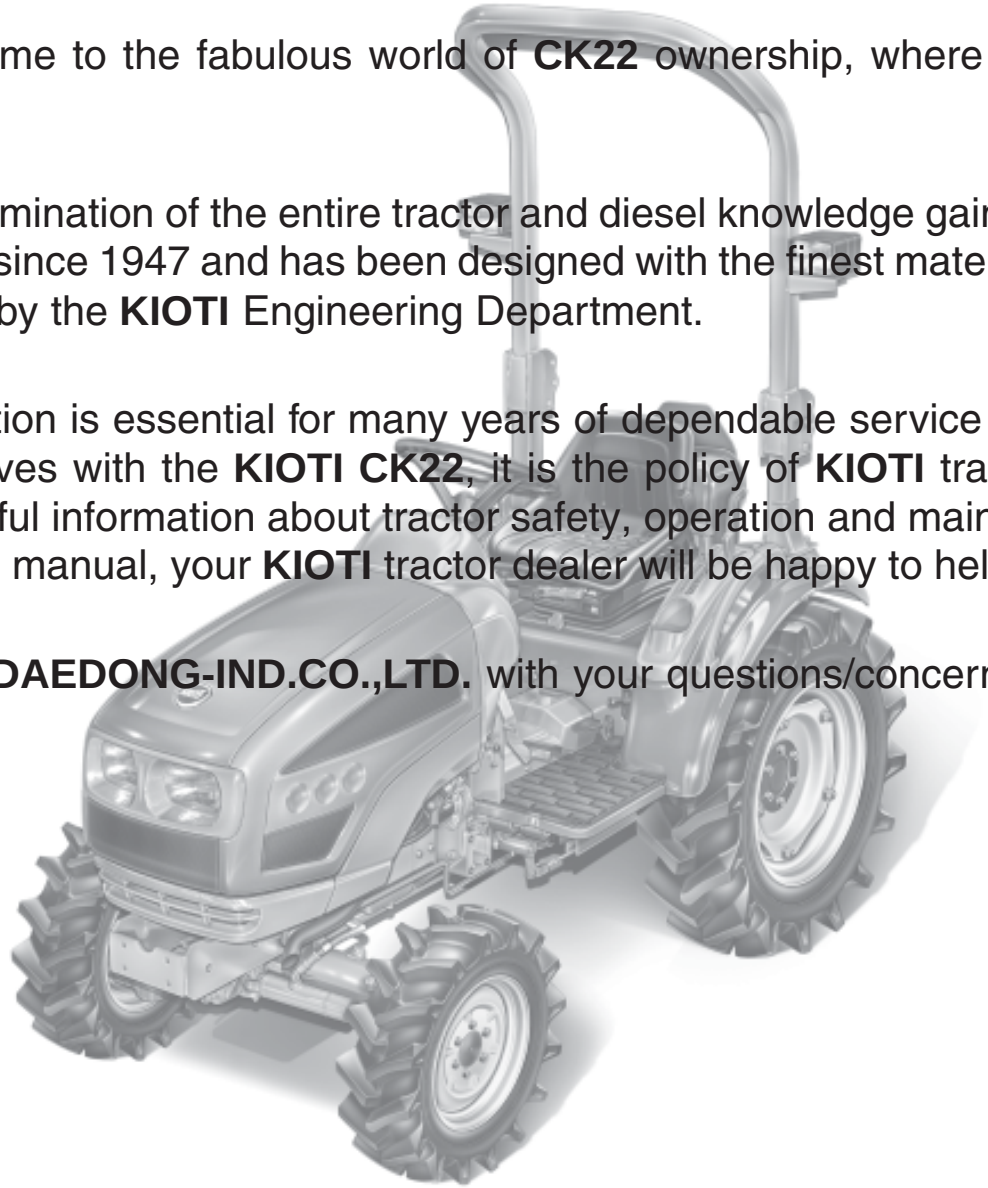
FOREWORD

Congratulations, and welcome to the fabulous world of **CK22** ownership, where serious work is made fun again!

This versatile tractor is a culmination of the entire tractor and diesel knowledge gained by the Daedong Industrial Co.,LTD over the years since 1947 and has been designed with the finest materials and under rigid quality control standards set forth by the **KIOTI** Engineering Department.

Knowledge of tractor operation is essential for many years of dependable service and reliability. To help new owner's familiarize themselves with the **KIOTI CK22**, it is the policy of **KIOTI** tractor to provide an owner's manual which includes helpful information about tractor safety, operation and maintenance. If the information you seek is not found in this manual, your **KIOTI** tractor dealer will be happy to help you.

Please feel free to contact **DAEDONG-IND.CO.,LTD.** with your questions/concerns.



SAFETY AND VEHICLE DAMAGE WARNING

This manual includes information titled as **WARNING, CAUTION, IMPORTANT** and **NOTE**. These titles indicate the following:

 **WARNING**	**This indicates that a condition may result in harm, serious injury or death to you or other persons if the warning is not heeded. Follow the advice provided with the warning.**
 **CAUTION**	**This indicates that a condition may result in damage to your vehicle or its equipment if the caution is not heeded. Follow the advice provided with the caution.**
 **IMPORTANT**	**This mark indicates emphasis on notable characteristics of working procedures, and information about technology for easier operation.**
 **NOTE**	**This indicates that interesting or helpful information is being provided.**

ABBREVIATION LIST

ABBREVIATIONS	DEFINITIONS
4WD	Four Wheel Drive
API	American Petroleum Institute
ASAE	American Society of Agricultural Engineers, USA
ASTM	American Society of Testing and Materials, USA
fpm	Feet Per Minute
Hi-Mid-Lo	High Speed-Middle Speed-Low Speed
HST	Hydrostatic Transmission
m/s	Meters Per Second
PTO	Power Take Off
RH/LH	Right-hand and Left-hand sides are determined by facing in the direction of forward travel
ROPS	Roll-Over Protective Structures
m^{-1} (rpm)	Revolutions Per Minute
S^{-1} (r/s)	Revolutions Per Second
SAE	Society of Automotive Engineers, USA
SMV	Slow Moving Vehicle

UNIVERSAL SYMBOLS

Various universal symbols have been used on the instruments and controls of your KIOTI tractor. Below is a list of the universal symbols and their meanings.

 Fuel-Level

 Engine Coolant-Temperature

 Parking Brake

 Battery Charging Condition

 Engine Oil-Pressure

 Turn Signal

 Power Take-Off Clutch Control-ON Position

 Power Take-Off Clutch Control-OFF Position

 Differential Lock

 Position Control-Lowered Position

 Hazard Warning Lights

 Headlight-Low Beam

 Headlight-High Beam

 Four-Wheel Drive-ON

 Fast

 Slow

 Coolant

 Preheat

TABLE OF CONTENTS

SECTION

SAFETY PRECAUTIONS

1

BEFORE OPERATING THE TRACTOR

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, use these safety precautions, and pay attention to the job at hand. If you can prevent an accident, your time will have been well spent.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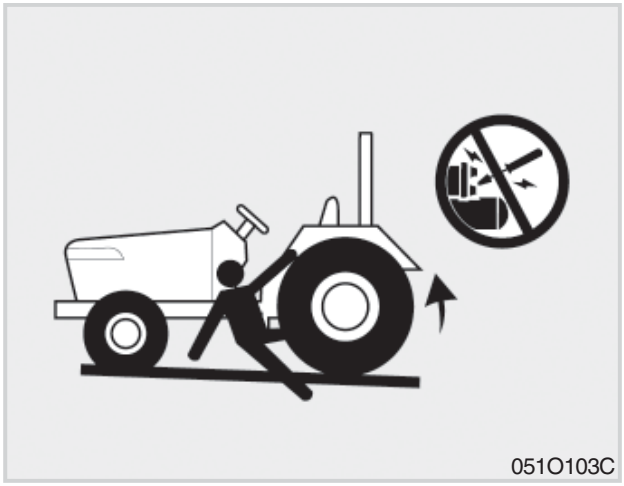
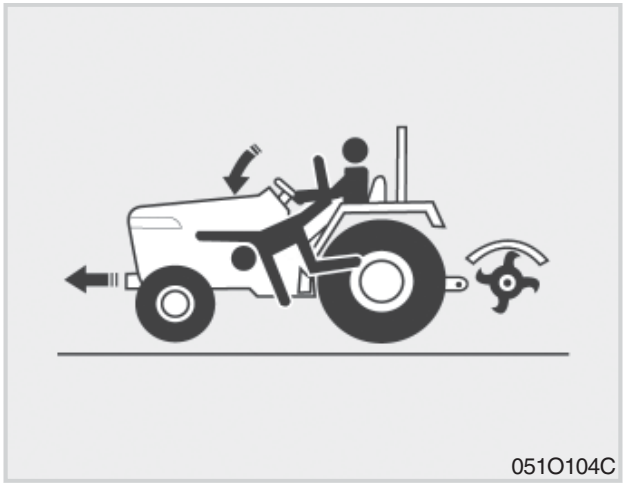
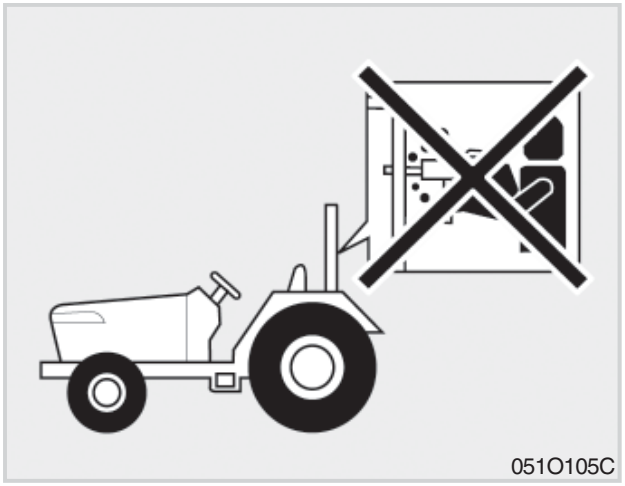
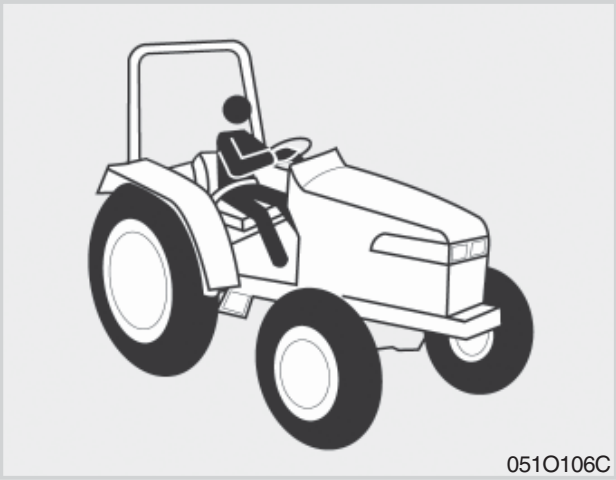
1. It is recommended that you read and understand this entire manual before operation of your new tractor. Failure to do so could result in accidents or injury.
2. Only persons who are properly trained should be allowed to operate the tractor.
3. Read and follow all warning labels and decals affixed to the tractor.
4. Replace any missing or damaged decals as soon as it is practical. A list of decals is shown on page1-14~16.
5. Keep safety decals clean of dirt and debris.
6. Watch where you are going at all times so that you are able to avoid obstacles that can cause injury or damage to your tractor.
7. When starting the tractor make sure your path is clear of people to avoid accidents caused by sudden movements.
8. Before making reverse movements with your tractor, you should always check to see that the path is clear.







9. Never operate this tractor or any other agricultural equipment while under the influence of alcohol, drugs or while fatigued.
10. While working in cooperation with other tractors always communicate your intentions.
11. Do not start your tractor by shorting across the starter.
12. Never start the engine while standing on the ground.
13. Only the operator should ride on the tractor unless a passenger seat is installed. Keep bystanders away from the tractor while in operation.
14. When getting on and off the tractor, handholds and step plates should always be used. This will help to prevent accidental slips trips and falls.
15. Be sure to scrape off mud or soil from your shoes before mounting the tractor.
16. All persons using the tractor should have knowledge of its proper operation and should read this manual carefully.
17. Never get off the tractor without setting the parking brake, lowering the implement to the ground and shutting of the tractor.
18. No alterations should be made to your **KIOTI** tractor.



19. Before starting your tractor you should depress the clutch and make sure that all shift levers are in the neutral position and parking brake is applied.

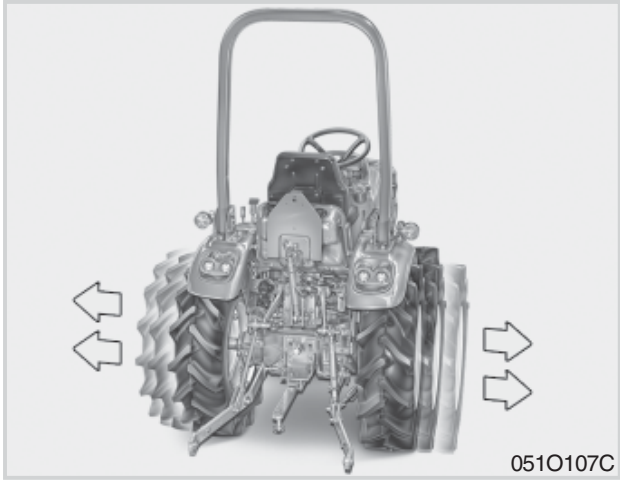
20. For your safety **ROPS** with a seat belt is recommended for all applications.

NOTE

- Always use seat belt when the tractor is equipped with a **ROPS**. Never use the seat belt when tractor is not equipped with a **ROPS**.

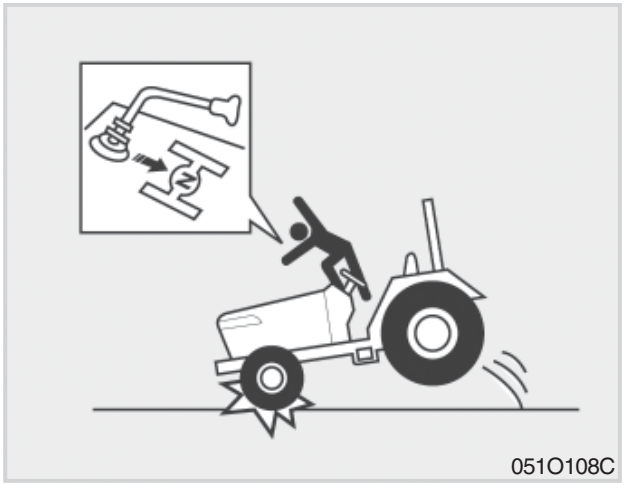
A **ROPS** should never be modified by welding, grinding or cutting, as this can weaken the **ROPS** structure. If any components of the **ROPS** unit is damaged, it must be replaced.

If the **ROPS** unit is removed or loosened for any reason, the parts should be fitted back to their original positions and all bolts should be properly torqued.



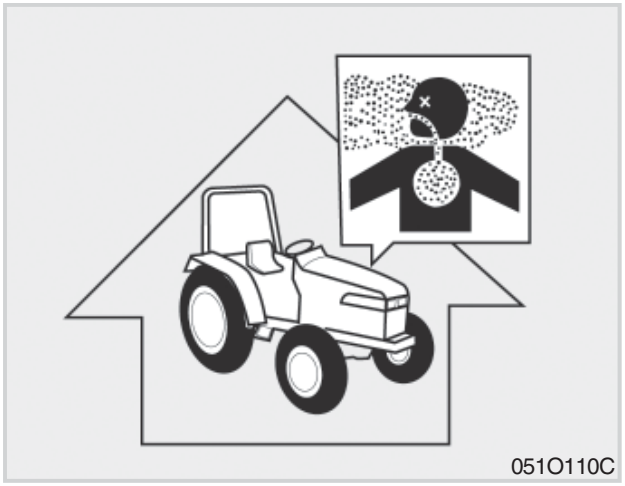
21. Extra caution should be taken when driving tractors with narrow tread widths. For added stability you should adjust your rear wheel tread width, see page 8-4.

OPERATING THE TRACTOR

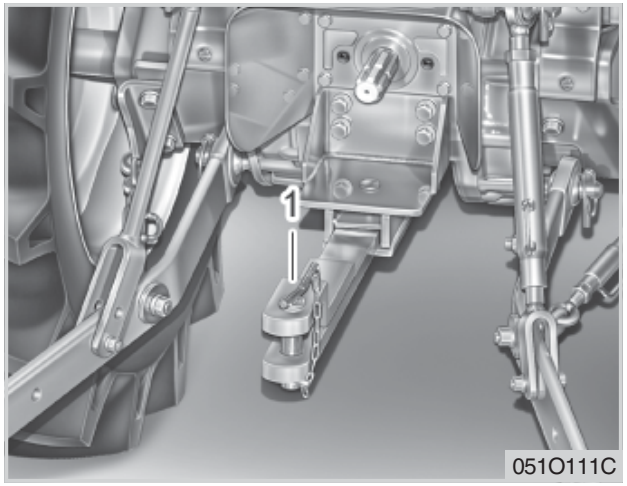


1. Avoid accidental contact with gear shift levers while the engine is running. Unexpected tractor movements can result in bodily injury.

2. Do not park your tractor on a steep incline, and remember to shut off the engine and PTO before dismounting the tractor.



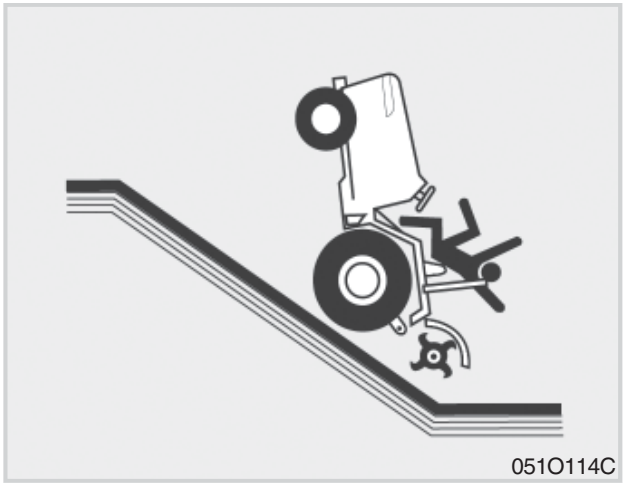
3. Do not operate your tractor in an enclosed building without the proper ventilation. Exhaust fumes contain carbon monoxide and may cause series injury or death.



(1) Drawbar

4. Make sure that all pressure lines are tight before starting the tractor.
5. Pull only from the drawbar. Never hitch anything to the axle housing or any other point except the drawbar. Pulling from any other location only increase the risk of serious personal injury or death.
6. If the front of the tractor tends to rise up when heavy implements are attached to the three point hitch, weights should be installed on the tractor. Do not operate the tractor with a light front end.
7. Always use the proper ballast weight on your tractor when using rear implements.
8. Watch front and rear to avoid obstacles at row ends, near trees and around other obstructions.

9. Do not leave equipment in the raised position when the vehicle is stopped or unattended.
10. When using implements or attachments with your tractor you should first read their respective owner's manual. You should always keep their safe operation procedures in mind.
11. You should be familiar with your equipment and its limitations.
12. If abused or used incorrectly your tractor can become dangerous to you and bystanders. Overloading your tractor or using unsafe equipment can also be dangerous and should be avoided. Refer to the "Specifications of Implement Limitation", which outlines the maximum load for safe tractor operation.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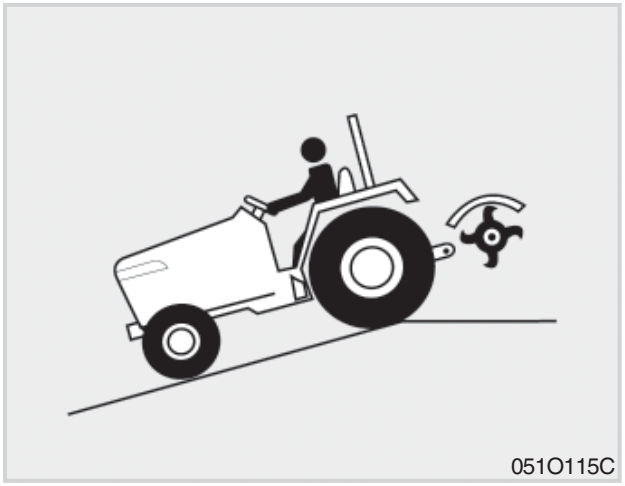
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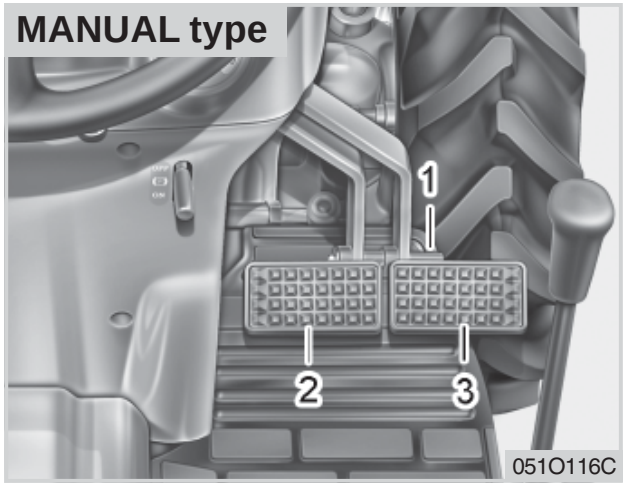
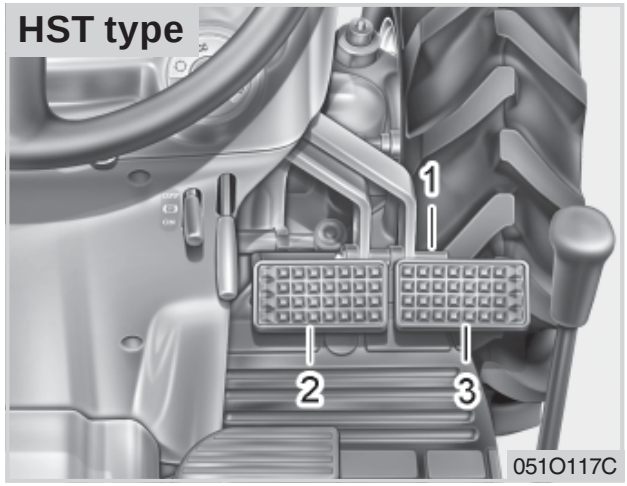
13. Driving forward out of a ditch or steep inclines can cause the tractor to tip over backwards. To avoid this you should back out of these positions. Four wheel drive tractors can give you a false sense of security in the tractors ability to maneuver out of these positions, so extra caution should be taken.
14. Never try to get on or off a moving tractor.
15. When working in groups, always let the others know what you are going to do before you do it.
16. Never "freewheel". Disengaging the clutch or shifting into neutral while descending a slope as this could lead to a loss of control.
17. Do not operate near ditches, holes, embankments, or other terrain features which may collapse under the tractor's weight. The risk of tractor upset is even higher when the ground is loose or wet.

DRIVING THE TRACTOR



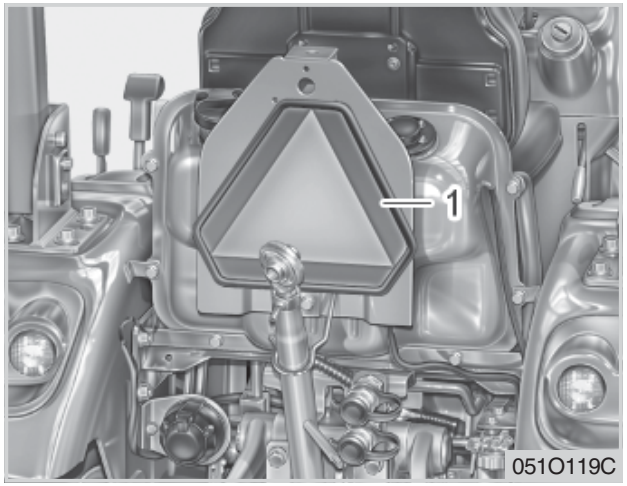
(1) Interlock
(2) Brake Pedal (L) *(3) Brake Pedal (R)*



(1) Interlock *(2) Brake Pedal (L)*
(3) Brake Pedal (R)

1. Lock the brake pedals together when traveling at road speeds. Brake both wheels simultaneously when making an emergency stop. Uneven braking at road speeds could cause the tractor to tip over.

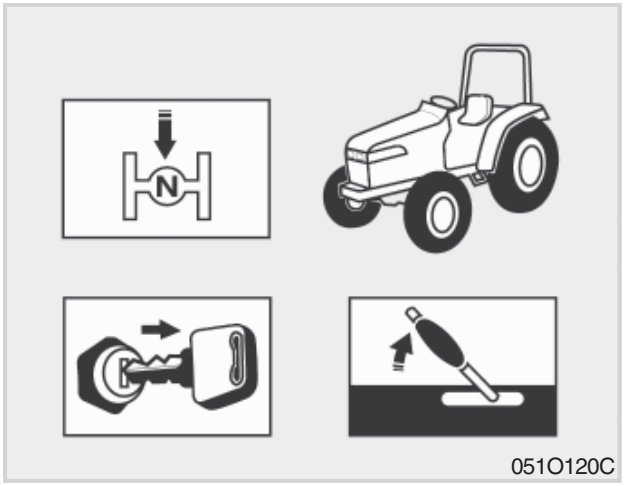
2. Always slow the tractor before turning. Turning at high speed may tip the tractor over or cause an operator to lose control of the tractor.



(1) SMV Emblem

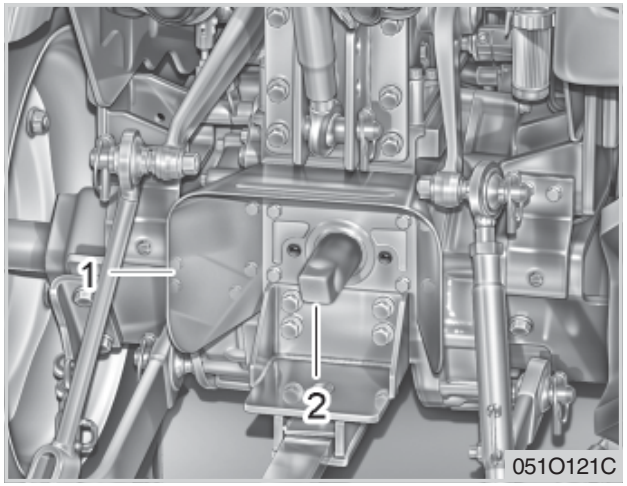
3. Make sure that the Slow Moving Vehicle (SMV) sign is clean and visible. Use hazard lights as required.
4. Observe all local traffic and safety regulations.
5. Turn the headlights on. Dim them when meeting another vehicle.
6. Drive at speeds that allow you to maintain control at all times.
7. Do not apply the differential lock while traveling at road speeds. As the tractor may lose the ability to steer.
8. Avoid sudden movements of the steering wheel as this can cause a loss of control of the tractor. This risk is especially great when traveling at road speeds.
9. Do not operate an implement while the tractor is on the road. Lock the three point hitch in the raised position.
10. When towing other equipment, use a safety chain and place an SMV emblem on it as well.

PARKING THE TRACTOR

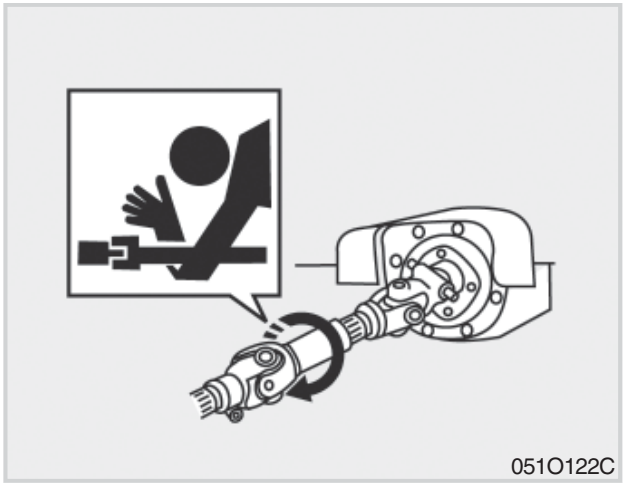


1. Disengage the PTO, lower all implements, place all control levers in the neutral position, set the parking brake, stop the engine and remove the key.

OPERATING THE PTO

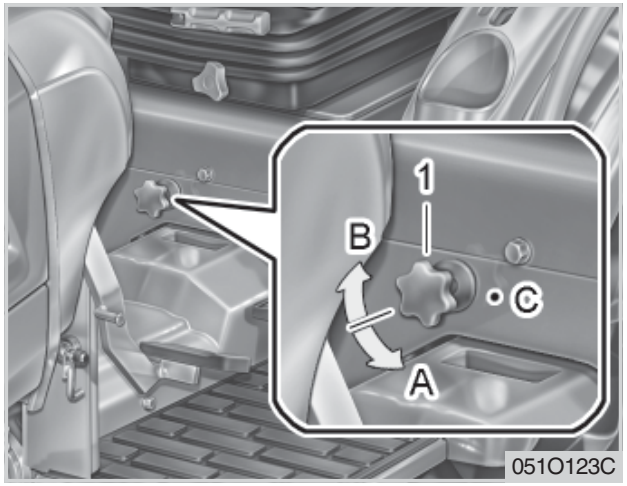


(1) PTO Shield
(2) PTO Shaft Cap



1. Make sure the tractor is completely stopped, gears are in neutral and all moving components have completely stopped before connecting, disconnecting, adjusting, cleaning or servicing any PTO driven equipment.
2. Keep the PTO shield in place at all times. Replace the PTO shaft cap when the shaft is not in use.
3. Before installing or using PTO driven equipment, read the manufacturer's manual and review the safety labels attached to the equipment.
4. When operating stationary PTO driven equipment, always apply the tractor parking brake and place chocks behind and in front of the rear wheels. Stay clear of all rotating parts.
5. Do not attach a PTO driven implement if the implement's safety shields are damaged or not in place. Rotating shafts are an entanglement hazard.

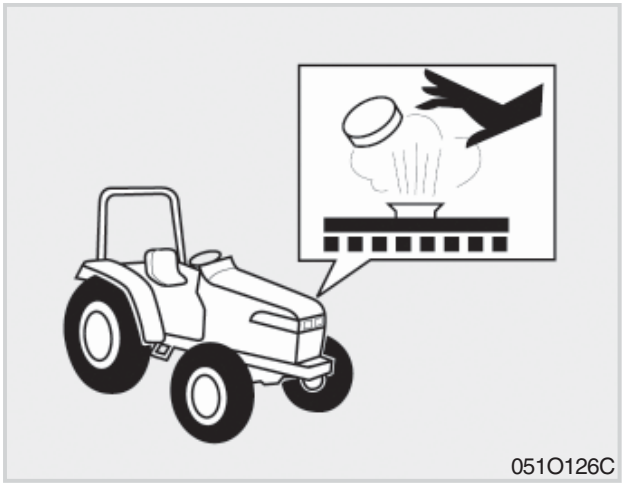
USING 3-POINT HITCH



(1) 3-point hitch lowering speed knob
(A) "FAST"
(B) "SLOW"
(C) "LOCK"

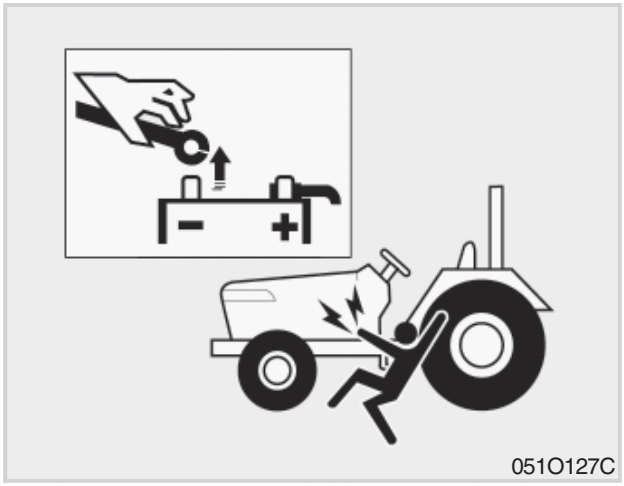
1. Use the 3-point hitch only with equipment designed for 3-point hitch usage.
2. When using a 3-point hitch mounted implement, be sure to install the proper counterbalance weight on the front of the tractor.
3. When transporting on the road, set the implement lowering control in the "LOCK" position to hold the implement in the raised position.

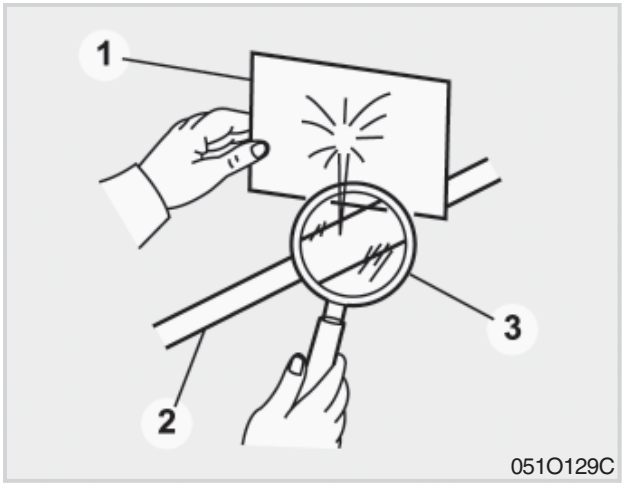
SERVICING THE TRACTOR



In order to service your tractor you must park it on a flat level surface, set the parking brake, place the gear shift lever in neutral and stop the engine.

1. Do not smoke while working around the battery or when refueling your tractor. Keep all sparks and flames away from the battery and fuel tank. The battery presents an explosive hazard because it gives off hydrogen and oxygen… especially when recharging.
2. Allow the tractor time to cool off before servicing any part that may have become hot while the tractor was running.
3. You must always stop the engine before refueling the tractor. Avoid overfilling the tractor or spilling the fuel.
4. Before jump starting a dead battery, read and follow all of the instructions.
5. It is recommended to keep a first aid kit and fire extinguisher handy at all times.
6. Do not remove the radiator cap while the coolant is hot. When cool, slowly rotate the cap to the first stop and allow sufficient time for excess pressure to escape. After all the pressure is released remove the cap completely. If your tractor is equipped with a coolant recovery tank, add coolant there rather than to the radiator.





(1) Cardboard
(2) Hydraulic Line
(3) Magnifying Glass

7. When working with your tractors electrical components you must first disconnect the battery cables.
8. To ensure that there are no accidents from sparks you must first disconnect the negative battery cable.
9. Tire mounting should be done by qualified professionals, with the proper equipment.
10. Maintaining correct tire pressure is important for the life of your tires.

