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LS TRACTOR

OPERATOR'S MANUAL

G-SERIES

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LS TRACTOR

INNOVATIVE  
TECHNOLOGY  
PARTNER

# LS TRACTOR OPERATOR'S MANUAL

G3033 • G3033H • G3038 • G3038H



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# 1. General Notices for Safety

## 1-1. Before using the tractor



✱ **Read this Operator's manual carefully, before using the tractor, to understand fully.**

### ◆ General information for right use

- Your tractor is designed and manufactured to be **used for agriculture**. Do not use the product for improper purpose out of the intention of manufacturer, and follow the safety instructions provided by the Operator's manual.
- Especially, read Chapter 1 "**General Notices for Safety**" thoroughly and **never modify or change** the driver protection device or safety device without permission, **never use tractor without safety** devices or operate in violation of traffic rules, etc. (Do not remove seat belt or safety frame (Roll bar) or PTO shield)
- After using first 50hours, perform **First 50 hour check** and periodic regular check. (See page 5-6)
- The manufacturer will not be responsible for the damage or safety problems caused by maintenance or repair with non-genuine parts. It must be requested to **use the genuine parts**.
- When cleaning the tractor by using high pressurized water, do not inject water directly to the electronic parts, wiring, air intake pipe, hot engine or muffler inside bonnet.
- Maintenance and repair of the tractor is performed by **skilled technical experts with the proper tools** authorized by the manufacturer.
- For damage or accidents caused by the miss use or operation in violation of these rules, the manufacturer will not have any responsibility and warranty.
- Keep this Operator's manual for future reference at hand (on the tractor).

### ◆ Safety Mark Description

- In the places where the cautions in usage are required, the marks such as **DANGER, WARNING, CAUTION** are found.
- You should comply with the description marked on the decals attached on the product or the contents marked with safety mark in this Operator's Manual..



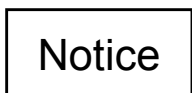
**Danger** - This indicates a fatal dangerous situation that may cause a serious injury or death if not avoided.



**Warning** - This indicates a potential dangerous situation that may cause a serious injury or death if not avoided.



**Caution** - This indicates a potential dangerous situation that may cause a light injury or damage to the properties if not avoided.



**Notice** - This indicates the instructions for right use for the safety of persons or products.

## ◆ Product Identification

Your tractor has a exclusive chassis number and engine number marked with product serial number tag to identify the product. (See Fig.1-1)

In case of requesting service or parts from your dealer

Dealer will need chassis serial number, engine serial number, and also running hours displayed on the instrument panel. (See Fig. 1-3)

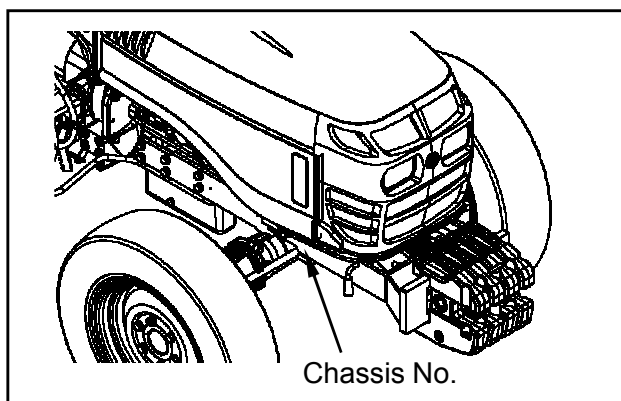


Fig.1-1

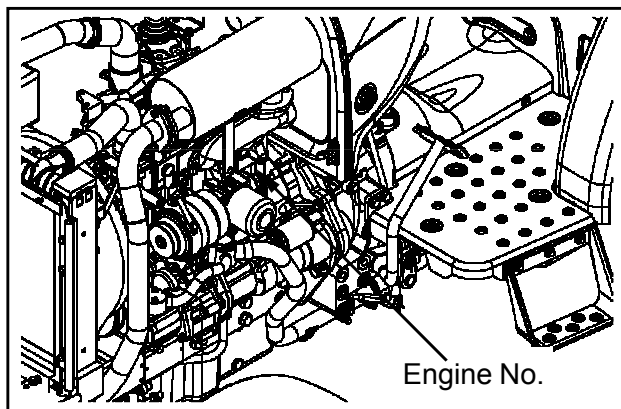


Fig.1-2

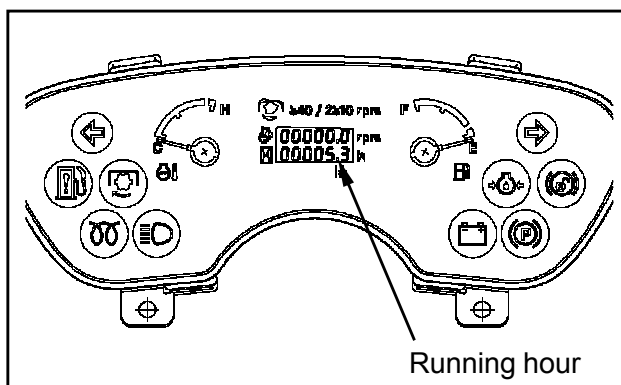
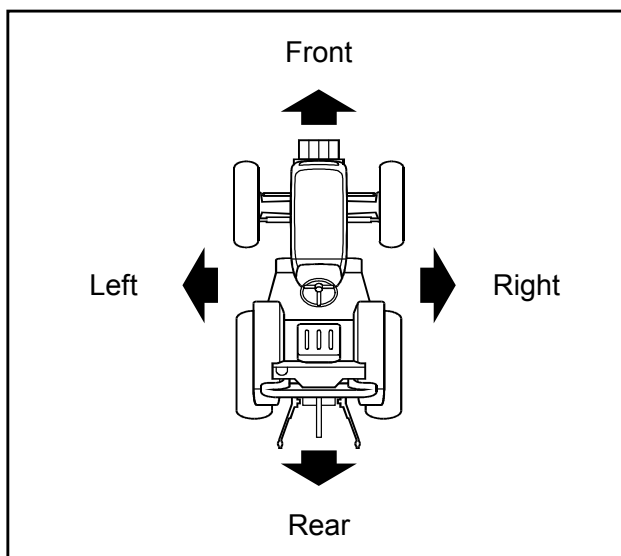


Fig.1-3

## ◆ Terminology

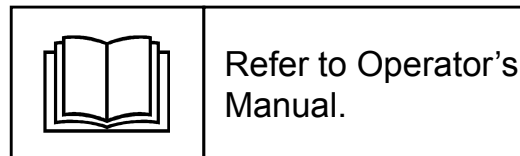
When reading this Operator's Manual, refer to the right figure for the discrimination of the front / rear / left / right direction.



## 1-2. Safety Precautions - read this for safety before using.

### (1) Notices before using

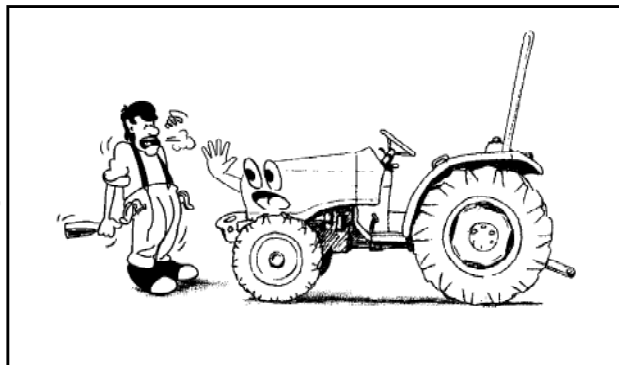
- **For Safety Instruction** : Before using the tractor, read the Operator's Manual carefully and understand the instructions fully for the safety prevention and right usage of the tractor and then use the tractor safely according to the instructions.



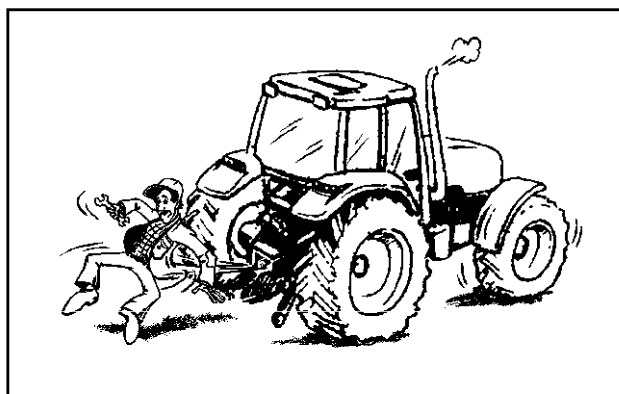
**Especially, special cares must be taken for using the tractor in the places where the safety signs such as Danger, Warning, Caution etc. are marked.** (For further information, See page 1-1)

- **Safety Decals** : For right use and personal safety of the operator, the safety decals are attached to the parts related with safety operation. Before using the tractor, comply with the safety instructions. (For further information, refer to the section, 1-6 Safety Decals. See page 1-16)

- **Operator's condition** : The persons such as patients, drunks, people on drugs etc. are never allowed to operate this tractor. Only educated operators can use the tractor after learning the usage of controls for moving, stopping, turning and other operating.



- **Suitable Clothes & Protect Entanglement** : When checking or operating the tractor, wear tight fitting clothes and safety equipment instead of loose or long clothes. Also, slippers, high heel shoes are not suitable for operation. Wear the low shoes or work shoes or boots.



Warning



▶ Do not approach the rotating shaft such as PTO shaft or cooling fan, especially, with loose clothing and long clothes. The entanglement in rotating shaft can cause serious injury or death.

▶ Stop the engine and be sure PTO shaft is stopped before getting near it.

- **Keep Riders off** : Riders on the tractor or implements obstruct the operator's view and can be thrown off the tractor. It can cause a serious injury or death. Riders should not be carried on the tractor at any time.



Warning

▶ Additional seat (if fitted) is used for driver training or instruction. Do not permit anyone to ride on the tractor.

- **Protect Children** : Pay special attention to children (or a child) while using the tractor or during storage.
  - Make sure children keep a safe distance from the tractor and all implements before using the tractor. Be alert to the presence of children.
  - Do not let children or an untrained person operate the tractor.
  - Do not allow children to approach the tractor while the engine is running.
  - When parking the tractor, remove the ignition key and lower implements to the ground for children's safety.



Warning

- ▶ As children are very curious, they may do unexpected movements or actions. Special care must be taken, when operating tractor or equipment.

- **Periodical Check** : Lubrication and Maintenance must be performed periodically. If necessary, do it immediately. If not, it may cause the failure, reduction of product life or physical injury.

\* Periodic Lubrication and Maintenance

Fuel, Oil, Filter, Air cleaner, Battery, Belt, Cable, Grease, Pedals such as clutch and brake pedal, Tire air pressure, Wheel bolts, Toe-in, Electrical wirings, other items related to safety.

- **Genuine Parts** : When replacing parts, you must use Genuine Parts for LS tractor. Contact your authorized dealer. If not, it may cause a reduction of product life, failure and serious injury.

- **Restrict Maintenance** : If you repair or change some components and settings arbitrary, the performance of the tractor can NOT be guaranteed and may void the warranty, And also, maintenance of the heavy weighted parts without special tools can cause serious injury. If it is required to check or repair the tractor due to trouble, or if you have any questions for the usage or operation of the tractor, contact your authorized dealer.

\* The items that are not allowed to be modified or changed or removed arbitrarily by user are below :

- Protection structures such as PTO cover, Guards, Safety frame (Roll Bar), Cabin, etc.
- Engine components, Fuel injection control and setting, etc.
- Automatic control equipment, Lamps, Transmission, Hydraulic valve and pressure settings.
- Other parts that detail and where complicated adjustments are needed.



Warning

- ▶ Skilled professional technology is needed for the repair.
- ▶ For detail maintenance or repair, contact your authorized dealer.


- **Lamps** : Do not modify the lamps or change the bulb capacity arbitrarily.



Warning

- ▶ Modified lamps or change bulb capacity may cause the traffic accident by disturbing approaching driver's views.
- ▶ If the lamp is blown out, replace it immediately with a genuine part. In case of driving at night, it may cause a traffic accident.

- **Safety Structure** : For the safety of the driver, various protection structures are attached on the tractor. If these structures are changed or detached by user arbitrarily, it may cause serious accident. Such behaviors are prohibited strictly and void the warranty.

 <b>Warning</b>	<p>► Do not disassemble or drill the Bonnet (Hood), Fan cover, PTO cover, PTO shaft cover, Safety frame (Roll Bar) or Cabin etc. or do not modify other structures by welding arbitrarily. It may cause the loss of original function of the structures and serious injury may occur, and may void warranty.</p> <p>► If the protections or safety devices are broken, replace them immediately. If not, it can cause a accident or serious injury.</p>
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## (2) Notices when starting Engine

- Check each part with reference of the section 5, *Lubrication and Maintenance* in this manual. If necessary, repair or replace it immediately.  
**Especially, check if safety protection structures or covers are attached originally and the bolts are tightened well.**
- Before starting, **check again if there are other workers or children around the tractor and implements and keep a safe distance.**
- Start engine and operate the tractor **after sitting on the driver's seat** correctly with seat belt fastened.
- Place the shuttle lever, transmission gear lever in NEUTRAL and especially check if parking brake is applied.
- Lower the implements on the ground.
- Ensure that rear view mirrors and the other mirrors (if fitted) are adjusted correctly, and check the operation of the headlights and other lights
- Put PTO switch to OFF position. If the PTO switch is NOT in OFF position, the engine can NOT be started. (See Fig.1-4 )
- Depress the clutch pedal fully (if fitted). If not, the start safety switch is not contacted enough and the engine can NOT start.

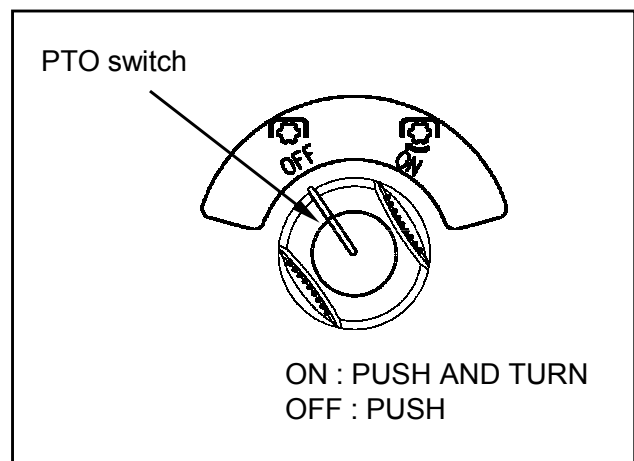
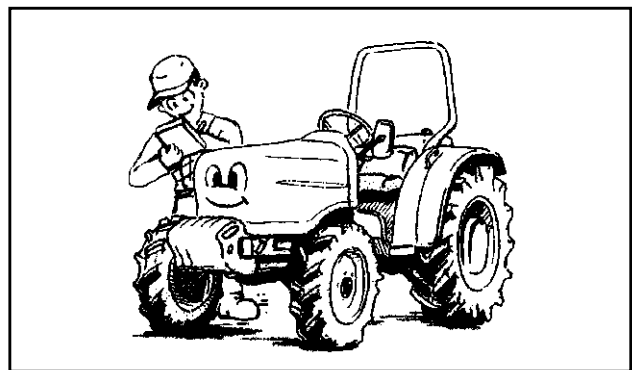






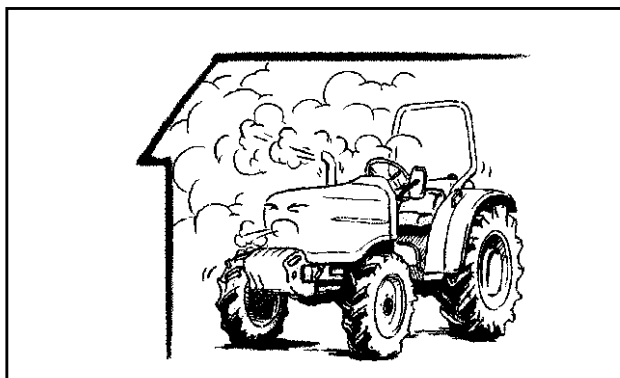
Fig.1-4

 <b>Warning</b> 	<p>► Do not start the engine in a closed area. The poisonous exhaust gas can cause fatal injury to the driver or persons around.</p>
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### (3) Notices while operating/using the tractor

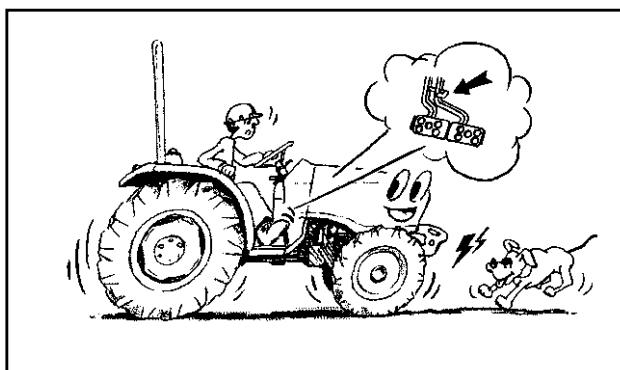
#### ● Ventilation

 <b>Warning</b>	<p>► It is very dangerous to work in a closed area. The poisonous exhaust gas may cause serious injury to the human body. If you should work in this area, make sure to ventilate well and put on the protective mask.</p>
	

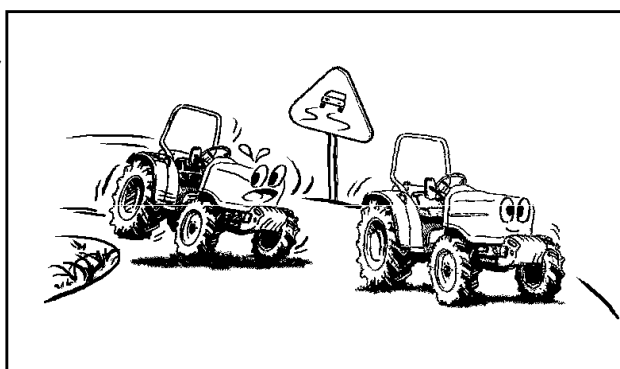


- **Noise and Vibration** : When working between buildings or in confined spaces, the sound pressure level can be increased. Wear suitable ear protectors in high noise level conditions. When working with equipment in the field, vibration may be intensified from operation of the equipment. To reduce harm to the body, take a rest periodically.

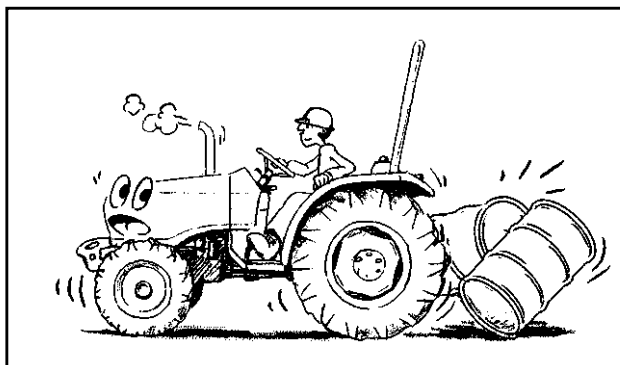
- Connect left and right brake pedals while driving on the road. (if fitted)
- DO NOT use differential lock device while driving on the road or turning in the field.
- DO NOT ride your foot on the brake pedal or clutch pedal.



- Lower the driving speed enough before turning a sharp curve. Especially, when you drive the tractor with implements, make the turning radius wider.
- DO NOT start or stop the tractor suddenly. Engage the clutch and brake softly. If not, front wheels can be lifted up and it is very dangerous.
- Do not jump up and down while tractor is moving. When getting off or on the tractor, use the grip or handrail and sub step to prevent falls.

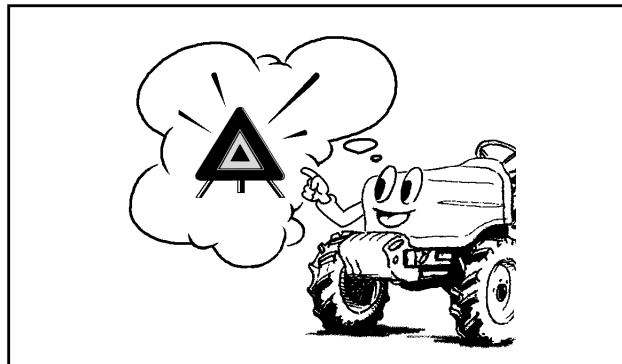


- When driving the tractor in reverse, lower the engine speed. Make sure to check if there is any obstacle or person in the rear.
- DO NOT permit other people and especially children approach within working area while operating tractor and equipment.



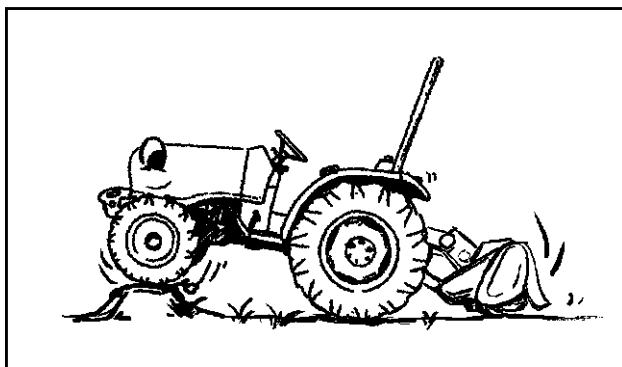
- Obey the traffic rules while driving on public roads.  
Do not exceed the local legal speed limit.  
Use a sign beacon or slow moving vehicle (SMV) to indicate that the vehicle is slow moving.

- If you can not drive the tractor due to a failure, move the tractor to a safe place and install troubled vehicle (safety tripod).  
(Day : backward 100m ( 328 ft )  
Night : backward 200m ( 656 ft))

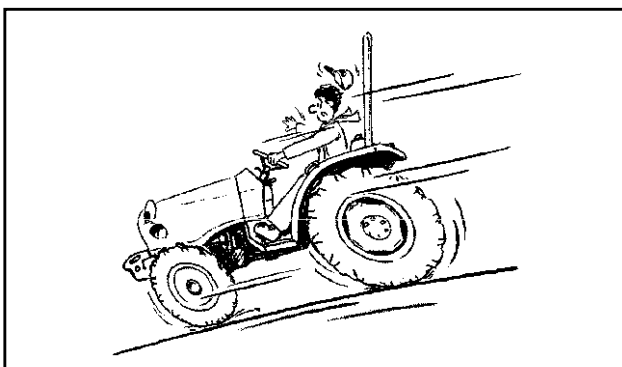


- Do not overuse the fuel, oil, etc and pay attention not to contact the skin directly. Generally, these materials contain harmful materials to the human body. When you work in a area where hazardous chemicals are sprayed, check the cabin filter (if fitted) and replace the filter with suitable one for the purpose being used. To protect the body completely from these harmful materials, wear a safe protection equipment such as mask, and clean the body after working.

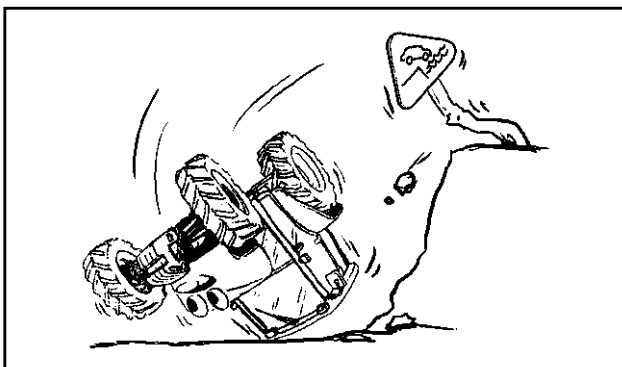
- When crossing a high ridge, let down the implement and go straight across the ridge at low speed.
- When connecting the implements to the front/rear of the tractor, install the proper additional weights in the rear/front of the tractor to keep the balance of the tractor.



- On a downhill, operate the throttle pedal and brake pedal slowly and DO NOT drive while the transmission gear is in NEUTRAL.
- To climb a steep slope, drive tractor slowly in reverse up the slope rather than forward. It is much safer.
- When turning the tractor on a slope, pay attention to safety especially.



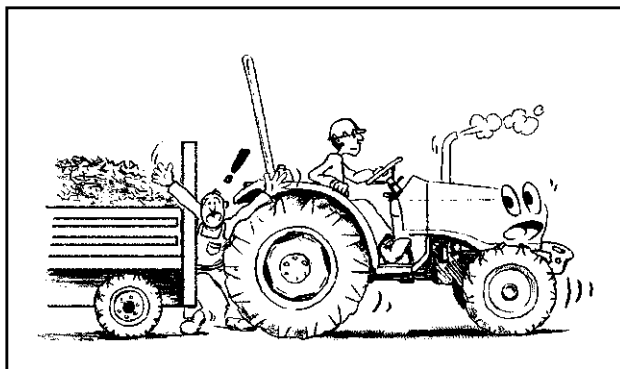
- When working at the edge of steep slope, take special care about a turn-over.
- When working, wear the protection equipment and tighten the seat belt.
- If the authorized passenger seat are not installed, keep riders off.









## (4) Notices when connecting Implement

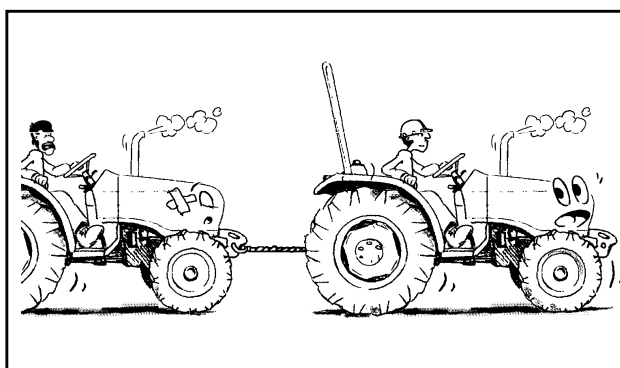
- Attach or detach the implement on wide and level ground.
- Do not stand between tractor and implement.
- Use hitch or drawbar for towing. Do not tow by connecting with any other structures.
- When connecting heavy implements, apply the parking brake and use the wheel chock.
- Do not attach over-weighted implement.



 <b>Caution</b>	<ul style="list-style-type: none"> <li>▶ When connecting or disconnecting hydraulic coupler, lower implement on the ground, turn off engine and check if the pressure of hydraulic line is released.</li> <li>▶ When installing the implement having big hydraulic cylinders or lines, check oil level in tractor transmission housing after installing the implements.</li> </ul>
 <b>Warning</b>    	<ul style="list-style-type: none"> <li>▶ Before connecting or checking the implement, put PTO switch to OFF position and place PTO gear lever in Neutral position.</li> <li>▶ When attaching or detaching the implement, make sure to fix the implement and tighten the three point hitch pins correctly. If not, serious troubles and injury can occur during the operation.</li> <li>▶ If heavy loaded trailer is connected to 3-point linkage or any structure, it can cause turnover or failure and serious injury. Make sure to use towing hitch or authorized draw bar.</li> </ul>

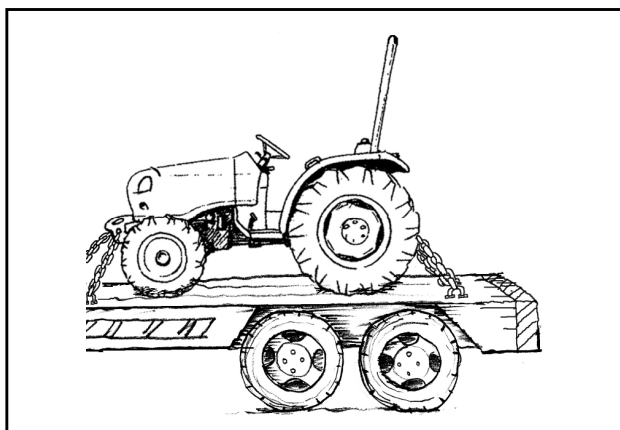
## (5) Notices when towing the tractor


- If tractor needs to be towed for a short distance, Use the hitch (or drawbar) or front towing hook. Do not connect to other structures such as rear axle, ROPS, front axle, steering components for towing.
- Tractor can be steered for a short distance without engine running, but it will be hard to turn the steering wheel. If possible, run the engine for steering and lubrication.
- When being towed, disengage the 4WD, differential lock, parking brake and place all gear shift levers in neutral position. Refer to "3-2. Operating levers and pedals". (See page 3-7)
- Check the horizontal and vertical permissible load of the hitch (or drawbar) before towing. The load is different with trailer brake, and stopping distance increases with speed and weight of towed loads and slope. Make sure you consider the total weight of the equipment and its load. (See page 4-16 )



## (6) Notices when transporting the tractor

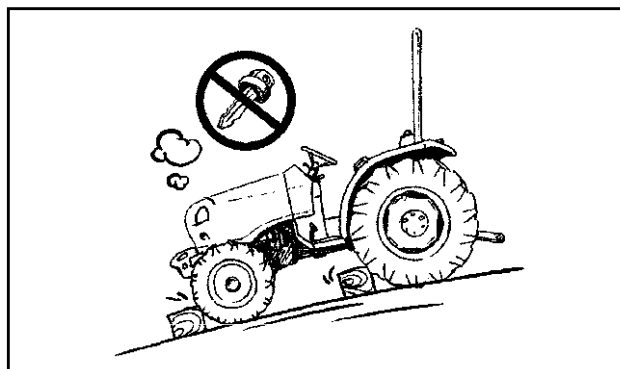
- When transporting the tractor by truck, trailer, etc, use suitable equipment or facilities to load or unload the tractor.
- Fix the tractor tightly to the vehicle with heavy-duty straps or chains.
- When fixing the rear of the tractor, use the hitch or hitch support.
- When fixing the front of the tractor, use the towing hook.
- When driving on public roads, the transporting vehicle must have signs and lights required by local regulation to avoid collision with a vehicle.




 <b>Caution</b>	<p>► When fixing the tractor, Do not hook or connect chains to the 4WD shaft, steering cylinder, tie-rod or front axle. These can be damaged by the chain or excessive strain.</p> <p>► In case of turbocharger engine (if fitted), cover the exhaust outlet to protect that the turbocharger does not rotate by air without lubrication.</p>
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## (7) Notices when parking tractor

- Stop the tractor on level ground. Place the transmission gear in neutral.
- Put PTO switch to OFF position and lower implements to the ground.
- Stop the engine and remove the ignition key.
- Apply the parking brake.
- Have to apply the wheel chock on a slope.



 <b>Caution</b>	<p>► When parking on a slope while attaching the loaded equipment, the tractor may move even if the parking brake is applied. Apply the wheel chock and low speed transmission gear as follow.</p> <p>- . Mechanical : downhill ⇒ Reverse 1gear / uphill ⇒ Forward 1gear</p> <p>- . HST type : Lowest gear</p>
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## (8) Notices when checking tractor after work

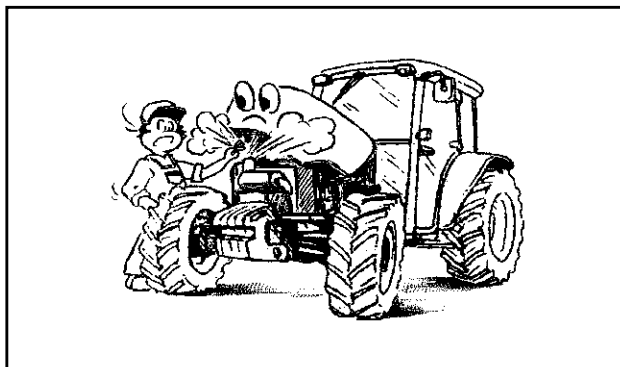
- The check and maintenance must be performed after stopping the engine and cooling down the engine sufficiently.
- DO NOT pour water into the radiator or engine when the engine is hot. The engine or radiator may crack.



**Warning**



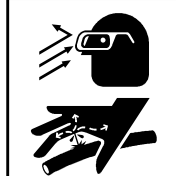
► When opening the radiator cap, hot cooling water or steam may explode. Remove the cap using a thick rag or glove to prevent serious burns.



- When checking or repairing the hydraulic system or fuel system, high pressurized oil or fuel may cause a severe injury.  
Make sure the engine is stopped, and all the transmission gears are in NEUTRAL, and lower the implements to the ground, and move once the remote control lever to each direction to release the hydraulic system pressure.



**Warning**



► Before removing hydraulic pipe or hose and other parts, check if the system pressure is removed. The leakage of pressurized oil can cause a fatal physical injury. Use the proper protection equipment.

► When connecting or disconnecting the hydraulic quick coupler, lower the implements to the ground after checking that hydraulic pressure is released.

- Never fill the fuel tank while the engine is running or the engine is hot. And never smoke or have flames around fuel tank.
- Keep the fire extinguisher near.
- When maintaining electric system, remove ground clamp, (-) terminal of the battery. To prevent fire or explosion, keep flames or sparks away from battery.



**Caution**


► Always remove grounded (-) battery clamp first and assemble it last. If not, It can cause an explosion by spark. (for further information, see page 5-27)

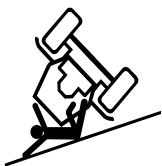
- Do not attempt to remove or unfasten the air conditioning components arbitrary. It is possible to be severely frostbitten or injured by escaping refrigerant. Contact your authorized dealer to work on air conditioning systems.

## (9) Notices when handling Diesel Fuel

- Do not mix gasoline, alcohol or blended fuels to diesel fuel. These mixtures are explosive in fuel tank.
- Never remove the fuel cap or refuel with the engine running or hot.
- Do not smoke while refueling the tractor or when standing near fuel. Keep any type of flame away.
- Maintain control of the fuel filler nozzle when filling the fuel tank.
- Do not fill the fuel tank to capacity. Fill only to the bottom of the filler neck to allow room for expansion.
- Wipe up spilled fuel immediately and always tighten the fuel tank cap securely.
- If the original fuel tank cap is lost, replace it with an approved one.
- Never use fuel for cleaning purposes.
- Arrange fuel purchases so that summer grade fuels are not held over and used in the winter.

## (10) Operator Protective Structure (OPS)

 <b>Warning</b>	<ul style="list-style-type: none"> <li>▶ Your tractor is equipped with an Operator Protective Structure (OPS), such as ; Safety frame (Roll Over Protective Structure (ROPS)) or Falling object Protective Structure (FOPS) or Cabin with ROPS (Roll Bar).</li> <li>▶ This structure is a special safety structure for agricultural tractor that used for the protection of the operator to minimize the possibility of serious injury. <b>This structure does not guarantee full protection against all working conditions, i.e. falling objects, low hanging wires and branches in the forest, orchard or construction area, etc. NEVER enter or operate these hazardous area without certified Operator Protective Structure installed.</b></li> <li>▶ The Protective Structure and interconnecting components are a certified system. Any damage, Fire, corrosion or modification will weaken the structure and reduce your protection. If this occurs, the Protective Structure <b>MUST</b> be replaced with a new one. Contact your authorized dealer for Protective Structure inspection and replacement.</li> <li>▶ In case of an accident, fire, tip or roll over, the following <b>MUST</b> be performed by a qualified technician before operating the tractor again. <ul style="list-style-type: none"> <li>- The Protective Structure <b>MUST</b> be replaced.</li> <li>- The mounting or suspension for the Protective Structure, operator seat and suspension, seat belt and mounting components and wiring within the operator's protective system <b>MUST</b> be carefully inspected for damage.</li> <li>- All damaged parts <b>MUST</b> be replaced.</li> </ul> </li> <li>▶ <b>DO NOT attach any device to the Protective Structure for pulling purposes.</b></li> <li>▶ <b>DO NOT weld, drill holes, attempt to straighten or repair the protective structure. The modification can reduce the structural integrity of the structure which can cause death or serious injury in the event of fire, tip, roll over, collision or accident and void the warranty.</b></li> </ul>
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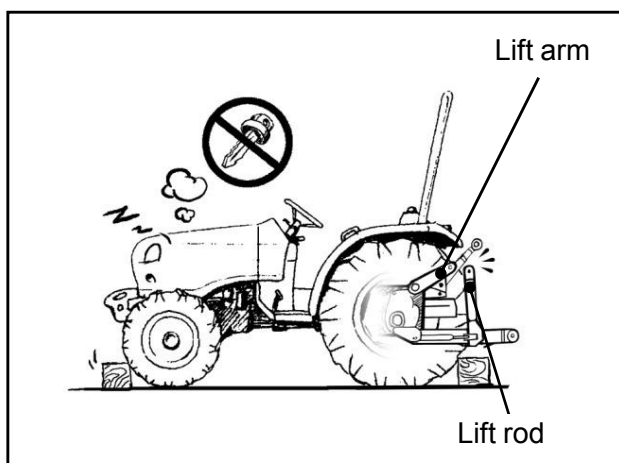
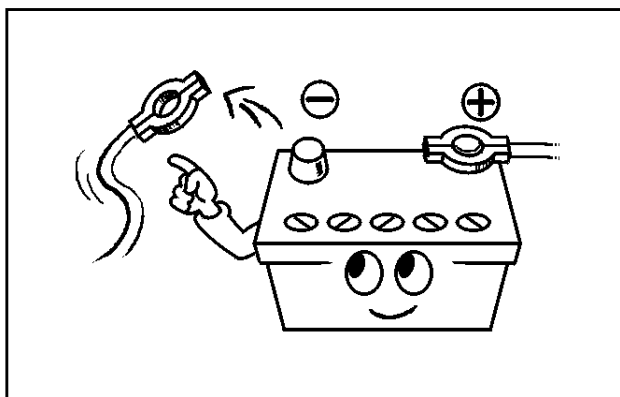


## 1-3. Long-term storage

### (1) Preparation for storage

※ Wash the tractor cleanly and follow the procedure as below.

- Apply grease or lubricant oil or spray paint to the non-painted metal to avoid corrosion. Keep the tractor in a covered, dry and well-ventilated place.  
Temperature : 10°C ~ 35°C (50°F ~ 95°F)  
Humidity : 45% ~ 70%
- Place all controls, including electrical switches, in neutral position and apply the wheel chock to the tires and disengage the parking brake.
- Check the lubricant capacity of each part and if the engine oil has exceeded 100 hours of work, change the oil and run the engine for 5 minutes at idle rpm.
- Drain the engine coolant completely. If the engine coolant is anti-freeze solution, it is not necessary to drain but check its concentration.
- Fill the fuel tank full with fuel.
- Loosen all drive belts and clean the air cleaner.
- Loosen the rubber plug (if fitted) under the clutch housing to drain water.
- Remove the battery, clean the cover and smear the terminals with grease. Place the battery in a ventilated place not less than 10°C (50°F) and away from direct sunlight.
- If possible, fit stands or other suitable supports under the axles to raise the wheel off the ground. And let the air out of the tires. If not, check the tire pressure from time to time.
- Remove the lift rod and place the lift arm to the highest position to protect the cylinder.
- Remove the ignition key.
- Cover the tractor with a non-water-proof cover.
- If the implements are attached, lower the implements on a support off the ground.




Warning

► When restarting the engine at the end of long-term storage, follow the instructions of *Preparation for Reuse*. (See next page)

## (2) Check & Maintenance during storage

- Apply grease or lubricant oil to non-painted metal to avoid corrosion.
- Check the leakage of fuel, oil and coolant. If necessary, repair the damaged part.
- The battery should be charged about once a month not to be discharged entirely.
- Check the tire air pressure and maintain the proper pressure.

