Be the ONE*

LS TRACTOR

OPERATOR'S MANUAL

XG3032•XG3032H•XG3037•XG3037H

LS Tractor

FEDERAL EMISSIONS WARRANTY

WARRANTY STATEMENT

ISM warrants that your 2013 and later off-road diesel engine was designed, built and equipped to conform to applicable U.S. Environmental Protection Agency (EPA) regulations and is free from defects in materials and workmanship which cause it to fail to conform with such regulations, for the following period of operation:

- For a period of two (2) years or 1,500 hours of operation, whichever occurs first, after the date of delivery to the initial retail owner of any variable speed off-road diesel engine rated at less than 19 kW (25 hp) and any constant-speed off-road diesel engine rated at less than 37 kW (50 hp) with rated speed greater than or equal to 3,000 rpm.
- For a period of five (5) years or 3,000 hours of operation, whichever occurs first, after the date of delivery to the initial retail owner for all other off-road diesel engines.

WARRANTY INFORMATION

The model year, class of diesel engine, and emission application for your engine are identified on the emission control information label affixed to the right hand side of your engine's front side of timing gear case or head cover.

Any emission control system parts that are proven defective during normal use will be repaired or replaced during the warranty period. The warranty repairs and service will be performed by any authorized ISM dealer at the dealer's place of business, with no charge for parts or labor (including diagnosis).

As the engine owner, you are responsible to perform all the required maintenance listed in your owner's manual. ISM will not deny an emission warranty claim solely because you have no record of maintenance; however, a claim may be denied if your failure to perform maintenance resulted in the failure of a warranted part. Receipts covering regular maintenance should be retained in the event of questions and these receipts should be passed on to each subsequent owner of the engine.

It is recommended that replacement parts used for maintenance or repairs be ISM Service Parts to maintain the quality originally designed into your emission certified engine. The use of non-ISM parts does not invalidate the warranty on other components unless the use of such parts causes damage to warranted parts.

ISM wishes to assure that the emission control systems warranty is being properly administered. If you believe you have not received the service to which you are entitled to under this warranty, you should contact the nearest ISM Branch Office for assistance. The address and phone number of each Branch Office is in your owner's manual.

EXCEPTIONS

Please note that Emission Warranty does not cover:

1. Systems and parts that were not first installed on the new equipment or engine as original equipment by ISM
2. Part malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering, disconnection, improper or inadequate maintenance, or use of non-recommended fuels and lubricating oils.
3. Damage caused by accident, acts of nature, or other events beyond ISM's control.
4. Replacement of expendable items made in connection with scheduled maintenance.
5. Parts requiring replacement or inspection or adjustment during scheduled maintenance intervals where the part is not defective.
6. Parts which are not ISM Service Parts.
7. Loss of time, inconvenience, loss of use of equipment/engine or commercial loss.
8. Equipment with an altered or disconnected hourmeter where the hours cannot be determined.
9. Equipment normally operated outside the United States
10. Non-defective parts replaced by other than ISM dealers.

PARTS COVERED

This emission control system warranty applies to the following emission control parts.

Fuel Injection Pump

Fuel Injectors

Intake Manifold

Exhaust Manifold

Positive Crankcase Ventilation system parts (including PCV Valve and Oil Filler Cap)

Turbocharger (if equipped)

Charge air cooling system (if equipped)

Smoke puff limiter <if equipped>

EGR system (including EGR Valve, EGR Pipe and EGR cooler) (if equipped)

Intake throttle valve (if equipped)

Exhaust Aftertreatment system (if equipped)

Aftertreatment Regeneration device (if equipped)

Miscellaneous hoses, clamps, connecters and sealing gaskets or devices used in the above systems.

CALIFORNIA EMISSION CONTROL
WARRANTY STATEMENT
California Air Resources Board (CARB)
YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and ISM (ISM) are pleased to explain the emission control system warranty on your 2013 and later engine. In California, new engines must be designed, built and equipped to meet the State's stringent anti-smog standards. ISM must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine. Additional conditions and responsibilities are further outlined below. Where a warrantable condition exists, ISM will repair your engine at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

ISM warrants to the original owner, and to each subsequent owner, of a new, diesel engine that the emission control system of your engine:

1. Was designed, built and equipped so as to conform at the time of sale with all applicable regulations of the California Air Resources Board (CARB).