    Do not inflate the tires above the recommended pressure specified in the owner's manual or on the tractor tire.
11. Securely support the tractor when changing wheels or the wheel tread width.
12. Make sure that wheel bolts have been tightened to the specified torque.
13. Escaping hydraulic fluid under pressure has sufficient force to penetrate skin, causing serious personal injury. Be sure to release all residual pressure. Before disconnecting hydraulic lines.

    Before adding pressure to the hydraulic system, make sure that all connections are tight and that all line, pipes and hoses are free of damage.

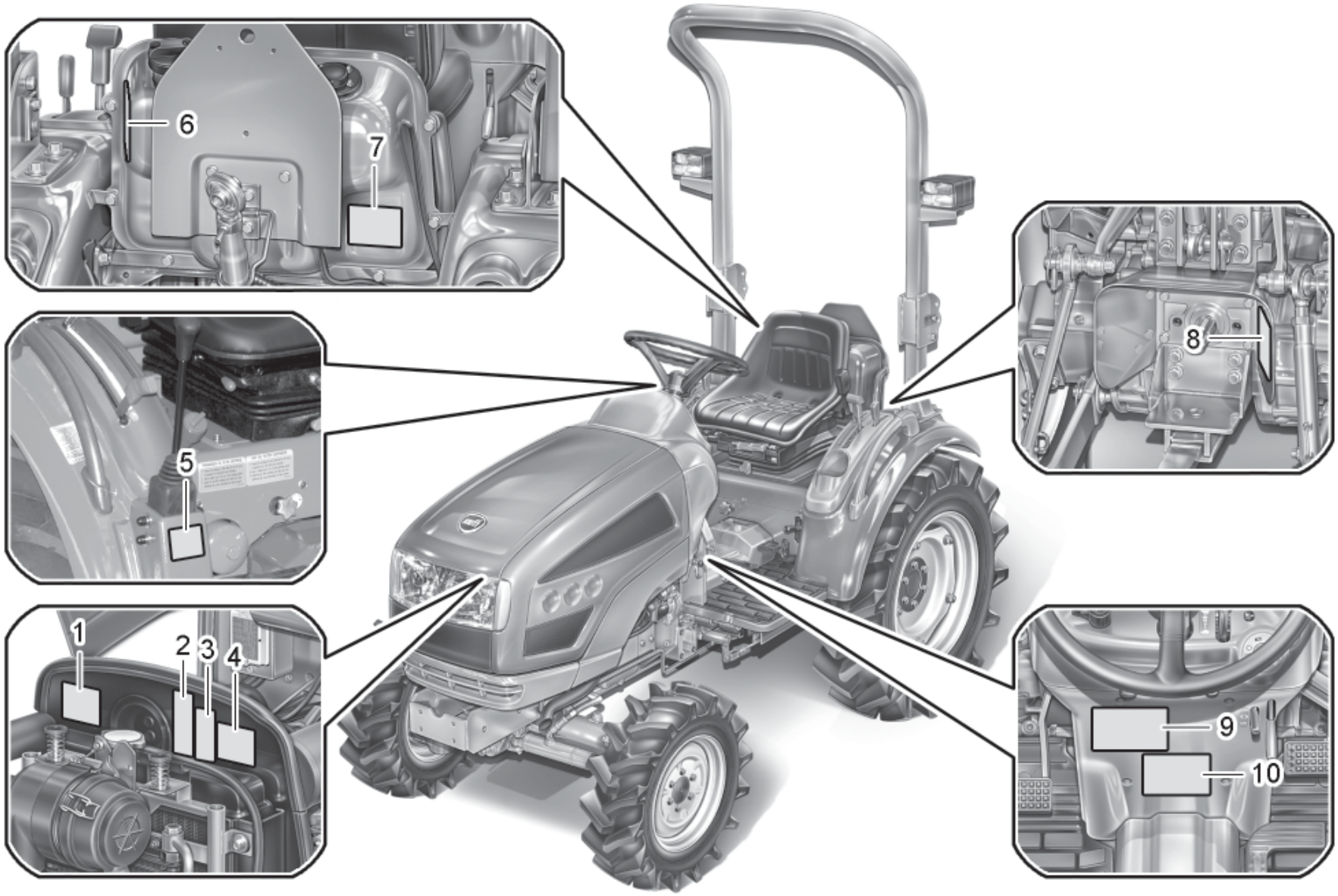
14. Fluid escaping from pinholes may be invisible. Do not use hands to search for suspected leaks;

    Use a piece of cardboard or wood, instead. Use of safety goggles or other eye protection is also highly recommended. If injured by escaping fluid, see a medical doctor at once. This fluid can produce gangrene and/or severe allergic reaction.

15. Keep environmental pollution in mind. When replacing coolant or oil, dispose of it the right way.

    Be sure to observe all relevant regulations when you dispose of engine oil, transmission oil, fuel, coolant, filters and battery.

TRACTOR SAFETY LABELS



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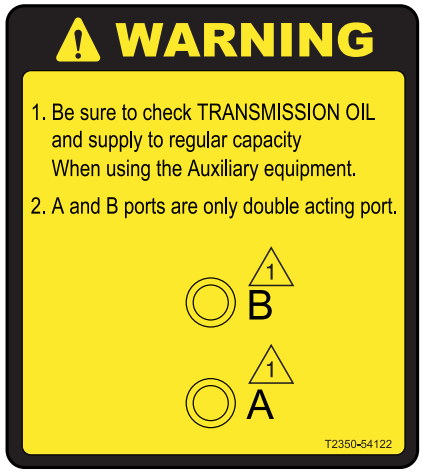

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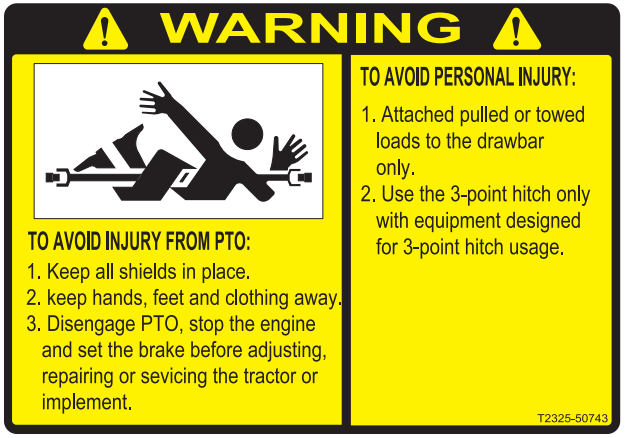
(3) Part No. : T4625-52361

(4) Part No. : T2325-50743



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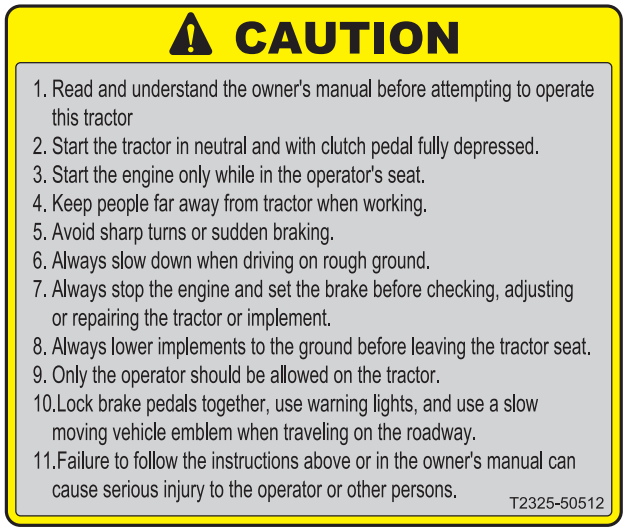

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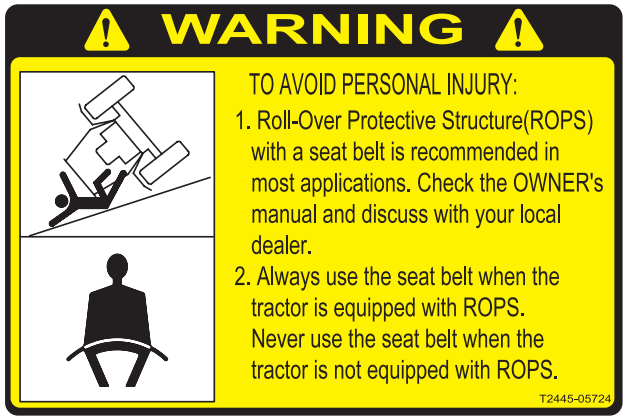

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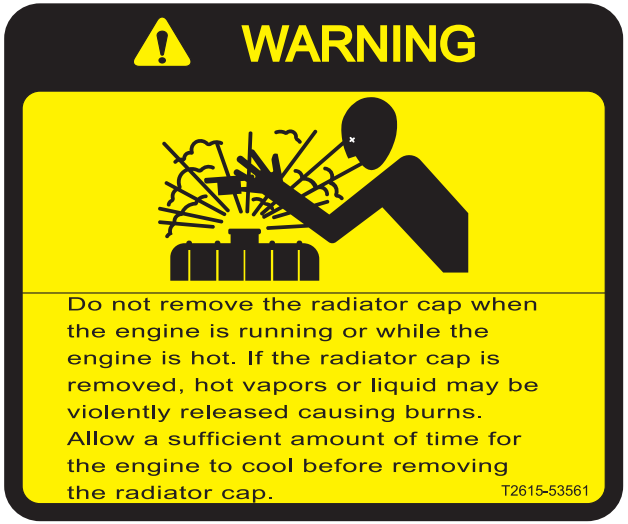

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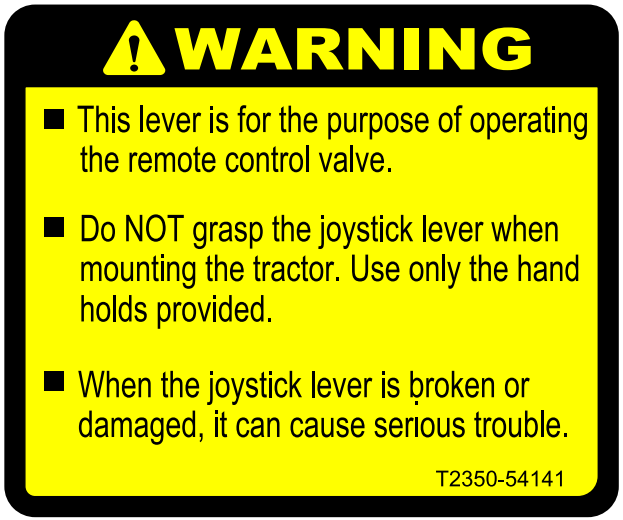
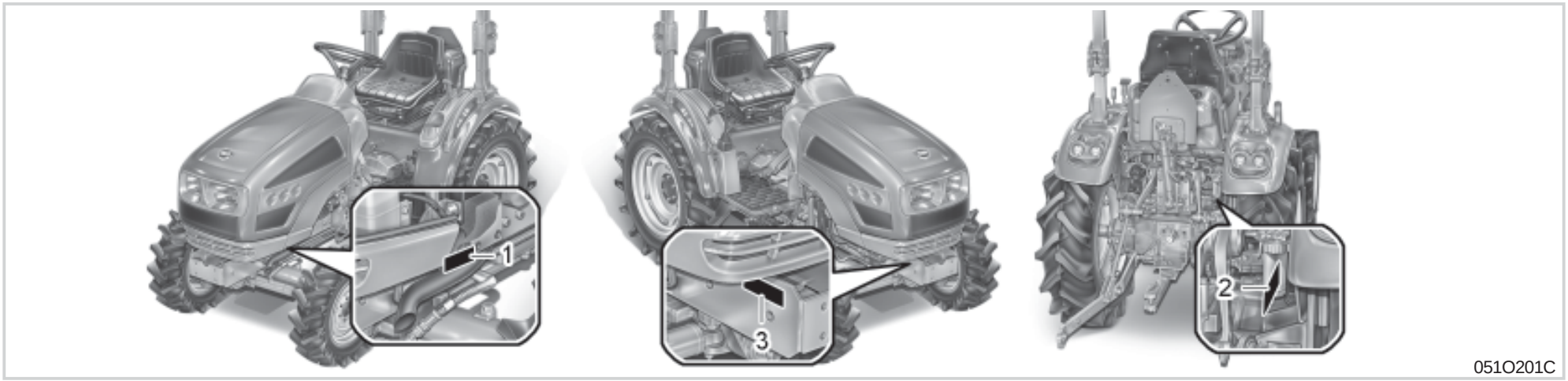


(9) Part No. : T2615-54112

SERVICING



(1) S/N Identification Plate

(2) Transmission Serial Number

(3) Engine Serial Number

Your dealer is interested in your new tractor and has the desire to help you get the most value from it. After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself.

However, when in need of parts, warranty or major service, be sure to see your **KIOTI** dealer. For service, contact the **KIOTI** dealership from which you purchased your tractor or your local authorized **KIOTI** dealer.

When in need of parts, be prepared to give your dealer both the tractor and engine serial numbers.

The tractor serial number is located on the front axle support on the left side of the tractor. The engine serial number is located on the upper side of the engine head cover. The transmission number is located on the rearward of the tractor and the transmission case in the upward of the PTO cover. Locate the serial numbers now and record them in the space provided.

Before using **NON-KIOTI** approved implements or attachments, contact your nearest dealer regarding safety and application.

- **S/N Identification No.**
- **Engine Serial No.**
- **Transmission Serial No.**
- **Date of Purchase**

To be filled in by purchaser

SPECIFICATIONS

3

SPECIFICATIONS

Model		CK22	
		MECHANICAL	HST
Engine	Model	3C100A	
	Type	Liquid-cooled, 3-cylinder diesel	
	Engine gross HP (kW)	22 (16.4)	
	P.T.O(Factory observed)HP (kW)/rpm	16.5 (12.3)/2800	15.5 (11.6)/2800
	Displacement cc (cu.in)	1,007 (61.45)	
	Rated revolution r.p.m min-1	2,800	
	Fuel tank capacity ℓ (gal.)	20 (5.28)	
Drive train	Clutch	Dry type single stage	
	Transmission	synchro/constant	Hydrostatic
	Speeds	6F 2R	INF.2
	Differential lock	Standard	
	Brake	Wet disc type	
	P.T.O	Transmission	Live continuous
	Rear (rpm)	1 speed (540 rpm at 2,646 engine rpm)	
	Mid (rpm)	1 speed (2,000 rpm at 2,706 engine rpm)	
Hydraulic system	Pump capacity (Max. flow rate) ℓ/min (gpm)	29 (7.66)	
	3-point hitch	Cat.I	
	Maximum lifting capacity (24in. aft of hitch) kg (lbs)	503 (1,109)	
	Hydraulic lift control system	Position control	
	Steering	Hydrostatic	

Model			CK22	
			MECHANICAL	HST
Standard tire size	Front (AG, TURF, INDUSTRIAL)		6 - 12 (23 x 8.50 - 12, 23 x 8.50 - 12)	
	Rear (AG, TURF, INDUSTRIAL)		9.5 - 16 (33 x 12.5 x 16.5, 12 - 16.5)	
Traveling speeds	Forward (At rated engine rpm) km/h (mph)		1.10 ~ 16.24 (0.68 ~ 10.09)	0 ~ 14.97 (0 ~ 9.30)
	Reverse (At rated engine rpm) km/h (mph)		1.36 ~ 6.31 (0.85 ~ 3.92)	0 ~ 9.37 (0 ~ 5.82)
Dimensions	Overall length (with 3p) mm (in.)		2,684 (105.7)	
	Overall width (minimum tread) mm (in.)		1,121 (44.1)	
	Overall height (Top of ROPS) mm (in.)		1,970 (77.5)	
	Wheel base mm (in.)		1,470 (57.9)	
	Min. ground clearance mm (in.)		310 (12.2)	
	Tread	Front mm (in.)	910 (35.8)	
		Rear mm (in.)	890 - 935 (35.0 - 36.8)	
	Min. turning radius (with brake) m (Ft.)		2.3 (7.5)	
	Weight (with rops) kg (lbs.)		890 (1,962)	904 (1,993)

NOTE: The specifications are subject to change for the purpose of improvement without any notice.

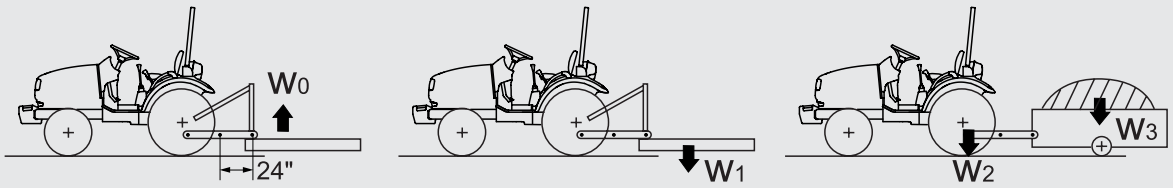
IMPLEMENT LIMITATIONS

This **KIOTI** tractor has been thoroughly tested for proper performance with implements approved by **KIOTI**. Use with implements which are not approved by **KIOTI** and which exceed the maximum specifications listed below, or which are otherwise unfit for use with this **KIOTI** tractor may result in malfunctions or failures of the tractor, damage to other property and injury to the operator or others. [Any malfunctions or failures of the tractor resulting from use with improper implements are not covered by the warranty.]

Item / Model	Tread (max. width)		Lifting Capacity max. loading weight (24 in. aft of hitch)
	Front	Rear	
CK22	910 mm (35.8 in.)	940 mm (37 in.)	503 kg (1,109 lbs)
CK22H			

Item / Model	Actual figures		Trailer loading weight W_3 Max. capacity
	Implement weight W_1 and / or size	Max. Drawbar Load W_2	
CK22	As in the following list (shown on the next page)	250 kg (551 lbs.)	812 kg (1,792 lbs.)
CK22H			

Lifting Capacity max. loading weight ..... The max. allowable load which can be put on the 24 in. aft of hitch : W_0
Implement weight ..... The implement's weight which can be put on the lower link : W_1
Max. drawbar load ..... W_2
Trailer loading weight ..... The max. loading weight for trailer (without trailer's weight) : W_3



051O301C

NOTE : Implement size may vary depending on soil types and field conditions.

TRAVELING SPEED

* AT RATED ENGINE RPM WITH STANDARD TIRES.

CK22

km/h(mile/h)

HI - LOW	Main		Speed
LOW	Forward	1	1.10 (0.680)
		2	1.70 (1.056)
		3	3.50 (2.170)
	Reverse		1.36 (0.845)
HIGH	Forward	1	5.11 (3.175)
		2	7.88 (4.896)
		3	16.24 (10.091)
	Reverse		6.31 (3.920)

CK22H

km/h(mile/h)

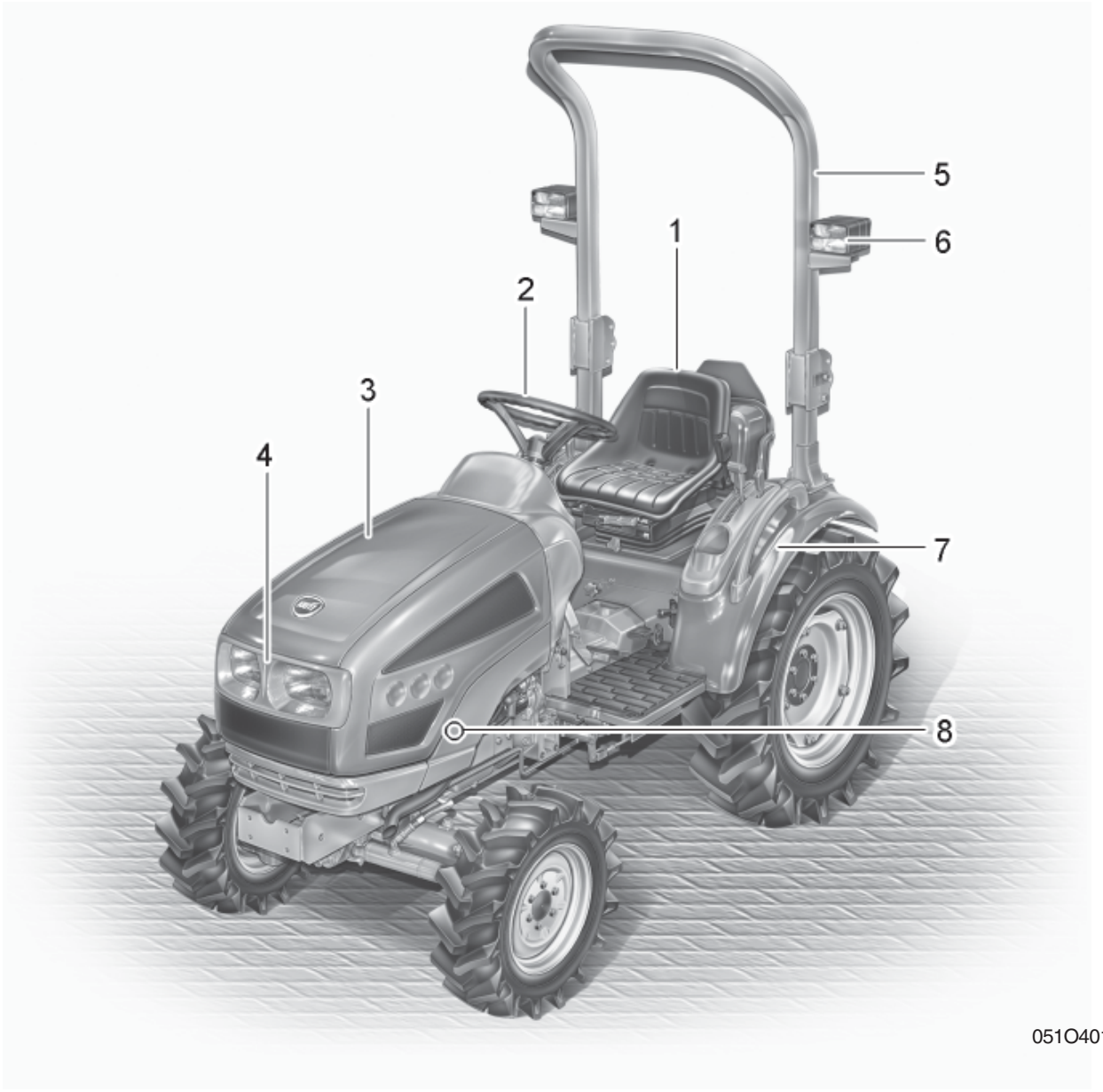
HI - LOW	Main	Speed
LOW	Forward	0 ~ 5.80 (0 ~ 3.604)
	Reverse	0 ~ 3.62 (0 ~ 2.249)
HIGH	Forward	0 ~ 14.17 (0 ~ 8.805)
	Reverse	0 ~ 9.37 (0 ~ 5.822)

Implement	Remarks	CK22	CK22H	Remarks
Loader	Max. Bucket width mm(in)	1219.2(48),1371.6(54)		Operating Capa.300kg(660lbs) and below
Backhoe with sub frame	Max. Diging depth mm(ft.in)	1955.8(6.5) and below		Do not use 3 point hitch backhoe
Mid Mower	Max. Cutting width mm(in)	1524(60) and below		
Tiller	Max. Cutting width mm(in)	1193.8(47) and below		
Box Blade	Max. Cutting width mm(in)	1219.2(48) and below		
Rear Blade	Max. Cutting width mm(in)	1524(60) and below		
Rotary Cutter	Max. Cutting width mm(in)	1320.8(52),1524(60)		
Belt Guard	Max. Cutting width mm(in)	1320.8(52),1524(60)		
Chain Guard	Max. Cutting width mm(in)	1320.8(52),1524(60)		
Bale Transport	Max. Width mm(in)	1219.2(48) and below		
Core Aerator	Max. Width mm(in)	1219.2(48),1524(60)		

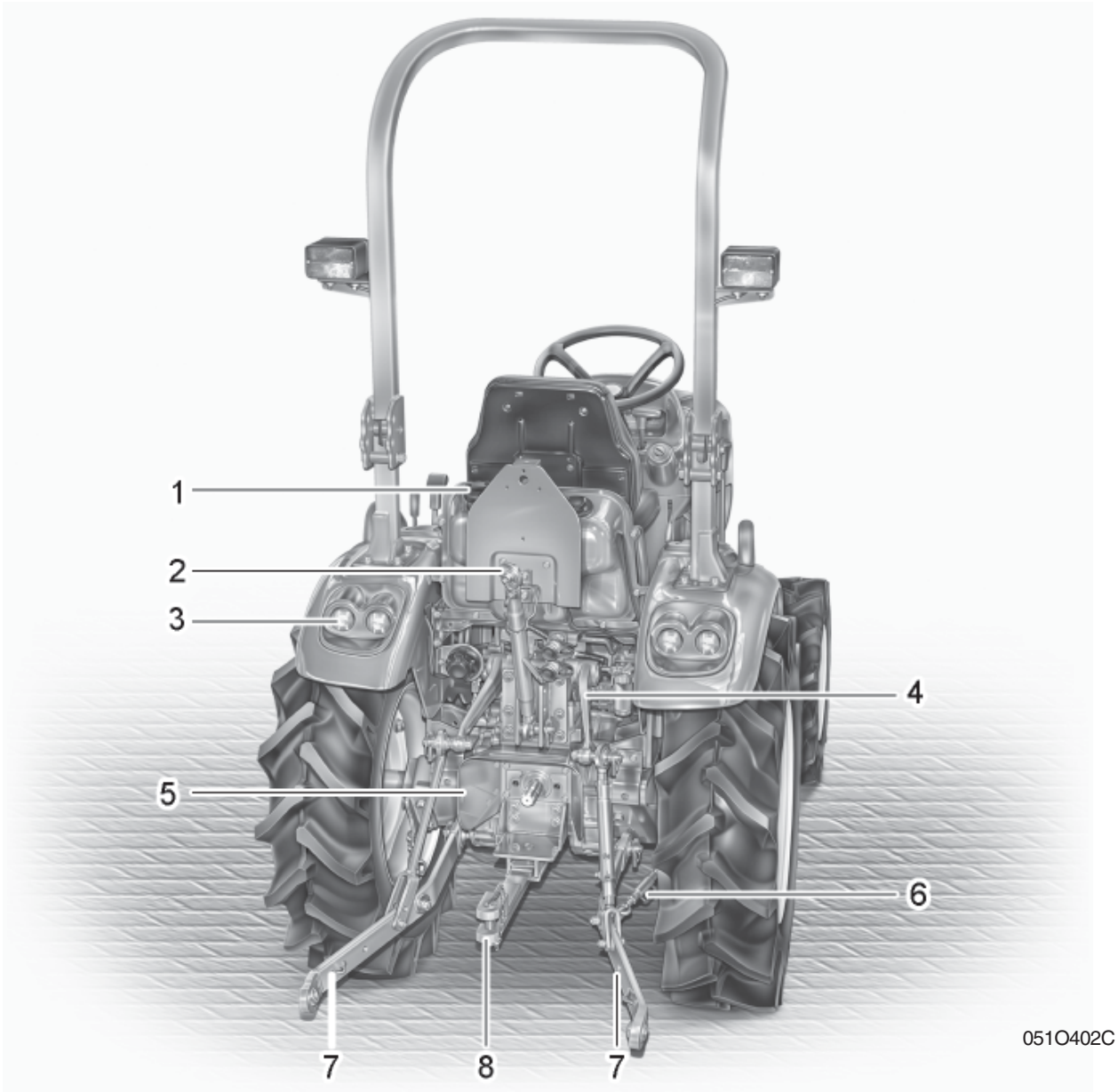
DESCRIPTION OF OPERATING SYSTEM

4

EXTERIOR VIEW

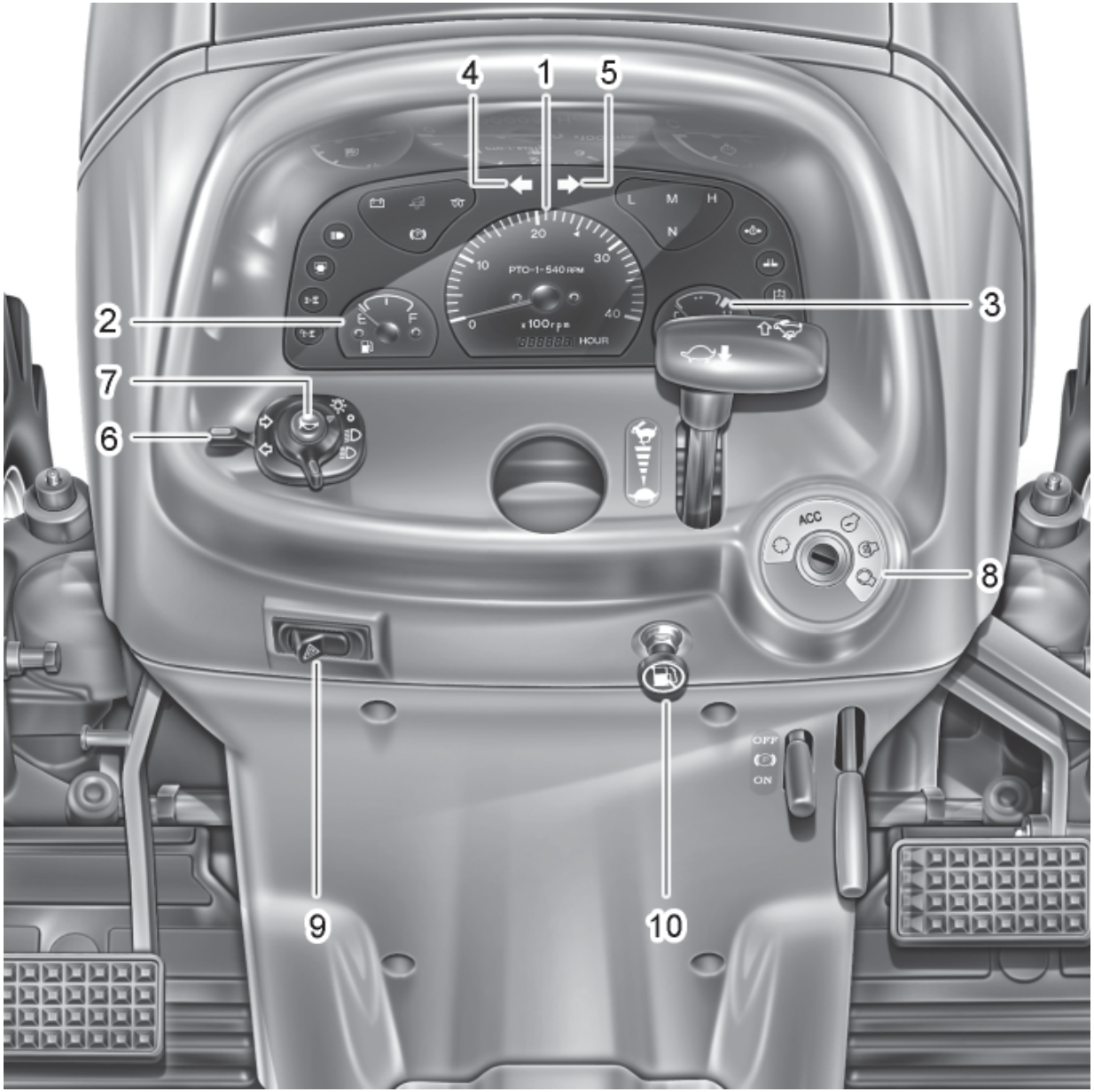


(1) Seat
(2) Steering Wheel
(3) Hood/Bonnet
(4) Head Light
(5) ROPS
(6) Turn Signal Lamp
(7) Fender
(8) Side Cover



(1) Fuel Tank Cap
(2) Top Link
(3) Stop Lamp
(4) Crank Lifting Rod
(5) PTO Shield
(6) Telescopic Sway bar
(7) Lower Link
(8) Draw Bar

INSTRUMENT PANEL AND SWITCHES

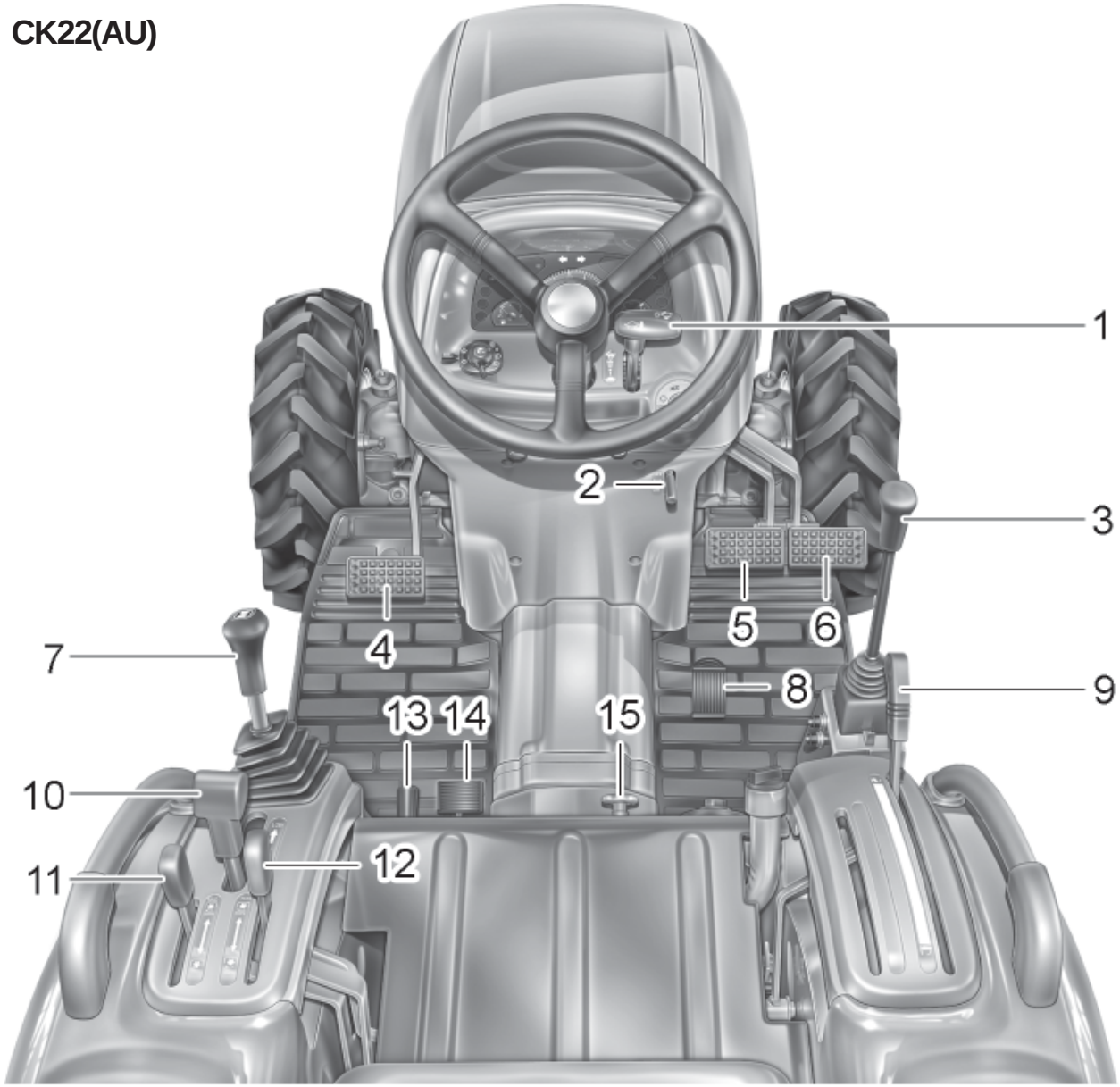


051O403C

(1) Tachometer
(2) Fuel Gauge
(3) Coolant Temp. Gauge
(4) Left Turn Indicator
(5) Right Turn Indicator
(6) Turn Signal Switch & Light Switch
(7) Horn Switch(only EU)
(8) Key Switch
(9) Hazard Lamp Switch
(10) Engine Stop Knob