 Caution	<ul style="list-style-type: none"><li>▶ As the electrolyte of battery is sulfuric acid, it emits the explosive and poisonous gas. It is strong enough to burn skin, clothing and can cause blindness if splashed into eyes.<ul style="list-style-type: none"><li>- Keep the sparks and flames and cigarettes away from the battery.</li><li>- When handling the battery, wear safety glasses to protect the eyes.</li><li>- If the electrolyte contacts the eyes and skin, wash with water immediately and go to see a doctor. (※ For further information, refer to the section of <i>Battery handling and Notices</i>, See page 5-27)</li></ul></li><li>▶ When removing and storing battery, select dry and cool place out of reach of children.</li></ul>
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## (3) Preparation for Reuse

- ※ When using first after long-term storage, check each part as below.
- Check the damaged part or loosen part
- Check the leakage of fuel, coolant, engine oil, transmission and front axle oil.
- Check the level and density of the engine coolant.
- Check the level of engine, transmission, rear and front axle oil, and fuel.  
(For further information, refer to the section 5, *Lubrication and Maintenance* in this manual.)
- Check all drive belts carefully, paying particular attention to the point where the straight run of the belt starts to bend around the pulley. Check the vee groove in the pulley for corrosion.
- Electric system check
  - Is there any open circuit or any other problem in the wiring?
  - Is there any problem of the instruments?
  - Is the charging state of the battery sufficient?
- Start engine and then check the engine oil pressure indicator and battery charging indicator. Run the engine at a fast idling speed (suggest 1000/1500 rpm) until normal operating temperature is registered, and check for oil, fuel and coolant leakage. (For further information, See page 4-1)

## 1-4. Notices for Use & Disposal related to Environment preservation

Soil, Air and Water are essential elements for human life. To contribute to environment preservation of the Earth, we are trying to minimize the environment pollution necessitated by general business activity such as product design, manufacturing, distribution, etc.

Several substances and products derived from chemical and petrochemical products are major portion of environment pollution and must be disposed of according to environment laws or related regulations, and common sense.

We would like to notify the following items for Use & Disposal related to environment preservation.

1. Avoid the overload work after reading the Operator's Manual.

Overload work may reduce the life of the product as well as the unburned exhaust gas occurred during overload work becomes the major cause of air pollution.

2. When you replace various oils (engine, transmission, anti-freeze solution) directly, do not throw away the exhausted oil on the ground.

This may pollute the soil and water seriously and also is prohibited. If violated, you would be responsible for that by civil or criminal case. The waste oil must be disposed according to the environment laws.

3. Use the product according to the Operator's Manual and if the life of product ended, do not throw away or dispose of on ground. The rust water or oil coming from the disposed product may cause the pollution of soil or water. Thus, the wasted product must be disposed lawfully, contact your authorized dealer nearby.

















































4. Modern lubricants contain additives. Do not burn the disposed oil or fuel in conventional heating systems.

5. When you drain or fill fuel, lubricants oil and coolants, do not let them absorbed into the ground. They must be collected and disposed in a suitable manner.

6. Do not adjust the setting of the fuel delivery system. This will alter the emission of exhaust fumes.

## 1-5. Symbols

The followings show the symbols and its meaning used for the tractor.


	Refer to User's Manual.		Gear Neutral		Low speed
	Caution!		Forward/Rearward		High speed
	Battery charging		Forward		Engine speed control (throttle)
	Fuel level		Backward		Engine speed control (throttle)
	Fuel filter		4WD connection		Turn signal light
	Engine coolant temperature		4WD disconnection		Direction indicating light
	Transmission oil pressure		Quick turn (Optional)		Light switch
	Engine oil pressure		Cruise drive (Optional)		Side lights
	Diesel engine preheat		Cruise drive release (optional)		Headlights (downward)
	Parking brake		Position control (Up)		Headlights (upward)
	Emergency lights		Position control (Down)		Work light
	Engine start		Draft control (Deep)		horn
	Engine stop		Draft control (Shallow)		Window wiper
	PTO stop		Cylinder rod (shorten)		Window wiper / Washer (front)
	PTO in operation		Cylinder rod (extend)		Window wiper / Washer (rear)
	Differential lock device		Cylinder rod (floating)		One side brake light (option)



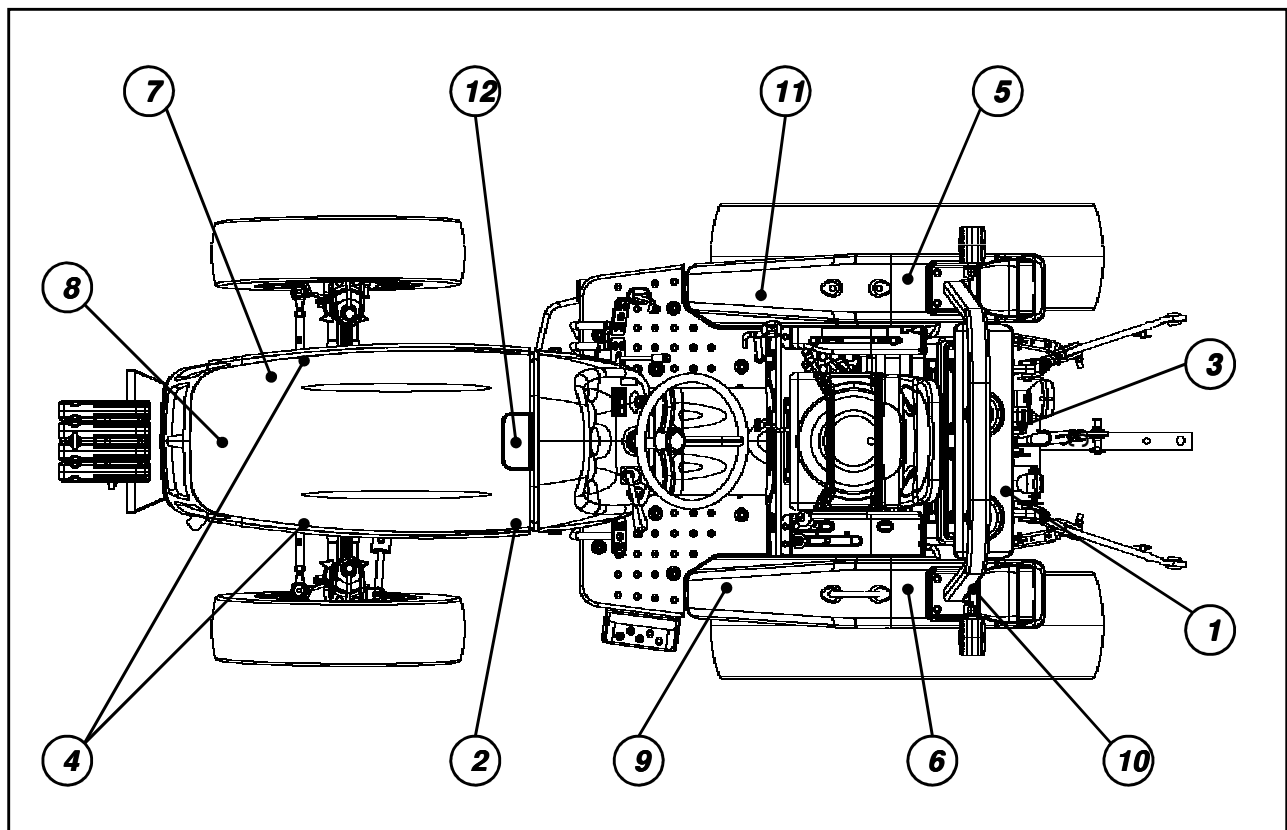
## 1-6. Safety Decals

### (1) Handling and Maintenance of Safety Decals

- For right use and personal safety of the operator, the safety decals (labels) are attached to the parts related with safety operation.
- Before operating or maintenance of the parts, check the position and read the instructions carefully.

 Caution	<ul style="list-style-type: none"><li>▶ The instructions described on the safety decals are very important for the safety of the operator and workers around. If ignored, it may cause the death or serious injury.</li><li>▶ If the decals are dirty, wash them with soap water and wipe with soft rags. Do not use thinner, acetone as it may erase the instructions.</li><li>▶ If the decal is detached or damaged, replace it with a new one in original position.</li><li>▶ When cleaning the tractor with pressurized water, the decals can be detached.</li><li>▶ When replacing the part which decal is attached, replace the decal with new part.</li></ul>
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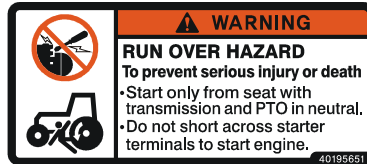
### (2) Safety Decals and Attaching position



### 1. Position : Fuel Cap



### 2. Position : Starting motor



### 3. Position : PTO Cover



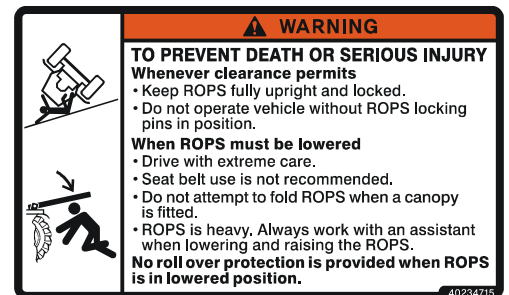
### 4. Position : Cooling fan



### 5. Position : Fender



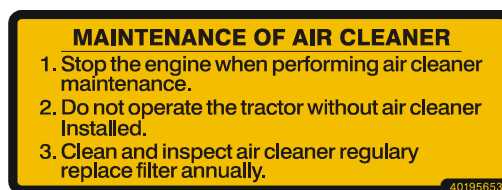
### 6. Position : Fender



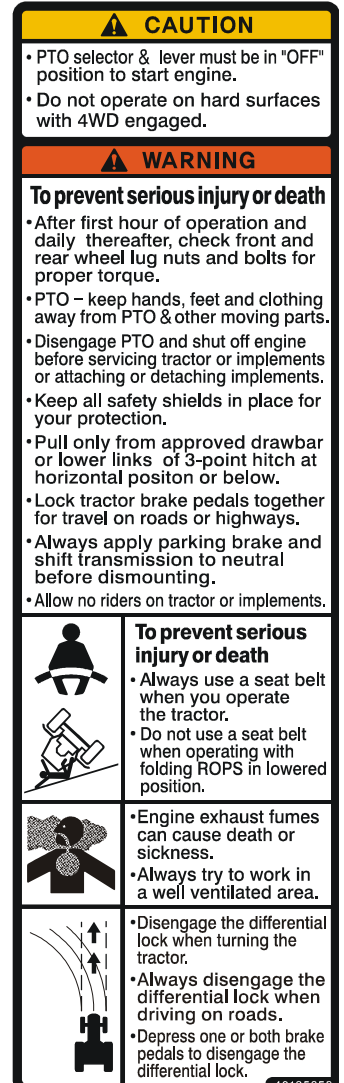
### 7. Position : Radiator



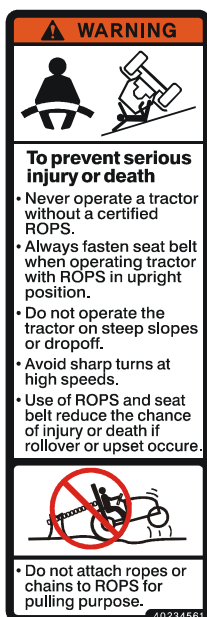
### 8. Position : Air cleaner



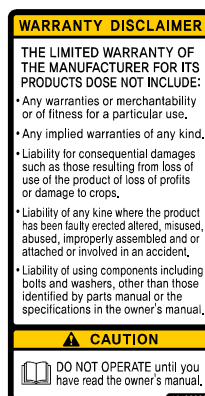
### 9. Position : Fender



### 10. Position : frame



### 11. Position : frame

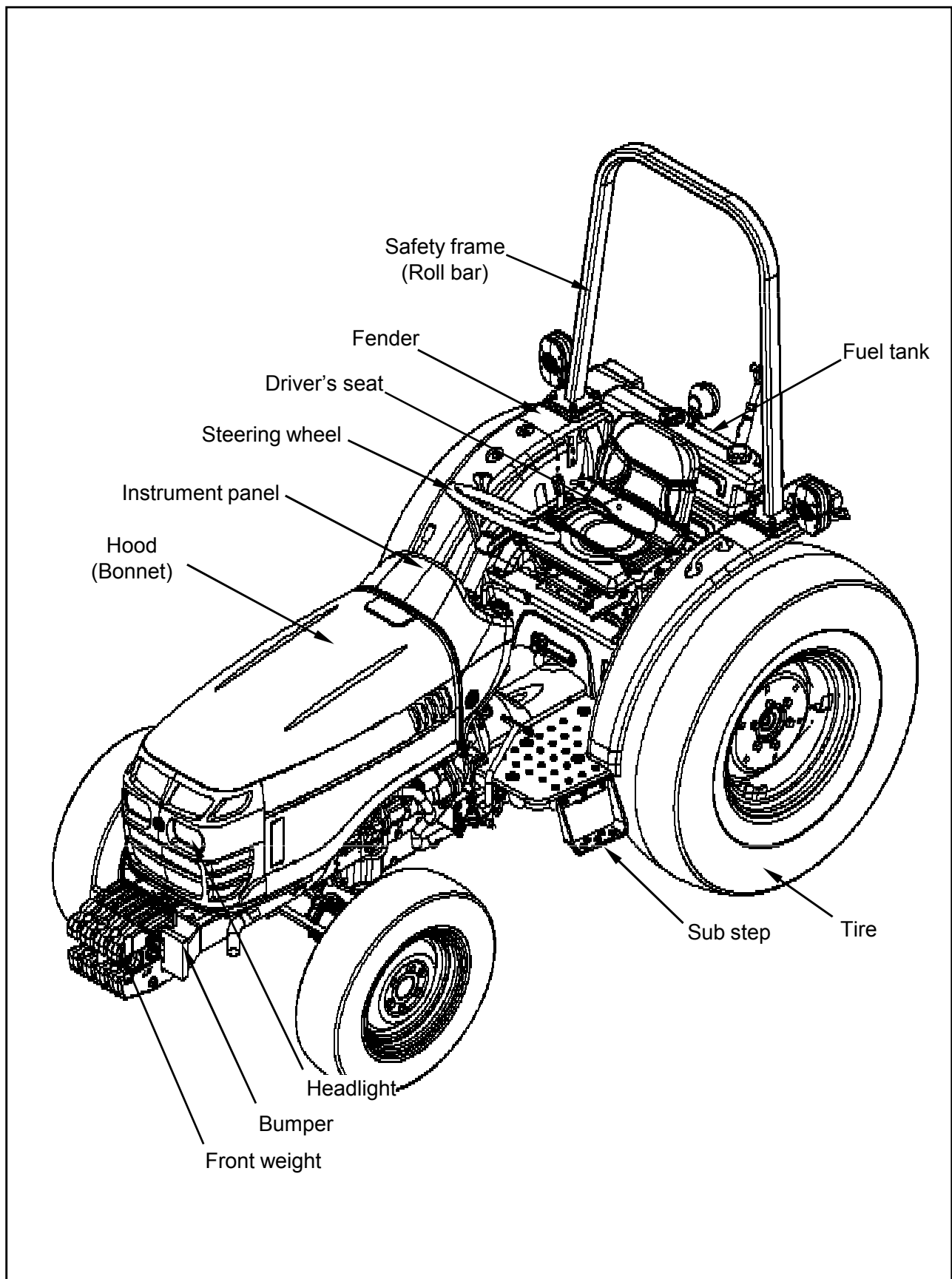


### 12. Position : Muffler



## 2. The Name of Each Part

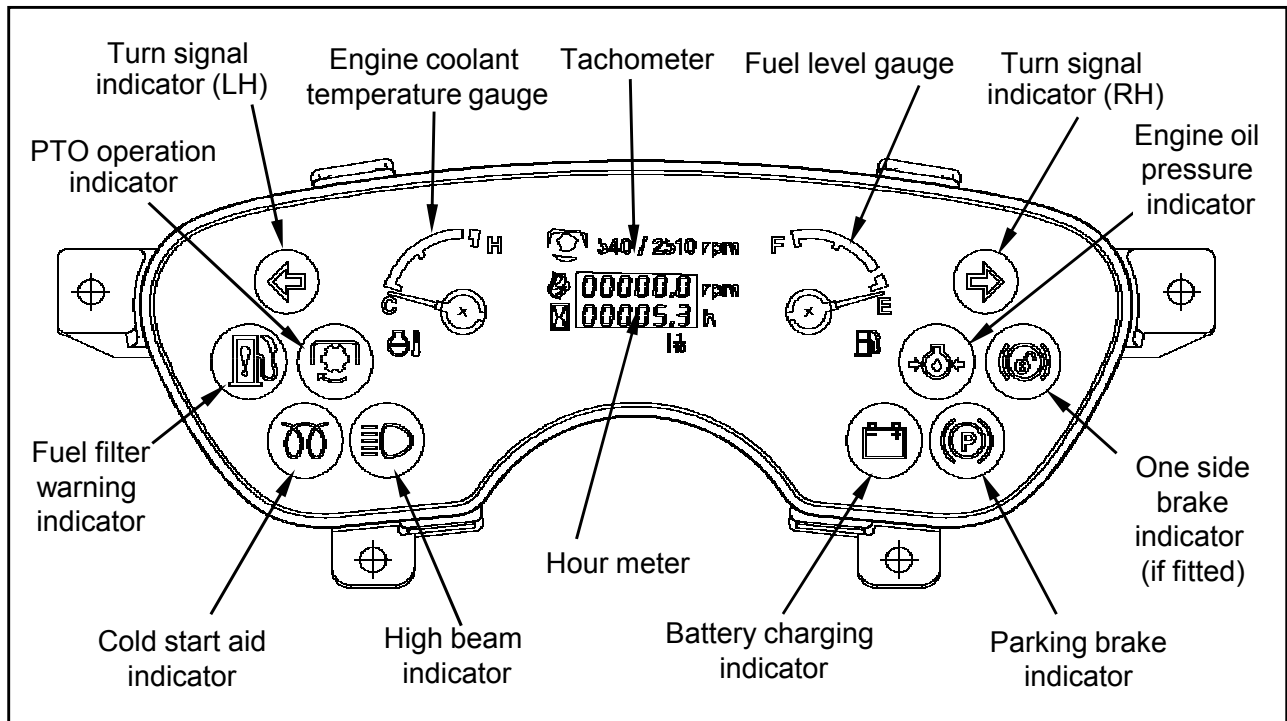
### (1) Roll-bar type



## 3. Instruments and Controls

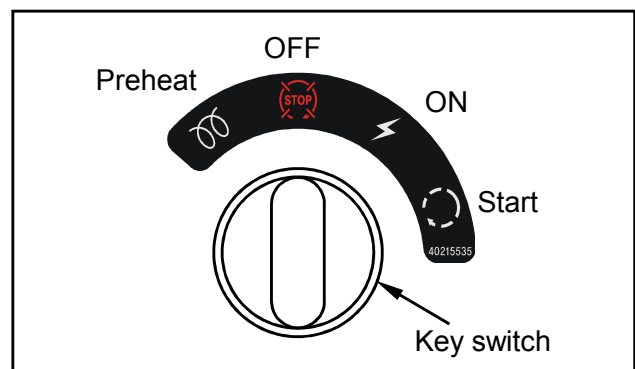
### 3-1. Instrument panel and Switches

#### (1) The name of each part



#### (2) Key switch

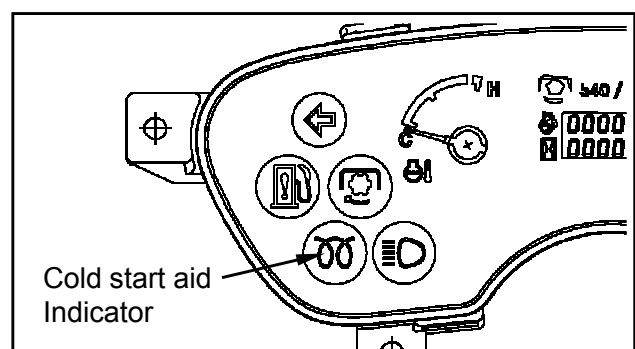
- Preheat - Preheat (Cold start aid)
- OFF - Engine stops, Power off
- ON - Power on
- Start - Engine start up



	<b>Caution</b>	<p>► As soon as engine starts, turn the key switch to ON position immediately. If not, it may cause damage to starter motor.</p> <p>► If the tractor is not in use, the ignition key should be removed.</p>
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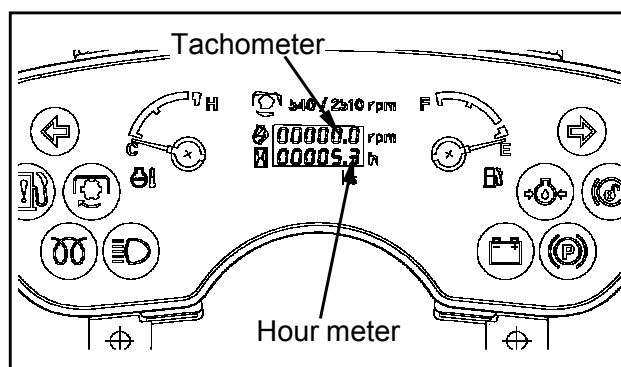
#### (3) Cold start aid indicator

- If the cold start aid device is working, this indicator will be ON. After the indicator is OFF, start the engine.



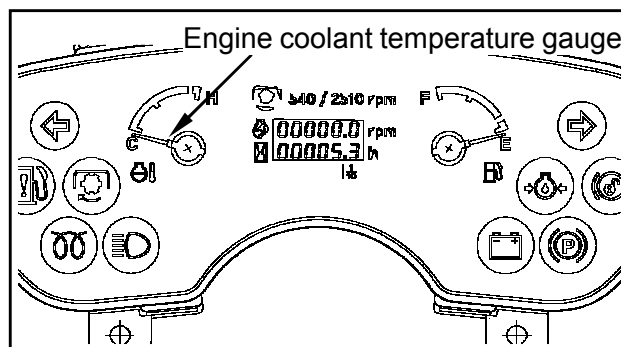
## (4) Tachometer and Hour meter

- The tachometer shows the engine revolutions per minute.
- The operating hour 00005.3 means the tractor has been operated for 5.3hr (5 hours and 18 minutes).



## (5) Engine coolant temperature gauge

- This gauge indicates the temperature of coolant during operation.
- The closer the needle approaches H (red), the higher the temperature of engine coolant is.

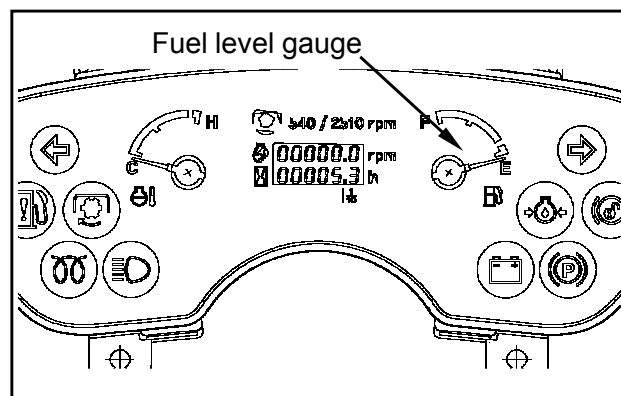


	<p>► If the needle of engine coolant temperature gauge indicates red zone,</p> <ul style="list-style-type: none"> <li>- Stop the engine immediately and check the coolant level after engine cools down. If necessary, add coolant.</li> <li>- Clean the radiator screen if dry grass etc. are attached.</li> <li>- If the trouble is repeated, contact your authorized dealer for check.</li> </ul>
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	<p>► The radiator is very hot. When opening the radiator cap, It may cause a danger of a burn due to the escape of hot coolant or steam.</p>
	<p>► After the coolant is cooled down sufficiently, open the radiator cap with protective gloves and clothing.</p>

## (6) Fuel level gauge

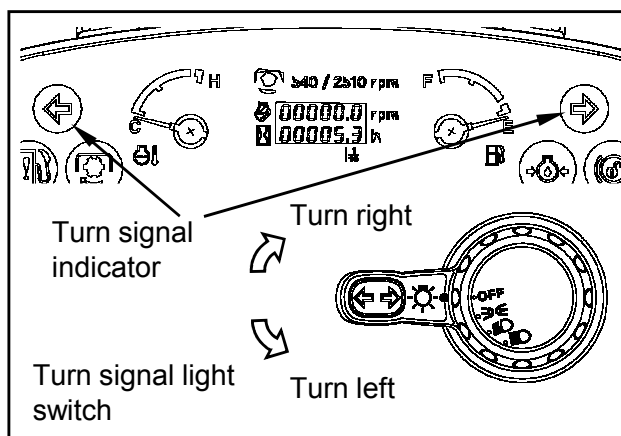
- This gauge indicates the remaining amount of fuel.
- If the needle indicates low or empty (E), fill the fuel tank immediately.



## (7) Turn signal light switch

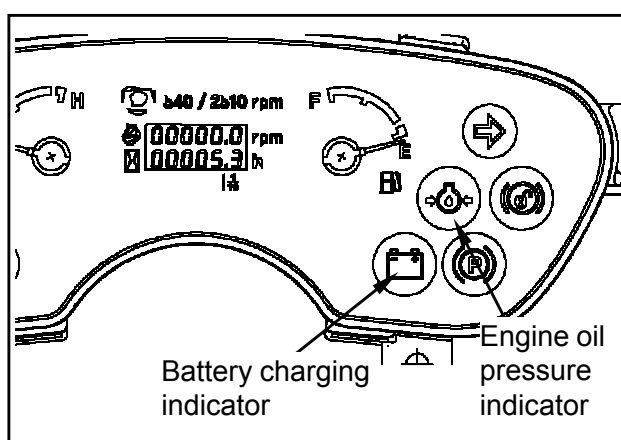
- This switch is used when turning to the left or right.
- If turning the switch to clockwise, the right turn signal light and the indicator are blinking.
  - If turning the switch to counter-clockwise, the left turn signal light and the indicator are blinking.

Notice	<p>► When changing direction during driving on the road, operate turn signal light switch to inform other vehicles of your direction.</p>
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## (8) Engine oil pressure indicator

- When turning the key switch to ON position while the engine stops, this indicator shall be ON.
- If the indicator is ON while the engine is running, stop the engine immediately and check the engine oil level.
  - If this indicator is ON even if the oil level is normal, contact your authorized dealer for check and repair.



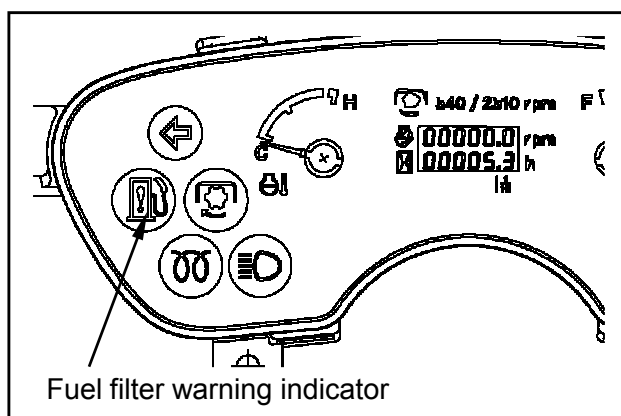
## (9) Battery charging indicator

- When turning the key switch to ON position while the engine stops, this indicator shall be ON.
- If the indicator is ON while the engine is running, this means there is a trouble in charging system. In this case, contact your authorized dealer for check and repair.

	<p>► If the engine oil pressure indicator or battery charging indicator is ON while the engine is running, contact your authorized dealer to check your tractor.</p> <p>► Check these indicators every time when the engine starts.</p>
--	---

## (10) Fuel filter warning indicator (if fitted)


- If the fuel filter warning indicator is ON, the engine shall be stopped automatically.
- Remove the water in the fuel filter. *(If fitted)*





## (11) Light switch

### ① EU version

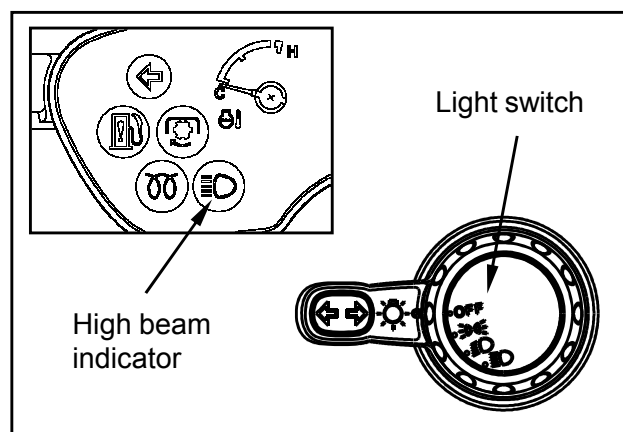
- OFF - Instrument panel and all lights are OFF.

 - Instrument panel and sidelights are ON.

 D - Instrument panel, sidelights, and headlights (low beam) are ON.


 D - Instrument panel, sidelights, headlights (high beam) are ON.


- High beam indicator on the instrument panel is ON.





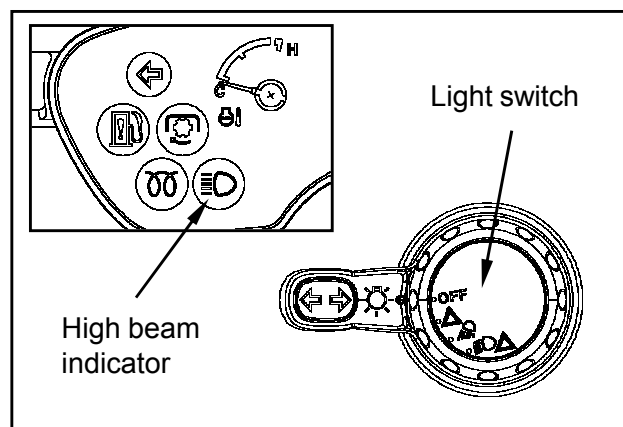
### ② U.S.A version

- OFF - Instrument panel and all lights are OFF.

 - Instrument panel, sidelights and hazard warning lights are ON.

 - Instrument panel, sidelights and headlights (high beam) are ON. (use when working)

 D  - Instrument panel, sidelights, headlights (low beam) and hazard warning lights are ON. (use when driving)

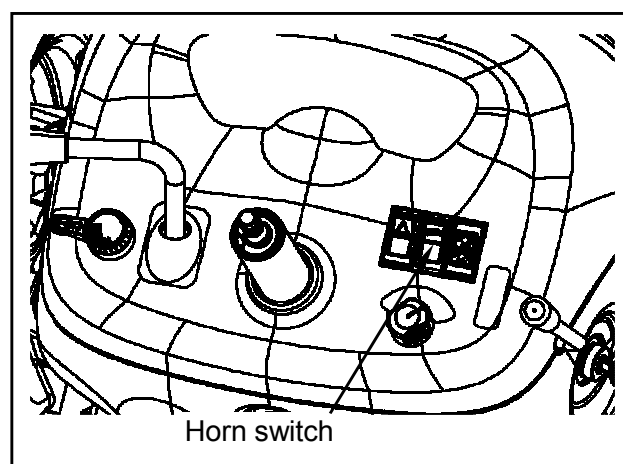
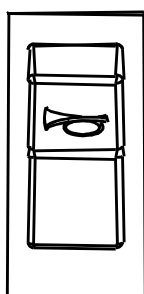


Caution

► When passing with other vehicles in the opposite lane at night, turn the headlights to low beam not to disturb on coming cars.

## (12) Horn switch (if fitted)

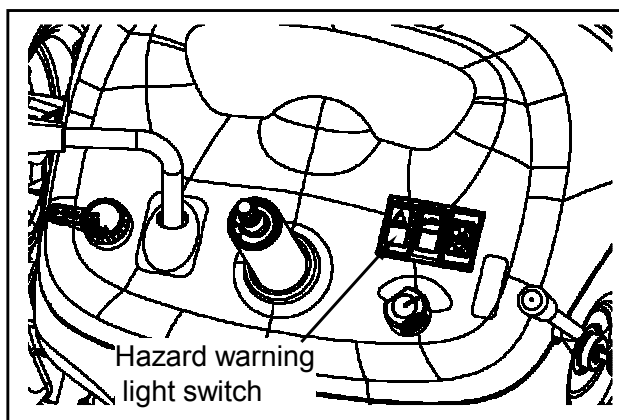
- If you press the horn switch, horn sounds.



## (13) Hazard warning light switch (optional)

### ① EU version

- This is used to warn other drivers to pay attention to emergency status. If you press the triangle switch, all turn signal lights and indicators shall be blinking.

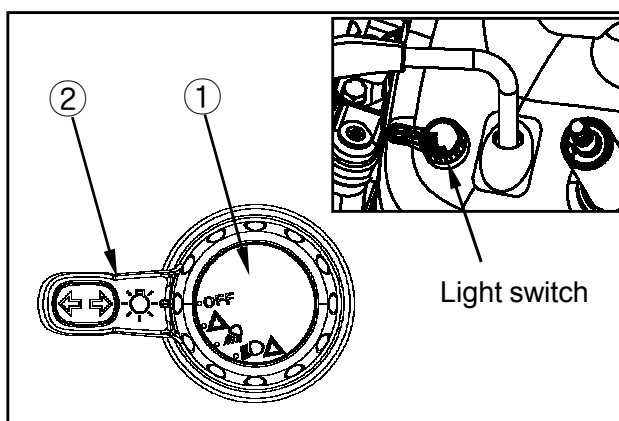


#### Notice

► If you use the hazard warning lights for a long time, it may cause a increase of electrical power consumption. Do not use the hazard warning lights for a long time.

### ② U.S.A version

- By turning the switch ① once to the clockwise, all turn signal lights are blinked.
- This is used to warn other drivers to pay attention to emergency status.
- Hazard warning light is automatically on by turning on the driving light.  
(Low beam)

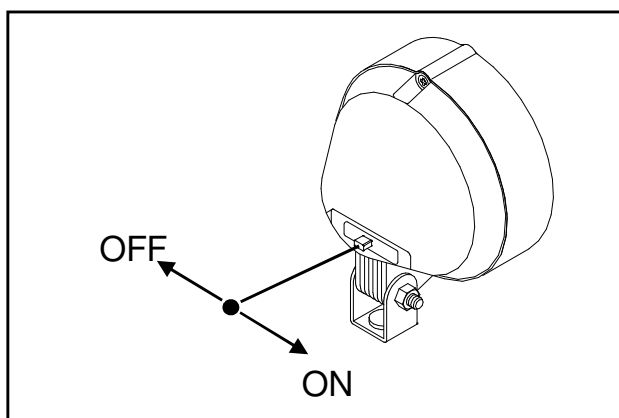


#### Notice

► If you use the hazard warning lights for a long time, it may cause a increase of electrical power consumption. Do not use the hazard warning lights for a long time.

## (14) Work light switch (if fitted)

- There is a switch to turn on the rear work light.
- ON - place the switch to the right direction and the work light shall be ON.
- OFF - place the switch to the left direction and the work light shall be OFF.



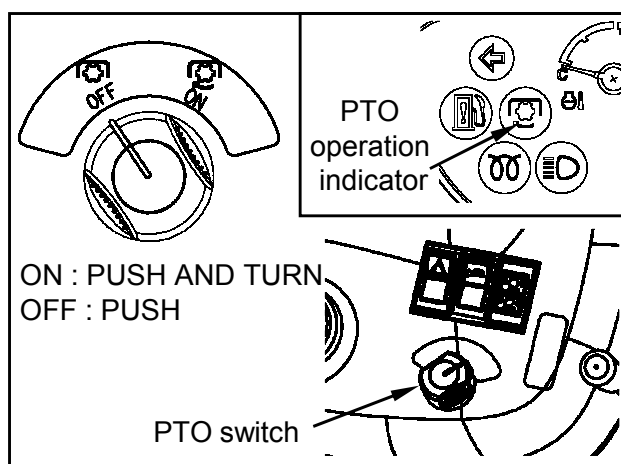
#### Caution

► When driving on the road at night, do not let the rear work light stay ON. It may cause a disturbance to the driver of the following car.




## (15) PTO operation indicator

- When the key switch is ON and PTO switch is ON, this indicator will be ON.



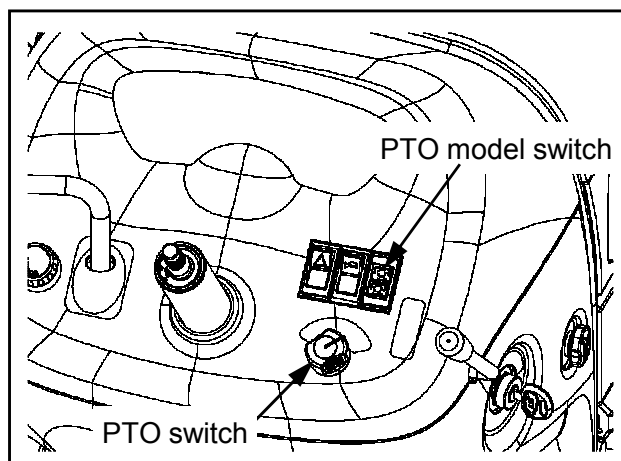
## (16) PTO switch (Independent PTO)

- The engine starts only when PTO switch is placed in OFF position for safety.
- After starting the engine, you must comply with the operation procedure of the PTO switch as follow.
  1. Check the safety around the implement.
  2. Turn the PTO switch to ON position to operate the PTO.
  3. When the PTO is working, PTO operation indicator on the instrument panel shall be ON.
  4. If you want to stop the PTO temporarily while operating, push the PTO switch to OFF position. The PTO operation shall be OFF.

 <b>Warning</b>	<ul style="list-style-type: none"> <li>▶ Before attaching or checking the PTO driven equipment,               <ul style="list-style-type: none"> <li>- Always place the PTO switch in OFF position.</li> </ul> </li> <li>▶ This independent PTO is working independently and has no relation with movement or its speed of the tractor. This PTO speed changes with engine speed and PTO gear lever (if fitted).</li> <li>▶ Do not engage the PTO with the engine running at high speed. Sudden engagement can cause damage to implement and tractor. Engage PTO at low RPM, and then raise engine speed to high RPM.</li> </ul>
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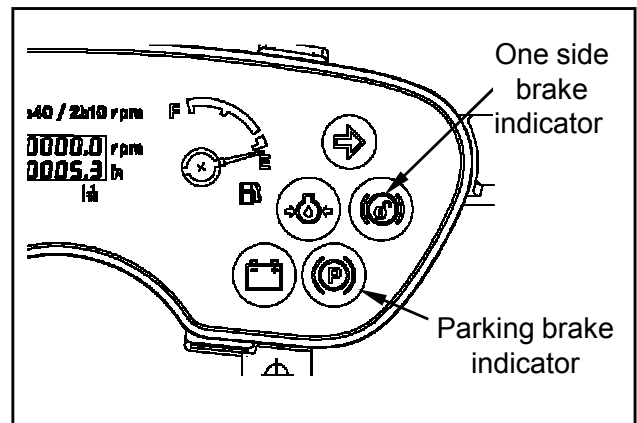
## (17) PTO mode switch (if fitted)

- If the upper side of the switch is pressed, it is AUTO mode.  
When the 3-point linkage is lifted, the PTO shaft will be stopped automatically. If the 3-point linkage lowered down, the PTO will rotate again.
- If the down side of the switch is pressed, it is Manual mode. When the PTO switch is ON and PTO gear is engaged, the PTO shaft always rotates.