2. Is free from defects in material and workmanship that will cause such engine to fail to conform with applicable regulations for the following warranty period:

- for variable speed engines rated under 19 kW (25 HP): two (2) years or 1,500 hours of operation, whichever occurs first. In the absence of a device to measure hours of use, the engine shall be warranted for a period of two years.
- for constant speed engines rated under 37 kW (50 HP) with peak power rated at 3,000 RPM or greater: two (2) years or 1,500 hours of operation, whichever occurs first. In the absence of a device to measure hours of use, the engine shall be warranted for a period of two years.
- for engines rated at or above 19 kW (25 HP): five (5) years or 3,000 hours of operation, whichever occurs first. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.
- for engines rated at or above 37 kW (50 HP): five (5) years or 3,000 hours of operation, whichever occurs first. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

The warranty period shall begin:

- on the date the equipment is first delivered to the first retail purchaser, or;
- if the equipment is placed in service for demonstration purposes prior to sale at retail, on the date the engine is first placed in service.

The emission control systems of your new ISM engine were designed, built and tested using genuine ISM parts, and the engine is certified as being in conformity with CARB emission control regulation.

Accordingly, it is recommended that any replacement parts used for maintenance, repair or replacement of emission control systems be ISM parts. Any replacement part may be used in the performance of any maintenance or repairs, although ISM recommends that the owner obtain assurance that such parts are warranted by their manufacturer to be equivalent to genuine ISM parts. Such use shall not reduce the warranty obligations of the engine manufacturer, provided they are warranted to be equivalent to genuine ISM parts.

Any warranted part that is not scheduled for replacement, as required maintenance shall be warranted for the warranty period defined above. If any such part fails during the period of warranty coverage, it will be repaired or replaced under warranty. Any such part repaired or replaced under the warranty shall be warranted for the remaining warranty period.

Any warranted part that is scheduled only for regular inspection in the written instructions shall be warranted for the warranty period defined above. A statement in the written instructions to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. Any such part repaired or replaced under warranty shall be warranted for the remaining warranty period.

Any warranted part that is scheduled for replacement, as required maintenance shall be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by the engine manufacturer under warranty. Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

Repair or replacement of any warranted part under warranty shall be performed at no charge to the owner at a warranty station.

ISM provides warranty services or repairs at all manufacturer distribution centers (warranty stations) that are franchised to service the subject engines. Please see the Customer Assistance section of this statement for help in locating such service centers.

The owner will not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a warranty station.

ISM is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

ISM is required by California regulations to maintain a supply of warranted parts sufficient to meet the expected demand for such parts during the warranty period for the engines covered by this warranty.

OWNER’S WARRANTY RESPONSIBILITIES:

This engine is designed to operate on ultra-low sulfur diesel fuel only if rated >19kW, and on low sulfur or ultra-low sulfur diesel fuel only if rated <19kW. Use of any other fuel may result in this engine no longer operating in compliance with California’s emissions requirements.

The purchaser is responsible for initiating the warranty process. The California Air Resources Board suggests that the engine be presented to an ISM dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

Add-on or modified parts, as defined in Section 1900(b)(1) and (b)(10), Title 13, that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty claim made in accordance with this article. The engine manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

The emissions control parts covered by this Emission Control System Warranty are listed under “What is Covered By the Emission Warranty.” As the off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. ISM recommends that you retain all receipts covering maintenance on your off-road engine, but ISM cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the off-road engine owner, you should however be aware that ISM may deny you warranty coverage if your off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Customer Assistance

In the event that you do not receive the warranty service to which you believe you are entitled under the Emission Control System’s Warranty, you should contact ISM at the address below for assistance. If you need additional assistance or information concerning the Emission Control System Warranty, contact:

IHI Shibaura Machinery Corporation
Quality department
1-1-1 Ishishiba , Matsumoto , Nagano,
390-8714 , Japan

Telephone: +81-263-25-4589

What is Not Covered by the Emission Warranty

Please note that Emission Warranty does not cover:

1. Systems and parts that were not first installed on the new equipment or engine as original equipment by ISM

2. Part malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering, disconnection, improper or inadequate maintenance, or use of non-recommended fuels and lubricating oils.