FOOT AND HAND CONTROLS

CK22(AU)

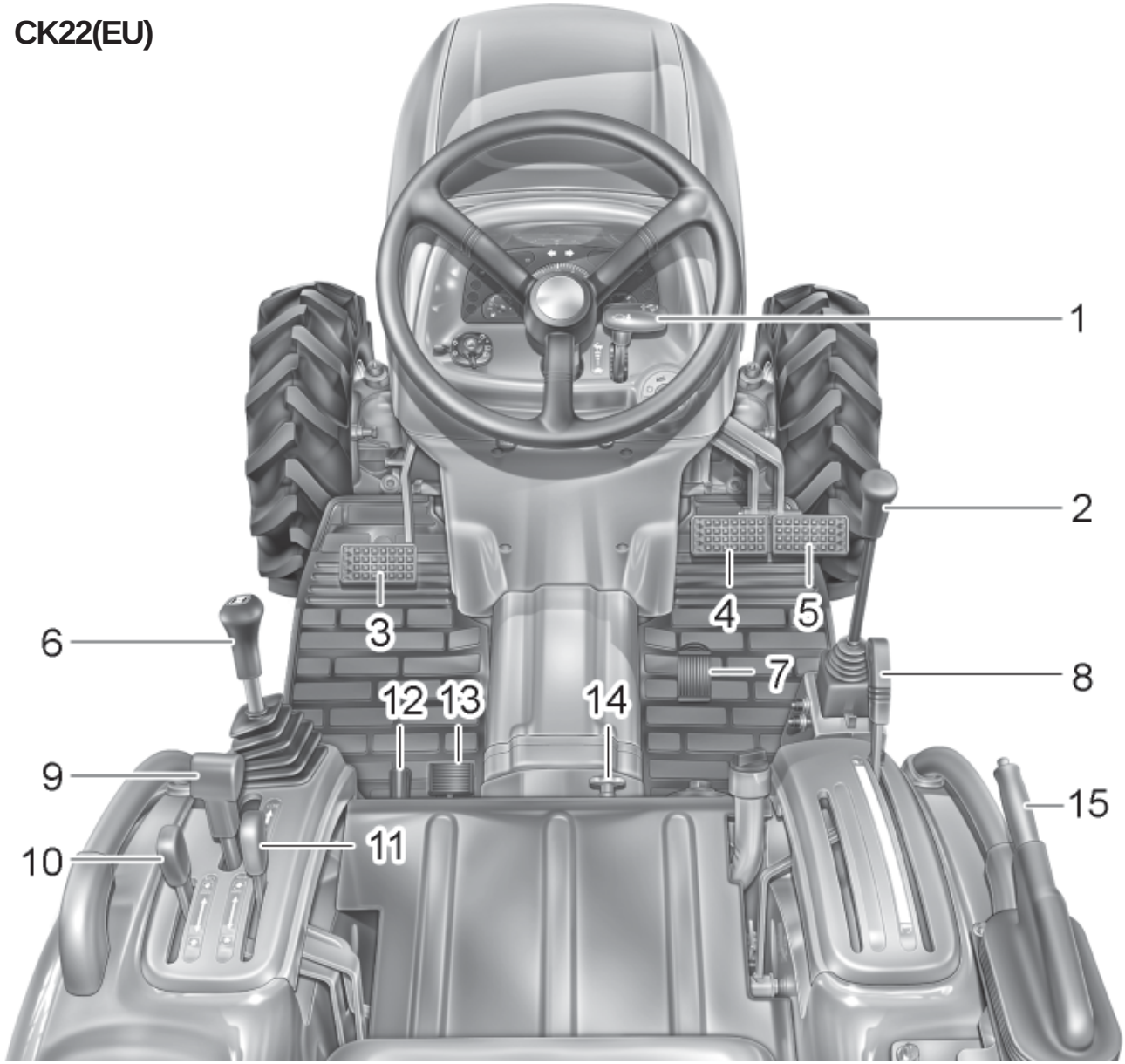


051O404C

(1) Hand Throttle Lever
(2) Speed Set Lever
(3) Joystick Lever
(4) Clutch Pedal
(5) Brake Pedal (L)
(6) Brake Pedal (R)
(7) Main Gear Shift Lever
(8) Foot Throttle
(9) Position Control Lever
(10) Range Gear Shift Lever(Hi-Lo)
(11) Mid PTO Gear Shift Lever
(12) Rear PTO Gear Shift Lever
(13) Front Wheel Drive Lever
(14) Differential Lock Pedal
(15) 3-Point Hitch Lowering Speed Knob

FOOT AND HAND CONTROLS

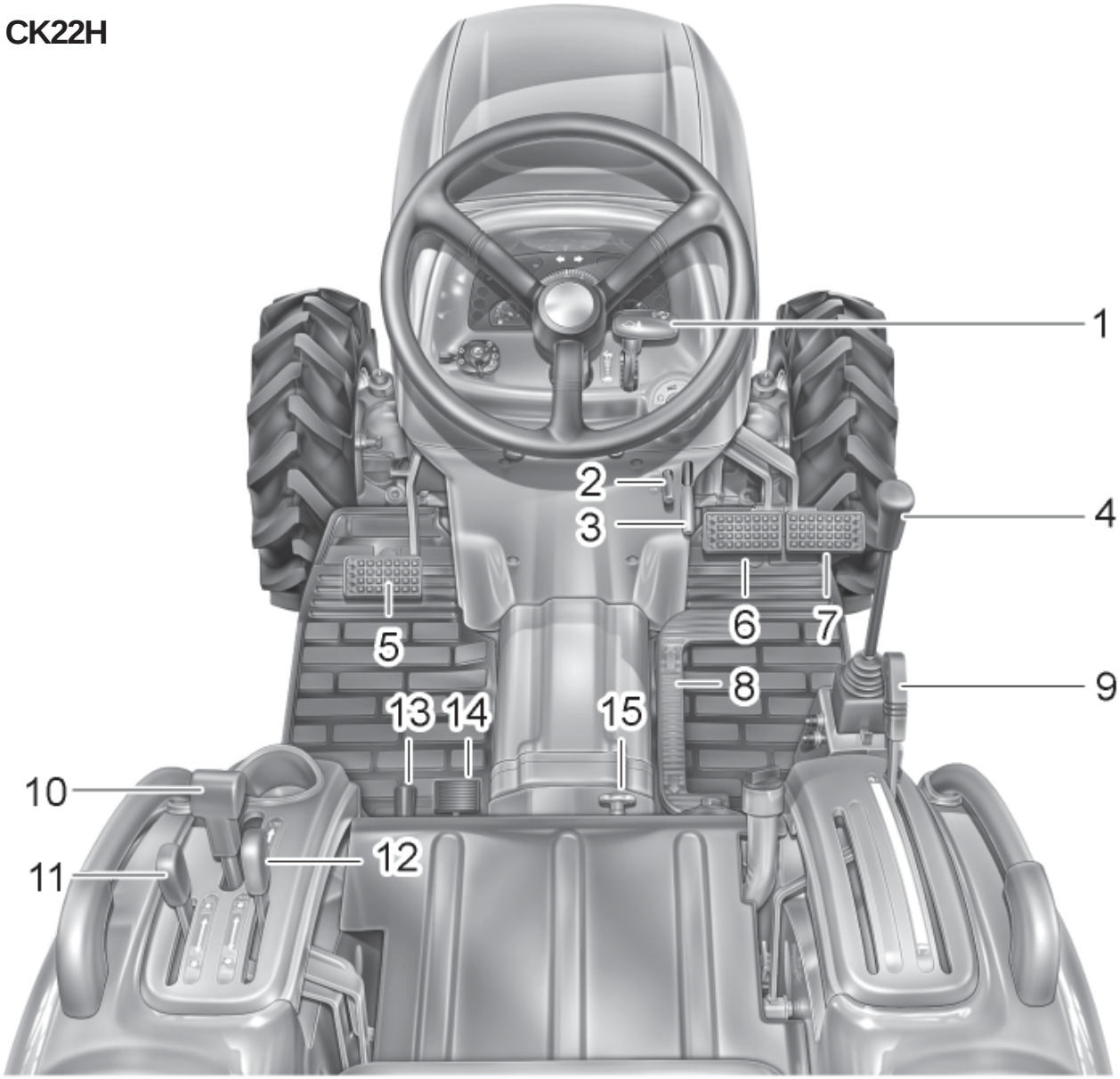
CK22(EU)



(1) Hand Throttle Lever
(2) Joystick Lever
(3) Clutch Pedal
(4) Brake Pedal (L)
(5) Brake Pedal (R)
(6) Main Gear Shift Lever
(7) Foot Throttle
(8) Position Control Lever
(9) Range Gear Shift Lever(Hi-Lo)
(10) Mid PTO Gear Shift Lever
(11) Rear PTO Gear Shift Lever
(12) Front Wheel Drive Lever
(13) Differential Lock Pedal
(14) 3-Point Hitch Lowering Speed Knob
(15) Handbrake

NOTE : The rearview mirror and the seat are only for the EU spec.

CK22H



051O405C

(1) Hand Throttle Lever
(2) Parking Brake Lock Lever
(3) Speed Set Lever
(4) Joystick Lever
(5) Clutch Pedal
(6) Brake Pedal (L)
(7) Brake Pedal (R)
(8) Speed Control Pedal
(9) Position Control Lever
(10) Range Gear Shift Lever(Hi-Lo)
(11) Mid PTO Gear Shift Lever
(12) Rear PTO Gear Shift Lever
(13) Front Wheel Drive Lever
(14) Differential Lock Pedal
(15) 3-Point Hitch Lowering Speed Knob

NOTE : The rearview mirror and the seat are only for the EU spec.

5

PRE-OPERATION

DAILY CHECK

It is a good practice to know the condition of your tractor before you start it. You should perform a routine check before each use.

⚠ CAUTION

To avoid personal injury:

- **Be sure to check and service the tractor on a level surface with the engine shut off and the parking brake “ENGAGED”.**
- **Follow the refueling procedures provided in “DAILY CHECK” in periodic service section.**
- **Familiarize yourself with all danger, warning and caution labels. Maintain all labels in their proper places in good legible condition.**

CHECK ITEM

- Walk around inspection.
- Check the engine oil level
- Check the transmission oil level
- Check the coolant level
- Clean the grill and radiator screen.
- Check the air cleaner and evacuator valve.
- Check the brake pedals and linkages
- Check all dash gauges and indicators
- Check head lights, tail lights, and all working lights.
- Check accessible wiring harness for any damage.
- Check the seat belt and **ROPS** for damage.
- Refuel (See "daily check" in the periodic service section)
- Check all danger and warning labels.

OPERATING NEW TRACTOR

How a new tractor is handled and maintained determines the life of the tractor.

A new tractor just off the factory production line has of course been, tested, but the various parts are not accustomed to each other, therefore care should be taken to operate the tractor for the first 50 hours at a slower speed and avoid excessive work or operation until the various parts become "broken-in." The manner in which the tractor is handled during the "breaking-in" period greatly affects the life of your tractor. Therefore, to obtain the maximum performance and the longest life of the tractor, it is very important to properly break-in your tractor.

In handling a new tractor, the following precautions should be observed.

- You should not operate your tractor at full speed for the first fifty hours of use.
- Avoid sudden starts and stops.
- In cold climates, allow your tractor plenty of time to warm up.
- Do not run the engine at speeds faster than necessary.
- Use due caution when operating your tractor on rough roads or terrain.

The above precautions are not limited to new tractors only, but are a good practice for tractors regardless of their age.

CHANGING LUBRICATING OIL FOR NEW TRACTORS

Special attention should be given to new tractors lubrication oil. New parts are not accustomed to each other and are not broken in properly. Small metal grit can develop in the lubricating system as metal parts begin to "break in" and continuous use of the contaminated oil can cause damage and failure.

Therefore you should change the tractor's oil after the break-in period.

For further details of the oil change and service schedule, see "maintenance" section.

OPERATING THE ENGINE

STARTING THE ENGINE

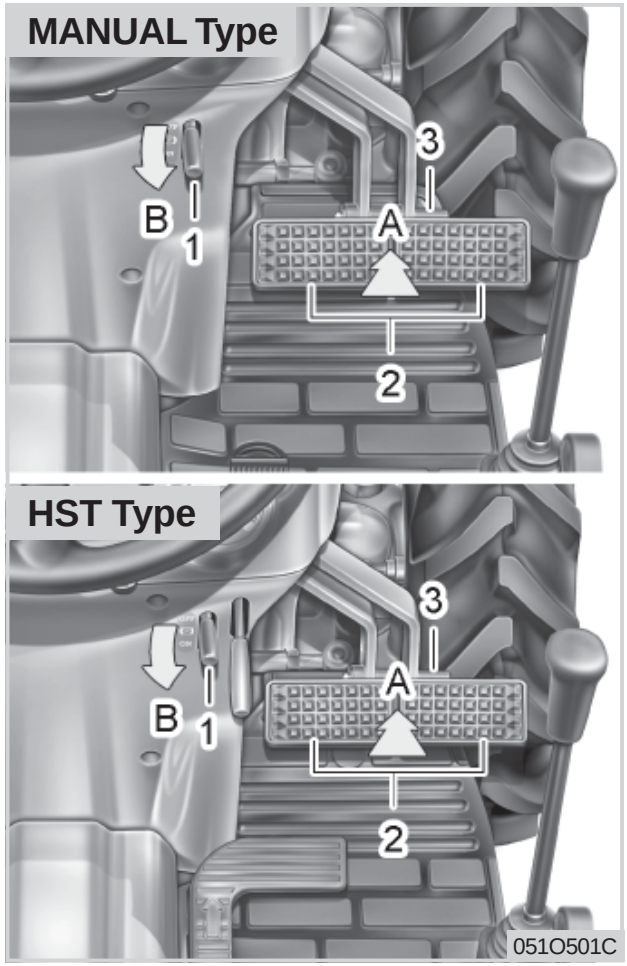
⚠ CAUTION

To avoid personal injury:

- **You must read and understand the warning and caution labels on your tractor.**
- **Proper ventilation is required when operating your tractor inside a building or enclosed area. Remember that exhaust fumes can be deadly.**
- **Never start your tractor's engine while standing on the ground. This can prevent an unexpected accident from happening.**

IMPORTANT

- **Using starting fluid or ether to start your tractor will cause damage and void your tractors warranty.**
- **To avoid damage to the starter and battery you should never continuously start your tractor for more than 10 seconds at a time.**



(1) Parking Brake Lever
(2) Brake Pedals
(3) Interlock the Brake Pedals
(A) "Depress"
(B) "Push Down"

1. MAKE SURE THE PARKING BRAKE IS SET

(1) To set the parking brake;
  1) Interlock the brake pedals
  2) Depress the brake pedals
  3) Latch the brake pedals with the parking brake lever.(Check that the parking brake lamp on the instrument cluster illuminates.)

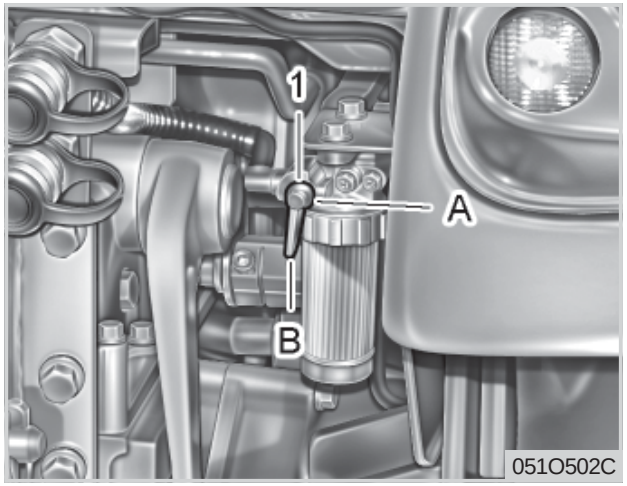
(2) To release the parking brake press the brake pedals again.

IMPORTANT

- **Make sure that the parking brake pedals are fully depressed before pulling the parking brake lever up.**

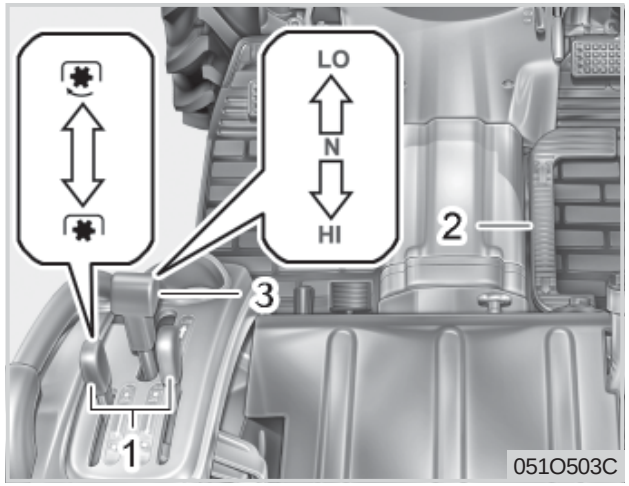
NOTE

- When the parking brake is engaged, the parking brake lamp on the instrument cluster illuminates. When releasing it, the parking brake lamp is turned off.



(1) Fuel Cock
(A) Close *(B) Open*

2. MAKE SURE THE FUEL COCK IS IN THE OPEN POSITION.



(1) P.T.O Clutch Lever
(2) Speed Control Pedal
(3) Range Gear Shift Lever (Hi-Lo)

"ON"
"OFF"
"HI" High
(N) *"NEUTRAL POSITION"*
"Lo" Low

3. PLACE THE PTO CLUTCH LEVER IN "OFF" POSITION.

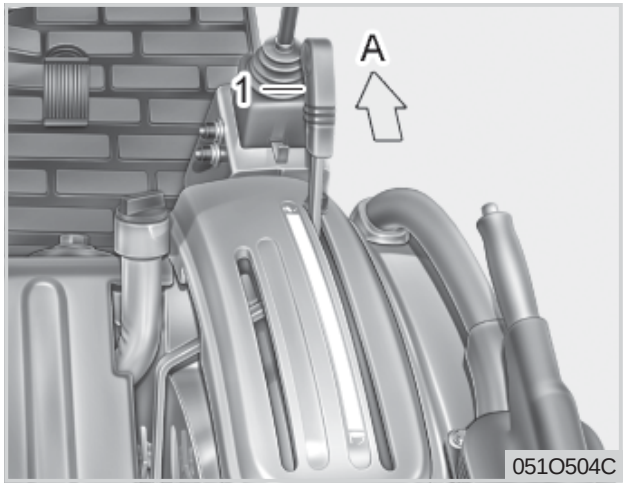
4. PLACE THE SPEED CONTROL PEDAL IN "NEUTRAL" POSITION (HST TYPE).

5. MAIN SHIFT LEVER TO NEUTRAL POSITION (MANUAL TYPE).

6. PLACE THE RANGE GEAR SHIFT LEVER (HI-LO) IN "NEUTRAL" POSITION.

NOTE

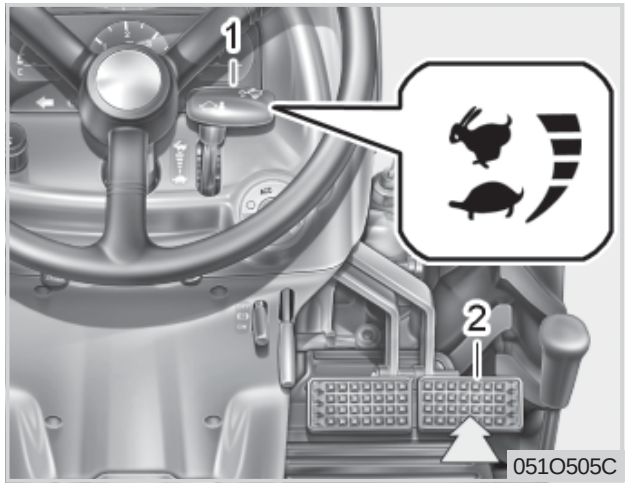
- The speed control pedal automatically return to neutral when the operator's foot is released from the pedal.



(1) Position Control Lever
(A) "DOWN"

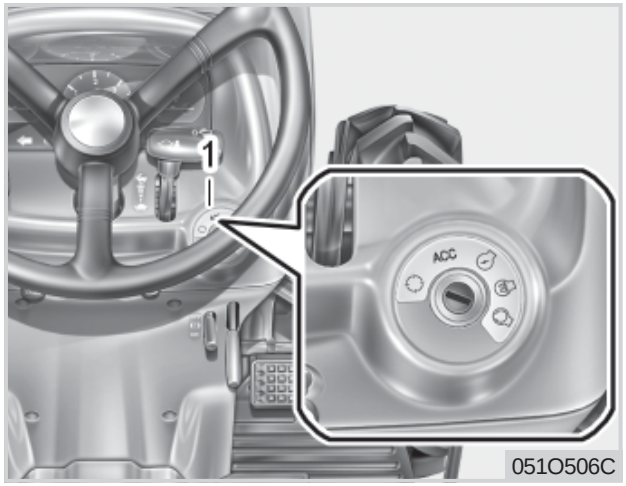
7. MOVE THE POSITION CONTROL LEVER.

To lower implement, move the position control lever forward.



(1) Hand Throttle Lever
(2) Brake Pedal (R)
"INCREASE" *"DECREASE"*

8. SHIFT THE THROTTLE LEVER TO "DECRESE" POSITION.



(1) Key Switch
( ) Off *( ) Manual Pre-Heat*
(ACC) Acc *( ) Start*
( ) On(Auto Pre-Heat)

9. INSERT THE KEY INTO THE KEY SWITCH AND TURN IT "ON". MAINTAIN IT UNTIL THE PRE-HEAT LAMP IS TURNED "OFF" (APPROX. 8 SEC.).

1. Be careful not to run the starting motor longer than 10 seconds due to its heavy current consumption.
2. If the tractor has not started in 10 seconds stop operating the starter, wait 30 seconds and then repeat the starting procedure.
3. Prior to restarting, be sure that the flywheel is completely stopped.
4. For manual preheating, turn and hold the key from ON to preheat position.

10. TURN THE KEY TO "START" POSITION AND RELEASE WHEN THE ENGINE STARTS.

NOTE

- Only when the range shift lever in neutral position, the motor can be started (HST).
- Only with the shuttle lever in neutral position, the motor can be started(Manual).

(1) Headlight-High Beam Lamp
(2) Battery Charge Warning Lamp
(3) Parking Brake
(4) Engine Oil Pressure Warning Lamp

11. CHECK TO SEE THAT ALL THE WARNING LAMPS ON THE INSTRUMENT CLUSTER TURN "OFF".

If any lamp remains on, immediately stop the engine and determine the cause.

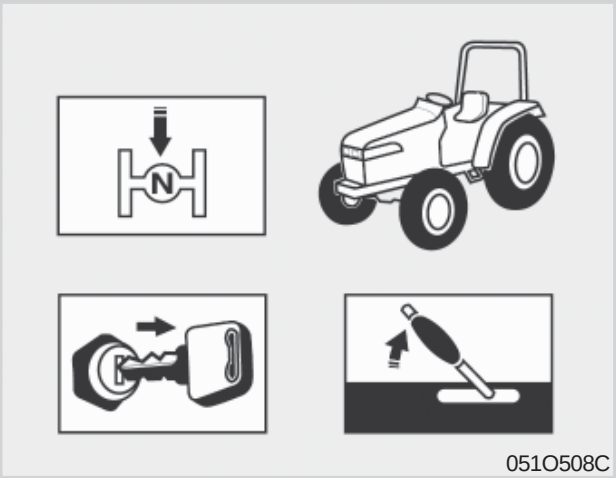
[CHECK EASY CHECKER LAMPS]

1. When the key is turned "ON", lamps should come on. If trouble should occur at any location while the engine is running, the warning lamp corresponding to that location comes on.
2. Glow plug indicator also comes on when the key is turned "ON" to preheat the engine and goes off automatically when preheat is completed.
3. The parking brake warning lamp comes on while parking brake is applied and goes off when it is released.

IMPORTANT

- **Daily checks with the Easy Check only, are not sufficient. Never fail to conduct daily checks carefully by referring to Daily Check. (See "DAILY CHECK" in Section 10)**

STOPPING THE ENGINE



1. You must first slow the engine to the idle position before turning the engine off.
2. Remove the key.

CAUTION

- **If the engine does not stop, consult with your local KIOTI dealer.**

WARMING UP

CAUTION

- **During warm up of the engine, be sure that the parking brake is set.**
- **During warm up of the engine, make sure that all shift levers are in the neutral position.**

After starting your tractor's engine allow a five minute warm up period before applying any load to the tractor. If a load is applied to the tractor before it has time to warm up, serious damage, can occur like premature wear, breakage, or seizure.

WARM-UP AND TRANSMISSION OIL IN THE LOW TEMPERATURE RANGE

- Hydraulic oil serves as transmission fluid to protect and lubricate moving parts.

  This fluid is also circulated through out the hydraulic circuit to operate functions like steering, three point hitch, and remote functions.

  In cold weather, the oil will be cold with increased viscosity. This can cause delayed oil circulation or abnormally low hydraulic pressure for some time after engine start-up. This in turn can result in trouble to the hydraulic system. To prevent the above, observe the following instructions:

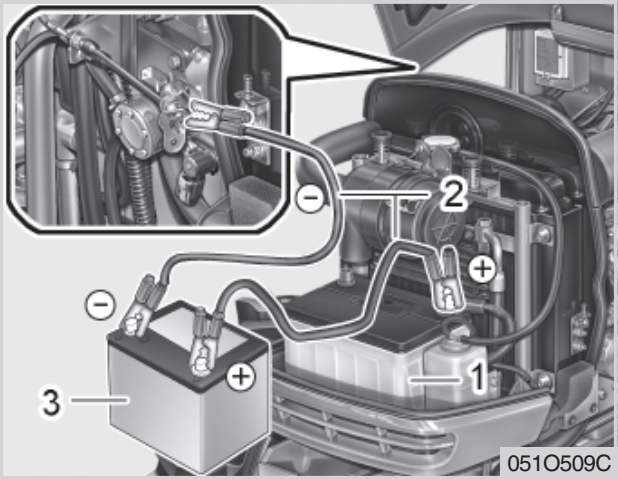
- Warm up the engine at a high idle according to the table below:

Ambient temperature	Warm-up time requirement
Above 32 ° F (0 ° C)	At least 5 minutes
32 ~ 14 ° F (0 ~ -10 ° C)	5 ~ 10 minutes
14 ~ -4 ° F (-10 ~ -20 ° C)	10 ~ 20 minutes
Below -4 ° F (-20 ° C)	More than 20 minutes

IMPORTANT

- **Do not operate the tractor under full load condition until it is sufficiently warmed up.**

JUMP STARTING



(1) Dead Battery (2) Jumper Cables
(3) Helper Battery

⚠ CAUTION

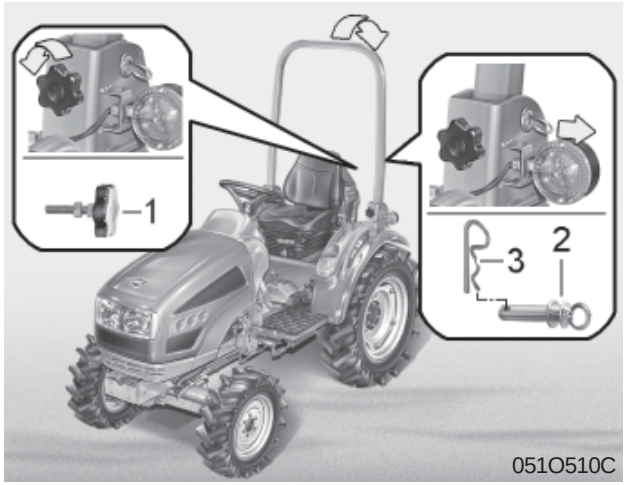
- **Keep fire, spark, cigarette, etc., from the battery.**
- **If the tractor battery is frozen, jump starting the engine is prohibited.**
- **Do not connect the (-) jumper cable to the negative(-) terminal of the discharged battery.**
- **Use a ground away from the battery**

When jump starting the engine, follow the instructions below to safely start the engine.

1. Use a battery of the same voltage as the disabled tractor battery to jump start the tractor. Locate the good battery in a safe place where the jumper cables will reach.
2. Engage the parking brake of the tractor and shift the transmission gear to the neutral position.
3. Put on safety goggles and rubber gloves.
4. Attach the red clamp to the positive terminal of the dead battery, and attach the other end to the positive terminal of the helper battery.
5. Clamp the black cable to the Engine hooks or other ground source and attach the other end to the negative cable of the helper battery.
6. If the helper battery is in another vehicle, do not allow the tractor and the other vehicle to touch. Start the vehicle's engine after connecting the cables and let it run for a few moments. Turn off all accessories on both vehicles. Then start the disabled tractor.
7. Disconnect the battery cables in the exact opposite order as they were attached.

OPERATING THE TRACTOR

TO FOLD THE ROPS

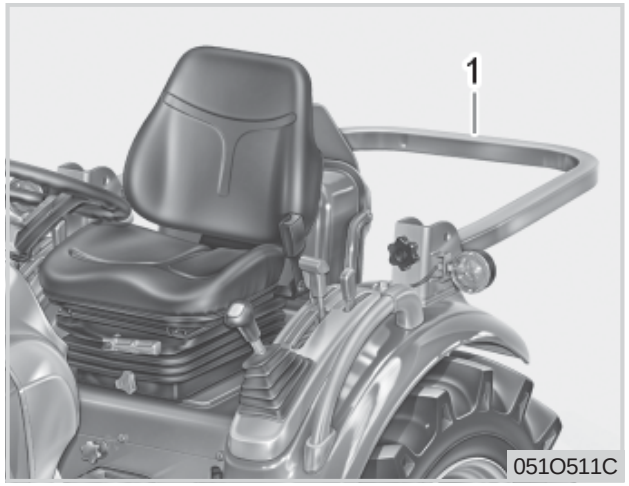


(1) Grip Bolt *(2) Set Pin*
(3) Clip Pin

1. Remove the clip pin and set pin.

⚠ CAUTION

- **You should always stop the engine, remove the key and set the parking brake before raising or folding the ROPS.**
- **Always perform such tasks from a safe and stable position at the rear of the tractor.**
- **Folding the ROPS should only be done when absolutely necessary, and should be returned to the up-right position as soon as possible.**



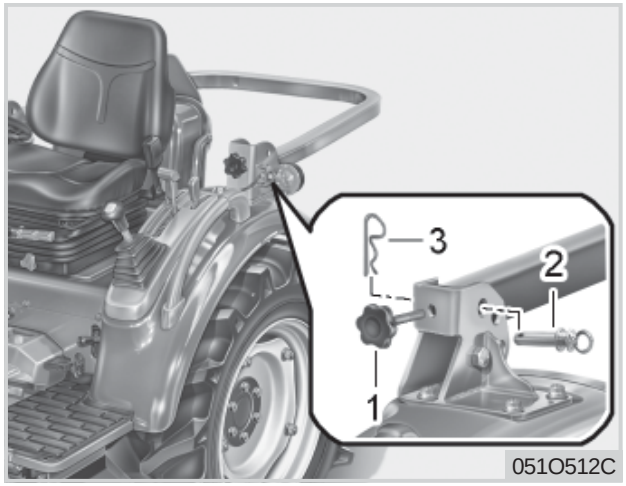
(1) ROPS

2. Loosen the grip bolt and fold the **ROPS**.

⚠ CAUTION

To avoid personal injury:

- **Hold the ROPS tightly with both hands and fold the ROPS slowly and carefully.**



(1) Grip Bolt *(2) Set Pin*
(3) Clip Pin

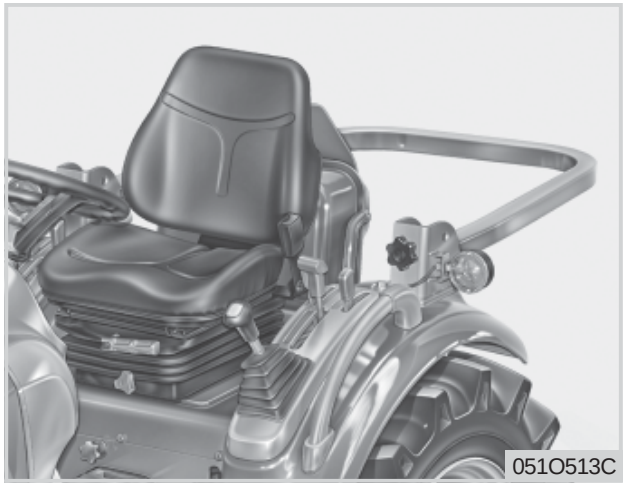
3. Align pin holes, insert set pin, and secure them with the clip pin.

