 6 L (1.6 U.S. gal).

A—Coupler
B—Sleeve
C—Pin
D—Spiral snap ring

ZX,TMXZCO009467-19-01AUG97

CAUTION: The approximate weight of final drive is 218 kg (480 lb).

8. Use D05070ST Service Jack with JT05874 Final Drive Adapter to remove final drive.



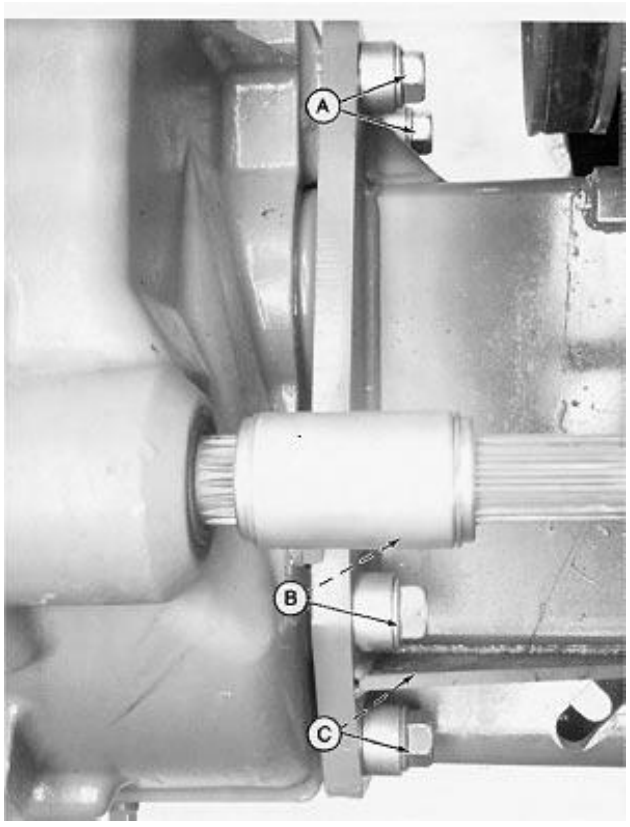
ZX,TMXZCO009468-19-01AUG97

9. Remove 6 cap screws (A—C).

10. If dowel pins do not come out with final drive, remove from axle and install in housing.

11. Remove and repair final drive as necessary. (See Disassemble and Assemble Final Drive.)

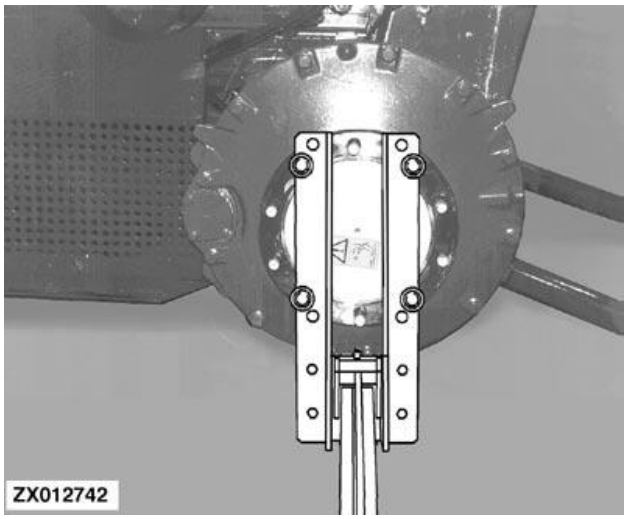
12. Remove axle spacers if needed.



ZX,TMXZCO010098-19-01AUG97

CAUTION: The approximate weight of final drive is 218 kg (480 lb).

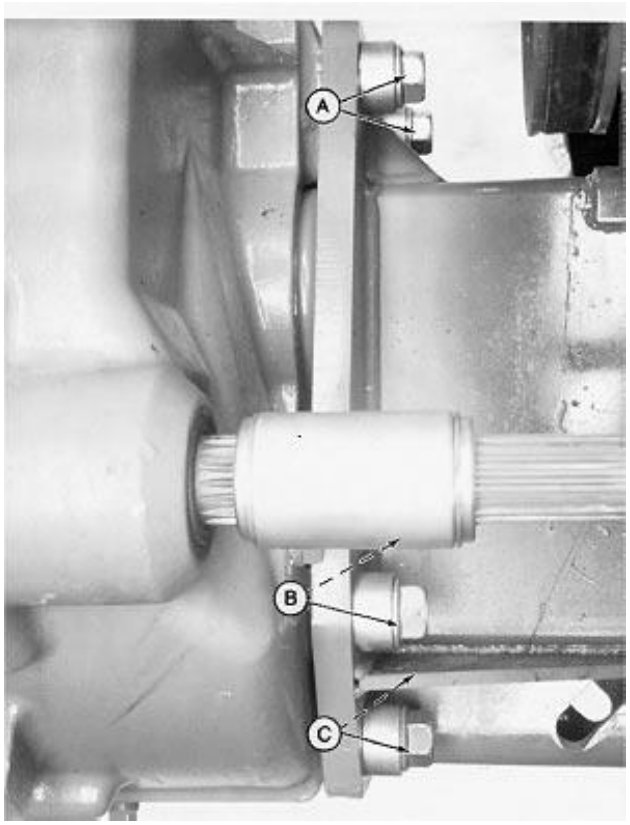
13. Use D05070ST Service Jack with JT05874 Final Drive Adapter to install final drive.



ZX,TMXZCO009469-19-01AUG97

14. Install 6 cap screws (A—C).

15. Tighten cap screws to 430 N·m (317 lb-ft).



ZX,TMXZCO010099-19-01AUG97

16. Apply multipurpose grease to drive shaft splines and coupler.

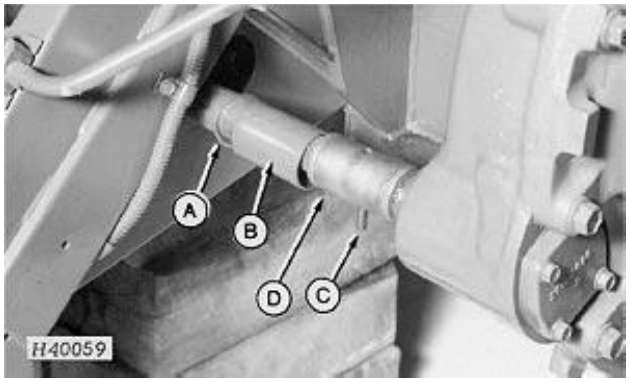
17. Drive coupler (D) toward final drive and drive in pin (C) flush with coupler.

18. Slide sleeve (B) on and install spiral snap ring (A).

19. Fill final drive with 6 L (1.6 U.S. gal) of recommended lubricant.

CAUTION: The approximate weight of tire and wheel is 340 kg (750 lb) (without liquid ballast).

20. Install wheel. Tighten bolts to 720 +0/-60 N·m (531 +0/-44 lb-ft), then an additional 90˚.

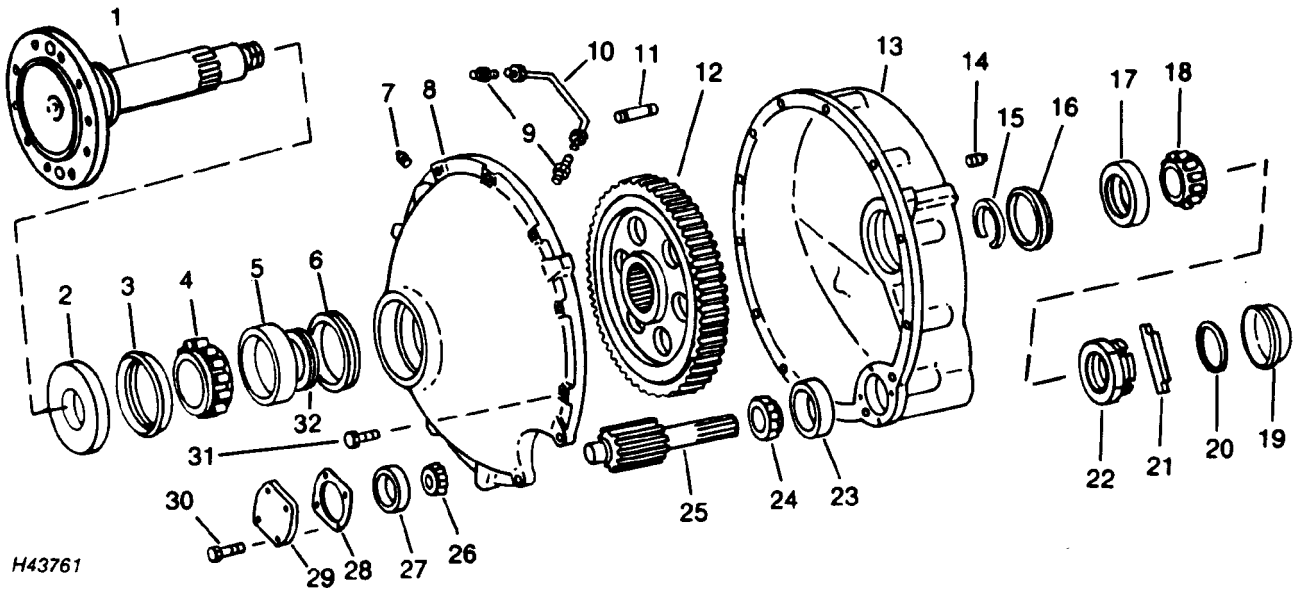


H40059 -UN-10OCT88

A—Spiral snap ring
B—Sleeve
C—Pin
D—Coupler

ZX,TMXZCO009470-19-01AUG97

DISASSEMBLE AND ASSEMBLE FINAL DRIVE



1—Axle
2—Seal
3—Seal
4—Bearing Cone
5—Bearing Cup
6—Seal
7—Grease Fitting
8—Outer Housing
9—Fitting (2 used)
10—Line
11—Dowel Pin (2 used)
12—Ring Gear
13—Inner Housing
14—Plug
15—Snap Ring
16—Spacer
17—Bearing Cup
18—Bearing Cone
19—Dust Cap
20—Retaining Ring
21—Key
22—Nut
23—Bearing Cup
24—Bearing Cone
25—Pinion Gear
26—Bearing Cone
27—Bearing Cup
28—Shim (as required)
29—Cap
30—Cap Screw (4 used)
31—Cap Screw (12 used)
32—Seal

HX,1401,5010,BB-19-16DEC92

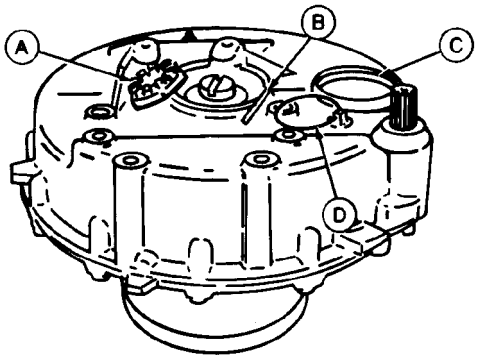
CAUTION: The approximate weight of final drive is 218 kg (480 lb).

1. Stand final drive on axle flange.

2. Pry off cap (C). Remove retaining ring (D) and key (B).

3. Remove nut (A) using JDG665 socket (E).

A—Nut
B—Key
C—Cap
D—Retaining Ring
E—Socket



H44787 -UN-15JUL92

H44022 -UN-23FEB92

HX1401,5010,G -19-13SEP94

4. Use adapter (A) from JDG690 Final Drive Repair Kit on end of shaft to protect shaft when removing inner cover.

H44024 -UN-23FEB92

HX,1401,5010D -19-16DEC92

5. Remove 12 cap screws (C).

6. Attach plate (A) from JDG690 Final Drive Repair Kit to inner cover (B). Attach 17-1/2 and 30 ton puller set to plate.

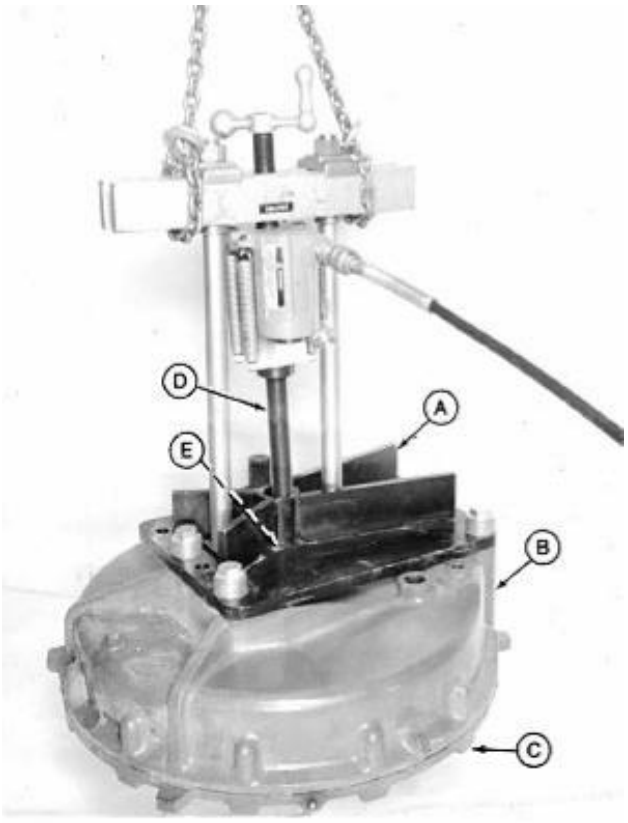
Install lifting chains on cross straps of puller set to lift cover after it is disconnected.

7. Thread puller screw (D) into adapter (E) on axle shaft.

8. Use puller to remove inner cover. Remove bearing cone and spacer.

9. Clean gasket material off housings. Run a wire through vent/fill plug to be sure it is open.

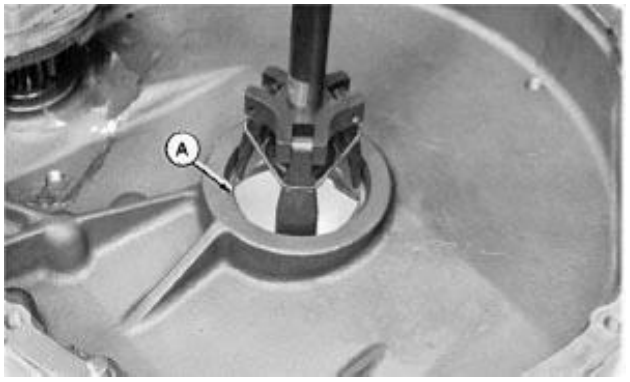
A—Plate
B—Inner Cover
C—Cap Screw (12 used)
D—Puller Screw
E—Adapter



-UN-23FEB92
H44025

HX,1401,5010E -19-16DEC92

10. Inspect bearing cup (A). If necessary to replace, drive bearing cup from inner housing.



-UN-15MAR89
H40230

HX,1401,5010F -19-16DEC92

11. Apply a light coat of multipurpose grease (or equivalent) to inner housing bore.

12. Drive bearing cup into bore of inner housing.

-UN-15MAR89
H40231

HX,1401,5010G -19-16DEC92

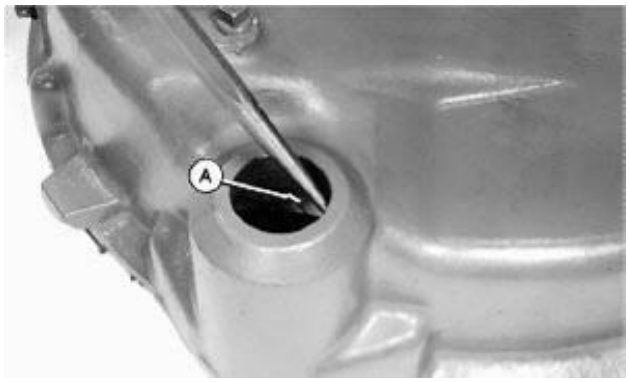
13. Remove pinion gear and bearing cup (A).

HX,1401,5010H -19-16DEC92

14. Remove seal from pinion shaft bore.

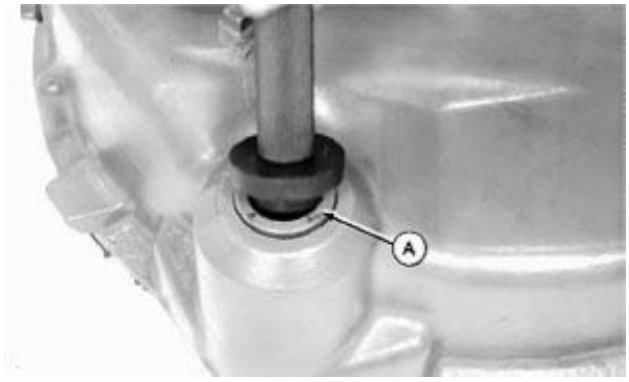
15. Inspect bearing cup (A). If necessary to replace, drive bearing cup from pinion shaft bore.

16. Apply a light coat of multipurpose grease (or equivalent), to pinion shaft bore. Drive in bearing cup.



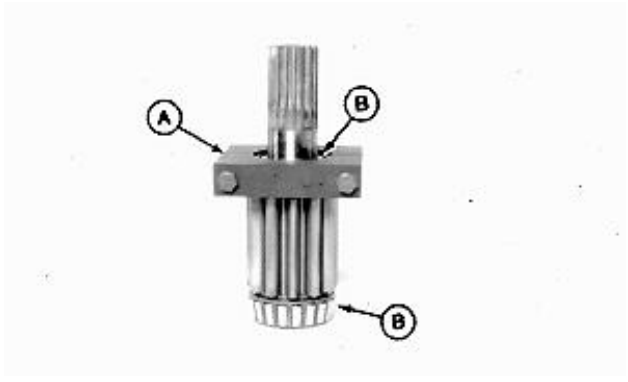
HX,1401,5010I -19-16DEC92

17. Install seal (A) in pinion shaft bore, flush with housing.



HX,1401,5010J -19-16DEC92

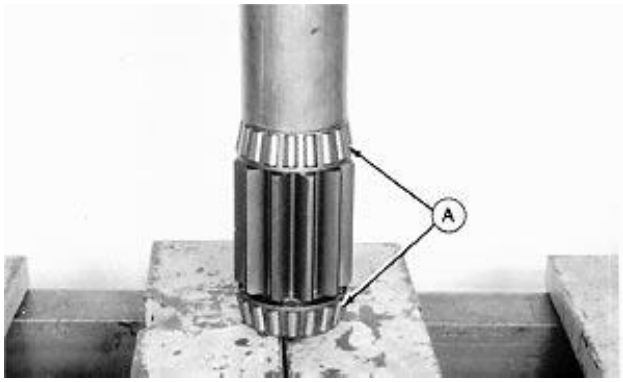
18. Remove bearing cones (B) (using bearing cone holding fixture (A) from JDG690 Final Drive Repair kit and a puller) from pinion shaft if necessary to replace bearings.



HX,1401,5010K -19-16DEC92

19. Pack bearing cones with multipurpose grease (or equivalent) and install bearing cones (A) on pinion shaft using driver from JDG690 Final Drive Repair Kit.

20. Install pinion shaft and bearing cup in inner housing.



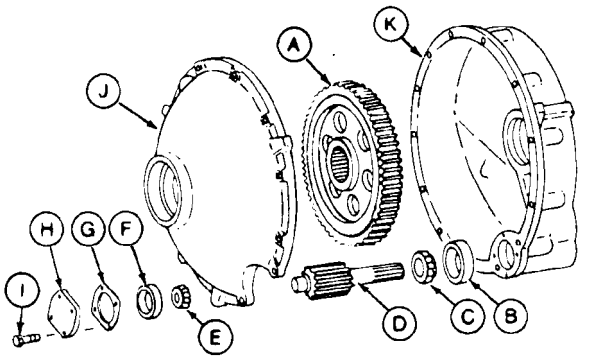
HX,1401,5010L -19-16DEC92

CAUTION: Use a lifting device for heavy components.

21. Lift ring gear (A) off axle.

22. Remove outer housing (J) from axle shaft. Turn housing over and, if necessary, remove bearing cap (H) and shim pack (G).

23. Remove bearing cup and seal from bore of outer housing if necessary to replace.



A—Ring Gear
B—Bearing Cup
C—Bearing Cone
D—Pinion Gear
E—Bearing Cone
F—Bearing Cup
G—Shim Pack (as required)
H—Bearing Cap
I—Cap Screw (4 used)
J—Outer Housing
K—Inner Housing

HX,1401,5010M -19-16DEC92

24. Install seal (A) and seal cup (B) in outer housing.

HX,1401,5010N -19-16DEC92

25. Apply a light coat of multipurpose grease to bore of outer housing. Install bearing cup (A).

26. The R99244 seal should be installed on spindle after JD9092 bearing. The V-lip of the seal MUST be pointed away from the bearing.

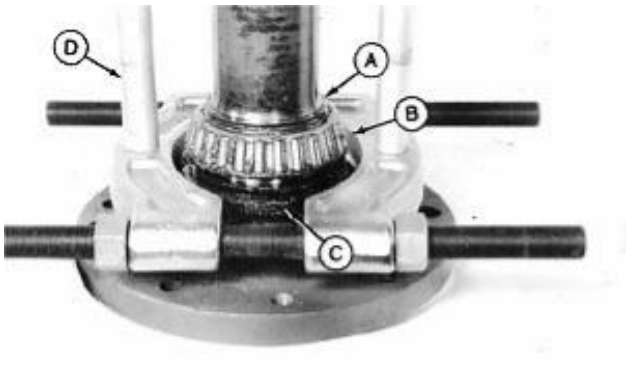
27. Apply a light coating of grease to the V-lip.

HX,1401,5010O -19-29AUG96

28. Remove V-ring seal (A), bearing cone (B), and seal (C) from axle using puller from JDG690 Final Drive Repair Kit and 17-1/2 and 30 ton puller set.

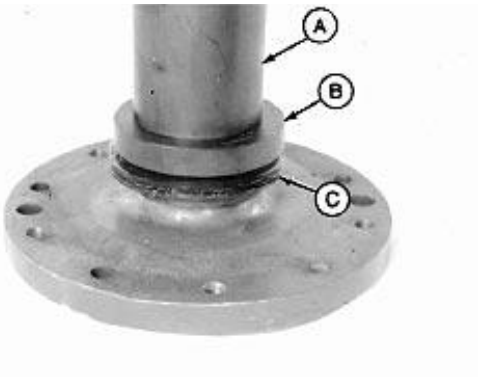
NOTE: Long puller legs (D) must be used.

A—V-Ring Seal
B—Bearing Cone
C—Seal
D—Long Puller Leg (2 used)



HX,1401,5010P -19-29AUG96

29. Apply multipurpose grease (or equivalent) to seal lips. Install seal (C) using drivers (A and B) from JDG690 Final Drive Repair Kit and 17-1/2 and 30 ton puller set. Metal edge of seal (C) must face toward outer housing when placed over axle.



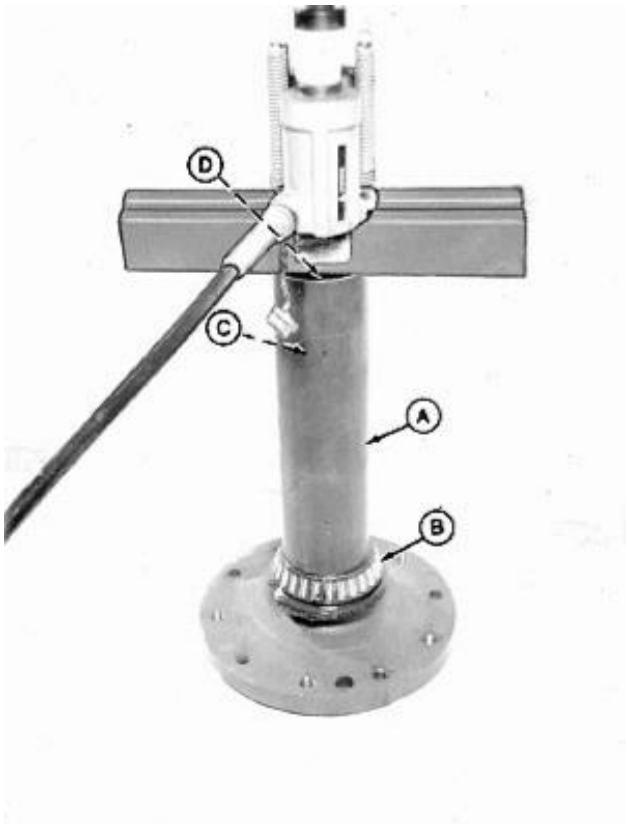
HX,1401,5010Q -19-29AUG96

NOTE: Pack all bearing cones with multipurpose grease (or equivalent) before assembly.

30. Thread puller screw (D) into adapter (C) on axle shaft. Install bearing cone (B) on axle using driver (A) from JDG690 Final Drive Repair Kit and 17-1/2 and 30 ton puller set.

31. Install V-ring (E) seal next to bearing cone. V-lip must be pointed away from bearing cone.

A—Driver
B—Bearing Cone
C—Adapter
D—Puller Screw
E—V-Ring Seal



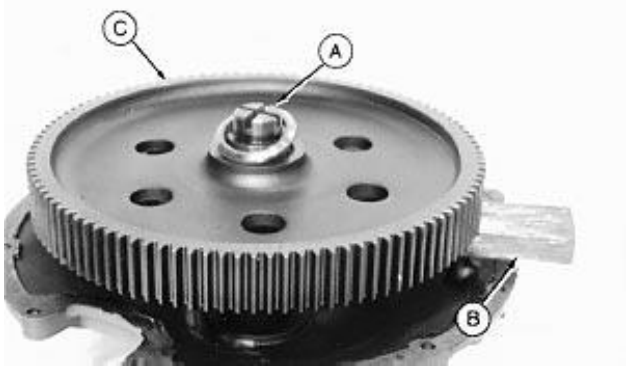
-UN-12JAN93
H44029

ZX,TMXZCO009471-19-01AUG97

32. Install outer housing on axle.

33. Install snap ring in ring gear and install ring gear (C) on axle. Install spacer (A) with chamfered or beveled edge toward bearing.

34. Block up ring gear using a 2 x 4 in. block (B).



-UN-15MAR89
H40303

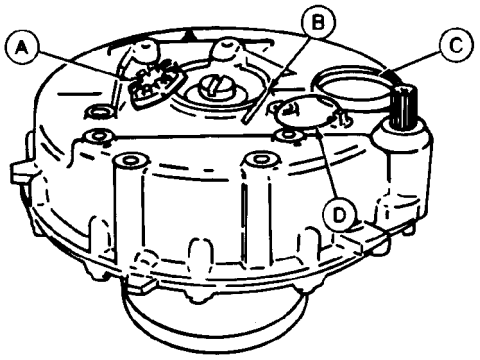
HX,1401,5010S -19-29AUG96

35. Apply a 1.5 mm (0.06 in.) continuous bead of form-in-place gasket around flange of outer housing. Install inner housing on outer housing. Tighten 12 cap screws to 320 ± 64 N·m (235 ± 47 lb-ft).

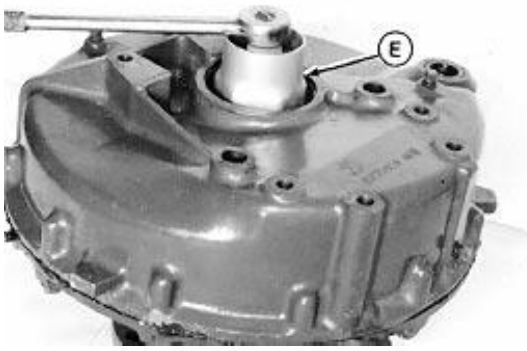
36. Install bearing cone on spindle.

37. Install nut (A). Tighten nut until SNUG with JDG665 socket (E). Do not overtighten bearings. (See Adjust Spindle Bearing in this group.)

A—Nut
B—Key
C—Cap
D—Retaining Ring
E—Socket



H44787 -UN-15JUL92



H44022 -UN-23FEB92

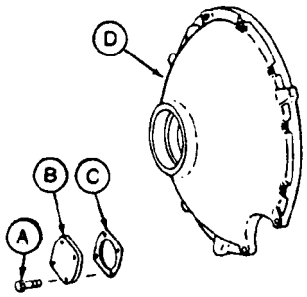
ZX,TMXZCO009472-19-01AUG97

38. If old shims have not been damaged, they may be used. If damaged, assemble a new pack (C) as follows:

0.13 mm (0.005 in.) - Plastic - 2 used
0.25 mm (0.010 in.) - Steel - 1 used
0.50 mm (0.020 in.) - Steel - 1 used

IMPORTANT: Install plastic shims against each housing case surface.

39. Attach bearing cap (B) with shim pack to outer housing (D). TIGHTEN cap screws (A) at this time to 73 N·m (55 lb-ft).



H40304 -UN-15MAR89

A—Cap Screw (4 used)
B—Bearing Cap
C—Shim (as required)
D—Outer Housing

ZX,TMXZCO009473-19-01AUG97

40. Check pinion gear shaft preload/end play with dial indicator. Adjust within range of 0.1 mm (0.004 in.) preload to 0.05 mm (0.002 in.) end play. If not within specifications, remove bearing cap and add or remove shims as needed. After correct setting is achieved, remove cap and apply 1.5 mm (0.06 in.) bead of flexible sealant to lip of cap and reinstall cap. Tighten cap screws to 73 N·m (55 lb-ft).

HX,1401,5010V -19-29AUG96

41. Pump in multipurpose grease (or equivalent) at lubrication fitting. Grease must ooze out around seal.

NOTE: If final drive is to be placed in service parts storage, add 29.6 mL (1 oz.) of AR41870 corrosion inhibitor.

HX,1401,5010W -19-29AUG96

ADJUST SPINDLE BEARING (PREFERRED METHOD)

1. Rotate final drive assembly two revolutions to seat lower bearing.

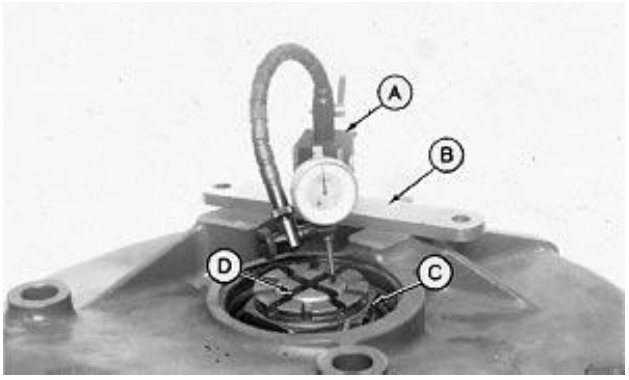
2. Install flat bar (B) across mounting flange.

3. Install dial indicator (A) on bar and with indicator on axle (D), set dial at zero.

4. Tighten nut (C) until 0.30—0.36 mm (0.012—0.014 in.) housing deflection is observed.

5. Advance nut to next locking position and install key and retainer.

6. Apply a bead of flexible sealant to lip of cap and install cap.



A—Dial Indicator
B—Flat Bar
C—Nut
D—Axle

HX,1401,5010AB -19-16DEC92

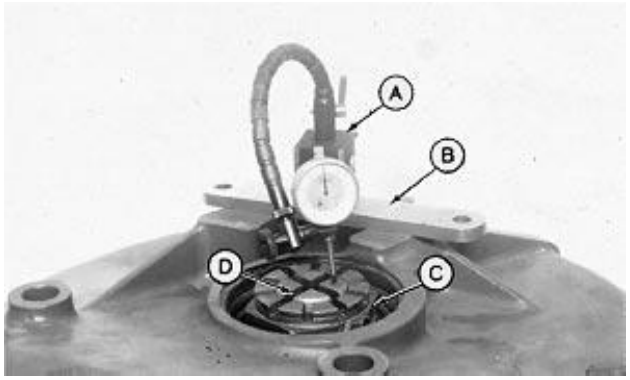
ADJUST SPINDLE BEARING (ALTERNATE METHOD)

1. Rotate final drive assembly two revolutions to seat bearings.

2. Tighten nut (C) to 300 N·m (275 lb-ft).

3. Advance nut to next locking position and install key and retainer.

4. Apply a bead of flexible sealant to lip of cap and install cap.

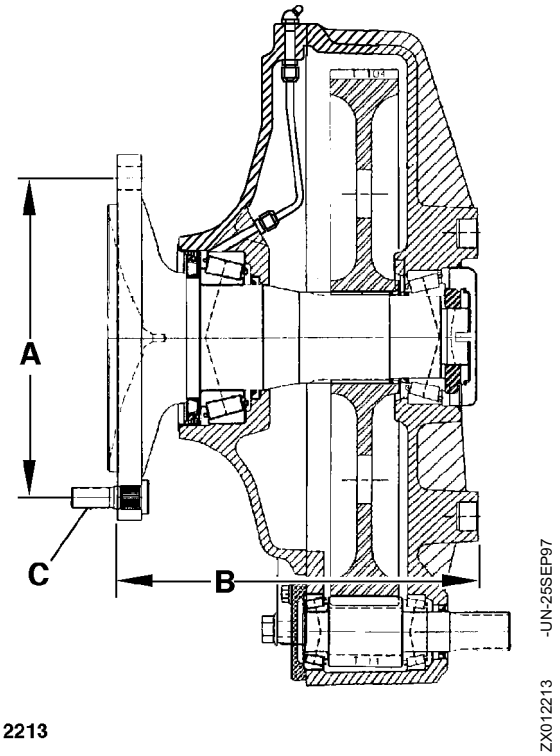


A—Dial Indicator
B—Flat Bar
C—Nut
D—Axle

ZX,TMXZCO009474-19-01AUG97

FINAL DRIVE FOR 6-WALKER COMBINES

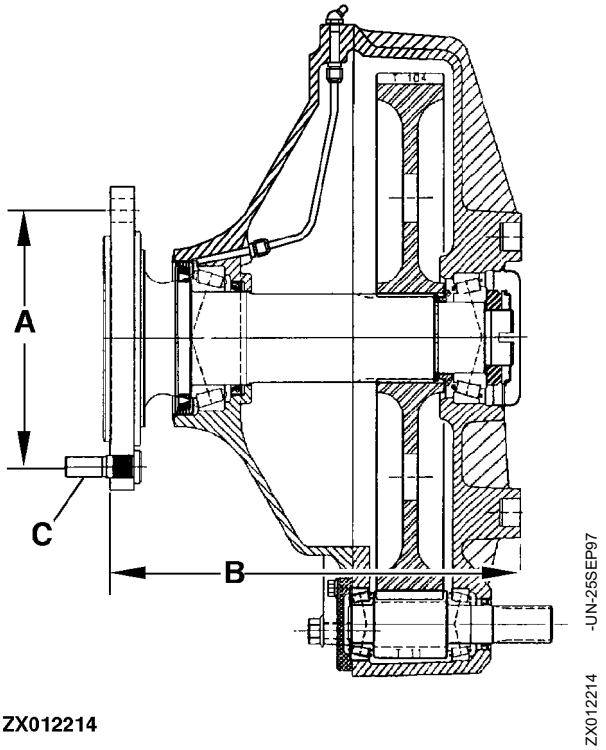
A—Dia. 335 mm
B—380 mm
C—Wheel bolts (10 used)



ZX012213

ZX,TMXZCO009475-19-01AUG97

A—Dia. 275 mm (10.8 in.)
B—442 mm (17.4 in.)
C—Wheel bolts (8 used)



ZX,TMXZCO009476-19-01AUG97

FINAL DRIVES

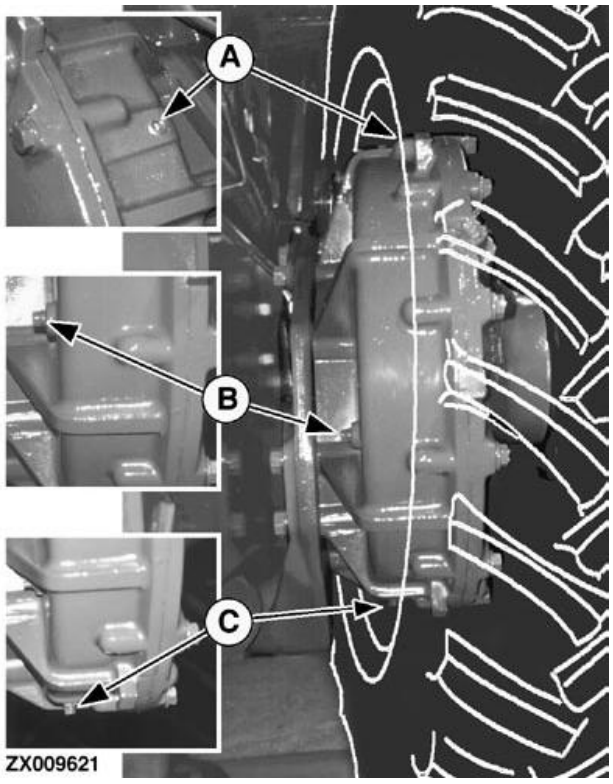
Change oil after the first 100 hours of operation. Thereafter change oil every 1000 hours of operation or before every harvesting season (whichever occurs first).

Check oil level every 250 hours of operation.

IMPORTANT: Always use specified oil.

NOTE: On Hillmaster machines, check the oil only when the harvester is in its normal working position (equalizing cylinder in middle position).

A—Filler/bleed screw
B—Level screw
C—Oil drain screw

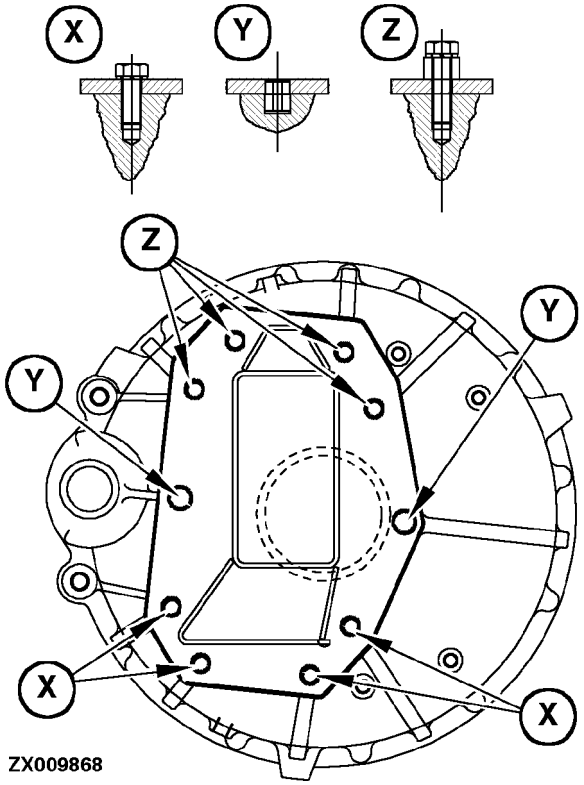


ZX,OMXZCO006996-19-01NOV96

FINAL DRIVE ATTACHING SCREWS

At least every 10 hours within the first 50 hours of operation, tighten attaching screws at points (X) and (Z) to the following torque:

430 N·m (317 lb-ft)

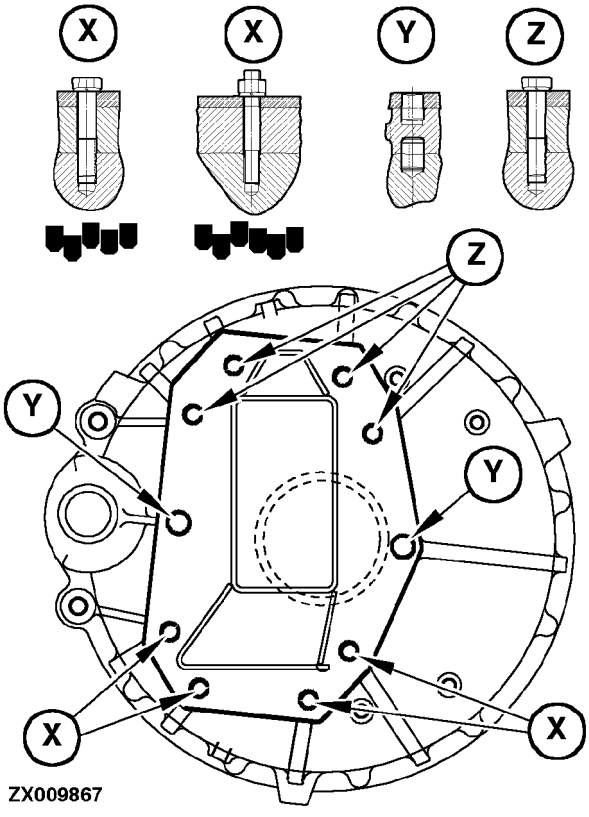


ZX,OMXZCO006997-19-01NOV96

FINAL DRIVE ATTACHING SCREWS, DUAL TIRES

At least every 10 hours within the first 50 hours of operation, tighten attaching screws at points (X) and (Z) to the following torque:

430 N·m (317 lb-ft)



ZX,OMXZCO006998-19-01NOV96

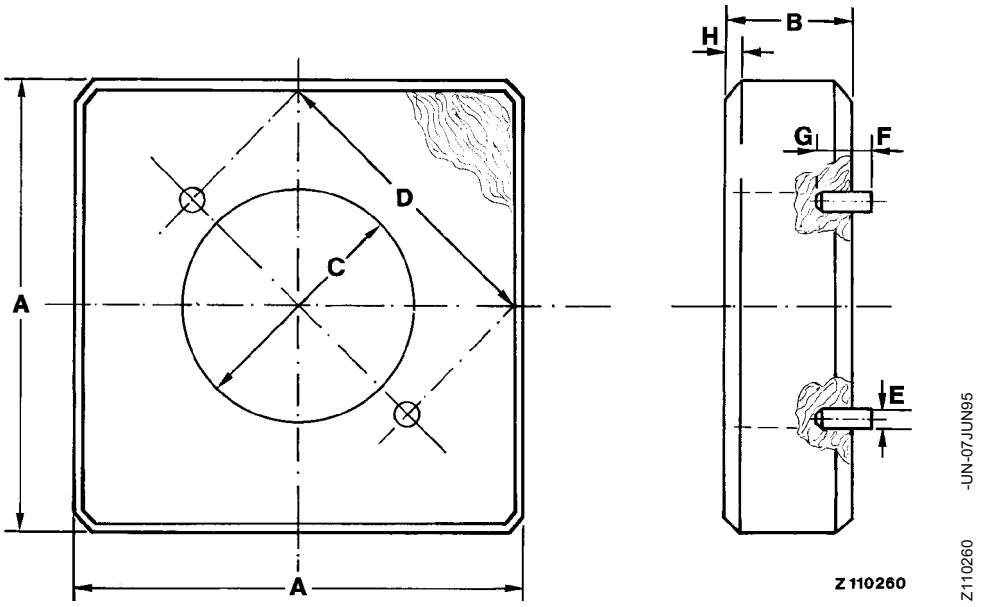
SPECIAL TOOL

A—D01045AA Driver set

-UN-09FEB90
R28087N

ZX,TMSPFH000330-19-22FEB92

SPECIAL TOOL, SELF-MANUFACTURED (HARDWOOD MOUNTING PLATE)

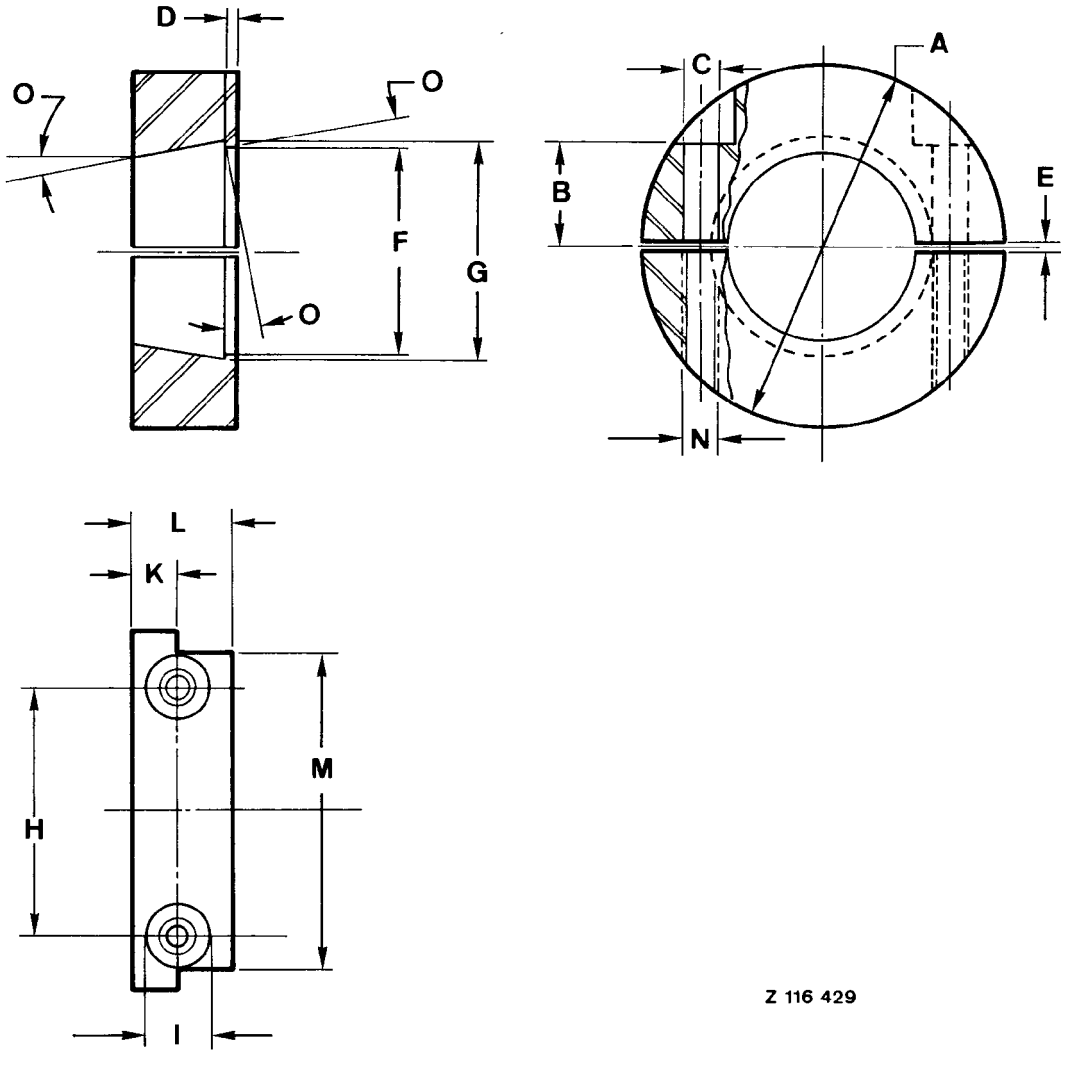


-UN-07JUN95
Z110260

A—250 mm (9.85 in.)
B—70 mm (2.75 in.)
C—Dia. 130 mm (5.12 in.)
D—165 mm (6.50 in.)
E—Dia. 10 mm (0.394 in.)
F—10 mm (0.394 in.)
G—20 mm (0.787 in.)
H—5 mm x 45˚ (0.20 in. x 45˚)

ZX,TMSPFH000331-19-31JAN96

SPECIAL TOOL, SELF-MANUFACTURED (PULLER)



A—100 mm (4 in.)
B—28.5 mm (1.12 in.)
C—9.5 mm (0.375 in.)
D—3.3 mm (0.130 in.)
E—1.5 mm (0.060 in.)
F—58.7 mm (2.310 in.)
G—61.7 mm (2.430 in.)
H—74 mm (2.910 in.)
I—19 mm (0.750 in.)
K—13 mm (0.500 in.)
L—28.5 mm (1.125 in.)
N—M8 thread
O—12°

ZX,TMSPFH000332-19-28JAN91

SPECIFICATIONS

Item	Measurement	Specification
Variable pump	Weight (approx.)	68 kg (160 lb)
Gap between retaining plate and slipper retainer	Wear tolerance	0.2 mm (0.08 in.)
Screws on retaining plate	Tightening torque	25 N·m (18 lb-ft)
Screws on swashplate	Tightening torque	60 N·m (45 lb-ft)
Swashplate bearing	Rolling drag torque	10 - 20 N (2.5 - 5 lb)
Difference at opposite sides of swashplate	Depth	0.012 mm (0.005 in.)
Screws at front cover	Tightening torque	60 N·m (45 lb-ft)
Drive shaft	End play	0.05 - 0.17 mm (0.002 - 0.007 in.)
Screws at end cap	Tightening torque	85 N·m (63 lb-ft)
Screws at charge pump	Tightening torque	22 N·m (16 lb-ft)
Screws at servo-control valve	Tightening torque	24 N·m (17.7 lb-ft)
Pressure-relief valve	Tightening torque	163 - 197 N·m (120 - 145 lb-ft)
Variable pump attaching screws	Tightening torque	130 N·m (96 lb-ft)

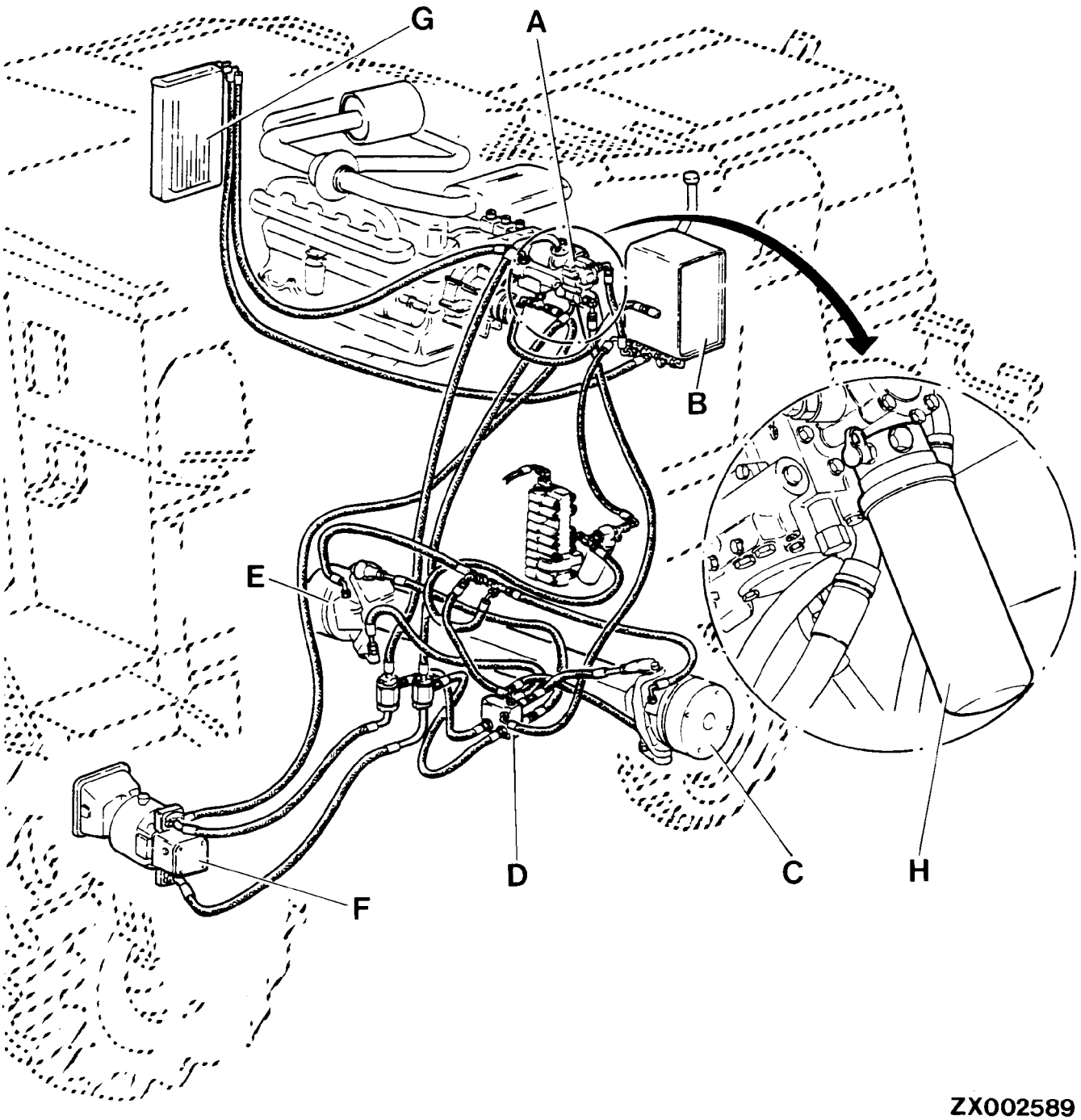
ZX,TMXZCO009477-19-01AUG97

OTHER MATERIAL

Number	Name	Use
TY9371	Loctite 271	Screws on retaining plate

ZX,TMXZCO009478-19-01AUG97

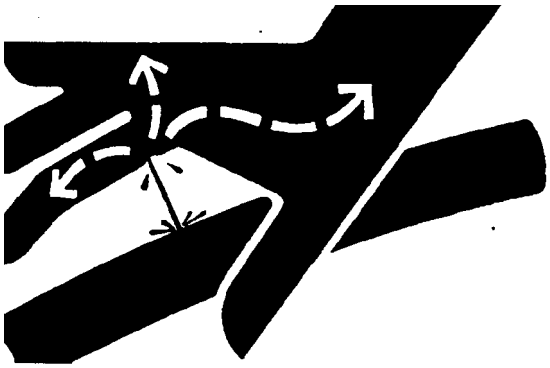
HYDROSTATIC DRIVE COMPONENTS



A—Variable pump
B—Hydrostatic oil tank
C—L.h. wheel motor
D—Four-wheel drive solenoid
E—R.h. wheel motor
F—Fixed-displacement motor
G—Oil cooler
H—Hydrostatic oil filter

ZX,OMXZCO002225-19-05OCT92

REMOVING THE VARIABLE PUMP



X9811 -UN-23AUG88

1. Clean pump and surrounding area thoroughly.

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

2. Stop Engine. Operate all controls to release hydraulic pressure.

IMPORTANT: When disconnecting a line, hose, or transfer tube from a hydrostatic component, always mark end and port from which it was removed so that it can be connected to proper port when reassembling.

Also, when disconnecting a line, hose, or transfer tube from a component, always plug them and component to keep dirt out of system. Use a plastic plug or plastic bag - never a cloth. Cloth contains lint which can damage hydrostatic system.

High pressure hoses have clamp-type bolted fittings with O-rings. When this type of fitting is disassembled, inner surfaces must be cleaned thoroughly and new O-rings installed. This is to insure a tight seal and reduce possibility of leakage.

ZX,TMXZCO009479-19-01AUG97

REMOVING THE VARIABLE PUMP

Drain hydrostatic oil at fixed-displacement motor. Remove line (A) from hydrostatic pump (for venting purposes).

Disconnect suction line (B) at charge pump and turn line until open end points upwards.

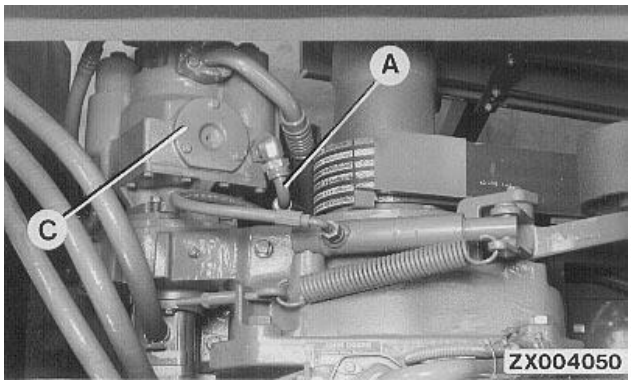
Disconnect high pressure hoses (D) and control cable (E) at hydrostatic pump (C).

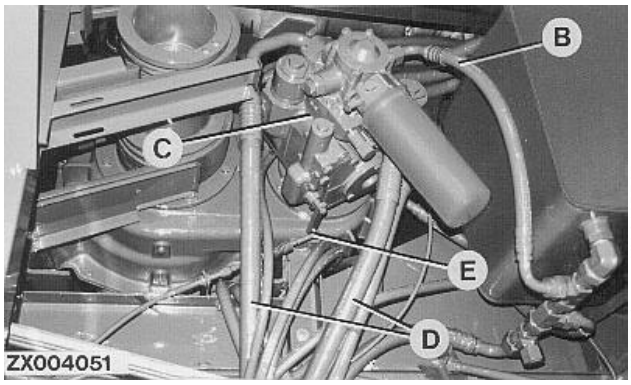
Attach pump to a suitable hoist.

CAUTION: Approximate weight of pump is 68 kg (160 lb).

Remove four cap screws and remove pump.

A—Line to hydrostatic oil cooler
B—Charge pump suction line
C—Hydrostatic pump
D—High-pressure hose (2 used)
E—Control cable





ZX,TMXZCO009480-19-01AUG97

DISASSEMBLE VARIABLE PUMP — PREPARATIONS

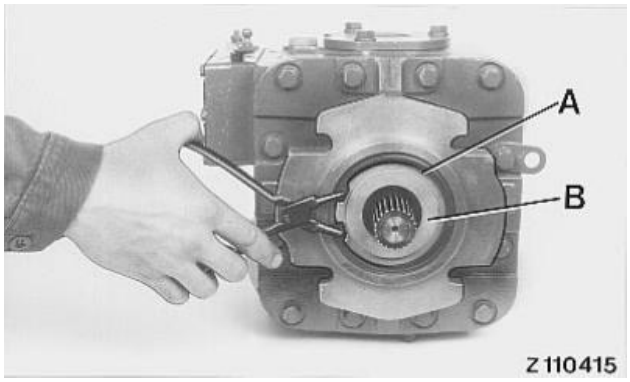
IMPORTANT: When repairing variable pump, observe utmost cleanliness.

1. Remove snap ring (A).

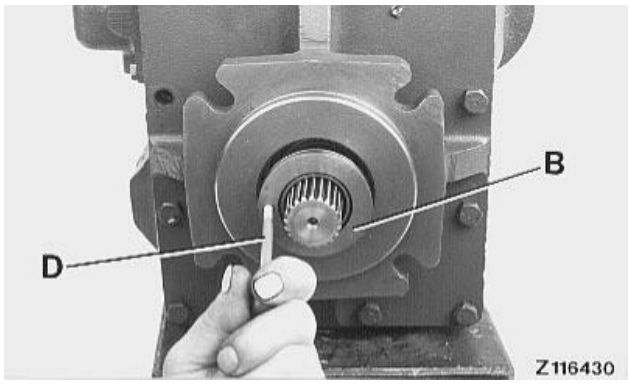
2. Remove seal retainer (B) with stationary part of seal set.

3. Remove moving part (C) of seal set. Make sure that O-ring of moving seal does not remain on shaft.

A—Snap ring
B—Seal retainer
C—Moving part of seal set
D—Threaded pin 1/4 - 20



-UN-01JUN95 Z110415



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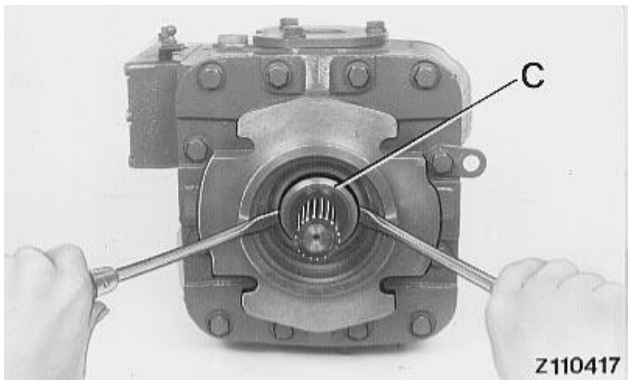

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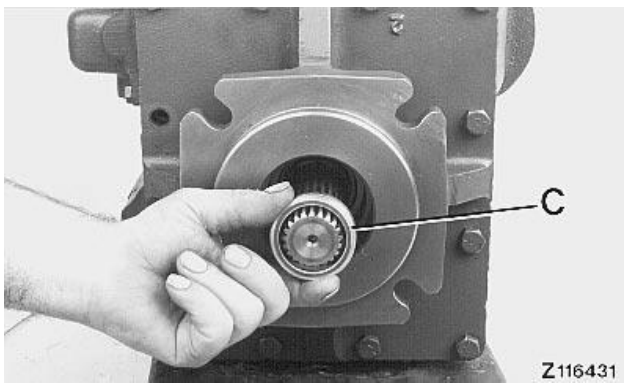

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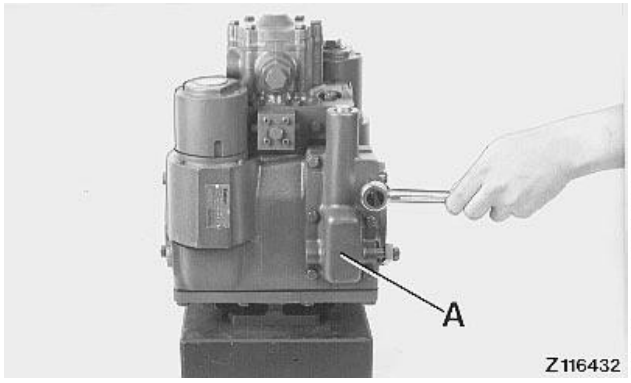
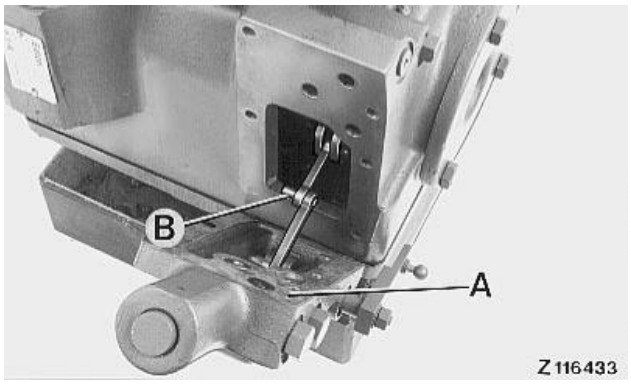
ZX,TMXZCO009481-19-01AUG97

REMOVE SERVO CONTROL VALVE

Loosen attaching screws of servo control valve (A).

Shift pin (B) laterally and pull out of swashplate strap. Remove servo control valve (A).

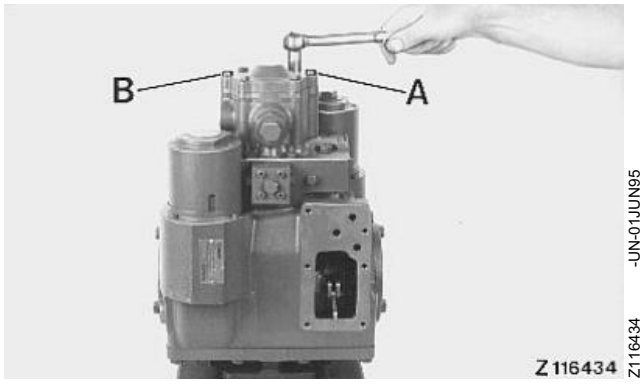




ZX,TMSPFH000300-19-28JAN91

REMOVE CHARGE PUMP

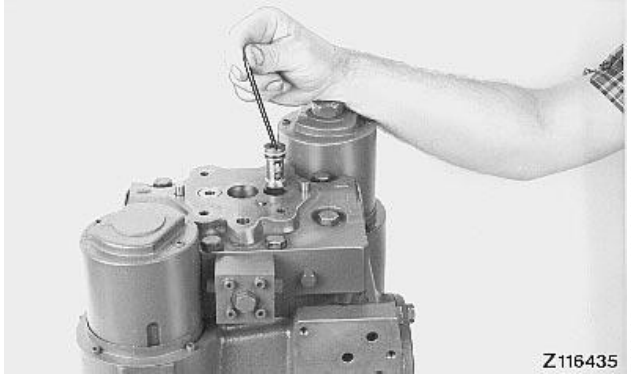
It is not necessary to remove screws (A) and (B) when removing charge pump. These screws are shorter and hold the charge pump housing together.



ZX,TMSPFH000301-19-28JAN91

REMOVE CHECK VALVE

Using a piece of strong wire, pull the check valve inserts from their seats.



ZX,TMSPFH000302-19-28JAN91

REMOVE END CAP

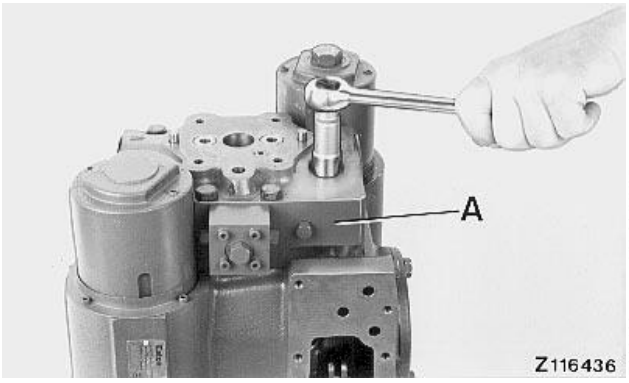
Turn out attaching screws of end cap (A), leaving two opposite screws in place.

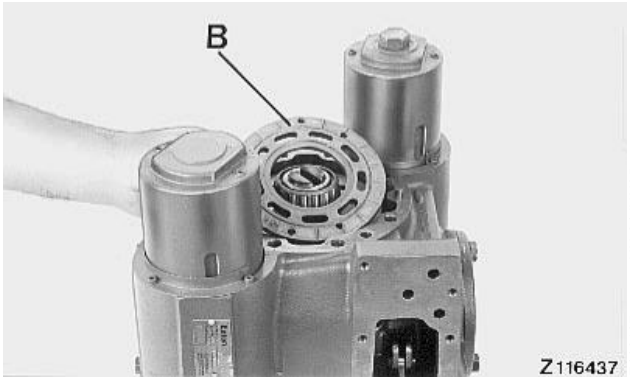
Loosen these screws alternately until tension of spring in variable pump has been released, then turn out screws completely.

IMPORTANT: When removing end cap, be careful not to damage valve plate and bearing plate.

Remove end cap (A).

Remove valve plate and bearing plate (B).



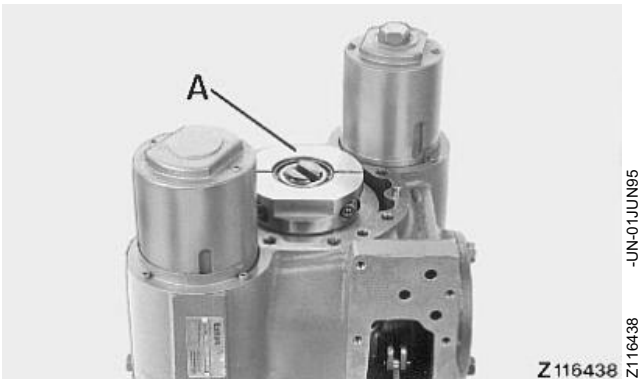


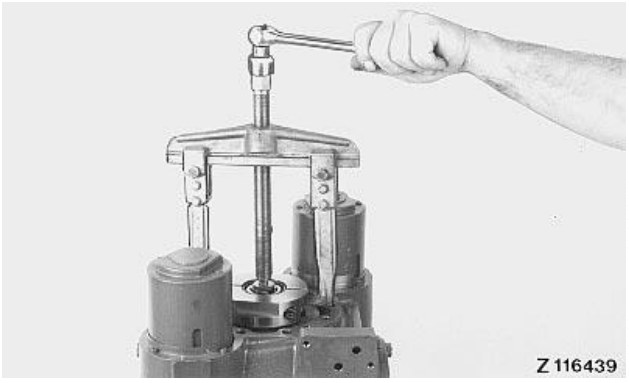
ZX,TMSPFH000303-19-28JAN91

REMOVE BEARING

Attach special tool (A) to top of bearing and remove bearing by means of a puller.

Before using the puller, place a back-up washer between the shaft end and the puller.





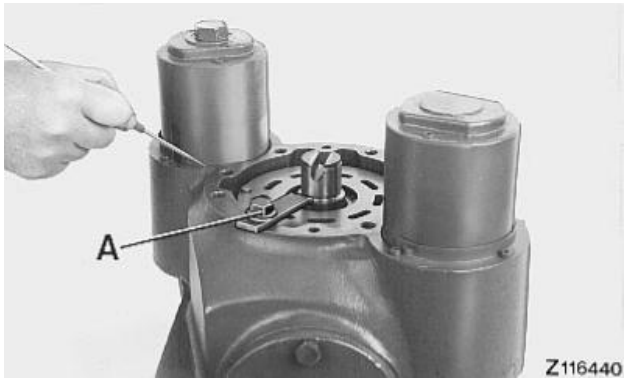
ZX,TMSPFH000304-19-28JAN91

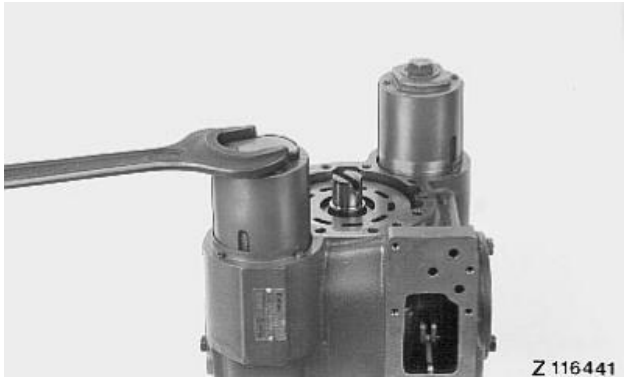
REMOVE SERVO CYLINDERS

IMPORTANT: Before removing servo cylinders, mark location and mounting depth.

Remove servo cylinders.

NOTE: Before placing variable pump housing in horizontal position, secure cylinder block with a self-manufactured strap (A).





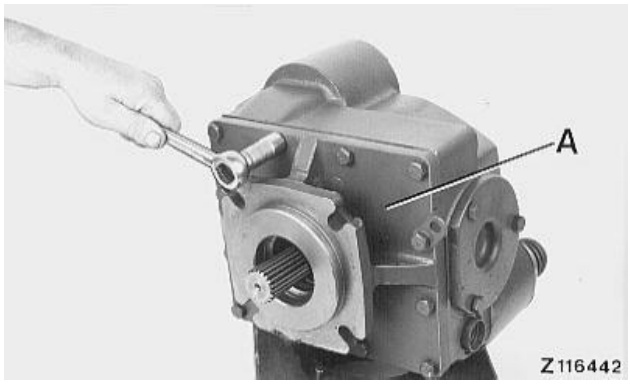
ZX,TMSPFH000305-19-28JAN91

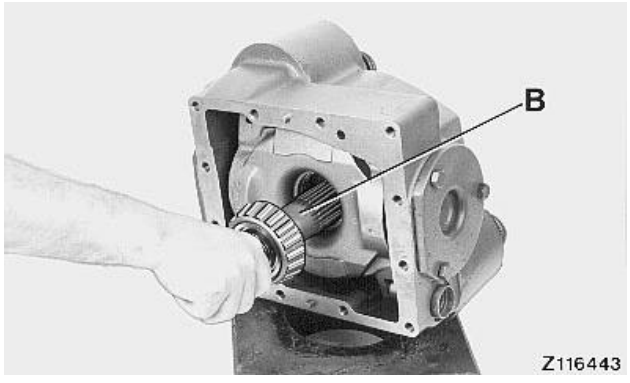
REMOVE FRONT COVER

IMPORTANT: Do not damage sealing surface of the drive shaft.

Place variable pump housing in horizontal position and remove front cover (A).

Remove drive shaft (B).





ZX,TMSPFH000306-19-22JUL91

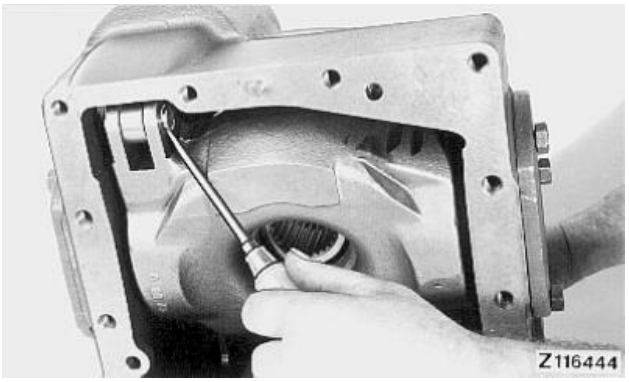
REMOVE SERVO PISTON

IMPORTANT: Protect sliding surfaces of servo piston against damage.

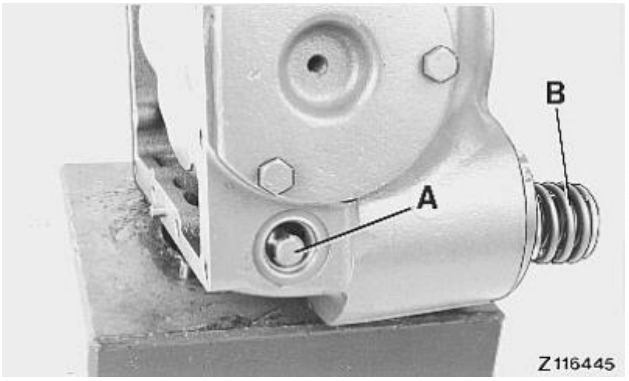
Remove snap ring from inner side of bolt (A).

Push bolt (A) through bore of pump housing.

Mark servo piston (B) and remove it from pump housing.



Z116444 -UN-01JUN95



Z116445 -UN-01JUN95

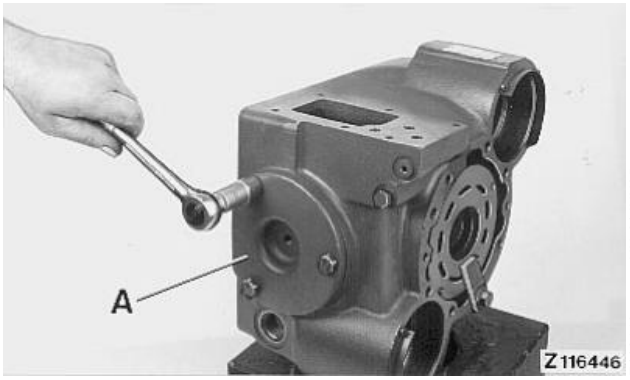
ZX,TMSPFH000307-19-22JUL91

REMOVE SWASHPLATE

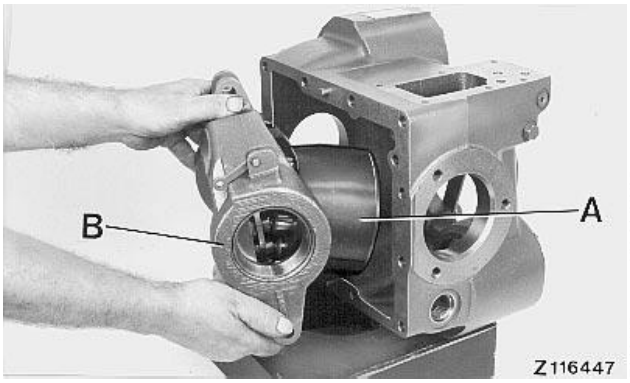
Mark trunnions (A) and remove them. Note number of washers.

CAUTION: When removing swashplate with cylinder block, make sure not to drop cylinder block, as it is not attached to the swashplate.

Remove swashplate (B) with cylinder block from pump housing.



Z116446 -UN-01JUN95

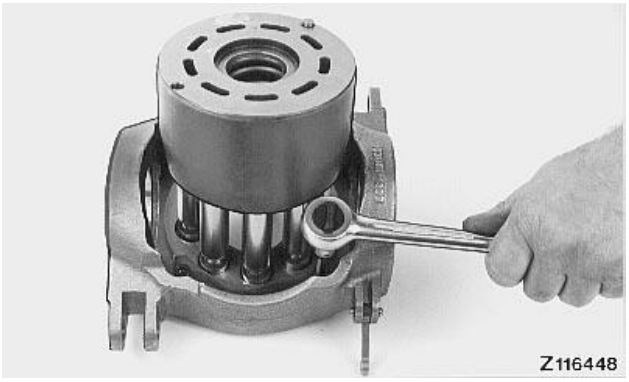


Z116447 -UN-01JUN95

ZX,TMSPFH000308-19-22JUL91

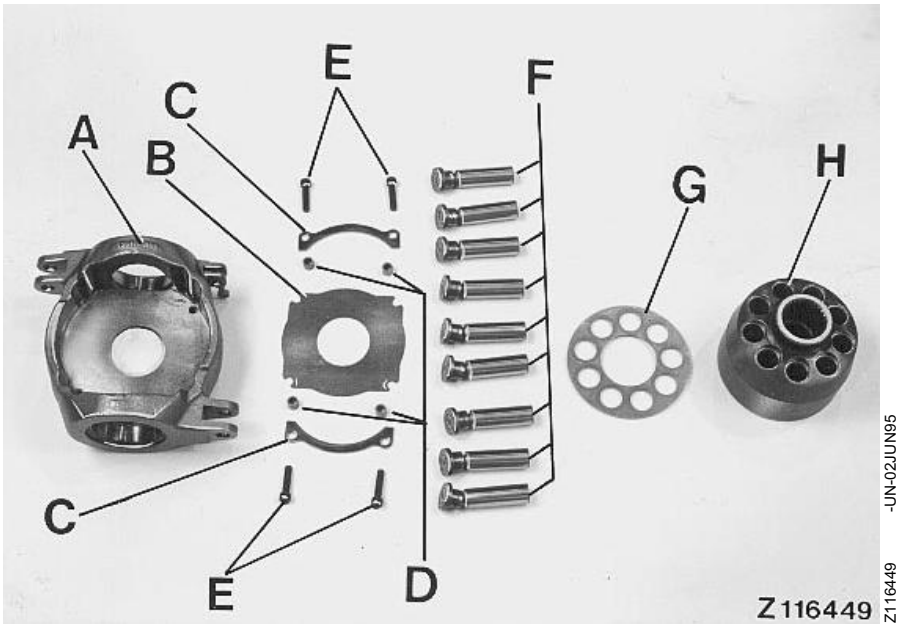
DISASSEMBLE SWASHPLATE

Swashplate can be disassembled by turning out four hex. socket screws.



ZX,TMSPFH000309-19-22JUL91

SWASHPLATE, EXPLODED VIEW



A—Swashplate
B—Wear plate
C—Retaining plate
D—Spacer bushings
E—Hex. socket screws
F—Pistons with slippers
G—Slipper retainer
H—Cylinder block

ZX,TMSPFH000310-19-22JUL91

REPLACING THE SPRING IN THE CYLINDER BLOCK

If spring (C) appears damaged or contaminated, press retaining ring (A) down to compress spring.

Remove outer retaining ring (B).

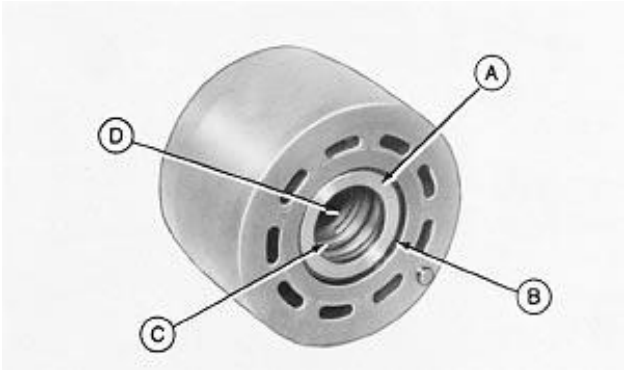
Remove retaining ring, spring, and beveled inner retainer (D).

Wash parts with clean solvent and replace spring.

Install beveled inner retainer (D) with beveled side toward splined end of block.

Install outer retainer (A) with shoulder toward open end of block.

Compress spring and outer retainer, then install retaining ring.



N36010 -UN-29SEP88

A—Retaining ring
B—Outer retaining ring
C—Spring
D—Inner retainer

ZX,TMXZCO009482-19-01AUG97

REPAIR VARIABLE PUMP

When repairing variable pump, note the following points:

• Check shaft seal assembly for scores at sliding surfaces. Replace all O-rings.

• Always use a new gasket between charge pump and end cap. If charge pump is defective, replace complete pump.

• Check valve plate and bearing plate for damage and replace, if necessary. Always use new O-rings and gaskets.

• Check wear plate surface for serviceability and replace plate, if necessary.

• Check drive shaft bearing surfaces and bearings as well as trunnions for roughness and discoloration and replace, if necessary.

• Check cylinder block and pistons with slippers for damage. Pistons may be replaced individually.

• Thoroughly clean all parts prior to assembly.

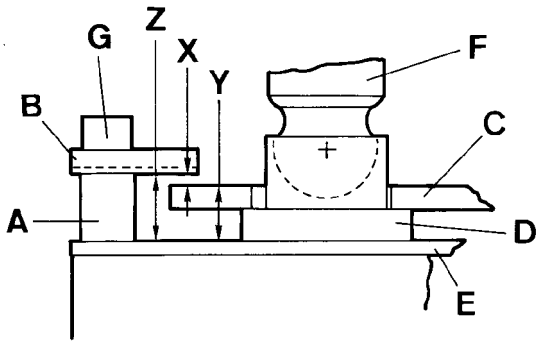
• Before assembling parts, coat all bearing surfaces with hydraulic oil. Grease O-rings with vaseline.

ZX,TMSPFH000311-19-22JUL91

CHECKING PARTS FOR WEAR

Distance (X) between retainer plate (B) and slipper retainer (C) must not exceed 0.2 mm (0.08 in.).

A—Spacer bushing
B—Retainer plate
C—Slipper retainer
D—Slipper
E—Wear plate
F—Piston
G—Hex. socket screw
X—Distance between slipper retainer and retainer plate
Y—Height of slipper and slipper retainer
Z—Height of spacer bushing



Z 116 450

Z116450 -UN-02JUN95

ZX,TMSPFH000312-19-22JUL91

ASSEMBLE AND INSTALL SWASHPLATE

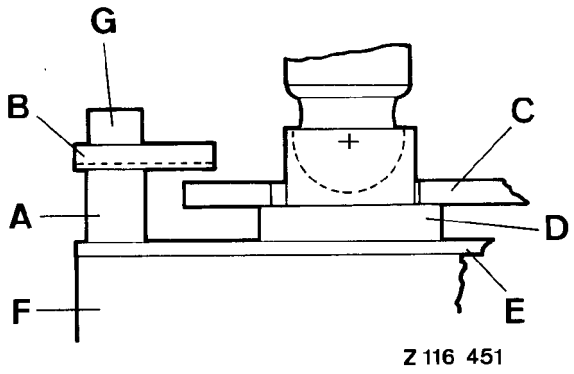
Insert pistons with slippers (D) and slipper retainers (C) into cylinder block.

Place wear plate (E) on swashplate (F).

Place slippers on wear plate. Install retainer plates (B) with bushings (A).

IMPORTANT: Do not apply Loctite to wear plate (E).

Coat screws (G) with Loctite No. 271 and tighten to 25 N·m (18 lb-ft).



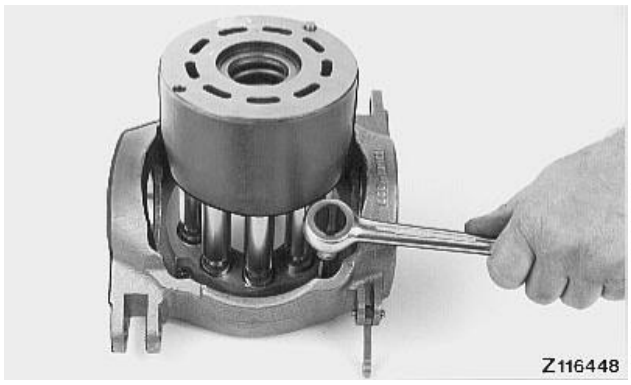
-UN-02JUN95 Z116451

Install Swashplate with Cylinder Block:

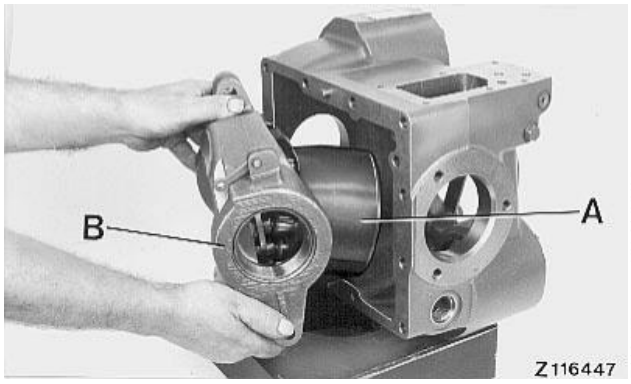
Install swashplate (B) with cylinder block in pump housing by inserting trunnions (A), using the same number of washers as installed before and noting marks applied prior to disassembly.

Tighten attachng screws to 60 N·m (45 lb-ft).

A—Bushings
B—Retainer plates
C—Slipper retainers
D—Slippers
E—Wear plate
F—Swashplate
G—Screws



-UN-01JUN95 Z116448



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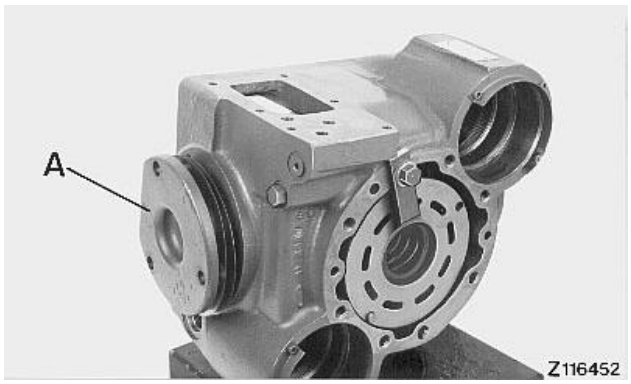

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ZX,TMSPFH000313-19-22JUL91

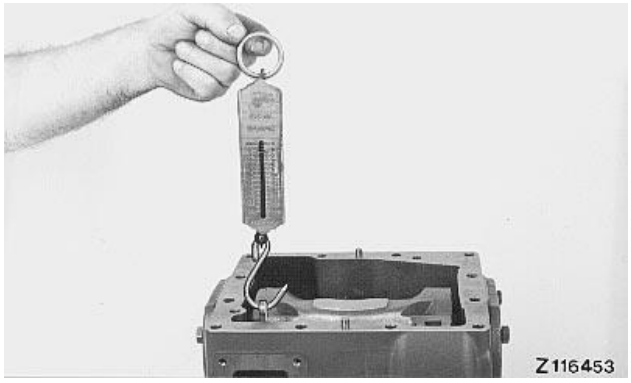
CHECK ROLLING DRAG TORQUE OF SWASHPLATE BEARINGS

Attach a spring scale to servo control valve strap and measure the force required to move swashplate.

This force should be 10—20 N (2.5—5 lb).

If rolling drag torque of swashplate bearings is not correct, remove trunnions and adjust by removing or adding washers.

NOTE: The total thickness of washers used on each trunnion should not differ by more than 0.3 mm (0.01 in.).

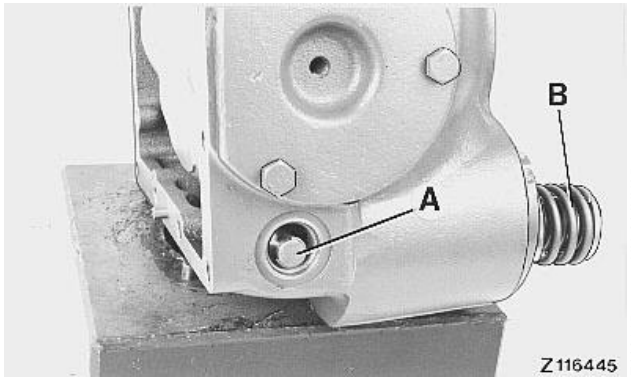


ZX,TMSPFH000314-19-28JAN91

INSTALL SERVO PISTON

Insert servo piston (B).

Align servo piston strap with swashplate attaching point. Install bolt (A) and secure with spring washers on both sides.



ZX,TMSPFH000315-19-28JAN91

INSTALL SERVO CYLINDER

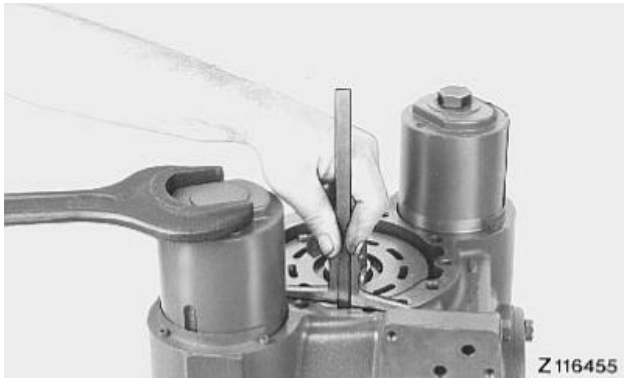
Install servo cylinder, noting mark and taking care not to damage O-rings.

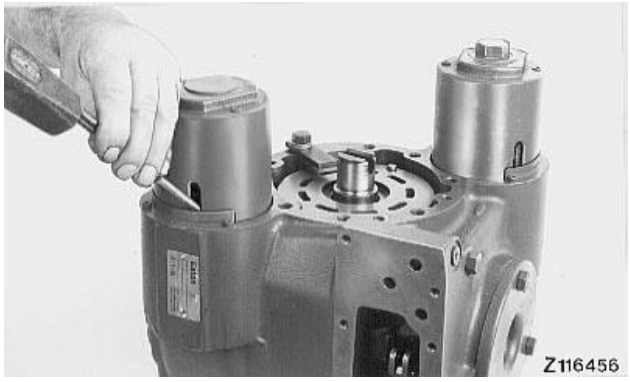
Check neutral position of swashplate with a depth gauge.

NOTE: Difference of depth (measured on two opposite sides of swashplate) must not exceed 0.012 mm (0.0005 in.).

If necessary, adjust neutral position by turning servo cylinders.

After swashplate adjustment, secure both servo cylinders to keep them in correct position.





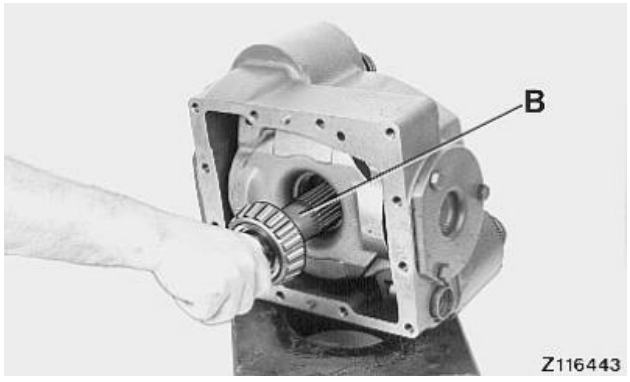
ZX,TMSPFH000316-19-22JUL91

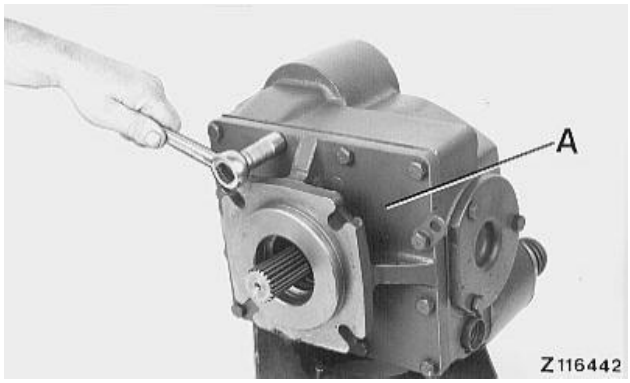
ATTACH FRONT COVER

Slide drive shaft (B) from underneath into swashplate assembly.

Install front cover (A).

Tighten attaching screws to 60 N·m (45 lb-ft).





ZX,TMSPFH000317-19-28JAN91

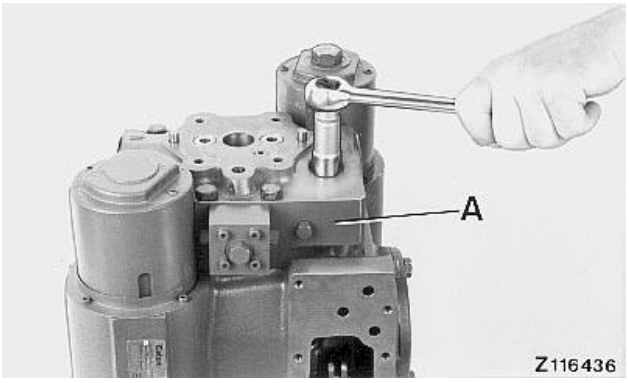
CHECK DRIVE SHAFT BEARING END PLAY

Drive bearing on shaft and install end cap (A) without valve plate and bearing plate.

Measure end play of drive shaft.

End play should be between 0.05 and 0.17 mm (0.002 and 0.007 in.).

Adjust end play, if necessary, by placing washers under bearing cup in end cap.



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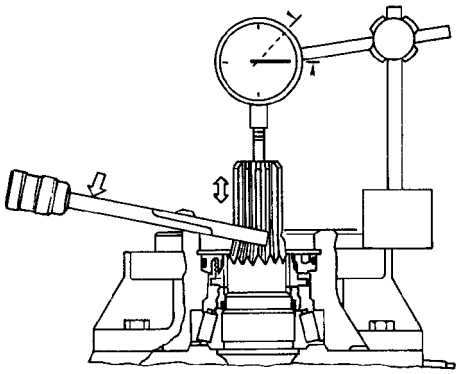

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ZX,TMSPFH000318-19-28JAN91

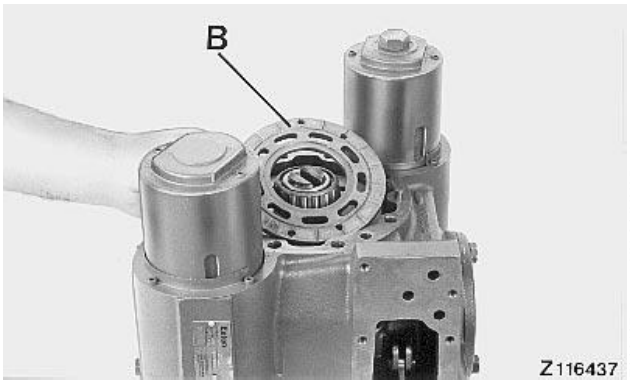
INSTALL END CAP

After checking bearing end play, remove end cap (A) again.

IMPORTANT: Before closing variable pump housing, all parts have to be coated with clean hydraulic oil of specified quality.

Place bearing plate (B) on cylinder block. Slightly coat valve plate with oil so that it sticks to the end cap. Place both parts on variable pump housing.

Tighten end cap attaching screws crosswise to 85 N·m (65 lb-ft).



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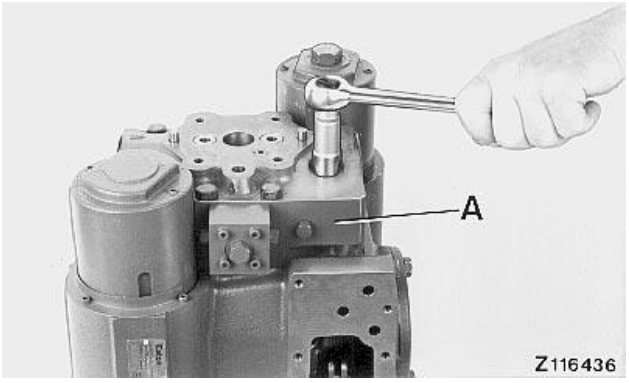

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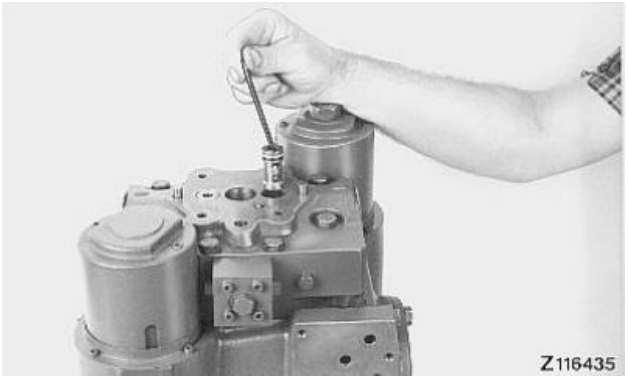
ZX,TMSPFH000319-19-28JAN91

INSTALL CHECK VALVES

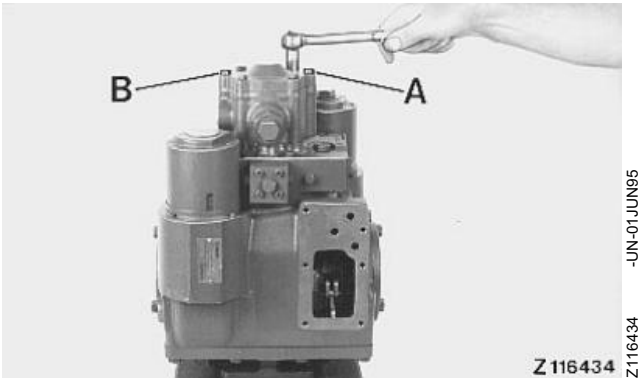
NOTE: Install back-up rings on the outside and O-rings on the inside of check valves.



ZX,TMSPFH000320-19-28JAN91

INSTALL CHARGE PUMP

Tighten attaching screws (A) and (B) of charge pump to 22 N·m (16 lb-ft).



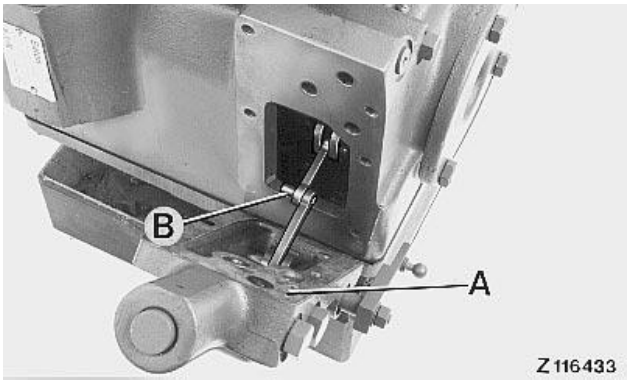
ZX,TMSPFH000321-19-28JAN91

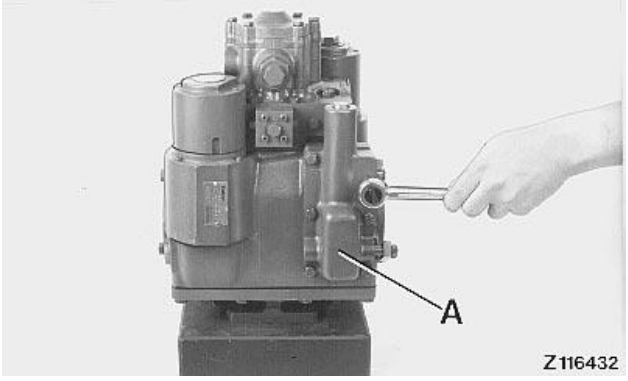
INSTALLING THE SERVO-CONTROL VALVE

Before installing servo-control valve, make sure that orifices are not clogged and installed correctly.

Insert pin (B) into swashplate strap and attach servo control valve (A).

Tighten screws to 24 N·m (16 lb-ft).





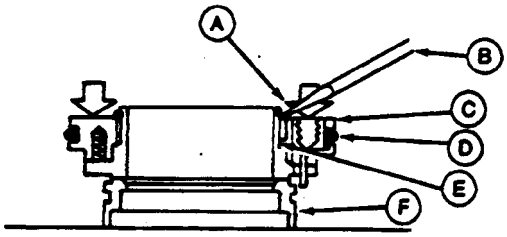
ZX,TMXZCO010100-19-01AUG97

OVERHAULING THE SEAL SET

Position stationary seal assembly on rotating seal (F).

Press stationary seal assembly down, then use a small screwdriver (B) to carefully remove retaining O-ring (A). Do not damage O-ring seat.

A—Retaining O-ring
B—Seal retainer
C—O-ring
D—O-ring
E—Rotating seal



-UN-22SEP88
N37725

ZX,TMXZCO009483-19-01AUG97

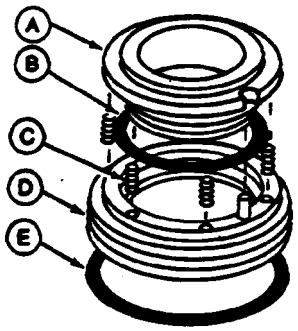
Remove stationary seal (A) from seal retainer (D).

Remove O-ring (B).

Remove six springs (C).

Remove O-ring (E) from retainer.

A—Stationary seal
B—O-ring
C—Spring (6 used)
D—Seal retainer
E—O-ring



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N37726

ZX,TMXZCO009484-19-01AUG97

Install new O-ring on stationary seal retainer.

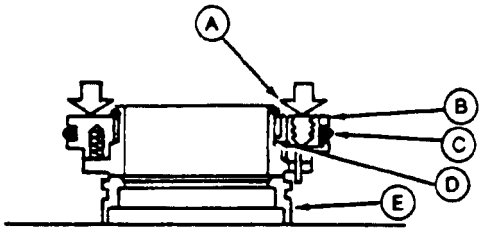
Install six springs in seal retainer (B).

Install new O-ring (D) in seal retainer.

Align dowel pin of seal retainer with notch in stationary seal, then install seal.

Position stationary seal assembly on rotating seal (E). Push assembly down and carefully install retaining O-ring (A).

Install O-ring in I.D. of rotating seal.



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H40203

A—Retaining O-ring
B—Seal retainer
C—O-ring
D—O-ring
E—Rotating seal

ZX,TMXZCO009485-19-01AUG97

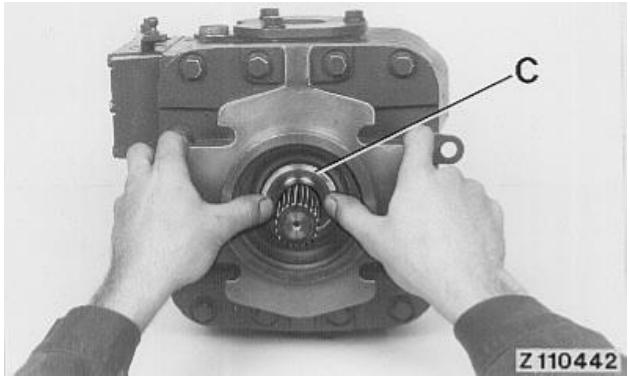
INSTALL SEAL SET

IMPORTANT: Do not touch sealing surfaces with your hands.

1. Install moving seal ring (C) with O-ring.

2. Install seal retainer (B) with stationary seal ring.

3. Install snap ring (A) with chamfered side facing outward.



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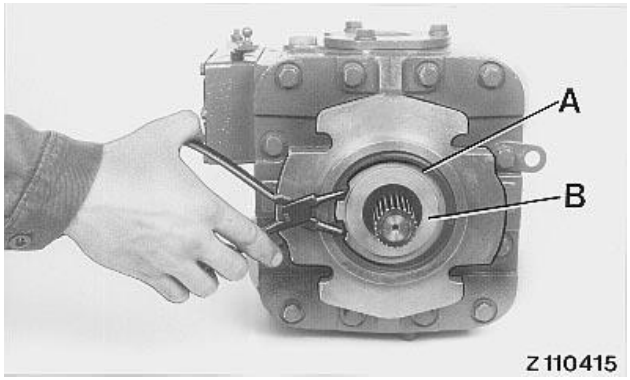
Z110442



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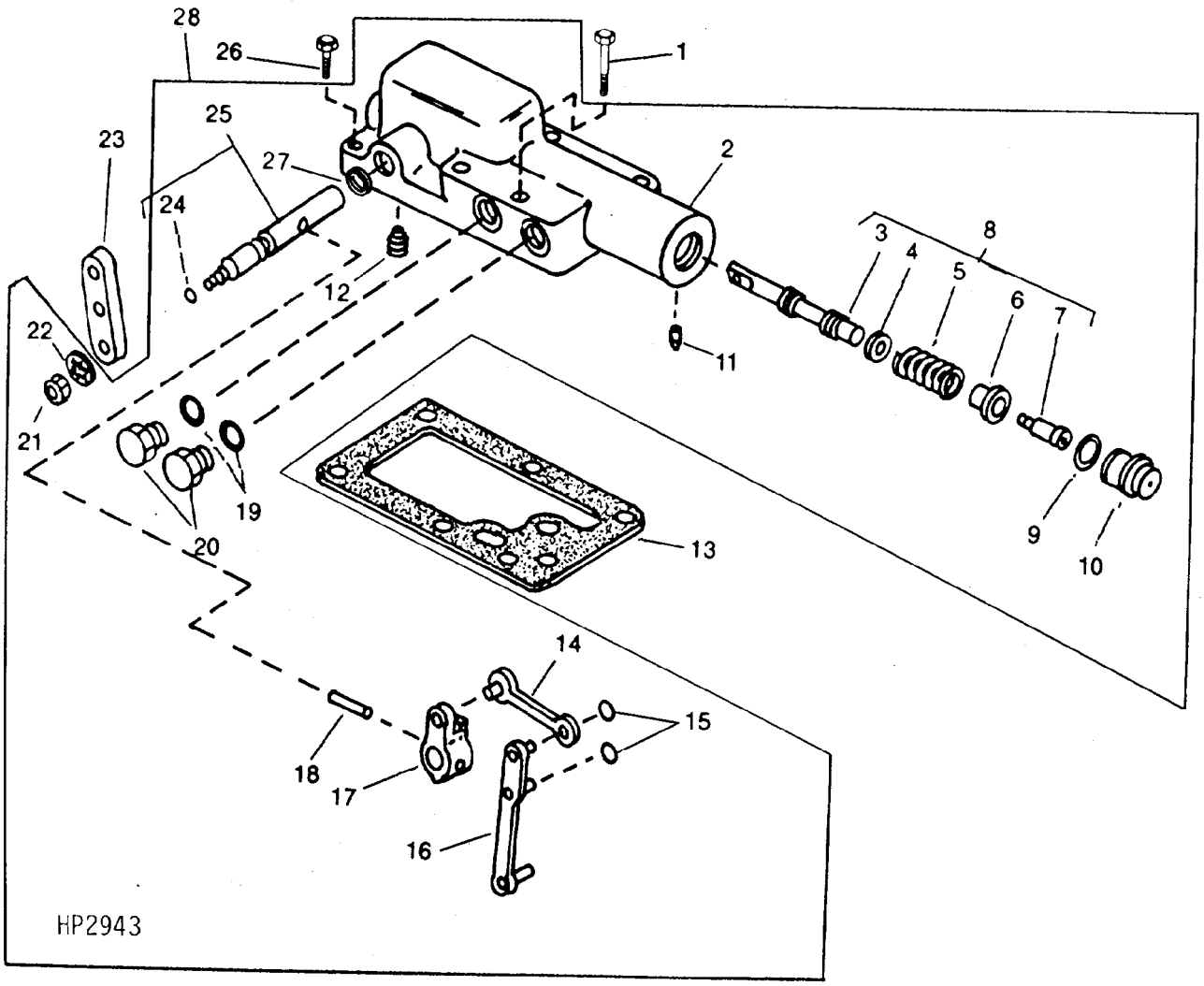
ZX,TMSPFH000323-19-22JUL91

REPAIRING THE CONTROL VALVE



HP2943 -UN-01JAN94

1—Cap screw (2 used)	8—Repair kit	15—Snap ring (2 used)	22—Washer
2—Housing	9—O-ring	16—Control link	23—Link
3—Spool	10—Adjusting screw	17—Connector	24—O-ring
4—Washer	11—Bolt	18—Spring pin	25—Shaft
5—Spring	12—Set screw	19—O-ring (2 used)	26—Cap screw (4 used)
6—Retainer	13—Gasket	20—Plug (2 used)	27—Seal
7—Cap screw	14—Link	21—Nut	28—Complete valve

ZX,TMXZCO009576-19-01AUG97

The servo-control valve may be removed from pump without removing pump from combine. Disconnect control linkage.

1. Remove six screws to loosen valve.

2. Unhook link (16) from control link.

3. Discard drained oil and cover opening in pump housing to keep dirt out.

4. Unhook link (14) from connector (17), loosen set screw (12), remove spring pin (18) and pull shaft (25) out of valve.

5. Scribe two lines on adjusting screw (10) to indicate setting.

6. Loosen set screw and remove adjusting screw (10) and spool (3).

7. Clean all part in solvent and dry thoroughly. Replace all worn or damaged parts and install new O-rings.

8. Insert spool kit (8) into housing. Screw centering spring adjusting screw (10) until scribe marks align. Tighten set screw.

9. If new spool, spring or adjusting screw is installed, turn adjusting screw into housing until just contacting spring. DO NOT compress spring.

10. Install pivot shaft, new sealing washer and O-ring. Tighten set screw (12) and install pin (18) and connect link (14) in connector (17).

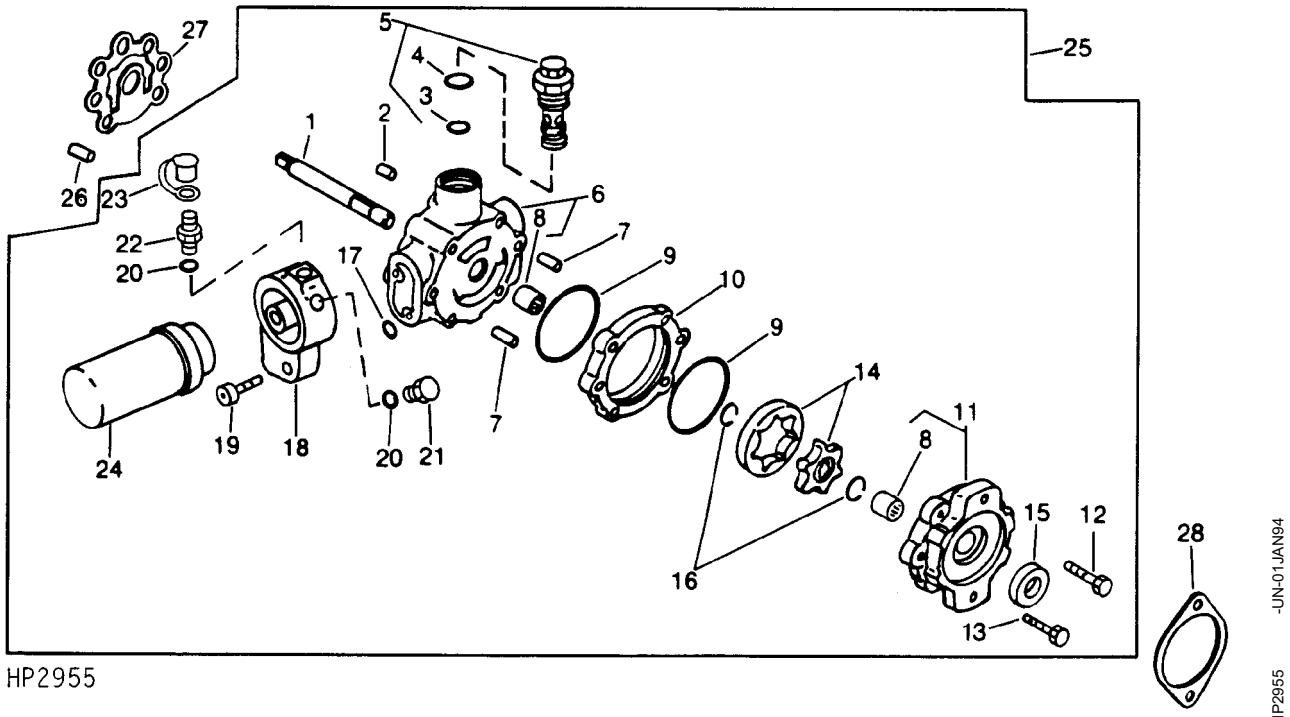
11. Check spool (3) for end play by moving it back and forth. If there is end play, tighten adjusting screw (10) until it touches spring. Exert a slight back and forth force on spool while adjusting screw. DO NOT compress spring beyond its installed length.

12. Hook link (16) into control link. Make sure control link is pointing toward end cover of housing or unit will not function properly.

13. Tighten attaching bolts to 24 N·m (17.7 lb-ft).

ZX,TMXZCO009577-19-01AUG97

REPAIRING THE CHARGE PUMP



1—Shaft
2—Pin
3—O-ring
4—O-ring
5—Charge pressure relief valve
6—Housing with needle bearing
7—Bushing
8—Needle bearing
9—O-ring (2 used)
10—Spacer
11—Cover with needle bearing
12—Cap screw
13—Cap screw
14—Rotor
15—Seal
16—Snap ring (2 used)
17—O-ring
18—Filter base
19—Cap screw
20—O-ring
21—Plug
22—Test port
23—Dust cap
24—Filter
25—Pump assembly
26—Pin
27—Gasket
28—Gasket

1. Scribe a line across pump sections.

2. Remove cap screws (12 and 13).

3. Inspect rotor assembly (14), shaft (1) and body (6) for excessive wear or scoring. Replace if necessary.

4. Remove and clean pressure relief valve (5).

5. Install new O-rings and packings.

6. Assemble pump, aligning scribe marks.

7. Tighten pressure relief valve (5) to 163-197 N·m (120-145 lb-ft).

8. Tighten cap screws (12 and 13) to 22 N·m (192 lb-in.).

ZX,TMXZCO009578-19-01AUG97

INSTALL HYDROSTATIC PUMP

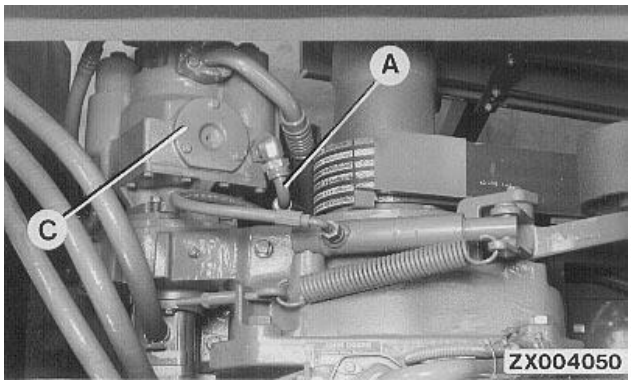
CAUTION: The approximate weight of the pump is 68 kg (160 lb).

1. Attach pump with four cap screws. Tighten screws to 130 N·m (96 lb-ft).

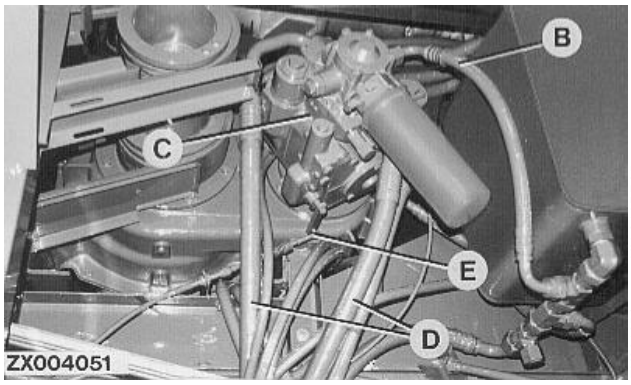
2. Connect lines and control cable to pump (C). Use new O-rings. Before connecting line (A), fill hydrostatic pump housing with clean hydrostatic oil.

3. Check oil level. Start engine and bleed system.

A—Line to Hydrostatic Oil Cooler
B—Charge Pump Suction Line
C—Hydrostatic Pump
D—High Pressure Hose (2 used)
E—Control Cable



ZX004050 -UN-24APR95



ZX004051 -UN-24APR95

ZX,TMXZCO002396-19-25NOV92

INSTALLING THE CONTROL CABLE

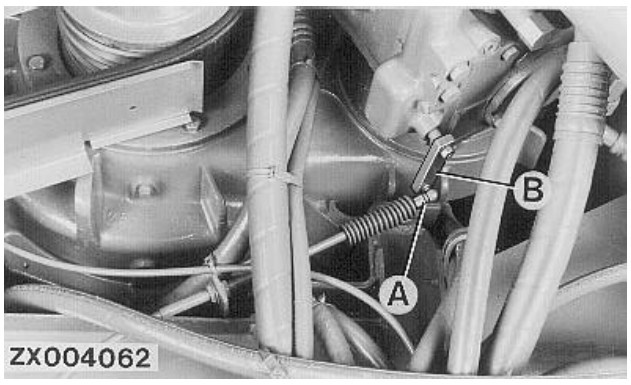
1. Adjust the cable to be sure combine will not “creep” with hydrostatic drive lever in neutral.

Place hydrostatic drive lever in neutral.

Attach ball joint (A) on cable to bore of arm (B).

2. Do not move the arm when attaching the ball joint. It must pass freely into the bore. Turn ball joint off or on rod to adjust.

3. Start engine. The combine should not “creep” with hydrostatic drive lever in neutral. If creeping does occur, readjust cable at ball joint.



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ZX,TMXZCO009579-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Pressure relief valve	Identification stamp	016-160 psi (1100 kPa; 11 bar) 500-5000 psi (35000 kPa; 350 bar)
Low pressure relief valve	Tightening torque	100 N·m (75 lb-ft)
High pressure relief valve	Tightening torque	35 N·m (25 lb-ft)
Gap between retaining plate and slipper retainer	Wear tolerance	0.2 mm (0.08 in.)
Drive shaft	End play	0.05-0.18 mm (0.002-0.007 in.)
Fixed displacement motor	Weight	40 kg (90 lb)
Screws at valve block	Tightening torque	42 N·m (31 lb-ft)
Screws at end cap	Tightening torque	70 N·m (50 lb-ft)

ZX,TMXZCO009580-19-01AUG97

REMOVING THE FIXED DISPLACEMENT MOTOR

IMPORTANT: Thoroughly clean fixed displacement motor and surrounding area.

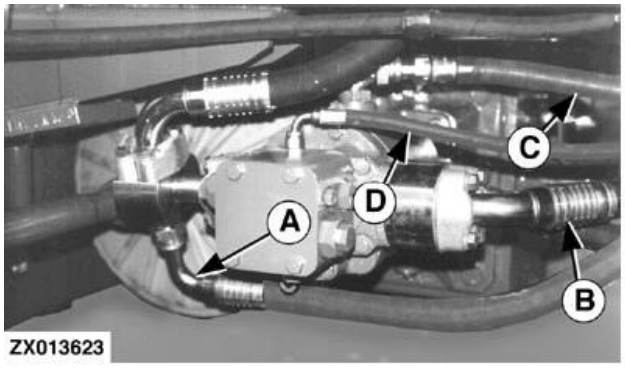
Drain hydrostatic oil.

Disconnect all hoses at fixed displacement motor.

IMPORTANT: Plug all open lines and connectors.

Support fixed displacement motor by means of a jack, separate from transmission and remove from bottom of machine.

CAUTION: Approximate weight of motor is 40 kg (90 lb).



A—High pressure line
B—High pressure line
C—Flushing oil line to variable pump
D—Pilot line to four-wheel-drive solenoid

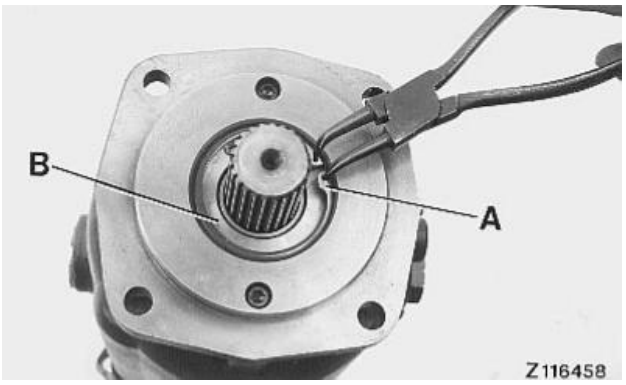
ZX,TMXZCO009581-19-01AUG97

DISASSEMBLE FIXED DISPLACEMENT MOTOR — PREPARATIONS

IMPORTANT: Cleanliness is a must when working on the fixed displacement motor.

1. Remove snap ring (A).

2. Remove seal retainer (B) with stationary part of seal set.



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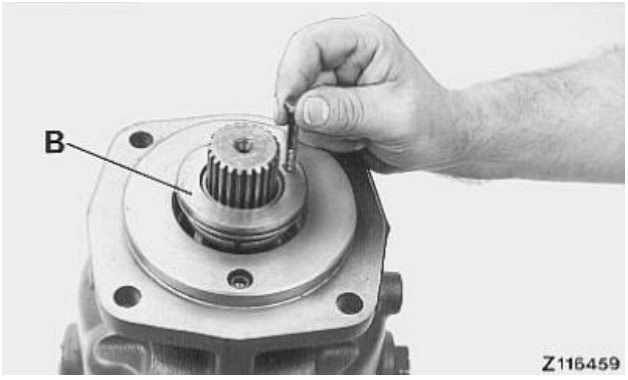

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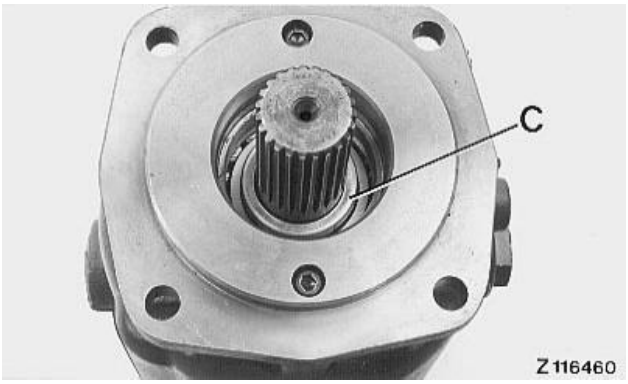
ZX,TMSPFH000335-19-22JUL91

3. Remove moving part of seal set (C).

4. Place fixed displacement motor on mounting plate.



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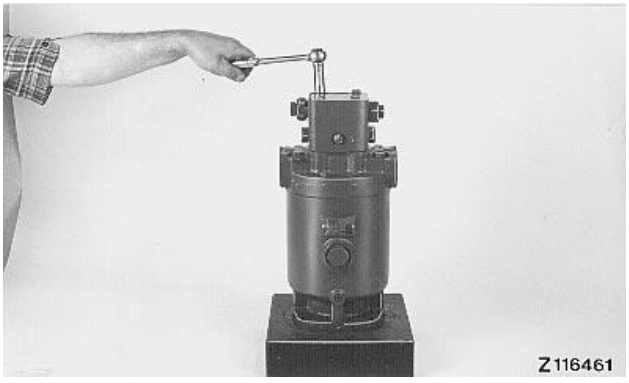
ZX,TMSPFH000336-19-28JAN91

REMOVE VALVE BLOCK



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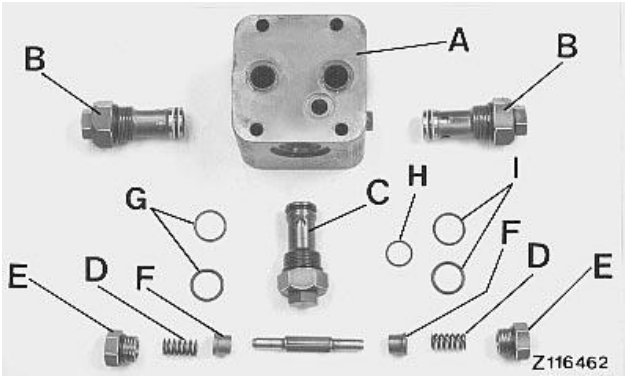
ZX,TMSPFH000337-19-28JAN91

VALVE BLOCK, EXPLODED VIEW

A—Housing
B—High pressure relief valves
C—Low pressure relief valve
D—Springs
E—Plugs
F—Valve seats
G—O-rings
H—Seal ring
I—Back-up rings



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ASSEMBLING THE VALVE BLOCK

Observe utmost cleanliness when assembling valve block.

If seal rings were removed, install new ones.

When installing high pressure relief valves, be sure to install one back-up ring on each side of the O-ring.

On low pressure relief valve, no back-up rings are used. This valve is only provided with an O-ring.

A number is stamped on the pressure relief valves for identification:
016—160 psi (1100 kPa; 11 bar)
500—5000 psi (35 000 kPa; 350 bar)

Tighten low pressure relief valve to 100 N·m (75 lb-ft).

Tighten high pressure relief valves to 35 N·m (25 lb-ft).

Tighten valve block to 42 N·m (31 lb-ft).

ZX,TMXZCO009582-19-01AUG97

REMOVE END CAP

1. Remove all but two of the screws (which should be opposite each other).

The end cap is spring-loaded, therefore loosen the last two opposite screws alternately until the load has been released.

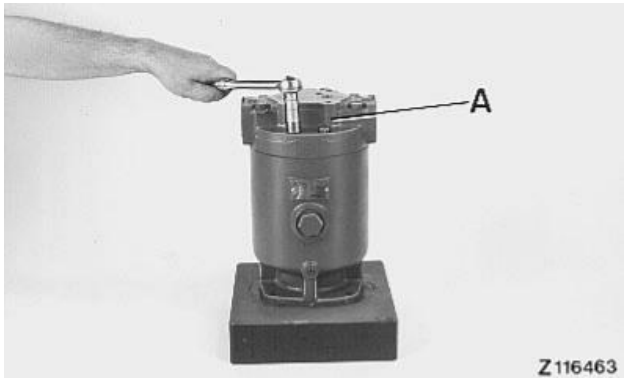
IMPORTANT: When removing end cap, be careful not to damage valve plate and bearing plate.

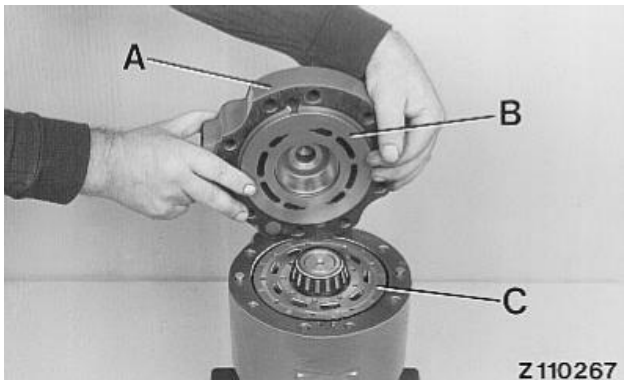
2. Remove end cap (A).

3. Remove valve plate (B) and bearing plate (C).

NOTE: To avoid damaging valve plate and bearing plate, both parts should be wrapped separately in clean fiberless paper.

A—End cap
B—Valve plate
C—Bearing plate





ZX,TMSPFH000340-19-22JUL91

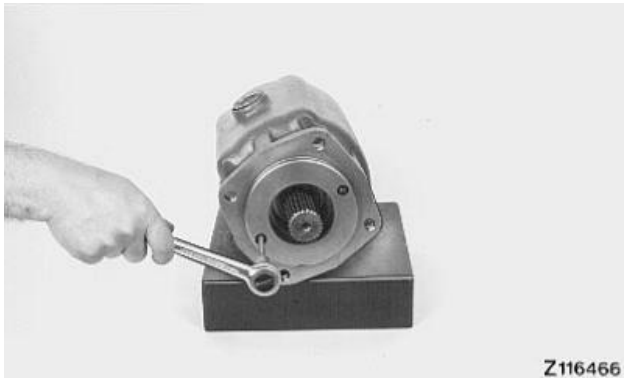
REMOVE BEARING

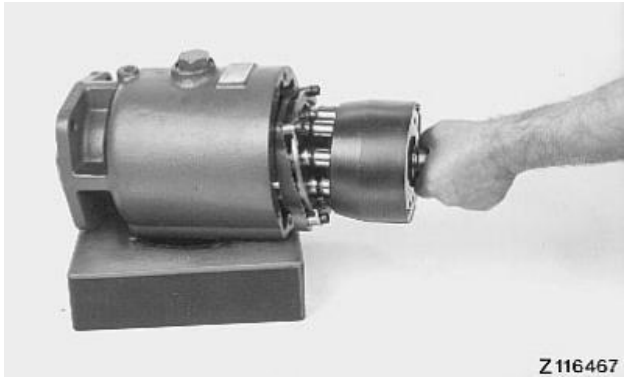
Install special tool on bearing. Remove bearing, using a puller.

ZX,TMSPFH000341-19-28JAN91

REMOVE SWASHPLATE

Remove the two hex. socket screws and take swashplate with drive shaft and cylinder block out of motor housing.





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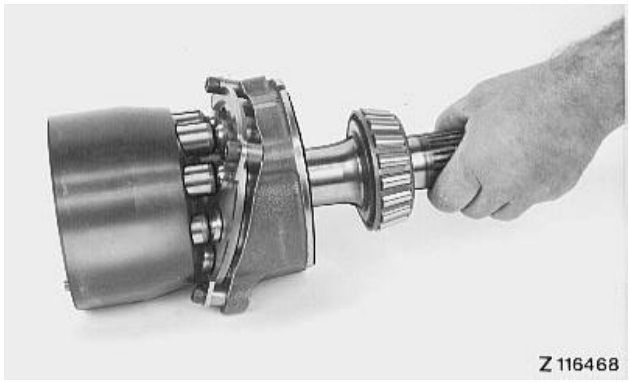
DISASSEMBLE SWASHPLATE PARTS

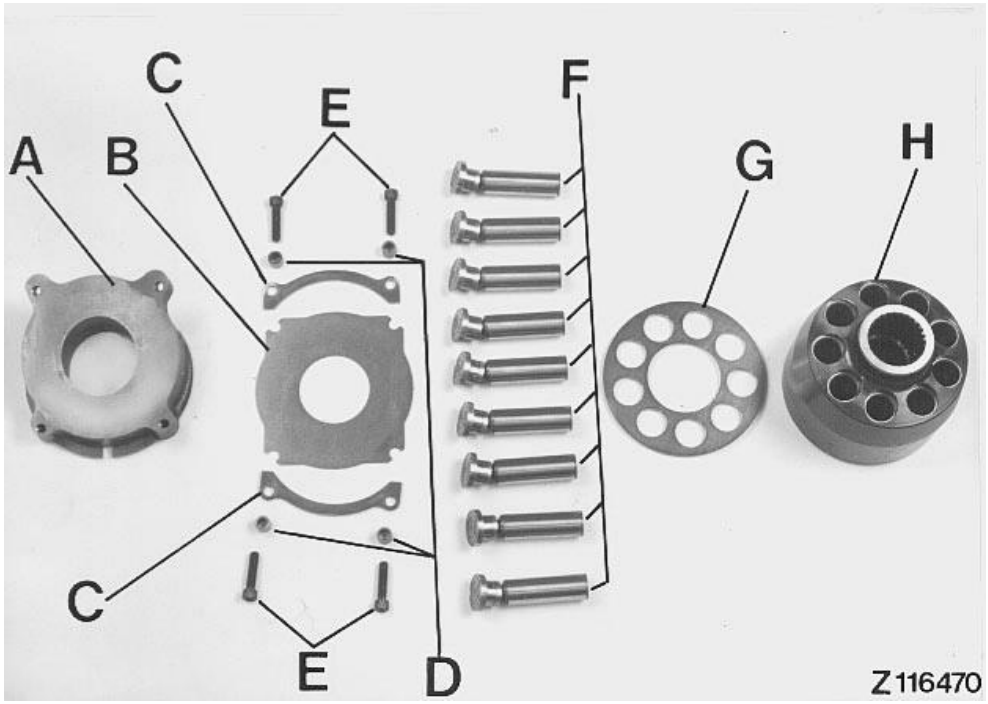
IMPORTANT: Do not damage drive shaft sealing surface.

Remove drive shaft from swashplate assembly.



ZX,TMSPFH000343-19-22JUL91

SWASHPLATE ASSEMBLY, EXPLODED VIEW



A—Swashplate
B—Wear plate
C—Retainer plates
D—Spacer bushings
E—Hex. socket screws
F—Piston with slippers
G—Slipper retainer
H—Cylinder block

ZX,TMSPFH000344-19-22JUL91

REPLACE CYLINDER BLOCK SPRING

1. Press outer retaining ring (A) down to compress spring (C).

2. Remove spiral retaining ring (B).

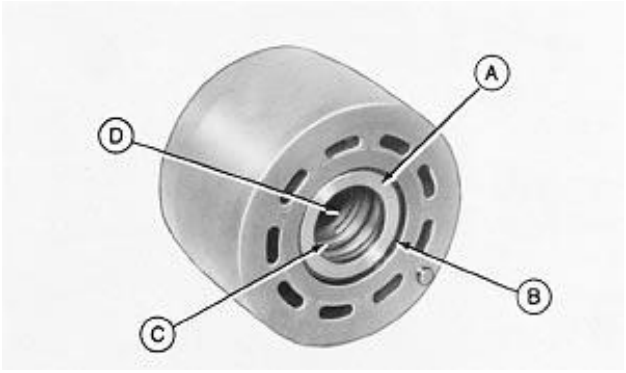
3. Remove retaining ring, spring, and beveled inner retainer (D).

4. Replace spring and reinstall parts.

5. Install beveled inner retainer (D) with beveled side toward splined end of block.

6. Install outer retaining ring (A) with shoulder towards open end of block.

7. Compress spring and outer retaining ring, then install spiral retaining ring.



N36010 -UN-29SEP88

A—Outer Retaining Ring
B—Spiral Retaining Ring
C—Spring
D—Inner Retainer (Beveled)

1401,5020,BZ -19-12SEP91

REPAIR FIXED DISPLACEMENT MOTOR

For repair of fixed displacement motor, note the following:

• When removing O-rings and seals, install new parts.

• Check shaft seal assembly. Sliding surfaces should not be damaged or scored.

• Check motor shaft bearing surfaces and bearings for roughness and discoloration. Replace parts as necessary.

• Check wear plate surface for proper condition and replace plate, if necessary.

• Check cylinder block and pistons for damage. Replace parts as necessary. Pistons may be replaced individually.

• Check valve plate and bearing plate for damage and replace, if necessary.

ZX,TMSPFH000345-19-22JUL91

ASSEMBLE FIXED DISPLACEMENT MOTOR

Prior to assembly, thoroughly clean and dry all parts.

Grease all O-rings, using non-acid grease.

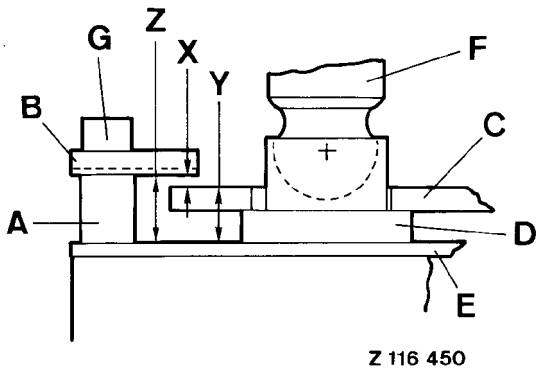
Coat all parts with hydraulic oil of specified quality to prevent them from running dry.

ZX,TMSPFH000346-19-22JUL91

CHECKING PARTS FOR WEAR

Distance (X) between retainer plate (B) and slipper retainer (C) must not exceed 0.2 mm (0.08 in.).

A—Spacer bushing
B—Retainer plate
C—Slipper retainer
D—Slipper
E—Wear plate
F—Piston
G—Hex. socket screw
X—Distance between slipper retainer and retainer plate
Y—Height of slipper and slipper retainer
Z—Height of spacer bushing



Z 116 450

Z116450 -UN-02JUN95

ZX,TMSPFH000312-19-22JUL91

For further assembly of fixed displacement motor, reverse disassembly procedure.

Check drive shaft axial play.

ZX,TMSPFH000348-19-22JUL91

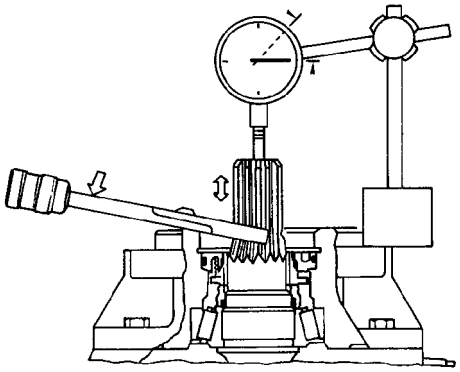
CHECK DRIVE SHAFT AXIAL PLAY

Drive bearing on shaft and attach end cap without valve plate and bearing plate.

Check drive shaft axial play.

Permissible axial play: 0.05 to 0.17 mm (0.002 to 0.007 in.).

If necessary, adjust axial play by adding spacer washers under bearing cup in end cap.



Z 116 457

Z116457 -UN-02JUN95

ZX,TMSPFH000349-19-28JAN91

INSTALL FIXED DISPLACEMENT MOTOR

Install fixed displacement motor, reversing removal procedure.

Before operating forage harvester, fill hydrostatic system with oil. Refer to “Hydrostatic Drive, Oil Change”.

ZX,TMSPFH000350-19-22JUL91

SPECIFICATIONS

Item	Measurement	Specification
Hydrostatic drive system	Capacity	24 L (6.34 U.S. gal)

ZX,TMSPFH000966-19-22JUL91

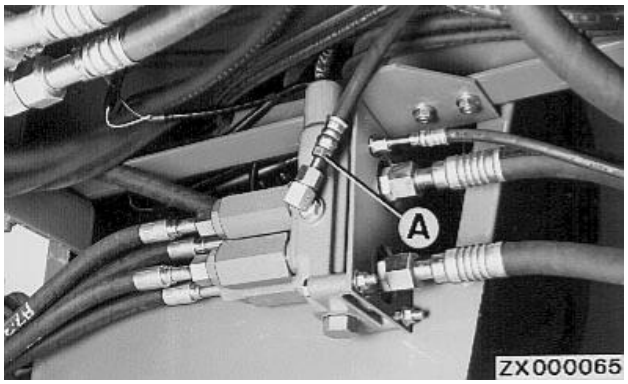
DRAINING OIL

Open filler cap.

Remove return hose (A) or drain plug (harvester without four wheel drive) and drain oil from tank.

Remove drain plug (B) at fixed-displacement motor and drain oil from variable pump and fixed displacement motor.

Replace oil filter element at variable pump.



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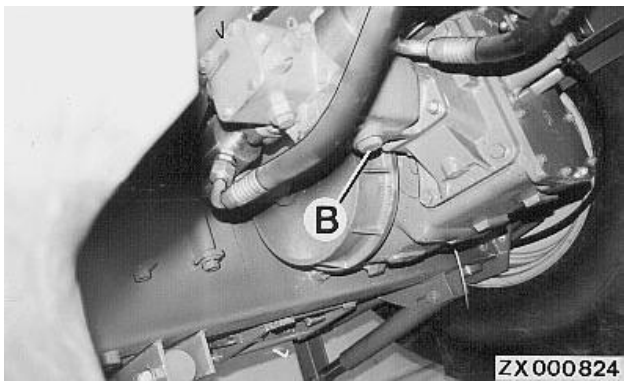
ZX000065



-UN-31MAY95
ZX000824

ZX,TMSPFH000967-19-01JUL91

REFILLING THE HYDROSTATIC SYSTEM

1. Remove hose (A) from fixed-displacement motor.

Fill fixed-displacement motor with clean hydraulic oil.

Reconnect hose (A).

2. Remove hose (B) from variable pump.

Fill variable pump with clean hydraulic oil.

Reconnect hose (B).

3. Fill hydrostatic oil tank up to sight glass.

4. Crank engine with starting motor until hydrostatic charge pressure indicator light goes out.

IMPORTANT: To prevent the engine from starting, on 2254 machines remove fuse F16 from the fuse board. On 2256, 2258, 2264 and 2266 machines, disconnect plug (C; solenoid for injection pump).

5. Insert fuse F16 or reconnect plug (C), and then start the engine.

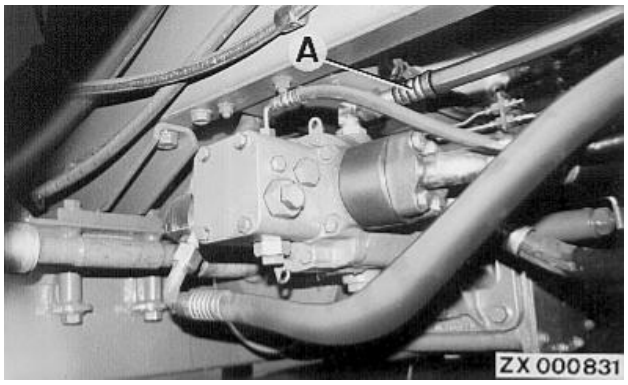
With transmission in first gear drive harvester slowly backward and forward.

6. Shut off engine.

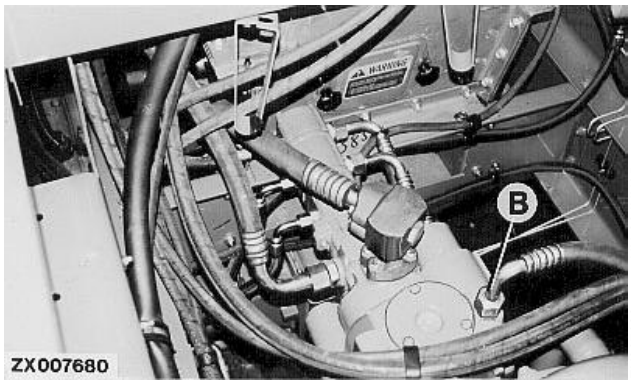
Check hydrostatic system for leaks.

Check oil level in hydrostatic oil tank.

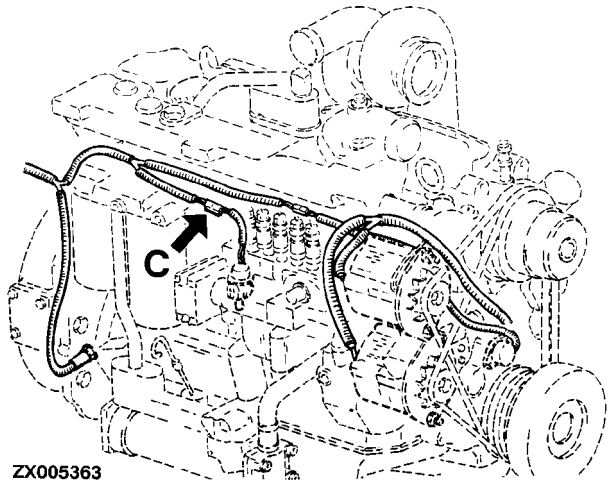
System is now ready for operation.



ZX000831 -UN-31MAY95



ZX007680 -UN-20JUN95



ZX005363 -UN-06JUN95

ZX,TMXZCO009458-19-05MAR98

SPECIFICATIONS

Item	Measurement	Specification
Cam lobe motor	Weight	170 kg (370 lb)
Attachment of cam lobe motor to axle	Tightening torque	560 N·m (410 lb-ft)
Slotted nut	Tightening torque	150 N·m (110 lb-ft)
Screws at steering cyl. support	Tightening torque	325 N·m (240 lb-ft) 163 N·m (120 lb-ft)

ZX,TMXZCO009583-19-01AUG97

FOUR-WHEEL DRIVE

IMPORTANT: Do not switch 4-wheel drive on or off while driving in 3rd gear (road gear) at maximum travel speed.

Move ground speed control lever to a position midway between neutral and max. speed before switching 4-wheel drive on or off.

NOTE: The road safety switch must be in the field (off-road) position before four-wheel drive can be engaged.

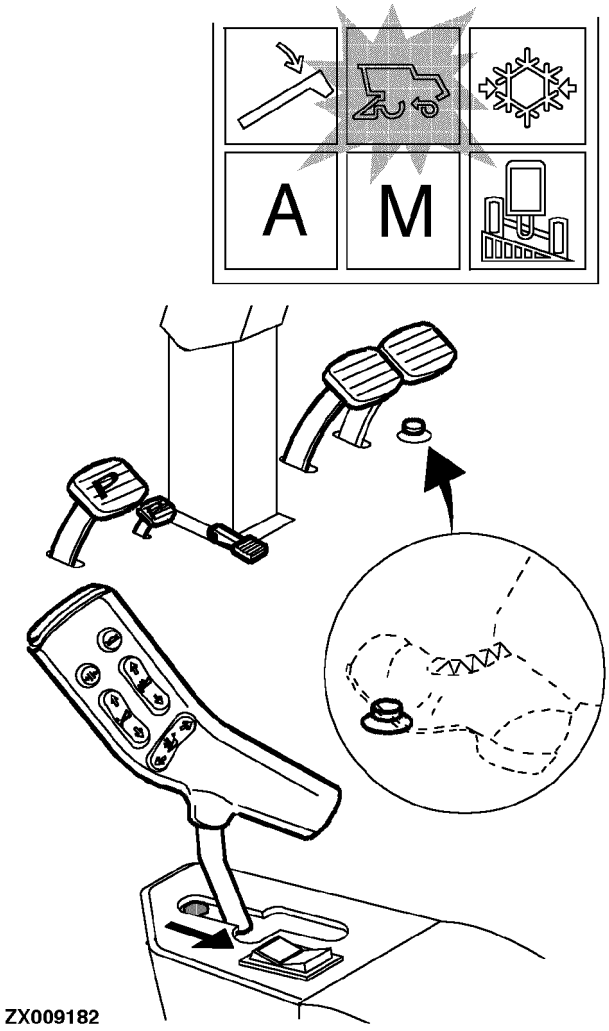
The 4-wheel drive system is designed for use in conditions where traction is poor or when needed to improve steering control.

To engage the drive, depress the foot switch.

To disengage the drive, depress foot switch once again.

It is not necessary to engage 4-wheel drive when driving the combine harvester unless conditions are soft or muddy.

In most conditions, it is normal for front wheels to spin before rear wheels spin. When this occurs, shift into 3rd gear. In extremely muddy conditions, it may be necessary to apply both brakes momentarily to increase hydrostatic pressure.



ZX009182

ZX009182 -UN-22MAY96

ZX,OMXZCO001582-19-02MAY96

INSTALLING THE CAM LOBE MOTOR

Bolt the cam lobe motor to the rear axle.

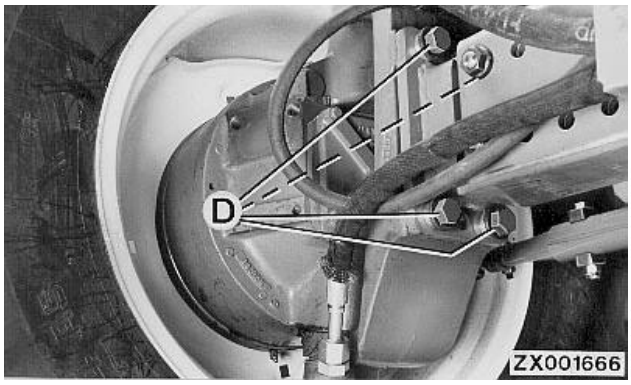
Tighten the four cap screws (D) to 560 N·m (410 lb-ft).

Connect the hydraulic hoses to the cam lobe motor.

Bolt the tie rod and steering cylinder to the steering lever.

Tighten slotted nut to 150 N·m (110 lb-ft), and then secure.

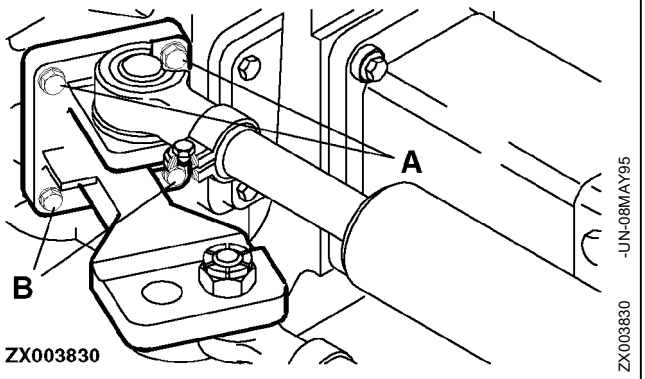
Finally, fill with hydraulic oil.



ZX,TMSPFH001717-19-22FEB92

STEERING CYLINDER SUPPORT ATTACHING SCREWS TO WHEEL MOTOR

After the first 10 hours of operation, tighten cap screws (A) at both sides to 325 N·m (240 lb-ft) and cap screws (B) to 163 N·m (120 lb-ft).



ZX,OMXZCO002221-19-05OCT92

Section 60
Brakes, Steering, Rear Axle

Contents

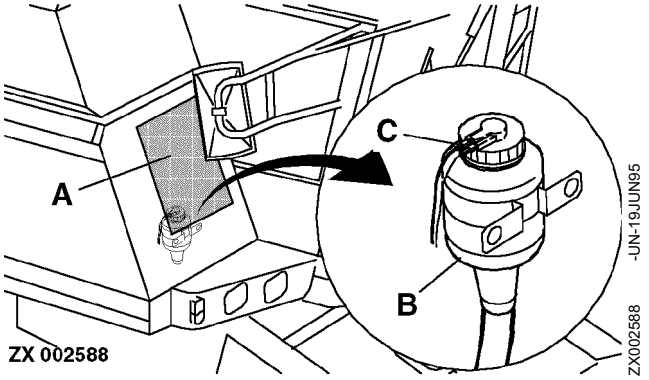
BRAKE FLUID FOR BRAKE SYSTEM

IMPORTANT: Use only brake fluid that meets SAE Standard J 1703 (DOT 4).

Capacity:

- Complete system 1.0 L (0.26 U.S. gal)
- Reservoir 0.5 L (0.13 U.S. gal)

A—Service flap, vehicle electrics
B—Brake fluid reservoir
C—Reservoir cap with float



ZX,OMXZCO002385-19-04DEC92

REMOVING BRAKE MASTER CYLINDER

1. Drain brake fluid at bleed valve in a suitable container.

2. Unhook spring (A).

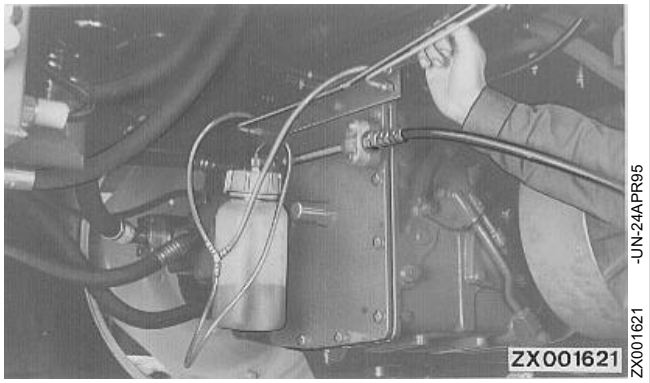
Remove pin (B).

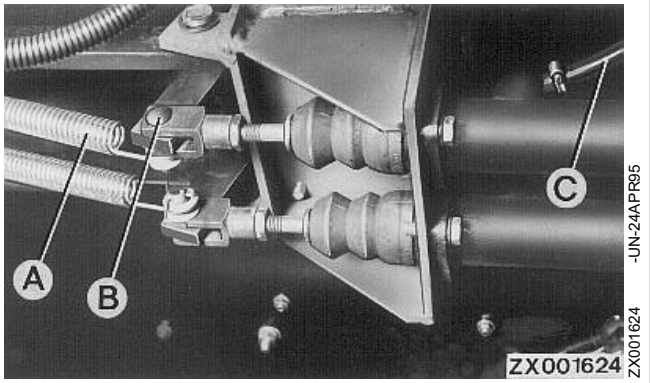
Remove hose (C).

Remove brake line on pressure side. If necessary, disconnect cable to brake light switch.

Remove brake master cylinder attaching screws and brake master cylinder.

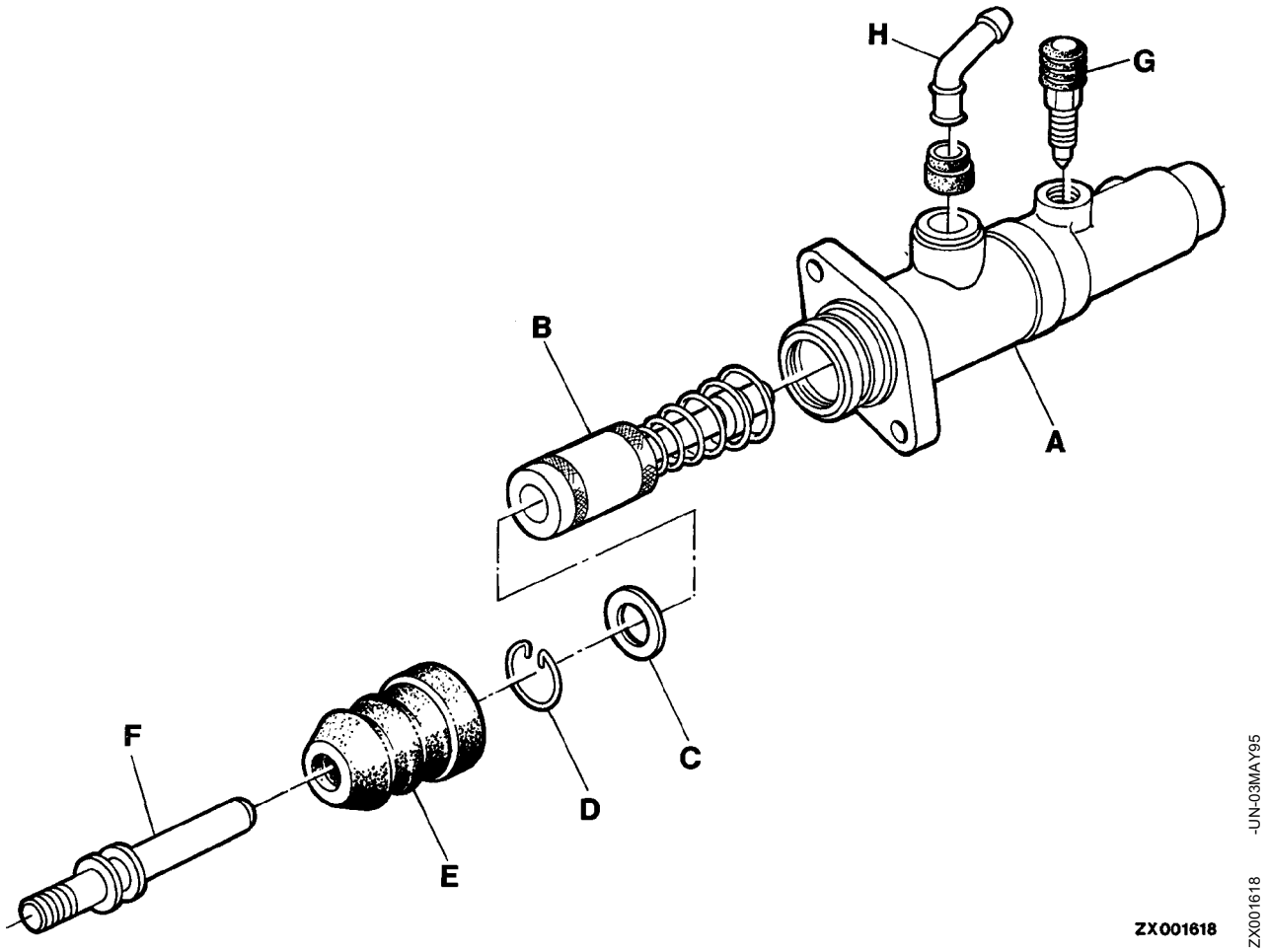
A—Spring
B—Pin
C—Hose





ZX,TMSPFH001097-19-23SEP91

REPAIRING BRAKE MASTER CYLINDER



A—Brake master cylinder housing
B—Double-stage piston
C—Washer
D—Snap ring
E—Boot
F—Rod
G—Bleed screw
H—Oil inlet

After snap ring (D) has been removed brake master cylinder can be disassembled.

IMPORTANT: To ensure exact operation do not repair double-stage piston (B). Replace double-stage piston (B) as a unit, if necessary.

If brake master cylinder is worn, rusty or has visible scores, replace it as a unit.

When assembling brake master cylinder make sure bore in boot (E) is at the bottom to drain condensation water.

ZX,TMSPFH001098-19-30AUG94

INSTALLING BRAKE MASTER CYLINDER

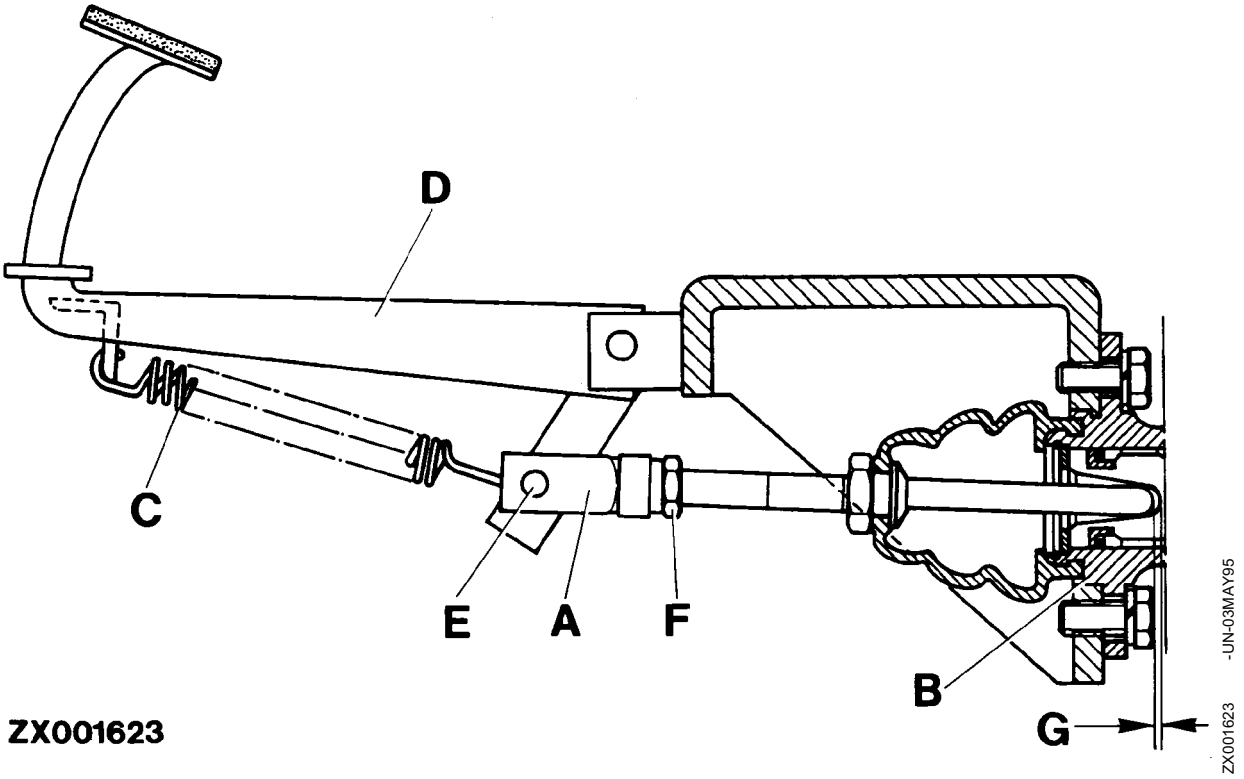
Install brake master cylinder by reversing removal procedure.

Check adjustment of yoke after installation and correct adjustment, if necessary.

Bleed brake system after yoke adjustment has been completed.

ZX,TMSPFH001099-19-23SEP91

ADJUSTING YOKE AT BRAKE MASTER CYLINDER



A—Yoke
B—Brake master cylinder
C—Retracting spring
D—Brake pedal
E—Pin
F—Lock nut
G—Distance 0.5—1 mm (0.02—0.04 in.)

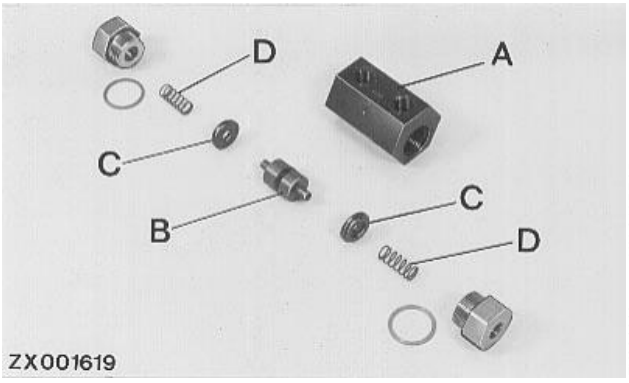
Adjust yoke (A) at brake master cylinder until a clearance (G) of 0.5—1 mm (0.02—0.04 in.) is obtained between rod and brake piston with brake pedal in home position.

ZX,TMSPFH001100-19-23SEP91

REPAIRING PRESSURE EQUALIZING VALVE

Replace pressure equalizing valve with a new one, when defective.

A—Housing
B—Piston
C—Stop washer
D—Spring



ZX001619 -UN-24APR95

ZX,TMSPFH001101-19-23SEP91

REMOVING BRAKE OPERATING CYLINDER

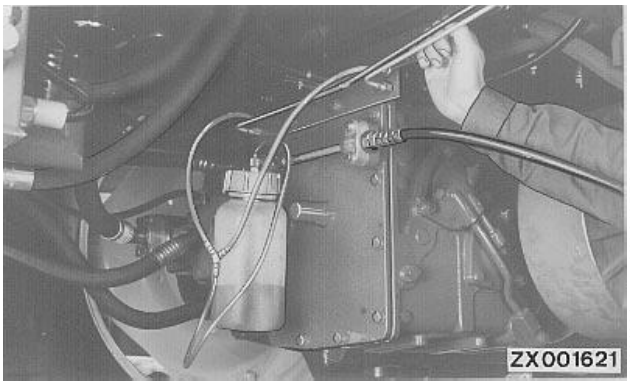
1. Open bleeding valve and drain brake fluid in a suitable container.

2. Remove brake drum and brake linings.

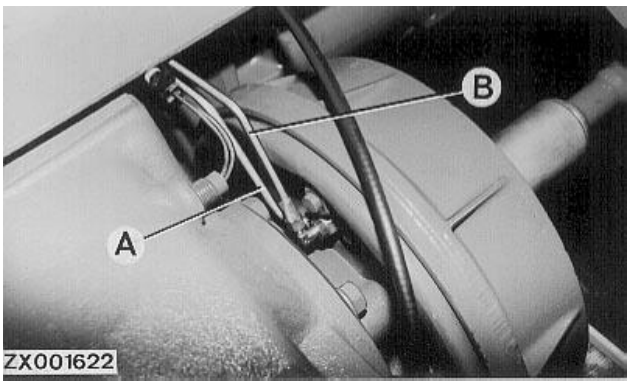
3. Remove brake line (A) and bleed line (B).

4. Remove brake operating cylinder after having removed attaching screws (C).

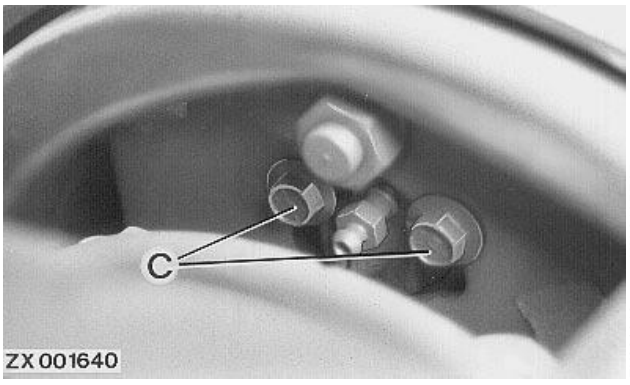
A—Brake line
B—Bleed line
C—Attaching screws



ZX001621 -UN-24APR95



ZX001622 -UN-24APR95



ZX001640 -UN-24APR95

ZX,TMSPFH001102-19-01OCT91

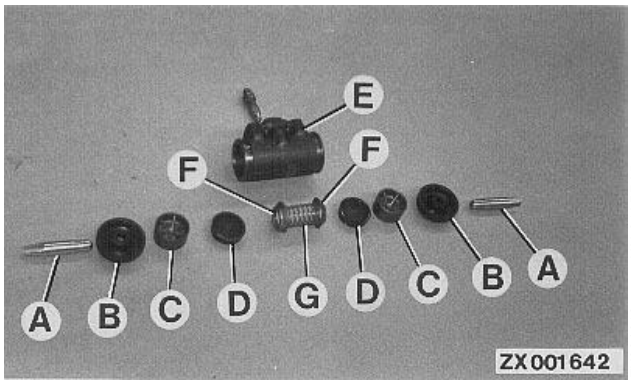
REPAIRING BRAKE OPERATING CYLINDER

Disassemble brake operating cylinder.

Check all parts for wear, scores or rust.

Use suitable repair kit if any parts are damaged.

A—Rod
B—Dust boot
C—Brake piston
D—Boot
E—Brake operating cylinder housing
F—Plate washer
G—Spring



-UN-24APR95
ZX001642

ZX,TMSPFH001103-19-23SEP91

BLEEDING BRAKE SYSTEM

1. Fill brake fluid reservoir.

2. Attach a transparent plastic hose to bleed valve to catch escaping oil in a container.

3. Unlock brake pedals.

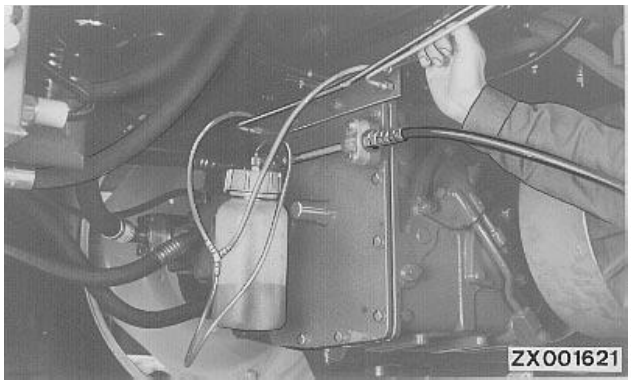
4. Depress brake pedal of brake being bled approx. five times and keep in depressed position.

5. For a short time open bleed valve of brake being bled, then close again.

6. Release brake pedal and repeat steps 4 and 5 until escaping brake fluid is free of bubbles.

-UN-27APR95
Z109615

-UN-27APR95
Z109616



-UN-24APR95
ZX001621

ZX,TMSPFH001104-19-23SEP91

REMOVING BRAKE DRUM

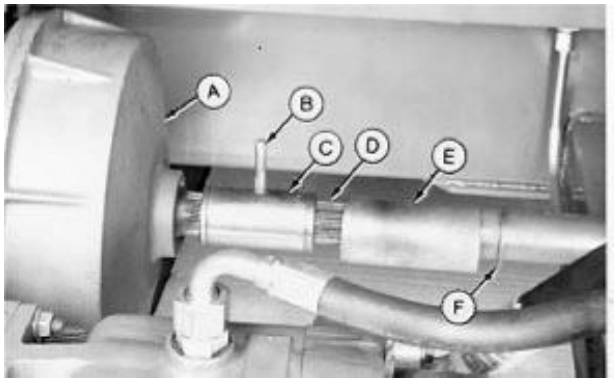
1. Remove snap ring (F) to slide coupling (E) from sleeve (C).

2. Remove pin (B) from sleeve (C).

3. Remove drive shaft (D) from brake drum (A).

4. Remove brake drum.

5. Pry plug out of hole in brake drum. Disconnect parking brake cable at equalizer bar. Disconnect brake line. Remove five cap screws that secure brake assembly to transmission. Lower assembly to the ground and remove brake drum.



H40510 -UN-06SEP89

A—Brake drum
B—Pin
C—Sleeve
D—Drive shaft
E—Coupling
F—Snap ring

ZX,1401,6010,C -19-12SEP91

REMOVING BRAKE SHOE

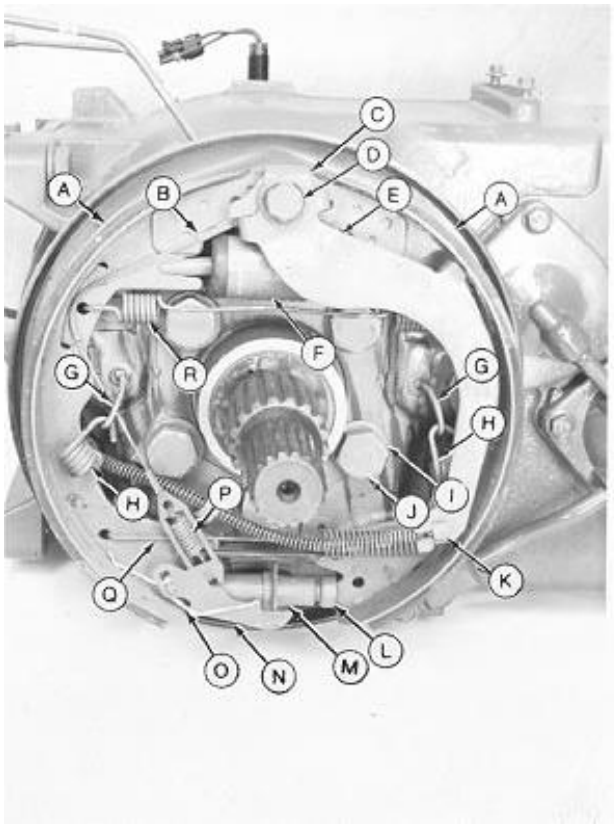
1. Remove brake drum (see this Group).

2. Remove springs (H and O—R) to remove brake shoes (A) from backing plate.

NOTE: Only remove anchor bolt (D) if it is necessary to repair park brake mechanism.

IMPORTANT: Keep hands clean when handling brake shoes. Do not permit oil or grease to come in contact with linings.

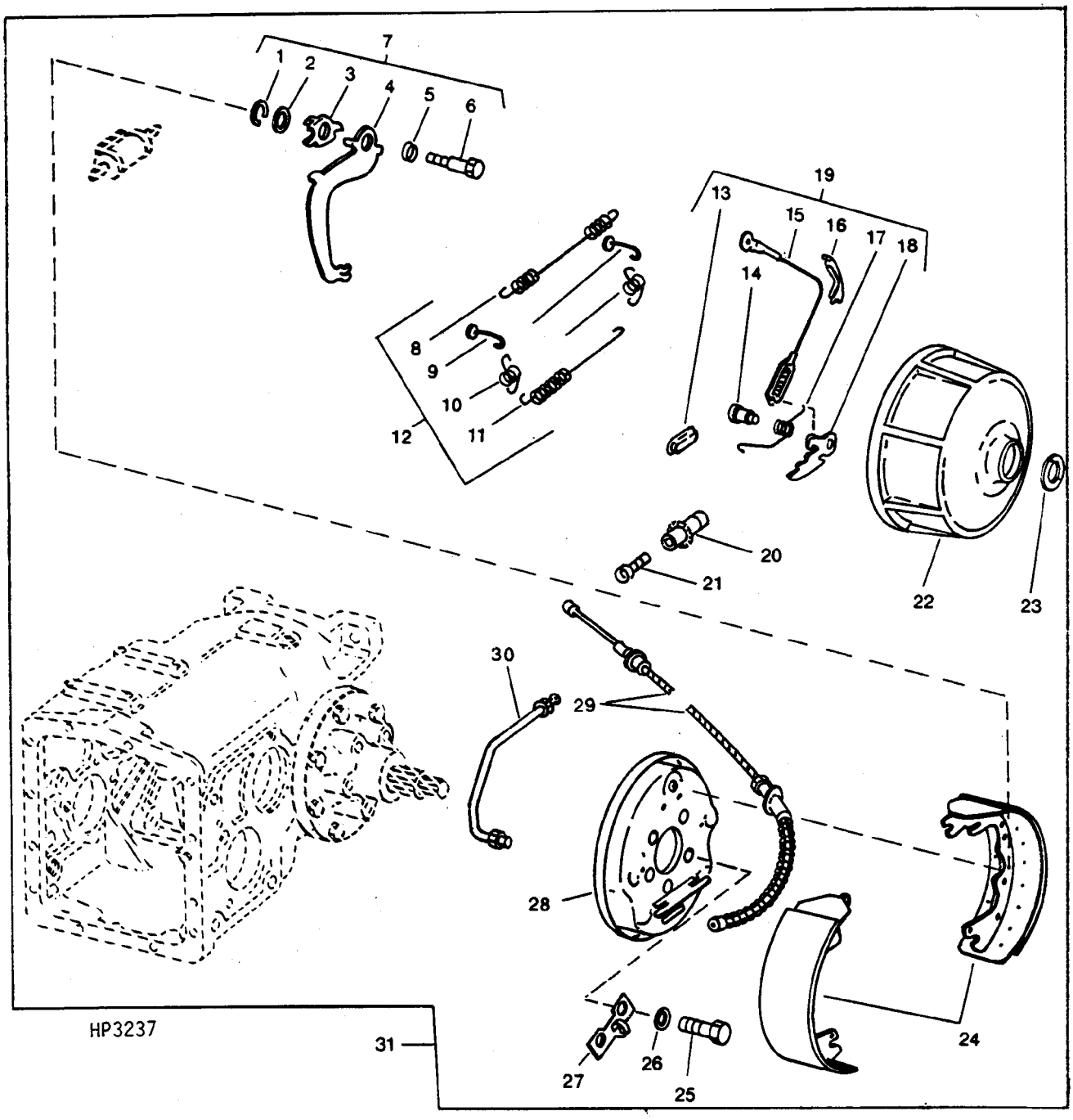
A—Brake shoe (2 used)
B—Cable
C—Eccentric plate
D—Anchor bolt
E—Park brake lever
F—Piston
G—Hook (2 used)
H—Spring (2 used)
I—Washer (4 used)
J—Cap screw (5 used)
K—Cable
L—Support pin
M—Adjuster bolt
N—Brake adjusting lever
O—Spring
P—Spring
Q—Spring
R—Spring



H40511 -UN-06SEP89

ZX,1401,6010,D -19-12SEP91

REPAIR BRAKES



ZX,1401,6010,E -19-12SEP91

1—Snap ring
2—Washer
3—Eccentric plate
4—Park brake lever
5—Spring
6—Anchor bolt
7—Park brake kit
8—Spring
9—Hook
10—Spring
11—Spring
12—Spring kit
13—Cover
14—Pin
15—Cable
16—Guide
17—Spring
18—Brake adjusting lever
19—Adjusting screw kit
20—Adjusting screw
21—Support pin
22—Brake drum
23—Snap ring
24—Brake shoes
25—Brake to transmission cap screws (5 used)
26—Washer
27—Guide
28—Backing plate
29—Cable (to pedal)
30—Fluid line

Legend for Exploded View of Brakes

1. Clean backing plate (28). Be sure shoe support points are smooth and free of rough edges.

2. Clean support pin (21) threads and check for thread damage. The adjusting screw (20) must turn freely.

3. Check springs (5, 8, 10, 11 and 17) and other parts for loss of tension and damage. Replace weak springs and any damaged or worn parts.

4. Shoe linings must not be glazed, soiled with grease or brake fluid or otherwise damaged. There must be a minimum of 0,8 mm (1/32 in.) lining remaining above rivet heads at the thinnest point.

5. Brake shoes (24) must not be distorted, cracked or have broken welds.

6. Check slave cylinder by pulling back edge of dust boot. There should be no brake fluid inside the boot. If inside of boot is wet, repair cylinder as described.

7. Each brake drum (22) can be turned down a maximum of 1,52 mm (0.060 in.) from the diameter or 0,76 mm (0.030 in.) on each side.

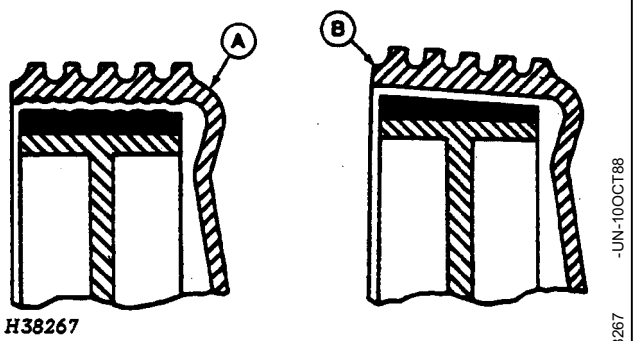
Rebore or replace the drum if the out of roundness exceeds 0,15 mm (0.006 in.). Measure out of roundness with a dial indicator with brake drum mounted on a lathe.

ZX,1401,6010,F -19-12SEP91

8. Rebore or replace brake drum if the contact surface has scoring deeper than 0,25 mm (0.010 in.) (A). The best method of checking scoring depth is to mount the brake drum on a lathe.

9. Rebore or replace brake drum if the inside diameter of the drum at the open end exceeds the inside diameter at the closed end by more than 0,25 mm (0.010 in.) (B). Measure diameters with a micrometer.

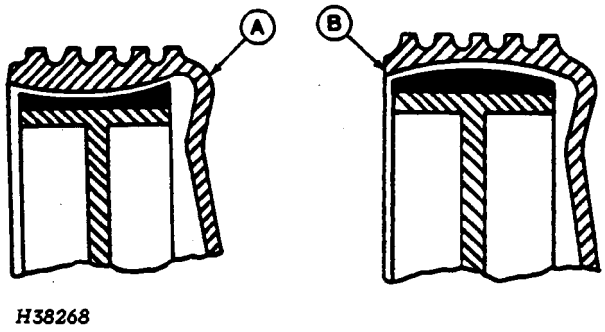
A—Scored brake drum
B—Bell shaped brake drum



ZX,1401,6010,G -19-12SEP91

10. Rebore or replace the drum if the surface variance exceeds 0,13 mm (0.005 in.) on the side. Measure this with a straight edge and a narrow feeler gauge.

A—Convex brake drum
B—Concave brake drum

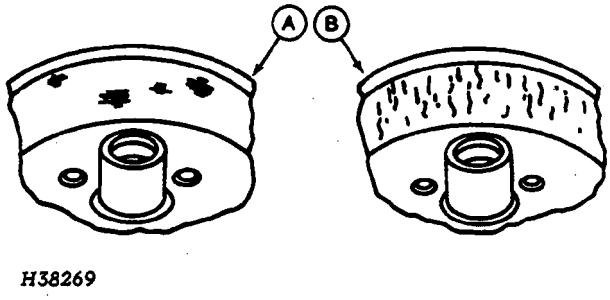


ZX,1401,6010,H -19-12SEP91

11. Rebore or replace the drum if hard or chill spots (A) cause noticeable effects of pedal pulsations or brake roughness.

12. Rebore or replace the drum if heat checks (B) are painly visible or can be felt with a fingernail.

A—Hard or chill spots
B—Heat checks



ZX,1401,6010,I -19-12SEP91

ASSEMBLING BRAKES

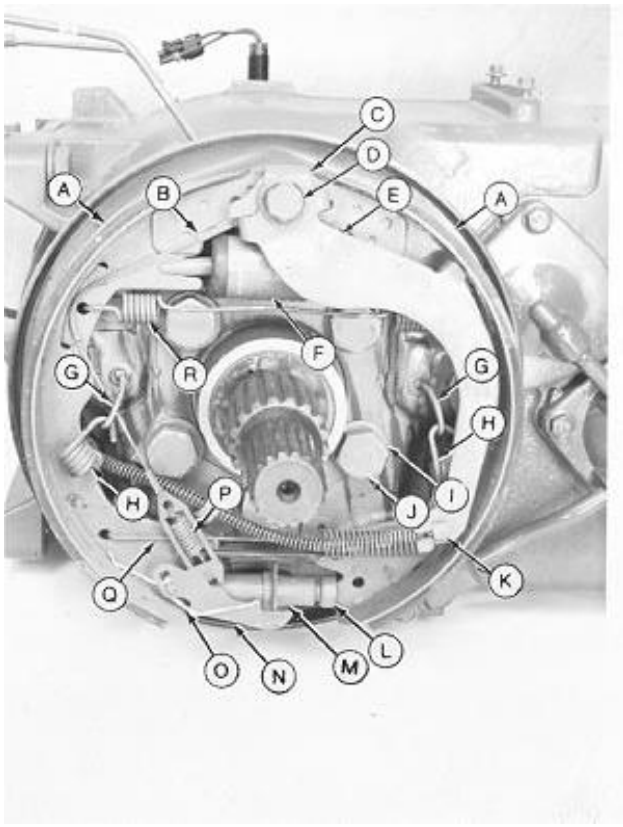
1. Apply a small amount of SAE multipurpose type grease to eccentric plate (C) mechanism behind the anchor bolt (D). Be certain parts are moving freely, but do not over-lubricate. Also apply a small amount of this grease to the dimples on the backing plate on which the brake shoes (A) ride.

2. Install parts (A—R).

3. Tighten nut on anchor bolt (D) to 45 N·m (33 lb-ft).

4. Tighten cap screws (J) to 620 N·m (460 lb-ft) anziehen.

A—Brake shoe (2 used)
B—Cable
C—Eccentric plate
D—Anchor bolt
E—Park brake lever
F—Piston
G—Hook (2 used)
H—Spring (2 used)
I—Washer (4 used)
J—Cap screw (5 used)
K—Cable
L—Support pin
M—Adjusting screw
N—Brake adjusting lever
O—Spring
P—Spring
Q—Spring
R—Spring



ZX,1401,6010,J -19-12SEP91

SPECIAL OR ESSENTIAL TOOLS

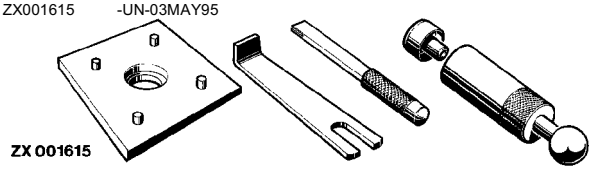
NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Tool kit KML10018

Installation of hydrostatic steering valve.

ZX001615 -UN-03MAY95

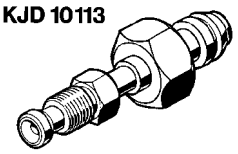


ZX,TMSPFH001105-19-23SEP91

Test fitting KJD10113

Use with R. Bosch nozzle tester JT25510

KJD10113 -UN-28APR95



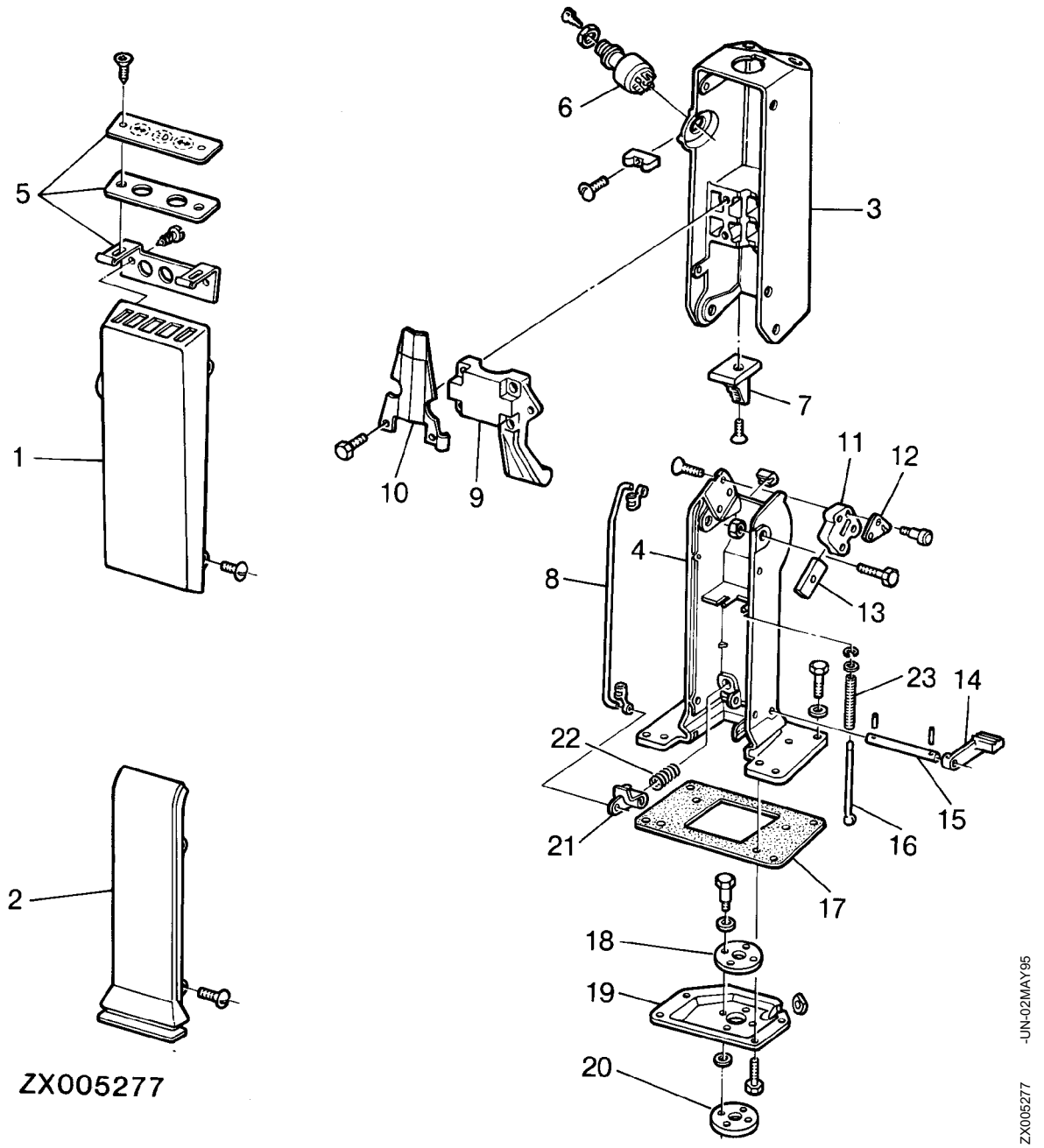
ZX,TMSPFH003505-19-05JUL94

SPECIFICATIONS

Item	Measurement	Specification
Pressure-control valve	Pressure adjustment range	13000-14000 kPa (130-140 bar; 1885-2030 psi)
Safety valve	Pressure adjustment range	18000-20000 kPa (180-200 bar; 1960-2900 psi)
Cover to housing	Torque	30 N·m (23 lb-ft)
Threaded plug on safety valves	Torque	30 N·m (23 lb-ft)
Straight screw connections to steering valve	Torque	55 N·m (40 lb-ft)
Steering wheel to spindle, hex. nut	Torque	50 N·m (35 lb-ft)
Adjusting ring on spindle, self-locking hex. nut	Torque	20 N·m (15 lb-ft)
Slotted nut to ball joints	Torque	180 N·m (133 lb-ft)
Slotted nut to adjustable tie rod	Torque	180 N·m (133 lb-ft)
Steering cylinder screws to wheel motor	Torque	325 N·m (240 lb-ft)
Lower screws, tie rod to wheel motor	Torque	136 N·m (100 lb-ft)
Clamp screw for clamp on ball joint	Torque	45 N·m (33 lb-ft)
Clamp screws on adjustable axle	Torque	420 N·m (177 lb-ft)
Screws, wheel motor to sliding sleeve	Torque	575 N·m (424 lb-ft)
Rear wheel nuts	Torque	180 N·m (133 lb-ft)

ZX,TMSPFH003471-19-29JUN94

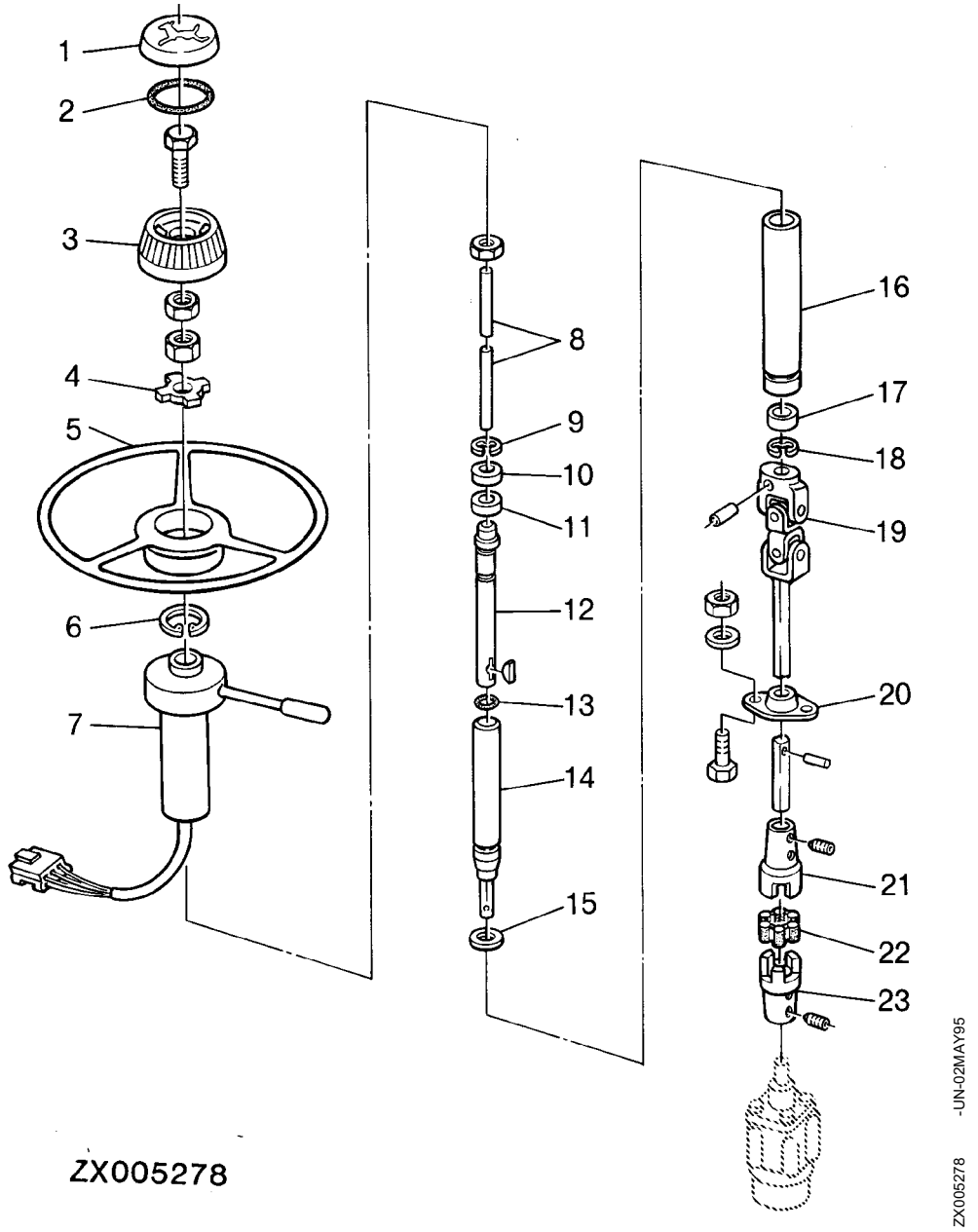
STEERING COLUMN COMPONENTS



1—Panel
2—Cover
3—Upper section of steering column
4—Lower section of steering column
5—Indicator light mounting
6—Starter switch
7—Cam
8—Rod
9—Guide
10—Cover
11—Bracket
12—Plate
13—Sliding plate
14—Pedal
15—Shaft
16—Screw
17—Plate
18—Disk
19—Cover
20—Disk
21—Bracket
22—Spring
23—Spring

ZX,TMSPFH003415-19-29JUN94

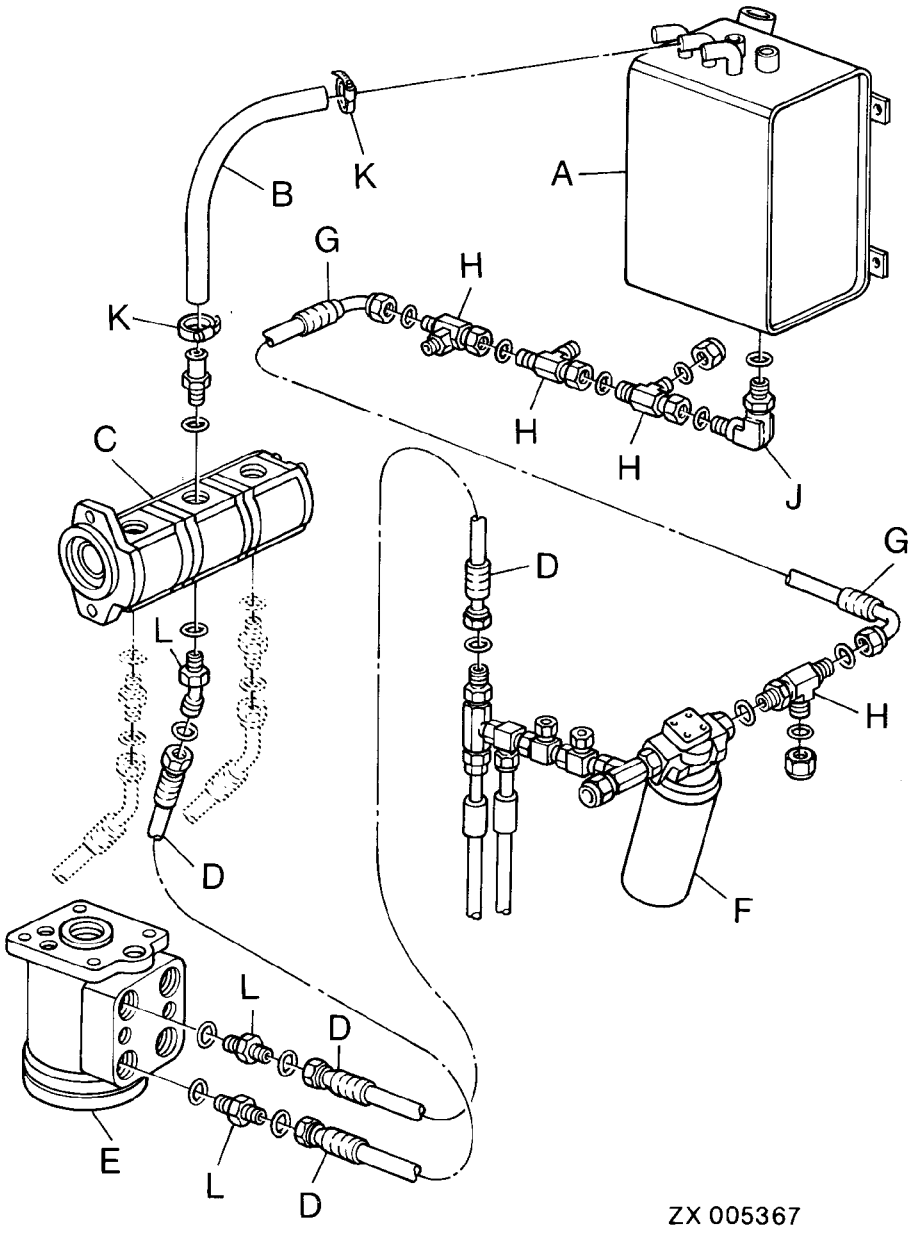
STEERING COLUMN COMPONENTS (CONTINUED)



1—Cap
2—O-ring
3—Adjusting ring
4—Retainer
5—Wheel
6—Snap ring
7—Turn indicator switch
8—Shaft
9—Snap ring
10—Bearing
11—Bearing
12—Shaft
13—Ring
14—Shaft
15—Washer
16—Shaft
17—Bearing
18—Snap ring
19—Universal jointed shaft
20—Guide
21—Coupler
22—Connector
23—Coupler

ZX,TMSPFH003416-19-29JUN94

STEERING HYDRAULIC CIRCUIT



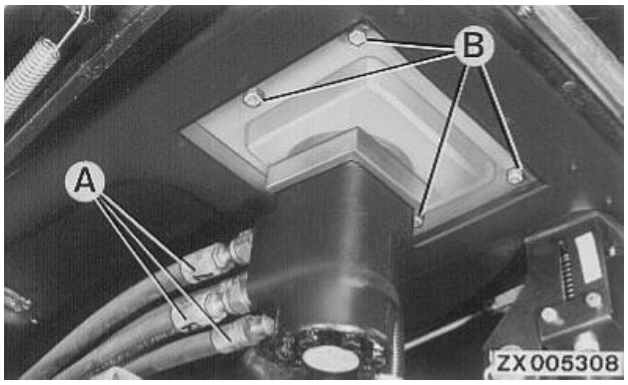
A—Hydraulic oil reservoir
B—Suction line
C—Steering pump
D—Pressure line
E—Steering valve
F—Filter
G—Return line
H—T-fitting
J—Elbow fitting
K—Hose clamp
L—Screw union

ZX,TMXZCO003969-19-15FEB95

REMOVING THE STEERING VALVE

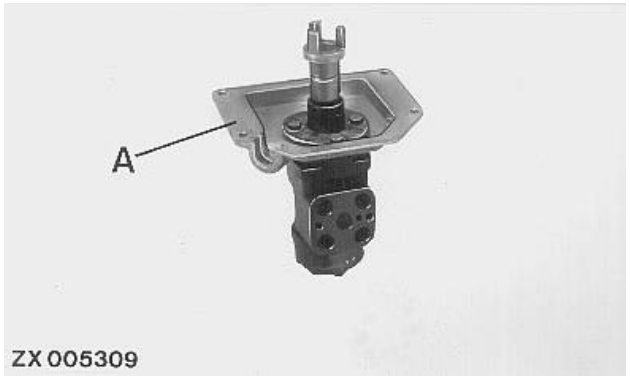
Unscrew hydraulic lines (A), seal all openings with stoppers mark the hoses.

Take four screws (B) out of steering valve plate and lift off steering valve together with the plate.



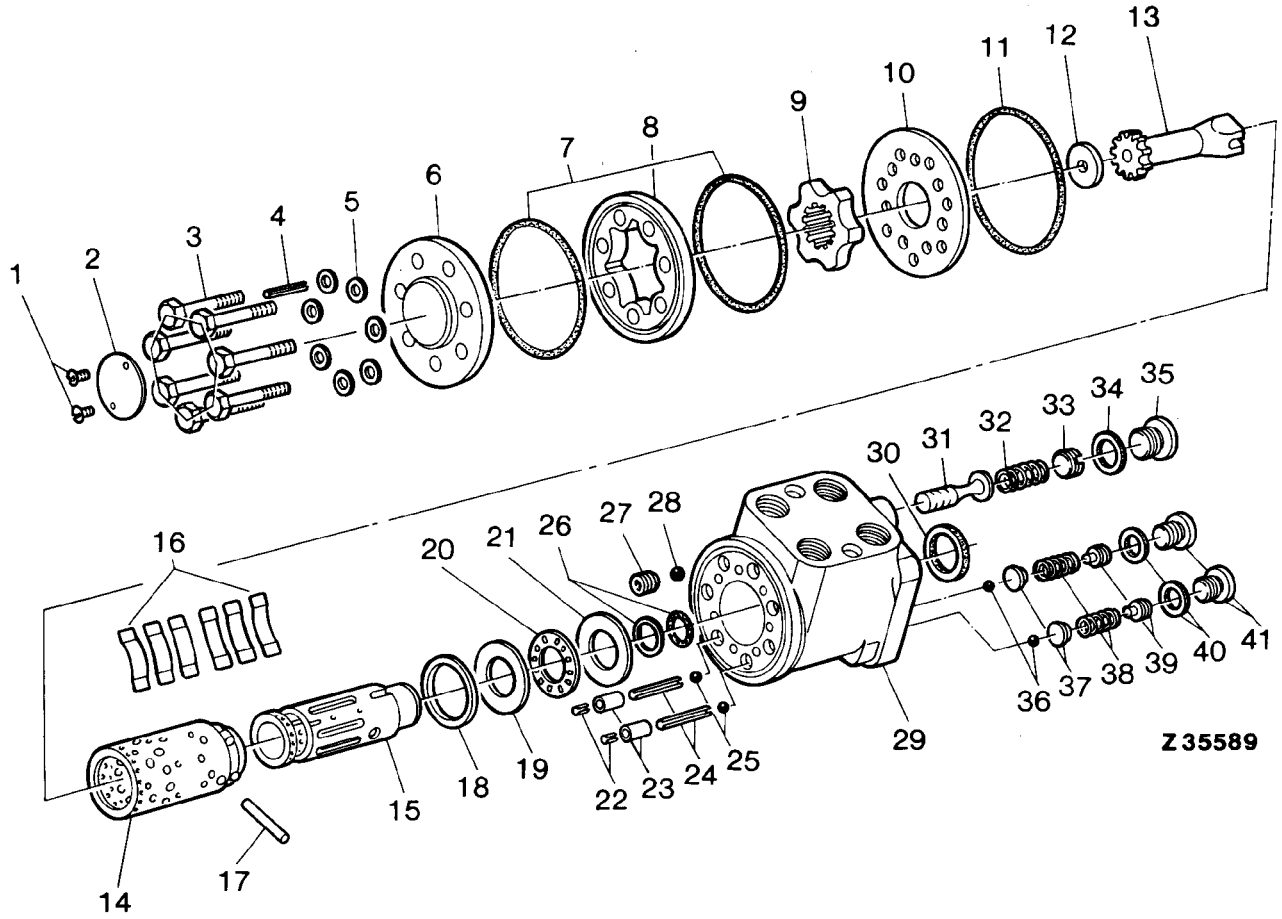
ZX,TMSPFH003417-19-29JUN94

Unscrew plate (A) from steering valve.



ZX,TMSPFH003418-19-29JUN94

STEERING VALVE COMPONENTS



1—Flat, round-head screws
2—Type plate
3—Cap screws
4—Roll pin
5—Seal washers
6—Cover
7—O-rings
8—Stator
9—Rotor
10—Distributor plate
11—O-ring
12—Spacer ring
13—Drive shaft
14—Valve sleeve
15—Valve spool
16—Leaf springs (6 used)
17—Cross pin
18—Retaining ring
19—Bearing race
20—Thrust bearing
21—Bearing race
22—Spring pin
23—Bushing
24—Spring pin
25—Ball (2 used)
26—O-ring and back-up ring
27—Threaded bushing
28—Ball
29—Housing
30—Seal ring
31—Valve piston
32—Spring
33—Adjusting screw
34—Seal ring
35—Plug
36—Ball
37—Valve head
38—Spring
39—Adjusting screw
40—Seal ring
41—Plug

ZX,TMSPFH003419-19-29JUN94

DISASSEMBLING THE STEERING UNIT

Disassembling the metering unit

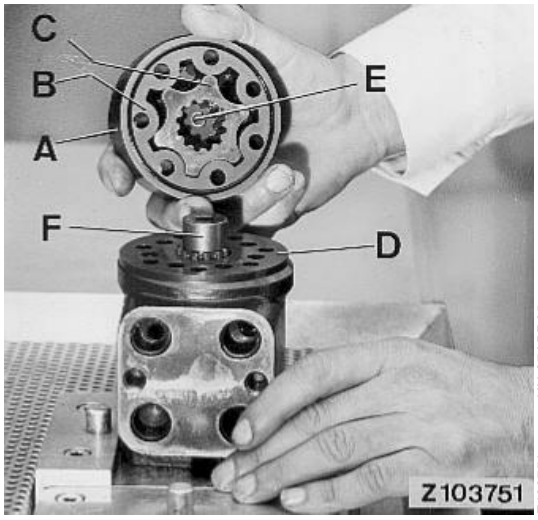
Thoroughly clean exterior of steering unit and install in clamping device KML10018-1 for dismantling.

IMPORTANT: Always use clamping device KML10018-1. Never attempt to clamp pump housing in a vice as this would seize the honed valve spool and render the unit unserviceable.

Remove the seven cap screws of cover (A).

NOTE: One of the seven cap screws is longer than the others. A roll pin is located in this screw.

Remove cover (A), rotor (C), stator (B) and, if required, spacer ring (E). Then remove distributor plate (D) and drive shaft (F).



A—Cover
B—Stator
C—Rotor
D—Distributor plate
E—Spacer ring
F—Drive shaft

ZX,TMSPFH003420-19-29JUN94

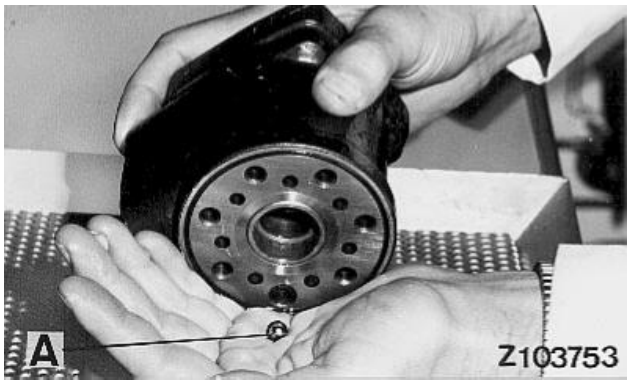
REMOVING SAFETY VALVES

Hold steering unit (B) at an angle and shake it to remove both safety valves (A).

ZX,TMSPFH003421-19-29JUN94

REMOVING CHECK VALVE

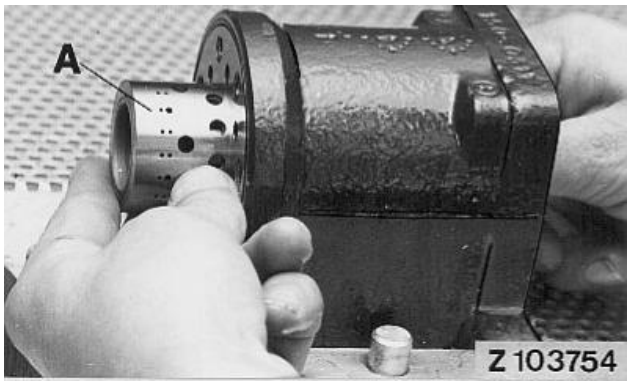
Remove threaded bushing and shake out check valve ball (A).



ZX,TMSPFH003422-19-29JUN94

REMOVING SPOOL AND SLEEVE

Press against spool to press spool (A) and the sleeve together with the retaining ring and bearing races out of the housing. Make sure that the cross pin is aligned in sleeve and spool. The cross pin is visible through the open end of the spool.



ZX,TMSPFH003423-19-29JUN94

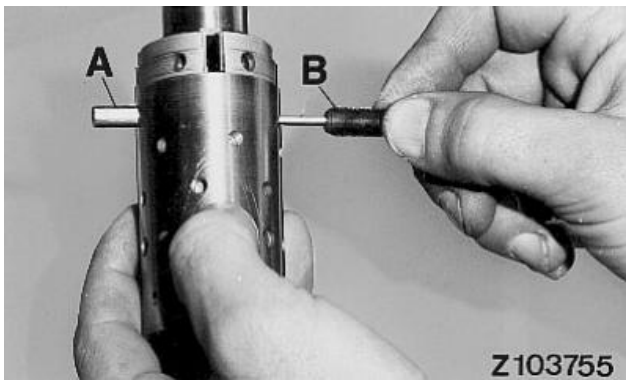
DISASSEMBLING THE SPOOL ASSEMBLY

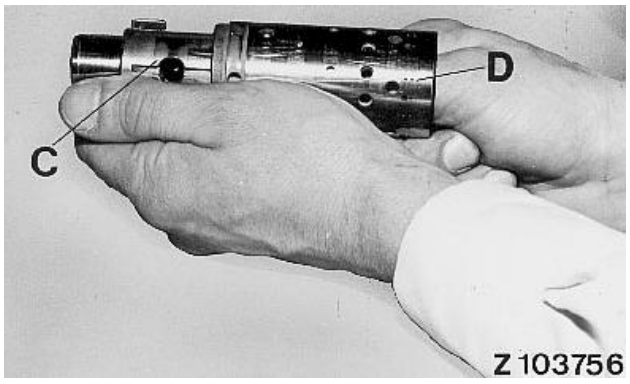
Using special cap screw with roll pin (B) (cover attaching screw), press cross pin (A) out of spool assembly.

Carefully press spool (C) out of sleeve (D).

IMPORTANT: Do not cant, as this would cause jamming. Press out carefully.

A—Cross pin
B—Cap screw with roll pin
C—Valve spool
D—Valve sleeve

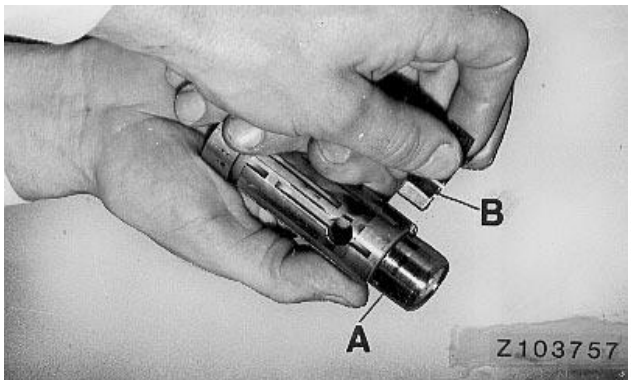




ZX,TMSPFH003424-19-29JUN94

REMOVING LEAF SPRINGS

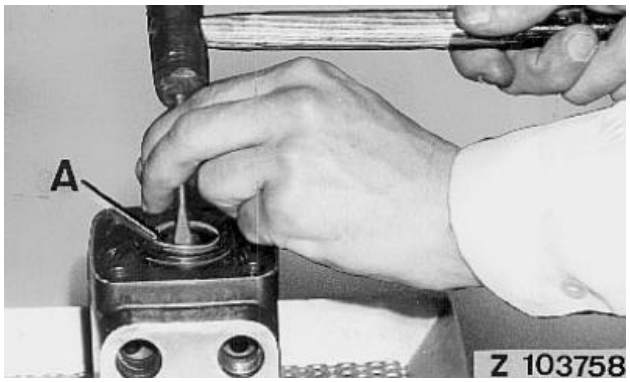
Press spring pack (B) out of the valve spool (A).



ZX,TMSPFH003425-19-29JUN94

REMOVING SEAL RING

Use a suitable tool to remove seal ring (A) from the housing.



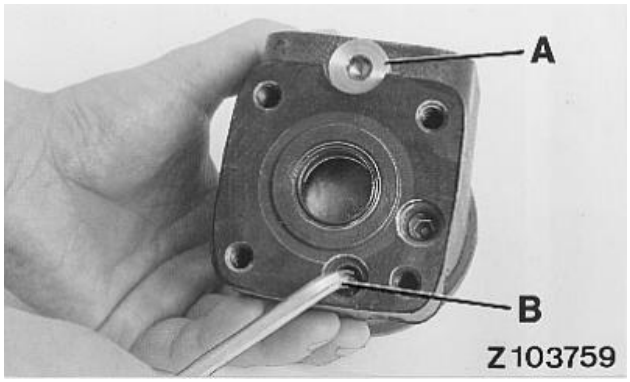
ZX,TMSPFH003426-19-29JUN94

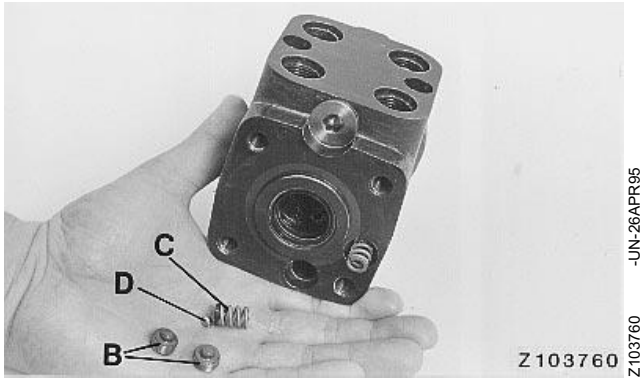
REMOVING THE SAFETY VALVES

NOTE: Disassemble safety valves only when absolutely necessary. These valves are set to a specified pressure.

Remove safety valve plug (A) and adjusting screw (B) with a 6 mm hex. socket wrench. Shake out spring with piston (C) and ball (D). Do not remove valve seats as these are secured with Loctite.

A—Valve plug
B—Adjusting screw
C—Spring with piston
D—Ball





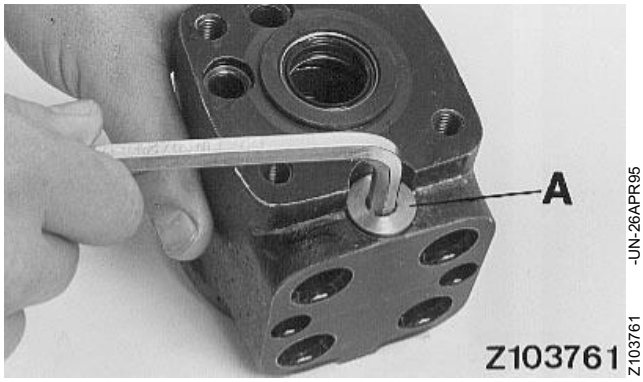
ZX,TMSPFH003427-19-29JUN94

REMOVING PRESSURE-CONTROL VALVE

NOTE: Disassemble pressure-control valve only when absolutely necessary. These valves are set to a specified pressure.

Using an 8 mm hex. socket wrench, remove valve plug (A). Remove adjusting screw (B) with a screwdriver.

Shake out spring and piston (C). Do not attempt to remove valve seat as it is secured with Loctite.



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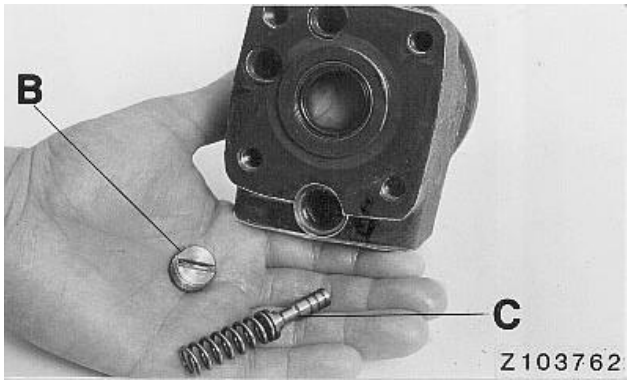
Z103761



-UN-26APR95
Z103762

ZX,TMSPFH003428-19-29JUN94

REPAIRING THE STEERING UNIT

-UN-27APR95
Z35741

Clean all parts thoroughly. Inspect all parts, and replace any that are no longer in perfect condition.

Inspect the following parts closely for excessive wear, scoring or damage:

All housing bores and channels and the edges of the machined surfaces.

Surface condition of valve sleeve and spool. Some burnishing is acceptable.

Check edges and grooves of valve sleeve and spool.

Check valve spool bearing surface for rust, pitting and wear.

Check thrust bearing and bearing races for pitting.

In addition, it is recommended to replace all seals, washers and — if necessary — the leaf springs.

ZX,TMSPFH003429-19-29JUN94

ASSEMBLING THE STEERING UNIT

General

Before resuming assembly, again wash all parts in clean, petroleum-based solvent and place on a fiberless absorbent paper for drying.

IMPORTANT: Do not, under any circumstances, use rags or cotton waste.

ZX,TMSPFH003430-19-29JUN94

INSTALLING PRESSURE-CONTROL VALVE

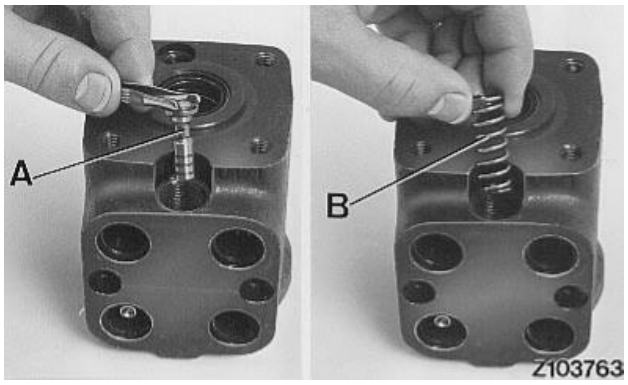
Use tweezers to install piston (A) in pressure-control valve.

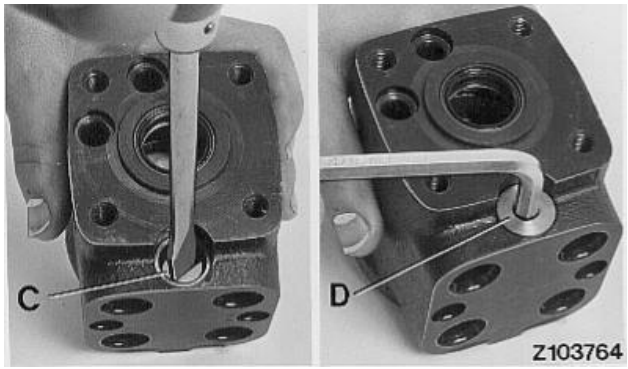
Insert spring (B) over the piston and into the bore.

Coat the thread of adjusting screw (C) with T43512 sealant. Screw in adjusting screw (C) until the spring comes under pressure.

Install seal ring in groove of bore. Install plug (D) in bore and tighten to 40 - 60 N·m (29 - 43 ft-lb).

A—Piston
B—Spring
C—Adjusting screw
D—Plug





ZX,TMSPFH003431-19-29JUN94

INSTALLING SAFETY VALVES

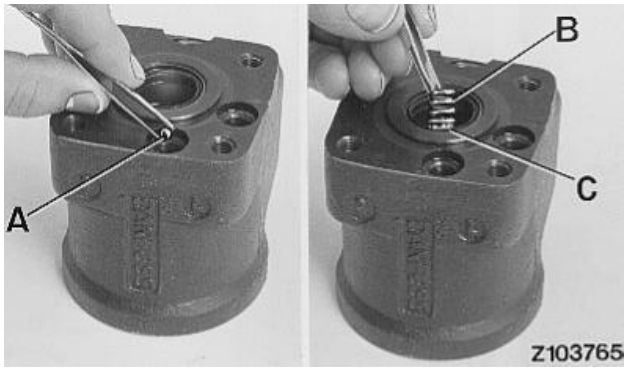
Use tweezers to install ball (A) in the bore of the safety valves.

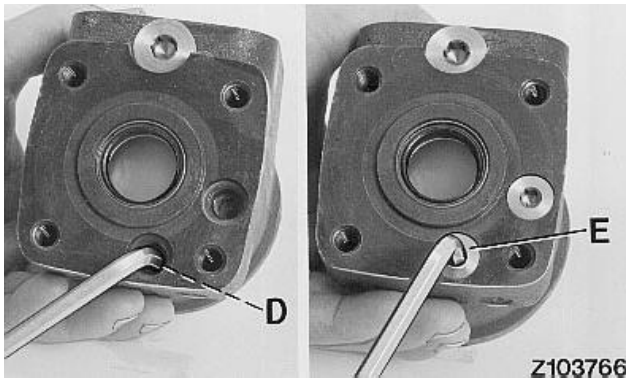
Coat springs on valve cones with vaseline, and assemble. Insert spring (B) together with valve cones (C) in the respective bore.

Coat adjusting screw (D) with T43512 sealant. Tighten the screw until the spring is under tension.

Place sealing ring in the groove of the bore, and screw in plug (E). Tighten plug (E) to 30 - 40 N·m (22 - 29 ft-lb).

A—Ball
B—Spring
C—Valve cone
D—Adjusting screw
E—Plug



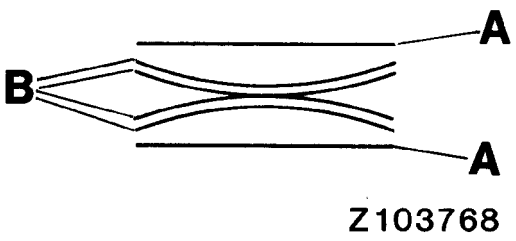


ZX,TMSPFH003432-19-29JUN94

ARRANGING THE LEAF SPRINGS

Lay leaf springs (A) and (B) down as shown in the illustration.

A—Straight leaf spring (2 used)
B—Convex leaf spring (4 used)



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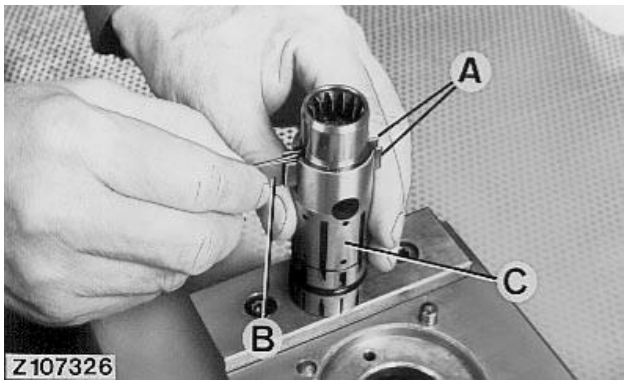
ZX,TMSPFH003433-19-29JUN94

INSTALLING THE LEAF SPRINGS

Insert the two straight leaf springs (A) into the slot. Slide the four convex springs (B) between the straight springs (A) and align spring pack.

A—Straight leaf spring (2 used)
B—Convex leaf spring (4 used)
C—Valve spool



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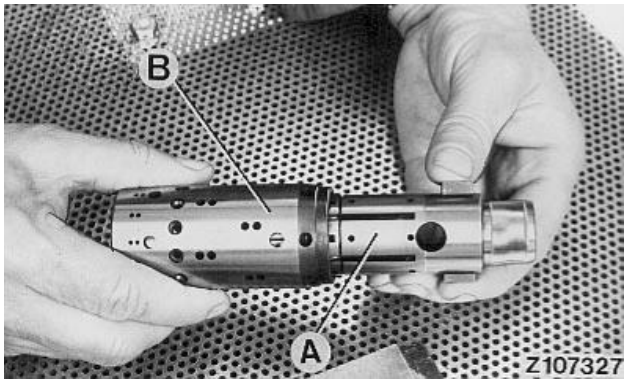
ASSEMBLING THE SPOOL ASSEMBLY

Assemble the sleeve and spool (A), pressing spring pack together and inserting it into sleeve (B). Align spring pack (C).



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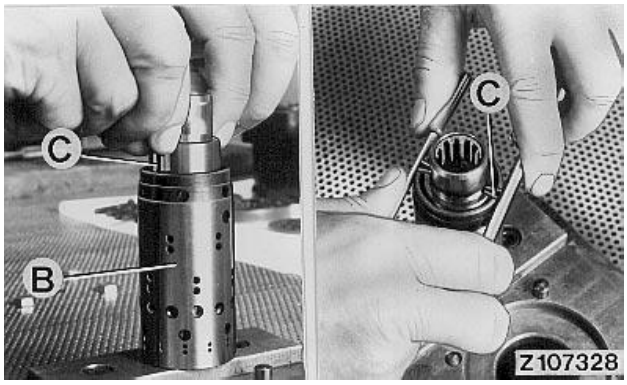
Z107327



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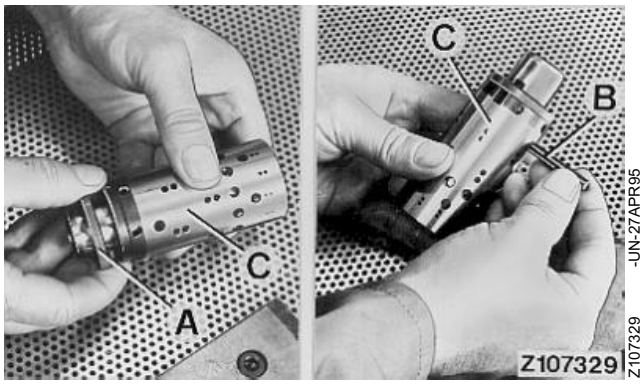
ZX,TMSPFH003435-19-29JUN94

INSTALLING RETAINING RING AND CROSS PIN

Slide retaining ring (A) over valve assembly (C). Make sure that the ring rotates freely over the spring pack. Insert cross pin (B) into spool assembly.



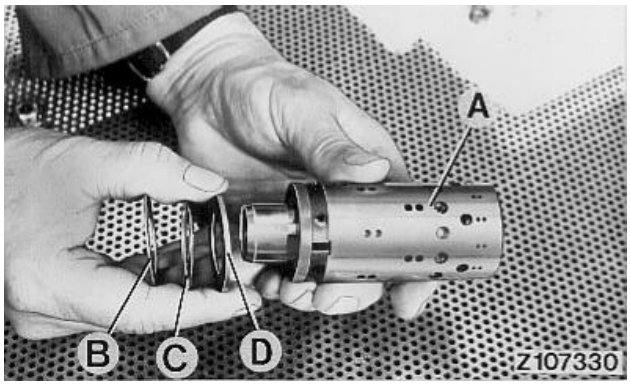
ZX,TMSPFH003436-19-29JUN94

ASSEMBLING THE THRUST BEARING

Slide bearing race (B), thrust washer (C) and axial washer (D) into place.

NOTE: Chamfer on bearing race (B) must face valve spool end.

A—Valve assembly
B—Bearing race
C—Thrust bearing
D—Axial washer



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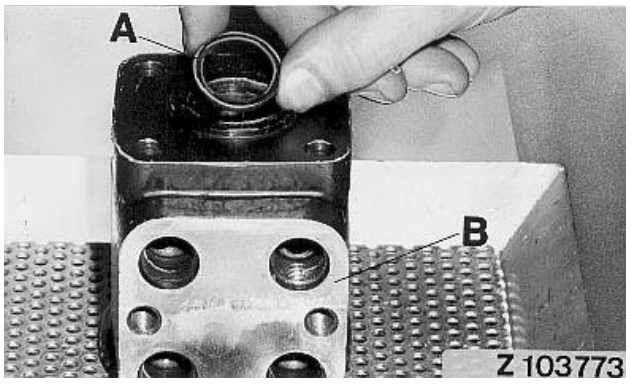
INSTALLING THE SEAL RING

With lip facing outwards, position new seal ring (A) into groove in housing (B) and tap ring into groove with a suitably sized drift.



ZX,TMSPFH003438-19-29JUN94

INSTALLING O-RING AND BACK-UP RING

Coat rings (E) with hydraulic oil and slide over small piston (A).

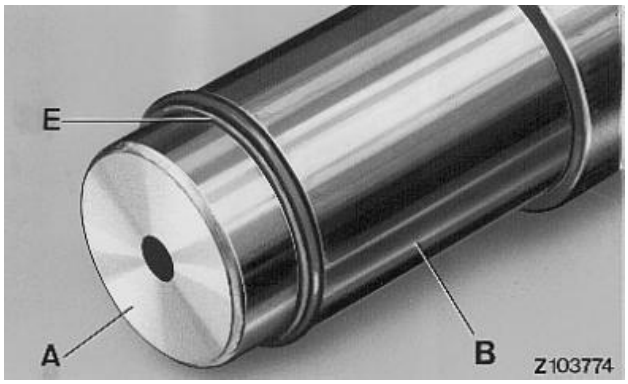
Press sleeve (C) of the special tool into housing (D) until it contacts stop.

Using the small piston (A), press large piston (B) of special tool into sleeve (C) until it contacts stop.

Pull sleeve (C), together with large piston (B), out of housing (D).

NOTE: Small piston remains in the steering valve until it is pushed out when the spool assembly is installed.

A—Small piston KML10018-5
B—Large piston KML10018-2
C—Sleeve of KML10018-2
D—Housing
E—O-ring with back-up ring



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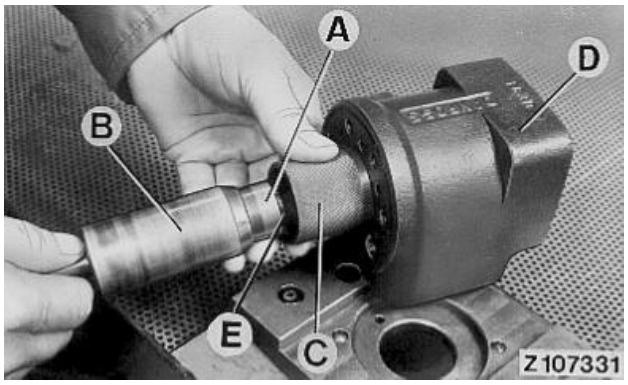

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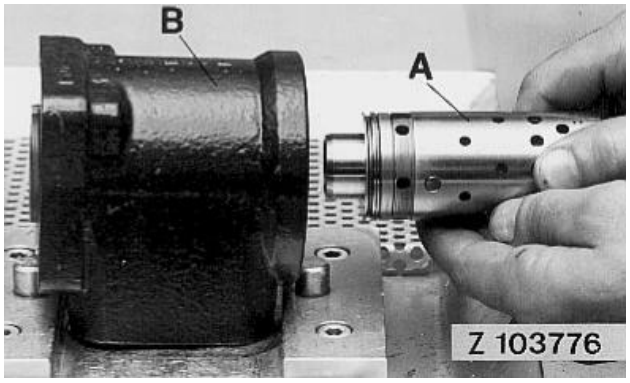
ZX,TMSPFH003439-19-29JUN94

INSTALLING SPOOL ASSEMBLY

Before installing spool assembly, coat it with oil. Insert pre-assembled spool assembly (A) into the bore in housing (B), applying a slight twisting movement.

IMPORTANT: Make sure that the cross pin is horizontal.



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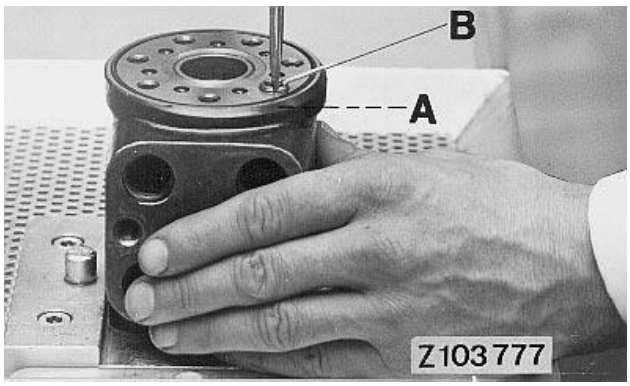
ZX,TMSPFH003440-19-29JUN94

INSTALLING THE CHECK VALVE

Insert ball (A) into bore. Screw threaded bushing (B) into bore until slight resistance is felt. Bushing should not protrude beyond housing surface.

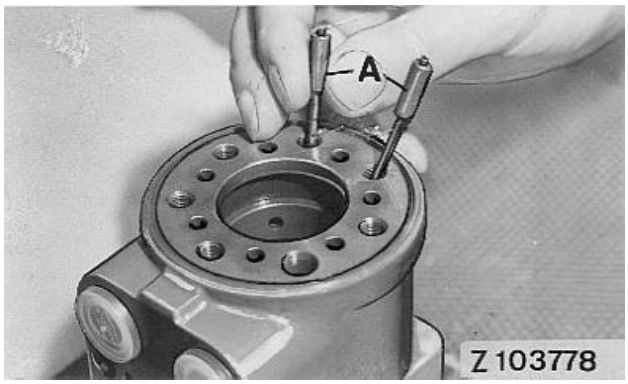


-UN-27APR95 Z103777

ZX,TMSPFH003441-19-29JUN94

INSTALLING SAFETY VALVES

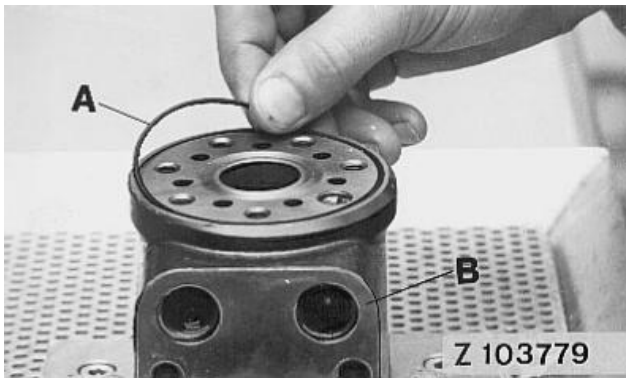
Install the two safety valves (A). Do not forget to put the balls in the bores.



ZX,TMSPFH003442-19-29JUN94

INSTALLING THE O-RING

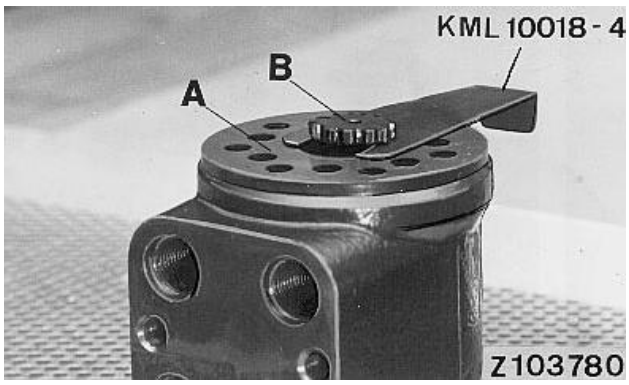
Install O-ring (A) in housing (B).



ZX,TMSPFH003443-19-29JUN94

INSTALLING DISTRIBUTOR PLATE AND DRIVE SHAFT

Install distributor plate (A) so that the bores are aligned with the corresponding bores in the housing. Insert drive shaft (B) so that the slot is parallel to the connection side. Use special tool KML10018-4 to hold drive shaft (B).



ZX,TMSPFH003444-19-29JUN94

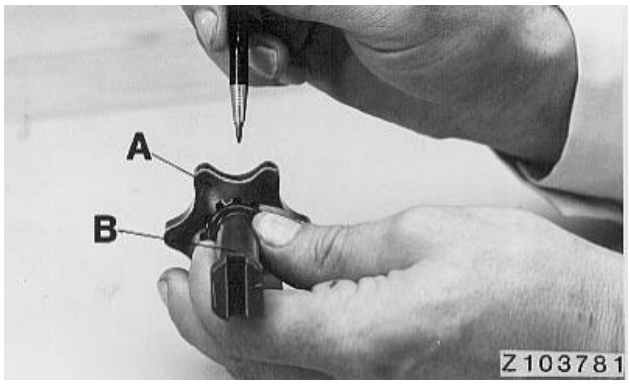
INSTALLING ROTOR AND STATOR

Install rotor (A) on drive shaft (B) so that rotor cavity is positioned in slot of drive shaft (B) as shown.

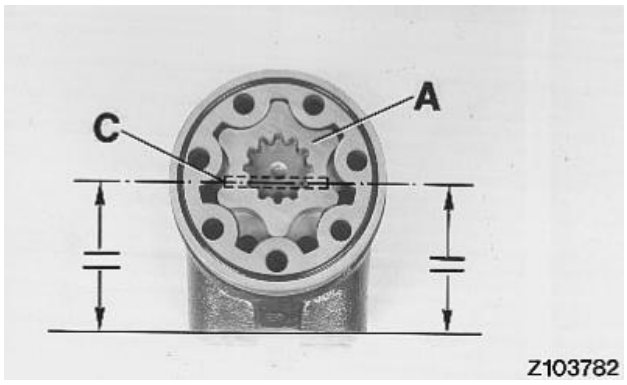
NOTE: Illustration shows plainly the desired position of rotor and shaft. This assembly, described below, must be reached even although slot of drive shaft and cross pin are not visible.

Rotor (A) and cross pin (C) must be in the specified position.

IMPORTANT: It is absolutely necessary for satisfactory performance of the steering unit that the cross pin is in the position shown.



-UN-27APR95 Z103781

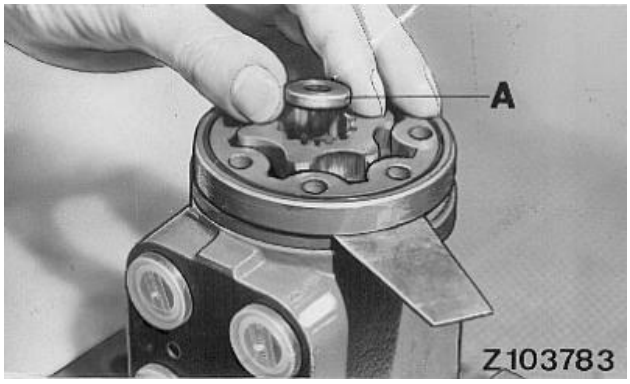


-UN-27APR95 Z103782

ZX,TMSPFH003445-19-29JUN94

INSTALLING SPACER RING

Insert spacer ring (A) as shown.

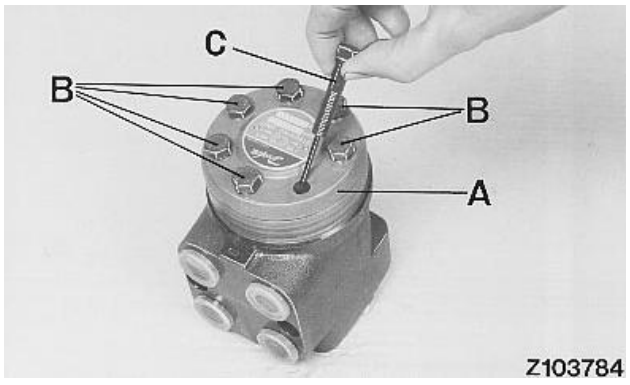


-UN-27APR95 Z103783

ZX,TMSPFH003446-19-29JUN94

INSTALLING METERING UNIT COVER

Use seven cap screws (B) to secure cover (A). Insert cap screw (C) with roll pin in the correct bore. Tighten cap screws to 30 - 35 N·m (22 - 25 ft-lb).



-UN-27APR95 Z103784

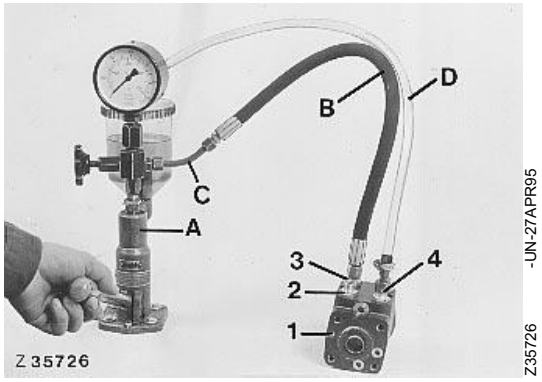
ZX,TMSPFH003447-19-29JUN94

TESTING THE SAFETY VALVES

NOTE: Safety valves must always be tested prior to testing the pressure-control valve.

Connect hose (B) to connection (3), steering cylinder (r.h. turn). Secure plastic hose (D) to return connection (4).

Build up pressure with lever of tester (A). Tester pressure gauge should show 180 - 195 bar (2610 - 2830 psi). Use same procedure to test safety valve for left-hand turn, connecting hose (B) to connection (2), steering cylinder (l.h. turn).



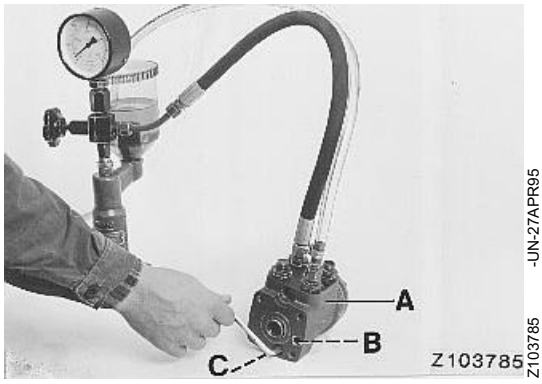
A—Bosch nozzle tester
B—Original steering hose (inlet)
C—Test fitting KJD10113 (see "Special Tools")
D—Plastic return hose
1—Steering valve
2—Steering cylinder connection (l.h. turn)
3—Steering cylinder connection (r.h. turn)
4—Return connection

ZX,TMSPFH003448-19-29JUN94

ADJUSTING THE SAFETY VALVES

Adjust pressure of safety valve by turning adjusting screws (B) and (C). First remove respective plug. Use a 6 mm hex. socket wrench to turn screw in to increase pressure or out to decrease pressure. Recheck valve operating pressure after adjustment.

When pressure is correct, install plug and tighten to 30 - 40 N·m (22 - 29 ft-lb).



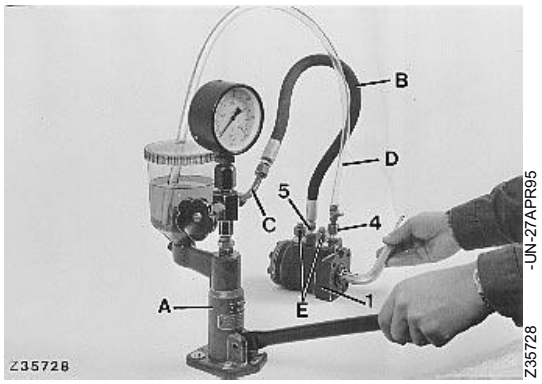
A—Steering valve
B—Adjusting screw (l.h. turn)
C—Adjusting screw (r.h. turn)

ZX,TMSPFH003449-19-29JUN94

TESTING THE PRESSURE-CONTROL VALVE

Connect hose (B) to pressure connection (5) and return hose (D) to return connection (4). Seal both connections to the steering cylinder with dealer-manufactured plugs. Use a 5/8“ hex. socket wrench to turn steering valve to full left- or right-hand lock and hold in this position. Operate pump lever of tester (A) to build up pressure. With control valve adjusted correctly, pressure should rise to 135 bar (1960 psi).

A—Bosch nozzle tester
B—Original steering hose (inlet)
C—Test fitting KJD10113 (see “Special Tools”)
D—Plastic return hose
E—Plug (dealer-fabricated)
1—Steering valve
4—Return connection
5—Pressure connection



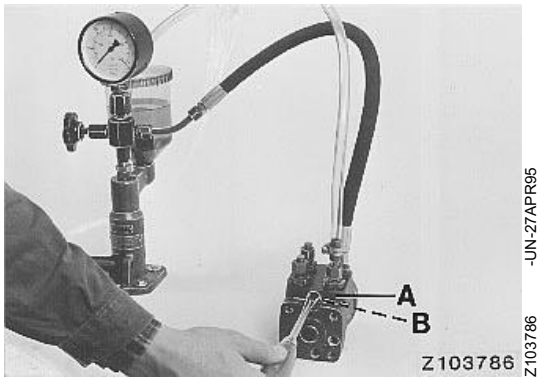
ZX,TMSPFH003450-19-29JUN94

ADJUSTING THE PRESSURE-CONTROL VALVE

Remove plug. Use a screwdriver to turn adjusting screw (B). Turn screw in to increase pressure, or out to decrease pressure.

After adjusting the valve, install plug and tighten to 50 N·m (36 ft-lb).

A—Steering valve
B—Adjusting screw



ZX,TMSPFH003451-19-29JUN94

BLEEDING THE HYDROSTATIC STEERING SYSTEM

CAUTION: Do not drive the combine harvester after repairs on the hydrostatic steering until the system has been bled.

Raise the rear axle and start the engine.

Turn the steering wheel several times to the right- and left-hand stops.

NOTE: Air will bleed out only at the oil reservoir. Oil in the lines to the steering cylinder does not flow in the circuit, but moves back and forth with the air bubbles. Therefore, air in the system may be slow in reaching the steering unit and oil reservoir.

When the oil in the reservoir is clear (not cloudy or creamy) and no play is noticeable at the steering wheel, the system is free of air.

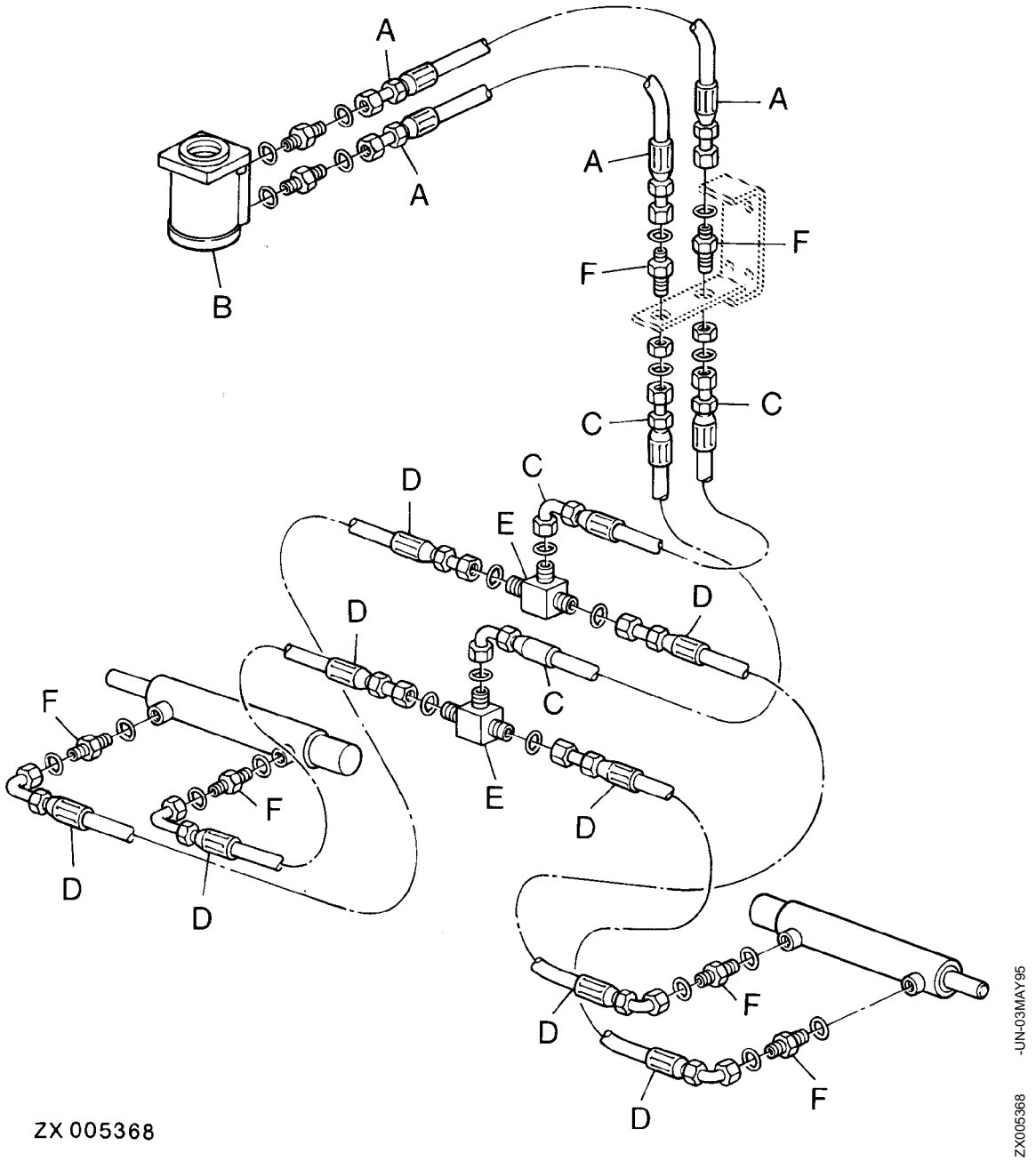
ZX,TMXZCO004129-19-15FEB95

REMOVING THE HYDRAULIC STEERING PUMP

See “Removing and Repairing the Pump” in Section 70, Group 10.

ZX,TMSPFH003453-19-29JUN94

HYDRAULIC LINES TO STEERING CYLINDERS



A—Pressure line
B—Steering valve
C—Pressure line to elbow fitting
D—Pressure line to steering cylinder
E—T-fitting
F—Screw union

ZX,TMXZCO003970-19-15FEB95

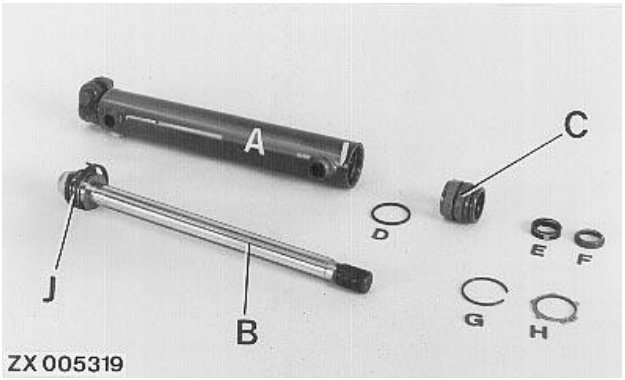
DISMANTLING THE STEERING CYLINDERS

Press snap ring (H) out of the groove and slide guide (C) inward.

Use a drift to take ring (G) out of the bore in the housing.

Pull out guide (C) together with grooved ring (E), wiper ring (F) and O-ring (D).

Piston (J), with one sealing ring and one wiper ring, is secured to the piston rod by a self-locking nut.

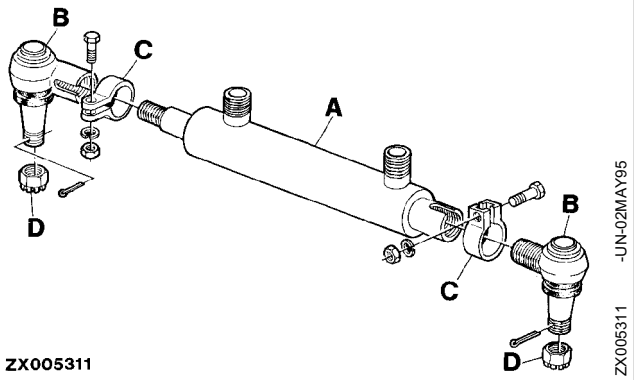


A—Housing
B—Piston rod with piston
C—Guide
D—O-ring
E—Grooved ring
F—Wiper ring
G—Snap ring
H—Snap ring
J—Piston with sealing rings

ZX,TMSPFH003458-19-29JUN94

STEERING CYLINDER WITH BALL JOINTS

A—Cylinder
B—Ball joint
C—Clamp
D—Slotted nut



ZX,TMSPFH003459-19-29JUN94

ADJUSTING STEERING ANGLE AT STEERING CYLINDER

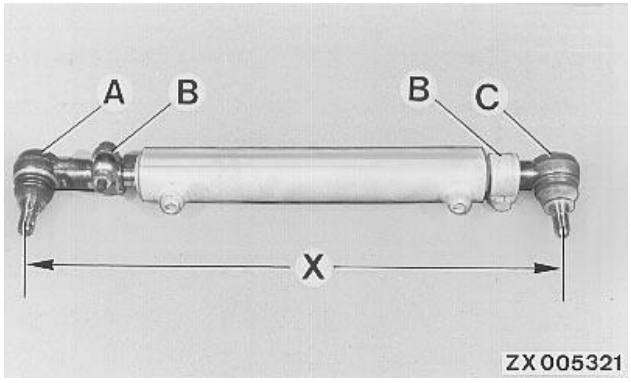
X-545 mm (21.45 in.) with standard axle, adjustable axle and four-wheel drive

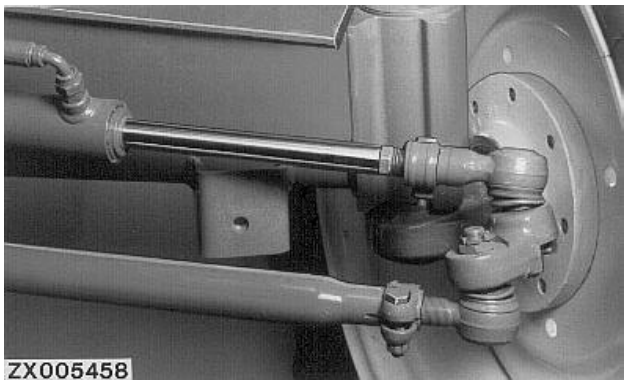
Screw ball joint (A) on piston rod end fully onto the thread, and clamp it securely using clamp (B). Tighten the clamp screw to 45 N·m (33 lb-ft).