3. Damage caused by accident, acts of nature, or other events beyond ISM's control.
4. Replacement of expendable items made in connection with scheduled maintenance.
5. Parts requiring replacement, inspection or adjustment during scheduled maintenance intervals where the part is not defective.
6. Parts that are not ISM Service Parts.
7. Loss of time, inconvenience, loss of use of equipment/engine or commercial loss.
8. Equipment with an altered or disconnected hourmeter where the hours cannot be determined. Equipment normally operated outside the United States.
9. Non-defective parts replaced by other than ISM dealers.

What is Covered by the Emission Warranty

The following is a list of systems and parts that are considered a part of the Emission Control System and are covered by the Emission Warranty for engines that were built to conform to CARB regulations:

IMPORTANT! This may not include expendable maintenance items. Emission related parts requiring scheduled maintenance are warranted until their first scheduled replacement point only.

PARTS COVERED

This emission control system warranty applies to the following emission control parts.

Fuel injection system

Intake manifold

Exhaust manifold

Positive crankcase ventilation system parts (including PCV Valve and Oil Filler Cap)

Turbocharger (if equipped)

Charge air cooling system (if equipped)

Smoke puff limiter (if equipped)

EGR system (including EGR Valve, EGR Pipe and EGR cooler) (if equipped)

Intake throttle valve (if equipped)

Exhaust aftertreatment system (if equipped)

Aftertreatment Regeneration Device (if equipped)

Miscellaneous hoses, clamps, connecters and sealing gaskets or devices used in the above systems.

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1. General Notices for Safety

1-1. Before using the tractor

※ Have to read and understand this operator's manual carefully and always refer to information and prescriptions outlined in this manual to prevent all potential health and safety risks.

◆ General information for intended use

- Your tractor is designed and manufactured to pull, to carry, to supply the power a variety of mounted or towed equipment **for agriculture**. Do not use the product for other purposes than intended by the manufacturer and outlined in this manual. Do not use this tractor for light/heavy forestry applications.
- Do not use the product beyond its **limits of terrain gradient** and stability than outlined in this manual. Using the tractor beyond these limits may cause a overturning accident.
- Do not use the tractor on higher speeds than allowed by the load of the tractor and road condition. Always choose **a suitable driving speed** to maintain the stability of the tractor.
- Do not use the tractor **near or on soft verges** of canals and brooks or banks and verges that are undermined by rodents. The tractor may sink sideways and roll-over.
- Do not use the tractor on brittle bridge heads and poor bridge floors, These constructions may collapse and cause overturning of the tractor. **Always check out the condition and carrying capacity of bridges and ramps** prior to engage.
- **Do not use the tractor without wearing the seat belt and Roll-Over Protective Structure (ROPS)** during operations where roll-over or tip-over hazards exist. The ROPS will only be fully effective when the driver remains attached to his/her seat.
- Do not use equipment mounted on the tractor which is not **correctly matching and firmly fixed**. Such equipment may increase the risk for roll-over and hit the tractor when coming loose.
- Do not use the tractor in combination with equipment arbitrary, without **having consulted the specific operator's manual provided with the equipment**. This manual alone cannot provide you with all the information about safety operation of the combination.
- Do not use the tractor beyond its **limits of dynamic stability**. High speed, abrupt maneuvers, and fast and short cornering will increase the risk of roll-over.
- Do not use the tractor for **overloaded pulling work**, in cases where you don't know if the load will yield, for instance when pulling stumps. The tractor may flip over when the stump is not yielding.
- Be extremely cautious when working with the tractor **on forage silos without lateral concrete walls**. A wide track setting may improve the lateral stability of the tractor.
- Be cautious that the **center of gravity of the tractor may increase** when the front-end loader is loaded or the three-point linkage are raised. In these conditions, the tractor may roll-over earlier than expected.
- **Do not step down from the tractor without shutting down the PTO, shifting the transmission to neutral and applying the parking brake.**