## (18) Parking brake indicator

- This indicator will be ON when applying the parking brake or pressing brake pedal. (See page 3-11)



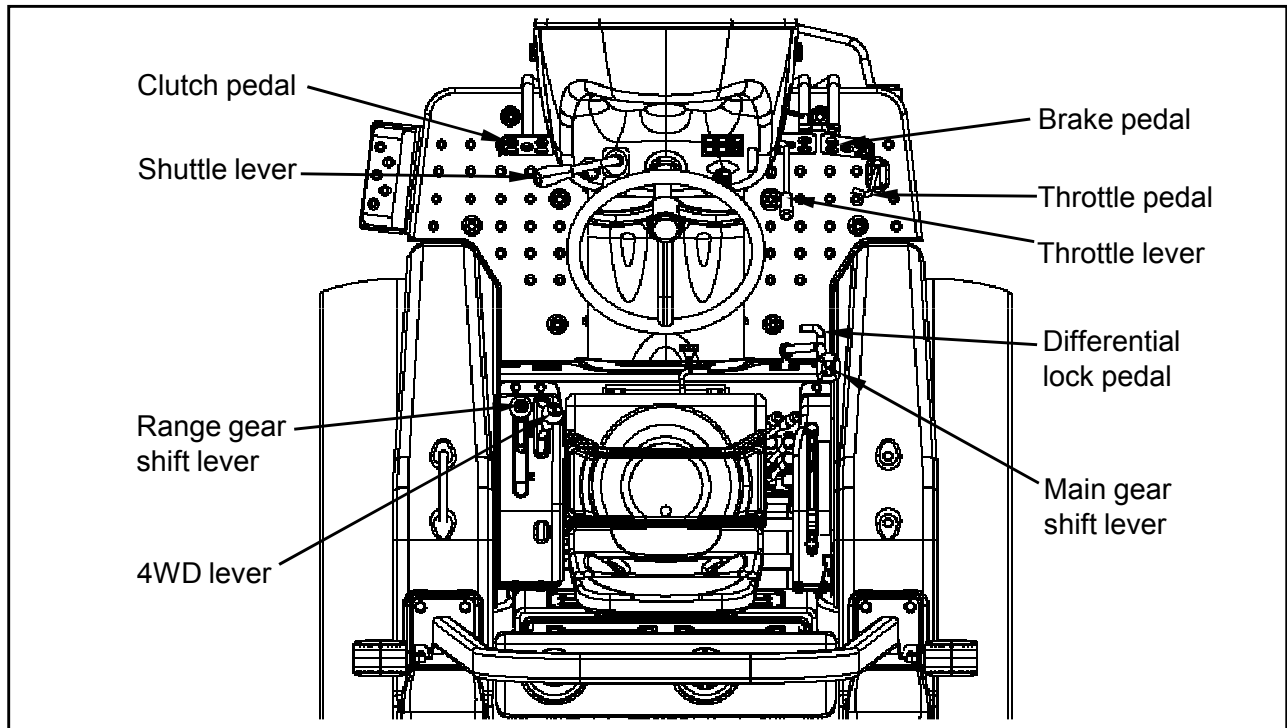
## (19) One side brake indicator (if fitted)

- Not used

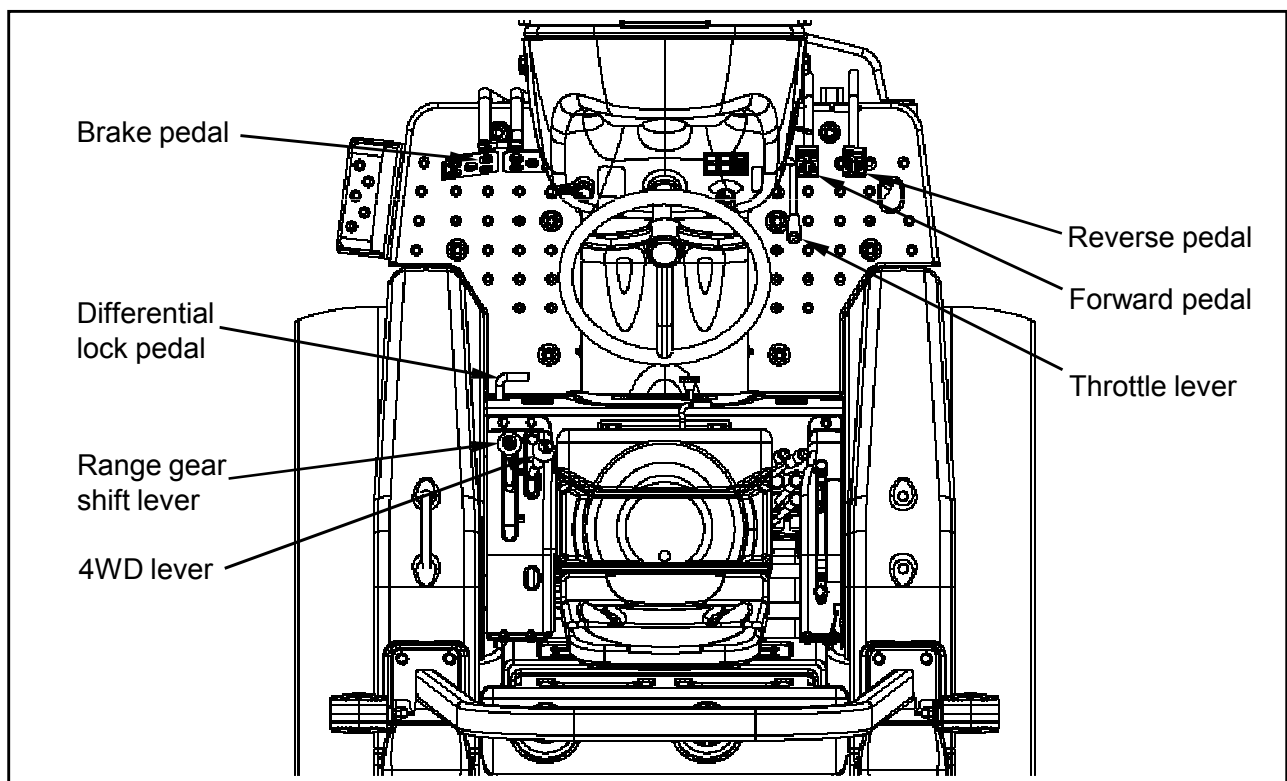
## 3-2. Operating Levers and Pedals

**Important to owner, read carefully.**

### Mechanical type

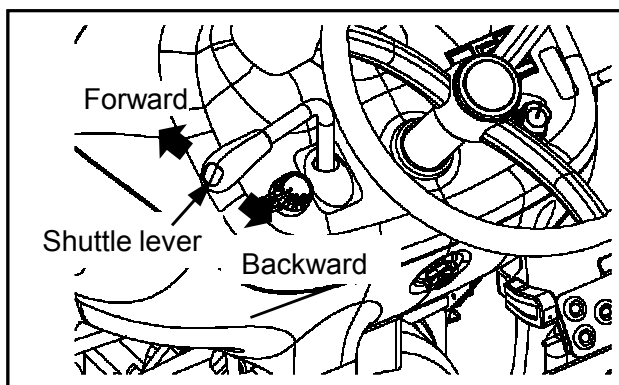


### HST



## (1) Shuttle lever (Mechanical type)

- It is used to select Forward / Reverse.
- If you push the lever forward, it runs forward and if you pull the lever back, it runs backward.
- Before moving tractor backward, lower the engine rpm and check behind you.

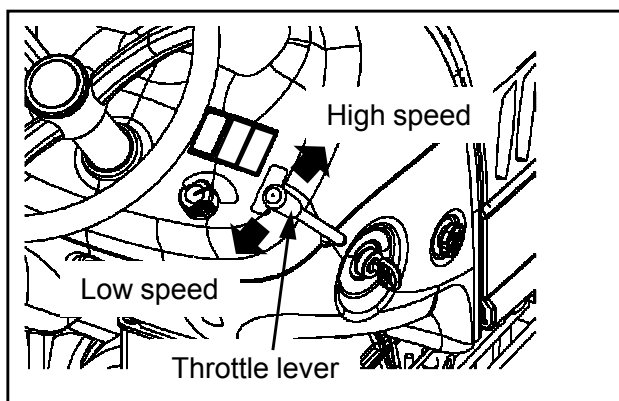


**Caution**

- ▶ The operation of shuttle lever must be done after the tractor has stopped completely.  
Do not operate shuttle lever while the tractor is moving, it may cause damage to synchronizer rings and gears. (Synchro-shuttle).

## (2) Throttle lever

- If you pull the lever backward, it means low speed, and if you push it forward, it means high speed.
- The lever must be used only for the work and not allowed to be used while driving.



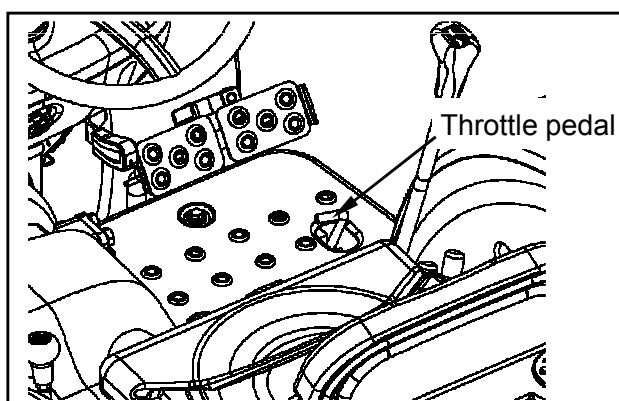
**HST type**

**Notice**

- ▶ Do not operate in the state more than 1500 rpm during driving or working after starting the engine. Otherwise, it may cause some noise.

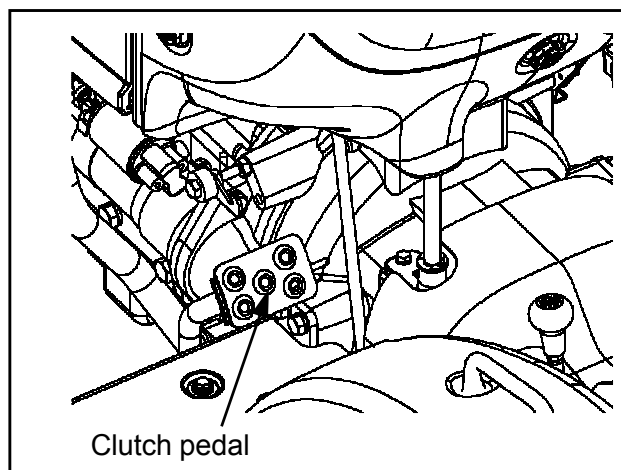
## (3) Throttle pedal (Mechanical type)

- This pedal is used when driving on the road.
- When using the throttle pedal, the throttle lever must be placed on low speed.



## (4) Clutch pedal (Mechanical type)

- This is used to engage or disengage the main transmission clutch for starting engine and shifting transmission gear.
- Depress the clutch pedal quickly and fully, and release it slowly.

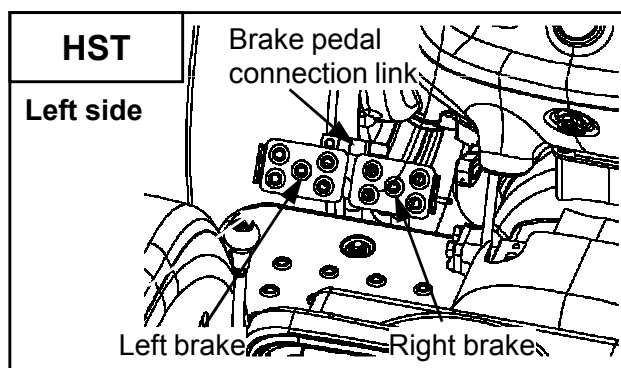
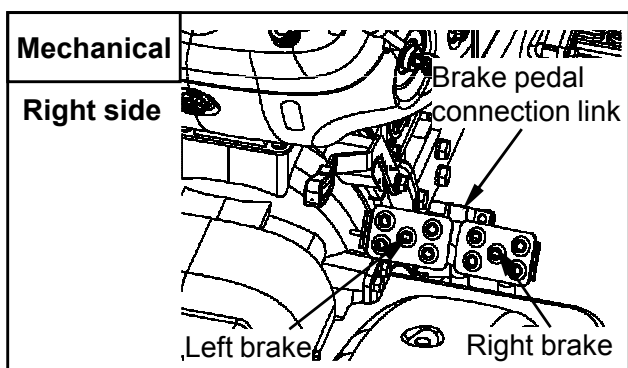


**Caution**

- ▶ DO NOT ride your foot on the clutch pedal while driving the tractor.
- ▶ As the start safety switch is installed for the operator's safety, depress the clutch pedal fully to start engine.

## (5) Brake pedal

- When stopping, press both brake pedals together with depressing the clutch pedal.
- If disengaging the brake pedal connection link, you can press the left or right brake pedals one side at a time, the left and right brake is applied on the rear wheel of the pressed pedal.
- When working, If you press one brake pedal to the left or right, you can make shorter turning radius.
- DO NOT press the one side brake pedal while the differential lock is engaged. It may cause damage or failure of the axle.
- Regarding the position of the brake pedals, HST type is on left side of plate form and mechanical is on the right side of plate form. Each pedals have same function on both different sides.

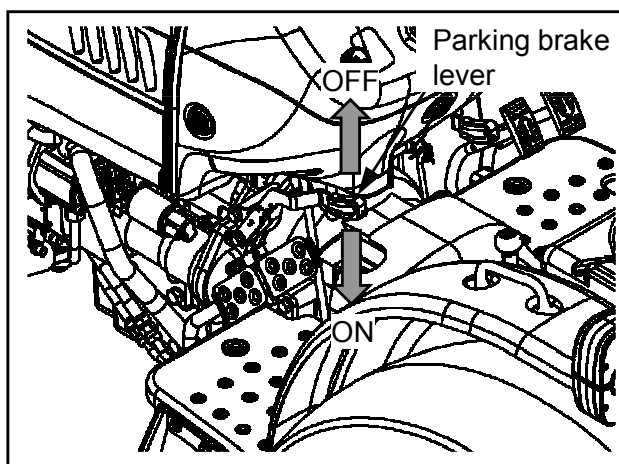
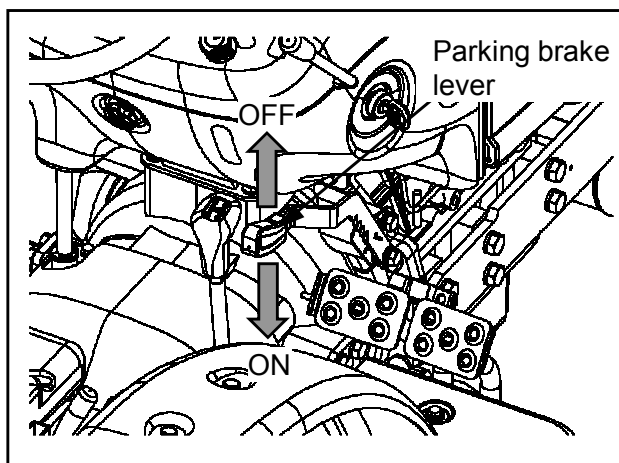


**Caution**

- ▶ When driving on the road, engage the left/right brake pedal by the brake pedal connection link. If pressing one side brake pedal when driving, the tractor may turnover.
- ▶ DO NOT ride your foot on the brake pedals while driving. If so, it may cause failure of brakes.

## (6) Parking brake lever

- Connect brake pedals each other with brake connection plate.
- Push down the parking brake lever while pressing the brake pedals and check that serrated part is engaged to left brake pedal.
- Release the brake pedals slowly to check slippage of the tractor.
- To release the parking brake, just press the brake pedals little harder and check if parking brake lever goes to its original position by spring.



**Caution**

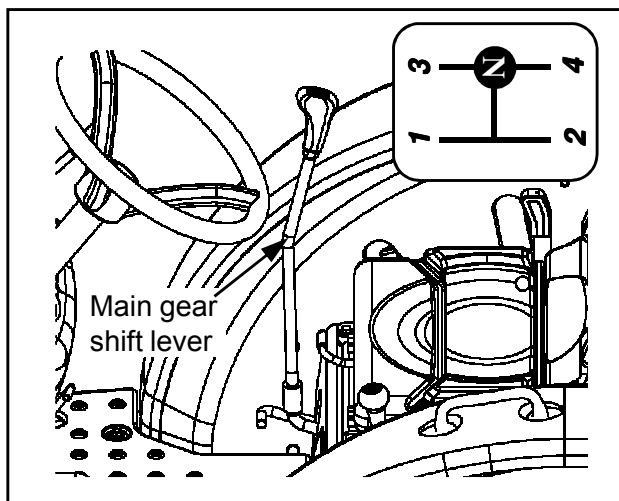
- ▶ DO NOT drive the tractor while parking brake is engaged. It may cause damage of brakes or parking brake device.

## (7) Main gear shift lever (Mechanical type)

- Four speed ratios are available.
- Main gear shift lever must be operated after the tractor has stopped completely. BE CAREFUL.

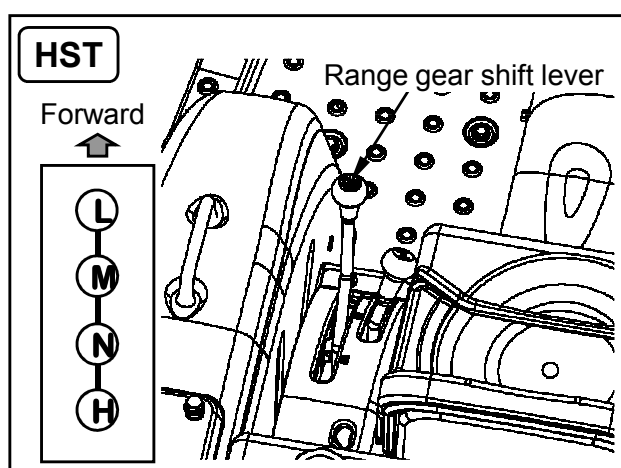
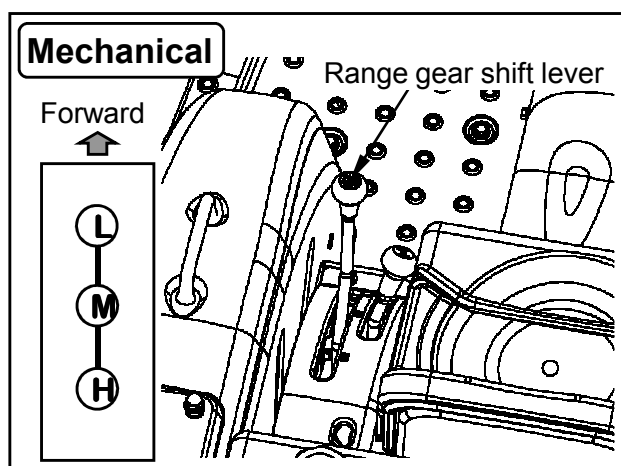
**Notice**

- ▶ Operate main gear shift lever by H-pattern. If operated diagonally, it may cause a failure.



## (8) Range gear shift lever

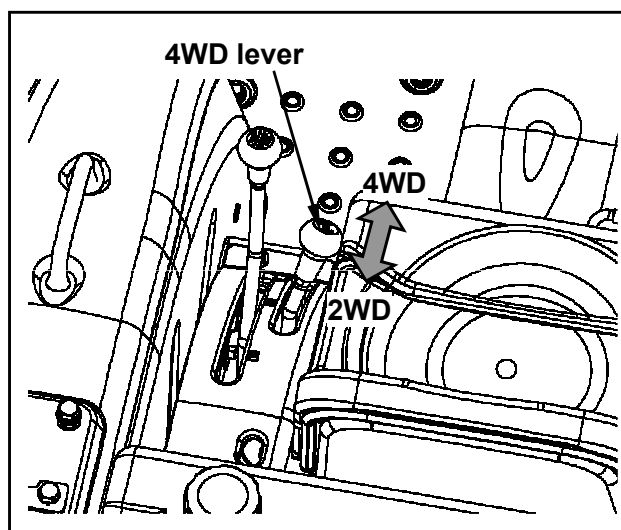
- Three speed ranges are available.
- Range gear shift lever must be operated after the tractor has stopped completely.



	<b>Caution</b>	<p>► While stopping tractor, place the main gear shift lever and range gear shift lever in neutral position to avoid unintended start.</p>
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## (9) 4WD lever

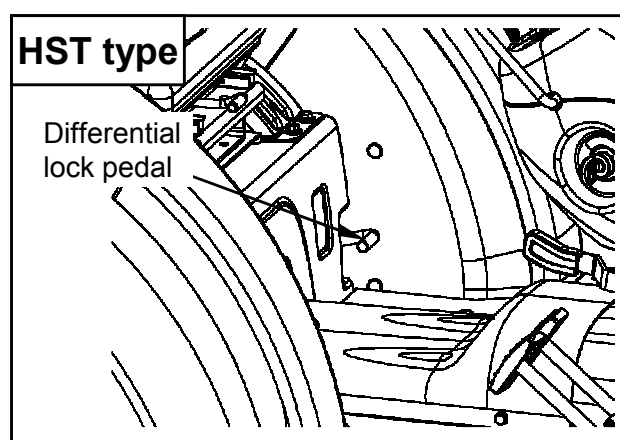
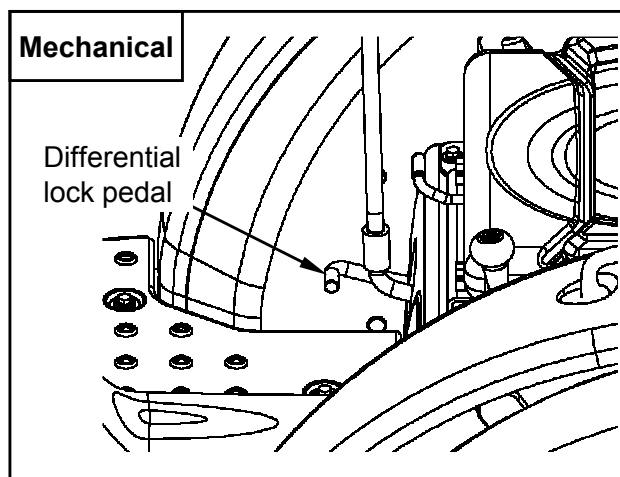
- If you push the lever forward, the front wheel is driven.
- Before driving front axle, depress the clutch pedal and stop the tractor completely and then operate the lever.
- Front wheel drive (4WD) is effective for the followings.
  - When traction is needed for plowed ground.
  - When working on slippery ground.
  - When working with tiller on hard ground.
  - When crossing a ridge




	<b>Caution</b>	<p>► When driving on the road, disengage the 4WD. If not, it may cause damage of drive line and serious accident. After working, before coming out from the field, select 2WD.</p> <p>► When driving the tractor at high speed while the 4WD is engaged, sharp steering may cause a accident.</p>
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## (10) Differential lock pedal

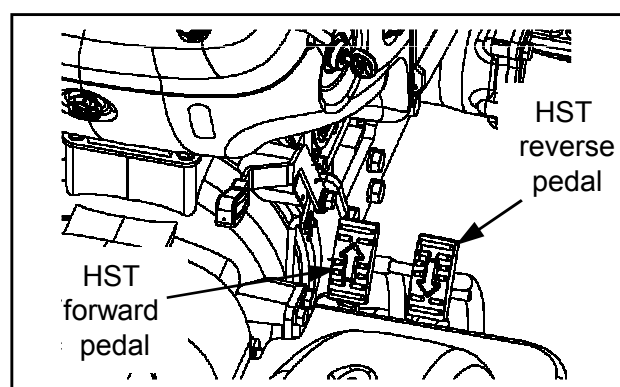
- If the tractor cannot go forward as one side rear wheels are slipping, press the differential lock pedal down.
- Differential lock is effective for working on slippery ground, and working with a plough
- If engaged, both rear wheels will rotate at equal speed. So, It disturbs steering operation and you cannot turn.
- Take your foot off the pedal to release the differential lock. If the traction is equalized, the lock is released automatically.
- If the differential lock does not disengaged, i.e. if turning to right or left in a wide radius, depress the clutch pedal once and press one side brake pedal slightly for a second, and then the other.
- Regarding the function of the differential lock pedal, HST type is identical with the mechanical one except that each pedal is located at both different sides of platform.




 <b>Warning</b>	<ul style="list-style-type: none"> <li>▶ Do not turn the tractor while the differential lock is engaged.</li> <li>▶ Do not use the differential lock while driving on the road.</li> <li>▶ Stop or slow the tractor before engaging the differential lock.</li> </ul>
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## (11) HST forward / reverse pedal (HST type)

- Press the HST forward pedal slowly in order to move forward and if release the pedal, it returns back to the neutral position and tractor stops.
- The HST reverse pedal is as same as the HST forward pedal operation.

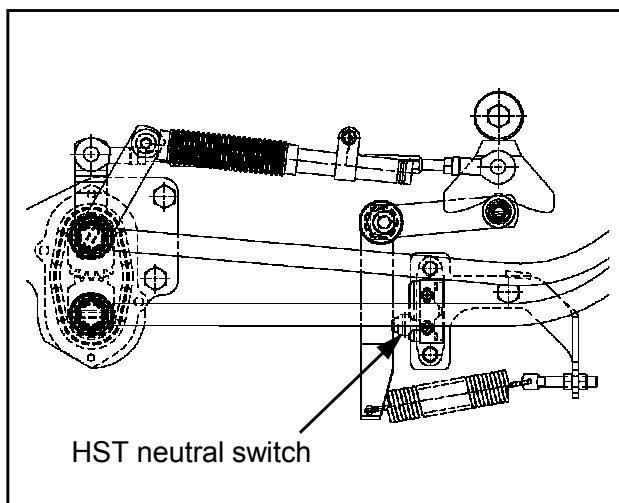


 <b>Warning</b>	<ul style="list-style-type: none"> <li>▶ Press the brake pedal to prevent stopping distance from being extended when driving in high speed .</li> <li>▶ DO NOT operate the pedal hastily. It may cause a shock to you.</li> </ul>
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## (12) HST neutral switch (HST type)

- It is located under the HST forward/reverse pedal and the switch shall be pressed if the pedal is placed on the NEUTRAL position as the pedal is not pressed.
- The engine does not start until the switch is pressed.
- This is the switch to prevent the tractor from suddenly starting in forward or reverse.

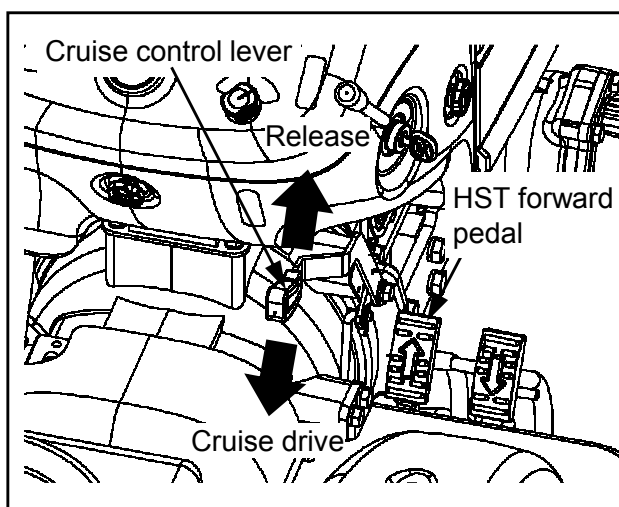


warning

- ▶ Do not disassemble the HST neutral switch. It may cause sudden starting and serious injury.
- ▶ If the HST neutral switch does not pressed in the neutral position of the HST forward / reverse pedal, adjust the switch to be pressed by HST pedal linkage.

## (13) Cruise control lever (HST Type)

- For cruise drive, push the cruise control lever down in the state of pressing the HST pedal forward. And then, the HST pedal shall be fixed and the tractor can drive forward with constant speed.
- To stop the cruise drive ;
  - 1) Press the brake pedal down or
  - 2) Press the HST pedal forward little more.
 And then, The HST pedal returns to the neutral position and the cruise drive shall be stopped.

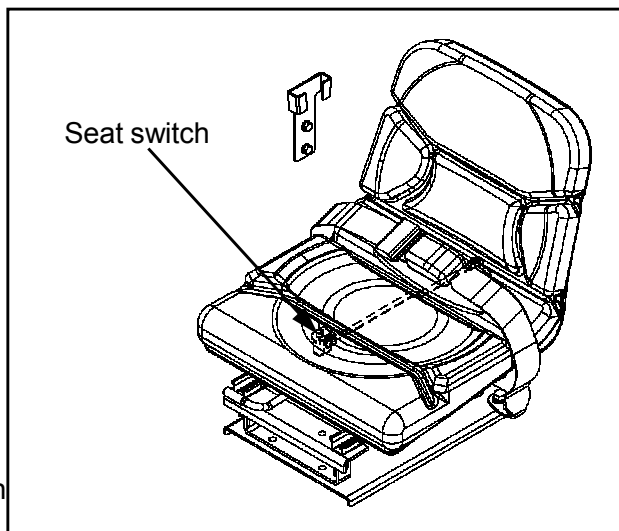


warning

- ▶ During the cruise drive, pressing the HST pedal backward to release the cruise drive or to reverse the tractor is NOT available. After stopping the cruise drive as above described, press the HST pedal backward.
- ▶ DO NOT try to move the cruise control lever down to quit the cruise drive. It may cause the failure of the cruise control linkage system.

## (14) Driver's seat (HST type)

- At the lower end of the seat, there is a switch to detect that operator is sitting in driver's seat.
- If the operator gets up from the seat while engine is running, the engine will stop automatically for safety in case of ;
  - getting up from the seat for more than 2 seconds with HST pedal NOT in neutral position.
  - the HST pedal is in NEUTRAL and rear PTO is engaged without applying the parking brake.
  - the Middle PTO lever (option) is engaged.
- Before leaving the driver's seat, turn the PTO switch to OFF and place the Middle PTO lever (option) on OFF position, and apply the parking brake.

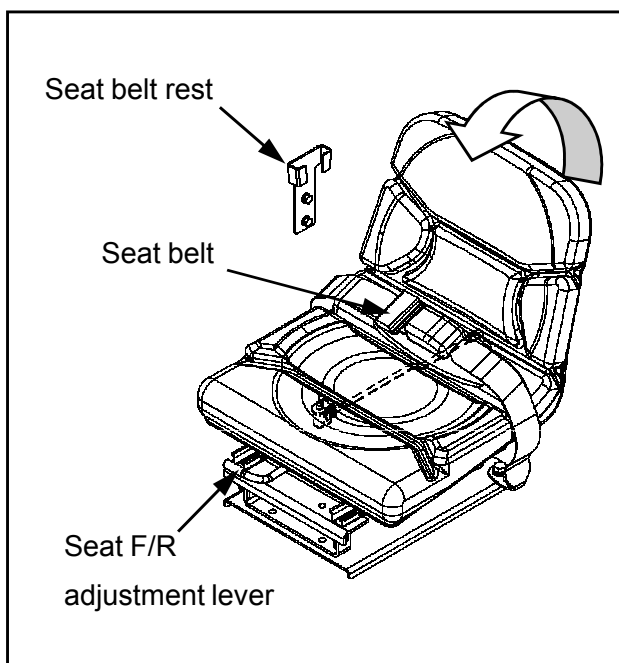


**! warning**

► DO NOT arbitrarily remove the seat switch. If it is necessary to replace the seat the seat switch has to be replaced together. If not, the engine does not start.

## (15) Seat adjustment

- Before operating the tractor, adjust the position of driver's seat according to body size and length.
- Seat F/R adjustment lever
  - 1) After sitting on driver's seat, lift the seat F/R adjustment lever up to release the lock.
  - 2) Move the driver's seat forward or backward according to driver's body length.
  - 3) Release the seat F/R adjustment lever and ensure that seat is locked.
- Keep the released seat belt on the seat belt rest after working.
- To prevent weathering of driver's seat, raise the seat forward.



**! warning**

- DO NOT put your hand under the seat while sitting. It may cause a injury by seat suspension.
- DO NOT adjust the seat position while driving.

## 3-3. Hydraulic system

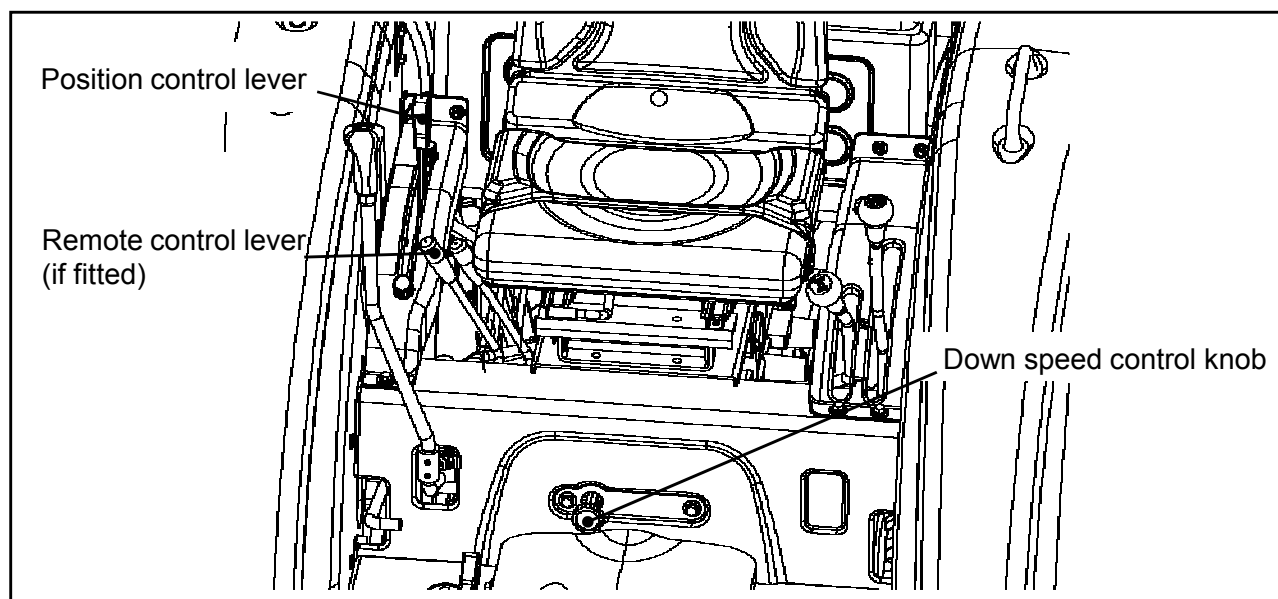
### (1) Steering system

- As the steering system of your tractor has a hydraulic pump, valve and etc., it provides you more convenience to operate the steering wheel.
- Notices when using the steering system.
  1. If there is too much of a load in front loader bucket, it could be difficult to operate the steering wheel. In this case, reduce the size of the load.
  2. After turning the steering wheel fully, do not turn the steering wheel to the same direction again. As the unnecessary force is applied, this could damage to the steering system. Especially, DO NOT operate the steering wheel excessively. If the front wheel mired in a ditch, the rim could be affected and damaged.
  3. If it sounds abnormal when operating the steering wheel, this means that there is some air in the steering components and line. In this case, turn the steering wheel to the left and right fully and hold it for about 5 seconds to bleed out air in the hydraulic system. If abnormal noise does not stop, contact your authorized dealer for repair.
  4. When starting engine in cold weather, a abnormal noise may occur. In this case, warm up the tractor before using to reduce the oil viscosity.
  5. If you use the tractor for a long time while turning the steering wheel fully, the oil temperature will increase which may cause the reduction of the product life or the failure of hydraulic and steering system.

Notice	<ul style="list-style-type: none"><li>▶ If the engine stops, the steering wheel does not turn easily because hydraulic pump does not work. But this is not a pump failure.</li><li>▶ If you turn the steering wheel while driving, the steering wheel does not return back automatically.</li></ul>
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### (2) Hydraulic lift control

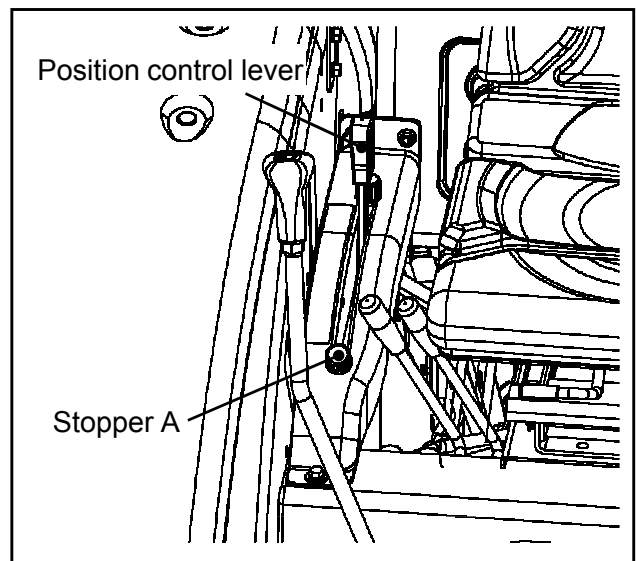
- Hydraulic lift device can be worked in position control, draft control and mixed control mode.



## ① Position control

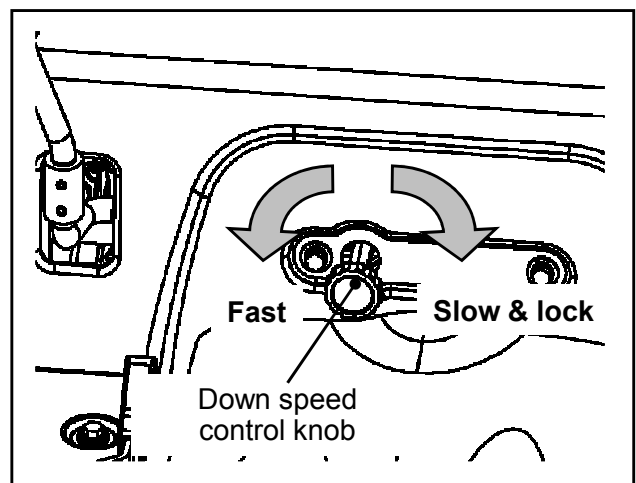
- This mode sets the position of implements freely by position control lever operation. Generally, this mode is used for tiller, fertilizer distributor, mower, rake etc. In this case, operate the lever as follows.

1. Push position control lever forward and the implement lets down by its own weight.
2. If the position control lever is on random position, the implement stops at the height corresponding to the lever position.
3. To keep the height of implement in a desired range, restrict the lever to the lowest point with stopper A.



## ② Down speed control knob

- Turn the knob to the clockwise to lower the implement slowly and to the counter-clockwise to rise speed faster. If turning clockwise, the implement is fixed and even if lowering down the position control lever, the implement does not let down. Do not over tighten control knob could cause damage to the control valve.
- Tiller : Slow in down speed
- Plough : Fast in down speed
- When working in hard ground, slow down the down speed to avoid the bounding of the implements.

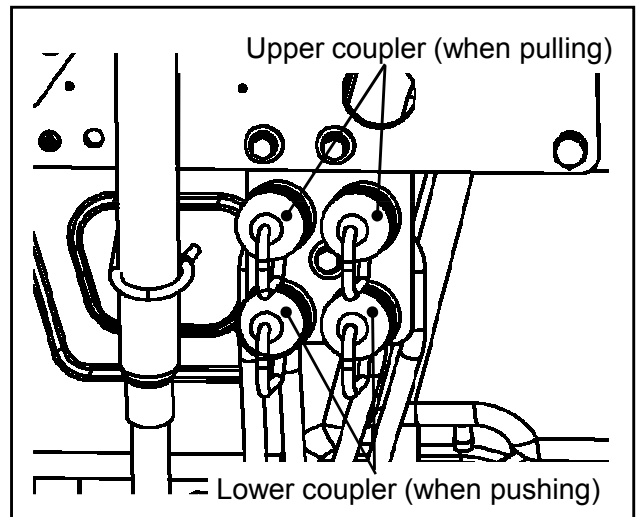
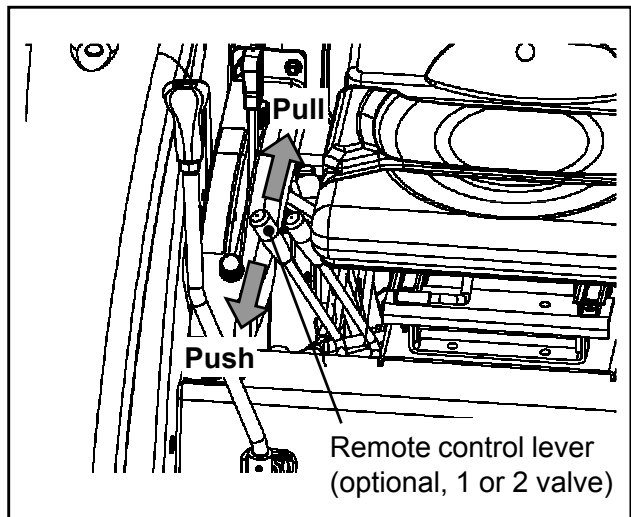


**Warning**

- ▶ When driving on the road, turn right the down speed control knob slightly to lock. Do not over tighten control knob.
- ▶ When changing the blades of tiller or removing grass, stop the engine and turn the down speed control knob to right slightly to lock. (The knob may turn about two revolutions. Do not over tighten control knob.)