Screw ball joint (C) in until dimension (X) is achieved from cone to cone (with the piston rod pushed in). Tighten the clamp screw to 45 N·m (33 lb-ft).

Install steering cylinder and tighten slotted nut to 180 N·m (133 lb-ft).

Finally, secure the nut with a cotter pin.

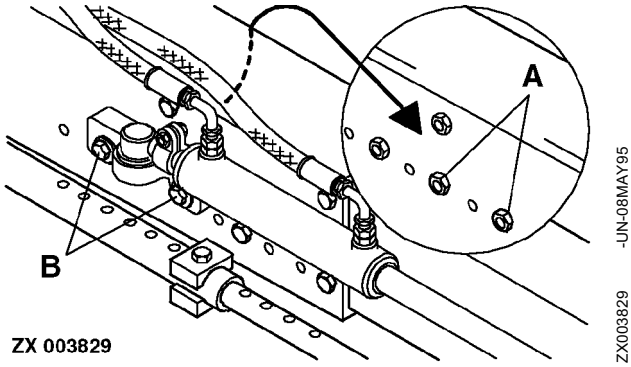




ZX,TMXZCO003971-19-15FEB95

STEERING CYLINDER SUPPORT ATTACHING SCREWS TO REAR AXLE

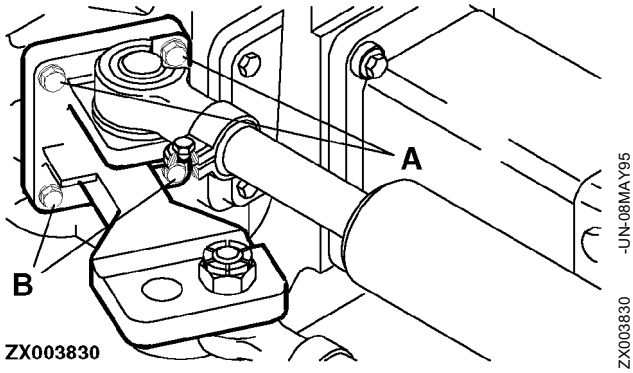
Tighten nuts (A) on cap screws (B) at right and left to 240 N·m (170 lb-ft).



ZX,TMXZCO003972-19-15FEB95

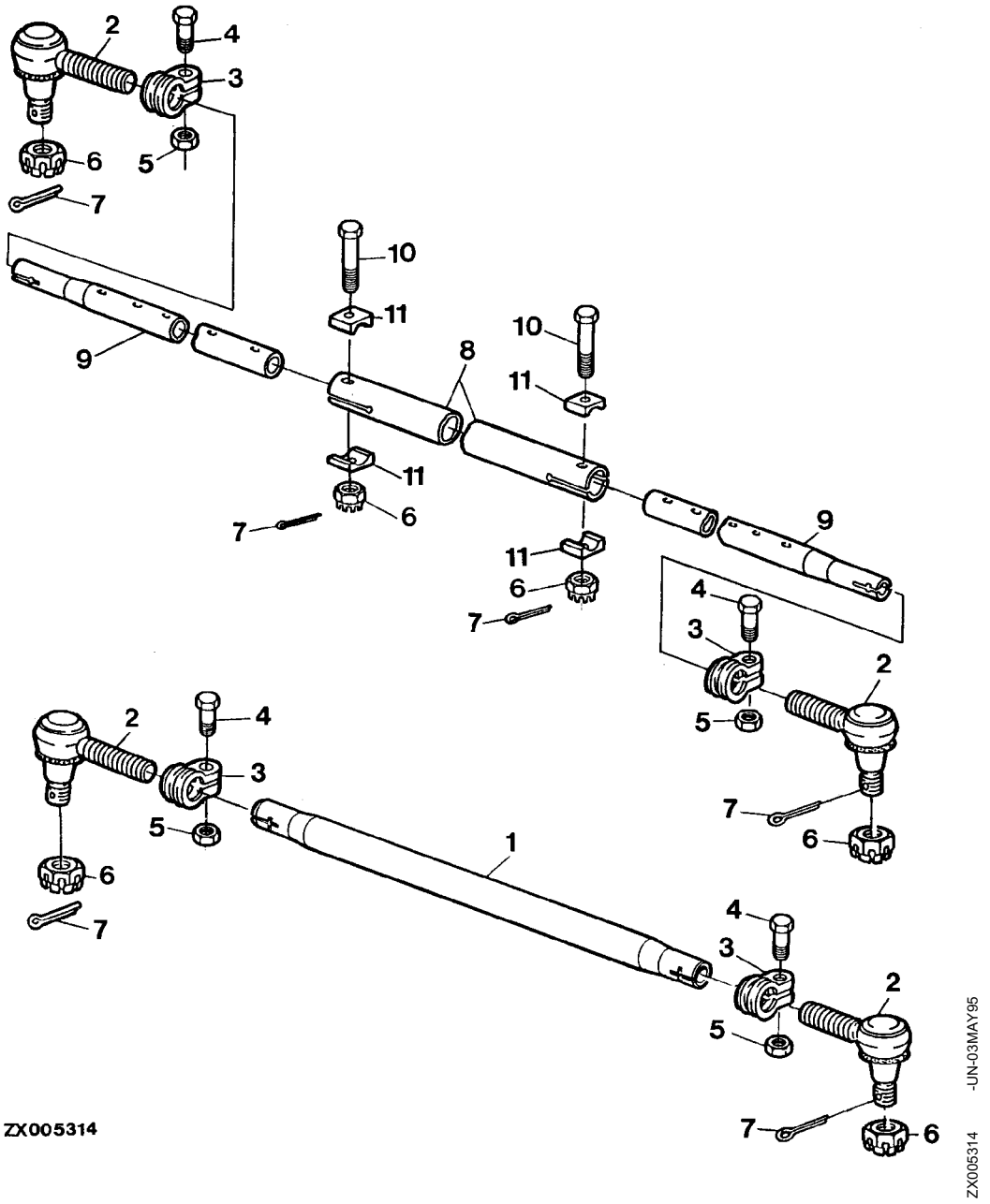
STEERING CYLINDER SUPPORT ATTACHING SCREWS TO WHEEL MOTOR

At both sides, tighten cap screws (A) to 325 N·m (240 lb-ft) and cap screws (B) to 163 N·m (120 lb-ft).



ZX,TMXZCO003973-19-15FEB95

TIE ROD — EXPLODED VIEW



1—Tie rod for standard axle	4—Clamp screw	7—Cotter pin	9—Tie rod extension
2—Ball joint	5—Nut	8—Tie rod for adjustable axle (center section)	10—Screw
3—Clamp	6—Slotted nut		11—Clamp plate

ZX,TMSPFH003461-19-29JUN94

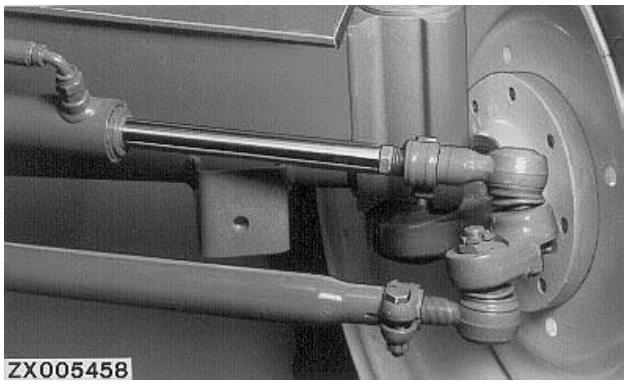
ADJUSTING TOE-IN

Screw in the ball joints at both ends of the tie rod. Screw in by the same distance at both sides.

Adjust the length of the tie rod so that a toe-in of 0 mm (0 in.) is reached.

Tighten the ball joint clamps to 45 N·m (33 lb-ft).

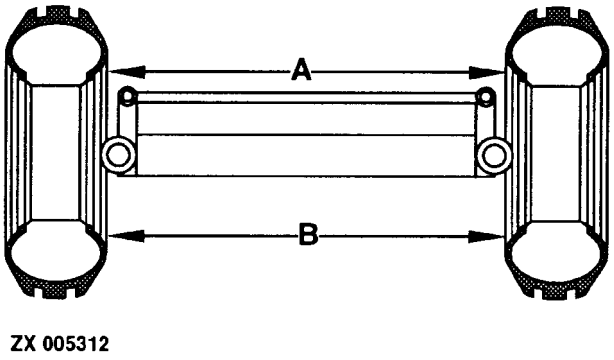
Install slotted nut. Tighten to 180 N·m (133 lb-ft) and secure with a cotter pin.



ZX,TMXZCO003974-19-15FEB95

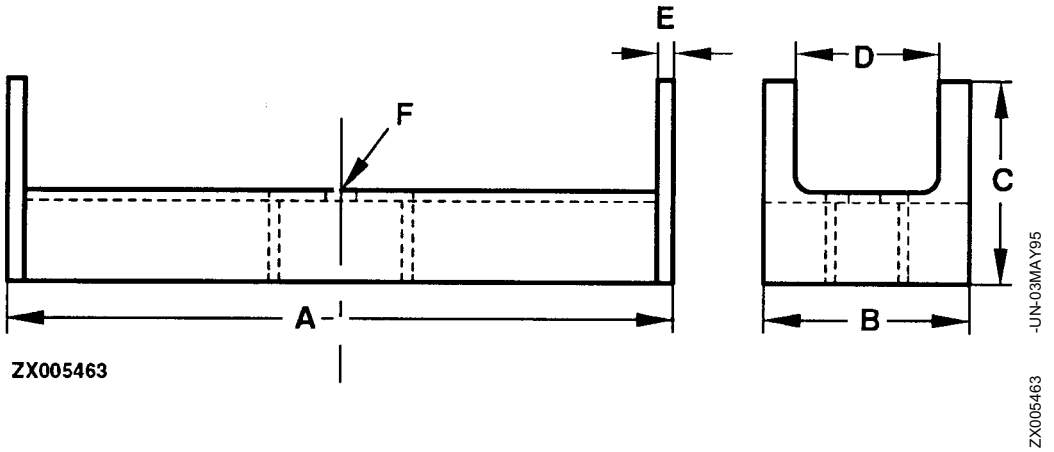
CHECKING REAR WHEEL TOE-IN

Measure track width (A) at the rim lip level with the axle, and mark the point of measurement on the tire. Move the vehicle until the point of measurement has moved through 180˚. Now measure distance (B). When toe-in is 0 mm, dimensions (A) and (B) must be the same.



ZX,TMSPFH003463-19-29JUN94

SPECIAL TOOL (SELF-MANUFACTURE)

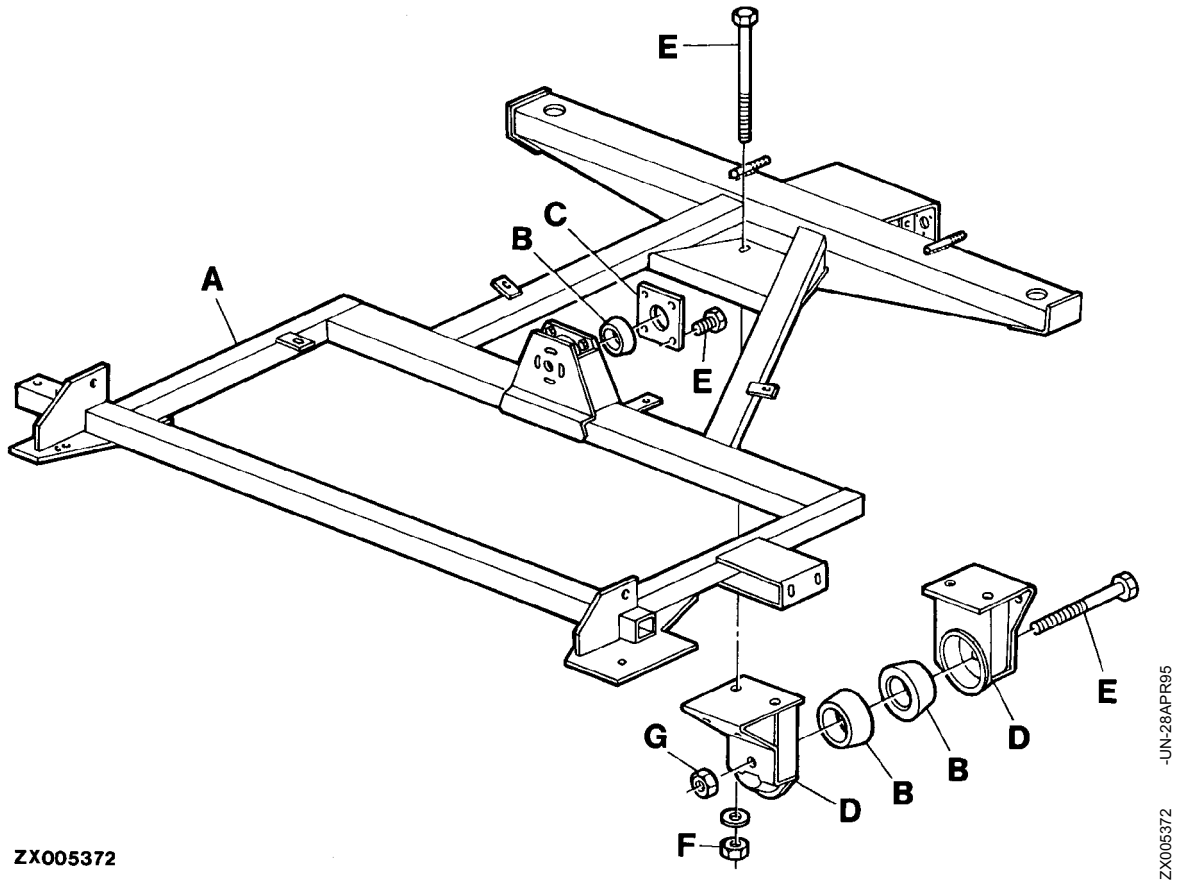


A—650 mm (25.6 in.)
B—200 mm (7.9 in.)
C—200 mm (7.9 in.)
D—140 mm (5.5 in.)
E—16 mm (0.6 in.)
F—30 mm (1.2 in.) dia.

Tool for raising the rear axle

ZX,TMXZCO003975-19-15FEB95

STANDARD REAR AXLE SUPPORT AND REAR AXLE ATTACHMENT

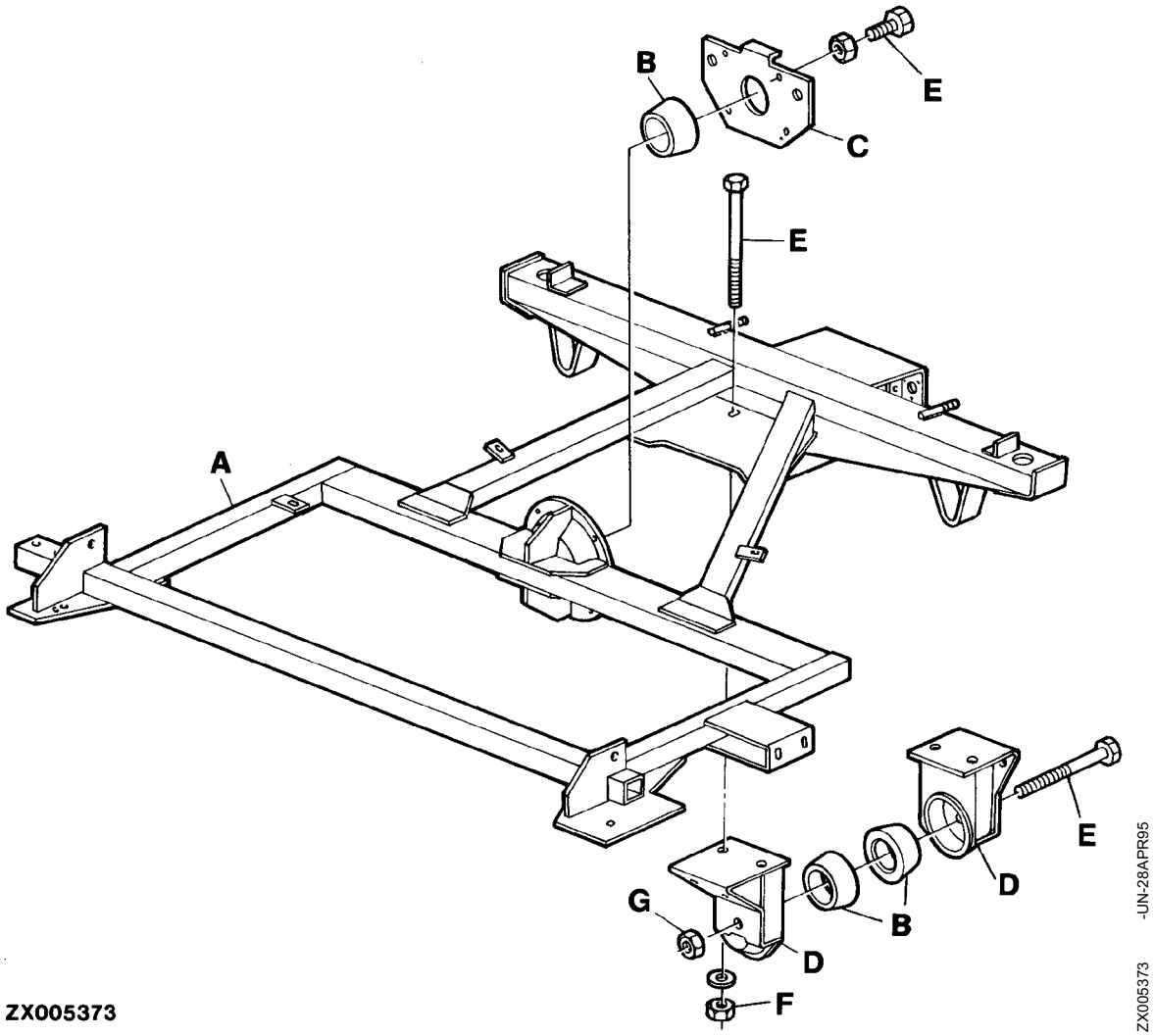


A—Standard support
B—Insert
C—Retaining plate
D—Bracket
E—Screw
F—Nut
G—Self-locking nut

NOTE: The rear axle support is welded to the side panels and cannot be replaced.

ZX,TMXZCO003976-19-15FEB95

HILLMASTER REAR AXLE SUPPORT AND REAR AXLE ATTACHMENT

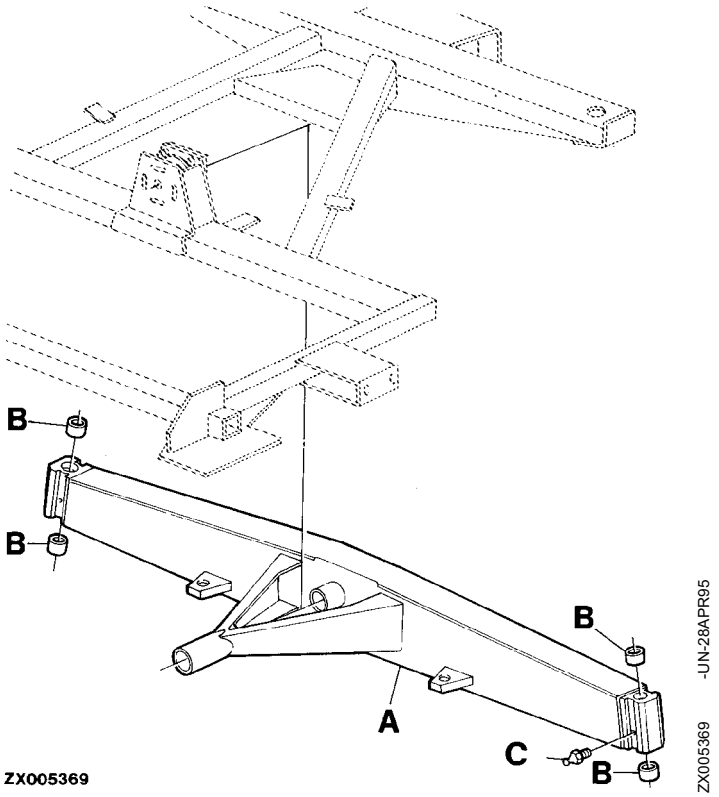


A—Hillmaster support
B—Insert
C—Retaining plate
D—Bracket
E—Screw
F—Nut
G—Self-locking nut

NOTE: The rear axle support is welded to the side panels and cannot be replaced.

ZX,TMXZCO003977-19-15FEB95

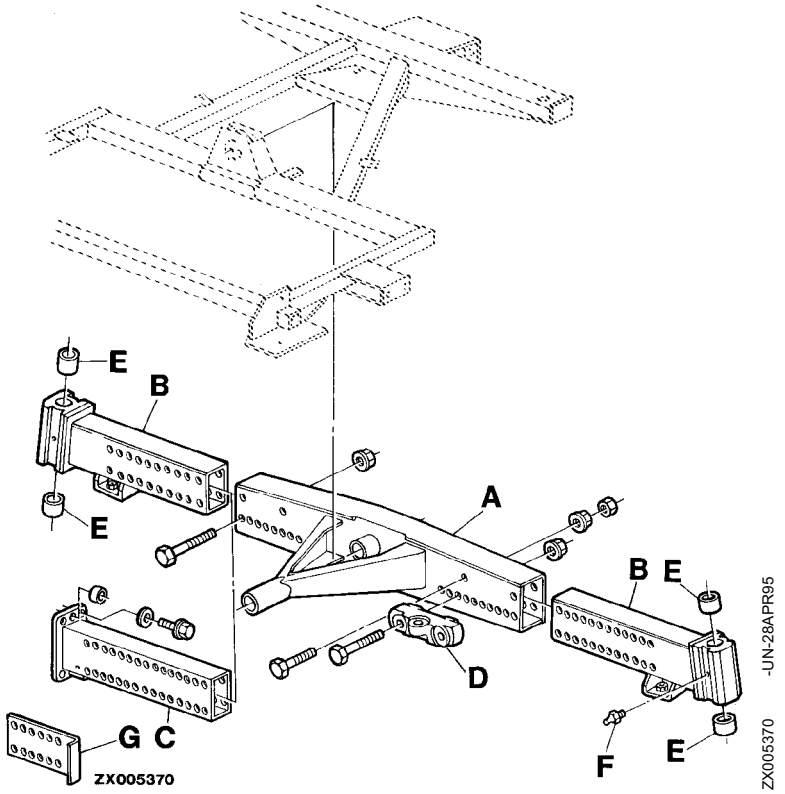
STANDARD REAR AXLE — EXPLODED VIEW



A—Axle **B—Brass bushing** **C—Grease fitting**

ZX,TMXZCO003978-19-15FEB95

ADJUSTABLE REAR AXLE — EXPLODED VIEW



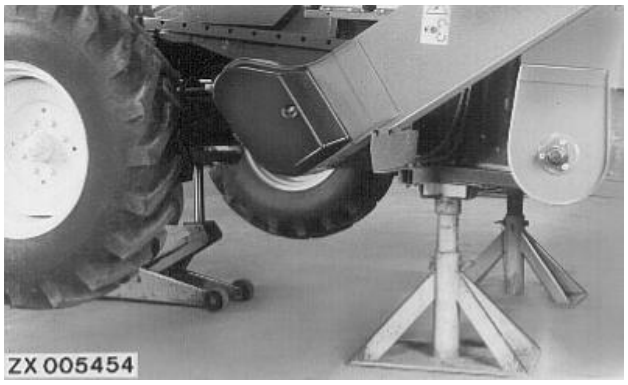
A—Axle center section
B—Axle extension
C—Extension for four-wheel drive
D—Steering cylinder support
E—Brass bushing
F—Grease fitting
G—Spacer

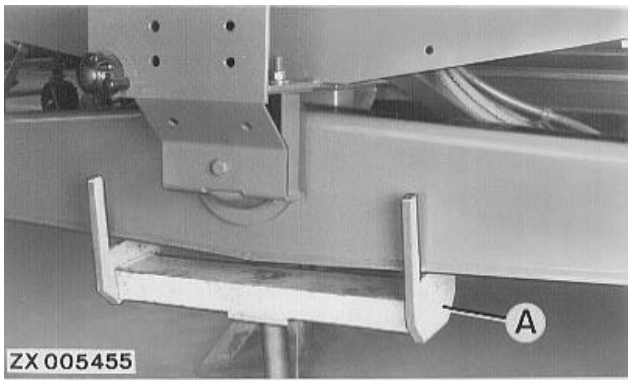
ZX,TMXZCO003979-19-15FEB95

REMOVING THE REAR AXLE

CAUTION: Take action to prevent the front wheels from turning (use chocks). Use a jack to raise the combine harvester and support it securely on adjustable support stands.

Raise the combine harvester and support stands high enough to allow the rear axle to be lowered using a jack and support (A).





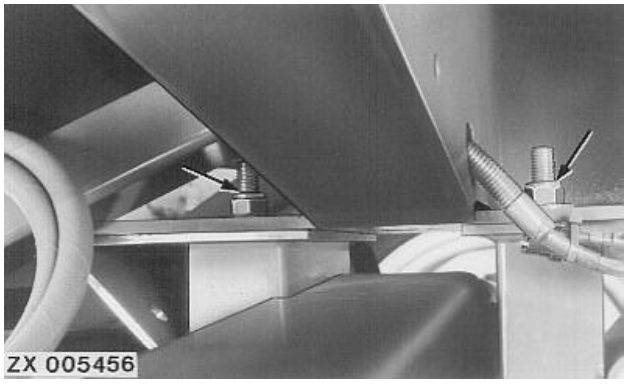
ZX,TMXZCO003980-19-15FEB95

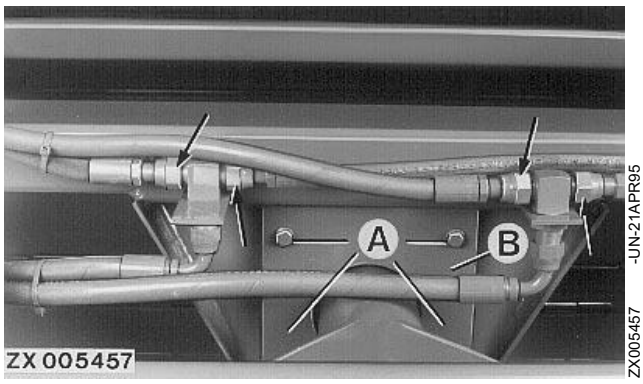
Place jack and support under the center of the axle and remove the four screws from the brackets.

Remove the four screws (A) from retaining plate (B).

Disconnect the hydraulic lines. Seal the open ends.

Lower the axle and roll it out on its wheels.





ZX,TMXZCO003981-19-15FEB95

INSTALLING THE REAR AXLE

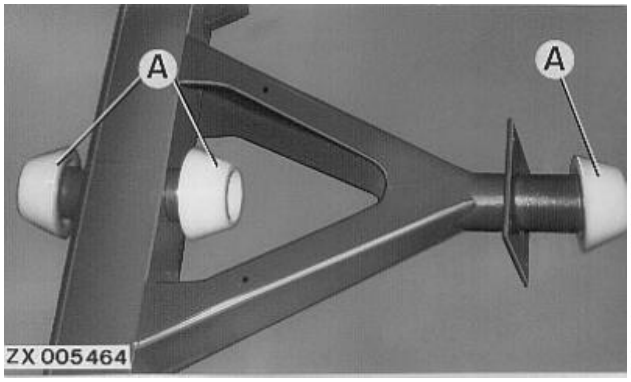
Check plastic bearings (A) for wear, and replace if necessary.

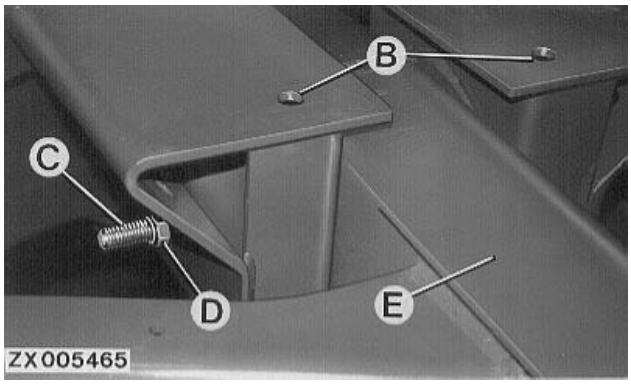
Use screw (C) and self-locking nut (D) to secure the two brackets (B) and plastic bearings to the axle (E).

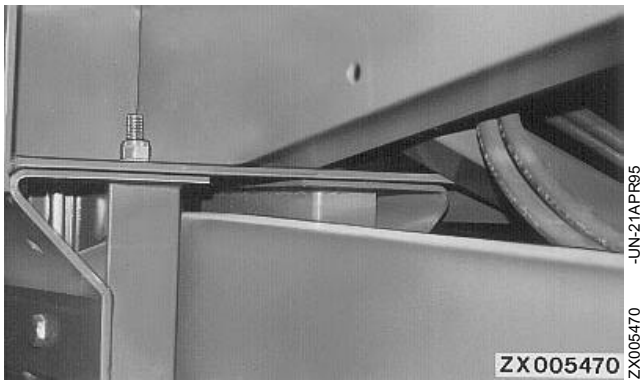
Tighten the screws and nuts, then slacken them off until the axle can pivot.

To continue, follow the removal procedure in reverse.

A—Plastic bearings
B—Brackets
C—Screw
D—Self-locking nut
E—Axle







ZX,TMXZCO003982-19-15FEB95

ADJUSTING REAR AXLE WIDTH

CAUTION: When changing axle widths, rear frame of harvester must be raised and supported properly.

Block front wheels (use chocks).

Raise rear axle until tires are approx. 2.5 cm (1 in.) off ground.

Remove steering cylinder support attaching screws (A) and rear axle cap screws (B) on both sides.

Also screw out tie rod bolt (C).

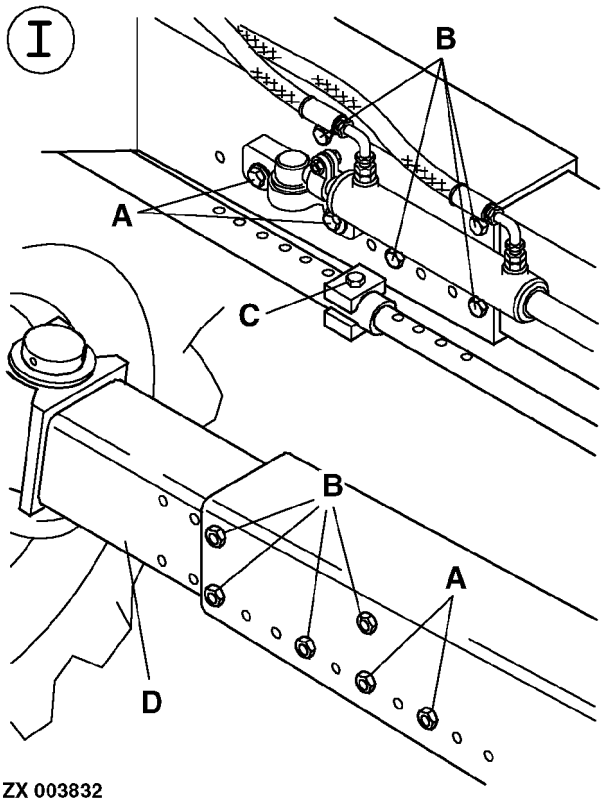
Pull or push sliding sleeve (D) in or out to desired width.

Reinstall screws (A), (B) and (C) and tighten.

Lower rear axle.

Make sure screws (A) and (B) are tightened to 240 N·m (170 lb-ft).

I—L.h. side
II—R.h. side
A—Steering cylinder support attaching screws
B—Sliding sleeve attaching screws
C—Tie rod bolt
D—Sliding sleeve



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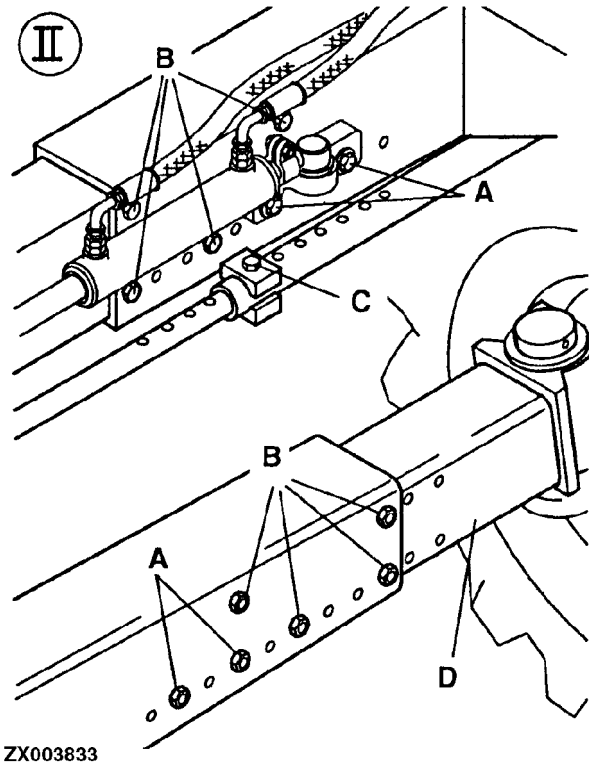
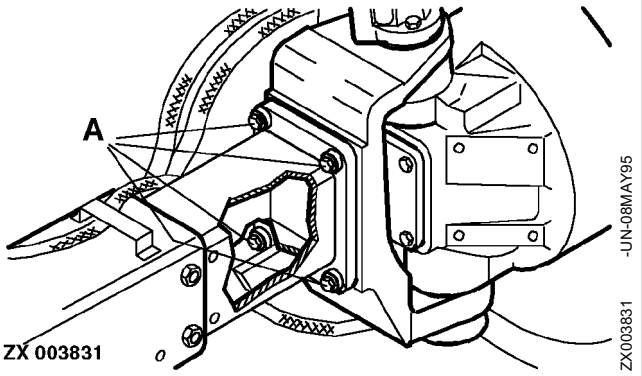


ZX003833 -UN-08MAY95

ZX,TMXZCO003983-19-15FEB95

WHEEL MOTOR YOKE ATTACHING SCREWS TO REAR AXLE SLIDING SLEEVE

Tighten cap screws (A) at both sides to 575 N·m (424 lb-ft).



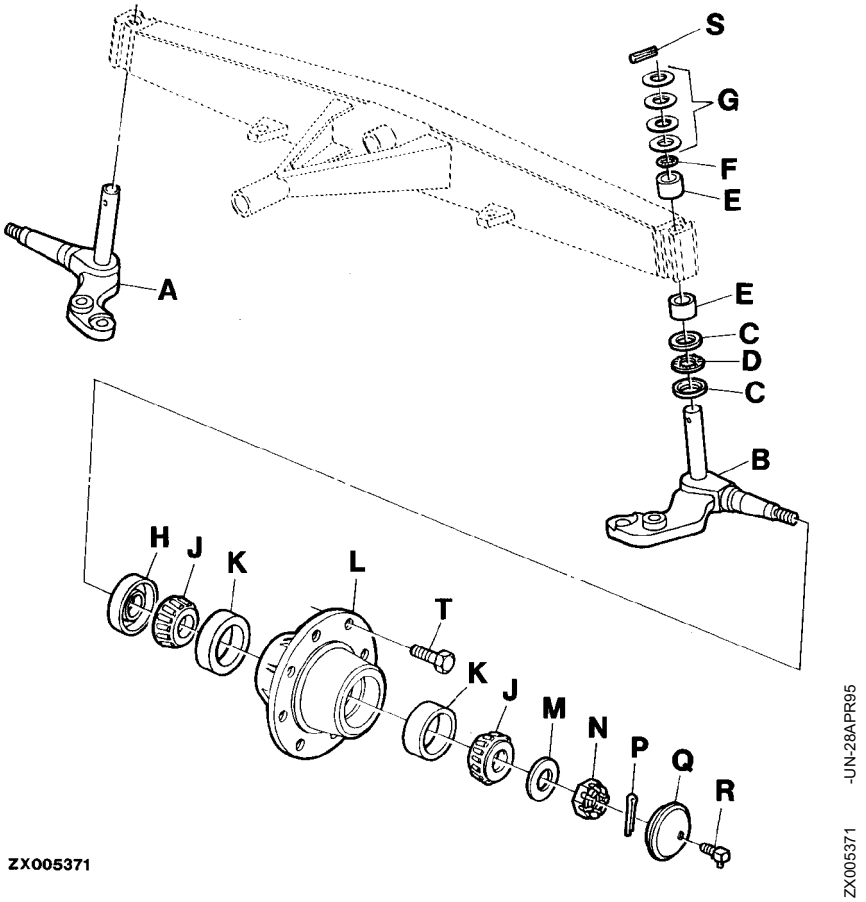
ZX,TMXZCO003984-19-15FEB95

REAR WHEEL TREAD

With 14.9-24 tires and an adjustable axle, rear wheel tread can be adjusted between 2.94 m (9.65 ft) and 3.53 m (11.58 ft.).

ZX,TMXZCO003985-19-15FEB95

SPINDLE AND WHEEL HUB — EXPLODED VIEW



A—R.h. spindle
B—L.h. spindle
C—Thrust bearing ring
D—Thrust bearing
E—Bushing
F—O-ring
G—0.5 mm (0.02 in.) or 2 mm (0.08 in.) shim
H—Sealing ring
J—Taper roller bearing cone
K—Bearing cup
L—Wheel hub
M—Washer
N—Slotted nut
P—Cotter pin
Q—Cover
R—Plug
S—Spring pin
T—Wheel-attaching bolt

ZX,TMXZCO003986-19-15FEB95

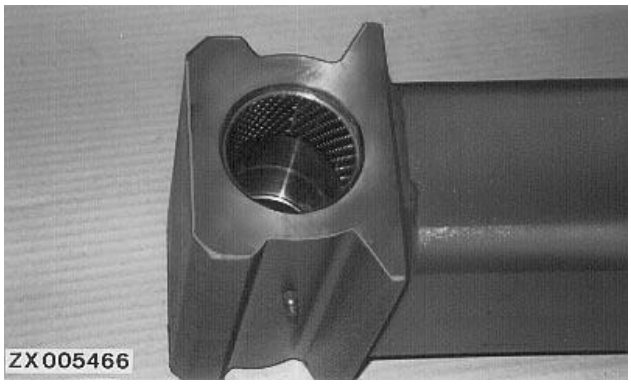
INSTALLING SPINDLE

Check bushings in spindle mountings for wear, and replace if necessary.

Coat thrust bearings (A) with grease and install on spindle.

Insert spindle in axle mounting.

Install O-ring (B) and shims (C). Install sufficient shims to allow spring pin (D) to be installed without applying pressure to the bearing.



ZX005466 -UN-21APR95

ZX005467 -UN-21APR95

ZX,TMXZCO003987-19-15FEB95

ASSEMBLING WHEEL HUB AND ADJUSTING BEARINGS

Press in the bearing races and fill wheel hub (C) with approx. 250 g (8.8 oz.) of grease.

Insert the rear taper roller bearing cone (B) and sealing ring (A) into wheel hub (C), with lettering outward.

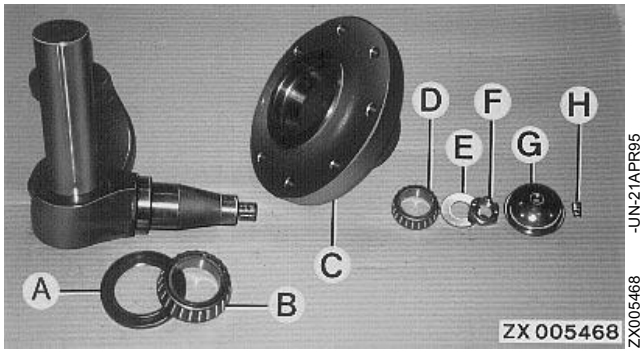
Slide pre-assembled wheel hub onto spindle and install front taper roller bearing cone (D) with washer (E) and slotted nut (F).

Tighten slotted nut until resistance is encountered. Turn wheel hub at the same time.

Slacken slotted nut by 1/6 of a turn, and secure with a cotter pin.

Install cover (G) and lubricate the wheel hub at the grease fitting.

Finally, replace grease fitting with plug (H).



ZX005468 -UN-21APR95

A—Sealing ring
B—Bearing cone
C—Wheel hub
D—Bearing cone
E—Washer
F—Slotted nut
G—Cover
H—Plug

ZX,TMXZCO003988-19-15FEB95

Section 70
Hydraulic System

Contents

CAPACITY OF HYDROSTATIC SYSTEM

5-walker combines

Standard . . . . . 65 L (17.17 U.S. gal)
Hillmaster . . . . . 76 L (20.07 U.S. gal)
Four-wheel drive version . . . . . 73 L (19.28 U.S. gal)
Hillmaster with 4WD . . . . . 78 L (20.61 U.S. gal)

6-walker combines

Standard . . . . . 76 L (20.07 U.S. gal)
Hillmaster . . . . . 81 L (22.40 U.S. gal)
Four-wheel drive version . . . . . 84 L (22.19 U.S. gal)
Hillmaster with 4WD . . . . . 89 L (23.51 U.S. gal)

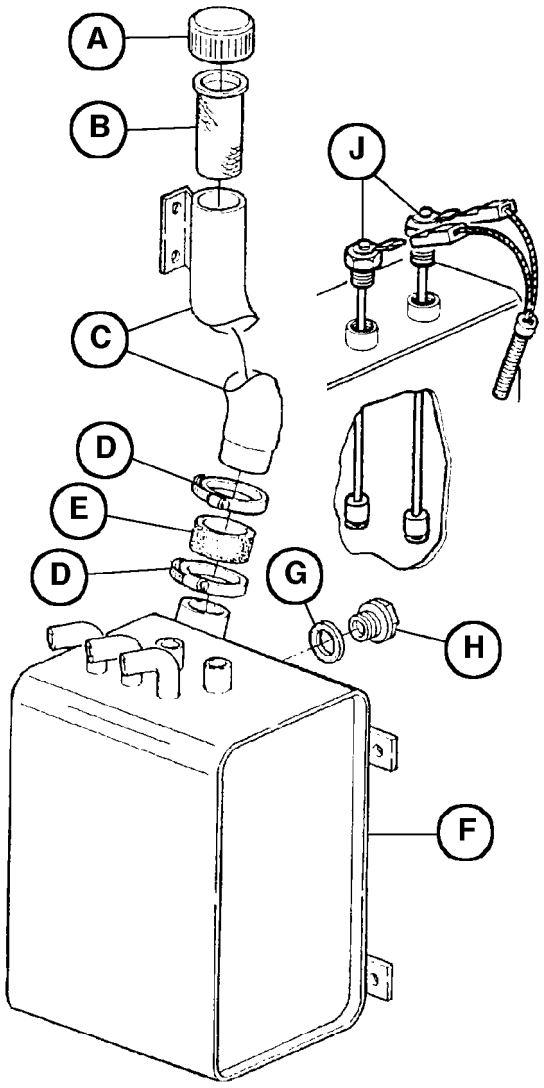
Reservoir capacity to center of sight-glass

5-walker combines . . . . . 33.4 L (8.82 U.S. gal)
6-walker combines . . . . . 44.2 L (11.68 U.S. gal)

ZX,TMXZCO010101-19-01AUG97

HYDRAULIC OIL RESERVOIR

A—Cap
B—Screen
C—Pipe
D—Hose clamp
E—Rubber ring
F—Reservoir
G—Sealing ring
H—Sight-glass
J—Sensor for level indicator



ZX012215

ZX,TMXZCO009584-19-01AUG97

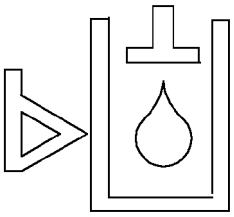
HYDRAULIC OIL LEVEL INDICATOR LIGHT

lights up if hydraulic oil level drops below minimum.

— Add hydraulic oil.

If larger quantities of oil are lost suddenly (e.g by leakage) and hydraulic oil level drops below minimum, “STOP” light of indicator light unit I will glow and the buzzer will sound (continuous tone).

— Shut off engine immediately.



ZX 002340

ZX002340 -UN-16JUN95

ZX,OMXZCO001508-19-27JAN92

GENERAL REPAIR INFORMATION

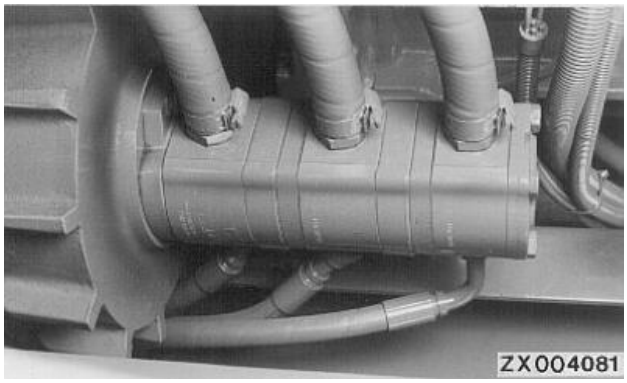
IMPORTANT: Prior to opening hydraulic components, thoroughly clean surrounding area. Observe the utmost cleanliness when repairing hydraulic components.

ZX,TMSPFH000674-19-23FEB92

REMOVING HYDRAULIC PUMP

Disconnect suction and pressure lines from hydraulic pump. Immediately plug openings.

Remove both attaching screws and lift off pump.



ZX,TMXZCO001967-19-01JUN92

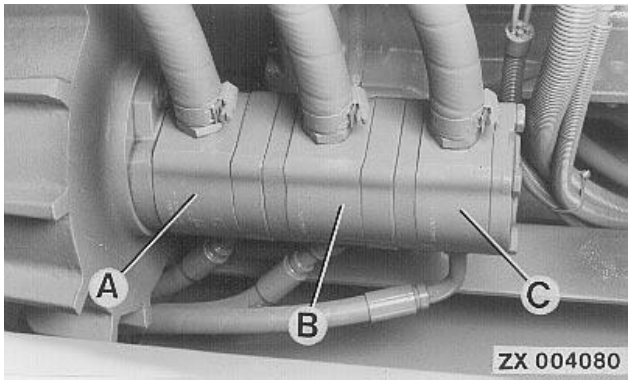
NOTE: Replace complete pump if bushings, gears or housing are defective or worn.

It is only possible to replace unserviceable seals.

A—Hydraulic pump
- **Standard machine 35 L/Min. (9.2 gpm)**
- **Hillmaster 45 L/Min. (11 gpm)**

B—Hydraulic pump 25 L/Min. (6.5 gpm) (steering)

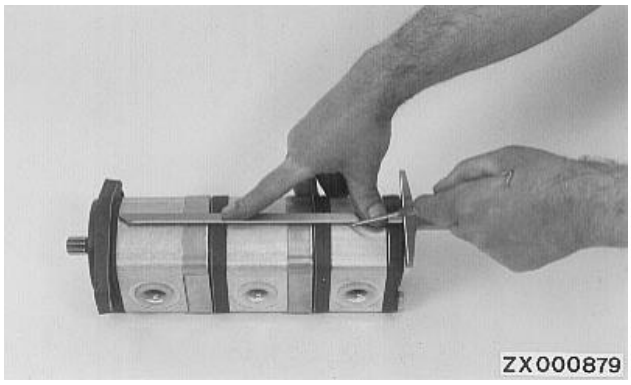
C—Hydraulic pump
- **Standard machine 15 L/Min. (3.9 gpm)**
- **Hillmaster 35 L/Min. (9.2 gpm)**



ZX,TMXZCO001968-19-01JUN92

MARKING HYDRAULIC PUMP

IMPORTANT: Mark all pump parts prior to removal to ensure correct reinstallation.

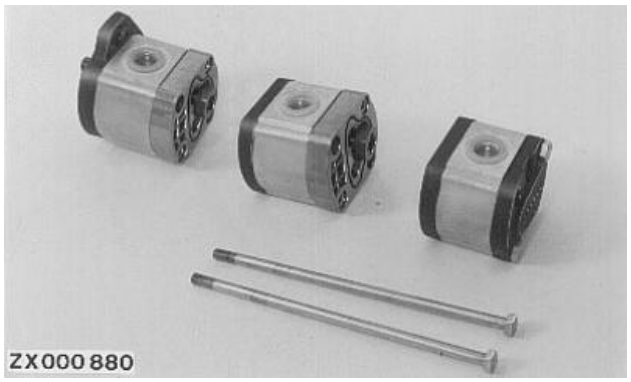


ZX,TMSPFH000677-19-06JUN91

DISASSEMBLING HYDRAULIC PUMP

NOTE: Two of the four cap screws are longer and hold together the hydraulic pump which consists of three pump units.

To disassemble remove the two longer cap screws.



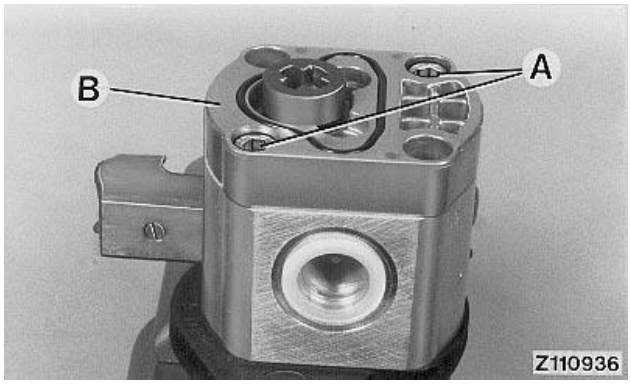
ZX,TMSPFH000678-19-22JUL91

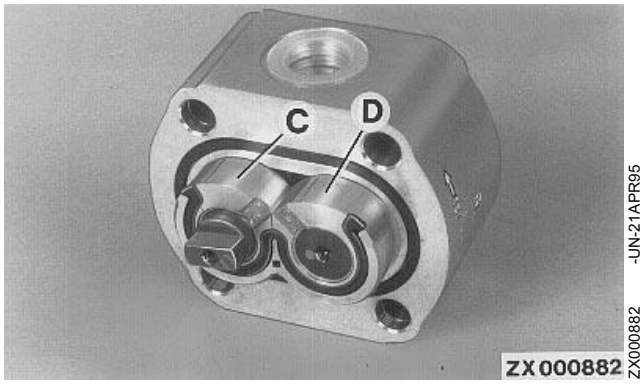
Disassemble parts of pump which have to be repaired:

Remove screws (A).

Remove intermediate cover (B).

Remove front bushings (C) and (D).



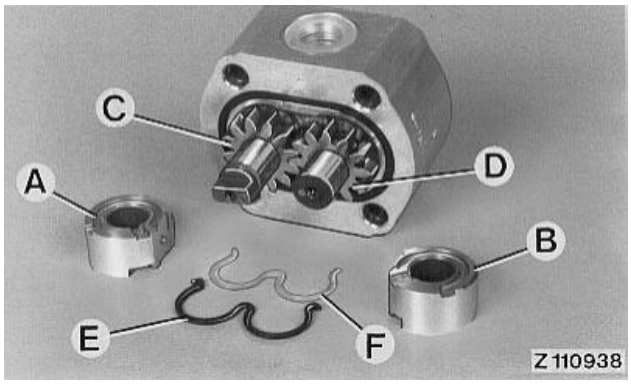


ZX,TMSPFH000679-19-06JUN91

Press out gears with rear bushings.

NOTE: Mark all parts prior to removal to ensure correct reinstallation.

A—Bushing
B—Bushing
C—Drive gear
D—Driven gear
E—Gasket
F—Gasket support



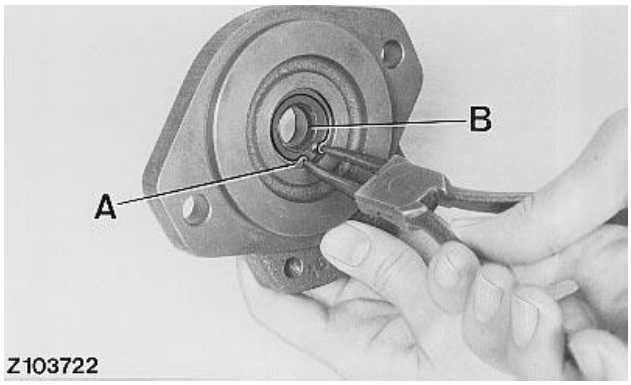
-UN-27APR95 Z110938

ZX,TMSPFH000680-19-06JUN91

REPLACE SHAFT SEAL

Remove snap ring (A) and extract seal ring (B), taking care not to damage seal seat surface.

When installing seal ring, make sure sealing lip faces toward the inside.



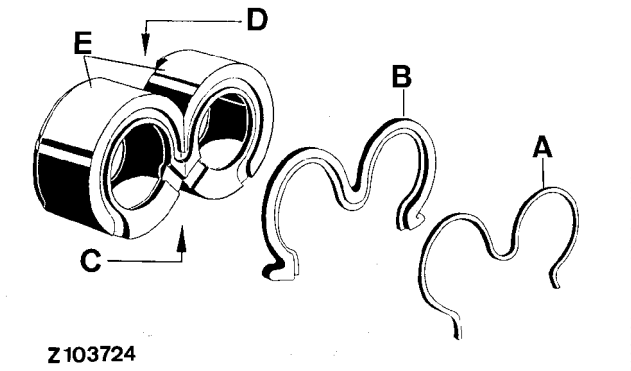
-UN-26APR95 Z103722

ZX,TMSPFH000681-19-06JUN91

INSTALLING GASKET AND SUPPORT

Install gasket (B) and support (A) in bushings, noting position of support (A).

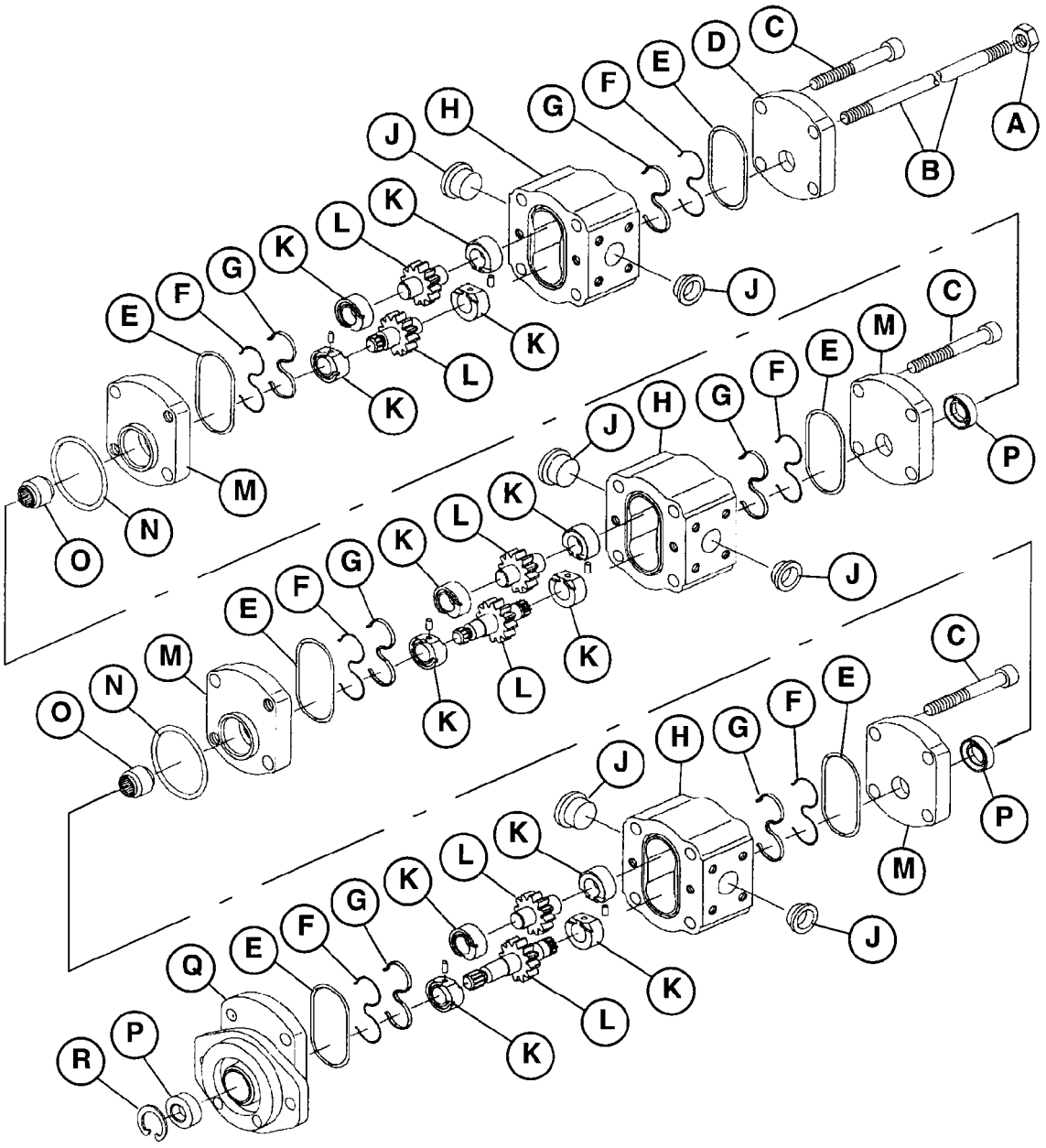
A—Support
B—Gasket
C—Suction side
D—Pressure side
E—Bushing set



-UN-02MAY95 Z103724

ZX,TMSPFH000682-19-06JUN91

TRIPLE HYDRAULIC PUMP, EXPLODED VIEW



A—Nut (4 used)
B—Tie-bolt (2 used)
C—Screw (6 used)
D—End plate
E—Seal ring
F—Back-up ring
G—Gasket
H—Housing
J—Cap
K—Bushing
L—Gear
M—Intermediate plate
N—O-ring
O—Carrier
P—Shaft seal
Q—Front plate
R—Snap ring

ZX,TMXZCO009586-19-01AUG97

ASSEMBLING THE HYDRAULIC PUMP

Assemble hydraulic pump, noting marks made before disassembly.

Use new gaskets.

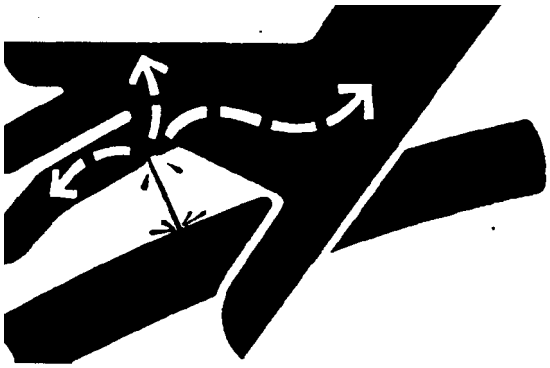
Coat all moving parts with clean hydraulic oil before assembling.

Tighten nuts (A) and screws (C) to 43 ± 3 N·m (31.7 ± 2 lb-ft).

ZX,TMXZCO009587-19-01AUG97

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 -UN-23AUG88

DX,FLUID2 -19-09AUG91

GENERAL REPAIR INFORMATION

IMPORTANT: Prior to opening hydraulic components, thoroughly clean surrounding area. Observe the utmost cleanliness when repairing hydraulic components.

ZX,TMSPFH000955-19-23FEB92

REMOVE BASIC MACHINE SOLENOID VALVE BLOCK

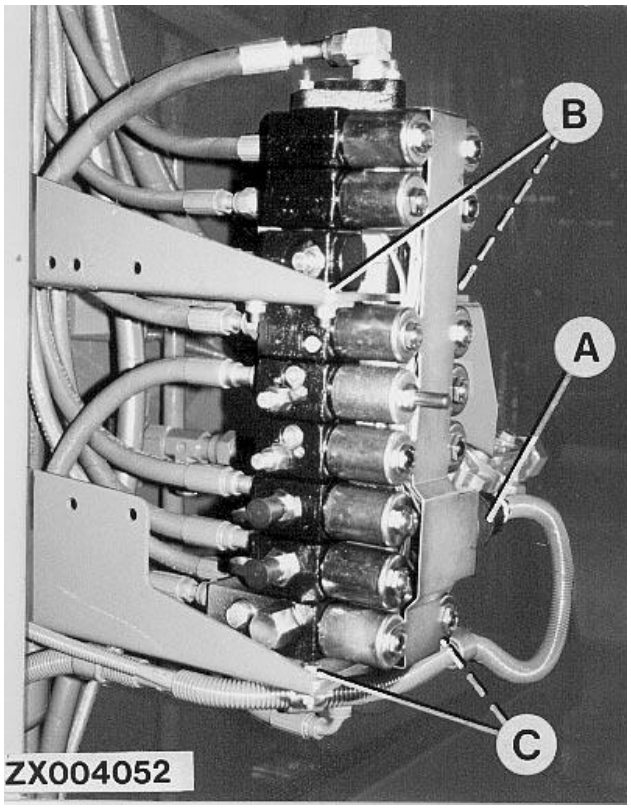
1. Lower harvesting unit completely and adjust lowest threshing cylinder speed to relieve pressure in hydraulic lines.

2. Disconnect wiring harness from solenoid valve block at disconnect point (A).

3. Mark hydraulic lines and disconnect at solenoid valve block.

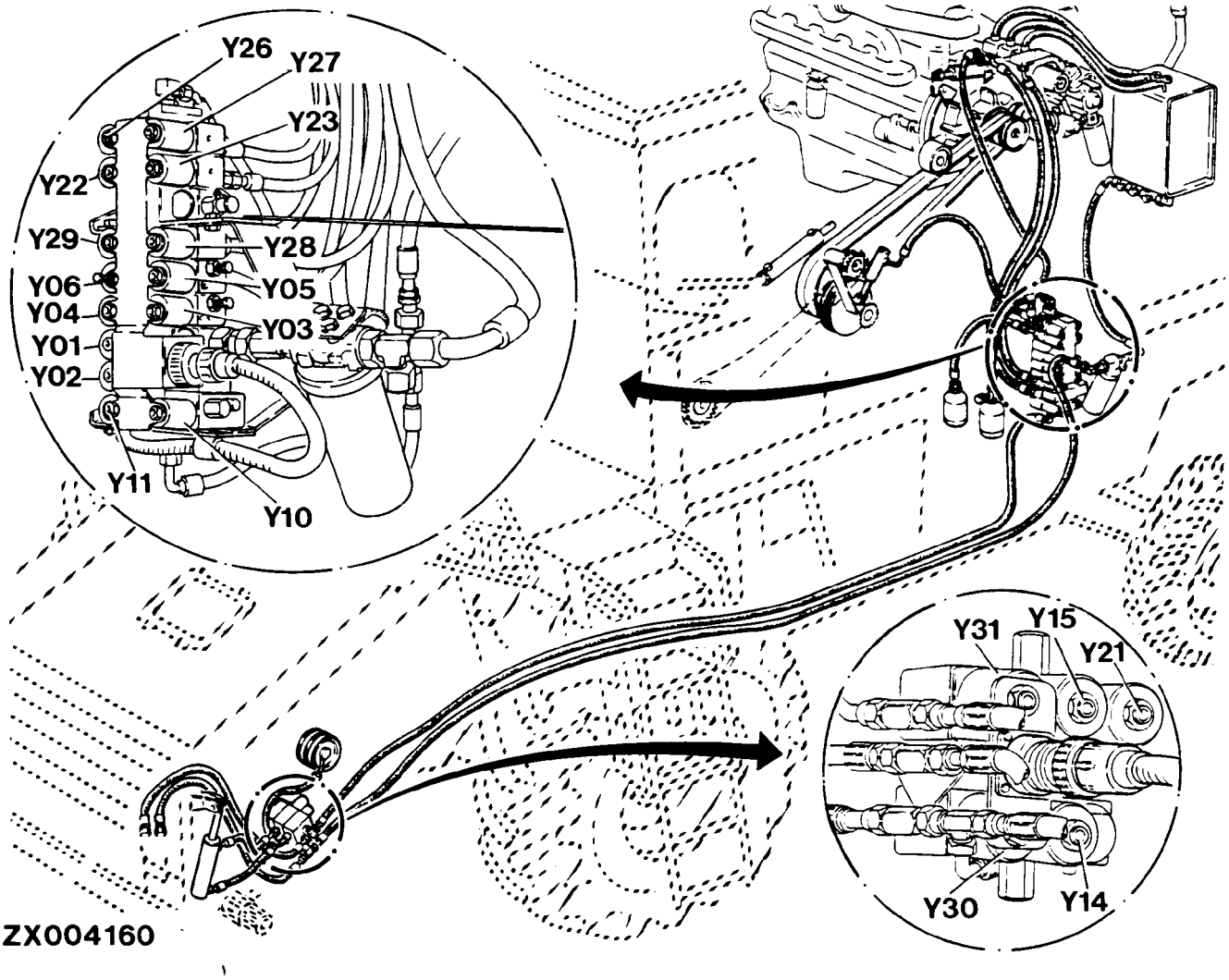
4. Plug all openings immediately.

5. Loosen screws (B) and (C) and remove solenoid valve block.



ZX,TMXZCO002402-19-25NOV92

SOLENOID VALVES — BASIC MACHINE

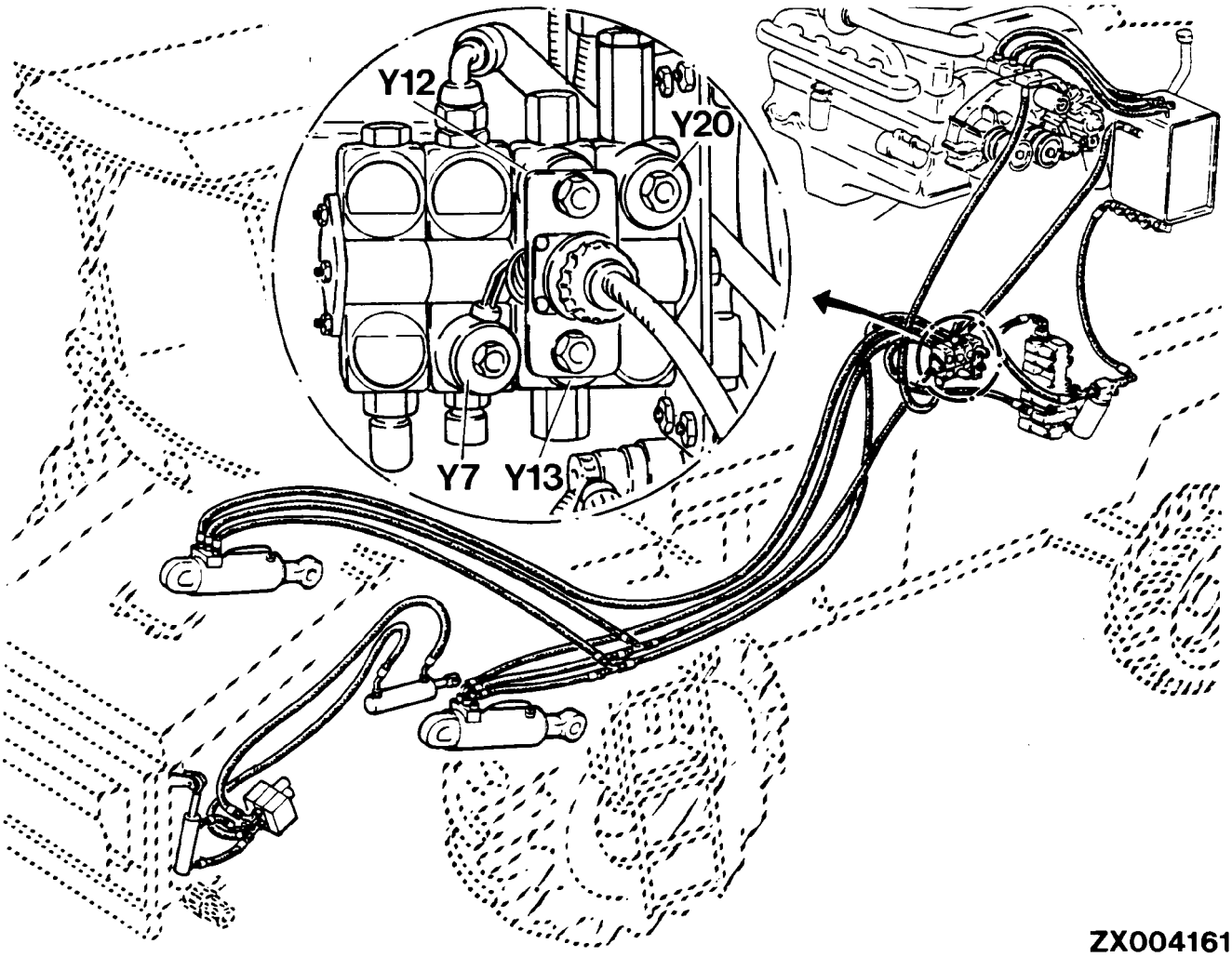


ZX004160 -UN-02MAY95

Y 1 — Pressure valve 1
Y 2 — Pressure valve 2
Y 3 — Solenoid, raising header
Y 4 — Solenoid, lowering header
Y 5 — Solenoid, raising header
Y 6 — Solenoid, lowering header
Y 10 — Solenoid, swinging in unloading auger
Y 11 — Solenoid, swinging out unloading auger
Y 14 — Solenoid, header leveling, left side
Y 15 — Solenoid, header leveling, right side
Y 21 — Solenoid not allocated
Y 22 — Solenoid, switching on separator
Y 23 — Solenoid, switching on separator
Y 26 — Solenoid, unloading grain tank
Y 27 — Solenoid, unloading grain tank
Y 28 — Solenoid, reducing cylinder speed
Y 29 — Solenoid, increasing cylinder speed
Y 30 — Solenoid, reducing feeder conveyor speed
Y 31 — Solenoid, increasing feeder conveyor speed

ZX,OMXZCO002193-19-05OCT92

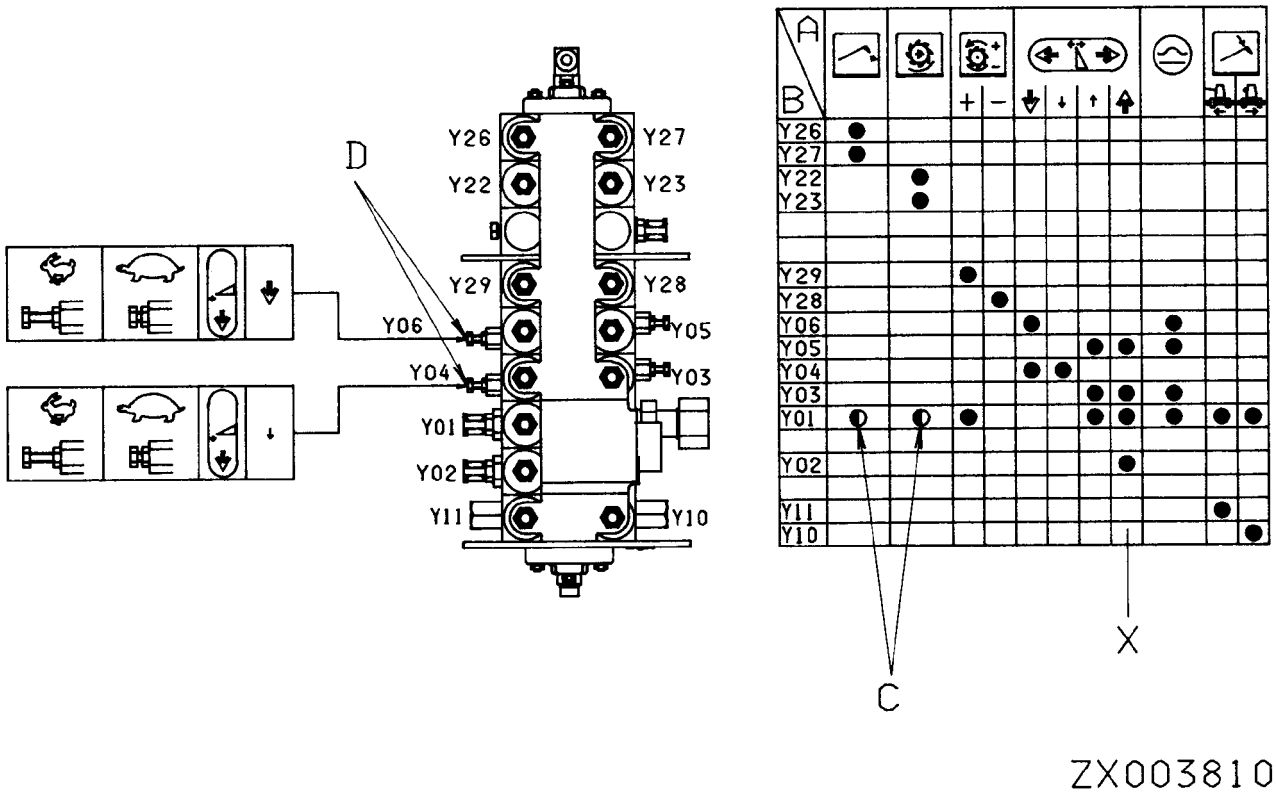
SOLENOID VALVES — HILLMASTER



Y 7 — Pressure valve 3
Y 12 — Solenoid, combine leveling system, left
Y 13 — Solenoid, combine leveling system, right
Y 20 — Solenoid, lowering combine harvester

ZX,OMXZCO002194-19-05OCT92

ACTUATION OF ELECTRO-MAGNETIC VALVES ON BASIC MACHINE



This chart and the two following ones illustrate which electro-magnetic valves are actuated when each particular function is selected.

X — Example: Raise header rapidly
Y01, Y02, Y03 and Y05 are actuated.

A — Function symbols

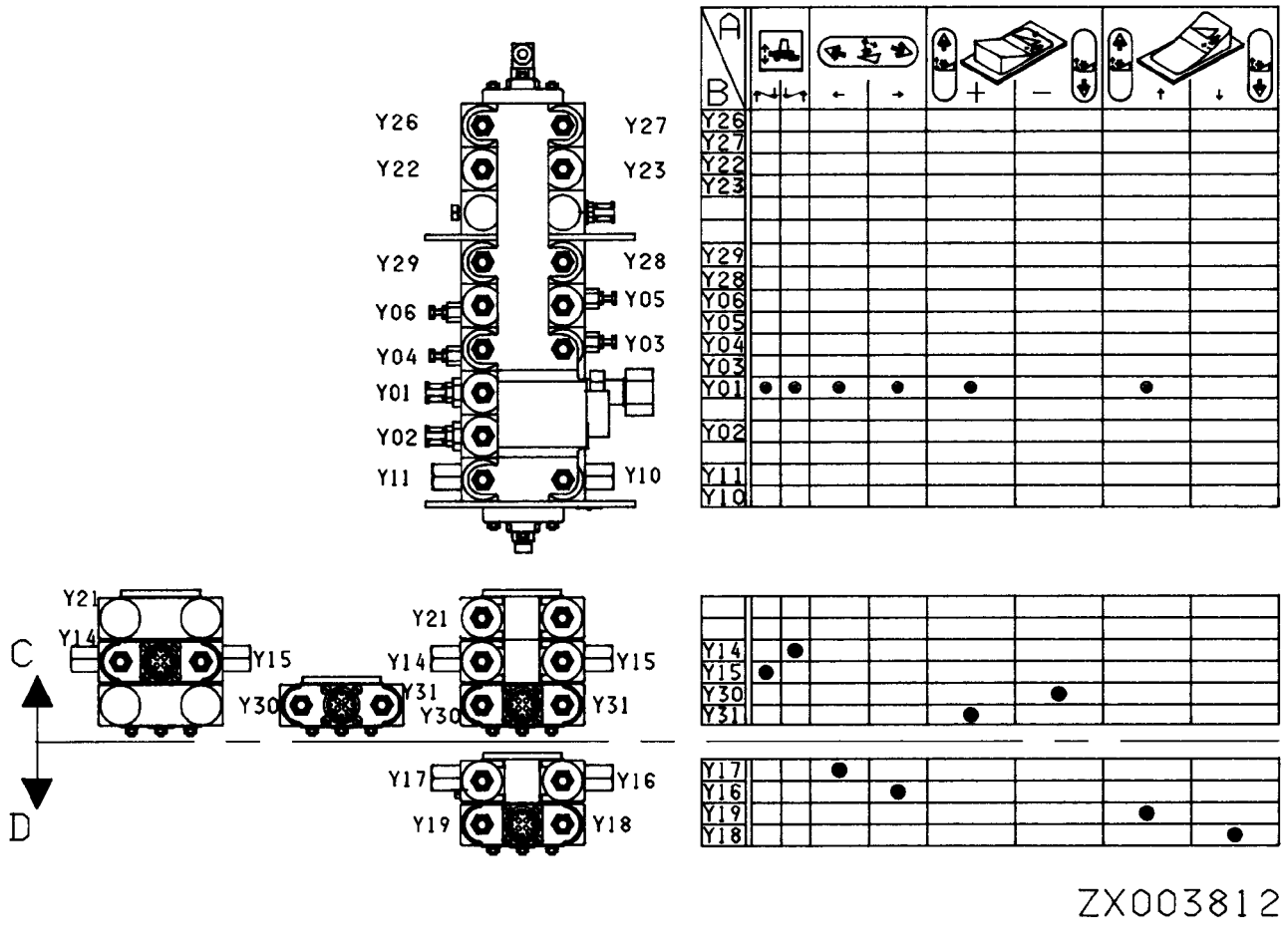
B — Electro-magnetic valves

C — These symbols indicate that pressure begins to build up as soon as the road safety switch is actuated. Pressure is monitored by a pressure switch.

D — Adjusting screws: Re-adjust the rate of drop every time the header is changed.

ZX,OMXZCO002205-19-05OCT92

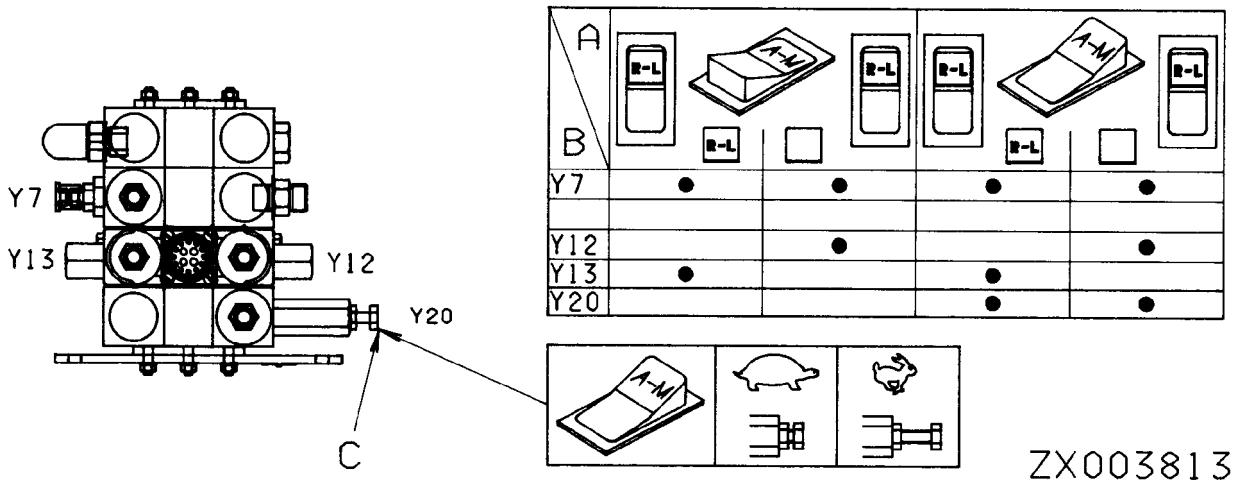
ACTUATION OF ELECTRO-MAGNETIC VALVES ON FEEDER HOUSE AND CUTTING PLATFORM



A — Function symbols
B — Electro-magnetic valves
C — Valves on feeder house
D — Valves on cutting platform

ZX,OMXZCO002206-19-05OCT92

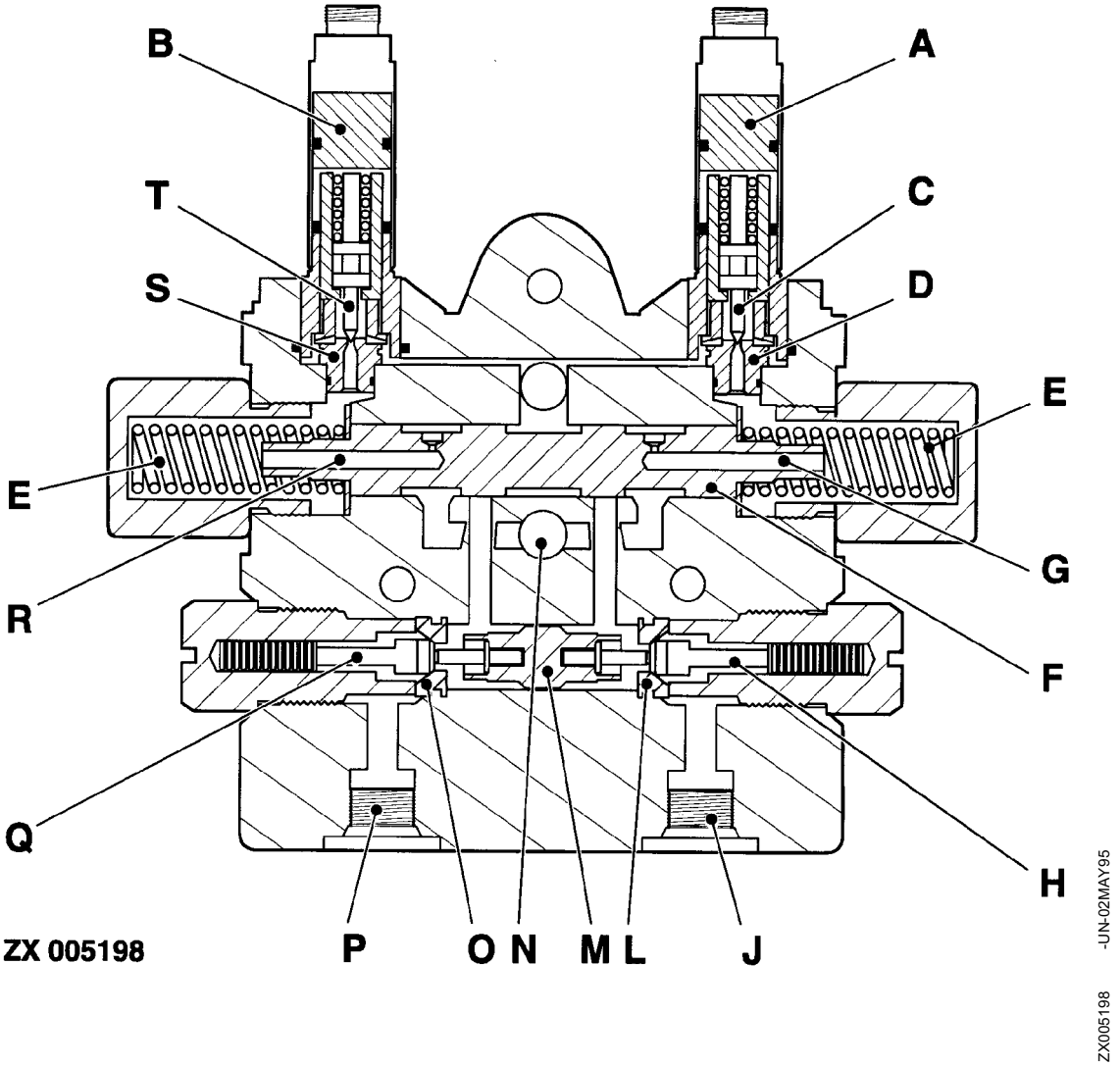
ACTUATION OF ELECTRO-MAGNETIC VALVES ON HILLMASTER



A — Function symbols
B — Electro-magnetic valves
C — Adjusting screw: For adjusting the combine harvester's rate of drop in the transport position

ZX,OMXZCO002207-19-05OCT92

REPAIRING SOLENOID VALVE PLATE 'SWINGING OUT UNLOADING AUGER'



A—Solenoid	**F—Control plunger**	**M—Check valve control plunger**	**Q—Check valve**
B—Solenoid	**G—Oil passage**		**R—Oil passage**
C—Needle valve	**H—Check valve**	**N—Return oil passage**	**S—Needle valve seat**
D—Needle valve seat	**J—Pressure oil connection**	**O—Check valve seat**	**T—Needle valve**
E—Spring	**L—Check valve seat**	**P—Pressure oil connection**	

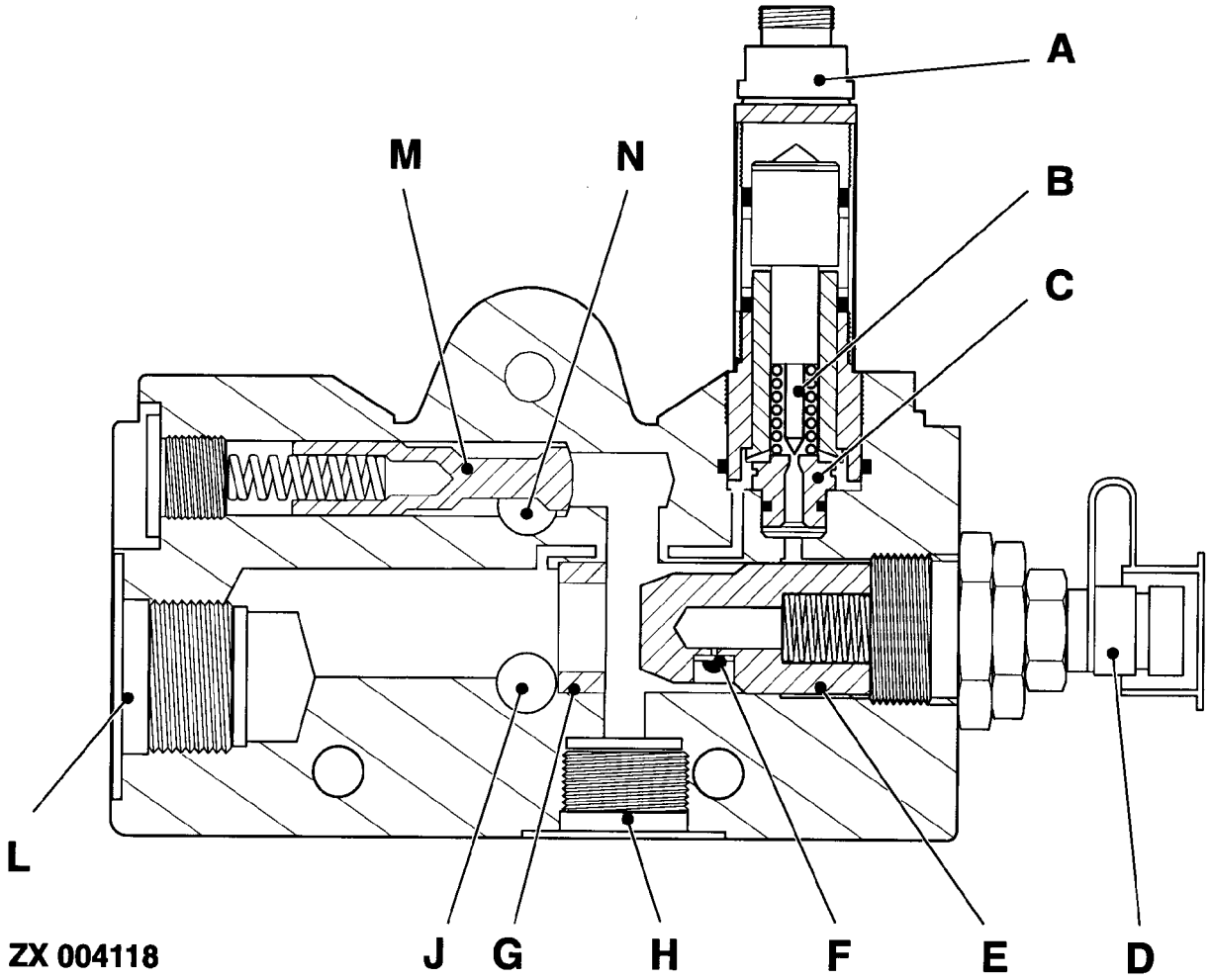
Disassemble solenoid valve plate.

Check all bores, orifices and valve seats for restriction. Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003030-19-18NOV93

PRESSURE VALVE REPAIR



ZX004118 -UN-02MAY95

A—Solenoid
B—Needle valve
C—Needle valve seat
D—Pressure test port
E—Control plunger
F—Orifice
G—Control plunger seat
H—Hydraulic oil inlet
J—Return oil passage
L—Hydraulic oil outlet (to reservoir)
M—Check valve
N—Pressure oil passage

Disassemble solenoid valve plate.

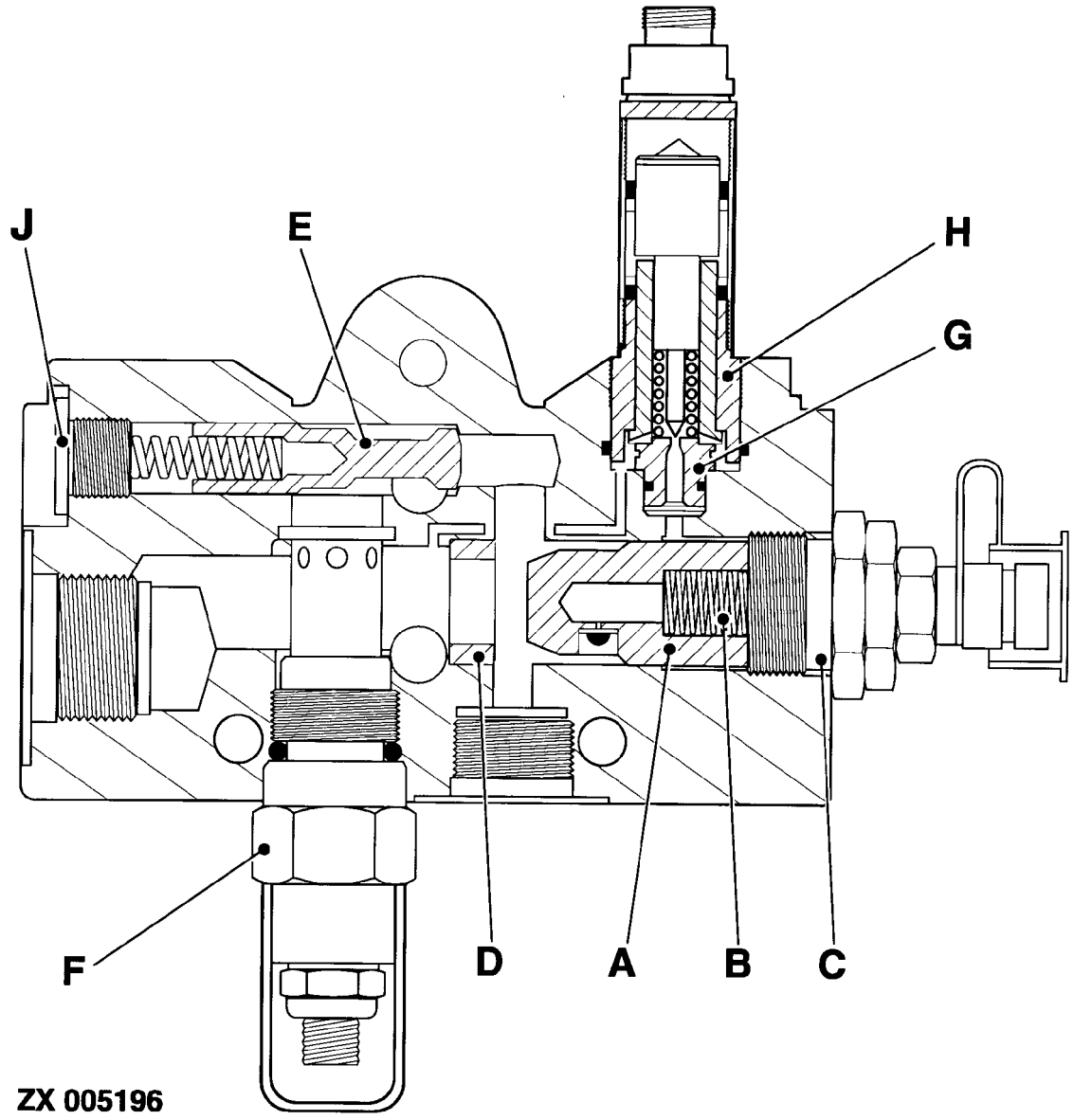
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003031-19-18NOV93

REPAIRING PRESSURE VALVE WITH PRESSURE RELIEF VALVE



ZX005196 -UN-02MAY95

A—Control plunger
B—Spring
C—Plug with test connection
D—Control plunger seat
E—Check valve plunger
F—Pressure relief valve
G—Needle valve seat
H—Solenoid
J—Plug

Remove plugs (C) and (J).

Screw out pressure relief valve (F) and solenoid (H).

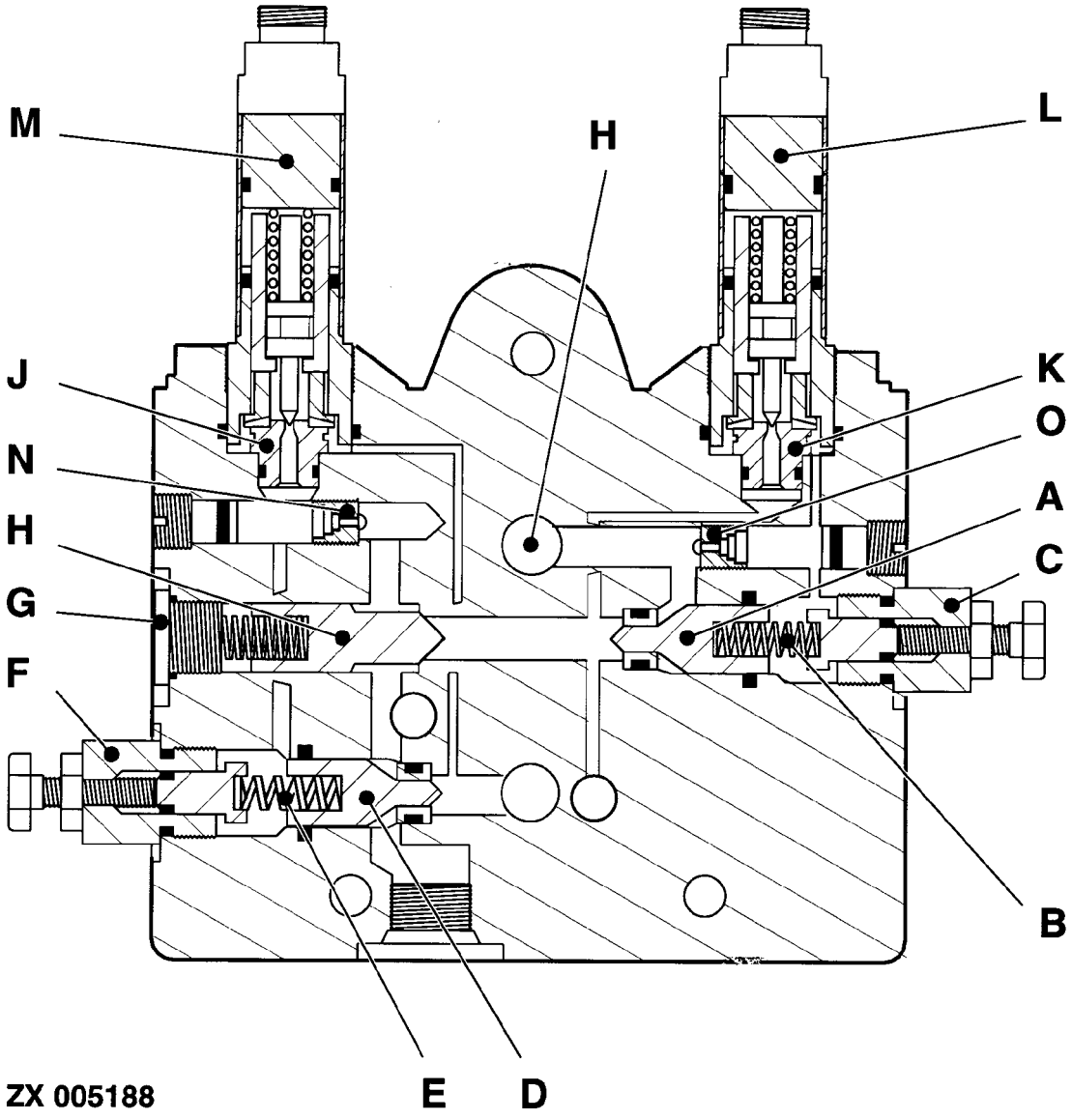
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003032-19-18NOV93

REPAIRING SOLENOID VALVE PLATE 'RAISING/LOWERING HARVESTING UNIT'



A—Control plunger, raising harvesting unit
B—Spring
C—Cap with adjusting screw for raising speed
D—Control plunger, lowering harvesting unit
E—Spring
F—Cap with adjusting screw for lowering speed
G—Plug
H—Check valve
J—Needle valve seat
K—Needle valve seat
L—Solenoid
M—Solenoid
N—Orifice
O—Orifice

Disassemble solenoid valve plate.

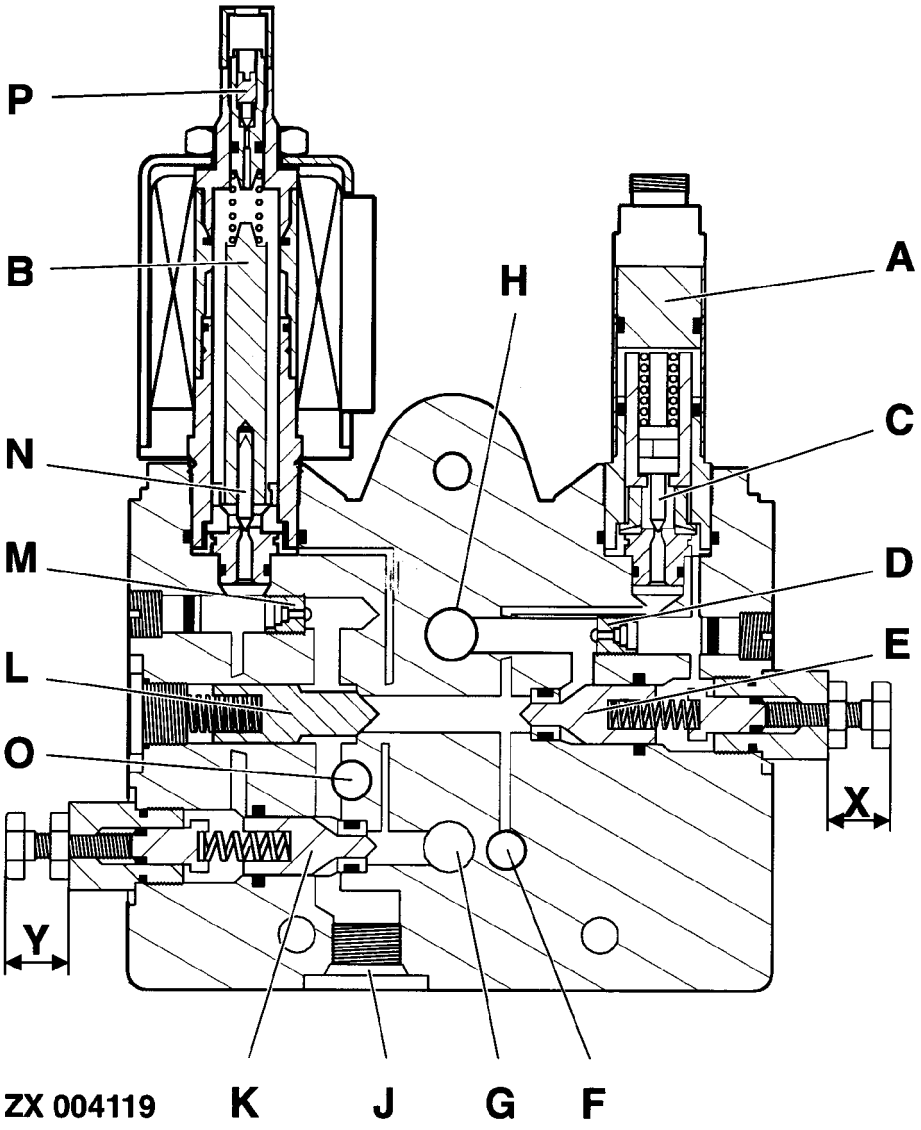
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003033-19-18NOV93

REPAIRING SOLENOID VALVE PLATE 'RAISING/LOWERING HARVESTING UNIT, FLOAT CONTROL'



ZX004119 -UN-02MAY95

A—Solenoid
B—Solenoid
C—Needle valve
D—Orifice
E—Control plunger, raising
F—Connecting passage to second solenoid valve plate
G—Return oil passage
H—Pressure oil passage
J—Pressure oil passage
K—Control plunger, lowering
L—Check valve
M—Orifice
N—Needle valve
O—Connecting passage
P—Bleed screw
X—Adjustment, raising
Y—Adjustment, lowering

Disassemble solenoid valve plate.

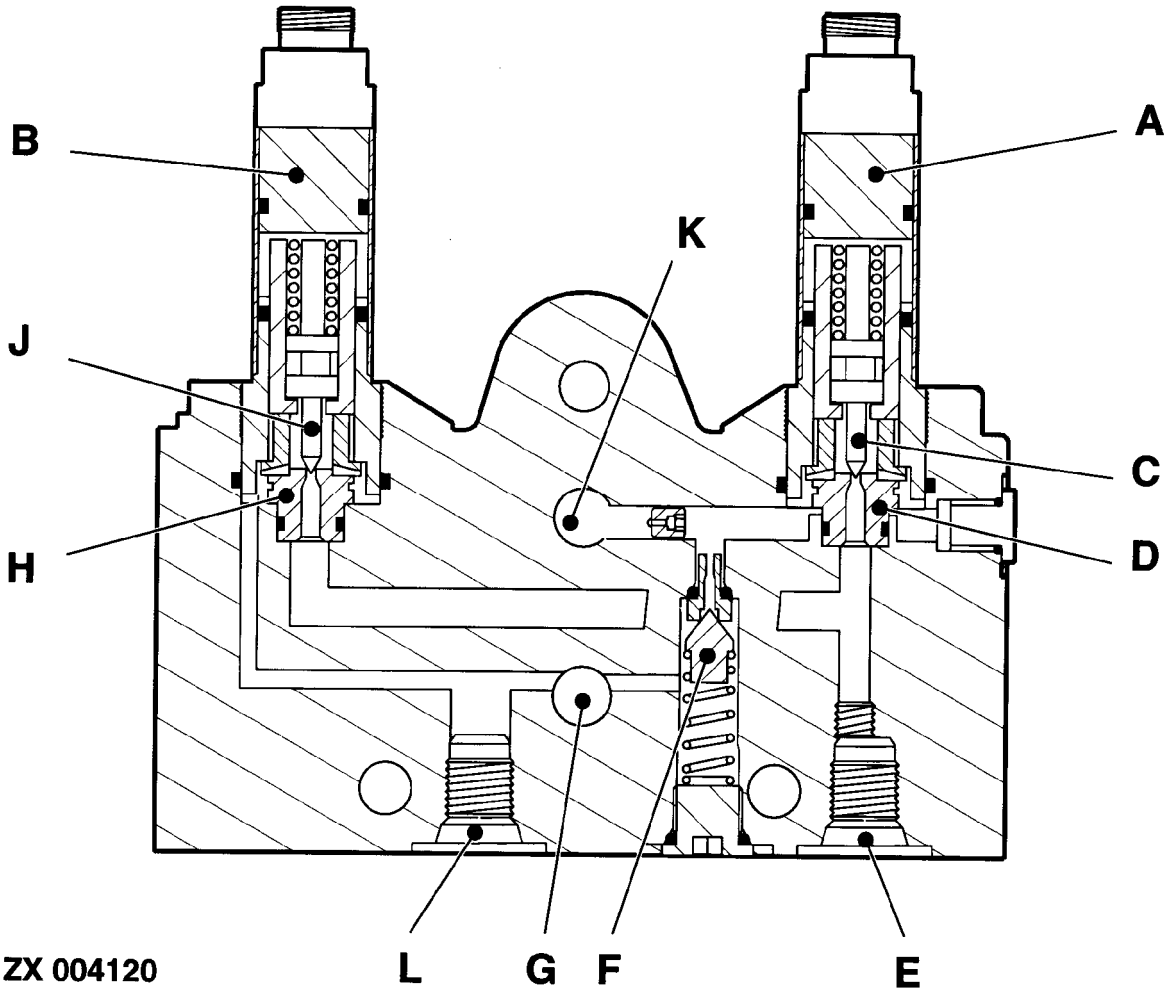
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003034-19-18NOV93

REPAIRING SOLENOID VALVE PLATE 'CYLINDER SPEED ADJUSTMENT'



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Pressure oil connection
F—Pressure relief valve
G—Return oil passage
H—Needle valve seat
J—Needle valve
K—Pressure oil passage
L—Return passage to reservoir

Disassemble solenoid valve plate.

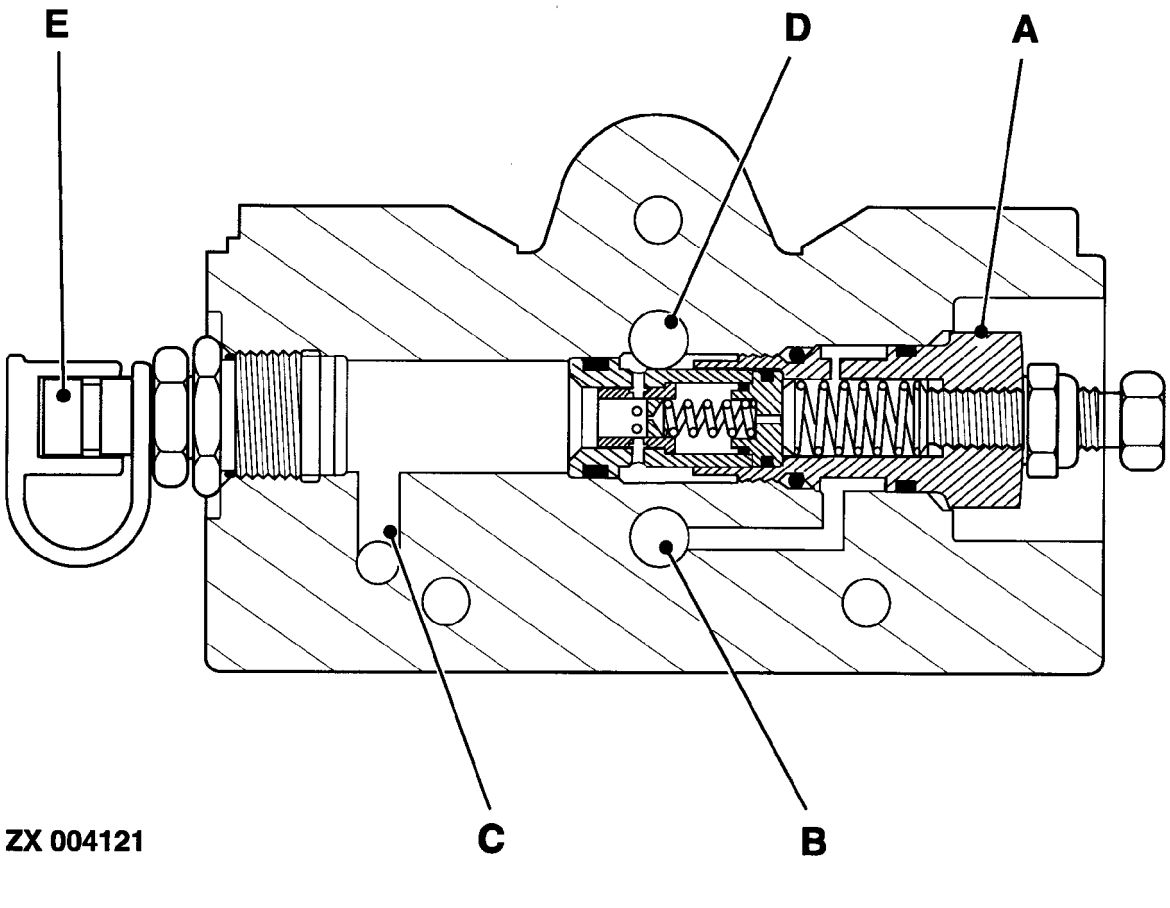
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced with new ones.

ZX,TMXZCO003035-19-18NOV93

REPAIR PRESSURE REDUCTION UNIT



A—Pressure reduction valve
B—Return oil passage
C—Passage for reduced pressure oil
D—Pressure oil passage
E—Test connection

Remove pressure reduction valve (A) from housing.

Remove test connection (E).

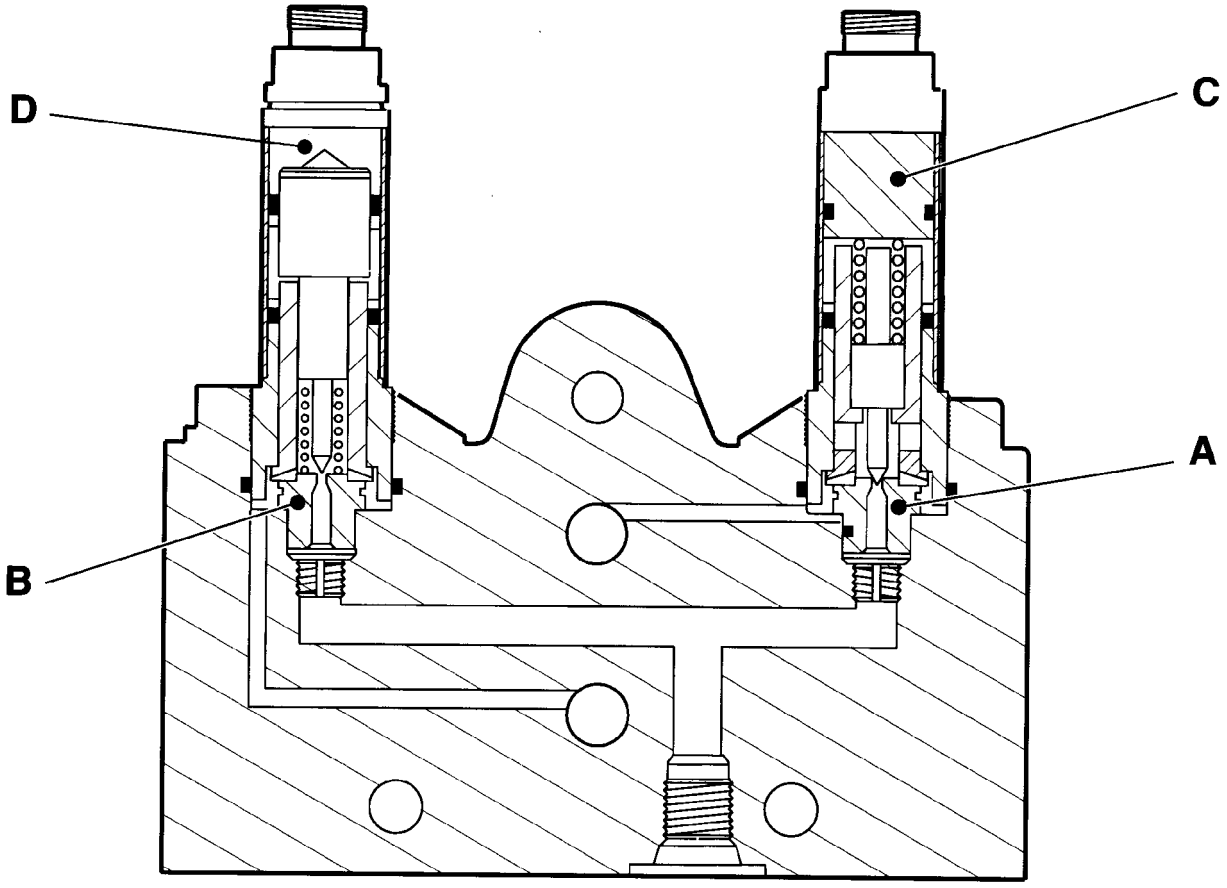
Check bores in housing and in pressure reduction valve (A) for restriction.

Once removed, seals must be replaced by new ones.

NOTE: Pressure reduction valve (A) interrupts oil flow at 6500 kPa (65 bar) (950 psi). Replace complete valve, if defective.

ZX,TMXZCO003036-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR ENGAGING/DISENGAGING MAIN DRIVE OR UNLOADING DRIVE



ZX005192 -UN-02MAY95

ZX 005192

A—Needle valve seat **B—Needle valve seat** **C—Solenoid** **D—Solenoid**

Disassemble solenoid valve plate.

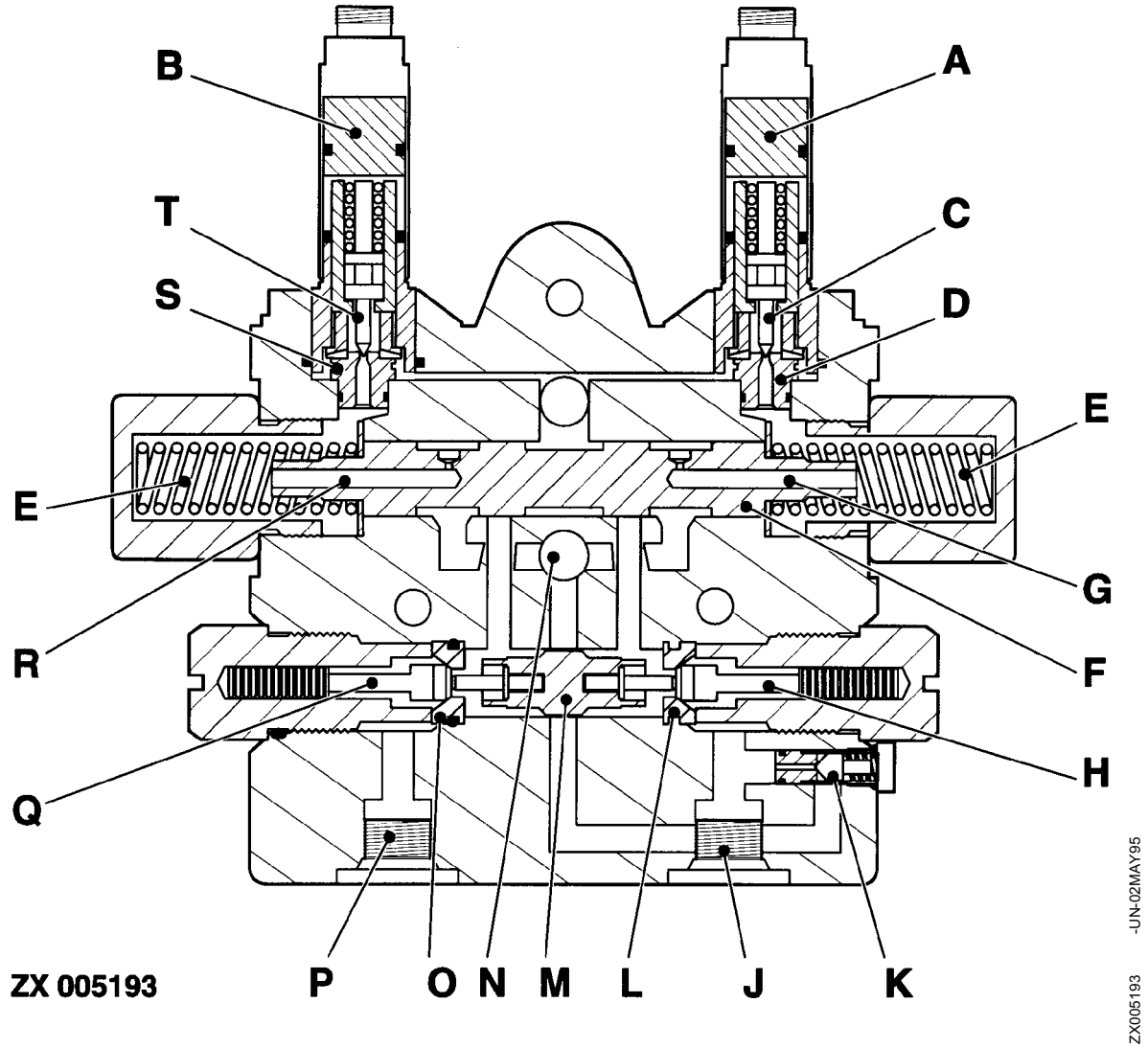
Check all bores, orifices and needle valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced by new ones.

ZX,TMXZCO003037-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR HORIZONTAL REEL ADJUSTMENT



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Oil passage
H—Check valve
J—Pressure oil connection
K—Thermal relief valve
L—Check valve seat
M—Check valve control plunger
N—Return oil passage
O—Check valve seat
P—Pressure oil connection
Q—Check valve
R—Oil passage
S—Needle valve seat
T—Needle valve

Disassemble valve plate.

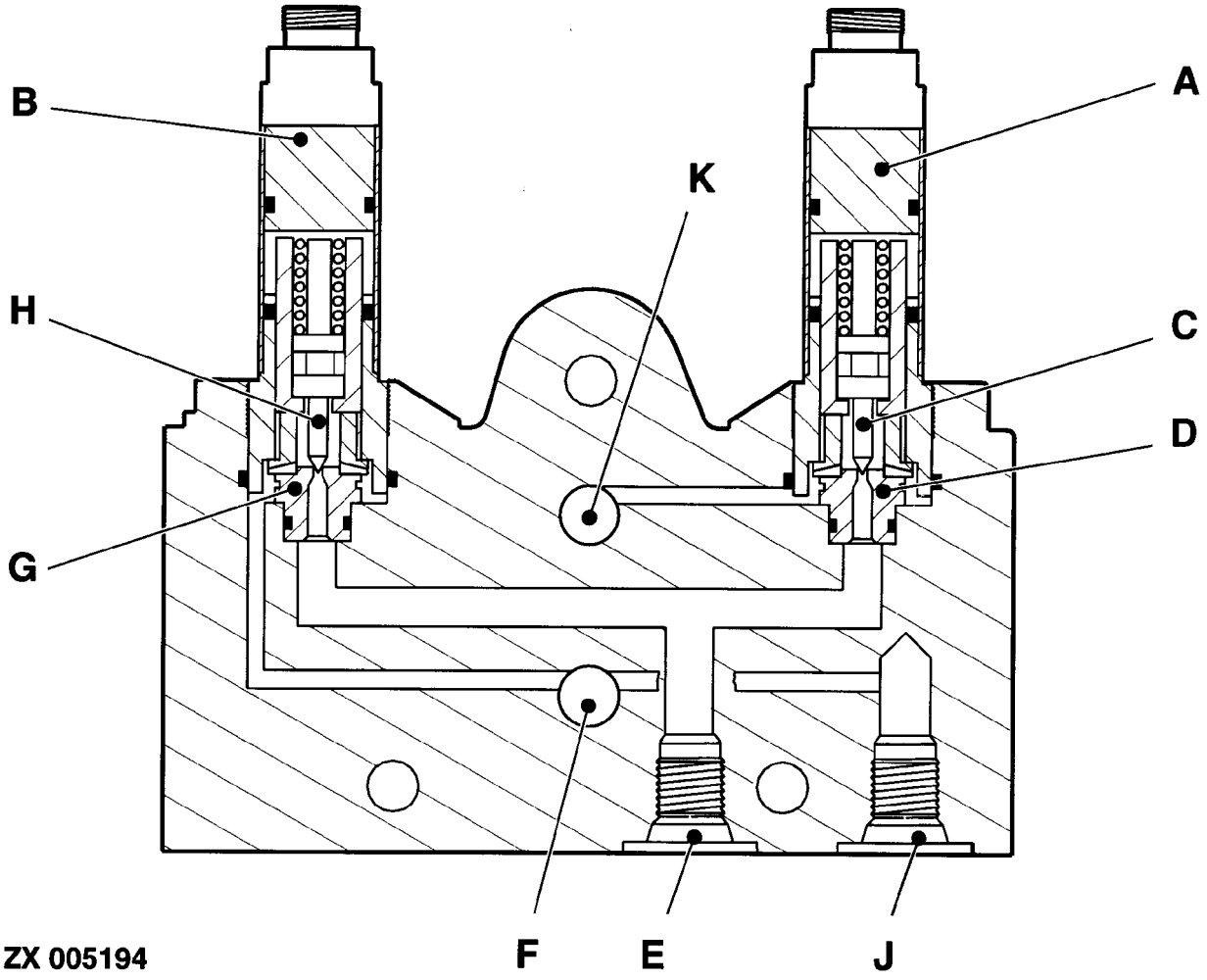
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced by new ones.

ZX,TMXZCO003038-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR REEL LIFT



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Pressure oil connection
F—Return oil passage
G—Needle valve seat
H—Needle valve
J—Accumulator connection
K—Pressure oil passage

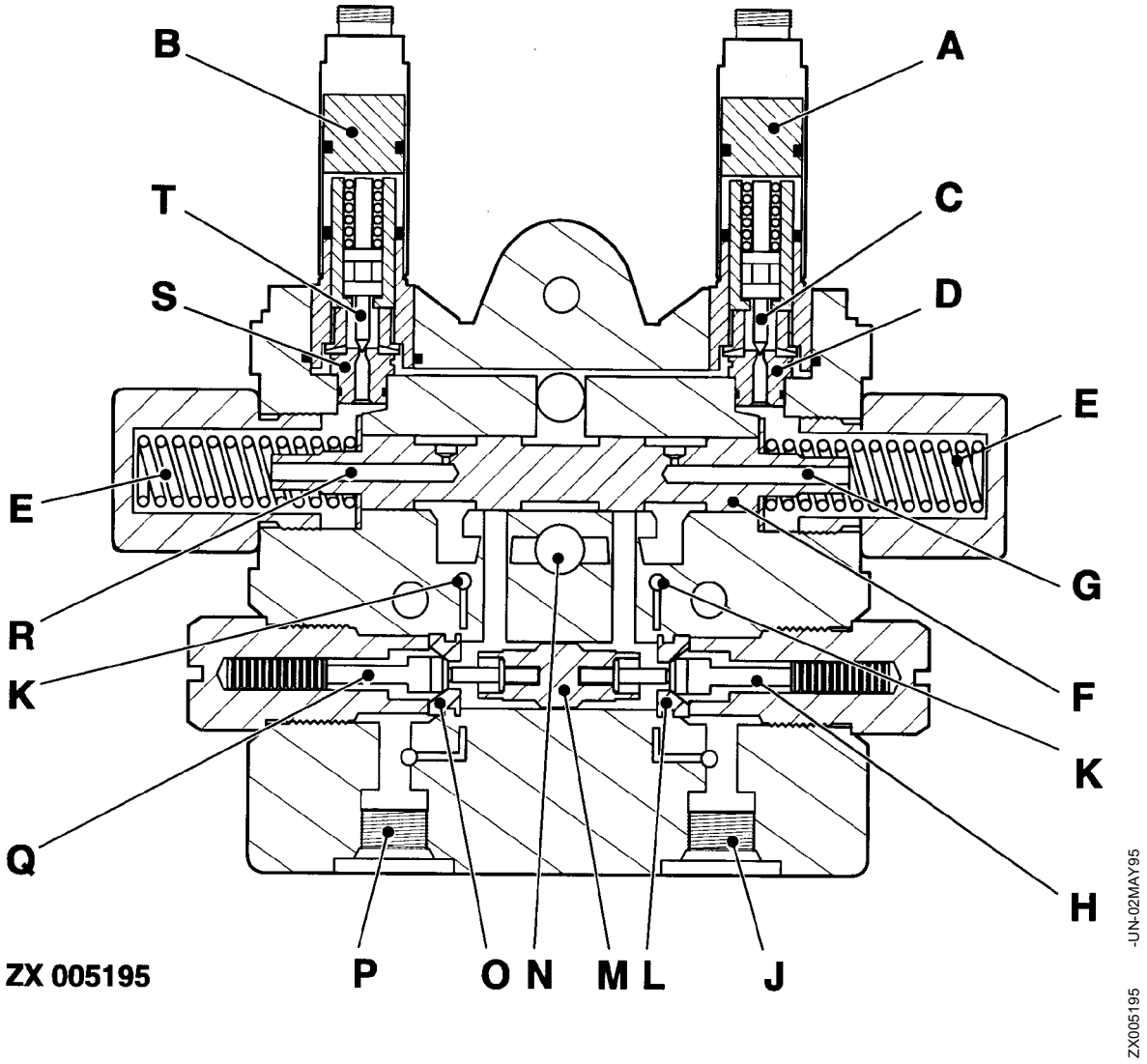
Disassemble solenoid valve plate.

Check needle valve seats for restriction.

Replace damaged parts.

ZX,TMXZCO003039-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR HEADER LATERAL TILT



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Oil passage
H—Check valve
J—Pressure oil connection
K—Connection to pressure relief plate
L—Check valve seat
M—Check valve control plunger
N—Return oil passage
O—Check valve seat
P—Pressure oil connection
Q—Check valve
R—Oil passage
S—Needle valve seat
T—Needle valve

Disassemble solenoid valve plate.

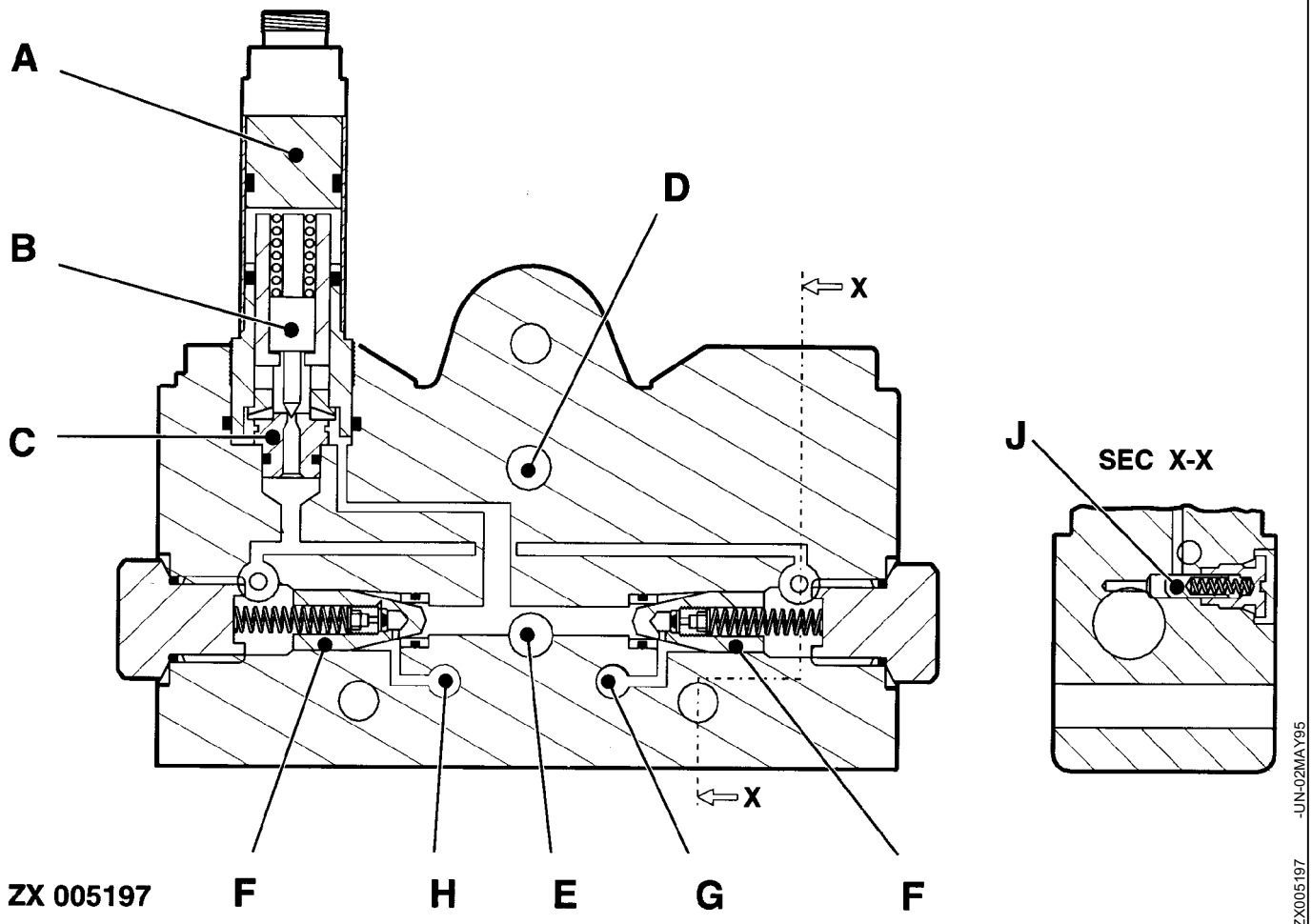
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced by new ones.

ZX,TMXZCO003040-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR PRESSURE RELIEF (HEADER LATERAL TILT)



A—Solenoid
B—Needle valve
C—Needle valve seat
D—Pressure oil passage
E—Return oil passage
F—Control plunger
G—Connection to hydraulic cylinder
H—Connection to hydraulic cylinder
J—Check valve

Disassemble solenoid valve plate.

Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced by new ones.

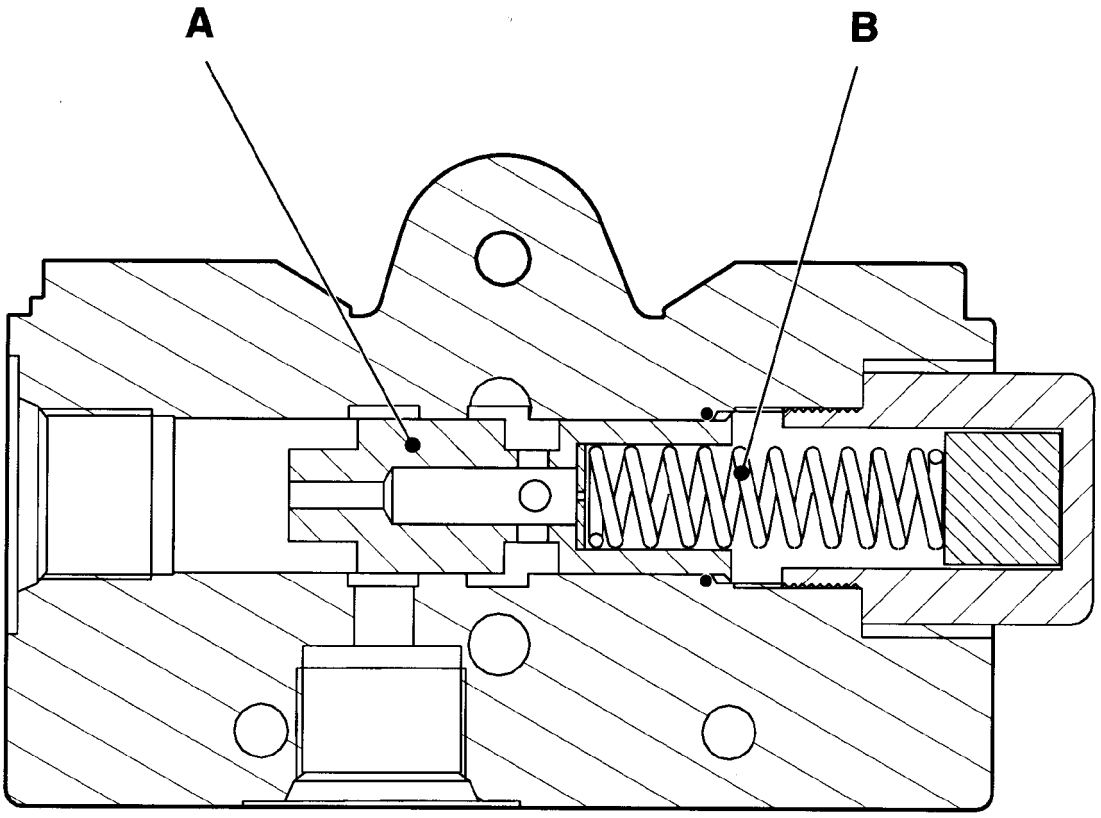
ZX,TMXZCO003041-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR VARIABLE FEEDER HOUSE DRIVE

NOTE: The solenoid valve plate for variable feeder house drive is identical with the solenoid valve plate for reel lift (refer to information given in this Group).

ZX,TMXZCO003042-19-18NOV93

REPAIR FLOW DIVIDER



ZX005200 -UN-02MAY95

ZX 005200

Remove cap from housing. Take piston (A) and spring (B) out of valve plate.

Check all bores for restriction.

Replace damaged parts.

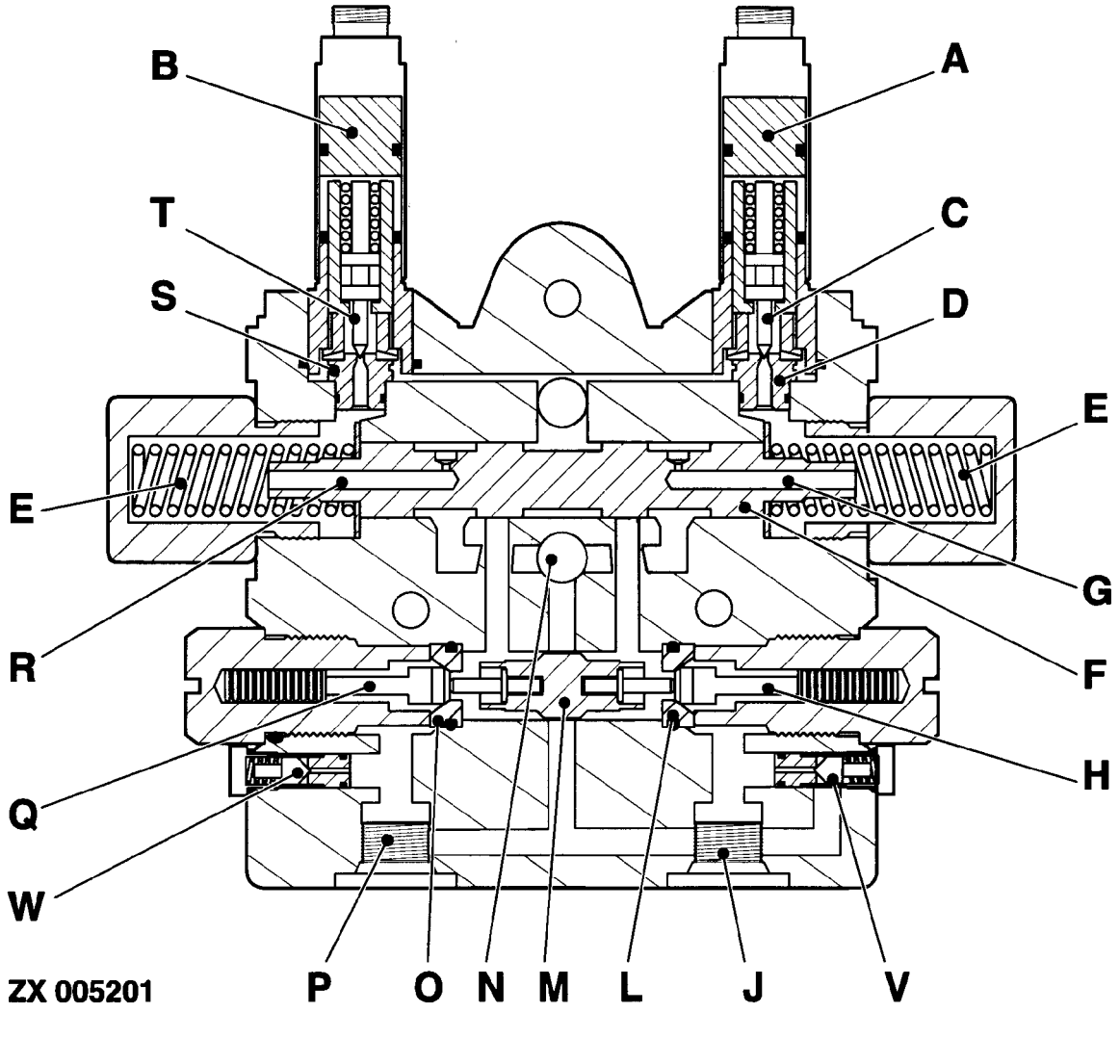
ZX,TMXZCO003043-19-18NOV93

REPAIR PRESSURE VALVE

NOTE: The pressure valve of Hillmaster combines is almost identical with the pressure valve of standard combines. The only difference is that no check valve is installed. When ordered as spare part, the valve plate is supplied with a check valve.

ZX,TMXZCO003044-19-18NOV93

REPAIR SOLENOID VALVE PLATE FOR HILLMASTER CONTROL



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Oil passage
H—Check valve
J—Pressure oil connection
L—Check valve seat
M—Check valve control plunger
N—Return oil passage
O—Check valve seat
P—Pressure oil connection
Q—Check valve
R—Oil passage
S—Needle valve seat
T—Needle valve
V—Thermal relief valve
W—Thermal relief valve

Disassemble solenoid valve plate.

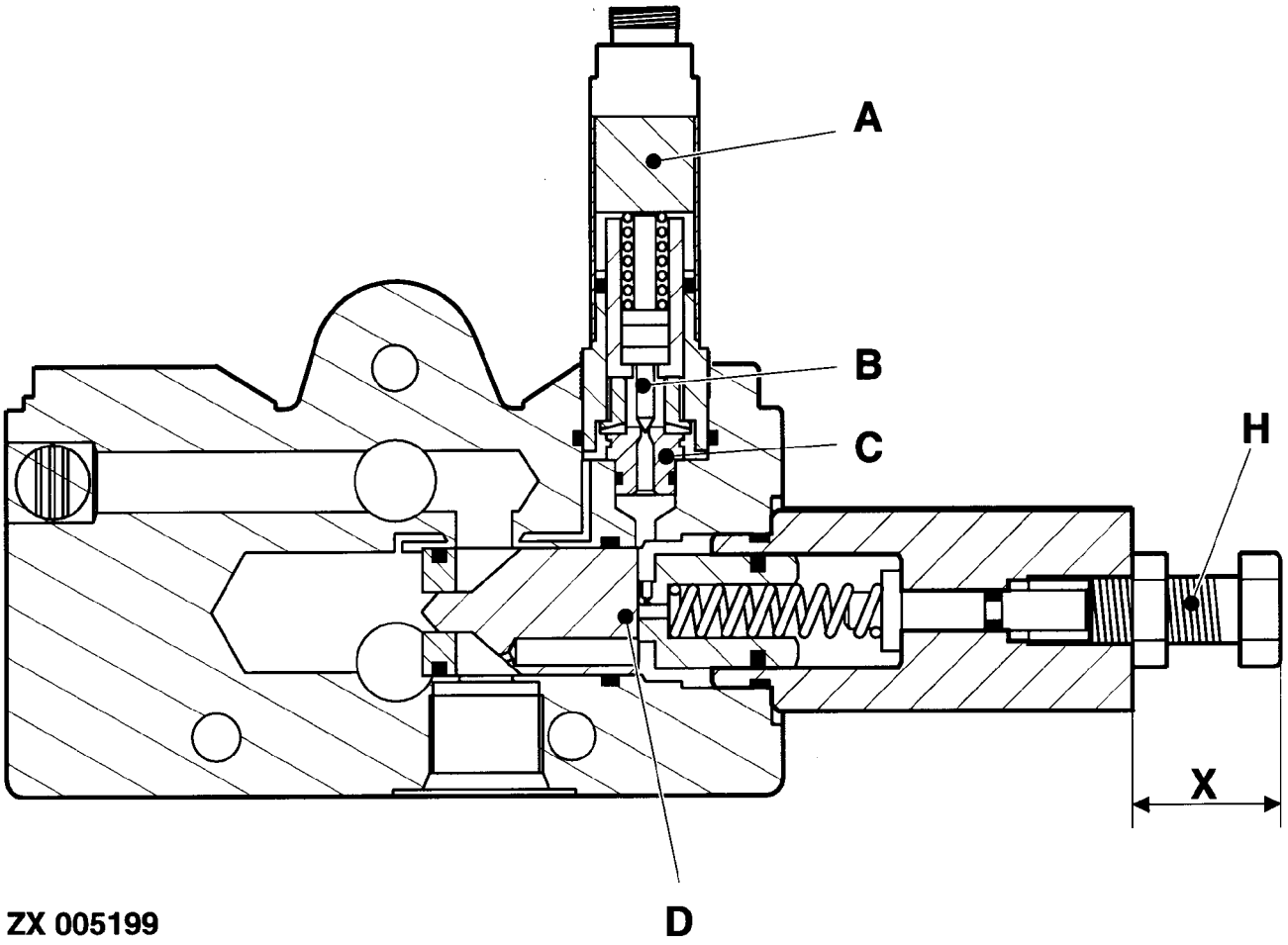
Check all bores, orifices and valve seats for restriction.

Replace damaged parts.

Once removed, seals must be replaced by new ones.

ZX,TMXZCO003045-19-18NOV93

REPAIR RATE-OF-DROP SOLENOID VALVE PLATE



A—Solenoid
B—Needle valve
C—Needle valve seat
D—Control plunger
H—Rate-of-drop adjusting screw
X—Adjusting dimension

Disassemble solenoid valve plate.

Check all bores, orifices and needle valve seats for restriction.

Replace damaged parts.

ZX,TMXZCO003046-19-18NOV93

GENERAL INFORMATION

A. Damage to the Piston Rod

Watch out for the following:

- Piston rods must not be subject to mechanical damage, such as dents.

- Prevent ice from forming on the running surface, as ice can damage the wiper ring.

- Piston rods must not be washed with acidic solutions or cleaning solutions that adversely affect chrome.

- Piston rods that are exposed to the elements when extended must be treated with non-corrosive grease if left inoperative for lengthy periods.

- Sticky dirt such as clay etc. must be carefully removed before the cylinder is operated.

Cylinders whose piston rods are extended but inaccessible must be actuated periodically.

B. Damage to Cylinder Barrels

- Never perform welding work on cylinder barrels. Cylinder barrels must never be subjected to thermal shocks (e.g. from welding rods etc.).

- Cylinder barrels must never be subjected to mechanical damage.

C. Mis-aligned Cylinders

Cylinders that are installed off-center and have no ball-and-socket joints are subject to dangerous lateral forces, which cause wear on the piston rod and guides. (An exception to this is cylinders built to withstand lateral forces).

ZX,TMXZCO006613-19-01AUG96

SPECIFICATIONS

Item	Measurement	Specification
Nut in cylinder for swinging out the unloading auger	Torque	114 ± 11 N·m (84 ± 8 lb-ft)
Nut in cylinder that controls the pivoting shield	Torque	114 ± 11 N·m (84 ± 8 lb-ft)

ZX,TMXZCO006623-19-01SEP96

DISASSEMBLY AND CHANGING THE SEALS

Using a blunt screwdriver, press axially against snap ring (A) and at the same time turn piston rod (B).

It should take about one turn before the snap ring jumps off the piston rod.

Turn the piston rod in the direction of the arrow.

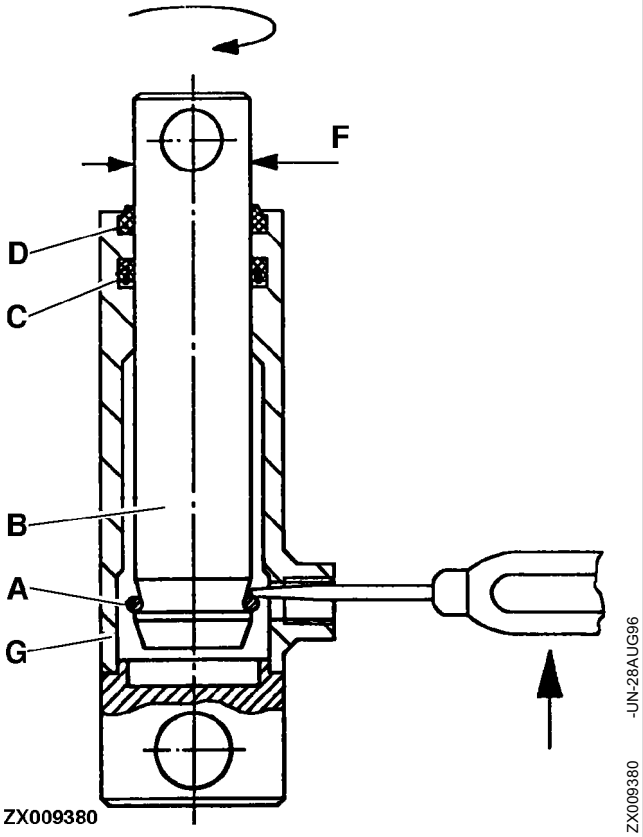
Use a blunt inscribing tool to extract grooved ring (C).

Once the piston rod is removed, wiper ring (D) can be removed easily from the groove.

Fold the new grooved ring (C) into a heart shape (E), leaving no sharp edges. Use snap ring pliers to hold the grooved ring together and push it in through bore (F). It will expand to fill the groove.

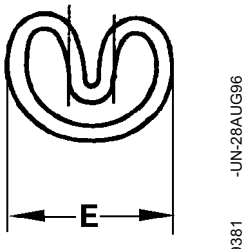
Install new wiper ring (D) in the wiper ring groove.

A—Snap ring
B—Piston rod
C—Grooved ring
D—Wiper ring
E—Grooved ring in “heart” shape
F—Piston rod bore
G—Cylinder barrel



ZX009380

ZX009380 -UN-28AUG96



ZX009381

ZX009381 -UN-28AUG96

ZX,TMXZCO006614-19-01AUG96

ASSEMBLING THE PISTON

Place snap ring (B) on piston rod (C) and slide the piston rod into cylinder (A).

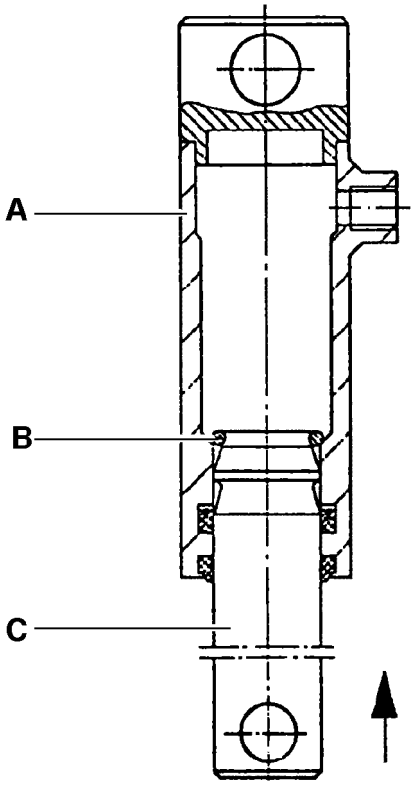
As shown by the arrow, insert the piston as far as it will go.

Place the end of the piston rod on a wooden surface and strike the end of the cylinder barrel once with a hammer. The blow should be brief but hard.

This causes the snap ring to jump into the snap ring groove.

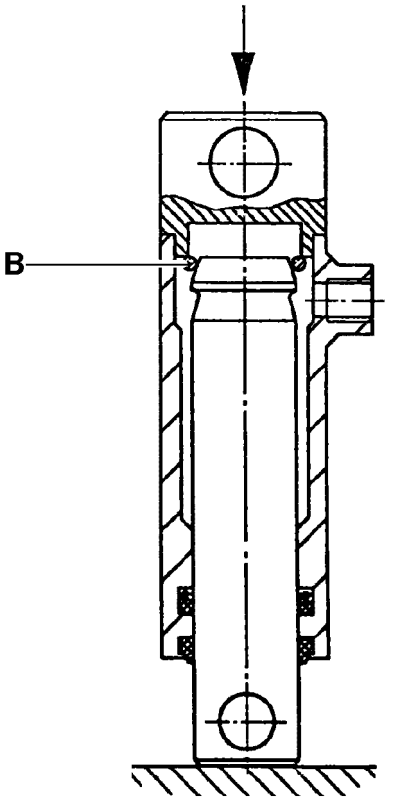
Look through disassembly hole to check that the snap ring is in its proper position.

A—Cylinder
B—Snap ring
C—Piston rod



ZX009382 -UN-28AUG96

ZX009382

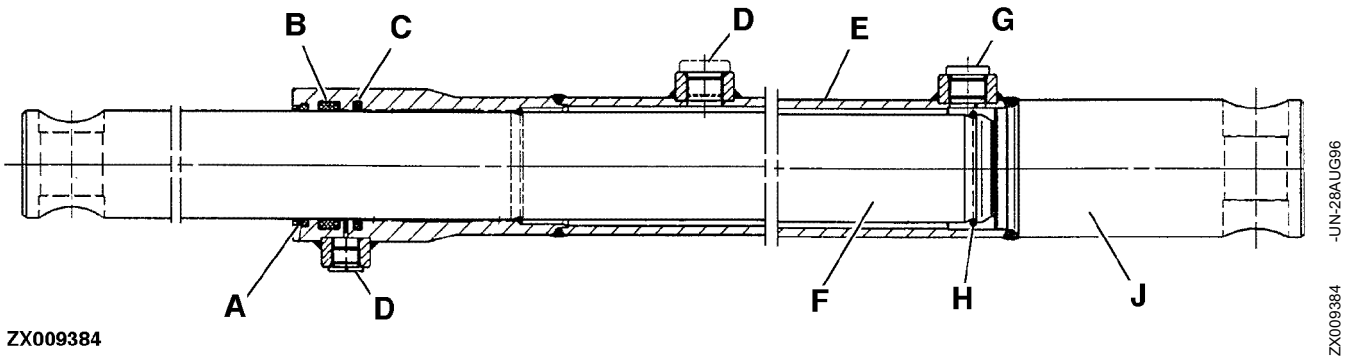


ZX009383 -UN-28AUG96

ZX009383

ZX,TMXZCO006615-19-01AUG96

CYLINDER FOR RAISING HEADER



A—Wiper ring
B—Grooved ring
C—Rod seal
D—Plug with O-ring
E—Cylinder barrel
F—Piston rod
G—Hose connection and disassembly hole
H—Snap ring
J—Cylinder base

Disassembly and Changing the Seals

Use a blunt screwdriver to press snap ring (H) down towards cylinder base (J).

Extract piston rod (F) from cylinder barrel (E).

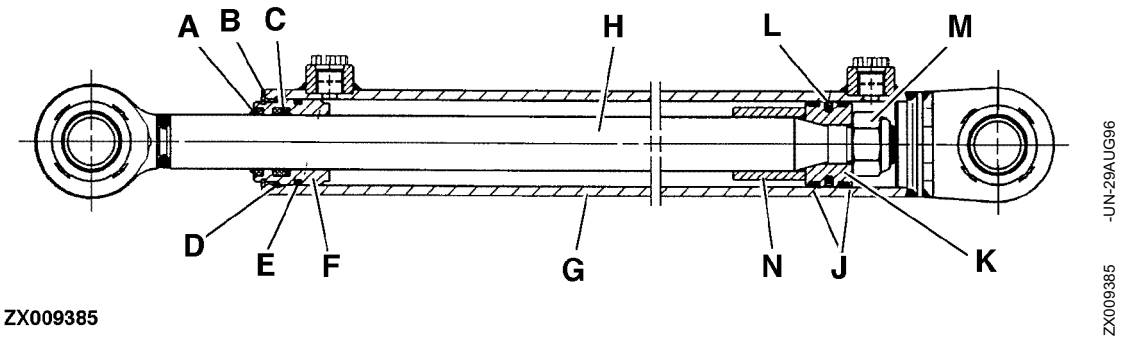
Use a blunt inscribing tool to remove all seals, and replace them with new ones.

IMPORTANT: Take care not to damage the base of the groove.

Assemble in reverse order.

ZX,TMXZCO006616-19-01SEP96

CYLINDER FOR SWINGING OUT THE UNLOADING AUGER



A—Wiper ring
B—Retaining ring
C—Grooved ring
D—Snap ring
E—O-ring
F—Guide
G—Cylinder barrel
H—Piston rod
J—Guide band
K—Piston
L—"Glyd" ring
M—Nut
N—Bushing

Disassembly and Changing the Seals

Use assembly pliers to remove retaining ring (B).

Push back guide (F) until snap ring (D) is exposed.

Use a blunt screwdriver to pry out snap ring (D).

Pull out piston rod (H) and piston (K).

If necessary, slacken nut (M) and take off piston (K).

Use a blunt inscribing tool to remove all seals, and replace them with new ones.

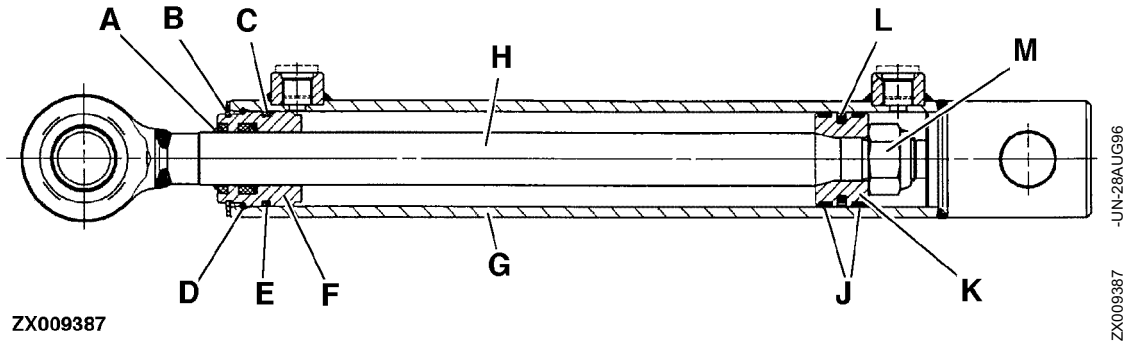
IMPORTANT: Take care not to damage the base of the groove.

Assemble in reverse order.

Tighten nut (M) to 114 ± 11 N·m (84 ± 8 lb-ft).

ZX,TMXZCO006617-19-01SEP96

PIVOTING SHIELD CONTROL CYLINDER



A—Wiper ring	D—Snap ring	G—Cylinder barrel	K—Piston
B—Retaining ring	E—O-ring	H—Piston rod	L—"Glyd" ring
C—Grooved ring	F—Guide	J—Guide band	M—Nut

Disassembly and Changing the Seals

Use assembly pliers to remove retaining ring (B).

Push back guide (F) until snap ring (D) is exposed.

Use a blunt screwdriver to pry out snap ring (D).

Pull out piston rod (H) and piston (K).

Slacken nut (M) and take off piston (K).

Use a blunt inscribing tool to remove all seals, and replace them with new ones.

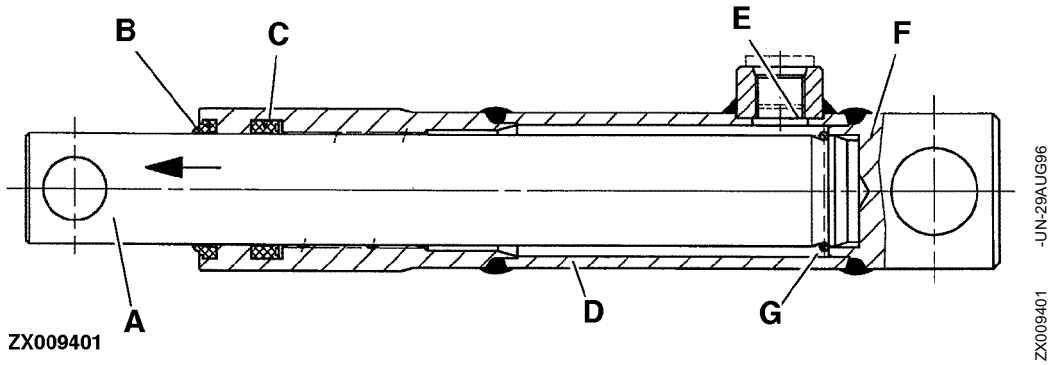
IMPORTANT: Take care not to damage the base of the groove.

Assemble in reverse order.

Tighten nut (M) to 114 ± 11 N·m (84 ± 8 lb-ft).

ZX,TMXZCO006618-19-01SEP96

BELT TENSIONING CYLINDER



A—Piston rod
B—Wiper ring
C—Grooved ring
D—Cylinder barrel
E—Disassembly hole
F—Cylinder base
G—Snap ring

Disassembly and Changing the Seals

Pull piston rod (A) in the direction of the arrow until snap ring (G) becomes visible in disassembly hole (E).

Insert a blunt screwdriver through disassembly hole (E) and press snap ring (G) down towards cylinder base (F).

Extract the piston rod from cylinder barrel (D).

Use a blunt inscribing tool to remove all sealing components.

IMPORTANT: Take care not to damage the base of the groove.

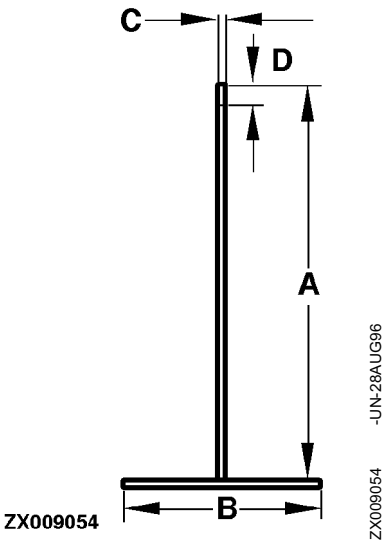
Assemble in reverse order.

ZX,TMXZCO006619-19-01AUG96

MAKING A SPECIAL TOOL

Tool for disassembling and assembling the valve seat and piston in the check valve.

A—200 mm (7.9 in.)
B—100 mm (4.0 in.)
C—Diameter 4 mm (0.16 in.)
D—M4 thread, 10 mm (0.4 in.)



ZX,TMXZCO006620-19-01AUG96

SPECIFICATIONS

Item	Measurement	Specification
Nut in hillmaster hydraulic cylinders	Torque	1400 ± 140 N·m (1033 ± 103 lb-ft)
Screw plug on check valve	Torque	130 ± 13 N·m (96 ± 10 lb-ft)

ZX,TMXZCO006621-19-01AUG96

OTHER MATERIALS

Number	Name	Use
TY9371	Loctite 270	Securing the guide in the hillmaster hydraulic cylinder

ZX,TMXZCO006767-19-01SEP96

GENERAL INFORMATION

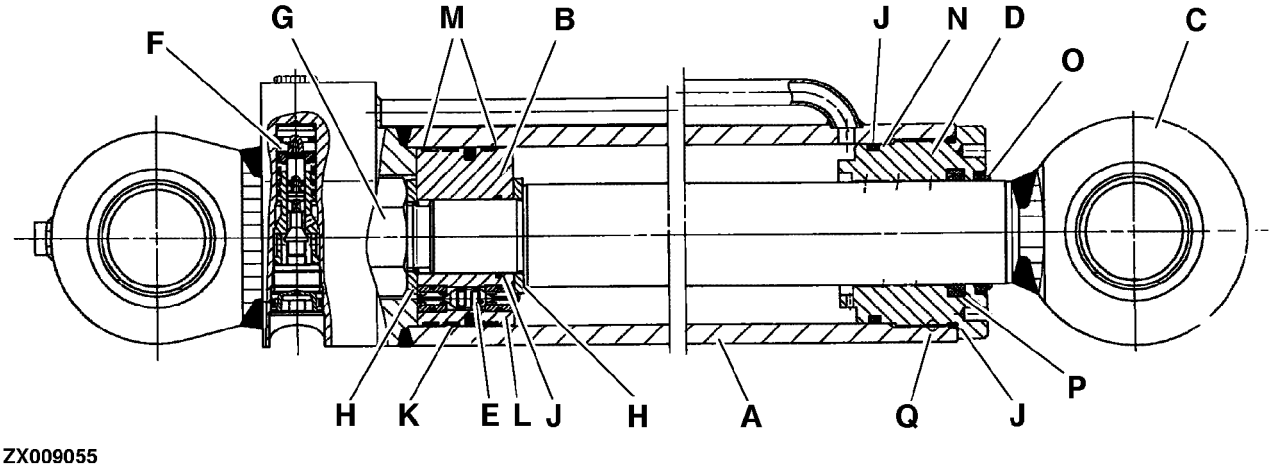
CAUTION: Never work on the hillmaster cylinders unless the combine harvester has already been lowered.

NOTE: Refer to Operator's Manual, "Operating With Hillmaster Levelling System".

CAUTION: Danger! Hillmaster cylinders weigh approx. 55 kg (121 lb).

ZX,TMXZCO006622-19-01AUG96

COMPONENTS OF HILLMASTER CYLINDER



A—Cylinder barrel
B—Piston
C—Piston rod
D—Guide
E—Compensating valve
F—Check valve
G—Nut
H—Washer
J—O-ring
K—Guide ring
L—"Glyd" ring
M—Guide band
N—Spiral back-up ring
O—Wiper ring
P—Grooved ring
Q—Secure with Loctite

Disassembly and Changing the Seals

Heat the area of the cylinder around the thread on guide (D) to a temperature of at least 300˚C (572˚F), break the Loctite seal and use assembly pliers to unscrew guide (D).

Pull out piston rod (C) and piston (B).

Remove nut (G), washers (H), piston (B) and guide (D) from the piston rod.

Use a blunt inscribing tool to remove all seals, and replace them with new ones.

IMPORTANT: Take care not to damage the base of the groove.

Assemble the cylinder in reverse order.

Tighten nut (G) to 1400 ± 140 N·m (1033 ± 130 lb-ft).

Apply Loctite 270 (TY9371) to the thread of guide (D) before inserting and tightening the guide.

ZX,TMXZCO006624-19-01SEP96

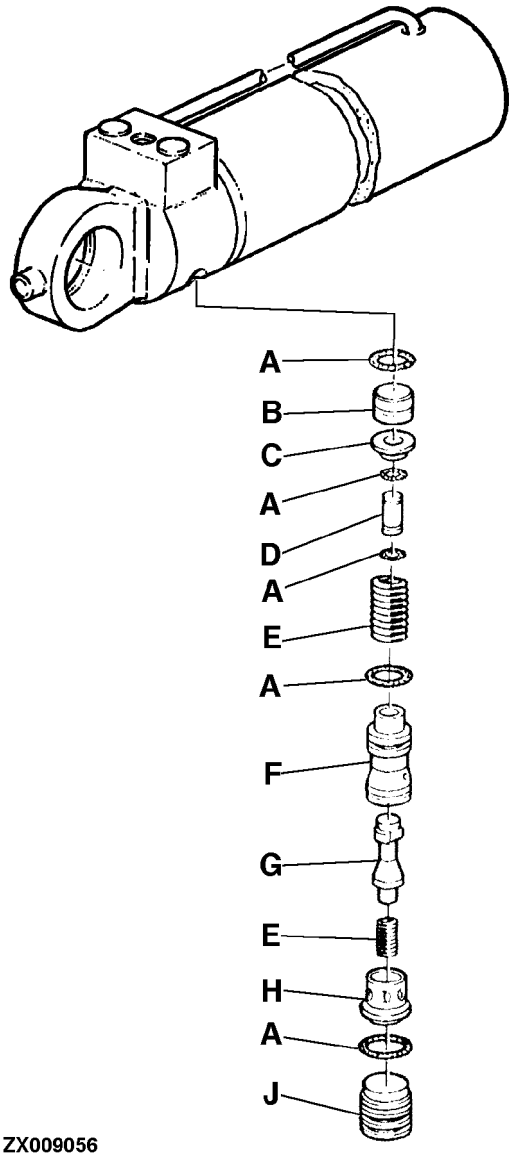
CHECK VALVE COMPONENTS

Removing the Check Valve

Use a hex. socket wrench with a width across flats of 17 mm to take out screw plug (J).

One after the other, remove spring (E), sleeve (H) and valve cone (G).

A—O-ring
B—Piston
C—Bushing
D—Pin
E—Spring
F—Valve seat
G—Valve cone
H—Sleeve
J—Screw plug



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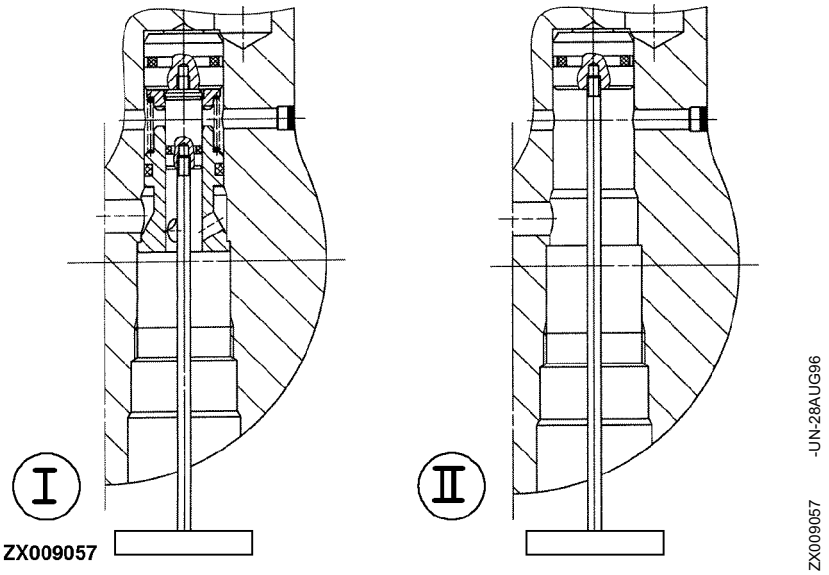


Removing the Check Valve (Continued)

Screw the (self-manufactured) disassembly tool into pin (D; refer to “Check Valve Components”).

Pulling on the disassembly tool (fig. I) releases the valve seat (F) and allows spring (E), bushing (C) and pin (D) to be removed.

Now screw the disassembly tool (fig. II) into piston (B), and pull out the piston.

Refer to “Check Valve Components” for the identifying letters.

Use a blunt inscribing tool to remove all seal rings, and replace them with new ones.

IMPORTANT: Take care not to damage the base of the groove.

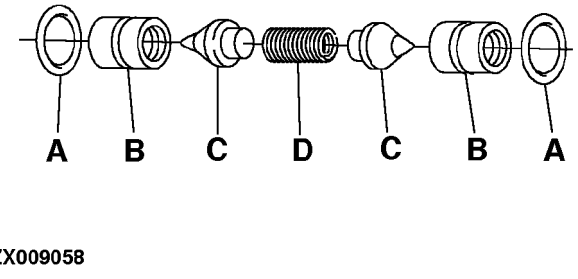
Assemble in reverse order.

Tighten screw plug (J) to 130 ± 13 N·m (96 ± 10 lb-ft).

ZX,TMXZCO006626-19-01SEP96

COMPONENTS OF COMPENSATING VALVE

A—O-ring
B—Valve seat
C—Valve cone
D—Spring

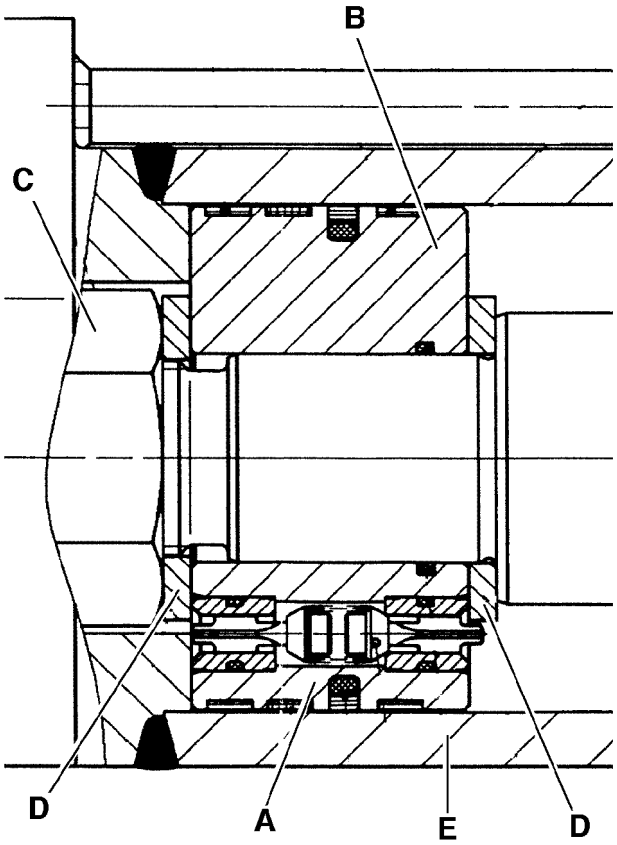


ZX009058

ZX,TMXZCO006627-19-01AUG96

COMPENSATING VALVE INSTALLED IN PISTON

A—Compensating valve assembly
B—Piston
C—Nut
D—Washer
E—Cylinder barrel

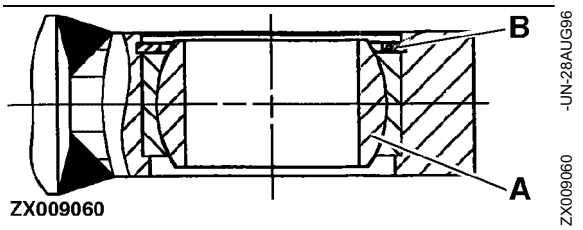


ZX,TMXZCO006628-19-01AUG96

ATTACHMENT OF HILLMASTER CYLINDER

The ball-and-socket joint is maintenance-free.

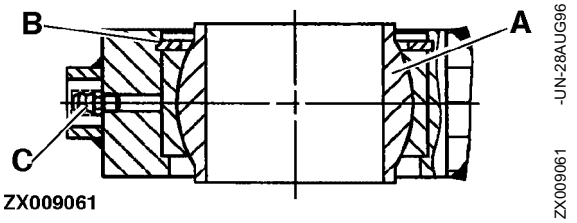
A—Ball-and-socket joint on piston rod
B—Retaining ring



ZX,TMXZCO006629-19-01AUG96

The ball-and-socket joint must be lubricated via the grease fitting. Lubricate every 50 hours.

A—Ball-and-socket joint on base
B—Retaining ring
C—Grease fitting



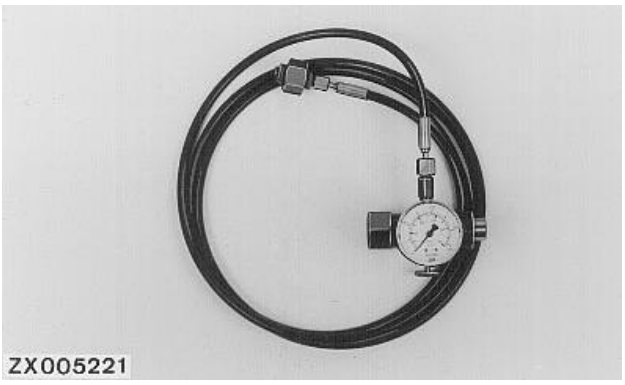
ZX,TMXZCO006630-19-01AUG96

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Accumulator charging and testing device FKM10448

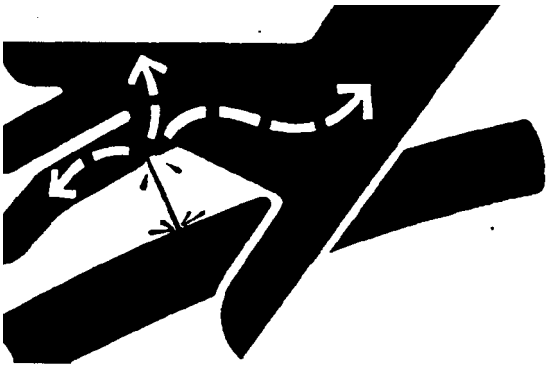


-UN-24APR95
ZX005221

ZX,TMXZCO003126-19-03JAN94

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



-UN-23AUG88
X9811

DX,FLUID2 -19-09AUG91

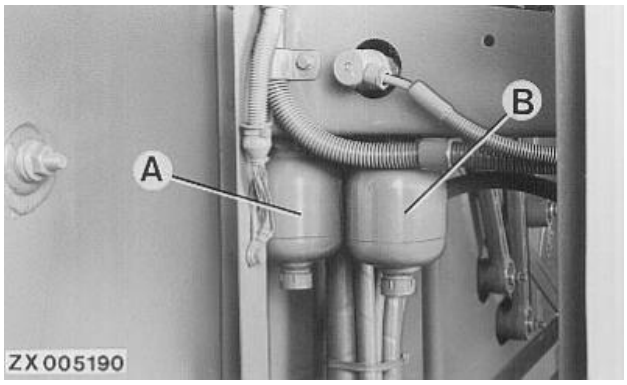
MAIN DRIVE/UNLOADING SYSTEM ACCUMULATORS

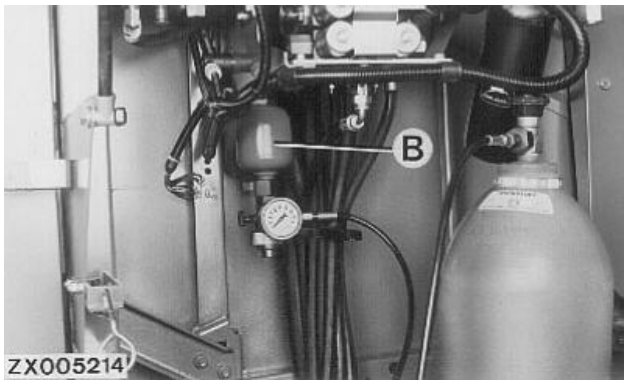
The unloading system accumulators have a capacity of 0,35 L (0.09 US.gal.) and are precharged with nitrogen under a pressure of 3800 kPa (38 bar) (550 psi).

NOTE: Before connecting testing device FKM10448 to accumulator, slightly loosen accumulator hex. socket screw. This will avoid damage to the testing device when accumulator is opened.

For checking accumulator (A), connect testing device FKM10448 to accumulator (A). For checking accumulator (B), connect testing device FKM10448 to accumulator (B).

A—Accumulator, main drive
B—Accumulator, main drive/unloading system



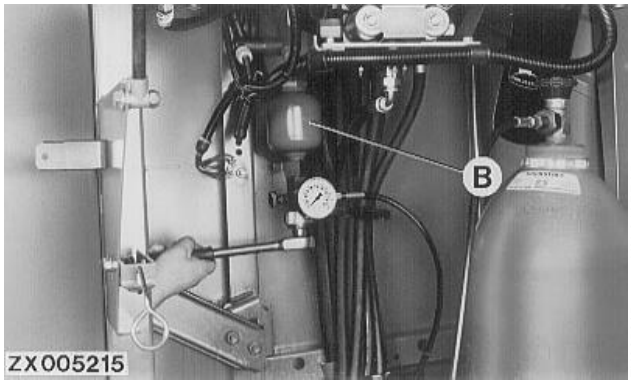


ZX,TMXZCO003028-19-03JAN94

NOTE: Before checking accumulator (B), engage and disengage main clutch several times with engine shut off, starter switch in position II and road safety switch in field position to relieve hydraulic pressure.

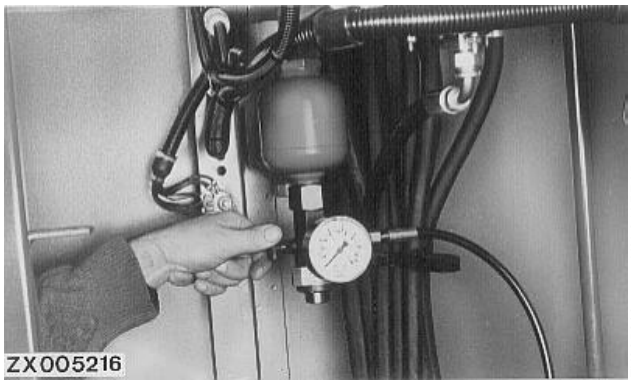
Use a ratchet on testing device to open accumulator valve.

Accumulator charging pressure is indicated by the pressure gauge. If charging pressure is too low, the accumulator must be charged with nitrogen.



ZX,TMXZCO003128-19-03JAN94

The accumulator may be charged by loosening knurled screw. If the accumulator is not connected to an external nitrogen source (under pressure), pressure is reduced by opening knurled screw.



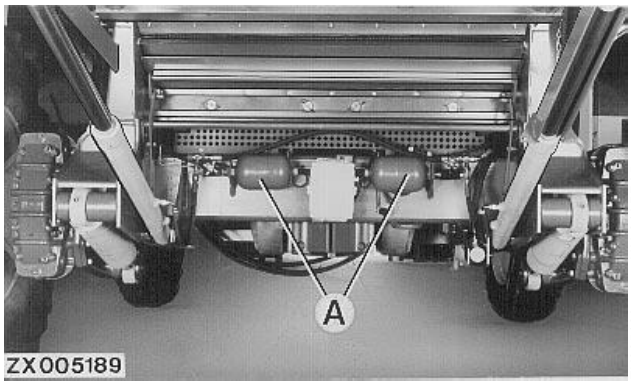
ZX,TMXZCO003129-19-03JAN94

HEADER FLOAT SYSTEM ACCUMULATOR

The combines are equipped with one or two accumulator(s). Accumulator capacity is 2 L (0.53 US.gal).

Accumulator charging pressure depends on weight of header and lift cylinder diameter.

A—Accumulator



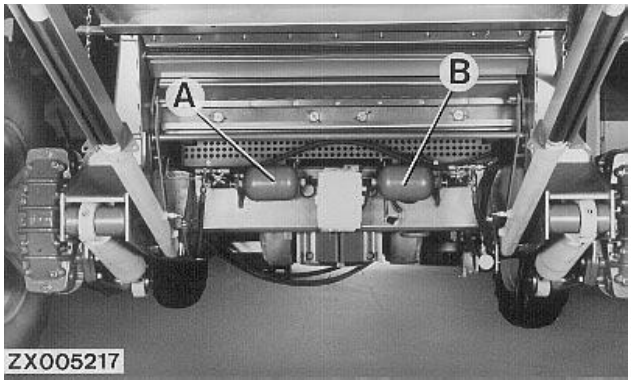
ZX,TMXZCO003029-19-03JAN94

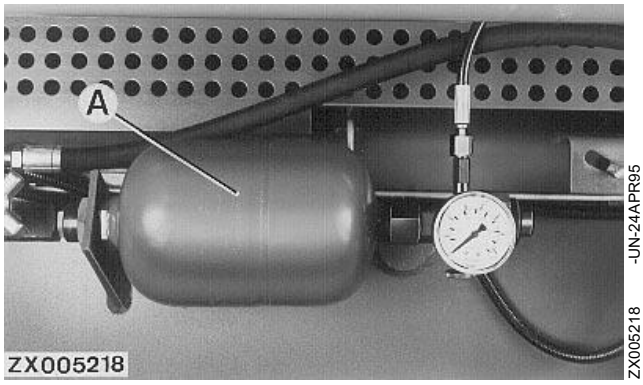
CHECKING HEADER FLOAT SYSTEM ACCUMULATOR(S)

NOTE: Before connecting testing device FKM10448 to accumulator, slightly loosen accumulator hex. socket screw. This will avoid damage to the testing device when accumulator is opened.

For checking accumulator (A), connect testing device FKM10448 to accumulator (A). For checking accumulator (B), connect testing device FKM10448 to accumulator (B).

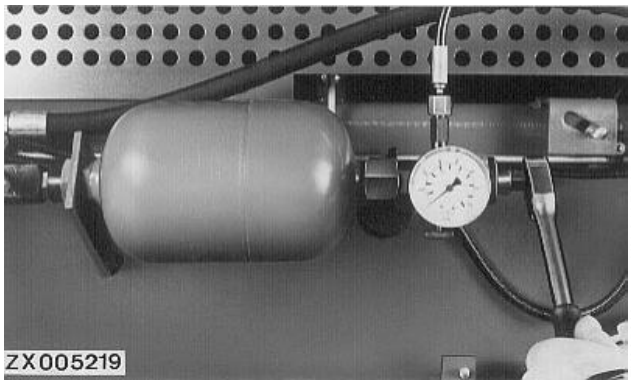
Relieve pressure in hydraulic line to header lift cylinders by actuating switch for lowering header.





ZX,TMXZCO003131-19-03JAN94

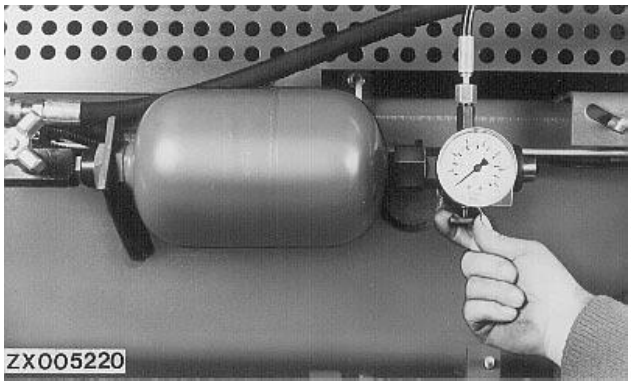
Use a ratchet on testing device to open accumulator valve. Accumulator charging pressure is indicated by the pressure gauge. If charging pressure is too low, the accumulator must be charged with nitrogen.



ZX,TMXZCO003133-19-03JAN94

The accumulator may be charged by loosening knurled screw. If the accumulator is not connected to an external nitrogen source (under pressure), pressure is reduced by opening knurled screw.

Adjust charging pressure according to the following table.



ZX,TMXZCO003134-19-03JAN94

CHARGING PRESSURES OF HEADER FLOAT SYSTEM ACCUMULATOR(S)

14’	6000 kPa (60 bar; 870 psi)
16’	6500 kPa (65 bar; 940 psi)
18’	7000 kPa (70 bar; 1015 psi)
20’	8000 kPa (80 bar; 1160 psi)
25’	9000 kPa (90 bar; 1300 psi)

The pressures given in the table apply to machines with standard feeder house and standard cutting platforms with a lift cylinder diameter of 55 mm.

For machines equipped with 60 mm dia. lift cylinders, subtract 1000 kPa (10 bar; 150 psi) from the values given.

For machines with Hillmaster feeder house (header lateral tilt), add 1000 kPa (10 bar; 150 psi) to the values given.

When cutting platforms with Hardox plates are used, add 1000 kPa (10 bar; 150 psi) to the values given.

When several of the points mentioned above apply to a certain machine, add or subtract the corresponding values as necessary.

ZX,TMXZCO003130-19-03JAN94

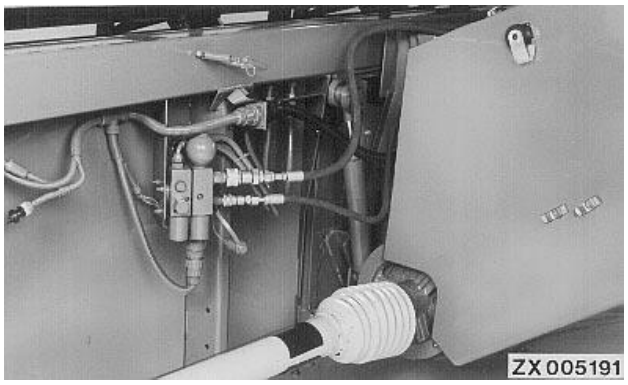
HEADER ACCUMULATOR

An accumulator is integrated in the header hydraulic system lines. With header detached, it prevents an excessive pressure build-up caused by solar radiation.

Accumulator capacity is 75 cm^3 (4.6 cu.in.) and is precharged with a pressure of 500 kPa (5 bar; 70 psi).

The accumulator is maintenance-free and cannot be repaired.

IMPORTANT: Before removing accumulator, relieve pressure in hydraulic system.



ZX,TMXZCO003047-19-18NOV93

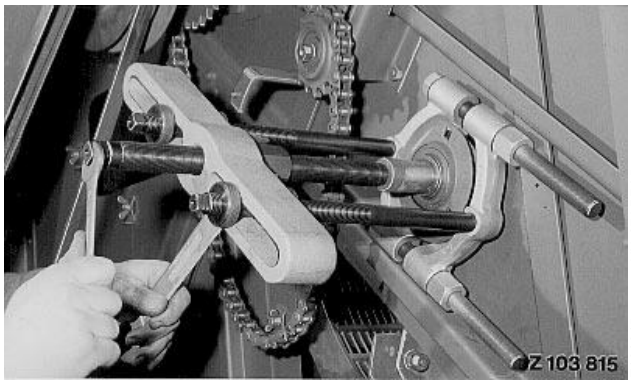
Section 80
Miscellaneous

Contents

REMOVING CLAMPING RING BEARINGS

Use a commercial puller to remove ball bearings from cylinder or beater shafts.

Use a puller combination, as shown, if bearings are hard to remove.



ZX,TMXZCO002707-19-13MAY93

REPAIRING CLAMPING RING BEARINGS

Check if bearings are in good condition. Replace, if necessary.

ZX,TMXZCO002708-19-13MAY93

INSTALLING CLAMPING RING BEARINGS WITH SHEET METAL HOUSING (EXAMPLE)

1. Guide one flange half over the shaft and align with corresponding holes.

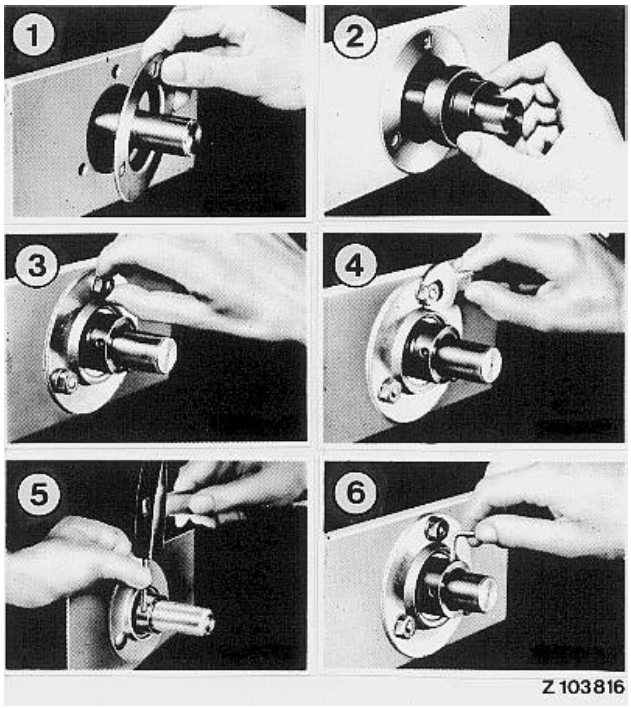
2. Install bearing with clamping ring on shaft.

3. Assemble other flange half, install attaching screws and tighten finger tight. Repeat procedure on other end of shaft.

4. Firmly tighten attaching screws at both ends.

5. Tighten clamping ring by turning it in rotating direction of shaft. Stake ring with a punch.

6. Lock clamping ring with a setscrew.

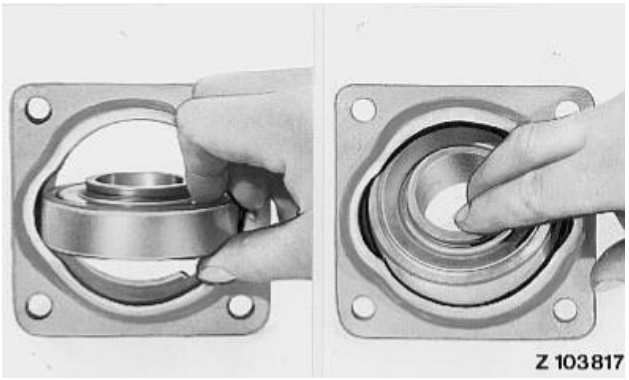


ZX,TMXZCO002709-19-13MAY93

INSTALLING CLAMPING RING BEARINGS WITH CAST IRON HOUSINGS

Preassembling Clamping Ring Bearings

Insert bearing into cast iron housing as shown in illustration.



-UN-27APR95 Z103817

ZX,TMXZCO002710-19-13MAY93

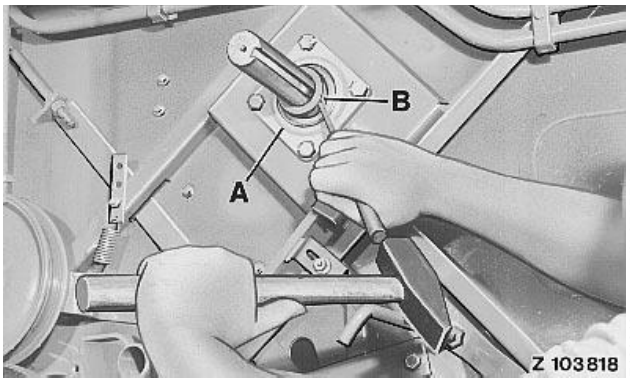
Installing Clamping Ring Bearings

Slide preassembled clamping ring bearings on both ends of shaft.

Secure cast iron housing (A) on both sides with attaching screws.

Tighten clamping ring (B) in direction of shaft rotation and stake with a punch.

Lock clamping ring (B) with a setscrew.



-UN-27APR95 Z103818

ZX,TMXZCO002711-19-13MAY93

SHEAVE INSPECTION

Before replacing a belt, always check all sheaves for chips, cracks, bent sidewalls, rust, corrosion etc.

Sheaves must have a smooth dry surface to grip to deliver full power. Replace any defective sheaves.

ZX,TMXZCO002712-19-13MAY93

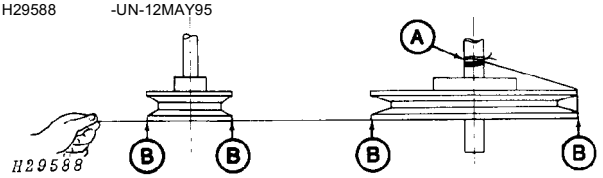
SHEAVE ALIGNMENT

Misaligned sheaves will result in reduced belt life. Use a straightedge or cord to check sheave alignment:

1. Position straightedge or cord to touch sheaves at indicated points. Shafts must be parallel.

2. Rotate each sheave a half revolution and note whether contact of either sheave with straightedge or cord is disturbed. If so, shaft is bent or the sheave wobbling.

H29588 -UN-12MAY95



A—Tie cord to shaft
B—Cord must touch sheaves at indicated points

ZX,TMXZCO002713-19-13MAY93

DRIVE CHAINS

Chain Tension

Check chains frequently for correct tension during the first several hours of operation.

The amount of slack in a chain should be approx. 2% of the distance between centers of drive and driven sprockets, with all slack removed on the tensioner sprocket side.

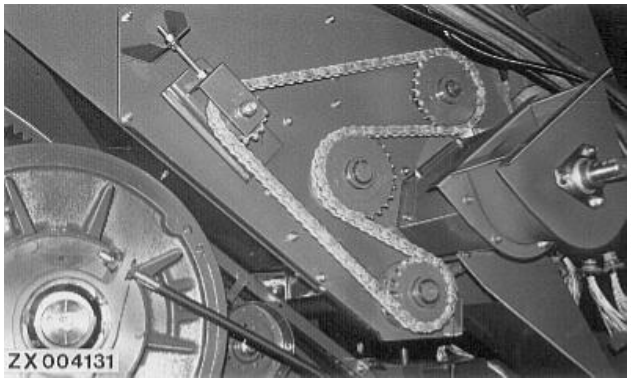
Example: If center distance between a drive and a driven sprocket is 250 mm (10 in.), slack should be 5 mm (0.2 in.).

Excessively loose chains will cause rapid and excessive wear of chain rollers, sprocket teeth and possibly chain-driven machine components.

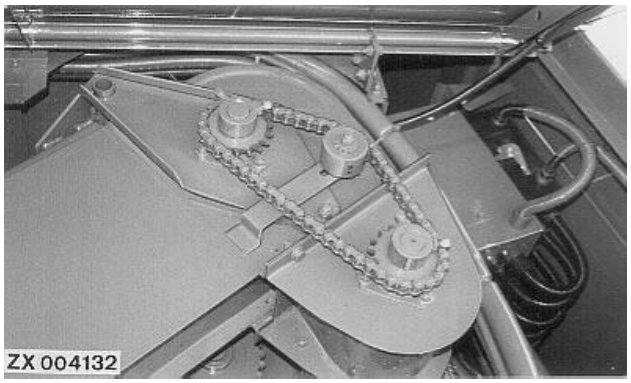
Excessively tight chains cause undue load on bearings, shafts and chains.

Chain Maintenance

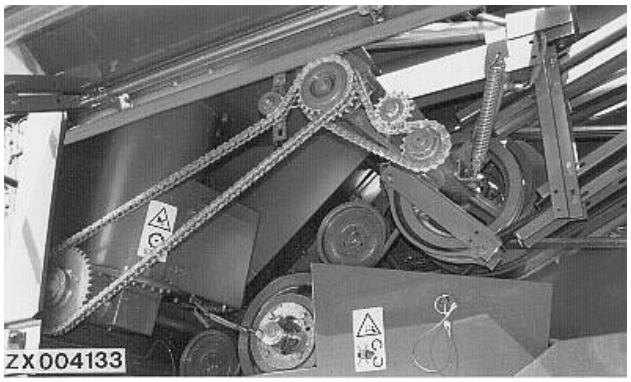
Grease or oil chains at regular intervals.



ZX004131 -UN-21APR95



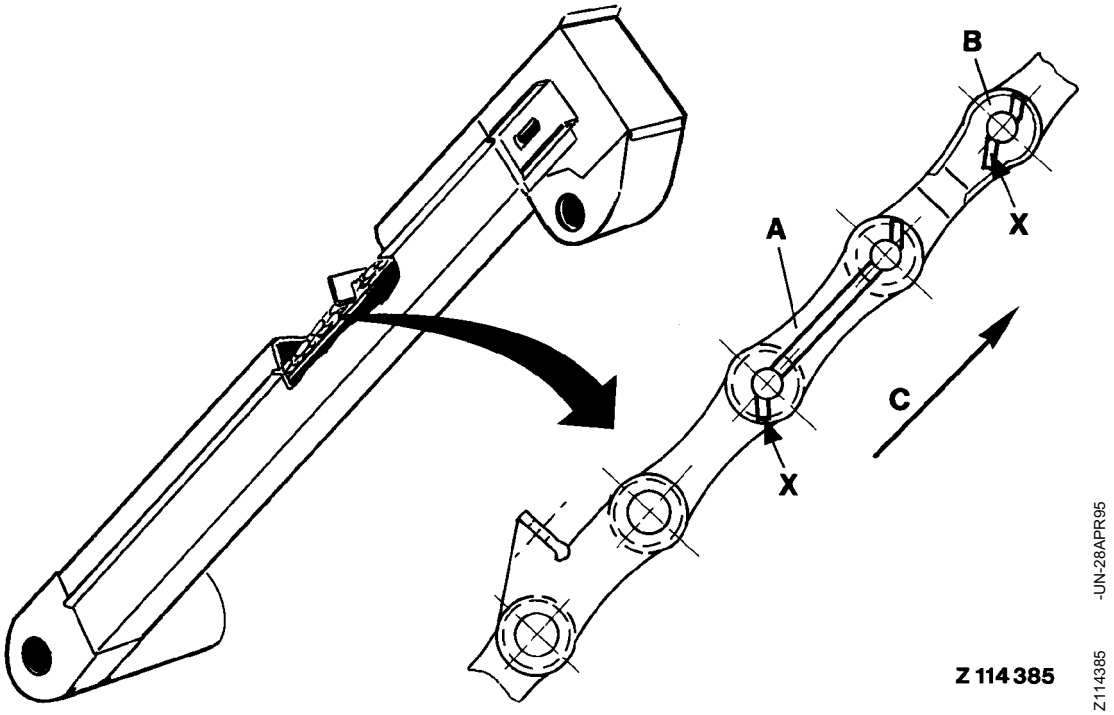
ZX004132 -UN-21APR95



ZX004133 -UN-21APR95

ZX,TMXZCO002714-19-13MAY93

SAFETY WIRES



A—Connecting link **B—Offset connecting link** **C—Chain travel direction** **X—Bend wire at this location as shown**

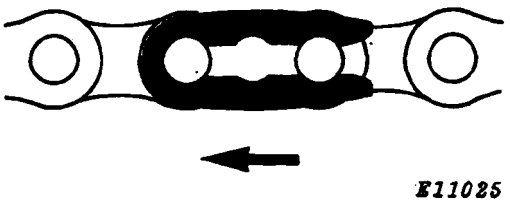
Install safety wire for conveyor chain with bent end facing upward and in direction of chain travel.

Bend other end as shown (see X).

ZX,TMXZCO002715-19-13MAY93

DRIVE CHAINS — CONNECTING LINK

Certain chains are connected with a connecting link as shown opposite. Always connect chain as shown with closed end of connecting link towards direction of chain travel.



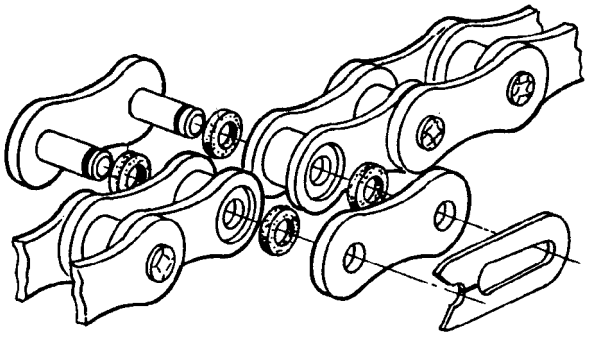
ZX,TMXZCO002716-19-13MAY93

CHAINS WITH O-RINGS

The drive chain may have O-rings and connecting link on some drives.

IMPORTANT: Do not repair drive chains with O-rings when installed (e.g. replacing pin link). Remove, install or repair these chains without opening them.

NOTE: When repairing chain, refer to the following steps.



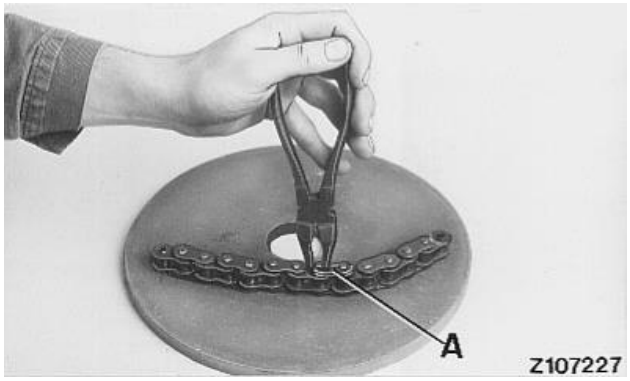
ZX,TMXZCO002717-19-13MAY93

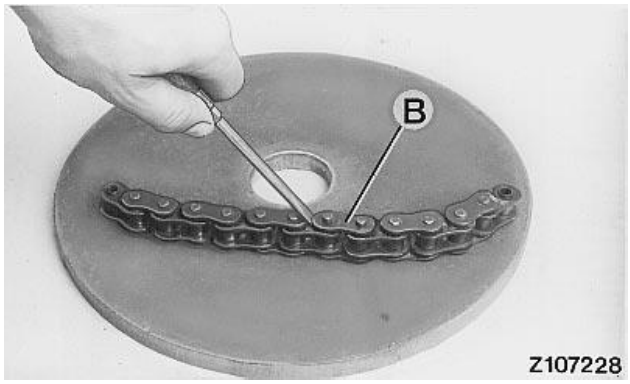
DISASSEMBLING CHAINS WITH O-RINGS

Use suitable pliers to remove connecting link (A) from pin link.

Remove link section (B) with a screwdriver.

A—Connecting link
B—Link section





ZX,TMXZCO002718-19-13MAY93

ASSEMBLING CHAINS WITH O-RINGS

Slide an O-ring on each pin of pin link against link.

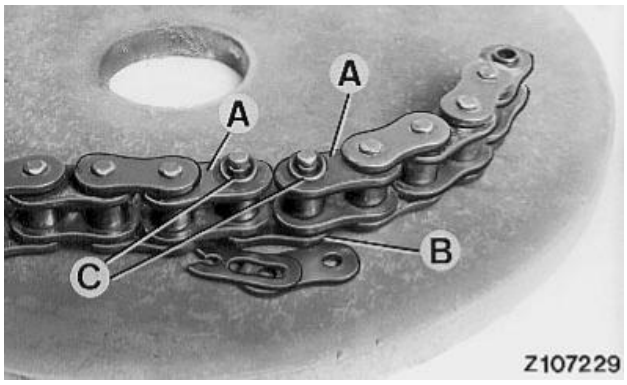
Lubricate bores and pins of pin link with John Deere chain spray or equivalent lubricant.

Insert pins of pin link (B) into both end links (A) of the chain.

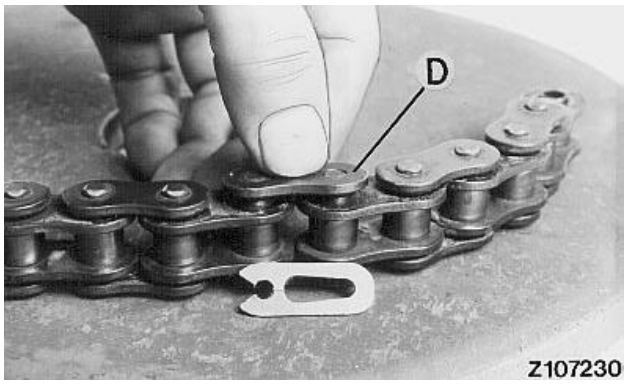
Slide the remaining two O-rings (C) on the pins.

Place link section (D) on the pins.

A—End links
B—Pin link
C—O-ring
D—Link section



-UN-27APR95
Z107229



-UN-27APR95
Z107230

ZX,TMXZCO002719-19-13MAY93

Use the hollow punch (A) (bore of punch must be slightly larger than diameter of link pin) to exert pressure on link section (B).

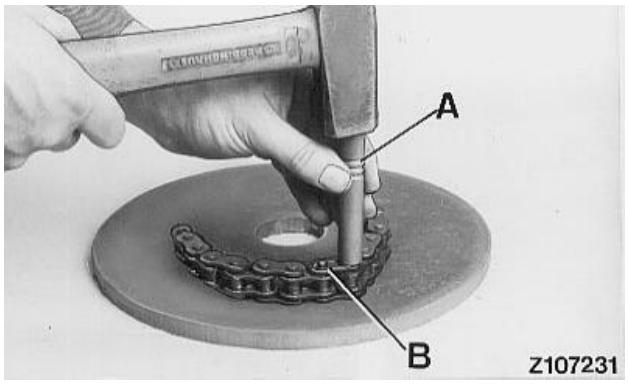
NOTE: Pin grooves of pin links must be exposed.

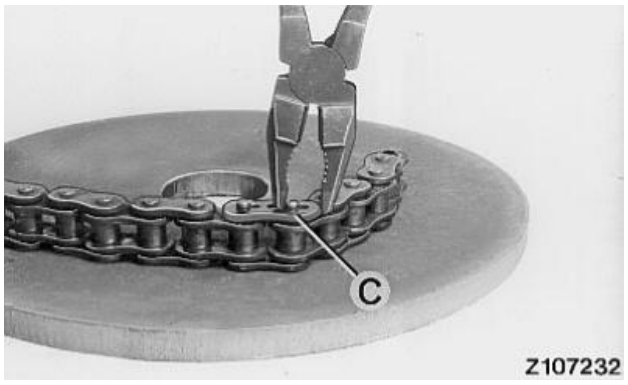
Using suitable pliers, slide connecting link (C) into pin grooves.

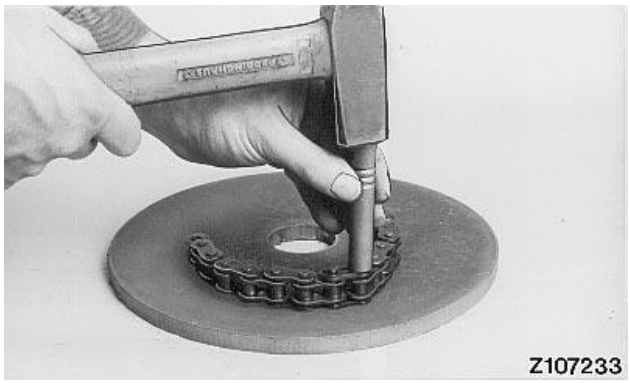
NOTE: Closed end of connecting link must point in direction of chain travel.

To make sure that the connecting link is seated correctly in the pin grooves use a hollow punch and a hammer to tap slightly on the connecting link. Install chain closed.

A—Hollow punch
B—Link section
C—Connecting link

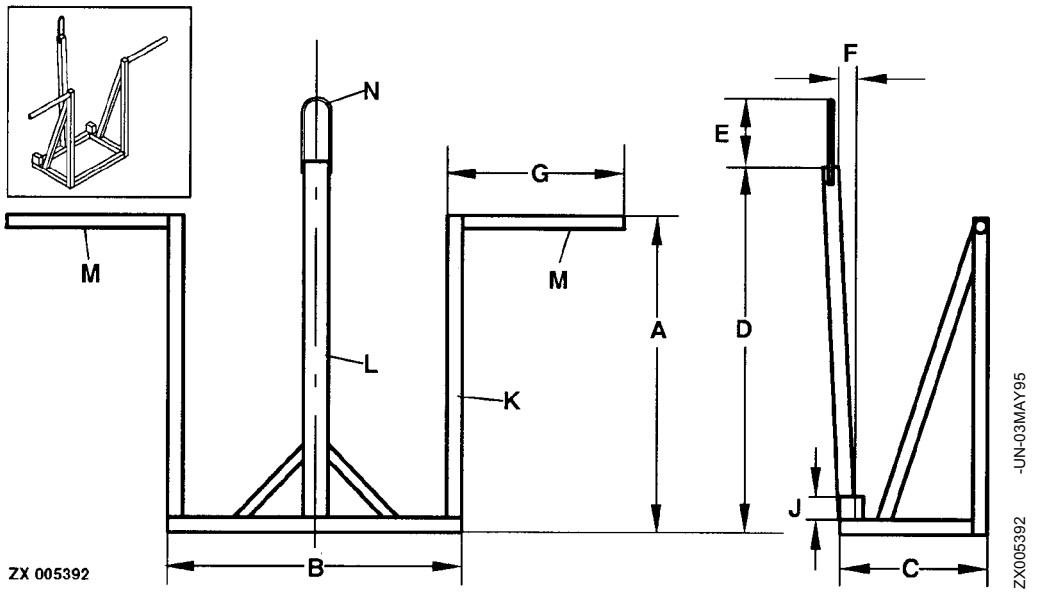






ZX,TMXZCO002720-19-13MAY93

REMOVAL AND INSTALLATION TOOL (SELF-MANUFACTURE)



A—1080 mm (42.52 in.)
B—1000 mm (39.37 in.)
C—500 mm (19.68 in.)
D—1260 mm (49.61 in.)
E—230 mm (9.05 in.)
F—30 mm (1.18 in.)
G—600 mm (23.62 in.)
J—80 mm (3.15 in.)
K—Length 50 mm (0.2 in.), Width 50 mm (0.2 in.)
L—Length 80 mm (0.3 in.), Width 50 mm (0.2 in.)
M—32 mm (1.26 in.)
N—12 mm (0.47 in.)

Device for holding large side guards during removal and installation

ZX,TMXZCO003991-19-15FEB95

REMOVING SIDE GUARD

CAUTION: Guard is heavy, weighing approx. 50 kg (110 lb.).

Disconnect electrical connection for side lights.

Open the guard and insert self-manufactured holding device (A).

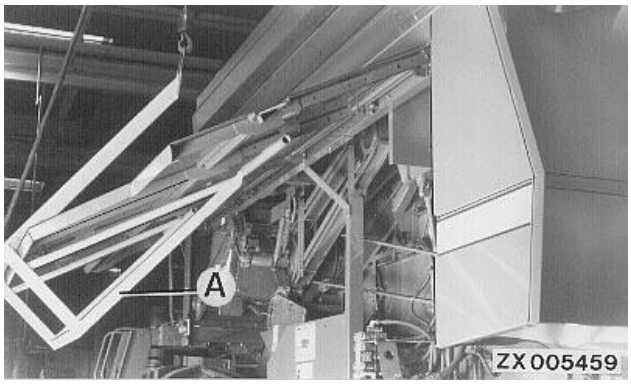
Disconnect support cylinder from guard.

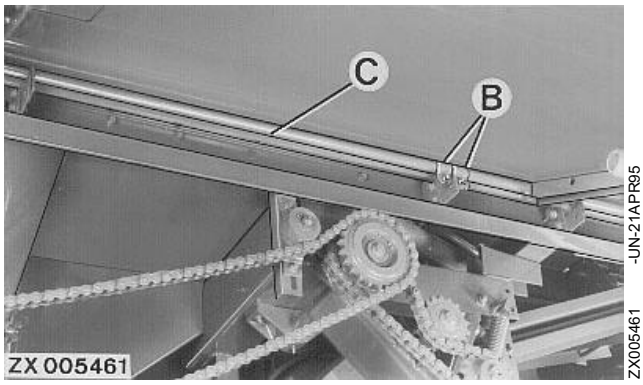
Use holding device to raise guard and gain easier access to the upper attachment points.

Take screws out of retaining lugs.

Slacken off clamps (B), which are used to adjust the guard.

Lift out the complete guard at tube (C), and swing it aside.





ZX,TMXZCO003992-19-15FEB95

INSTALLING SIDE GUARD

To install guard, follow removal procedure in reverse.

Once the guard is installed, align it correctly and adjust it using the clamps.

ZX,TMXZCO003993-19-15FEB95

Section 90
Operator's Cab and Air Conditioning

Contents

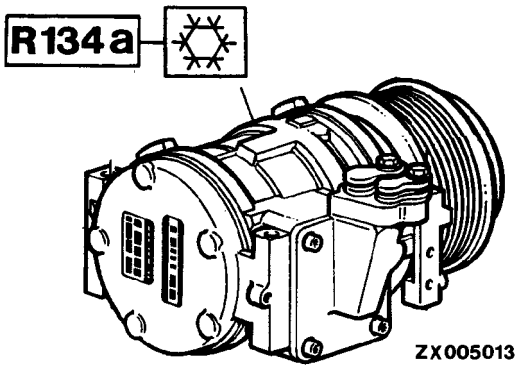
Page

GENERAL INFORMATION

The air conditioning system is filled with R134a refrigerant which does not contain CFC.

The R134a air conditioning system can be identified by the compressor.

IMPORTANT: Use only R134a refrigerant in this air conditioning system. When using R12 refrigerant, the entire system including the compressor will be damaged.



ZX005013 -UN-28APR95

ZX,TMXZCO003094-19-01DEC93

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

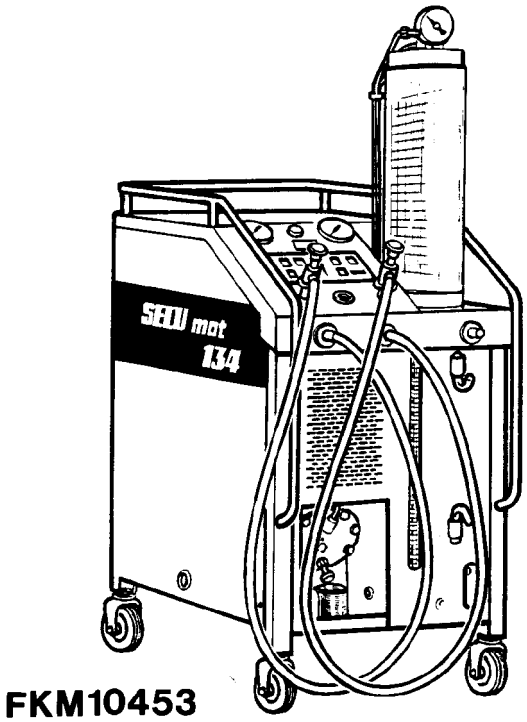
DX,TOOLS -19-20JUL95

Service unit FKM10453

Discharging, evacuating, filling, cleaning and checking the air conditioning system

NOTE: All work performed with this unit must be carried out in accordance with the service unit operator's manual.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.



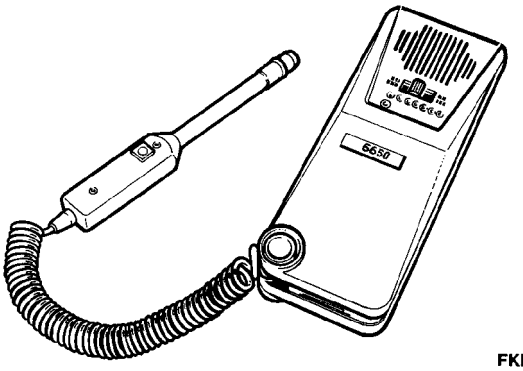
FKM10453 -UN-28APR95

ZX,TMSPFH002841-19-30AUG94

Leak tester FKM10444

Identifying refrigerant leaks.

NOTE: Leak tester can be used with R12 as well as R134a refrigerant.



FKM10444

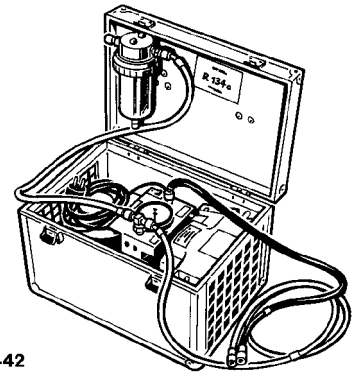
FKM10444 -UN-17MAR95

ZX,TMXZCO003095-19-01DEC93

Discharging unit FKM10442

Discharging refrigerant from the system.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.



FKM10442

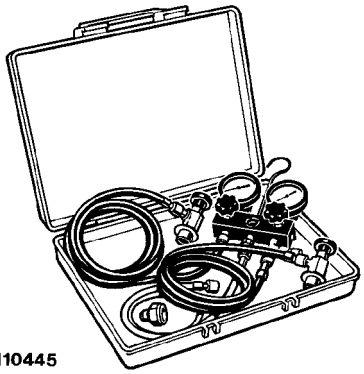
FKM10442 -UN-27APR95

LX,ROSG 003844-19-02FEB93

Gauge set FKM10445

Evacuating, filling and checking the air conditioning system.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.



FKM10445

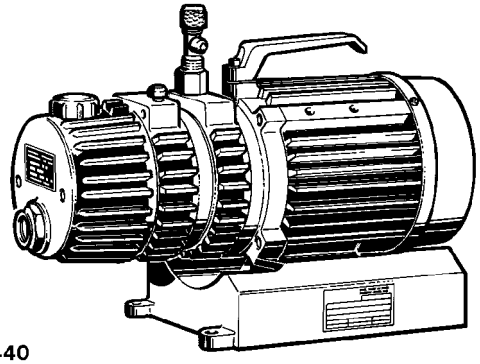
FKM10445 -UN-27APR95

ZX,TMXZCO003096-19-01DEC93

Vacuum pump FKM10440

Evacuating the system.

NOTE: The vacuum pump is suitable for both R12 and R134a refrigerant.



FKM10440

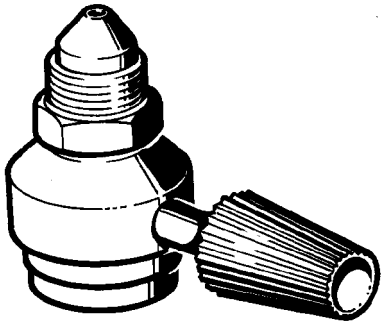
FKM10440 -UN-27APR95

LX,ROSG 003846-19-02FEB93

Charging valve FKM10443

Filling the system.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.



FKM10443

FKM10443 -UN-06MAR96

LX,ROSG 003849-19-03FEB93

Refrigerant can (R134a; 920g; 750 ml) FKM10447

Filling the system.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.

FKM10447

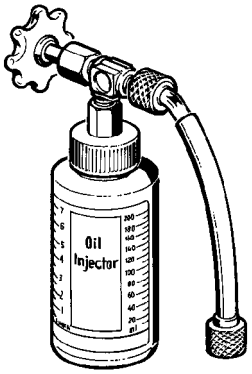
FKM10447 -UN-27APR95

LX,ROSG 003848-19-02FEB93

Oil injector FKM10436

Filling air conditioning system with refrigerant oil.

IMPORTANT: Use PAG oil (ND-Oil8) only.



FKM10436

FKM10436 -UN-27APR95

ZX,TMXZCO003097-19-01DEC93

PAG refrigerant oil (ND-Oil8; 250 ml) FKM10446

IMPORTANT: Use PAG oil (ND-Oil8) only.

FKM10446

FKM10446 -UN-27APR95

LX,ROSG 003850-19-03FEB93

SPECIFICATIONS

Item	Measurement	Specification
Air conditioning system	Refrigerant capacity	2400 g (85 oz)
Hub to pulley	Clearance	0.35—0.65 mm (0.014—0.026 in.)
Compressor	Oil quantity	160 ml (5.4 fl oz)
Air conditioning system, high pressure side	Refrigerant pressure	1500—2000 kPa (15—20 bar) (218—290 psi)
Air conditioning system, low pressure side	Refrigerant pressure	50—200 kPa (0.5—2 bar) (7.5—29 psi)
Compresssor clutch coil	Current draw at 12 volts, 20˚C (68˚F)	2.2 A, 40 W power
Hub attaching screw	Torque	15 N·m (11 lb-ft)
High and low pressure switches	Torque	16 N·m (12 lb-ft)
Hex. socket screw of compressor manifold	Torque	25 N·m (18 lb-ft)
O-ring threaded connections	Width across flats 19 mm, 5/8“	14—20 N·m (10—15 lb-ft)
	Width across flats 22 mm, 3/4“	33—39 N·m (24—29 lb-ft)
	Width across flats 27 mm, 7/8“	35—42 N·m (26—31 lb-ft)

ZX,TMXZCO003098-19-01DEC93

SAFETY AT WORK

CAUTION: Certain basic safety regulations apply when dealing with air conditioning systems, and must be observed at all times. They are backed up by legislation covering safety precautions for air conditioning systems. The following excerpts are particularly important:

1. Air conditioning systems may be operated, serviced or repaired by authorized, trained personnel only.

2. Adolescents should not be allowed to carry out service work on air conditioning systems involving the discharge of Category 1 or 2 refrigerants, unless trade training of adolescents over 16 years old requires such work. In this case, the adolescent must be supervised by a trained adult.

3. Before repairing components carrying refrigerant, remove refrigerant as far as necessary to ensure that the work can be carried out safely.

4. Refrigerant should be extracted by suction and re-used. When refrigerant is discharged into the air, there is the danger of asphyxiation, especially if work is being performed in an inspection pit, since refrigerant is heavier than air and concentrates at the lowest level. Moreover, refrigerant is odorless and colorless, so small quantities emerging from a leak cannot be detected. In such a case, ensure that there is adequate ventilation at the place of work.

5. Smoking and naked flames are not permitted in enclosed spaces where refrigerant has been released. High temperatures cause chemical reactions in the refrigerant gas, and highly poisonous substances can form. If inhaled, these substances have serious effects on health.

6. High temperatures produced by welding and soldering cause very high pressures inside components of the air conditioning system, and these pressures may result in an explosion.

LX,290,10002639-19-25FEB92

HANDLING REFRIGERANT

CAUTION: When handling refrigerant, always wear safety glasses and leather gloves. Contact with escaping refrigerant may result in serious frostbite, or even blindness if the refrigerant strikes the eye.

Whenever there is the risk of refrigerant encountering high temperatures, wear a suitable breathing mask while working. However, a breathing mask provides no protection against asphyxiation if large quantities of refrigerant escape.

LX,290,10002718-19-04MAR92

IN AN EMERGENCY

- Rinse eye with cold water; preferably use a 1% boric acid solution.

- Wash affected parts of the body with water, or preferably with a solution consisting of one part essence of vinegar and five parts water.

- See a doctor as soon as first aid has been administered.

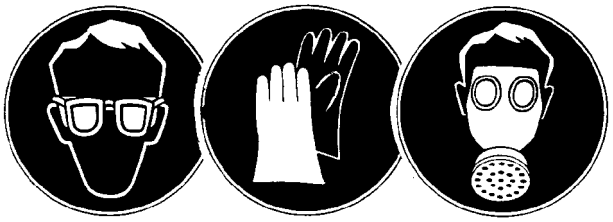
LX,290,10002719-19-04MAR92

SAFETY EQUIPMENT

This equipment consists of safety glasses, safety gloves and, where approriate, a breathing mask (if there is the risk of poisonous gases being released).

CAUTION: A breathing mask provides NO protection against lack of oxygen.

Prepare a 1% boric acid solution for rinsing the eyes and a solution consisting of 1 part essence of vinegar and 5 parts water for washing affected parts of the body. Also provide a first aid kit.



LX002150 -UN-26JUL94

LX002150

LX,290,10002576-19-01JUL96

STORAGE OF REFRIGERANT CONTAINERS

CAUTION: Refrigerant containers are under pressure, and this pressure increases rapidly when the temperature of the container rises. The thin-walled refill containers are particularly at risk in this respect. Refrigerant containers must never be exposed to temperatures over 52˚C (120˚F).

Never store pressurized containers in the vicinity of heat sources or in places exposed to direct sunlight. Never open pressurized containers by force or damage them in any way.

ZX,TMXZCO002464-19-25NOV92

R134A REFRIGERANT

IMPORTANT: The air conditioning system operates using R134a refrigerant (tetrafluorethane). This substance does not contain any chlorine atoms, so it does not have a detrimental effect on the ozone in the Earth's atmosphere.

Even so, the refrigerant must never be discharged straight into the air. It must be trapped in a recycling unit. Refrigerant stored in a recycling unit may be re-used at any time.

The recycling unit used to do this must be of a type suitable for handling R134a refrigerant.

The boiling point of R134a is minus 26.5˚C (minus 15.7˚F) and its freezing point is minus 101˚C (minus 149.8˚F).

R134a has a corrosive effect on copper as well as various seals and components used in the R12 system. For this reason, never use R134a refrigerant in a system that has previously used R12. Before replacing any component, it is vital to check whether it is compatible with the type of refrigerant used.

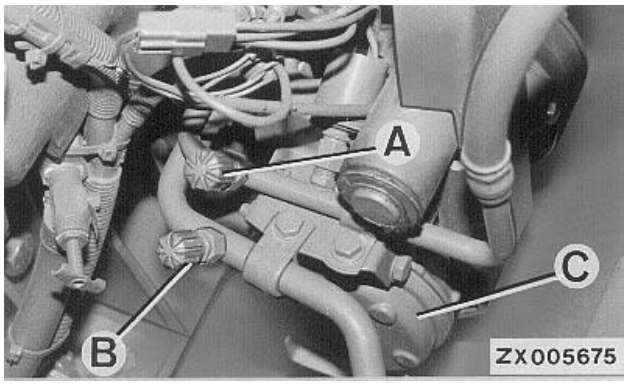
It is still essential to ensure that the correct refrigerant oil is used. R12 systems were lubricated with mineral oil, which is totally unsuitable for R134a systems. The latter require PAG oil, which mixes very well with the refrigerant and provides ideal lubrication throughout the system.

ZX,TMSPFH002887-19-16JUN93

TEST AND SERVICE PORTS

The test and service ports are located at compressor refrigerant lines.

A—Test port - high side valve
B—Test port - low side valve
C—Compressor



ZX005675 -UN-21APR95

ZX,TMXZCO003099-19-01DEC93

DISCHARGING THE SYSTEM

CAUTION: To prevent injury, wear protective goggles and gloves when servicing the air conditioning system.

Connect the red hose to the pressure connection and the blue hose to the suction connection (oil separator) of discharge unit FKM10442 (A).

Connect the other ends of the hoses as follows:

Connect the blue hose to low-side valve (C), using connecting valve (B). Connect the red hose to a commercially available R134a recycling container.

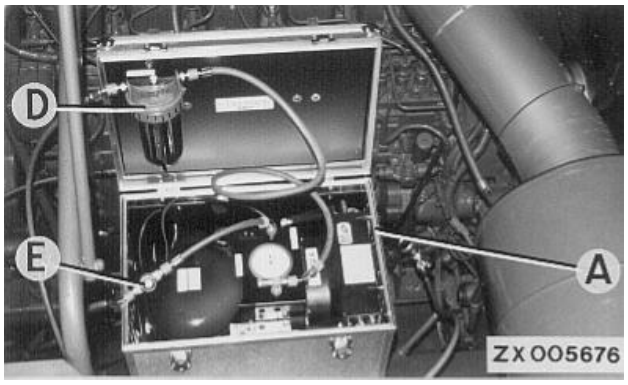
NOTE: The recycling container must be weighed repeatedly during the discharging process to make sure that it is not over-filled.

Tighten all connections and switch on the discharge unit.

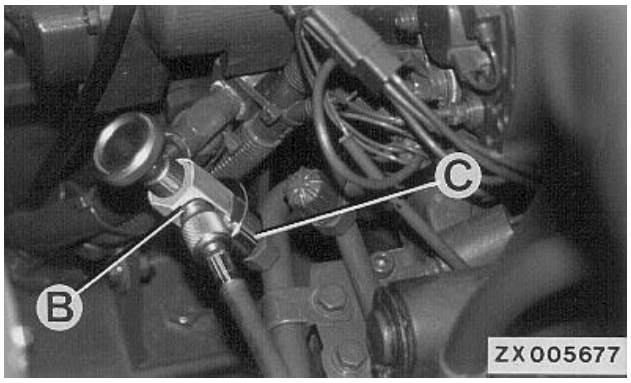
The discharge unit discharges the system until the suction pressure switch trips and switches the unit off at a pressure of approx. -30 kPa (-0.3 bar; -4.5 psi).

NOTE: If the system is already discharged, i.e. no rise in pressure can be observed, do not attempt to discharge the system further. Avoid air ingestion.

At the sight-glass in the oil separator, observe how much oil has been sucked out. When the system is subsequently recharged, remember to top up with the same quantity of fresh oil.



ZX005676 -UN-21APR95



ZX005677 -UN-21APR95

A—Discharge unit (FKM10442)
B—Connecting valve (blue)
C—Low-side valve
D—Oil separator
E—Connector for recycling container

ZX,TMXZCO003100-19-01DEC93

EVACUATING THE SYSTEM

CAUTION: To prevent the risk of injury, always wear protective goggles and gloves when working on the air conditioning system.

NOTE: Evacuating the system means sucking all the air out of the system until a vacuum is obtained. Every time the system is discharged, it must then be evacuated, otherwise air and moisture will enter the openings before they can be capped.

Connect dual gauge set FKM10445 (D) as follows:

Open the two manual valves on the test equipment. Connect the red hose to high-side valve (A) and the blue hose to low-side valve (B).

Connect the yellow hose to vacuum pump FKM10440 (C) and switch on the pump.

The system should reach a vacuum pressure of 100 kPa; 1 bar; 14.5 psi (1000 mbar; 75 cm Hg; 29 in. Hg) within 5 minutes.

NOTE: If this vacuum pressure is not reached within 5 minutes, all joints must be checked, and it may be necessary to perform a leak test as well.

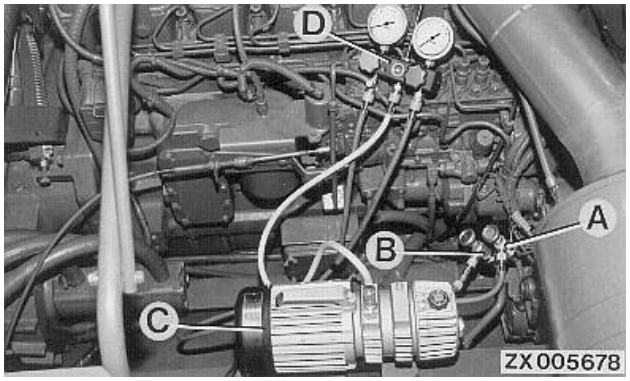
Close the valves and switch off the pump. Wait 5 minutes. The gauge should not rise by more than 3.4 kPa; 0.034 bar; 0.5 psi (34 mbar; 2.5 cm Hg; 1 in. Hg).

Switch on the pump again and open the valves.

Extract air from the system for at least 30 minutes.

Close the valves and disconnect the pump.

NOTE: Do not open the system; the vacuum must remain until the system is filled.



ZX005678 -UN-21APR95

A—High-side valve
B—Low-side valve
C—Vacuum pump FKM10440
D—Dual gauge set FKM10445

ZX,TMXZCO003101-19-01DEC93

FILLING THE SYSTEM

CAUTION: To prevent the risk of injury, always wear protective goggles and gloves when working on the air conditioning system. To avoid damaging the compressor while putting refrigerant into the high-side section of the system, it is VITAL to shut off the engine first.

Connect dual gauge set FKM10445 (C) and evacuate the system as described in “Evacuating the System”.

Screw charging valve FKM10443 (A) into refrigerant can FKM10447 (B) and connect the yellow hose.

IMPORTANT: A system using R134a refrigerant must NEVER be filled with R12.

Open charging valve (A) and high-side valve (D). Neither of the two gauges should indicate a pressure vacuum.

NOTE: If the low-side pressure gauge fails to rise, there must be a blockage in the system. Any blockages must be cleared.

Wait till the pressure has stopped rising, then close the high-side valve (D).

Run the engine at 2100 rpm and set the system to maximum cooling effect.

Hold refrigerant can (B) upright and open low-side valve (E).

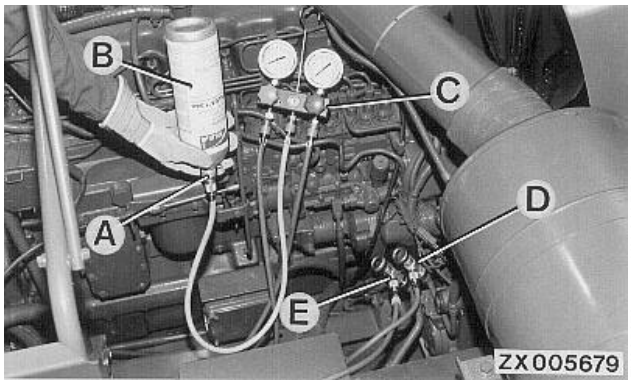
IMPORTANT: Liquid refrigerant must not enter the compressor. Liquid refrigerant will damage the compressor.

Specified capacity: 2.4 kg (5.29 lb).

CAUTION: The temperature of the refrigerant must not exceed 50˚C (120˚F), otherwise the refrigerant can may explode.

When the filling process is completed, close charging valve (A).

Check if enough refrigerant is in the system by looking at the sight-glass in the receiver-drier. If bubbles occur, top up with more refrigerant.



ZX005679 -UN-21APR95

A—Charging valve FKM10443
B—Refrigerant can FKM10447
C—Dual gauge set FKM10445
D—High-side valve
E—Low-side valve

ZX,TMXZCO003102-19-01DEC93

TOPPING UP A PARTLY DISCHARGED SYSTEM

It may become necessary to top up the system with small amounts of refrigerant in order to compensate for refrigerant lost through leakage or service work. In the event of a major leak or if there are signs of oil loss (e.g. an oil film), check the oil level in the compressor before topping up with refrigerant.

Connect gauge set FKM10445 (C) as described in “Filling the System”.

Connect the yellow hose to refrigerant can FKM10447 (B).

IMPORTANT: Never attempt to fill an R134a system with R12 refrigerant.

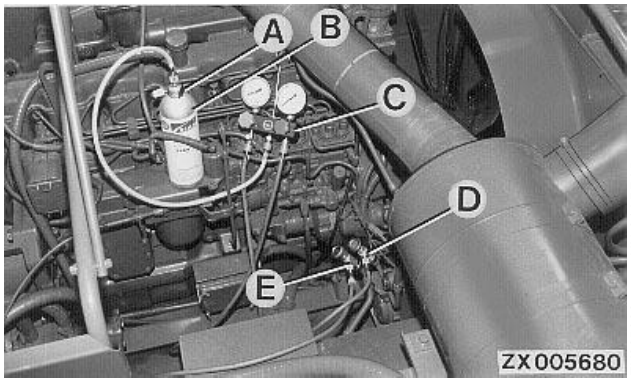
Unfasten the hose connection at gauge set (C). Briefly open charging valve (A) so that air can escape from the yellow hose. Tighten the hose connection.

Run the system at maximum cooling effect.

Hold refrigerant can (B) upright and open low-side valve (E).

Observe the sight-glass at the receiver-drier. When no more air bubbles are visible, add a further 0.2 to 0.4 kg (7 to 14 oz.) of refrigerant.

CAUTION: The temperature of the refrigerant must never exceed 50˚C (120˚F), otherwise the refrigerant can may explode.



A—Charging valve FKM10443
B—Refrigerant can FKM10447
C—Dual gauge set FKM10445
D—High-side valve
E—Low-side valve

ZX,TMXZCO003103-19-01DEC93

FILLING WITH REFRIGERANT OIL

CAUTION: To prevent the risk of injury, always wear protective goggles and gloves when working on the air conditioning system.

Connect dual gauge set FKM10445 (C) as described in “Evacuating the System”.

Evacuate the system as described in “Evacuating the System”.

Close the valves and disconnect the pump.

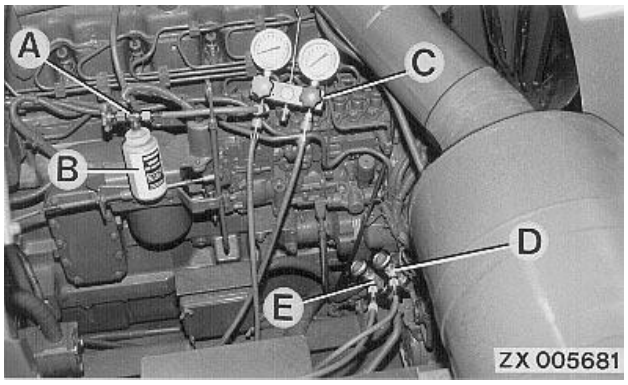
Read how much oil is extracted during the evacuation process at the sight-glass in the oil separator. Add the same amount of new oil plus 10 ml (0.3 fl.oz.) to the oil injector.

IMPORTANT: Use PAG oil (ND-Oil8) only. Refrigerant oil is extremely hygroscopic — this means it attracts moisture in large amounts from the atmosphere. For this reason, do not open the system and oil can any longer than necessary.

Connect refrigerant oil injector FKM10436 (B) to the low side of gauge set.

Open charging valve (A) of oil injector (B) and low-side valve (E).

NOTE: The vacuum within the system will draw oil into the system.



A—Charging valve
B—Oil injector FKM10436
C—Dual gauge set FKM10445
D—High-side valve
E—Low-side valve

ZX,TMXZCO003104-19-01DEC93

OIL CAPACITIES OF AIR CONDITIONING COMPONENTS

If one of the air conditioning components has been removed, the oil drained and the component cleaned (separately), add the following amounts of oil to the refrigerant circuit:

Component	ml	fl oz
Condenser	60 ml	2 fl oz
Evaporator	60 ml	2 fl oz
Receiver-drier	10 ml	0.3 fl oz
Refrigerant lines	110 ml	3.9 fl oz
Compressor	60 ml	2 fl oz

If a new compressor is installed, it must contain the full capacity of 160 ml (5.4 fl. oz.).

If the entire system is disassembled and all the lines and components (including compressor) are discharged and cleaned individually, add the full capacity of 300 ml (11 fl. oz.) to the system after re-assembly.

ZX,TMSPFH002882-19-16JUN93

LEAK TEST

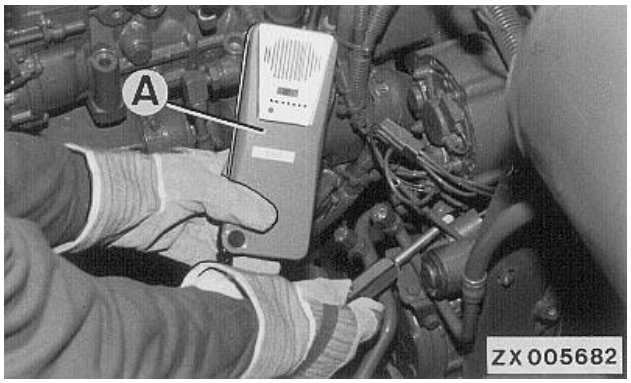
NOTE: The leak test confirms that an oily patch on the exterior of the system is caused by a leak. Perform a leak test only on systems that are ready for operation. If the system has already lost some of its refrigerant, top it up with refrigerant before testing for leaks.

Connect dual gauge set FKM10445 and evacuate the test hoses.

Read the static pressure at the low-side pressure gauge. If the pressure is less than 340 kPa (3.4 bar; 50 psi), top up with refrigerant.

Go over the entire system with the probe of electronic leak tester FKM10444 (A).

NOTE: Always look underneath each potential leak, as R134a refrigerant is heavier than air. Dense concentrations of R134a in the air may affect the result of the test.



ZX005682 -UN-21APR95

ZX,TMXZCO003105-19-01DEC93

REMOVING THE COMPRESSOR

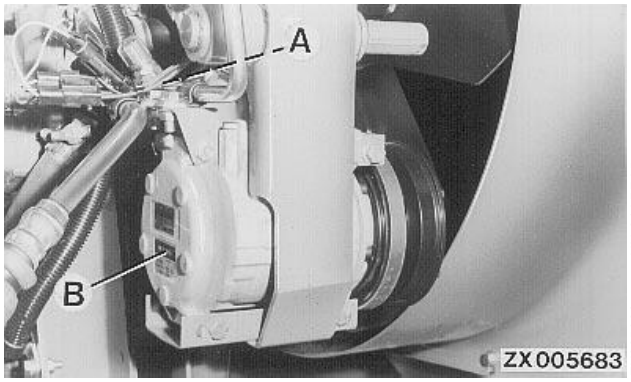
Drain the refrigerant (see “Discharging the System”).

Remove the drive belt.

Slacken attaching screws of line clamping plate (A) and remove the lines.

Seal all openings and lines so that no dirt can get in.

Remove the compressor.



ZX,TMXZCO003106-19-01DEC93

CHECKING OIL LEVEL IN THE COMPRESSOR

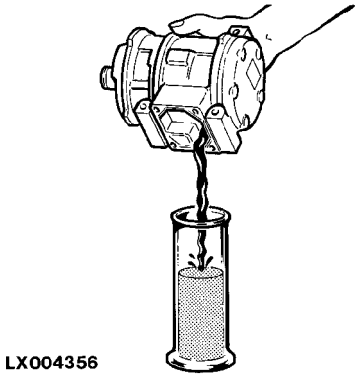
Remove the compressor manifold (see “Checking the Compressor Manifold”).

Drain compressor oil through the suction line connection.

Dispose of the oil in an environmentally friendly way.

Fill with refrigerant oil as described in “Filling with Refrigerant Oil”.

NOTE: Replace the receiver-drier every time the system is opened.



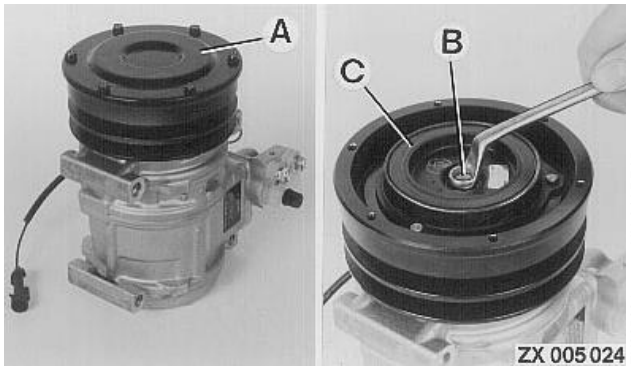
ZX,TMSPFH002855-19-16JUN93

DISASSEMBLING THE COMPRESSOR CLUTCH

Removing the Clutch Hub

Remove cover (A).

Remove screw (B) and pull out clutch hub (C).

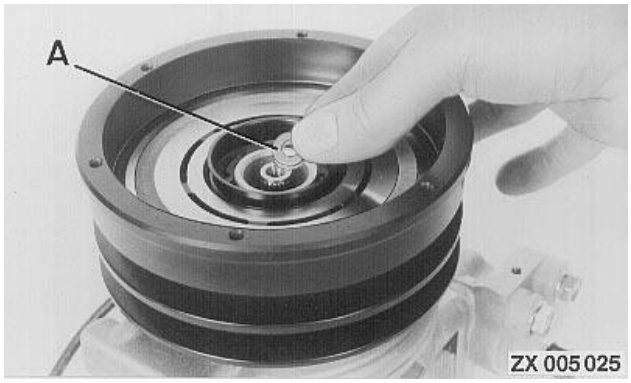


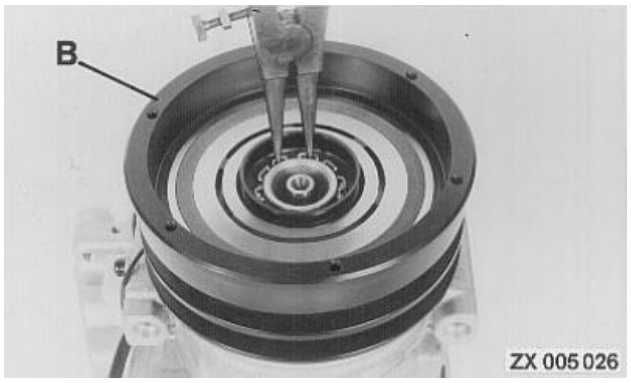
ZX,TMSPFH002856-19-16JUN93

Removing the Clutch Plate

Remove shims (A) and keep them ready for re-installation.

Remove snap ring and take off clutch plate (B).





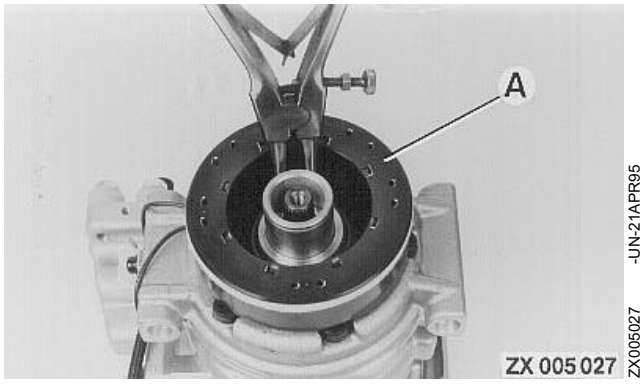
ZX,TMSPFH002857-19-16JUN93

Removing Magnetic Coil

Remove snap ring.

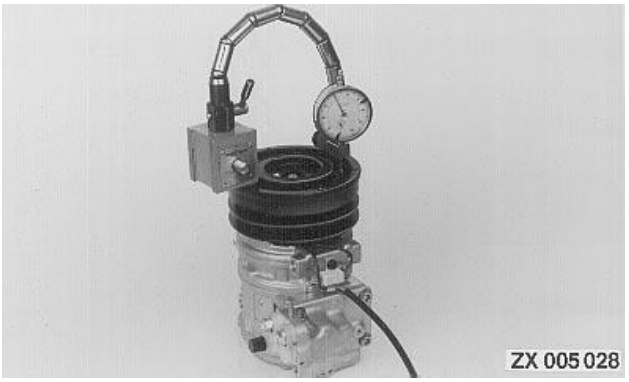
Disconnect magnetic coil cable at compressor and take off magnetic coil (A).

NOTE: When re-installing the snap ring, make sure that the chamfered side of the snap ring is at the top.



ZX,TMSPFH002858-19-16JUN93

CHECKING CLUTCH HUB CLEARANCE



ZX005028 -UN-21APR95

NOTE: Clutch coil is NOT polarity sensitive.

1. Use a feeler gauge to measure the clearance between pulley and clutch hub. Attach feeler gauge to pulley as shown and connect compressor to a 12 volts battery using a set of jumper wires.

2. Turn the pulley and measure the clearance again at three different points of clutch hub circumference. The distance between the measuring points should be equal. Specified clearance is 0,35—0,65 mm (0.014—0.026 in.). Add or remove shims as required.

3. Tighten the clutch hub retaining bolt to 15 Nm (11 lb-ft) after clearance has been adjusted correctly..

ZX,TMSPFH002859-19-16JUN93

CHECKING THE COMPRESSOR MANIFOLD

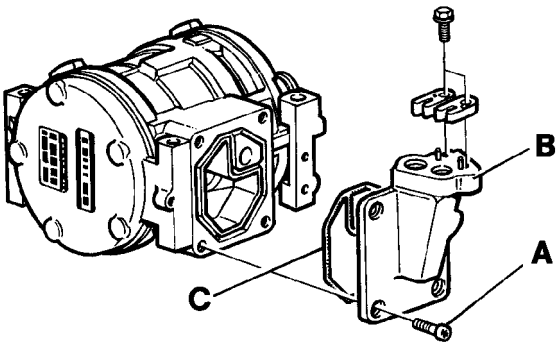
Take out hex. socket screws (A) and remove manifold (B).

Discard gasket (C). Check the contact surfaces.

Apply oil to new gasket (C), and install.

Install manifold.

Tighten hex. socket screws to 25 Nm (18 lb-ft).



LX004361

LX004361 -UN-19SEP94

A—Hex. socket screw
B—Manifold
C—Manifold gasket

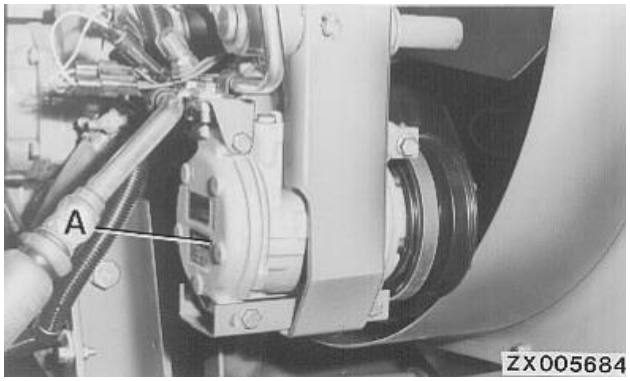
ZX,TMSPFH002860-19-16JUN93

INSTALLING THE COMPRESSOR

Before installing, ensure that the compressor contains the specified amount of oil.

Install the compressor (A).

Install drive belt.



ZX,TMXZCO003107-19-01DEC93

REMOVING AND INSTALLING THE CONDENSER

1. Discharge the air conditioning system.

2. Disconnect refrigerant lines at the condenser.

3. Seal the open ends with plastic caps.

4. Remove condenser (A). Drain the refrigerant oil and dispose of it in an environmentally friendly way.

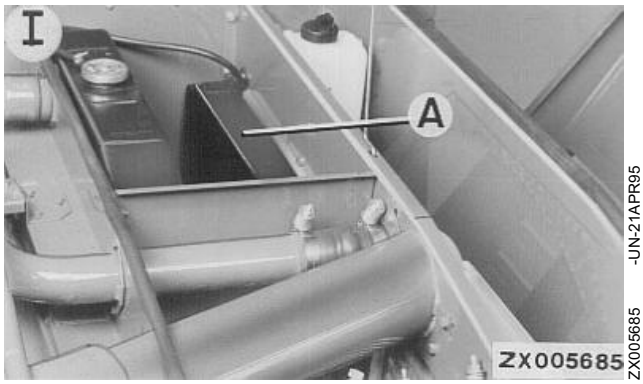
NOTE: The condenser and the hydraulic oil cooler are joined to an assembly. Condenser is located in the lower part.

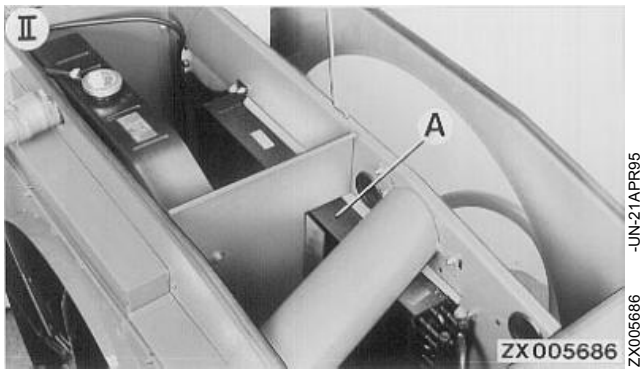
NOTE: Fill with new refrigerant oil as described in "Filling with Refrigerant Oil".

NOTE: Replace the receiver-drier every time the system is opened.

5. Evacuate the system, fill with refrigerant, and check.

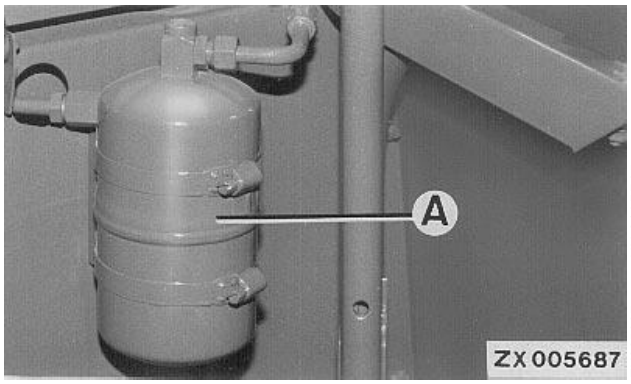
A—Condenser
I—2254,2266
II—2256,2258,2264





ZXTMXZCO 011383-19-05MAR98

REMOVING AND INSTALLING THE RECEIVER-DRIER



1. Discharge the air conditioning system.
2. Disconnect the refrigerant lines.
3. Seal the open ends with plastic caps.
4. Remove receiver-drier (A).

IMPORTANT: As soon as the dessicant material reaches its saturation level, the receiver-drier must be replaced, otherwise the system will become contaminated with moisture. Replace the receiver-drier every time an air conditioning component is removed or replaced.

NOTE: Fill with new refrigerant oil as described in "Filling with Refrigerant Oil".

5. Evacuate the system, fill with refrigerant, and check.

ZX,TMXZCO003108-19-01DEC93

REMOVING AND INSTALLING THE EVAPORATOR AND EXPANSION VALVE

1. Discharge the air conditioning system.

2. Remove the passenger's seat.

3. Remove air conditioning system housing (A) completely. Housing is attached at the floor by means of two screws and at the rear wall by means of one screw.

4. Open housing (A)

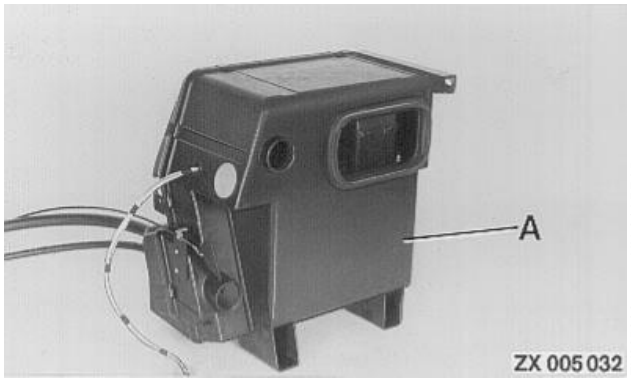
5. Disconnect refrigerant lines (C) at expansion valve (D). Drain refrigerant oil and dispose of it in an environmentally friendly way.

6. Seal the open ends with plastic caps.

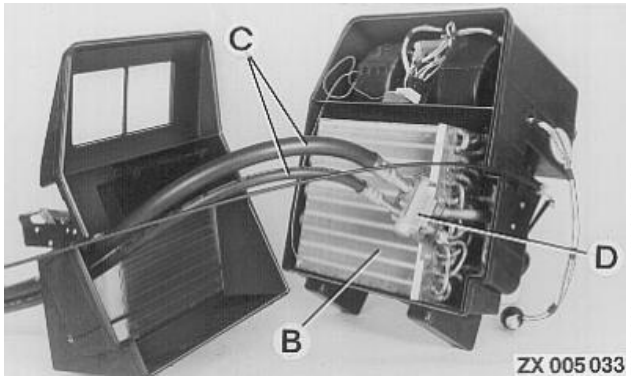
7. Remove evaporator (B) and expansion valve (D).