- **Never remove or modify or change** the driver's protection device or safety device arbitrary.
- You must take the necessary precautions to always be **aware of the possible presence of bystanders**, certainly when maneuvering in confined areas. Keep people away from the tractor during work. Pay the necessary attention while operating next to public roads or footpaths. Thrown objects can get projected outside the field and hit unprotected people like bikers or pedestrians. Wait until it is clear of bystanders.
- Do not violate the **local traffic rules** related to public roads and highways.
- **Do not allow riders** on the tractor; do not allow people standing on the access way or step to the cab when the tractor is moving. Your view to the left will be obstructed and a rider risks to fall from the tractor during unforeseen or abrupt movements.
- **This tractor has only one operator station** and is a one man operated vehicle. Other people on or around the tractor during normal operation are not allowed.
- Always stay clear from implements operating area and especially **do not stand between tractor and trailed vehicle either three-point linkage when operating lift controls**; ensure no bystanders are near these operating areas.
- This tractor may be equipped with a number of sensors to control safety functions. **Do not attempt to bypass any function** on the tractor. You will be exposed to serious hazards, and moreover, the behavior of the tractor may become unpredictable.
- 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 the 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 misuse or operation in violation of these rules, the manufacturer and its distributors **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	**Danger** – This indicates a fatal dangerous situation that may cause a serious injury or death if not avoided.
Warning	**Warning –** This indicates a potential dangerous situation that may cause a serious injury or death if not avoided.
Caution	**Caution –** This indicates a potential dangerous situation that may cause a light injury or damage to the properties if not avoided.
Notice	**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, TM number and also running hours displayed on the instrument panel. (*See Fig. 1-3*)