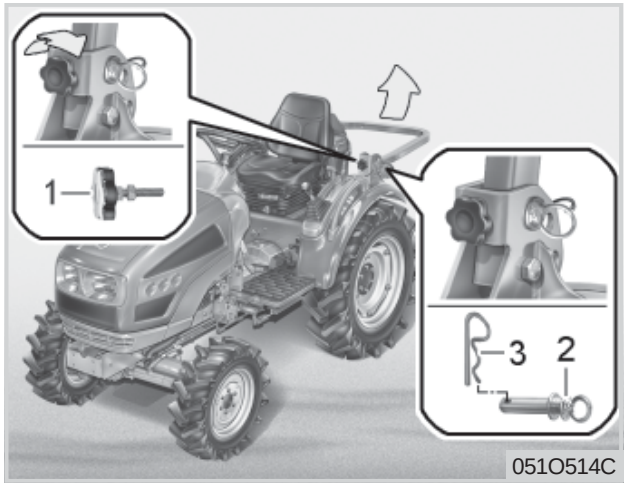
⚠ CAUTION

To avoid personal injury:

- **Make sure the pins are properly installed and secured.**

TO RAISE THE ROPS TO UPRIGHT POSITION





(1) Grip Bolt (2) Set Pin
(3) Clip Pin

1. Remove both the grip bolt, clip pin and set pin.
2. Raise **ROPS** to the upright position.

⚠ CAUTION

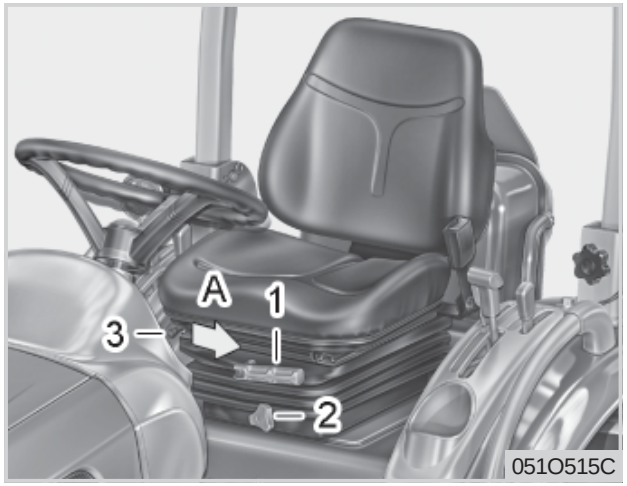
To avoid personal injury:
- **The ROPS must be raised slowly and carefully.**

3. Align pin holes, insert set pin and secure them with the clip pin.
4. Fix the ROPS with the grip bolt.

⚠ CAUTION

To avoid personal injury:
- **Make sure that pins are properly installed and secured.**

STARTING



(1) Weight Adjuster (2) Height Adjuster Lever
(3) Position Height Adjuster

1. ADJUSTING THE OPERATOR'S POSITION

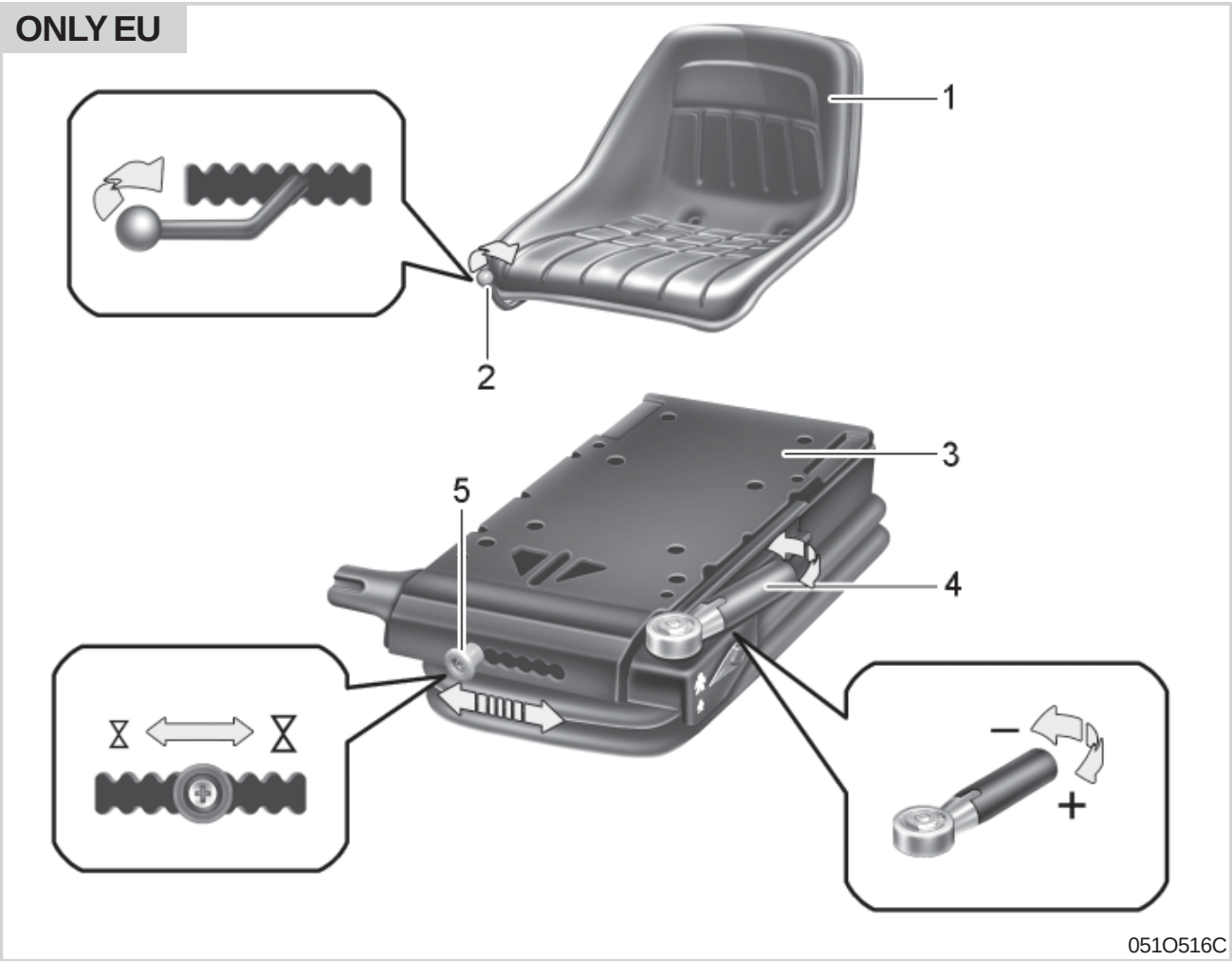
(1) OPERATOR'S SEAT

⚠ CAUTION

To avoid personal injury:
- **Make sure that the seat is completely secured after each adjustment.**
- **Do not allow any person other than the driver to ride on the tractor.**

SEAT

ONLY EU



(1) Seat
(2) Horizontal Adjustment(Slide rails)
(3) Suspension Assembly
(4) Height Adjuster
(5) Weight Adjuster

The seat installed on your tractor has a comprehensive range of adjustments. Before prorating the tractor, it is important to adjust the seat to the comfortable position.

1. The lever which control the seat position (up or down) in accordance with operator's. Use the lever when you change the seat position.
2. When you change the seat position (front or rear), pull the lever up and push or pull seat to front or rear direction.
3. When you change the suspension of the seat, you can adjust the suspension of the seat using the lever. Pull the lever front direction and move the lever left or right.

⚠ CAUTION

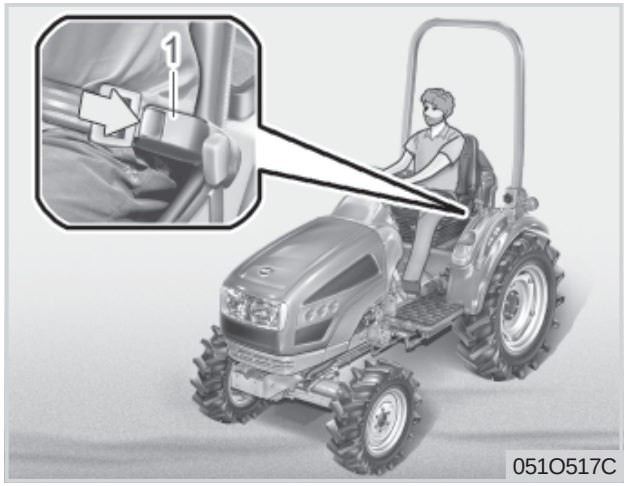
- **For one seated occupant.**
- **Do not adjust seat when vehicle is in operation.**
- **Keep clear of maintenance should be carried out by authorized & competent personnel only.**

(2) TRAVEL/HEIGHT ADJUSTMENT

Pull out the position adjust lever and slide the seat backward or forward, as required.

IMPORTANT

- **After adjusting the operator's seat, be sure to check that the seat is properly locked.**



(1) Seat Belt

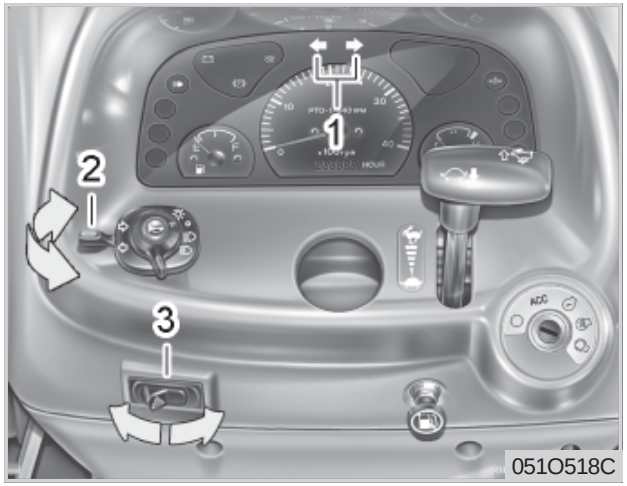
(3) SEAT BELT

CAUTION

To avoid personal injury:

- **Always use your seat belt when the ROPS is installed.**
- **Do not use the seat belt if your tractor is not equipped with a ROPS or when it is removed.**

Adjust the seat belt for proper fit and connect to the buckle. The seat belt is an auto-locking retractable type.



(1) Hazard / Turn Signal Indicator
(2) Turn Signal Light Switch
(3) Hazard Light Switch

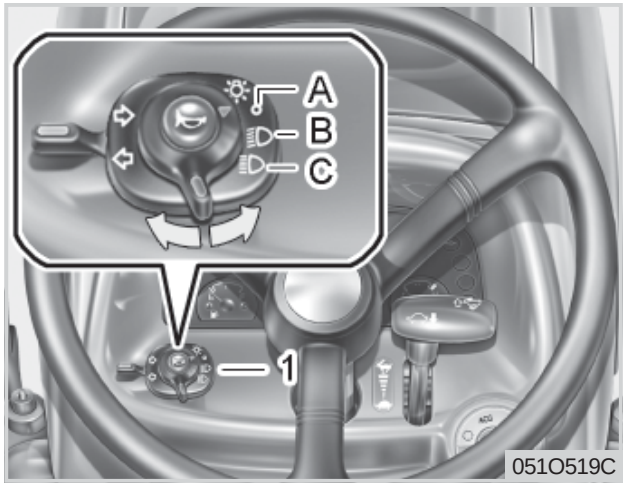
2. SELECTING LIGHT SWITCH POSITIONS

(1) HAZARD LIGHT SWITCH

When hazard light switch is pushed "ON", the hazard lights flash along with the indicator on the instrument panel. Push the switch to "OFF" to turn flashers "OFF".

(2) TURN SIGNAL LIGHT SWITCH

To indicate a right turn, push forward. To indicate a left turn, push rearward.



(1) Head Light Switch
(A) "OFF" *(B) "ON (LOW)"*
(C) "ON (HIGH)"

When the left or right turn signal is activated, the indicated turning light will flash and the other will be off.

NOTE

- Be sure to return switch to center positionto turn "OFF".

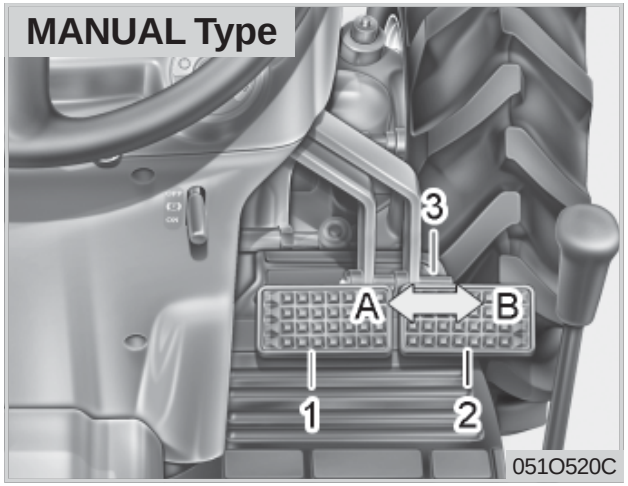
(3) HEAD LIGHT SWITCH

(A): Head lights OFF.

(B): Head lights - Low Beam ON.

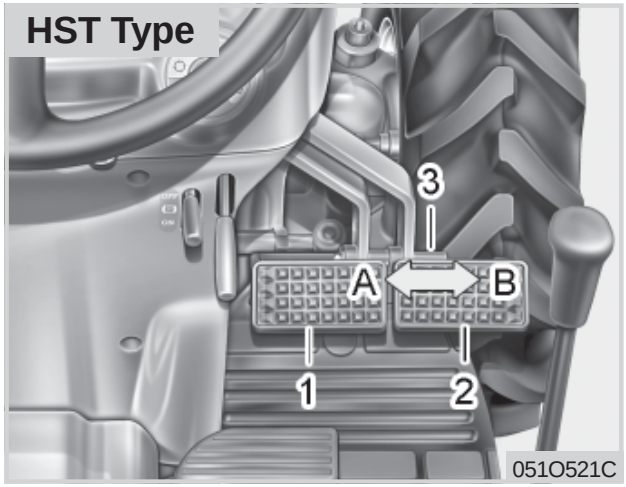
(C): Head lights - High Beam ON.

MANUAL Type



(1) Brake Pedal (L) *(2) Brake Pedal (R)*
(3) Interlock
(A) Lock *(B) Release*

HST Type



(1) Brake Pedal (L) *(2) Brake Pedal (R)*
(3) Interlock
(A) Release *(B) Lock*

3. CHECKING THE BRAKE PEDAL

(1) BRAKE PEDAL (RIGHT AND LEFT)

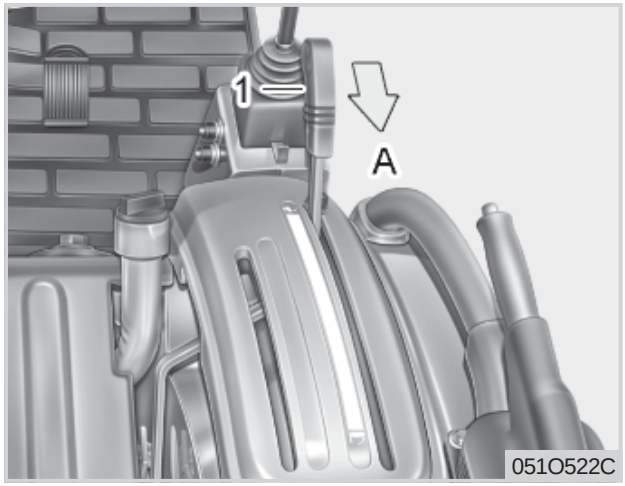
WARNING

To avoid personal injury:

- ***Applying one rear wheel brake at a time can cause the tractor to swerve or roll over at high speeds.***

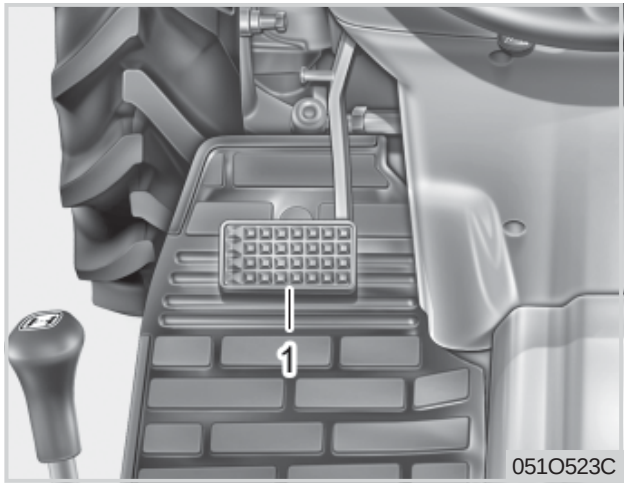
1. Before operating the tractor on the road or before applying the parking brake, be sure to interlock the right and left pedals as illustrated.
2. Use individual brakes to assist in making sharp turns at slow speeds (Field Operation Only).

   Disengage the brake pedal interlock and depress only one brake pedal.
3. Be sure brake pedals have equal adjustment when using locked together.



(1) Position Control Lever
(A) UP

4. RAISE THE IMPLEMENT.



(1) Clutch Pedal

5. DEPRESS THE CLUTCH PEDAL

⚠ CAUTION

To avoid personal injury:

- **Do not release the clutch suddenly, it may cause the tractor to lunge forward unexpectedly.**

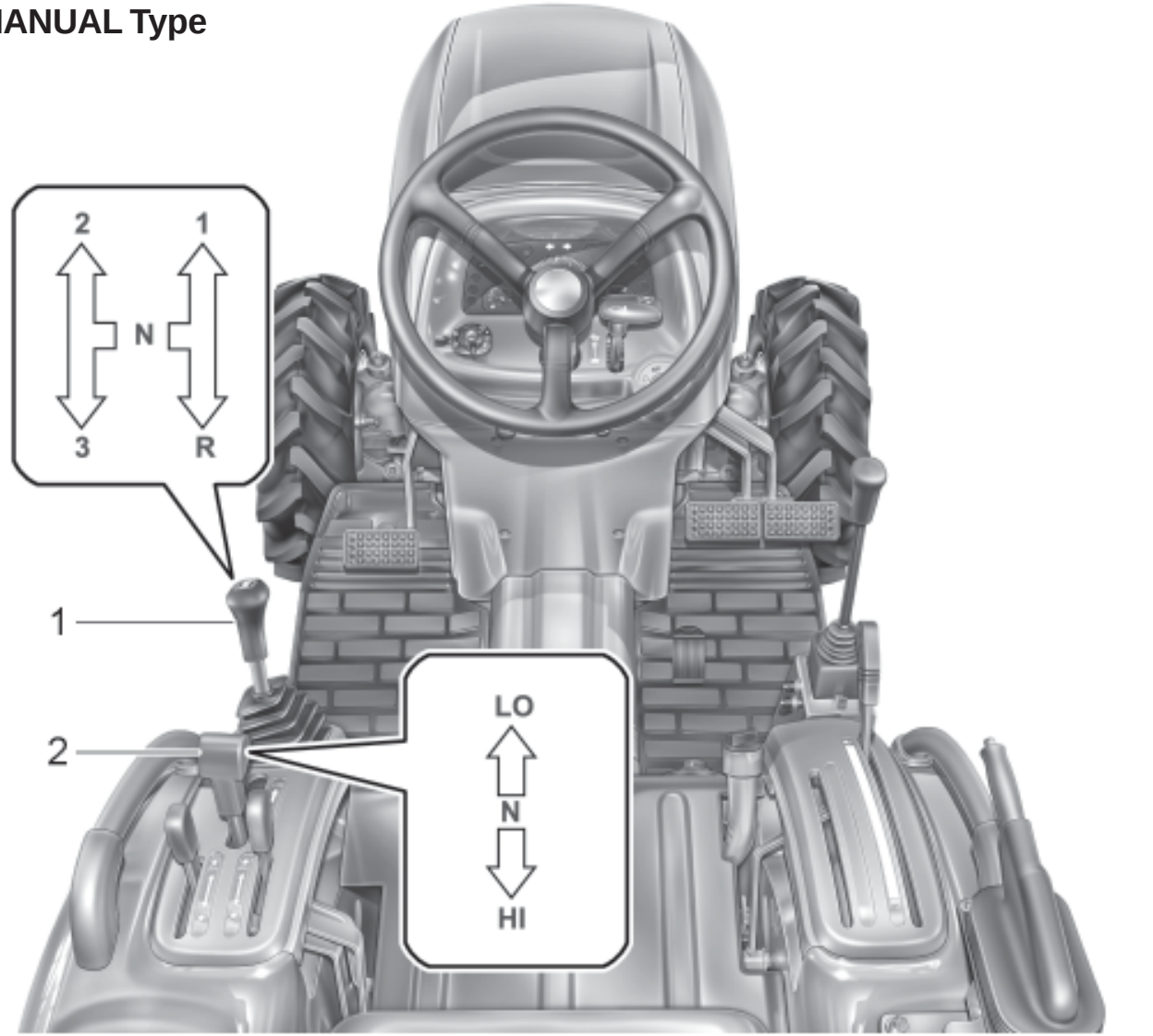
The clutch is disengaged when the clutch pedal is fully pressed down.

IMPORTANT

To help prevent premature clutch wear.

- **The clutch pedal must be engaged slowly and disengaged quickly.**
- **Do not rest your foot on the clutch pedal.**
- **Select the proper gear and engine speeds according to the type of job you are doing.**

MANUAL Type



051O524C

(1) Main Gear Shift Lever
(2) Range Gear Shift Lever(Hi-Lo)

(N) NEUTRAL POSITION
HI - HIGH
LO - Low

6. SELECTING THE TRAVEL SPEED (EU MANUAL Type)

(1) MAIN GEAR SHIFT LEVER

The main shift uses a syncro-mesh and a constant mesh.

Rotary power which is transmitted from engine to gear shaft via the clutch is changed in three ways by operating the main shift lever to shift the shifters, and transmits to the counter shaft.

(2) RANGE GEAR SHIFT LEVER (HI-LO)

The range gear shift can only be shifted when tractor is completely stopped and clutch is depressed. If it is difficult to shift the range gear, take the following actions.

1. Be sure the range gear shift lever is in neutral position.
2. Release clutch pedal or slightly depress the speed control pedal to rotate the gears inside of transmission. Release the speed control pedal to neutral(HST only).
3. Depress clutch pedal and then shift the range gear shift lever.

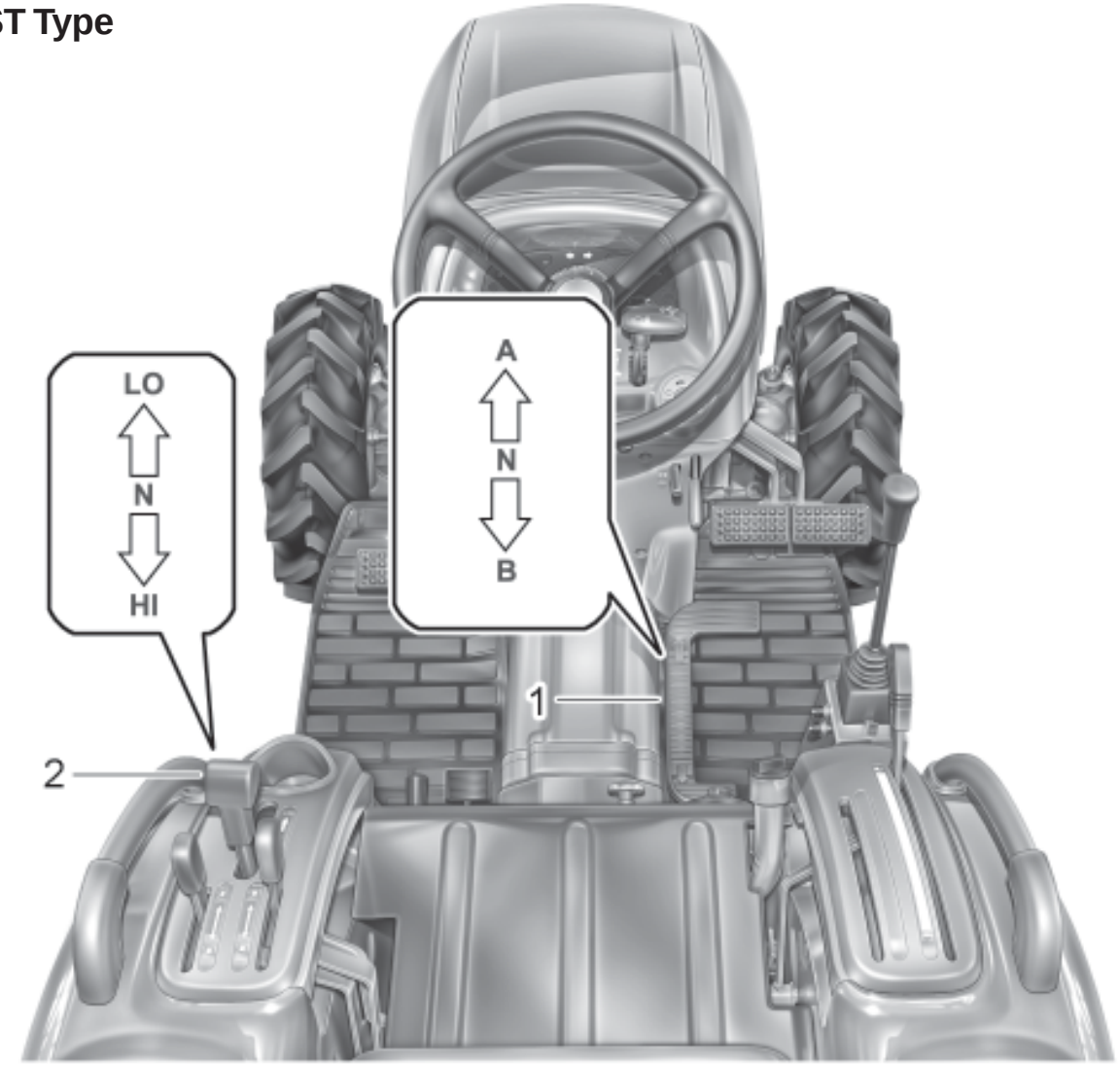
IMPORTANT

- **To avoid transmission damage, depress clutch pedal and stop tractor before shifting between ranges.**

CAUTION

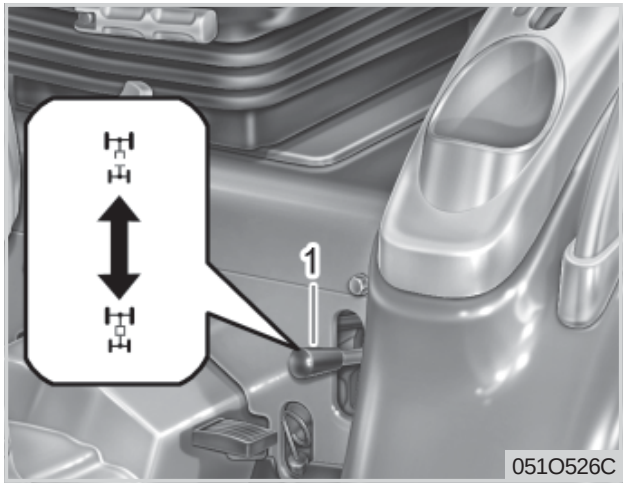
- **It may be easy to stall the engine when operating the tractor in high range at low engine rpm's.**

HST Type



051O525C

(1) Speed Control Pedal
(2) Range Gear Shift Lever (Hi-Lo)
(A) FORWARD
(B) REVERSE
(N) NEUTRAL POSITION
HI - HIGH
LO - LOW



(1) Front Wheel Drive Lever

"ENGAGED" *"DISENGAGED"*

(3) FRONT WHEEL DRIVE LEVER

The front wheel drive should always be engaged when the tractor is stopped. Shift the lever to the "ON" position to engage the front wheel.

FRONT WHEEL DRIVE IS EFFECTIVE FOR THE FOLLOWING JOBS:

1. When greater pulling force is needed, such as working in a wet field, when pulling a trailer or when working with front-end loader.
2. When working in sandy soil.
3. When working on a hard soil where a rotary tiller might push the tractor forward.

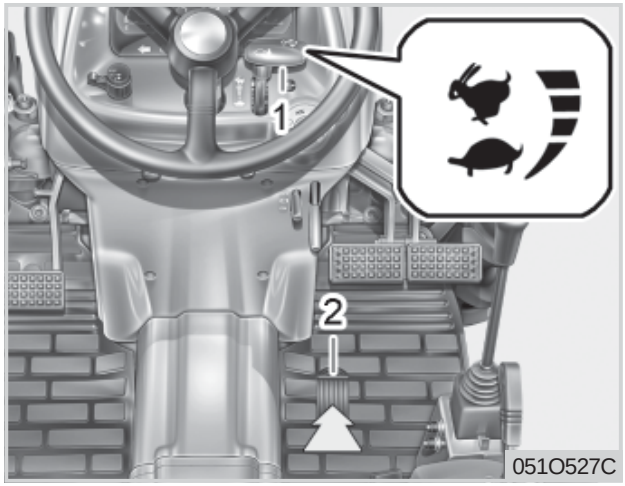
IMPORTANT

To avoid personal injury:

- **You should not engage your front wheel drive while traveling at road speeds. This can cause your tractor to stop quickly, and unexpectedly.**

CAUTION

- **Engage the front wheel drive only when the engine stops and do not shift if in drive.**
- **Tires will wear quickly if front wheel drive is engaged on paved roads.**
- **Damage to the drive train may be caused due to operation of 4WD on roads or pave surfaces.**



(1) Hand Throttle Lever (2) Foot Throttle

INCREASE *DECREASE*

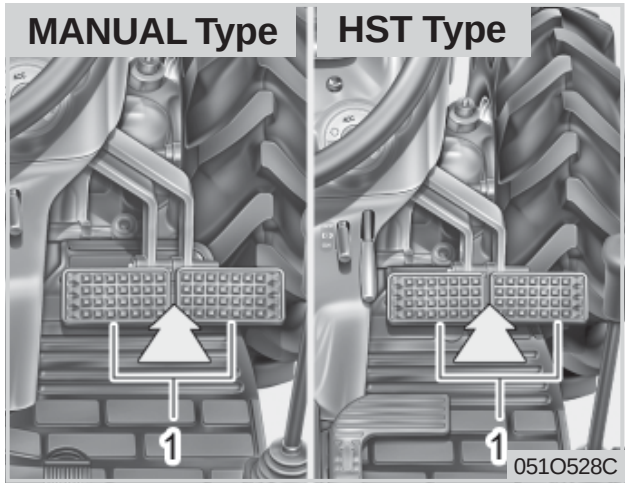
7. ACCELERATE THE ENGINE

(1) HAND THROTTLE LEVER

Pushing the throttle lever forward decreases engine speed, and pulling it back increases engine speed.

(2) FOOT THROTTLE (MANUAL Type)

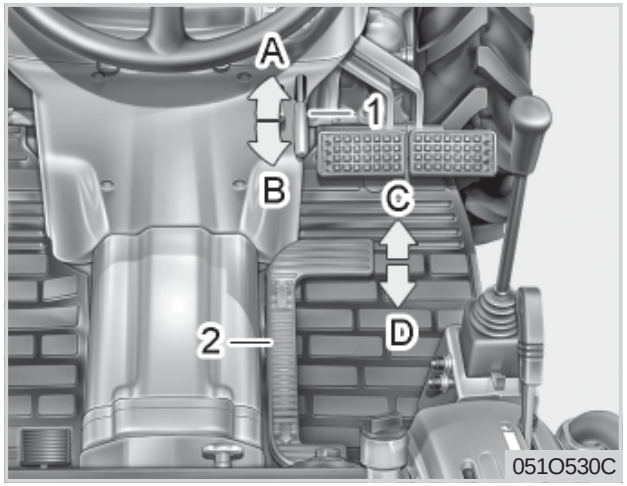
Use the foot throttle when traveling on the road. Press down on it for higher speed. The foot throttle is interlocked with the hand throttle lever; when using the foot throttle, keep the hand throttle lever in low idling position.



(1) Brake Pedals

8. UNLOCK THE PARKING BRAKE AND SLOWLY RELEASE THE CLUTCH PEDAL.

To release the parking brake, simply depress the brake pedals again. Once released, the parking brake indicator in the easy checker will go off.



(1) Speed Set Lever
(2) Speed Control Pedal
(A) Lock *(C) Forward*
(B) Release *(D) Reverse*

9. DEPRESS THE SPEED CONTROL PEDAL (HST TYPE)

(1) SPEED CONTROL PEDAL

⚠ WARNING

To avoid personal injury:

- ***If your tractor moves while on level ground with your foot of the control pedal, do not operate the tractor.***
- ***Consult your KIOTI dealer.***

1. Forward pedal

   Depress the control pedal with the toe of your right foot to move forward.

2. Reverse pedal

   Depress the pedal with the heel of your right foot to move backward.

IMPORTANT

- **To prevent serious damage to the HST do not adjust the stopper bolts.**

(2) CRUISE CONTROL

The Cruise Control is designed for tractor operating efficiency and operator comfort. This device will provide a constant forward operating speed by mechanically holding the cruise control pedal at the selected position.

[To Engage Speed Set Device]

1. Accelerate speed to desired level using Speed Control Pedal, and pull the cruise control up to the "ON" position.
2. Release Speed Control Pedal and desired speed will be maintained.

[To Disengage Speed Set Device]

1. Place the lever to the off position.

NOTE

- If you step on the brake, the cruise control will disengage.
- Make sure to keep the cruise control in the off position when starting the tractor.
- Return the cruise control to the off position when stopping the tractor.
- cruise control will not operate in reverse.
- The cruise control can be released When overloads or any sudden forces are obtained.

IMPORTANT

- **To prevent the damage to cruise control, do not depress the reverse pedal when the cruise control is engaged.**

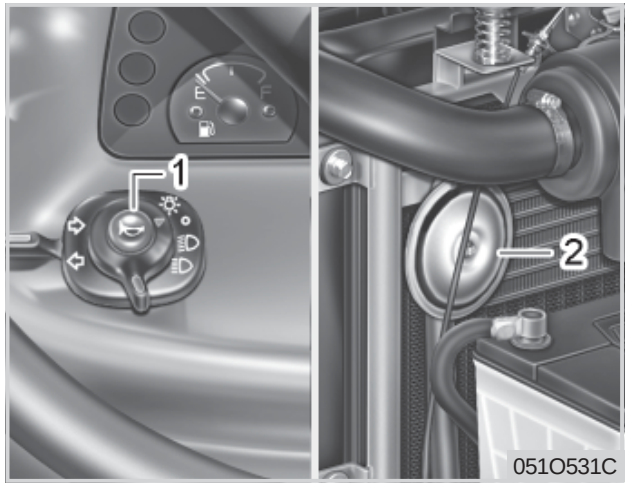
⚠ CAUTION

- **To avoid personal injury and maintain optimum control of tractor, do not use the cruise control at high speeds or when driving the tractor on roads.**

STOPPING

1. Slow the engine to idle
2. Depress the clutch and brake pedal. (Manual model)
3. After the tractor has stopped, disengage the PTO, lower the implement, shift the transmission into neutral, release the clutch pedal and set the parking brake.