NOTE: Replace the receiver-drier every time the system is opened.

A—Housing
B—Evaporator
C—Refrigerant lines
D—Expansion valve



ZX005032 -UN-21APR95



ZX005033 -UN-21APR95

ZX,TMSPFH002864-19-16JUN93

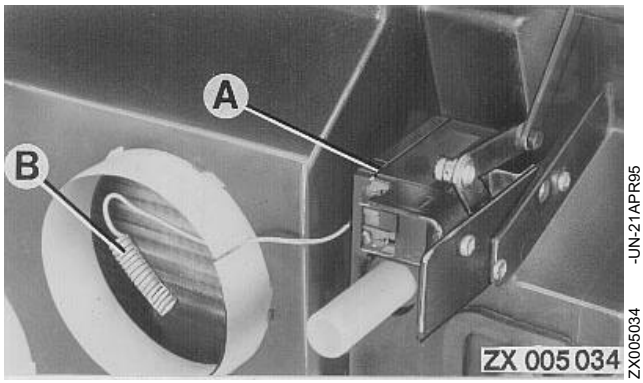
REMOVING AND INSTALLING THE THERMOSTAT SWITCH

1. Remove the two bowden cables.

2. Disconnect the two wires.

3. Remove thermostat switch (A) and sensing bulb (B).

IMPORTANT: Never bend or squash the sensing bulb capillary tube.



ZX005034 -UN-21APR95

ZX,TMSPFH002865-19-16JUN93

REMOVING AND INSTALLING THE HIGH/LOW PRESSURE SWITCH

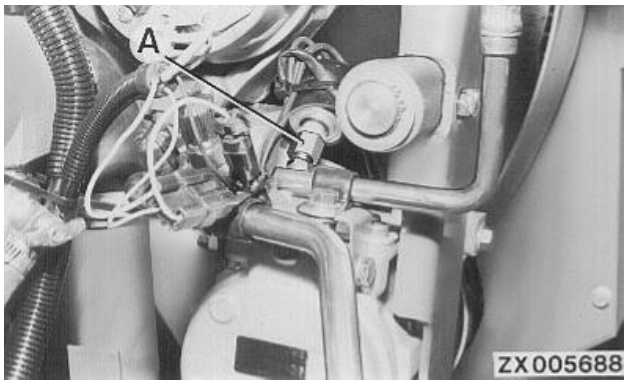
NOTE: There is no need to discharge the system when removing or installing high pressure switch (A) and low pressure switch (B).

The line connections are equipped with a check valve.

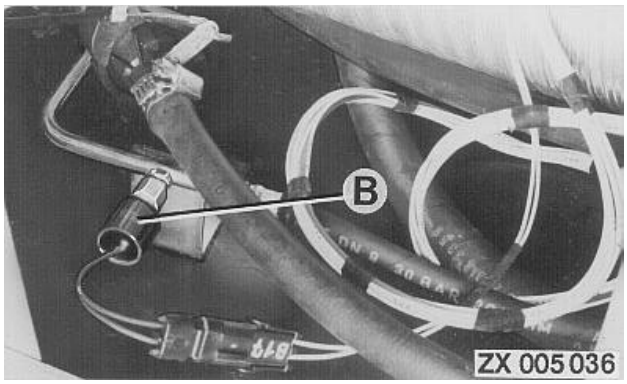
The high pressure switch is located at the compressor refrigerant line.

The low pressure switch is located near the air conditioning system housing in the operator's cab.

Tighten new switches (A) and (B) to 16 Nm (12 lb-ft).



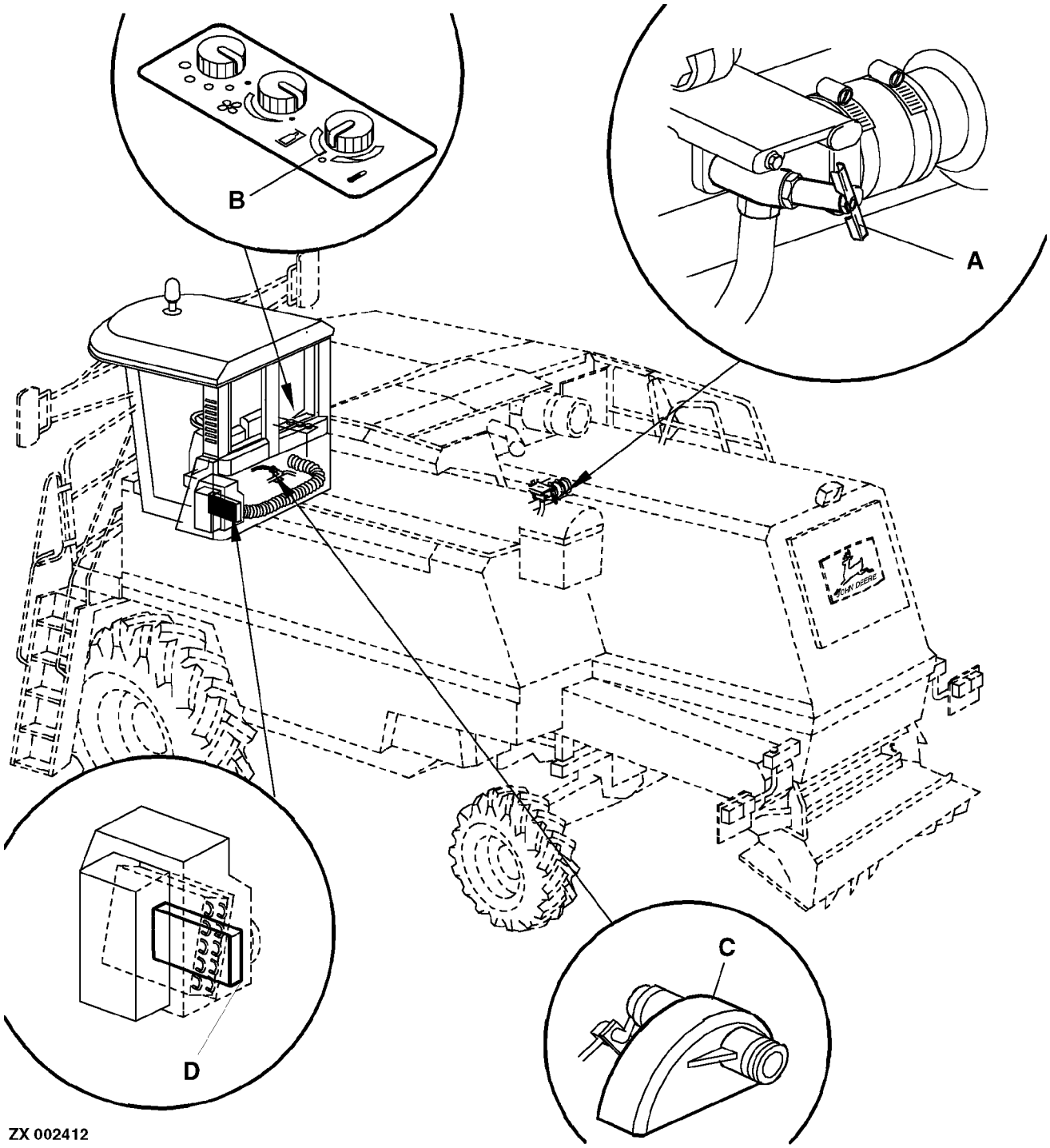
High pressure switch



Low pressure switch

ZX,TMXZCO003109-19-01DEC93

HEATER COMPONENTS



A—Heater valve at cylinder block

B—Air conditioning/heater rotary switch

C—Heater control in cab

D—Radiator

ZX,TMXZCO003110-19-01DEC93

REMOVING AND INSTALLING FAN AND RADIATOR

1. Discharge the cooling system.

2. Remove the passenger's seat.

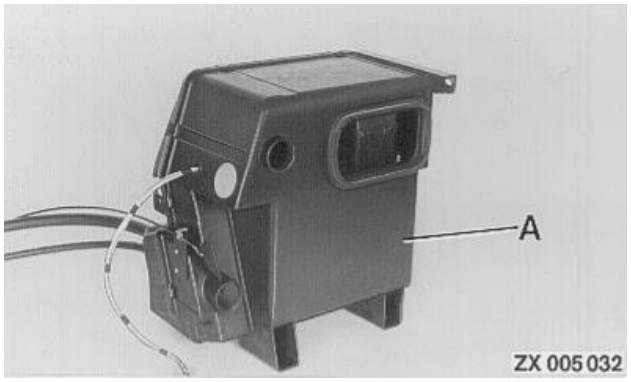
3. Remove air conditioning/heating system housing (A) completely. Housing is attached at the floor by means of two screws and at the rear wall by means of one screw.

4. Open housing (A).

5. Disconnect and remove fan (B)

6. Disconnect coolant lines from radiator (C) and remove radiator

A—Housing
B—Fan
C—Radiator



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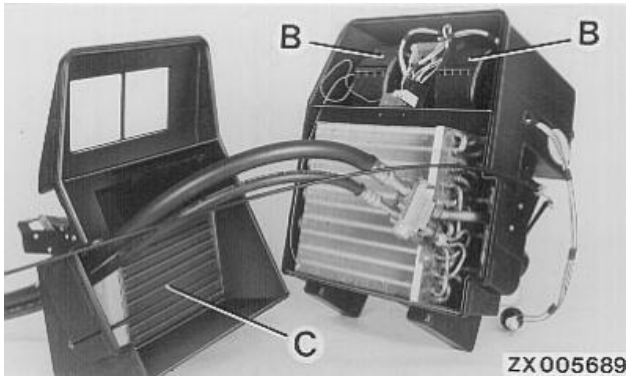


ZX005689 -UN-21APR95

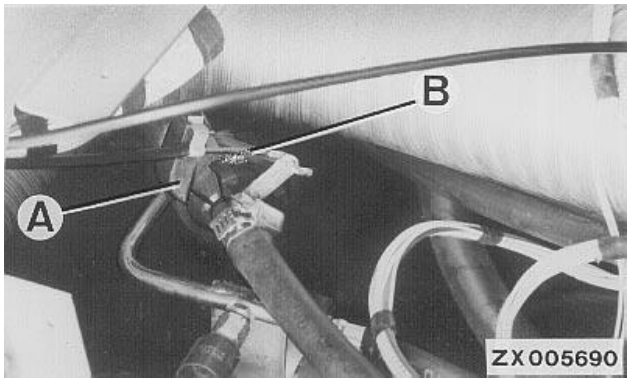
ZX,TMXZCO003111-19-01DEC93

REMOVING AND INSTALLING HEATER CONTROL

Coolant control is located next to air conditioning/ heating system housing in operator's cab.

1. Drain cooling system.

2. Disconnect heater hoses at heater control (A), disconnect bowden cable (B) and remove heater control (A).



ZX005690 -UN-21APR95

ZX,TMXZCO003112-19-01DEC93

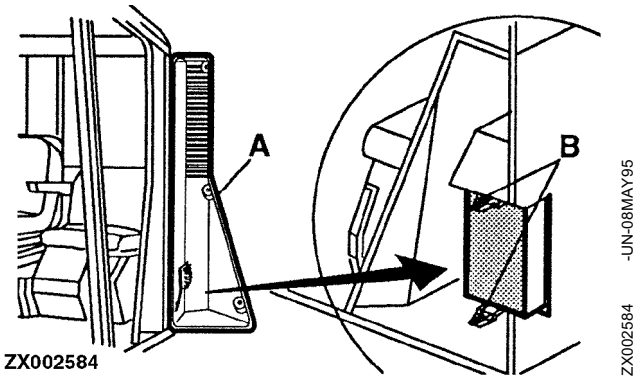
REMOVING OPERATOR'S CAB MAIN FILTER ELEMENT

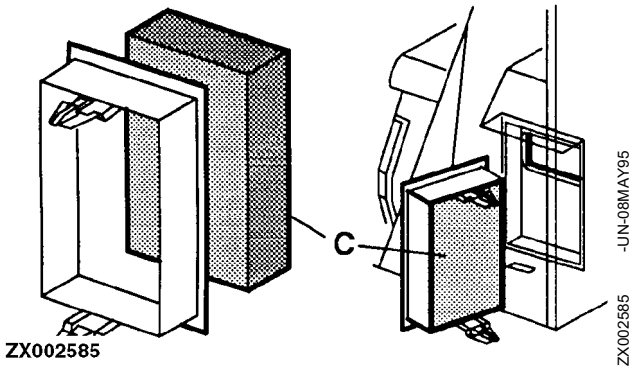
Open service cover (A).

Disengage fasteners (B).

Lift out filter housing with element (C).

When reinstalling, make sure filter element is in correct position.



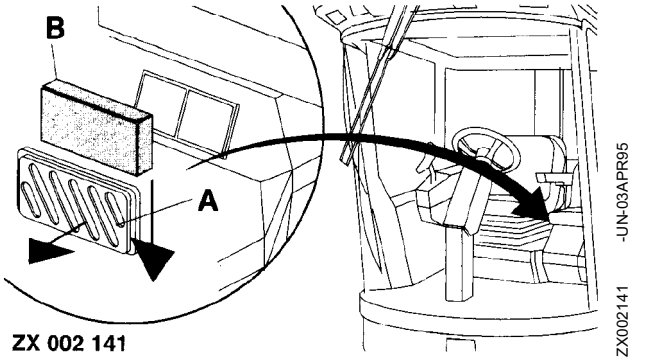


ZX,TMXZCO003113-19-01DEC93

REMOVING AND INSTALLING RECIRCULATING FILTER

Press down grille (A) and pull out to the top.

Lift out filter element (B).

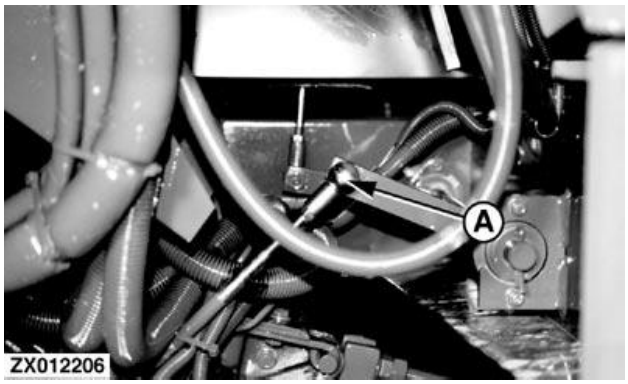


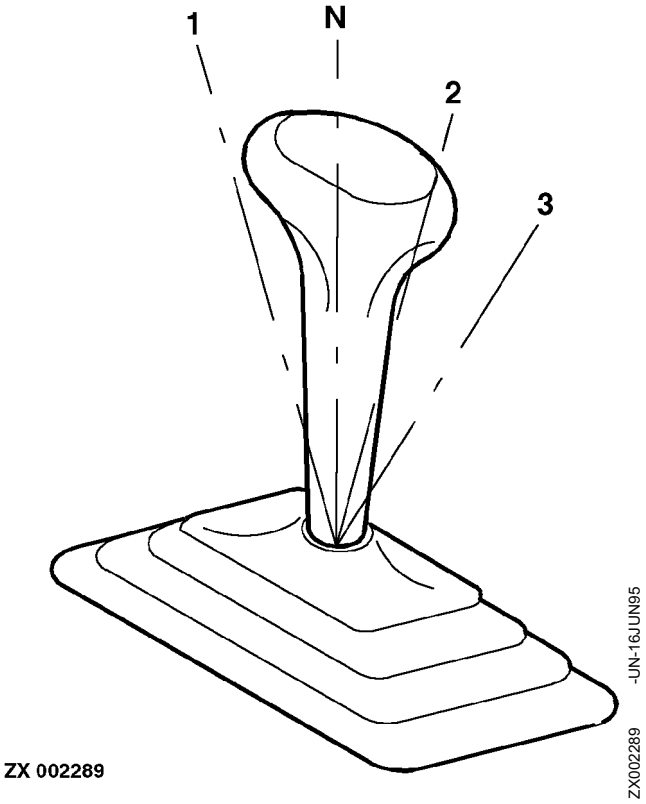
ZX,TMXZCO003114-19-01DEC93

ADJUSTING THE GEAR SHIFT MECHANISM

— Disengage ball-end (A).

— Move shift lever to position (1).



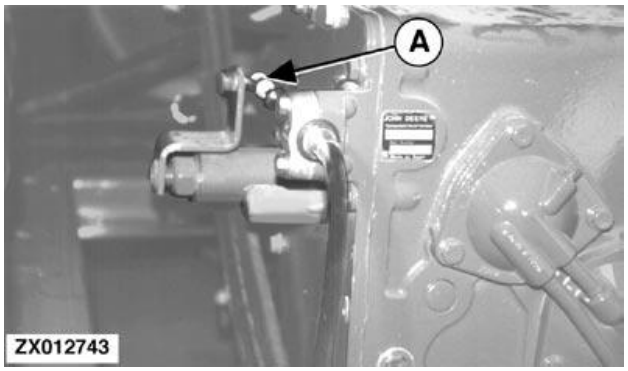


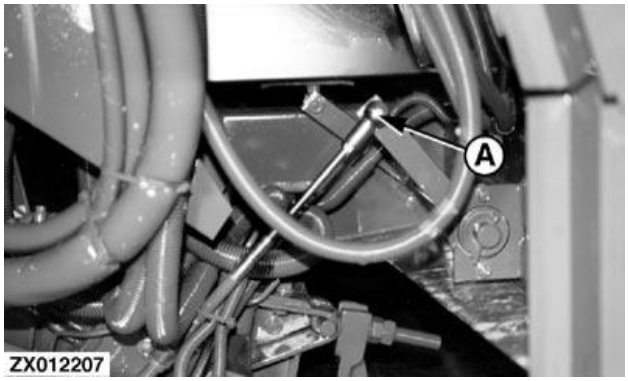
ZX,TMXZCO009588-19-01AUG97

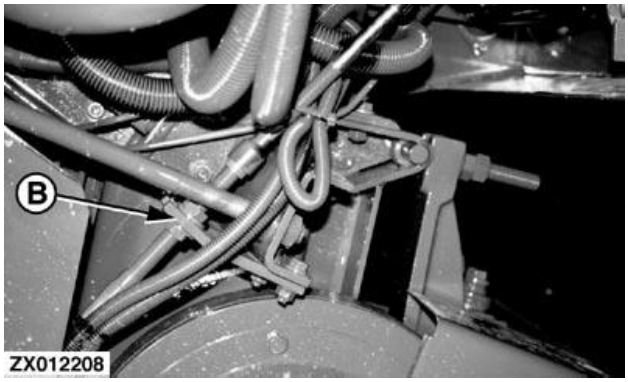
— Transmission to 1st gear.

— In this position, it should be easy to install ball-end (A).

— Re-adjust bowden cable at bracket (B).

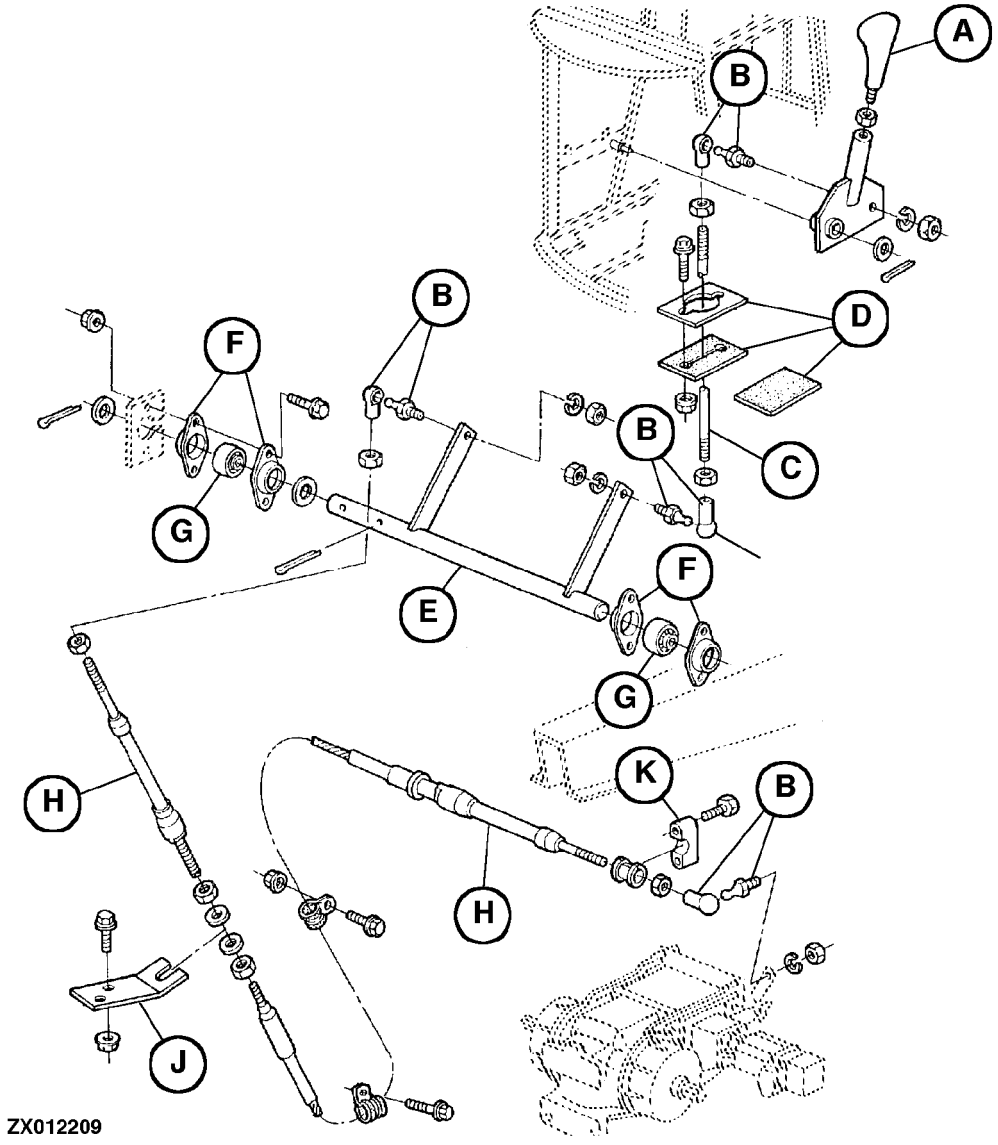






ZX,TMXZCO009589-19-01AUG97

GEAR SHIFT MECHANISM, EXPLODED VIEW



A—Shift lever
B—Ball-end
C—Rod
D—Seals
E—Shaft
F—Bearing support
G—Ball bearing
H—Bowden cable
J—Bracket
K—Clamp

ZX,TMXZCO009590-19-01AUG97

Section 110
Feeder House

Contents

REMOVING THE FEEDER HOUSE

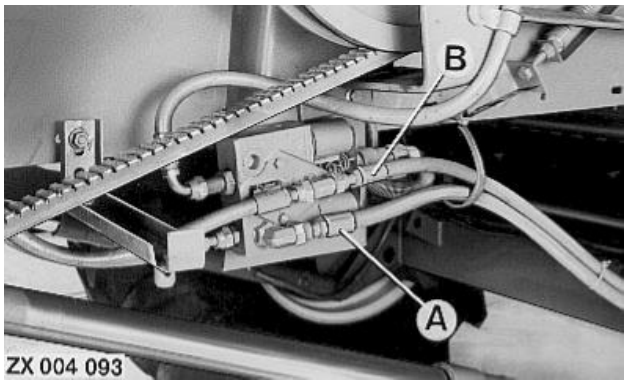
CAUTION: Remove feeder house only with combine on level and solid ground.

Disconnect hose connections (A) and (B). Seal open hose ends with metal plugs.

— Metal plugs for connection (A): 38H1147
— Metal plugs for connection (B): 38H1146

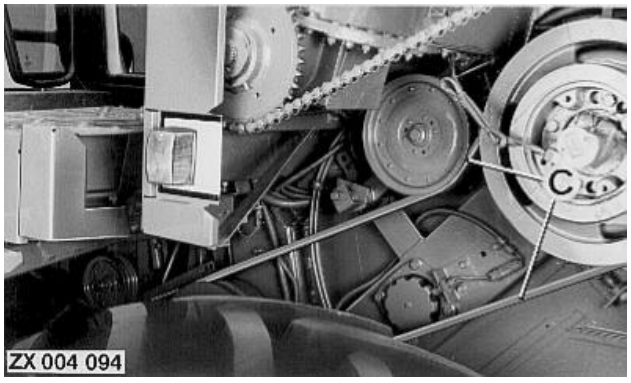
On Hillmasters, two additional pressure hoses must be disconnected between the master cylinder and the pivoting shield cylinder.

To avoid damaging the master cylinder, use plastic plugs only to seal these hoses.



ZX,TMXZCO009591-19-01AUG97

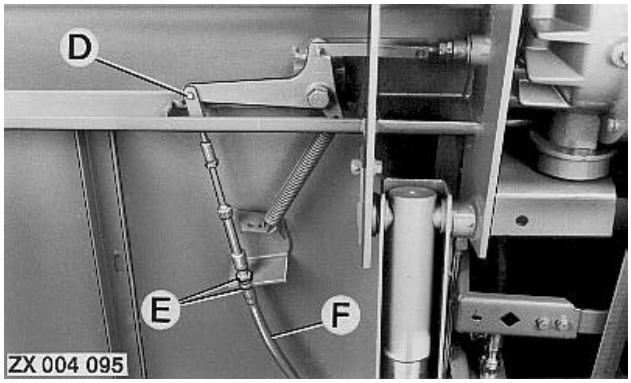
Remove drive belt (V-belt) (C).



ZX,TMXZCO002722-19-13MAY93

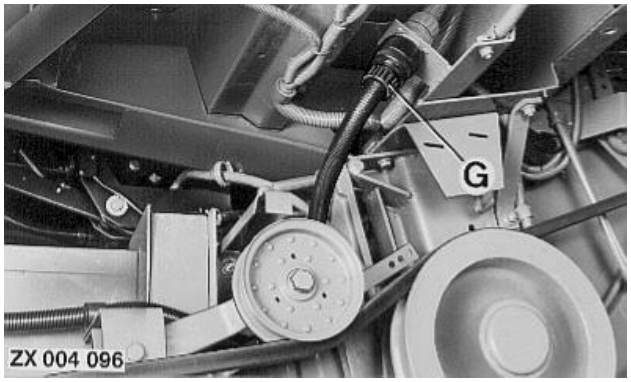
Remove pin (D). Loosen clamping nuts (E).

Remove cable (F). Remove cable retainers from feeder house after turning out attaching screws.



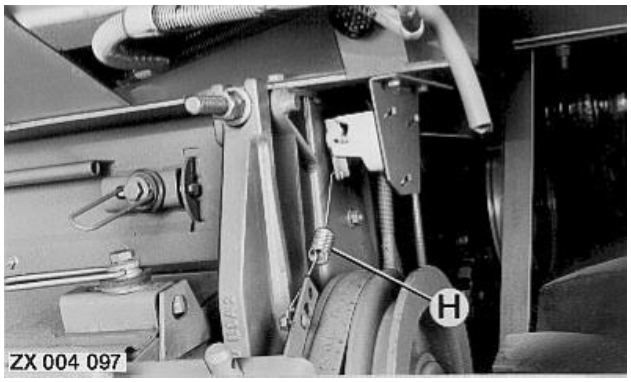
ZX,TMXZCO002723-19-13MAY93

Disconnect connector (G).



ZX,TMXZCO002724-19-13MAY93

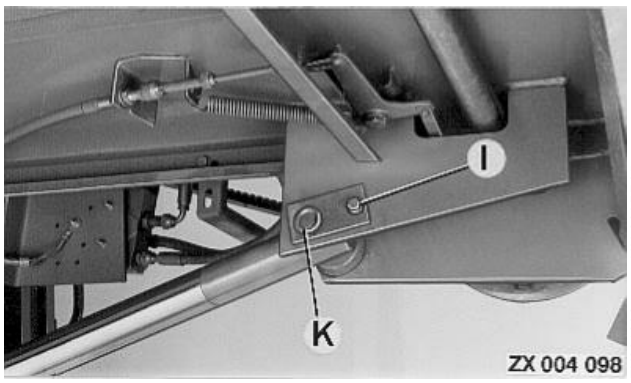
Disconnect spring (H).



ZX,TMXZCO002725-19-13MAY93

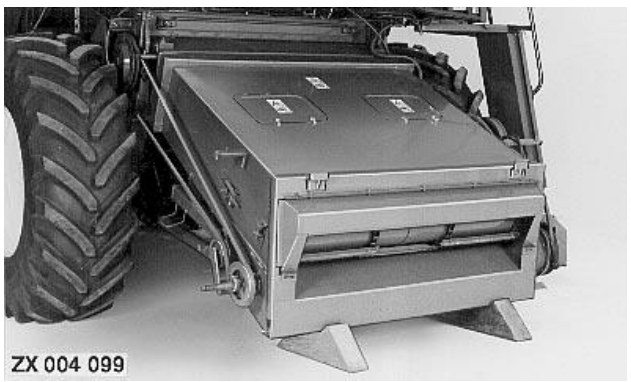
Support front end of feeder house, using a suitable jack.

Remove locking screw (I) and drive out pin (K). Place hydraulic cylinder on the ground.



ZX,TMXZCO002726-19-13MAY93

Lower jack and support front end of feeder house on two wooden blocks.

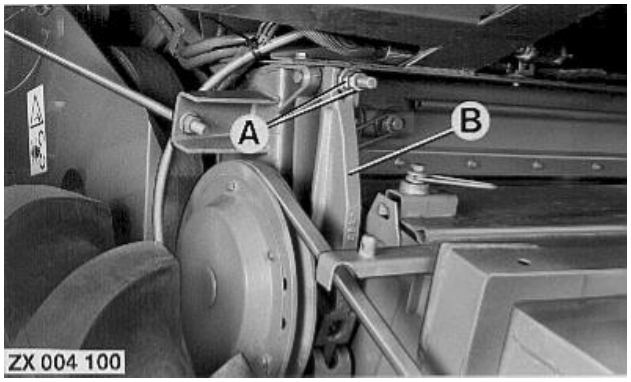


ZX,TMXZCO002727-19-13MAY93

Support rear side of feeder house by means of support stands.

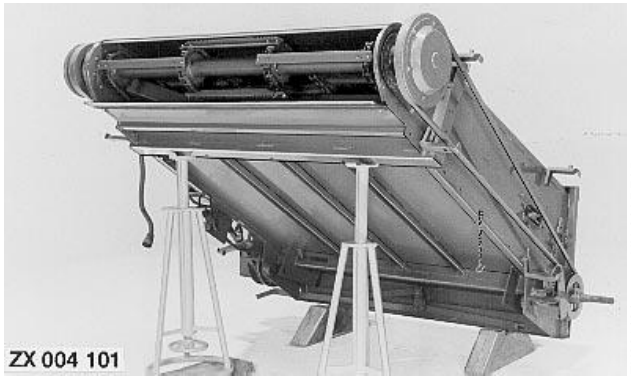
Loosen lock nuts (A) and turn threaded pin upwards.

Remove clamps (B) on right and left-hand sides.



ZX,TMXZCO002728-19-13MAY93

Back up combine.



ZX,TMXZCO002729-19-13MAY93

SPECIFICATIONS

Item	Measurement	Specification
Screws in drum carrier	Tightening torque	50 N·m (37 lb-ft)
Screws in bearing flange	Tightening torque	130 N·m (96 lb-ft)

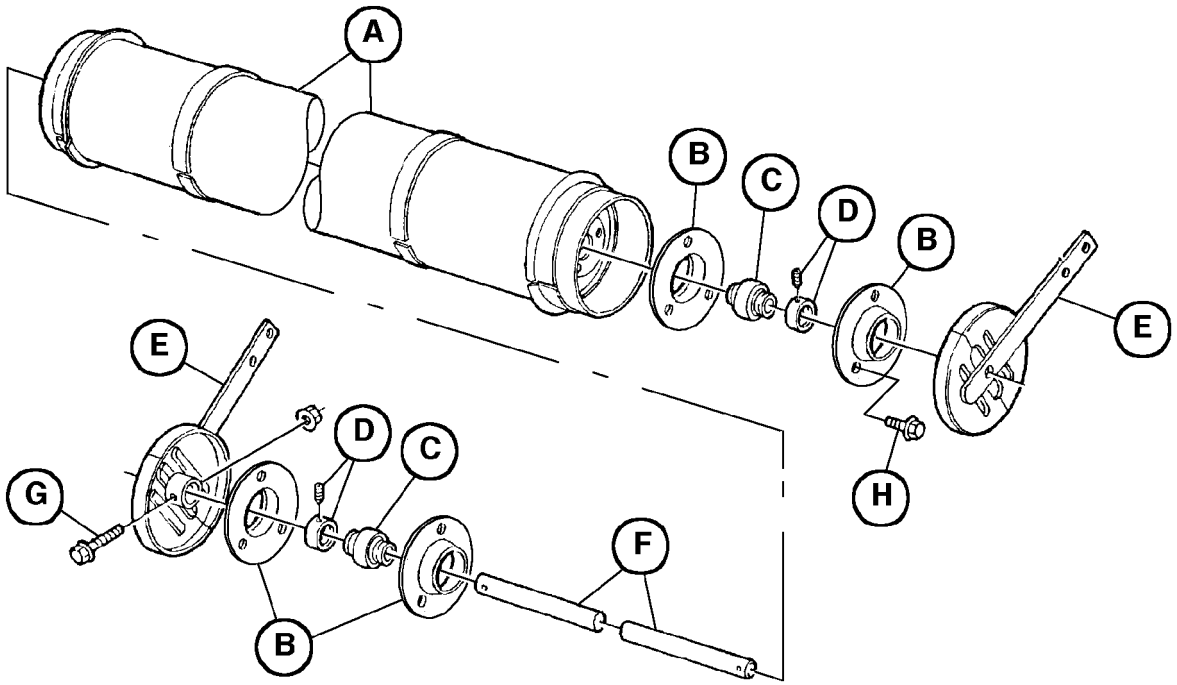
ZX,TMXZCO009592-19-01AUG97

OTHER MATERIALS REQUIRED

Order no.	Designation	Application
TY9370	Loctite 242	Screws in bearing flange

ZX,TMXZCO009593-19-01AUG97

BOTTOM FEEDER DRUM, EXPLODED VIEW



ZX012216 -UN-25SEP97

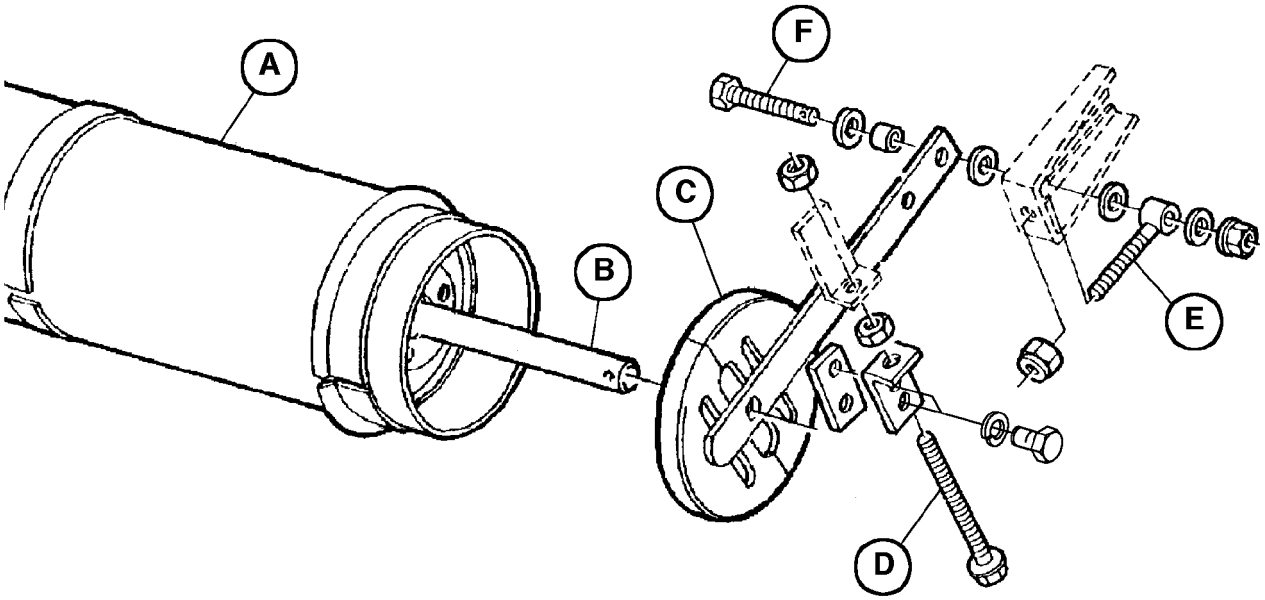
ZX012216

A—Bottom feeder drum	C—Ball bearing	E—Drum carrier	G—M10x65 screw
B—Bearing flange	D—Clamping ring	F—Shaft	H—M12x35 screw

— Tighten screws (G) to 50 N·m (37 lb-ft).

— Apply Loctite 242 (TY9370) to screws (H), then insert and tighten to 130 N·m (96 lb-ft).

ZX,TMXZCO009594-19-01AUG97



-UN-25SEP97
ZX012217

ZX012217

A—Bottom feeder drum
B—Shaft
C—Drum carrier
D—Height adjustment
E—Fore-and-aft adjustment
F—Screw with bore

If you want to move drum (A) further forward, install screw (F) in the rearmost hole in drum carrier (C).

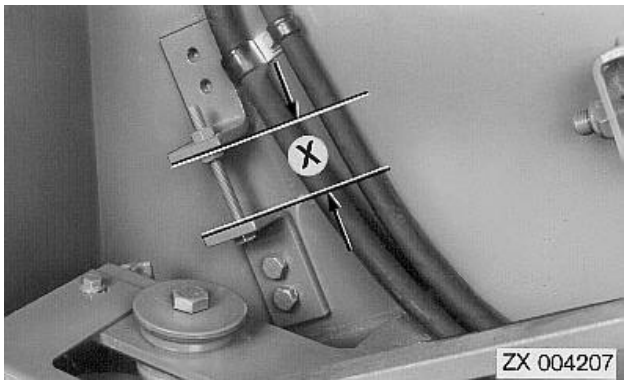
ZX,TMXZCO009595-19-01AUG97

ADJUSTING HEIGHT OF BOTTOM FEEDER CONVEYOR DRUM

IMPORTANT: This adjustment must be carried out equally on both sides.

The required height depends on the type of crop:
- Normal grain crops: Lower
- Corn, rape etc.: Higher

IMPORTANT: Adjust length (X):
- **Normal grain crops: 50 mm (1.97 in.)**
- **Corn, rape etc.: 34 mm (1.3 in.)**



-UN-19MAY95
ZX004207

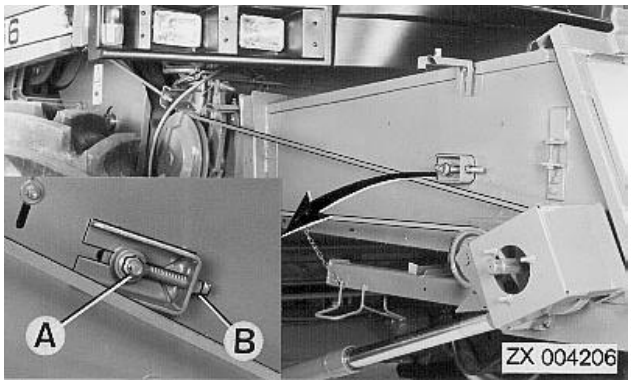
X—Adjusted length

ZX,OMXZCO002272-19-01MAR95

ADJUSTING TENSION OF FEEDER CONVEYOR CHAIN

IMPORTANT: This adjustment must be carried out equally on both sides.

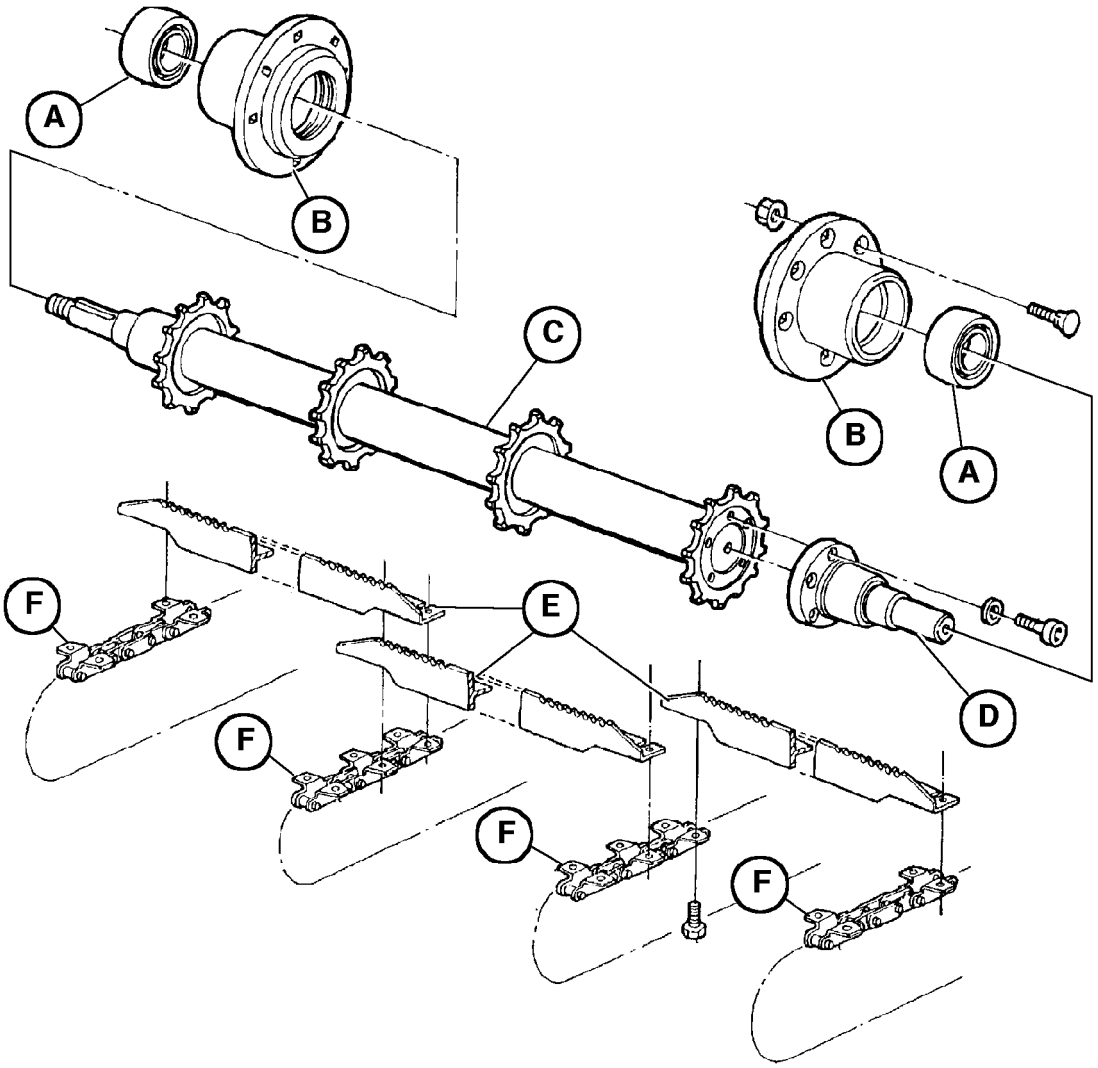
To adjust tension of conveyor chain, loosen hex. nut (A) on both sides. Then turn adjusting nut (B) until correct chain tension has been obtained. Finally tighten all nuts.



-UN-19MAY95
ZX004206

ZX,OMXZCO002271-19-05OCT92

UPPER FEEDER SHAFT AND CONVEYOR CHAIN



ZX012218

ZX012218 -UN-25SEP97

A—Ball bearing
B—Bearing support
C—Sprocket shaft
D—Shaft with flange
E—Slat
F—Conveyor chain

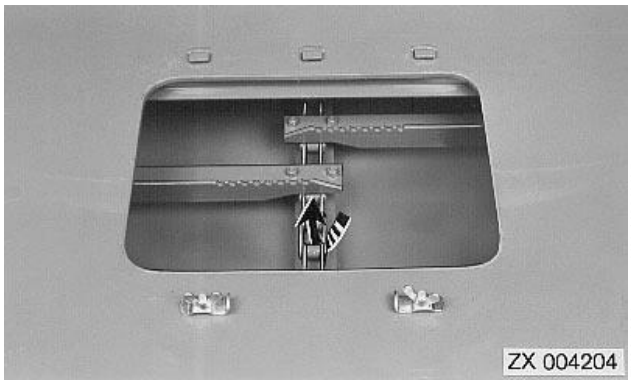
ZX,TMXZCO009596-19-01AUG97

TENSION OF FEEDER CONVEYOR CHAIN

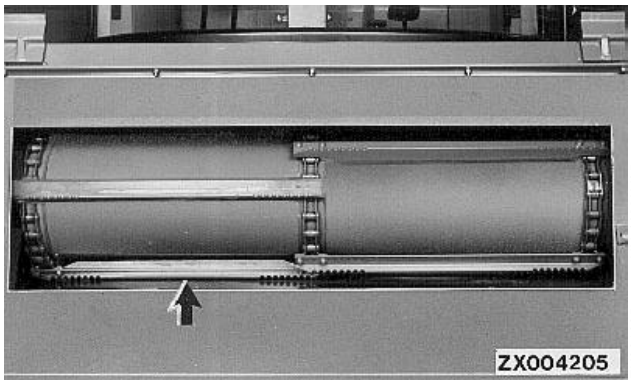
Checking chain tension

Chain tension is correctly adjusted when the chain can be raised 30 to 40 mm (1-3/16 to 1-37/64 in.) by exerting a force of approx. 300 N (66 lb) halfway between upper and lower feeder conveyor shafts.

A further check is possible with the header removed. The third slat (as seen from the front) should lightly contact the floor of the feeder house.



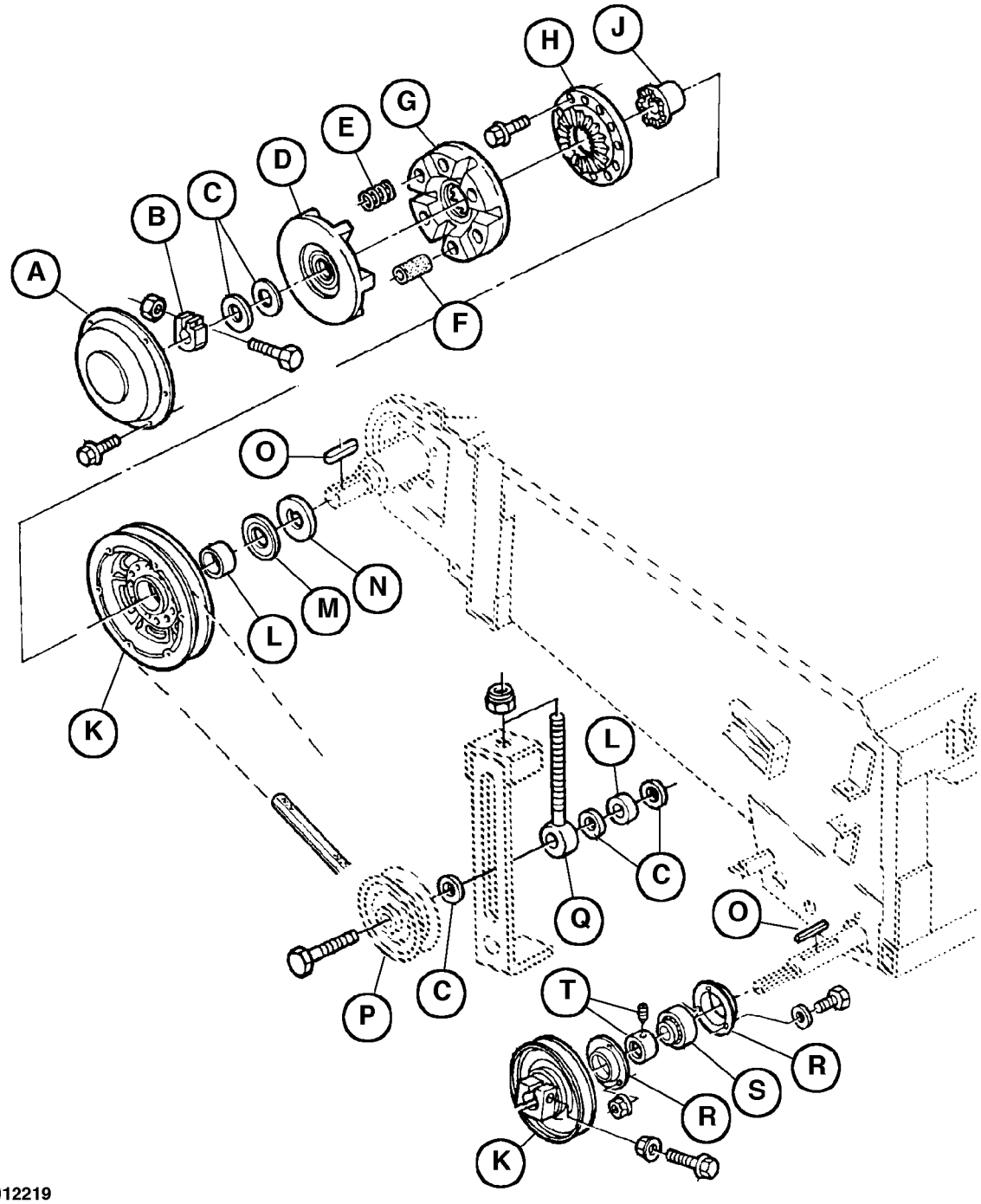
ZX004204 -UN-19MAY95



ZX004205 -UN-19MAY95

ZX,OMXZCO002270-19-05OCT92

DRIVE AND SLIP CLUTCH FOR UPPER FEEDER SHAFT



A—Cover
B—Clamping nut
C—Washer
D—Plate
E—Spring
F—Rubber bushing
G—Main plate
H—Disk with teeth
J—Hub
K—Sheave
L—Bushing
M—Brass washer
N—Carrier disk
O—Key
P—Tensioning roll
Q—Tensioning screw
R—Bearing flange
S—Ball bearing
T—Clamping ring

ZX,TMXZCO009597-19-01AUG97

SLIP CLUTCH ON UPPER FEEDER SHAFT

Remove cover (A).

Adjust slip clutch:

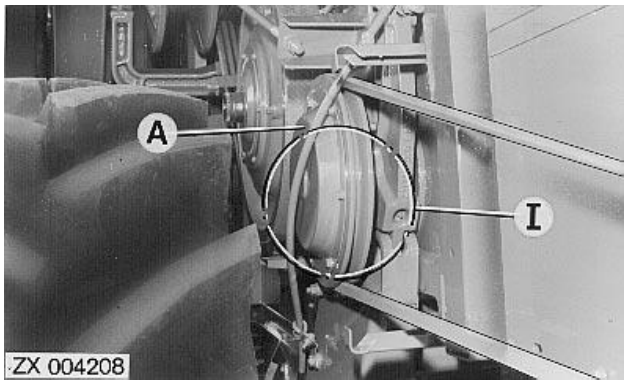
• Loosen clamping screw (B).

• Adjust length (X) to 12 mm (0.47 in.) at clamping nut (C).

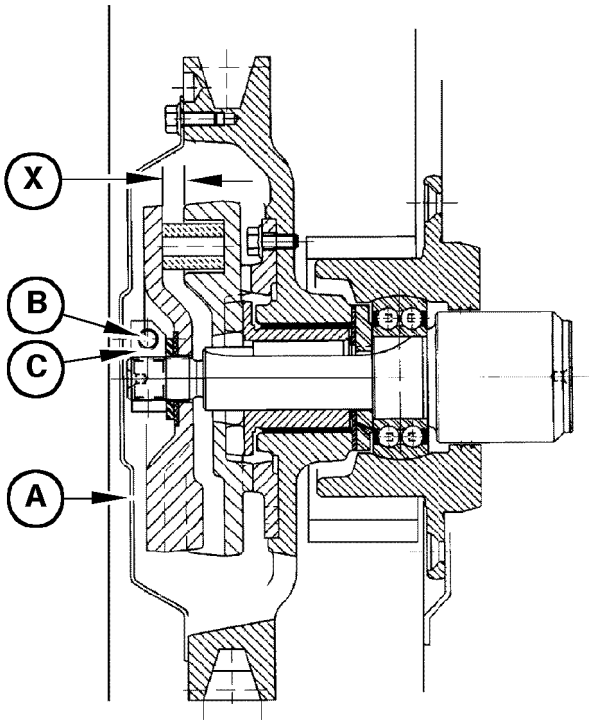
• Tighten clamping screw (B).

• Install cover (A) and side guard.

A—Cover
B—Clamping screw
C—Clamping nut
X—Adjusted length 12 mm (0.47 in.)
I—Slip clutch



ZX004208 -UN-19MAY95



ZX009540 -UN-08NOV96

ZX009540

ZX,OMXZCO002273-19-01NOV96

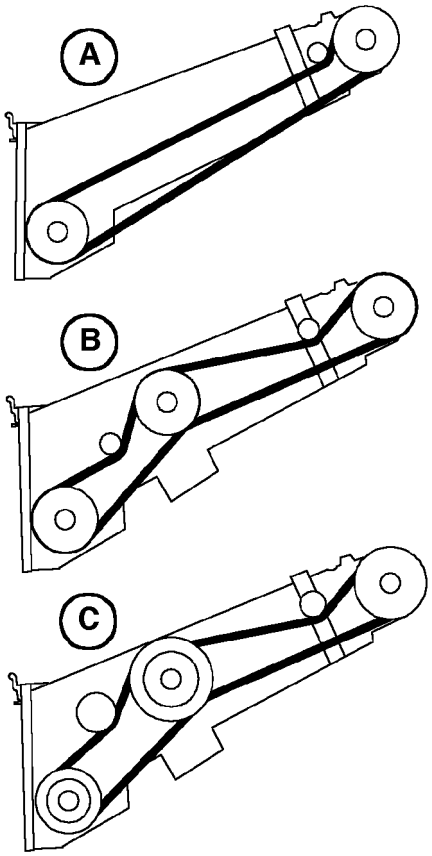
SPECIFICATIONS

Item	Measurement	Specification
Screws to hub	Tightening torque	35 N·m (26 lb-ft)
Cylinder	Tightening torque	200 N·m (150 lb-ft)
Variator extended (middle unit)	Gap	24 mm (0.9 in)
Variator (lower unit)	Gap	3 - 6 mm (0.12 - 0.24 in)

ZX,TMXZCO009598-19-01AUG97

DRIVES ON LEFT-HAND SIDE OF FEEDER HOUSE

A—Direct drive
B—Drive with countershaft
C—Drive with variator

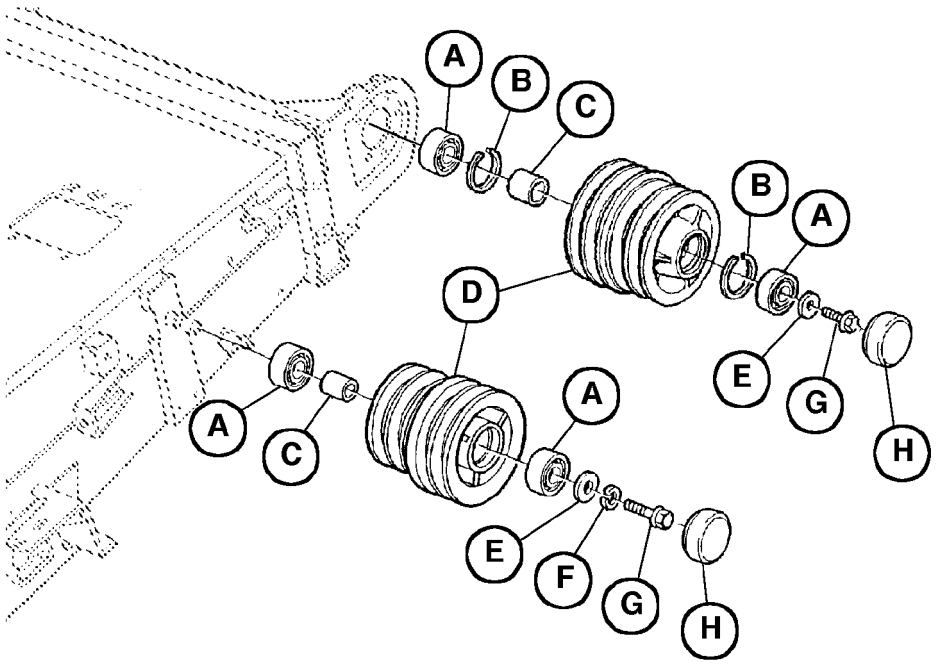


ZX012220

ZX012220 -UN-25SEP97

ZX,TMXZCO009599-19-01AUG97

DRIVE WITH COUNTERSHAFT, EXPLODED VIEW

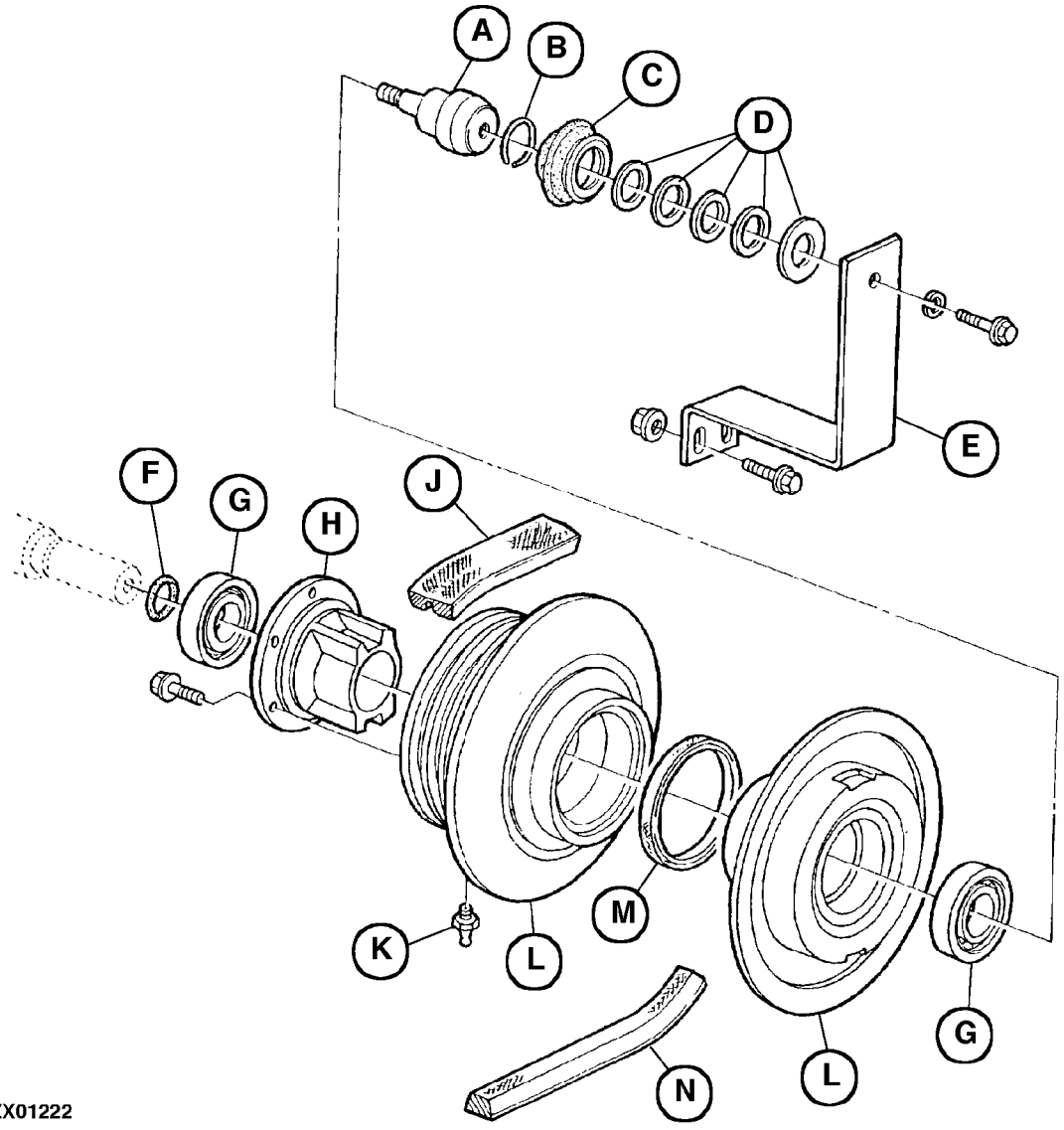


ZX012221

A—Ball bearing
B—Snap ring
C—Bushing
D—V-belt sheave
E—Washer
F—Spring ring
G—Retaining screw
H—Dust cap

ZX,TMXZCO009600-19-01AUG97

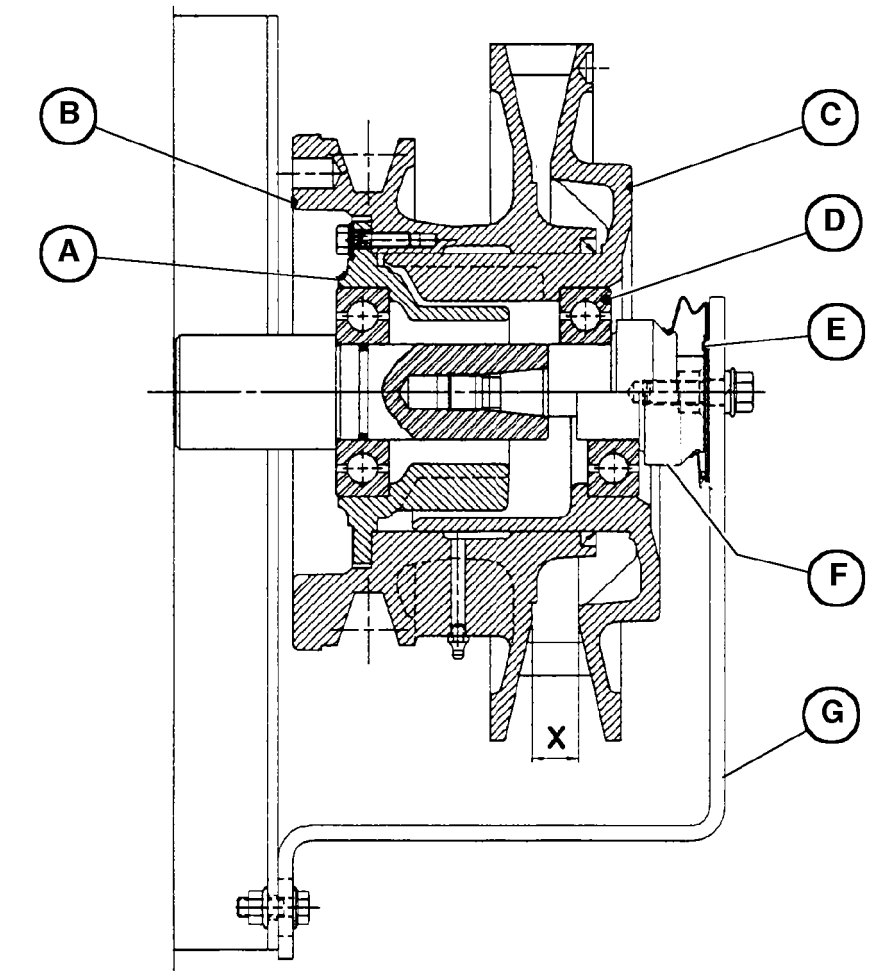
CENTRAL UNIT OF VARIATOR DRIVE, EXPLODED VIEW



A—Cylinder
B—Snap ring
C—Rubber seal
D—Shims
E—Bracket
F—O-ring
G—Ball bearing
H—Hub
J—Drive belt
K—Grease fitting
L—Variator half
M—Seal ring
N—Variator V-belt

ZX,TMXZCO009601-19-01AUG97

ASSEMBLING THE VARIATOR DRIVE



A—Hub
B—Inner sheave
C—Outer sheave
D—Ball bearing
E—0.8 mm (0.03 in.) shims
F—Cylinder
G—Bracket
X—Gap with variator extended 24 mm (0.9 in.)

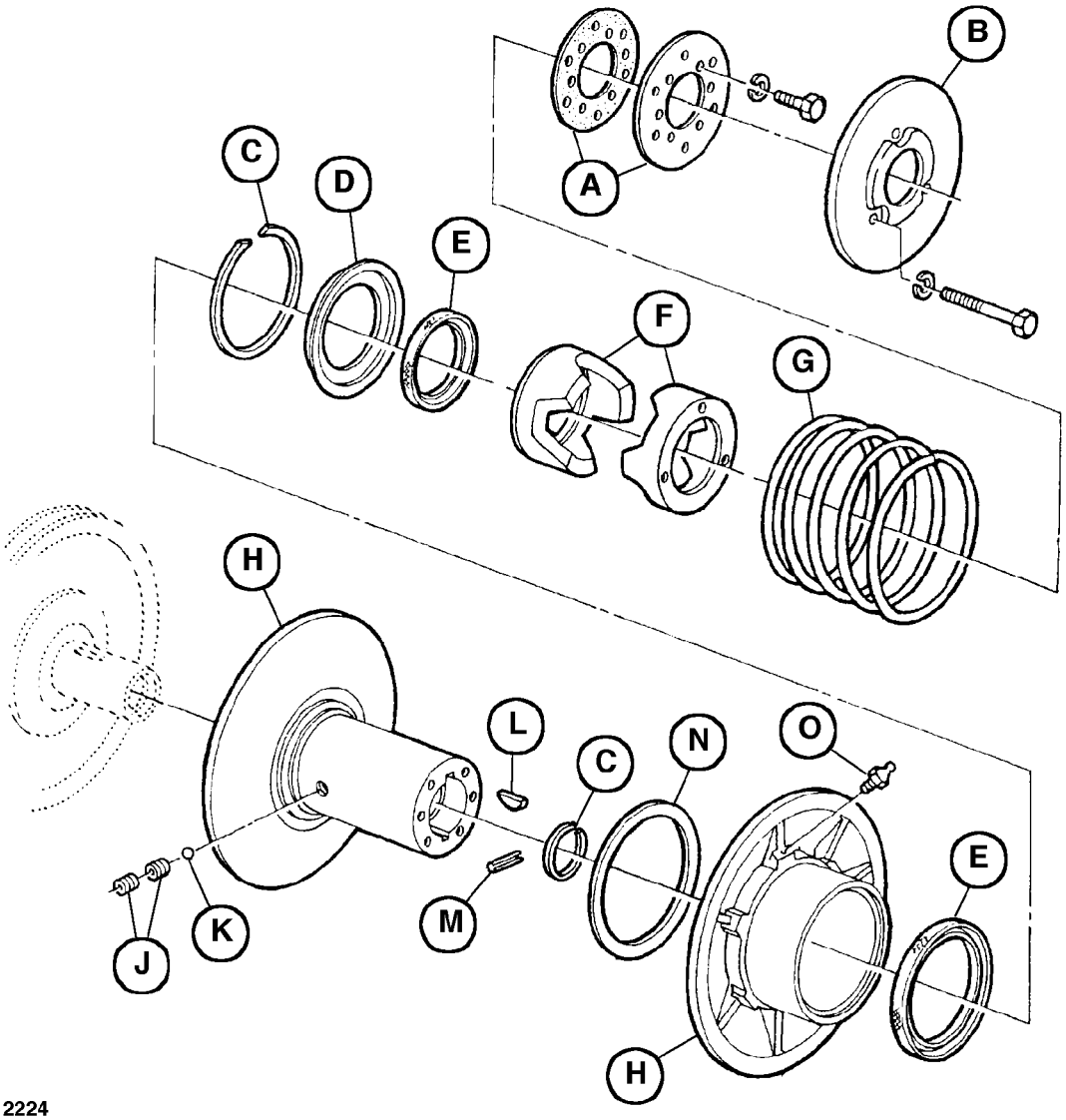
— Tighten the screws at the hub (A) to 35 N·m (26 lb-ft).

— Tighten cylinder (F) to 200 N·m (150 lb-ft).

— Adjust gap (X) by adding or removing shims (E). If the gap is too wide, the variator V-belt will be destroyed.

ZX,TMXZCO009602-19-01AUG97

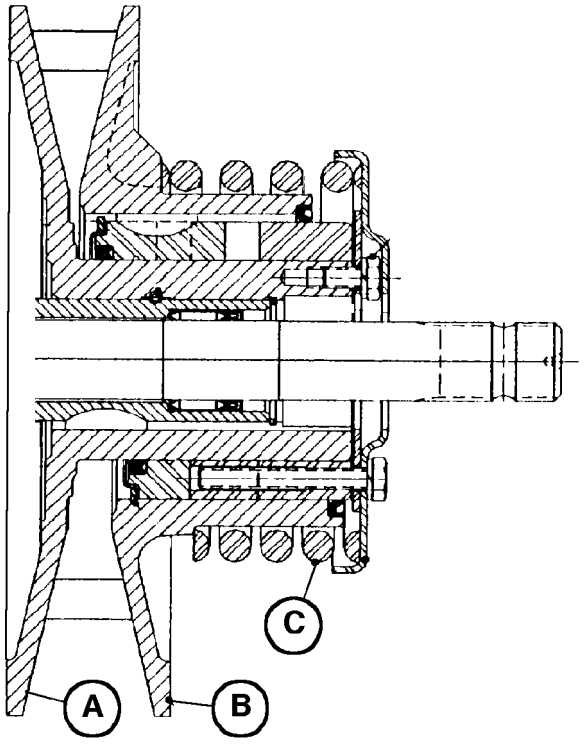
LOWER VARIATOR, EXPLODED VIEW



A—Disks
B—Cover
C—Snap ring
D—Ring
E—Seal ring
F—Engaging rings
G—Spring
H—Variator half
J—Set screws
K—Ball
L—Key
M—Spring pin
N—Ring
O—Grease fitting

ZX,TMXZCO009603-19-01AUG97

VARIATOR ASSEMBLY



ZX012225

A—Inner half of variator **B—Outer half of variator** **C—Spring**

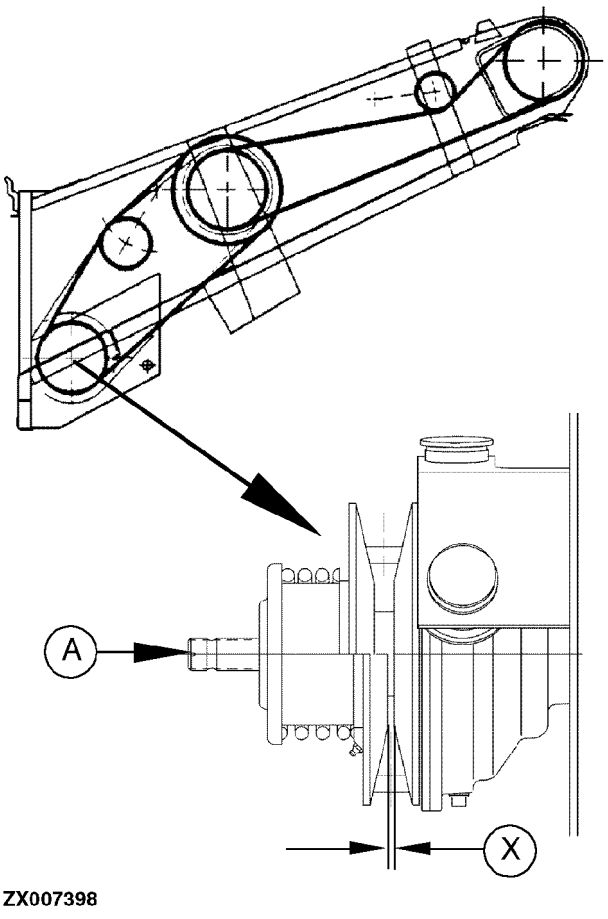
ZX,TMXZCO009604-19-01AUG97

ADJUSTING BOTTOM UNIT OF FEEDER HOUSE VARIATOR

CAUTION: Before adjusting the machine or performing service work, always switch off all drives, shut off the engine and wait until all moving parts have come to a stop.

Run the header drive shaft (A) at the slowest speed.

With the combine stationary and all functions switched off, adjust gap (X) to 3-6 mm (0.12-0.24 in.) by means of the tensioning device.



ZX,OMXZCO002276-19-01MAR95

SPECIFICATIONS

Item	Measurement	Specification
Reverser gear attaching screws	Tightening torque	240 N·m (177 lb-ft)
Oil in reverser gear	Capacity	1.75 L (0.46 U.S.gal)

ZX,TMXZCO009605-19-01AUG97

OTHER MATERIAL

Number	Name	Use
TY15130	Loctite 515 sealant	Sealing the surfaces of the reverser gear housing
TY9371	Loctite 242	Securing the screws on the cover

ZX,TMXZCO010102-19-01AUG97

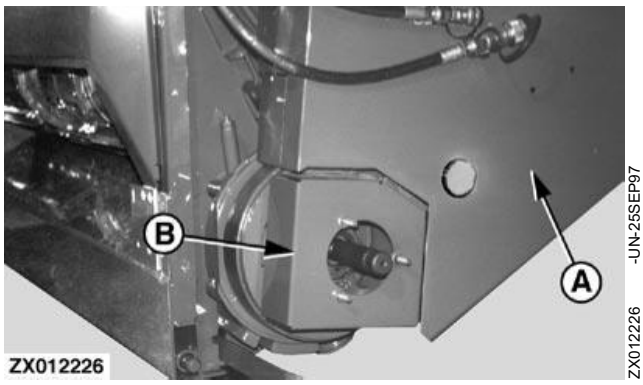
REMOVING THE REVERSER

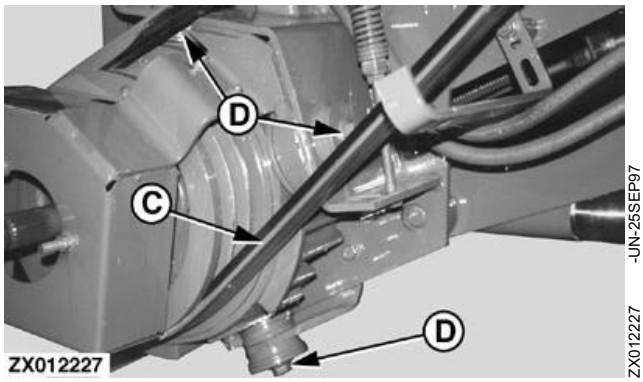
— Remove shields (A) and (B).
— Relieve tension on V-belt (C), and remove.
— Remove bolts from bowden cable underneath the feeder house.
— Take out the three attaching screws (D).
— Remove reverser assembly.

CAUTION: The reverser weighs over 50 kg (110 lb), so take care!

— On reversers up to a certain serial number, the feeder house drive shaft is made in one piece. In this case, the belt pulley and bearing clamping ring must be removed from the r.h. side of the reverser prior to its removal.

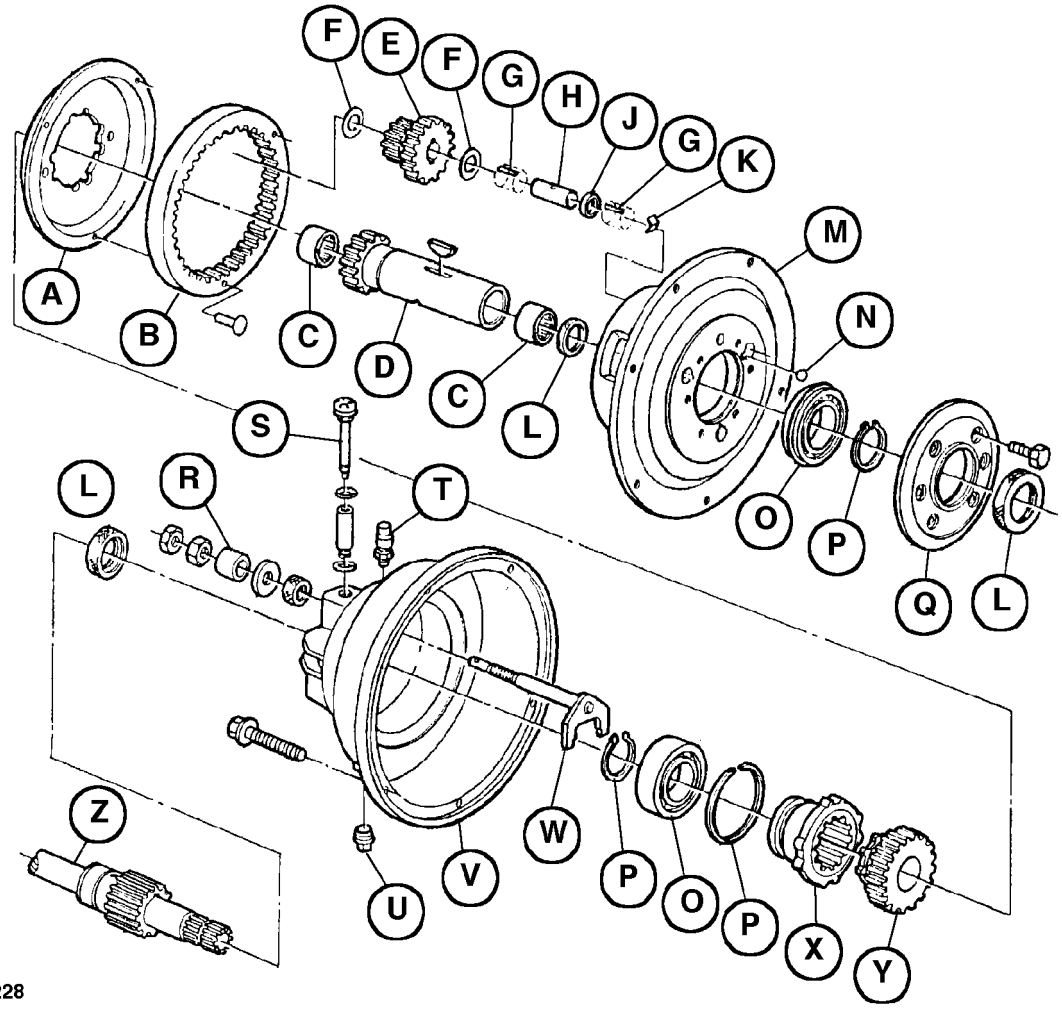
A—Shield
B—Shield
C—V-belt
D—Attaching screws





ZX,TMXZCO009606-19-02AUG97

REVERSER, EXPLODED VIEW



A—Metal cap
B—Ring gear
C—Needle roller bearing
D—Input shaft
E—Pinion
F—Thrust washer
G—Needle roller
H—Pin
J—Washer
K—Spring
L—Seal ring
M—Planet carrier
N—Ball
O—Ball bearing
P—Snap ring
Q—Cover
R—Bushing
S—Dipstick
T—Vent
U—Oil drain plug
V—Housing
W—Fork
X—Shift collar
Y—Reverser gear
Z—Shaft

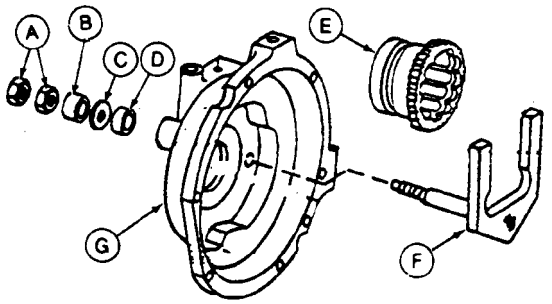
ZX,TMXZCO009608-19-01AUG97

Reverser/Exploded view

— Apply multipurpose grease to threads on fork (F).

— Install parts (A—F) in the order shown. Do not tighten nuts (A) at this time.

A—Nut (2 used)
B—Bushing
C—Washer
D—Seal
E—Shift collar
F—Fork
G—Housing



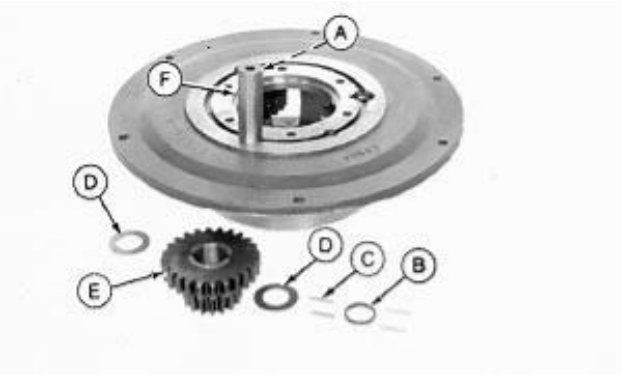
H40423 -UN-20MAR89

ZX,TMXZCO009609-19-01AUG97

— Install parts (A—F) in cover.

NOTE: Install pinions consecutively (one, two, and three) in a counterclockwise direction.

A—Ball (3 used)
B—Washer (3 used)
C—Needle roller (186 used)
D—Thrust washer (6 used)
E—Pinion (3 used)
F—Pin (3 used)



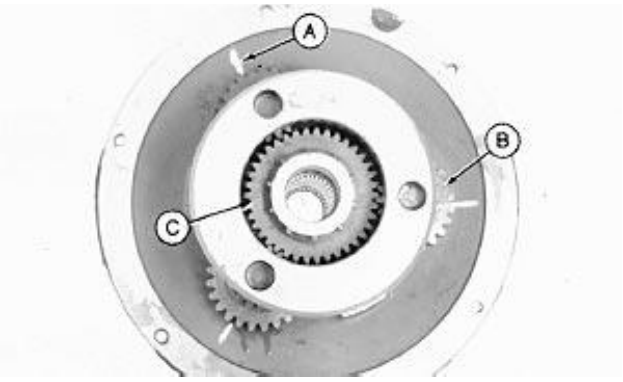
H40425 -UN-20MAR89

ZX,TMXZCO009610-19-01AUG97

— Line up numbers on pinions (B) with marks (A) made on cover during disassembly. Install gear (C).

IMPORTANT: If gears are not installed correctly timed, the gearcase could overheat.

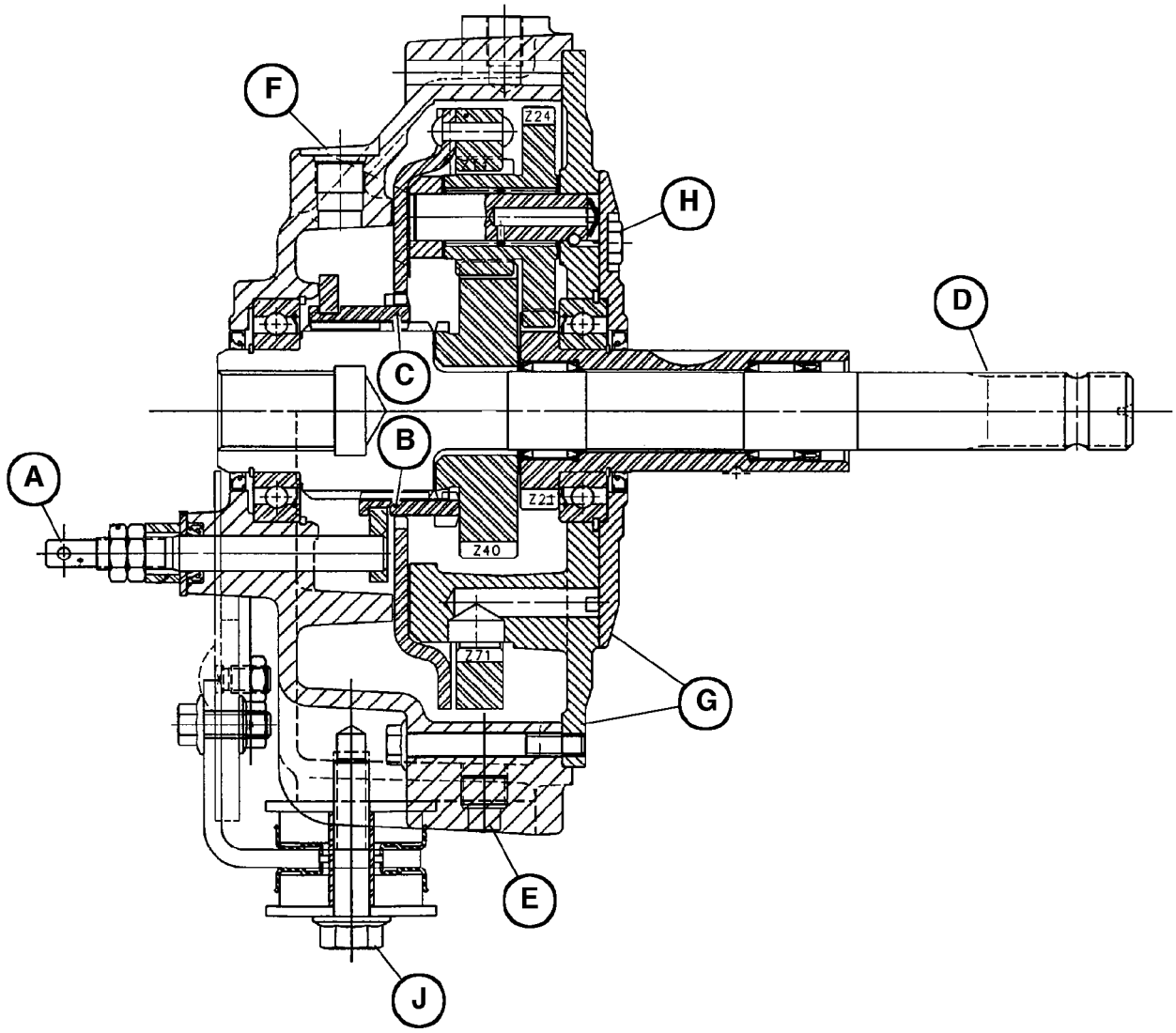
— Install ring gear over planetary assembly.



H40424 -UN-20MAR89

ZX,TMXZCO009611-19-01AUG97

ASSEMBLING THE REVERSER



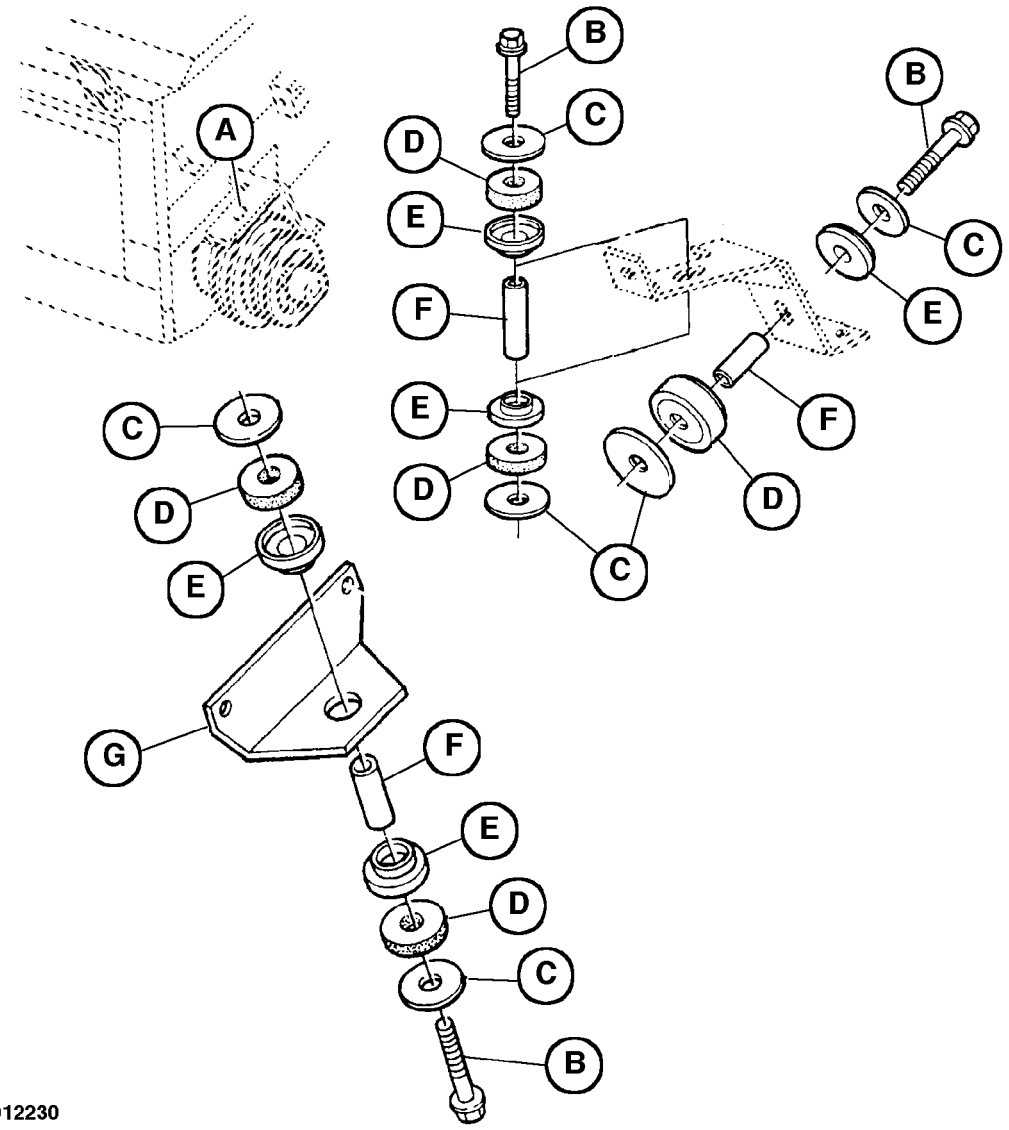
ZX012229

A—Fork
B—Forward position
C—Reverse position
D—Cutting platform drive shaft
E—Oil drain
F—Oil filler neck
G—Sealing face
H—M10x20 screw
J—M16x70 screw

Coat sealing face (G) with Loctite 515 (TY15130). Insert screws (H), having first coated them with Loctite 242 (TY9371).

ZX,TMXZCO009612-19-01AUG97

ATTACHING THE REVERSER



ZX012230

ZX012230 -UN-25SEP97

A—Retaining plate
B—Screw
C—Washer
D—Rubber damper
E—Spacer retainer
F—Spacer bushing
G—Bracket

Tighten screws (B) to 240 N·m (177 lb-ft).

ZX,TMXZCO009613-19-01AUG97

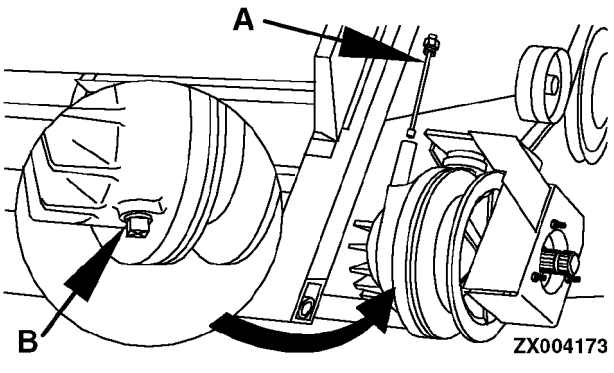
Reverser

Capacity: 1.75 L (0.46 U.S. gal)

NOTE: Before checking the oil level, raise the feeder house until the filler tube is vertical.

If the combine harvester is equipped with a pivoting feeder house shield, tilt the shield to the right so that its right end is down and its left end is up.

A—Dipstick and filler neck
B—Drain screw



ZX,OMXZCO002066-19-21NOV96

ADJUSTING REVERSER SHIFTER FORK AND CONTROL CABLE

Sit in the operator's seat and depress the right side of the reverser pedal.

Raise feeder house and lower safety rail. All adjustments are made under the feeder house.

Remove cotter pin, pin (A) and washer from yoke (B).

Remove pin (C).

CAUTION: Bellcrank is spring-loaded and could pinch fingers if released accidentally.

Pull bellcrank (D) away and hold it firmly.

Using a suitable wrench, loosen lock nuts (E) and (F) on shifter fork (G).

Relax hold on bellcrank (D). Push shifter fork (G) in as far as possible.

Hold shifter fork (G) in firmly and screw down lock nut (F) until spacer (H) is tight against washer (J).

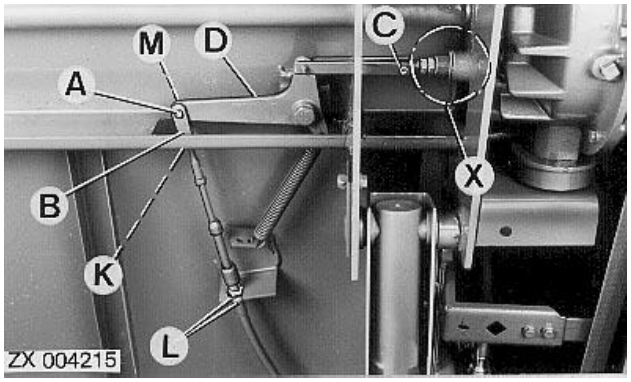
Tighten lock nut (F) further by one complete turn.

Tighten lock nut (E) with the wrench. Be careful not to turn lock nut (F).

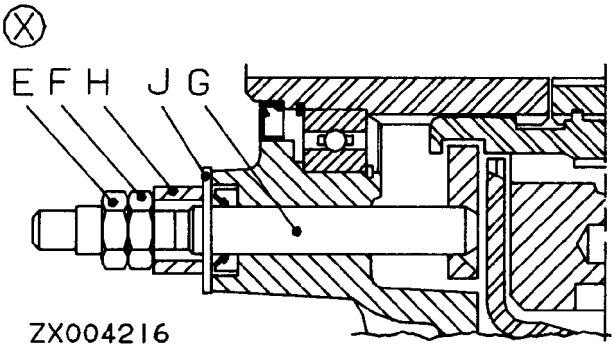
Reinsert pin (C) through bellcrank (D) and shifter fork (G).

Use lock nut (K) on yoke or lock nuts (L) to adjust the yoke until the end of the slot furthest from nut (K) is aligned with hole (M) in the arm.

Reinstall pin (A), washer (J) and the cotter pin.



ZX004215 -UN-19MAY95

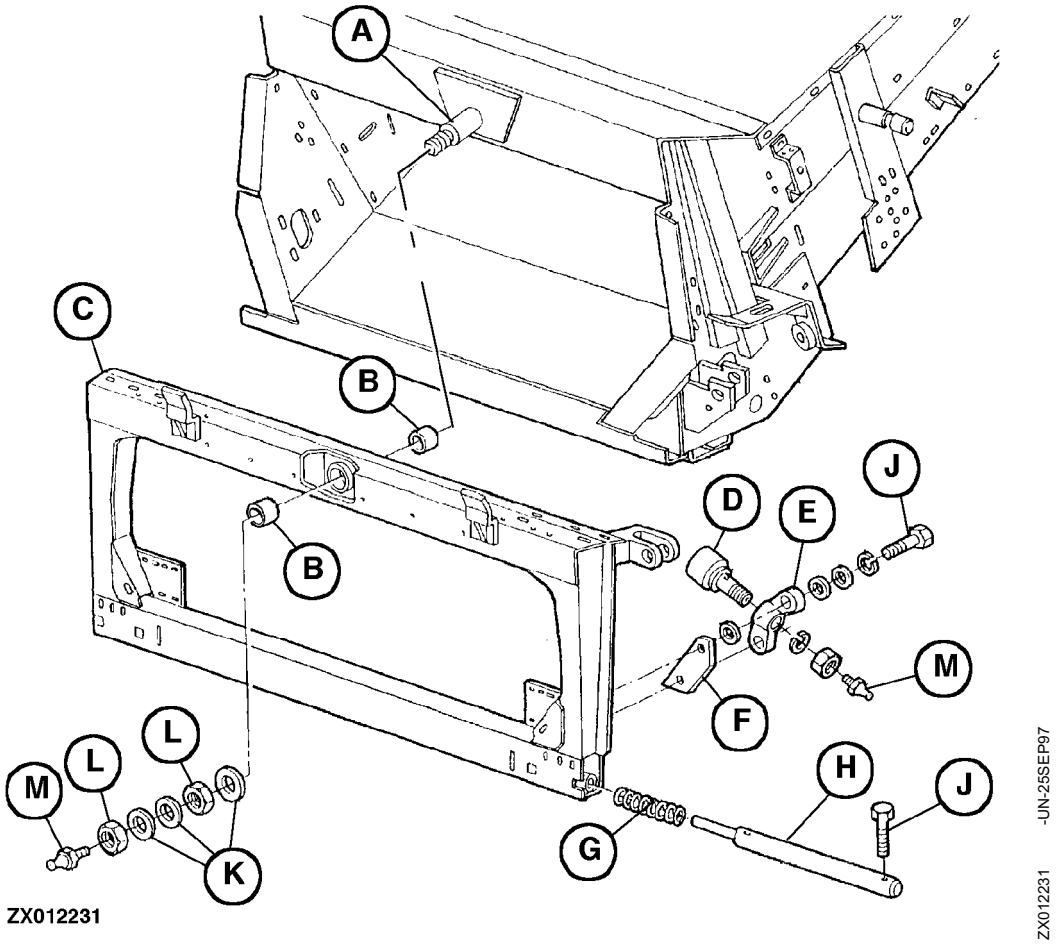


ZX004216 -UN-22MAY95

A—Pin
B—Yoke
C—Pin
D—Bellcrank
E—Lock nut
F—Lock nut
G—Shifter fork
H—Spacer
J—Washer
K—Yoke lock nut
L—Cable lock nuts
M—Hole in arm

ZX,OMXZCO002277-19-04DEC92

PIVOTING SHIELD AND ASSOCIATED COMPONENTS

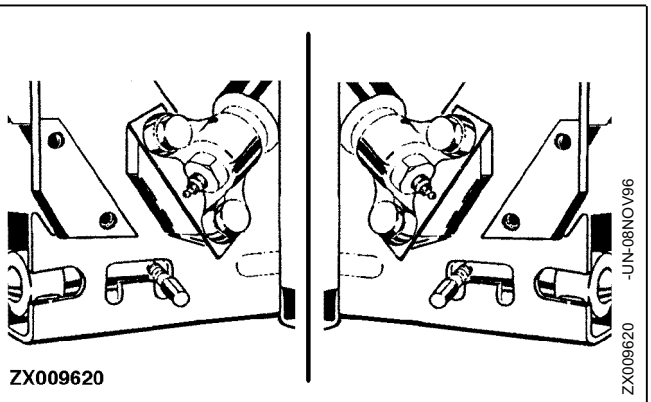


A—Spigot for pivoting shield	D—Guide roll	G—Spring	K—Washer
B—Bushing	E—Retainer	H—Lock	L—Nut
C—Pivoting shield	F—Plate	J—Screw	M—Grease fitting

ZX,TMXZCO009614-19-01AUG97

PIVOTING SHIELD GUIDE ROLLS

The guide rolls on the pivoting shield prevent the pivoting shield from rising above the surfaces of the feeder house during reversing. They also act as additional supports when the shield is being pivoted.



ZX,TMXZCO009615-19-01AUG97

Section 120
Separator and Cleaning Unit

Contents

OPENING STONE TRAP BOTTOM PLATE

CAUTION: Watch for falling stones when bottom plate swings downward.

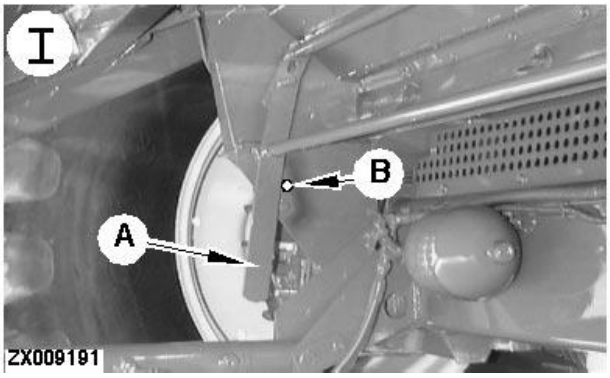
Remove any stones that have been collected.

Pull lever (A) upward. Access to the lever is from either side. The stone trap opens by itself.

When closing the stone trap, push lever (A) beyond the engagement point as far as stop (B).

The engagement point can be adjusted at slots (C).

A—Lever
B—Stop
C—Slots
I—Bottom plate closed
II—Bottom plate open



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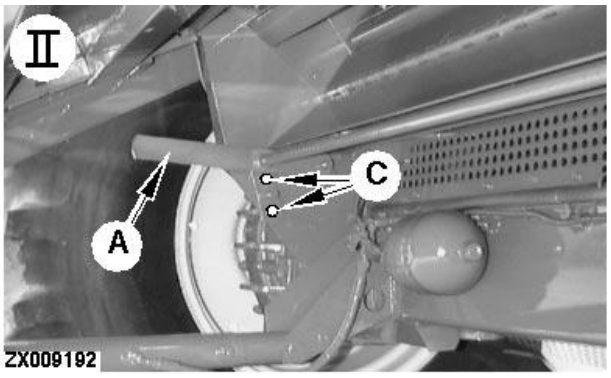


ZX009192 -UN-30MAY96

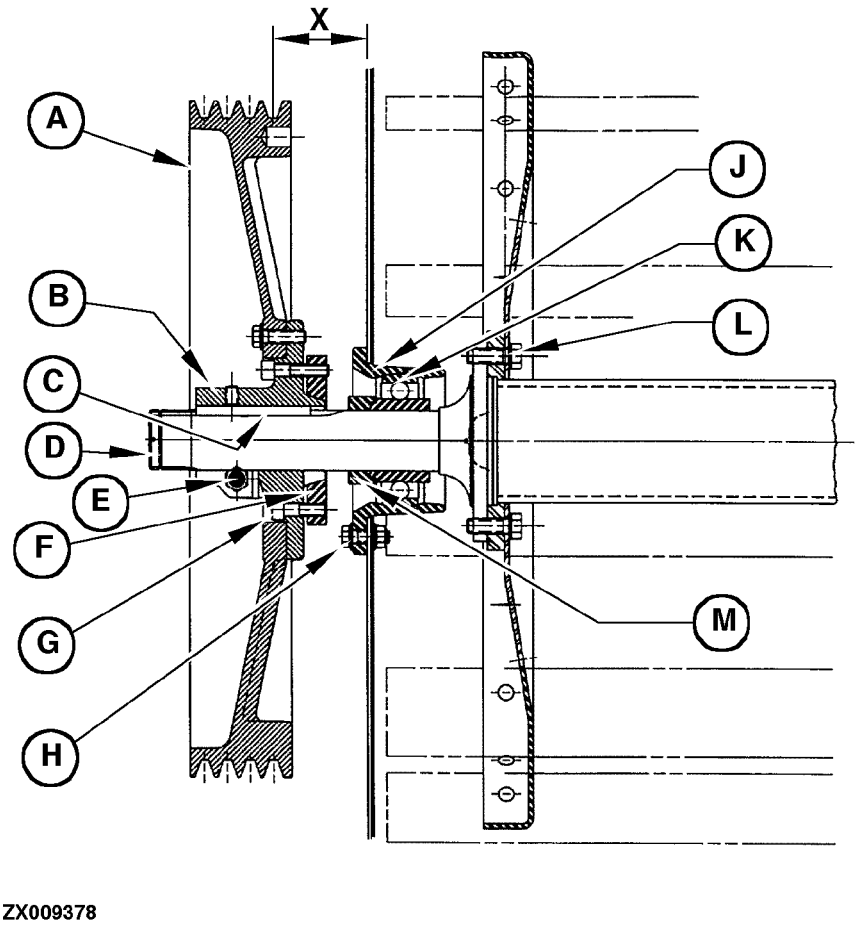
ZX,OMXZCO002280-19-02MAY96

SPECIFICATIONS

Item	Measurement	Specification
Screws in belt pulley and clamping hub	Tightening torque	73 N·m (53.8 lb-ft)
Screw in clamping hub	Tightening torque	85 N·m (62.7 lb-ft)
Screws in bearing housing	Tightening torque	50 N·m (37 lb-ft)
Screws in flanged shaft	Tigthening torque	130 N·m (96 lb-ft)
Screws in clamping plate	Tightening torque	80 N·m (59 lb-ft)
Screws on rasp bars	Tightening torque	140 N·m (103 lb-ft)
Screws on cylinder filler plates	Tightening torque	50 N·m (35 lb-ft)
Screws on bracket for adjusting motor	Tightening torque	55 N·m (41 lb-ft)
Concave clearance at front	Gap	3-5 mm (0.12-0.2 in.)
Concave clearance at rear	Gap	2-6 mm (0.08-0.24 in.)

ZX,TMXZCO009616-19-01AUG97

EXPLODED VIEW OF CYLINDER DRIVE



ZX009378

A—Belt pulley
B—Clamping hub
C—Key
D—Flanged shaft
E—M12x90 screw
F—Clamping plate
G—M10x35 fillister-head screw
H—M12x30 screw
J—Bearing housing
K—Self-aligning ball bearing
L—M12x35 screw
M—Clamping ring
X—77.5 mm (3.0 in.)

— Tighten screw (E) to 85 N·m (62.7 lb-ft).
— Tighten screw (G) to 80 N·m (59 lb-ft).
— Tighten screw (H) to 50 N·m (37 lb-ft).
— Tighten screw (L) to 130 N·m (96 lb-ft).

IMPORTANT: Tighten fillister-head screws (G) evenly, otherwise the clamping plate will become skewed.

ZX,TMXZCO009617-19-01AUG97

ALIGNING THE BELT PULLEY

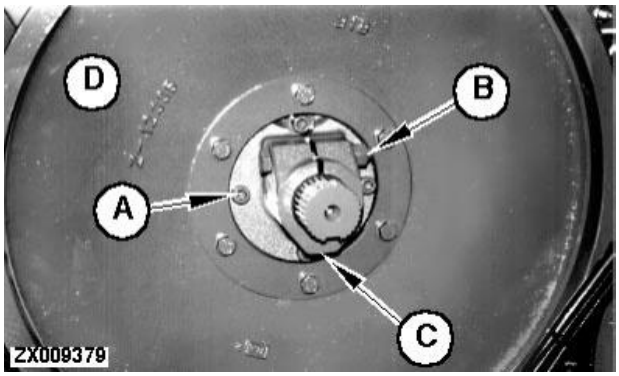
Slacken off fillister-head screws (A), clamping plate (B) and set-screw (C).

Align the belt pulley to suit the power band.

Tighten fillister-head screws (A) evenly to 80 N·m (59 lb-ft).

Tighten clamping screw (B) to 85 N·m (62.7 lb-ft).

Then tighten set-screw (C).



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ZX009379

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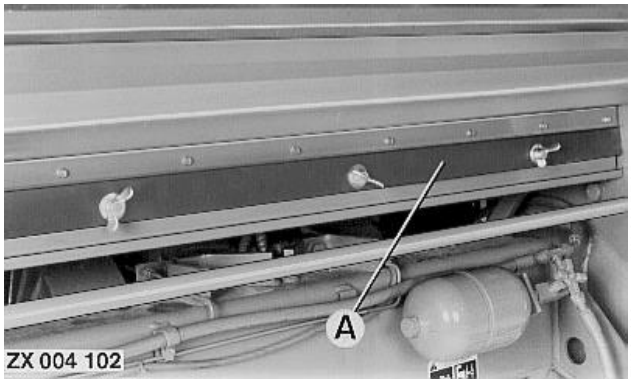
REMOVING THRESHING CYLINDER

NOTE: Prior to threshing cylinder removal, feeder house must be removed. If the threshing cylinder is equipped with filler plates, remove these plates prior to threshing cylinder removal.

Remove cover bar (A).



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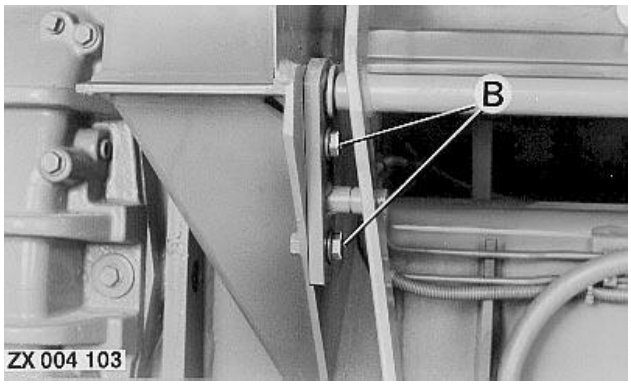
ZX004102

ZX,TMXZCO002730-19-13MAY93

Turn out attaching screws (B) of stone trap locking mechanism on right and left-hand sides.



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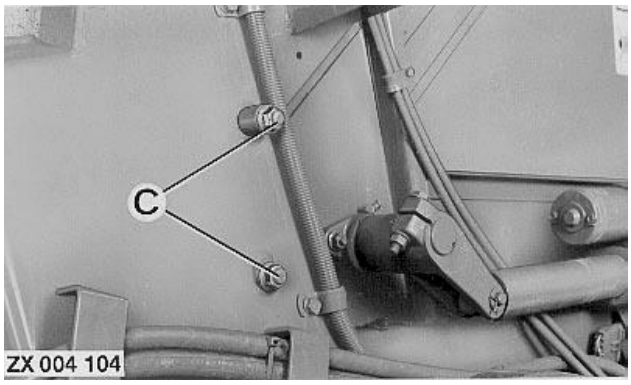
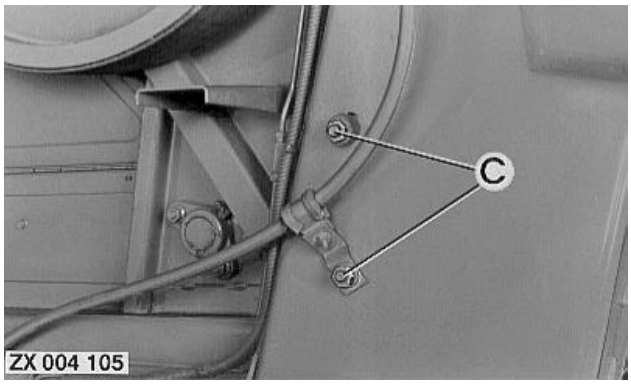
ZX004103

ZX,TMXZCO002731-19-13MAY93

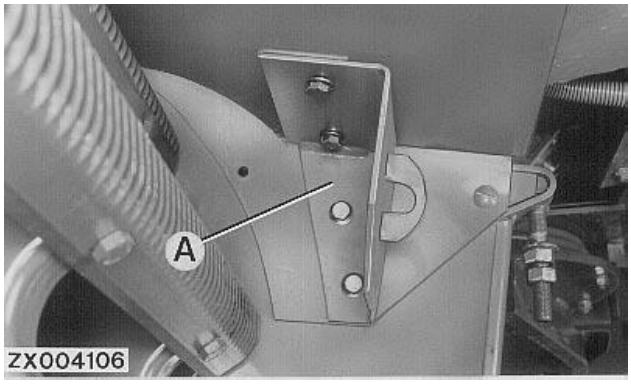
Remove attaching screws (C) of stone trap on right and left-hand sides. Lift stone trap out of machine frame. Two persons are required to perform this job.

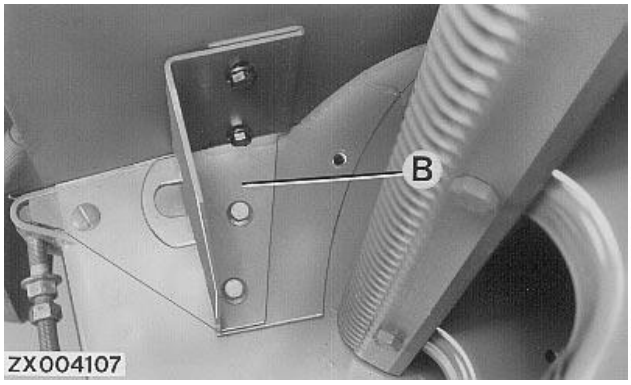




ZX,TMXZCO002732-19-13MAY93

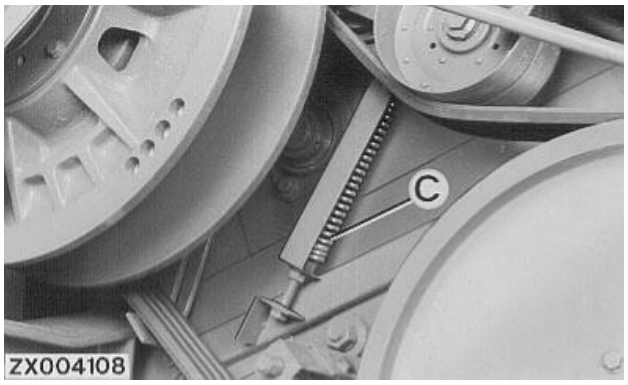
Remove straps (A) and (B).





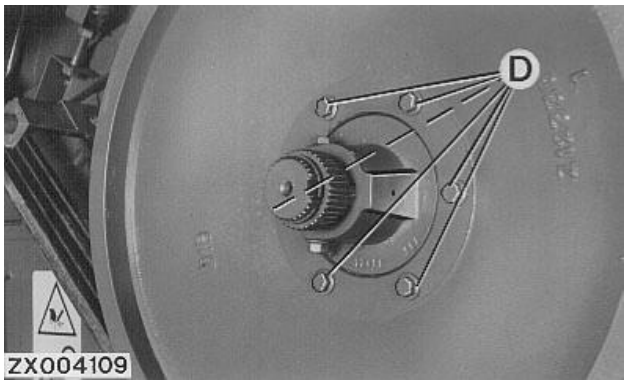
ZX,TMXZCO002733-19-13MAY93

Completely relieve spring tensioner (C).



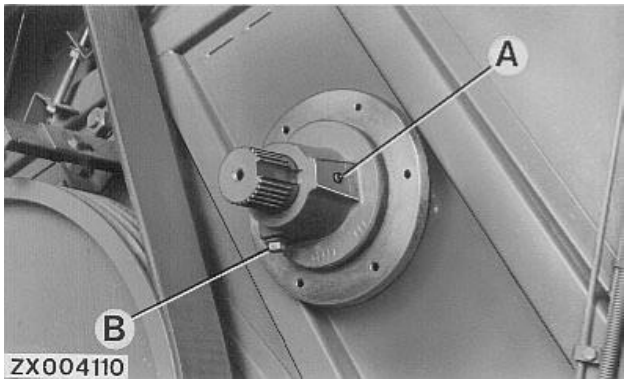
ZX,TMXZCO002734-19-13MAY93

Turn out attaching screws (D). Lift pulley off hub and leave it suspended in the V-belt.



ZX,TMXZCO002735-19-13MAY93

Turn out hex. socket screw (A). Loosen cap screw (B) and lift hub off the shaft.



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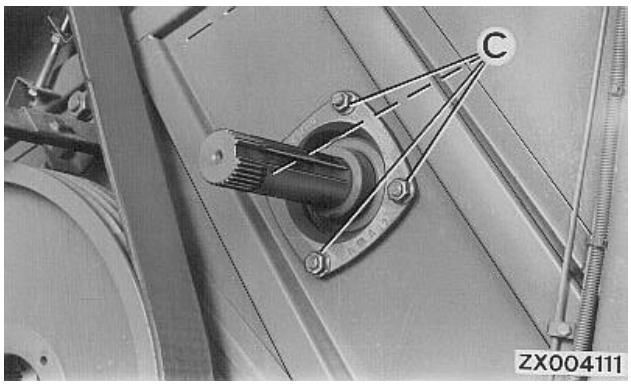
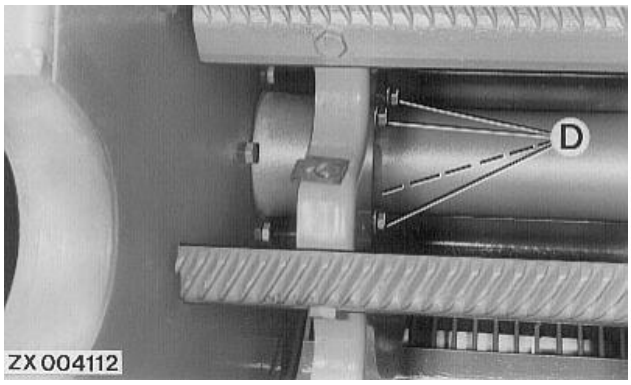
Raise concave to highest position from the cab.

Turn out attaching screws (C).



ZX,TMXZCO002737-19-13MAY93

Separate stub shaft from threshing cylinder by loosening screws (D) and take stub shaft out of combine frame.

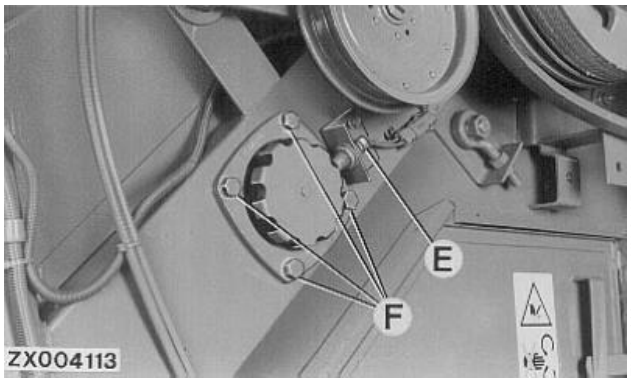


ZX,TMXZCO002738-19-13MAY93

Loosen lock nuts of speed sending unit (E). Remove speed sending unit.

Turn out attaching screws (F).

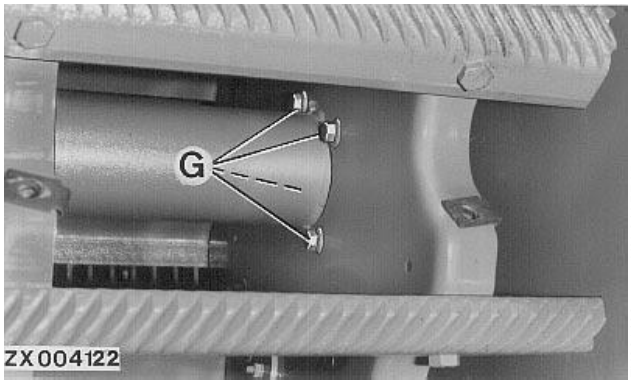
Remove bearing housing half.



ZX,TMXZCO002739-19-13MAY93

Turn out flange screws (G). Separate stub shaft from threshing cylinder.

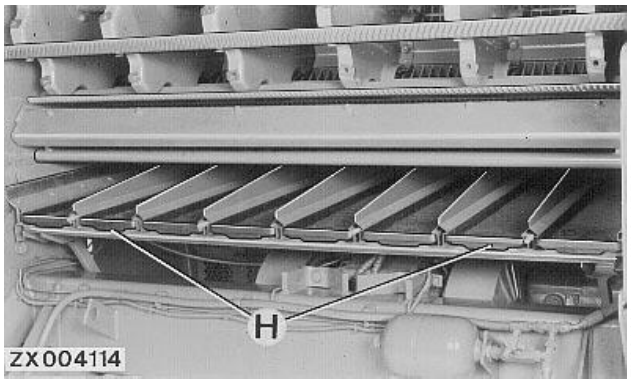
- The threshing cylinder touches the concave -



ZX,TMXZCO002988-19-04OCT93

Pull out two plastic grids (H) of grain pan.

Place two 10 x 12 cm (0.4 x 0.5 in.) wooden supports with a length of 4 m (1.6 in.) against grain pan at the points where the grids have been removed.



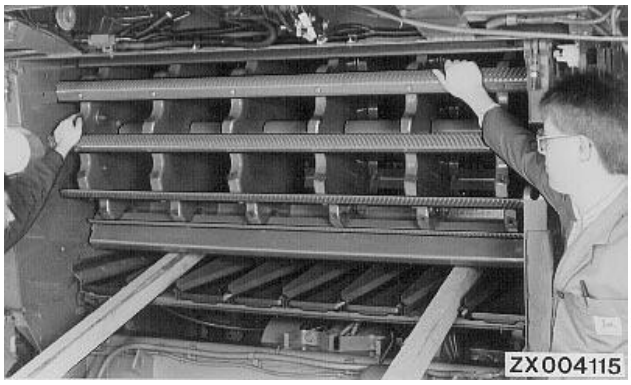
ZX,TMXZCO002740-19-13MAY93

CAUTION: Secure threshing cylinder to prevent it from rolling out of combine.

Move concave to lowest position from the cab.

Roll threshing cylinder out of machine over concave front edge and the two wooden supports. Two persons are required to perform this job.

NOTE: When removing threshing cylinder from combine, make sure that a deep spot of the cylinder is rolled over the concave front edge.



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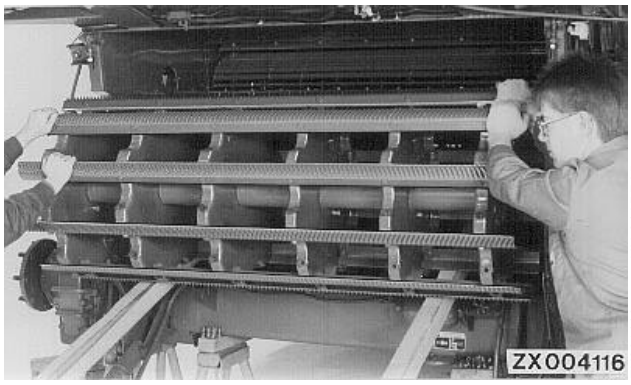
ZX004115



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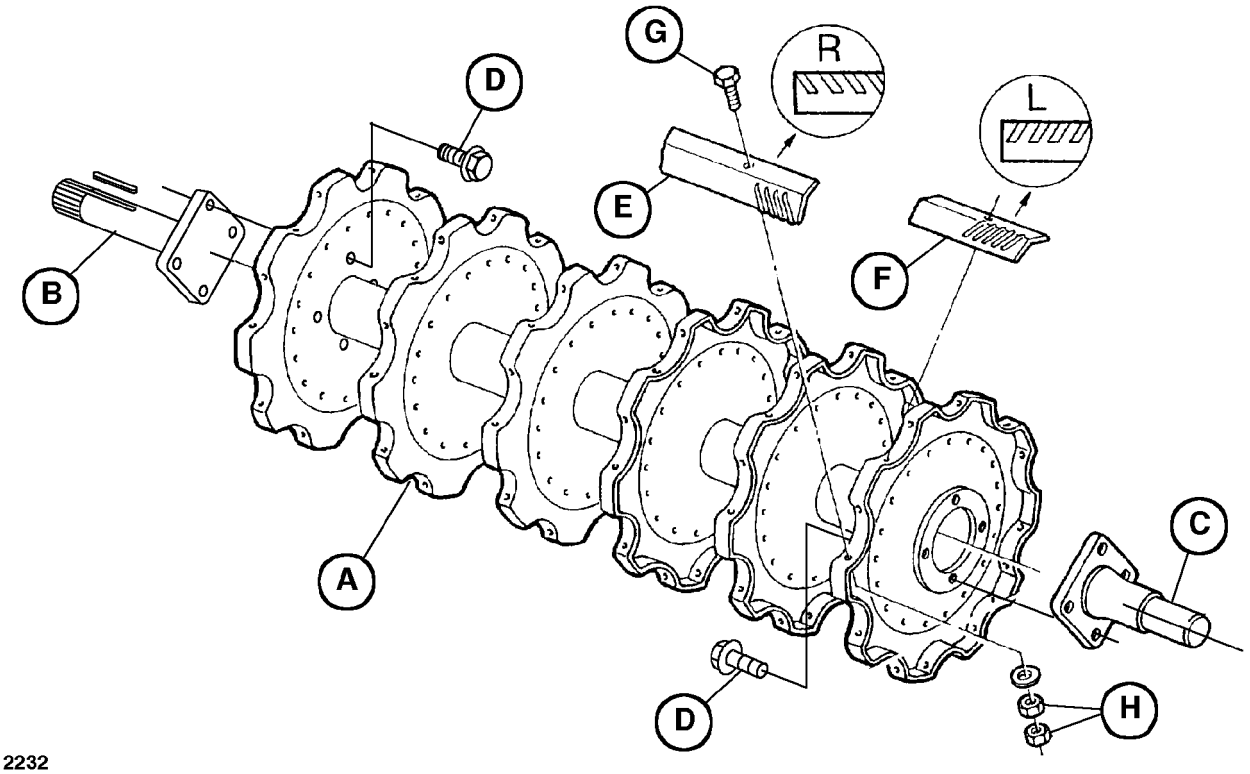
ZX004116

ZX,TMXZCO002741-19-13MAY93

THRESHING CYLINDER, EXPLODED VIEW



ZX012232

ZX012232 -UN-25SEP97

A—Threshing cylinder
B—R.h. flanged shaft
C—L.h. flanged shaft
D—M12x35 screw, to flanged shaft
E—Rasp bar (right-serrated)
F—Rasp bar (left-serrated)
G—M12x35 screw
H—M12 nuts (2 used)

— Tighten screws (D) to flanged shafts (B and C) to 130 N·m (96 lb-ft).

— Tighten screws (G) to 140 N·m (103 lb-ft), and lock.

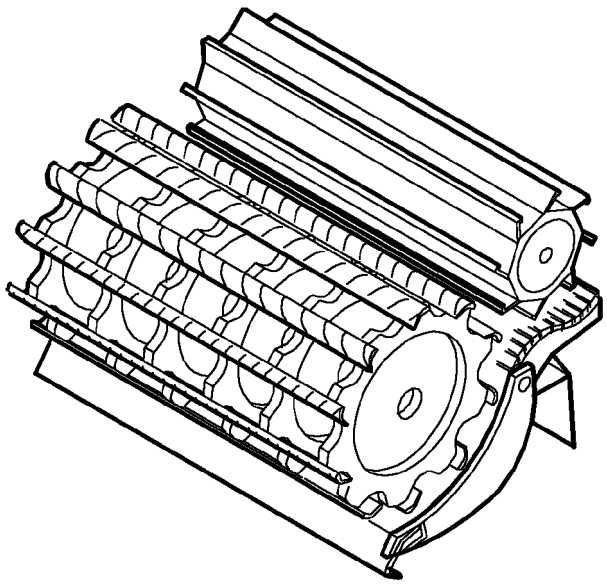
ZX,TMXZCO009618-19-01AUG97

CYLINDER RASP BARS

The cylinder is equipped with right-serrated and left-serrated rasp bars, installed alternately. When replacing a rasp bar, replace the corresponding bar on the opposite side as well to maintain proper cylinder balance.

Rasp bars can be replaced without removing the cylinder.

IMPORTANT: After the first 10 hours of operating with new rasp bars, retighten the attaching screws to 140 N·m (103 lb-ft).



ZX 004254

ZX004254 -UN-19JUN95

ZX,OMXZCO002282-19-01MAR95

CYLINDER FILLER PLATES

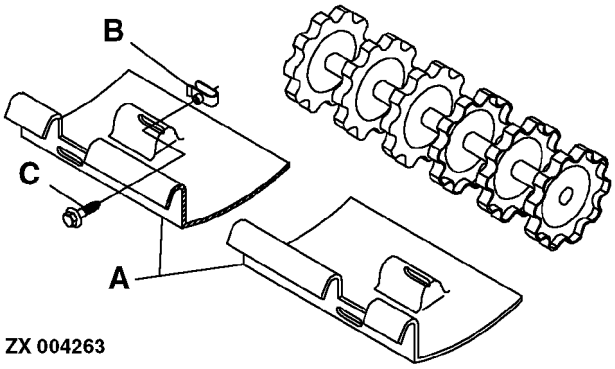
To harvest corn, the cylinder must be fitted with filler plates (A). These plates rub the kernels off the cobs and prevent the cobs from breaking up.

Tighten screws (C) to 50 N·m (35 lb-ft), and retighten them after the first half hour of operation.

IMPORTANT: Make sure the filler plates have been removed before harvesting grain crops.

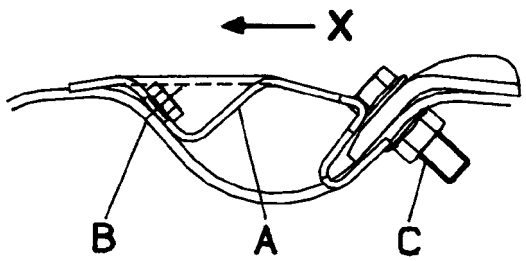
NOTE: Leave clips (B) in place, as they suffer damage in the removal process.

A—Filler plate
B—Clip
C—Cap screw
X—Direction of rotation



ZX 004263

ZX004263 -UN-19JUN95



ZX004264

ZX004264 -UN-22MAY95

ZX,TMXZCO010118-19-01AUG97

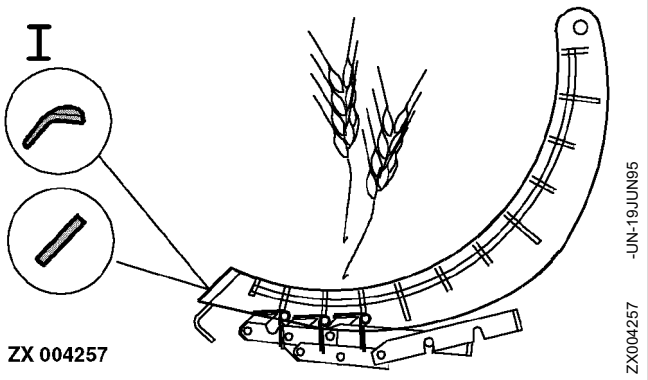
CONCAVES

Three different concaves are available, providing ideal threshing and cleaning characteristics for every type of crop.

I. Grain crop concave

Two-position (engaged/disengaged) de-awning plates are integrated into the grain crop concave.

Either a booster bar or a special rasp bar may be installed at the concave inlet.



Grain crop concave

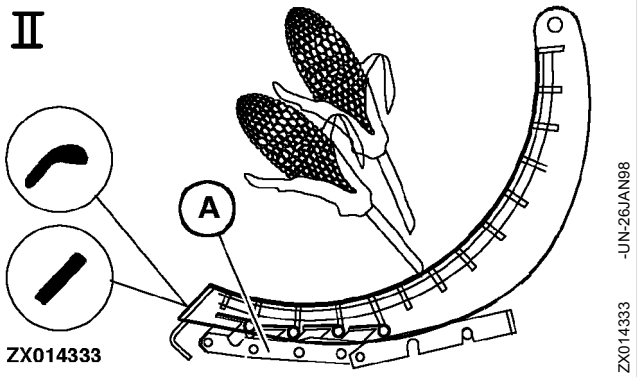
ZX,TMXZCO010103-19-01AUG97

II. Corn (maize) concave

This concave may be used to harvest both corn (maize) and sunflowers.

The corn (maize) concave has integral de-awning plates (A) which can be engaged or disengaged.

Either a booster bar or a special rasp bar may be installed at the concave inlet.



Corn (maize) concave

ZX,OMXZCO002288-19-01APR98

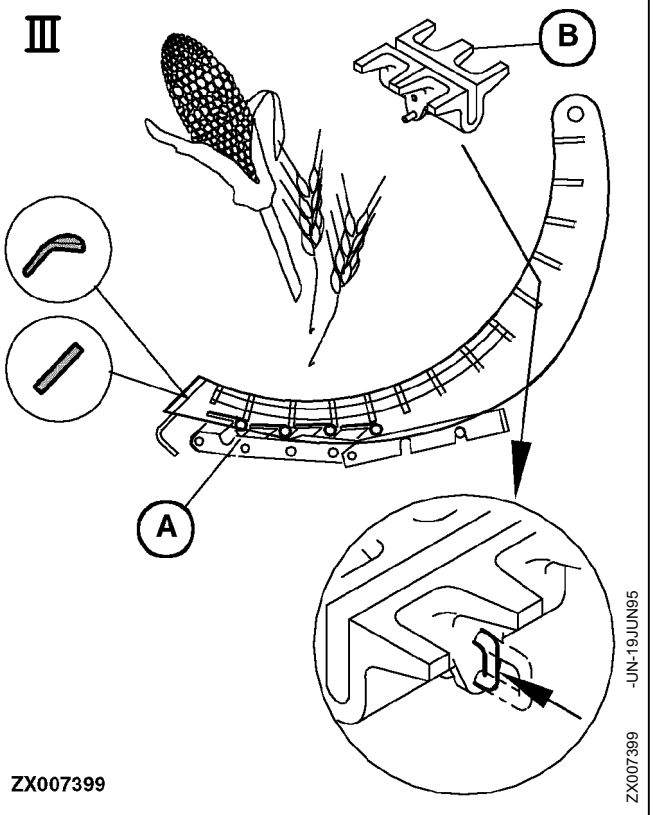
III. Universal concave

Either a booster bar or a special rasp bar may be installed at the concave inlet.

The corn concave has integral de-awning plates (A) which can be engaged or disengaged.

The rear part of the concave can be shielded by concave inserts (B) for corn harvesting.

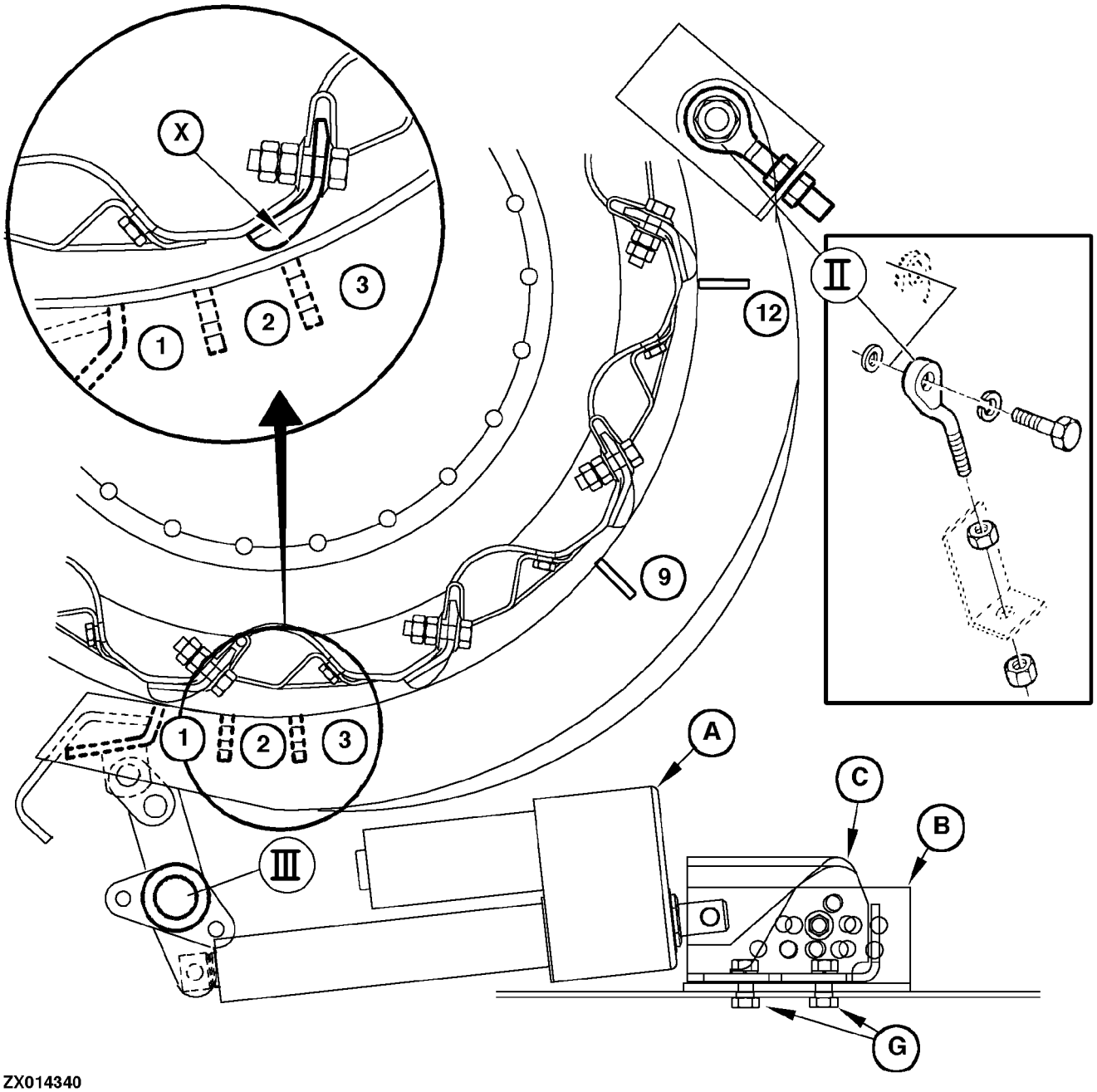
IMPORTANT: Concave inserts (B) must be removed for harvesting grain crops.



Universal concave

ZX,OMXZCO002289-19-02MAR95

CONCAVE BASIC SETTING



ZX014340

A—Adjusting motor
B—Bracket
C—Holder
G—Attaching screws
X—Punch-mark on highest rasp bar
I—Adjusting point, rear right
II—Adjusting point, rear left
III—Adjusting point, front left
IV—Adjusting point, front right

ZX,OMXZCO002296-19-01APR98

CONCAVE BASIC SETTING (CONTINUED)

NOTE: When measuring, select the highest rasp bar at either side. This rasp bar (or these rasp bars) are marked with an "X" punch-mark before leaving the factory. Different rasp bars may be marked either on the left or right ends.

Install the concave and attach it at the adjusting points (see above). At adjusting point IV, attach the mountings to the center of the slots.

Install adjusting motor (A) at bracket (B), holders (C) and at the adjusting lever.

Adjusting points I and II

With the highest cylinder rasp bar at each end, set a gap of 3 mm (0.12 in.) at the last concave rasp bar.

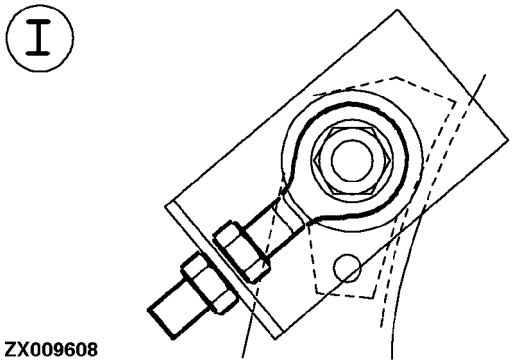
Measure the gap between the 3rd concave rasp bar and the highest cylinder rasp bar. Concave clearance should be 4 mm (0.16 in.). If clearance is OK at both ends, continue with assembly (see below).

Adjusting points III

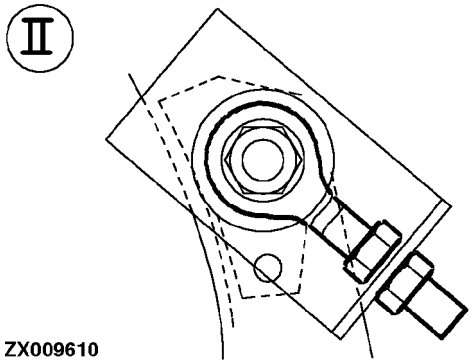
If concave clearance is greater than 4 mm (0.16 in.), push bracket (B) at adjusting point III onto the combine harvester's frame until clearance at 3rd concave rasp bar is 4 mm (0.18 in.).

If concave clearance is less than 4 mm (0.16 in.), pull bracket (B) at adjusting point III forward along the combine harvester's frame until clearance at 3rd concave rasp bar is 4 mm (0.18 in.).

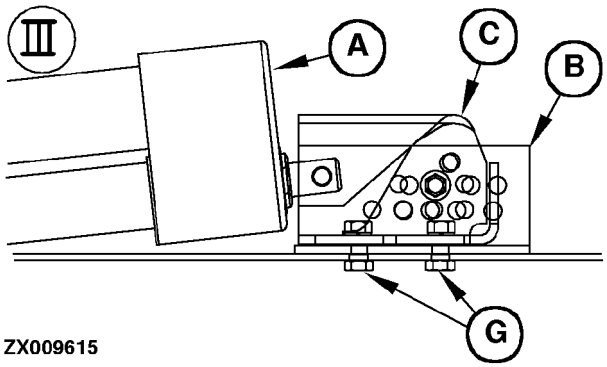
A—Adjusting motor
B—Bracket
C—Holder
D—Aluminium bearing
E—Adjusting screw
F—Stop plate
G—Attaching screws
X—Punch-mark on highest rasp bar
I—Rear right adjusting point
II—Rear left adjusting point
III—Front left adjusting point
IV—Front right adjusting point



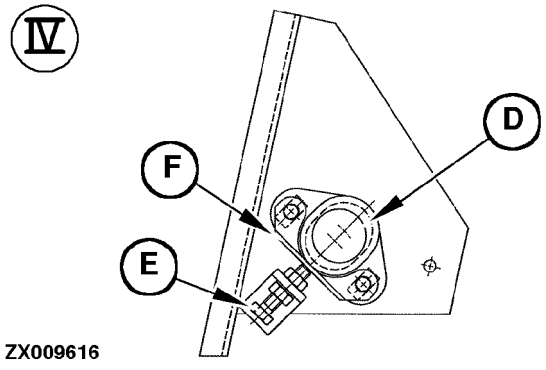
ZX009608 -UN-08NOV96



ZX009610 -UN-08NOV96



ZX009615 -UN-08NOV96



ZX009616 -UN-08NOV96

ZX,OMXZCO002297-19-01NOV96

CONCAVE BASIC SETTING (CONTINUED)

Adjusting point IV

If concave clearance is greater or less than 4 mm (0.16 in.), slacken off the screws that hold on aluminium bearing (D). Also slacken off adjusting screw (E). Set a gap of 4 mm (0.18 in.) at the 3rd rasp bar by moving the adjusting shaft up or down. Once the setting is correct, tighten the attaching screws on the aluminium bearing. Set the adjusting screw so that stop plate (F) is hard against the aluminum bearing. Tighten the locknut.

Check

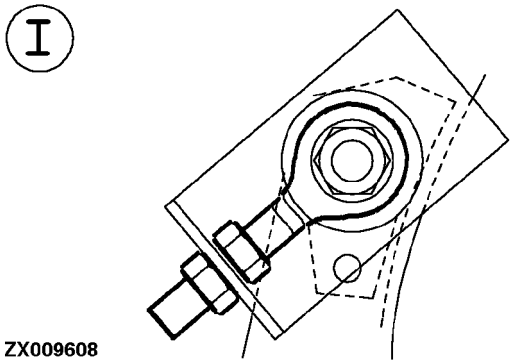
The gap at the 9th concave rasp bar should be 1.5 mm (0.06 in.), measured at each end of the highest cylinder rasp bar. If the gap is not correct, turn the eye-bolts at adjusting points I and II until clearance is as quoted.

Check that the cylinder is free to rotate and is not obstructed at any point along its length.

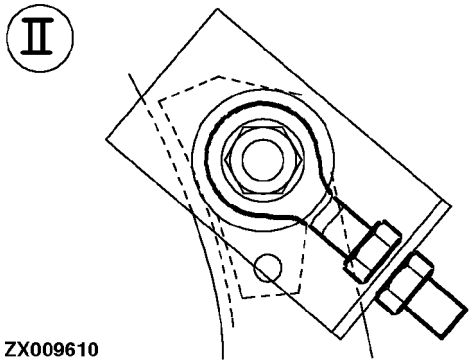
Adjusting point III

Join bracket (B) to holder (C), using the holes that match each other closest. (Re-)tighten all the screws. The tightening torque for the attaching screws (G) at bracket (B) and holder (C) is 55 N·m (41 lb-ft).

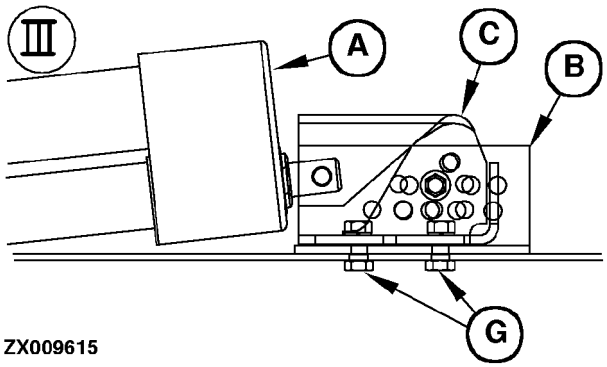
A—Adjusting motor
B—Bracket
C—Holder
D—Aluminium bearing
E—Adjusting screw
F—Stop plate
G—Attaching screws
I—Rear right adjusting point
II—Rear left adjusting point
III—Front left adjusting point
IV—Front right adjusting point



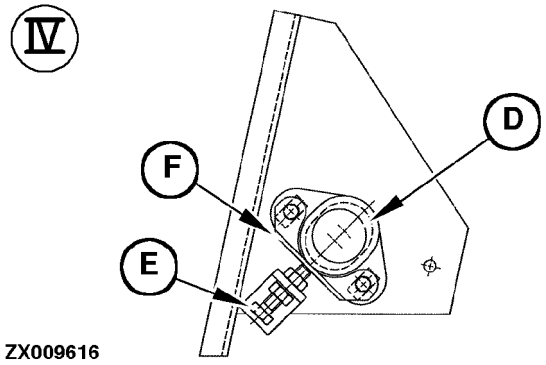
ZX009608



ZX009610



ZX009615



ZX009616

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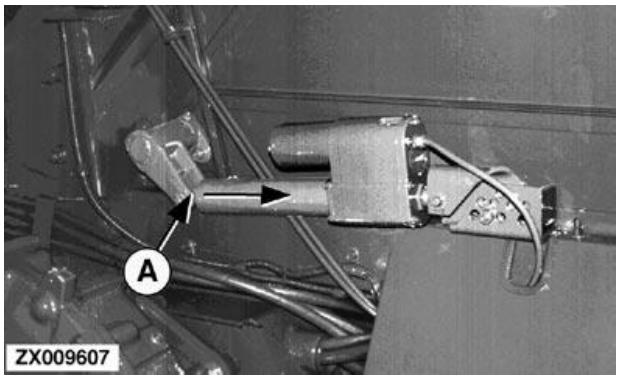
CHANGING THE CONCAVE

IMPORTANT: Before changing the concave, adjust it to give the minimum clearance (spindle (A) fully retracted). The infotrak monitor must display a concave clearance of "4".

Once it is removed, do not make any changes to the adjusting motor's spindle, either electrically or manually.



ZX009607 -UN-08NOV96

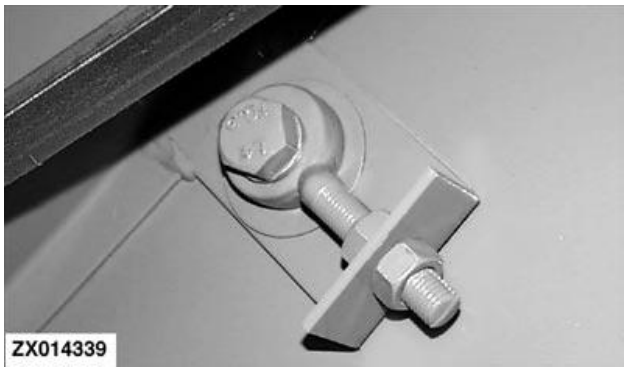
ZX,OMXZCO002294-19-01NOV96

CONCAVE ADJUSTMENT

IMPORTANT: Concave must always be horizontal and parallel to cylinder. Speed and clearance determine effectiveness of threshing.

NOTE: Under certain circumstances, it may be a good idea to open the rear of the concave further at the two adjusting screws.

OPENINGS	FRONT	REAR
MINIMUM GAP	3-5 mm	2- 6 mm
MAXIMUM GAP	47-53 mm	20-26 mm

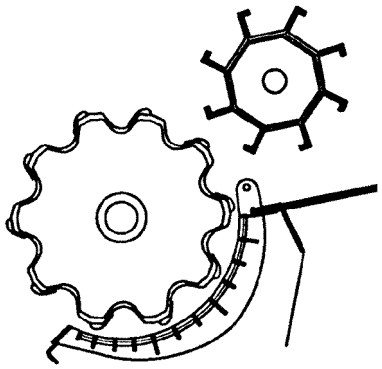


ZX014339 -UN-26JAN98

ZX,OMXZCO002298-19-01APR98

FINGER RAKE

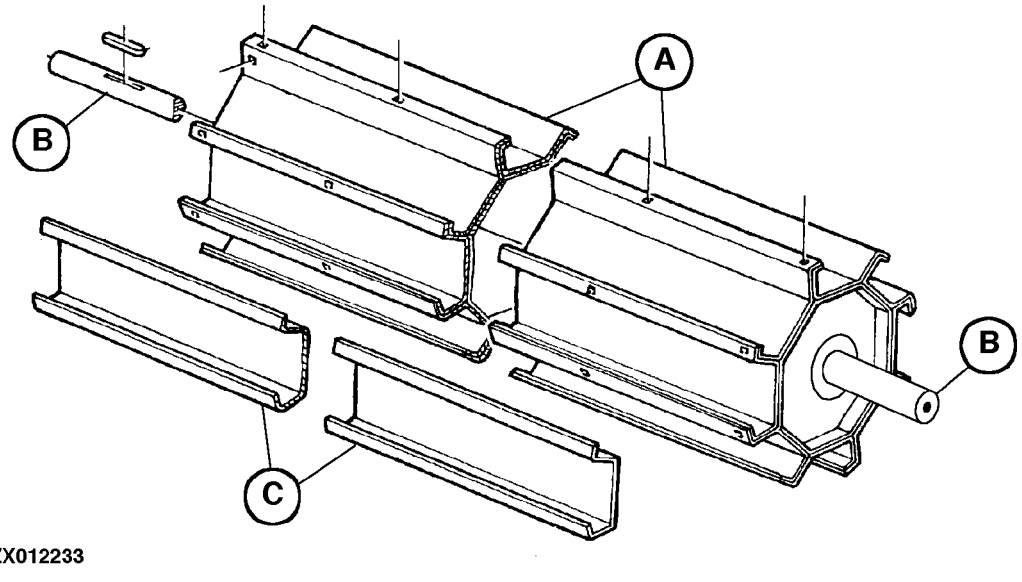
The finger rake is available for combines harvesting in very dry, brittle crops where additional separation is not required or in high moisture crops where the finger rake enables loose grains to pass through the straw more easily.



ZX004294 -UN-19JUN95

ZX,OMXZCO002302-19-01MAR95

BEATER/SECOND CYLINDER



A—Beater/cylinder **B—Shaft** **C—Cover**

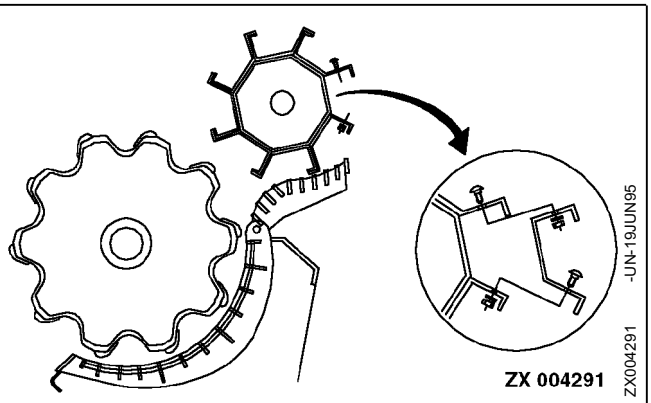
Tighten the M12x100 screws on the inner clamping hubs to 70 N·m (52 lb-ft).

ZX,TMXZCO009619-19-01AUG97

SECOND CYLINDER

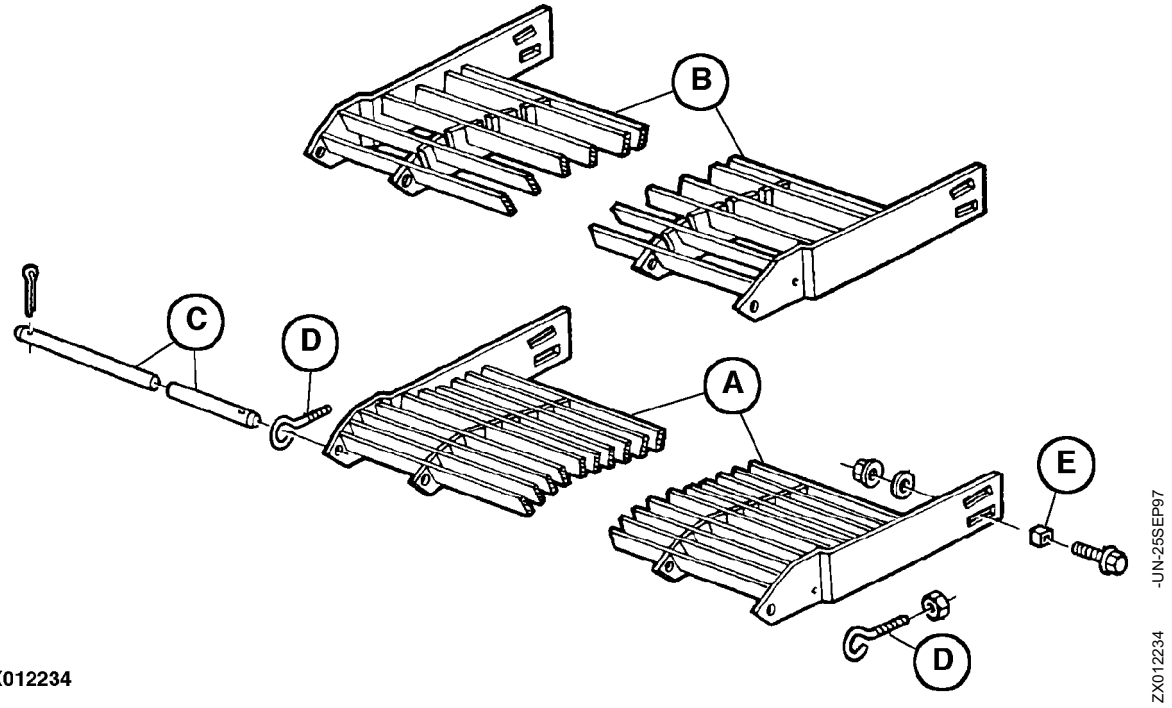
Opening the cover gives access to the clamping hubs on the cylinder.

IMPORTANT: To avoid imbalance, use genuine screws only.



ZX,TMXZCO010104-19-01AUG97

DIFFERENT TYPES OF SECOND CONCAVE



A—Second concave (grain-crop version)
B—Second concave (rice version)
C—Retaining rod
D—Retaining eye
E—Friction element

ZX,TMXZCO009621-19-01AUG97

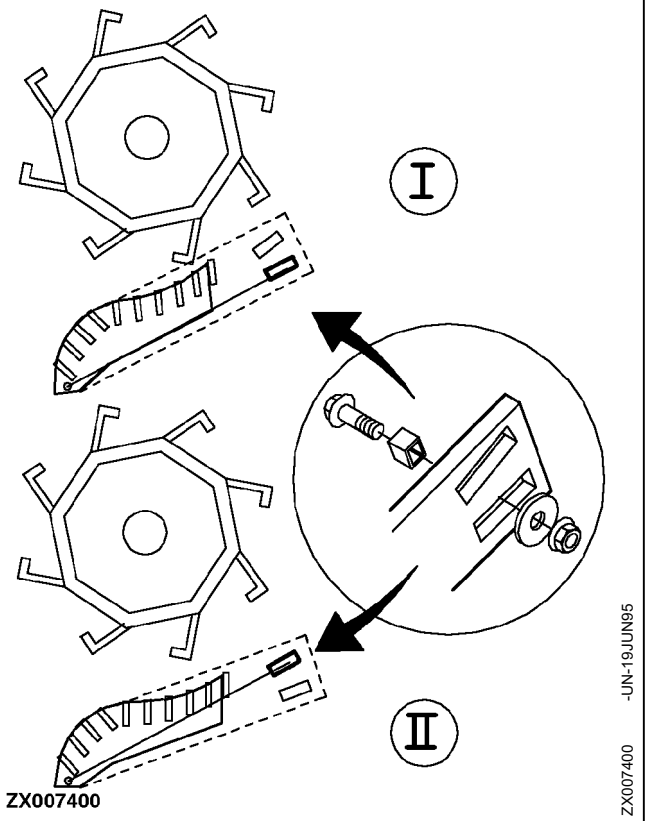
SECOND CONCAVE

The gap to the cylinder can be adjusted to provide the most efficient throughput of material in relation to the harvesting conditions.

Moving the concave closer to the cylinder provides a higher degree of separation for crops that are hard to thresh.

If the concave is moved away from the cylinder, the crop material is threshed more gently.

I—Setting for grain crops
II—Setting for corn



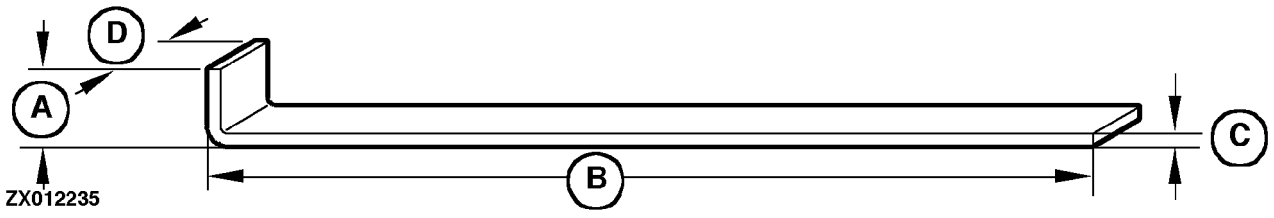
ZX,OMXZCO002301-19-01MAR95

SPECIFICATIONS

Item	Measurement	Specification
Gap between armature baseplate and coil	Gap	1.5 mm (0.06 in.)
Electric clutch to side panel	Clearance	59 mm (2.3 in.)
Shim	Thickness	0.5 mm (0.02 in.)

ZX,TMXZCO009620-19-01AUG97

SELF-MANUFACTURED GAUGE FOR MEASURING GAP



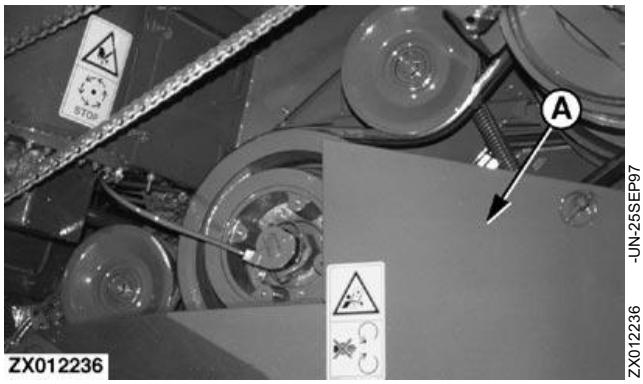
A—10 mm (0.4 in.) **B—150 mm (6 in.)** **C—1.5 mm (0.06 in.)** **D—20 mm (0.8 in.)**

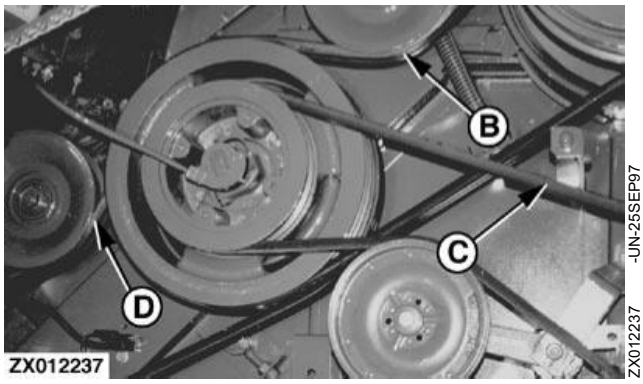
ZX,TMXZCO009623-19-01AUG97

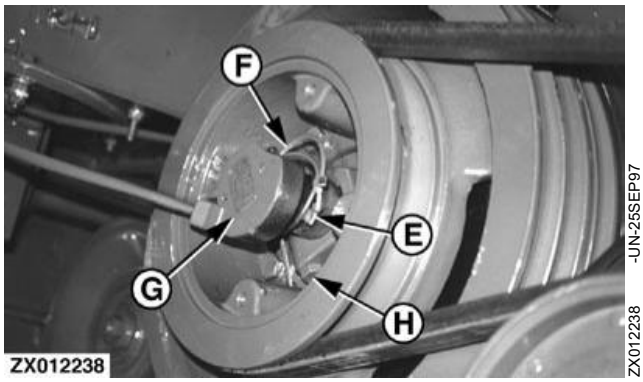
REMOVING THE ELECTRIC CLUTCH

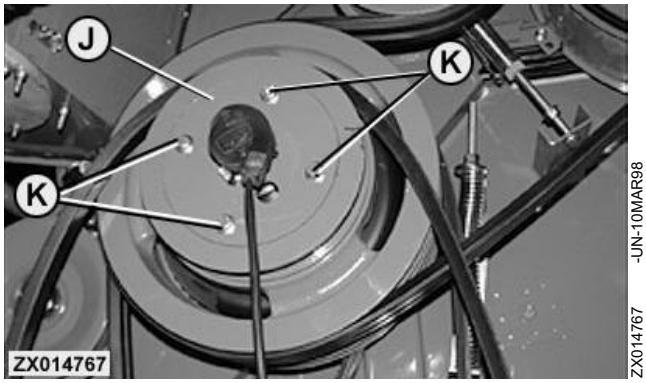
— Remove shield (A).
— Relieve tension on drive belts (B), (C) and (D), and remove.
— Pull the two cables (E) and (F) off the power supply (G).
— Use a 32 mm (1.26 in.) open-ended wrench to unscrew the power supply (G).
— Unfasten clamping screw (H) and lift off the electric clutch assembly.
— If el. clutch has single-speed relationship drive, remove retaining plate (J) and screws (K).
— Replace any parts that are worn. Make gap 1.5 mm (0.06 in.) wide by adding or removing shims.

A—Shield
B—Drive belt
C—Drive belt
D—Drive belt
E—Cable
F—Cable
G—Power supply
H—Clamping screw
J—Retaining plate
K—Screws (4 used)



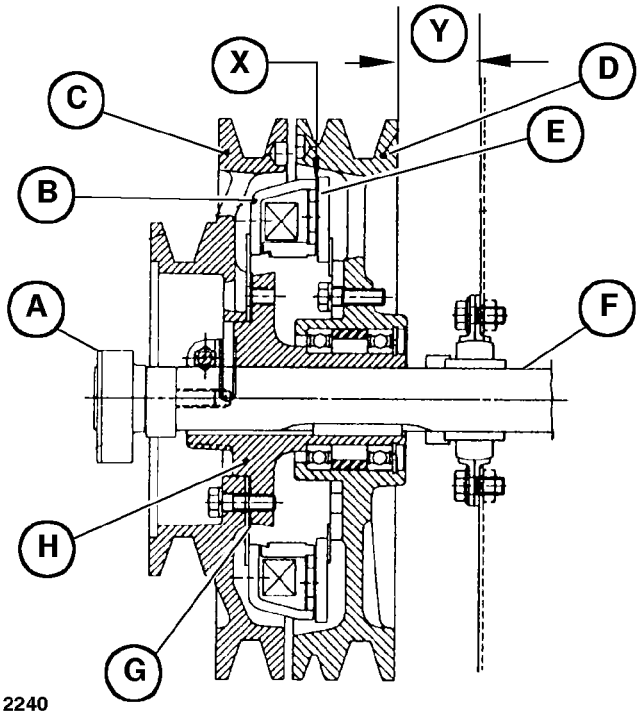






ZX,TMXZCO009624-19-05MAR98

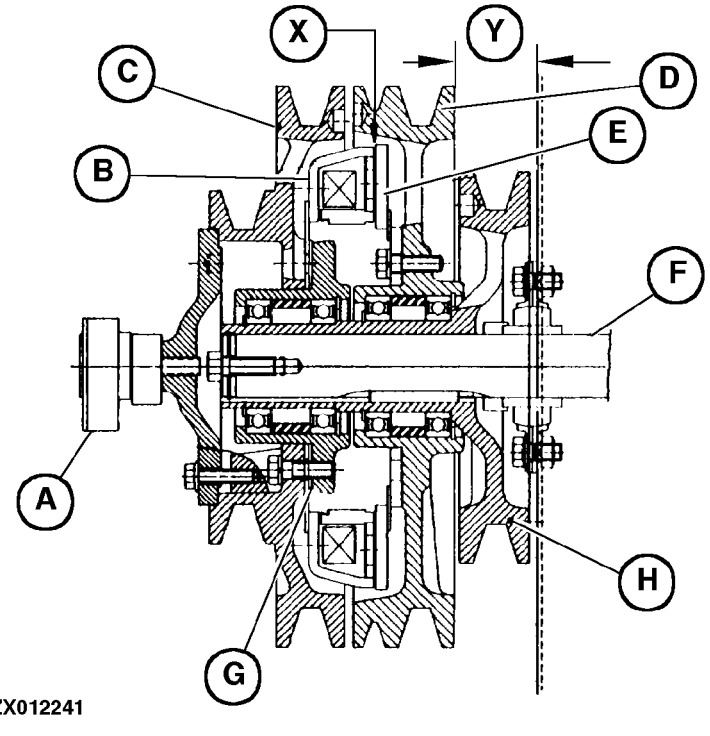
ASSEMBLING THE ELECTRIC CLUTCH



A—Power supply
B—Coil
C—Drive belt pulley
D—Driven pulley
E—Armature baseplate
F—Beater shaft
G—Shim
H—Clamping hub
X—Gap: 1.5 mm (0.06 in.)
Y—Clearance: 59 mm (2.3 in.)

ZX,TMXZCO009625-19-01AUG97

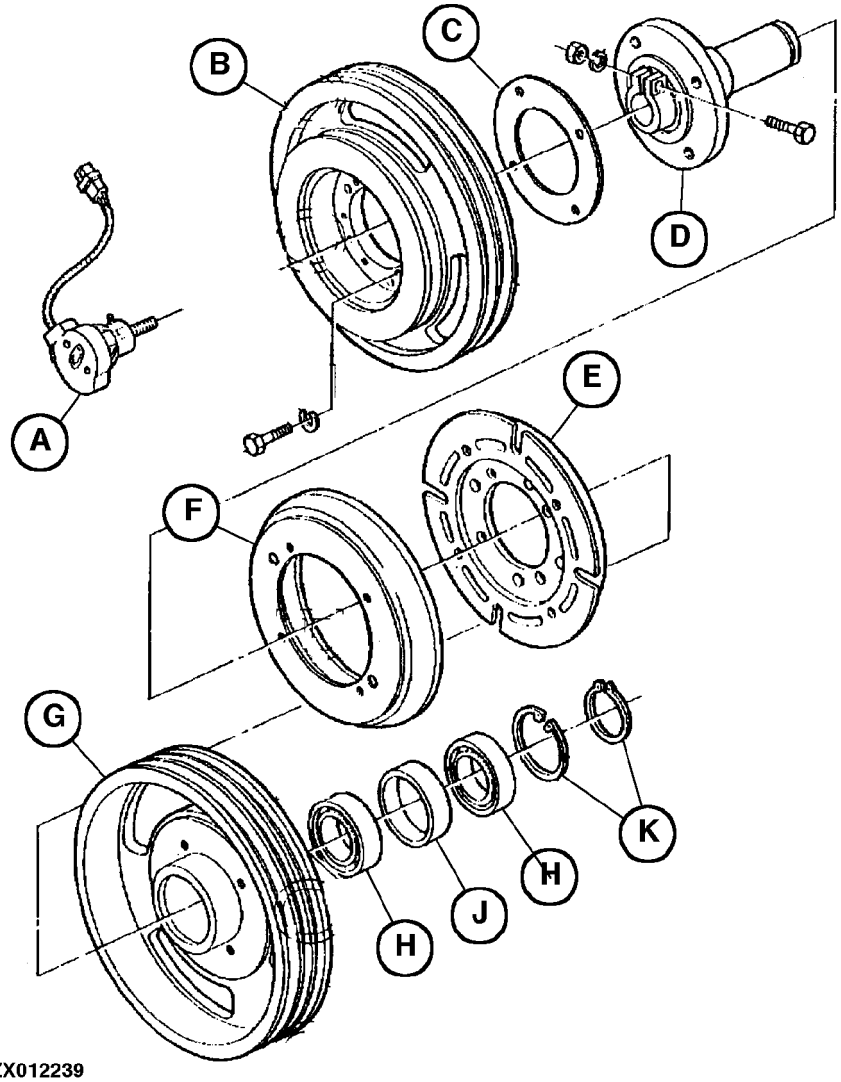
ASSEMBLING THE ELECTRIC CLUTCH (WITH SINGLE-SPEED RELATIONSHIP DRIVE)



A—Power supply
B—Coil
C—Drive belt pulley
D—Driven pulley
E—Armature baseplate
F—Beater shaft
G—Shim
H—Drive belt pulley for single-speed relationship drive
X—Gap: 1.5 mm (0.06 in.)
Y—Clearance: 59 mm (2.3 in.)

ZX,TMXZCO010005-19-01AUG97

ELECTRIC CLUTCH, EXPLODED VIEW



A—Power supply
B—Belt pulley
C—0.5 mm (0.02 in.) shim
D—Clamping hub
E—Armature baseplate
F—Coil
G—Belt pulley
H—Ball bearing
J—Spacer ring
K—Snap ring

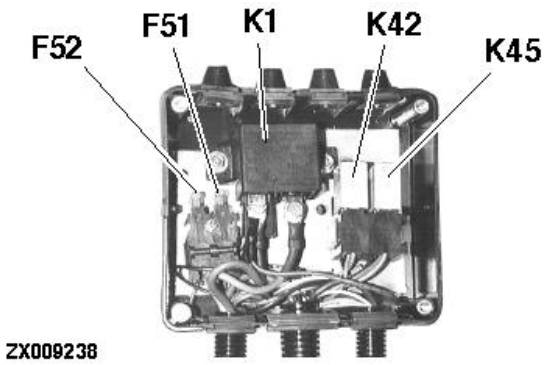
ZX,TMXZCO010006-19-01AUG97

Electric Clutch/Exploded view

ELECTRICAL BOX IN ENGINE COMPARTMENT

F 51 — 7.5 A fuse, reverse travel alarm
F 52 — 7.5 A fuse, header electrical clutch
K 01 — Starting motor relay
K 42 — Relay, header electrical clutch
K 45 — Relay D+

Relays and fuses for electric clutch, from serial no. 061 687



-UN-22MAY96
ZX009238

ZX,TMXZCO010007-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Screws, belt pulley to clamping hub	Tightening torque	69 N·m (51 lb-ft)
Screw on clamping hub	Tightening torque	85 N·m (63 lb-ft)
Screws on clamping hub to clamping plate	Tightening torque	80 N·m (59 lb-ft)

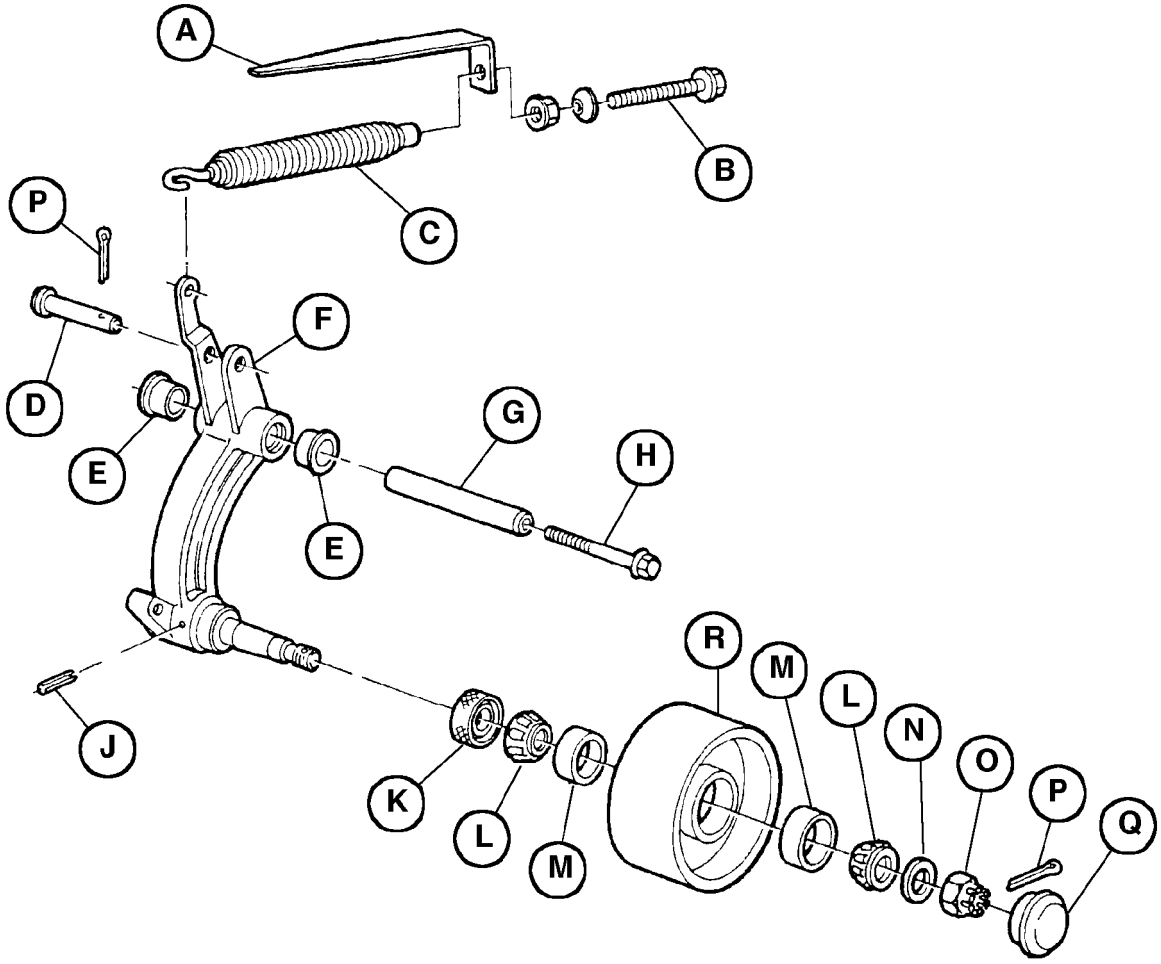
ZX,TMXZCO010008-19-01AUG97

OTHER MATERIAL

Number	Name	Use
TY9370	Loctite 242	Screws, belt pulley to clamping hub

ZX,TMXZCO010009-19-01AUG97

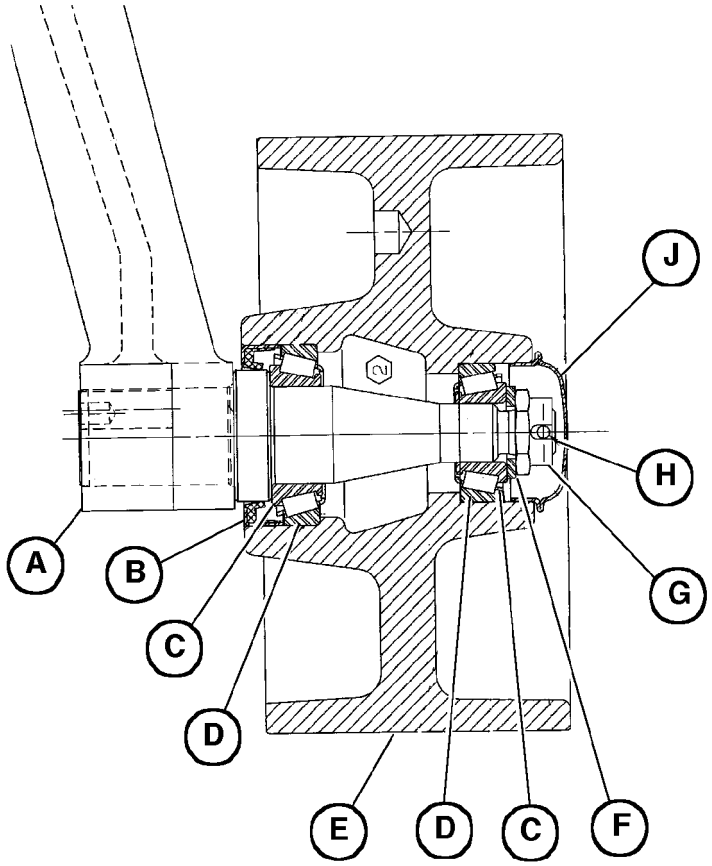
IDLER, EXPLODED VIEW



A—Pointer
B—Set screw
C—Spring
D—Pin
E—Bushing
F—Lever
G—Shaft
H—Screw
J—Spring pin
K—Seal ring
L—Taper roller bearing
M—Bearing cup
N—Washer
O—Slotted nut
P—Cotter pin
Q—Grease cap
R—Idler

ZX,TMXZCO010010-19-01AUG97

ASSEMBLING THE IDLER



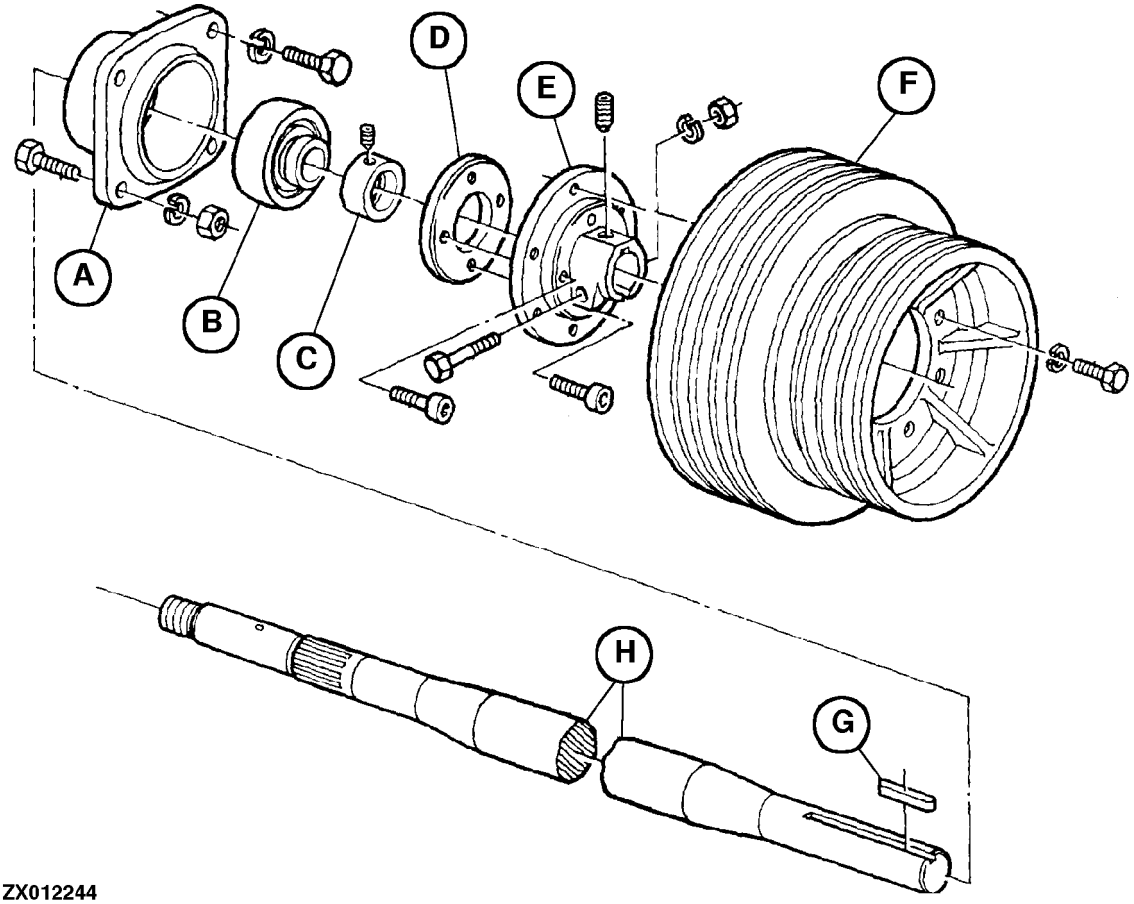
A—Lever
B—Seal ring
C—Taper roller bearing
D—Bearing cup
E—Idler
F—Washer
G—Slotted nut
H—Cotter pin
J—Grease cap

— Before assembling, apply multi-purpose grease to taper roller bearing and seal ring.
— Fill cavities in idler and grease cap with multi-purpose grease.

— With idler (E) turning, tighten slotted nut (G) until the idler is braked. Then turn the slotted nut back by 1/16 of a turn, and secure with cotter pin (H).

ZX,TMXZCO010011-19-01AUG97

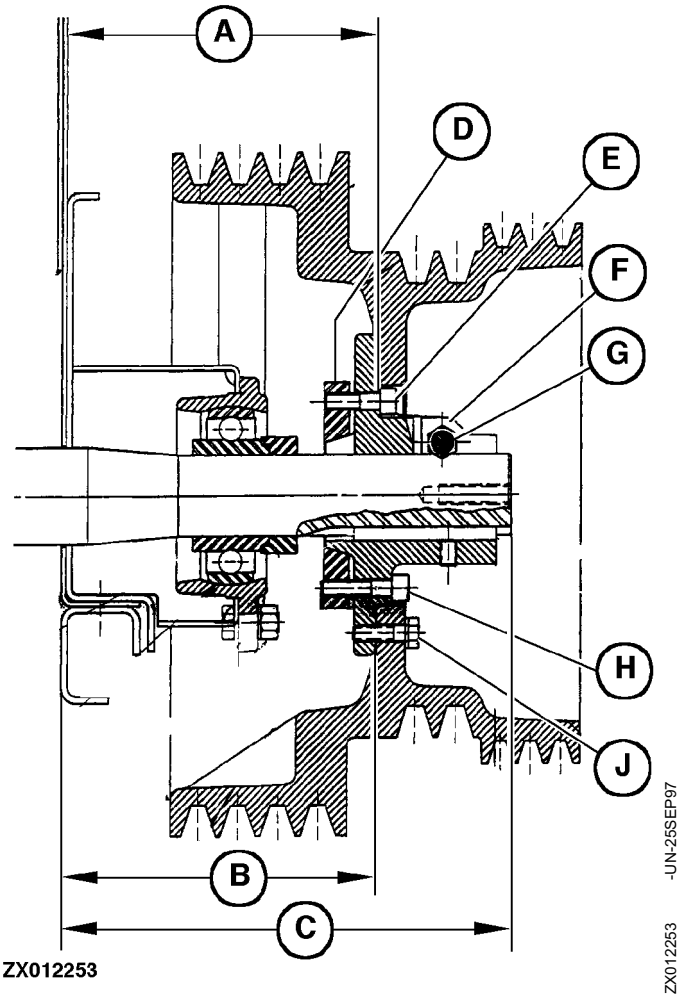
COUNTERSHAFT DRIVE ON LEFT-HAND SIDE, EXPLODED VIEW



A—Bearing housing
B—Ball bearing
C—Clamping ring
D—Clamping plate
E—Clamping hub
F—Belt pulley
G—Key
H—Countershaft

ZX,TMXZCO010012-19-01AUG97

ASSEMBLING THE DRIVE PULLEY ON LEFT-HAND SIDE



A—193 mm (7.6 in.)
B—200 mm (7.9 in.)
C—284 mm (11.2 in.)
D—Clamping plate
E—M10x35 screw
F—Clamping hub
G—M12x90 screw
H—M10x45 screw
J—M10x35 screw

Coat screws (J) with TY9370 (Loctite 242), insert them and tighten to 69 N·m (51 lb-ft).

Align the belt pulley and tighten screw (G) to 85 N·m (63 lb-ft).

Tighten screws (E) to 89 N·m (59 lb-ft).

IMPORTANT: Tighten screws (E) evenly, otherwise the clamping plate (D) may become skewed.

ZX,TMXZCO010013-19-01AUG97

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

ASSEMBLY AND DISASSEMBLY TOOL

Spring tensioning device for lower unit of variable cylinder drive, KMZ10001.

KMZ10001

KMZ10001 -UN-28AUG96

ZX,TMXZCO006631-19-01SEP96

OTHER MATERIALS

Order no.	Designation	Application
TY9370	Loctite 243	Clamp nut to variable drive
TY15969	Loctite 638	Bolts in variable drive

ZX,TMXZCO006770-19-01SEP96

SPECIFICATIONS

Item	Measurement	Specification
Clamp nut to variable drive	Torque	300 N·m (221 lb-ft)
Clamp screw on variable drive	Torque	55 N·m (40.6 lb-ft)
Screws on flanged shaft	Torque	31 N·m (23 lb-ft)
Screws to bearing support	Torque	90 N·m (66.4 lb-ft)
Screws to hub and variable sheave	Torque	90 N·m (66.4 lb-ft)

ZX,TMXZCO006771-19-01SEP96

REPLACING THE V-BELT ON VARIABLE CYLINDER DRIVE

Close the upper variable drive (A).

On the lower variable drive (B), insert at least two M12x65 screws into the threaded bores provided. This holds the variable drive sheaves apart.

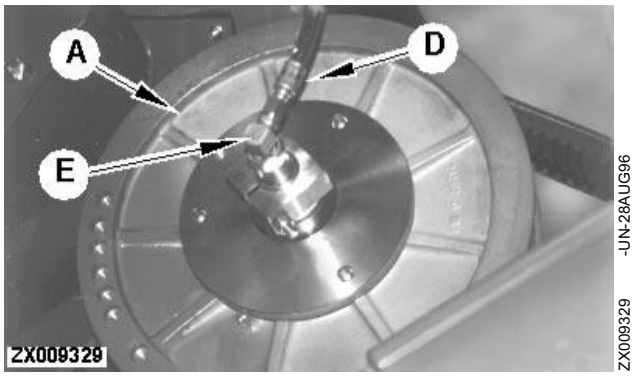
Run the separator and bleed the pressure in hydraulic line (D) by separating the upper variable drive sheaves (A).

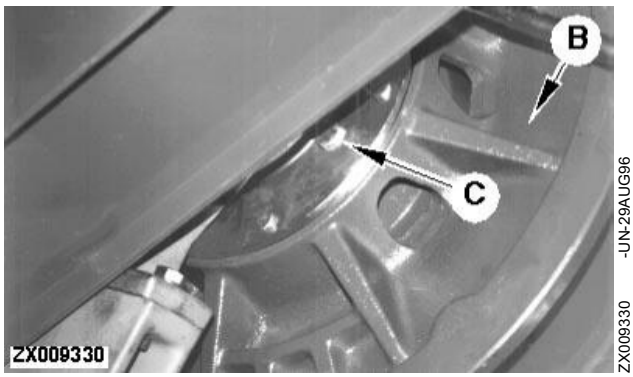
Unscrew elbow fitting (E) from countershaft.

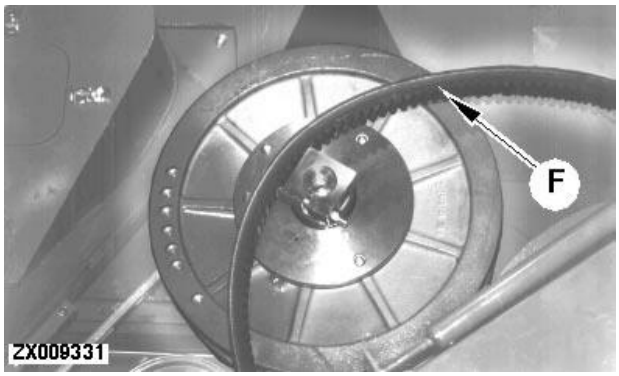
Take V-belt (F) off the upper variable drive.

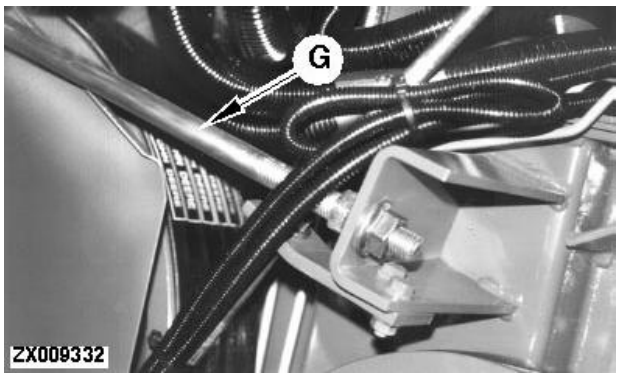
Unbolt support (G).

A—Variable drive
B—Variable drive
C—Threaded bores
D—Hydraulic line
E—Elbow fitting
F—V-belt
G—Support







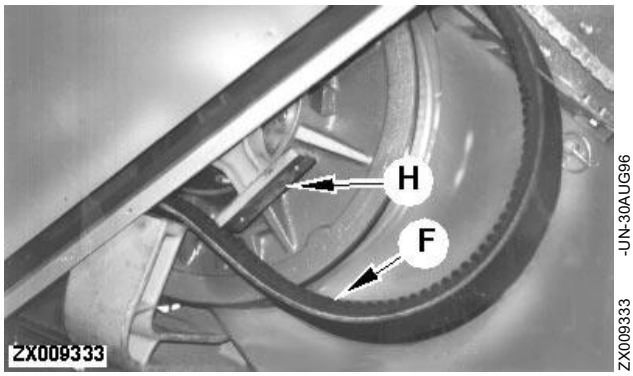


ZX,TMXZCO006587-19-01AUG96

REPLACING THE V-BELT ON VARIABLE CYLINDER DRIVE (CONTINUED)

Take two screws out of the bearing support (H), raise the variable drive, pull the support forward and remove V-belt (F).

NOTE: On 6-walker combines, the tailings elevator must be partly unfastened and pulled far enough away from the machine to allow V-belt (F) to clear the bearing support (H).



ZX,TMXZCO006588-19-01AUG96

INSTALLING THE V-BELT

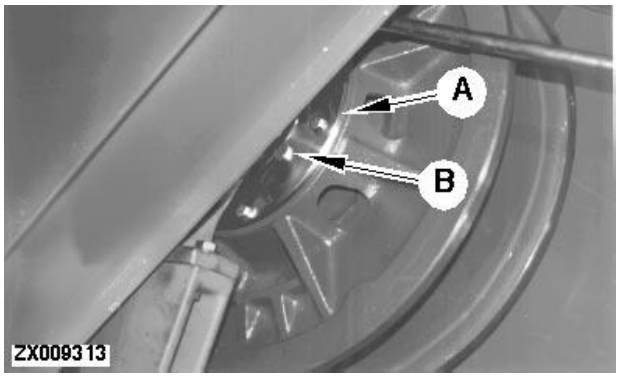
To install V-belt, follow removal procedure in reverse order.

ZX,TMXZCO006589-19-01AUG96

REMOVING THE UPPER UNIT OF VARIABLE CYLINDER DRIVE

Before disassembling, close the variable drive hydraulically.

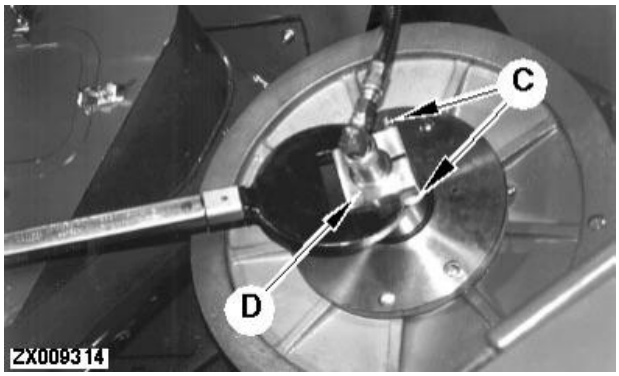
On flange (A) of the lower variable drive, screw in at least two M12x65 screws (three threaded bores (B) are provided). This holds the variable drive sheaves apart.



ZX,TMXZCO006590-19-01AUG96

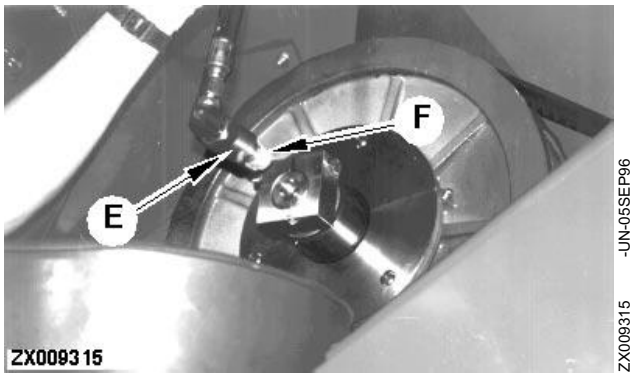
Run the separator and bleed the pressure in hydraulic line by separating the upper variable drive sheaves.

Slacken off clamp screw (C) and square nut (D).



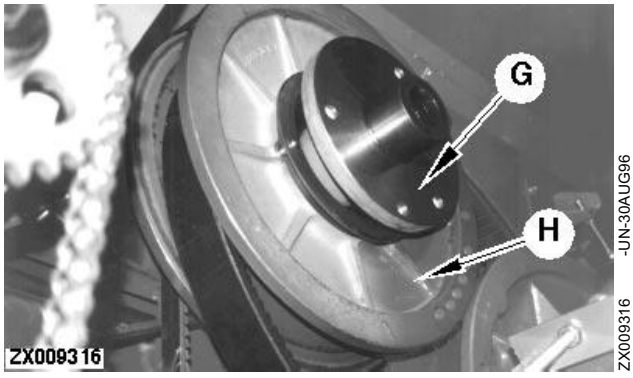
ZX,TMXZCO006591-19-01AUG96

Unscrew pressure hose (E). Trap any remaining oil and seal line with plug (F).



ZX,TMXZCO006592-19-01AUG96

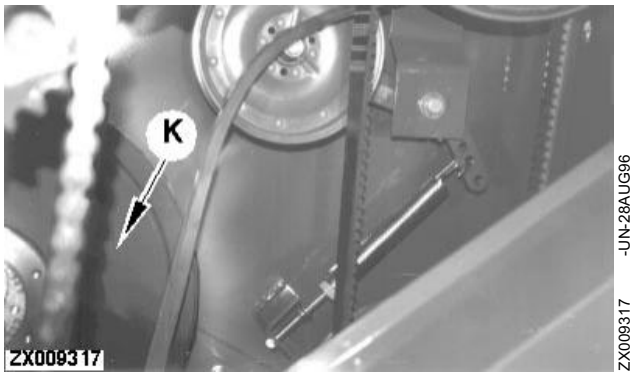
Remove ring-shaped piston assembly (G) and outer variable drive sheave (H).



ZX,TMXZCO006593-19-01AUG96

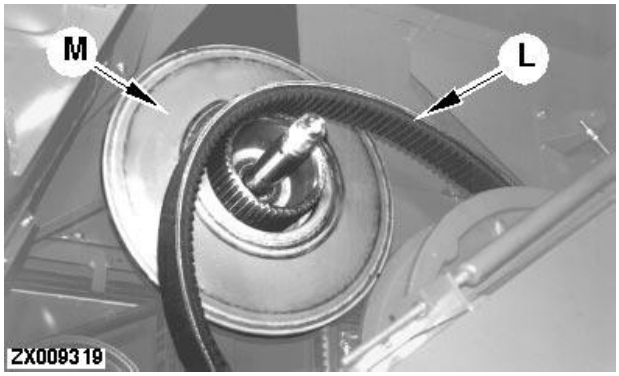
REMOVING THE UPPER UNIT OF VARIABLE CYLINDER DRIVE (CONTINUED)

Relieve tension on V-belts to blower variable drive (J) and to elevator drive (K). Remove the V-belt from the rear variable drive sheave.



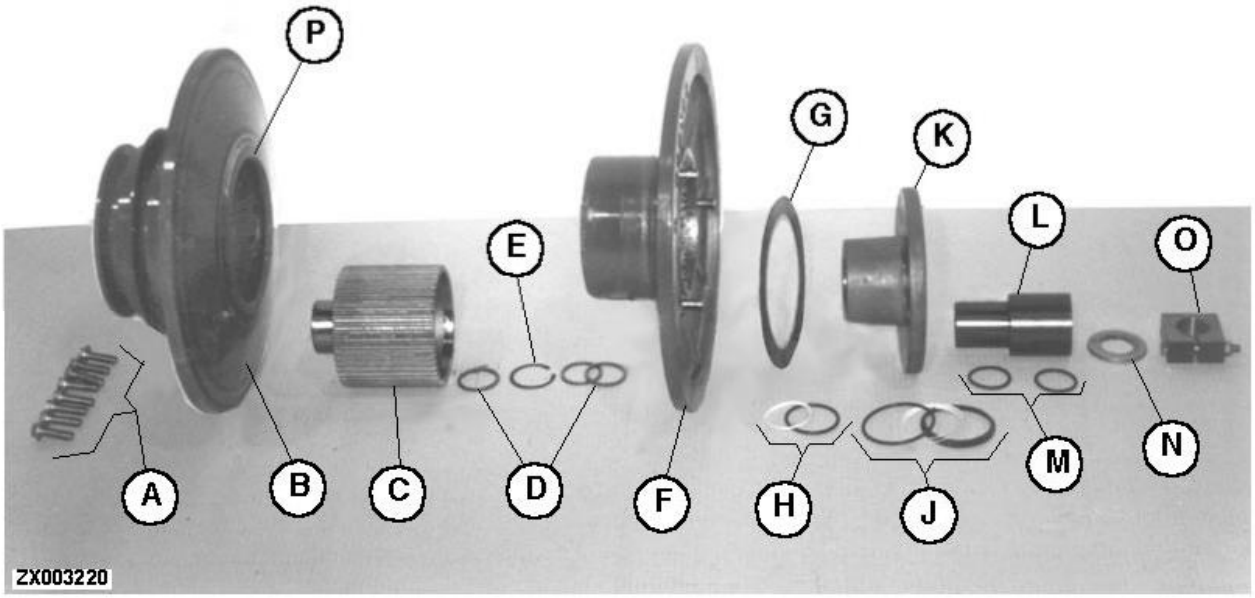
ZX,TMXZCO006594-19-01AUG96

Put down V-belt (L) and remove the variable drive sheave assembly (M).



ZX,TMXZCO006595-19-01AUG96

COMPONENTS OF VARIABLE CYLINDER DRIVE, UPPER UNIT

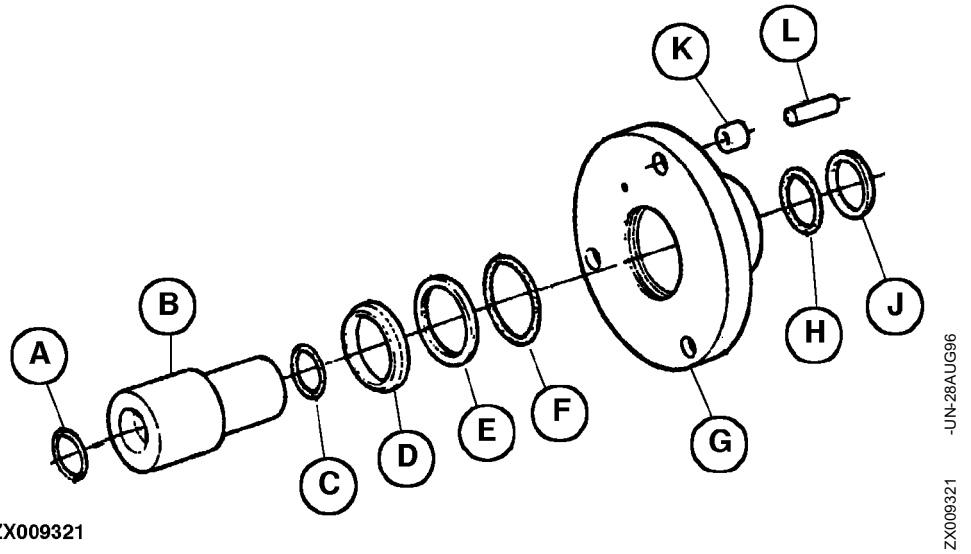


ZX009320 -UN-30AUG96

A—Flanged-head screws
B—Rear variable drive sheave
C—Hub
D—Washers (3 used)
E—Snap ring
F—Front variable drive sheave
G—Intermediate ring
H—Seat of seals
J—Set of seals
K—Ring-shaped piston
L—Stepped cylinder
M—O-ring (2 used)
N—Washer
O—Clamp nut and clamp screw
P—Seal ring

ZX,TMXZCO006596-19-01AUG96

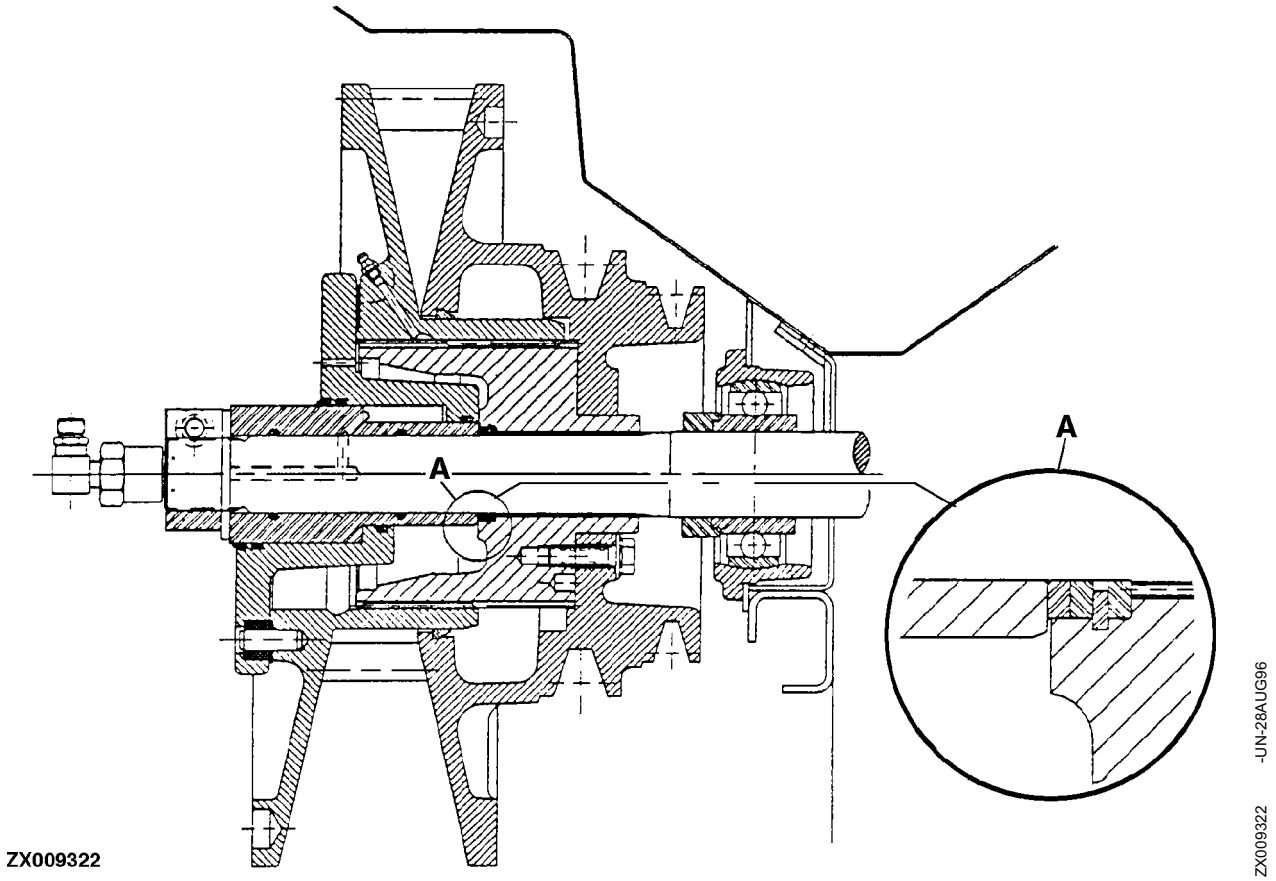
COMPONENTS OF RING-SHAPED PISTON



A—O-ring
B—Stepped cylinder
C—O-ring
D—Wiper ring
E—Spiral back-up ring
F—O-ring
G—Ring-shaped piston
H—O-ring
J—Spiral back-up ring
K—Bushing (3 used)
L—Pin (3 used)

ZX,TMXZCO006597-19-01AUG96

ASSEMBLY OF VARIABLE CYLINDER DRIVE (UPPER UNIT), UP TO SERIAL NO. 064838



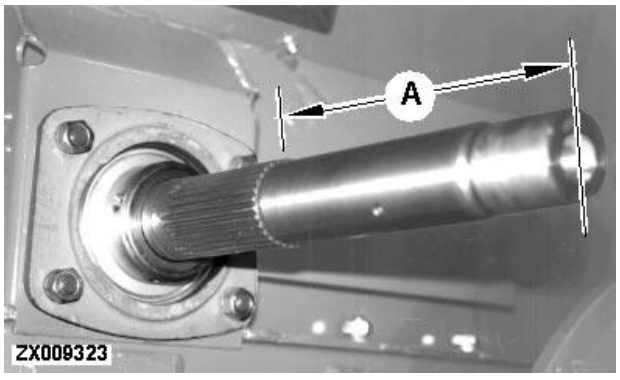
ZX,TMXZCO006598-19-01AUG96

INSTALLING THE VARIABLE DRIVE

The countershaft must be installed with 386 mm (15.2 in.) separating the sidewall from the front edge of the shaft.

Before assembly, coat all bearing points and seals with multi-purpose grease.

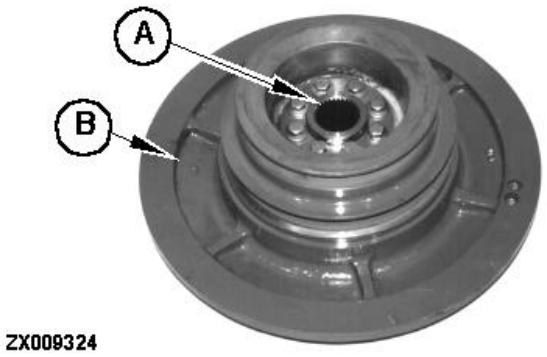
A—386 mm (15.2 in.)



ZX,TMXZCO006599-19-01AUG96

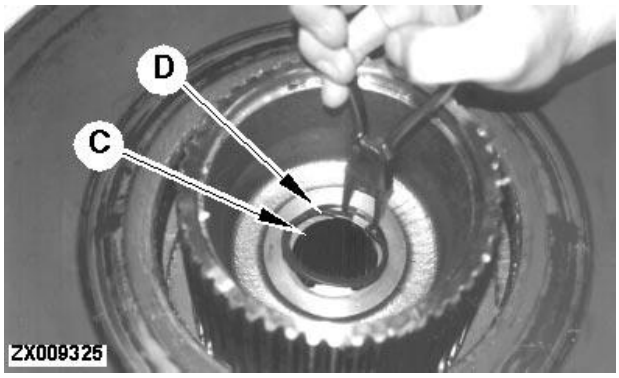
INSTALLING THE VARIABLE DRIVE (CONTINUED)

Using 8 flat-collar screws coated with Loctite 243 (TY9370), bolt hub (A) onto variable drive sheave (B). Tighten the screws to 90 N·m (66.4 lb-ft).



ZX,TMXZCO006600-19-01AUG96

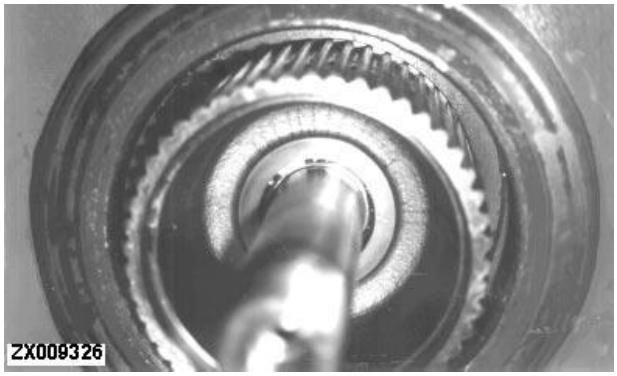
Place one washer (C) in the hub and secure it in position with a snap ring (D).



ZX,TMXZCO006601-19-01AUG96

Slide the variable drive sheave onto the countershaft and install two more washers in front of the snap ring.

See detail (A) in “Assembly of Variable Cylinder Drive”.



ZX,TMXZCO006602-19-01AUG96

INSTALLING THE VARIABLE DRIVE (CONTINUED)

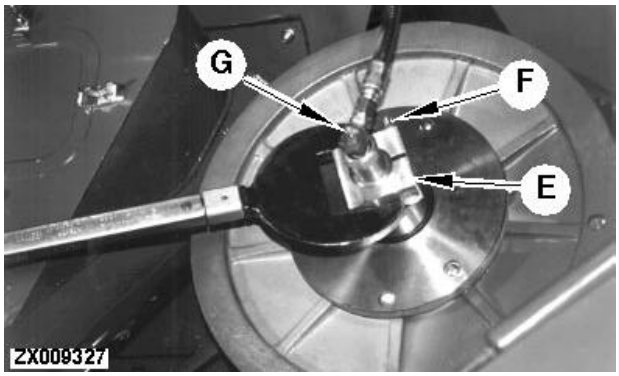
Install the front variable drive sheave and ring-shaped piston. Insert clamp nut (E) (treated with Loctite TY 9370), and tighten to 300 N·m (221 lb-ft).

Tighten clamp screw (F) to 55 N·m (40.6 lb-ft).

Apply sealing tape to the pressure hose and elbow fitting (G), and screw the latter tight.

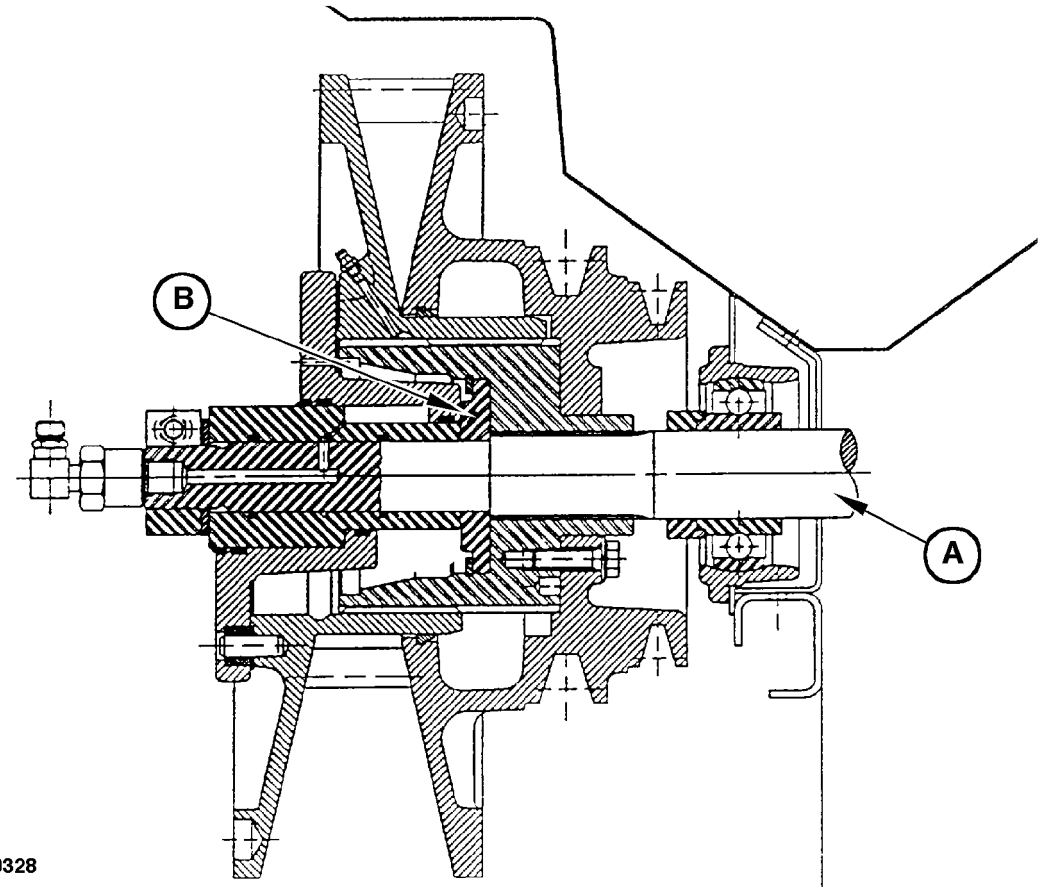
Check that the connection is tight.

With the variable drive sheaves closed, lubricate the variable drive using the grease fitting provided.



ZX,TMXZCO006603-19-01AUG96

ASSEMBLY OF VARIABLE CYLINDER DRIVE (UPPER UNIT), FROM SERIAL NO. 064839



This assembly differs from the previous one in having a modified countershaft (A) and an additional spacer ring (B).

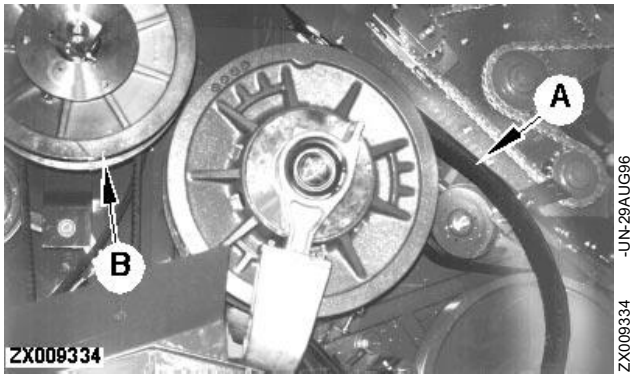
ZX,TMXZCO006604-19-01AUG96

REMOVING THE LOWER UNIT OF VARIABLE CYLINDER DRIVE

Remove the large side guard on the right-hand side (see Section 80).

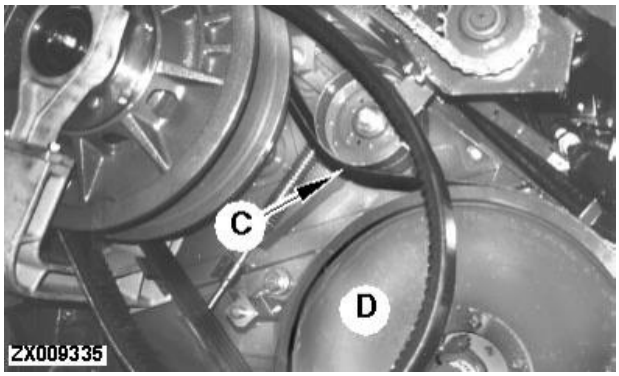
Remove the tailings elevator (see Section 130).

Take variable drive V-belt (A) off the upper variable drive (B). See description at “Replacing The V-Belt On Variable Cylinder Drive”.



ZX,TMXZCO006605-19-01AUG96

Relieve tension on power band to cylinder drive (C), and take it off belt sheave (D).

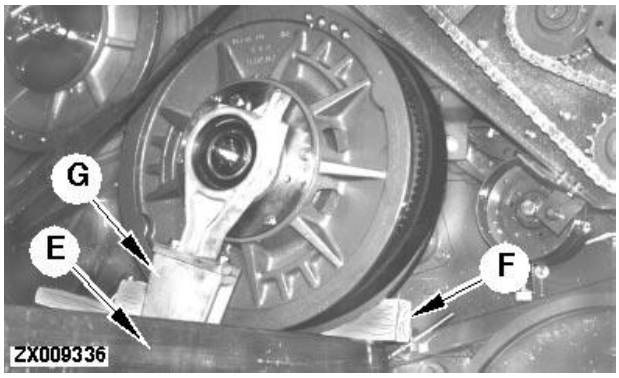


ZX,TMXZCO006606-19-01AUG96

Support the variable drive unit with a forklift truck (E), and secure with wooden chocks (F).

CAUTION: The variable drive unit weighs approx. 100 kg (220 lb).

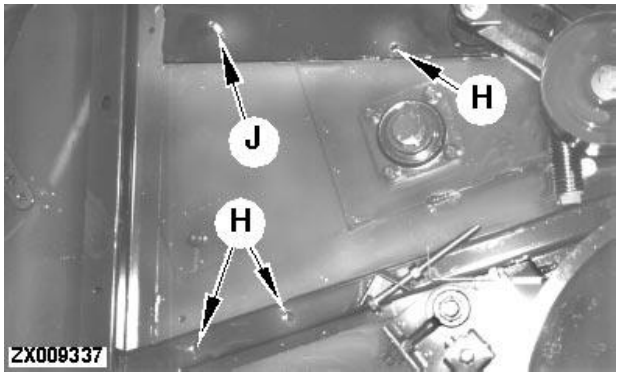
Unbolt the variable drive mounting assembly (G) at the four points where it is attached to the sidewall, and lower the complete variable drive unit.



ZX,TMXZCO006607-19-01AUG96

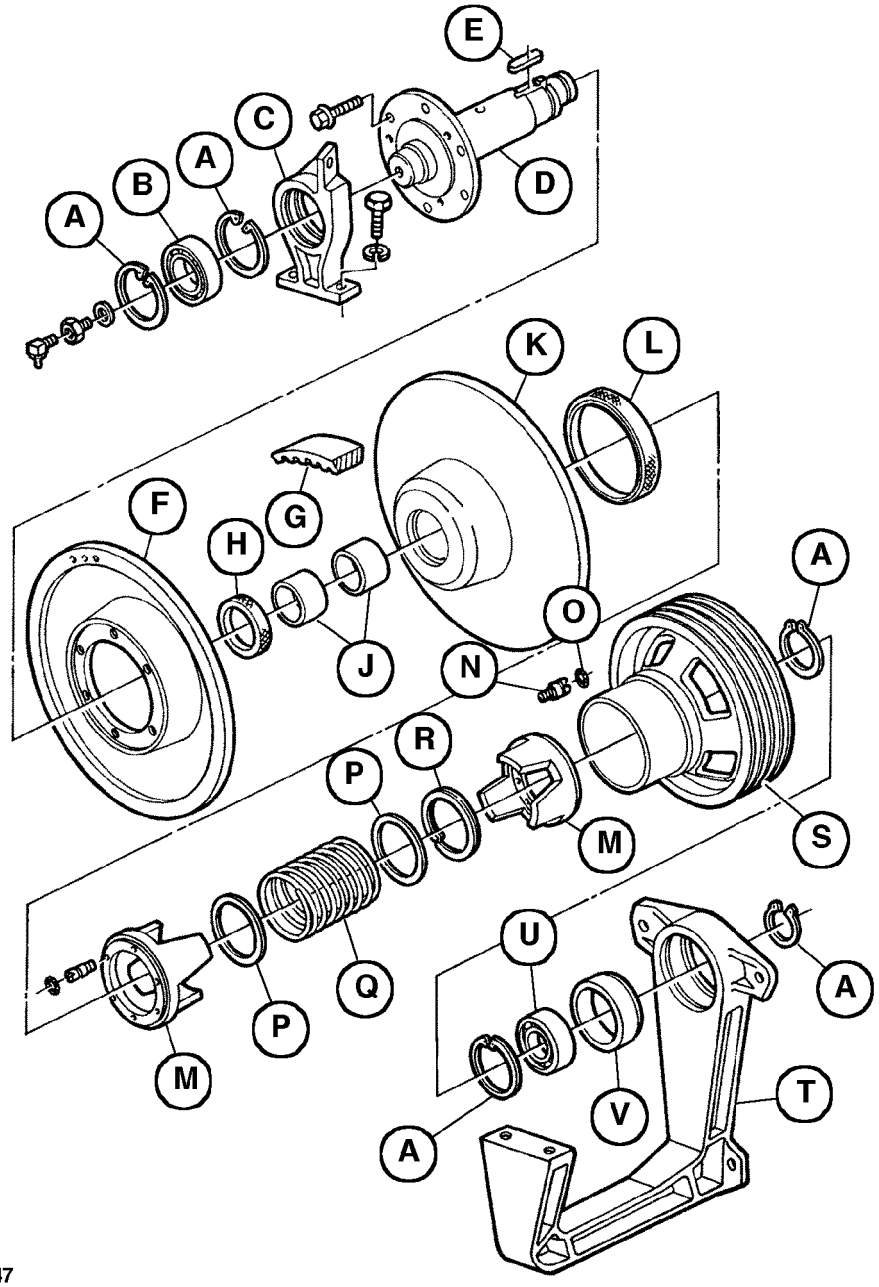
Here are the points where the variable drive mounting is attached.

H—Threaded bores
J—Threaded pin



ZX,TMXZCO006608-19-01AUG96

COMPONENTS OF VARIABLE CYLINDER DRIVE, LOWER UNIT



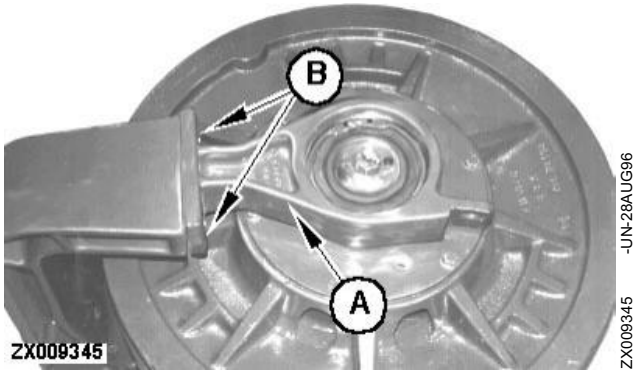
ZX009347

A—Snap ring
B—Ball bearing
C—Bearing support
D—Flanged shaft
E—Key
F—Sheave
G—V-belt
H—Seal ring
J—Brass bushing
K—Sheave
L—Seal ring
M—Ring with lugs
N—Stud
O—O-ring
P—Washer
Q—Spring
R—Double snap ring
S—Belt sheave
T—Variable drive mounting
U—Ball bearing
V—Bearing ring

ZX,TMXZCO006632-19-01AUG96

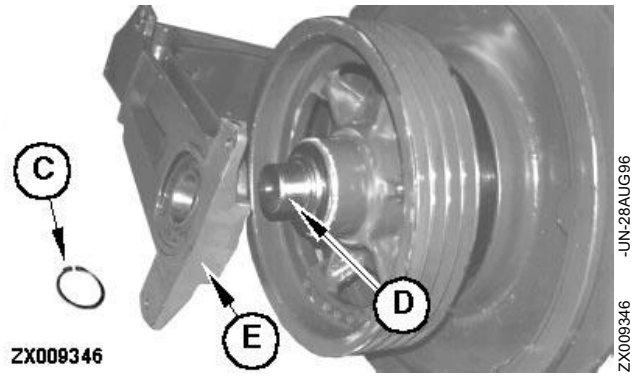
DISASSEMBLING THE LOWER UNIT OF THE VARIABLE CYLINDER DRIVE

Take two screws (B) out of the bearing support (A).



ZX,TMXZCO006633-19-01AUG96

Take snap ring (C) off flanged shaft (D), and disassemble variable drive mounting (E).

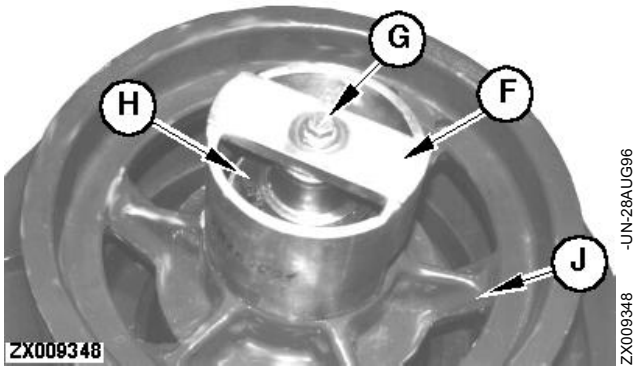


ZX,TMXZCO006634-19-01AUG96

Place the thrust ring (F) of tool KMZ10001 on the belt sheave (J) and use an M12x40 screw (G) to press the thrust ring onto the belt sheave.

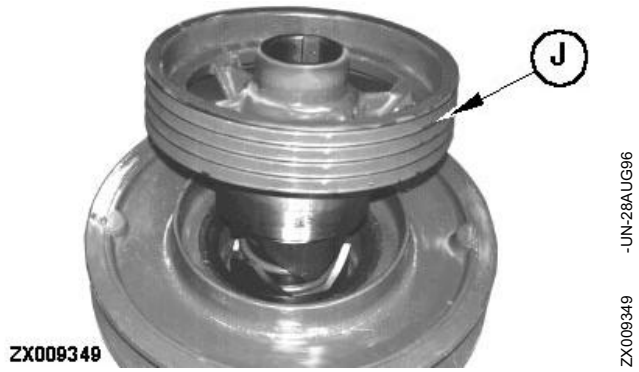
Remove snap ring (H).

F—Thrust ring
G—Screw
H—Snap ring
J—Belt sheave



ZX,TMXZCO006635-19-01AUG96

Lift off belt sheave (J) from above.

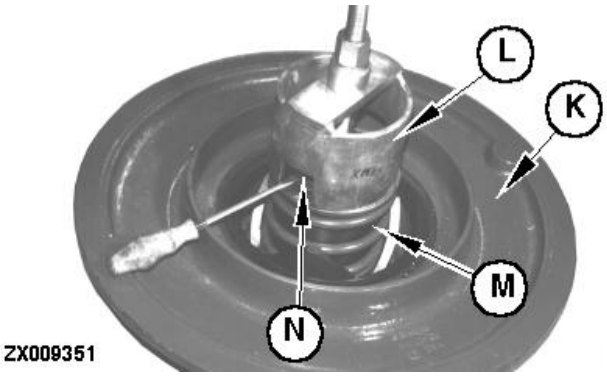


ZX,TMXZCO006636-19-01AUG96

DISASSEMBLING THE LOWER UNIT OF THE VARIABLE CYLINDER DRIVE (CONTINUED)

Lift variable drive sheave (K) off the flanged shaft and place it on the spindle of tool KMZ10001. By using thrust ring (L) to compress spring (M), it becomes possible to remove the double snap ring (N).

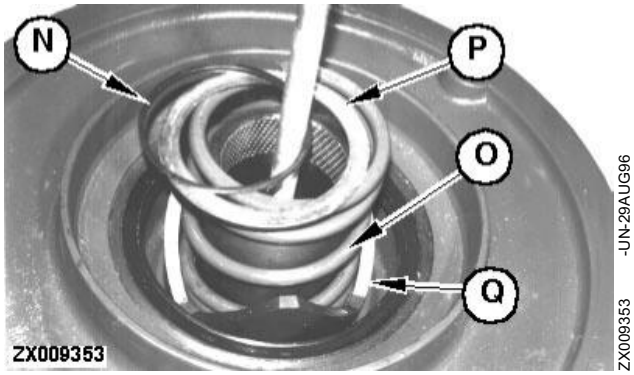
K—Variable drive sheave
L—Thrust ring
M—Spring
N—Double snap ring



ZX,TMXZCO006637-19-01AUG96

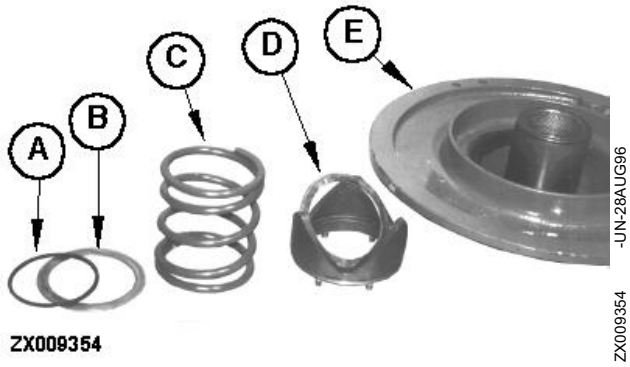
By slackening the nut on the spindle of the tool, the pressure on spring (O) is relieved, and it becomes possible to remove double snap ring (N), washer (P), spring (O) and the ring with lugs (Q).

N—Double snap ring
O—Spring
P—Washer
Q—Ring with lugs



ZX,TMXZCO006638-19-01AUG96

A—Double snap ring
B—Washer
C—Spring
D—Ring with lugs
E—Variable drive sheave

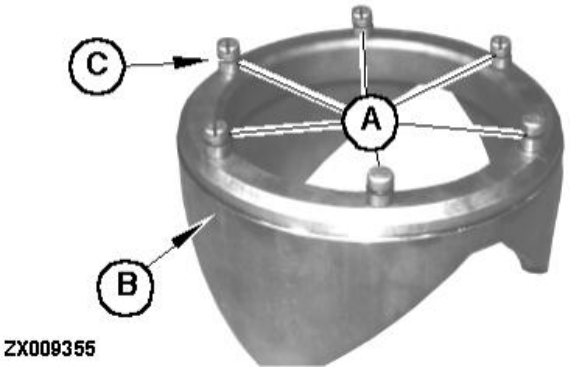


ZX,TMXZCO006639-19-01AUG96

REPAIRING THE LOWER UNIT OF THE VARIABLE CYLINDER DRIVE

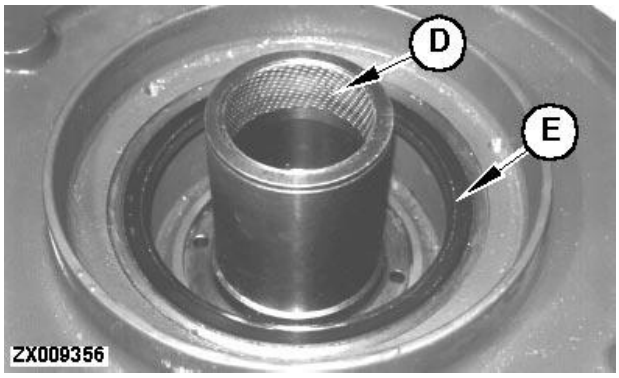
Insert locating screws (A) into the ring with lugs (B). Use Loctite 638 (TY15969) on the screws.

Replace all O-rings (C) with new ones.



ZX,TMXZCO006640-19-01AUG96

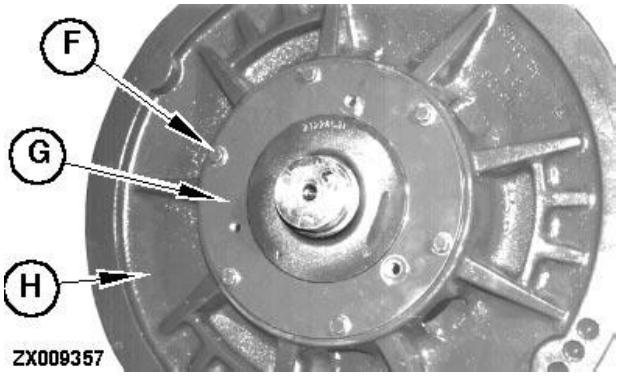
If brass bushings (D) and seal ring (E) are worn, replace them.



ZX,TMXZCO006641-19-01AUG96

ASSEMBLING THE LOWER UNIT OF THE VARIABLE CYLINDER DRIVE

Use screws (F) to bolt flanged shaft (G) to the variable drive sheave (H). Apply Loctite 243 (TY9370) to the screws before inserting them, and tighten to 31 N·m (23 lb-ft).



ZX,TMXZCO006642-19-01AUG96

Fill the cavity between the lugged rings and the spring with approx. 0.86 kg (30 oz.) of multi-purpose grease.

Apply Molykote to the end surfaces of the lugged rings.

ZX,TMXZCO006643-19-01AUG96

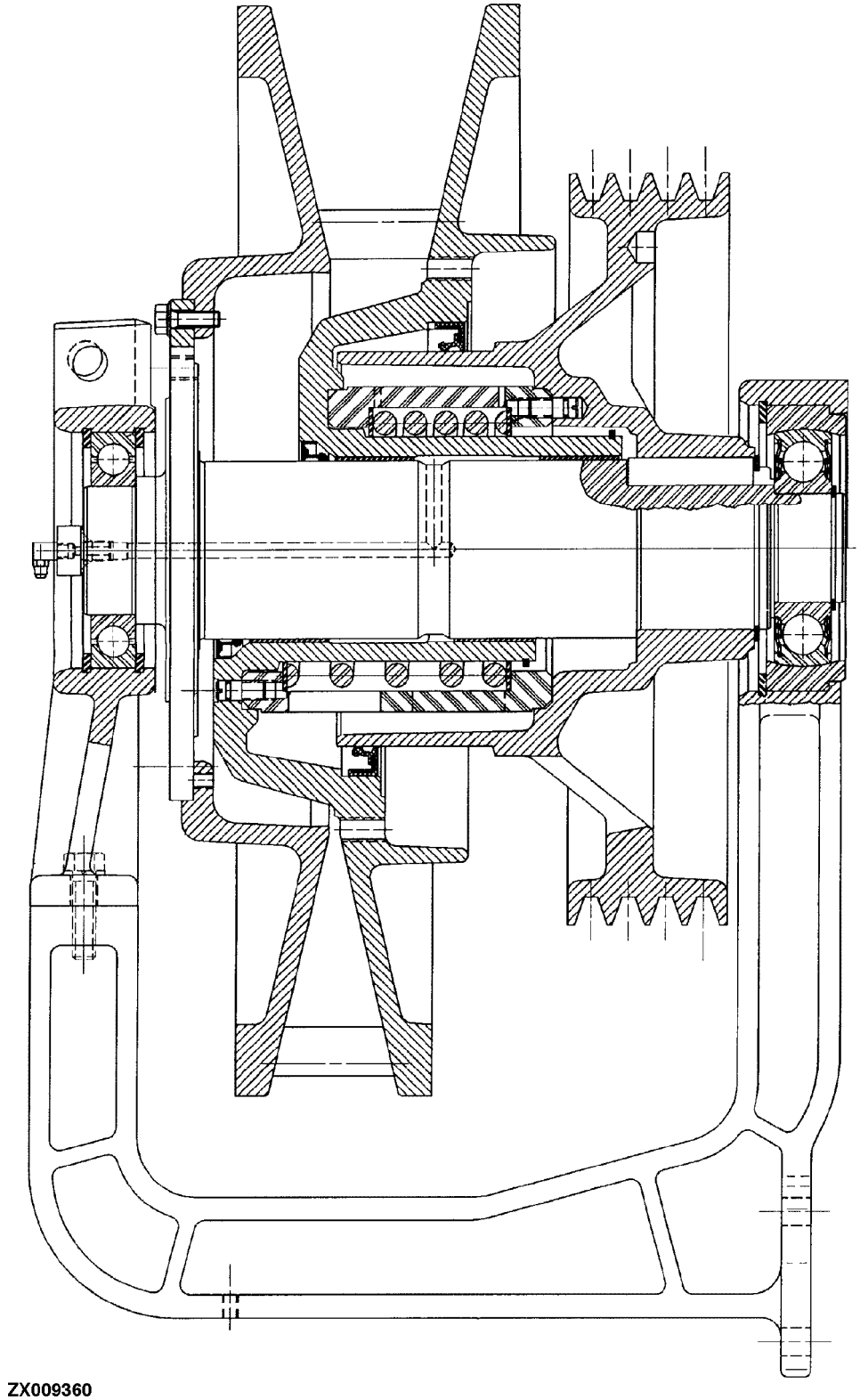
ASSEMBLING THE LOWER UNIT OF THE VARIABLE CYLINDER DRIVE (CONTINUED)

For further assembly, follow removal procedure in reverse order.

Tighten the two screws on the bearing support to 90 N·m (66.4 lb-ft).

ZX,TMXZCO006644-19-01AUG96

ASSEMBLY, LOWER UNIT OF VARIABLE CYLINDER DRIVE



ZX009360

ZX009360 -UN-28AUG96

ZX,TMXZCO006645-19-01AUG96

SPECIFICATIONS

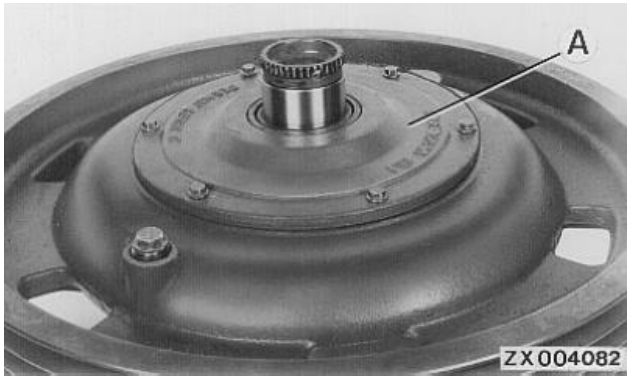
Item	Measurement	Specification
Screws on flanged shaft	Tightening torque	130 N·m (96 lb-ft)
Screws, reduction gear attachment	Tightening torque	130 N·m (96 lb-ft)
With gear disengaged	Speed range	370 - 1110 rpm
With gear engaged	Speed range	150 - 440 rpm

ZX,TMXZCO010014-19-01AUG97

DISASSEMBLE CYLINDER DRIVE REDUCTION GEAR

Remove attaching screws of cover (A).

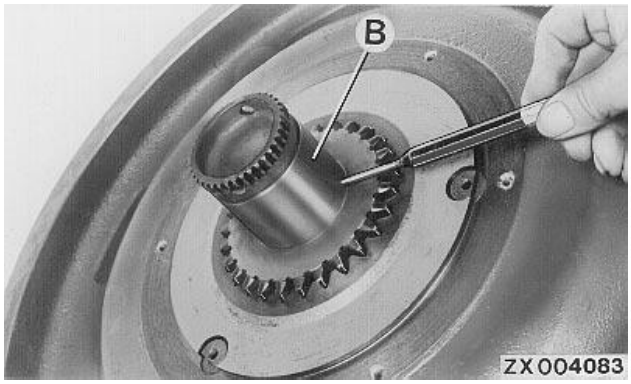
Remove cover (A).



ZX,TMXZCO002130-19-05OCT92

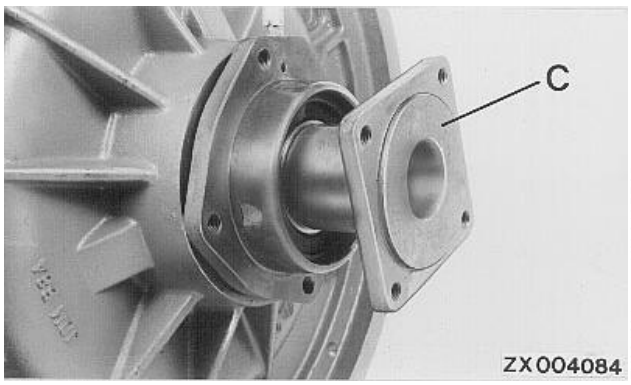
Use a mandrel or similar tool to hold locking ball between sliding sleeve (B) and shaft in place.

Before removing sliding sleeve, take out locking ball and spring through bore.



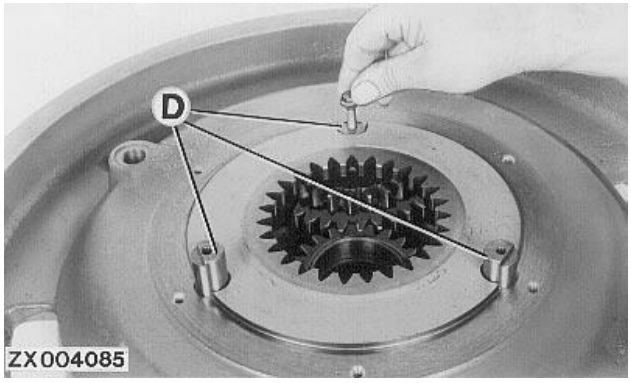
ZX,TMXZCO002131-19-05OCT92

Drive flanged shaft (C) out of gearcase.



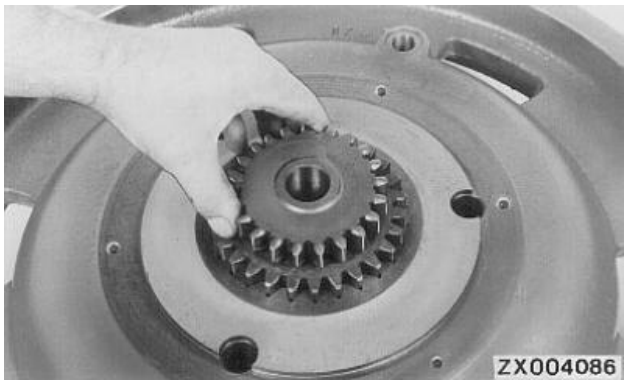
ZX,TMXZCO002132-19-05OCT92

Using an M6 screw, pull the three planet gear shafts (D) out of gearcase.



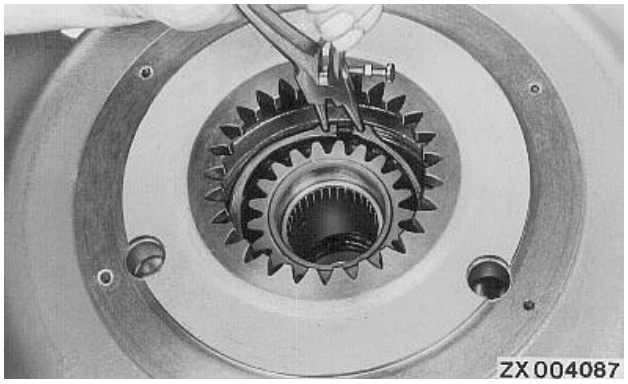
ZX,TMXZCO002133-19-05OCT92

Take individual planet gears (3 used) out of gearcase.



ZX,TMXZCO002134-19-05OCT92

Remove snap ring and drive sun gear out of gearcase.



ZX,TMXZCO002135-19-05OCT92

REPAIR CYLINDER DRIVE REDUCTION GEAR

Check all parts of cylinder drive reduction gear for wear or damage.

Replace worn or damaged parts as necessary.

Whenever seals are removed, install new ones.

ZX,TMXZCO002136-19-05OCT92

INSTRUCTIONS FOR ASSEMBLY OF CYLINDER DRIVE REDUCTION GEAR

1. Before assembly, wash all parts. Make sure that all parts are clean and free of chips.

2. Lubricate all bearing points and seals with SAE multipurpose grease before assembly.

Fill space between dust and sealing lips of seals with grease.

3. Before pressing bearing (H) on flanged shaft, position snap ring (J).

4. When installing planet gears, note “zero” position.

5. Apply sealant to screws before installation.

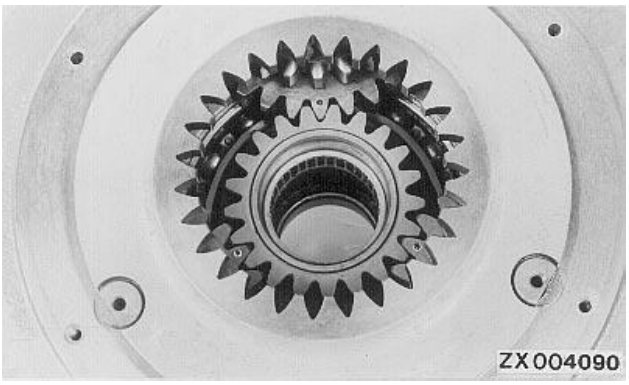
Seal sun gear against side wall by means of sealant before installation.

6. Fill gearcase with 2.2 L (0.6 U.S.gal) of SAE 90 gear case oil.

ZX,TMXZCO002137-19-05OCT92

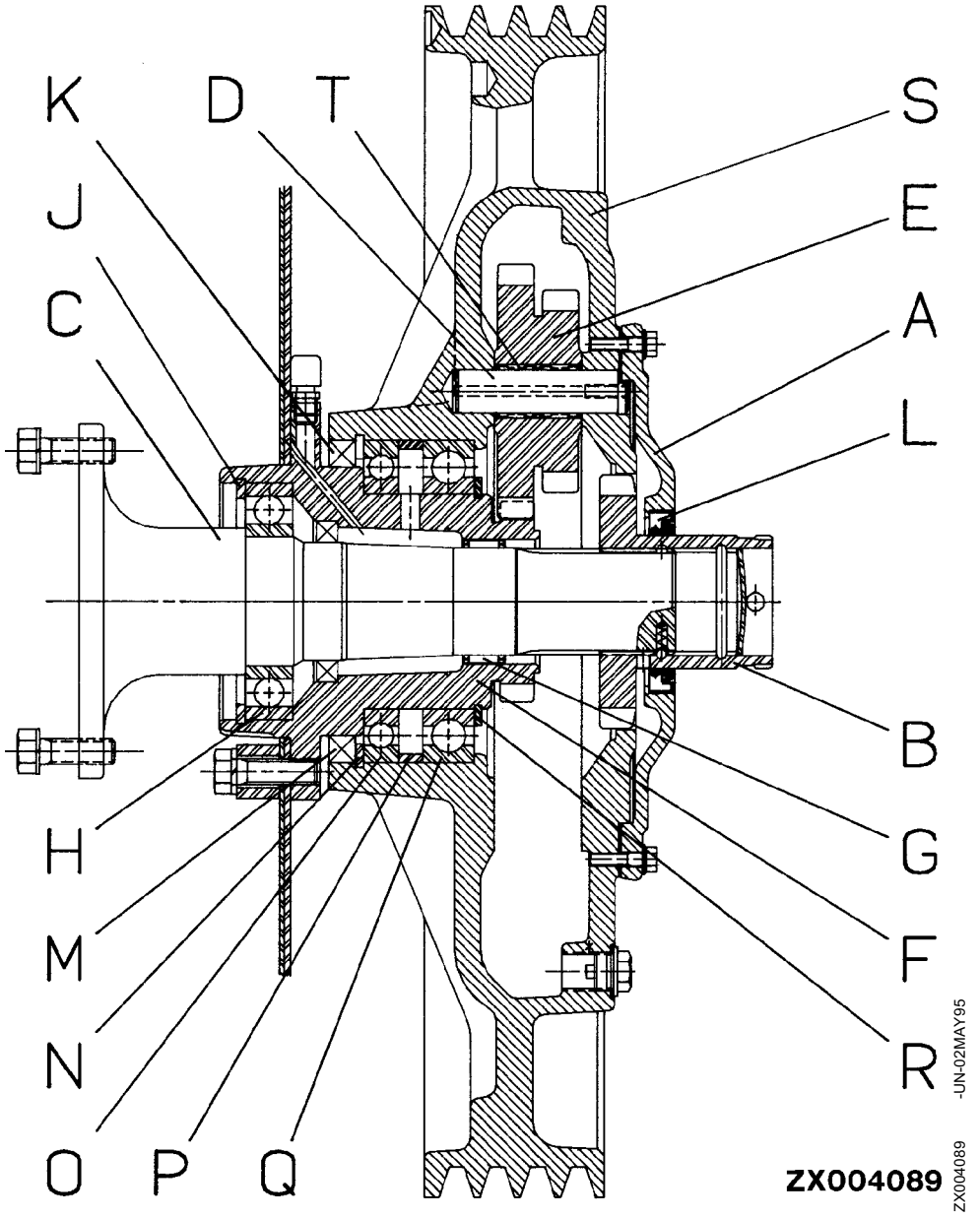
ADJUST PLANET GEARS

Install planet gears with marked teeth facing center of reduction gear unit.



ZX,TMXZCO002138-19-05OCT92

ASSEMBLE CYLINDER DRIVE REDUCTION GEAR

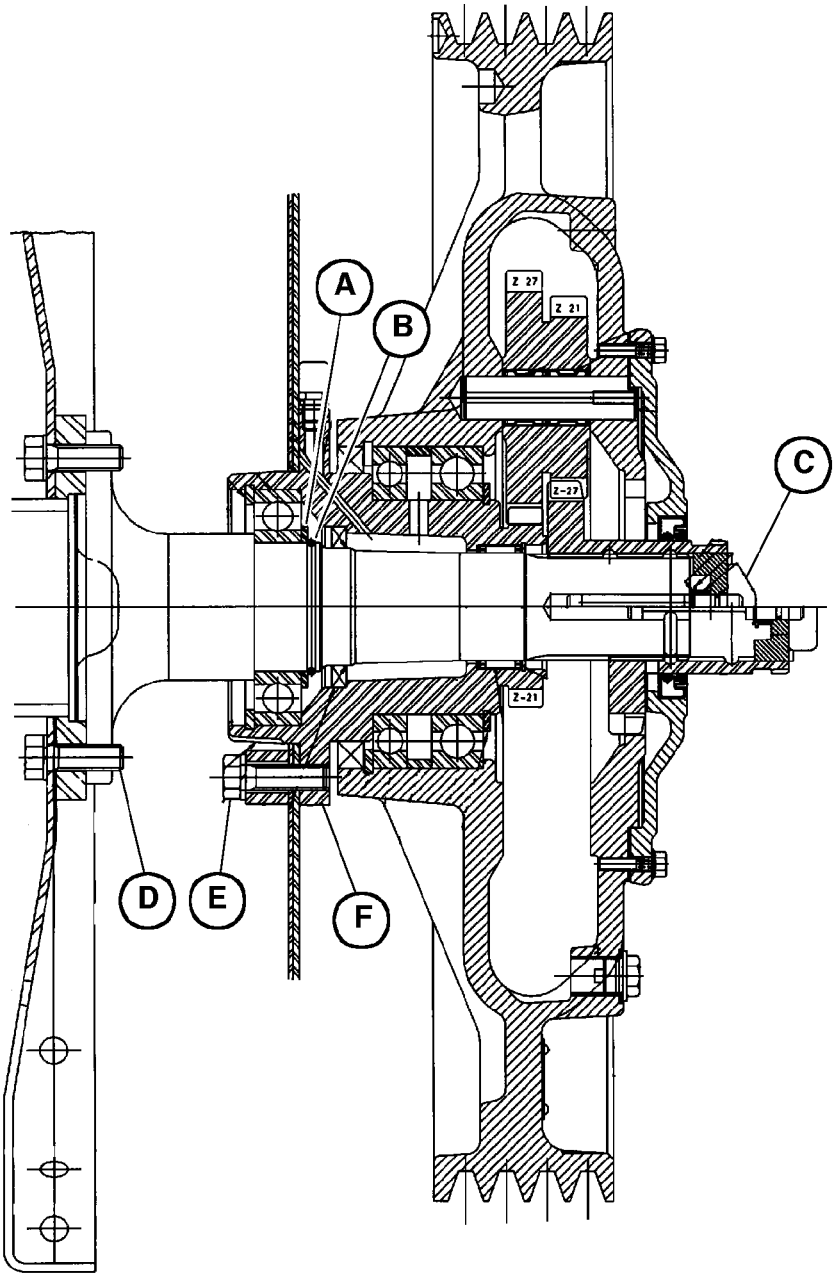


A—Cover
B—Sliding sleeve
C—Flanged shaft
D—Planet gear shaft (3 used)
E—Planet gear
F—Sun gear
G—Needle bearing
H—Ball bearing
J—Snap ring
K—Shaft seal
L—Shaft seal
M—Shaft seal
N—Snap ring
O—Ball bearing
P—Spacer
Q—Ball bearing
R—Snap ring
S—Pulley with gearcase

Assemble cylinder drive reduction gear, using above illustration as a guide.