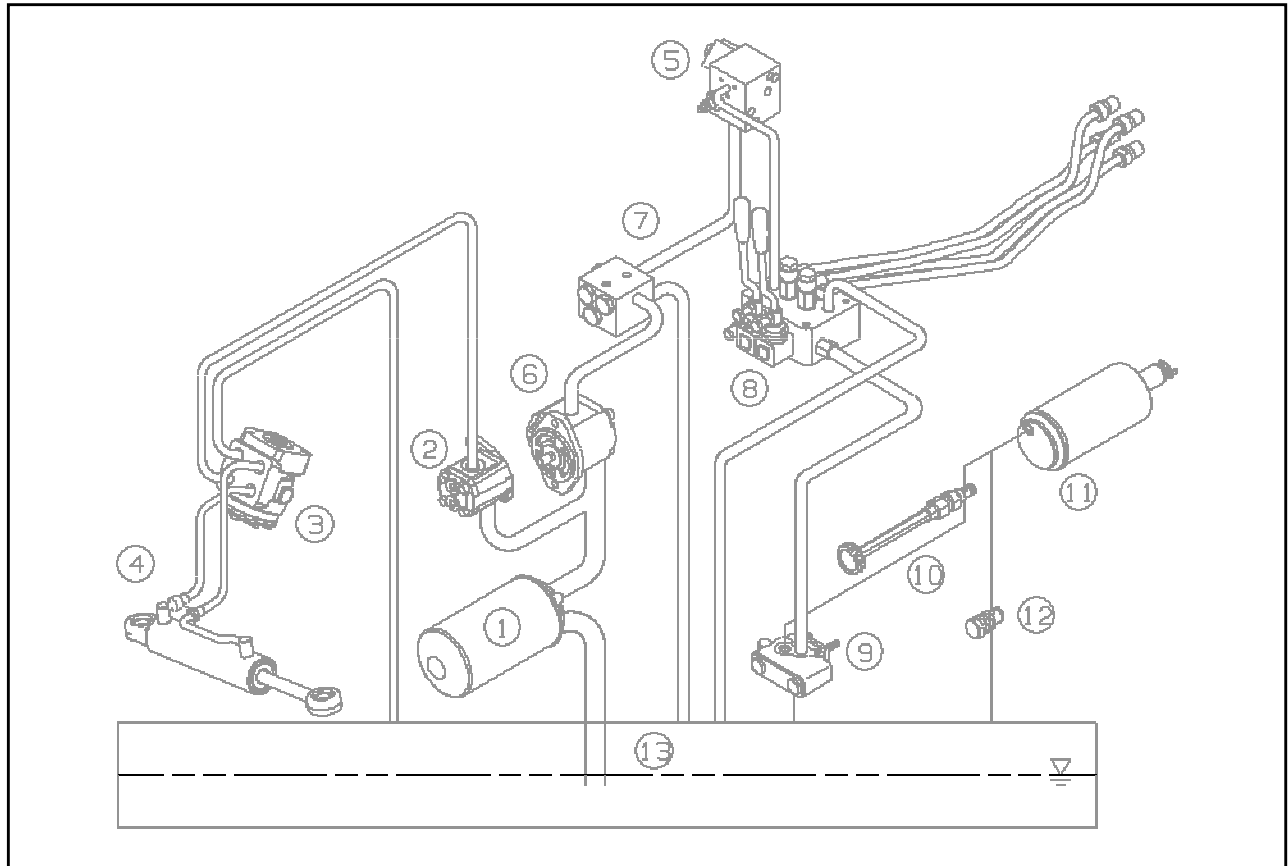
### (3) Remote control lever and Quick coupler (if fitted)

- ※ This is used to operate the implement (i.e. Dump trailer, Hydraulic conversion plough, etc) attached to the tractor by the hydraulic pressure.
- If you pull the remote control lever backward, the hydraulic pressure works to the upper coupler, and the lower coupler is connected to the drain.
- Each lever of the remote control valve operates respectively and when operating the levers at the same time, the one received less force begins to start first.



## (4) Hydraulic System Diagram

### Mechanical type



1. Hydraulic oil filter

2. Steering pump

3. Steering unit

4. Steering cylinder

5. Independent PTO valve

6. Hydraulic lift pump

7. Front outlet valve

8. Remote control valve  
(optional)

9. Hydraulic lift control valve

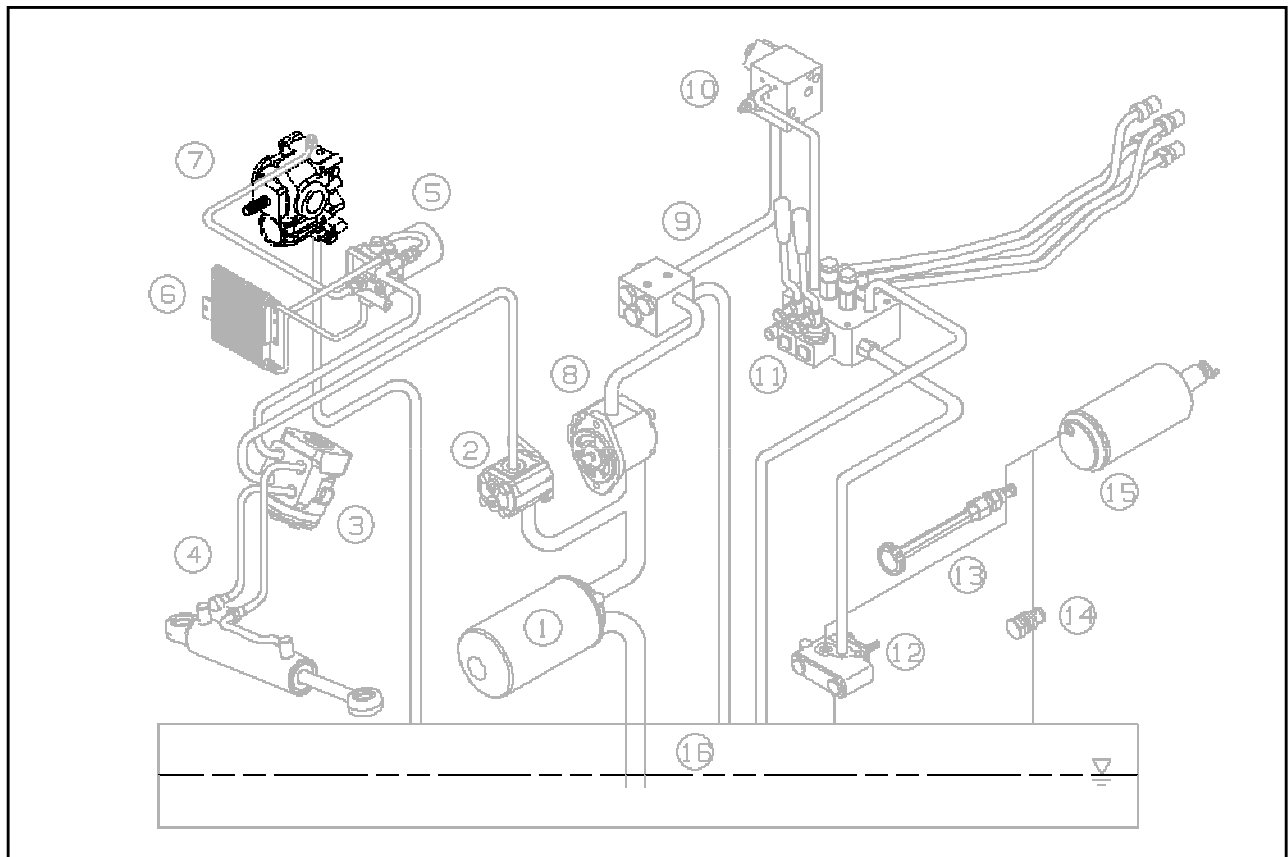
10. Down speed control valve

11. Hydraulic lift cylinder

12. Safety valve

13. Oil tank (Transmission)

## HST



1. Hydraulic filter
2. Steering pump
3. Steering unit
4. Steering cylinder
5. HST filter
6. Oil cooler



7. HST unit
8. Hydraulic lift pump
9. Front outlet valve
10. Independent PTO valve
11. Remote control valve (optional)

12. Hydraulic lift control valve
13. Down speed control valve
14. Safety valve
15. Hydraulic lift cylinder
16. Oil tank

## 3-4. Safety Device

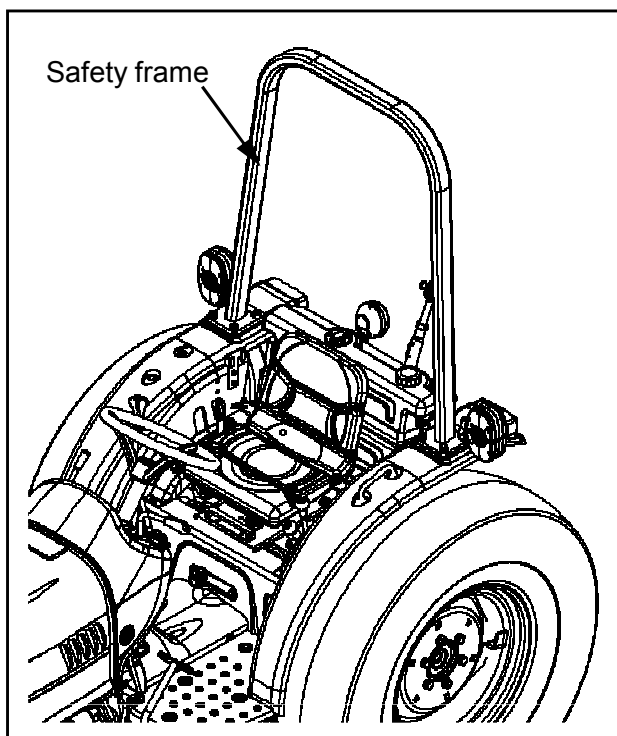
### (1) Seat belt


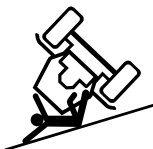
- Always wear the seat belt before operating the tractor and adjust the belt to fit the operator.
  1. Insert the seat belt end into the buckle until a click indicates it is properly engaged.
  2. To remove the seat belt from the buckle, press the red release button on the buckle.
- Check the seat belt regularly. If damaged or frayed, replace it with a new one.

 Warning	▶ If not wearing the seat belt, it may cause serious injury in case of accident.
	During operation, it must be required to wear seat belt with a cab or safety frame installed. After wearing the seat belt, adjust the belt to fit the operator.  ▶ If safety frame is folded down for frame model, do not wear the seat belt.

### (2) Safety frame (Roll-bar type)

- DO NOT remove the safety frame arbitrary. This structure will reduce the risk of serious injury or death.
- DO NOT modify or repair the safety frame. The welding, bending, drilling, grinding, or cutting of any part of the safety frame, it can weaken the structure.
- If the safety frame is loosened or removed for any reason, make sure that all parts reinstalled correctly before operating the tractor.



 Warning	▶ If the safety frame is damaged or deformed, contact to your local authorized dealer to replace it with a new one.
	▶ Unless the safety frame is applied correctly, it may cause a serious accident on tractor when being overturned.



### (3) Foldable Safety frame (Roll-bar type) (optional)

- How to fold the Safety frame.

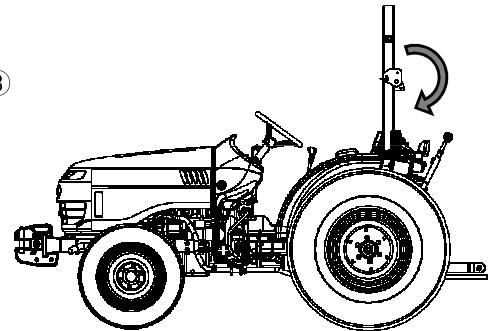
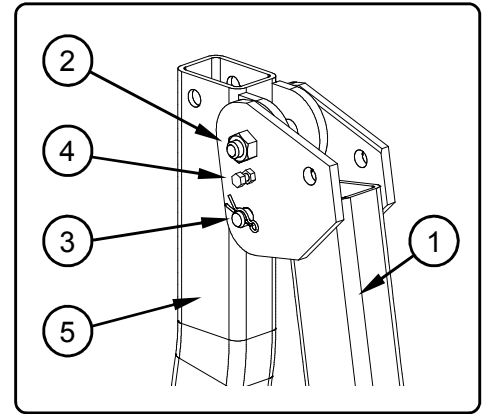
1. Loosen the safety frame bolts② ④ and nuts (both sides) loosely. (Do not unfasten it completely)
2. Remove the pins③ on the both side and fold the safety frame backward.


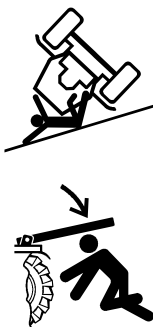
- Be careful of the possibility that your head, hand and shoulder might be hurt by folding bar due to weight of the safety frame.

3. Set the holes of the frame ① and ⑤ in line, and put the pins③ into the hole to fix the safety frame and apply the snap pin.

4. Fasten the bolts② ④ and nuts (both sides) tightly.

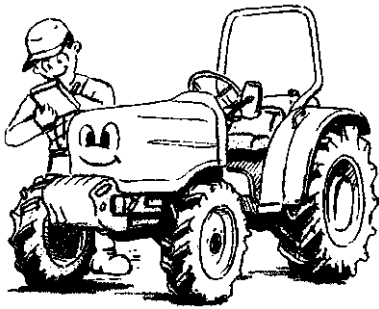
- When standing the safety frame up, follow the same procedure.



 <b>Warning</b>	<ul style="list-style-type: none"> <li>▶ Do not change or disassemble the safety frame arbitrarily for safety.</li> </ul>
	<ul style="list-style-type: none"> <li>▶ Unless the safety frame is applied correctly, it may cause a serious accident on tractor when being overturned. <ul style="list-style-type: none"> <li>- Be sure to stand the safety frame up completely and assemble the bolts, pins and nuts in correctly.</li> </ul> </li> <li>▶ In case of folding the safety frame. <ul style="list-style-type: none"> <li>- Do cooperate with more than 2 people when folding or standing up the safety frame as it's heavy.</li> <li>- Be careful not to be injured by sudden folding, which might occur when folding or standing up the safety frame, due to its weight.</li> <li>- Do not wear seatbelt when the safety frame is folded down.</li> <li>- Do stand the safety frame up again as soon as the work is finished.</li> </ul> </li> </ul>

## 4. Operation and Work

### 4-1. Engine start and stop



**Caution**

- ▶ Check each part before starting engine.
- ▶ Check if there is some other people around before starting.
- ▶ Place all the levers and switches in NEUTRAL or OFF position.

#### (1) Engine start

##### Mechanical type

1. Sit in the driver's seat and apply the parking brake lever.



2. Place the main gear shift lever, range gear shift lever, shuttle lever in NEUTRAL and PTO switch in OFF position.



3. Push the throttle lever to the middle position of the full throttle.



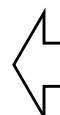
4. Turn the key switch to ON and check if engine oil pressure indicator, battery charging indicator, cold start aid indicator is ON.



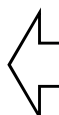
5. Wait until cold start aid indicator is OFF. (about 10~15 seconds)



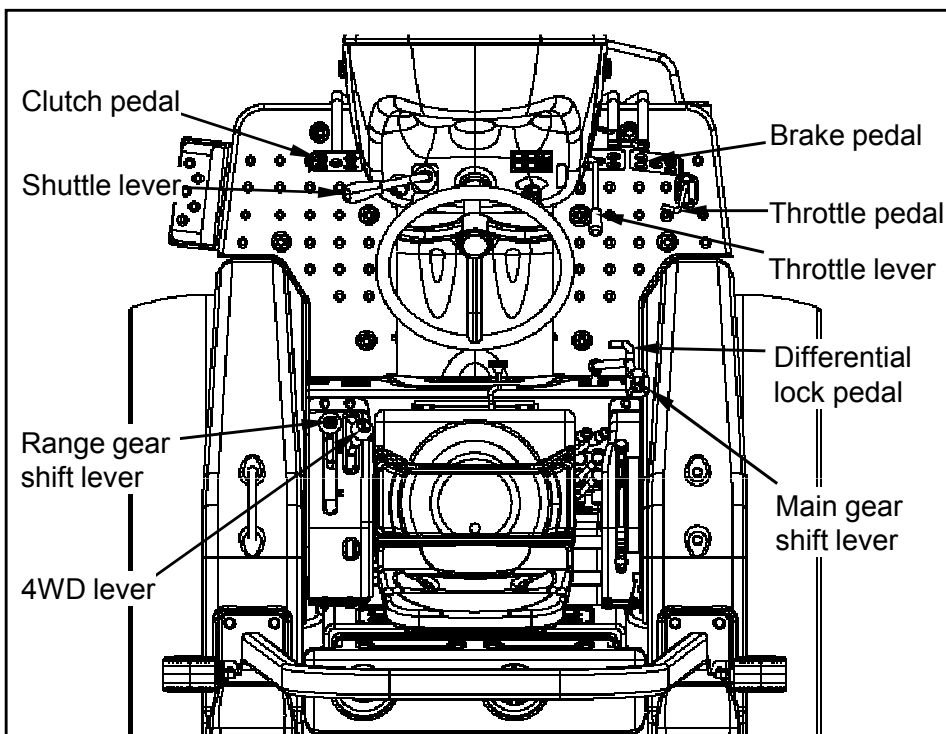
6. Depress the clutch pedal fully and turn the key switch to START position. As soon as the engine starts, release the key switch to ON position.

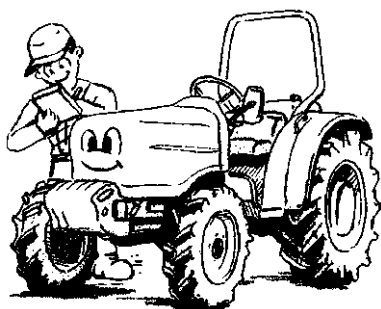


7. Check if engine oil pressure indicator and battery charging indicator are OFF. If any indicator is ON, stop the engine immediately and check.



8. Run engine for a few minutes to warm up the engine oil and transmission oil.





### ⚠ Caution

- ▶ Check each part before starting engine.
- ▶ Check if there is some other people around before starting.
- ▶ Place all the levers and switches in NEUTRAL or OFF position.

## HST type

1. Sit in the driver's seat and apply the parking brake lever.



2. Place the range gear shift lever and HST forward/reverse pedal in NEUTRAL, and PTO switch in OFF position.



3. Push the throttle lever to the middle position of the full throttle.



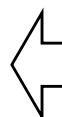
4. Turn the key switch to ON and check if engine oil pressure indicator, battery charging indicator, cold start aid indicator is ON.



5. Wait until cold start aid indicator is OFF. (about 10~15 seconds)



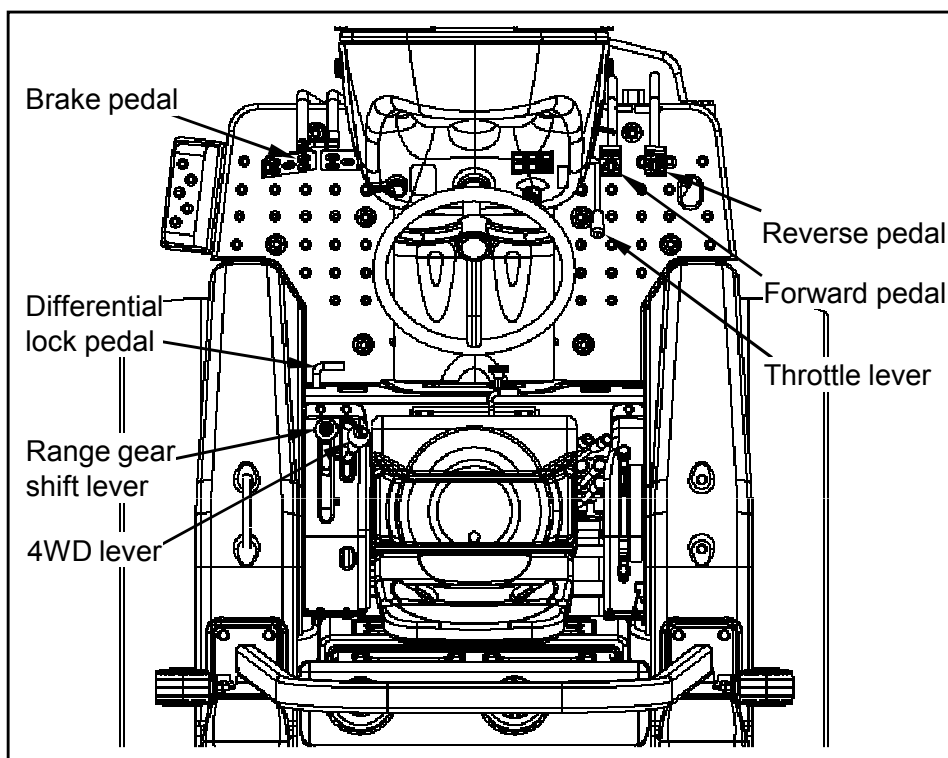
6. Turn the key switch to START position. As soon as the engine starts, release the key switch to ON position.







7. Check if engine oil pressure indicator and battery charging indicator are OFF. If any indicator is ON, stop the engine immediately and check.



8. Run engine for a few minutes to warm up the engine oil and transmission oil.




 <b>Warning</b>	<p>▶ Only start engine outdoors or in a well ventilated place, as the engine exhaust fumes may cause sickness or death. .</p>
 	<p>▶ To avoid an explosion, never use starting fluid to start engine.</p> <p>▶ Start the engine ONLY from the driver's seat with placing all the transmission gear levers in NEUTRAL</p> <p>▶ DO NOT start the engine by shorting across the terminals of starter motor. If the engine starts, the tractor can move suddenly.</p>

 <b>Caution</b>	<p>▶ If clutch pedal does not depressed fully or PTO switch is not OFF, the engine does not start even if turning the key switch to START position. (for mechanical type)</p> <p>▶ If HST pedal is not in NEUTRAL or PTO switch is not OFF or operator does not sit on the driver's seat, the engine does not start even if turning the key switch to START position. (for HST type)</p> <p>▶ DO NOT operate starter motor more than 10 seconds. If the engine does not start, wait for 1~2 minutes before restarting.</p> <p>▶ When the engine is running, DO NOT turn the key switch to START position. It may cause the failure of starter motor.</p> <p>▶ In the cold weather, carry out the warm-up. If you suddenly use the tractor in the cold weather, the engine life shall be reduced.</p>
--	--


## (2) Start in cold weather

- Push the throttle lever to the middle position of full throttle.
- Start the engine after cold start aid indicator goes OFF. (If fitted)
- If engine runs rough, press the throttle pedal down 2~3 times for a while. (Mechanical type)
- If engine runs smoothly, carry out the warm-up for 5~10 minutes at about 1500 rpm.
- Use the engine oil for winter in cold weather. Refer to the section, *Lubricants and Capacity* at the end of this manual.
- Use the diesel for winter when it is very cold weather. It is much easier to start engine.

 <b>Caution</b>	<p>▶ When storing the tractor in the cold weather, the battery must be removed and stored in a cool and dry place where it is warm and is isolated from the children.</p> <p>▶ Allowing engine to idle for a long time will waste fuel and cause a build up of carbon.</p>
--	--

## (3) Engine stop

- Pull the throttle lever backward to reduce the engine speed and turn the key switch to OFF position. The engine shall be stopped.

 <b>Caution</b>	<p>▶ When stopping engine after heavy work, run the engine for 1~2 minutes at low speed. If you stop the engine suddenly, the engine life could be reduced.</p>
--	---

## 4-2. How to drive and how to stop

### (1) How to drive

#### Mechanical type

1. Pull the position control lever back to lift the implement up after starting engine.



2. Set the engine speed at 1500 rpm.



3. Depress the clutch pedal fully.



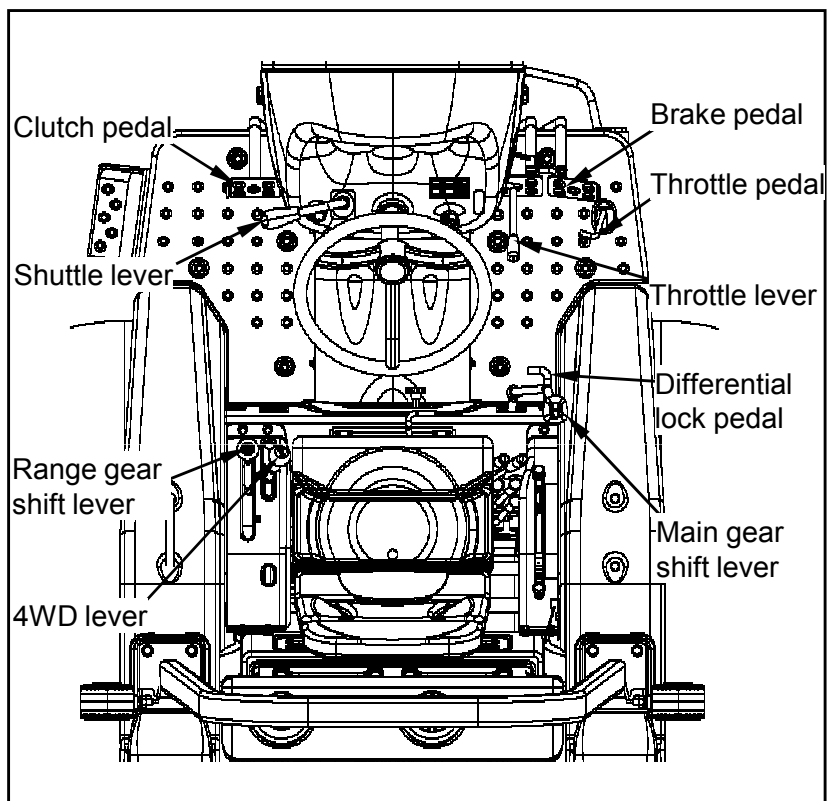
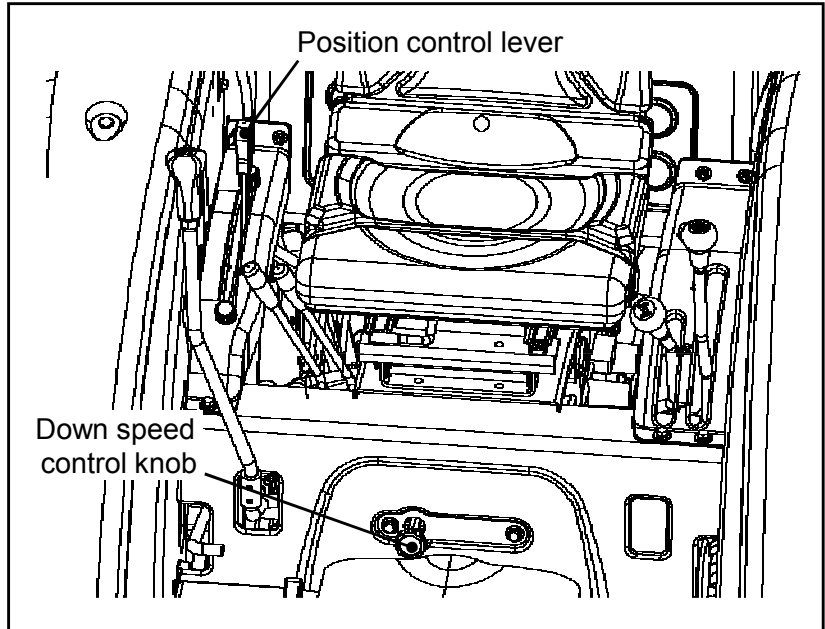
4. Place each transmission gear lever (Main, Range, Shuttle lever) on the desired position.



5. Press the brake pedal and release the parking brake lever.



6. Release the clutch pedal slowly, and the tractor starts.



#### Notice

► Release the clutch pedal slowly. If you release the clutch pedal suddenly, the gear life shall be reduced and it might start suddenly.

## HST type

1. Pull the position control lever back to lift the implement up after starting engine.



2. Set the engine speed more than 1500 rev/min.



3. Place the range gear shift lever in desired position.



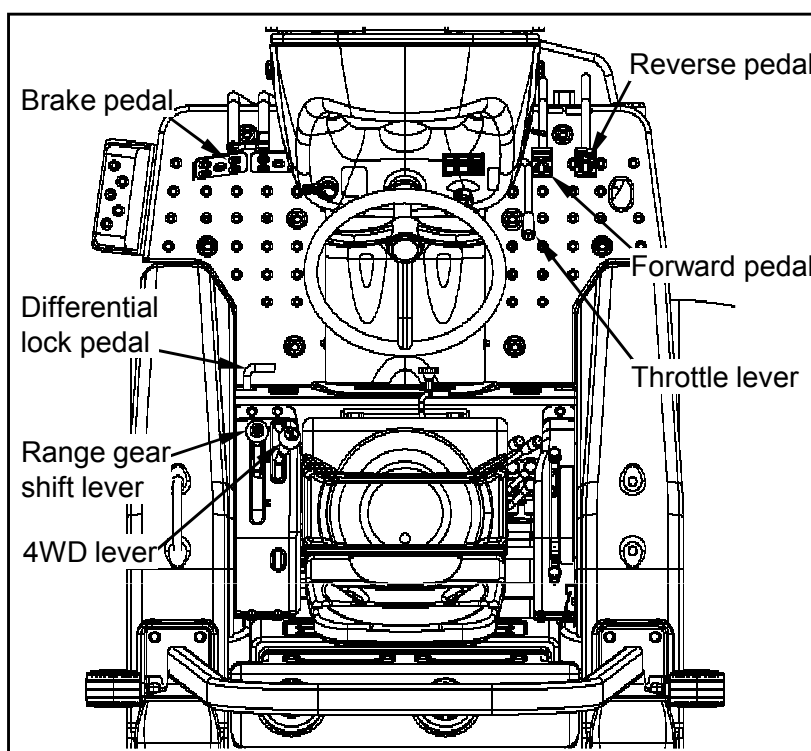
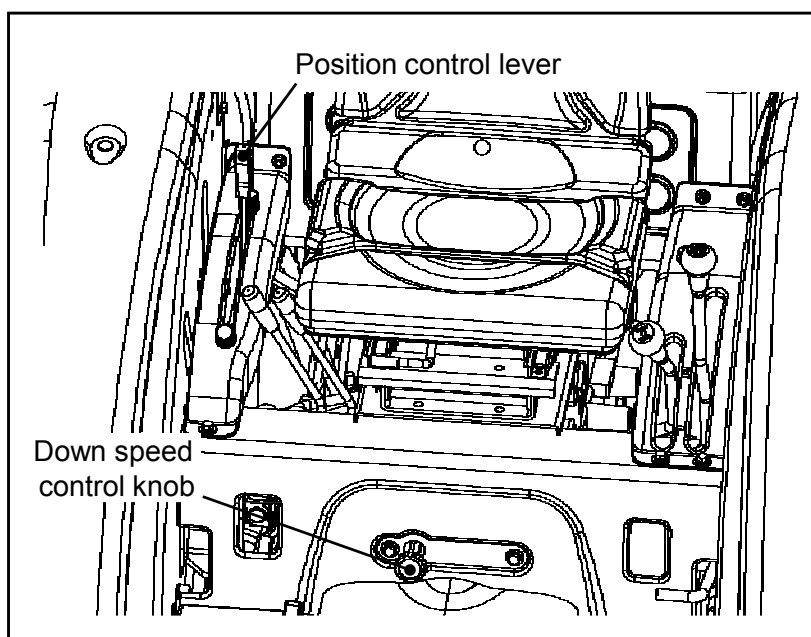
4. Press the brake pedal and release the parking brake lever.



5. Press the HST pedal slowly forward or backward to move the tractor.



6. If necessary, pull the cruise control lever up for constant driving speed.



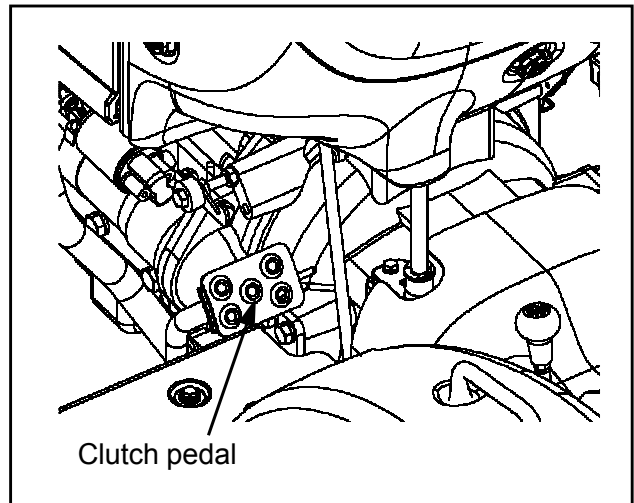
### Caution

- ▶ If you press the brake pedal or push down the cruise control lever, the cruise control drive shall be stopped.
- ▶ For HST model, there is a switch to control engine cut-off for driver's safety. If the operator leaves the driver's seat without proper action for safety, the engine shall be stop automatically. (For further information about seat, see page 3-15)
- ▶ When driving or working with a tractor, operate it more than 1500 rev/min.
- ▶ Press the HST forward / reverse pedal slowly. If you depress the HST forward / reverse pedal hastily, It might start suddenly.

## (2) Changing speed

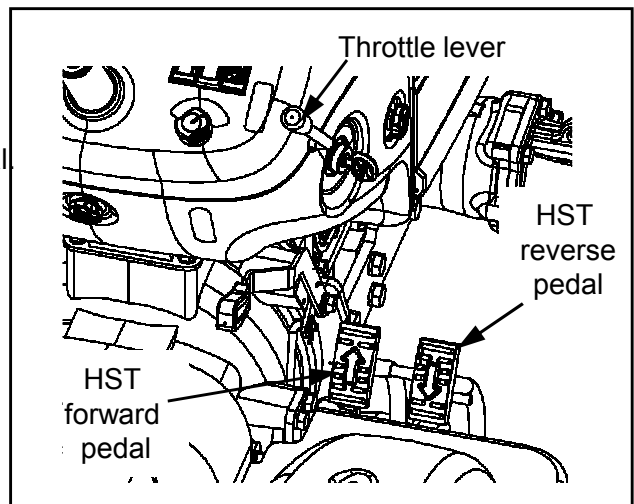
### Mechanical type

- Depress the clutch pedal fully and operate all the shift lever correctly.
- For more information, refer to *Operating Levers and Pedals* in the Section 3-2. (See page 3-8)



### HST type

- Just pressing the HST forward / reverse pedal respectively makes it possible to travel forward and in reverse. Moving (forward / reverse), neutral and changing speed can be controlled by the pedal.
- The range gear shift lever must be operated in the neutral state of the pedal, and after tractor has stopped completely.
- Set driving speed properly depending on the road condition.



### (3) Emergency Stop

#### Mechanical type

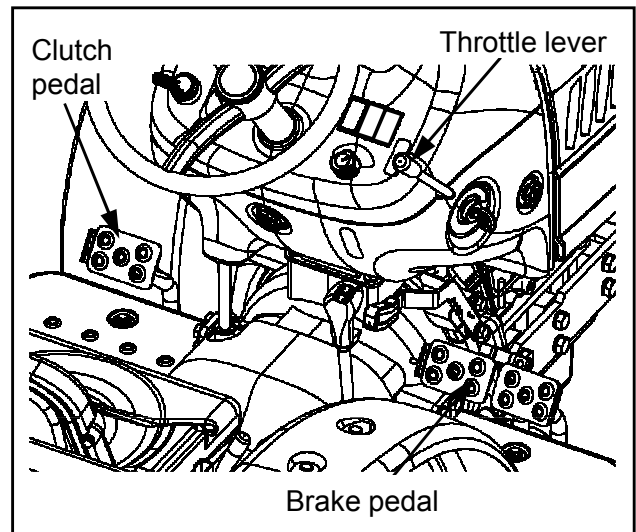
1. Press the clutch pedal and brake pedal at the same time to stop the tractor. Turn OFF the key switch.



2. DO NOT release clutch pedal until all moving parts have stopped. Apply the parking brake.



3. Apply the parking brake.



#### HST type

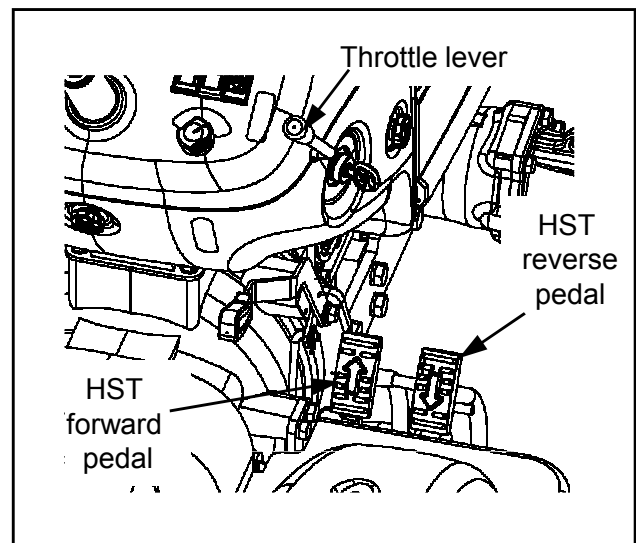
1. Release the HST forward or reverse pedal and press the brake pedal immediately.



2. Pull the throttle lever backward to decrease the engine speed.



3. Apply the parking brake.





## (4) Stopping tractor

### Mechanical type

1. Press the clutch and brake pedal.  
Place the shuttle lever, main gear shift lever in NEUTRAL and PTO switch to OFF and release the clutch pedal.