HORN
(only EU)



(1) Horn Switch
(2) Horn

CHECK DURING DRIVING

IMMEDIATELY STOP THE ENGINE IF

051O532C

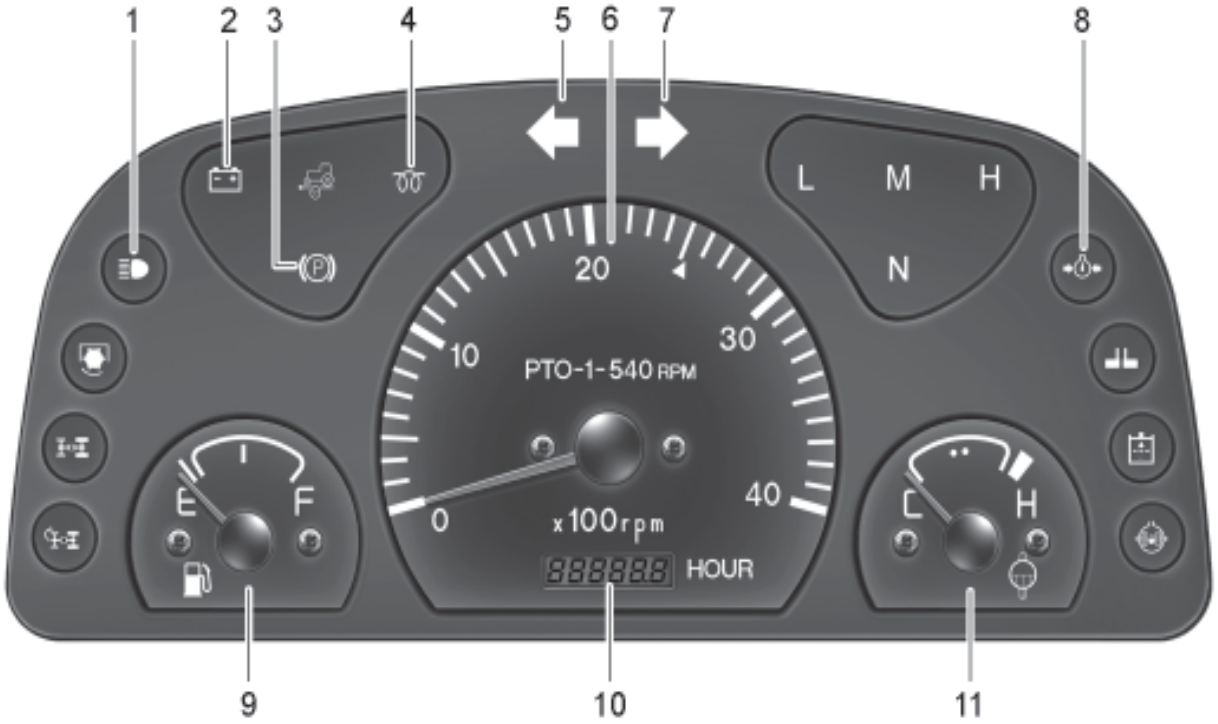
(1) Battery Charging Warning Lamp
(2) Tachometer
(3) Engine Oil Pressure Warning Lamp
(4) Fuel Gauge
(5) Coolant Temperature Gauge

- The engine suddenly slows or accelerates.
- Unusual noises are heard.
- Exhaust fumes become dark.

NOTE

- Frequently check all gauges to verify the tractors operating status.

INSTRUMENT CLUSTER



051O533C

If warning lamps come on while operating the engine, immediately stop the engine and check for the cause.

Never operate the tractor while warning lamps are on.

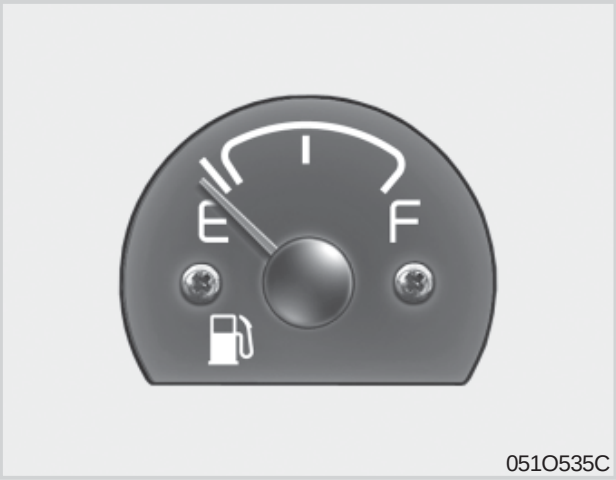
(1) Headlight-High Beam Lamp
(2) Battery Charging Warning Lamp
(3) Parking Brake Lamp
(4) Glow Plug Indicator
(5) Left Turn Indicator
(6) Tachometer
(7) Right Turn Indicator
(8) Engine Oil Pressure Warning Lamp
(9) Fuel Gauge
(10) Hour-Meter Indicator
(11) Coolant Temperature Gauge

TACHOMETER

The tachometer indicates the engine speed and the 540rpm PTO operating speed.

The hour-meter indicates, in five digits, the hours that the tractor has been operated.

FUEL GAUGE



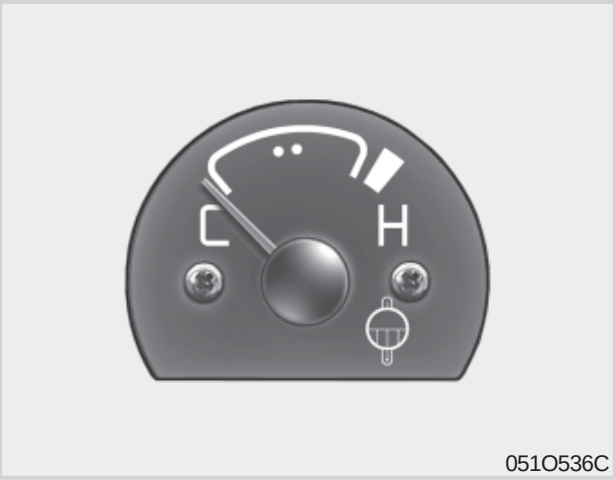
"E" EMPTY *"F" FULL*

When the key switch is on, the fuel gauge indicates the fuel level.

Be careful not to empty the fuel tank. Otherwise air may enter the fuel system.

Should this happen, the system should be bled(See "Bleeding Fuel System" in Periodic Service Section).

COOLANT TEMPERATURE GAUGE



"C" COLD *"H" HOT*

When the key switch is turned "ON" this gauge indicates the temperature of the coolant. "C" is for cold, and "H" is for hot.

⚠ CAUTION

To avoid personal injury:

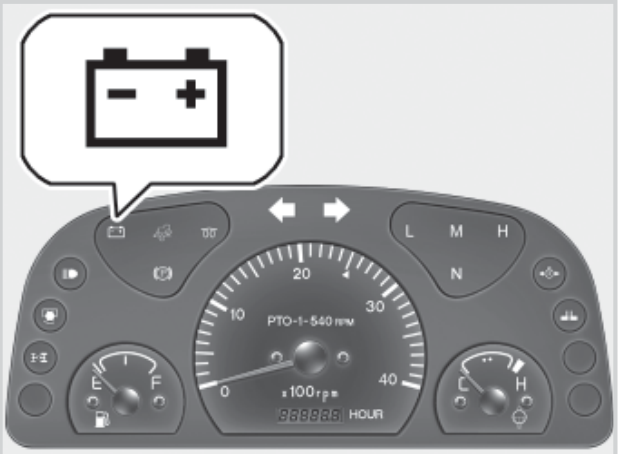
- **Do not remove radiator cap until coolant temperature is well below its boiling point. Then loosen cap slightly to the stop to relieve any pressure before removing cap completely.**

ENGINE OIL PRESSURE WARNING LAMP

051O537C

If the tractor engine oil pressure is below the specified ranges, the warning lamp will illuminate.

BATTERY CHARGING WARNING LAMP



051O538C

If the battery of the generator is not fully charged, the warning lamp illuminates on the instrument cluster. (Illumination at KEY ON(START OFF) is normal)

NOTE

- In the event a warning indicator lamp illuminates while operating the tractor, immediately shut the engine off and consult with your **KIOTI** dealer.

HEAD LIGHT HIGH BEAM PILOT LAMP

051O539C

When head lights are turned to high, an indicator lamp will illuminate on the dash.

TURN SIGNAL LAMP

If the turn signal lamp switch is turned left or right, the corresponding indicator will illuminate in green.

GLOW PLUG INDICATOR

When the key switch is turned to the "ON" position, the glow plug indicator will illuminate.

NOTE

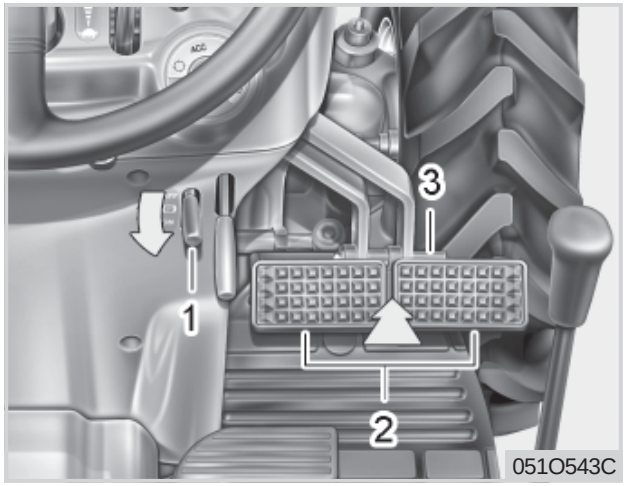
- Glow plug operation is controlled by engine water temperature. The glow plug indicator will only illuminate if water temperature is below 60 ° C (140 ° F).

PARKING BRAKE LAMP

If the parking lever is engaged, the corresponding indicator will illuminate in red.

PARKING

PARKING BRAKE LEVER



(1) Parking Brake Lever
(2) Brake Pedals *(3) Interlock*
(A) DEPRESS *(B) PUSH "DOWN"*

⚠ CAUTION

To avoid personal injury:

- **Always set the parking brake and stop the engine before leaving the tractor seat.**
- **When parking the vehicle on a hill, position the shift lever in low forward (1st gear) for uphill and low reverse (1st gear) for downhill. Set the parking brake and chock the wheels.**

⚠ CAUTION

HST TYPE

- **Leaving transmission in gear with the engine stopped will not prevent tractor from rolling. Park on level ground whenever possible.**
- **Always lock the parking brake.**

1. When parking, be sure to set the parking brake.

   To set the parking brake:

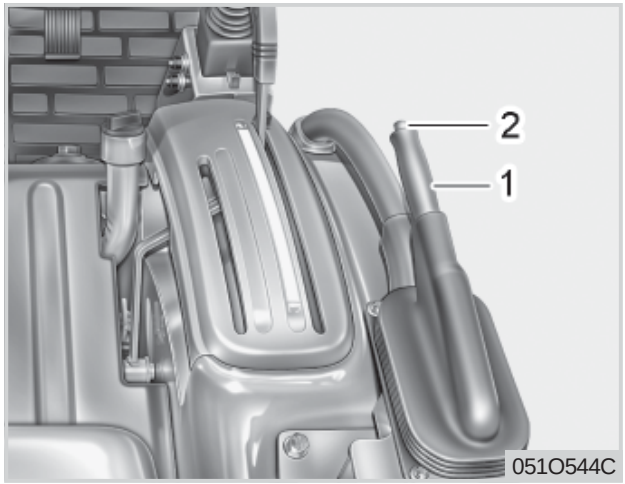
   1) Interlock the brake pedals.
   2) Depress the brake pedals.
   3) latch the brake pedals with the parking brake lever.

IMPORTANT

- **To prevent damage to the parking brake lever, make sure that brake pedals are fully depressed before pulling the parking brake lever up.**

2. Before getting off the tractor, disengage the PTO, lower all implements, place all control levers in their neutral positions, set the parking brake, stop the engine and remove the key.

ONLY EU MANUAL TYPE



(1) Handbrake
(2) Push button

A conventional handbrake lever(1) is installed to the right of the driver's seat.

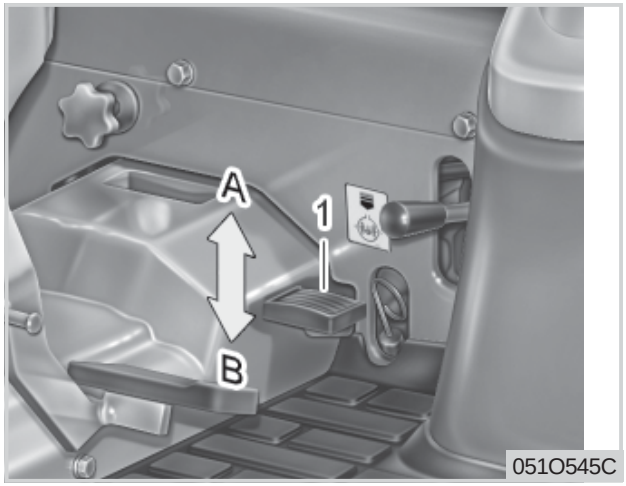
To apply the handbrake, pull the lever up. To release, ease the lever up further, depress the button(2) on the end lower the lever fully.

IMPORTANT

- **Ensure that the handbrake is fully released before driving off.**

OPERATING TECHNIQUES

DIFFERENTIAL LOCK



(1) Differential Lock Pedal
(A) Release to "DISENGAGE"
(B) Press to "ENGAGE"

WARNING

To avoid personal injury due to loss of steering control.

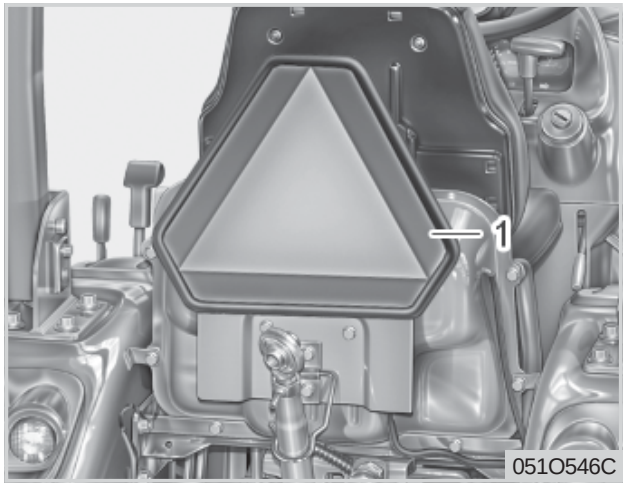
- ***Do not operate the tractor at high speeds with the differential lock engaged.***
- ***Do not attempt to turn with the differential lock engaged.***

If one of the rear wheels should slip, use the differential lock. This will cause both wheels to turn together. The differential lock is engaged only when the pedal is depressed.

IMPORTANT

- **When using the differential lock, always slow the engine and press the differential lock down.**
- **If the differential lock cannot be released in the above manner, step lightly on the brake pedals alternately.**

OPERATING THE TRACTOR ON A ROAD



(1) SMV Emblem

⚠ CAUTION

To avoid personal injury:

- **To help assure straight line stops when driving at transport speeds, lock the brake pedals together. Uneven braking at road speeds could cause the tractor to roll-over.**
- **When traveling on road with 3-point hitch mounted implement attached, be sure to have sufficient front weight on the tractor to maintain steering ability.**

Make sure that the warning lamps and SMV sign are clean and visible at all times. If you are towing rear mounted equipment or implements you will need to install warning lamps and SMV signs on the equipment.

OPERATING ON SLOPES AND ROUGH TERRAIN

⚠ CAUTION

To avoid personal injury:

- **Always back up when going up a steep slope. Driving forward could cause the tractor to tip over backward. Stay off hills and slopes too steep for safe operation.**
- **Avoid changing gears when climbing or descending a slope.**
- **If operating on a slope, never disengage the clutch or shift levers to neutral. Doing so could cause loss of control.**
- **Do not drive the tractor close to the edges of ditches or banks which may collapse under the weight of the tractor, especially when the ground is loose or wet.**

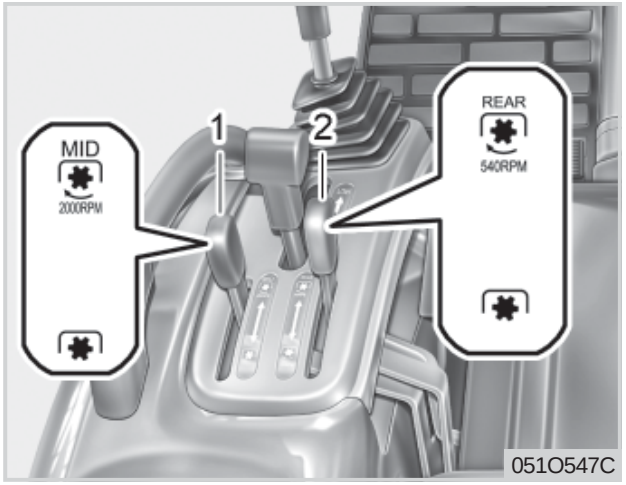
1. Be sure that the wheels are adjusted to provide the maximum stability possible.
2. You should slow down for rough roads, slope and sharp turns. This is especially important when you are transporting heavy equipment on the rear of the tractor.
3. Use gears according to the decent of the slope, and try to avoid using the brake.

DIRECTIONS FOR USE OF POWER STEERING

1. Power steering is activated only while the engine is running. Slow engine speeds make the steering a little heavier. While the engine is stopped, the tractor functions in the same manner as tractors without power steering.
2. When the steering wheel is turned all the way to the stop, the relief valve is activated. Do not hold the steering wheel in this position for a long period of time.
3. To avoid tire wear and front-end damage only turn steering wheel while moving.

PTO OPERATION

REAR PTO GEAR SHIFT LEVER



(1) Mid PTO Gear Shift Lever
(2) Rear PTO Gear Shift Lever

OFF *ON*

⚠ CAUTION

To avoid personal injury:

- **Disengage PTO, stop engine, and allow all rotating components to come to a complete stop before connecting, disconnecting, adjusting, or cleaning any PTO driven equipment.**

1. The tractor has a 540 rpm speed position.
2. PTO shifting needs clutch operation. Press the clutch pedal down completely to stop the tractor movement and any PTO driven equipment movement before shifting the PTO gear shift lever.

IMPORTANT

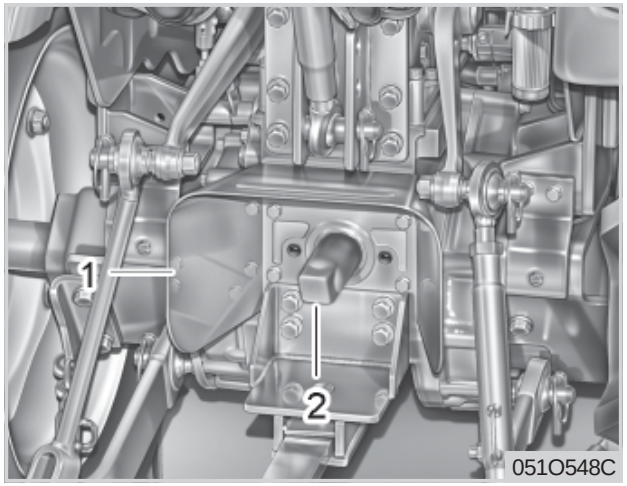
- **To avoid shock loads to the PTO, reduce engine speed when engaging the PTO, then open the throttle to the recommended speed:**
- **To avoid damage of transmission, before shifting the PTO gear shift lever, fully disengage the main clutch.**

Model	CK22
Engine Speed min^{-1} (rpm)	2,646
Shaft	6-Spline
PTO Speed min^{-1} (rpm)	540

NOTE

- There is a PTO-1 (540 rpm) indicator marked on the tachometer dial.
- Tractor engine will not start if PTO gear shift lever is in the engaged "ON" position.

PTO SHIELD AND SHAFT CAP

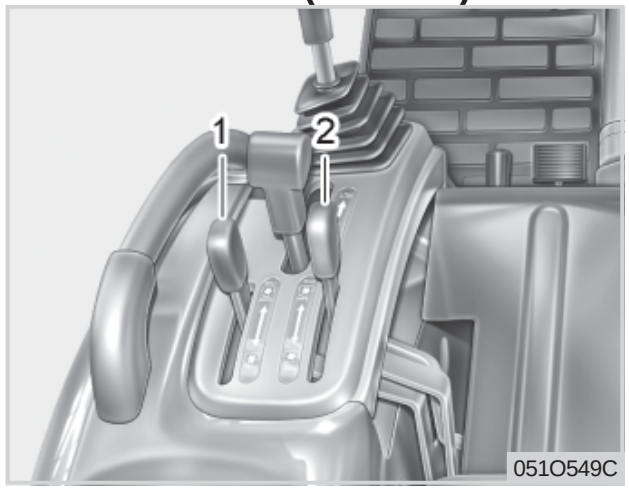


(1) PTO Shield
(2) PTO Shaft Cap

The shield rotates upward, allowing for easy implement attachment to the PTO stub shaft.

You should keep the PTO cover in place at all times and remember to replace the cap when the PTO shaft is not in use.

MID-PTO LEVER (OPTION)



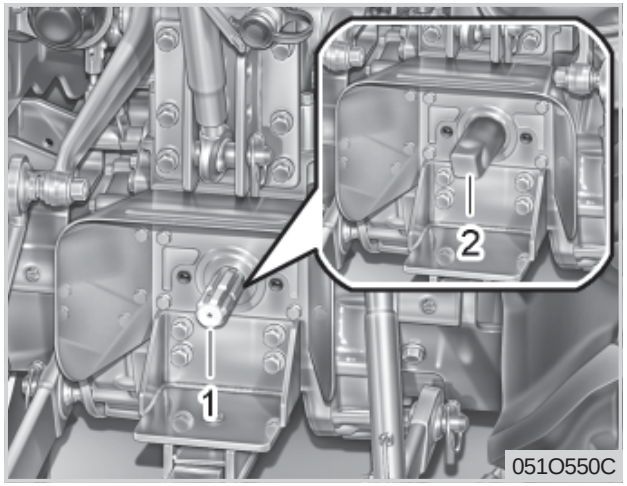
(1) Mid PTO Lever
(2) Rear PTO Lever

To use the mid-PTO, shift the PTO lever to engaged position. This shifting requires clutch pedal operation.

⚠ WARNING

To avoid personal injury:

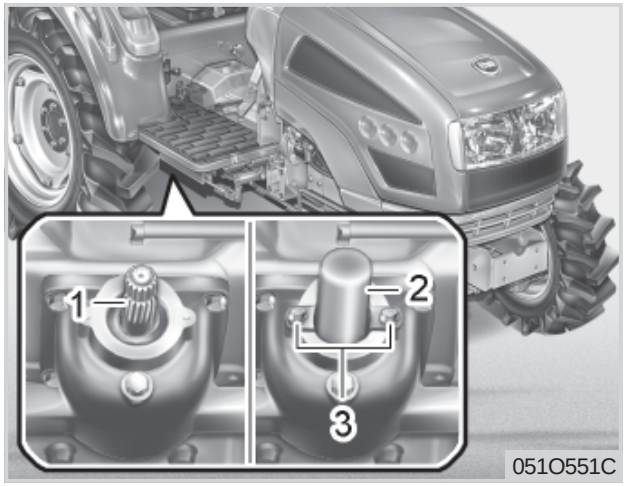
- ***Before operation, be sure to select the correct PTO lever (mid/rear).***
- ***Do not operate rear-PTO driven implements and mid-PTO driven implements at the same time.***



(1) PTO *(2) PTO Shaft Cap*

(1) REAR AND MID-PTO SPEED

PTO REVOLUTION [mn^{-1} (rpm)]				
	REAR PTO		1st	540
			2nd	1,000
	MID PTO		2,000	



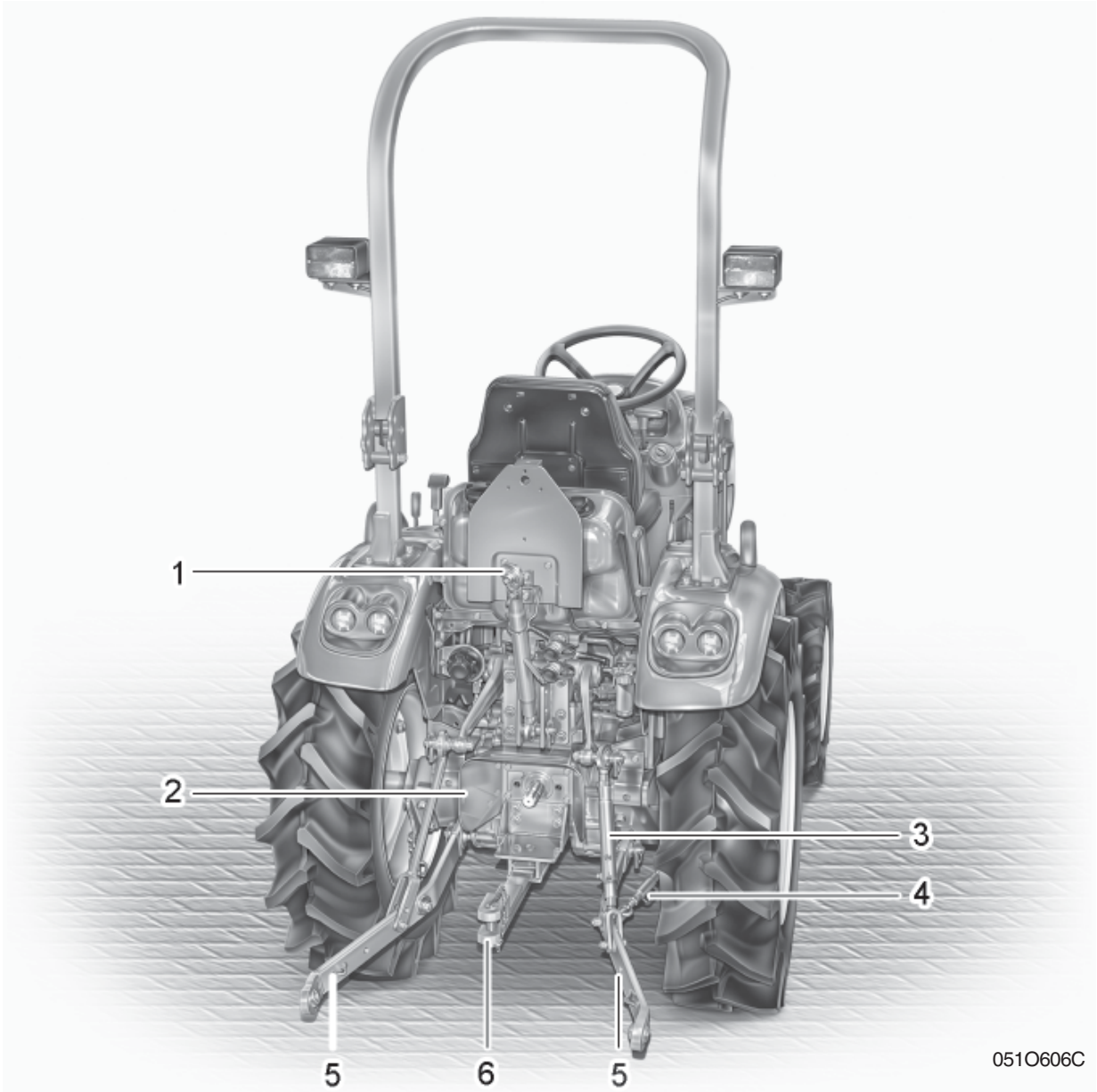
(1) Mid PTO *(2) Mid PTO Shaft Cap*
(3) Bolt

(2) MID-PTO SHAFT COVER

The mid PTO is available for **KIOTI** approved implements.

6

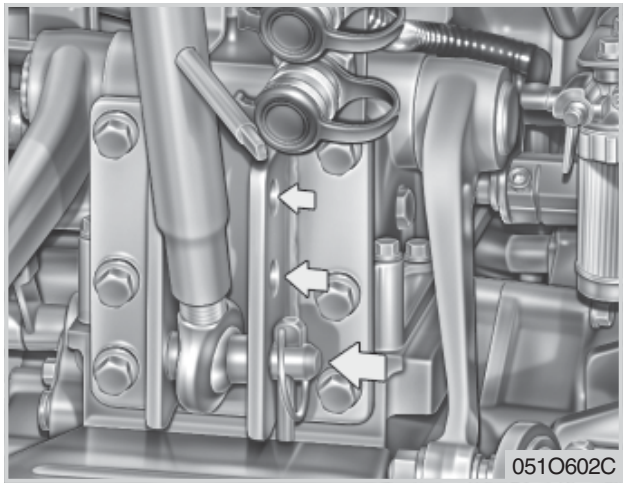
THREE-POINT HITCH & DRAWBAR



(1) Top Link
(2) Lifting Rod (Left)
(3) Lifting Rod (Right)
(4) Telescopic stabilizer
(5) Lower Link
(6) Drawbar

3-POINT HITCH

MAKE PREPARATIONS FOR ATTACHING IMPLEMENT



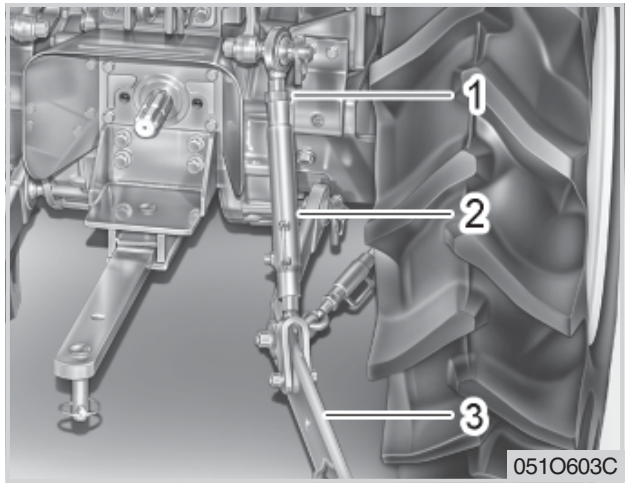
SELECTING THE TOP LINK MOUNTING HOLES

1. Adjust the angle of the implement to the desired position by shortening or lengthening the top link.
2. The proper length of the top link varies according to the type of implement being used.

DRAWBAR

Remove the drawbar if close mounted implement is being attached.

ATTACHING AND DETACHING



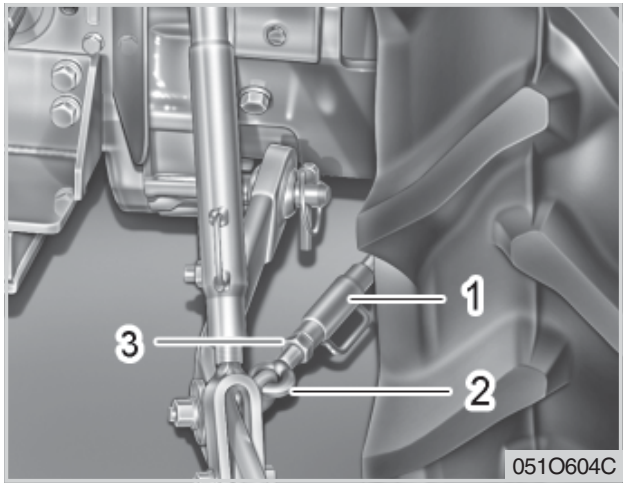
(1) Nut
(2) Lifting Rod (Right)
(3) Lower Link

⚠ CAUTION

- **To avoid personal injury:**
  Be sure to stop the engine.
  Do not stand between tractor and implement unless parking brake is applied.
- **Before attaching or detaching implement, locate the tractor and implement on a firm level surface.**
- **Whenever an implement or other attachment is connected to the tractor 3-point hitch, check full range of operation for interference, binding or P.T.O separation.**

LIFTING ROD (RIGHT)

Lift Rod - To adjust the horizontal position of the implement twist the turn buckle on the right lift rod. Most implements are designed to operate level. Set the position desired by tightening the set nut against the turn buckle.



(1) Turn Buckle
(2) Check Chains
(3) Nut

CHECK CHAINS

Check chains are used to adjust the side sway that your implement has while in use. Check Chains are also used to center the implement on the rear of the tractor.

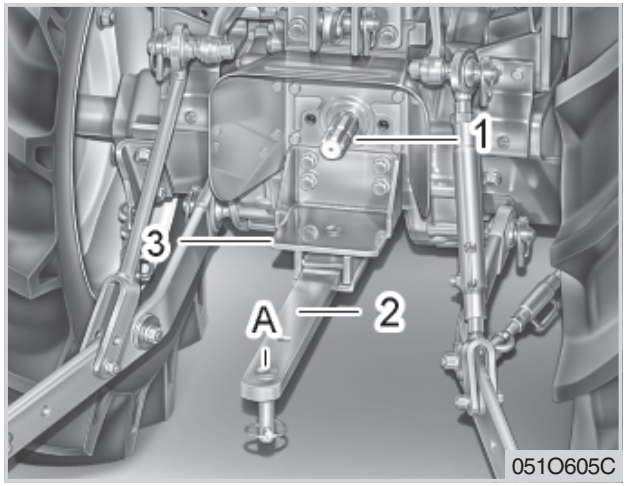
⚠ WARNING

- ***Use caution when adjusting the check chains. Heavy implement can move causing harm.***

To adjust the check chains, loosen the set nuts and twist the turn buckles on both sides until the desired amount of sway is reached. Set the adjustment by tightening the set nuts against the turn buckles.

DRAWBAR

ADJUSTING DRAWBAR LENGTH



(1) PTO Shaft
(2) Drawbar
(3) Drawbar Pin
(A) Holes

⚠ WARNING

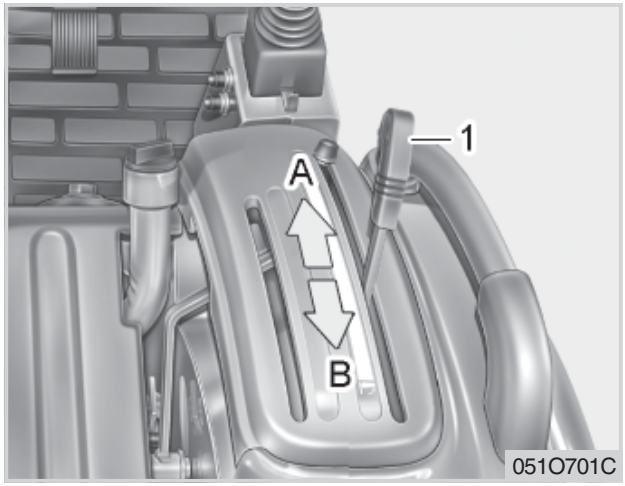
To avoid personal injury:

- ***Never pull from the top link, the rear axle or any point above the drawbar. Doing so could cause the tractor to tip over rearward causing personal injury or death.***

The drawbar load is rating is listed in the "IMPLEMENT LIMITATIONS" section.

3-POINT HITCH CONTROL SYSTEM

HYDRAULIC CONTROL



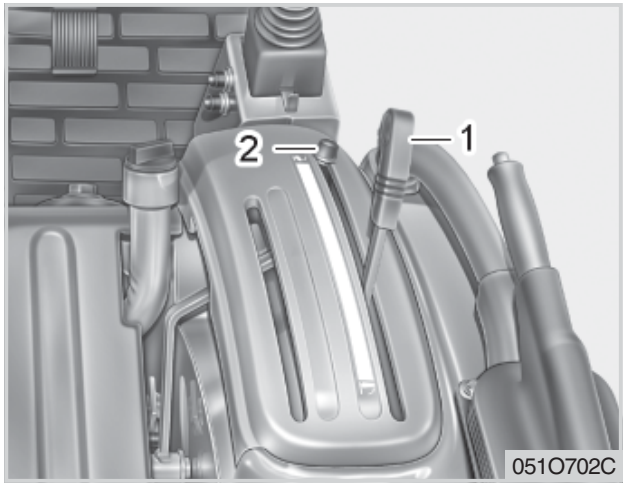
(1) Hydraulic Control Lever
(A) DOWN (B) UP

Operating the position control lever actuates the hydraulic lift arm. This controls the elevation of the 3-point hitch mounted implement.