ZX,TMXZCO002139-19-05OCT92

CYLINDER DRIVE REDUCTION GEAR (FROM A CERTAIN SERIAL NUMBER)



ZX012254

ZX012254 -UN-25SEP97

A—Back-up ring
B—Snap ring
C—Shift collar
D—Screws
E—Screws
F—Face

This reduction gear differs in relation to the previous one in having back-up ring (A) and snap ring (B). In addition, shift collar (C) can now be locked.

Tighten screws (D) and (E) to 130 N·m (96 lb-ft). Coat face (F) with a commercially-available sealant.

ZX,TMXZCO010015-19-01AUG97

SELECTING THE CYLINDER DRIVE REDUCTION GEAR

The cylinder drive reduction gear allows the cylinder speed to be reduced by about half. It is used to harvest corn (maize) and sunflowers.

The angled end of lug (A) indicates the position to which the camshaft is set:

• F-Lock position

• S-Select position

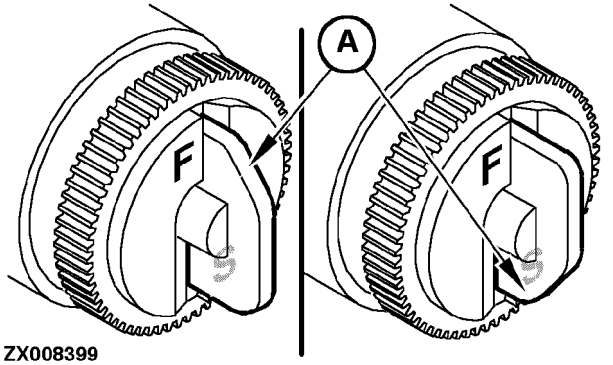
Changing Speeds

• Turn lug (A) from position “F” to position “S”.

• Pull out shifter sleeve (B) (reduction gear disengaged) for speeds in the 370—1110 rpm range

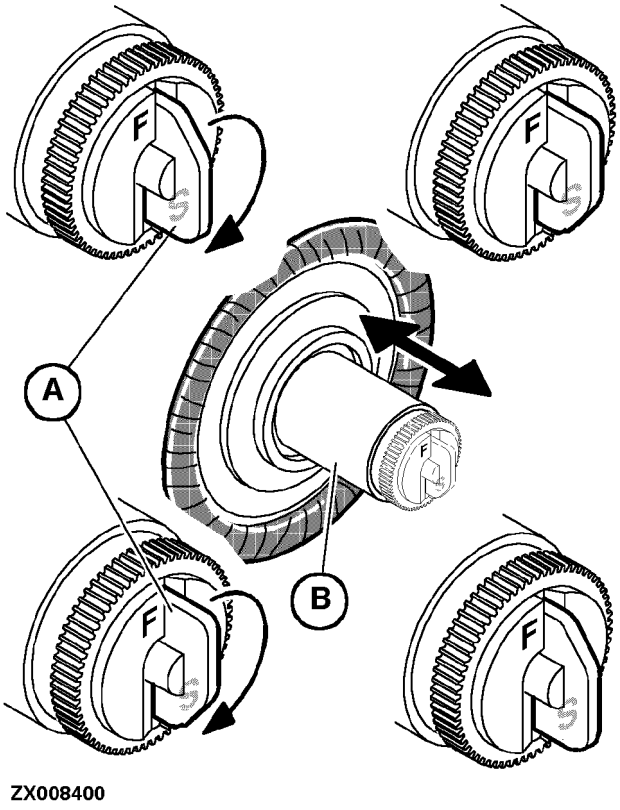
• Push in shifter sleeve (B) (reduction gear engaged) for speeds in the 150—440 rpm range.

• Turn lug (A) from position “S” to position “F”.



ZX008399

ZX008399 -UN-22NOV95

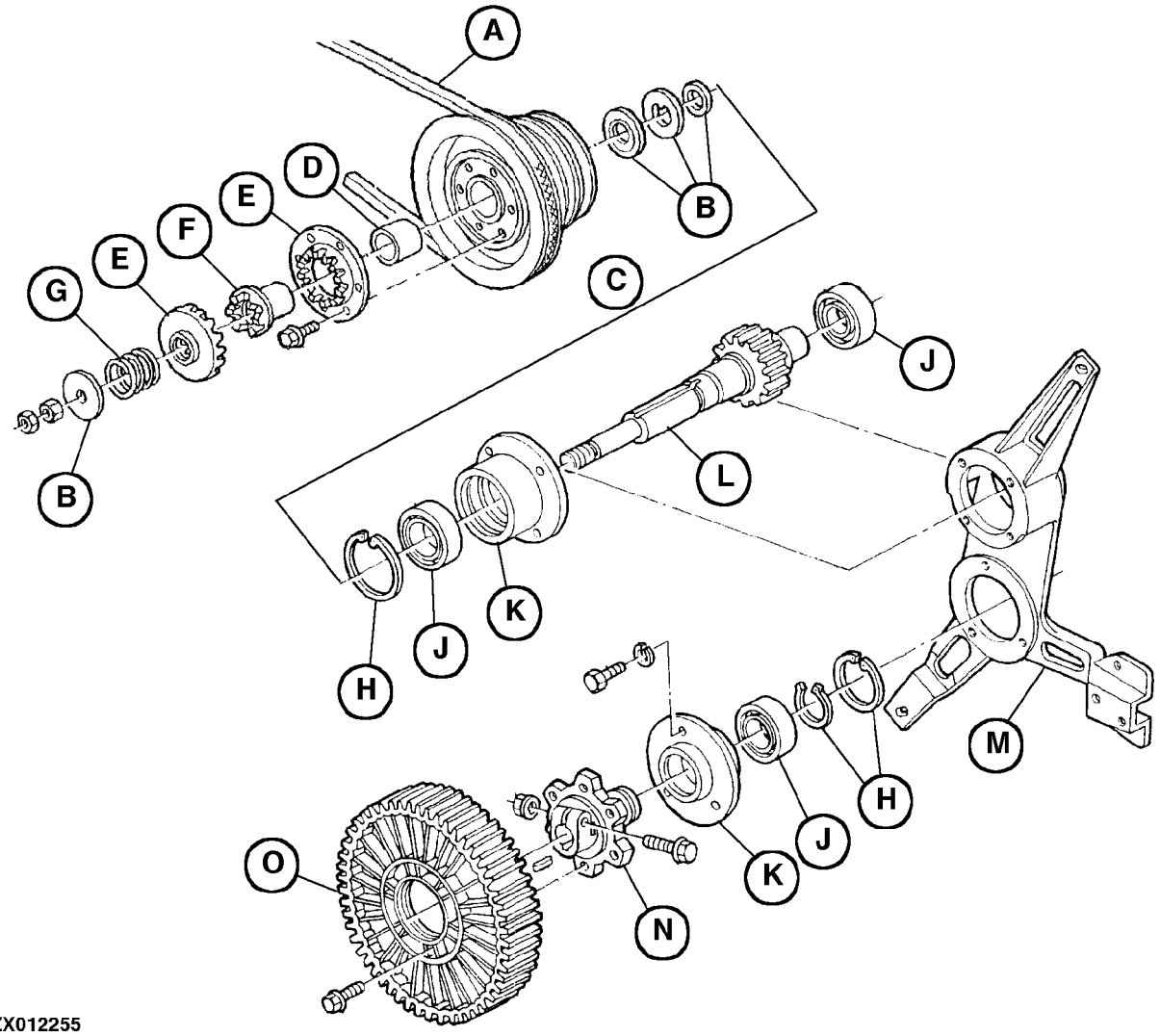


ZX008400

ZX008400 -UN-22NOV95

ZX,TMXZCO010016-19-01AUG97

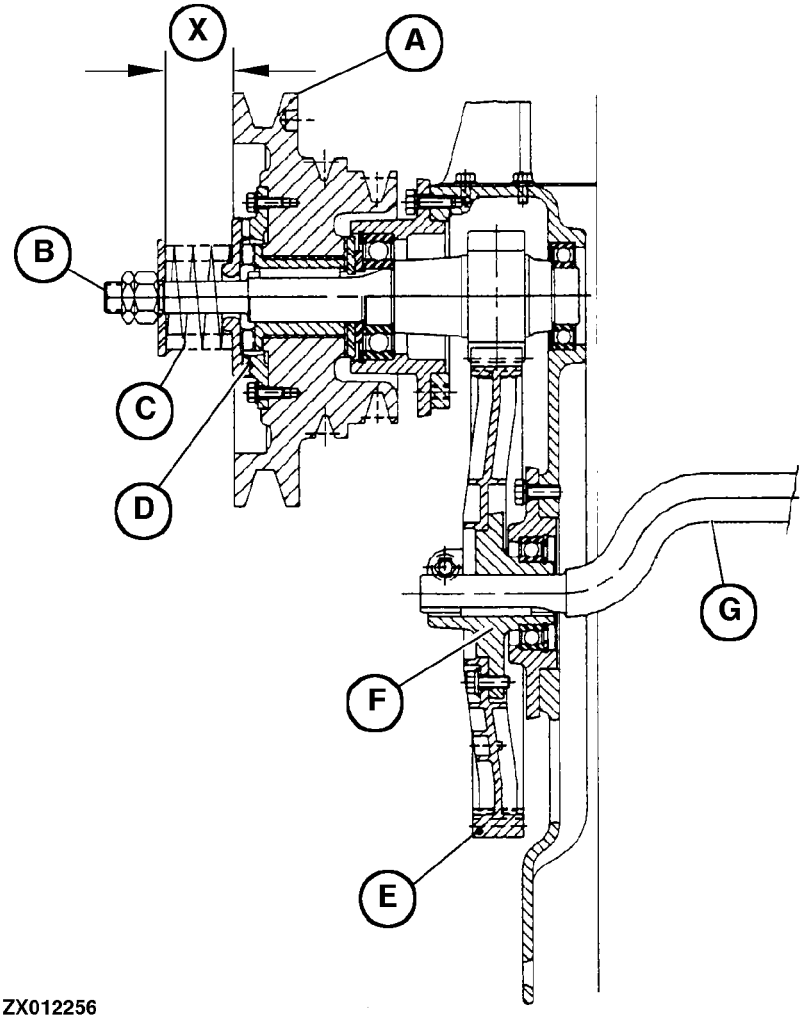
COUNTERSHAFT, EXPLODED VIEW



A—Drive belt (V-belt)
B—Washer
C—V-belt pulley
D—Bushing
E—Disk with teeth
F—Carrier
G—Spring
H—Snap ring
J—Ball bearing
K—Bearing housing
L—Shaft
M—Retaining plate
N—Clamping hub
O—Gear

ZX,TMXZCO010017-19-01AUG97

ASSEMBLING THE COUNTERSHAFT



A—V-belt pulley
B—Shaft
C—Spring
D—Slip clutch
E—Gear
F—Clamping hub
G—Straw walker crankshaft
X—Setting: 52 mm (2.0 in.)

ZX,TMXZCO010018-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Screws through bearing halves	Tightening torque	8 - 10 N·m (6 - 7 lb-ft)
Screws on walker bearing to walker	Tightening torque	50 N·m (37 lb-ft)
Straw walkers	Weight (each)	80 kg (176 lb)

ZX,TMXZCO010019-19-01AUG97

REMOVING THE STRAW WALKERS

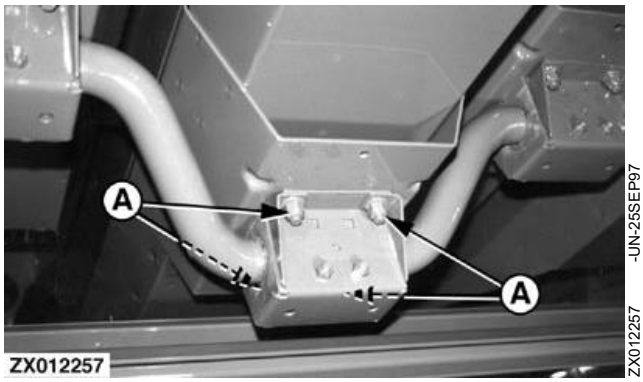
— To gain access to the front walker bearing, remove the chaffer and sieve.

— Also unbolt the two cross-shaker tines above the straw walker that is to be removed.

— Take four screws (A) out of the front walker bearing, and four screws out of the rear walker bearing.

— Remove straw walker through the rear cleaning flap.

CAUTION: Each straw walker weighs 80 kg (176 lb) and is awkward to handle.



ZX,TMXZCO010020-19-01AUG97

INSTALLING THE STRAW WALKERS

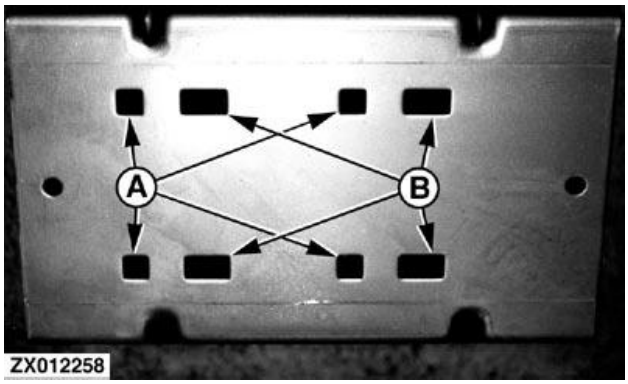
— Same as removal procedure, but in reverse order.

— On the bearing support, the front straw walker bearings are bolted onto the square holes (A).

— On the bearing support, the rear straw walker bearings are bolted onto the rectangular holes (B).

— Tighten screws to 50 N·m (37 lb-ft).

IMPORTANT: Before tightening the bolts on the rear bearings, turn straw walker crankshaft two or three times to allow the straw walkers to settle on bearing support.



ZX,TMXZCO010021-19-01AUG97

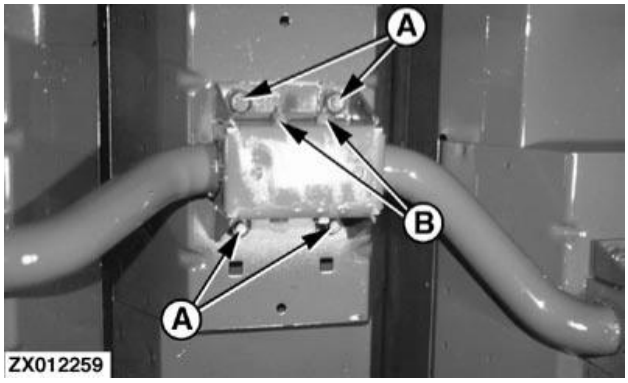
REMOVING THE STRAW WALKER BEARINGS

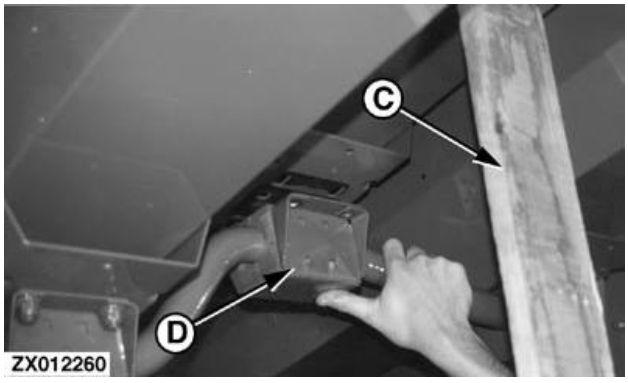
— Take out screws (A). Raise walker and insert a support (C).

— Take out screws (B) and pull off metal housing (D).

— Take the bearing halves off the crankshaft.

A—Screws
B—Screws
C—Support
D—Metal housing





ZX,TMXZCO010022-19-01AUG97

INSTALLING THE STRAW WALKER BEARINGS

— Check bearing halves (A) for signs of wear.

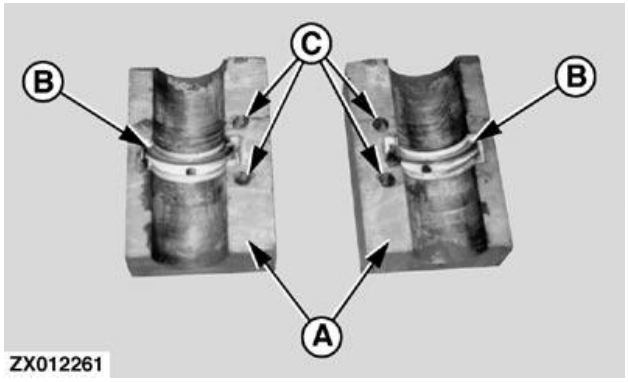
— Check plastic insert (B) for signs of wear.

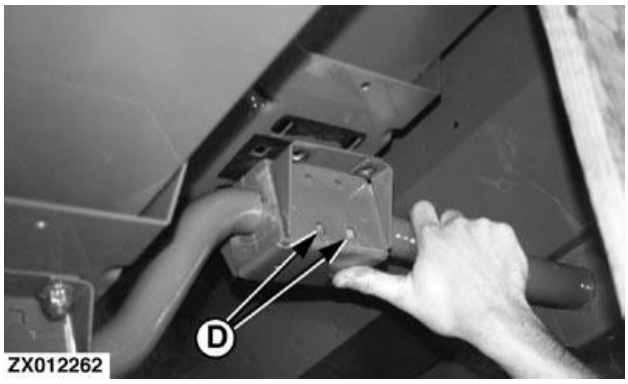
— Before installing the bearing halves and plastic insert, coat them all with grease.

— Install with holes (C; for screws) at the bottom.

— Install metal housing, and screw the bearing together with two screws in holes (D).

A—Bearing halves
B—Plastic insert
C—Holes for screws
D—Holes



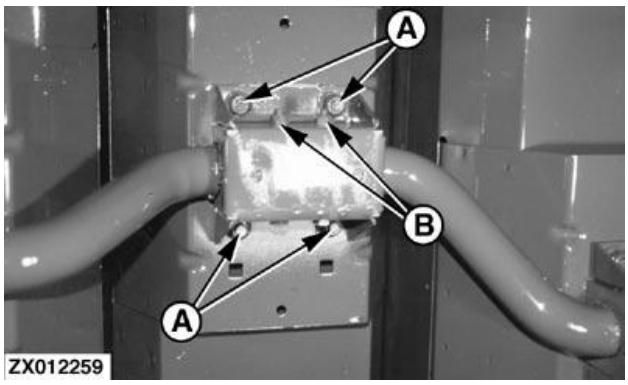


ZX,TMXZCO010023-19-01AUG97

— Tighten screws (B) to between 8 and 10 N·m (6 and 7 lb-ft).

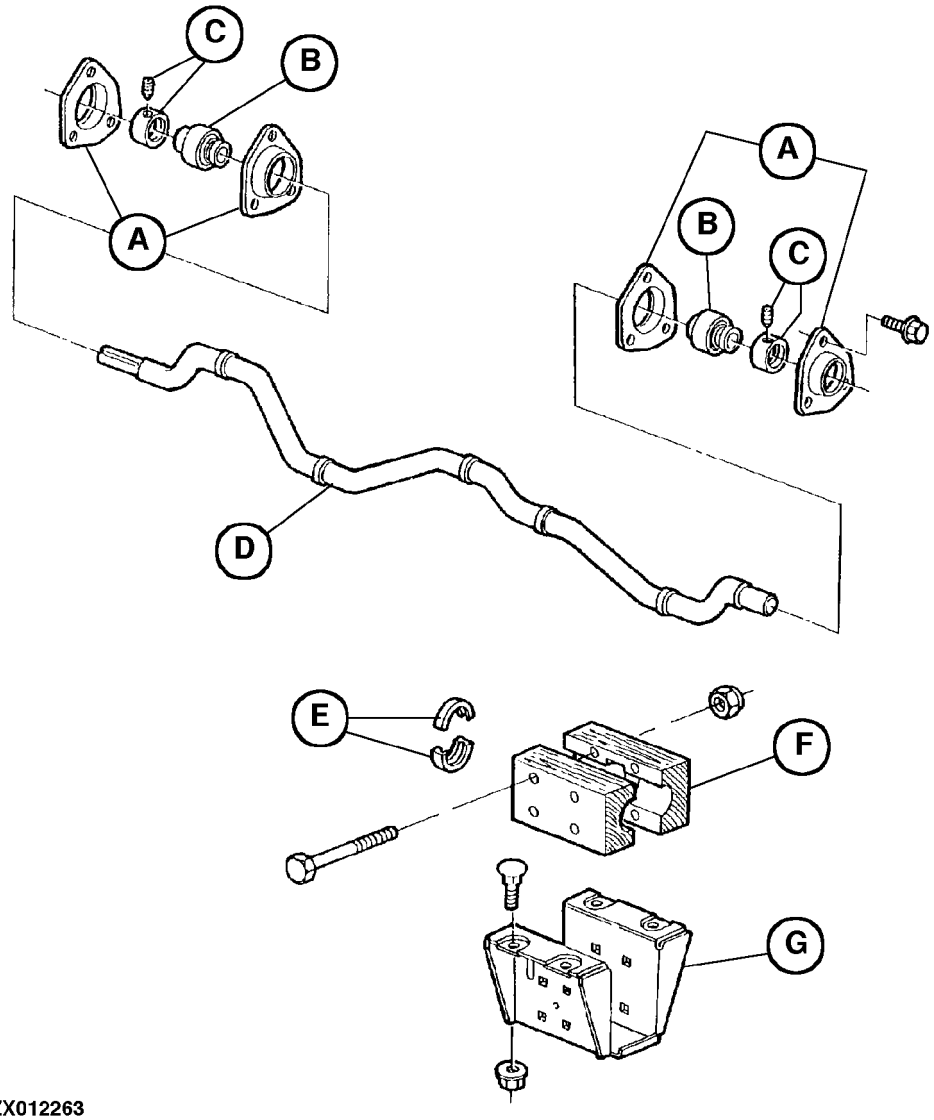
— Install bearings on straw walker (4 screws per bearing).

— Tighten screws (A) to 50 N·m (37 lb-ft).



ZX,TMXZCO010024-19-01AUG97

STRAW WALKER CRANKSHAFT AND CRANKSHAFT BEARINGS



ZX012263

A—Bearing support
B—Ball bearing
C—Clamping ring
D—Crankshaft
E—Plastic insert
F—Bearing halves
G—Metal housing

ZX,TMXZCO010025-19-01AUG97

REMOVING THE FRONT STRAW WALKER CRANKSHAFT

— Remove the chaffer and sieve.

— Remove bolts from all straw walker bearings.

— Support the straw walkers with a plank of wood. Pull them through the opening in the grain tank floor and secure them so they cannot slip.

— Remove bolts from the front right bearing (A) of the walker shaft.

— On the left-hand side, remove drive belts (B) and (C).

— Unbolt gear (D).

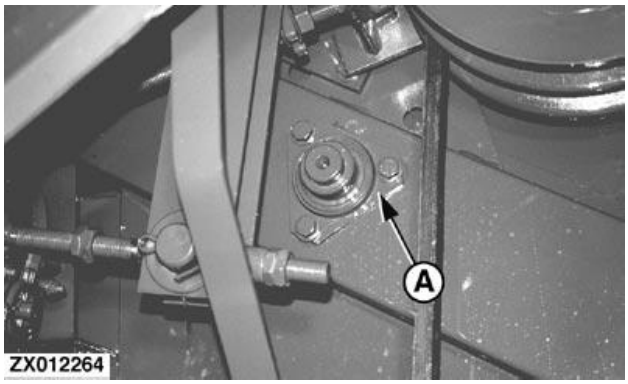
— Unfasten clamping hub (E), unbolt the bearing retainer at screws (F) and remove it.

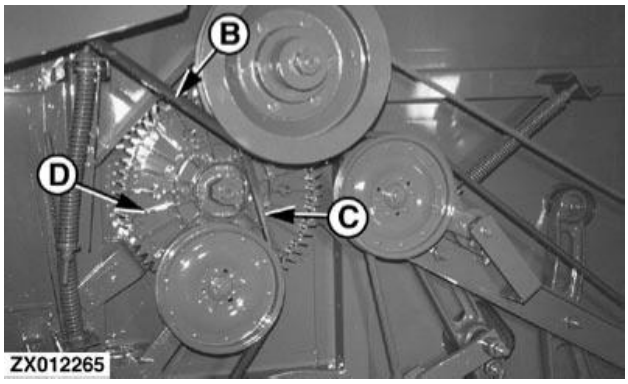
— Pull the straw walker crankshaft out to the left.

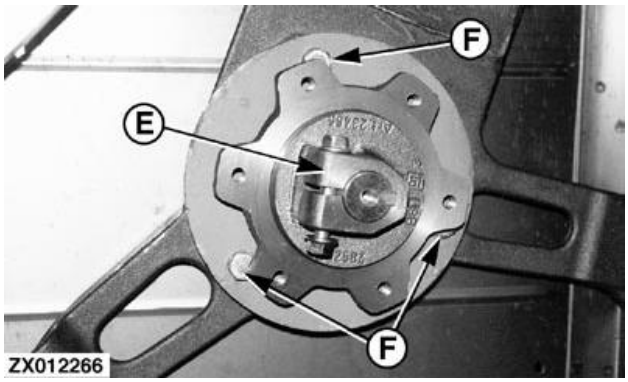
— Installation of straw walker crankshaft is same as removal procedure, but in reverse order.

— Align the straw walker crankshaft so that the gap between the straw walkers and the side wall is the same at left and right.

A—Bearing
B—Drive belt
C—Drive belt
D—Gear
E—Clamping hub
F—Screws







ZX,TMXZCO010026-19-01AUG97

REMOVING THE REAR STRAW WALKER CRANKSHAFT

— Remove bolts from all the straw walker bearings. Support the walkers with a plank of wood and a wooden prop (A).

— Remove bolts that hold the bearing halves onto the crankshaft.

— Remove bolts that hold the right rear ball bearing (B).

— On the left-hand side, remove cross-shaker drive (C).

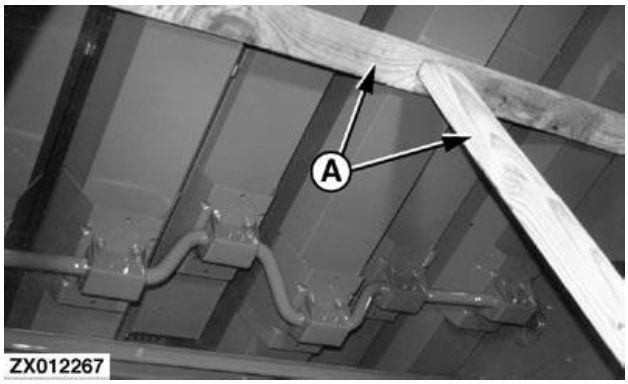
— Unfasten the driven pulley (D) and ball bearing (E), and remove.

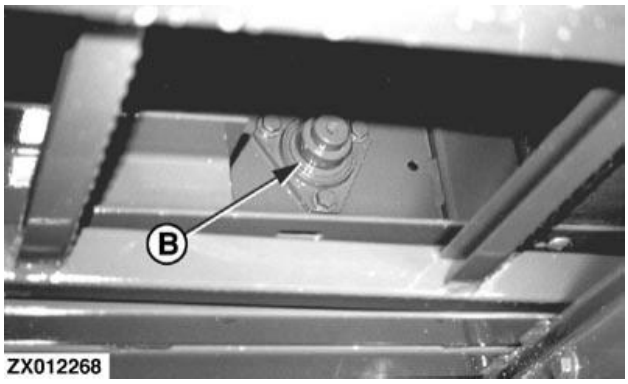
— Pull the straw walker crankshaft out to the left.

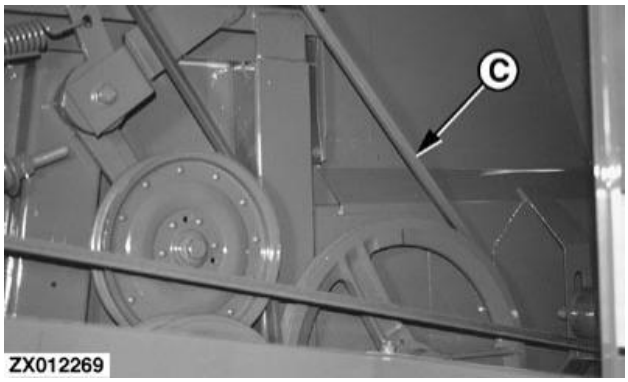
— Installation of straw walker crankshaft is same as removal procedure, but in reverse order.

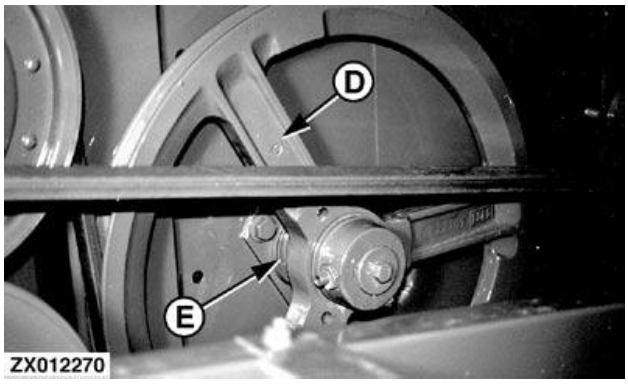
— Align the straw walker crankshaft so that the gap between the straw walkers and the side wall is the same at left and right.

A—Plank and wooden prop
B—Ball bearing
C—Cross-shaker drive belt
D—Driven pulley
E—Ball bearing









ZX,TMXZCO010027-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Screws on fan variator	Tightening torque	30 N·m (22 lb-ft)
Gap between middle and outer sheaves	Gap	approx. 1 mm (0.04 in.)

ZX,TMXZCO010028-19-01AUG97

REMOVING THE CLEANING FAN VARIATOR

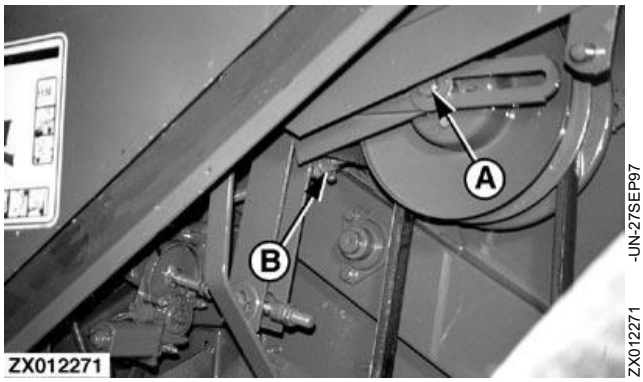
— Unfasten nut on screw (A).

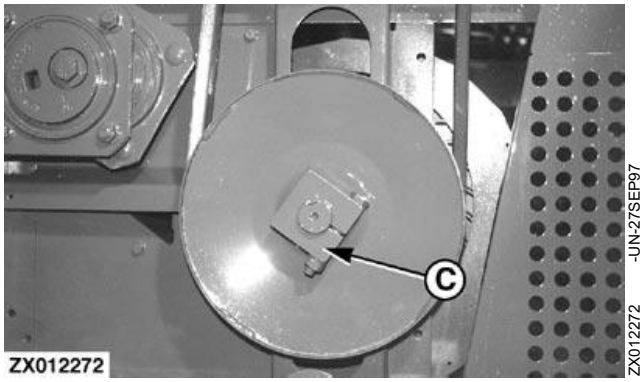
— Screw back the nut on adjusting fork (B) to relieve the tension on the drive belt.

— Unfasten the screw clamping hub (C) and remove the sheave.

— Pull out screw (A) and remove the variator.

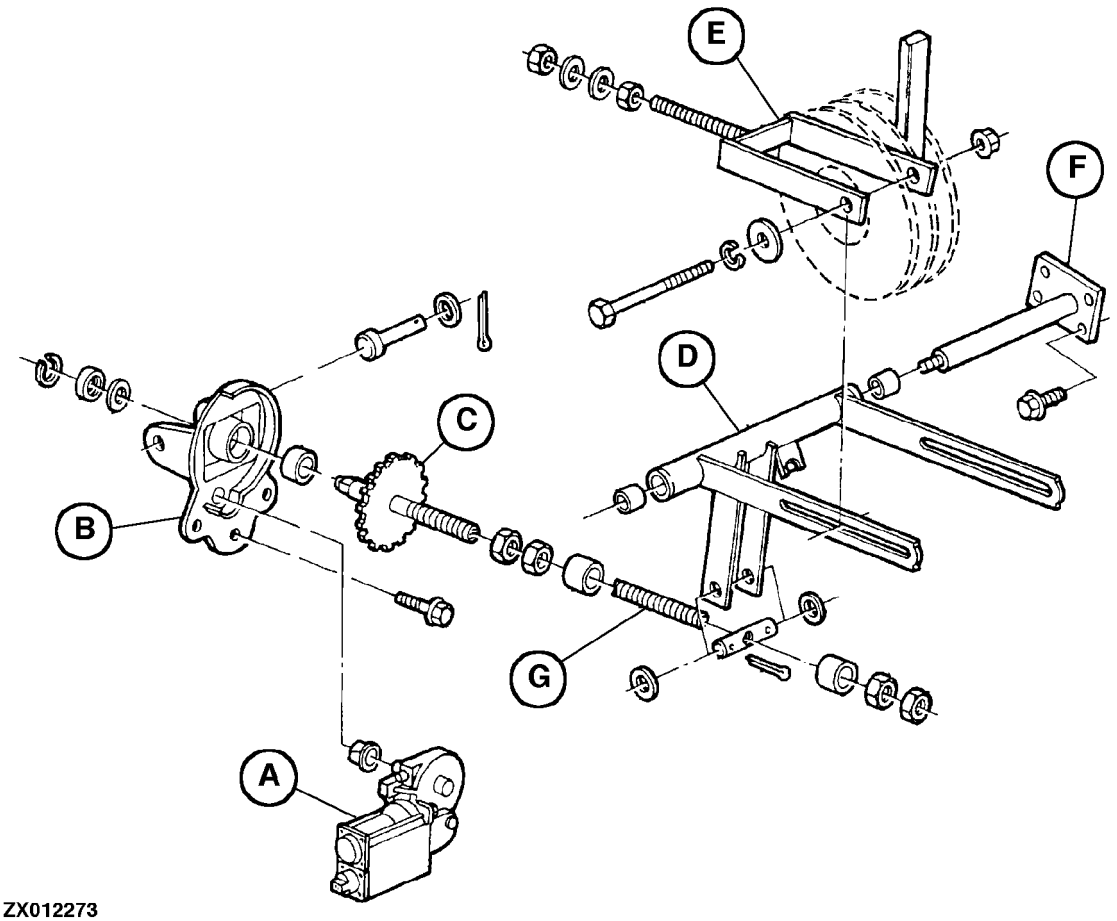
— Replace any parts that are worn; re-install variator in reverse order.





ZX,TMXZCO010029-19-01AUG97

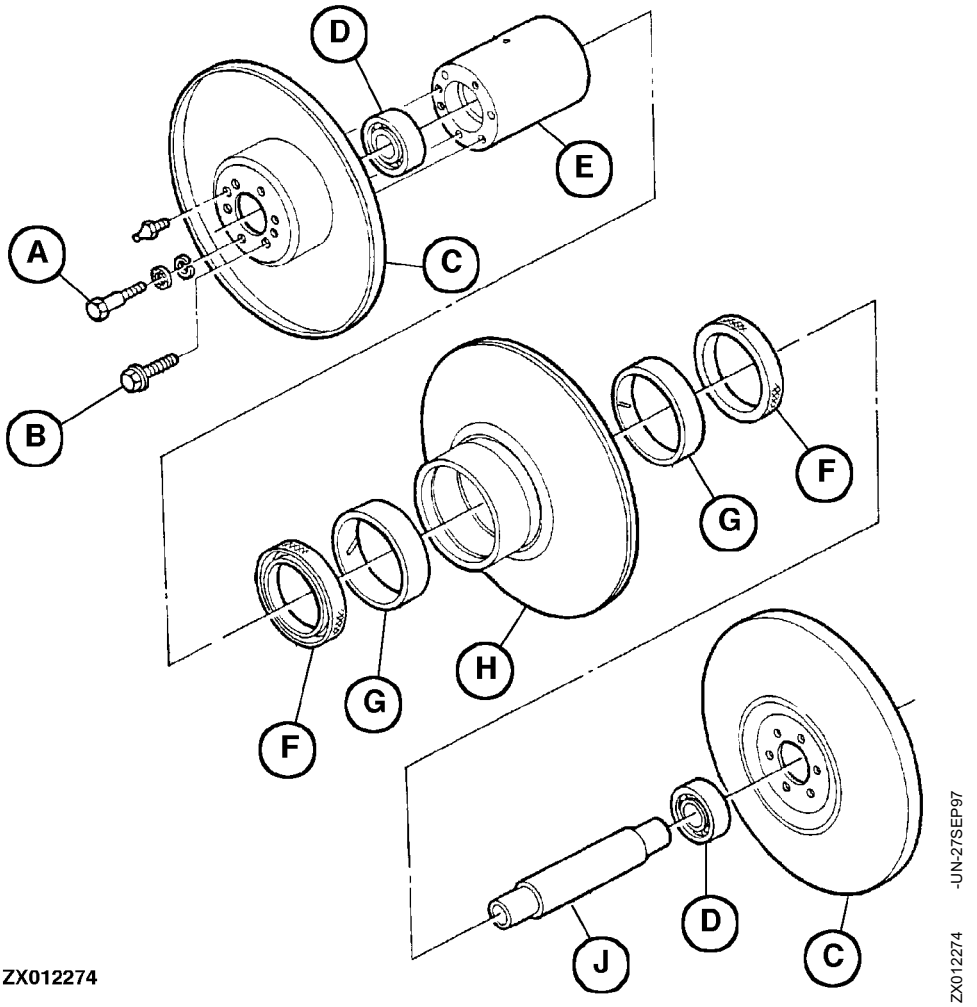
ADJUSTING THE CLEANING FAN VARIATOR



A—Electric motor
B—Spindle housing
C—Spindle
D—Variator mounting
E—Adjusting fork
F—Bracket
G—Threaded pin

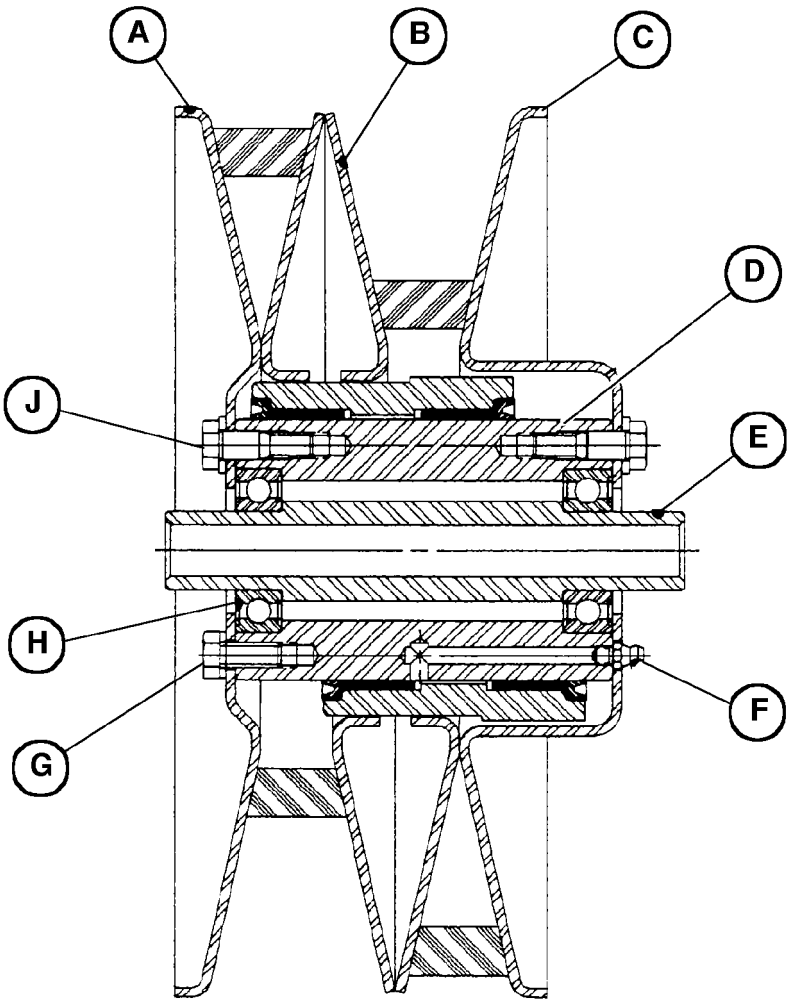
ZX,TMXZCO010030-19-01AUG97

CLEANING FAN VARIATOR, EXPLODED VIEW



A—Fitted screw
B—M8x25 screw
C—Sheave halves
D—Ball bearing
E—Hub
F—Seal ring
G—Thrust ring
H—Middle sheave
J—Hollow shaft

ZX,TMXZCO010031-19-01AUG97



A—Sheave half
B—Middle sheave
C—Sheave half
D—Hub
E—Hollow shaft
F—Grease fitting
G—Screw
H—Ball bearing
J—Fitted screw

Tighten screws (G) and (J) to 30 N·m (22 lb-ft).

NOTE: Holes for fitted screws are marked with a punch-mark.

ZX,TMXZCO010032-19-01AUG97

ADJUSTING FAN VARIATOR

CAUTION: Before adjusting the machine or performing service work, always switch off all drives, shut off the engine and wait until all moving parts have come to a stop.

Tension drive belts:

Once belts (A) and (B) are in position, tension the belts by means of fork (C). First slacken off screw (D).

Variator stroke adjustment:

• Slacken off nuts (E) and locknuts (F) fully.

• With the machine running, set variator to low speed until the middle disk moves outward.

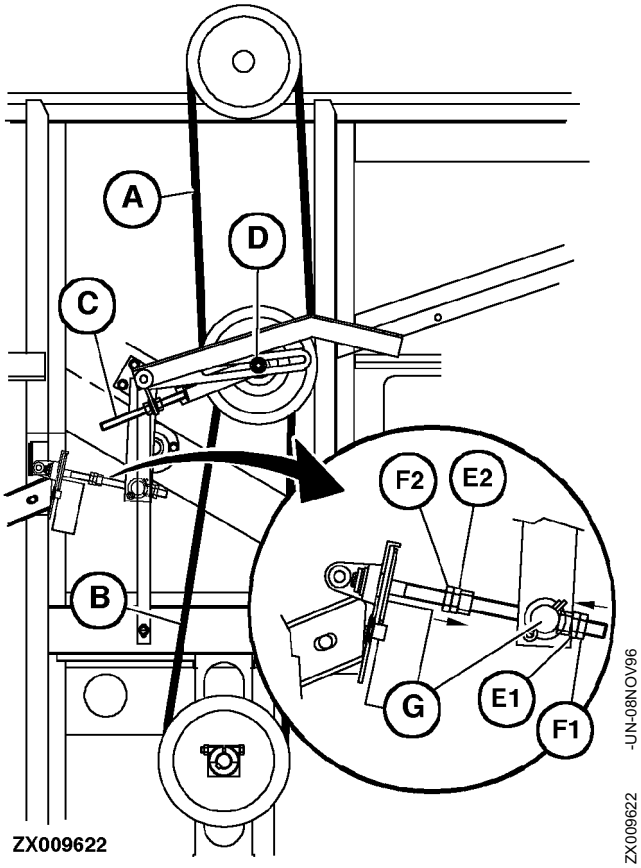
• With the machine stopped, turn nut (E1) as far as pin (G). Tighten locknut (F1).

• With the machine running, set variator to high speed until the middle disk moves inward.

• With the machine stopped, turn nut (E2) as far as pin (G). Tighten locknut (F2).

• Set the variator to medium speed.

• With the machine stopped, turn nuts (E) and locknuts (F) half a revolution in the direction of the arrow.



A—Drive belt
B—Drive belt
C—Adjusting fork
D—Screw
E—Adjusting nuts
F—Locknuts
G—Threaded pin

ZX,OMXZCO002254-19-01NOV96

Section 130
Grain Recovery and Unloading System

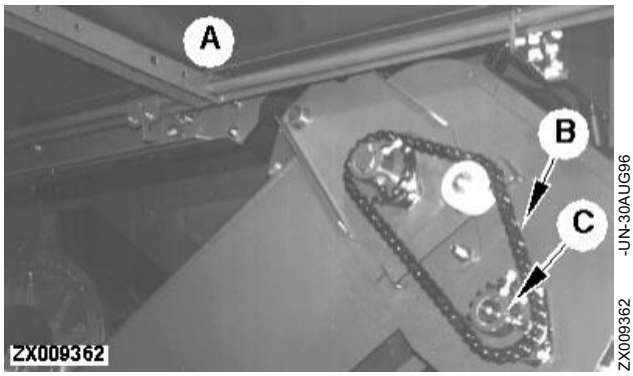
Contents

Page

REMOVING THE TAILINGS ELEVATOR

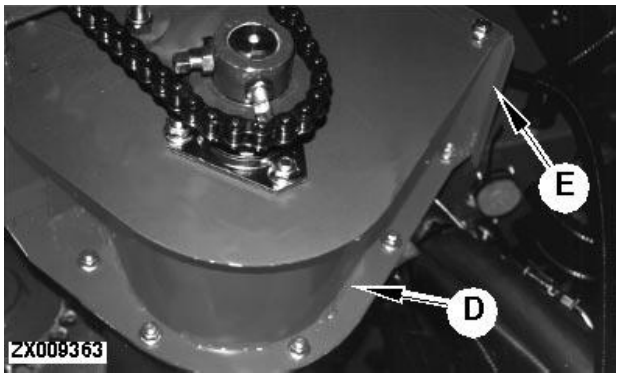
Remove the large side guard (A; see description in Section 80).

Remove drive chain (B) and sprocket (C).



ZX,TMXZCO006649-19-01AUG96

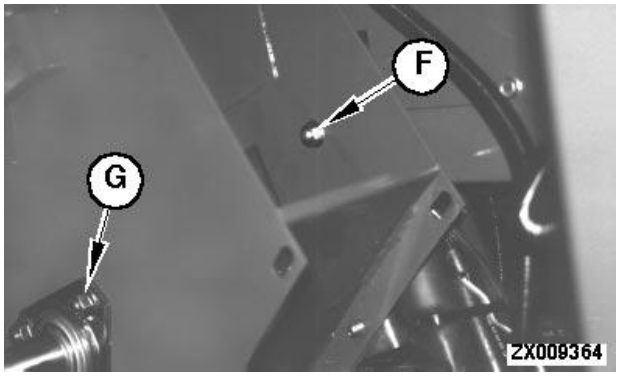
Take 6 screws out of housing (D) and lift off cover (E).



ZX,TMXZCO006650-19-01AUG96

Take out screw (F).

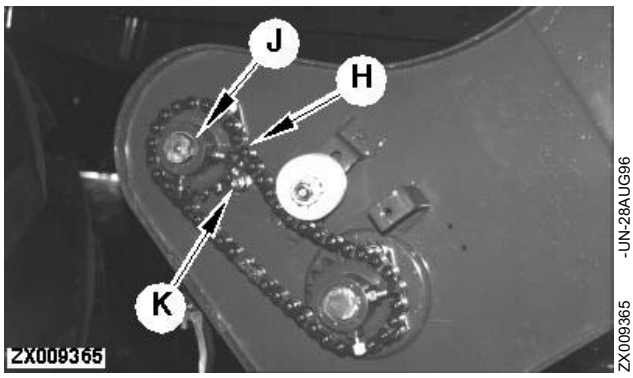
Slacken off nuts (G) on the bearing flange.



ZX,TMXZCO006651-19-01AUG96

Remove lower drive chain (H) and sprocket (J).

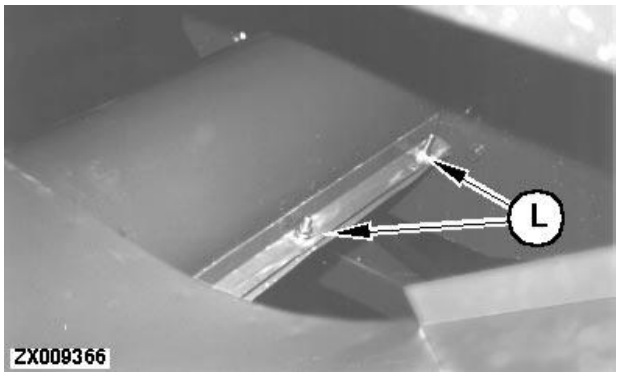
Slacken off nuts (K) on the bearing flange.



ZX,TMXZCO006652-19-01AUG96

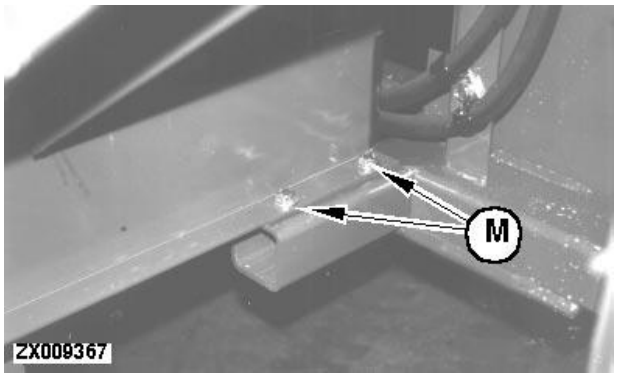
REMOVING THE TAILINGS ELEVATOR (CONTINUED)

Slacken off screws (L) on the sheet-metal cover.



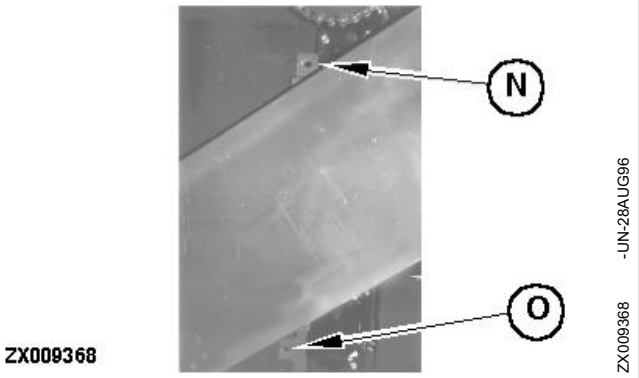
ZX,TMXZCO006653-19-01AUG96

Take screws (M) out of the support.



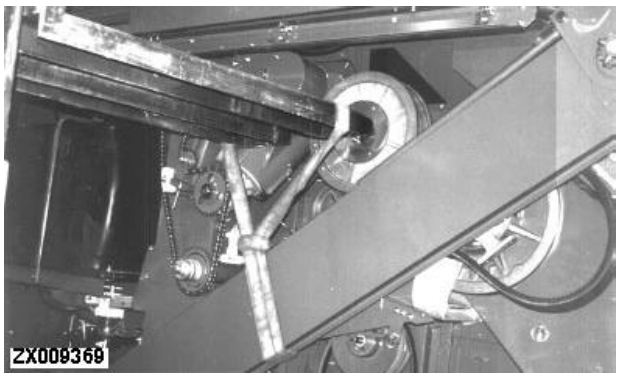
ZX,TMXZCO006654-19-01AUG96

Takes screws (N) and (O) out of the central attaching element.



ZX,TMXZCO006655-19-01AUG96

Suspend the elevator by a cable from a forklift truck, and move it to the side.



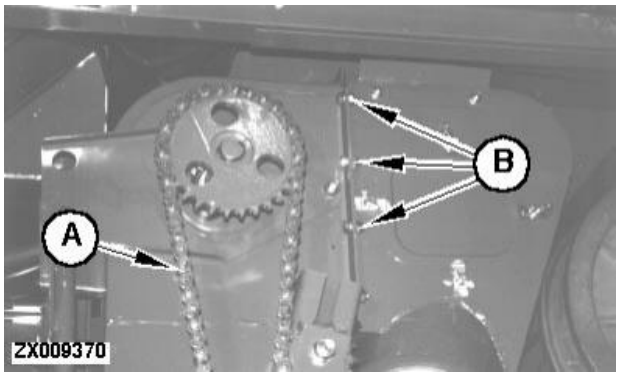
ZX,TMXZCO006656-19-01AUG96

REMOVING THE CLEAN GRAIN ELEVATOR

Before the clean grain elevator can be removed, it is first necessary to remove the tailings elevator.

Relieve the tension on drive chain (A), and remove.

Take out the screws on both sides of the elevator top section (B).

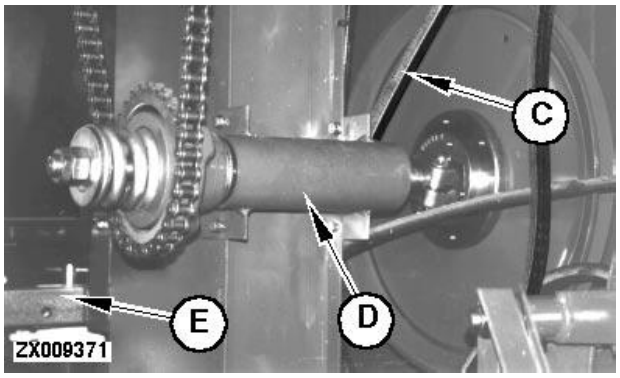


ZX,TMXZCO006658-19-01AUG96

Relieve the tension on drive belt (C), and remove.

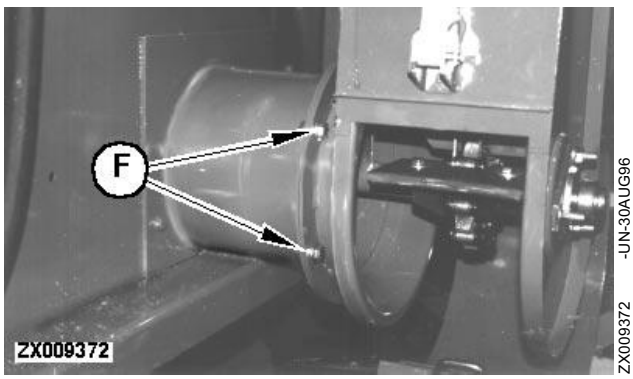
Take out the screws and remove drive (D) from the elevator.

Disconnect attaching element (E).



ZX,TMXZCO006659-19-01AUG96

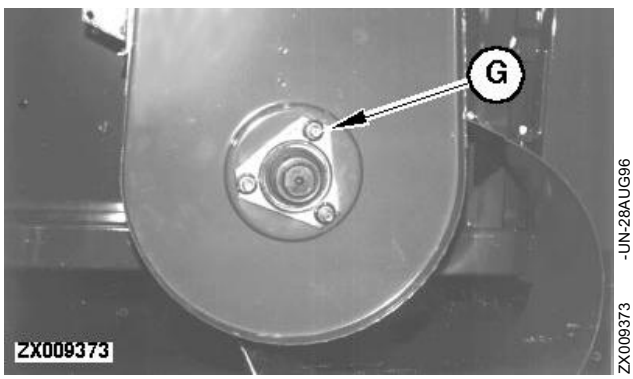
Disconnect the elevator from inlet (F).



ZX,TMXZCO006660-19-01AUG96

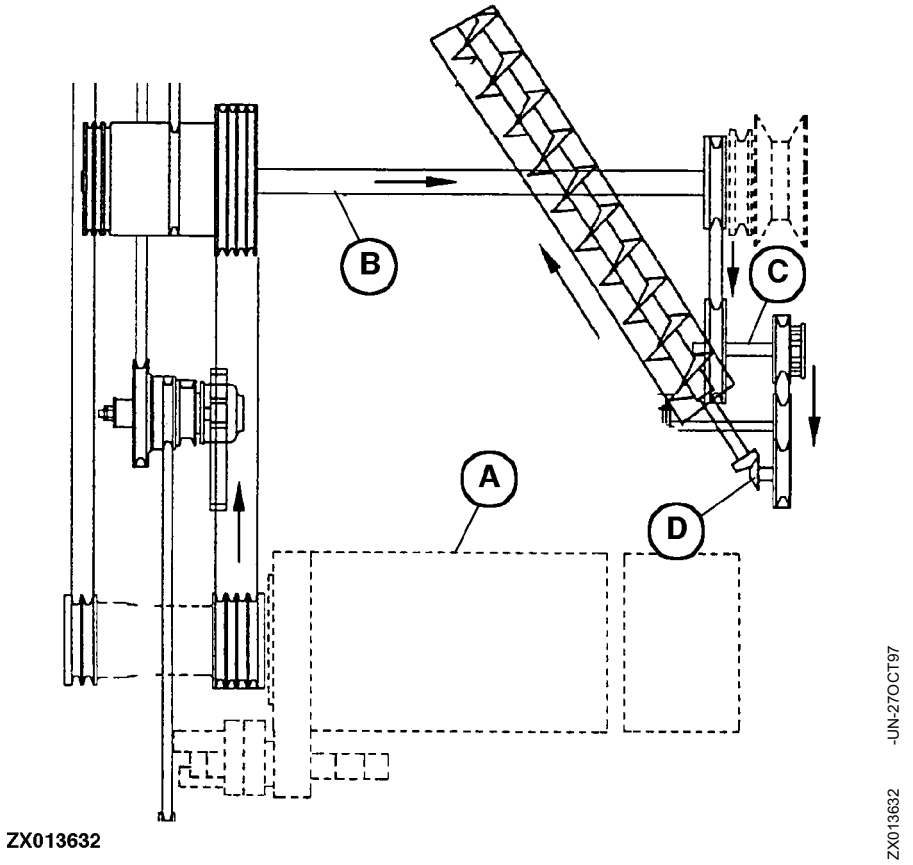
Remove the tensioning ring and slacken off screws (G) at the bearing flange.

Then use a forklift to lift the elevator sideways off the machine.



ZX,TMXZCO010033-19-01AUG97

DRIVES FOR FILLING THE GRAIN TANK

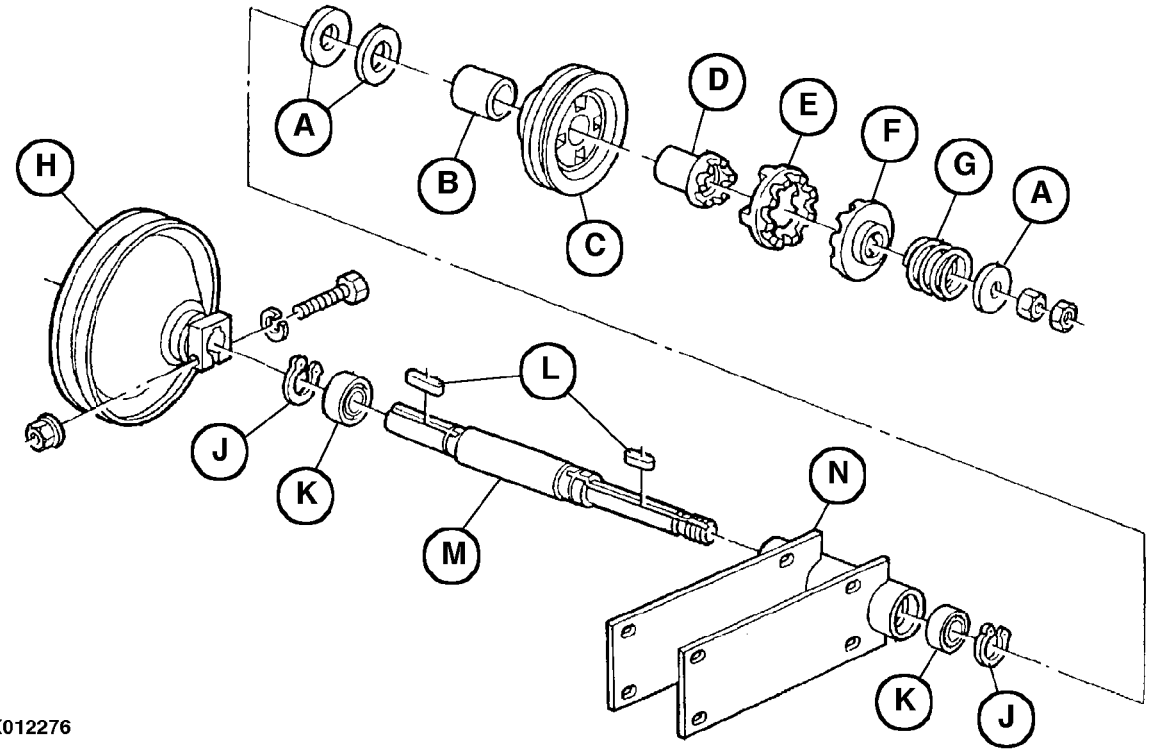


A—Engine **B—Countershaft** **C—Drive** **D—Angle drive**

Drive (C) and angle drive (D) are described in this Group (see below).

ZX,TMXZCO010034-19-01AUG97

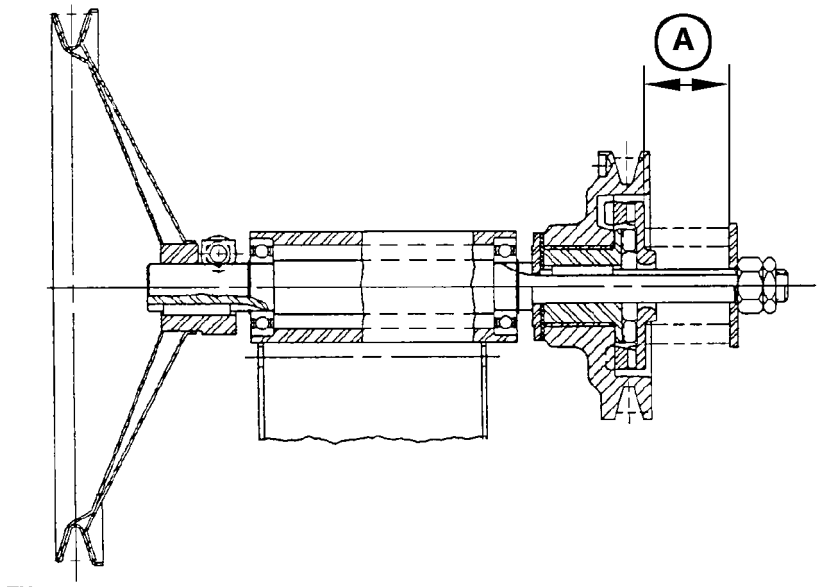
DRIVE (C), EXPLODED VIEW



A—Washer
B—Bushing
C—Belt pulley with gear
D—Hub
E—Carrier
F—Disk with teeth
G—Spring
H—Belt pulley
J—Snap ring
K—Ball bearing
L—Keys
M—Shaft
N—Support

ZX,TMXZCO010035-19-01AUG97

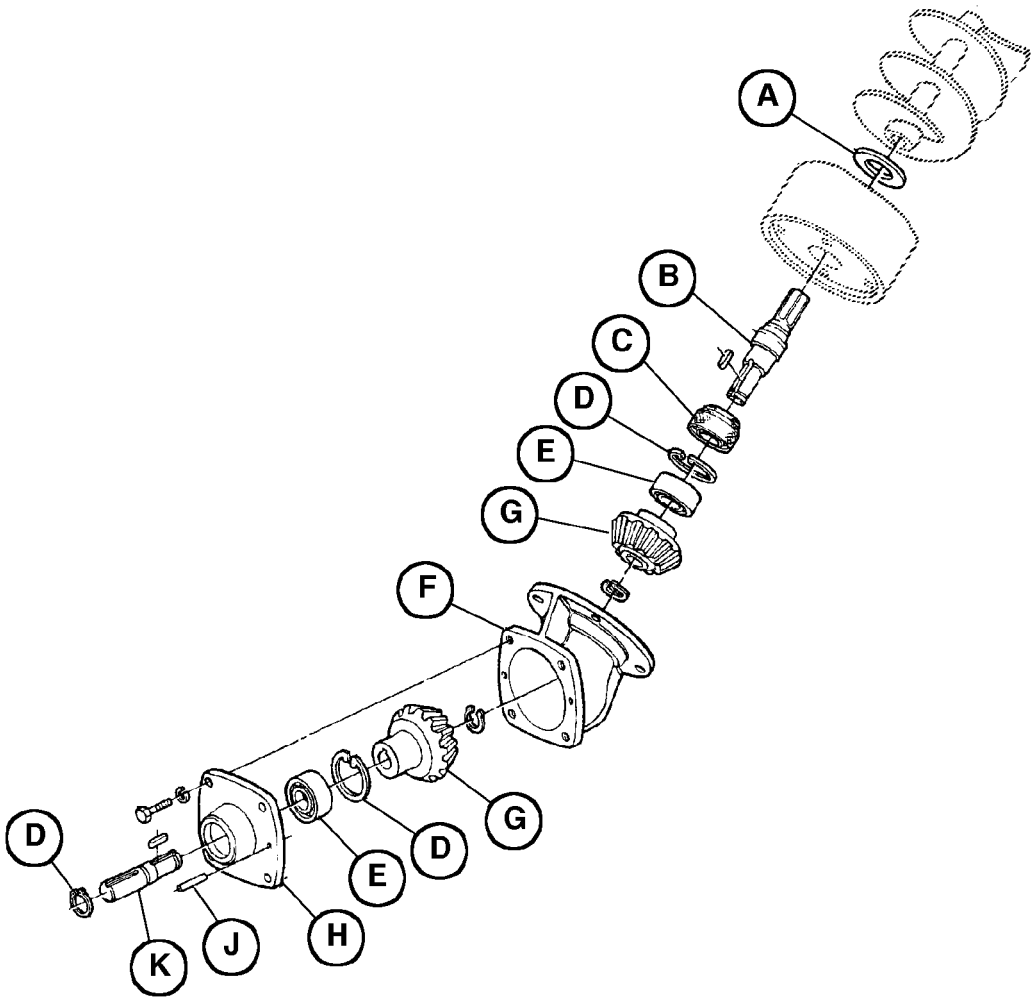
ASSEMBLING DRIVE (C)



A—59.5 mm (2.34 in.)

ZX,TMXZCO010036-19-01AUG97

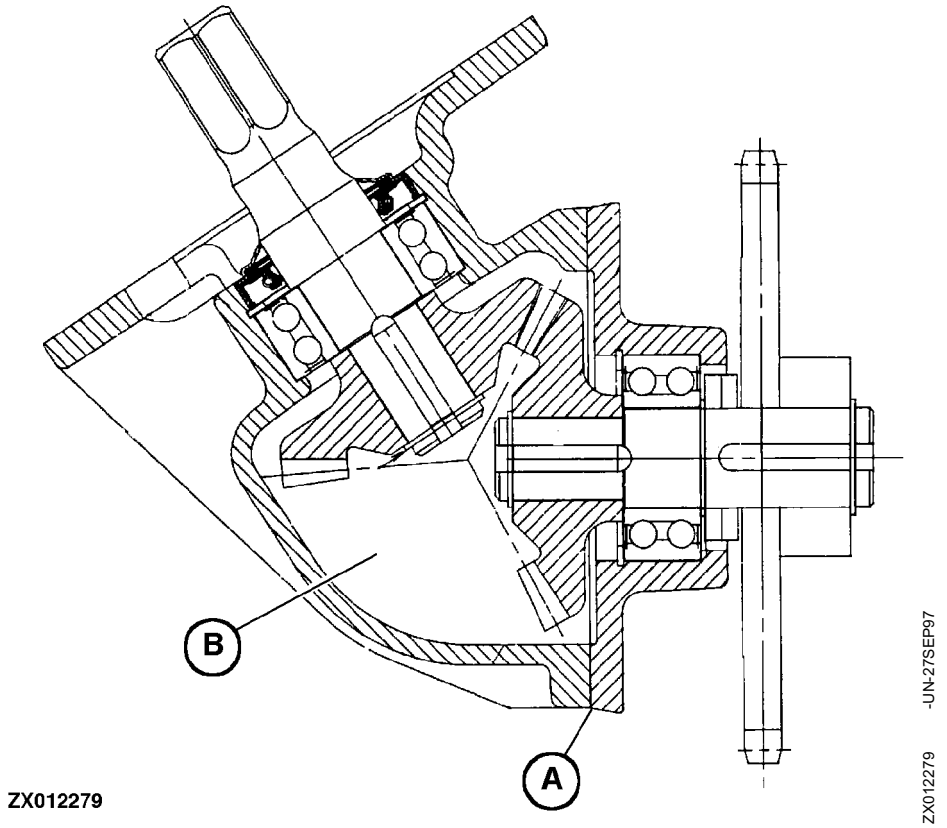
ANGLE DRIVE (D) FOR FILLING THE GRAIN TANK



A—Sealing disk
B—Output shaft
C—Sealing ring
D—Snap ring
E—Ball bearing
F—Housing
G—Bevel gear
H—Cover
J—Locating pin
K—Input shaft

ZX,TMXZCO010037-19-01AUG97

ASSEMBLING ANGLE DRIVE (D)

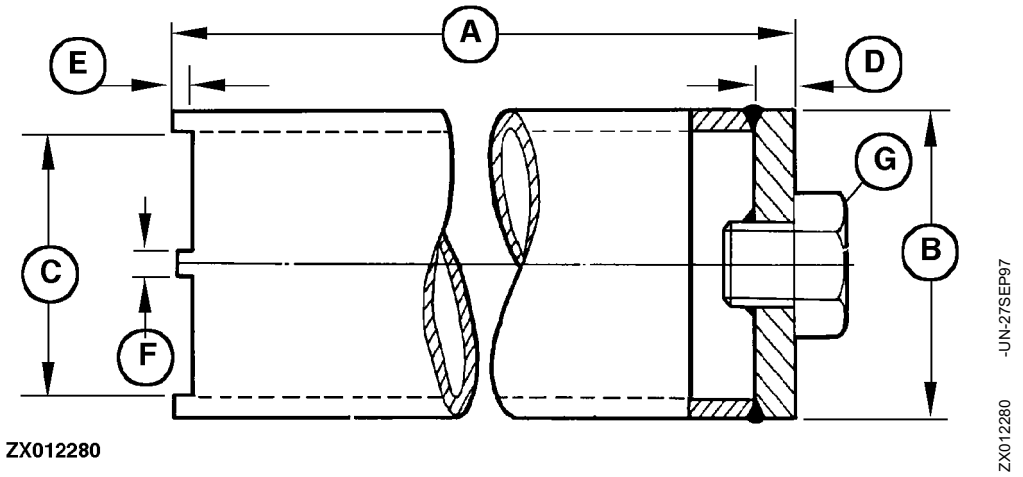


— Coat cover (A) with sealant.

— Fill housing (B) with multi-purpose grease.

ZX,TMXZCO010038-19-01AUG97

SPECIAL TOOL (SELF-MANUFACTURED)



A—70 mm (2.8 in.)
B—55 mm (2.2 in.)
C—45 mm (1.8 in.)
D—10 mm (0.4 in.)
E—7 mm (0.3 in.)
F—4 mm (0.16 in.)
G—M20x20 screw

This tool is required to tighten the slotted nut on the angle drive at the unloading tube.

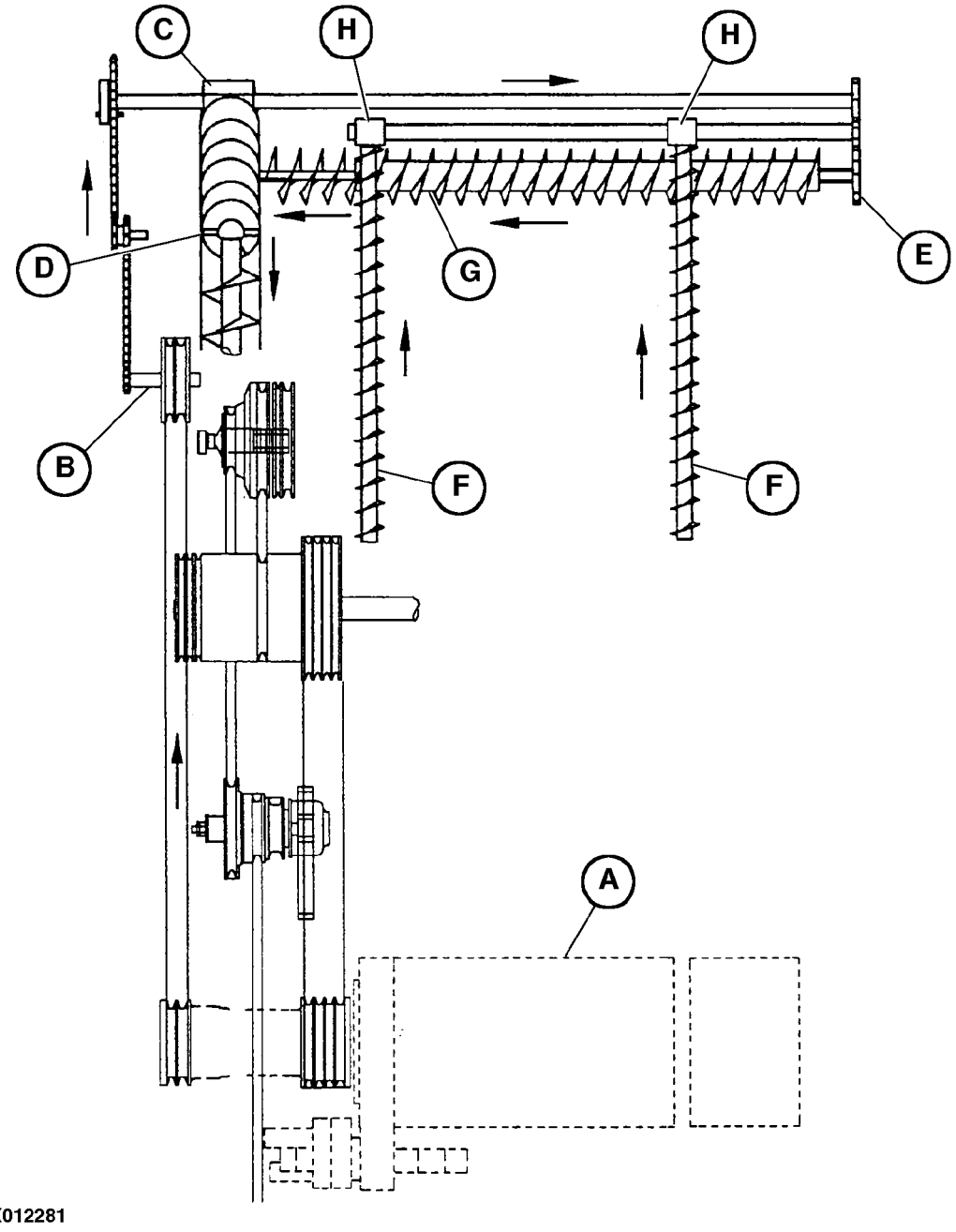
ZX,TMXZCO010049-19-01AUG97

SPECIFICATIONS

Item	Measurement	Specification
Slotted nut on angle drive	Tightening torque	150 - 250 N·m (110 - 184 lb-ft)

ZX,TMXZCO010039-19-01AUG97

DRIVES FOR UNLOADING THE GRAIN TANK

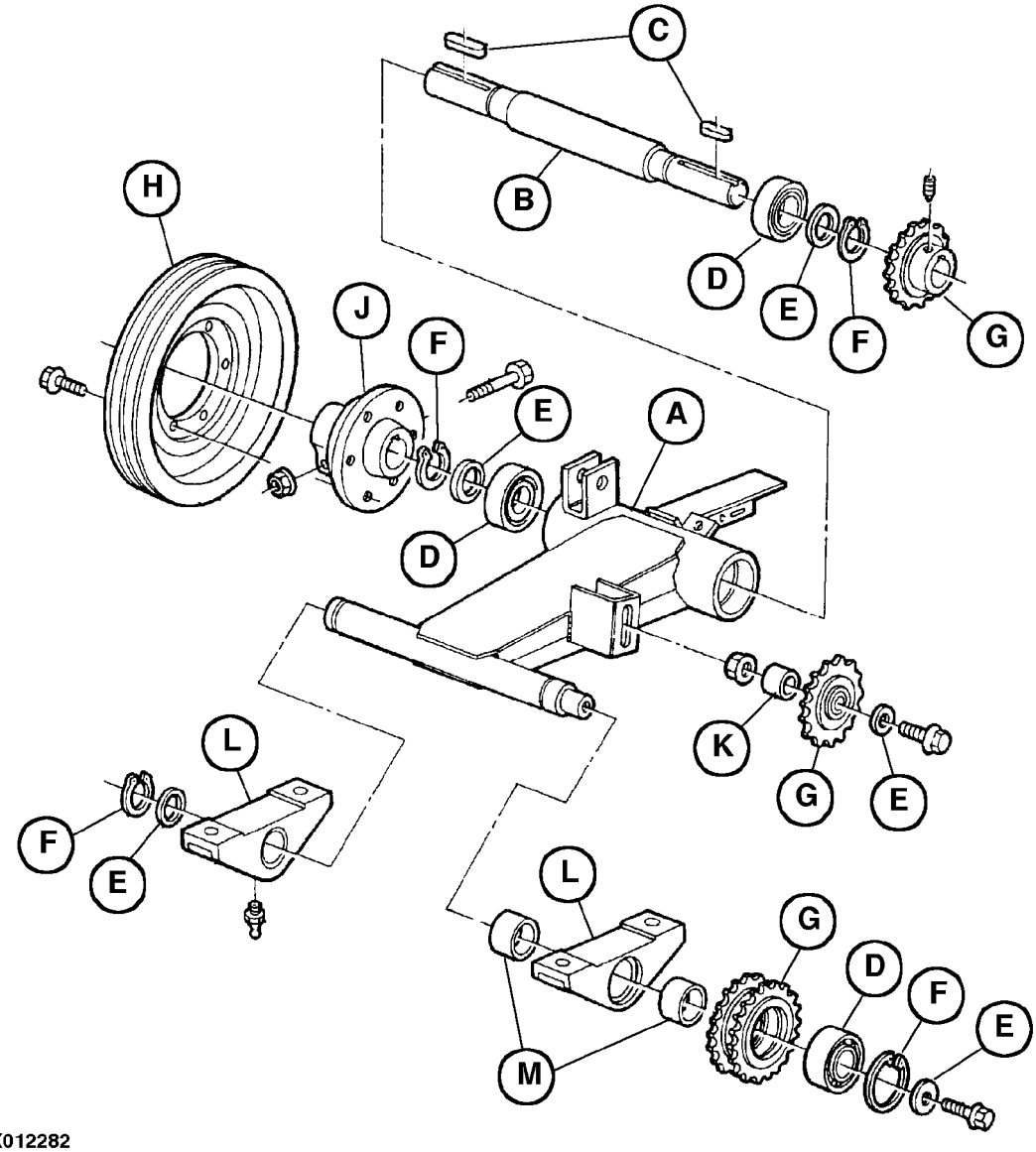


A—Engine
B—Pivoting arm drive
C—Angle drive, unloading tube drive
D—Unloading tube angle drive
E—Unloading drive, right
F—Feed augers
G—Grain tank unloading auger
H—Angle drives for feed augers

The drives for unloading the grain tank are described in detail in this Group (see below).

ZX,TMXZCO010040-19-01AUG97

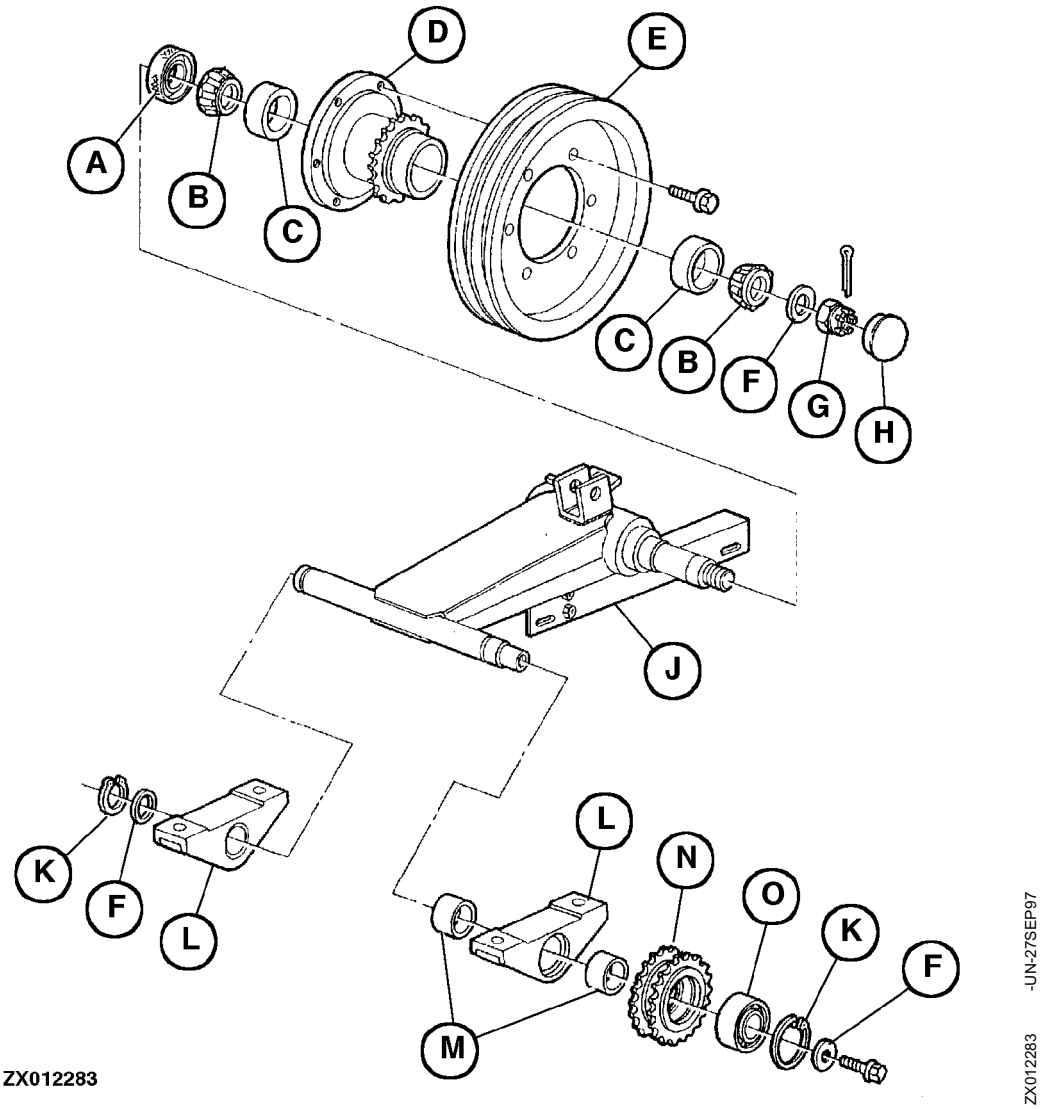
PIVOTING ARM DRIVE (5-WALKER COMBINES; B), EXPLODED VIEW



A—Pivoting arm	D—Ball bearing	G—Sprocket	K—Bushing
B—Shaft	E—Washer	H—Belt pulley	L—Retainer
C—Key	F—Snap ring	J—Clamping hub	M—Thrust bushing

ZX,TMXZCO010041-19-01AUG97

PIVOTING ARM DRIVE (6-WALKER COMBINES; B), EXPLODED VIEW



A—Seal ring	**E—Belt pulley**	**J—Pivoting arm**	**M—Thrust bushing**
B—Taper roller bearing	**F—Washer**	**K—Snap ring**	**N—Sprocket**
C—Bearing cup	**G—Slotted nut**	**L—Retainer**	**O—Ball bearing**
D—Hub	**H—Dust cap**		

— Before assembly, coat the seal ring (A) and taper roller bearing (B) with multi-purpose grease.

— Fill the cavity in hub (D) 3/4 full with multi-purpose grease.

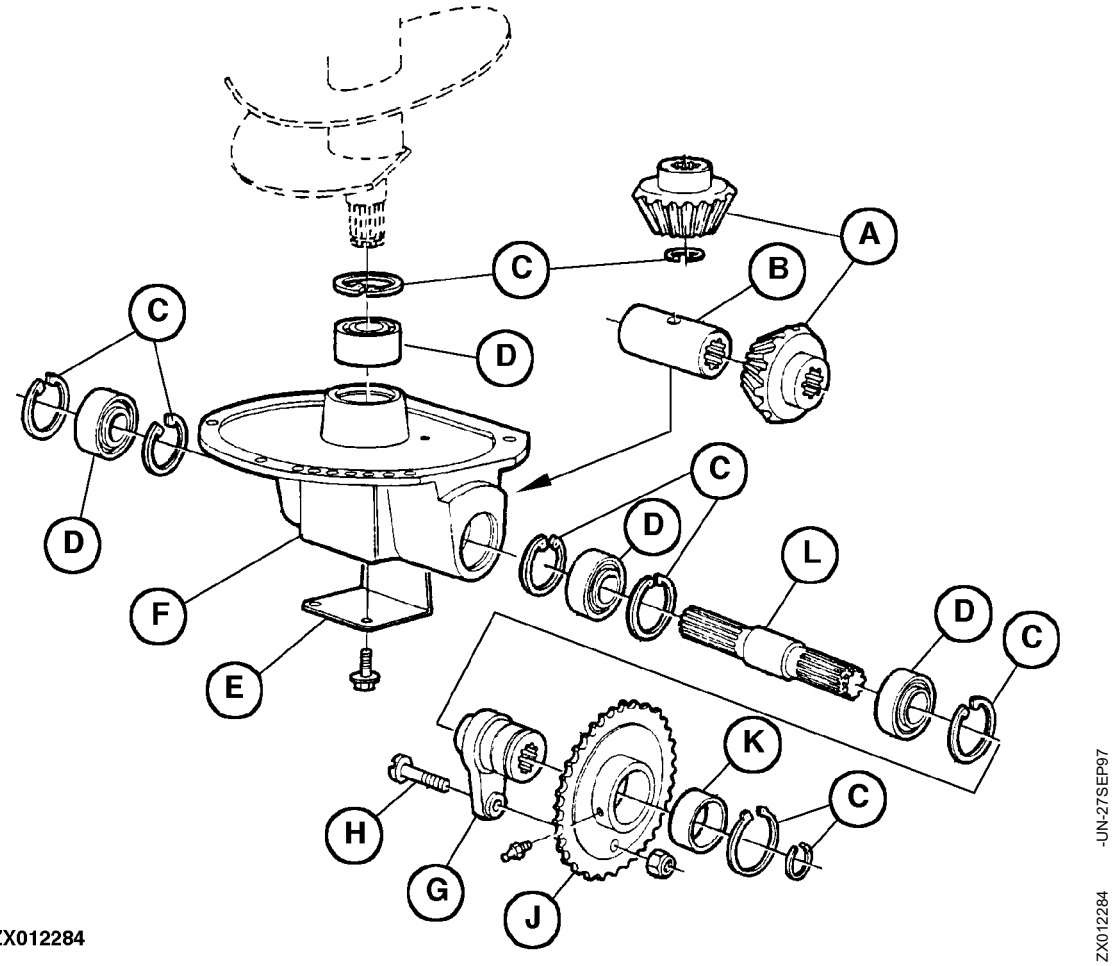
— Install hub assembly on shaft of pivoting arm.

— With the hub turning, tighten slotted nut (G) until the hub is braked, then turn the nut back by 1/16 of a turn and secure it with a cotter pin.

— Axial play should be 0.1 - 0.2 mm (0.004 - 0.008 in.).

ZX,TMXZCO010042-19-01AUG97

ANGLE DRIVE OF UNLOADING TUBE DRIVE (C)

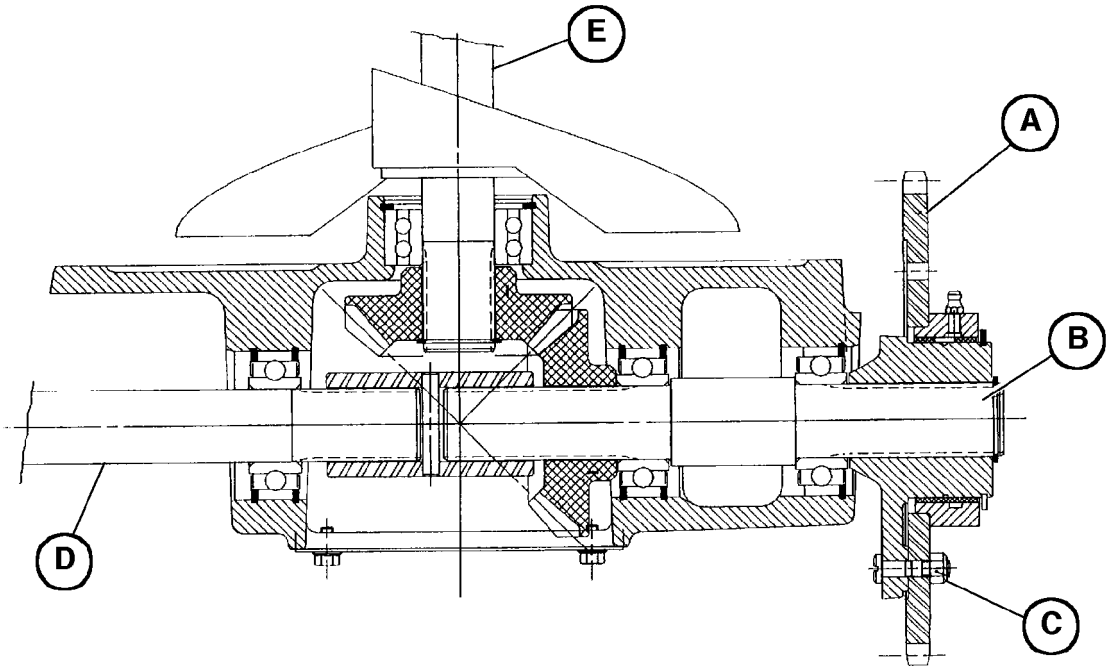


A—Bevel gears	**D—Ball bearing**	**G—Carrier**	**K—Bushing**
B—Sleeve	**E—Cover**	**H—Shear bolt**	**L—Input shaft**
C—Snap ring	**F—Housing**	**J—Sprocket**	

Install components as shown and fill cavity in housing (F) with multi-purpose grease before closing cover (E).

ZX,TMXZCO010043-19-01AUG97

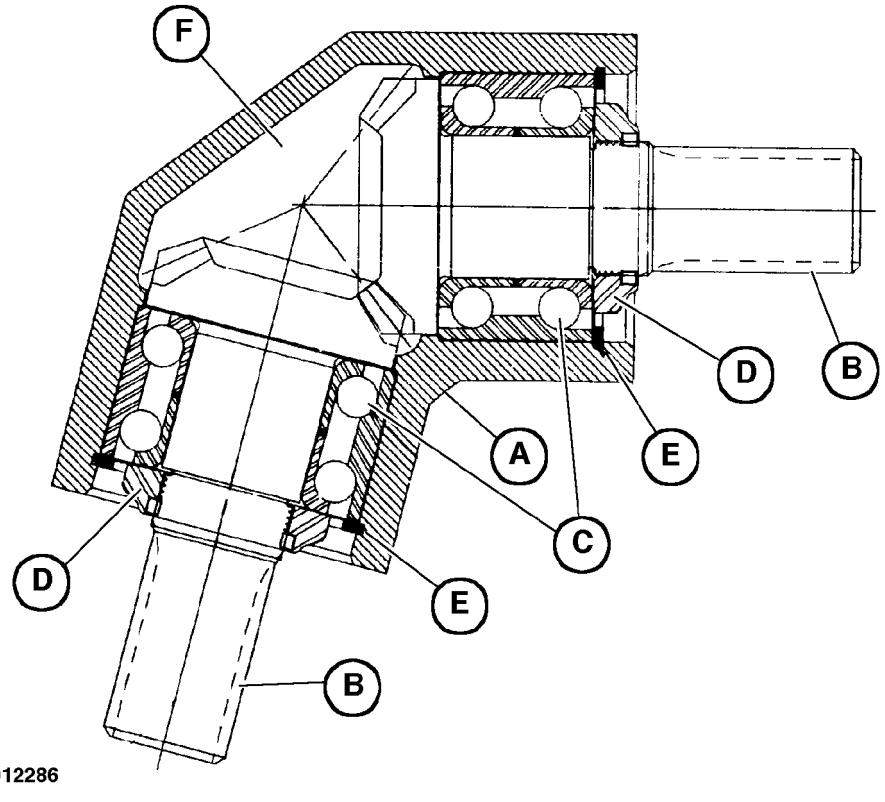
ASSEMBLING ANGLE DRIVE (C)



A—Sprocket
B—Input shaft
C—Shear bolt
D—Drive shaft to r.h. side
E—Vertical auger to unloading tube

ZX,TMXZCO010044-19-01AUG97

ASSEMBLING ANGLE DRIVE (D)



A—Housing
B—Shaft and bevel gear
C—Ball bearing
D—Slotted nut
E—Snap ring
F—Cavity in housing

— Join shafts and bevel gears (B) to ball bearings (C) and slotted nuts (D).

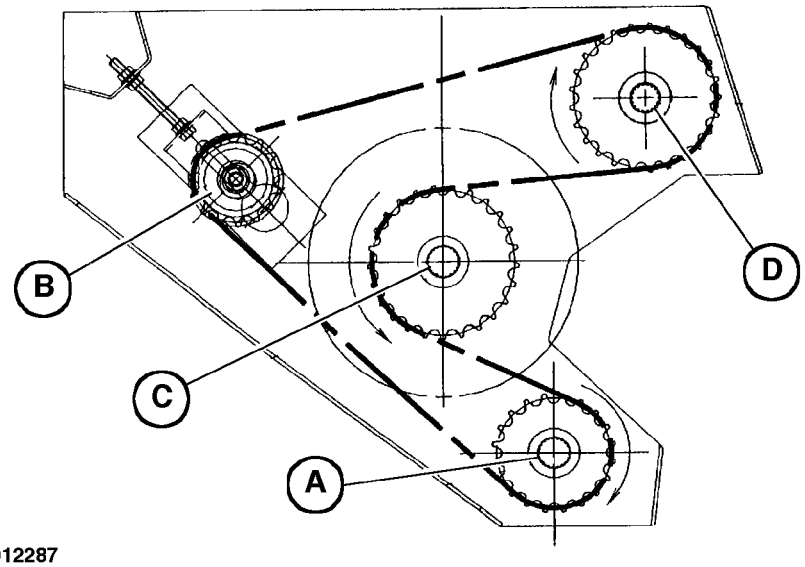
— Using the self-manufactured wrench, tighten the slotted nut to between 150 and 250 N·m (110 and 184 lb-ft).

— Fill the cavity (F) in the housing with multi-purpose grease.

— Insert the two shafts and bevel gears into housing (A) and install snap rings (E).

ZX,TMXZCO010045-19-01AUG97

GRAIN TANK UNLOADING DRIVE, RIGHT (E)



ZX012287

ZX012287 -UN-27SEP97

A—Drive shaft from angle drive (C)

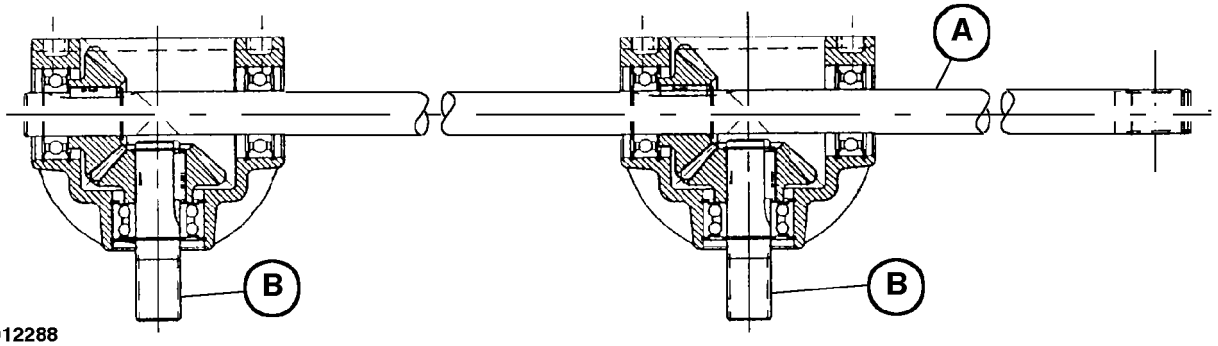
B—Tensioning sprocket

C—Drive for grain tank unloading auger

D—Drive for feed augers

ZX,TMXZCO010046-19-01AUG97

ANGLE DRIVES FOR FEED AUGERS (H)



ZX012288

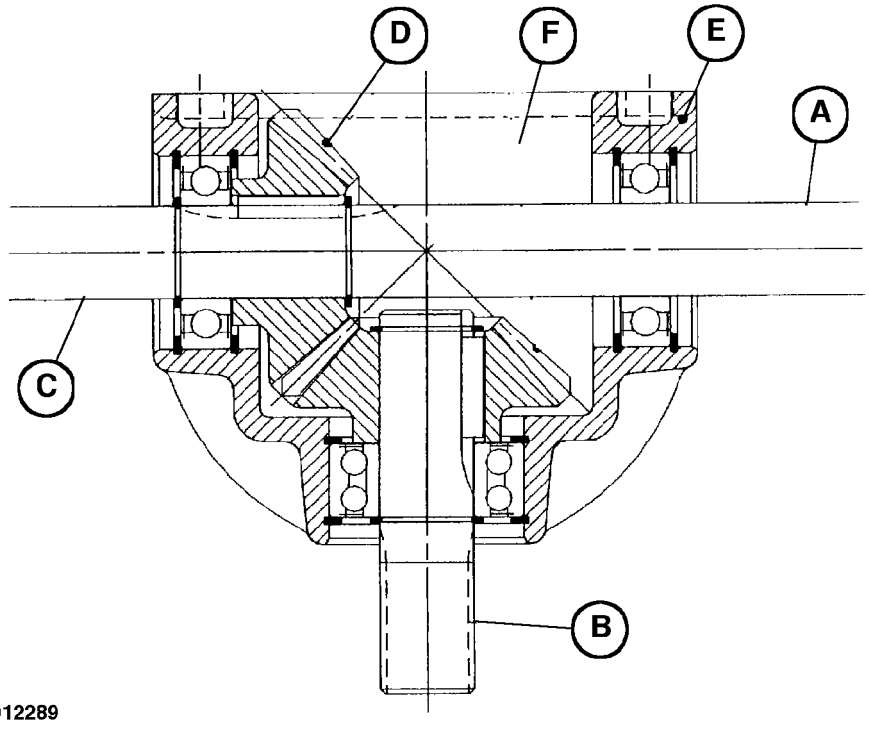
ZX012288 -UN-27SEP97

A—Drive shaft

B—Feed auger drive shaft

ZX,TMXZCO010050-19-01AUG97

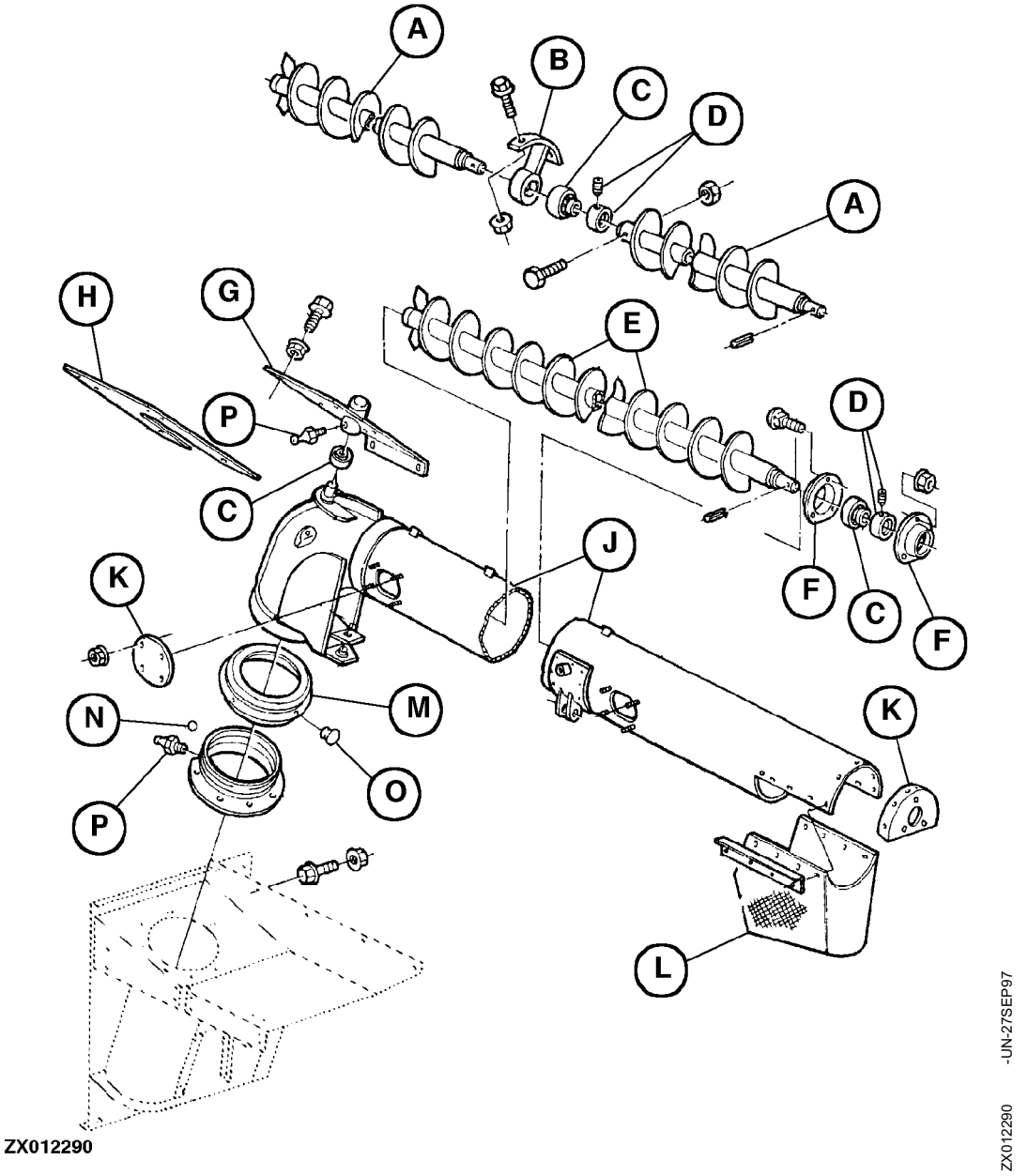
ASSEMBLING ANGLE DRIVES (H)



A—Drive shaft
B—Feed auger drive shaft
C—Drive to second angle drive
D—Bevel gears
E—Housing
F—Cavity (filled with multi-purpose grease)

ZX,TMXZCO010047-19-01AUG97

UNLOADING TUBE AND AUGER



A—Extra-long unloading auger
B—Central support
C—Ball bearing
D—Clamping ring
E—Standard unloading auger
F—Bearing flange
G—Retaing plate
H—Cover plate
J—Unloading tube
K—End-cover
L—Rubber curtain
M—Turret ring
N—Ball
O—Plug
P—Grease fitting

ZX,TMXZCO010048-19-01AUG97

Section 140
Special Equipment

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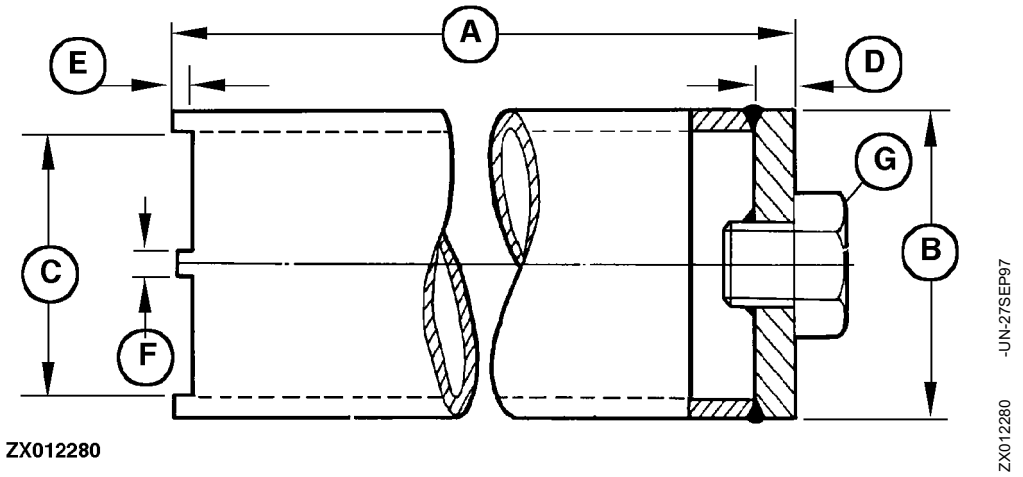
SELF-MANUFACTURED SPECIAL TOOL



A—250 mm (10 in.)
B—76 mm (3 in.)
C—65 mm (2.56 in.)
D—10 mm (0.4 in.)
E—7 mm (0.275 in.)
F—6 mm (0.236 in.)
G—M20x20 screw

For removing and installing the adapter sleeve bearing

ZX,TMXZCO010051-19-01AUG97

SPECIFICATIONS

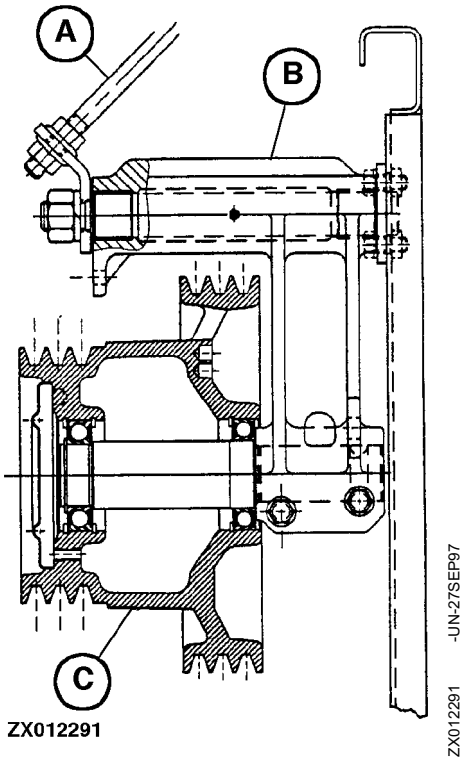
Item	Measurement	Specification
Position of r.h. ball bearing (loose bearing)	Clearance	8 mm (0.32 in.)
Slotted nut on adapter sleeve bearing	Tightening torque	140 n·m (100 lb-ft)
Screws on rotating knives	Tightening torque	65 N·m (47 lb-ft)

ZX,TMXZCO010052-19-01AUG97

DRIVE FOR STRAW CHOPPER

Align the drive at struts (A) until the drive is parallel to the side wall.

A—Strut
B—Retainer
C—Belt pulley



ZX,TMXZCO010054-19-01AUG97

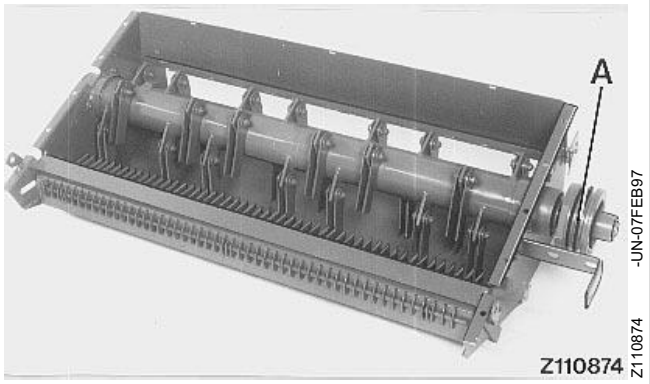
REMOVING THE ROTOR

— Remove straw chopper assembly.

— Remove drive pulley (A).

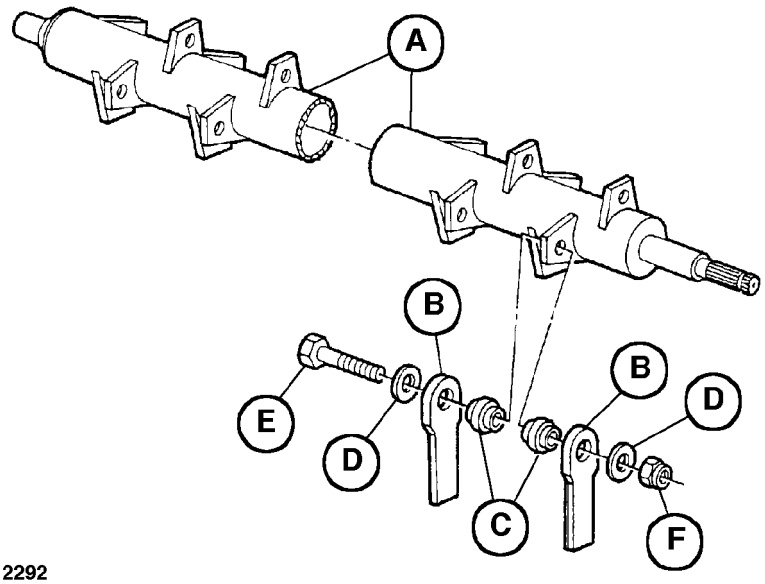
— Remove adapter sleeve bearing with bearing supports on both sides.

— Lift rotor out of chopper housing.



ZX,TMXZCO010053-19-01AUG97

CHOPPER ROTOR WITH KNIVES



ZX012292

ZX012292 -UN-27SEP97

A—Rotor
B—Knife
C—Knife guide
D—Washer
E—M10x50 screw
F—Self-locking nut

— Knives (B) must move freely within knife guide (C).

ZX,TMXZCO010055-19-01AUG97

REPLACING ROTATING KNIVES

CAUTION: Always jam the rotor to prevent accidents when replacing rotating knives.

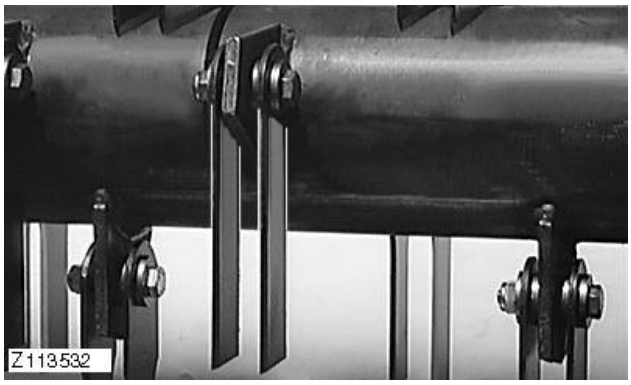
IMPORTANT: Note the following to avoid unbalancing the straw chopper:

Excessive vibration may be caused by broken knives. Remove the broken knife (together with the knife that is most nearly opposite) at once, and install replacements.

Do not resharpen knives that go dull. Instead, turn them round or replace them. This ensures that all the knives on the rotating knife shaft weigh approximately the same.

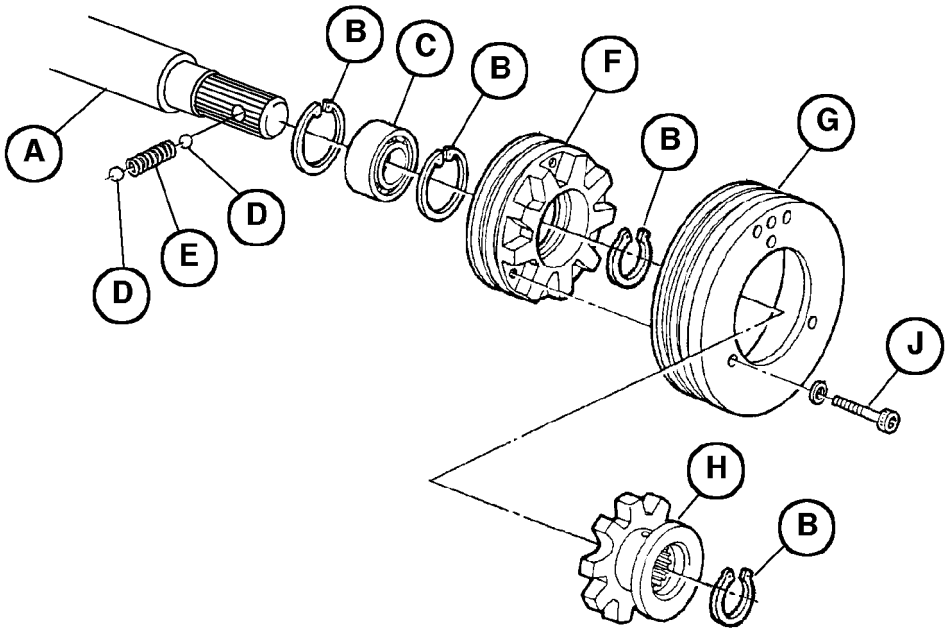
Always use M10x50 screws of 10.9 grade together with self-locking nuts. Tighten the cap screws to 65 N·m (47 lb-ft).

Install the screws from right to left (in direction of forward travel).



ZX,OMXZCO002339-19-04DEC92

ROTOR ENGAGEMENT CLUTCH



ZX012293

A—Rotor shaft
B—Snap ring
C—Ball bearing
D—Detent ball
E—Spring
F—Belt pulley for 3600 rpm
G—Flanged pulley for 2700 rpm
H—Clutch
J—M12x20 screw

CAUTION: Before switching the chopper on or off, switch off the drive and wait till all the moving parts stop moving.

ZX,TMXZCO010056-19-01AUG97

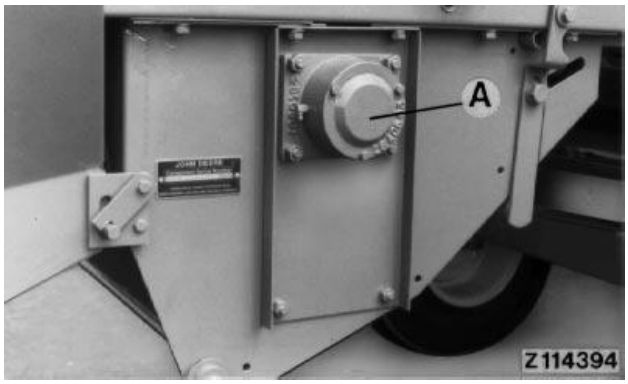
REMOVING ADAPTER SLEEVE BEARINGS

— Remove bearing cap (A).

— Unlock and loosen slotted nut.

— Loosen adapter sleeve.

— Loosen bearing support attaching screws and remove bearing support with bearing.



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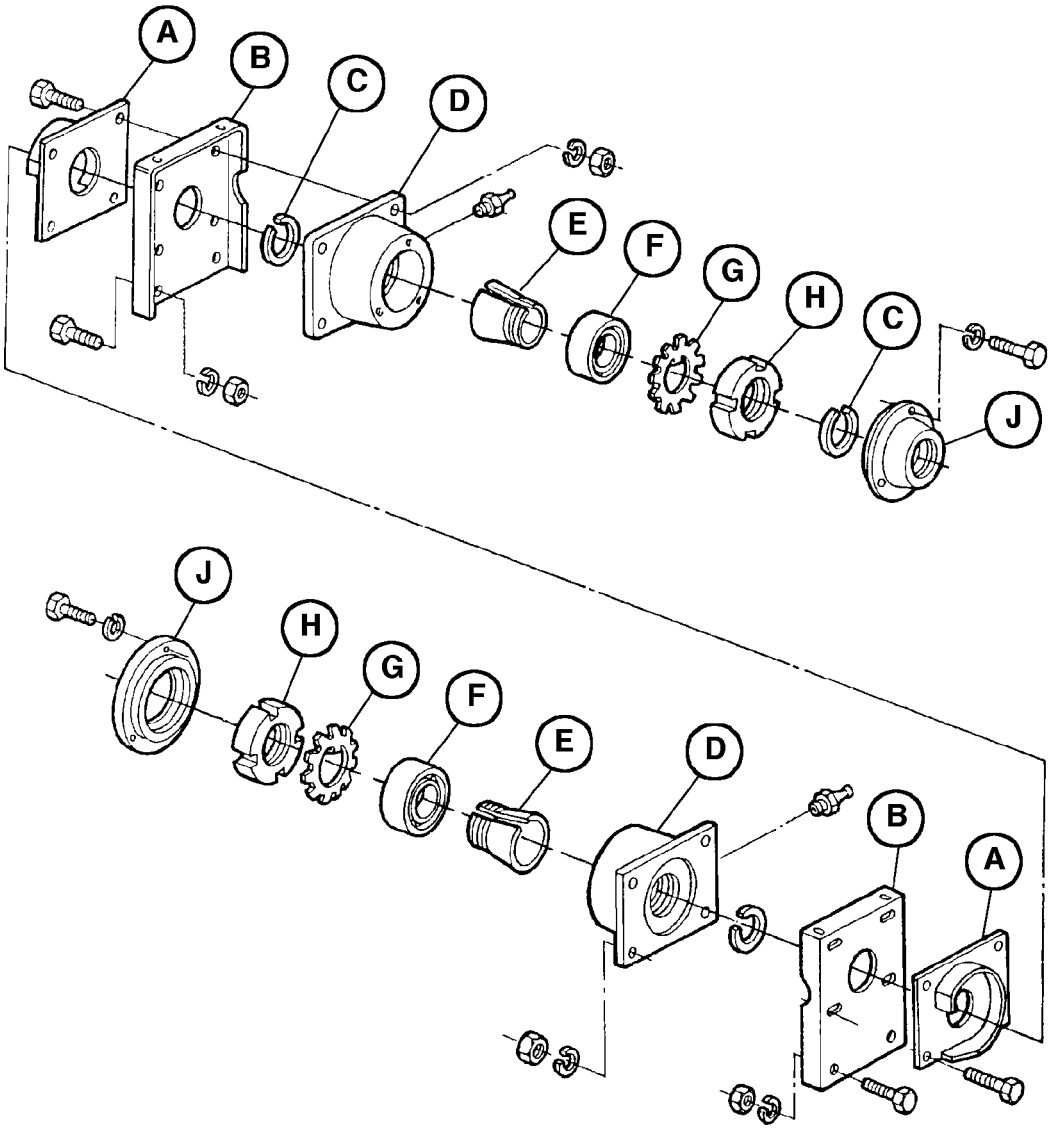
ZX,TMXZCO010057-19-01AUG97

ADAPTER SLEEVE BEARING, EXPLODED VIEW



A—Guard
B—Reinforcement
C—Felt seal
D—Bearing support
E—Clamping ring
F—Ball bearing
G—Lock washer
H—Slotted nut
J—Bearing cap

ZX,TMXZCO010058-19-01AUG97

Straw Chopper/Adapter sleeve bearing, exploded view

INSTALLING ADAPTER SLEEVE BEARINGS

Bearing on drive side (fixed bearing):

— Attach bearing support (C).

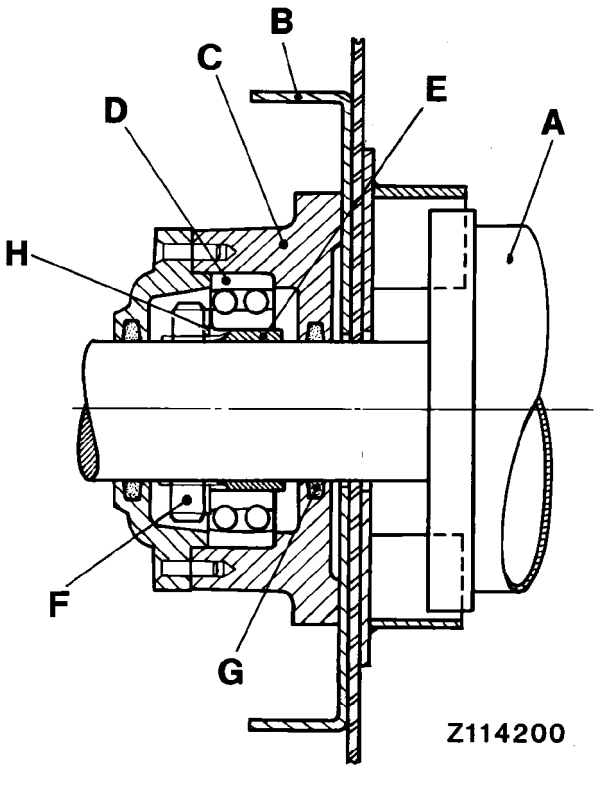
— Slide clamping ring (E) onto shaft.

— Install bearing (D) in bearing support and press against stop.

— Align rotor so that rotor knives are centered between counter-knives.

— Install slotted nut (F) on clamping ring, tighten to 140 N·m (100 lb-ft) and secure by means of lock washer (H).

A—Rotor
B—Reinforcement
C—Bearing support
D—Bearing
E—Clamping ring
F—Slotted nut
G—Felt seal
H—Lock washer



ZX,TMXZCO010059-19-01AUG97

Bearing opposite drive side (loose bearing):

— Attach bearing support (C).

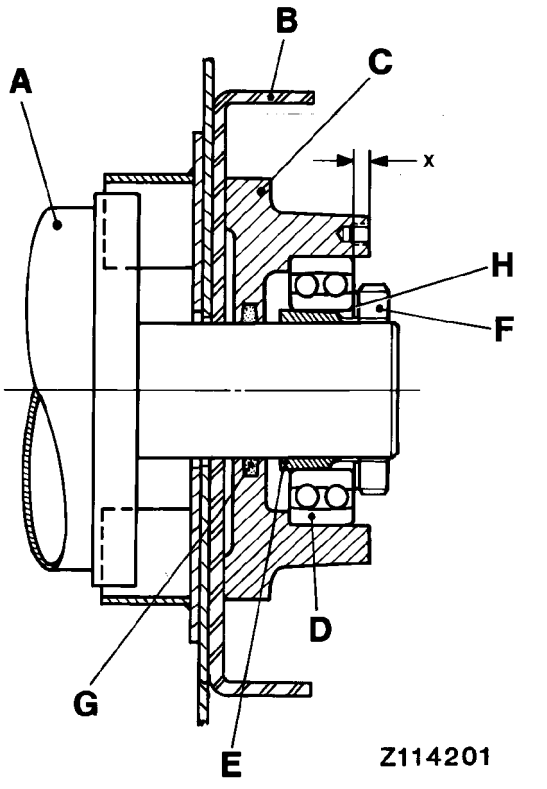
— Slide clamping ring (E) onto shaft.

— Install bearing (D) in bearing support and adjust dimension (X).

NOTE: When adjusting dimension (X), bearing on drive side must be tight.

— Install slotted nut on clamping ring, tighten to 140 N·m (100 lb-ft) and secure by means of lock washer (H).

A—Rotor
B—Reinforcement
C—Bearing support
D—Bearing
E—Clamping ring
F—Slotted nut
G—Felt seal
H—Lock washer
X—Dimension, bearing opposite drive side (8 mm; 0.32 in.)



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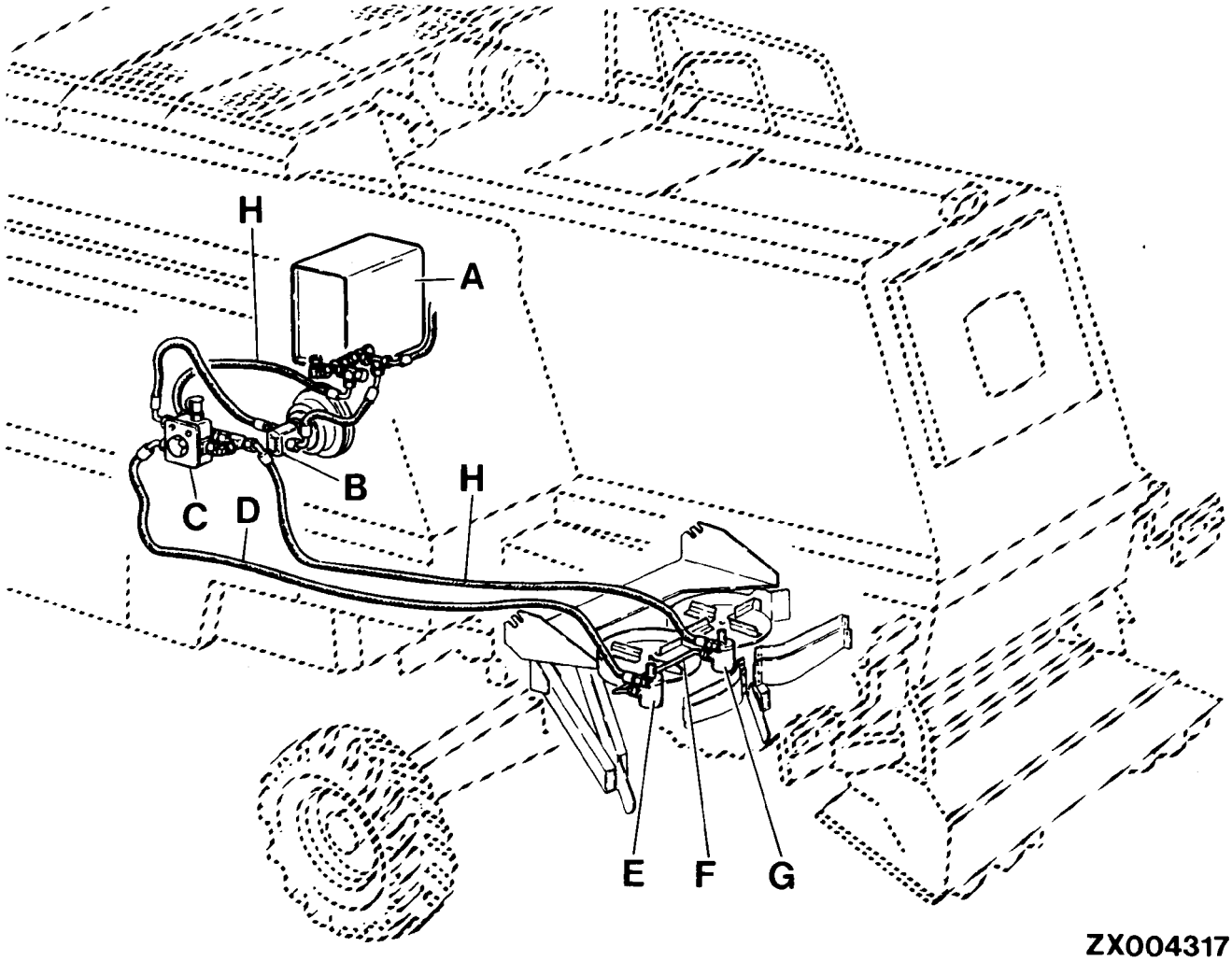
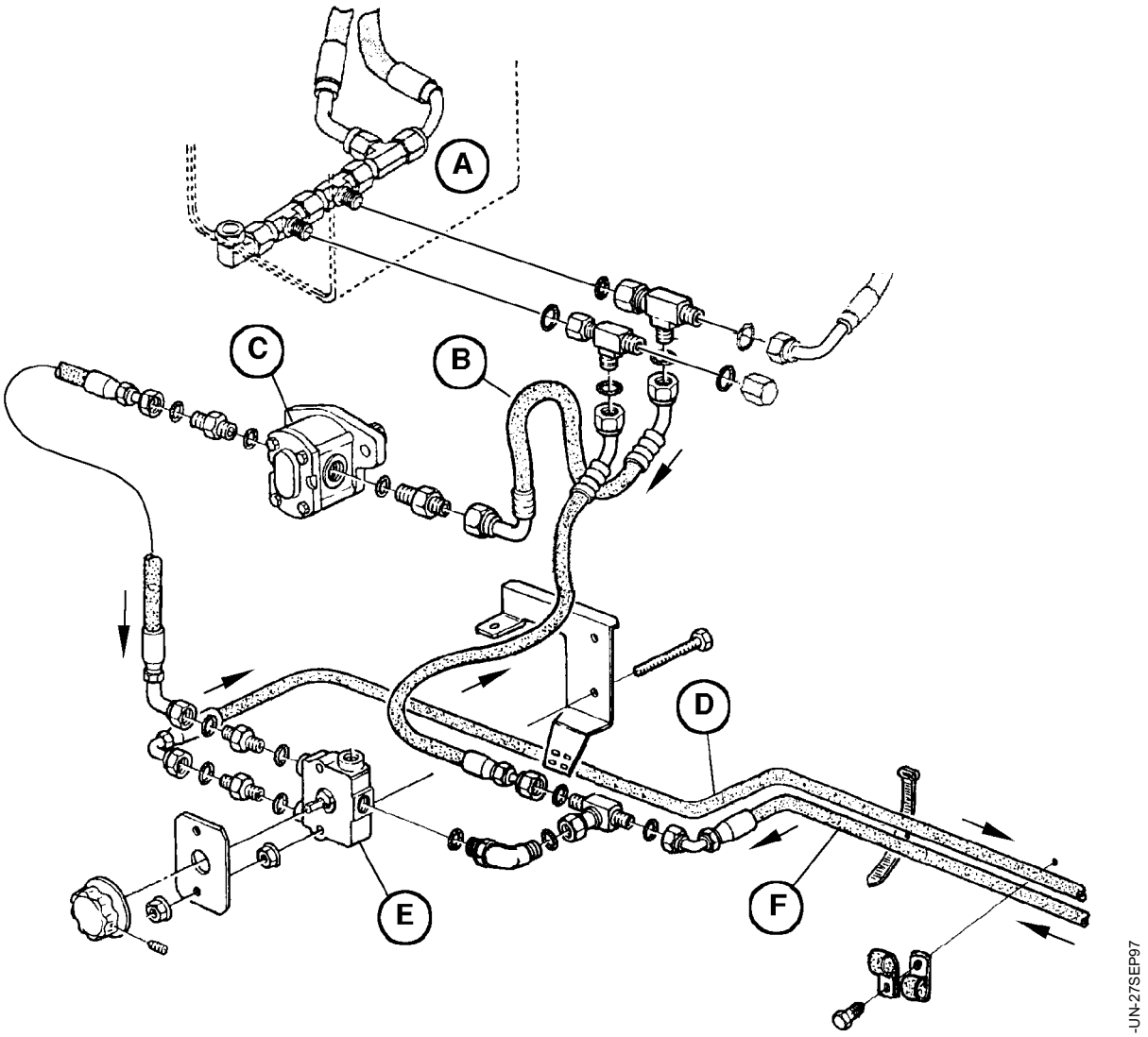
CHAFF SPREADER HYDRAULIC COMPONENTS



A—Hydraulic tank
B—Chaff spreader pump
C—Pressure regulating valve
D—Pressure hose
E—Hydraulic motor, left
F—Connecting line
G—Hydraulic motor, right
H—Return

ZX,OMXZCO002358-19-05OCT92

HYDRAULIC LINES TO CHAFF SPREADER

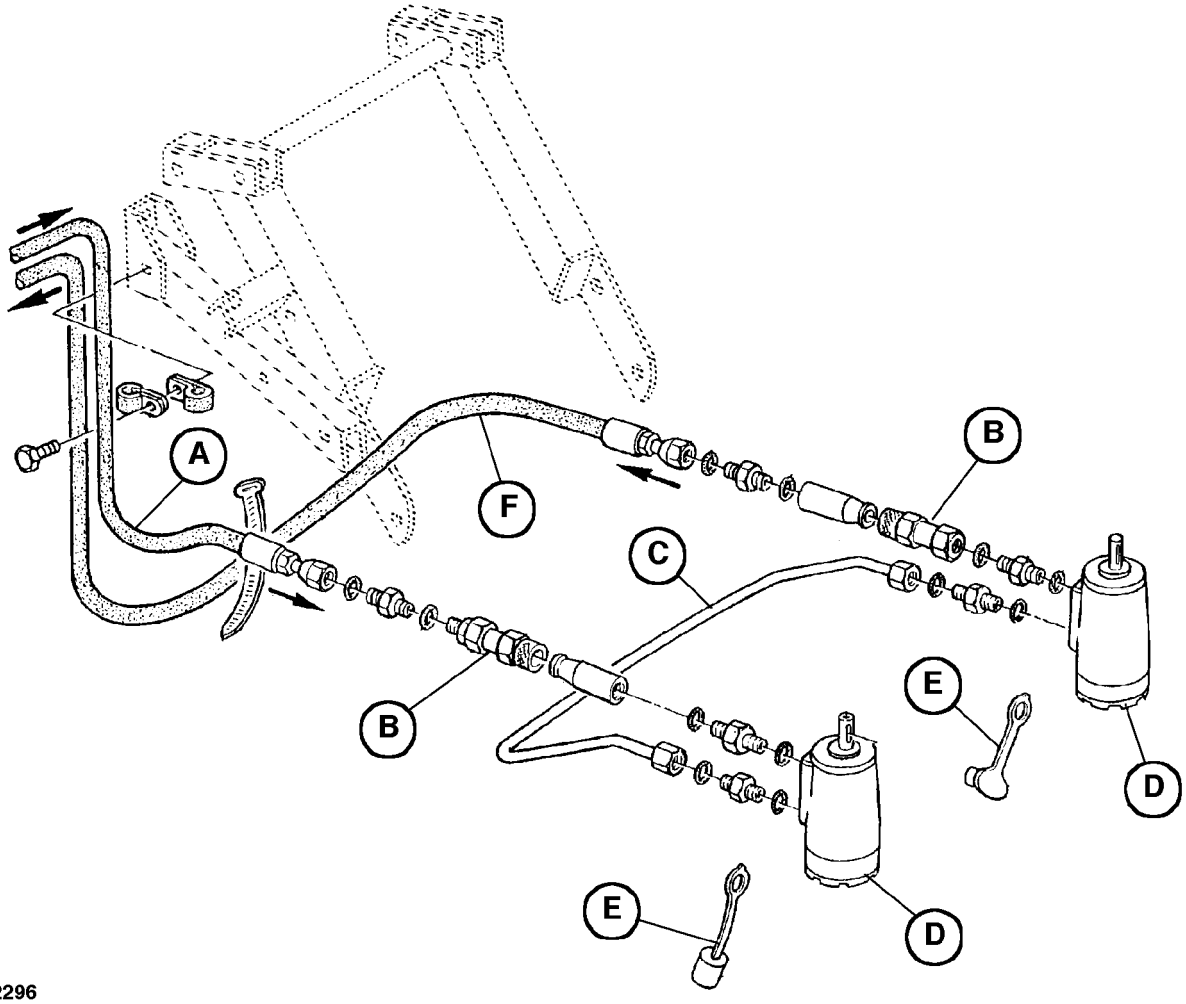


ZX012295

A—Hydraulic reservoir
B—Suction line
C—Hydraulic pump
D—Pressure line
E—Pressure regulating valve
F—Return line

ZX,TMXZCO010061-19-01AUG97

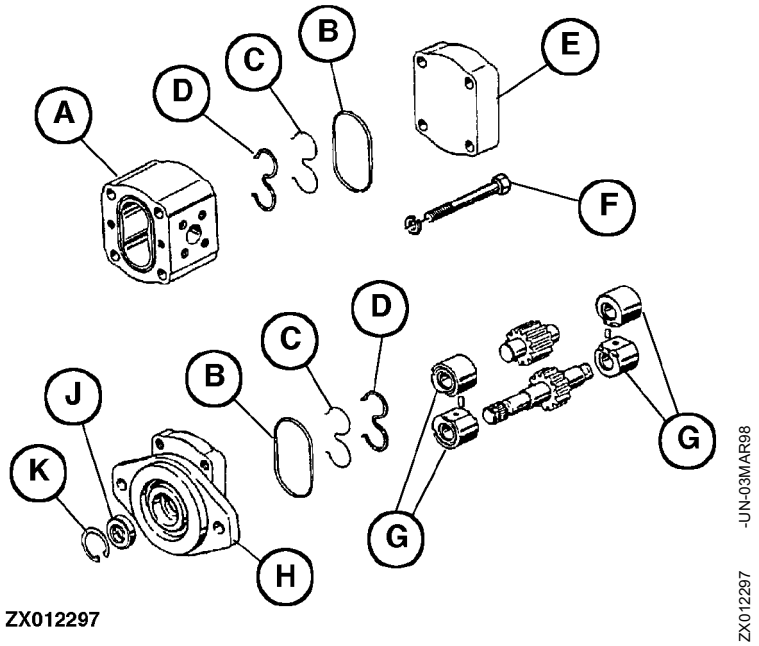
HYDRAULIC LINES TO HYDRAULIC MOTORS



A—Pressure line
B—Coupler
C—Connecting line
D—Hydraulic motor
E—Dust cap
F—Return line

ZX,TMXZCO010062-19-01AUG97

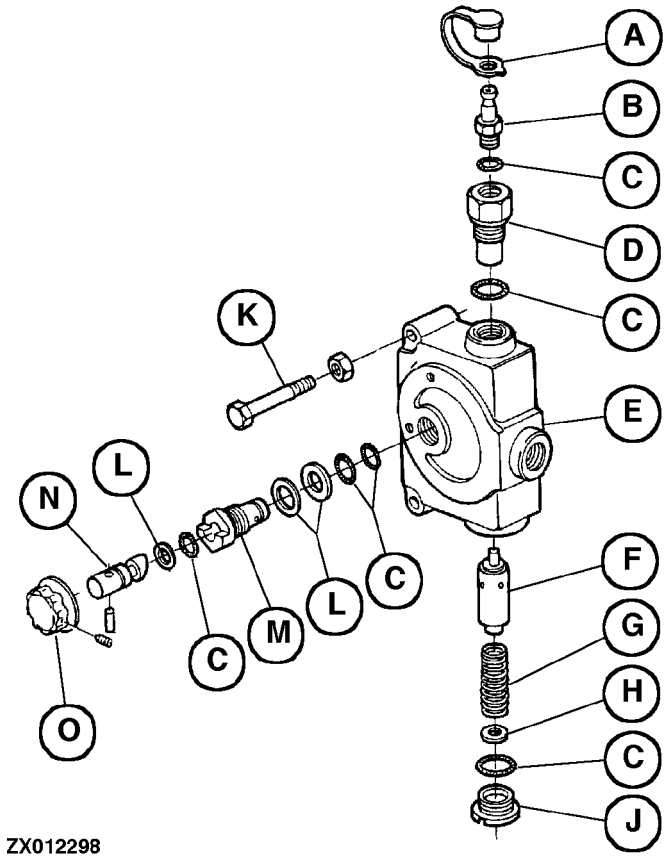
HYDRAULIC PUMP FOR CHAFF SPREADER



A—Housing
B—Seal ring
C—Back-up ring
D—Seal ring
E—Cover
F—Screw
G—Bushing
H—Endplate
J—Gasket
K—Snap ring

ZX,TMXZCO010063-19-01AUG97

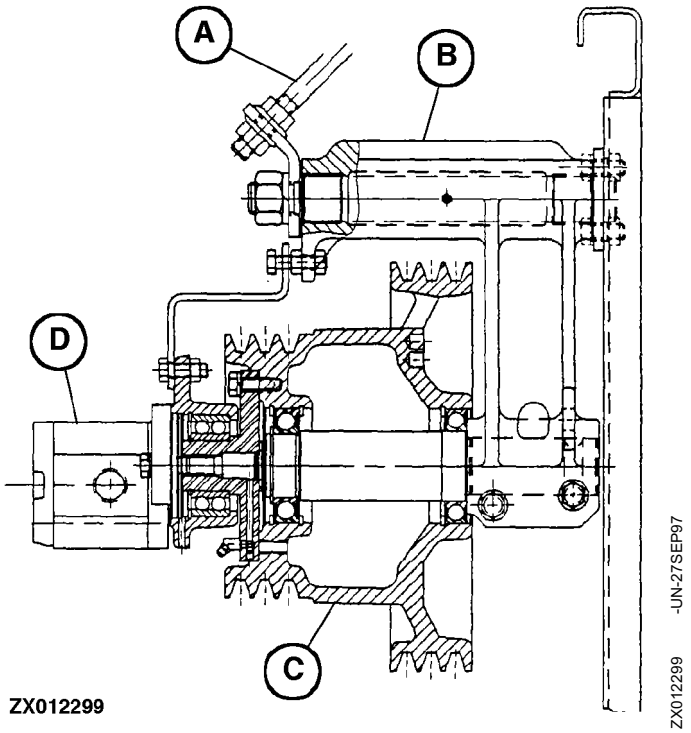
CHAFF SPREADER SPEED CONTROLLER



A—Dust cap
B—Coupler
C—O-ring
D—Screw union
E—Pressure regulating valve
F—Pressure relief valve
G—Spring
H—Shim for regulating pressure
J—Screw plug
K—Screw
L—Washer
M—Valve spool
N—Controller
O—Hand-wheel

ZX,TMXZCO010064-19-01AUG97

DRIVE WITH PUMP FOR CHAFF SPREADER



A—Strut **B—Retainer** **C—Belt pulley** **D—Hydraulic pump**

Align the drive at struts (A) until the drive is parallel to the side wall.

ZX,TMXZCO010065-19-01AUG97

REMOVING THE CHAFF SPREADER

Hydraulic Connections

To disconnect the quick-couplers, pull the collar ring at pressure hose (A) to the rear, and pull the collar ring on return hose (B) to the front.

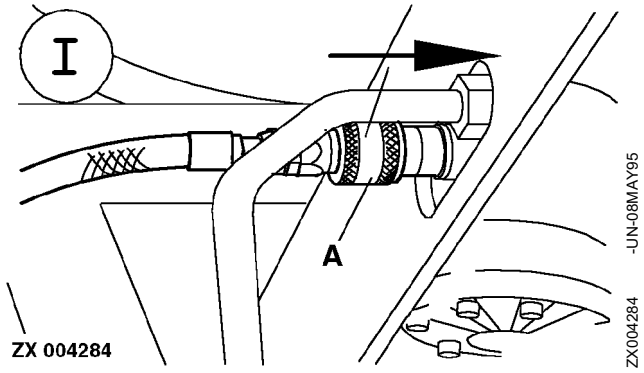
Insert the two ends of the hydraulic hoses together. This makes the chaff spreader inoperative. Secure the hydraulic hoses so that they cannot be damaged during operation.

Use the protective caps to prevent dirt from getting into the openings in the chaff spreader.

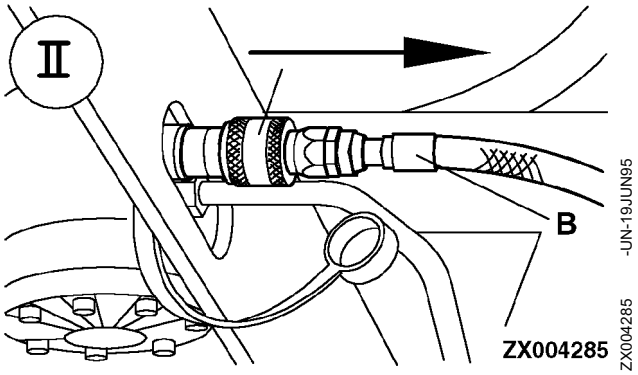
Electrical Plug Connection

If the combine harvester has both a straw chopper and a chaff spreader installed at the same time, and the chaff spreader is to be removed, bridging plug (D) must be inserted at connecting point (C).

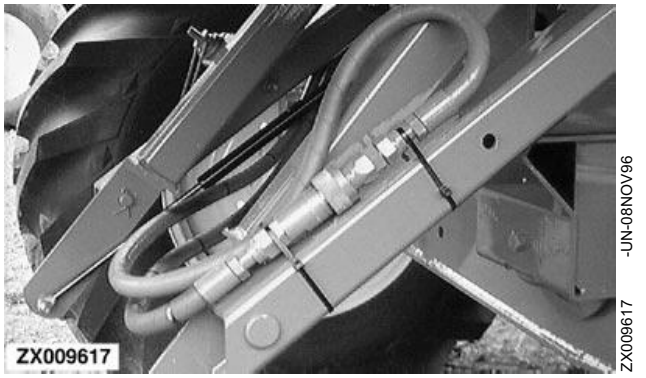
I—Pressure connection
II—Return connection
III—Electrical plug connection
A—Pressure hose
B—Return hose
C—Connecting point
D—Bridging plug

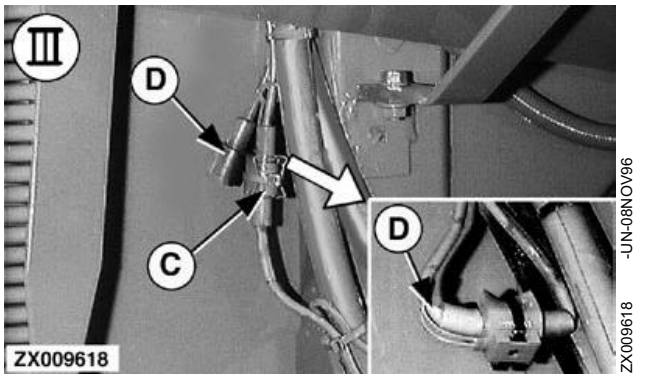


Pressure connection



Return connection





ZX,OMXZCO002178-19-01NOV96

Section 210
General

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SPEEDS OF ROTATION, 2254, 2256, 2258, 2264 AND 2266 STANDARD AND HILLMASTER COMBINES

Speeds shown are average and can vary from machine to machine. Speeds are rated at high idle with separator engaged, and no load.

ENGINE

Slow idle . . . . . 1250 ± 50 rpm
Fast idle . . . . . 2350 + 50 rpm
Rated speed . . . . . 2200 rpm

HYDROSTATIC DRIVE

Hydrostatic pump speed . . . . . 3385 rpm

SEPARATOR

Main countershaft speed . . . . . 1220 rpm
Primary cylinder speed range
— without reduction gear . . . . . 370—1110 rpm
— with reduction gear
  • disengaged . . . . . 370—1110 rpm
  • engaged . . . . . 150—440 rpm
Secondary cylinder speed . . . . . 910 rpm
Variable secondary cylinder speed . . . . . 370—1110 rpm

FEEDER HOUSE LOWER SHAFT

Fixed speed . . . . . 520 rpm
Variable speed . . . . . 520—820 rpm

STRAW WALKERS

Standard . . . . . 160 rpm
Optional . . . . . 170 rpm

CROSS-SHAKER DRIVE SHAFT

Speed . . . . . 380 rpm

CLEANING TURBO FAN

Speed range . . . . . 750—1500 rpm

CHOPPER SPEED

For grain . . . . . 3615 rpm
For corn (maize) . . . . . 2720 rpm

ZX,TMXZCO010066-19-01AUG97

SPECIFICATIONS, 2254, 2256 AND 2258 (STANDARD AND HILLMASTER, WITH FIVE STRAW WALKERS)

FEEDER HOUSE

Conveyor chains	3
Slats	bolted T-slats
Fixed speed (engine rated speed)	490 rpm
Variable speed (engine rated speed)	490—770 rpm
Header reverser	mechanical
Pivoting feeder house front shield on	
2254, 2256 and 2258 (standard)	optional
2254, 2256 and 2258 Hillmasters	standard

SEPARATOR

Primary Cylinder and Concave

Cylinder diameter	660 mm (26 in.)
Cylinder width	1400 mm (55 in.)
No. of rasp bars	10
Cylinder speed (engine rated speed)	345—1040 rpm
Speed with reduction gear	140—1040 rpm
Circumferential velocity	4.8—35.9 m/sec. (15.7—117.8 fps)
Cylinder speed adjustment	hydraulic
Drive type	POSI-TORQ™

Concave

No. of concave bars (grain crops / maize)	12 / 13
Concave width	1400 mm (55 in.)
Concave length	680 mm (26.8 in.)
Concave wrap	121˚
Concave area	0.9 m^2 (9.7 sq ft)
Concave adjustment	electric motor
No. of de-awning plates	
Grain-crop concave	3
Universal concave	4

Secondary Cylinder and Concave

Cylinder diameter	400 mm (15.7 in.)
Cylinder width	1400 mm (55 in.)
No. of cylinder wings	8
Fixed cylinder speed (engine rated speed)	850 rpm
Variable cylinder speed (optional)	100% of primary cylinder speed
Concave area	0.53 m^2 (5.70 sq ft)

ZX,TMXZCO010067-19-05MAR98

SPECIFICATIONS, 2254, 2256 AND 2258 (STANDARD AND HILLMASTER, WITH FIVE STRAW WALKERS) (CONTINUED)

Stone Trap

Actuation	2 levers

Grain Pan

No. of removable sections	7

STRAW WALKERS

No. of walkers	5
No. of walker steps	
with cross-shaker	4
without cross-shaker	5
Walker length	4600 mm (181 in.)
Walker throw	150 mm (5.9 in.)
Walker speed (engine rated speed)	150 rpm
Walker area	6.4 m^2 (68.9 sq ft)
Walker area with cross-shaker	8.13 m^2 (87.50 sq ft)
Open-type walkers	yes

CROSS-SHAKER

No. of rotating units	5
No. of spring tines	40
Lateral tine kicks	720 per min.
Rotating speed (engine rated speed)	17 rpm

CLEANING SYSTEM

Chaffer area including extension	2.76 m^2 (29.70 sq ft)
Grain sieve area	2.08 m^2 (22.40 sq ft)
Total cleaning area	4.84 m^2 (52.10 sq ft)
Sieve type	adjustable louver type
Shoe movement	reciprocating
Dual-flow cleaning	pre-cleaning
Slope Master system	standard

CLEANING TURBO FAN

Type of fan	turbo, 4 rotors
Fan speed range	750—1500 rpm
Fan speed adjustment	electrical, from the cab

ZX,TMXZCO010068-19-01AUG97

SPECIFICATIONS, 2254, 2256 AND 2258 (STANDARD AND HILLMASTER, WITH FIVE STRAW WALKERS) (CONTINUED)

GRAIN TANK

Capacity	
2254 (standard)	6000 L (170 bu)
2254 Hillmaster	6000 L (170 bu)
2256 (standard)	6500 L (185 bu)
2256 Hillmaster	6500 L (185 bu)
2258 (standard)	7000 L (198 bu)
2258 Hillmaster	7000 L (198 bu)
Unloading auger swing range	110°
Unloading height, spout	320 cm (126 in.)
Unloading rate	4300 L/min. (122 bu/min.)

ZX,TMXZCO010069-19-05MAR98

SPECIFICATIONS, 2254, 2256 AND 2258 (STANDARD AND HILLMASTER, WITH FIVE STRAW WALKERS) (CONTINUED)

FUEL TANK

Capacity	450 L (119 U.S. gal)

GROUND DRIVE

Transmission type	three-speed
Foot brake type	305 mm (12 in.) dia., hydraulically operated shoe type
Parking brake	pedal-operated, two brake circuits
Rear axle	rigid or adjustable, with or without rear-wheel drive

SLOPE MASTER SYSTEM

Automatic self-leveling to 11% on 2254 Hillmaster, 2256 Hillmaster and 2258 Hillmaster	standard

GROUND TRAVEL SPEEDS

20 km/h (12.5 mph) version:	
1st gear	6 km/h (3.7 mph)
2nd gear	10 km/h (6.3 mph)
3rd gear	20 km/h (12.5 mph)
25 km/h (15.5 mph) version:	
1st gear	7.5 km/h (4.7 mph)
2nd gear	12.5 km/h (7.8 mph)
3rd gear	25 km/h (15.5 mph)

ZX,TMXZCO010070-19-05MAR98

SPECIFICATIONS, 2254, 2256 AND 2258 (STANDARD AND HILLMASTER, WITH FIVE STRAW WALKERS) (CONTINUED)

ELECTRICAL SYSTEM

Alternator . . . . . 120 A / 12 V
Batteries . . . . . 2, each 12 V, 88 AH, 395 A

STEERING

Type . . . . . hydrostatic
Steering column . . . . . height and tilt adjustment

SOUND LEVEL

Max. sound level at operator's ear in accordance with Directive 86/188/EEC. Meaurement method in accordance with ISO5131 with cab closed (average value)
2254 (standard and Hillmaster) . . . . . 76 dB(A)
2256 (standard and Hillmaster) . . . . . 76 dB(A)
2258 (standard and Hillmaster) . . . . . 79 dB(A)

ZX,TMXZCO010071-19-05MAR98

SPECIFICATIONS, 2264 AND 2266 (STANDARD AND HILLMASTER, WITH SIX STRAW WALKERS)

FEEDER HOUSE

Conveyor chains	3/4
Slats	bolted T-slats
Fixed speed (engine rated speed)	490 rpm
Variable speed (engine rated speed)	490 / 770 rpm
Header reverser	mechanical
Pivoting feeder house front shield on	
2264 and 2266 (standard)	optional
2264 and 2266 Hillmasters	standard

SEPARATOR

Primary Cylinder and Concave

Cylinder diameter	660 mm (26 in.)
Cylinder width	1670 mm (65.7 in.)
No. of rasp bars	10
Cylinder speed (engine rated speed)	345—1040 rpm
Speed with reduction gear	140—1040 rpm
Circumferential velocity	4.8—35.9 m/sec. (15.7—117.8 fps)
Cylinder speed adjustment	hydraulic
Drive type	POSI-TORQ™

Concave

No. of concave bars (grain crops / maize)	12 / 13
Concave width	1670 mm (65.7 in.)
Concave length	680 mm (26.8 in.)
Concave wrap	121˚
Concave area	1.08 m^2 (11.60 sq ft)
Concave adjustment	electric motor
No. of de-awning plates	
Grain-crop concave	3
Universal concave	4

Secondary Cylinder and Concave

Cylinder diameter	400 mm (15.7 in.)
Cylinder width	1670 mm (65.7 in.)
No. of cylinder wings	8
Fixed cylinder speed (engine rated speed)	850 rpm
Variable cylinder speed (optional)	100% of primary cylinder speed
Concave area	0.63 m^2 (6.80 sq ft)

ZX,TMXZCO010072-19-05MAR98

SPECIFICATIONS, 2264 AND 2266 (STANDARD AND HILLMASTER, WITH SIX STRAW WALKERS) (CONTINUED)

Stone Trap

Actuation	2 levers

Grain Pan

No. of removable sections	8

STRAW WALKERS

No. of walkers	6
No. of walker steps	
with cross-shaker	4
without cross-shaker	5
Walker length	4600 mm (181 in.)
Walker throw	150 mm (5.9 in.)
Walker speed (engine rated speed)	150 rpm
Walker area	7,67 m^2 (82.60 sq ft)
Walker are with cross-shaker	8,13 m^2 (87.50 sq ft)
Open-type walkers	yes

CROSS-SHAKER

No. of rotating units	6
No. of spring tines	48
Lateral tine kicks	720 per min.
Rotating speed (engine rated speed)	17 rpm

CLEANING SYSTEM

Chaffer area including extension	3,32 m^2 (35.70 sq ft)
Grain sieve area	2,51 m^2 (27.00 sq ft)
Total cleaning area	5,83 m^2 (62.70 sq ft)
Sieve type	adjustable louver type
Shoe movement	reciprocating
Dual-flow cleaning	pre-cleaning
Slope Master system	standard

CLEANING TURBO FAN

Type of fan	turbo, 5 rotors
Fan speed range	750—1500 rpm
Fan speed adjustment	electrical, from the cab

ZX,TMXZCO010073-19-05MAR98

SPECIFICATIONS, 2264 AND 2266 (STANDARD AND HILLMASTER, WITH SIX STRAW WALKERS) (CONTINUED)

GRAIN TANK

Capacity	
2264 (standard)	7000 L (198 bu)
2264 Hillmaster	7000 L (198 bu)
2266 (standard)	7500 L (212 bu)
2266 Hillmaster	7000 L (198 bu)
Unloading auger swing range	110˚
Unloading height, spout	320 cm (126 in.)
Unloading rate	4300 L/min. (122 bu/min.)

ZX,TMXZCO010074-19-05MAR98

SPECIFICATIONS, 2264 AND 2266 (STANDARD AND HILLMASTER, WITH SIX STRAW WALKERS) (CONTINUED)

FUEL TANK

Capacity	
2264 (standard and Hillmaster)	450 L (119 U.S. gal)
2266 (standard and Hillmaster)	550 L (145.3 U.S. gal)

GROUND DRIVE

Transmission type	three-speed
Foot brake type	305 mm (12 in.) dia., hydraulically operated shoe type
Parking brake	pedal-operated, two brake circuits
Rear axle	rigid or adjustable, with or without rear wheel drive

SLOPE MASTER SYSTEM

Automatic self-leveling to 11% on	
2264 Hillmaster and 2266 Hillmaster	standard

GROUND TRAVEL SPEEDS

20 km/h (12.5 mph) version:	
1st gear	6 km/h (3.7 mph)
2nd gear	10 km/h (6.3 mph)
3rd gear	20 km/h (12.5 mph)
25 km/h (15.5 mph) version:	
1st gear	7.5 km/h (4.7 mph)
2nd gear	12.5 km/h (7.8 mph)
3rd gear	25 km/h (15.5 mph)

ZX,TMXZCO010075-19-05MAR98

SPECIFICATIONS, 2264 AND 2266 (STANDARD AND HILLMASTER, WITH SIX STRAW WALKERS) (CONTINUED)

ELECTRICAL SYSTEM

Alternator . . . . . 120 A / 12 V
Batteries . . . . . 2, each 12 V, 88 AH, 395 A

STEERING

Type . . . . . hydrostatic
Steering column . . . . . height and tilt adjustment

SOUND LEVEL

Max. sound level at operator's ear in accordance with Directive 86/188/EEC. Measurement method in accordance with ISO5131 with cab closed (average value)
2264 (standard and Hillmaster) . . . . . 77 dB(A)
2266 (standard and Hillmaster) . . . . . 79 dB(A)

ZX,TMXZCO010076-19-05MAR98

PERMISSIBLE TOTAL WEIGHT

The maximum permissible total weight for all 2200 Series combine harvesters is 14500 kg (31967 lb.)

ZX,OMXZCO006499-19-01NOV96

VIBRATIONS AT OPERATOR'S POSITION

Measured according to Directive VDI 2057,
page 4.2, May 1987

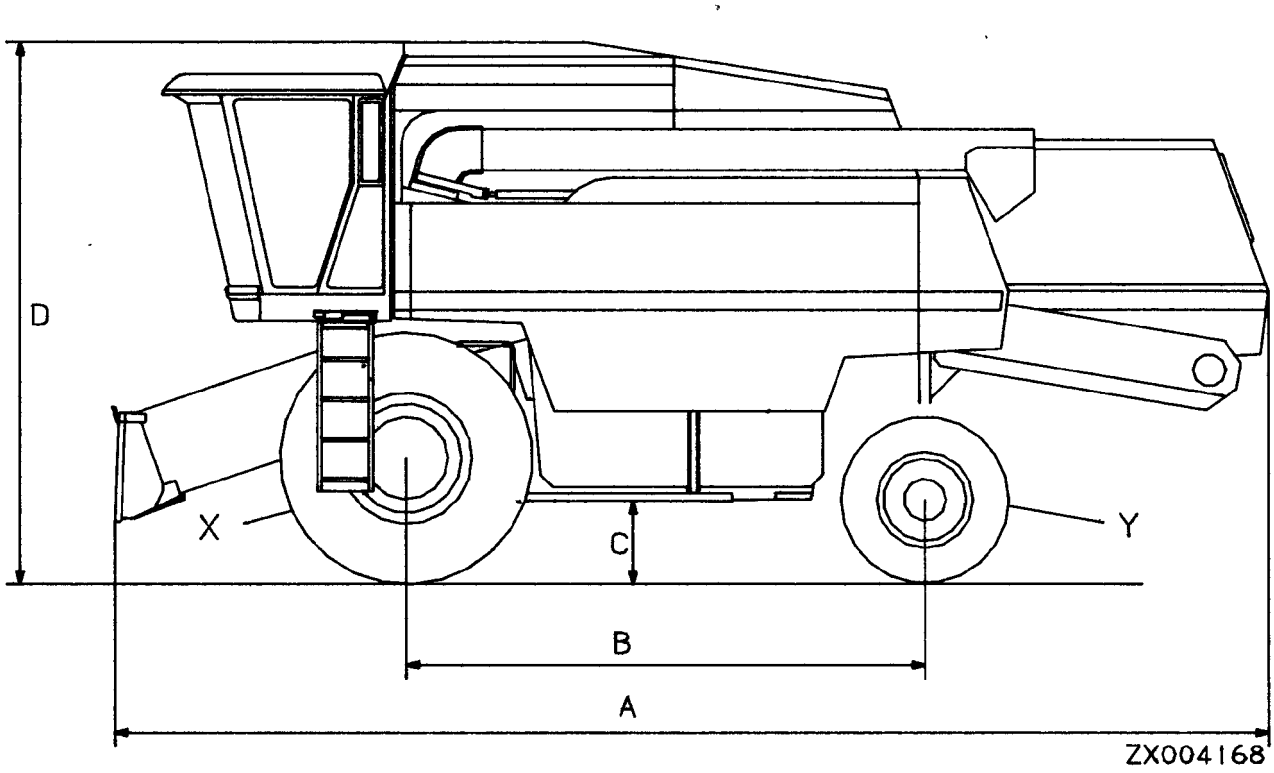
1. Max. acceleration value to which the
   feet of the operator are subjected . . . . . 2.1 m/s^2 at 20 Hertz

2. Max. acceleration value to which
   the seat surface is subjected . . . . . 2.0 m/s^2 at 20 Hertz

3. Max. acceleration value to which the
   body of the operator is subjected . . . . . 5.35 m/s^2 at 50 Hertz

ZX,OMXZCO003410-19-22JUN94

DIMENSIONS, 2254 AND 2256 COMBINES

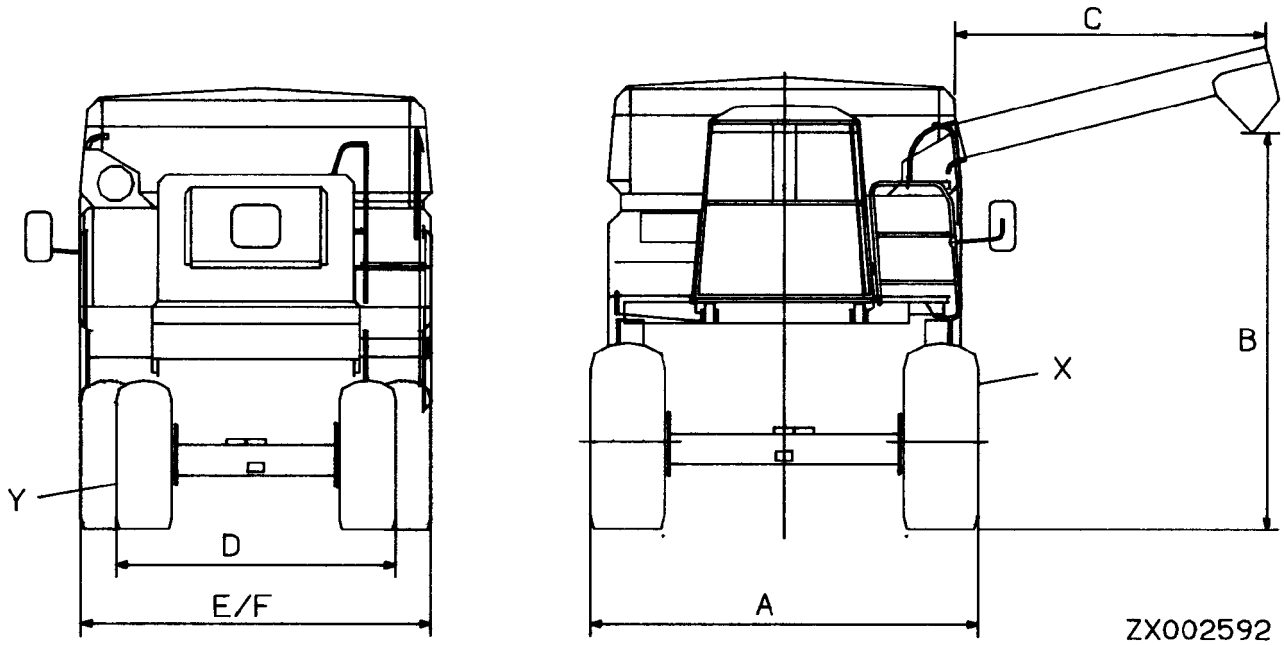


A—Overall length
B—Wheel base
C—Ground clearance
D—Overall height
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D
2254	620/75-R34	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3780 mm (12.40 ft)
	24.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	550 mm (1.80 ft)	3790 mm (12.43 ft)
2256	620/75-R34	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3840 mm (12.60 ft)
	24.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	550 mm (1.80 ft)	3850 mm (12.63 ft)
	30.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3840 mm (12.60 ft)

ZX,TMXZCO010105-19-01AUG97

DIMENSIONS, 2254 AND 2256 COMBINES (CONTINUED)

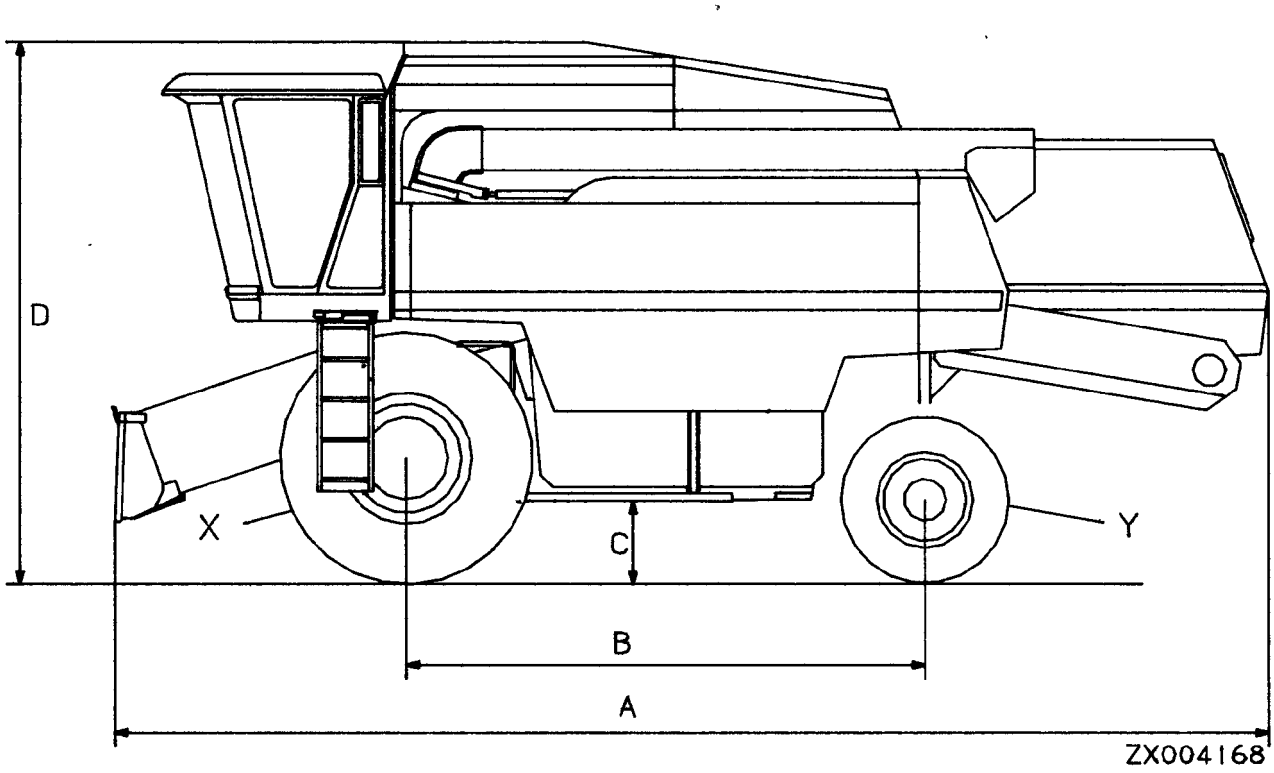


A—Front axle width
B—Max. discharge height
C—Outreach of unloading auger
D—Width of standard (fixed) rear axle
E—Width of adjustable rear axle
F—Width of rear wheel drive axle
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D	E	F
2254	620/75-R34	14.9-24	3300 mm (10.83 ft)	3980 mm (13.06 ft)	2570 mm (8.43 ft)	2940 mm (9.65 ft)	2940—3530 mm (9.65—11.58 ft)	3110—3720 mm (10.20—12.20 ft)
	24.5-32	14.9-24	3300 mm (10.83 ft)	3960 mm (13.00 ft)				
2256	620/75-R34	14.9-24	3300 mm (10.83 ft)	3980 mm (13.06 ft)	2570 mm (8.43 ft)	2940 mm (9.65 ft)	2940—3530 mm (9.65—11.58 ft)	3110—3720 mm (10.20—12.20 ft)
	24.5-32	14.9-24	3300 mm (10.83 ft)	3960 mm (13.00 ft)				
	30.5-32	14.9-24	3500 mm (11.48 ft)	3980 mm (13.06 ft)				

ZX,TMXZCO010106-19-01AUG97

DIMENSIONS, 2258 AND 2264 COMBINES

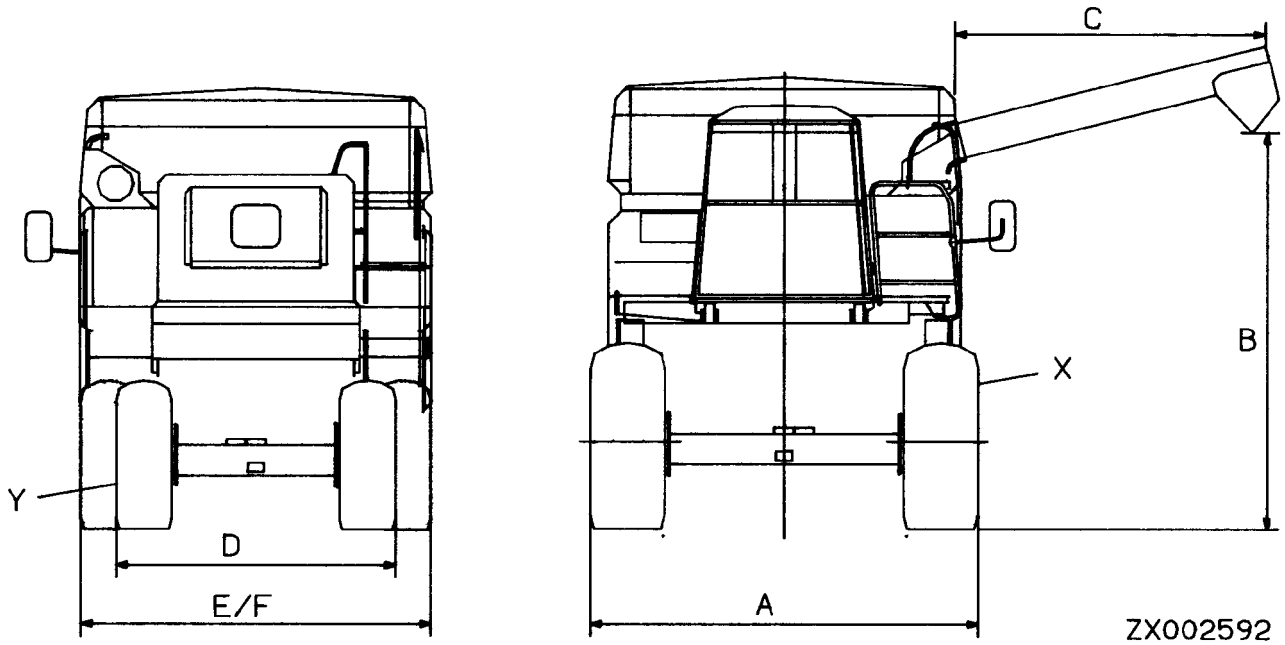


A—Overall length
B—Wheel base
C—Ground clearance
D—Overall height
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D
2258	620/75-R34	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3910 mm (12.83 ft)
	24.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	550 mm (1.80 ft)	3940 mm (12.93 ft)
	30.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3910 mm (12.83 ft)
2264	620/75-R34	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3910 mm (12.83 ft)
	24.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	550 mm (1.80 ft)	3940 mm (12.93 ft)
	30.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3910 mm (12.83 ft)

ZX,TMXZCO010107-19-01AUG97

DIMENSIONS, 2258 AND 2264 COMBINES (CONTINUED)



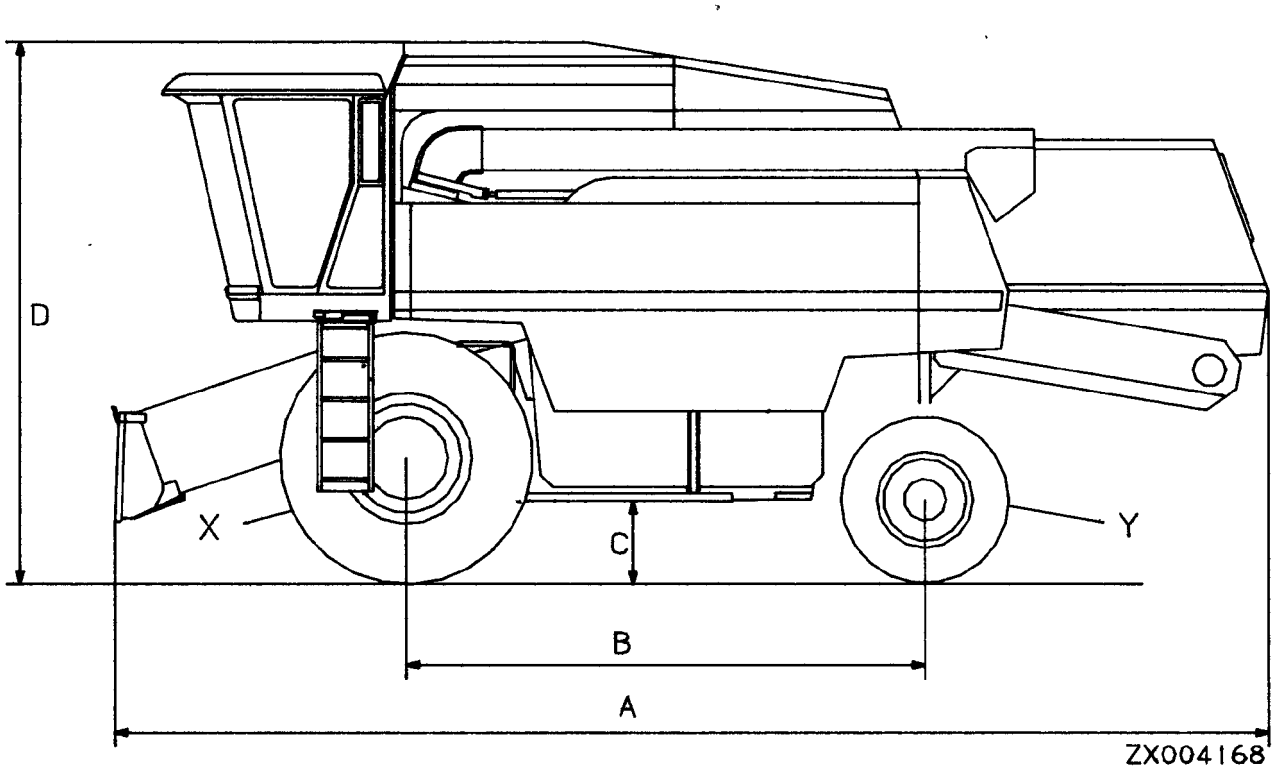
ZX002592 -UN-23MAY95

A—Front axle width
B—Max. discharge height
C—Outreach of unloading auger
D—Width of standard (fixed) rear axle
E—Width of adjustable rear axle
F—Width of rear wheel drive axle
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D	E	F
2258	620/75-R34	14.9-24	3300 mm (10.83 ft)	3980 mm (13.06 ft)	2570 mm (8.43 ft)	2940 mm (9.65 ft)	2940—3530 mm (9.65—11.58 ft)	3110—3720 mm (10.20—12.20 ft)
	24.5-32	14.9-24	3300 mm (10.83 ft)	3960 mm (13.00 ft)				
	30.5-32	14.9-24	3500 mm (11.48 ft)	3980 mm (13.06 ft)				
2264	620/75-R34	14.9-24	3300 mm (10.83 ft)	3980 mm (13.06 ft)	2570 mm (8.43 ft)	2940 mm (9.65 ft)	2940—3530 mm (9.65—11.58 ft)	3110—3720 mm (10.20—12.20 ft)
	24.5-32	14.9-24	3500 mm (11.48 ft)	3960 mm (13.00 ft)				
	30.5-32	14.9-24	3800 mm (12.47 ft)	3980 mm (13.06 ft)				

ZX,TMXZCO010108-19-01AUG97

DIMENSIONS, 2266 COMBINE

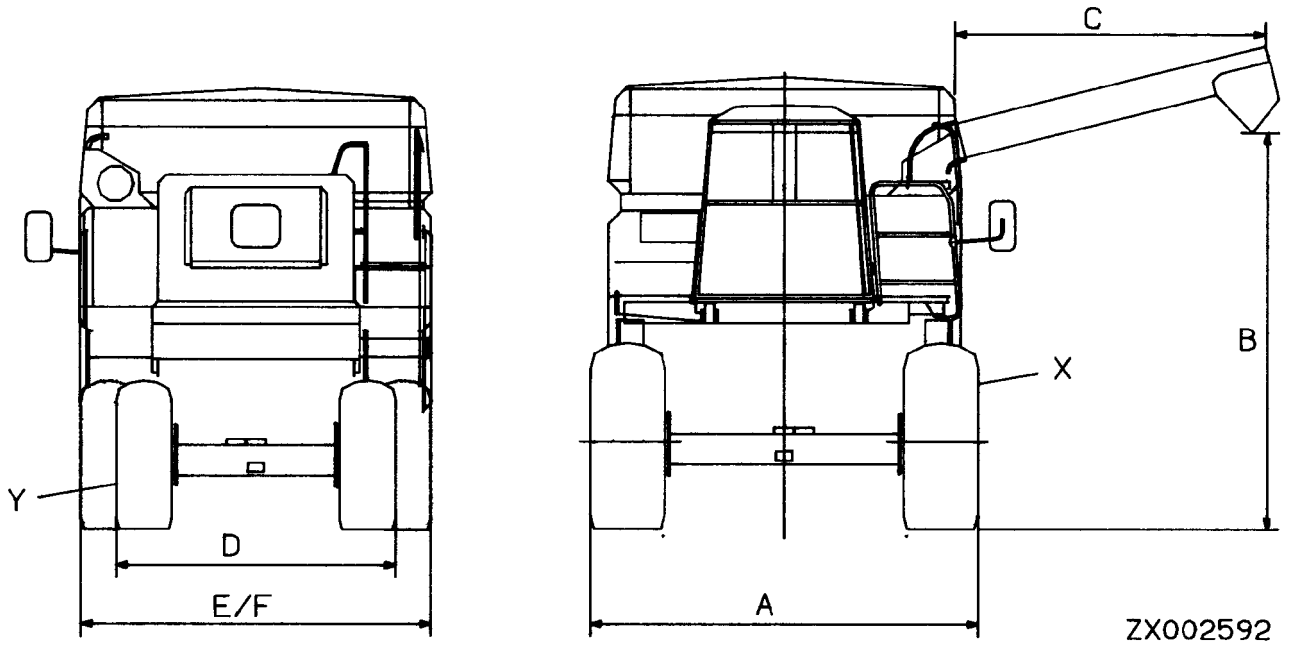


A—Overall length
B—Wheel base
C—Ground clearance
D—Overall height
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D
2266	620/75-R34	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3980 mm (13.06 ft)
	24.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	550 mm (1.80 ft)	4000 mm (13.12 ft)
	30.5-32	14.9-24	8630 mm (28.31 ft)	3820 mm (12.53 ft)	540 mm (1.77 ft)	3980 mm (13.06 ft)

ZX,TMXZCO010109-19-01AUG97

DIMENSIONS, 2266 COMBINE (CONTINUED)



A—Front axle width
B—Max. discharge height
C—Outreach of unloading auger
D—Width of standard (fixed) rear axle
E—Width of adjustable rear axle
F—Width of rear wheel drive axle
X—Front tires
Y—Rear tires

	X	Y	A	B	C	D	E	F
2266	620/75-R34	14.9-24	3300 mm (10.83 ft)	3980 mm (13.06 ft)	2570 mm (8.43 ft)	2940 mm (9.65 ft)	2940—3530 mm (9.65—11.58 ft)	3110—3720 mm (10.20—12.20 ft)
	24.5-32	14.9-24	3500 mm (11.48 ft)	3960 mm (13.00 ft)				
	30.5-32	14.9-24	3800 mm (12.47 ft)	3980 mm (13.06 ft)				

ZX,TMXZCO010110-19-01AUG97

Section 220
Engine

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ENGINE SPECIFICATION DATA FOR MODEL 6068HZ001 (2254)

GENERAL DATA

Number of cylinders	6
Bore	106.5 mm (4.19 in.)
Stroke	127 mm (5 in.)
Displacement	6.8 L (415 $in.^3$)
Compression ratio	17.2:1
Compression at starting motor speed	2380—2790 kPa (23.8—27.9 bar; 345—405 psi)
Starting motor speed	150—200 rpm
Valves per cylinder — intake/exhaust	1/1
Firing order	1-5-3-6-2-4
Combustion system	direct injection
Engine type	in-line 4-cycle
Aspiration	turbocharged
Charge air cooling system	air to air
Engine crankcase vent system	open
Maximum crankcase pressure	0.5 kPa (2 in. H_2O)

DIMENSIONS

Length	1097 mm (43.2 in.)
Width	630 mm (24.8 in.)
Height	1023 mm (40.3 in.)
Weight, without oil (includes flywheel and flywheel housing)	700 kg (1543 lb)

ZX,TMXZCO010077-19-01AUG97

ENGINE SPECIFICATION DATA FOR MODEL 6068HZ001 (CONTINUED)

FUEL SYSTEM

Fuel injection pump	Stanadyne DB4
Governor regulation	7—9 percent
Governor type	mechanical
Fuel filter micron size at 98 percent efficiency	8

LUBRICATION SYSTEM

Oil pressure at rated speed	345 kPa (3.45 bar; 50 psi)
Oil pressure at low idle	105 kPa (1.05 bar; 15 psi)
Oil pan capacity, high	16 L (4.2 U.S. gal)
Oil pan capacity, low	15 L (4 U.S. gal)
Total engine oil capacity with filters	19 L (5 U.S. gal)
Engine angularity limits (intermittent) Any direction	35˚

EXHAUST SYSTEM

Maximum allowable back pressure	7.5 kPa (2.2 in. Hg)

COOLING SYSTEM

Thermostat starts to open at	82˚C (180˚F)
Thermostat fully open at	94˚C (202˚F)
Coolant capacity (engine only)	11.3 L (3 U.S. gal)

ZX,TMXZCO010078-19-01AUG97

ENGINE SPECIFICATION DATA FOR MODEL 6068HZ001 (CONTINUED)

AIR INTAKE SYSTEM

Maximum allowable temperature rise
— ambient air to engine inlet . . . . . 8˚C (15˚F)

Maximum air intake restriction
Dirty air cleaner . . . . . 6.25 kPa (25 in. H_2O)
Clean air cleaner . . . . . 3 kPa (12 in. H_2O)

Intake manifold pressure . . . . . 105 kPa (31 in. Hg)

ELECTRICAL SYSTEM

Max. starting motor current consumption
when starting (12 V system)
At 0˚C (32˚F) . . . . . 950 A
At -30˚C (-22˚F) . . . . . 1300 A

Starter power . . . . . 3.1 kW (4 hp)

Alternator (2 used) . . . . . 120 A

PERFORMANCE DATA

Power according to ECE R24
(at rated speed) . . . . . 132 kW (180 hp)

Rated speed . . . . . 2200 rpm

Peak torque speed . . . . . 1500 rpm

Slow idle speed . . . . . 1250 rpm

Fast idle . . . . . 2350 rpm

Smoke at rated speed — Bosch number 1.5

Smoke at peak torque — Bosch number 3.0

Radiator screen . . . . . self-cleaning

ZX,TMXZCO010079-19-01AUG97

ENGINE SPECIFICATION DATA FOR MODELS 6081HZ001, HZ002, HZ003 AND HZ005 (CONTINUED)

GENERAL DATA

Number of cylinders	6
Bore	116 mm (4.56 in.)
Stroke	129 mm (5.06 in.)
Displacement	8.1 L (496 $in.^3$)
Compression ratio	15.7:1
Compression at starting motor speed	2380—2790 kPa (23.8—27.9 bar; 345—405 psi)
Starting motor speed	200—250 rpm
Valves per cylinder — intake/exhaust	1/1
Firing order	1-5-3-6-2-4
Combustion system	direct injection
Engine type	in-line 4-cycle
Aspiration	turbocharged
Charge air cooling system	air to air
Engine crankcase vent system	open
Maximum crankcase pressure	0.5 kPa (2 in. H_2O)

DIMENSIONS

Length	1208 mm (47.6 in.)
Width	555 mm (21.8 in.)
Height	1040 mm (40.9 in.)
Weight, without oil (includes flywheel and flywheel housing)	776 kg (1710 lb)

ZX,TMXZCO010080-19-11MAR98

ENGINE SPECIFICATION DATA FOR MODELS 6081HZ001, HZ002, HZ003 AND HZ005 (CONTINUED)

FUEL SYSTEM

Fuel injection pump (HZ002, HZ003, HZ005)	Bosch P3000
Fuel injection pump (HZ001)	Bosch P7100
Governor regulation	7—9 percent
Governor type	mechanical
Fuel filter micron size at 98 percent efficiency	8

LUBRICATION SYSTEM

Oil pressure at rated speed	345 kPa (3.45 bar; 50 psi)
Oil pressure at low idle	210 kPa (2.1 bar; 30 psi)
Oil pan capacity, high	28.5 L (7.5 U.S. gal)
Oil pan capacity, low	25.5 L (6.7 U.S. gal)
Total engine oil capacity with filters	30 L (7.9 U.S. gal)
Engine angularity limits (intermittent) Any direction	35˚

EXHAUST SYSTEM

Maximum allowable back pressure	7.5 kPa (2.2 in. Hg)

COOLING SYSTEM

Thermostat starts to open at	82˚C (180˚F)
Thermostat fully open at	94˚C (202˚F)
Coolant capacity (engine only)	14.2 L (3.8 U.S. gal)

ZX,TMXZCO010081-19-11MAR98

ENGINE SPECIFICATION DATA FOR MODELS 6081HZ001, HZ002, HZ003 AND HZ005 (CONTINUED)

AIR INTAKE SYSTEM

Maximum allowable temperature rise
— ambient air to engine inlet . . . . . 8˚C (15˚F)

Maximum air intake restriction
Dirty air cleaner . . . . . 6.25 kPa (25 in. H_2O)
Clean air cleaner . . . . . 3 kPa (12 in. H_2O)

Intake manifold pressure . . . . . 189 kPa (27.3 in. Hg)

ELECTRICAL SYSTEM

Max. starting motor current consumption
when starting (12 V system)
At 0˚C (32˚F) . . . . . 950 A
At -30˚C (-22˚F) . . . . . 1300 A

Starter power . . . . . 4 kW (5.4 hp)

Alternator (2 used) . . . . . 120 A

ZX,TMXZCO010082-19-11MAR98

PERFORMANCE DATA, 2256

Power according to ECE R24
(at rated speed) . . . . . 154 kW (210 hp)

Rated speed . . . . . 2200 rpm

Peak torque speed . . . . . 1600 rpm

Slow idle speed . . . . . 1250 rpm

Fast idle speed . . . . . 2350 rpm

Smoke at rated speed — Bosch number 1.2

Smoke at peak torque — Bosch number 3.5

Radiator screen . . . . . self-cleaning

ZX,TMXZCO010083-19-01AUG97

PERFORMANCE DATA, 2258

Power according to ECE R24
(at rated speed) . . . . . 173 kW (235 hp)

Rated speed . . . . . 2200 rpm

Peak torque speed . . . . . 1600 rpm

Slow idle speed . . . . . 1250 rpm

Fast idle speed . . . . . 2350 rpm

Smoke at rated speed — Bosch number 1.2

Smoke at peak torque — Bosch number 3.5

Radiator screen . . . . . self-cleaning

ZX,TMXZCO010084-19-01AUG97

PERFORMANCE DATA, 2264

Power according to ECE R24
(at rated speed) . . . . . 184 kW (250 hp)

Rated speed . . . . . 2200 rpm

Peak torque speed . . . . . 1600 rpm

Slow idle speed . . . . . 1250 rpm

Fast idle speed . . . . . 2350 rpm

Smoke at rated speed — Bosch number 1.2

Smoke at peak torque — Bosch number 3.5

Radiator screen . . . . . self-cleaning

ZX,TMXZCO010085-19-01AUG97

PERFORMANCE DATA, 2266

Power according to ECE R24 (at rated speed)	199 kW (270 hp)
Rated speed	2200 rpm
Peak torque speed	1600 rpm
Slow idle speed	1250 rpm
Fast idle speed	2350 rpm
Smoke at rated speed — Bosch number	1.2
Smoke at peak torque — Bosch number	3.5
Radiator screen	self-cleaning

ZX,TMXZCO010086-19-01AUG97

Section 230
Fuel, Air Intake and Cooling Systems

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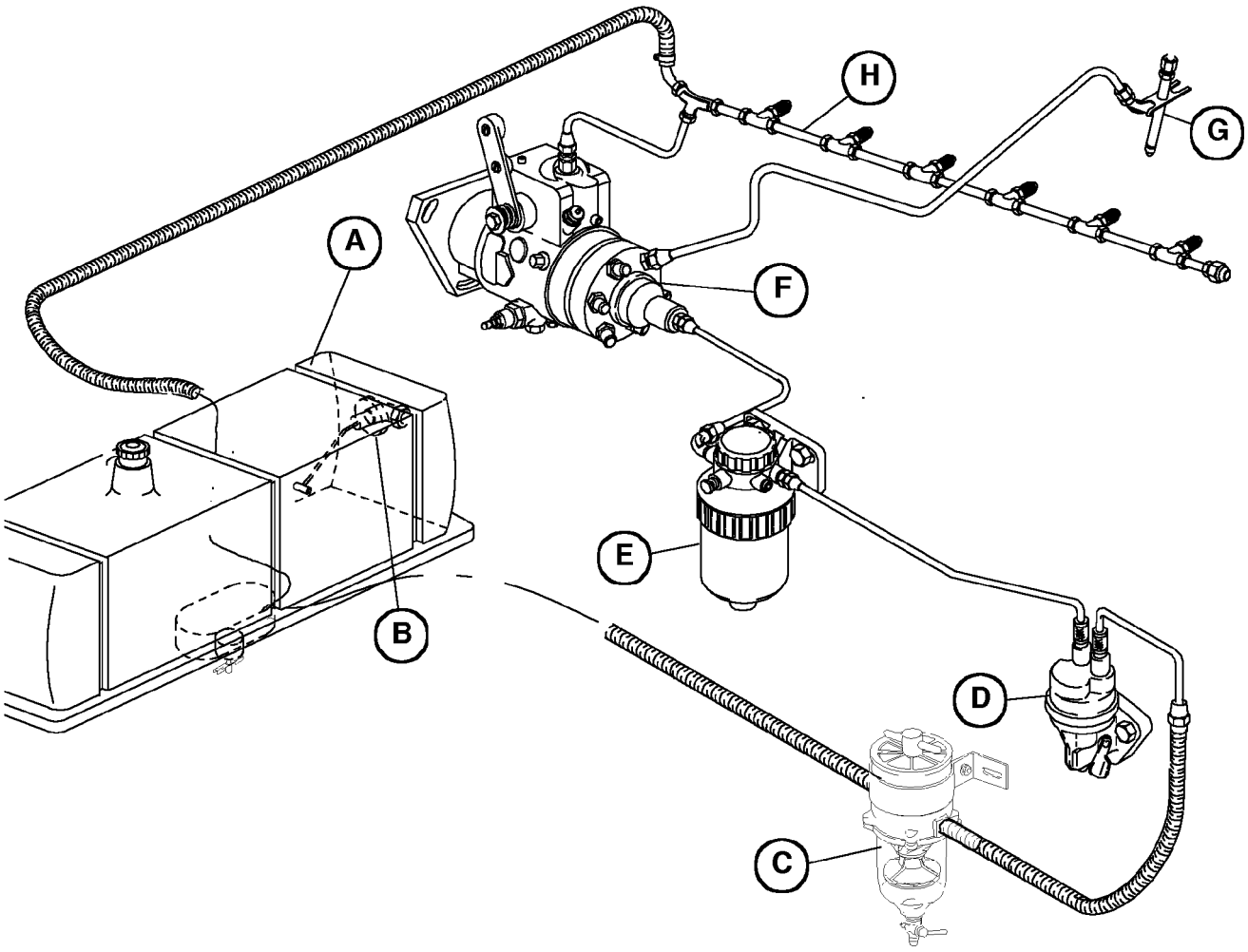
FUEL SYSTEM ON 6.8-L ENGINE



ZX007424

A—Fuel tank
B—Fuel gauge sending unit
C—Water trap
D—Mechanical fuel transfer pump
E—Fuel filter
F—Injection pump
G—Injection nozzle
H—Return line

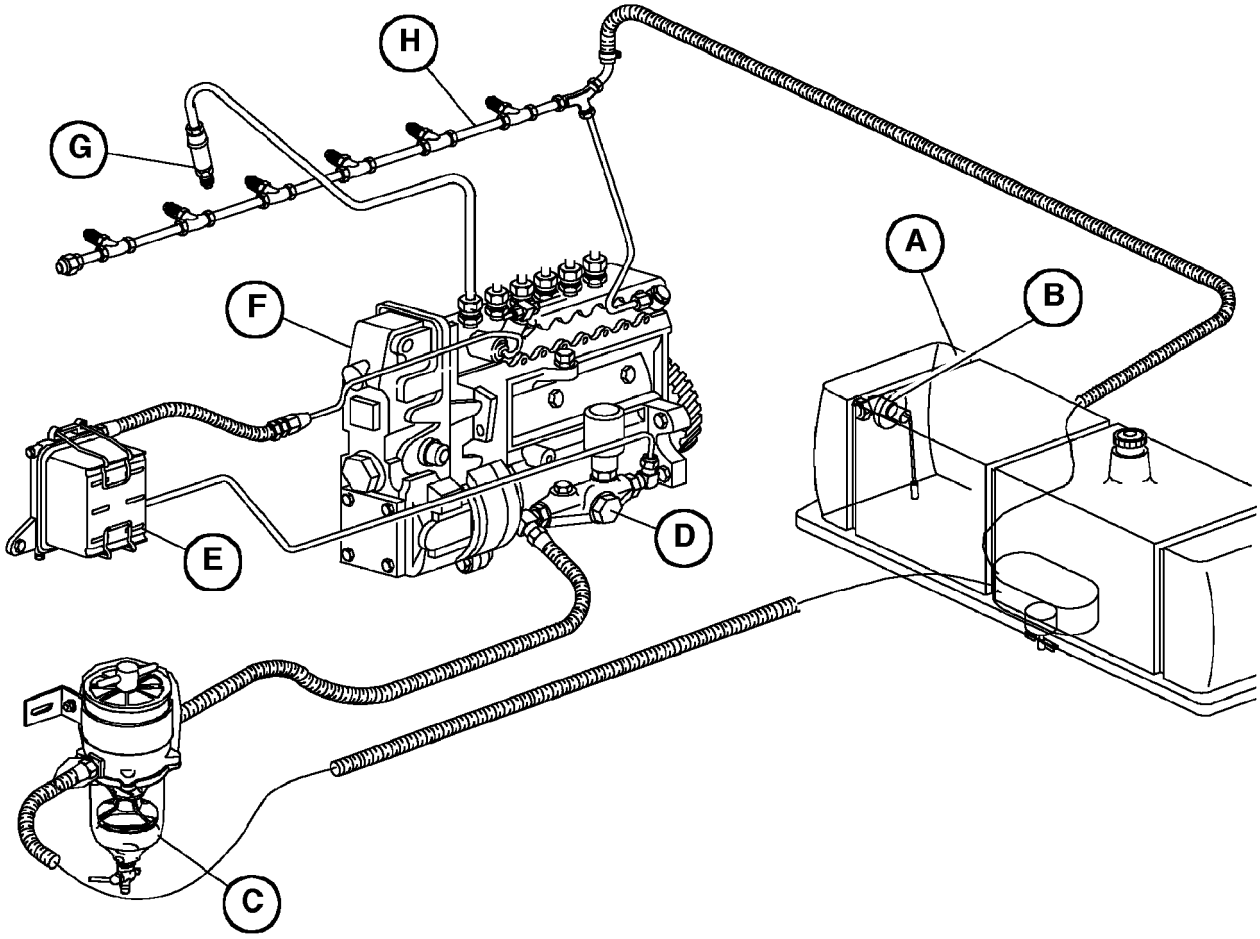
ZX,OMXZCO002087-19-01MAR95

SPECIFICATIONS

Fuel injection pump	Stanadyne DB4
Governor regulation	7—9 percent
Governor type	mechanical
Fuel filter micron size at 98 percent efficiency	8

ZX,TMXZCO010087-19-01AUG97

FUEL SYSTEM ON 8.1-L ENGINE



ZX009860

A—Fuel tank
B—Fuel gauge sending unit
C—Water trap
D—Mechanical fuel transfer pump (2256—2266)
E—Fuel filter
F—Injection pump (2256—2266)
G—Injection nozzle
H—Return line

ZX,OMXZCO002088-19-01NOV96

SPECIFICATIONS

Fuel injection pump (HZ002, HZ003, HZ005)	Bosch P3000
Fuel injection pump (HZ001)	Bosch P7100
Governor regulation	7—9 percent
Governor type	mechanical
Fuel filter micron size at 98 percent efficiency	8

ZX,TMXZCO010088-19-01AUG97

Section 240
Electrical System to Serial Number 066832

Contents

Continued on next page

Continued on next page

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

MULTIMETER

Multimeter JT05791

ZX001756 -UN-27APR95

ZX,TMSPFH001915-19-17JAN94

WIRING HARNESS TESTER

Wiring harness tester FKM10438

NOTE: By means of this "Wiring Harness Tester" electrical system checks can be carried out. The electrical signals are received by inserting T-adapters into connectors.

Case JT02048

Test box with extension cable JT02006

T-adapter, 37-pin KJD10176
T-adapter, 21-pin KJD10175
T-adapter, 16-pin KJD10174
T-adapter, 37-pin JT02013
T-adapter, 16-pin JT02009
T-adapter, 9-pin JT02008
T-adapter, 4-pin JT02007

ZX001760 -UN-24APR95

ZX,TMSPFH001916-19-22APR92

USE OF WIRING HARNESS TESTER

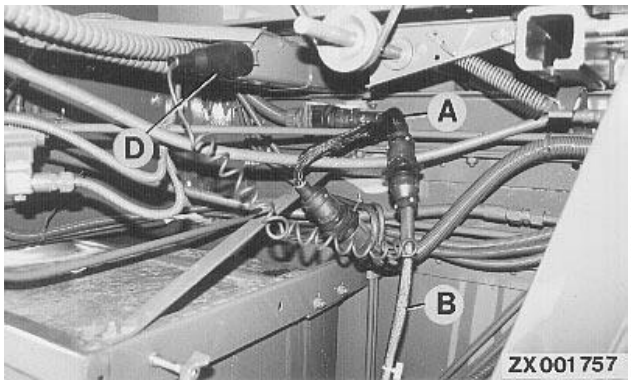
Disconnect connector to be tested and insert suitable T-adapter (A) into the connector.

Connect third T-adapter terminal to test box (C) via extension cable (B).

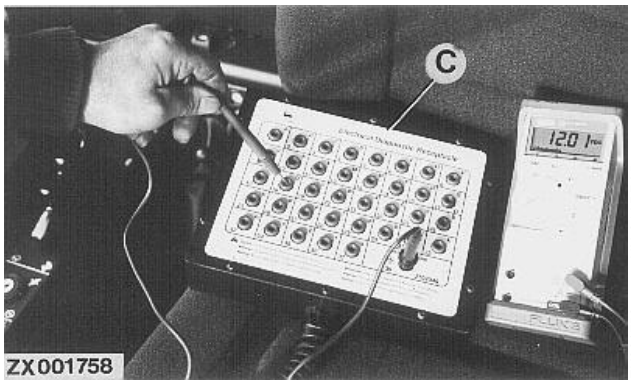
Connect clip (D) to machine frame (ground connection).

The individual signals coming from the connector can be received at the test box by means of the multimeter.

A—T-adapter
B—Extension cable (test box)
C—Test box
D—Ground clip



ZX001757 -UN-24APR95



ZX001758 -UN-24APR95

ZX,TMSPFH001914-19-22APR92

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

MULTIMETER

Multimeter JT05791

ZX001756 -UN-27APR95

ZX,TMSPFH001915-19-17JAN94

WIRING HARNESS TESTER

Wiring harness tester FKM10438

NOTE: By means of this "Wiring Harness Tester" electrical system checks can be carried out. The electrical signals are received by inserting T-adapters into connectors.

Case JT02048

Test box with extension cable JT02006

T-adapter, 37-pin KJD10176
T-adapter, 21-pin KJD10175
T-adapter, 16-pin KJD10174
T-adapter, 37-pin JT02013
T-adapter, 16-pin JT02009
T-adapter, 9-pin JT02008
T-adapter, 4-pin JT02007

ZX001760 -UN-24APR95

ZX,TMSPFH001916-19-22APR92

USE OF WIRING HARNESS TESTER

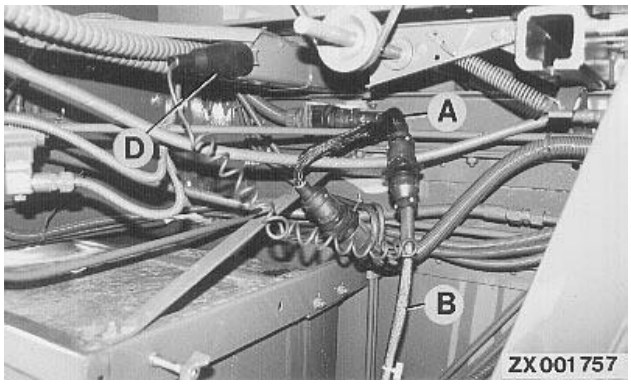
Disconnect connector to be tested and insert suitable T-adapter (A) into the connector.

Connect third T-adapter terminal to test box (C) via extension cable (B).

Connect clip (D) to machine frame (ground connection).

The individual signals coming from the connector can be received at the test box by means of the multimeter.

A—T-adapter
B—Extension cable (test box)
C—Test box
D—Ground clip



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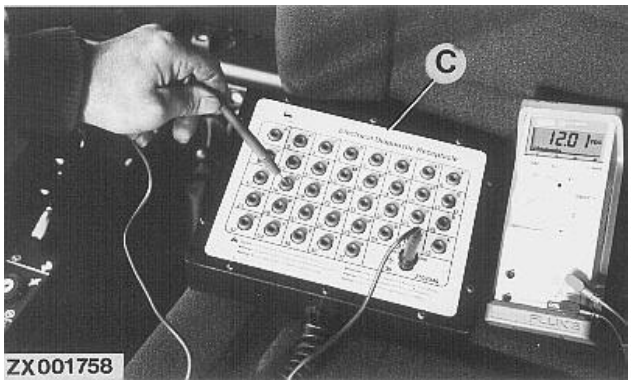

ZX001758 -UN-24APR95

ZX,TMSPFH001914-19-22APR92

SECTION SURVEY

ZX,TM4543009500-19-30JUN97

WIRING HARNESS SURVEY

W 1 — Main distribution wiring harness

W 2 — Cab wiring harness

W 3 — Switch console wiring harness

W 4 — Corner post wiring harness

W 5 — Armrest wiring harness

W 6 — Air conditioning and fan wiring harness

W 7 — Basic wiring harness, front

W 8 — Steering column wiring harness

W 9 — Basic wiring harness, rear

W 10 — Feeder house wiring harness

W 12 — Wiring harness, Saran engine

W 13 — Wiring harness, Waterloo engine

W 14 — Optional equipment wiring harness

W 15 — Grain tank wiring harness

W 18 — Positive battery cable

W 20 — Straw hood wiring harness

W 21 — Power supply cable

W 22 — Wiring harness, 20 ft. header

W 23 — Wiring harness, combine data center

W 24 — Sieve motor wiring harness

W 25 — Chopper wiring harness

W 28 — Ground cable, straw warning device

W 29 — Leveling system wiring harness

W 30 — Antenna for CB radio

W 31 — Radio antenna

W 32 — Header lighting wiring harness

W 33 — Wiring harness, ultrasonic sensors

W 34 — Wiring harness, logic relay board

W 35 — Frame wiring harness switch

W 36 — Wiring harness switch, batt. neg. terminal

W 37 — Four-wheel drive wiring harness

W 39 — Wiring harness, electrical mirror adjustment

W 40 — Header wiring harness

W 41 — Header wiring harness, without hydraulics (Europe)

W 42 — Underslung chopper wiring harness

W 44 — Engine/cab wiring harness

W 45 — Wiring harness, 25 ft. header (USA)

W 46 — Header wiring harness with DIAL-A-MATIC™

W 47 — Adapter cable for header electr. clutch

W 55 — Beacon light wiring harness

W 56 — Wiring harness, header lateral tilt

W 59 — Adapter cable for row-crop unit

ZX,TM4543009501-19-30JUN97

COMPONENT SURVEY

	Section	Wiring harness
A 1 — Reel speed control	19	W 1
A 2 — DIAL-A-MATIC™ relay board	20	W 1
A 3 — Electronic speed monitoring system	22	W 1
A 4 — Harvest performance monitor (105,152 IMP)	23	W 2
A 5 — Combine data center	25	W 23
A 6 — Header control	26	W 1
A 7 — Electronics for Automatic Header Control	--	
A 8 — Leveling control box, Hillmaster	24	W 29
A 9 — Control board, combine data center	25	W 1
A 10 — Float control	30	W 3
A 11 — Relay board, combine data center	25	W 1
A 12 — Radio	08	W 2
A 13 — CB radio	08	W 2
A 14 — Relay and diode board	--	W 2
A 15 — Fuse board	--	W 1
A 16 — Warning module I	09	W 4
A 17 — Warning module II	10	W 4
A 18 — Infotrak monitor	22	W 2
B 1 — Sending unit, brake fluid level	09	W 7
B 2 — Sending unit, engine oil pressure	09	W 12; W 13
B 4 — Sending unit, coolant temperature	05	W 12; W 13
B 5 — Sending unit, reel speed	19	W 22
B 6 — Sending unit, ground speed	22	W 7
B 7 — Sending unit, hydraulic oil filter	10	W 9
B 8 — Sending unit, hydraulic oil temperature	09	W 9
B 9 — Thermostat (protection against freezing)	15	W 6
B 10 — Sending unit, air cleaner	10	W 12; W 13
B 11 — Sending unit, fuel tank	05	W 9
B 12 — Horn	18	W 7
B 13 — Temperature switch, air conditioning	15	W 2
B 14 — Low pressure switch, air conditioning	15	W 2
B 15 — High pressure switch, air conditioning	15	W 12; W 13
B 16 — Speed sending unit, straw chopper	22	W 25
B 17 — Speed sending unit, tailings elevator	22	W 7
B 18 — Speed sending unit, cross-shaker	22	W 9
B 19 — Speed sending unit, clean grain elevator	22	W 7
B 20 — Speed sending unit, chaff spreader	22	W 26
B 21 — Straw walker sensor, right-hand	23	W 20
B 22 — Straw walker sensor, left-hand	23	W 20
B 23 — Sieve sensor (5-walker machine)	23	W 9
B 24 — Sieve sensor (6-walker machine)	23	W 9
B 25 — Sending unit, grain tank indicator 1/2	10	W 15
B 26 — Sending unit, grain tank indicator 3/4	10	W 15
B 27 — Sending unit, grain tank indicator 4/4	10	W 15

ZX,TM4543009503-19-30JUN97

	Section	Wiring harness
B 28 — Sending unit, engine speed	22	W 12; W 13
B 29 — Sending unit, threshing cylinder speed	22	W 7
B 30 — Sending unit, fan speed	22	W 7
B 31 — Pressure switch, main clutch	27	W 9
B 32 — Sending unit, empty grain tank	--	
B 34 — Sending unit, hydr. oil fill level 1	10	W 9
B 35 — Sending unit, hydr. oil fill level 2	09	W 9
B 36 — Ultrasonic sensor, left	--	
B 38 — Ultrasonic sensor, right	--	
B 39 — Loudspeaker, left-hand	08	W 2
B 40 — Loudspeaker, right-hand	08	W 2
B 41 — Sending unit, oil temp., underslung chopper	--	
B 42 — Sending unit, charged air temperature	--	
B 43 — Back-up alarm, buzzer	31	W 20
E 1 — Headlight, left-hand	12	W 7
E 2 — Headlight, right-hand	12	W 7
E 3 — Rear worklight	17	W 20
E 4 — Cab roof worklight, outer r.h.	17	W 2
E 5 — Cab roof worklight, inner r.h.	17	W 2
E 6 — Cab roof worklight, outer l.h.	17	W 2
E 7 — Cab roof worklight, inner l.h.	17	W 2
E 8 — Unloading auger worklight	17	W 15
E 9 — Cigarette lighter	11	W 3
E 10 — Grain tank lighting	07	W 15
E 11 — Lighting (according to local requirements)	12	W 7
E 12 — Cab interior lighting	07	W 2
E 13 — Tail light, left-hand	12	W 20
E 14 — Tail light, right-hand	12	W 20
E 15 — Clearance light, left-hand	12	W 7
E 16 — Clearance light, right-hand	12	W 7
E 17 — Straw hood lighting	07	W 20
E 18 — Platform worklight, right-hand	17	W 7
E 19 — Platform worklight, left-hand	17	W 7
E 20 — Worklight, US cutting platform, right-hand	--	
E 21 — Work light, US cutting platform, left-hand	--	
E 22 — Registration plate lighting	12	W 20
E 23 — Clearance light, header, left-hand	12	W 32
E 24 — Clearance light, header, right-hand	12	W 32
E 25 — Worklight, mirror bracket, right	17	W 2
E 26 — Worklight, mirror bracket, left	17	W 2
F 1 — Fuse, 7.5 amp., spare	--	A 15
F 2 — Fuse, 7.5 amp., spare	--	A 15
F 3 — Fuse, 7.5 amp., spare	--	A 15
F 4 — Fuse, 7.5 amp., spare	--	A 15
F 5 — Fuse, 15 amp., spare	--	A 15
F 6 — Fuse, 15 amp., spare	--	A 15

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	Section	Wiring harness
F 7 — Fuse, 30 amp., spare	--	A 15
F 8 — Fuse, 7.5 amp., fan and threshing cylinder speed adjustment	25	A 15
F 9 — Fuse, 7.5 amp., parking light, r.h.	12	A 15
F 10 — Fuse, 7.5 amp., parking light, l.h.	12	A 15
F 11 — Fuse, 30 amp., fan adjustment	25	A 15
F 12 — Fuse, 15 amp., stop lights, reel speed adjustment	19	A 15
F 13 — Fuse, 30 amp., cab roof worklights	17	A 15
F 14 — Fuse, 7.5. amp., straw warning device electronic infotrak monitor	18	A 15
F 15 — Fuse, 15 amp., distributor adjustment on straw chopper	6B	A 15
F 16 — Fuse, 7.5 amp., engine shut-off solenoid	03A/B	A 15
F 17 — Fuse, 7.5 amp., instrument lighting	12	A 15
F 18 — Fuse, 7.5 amp., radio, CB radio, clock	08	A 15
F 19 — Fuse, 30 apm., platform worklights and rear worklight	21	A 15
F 20 — Fuse, 7.5 amp., flasher functions	13	A 15
F 21 — Fuse, 15 amp., radiator cleaner motor	21	A 15
F 22 — Fuse, 7.5 amp., radio, CB radio, clock	08	A 15
F 23 — Fuse, 15 amp., separator and header clutch	21	A 15
F 24 — Fuse, 7.5. amp., indicator lights, temperature gauge	05	A 15
F 25 — Fuse 7.5 amp., low-beam headlight, l.h.	12	A 15
F 26 — Fuse, 7.5 amp., header controls	26	A 15
F 27 — Fuse, 15 amp., horn	18	A 15
F 28 — Fuse, 7.5 amp., combine data center	25	A 15
F 29 — Fuse, 15 amp., leveling system	24	A 15
F 30 — Fuse, 7.5 amp., four-wheel drive	28	A 15
F 31 — Fuse, 7.5 amp., speed monitoring system	22	A 15
F 32 — Fuse, 7.5 amp., low-beam headlight, r.h.	12	A 15
F 33 — Fuse, 15 amp., raise/lower header	26	A 15
F 34 — Fuse, 15 amp., hazard warning lights	13	A 15
F 35 — Fuse, 15 amp., beacon lights	14	A 15
F 36 — Fuse, 15 amp., windshield wiper, grain tank lighting	07	A 15

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	Section	Wiring harness
F 37 — Fuse, 7.5 amp., mirror adjustment	16	A 15
F 38 — Fuse, 7.5 amp., performance monitor	23	A 15
F 39 — Fuse, 15 amp., grain tank unloading system	27	A 15
F 40 — Fuse, 30 amp., starter switch	01	A 15
F 41 — Fuse, 15 amp., concave adjustment	25	A 15
F 42 — Fuse, 30 amp., air conditioning system	15	A 15
F 43 — Fuse, 7.5 amp., DIAL-A-MATIC™	20	A 15
F 44 — Fuse, 7.5 amp., full-beam headlight, l.h.	12	A 15
F 45 — Fuse, 15 amp., reel control	26	A 15
F 46 — Fuse, 15 amp., starting aid	02	A 15
F 47 — Fuse, 15 amp., spare	--	A 15
F 48 — Fuse, 7.5 amp., alternator D+	01	A 15
F 49 — Fuse, 15 amp., cigarette lighter, seat compressor	11	A 15
F 50 — Fuse, 7.5 amp., full-beam headlight, r.h.	12	A 15
F 51 — Fuse, 7.5 amp., electro-clutch for header drive	31	W12/W13
F 52 — Fuse, 7.5 amp., back-up alarm	31	W12/W13
G 1 — Battery, 12 V, 88 AH	01	W 12; W 13
G 2 — Alternator	01	W 12; W 13
H 1 — Brake fluid indicator light	09	W 4
H 2 — Engine oil pressure indicator light	09	W 4
H 3 — Parking brake indicator light	09	W 4
H 4 — Coolant temperature indicator light	09	W 4
H 5 — Indicator light, unloading auger swing	10	W 4
H 6 — Fuel level indicator light	10	W 4
H 7 — Hydraulic oil filter indicator light	10	W 4
H 8 — Hydraulic oil temperature indicator light	09	W 4
H 9 — Four-wheel drive indicator light	10	W 4
H 10 — Air cleaner indicator light	09	W 4
H 11 — Alternator indicator light	10	W 4
H 12 — Alarm light (“STOP”)	09	W 4
H 13 — Turn signal light, rear left-hand	13	W 20
H 14 — Turn signal light, rear right-hand	13	W 20
H 15 — Turn signal light, front left-hand	13	W 7
H 16 — Turn signal light, front right-hand	13	W 7
H 17 — Additional turn signal light, left-hand	13	W 7
H 18 — Additional turn signal light, right-hand	13	W 9
H 19 — Indicator light, straw warning device	09	W 4
H 20 — Buzzer	09	W 2
H 21 — Beacon light	14	W 2
H 22 — High pressure indicator light (AC system)	10	W 4
H 23 — Indicator light, straw chopper speed	09	W 4
H 24 — Indicator light, tailings elevator speed	09	W 4
H 25 — Indicator light, cross-shaker speed	09	W 4
H 26 — Indicator light, grain elevator speed	09	W 4
H 27 — Grain tank fill indicator light 1/2	10	W 4

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	Section	Wiring harness
H 28 — Grain tank fill indicator light 3/4	10	W 4
H 29 — Grain tank fill indicator light 4/4	10	W 4
H 31 — Indicator light, fan speed	09	W 4
H 32 — Indicator light, cylinder speed	09	W 4
H 33 — Full-beam indicator light	12	W 8
H 34 — Turn signal indicator light 1, combine	13	W 8
H 35 — Turn signal indicator light 2, trailer	13	W 8
H 36 — Beacon light	14	W 9
H 37 — Hillmaster combine, automatic operation	10	W 4
H 38 — Hillmaster combine, manual operation	10	W 4
H 39 — Hillmaster combine, end stop	10	W 4
H 40 — Hydraulic oil level indicator light	10	W 4
H 41 — Turn signal light, header, left-hand	13	W 32
H 42 — Turn signal light, header, right-hand	13	W 32
H 43 — Stop light, left-hand	19	W 20
H 44 — Stop light, right-hand	19	W 20
K 1 — Starting motor relay	01	W 12; W 13
K 2 — Basic relay	01	A 15
K 3 — Basic relay	01	A 15
K 4 — Buzzer timer relay	09	A 14
K 5 — Flasher	13	A 14
K 6 — Relay, straw warning device	18	A 14
K 7 — Relay, work lights	17	A 15
K 8 — Float control relay	24	A 14
K 9 — Hillmaster leveling relay	24	A 14
K 10 — Relay, fan speed alarm	22	A 14
K 11 — Relay, cylinder speed alarm	22	W 14
K 12 — Relay, field operation/road travel	22	A 15
K 13 — Relay, lower header quickly	26	A 14
K 14 — Relay, lower header slowly	26	A 14
K 15 — Relay, raise header quickly	26	A 14
K 16 — Relay, raise header slowly	26	A 14
K 17 — Relay, lower reel	26	A 14
K 18 — Relay, raise reel	26	A 14
K 19 — Relay, move reel to the rear	26	A 14
K 20 — Relay, move reel to the front	26	A 14
K 21 — Relay, separator clutch	21	A 15
K 22 — Relay, straw warning device	18	A 14
K 23 — Safety relay, header drive	21	A 14
K 24 — Safety relay, unloading auger drive	27	A 14
K 25 — Timer relay, unloading auger swing	27	A 14
K 26 — Relay, enlarge concave clearance	25B	A 11 integrated
K 27 — Relay, reduce concave clearance	25B	A 11 integrated
K 28 — Relay, adjust feeder house speed	26	A 14
K 29 — Relay, adjust feeder house speed	26	A 14

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	Section	Wiring harness
K 30 — Relay, cylinder faster	25B	A 11 integrated
K 31 — Relay. cylinder slower	25B	A 11 integrated
K 32 — Relay, adjust reel speed	17	A 14
K 33 — Relay, adjust reel speed	17	A 14
K 34 — Flasher (USA)	--	
K 35 — Timer relay, header drive	21	A 14
K 36 — Relay, adjust fan speed	25	W 9
K 37 — Relay, adjust fan speed	25	W 9
K 38 — Relay, increasing fan speed	25B	A 11 integrated
K 39 — Relay, decreasing fan speed	25	A 11 integrated
K 40 — Relay, right	--	
K 41 — Relay, left	--	
K 42 — Relay, header el.-clutch (moving motor)	31	
K 43 — Relay, automatic resume potentiometer	--	
K 44 — 2-sec. timer relay	--	
K 45 — Relay, dynamo + (moving motor)	31	
K 46 — Separator timer relay	32	
K 48 — Relay, grain tank gauge	14	
K 51 — Relay, unloading auger drive	27	
K 52 — Relay, unloading auger drive	27	
M 1 — Starting motor	01	W 12; W 13
M 2 — Reel speed adjusting motor	19	W 22
M 3 — Windshield wiper motor	07	W 2
M 4 — Cab fan	15	W 6
M 5 — Seat compressor	11	W 5
M 6 — Chaffer adjusting motor	--	
M 7 — Sieve adjusting motor	--	
M 8 — Concave adjusting motor	25	W 7
M 9 — Fan speed adjusting motor	25	W 9
M 10 — Sieve extension	--	
M 11 — Windshield washer pump	07	W 9
M 12 — Radiator cleaner motor	21	W 12; W 13
M 13 — Distributor adjusting motor	06	W 25
M 14 — Reel variable drive (USA)	--	
M 15 — Mirror	--	
M 16 — Mirror	--	
P 1 — Coolant temperature gauge	05	W 4
P 2 — Fuel gauge	05	W 4
P 3 — Header height gauge	05	W 4
P 4 — Steering wheel positioning gauge	--	
P 5 — Grain loss indicator	05	W 4
P 6 — Digital clock	--	
P 7 — Analog clock	08	W 2
P 8 — Distributor gauge	06	W 4
R 1 — Fan resistor	15	W 6
R 2 — Potentiometer, concave adjustment	25	W 7
R 3 — Potentiometer, header height	26	W 14

ZX,TM4543009508-19-30JUN97

	Section	Wiring harness
R 4 — Sending unit, header height	26	W 7
R 5 — Potentiometer, reel height	26	W 14
R 6 — Sending unit, reel height	26	W 22
R 7 — Potentiometer, reel horizontal position	26	W 14
R 8 — Sending unit, reel horizontal position	26	W 22
R 9 — Resistor, LED fuse tester	04	A 15
R 10 — Potentiometer, chaffer	--	
R 11 — Potentiometer, sieve	--	
R 12 — Potentiometer, sieve extension	--	
R 13 — Potentiometer, header float	26	W 14
R 14 — Potentiometer, distributor position	06	W 25
R 15 — Potentiometer, steering wheel position	--	
R 16 — Glow-type starting aid	--	
R 17 — 2 kilo-ohm resistor, engine speed	--	
R 18 — 2 kilo-ohm resistor, engine tuning	--	
S 1 — Starter switch	01	W 8
S 2 — Hydrostatic safety switch	01	W 5
S 3 — Cold-weather starting aid switch	02	W 8
S 4 — Indicator light test switch	10	W 2
S 5 — Parking brake control switch	09	W 7
S 6 — Header float switch	30	W 5
S 7 — Stop light switch	19	W 7
S 8 — Horn button	18	W 8
S 9 — Potentiometer, reel speed	17	W 14
S 10 — Reel speed switch	17	W 5
S 11 — Hazard warning light switch	13	W 2
S 12 — Turn signal light switch	13	W 8
S 13 — Light switch	12	W 2
S 14 — Grain tank lighting switch	07	W 2
S 15 — Switch,straw warning device (cross-shaker)	18	W 9
S 16 — Switch, straw warning device (walkers)	18	W 20
S 17 — Switch, straw warning device (chopper)	18	W 20
S 18 — Beacon light switch	14	W 2
S 19 — Switch for cab roof worklights	17	W 2
S 20 — Windshield wiper switch	07	W 2
S 21 — Windshield washer switch	07	W 2
S 22 — Fan switch	15	W 2
S 23 — DIAL-A-MATIC™ switch	20	W 14
S 24 — Speed monitoring switch, chopper	22	W 25
S 25 — Air conditioning switch	25	W 2
S 26 — Speed monitoring switch, chaff spreader	15	
S 27 — Switch, raise/lower header	26	W 5
S 28 — Automatic function switch	26	W 5
S 29 — Switch, reel height adjustment	26	W 5
S 30 — Switch, reel horizontal adjustment	26	W 5

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	Section	Wiring harness
S 31 — Road safety switch	21	W 2
S 32 — Switch, header control	26	W 14
S 33 — Separator drive switch	21	W 3
S 34 — Header drive switch	21	W 3
S 35 — Unloading auger drive switch	27	W 3
S 36 — Switch, concave adjustment	25	W 5
S 38 — Switch, combine data center	25	W 14
S 39 — Switch, unloading auger swing	27	W 3
S 40 — Switch, cylinder speed adjustment	25	W 5
S 41 — Switch, fan speed adjustment	25	W 5
S 42 — Parking brake switch	09	W 5
S 44 — Four-wheel drive switch	28	W 7
S 45 — Switch, seat	--	
S 46 — Hazard warning light switch (USA)	--	
S 47 — Emergency cut-off switch	21	W 5
S 48 — Worklight switch	17	W 2
S 49 — Full-beam headlight switch	12	W 2
S 50 — Manual leveling control switch	24	W 3
S 51 — Leveling control switch automatic/manual	24	W 3
S 52 — Demoisturizer switch (air conditioning)	15	W 3
S 53 — Switch, header variable drive	26	W 3
S 54 — Switch, distributor adjustment	06	W 14
S 55 — Reverse travel switch	25	W 5
S 56 — Switch, chaffer	--	
S 57 — Switch, sieve	--	
S 58 — Sieve extension switch	--	
S 59 — End switch, leveling to the left	24	W 29
S 60 — End switch, leveling to the right	24	W 29
S 61 — ContourMaster switch	--	
S 62 — Switch, header horizontal adjustment	29	W 3
S 63 — Battery switch	01	W 12; W 13
S 64 — Mirror adjusting switch	16	W 39
S 65 — Mirror heater switch	16	W 39
S 66 — Switch, header lateral tilt	26	
S 67 — Engine speed switch	--	
S 68 — AHC switch, header lateral tilt	--	
S 69 — Switch, back-up alarm	--	
S 70 — Unloading auger drive switch	--	
S 71 — Area counter height cut-off switch	--	
S 72 — DIAL-A-MATIC™ switch on header	--	
V 1 — Fuse tester	04	A 15
V 2 — Diode, pressure switch	26	A 14
V 3 — Diode, raising header	26	A 14
V 4 — Diode, increase feeder house speed	26	A 14
V 5 — Diode, reel raising function	26	A 14
V 6 — Diode, reel back function	26	A 14

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	Section	Wiring harness
V 7 — Diode, reel forward function	26	A 14
V 8 — Diode, swinging unloading auger in	26	A 14
V 9 — Diode, swinging unloading auger out	26	A 14
V 10 — Diode, cylinder speed	26	A 14
V 11 — Diode, concave indicator	26	A 14
V 12 — Diode, concave indicator	--	
V 13 — Diode Y 6	26	A 14
V 14 — Diode Y 4	26	A 14
V 15 — Diode Y 2	26	A 14
V 16 — Diodes Y 3 and Y 5	26	A 14
V 17 — Diode Y 18	26	A 14
V 18 — Diode Y 19	26	A 14
V 19 — Diode Y 16	26	A 14
V 20 — Diode Y 17	26	A 14
V 21 — Diodes Y 22 and Y 23	21	A 15
V 22 — Diode Y 28	--	
V 23 — Diode Y 29	--	
V 24 — Diodes Y 26 and Y 27	27	A 14
V 25 — Diode Y 10	27	A 14
V 26 — Diode Y 11	27	A 14
V 27 — Diode Y 34	21	A 14
V 28 — Diode Y 31	26	A 14
V 29 — Diode Y 30	26	A 14
V 30 — Diode Y 12	24	A 14
V 31 — Diode Y 13	24	A 14
V 32 — Diode K 13	26	A 14
V 33 — Diode K 14	26	A 14
V 34 — Diode K 15	26	A 14
V 35 — Diode K 16	26	A 14
V 36 — Diode K 17	26	A 14
V 37 — Diode K 18	26	A 14
V 38 — Diode K 19	26	A 14
V 39 — Diode K 20	26	A 14
V 40 — Diode K 28	26	A 14
V 41 — Diode K 29	26	A 14
V 42 — Diode, raise header	26	A 14
V 43 — Diode, lower header	26	A 14
V 44 — Diode, header horizontal adjustment	29	A 14
V 45 — Diode, header horizontal adjustment	29	A 14
V 46 — Diode, leveling to the left	24	A 14
V 47 — Diode, leveling to the right	24	A 14
V 48 — Diode, header float control	30	A 14
V 51 — Diode K8	24	A 14
V 52 — Diode K9	24	A 14
V 53 — Diode Y14	29	A 14
V 54 — Diode Y15	29	A 14
V 55 — Diode Y13	--	A 14

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	Section	Wiring harness
V 56 — Diode Y6	--	
V 57 — Diode Y6	--	
V 58 — Diode DIAL-A-MATIC™	--	
V 59 — Diode K43	--	
V 60 — Diode K41	--	
V 61 — Diode K40	--	
V 62 — Zener diode 1N5344B	--	
V 63 — Zener diode 1N5344B	--	
V 64 — Zener diode 1N5444B	--	
V 65 — Diode, grain tank 3/4 full	--	
V 66 — Diode, air-conditioning compressor	--	
X 0 — Ground connection, cab wiring harness	--	W 2
X 1 — Ground connection, distribution harness	--	W 1
X 2 — Disconnect point, radio (USA)	--	W 2
X 3 — Disconnect point, CB radio	--	
X 4 — Disconnect point, DIAL-A-MATIC™	--	
X 5 — Fuse tester socket	04	A 15
X 6 — Connection, relay board	--	W 2
X 7 — Connection, relay board	--	W 2
X 8 — Connection, relay board	--	W 2
X 9 — Connection, relay board	--	W 2
X 10 — Connection, relay board	--	W 2
X 11 — Connection, relay board	--	W 2
X 12 — Connection, relay board	--	W 2
X 13 — Connection, relay board	--	W 2
X 14 — Connection, relay board	--	W 2
X 15 — Trailer socket	--	W 9
X 16 — Terminal, fuse board	--	W 21; W 12
X 17 — Connection, fuse board, l.h.	--	W 1
X 18 — Connection, fuse board, r.h.	--	W 1
X 19 — Plug for warning light block	--	
X 20 — Plug for alarm light block	--	
X 21 — Disconnect point, header wiring harness	--	W 10; W 22
X 22 — Disconnect point, chopper wiring harness	--	W 9; W 25
X 23 — Disconnect point, cab	27	W 7; W 2
X 24 — Disconnect point, solenoid valve block, basic hydraulics	--	W 9
X 25 — Disconnect point, cab	--	W 1; W 2
X 26 — Disconnect point, cab	--	W 1; W 2
X 27 — Disconnect point, cab	--	W 1; W 2
X 28 — Disconnect point, cab	--	W 1; W 2
X 29 — Splice 071	--	W 2
X 30 — Electr. ground, adjusting potentiometers	--	
X 31 — Programming window flasher	13	W A 14
X 32 — Plug for solenoid block 2	--	W 22
X 33 — Ground distributor, hydraulic block 1	--	W 9
X 34 — Ground distributor, hydraulic block 2	--	W 22

ZX,TM4543009512-19-30JUN97

	Section	Wiring harness
X 35 — 37-terminal armrest plug	--	W 2; W 5
X 36 — Plug for forward/reverse lever	--	W 5
X 37 — Plug for dashboard 1	--	W 2; W 3
X 38 — Plug for dashboard 2	--	W 2; W 14
X 39 — 18-term. plug on data center relay board	--	W 1
X 40 — Cross-shaker switch plug	--	W 9
X 41 — Straw chopper plug	--	W 20
X 42 — Data center control board plug	--	W 1
X 43 — Straw hood wiring harness plug	--	W 20; W 9
X 44 — Plug for basic harness, r.h.	--	W 2; W 9
X 45 — Plug for basic harness, l.h.	--	W 2; W 9
X 46 — Plug for platform wiring harness	--	W 7; W 2
X 47 — Plug for Hillmaster wiring harness	--	W 29; W 1
X 48 — Plug for grain tank harness	--	W 15; W 9
X 49 — Plug for corner post harness	--	W 2; W 4
X 50 — Plug for electronic box of speed monitoring system	--	W 1
X 51 — Plug for header control	--	W 1
X 52 — Plug for DIAL-A-MATIC™ electronic box	--	W 1
X 53 — Spare plug	--	W 1
X 54 — Ground connection, engine wiring harness	--	W 12; W 13
X 55 — Plug for combine data center	--	W 2; W 23
X 56 — Plug for reel speed control	--	W 1
X 57 — Plug for electronic row guidance	--	
X 58 — Plug for flex. cable on chaffer	--	
X 59 — Plug for flex. cable on sieve	--	
X 60 — Plug for flex. cable on sieve extension	--	
X 61 — Plug for beacon light	--	
X 62 — Plug for engine wiring harness	--	W 12; W 13
X 63 — Plug (according to local requirements)	--	
X 64 — Ground connection, basic harness, l.h.	--	W 1
X 65 — Plug for steering column harness	--	W 7; W 8
X 66 — Plug for air-conditioning harness	--	W 2; W 6
X 67 — Socket, rear axle	09	W 9
X 68 — Socket, engine	--	
X 69 — Plug for battery + clock; radio; CB radio	--	
X 70 — Plug for sieve motors	--	
X 71 — Plug for chaff spreader harness	--	W 25; W 26
X 72 — Plug for data center relay board	--	W 1
X 73 — 16-terminal plug for hydraulic block	--	W 10
X 74 — Plug for Hillmaster solenoid block	--	W 29
X 75 — Connection, leveling control box	--	W 29
X 76 — Plug for corner post harness	--	W 2; W 4
X 77 — Plug for feeder house harness	--	W 7; W 10
X 78 — Splice 245	--	W 2
X 79 — Splice 075	--	W 1

ZX,TM4543009513-19-30JUN97

	Section	Wiring harness
X 80 — Splice 1, ground for electronics	--	W 1
X 81 — Splice 2, ground for electronics	--	W 1
X 82 — Plug for ultrasonic sensors	29	W 7; W 1
X 83 — Splice 256	--	W 1
X 84 — Splice 327	--	
X 85 — Splice 050	--	
X 86 — Splice 147	--	W 20
X 87 — Splice 148	--	W 20
X 88 — Dashboard plug	--	W 2; W 3
X 89 — Splice 151	--	W 20
X 90 — Ground connection, straw hood	--	W 20
X 91 — Plug for walker sensor, l.h.	--	W 20
X 92 — Plug for walker sensor, r.h.	--	W 20
X 93 — Plug for sieve sensor	--	W 9
X 94 — Plug for straw hood lighting	--	W 20
X 95 — 5-terminal plug for ultrasonic sensors	--	W 22
X 96 — Bosch plug for float control	30	W 3
X 97 — Plug for electrical mirror adjustment	--	W 2; W 39
X 98 — Ground connection, electrical mirror adjustment	--	
X 99 — 2-terminal plug, 4-wheel drive solenoid	--	
X 100 — Ground connection, hydraulic block 3	--	W 10
X 101 — Plug for header lighting	--	W 22; W 32
X 102 — Plug for underslung chopper	--	
X 103 — Float control bridging plug	30	
X 104 — Plug for seat compressor	--	
X 105 — Plug for data bus	--	W 2
X 117 — 9-terminal plug for power board	--	W 1
X 118 — 9-terminal plug for power board	--	W 1
X 119 — Service plug for engine electronics	--	
X 120 — Service plug for engine electronics	--	
X 121 — Service plug for engine electronics	--	
X 122 — Splice, engine harness	--	
X 123 — Splice, engine harness	--	
X 159 — Plug for Hillmaster end-switch	--	W 29
X 160 — Plug for Hillmaster end-switch	--	W 29
X 161 — 6-terminal plug, header electrical clutch	--	
X 162 — 2-terminal plug, back-up alarm	--	
X 163 — 2-terminal plug, grain tank switch	--	

ZX,TM4543009514-19-30JUN97

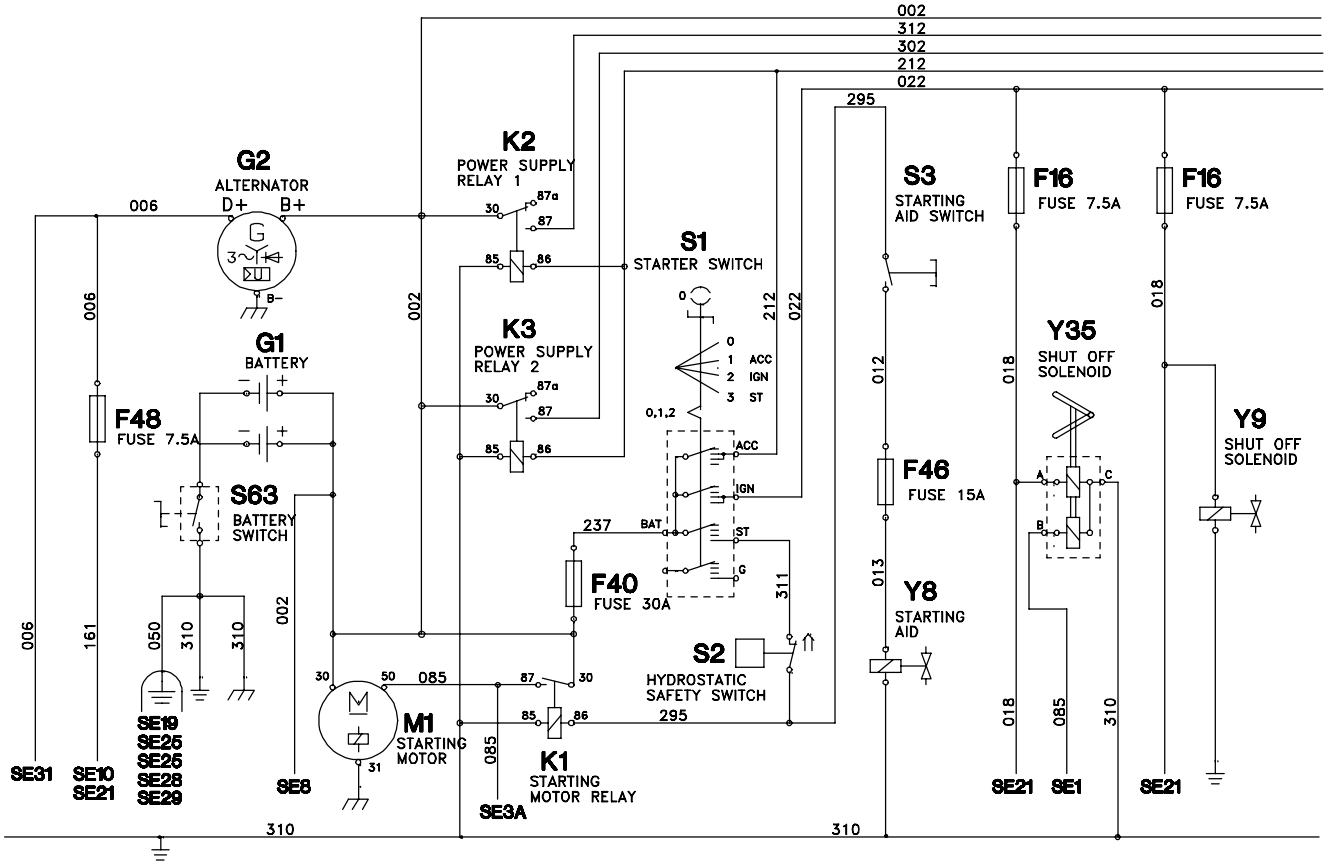
	Section	Wiring harness
X 164 — Splice, platform wiring harness	--	
X 165 — 2-terminal plug, header float pressure	--	
X 166 — 1-terminal plug, a/c compressor	--	
X 167 — Splice 215	--	
X 168 — 1-terminal plug, to S61	--	
X 169 — 19-terminal plug, to A7	--	
X 170 — 1-terminal plug, beacon light	--	
X 171 — 4-terminal plug, header lateral tilt	--	
X 172 — Splice 050	--	
X 173 — Splice 327	--	
X 174 — Splice 310	--	
X 175 — Splice 431	--	
X 176 — Splice 433	--	
X 177 — Splice 421	--	W 7
X 178 — Splice 423	--	W 7
X 179 — Splice 421	--	W 22
X 180 — Splice 423	--	W 23
X 181 — 4-term. plug, header potentiometer, l.h.	--	
X 182 — 4-term. plug, header potentiometer, r.h.	--	
X 183 — 3-terminal plug	--	
Y 1 — Main valve, solenoid control block	27	W 9
Y 2 — Header solenoid valve	26	W 9
Y 3 — Solenoid, raise header	26	W 9
Y 4 — Solenoid, lower header	26	W 9
Y 5 — Solenoid, raise header	26	W 9
Y 6 — Solenoid, lower header	26	W 9
Y 8 — Solenoid, ether starting aid	02	W 13
Y 9 — Solenoid, shut off engine	03A/B	W 12
Y 10 — Solenoid, swing in unloading auger	27	W 9
Y 11 — Solenoid, swing out unloading auger	27	W 9
Y 12 — Solenoid, leveling to the left	24	W 29
Y 13 — Solenoid, leveling to the right	24	W 29
Y 14 — Solenoid, header horizontal position, left-hand	29	W 10; W 11
Y 15 — Solenoid, header horizontal position, right-hand	29	W 10; W 11
Y 16 — Solenoid, move reel forward	26	W 11; W 22
Y 17 — Solenoid, move reel back	26	W 11; W 22
Y 18 — Solenoid, lower reel	26	W 11; W 22
Y 19 — Solenoid, raise reel	26	W 11; W 22
Y 20 — Solenoid, lower combine	24	W 29
Y 21 — Solenoid, raise combine	--	
Y 22 — Solenoid, engage separator	21	W 9
Y 23 — Solenoid, engage separator	21	W 9
Y 26 — Solenoid, unloading grain	27	W 9

ZX,TM4543009515-19-30JUN97

	Section	Wiring harness
Y 27 — Solenoid, unloading grain	27	W 9
Y 28 — Solenoid, reduce cylinder speed	25	W 9
Y 29 — Solenoid, increase cylinder speed	25	W 9
Y 30 — Solenoid, reduce feeder house speed	26	W 10
Y 31 — Solenoid, increase feeder house speed	26	W 10
Y 32 — Solenoid, four-wheel drive	28	W 9
Y 33 — Compressor clutch	15	W 13; W 12
Y 34 — Header clutch	21	W 7
Y 35 — Engine shut-off solenoid	03A	W 13
Y 36 — Solenoid, underslung chopper	--	

ZX,TM4543009516-19-30JUN97

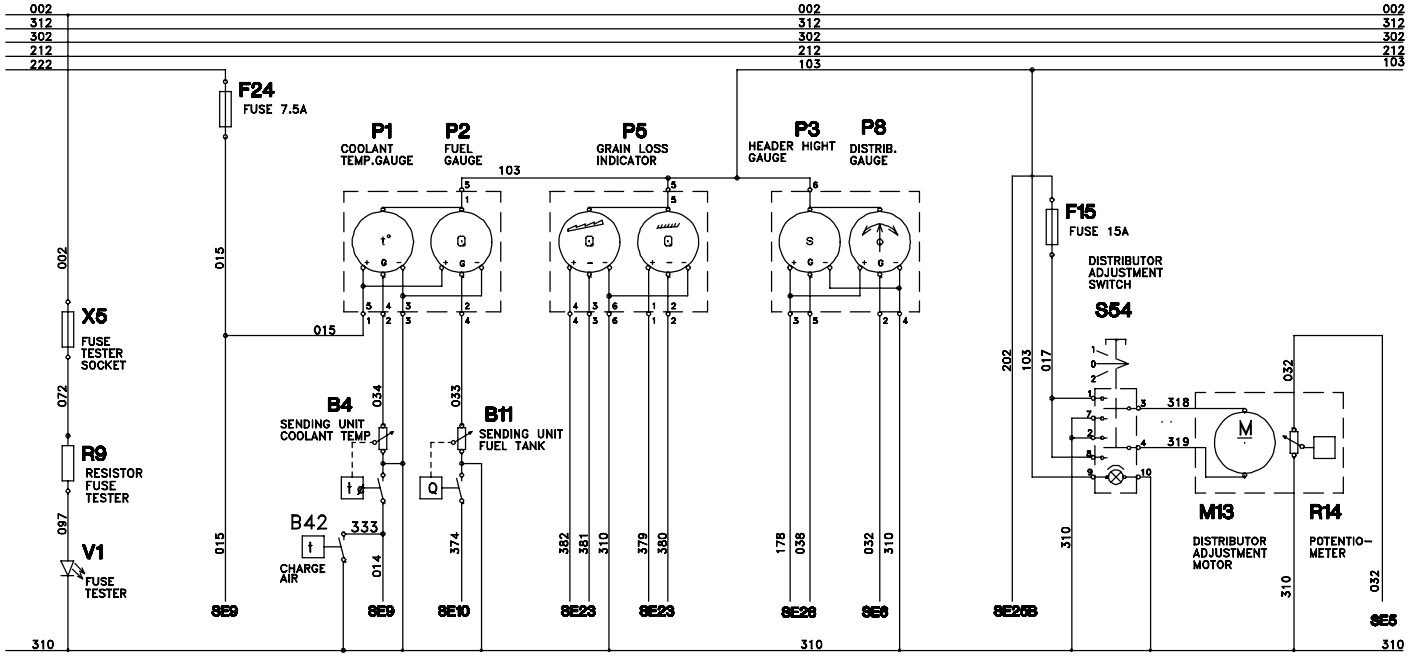
FUNCTIONAL SCHEMATIC, SECTIONS 1, 2, 3A AND 3B



SE1	SE2	SE3A	SE3B
POWER SUPPLY / STARTING MOTOR	START AID	ENGINE STOP	

ZX012426

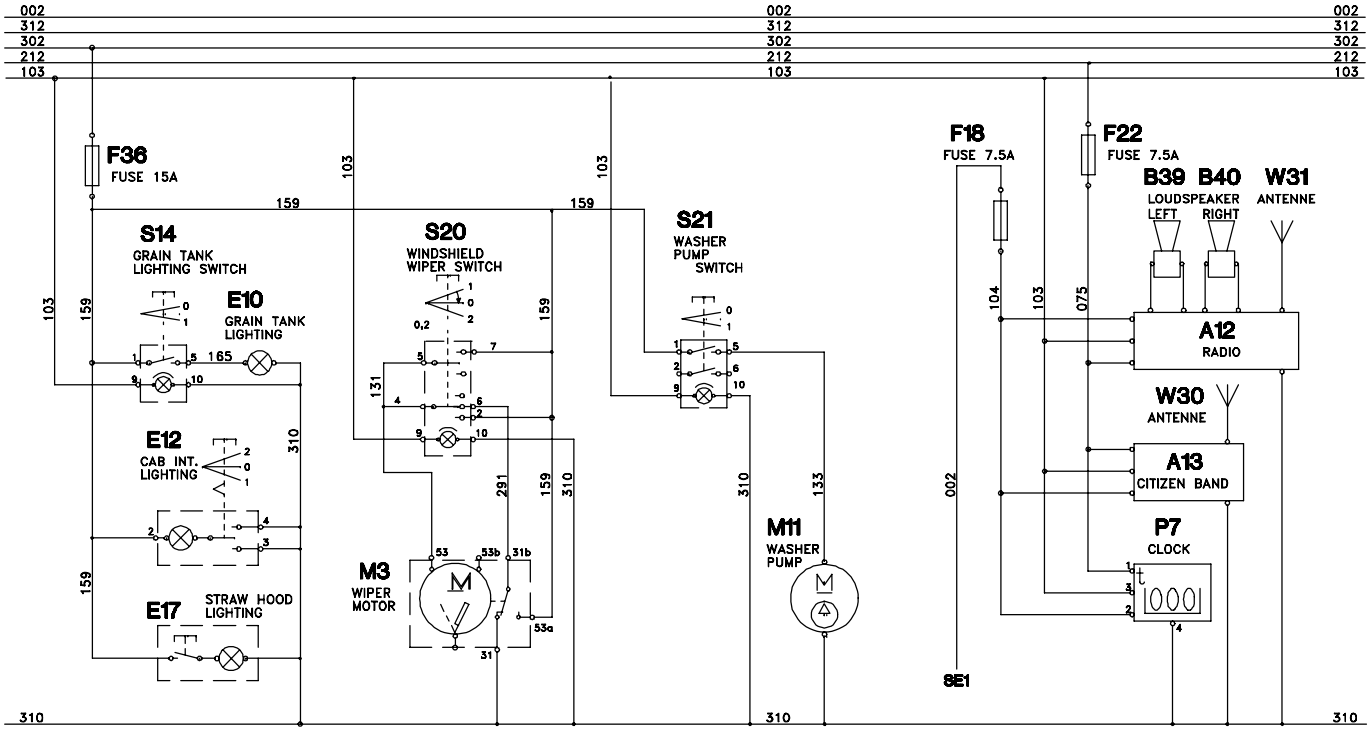
FUNCTIONAL SCHEMATIC, SECTIONS 4, 5 AND 6



SE4	SE5	SE6
F–TEST	INSTRUMENTS	CHOPPER DISTRIBUTOR ADJ.