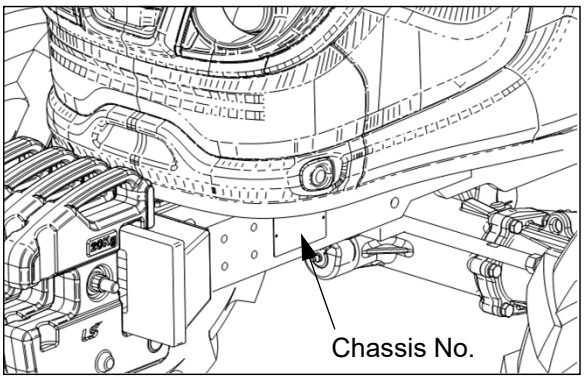


Fig.1-1

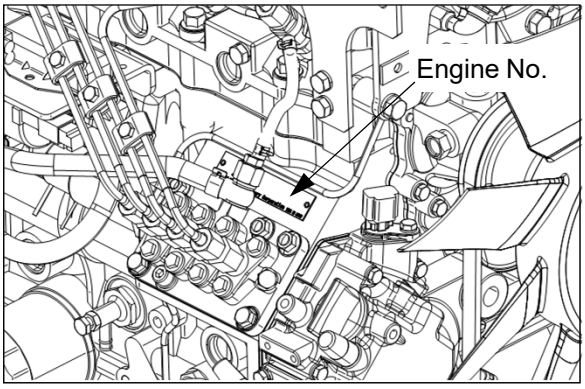


Fig.1-2

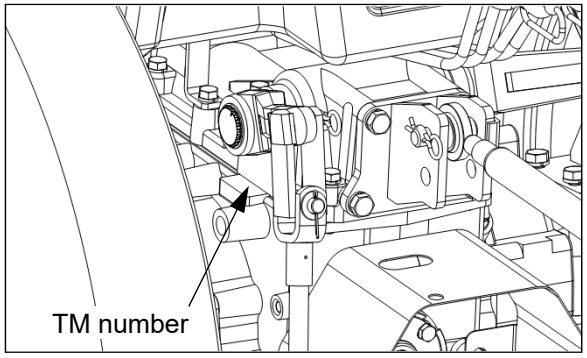


Fig.1-4

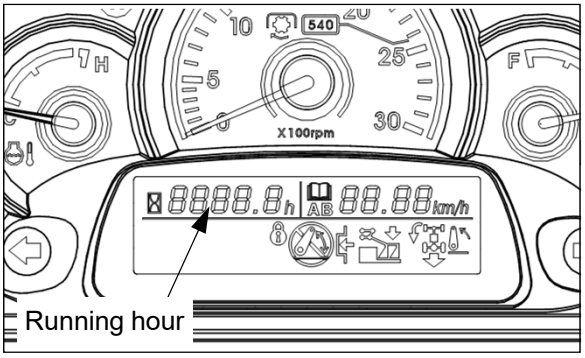
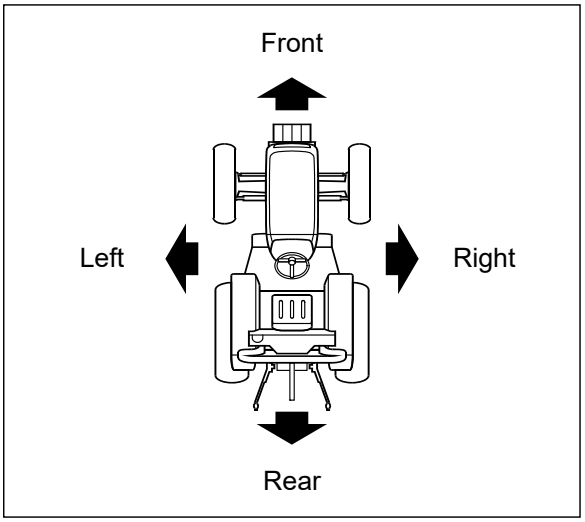


Fig.1-3

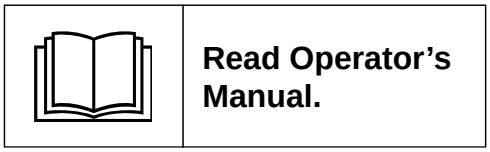
◆ Terminology

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 the tractor



- **For Safety Instruction :** Before using the tractor, read this 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. *(See page 1-2)*

- **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"*)

- **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 (where 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 and if not, it may cause a 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" of LS tractor. Contact your authorized local dealer. If not, it may cause a reduction of product life, failure and serious injury.

● **Restrict Maintenance :** If repairing or changing some components or 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 may cause serious injury. These works have to be treated by well-educated and skilled service experts.
If required to check or repair the tractor due to such a trouble, or having any question about your tractor, contact your authorized local dealer.

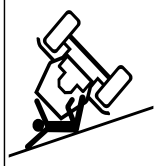
** The items that are not allowed to be modified or removed arbitrarily by user are as below :*
- Protection structures such as PTO cover, Guards, Safety frame(Roll-bar), Cab, etc.
- Engine components, Fuel injection control and setting, etc.
- Automatic control equipment, Lamps, Transmission, Hydraulic valve and pressure settings.
- Other parts that detail and where complicated adjustments are needed.

● **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.

- **Protective Structures :** For the operator's safety, various protective structures, i.e. Bonnet (Hood), Fan cover, PTO safety cover, PTO shaft protection cap, Roll-bar or another Roll-over Protective Structure, etc are attached on the tractor. If these structures are modified or removed by user arbitrarily, it may cause serious accident. Such behaviors are prohibited strictly.

Warning	▶ 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 MUST be replaced with a new one. Contact your authorized local dealer for Protective Structure inspection and replacement. ▶ In case of an accident, fire, tip or roll-over, the following MUST be performed by a qualified technician before operating the tractor again. - The Protective Structure MUST be replaced. - 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 MUST be carefully inspected for damage. - All damaged parts MUST be replaced. ▶ **DO NOT attach any device to the Protective Structure for pulling purposes.** ▶ **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.**

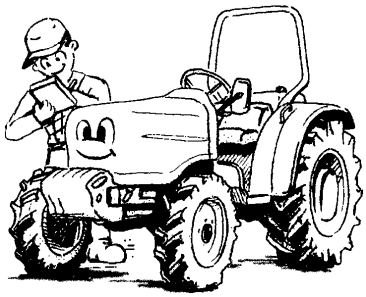


- **Level of protection of the FOPS (Falling Objects Protective Structure) :** This tractor does **NOT** provide any protection against falling objects according to OECD code 10 standard. It is recommended to use a certified FOPS structure when working with front-end loaders.
- **Level of protection against hazardous substances :** This tractor does **NOT** provide any protection against hazardous substances. Do not use the tractor with crop sprayers in hazardous area.
- **Level of protection of the OPS (Operators Protection Structure) :** This tractor does **NOT** provide any protection against
  - low hanging wires and branches in the forest, orchard or construction area, etc.
  - toppling trees, primarily in case a rear-mounted tree grab-crane is mounted at the rear of the tractor.
  - penetrating objects in the operator's enclosure, primarily in case a winch is mounted at the rear of the tractor.
  - potential risks by using any optional equipment that might be available to deal with those hazards.