2. Push the position control lever forward to lower implements to the ground. Turn key switch to OFF position.



3. Apply the parking brake and release the brake pedal slowly.

### HST Type

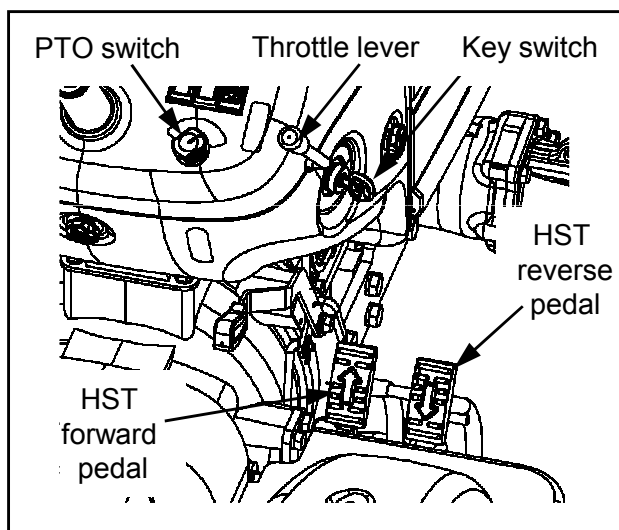
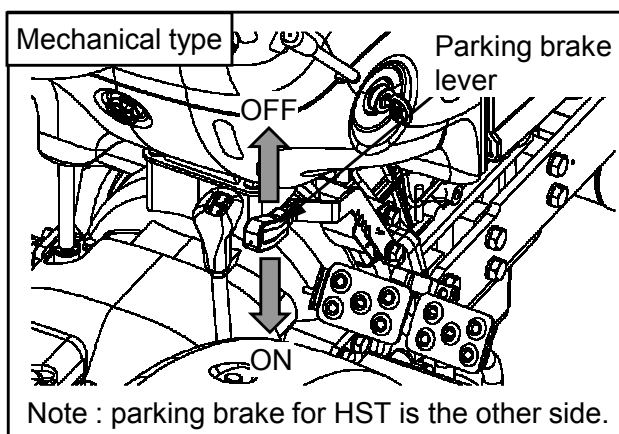
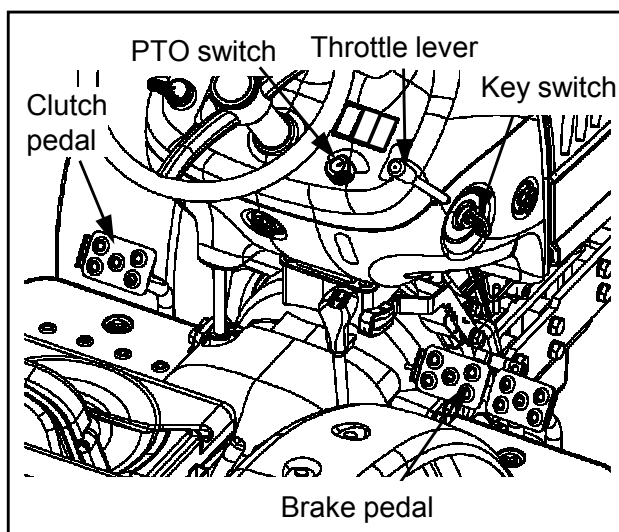
1. Release the HST forward/ reverse pedal slowly and pull the throttle lever backward to reduce the engine speed, and place the range gear shift lever in NEUTRAL and PTO switch to OFF.



2. Push the position control lever forward to lower implements to the ground. Turn key switch to OFF position..



3. Apply the parking brake and release the brake pedal slowly.

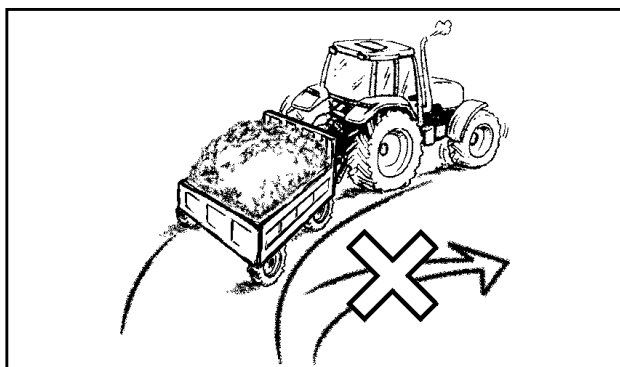
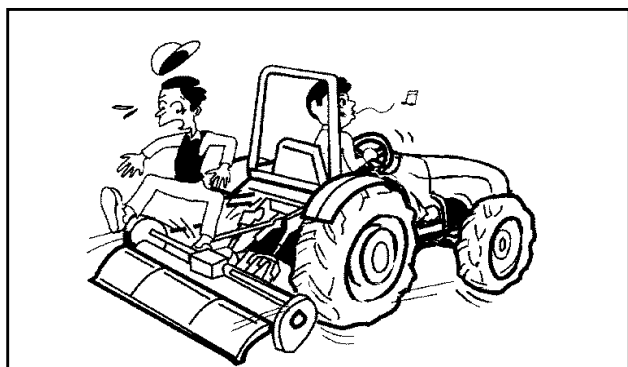
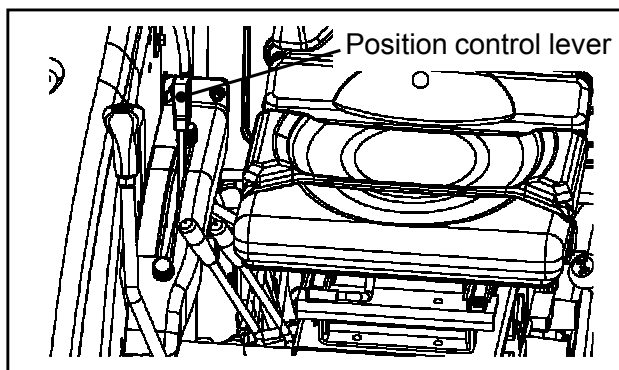
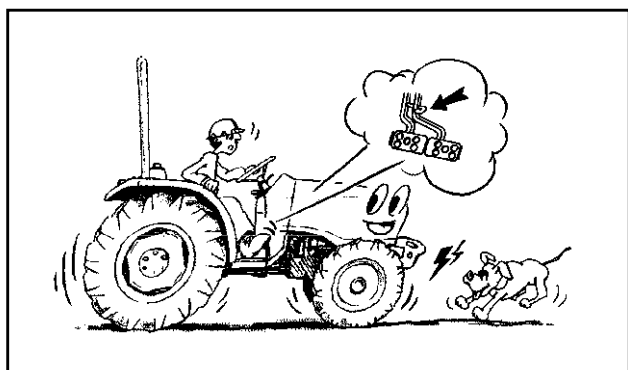


### Caution

- ▶ DO NOT keep apart from the tractor in the state that the transmission gear is placed in NEUTRAL and the parking brake is not applied. The tractor may move down. Apply the parking brake at all times before leaving the tractor.
- ▶ Remove the ignition key always after stopping engine.

## (5) Driving tractor on the road

- When facing downhill, DO NOT place the gear lever in NEUTRAL position.
- When driving the tractor on a unpaved road by attaching an implement to 3-point linkage, place the gear lever to low speed and DO NOT lift the implement up to the highest position. When the tractor bumps an obstacle, it may cause the jolting of the implement and the failure of hydraulic system. (In this case, place the position control lever on  $\frac{3}{4}$  rising position of full stroke for safety.)

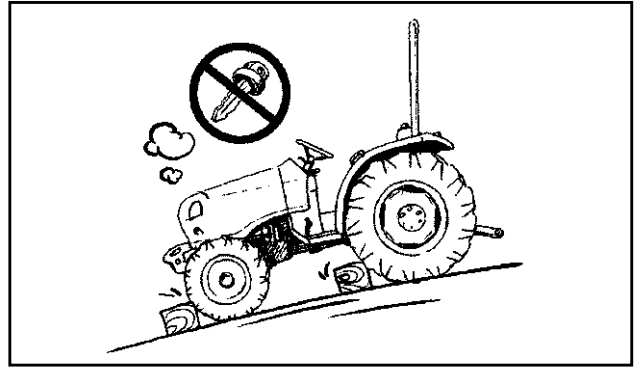


Caution

- ▶ Connect the left/right brake pedal with brake pedal connecting pin before driving (if fitted).
- ▶ Avoid a sudden start, sudden brake and sudden turning.
- ▶ DO NOT allow people on the tractor or on other implements.
- ▶ DO NOT place the baggage on the tractor or implement.
- ▶ Place PTO gear lever in NEUTRAL position and put the PTO switch in OFF position.
- ▶ DO NOT use the differential lock and four wheel drive (2WD use only).
- ▶ When traveling with implement on rear 3-point linkage, tighten the stabilizer to avoid lateral movement.
- ▶ When traveling with implements installed, turn slowly by wide turning radius.
- ▶ While traveling, DO NOT ride your foot on the clutch pedal (if fitted) or brake pedal.
- ▶ While traveling, DO NOT operate any implement such as tiller, loader etc.

## (6) Parking

- Stop the tractor on a level surface, not on a slope.
- Disengage PTO and place all the transmission shift lever in NEUTRAL position and apply the parking brake.
- Stop engine and remove ignition key.
- Before you leave the operator's station, wait for engine and all moving parts to stop.



Caution

- If it is necessary to park the tractor on a slope, furthermore with loaded trailer, the tractor may roll down, even though the parking brake is applied. In this case, apply the gear in low speed and apply the chocks or blocks to all the tire.
- Mechanical : downward slope  $\Rightarrow$  reverse 1 gear / upward slope  $\Rightarrow$  forward 1 gear.
  - HST Type : place the range gear shift lever to the lowest speed.

## 4-3. How to handle new tractor

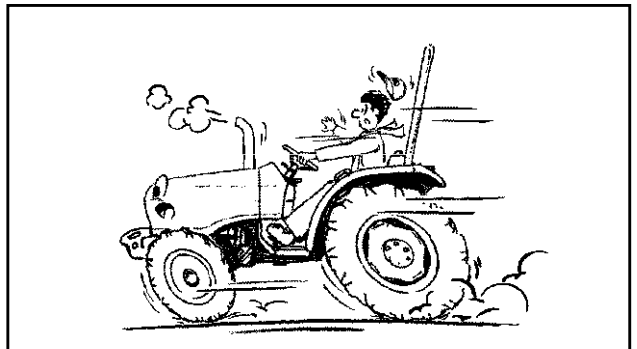
### (1) Check points

- ※ For new tractor, the followings must be checked once again even though there was sufficient quality management, inspection, regulating of each part in the factory.
- Appearance check
  - Is there any damage while transporting?
- Engine cooling system check
  - Is there anti-freeze solution in the radiator? And any leakage?
- Fuel system check
  - Is there any leakage of fuel in the fuel system?
- Oil level check
  - Is there optimal oil amount in each part ?
- Electric system check
  - Is there any cut-off or any other problem in the wiring?
  - Is there any problem to operate the instruments?
  - Is the state of battery charging sufficient?

### (2) Notices in handling new tractor

- To get the best performance, comply with the following instructions.

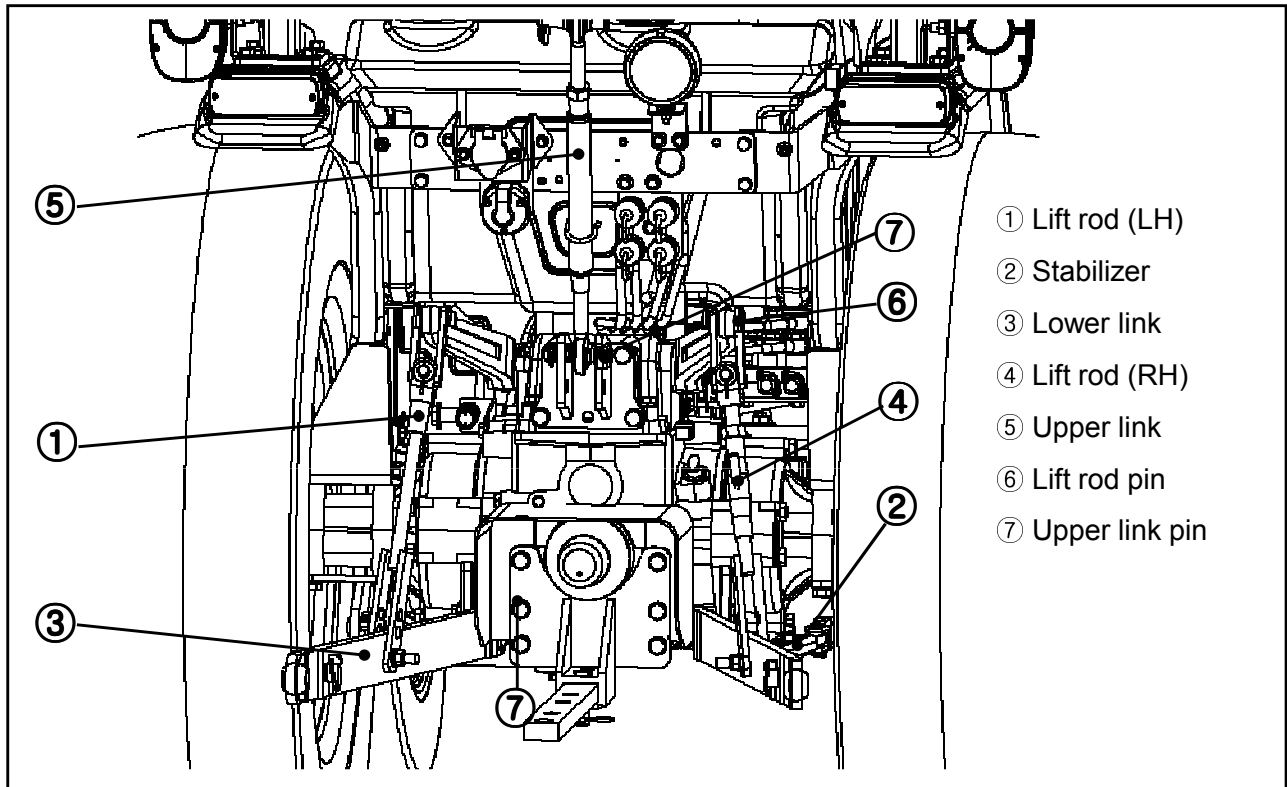
- DO NOT start or stop the tractor suddenly.
- DO NOT carry out heavy loaded work and DO NOT increase the engine rpm to high speed suddenly.
- Despite warm temperature outside, carry out warming up the engine for approximately 5 minutes at 1500 rev/min



- After using first 50 hours,
  - Replace the engine oil filter and hydraulic oil filters after first 50 hours of work, and check each part of your tractor as reference of chapter 5, *Lubrication and Maintenance*. (See page 5-1.)
  - If possible, contact your authorized dealer for First 50 hour check.

## 4-4. Attaching Implement

### (1) 3-point linkage

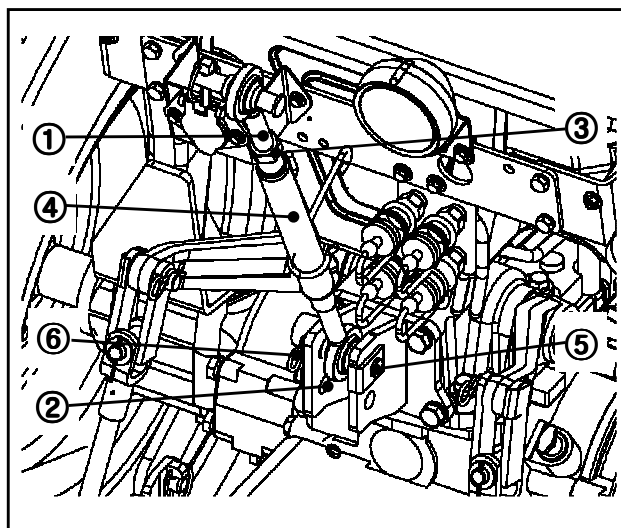


- When driving without attaching implement, comply with the followings.
  1. Fix upper link(5) with the fixing hook.
  2. Connect stabilizer(2) to the lower link(3) to avoid the lateral movement of the lower link.
  3. Connect lower link spring(7) to lower link(3) (if fitted, check chain type stabilizer only).
- If 3-point linkage is not necessary, raise 3-point linkage to maximum height and fix it by turning the down speed control knob, or remove it as follow.
  1. Remove upper link pin(8) and upper link(5).
  2. Detach rear side of the stabilizer(2) from the lower link(3) while holding lower link tightly not to fall down.
  3. Remove lift rod (LH), lift rod (RH) and stabilizer(2) step by step.
  4. Remove lower link(3) carefully not to get hurt due to its weight.

	<b>Warning</b> ▶ Before attaching / detaching implement, place PTO switch in OFF position and apply the parking brake.
	▶ When attaching / detaching implement, be sure to assemble and tighten the connecting parts correctly.
	▶ if the tractor is used to tow heavy loads, always use the approved drawbar or hitch to avoid injury. Never connect to lower link or upper link of the 3-point linkage. If not, it may cause tipping or turnover.
	▶ DO NOT connect the implements that require more power than can be generated by your tractor.
	▶ Never stand between implement and tractor when backing up.

## (2) Upper link installation and adjustment

- Select the suitable attaching hole(2) depending on the implement.
- Adjust the length of the upper link(1) using the sleeve(4) after releasing the locking nut (3).
- After the adjustment, fasten the locking nut (3).
- Adjustment range : 400~ 50mm (15.7~29.5 in)

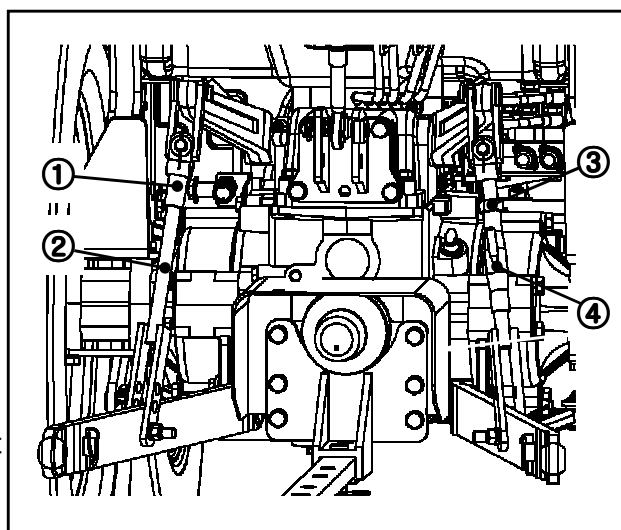


### Notice

► To keep the upper link pin(5) from being lost, be sure to fix the snap pin(6).

## (3) Adjustment of the lift rod's length (Left / Right)

- For lift rod (LH), detach the upper side from the lift arm and adjust the length by turning the upper side (1).  
-Adjustment range : 492~502mm (19.4~19.8 in)
- For lift rod (RH), turn the handle to the right to shorten the rod. If turning it to the left, the rod is elongated. After adjustment, tighten the locking nut(3).  
- Adjustment range : 445~538mm (17.5~21.2 in)
- When assembling lower link to upper hole of the lift rod, it can additionally shorten the rod length by 63mm(2.5 in).



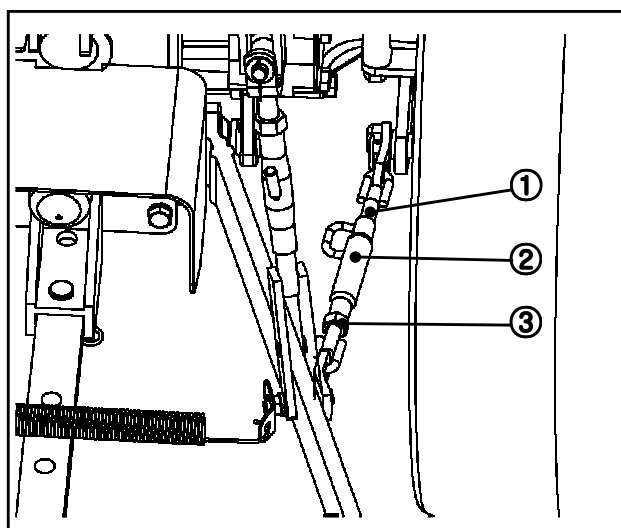
## (4) Adjustment of stabilizer's length

### ① Check chain type

- Turn the grip(2) to adjust the length of the stabilizer(1). After the adjustment, let it tightened firmly by locking nut(3).

### Notice

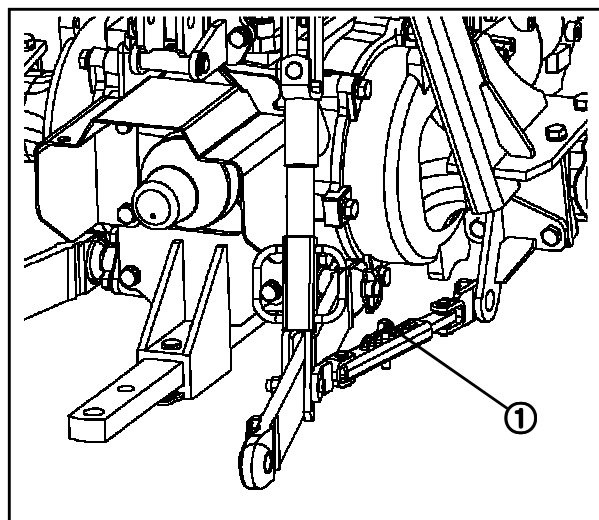
► When adjusting the stabilizer's length, adjust the implement's swinging clearance to be 20~40mm (0.79~1.57 in.) left and right.



## ② Telescopic type

- Pull up the link pin (1) and adjust the stabilizer by moving the pin in stabilizer holes.
- After the adjustment, insert the pin into the desired hole and let it tightened firmly by locking spring.

Notice	<p>► When adjusting the stabilizer's length, adjust the implement's swinging clearance to be 20~40mm (0.79~1.57 in.) left and right.</p>
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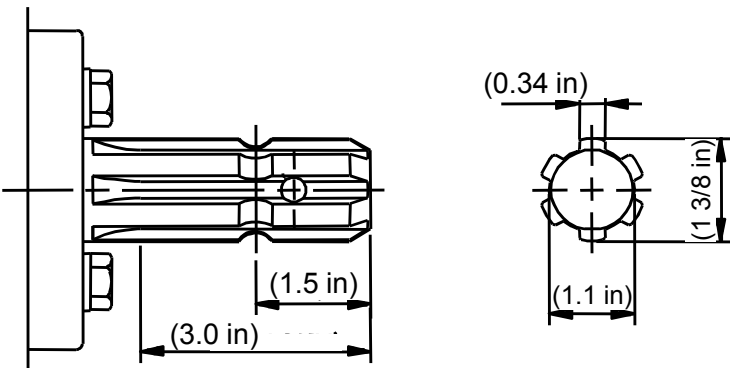
## (5) Reference of Implement installation part

	A	B	C (Max)	D (Min)	E (Max)	F (Min)	G	H	J	K	L	N
CAT.1	19 (0.74)	19.3 (0.75)	44 (1.73)	76 (2.99)	69 (2.71)	44.5 (1.75)	22 (0.86)	22.4 (0.88)	35 (1.53)	39 (1.53)	12 (0.47)	683 (26.8)

The diagram shows three views of a mechanical component with various dimensions labeled with letters A through N. The top view shows dimensions A, B, C, D, E, F, G, H, J, K, L, and N. The side view shows dimensions A, B, C, D, E, F, G, H, J, K, L, and N. The bottom view shows dimensions A, B, C, D, E, F, G, H, J, K, L, and N. The dimensions are indicated by arrows and lines.

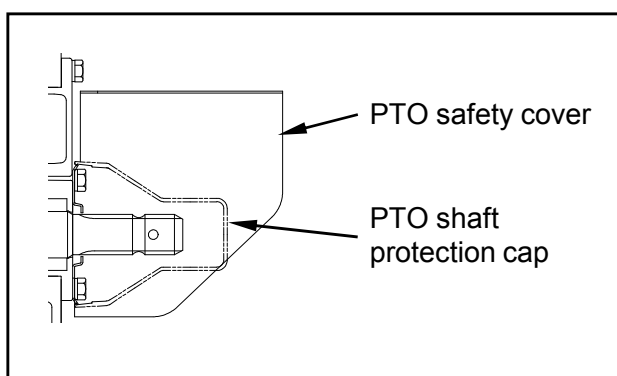
Unit : mm  
(unit : inch)

## (6) Reference of PTO shaft

PTO gear	1	2	3
PTO / Engine speed	540 / 2509 rpm	N/A	N/A
Revolution direction	Clockwise (direction from which looking at PTO shaft)		
Ground clearance	568mm (22.4 in) at Rear tire radius = 560mm (22.0 in)		
Shaft dimension (Unit : inch)	 <p>The technical drawing shows two views of the PTO shaft. The side view on the left indicates a total length of 3.0 in, with a section of 1.5 in. The front view on the right shows a circular shaft with a diameter of 1.1 in. The distance from the mounting flange to the center of the shaft is 0.34 in. The distance from the center of the shaft to the end of the shaft is 1 3/8 in.</p>		

## (7) PTO safety cover and protection cap

- Attach PTO safety cover always.
- If the safety cover is damaged or removed, replace it with a new one.
- When PTO is not used, apply grease and insert the PTO protection cap.



### Warning

► If you contact the rotating shaft, it may cause a serious injury.

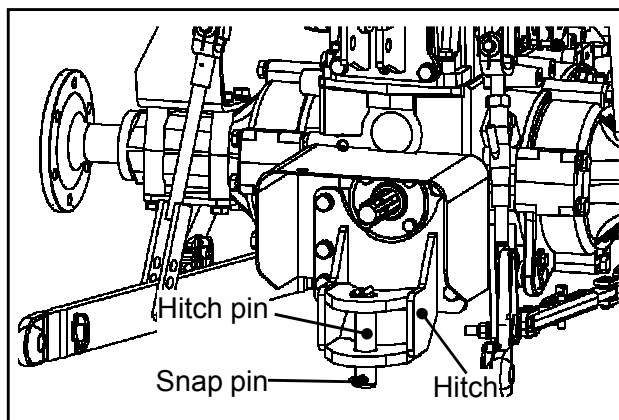


- DO NOT touch shaft which is rotating.
- DO NOT remove the safety cover.
- Avoid loose clothes that can easily be rolled up in the revolving shaft.



## (8) Hitch and Drawbar (optional)

- When attaching towing equipments, use the hitch or drawbar. DO NOT use the 3-point linkage or other parts. If so, the tractor could turnover.
- Insert the hitch pin and snap pin correctly after attaching / detaching equipment.
- DO NOT exceed the maximum permissible vertical and horizontal load as below.

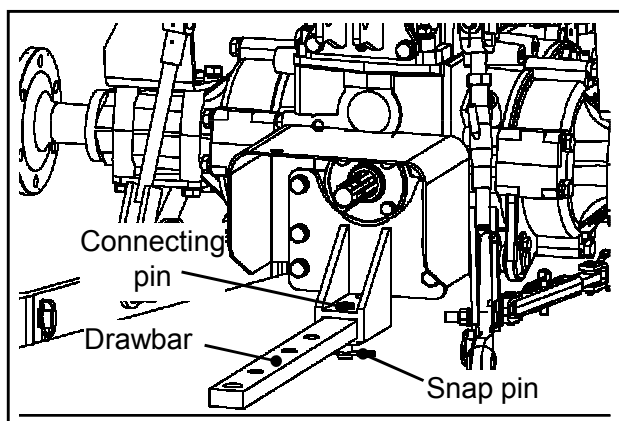


### ① Hitch

- Vertical load : 900kg (1984 lbs)
- Horizontal load : 3600kg (7937 lbs)

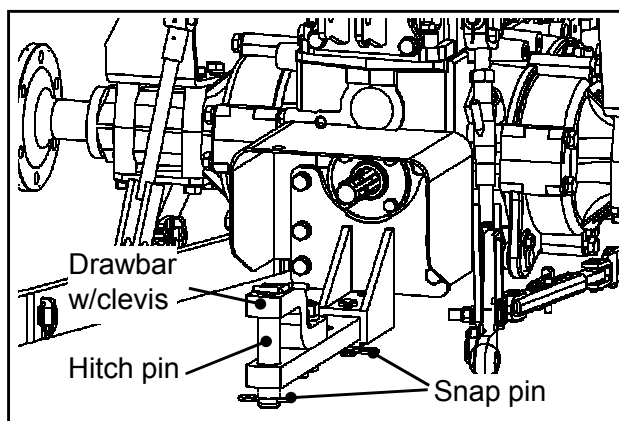
### ② Drawbar

- Vertical load : 350kg (Long position) (772 lbs)  
450kg (Short position) (992 lbs)
- Horizontal load : 2800kg (6173 lbs)



### ③ Drawbar w/clevis

- Vertical load : 350kg (Long position) (772lbs)  
450kg (Short position) (992lbs)
- Horizontal load : 2800kg (6173lbs)



Caution

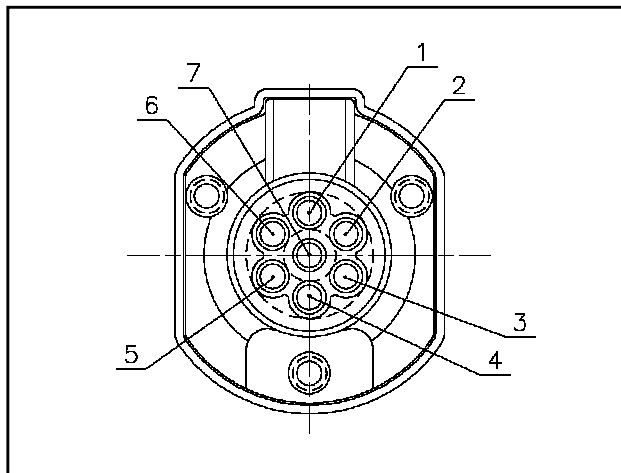
- ▶ Pulling from the tractor rear axle or any point above the axle may cause the tractor to overturn. Use always the drawbar or hitch for pulling work.
- ▶ Do not tow equipment without brakes, weighing more than twice the tractor weight.
- ▶ When locking the hitch or drawbar with pin after aligning to the towing equipment, apply the parking brake and stop the engine.
- ▶ Before transporting equipment on public roads, make sure you comply with your local traffic regulation.

## (9) 7-Pole connector (optional)

- The one of the standard 7-pole trailer connectors is provided and is mounted at the rear of the tractor. The connections of the 7-pole connector (viewed from the rear of the tractor) are as follows;

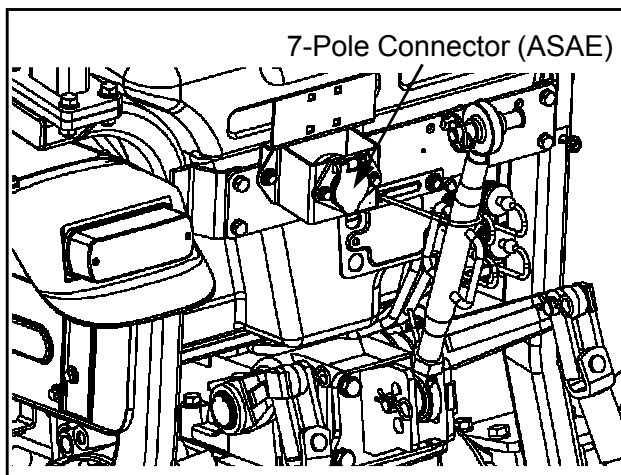
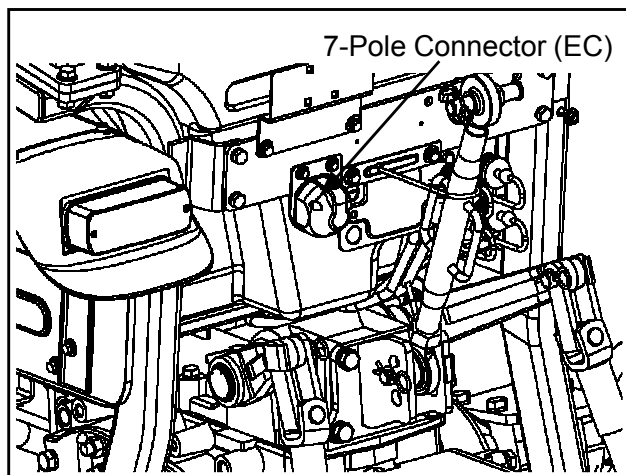
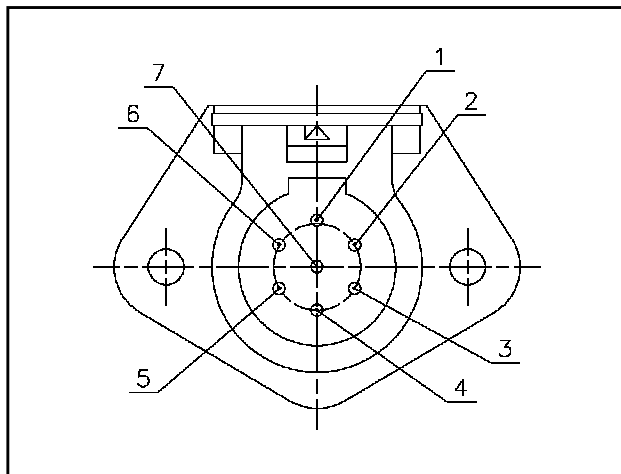
### ● EC Version

Pin No.	Function
1	Left turn signal light
2	NA
3	Ground (Earth)
4	Right turn signal light
5	Side light
6	Brake light
7	Side light



### ● ASAE Version

Pin No.	Function
1	Ground (Earth)
2	Working light
3	Left turn signal light
4	Brake light
5	Right turn signal light
6	License number plate light
7	Auxiliary




## (10) Technically maximum permissible mass

- When working with front loader or rear heavy loaded attachments installed to the 3-point linkage, install ballast weights on the counter-part axle to maintain the front and rear weight balance of the tractor. If not, front or rear axle can be strained by the overloaded weight.
- When working with front loader, place the attached rear weight to the highest position and turn the down speed control knob clockwise slightly to lock.

	All models	Remarks
Technically total maximum permissible mass	2508kg (5529 lb)	without consideration of the load capacity of the tires
Front axle (*)	1163kg (2564 lb)	
Rear axle	1345kg (2965 lb)	

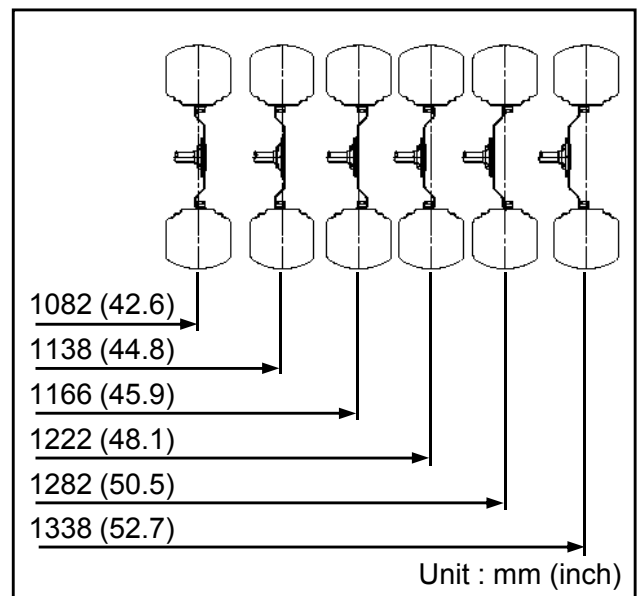
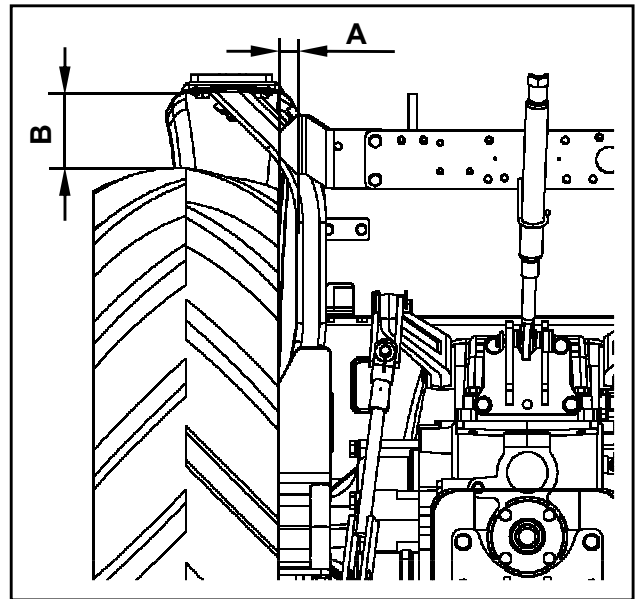
\* includes front mounted equipment or loader in the raised position but without load in the bucket.

- **Restrict operation** : In case of driving speed does not exceed 8km/h (5 mph) and standard front/rear wheel track (See *next page*), Intermittent maximum permissible load of the front axle can be ;  
1995kg (4398 lb) for all models - without consideration of the load capacity of the tires.

	Caution	<ul style="list-style-type: none"> <li>▶ Maximum permissible mass is measured with only the front or rear wheels on the scales inclusive of ballasts and with mounted equipments in the raised position.</li> <li>▶ Do not exceed the maximum permissible mass above. Overloaded condition may invalidate the warranty and may exceed the load rating of the tires.</li> <li>▶ If the load capacity of the tire is lower than maximum permissible mass of the front axle, the maximum load on the front axle meets the load capacity of the tire. (See <i>page 4-20</i>)</li> <li>▶ DO NOT change the setting pressure of the relief valve arbitrarily to increase the lift capacity of the front loader or 3-point linkage. It can cause fatal damage to the hydraulic system and front axle.</li> </ul>
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## (11) Adjusting Wheel tracks and tire replacement (Rear wheel)

- Track between rear wheels  
1082mm (42.6in.) ~ 1338mm (52.7in.)
- If the front wheel track is adjusted, check the clearance between tires and tractor body case by case. If necessary, the steering angle must be adjusted as following page.
- When adjusting rear wheel track, check the radial and lateral clearance between rear tire and tractor chassis as below.
  - **A : 15mm (0.6 in) (Minimum)**
  - **B : 30mm (1.2 in) (Minimum)**



### Notice

- ▶ When adjusting the wheel track, pay attention to the direction of tire lugs.
- ▶ if it shows  $\Lambda$  shape when looked behind, it is correct.

## (12) Tires and Load capacity

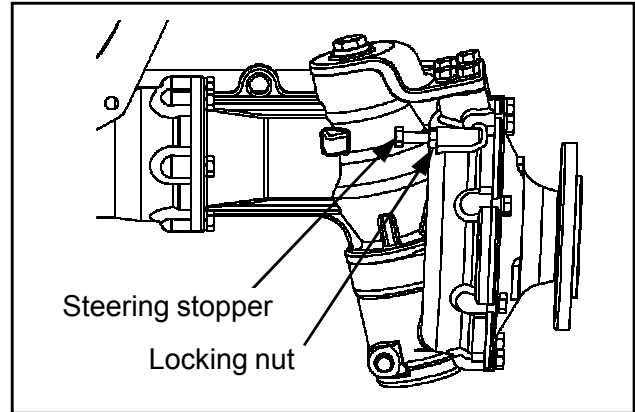
Axle No. (*)	Tires	Standard tire air pressure (kg/cm <sup>2</sup> )	Load capacity (x2) (kg)
1	7-14 6PR	1.3 (124 KPa, 17.9 psi)	810 (1786 lb)
2	11.2-24 4PR	2.5 (248 KPa, 35.9 psi)	2220 (4894 lb)
1	7-16 4PR	1.8 (180 KPa, 26.1 psi)	810 (1786 lb)
2	12.4-24 6PR	1.6 (160 KPa, 23.2 psi)	2180 (4806 lb)
1	6-14 4PR	2.0 (196 KPa, 28.4 psi)	810 (1786 lb)
2	9.5-24 6PR	2.1 (207 KPa, 30.0 psi)	1590 (3505 lb)
Optional Tire			
1	200/70R16	2.4 (240 KPa, 34.8 psi)	1340 (2954 lb)
2	320/70R24	1.6 (160 KPa, 23.2 psi)	2500 (5512 lb)
1	240/70R16	2.4 (240 KPa, 34.8 psi)	1800 (3968 lb)
2	380/70R24	1.6 (160 KPa, 23.2 psi)	3300 (7275 lb)
1	25x8.50-14-4PR	1.5 (151 KPa, 21.9 psi)	1198 (2641 lb)
2	41x14.00-20-4PR	1.8 (172 KPa, 24.9 psi)	2794 (6160 lb)
1	25x8.50-14 6PR	3.5 (345 KPa, 50.0 psi)	1932 (4259 lb)
2	43x16.00-20 4PR	1.4 (138 KPa, 20.0 psi)	4118 (9079 lb)

(\*) 1 : Front axle, 2 : Rear axle

## (13) Adjusting Steering angle

- If the front wheel track is adjusted or front tires are replaced with new tires having bigger diameter or width, or one of the front equipments is attached, the steering angle must be adjusted as below.