ZX012427

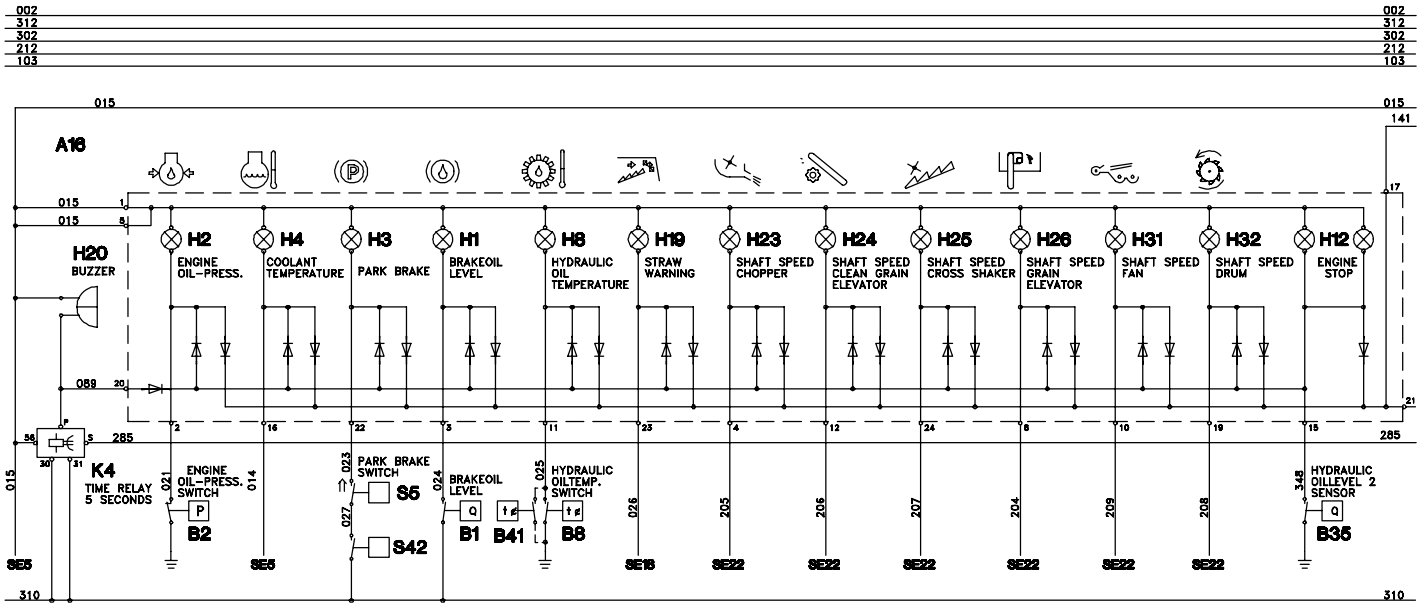
FUNCTIONAL SCHEMATIC, SECTIONS 7 AND 8



SE7	SE8
LIGHTING; WINDSHIELD WASHER	RADIO; CLOCK

ZX012428

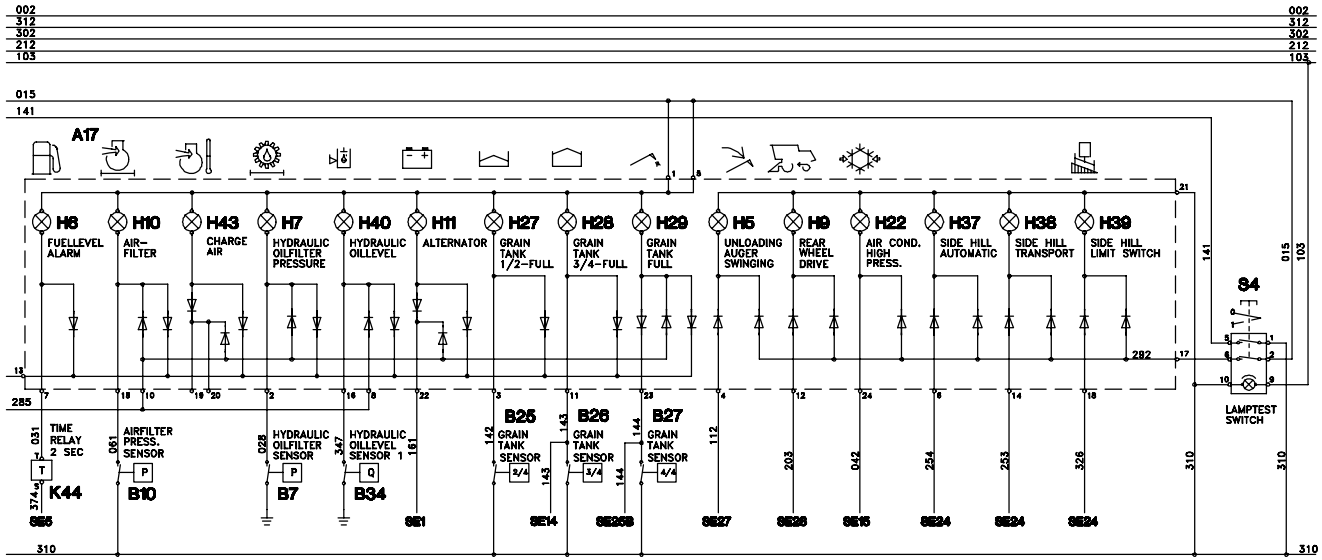
FUNCTIONAL SCHEMATIC, SECTION 9



SE9
ALARMMODUL – STOP–FUNKTIONEN

ZX012429

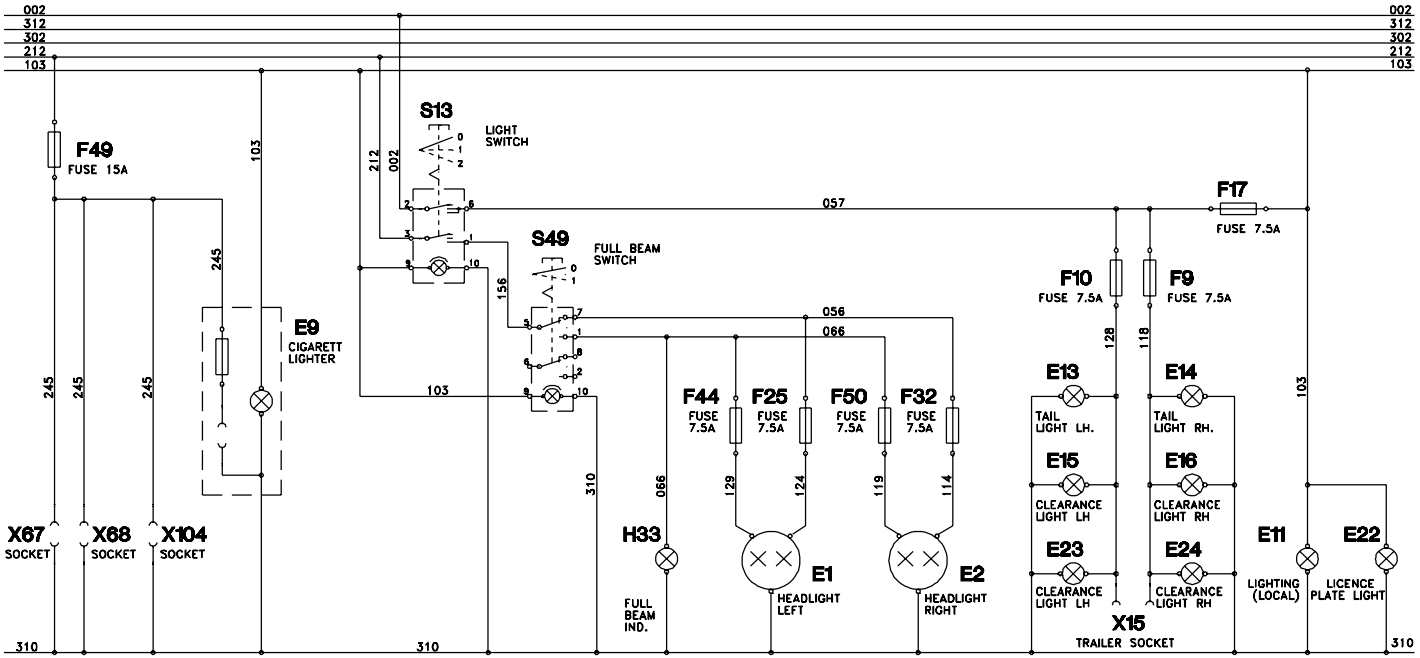
FUNCTIONAL SCHEMATIC, SECTION 10



SE10
WARNMODUL

ZX012430

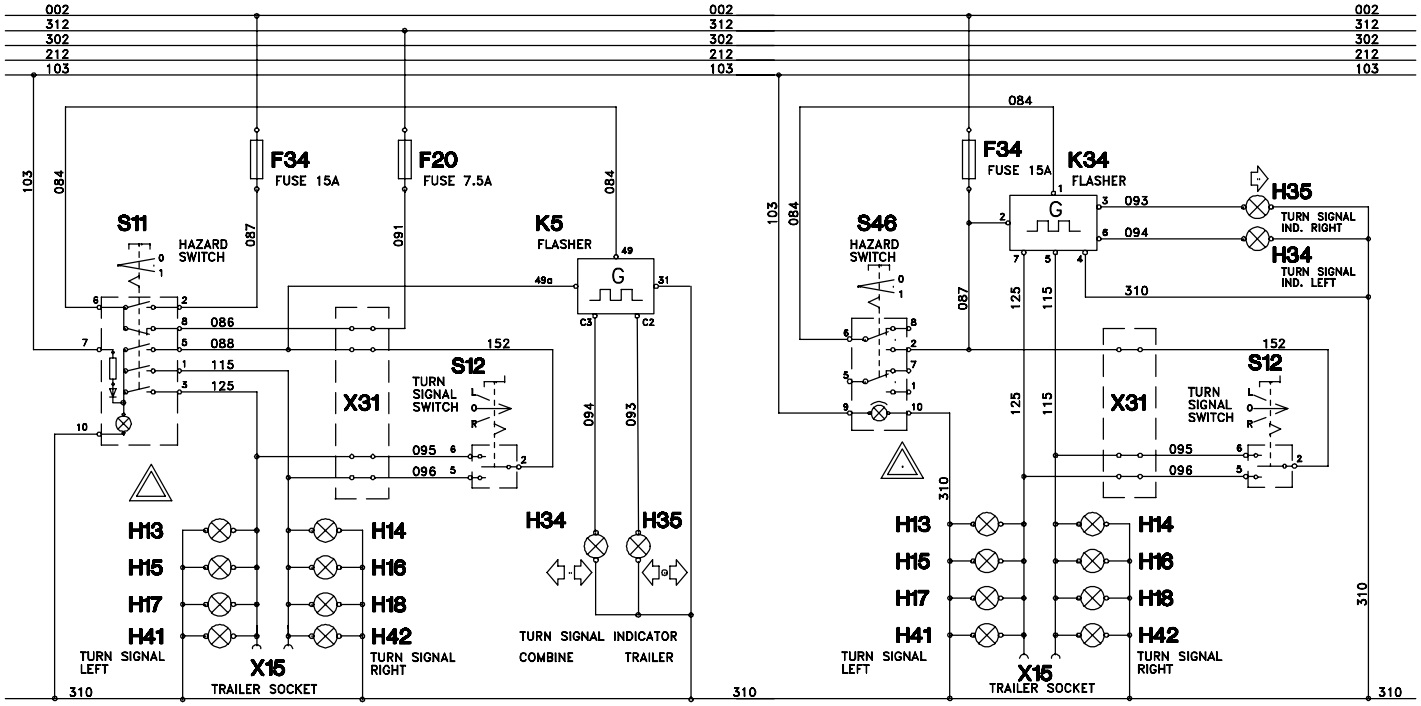
FUNCTIONAL SCHEMATIC, SECTIONS 11 AND 12



SE11	SE12
CIGARETT LIGHTER / SOCKETS	LIGHT FUNCTION

ZX012431

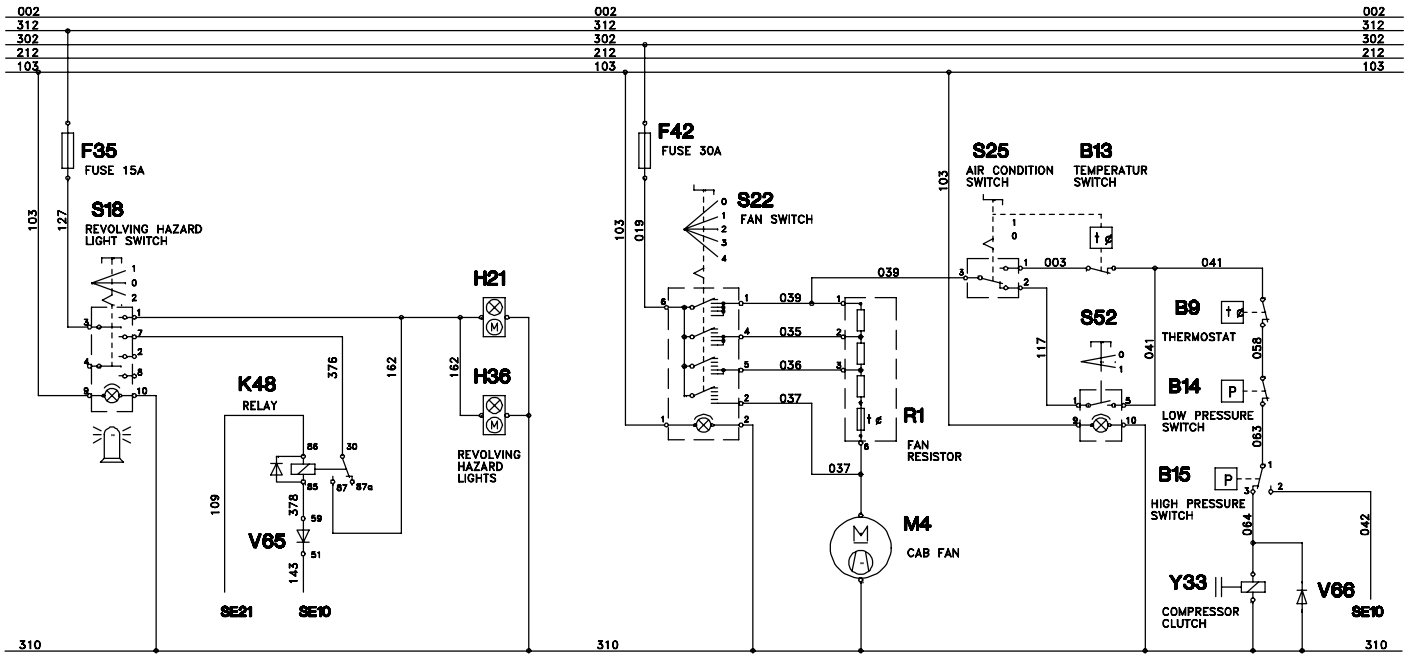
FUNCTIONAL SCHEMATIC, SECTIONS 13A AND 13B



SE13A	SE13B
FLASHER FUNCTION	FLASHER FUNCTION

ZX012432

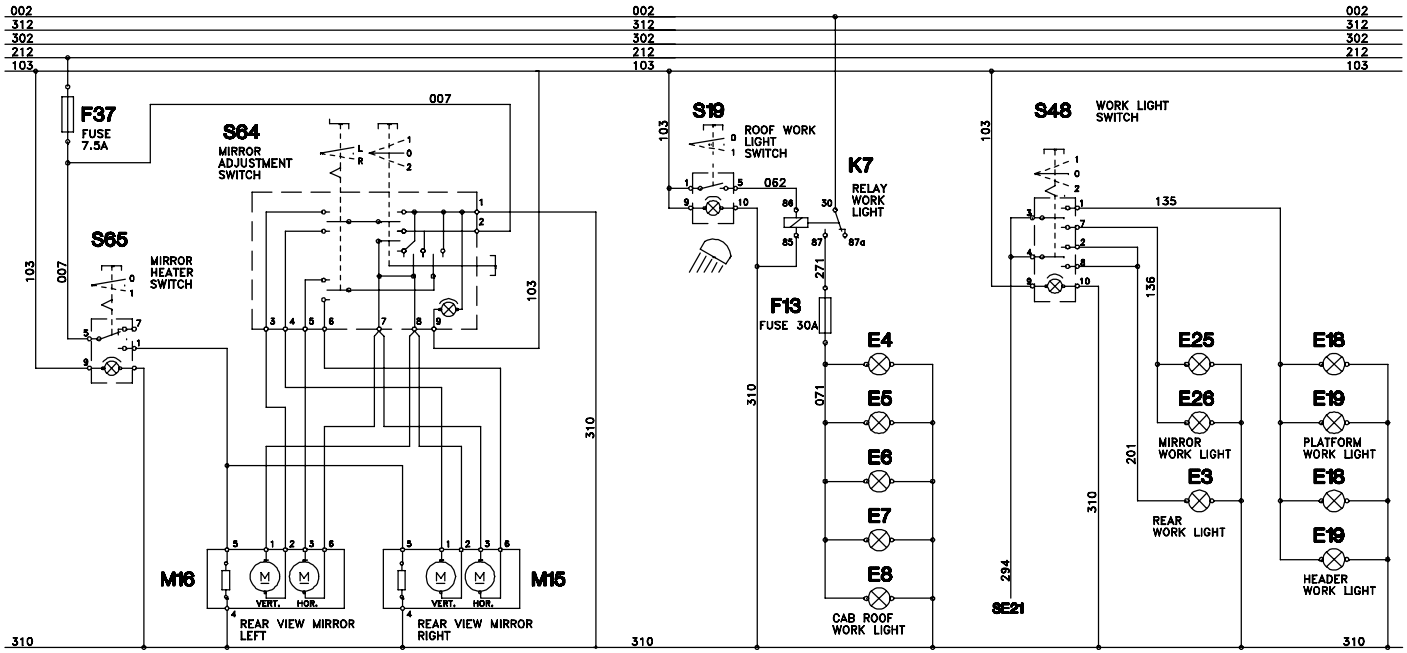
FUNCTIONAL SCHEMATIC, SECTIONS 14 AND 15



SE14	SE15
REVOLVING LIGHTS	AIR CONDITION

ZX012433

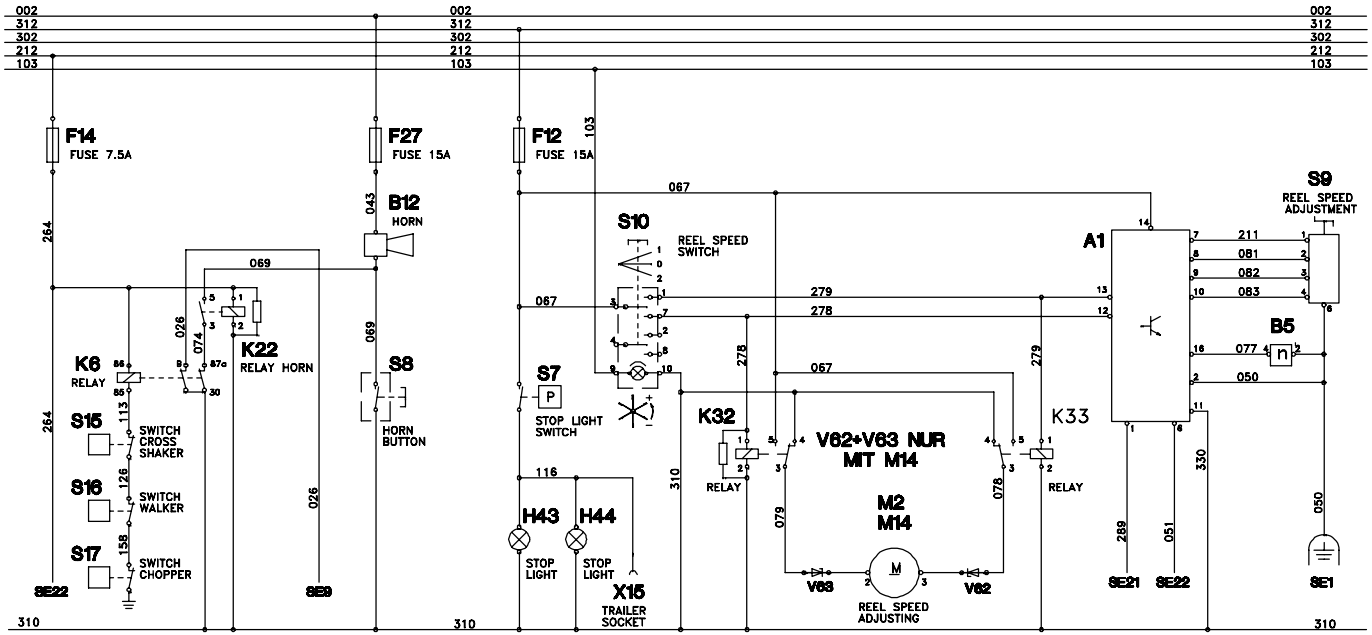
FUNCTIONAL SCHEMATIC, SECTIONS 16 AND 17



SE16	SE17
REAR VIEW MIRROR ADJUSTMENT	WORK LIGHTS

ZX012434

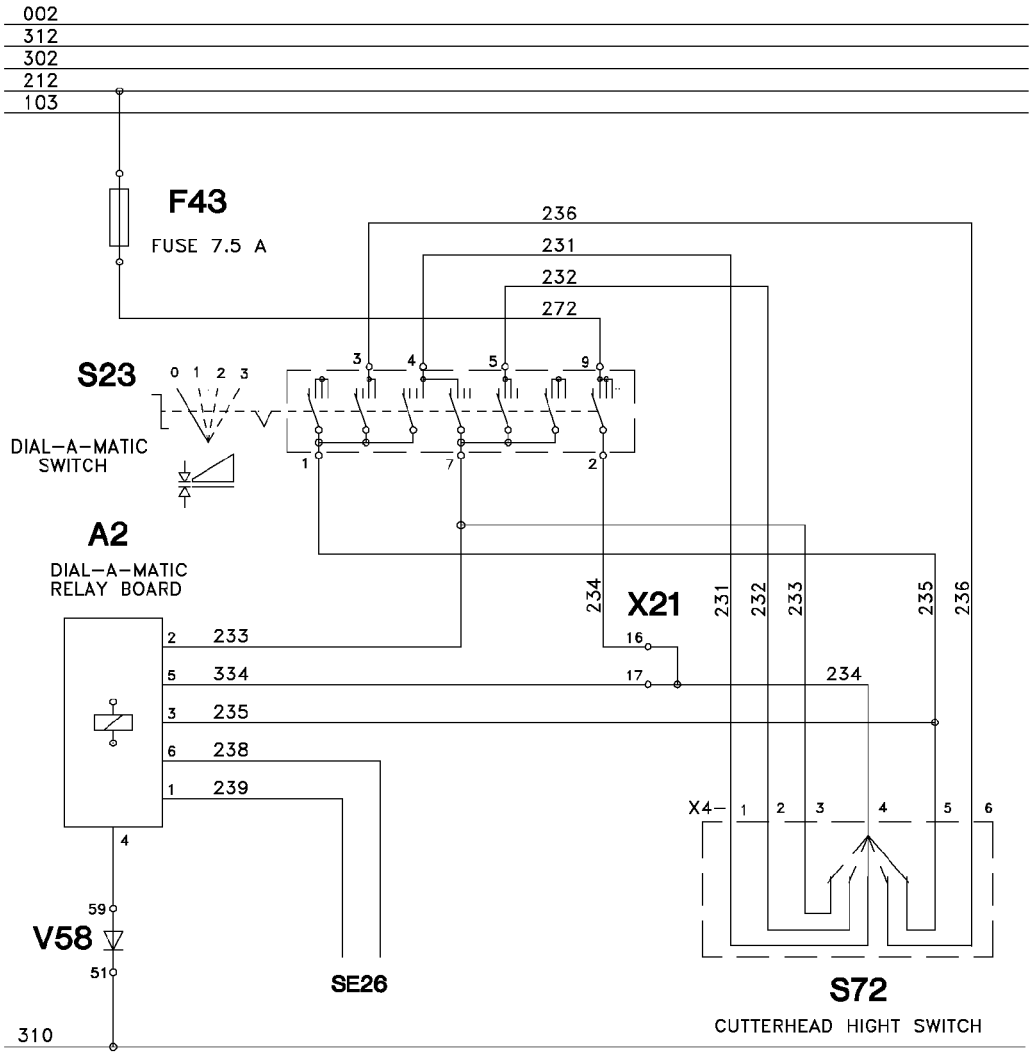
FUNCTIONAL SCHEMATIC, SECTIONS 18 AND 19



SE18	SE19
STRAW WARNING DEVICE	STOP LIGHTS ; REEL SPEED ADJUSTMENT

ZX012435

FUNCTIONAL SCHEMATIC, SECTION 20



SE20

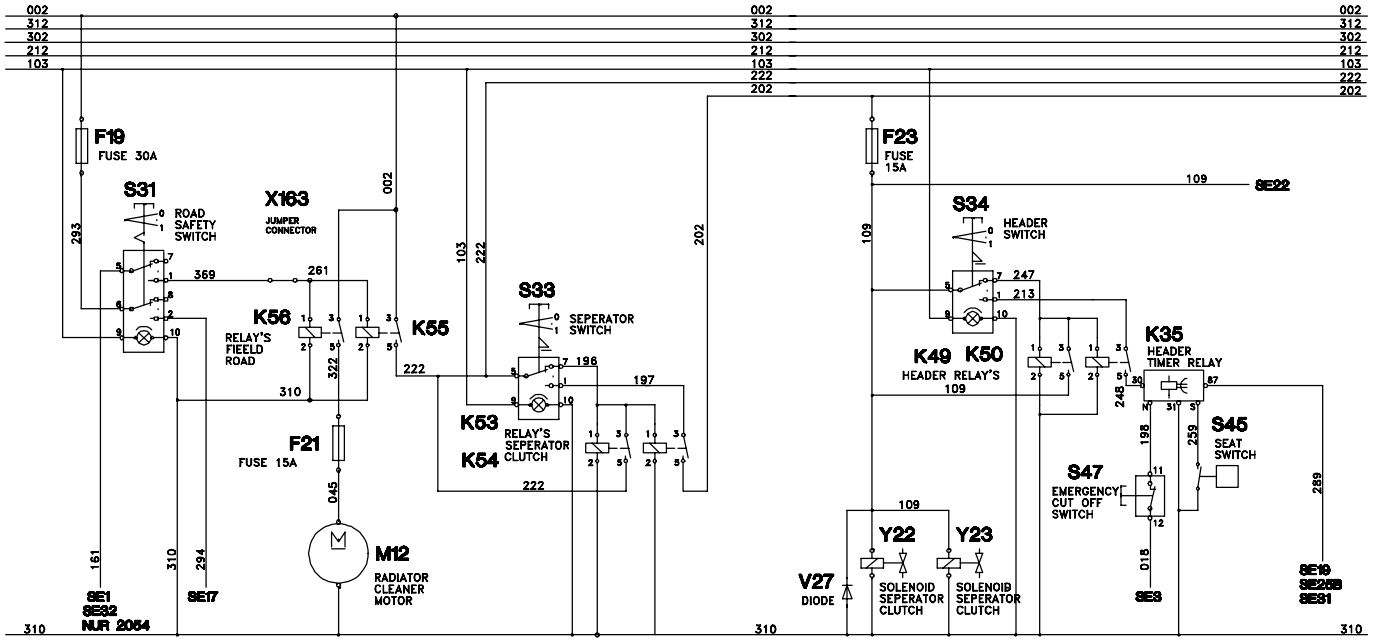
DIAL –A– MATIC

ZX012436

ZX012436 -UN-11MAR98

ZX,TM4543009527-19-30JUN97

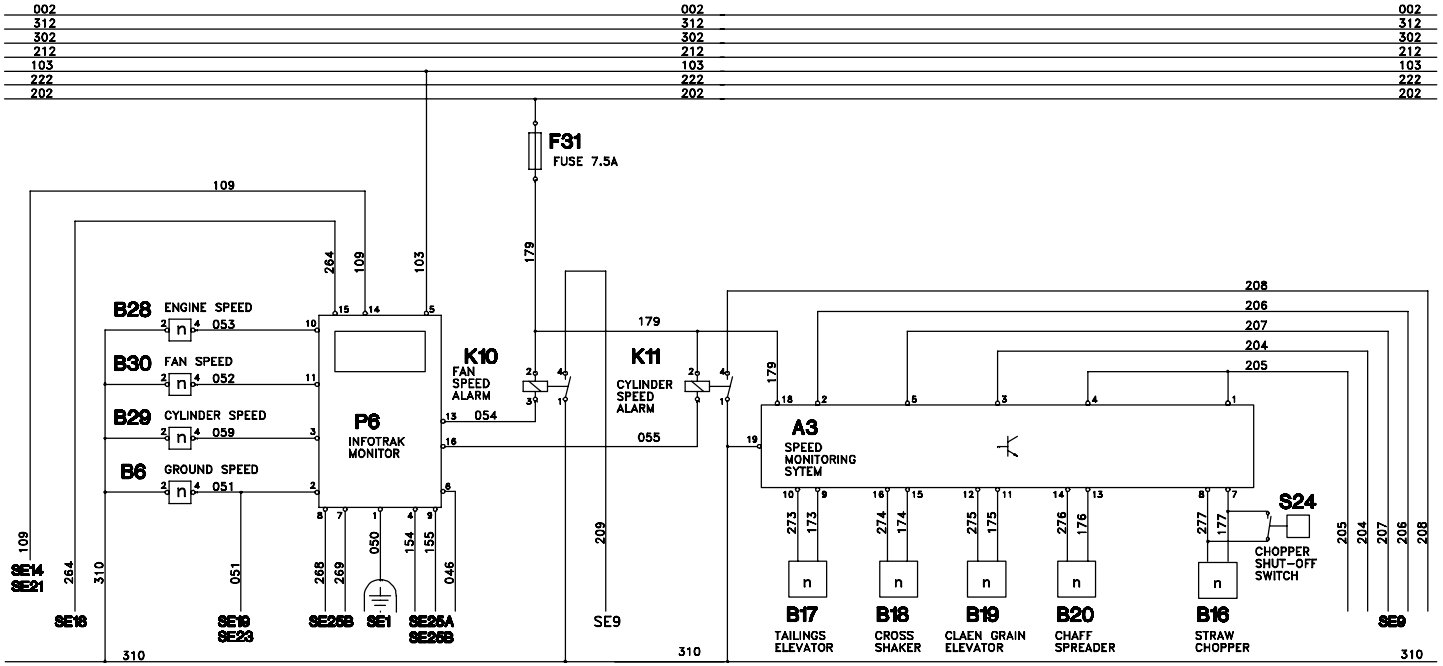
FUNCTIONAL SCHEMATIC, SECTION 21



SE21
SEPERATOR ; HEADER CLUTCH ; RADIATOR CLEANER MOTOR

ZX012437

FUNCTIONAL SCHEMATIC, SECTION 22

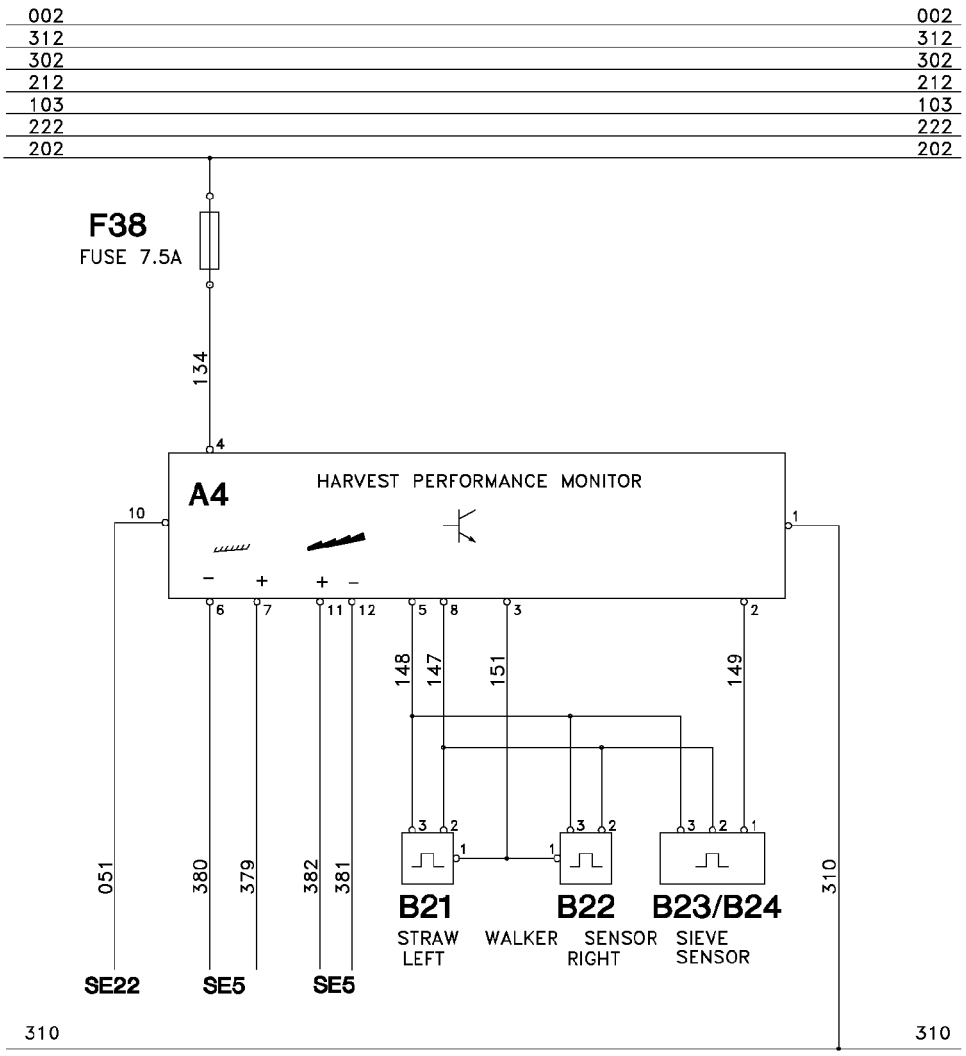


SE22

INFOTRAK MONITOR / SPEED MONITORING SYSTEM

ZX012438

FUNCTIONAL SCHEMATIC, SECTION 23



SE23

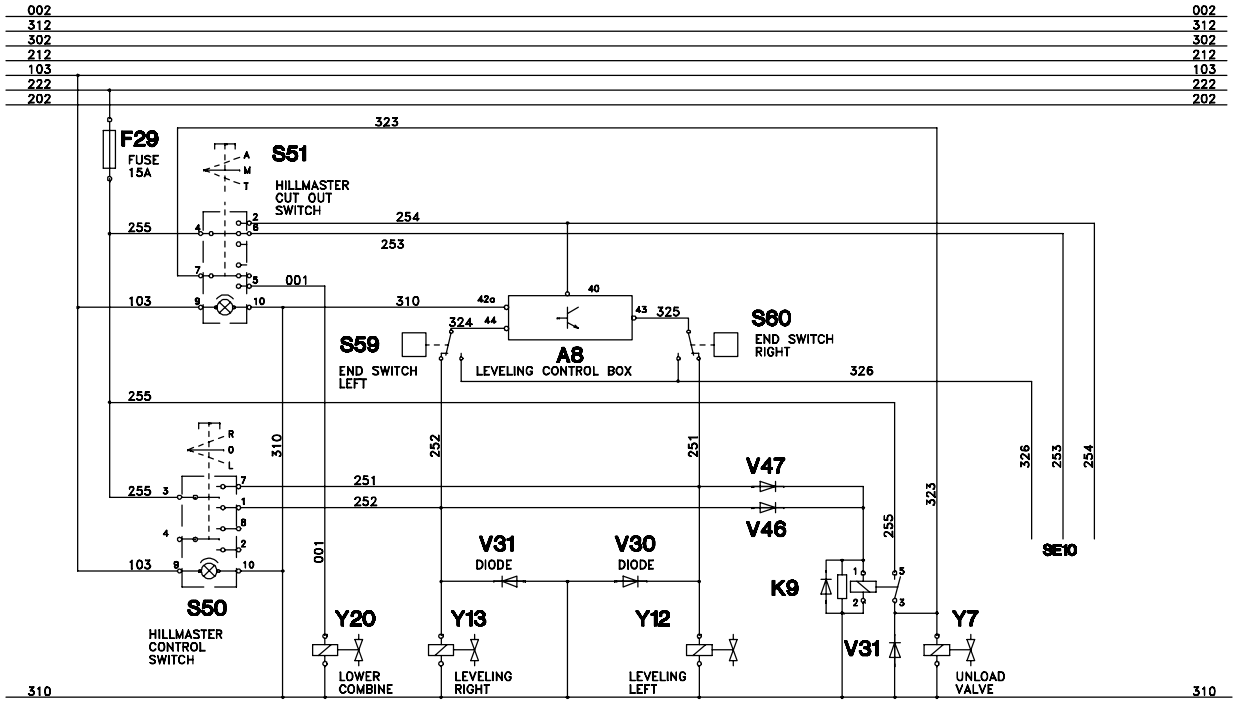
HARVEST PERFORMANCE MONITOR

ZX012439

ZX012439 -UN-11MAR98

ZX,TM4543009530-19-30JUN97

FUNCTIONAL SCHEMATIC, SECTION 24

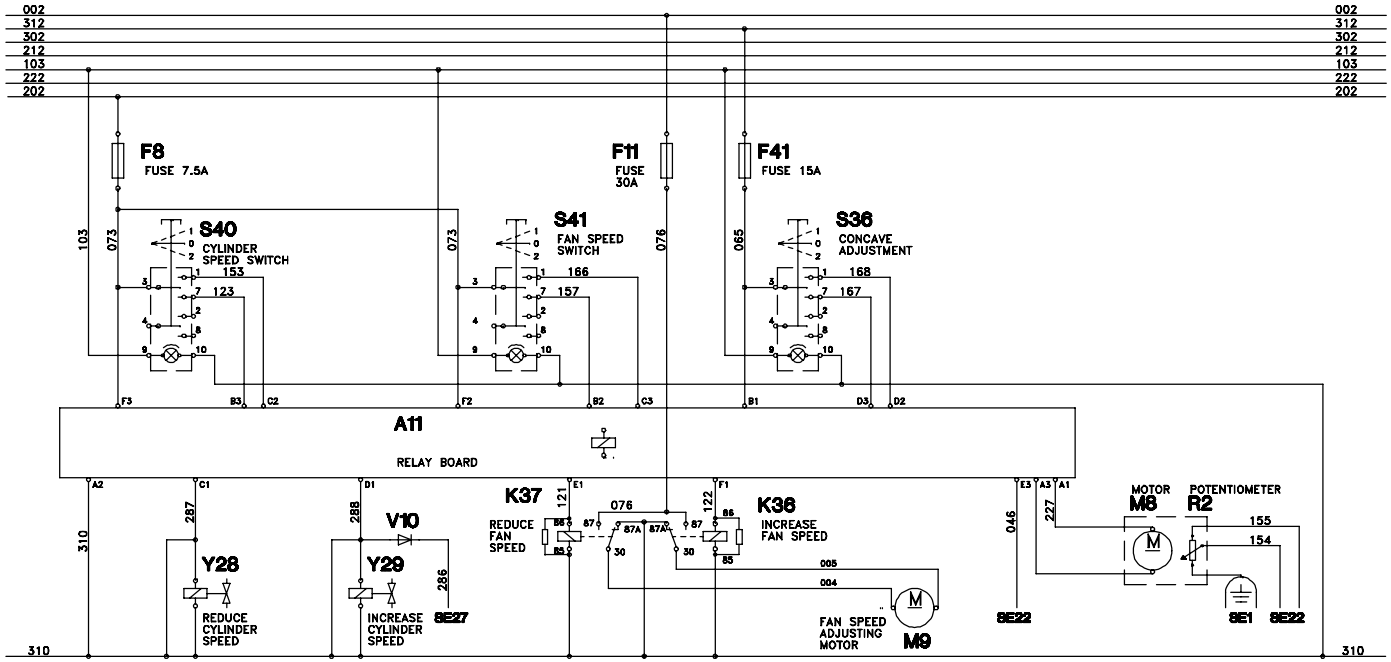


SE24

HILLMASTER LEVELING SYSTEM

ZX012440

FUNCTIONAL SCHEMATIC, SECTION 25A

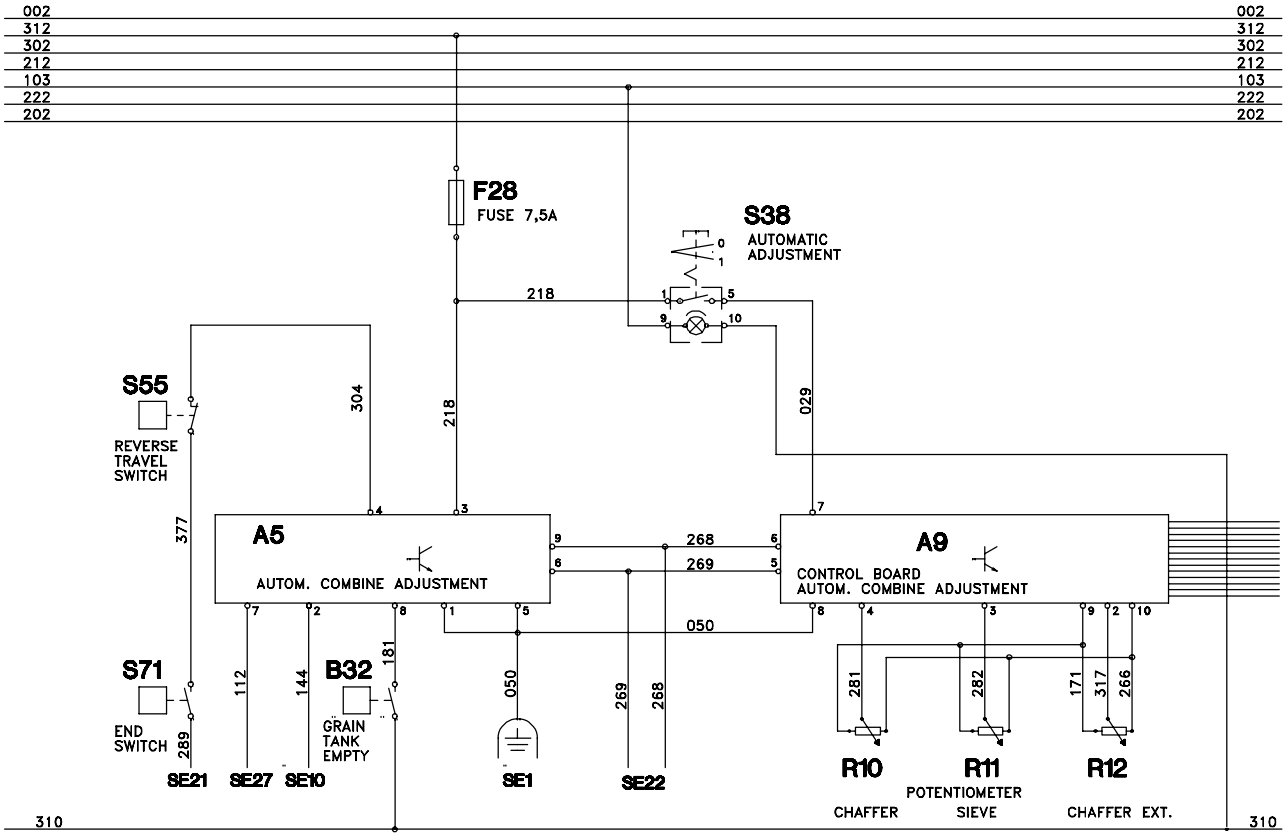


SE25A

CYLINDER , CONCAVE , FAN ADJUSTMENT

ZX012441

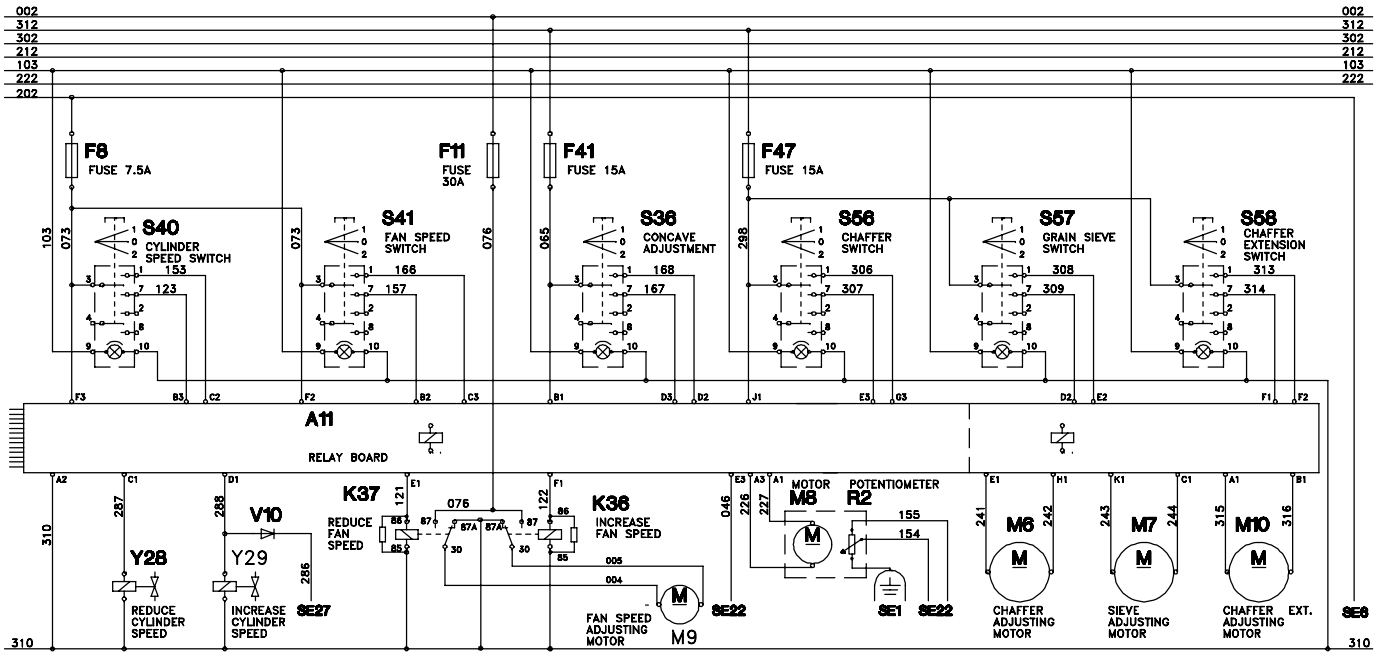
FUNCTIONAL SCHEMATIC, SECTION 25B - PART 1



SE25B
CYLINDER ;CONCAVE ; FAN ADJUSTMENT —PART 1

ZX012442

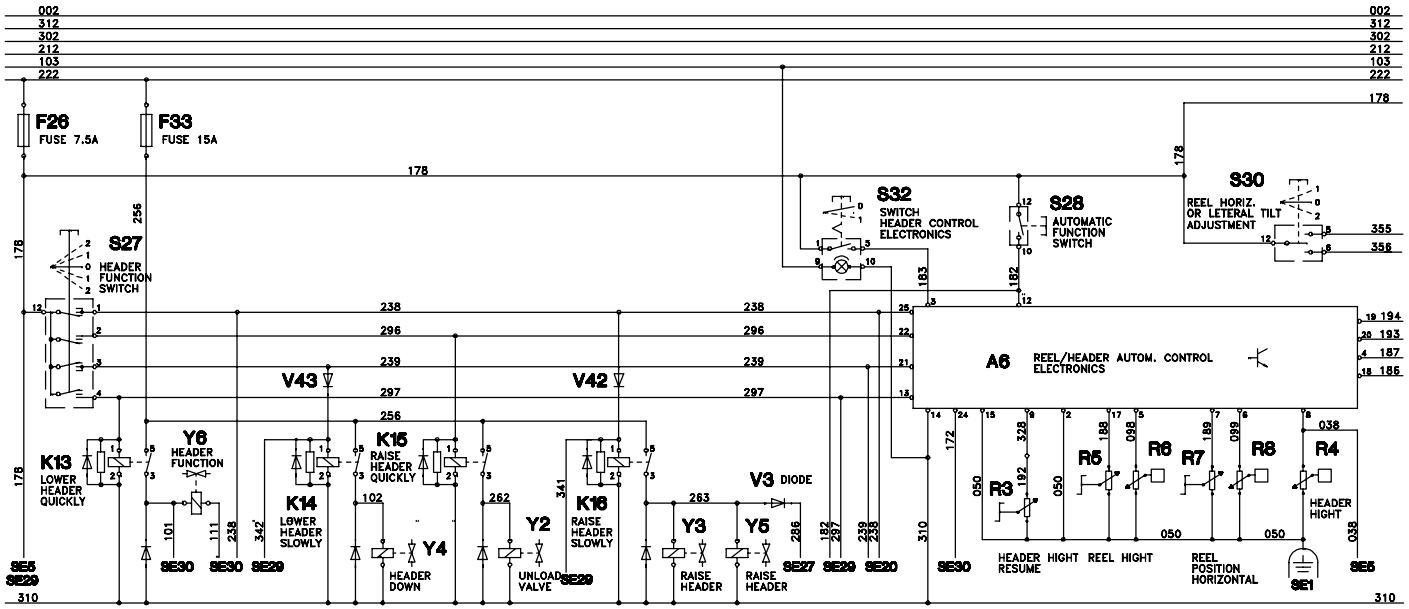
FUNCTIONAL SCHEMATIC, SECTION 25B - PART 2



SE25B
CYLINDER , CONCAVE , FAN ADJUSTMENT —PART 2

ZX012443

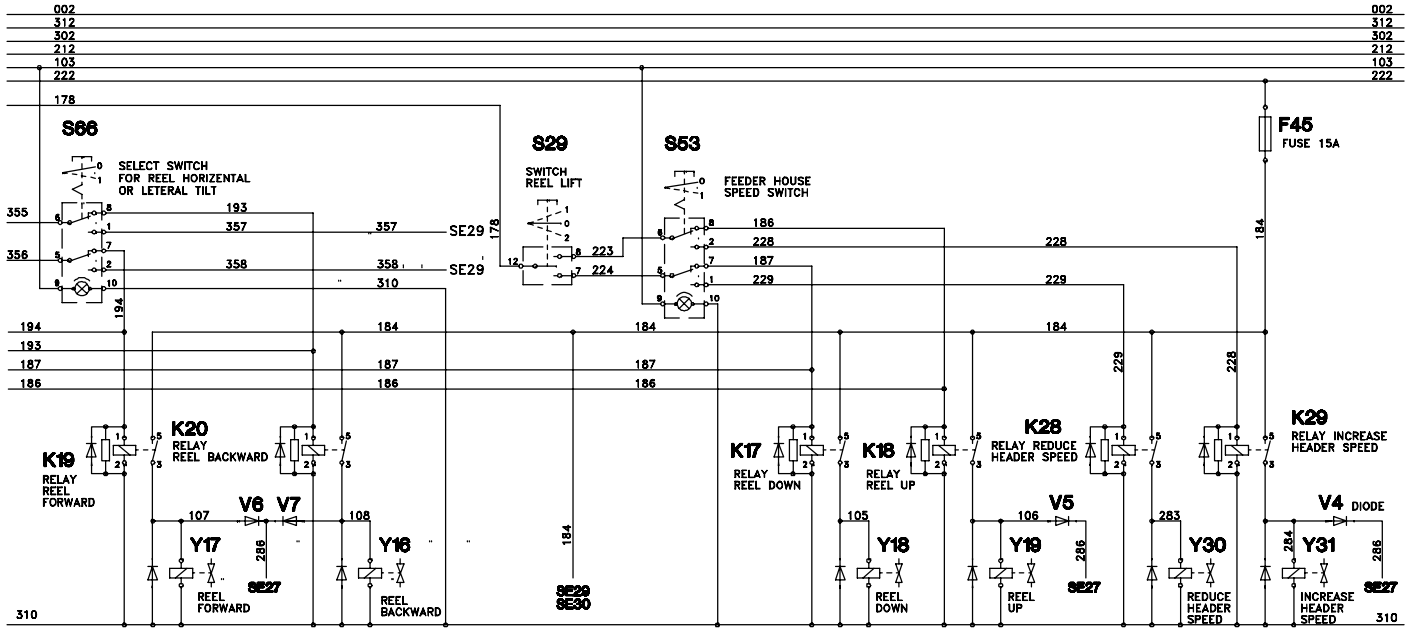
FUNCTIONAL SCHEMATIC, SECTION 26 - PART 1



SE26
HEADER ADJUSTMENT (CUTTING HEIGHT; REEL; FLOAT) –PART 1

ZX012444

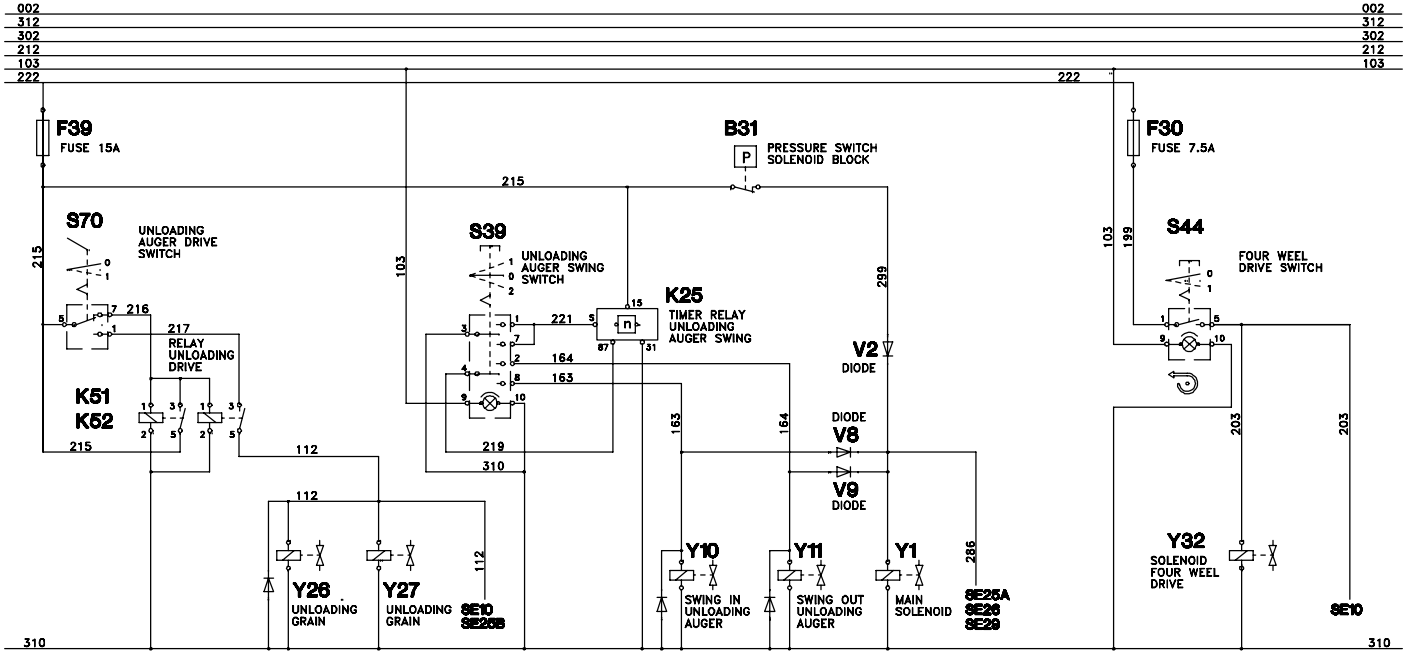
FUNCTIONAL SCHEMATIC, SECTION 26 - PART 2



SE26
HEADER ADJUSTMENT (CUTTING HEIGHT; REEL; FLOAT) —PART 2

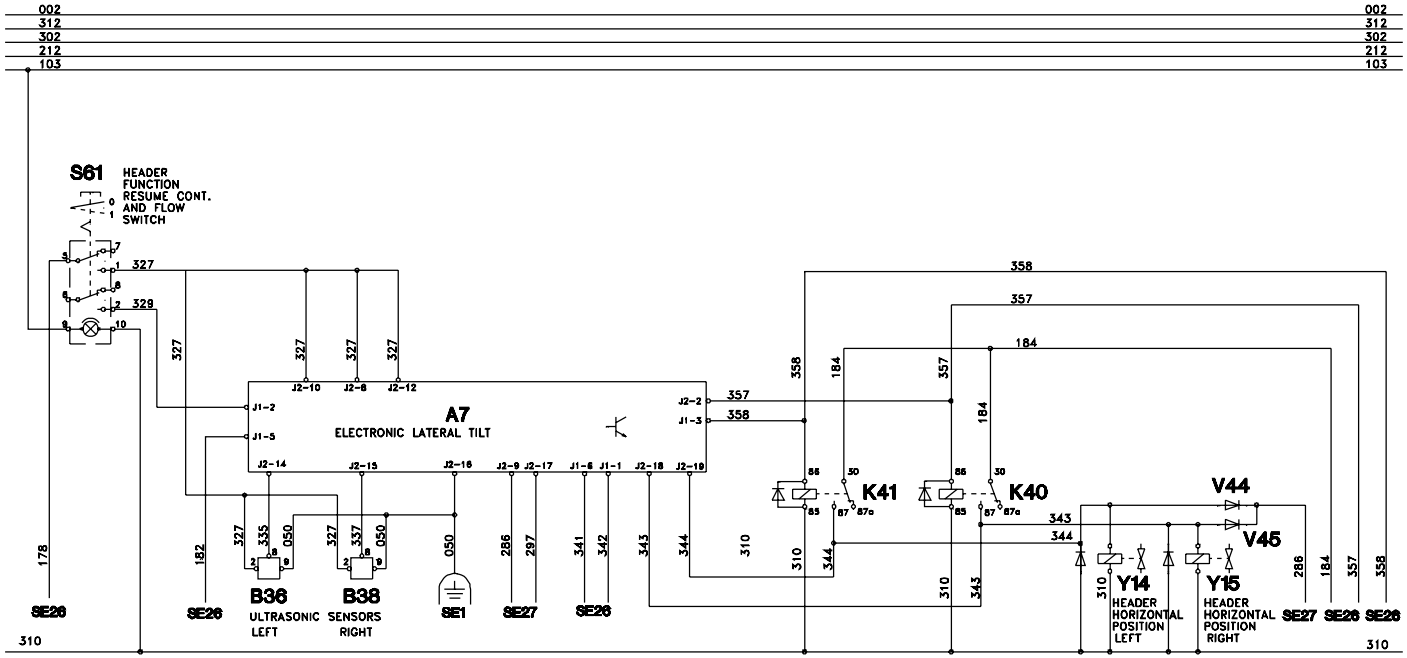
ZX012445

FUNCTIONAL SCHEMATIC, SECTIONS 27 AND 28



ZX012446

FUNCTIONAL SCHEMATIC, SECTION 29

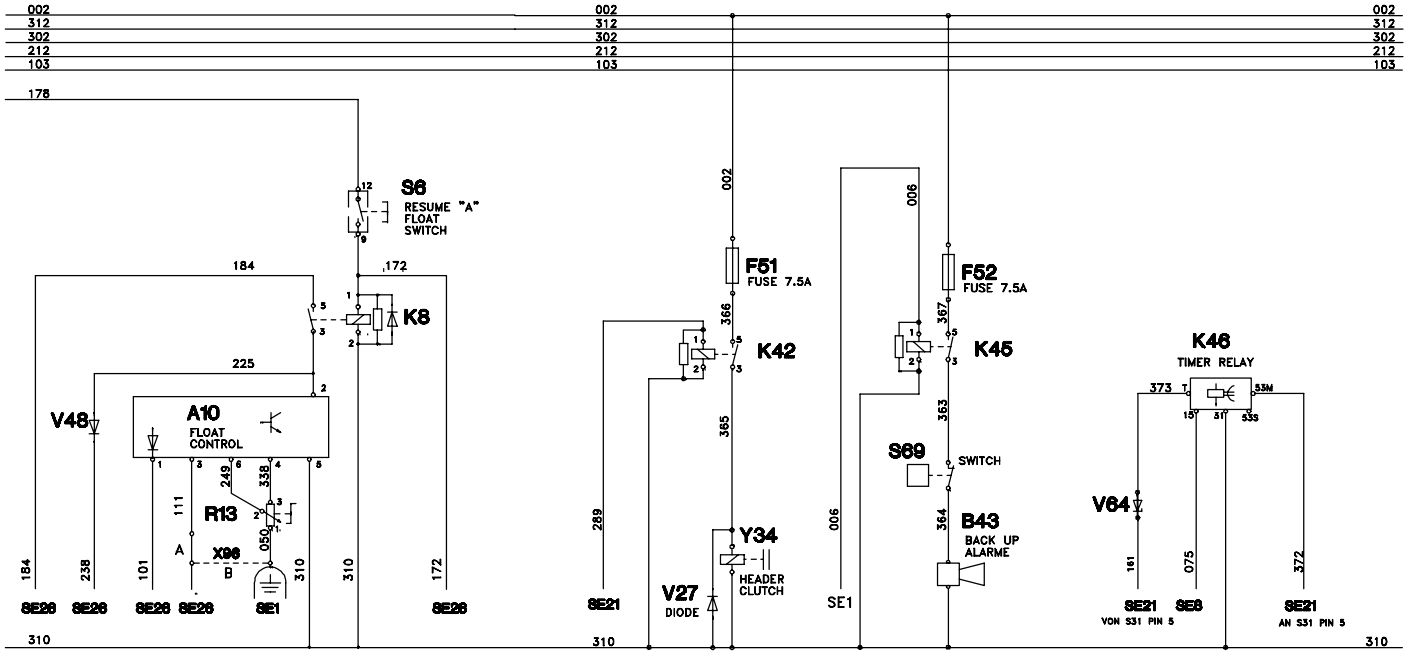


SE29

CUTTING HIGHT CONTROL (ULTRASONICS)

ZX012447

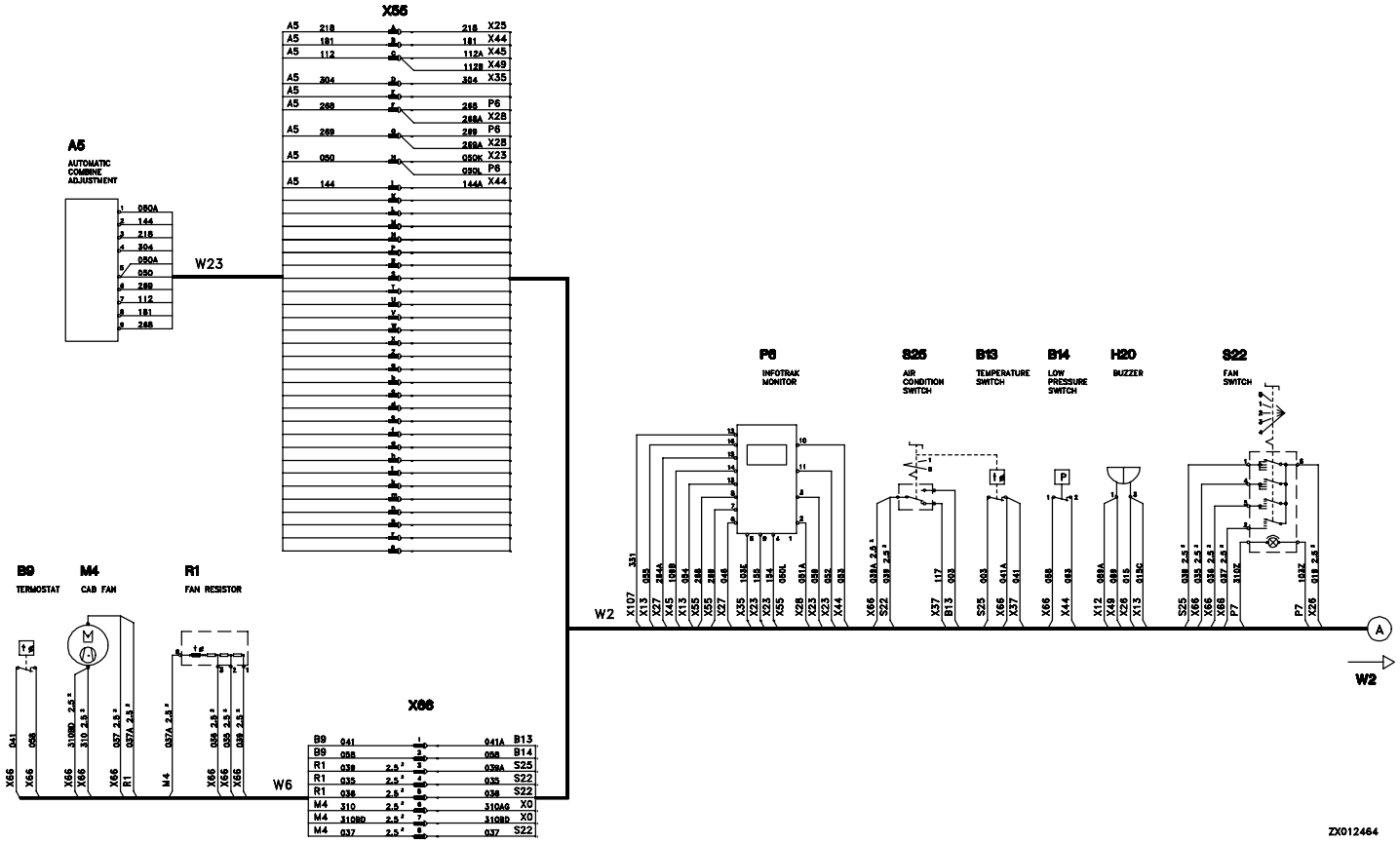
FUNCTIONAL SCHEMATIC, SECTIONS 30, 31 AND 32



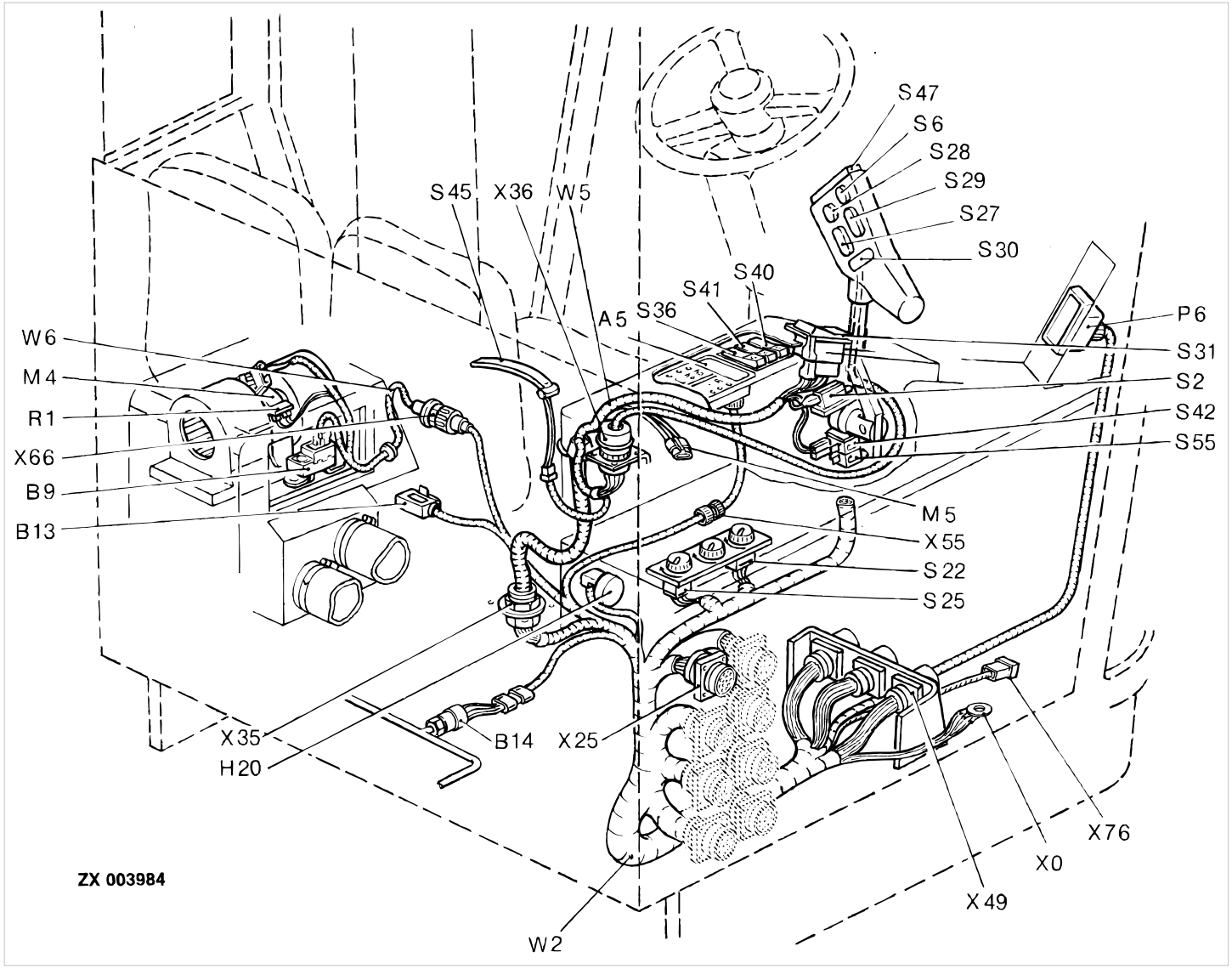
SE30	SE31	SE32
FLOAT CONTROL	BACK UP ALARME	TIMER RELAY 4,5S MD 2054

ZX012448

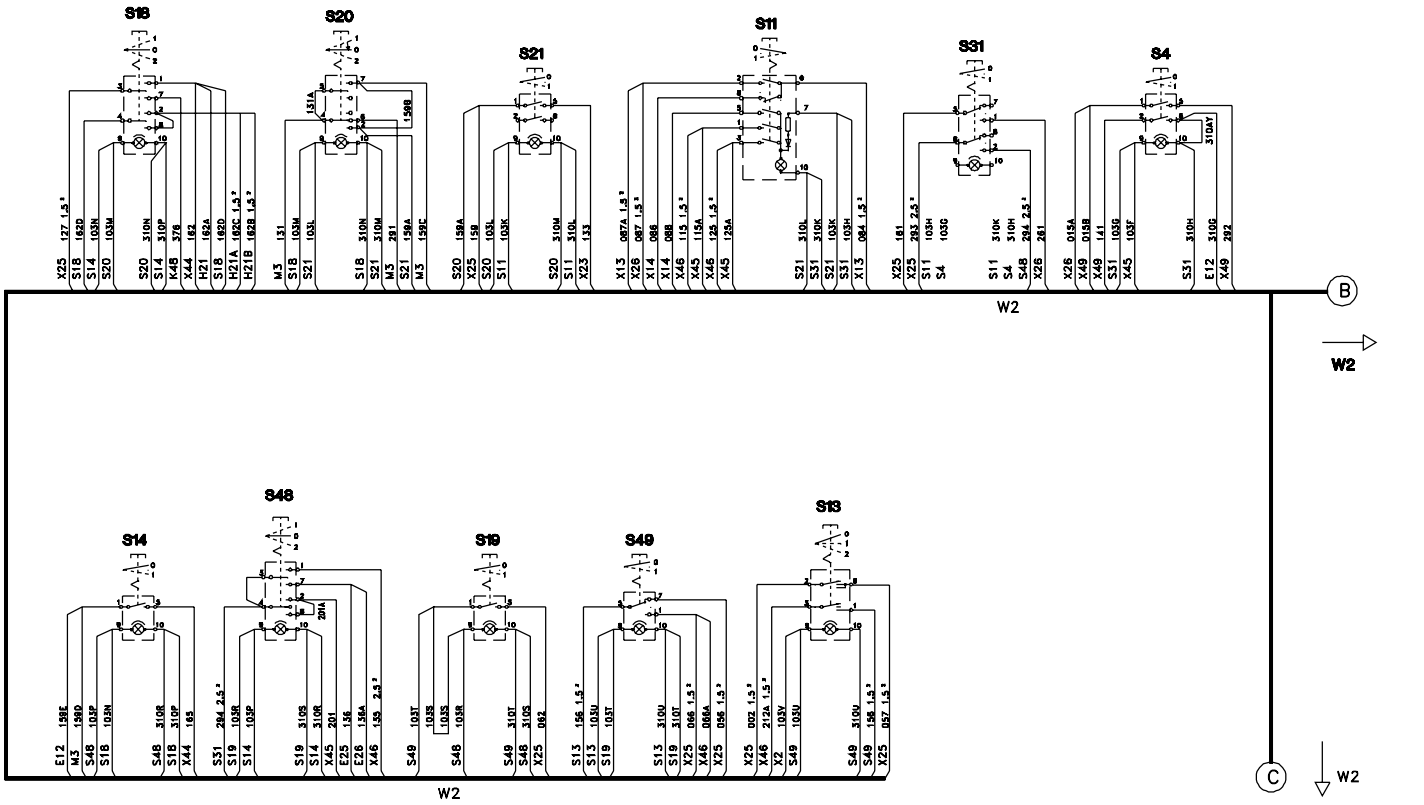
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 1



LOCATION OF CAB WIRING HARNESS W2 (PART 1), ARMREST WIRING HARNESS W5 AND AIR CONDITIONING WIRING HARNESS W6 WITH COMPONENTS

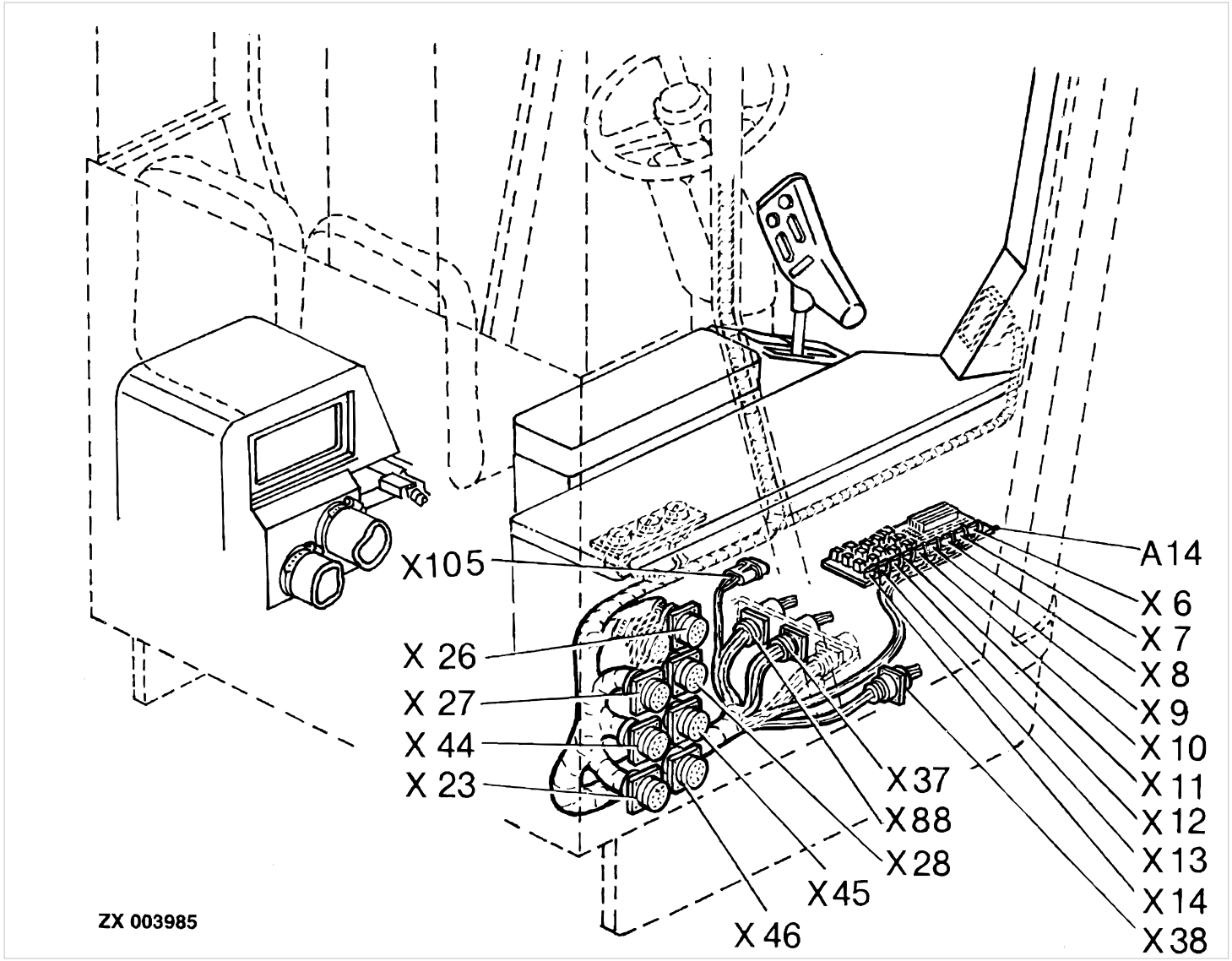


WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 2

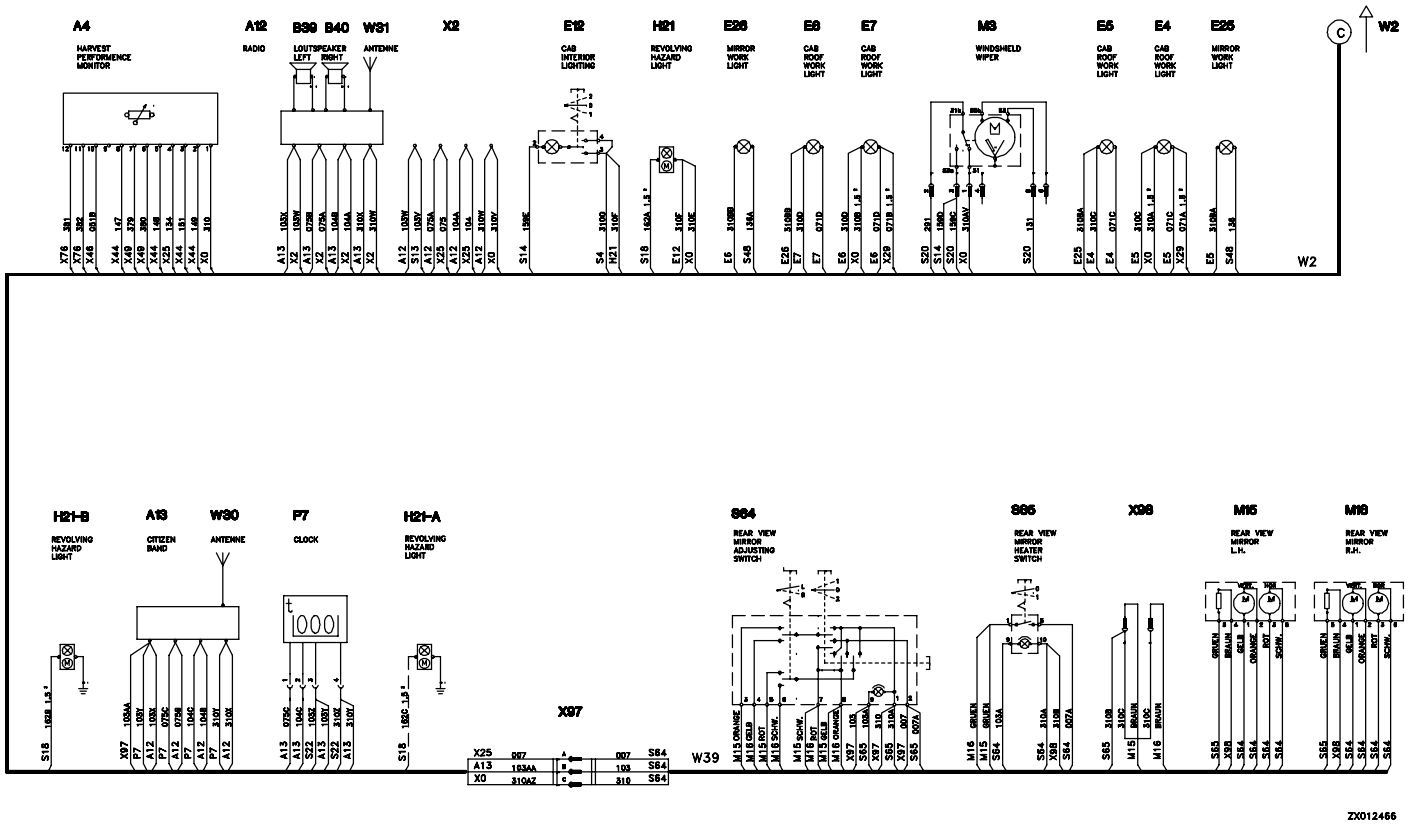


ZX012465

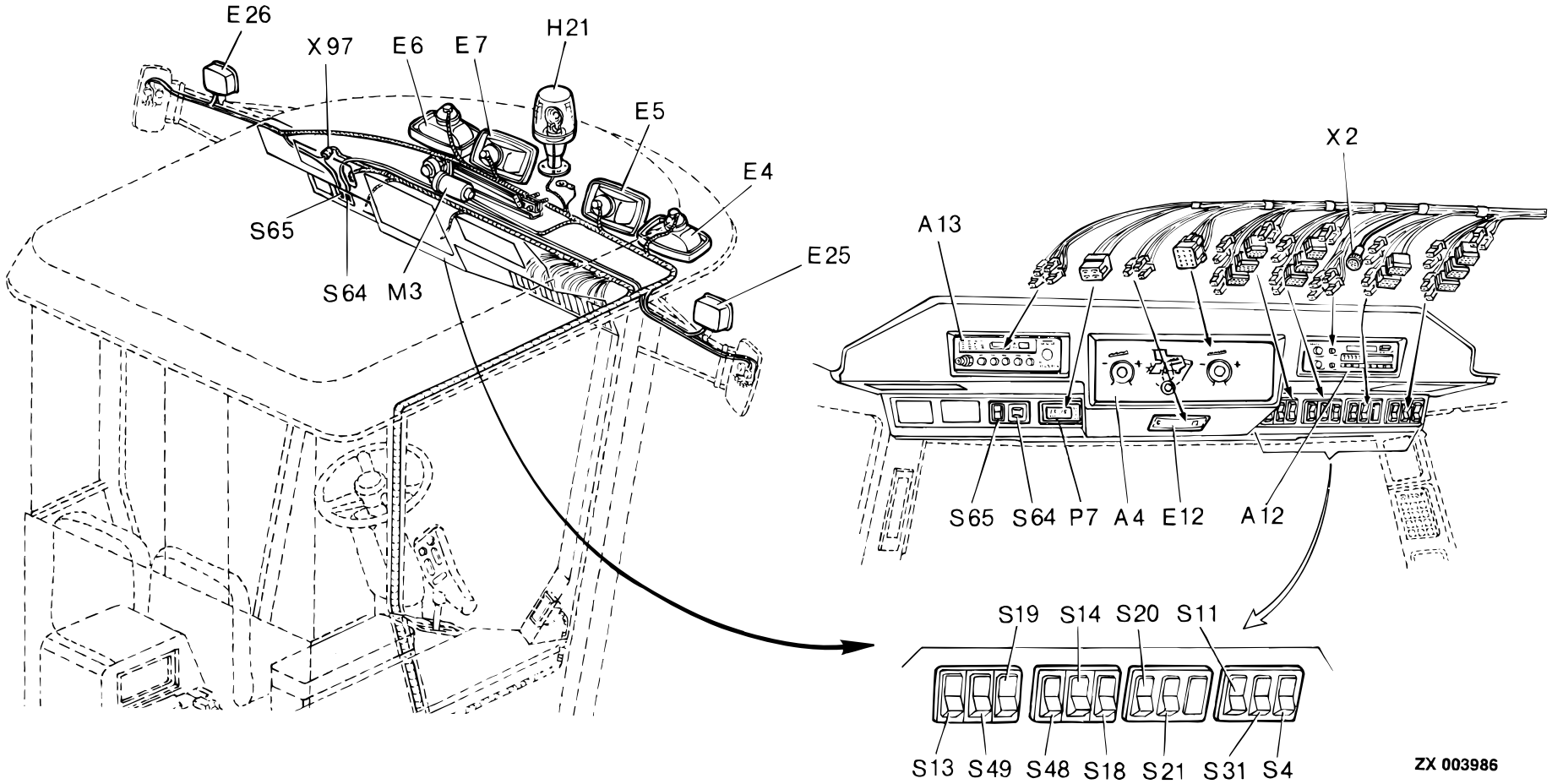
LOCATION OF CAB WIRING HARNESS W2 (PART 2) WITH COMPONENTS



WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 3

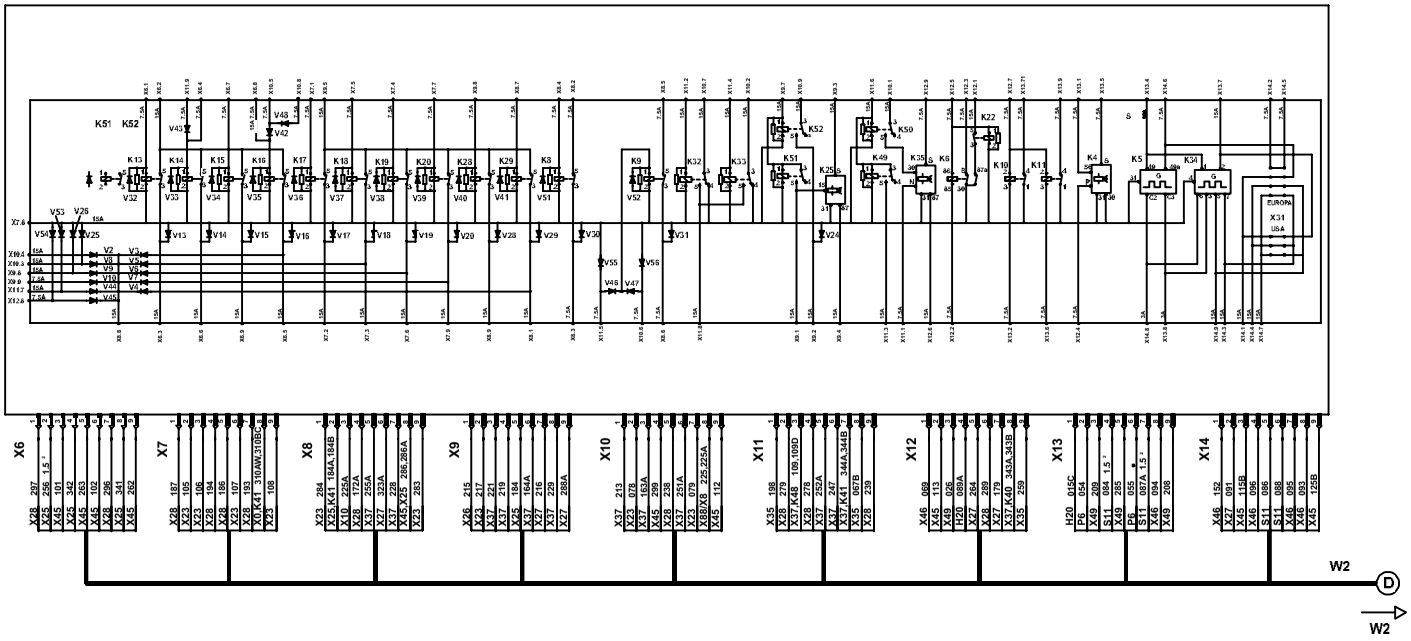


LOCATION OF CAB WIRING HARNESS W2 (PART 3) AND REAR VIEW MIRROR WIRING HARNESS W39 WITH COMPONENTS



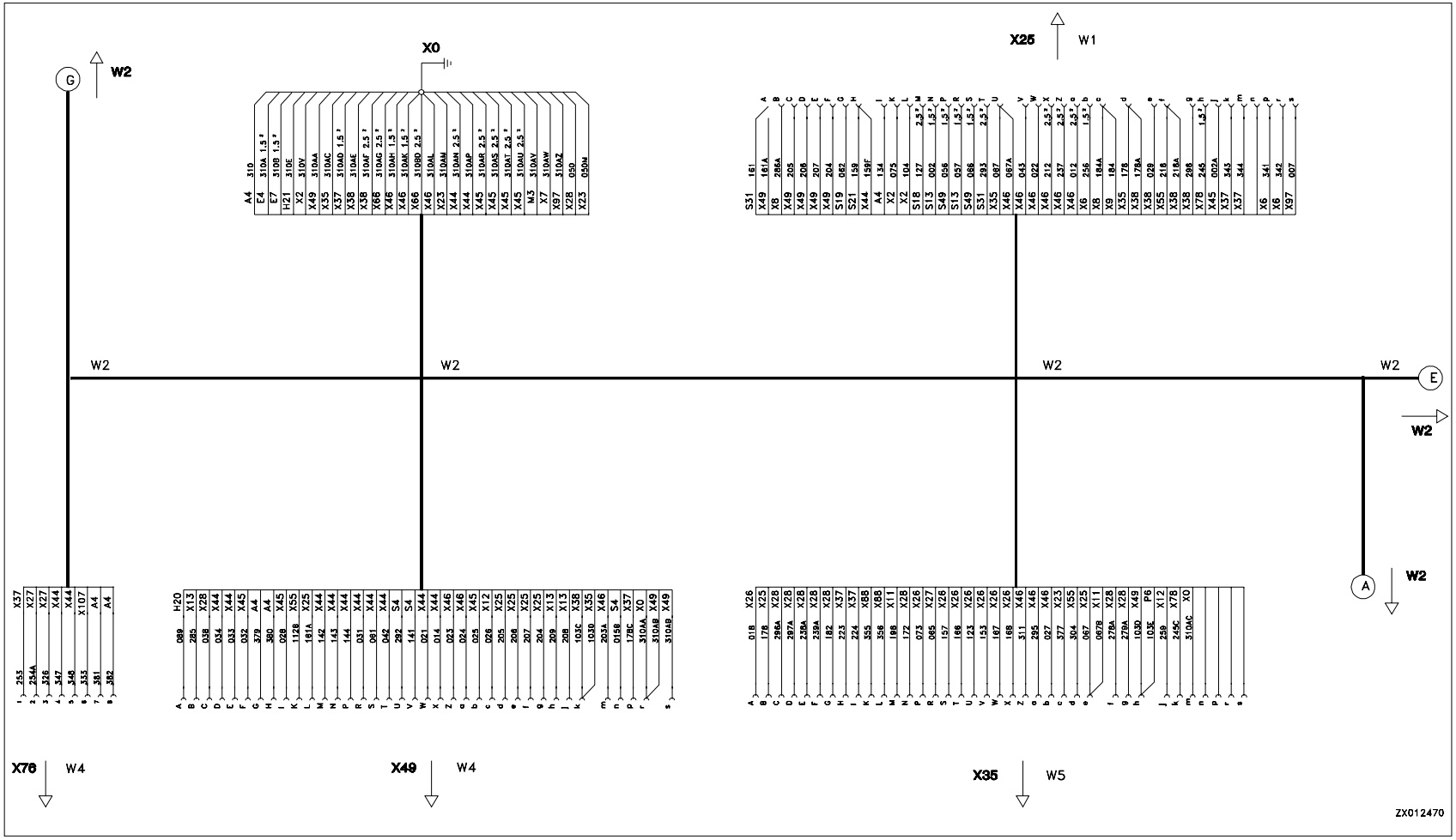
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 4

A14
RELAY AND
DIODE BOARD

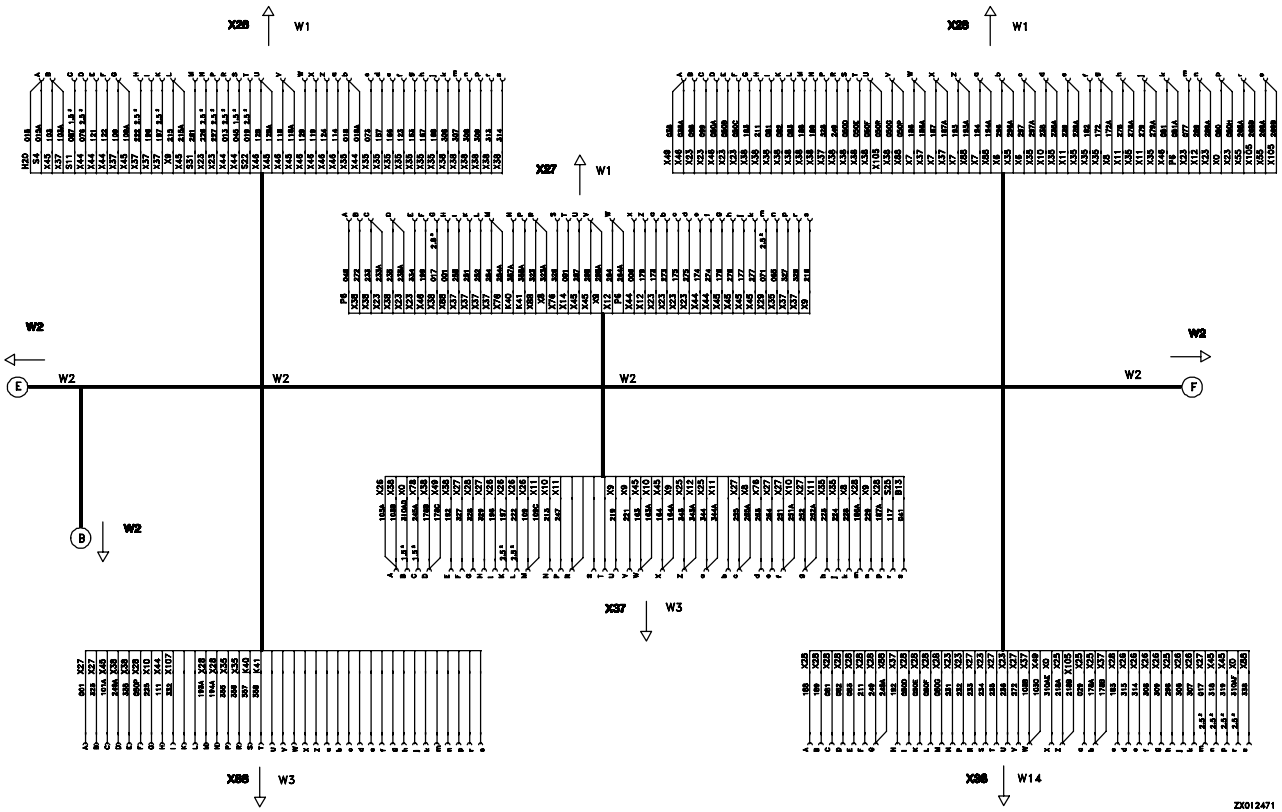


ZX012469

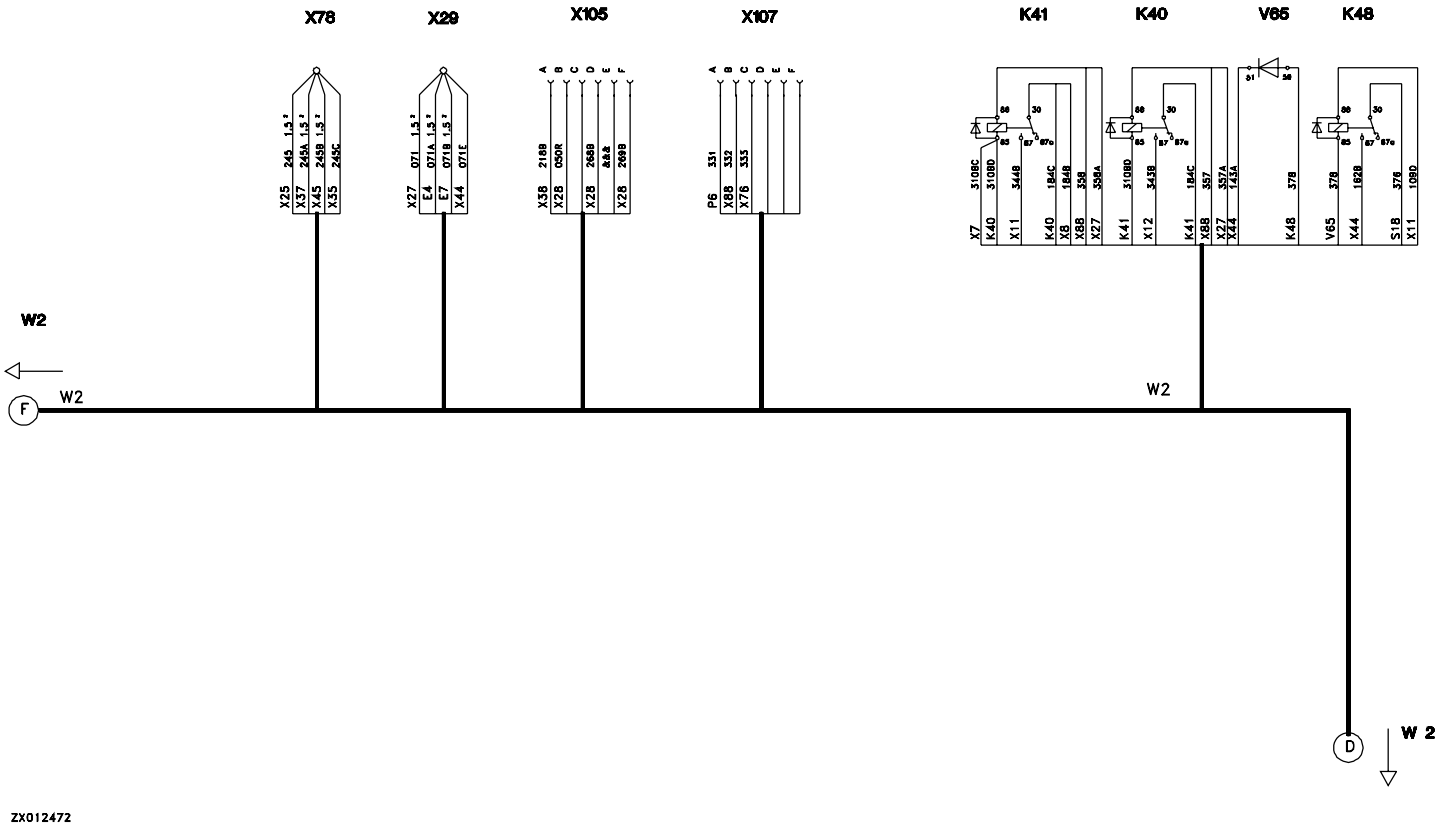
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 5



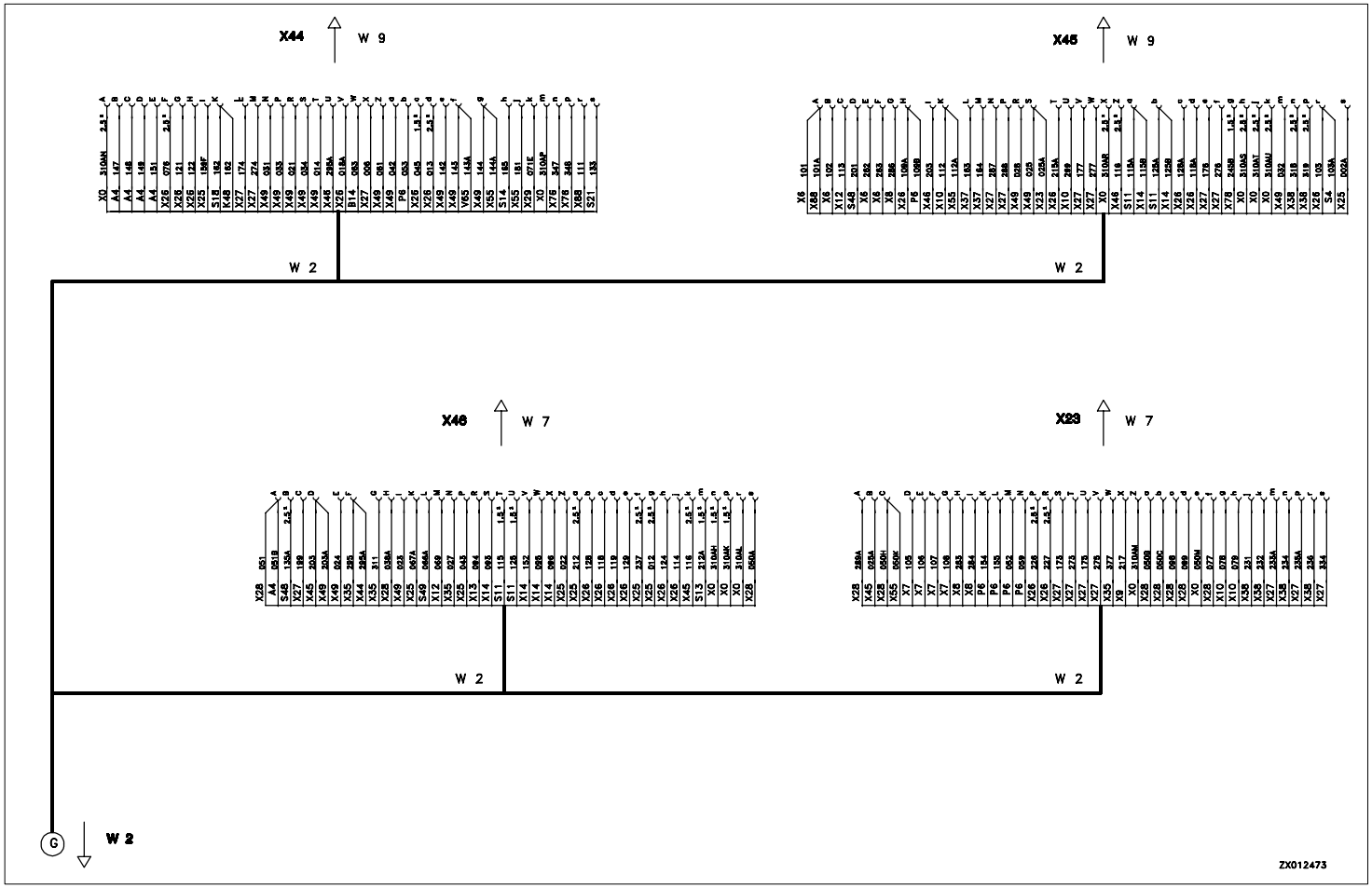
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 6



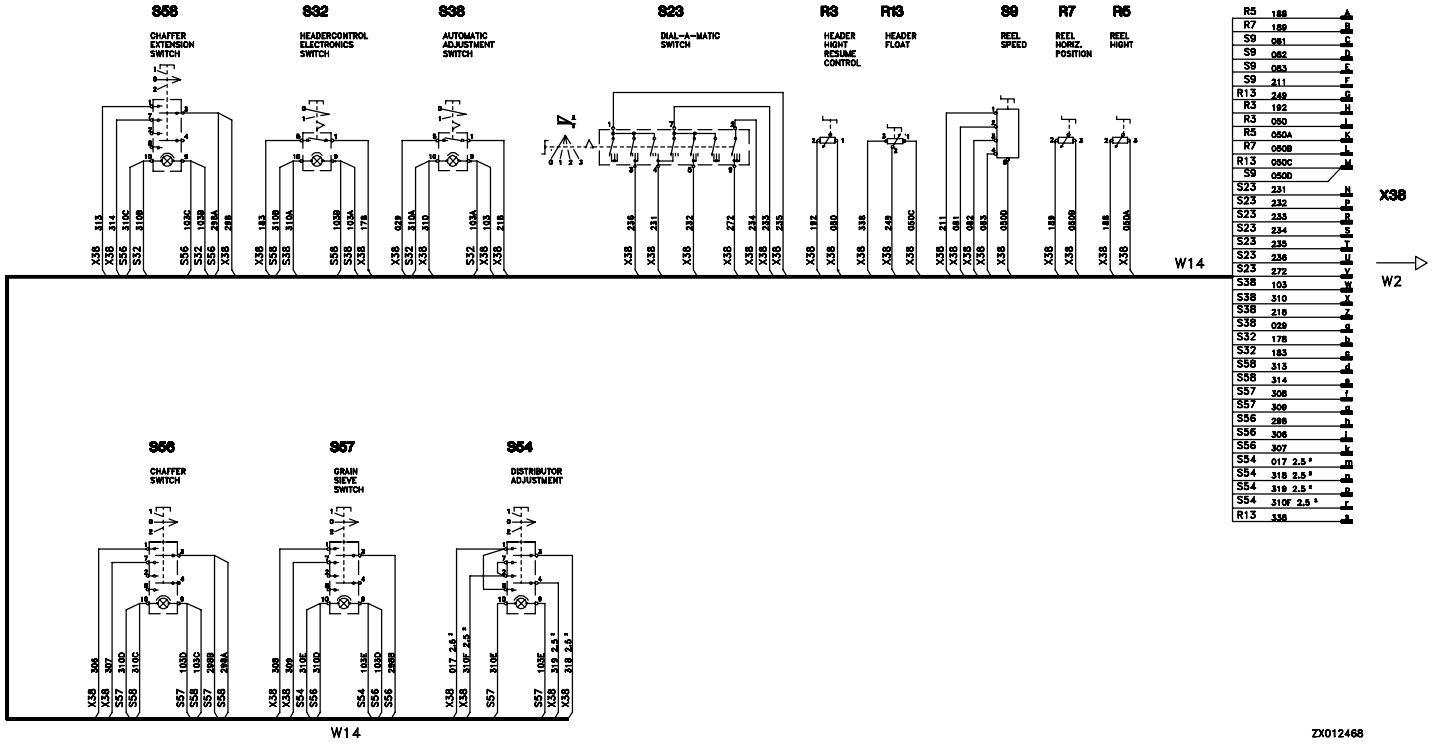
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 7



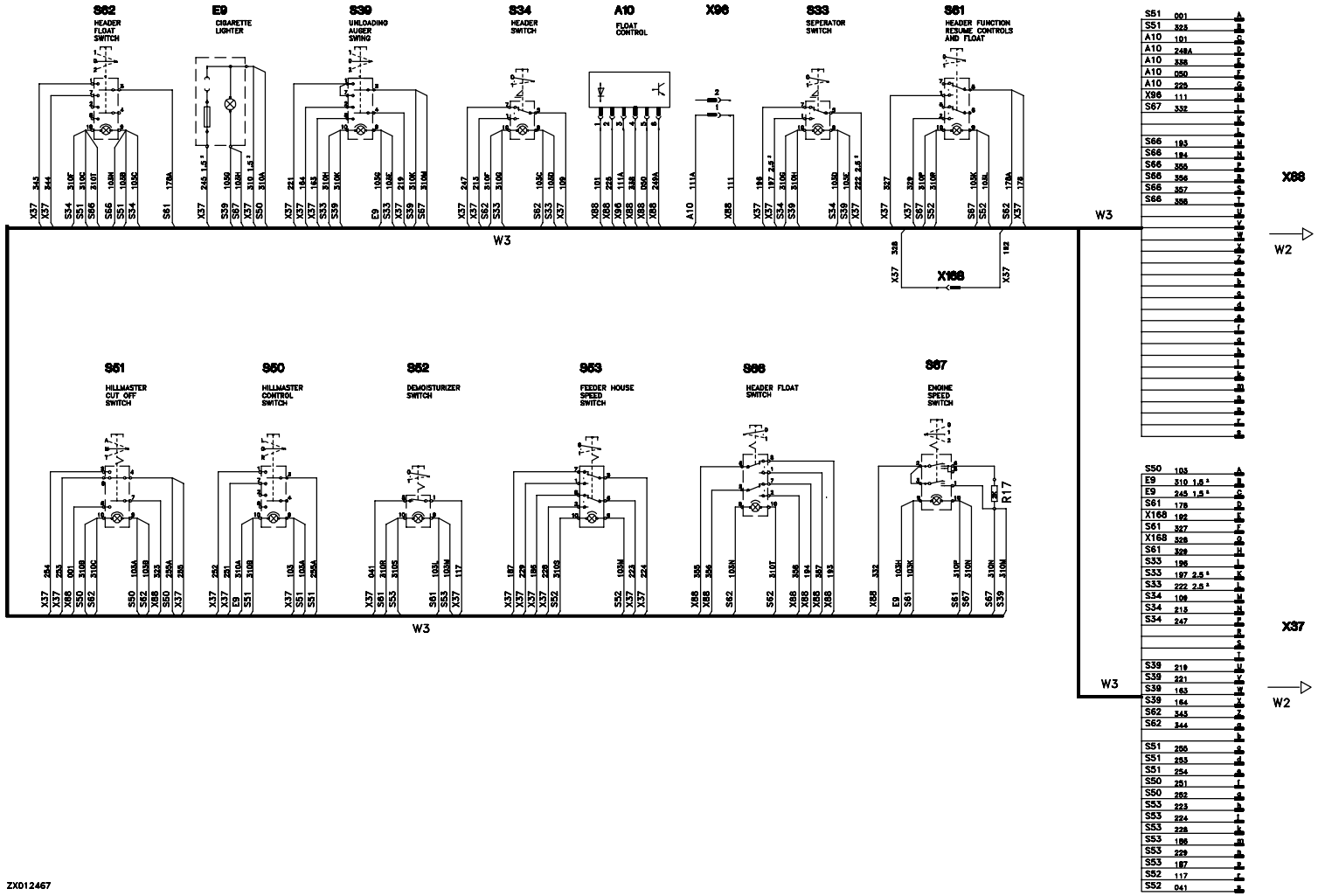
WIRING AND HARNESS DIAGRAM, CAB WIRING HARNESS W2 - PART 8



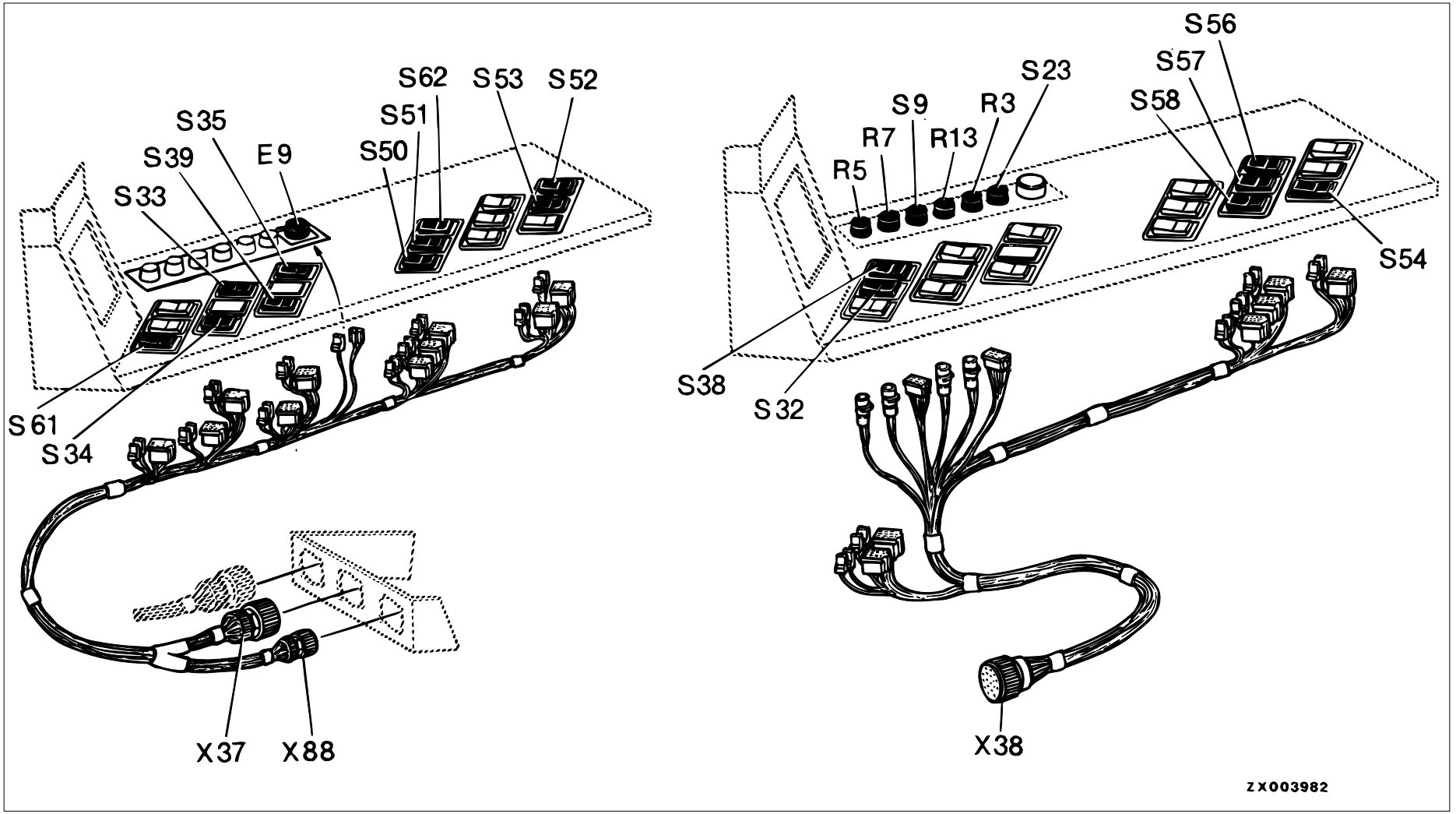
WIRING AND HARNESS DIAGRAM, OPTIONAL EQUIPMENT HARNESS W14 ON SWITCH CONSOLE



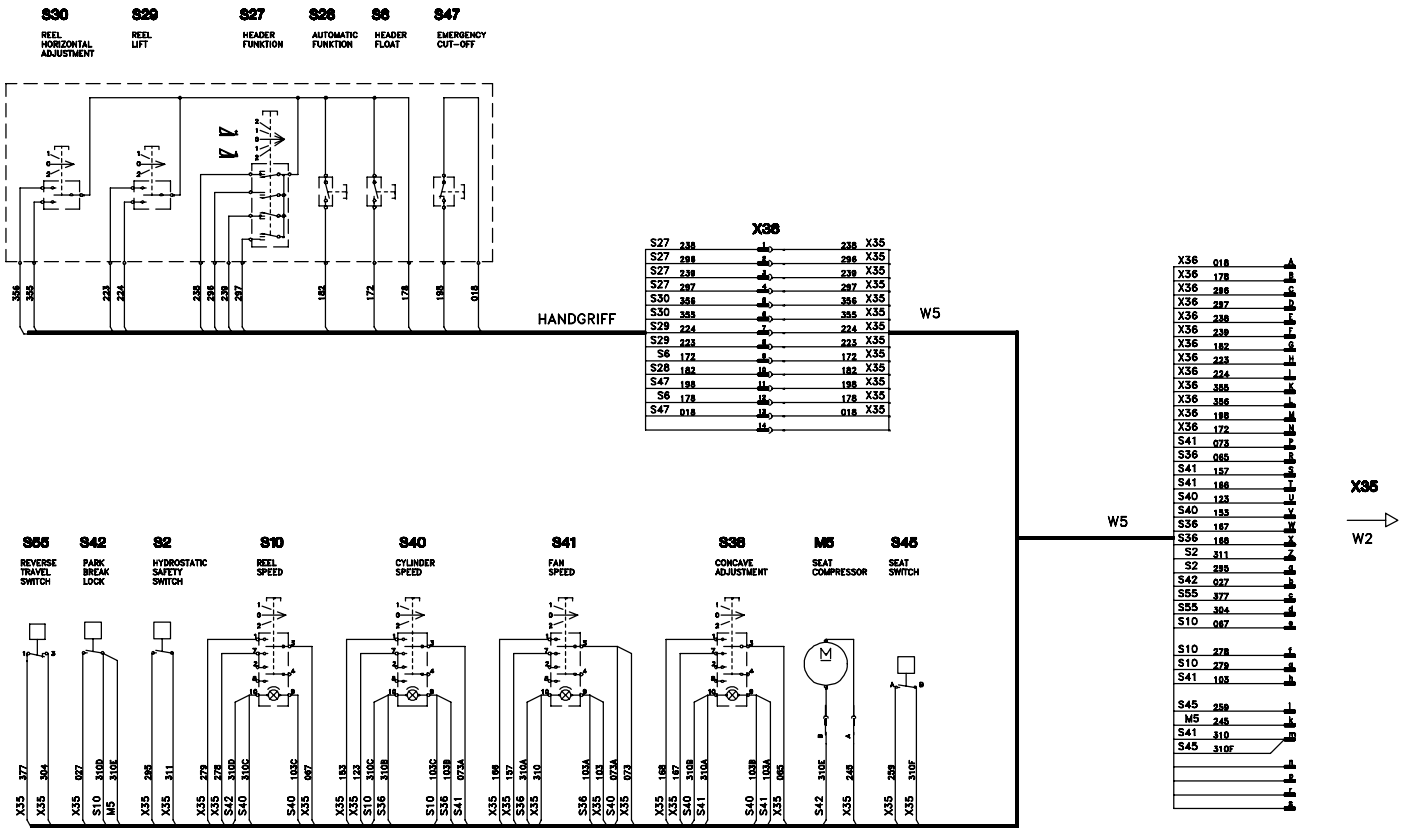
WIRING AND HARNESS DIAGRAM, SWITCH CONSOLE WIRING HARNESS W3



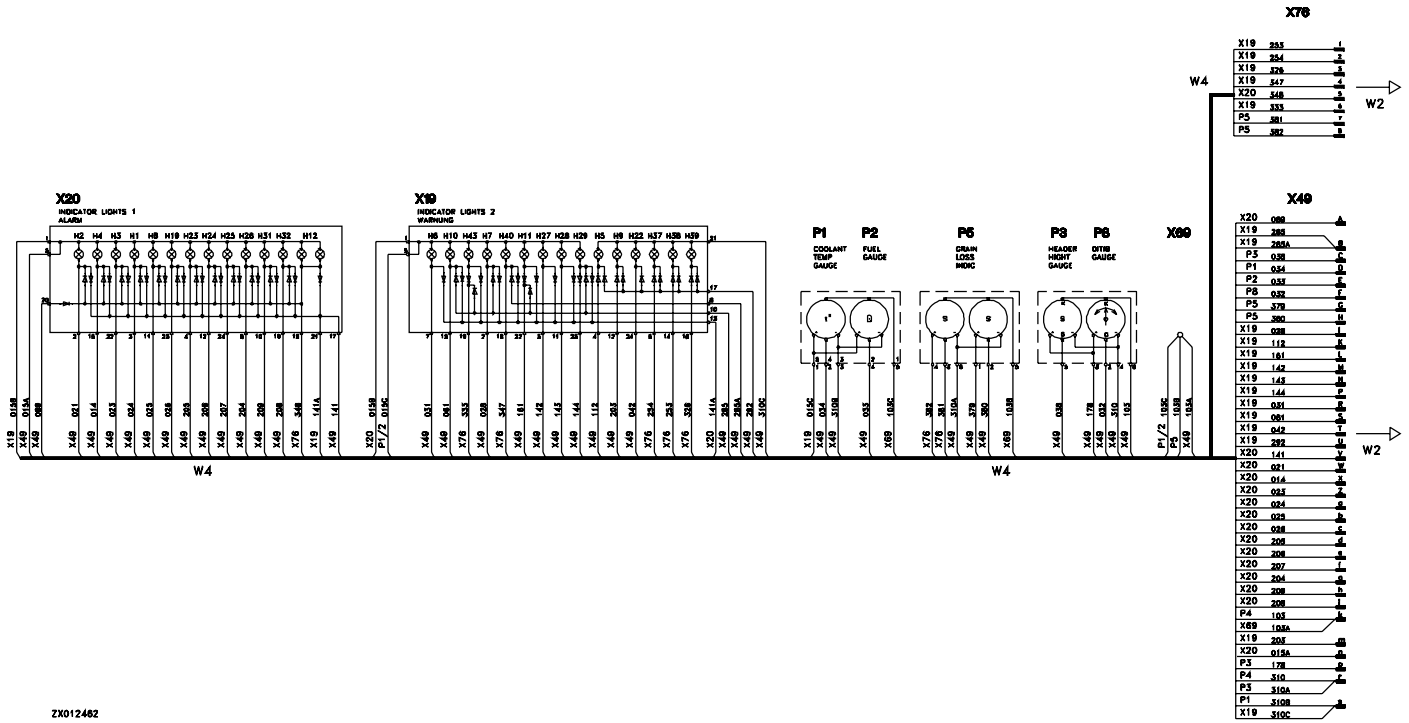
LOCATION OF SWITCH CONSOLE WIRING HARNESS W3 AND OPTIONAL EQUIPMENT WIRING HARNESS W14 WITH COMPONENTS



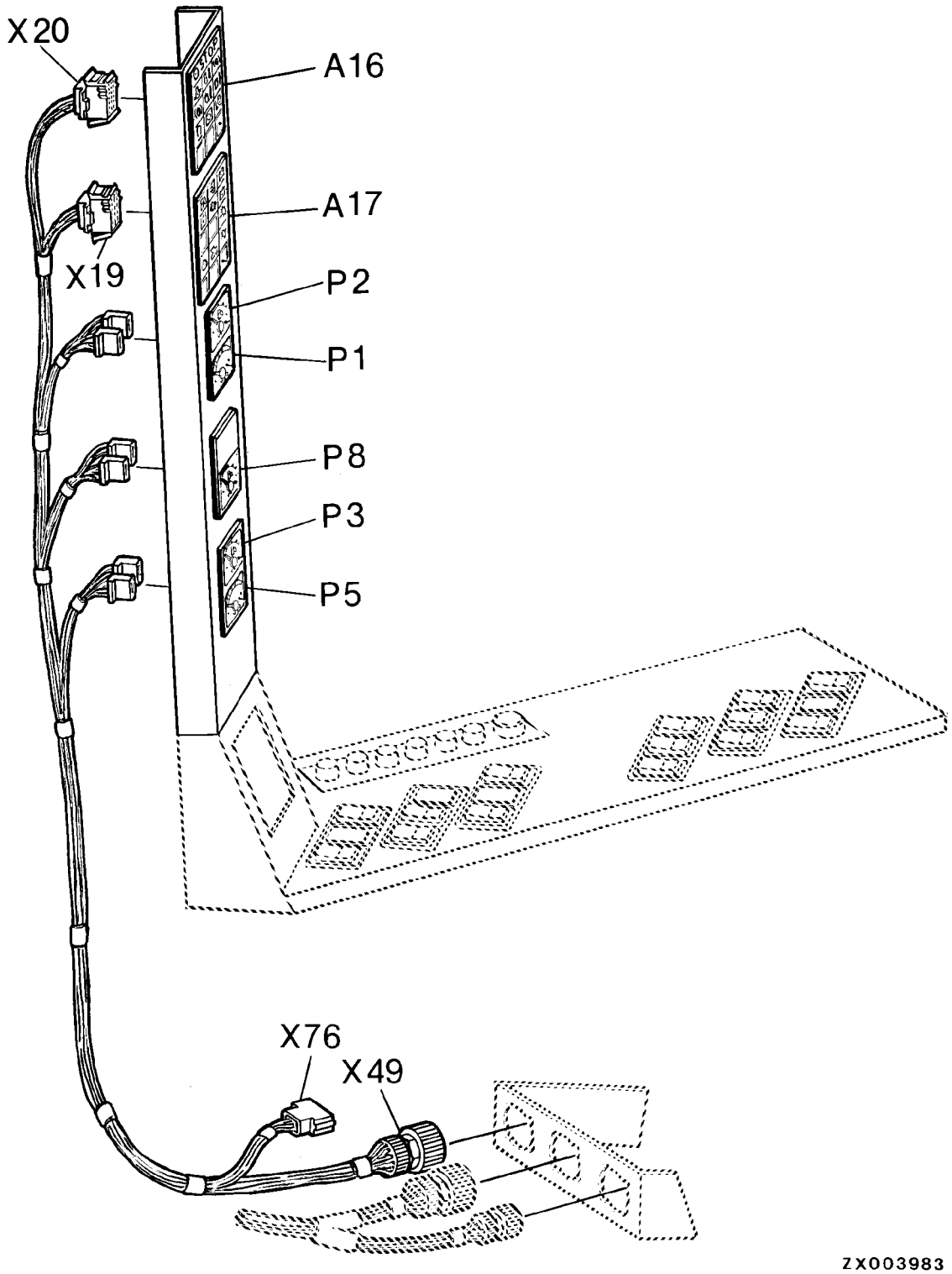
WIRING AND HARNESS DIAGRAM, ARMREST WIRING HARNESS W5



WIRING AND HARNESS DIAGRAM, CORNER POST WIRING HARNESS W4



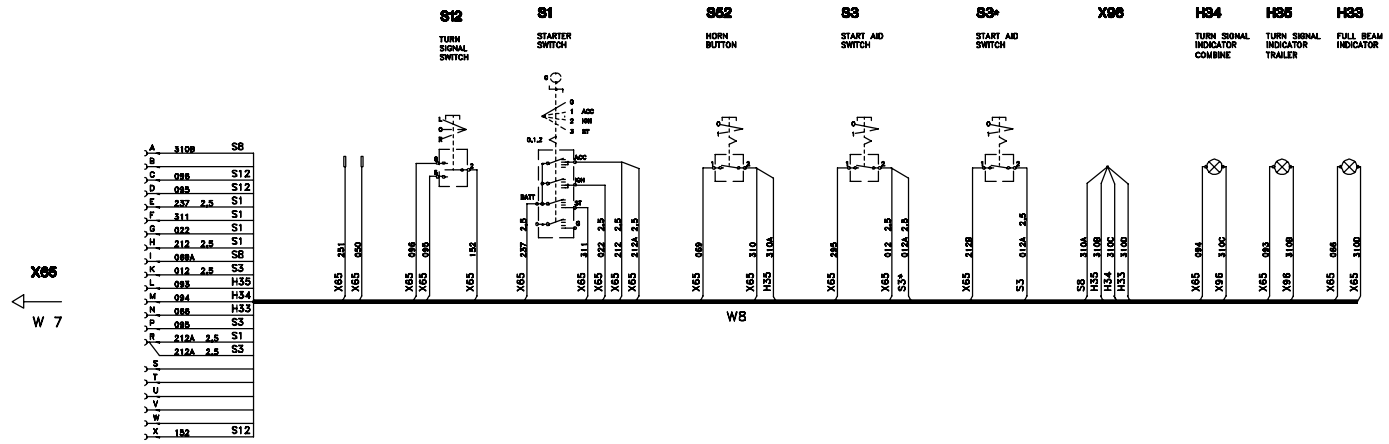
LOCATION OF CORNER POST WIRING HARNESS W4 WITH COMPONENTS



ZX003983 -UN-03APR98

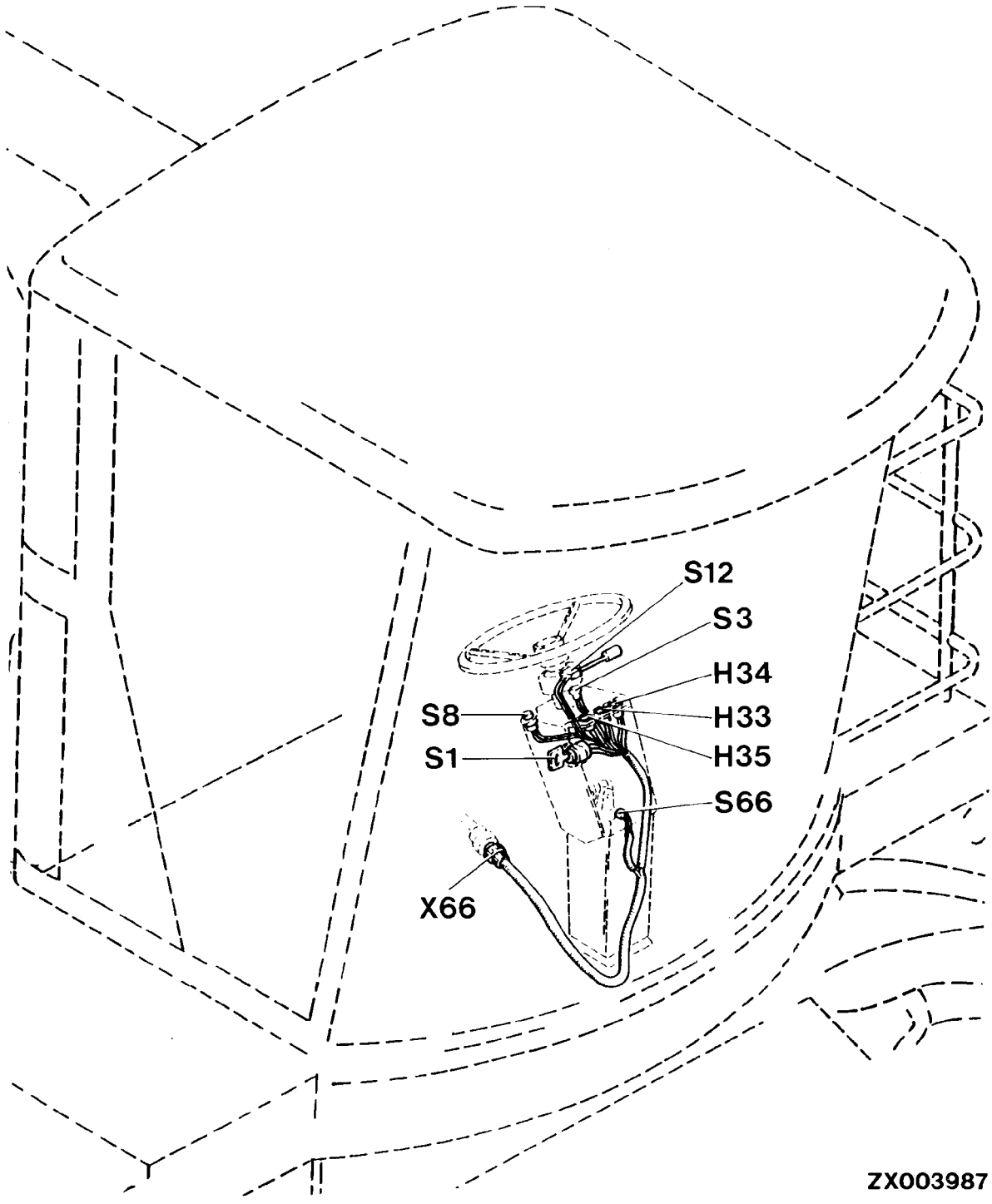
ZX,TMXZCO002158-19-06OCT92

WIRING AND HARNESS DIAGRAM, STEERING COLUMN WIRING HARNESS W8



ZX012574

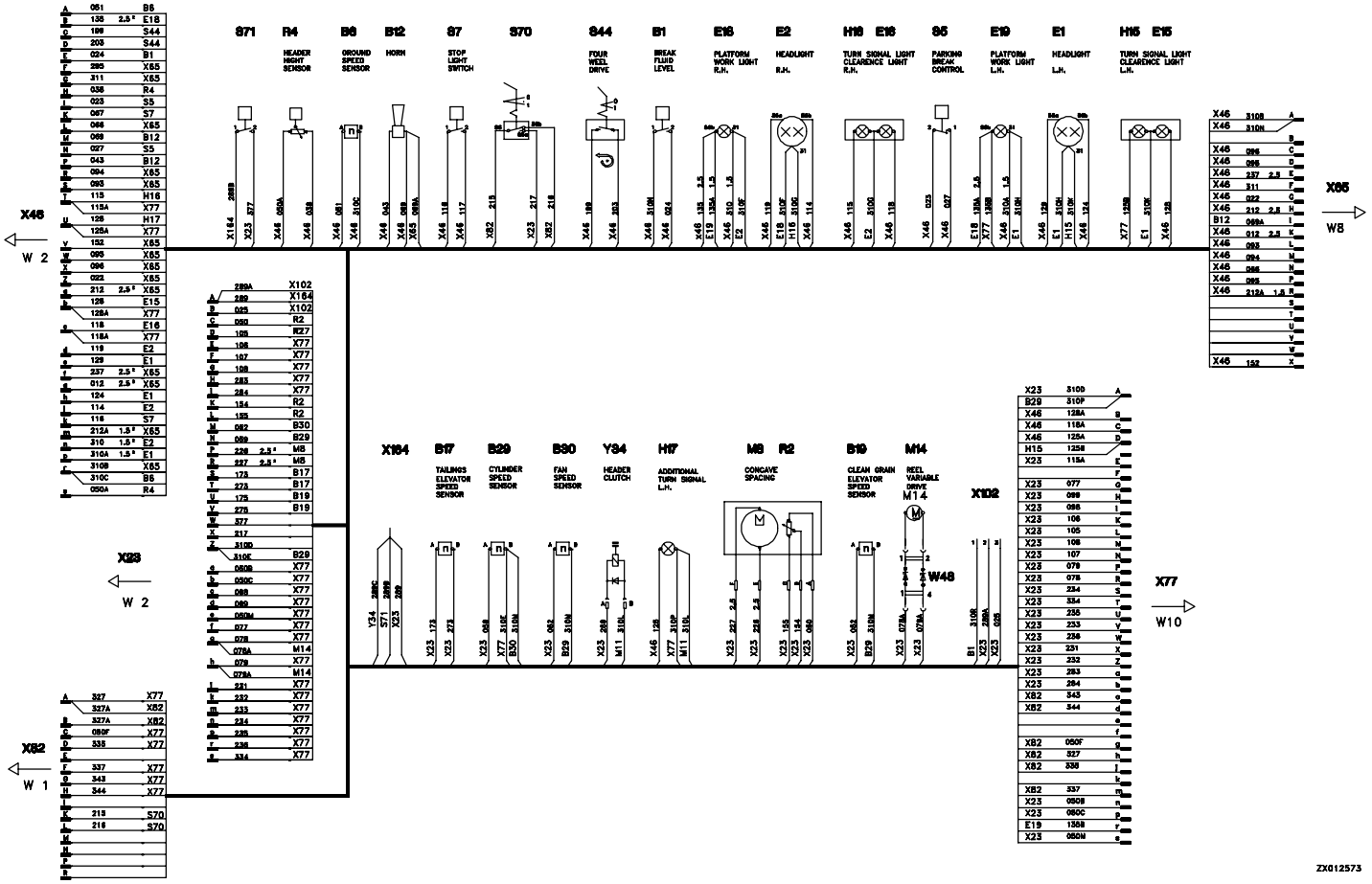
LOCATION OF STEERING COLUMN WIRING HARNESS W8 WITH COMPONENTS



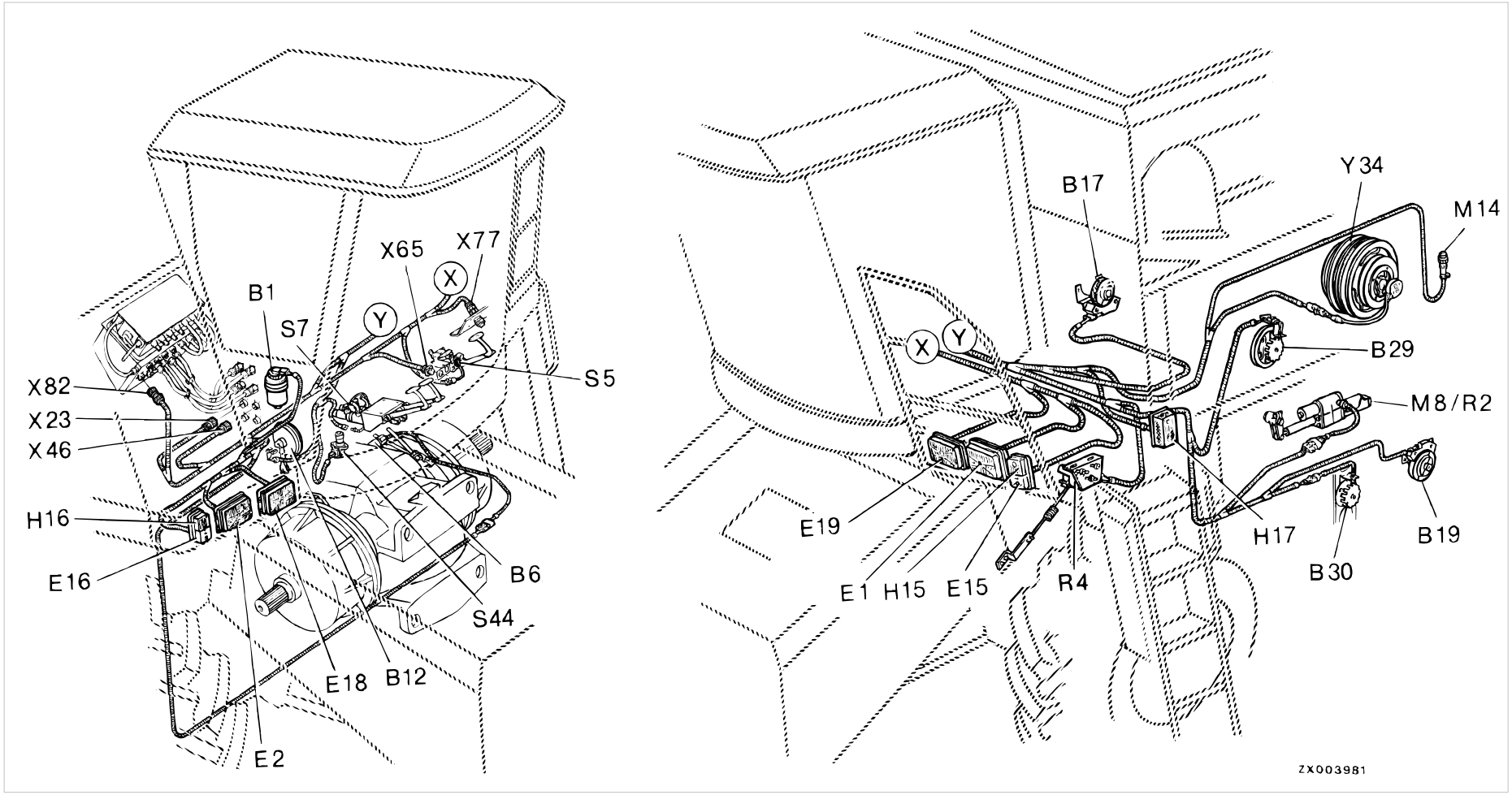
ZX003987 -UN-03APR98

ZX,TMXZCO002162-19-06OCT92

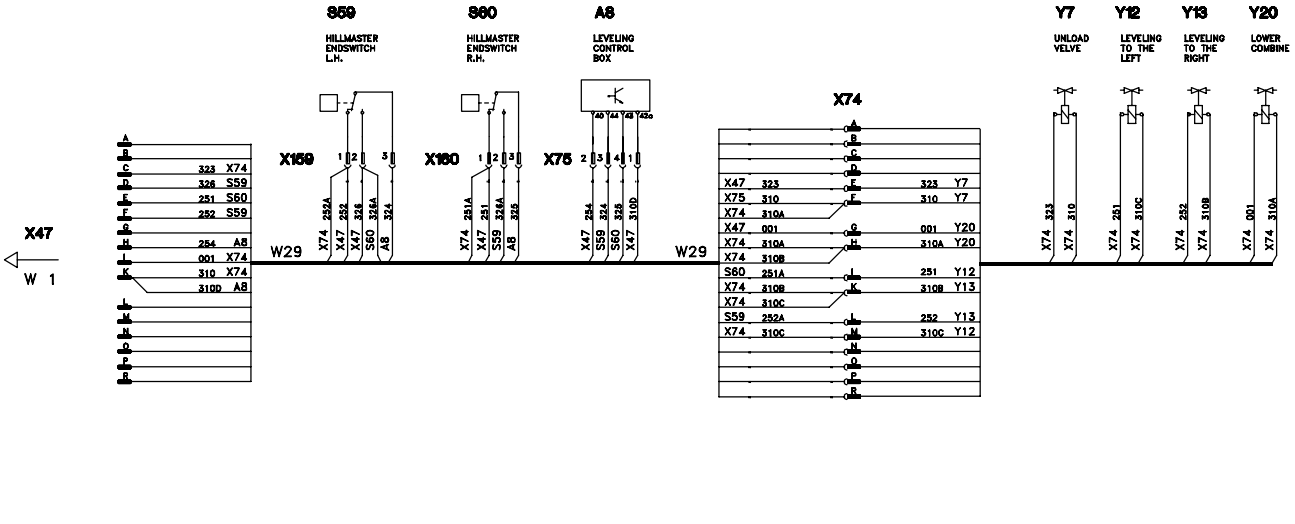
WIRING AND HARNESS DIAGRAM, FRONT BASIC WIRING HARNESS W7



LOCATION OF FRONT BASIC WIRING HARNESS W7 WITH COMPONENTS

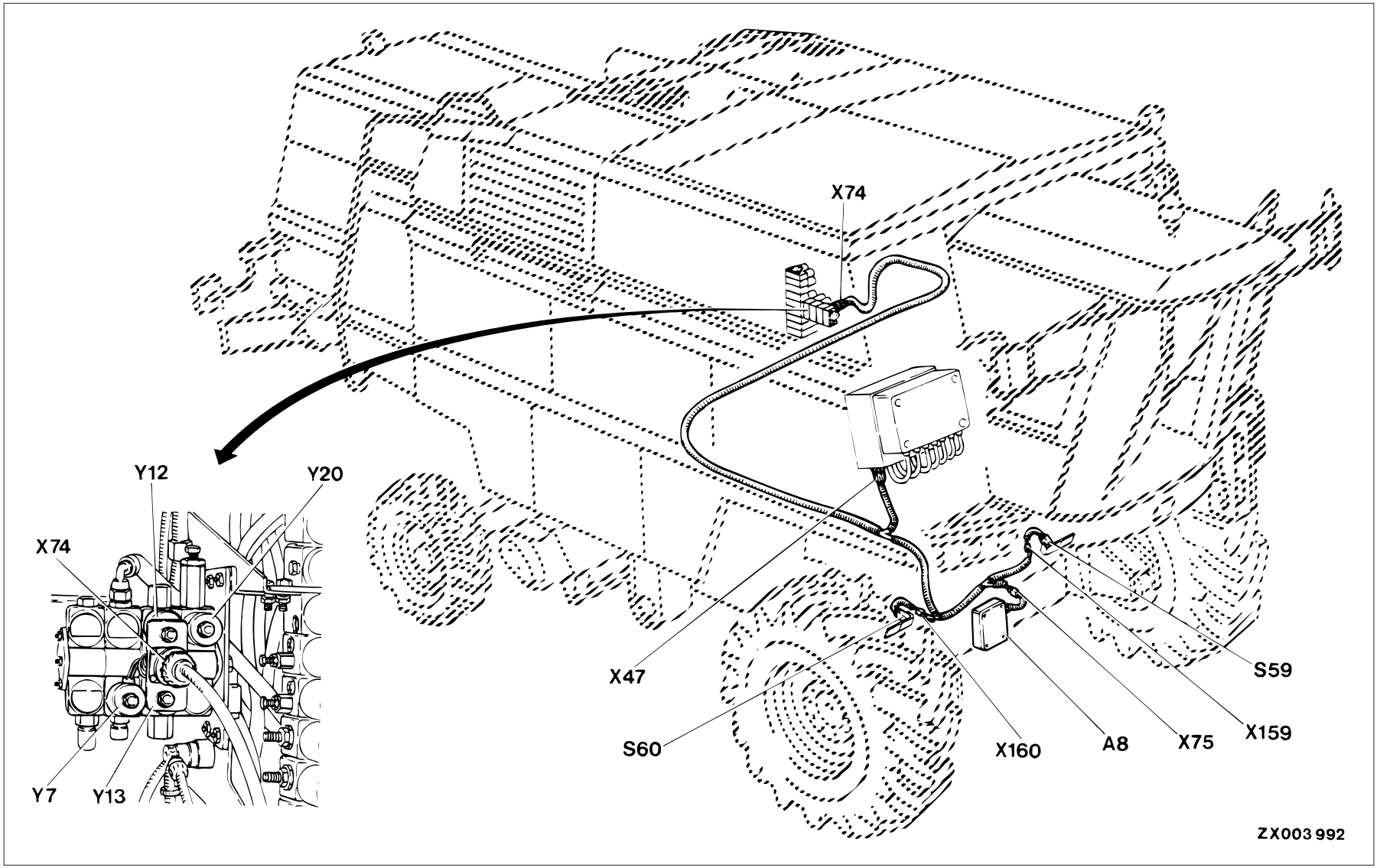


WIRING AND HARNESS DIAGRAM, LEVELING SYSTEM WIRING HARNESS W29

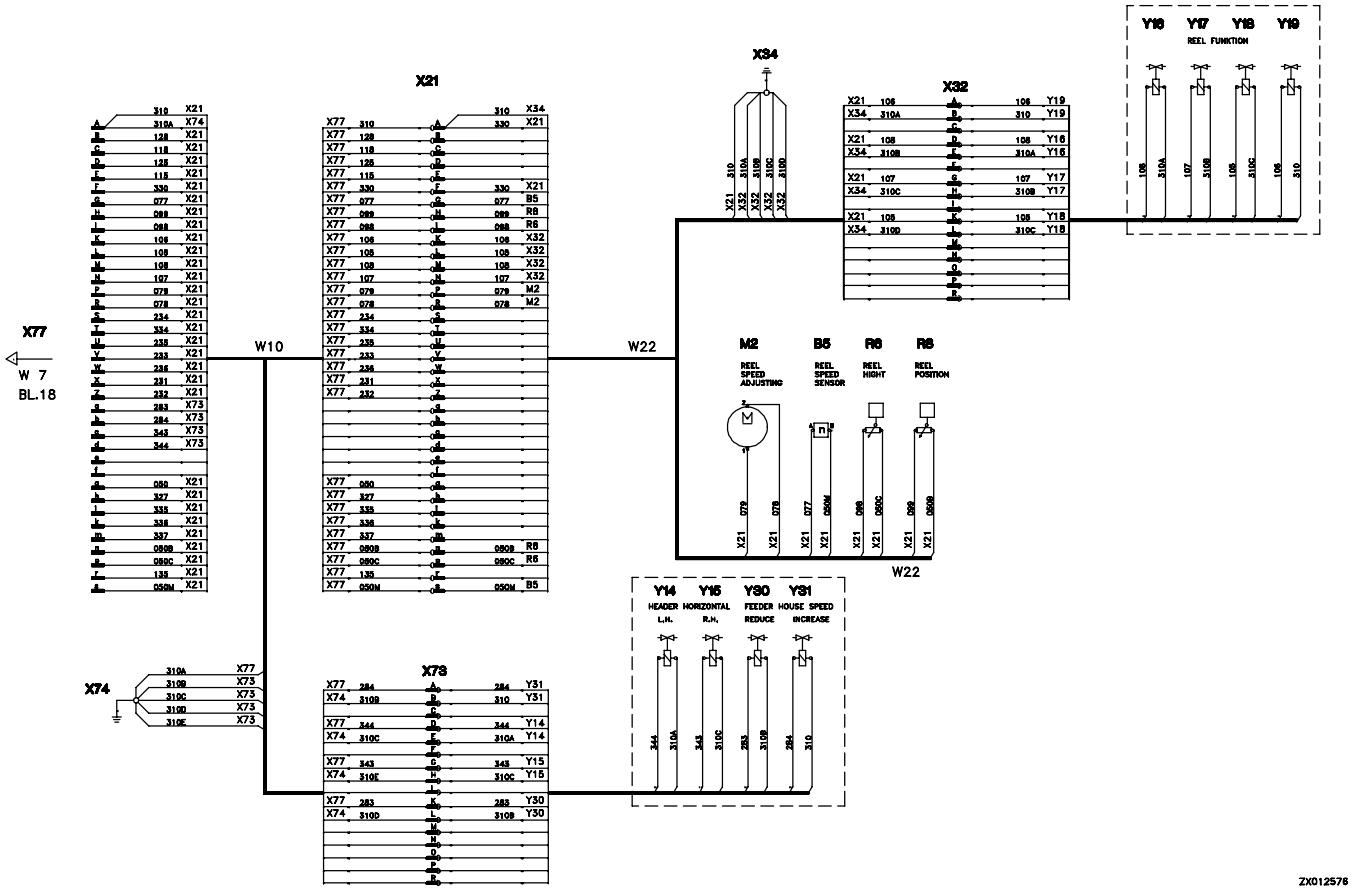


ZX012578

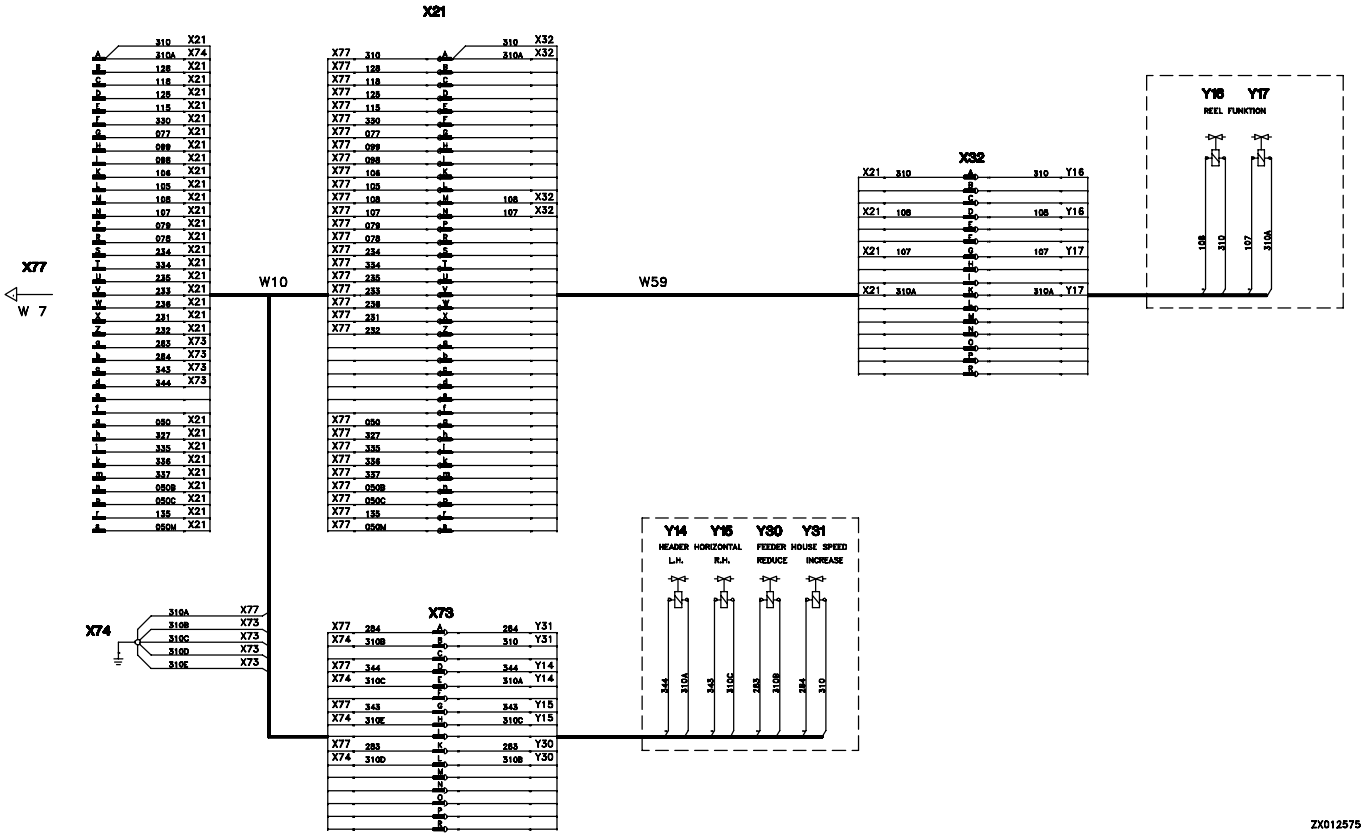
LOCATION OF LEVELING SYSTEM WIRING HARNESS W29 WITH COMPONENTS



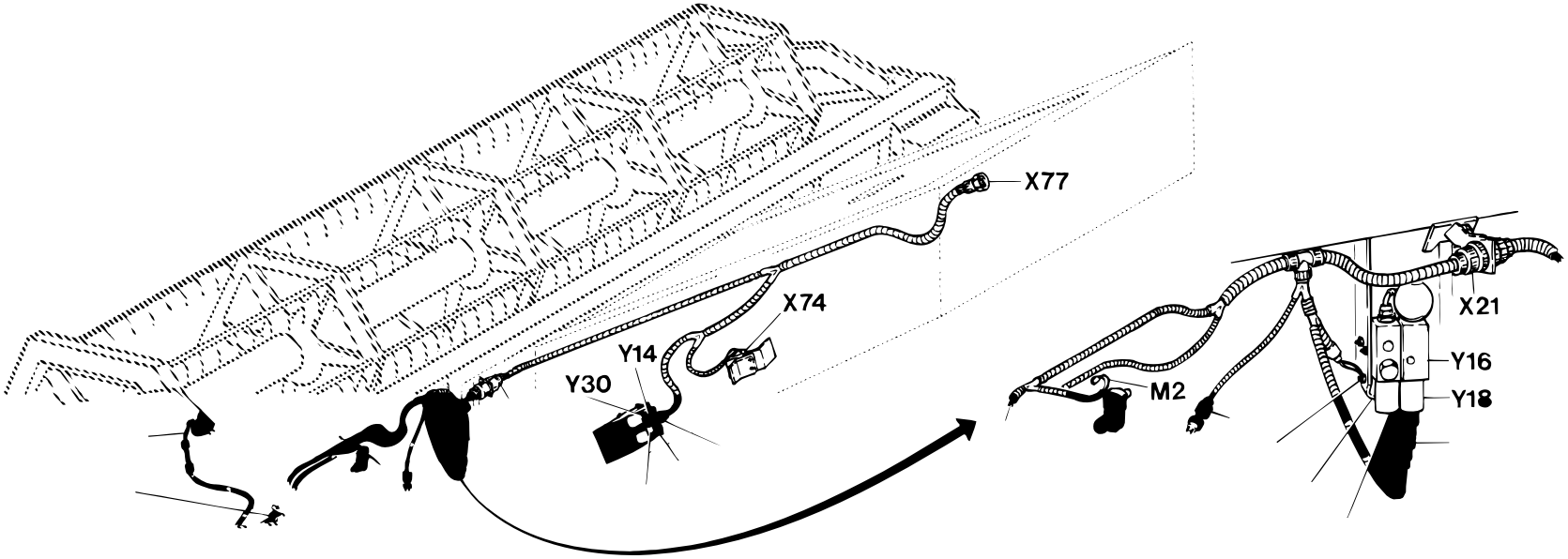
WIRING AND HARNESS DIAGRAM, WIRING HARNESS W10, FEEDER HOUSE WIRING HARNESS W59 AND HEADER WIRING HARNESS W22



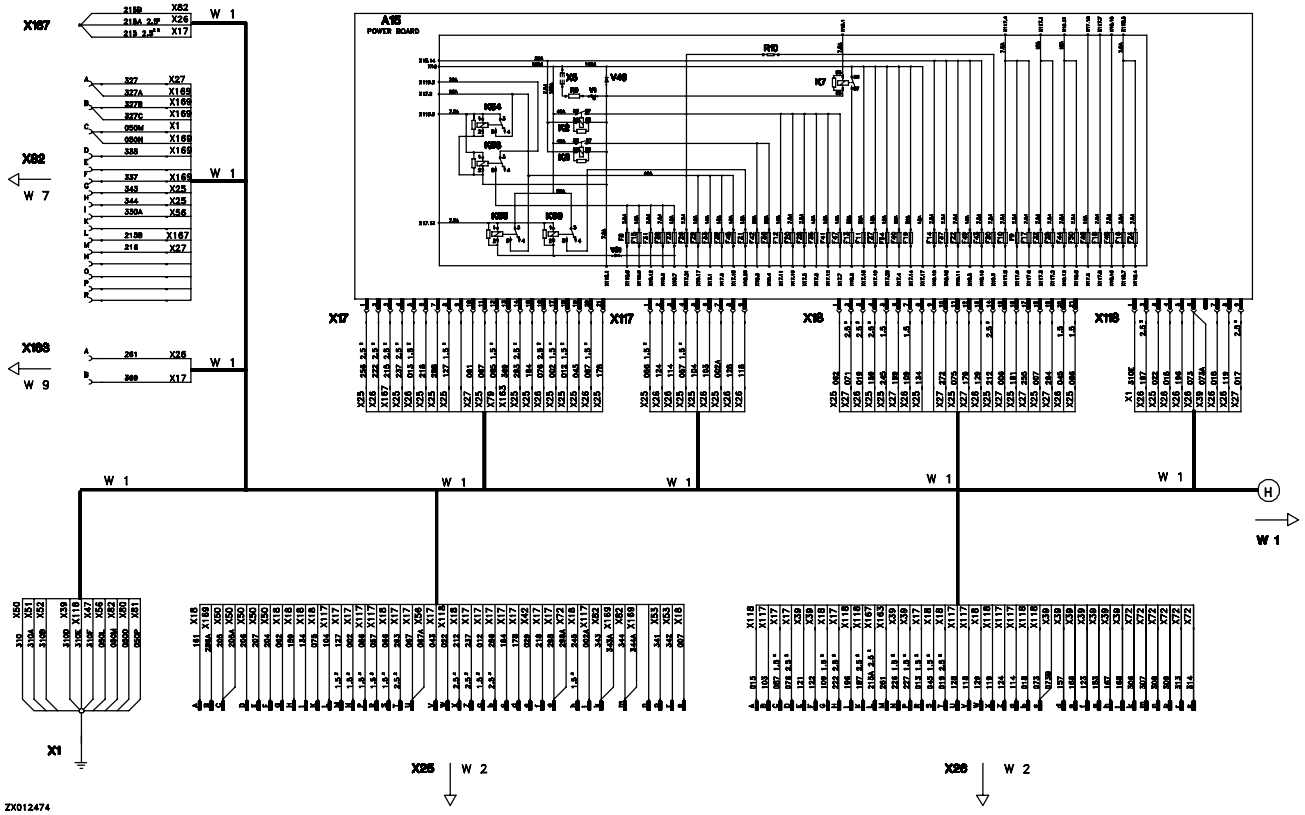
WIRING AND HARNESS DIAGRAM, WIRING HARNESS W10, FEEDER HOUSE WIRING HARNESS W59 AND ROW-CROP UNIT ADAPTER



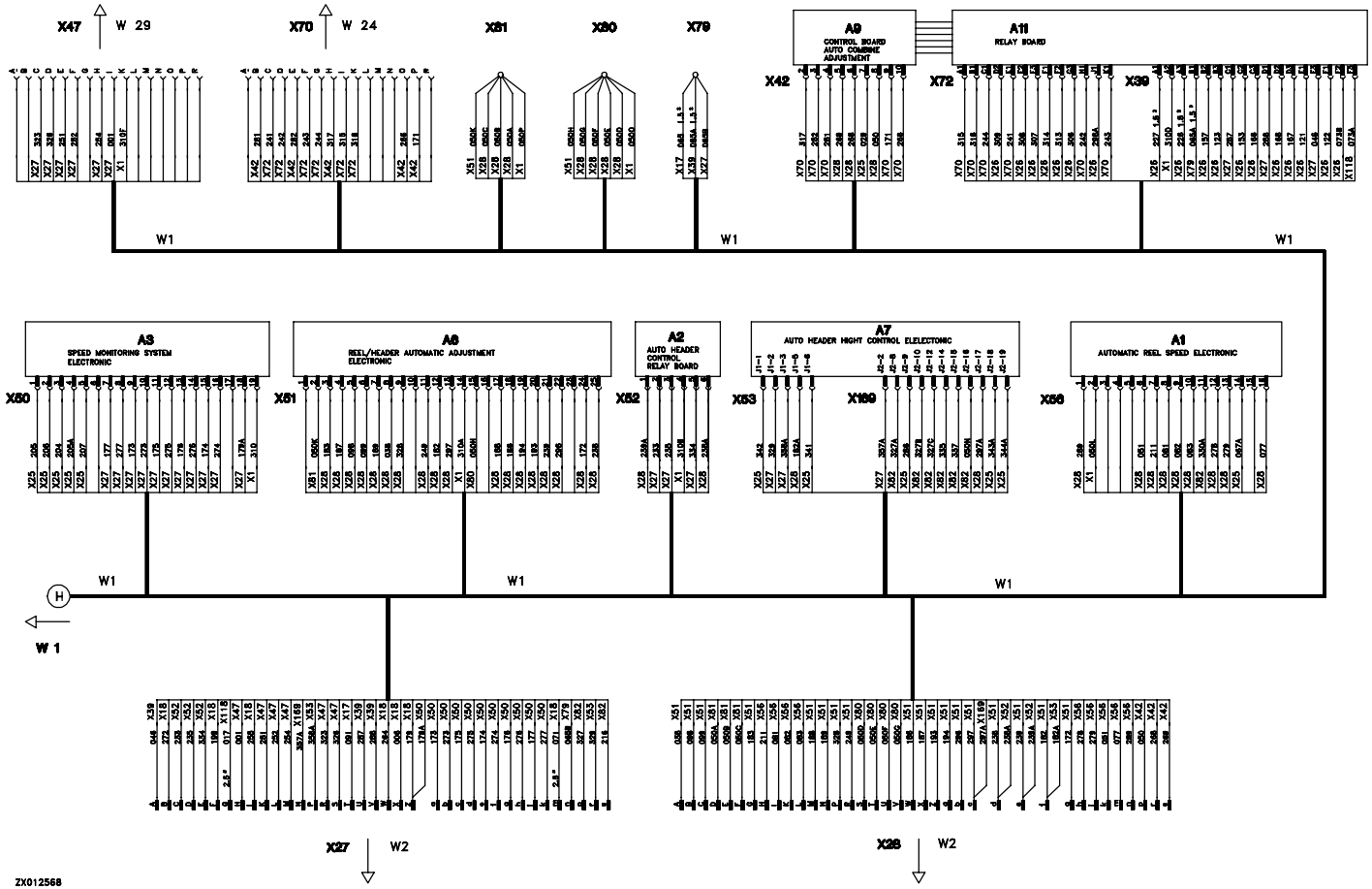
LOCATION OF FEEDER HOUSE WIRING HARNESS W10, HEADER WIRING HARNESS W22 AND HEADER LIGHTING WIRING HARNESS W32 WITH COMPONENTS



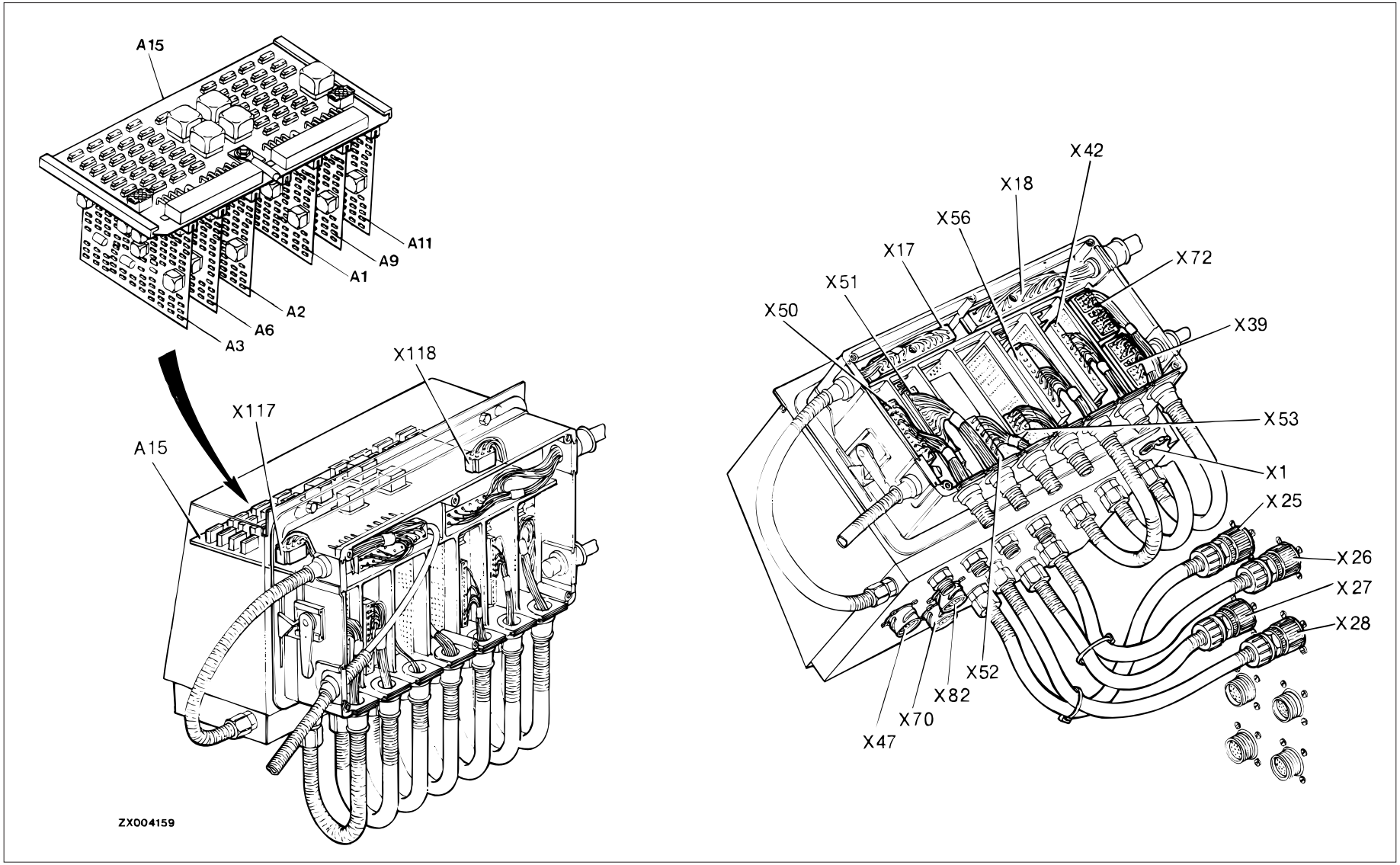
WIRING AND HARNESS DIAGRAM, MAIN DISTRIBUTION WIRING HARNESS W1 - PART 1



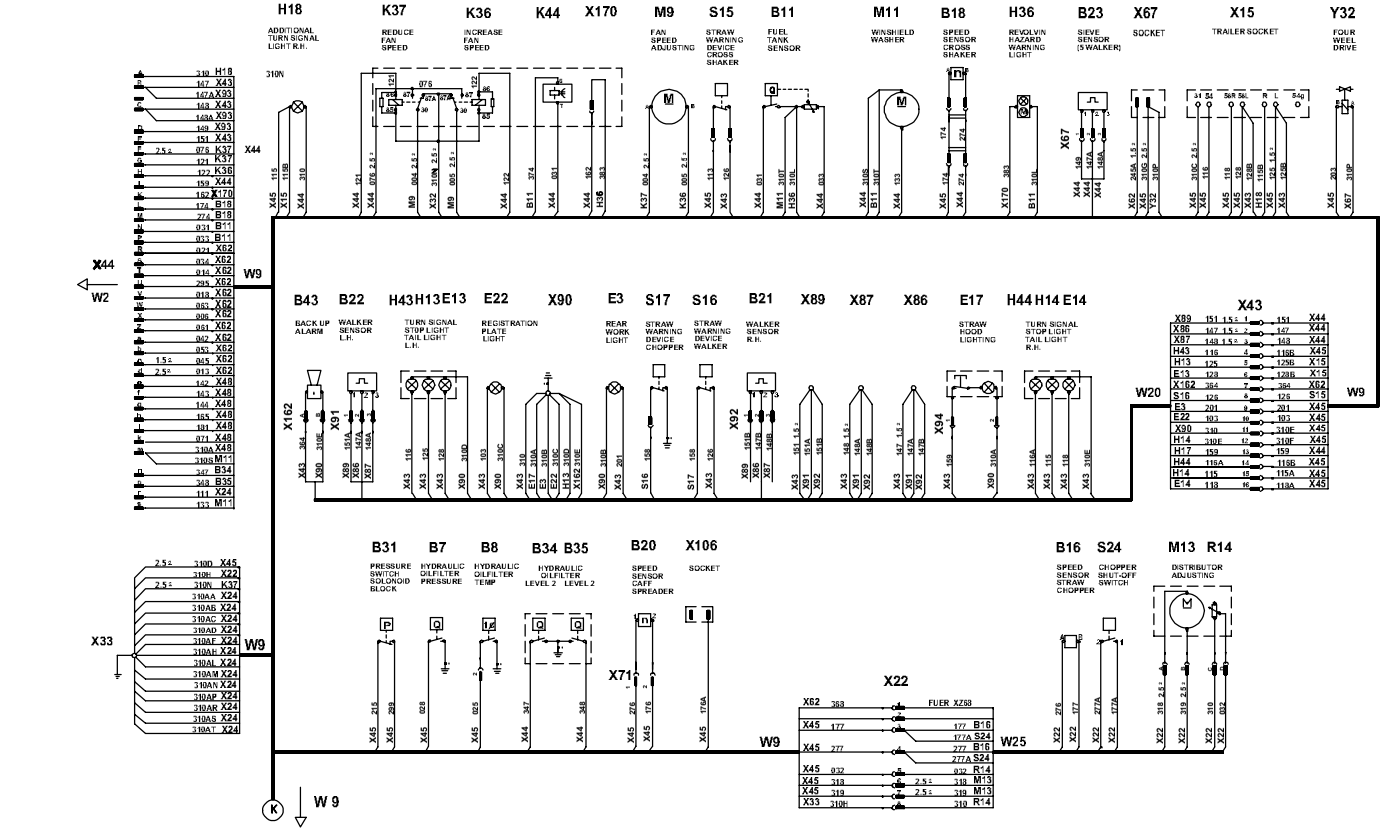
WIRING AND HARNESS DIAGRAM, MAIN DISTRIBUTION WIRING HARNESS W1 - PART 2



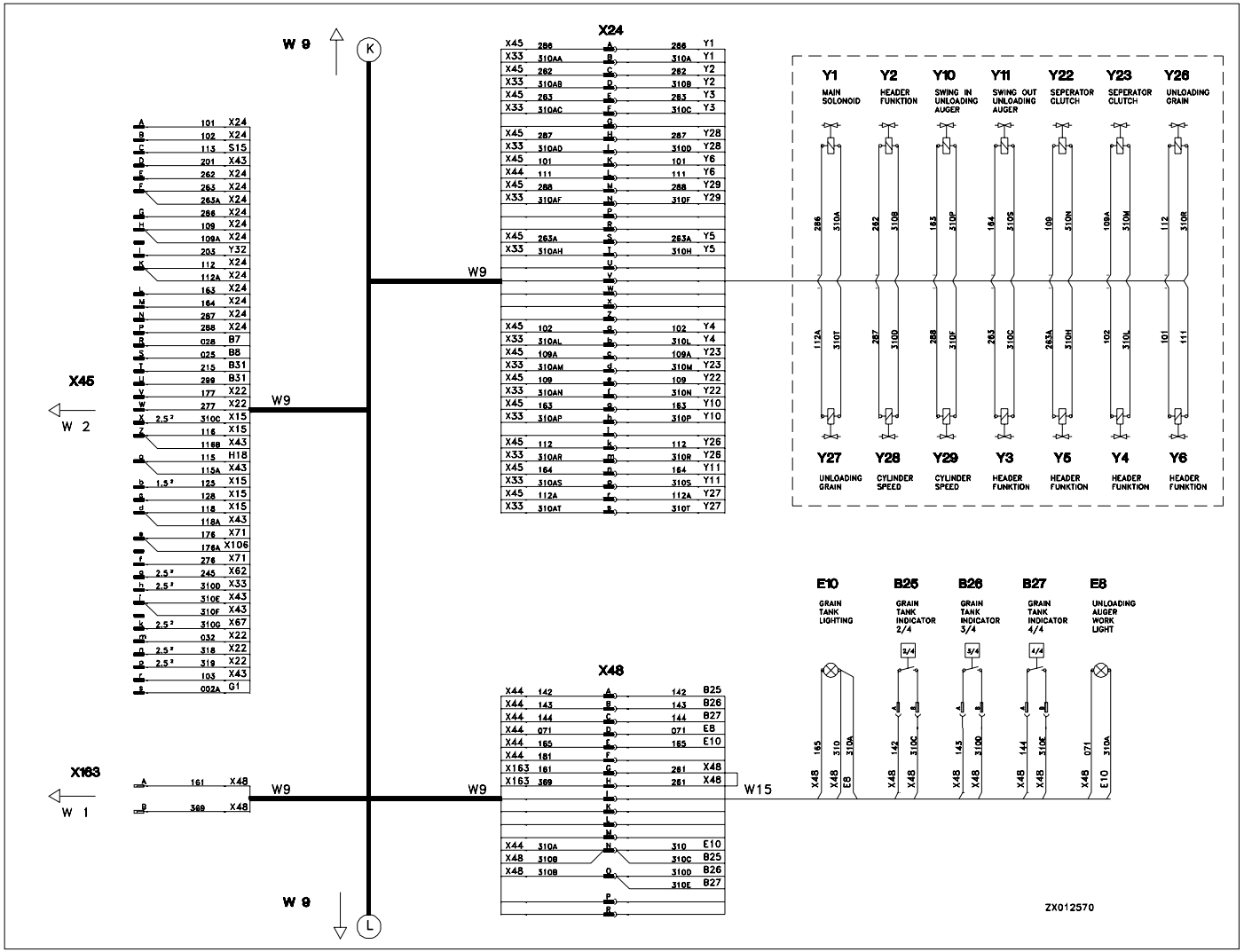
LOCATION OF MAIN DISTRIBUTION WIRING HARNESS W1 WITH COMPONENTS



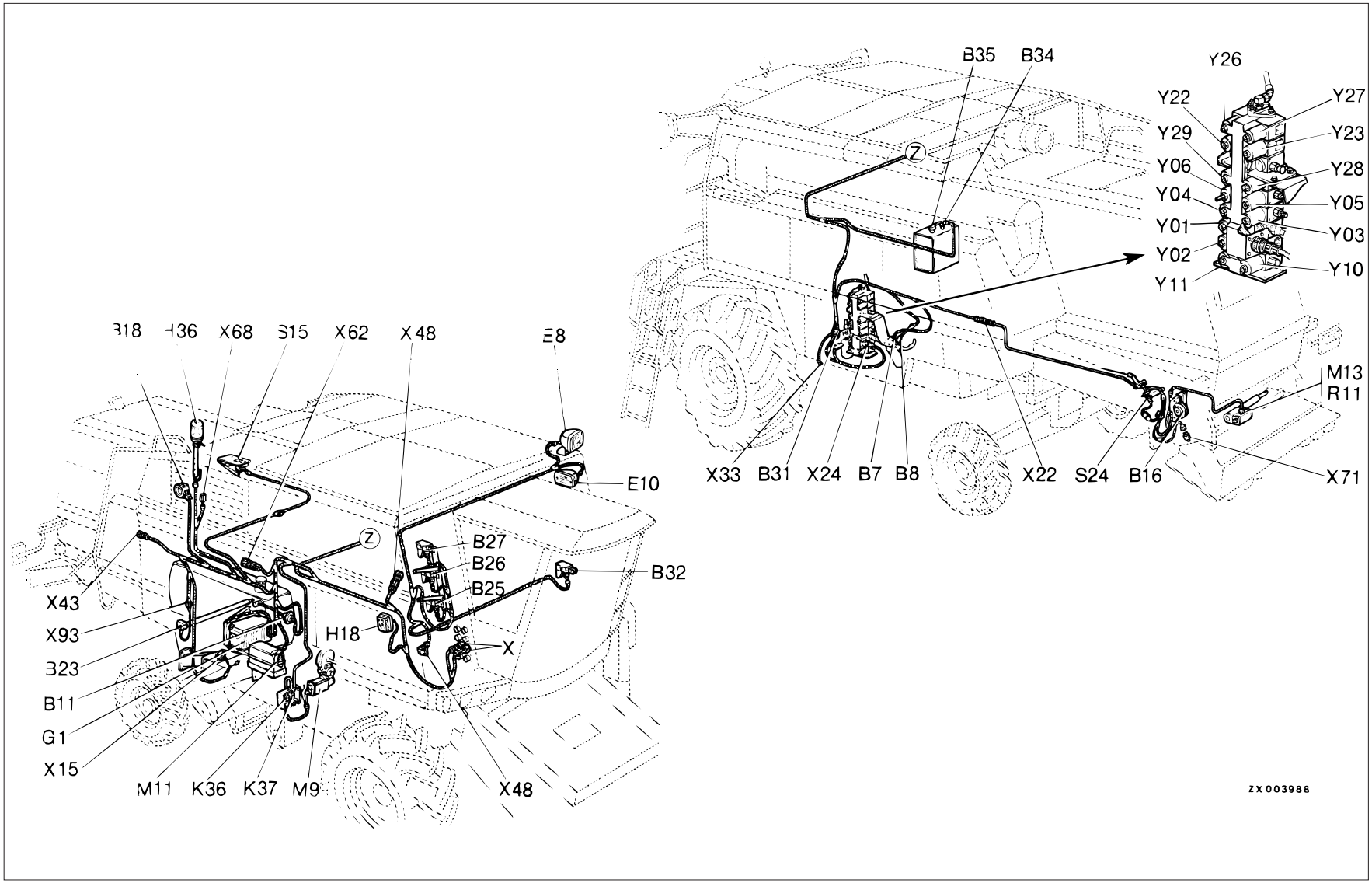
WIRING AND HARNESS DIAGRAM, REAR BASIC WIRING WIRING HARNESS W9, GRAIN TANK WIRING HARNESS W15, CHOPPER WIRING HARNESS W25 AND CHAFF SPREADER WIRING HARNESS W26 - PART 1



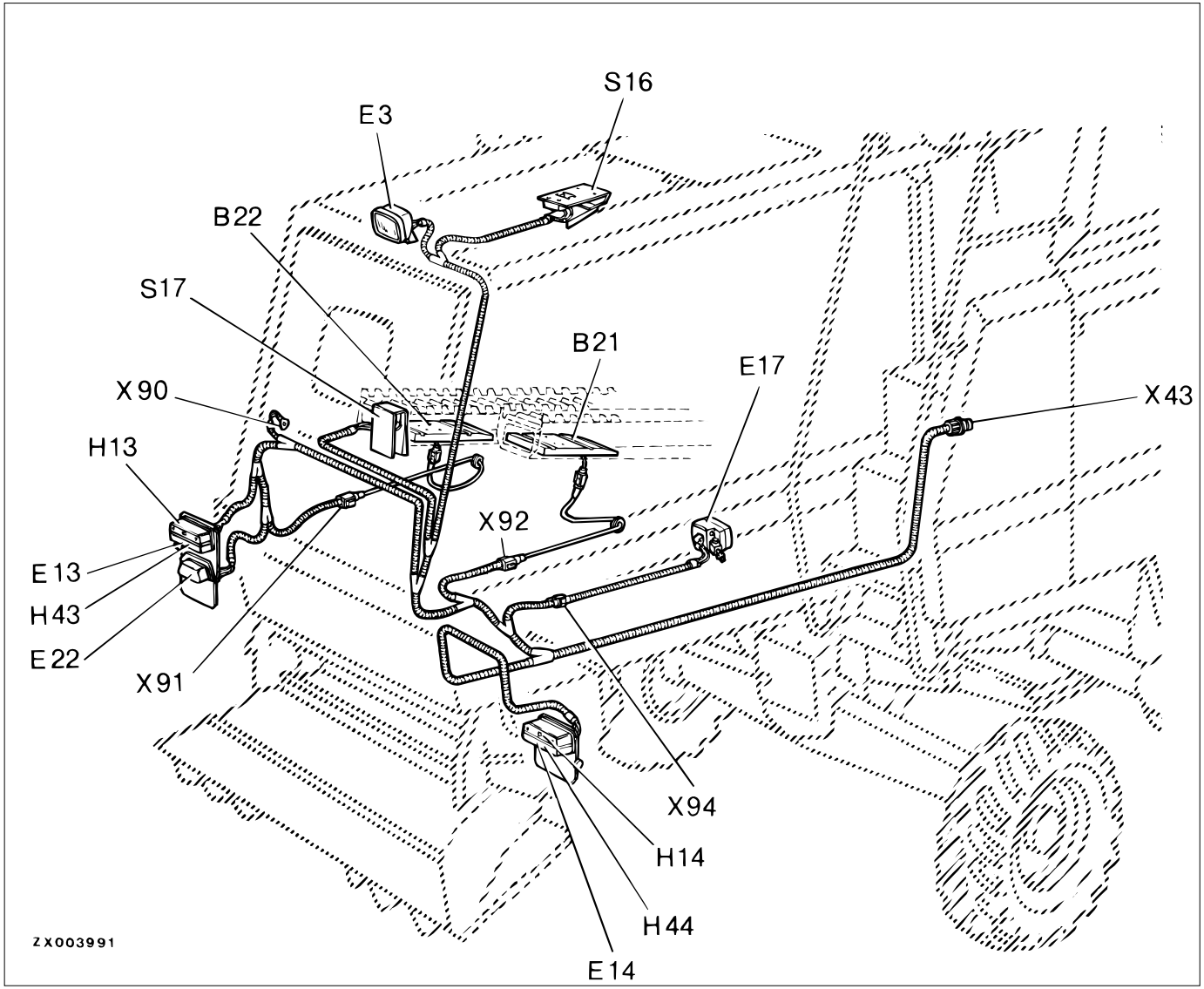
WIRING AND HARNESS DIAGRAM, REAR BASIC WIRING WIRING HARNESS W9, GRAIN TANK WIRING HARNESS W15, CHOPPER WIRING HARNESS W25 AND CHAFF SPREADER WIRING HARNESS W26 - PART 2



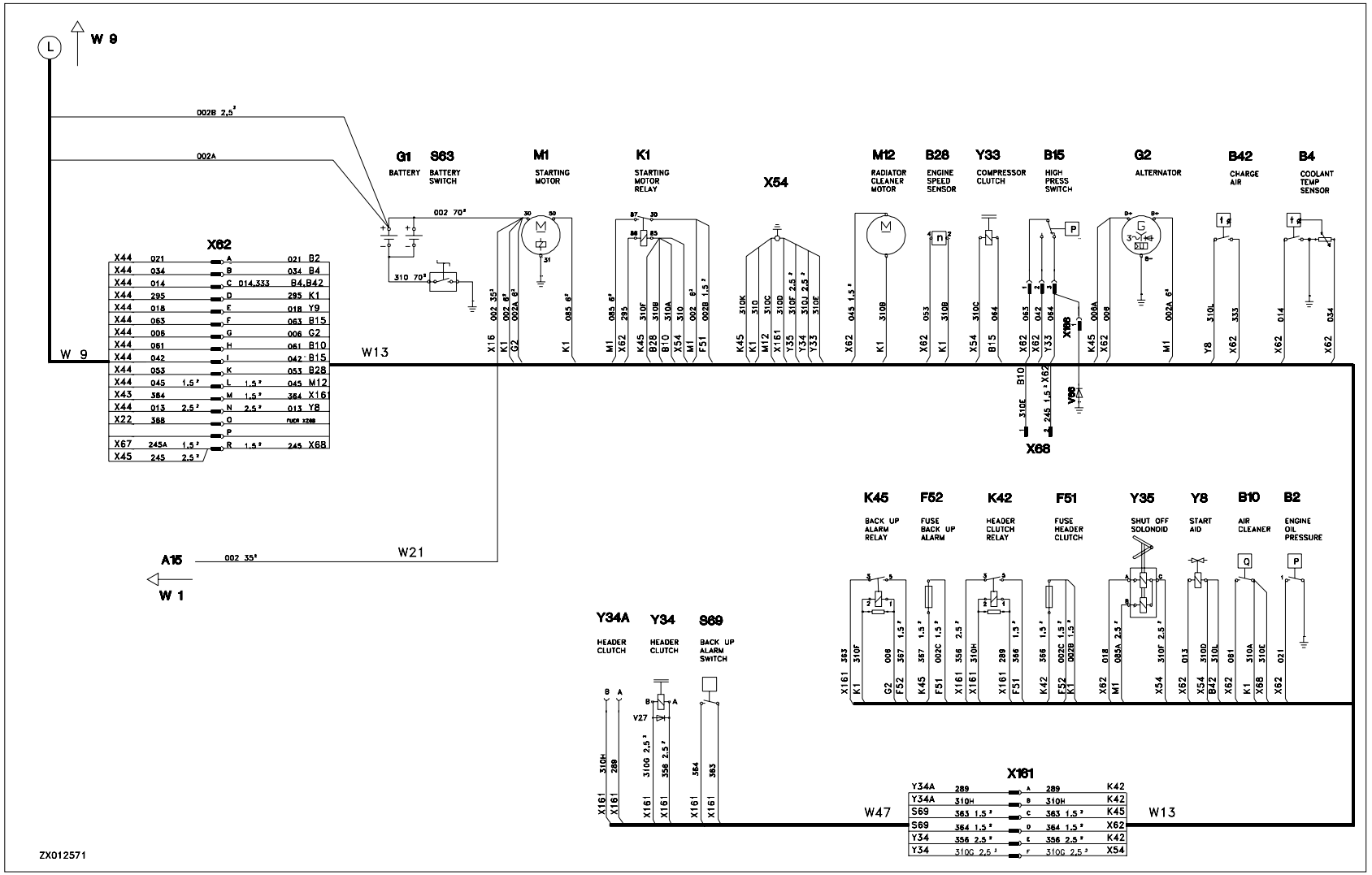
LOCATION OF REAR BASIC WIRING HARNESS W9, GRAIN TANK WIRING HARNESS W15 AND CHOPPER WIRING HARNESS W25



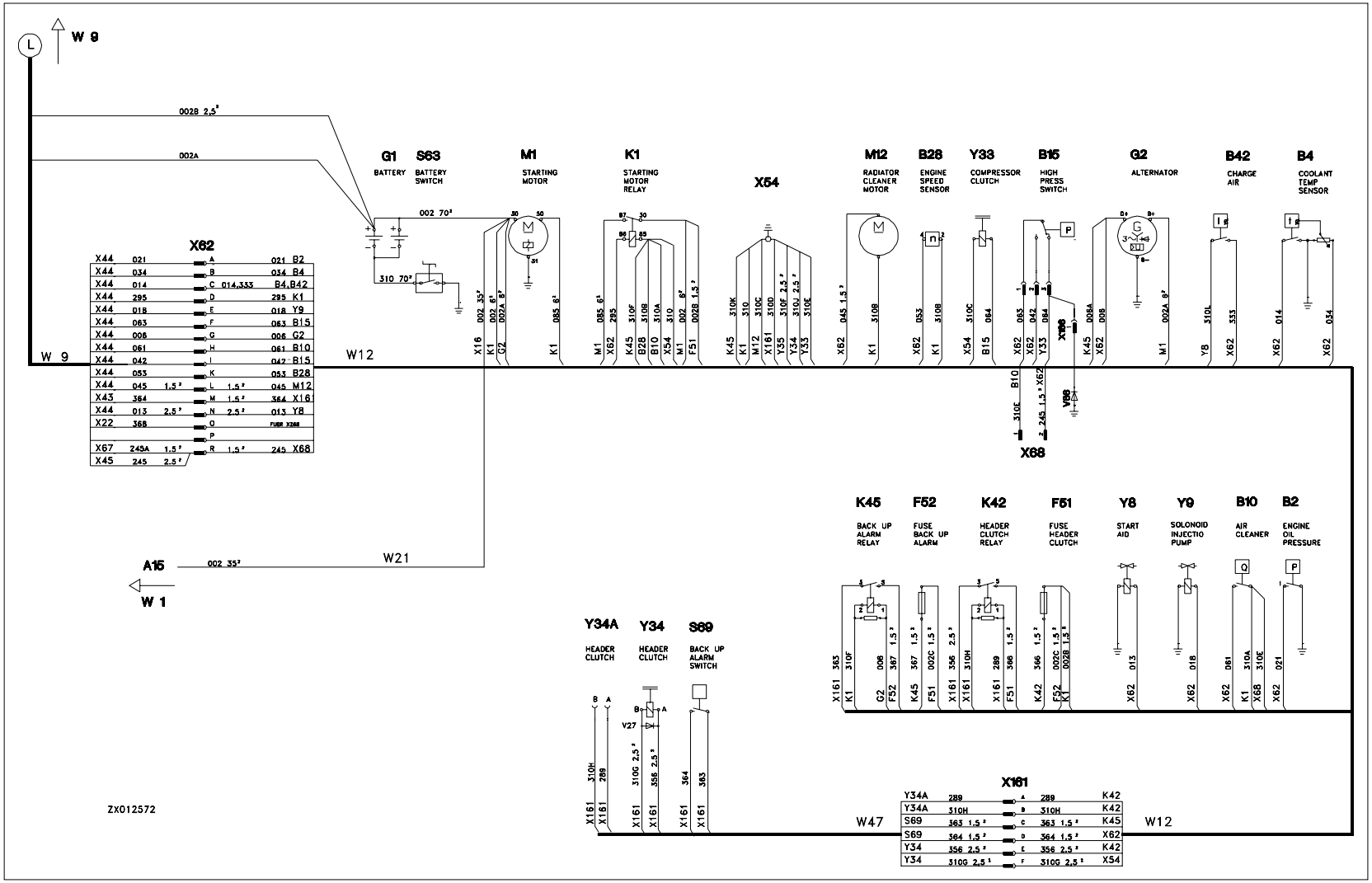
LOCATION OF STRAW HOOD WIRING HARNESS W20 WITH COMPONENTS



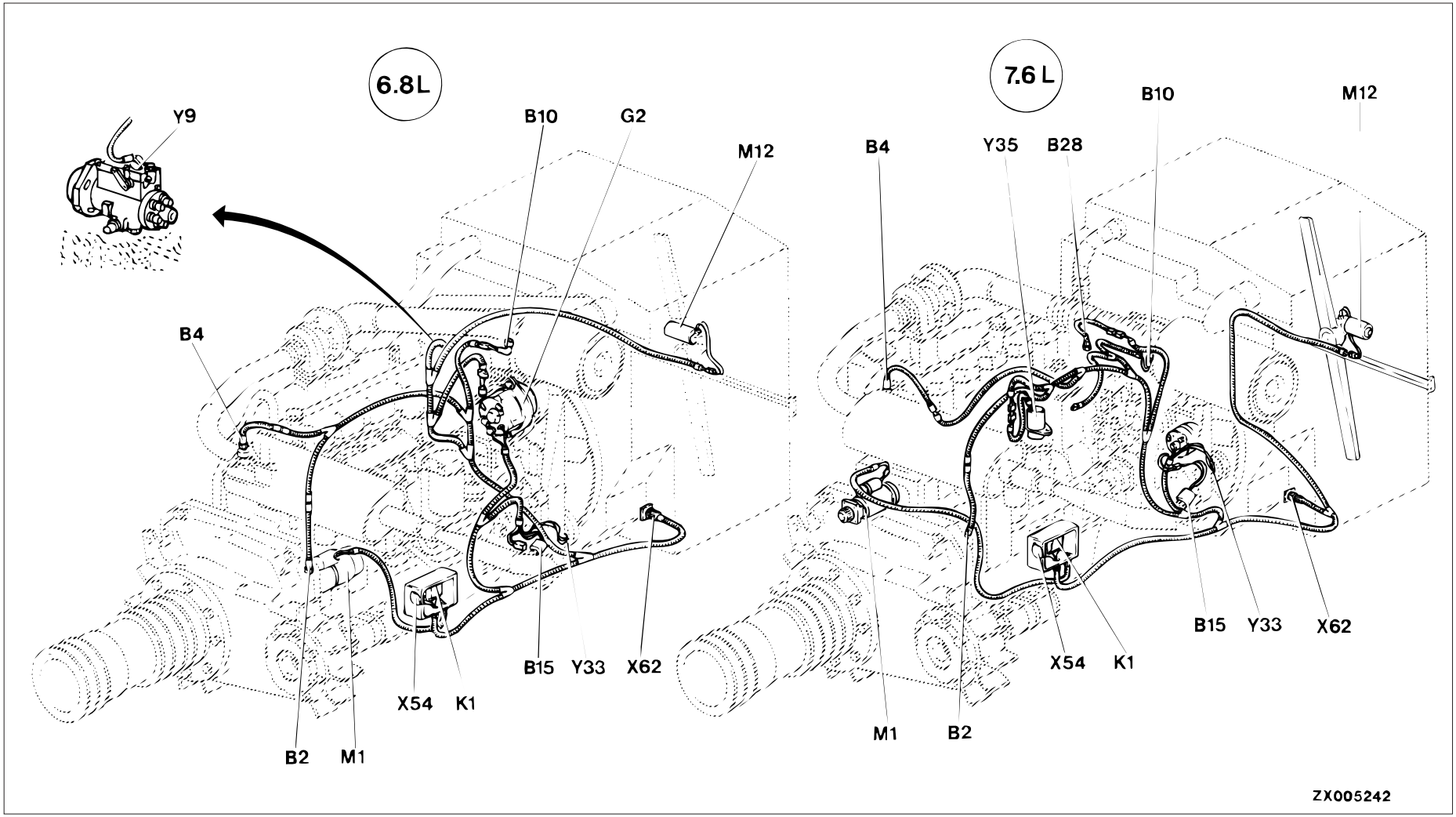
WIRING AND HARNESS DIAGRAM, ENGINE WIRING HARNESSES W12 AND W13 - PART 1



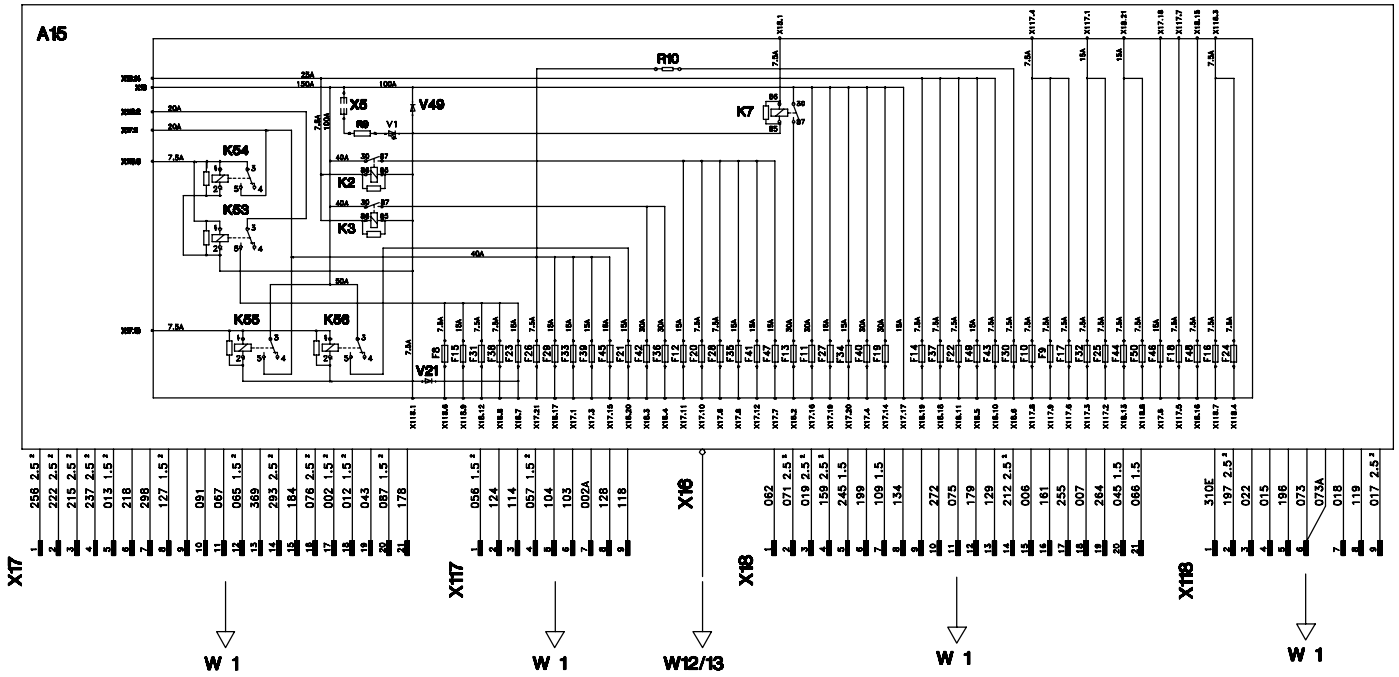
WIRING AND HARNESS DIAGRAM, ENGINE WIRING HARNESSES W12 AND W13 - PART 2



LOCATION OF ENGINE WIRING HARNESSES W12 AND W13 WITH COMPONENTS, AND OF ADAPTER WIRING HARNESS W47 FOR THE HEADER CLUTCH

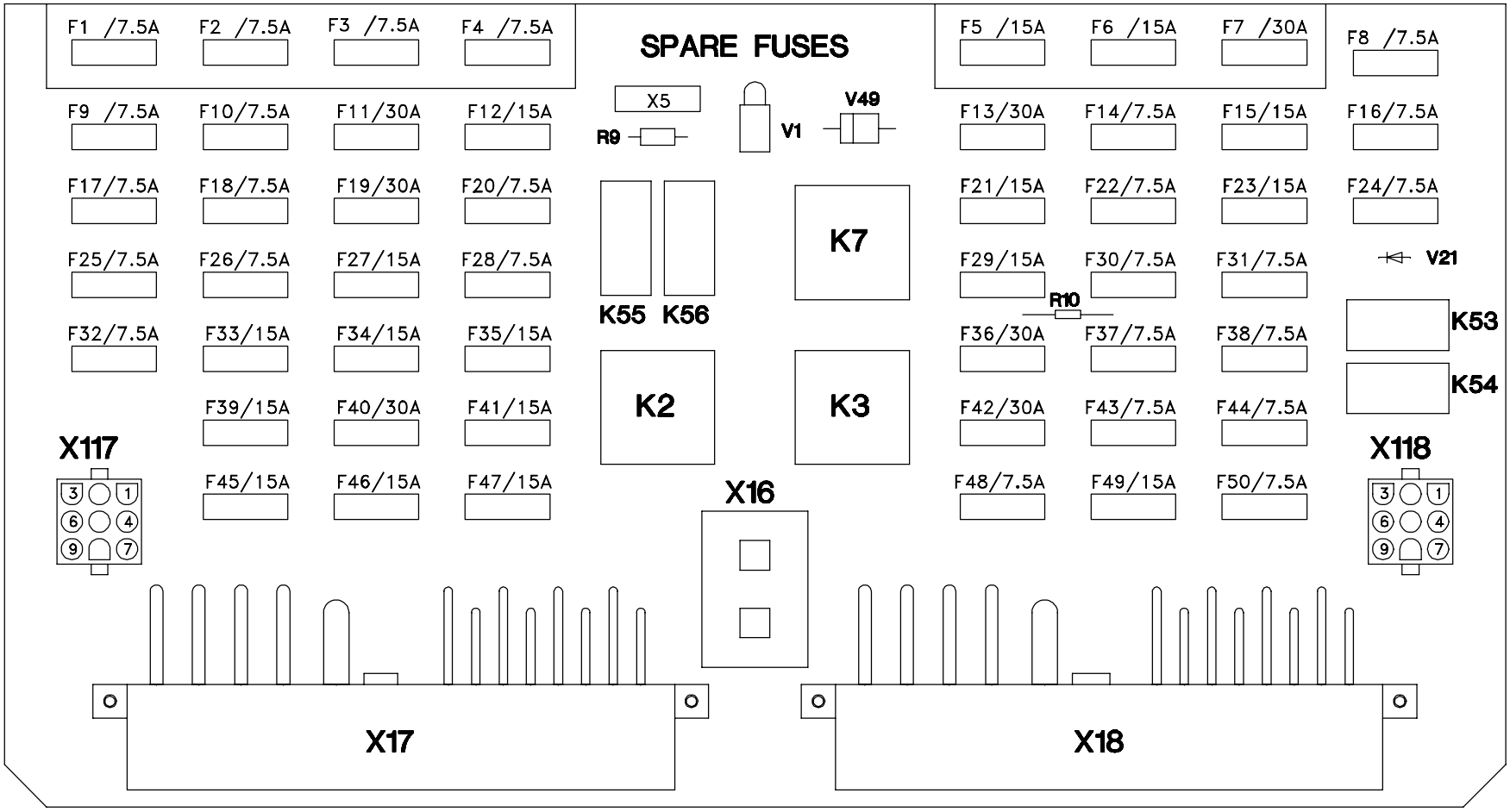


WIRING AND HARNESS DIAGRAM, FUSE BOARD A15



ZX012585

LOCATION OF COMPONENTS ON FUSE BOARD A15



ZX012584

SPECIFICATIONS

Item	Measurement	Specification
Alternator	Capacity	120 A
Batteries	Number	2
Batteries	Voltage	12 V
Battery	Capacity	88 AH

ZX,TMXZCO002403-19-17JAN94

OPERATIONAL INFORMATION

Clearance lights, hazard warning lights, work lights and horn may be switched on regardless of starter switch position.

With starter switch in position (I), all electrical systems may be switched on, with the exception of gauges and indicator lights. These components are activated when starter switch is turned to position (II).

With hydrostatic ground speed drive lever in neutral position, starting motor may be operated by turning starter switch to position (III).

NOTE: Power is supplied to memory functions of clock, radio and citizen band from a point located in front of the battery switch which may be installed. This ensures correct operation of these components with battery switch in "OFF" position.

ZX,TMXZCO002405-19-25NOV92

THEORY OF OPERATION

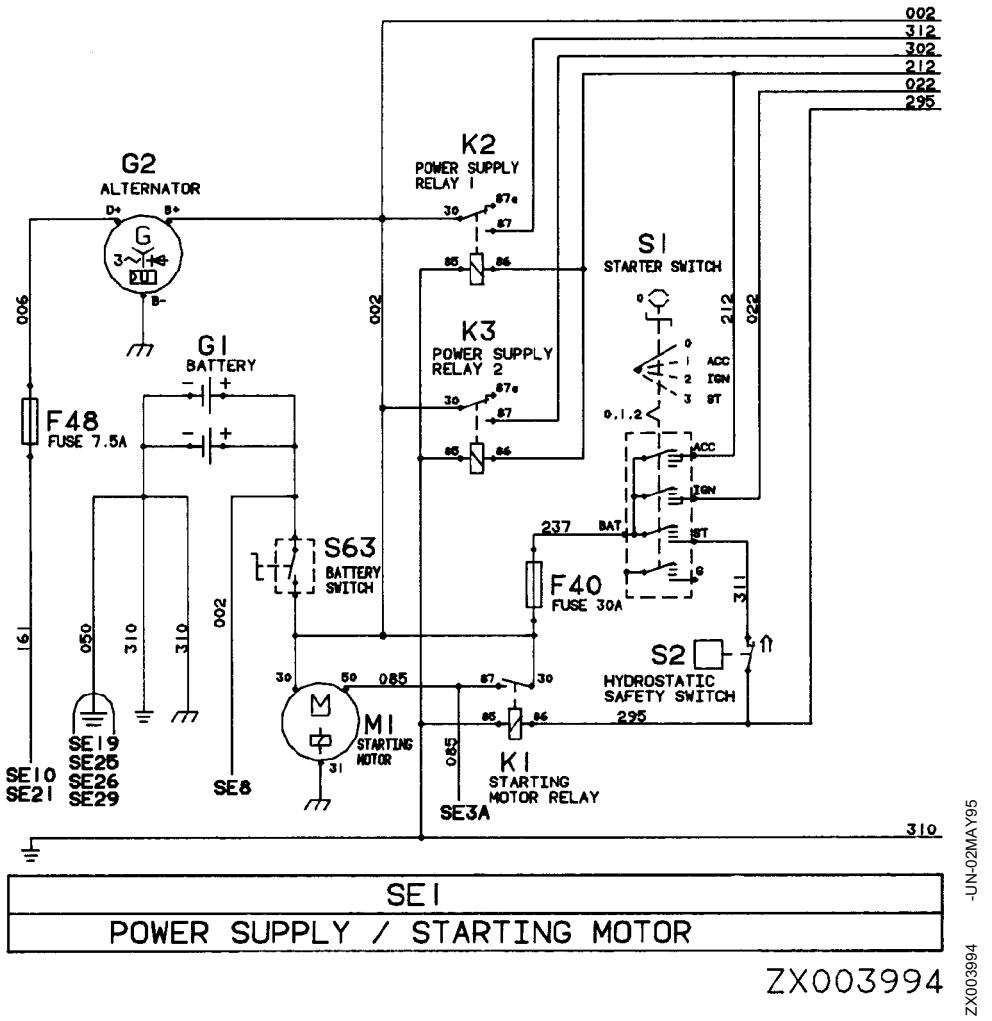
On all combine models, the negative battery terminal is connected to the machine frame via the main battery switch (S63). The positive battery terminal is connected to terminal (30) of starting motor and to the fuse board on which the fuses and basic relays (K2) and (K3) are located.

The starter switch is supplied with current via fuse (F40).

The hydrostatic ground speed control lever must be in neutral position when starting the engine. This will activate switch (S2) and change switch (S63) from a positive conductor to a negative one.

ZX,TMXZCO005138-19-15MAR96

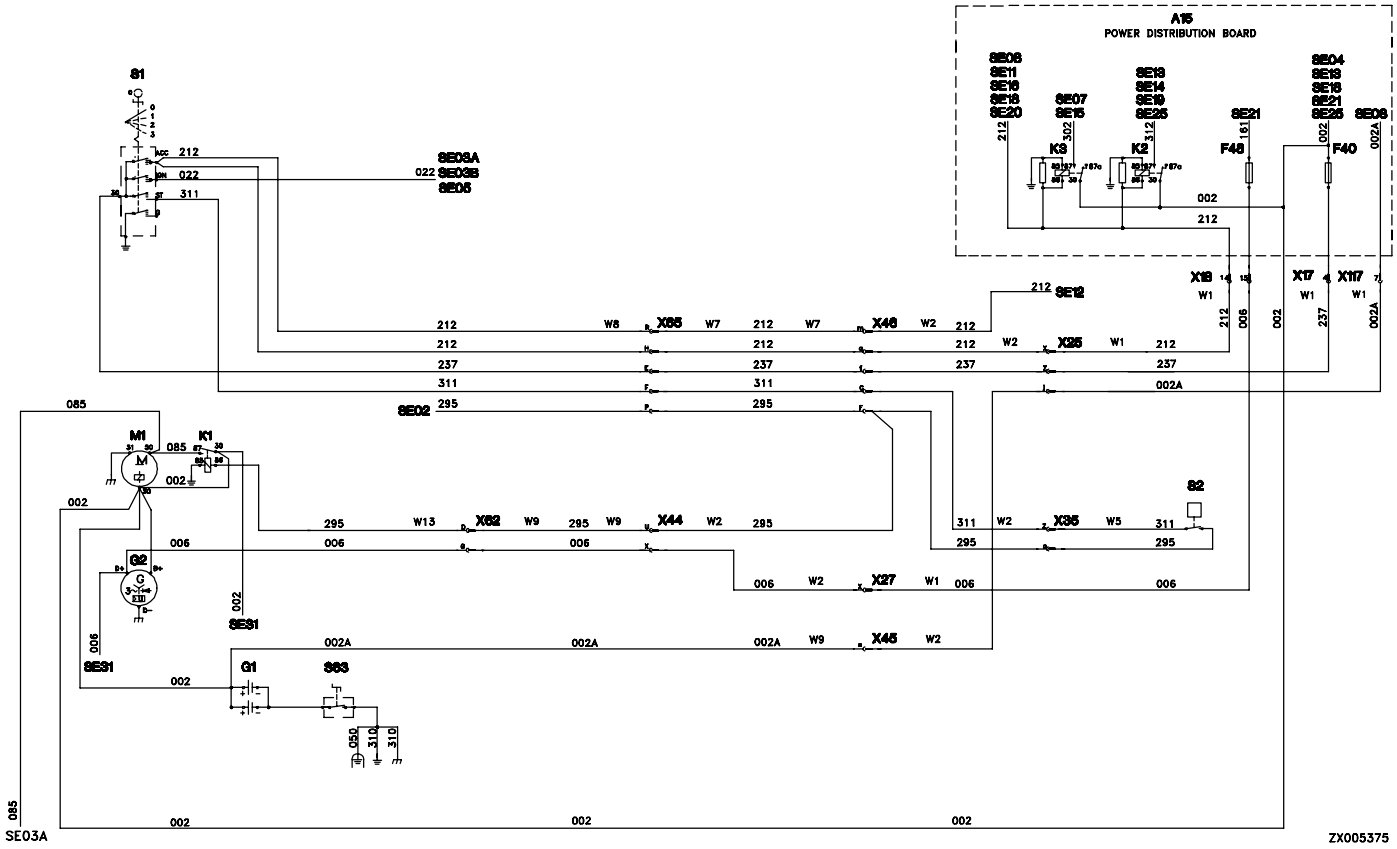
FUNCTIONAL SCHEMATIC OF SECTION 1



A15 — Fuse board
F40 — Fuse, 30 amps.
F48 — Fuse, 7.5 amps.
G1 — Batteries
G2 — Alternator
K1 — Starting motor relay
K2 — Basic relay
K3 — Basic relay
M1 — Starting motor
S1 — Starter switch
S2 — Hydrostatic safety switch
S63 — Battery switch
X17 — Connection, distribution harness (W1) to fuse board
X18 — Connection, distribution harness (W1) to fuse board
X25 — Disconnect point, distribution harness (W1), cab harness (W2)
X27 — Disconnect point, distribution harness (W1), cab harness (W2)
X35 — Disconnect point, cab harness (W2), armrest harness (W5)
X44 — Disconnect point, cab harness (W2), rear basic harness (W9)
X45 — Disconnect point, cab harness (W2), rear basic harness (W9)
X46 — Disconnect point, cab harness (W2), front basic harness (W7)
X62 — Disconnect point, rear basic harness (W9), engine harness (W13)
X65 — Disconnect point, front basic harness (W7), steering column harness (W8)
X117— Connection, distribution harness (W1) to fuse board

ZX,TMXZCO002406-19-17JAN94

DIAGNOSTIC SCHEMATIC OF SECTION 1



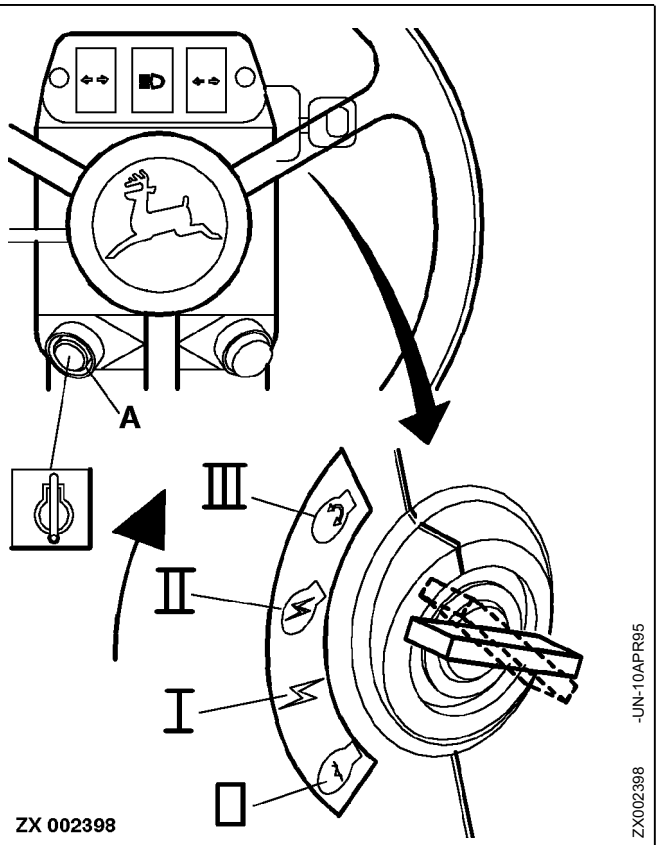
OPERATIONAL INFORMATION

The cold weather starting aid injects ether fluid into the intake manifold while cranking engine by means of starting motor.

Ether is highly flammable. The heat created in the combustion chamber is sufficient to ignite the injected ether. This in turn will ignite the fuel/air mixture.

Operating cold weather starting aid:

Turn starter switch to position III. As soon as the engine is cranking, push ether starting aid button (A). After the engine has started, release starter switch and starting aid button.



ZX,TMXZCO003182-19-17JAN94

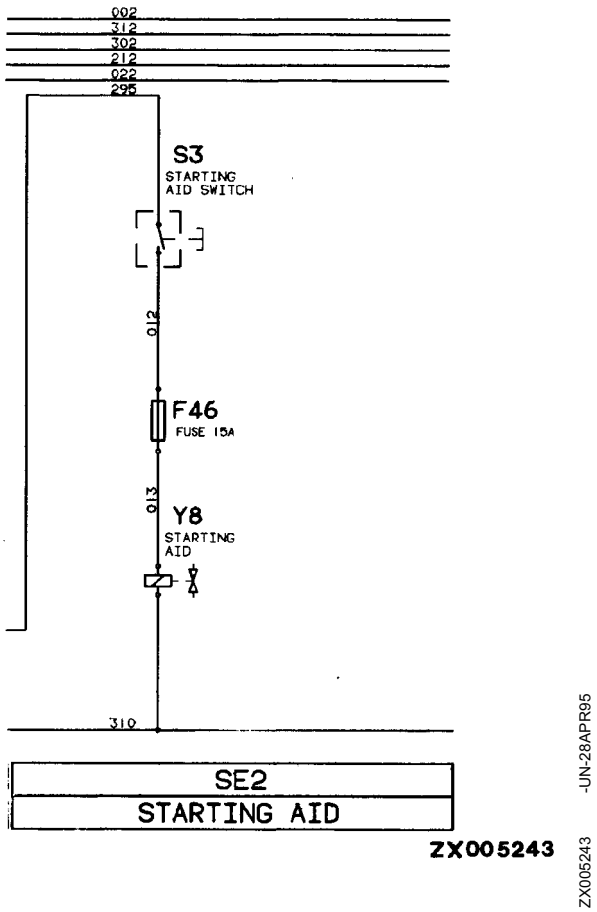
THEORY OF OPERATION

With starter switch in position III, voltage is supplied to starting motor relay coil via hydrostatic safety switch. At the same time, voltage is supplied to starting aid switch (S3) via wire 295.

Solenoid (Y8) is activated by actuating switch (S3), which will inject ether into the intake manifold.

ZX,TMXZCO003183-19-17JAN94

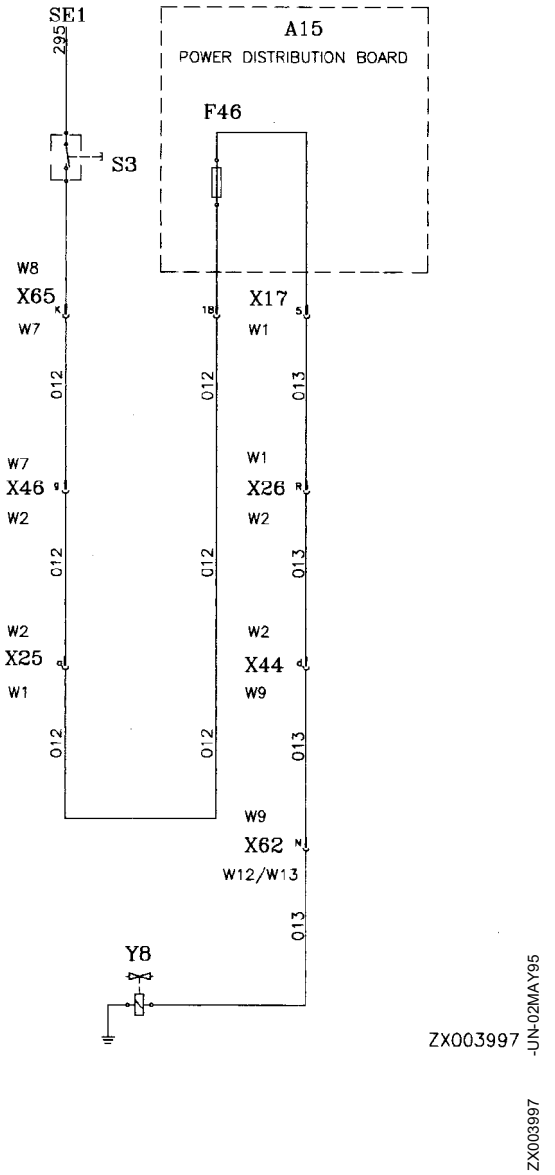
FUNCTIONAL SCHEMATIC OF SECTION 2



A15—Fuse board
F46—Fuse, 15 amps.
S3 —Ether starting aid switch
X17—Connection, distribution harness (W1) to fuse board
X25—Disconnect point, distribution harness (W1), cab harness (W2)
X44—Disconnect point, cab harness (W2), basic harness (W9)
X46—Disconnect point, cab harness (W2), front basic harness (W7)
X62—Disconnect point, rear basic harness (W9), engine harness (W12/W13)
X65—Disconnect point, front basic harness (W7), steering column harness (W8)
Y8 —Solenoid, ether starting aid

ZX,TMXZCO003184-19-17JAN94

DIAGNOSTIC SCHEMATIC OF SECTION 2



ZX,TMXZCO003185-19-17JAN94

OPERATIONAL INFORMATION

When starter switch is moved back from position (II) to position (I), the engine is shut off electrically.

On the 7.6 Liter engine, a shut-off lever is moved by interrupting current supply to the lever retaining solenoid.

On the 6.8 Liter engine, the fuel supply is shut off by means of a solenoid valve in the fuel pump.

ZX,TMXZCO002408-19-25NOV92

THEORY OF OPERATION

7.6 LITER ENGINE

When moving starter switch from position (I) to position (II), coil of (Y35) is supplied with current via wire (018).

In addition, the second coil of (Y35) is activated via wire (085) during the starting procedure, moving the shut-off lever at fuel injection pump.

The engine is ready for starting.

After starting procedure is completed, the second coil is again without current.

The engine shut-off lever is held in operating position by the retaining coil.

For shutting off the engine current supply to the retaining coil is interrupted.

A return spring moves shut-off lever at fuel injection pump to the zero position.

6.8 LITER ENGINE

Fuel supply at injection pump is interrupted by a solenoid.

With engine running, solenoid coil is supplied with current, keeping solenoid valve open.

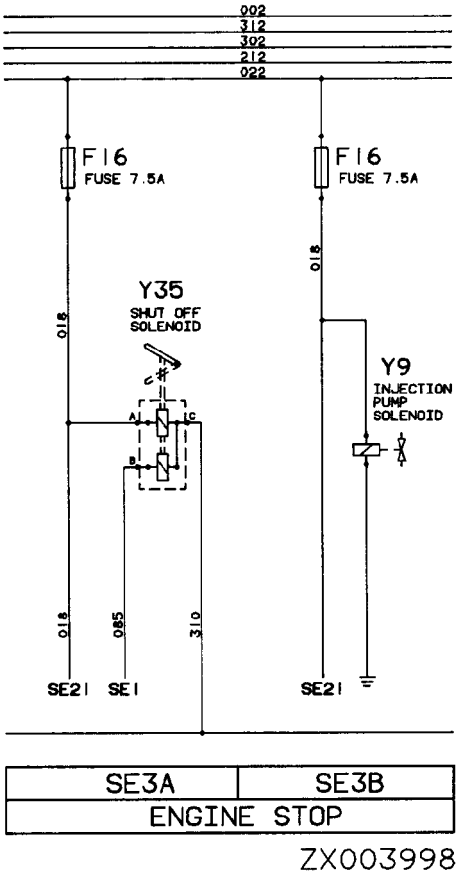
When current supply is interrupted, the valve is closed by spring force.

NOTE: If fuse (F16) fails, the machine will stop.

SWITCH POSITIONS:
•Position III: Wire 085 is live only when starting.
•Position II: Wire 018 is live.
•Position I: No current at wires 018 or 085. Current available for lighting only.
•Position 0: Everything off.

ZX,TM4543010317-19-30JUN97

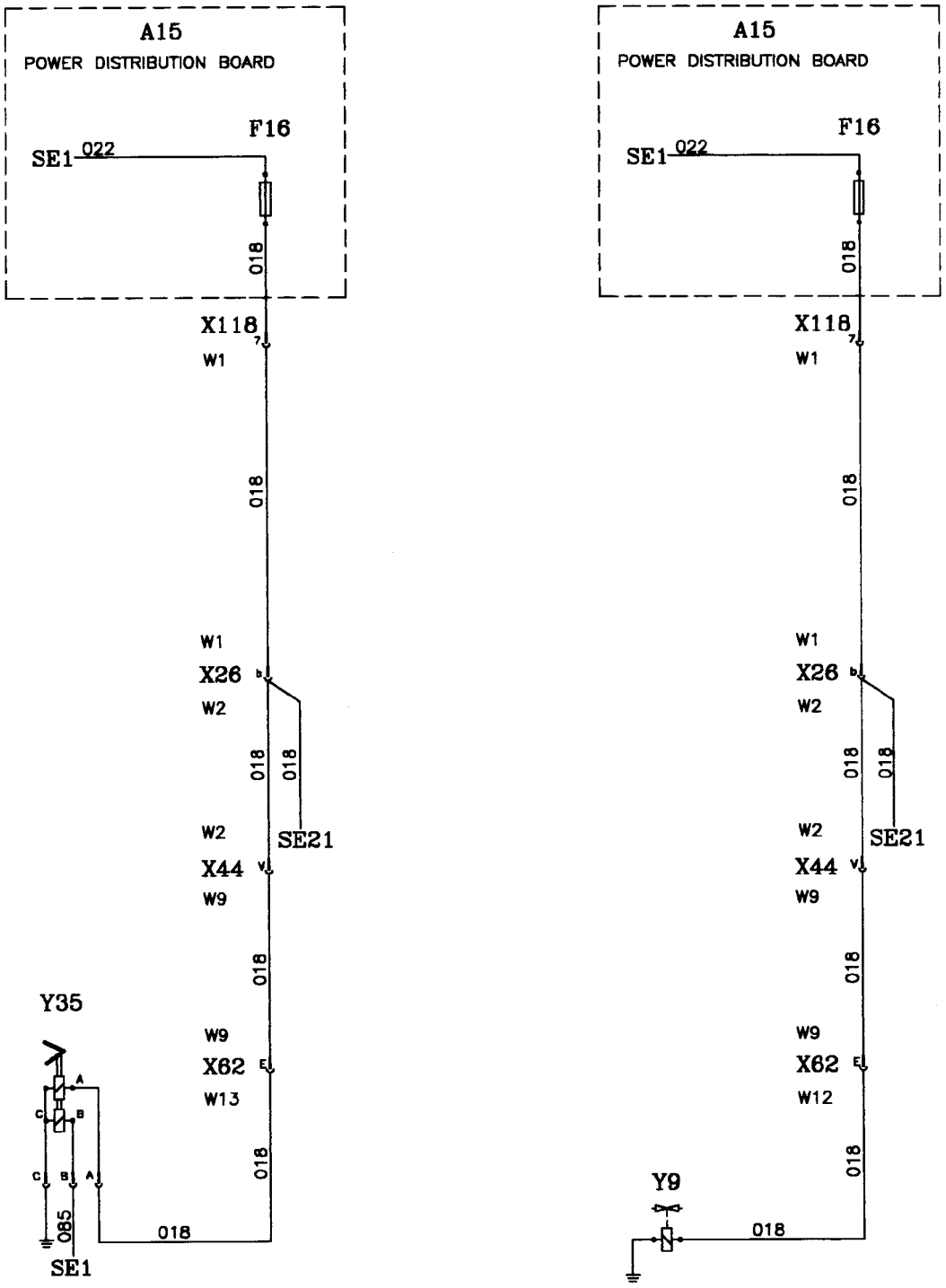
FUNCTIONAL SCHEMATIC OF SECTIONS 3A AND 3B



A15 —Fuse board
F16 —Fuse, 7.5 amps.
X44 —Disconnect point, cab harness (W2), basic harness (W9)
X26 —Disconnect point, distribution harness (W1), cab harness (W2)
X62 —Disconnect point, rear basic harness (W9), engine harness (W12/W13)
X118—Connection, distribution harness (W1) to fuse board
Y9 —Engine shut-off solenoid
Y35 —Engine shut-off solenoid

ZX,TMXZCO002410-19-17JAN94

DIAGNOSTIC SCHEMATIC OF SECTIONS 3A AND 3B



ZX,TMXZCO002411-19-25NOV92

OPERATIONAL INFORMATION

The combine is equipped with analog gauges to display coolant temperature, fuel level, grain losses and header height.

When certain limit values are reached, the coolant or fuel level sending units activate indicator lights and buzzer.

ZX,TMXZCO002412-19-25NOV92

THEORY OF OPERATION

With starter switch in position (II), the gauges are supplied with current via fuse (F24).

The COOLANT TEMPERATURE GAUGE (P1) is connected to sending unit (B4) via wire (034).

Sending unit (B4) is a variable resistor.

At a coolant temperature of 20˚C (68˚F) resistance is very high. The gauge shows a very low temperature.

At a coolant temperature of 110˚C (240˚F) resistance is low. The gauge shows a high temperature.

The FUEL GAUGE (P2) is connected to sending unit (B11) via wire (033).

Sending unit (B11) is a variable resistor.

At a low fuel level in fuel tank, resistance is low. Gauge shows empty tank.

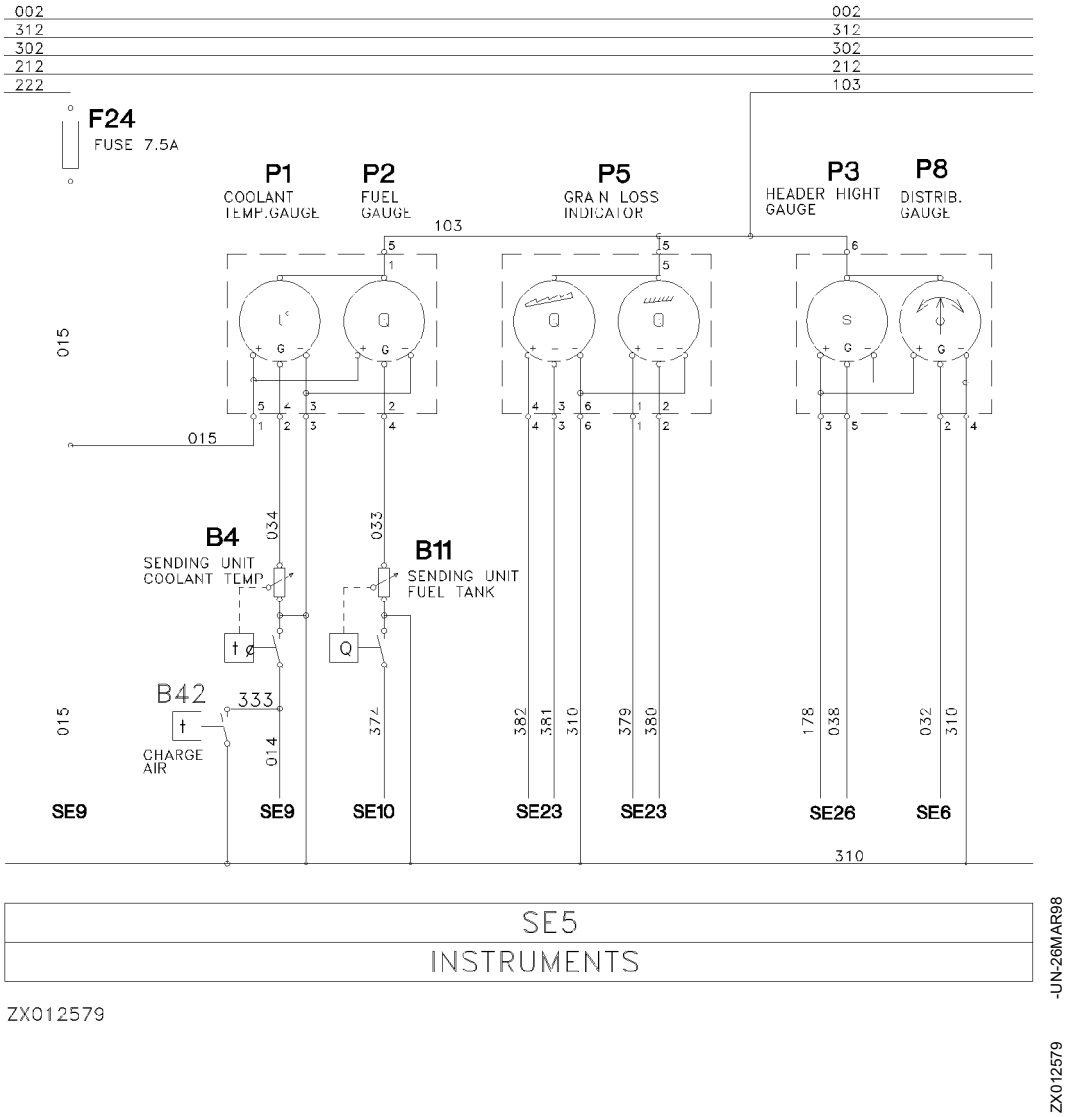
At a high fuel level in fuel tank, resistance is high. Gauge shows full tank.

The HEADER HEIGHT GAUGE receives signals from potentiometer (R4) on feeder house.

Display of GRAIN LOSS GAUGE is controlled by harvest performance monitor (A4).

ZX,TMXZCO002413-19-25NOV92

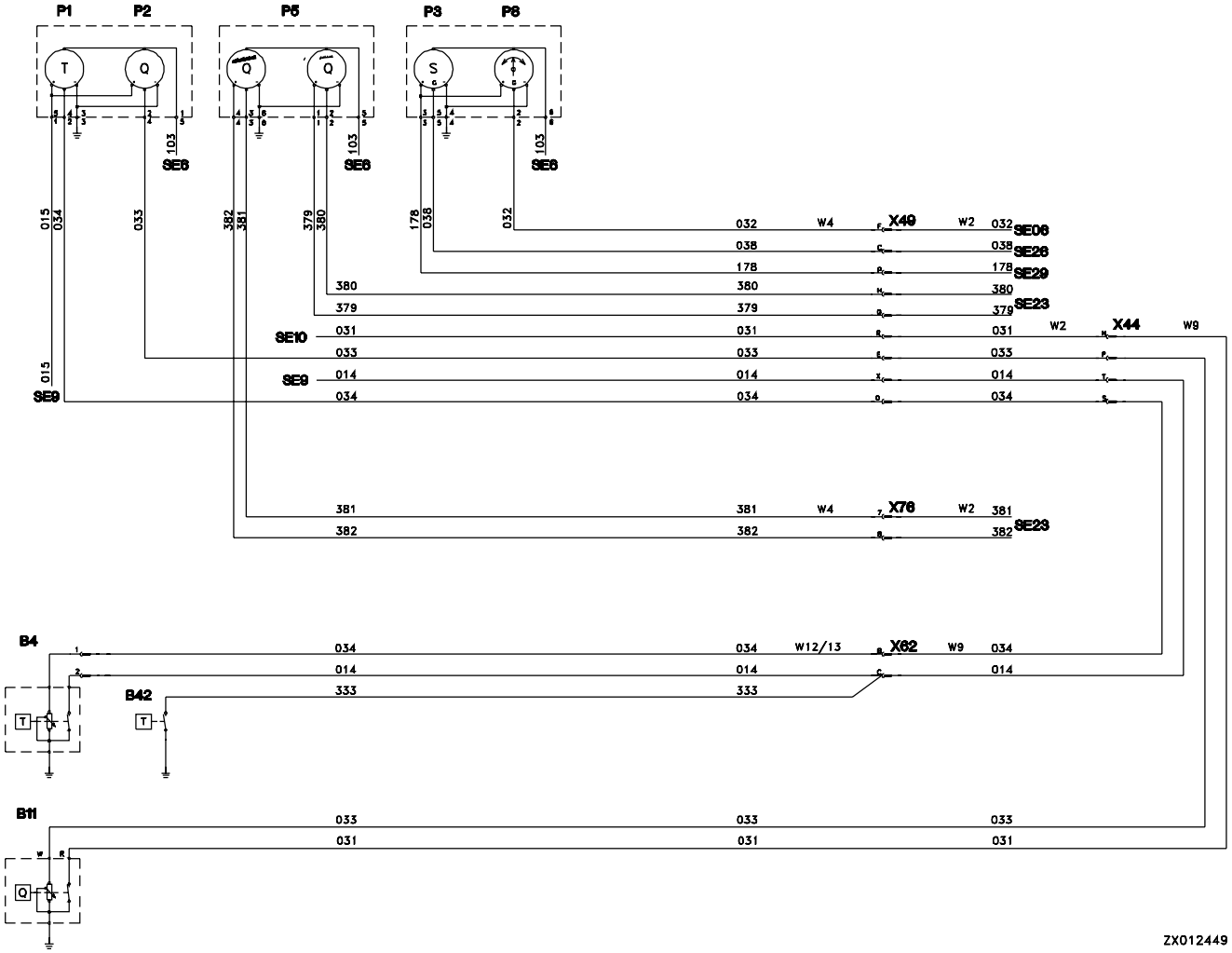
FUNCTIONAL SCHEMATIC OF SECTION 5



B4 —Coolant temperature sending unit
B11—Fuel tank sending unit
B12—Horn
F24—Fuse, 7.5 amps.
P1 —Coolant temperature gauge
P2 —Fuel gauge
P3 —Header height gauge
P5 —Grain loss indicator
P8 —Distributor gauge
X44—Disconnect point, cab harness (W2), rear basic harness (W9)
X62—Disconnect point, rear basic harness (W9), engine harness (W12/W13)

ZX,TM4543010318-19-30JUN97

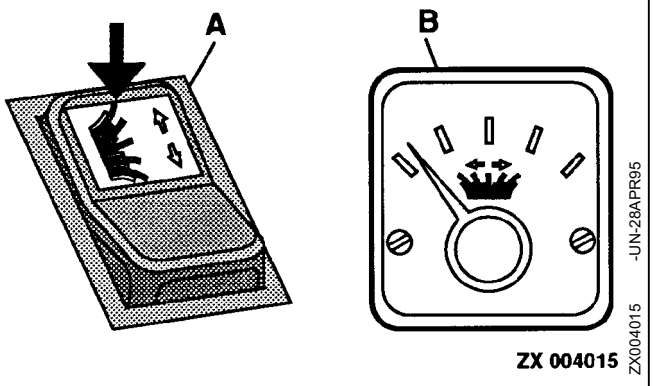
DIAGNOSTIC SCHEMATIC OF SECTION 5



OPERATIONAL INFORMATION

With separator engaged, it is possible to distribute chopped material to the right or left by repositioning distributor plates. Gauge (B) shows direction of material distribution.

A—Chopper distributor switch
B—Chopper distributor gauge



ZX,TMXZCO002416-19-25NOV92

THEORY OF OPERATION

Switch (S54) is supplied with current via wire (202) (depending on position of separator switch) and via fuse (F15). Ground connection is also established by means of switch (S54).

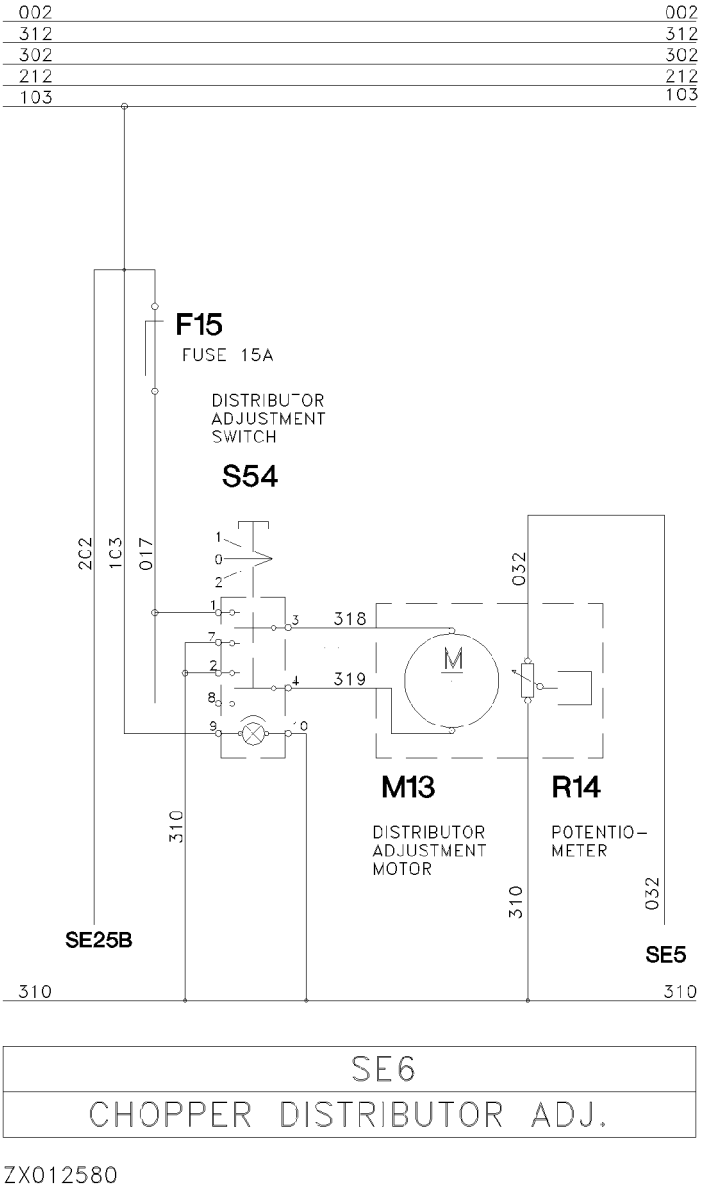
Rotating direction of electric motor (M13) depends on position of switch (S54).

An internal mechanical slip clutch prevents overloading of the system.

Gauge (P8) is controlled by potentiometer (R14) integrated in electric motor.

ZX,TMXZCO002417-19-25NOV92

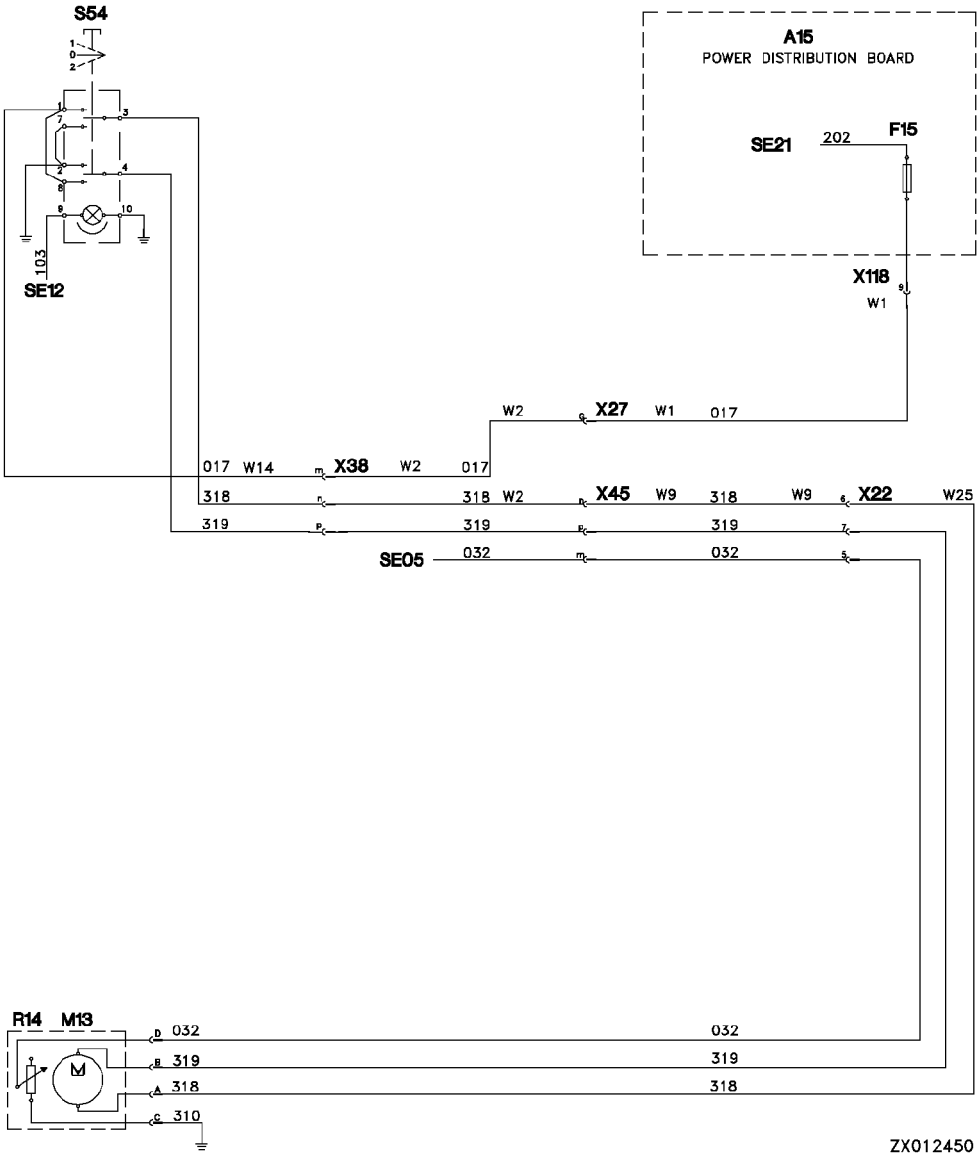
FUNCTIONAL SCHEMATIC OF SECTION 6



A15 —Fuse board
F15 —Fuse, 15 amps.
M13 —Distributor adjusting motor
R14 —Potentiometer
S54 —Switch, distributor adjustment
X22 —Disconnect point, rear basic harness (W9), chopper harness (W25)
X27 —Disconnect point, distribution harness (W1), cab harness (W2)
X38 —Disconnect point, cab harness (W2), switch console harness (W14)
X49 —Disconnect point, cab harness (W2), corner post harness (W4)
X118—Connection, cab harness to fuse board

ZX,TMXZCO002418-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 6



ZX012450 -UN-11MAR98

ZX,TMXZCO003127-19-30JUN97

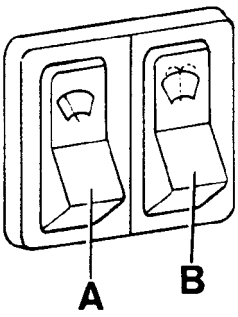
OPERATIONAL INFORMATION

With starter switch in position (I), windshield wiper/washer may be switched on by actuating switches (A) or (B).

Windshield wiper switch (A) is a tumbler/rocker switch, for one-cycle or continuous wiper operation.

Windshield washer rocker switch (B) can be actuated regardless of position of switch (A).

Cab, grain tank and straw hood lighting are located in the same circuit.



ZX004091

ZX004091 -UN-28APR95

ZX,TMXZCO002420-19-25NOV92

THEORY OF OPERATION

With starter switch in position (I), current is supplied to switches (S20) and (S21) via fuse (F36).

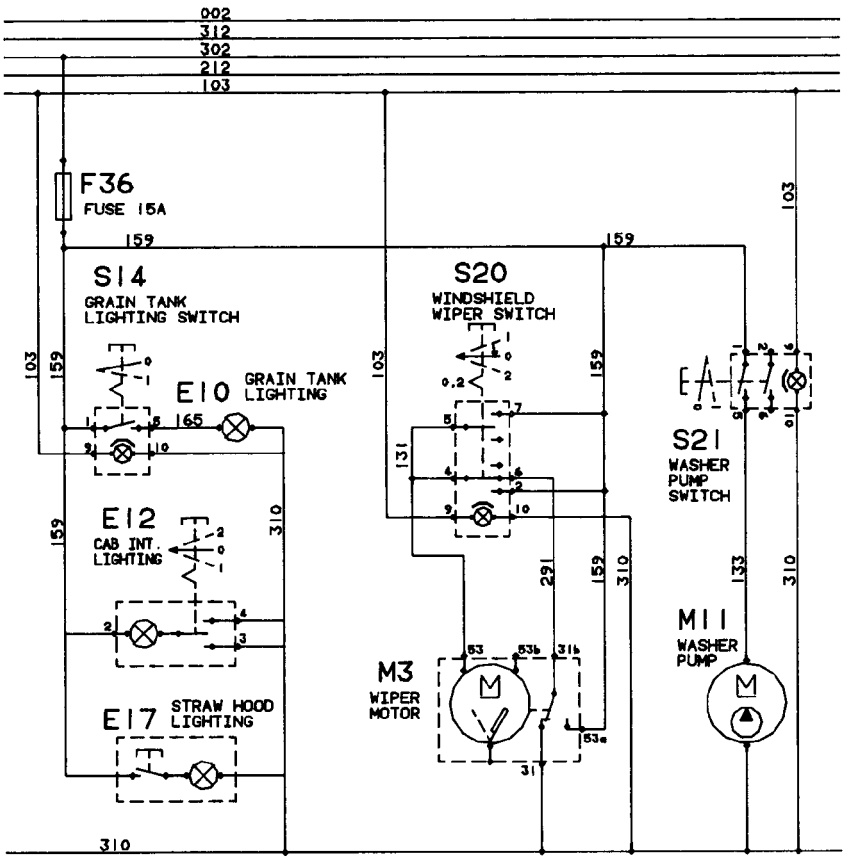
Windshield wiper will operate in wiper switch position (I) or (II). Position (I) is for one-cycle operation, position (II) for continuous operation.

After shutting off windshield wiper, wiper motor (M3) will automatically return it to “park” position.

Switch (S21) activates the windshield washer pump.

ZX,TMXZCO002421-19-25NOV92

FUNCTIONAL SCHEMATIC OF SECTION 7

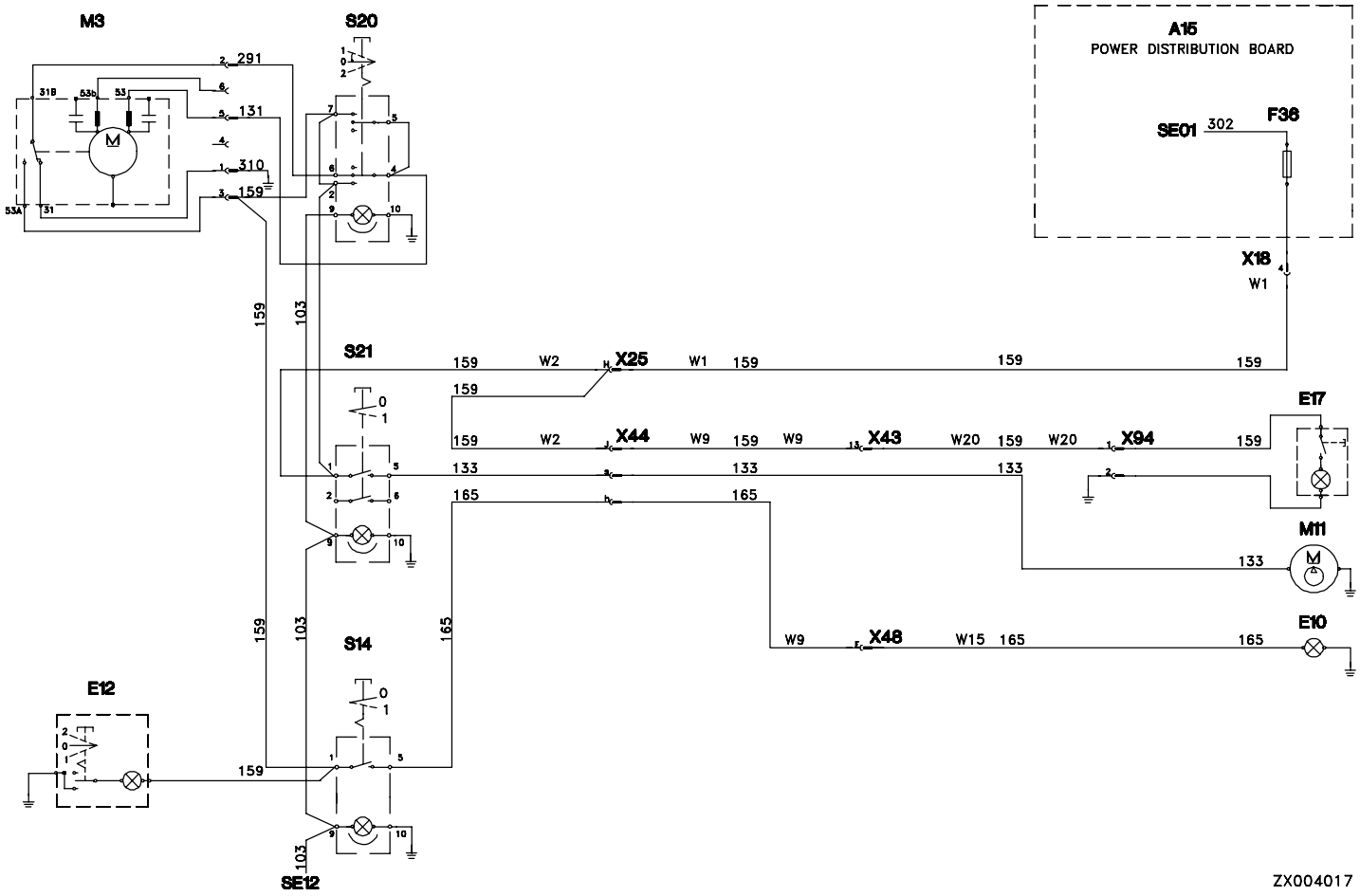


ZX004016 -UN-02MAY95

A15—Fuse board
E10—Grain tank lighting
E12—Cab interior lighting
E17—Straw hood lighting
F36—Fuse, 15 amps.
M3—Windshield wiper motor
M11—Windshield washer pump
S14—Grain tank lighting switch
S20—Windshield wiper switch
S21—Windshield washer switch
X18—Connection, fuse board to distribution harness
X25—Disconnect point, distribution harness — cab harness
X43—Disconnect point, rear basic harness — straw hood harness
X44—Disconnect point, cab harness — rear basic harness
X48—Disconnect point, rear basic harness — grain tank harness

ZX,TMXZCO002422-19-25NOV92

DIAGNOSTIC SCHEMATIC OF SECTION 7



OPERATIONAL INFORMATION

With starter switch in position (I), display of digital clock will light up. When parking lights are switched on, display is dimmed by 50%.

At the same time the radio, citizen band or interior light may be switched on with starter switch in position (I).

ZX,TMSPFH001734-19-22FEB92

THEORY OF OPERATION

With starter switch in position (I), power is supplied to radio (A12) and citizen band (A13) via fuse (F22), allowing the operator to switch on these components.

Display of digital clock (P7) will light up.

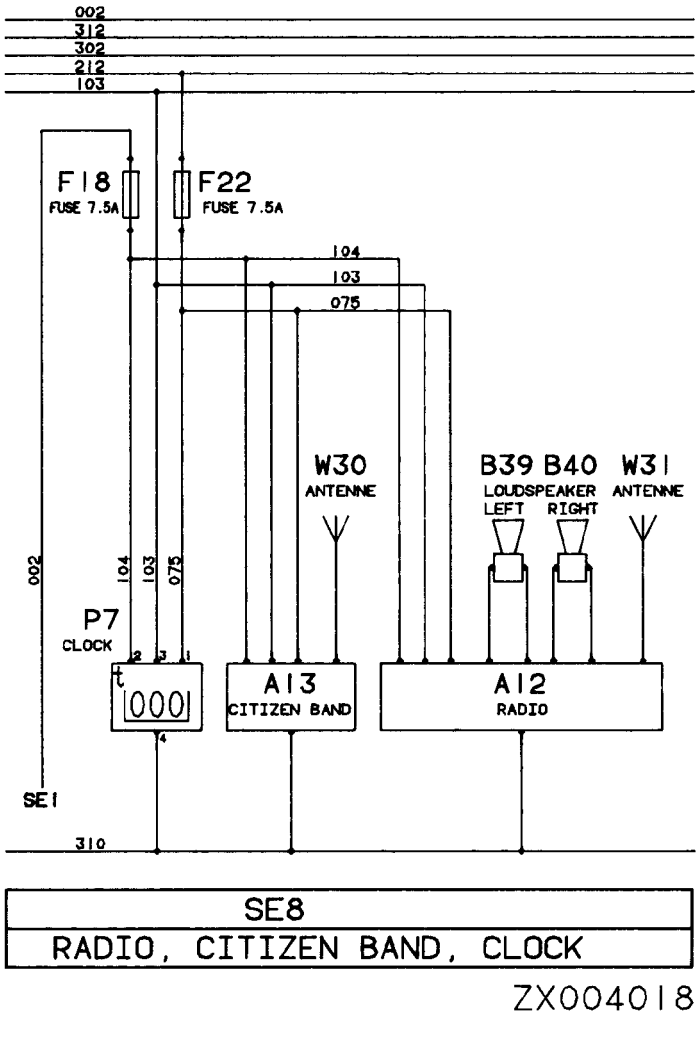
When current is supplied to digital clock via wire (103) (with lights switched on), display is dimmed by 50%.

Digital clock, radio and citizen band are continuously supplied with current via fuse (F18).

NOTE: Connection from line (075) to relay (K46) in Section 32 applies only in the case of the 2054 combine.