  NEVER enter or operate these hazardous area without certified Operator Protective Structure installed.

(2) Notices when starting Engine

- Check each part with reference of “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 and nuts 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.
- For driver’s safety, to prevent an unintentional start, movement and operation, several and various start-safety interlock devices may be equipped on your tractor. And, these installation may need to do correct operation and follow the procedure strictly. Read carefully section 4-1, “Engine start and stop” in this manual before trying to start engine.
- Do not short across the starter motor terminals to start engine. It may cause a sudden start and serious injury or death.
- Keep maintenance tools away from engine after check and repair.

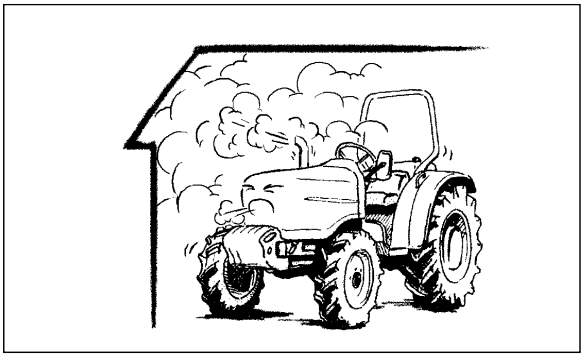


Warning	
	▶ Do not start the engine in a closed area. The poisonous exhaust gas can cause fatal damage to the driver or persons around.

(3) Notices while operating/using the tractor

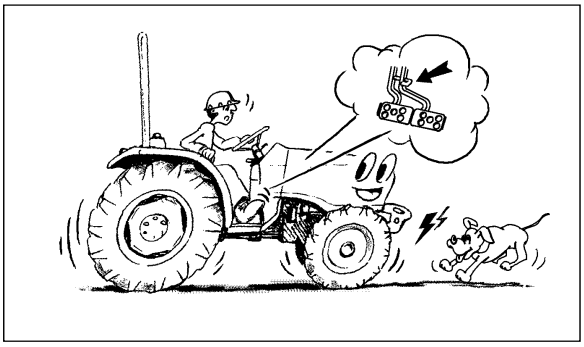
- **Ventilation**

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

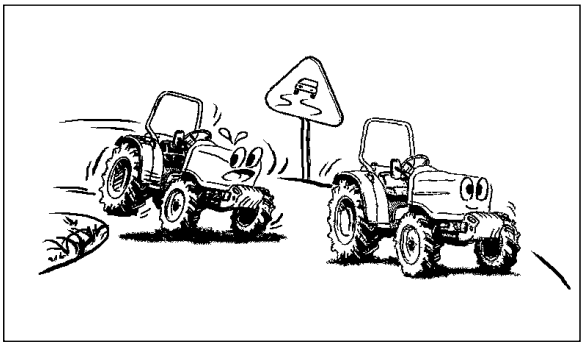


- **Noise and Vibration** : When working between buildings or in confined spaces, the sound pressure level can be increased. Wear suitable ear protectors in high noise level conditions. When working with equipment in the field, vibration intensity from equipment may be increased. To reduce the harm to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

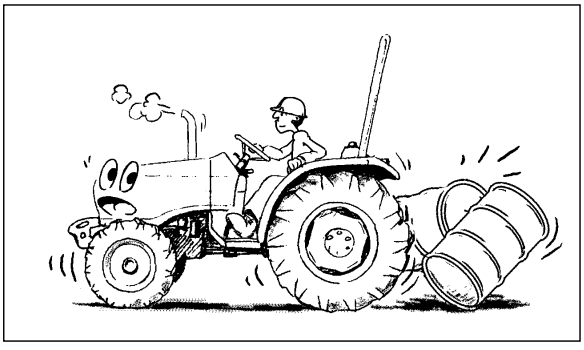
- Connect left and right brake pedals while driving on the road. (if fitted)
- DO NOT use differential lock device while driving on the road or turning in the field.
- DO NOT ride your foot on the brake pedal or clutch pedal.