- 1) Loosen the locking nut on both sides.
- 2) Connect the front hook of the tractor to the crane by using specified wire. And, lift up the front axle off the ground sufficiently.
- 3) Lift up one side of the front axle fully and turn the steering wheel to the left and right with checking that the clearances between tire and other parts are over 20mm (0.79 in.) at least.
- 4) At this time, set each steering stopper of the both sides to be contacted with the cast. Check all the possible interferences by combinations of the steering and oscillation of the front axle.
- 5) Tighten the locking nuts of the each side.



Notice	► DO NOT shorten the length of the steering stopper rather than factory condition. If the stopper does not contact with cast at maximum steering condition, it can damage the steering linkage system.
--------	---

## 4-5. Driving speed

- The driving speed of tractor or the revolution speed of PTO depends on the work, tire and ground condition. For safety, operate the tractor at suitable speed.
- Table of driving speed (unit : Km/h -> Mile/h)

### Mechanical Type

#### G3033

Range gear	1				2				3			
Main gear	1	2	3	4	1	2	3	4	1	2	3	4
Forward	1.2 (0.75)	1.8 (1.12)	2.3 (1.43)	2.8 (1.74)	3.3 (2.05)	4.8 (2.98)	6.2 (3.85)	7.6 (4.72)	10.0 (6.21)	14.6 (9.07)	19.0 (11.81)	23.4 (14.54)
Reverse	1.1 (0.68)	1.7 (1.06)	2.2 (1.37)	2.7 (1.68)	3.1 (1.93)	4.6 (2.86)	5.9 (3.67)	7.3 (4.54)	9.5 (5.90)	13.9 (8.64)	18.0 (11.18)	22.2 (13.79)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 533mm (20.98 in.)

#### G3038

Range gear	1				2				3			
Main gear	1	2	3	4	1	2	3	4	1	2	3	4
Forward	1.25 (0.78)	1.83 (1.14)	2.41 (1.50)	2.99 (1.85)	3.47 (2.15)	5.01 (3.11)	6.55 (4.07)	7.99 (4.97)	10.50 (6.52)	15.31 (9.51)	19.93 (12.39)	24.56 (15.26)
Reverse	1.16 (0.72)	1.73 (1.08)	2.31 (1.44)	2.79 (1.74)	3.27 (2.03)	4.81 (2.99)	6.16 (3.83)	7.61 (4.73)	10.01 (6.22)	14.64 (9.10)	18.97 (11.79)	23.40 (14.54)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 560mm (22.05 in.)

- Driving speed (unit : Km/h -> Mile/h)

### ***HST Type***

#### **G3033H**

Range gear	1	2	3
Forward	4.9 (3.04)	10.0 (6.12)	22.5 (13.98)
Reverse	3.6 (2.24)	7.3 (4.54)	16.4 (10.19)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 533mm (20.98 in.)

#### **G3038H**

Range gear	1	2	3
Forward	5.10 (3.17)	10.50 (6.52)	23.59 (14.66)
Reverse	3.76 (2.33)	7.70 (4.79)	17.24 (10.71)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 560mm (22.05 in.)

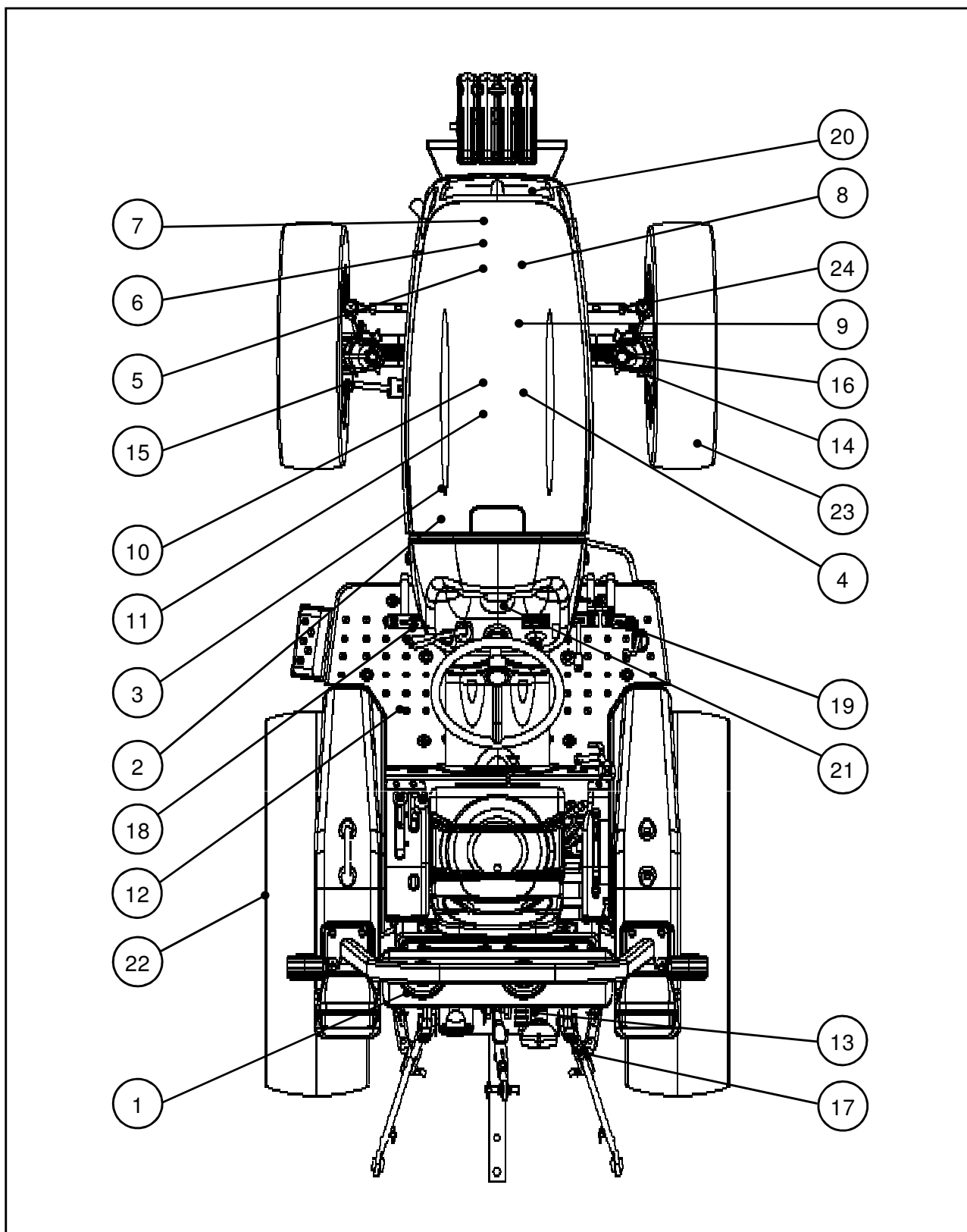


## 5. Lubrication and Maintenance

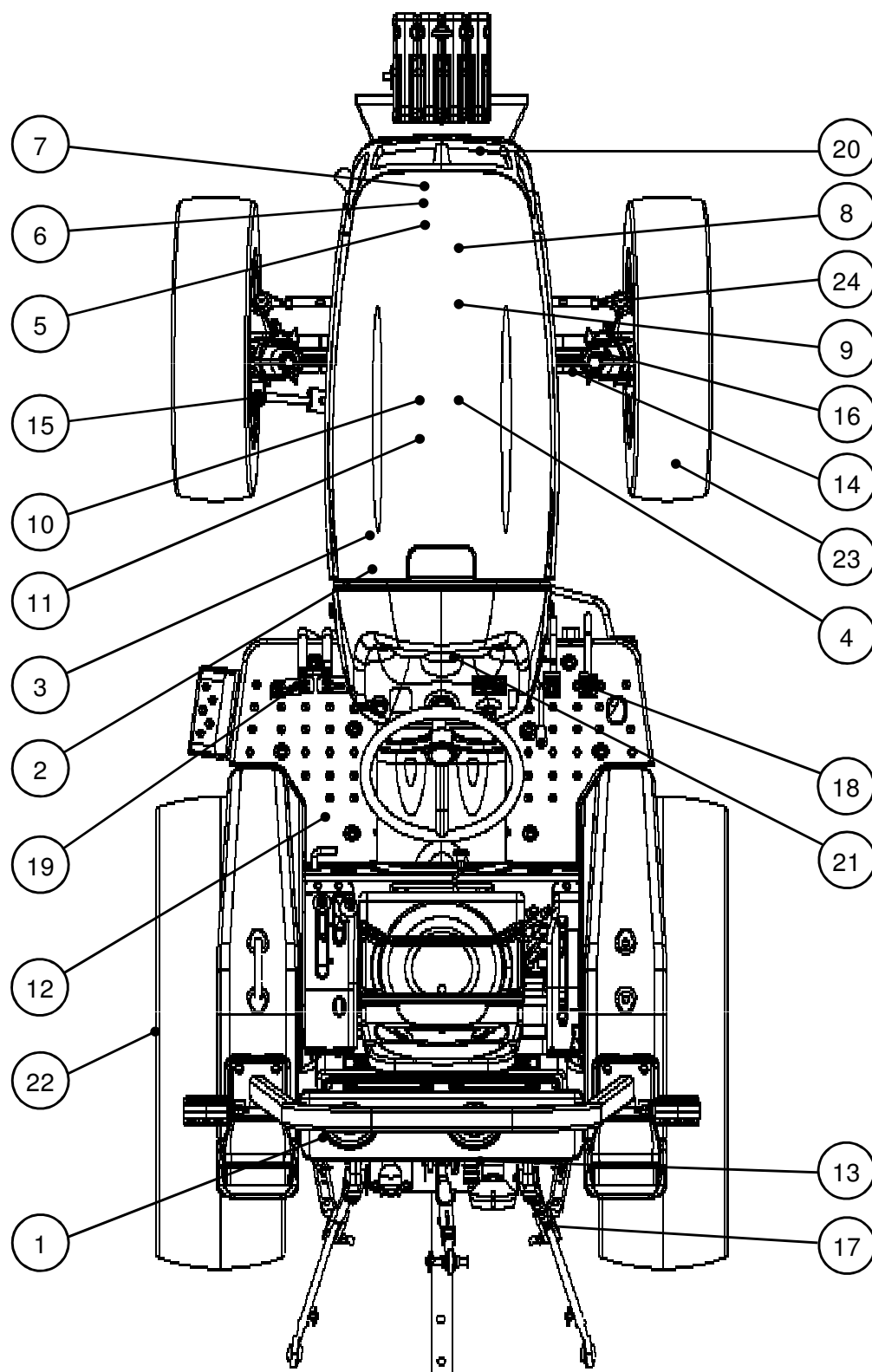
### 5-1. Checking of Each Part

#### (1) Checking parts

##### Mechanical type



## ***HST type***



## (2) Maintenance Table

### Mechanical type

No.	Checking part	Type	Capacity & Dimension	Checking period (Time)				
				Daily	50	300	600	1200
1	Fuel tank	See page 5-5	28 L (7.4 U.S.gals.)	▲				
2	Fuel filter	Element				●		
3	Engine oil	See page 5-5	See page 5-5	▲		●		
4	Engine oil filter	Element			★	●		
5	Engine coolant	See page 5-5	See page 5-5	▲			●	
6	Radiator screen			▲	■			
7	Air cleaner	Dry		▲	■	●		
8	Battery				▲			
9	Fan belt tension		10~12 mm (0.39~0.47 in.)			▲		
10	Valve clearance		0.25 mm(0.0098 in.)				▲	
11	Nozzle injection pressure		14.7MPa (2132psi)				▲	
12	Hydraulic oil filter				★	●		
13	Transmission oil	See page 5-5	30 L (7.9 U.S.gals.)		▲		●	
14	Front axle oil	See page 5-5	5.5 L (1.5 U.S.gals.)		▲		●	
15	Steering cylinder	Grease	Proper amount		▲			
16	Front axle holder & Steering arm	Grease	Proper amount		▲			
17	3-Point linkage	Grease	Proper amount		▲			
18	Clutch pedal play		20~30 mm (0.79~1.18 in.)	▲				
19	Brake pedal play		50~60 mm (1.97~2.36 in.)	▲				
20	Turn signal lights, Lights, Horn			▲				
21	Instrument panel & Indicators			▲				
22	Bolts and Nuts			▲				
23	Tire air pressure			▲				
24	Toe-in		0~5 mm (0~0.20 in.)			▲		

★ First Replacement    ● Replacement    ▲ Check, Adjustment and Supply    ■ Clean up

## HST type

No.	Checking part	Type	Capacity & Dimension	Checking period (time)				
				Daily	50	300	600	1200
1	Fuel tank	See page 5-5	28 L (7.4 U.S.gals.)	▲				
2	Fuel filter	Element				●		
3	Engine oil	See page 5-5	See page 5-5	▲		●		
4	Engine oil filter	Element			★	●		
5	Engine coolant	See page 5-5	See page 5-5	▲			●	
6	Radiator screen			▲	■			
7	Air cleaner	Dry		▲	■	●		
8	Battery				▲			
9	Fan belt tension		10~12 mm (0.39~0.47 in.)			▲		
10	Valve clearance		0.25 mm(0.0098 in.)				▲	
11	Nozzle injection pressure		14.7MPa (2132psi)				▲	
12	Hydraulic oil filter				★	●		
13	Transmission oil	See page 5-5	30 L (7.9 U.S.gals.)		▲		●	
14	Front axle oil	See page 5-5	5.5 L (1.5 U.S.gals.)		▲		●	
15	Steering cylinder	Grease	Proper amount		▲			
16	Front axle holder & Steering arm	Grease	Proper amount		▲			
17	3-Point linkage	Grease	Proper amount		▲			
18	HST pedal Neutral state			▲				
19	Brake pedal play		50~60 mm (1.97~2.36 in.)	▲				
20	Turn signal lights, Lights, Horn			▲				
21	Instrument panel & Indicators			▲				
22	Bolts and Nuts			▲				
23	Tire air pressure			▲				
24	Toe-in		0~5 mm (0~0.20 in.)			▲		

★ First Replacement    ● Replacement    ▲ Check, Adjustment and Supply    ■ Clean up

## 5-2. Lubricants and Capacity

Lubricants	Capacity	International Standard	Recommended products
Engine coolant (Radiator)	5.5 L (1.5U.S.gals.)	ASTM D5216	Soft water (50%) + Anti-freeze (50%)
Fuel	28 L (7.4 U.S.gals.)	ASTM D975 No.2	Low Sulfuric Diesel Fuel
Engine oil (Crank case)	6.5 L (1.7U.S.gals.)	API CF-4 or CG-4 Winter : SAE 10W/30 Summer : SAE 20W/40 Spring/ Fall : SAE 15W/40, SAE 20	GS Caltex RPM Dello 200
Transmission oil (common use for hydraulic lift and steering system)	30 L (7.9 U.S.gals.)	API GL4 ISO VG 46/68	LSTH570 (LS Tractor T/M & Hyd. oil) Manufacturer : GS Caltex or S-OIL TOTAL Co. Ltd.
Front axle oil	5.5 L (1.5 U.S.gals.)	API GL4 SAE 80W	EPK 80W90 (Manufacturer : S-OIL TOTAL Co. Ltd.)
Grease (Front axle holder, Steering cylinder pin, 3-point linkage, etc.)	Proper amount	NLGI 2	CALTEX MAHWAK Multi purpose or CALTEX MAHWAK All purpose

### RECOMMENDED OIL VISCOSITIES

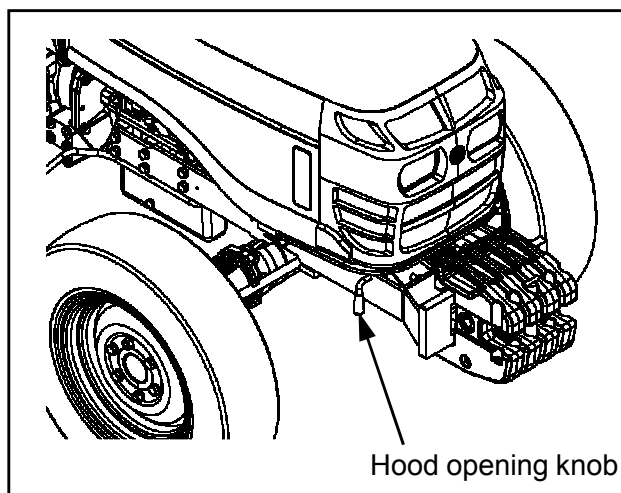
The correct engine oil viscosity grade is dependent upon ambient temperature. Refer to the chart below when selecting oil for your tractor engine.

In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable ; such as the use of SAE 5W 30 in extreme low temperatures or SAE 50 in extreme high temperatures.

Starting Temperature °C(°F)	-30 (-22)	-25 (-13)	-20 (-4)	-15 (-5)	-10 14)	-5 (23)	0 (32)	-10 (50)	20 (68)	30 (86)	40 (104)
Oil Viscosity	<div> <div>SAE 5W-20</div> <div>SAE 10W-30</div> <div>SAE 15W-40</div> </div>										

## 5-3. Access for maintenance

- For safety, the hood must be closed and correctly latched before operating the tractor.
- The hood is hinged at the rear and a gas cylinder is attached to provide easy access to the engine for check and maintenance.
- To open the hood, pull the hood opening knob and lift the hood up.
- To close the hood, pull the hood and push it down to locking position slightly.



Caution

- ▶ After the engine has stopped completely, you have to open the hood for checking.
- ▶ If you open the hood while the engine is running, it can cause serious damage by the intended or unintended access to the rotating shaft, pulley, V-belt, cooling fan of the engine or engine application parts. BE CAREFUL.

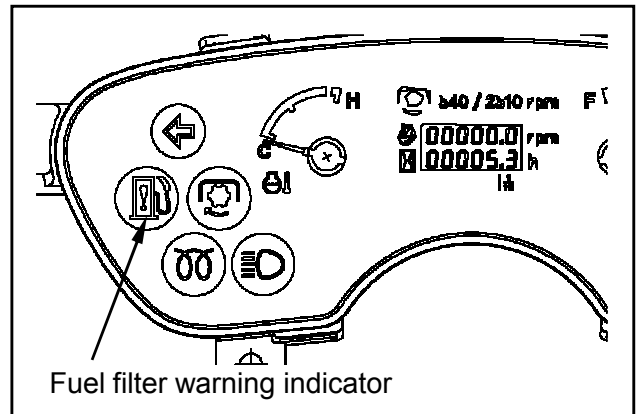
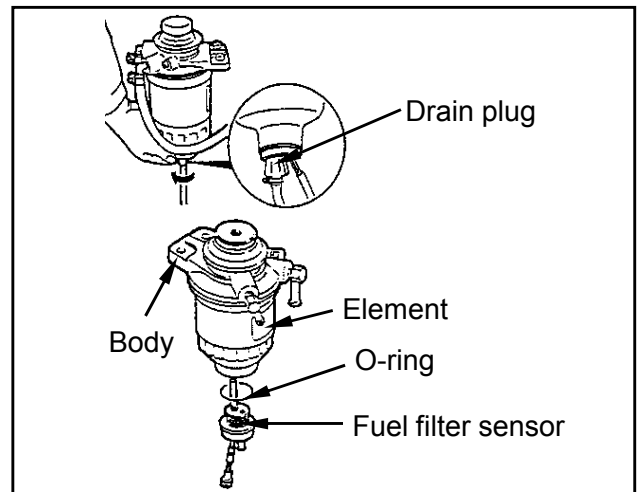
## 5-4. First 50 hour check

- After using first 50 hours, contact your authorized dealer for maintenance if possible.
  - Replace engine oil filter. (⇒ Refer to Every 300 hour check. *See page 5-18*)
  - Replace hydraulic oil filter. (⇒ Refer to Every 300 hour check. *See page 5-19*)
  - Check transmission / rear axle / hydraulics oil level
  - Check front axle oil level
  - Check and adjust parking brake
  - Check torque of exhaust manifold bolts
  - Check and adjust V-belts and tension
  - Tighten all cooling system hose connections
  - Check torque of safety cab or frame mounting bolts
  - Check torque of front end weight clamp bolts (if fitted)
  - Check torque of wheel bolts and nuts
  - Check tire pressures and condition
  - Clean radiator, oil cooler and A/C condenser cores (if fitted)
  - Check radiator coolant level and specific gravity
  - Check clutch pedal free play
  - Check brake adjustment and pedal equalization
  - Lubricate all grease fittings
  - Neutral start switches operative

## 5-5. When the warning indicator lights

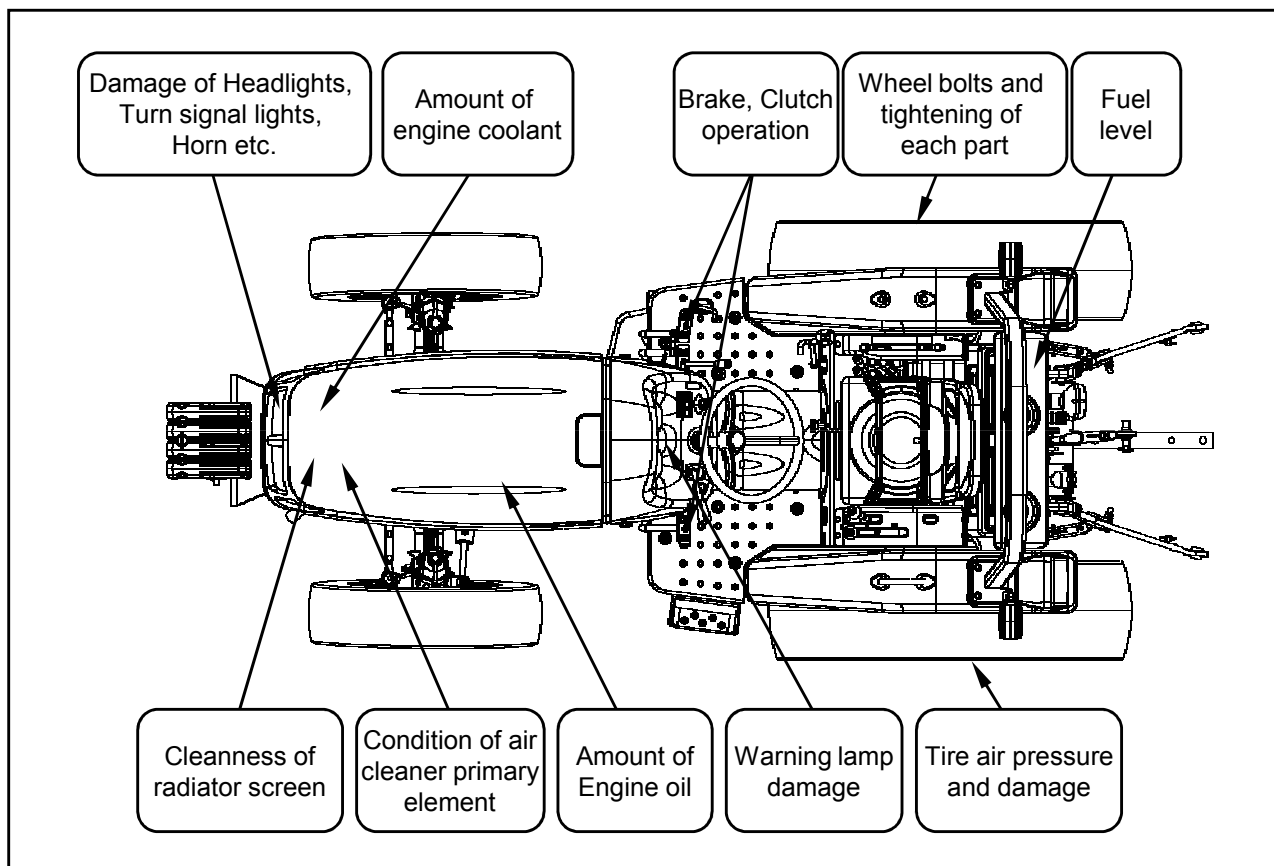
### (1) Drain water from Fuel filter

1. Loosen the drain plug and drain water inside of the filter. (Approx. 150cc(9.1 in<sup>3</sup>))
2. Tighten the drain plug and bleed the air from the fuel filter. (See page 5-25)



## 5-6. Checking Before Starting (Daily check)

- Before starting engine, check the followings carefully to avoid any failure or damage.

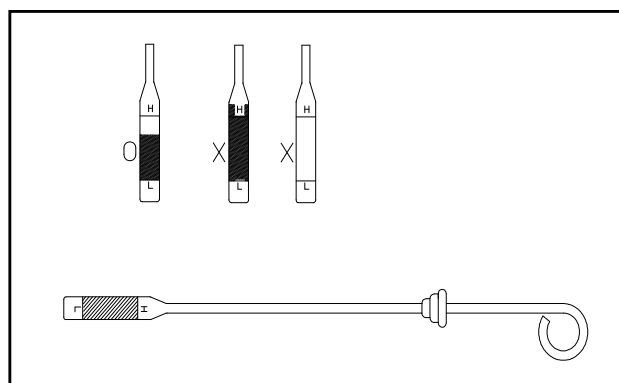


### (1) Engine oil

- **Oil capacity**  
: 6.5 L (1.7 U.S.gals.)
- **Using Engine oil**
  - Diesel engine oil ; API CF-4 or CG-4.

Select Engine oil depending on the temperature as shown in the table.
- **Checking oil level**
  - Check it before starting engine or at 5 minutes later after stopping engine.
  - If the oil is between high mark and low mark of oil gauge, it means that oil level is ok.
  - It must only be performed while engine is STOP.

Season	Temperature	Lubricant No.
Winter	0°C ~ -20°C (32°F ~ -4 °F)	SAE 10W/30
Spring / Fall	0°C ~ 20°C (32°F ~ 68 °F)	SAE 15W/40, SAE20
Summer	≥20°C ≥68 °F	SAE 20W/40



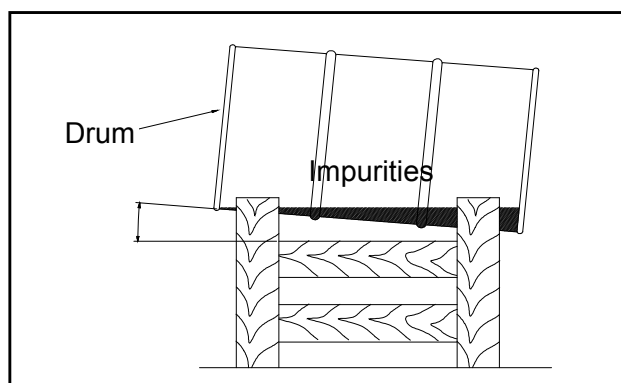


## (2) Fuel tank

### ① Tank capacity : 28 L (7.4 U.S.gals.)

### ② Using Fuel

- Use low sulfuric diesel.
- If contaminants like water or dusts are mixed in the fuel, it may cause a severe damage to the engine. To fill the tank, the fuel storage facility must be equipped as shown in the figure. If possible, fill the tank at the gas station.



### ③ Using Diesel for winter

- General diesel fuel tends to generate paraffin dregs in winter time which may cause a bad engine start. Thus, it is recommended to use diesel for winter in winter time.
- If the ambient temperature is below  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ), it is advised to mix diesel with kerosene as shown on the right.

Temp.	$\geq -15^{\circ}\text{C}$ ( $5^{\circ}\text{F}$ )	$\leq -15^{\circ}\text{C}$ ( $5^{\circ}\text{F}$ )
Fuel	Diesel fuel for winter 100%	20% kerosene added

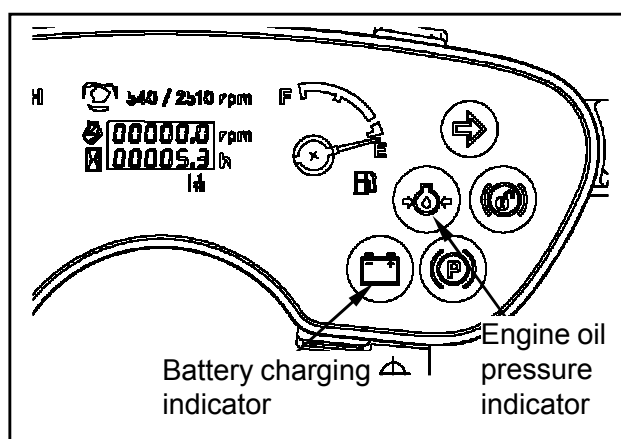
### ④ Checking Fuel level

- Check the fuel gauge and if it's not sufficient, fill the fuel tank with fuel.

Notice	<p>► If the engine stops after finishing work, fill the tank fully.</p> <p>As the temperature drops down, the humidity in the fuel tank is condensed and may mix with the fuel.</p>
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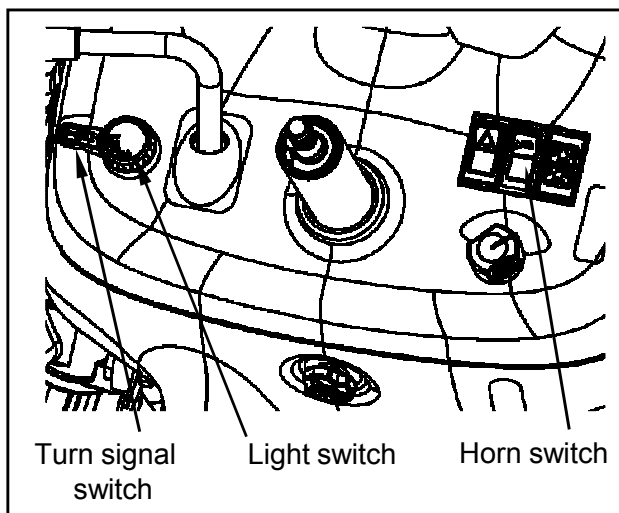
## (3) Instrument panel & Indicators

- Turn the key switch to ON position and check if the engine oil pressure indicator and battery charging indicator are ON.
- If the indicators are not OFF after starting engine, Contact your authorized dealer for check.



## (4) Turn signal lights, Lights, Horn

- Check the operation of lights, turn signal lights, horn etc.
- If the light goes OFF suddenly when operating the switch, check the problems as followings.
  1. Check the corresponding fuse in the fuse box.
  2. Check the light bulb. If necessary, replace it by a new one as referring to below.



Illuminating Lights	Light bulb specification
Headlights (Low beam / High beam)	12V 40W / 45W
Turn signal lights / Side lights (front)	12V 21W / 5W
Turn signal lights (rear)	12V 8W (Standard), 12V 21W (EC)
Brake lights / Tail lights (rear)	12V 10W / 5W (Standard), 12V 21W/5W (EC)
Work light	12V 23W
Instrument panel lights	LED
Warning indicators	LED

Notice	<ul style="list-style-type: none"><li>▶ Use the bulb of rated capacity.</li><li>▶ In case of using the improper bulb, it may cause a failure of electric system</li></ul>
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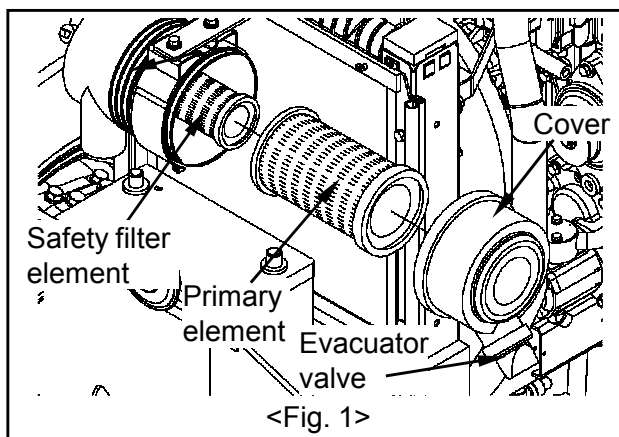
## (5) Engine coolant

- Refer to the section, Replacement of Engine coolant. (See page 5-23)

## (6) Air cleaner (Dry type)

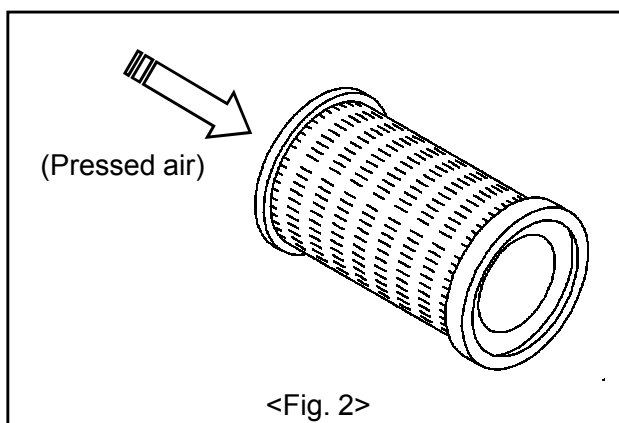
### ① Cleaning filter element

- Remove the cover and pull the primary element straight out, ensuring the safety filter element remains in place. (Fig. 1)
- When cleaning the element in the working field, tap the element by hand to remove the dust



Notice	<ul style="list-style-type: none"> <li>▶ Do not tap the element on a hard place when cleaning it.</li> <li>▶ if the element is cracked, change it with a new one.</li> </ul>
--------	--

- If the dust is not removed by tapping, use compressed air (less than 500kPa (5bar; 72psi)) from inside to outside as shown in the right figure (Fig. 2) to remove the dust and foreign materials. And clean inside the filter element with a clean damp cloth.



Notice	<ul style="list-style-type: none"> <li>▶ Do not assemble a wet filter element.</li> <li>▶ Do not dry the wet filter element by using the compressed air.</li> <li>▶ Do not start the engine if air filter element is not assembled.</li> </ul>
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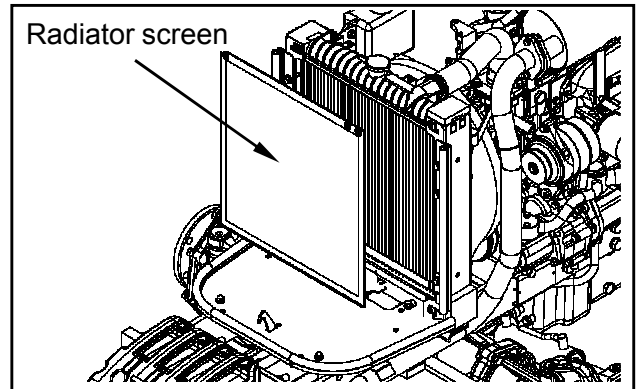
### ② Assembling filter element


- Clean the inside of the air cleaner housing using a clean damp cloth, taking care not to damage the safety element.
- Check if there is damage inside filter element by using a light. If there is tiny crack or small hole in the filter element or the gasket is damaged, replace it with a new one.
- Insert the filter element by pushing it deeply into the filter housing.
- Remove the dust of the evacuator valve and clean the inside of the cover.
- Assemble the cover with the evacuator valve placed downward.

Notice	<ul style="list-style-type: none"> <li>▶ DO NOT start the engine or close the hood if the filter element is not assembled.</li> </ul>
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## (7) Cleaning of Radiator and Radiator screen

- Remove dust or dry grass stuck to the radiator or radiator screen daily.
- When cleaning the radiator with water, let water flow from the fan side.

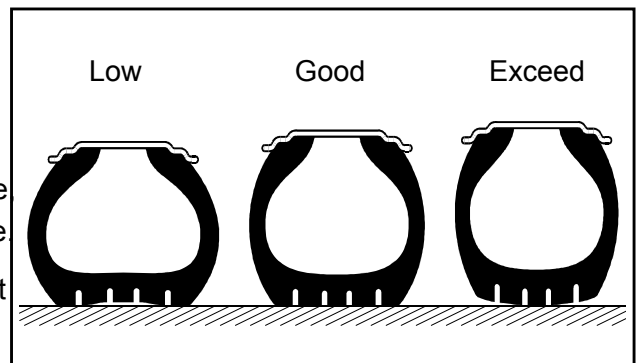



 <b>Caution</b>	<ul style="list-style-type: none"> <li>▶ If there are lots of foreign materials such as dry grass stuck to the radiator screen, the cooling efficiency will be reduced and the engine can be overheated.</li> <li>▶ Clean the radiator only while the engine is stopped.</li> </ul>
--	---

## (8) Tire air pressure and damage

### ① Check

- Check the air pressure or the damage of the tires daily. Always use the correct pressure for each axle and If the tire is damaged, change it with a new one
- Ensure tire pressures are not lower than the correct values, to prevent ;
  - blown tires;
  - bead wear;
  - internal damage;
  - irregular wear and short service life.
- Do not over-inflate the tires, as this may lead to damage in the event of impact and, in extreme conditions, the tire rim may be deformed or the tire may burst.



 <b>Caution</b>	<ul style="list-style-type: none"> <li>▶ It is not allowed to remove/attach or change the tire arbitrarily. Carry out the work in the tire repair center equipped with a expert and special safety tools.</li> <li>▶ When checking tire pressures, keep the body away from the valve mechanism or cap.</li> <li>▶ The tire pressures vary depending on the load weighing on the axles.</li> </ul>
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### ② Standard air pressure – for further information, see page 4-20

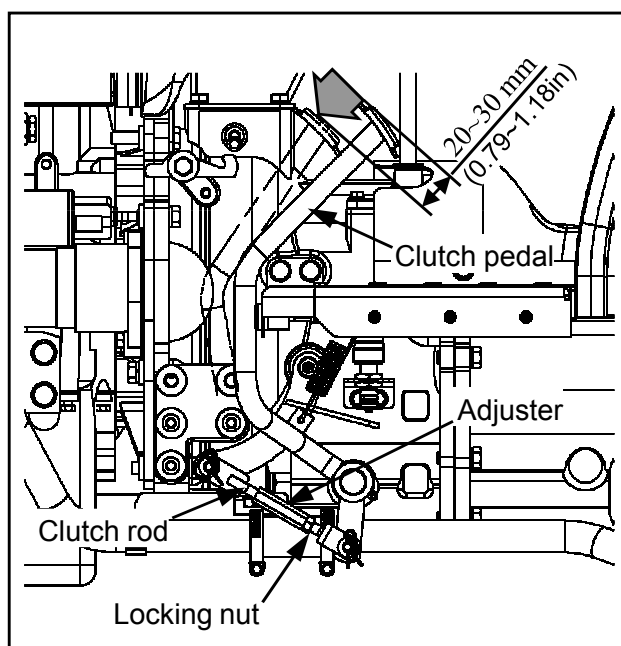
Classification	Tire	Air pressure
Front wheel	7-14 (6PR)	124 KPa (17.9psi)
Rear wheel	11.2-24 (4PR)	248 KPa (35.9 psi)

## (9) Tightening state of Bolts and Nuts of each part

- Check if the bolt or nut of each part is loosened and If loosened, tighten it again.
- Check the bolts and nuts of tires before starting engine.

## (10) Adjustment of Clutch pedal play (Mechanical type)

- Check the distance of clutch pedal play.
- **Normal distance : 20~30mm (0.79~1.18 in.)**  
if the distance is over **30mm (1.18 in.)**,  
adjust it as below.
  1. Loosen locking nut and turn adjuster to adjust.
  2. If the adjuster is tightened, the pedal play shall be decreased, and if adjuster is loosened, it shall be increased.
  3. After adjusting the pedal play, tighten the locking nut.
  4. Check if the clutch is disengaged completely.