ZX,TMXZCO006479-19-15MAR96

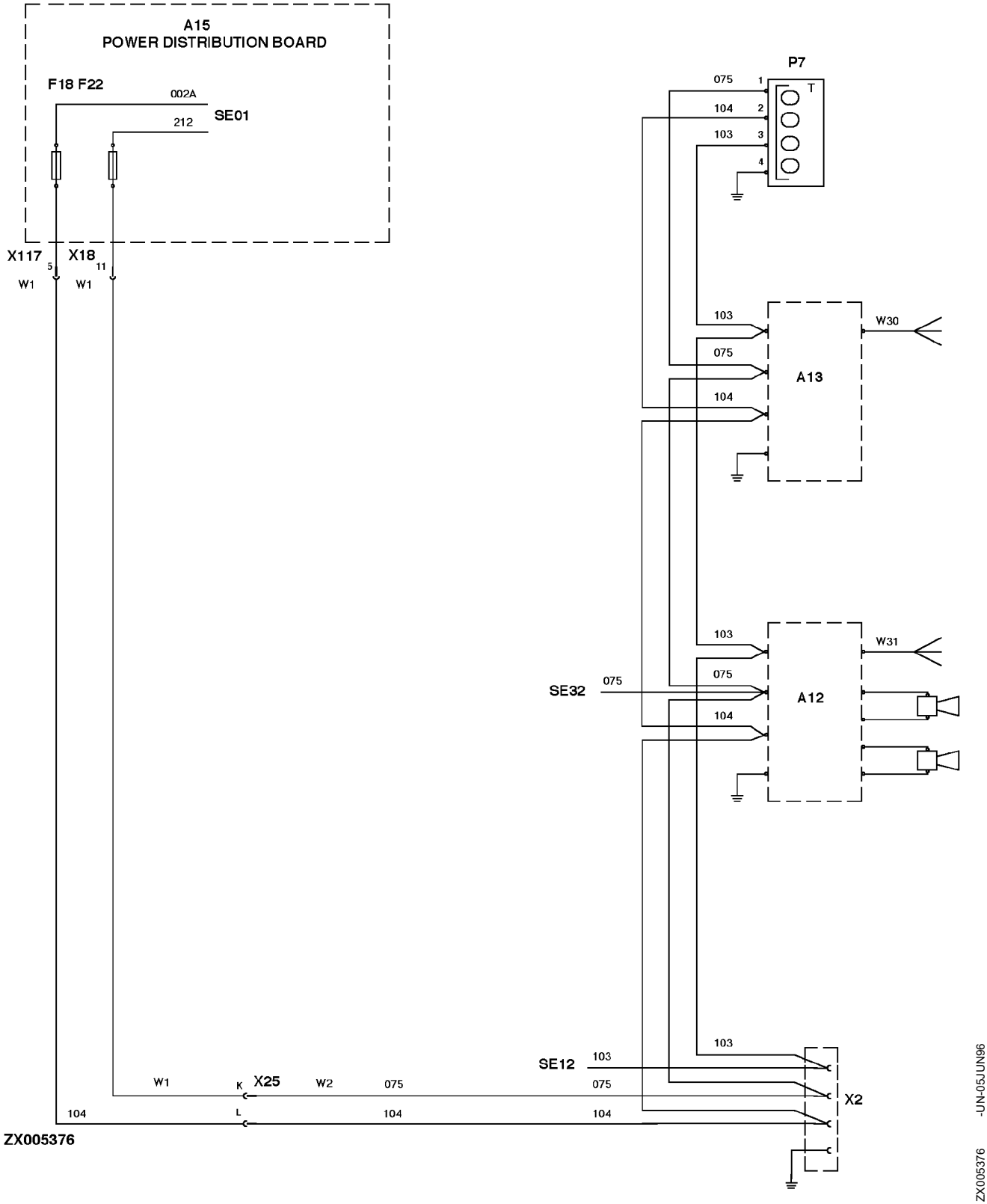
FUNCTIONAL SCHEMATIC OF SECTION 8



A12—Radio
A13—Citizen band
A15—Fuse board
F18—Fuse, 7.5 amps.
F22—Fuse, 7.5 amps.
P7—Digital clock
X2—Disconnect point, radio (USA)
X18—Connection, fuse board to distribution harness
X25—Disconnect point, distribution harness — cab harness
X117—Connection, fuse board to distribution harness

ZX,TMXZCO006554-19-15MAR96

DIAGNOSTIC SCHEMATIC OF SECTION 8



ZX,TMXZCO006480-19-15MAR96

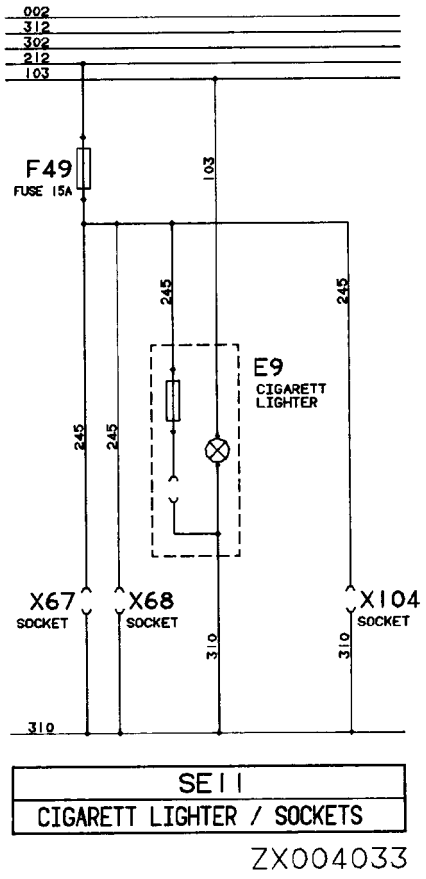
OPERATIONAL INFORMATION

The machine is equipped with sockets for auxiliary equipment which are powered with starter switch in position (II).

When the machine is equipped with an air-cushioned seat, the seat compressor is connected to socket (X104) located inside cab.

ZX,TMXZCO002427-19-25NOV92

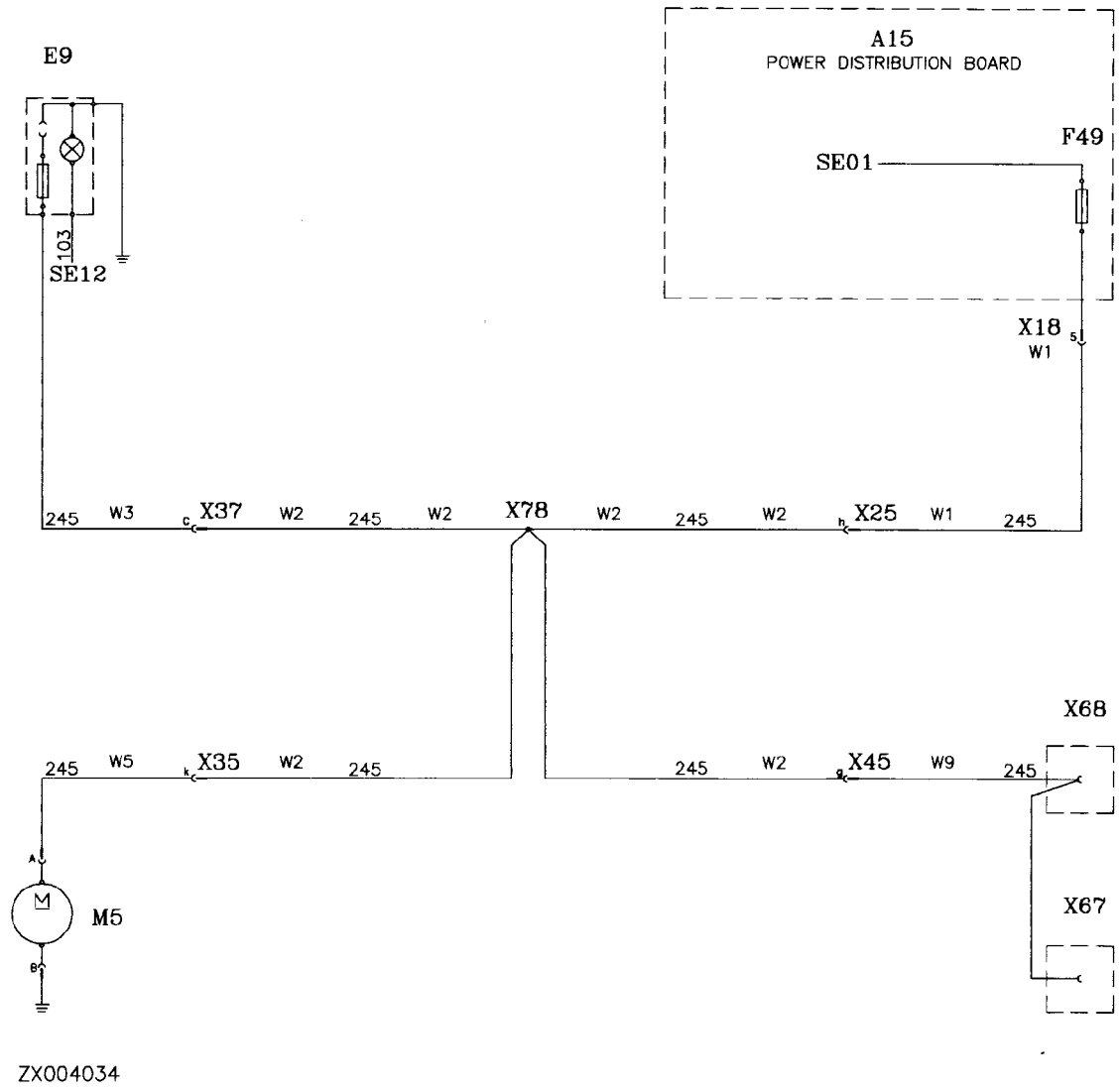
FUNCTIONAL SCHEMATIC OF SECTION 11



A15 — **Fuse board**
E9 — **Cigarette lighter**
F49 — **Fuse 15 amps.**
X18 — **Connection, main distribution harness (W1) to fuse board**
X25 — **Disconnect point, main distribution harness (W1), cab harness (W2)**
X35 — **Disconnect point, cab harness (W2), armrest harness (W5)**
X37 — **Disconnect point, cab harness (W2), switch console harness (W3)**
X45 — **Disconnect point, cab harness (W2), rear basic wiring harness (W9)**
X67 — **Socket**
X68 — **Socket**
X104 — **Socket**

ZX,TMXZCO002428-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 11



ZX,TMXZCO002743-19-13MAY93

OPERATIONAL INFORMATION

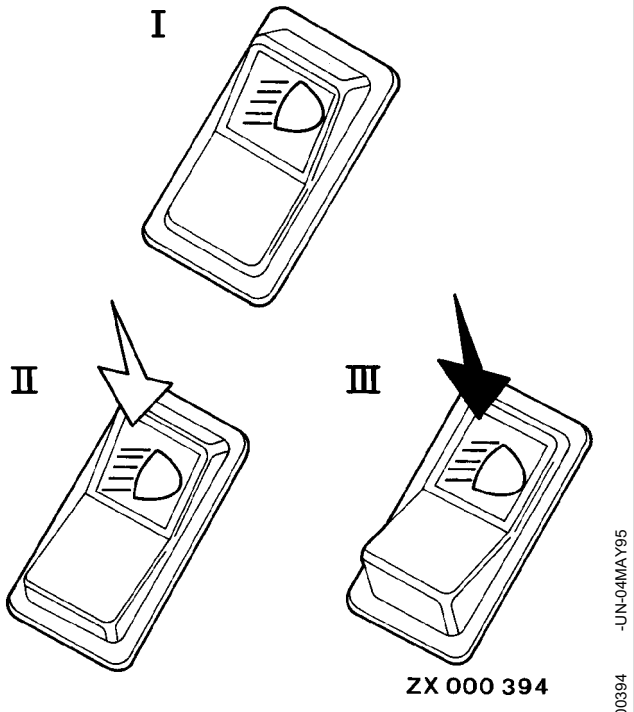
In position (II) of dual-stage, double contact switch (S13), parking lights are switched on and in position (III) full or low-beam headlights.

Parking lights can be switched on regardless of starter switch position.

To switch on full or low-beam headlights, starter switch must be in position (I) or (II).

When parking lights are switched on, switch and instrument lighting is also switched on. At the same time, infotrak monitor and digital clock displays are dimmed.

I—Light functions off
II—Parking lights, switch and instrument lighting
III—Low-beam headlights, only with starter switch positions (I) or (II)



ZX,TMXZCO002429-19-25NOV92

THEORY OF OPERATION

Light switch (S13) is a dual-stage, double contact switch.

The first contact is used for parking lights and instrument lighting, the second contact for low/full-beam headlights.

The parking light system is divided into three circuits which are protected individually.

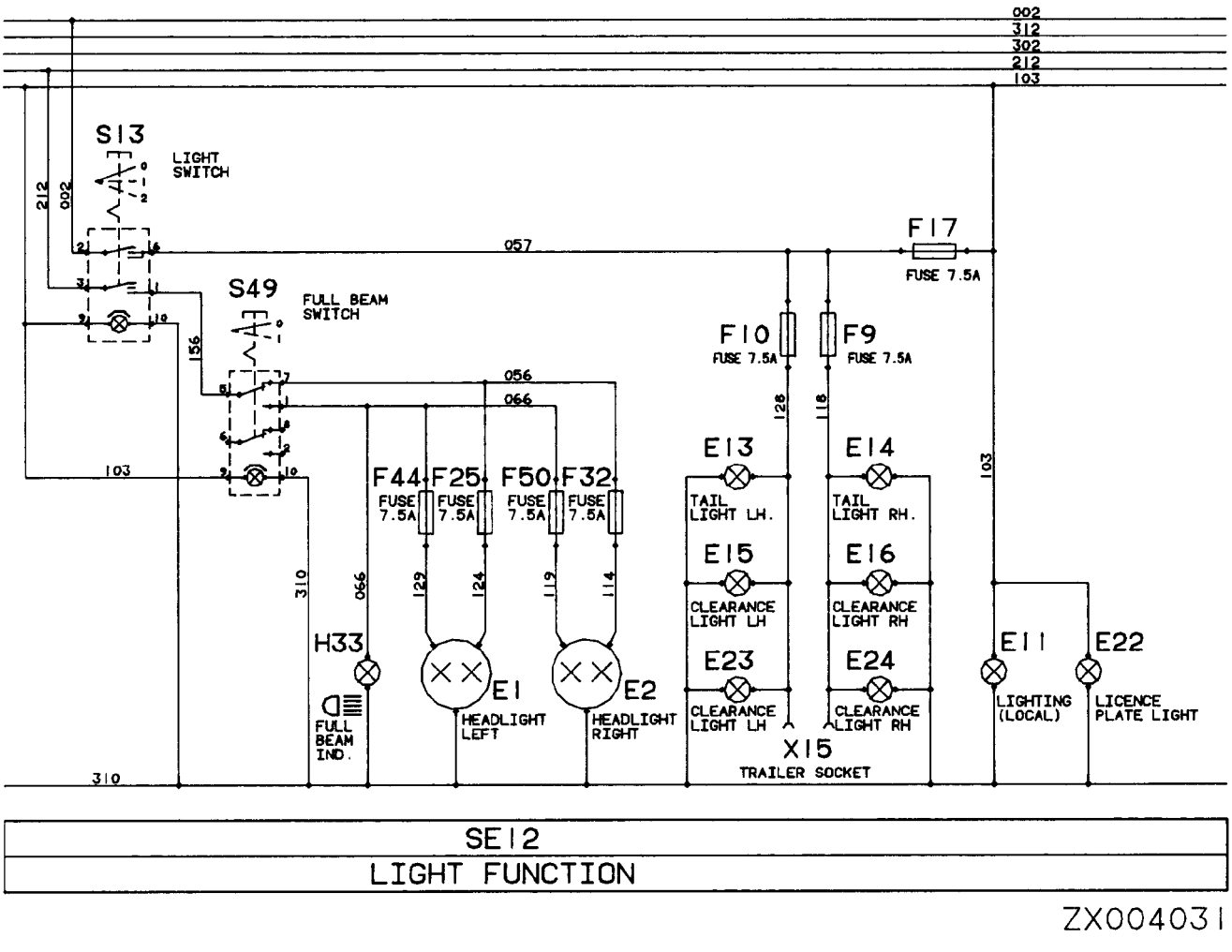
One circuit is provided for left-hand parking lights, one for right-hand parking lights and another circuit for switch and instrument lighting.

The low/full-beam headlight circuit is connected to the starter switch.

In light switch position (III), low- or full-beam headlights are switched on, depending on position of low/full-beam headlight switch.

ZX,TMXZCO002430-19-25NOV92

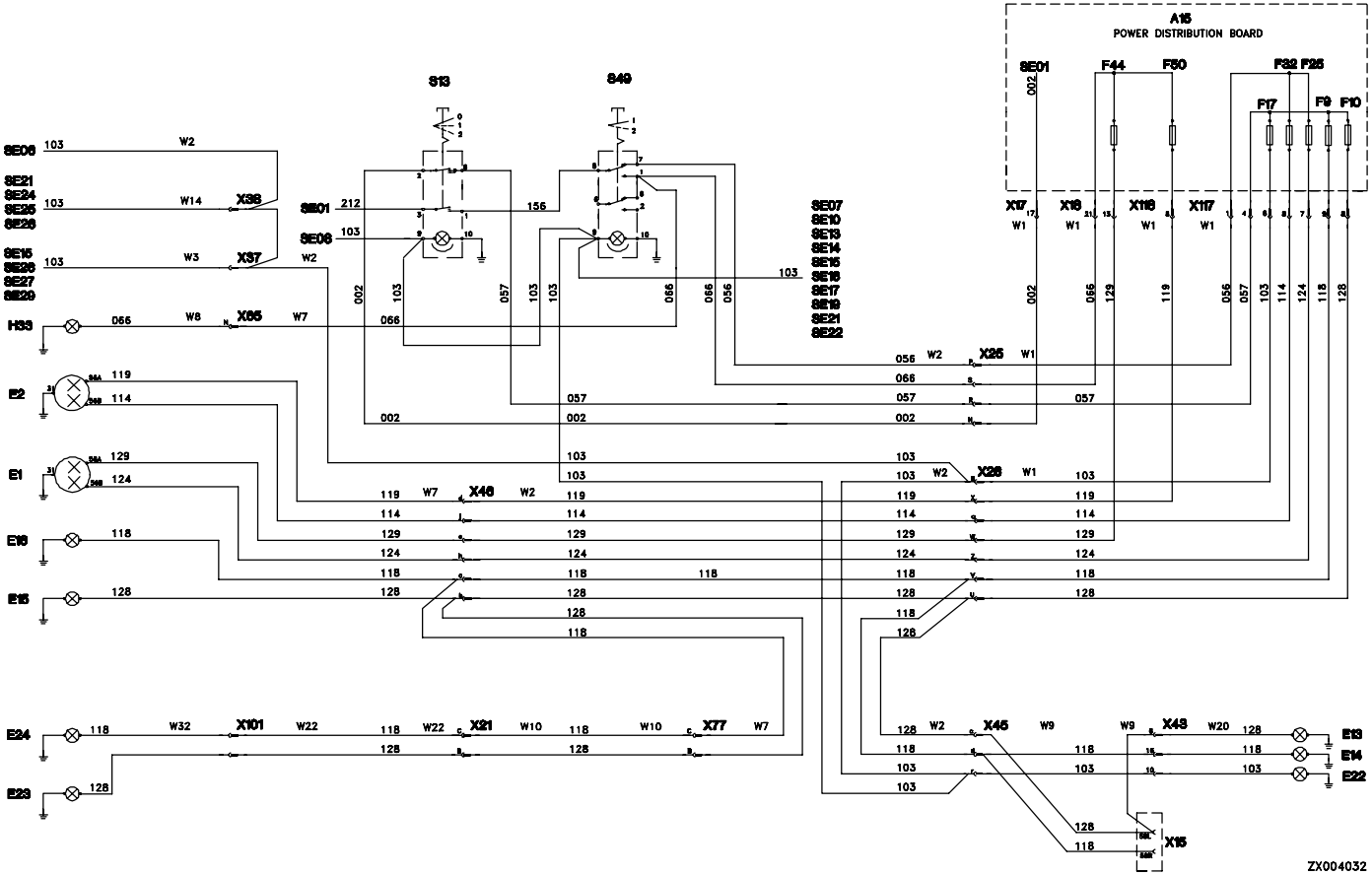
FUNCTIONAL SCHEMATIC OF SECTION 12



E1 —Headlight, l.h.
E2 —Headlight, r.h.
E13 —Tail light, l.h.
E14 —Tail light, r.h.
E15 —Clearance light, l.h.
E16 —Clearance light, r.h.
E22 —Registration plate light
E23 —Clearance light, header, l.h.
E24 —Clearance light, header, r.h.
F9 —Fuse 7.5 amps.
F10 —Fuse 7.5 amps.
F17 —Fuse 7.5 amps.
F25 —Fuse 7.5 amps.
F32 —Fuse 7.5 amps.
F44 —Fuse 7.5 amps.
F50 —Fuse 7.5 amps.
H33 —Full-beam indicator light
S13 —Light switch
S49 —Full-beam switch
X15 —Trailer socket
X17 —Connection, main distribution harness (W1) to fuse board
X18 —Connection, main distribution harness (W1) to fuse board
X21 —Disconn. point, feeder house harness (W10), header harness (W22)
X25 —Disconn. point, main distribution harness (W1), cab harness (W2)
X26 —Disconn. point, main distribution harness (W1), cab harness (W2)
X37 —Disconn. point, cab harness (W2), switch console harness (W3)
X38 —Disconn. point, cab harness (W2), optional equipment harness (W14)
X43 — Disconn. point, rear basic harness (W9), straw hood harness (W20)
X45 — Disconn. point, cab harness (W2), rear basic harness (W9)
X46 — Disconn. point, cab harness (W2), front basic harness (W7)
X65 — Disconn. point, front basic harness (W7), steering column harness (W8)
X77 — Disconn. point, front basic harness (W7), feeder house harness (W10)
X101 — Disconn. point, header harness (W22), header lighting harness (W32)
X117 — Connection, main distribution harness (W1) to fuse board
X118 — Connection, main distribution harness (W1) to fuse board

ZX,TMXZCO002431-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 12



OPERATIONAL INFORMATION

When driving on public roads, use turn signal switch to indicate direction of machine travel.

In emergency situations both turn signal lights can be switched on by means of the hazard warning light switch regardless of starter switch position (hazard warning light function).

ZX,TMXZCO002432-19-25NOV92

THEORY OF OPERATION

TURN SIGNAL LIGHTS

Power is supplied to terminal (49) of flasher via fuse (F20) and hazard warning light switch (S11). Terminal (31) establishes ground connection.

When actuating turn signal switch (S12), current flows to the right or left-hand turn signal lights. Flasher (K5) generates the required flashing frequency and activates the corresponding turn signal indicator light via terminal (C2) or (C3).

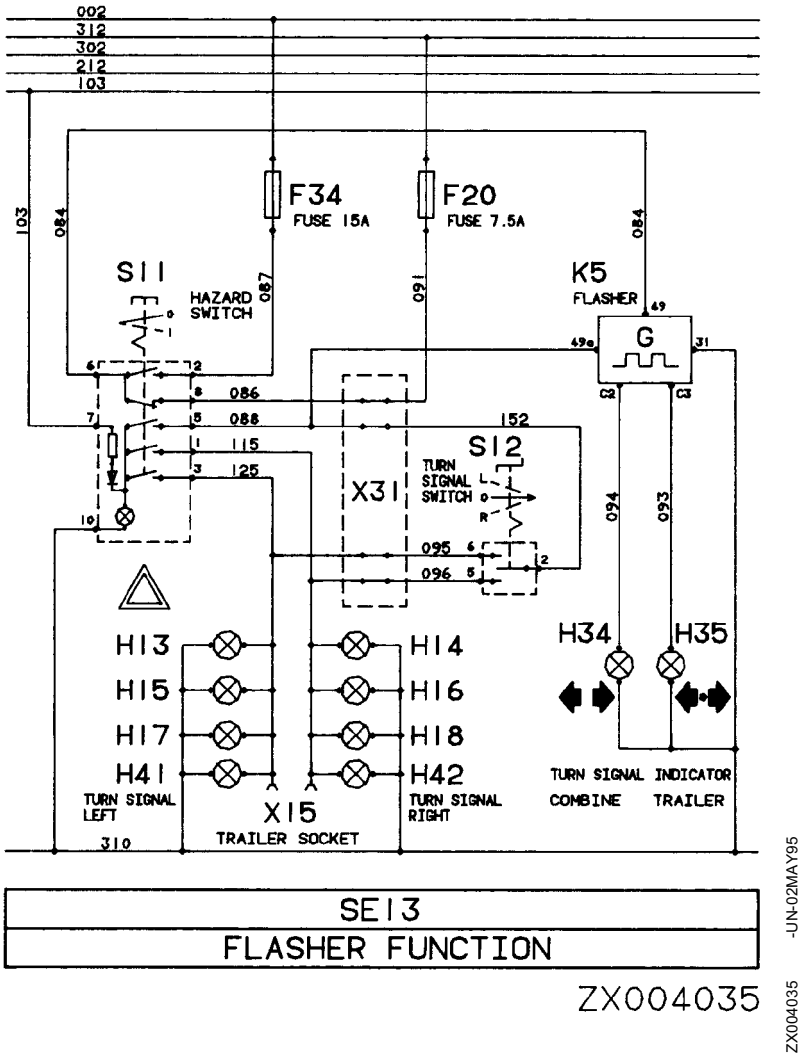
HAZARD WARNING LIGHTS

With hazard warning light switch (S11) in position (I), power is supplied to terminal (49) of flasher via fuse (F34) regardless of starter switch position.

At the same time the turn signal lights on both sides of the machine are connected to terminal (49A) of flasher. This generates the required flashing frequency.

ZX,TMXZCO002433-19-25NOV92

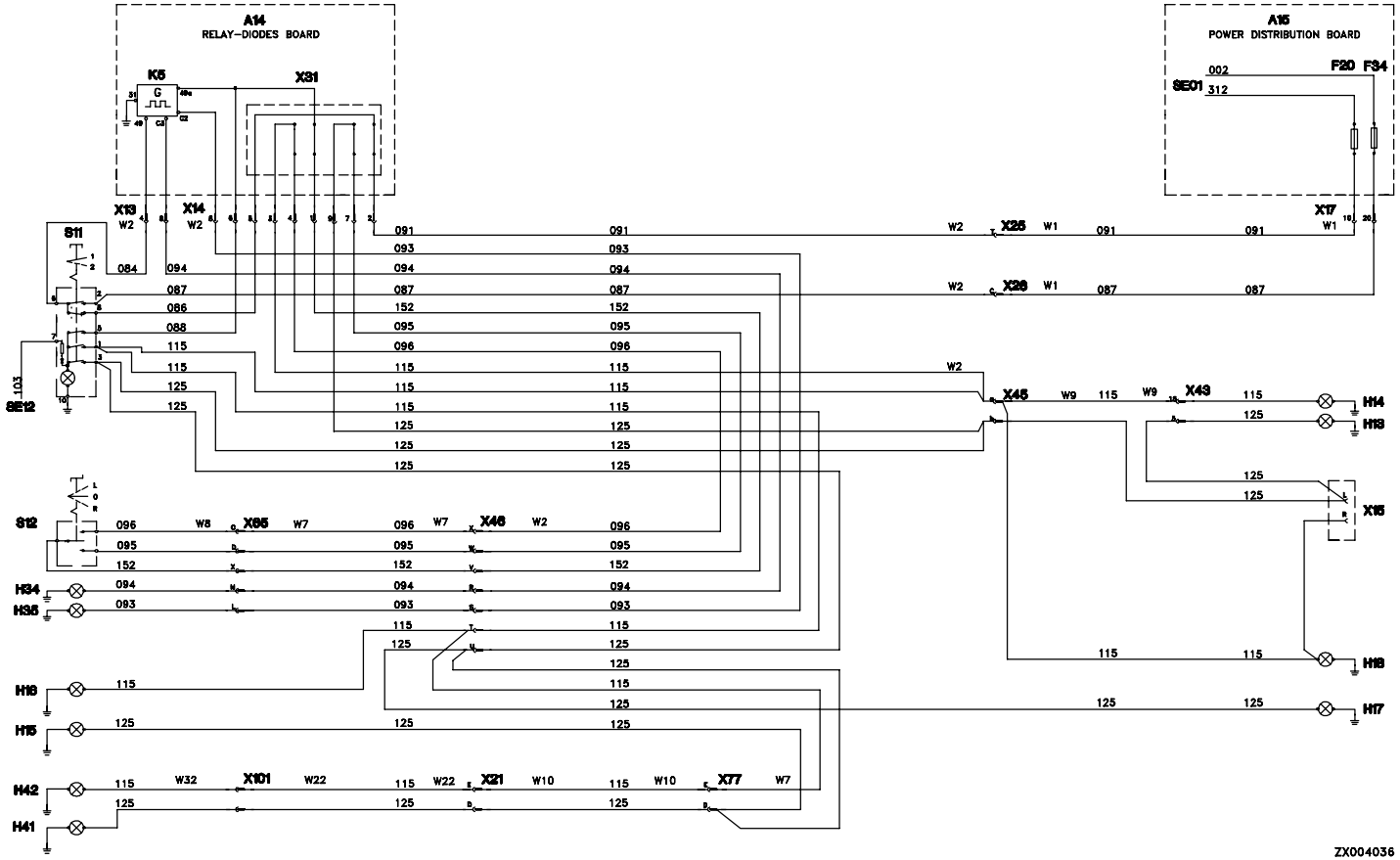
FUNCTIONAL SCHEMATIC OF SECTION 13



A14—Relay and diode board
A15—Fuse board
F20—Fuse 7.5 amps.
F34—Fuse 15 amps.
H13—Turn signal light, rear l.h.
H14—Turn signal light, rear r.h.
H15—Turn signal light, front l.h.
H16—Turn signal light, front r.h.
H17—Add. turn signal light, l.h.
H18—Add. turn signal light, r.h.
H34—Turn signal indicator light 1, combine
H35—Turn signal indicator light 2, trailer
H41—Turn signal light, header, l.h.
H42—Turn signal light, header, r.h.
K5—Flasher
S11—Hazard warning light switch
S12—Turn signal switch
X13—Connection, cab harness (W2) to relay and diode board
X14—Connection, cab harness (W2) to relay and diode board
X15—Trailer socket
X17—Connection, main distribution harness (W1) to fuse board
X21—Disconn. point, feeder house harness (W10), header harness (W22)
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X26—Disconn. point, main distribution harness (W1), cab harness (W2)
X31—Soldered connection on board
X43—Disconn. point, rear basic harness (W9), straw hood harness (W20)
X45—Disconn. point, cab harness (W2), rear basic harness (W9)
X46—Disconn. point, cab harness

ZX,TMXZCO002434-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 13



OPERATIONAL INFORMATION

With starter switch in position (I) or (II) the revolving hazard warning lights may be switched on by means of switch (S18).

ZX,TMXZCO002435-19-25NOV92

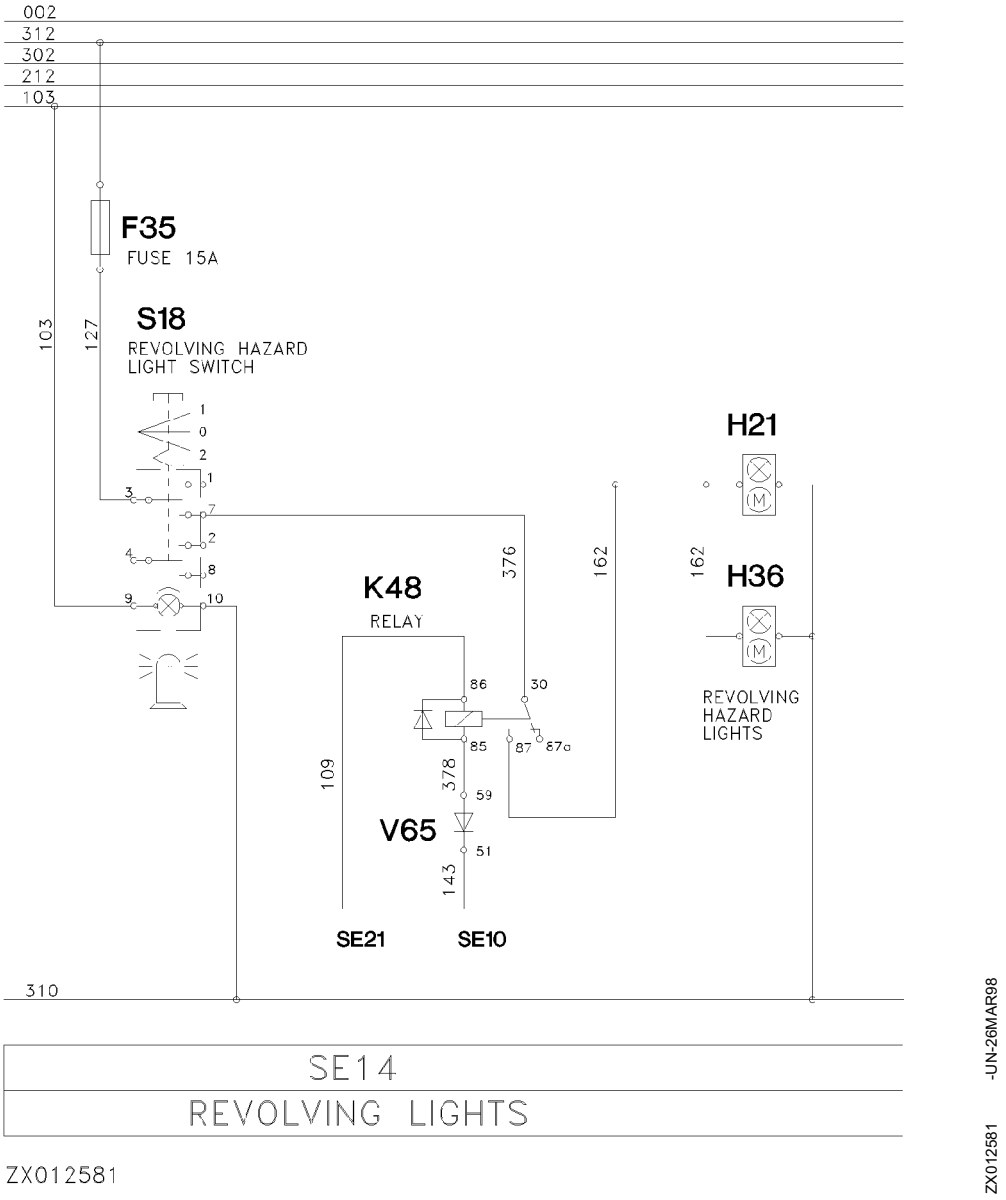
THEORY OF OPERATION

With starter switch in position (I) or (II), switch (S18) is powered via fuse (F35).

If switch (S18) is activated, revolving hazard warning lights (H21) and (H36) are directly supplied with current. The revolving motion is acccomplished by means of an electric motor.

ZX,TMXZCO002436-19-25NOV92

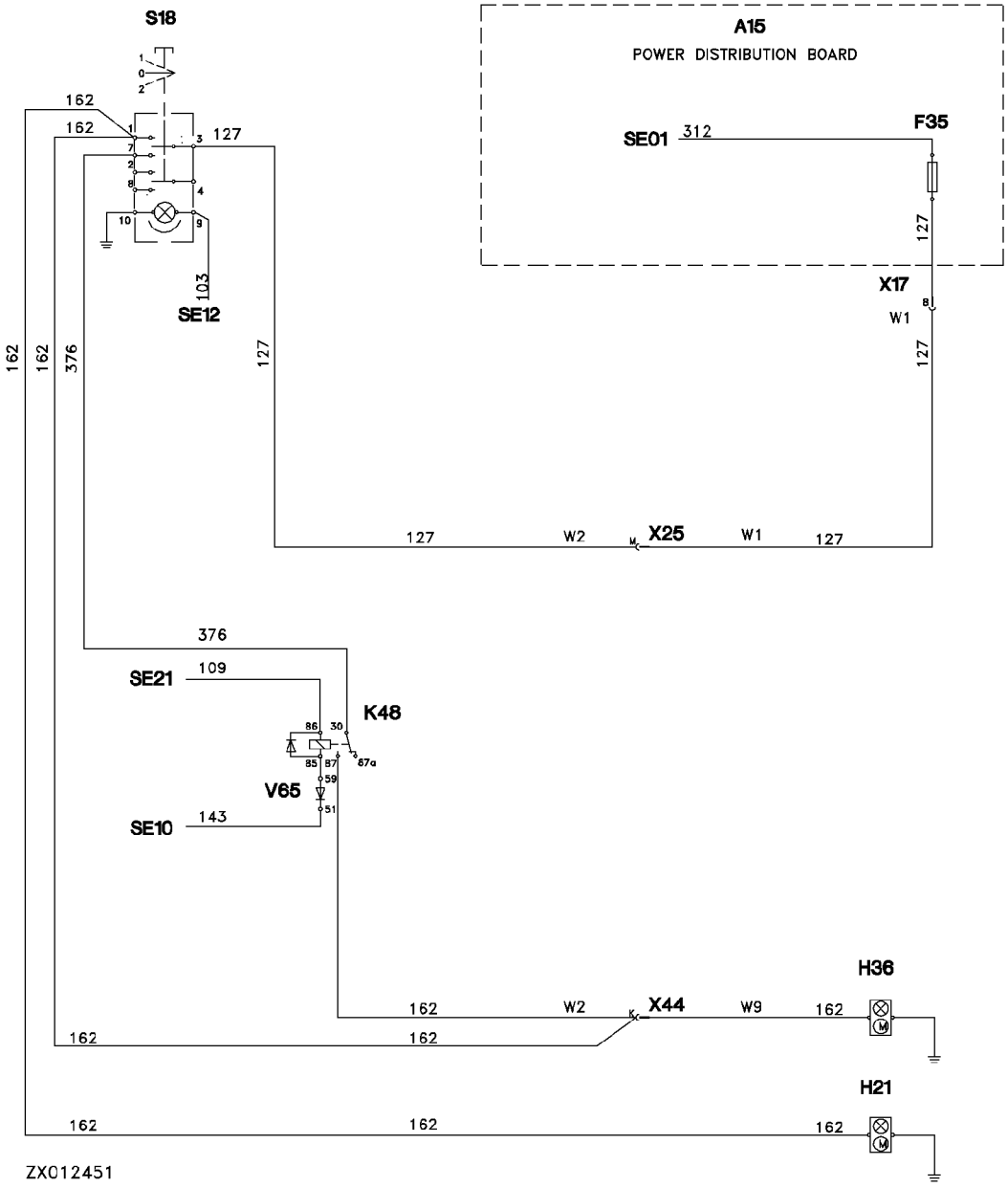
FUNCTIONAL SCHEMATIC OF SECTION 14



A15—Fuse board
F35—Fuse 15 amps.
H21—Beacon light
H36—Beacon light
K48—Relay, grain tank gauge
S18—Beacon light switch
V65—Diodes, grain tank gauge
X17—Connection, main distribution harness (W1) to fuse board
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X44—Disconn. point, cab harness (W2), basic harness (W9)

ZX,TM4543009713-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 14



ZX012451 -UN-11MAR98

ZX,TM4543009714-19-30JUN97

OPERATIONAL INFORMATION

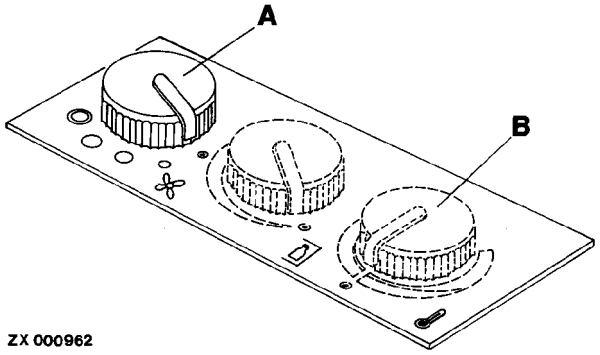
With starter switch in position (I) or (II) fan may be switched on by means of rotary switch (A).

Fan can be adjusted to four speeds.

With fan running, the air conditioning system can be adjusted to the desired temperature by means of rotary switch (B).

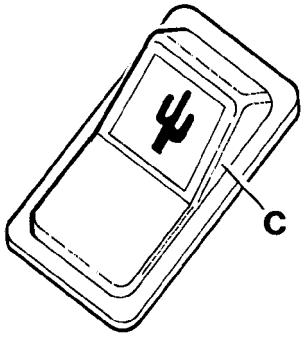
Even if air conditioning system is switched off at rotary switch (B) (e.g. switch turned to heating position), it can be switched on to maximum output by means of switch (C).

NOTE: The above combination is used, for example, to reduce moisture content of cab air when windows are misted.



ZX 000962

ZX000962 -UN-02MAY95



ZX 000963

ZX000963 -UN-28APR95

ZX,TMXZCO002438-19-25NOV92

THEORY OF OPERATION

With starter switch in position (I) or (II), switch (S22) is supplied with current via fuse (F42).

Fan (M4) can be adjusted to four speeds by means of resistor (R1).

As soon as rotary switch (S22) is turned to position (I) or further, switch (S25) is supplied with current.

Either air conditioning system or heater can be switched on by means of switch (S25).

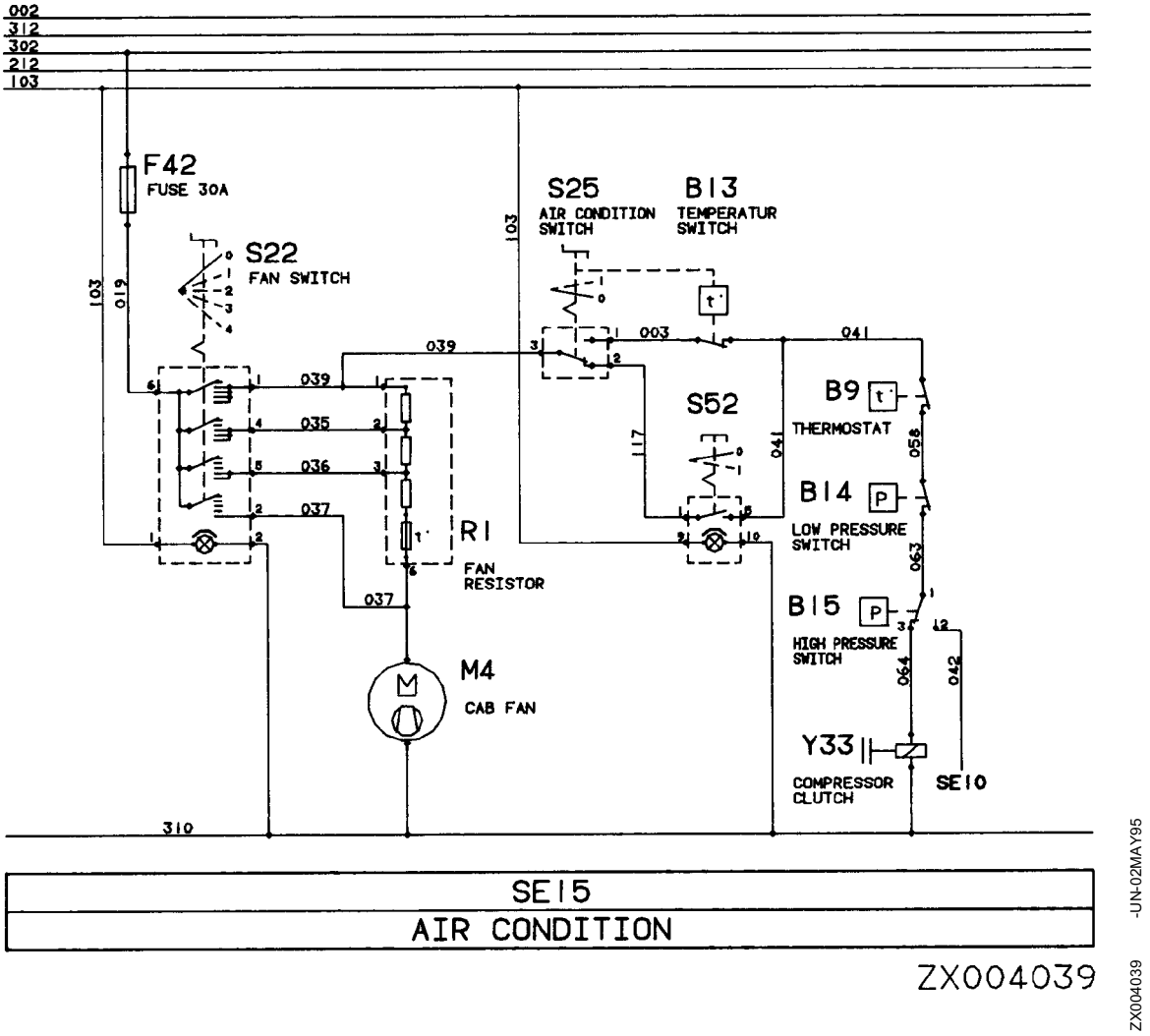
In neutral position or when heater is switched on, the contact of switch (S25) is in “0” position. Thus switch (S52) is supplied with current, making it possible to switch air conditioning system to maximum output.

With air conditioning system switched on by means of switch (S25), electromagnetic clutch (Y33) is activated via thermostat (B9), low pressure switch (B14) and high pressure switch (B15).

If pressure in air conditioning system is too high, high pressure switch (B15) is activated and the corresponding indicator light in SE10 will glow.

ZX,TMXZCO002439-19-25NOV92

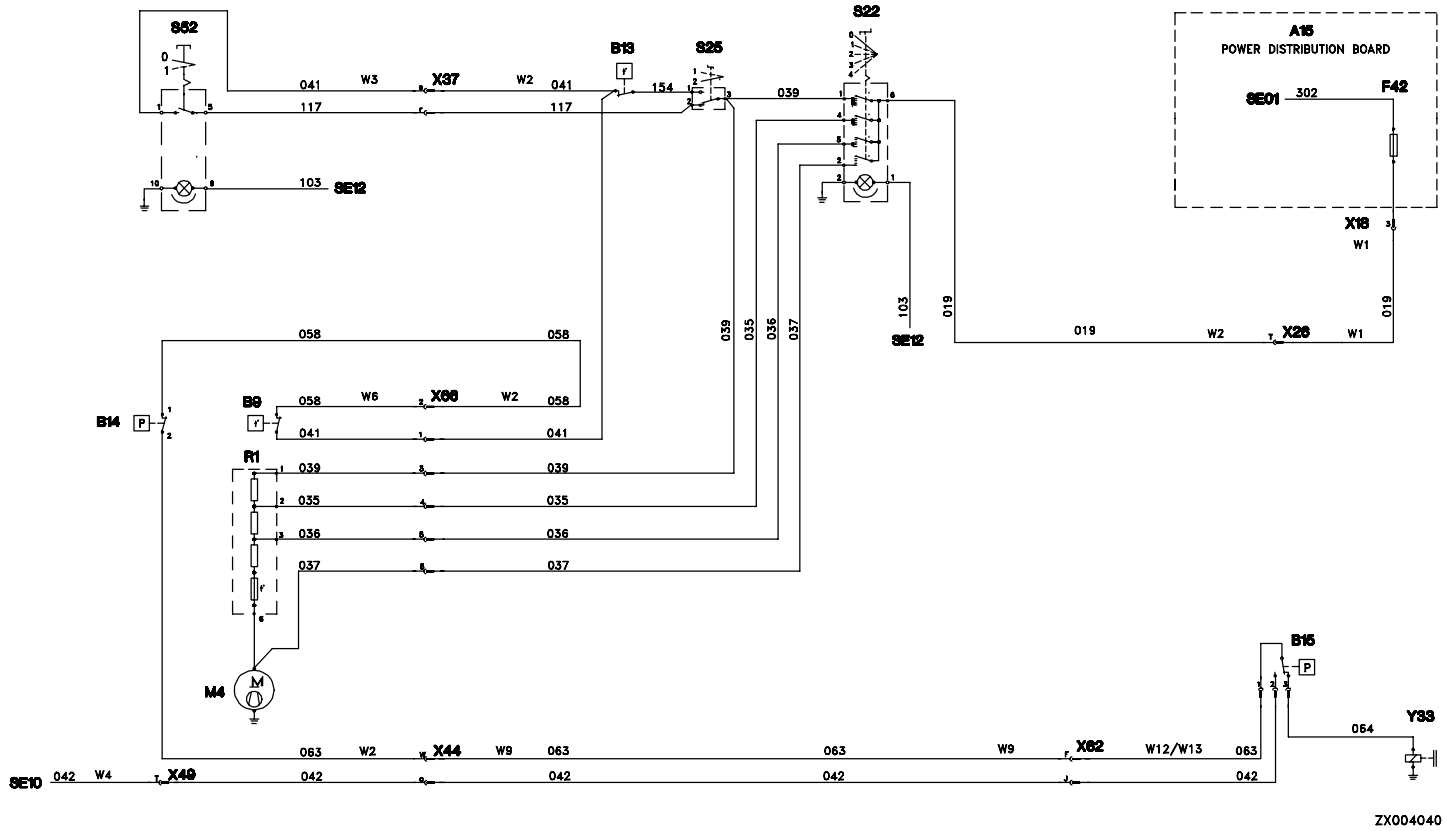
FUNCTIONAL SCHEMATIC OF SECTION 15



A15—Fuse board
B9—Thermostat (protection against freezing)
B13—Temperature switch, air conditioning
B14—Low pressure switch, air conditioning
B15—High pressure switch, air conditioning
F42—Fuse 30 amps.
M4—Cab fan
R1—Fan resistor
S22—Fan switch
S25—Air conditioning switch
S52—Demoisturizer switch
X18—Connection, main distribution harness (W1) to fuse board
X26—Disconn. point, main distribution harness (W1), cab harness
X37—Disconn. point, cab harness (W2) switch console harness (W3)
X62—Disconn. point, rear basic harness (W9), engine harness (W12/W13)
X66—Disconn. point, cab harness (W2), air conditioning and fan harness (W6)

ZX,TMXZCO002440-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 15

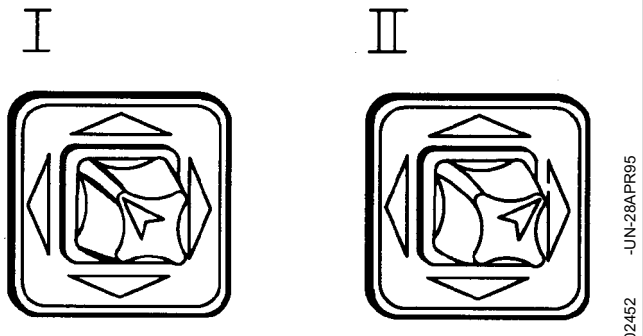


OPERATIONAL INFORMATION

For mirror adjustment starter switch must be turned to position (I) or further.

Move mirrors up/down or to the right/left according to arrows on switch.

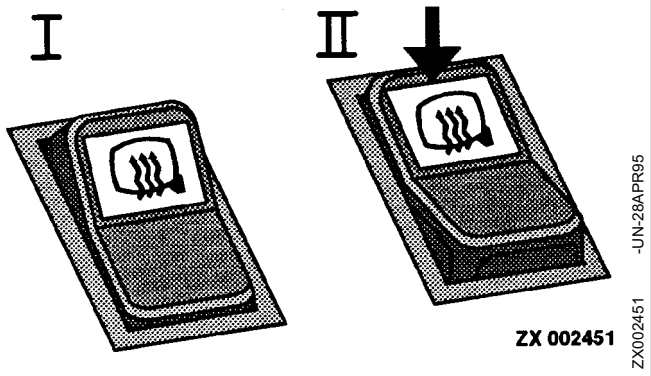
I—Adjusting l.h. outside mirror
II—Adjusting r.h. outside mirror



ZX,TMXZCO002441-19-25NOV92

Switching on mirror heater is only possible with starter switch turned to position (I) or further.

I—Mirror heater off
II—Mirror heater on



ZX,TMXZCO002442-19-25NOV92

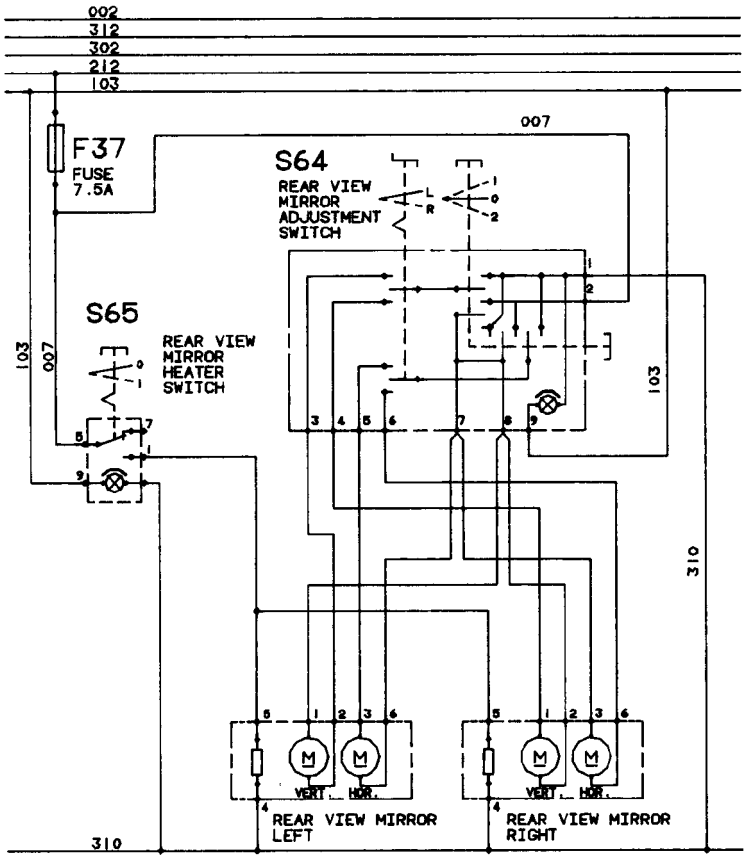
THEORY OF OPERATION

Mirror heater switch (S65) and mirror adjusting switch (S64) are powered via fuse (F37).

Turn mirror adjusting switch knob to select mirror to be adjusted. Mirror adjustment is carried out by tilting switch to the right/left or up/down. This will reposition mirror surface by activating electric motors integrated in mirror housing.

ZX,TMXZCO002443-19-25NOV92

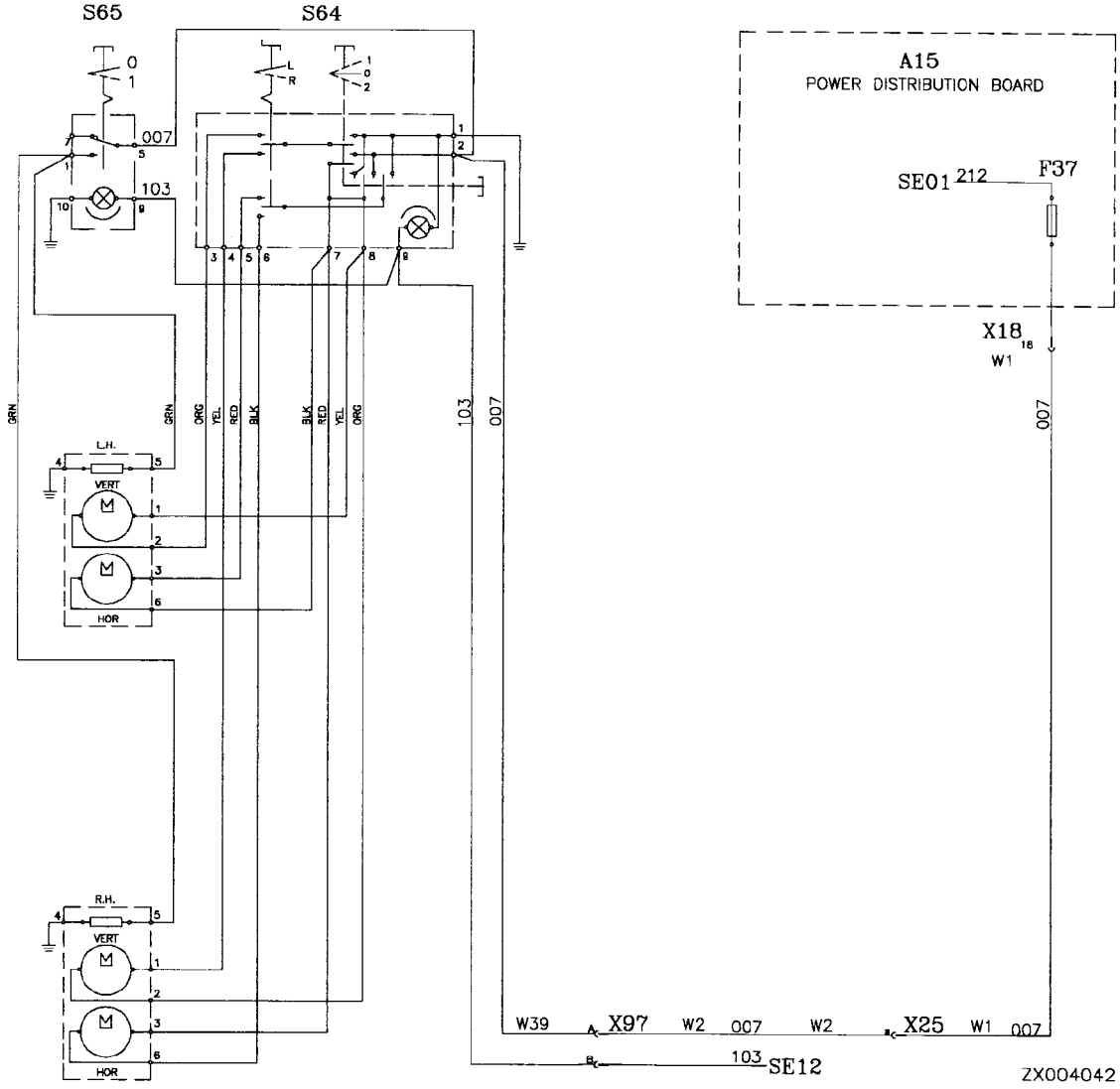
FUNCTIONAL SCHEMATIC OF SECTION 16



A15—Fuse board
F37—Fuse 7.5 amps.
S64—Mirror adjusting switch
S65—Mirror heater switch
X18—Connection, main distribution harness (W1) to fuse board
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X97—Disconn. point, cab harness (W2), harness for electrical mirror adjustment (W39)

ZX,TMXZCO002444-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 16



ZX,TMXZCO002748-19-13MAY93

OPERATIONAL INFORMATION

With parking lights on, the work lights on cab roof and unloading auger may be switched on by actuating switch (S19).

With road safety switch in field position, work lights on mirror arms, straw hood and operator's platform may also be switched on.

ZX,TMXZCO002445-19-25NOV92

THEORY OF OPERATION

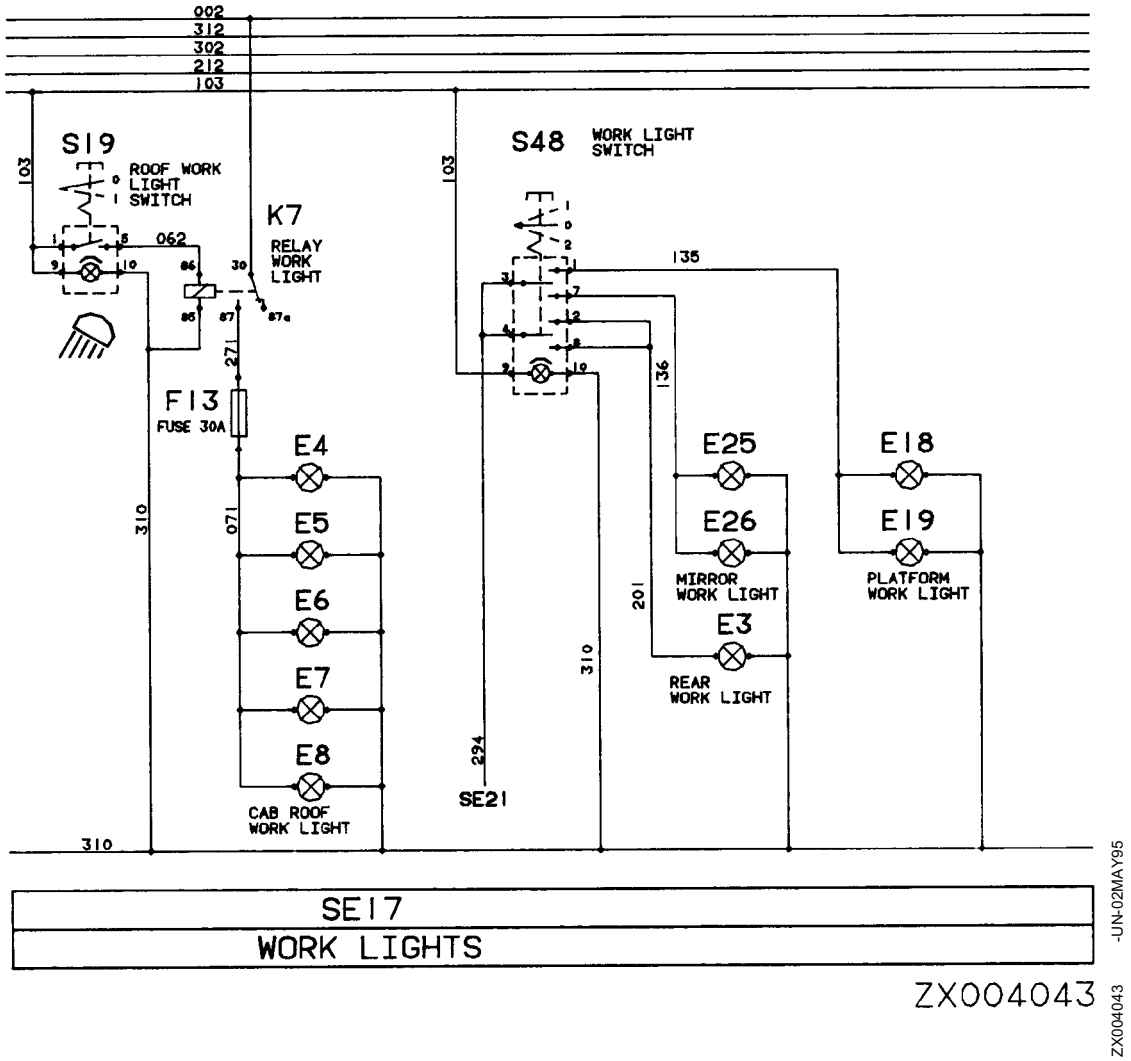
With parking lights switched on, switch (S19) is supplied with current via wire (103).

When switch (S19) is activated, relay (K7) is also activated and thus cab roof and unloading auger work lights are switched on directly.

Work lights on operator's platform, mirror arms and straw hood may be switched on in any starter switch position by means of switch (S48), depending on position of road safety switch, even if parking lights are not switched on.

ZX,TMXZCO002446-19-25NOV92

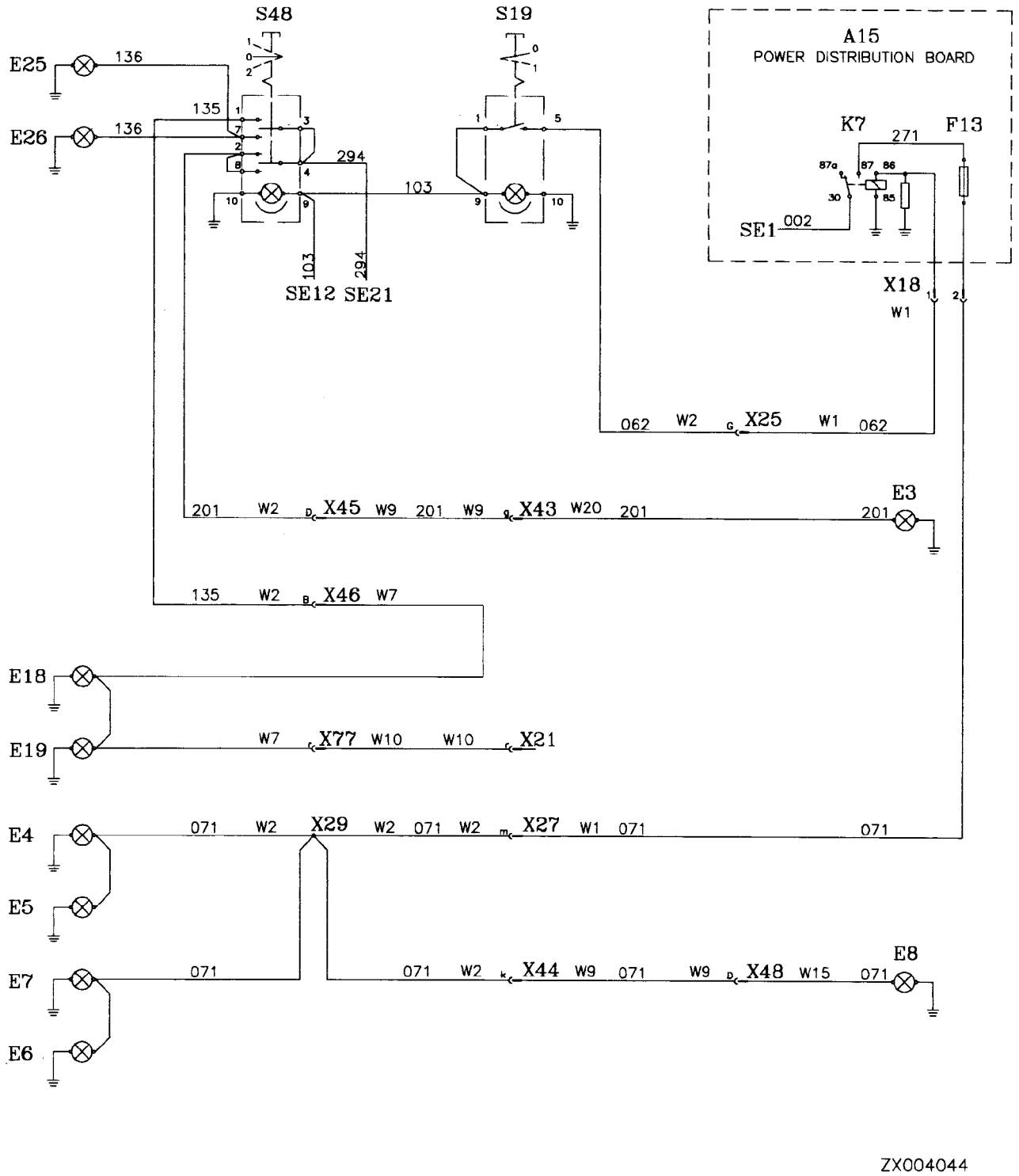
FUNCTIONAL SCHEMATIC OF SECTION 17



A15—Fuse board
E3—Rear work light
E4—Cab roof work light, outer r.h.
E5—Cab roof work light, inner r.h.
E6—Cab roof work light, outer l.h.
E7—Cab roof work light, inner l.h.
E8—Unloading auger work light
E18—Platform work light, r.h.
E19—Platform work light, l.h.
E25—Work light, mirror bracket
E26—Work light, mirror bracket
X18—Connection, main distribution harness (W1) to fuse board
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X27—Disconn. point, main distribution harness (W1), cab harness (W2)
X29—Splice
X43—Disconn. point, rear basic harness (W9), straw hood harness (W20)
X44—Disconn. point, cab harness (W2), rear basic harness (W9)
X45—Disconn. point, cab harness (W2), rear basic harness (W9)
X46—Disconn. point, cab harness (W2), front basic harness (W7)
X48—Disconn. point, rear basic harness (W9), grain tank harness (W15)

ZX,TMXZCO002447-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 17



ZX004044

ZX004044 -UN-02MAY95

ZX,TMXZCO002749-19-31MAY95

OPERATIONAL INFORMATION

The straw warning device is provided to detect plugging of material in the entire straw walker area. The first sensor is located in front of the cross shaker, the second one behind the cross shaker and the third one above the straw chopper.

When plugging of material occurs, the “STOP” light of the indicator light unit will glow. In addition the buzzer and horn will sound.

ZX,TMXZCO002448-19-25NOV92

THEORY OF OPERATION

Horn (B12) is continuously supplied with current via fuse (F27).

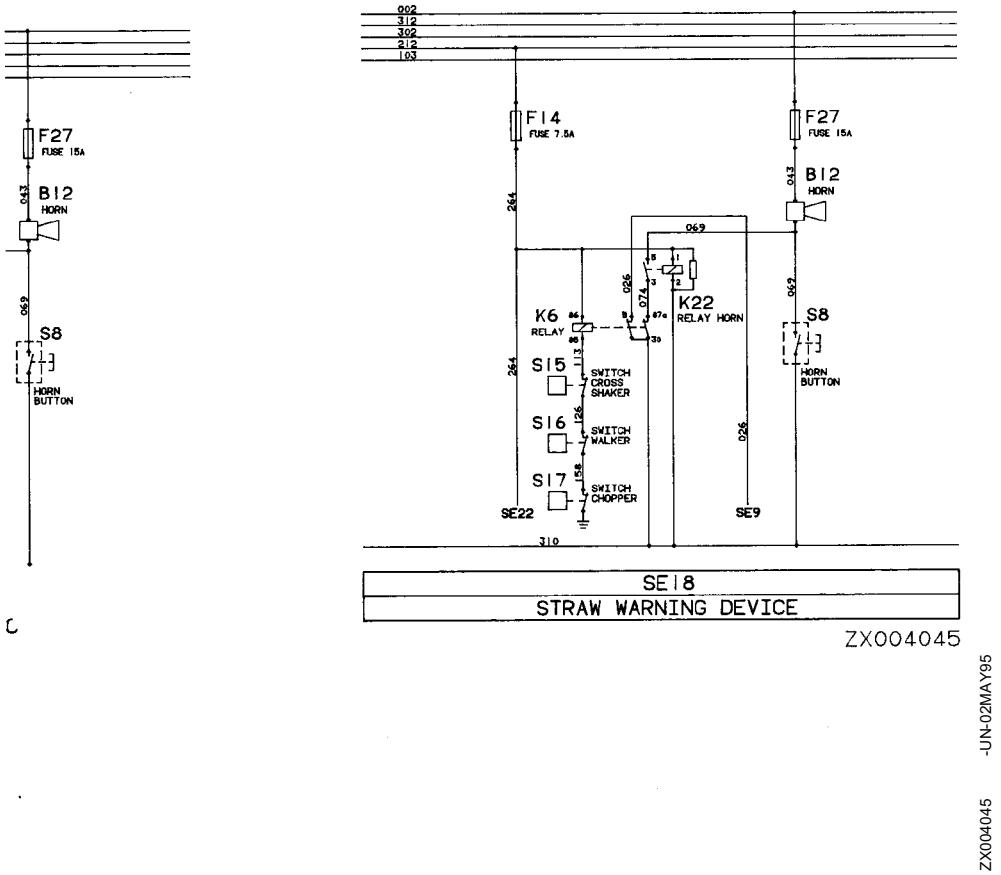
When actuating switch (S8), the horn is connected to ground and the horn signal will be heard.

With starter switch in position (I), relays (K6) and (K22) are supplied with current via fuse (F14). Switches (S15), (S16) and (S17) are in “OFF” position (closed). This causes relay (K6) to open and relay (K22) to close, interrupting ground connection to horn, buzzer and indicator light.

If one of the switches (S15), (S16) or (S17) is actuated due to excessive straw accumulation in the straw hood, relay (K6) establishes ground connection to horn, buzzer and indicator light.

ZX,TMXZCO002449-19-25NOV92

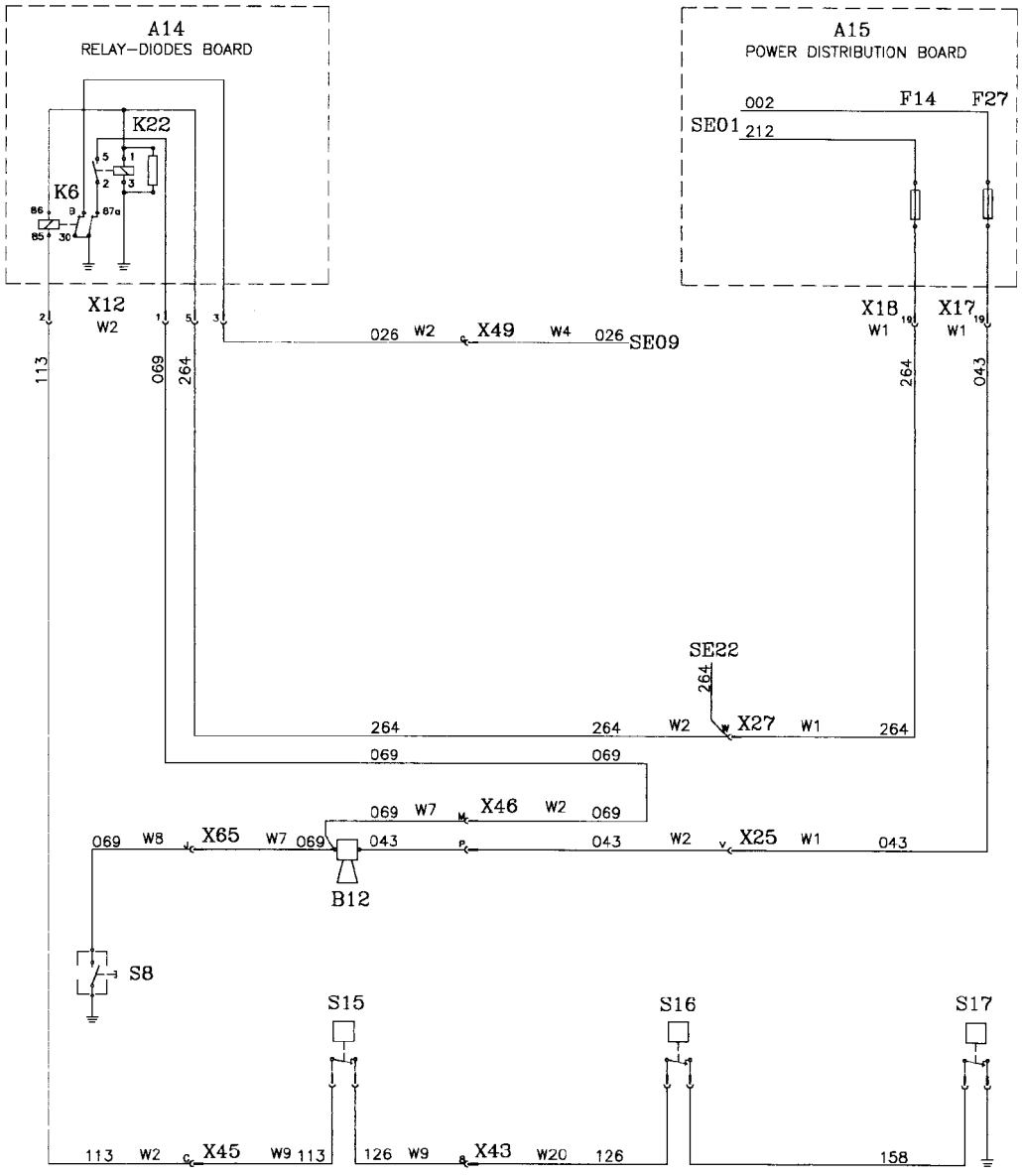
FUNCTIONAL SCHEMATIC OF SECTION 18



A14—Relay and diode board
A15—Fuse board
B12—Horn
F14—Fuse 7.5 amps.
F27—Fuse 15 amps.
K6—Relay, straw warning device
K22—Relay, straw warning device
S8—Horn button
S15—Switch, straw warning device (cross shaker)
S16—Switch, straw warning device (walkers)
S17—Switch, straw warning device (chopper)
X12—Connection, cab harness (W2) to relay board
X17—Connection, main distribution harness (W1) to fuse board
X18—Connection, main distribution harness (W1) to fuse board
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X27—Disconn. point, main distribution harness (W1), cab harness (W2)
X43—Disconn. point, rear basic harness (W9), straw hood harness (W20)
X45—Disconn. point, cab harness (W2), rear basic harness (W9)
X46—Disconn. point, cab harness (W2), front basic harness (W7)
X49—Disconn. point, cab harness (W2), corner post harness (W4)
X65—Disconn. point, front basic harness (W7), steering column harness (W8)

ZX,TMXZCO002450-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 18



ZX004046 -UN-02MAY95

ZX,TMXZCO002750-19-13MAY93

OPERATIONAL INFORMATION

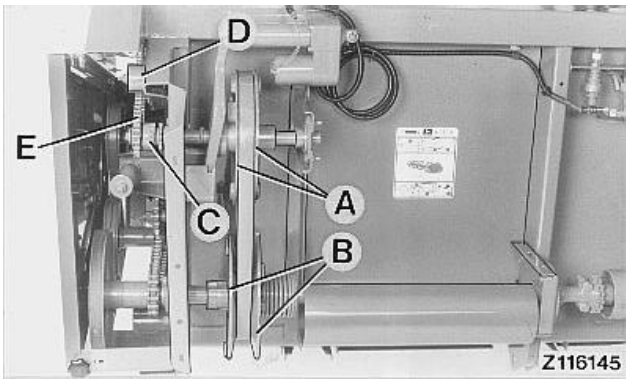
Reel height, reel horizontal position and reel speed may be adjusted for best performance according to harvesting conditions. A variable drive controlled by an electric motor permits infinite reel speed adjustment within a certain range.

The reel speed adjusting motor can be activated by a switch in the cab or by the reel speed control system.

NOTE: Diodes (V62) and (V63) are installed only in conjunction with motor (M14).

ZX,TMXZCO005146-19-15MAR96

Depending on position of double sprocket (C), reel speed may be adjusted within a range of 14—30 rpm [this equals 3.2—6.8 km/h (2—4.2 mph)] or 23—50 rpm [5.2—10.8 km/h (3.2—6.7 mph)].



ZX,TMXZCO002511-19-01DEC92

The reel speed control system activates the electric motor which controls variable reel drive. In this case the following adjusting ranges are also obtained: 14—30 rpm [this equals 3.2—6.8 km/h (2—4.2 mph)] or 22—50 rpm [5.2—10.8 km/h (3.2—6.7 mph)].

NOTE: The reel speed control system will only operate within a ground speed range from 1.2 km/h (0.75 mph) to 10 km/h (6 mph).

ZX,TMXZCO002512-19-01DEC92

THEORY OF OPERATION

With starter switch in position (I) or (II), current is supplied to switch (S10) and reel speed control system (A1).

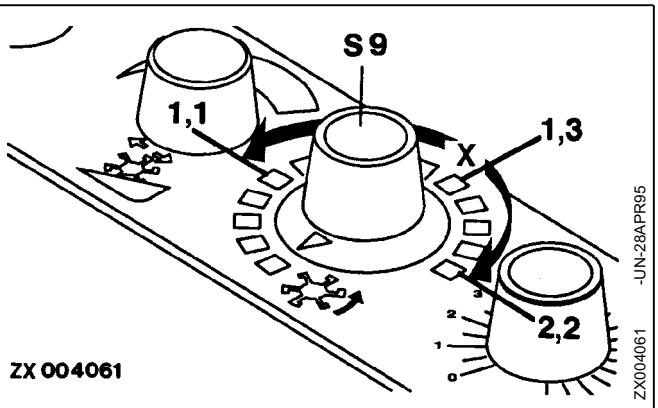
Stop light switch (S7) is also supplied with current.

When actuating switch (S10), relay (K32) or (K33) is activated. This will increase or reduce reel speed.

ZX,TMXZCO002513-19-01DEC92

With header running (wire 289 powered), a diagnostic mode is activated when turning speed ratio switch (potentiometer) (S9) to first position. The other switch positions will provide various reel speed ratios.

The speed ratio switch (S9) is connected to reel speed control system (A1) by means of four wires, providing 13 possible switch positions.



ZX,TMXZCO002521-19-25NOV92

POSITIONS OF SPEED RATIO SWITCH S9

BIT	OFF	TEST	0.80	1.00	1.10	1.15	1.20	1.25	1.30	1.50	1.80	2.00	2.20
1	0	X	0	X	0	X	0	X	0	X	0	X	0
2	0	X	X	0	0	X	X	0	0	X	X	0	0
3	0	X	X	X	X	0	0	0	0	X	X	X	X
4	0	X	X	X	X	X	X	X	X	0	0	0	0

NOTE: (X) means that the corresponding switch connection is grounded.

ZX,TMXZCO002522-19-25NOV92

DIAGNOSTIC MODE

The program of the reel speed control system provides a diagnostic mode. In this mode input and output signals of the system are tested.

Diagnostic Procedure:

1. Move micro switch 1 to “ON” position (switches 2 to 5 are already “ON”).

2. Move speed ratio switch (S9) to “OFF” position.

3. Start engine; engage separator and header.

4. Drive combine with a speed of 5.5 km/h (3.5 mph).

5. At a ground speed of 5.5 km/h (3.5 mph) move speed ratio switch (S9) to test position.

6. Continue to drive combine with an exact speed of 5.5 km/h (3.5 mph) for 30 seconds.

7. Stop combine. Keep separator and header running. Read error displays at LED’s.

ZX,TMXZCO002523-19-25NOV92

ERROR CODE DISPLAY

0 — LED off
X — LED on

Error Code	Problem	Solution
A—0 B—0 C—0 D—0	No voltage	Check fuse (F12)
A—X B—0 C—0 D—0	No ground speed signal	Check sending unit on 3-speed transmission
A—0 B—X C—0 D—0	Ground speed signal not within operating range	See “Operating Range of Reel Speed Control System“ in ”Controls and Instruments“ Section of Operator’s Manual
A—X B—X C—0 D—0	No reel speed signal	Check sending unit at cutting platform
A—0 B—0 C—X D—0	Reel speed signal not within operating range	See “Operating Range of Reel Speed Control System“ in ”Controls and Instruments“ Section of Operator’s Manual
A—X B—0 C—X D—0	Error “Bit 1” at reel speed control switch	
A—0 B—X C—X D—0	Error “Bit 2” at reel speed control switch	
A—X B—X C—X D—0	Error “Bit 3” at reel speed control switch	
A—0 B—0 C—0 D—X	Error “Bit 4” at reel speed control switch	

ZX,TMXZCO002514-19-01DEC92

ERROR CODE DISPLAY (CONTINUED)

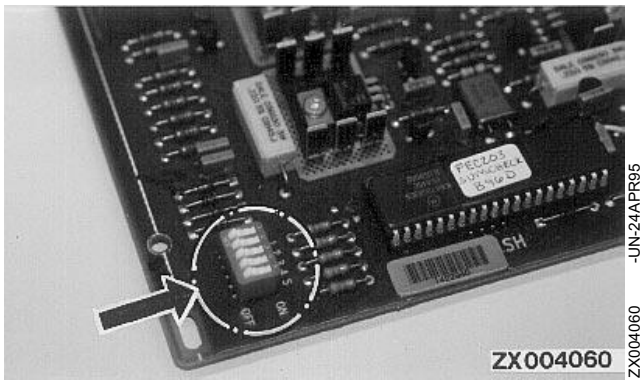
0 — LED off
X — LED on

Error Code	Problem	Solution
A—X B—0 C—0 D—X	Option A, output 1 shorted to ground	
A—0 B—X C—0 D—X	Option A, output 2 shorted to ground	
A—X B—X C—0 D—X	Reel does not accelerate	
A—0 B—0 C—X D—X	Reel does not slow down	
A—X B—0 C—X D—X	Reel speed control switch not in diagnostic position	See “Reel Speed Control Switch” in “Controls and Instruments” Section of Operator’s Manual
A—0 B—X C—X D—X	Fault not found	
A—X B—X C—X D—X	All contacts to reel speed control switch open	

ZX,TMXZCO002515-19-01DEC92

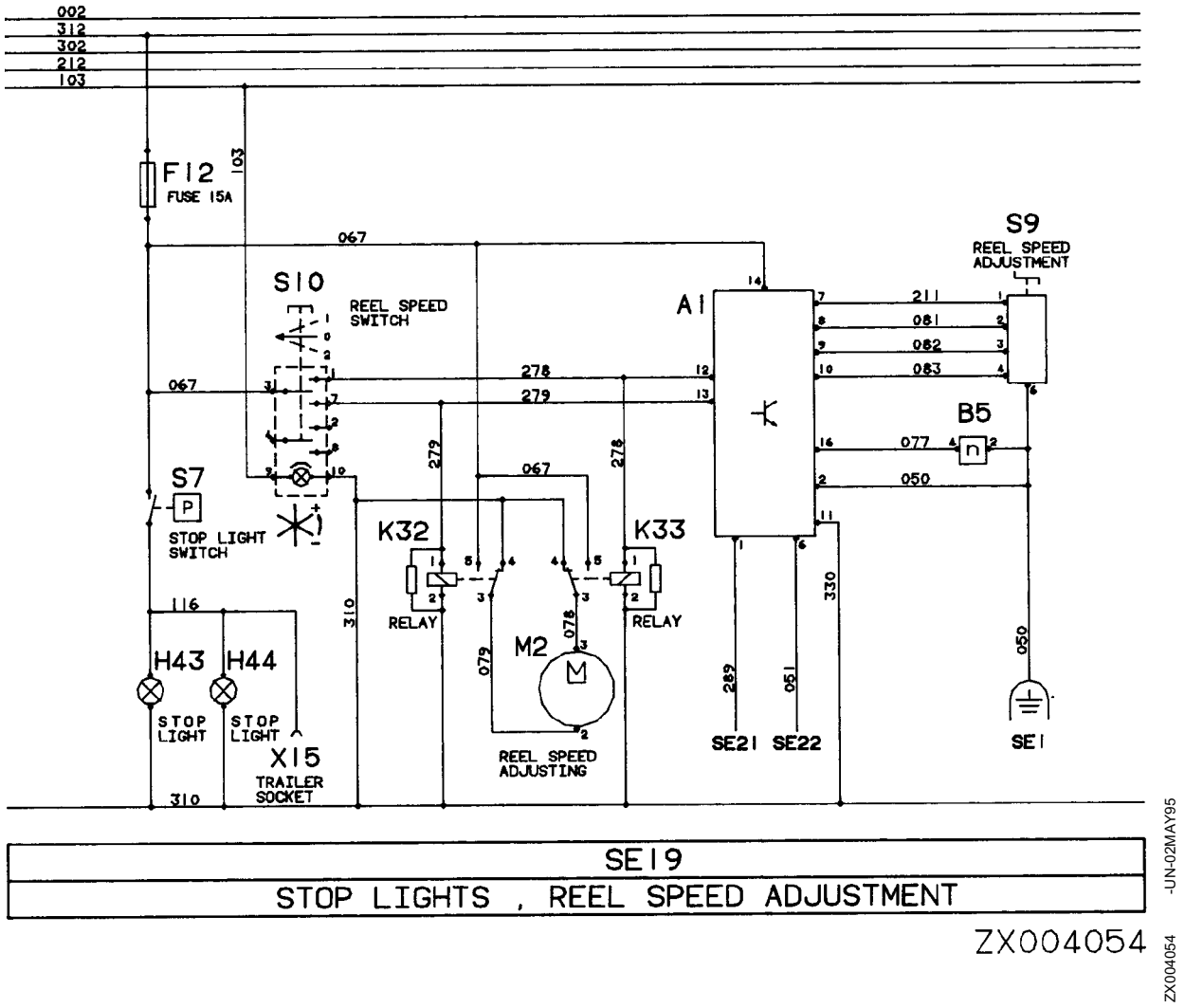
OPERATING ADJUSTMENT OF MICRO SWITCHES

During normal operation, micro switch 1 on board of reel speed control system is in “OFF” position, while switches 2 to 5 are in “ON” position.



ZX,TMXZCO002516-19-01DEC92

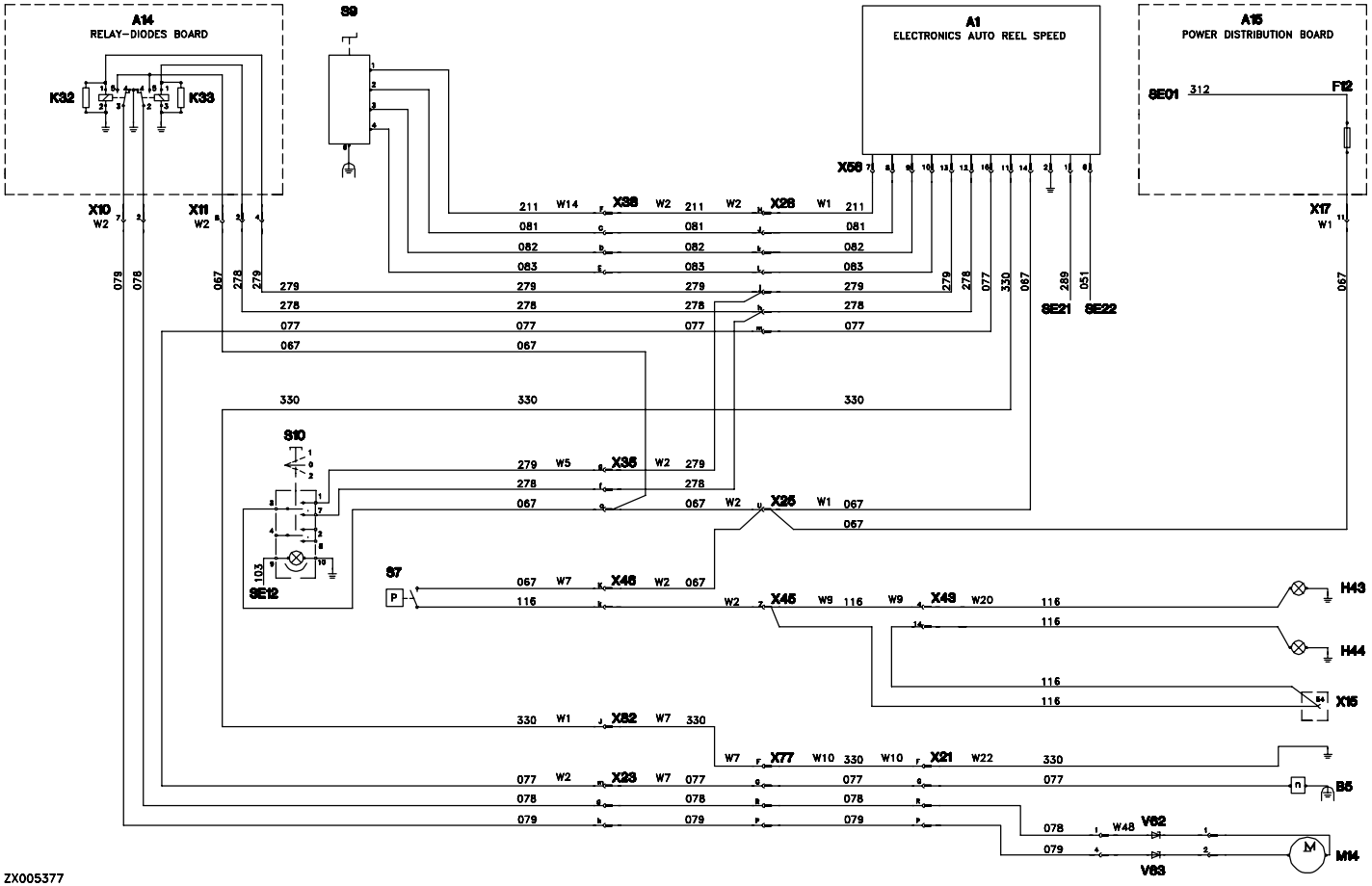
FUNCTIONAL SCHEMATIC, SECTION 19



A1—Reel speed control
A14—Relay and diode board
A15—Fuse board
B5—Sending unit, reel speed
F12—Fuse 15 amps.
H43—Stop light, l.h.
H44—Stop light, r.h.
K32—Relay, adjust reel speed
K33—Relay, adjust reel speed
M2—Reel speed adjusting motor
M14—Reel speed adjusting motor
S7—Stop light switch
S9—Potentiometer, reel speed
S10—Reel speed switch
X10—Connection, cab harness (W2) to relay board
X11—Connection, cab harness (W2) to relay board
X17—Connection, main distribution harness (W1) to fuse board
X21—Disconn. point, feeder house harness (W10), header harness (W22)
X23—Disconn. point, cab harness (W2), front basic harness (W7)
X25—Disconn. point, main distribution harness (W1), cab harness (W2)
X28—Disconn. point, main distribution harness (W1), cab harness (W2)
X35—Disconn. point, cab harness (W2), armrest harness (W5)
X38—Disconn. point, cab harness (W2), optional equipment harness (W14)
X43—Disconn. point, rear basic harness (W9), straw hood harness (W20)
X45—Disconn. point, cab harness (W2), rear basic harness (W9)
X46—Disconn. point, cab harness (W2), front basic harness (W7)
V62—Diode
V63—Diode

ZX,TMXZCO005147-19-15MAR96

DIAGNOSTIC SCHEMATIC, SECTION 19



OPERATIONAL INFORMATION

The ground pressure once adjusted by the operator on 900 Series cutting platforms will be kept constant by the DIAL-A-MATIC™.

Three different ground pressures can be preselected by means of the rotary switch on switch console.

By raising cutting platform manually the DIAL-A-MATIC™ is switched off. It is actuated again by lowering the platform manually (even for a short period of time only).

ZX,TMXZCO002752-19-13MAY93

THEORY OF OPERATION

Rotary switch (S23) in switch console is supplied with current via fuse (F43). By moving switch (S23) to positions 1, 2 or 3, electronic box (A2) and sending unit at cutting platform (S66) are supplied with current.

This preselection via switch determines which of the three center contacts in sending unit (S66) is without connection to electronic box (A2).

The contact revolving in relation to cutting platform ground pressure transmits a signal to the electronic control box (A2) until the revolving contact reaches the stationary contact without connection to electronic control box (A2).

The input signal is converted in the electronic control box (A2) and used for raising and lowering cutting platform (via wires 238 and 239).

ZX,TMXZCO002753-19-13MAY93

TESTING THE DIAL-A-MATIC

DIAL-A-MATIC test can be carried out by bridging various terminals at connection (X4) to cutting platform. Proceed as follows:

1. Run engine at fast idle.

2. Move road safety switch to field position. Engage separator drive.

CAUTION: It is possible during DIAL-A-MATIC test that feeder house moves up or down. DANGER OF ACCIDENTS.

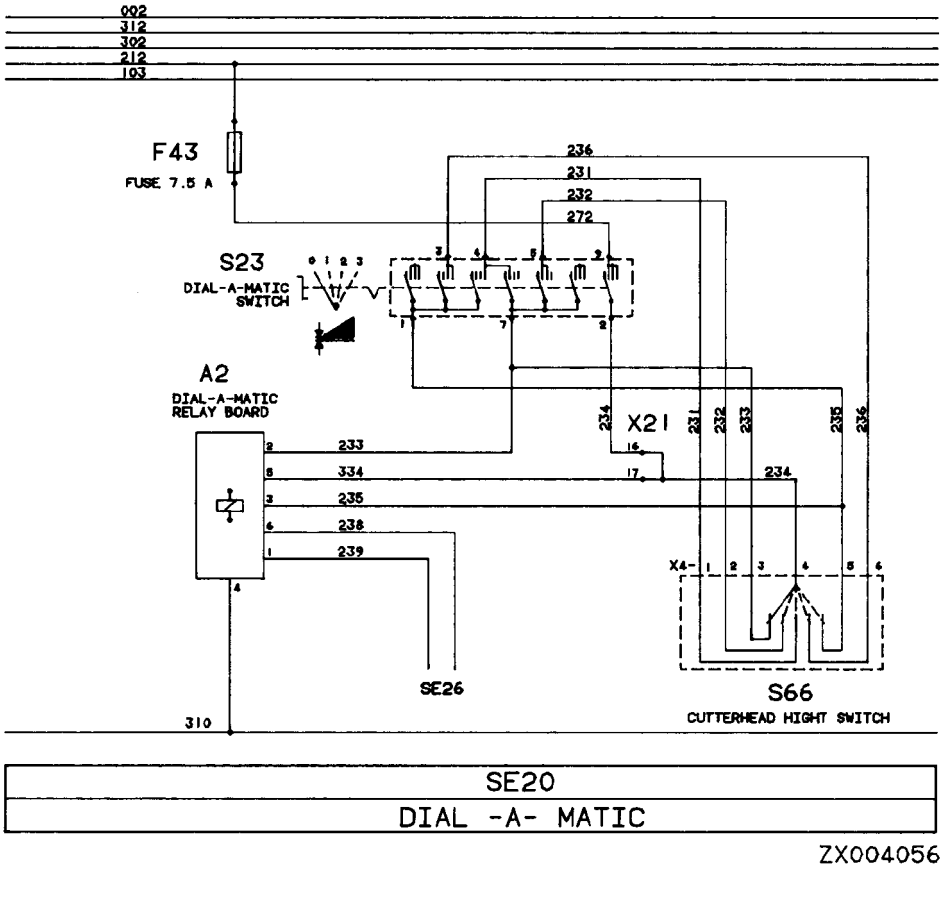
3. Move rotary switch (S23) in switch console to position 1,2 or 3 and press switch for a short period of time to lower cutting platform.

4. Check according to the following chart by bridging connection terminals.

CONNECTION X4	SWITCH POSITION			FEEDER HOUSE
	1	2	3	
Bridge contacts	4—5	4—5, 6	4—5, 6, 1	Feeder house rising
Bridge contacts	4—6	4—1	4—2	Feeder house not moving
Bridge contacts	4—1, 2, 3	4—2, 3	4—3	Feeder house lowering

ZX,TMXZCO002754-19-13MAY93

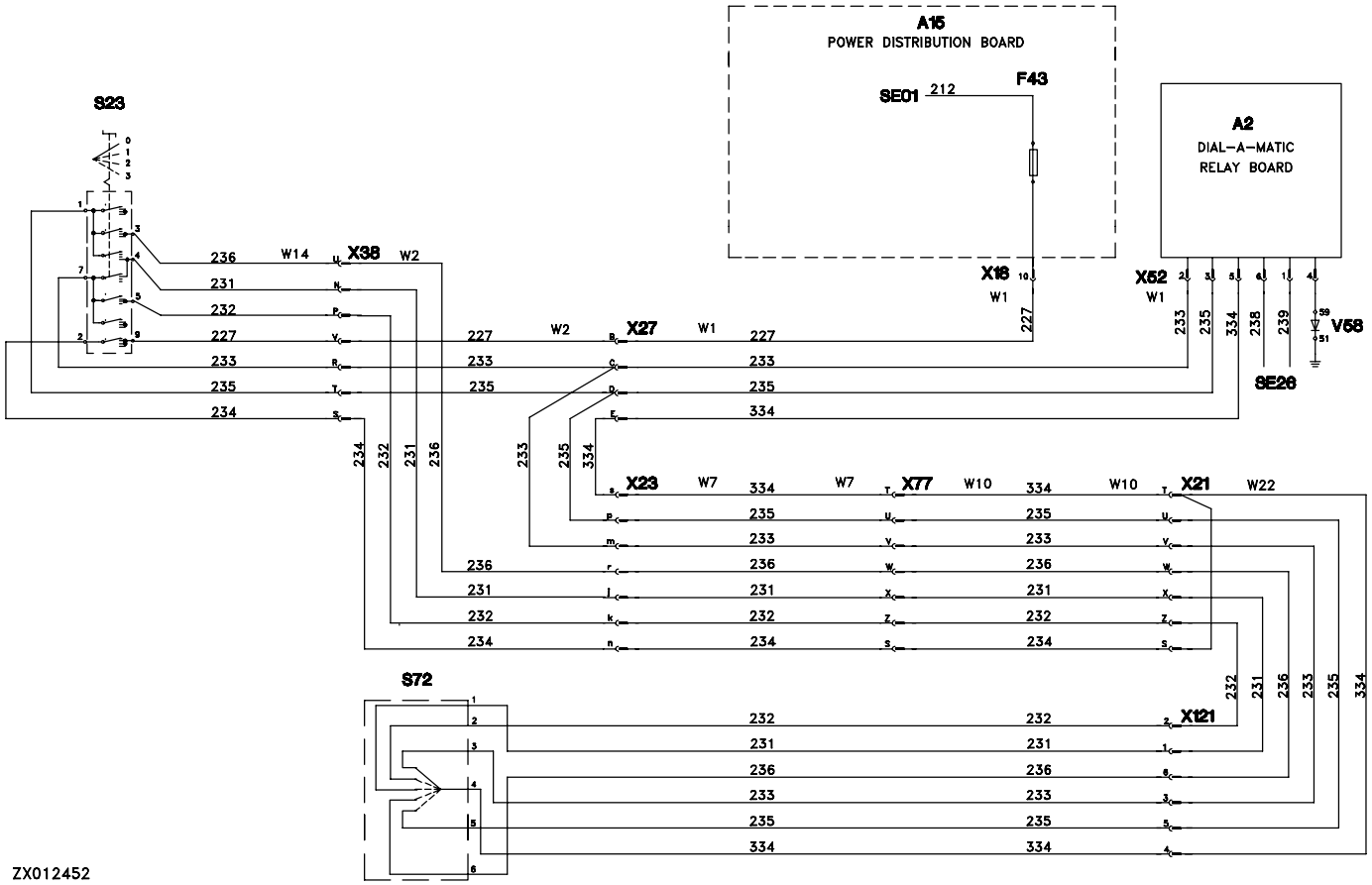
FUNCTIONAL SCHEMATIC OF SECTION 20



A2—Electronic box DIAL-A-MATIC
A15—Fuse board
F43—Fuse 7,5A
S23—DIAL-A-MATIC switch
S66—DIAL-A-MATIC sending unit
X18—Connection main distribution harness (W1) to fuse board
X21—Disconnect point feeder house harness (W10), cutting platform harness (W22)
X23—Disconnect point front basic wiring harness (W7)-cab wiring harness (W2)
X27—Disconnect point main distribution harness (W1)-cab wiring harness (W2)
X38—Disconnect point cab wiring harness (W2), optional equipment wiring harness (W14)
X52—Connection main distribution harness (W1)-electronic box DIAL-A-MATIC

ZX,TMXZCO002755-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 20



OPERATIONAL INFORMATION

By moving road safety switch to field position all hydraulic functions (including all hillmaster functions) can be used. At the same time fan in front of radiator is rotating.

Now separator and rear work lights can be switched on as well.

A safety device prevents the separator from being switched on when road safety switch is moved to field position.

With separator engaged, harvesting unit can be engaged as well.

A similar safety device prevents that the harvesting unit is engaged at the same time separator is switched on.

ZX,TMXZCO002757-19-13MAY93

THEORY OF OPERATION

With engine running, the road safety switch is supplied with current from terminal (D+) of alternator via fuse (F48). When switching to field position, relay (K12) is activated and wire (222) is supplied with current.

With switch (S33) in neutral position, relay (K21) has been activated. When separator drive is engaged, relay (K21) is kept in position and wire (202) is supplied with current.

Solenoids (Y22) and (Y23) are now supplied with current via fuse (F23). The hydraulic cylinder activated by the solenoids tensions the separator drive V-belt.

Harvesting unit is basically engaged in the same way as the separator.

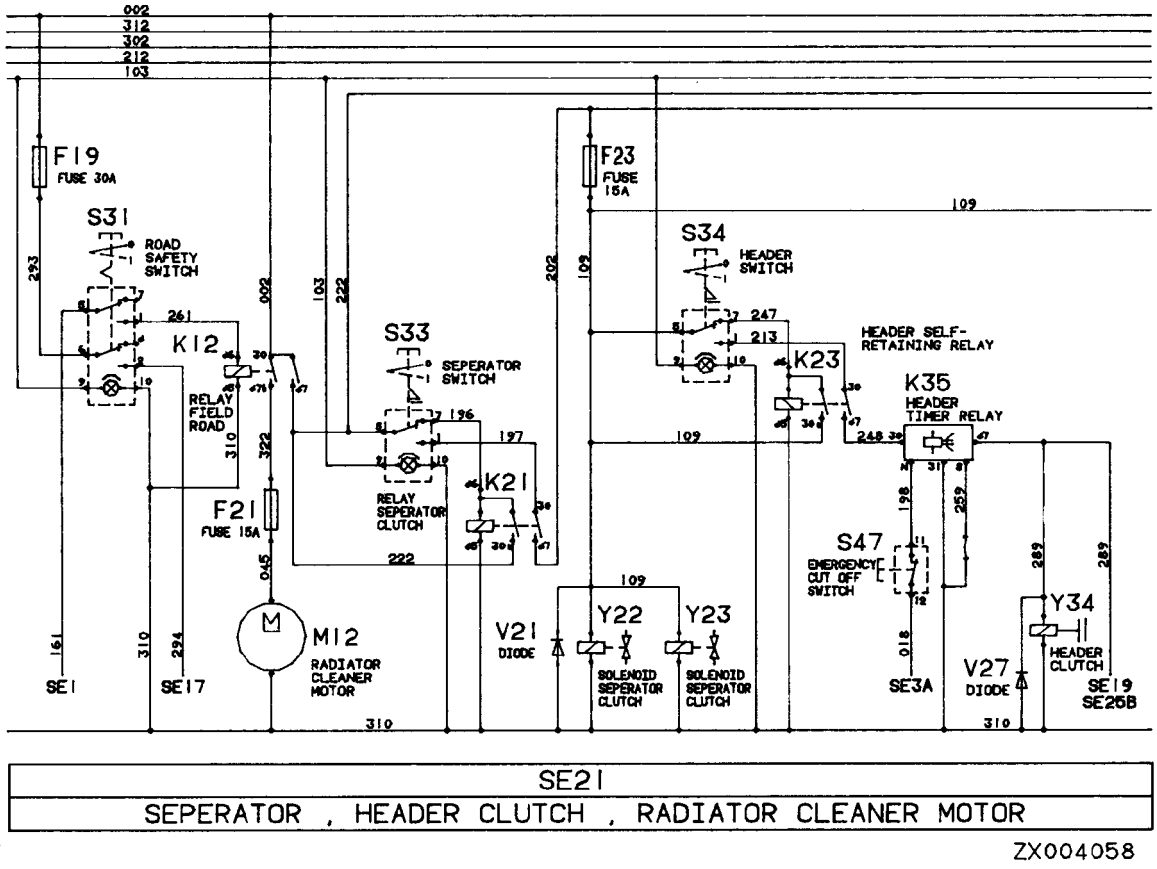
The time delay relay integrated in the circuit is not used. Harvesting unit is directly engaged and disengaged via switch (S34).

Actuating emergency cut-off switch interrupts the input signal of wire (198) to time delay relay. Wire (289) is without current supply and harvesting unit drive is interrupted by the electromagnetic clutch.

NOTE: Interruption of wire 259 or connection of terminal (S) to ground causes harvesting unit to be disengaged 5 seconds after engagement. Switch (S45) prevents the disengagement of the electric clutch for the feeder house drive.

ZX,TM4543009572-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 21

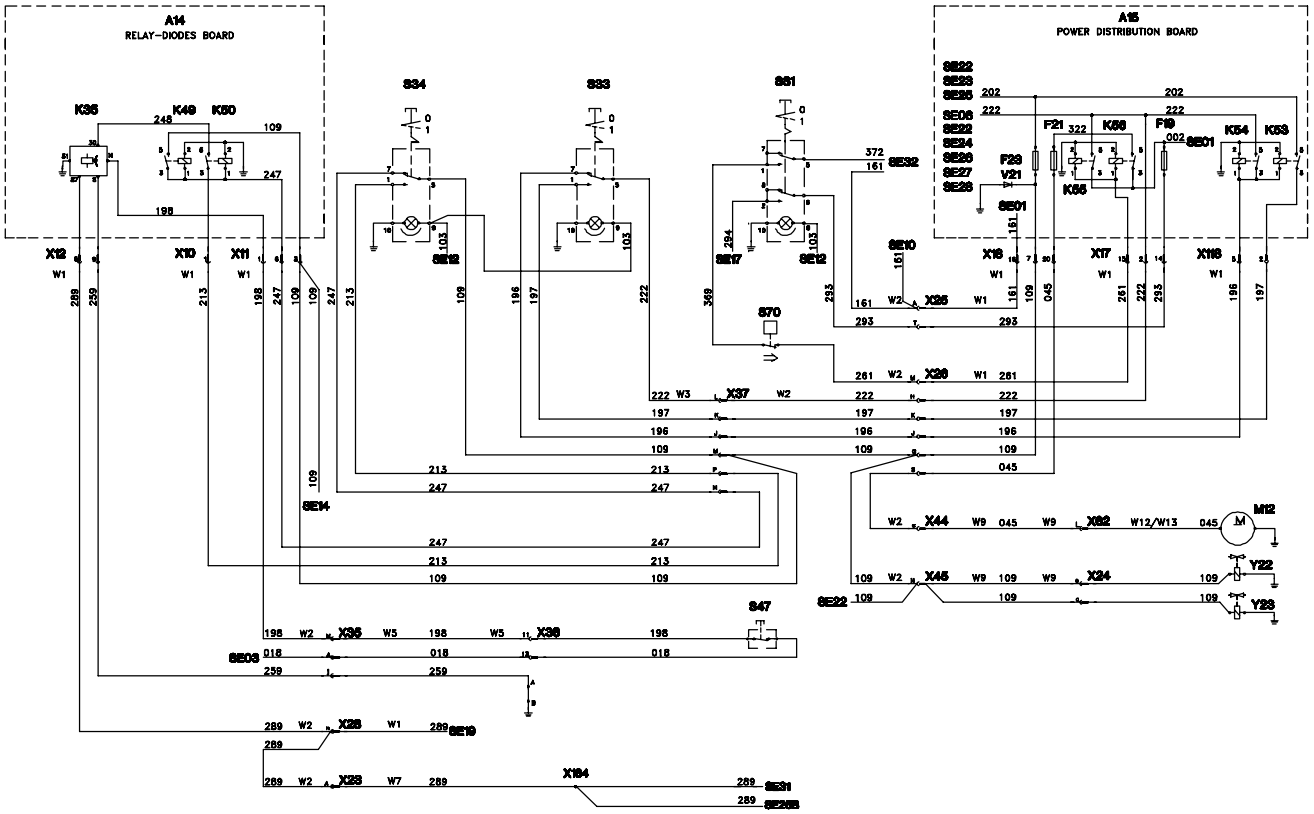


ZX004058 -UN-02MAY95

A14 —Relay and diode board
A15 —Fuse board
F19 —Fuse 30A
F21 —Fuse 15A
F23 —Fuse 15A
K12 —Relay, field operation-road travel
K21 —Relay, separator clutch
K35 —Time delay relay, cutting platform drive
M12 —Radiator cleaner motor
S31 —Road safety switch
S33 —Separator drive switch
S34 —Harvesting unit drive switch
S47 —Emergency cut-off switch
V2 —Diode, pressure switch
X10 —Connection cab harness (W2)-relay board
X11 —Connection cab harness (W2)-relay board
X12 —Connection cab harness (W2)-relay board
X17 —Connection main distribution harness (W1)-fuse board
X18 —Connection main distribution harness (W1)-fuse board
X23 —Disconnect point cab harness (W2)-front basic harness (W7)
X24 —Conn.solenoid valve block -rear basic harness (W9)
X25 —Disconnect point main distribution harness (W1) -cab harness (W2)
X26 —Disconn. point main distribution harness (W1)-cab harness (W2)
X28 —Disconnect point main distribution harness (W1) -cab harness (W2)
X35 —Disconnect point cab -harness (W2)-armrest harness (W5)
X36 —Conn. master control lever-armrest harness (W5)
X37 —Disconn. point cab harness (W2)-switch console harness (W3)
X44 —Disconnect point cab harness (W2)-rear basic harness (W9)
X45 —Disconnect point cab harness (W2)-rear basic harness (W9)
X62 —Disconnect point rear basic harness (W9)-engine harness (W12/W13)
X117 —Conn. main distribution harness (W1)-fuse board
Y22 —Solenoid,engage separator
Y23 —Solenoid,engage separator
Y34 —Harvesting unit clutch

ZX,TMXZCO002759-19-13MAY93

DIAGNOSTIC SCHEMATIC OF SECTION 21



OPERATIONAL INFORMATION, INFOTRAK-MONITOR

With starter switch in position (I) the infotrak monitor is ready for operation.

The infotrak monitor is identical with the ones in other John Deere products.

By the input of certain specific machine data the infotrak monitor is adjusted to the combine's needs.

All important separator drives are monitored by the speed monitoring system for decreasing of speed. An optical and an acoustical signal indicate the operator if the speed drops below a certain level.

ZX,TMXZCO002761-19-13MAY93

INPUT OF SPECIFIC MACHINE DATA

IMPORTANT: Each time different size drive wheels are installed or tire radius changes due to wear, the infotrak monitor must be calibrated accordingly. This will also ensure correct area counter operation.

Activate Input Status

Press key combination (C + D) and simultaneously turn starter switch from position (0) to position (I). The position indicator will move to upper left-hand position.

Data Input

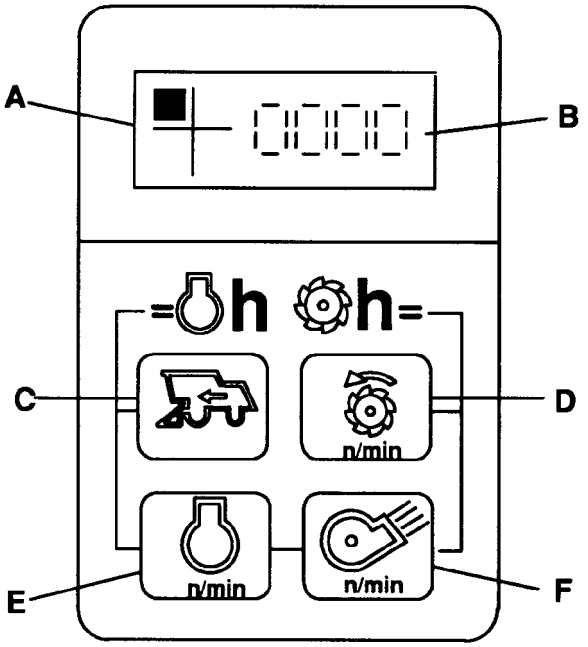
Press key (C): displayed value will increase.
Press key (E): displayed value will decrease.

Data Storage

Press key combination (D + F). At the same time the position indicator will move to another field (upper right-hand, lower right-hand, lower left-hand field).

Deactivate Input Status

After input and storage of all data, turn starter switch to position (0).



ZX 002352

ZX002352 -UN-28APR95

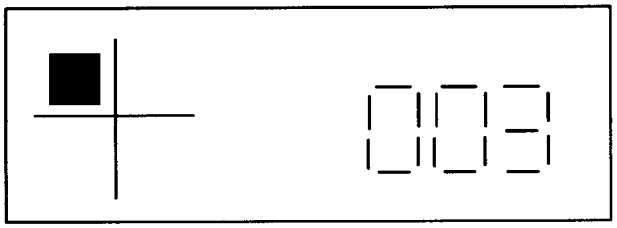
A—Position indicator
B—Display panel
C—Key for ground speed display
D—Key for cylinder speed display
E—Key for engine speed display
F—Key for fan speed display

ZX,OMXZCO001834-19-14NOV92

MACHINE CODE

Input code for mph:
03 — Combine

Input code for km/h:
23 — Combine



ZX 002483

-UN-28APR95

ZX002483

ZX,OMXZCO001835-19-13APR92

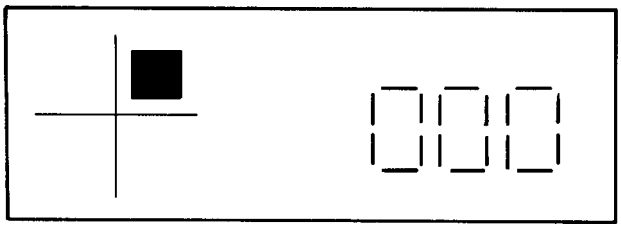
TRANSMISSION SPEED RATIO CODE

00 — Final drive (85/11)
Z12231 (I)

01 — Final drive (97/11)
Z12232 (II)

02 — Planetary final drive

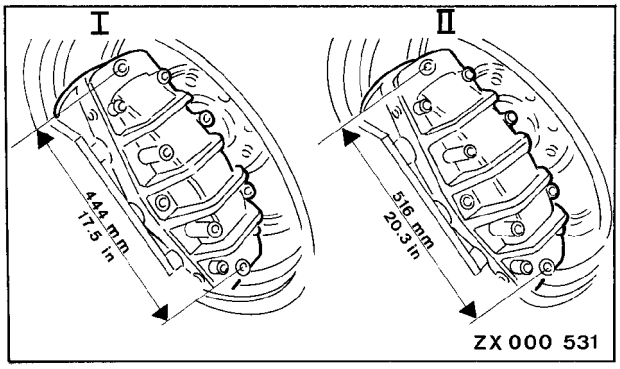
I—Final drive 85/11
II—Final drive 97/11



ZX 000 843

-UN-28APR95

ZX000843



ZX 000 531

-UN-03MAY95

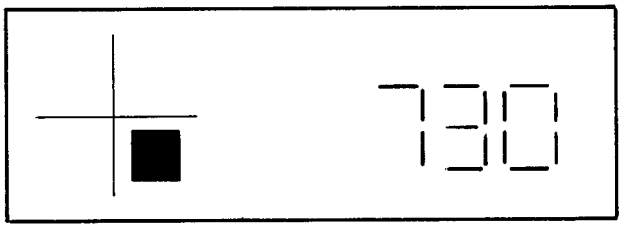
ZX000531

ZX,OMXZCO001836-19-13APR92

TIRE RADIUS CODE

For input of tire radius code, use actual tire radius. On machines with machine code 03 the radius must be keyed in in inches. On machines with machine code 23 the radius must be keyed in in millimeters.

NOTE: Refer to the tire chart in the operator's manual (Section "Wheels and Axles") for tire radius. Radius can also be determined by proceeding according to the following instructions.



ZX 000 532

-UN-28APR95

ZX000532

ZX,TMXZCO002762-19-13MAY93

DETERMINING TIRE RADIUS

Requirements:

- Combine on solid ground
- Correct tire pressures
- Combine steering wheels in straight-ahead position

Mark tire and ground with dashes.

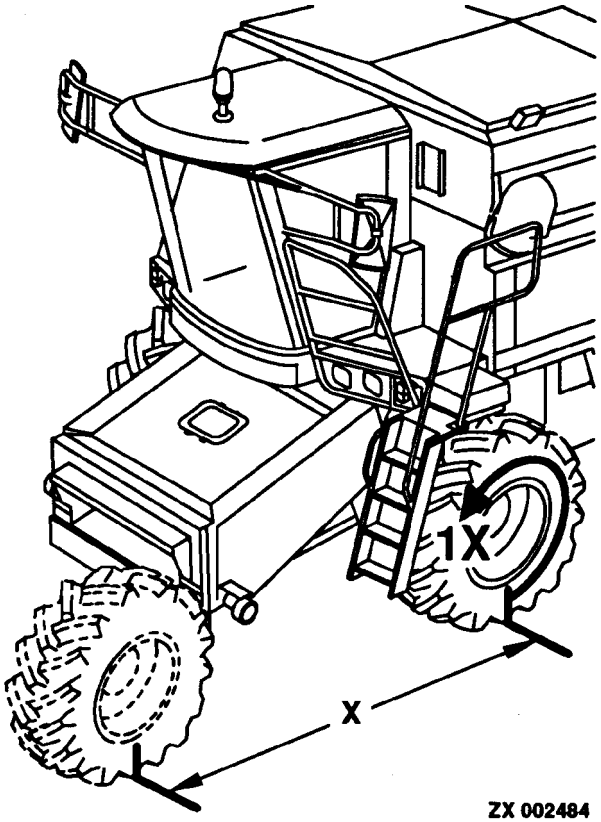
Drive combine until marked tire has completed one revolution.

Transfer tire mark to ground.

Measure distance (X) between ground marks.

Divide measured distance (X) by 6.28.

The value obtained is the tire radius for infotrak monitor input.

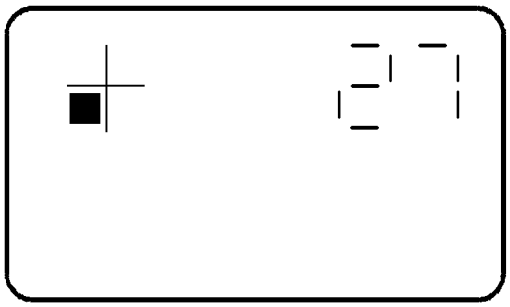


ZX002484 -UN-28APR95

ZX,OMXZCO001838-19-14NOV92

ENGINE IMPULSE CODE

24 — 2254 combine
27 — 2256—2266 combines



ZX012635 -UN-20AUG97

ZX,OMXZCO001839-19-01APR98

ERROR CODES, INFOTRAK-MONITOR

As soon as the infotrak monitor displays a three digit number followed by an “E” a malfunction or error of the operator is indicated.

The cause of a machine malfunction may be a broken wire etc.

Error code	Problem	Solution
101E	Counter of engine operating hours in infotrak monitor is defective	Replace infotrak monitor
102E	Counter of working hours in infotrak monitor is defective	Replace infotrak monitor
122E	Concave adjustment impossible, Sensor signal in wrong range (too low)	Voltage between pin 4 and 9 on infotrak monitor not between 1 and 4 Volts, wire on potentiometer (R2) may not be correctly connected
123E	Concave adjustment impossible, Sensor signal in wrong range (too high)	Voltage between pin 4 and 9 on infotrak monitor not between 1 and 4 Volts, wire on potentioeter (R2) may not be correctly connected
128E	No reaction from infotrak monitor	Check data lines 268 and 269 for correct connection, malfunction of infotrak monitor possible
129E	No reaction from control board	Check data lines 268 and 269 for correct connection, possibly control board of machine computer defective
130E	Adjusting motor can not reduce fan speed to the desired rpm	Check fuses F3, F25
131E	Variator can not reduce cylinder speed to the desired rpm	Check fuse F3
132E	Adjusting motor can not reduce concave clearance to desired gap	Check fuse F41
135E	Adjusting motor can not increase fan speed to the desired rpm	Check fuses F3, F25
136E	Variator can not increase cylinder speed to the desired rpm	Check fuse F3
137E	Adjusting motor can not increase concave clearance to desired gap	Check fuse F41

ZX,TMXZCO002763-19-13MAY93

OPERATIONAL INFORMATION, SPEED MONITORING SYSTEM

For better monitoring of drive systems the machines are equipped with a speed monitoring system.

The following speeds are monitored:

- Cylinder speed
- Fan speed
- Clean grain elevator
- Tailings elevator
- Cross shaker
- Straw chopper
- Chaff spreader

NOTE: Cylinder and fan speeds are monitored via infotrak monitor.

ZX,TMXZCO002764-19-13MAY93

THEORY OF OPERATION

Impulse pick-up units are installed at tailings elevator, clean grain elevator, cross shaker, straw chopper and chaff spreader shafts. On the shafts magnet rings are attached which influence the impulse pick-up units.

If speed of one shaft drops to below 65% of rated shaft speed, the corresponding indicator light is connected to ground and the buzzer sounds.

If shaft speed exceeds 85% of the rated speed, the corresponding alarm is switched off again.

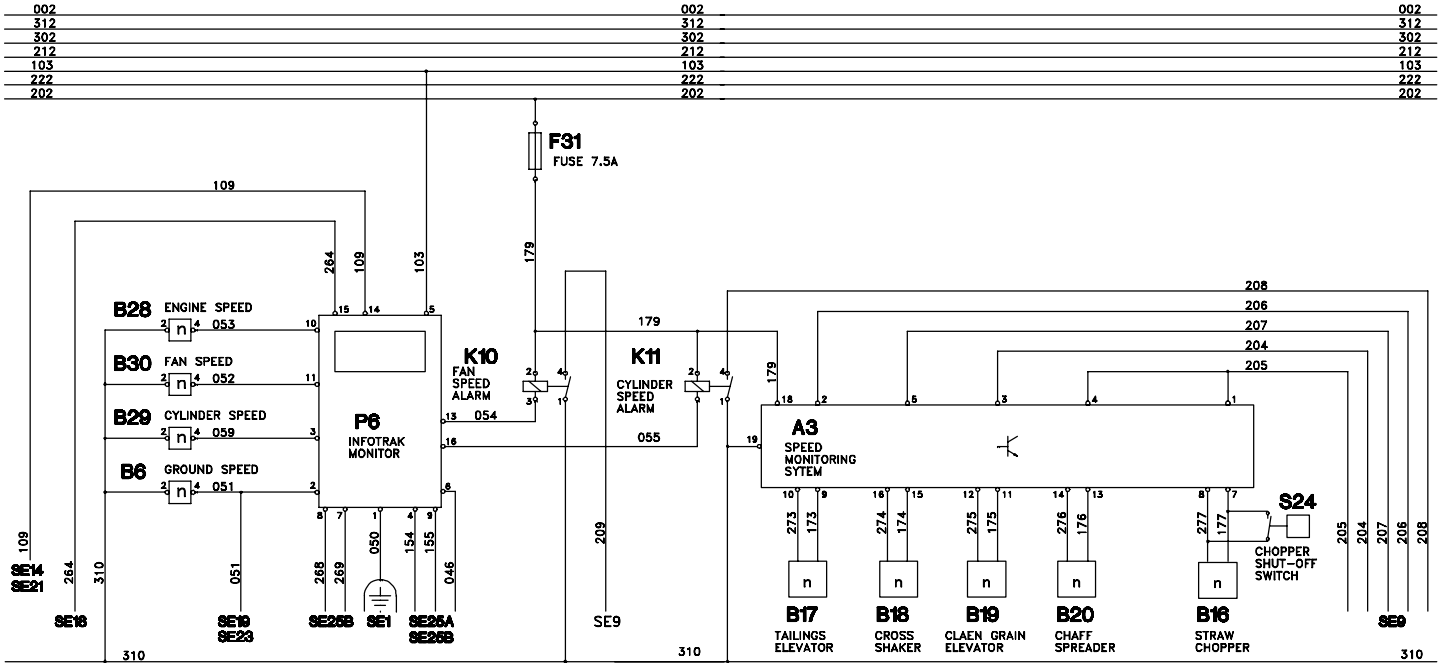
Shaft alarm speeds are:

Clean grain elevator	370 rpm
Tailings elevator	300 rpm
Cross shaker	210 rpm
Straw chopper	1730 rpm
Chaff spreader	130 rpm

NOTE: If straw chopper or chaff spreader are disengaged, the additional switch (S24) or (S26) switches off the speed monitoring system for the shaft concerned.

ZX,TMXZCO002765-19-13MAY93

FUNCTIONAL SCHEMATIC OF SECTION 22



SE22

INFOTRAK MONITOR / SPEED MONITORING SYSTEM

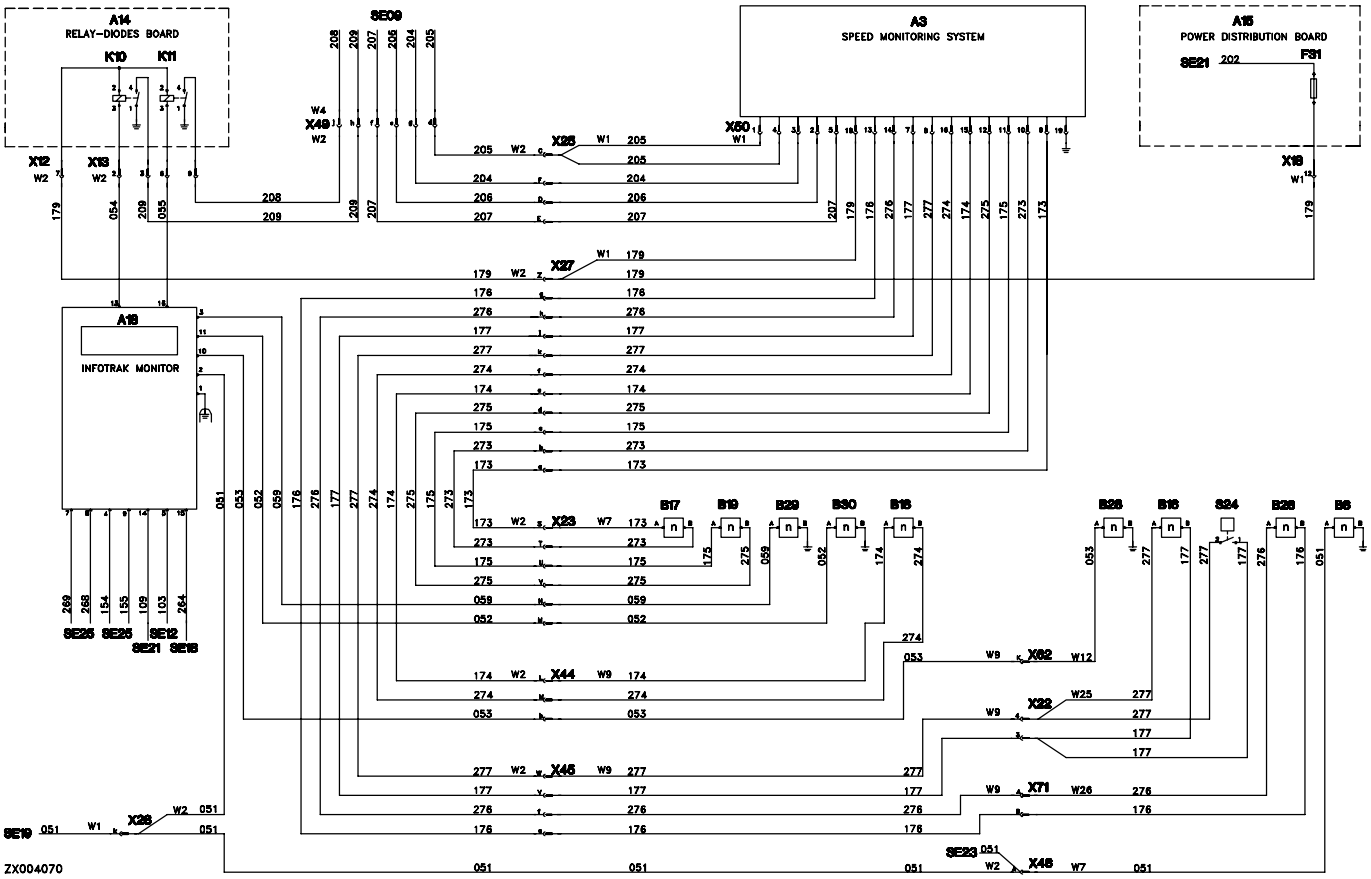
ZX012438

FUNCTIONAL SCHEMATIC OF SECTION 22

A3 —Electronic speed monitoring system
A14—Relay and diode board
A15—Fuse board
A18—Infotrak monitor
B6 —Ground speed sending unit
B16—Straw chopper speed sending unit
B17—Tailings elevator speed sending unit
B18—Cross shaker speed sending unit
B19—Clean grain elevator speed sending unit
B20—Chaff spreader speed sending unit
B28—Engine speed sending unit
B29—Cylinder speed sending unit
B30—Fan speed sending unit
K10—Relay, fan speed alarm
K11—Relay, cylinder speed alarm
S24—Speed monitoring switch, straw chopper
X12—Connection, cab harness (W2)-relay and diode board
X13—Connection, cab harness (W2)-relay and diode board
X18—Connection, main distribution harness (W1)-fuse board
X22—Disconnect point, rear basic harness (W9)-chopper harness (W25)
X23—Disconnect point, cab harness (W2)-front basic harness (W7)
X25—Disconnect point, main distribution harness (W1)-cab harness (W2)
X27—Disconnect point, main distribution harness (W1)-cab harness (W2)
X28—Disconnect point, main distribution harness (W1)-cab harness (W2)
X44—Disconnect point, cab harness (W2)-rear basic harness (W9)
X45—Disconnect point, cab harness (W2)-rear basic harness (W9)
X46—Disconnect point, cab harness (W2)-front basic harness (W7)
X49—Disconnect point, cab harness (W2)-corner post harness (W4)
X50—Connection, main distribution harness(W1)-electronic speed monitoring system
X62—Disconnect point, rear basic harness (W9)-engine harness (W12/W13)
X71—Disconnect point, rear basic harness (W9)-chaff spreader harness (W26)

ZX,TM4543010495-19-02AUG97

DIAGNOSTIC SCHEMATIC OF SECTION 22



OPERATIONAL INFORMATION

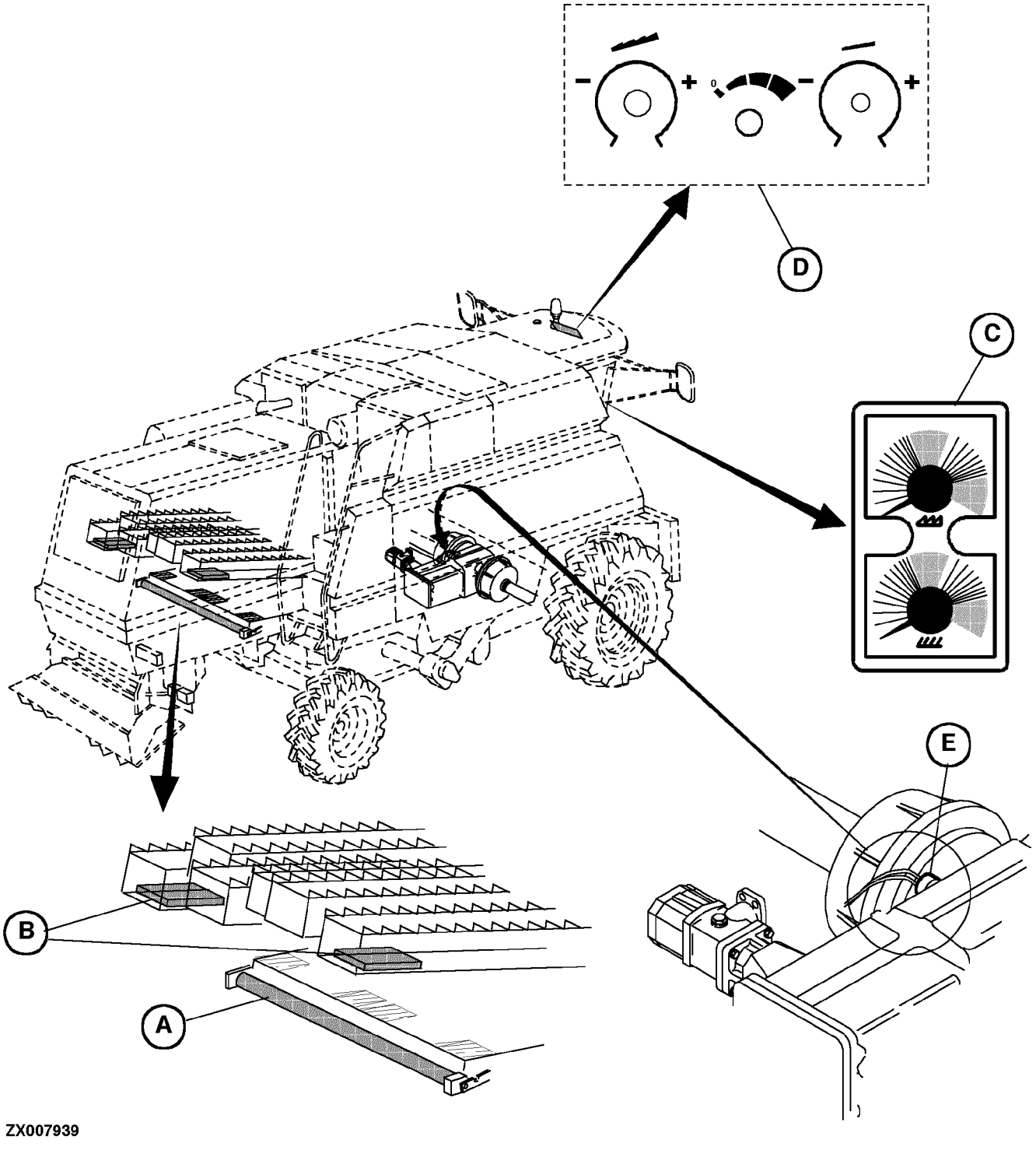
Sensors are located at the end of the cleaning shoe and straw walkers which record the amount of grains falling on the sensor surface.

Ground speed is measured by sensor (F) and light conditions (day/night) and moisture by sensor (C). Once these factors have been taken into account, the loss rate is shown at display unit (D). Display unit (D) indicates the loss level in relation to the level that is acceptable to the user.

The performance monitor enables the operator to use maximum combine capacity within the performance range selected by him. After the operator has adjusted the combine and cutting platform to suit the harvesting conditions, he must set the monitor to these conditions by means of the adjusting/selecting unit (E).

ZX,TMXZCO003211-19-17JAN94

HARVEST PERFORMANCE MONITOR



A—Cleaning shoe sensor
B—Straw walker sensors
C—Display unit
D—Adjusting/selecting unit
E—Ground speed sensor

ZX,OMXZCO001973-19-02MAY96

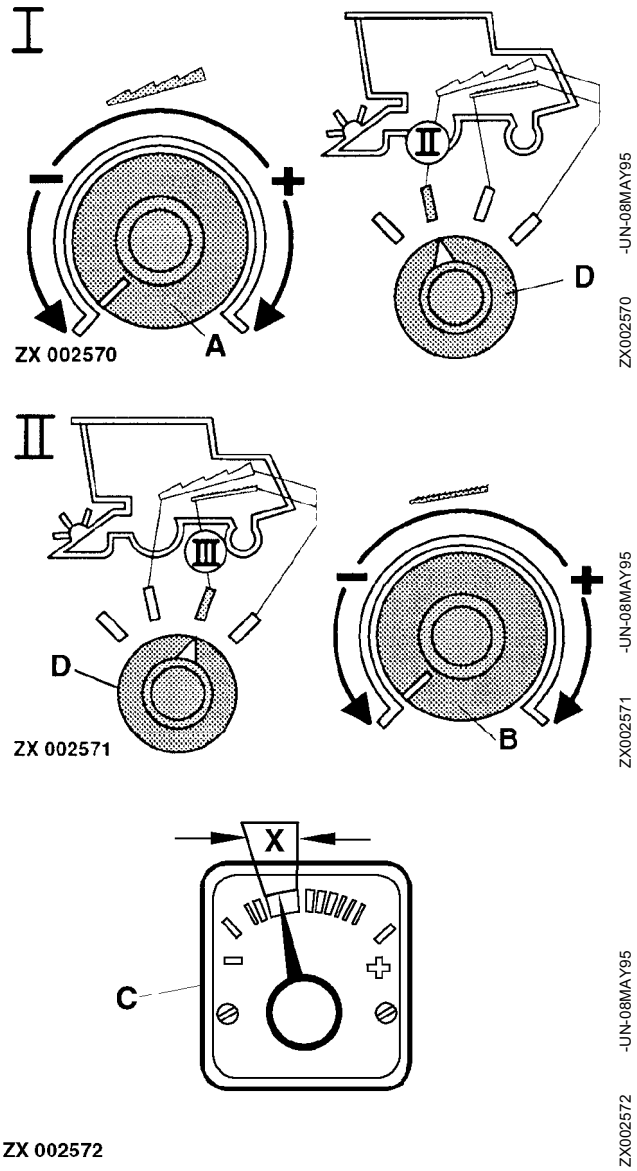
OPERATIONAL ADJUSTMENT OF HARVEST PERFORMANCE MONITOR

While threshing, adjust potentiometers (A) and (B) so that needle of display unit (C) moves to the center of the green sector (X) at a given, accepted loss level.

I — Set potentiometer for straw walker losses:
• Move selector switch (D) to position (II).
• Use potentiometer (A) to bring the needle into the green sector (X).

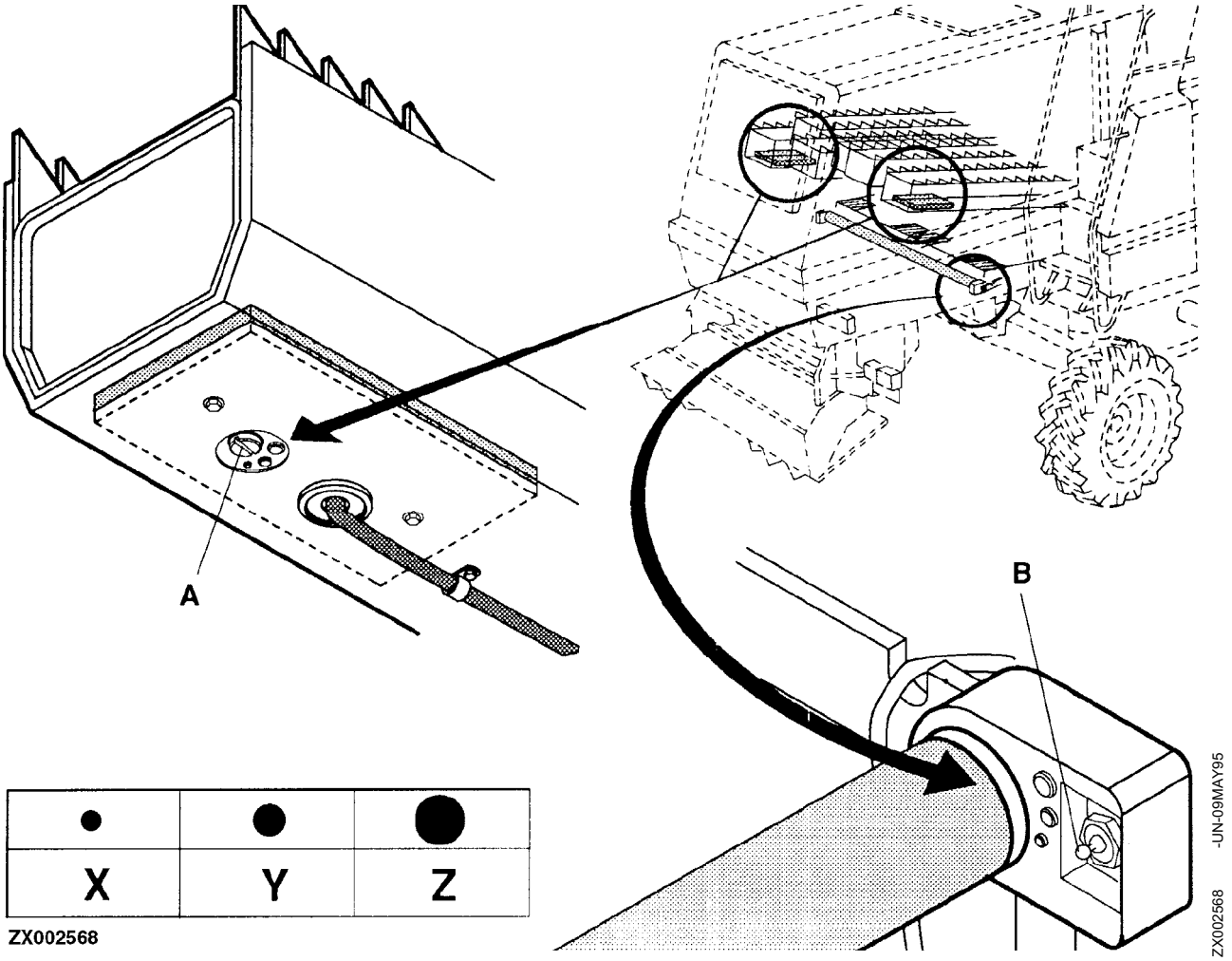
II — Set potentiometer für cleaning shoe losses:
• Move selector switch (D) to position (III).
• Use potentiometer (B) to bring the needle into the green sector (X).

A—Potentiometer, straw walker sensitivity
B—Potentiometer, cleaning shoe sensitivity
C—Display unit
D—Selector switch
X—Green sector



ZX,TMXZCO003186-19-17JAN94

SETTING SENSOR SENSITIVITY



A—Switch for grain size setting at straw walker sensor

B—Switch for grain size setting at cleaning shoe sensor

X—Higher sensor sensitivity for fine grain crops

Y—Medium sensor sensitivity for medium grain crops

Z—Lower sensor sensitivity for coarse grain crops

ZX,TMXZCO003212-19-17JAN94

OPERATIONAL CHECK OF HARVEST PERFORMANCE MONITOR

CAUTION: Before carrying out the operational check, remove fuse F23. This prevents the separator from being engaged while at the same time ensuring that the harvest performance monitor is supplied with power.

Start the engine.
Put road safety switch in field position.
Move separator switch to ON position.

I — Check straw walker sensors:

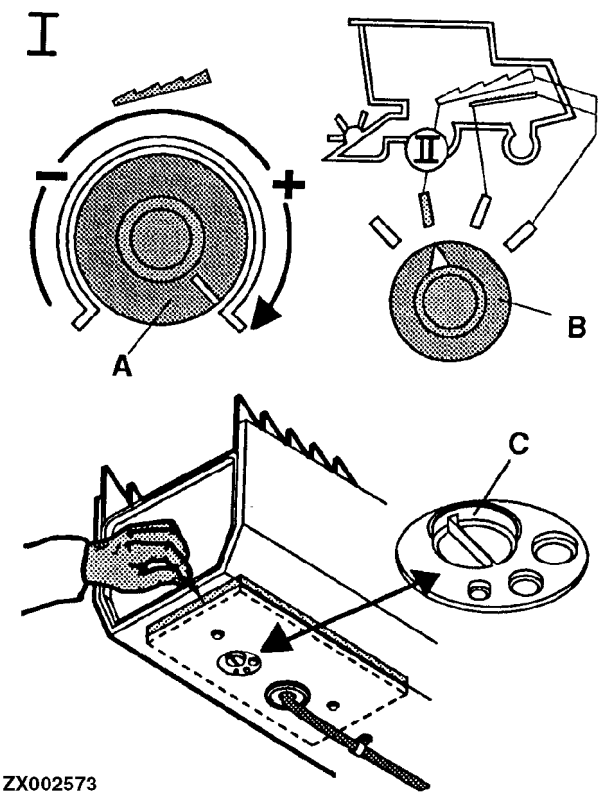
- Turn potentiometer (A) clockwise as far as it will go.
- Set selector switch (B) to position (II) (straw walkers).
- Rotary switch (C) should be in the medium position at both sides.
- Actuate the left and right straw walker sensors by tapping them lightly with a hard object or by dropping kernels on them. A second person is required to observe the needle at the display. The needle must be seen to move.

II — Check cleaning shoe sensor:

- Turn potentiometer (D) clockwise as far as it will go.
- Set selector switch (B) to position (III) (cleaning shoe).
- Tumbler switch (E) should be in the middle position.
- Check cleaning shoe sensor in the same way as the straw walker sensors.
- Switch on the parking light and check whether the display light is on.
- Switch off the parking light. Disengage the separator and remove the switch key.
- If a fault occurs during the check described above, rectify the fault as necessary.

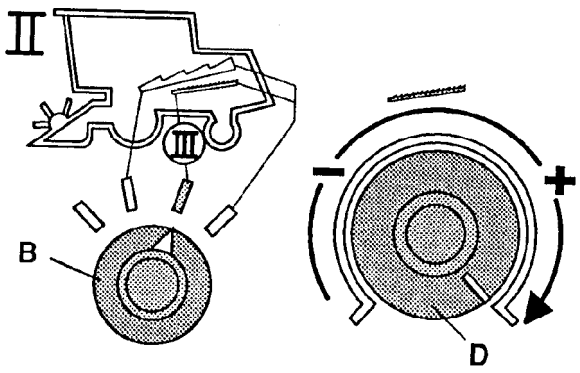
NOTE: Once the operational check is completed, put fuse F23 back in place.

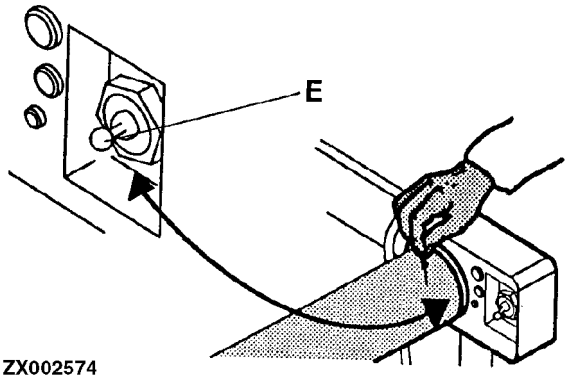
A—Potentiometer, straw walker sensitivity
B—Selector switch
C—Rotary switch
D—Potentiometer, cleaning shoe sensitivity
E—Tumbler switch



ZX002573 -UN-08MAY95

ZX002573



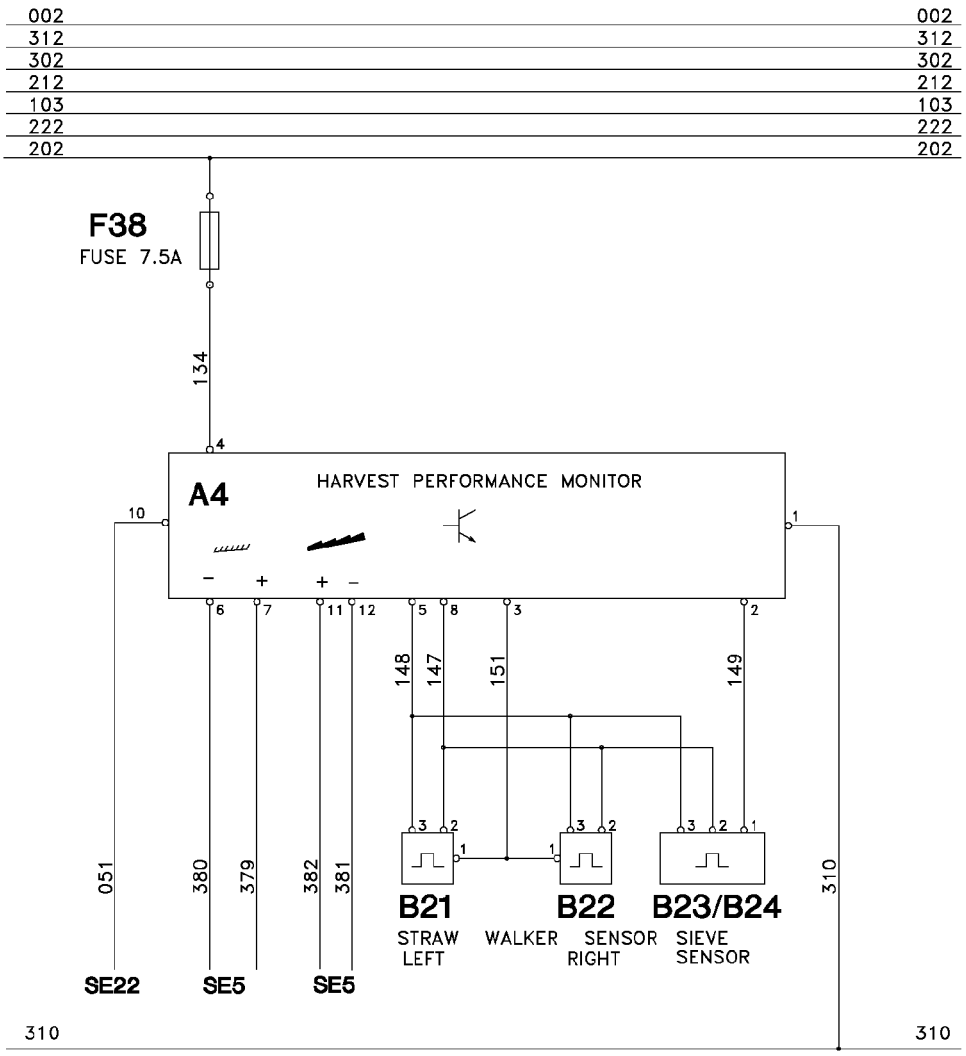


ZX002574 -UN-08MAY95

ZX002574

ZX,TMXZCO003213-19-17JAN94

FUNCTIONAL SCHEMATIC OF SECTION 23



SE23

HARVEST PERFORMANCE MONITOR

ZX012439

ZX012439 -UN-11MAR98

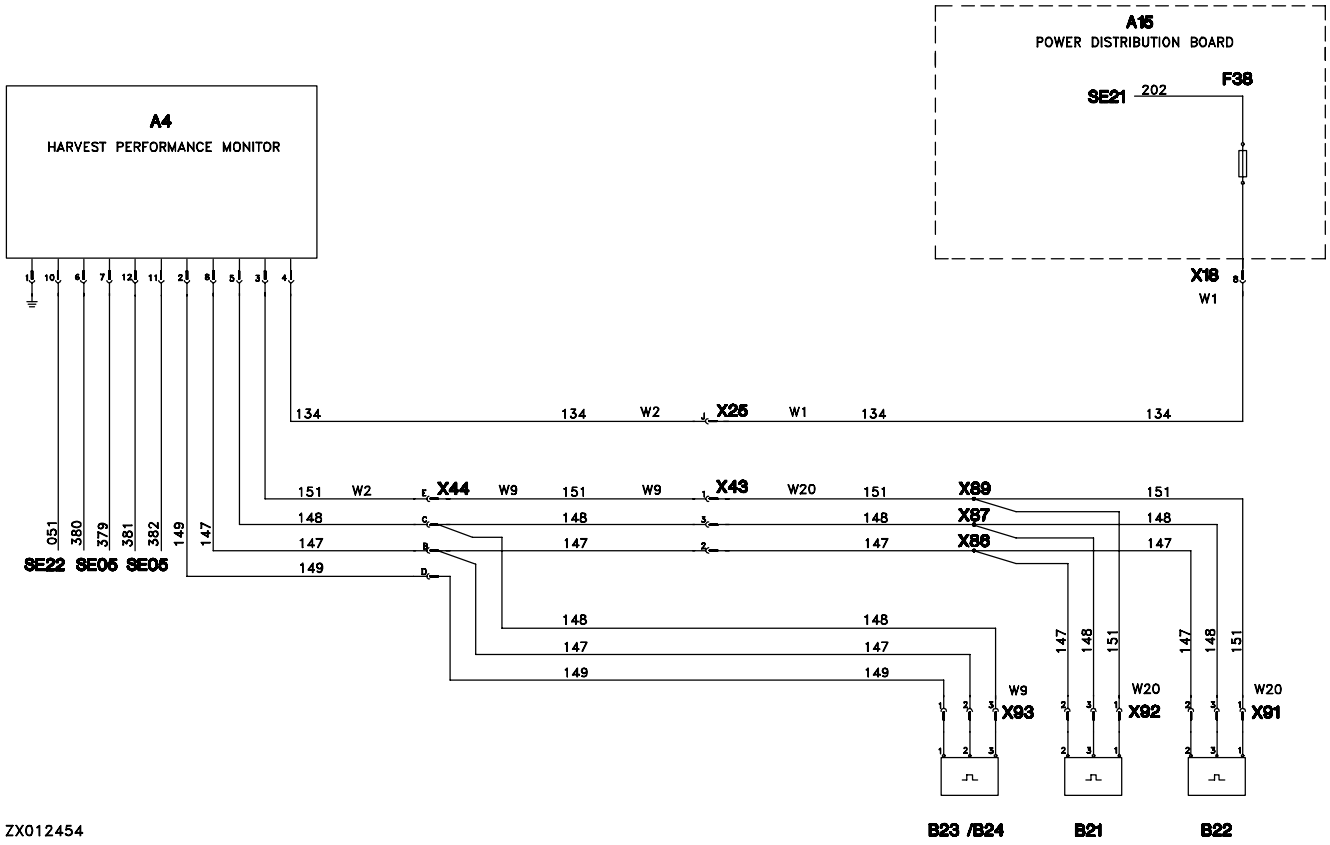
ZX,TMXZCO003214-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 23

A4 —Harvest performance monitor
A15—Fuse board
F38—Fuse, 7.5 amps.
B3 —Light sensor
B21—Straw walker sensor, right
B22—Straw walker sensor, left
B23—Cleaning shoe sensor (5 walkers)
B24—Cleaning shoe sensor (6 walkers)
X18—Connection, distribution harness (W1) to fuse board
X25—Disconnect point, distribution harness (W1), cab harness (W2)
X43—Disconnect point, rear basic harness (W9), straw hood harness (W20)
X44—Disconnect point, cab harness (W2), rear basic harness (W9)
X86—Splice
X87—Splice
X88—Splice
X91—Connection, straw walker sensor, left
X92—Connection, straw walker sensor, right
X93—Connection, cleaning shoe sensor

ZX,TM4543011400-19-30JUN97

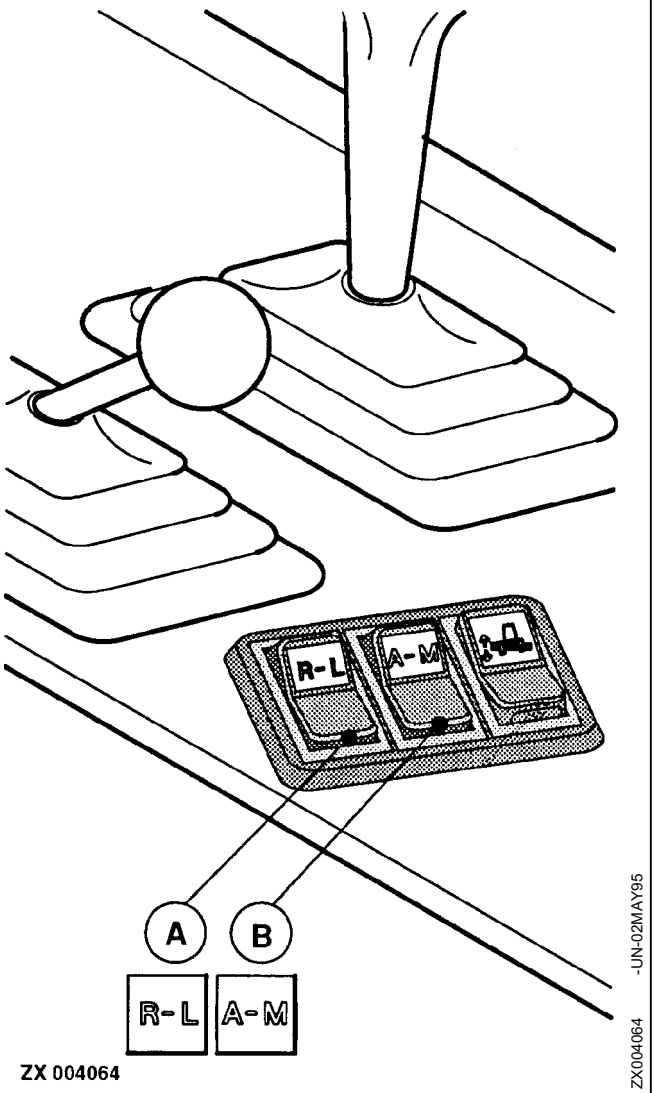
DIAGNOSTIC SCHEMATIC OF SECTION 23



OPERATIONAL INFORMATION

Two switches for Hillmaster leveling system operation are provided in the switch console. Switch (B) is used as selector switch. Depending on switch position, the system operates manually, automatically or the combine may be lowered for driving on public roads.

Switch (A) is used to tilt the machine manually to the right or left. With selector switch (B) in position (III), hydraulic oil from the retracting cylinder is routed to the hydraulic oil reservoir when tilting combine to the right or left.



ZX,TMXZCO003216-19-17JAN94

THEORY OF OPERATION

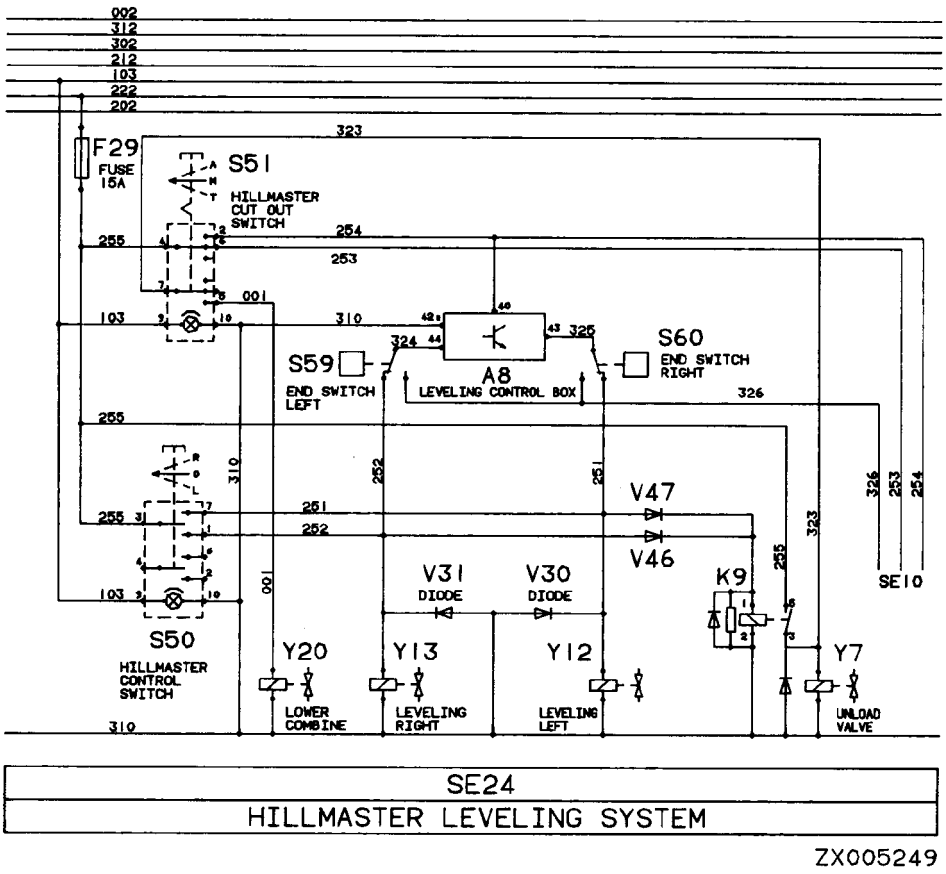
With road safety switch in field position and engine running, power is supplied to switches (S50) and (S51) via fuse (F29). When actuating switch (S50), solenoids (Y12) or (Y13) are activated. Pressure valve (Y7) is also activated via relay (K9). In addition, solenoid (Y20) is activated with selector switch (S51) in position (T) to lower the combine.

With selector switch (S51) in position (M), leveling control box (A8) is supplied with power. The output signals of the leveling control box also activate solenoids (Y12) and (Y13) and pressure valve (Y7).

When maximum tilt is reached, end switch (S59) or (S60) changes position and the indicator light in the cab will glow.

ZX,TMXZCO003217-19-17JAN94

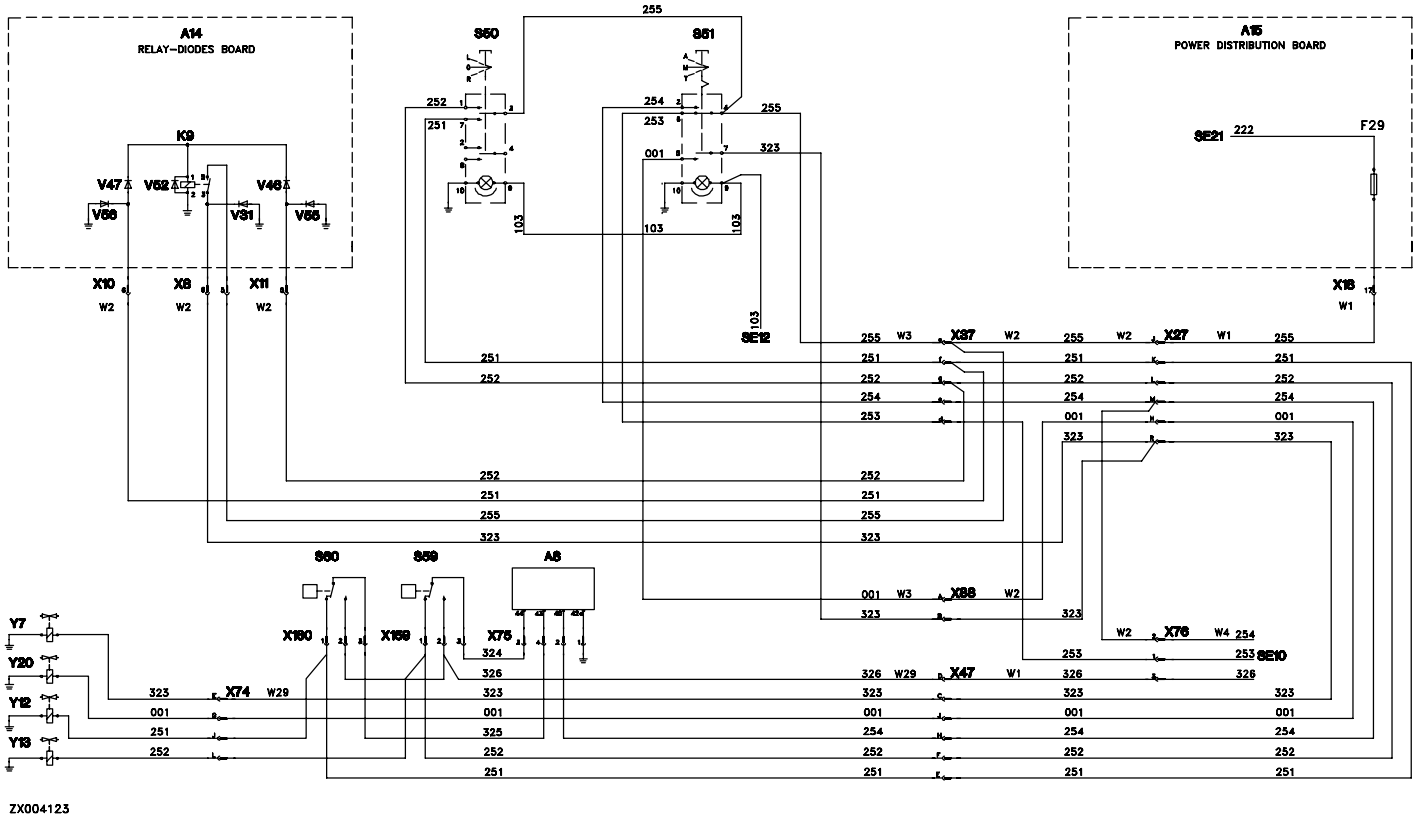
FUNCTIONAL SCHEMATIC OF SECTION 24



A8 —Leveling control box
A14 —Relay and diode board
A15 —Fuse board
F29 —Fuse, 15 amps.
S50 —Manual leveling control switch
S51 —Leveling control switch, automatic/manual
S59 —End switch, leveling to the left
S60 —End switch, leveling to the right
V31 —Diode
V46 —Diode
V47 —Diode
V52 —Diode
V55 —Diode
V56 —Diode
X8 —Connection, cab harness (W2) to relay and diode board
X10 —Connection, cab harness (W2) to relay and diode board
X11 —Connection, cab harness (W2) to relay and diode board
X18 —Connection, distribution harness (W1) to fuse board
X27 —Disconnect point, distribution harness (W1), cab harness (W2)
X37 —Disconnect point, cab harness (W2), switch console harness (W3)
X47 —Disconnect point, distribution harness (W1), Hillmaster harness (W29)
X74 —Connection, Hillmaster harness (W29) to solenoid valve block
X75 —Connection, Hillmaster harness (W29) to leveling control box
X76 —Disonnect point, cab harness (W2), corner post harness (W4)
X88 —Disconnect point, cab harness (W2), switch console harness (W3)
X159—Connection, Hillmaster harness (W29) to left end switch
X160—Connection, Hillmaster harness (W29) to right end switch

ZX,TMXZCO003218-19-17JAN94

DIAGNOSTIC SCHEMATIC OF SECTION 24



OPERATIONAL INFORMATION

The concave and threshing cylinder/fan speeds may be adjusted by means of rocker switches in the cab.

Current cylinder speed may be displayed at the Infotrak monitor. When adjusting concave spacing, the corresponding value is also displayed at the Infotrak monitor.

NOTE: Separator must be running when adjusting cylinder and fan speeds.

ZX,TMXZCO003222-19-17JAN94

THEORY OF OPERATION

Adjusting threshing cylinder speed:

With separator engaged, power is supplied to switch (S40) via fuse (F8). When actuating the switch, relays on board (A11) are activated, which in turn activate solenoids (Y28) or (Y29) and provide hydraulic adjustment of cylinder variable drive.

Adjusting fan speed:

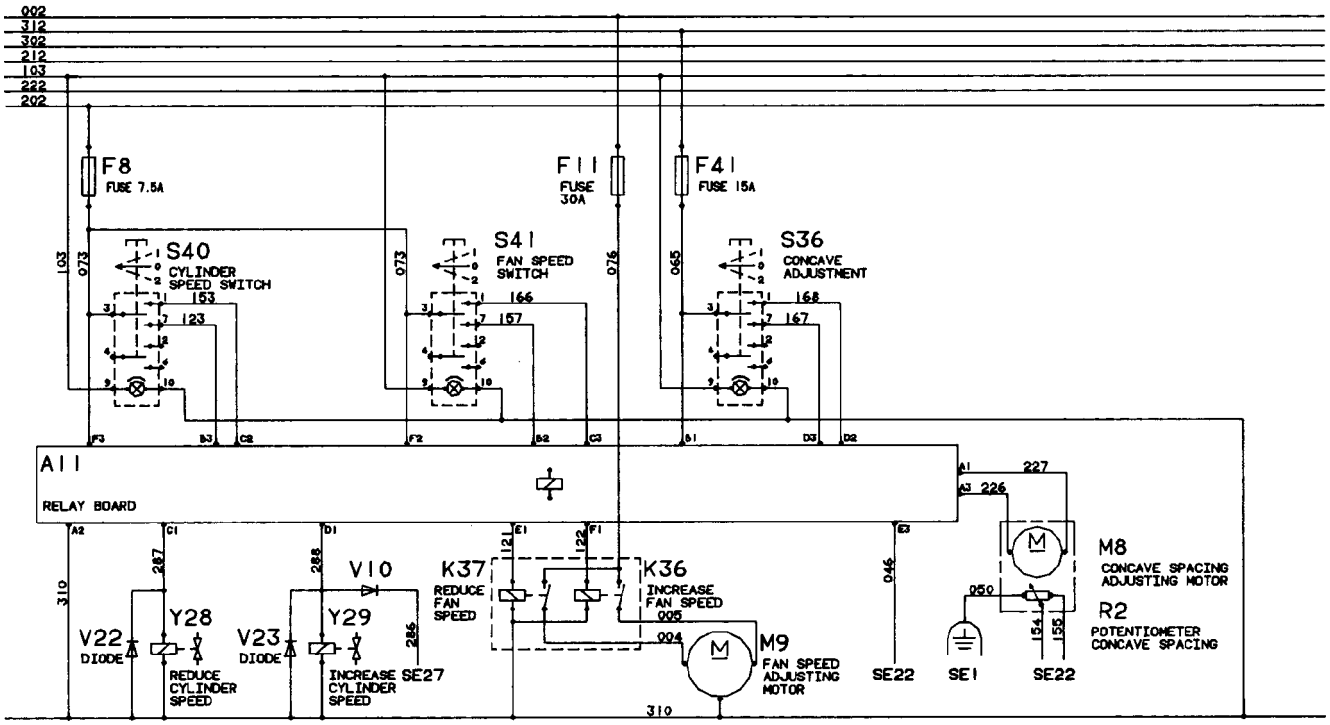
With separator engaged, power is supplied to switch (S41) via fuse (F8). When actuating the switch, relays on board (A11) are activated which in turn activate relay (K36) or (K37). Motor (M9) will then adjust variable fan speed drive.

Adjusting concave:

With starter switch in position (I), power is supplied to switch (S36) via fuse (F41). When actuating the switch, motor (M8) is activated via relays on board (A11). Motor (M8) is used for concave adjustment. Potentiometer (R2) integrated in motor (M8) will transmit the concave spacing value to the Infotrak monitor.

ZX,TMXZCO003223-19-17JAN94

FUNCTIONAL SCHEMATIC OF SECTION 25A



SE25A
CYLINDER , CONCAVE , FAN ADJUSTMENT

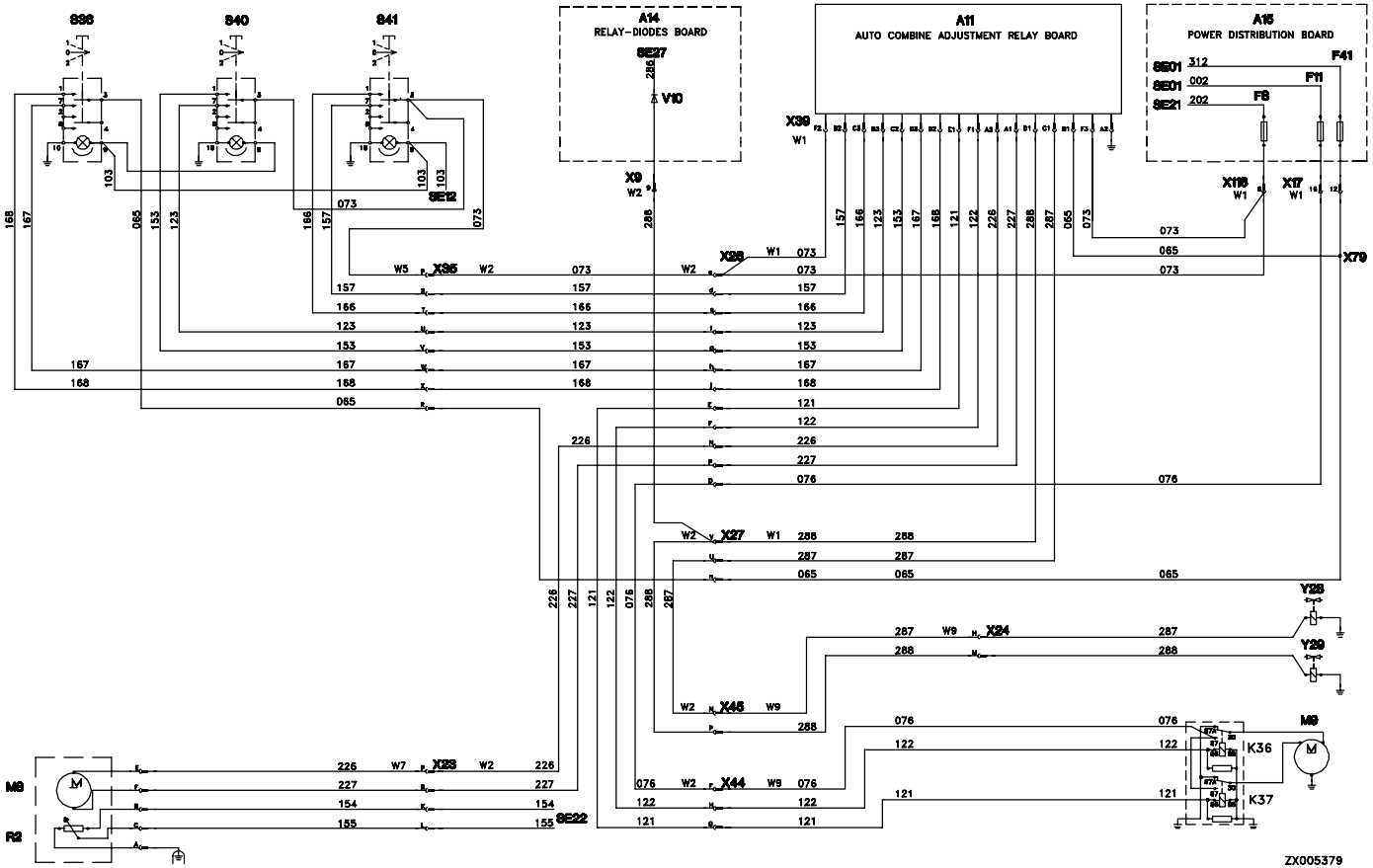
ZX005250

ZX005250 -UN-02MAY95

A11 —Relay board, combine data center
A14 —Relay and diode board
A15 —Fuse board
F8 —Fuse, 7.5 amps.
F11 —Fuse, 30 amps.
F28 —Fuse, 7.5 amps.
F41 —Fuse, 15 amps.
K36 —Relay, adjust fan speed
K37 —Relay, adjust fan speed
M8 —Concave adjusting motor
M9 —Fan speed adjusting motor
R2 —Potentiometer, concave adjustment
S36 —Switch, concave adjustment
S40 —Switch, cylinder speed adjustment
S41 —Switch, fan speed adjustment
V10 —Diode
X9 —Connection, cab harness (W2) to relay and diode board
X17 —Connection, distribution harness (W1) to fuse board
X23 —Disconnect point, cab harness (W2), front basic harness (W7)
X24 —Connection, rear basic harness (W9) to solenoid valve block
X25 —Disconnect point, distribution harness (W1), cab harness (W2)
X26 —Disconnect point, distribution harness (W1), cab harness (W2)
X27 —Disconnect point, distribution harness (W1), cab harness (W2)
X28 —Disconnect point, distribution harness (W1), cab harness (W2)
X35 —Disconnect point, cab harness (W2), armrest harness (W5)
X38 —Disconnect point, cab harness (W2), optional harness (W14)
X39 —Connection, distribution harness (W1) to data center relay board
X40 —Connection, distribution harness (W1) to data center control board
X44 —Disconnect point, cab harness (W2), rear basic harness (W9)
X45 —Disconnect point, cab harness (W2), rear basic harness (W9)
X55 —Disconnect point, cab harness (W2), data center harness (W23)
X79 —Splice
X118—Connection, distribution harness (W1) to fuse board

ZX,TMXZCO003224-19-17JAN94

DIAGNOSTIC SCHEMATIC, SECTION 25A



OPERATIONAL INFORMATION

The combine data center integrated in the right-hand armrest essentially consists of an area counter and a system for automatic separator adjustments.

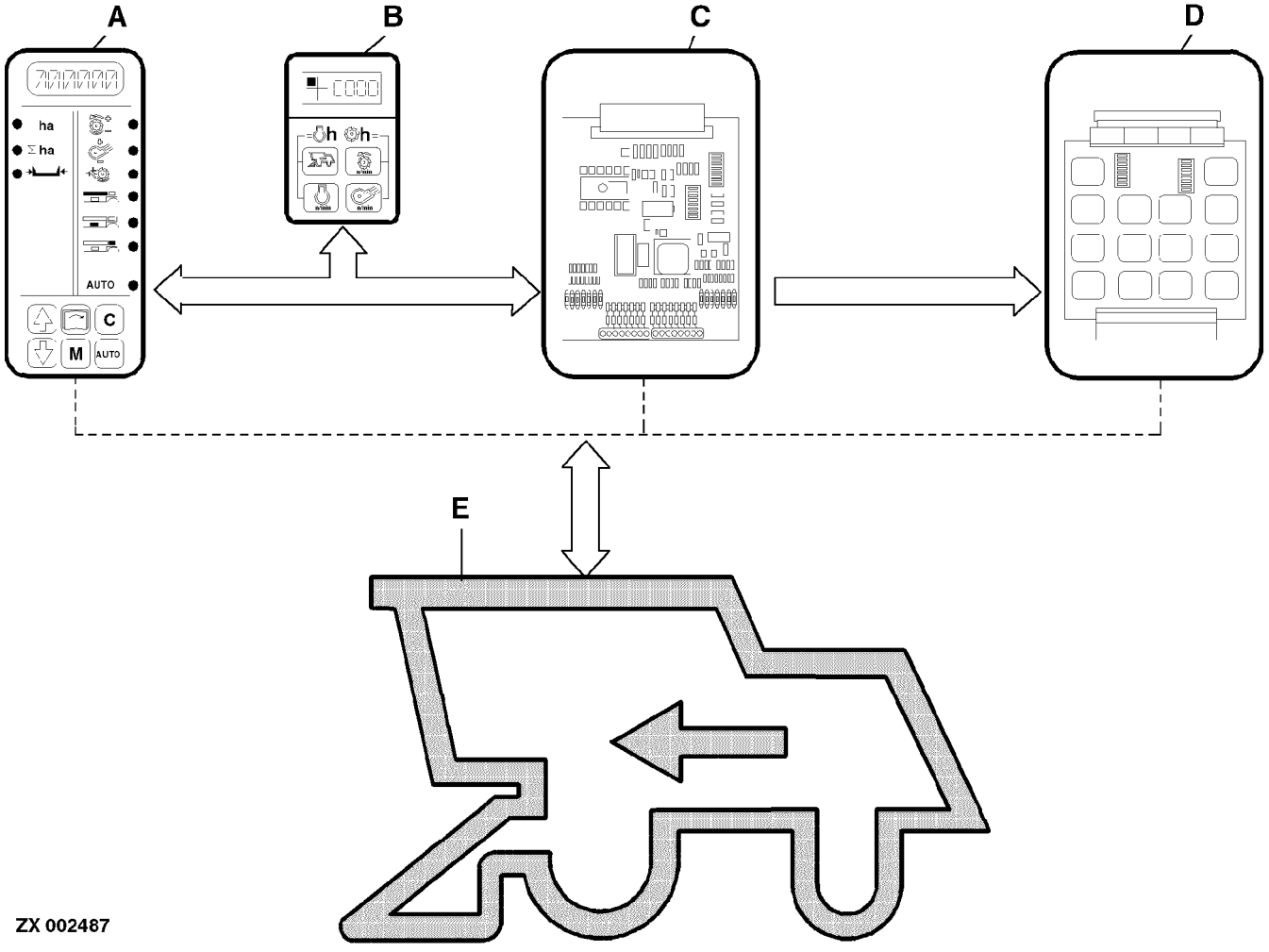
Area counting is based on travel distance during harvesting and cutting width.

Automatic settings are performed depending on the type of crop selected on the combine data center.

A data or signal transfer takes place between the mentioned components. Actual settings (speeds, clearances) and error codes (in case of malfunctions) are displayed on the Infotrak monitor.

ZX,TMXZCO003227-19-17JAN94

SYSTEM COMPONENTS ("AREA COUNTER" AND "AUTOMATIC SEPARATOR ADJUSTMENTS")



A—Combine data center
B—Infotrak monitor
C—Control board (for automatic machine adjustments only)
D—Relay board
E—Combine (sensors, switches, solenoids, motors)

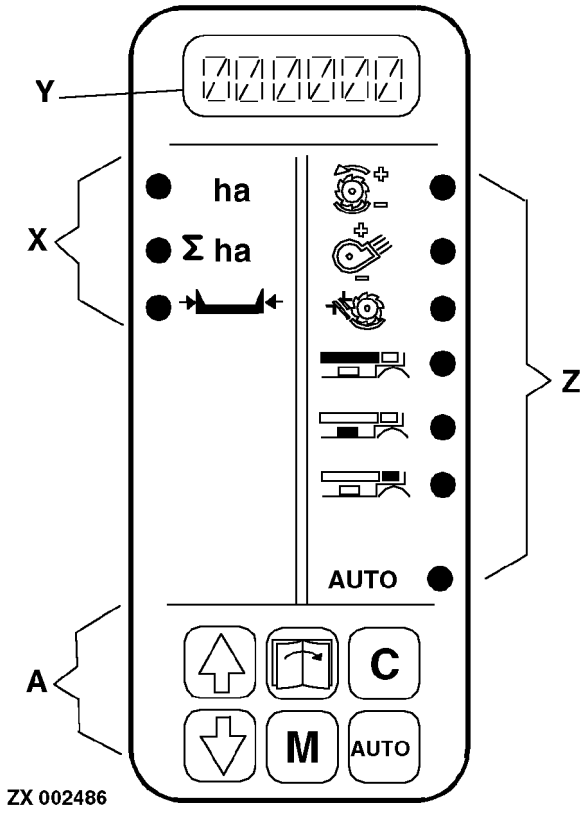
ZX,TMXZCO003187-19-15JUL96

COMBINE DATA CENTER

With starter switch in position (I), the combine data center is ready for operation.

Functions:

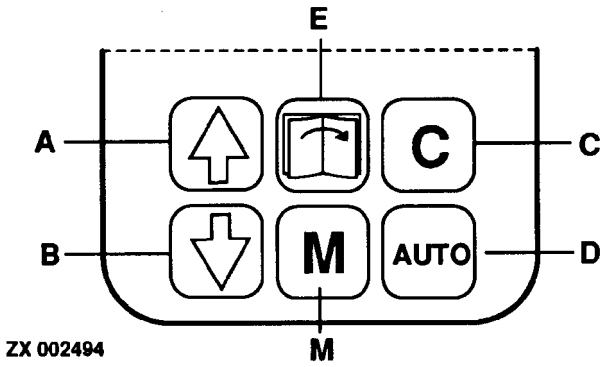
A—Controls (6 keys)
X—Area counter
Y—Display (6 digits)
Z—Setting unit



ZX,TMXZCO003228-19-15JUL96

CONTROL KEYS

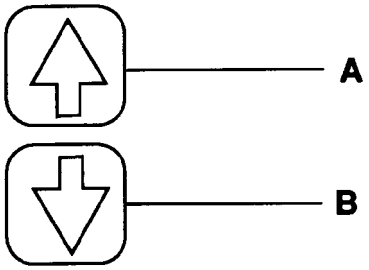
A—Up
B—Down
C— • Clear
• Calibrate
• Cancel
D—Automatic function (AUTO)
E—Page change
M— • Modify
• Memory



ZX,OMXZCO001847-19-20JUL92

Keys A and B

These keys are used to run through the various functions of area counter, display panel or setting unit. If “Modify” mode is activated by pressing key (M), displayed values may be increased or decreased at given increments by pressing these keys.

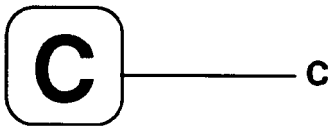


ZX,OMXZCO001848-19-20JUL92

Key C

This key is used to set data center displays to “zero” (e.g. area, header width) and to clear crop settings created by the operator.

This key is also used to interrupt automatic settings, to leave the automatic or modify mode and for input of partial header width.



ZX 002516

-UN-27APR95

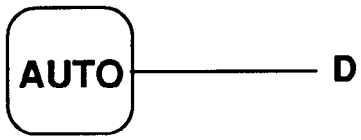
ZX002516

ZX,OMXZCO001851-19-20JUL92

Key D

This key is used to activate automatic functions for setting combine components according to the values of the previously selected crop (cylinder speed, fan speed and concave spacing). During the setting procedure, the “AUTO” light of the setting unit will glow. The light will go out as soon as the setting procedure is completed.

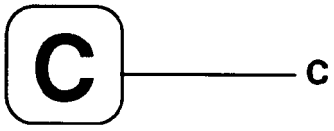
NOTE: During the setting procedure, the automatic mode may be left by pressing key (C).



ZX 002517

-UN-28APR95

ZX002517



ZX 002516

-UN-27APR95

ZX002516

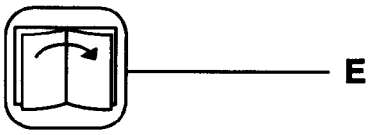
ZX,OMXZCO001852-19-20JUL92

Key E

This key is used to “jump” from one unit of combine data center to another:

- From area counter to display
- From display to setting unit
- From setting unit back to area counter

This key is also used for the “Select Language” mode.



ZX 002514

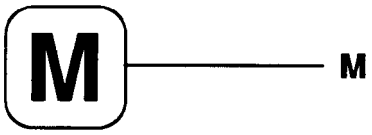
-UN-27APR95

ZX002514

ZX,OMXZCO001849-19-20JUL92

Key M

If a certain setting (e.g. fan speed for a crop version created by the operator or header width) is to be changed, select the corresponding function and press key (M). Now the setting can be changed, using the “arrow” keys. The new setting is saved by pressing key (M) once again.



ZX002515 -UN-27APR95

ZX 002515

ZX,OMXZCO001850-19-20JUL92

AREA COUNTER

Requirements:

• Starter switch in position (I) or (II).
• Infotrak monitor correctly programmed
• The area counter “ON” switch must be set for relevant crop (see “Feeder House” Section), and the header must be at its operating height. (The display gives a reading even without these preconditions being met).

Setting Instructions

Display (A) of area counter always lights up when unit is switched on.

Area Counter:

• Area-per-day values can only be cleared, but not changed.

• Total area values can neither be cleared nor changed.

• The smallest area per day that can be displayed is 0.001 hectare or 0.001 acre.

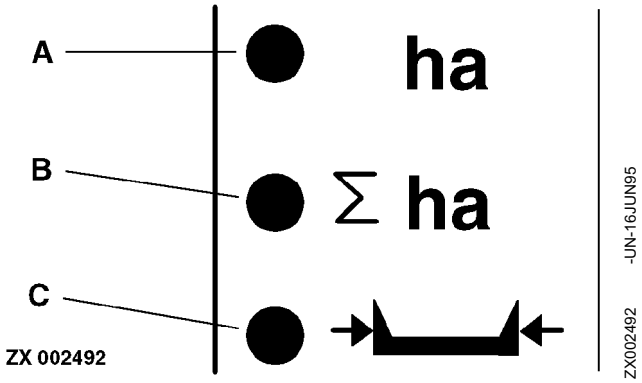
• The smallest total area that can be displayed is 0.1 hectare or 0.1 acre.

Header Width:

• The smallest setting increment for header width is 0.1 m or 0.5 ft.

When full width of header is not used during operation, partial width may be set in 1/4 increments. Header width will return to the previously saved value if header moves out of range of header height gauge.

NOTE: The displayed measurement units for width and area are determined by infotrak monitor programming (see this Section).



A—Area-per-day function light
B—Total area function light
C—Header width function light

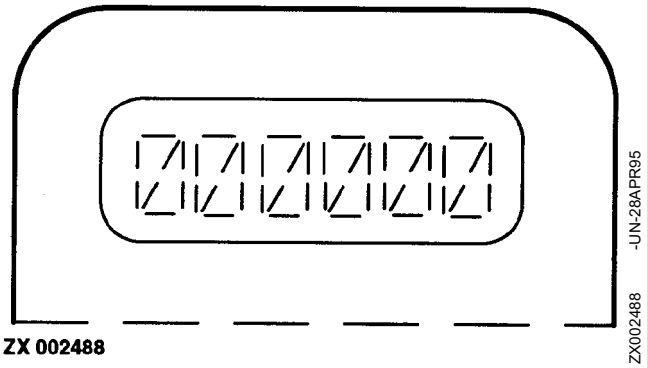
ZX,OMXZCO001845-19-01NOV96

DISPLAY

With ignition turned on, the following data are displayed:

- Preloaded settings for various crops
- Area counter data (area, total area, header width)
- Preloaded crops (9), crops created by the operator (14)
- Languages available:

German	DEUTSC
French	FRANCA
Spanish	ESPANI
Italian	ITALIA
Dutch	NEDERL
Danish	DANSK
Swedish	SVENSK
English	ENGLIS



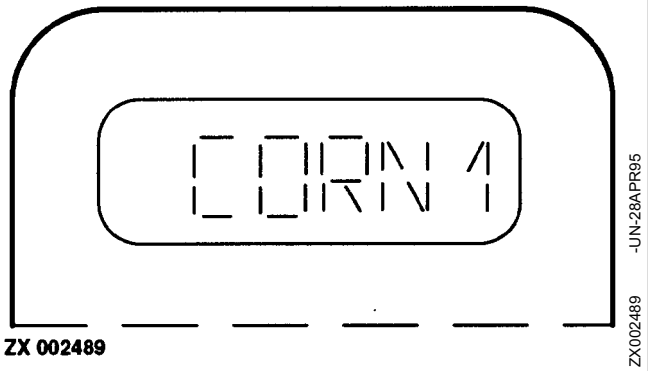
ZX 002488

ZX,OMXZCO001842-19-20JUL92

Factory-Loaded Crops

- Barley
- Corn
- Beans
- Peas
- Wheat
- Rye
- Sunflowers
- Oats
- Rape

NOTE: The names of the factory-loaded (permanent memory) crops end with a number 1.



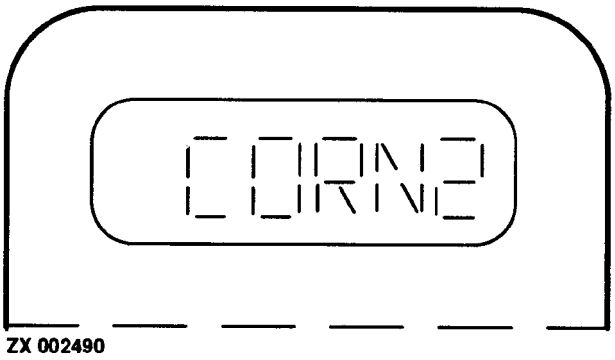
ZX 002489

ZX,OMXZCO001843-19-20JUL92

Crop Codes Created by the Operator

For each of the previously mentioned crops (all of which are entered into the memory at the factory), the operator may enter one modified crop into the data center memory, including all necessary settings according to harvesting conditions. The names of these crop versions, created by the operator, end with a number 2.

NOTE: The crops entered into data center memory by the operator may be recorded on the bottom of right-hand armrest.

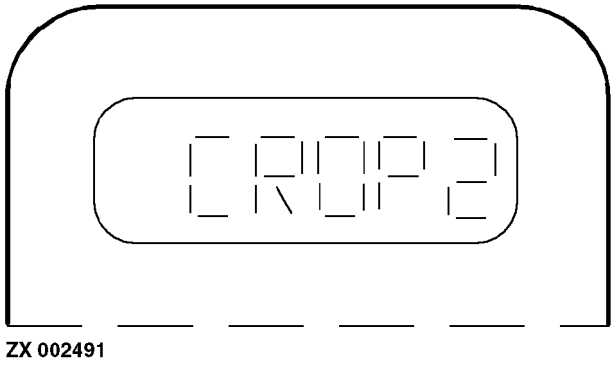


ZX,OMXZCO001844-19-13NOV92

Special Crops

The operator may enter five additional special crops into the data center memory. These crops are named CROP1 — CROP5.

NOTE: The crops entered into data center memory by the operator may be recorded on the bottom of right-hand armrest.



ZX,OMXZCO001910-19-01MAR95

SETTING UNIT

Requirements:

To start automatic setting of functions (A, B and C):
• Engine must be running (throttle lever pushed all the way forward)
• Separator must be engaged
• Switch for automatic machine adjustments must be ON

Setting Instructions

Values of functions (A—F) for the previously selected crop are displayed and may be changed as follows:

Function	Increments	Setting range
A	10 rpm	150—1150 rpm
B	10 rpm	600—1750 rpm
C	1 mm *	4—52 mm
D	1 mm (1/16 in.)	0—25 mm (0—1 in.)
E	1 mm (1/16 in.)	0—20 mm (0—1-1/4 in.)
F	1 mm (1/16 in.)	0—20 mm (0—1-1/4 in.)

NOTE: Concave spacing (*) is displayed in millimetres only. The figures in brackets are displayed in machine code 03.

Values of functions (A—F) for crops ending with a number “1” (e.g. “CORN1”) are factory loaded (permanent memory) and cannot be changed.

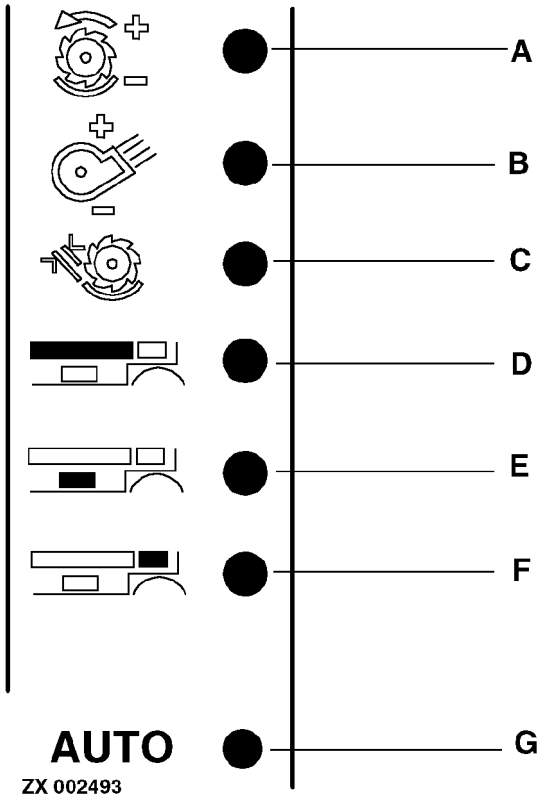
Values of functions (A—F) for crops ending with a number “2” (e.g. “CORN2”) may be cleared or changed.

Values of functions (A—F) for “CROP1” to “CROP5” may also be cleared or changed.

Functions (A—C) are set automatically by pressing the “AUTO” key (if the above requirements are met).

Values of functions (D—F) are only displayed. Setting must be carried out manually.

Lights (A—C) and (G) will glow during automatic setting procedure.



A—Cylinder speed function light
B—Fan speed function light
C—Concave spacing function light
D—Chaffer function light
E—Sieve function light
F—Chaffer extension function light
G—Automatic function light

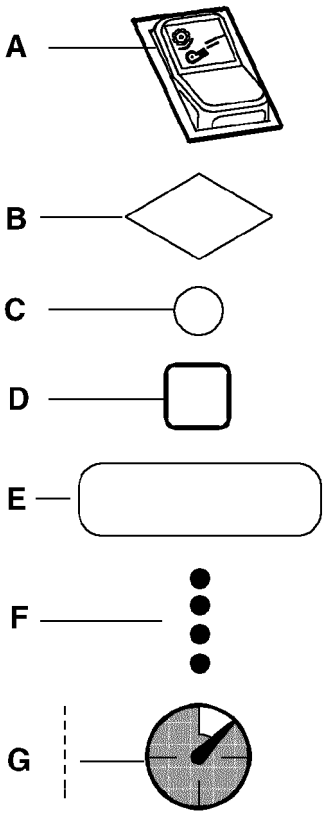
ZX,OMXZCO001846-19-02MAY96

OPERATIONAL DIAGRAMS

Explanation of Symbols:

A—Switch on automatic machine adjustments
B—Shows the combine data center unit to be selected:
- **X-Area counter**
- **Y-Display**
- **Z-Setting unit**

C—Shows individual functions of area counter/setting unit (blue light)
D—Shows the key to be pressed (bold enclosure)
E—Display information
F—Shows possible choices
G—Shows time required for individual procedure



ZX,OMXZCO001853-19-21JUL92

SELECTING COMBINE DATA CENTER UNITS

• Turn starter switch to position (I).

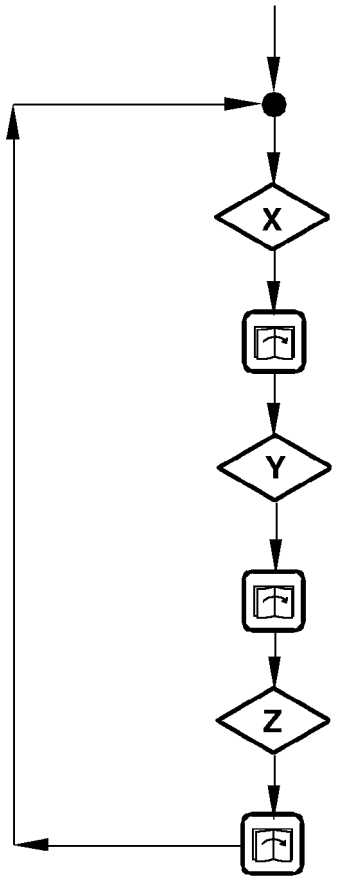
Combine data center will switch to area counter (X).

• Press “PAGE” key.

Combine data center will switch to display (Y).

• Press “PAGE” key.

Combine data center will switch to setting unit (Z).



ZX 002328

ZX002328 -UN-16JUN95

ZX,OMXZCO001854-19-21JUL92

SELECTING AREA COUNTER FUNCTIONS

• Select “Area Counter” unit.

Light of “Area” function will glow.

The harvesting area (for each day) is displayed.

• Press “Down” key.

Light of “Total Area” function will glow.

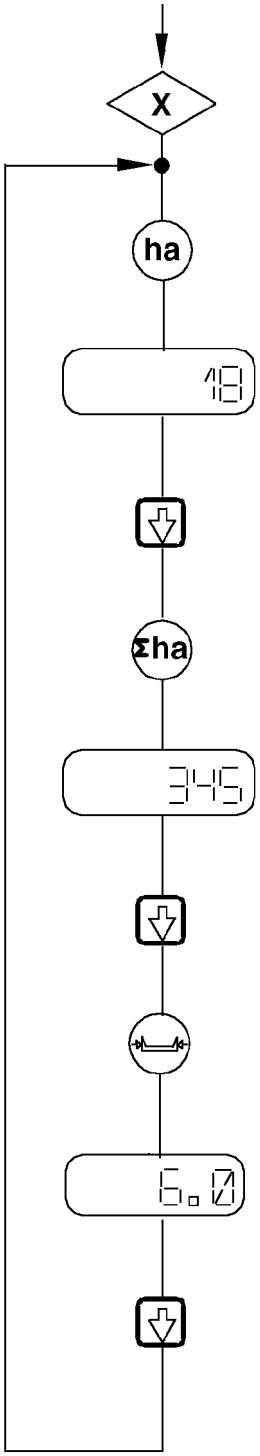
The total harvesting area is displayed.

• Press “Down” key.

Light of “Header Width” function will glow.

Header width (cutting width) is displayed.

NOTE: Running through the various crop displays or setting unit functions is done in a similar way as described above.



ZX 002519

ZX002519 -UN-16JUN95

ZX,OMXZCO001983-19-21JUL92

CLEARING “AREA” DISPLAY

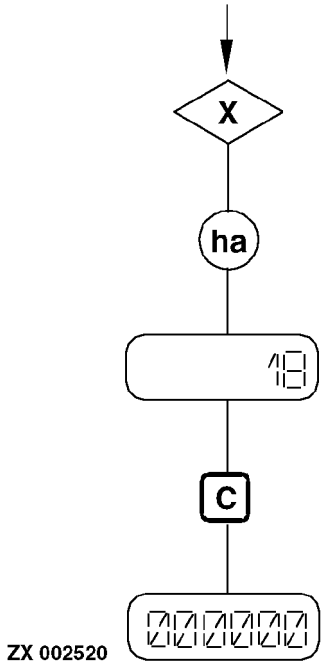
• Select “Area Counter” unit.

• Select “Area” function.

The harvesting area for the day will be displayed.

• Press key (C) (“Clear”).

Display will change to “zero”.



ZX 002520

-UN-16JUN95

ZX002520

ZX,OMXZCO001855-19-21JUL92

CHANGING HEADER WIDTH

• Select “Area Counter” unit.

• Select “Header Width” function.

The current header width (cutting width) will be displayed.

• Press “Modify” key (M).

An “M” will appear at the left of the display.

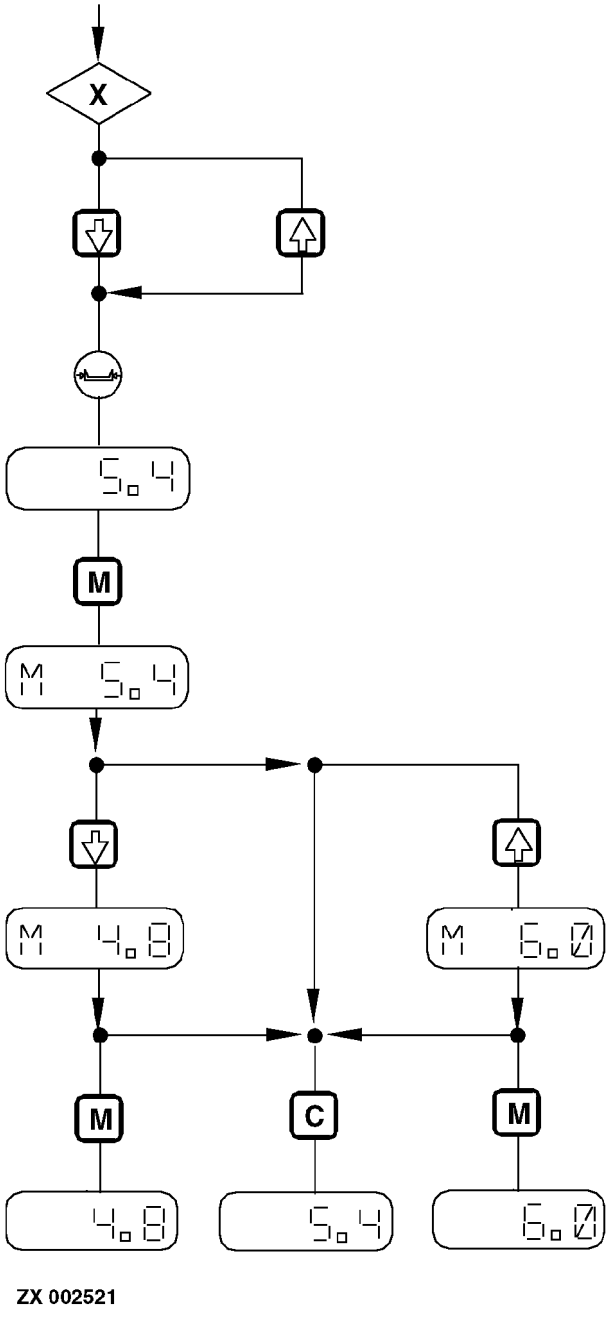
• Press “Up” or “Down” key.

The changed header width will be displayed.

• Press key (M) again.

The displayed setting is saved; the “M” at the left of the display will disappear.

NOTE: After pressing the “M” key, it is always possible to interrupt the setting of the new header width by pressing “Cancel” key (C). The previous header width will be displayed once again.



ZX 002521

ZX,OMXZCO001984-19-21JUL92

SETTING PARTIAL HEADER WIDTH

• Select “Area Counter” unit.

• Select “Header Width” function.

The current header width will be displayed.

• Press “Calibrate” key (C).

“3/4” will be displayed = 3/4 of the previous header width (cutting width).

• Press “Calibrate” key (C).

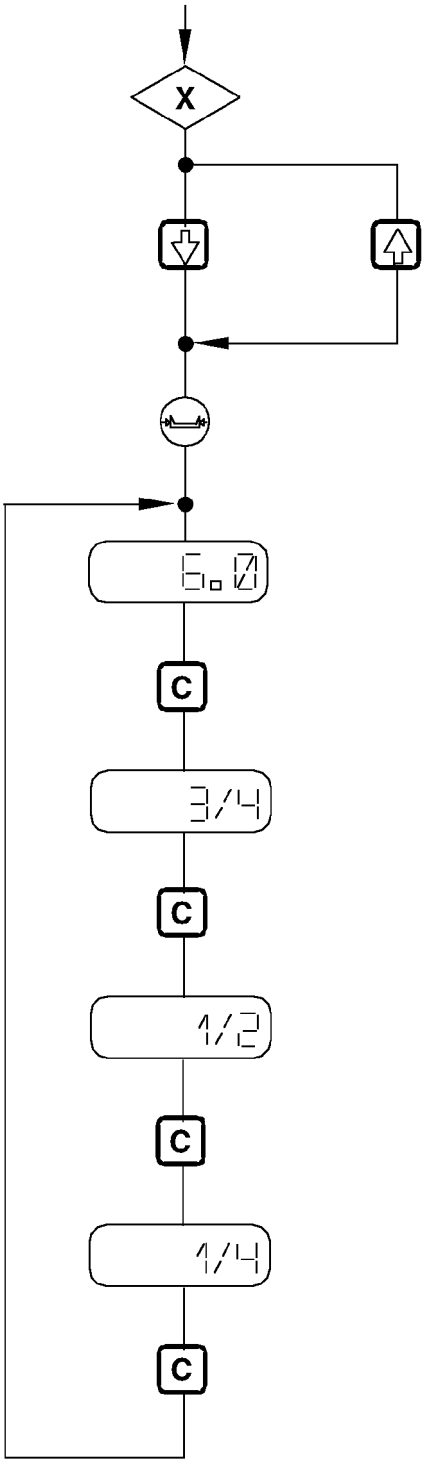
“1/2” will be displayed = 1/2 of the previous header width (cutting width).

• Press “Calibrate” key (C).

“1/4” will be displayed = 1/4 of the previous header width (cutting width).

• Press “Calibrate” key (C).

The cutting width saved previously will be displayed.



ZX 002522

ZX002522 -UN-16JUN95

ZX,OMXZCO001856-19-21JUL92

SELECTING LANGUAGE

• Press “Page” key while turning starter switch to position (I).

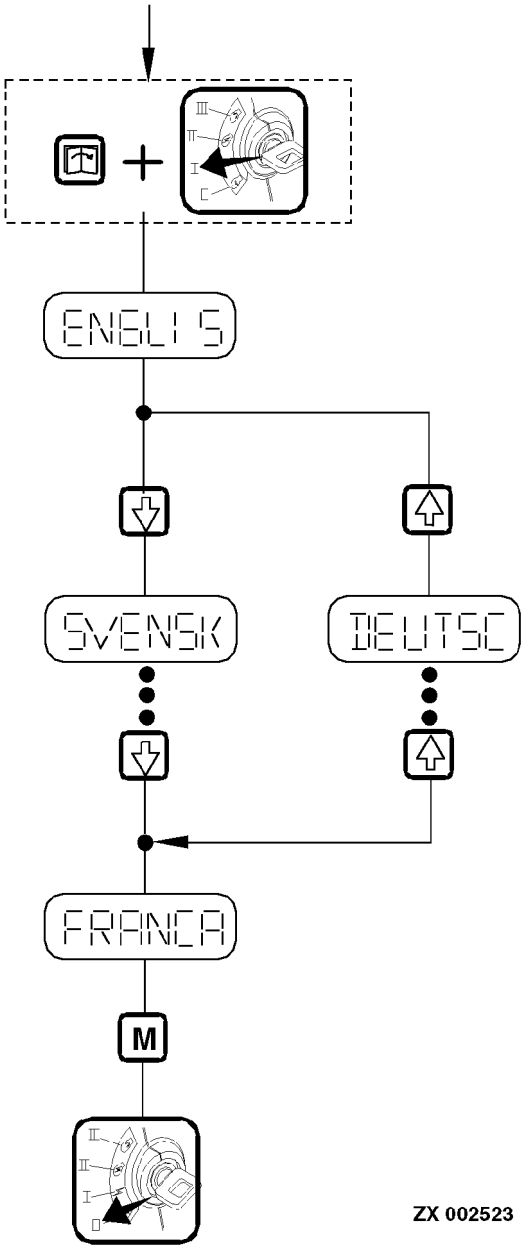
The language saved previously will be displayed.

• Press “Up” or “Down” key until desired language is displayed.

• Press “Memory” key (M).

• Turn starter switch to position (0).

The desired language is saved.



ZX,OMXZCO001857-19-21JUL92

SELECTING CROP

NOTE: This procedure is required to start automatic settings and to change to a different crop.

• Select “Display” unit.

The crop selected previously will be displayed.

• Press “Up” or “Down” key until desired crop is displayed.

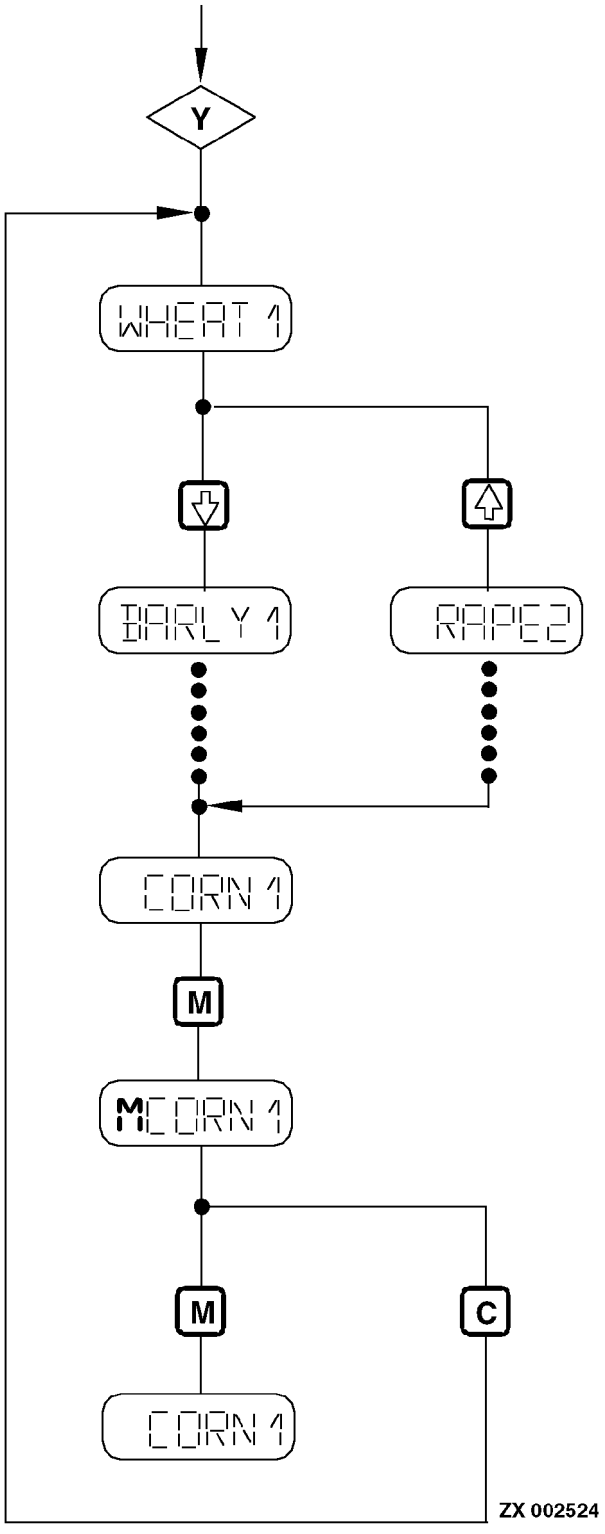
• Press “Modify” key (M).

A flashing “M” will appear at the left of the display.

• Press key (M) again.

The selected crop is saved; the “M” at the left of the display will disappear.

NOTE: After pressing the “M” key, it is possible to interrupt crop selecting procedure by pressing “Cancel” key (C).



ZX,OMXZCO001985-19-21JUL92

AUTOMATIC MACHINE SETTING ACCORDING TO CROP SELECTED

• Separator must be engaged.

• Switch on function “Automatic Machine Adjustments”.

• Select “Display” unit.

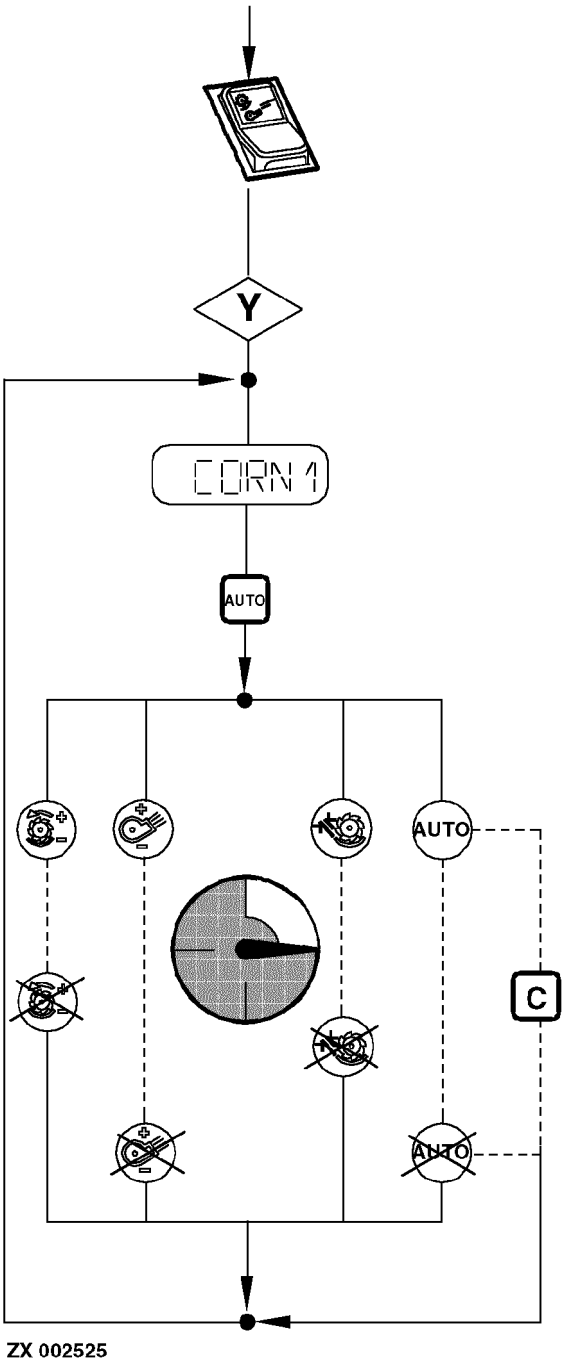
The selected crop will be displayed.

• Press “AUTO” key.

Lights of functions
— Cylinder speed
— Fan speed
— Concave spacing and
— Automatic operation (“AUTO”)
will glow until the corresponing setting is completed.

After setting procedure for all functions is completed, the “AUTO” light will go out.

NOTE: It is possible to interrupt setting procedure by pressing “Cancel” key (C).



ZX,OMXZCO001960-19-21JUL92

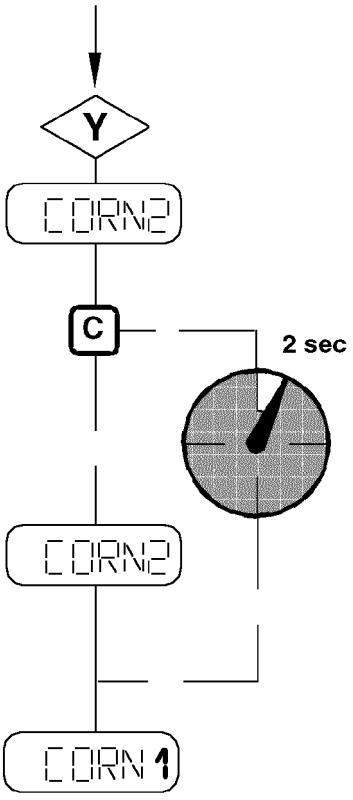
CLEARING CROPS CREATED BY THE OPERATOR

• Select “Display” unit.

• Select crop to be cleared (ending with a number “2” or named “CROP1”—“CROP5”).

• Press “Clear” key (C) for 2 seconds.

Display will change to crop version ending with a number “1”.



ZX,OMXZCO001986-19-01MAR95

READING SETTINGS FOR SELECTED CROP

• Select “Display” unit.

The previously selected crop will be displayed.

• Select “Setting Unit” function.

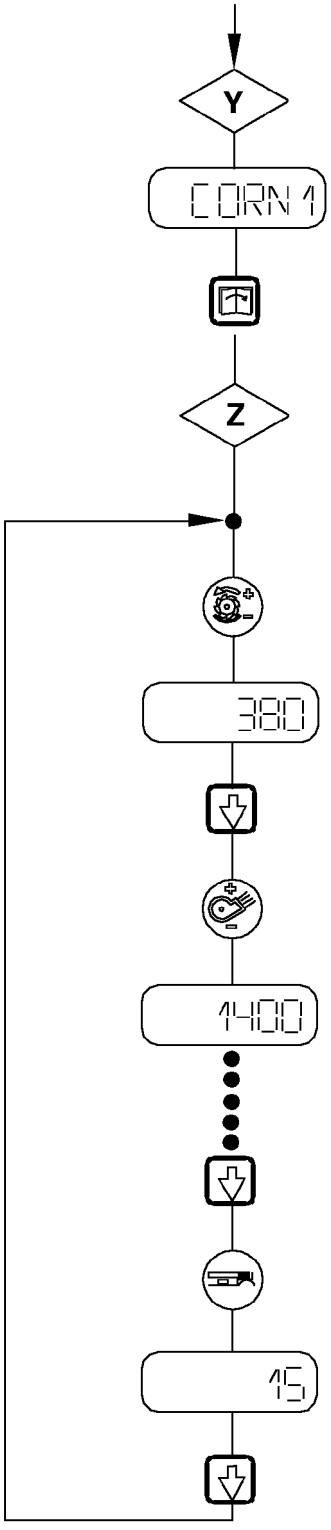
• Select “Cylinder Speed” function.

The cylinder speed for the selected crop is displayed.

• Select “Fan Speed” function.

The fan speed for the selected crop is displayed.

NOTE: The remaining settings may be displayed in the same way.



-UN-16JUN95
ZX002527

ZX,OMXZCO001858-19-21JUL92

CHANGING CROP SETTINGS

(Crops Created by the Operator)

• Select “Display” unit.

The previously selected crop will be displayed.

• Select “Setting Unit” function.

• Select “Cylinder Speed” function.

The cylinder speed for the selected crop is displayed.

• Press “Modify” key (M).

An “M” will appear at the left of the display.

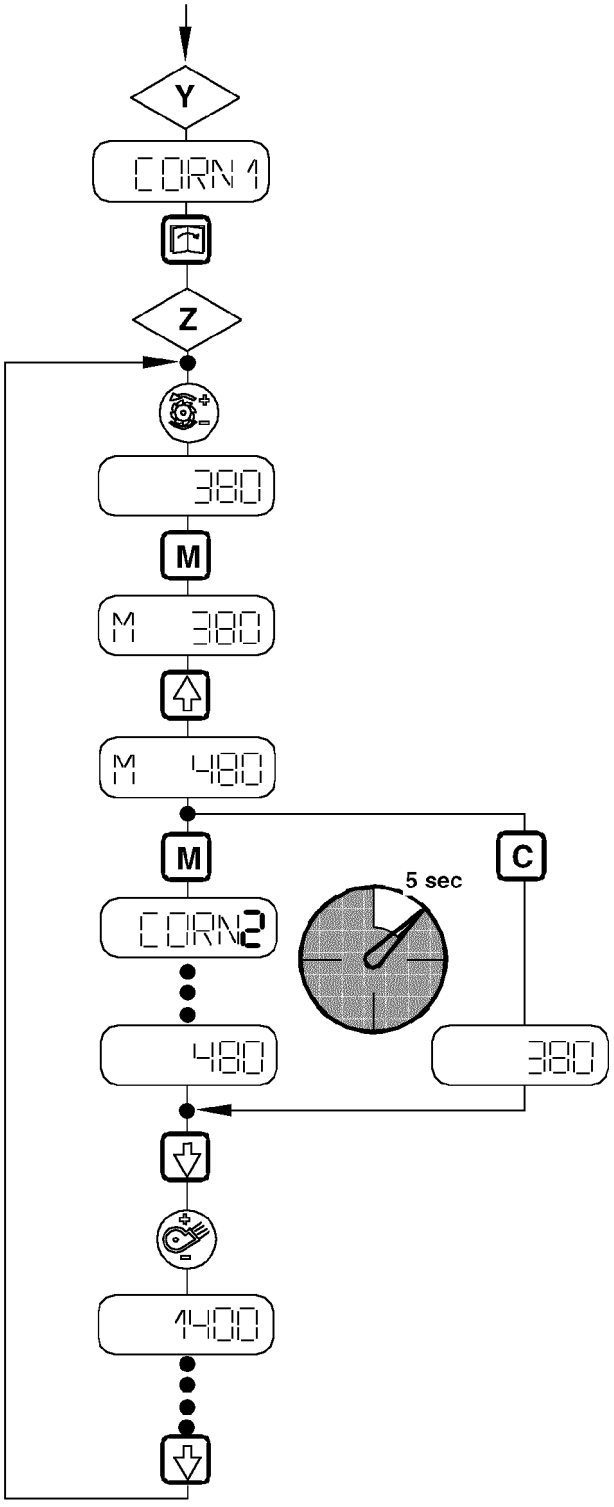
• Press “Up” or “Down” key until desired display appears.

NOTE: At this time it is possible to interrupt changing procedure by pressing “Cancel” key (C).

• Press key (M) again.

The crop created by the operator is saved (indicated by a “2” behind the crop name); the “M” at the left of the display will disappear.

NOTE: The values for the remaining functions are changed in the same way.



ZX,OMXZCO001987-19-21JUL92

INDIVIDUAL SETTING OF CHANGED VALUES (AUTOMATIC SETTING)

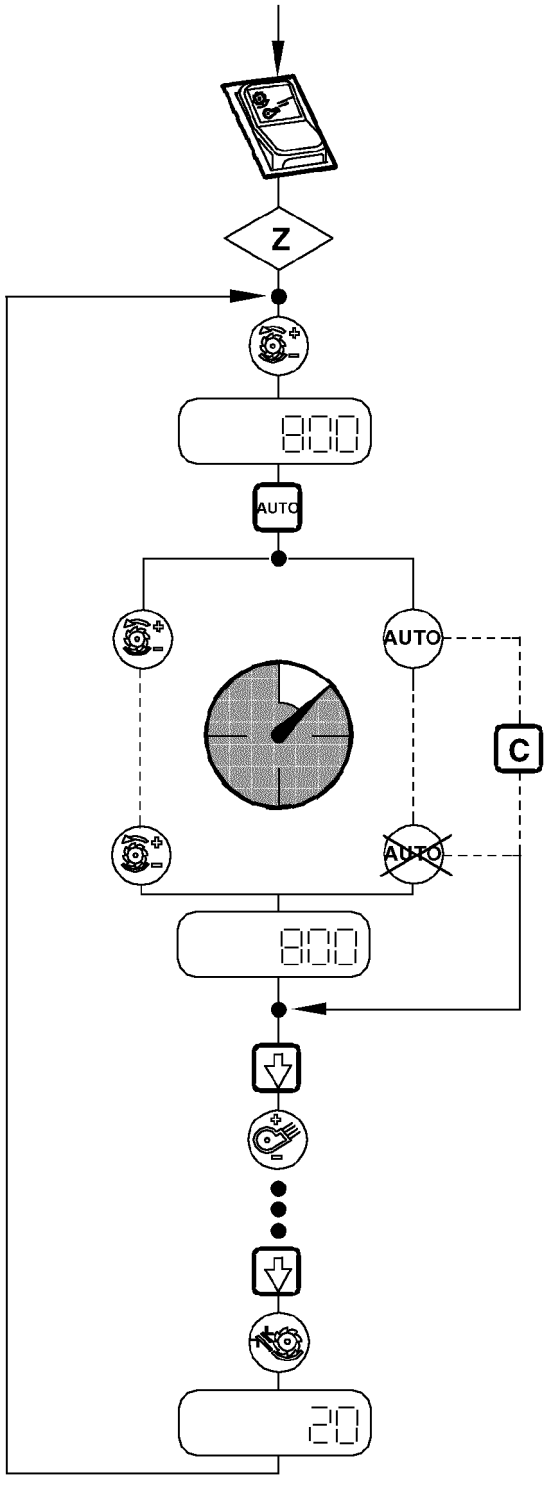
- Separator must be engaged.
- Switch on function “Automatic Machine Adjustments”.
- Select “Setting Unit” function.
- Select “Cylinder Speed” function.

The corresponding value is displayed.

- Press “AUTO” key.

The light of the selected function and the “AUTO” light will glow during automatic setting procedure.

NOTE: It is possible to interrupt setting procedure by pressing “Cancel” key (C).



ZX 002529

ZX002529 -UN-16JUN95

ZX,OMXZCO001859-19-21JUL92

THEORY OF OPERATION

Manual adjustments of cylinder speed, fan speed and concave spacing are identical with the procedures described in Group 240-15Z.

These adjustments may be performed automatically by means of the combine data center.

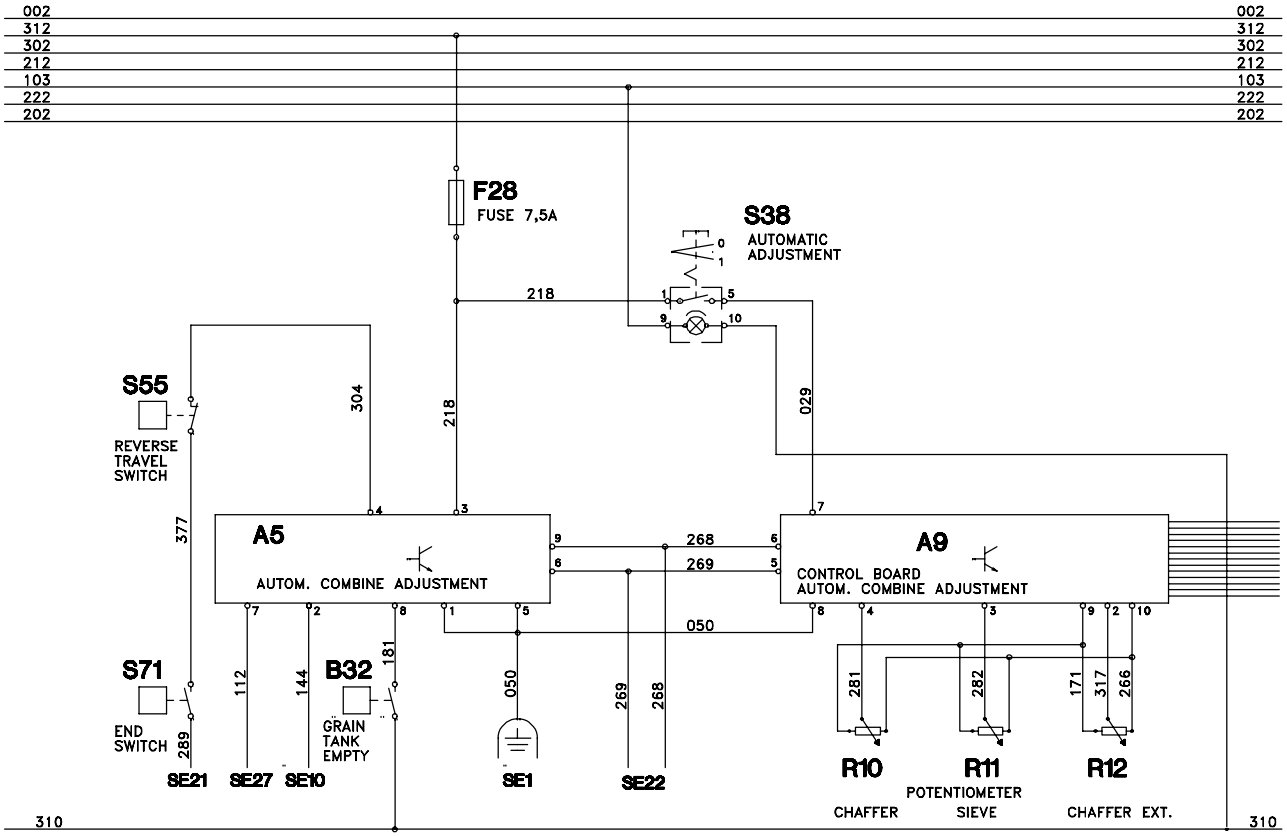
The relays on the relay board are activated by control board (A9) via connecting wires. Control board (A9) and combine data center (A5) are connected to the Infotrak monitor via data transfer wires (268) and (269).

Wire 038 transmits the signal from the header height sending unit to the combine data center. Wire 304 transmits a signal from switch (S55) during reverse travel to switch off the area counter.

NOTE: The infotrak monitor displays error codes in case of combine data center malfunctions.

ZX,TMXZCO003188-19-17JAN94

FUNCTIONAL SCHEMATIC, SECTION 25B - PART 1



SE25B
CYLINDER ;CONCAVE ; FAN ADJUSTMENT —PART 1

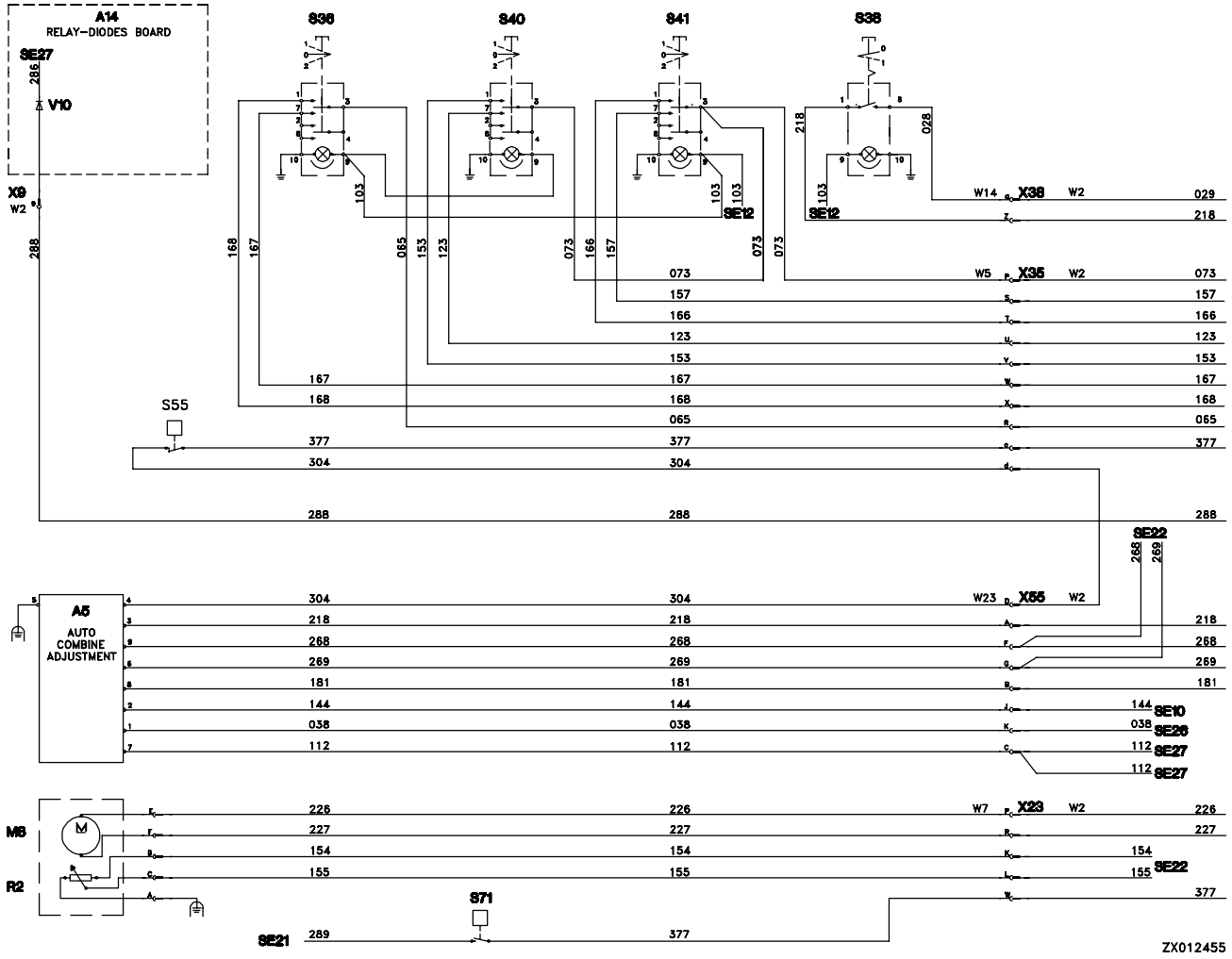
ZX012442

FUNCTIONAL SCHEMATIC, SECTION 25B - PART 1

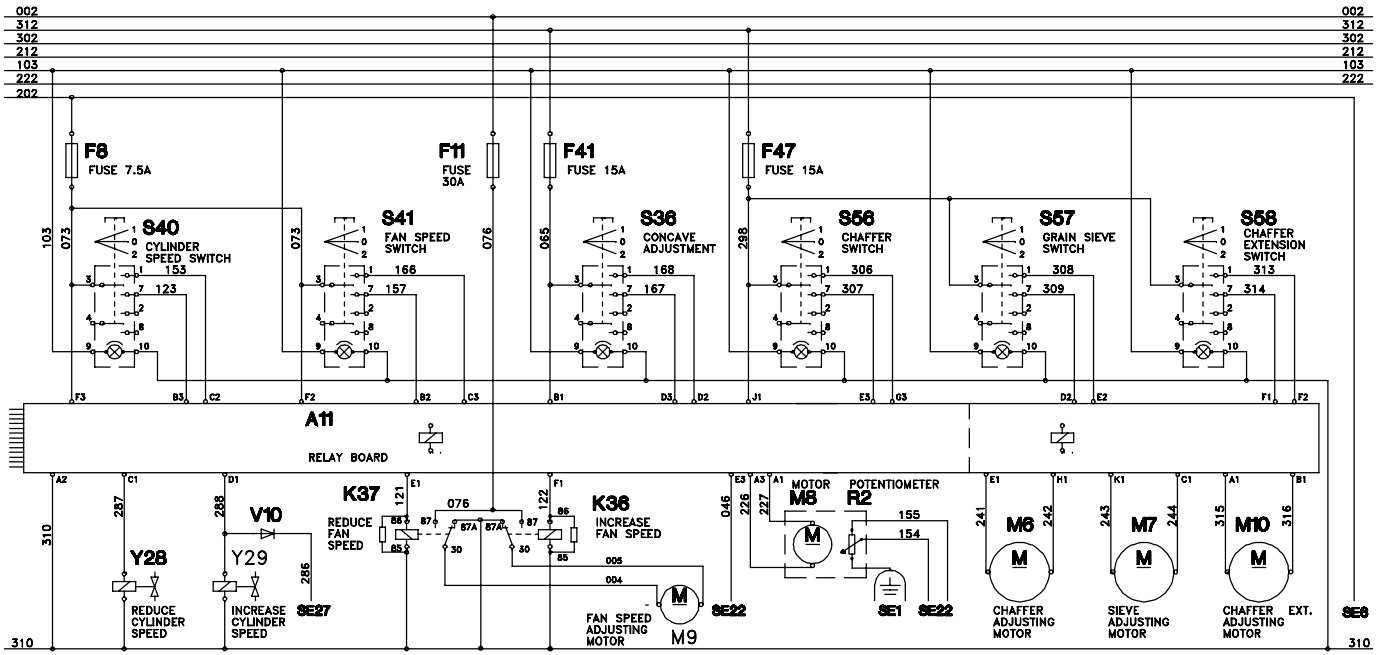
A5 — Combine data center
A9 — Control board, combine data center
A11 — Relay board, combine data center
A14 — Relay and diode board
A15 — Fuse board
B32 — Sending unit, empty grain tank
F8 — Fuse, 7.5 amps.
F11 — Fuse, 30 amps.
F28 — Fuse, 7.5 amps.
F41 — Fuse, 15 amps.
K36 — Relay, adjust fan speed
K37 — Relay, adjust fan speed
M8 — Concave adjusting motor
M9 — Fan speed adjusting motor
R2 — Potentiometer, concave adjustment
R10 — Potentiometer, chaffer
R11 — Potentiometer, sieve
R12 — Potentiometer, sieve extension
S38 — Switch, combine data center
S55 — Reverse travel switch
S71 — Height cut-off switch
V10 — Diode
X9 — Connection, cab harness (W2) to relay and diode board
X17 — Connection, main distribution harness (W1) to fuse board
X23 — Disconnect point, cab harness (W2), front basic harness (W7)
X24 — Connection, rear basic harness (W9) to solenoid valve block
X25 — Disconnect point, distribution harness (W1), cab harness (W2)
X26 — Disconnect point, distribution harness (W1), cab harness (W2)
X27 — Disconnect point, distribution harness (W1), cab harness (W2)
X28 — Disconnect point, distribution harness (W1), cab harness (W2)
X35 — Disconnect point, cab harness (W2), armrest harness (W5)
X38 — Disconnect point, cab harness (W2), optional harness (W14)
X39 — Connection, distribution harness (W1) to data center relay board
X42 — Connection, distribution harness (W1) to data center control board
X44 — Disconnect point, cab harness (W2), rear basic harness (W9)
X45 — Disconnect point, cab harness (W2), rear basic harness (W9)
X55 — Disconnect point, cab harness (W2), data center harness (W23)
X79 — Splice
X118— Connection, distribution harness (W1) to fuse board

ZX,TM4543010322-19-30JUN97

DIAGNOSTIC SCHEMATIC, SECTION 25B - PART 1



DIAGNOSTIC SCHEMATIC, SECTION 25B - PART 2



SE25B
CYLINDER , CONCAVE , FAN ADJUSTMENT —PART 2

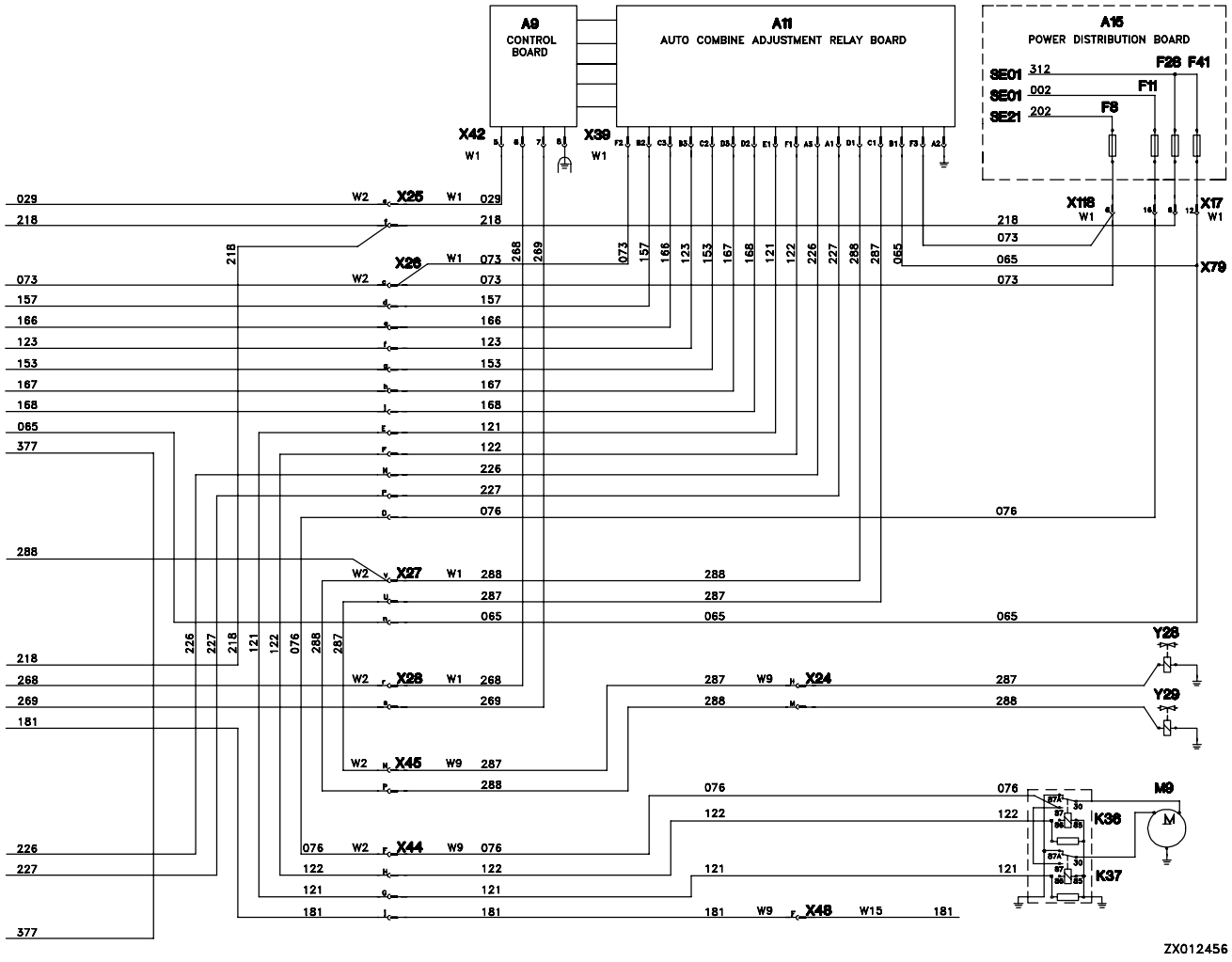
ZX012443

FUNCTIONAL SCHEMATIC, SECTION 25B - PART 2

A5 — Combine data center
A9 — Control board, combine data center
A11 — Relay board, combine data center
A14 — Relay and diode board
A15 — Fuse board
F8 — Fuse, 7.5 amps.
F11 — Fuse, 30 amps. (fan adjustment)
F28 — Fuse, 7.5 amps. (ACA board)
F41 — Fuse, 15 amps. (concave adjusting motor)
F47 — Fuse, 15 amps. (sieve adjusting motor)
K36 — Relay, adjust fan speed
K37 — Relay, adjust fan speed
M6 — Chaffer adjusting motor
M7 — Sieve adjusting motor
M8 — Concave adjusting motor
M9 — Fan speed adjusting motor
M10 — Sieve extension motor
R2 — Potentiometer, concave adjustment
V10 — Diode
X9 — Connection, cab harness (W2) to relay and diode board
X17 — Connection, main distribution harness (W1) to fuse board
X23 — Disconnect point, cab harness (W2), front basic harness (W7)
X24 — Connection, rear basic harness (W9) to solenoid valve block
X25 — Disconnect point, distribution harness (W1), cab harness (W2)
X26 — Disconnect point, distribution harness (W1), cab harness (W2)
X27 — Disconnect point, distribution harness (W1), cab harness (W2)
X28 — Disconnect point, distribution harness (W1), cab harness (W2)
X35 — Disconnect point, cab harness (W2), armrest harness (W5)
X38 — Disconnect point, cab harness (W2), optional harness (W14)
X39 — Connection, distribution harness (W1) to data center relay board
X42 — Connection, distribution harness (W1) to data center control board
X44 — Disconnect point, cab harness (W2), rear basic harness (W9)
X45 — Disconnect point, cab harness (W2), rear basic harness (W9)
X55 — Disconnect point, cab harness (W2), data center harness (W23)
X79 — Splice
X118— Connection, distribution harness (W1) to fuse board
Y28 — Decrease cylinder speed
Y29 — Increase cylinder speed

ZX,TM4543010324-19-30JUN97

DIAGNOSTIC SCHEMATIC, SECTION 25B - PART 2



OPERATIONAL INFORMATION

All header settings such as header lift, reel lift and horizontal reel adjustment are carried out hydraulically and are controlled electrically.

The basic adjustment preset by the operator can be obtained automatically at any time by pressing a button.

NOTE: For safety reasons, header or reel can only be adjusted with engine running and road safety switch in "field" position.

ZX,TMXZCO003191-19-17JAN94

THEORY OF OPERATION

As switches (S27, S29 and S30) are not designed for high current draw, a relay is located in front of each hydraulic function solenoid of this Section.

All switches and header control (A6) are protected by fuse (F26).

Operating current for solenoids used for raising/lowering header is supplied via fuse (F33). Operating current for solenoids of reel functions and variable feeder house drive is supplied via fuse (F45).

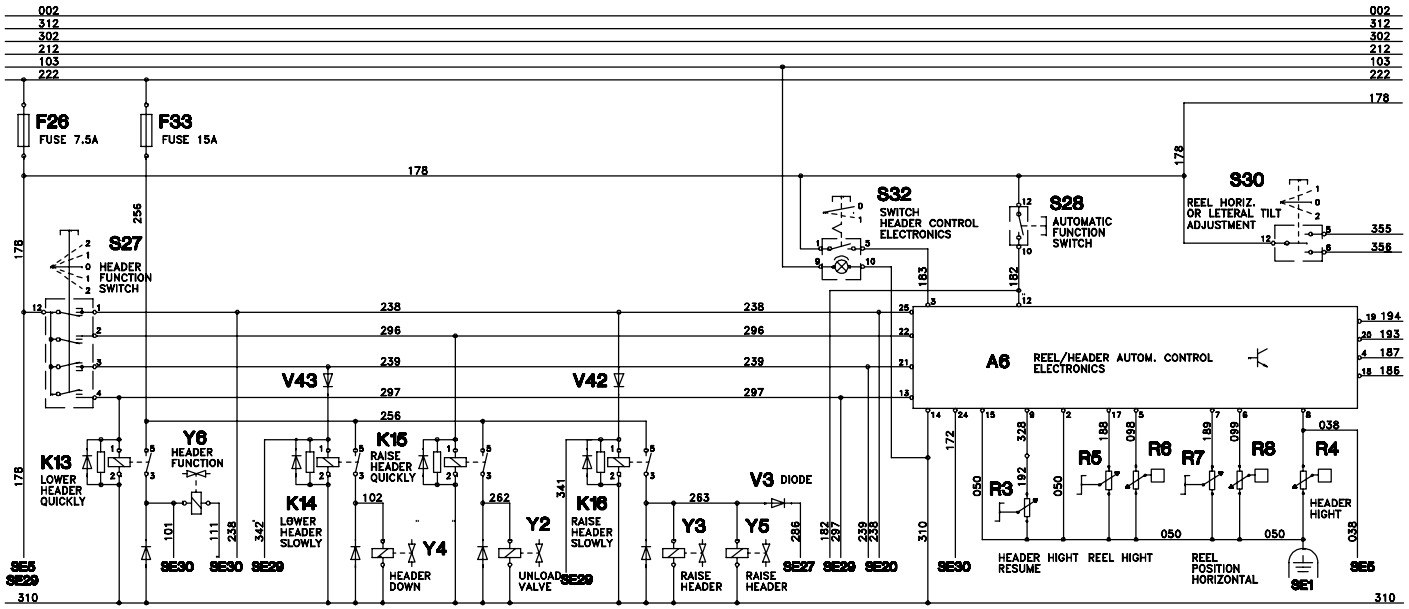
Depending on position of selector switch (S53), switch (S29) activates the solenoids for raising or lowering reel or the solenoids for increasing or decreasing header speed.

Potentiometers (R4,R6 and R8) indicate reel position (height and horizontal position) and header height (needed for electronic control). Potentiometers (R3, R5 and R7) in the switch console can be used to select desired settings. When actuating switch (S28), the header is automatically set according to the selected values.

NOTE: Manual control functions will override automatic control functions.