IMPORTANT

- **If the 3-point hitch can not be raised by setting the hydraulic control lever to the "UP" position after long term storage or when changing the transmission oil, follow these air bleeding procedures.**
  1. **Stop the engine.**
  2. **Set the hydraulic control lever to the "DOWN" position and start the engine.**
  3. **Operate the engine at low idle speed for at least 30 seconds to bleed air from the system.**
- **Do not operate until the engine is warmed up. If operation is attempted when the engine is still cold, the hydraulic system may be damaged.**
- **If noises are heard when implement is lifting after the hydraulic control lever has been activated, the hydraulic mechanism is not adjusted properly. Unless corrected the unit will be damaged. Contact your KIOTI dealer for adjustment.**

IMPLEMENT LOWERING LIMIT



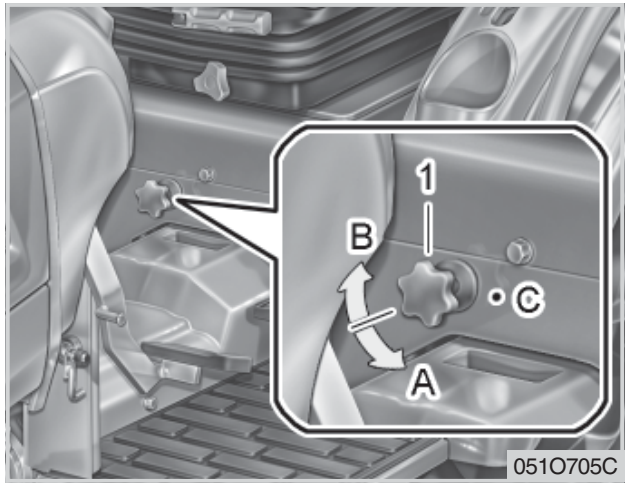
(1) Hydraulic Control Lever
(2) Lock Bolt

The implement lowering limit can be changed and adjusted by shifting the locker.

LOWER LIMIT

The lower limit can be adjusted by moving the position of the locker. Shifting the locker backward raises the lower limit and shifting the locker forward lowers the lower limit.

3-POINT HITCH LOWERING SPEED



(1) 3-Point Lowering Speed Knob
(A) FAST (C) LOCK
(B) SLOW

⚠ CAUTION

To avoid personal injury:

- **Fast lowering speed may cause damage or injury. Lowering speed of implement should be adjusted to two or more seconds.**

The lowering speed of the 3-point hitch can be controlled by adjusting the 3-point lowering speed knob.

HYDRAULIC BLOCK TYPE OUTLET

Hydraulic block type outlet is useful when adding hydraulically operated equipment such as:

front end loader, front blade, etc.

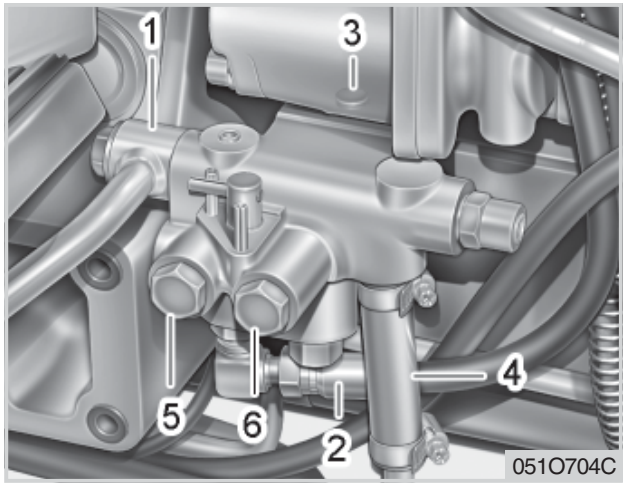
WHEN IMPLEMENT IS ATTACHED

1. Remove the plugs.
2. Route the implement inlet, outlet, and return hoses as shown in the illustration.
3. Move the control screw groove to "vertical position" when implement is attached.

⊕ IMPORTANT

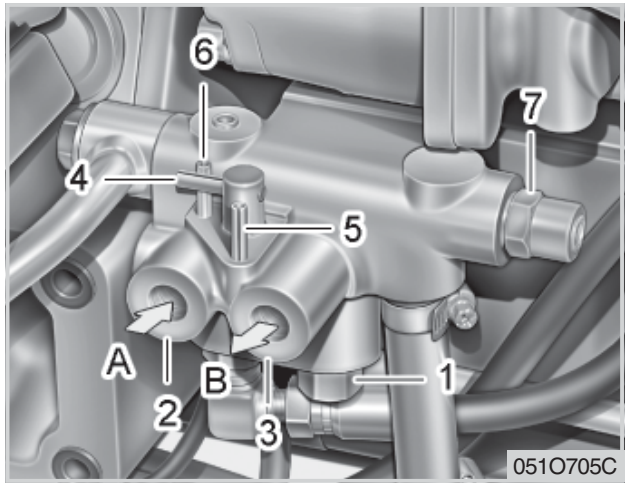
- **To prevent overheating and damage to the hydraulic system once an implement is detached, be sure the control screw is turned back to the “Horizontal position”.**

When implement is not attached



(1) To Hydraulic Control Valve (3-point hitch)
(2) To Power steering (PS type only)
(3) From Gear Pump
(4) To Gear Pump (Relief Valve)
(5) From Implement
(6) To Implement

When implement is attached

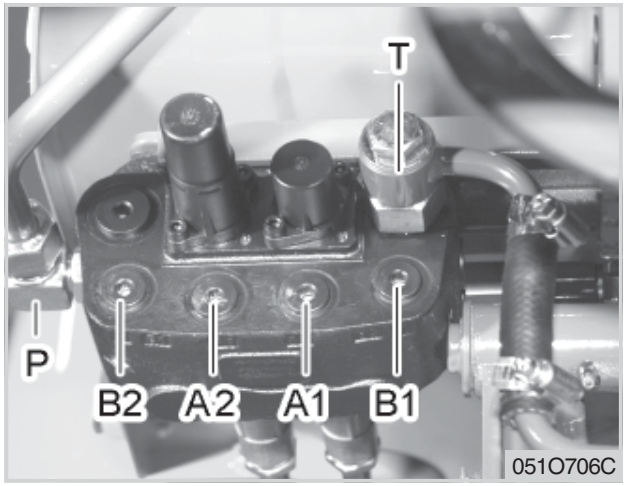


(1) Flow Priority Valve
(2) Inlet from Implements (PS 3/8")
(3) Outlet to Implements (PS 3/8")
(4) Directional Valve
(5) Pin (Setting Position for Attaching Implements)
(6) Pin (Setting Position for Attaching no Implement)
(7) Relief Valve
(A) In *(B) Out*

The main components of the hydraulic block outlet are shown in the figure. The hydraulic block outlet is used to take power out from the tractor to operate the implements that require hydraulic pressure.

AUXILIARY HYDRAULICS

JOYSTICK VALVE

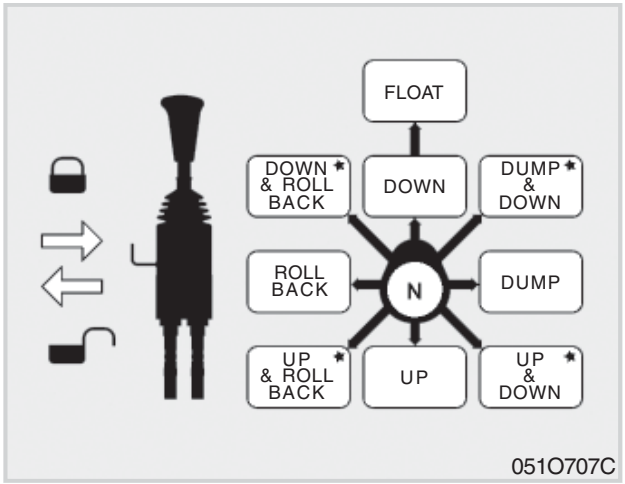


(T) To the Tank
(P) From the Pump
(A1) A1 PORT
(A2) A2 PORT
(B1) B1 PORT
(B2) B2 PORT

- *Boom Cylinder : A1,B1*
- *Bucket Cylinder : A2,B2*

NOTE

- When the lever is at each corner position marked by*, boom and bucket cylinders work at the same time. However, the position marked by cross is not recommended for scooping because of insufficient lift force.



To begin test operation, slightly move the control lever from the "N" position. Slowly raise the loader boom just enough for the bucket to clear the ground when fully dumped. Slowly work through the dump and roll back cycles.

IMPORTANT

- **If the boom or bucket does not work in the directions indicated in the label, lower the bucket to the ground, stop the engine, and relieve all hydraulic pressure. Recheck and correct all hydraulic connections.**

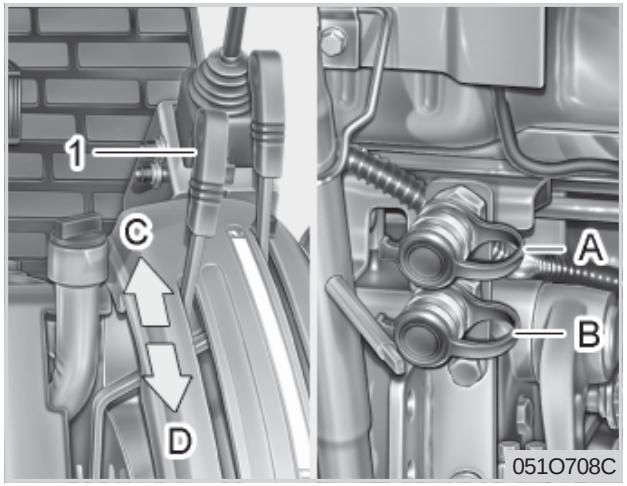
This loader control valve has two stage dump position. The first dump position by moving the lever to the right is the “Regular” dump position.

It has good power and control for dumping precisely. This position should be used when operating another implement with the loader’s control valve.

IMPORTANT

- **Do not move the control lever into float position when the bucket is off the ground.**

REMOTE CONTROL VALVE LEVER



(1) Remote Control Valve Lever
(A) A Port *(C) Push*
(B) B Port *(D) Pull*

Pressure ⇨
Returning ←

Port		Push	Pull
Lever1	A	Out ←	In ⇨
	B	In ⇨	Out ←

	Coupler Size
Port A, B, C, D	PT 1/2″

Move the lever up or down and hold. This will raise or lower the implement.

IMPORTANT

- **Do not hold the lever in the "pull" or "push" position once the remote cylinder has reached the end of the stroke, as this will cause oil to flow through the relief valve. Forcing oil through the relief valve for extended periods will overheat the oil.**
- **When using the tractor hydraulic system to power front loader, do not operate boom and bucket cylinders simultaneously.**

COUPLER CONNECTING AND DISCONNECTING

⚠ CAUTION

To avoid personal injury:

- **Stop the engine and relieve pressure before connecting or disconnecting lines.**
- **Do not use your hand to check for leaks.**

CONNECTING

1. Clean both couplers.
2. Remove dust plugs.
3. Insert the implement coupler to the tractor hydraulic coupler.
4. Pull the implement coupler slightly to make sure couplers are firmly connected.

DISCONNECTING

1. Lower the implement first to the ground to release hydraulic pressure in the hoses.
2. Clean the couplers.
3. Relieve pressure by moving hydraulic control levers with engine shut off. Pull the hose straight from the hydraulic coupler to release it.
4. Clean oil and dust from the coupler, then replace the dust plugs.

NOTE

- Your local **KIOTI** Dealer can supply parts to adapt couplers to hydraulic hoses.

TIRES, TREAD AND BALLAST

8

TIRES

⚠ WARNING

To avoid personal injury:

- ***Do not attempt to mount a tire. This should be done by a qualified person with the proper equipment.***
- ***Always maintain the correct tire pressure.***
  Do not inflate tires above the recommended pressure shown in the operator's manual.

IMPORTANT

- **Do not use tires larger than specified.**
- **When you intend to mound different size of tires from equipped ones, consult your dealer about front drive gear ratio for details. Excessive wear of tires may occur due to improper gear ratio.**

INFLATION PRESSURE

Though the tire pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time. Thus, check it everyday and inflate as necessary.

	Tire sizes		Inflation Pressure
Rear	AG	9.5 - 16, 6PR	207 kPa (2.1 kgf/cm^2, 30 psi)
	TURF	33 x 12.5 - 16.5, 4PR	207 kPa (2.1 kgf/cm^2, 30 psi)
	IND	12 - 16.5, 6PR	276 kPa (2.8 kgf/cm^2, 40 psi)
Front	AG	6 - 12, 4PR	193 kPa (2.0 kgf/cm^2, 28 psi)
	TURF	23 x 8.50 - 12, 4PR	152 kPa (1.5 kgf/cm^2, 22 psi)
	IND	23 x 8.50 - 12, 6PR	241 kPa (2.5 kgf/cm^2, 35 psi)

NOTE

- Maintain the maximum pressure in front tires, if using a front loader or when equipped with a full load of front weights.

TREAD

FRONT WHEELS

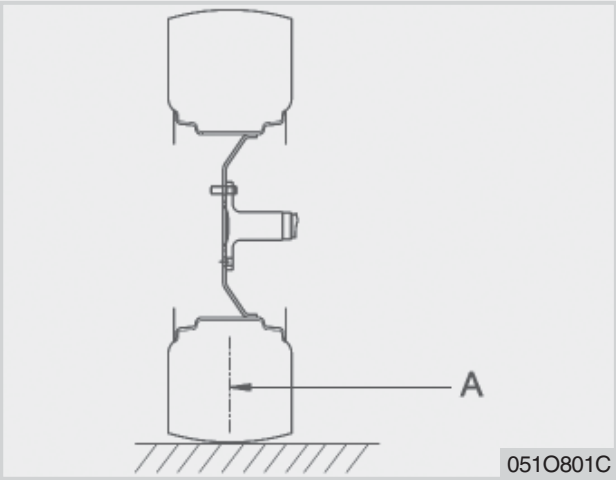
Front tread can not be adjusted.

IMPORTANT

- **Do not turn front discs to obtain wider tread.**

NOTE

- IND… for Industrial



(A) Tread

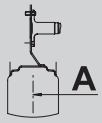
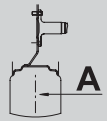
Models	CK 22, CK22H		
Tires	6 - 12 Ag	23x8.50-12 Turf	23x8.50-12 IND
Tread	909 mm (35.8 in.)	1,014 mm (39.9 in.)	1,014 mm (39.9 in.)

REAR WHEELS

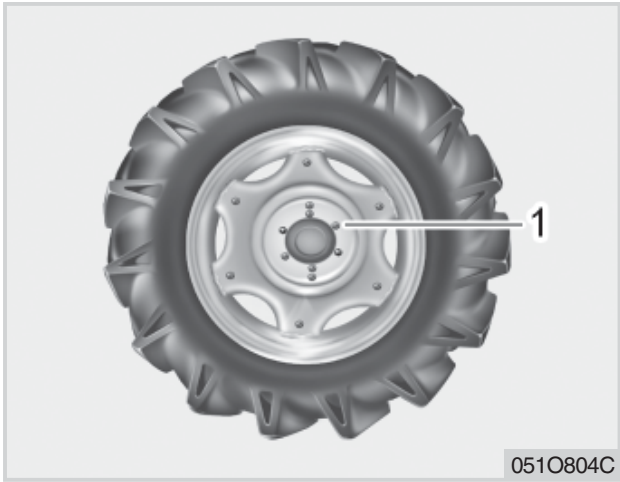
Rear wheel tread width can be adjusted as shown with the standard equipment tires.

To change the tread width.

1. Remove the wheel rim and the disk mounting bolts.
2. Change the position of the rim and disk to the desired position, and then tighten the bolts.

Models	 A	 A
CK22, CK22H 9.5 - 16 Ag	890 mm (35 in.)	935 mm (36.8 in.)
CK22, CK22H 33x12.5-16.5Turf	-	995 mm (39.2 in.)
CK22, CK22H 12 - 16.5 IND	-	1,015 mm (40 in.)

A: Tread



(1) 215 N·m (22 kgf·m, 160 lbs·ft)

IMPORTANT

- **Always attach tires as shown in the drawings.**
- **If not attached as illustrated, transmission parts may be damaged.**
- **When re-fitting or adjusting a wheel, tighten the bolts to the following torques then recheck after driving the tractor 200 m (200 yards) and thereafter according to service interval. (See “MAINTENANCE” section)**

BALLAST (OPTIONAL)

FRONT BALLAST

(1) Front End Weights
(2) Rear Wheel Weights

⚠ CAUTION

To avoid personal injury:

- **Additional ballast will be needed for transporting heavy implements. When the implement is raised, drive slowly over rough ground, regardless of how much ballast is used.**
- **Do not fill the front wheel with liquid to maintain steering control.**

FRONT END WEIGHTS

Front end weights can be attached to the front of the tractors frame. You should consult your implement owner's manual for the required amount of weight or contact your local **KIOTI** dealer for a recommendation.

IMPORTANT

- **Never overload the tires.**
- **Do not add more weight than is necessary, or is indicated in chart.**

Maximum weight	17 kg X 3 Pieces (112 lbs.)

REAR BALLAST

Weight should be added to the rear wheels only if it is needed to improve traction or stability. The amount of weight should directly correspond to the job at hand and should be removed when not needed.

The weight should be added to the rear wheel weights.

REAR WHEEL WEIGHTS

The rear wheel weights can be attached to the rear wheel. See your implement owner's manual for the proper amount of weight or consult your local **KIOTI** dealer.

IMPORTANT

- **Do not overload tires.**
- **Add no more weight than indicated in chart.**

Maximum weight per wheel	20 kg X 2 Pieces (88.2 lbs.)

MAINTENANCE

9

SERVICE INTERVALS

NO.	PERIOD		PERIODICAL CHECK																SINCE THEN	REFERENCE
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
1	Engine oil	Change	⊙	o															Every100Hr	10-8
2	Engine oil filter	Replace	⊙			o													Every200Hr	10-8
3	Hydraulic oil filter	Replace	⊙			o													Every200Hr	10-10
4	Transmission oil filter(HST)	Replace	⊙			o													Every200Hr	10-10
5	Transmission fluid	Change	⊙							o									Every400Hr	10-11
6	Front axle case oil	Change	⊙							o									Every400Hr	10-12
7	Greasing	-	o																Every50Hr	10-13
8	Engine start system	Check	o																Every50Hr	
9	Wheel bolt torque	Check	o																Every50Hr	10-14
10	Battery condition	Check		o															Every100Hr	10-17
11	Air cleaner element	Clean		o															Every100Hr	10-17
		Replace																	Every1year	10-23
12	Fuel filter element	Check		o															Every100Hr	10-14
		Replace								o									Every400Hr	10-22
13	Fan belt	Adjust		o															Every100Hr	10-19
14	Clutch	Adjust	⊙	o															Every100Hr	10-9
15	Brake	Adjust		o															Every100Hr	10-16
16	Adjusting front axle pivot	Adjust																	Every200Hr	
17	Radiator hose and clamp	Check												o					Every600Hr	10-20
		Change																	Every2years	10-25
18	Power steering oil line	Check				o												o	Every200Hr	10-20
		Replace																	Every2years	10-25

NO.	PERIOD		PERIODICAL CHECK																SINCE THEN	REFERENCE PAGE
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
19	Fuel line	Check		o															Every100Hr	10-15
		Replace																	Every2years	10-25
20	HST oil line	Check				o													Every200Hr	10-20
		Replace																	Every2years	10-25
21	Toe-in	Adjust				o												o	Every200Hr	10-21
22	Engine valve clearance	Adjust																o	Every800Hr	10-23
23	Cooling system	Flush																	Every2years	10-24
24	Coolant	Change																	Every2years	10-24
25	Fuel system	Bleed																	Service as required	10-26
26	Clutch housing water	Drain																		10-26
27	Fuse	Replace																		10-27
28	Light bulb	Replace																		10-28
29	HST netural spring	Adjust		o															Every100Hr	

IMPORTANT

- **The jobs indicated by ⊙ must be done after the first 50 hours of operation.**

LUBRICANTS

To prevent serious equipment damage, use only genuine KIOTI fluids, oils and greases, or equivalents.

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Locations</th><th colspan="2">Capacities</th><th rowspan="2">Lubricants</th></tr>
<tr><th>CK22HST</th><th>CK22</th></tr>
<tr><td>1</td><td>Fuel</td><td colspan="2">20ℓ (5.28 U.S.gal.)</td><td>No.2-D diesel fuel
No.1-D diesel fuel if temperature is below -10°C (14°F)</td></tr>
<tr><td>2</td><td>Coolant</td><td colspan="2">5.7ℓ (1.50 U.S.gal.)</td><td>Fresh clean water with anti-freeze</td></tr>
<tr><td>3</td><td>Engine crankcase</td><td colspan="2">3.2ℓ (0.84 U.S.gal.)</td><td>Engine oil: API Service Classification CC or CD
<table><tr><td>Above 25°C (77°F)</td><td>SAE30, SAE10W-30 or 15W-40</td></tr><tr><td>0 to 25°C (32 to 77°F)</td><td>SAE20, SAE10W-30 or 15W-40</td></tr><tr><td>Below 0°C (32°F)</td><td>SAE10W, SAE15W-30 or 10W-30</td></tr></table></td></tr>
<tr><td>4</td><td>Transmission case</td><td>18.5ℓ
(4.89 U.S.gal.)</td><td>21.6ℓ
(5.71 U.S.gal.)</td><td><table><tr><td>Exxonmobil</td><td>Mobilfluid 423 or 424
Exxon Hydraul 560</td></tr><tr><td>Shell</td><td>DONAX-TD/TD Plus</td></tr><tr><td>BP</td><td>Tractran UTH</td></tr></table></td></tr>
<tr><td>5</td><td>Front axle case
(4WD only)</td><td colspan="2">3.1ℓ (0.82 U.S.gal.)</td><td>T/M OIL OR SAE 90 gear oil</td></tr>
<tr><td rowspan="2">6</td><td>Greasing</td><td colspan="2">No. of greasing points</td><td>Capacity</td><td>Type of grease</td></tr>
<tr><td>Battery terminal</td><td colspan="2">2</td><td>Moderate amount</td><td>Multipurpose type grease</td></tr>
</table>

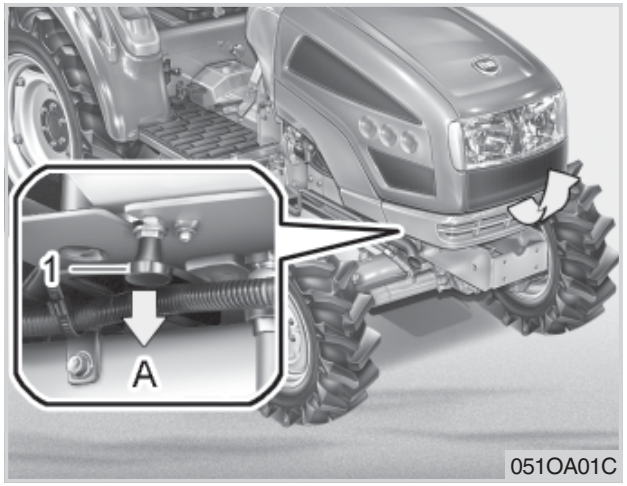
⚠ WARNING

- ***Check the oil level regularly.***
- ***Correct the oil level, if needed, before operating.***
- ***Always check and add oil with the tractor on a flat, level surface.***
- ***To prevent personal injury, always stop the engine and set the parking brake before performing any kind of service.***

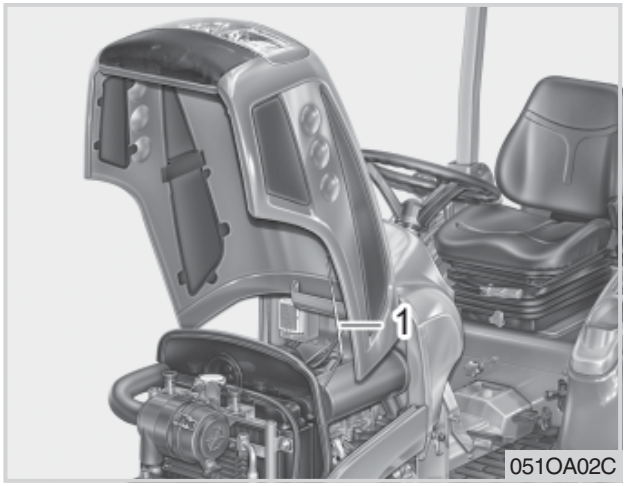
10

HOW TO OPEN THE HOOD

HOOD



(1) Knob (A) Pull



(1) Hood Rod

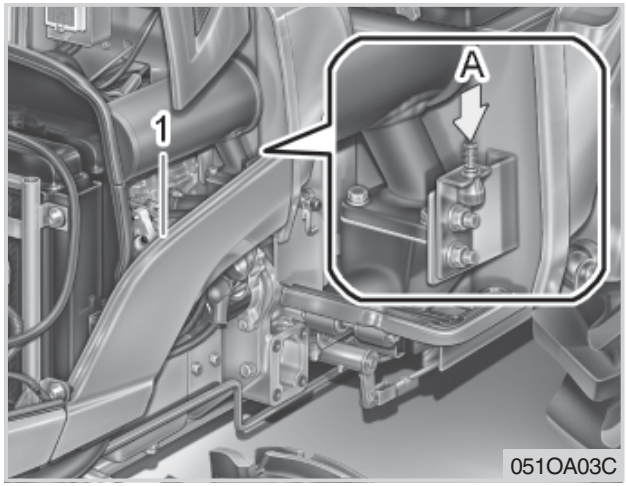
⚠ CAUTION

To avoid personal injury from contact with moving parts:

- **Never open the hood or engine side cover while the engine is running.**
- **Do not touch muffler or exhaust pipes while they are hot; severe burns could result.**

To open the tractors hood you should first pull the knob to release the latch.

ENGINE COVER



(1) Sider Cover (A) Push

To remove the side cover.

It is not necessary to remove the side cover to do daily check on your tractor.

DAILY CHECK

For your own safety and maximum service life of the machine, make a thorough daily inspection before starting and operating the machine.

⚠ CAUTION

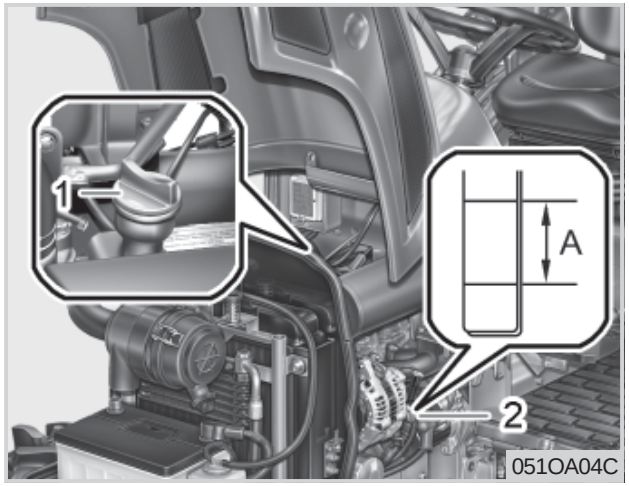
To avoid personal injury:

- **Be sure to check and service the tractor on a flat place with the engine shut off and the parking brake "ON".**

WALK AROUND INSPECTION

Look around and under the tractor for such items as loose bolts, trash build-up, oil or coolant leaks, broken or worn parts.

CHECKING ENGINE OIL LEVEL



(1) Oil Inlet (2) Dipstick
(A) Oil Level is Acceptable Within This Range.

IMPORTANT

- **When using an oil from a different maker or viscosity from the previous one, remove all of the old oil. Never mix two different types of oil.**
- **If oil level is low, do not run engine.**

⚠ CAUTION

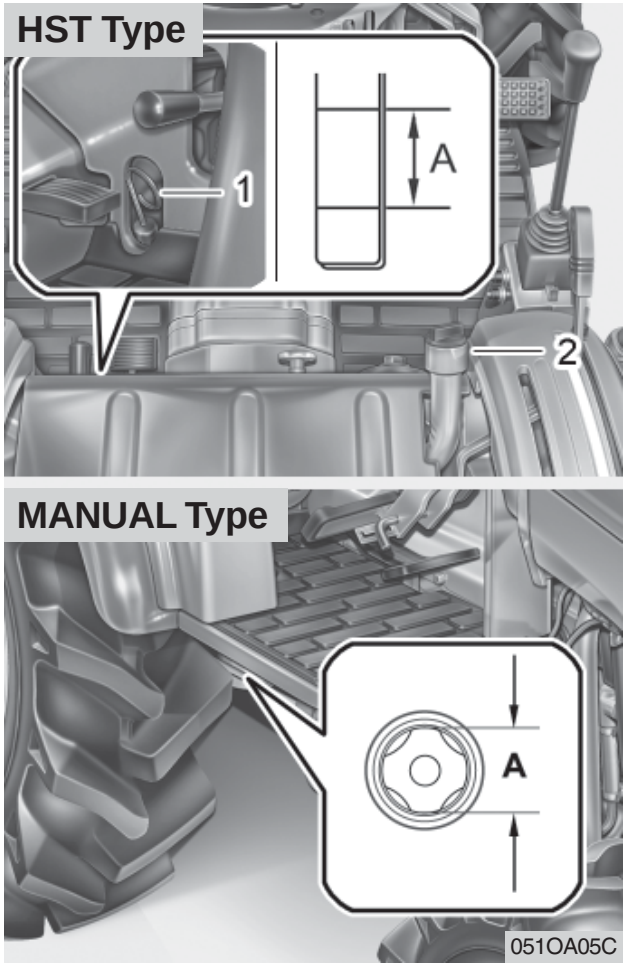
To avoid personal injury:

- **Be sure to stop the engine before checking the oil level.**

1. Park the machine on a flat surface.
2. Check engine oil before starting the engine or 5 minutes or more after the engine has stopped.
3. To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level lies between the two notches. If the level is too low, add new oil to the prescribed level at the oil inlet.

   (See "LUBRICANTS" in Maintenance Section)

CHECKING TRANSMISSION FLUID LEVEL



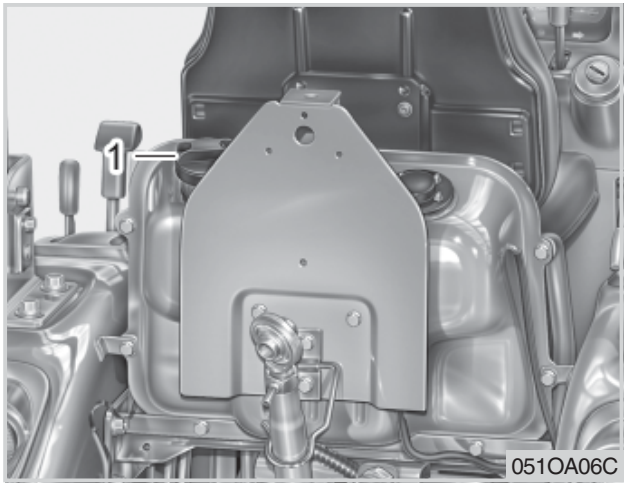
(1) Gauge (2) Oil Filler Plug
(A) Oil Level is Acceptable Within This Range.

CHECKING AND REFUELING

1. Park the machine on a flat surface, lower the implement and shut off engine.
2. Check the fluid level on the fluid level dipstick. If the level is too low, add new oil to the prescribed level at the oil inlet. (See "LUBRICANTS" in Maintenance Section)

IMPORTANT

- **If oil level is low, do not run engine.**



(1) Fuel Tank Cap

Fuel tank capacity	5.28 U.S.gals. (20 ℓ)

⚠ CAUTION

To avoid personal injury:

- **Do not smoke while refueling.**
- **Be sure to stop the engine before refueling.**

1. Turn the key switch to "ON", check the amount of fuel by fuel gauge.
2. Fill fuel tank when fuel gauge shows 1/4 or less fuel in tank.
3. Use for the winter season fuel at temperatures above 14 ° F (-10 ° C).

IMPORTANT

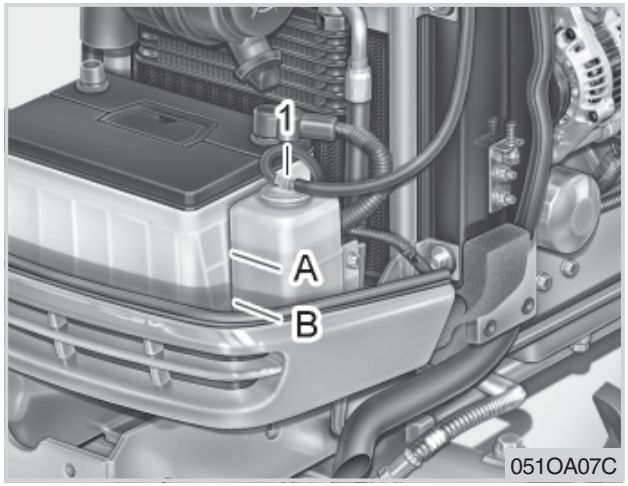
- **Do not permit dirt or trash to get into the fuel system.**
- **Be careful not to let the fuel tank become empty, otherwise air will enter the fuel system, necessitating bleeding before next engine start.**
- **Be careful not to spill fuel during refueling. If spills occur, wipe it off at once, as it may cause a fire.**
- **To prevent condensation (water) accumulation in the fuel tank, fill the tank before parking overnight.**
- **During cold, damp periods of the year or for tractors that sit for long periods, adding a fuel supplement to disperse water and add lubricity is recommended.**

NOTE

- No.2-D is a distillate fuel of lower volatility for engines in industrial and heavy mobile service. (SAE J313 JUN87)
- Grade of Diesel Fuel Oil According to ASTM D975.

Flash Point, ° F (° C)	Water and Sediment, volume %	Carbon Residue on, 10 percent Residuum, %	Ash, weight %
Min	Max	Max	Max
125 (52)	0.05	0.35	0.01

Distillation Temperatures, °F (°C) 90% Point		Viscosity Kinematic cSt or mm²/s at 104 °F(40°C)		Viscosity Saybolt, SUS at 100°F (38°C)		sulfur, weight %	Copper Strip Corrosion	Cetane Number
Min	Max	Min	Max	Min	Max	Max	Max	Min
540(282)	640(338)	1.9	4.1	32.6	40.1	0.50	No.3	40



(1) Recovery Tank
(A) FULL *(B) LOW*

⚠ CAUTION

To avoid personal injury:

- **Do not remove radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely.**

1. Check to see that the coolant level is between the "FULL" and "LOW" marks of recovery tank.
2. When the coolant level drops due to evaporation, add water only up to the full level.

   In case of leakage, add anti-freeze and water in the specified mixing ratio up to the full level.

   (See "Flush Cooling System and Changing Coolant" in every 2 years maintenance.)