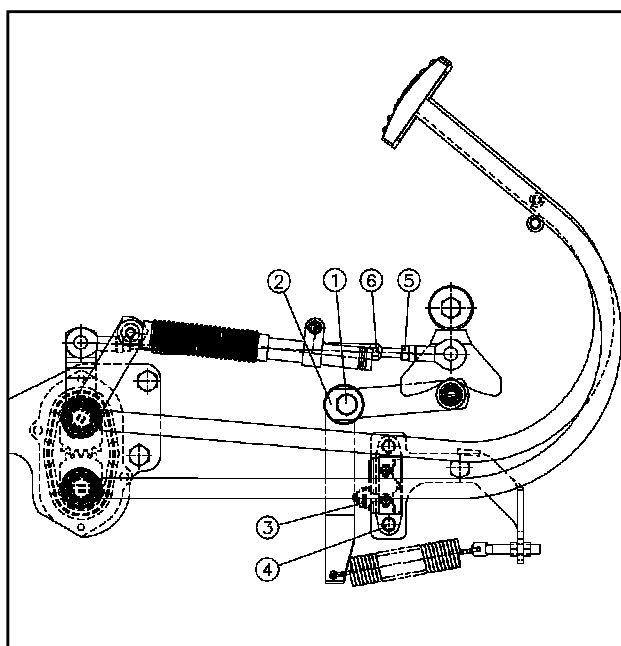


## (11) Adjusting HST control linkage (HST type)

- Run engine and place the range gear shift lever in lowest range.
- Check if the HST tractor stops by taking the foot off from the pedal while driving.  
If the tractor does not stop, stop the tractor immediately by using brake pedal. And, adjust the neutral position as below.

### ● Adjustment of NEUTRAL setting of the HST control.

1. Stop tractor on a flat ground and stop the engine.
2. Lift the rear wheel of the tractor off the ground sufficiently by using a crane. If there is no crane, use the suitable device can lift the tractor safely. For tractor weight, refer to the section, Dimension and Specification. (See page 6-2)
3. Place the 4WD lever to 2WD position and apply the wheel chock to the front wheels. It is necessary for the tractor not to move when the engine starts.
4. After loosening bolt(1) in half, adjust the height of forward pedal and reverse pedal to be same by turning shaft(2) to the left/right little by little. After adjusting, tighten the bolt(1).
5. Start the engine after checking that HST neutral switch is pressed by the linkage.
6. Loosen locking nut(5) and turn HST rod(6) slightly to the left or right with checking that rear axle does not rotate anymore. Tighten the locking nut(5).
7. Check if HST neutral switch(3) is pressed or not. If the switch is not pressed, loosen bolt(4) and adjust the position of HST neutral switch(3).

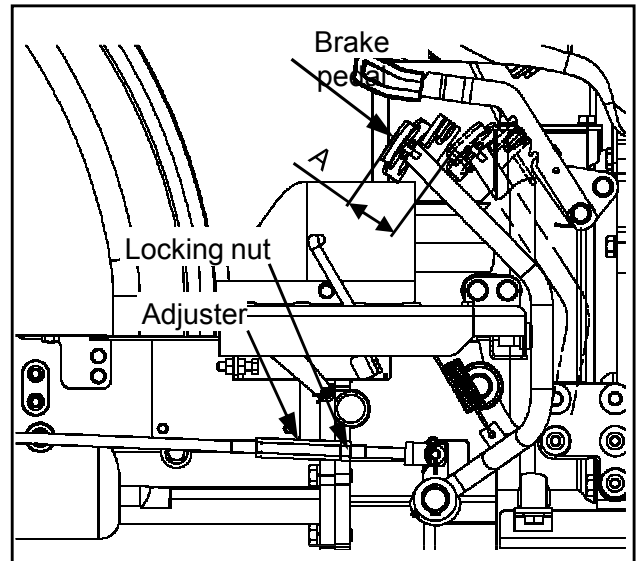


Caution

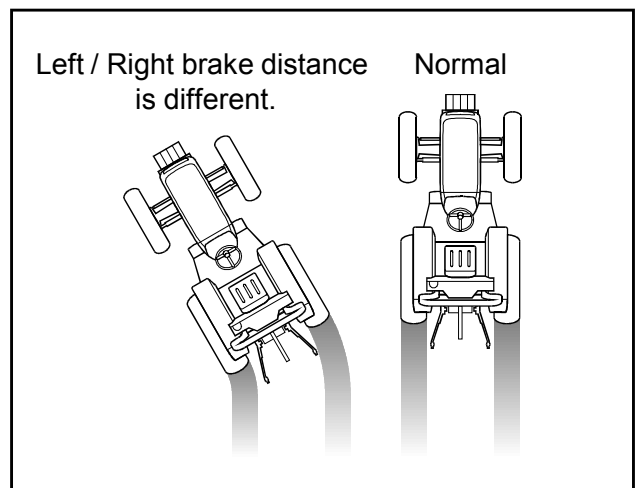
► When lifting the rear of the tractor, The tractor may incline to the left or right by oscillating angle of the front axle. Insert the chock between the front axle and engine frame tightly.

## (12) Adjustment of Brake pedal play

- Check the distance of brake pedal play (A).
- **Normal distance : 50~60mm. (1.97~2.36 in.)**  
If the pedal play distance is over **60mm (2.36 in.)**, adjust it as below.
  1. Loosen the locking nut and turn brake rod to adjust.
  2. If brake rod is tightened, the pedal play shall be reduced and if brake rod is loosened, it shall be increased.
  3. After adjusting the pedal play, tighten the locking nut.
  4. Check if the brake distance of the left and right brake is same as below.



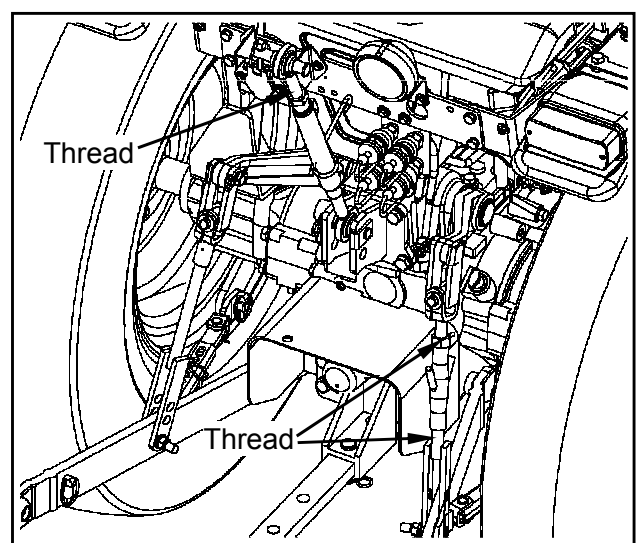
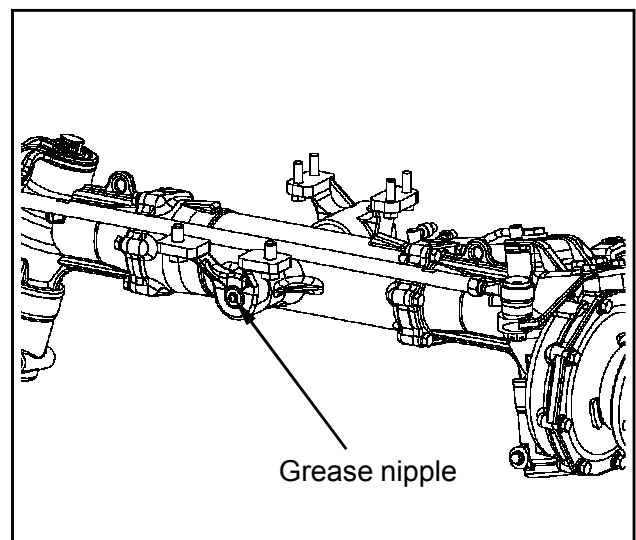
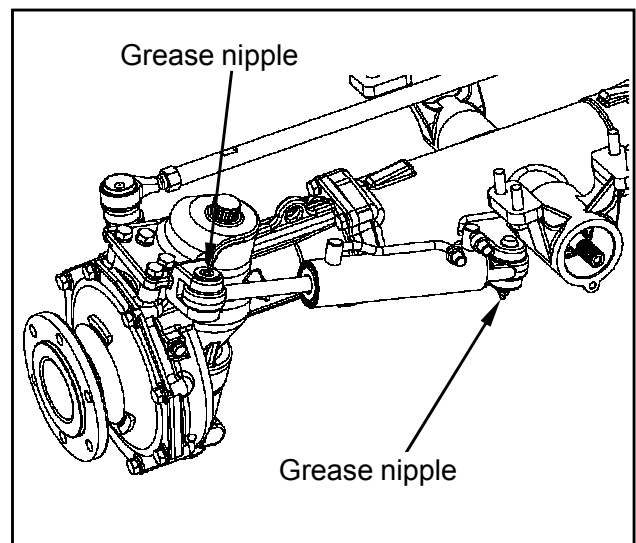
- Checking the brake distance
  1. Connect left and right brake pedal using connecting pin.
  2. Check the skid mark of the tire or stability of the tractor while driving at a suitable speed.
  3. If the brake distance is different as shown in the right figure, adjust the pedal play again.



## 5-7. Every 50 hour check

### (1) Lubricating grease nipple

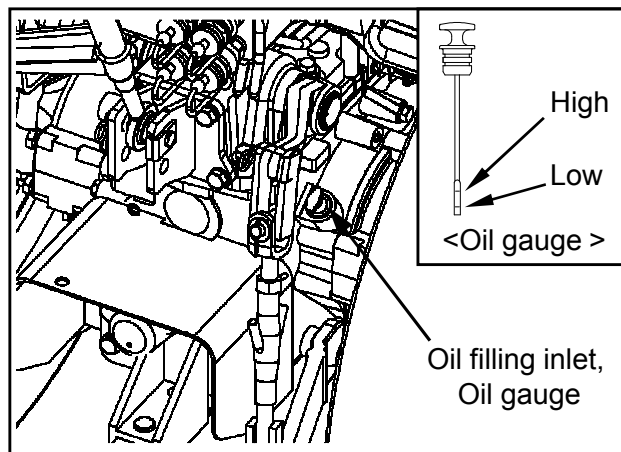
- Steering cylinder pins
- Front axle pivot
- 3- point linkage





## (2) Checking Transmission oil

- Stop the tractor on level surface and apply the Parking brake and lower implements to the ground.
- Clean around oil filling inlet and pull the gauge straight out.
- If oil level is between low and high mark of oil gauge, it means proper amount.
- For oil specification, refer to the section, Lubricants and Capacity, at the end of this manual.  
(or, See page 5-5)

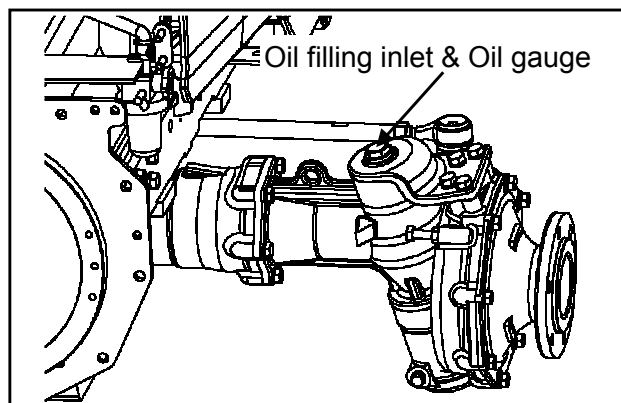


Caution

- The contaminated oil may reduce the durability of transmission and cause the failure of hydraulic system. Clean around oil filling inlet and then open the cap.

## (3) Checking Front axle oil

- Unscrew the oil gauge and check if the oil level is between low and high marks.
- If necessary, add new oil into the oil filling inlet.  
(after 5~10 minutes later, check the oil level again)
- For oil specification, refer to the section, Lubricants and Capacity, at the end of this manual.  
(or, See page 5-5)



## (4) Battery check

- Refer to the section, Batter handling and Notices. (See page 5-29 )

## (5) Air cleaner (Dry type)

- (See page 5-11)

## (6) Cleaning of Radiator and Radiator screen

- (See page 5-12)

## 5-8. Every 300 hour check

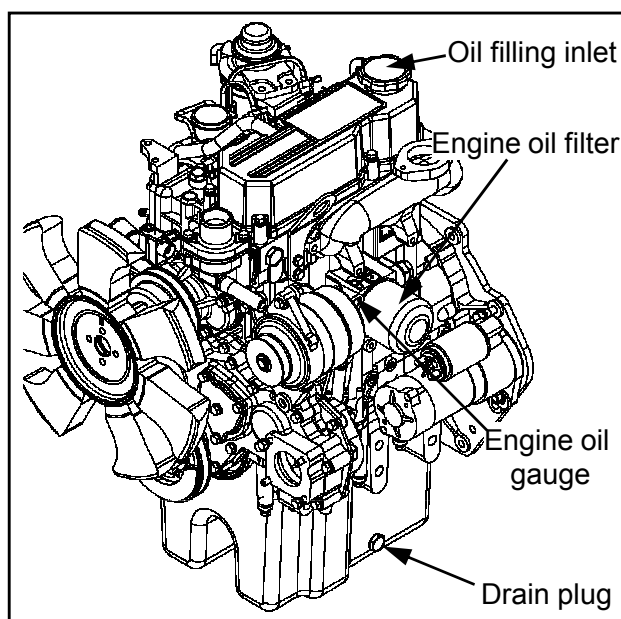
### (1) Replacing Engine oil and Filter

#### ① Drain Engine oil

- Run engine for a few minutes to warm oil
- Park the tractor on a level surface.
- Remove drain plug of oil pan and drain the oil completely.

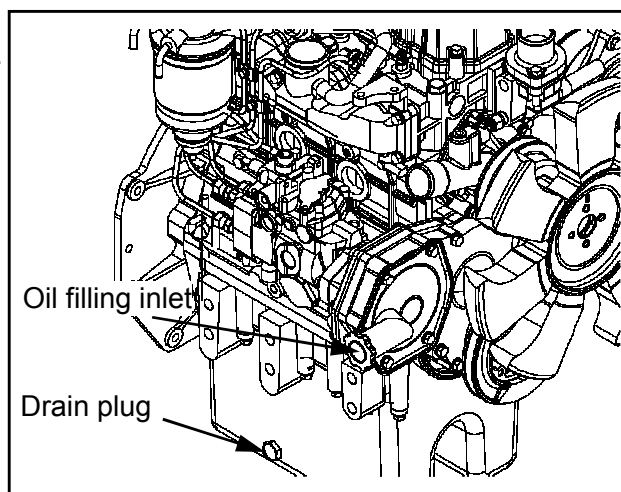
#### Notice

► When engine oil is warm, the impurities can be drained completely.



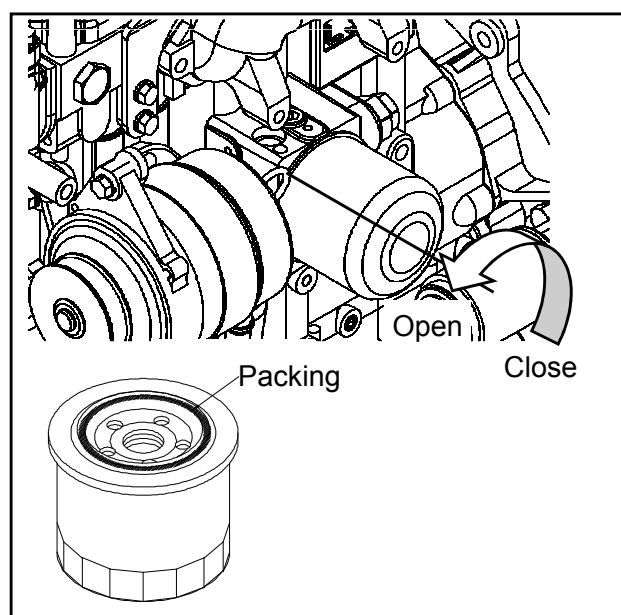
#### ② Replace Engine oil filter

- Clean carefully around the filter.
- Coat clean engine oil on the packing of new filter and check the packing is placed well in the groove.
- Turn the oil filter counter-clockwise to remove with filter wrench.
- Turn the new filter clockwise to assemble until the packing makes contact with the mounting surface. Tighten clockwise from  $\frac{3}{4}$  to 1 turn more after packing contact.
- If the metal is attached to the element of oil filter to be disassembled, contact your authorized dealer.



#### ③ Fill Engine oil

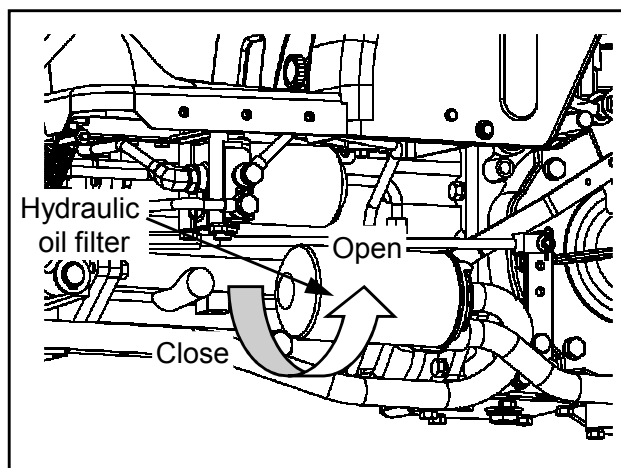
- Tighten the drain plugs. (Tightening torque :  $40 \pm 5$  N.m) ( $29.5 \pm 5$  lbs-ft)
- Add engine oil as its capacity and check the oil level is between low and high marks of the oil gauge. For oil specification, refer to the section, Lubricants and Capacity, at the end of this manual. (or, See page 5-5)
- Check any leakage of the engine while running the engine for several minutes at idle rpm.
- Stop the engine. After about 5~10 minutes later, check again the oil level is between low and high marks of the oil gauge.
- Install the oil gauge.



## (2) Replacing Hydraulic Oil Filter

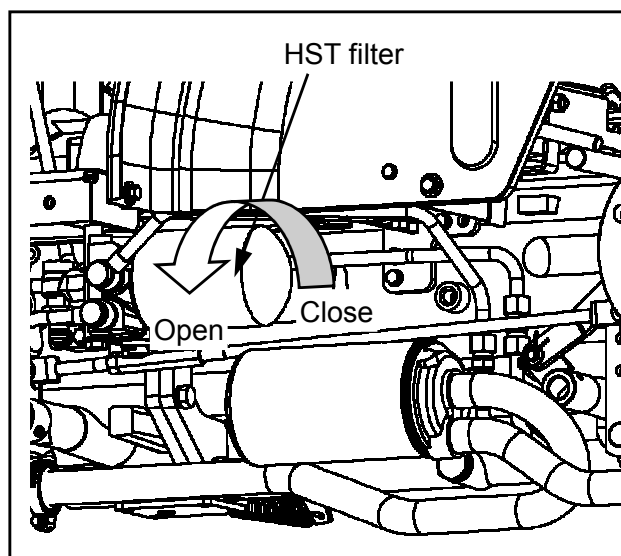
### ① Hydraulic oil filter (Main)

- Park tractor on level surface and apply parking brake and lower implements and stop the engine.
- Carefully clean around the filter and set a clean container under the filter.
- Coat clean hydraulic oil on the packing of new filter and check the packing is placed well in the groove.
- Turn the oil filter CCW to remove with filter wrench.
- Turn the new filter CW to assemble until the packing makes contact with the mounting surface. Tighten CW from  $\frac{3}{4}$  to 1 turn more after packing contact.
- Run the engine at idle and check any leakage.
- Check the oil level. If necessary, add new oil.



### ② HST filter

- Replace the HST filter according to the same procedure of the hydraulic oil filter.



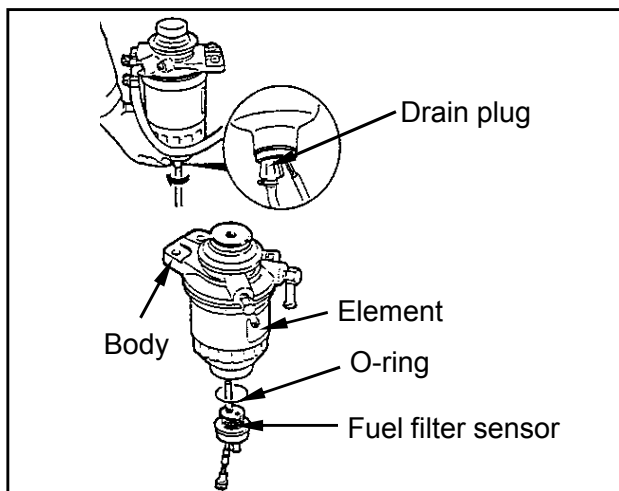
Warning



- ▶ Be sure to stop the engine before loosening the oil filter.
- ▶ If the filter or oil is very hot, it may cause serious burns. After cooling down the tractor sufficiently, replace the filters.

### (3) Replacing Fuel filter cartridge

1. Loosen the drain plug and drain the fuel inside of the filter.
2. Disconnect electric wire of the fuel filter sensor.
3. Remove the element from the body
4. Remove the fuel filter sensor from the element and assemble it to the new element.
5. Attach the element to the body.
6. Connect electric wire of the fuel filter sensor.
7. Tighten the drain plug and bleed the air.  
(See page 5-25)

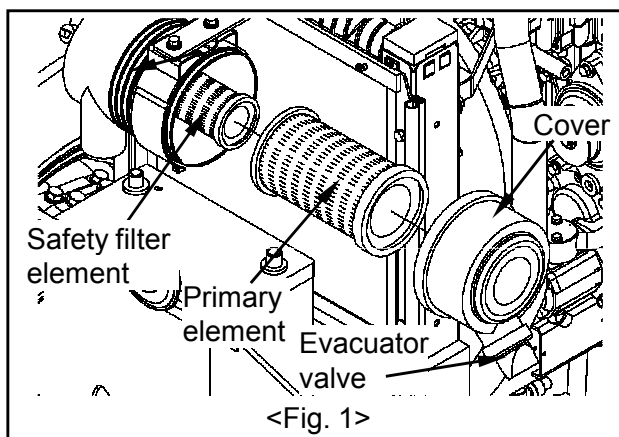


#### Caution

- ▶ Do not fill the new filter with fuel. The invisible fine foreign materials enter the injection pump and it may cause damage to the fuel injection system.

### (4) Replacing Air cleaner element (Dry type)

- Remove the cover and pull the primary element straight out, ensuring the inner element remains in place.
- Clean the inside of the air cleaner housing using a clean damp cloth, taking care not to damage the safety element.
- Check if there is damage inside filter element by using a light. If finding tiny crack or small holes in the filter element or the gasket is damaged, change it with a new one.
- Insert the filter element by pushing it deeply into the filter housing.
- Remove the dust of the evacuator valve and clean the inside of the cover.
- Assemble the cover with the evacuator valve placed downward.

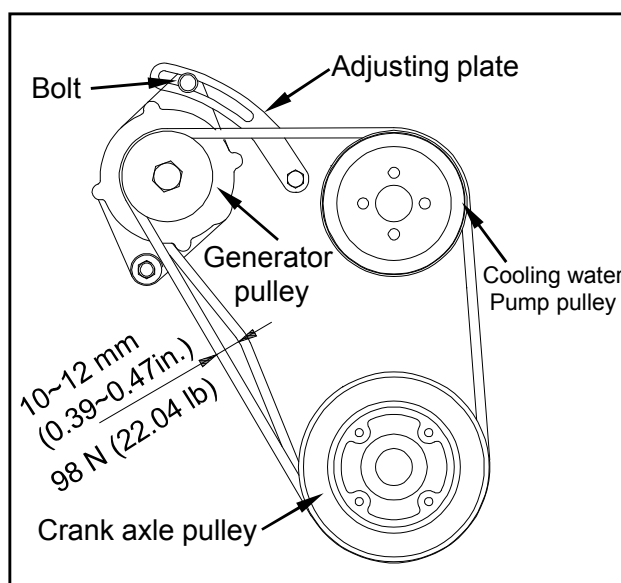


#### Notice

- ▶ Do not start the engine or close the hood if the filter element is not assembled..

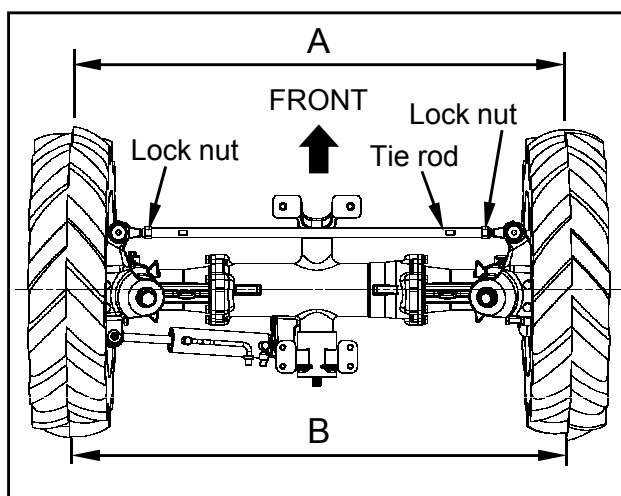
## (5) Tension adjustment of Fan belt

- Check the tension of fan belt. If it's not normal, loosen the bolt and adjust the tension.
  - Belt tension : crank shaft pulley ~ water pump pulley
  - **Normal : approx. 10~12mm (0.39~0.47in.)**  
(if pressed by 98 N (22.04 lb))
- When adjusting the belt tension,
  1. loosen two locking bolts of alternator and bolt of adjusting plate slightly
  2. Tighten or loose the tension bolt to apply the standard tension to the belt.
  3. Tighten the locking bolts of alternator and adjusting plate.



## (6) Toe-in

- Check and adjust Toe-in of the front wheel as follow.  
Normal value ;  $B - A = 0 \sim 5 \text{ mm (0} \sim 0.2 \text{ in.)}$
- Unscrew the lock nuts of the tie rod.
- If you turn the tie rod clockwise at right hand side, it shall be increased.
- After checking that Toe-in is correct, tighten the lock nuts.

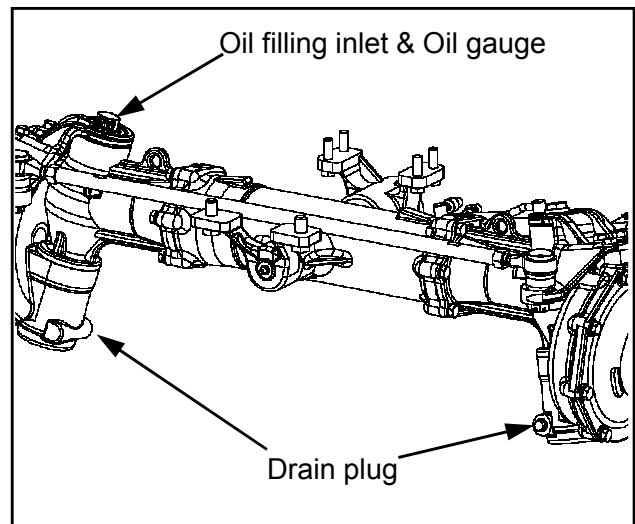


## 5-9. Every 600 hour check

### (1) Changing Front axle oil

- Stop tractor on a level surface and apply parking brake.
- Remove left/right drain plug and oil gauge to drain oil completely.
- Wrap the sealing tape on the plug and tighten the drain plug.
- Add new oil into the oil filling inlet.
- Check if the oil level is between low and high marks after about 5 minute later.
- Tighten the oil gauge.

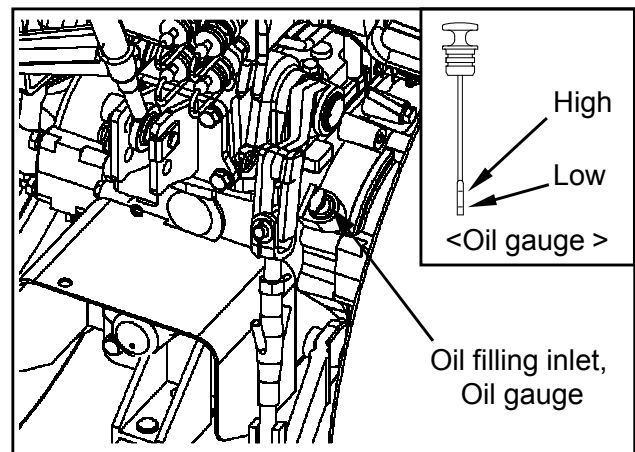
**Oil capacity : 5.5 L (1.5 U.S.gals.)**



### (2) Changing Transmission oil

- Stop tractor on a level surface and apply parking brake. Run engine for several minutes to warm oil and lower implements and stop the engine.
- Set container under the drain plug and remove drain plug under the transmission and drain oil completely.
- Clean metal powder stuck to the drain plug and tighten drain plug again with cooper washer.
- Add new oil until the oil level is between low and high marks of the oil gauge.

**Oil capacity : 30 L (7.9 U.S.gals.)**



**Caution**

► The contaminated oil may reduce the durability of transmission and cause the failure of hydraulic system. Clean around oil filling inlet and then open the cap.

### (3) Replacement of Engine Coolant

#### ① Capacity

: 5.5 L (1.5 U.S.gals.)

#### ② Check

- Check the coolant of radiator and expansion tank whether it is insufficient or not.
- Do not open the radiator cap except to check the coolant or change it.

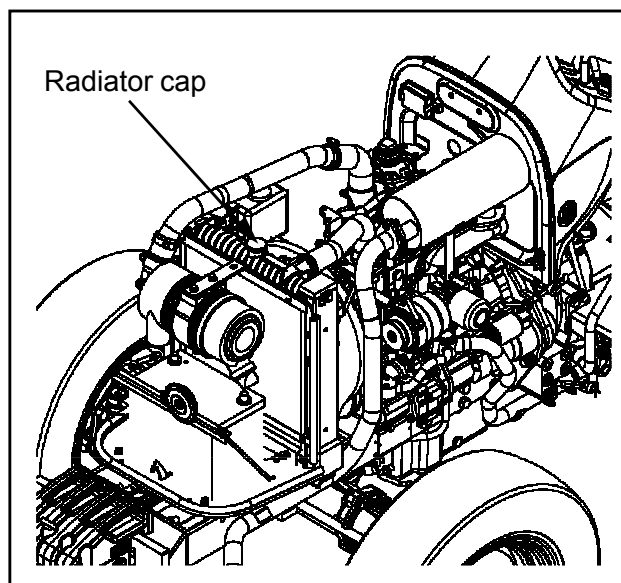


Warning



▶ When opening the radiator cap, be careful of the escaping hot water or steam.

▶ Cool down the coolant sufficiently before opening.

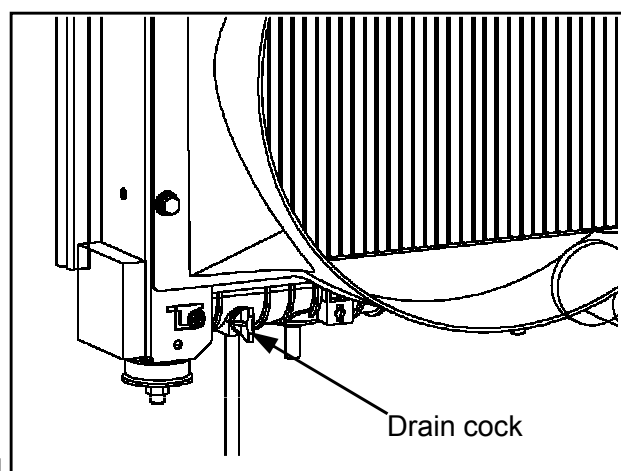


#### ③ Add coolant

- Supply the clean soft water to the coolant. If not, the radiator shall be corroded or rust shall be generated.

#### ④ Replacing coolant

- The drain cock must be loosened only when the engine is cooled down.
- Loosen the drain cock under the radiator to drain the coolant in the engine and radiator.
- Before supplying the coolant, wash out the radiator with clean water 2~3 times.
- Apply the overflow tube and supply the coolant up to the inlet of radiator. Fill up the expansion tank (if fitted) with coolant between low and high marks. Change the coolant with anti-freeze solution in cold weather.



- Anti-freeze solution is filled up from the factory. After first winter, change the coolant to remove foreign materials.

#### ⑤ Anti-freeze

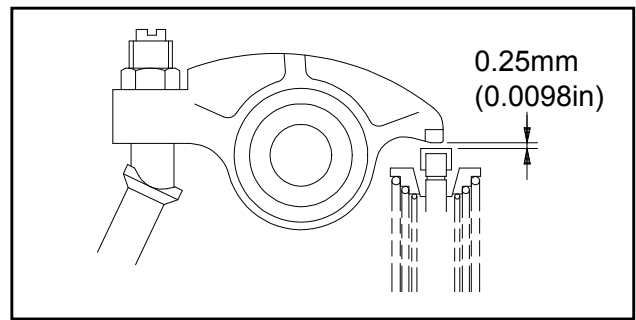
- The amount of anti-freeze in the coolant must be determined on the ambient temperature. If the amount of anti-freeze in the coolant is low, the coolant can be frozen and the engine and radiator may be damaged.
- Use anti-freeze solution always. if not, change the coolant with anti-freeze solution before winter time. (Drain port : Radiator – Drain cock, Engine – Engine coolant drain plug)
- Run the engine for 5 minutes after injecting the anti-freeze to mix it with water well.

#### (4) Adjusting Engine Valve clearance

- Ask your authorized dealer to check the valve clearance.

**Clearance : 0.25mm (0.0098 inch)**

If the gap is big, the noise increase and if the gap is small, the engine power can be low.



#### (5) Checking Nozzle injection pressure

- Contact your authorized dealer.

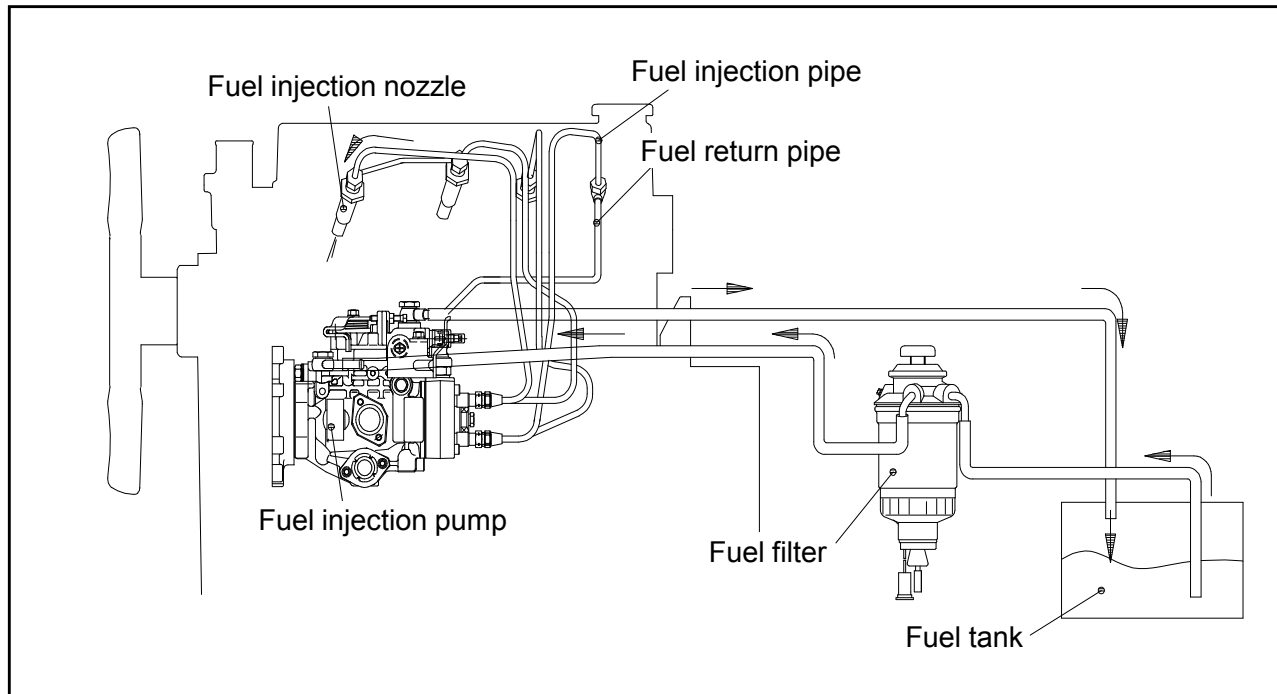
**Normal injection pressure : 14.7MPa (2132psi)**



## 5-10. General maintenance (When required)

### (1) Air-bleeding from Fuel system

- The air in the fuel system may cause weak injection and the failure of engine start or stop. To prevent such failures, bleed the air from fuel system.

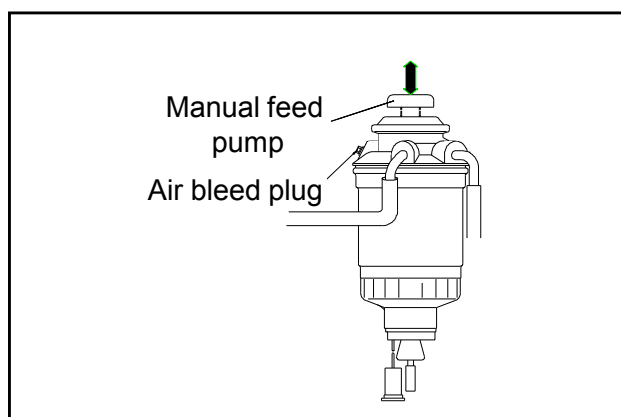


#### Notice

- ▶ When replacing fuel filter only, air-bleeding from fuel injection pipe is not necessary.

### ① Air-bleeding from Fuel filter

1. Loosen the air bleed plug of fuel filter flange.
2. Apply a rag to the air bleed plug and press the manual feed pump several times.  
If no bubbles from the plug, the process is completed.
3. Tighten the air bleed plug.



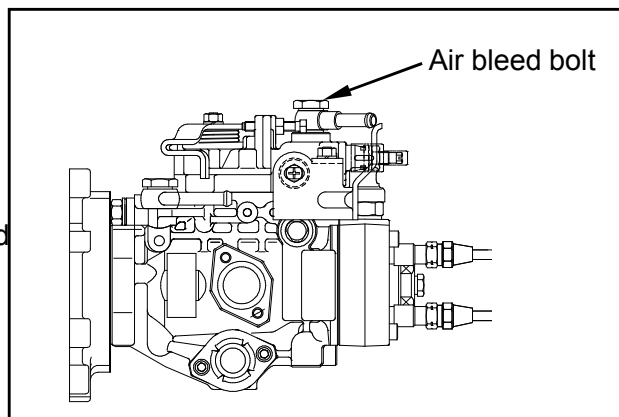
#### Notice

- ▶ If the foreign materials are stuck to the air bleed plug, it may prevent the air-bleeding. In this case, unscrew the air bleed plug and remove foreign materials by blowing.

## ② Air-bleeding from Fuel injection pump

1. Turn key switch to the ON position.
2. Loosen the air-bleed bolt by using a spanner and turn it by hands until it stops.
3. If clean fuel without bubbles comes out, turn the key switch to OFF position and tighten the air-bleed bolt.

**Tightening torque : 19.6~29.4 N.m  
(14.54~21.81 lb-ft)**



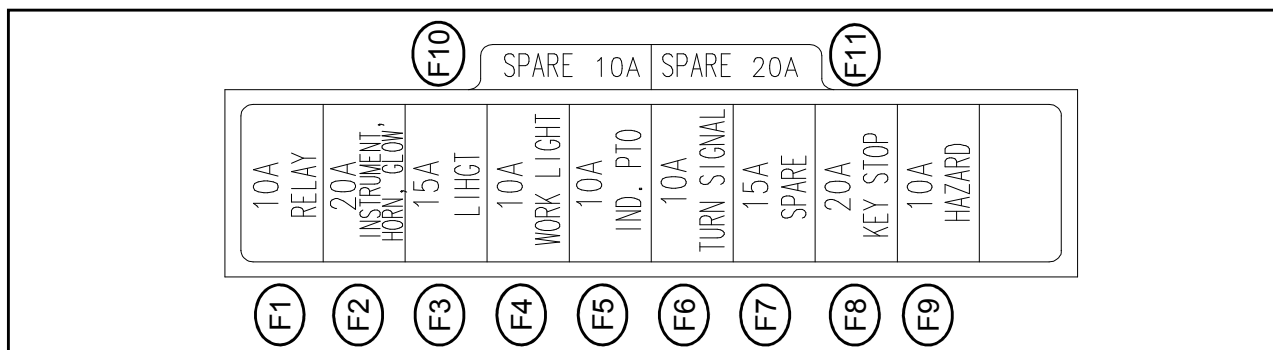
### Notice

► Cover the bleeding fuel with a rag so that it does not flow to other components.