ZX,TMXZCO003192-19-17JAN94

FUNCTIONAL SCHEMATIC, SECTION 26 - PART 1



SE26

HEADER ADJUSTMENT (CUTTING HEIGHT; REEL; FLOAT) –PART 1

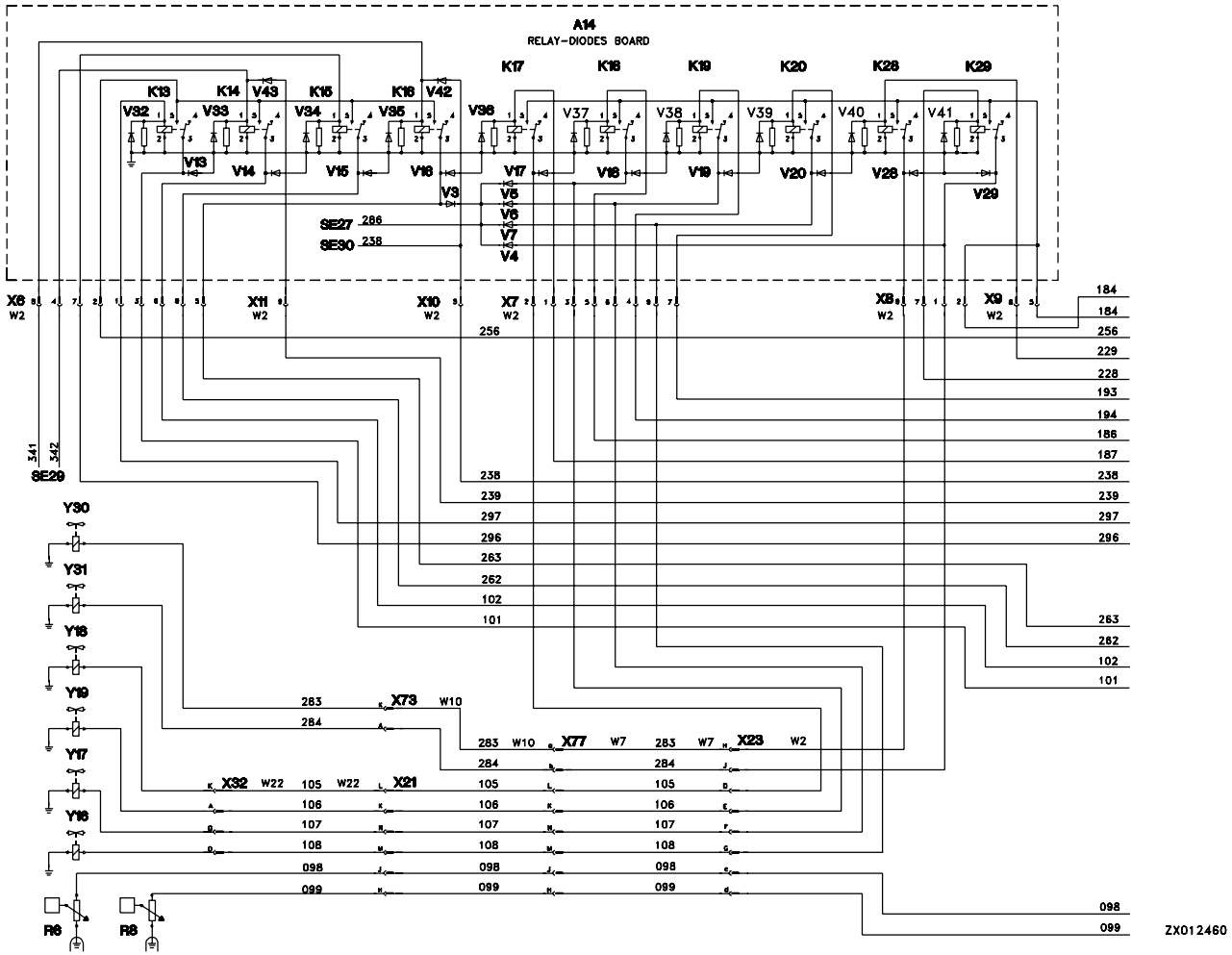
ZX012444

FUNCTIONAL SCHEMATIC, SECTION 26 - PART 1

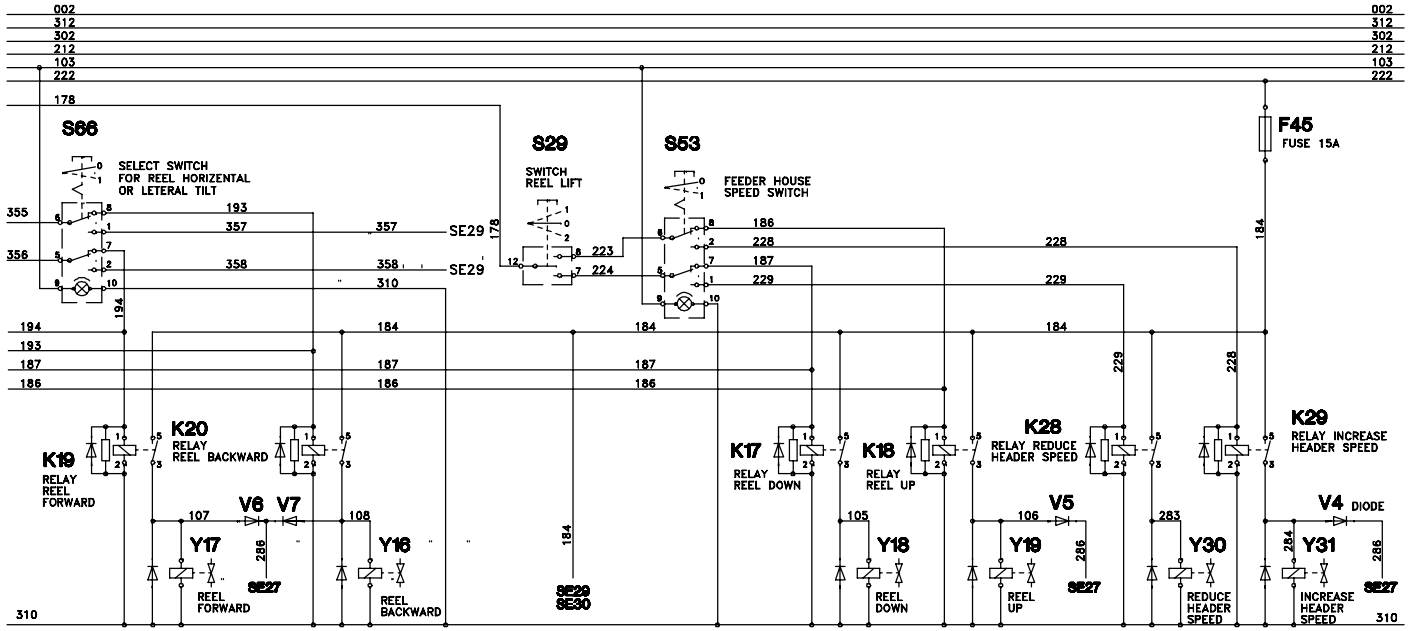
A6 —Automatic header control
A14 —Relay and diode board
F26 —Fuse, 7.5 amps.
F33 —Fuse, 15 amps.
F45 —Fuse, 15 amps.
K13 —Relay, lower header quickly
K14 —Relay, lower header slowly
K15 —Relay, raise header quickly
K16 —Relay. raise header slowly
K17 —Relay, lower reel
K18 —Relay, raise reel
K19 —Relay, move reel to the rear
K20 —Relay, move reel to the front
K28 —Relay, variable header drive (slow)
K29 —Relay, variable header drive (fast)
K40 —Relay, tilting header to the left
K41 —Relay, tilting header to the right
R3 —Potentiometer, header height resume
R4 —Sending unit, header height
R5 —Potentiometer, reel height
R6 —Sending unit, reel height
R7 —Potentiometer, reel position
R8 —Sending unit, reel position
S27 —Switch, raise/lower header
S28 —Automatic function switch
S29 —Switch, raise reel
S30 —Switch, reel horizontal adjustment
S32 —Switch, resume controls
S53 —Selector switch, raise reel/variable header drive
S66 —Selector switch, horizontal reel adjustment/header lateral tilt
X6 —Connection, relay board
X7 —Connection, relay board
X8 —Connection, relay board
X9 —Connection, relay board
X10 —Connection, relay board
X11 —Connection, relay board
X21 —37-terminal header plug
X23 —Disconnect point, cab
X32 —Plug for solenoid block
X73 —16-terminal hydraulic block plug
X77 —Feeder house plug
Y2 —Solenoid, header function
Y3 —Solenoid, header function
Y4 —Solenoid, header function
Y5 —Solenoid, header function
Y6 —Solenoid, header function
Y16 —Solenoid, move reel forward
Y17 —Solenoid, move reel back
Y18 —Solenoid, lower reel
Y19 —Solenoid, raise reel
Y30 —Solenoid, reduce feeder house speed
Y31 —Solenoid, increase feeder house speed

ZX,TM4543010328-19-30JUN97

DIAGNOSTIC SCHEMATIC, SECTION 26 - PART 1



FUNCTIONAL SCHEMATIC, SECTION 26 - PART 2



SE26
HEADER ADJUSTMENT (CUTTING HEIGHT; REEL; FLOAT) —PART 2

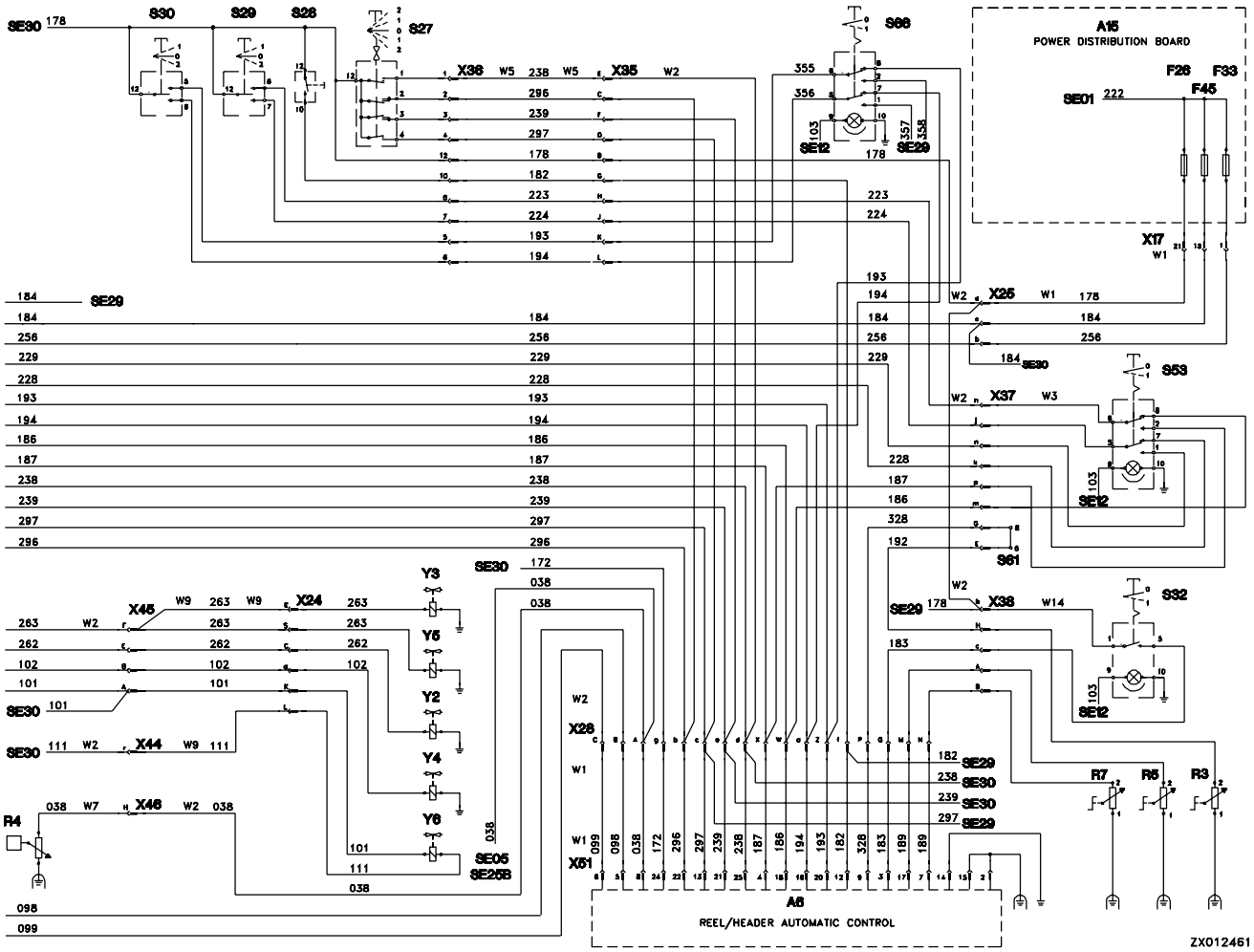
ZX012445

FUNCTIONAL SCHEMATIC, SECTION 26 - PART 2

A6 —Automatic header control
A15 —Fuse board
F26 —Fuse, 7.5 amps.
F33 —Fuse, 15 amps.
F45 —Fuse, 15 amps.
K13 —Relay, lower header quickly
K14 —Relay, lower header slowly
K15 —Relay, raise header quickly
K16 —Relay. raise header slowly
K17 —Relay, lower reel
K18 —Relay, raise reel
K19 —Relay, move reel to the rear
K20 —Relay, move reel to the front
K28 —Relay, variable header drive (slow)
K29 —Relay, variable header drive (fast)
R3 —Potentiometer, header height resume
R4 —Sending unit, header height
R5 —Potentiometer, reel height
R6 —Sending unit, reel height
R7 —Potentiometer, reel position
R8 —Sending unit, reel position
S27 —Switch, raise/lower header
S28 —Automatic function switch
S29 —Switch, raise reel
S30 —Switch, reel horizontal adjustment
S32 —Switch, resume controls
S53 —Selector switch, raise reel/variable header drive
S61 —ContourMaster switch
S66 —Selector switch, horizontal reel adjustment/header lateral tilt
X17 —21-term. plug, distribution board, l.h.
X24 —Plug, solenoids on hydraulic block
X25 —Plug 1, cab
X28 —Plug 4, cab
X35 —37-terminal armrest plug
X36 —Plug for forward/reverse lever
X37 —Plug 1, dashboard
X38 —Plug 2, dashboard
X44 —Plug, basic wiring harness, right
X45 —Plug, basic wiring harness, left
X46 —Plug for platform wiring harness
X51 —Plug for header control (electronics)
Y2 —Solenoid, header function
Y3 —Solenoid, header function
Y4 —Solenoid, header function
Y5 —Solenoid, header function
Y6 —Solenoid, header function

ZX,TM4543010330-19-30JUN97

DIAGNOSTIC SCHEMATIC, SECTION 26 - PART 2



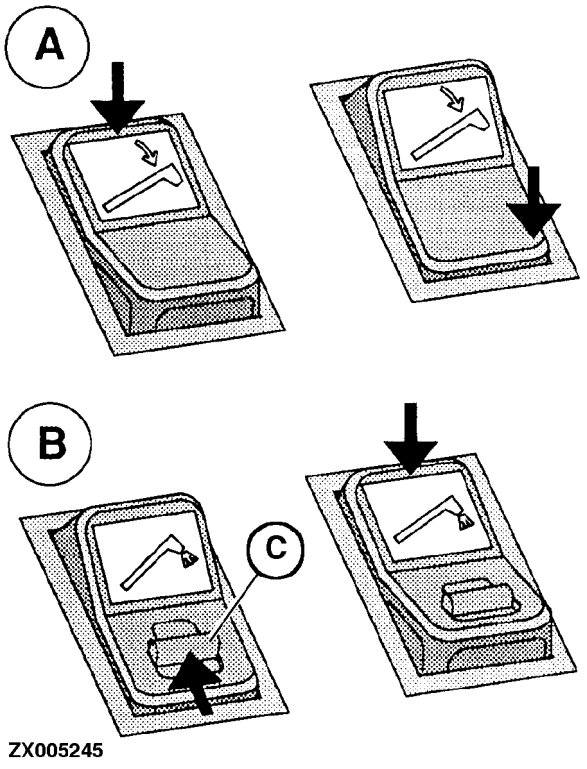
OPERATIONAL INFORMATION

Switch (A) is used to swing unloading auger in or out.

NOTE: A timer relay interrupts current supply to electromagnetic control valve after 22 seconds to prevent overheating of the hydraulic system.

Switch (B) is used to engage unloading auger drive. A switch lock is provided to avoid unintentional engagement of unloading auger drive.

A—Switch, swing unloading auger in or out
B—Unloading auger drive switch
C—Switch lock



ZX,TMXZCO003195-19-17JAN94

THEORY OF OPERATION

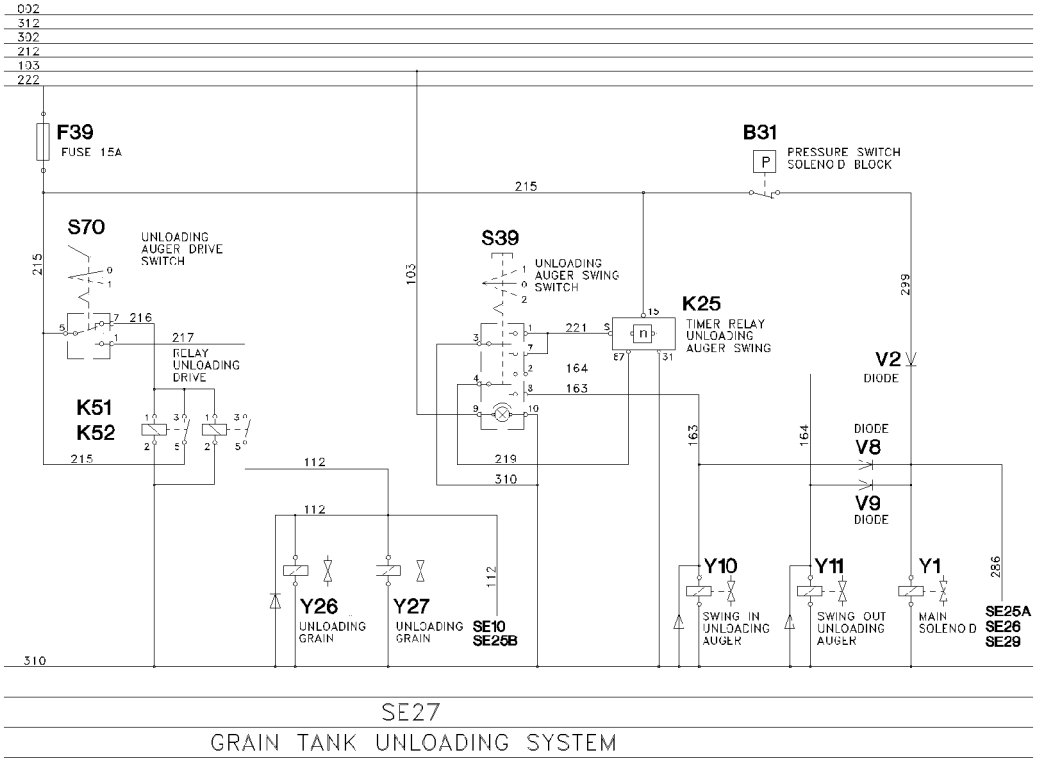
With road safety switch in “field” position and engine running, power is supplied to switches (S35) and (S39), pressure switch (B31) and timer relay (K25) via fuse (F39).

With switch (S35) in neutral position, relay (K24) is activated. When engaging unloading auger drive, relay (K24) is held in position. Solenoids (Y26) and (Y27) are activated. The pressure valve is activated by pressure switch (B31), depending on pressure.

When swinging unloading auger in or out, double contact switch (S39) connects terminal (S) of timer relay (K25) to ground. Thus terminal (87) of timer relay is supplied with power. The second contact of double contact switch (S39) activates the solenoid for swinging unloading auger in or out. The timer relay powers terminal (87) for 22 seconds.

ZX,TMXZCO003196-19-17JAN94

FUNCTIONAL SCHEMATIC OF SECTION 27



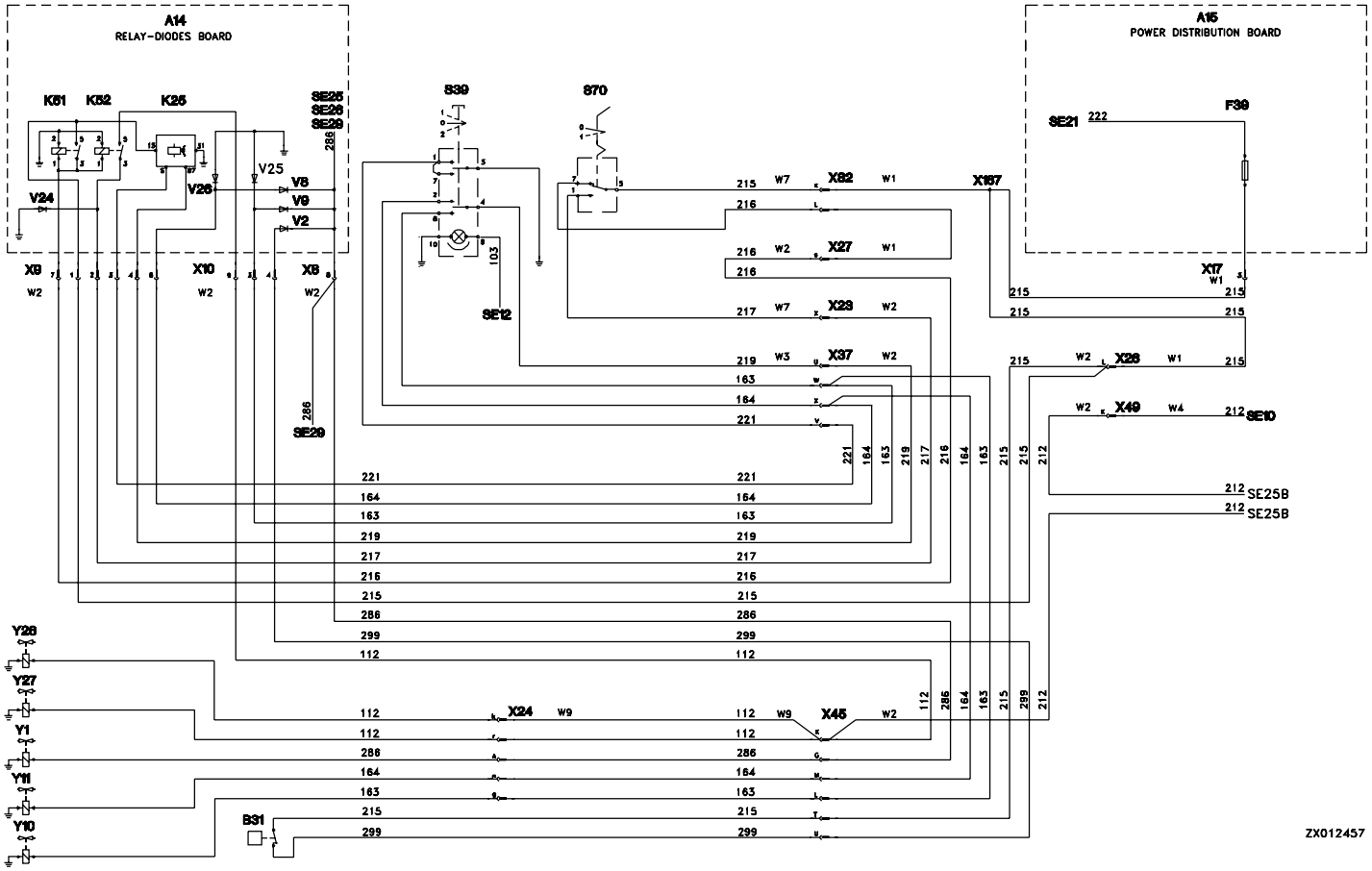
ZX,TM4543011336-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 27

A14 —Relay and diode board
A15 —Fuse board
B31 —Pressure switch, main clutch
F39 —Fuse, 15 amps.
K25 —Timer relay, unloading auger swing
K51 —Relay, unloading auger drive
K52 —Relay, unloading auger drive
S39 —Switch, unloading auger swing
S70 —Unloading auger drive switch
V2 —Diode
V8 —Diode
V9 —Diode
V24 —Diode
V25 —Diode
V26 —Diode
X8 —Connection, cab harness (W2) to relay and diode board
X9 —Connection, cab harness (W2) to relay and diode board
X10 —Connection, cab harness (W2) to relay and diode board
X17 —Connection, main distribution harness (W1) to fuse board
X23 —Disconnect point, cab
X24 —Connection, rear basic harness (W9) to solenoid valve block
X26 —Disconnect point, distribution harness (W1), cab harness (W2)
X27 —Plug 3, cab
X37 —Disconnect point, cab harness (W2), switch console harness (W3)
X45 —Disconnect point, cab harness (W2), rear basic harness (W9)
X49 —Disconnect point, cab harness (W2), corner post harness (W4)
X82 —Plug for ultrasonic sensors
X167—Switch 215
Y1 —Main valve, solenoid control block
Y10 —Solenoid, swing in unloading auger
Y11 —Solenoid, swing out unloading auger
Y26 —Solenoid, unloading grain tank
Y27 —Solenoid, unloading grain tank

ZX,TM4543010332-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 27

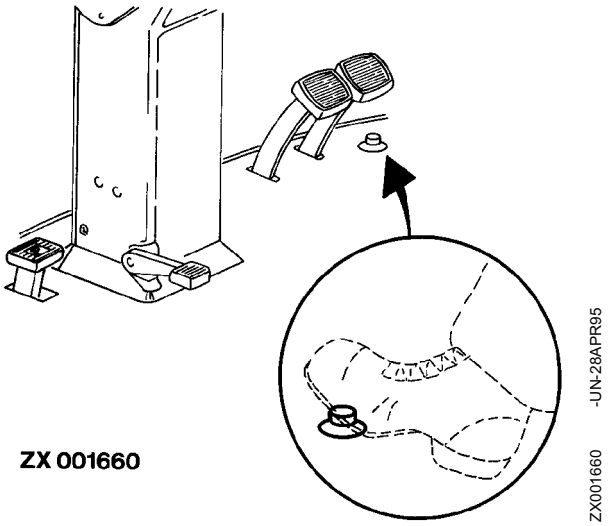


OPERATIONAL INFORMATION

With starter switch in position (II), hydraulic four-wheel drive may be engaged by means of switch (S44).

An indicator light shows that four-wheel drive is engaged.

Four-wheel drive may be selected only when the road safety switch is in the “field” position.



ZX,TM4543010333-19-30JUN97

THEORY OF OPERATION

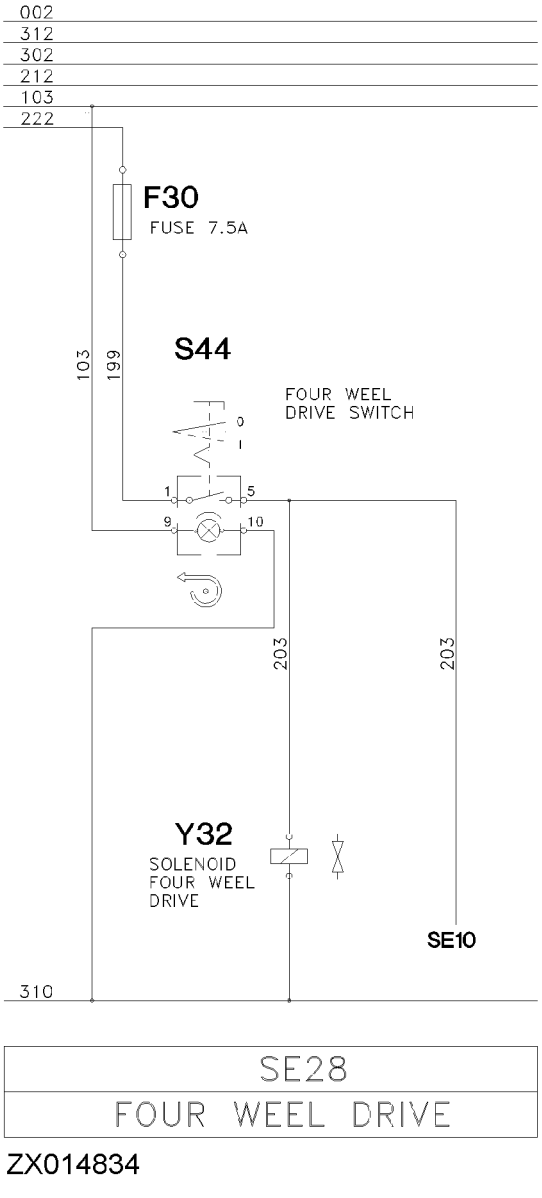
With starter switch in position (II), power is supplied to switch (S44) via fuse (F30).

When actuating switch (S44), solenoid (Y32) is activated and a certain amount of hydrostatic oil flow is directed to the rear axle.

At the same time an indicator light in Section 10 will glow.

ZX,TMXZCO003200-19-17JAN94

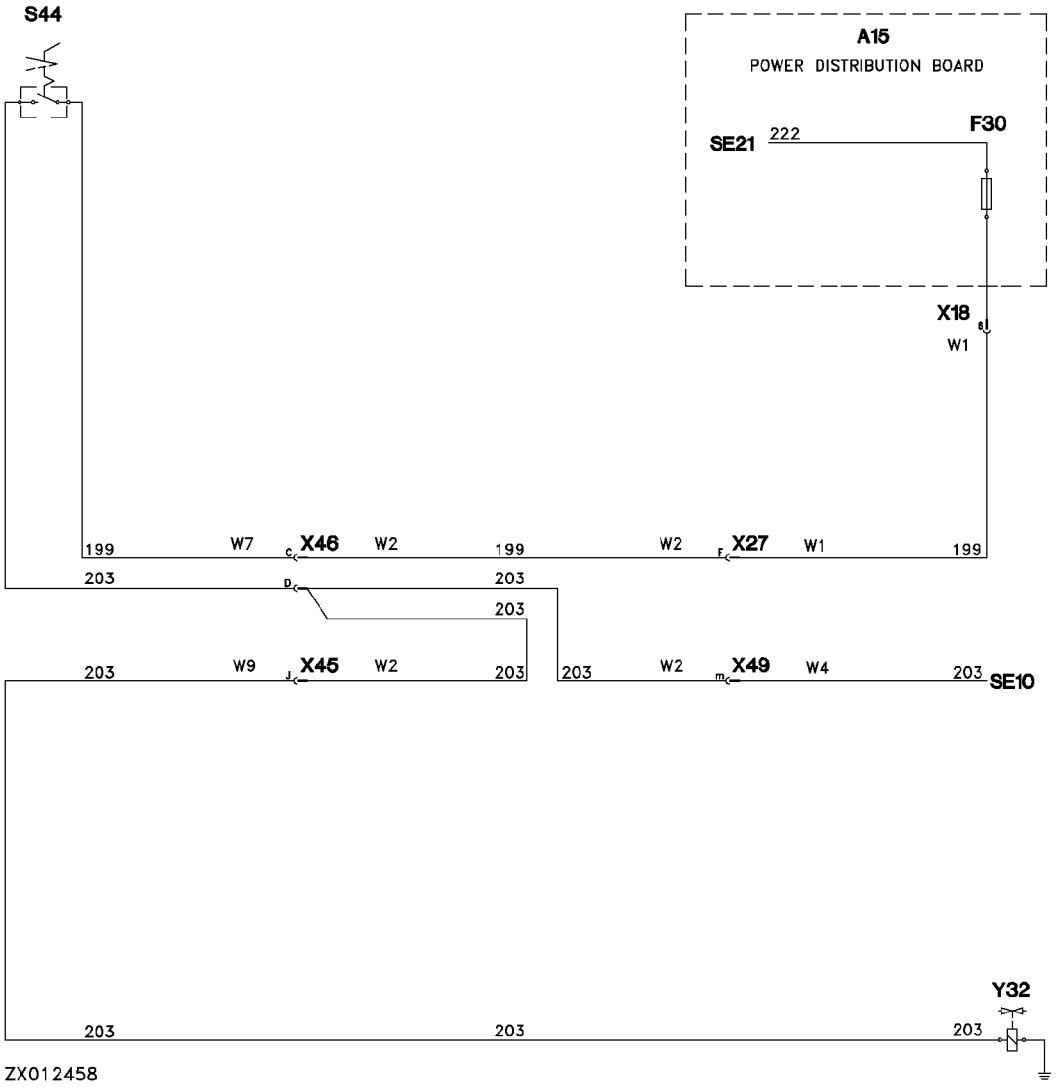
FUNCTIONAL SCHEMATIC OF SECTION 28



A15 —Fuse board
F30 —Fuse
S44 —Four-wheel drive switch
X18 —Connection, distribution harness (W1) to fuse board
X27 —Disconnect point, distribution harness (W1), cab harness (W2)
X37 —Disconnect point, cab harness (W2), switch console harness (W3)
X45 —Disconnect point, cab harness (W2), rear basic harness (W9)
X49 —Disconnect point, cab harness (W2), corner post harness (W4)
Y32 —Four-wheel drive solenoid

ZX,TMXZCO003201-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 28

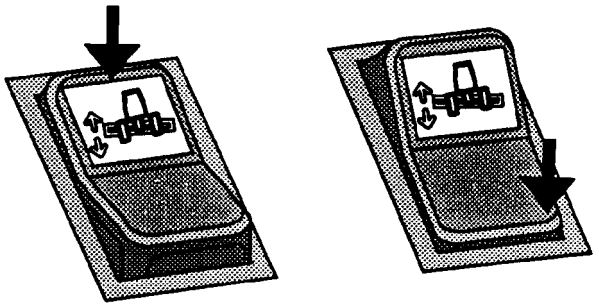


ZX012458 -UN-11MAR98

ZX,TMXZCO003202-19-30JUN97

OPERATIONAL INFORMATION

This function is provided to tilt the header laterally, e.g. when working on slopes. It will provide a uniform cutting height over the entire header width. Without the lateral tilt function, cutting height on the uphill side would be higher than on the downhill side due to combine weight distribution.



ZX,TMXZCO003203-19-17JAN94

THEORY OF OPERATION

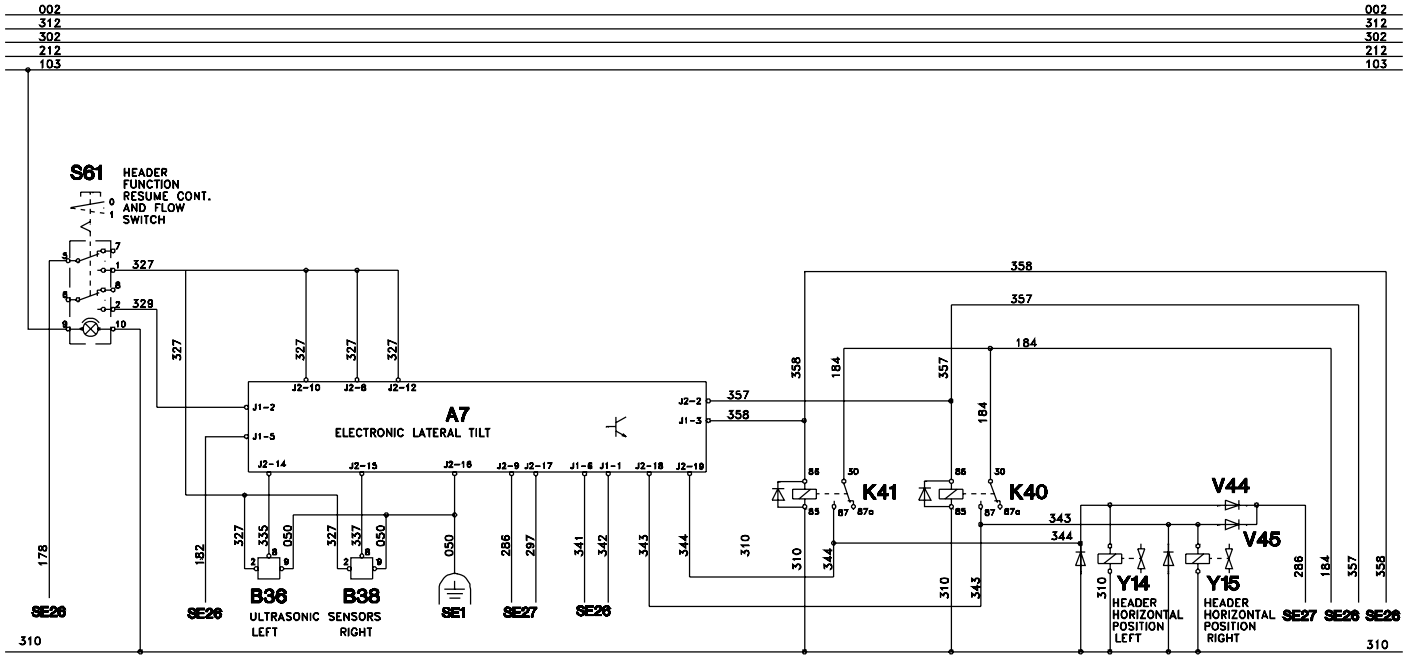
With road safety switch in “field” position and engine running, power is supplied to switch (S22) via fuse (F26). When tilting header to the left or right, solenoid (Y14) or (Y15) is activated.

Pressure valve (Y1) in Section 27 is also activated via diode (V44) or (V45).

NOTE: Switch (S62) is normally not installed, because Section 26 is used to control the function. Field installation of the switch is possible.

ZX,TMXZCO003204-19-17JAN94

FUNCTIONAL SCHEMATIC OF SECTION 29



SE29

CUTTING HIGHT CONTROL (ULTRASONICS)

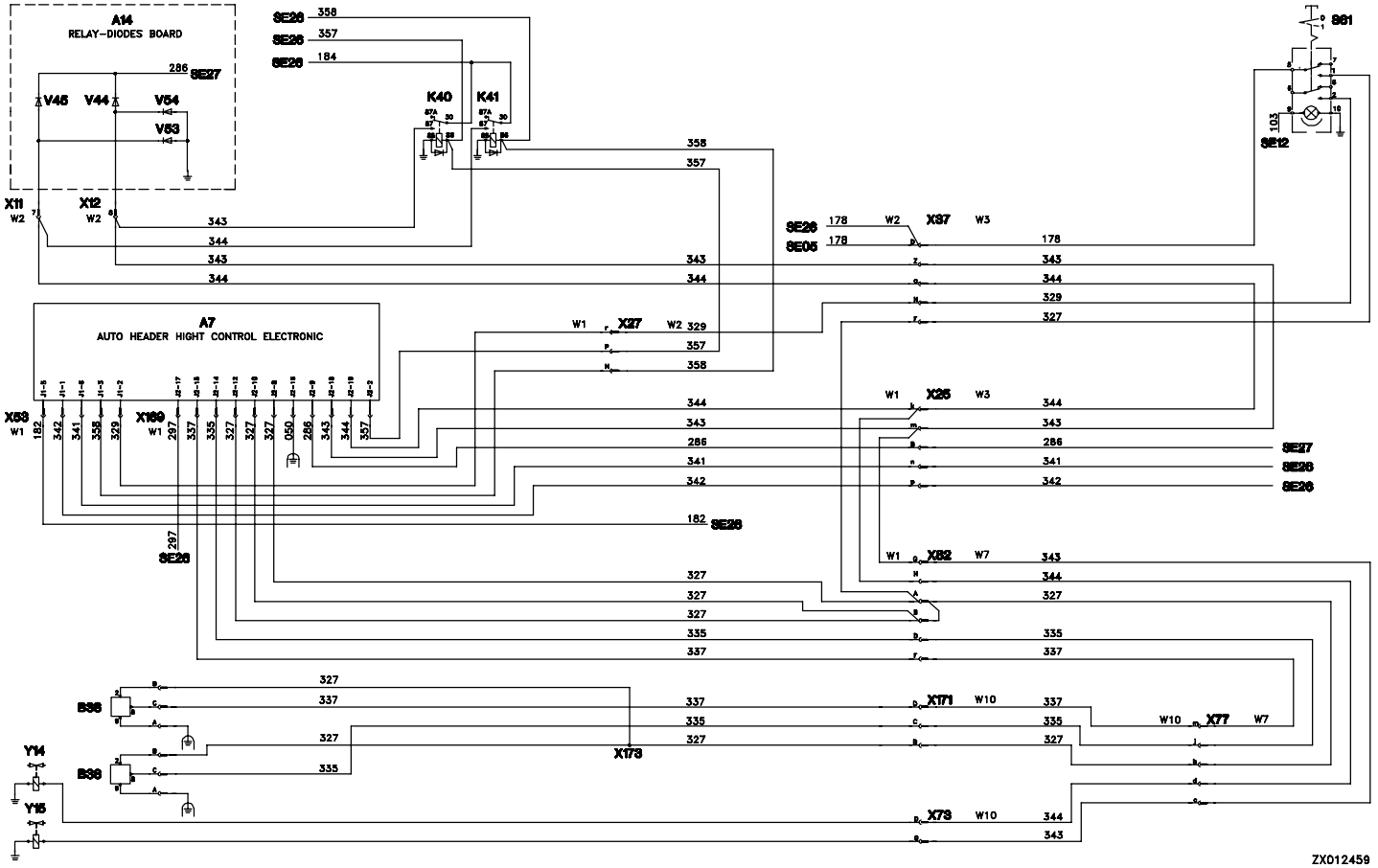
ZX012447

FUNCTIONAL SCHEMATIC OF SECTION 29

A14 —Relay and diode board
A7 —Electronics for ContourMaster (AHC)
B36 —Ultrasonic sensor, l.h.
B38 —Ultrasonic sensor, r.h.
K40 —Header height relay, r.h.
K41 —Header height relay, l.h.
S61 —ContourMaster switch
X11 —Connection, cab harness (W2) to relay board
X12 —Connection, cab harness (W2) to relay board
X21 —37-term. header plug, ContourMaster switch
X25 —Disconn. point, main distribution harness (W1), cab harness (W2)
X27 —Plug 3, cab
X37 —Disconnect point, cab harness (W2), switch console harness (W3)
X53 —Plug, AHC electronics box
X73 —Connection, feeder house harness (W10) to solenoid block
X77 —Disconnect point, front basic harness (W7), feeder house harness (W10)
X82 —Plug for ultrasonic sensors
X95 —5-terminal plug for ultrasonic sensors
X169—19-terminal plug, to A7
Y14 —Solenoid, l.h. side of header
Y15 —Solenoid, r.h. side of header

ZX,TM4543010335-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 29

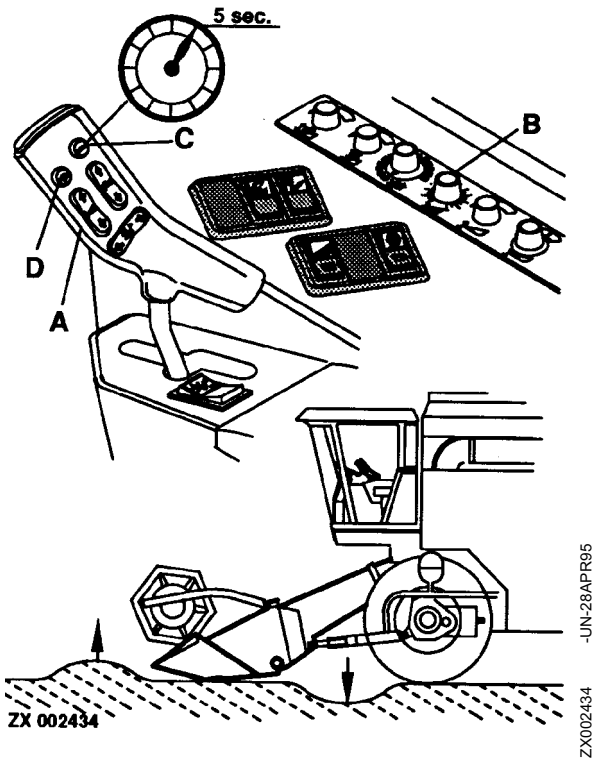


OPERATIONAL INFORMATION

A preset float is selected by pressing button (C). Float is obtained by activating hydraulics of header lift system.

Use potentiometer (B) to adjust desired header float.

IMPORTANT: Do not operate float control for more than one minute without interruption to avoid overheating of the hydraulic oil.



ZX,TMXZCO003207-19-17JAN94

THEORY OF OPERATION

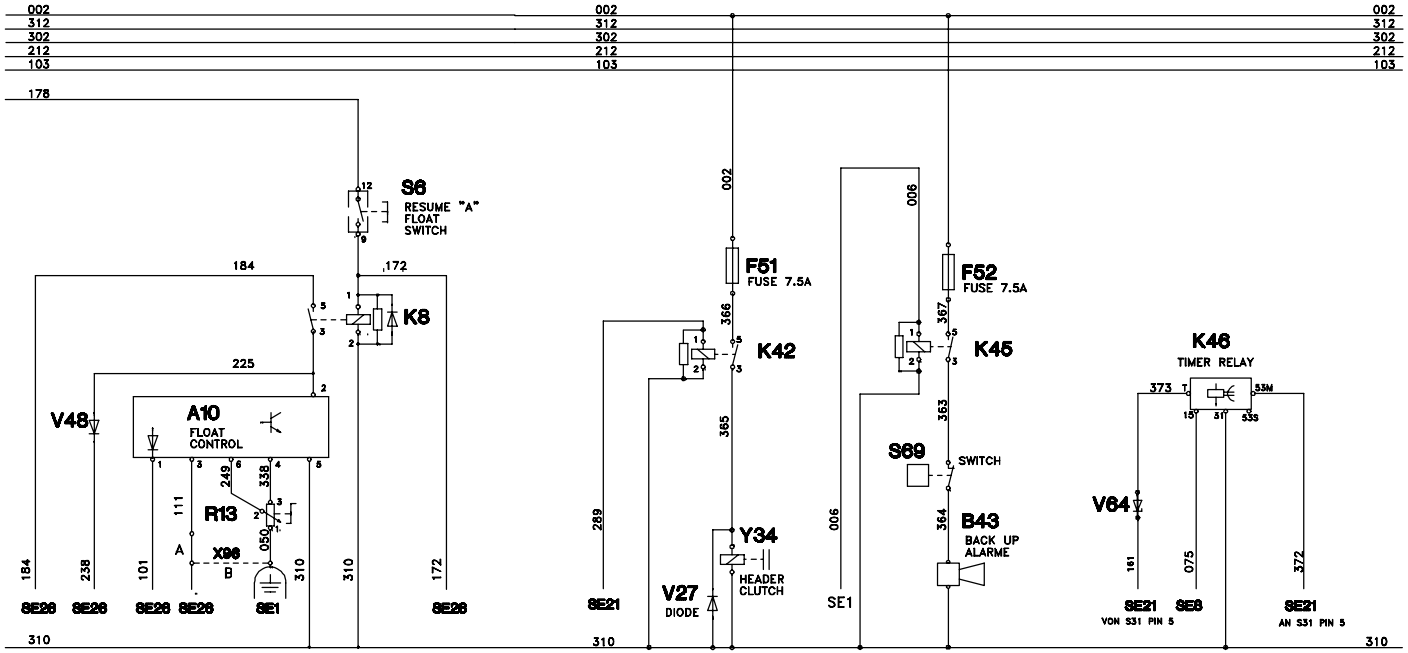
Float control system (A10) is powered via wire 184. When switch (S6) is actuated, header control system (A6) in Section 26 is switched off. The function “raise header slowly” is activated via diode (V48) and wire 238.

At the same time, coil of solenoid (Y6) is supplied with voltage via wires 101 and 102.

Depending on potentiometer setting, float control electronics will provide a current between 350 and 900 mA to the solenoid coil. This in turn will provide a lower or higher hydraulic system pressure.

ZX,TMXZCO003208-19-17JAN94

FUNCTIONAL SCHEMATIC OF SECTIONS 30, 31 AND 32



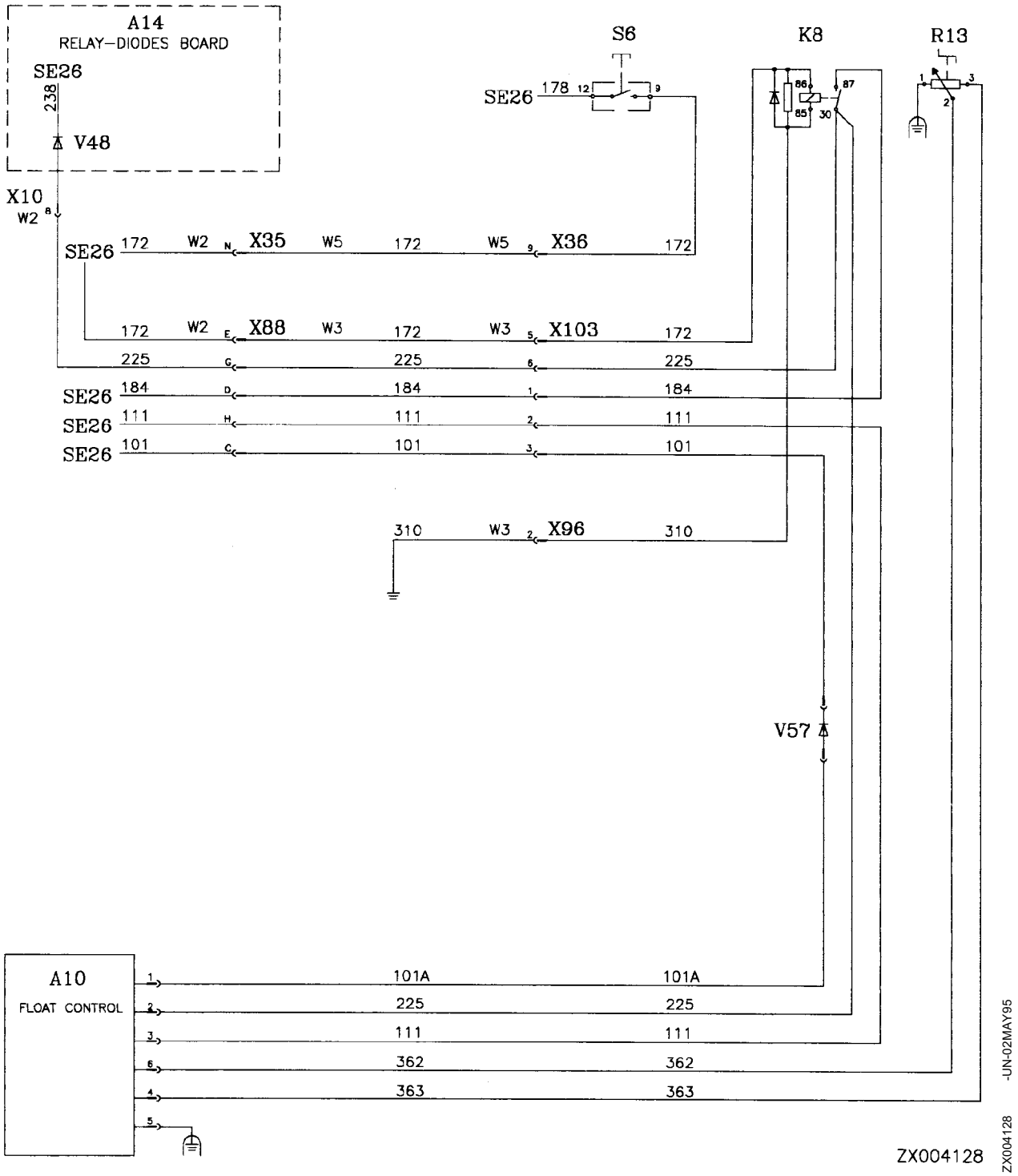
ZX012448

FUNCTIONAL SCHEMATIC OF SECTIONS 30, 31 AND 32

A10 —Float control
A14 —Relay and diode board
B43 —Buzzer, back-up alarm
F51 —7.5 amp. fuse, header drive clutch
F52 —7.5 amp fuse, header back-up alarm
K8 —Relay
K42 —Relay, header el.-clutch (moving motor)
K45 —Relay, D + (moving motor)
R13 —Potentiometer
S6 —Header float switch
S69 —Back-up alarm switch
X10 —Connection, cab harness (W2) to relay and diode board
X35 —Disconnect point, cab harness (W2), armrest harness (W5)
X36 —Connection, armrest harness (W5) to forward/reverse lever
X88 —Disconnect point, cab harness (W2), switch console harness (W3)
X96 —Plug for float control
X103—Float control bridging plug
Y34 —Header clutch

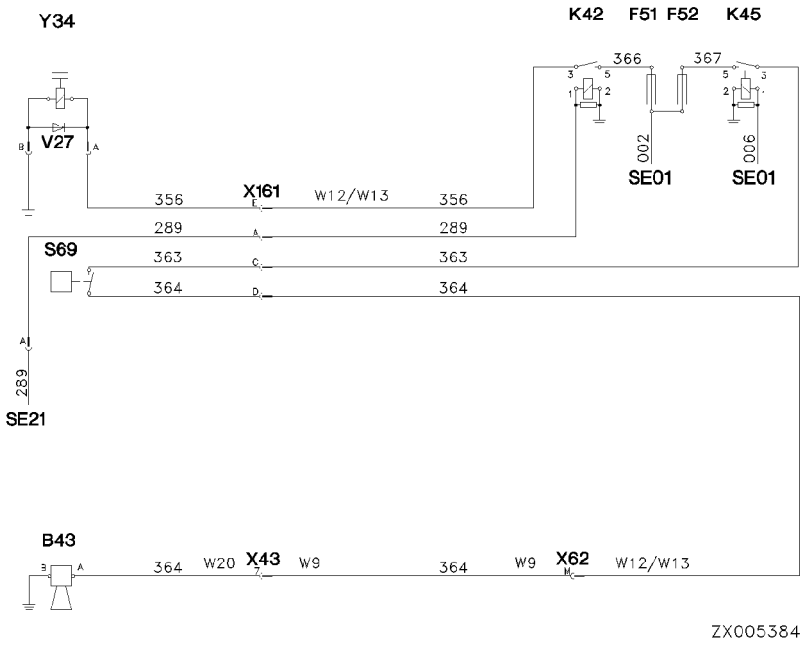
ZX,TM4543010338-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 30



ZX,TM4543010339-19-30JUN97

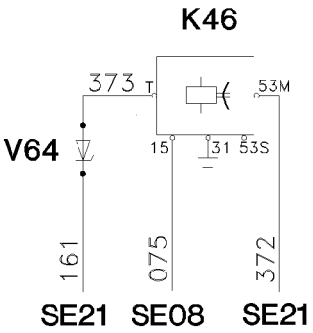
DIAGNOSTIC SCHEMATIC OF SECTION 31



ZX005384 -UN-26MAR98

ZX,TM4543010340-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 32



ZX005385

ZX005385 -UN-26MAR98

ZX,TM4543010341-19-30JUN97

Section 241
Electrical System from Serial Number 066833

Contents

NOTE

See Section 240, Group 05.

ZXTM4543 011395-19-30JUN97

NOTE

For details of test equipment, see Section 240, Group 06.

ZXTM4543 011396-19-30JUN97

SECTION SURVEY

The functional schematics for the electrical sections listed below are to be found in Group 15 of this Section.

SE 08 — Radio

SE 09 — Alarm module, stop function

SE 10 — Indicator lights

SE 22 — Digital infotrak monitor, speed monitoring system

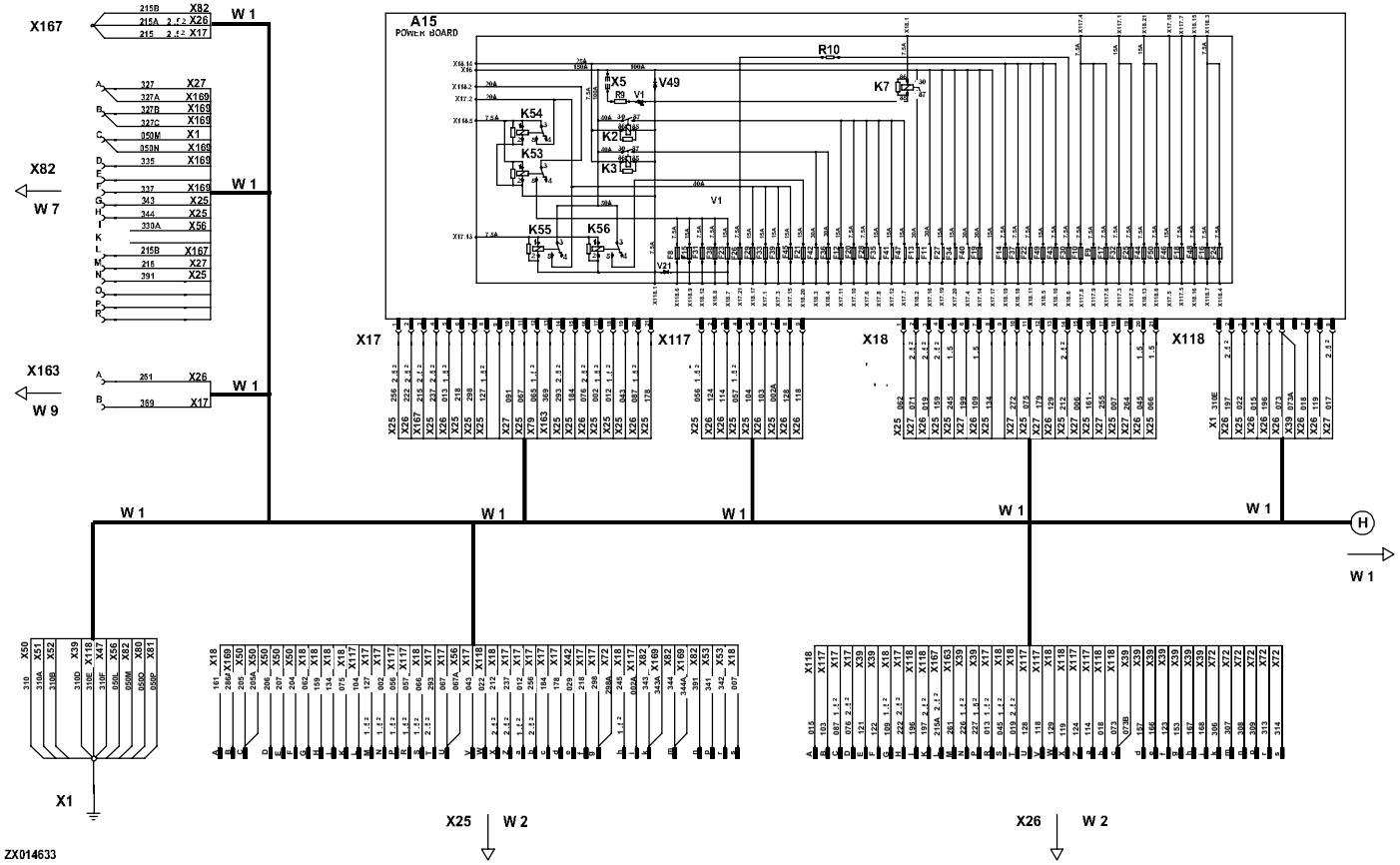
SE 25B — Separator adjustment, combine data center

For information on the functional schematics in the other electrical sections, see Section 240, Group 10.

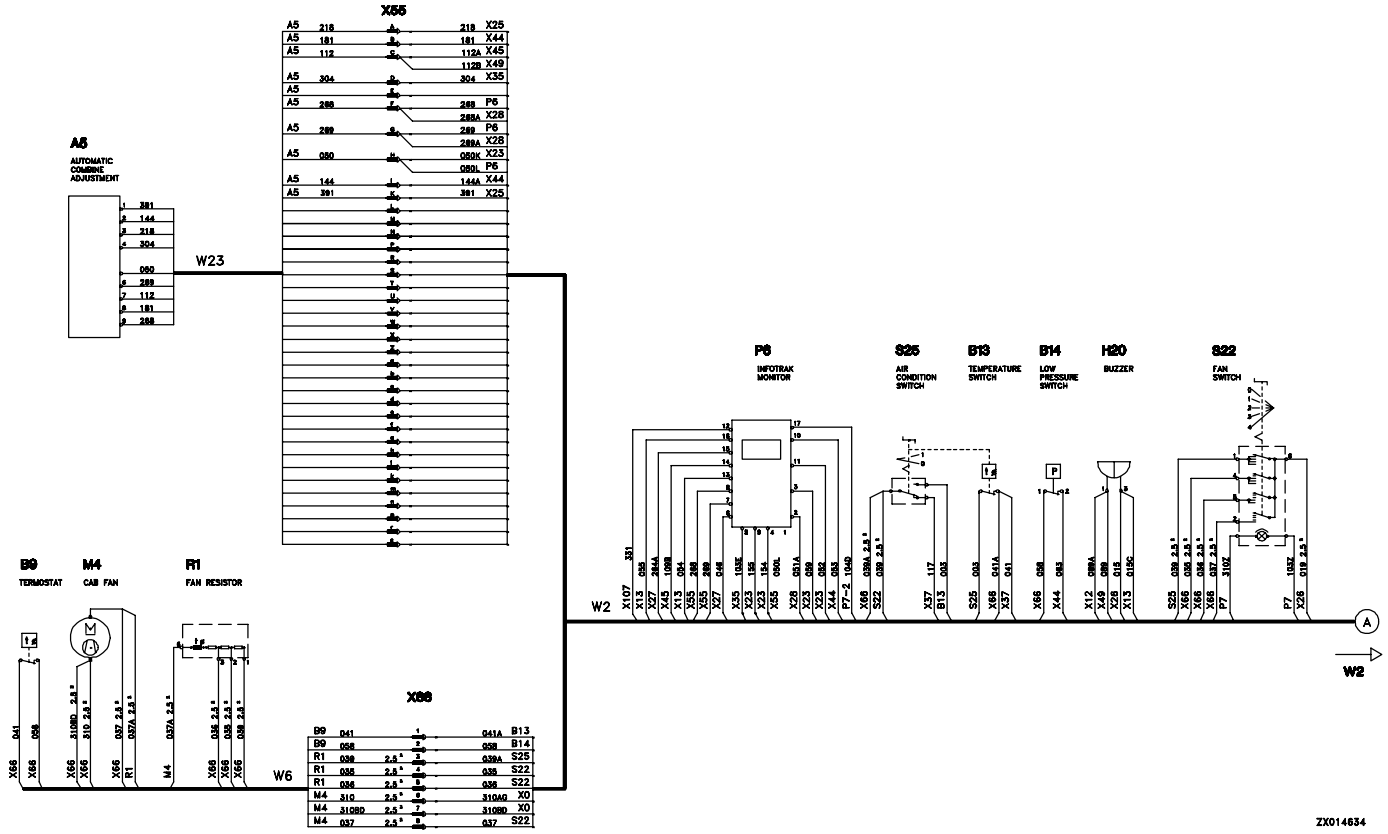
The diagrams in Section 240, Group 10 apply for all the wiring and harness diagrams that are not shown below.

ZX,TM4543011360-19-30JUN97

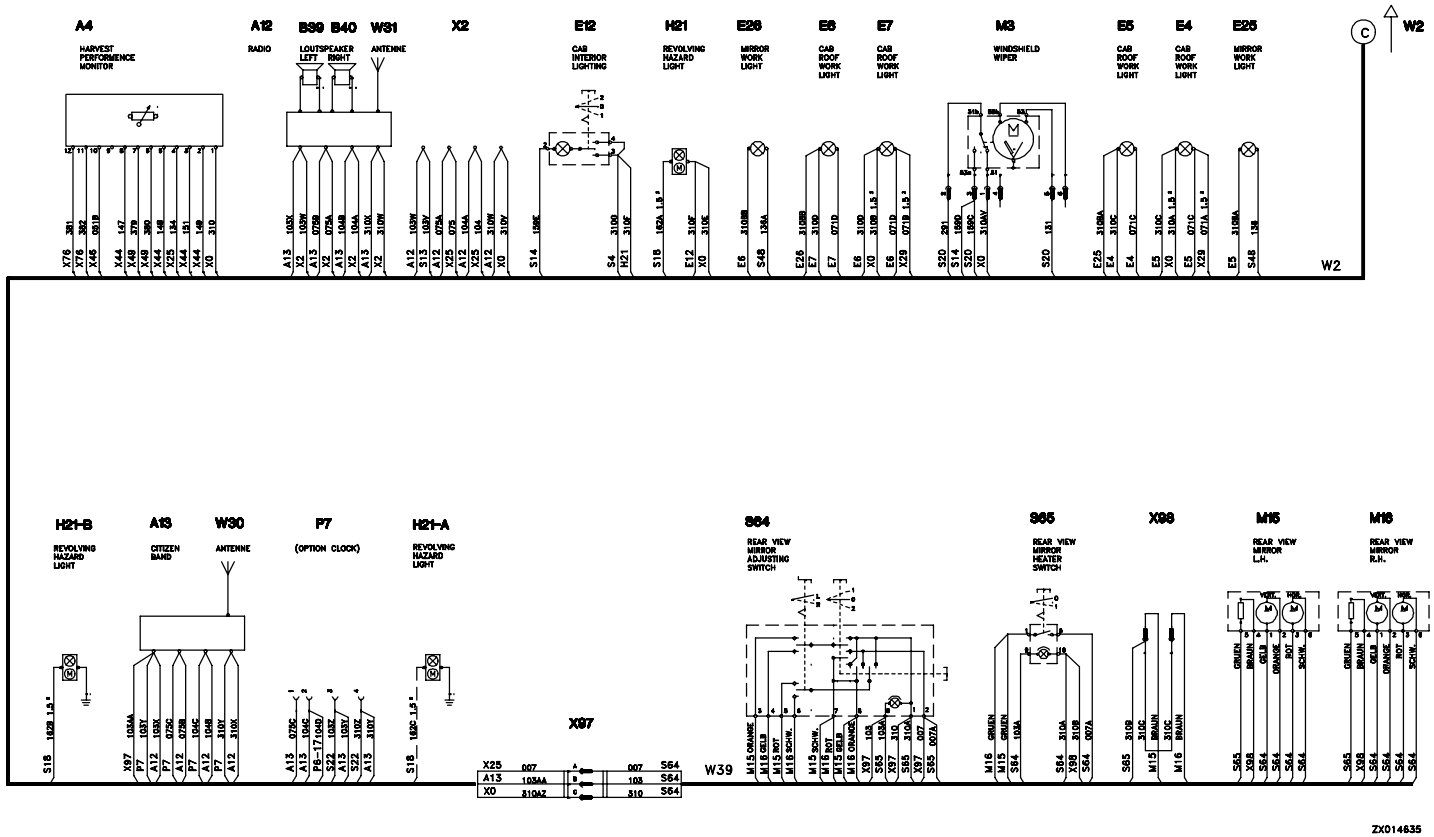
WIRING AND HARNESS DIAGRAM OF MAIN DISTRIBUTION HARNESS W1



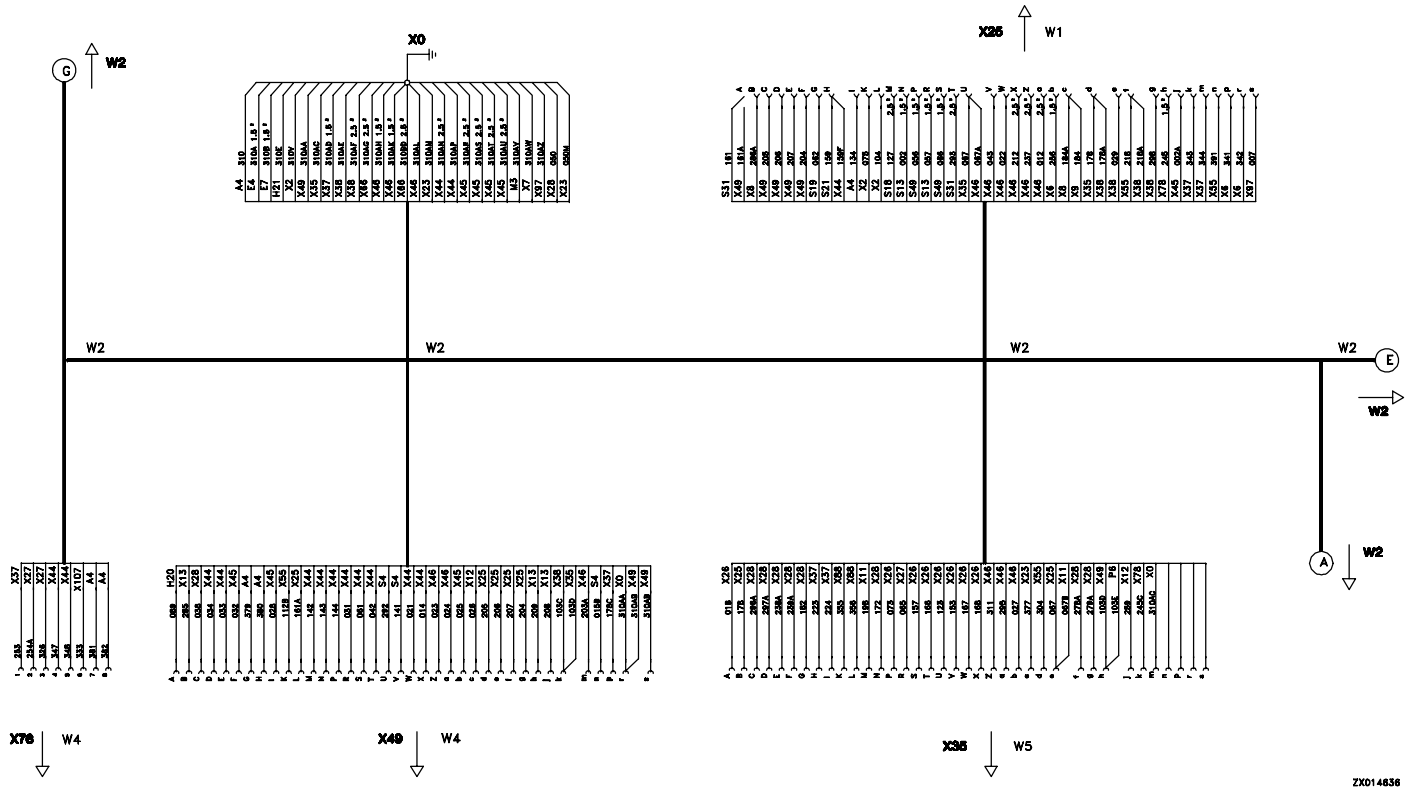
WIRING AND HARNESS DIAGRAM OF CAB HARNESS W2 - PART 1



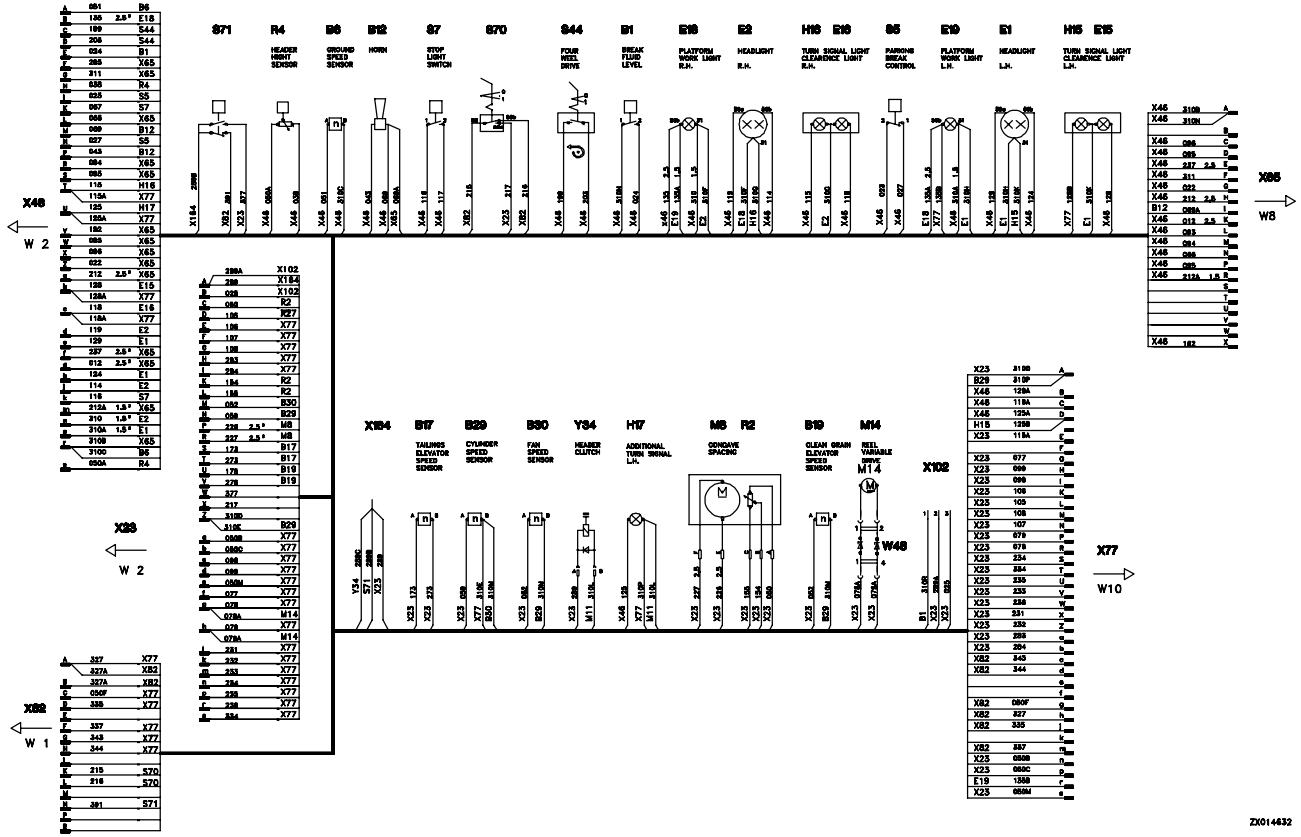
WIRING AND HARNESS DIAGRAM OF CAB HARNESS W2 - PART 2



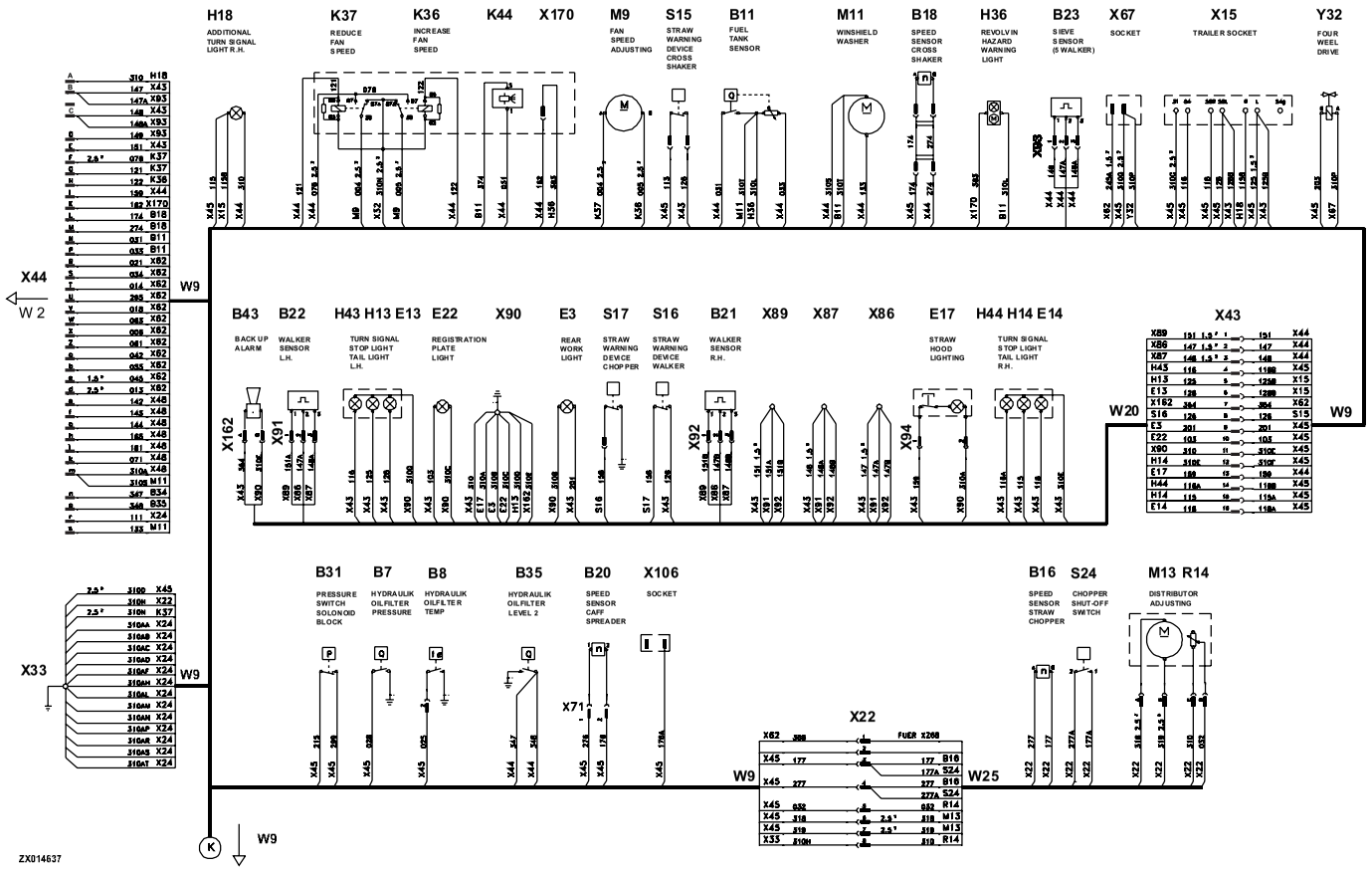
WIRING AND HARNESS DIAGRAM OF CAB HARNESS W2 - PART 3



WIRING AND HARNESS DIAGRAM OF FRONT BASIC HARNESS W7



WIRING AND HARNESS DIAGRAM, REAR BASIC HARNESS W9, GRAIN TANK HARNESS W15, CHOPPER HARNESS W25 AND CHAFF SPREADER HARNESS W26

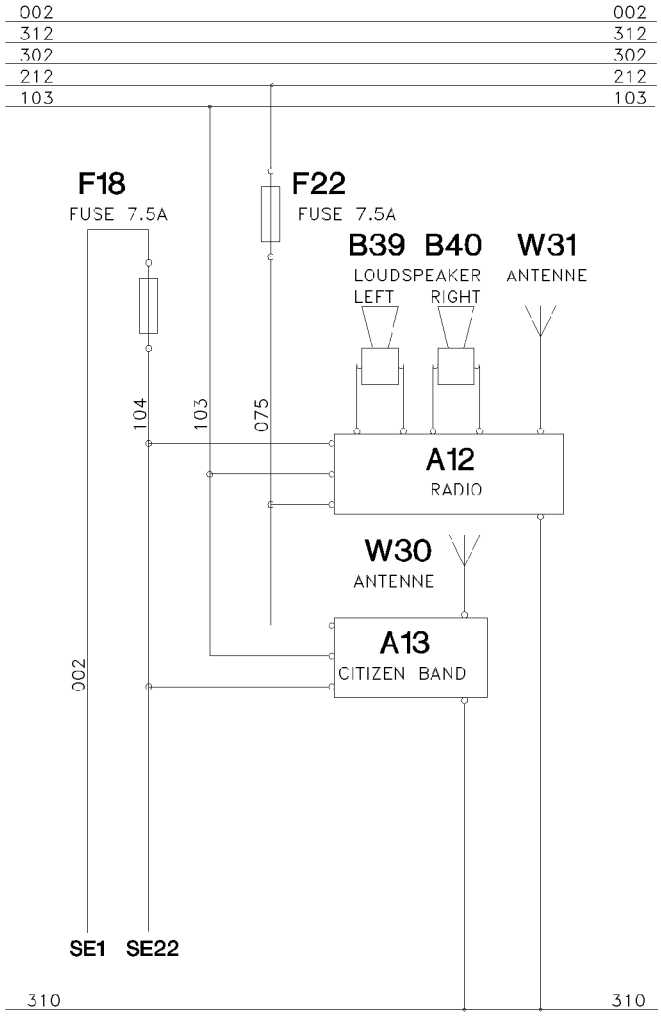


THEORY OF OPERATION

NOTE: The clock has been removed from Section 08 and integrated into the combine data center (Section 22).

ZX,TM4543011361-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 8



ZX014218

ZX014218 -UN-12MAR98

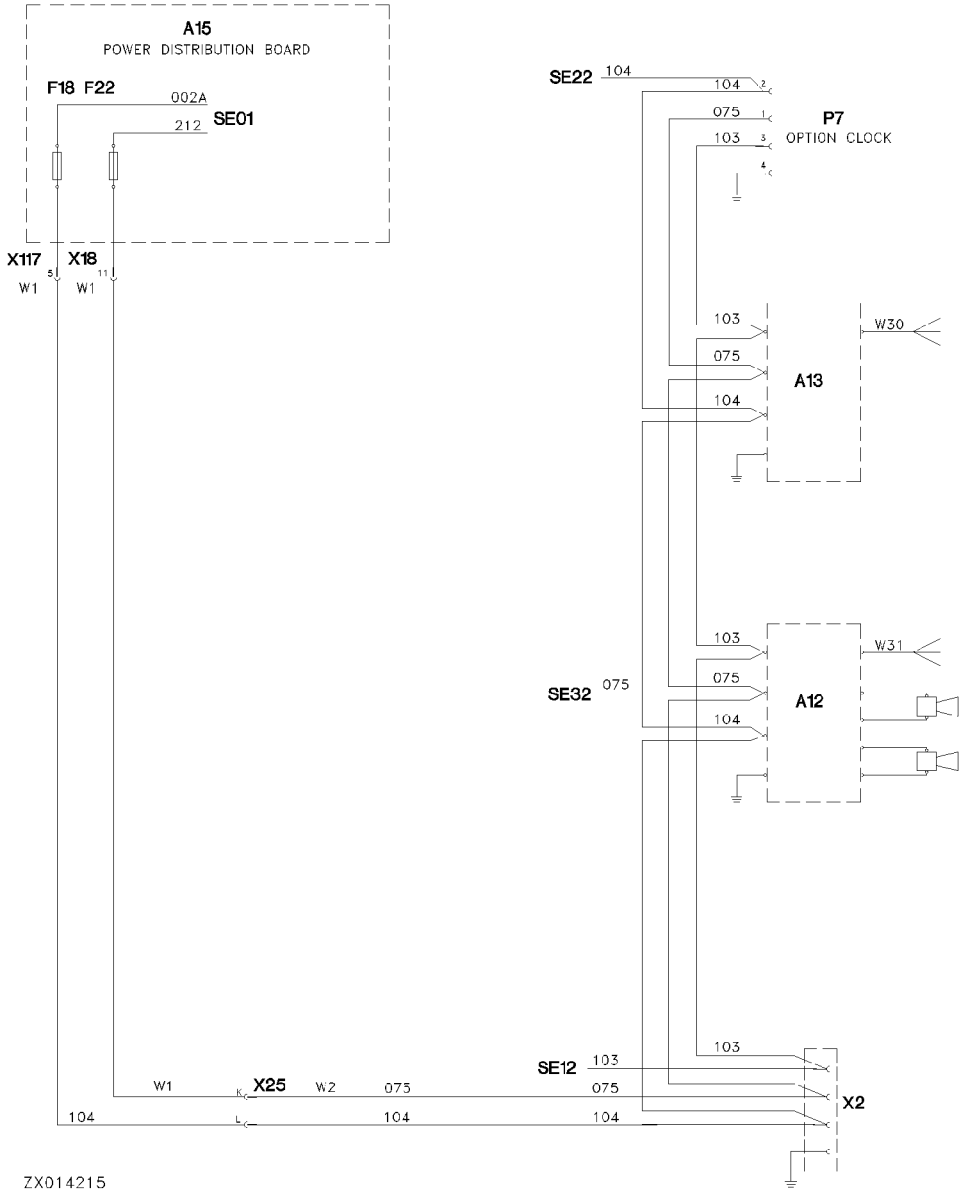
ZX,TM4543011362-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 8

A12 —Radio
A13 —CB radio
A15 —Fuse board
B39 —Loudspeaker, left
B40 —Loudspeaker, right
F18 —7.5 amp. fuse
F22 —7.5 amp. fuse
P7 —Digital clock
W30 —Antenna
W31 —Antenna
X2 —Disconnect point, US radio
X18 —Connection, fuse board to main distribution harness
X25 —Disconnect point, main distr. harness — cab harness
X117—Connection, fuse board to main distribution harness

ZX,TM4543011363-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 8



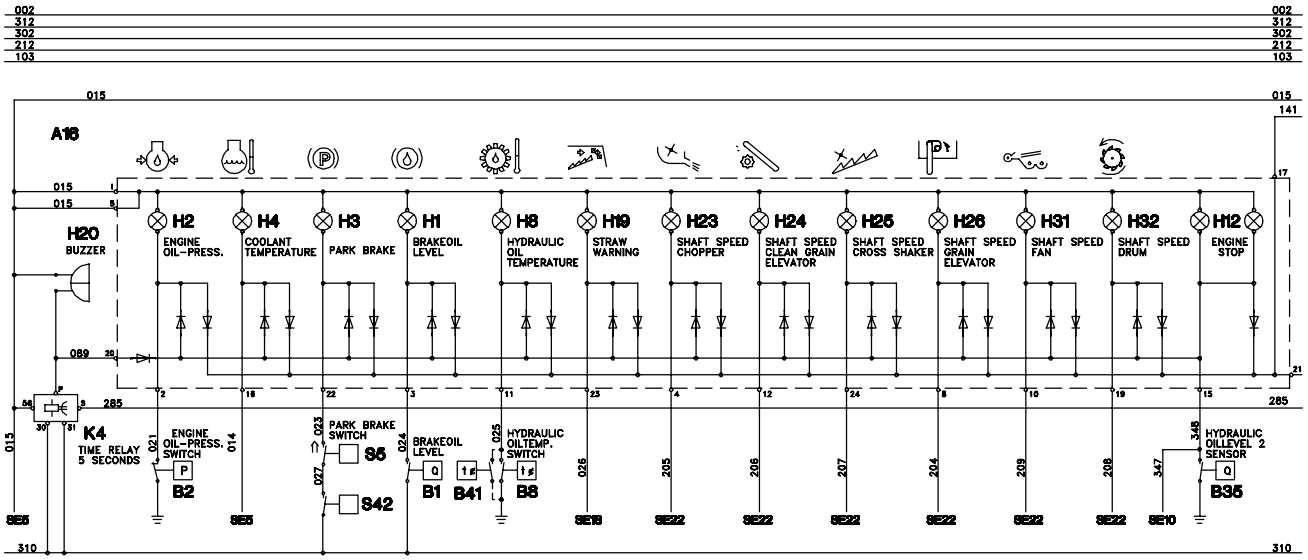
ZX,TM4543011364-19-30JUN97

THEORY OF OPERATION

NOTE: Hydraulic oil level sensor (B34) has been deleted. No warning is given before the system shuts down. Wire 347 is connected to sending unit (B35).

ZX,TM4543011365-19-30JUN97

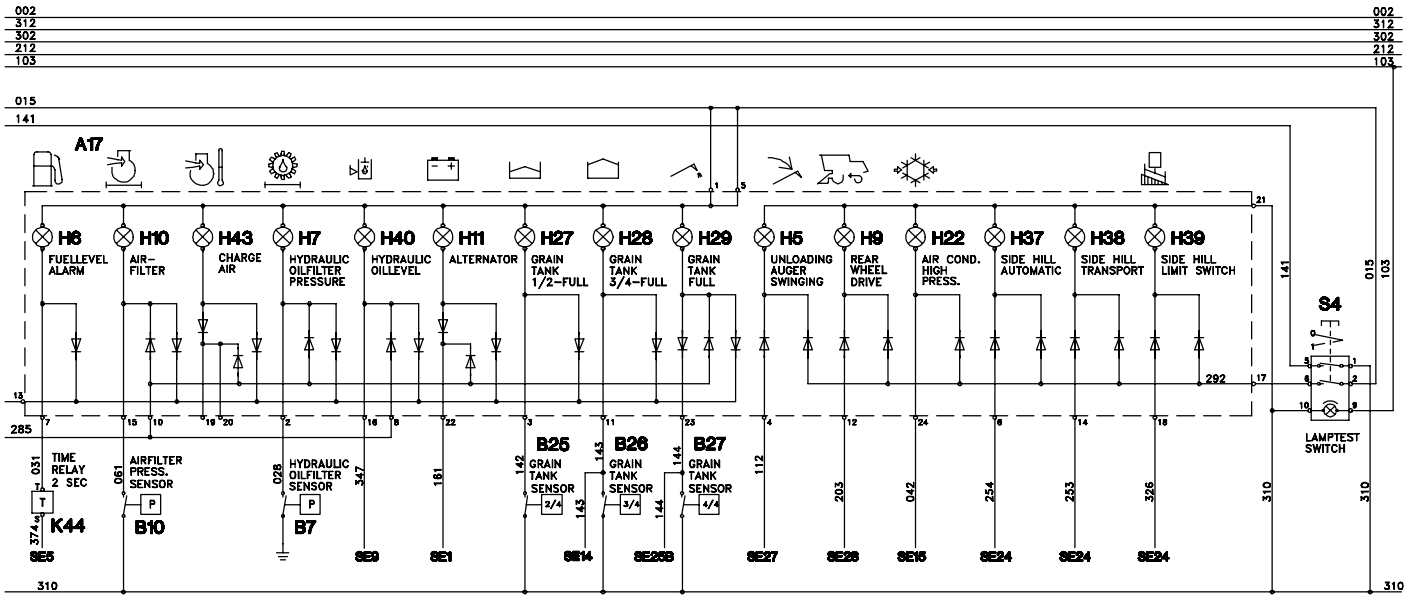
FUNCTIONAL SCHEMATIC OF SECTION 9



SE9
ALARMMODUL – STOP–FUNKTIONEN

ZX014219

FUNCTIONAL SCHEMATIC OF SECTION 10



SE10
WARNMODUL

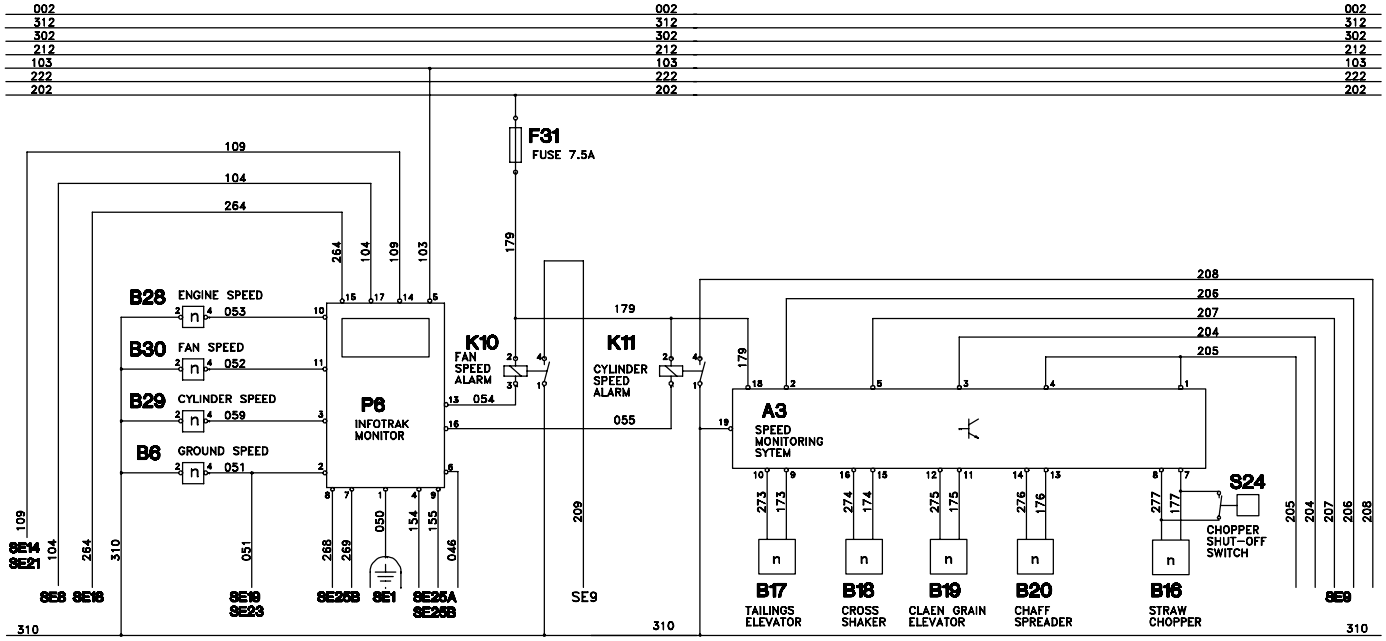
ZX014220

OPERATIONAL INFORMATION

NOTE: The clock has been integrated into the combine data center. The new data center has a double display. See the Operator's Manual for instructions on how to program the clock.

ZX,TM4543011368-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 22



SE22

INFOTRAK MONITOR / SPEED MONITORING SYSTEM

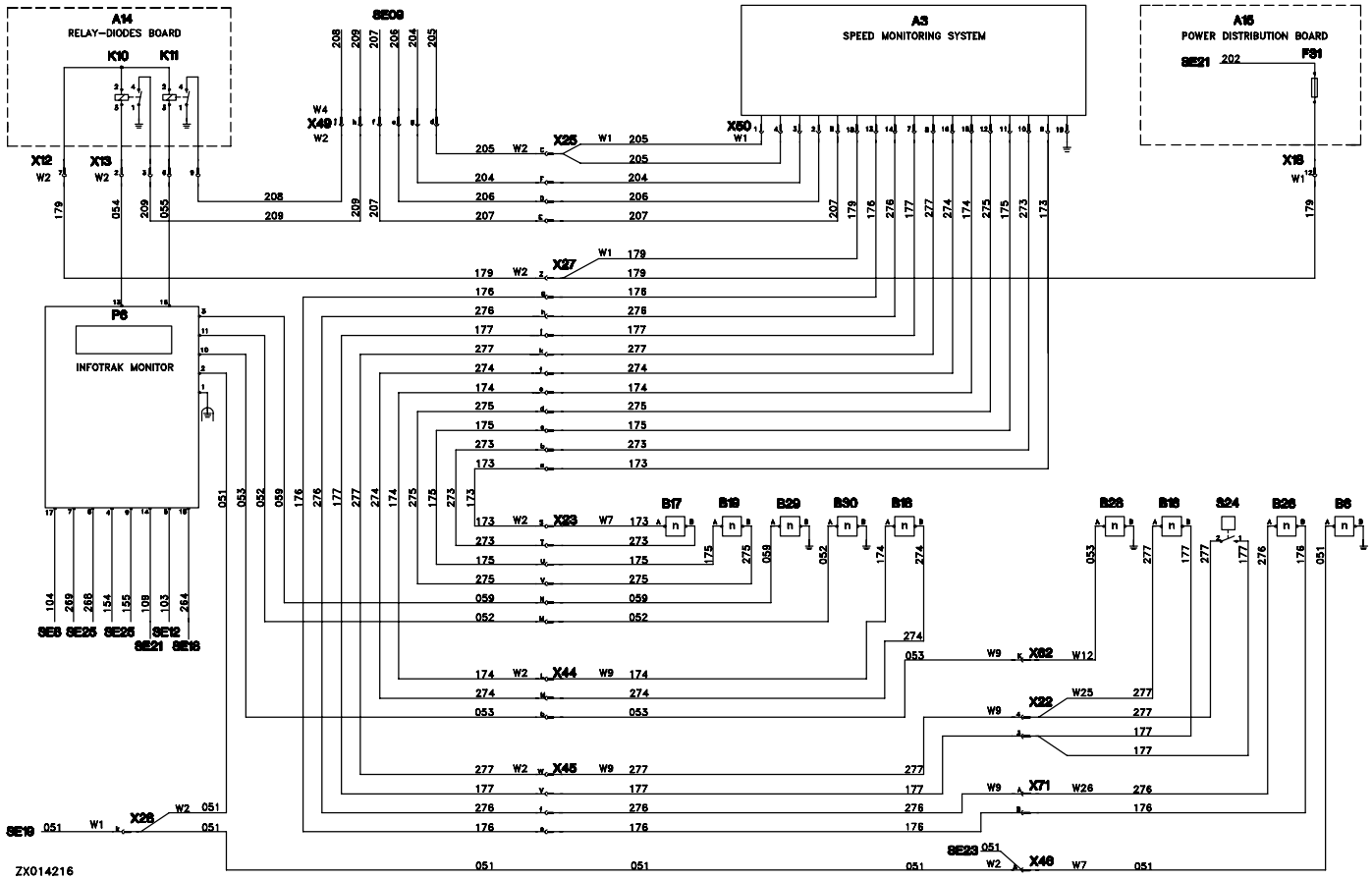
ZX014221

FUNCTIONAL SCHEMATIC OF SECTION 22

A3 —Electronic speed monitoring system
A14 —Relay and diode board
A15 —Fuse board
A18 —Infotrak monitor
B6 —Ground speed sending unit
B16 —Straw chopper speed sending unit
B17 —Tailings elevator speed sending unit
B18 —Cross shaker speed sending unit
B19 —Clean grain elevator speed sending unit
B20 —Chaff spreader speed sending unit
B28 —Engine speed sending unit
B29 —Cylinder speed sending unit
B30 —Fan speed sending unit
K10 —Relay, fan speed alarm
K11 —Relay, cylinder speed alarm
S24 —Speed monitoring switch, straw chopper
X12 —Connection, cab harness (W2)-relay and diode board
X13 —Connection, cab harness (W2)-relay and diode board
X18 —Connection, main distribution harness (W1)-fuse board
X22 —Disconnect point, rear basic harness (W9)-chopper harness (W25)
X23 —Disconnect point, cab harness (W2)-front basic harness (W7)
X25 —Disconnect point, main distribution harness (W1)-cab harness (W2)
X27 —Disconnect point, main distribution harness (W1)-cab harness (W2)
X28 —Disconnect point, main distribution harness (W1)-cab harness (W2)
X44 —Disconnect point, cab harness (W2)-rear basic harness (W9)
X45 —Disconnect point, cab harness (W2)-rear basic harness (W9)
X46 —Disconnect point, cab harness (W2)-front basic harness (W7)
X49 —Disconnect point, cab harness (W2)-corner post harness (W4)
X50 —Connection, main distribution harness(W1)-electronic speed monitoring system
X62 —Disconnect point, rear basic harness (W9)-engine harness (W12/W13)
X71 —Disconnect point, rear basic harness (W9)-chaff spreader harness (W26)

ZX,TM4543011370-19-30JUN97

DIAGNOSTIC SCHEMATIC OF SECTION 22

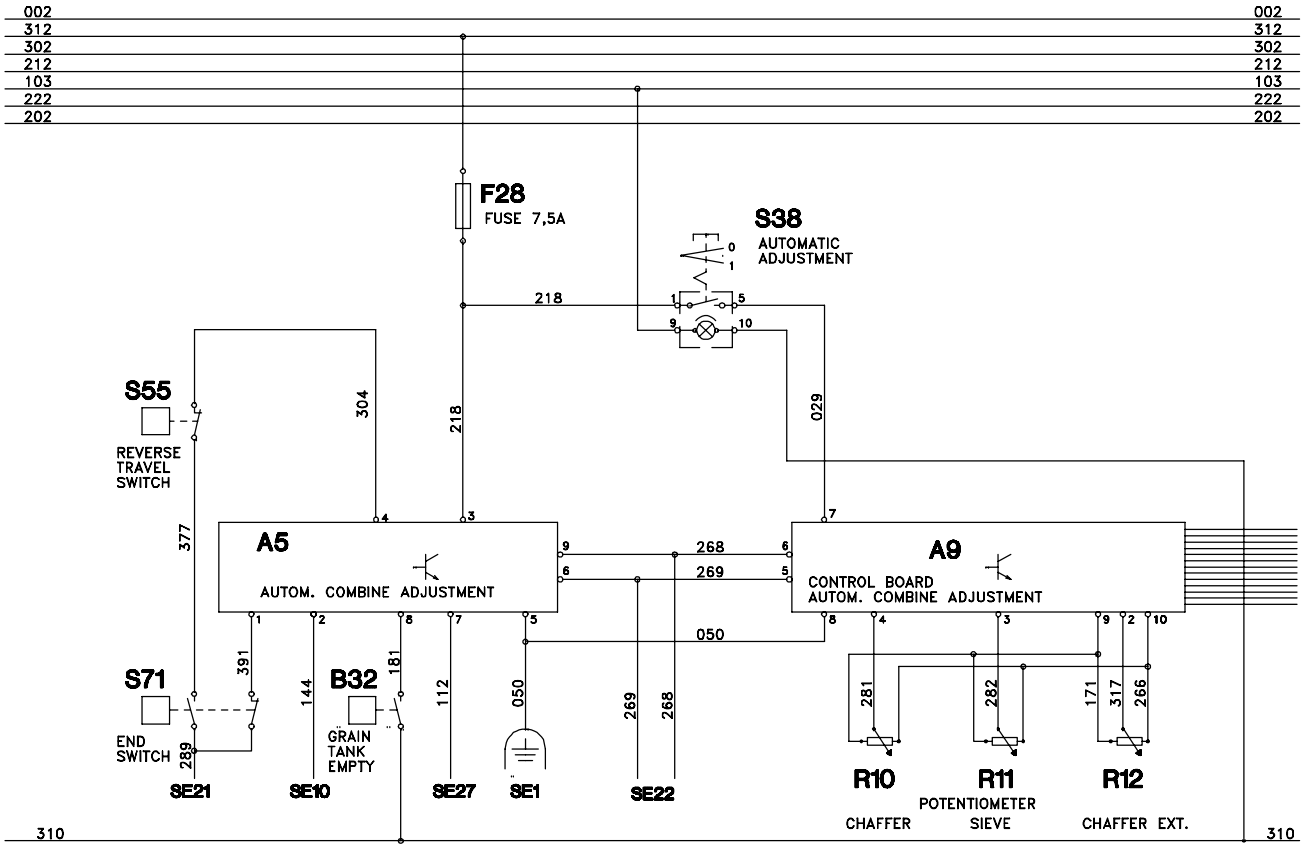


THEORY OF OPERATION

NOTE: Switch S71 ensures that when the area counter is set to 1/4, 1/2 or 3/4 cutting width, it will return to 1/1 (full width) automatically whenever the header is raised and lowered again.

ZX,TM4543011372-19-30JUN97

FUNCTIONAL SCHEMATIC OF SECTION 25B



SE25B
CYLINDER ;CONCAVE ; FAN ADJUSTMENT —PART 1

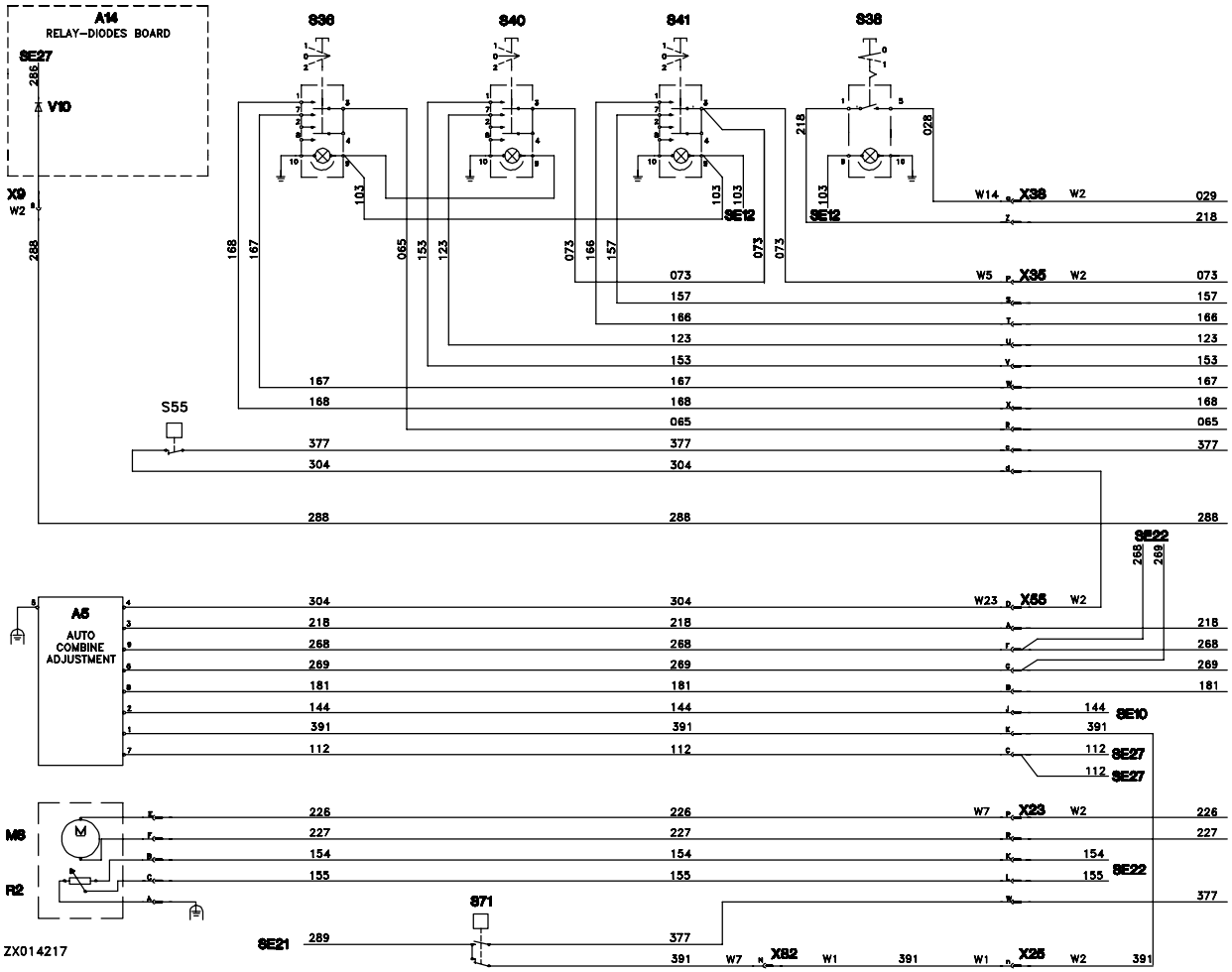
ZX014222

FUNCTIONAL SCHEMATIC OF SECTION 25B

A5 — Combine data center
A9 — Control board, combine data center
A11 — Relay board, combine data center
A14 — Relay and diode board
A15 — Fuse board
B32 — Sending unit, grain tank empty
F28 — 7.5 amp fuse
M8 — Concave adjusting motor
R2 — Potentiometer, concave adjustment
R10 — Potentiometer, chaffer
R11 — Potentiometer, sieve
R12 — Potentiometer, sieve extension
S32 — Header control switch
S36 — Concave adjustment switch
S38 — Switch, combine data center
S40 — Cylinder speed adjustment switch
S41 — Fan speed adjustment switch
S55 — Reverse travel switch
S71 — Height cut-off switch
V10 — Diode
X9 — Connection, cab harness (W2) to relay and diode board
X23 — Disconnect point, cab harness (W2)-front basic harness (W7)
X25 — Disconnect point, main distribution harness (W1)-cab harness (W2)
X35 — Disconnect point, cab harness (W2), armrest harness (W5)
X38 — Disconnect point, cab harness (W2), optional harness (W14)
X55 — Disconnect point, cab harness (W2), data center harness (W23)
X79 — Splice
X82 — Plug for ultrasonic sensors

ZX,TM4543011375-19-30JUN97

DIAGNOSTIC SCHEMATIC, SECTION 25B



Section 250
Power Train

Contents

SPECIFICATIONS

Item	Measurement	Specification
Variable pump and fixed-displacement motor	Displacement	75 cm^3/rev. (4.6 cu.in./rev.)
Charge pump	Flow (at max. speed)	13.9 cm^3/rev. (0.85 cu.in./rev.)
Variable pump swashplate	Angle variation	0˚ — 18˚
Variable pump	Weight	70 kg (154 lb)
Fixed-displacement motor	Weight	38 kg (83.7 lb)
Control valve orifice	Diameter	0.9 mm (0.036 in.)
Hydraulic oil	Operating temperature	50 — 80˚C (122 — 176˚F)
Charge pump, neutral position	Pressure	1500 kPa (15 bar) (220 psi)
Charge pump, operating position	Pressure	1100 kPa (11 bar) (160 psi)
High pressure relief valves	Test pressure	Flushing pressure plus pressure setting of relief valves
Setting of high pressure relief valves	Pressure	46500 kPa (465 bar) (6750 psi)
Overload valve setting	Pressure	44000 kPa (440 bar) (6400 psi)
Oil cooler relief valve	Relief pressure	100 kPa (1 bar) (14.5 psi)
Pump and motor	Max. speed	3345 rpm
Cam lobe motor	Displacement	1200 cm^3/rev. (73 cu.in./rev.)
Oil flow (forward or reverse)	Max. displacement	80 L/Min. (21 gpm)
Motor drain to reservoir	Max. oil quantity	Approx. 3.8 L/Min. (1 gpm) (each motor)
Cam lobe motor	Capacity of oil	2.8 L (0.75 U.S.gal)
Cam lobe motor	Weight	160 kg (360 lb)

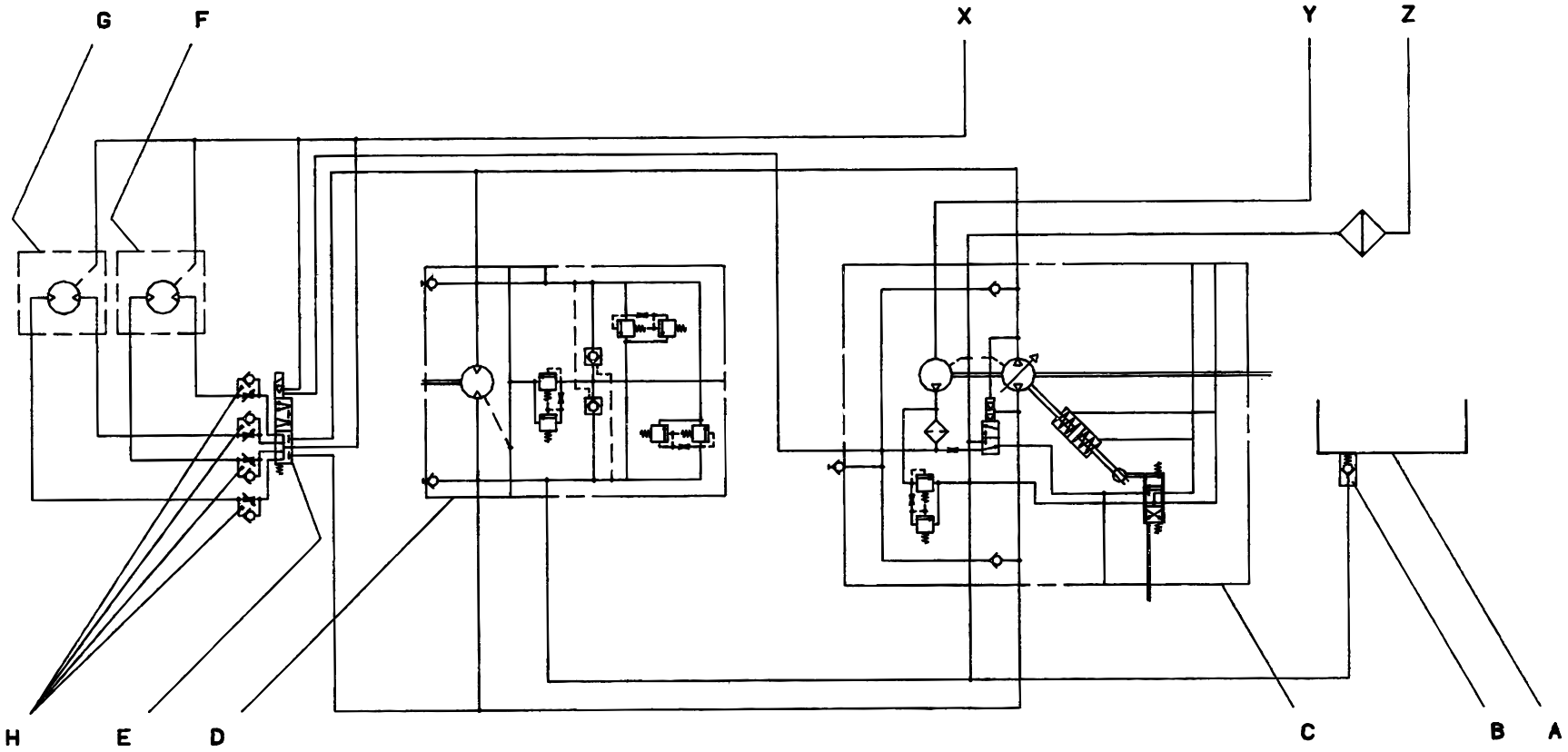
ZX,TMXZCO010089-19-01AUG97

2264, 2266 Combines, Option for 2258 Hillmaster
SPECIFICATIONS

Item	Measurement	Specification
Variable pump and fixed-displacement motor	Displacement	105 cm^3/rev. (6.43 cu.in./rev.)
Charge pump	Flow (at max. speed)	17,4 cm^3/rev. (106 cu.in./rev.)
Variable pump swashplate	Angle variation	0˚ — 18˚
Variable pump	Weight	85 kg (188 lb)
Fixed-displacement motor	Weight	48 kg (106 lb)
Control valve orifice	Diameter	1.32 mm (0.052 in.)
Hydraulic oil	Operating temperature	50 — 80˚C (122 — 176˚F)
Charge pump, neutral position	Pressure	1500 kPa (15 bar) (220 psi)
Charge pump, operating position	Pressure	1100 kPa (11 bar) (160 psi)
High pressure relief valves	Test pressure	Flushing pressure plus pressure setting of relief valves
Setting of high pressure relief valves	Pressure	43100 kPa (431 bar) (6250 psi)
Overload valve setting	Pressure	39700 kPa (397 bar) (5750 psi)
Oil cooler relief valve	Relief pressure	340 kPa (3.4 bar) (49 psi)
Pump and motor	Max. speed	3384 rpm
Cam lobe motor	Displacement	1200 cm^3/rev. (73 cu.in./rev.)
Oil flow (forward or reverse)	Max. displacement	80 L/Min. (21 gpm)
Motor drain to reservoir	Max. oil quantity	Approx. 3.8 L/Min. (1 gpm) (each motor)
Cam lobe motor	Capacity of oil	2.8 L (0.75 U.S.gal)
Cam lobe motor	Weight	160 kg (360 lb)

ZX,TMXZCO010090-19-01AUG97

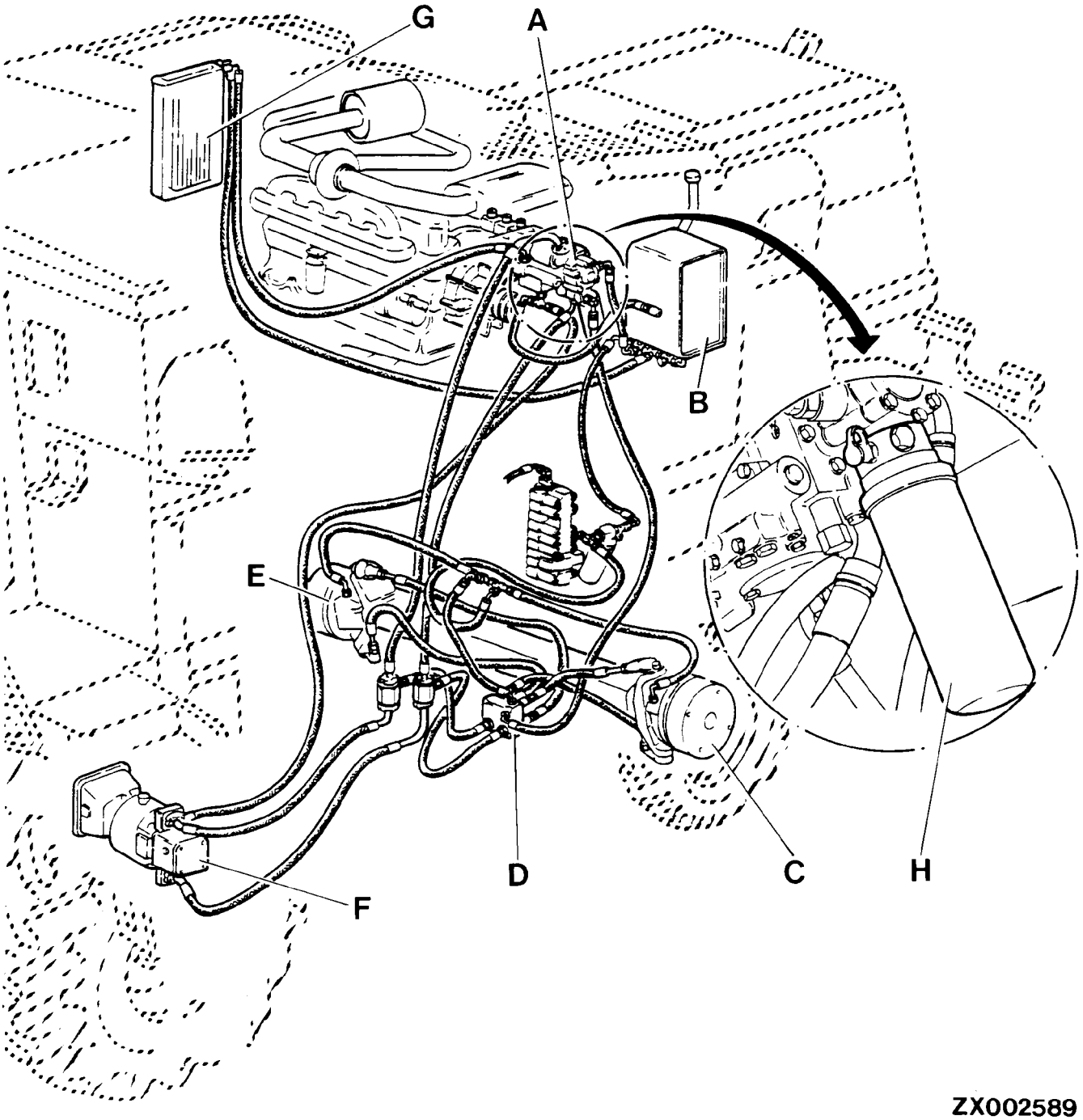
HYDROSTATIC DRIVE CIRCUIT DIAGRAM



ZX004026

A—Hydraulic oil reservoir
B—Pressure relief valve
C—Variable pump
D—Fixed-displacement motor
E—Four-wheel drive solenoid valve
F—Cam lobe motor, right-hand
G—Cam lobe motor, left-hand
H—Flow control valve
X—Return line for cam lobe motor leak-off oil
Y—Charge pump suction line
Z—Return line to hydraulic system

HYDROSTATIC DRIVE COMPONENTS



ZX002589 -UN-20JUN95

A—Variable pump
B—Hydrostatic oil tank
C—L.h. wheel motor
D—Four-wheel drive solenoid
E—R.h. wheel motor
F—Fixed-displacement motor
G—Oil cooler
H—Hydrostatic oil filter

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HYDROSTATIC DRIVE — COMPONENTS

The hydrostatic ground speed drive transmits engine power to the drive wheels via a hydraulic pump and motor.

Variable pump (A) is driven by the Diesel engine via intermediate drive.

Variable pump (A) is connected to fixed-displacement motor (F) by means of hoses. From the motor, power is transmitted to the individual transmission speed ranges via transmission input shaft. Finally, engine power reaches the final drives and front wheels.

When four-wheel drive is engaged, solenoid (D) directs a certain amount of oil to hydraulic (cam lobe) motors (C) and (E).

The hydrostatic drive has no oil circuit of its own, but draws oil from behind the hydraulic oil filter and returns it to the hydraulic oil reservoir via an oil cooler.

ZX,TMXZCO010111-19-01AUG97

HYDROSTATIC DRIVE OPERATION, NEUTRAL POSITION

A—Variable pump
B—Charge pump
C—Charge pressure relief valve
D—Servo control valve
E—Overload cut-off valve
F—Fixed-displacement motor
G—Flushing pressure relief valve
H—High pressure relief valve
J—High pressure relief valve
K—Four-wheel drive solenoid valve
L—Cam lobe motor, right
M—Cam lobe motor, left
N—Hydrostatic system oil cooler
O—Hydraulic oil reservoir
Q—Low pressure oil (return)
R—Charge pressure

The hydrostatic ground speed drive consists essentially of an axial piston pump and an axial piston hydraulic motor which are connected hydraulically. The axial piston pump is driven by the Diesel engine.

Displacement of axial piston pump per revolution is variable. Therefore, this pump is referred to as “variable pump”. Displacement of axial piston hydraulic motor is not variable. Therefore, this motor is called “fixed-displacement motor”.

With control lever in cab in neutral position, the variable pump flow is at zero, i.e. when drive shaft rotates at rated speed, no hydraulic oil is delivered to the fixed-displacement motor.

The charge pump draws hydraulic oil into the circuit. The charge pressure relief valve, integrated in the variable pump, limits pressure to approx. 1500 kPa (15 bar; 220 psi).

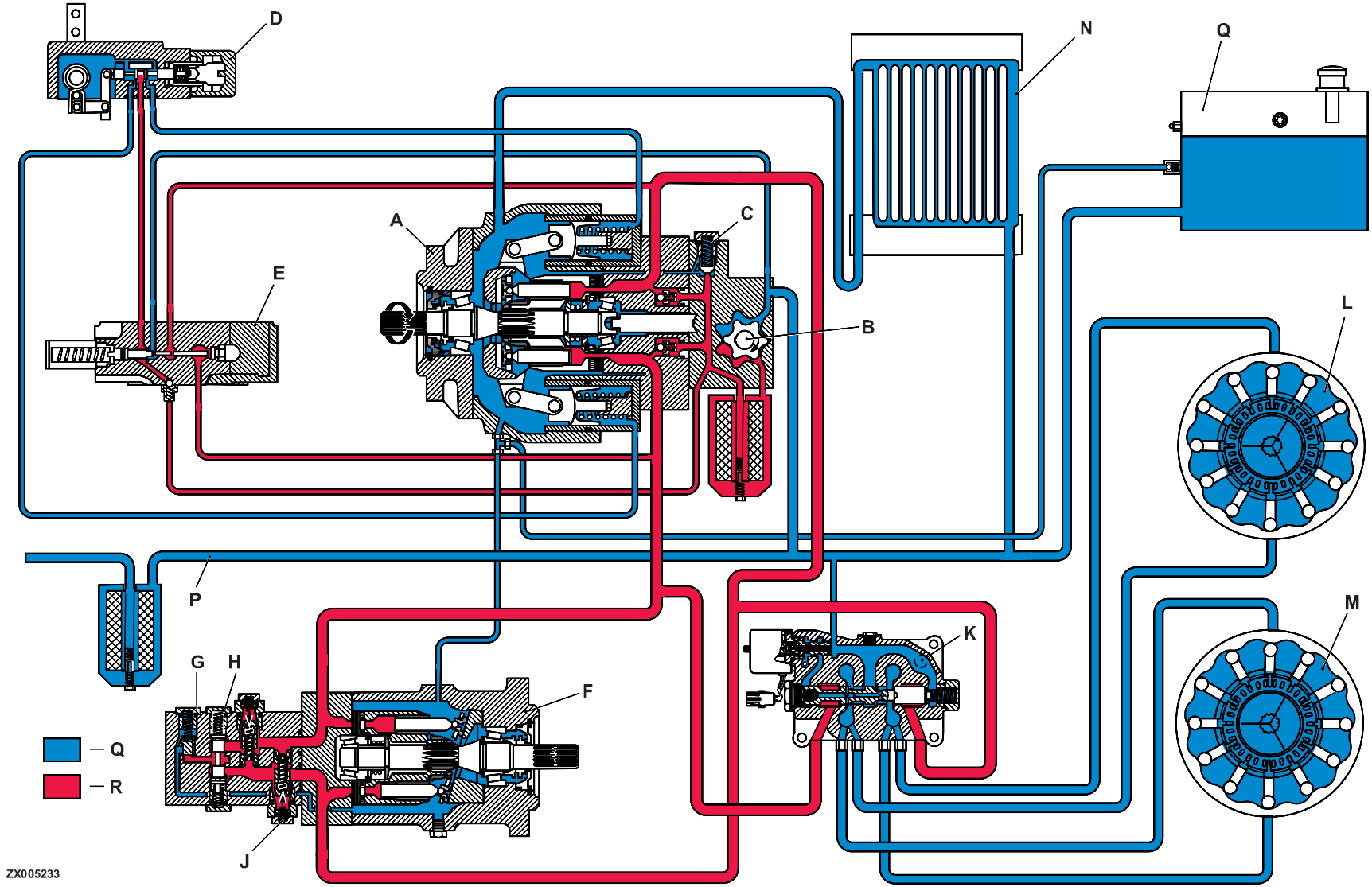
Oil flow from the pressure relief valve is routed to the hydraulic oil reservoir via the oil cooler. If housing pressure is too high (cold oil), the pressure relief valve in front of the oil cooler is activated allowing oil to flow directly to the hydraulic oil reservoir.

On machines with four-wheel drive, hydraulic (cam lobe) motors are installed at the rear wheels. When four-wheel drive is engaged, oil flow from variable pump is distributed to fixed-displacement motor and to both cam lobe motors.

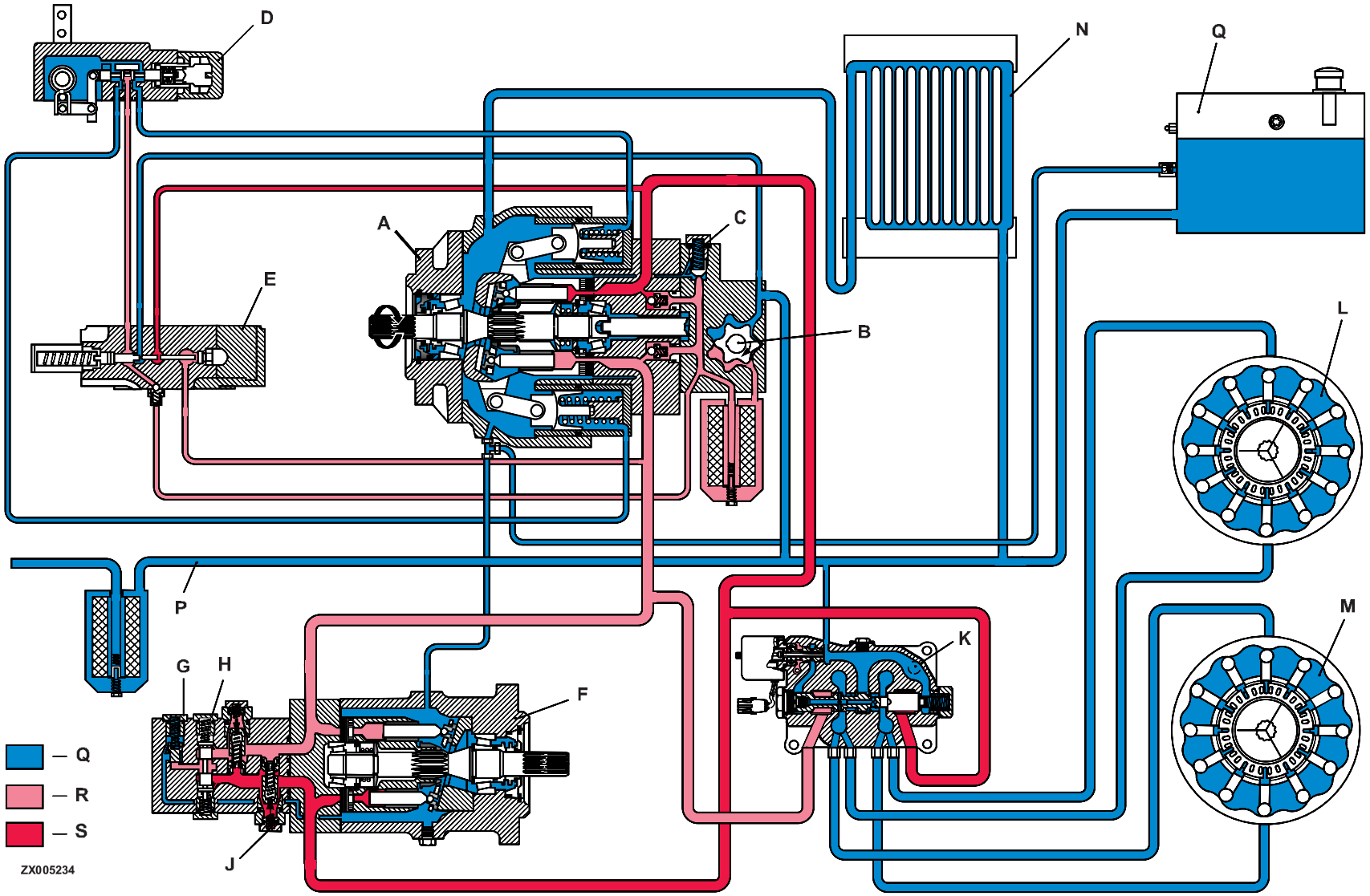
The hydrostatic system has no hydraulic oil reservoir of its own, but the charge pump draws hydraulic oil from the hydraulic system return line behind the oil filter.

ZX,TMXZCO003170-19-17JAN94

HYDROSTATIC DRIVE OPERATION, NEUTRAL POSITION



HYDROSTATIC DRIVE OPERATION, FORWARD TRAVEL



HYDROSTATIC DRIVE OPERATION, FORWARD TRAVEL

A—Variable pump
B—Charge pump
C—Charge pressure relief valve
D—Servo control valve
E—Overload cut-off valve
F—Fixed-displacement motor
G—Flushing pressure relief valve
H—High pressure relief valve
J—High pressure relief valve
K—Four-wheel drive solenoid valve
L—Cam lobe motor, right
M—Cam lobe motor, left
N—Hydrostatic system oil cooler
O—Hydraulic oil reservoir
Q—Low pressure oil (return)
R—Charge pressure
S—High pressure oil

When hydrostatic drive control lever is moved forward with engine running, variable pump delivers pressure oil to the fixed-displacement motor. This motor is attached to the transmission and transmits power to the transmission input shaft. The transmission offers three different speed ratios which can be selected by means of shift lever in cab.

Forward movement of control lever is transmitted to the servo control valve of the variable pump via a cable. The servo control valve directs oil to one of the servo pistons, whch causes the swashplate to move out of neutral position.

NOTE: On machines operating in Germany, swashplate adjusting angle for forward travel is limited. This in turn will limit max. travel speed on public roads to 20 km/h according to legal requirements.

ZX,TMXZCO003172-19-17JAN94

HYDROSTATIC DRIVE OPERATION, FORWARD TRAVEL WITH FOUR-WHEEL DRIVE

A—Variable pump
B—Charge pump
C—Charge pressure relief valve
D—Servo control valve
E—Overload cut-off valve
F—Fixed-displacement motor
G—Flushing pressure relief valve
H—High pressure relief valve
J—High pressure relief valve
K—Four-wheel drive solenoid valve
L—Cam lobe motor, right
M—Cam lobe motor, left
N—Hydrostatic system oil cooler
O—Hydraulic oil reservoir
Q—Low pressure oil (return)
R—Charge pressure
S—High pressure oil

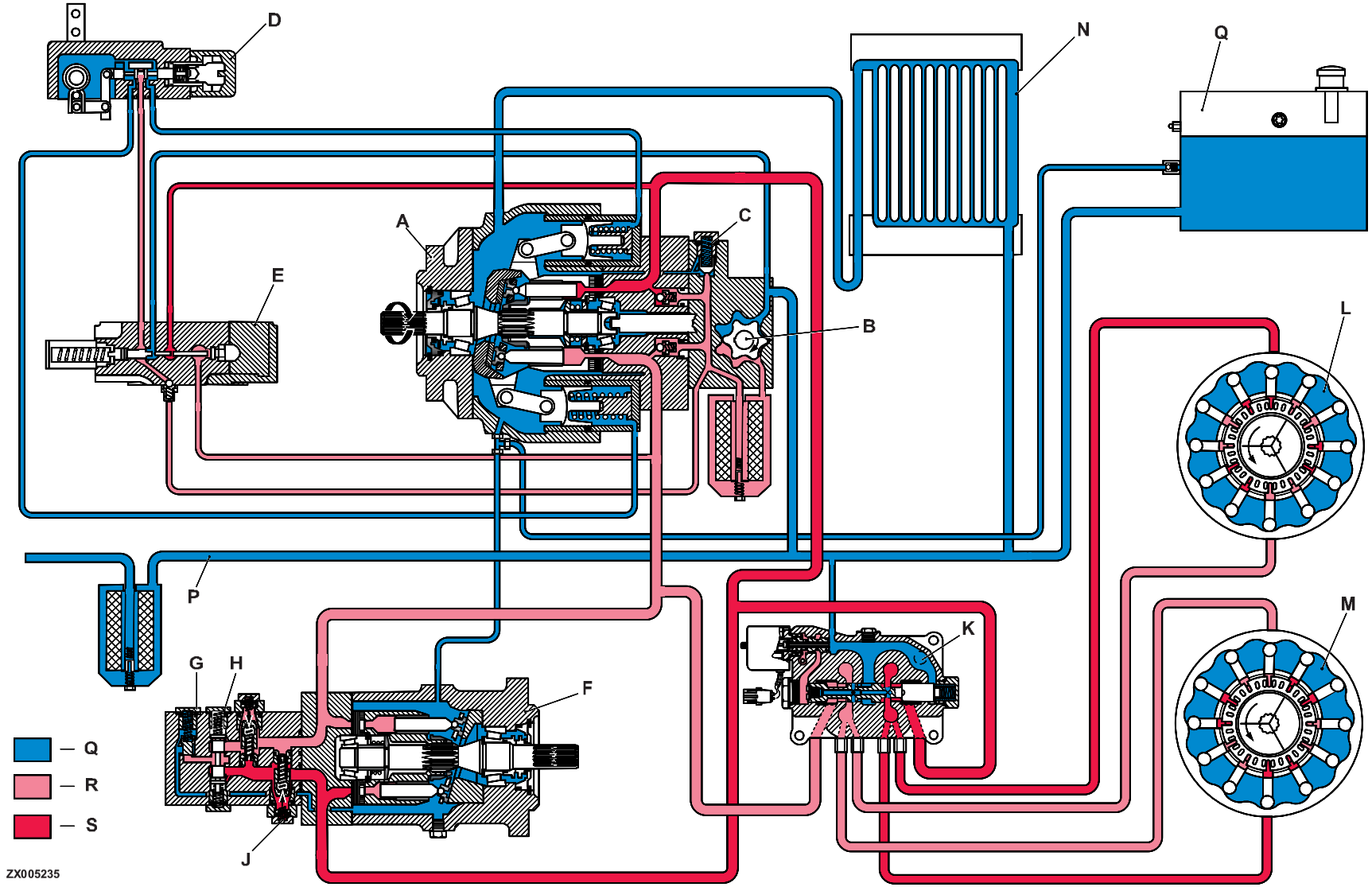
When four-wheel drive is engaged, the oil delivered by the variable pump is also routed to hydraulic motors located at the rear wheels. Flow control valves at each outlet of the four-wheel drive solenoid valve ensure sufficient oil flow to the fixed-displacement motor of the front axle.

NOTE: When engaging four-wheel drive, ground speed control lever should be moved in desired direction as far as possible to provide max. oil flow of variable pump.

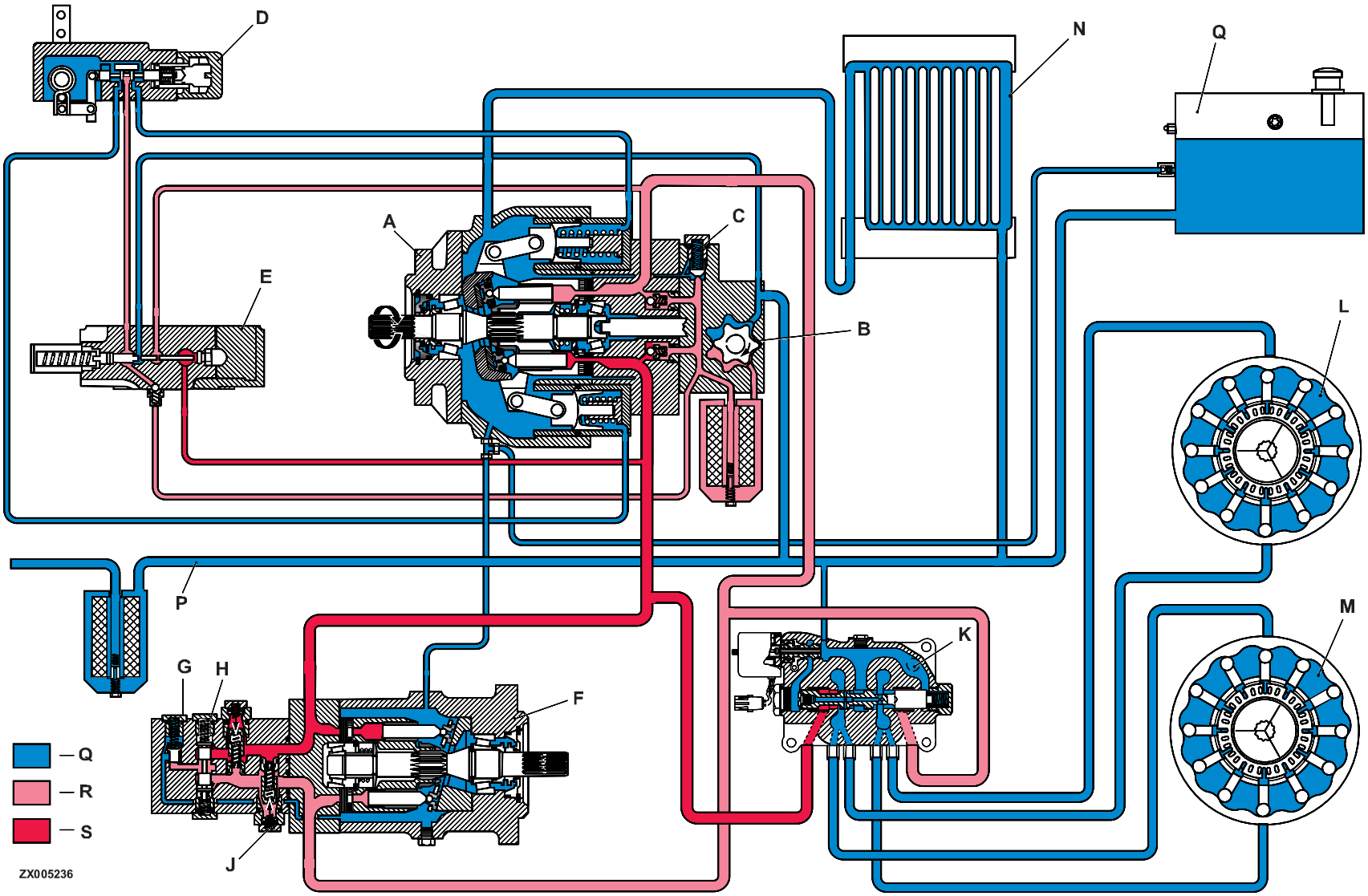
IMPORTANT: To avoid overload damage to the hydrostatic system, four-wheel drive should only be engaged at low speeds and soft ground conditions.

ZX,TMXZCO003174-19-17JAN94

HYDROSTATIC DRIVE OPERATION, FORWARD TRAVEL WITH FOUR-WHEEL DRIVE



HYDROSTATIC DRIVE OPERATION, REVERSE TRAVEL



HYDROSTATIC DRIVE OPERATION, REVERSE TRAVEL

A—Variable pump
B—Charge pump
C—Charge pressure relief valve
D—Servo control valve
E—Overload cut-off valve
F—Fixed-displacement motor
G—Flushing pressure relief valve
H—High pressure relief valve
J—High pressure relief valve
K—Four-wheel drive solenoid valve
L—Cam lobe motor, right
M—Cam lobe motor, left
N—Hydrostatic system oil cooler
O—Hydraulic oil reservoir
Q—Low pressure oil (return)
R—Charge pressure
S—High pressure oil

For reverse travel, oil flows to the servo pistons for swashplate angle variation in opposite direction as compared to forward travel. The swashplate moves in opposite direction and the variable pump delivers pressure oil to the fixed-displacement motor, causing the motor to rotate in reverse direction.

A stop at the control lever located in the operator's cab limits swashplate angle variation for reverse travel. This in turn limits max. oil flow and reverse travel speed.

For this reason the flow control valves at the four-wheel drive solenoid outlets for reverse travel are designed to provide less oil flow.

ZX,TMXZCO003176-19-17JAN94

HYDROSTATIC DRIVE OPERATION, OVERLOAD CONDITIONS

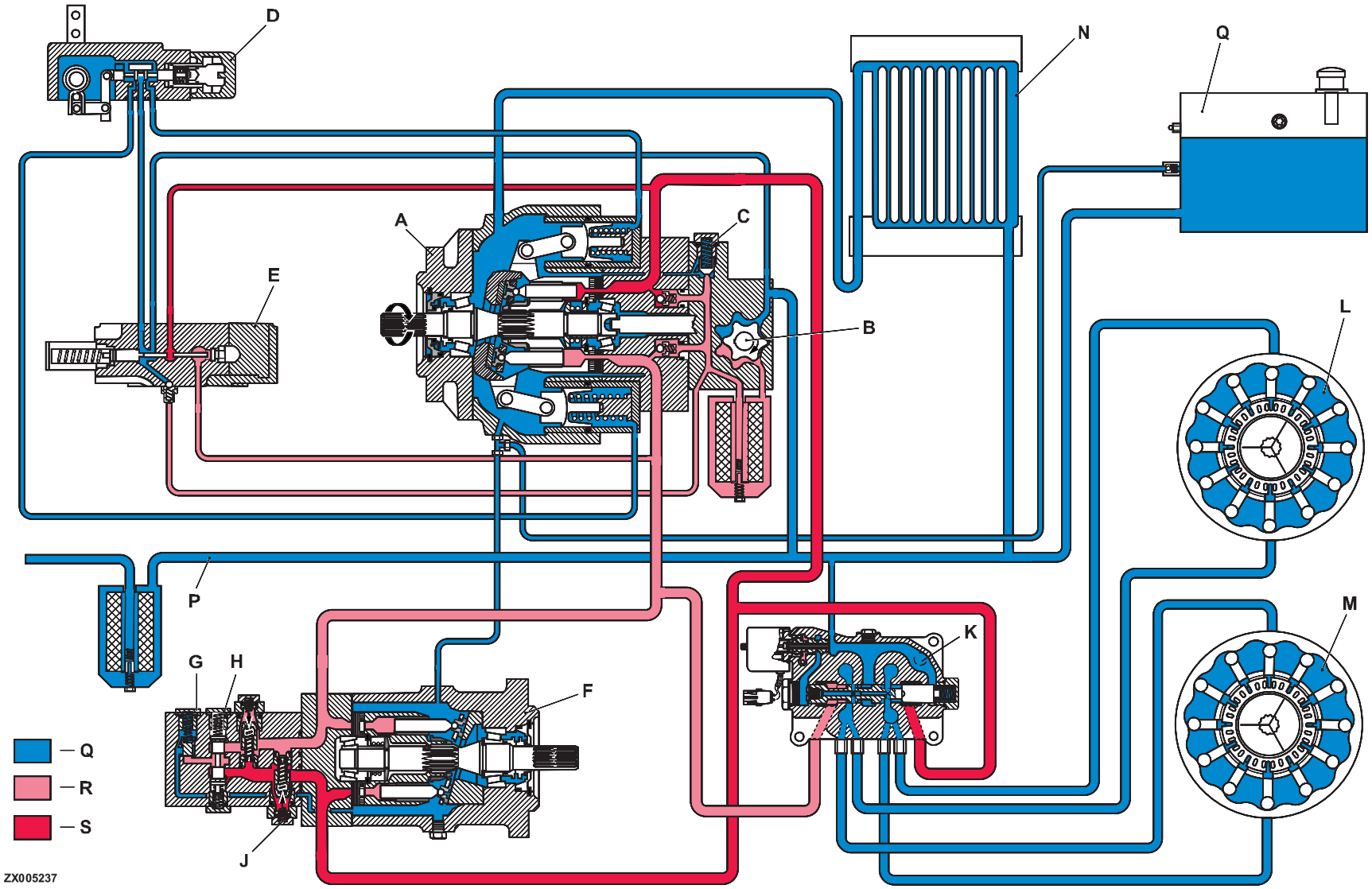
A—Variable pump
B—Charge pump
C—Charge pressure relief valve
D—Servo control valve
E—Overload cut-off valve
F—Fixed-displacement motor
G—Flushing pressure relief valve
H—High pressure relief valve
J—High pressure relief valve
K—Four-wheel drive solenoid valve
L—Cam lobe motor, right
M—Cam lobe motor, left
N—Hydrostatic system oil cooler
O—Hydraulic oil reservoir
Q—Low pressure oil (return)
R—Charge pressure
S—High pressure oil

When the hydrostatic system is overloaded and pressure in one of the high pressure hoses reaches 44000 kPa (440 bar; 6400 psi) or more, the overload valve in the supply line to servo control valve opens a path to route oil back to the reservoir. The pressure holding the servo pistons will drop and the swashplate moves back towards the center position.

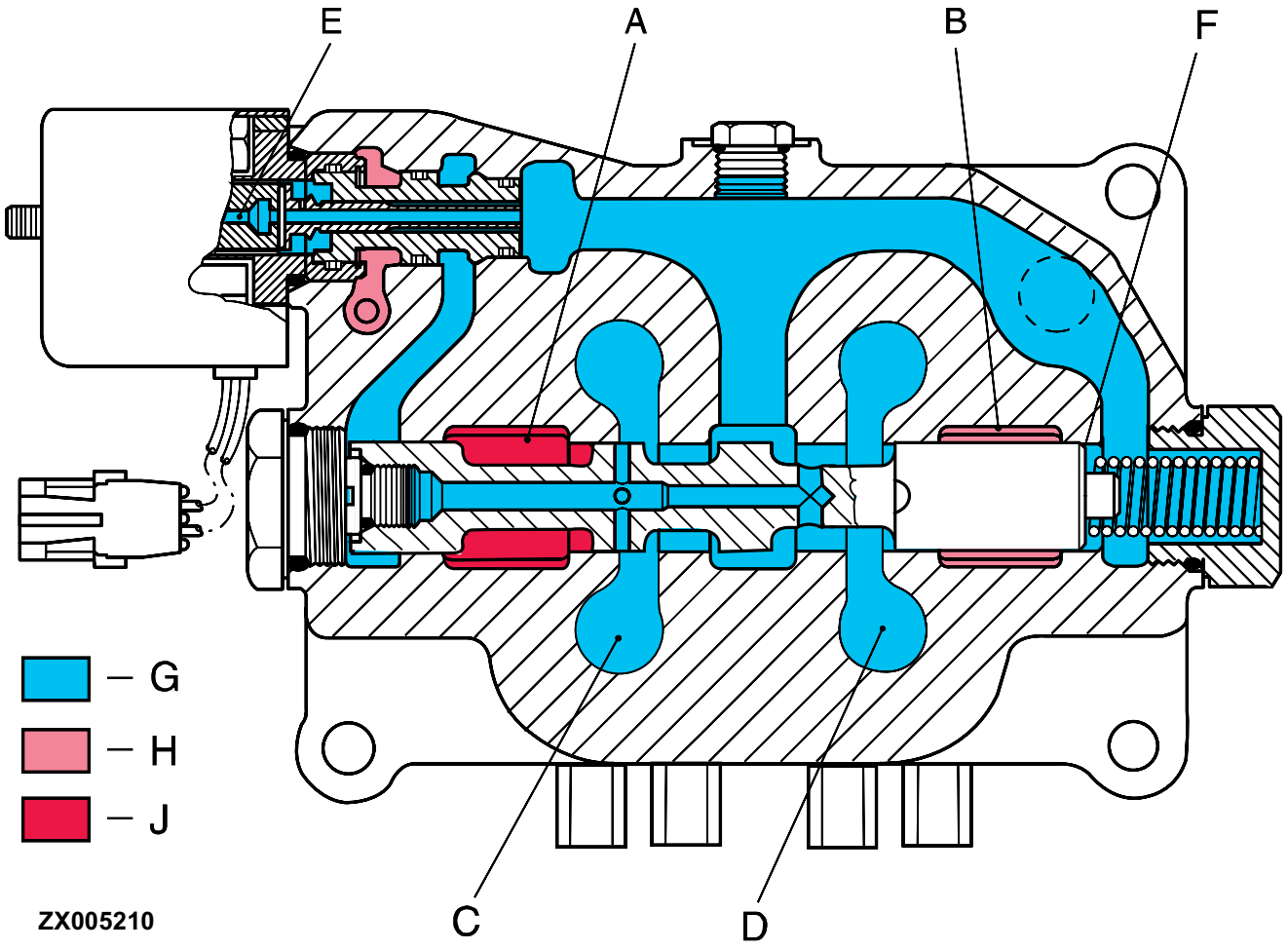
The swashplate moves to a position in which oil delivery is just sufficient to maintain a pressure of 44000 kPa (440 bar; 6400 psi). This will avoid rapid overheating of the system.

ZX,TMXZCO003178-19-17JAN94

HYDROSTATIC DRIVE OPERATION, OVERLOAD CONDITIONS



FOUR-WHEEL DRIVE SOLENOID VALVE, DISENGAGED POSITION

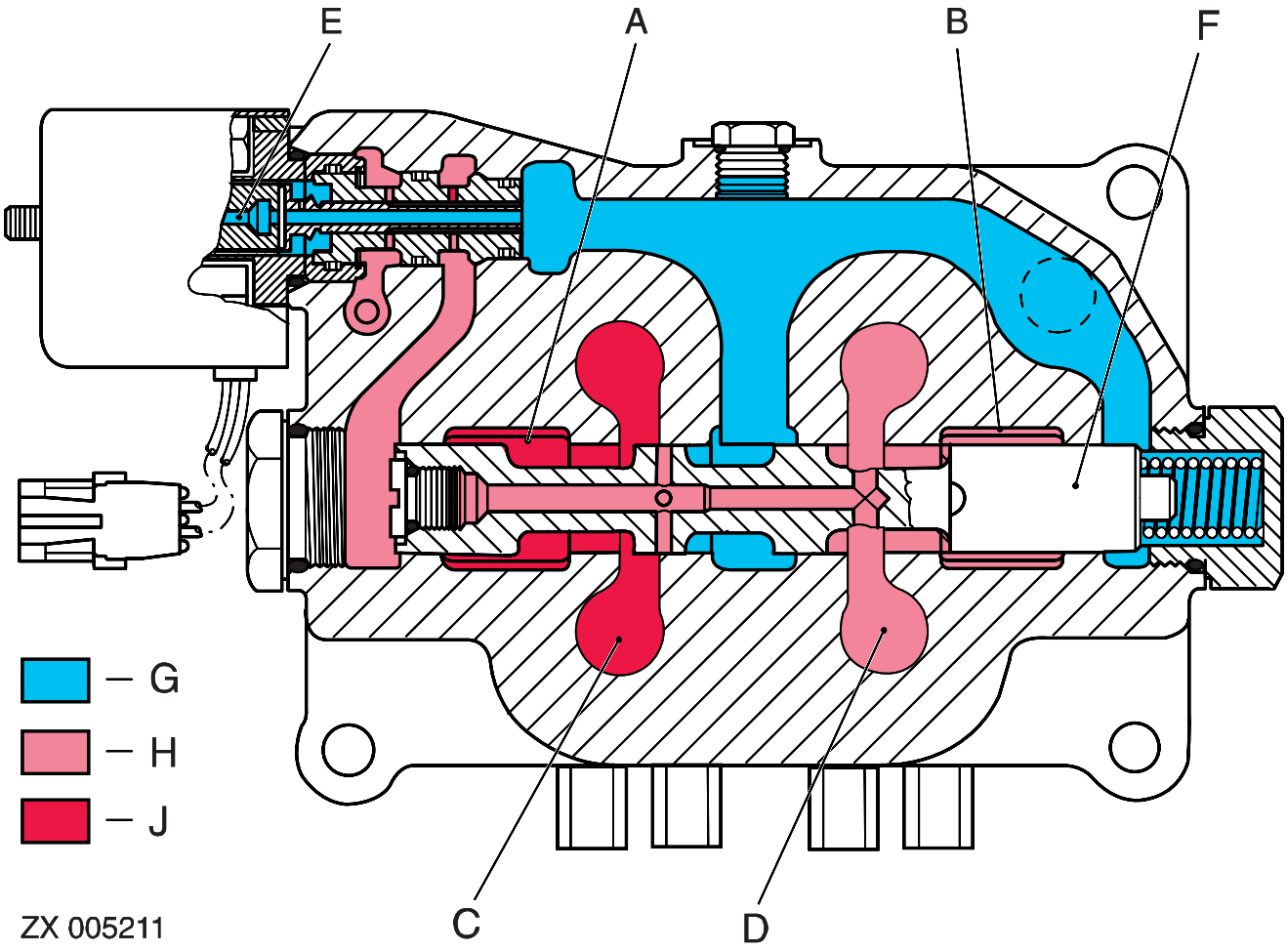


A—High pressure oil passage (forward)
B—High pressure oil passage (reverse)
C—Passage to cam lobe motors (forward)
D—Passage to cam lobe motors (reverse)
E—Solenoid valve
F—Plunger
G—Low pressure oil (return oil)
H—Charge pressure
I—High pressure oil

With four-wheel drive shut off, solenoid valve (E) is not activated. Pressure oil from charge pump does not reach plunger (F). Plunger (F) remains in left-hand end position where there is no connection between front axle drive oil passages and rear axle drive oil passages.

ZX,TMXZCO003179-19-21JUL98

FOUR-WHEEL DRIVE SOLENOID VALVE, ENGAGED POSITION

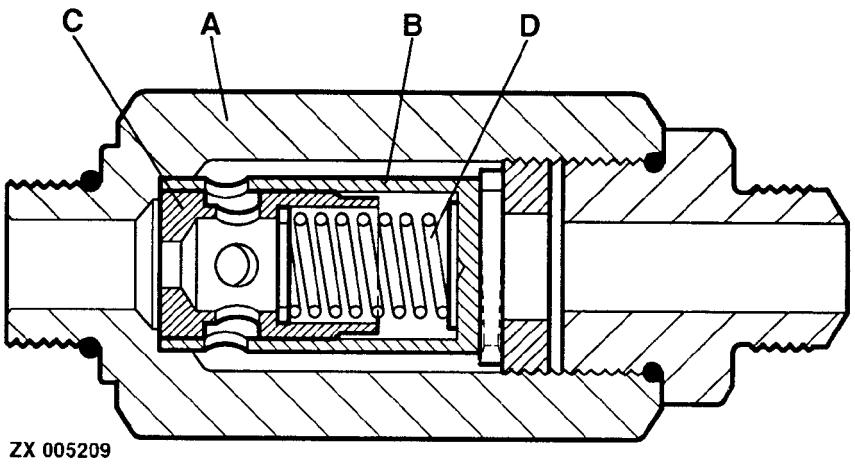


A—High pressure oil passage (forward)
B—High pressure oil passage (reverse)
C—Passage to cam lobe motors (forward)
D—Passage to cam lobe motors (reverse)
E—Solenoid valve
F—Plunger
G—Low pressure oil (return oil)
H—Charge pressure
I—High pressure oil

With four-wheel drive engaged, solenoid valve (E) is activated. Pressure oil is directed from the charge pump to face of plunger (F). Plunger (F) is moved against spring force. Now front axle high pressure lines and rear axle high pressure lines (to cam lobe motors) are connected to each other. Hydraulic oil flow is distributed to front and rear axles.

ZX,TMXZCO003180-19-21JUL98

FOUR-WHEEL DRIVE FLOW CONTROL VALVES



A—Housing **B—Insert** **C—Piston** **D—Spring**

Machines with four-wheel drive are provided with four flow control valves. They are located directly at the electromagnetic control valve used for engaging four-wheel drive.

The two flow control valves for forward travel limit oil flow to 80 L/Min (21 gpm). The two flow control valves for reverse travel limit oil flow to 53 L/Min (14 gpm).

Max. delivery of variable pump is 255 L/Min (67 gpm). In Germany, max. delivery is limited to 200 L/Min (53 gpm), because speed limit for road travel is 20 km/h. For this reason the control lever must be moved as far as possible when rear wheels start to spin to ensure an adequate oil supply to fixed-displacement motor.

ZX,TMXZCO003181-19-17JAN94

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

TESTING HYDROSTATIC SYSTEM

Universal pressure test kit (A) FKM10002

Z110413 -UN-02JUN95

ZX,TMSPFH001762-19-22FEB92

TESTING HIGH PRESSURE RELIEF VALVES

Pressure gauge FKM10208

ZX001661 -UN-06JUN95

ZX,TMSPFH001763-19-22FEB92

TEST PORT CONNECTIONS

Quick coupler JT03264

ZX001719 -UN-26APR95

ZX,TMSPFH001764-19-22FEB92

SPECIFICATIONS

Item	Measurement	Specification
Charge pressure relief valve	Charge pressure	1500 kPa (15 bar; 220 psi)
Flushing pressure relief valve	Flushing pressure	1100 kPa (11 bar; 160 psi)
High-pressure relief valves, 2254-2258	Valve setting	Flushing pressure plus 46500 kPa (465 bar; 6750 psi)
High-pressure relief valves, 2264-2266	Valve setting	Flushing pressure plus 43100 kPa (431 bar; 6250 psi)

ZX,TMXZCO010091-19-01AUG97

TESTING HYDROSTATIC SYSTEM

NOTE: For all checks, oil temperature in reservoir must be 50—80˚C (122—176˚F).

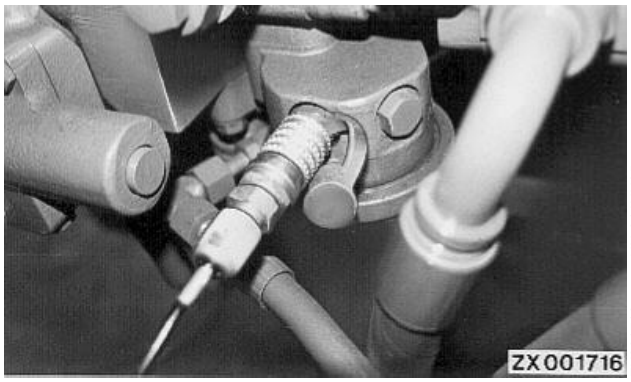
ZX,TMSPFH001767-19-22FEB92

CHECKING CHARGE AND FLUSHING PRESSURE

1. Move hydrostatic drive control lever to neutral position. Apply parking brake. Connect a pressure gauge with a measuring range of 0—4000 kPa (0—40 bar; 0—600 psi).

2. Run engine at fast idle. Charge pressure should now be between 1700 and 2400 kPa (17 and 24 bar; 246 and 350 psi).

3. Move hydrostatic drive control lever fully forward or rearward. A flushing pressure of at least 100 kPa (1 bar; 14 psi) below the charge pressure measured in step 2 must be obtained.



ZX001716 -UN-01JUN95

ZX,TMXZCO010092-19-01AUG97

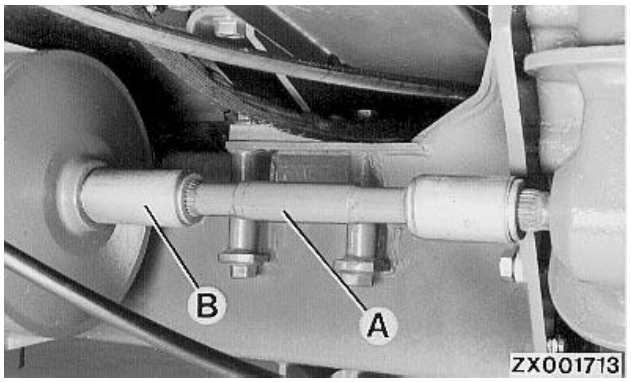
CHECKING HIGH PRESSURE RELIEF VALVES — PREPARATIONS

IMPORTANT: When checking high pressure relief valves, observe the following points:

1. Block front wheels.

2. On both sides, disconnect drive shafts (A) from transmission by sliding sleeves (B) on shafts.

3. Apply parking brake and engage 3rd gear.



ZX001713 -UN-01JUN95

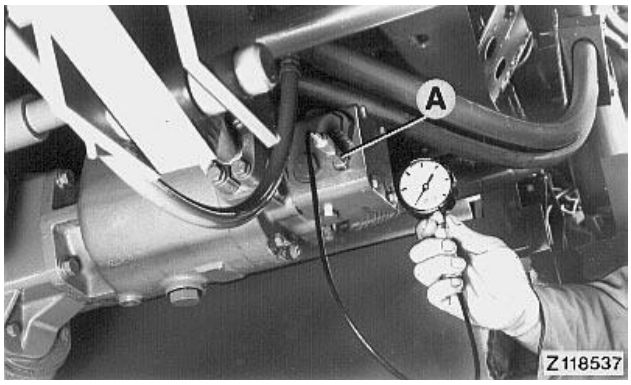
ZX,TMSPFH001769-19-22FEB92

CHECKING HIGH PRESSURE RELIEF VALVE FOR FORWARD TRAVEL

Connect pressure gauge to test port (A). Run engine at fast idle. Operate foot brakes and temporarily move hydrostatic drive control lever forward.

Minimum pressure must be 41 400 kPa (414 bar) (6000 psi) plus flushing pressure measured previously.

If pressure is not as specified, replace high pressure relief valve (rear valve as seen in direction of travel).



-UN-01JUN95
Z118537

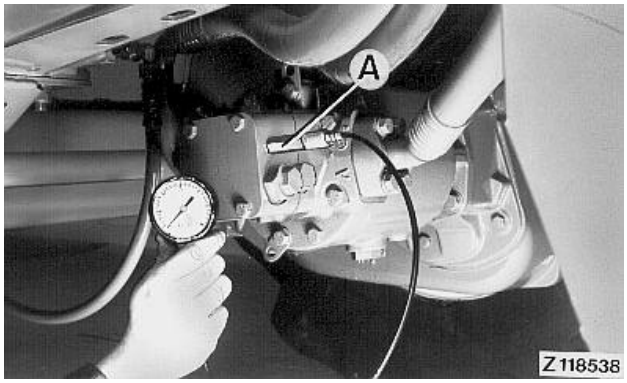
ZX,TMSPFH001770-19-22FEB92

CHECKING HIGH PRESSURE RELIEF VALVE FOR REVERSE TRAVEL

Connect pressure gauge to test port (A). Run engine at fast idle. Operate foot brakes and temporarily move hydrostatic drive control lever rearward.

Minimum pressure must be 41 400 kPa (414 bar) (6000 psi) plus flushing pressure measured previously.

If pressure is not as specified, replace high pressure relief valve (front valve as seen in direction of travel).



-UN-01JUN95
Z118538

ZX,TMSPFH001771-19-22FEB92

INSPECT PARTS

NOTE: Some internal parts of the motor and pump are similar in appearance and function; others have the same part number.

Most part failures are identifiable by inspecting the part and comparing it to the following information to determine the suspected cause of failure.

(Worn) This condition is usually indicated by a smooth but definite wear pattern in or across finished surfaces. A worn condition is usually caused by a lack of lubrication or very fine abrasive contamination suspended in the fluid.

(Scored) This condition is usually indicated by fine scratch marks in or across finished surfaces. Scoring usually is caused by a lack of or improper lubrication or possible abrasive contamination suspended in the fluid.

(Scratched) This condition is usually indicated by small scratches in or across finished surfaces. It is usually caused by abrasive contamination suspended in the fluid.

(Grooved) This condition is usually indicated by grooves cut in or across finished surfaces. Grooves are usually caused by a lack of lubrication or large particle contamination suspended in the fluid.

(Discoloration) This condition is usually indicated by a noticeable change in color on the finished surfaces. Discoloring usually is caused by a lack of or improper lubrication.

Excessive fluid temperature may also cause this condition by increasing the lubricating film loss between rotating mating parts.

(Smeared) This condition is usually indicated by the presence of bronze embedded in or across finished mating surfaces. Smearing is usually caused by a lack of or improper lubrication or possible abrasive contamination suspended in the fluid. Excessive fluid temperature may also cause this condition by the lubricating fluid film loss between rotating mating parts.

(Galled) This condition is usually indicated by the presence of material that has been removed from one surface, normally by friction, and sometimes adhered to its mating component surface. Galling usually is caused by a lack of or improper lubrication. Excessive fluid temperature may also cause this condition by increasing the lubricating fluid loss between rotating mating parts.

(Eroded) This condition is usually indicated by erosion (pitted appearance) or removal of material from finished surfaces. Eroding is usually caused by cavitation or voids in the fluid.

(Rolled) This condition is usually indicated by the extreme outer edge of the finished surface being deformed or rolled over. Rolled usually is caused by a lack of lubrication to the edges of these finished surfaces when subjected to over speeding or block lift conditions.

1401,5020,Y -19-12SEP91

LACK OF LUBRICATION

The following terminology will be used for determining probable causes of system and/or part failure.

Lack of lubrication is probably the most common, yet misinterpreted terminology associated with failure analysis of system and/or part failures. It usually is a result of condition(s) that create an insufficient oil film required to lubricate rotating part surfaces.

Without the proper oil film, rotating metal-to-metal surfaces create friction and excessive temperatures that usually cause premature part failures.

Depending on the severity of the oil film loss and friction, rotating critical surfaces will become severely worn, smeared, galled or noticeably discolored.

1401,5020,AC -19-12SEP91

ABRASIVE CONTAMINATION

Abrasive contamination is probably the second most common, yet identifiable terminology.

This condition usually is system-related by the introduction of abrasive foreign particles that damage the critical surface areas as they pass through the system.

These abrasive particles usually are larger than the lubricating oil film thickness required to lubricate part surfaces.

A lack of lubrication may also be created by abrasive contamination that creates excessive leakage passages between critical rotating surfaces.

Depending on the size and amount of abrasive contamination passing through or contacting parts, the rotating surfaces will become worn, scored, scratched or grooved.

1401,5020,AD -19-12SEP91

CAVITATION

Cavitation is sometimes confused with the lack of lubrication which usually is the result of, but not the cause of cavitation.

This condition usually is created by the presence of air suspended in the oil.

Excessive amounts of air in the oil will not provide an adequate film required to properly lubricate.

Partial or total restriction of the pump inlet will also create cavitation.

Depending on the severity of cavitation, rotating surfaces will become eroded, scored, smeared or galled.

1401,5020,AE -19-12SEP91

Excessive oil temperature is sometimes the result or lack of lubrication, but not necessarily the direct cause. This condition usually is system-created by improper system cooling, high pressure oil passing over relief valves and excessive closed loop leakage. Excessive oil temperatures usually will decrease the fluid viscosity or lubrication oil film thickness required to lubricate rotating surfaces.

Depending on the condition or severity of oil temperature, rotating surfaces usually will become scored, smeared, galled or discolored.

1401,5020,AF -19-12SEP91

The most common cause of improper lubrication is created by chemical contaminants present in the hydraulic fluid, such as water. Water not only creates improper lubrication to rotating surfaces, but also creates undesirable chemical changes to the oil and mating surfaces.

Depending on the severity of the improper lubrication used, component parts usually will become discolored, scored, smeared, or galled.

1401,5020,AG -19-12SEP91

OVER SPEEDING

Over speeding is sometimes associated with the lack of lubrication, which usually is the result of, but not necessarily the direct cause of over speeding.

Hydrostatic transmissions by design, are subject to operate within certain speed limitations. When units are operated above their design limitations, certain parts separate or tip, creating excessive loading to small areas of these parts.

This small area usually is located on the outer edge of rotating parts, and because of the excessive loading subject to this area, the lubrication is removed also. Depending on the severity of over speeding that creates this excessive loading and loss of lubrication to rotating parts, a rolled, scored, smeared or galled condition will occur.

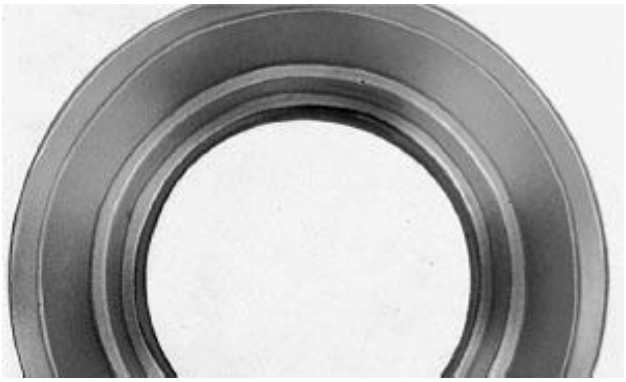
1401,5020,AH -19-12SEP91

INSPECT SHAFT SEAL

The shaft seal assembly is a pressure-type mechanical seal that consists of two mating parts, a bronze rotating half and a steel stationary half.

To properly seal the shaft, the fine lapped sealing surface located on each seal half must be smooth, flat, and free of all nicks, burrs, and scratches.

The scoring across the sealing surfaces indicates the seal was subject to abrasive contamination.



N36987 -UN-22SEP88

1401,5020,AI -19-12SEP91

The scoring marks across the sealing surface indicate that it was subject to abrasive contamination.

H50349 -UN-20JAN89

1401,5020,AJ -19-12SEP91

The smearing around the center of the sealing surface indicates it was subject to a lack of/or insufficient lubrication. This condition usually is a result of insufficient oil film to properly lubricate rotating part mating surfaces.

The discoloration on this bronze seal half indicates the possibility of excessive oil temperatures.

Water not only creates an improper lubrication condition, but will also cause undesirable chemical changes to the oil. This chemical change to the oil will cause the bronze parts to discolor or turn dark.

H50350 -UN-20JAN89

1401,5020,AK -19-12SEP91

INSPECT THRUST PLATE

The smearing on this thrust plate surface indicates it was subjected to a lack of/or insufficient lubrication. This condition usually is a result of insufficient oil film required to properly lubricate rotating part surfaces.

This thrust plate may be reused by installing it with the smeared side toward the swashplate, only if the thrust plate is not damaged in any way. The other finished side must be smooth, flat and free of any nicks, burrs, and scratches.

1401,5020,AL -19-12SEP91

The scoring marks on this thrust plate indicate it was subjected to abrasive contamination. This contamination may have been suspended in the oil.

H50352 -UN-20JAN89

1401,5020,AM -19-12SEP91

The discoloration on this thrust plate indicates it was subjected to extremely high temperature. This condition is a result of very high oil temperature.

This thrust plate should not be reversed and reused because the excessive temperature created bends.

H50353 -UN-20JAN89

1401,5020,AN -19-12SEP91

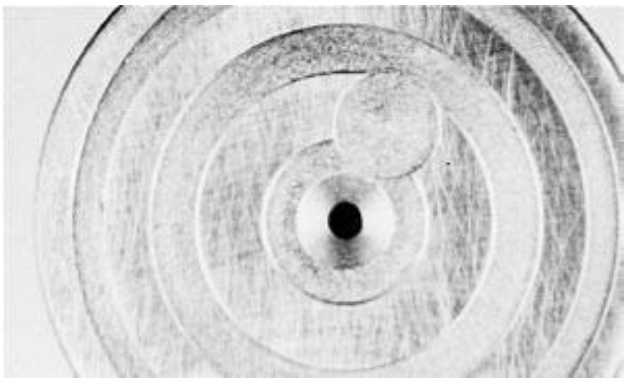
INSPECT FIXED SWASHPLATE

The scoring on this fixed swashplate indicates it was subjected to abrasive contamination.

1401,5020,AO -19-12SEP91

INSPECT PISTON SLIPPER

The small scratch marks across this slipper face indicates that it was subjected to some very fine abrasive.



H50355 -UN-20JAN89

1401,5020,AP -19-12SEP91

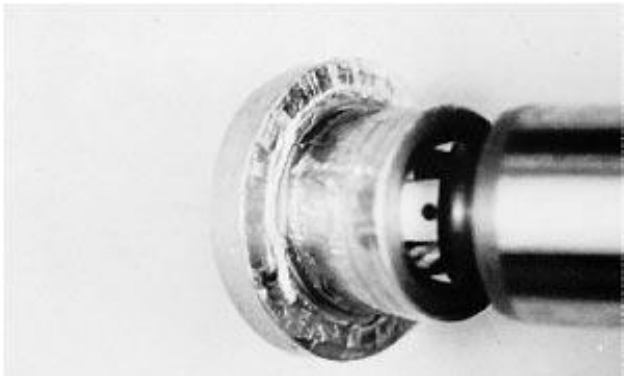
The scoring on this piston slipper face indicates it was subjected to abrasive contamination. A small particle of contamination is embedded into the balance land of this piston slipper.

H50356 -UN-20JAN89

1401,5020,AQ -19-12SEP91

The galling around the underside of this slipper indicates it was subjected to an over speeding condition.

Over speeding usually causes the piston slipper to tip and scrape against the edge of its mating part, creating galling.



H50357 -UN-20JAN89

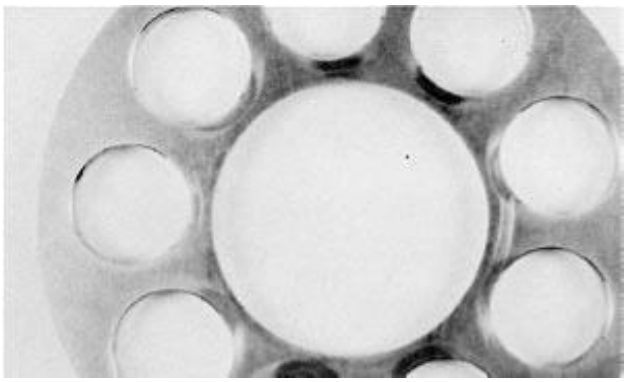
1401,5020,AR -19-12SEP91

The smearing across this slipper indicates it was subjected to a severe lack of or insufficient lubrication.

1401,5020,AS -19-12SEP91

INSPECT PISTON RETAINER

The scoring around the nine holes and center hole indicates it was subjected to a fine abrasive contamination.



1401,5020,AT -19-12SEP91

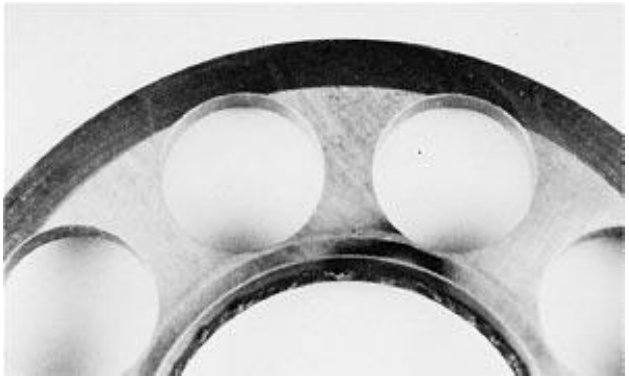
The scoring around the nine holes indicates it was subjected to fine abrasive contamination.

The galling on the center hole usually is created by a lack of lubrication.

1401,5020,AU -19-12SEP91

The slight scoring around the nine piston slipper holes indicates it was subjected to a fine abrasive.

The galling on the center hole usually is created by a lack of lubrication.



1401,5020,AV -19-12SEP91

The discoloration on this retainer indicates it was subjected to possible improper lubrication or excessive heat.

1401,5020,AW -19-12SEP91

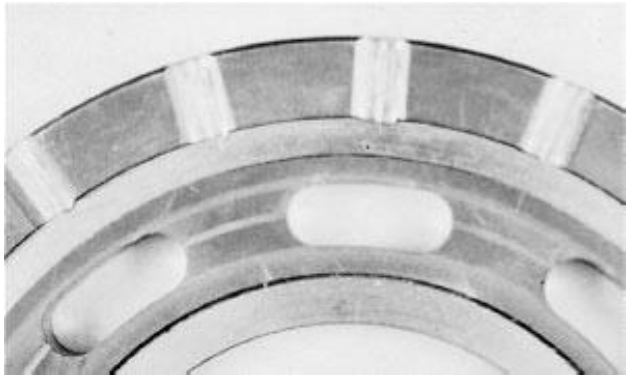
INSPECT CYLINDER BLOCK

The scoring in these cylinder barrel bushings indicates it was subjected to abrasive contamination. This contamination between the cylinder bushing and pistons caused two of the bushings to be pulled out of the cylinder barrel.

1401,5020,AZ -19-12SEP91

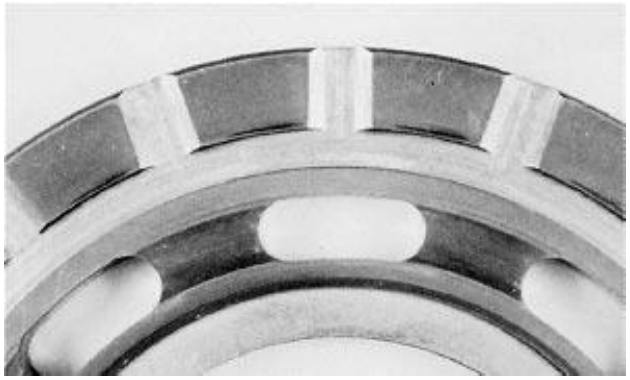
INSPECT BEARING PLATE

The grooving between the port or kidneys on this bearing plate indicates it was subjected to particle contamination.



1401,5020,BA -19-12SEP91

The discoloration between the port or kidneys indicates it was possibly subjected to an improper oil. This condition most likely was caused by water in the system. Water under pressure tends to discolor bronze parts.



1401,5020,BB -19-12SEP91

The discoloration and grooving between the port or kidneys indicates it was not only subjected to improper fluid but also to particle contamination.

1401,5020,BC -19-12SEP91

The smearing on the balance lands and slight erosion between the port or kidneys indicates it was subjected to a lack of or improper lubrication or possibly cavitation.

1401,5020,BD -19-12SEP91

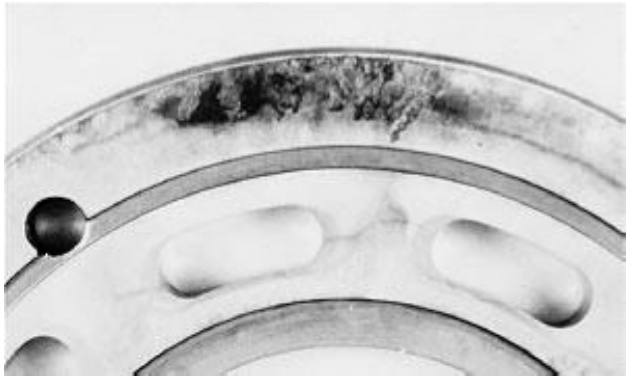
The corrosion appearance on the back side of the plate indicates possible cavitation. This condition usually is the result of the bearing plate being separated or pulled off its mating part in a fluttering motion.

1401,5020,BE -19-12SEP91

The smearing on the balance lands, inner bearing support area and erosion of the leading edge of the port or kidneys indicates it was subjected to a lack of or improper lubrication or cavitation.

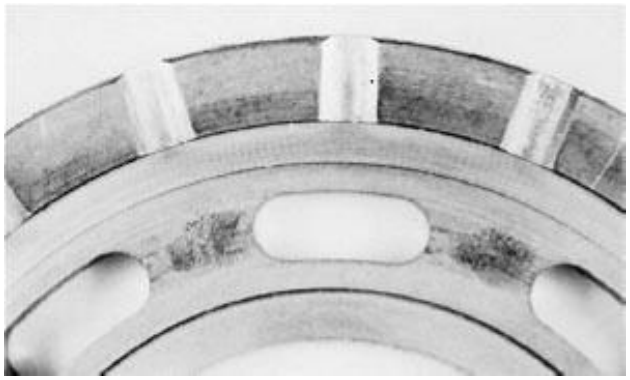
1401,5020,BF -19-12SEP91

The corrosion appearance on the back side of the plate indicates possible extended cavitation.



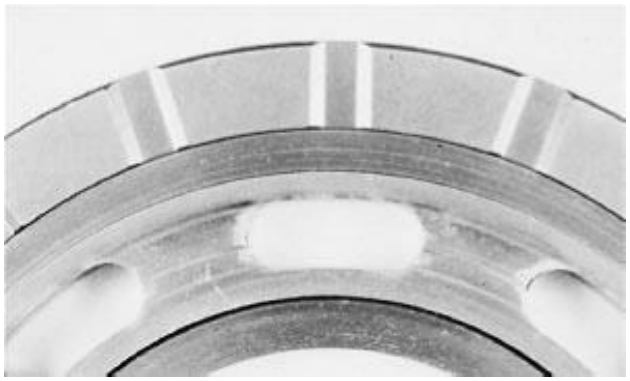
1401,5020,BG -19-12SEP91

The erosion noted between the port or kidneys indicates it was subjected to cavitation.



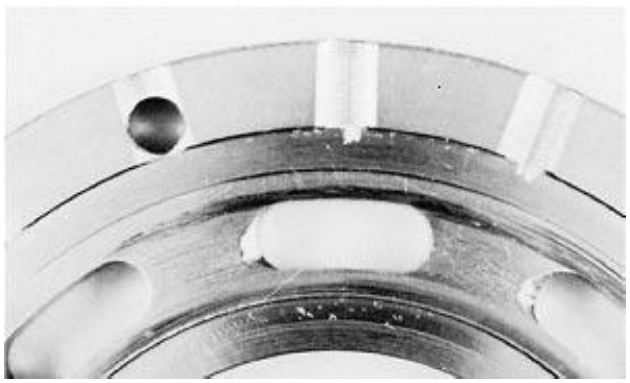
1401,5020,BH -19-12SEP91

The erosion on the leading edges and grooves between the port or kidneys indicates it was subjected to cavitation and particle contamination.



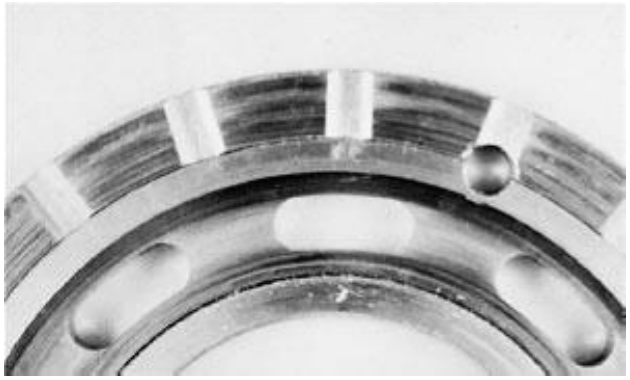
1401,5020,BI -19-12SEP91

The erosion on the leading edges and in between the port or kidneys indicates it was subjected to extended cavitation. The smearing on the inner and outer balance lands indicates a possible lack of or insufficient lubrication.



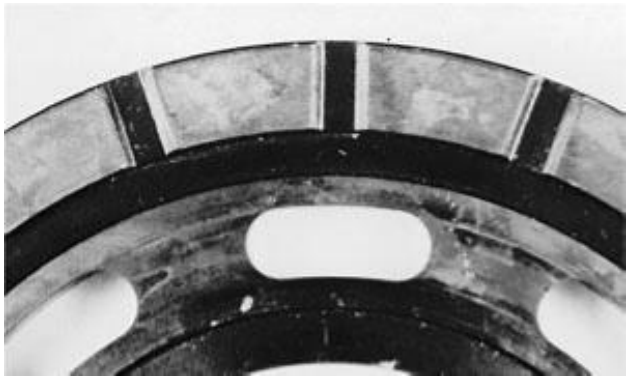
1401,5020,BJ -19-12SEP91

The smearing across the entire face of this bearing plate indicates it was subjected to a lack of or insufficient lubrication.



1401,5020,BK -19-12SEP91

The severe discoloration noted on this bearing plate indicates it was subjected to a very high oil temperature.



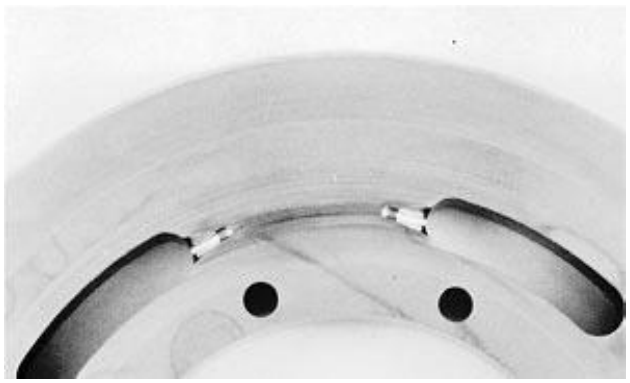
1401,5020,BL -19-12SEP91

INSPECT VALVE PLATE

The smearing on both the inner plate and outer balance lands indicates it was subjected to a lack of or insufficient lubrication.

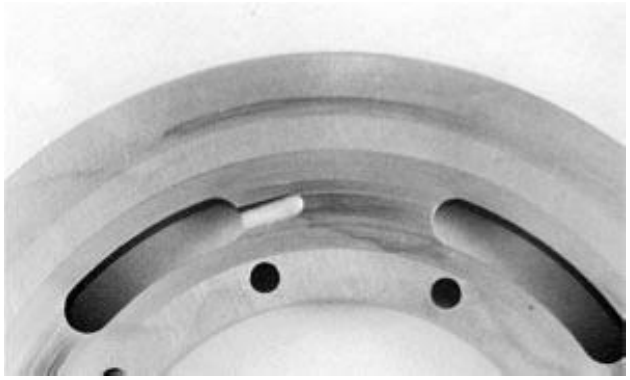
1401,5020,BM -19-12SEP91

The heavier score marks between the port or kidneys and lighter score marks noted on the balance lands and bearing support areas indicate the valve plate was subjected to abrasive contaminants.



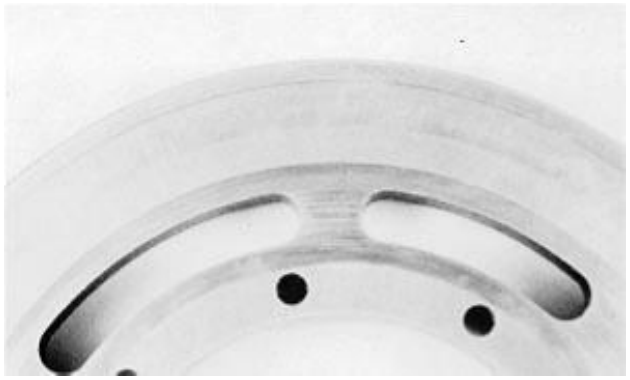
1401,5020,BN -19-12SEP91

The scoring marks on the balance lands and bearing support area indicate the valve plate was subjected to abrasive contamination. Also noticeable, is some smearing between the port or kidneys and inner bearing support area indicating a possible lack of or improper lubrication.



1401,5020,BO -19-12SEP91

The scoring on the balance lands and inner part of the bearing support area indicates abrasive contamination. Also noticeable is some smearing between the port or kidneys and extreme outer edge of the bearing support, which indicates possible over speeding. Over speeding usually causes the rotating parts to tip and contact only their outer edges rather than across the entire surface. When tipped, excessive loading to small contact areas occurs.

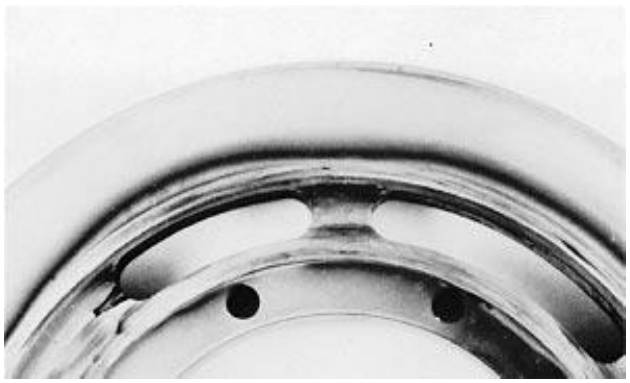


1401,5020,BP -19-12SEP91

The smearing on the bearing support area indicates the valve plate was subjected to a lack of and possibly improper lubrication. Close inspection shows cracks across this area, likely created by friction, probably as a result of the loss of lubricating oil film required to properly lubricate mating part surfaces. Also shown is some very heavy scoring between the port or kidneys caused by particle abrasive contamination suspended in the system oil.

1401,5020,BQ -19-12SEP91

The discoloration between the balance indicates it was subjected to high fluid temperature or possibly a complete loss of lubrication.

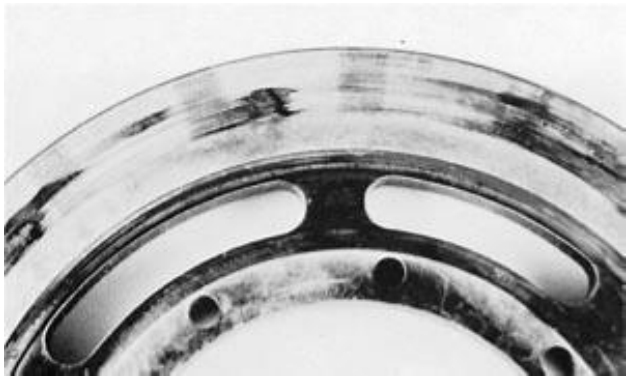


1401,5020,BR -19-12SEP91

The discoloration of this valve plate indicates it was subjected to a high oil temperature or improper fluid.

1401,5020,BS -19-12SEP91

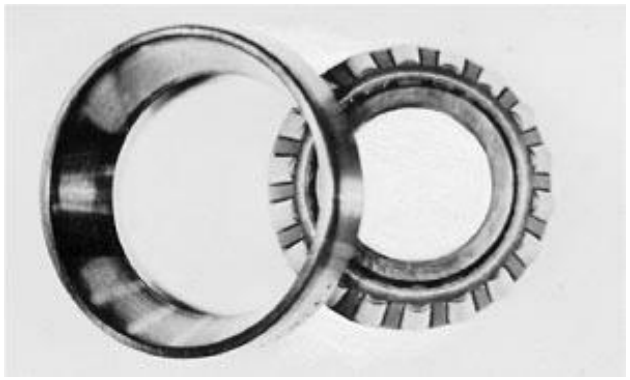
The discoloration of this valve plate indicates it was subjected to excessive oil temperature. The scoring across the plate surface indicates a possible lack of or improper lubrication.



1401,5020,BT -19-12SEP91

INSPECT BEARING AND RACE

The discoloration indicates excessive system temperatures.



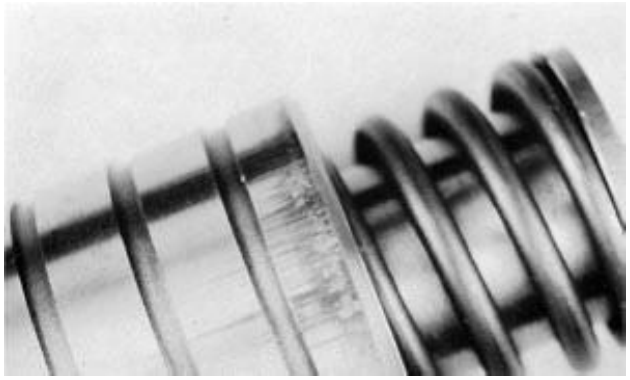
1401,5020,BU -19-12SEP91

The grooves across this trunnion bearing race indicates it was subjected to an improper bearing preloading. This condition is the result of the insufficient preload, allowing the trunnion to move back and forth during operation.

1401,5020,BV -19-12SEP91

INSPECT SERVO PISTON

The scratches on this servo piston indicate it was subjected to abrasive contamination.



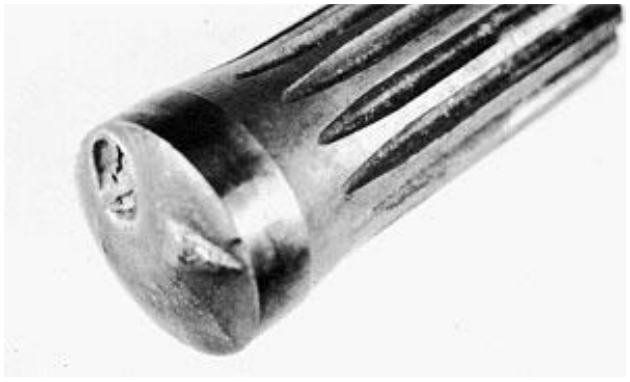
1401,5020,BW -19-12SEP91

The scoring inside the threaded end on this servo sleeve indicates it was subjected to abrasive contamination or lack of lubrication.

1401,5020,BX -19-12SEP91

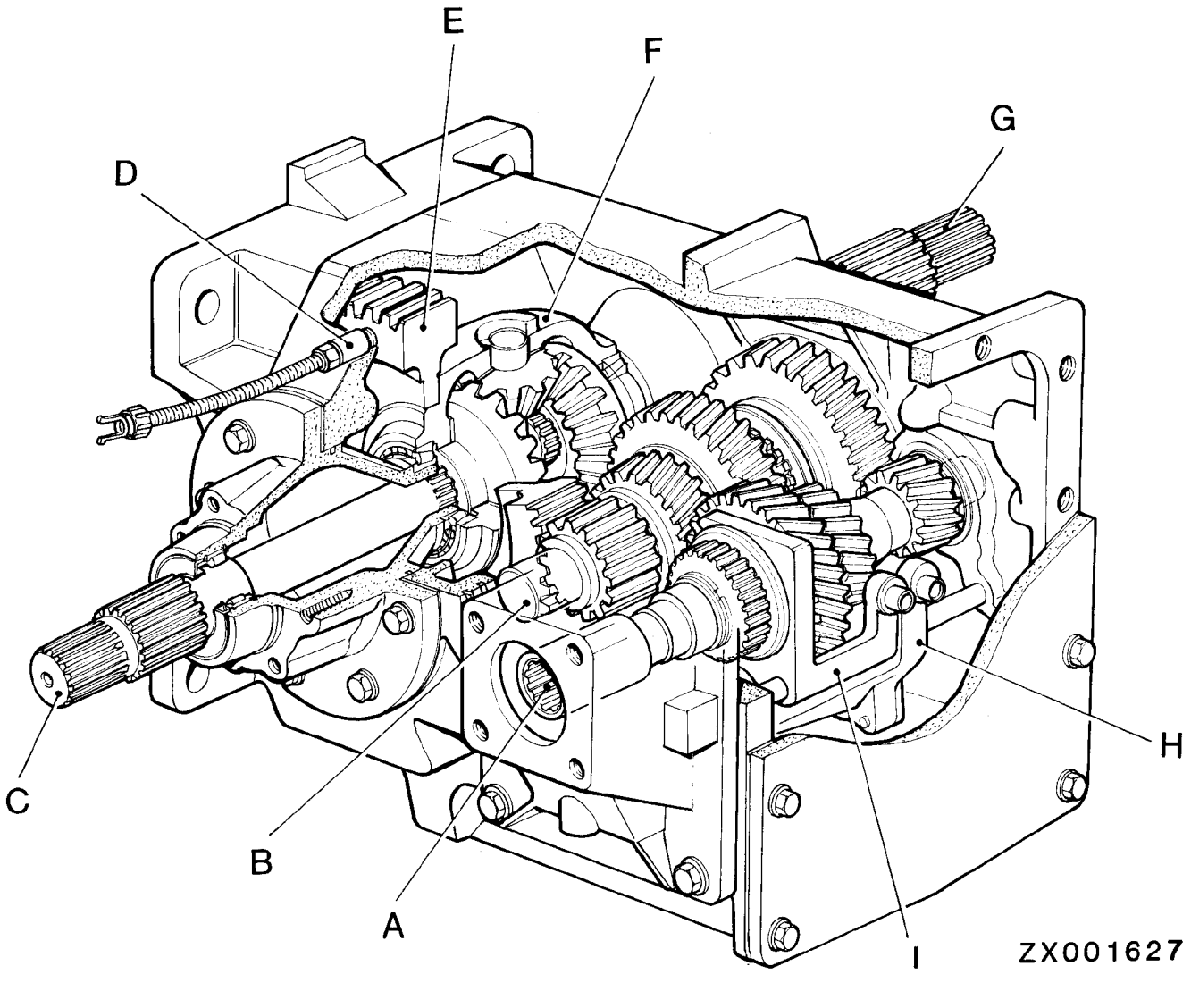
INSPECT DRIVE SHAFT

This broken shaft end indicates a severe side loading or misalignment.



1401,5020,BY -19-12SEP91

THREE-SPEED TRANSMISSION — OPERATION



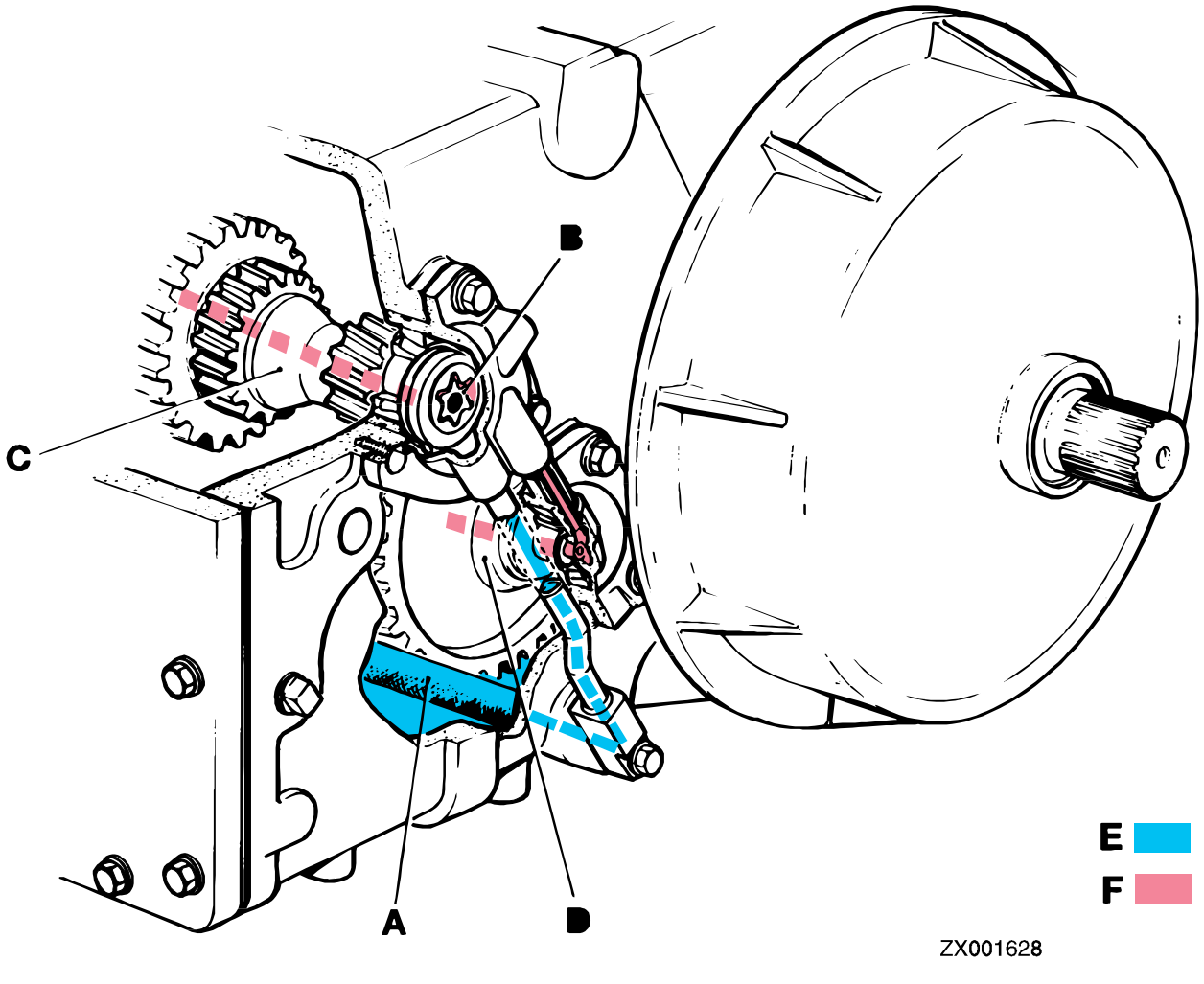
A—Transmission input shaft
B—Countershaft
C—Differential output shaft, left-hand
D—Speed sending unit
E—Differential ring gear
F—Differential housing
G—Differential output shaft, right-hand
H—Shifter fork
I—Shifter fork

Power is transmitted from fixed-displacement motor of hydrostatic drive to countershaft (B) via transmission input shaft (A).

Three different speed ratios are obtained by laterally moving shifter forks (H) and (I).

ZX,TMSPFH001130-19-23SEP91

LUBRICATION OF THREE-SPEED TRANSMISSION



ZX001628

A—Suction filter
B—Lube pump
C—Transmission input shaft
D—Countershaft
E—Low-pressure oil
F—Charge pressure

Transmission input shaft and countershaft are pressure lubricated.

Lube pump (B) draws oil from the sump and forces it into lubrication bore of transmission input shaft and, via an external line, into lubrication bore of countershaft.

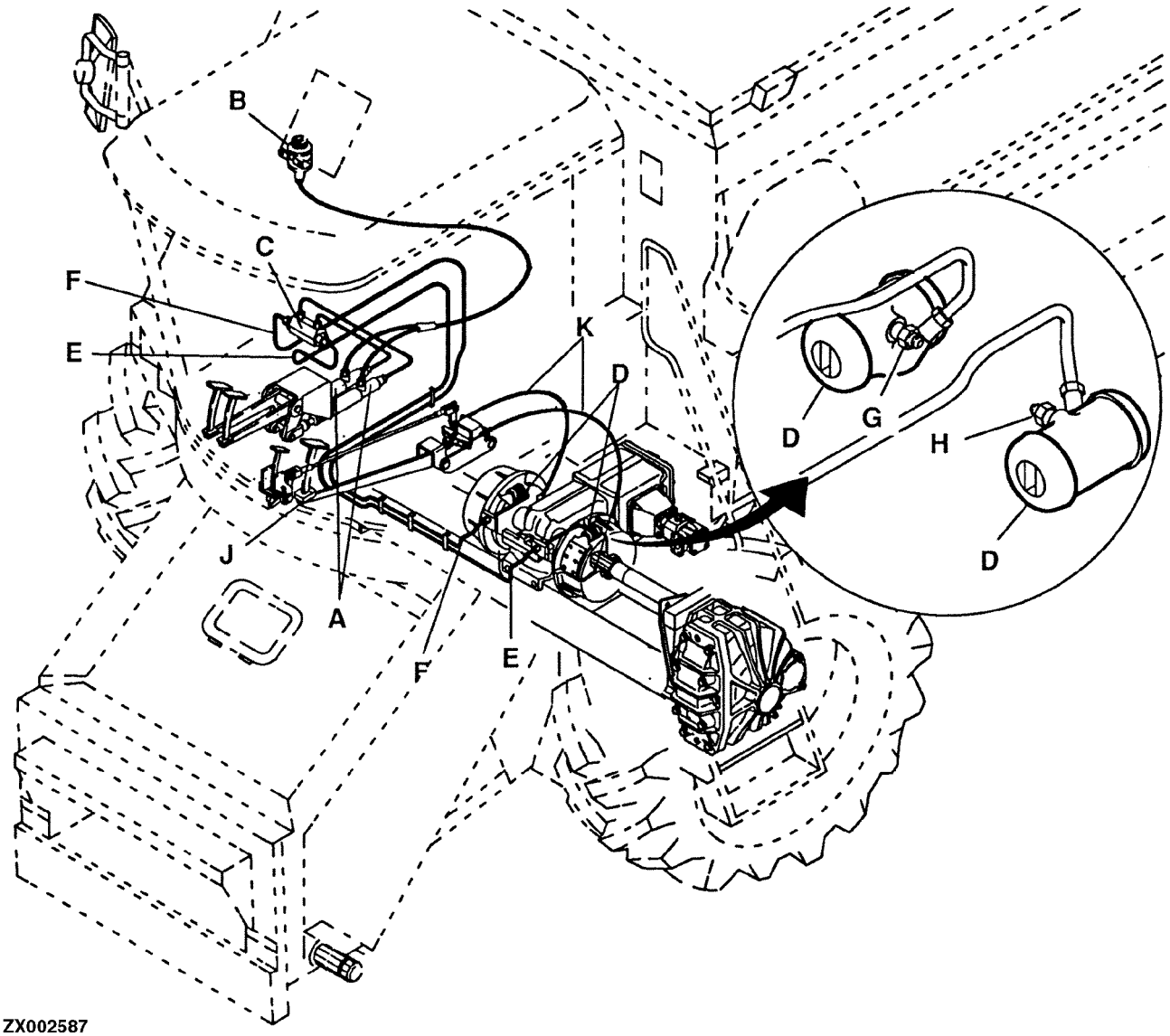
ZX,TMSPFH001131-19-16SEP94

Section 260
Brakes, Steering, Rear Axle

Contents

Page

BRAKE OPERATION



A—Brake master cylinder (2 used)
B—Brake fluid reservoir
C—Pressure equalizing valve
D—Brake slave cylinder
E—Brake line
F—Brake line
G—Bleed valve
H—Bleed valve
J—Parking brake operating assembly
K—Parking brake cables

Drum brakes acting on drive shafts are located on both sides of the transmission.

Brake pedal forces are transmitted hydraulically to slave cylinders (D) via two double-stage master cylinders (A).

Pressure equalizing valve (C) ensures equal braking action on both sides.

The parking brake operated by a pedal to the left of the steering column also acts on the drum brakes. Braking force is transmitted to brake drums via cables (K).

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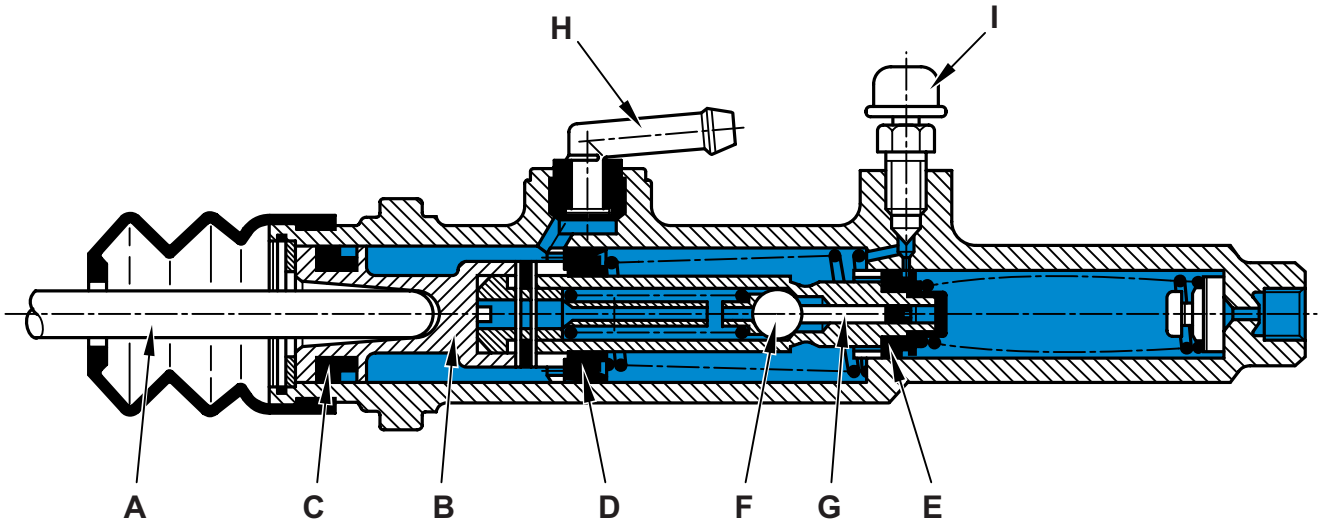
BRAKE MASTER CYLINDER — OPERATION



A—Piston rod
B—Double-stage piston
C—Secondary boot
D—Primary boot (low pressure cylinder)
E—Primary boot (high pressure cylinder)
F—Valve ball
G—Plunger
H—Brake fluid inlet
I—Bleed valve

Drum brakes are actuated in two stages: JOINING brake linings and drum and PRESSING linings against drum.

For joining brake linings and drum — with little pedal travel — only a low pressure is needed. The joining process is accomplished by the large diameter cylinder stage (charging stage).

To press linings against drum, a high pressure must be exerted; a relatively long pedal travel is still available for this purpose. Now the small diameter cylinder stage (pressure stage) is used.

Changing from charging stage to pressure stage is a continuous process.

Neutral Position

The above illustration shows neutral position of double-stage brake master cylinder.

Piston (B) is in end position, there is some play between piston rod (A) and piston (B). Equalizing bores are free, allowing brake fluid to flow to the brake fluid reservoir.

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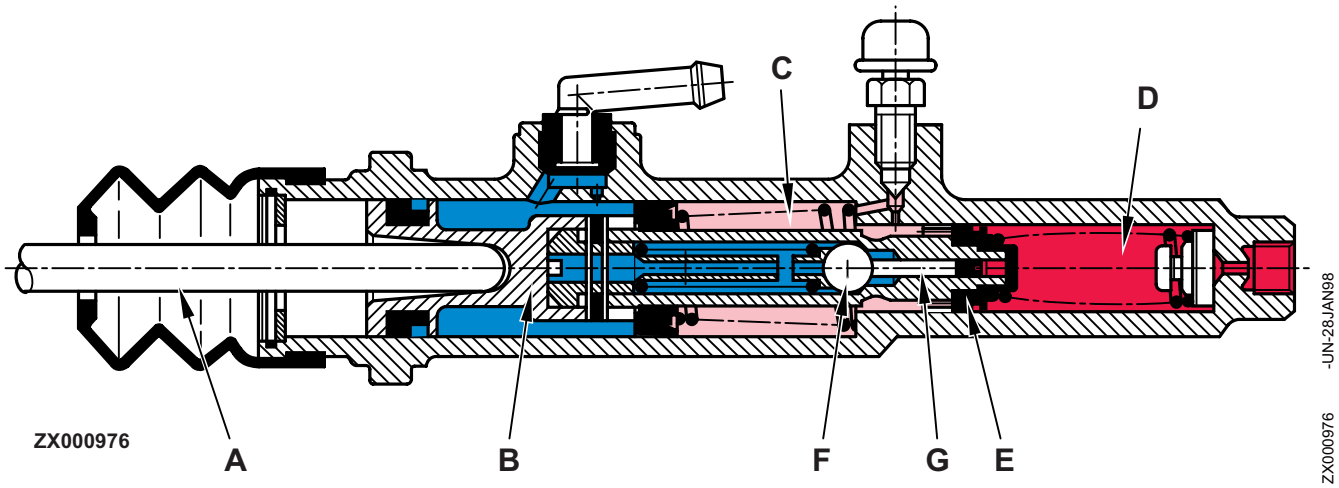

A—Piston rod
B—Double-stage piston
C—Low pressure stage
D—High pressure stage
E—Pressure spring
F—Ball
G—Plunger

Low Pressure Braking Action

When brakes are applied and piston of brake master cylinder is moved away from neutral position, the full amount of brake fluid from low pressure stage (C) and high pressure stage (D) flows to the brake slave cylinder.

The brake shoes are rapidly brought into contact with the brake drum.

When brake fluid force acting on ball (F) is bigger than force of spring (E), the ball is moved from its seat and allows brake fluid from low pressure stage to flow back through hollow plunger.

Now only brake fluid from high pressure stage flows to the brake slave cylinder.

As soon as pressure in high pressure stage increases, pressure in low pressure stage will decrease continuously. The pressure change is transmitted to ball (F) by plunger (G).

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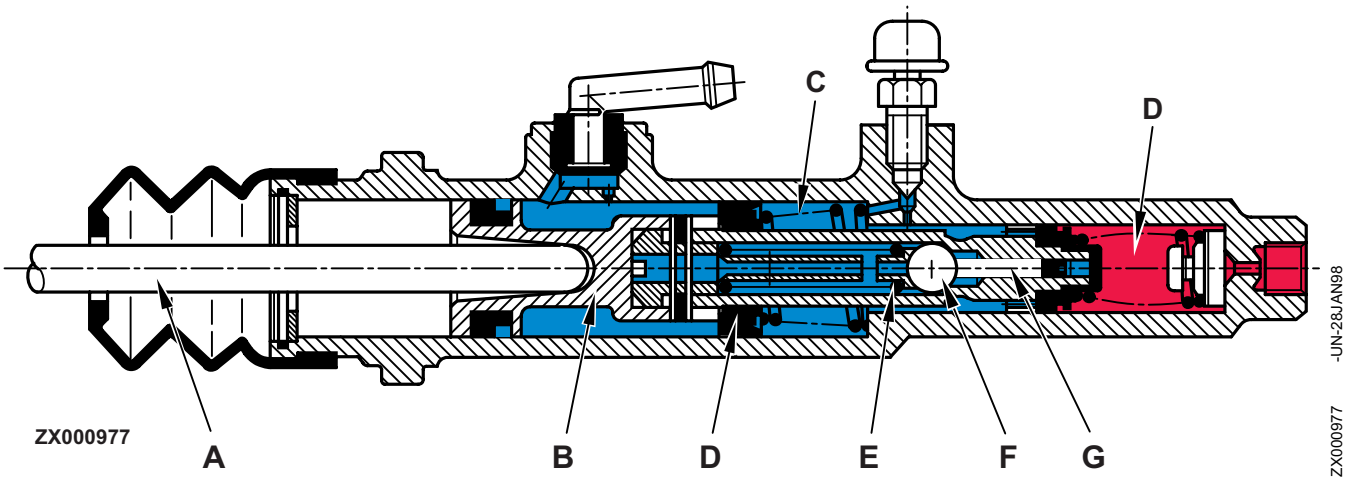

A—Piston rod
B—Double-stage piston
C—Low pressure stage
D—High pressure stage
E—Pressure spring
F—Ball
G—Plunger

High Pressure Braking Action

With brakes fully applied, i.e. very high pressure in high pressure stage (D), ball (F) is completely pushed from its seat by plunger (G). Pressure in low pressure stage drops to 0 kPa (0 bar) (0 psi).

The full pedal force is now transmitted to high pressure stage (D). A very high pressure will build up due to the relatively small piston surface, resulting in a very high braking force.

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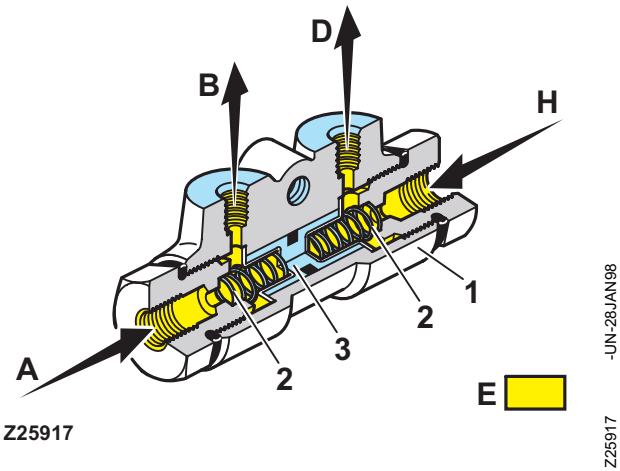
PRESSURE EQUALIZING VALVE

The valve equalizes pressure in both brake circuits. This is achieved by moving piston (3) from center position.

1—Pressure equalizing valve
2—Spring
3—Piston
A—Inlet port (l.h. circuit)
B—Outlet port (l.h. circuit)
C—inlet port (r.h. circuit)
D—Outlet port (r.h. circuit)
E—Brake fluid



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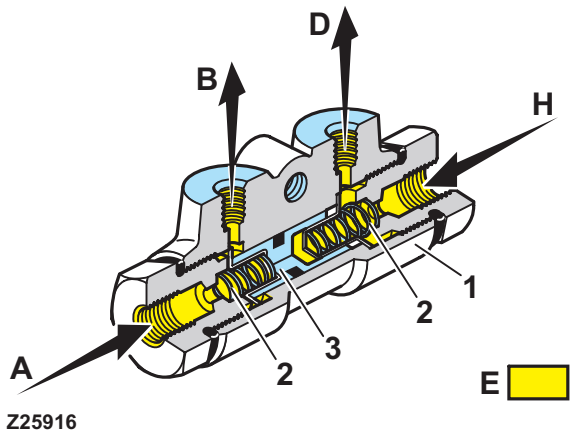
When pressure differs considerably in both brake circuits, e.g. when operating only one brake pedal or when one brake circuit fails to function, piston (3) is moved fully against the stop to maintain pressure.

1—Pressure equalizing valve
2—Spring
3—Piston
A—Inlet port (l.h. circuit)
B—Outlet port (l.h. circuit)
C—Inlet port (r.h. circuit)
D—Outlet port (r.h. circuit)
E—Brake fluid



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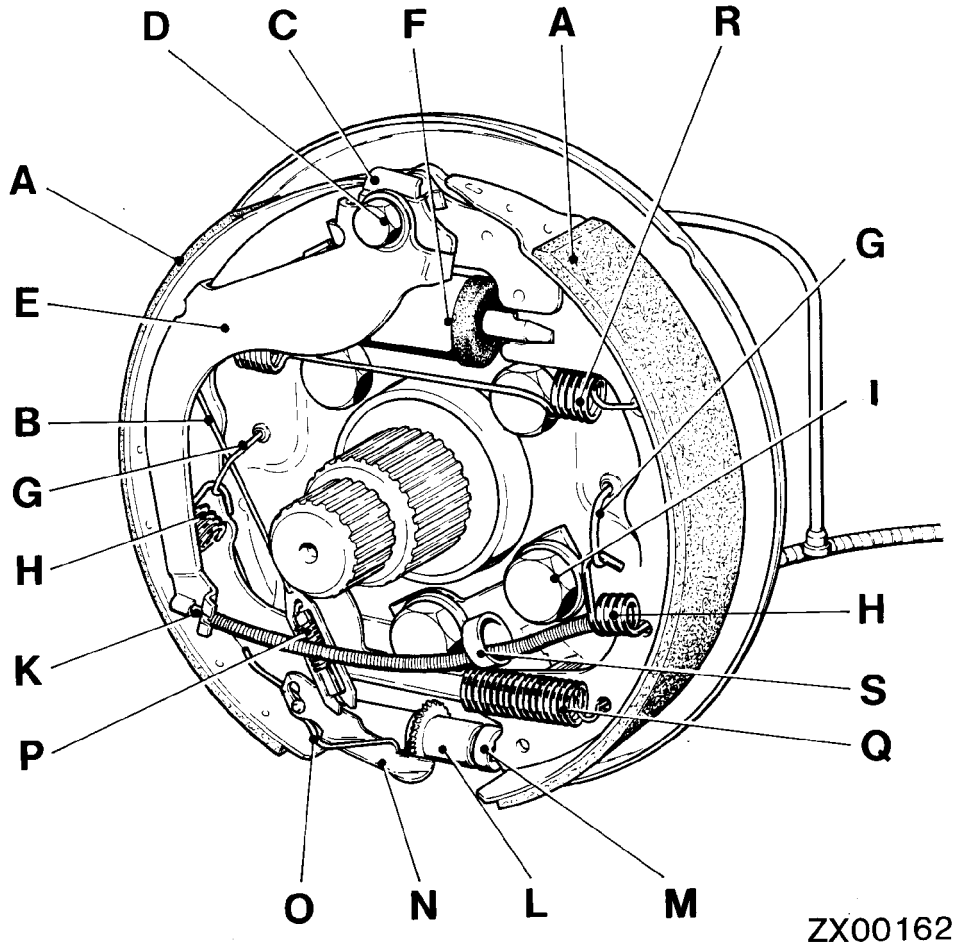
DRUM BRAKE COMPONENTS



A—Brake shoe
B—Adjusting cable
C—Eccentric plate
D—Cap screw
E—Parking brake lever
F—Brake operating cylinder
G—Hook
H—Brake shoe retainer
I—Anchor plate attaching screw
K—Parking brake cable
L—Brake adjusting screw
M—Support pin
N—Brake adjusting lever
O—Retracting spring
P—Cylinder spring
Q—Lower retracting spring
R—Upper retracting spring
S—Parking brake cable guide

When operating brakes, the operating cylinder (F) forces brake shoes against the brake drum resulting in braking action.

When front brake shoe (A) moves, cable (B) is tensioned and moves lever (N) upwards. By means of this mechanism the brakes are adjusted automatically.

ZX,TMSPFH001096-19-01DEC92

Section 270
Hydraulic System

Contents

DESCRIPTION OF HYDRAULIC SYSTEM

The machine is equipped with a so-called “open-center hydraulic system”, i.e. with engine running at constant speed the hydraulic pump conveys a constant amount of hydraulic oil.

The hydraulic pump is a triple pump.

Flow rates for basic machine are as follows:

- Pump (A) conveys 35 L/min. (9.2 gpm)
- Pump (B) conveys 25 L/min. (6.5 gpm)
- Pump (C) conveys 15 L/min. (4.0 gpm)

Flow rates for Hillmaster machines are as follows:

- Pump (A) conveys 45 L/min. (11 gpm)
- Pump (B) conveys 25 L/min. (6.5 gpm)
- Pump (C) conveys 35 L/min. (9.2 gpm)

For pumps (A) and (B), pressure valves are located in solenoid valve block (D) (one pressure valve for each of these pumps). If no pressure oil is required, the pressure valves direct pressure-free oil back to the reservoir via the oil cooler.

On Hillmaster combines, hydraulic pump (A) delivers oil to Hillmaster solenoid valve block (E). An integrated flow divider controls hydraulic oil flow, providing 30 L/min. (7.8 gpm) for the Hillmaster system and 15 L/min. (3.9 gpm) for the basic hydraulic functions, i.e. solenoid valve block (D).

Hydraulic functions of feeder house and header are controlled by solenoid valve blocks (F) and (G). A pressure valve in solenoid valve block (D) is also activated.

A—Hydraulic pump
- **Standard machine 35 L/min. (9.2 gpm)**
- **Hillmaster 45 L/min. (11 gpm)**

B—Hydraulic pump 25 L/min. (6.5 gpm) (steering system)

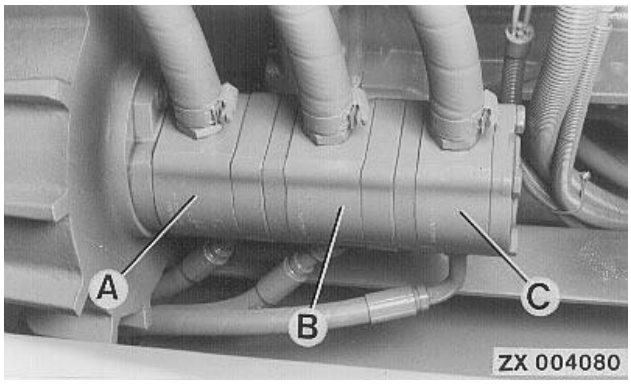
C—Hydraulic pump
- **Standard machine 15 L/min. (3.9 gpm)**
- **Hillmaster 35 L/min. (9.2 gpm)**

D—Solenoid valve block, basic machine

E—Solenoid valve block, Hillmaster

F—Solenoid valve block, feeder house

G—Solenoid valve block, header



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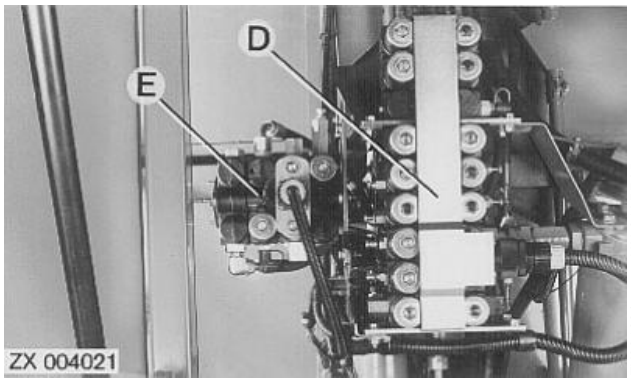

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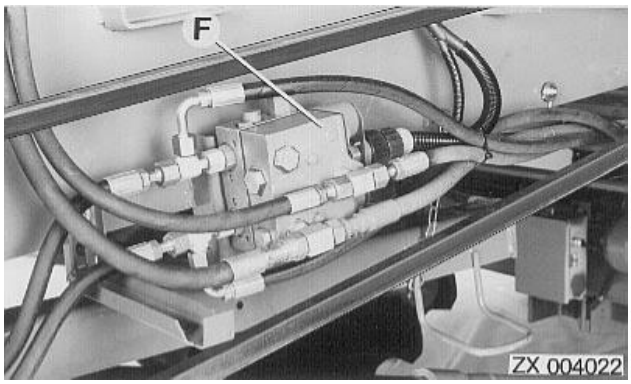

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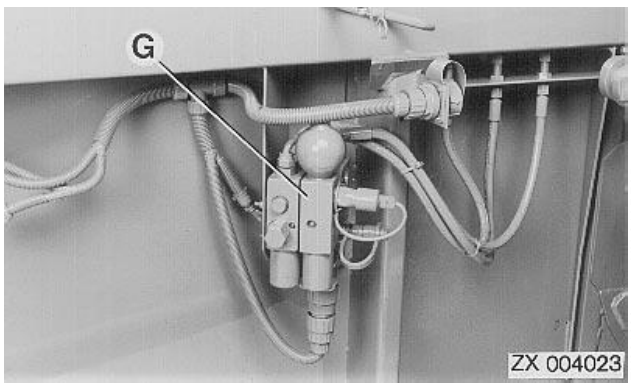

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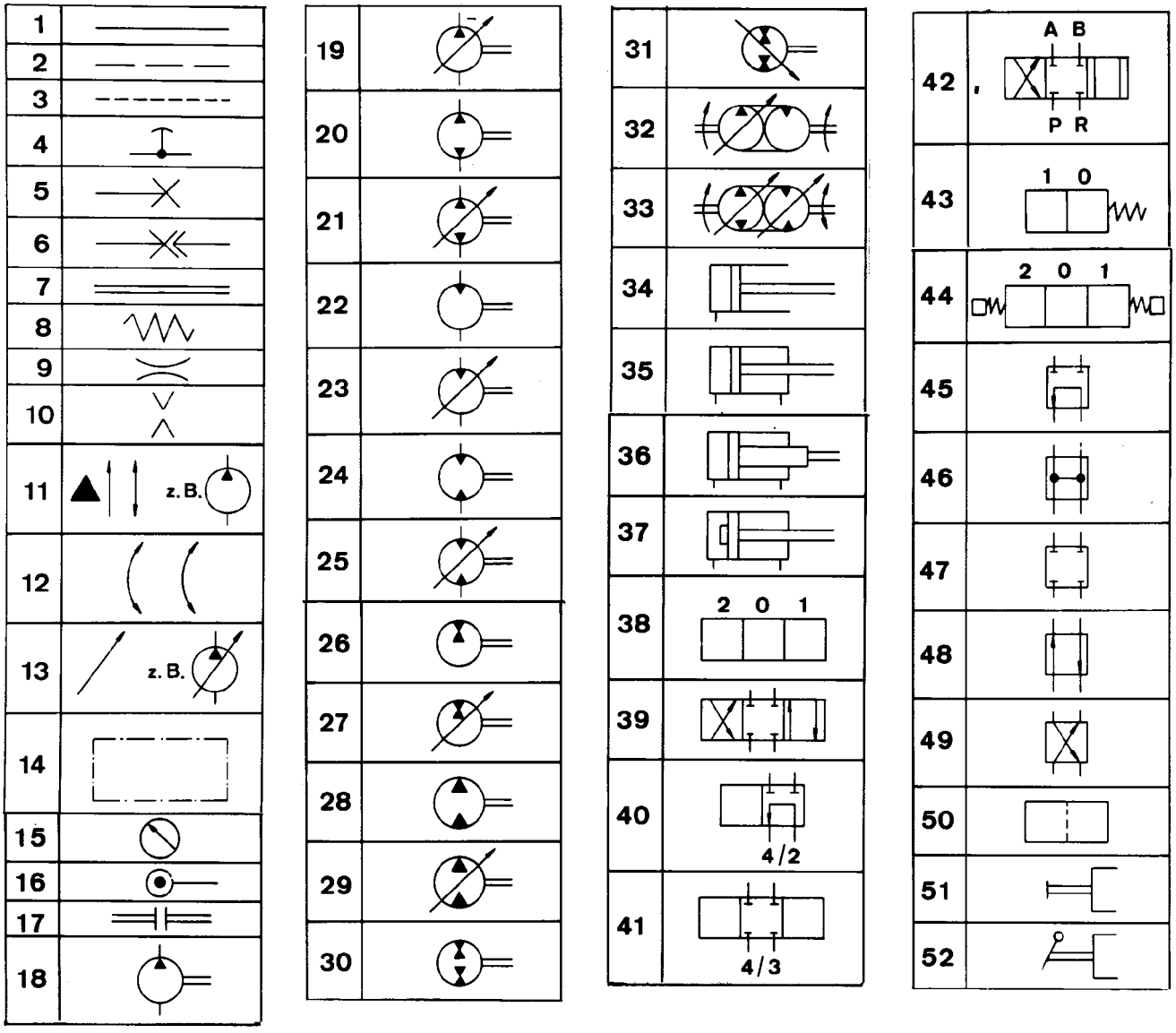
HYDRAULIC SYMBOLS (AS DEFINED BY ISO 1219)



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LEGEND — GRAPHIC SYMBOLS FOR HYDRAULICS

1—Working (main) line
2—Pilot (control) line
3—Liquid (drain/return) line
4—Bleed station
5—Plugged port
6—Port with connector
7—Shaft, lever or rod
8—Spring
9—Orifice
10—Restriction
11—Direction of flow
12—Direction of rotation
13—Adjustable or variable component
14—Component enclosure
15—Pressure gauge
16—Pressure source
17—Mechanical clutch
18—Unidirectional fixed displacement pump
19—Unidirectional variable displacement pump
20—Bidirectional fixed displacement pump
21—Bidirectional variable displacement pump
22—Unidirectional fixed displacement motor
23—Unidirectional variable displacement motor
24—Bidirectional fixed displacement motor
25—Bidirectional variable displacement motorn
26—Unidirectional fixed displacement pump, operating in opposite flow direction as motor
27—Unidirectional variable displacement pump, operating in opposite flow direction as motor
28—Unidirectional fixed displacement pumpmotor, operating in one flow direction as pump/motor
29—Unidirectional variable displacement pump/motor, operating in one flow direction as pump/motor
30—Bidirectional fixed displacement pump/motor operating in both directions as pump/motor
31—Bidirectional variable displacement pump/motor operating in both directions as pump/motor
32—Unidirectional hydraulic transmission with unidirectional variable displacement pump and fixed displacement motor
33—Bidirectional hydraulic transmission with bidirectional variable displacement pump and variable displacement motor
34—Single acting hydraulic cylinder
35—Double-acting hydraulic cylinder
36—Double-acting differential hydraulic cylinder
37—Double-acting unidirectional fixed cushion hydraulic cylinder
38—Direction control valves are symbolized by multiple envelopes. The number of numerically identified envelopes equals the number of valve shift positions.
39—Arrows and lines within the envelopes connect valve ports and indicate internally open flow paths. Small cross bars indicate internally blocked valve ports.
40—Directional control valves are defined by the number of ports (ways) followed by the number of valve shift positions
41—The first digit is the number of ports (ways); the second digit the number of valve shift positions, e.g.: 3/2 or three-way two-position valve, 4/2 or four-way two-position valve, 4/3 or four-way three-position, 5/3 or five-way three-position
42—Valve connections (ports) are defined by capital letters, e.g.:
A, B, C Working lines
P Inlet (pressure)lines
R, S Return (drain) lines
X, Y, Z Pilot (control) lines
43—Zero position of directional control valves with internal return is the position to which moving valve parts return, when pressure is released.
44—Zero position of directional control valves with internal return is the position to which moving valve parts return, when pressure is released.
45—Circulation flow path
46—Flotation flow path
47—Valve ports blocked internally
48—Advance flow path
49—Reverse flow path
50—Two-position valve with transition
51—Direct manual operation
52—Hand lever operation

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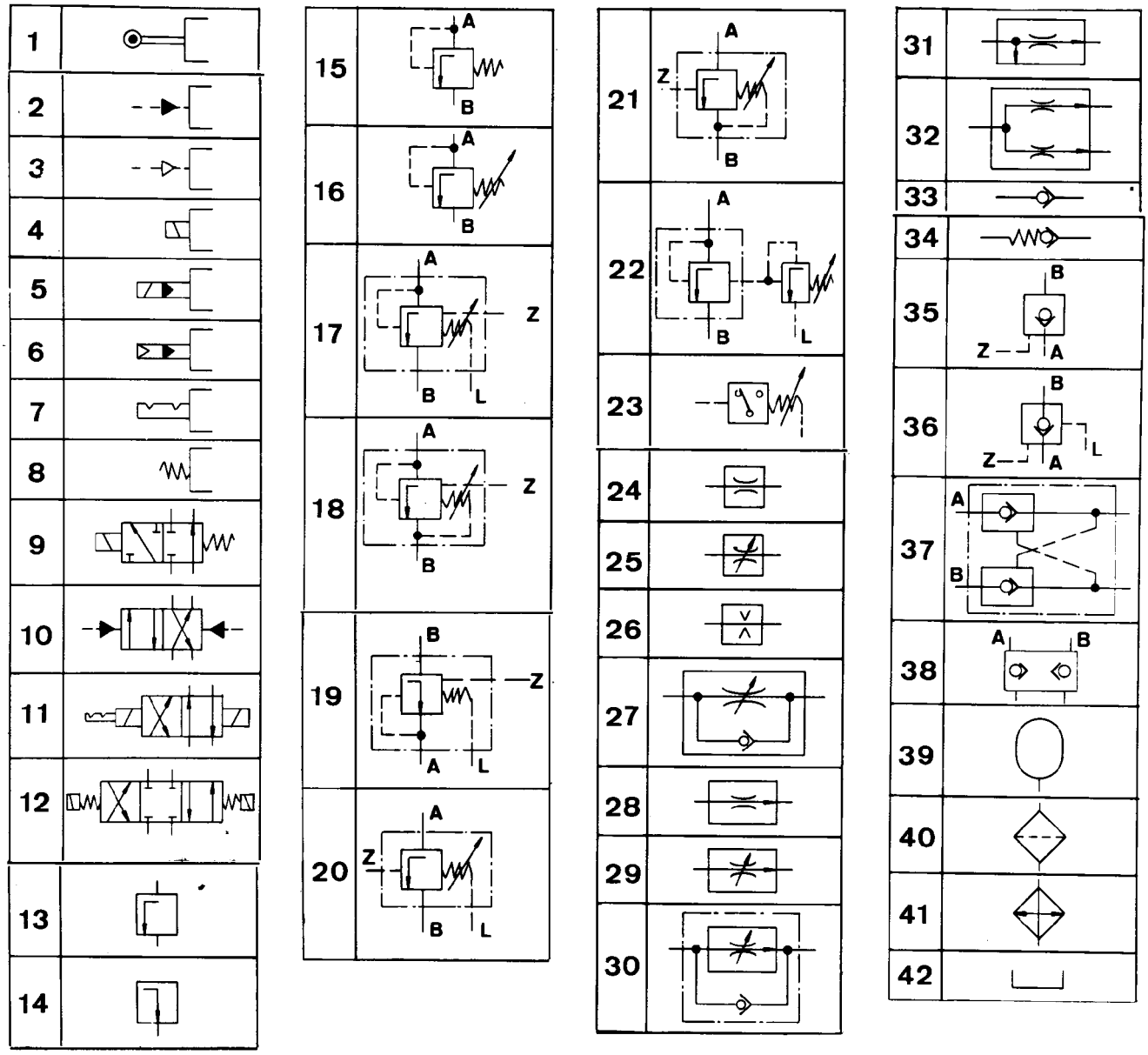
HYDRAULIC SYMBOLS (AS DEFINED BY ISO 1219)



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LEGEND — GRAPHIC SYMBOLS FOR HYDRAULICS

1—Mechanical (roller-head) actuator
2—Hydraulic actuator
3—Pneumatic actuator
4—Electromagnetic (solenoid) actuator
5—Solenoid pilot and hydraulic actuator
6—Pneumatic pilot and hydraulic actuator
7—Detent actuator
8—Spring-loaded return
9—4/2 directional control valve with solenoid actuator and spring loaded return
10—4/2 valve with external hydraulic actuator and return
11—4/2 valve with detent and solenoid actuator and return
12—4/3 valve with solenoid actuator, spring centered
13—Pressure control valve, 0-position normally blocked
14—Pressure control valve, 0-position normally normally open
15—Pressure relief valve, fixed spring pressure
16—Adjustable pressure relief valve
17—Adjustable pressure relief valve, remote control connection with external pilot oil drain
18—Adjustable pressure relief valve, remote control connection with internal pilot oil drain
19—Fixed pressure reduction valve, remote control connection with external pilot oil drain
20—Adjustable pressure control valve, remote operated with external pilot oil drain
21—Adjustable pressure control valve, remote operated with internal pilot oil drain
22—Pressure relief valve, remote operated
23—Pressure switch
24—Orifice, fixed restriction
25—Orifice, variable restriction
26—Viscosity influenced restriction
27—Adjustable flow control valve with bypass
28—Fixed unidirectional flow control valve
29—Variable unidirectional flow control valve
30—Variable unidirectional flow control valve with bypass check valve
31—Three-way flow control valve
32—Flow divider
33—Check valve without spring
34—Spring loaded check valve
35—Check valve pilot-operated to open with internal oil drain
36—Check valve pilot-operated to open with external oil drain
37—Pilot operated double check valve in detail
38—Same valve simplified
39—Hydraulic accumulator
40—Filter, strainer
41—Cooler
42—Reservoir (vented)

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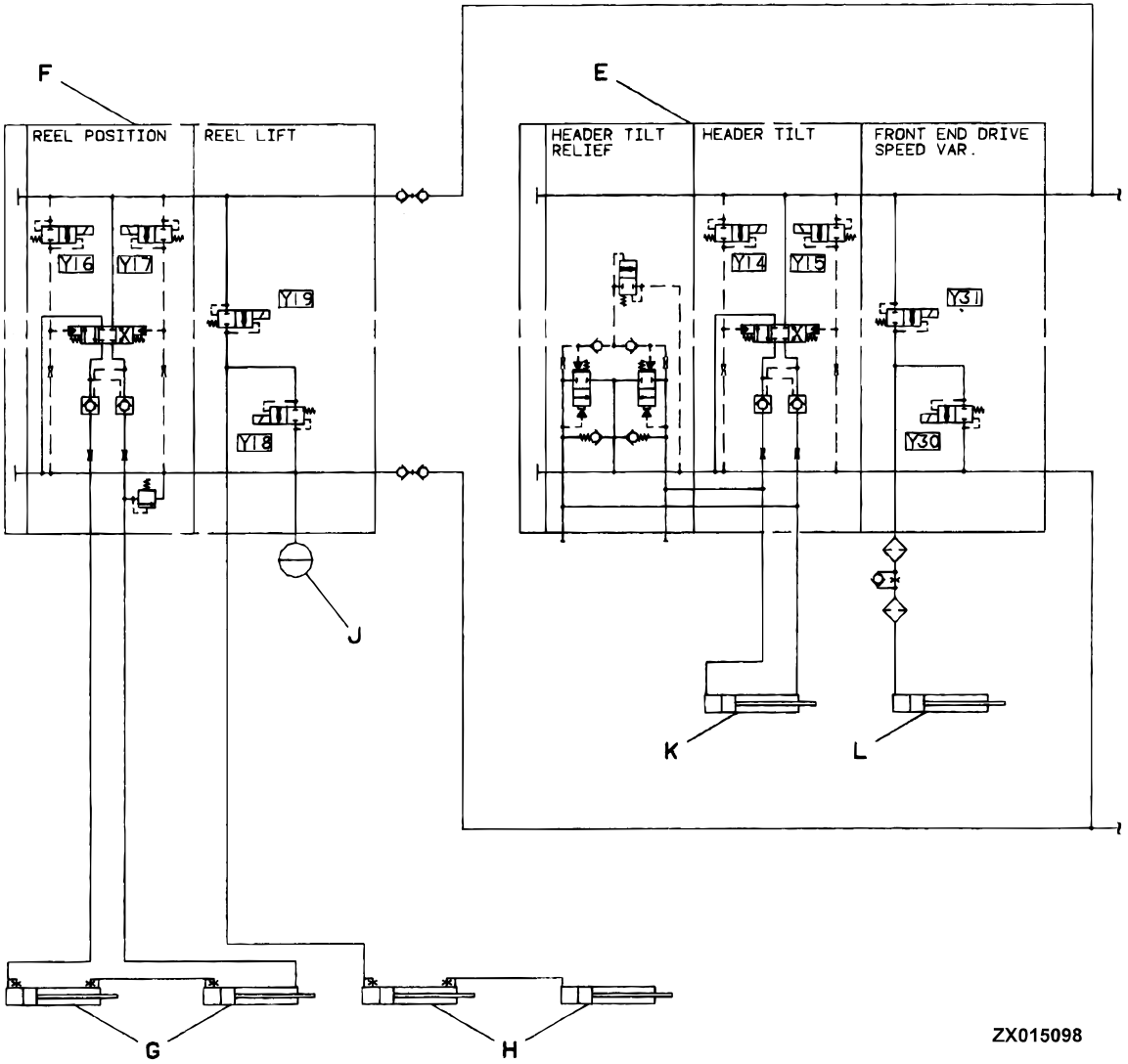
HYDRAULIC SYSTEM CIRCUIT DIAGRAM — BASIC MACHINE FUNCTIONS, PART 1



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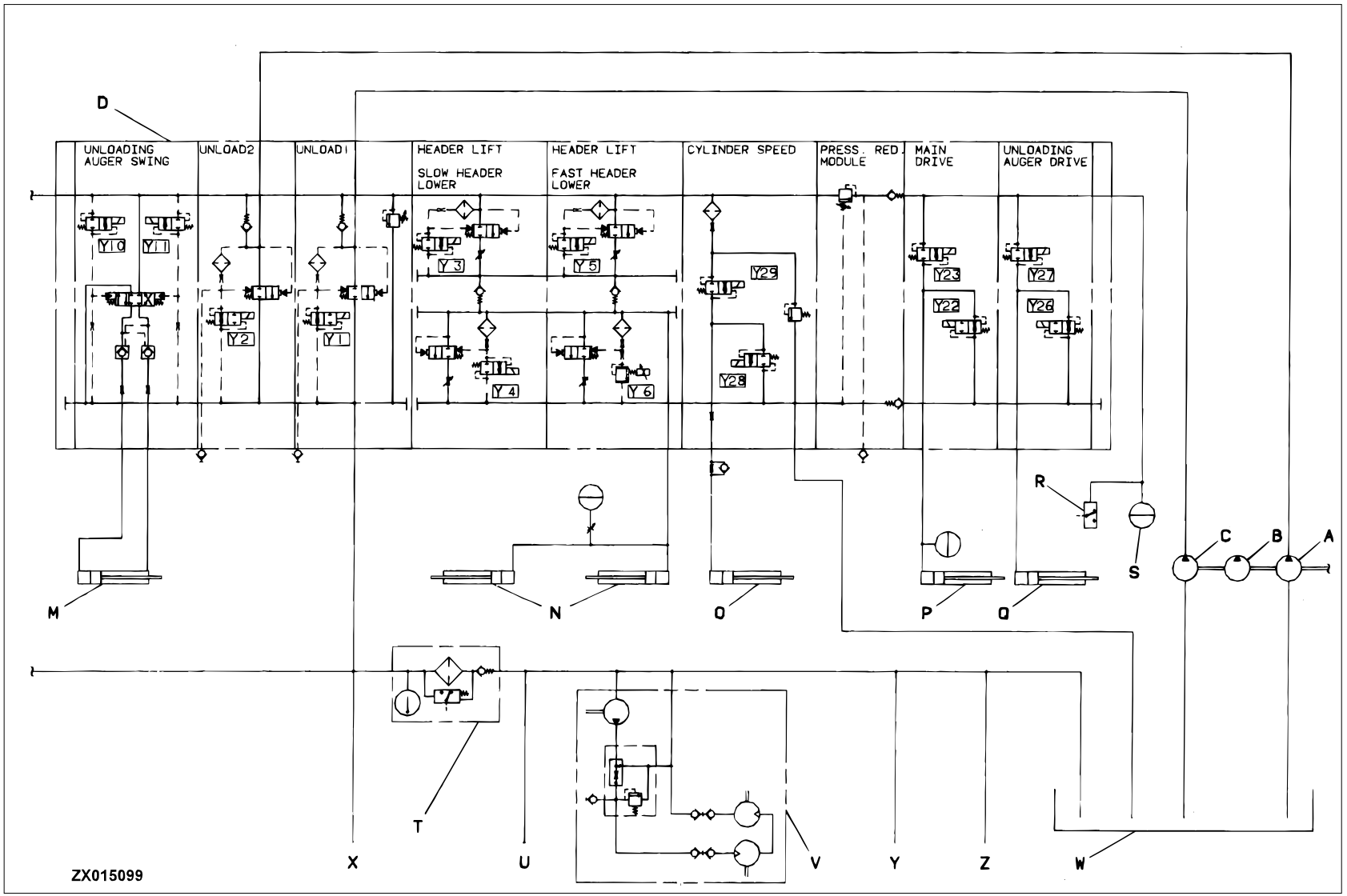
HYDRAULIC SYSTEM CIRCUIT DIAGRAM — BASIC MACHINE FUNCTIONS, PART 2



EXPLANATION OF SYMBOLS

A—Hydraulic pump
B—Hydraulic pump
C—Hydraulic pump
D—Solenoid valve block, basic machine
E—Solenoid valve block, feeder house
F—Solenoid valve block, header
G—Hydraulic cylinder, horizontal reel adjustment
H—Hydraulic cylinder, raise reel
J—Accumulator
K—Hydraulic cylinder, header parallel adjustment
L—Cylinder, variable feeder house drive
M—Hydraulic cylinder, swing out unloading auger
N—Header lift cylinder
O—Cylinder, variable threshing cylinder drive
P—Tensioning cylinder, main drive
Q—Tensioning cylinder, unloading drive
R—Pressure switch
S—Accumulator
T—Hydraulic oil filter
U—Drain connection
V—Hydraulic chaff spreader drive
W—Hydraulic oil reservoir
X—Return connection from powered rear axle
Y—Suction line of hydrostatic ground drive
Z—Return line of hydrostatic ground drive

NOTE: Connections (X), (Y) and (Z) are continued in hydrostatic system circuit diagram (refer to Section 250).

"Y" designations of solenoids are identical with those in the electrical system diagrams.

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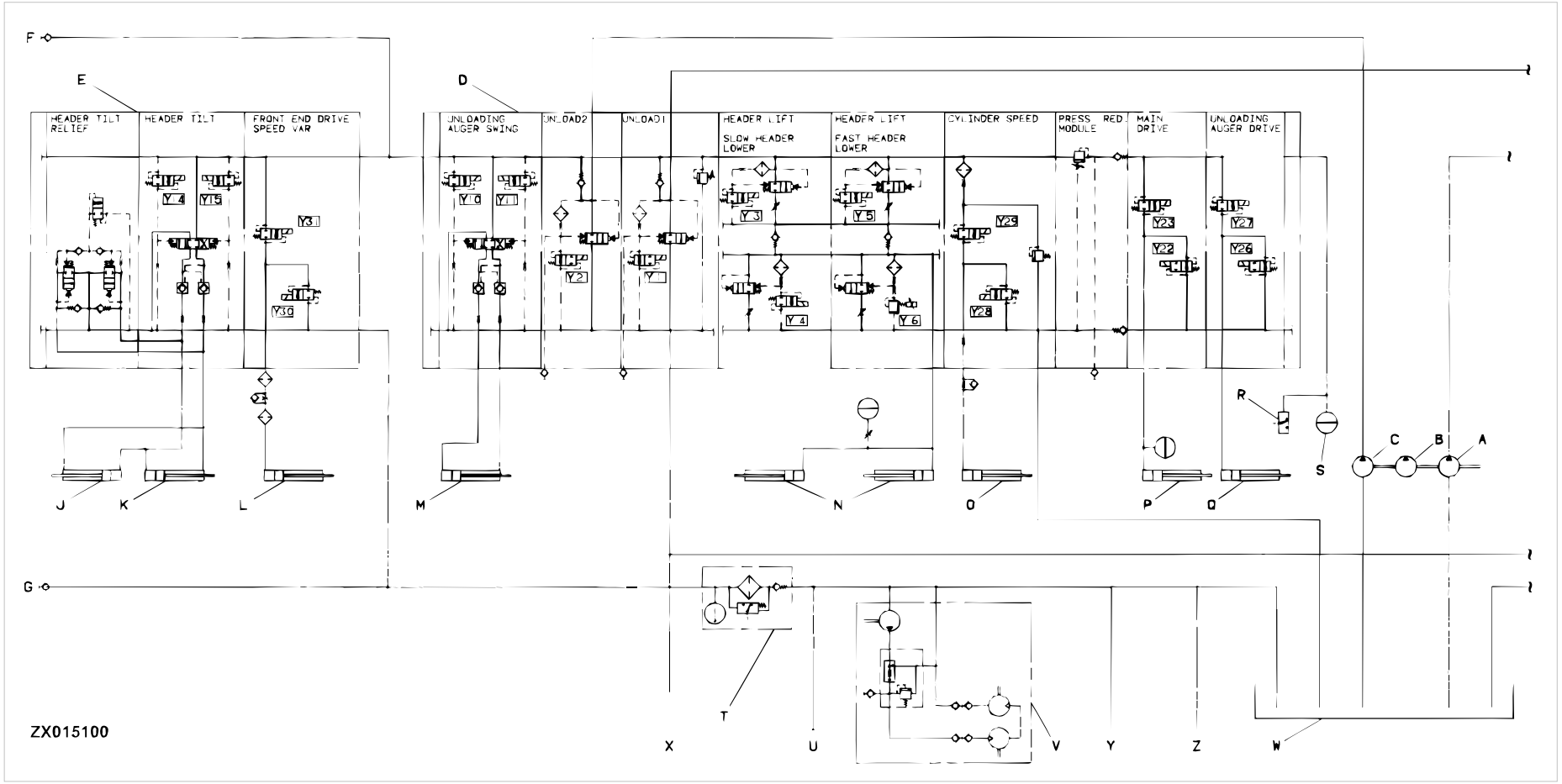
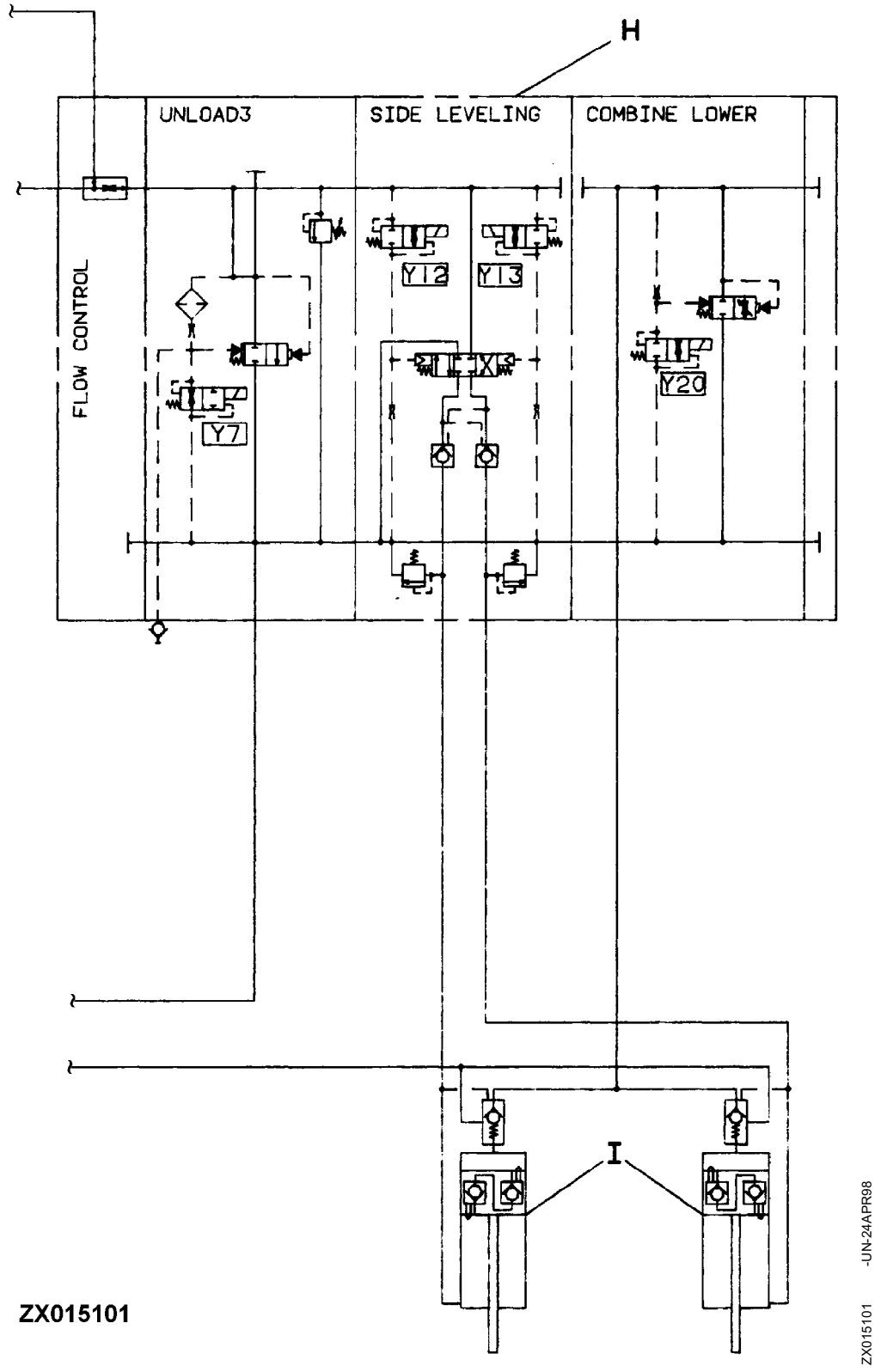
HYDRAULIC SYSTEM CIRCUIT DIAGRAM — HILLMASTER MACHINE FUNCTIONS, PART 1



HYDRAULIC SYSTEM CIRCUIT DIAGRAM — HILLMASTER MACHINE FUNCTIONS, PART 2



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EXPLANATION OF SYMBOLS

A—Hydraulic pump
B—Hydraulic pump
C—Hydraulic pump
D—Solenoid valve block, basic machine
E—Solenoid valve block, feeder house
F—Header quick coupler
G—Header quick coupler
H—Solenoid valve block, Hillmaster
J—Hydraulic cylinder, header parallel adjustment (master cylinder at final drive)
K—Hydraulic cylinder, header parallel adjustment
L—Cylinder, variable feeder house drive
M—Hydraulic cylinder, swing out unloading auger
N—Header lift cylinder
O—Cylinder, variable threshing cylinder drive
P—Tensioning cylinder, main drive
Q—Tensioning cylinder, unloading drive
R—Pressure switch
S—Accumulator
T—Hydraulic oil filter
U—Drain connection
V—Hydraulic chaff spreader drive
W—Hydraulic oil reservoir
X—Return connection from powered rear axle
Y—Suction line of hydrostatic ground drive
Z—Return line of hydrostatic ground drive

NOTE: Connections (X), (Y) and (Z) are continued in hydrostatic system circuit diagram (refer to Section 250).