IMPORTANT

- **If the radiator cap has to be removed, follow the caution above and securely retighten the cap.**
- **Use clean, fresh water and anti-freeze to fill the recovery tank.**
- **If water should leak, consult your local KIOTI dealer.**

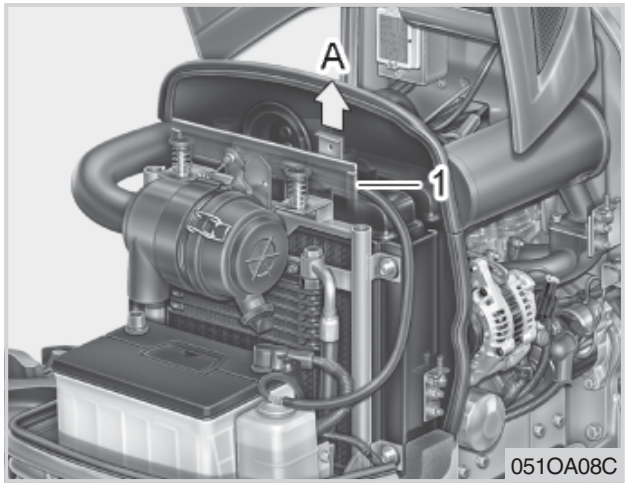
CHECKING BRAKE AND CLUTCH PEDALS

1. The brake and clutch pedals should be inspected for free travel, and smooth operation.
2. You should adjust these pedals if an incorrect measurement is found. (See "adjusting clutch and brake pedals" in the 100 hour maintenance schedule.)

NOTE

- Brake pedals should be equal when depressed.

CLEANING GRILL, RADIATOR SCREEN AND OIL COOLER SCREEN



(1) Radiator Screen (A) DETACH

⚠ CAUTION

To avoid personal injury:

- **Be sure to stop the engine before removing the screen.**
- **Engine/Radiator may be hot!**

1. Check front grill and side screens to be sure they are clean of debris.
2. Lift out the screen and remove all the foreign material. Replace screen.

IMPORTANT

- **Grill and screen must be clean from debris to prevent engine from overheating and to allow good air intake for the air cleaner.**

CHECKING GAUGES, METER AND EASY CHECKER

1. Inspect the instrument panel for broken gauge(s), meter(s) and Easy Checker lamps.
2. Replace if broken.

CHECKING HEAD LIGHT, HAZARD LIGHT ETC.

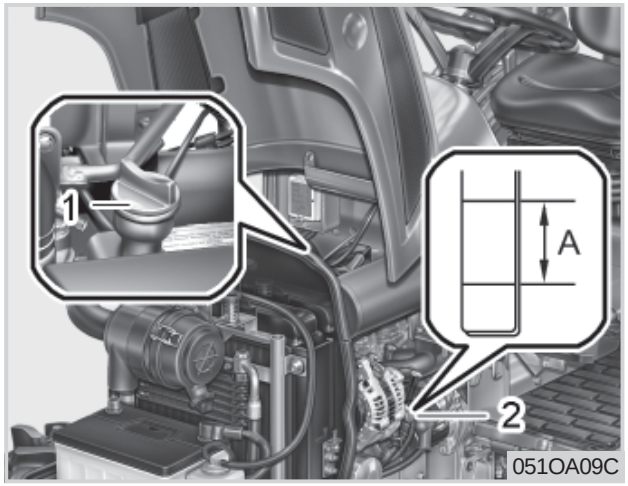
1. Inspect the lights for broken bulbs and lenses.
2. Replace if broken.

CHECKING SEAT BELT AND ROPS

1. Always check condition of seat belt and **ROPS** attaching hardware before operating tractor.
2. Replace if damaged.

INITIAL 50 HOURS

CHANGING ENGINE OIL

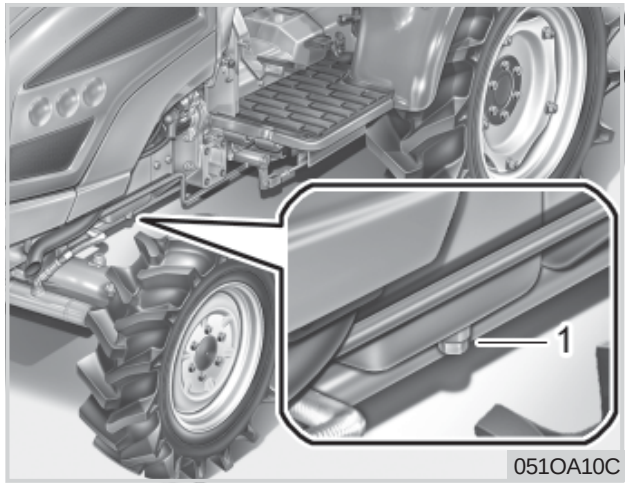


(1) Oil Inlet (2) Dipstick
(A) Oil level is acceptable within this range

⚠ CAUTION

To avoid personal injury:

- **Be sure to stop the engine before changing the oil.**
- **Allow engine to cool down sufficiently, oil can be hot and can burn.**



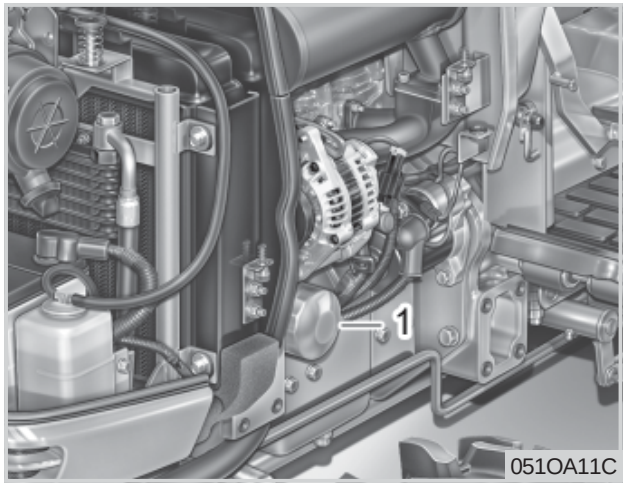
(1) Drain Plug

1. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan.

   All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plug.
3. Fill with the new oil up to the upper notch on the dipstick.

Oil capacity with filter	CK20	0849 U.S.gals. (3.2 ℓ)
	CK20H	

REPLACING ENGINE OIL FILTER



(1) Engine Oil Filter

⊕ IMPORTANT

- **To prevent serious damage to the engine, use only a KIOTI genuine filter.**

⚠ CAUTION

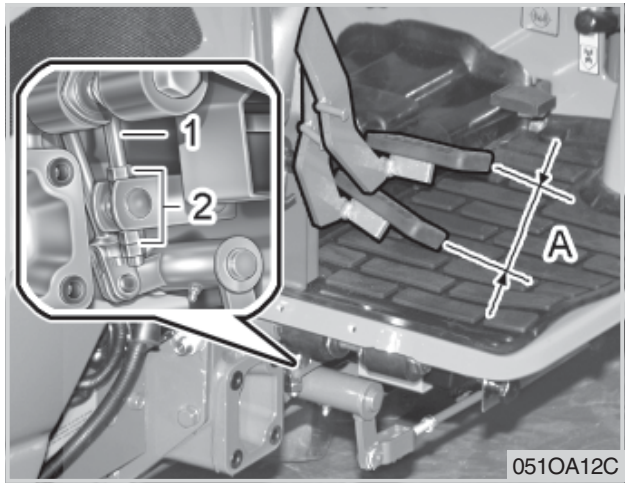
To avoid personal injury:

- **Be sure to stop the engine before changing oil filter cartridge.**
- **Allow engine to cool down sufficiently, oil can be hot and can burn.**

1. Place the oil pan under the engine.
2. Remove the oil filter.
3. Put a film of clean engine oil on the rubber seal of the new filter.
4. Tighten the filter quickly until it contacts the mounting surface.

   Tighten filter, by hand, an additional half turn only.
5. After the new filter has been replaced, the engine oil normally decreases a little. Make sure that the engine oil does not leak through the seal and be sure to check the oil level on the dipstick. Replenish the engine oil up to the prescribed level if necessary.

ADJUSTING CLUTCH PEDAL (MANUAL)

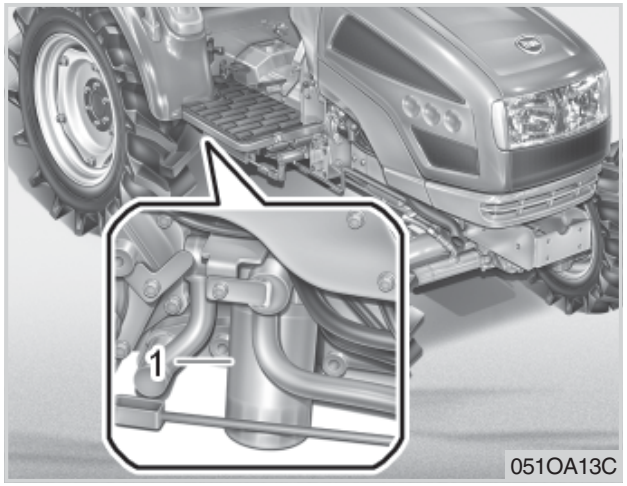


(1) Clutch Rod *(2) Nut*
(A) Free Travel

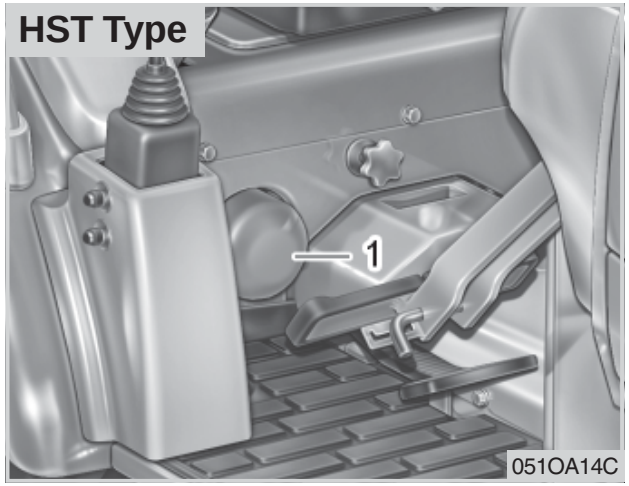
Proper clutch pedal free travel (A)	0.8 ~ 1.2 in. (20 ~ 30 mm) on the pedal

1. Stop the engine and remove the key.
2. Slightly depress the clutch pedal and measure free travel at top of pedal stroke.
3. If adjustment is needed, loosen the lock nut, remove the clevis pin and adjust the rod length within acceptable limits.
4. Retighten the lock nut and replace the clevis pin.

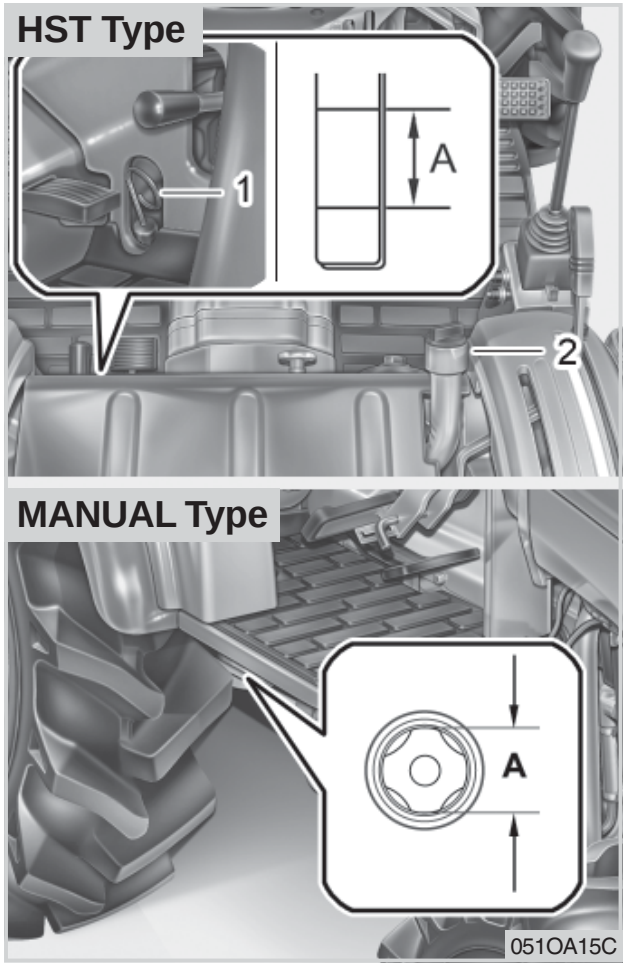
REPLACING HYDRAULIC OIL FILTER & TRANSMISSION OIL FILTER



(1) Hydraulic Oil Filter



(1) HST Oil Filter



(1) Gauge *(2) Oil Filler Plug*
(A) Oil level is acceptable within this range

⚠ CAUTION

To avoid personal injury:

- **Be sure to stop the engine before changing oil filter cartridge.**

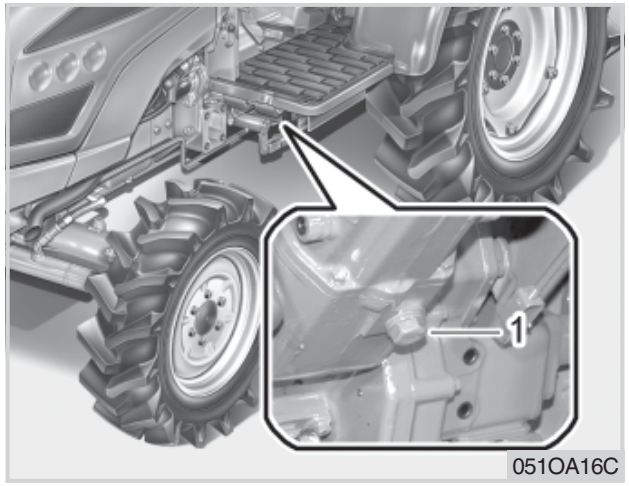
1. Place the oil pan under the hydraulic oil filter.
2. Remove the oil filter.
3. Place a film of clean transmission fluid to the rubber seal of the new filter.
4. Tighten the filter firmly until it contacts the mounting surface. Then tighten the filter, by hand, an additional half turn only.
5. After the new filter is in place, fill the transmission up with oil to the upper line of the oil gauge.
6. After running the engine for a few minutes, stop it and check the oil level again, add oil to the prescribed level.

7. Make sure that the transmission fluid doesn't leak through the seal.
8. HST models have a hydraulic filter and HST filter.

IMPORTANT

- **To prevent serious damage to the hydraulic system, use only a genuine KIOTI filter.**

CHANGING TRANSMISSION FLUID



(1) Drain Plugs

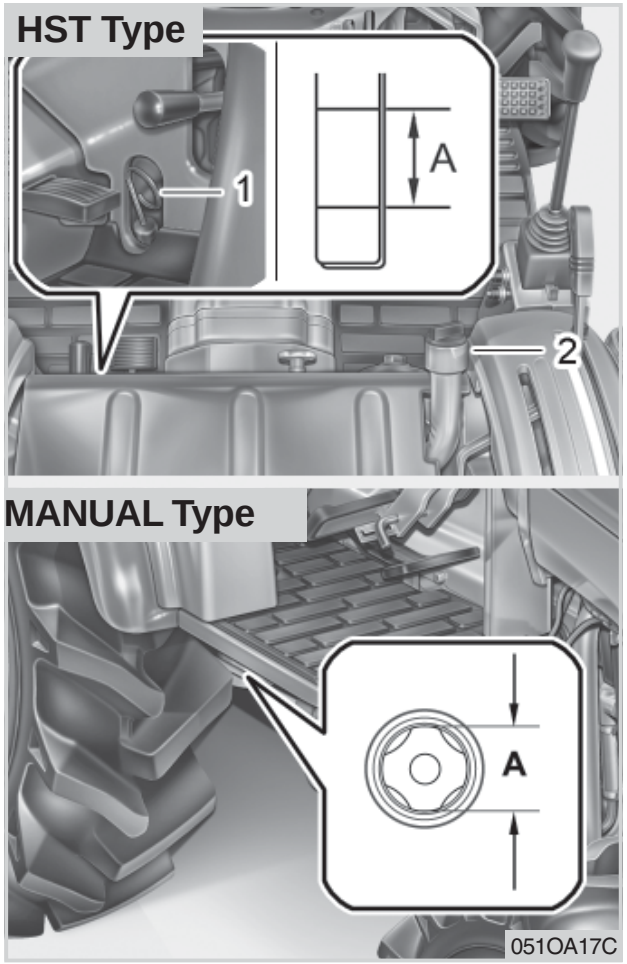
IMPORTANT

- **Do not operate the tractor immediately after changing the transmission fluid.**
- **Run the engine at medium speed for a few minutes to prevent damage to the transmission.**

CAUTION

To avoid personal injury:

- **Allow engine to cool down sufficiently, oil can be hot and can burn.**



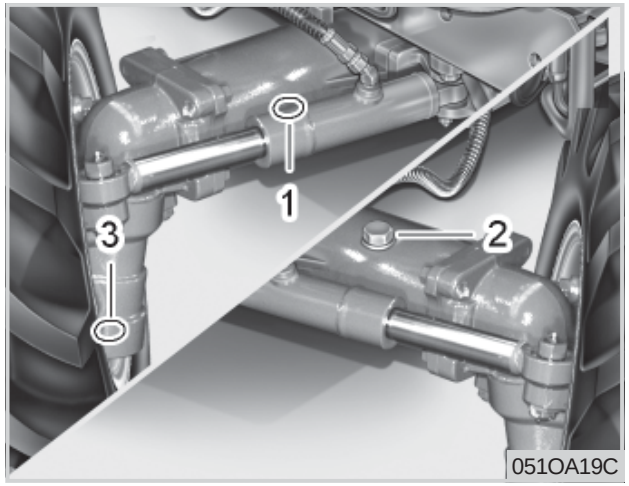
(1) Gauge *(2) Oil Filler Plug*
(A) Oil level is acceptable within this range

1. To drain the used oil, remove the drain plugs at the bottom of the transmission case and differentials. Drain the oil completely into a drain pan.
2. After draining reinstall the drain plug.
3. Fill with the new fluid to the upper line of the gauge.

   (See "LUBRICANTS" in Maintenance Section)
4. After running the engine for a few minutes, stop it and check the oil level again; add oil to prescribed level.

Oil capacity	CK20	4.89 U.S.gals. (18.5 ℓ)
	CK20H	5.71 U.S.gals. (21.6 ℓ)

CHANGING FRONT AXLE CASE OIL



(1) Check Plug *(2) Filling Plug*
(3) Drain Plug

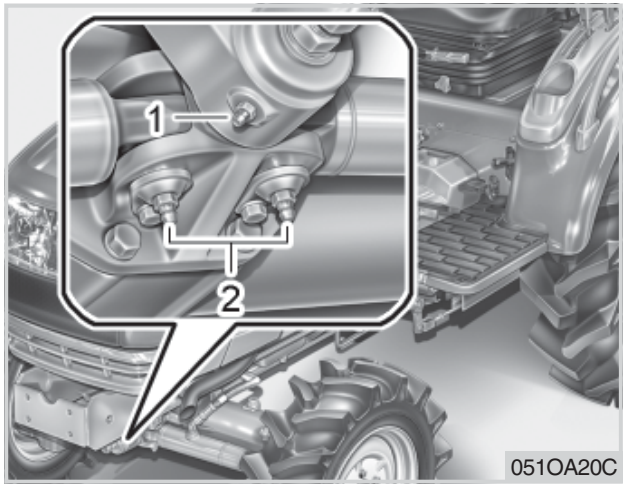
1. Remove the filling plug from the left top and the drain plugs from the both side bottom and drain oil.
2. Install the drain plugs to the both side bottom and fill the reservoir with oil.
3. Check oil level with an oil gauge. (Refer to section 10-10 or 10-27).

Oil Capacity	0.82 U.S.gals. (3.1 ℓ)

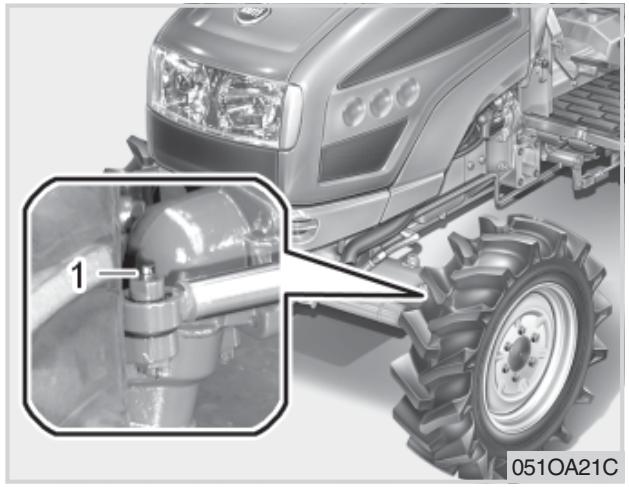
EVERY 50 HOURS

LUBRICATING GREASE FITTINGS

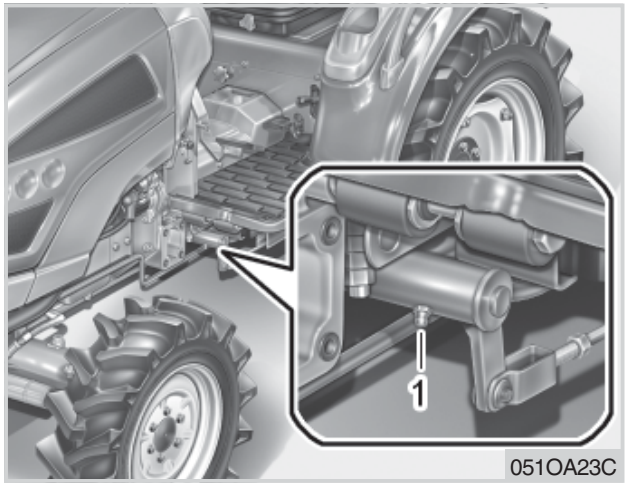
You should apply a small amount of multi-purpose grease to the following points every 50 hours or as needed.
If your tractor is operated in extremely wet, muddy, or dusty conditions you should lubricate the fittings more often.



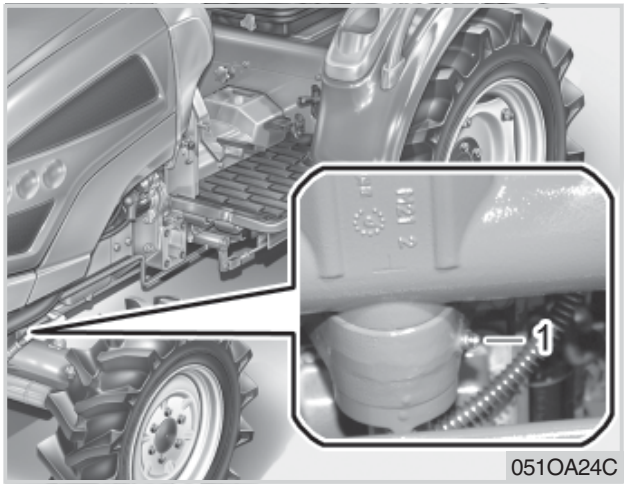
(1) Grease Fitting (Front bracket axle pivot)
(2) Grease Fitting (Power steering cylinder)(RH,LH)



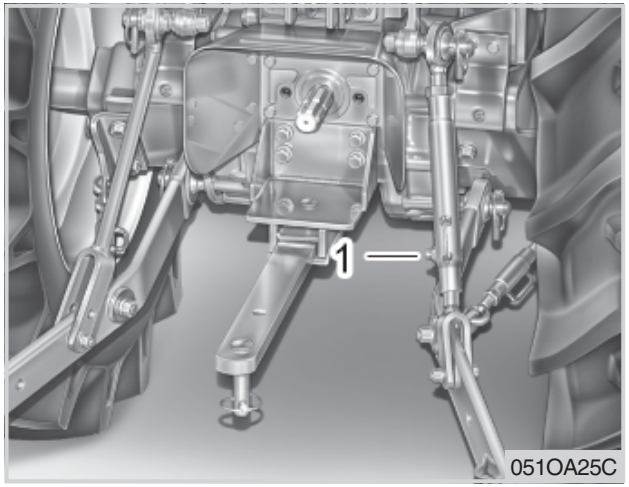
(1) Grease Fitting (Power steering cylinder) (RH, LH)



(1) Grease Fitting (Brake Lever RH, LH)



(1) Grease Fitting (Rear Bracket Axle Pivot)



(1) Grease Fitting (RH)(Lift Rod)

CHECKING WHEEL BOLT TORQUE

(1) Bolt : 83N.M (8.5kgf·m, 62lbf·ft)
Nut : 68N.M (7kgf·m, 50lbf·ft)
(2) Bolt, Nut : 215N.M (22kgf·m, 160lbf·ft)

⚠ CAUTION

To avoid personal injury:
- **Never operate tractor with a loose rim, wheel, or axle.**
- **Any time bolts and nuts are loosened, retighten to specified torque.**
- **Check all bolts and nuts frequently and keep them tight.**

Check wheel bolts and nuts regularly especially when new. If they are loose, tighten them as follows.

EVERY 100 HOURS

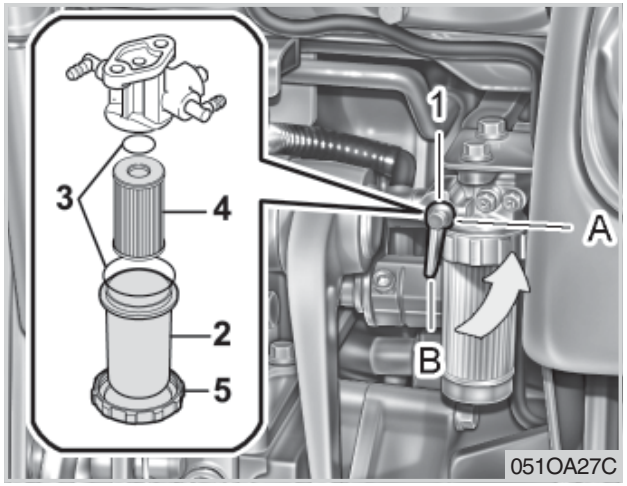
CHANGING ENGINE OIL

See "Initial 50 hours" in page 10-8.

ADJUSTING BRAKE PEDAL

See "Initial 50 hours" in page 10-16.

CHECKING FUEL FILTER



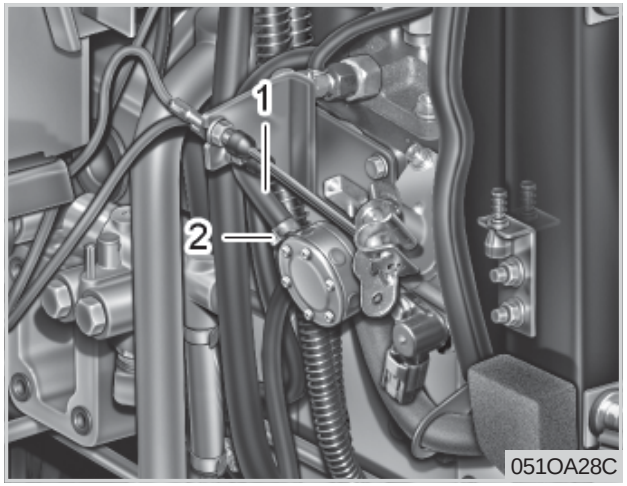
(1) Fuel Cock *(2) Filter Bowl*
(3) O-Ring *(4) Filter Element*
(5) Screw Ring
(A) Close *(B) Open*

⊕ IMPORTANT

- **If dust and dirt enters the fuel system, the fuel pump and injection nozzles are subject to premature wear. To prevent this, be sure to check the fuel filter bowl and element periodically.**

1. Check for water and deposits bowl.
2. Replace fuel filter element if necessary(See "Replacing fuel filter element" in page 10-22).

CHECKING FUEL LINE



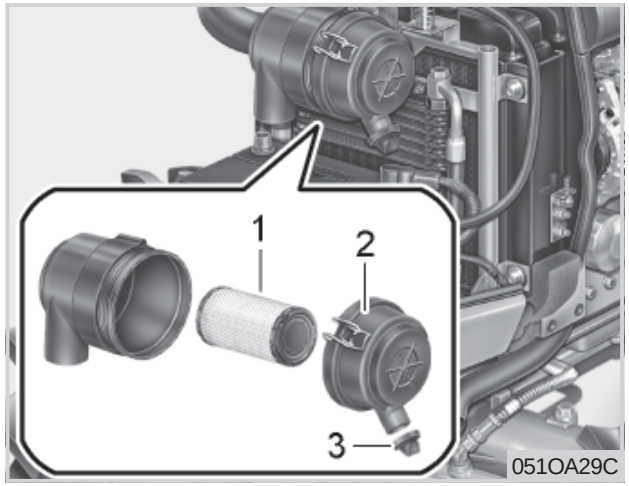
(1) Fuel Lines *(2) Clamp Bands*

1. Check to see that all lines and hose clamps are tight and not damaged.
2. If hoses and clamps are found worn or damaged, replace or repair them at once.

NOTE

- **If the fuel line is removed, be sure to properly bleed the fuel system.**
  (See "Bleeding Fuel System" in as required maintenance)

CLEANING AIR CLEANER PRIMARY ELEMENT



(1) Element *(3) Evacuator Valve*
(2) Cover

1. Remove the air cleaner cover and element.
2. Clean the element:
   1) When dry dust adheres to the element, blow compressed air from the inside, turning the element. Pressure of compressed air must be under 99 psi (7 kgf/cm^2, 686 kPa).
   2) When carbon or oil adheres to the element, soak the element in detergent for 15 minutes then wash it several times in water, rinse with clean water and dry it naturally. After element in fully dried, inspect inside of the element with a light and check if it is damaged or not.
3. Replace air cleaner element:

   Once yearly or after every sixth cleaning, whichever comes first.

NOTE

- Check to see if the evacuator valve is blocked with dust.

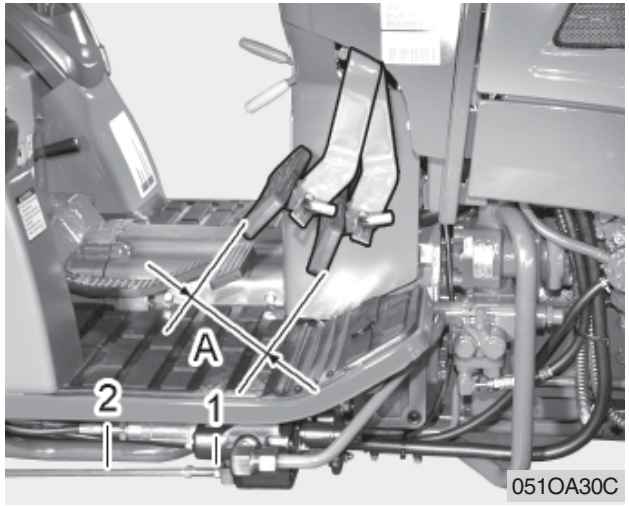
IMPORTANT

- **The air cleaner uses a dry element, never apply oil.**
- **Do not run the engine with filter element removed.**
- **Be sure to refit the cover with the arrow ⬆ (on the rear of cover) upright. If the cover is improperly fitted, evacuator valve will not function and dust will adhere to the element. (See "Replacing Air Cleaner Secondary Element" in Every 1 Year maintenance.)**

EVACUATOR VALVE

Open the evacuator valve once a week under ordinary conditions - or daily when used in a dusty place - to get rid of large particles of dust and dirt.

ADJUSTING BRAKE PEDAL



(1) Brake Rod *(2) Turnbuckle*
(A) Free Travel

⚠ CAUTION

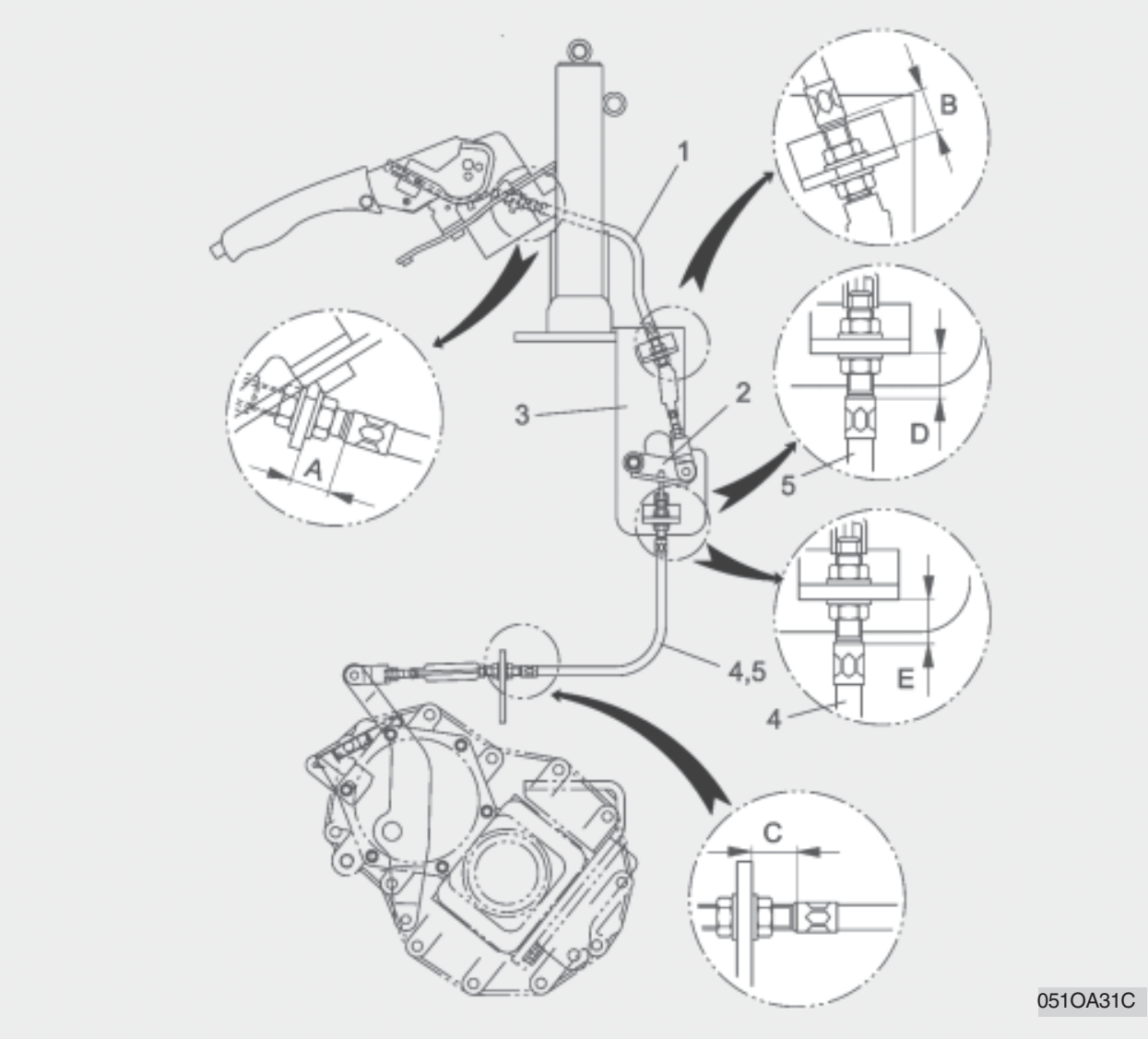
To avoid personal injury:

- **Stop the engine and chock the wheels before checking brake pedal.**

Proper brake pedal free travel (A)	0.787 ~ 0.181 in. (20 ~ 30 mm) on the pedal.
	Keep the free travel in the right and left brake pedals equal.