## (2) Fuse & Main fuse

### ① Fuse check and replacement

- How to replace the fuse
  1. Remove the cover of fuse box.
  2. Check each fuse and remove the damaged fuse.
  3. Replace the new one same as damaged one.
- Capacity and function of each fuse is described in the cover of fuse box.

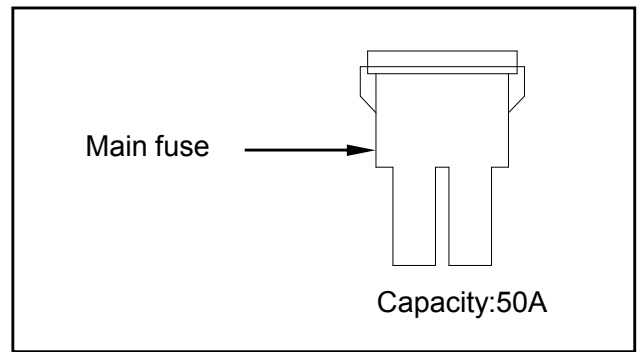


Fuse position	Fuse capacity	Circuit	
		Mechanical type	HST type
F1	10A	Engine stop, Alternator	Engine stop, Alternator, HST relay
F2	20A	Instrument panel, horn, glow relay	Instrument panel, horn, glow relay
F3	15A	Headlight, brake light, sidelight	Headlight, brake light, sidelight
F4	10A	Work light	Work light
F5	10A	PTO	PTO
F6	10A	Turn signal light	Turn signal light
F7	15A	Spare fuse	Spare fuse
F8	20A	Instrument panel light	Instrument panel light
F9	10A	Warning indicators	Warning indicators
F10	10A	Spare fuse	Spare fuse
F11	20A	Spare fuse	Spare fuse

Notice	<p>► If the same function fuse is damaged repeatedly, contact your authorized dealer for check instead of using the alternatives such as wire or aluminum foil.</p> <p>► If using the alternatives instead of the rated capacity fuse, it may cause fire which results in the damage of tractor or injury.</p>
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## ② Main fuse (SLOW BLOW FUSE) check and replacement

- Main fuse is attached to the wiring of right side of the engine.
- If main fuse is damaged, remove it from the wiring and replace with a genuine part.
- As main fuse is a device to protect the electric system and wiring, if damaged, check if there is trouble in the electric system. Contact your authorized dealer for check.



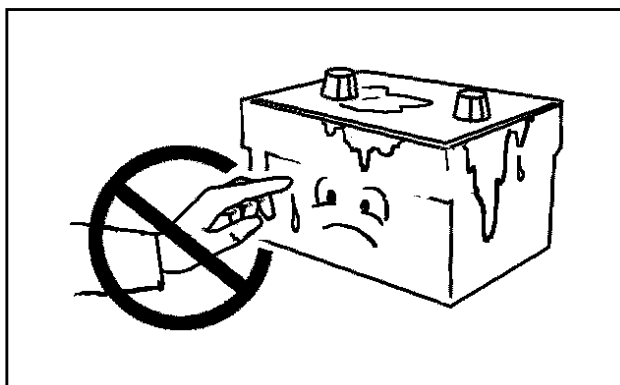
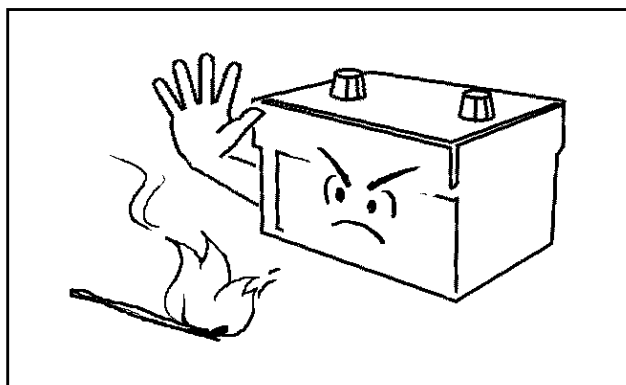
Notice	<ul style="list-style-type: none"><li>▶ If main fuse is cut off often, contact your authorized dealer to check the problem.</li><li>▶ If using the alternatives instead of the rated capacity main fuse, it may cause the fire which results in the damage of tractor or injury.</li><li>▶ Do not connect electric wire to the battery terminals directly. It may cause a fire by spark.</li></ul>
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### (3) Battery handling and Notices

- ※ **Battery fluid (Electrolyte) is a solution of water and sulfuric acid. It makes poisonous gas which is very harmful to eyes, skin and clothing. And also this gas is explosive. Read the following instructions thoroughly before handling the battery.**

#### ① Battery check

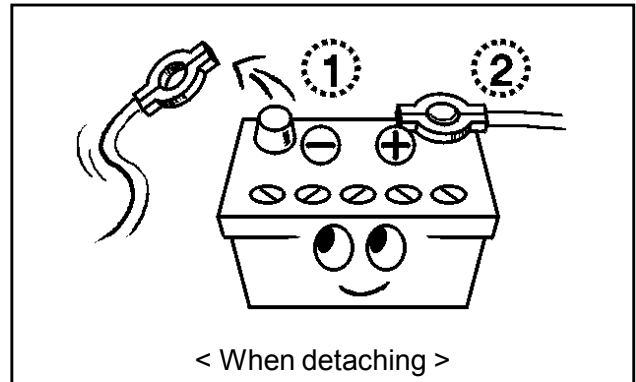
- Indicator on the top of the battery displays the battery state. If the indicator color is
  - **Green** : Normal state.  
If the engine does not start despite of green color, contact your authorized dealer.
  - **Clean** : Low charging state - charge the battery.
  - **White or Red** : replace the battery with a new one after checking the vehicle.
- If the terminals of battery harness are loosened, tighten it completely.  
If the terminals of battery are corroded, clean it with warm water and apply grease.



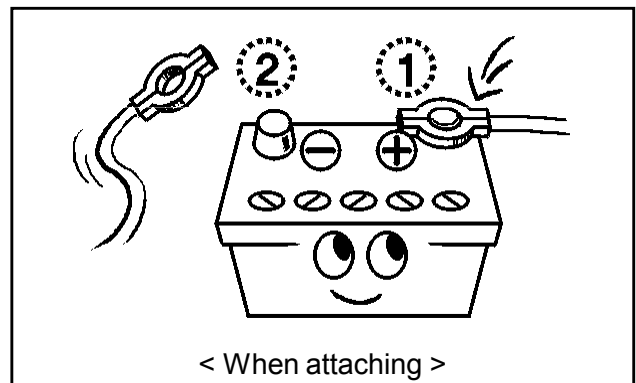
⚠ Caution	
  	<ul style="list-style-type: none"><li>▶ The gas generated from the battery is explosive. comply with following instructions.<ul style="list-style-type: none"><li>- Keep cigarettes, sparks and flames away from battery. Use a flashlight to check battery electrolyte level or indicator.</li><li>- Never check battery charge by placing a metal object across the terminals. Use a voltmeter or hydrometer.</li><li>- Always remove grounded (-) battery clamp first and assemble it last. If not, It can cause explosion by spark.</li></ul></li><li>▶ Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and can cause blindness if splashed into eyes.<ul style="list-style-type: none"><li>- Never disassemble the battery.</li><li>- Do not touch the battery or liquid by bare hand without gloves or any protection.</li><li>- Flush eyes with clean water for about 20 minutes If the electrolyte is splashed into the eyes. Get medical attention immediately.</li></ul></li><li>▶ Charge the battery in an area with good ventilation and DO NOT charge a frozen battery.</li><li>▶ Replace it with LS tractor genuine products or the battery with the same capacity.</li></ul>





## ② Notices in attaching/detaching the battery

- When detaching the battery, remove the negative(-) terminal from the battery first. If not, when metal object is contacted between positive(+) terminal and the body, it may cause the dangerous spark.



- When attaching the battery, the positive (+) terminal must be attached first and the negative (-) terminal must be connected last.

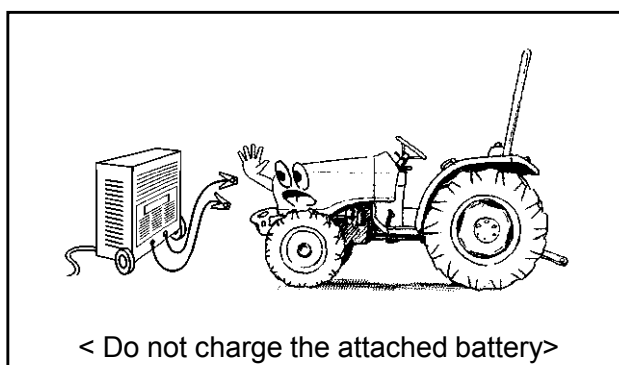
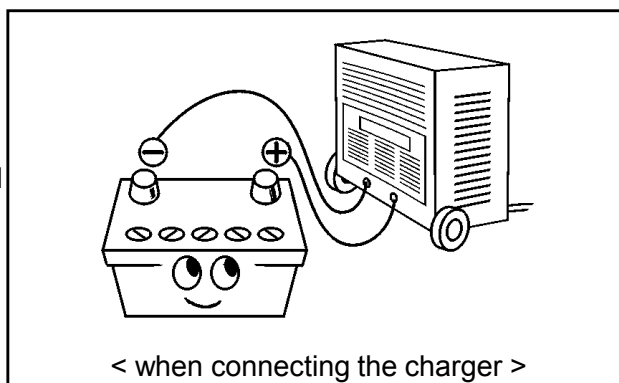


 Caution	<ul style="list-style-type: none"> <li>▶ Stop engine and apply parking brake and remove the ignition key before replacing the battery.</li> </ul>
	<ul style="list-style-type: none"> <li>▶ Put on eye protection and gloves to protect human body from poisonous sulfuric acid before handling the battery .</li> </ul>
	<ul style="list-style-type: none"> <li>▶ Always remove grounded (-) battery clamp first and assemble it last. If not, It can cause an explosion by spark.</li> <li>▶ Keep all flames and sparks away and DO NOT smoke while you charge the battery.</li> </ul>
	<ul style="list-style-type: none"> <li>▶ Replaced old battery must be disposed of in a suitable manner, according to the national legislation or local regulations. Contact your authorized dealer.</li> <li>▶ Replace it with LS tractor genuine products or the battery with the same capacity.</li> </ul>

### ③ Notices in charging the battery using separate charger

- As the battery fluid makes poisonous gas which can explode during the charging, comply with the following instructions.

1. Detach battery from the tractor.
2. Wait until the battery is warmed to room temperature.
3. Connect the cable of charger to the (+), (-) terminal of the battery correctly.
  - Connect (+) charger cable to (+) battery terminal.  
: Red color
  - Connect (-) charger cable to (-) battery terminal.  
: Black color
4. Plug in charger cord.
5. Charge battery with a Slow Charge setting.
6. Check the charging current and temperature of electrolyte during the charging.
7. Unplug charge cord and remove charger cables.
8. Attach battery to the tractor.



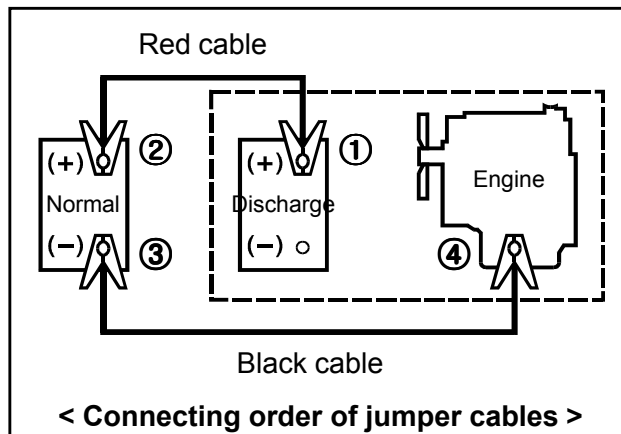
	<p>▶ Put on eye protection and gloves to protect human body from poisonous sulfuric acid before handling the battery .</p>
	<p>▶ Always remove grounded (-) battery clamp first and assemble it last. If not, It can cause explosion by spark.</p>
	<p>▶ Keep all flames and sparks away and DO NOT smoke while you charge battery.</p>
	<p>▶ Detach battery from the tractor before charging. DO NOT charge directly while the battery is attached to the tractor.</p>
	<p>▶ Turn off or unplug the charger cord, before connecting or disconnecting the charger cable to or from the battery</p> <p>▶ Charge the battery in an area with good ventilation.</p> <p>▶ Do not charge the frozen battery.</p> <p>▶ Use the rated 12V-5A charger.</p> <p>▶ Never check battery charge by placing a metal object across the terminals.</p>

## ④ How to use jumper cables

※ If the battery which is attached to the tractor is discharged and needs to connect a auxiliary battery, follow the instructions as below.

### a) Connecting Jumper cables

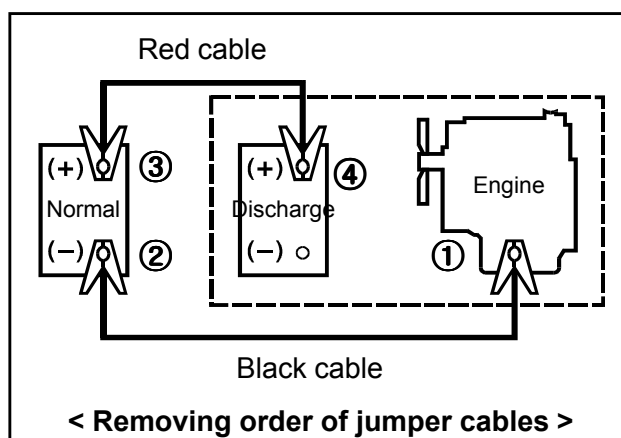
- Check followings before connecting the cables.
  - is the spring of clamp normal?
  - Is the cable and clamp cut-off?
- 1. Stop engine, apply parking brake and remove the ignition key.
- 2. Connect two (+) terminals of both batteries. with red cable.  
(tractor battery-①, auxiliary battery-②)
- 3. Connect one end of black cable to (-) terminal(③) of auxiliary battery and the other end to engine block desired to start (④).
- 4. If engine does not start, check the electrolyte level of each battery.



	<p>▶ The gas generated from the battery can be exploded by spark.</p>
	<p>▶ The negative(-) cable of auxiliary battery must be connected to the engine block, not to the tractor battery.</p> <p>▶ Keep all flames and sparks away and DO NOT smoke while you charge battery.</p>

### b) Removing Jumper cables


- Remove jumper cables as referring to the right figure.



<p>Notice</p>	<p>▶ Pay attention not to change the (+) and (-) pole. If not, it may cause a failure of electric circuit or the damage of wire and even the polarity of battery can be changed at over-discharged state.</p>
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## 5-11. Troubleshooting

 <b>Warning</b>	<p>► To avoid injury due to sudden start, apply parking brake and place the transmission gear in neutral position.</p>
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System	Faults	Possible causes	Solutions
Engine	The start motor does not turn when turning the key switch.	<ul style="list-style-type: none"> <li>▲ Start safety switch is not contacted.</li> <li>▲ PTO switch is not in OFF position.</li> <li>▲ Discharge of battery</li> <li>▲ Terminal loosened</li> <li>▲ Key switch failure</li> <li>▲ Start motor failure</li> </ul>	<ul style="list-style-type: none"> <li>▲ Depress clutch pedal fully</li> <li>▲ Place PTO switch in OFF position</li> <li>▲ Charge or replace</li> <li>▲ Tighten the terminal</li> <li>▲ Repair or replace</li> <li>▲ Repair or replace</li> </ul>
	The start motor turns but the engine does not start.	<ul style="list-style-type: none"> <li>▲ The battery is weak.</li> <li>▲ Bad grounding</li> <li>▲ Improper viscosity of engine oil</li> <li>▲ Air in fuel system</li> <li>▲ Fuel filter clogged</li> <li>▲ Error in engine body</li> <li>▲ Fuel cock closed</li> </ul>	<ul style="list-style-type: none"> <li>▲ Charge or replace</li> <li>▲ Tighten the ground</li> <li>▲ Replace the oil with proper viscosity.</li> <li>▲ Bleed the air</li> <li>▲ Clean or replace the filter</li> <li>▲ Repair</li> <li>▲ Open the cock</li> </ul>
	Engine revolution is irregular.	<ul style="list-style-type: none"> <li>▲ Air in fuel system</li> <li>▲ Fuel filter clogged</li> <li>▲ Injection nozzle clogged</li> <li>▲ Fuel leakage</li> <li>▲ Irregular fuel injection</li> </ul>	<ul style="list-style-type: none"> <li>▲ Bleed air</li> <li>▲ Clean or replace the filter</li> <li>▲ Repair or replace</li> <li>▲ Repair</li> <li>▲ Repair</li> </ul>
	Engine turns more than maximum speed.	<ul style="list-style-type: none"> <li>▲ impurities in governor</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair</li> </ul>
	Engine stops suddenly during operation.	<ul style="list-style-type: none"> <li>▲ Fuel shortage</li> <li>▲ Fault of nozzle</li> <li>▲ moving parts failure due to bad lubrication</li> </ul>	<ul style="list-style-type: none"> <li>▲ Add fuel and bleed air.</li> <li>▲ Repair or replace</li> <li>▲ Repair</li> </ul>

System	Faults	Possible causes	Solutions
Engine	Engine stops at low speed revolution.	<ul style="list-style-type: none"> <li>▲ Fault of injection pump</li> <li>▲ Valve gap is not correct</li> <li>▲ Poor nozzle pressure</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair</li> <li>▲ Adjust the gap</li> <li>▲ Repair</li> </ul>
	Engine overheat	<ul style="list-style-type: none"> <li>▲ Lack of coolant</li> <li>▲ Bad fan belt tension or broken</li> <li>▲ Dirt attached to the radiator</li> </ul>	<ul style="list-style-type: none"> <li>▲ Supplement</li> <li>▲ Adjust belt tension or replace</li> <li>▲ Wash</li> </ul>
	The color of exhausted smoke is white.	<ul style="list-style-type: none"> <li>▲ Air cleaner clogged</li> <li>▲ Engine oil exceeded</li> <li>▲ Lack of fuel supply</li> </ul>	<ul style="list-style-type: none"> <li>▲ Clean element or replace</li> <li>▲ Adjust in proper level</li> <li>▲ Repair</li> </ul>
	The color of exhausted smoke is black.	<ul style="list-style-type: none"> <li>▲ Bad quality of fuel</li> <li>▲ Over fuel supply</li> <li>▲ Fault of nozzle</li> </ul>	<ul style="list-style-type: none"> <li>▲ Use good quality fuel</li> <li>▲ Repair</li> <li>▲ Repair</li> </ul>
	Engine power is low.	<ul style="list-style-type: none"> <li>▲ Injection nozzle clogged</li> <li>▲ Carbon piled to valve seat</li> <li>▲ Bad adjustment of valve gap</li> <li>▲ Bad injection timing</li> <li>▲ Lack of fuel supply</li> <li>▲ Air cleaner clogged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair</li> <li>▲ Repair</li> <li>▲ Repair</li> <li>▲ Repair</li> <li>▲ Check fuel system</li> <li>▲ Clean or replace</li> </ul>
	Engine oil pressure indicator is ON during operation.	<ul style="list-style-type: none"> <li>▲ Lack of engine oil</li> <li>▲ Low viscosity of engine oil</li> <li>▲ Pressure switch error</li> <li>▲ Fault of oil pump</li> <li>▲ Engine oil filter clogged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Supplement</li> <li>▲ Replace the proper oil viscosity</li> <li>▲ Replace</li> <li>▲ Repair</li> <li>▲ Replace the filter</li> </ul>
	Battery charging indicator is ON during operation	<ul style="list-style-type: none"> <li>▲ Bad electrical connection</li> <li>▲ Fault of alternator</li> <li>▲ Fault of battery</li> <li>▲ Bad fan belt tension or broken</li> </ul>	<ul style="list-style-type: none"> <li>▲ Check battery terminals, ground, and repair</li> <li>▲ Repair or replace</li> <li>▲ Replace</li> <li>▲ Adjust belt tension or replace</li> </ul>
Clutch	Clutch is slipped.	<ul style="list-style-type: none"> <li>▲ Wrong adjustment of clutch pedal play</li> <li>▲ Friction lining worn or broken</li> </ul>	<ul style="list-style-type: none"> <li>▲ Adjust the pedal play correctly</li> <li>▲ Replace</li> </ul>
	Clutch does not cut-off.	<ul style="list-style-type: none"> <li>▲ Lining damaged</li> <li>▲ Clutch pedal play exceeded</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair or replace</li> <li>▲ Adjust the pedal play</li> </ul>

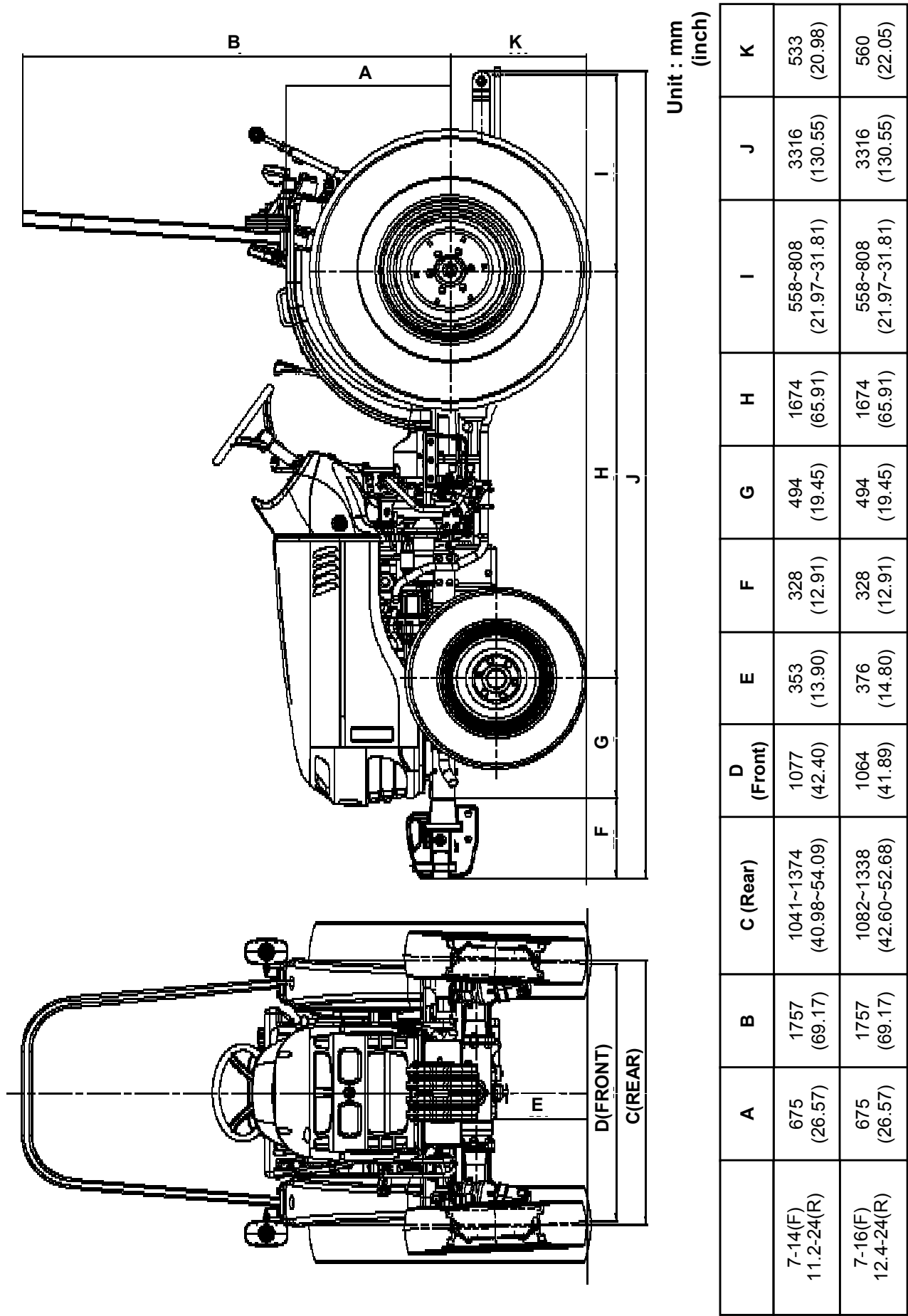
System	Faults	Possible causes	Solutions
Brake	Brake does not work or only one side works.	<ul style="list-style-type: none"> <li>▲ Wrong brake pedal play.</li> <li>▲ Lining worn or broken</li> <li>▲ Left/right pedal play is different</li> </ul>	<ul style="list-style-type: none"> <li>▲ Adjust</li> <li>▲ Replace</li> <li>▲ Adjust</li> </ul>
	After brake pedal working, it does not return.	<ul style="list-style-type: none"> <li>▲ Return spring damaged</li> <li>▲ Lack of grease in shaft parts</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace the spring</li> <li>▲ Remove the rust, apply grease</li> </ul>
Hydraulic lift system	The linkage does not move up.	<ul style="list-style-type: none"> <li>▲ Lack of transmission oil</li> <li>▲ Air in the suction pipe</li> <li>▲ Hydraulic filter clogged</li> <li>▲ Hydraulic pump failure</li> <li>▲ Control valve failure</li> <li>▲ Cylinder or cylinder related parts broken</li> </ul>	<ul style="list-style-type: none"> <li>▲ Add oil</li> <li>▲ Tighten the filter or replace seal of connecting part</li> <li>▲ Clean the filter or replace</li> <li>▲ Repair or replace</li> <li>▲ Repair or replace</li> <li>▲ Repair or replace</li> </ul>
	Oil leakage	<ul style="list-style-type: none"> <li>▲ Connecting part loosened</li> <li>▲ Oil seal damaged</li> <li>▲ Pipe cracked</li> </ul>	<ul style="list-style-type: none"> <li>▲ Tighten</li> <li>▲ Replace</li> <li>▲ Replace</li> </ul>
	If lever is placed on the raising position, relief valve sounds off.	<ul style="list-style-type: none"> <li>▲ Upper limit of position control lever is changed</li> </ul>	<ul style="list-style-type: none"> <li>▲ Adjust the upper limit</li> </ul>
	The linkage does not move down.	<ul style="list-style-type: none"> <li>▲ Down speed control valve locked</li> <li>▲ Control valve failure</li> <li>▲ Cylinder damaged</li> <li>▲ Lift shaft moving part damaged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Turn the knob counter-clockwise</li> <li>▲ Repair or replace</li> <li>▲ Replace</li> <li>▲ Repair or replace</li> </ul>

System	Faults	Possible causes	Solutions
Steering System	Hydraulic steering system does not work.	<ul style="list-style-type: none"> <li>▲ Pump worn or part damaged</li> <li>▲ Steering unit damaged or worn</li> <li>▲ Oil leakage by steering cylinder piston seal damaged or worn</li> <li>▲ Oil leakage by pipe damage</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair or replace</li> <li>▲ Repair or replace</li> <li>▲ Repair</li> <li>▲ Repair or replace</li> </ul>
	Hard to operate the steering wheel.	<ul style="list-style-type: none"> <li>▲ Steering unit <ul style="list-style-type: none"> <li>- Steering unit spline and column spline does not aligned</li> <li>- Spool and sleeve damaged by foreign material</li> <li>- Excessive tightening torque of end cap bolt</li> </ul> </li> <li>▲ Pump <ul style="list-style-type: none"> <li>- Low speed</li> <li>- Wearing, failure</li> </ul> </li> <li>▲ Relief valve <ul style="list-style-type: none"> <li>- Valve spool clogged</li> <li>- Setting pressure too low</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▲ <ul style="list-style-type: none"> <li>- Check mounted condition of steering unit and column</li> <li>- Replace</li> <li>- Apply regular torque</li> </ul> </li> <li>▲ <ul style="list-style-type: none"> <li>- Adjust RPM or Repair</li> <li>- Repair or replace</li> </ul> </li> <li>▲ <ul style="list-style-type: none"> <li>- Repair or replace</li> <li>- Reset or adjust</li> </ul> </li> </ul>
	Cylinder does not work smoothly as steering wheel movement	<ul style="list-style-type: none"> <li>▲ Air in steering line if not used for a long time</li> <li>▲ Air in suction pipe</li> <li>▲ Piston seal damaged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Bleed air</li> <li>▲ Repair</li> <li>▲ Replace</li> </ul>
	Steering wheel turns to the opposite direction.	<ul style="list-style-type: none"> <li>▲ Bad assembly of steering gear</li> <li>▲ Bad assembly of steering hose</li> </ul>	<ul style="list-style-type: none"> <li>▲ Repair</li> <li>▲ Repair</li> </ul>
	Oil leakage of steering pump, steering unit, cylinder and fittings	<ul style="list-style-type: none"> <li>▲ Seal damaged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace seal</li> </ul>
	Abnormal noise	<ul style="list-style-type: none"> <li>▲ Lack of oil</li> <li>▲ Exceeding resistance of suction line</li> <li>▲ Air in system</li> </ul>	<ul style="list-style-type: none"> <li>▲ Aid oil</li> <li>▲ Replace filter</li> <li>▲ Bleed air</li> </ul>

System	Faults	Possible causes	Solutions
HST	When operating HST pedal, tractor dose not start.	<ul style="list-style-type: none"> <li>▲ Low pressure relief set is too low</li> <li>▲ High pressure relief set is too low</li> <li>▲ HST charger valve fault</li> <li>▲ Filter clogged</li> <li>▲ Pump worn or part damaged</li> <li>▲ HST moving part worn or damaged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Check and repair</li> <li>▲ Check and repair</li> <li>▲ Replace</li> <li>▲ Replace filter</li> <li>▲ Repair or replace</li> <li>▲ Repair or replace after check the circuit.</li> </ul>
	Tractor is still moving despite pedal bring in neutral position on HST pedal.	<ul style="list-style-type: none"> <li>▲ Neutral position of HST pedal is changed.</li> <li>▲ HST pedal linkage damaged.</li> <li>▲ HST arm bolt loosened.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Adjust neutral position</li> <li>▲ Replace damaged part</li> <li>▲ Fasten the bolt with adhesive</li> </ul>
	HST power is too low	<ul style="list-style-type: none"> <li>▲ Oil shortage</li> <li>▲ Air in HST circuit</li> <li>▲ Transmission oil temperature is too high.</li> <li>▲ HST moving part worn</li> <li>▲ HST filter clogged</li> </ul>	<ul style="list-style-type: none"> <li>▲ Add oil</li> <li>▲ Check and repair the hydraulic suction line.</li> <li>▲ Stop engine to cool the oil, and restart.</li> <li>▲ Repair or replace</li> <li>▲ Replace the filter</li> </ul>
	Abnormal noise	<ul style="list-style-type: none"> <li>▲ Engine speed is too low.</li> <li>▲ Oil temperature is too low.</li> <li>▲ Hydraulic oil filter clogged</li> <li>▲ Oil shortage</li> </ul>	<ul style="list-style-type: none"> <li>▲ Set engine rpm over 1500 rev/min</li> <li>▲ Run engine to warm up the oil.</li> <li>▲ Replace the filter</li> <li>▲ Add oil</li> </ul>

System	Faults	Possible causes	Solutions
Electric System	Battery does not charge	<ul style="list-style-type: none"> <li>▲ Abnormal wiring</li> <li>▲ Alternator failure</li> <li>▲ Lack of fan belt tension or broken</li> <li>▲ Abnormal battery</li> </ul>	<ul style="list-style-type: none"> <li>▲ Check the tightening state of terminals and ground</li> <li>▲ Repair or replace</li> <li>▲ Adjust fan belt tension or replace</li> <li>▲ Replace</li> </ul>
	Headlight is dark.	<ul style="list-style-type: none"> <li>▲ Battery capacity is low</li> <li>▲ Bad wiring and contact</li> </ul>	<ul style="list-style-type: none"> <li>▲ Charge or replace</li> <li>▲ Check and repair</li> </ul>
	Headlight is not ON.	<ul style="list-style-type: none"> <li>▲ Light bulb cut-off</li> <li>▲ Fuse blown</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace</li> <li>▲ Check the cause, and replace it</li> </ul>
	Horn does not sound.	<ul style="list-style-type: none"> <li>▲ Switch failure</li> <li>▲ Abnormal wiring</li> <li>▲ Horn failure</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace</li> <li>▲ Repair</li> <li>▲ Replace</li> </ul>
	Turn signal light does not work.	<ul style="list-style-type: none"> <li>▲ Light bulb cut-off</li> <li>▲ Bad connection</li> <li>▲ Fuse blown</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace</li> <li>▲ Tighten terminals</li> <li>▲ Check the cause, and replace it</li> </ul>
	Cold start aid indicator is not ON.	<ul style="list-style-type: none"> <li>▲ Relay and timer damaged</li> <li>▲ Bad connection of preheat plug wiring</li> </ul>	<ul style="list-style-type: none"> <li>▲ Replace</li> <li>▲ Check and tighten</li> </ul>
	Other illuminating light or indicator is not ON.	<ul style="list-style-type: none"> <li>▲ Fuse blown</li> <li>▲ Light bulb cut-off</li> </ul>	<ul style="list-style-type: none"> <li>▲ Check the cause, and replace it</li> <li>▲ Replace</li> </ul>

6. Dimension and Specification



		G3033	G3033H	G3038	G3038H
WEIGHT	Mechanical Type	1175kg (2590 lb)	-	1220kg (2690 lb)	-
	HST Type	-	1185kg (2612 lb)	-	1230kg (2712 lb)
	Bumper	21kg (46.3 lb) (option)			
	Front weight	20kg (44.1 lb) x 4 (option)			
ENGINE	Model	L3BL		L3AL	
	Type	4-stroke, vertical, water cooling			
	No. of cylinder	3			
	Diameter x stroke	88 x 105mm (3.36 x 4.13 in)		90 x 105mm (3.54 x 4.13 in)	
	Displacement	1916cc (116.9 in3)		2003cc (122.2 in3)	
	Rated speed	2600 rev/min		2600 rev/min	
	Maximum speed	2750 rev/min		2750 rev/min	
	Engine rated power	24.3kW		27.9kW	
FUEL INJECTION PUMP	Type	Distribution type			
	Speed regulation	Centrifugal			
	Fuel filter	Replaceable cartridge type			
	Air cleaner	Dry			
	Injection order	1-3-2			
LUBRICATION SYSTEM	Type	Forced circulation			
	Pump	Trochoid gear pump			
	Filter	Replaceable cartridge type			
COOLING SYSTEM	Pump	Centrifugal type			
	Temperature control	Thermostat			
CLUTCH	Type (MAIN)	Dry single disk			
	Operation (MAIN)	Pedal			
	Return system (MAIN)	Diaphragm			



			G3033	G3033H	G3038	G3038H
TRANSMISSION	Forward / Reverse		Synchro-shuttle type			
	Gear type	Main gear	Spur / Constant mesh			
		Range gear	Spur / Constant mesh			
		Creeper gear	N/A			
	Gear stage	Main gear	4	N/A	4	N/A
		Range gear	3			
		Creeper gear	N/A			
	DIFFERENTIAL LOCK	Gear type		Spiral bevel		
Operation		Mechanical foot pedal				
REAR PTO	Type		Independent PTO / TM driven PTO (option)			
	No. of speed		1 stage			
	PTO / Engine		1 stage : 540 rpm / 2509 rpm			
HYDRAULIC LIFT	3 Point linkage		CAT1			
	Draft load detection		N/A			
	Lowering speed control and cylinder fixing device		Down speed control valve			
	Pump		Gear type, Engine drive			
	Rated flow		28LPM (7.4GPM)		28LPM (7.4GPM)	
	System pressure		16.7MPa (2422psi)			
	Lift capacity (@ 24in. behind)		650 kgf (1433 lbf)			
REMOTE CONTROL	No. of spool		N/A / 1 or 2 (optional)			
	Valve operation mode		Double acting , Spring return type (optional)			

		G3033	G3033H	G3038	G3038H
REMOTE CONTROL	No. of Quick coupler	N/A / 2 or 4 (optional)			
	Aux. Valve for front loader	Front outlet block			
STEERING SYSTEM	Wheel position	Center			
	Type	Hydrostatic			
	Min. turning radius (w/ brake)	2.8m (9.2ft)			
	Max. steering angle	48° / 37.4°			
	No. of steering turns	3.7 (right) / 2.9 (left) turns from stop to stop			
	Oil	Transmission oil			
ALTERNAT OR	Rated output	12V, 0.6kW (50A)			
	Voltage control	Built-in (IC type)			
BATTERY	Voltage	12V			
	Capacity	80AH			
START MOTOR	Output power	12V-2.0kW			
	Operation	Solenoid			
LIGHTS	Headlights (Upper / Lower)	12V 40W / 45W			
	Turn signal lights Side lights (front)	12V 21W / 5W			
	Turn signal lights (rear)	12V 8W (Standard) 12V 21W (EC)			
	Stop light / Taillight (rear)	12V 10W / 5W (Standard) 12V 21W / 5W (EC)			
	Work light	12V 23W			
OTHERS	Instrument lights	LED			
	Indoor light (CAB)	N/A			
	Instrument indicator light	LED			
	Cold start aid	Glow plug			

			G3033	G3033H	G3038	G3038H
STD. AGRIC. TIRE	Front		7-14 (6PR)		7-16 (4PR)	
	Rear		11.2-24 (4PR)		12.4-24 (6PR)	
WHEEL TRACK ADJUSTMENT	Front	Stage	N/A			
		Range	N/A			
	Rear	Stage	6 Stage			
		Range	1082~1338mm (42.6~52.7 in.)			

## Lubricants and Capacity

Lubricants	Capacity	International Standard	Recommended products
Engine coolant (Radiator)	5.5 L (1.5U.S.gals.)	ASTM D5216	Soft water (50%) + Anti-freeze (50%)
Fuel	28 L (7.4 U.S.gals.)	ASTM D975 No.2	Low Sulfuric Diesel Fuel
Engine oil (Crank case)	6.5 L (1.7U.S.gals.)	API CF-4 or CG-4 Winter : SAE 10W/30 Summer : SAE 20W/40 Spring/ Fall : SAE 15W/40, SAE 20	GS Caltex RPM Dello 200
Transmission oil (common use for hydraulic lift and steering system)	30 L (7.9 U.S.gals.)	API GL4 ISO VG 46/68	LSTH570 (LS Tractor T/M & Hyd. oil) Manufacturer : GS Caltex or S-OIL TOTAL Co. Ltd.
Front axle oil	5.5 L (1.5 U.S.gals.)	API GL4 SAE 80W	EPK 80W90 (Manufacturer : S-OIL TOTAL Co. Ltd.)
Grease (Front axle holder, Steering cylinder pin, 3-point linkage, etc.)	Proper amount	NLGI 2	CALTEX MAHWAK Multi purpose or CALTEX MAHWAK All purpose

### RECOMMENDED OIL VISCOSITIES

The correct engine oil viscosity grade is dependent upon ambient temperature. Refer to the chart below when selecting oil for your tractor engine.

In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable ; such as the use of SAE 5W 30 in extreme low temperatures or SAE 50 in extreme high temperatures.

Starting Temperature ℃(°F)	-30 (-22)	-25 (-13)	-20 (-4)	-15 (-5)	-10 14)	-5 (23)	0 (32)	-10 (50)	20 (68)	30 (86)	40 (104)
Oil Viscosity	<div> <div>SAE 5W-20</div> <div>SAE 10W-30</div> <div>SAE 15W-40</div> </div>										