"Y" designations of solenoids are identical with those in the electrical system diagrams.

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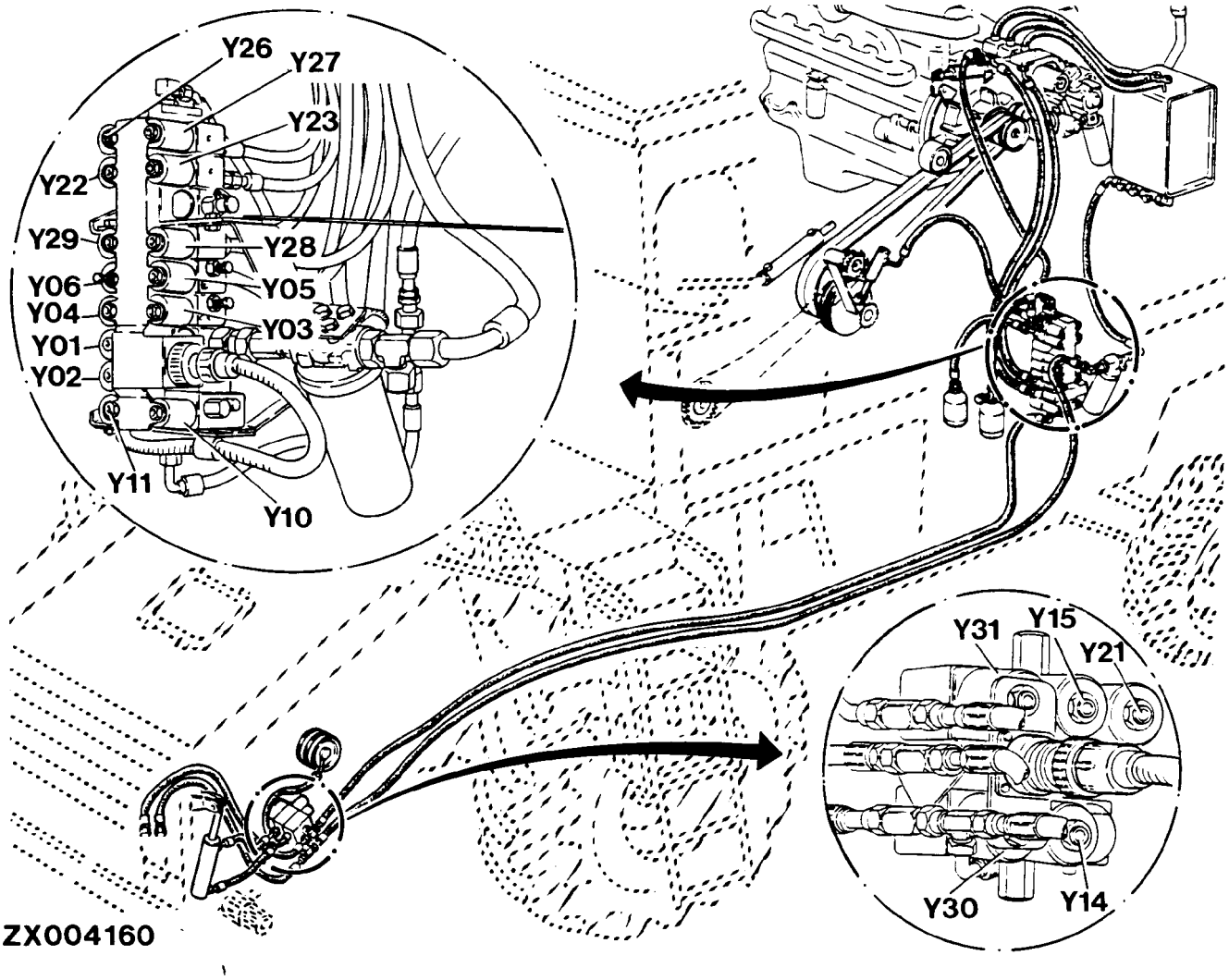
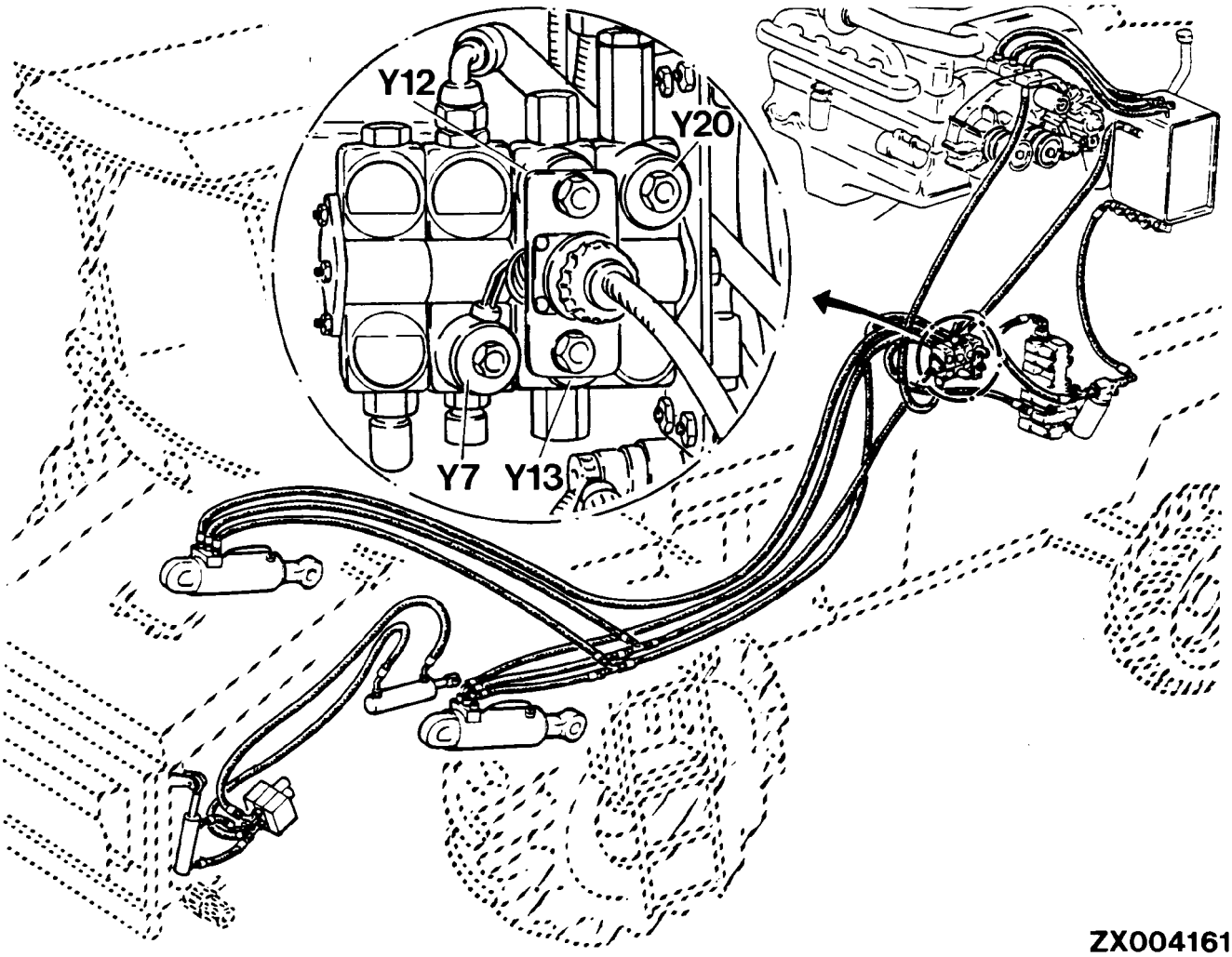
SOLENOID VALVES — BASIC MACHINE



Y 1 — Pressure valve 1
Y 2 — Pressure valve 2
Y 3 — Solenoid, raising header
Y 4 — Solenoid, lowering header
Y 5 — Solenoid, raising header
Y 6 — Solenoid, lowering header
Y 10 — Solenoid, swinging in unloading auger
Y 11 — Solenoid, swinging out unloading auger
Y 14 — Solenoid, header leveling, left side
Y 15 — Solenoid, header leveling, right side
Y 21 — Solenoid not allocated
Y 22 — Solenoid, switching on separator
Y 23 — Solenoid, switching on separator
Y 26 — Solenoid, unloading grain tank
Y 27 — Solenoid, unloading grain tank
Y 28 — Solenoid, reducing cylinder speed
Y 29 — Solenoid, increasing cylinder speed
Y 30 — Solenoid, reducing feeder house speed
Y 31 — Solenoid, increasing feeder house speed

ZX,TMXZCO003067-19-25NOV93

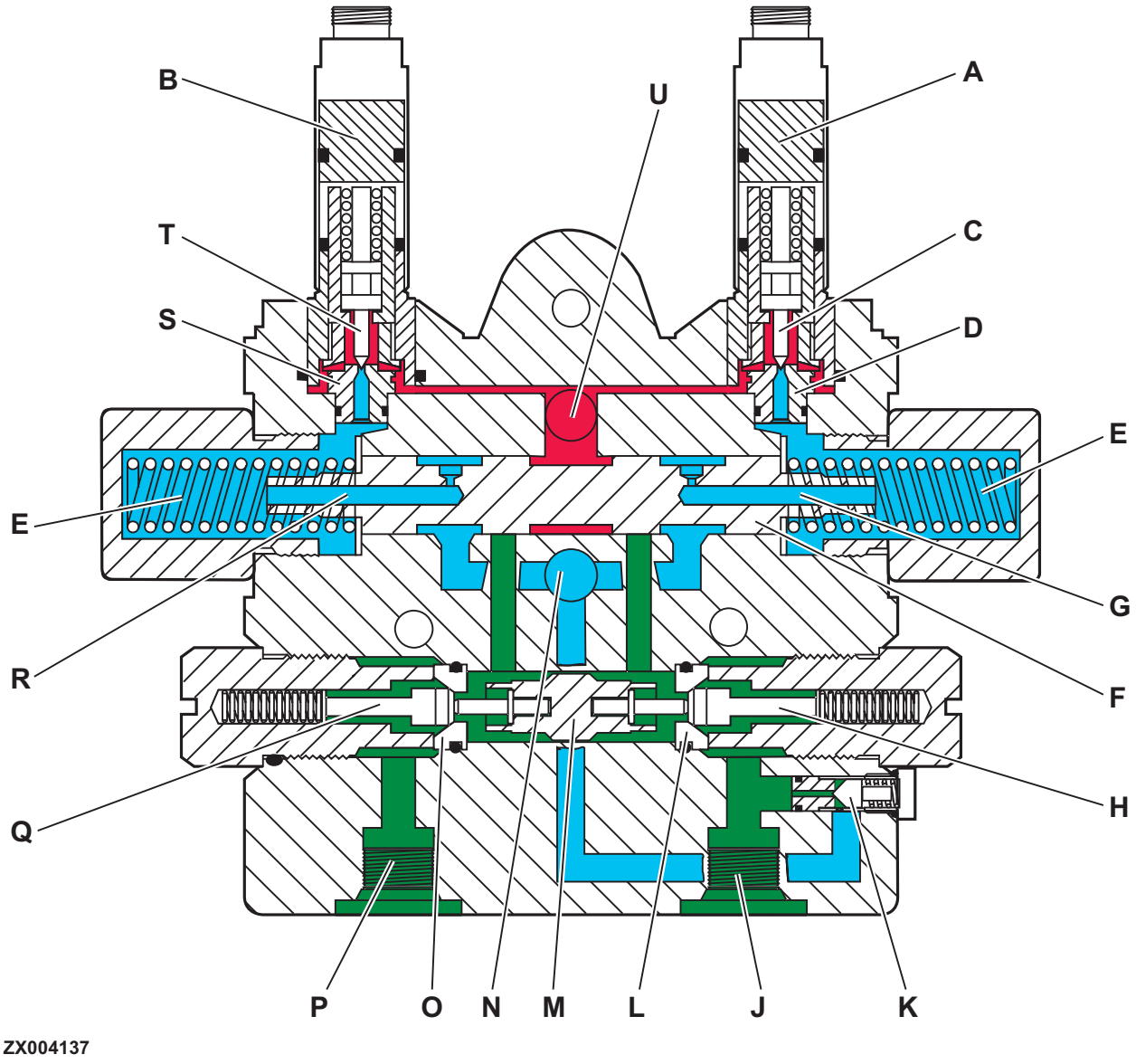
SOLENOID VALVES — HILLMASTER



Y 7 — Pressure valve 3
Y 12 — Solenoid, leveling system, left
Y 13 — Solenoid, leveling system, right
Y 20 — Solenoid, lowering combine

ZX,TMXZCO003068-19-25NOV93

SOLENOID VALVE PLATE FOR HORIZONTAL REEL ADJUSTMENT, NEUTRAL POSITION



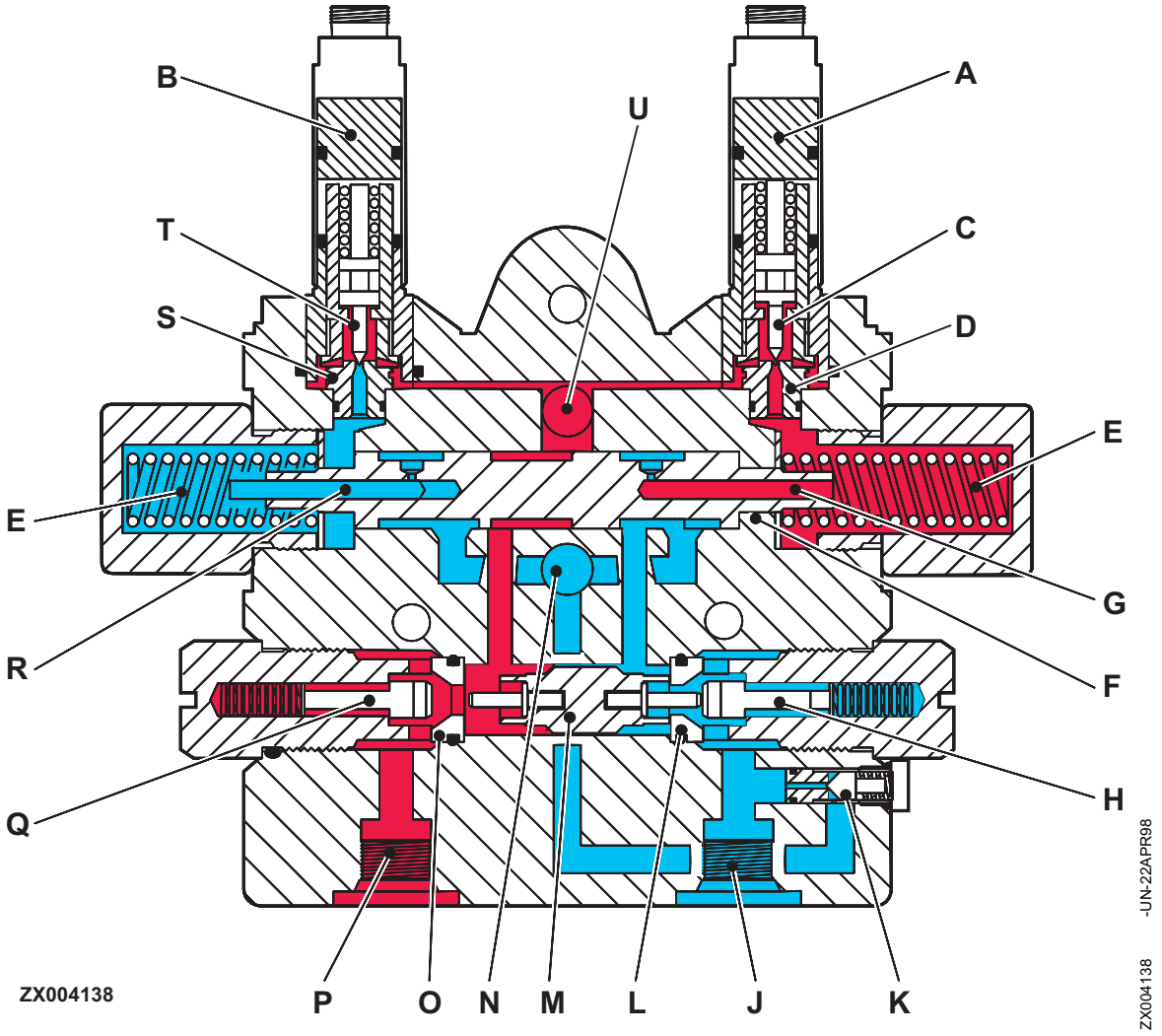
A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Return oil passage
H—Check valve
J—Connection, working line
K—Thermal relief valve
L—Check valve seat
M—Piston
N—Return oil passage
O—Check valve seat
P—Connection, working line
Q—Check valve
R—Return oil passage
S—Needle valve seat
T—Needle valve
U—Pressure oil passage

The solenoid valve plate for horizontal reel adjustment is a 3/4 directional control valve plate with integrated check valves.

In neutral position, solenoids (A) and (B) are closed (without current). Orifices of control plunger (F) relieve pressure on both sides of plunger, moving it to center position. Both check valves are closed.

ZX,TMXZCO003069-19-25NOV93

SOLENOID VALVE PLATE FOR HORIZONTAL REEL ADJUSTMENT, WORKING POSITION

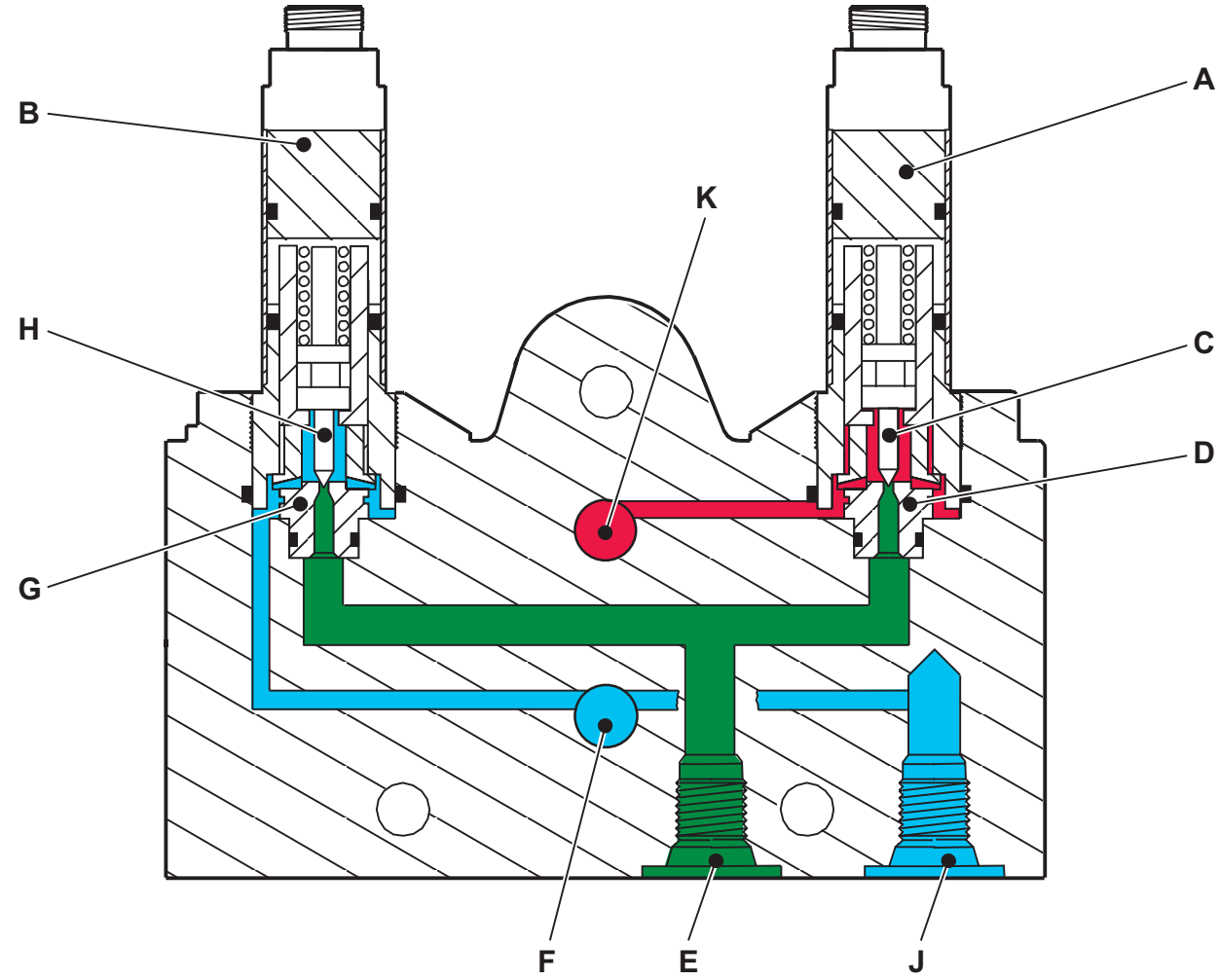


A—Solenoid	F—Control plunger	L—Check valve seat	Q—Check valve
B—Solenoid	G—Return oil passage	M—Piston	R—Return oil passage
C—Needle valve	H—Check valve	N—Return oil passage	S—Needle valve seat
D—Needle valve seat	J—Connection, working line	O—Check valve seat	T—Needle valve
E—Spring	K—Thermal relief valve	P—Connection, working line	U—Pressure oil passage

In working position, needle valve (C) or (T) is opened electromagnetically. Control plunger (F) moves to the right or left and routes pressure oil to the working line via the check valve. Pressure moves piston (M) to the opposite side, opening return check valve. The reel is moved forward or rearward.

ZX,TMXZCO003070-19-25NOV93

SOLENOID VALVE PLATE FOR REEL LIFT, NEUTRAL POSITION



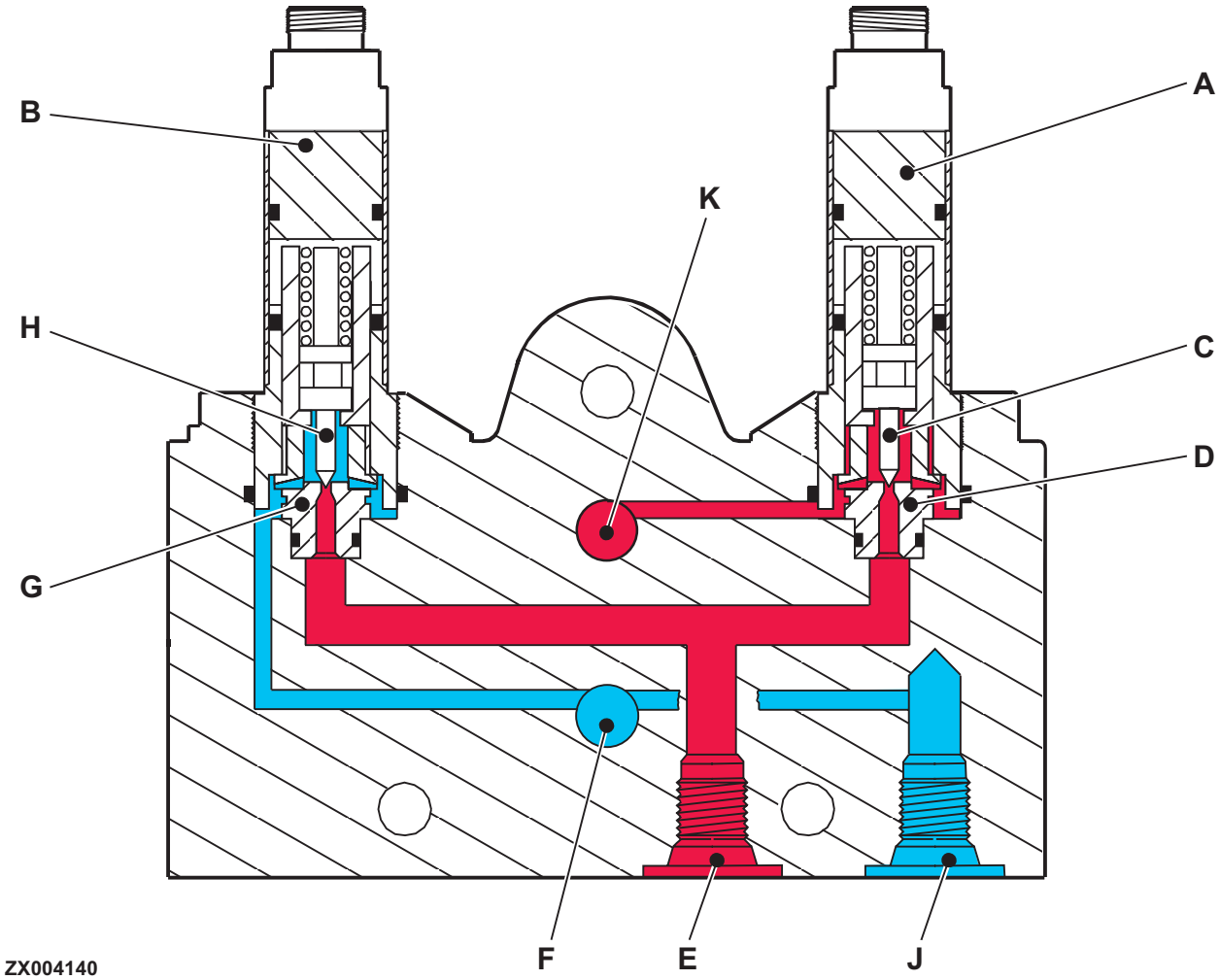
A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Cylinder connection
F—Return oil passage
G—Needle valve seat
H—Needle valve
J—Accumulator connection

A hydraulic cylinder or a hydraulically adjustable variable drive is connected to (E).

When using solenoid valve plate on cutting platform, an accumulator is connected to (J) to facilitate the coupling process.

ZX,TMXZCO003071-19-25NOV93

SOLENOID VALVE PLATE FOR REEL LIFT, 'RAISE' POSITION



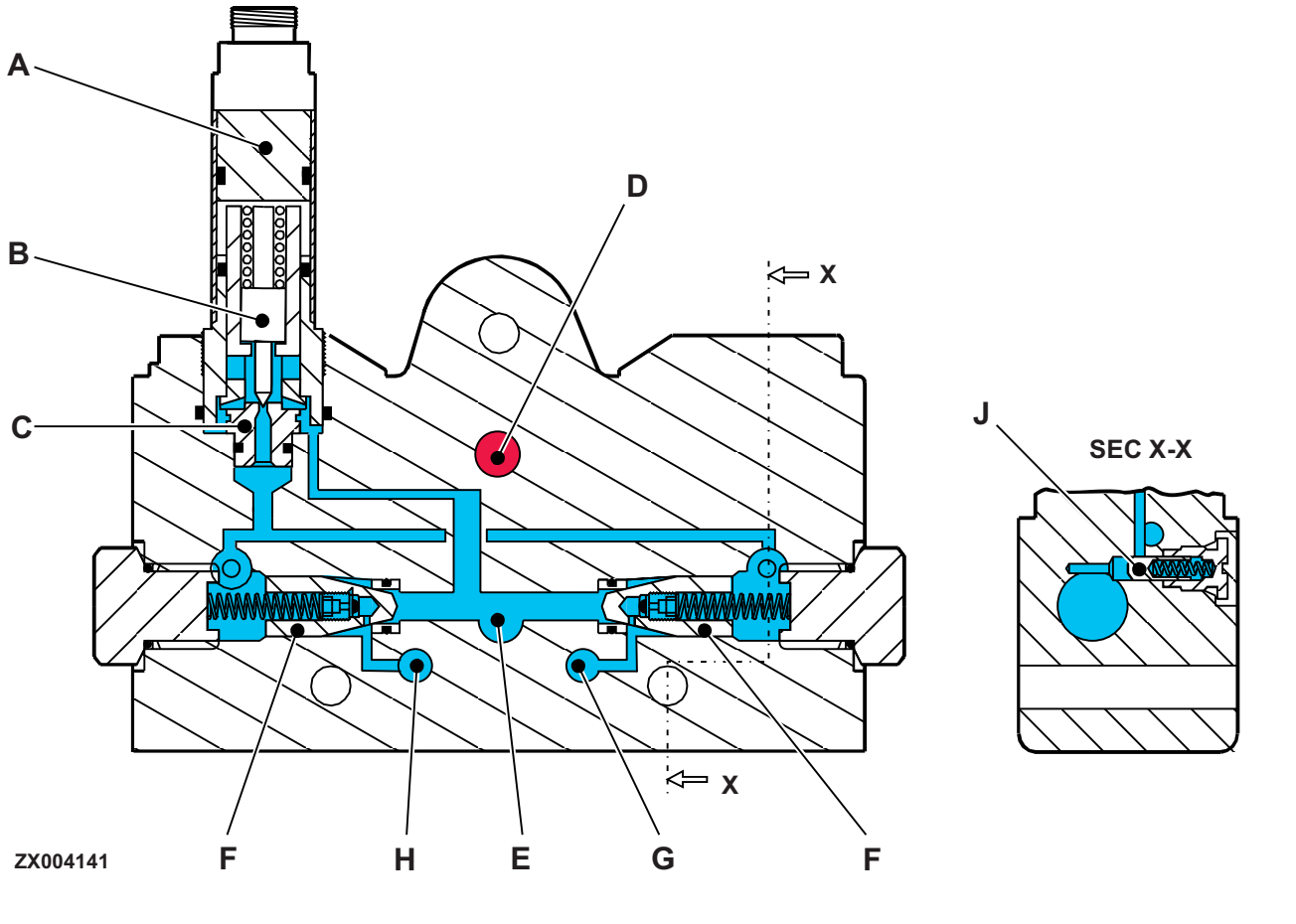
A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Cylinder connection
F—Return oil passage
G—Needle valve seat
H—Needle valve
J—Accumulator connection

Needle valve (C) is opened, routing pressure oil to connection (E).

Needle valve (H) is opened to lower reel.

ZX,TMXZCO003072-19-25NOV93

SOLENOID VALVE PLATE FOR PRESSURE RELIEF (HEADER LATERAL TILT)



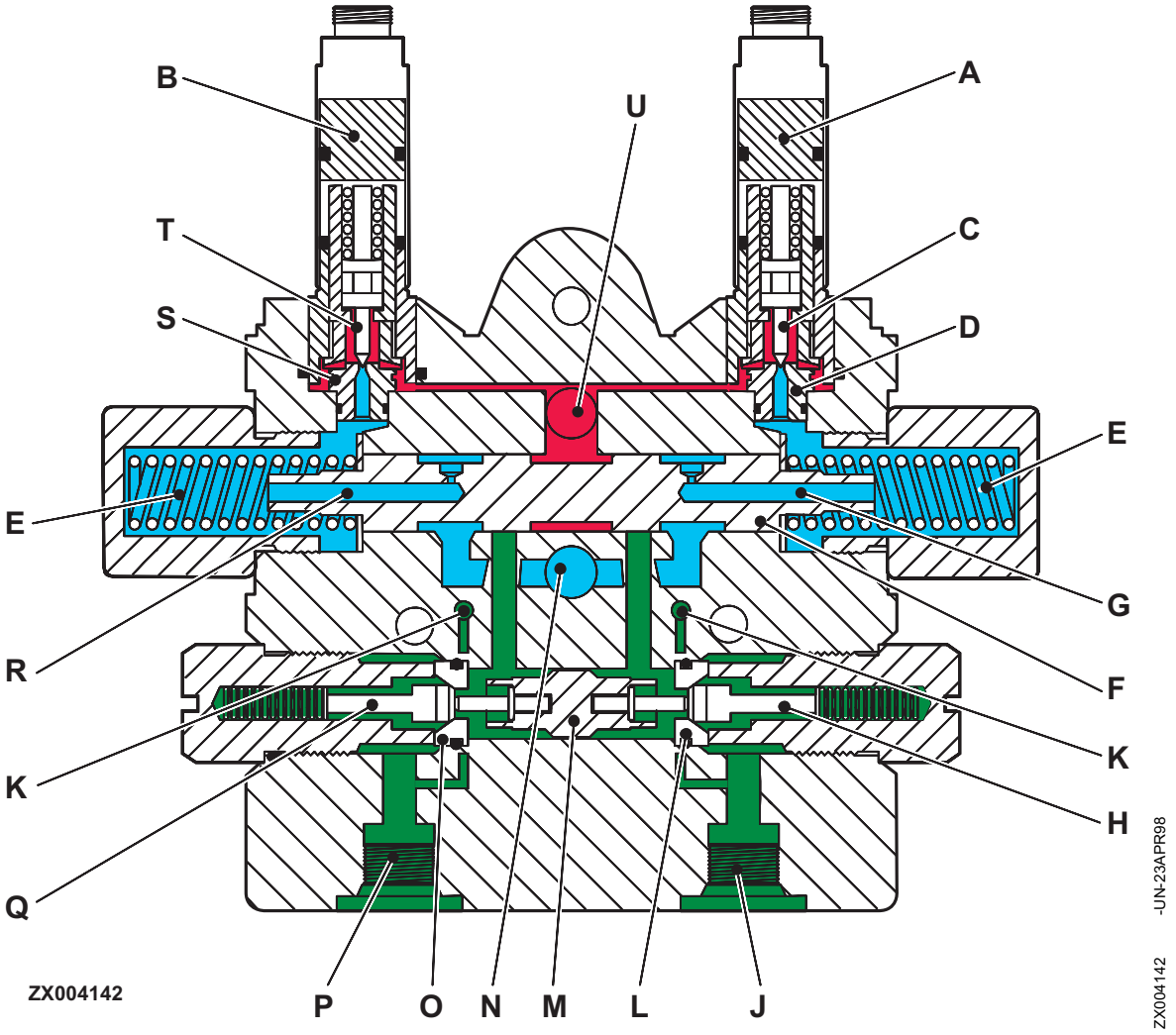
A—Solenoid (not installed)
B—Needle valve
C—Needle valve seat
D—Pressure oil passage
E—Return oil passage
F—Control plunger
G—Hydraulic cylinder connection
H—Hydraulic cylinder connection
J—Check valve

This solenoid valve plate is used on machines provided with header lateral tilt function.

When the cutting platform is lowered and touches the ground on one side, high pressure is created on corresponding side of double-acting hydraulic cylinder. The pressure relief valves installed on right and left-hand side limit pressure to 12500 kPa (125 bar; 1800 psi), controlled by needle valve (B).

ZX,TMXZCO003073-19-25NOV93

SOLENOID VALVE PLATE FOR HEADER LATERAL TILT, NEUTRAL POSITION



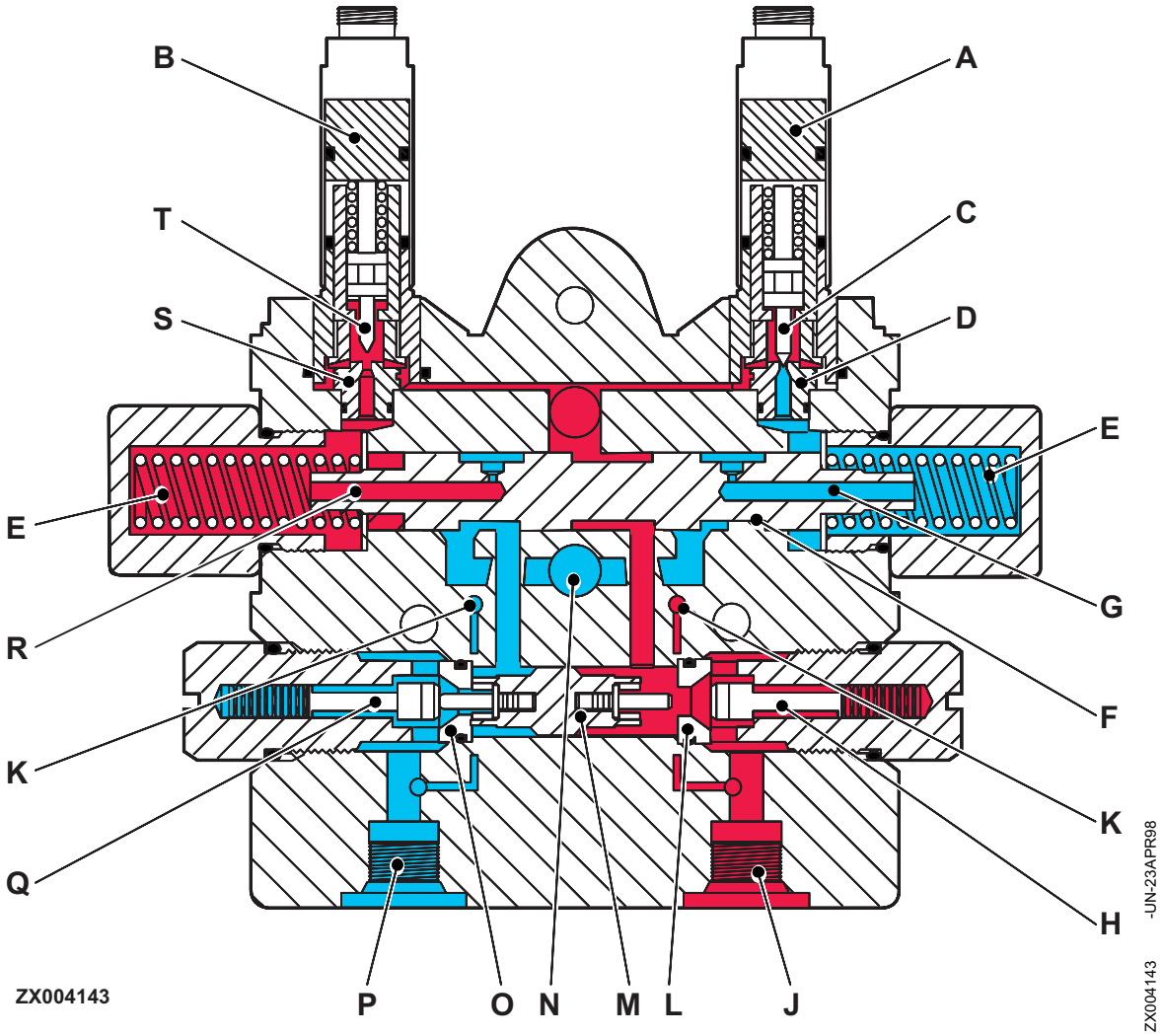
A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Return oil passage
H—Check valve
J—Connection, working line
K—Connecting passage to pressure relief plate
L—Check valve seat
M—Piston
N—Return oil passage
O—Check valve seat
P—Connection, working line
Q—Check valve
R—Return oil passage
S—Needle valve seat
T—Needle valve
U—Pressure oil passage

The function of the solenoid valve plate for header lateral tilt corresponds to the function of the solenoid valve plate for horizontal reel adjustment (refer to information in this Group).

The only difference is that two connecting passages (K) to the solenoid valve plate for pressure relief are provided.

ZX,TMXZCO003074-19-25NOV93

SOLENOID VALVE PLATE FOR HEADER LATERAL TILT, WORKING POSITION



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Return oil passage
H—Check valve
J—Connection, working line
K—Connecting passage to pressure relief plate
L—Check valve seat
M—Piston
N—Return oil passage
O—Check valve seat
P—Connection, working line
Q—Check valve
R—Return oil passage
S—Needle valve seat
T—Needle valve
U—Pressure oil passage

In working position, needle valve (C) or (T) is opened electromagnetically. Control plunger (F) is moved to the right or left and directs pressure oil to the working line via the check valve. Pressure moves piston (M) to the opposite side, opening return check valve. The cutting platform is tilted to the right or left.

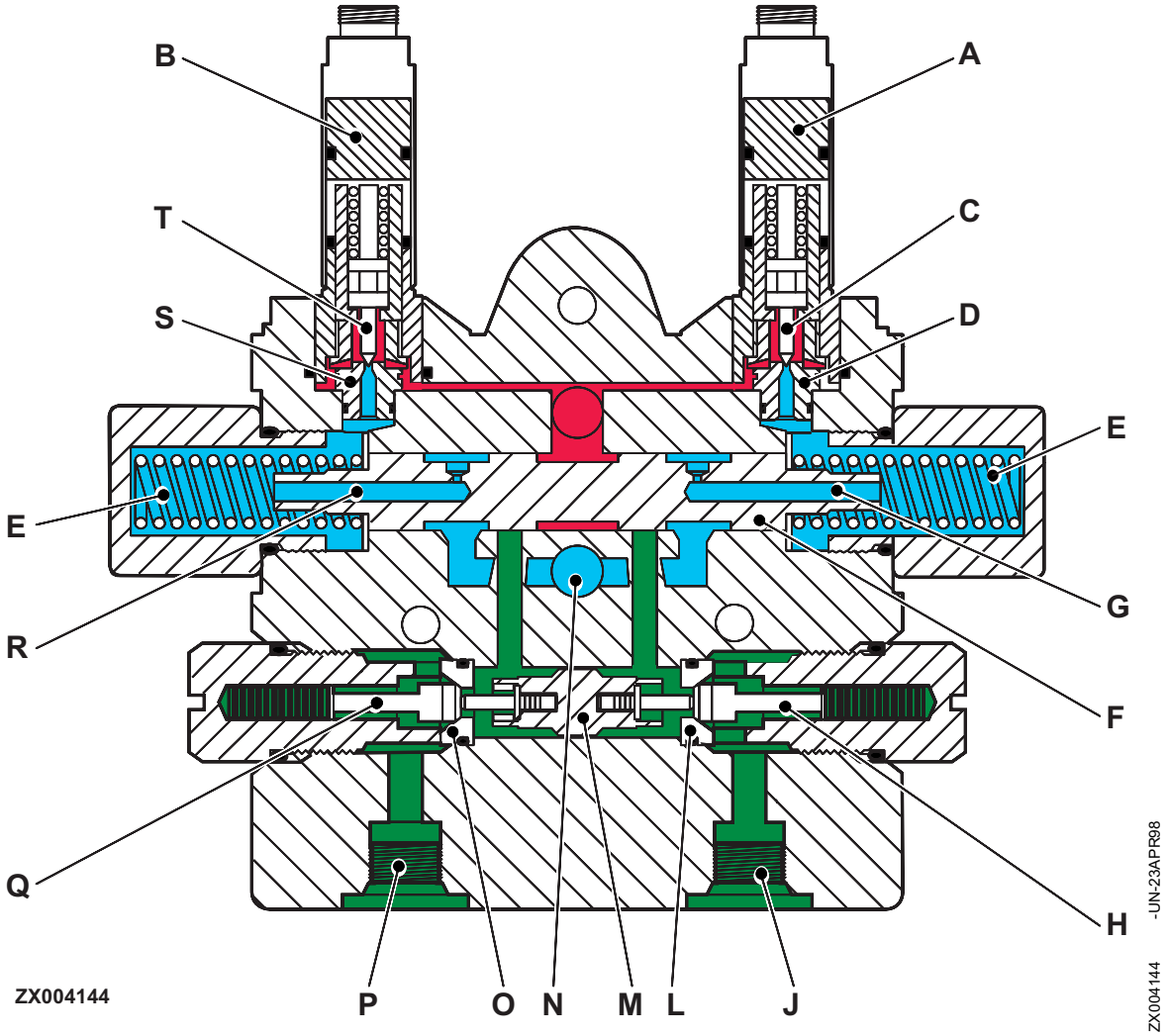
ZX,TMXZCO003075-19-25NOV93

SOLENOID VALVE PLATE FOR HARVESTING UNIT VARIABLE DRIVE

NOTE: The solenoid valve plate for harvesting unit variable drive is identical with the solenoid valve plate for reel lift. Refer to information given in this Group.

ZX,TMXZCO003076-19-25NOV93

SOLENOID VALVE PLATE FOR SWINGING OUT UNLOADING AUGER, NEUTRAL POSITION



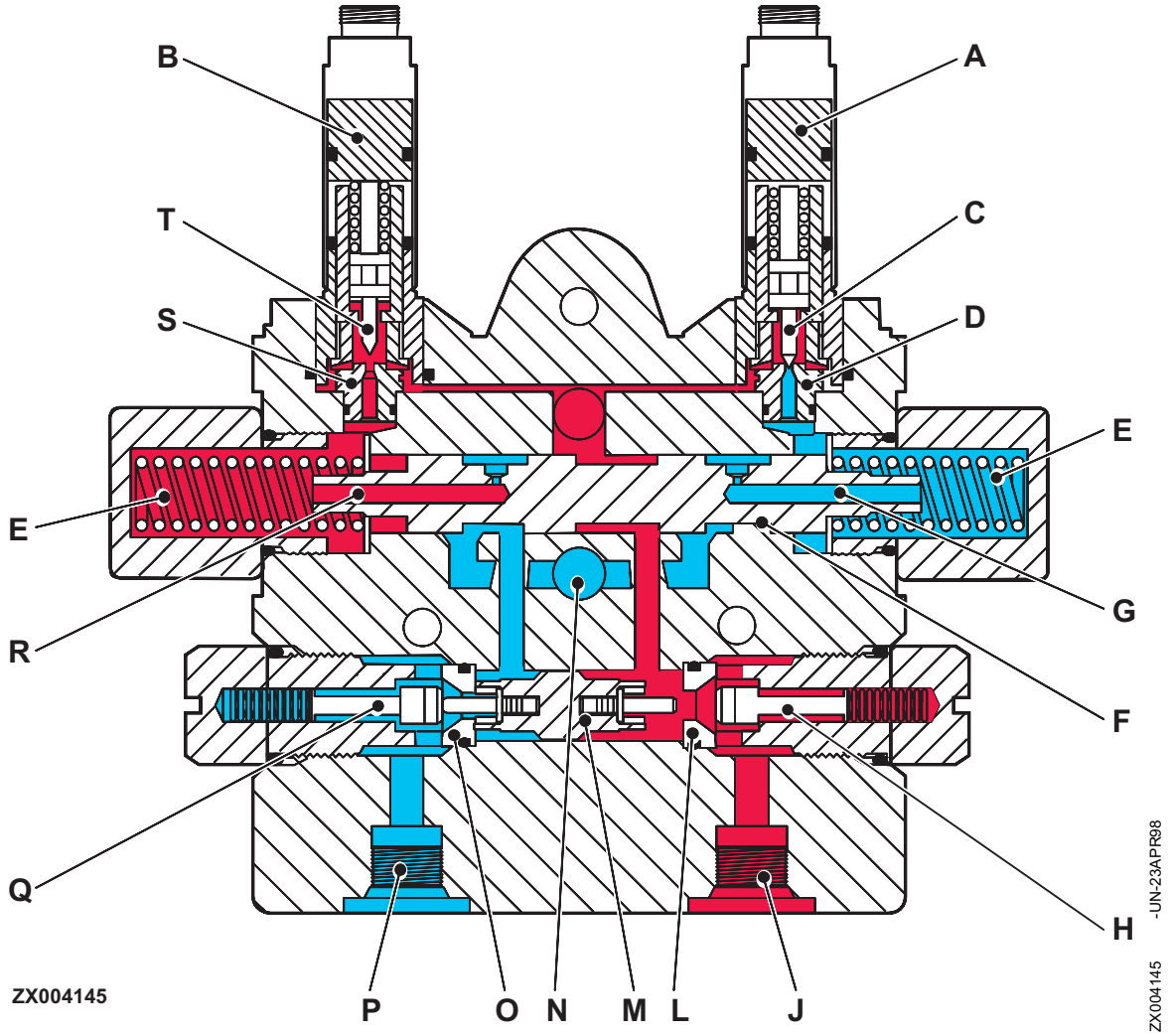
A—Solenoid	F—Control plunger	M—Piston	R—Return oil passage
B—Solenoid	G—Return oil passage	N—Return oil passage	S—Needle valve seat
C—Needle valve	H—Check valve	O—Check valve seat	T—Needle valve
D—Needle valve seat	J—Connection, working line	P—Connection, working line	U—Pressure oil passage
E—Spring	L—Check valve seat	Q—Check valve	

Pilot-operated check valves are located in front of the connections to the double-acting hydraulic cylinder.

This makes it possible to hold the unloading auger securely in any position.

ZX,TMXZCO003077-19-25NOV93

SOLENOID VALVE PLATE FOR SWINGING OUT UNLOADING AUGER, WORKING POSITION

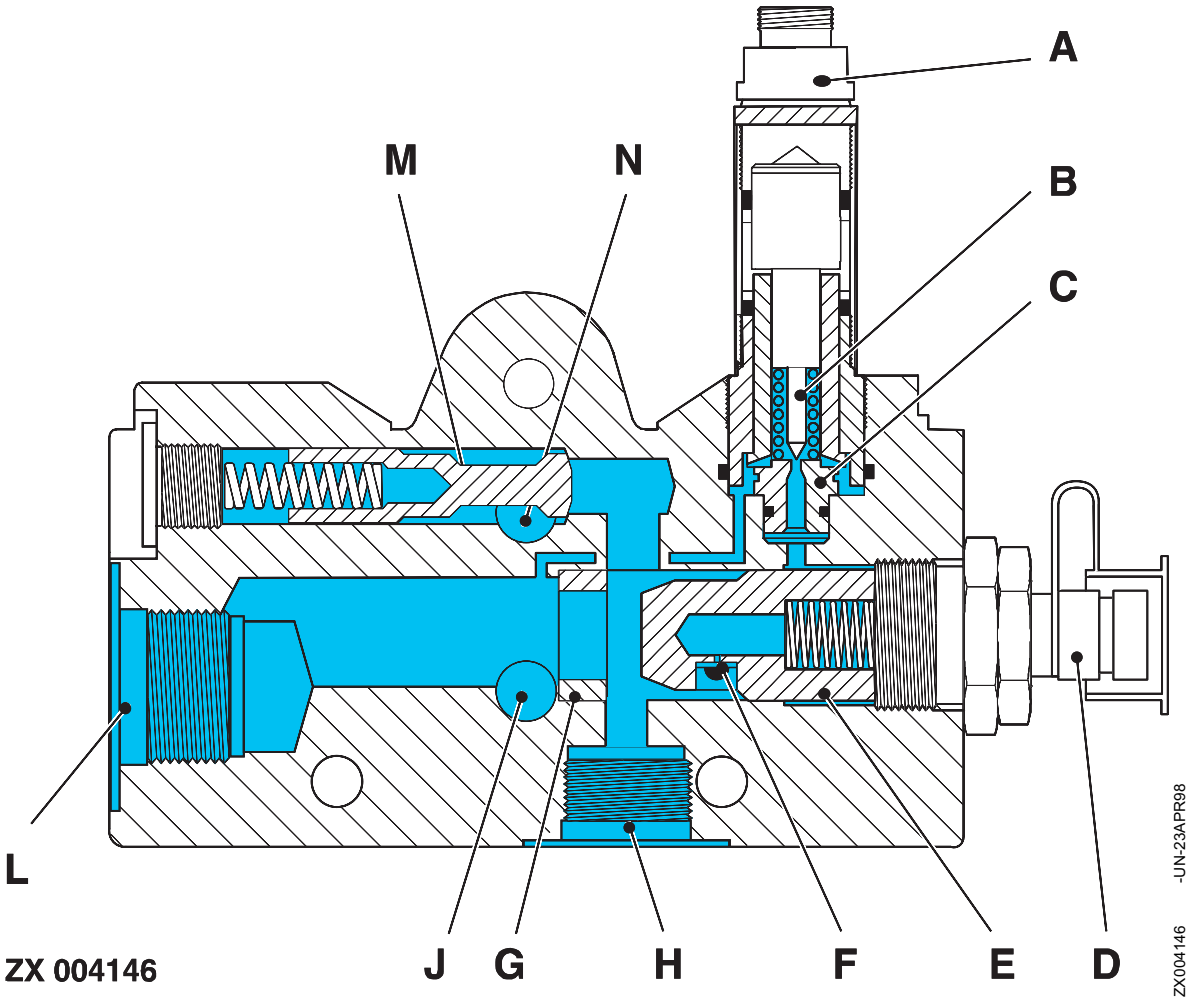


A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Return oil passage
H—Check valve
J—Connection, working line
L—Check valve seat
M—Piston
N—Return oil passage
O—Check valve seat
P—Connection, working line
Q—Check valve
R—Return oil passage
S—Needle valve seat
T—Needle valve
U—Pressure oil passage

Plunger (F) is pressurized on one side by opening one needle valve. This moves the plunger out of center position to right or left-hand end position, providing a connection between pressure oil passage (U) and line (J) or (P). The pressure buildup opens the check valve on the opposite side to provide a return oil connection.

ZX,TMXZCO003078-19-25NOV93

PRESSURE VALVE IN NEUTRAL POSITION



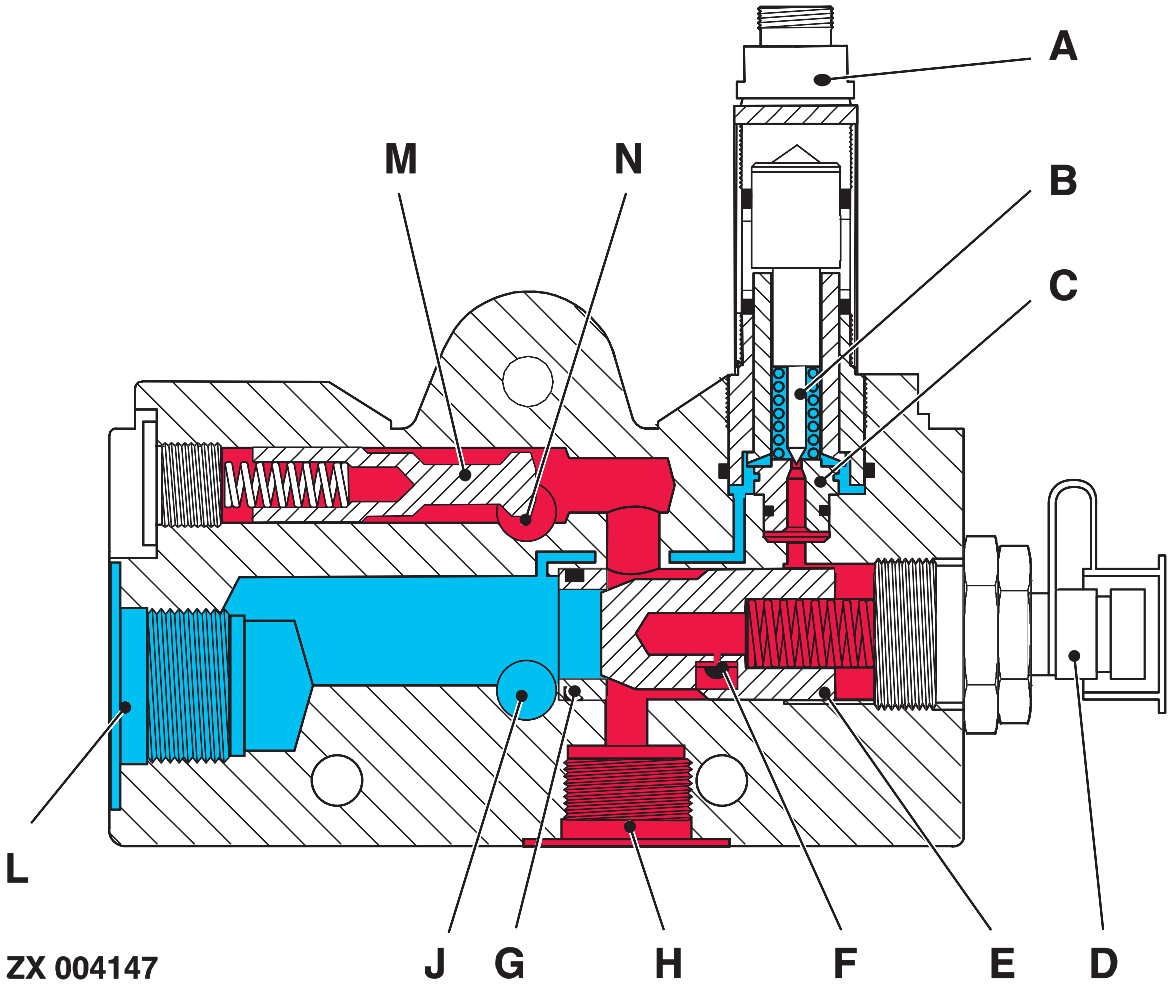
A—Solenoid
B—Needle valve
C—Needle valve seat
D—Pressure test connection
E—Control plunger
F—Orifice
G—Control plunger seat
H—Connection, pressure oil from hydraulic pump
J—Return oil passage (with connection to the other valve plates)
L—Connection, return oil to hydraulic oil reservoir
M—Check valve plunger
N—Pressure oil passage (with connection to the other valve plates)

With pressure valve in neutral position, needle valve (B) is open. Space behind control plunger (E) is pressure-free, because this space is connected to return oil passage and, via connection (L), to hydraulic oil reservoir.

Oil from hydraulic pump entering at connection (H) pushes plunger (E) back and returns to hydraulic oil reservoir via connection (L).

ZX,TMXZCO003079-19-25NOV93

PRESSURE VALVE IN WORKING POSITION



A—Solenoid
B—Needle valve
C—Needle valve seat
D—Pressure test connection
E—Control plunger
F—Orifice
G—Control plunger seat
H—Connection, pressure oil from hydraulic pump
J—Return oil passage (with connection to the other valve plates)
L—Connection, return oil to hydraulic oil reservoir
M—Check valve plunger
N—Pressure oil passage (with connection to the other valve plates)

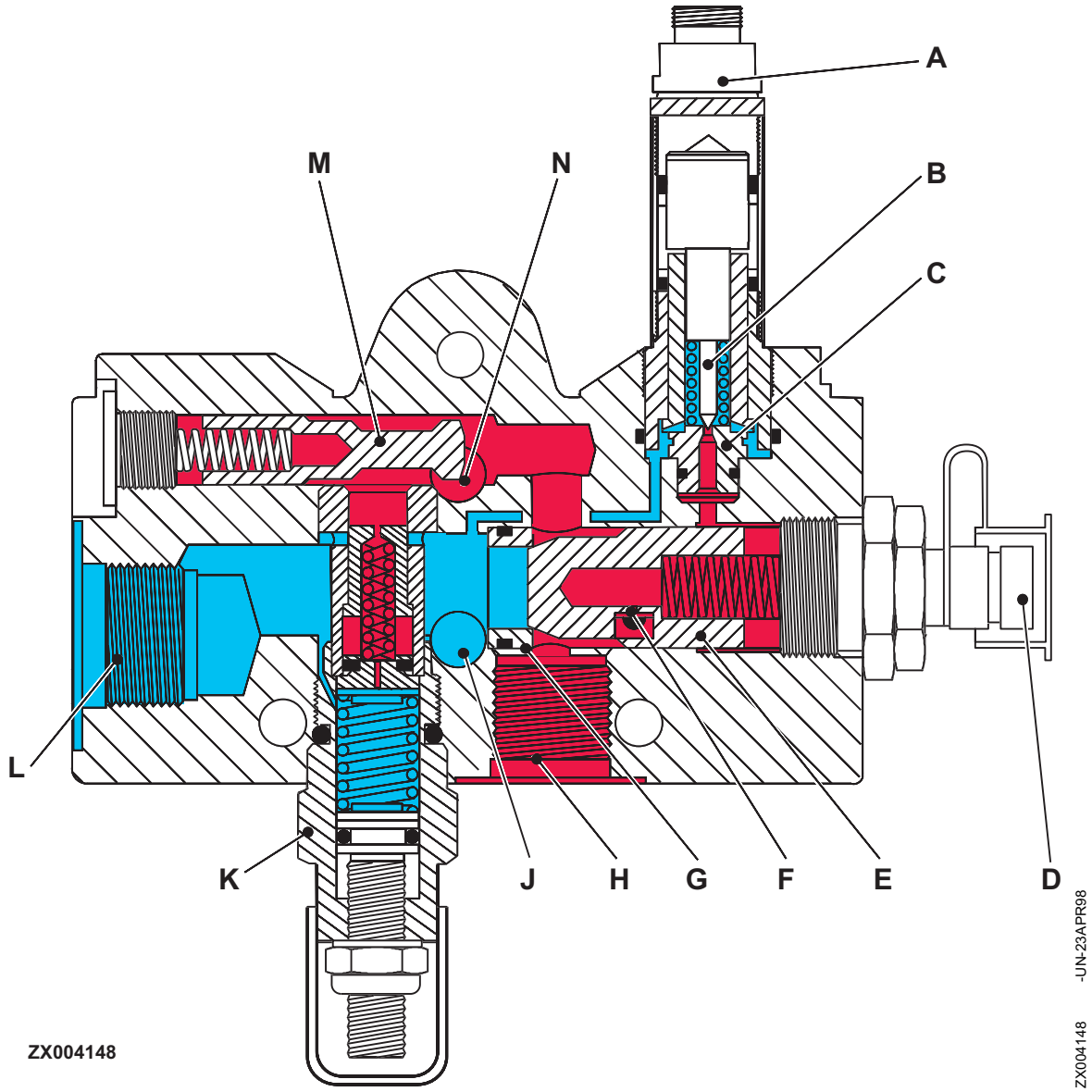
With pressure valve in working position, needle valve (B) is pressed on its seat (C) by solenoid (A). There is no connection between space behind plunger (E) and return oil passage.

Orifice (F) builds up pressure behind plunger. Due to the pressure buildup and spring force, control plunger (E) is pressed on its seat (G). The connection to return oil passage is interrupted.

The pressure oil pushes back plunger (M) of check valve and flows into pressure oil passage (N). Pressure oil can flow from pressure oil passage (N) to one of the control valve plates (arranged parallel) to perform any desired hydraulic function.

ZX,TMXZCO003080-19-25NOV93

PRESSURE VALVE WITH PRESSURE RELIEF VALVE



A—Connection, pressure oil from hydraulic pump

B—Connection, return oil to hydraulic oil reservoir

C—Pressure oil passage

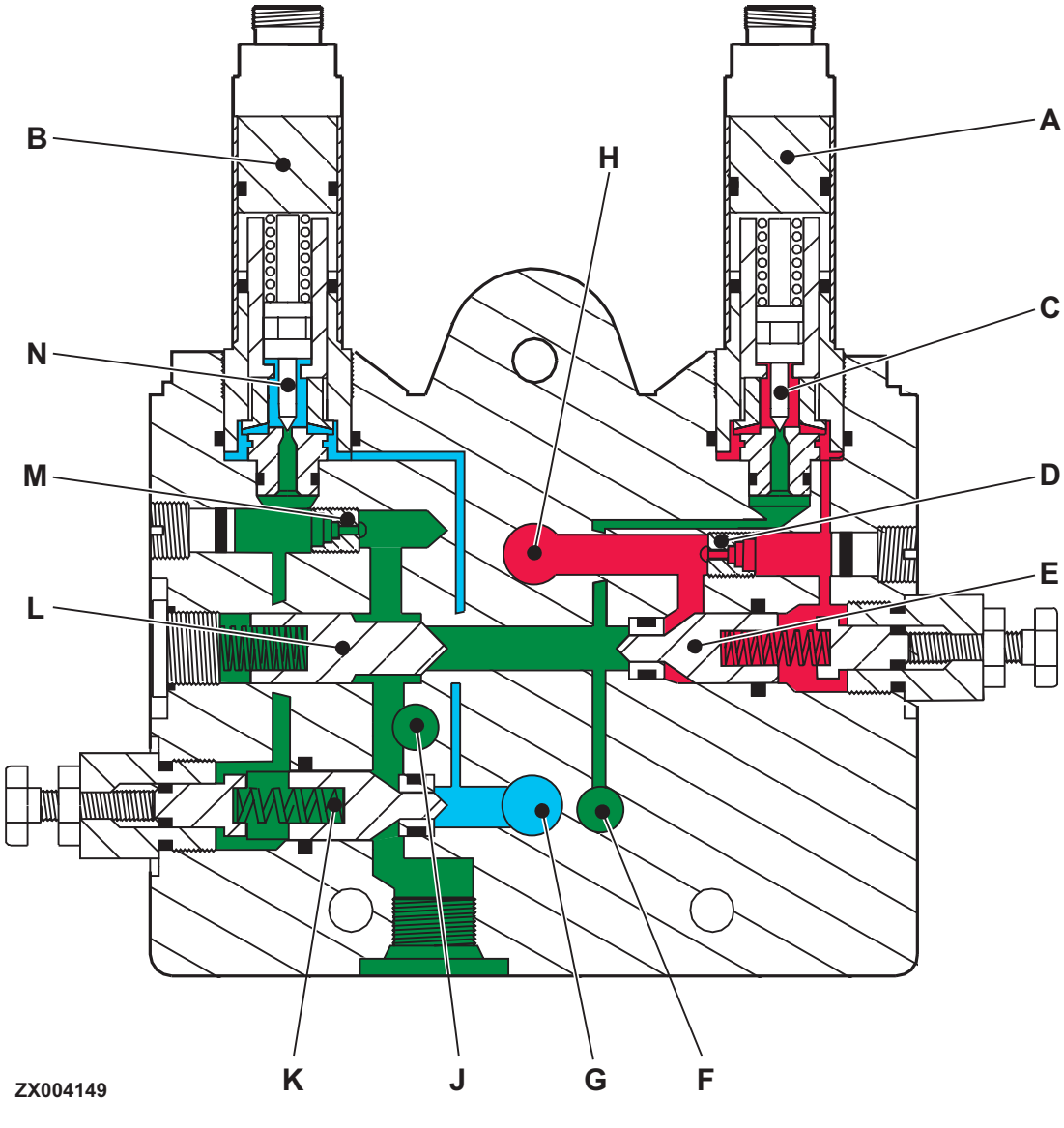
D—Pressure relief valve

Operation of pressure valve with relief valve is similar to operation of pressure valve without relief valve.

The only difference is a connecting bore between pressure oil passage and return oil passage with incorporated relief valve. Relief valve opening pressure is 22000 kPa (220 bar; 3200 psi).

ZX,TMXZCO003081-19-25NOV93

SOLENOID VALVE PLATE 'RAISING HARVESTING UNIT', NEUTRAL POSITION



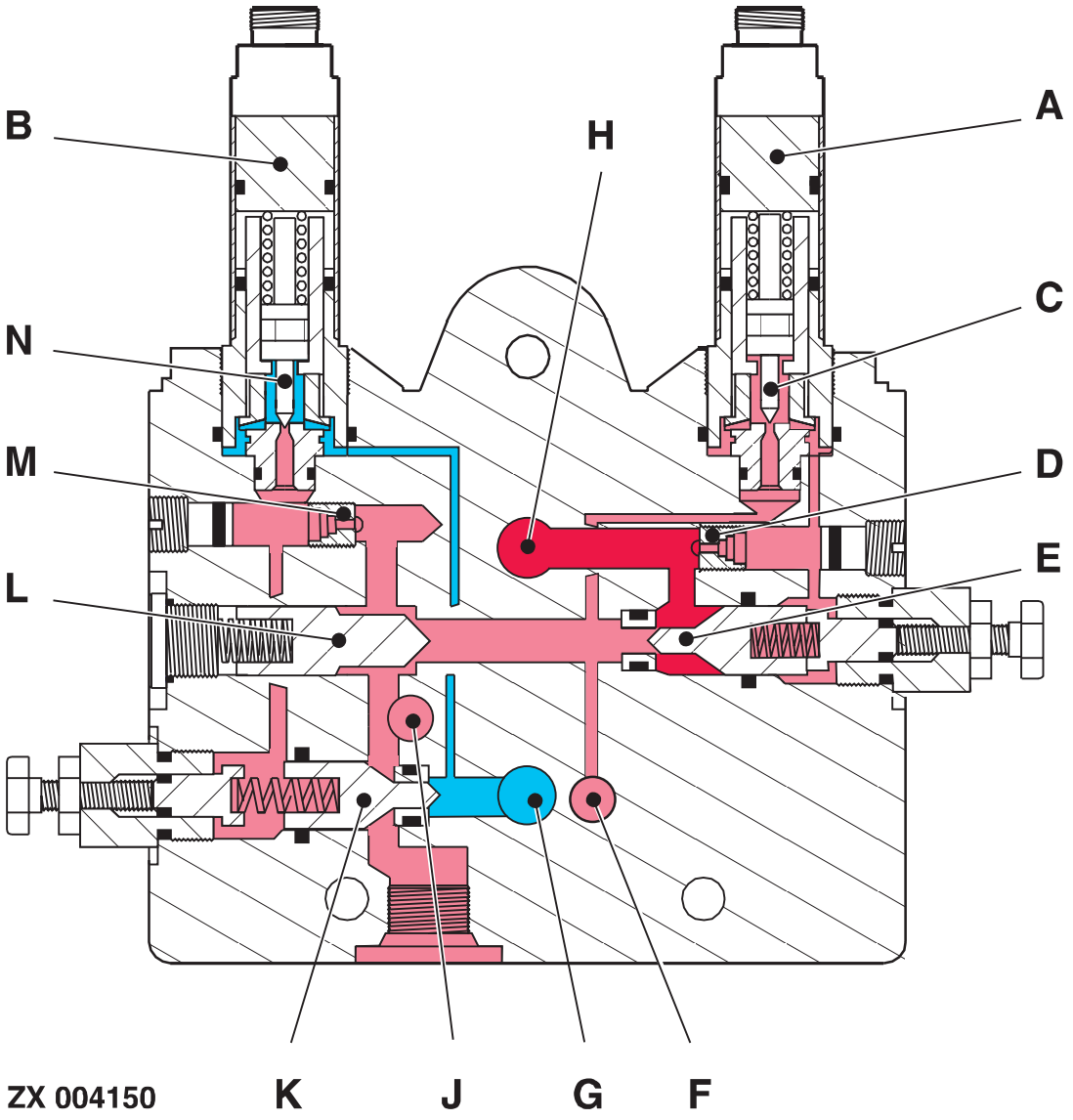
A—Solenoid
B—Solenoid
C—Needle valve
D—Orifice
E—Control plunger, raising
F—Connecting passage
G—Return passage
H—Pressure oil passage
J—Connecting passage
K—Control plunger, lowering
L—Check valve
M—Orifice
N—Needle valve
X—Dimension for lift rate adjustment
Y—Dimension for rate-of-drop adjustment

In neutral position needle valves (C) and (N) are closed by spring pressure. Pressure can be built up via orifices (M) and (D) in space behind control plungers (E) and (K) and both control plungers are pressed on their seats. Pressure oil passage (H) and return oil passage (G) are closed by lift cylinder connection.

When no hydraulic functions are operated and pressure oil passage is without pressure, check valve (L) prevents hydraulic oil from flowing back. This in turn prevents harvesting unit from lowering.

ZX,TMXZCO003082-19-25NOV93

SOLENOID VALVE PLATE 'RAISING HARVESTING UNIT', RAISING POSITION



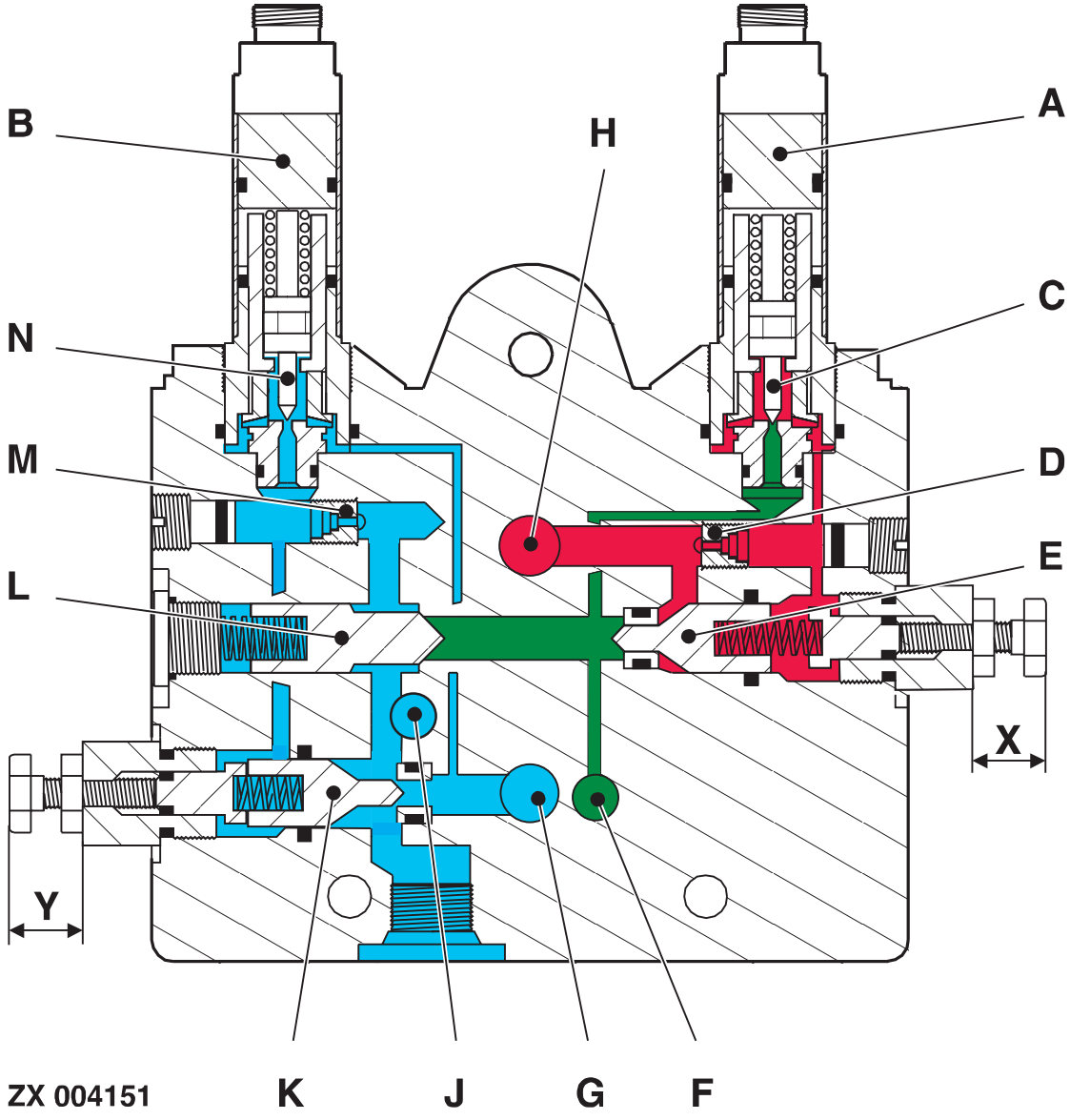
A—Solenoid
B—Solenoid
C—Needle valve
D—Orifice
E—Control plunger, raising
F—Connecting passage
G—Return oil passage
H—Pressure oil passage
J—Connecting passage
K—Control plunger, lowering
L—Check valve
M—Orifice
N—Needle valve
X—Dimension for lift rate adjustment
Y—Dimension for rate-of-drop adjustment

To raise harvesting unit solenoid (A) is activated. Needle valve (C) opens and so connection between space behind control plunger (E) and passage to harvesting unit lift cylinder (blocked by control plunger, E) is open.

This causes pressure to drop in space behind control plunger (E), and plunger (E) to open. Pressure oil flows past check valve (L) to harvesting unit lift cylinders.

ZX,TMXZCO003083-19-25NOV93

SOLENOID VALVE PLATE 'RAISING HARVESTING UNIT', LOWERING POSITION



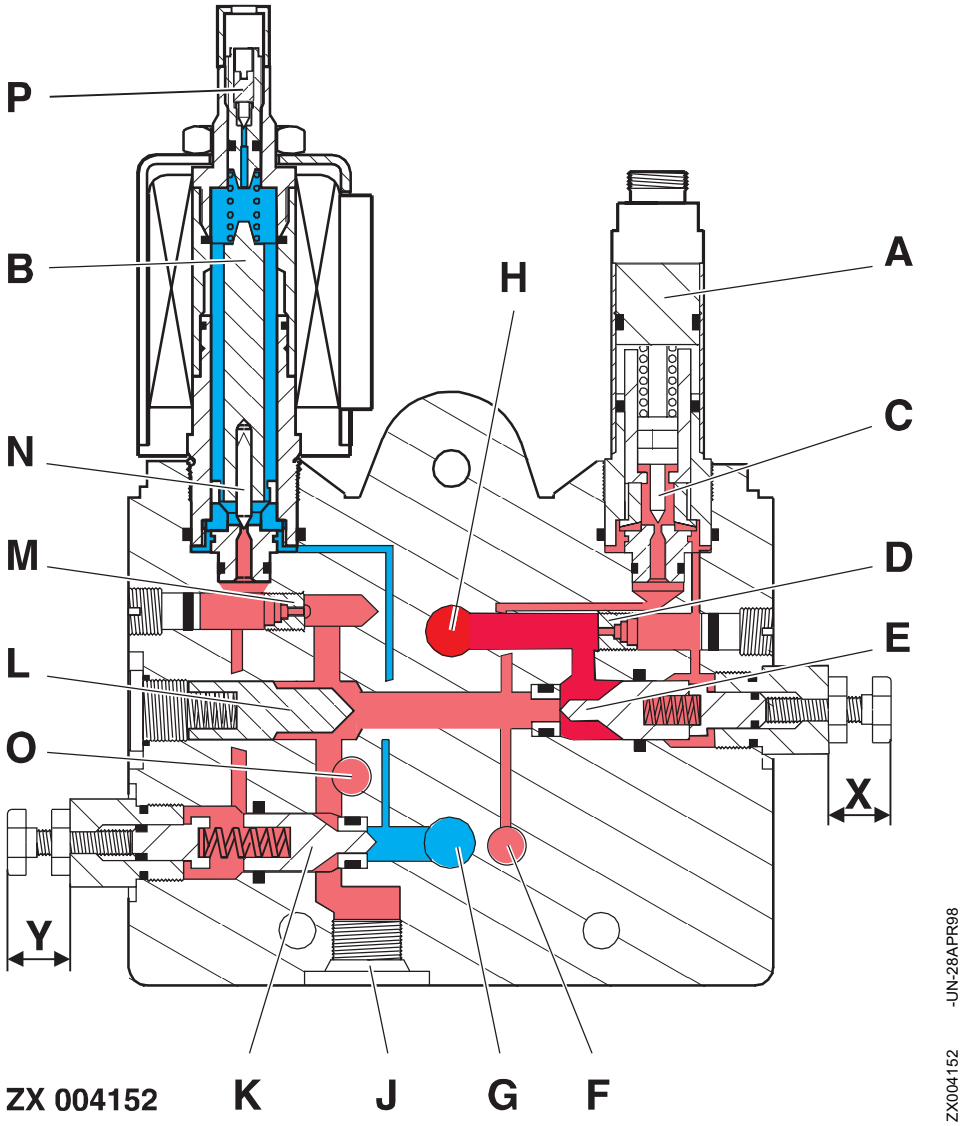
A—Solenoid
B—Solenoid
C—Needle valve
D—Orifice
E—Control plunger, raising
F—Connecting passage
G—Return oil passage
H—Pressure oil passage
J—Connecting passage
K—Control plunger, lowering
L—Check valve
M—Orifice
N—Needle valve
X—Dimension for lift rate adjustment
Y—Dimension for rate-of-drop adjustment

To lower harvesting unit solenoid (A) is activated. Needle valve (C) opens and so connection between space behind control plunger (E) and return oil passage (G) is open.

This causes pressure to drop in space behind control plunger (E), and plunger (E) to open. Oil can now flow from harvesting unit lift cylinders to return oil passage (G).

ZX,TMXZCO003084-19-25NOV93

SOLENOID VALVE PLATE 'RAISING HARVESTING UNIT', FLOAT POSITION

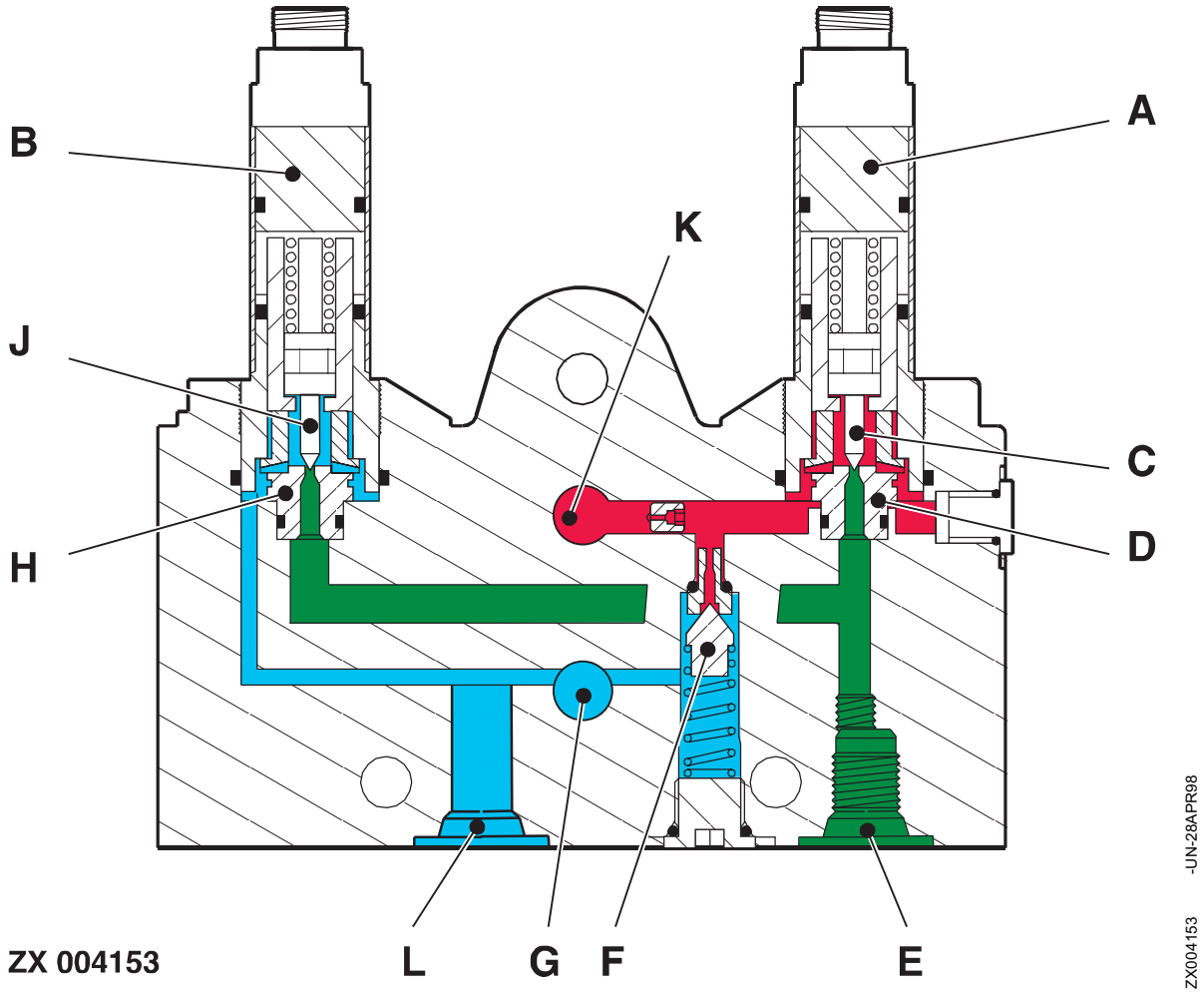


A—Solenoid
B—Steel core
C—Needle valve
D—Orifice
E—Control plunger, raising
F—Connecting passage
G—Return oil passage
H—Pressure oil passage
J—Connection to lift cylinder
K—Control plunger, lowering
L—Check valve
M—Orifice
N—Needle valve
O—Connecting bore
P—Bleed screw
X—Dimension for lift rate adjustment
Y—Dimension for rate-of-drop adjustment

To obtain float function, the solenoid valve plate is equipped with a special solenoid (B). For float function the solenoid is supplied with an electric current between 300 and 900 mA. Depending on current a certain needle valve (N) opening pressure is obtained which determines ground pressure.

ZX,TMXZCO003085-19-25NOV93

SOLENOID VALVE PLATE 'CYLINDER VARIABLE DRIVE ADJUSTMENT'



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Connection, cylinder variable drive
F—Pressure relief valve
G—Return oil passage
H—Needle valve seat
J—Needle valve
K—Pressure oil passage
L—Return connection to reservoir

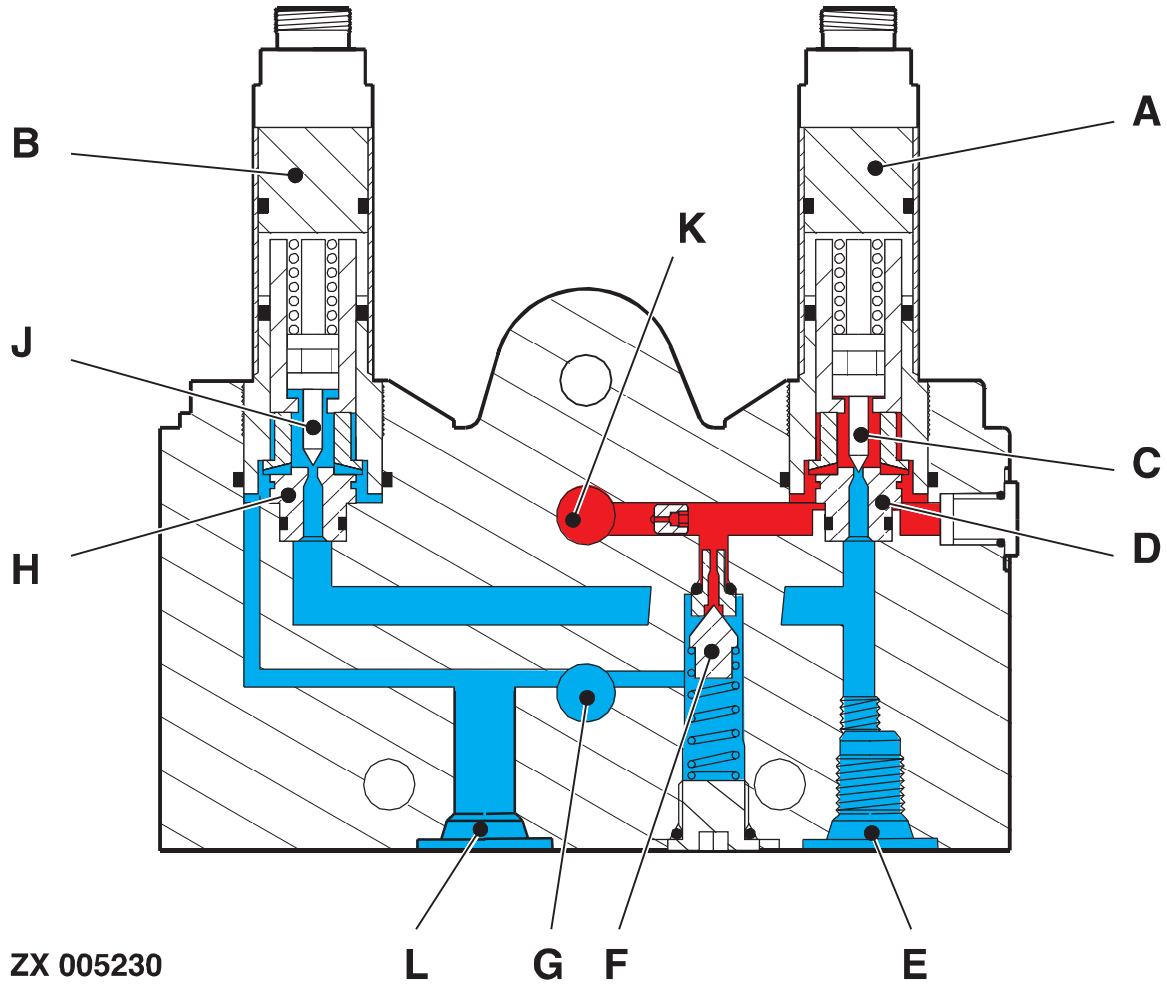
Threshing cylinder variable drive hydraulic cylinder is connected to connection (E) of solenoid valve plate. By activating solenoid (B) and opening needle valve (J) hydraulic oil is discharged from variable drive cylinder.

By activating a pressure valve and solenoid (A) hydraulic oil is directed to variable drive cylinder.

Pressure relief valve (F) limits pressure to 7000 kPa (70 bar; 1015 psi).

ZX,TMXZCO003086-19-14JAN94

SOLENOID VALVE PLATE 'CYLINDER VARIABLE DRIVE ADJUSTMENT', INCREASING SPEED

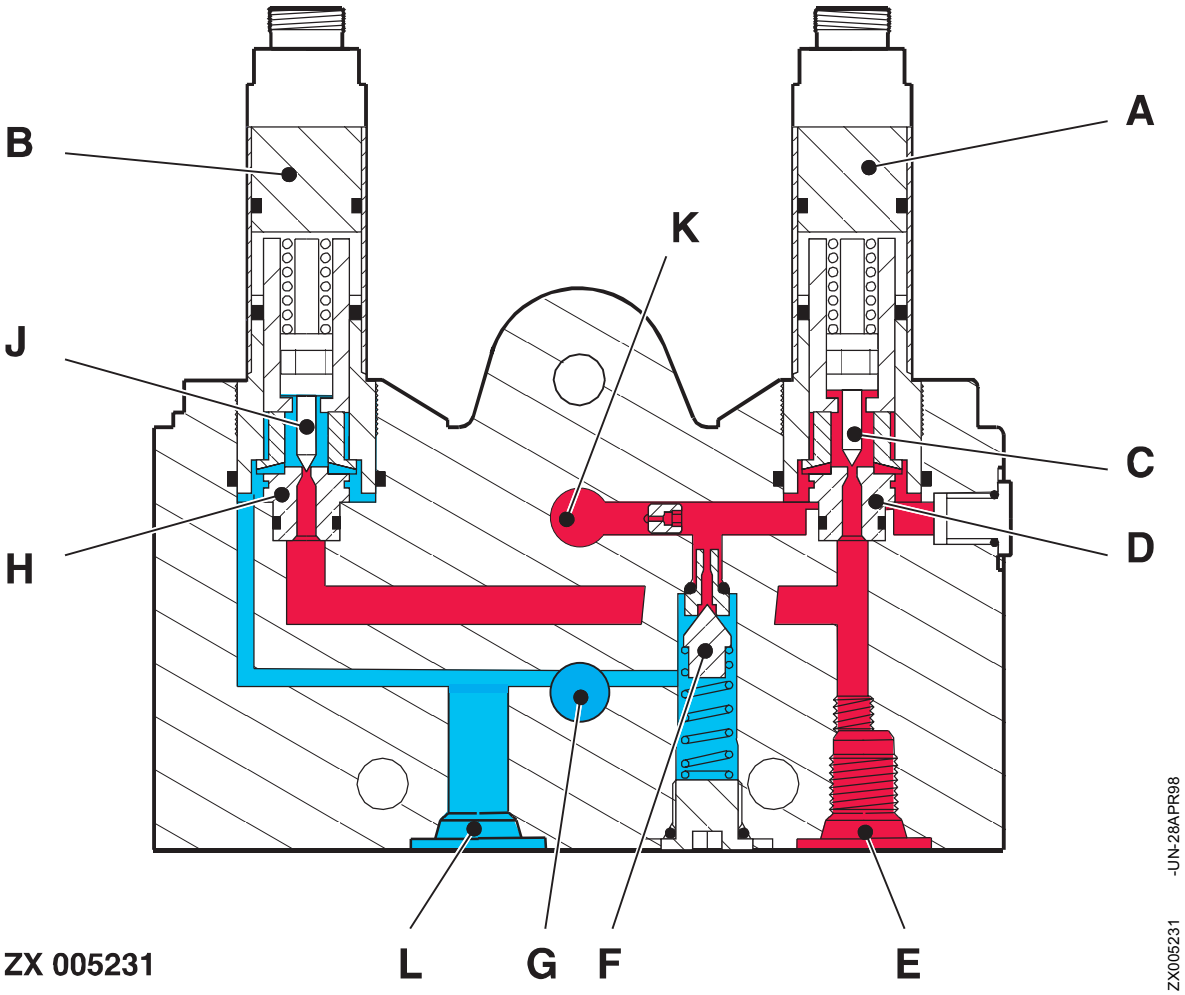


A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Connection, cylinder variable drive
F—Pressure relief valve
G—Return oil passage
H—Needle valve seat
J—Needle valve
K—Pressure oil passage
L—Return connection to reservoir

One pressure valve and solenoid (A) are activated to increase threshing cylinder speed. The orifice in the pressure oil passage limits oil flow. Pressure relief valve (F) limits pressure to 7000 kPa (70 bar; 1015 psi). An additional orifice plate is located in connection (E). This ensures that cylinder variable drive adjustment is not carried out too rapidly.

ZX,TMXZCO003167-19-14JAN94

SOLENOID VALVE PLATE 'CYLINDER VARIABLE DRIVE ADJUSTMENT', DECREASING SPEED

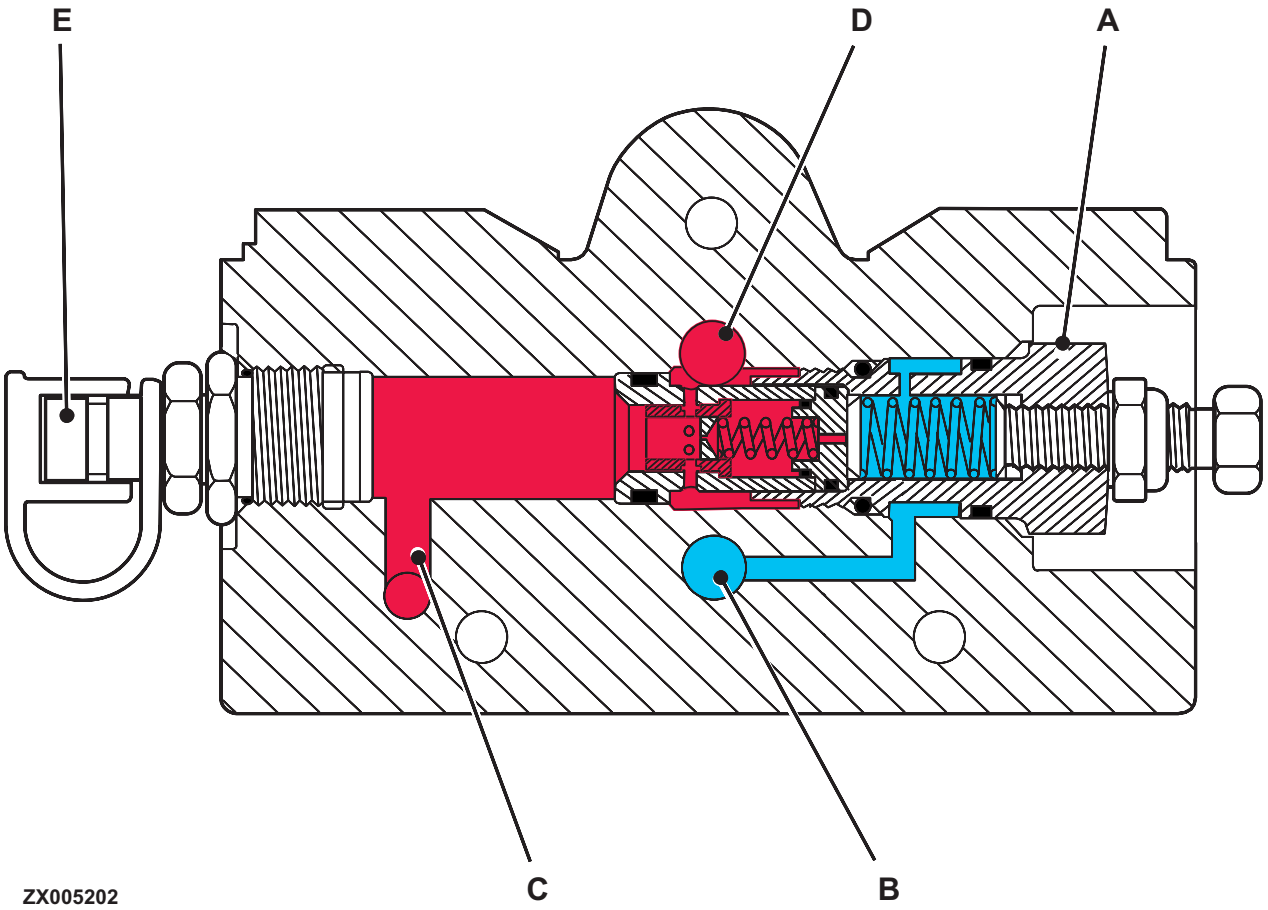


A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Connection, cylinder variable drive
F—Pressure relief valve
G—Return oil passage
H—Needle valve seat
J—Needle valve
K—Pressure oil passage
L—Return connection to reservoir

Solenoid (B) is activated to decrease threshing cylinder speed. Hydraulic oil flows via needle valve seat into the return oil passage and back to the hydraulic oil reservoir.

ZX,TMXZCO003168-19-14JAN94

PRESSURE REDUCING VALVE



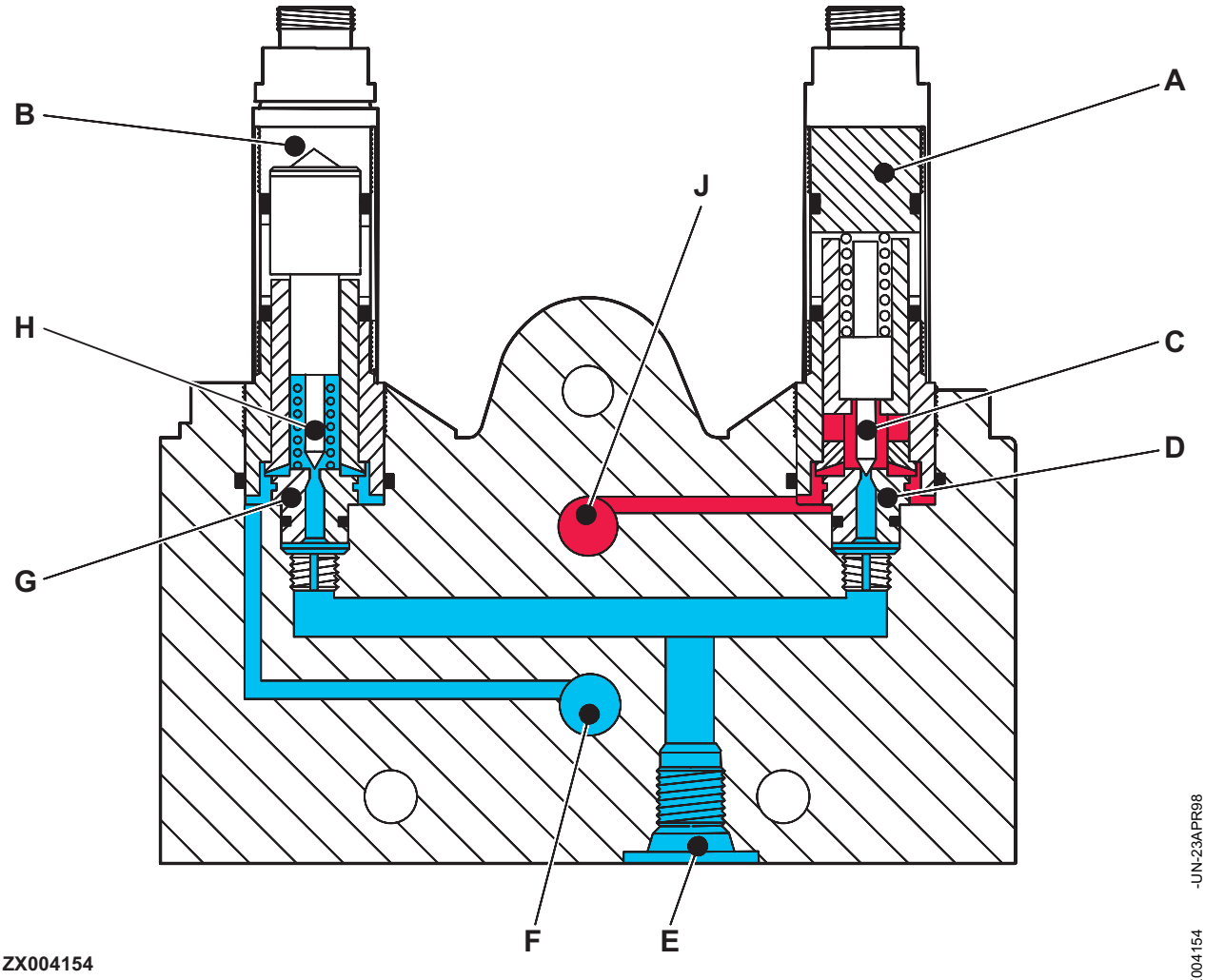
A—Pressure reducing insert **B—Return oil passage** **C—Pressure oil passage to main clutch solenoid valve plate** **D—Pressure oil passage from pressure valves**

The purpose of pressure reducing valve is to limit oil pressure which is necessary for main clutch operation to 6500 kPa (65 bar; 940 psi) max.

The pressure reducing insert (A) limits pressure from pressure valves in passage (D) of 21000 kPa (210 bar; 3050 psi) max. (when other hydraulic functions are operated) to 6500 kPa (65 bar; 940 psi) max. in passage (C).

ZX,TMXZCO003087-19-25NOV93

SOLENOID VALVE PLATE 'ENGAGING SEPARATOR OR UNLOADING DRIVE', NEUTRAL POSITION

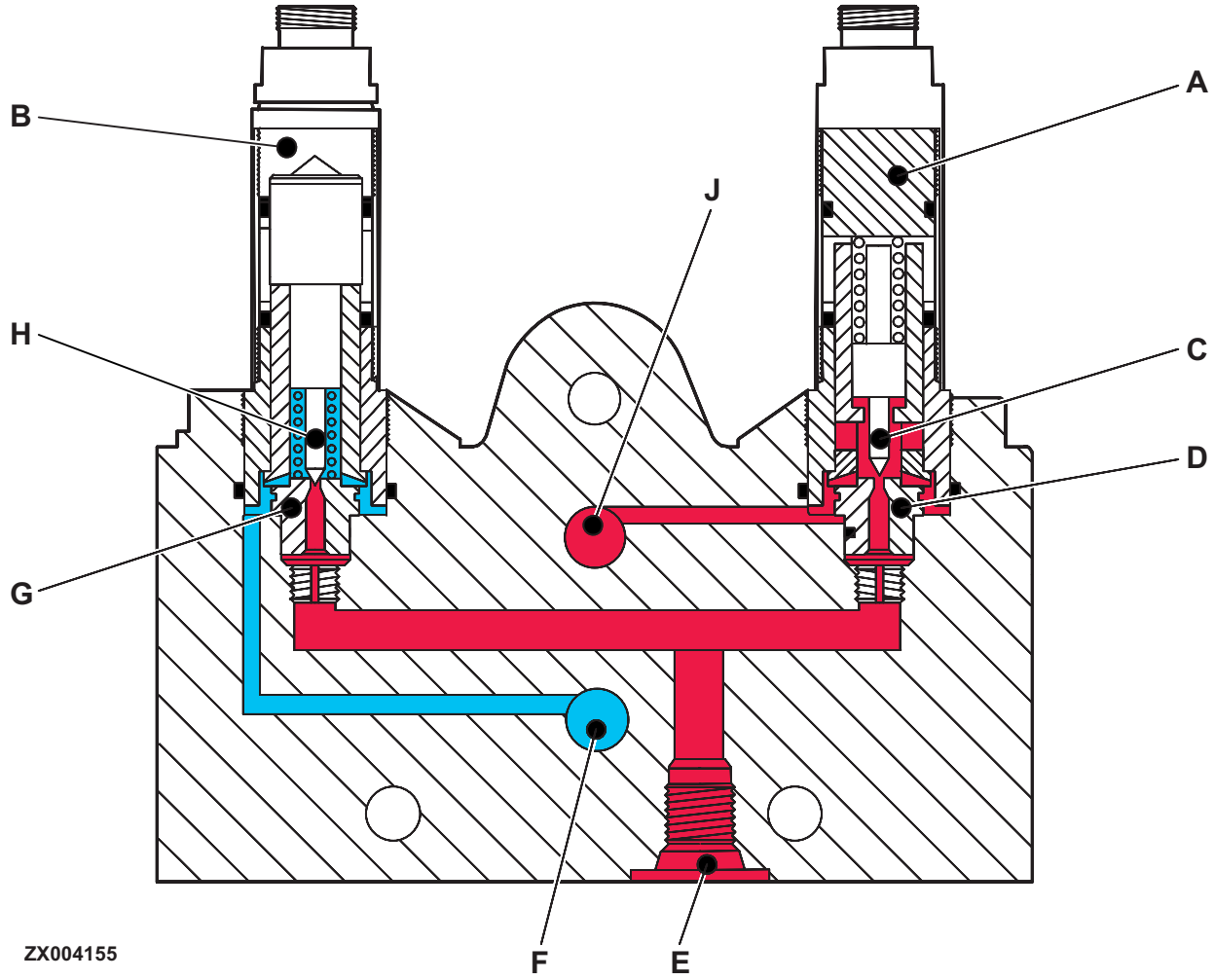


A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Connection to main clutch
F—Return oil passage
G—Needle valve seat
H—Needle valve
J—Pressure oil passage

With solenoid valve plate in neutral position, solenoid valve (A) is closed without current and solenoid valve (B) open without current. In this position connection (E) leading to main clutch, is connected to return oil passage. Main clutch is without pressure and thus disengaged.

ZX,TMXZCO003088-19-25NOV93

MAIN CLUTCH SOLENOID VALVE PLATE IN OPERATING POSITION



A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Connection to main clutch
F—Return oil passage
G—Needle valve seat
H—Needle valve
J—Pressure oil passage

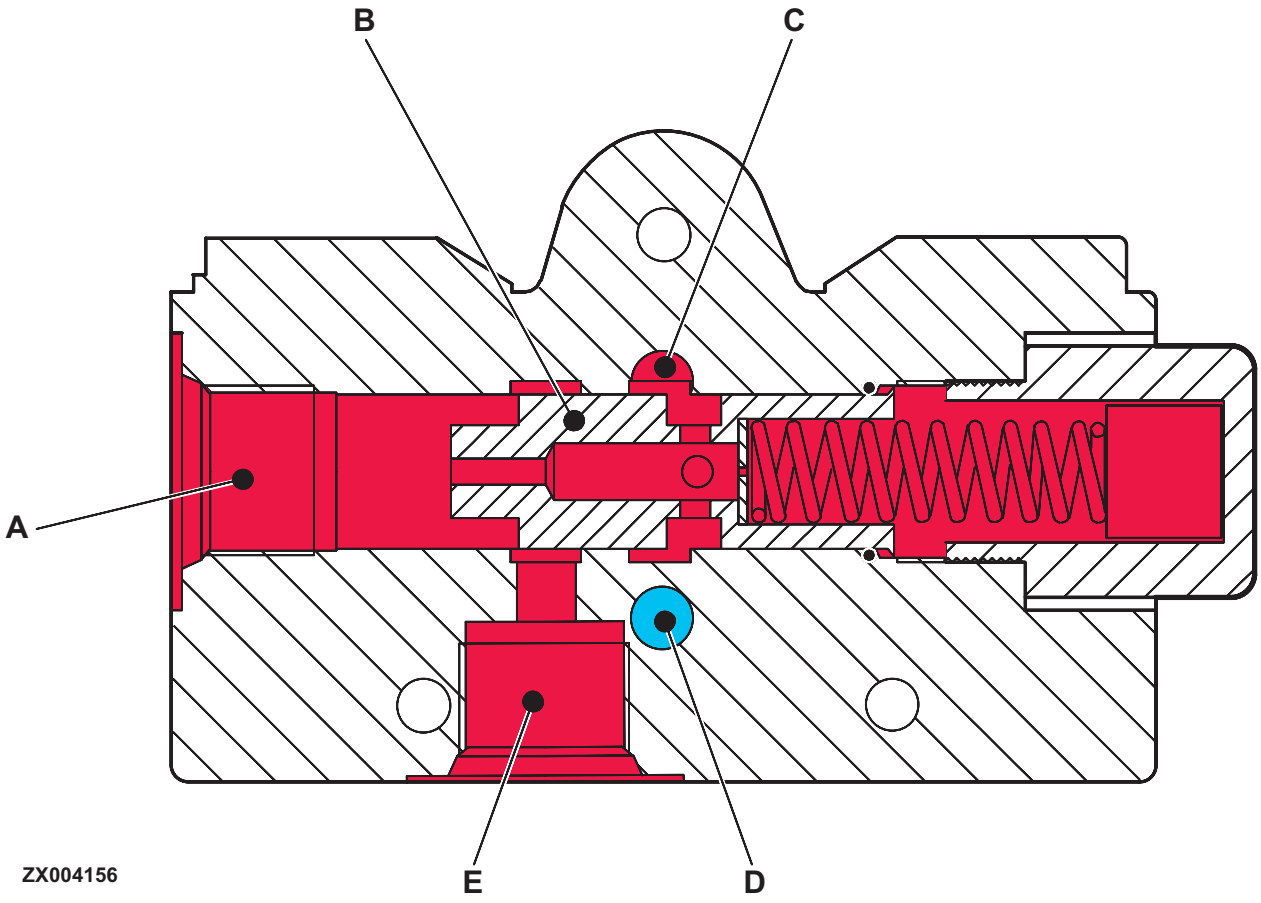
With solenoid valve in operating position solenoid valves (A) and (B) are activated, solenoid valve (A) opens and provides a connection between pressure oil passage and connection (E).

Solenoid valve (B) interrupts connection to return oil passage.

Via connection (E) pressure is built up in main clutch and main clutch is engaged.

ZX,TMXZCO003089-19-25NOV93

FLOW DIVIDER (HILLMASTER)



A—Supply from pump
B—Spool
C—Pressure oil passage (primary system)
D—Return oil passage
E—Connection to main solenoid valve block

The first module at hillmaster combine hydraulic valve block is the flow divider. It is supplied from hydraulic pump with 45 L/min (12 US gal/min) oil via connection (A). Hillmaster system is supplied with priority via spool (B) and passage (C) with 27 L/min (7 US gal/min) oil approx. The surplus amount of oil of 18 L/min (5 US gal/min) approx. flows via connection (E) to secundary system, the combine main valve block with pressure valve (Y1).

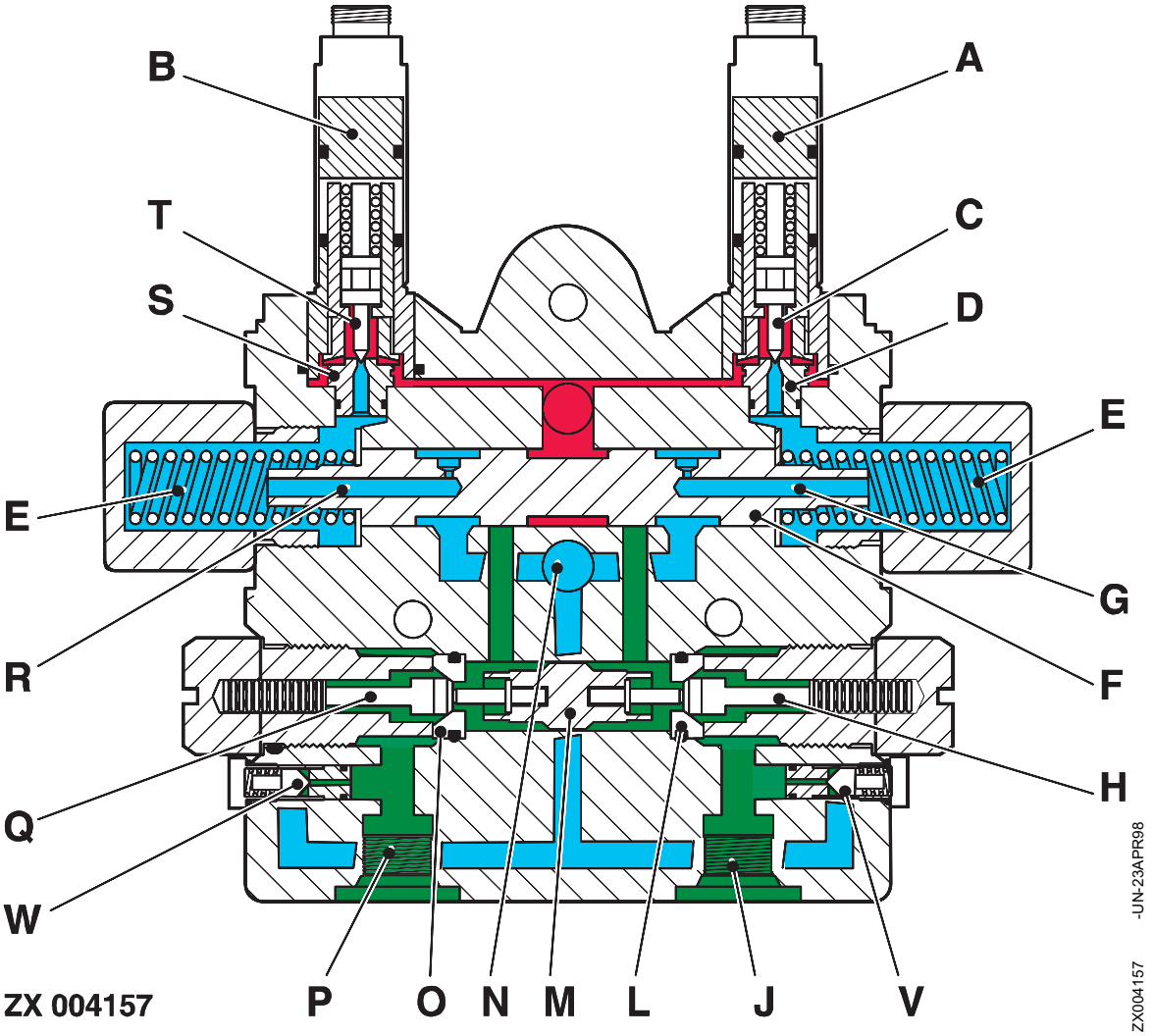
ZX,TMXZCO003090-19-25NOV93

PRESSURE VALVE, HILLMASTER

Function of pressure valve of hillmaster combine solenoid valve block is the same as function of pressure valve on basic machine. The difference is that on hillmaster combines no check valve is installed. Opening pressure of pressure relief valve is 22000 KPa (220 bar; 32000 psi).

ZX,TMXZCO003091-19-25NOV93

SOLENOID VALVE PLATE 'HILLMASTER', TILTING LATERALLY

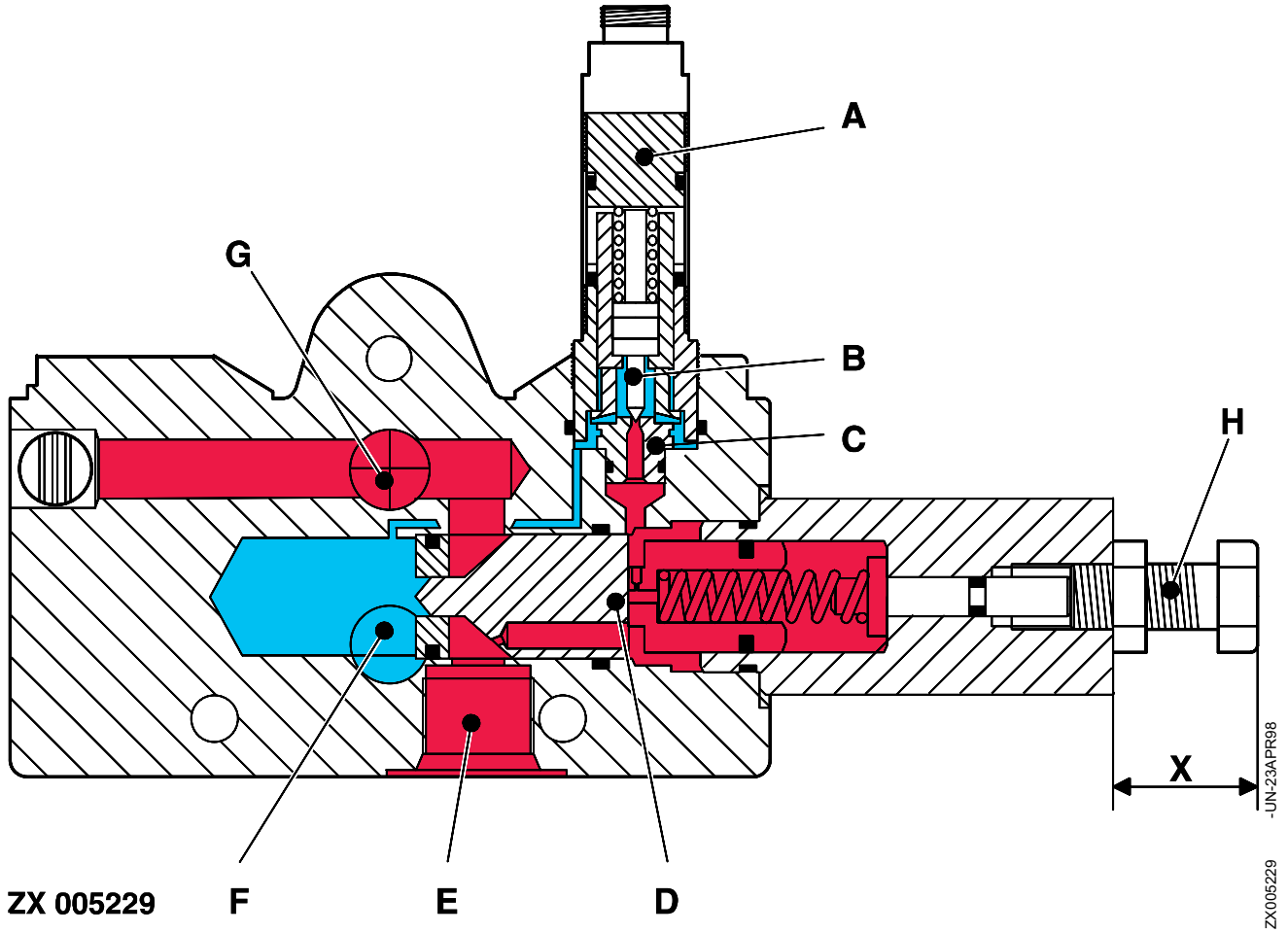


A—Solenoid
B—Solenoid
C—Needle valve
D—Needle valve seat
E—Spring
F—Control plunger
G—Return oil passage
H—Check valve
J—Connection, work line
L—Check valve seat
M—Plunger
N—Return oil passage
O—Check valve seat
P—Connection, work line
Q—Check valve
R—Return oil passage
S—Needle valve seat
T—Needle vale
U—Pressure oil passage
V—Thermal relief valve
W—Thermal relief valve

Function of solenoid valve plate shown is the same as the function of solenoid valve plate for swinging out unloading auger. A difference is, that on hillmaster combines a pressure relief valve (V) and (W) is integrated in each connection for work line. This is to avoid pressure build-up caused by heating up hydraulic oil by solar radiation.

ZX,TMXZCO003092-19-25NOV93

SOLENOID VALVE PLATE 'LOWERING MACHINE', NEUTRAL POSITION



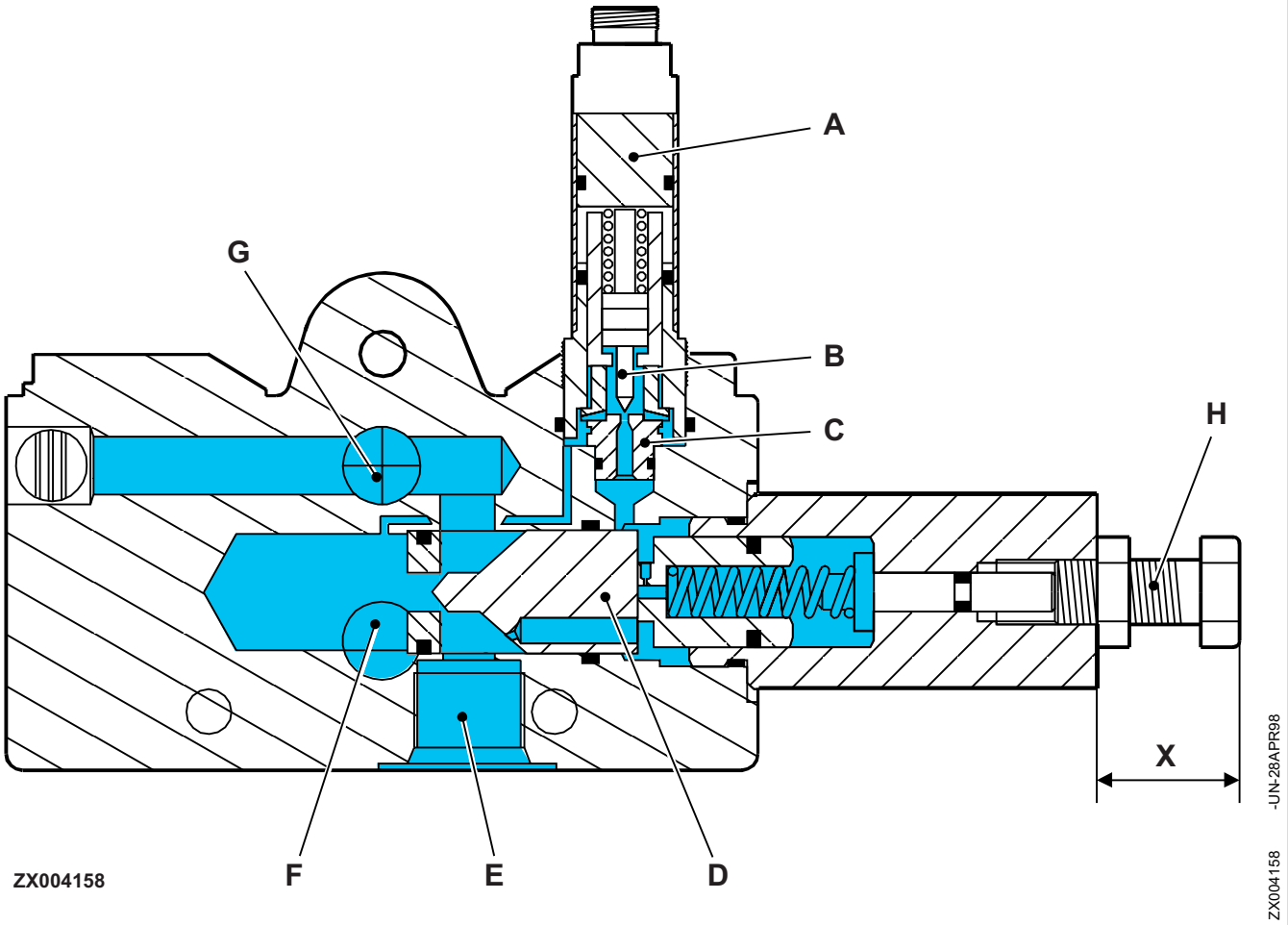
A—Solenoid
B—Needle valve
C—Needle valve seat
D—Control plunger
E—Connection to piston side of hillmaster hydraulic cylinders
F—Return oil passage
G—Passage without function
H—Adjusting screw
X—Dimension for adjustment 20 mm (0.88 in.)

In neutral position, needle valve (B) is closed. Pressure from connection (E) also builds up behind plunger (D). This closes passage (F) and return line to hydraulic oil reservoir.

With needle valve (B) open, no pressure can build up behind plunger (D). This will open return oil passage and the oil can flow to the hydraulic oil reservoir.

ZX,TMXZCO003166-19-13JAN94

SOLENOID VALVE PLATE 'LOWERING MACHINE'



A—Solenoid
B—Needle valve
C—Needle valve seat
D—Control plunger
E—Connection of piston-side connecting lines
F—Return oil passage
G—Passage without function (blocked)
H—Adjusting screw
X—Dimension for adjustment 20 mm (0.80 in.)

Connection (E) is connected to hydraulic line connecting hillmaster cylinder piston sides. Oil flowing during normal lateral tilting from one hydraulic cylinder to the other, is directed to return oil passage if solenoid (A) is activated. This prevents one hydraulic cylinder from extending when the other one is retracted, and the machine is lowering.

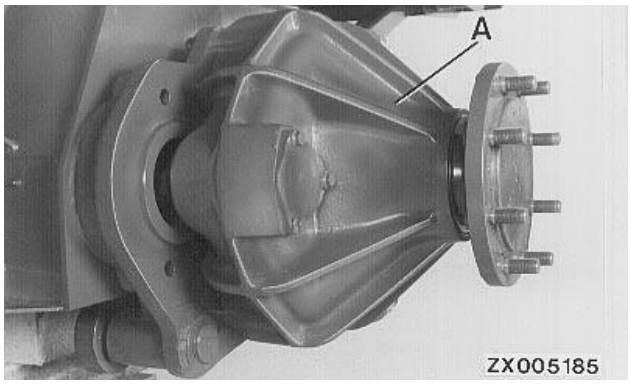
ZX,TMXZCO003093-19-25NOV93

GENERAL INFORMATION

On combines with Hillmaster leveling system, final drives pivot on front axle. Final drive position is determined by hydraulic cylinders (one on each side of the combine).

The cutting platform pivots on feeder house. Cutting platform position in relation to slope angle is determined by a master cylinder on final drive and a slave cylinder on pivoting shield of feeder house.

A—Pivoting final drive
B—Final drive hydraulic cylinder
C—Pivoting shield hydraulic cylinder



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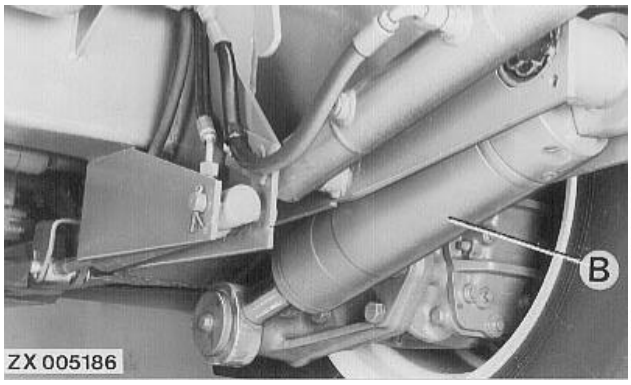
ZX005185



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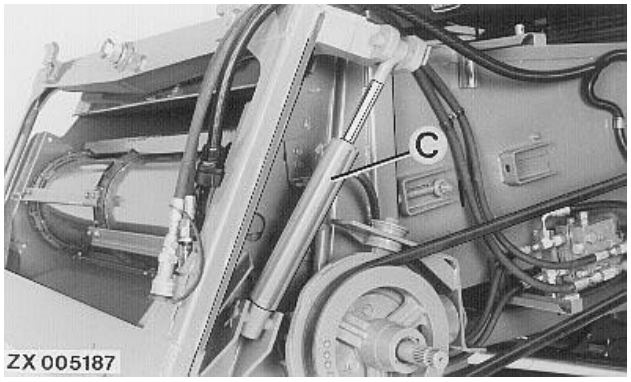
ZX005186



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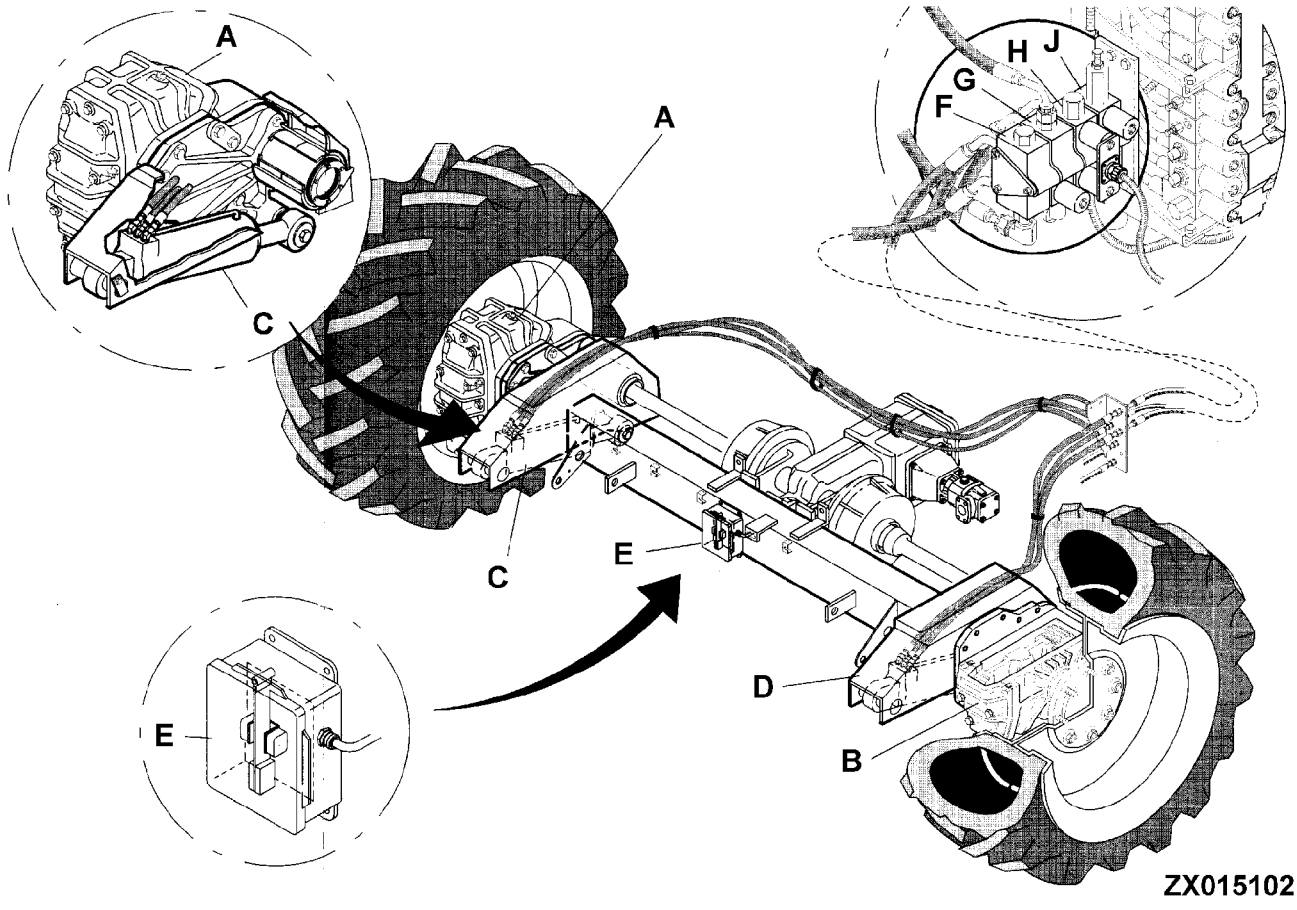
HILLMASTER LEVELING SYSTEM COMPONENTS



ZX,TMXZCO003148-19-30JUN97

HILLMASTER LEVELNG SYSTEM COMPONENTS

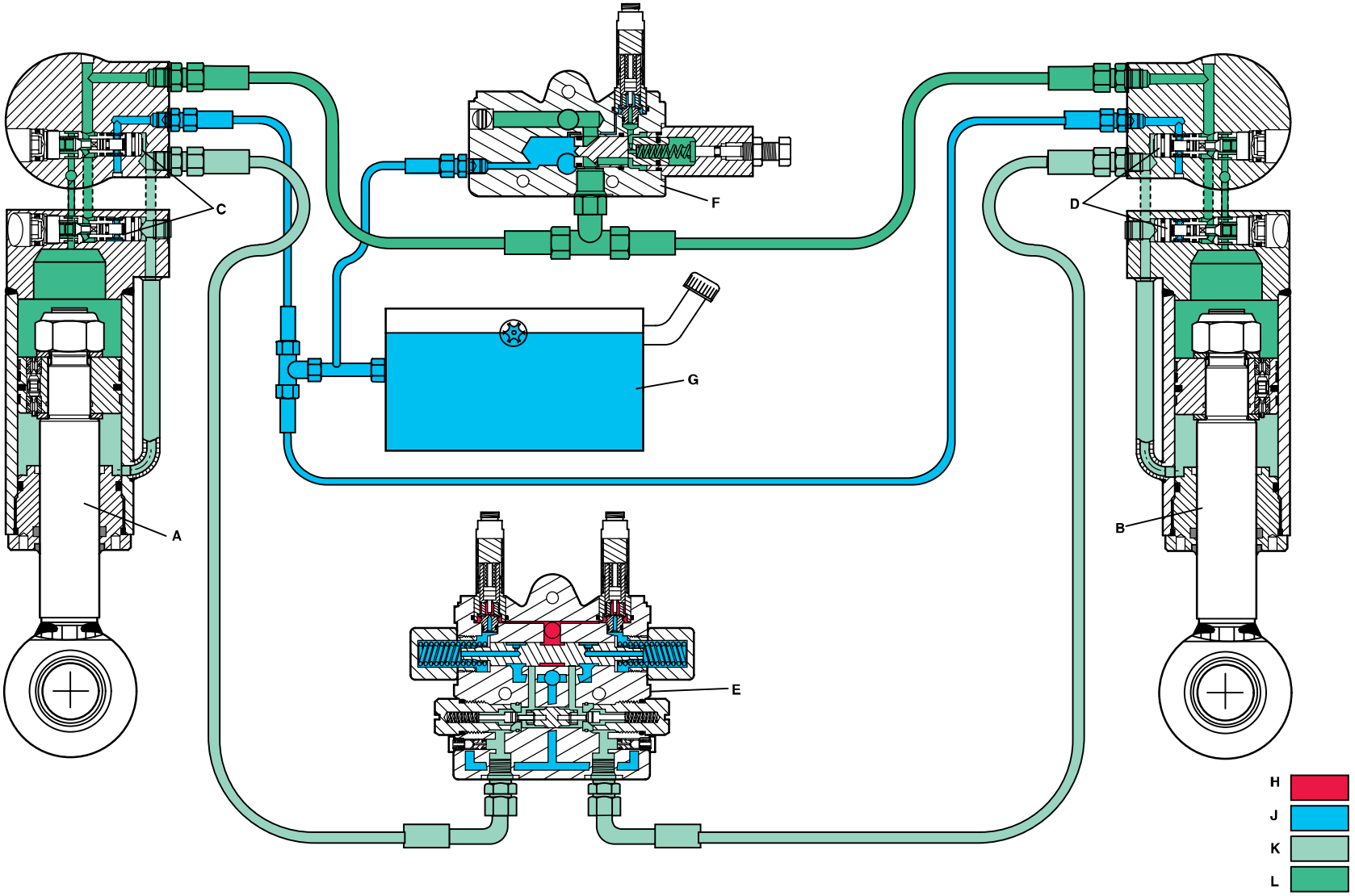
A—Final drive, right
B—Final drive, left
C—Hillmaster hydraulic cylinder, right
D—Hillmaster hydraulic cylinder, left
E—Level sensing control box
F—Flow divider
G—Pressure valve
H—Solenoid valve plate, tilting to the right/left
J—Solenoid valve plate, lowering combine

The final drives are bolted to two support plates, which can be pivoted around a horizontal axis relative to the axle. The plate is held in a certain position relative to the axle or pivoted by a large hydraulic cylinder.

A pendulum in the level sensing control box is used to sense slope angle. This box transmits a signal until the pendulum is centered in the box and the combine is exactly level.

ZX,TMXZCO003149-19-07JAN94

PREPARING HILLMASTER LEVELING SYSTEM FOR OPERATION



ZX005222

PREPARING HILLMASTER LEVELING SYSTEM FOR OPERATION

A—Hydraulic cylinder, right
B—Hydraulic cylinder, left
C—Pilot-operated check valve
D—Pilot-operated check valve
E—Solenoid valve plate, Hillmaster control
F—Solenoid valve plate, lowering combine
G—Reservoir
H—Hydraulic oil, high pressure
J—Hydraulic oil, pressure-free (return oil)
K—Hydraulic oil, trapped
L—Hydraulic oil, trapped

Before operating Hillmaster leveling system, it is necessary to move the machine from lowered position (for road travel) to higher position (for field operation).

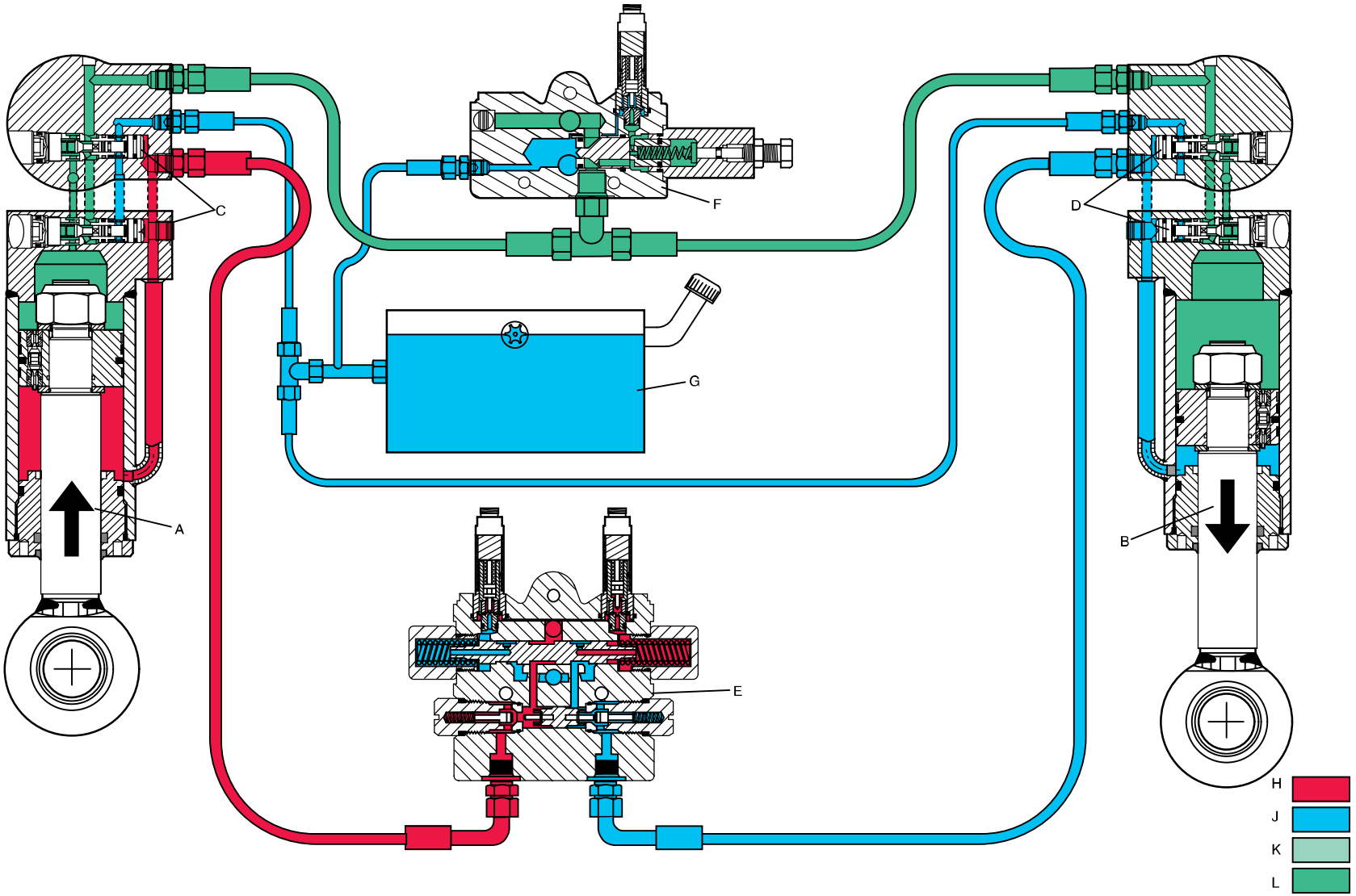
This is done by moving combine to maximum right or left-hand tilt position by operating manual leveling control switch.

During the tilting process, the solenoid valve directs hydraulic oil to the rod side of one hydraulic cylinder and, via the check valves in the piston, to the piston side of the opposite cylinder. The piston side of the hydraulic cylinder is filled with hydraulic oil, causing the cylinder to extend.

When the combine is moved back to center position, oil flows back from the piston side of the extended hydraulic cylinder. This means that both hydraulic cylinders are halfway extended with combine in center position (on level ground).

ZX,TMXZCO003151-19-07JAN94

HILLMASTER LEVELING SYSTEM OPERATION, LEVELING TO THE RIGHT



ZX005224

HILLMASTER LEVELING SYSTEM OPERATION, LEVELING TO THE RIGHT

A—Hydraulic cylinder, right
B—Hydraulic cylinder, left
C—Pilot-operated check valve
D—Pilot-operated check valve
E—Solenoid valve plate, Hillmaster control
F—Solenoid valve plate, lowering combine
G—Reservoir
H—Hydraulic oil, high pressure
J—Hydraulic oil, pressure-free (return oil)
K—Hydraulic oil, trapped
L—Hydraulic oil, trapped

NOTE: During leveling system operation, the machine is held in position by pilot-operated check valves integrated in the hydraulic cylinders, e.g. if a hydraulic hose should burst. Hydraulic oil is trapped on the piston side of hydraulic cylinders.

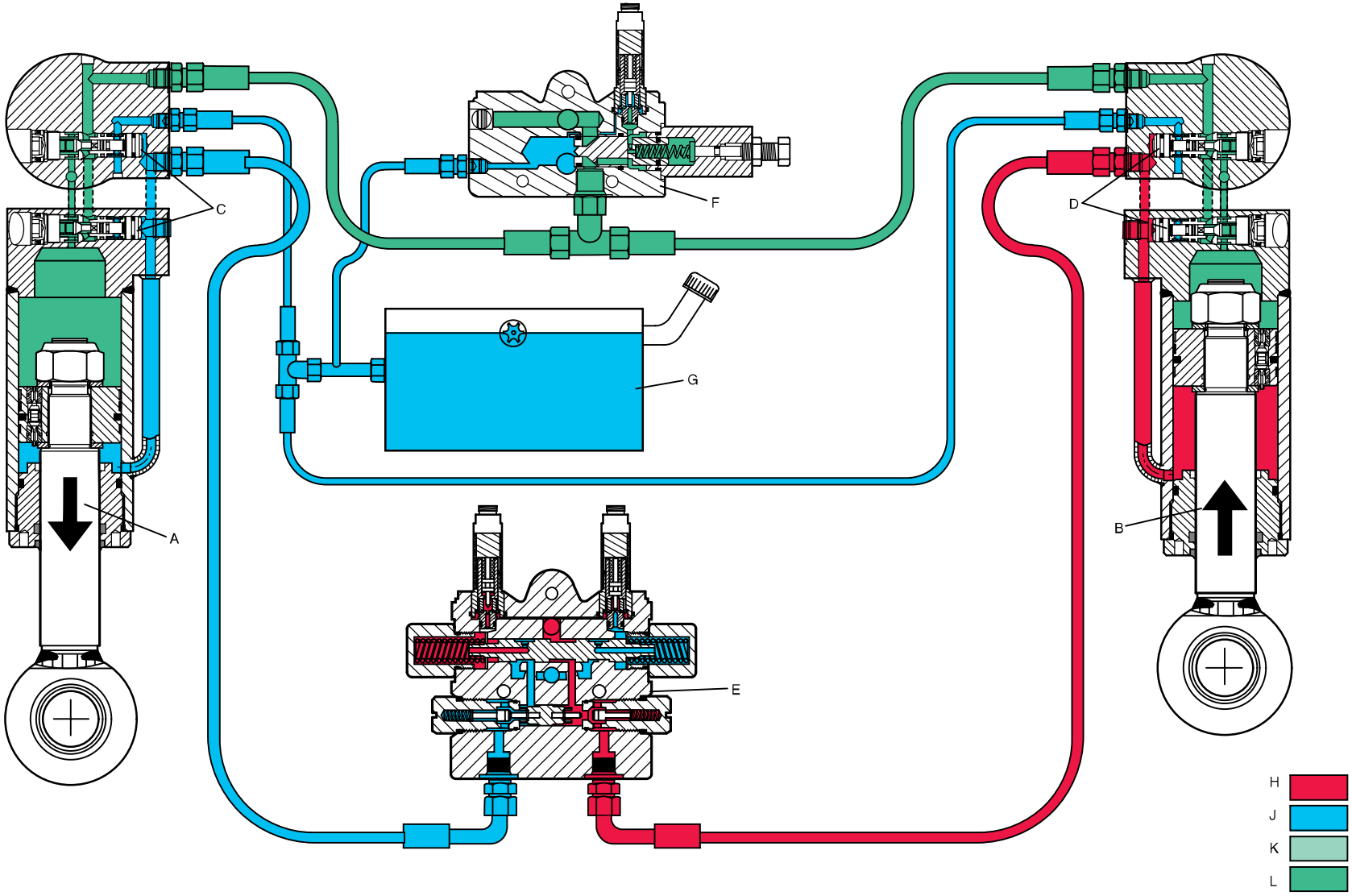
When leveling to the right, the solenoid valve plate routes hydraulic oil to the right-hand hydraulic cylinder. Oil pressure is directed to the rod side of the hydraulic cylinder. At the same time the pilot-operated check valve in the hydraulic cylinder head is activated, allowing trapped oil to flow out of the piston side. The right-hand hydraulic cylinder is retracted.

The oil flow from the right-hand cylinder is directed to the piston side of the left-hand cylinder. The left-hand cylinder is extended by the same distance as the right-hand cylinder is retracted.

The oil flowing out of the rod side of the left-hand hydraulic cylinder is directed to the return passage of the solenoid valve plate and returned to the hydraulic oil reservoir.

ZX,TMXZCO003153-19-07JAN94

HILLMASTER LEVELING SYSTEM OPERATION, LEVELING TO THE LEFT



ZX005226

HILLMASTER LEVELING SYSTEM OPERATION, LEVELING TO THE LEFT

A—Hydraulic cylinder, right
B—Hydraulic cylinder, left
C—Pilot-operated check valve
D—Pilot-operated check valve
E—Solenoid valve plate, Hillmaster control
F—Solenoid valve plate, lowering combine
G—Reservoir
H—Hydraulic oil, high pressure
J—Hydraulic oil, pressure-free (return oil)
K—Hydraulic oil, trapped
L—Hydraulic oil, trapped

NOTE: During leveling system operation, the machine is held in position by pilot-operated check valves integrated in the hydraulic cylinders, e.g. if a hydraulic hose should burst. Hydraulic oil is trapped on the piston side of hydraulic cylinders.

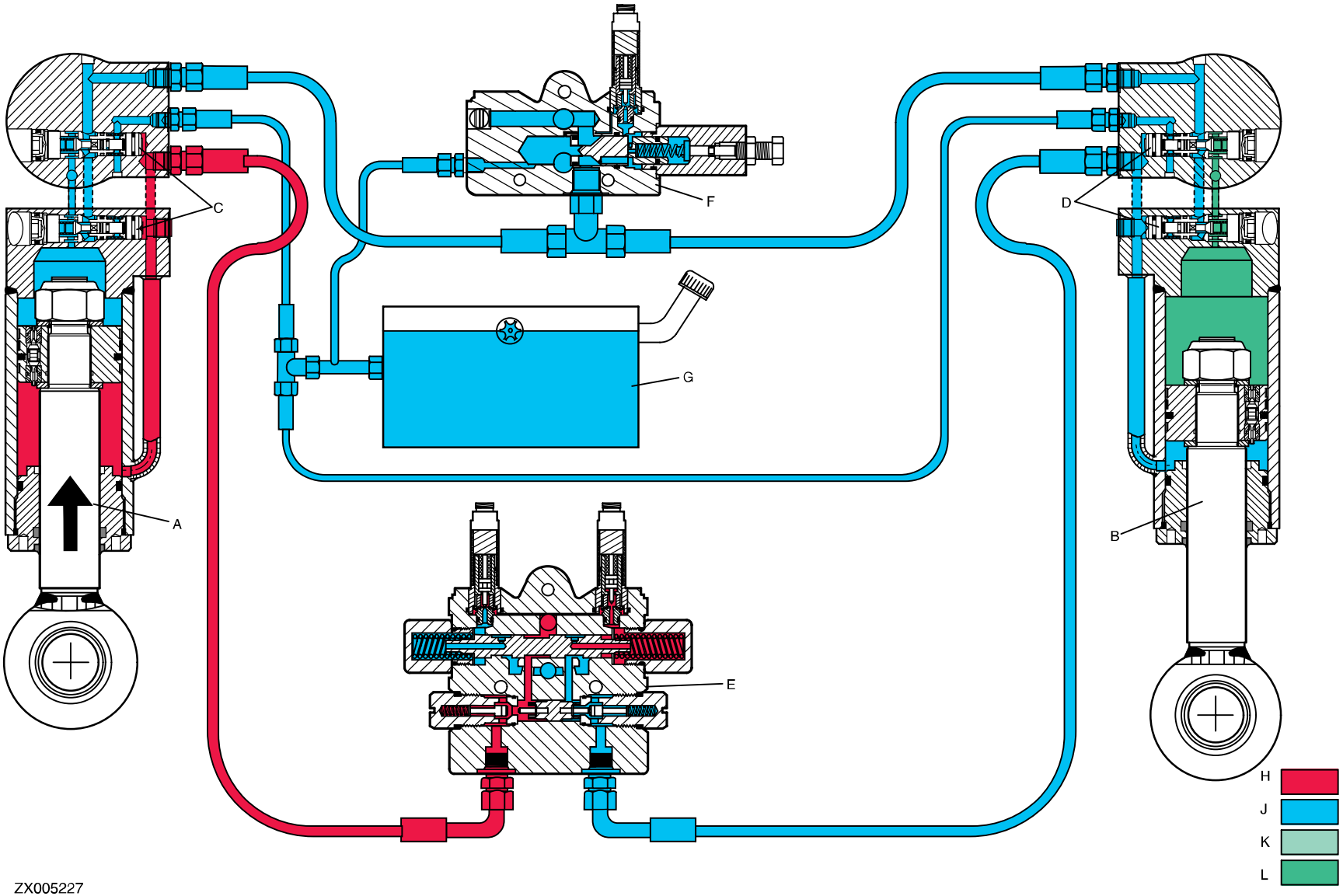
When leveling to the left, the solenoid valve plate routes hydraulic oil to the left-hand hydraulic cylinder. Oil pressure is directed to the rod side of the hydraulic cylinder. At the same time the pilot-operated check valve in the hydraulic cylinder head is activated, allowing trapped oil to flow out of the piston side. The left-hand hydraulic cylinder is retracted.

The oil flow from the left-hand cylinder is directed to the piston side of the right-hand cylinder. The right-hand cylinder is extended by the same distance as the left-hand cylinder is retracted.

The oil flowing out of the rod side of the right-hand hydraulic cylinder is directed to the return passage of the solenoid valve plate and returned to the hydraulic oil reservoir.

ZX,TMXZCO003155-19-07JAN94

HILLMASTER LEVELING SYSTEM OPERATION, LOWERING COMBINE



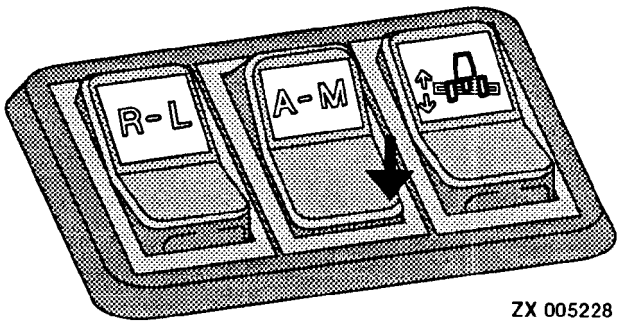
ZX005227

HILLMASTER LEVELING SYSTEM OPERATION, LOWERING COMBINE

NOTE: Before driving a Hillmaster combine on public roads, it must be moved to lowered position to ensure that the maximum permissible height of 4 m (13 ft) is not exceeded.

When lowering a Hillmaster combine, the solenoid valve plate for lowering combine is activated as well as the lateral tilt hydraulic function. In this case the oil displaced from the piston side does not flow to the opposite hydraulic cylinder, but to the hydraulic oil reservoir via the solenoid valve plate for lowering combine.

NOTE: For more information on solenoid valve plate function, refer to Group 10 of this Section. Electrical system operation is described in Group 240-15Y.



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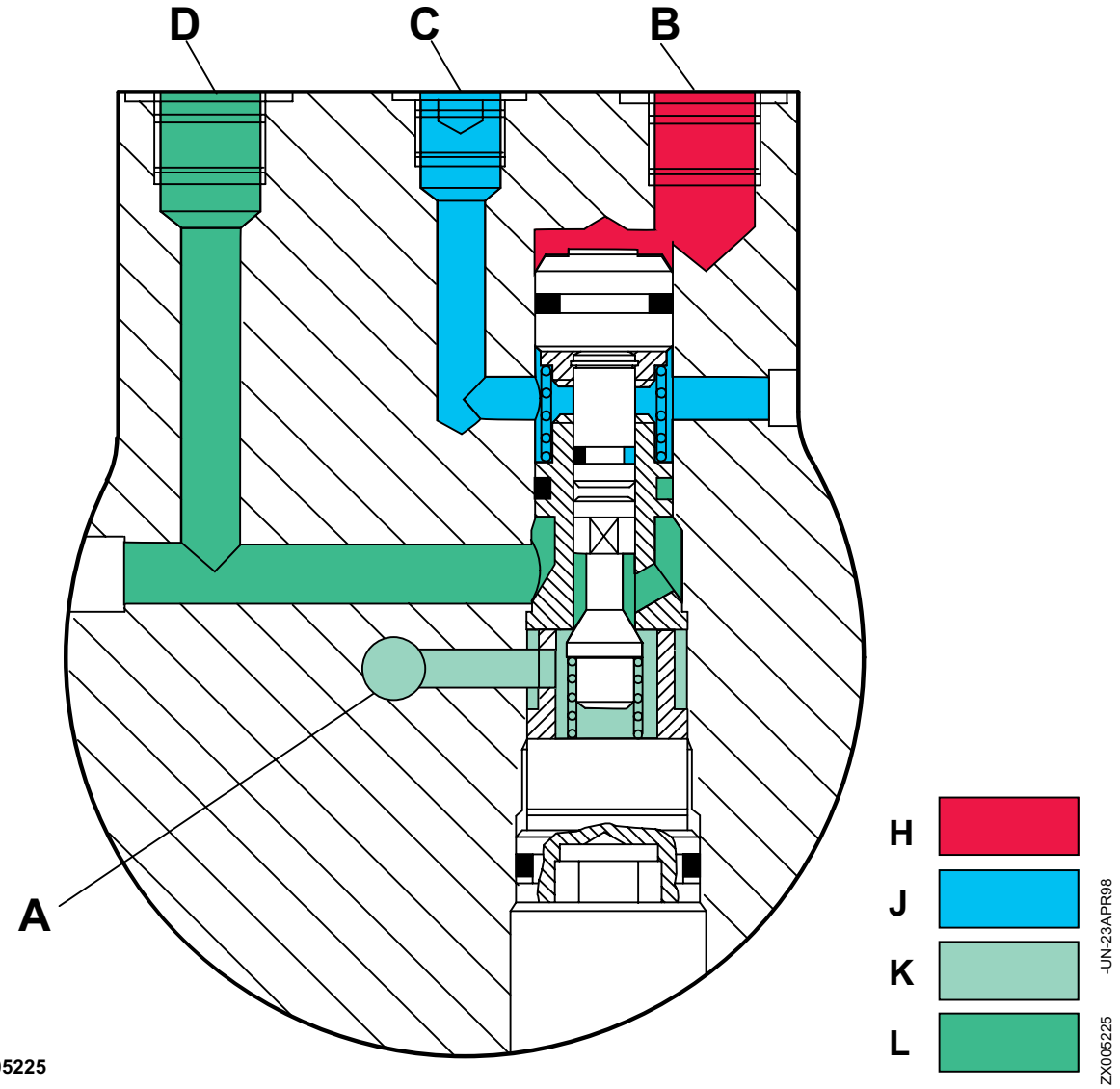
CHECK VALVE IN HILLMASTER HYDRAULIC VALVE BLOCK



A—Connection to piston side of hydraulic cylinder
B—Connection to rod side of hydraulic cylinder
C—Connection to hydraulic oil reservoir
D—Connection to piston side of opposite hydraulic cylinder
H—Hydraulic oil, high pressure
J—Hydraulic oil, pressure-free (return oil)
K—Hydraulic oil, trapped
L—Hydraulic oil, trapped

When the solenoid valve plate of Hillmaster leveling system is activated, it will direct hydraulic oil to the rod side of the hydraulic cylinder to be rectracted. At the same time, hydraulic oil pressure opens pilot-operated check valve via connection (B). This allows oil from the piston side to flow to the opposite hydraulic cylinder via connections (A) and (D). Connection (C) to the hydraulic oil reservoir is always pressure-free.

ZX,TMXZCO003158-19-07JAN94

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-20JUL95

Universal pressure test kit (A) FKM10002

ZX,TMSPFH001812-19-22FEB92

Quick coupler JT03264

ZX001719 -UN-26APR95

ZX,TMSPFH001805-19-22FEB92

SPECIFICATIONS

Item	Measurement	Specification
Hydraulic pump I (standard)	Delivery	35 L/Min. (9.2 gpm)
Hydraulic pump I (Hillmaster)	Delivery	45 L/Min. (11 gpm)
Hydraulic pump III (standard)	Delivery	15 L/Min. (4 gpm)
Hydraulic pump III (Hillmaster)	Delivery	35 L/Min. (9.2 gpm)
Pressure relief valve	Setting	21 000 kPa (210 bar) (3050 psi)
Pressure reduction unit	Setting	6500 kPa (65 bar) (940 psi)
Main clutch pressure	Minimum pressure	5000 kPa (50 bar) (725 psi)
Pressure switch	Shut-off pressure	6000 kPa (60 bar) (870 psi)
Variable threshing cylinder drive pressure	Maximum pressure	7000 kPa (70 bar) (1020 psi)

ZX,TMXZCO003159-19-13JAN94

CHECKING PRESSURE RELIEF VALVE

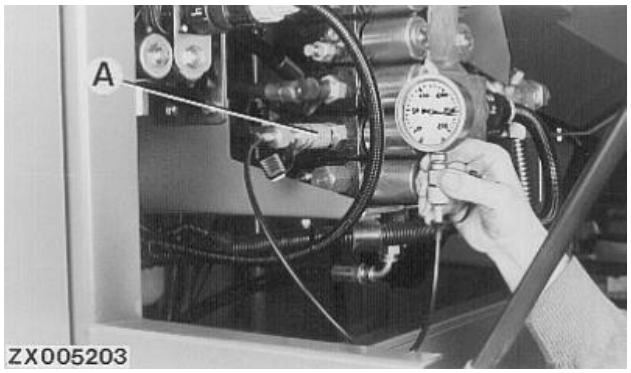
Connect a pressure gauge with a measuring range of 0—25 000 kPa (0—250 bar) (0—3600 psi) to test port (A).

Run engine at fast idle.

Press switch for raising header.

Read pressure at gauge. Pressure should be 21 000 kPa (210 bar) (3050 psi).

If this pressure is not obtained, the cause may be a malfuction of the pressure relief valve, the pressure valve or the corresponding hydraulic pump section.



ZX,TMXZCO003160-19-13JAN94

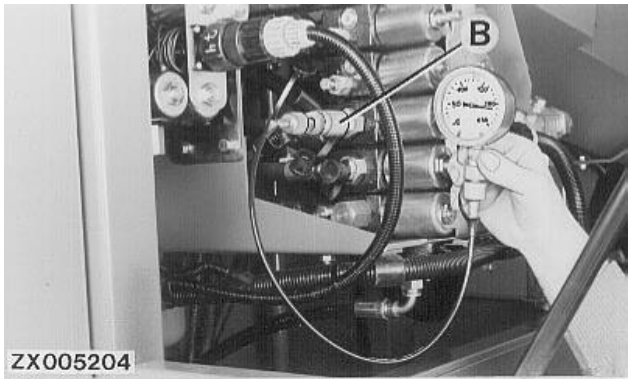
Connect a pressure gauge with a measuring range of 0—25 000 kPa (0—250 bar) (0—3600 psi) to test port (B).

Run engine at fast idle.

Press switch for raising header.

Read pressure at gauge. Pressure should be 21 000 kPa (210 bar) (3050 psi).

If this pressure is not obtained, the cause may be a malfuction of the pressure relief valve, the pressure valve or the corresponding hydraulic pump section.



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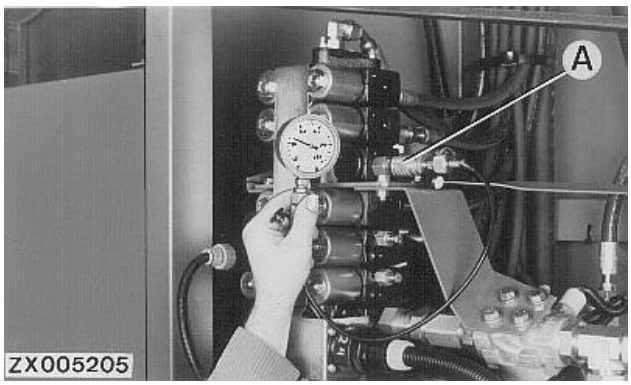
CHECKING PRESSURE REDUCTION UNIT

1. Connect a pressure gauge to test port (A).

2. Engage unloading drive with engine running.

3. Swing in unloading auger against stop until pressure relief valve is activated.

The gauge should show a pressure of 6500 kPa (65 bar) (940 psi).



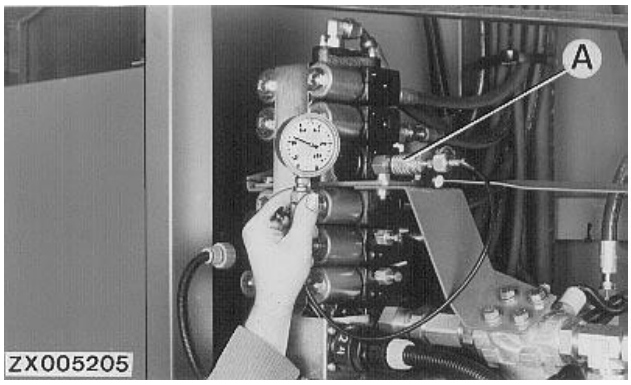
ZX,TMXZCO003162-19-13JAN94

CHECKING PRESSURE SWITCH

1. Referring to “Checking Pressure Reduction Unit”, perform steps 1 and 3.

2. Temporarily disengage and reengage main clutch to discharge accumulator. When pressure has dropped to 5000 kPa (50 bar) (725 psi), it should increase again to 6000 kPa (60 bar) (8700 psi).

A—Test port



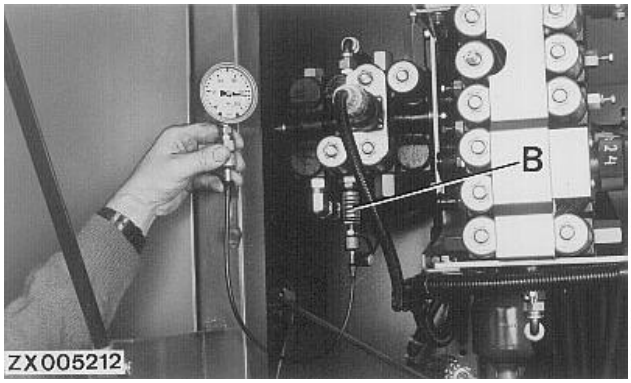
ZX,TMXZCO003163-19-13JAN94

CHECKING THE PRESSURE RELIEF VALVE ON THE HILLMASTER BLOCK

Connect pressure gauge to test port (B).

Swing out the hillmaster combine automatically. Maximum pressure should be no more than 21000 kPa (210 bar; 3050 psi).

Swing out the hillmaster combine manually as far as the stop. Maximum pressure should be approx. 15000 kPa (150 bar; 2180 psi).



ZX,TMXZCO006773-19-01SEP96

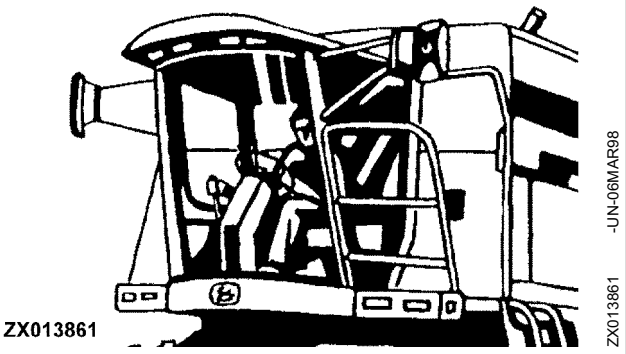
Section 290
Operator's Cab

Contents

OPERATOR'S CAB

Located on the machine's center-line, the operator's cab is supported by four silent blocks to minimize vibrations and noise. It also ensures good views to the front and rear as well as to the sides.

The operator's cab, manufactured as an assembly, is delivered fully assembled to the production line. It is available with or without air conditioning system.



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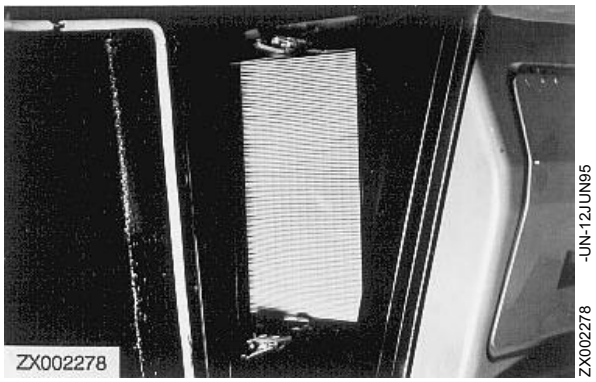
CAB AIR FILTER

At the cab rear wall, fresh air for heating and air conditioning system is aspirated via plastic tube connected to the cab fan. The air filter will be accessible from outside after opening the housing cover located near the cab door.

With the introduction of the new cab, all plastic parts are identified by a part number and a material code to permit recycling according to the type of material.



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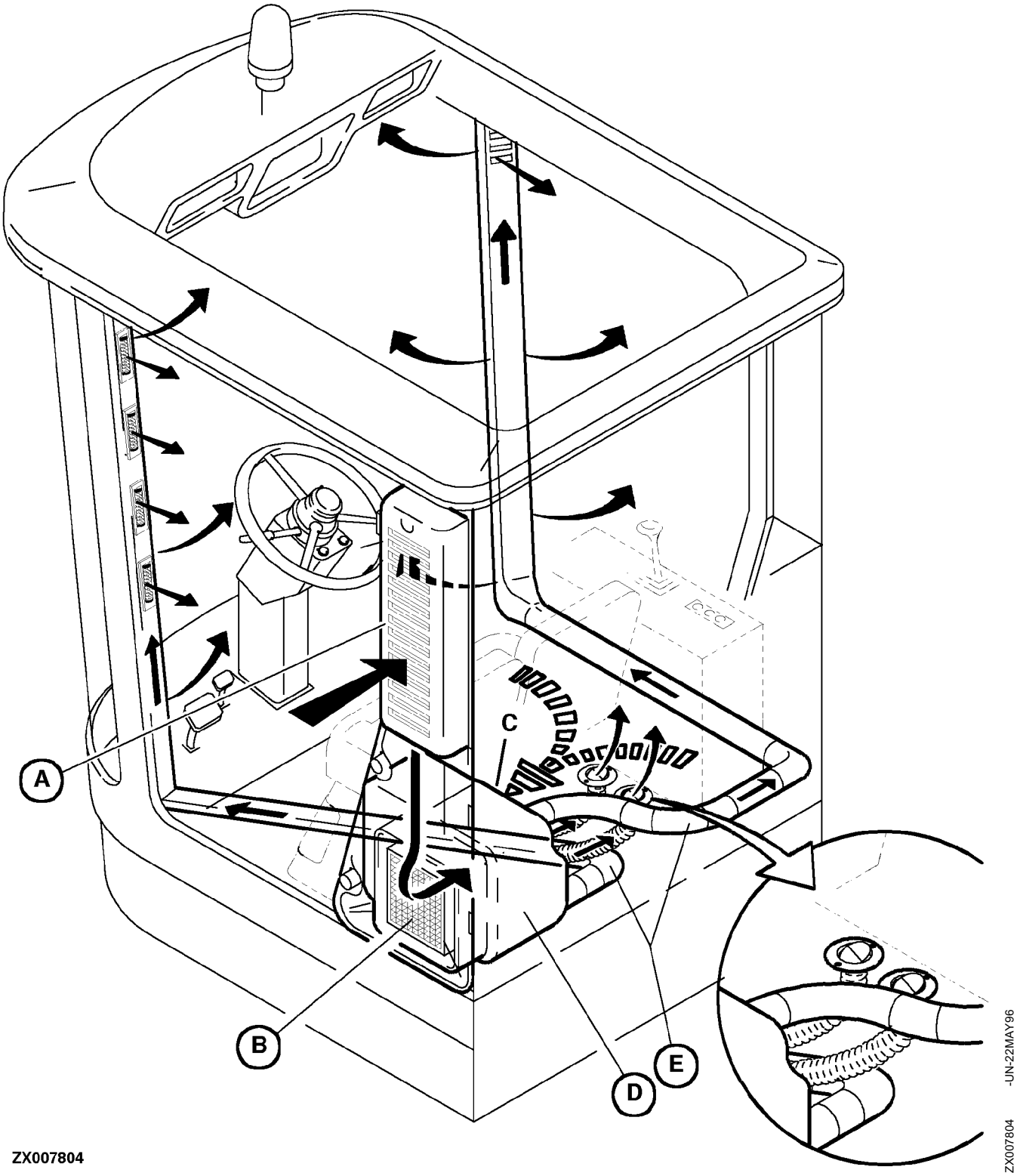
AIR INTAKE AND DISTRIBUTION



A—Air intake channel
B—Air (main) filter
C—Recirculating air filter
D—Fan
E—Air outlet channels

ZX,OMXZCO002230-19-02MAY96

OPERATOR'S SEAT AND PASSENGER SEAT

The mechanically suspended operator's seat can be adjusted in length and height and can be adapted to the weight of the operator.

The passenger seat is standard equipment and includes a storage compartment in the folding seat backrest.

ZX,TMSPFH001894-19-22APR92

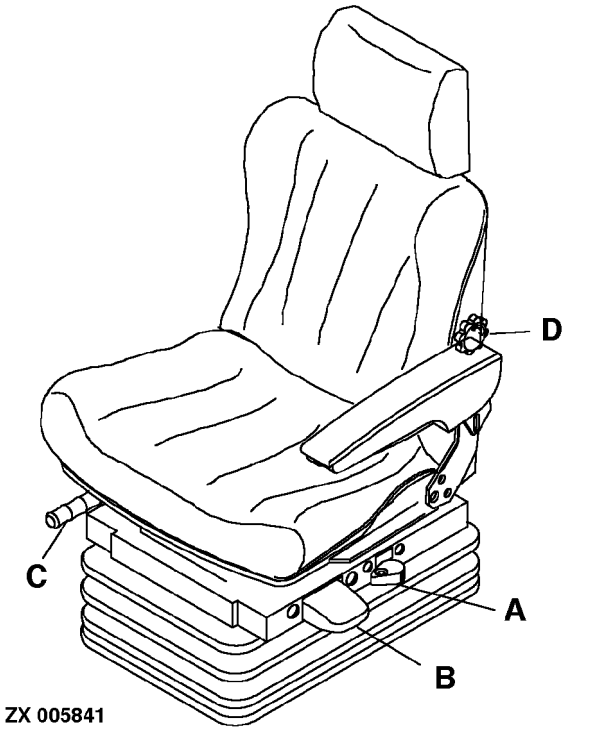
AIR COMFORT SEAT

The seat's spring setting can be varied from soft to hard by means of lever (A).

After starting the engine, release lever (B) briefly to bring the seat to its central position.

To adjust the height, pull lever (B) upward or push it down.

A—Spring setting adjustment
B—Height and weight adjustment
C—Horizontal adjustment
D—Lumbar support adjustment



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SYSTEM DIAGNOSIS ON AIR COMFORT SEATS

Symptom	Problem	Solution
Correct weight adjustment not possible	Springs over-extended	Replace springs.
	Spring broken	See above.
Seat bounces	Shock absorber defective	Replace shock absorber.
Seat cannot be adjusted	Loose screw connections	Tighten or replace screw connections.
	Locking device defective	Replace locking device.
Seat shakes	Loose screw connections	Tighten or replace screw connections.
Seat does not move to center position	Wire not connected or loose	Reconnect or replace wire. See Section 240, Group 10
	Fuse defective	Replace fuse
	Compressor defective	Replace compressor
	Air spring defective	Replace air spring

ZX,TMXZCO010093-19-01AUG97

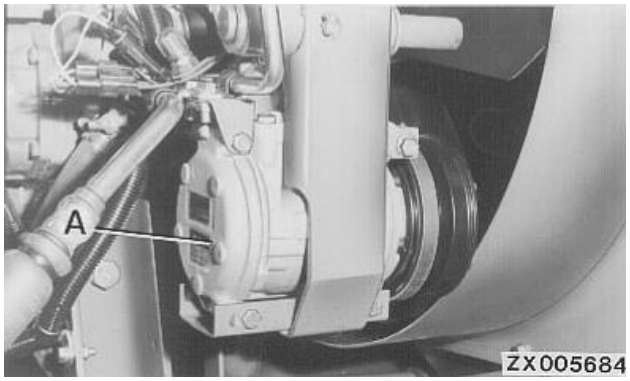
COMPRESSOR WITH DRIVE

Compressor (A) of the air conditioning system is driven by a V-belt from the front belt pulley on the engine.

Power is transmitted by the electromagnetic clutch of the compressor.

When starting the engine, a tension spring on the compressor support tensions the drive. During operation, the drive belt is self-tensioning.

The belt can be aligned by shifting the support laterally in the slots.



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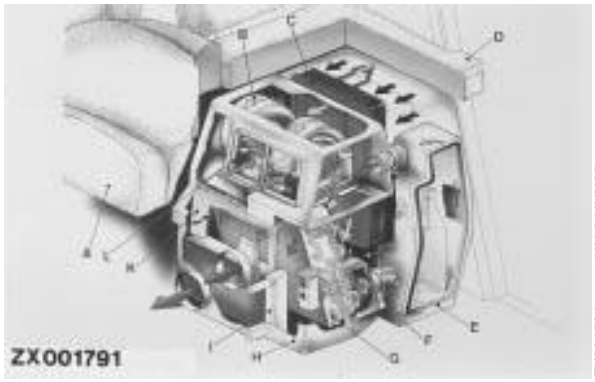
AIR CONDITIONING AND HEATER UNIT

The air conditioning and heater unit is located underneath the passenger seat in the operator's cab of the machine.

The heater unit is standard equipment, while the air conditioning system is optional. The cooling compartment is an option for machines equipped with air conditioning system.

The dual housing includes the fan (B), the heater block (I) and the evaporator (G).

Outside air is sucked in by fan (B) via filter (C) and cab air is sucked in via filter (L). Via two hoses located in the cab floor the air is conveyed from the air conditioning and heater unit to the front corner posts with adjustable louvers .



ZX001791 -UN-01JUN95

A—Operator's seat
B—Fan
C—External air filter
D—Passenger seat
E—Cooling compartment
F—Air control flap of cooling compartment
G—Evaporator
H—Air conditioning and heater unit
I—Heater block
K—Air control flap
L—Interior air filter

ZX,TMSPFH001896-19-05MAR98

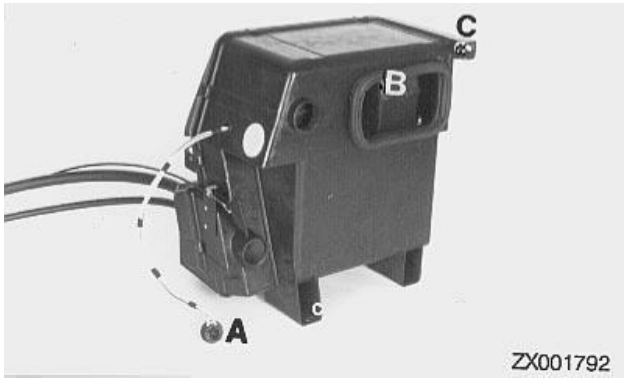
AIR CONDITIONING HOUSING

The air conditioning housing is attached at three locations (C) (two on the floor and one on the rear wall).

The filtered fresh air enters the cab at the air inlet (B).

Plug (A) connects the fan motor wiring harness with the cab wiring harness.

The air conditioning housing includes the fan, the heater unit, the evaporator and an air control flap.



ZX001792 -UN-02JUN95

A—Plug for fan motor cable
B—Fresh air inlet
C—Housing attaching points

ZX,TMSPFH001897-19-22APR92

AIR CONDITIONING HOUSING (LEFT-HAND SIDE)

Machines equipped with air conditioning system may also be equipped with a cooling compartment to keep food cool and fresh.

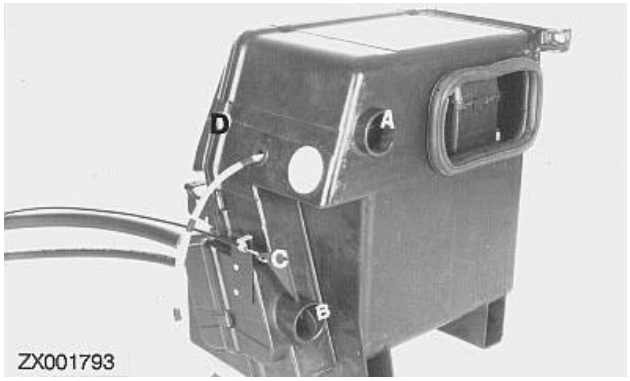
The bottom and the rear of the cooling compartment are double-walled to permit passage of cool air.

The air control flap (B) of the cooling compartment is operated by means of a rotary switch on the switch console via bowden cable (C).

Stale air returns to the air conditioning housing via upper hose connection (A).

On machines without cooling compartment, outlets (A) and (B) for recirculating air must be closed by means of plugs.

To open the housing, remove ten retaining clamps (D).



ZX001793 -UN-02JUN95

A—Hose connection, stale air from cooling compartment
B—Hose connection, fresh air to cooling compartment
C—Lever of fresh air flap
D—Housing clamps

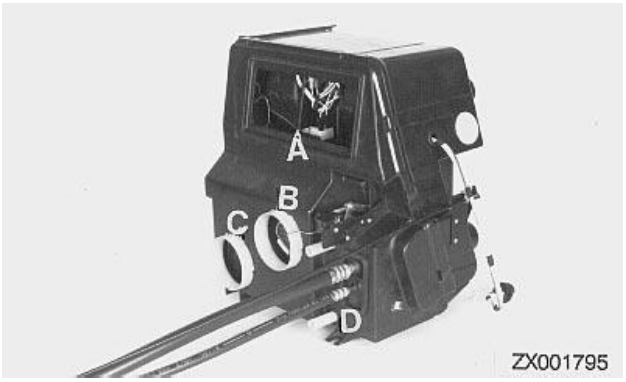
ZX,TMSPFH001898-19-22APR92

AIR CONDITIONING HOUSING (RIGHT-HAND SIDE)

The fan sucks in cab air at port (A) through a filter between operator's seat and passenger seat.

Fresh air for corner post louvers is conveyed via two hoses attached to ports (B) and (C) on air conditioning housing.

One of the two screws attaching the housing to the cab floor is located at point (D).



ZX001795 -UN-02JUN95

A—Suction port for cab air
B—Hose connection for right-hand side
C—Hose connection for left-hand side
D—Bottom attaching point

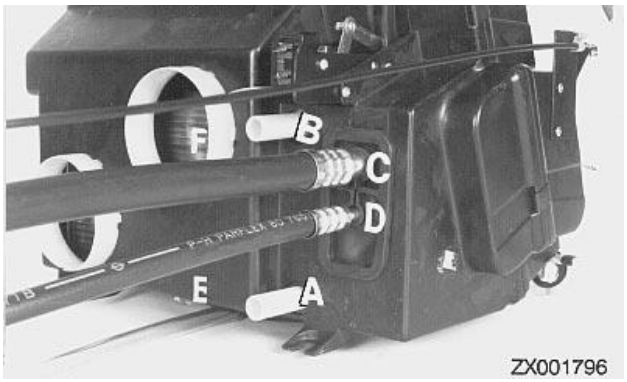
ZX,TMSPFH001891-19-22APR92

AIR CONDITIONING HOUSING (HOSE CONNECTIONS)

Heater block (F) is connected to engine coolant circuit by means of two hoses at ports (A) and (B).

The evaporator is connected to the refrigerant circuit by means of hoses (C) and (D). The housing is sealed at the hoses by a removable seal. This seal must be removed for opening the housing. By doing this the right-hand housing half can be slid over hoses (C) and (D) of the air conditioning system.

A hose is attached to port (E) for draining condensing water through the cab floor down to the ground.



ZX001796 -UN-02JUN95

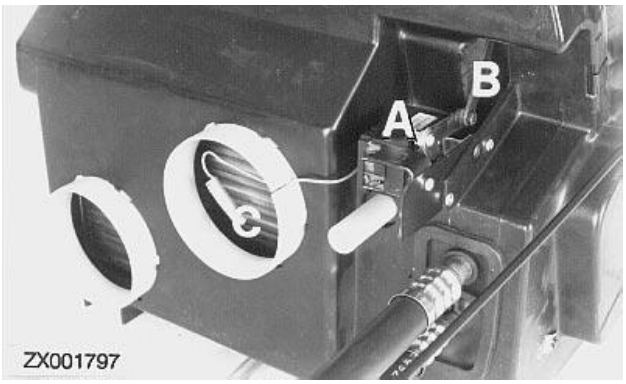
A—Coolant return flow to engine
B—Coolant flow to heater block
C—Refrigerant return hose to compressor
D—Refrigerant hose to expansion valve
E—Condensing water drain
F—Heater block

ZX,TMSPFH001892-19-22APR92

TEMPERATURE CONTROL SWITCH WITH SENSOR

On machines equipped with air conditioning system, cab air temperature is preselected (with system on) by means of temperature control switch (A) via a bowden cable. Simultaneously this cable is used to adjust air control flap via linkage (B).

Temperature sensor (C) controls fresh air blown into the cab directly at the housing outlet and monitors air temperature to the control switch.



A—Temperature control switch
B—Lever for air control flap
C—Temperature sensor

ZX,TMSPFH001899-19-22APR92

AIR CONDITIONING HOUSING IN OPEN POSITION

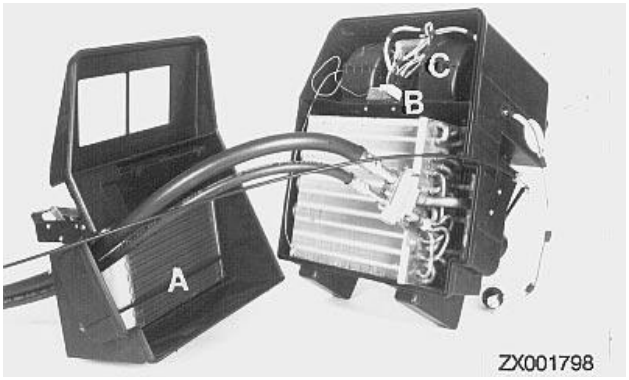
To clean heater block or evaporator the housing must be open. Heater block (A) is located in a housing half. To open the housing it is not necessary to remove the heater hoses. The heater block is held in position by means of a rod.

Evaporator (C) is not fixed when the housing is opened. It is kept in proper position when the housing halves are closed.

In the lower housing area a seal is installed to channel condensed water only through the port designed for this purpose.

In the upper housing half a fan (C) is installed, aspirating stale cab air and fresh air from outside which is then conveyed to the lower housing half where the evaporator and the heater block are located.

On machines not equipped with air conditioning system no evaporator (B) is installed in the fan housing.



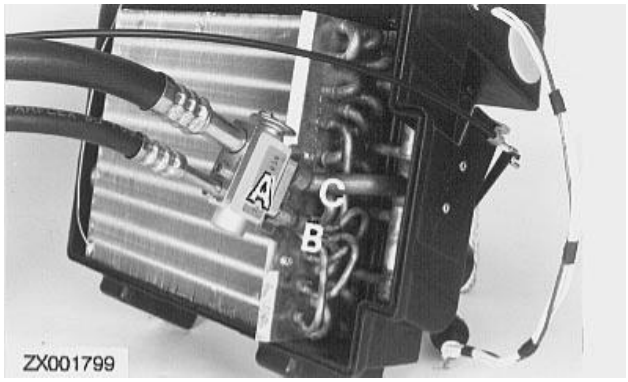
A—Heater block
B—Evaporator with expansion valve
C—Fan assembly

ZX,TMSPFH001900-19-22APR92

EVAPORATOR WITH EXPANSION VALVE

Expansion valve (A) is directly connected to the evaporator by means of several expansion pipettes (B). The refrigerant circulates through the evaporator and returns via pipe (C) to the compressor.

A—Expansion valve
B—Expansion pipettes
C—Return pipe



ZX001799 -UN-02JUN95

ZX,TMSPFH001901-19-22APR92

AIR CONTROL FLAP

Air control flap (A) is located above the heater block.

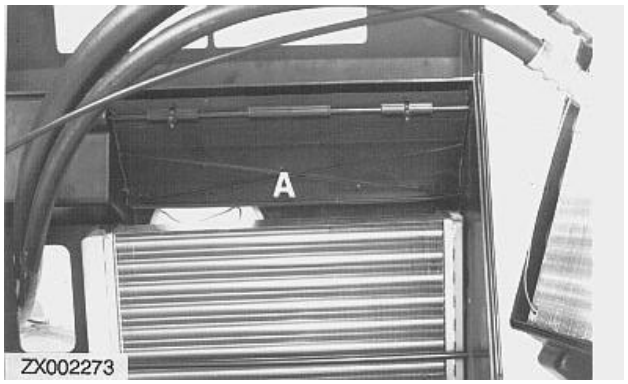
Adjustment is made at the rotary switch for air conditioning and heating by means of the bowden cable also used for temperature control. If this switch is in neutral position (air conditioning and heating switched off), the air control flap is also closed.

If the heating is switched on by means of the rotary switch, the air control flap is always closed so that all the air will pass through the heater block.

If the air conditioning system is switched on by means of the rotary switch, the air control flap will open accordingly so cold air can bypass the heater block.

Basic adjustment for attaching the bowden cable to the temperature control lever is as follows: turn rotary switch to “MAX” cold, open air control flap fully and pull temperature control lever completely away from the housing.

On machines without air conditioning system, the bowden cable is directly attached to the lever of the air control flap. Basic adjustment is the same as above: Turn rotary switch to “MAX” cold and pull temperature control lever completely away from the housing so air control flap is fully open.



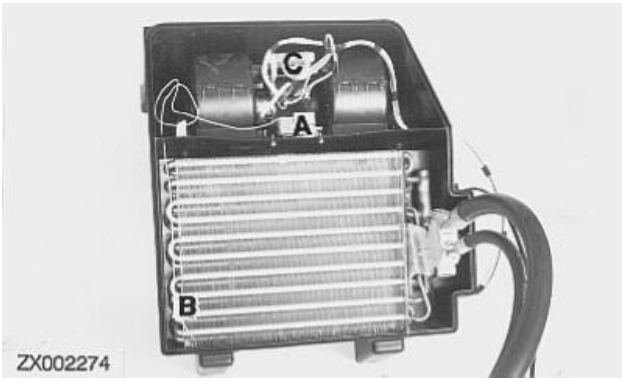
ZX002273 -UN-09JUN95

ZX,TMSPFH001902-19-22APR92

Ice protection switch (A) is activated by sensing tube (B) inserted into lower end of evaporator core as soon as evaporator starts icing.

By means of fan resistor (C) the various fan speeds are adjusted.

A—Ice protection switch
B—Sensing tube
C—Fan resistor



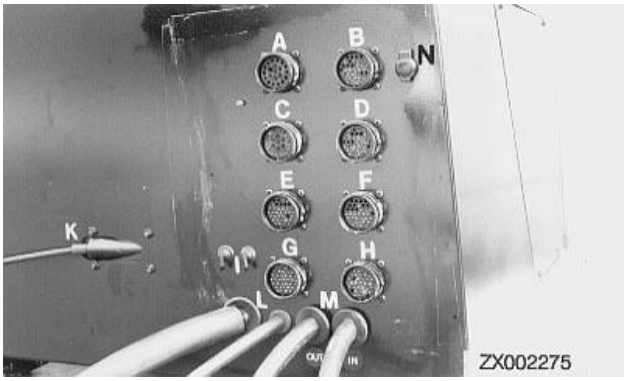
-UN-09JUN95
ZX002274

ZX,TMSPFH001903-19-22APR92

CAB REAR WALL

At the right-hand side of the cab rear wall the following items are easily accessible: cab wiring connectors, a socket, holes for heater and air conditioning hoses, connections for windshield washer unit and the throttle cable.

A—Disconnecting point X51
B—Disconnecting point X1
C—Disconnecting point X5
D—Disconnecting point X2
E—Disconnecting point X6
F—Disconnecting point X3
G—Disconnecting point X7
H—Disconnecting point X4
I—Connections for windshield washer unit
K—Throttle cable
L—Air conditioning hoses
M—Heater hoses
N—Socket



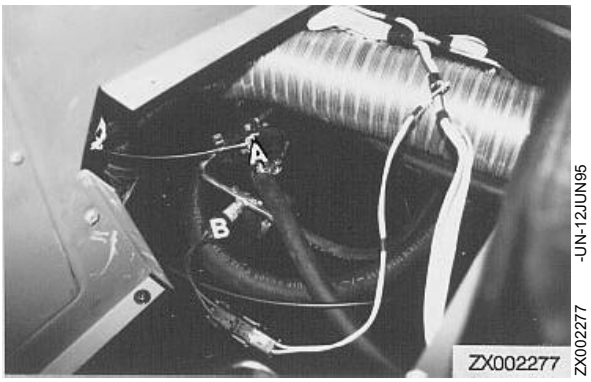
-UN-09JUN95
ZX002275

ZX,TMSPFH001904-19-22APR92

HEATER CONTROL VALVE AND AIR CONDITIONING SYSTEM LOW PRESSURE SWITCH

On the cab floor to the right of the operator's seat the heater control valve Is located in the coolant line from engine to heater block. This valve is operated by the rotary heater switch via a bowden cable.

Next to it the low-pressure switch is located in the refrigerant hose. If pressure has dropped to 170 kPa (1.7 bar; 24.7 psi), this switch disengages the compressor; if pressure has risen to 350 kPa (3.5 bar; 51 psi), it reengages the compressor.



-UN-12JUN95
ZX002277

A—Heater control valve
B—Low pressure switch

ZX,TMSPFH001906-19-22APR92

Symptom	Problem	Solution
Inadequate flow of fresh air	Main filter or recirculating air filter clogged	Clean or replace filters. See Section 90, Group 10
	Air inlets clogged	Clean air inlets
	Blower motor defective	Replace blower. See Section 90, Group 10
	Blower motor switch defective	Replace switch
	Loose wire connection	Reconnect or replace wires. See Section 240, Group 10
Blower not working	Blower motor defective	Replace blower. See Section 90, Group 10
	Blower motor switch defective	Replace switch
	Wire broken, or loose connection	Reconnect or replace wires. See Section 240, Group 10
	Electrical circuit interrupted	Check circuit. See Section 240, Group 15
Blower operating too slowly or irregularly	Blower motor shaft is jamming	Replace blower. See Section 90, Group 10
	Loose wire	Reconnect wire or replace connection. See Section 240, Group 10
	Blower motor switch defective	Replace switch
Inadequate heating effect	Engine thermostat defective	Replace thermostat. See Component Technical Manual “Engines”
	Foreign bodies in heating element or heater hoses	Clean heater element or heater hoses
	Heater switch not operating correctly	Check heater switch. Replace if necessary. See Section 90, Group 10
	Blower not operating correctly	Clean blower. Replace if necessary
	Blockage at air inlets	Clean air inlets
Ice or misting on windows does not clear properly	Air louvers not directed properly	Direct the air louvers properly

Continued on next page

Symptom	Problem	Solution
	Blower not operating correctly	Clean blower. Replace if necessary. See Section 90, Group 10
	Heater switch not operating correctly	Check heater switch. Replace if necessary. See Section 90, Group 10
Heater valve does not turn coolant flow off	Inlet and outlet hoses wrongly connected	Connect inlet and outlet hoses correctly. See Section 90, Group 10
	Heater switch defective	Replace heater switch. See Section 90, Group 10

ZX,TMXZCO003117-19-01DEC93

TEST SEQUENCE

Perform the operational checks in 290-05 first. In many cases, this is sufficient to allow the cause of the fault to be identified.

If the operational checks in 290-05 do not identify the fault, perform the checks in 290-10A, 10B and 10C. These lead the user to the cause of the fault one step at a time.

LX,29005003398 -19-01FEB93

OPERATIONAL CHECKS ON AIR CONDITIONING, HEATER AND OPERATOR'S SEAT

NOTE: In the following preliminary checks, it is possible to identify a fault without using tools or a testing device.

LX,29005003399 -19-01FEB93

; **Tests with the engine shut off**	• Open cab doors. • A/c compressor switched on. • Temp. selection knob set to max. cooling effect. • Main switch on. • Switch on blower several times. *NOTE: The compressor clutch must give an audible click.* The following preconditions must be met:	• Temperature in evaporator housing over 3˚C (37˚F), so that thermostat is switched on • Static refrigerant pressure over 2 bar (29 psi) (200 kPa), so that high/low pressure switch is switched on	**OK:** Proceed from Test ‘. **NOT OK:** See Section 240-15.

LX,29005003400 -19-01SEP97

‘	Move blower switch from lowest setting to highest setting.	Blower not operating. Remove and check fuse F42. Re-install fuse.	**OK:** Proceed with Test Æ. **NOT OK:** One or both of the blower motors is defective, proceed with Test Õ.

ZX,TMXZCO003115-19-01DEC93

Æ **Air Flow Check**	Move the fan speed control to high speed. Move the air duct control to all positions. Check the air flow from all ducts and in all positions.		**OK:** Go to Check Å **NOT OK:** Repair the duct control switch and ducts, go to Check Å LX,29005003402 -19-31DEC97

Å **Tests with engine switched on**	a. Run engine at 2000 rpm. b. Set blower switch to maximum output. c. Set thermostat switch to maximum cooling effect. d. Keep cab doors closed.	Check the following: Cold airflow from air louvers after approx. 6 minutes. Compressor intake line should be cool or cold. Look for bubbles at sight-glass on receiver-drier.	**OK:** Proceed with Test Ö. **NOT OK:** Proceed with Test Ú. LX,29005003403 -19-01NOV96

Ö **Temperature test**	Measure outside temperature (in the shade). Switch on air conditioning system. Wait 15 to 20 minutes and measure temperature at front air louver (see table).	**Outside temperature**	**Min. diff. in temperature**	**OK:** Proceed with Test Ú. **NOT OK:** Proceed with Test Ò. LX,29005003404 -19-01NOV96
		less than 24˚C (75˚F)	12˚C (20˚F)	
		between 24—32˚C (75—90˚F)	14˚C (25˚F)	
		over 32˚C (90˚F)	16˚C (30˚F)	

Ú RESULT OF FUNCTIONAL TESTS

NOT OK: See Groups 10A, 10B and 10C.

LX,29005003406 -19-01FEB93

SAFETY AT WORK

CAUTION: Certain basic safety regulations apply when dealing with air conditioning systems, and must be observed at all times. They are backed up by legislation covering safety precautions for air conditioning systems. The following excerpts are particularly important:

1. Air conditioning systems may be operated, serviced or repaired by authorized, trained personnel only.

2. Adolescents should not be allowed to carry out service work on air conditioning systems involving the discharge of Category 2 or 3 refrigerants, unless trade training of adolescents over 16 years old requires such work. In this case, the adolescent must be supervised by a trained adult.

3. Before repairing components carrying refrigerant, remove refrigerant as far as necessary to ensure that the work can be carried out safely.

4. Refrigerant should be extracted by suction and re-used. When refrigerant is discharged into the air, there is the danger of asphyxiation, especially if work is being performed in an inspection pit, since refrigerant is heavier than air and concentrates at the lowest level. Moreover, refrigerant is odorless and colorless, so small quantities emerging from a leak cannot be detected. In such a case, ensure that there is adequate ventilation at the place of work.

5. Smoking and naked flames are not permitted in enclosed spaces where refrigerant has been released. High temperatures cause chemical reactions in the refrigerant gas, and highly poisonous substances can form. If inhaled, these substances have serious effects on health.

6. High temperatures produced by welding and soldering cause very high pressures inside components of the air conditioning system, and these pressures may result in an explosion.

ZX,TMXZCO002461-19-25NOV92

HANDLING REFRIGERANT

CAUTION: When handling refrigerant, always wear safety glasses and leather gloves. Contact with escaping refrigerant may result in serious frostbite, or even blindness if the refrigerant strikes the eye.

Whenever there is the risk of refrigerant encountering high temperatures, wear a suitable breathing mask while working. However, a breathing mask provides no protection against asphyxiation if large quantities of refrigerant escape.

ZX,TMXZCO002462-19-25NOV92

IN AN EMERGENCY

• Rinse eye with cold water; preferably use a 1% boric acid solution.

• Wash affected parts of the body with water, or preferably with a solution consisting of one part essence of vinegar and five parts water.

• See a doctor as soon as first aid has been administered.

ZX,TMXZCO002520-19-01DEC92

STORAGE OF REFRIGERANT CONTAINERS

CAUTION: Refrigerant containers are under pressure, and this pressure increases rapidly when the temperature of the container rises. The thin-walled refill containers are particularly at risk in this respect. Refrigerant containers must never be exposed to temperatures over 52˚C (120˚F).

Never store pressurized containers in the vicinity of heat sources or in places exposed to direct sunlight. Never open pressurized containers by force or damage them in any way.

ZX,TMXZCO002464-19-25NOV92

R134A REFRIGERANT

IMPORTANT: The air conditioning system operates using R134a refrigerant (tetrafluorethane). This substance does not contain any chlorine atoms, so it does not have a detrimental effect on the ozone in the Earth's atmosphere.

Even so, the refrigerant must never be discharged straight into the air. It must be trapped in a recycling unit. Refrigerant stored in a recycling unit may be re-used at any time.

The recycling unit used to do this must be of a type suitable for handling R134a refrigerant.

The boiling point of R134a is minus 26.5˚C (minus 15.7˚F) and its freezing point is minus 101˚C (minus 149.8˚F).

R134a has a corrosive effect on copper as well as various seals and components used in the R12 system. For this reason, never use R134a refrigerant in a system that has previously used R12. Before replacing any component, it is vital to check whether it is compatible with the type of refrigerant used.

It is still essential to ensure that the correct refrigerant oil is used. R12 systems were lubricated with mineral oil, which is totally unsuitable for R134a systems. The latter require PAG oil, which mixes very well with the refrigerant and provides ideal lubrication throughout the system.

ZX,TMXZCO002465-19-25NOV92

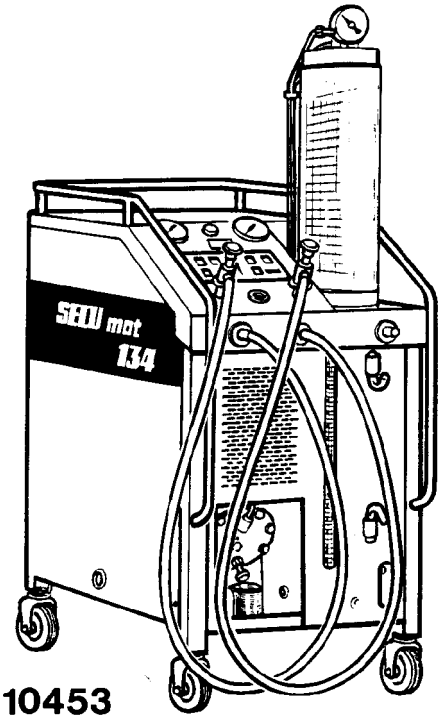
SPECIAL TOOLS

Service unit FKM10453

Evacuating, filling, cleaning and checking the air conditioning system.

NOTE: All work performed with this unit must be carried out in accordance with the service unit operator's manual.

IMPORTANT: Use only service units suitable for handling R134a refrigerant.



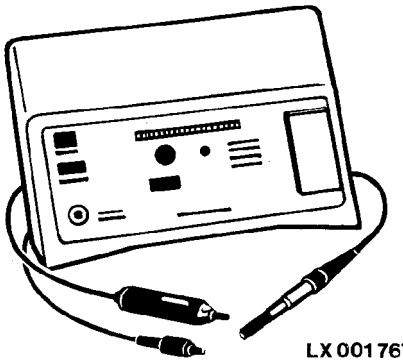
FKM10453 -UN-28APR95

ZX,TMXZCO002466-19-15FEB95

Leak tester FKM10444

Pinpointing a refrigerant leak.

NOTE: Use only leak testers suitable for finding R134a leaks.



LX001767 -UN-28APR95

ZX,TMXZCO002467-19-15FEB95

SPECIFICATIONS

Item	Measurement	Specification
Air conditioning system	Refrigerant quantity	2400 g (85 oz)
Evacuating system	Vacuum at sea level	100 kPa (1 bar) (14.5 psi)
Air conditioning system with compressor	Oil quantity	300 cm^3 (18.3 cu in.)
Compressor	Oil quantity	160 cm^3 (9.8 cu in.)
Air conditioning system, pressure side (2200 rpm)	Refrigerant pressure	1500—2000 kPa (15—20 bar) (218—290 psi)
Air conditioning system, suction side (2200 rpm)	Refrigerant pressure	80—200 kPa (0.8—2 bar) (11—29 psi)
Compressor clutch coil	Current draw (at 12 volts)	2.2 amps. max.
Temperature control switch set for max. cooling:		
• Contact points open (low limit)	Temperature at capillary tube	-1˚ to 1˚C (30˚ to 34˚F)
• Contact points closed (high limit)	Temperature at capillary tube	1.8˚ to 3.8˚C (35˚ to 39˚F)
Temperature control switch set for min. cooling:		
• Contact points closed (high limit)	Temperature at capillary tube	13.6˚ to 17.6˚C (56˚ to 64˚F)
Ice protection switch		
• Contact points open (low limit)	Temperature at capillary tube	-3˚ to -1˚C (26˚ to 30˚F)
• Contact points closed (high limit)	Temperature at capillary tube	0.5˚ to 2.5˚C (33˚ to 36˚F)
Double radial fan (installed)	Current draw (at 12 volts)	13 amps.

ZX,TMXZCO002468-19-25NOV92

TROUBLESHOOTING

Symptom	Problem	Solution
No cooling effect	System not in operation.	Switch on compressor switch. Turn temperature control switch counterclockwise. Switch on fan. If functioning, proceed to checks **1**
Inadequate cooling effect	Condenser severely contaminated.	Clean condenser.
	Evaporator severely contaminated.	Clean evaporator.
	Actuating cables of temperature control switch not functioning correctly.	Check and adjust actuating cables.
	Insufficient tension at compressor drive belt.	Replace drive belt or belt tensioner.
	Coolant leak	See checks **3**
	Thermostat switch not functioning correctly.	See checks **4 A**
	Compressor not functioning correctly.	See checks **5**
Intermittent or poor cooling effect	System components iced up.	Evacuate refrigerant and refill with recycled or new refrigerant. Replace receiver-drier.
Unusual noises when system is in operation	Insufficient tension at compressor drive belt.	Replace drive belt or belt tensioner.
	Defective compressor	Replace compressor.

ZX,TMXZCO002469-19-25NOV92

EXPLANATION OF CHECKS

The checks on the following pages show how to find an existing fault and then rectify it.

Visual checks are performed first, as this is the simplest way to eliminate possible causes of the fault.

The preliminary checks reveal whether individual components of the air conditioning system are functioning correctly.

Next, the leak tester is used to check if there is a leak at any point in the air conditioning circuit.

Up to this stage, the checks are relatively straightforward and do not involve lots of tools. The subsequent tests, however, may involve repair work or the replacement of major components, depending on the results of the test.

If the checks do not produce a clear result, observe the note below.

NOTE: A frequent cause of faults in air conditioning systems is too much moisture in the refrigerant circuit. Moisture results in air conditioning components icing up from the inside and functioning incorrectly. Too much moisture can also produce acid, which destroys the air conditioning system from within.

If moisture is suspected, the air conditioning system must be evacuated, cleaned, bled and refilled with new or recycled refrigerant. The refrigerant oil contained in the compressor must be changed.

It is particularly important to replace the receiver-drier, as it gradually loses its ability to absorb moisture. Eventually, it loses this ability altogether.

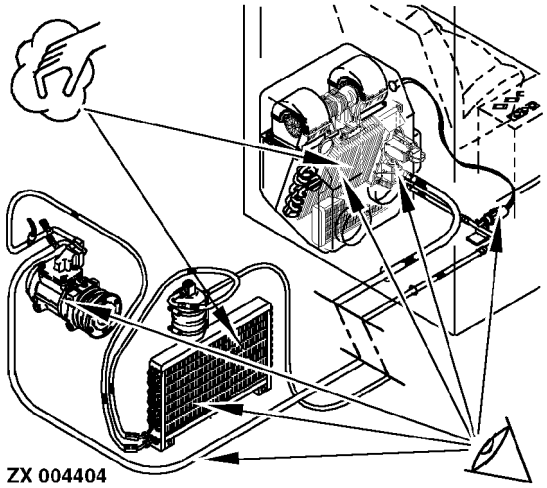
NOTE: After replacing a defective component or rectifying a fault, it is advisable to perform the operational check described in 290-05.

LX,290,10002721-19-01NOV96

AIR CONDITIONING SYSTEM, CHECKS

ZX,TMXZCO002470-19-25NOV92

; **VISUAL CHECKS**



ZX004404 -UN-08MAY95

a. Check tension of compressor belt.

b. Cab filters must be clean.

c. Air passages must be clear.

d. Check for damaged lines.

e. Hoses must not be deformed or trapped.

f. Condenser and evaporator must not be contaminated.

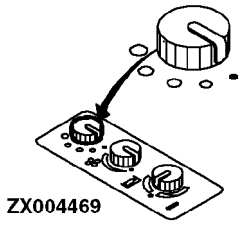
g. All electrical lines must be OK.

h. Listen for unusual noises while the system is operating.

ZX,TMXZCO002471-19-25NOV92

‘ A

PRELIMINARY CHECKS



ZX004469 -UN-08MAY95

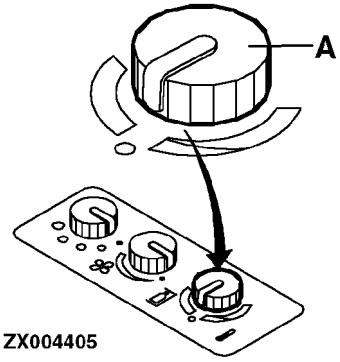
Switch on ignition and run the fan at each possible speed.

NOT OK: See Section 240-15.

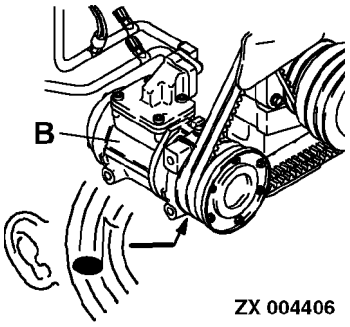
OK: Proceed with checks.

ZX,TMXZCO002472-19-25NOV92

B



ZX004405 -UN-08MAY95



ZX004406 -UN-08MAY95

Switch on ignition and run fan at lowest possible speed. Set temperature control switch (A) to operate the air conditioning system.

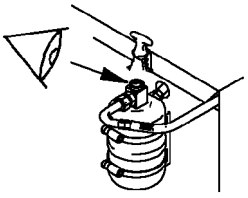
Note whether the clicking of the magnetic clutch can be heard at compressor (B).

NOT OK: See Section 240-15.

OK: Proceed with checks.

ZX,TMXZCO002473-19-25NOV92

C



ZX004407 -UN-08MAY95

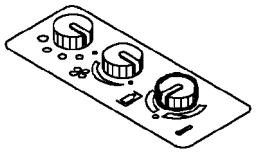
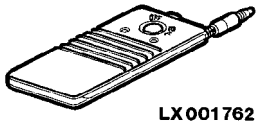
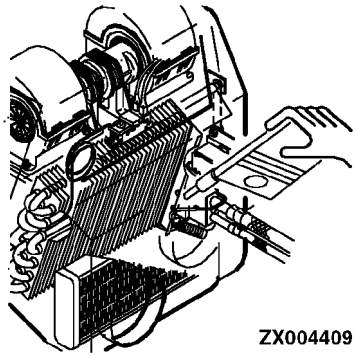
Run engine at 2200 rpm and set air conditioning to full output. Observe refrigerant flowing past the sight glass at receiver-drier.

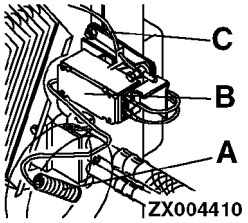
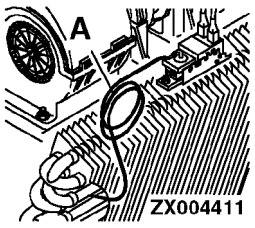
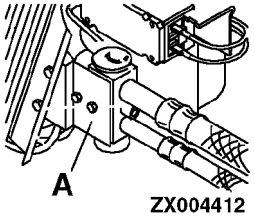
After some time, the bubbles in the refrigerant should disappear completely.

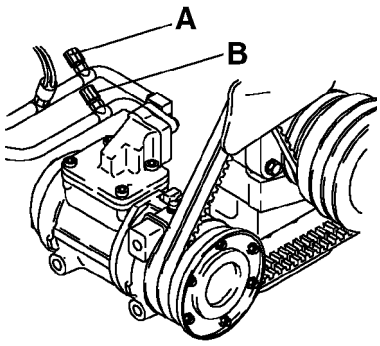
NOT OK: The air conditioning system must be topped up.

OK: Proceed with checks.

ZX,TMXZCO002474-19-25NOV92

D	 **ZX004408** ZX004408 -UN-08MAY95	Run engine at 800 rpm and set temperature control switch to max. cooling position. At the moment the switch trips, the engine sound should change slightly.	**NOT OK:** The compressor or its magnetic clutch must be repaired. See Section 90. **OK:** Proceed with checks. ZX,TMXZCO002475-19-16JUN93
Æ A **LEAK TEST**	 **LX001762** LX001762 -UN-28APR95	Run the engine at 1000 rpm and switch on fan and air conditioning system. Use FKM10444 leak tester to check the entire refrigerant circuit for leaks. Comply with the manufacturer's instructions. ⚠ **CAUTION: Keep away from moving engine parts at all times. Avoid accidents!** Hold the leak tester at the air outlets in the cab to test whether there is a leak in the evaporator housing.	**NOT OK:** If the leak tester indicates a leak while testing at the air outlets, proceed with Æ B. If a leak is found at another part of the system, the leak must be repaired or the leaking component must be replaced. See Section 90. **OK:** Proceed with Å ZX,TMXZCO002476-19-15FEB95
B **REFRIGERANT LEAK AT EVAPORATOR HOUSING**	 **ZX004409** ZX004409 -UN-08MAY95	Open evaporator housing under passenger seat. Run engine at 1000 rpm and switch on fan and air conditioning system. Use leak tester FKM10444 to test evaporator, expansion valve and refrigerant lines for leaks.	**NOT OK:** If a leak is found at any part of the system, the leak must be repaired or the leaking component must be replaced. See Section 90. **OK:** Proceed with Å. ZX,TMXZCO002477-19-15FEB95

Å **COMPONENT CHECKS** A Thermostat switch	 ZX004410 -UN-08MAY95	Open evaporator housing under passenger seat. Check that sensing bulb (A) is not damaged. Make sure that thermostat switch (B) is actuated correctly. Do this by actuating the temperature switch several times and observing cable (C). Check all electrical contacts of the thermostat switch.	**NOT OK:** To correct faults, see Section 90. **OK:** Proceed with checks. ZX,TMXZCO002478-19-25NOV92
B **Ice protection switch**	 ZX004411 -UN-08MAY95	Make sure that capillary tube (A) is not damaged and inserted into evaporator. Check all electrical contacts of the ice protection switch.	**NOT OK:** To correct faults, see Section 90. **OK:** Proceed with checks. ZX,TMXZCO002479-19-25NOV92
C **Evaporator**	Remove any contamination and check for signs of damage.	**NOT OK:** If the evaporator shows signs of damage, it must be replaced. See Section 90. ⚠ **CAUTION: Before removing the evaporator, first evacuate the refrigerant from the air conditioning system.** **OK:** Proceed with checks. ZX,TMXZCO002480-19-25NOV92	
D **Expansion valve**	 ZX004412 -UN-08MAY95	Check that there are no signs of damage at thermal head (A). Check all connections.	**NOT OK:** Replace expansion valve. ⚠ **CAUTION: Before removing the expansion valve, evacuate refrigerant from the air conditioning system.** **OK:** Proceed with checks. ZX,TMXZCO002481-19-25NOV92

Ö **Compressor, pressure tests**	 **ZX004413** ZX004413 -UN-08MAY95	**A—High pressure connection** **B—Low pressure connection**	Connect the pressure gauges of the service unit to the compressor. Run engine at 2200 rpm. Switch on fan and set temperature control switch to max. cooling position. On the high pressure side, the pressure reading must be 1500—2000 kPa (15—20 bar) (218—290 psi). On the low pressure side, the pressure reading must be 80—200 kPa (0.8—2 bar) (11—29 psi).
			NOT OK: See pressure deviations. ZX,TMXZCO002482-19-25NOV92

PRESSURE DEVIATIONS

Symptom	Problem	Solution
Low pressure and high pressure both too high	System has been over-filled.	Reduce amount of refrigerant in system.
	Condenser is contaminated or plugged.	Clean or unplug condenser. Replace condenser, if necessary.
Low pressure too low and high pressure too high	Condenser plugged.	Unplug condenser or replace, if necessary.
	Receiver-drier plugged.	Unplug receiver-drier or replace, if necessary.
	Expansion valve not operating correctly.	Replace expansion valve.
Low pressure too high but high pressure normal	Compressor not operating correctly.	Repair or replace compressor.
Low pressure and high pressure are the same	Compressor not operating.	Check drive belt. Check electrical wiring. Change high/low pressure switch. Check thermostat switch, see Section 240. Check magnetic clutch of compressor.
Low pressure too low but high pressure normal	Not enough refrigerant in circuit.	Top up system.
	Expansion valve not operating correctly.	Replace expansion valve.
	Evaporator contaminated or plugged.	Clean evaporator. Unplug evaporator or replace, if necessary.
Low pressure and high pressure both too low	Not enough refrigerant in circuit.	Top up system.
	Receiver-drier plugged.	Unplug receiver-drier or replace, if necessary.
	Expansion valve not operating correctly.	Replace expansion valve.

Continued on next page

Symptom	Problem	Solution
Low pressure and high pressure both too low (Continued)	Too much moisture in circuit, causing components to ice up.	Evacuate system, replace receiver-drier and then refill system.
	Compressor not operating correctly.	Repair compressor or replace, if necessary.

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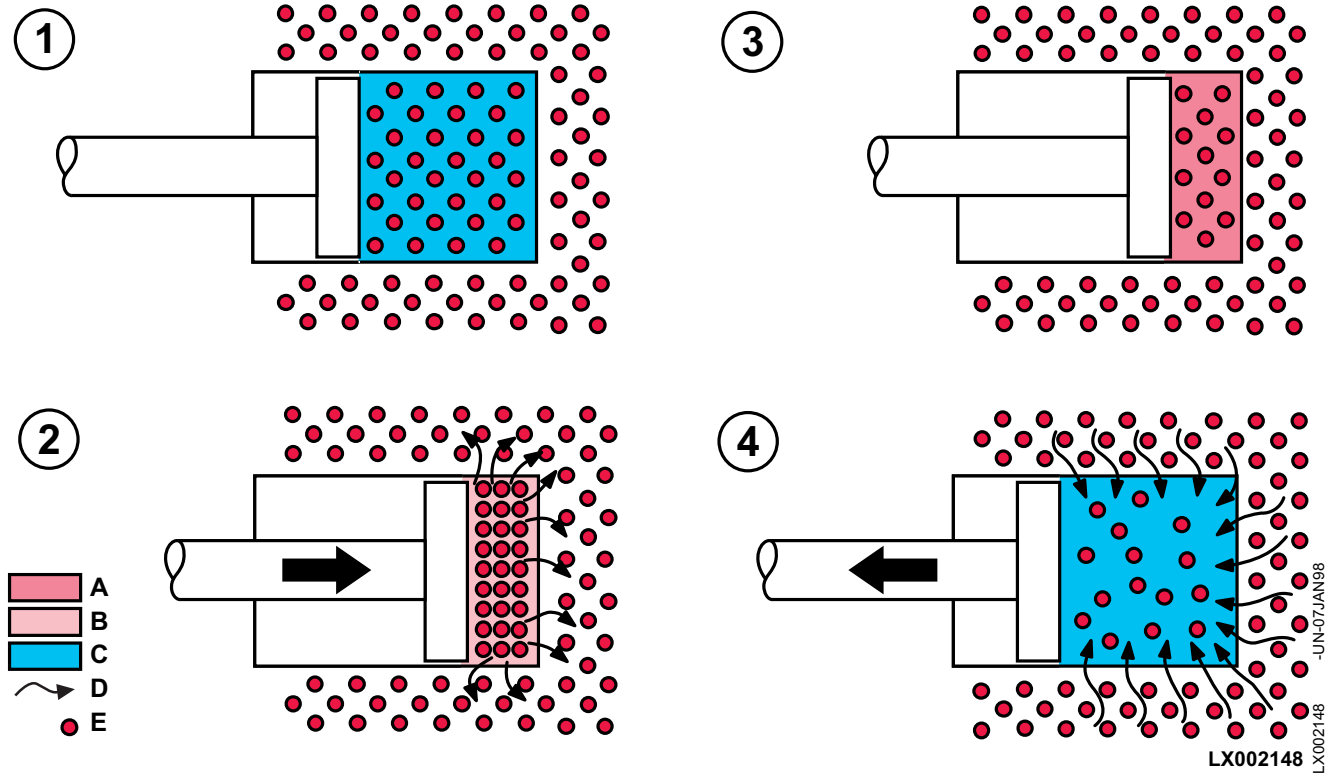
PRINCIPLE OF HEAT EXCHANGE



A—Liquid refrigerant under high pressure
B—Gaseous refrigerant under high pressure
C—Gaseous refrigerant under low pressure
D—Exchange of heat
E—Energy in the form of heat

The simplified example set out below is intended to show how heat is exchanged in an air conditioning system. Each explanation concludes with the part of the air conditioning system that corresponds to the principle involved.

Fig. 1: Gaseous refrigerant is contained in a cylinder which has a certain reserve of energy (E) in the form of heat. (intake line of compressor)
Fig. 2: A piston reduces the space in which the gaseous refrigerant is trapped. This concentrates the heat (E) in a smaller space. This means that the temperature inside the cylinder is now higher than it was before. Heat is now exchanged, with the surrounding area absorbing the heat of the gas. Heat always moves from a hotter substance to a colder one. (compressor to condenser)

Fig. 3: The pressurized refrigerant condenses on the cylinder wall and becomes a liquid. The gas has transferred its heat through the cylinder wall to the surrounding area. (condenser)
Fig. 4: The space inside the cylinder is increased. This means that the pressure drops rapidly and the liquid refrigerant is free to expand. The refrigerant evaporates and returns to its gaseous state. In consequence, the heat remaining in the gas is free to spread through a larger area. The temperature inside the cylinder drops and heat is exchanged once again. This time the heat is absorbed from the surrounding area by the cold cylinder. (expansion valve and evaporator)

LX,290,20002575-19-01APR94

R134A REFRIGERANT

IMPORTANT: The air conditioning system operates using R134a refrigerant (tetrafluorethane). This substance does not contain any chlorine atoms, so it does not have a detrimental effect on the ozone in the Earth's atmosphere.

Even so, the refrigerant must never be discharged straight into the air. It must be trapped in a recycling unit. Refrigerant stored in a recycling unit may be re-used at any time.

The recycling unit used to do this must be of a type suitable for handling R134a refrigerant.

The boiling point of R134a is minus 26.5˚C (minus 15.7˚F) and its freezing point is minus 101˚C (minus 149.8˚F).

Before replacing any component, it is vital to check whether it is compatible with the type of refrigerant used.

It is still essential to ensure that the correct refrigerant oil is used. R12 systems were lubricated with mineral oil, which is totally unsuitable for R134a systems. The latter require PAG oil, which mixes very well with the refrigerant and provides ideal lubrication throughout the system.

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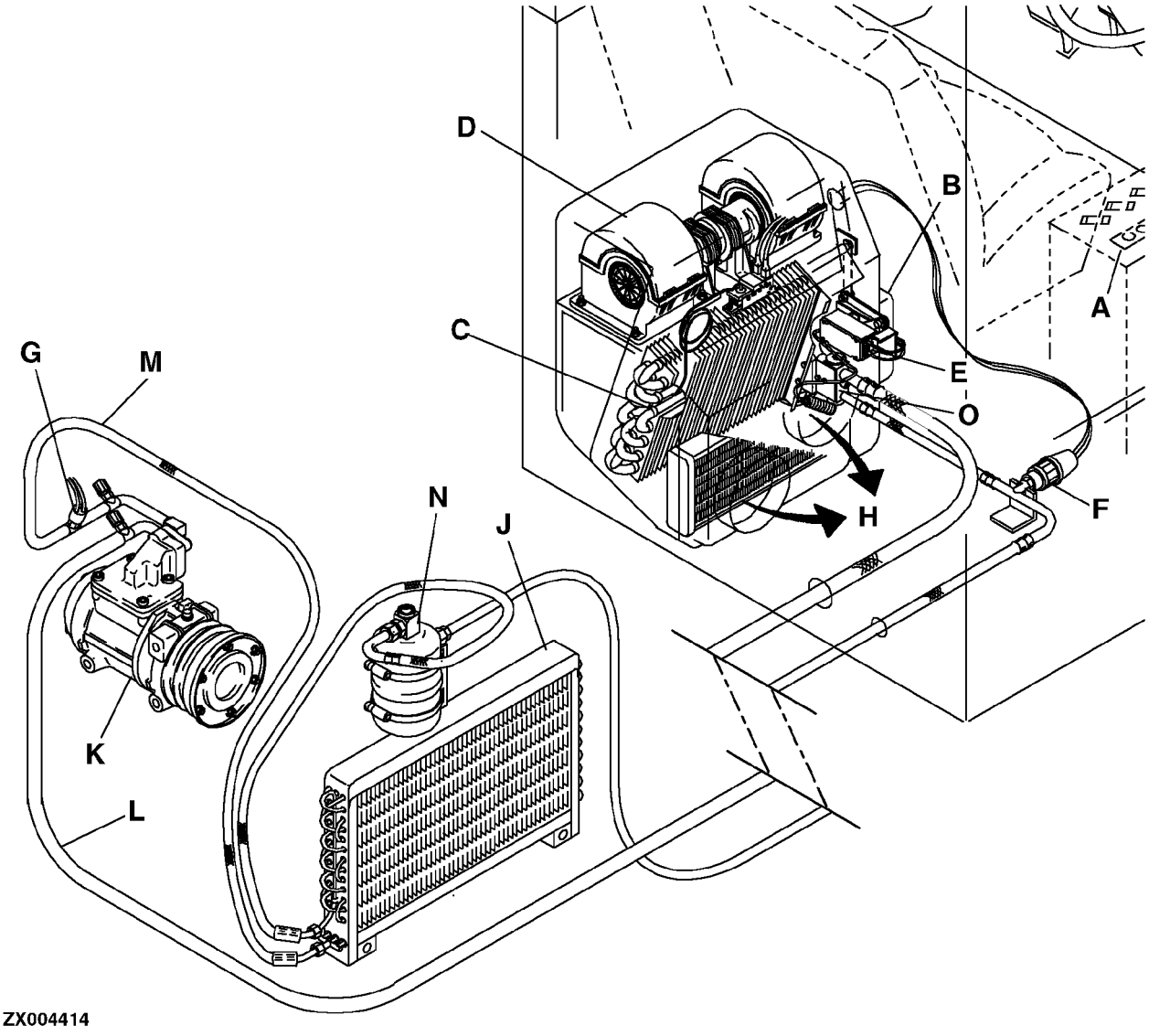
LAYOUT OF REFRIGERANT CIRCUIT



ZX004414 -UN-08MAY95

A—Temperature control switch
B—Cab air filter
C—Evaporator
D—Blower fan
E—Thermostat switch
F—Low pressure switch
G—High pressure switch
H—Flow of air into cab
J—Condenser
K—Compressor
L—Low-pressure line
M—High-pressure line
N—Receiver-drier
O—Expansion valve

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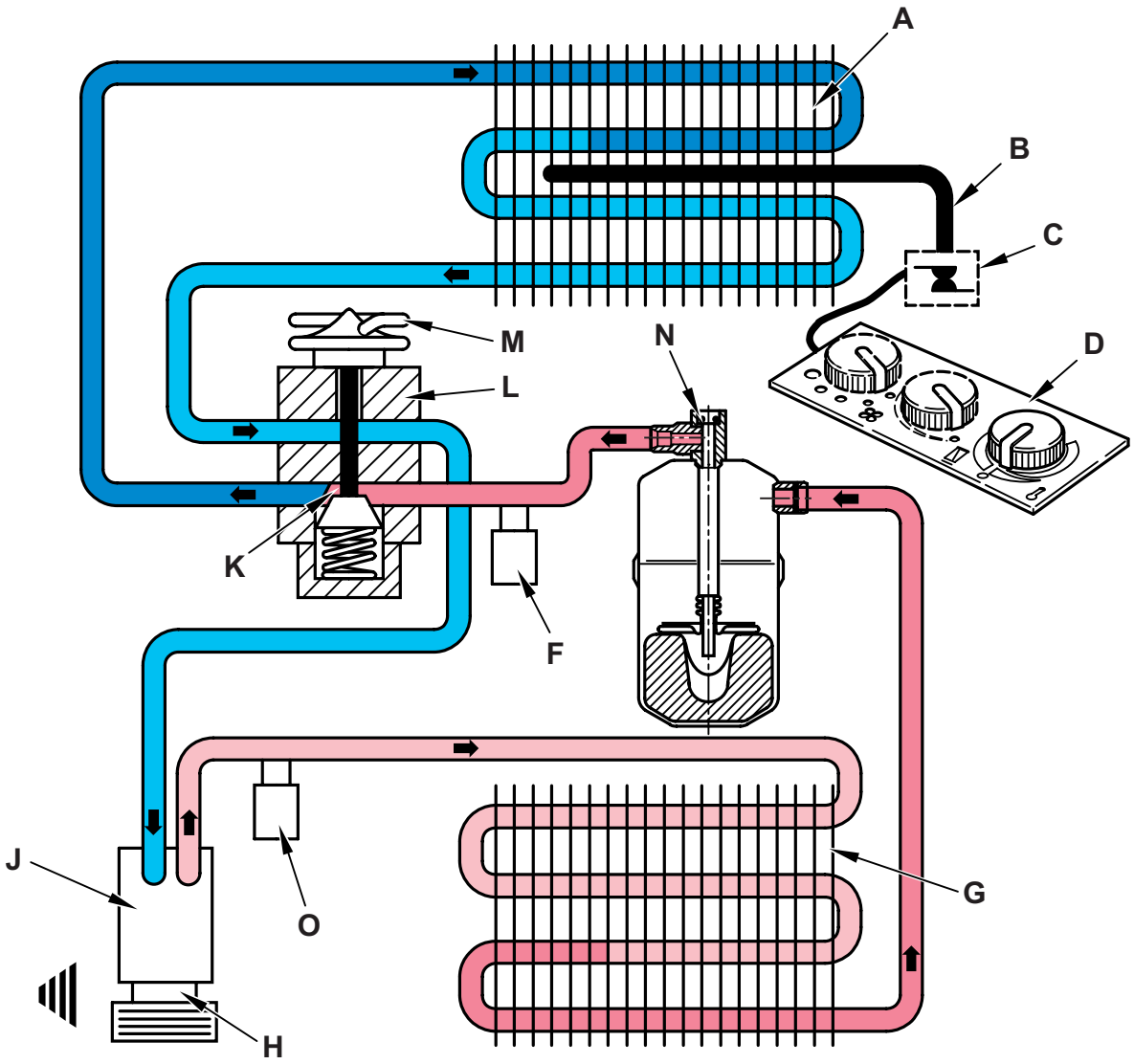
DESCRIPTION OF REFRIGERANT CIRCUIT FUNCTION



A—Evaporator
B—Sensing bulb
C—Thermostat switch
D—Temperature control switch
E—Receiver-drier
F—Low pressure switch
G—Condenser
H—Magnetic clutch
J—Compressor
K—Variable throttle
L—Expansion valve
M—Thermal head
N—Sight glass
O—High pressure switch
P—Liquid refrigerant under high pressure
Q—Gaseous refrigerant under high pressure
R—Liquid refrigerant under low pressure
S—Gaseous refrigerant under low pressure

ZX,TMXZCO002485-19-01DEC92

DESCRIPTION OF REFRIGERANT CIRCUIT FUNCTION (CONTINUED)

The air conditioning system operates on the compression principle. The main components are the compressor (J), condenser (G), receiver-drier (E), expansion valve (L), evaporator (A), temperature control switch (D), thermostat switch (C), high pressure switch (O) and low pressure switch (F).

Gaseous refrigerant is compressed in compressor (J), causing it to absorb heat. Then the pressurized gas is fed through the condenser (G), where it transfers its heat to the cooling fins and condenses.

Now in the form of a pressurized liquid, the refrigerant flows through receiver-drier (E), where a special filter separates out all impurities including moisture and acid.

A sight glass (N) is provided at the receiver-drier (E). Through this can be seen whether the refrigerant is in a completely liquid state at this point, and whether there is enough refrigerant in the circuit.

After it leaves the receiver-drier (E), the refrigerant passes to expansion valve (L), where it is fed through a variable throttle (K). The pressure is still high at the inlet side of the expansion valve. Once the refrigerant has passed through the throttle, howevever, it is free to expand and cool down.

Expansion is completed in evaporator (A), where the refrigerant returns to its gaseous state and cools down the surrounding area considerably. The refrigerant transfers its cold temperature to the evaporator's cooling fins, and air flowing into the evaporator is cooled down.

High pressure switch (O) and low pressure switch (F) determine the refrigerant pressure. This is required in order to switch off the compressor if the pressure becomes too high or too low.

Thermostat switch (C) controls the cooling output by switching compressor (J) on or off. The thermostat switch can be reset by turning temperature control switch (D).

The refrigerant flows back via the evaporator return line and is unimpeded as it passes through the housing of expansion valve (L). There it comes under the influence of the gas-filled thermal head (M), which actuates variable throttle (K) in relation to the temperature. In this way, the refrigerant always flows to evaporator (A) at the optimum rate.

Then the gaseous refrigerant is fed back into compressor (J), and the circuit is closed.

ZX,TMXZCO002486-19-25NOV92

COMPRESSOR

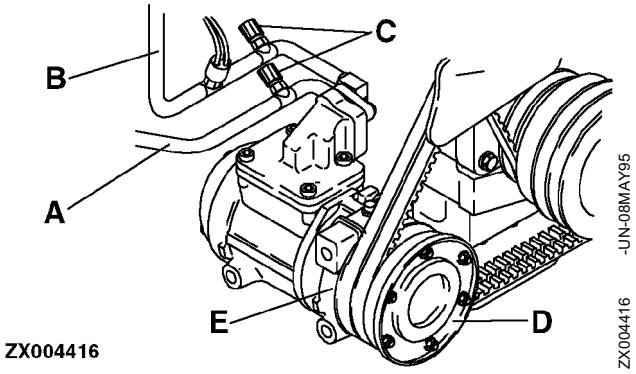
The compressor is located on the engine and is driven by a multi-groove drive belt. The compressor is of the axial piston compressor type and is controlled by a swashplate.

The purpose of the compressor is to ingest the gaseous refrigerant from the low pressure area, to compress it and send it on to the condenser.

When this happens, the low pressure gas is compressed into a smaller space, which greatly increases the temperature of the refrigerant.

The compressor drive assembly includes a magnetic clutch, which allows the compressor to be switched on and off while the air conditioning system is in operation. This is necessary to keep the temperature in the cab as nearly constant as possible.

The compressor housing also serves as the reservoir for refrigerant oil. The compressor is normally switched on and off by the thermostat switch. If refrigerant pressure becomes too high or too low, the compressor is switched off by the high or low pressure switch.



A—Suction line
B—Pressure line
C—Test ports
D—Drive belt pulley
E—Magnetic clutch

ZX,TMXZCO002487-19-25NOV92

CONDENSER

The condenser is located in front of the radiator. The purpose of the condenser is to cool down the pressurized refrigerant gas so that it condenses and leaves the condenser as a liquid.

The cooling effect is produced by the airflow created by the fan blades. The condenser's inlet is connected to the compressor's pressure connection, its return line to the receiver-drier.

ZX,TMXZCO002488-19-25NOV92

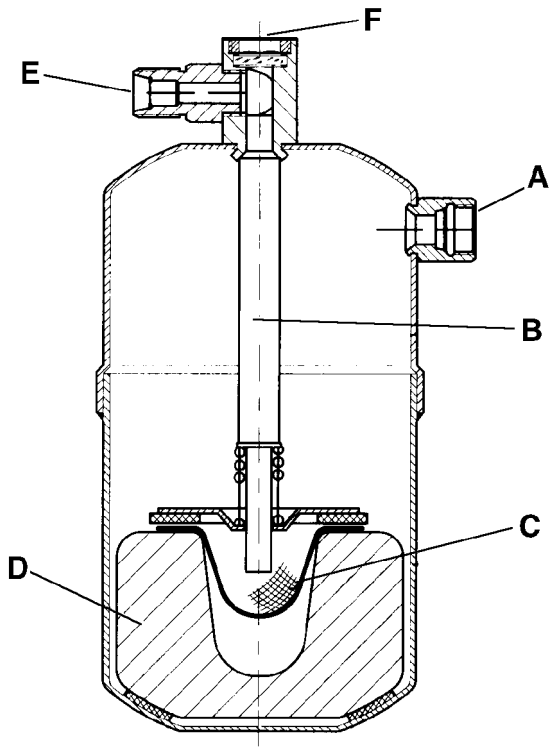
RECEIVER-DRIER

The receiver-drier performs two functions. Firstly, it receives high pressure refrigerant from the condenser and stores it until it is required by the evaporator. Secondly, it absorbs moisture that would have a detrimental effect on the system's ability to operate.

The sight glass on the receiver-drier enables the refrigerant to be observed when tests or service work are being performed. The receiver-drier's inlet is connected to the condenser, and its return line to the expansion valve.

The receiver-drier should be replaced every time the air conditioning system is repaired.

A—To expansion valve
B—Tube
C—Screen
D—Dessicant block
E—From condenser
F—Sight glass



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EXPANSION VALVE

The expansion valve is located on the left side of the evaporator looking in the direction of forward travel and is connected to the evaporator's inlet and return lines.

The expansion valve is a diaphragm valve with a stainless steel thermal head. Its purpose is to control the throughflow of refrigerant in relation to the return temperature from the evaporator.

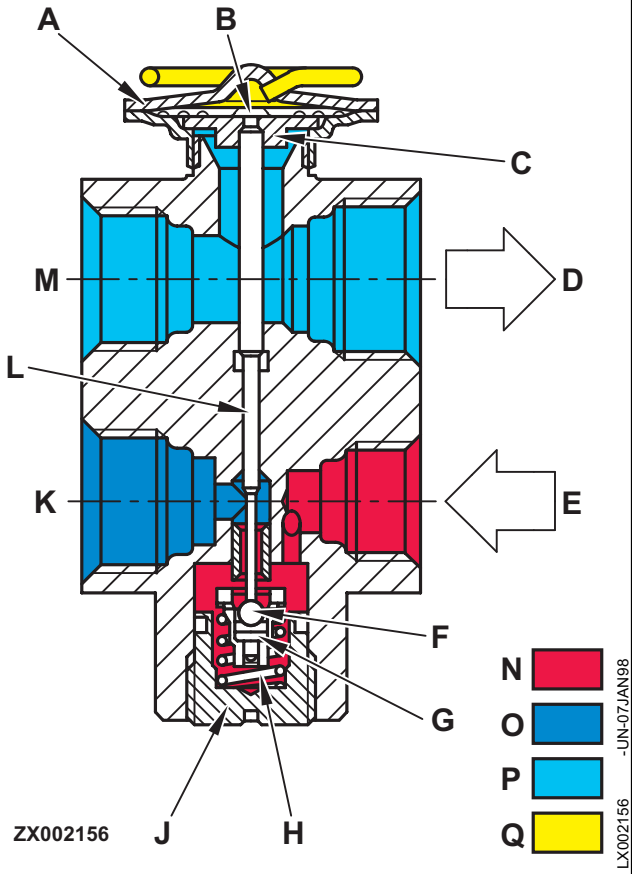
If too much refrigerant flows through the evaporator, liquid refrigerant could reach the compressor via the return line and cause damage to the compressor.

Too much liquid refrigerant is one reason why the system may not be performing well, as the refrigerant does not evaporate completely.

A variable throttle is located in the inlet to the expansion valve. This throttle is formed by valve ball (F) and actuating pin (L). At this point the pressure of the liquid refrigerant is reduced considerably. This allows the refrigerant to expand and change into its gaseous state in the evaporator, thus bringing down the temperature.

Once the refrigerant has left the evaporator, it has to flow through the expansion valve once again. However, it does not do so through the throttle, but through a passage where the refrigerant temperature can be registered by thermal head (A).

The thermal head is filled with gas, which expands and contracts as the temperature rises and falls. This process is employed to produce a movement at diaphragm (B) that is passed on to the throttle. This makes it possible to control the throughflow of refrigerant in relation to its temperature.



A—Thermal head
B—Diaphragm
C—Pressure plate
D—To compressor
E—From receiver-drier
F—Valve ball
G—Ball seat
H—Spring
J—Plug
K—To evaporator
L—Actuating pin
M—From evaporator
N—Liquid high pressure refrigerant
O—Liquid low pressure refrigerant
P—Gaseous low pressure refrigerant
Q—Gas in thermal head

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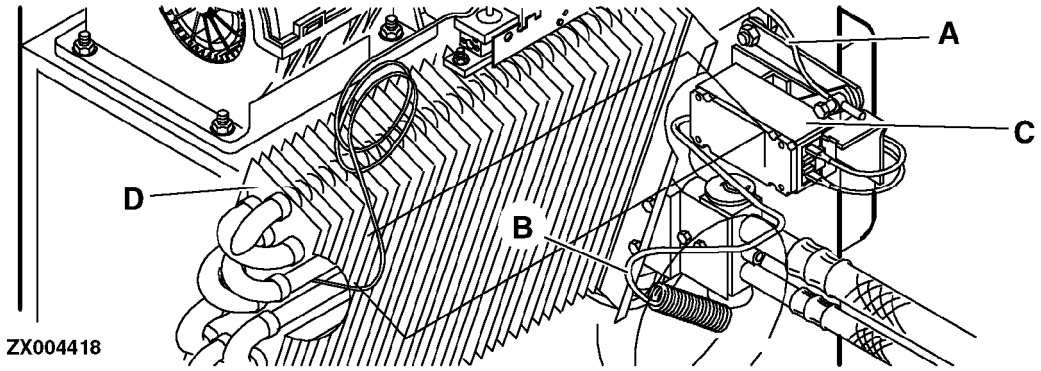
THERMOSTAT SWITCH



-UN-08MAY95
ZX004418

A—Actuating cable **B—Sensing bulb (gas-filled capillary tube)** **C—Thermostat switch** **D—Evaporator**

Thermostat switch (C) is located at the left side of the evaporator (looking in the direction of forward travel), inside the evaporator housing.
It is operated by actuating cable (A), which moves in response to the temperature control switch. The cable also changes position of air control flap.

The thermostat switch controls the cooling output of the air conditioning system by switching the compressor on and off, thus regulating the evaporator's temperature. This effect is determined by the position to which the temperature control switch is set.

The switch consists of a set of contacts which receive current via the fan switch. Current flows on from the thermostat switch to the magnetic clutch for the compressor.

The opening and closing of the electrical contacts is controlled by a gas-filled capillary tube (B), one end of which is fitted with a diaphragm or bellows. The other (spiral) end of the capillary tube protrudes into air flow at housing outlet.

When the thermostat switch is actuated, the switch contacts close, allowing current to flow between the switch and the compressor. However, the compressor comes into operation only if the ventilator fan is also in operation.

Once the temperature in evaporator (D) reaches a preselected lower limit, the switch contacts open and the compressor is shut off. The compressor remains shut off until the temperature in the evaporator reaches the upper limit.

When this happens, the switch contacts close again and the compressor comes into operation once more. In this way, the compressor is switched on and off as required and in relation to the temperature inside the evaporator.

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EVAPORATOR

The evaporator is located in the evaporator housing, underneath the operator's seat. It allows the heat transfer to take place between the refrigerant and the cab air. The same component also includes the heat exchanger for the heating system; this makes use of engine coolant to heat the cab air as required. It is controlled via the heating valve.

The refrigerant is still in its liquid form as it comes from the expansion valve. It expands in the evaporator and becomes a gas. The resulting low temperature is transferred to the cooling fins and the airflow produced by the fan transfers its heat to the fins.

The moisture in the ambient air condenses when it comes into contact with the cold evaporator fins. The condensation is drained away via a drain hose.

The gaseous refrigerant is removed from the evaporator outlet via the expansion valve to the compressor.

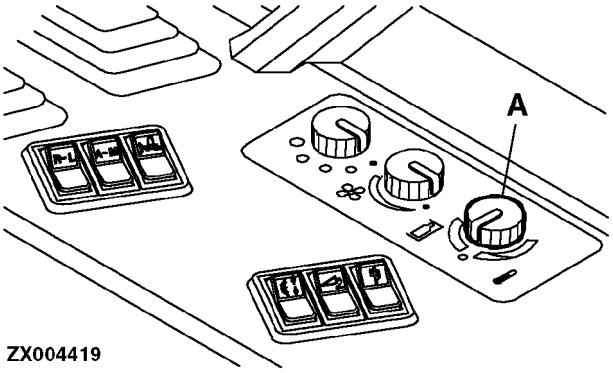
ZX,TMXZCO002491-19-25NOV92

TEMPERATURE CONTROL SWITCH AND COMPRESSOR SWITCH

Temperature control switch (A) is a combined control element located on the switch console in the cab. Depending on its setting, it activates the heating or air conditioning system by means of two actuating cables.

If the knob is set to the blue sector, the heating valve is shut off and the thermostat switch is on. At the same time, the compressor is switched on by an integrated electric switch.

This situation is reversed when the switch is set to the red sector.



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Section 340
Optional Equipment

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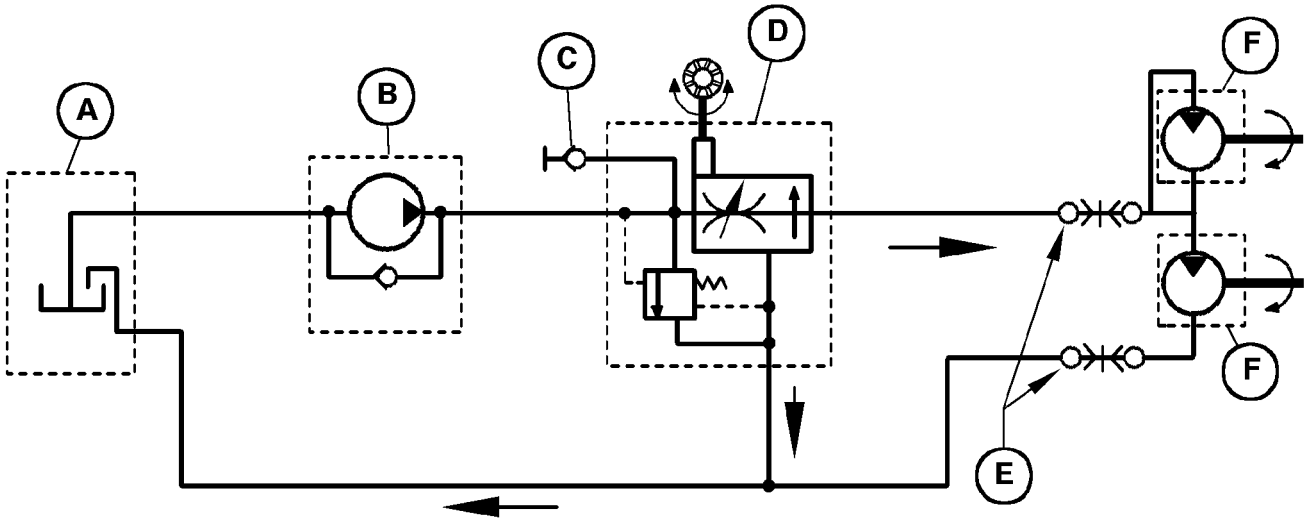
SYSTEM DIAGRAM, HYDROSTATIC CHAFF SPREADER DRIVE



ZX013591

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ZX013591

A—Hydraulic oil reservoir
B—Hydraulic pump
C—Diagnostic port
D—Speed controller
E—Coupler
F—Hydraulic motor

ZX,TMXZCO010095-19-01AUG97

CHECKING PRESSURE RELIEF VALVE OF CHAFF SPREADER DRIVE

Disconnect quick coupler (A).

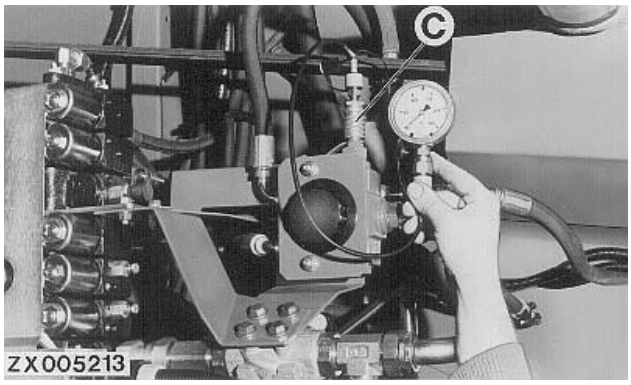
Engage separator.

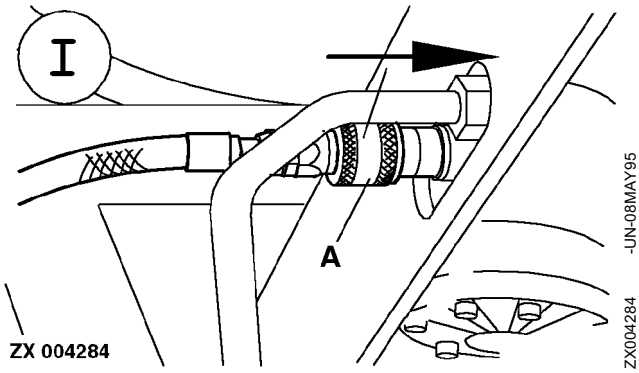
Connect a pressure gauge to test port (C).

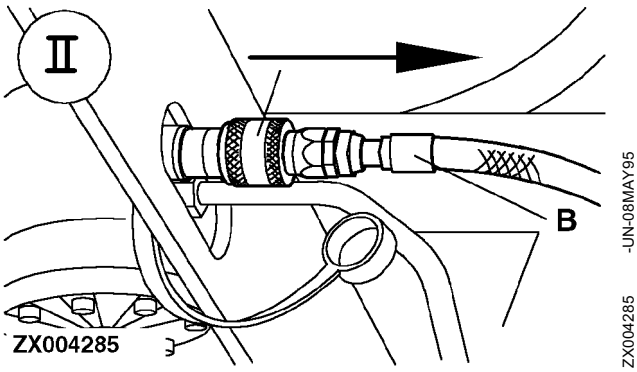
Read pressure at gauge.

Maximum pressure should be 21000 kPa (210 bar; 3050 psi).

A—Quick coupler (inlet flow)
B—Quick couper (return flow)
C—Pressure test port







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