1. Release the parking brake
2. Slightly depress the pedals and measure the free travel at the top of the pedal stroke.
3. When adjustments are needed, loosen the locking nut and turn the turnbuckle until the rod length is at the desired and acceptable limit.
4. Re-tighten the lock nuts.

ADJUSTING HANDBRAKE (ONLY EU-CK20)



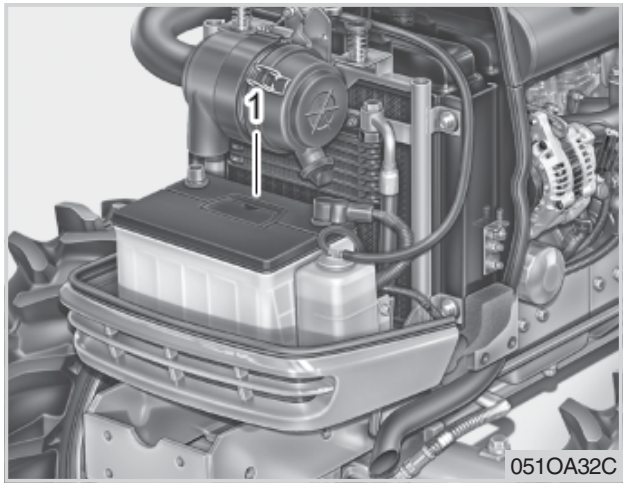
(1) Parking Brake Wire
(2) Parking Brake Bracket
(3) Parking Brake Bracket 1
(4) Parking Brake Wire 1
(5) Parking Brake Wire 3

1. Please adjust the parking brake wire by following the assembling dimensions as shown.
   (A) : 19 mm
   (B) : 17 mm
   (C) : 15 mm
   (D) : End play Adjustment
   (E) : End play Adjustment
2. Please be careful not to bend the parking brake wire for assembling it.
3. Please fasten the nut securely not to be loosen the parking brake wire.
4. Please assemble the ballof wire to keep on moving freely.

⚠ CAUTION

- **The adjustment of the parking brake wire should be followed by adjusting the end play of the brake pedal.**

BATTERY



(1) Battery

⚠ CAUTION

To avoid personal injury:

- **Keep electrolyte away from eyes, hands and clothes. If you are spattered with it, wash it away completely with water immediately and call your local poison information center.**
- **Wear eye protection and rubber gloves when working around the battery.**

Mishandling or abuse of the battery can shorten the service life and adds to maintenance cost of the tractor.

If the battery is weak it will cause the engine to be hard to start and also make lights dim. It is important to check the battery periodically.

BATTERY CHARGING

⚠ CAUTION

To avoid personal injury:

- **When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.**
- **When disconnecting the cable from the battery, start with the negative terminal first.**
- **When connecting the cable to the battery, start with the positive terminal first.**
- **Never check battery charge by placing a metal object across the posts. Use a voltmeter or load tester.**

1. The water in the electrolyte evaporates during recharging. Liquid shortage damages the battery. Excessive liquid spills damages the tractor body.
2. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
3. A boost charge is only for emergencies. It will partially charge the battery at a high rate and in a short time.

   When using a boost-charged battery, it is necessary to recharge the battery as early as possible.

   Failure to do this will shorten the battery's service life.
4. When exchanging an old battery for a new one, use battery of equal specification shown in table 1.

Table 1

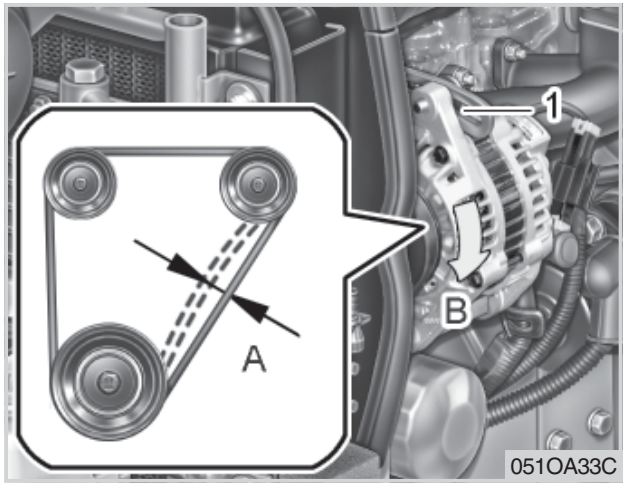
Tractor model	Battery TYPE	Volts (v)
CK22 CK22H	535MF(AU) DELKORDF65D(EU)	12

DIRECTION FOR STORAGE

1. When storing the tractor for a long period, remove the battery from tractor and store in a dry place out of direct sunlight.
2. The battery self-discharges while it is stored.

   Recharge it once every three months in hot seasons and once every six months in cold seasons.

ADJUSTING FAN BELT TENSION



(1) Bolt
(A) Check the Belt Tension
(B) To Tighten

⚠ CAUTION

To avoid personal injury:
- **Be sure to stop the engine before checking belt tension.**

Proper fan belt tension	A deflection of between 0.28 ~ 0.34 in. (7 ~ 9 mm) when the belt is pressed in the middle of the span.

1. Stop the engine and remove the key.
2. Apply moderate thumb pressure to belt between pulleys.
3. If tension is incorrect, loosen the alternator mounting bolts and, using a lever placed between the alternator and the engine block, pull the alternator out until the deflection of the belts falls within acceptable limits.
4. Replace fan belt if it is damaged.

EVERY 200 HOURS

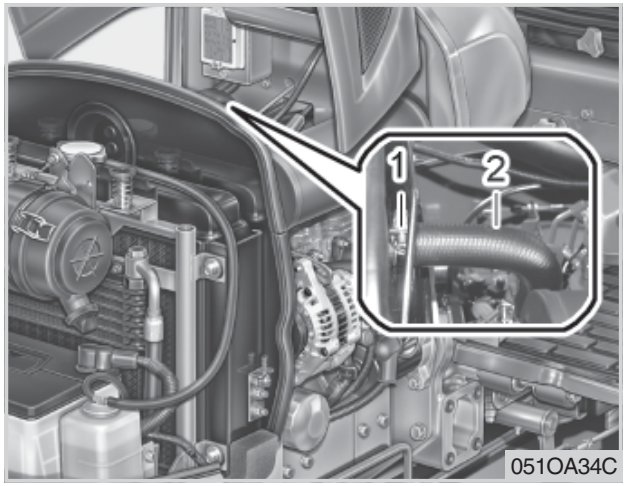
REPLACING ENGINE OIL FILTER

See "Initial 50 hours" in page 10-8.

REPLACING HYDRAULIC OIL FILTER & TRANSMISSION OIL FILTER

See "Initial 50 hours" in page 10-10.

CHECKING RADIATOR HOSE AND CLAMP



(1) Clamp
(2) Radiator Hoses

Check to ensure the radiator hoses are free from damage and are tightened properly every 200 hours or every 6 months, whichever comes first.

1. If the hose clamps are loose or water leaks from hose, tighten clamps securely.
2. If the radiator hoses are swollen, hardened, cracked, or otherwise damaged, you must replace the hose.

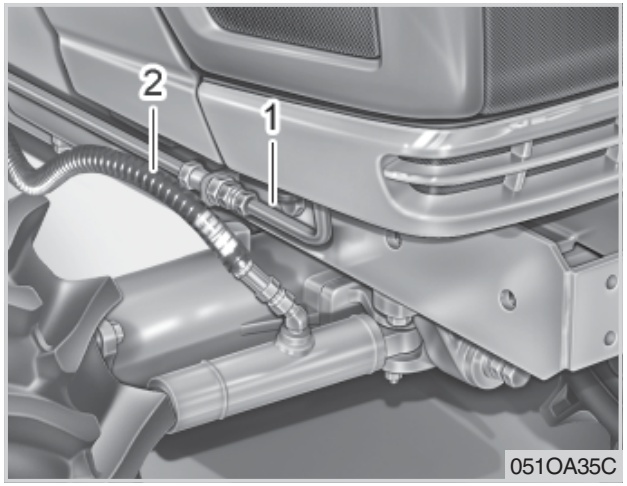
It is a good practice to replace the radiator hoses once every two years.

PRECAUTION AT OVERHEATING

Take the following actions in the event the coolant temperature reaches the boiling point, what is called "Overheating"

1. Stop the machine operation in a safe place and keep the engine unloaded idling.
2. Don't stop the engine suddenly, but stop it after about 5 minutes of unloaded idling.
3. Keep yourself well away from the machine for 10 minutes or while the steam blows out.
4. Once the engine has cooled down, remove any debris, dirt causing overheating. Refill the radiator and start the engine again. If the overheating issue is a result of a mechanical issue/failure, consult your **KIOTI** dealer for repairs.

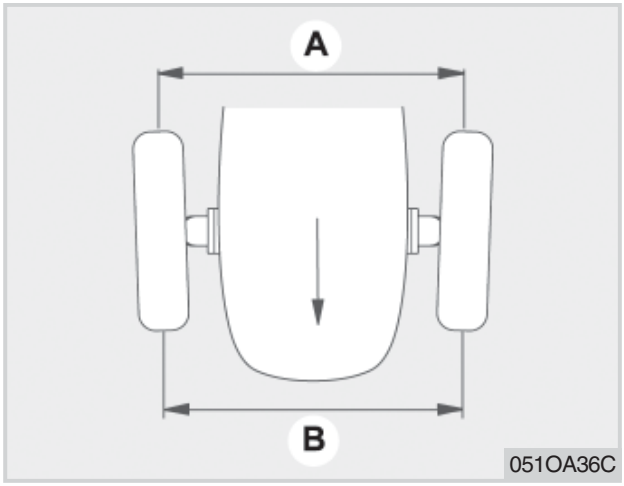
CHECKING HST OIL LINE & POWER STEERING LINE



(1) HST Oil Line
(2) Power Steering Line

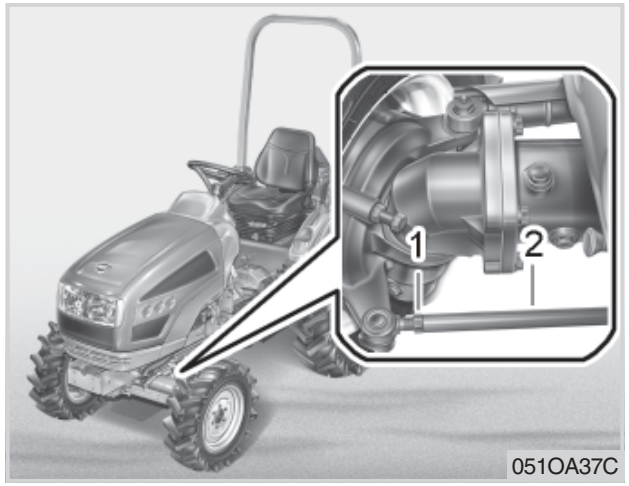
1. Check to see that all hydraulic lines and hose clamps are tight and undamaged.
2. If damage is found, replace the hose or clamp at once.

ADJUSTING TOE-IN



(A) Wheel - to - wheel distance at front
(B) Wheel - to - wheel distance at rear

1. Park tractor on a flat place.
2. Turn steering wheel so front wheels are in the straight ahead position.
3. Lower the implement, lock the parking brake and stop the engine.
4. Measure distance between tire beads (center) at front of tire, hub height.
5. Measure distance between tire beads at rear of tire, hub height.
6. Front distance should be 0.079 ~ 0. 315 in.(2 ~ 8 mm) less than rear distance. If not, adjust tie rod length.



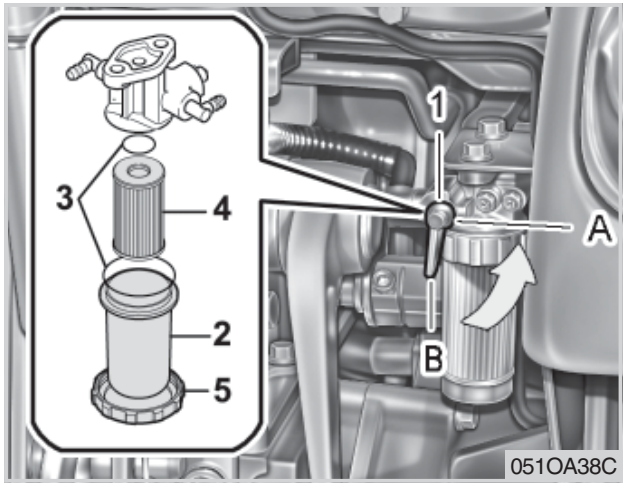
(1) Lock Nuts *(2) Tie Rod*

ADJUSTING PROCEDURE

1. Loosen the lock nut and turn the turnbuckle to adjust the rod length until the proper toe-in measurement is obtained.
2. Retighten the lock nut.

EVERY 300 HOURS

REPLACING FUEL FILTER ELEMENT



(1) Fuel Cock
(2) Fuel Filter Bowl
(3) O-Ring
(4) Filter Element
(5) Screw Ring
(A) Close
(B) Open

IMPORTANT

- **If dust and dirt enters the fuel system, the fuel pump and injection nozzles are subject to premature wear. To prevent this, be sure to clean the fuel filter bowl and element periodically.**

This job can be done in the field but in a clean place.

1. Close the fuel cock.
2. Unscrew the ring and remove the filter bowl. Rinse the inside with kerosene.
3. Take the filter element out and replace it.
4. After replacing you should reassemble the filter element, making sure that it is free from dust and dirt.
5. Bleed the fuel system. (See "Bleeding the fuel System" in the service section)

EVERY 400 HOURS

CHANGING TRANSMISSION FLUID

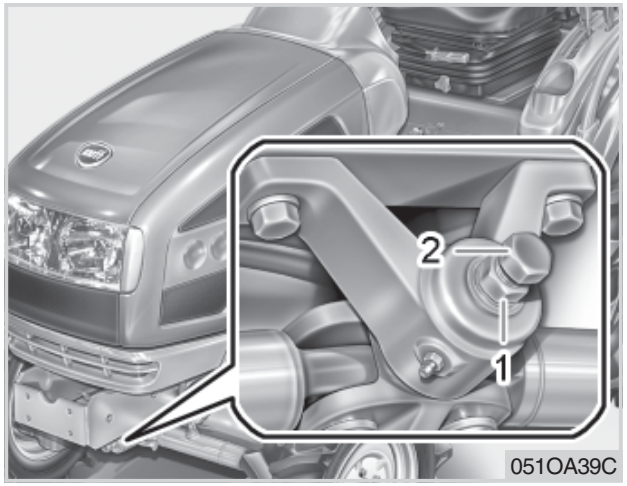
See "Initial 50 hours" in page 10-11.

CHANGING FRONT AXLE CASE OIL

See "Initial 50 hours" in page 10-11.

EVERY 600 HOURS

ADJUSTING FRONT AXLE PIVOT



(1) Lock Nut *(2) Adjusting Screw*

If the front axle pivot pin adjustment is not correct, front wheel vibration can occur causing vibration in the steering wheel.

ADJUSTING PROCEDURE

Loosen the lock nut, tighten the adjusting screw all the way, and then loosen the screw by 1/6 turn. Retighten the lock nut.

EVERY 800 HOURS

ADJUSTING ENGINE VALVE CLEARANCE

Consult your local **KIOTI** dealer for this service.

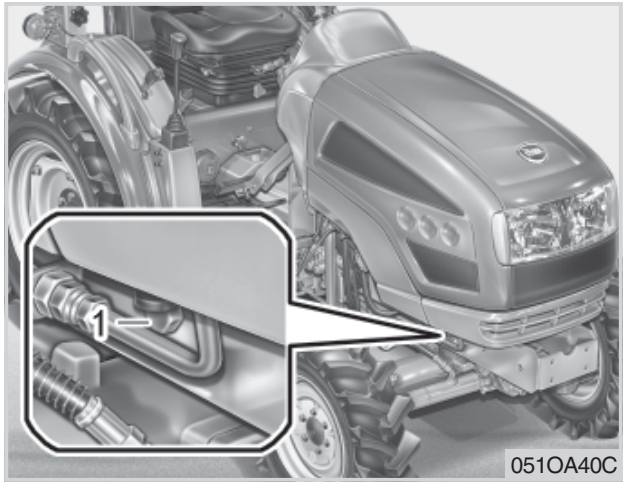
EVERY 1 YEAR

REPLACING AIR CLEANER ELEMENT

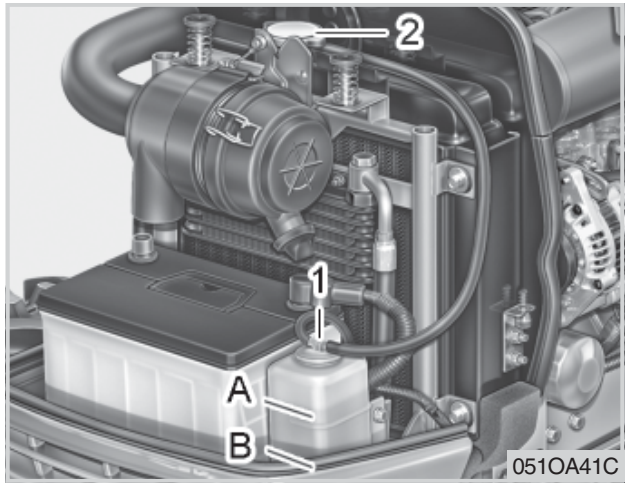
(See "Cleaning Air Cleaner Element" in every 100 hours maintenance.)

EVERY 2 YEARS

FLUSH COOLING SYSTEM AND CHANGING COOLANT



(1) Drain Cock



(1) Recovery Tank (A) FULL
(2) Radiator Cap (B) LOW

IMPORTANT

- **Do not start engine without coolant.**
- **Use clean, fresh water and anti-freeze to fill the radiator and recovery tank.**
- **When the anti-freeze is mixed with water, the anti-freeze mixing ratio must be less than 50%.**
- **Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.**

CAUTION

To avoid personal injury:

- **Do not remove the radiator cap when the engine is hot. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

1. Stop the engine and let it cool.
2. To drain the coolant, open the radiator drain cock and remove radiator cap.

   The radiator cap must be removed to completely drain the coolant.
3. After all coolant is drained, close the drain cock.
4. Fill with clean water and rust inhibitor.
5. Follow the rust inhibitor manufacture's instructions.
6. After flushing, fill with clean water and anti-freeze until the coolant level is just below the port.

   Install the radiator cap securely.
7. Fill with coolant up to the "FULL" mark on the recovery tank.
8. Start and operate the engine for few minutes.
9. Stop the engine and let cool.
10. Check coolant level of recovery tank and add coolant if necessary.

Coolant capacity	CK22	1.50U.S.gals. (2.7 ℓ)
	CK22H	

ANTI-FREEZE

If cooling water freezes, it can damage the engine and radiator. It is necessary, if the ambient temperature falls below 32° F (0° C), to remove cooling water after operating or to add anti-freeze to it.

1. There are two types of anti-freeze available; use the permanent type (PT) for this engine.
2. Before adding anti-freeze for the first time, clean the radiator interior by pouring fresh water and draining it a few times.
3. The procedure for mixing of water and anti-freeze differs according to the make of the anti-freeze and the ambient temperature, basically it should be referred to SAE J1034 standard, more specifically also to SAE J814C.
4. Mix the anti-freeze with water, and then fill into the radiator.

Vol. % Anti-freeze	Freezing Point		Boiling Point*	
	°F	°C	°F	°C
40	-12	-24	222	106
50	-34	-37	226	108

* At 760 mmHg pressure (atmospheric). A higher boiling point is obtained by using a radiator pressure cap which permits the development of pressure within the cooling system.

NOTE

- The above date represents industry standards that necessitate a minimum glycol content in the concentrated anti-freeze.
- When the cooling water level drops due to evaporation, add water only. In case of leakage, add anti-freeze and water in the specified mixing ratio.
- Anti-freeze absorbs moisture. Keep unused anti-freeze in a tightly sealed container.
- Do not use radiator cleaning agents when anti-freeze has been added to the cooling water. (Anti-freeze contains an anti-corrosive agent, which will react with the radiator cleaning agent forming sludge which will affect the engine parts.)

REPLACING RADIATOR HOSE (WATER PIPES)

Replace the hoses and clamps.

(See "Checking Radiator Hose and Clamp" in every 200 hours maintenance.)

REPLACING POWER STEERING HOSE

Replace the hoses and clamps.

(See "Checking power steering line" in every 200 hours maintenance.)

REPLACING HST OIL LINE

Replace the hoses and clamps.

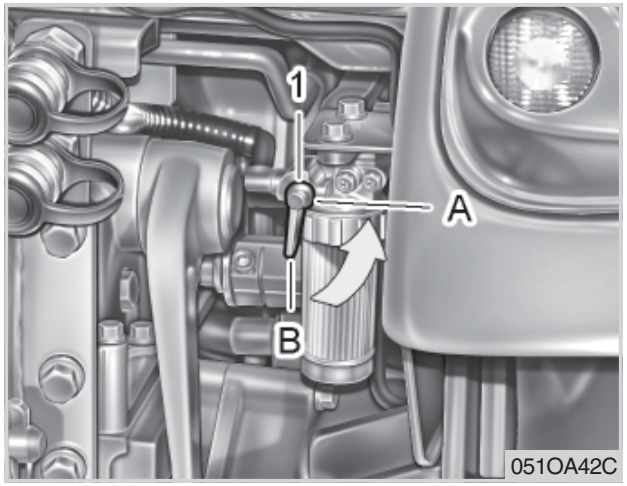
(See "Checking HST oil line" in every 200 hours maintenance.)

REPLACING FUEL HOSE

Replace the hoses and clamps.

(See "Checking Fuel line" in every 100 hours maintenance.)

SERVICE AS REQUIRED
BLEEDING FUEL SYSTEM



(1) Fuel Cock *(A) Close* *(B) Open*

AIR MUST BE REMOVED:

1. When the fuel filter or lines are removed.
2. When tank is completely empty.
3. After the tractor has not been used for a long period of time.

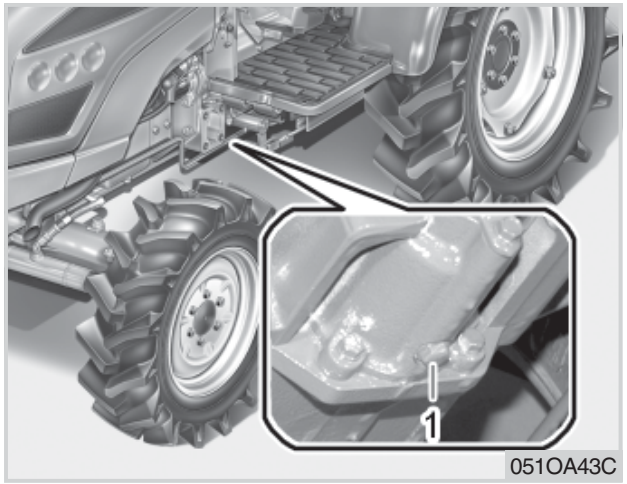
BLEEDING PROCEDURE IS AS FOLLOWS:

1. Fill the fuel tank with fuel, and open the fuel cock.
2. Open the air vent cock on the fuel injection pump.
3. Start the engine and run for about 30 seconds, and then stop the engine.
4. Close the air vent cock.

IMPORTANT

- **Always close the air vent cock except for bleeding fuel lines. Otherwise, engine runs irregularly or stalls frequently.**

DRAINING CLUTCH HOUSING WATER

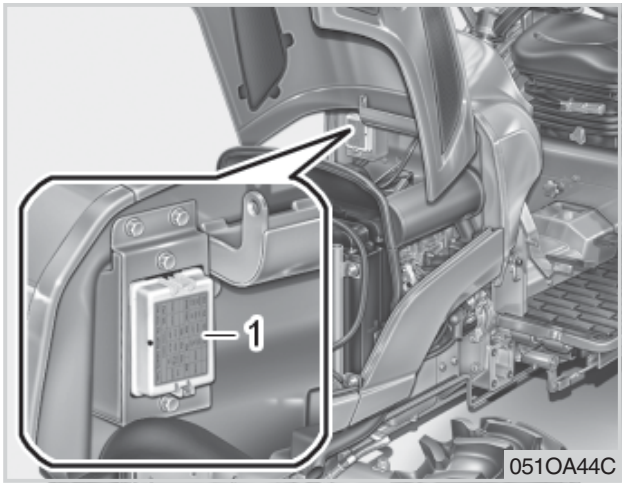


(1) Plug

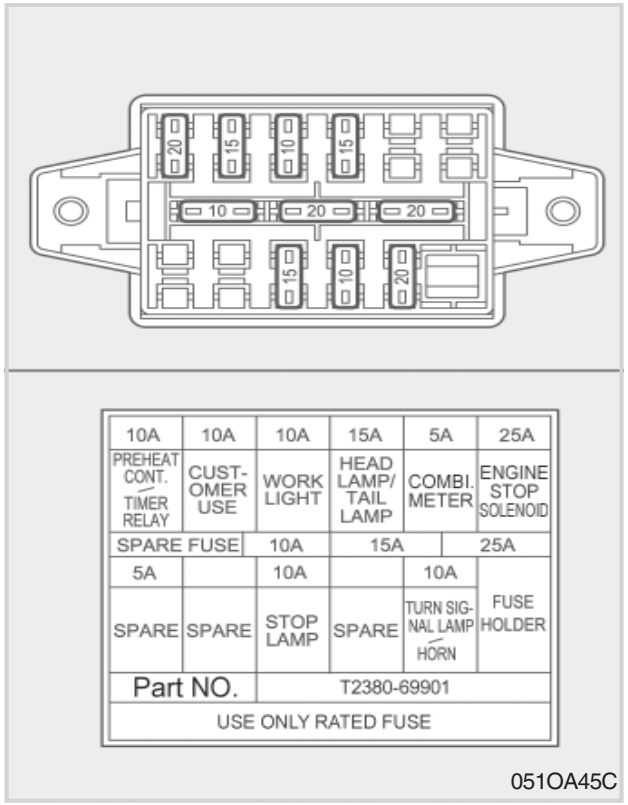
Your tractor is equipped with a plug under the clutch housing.

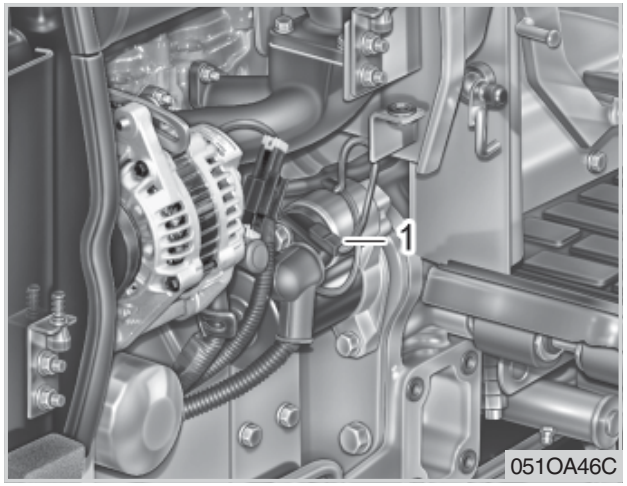
After you operate your tractor in the rain, snow, or after washing the tractor, water may get into the clutch housing. If this happens, remove the plug in the clutch housing and drain water. Remember to reinstall the plug to avoid serious damage to clutch.

REPLACING FUSE



(1) Fuse Box





(1) Slow Blow Fuse

Fuses protect the tractor electrical system from potential damage.

A blown fuse indicates that there is an overload or short somewhere in the electrical system.

If any of the fuses should blow, correct the cause of the short and replace with a new fuse of the same capacity.

Slow Blow Fuse	60A

IMPORTANT

- **Before replacing a blown fuse, determine why the fuse blew and make any necessary repairs. Failure to follow this procedure may result in serious damage to the tractor electrical system. Refer to the trouble-shooting section of this manual or your local KIOTI dealer for specific information dealing with electrical problems.**

PROTECTED CIRCUIT

No.	Capacity	Protected circuit
1	10A	Heater Control/ Timer Relay
2	10A	Customer Use
3	10A	Work Light
4	15A	Head Lights/Tail Light
5	5A	Comi Meter
6	25A	Engine Stop Solenoid
7	10A	Stop Lights
8	10A	Turn Signal Lamp/Horn
9	25A	Fuse Holder

REPLACING LIGHT BULB

1. Head lights and rear combination lights:
   Take the bulb out of the light body and replace with a new one.
2. Other lights:
   Detach the lens and replace the bulb.

Light		Capacity
1	Head Lights(AU)	35W / 35W
2	Head Lights(EU)	55W / 60W
3	Head Lights(EN)	55W / 60W
4	Tail Lights(AU)	5W
5	Stop Lights(AU)	21W
6	Front Position Lamps(EU)	5W
7	Stop Lights/Rear Position(EU)	21W / 5W
8	Turn signal Lights	21W
9	Work Light	21W
10	Instrument panel Light	1.7W,3.4W(Charge Lamp)

STORAGE

11

TRACTOR STORAGE

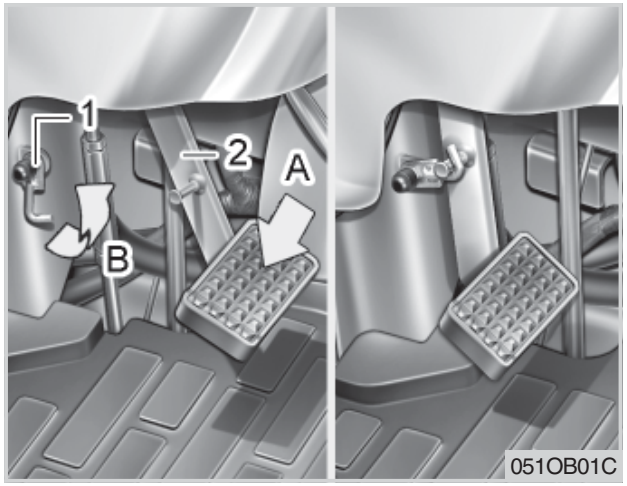
⚠ CAUTION

To avoid personal injury:

- **Do not clean the machine with engine running.**
- **To avoid the danger of exhaust fume poisoning (carbon monoxide), do not operate the engine in a closed building without proper ventilation.**
- **When storing, remove the key from the key switch to avoid unauthorized persons from operating the tractor and getting injured.**

If you intend to store your tractor for an extended period of time, follow the procedures outlined below. These procedures will insure that the tractor is ready to operate with minimum preparation when it is removed from storage.

1. Check the bolts and nuts for looseness, and tighten if necessary.
2. Apply grease to tractor areas where bare metal will rust also to pivot areas.
3. Detach the weights from the tractor body for extremely long periods(3 months or greater).
4. Inflate the tires to a pressure a little higher than usual.
5. Change the engine oil and run the engine to circulate oil throughout the engine block and internal moving parts for about five minutes.
6. Pull the engine stop knob all the way out.
7. Use the clutch looking pin to keep the clutch disengaged. If the clutch is left engaged for a long period of time, the clutch plate may rust, making clutch disengagement impossible at the next operation.



(1) Latch *(A) Depress*
(2) Clutch Pedal *(B) Hook to Lock*

8. With all implements lowered to the ground, coat any exposed hydraulic cylinder piston rods with grease.
9. Remove the battery from the tractor. Store the battery following the battery storage procedures. (See "Direction for storage in every 100 hours in periodic service section.)

10. Keep the tractor in a dry place where the tractor is sheltered from rain. Cover the tractor.
11. Store the tractor indoors in a dry area that is protected from sunlight and excessive heat. If the tractor must be stored outdoors, cover it with a waterproof tarpaulin.

    Jack the tractor up and place blocks under the front and rear axles so that all four tires are off the ground. Keep the tries out of direct sunlight and extreme heat(3 months or greater).

IMPORTANT

- **When washing the tractor, be sure to stop the engine. Allow sufficient time for the engine to cool before washing.**
- **Cover the tractor after the muffler and the engine have cooled down.**

REMOVING THE TRACTOR FROM STORAGE

1. Check the tire air pressure and inflate the tires if they are low.
2. Jack the tractor up and remove the support blocks from under the front and rear axles.
3. Install a fully charged battery.
4. Check the fan belt tension.
5. Check all fluid levels (engine oil, transmission / hydraulic oil, engine coolant and any attached implements.)
6. Start the engine. Observe all gauges. If all gauges are functioning properly and reading normal, move the tractor outside. Once outside, park the tractor and let the engine idle for at least five minutes. Shut the engine off and walk around tractor and make a visual inspection for evidence of oil or water leaks.
7. With the engine fully warmed up, release the parking brake and test the brakes for proper adjustment as you move forward. Adjust the brakes if necessary.

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ENGINE TROUBLESHOOTING

If something is wrong with the engine, refer to the table below for the cause and its corrective measure.

Trouble	Cause	Countermeasure
Engine is difficult to start or won't start	• No fuel flow.	• Check the fuel tank and the fuel filter. Replace filter if necessary.
	• Air or water is in the fuel system.	• Check to see if the fuel line coupler bolt and nut are tight. • Bleed the fuel system (See "Bleeding Fuel System" in as required maintenance)
	• In winter, oil viscosity increases, and engine revolution is slow.	• Use oils of different viscosities, depending on ambient temperatures.
	• Battery becomes weak and the engine does not turn over quick enough.	• Clean battery cables and terminals. • Charge the battery. • In cold weather, always remove the battery from the engine, charge and store it indoors. Install it on the tractor only when the tractor is going to be used.
Insufficient engine power.	• Insufficient or dirty fuel. • The air cleaner is clogged.	• Check the fuel system. • Clean or replace the element.
Engine stops suddenly.	• Insufficient fuel.	• Refuel. • Bleed the fuel system if necessary.

Trouble		Cause	Countermeasure
Exhaust fumes are colored.	Black	• Fuel quality is poor. • Too much oil. • The air cleaner is clogged.	• Change the fuel and fuel filter. • Check the proper amount of oil. • Clean or replace the element.
	Blue white	• The inside of exhaust muffler is dumped with fuel. • Injection nozzle trouble. • Fuel quality is poor.	• Heat the muffler by applying load to the engine. • Check the injection nozzle. • Change the fuel and fuel filter. • Shift to lower gear or reduce load.
Engine overheats		• Engine overloaded	• Shift to lower gear or reduce load.
		• Low coolant level	• Fill cooling system to the correct level; check radiator and hoses for loose connections or leaks.
		• Loose or defective fan belt	• Adjust or replace fan belt.
		• Dirty radiator core or grille screens	• Remove all trash.
		• Coolant flow route corroded	• Flush cooling system.

If you have any questions, contact your local **KIOTI** dealer.

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OPTIONS

Consult your local **KIOTI** dealer for further detail.

- Work Light
  High visibility for night work
- Front end weights
  For front ballast
- Rear Wheel Weights
  For rear ballast
- Sunshade

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