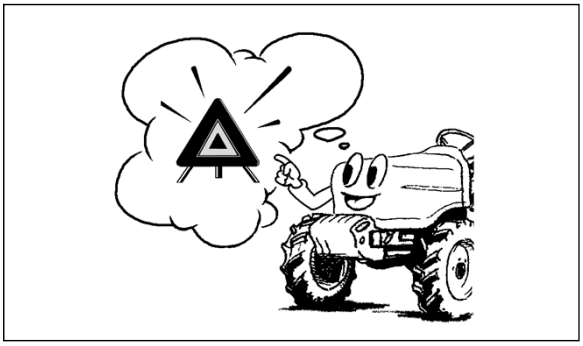
- Lower the driving speed enough before turning a sharp curve. Especially, when you drive the tractor with implements, make the turning radius wider.
- DO NOT start or stop the tractor suddenly. Engage the clutch and brake softly. If not, front wheels can be lifted up and it is very dangerous.
- Do not 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.

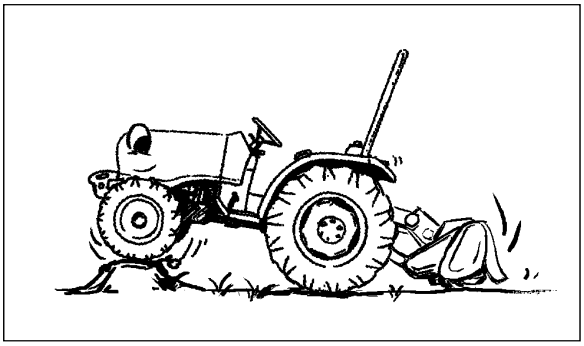


- Obey the traffic rules while driving on public roads. Do not exceed the local legal speed limit. Use a beacon or slow moving vehicle (SMV) to indicate that the vehicle is slow moving.
- If you can not drive the tractor due to a failure, move the tractor to a safe place and install troubled vehicle (safety tripod).
  (Day : backward 100m (328 ft)
  Night : backward 200m (656 ft))

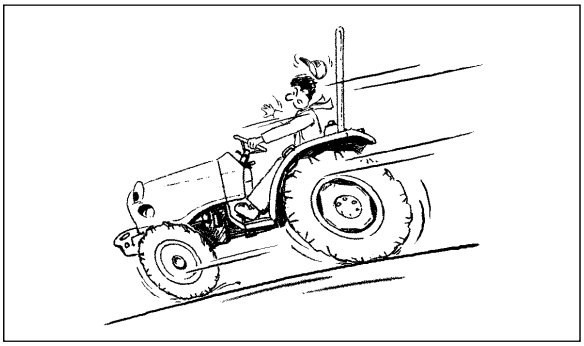


- Do not overuse the fuel, oil, etc and pay attention not to contact the skin directly. Generally, these materials contain harmful materials to the human body. When you work in a area where hazardous chemicals are sprayed, check the cabin filter (if fitted) and replace the filter with suitable one for 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.

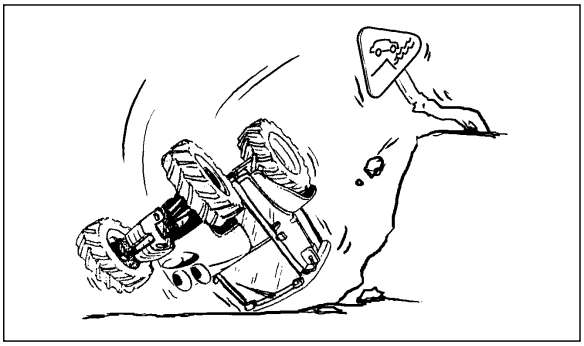
- When crossing a high ridge, let down the implement and go straight across the ridge at low speed.
- When connecting the implements to the front/rear of the tractor, install the proper additional weights in the rear/front of the tractor to keep the balance of the tractor.



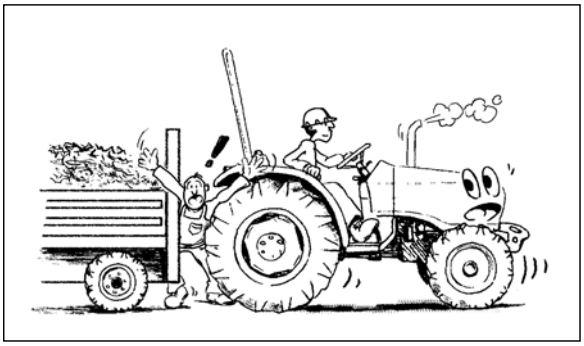
- On a downhill, operate the throttle pedal and brake pedal slowly and DO NOT drive while the transmission gear is in NEUTRAL.
- To climb a steep slope, drive tractor slowly in reverse up the slope rather than forward. It is much safer.
- When turning the tractor on a slope, pay attention to safety especially.



- 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

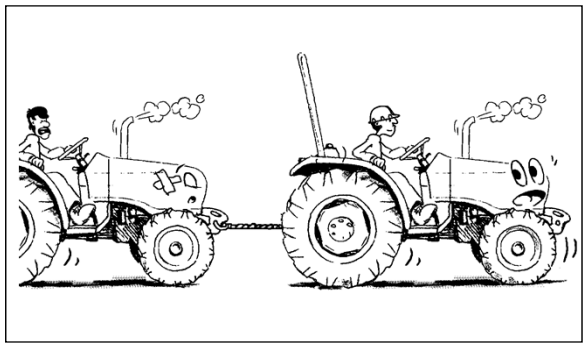


- Attach or detach the implement on wide and level ground.
- Do not use the tractor in combination with equipment arbitrary, without having consulted the specific operator's manual provided with the equipment.
- You have to stay clear from the three-point linkage when controlling it. Do not stay between tractor and implement.
- Do not stay between tractor and trailed vehicle for connecting/disconnecting or checking it. Trailed vehicle may roll down or tractor can move reverse.
- When towing the trailed vehicle, use only hitch or drawbar. 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.

⚠ Caution	▶ When connecting or disconnecting hydraulic coupler, lower implement on the ground, turn off engine and check if the pressure of hydraulic line is released. ▶ When installing the implement having big hydraulic cylinders or lines, check oil level in tractor transmission housing after installing the implements.

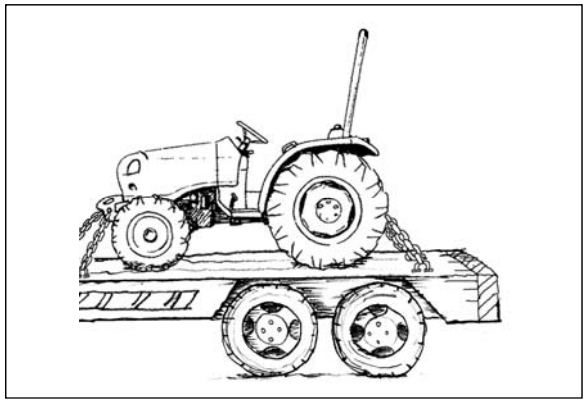
⚠ Warning	▶ Before connecting or checking the implement, put PTO switch to OFF and place PTO gear lever in Neutral position.
	▶ When attaching or detaching the implement, make sure to fix the implement and tighten the three point hitch pins correctly. If not, the serious troubles and injury can occur during the operation.
	▶ 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.

(5) Notices when towing the tractor



- If your 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.
- 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 section 4. "Hitch and Drawbar"*)
- Drive slowly when towing extremely heavy loads.
- Do not tow trailers that are not fitted with an independent braking system.

(6) Notices when transporting the tractor

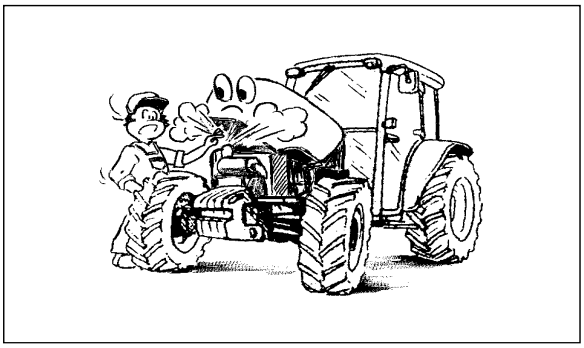


- When transporting the tractor by truck, trailer, etc, use suitable equipment or facilities to load or unload the tractor.
- Fix the tractor tightly to the vehicle with heavy-duty straps or chains.
- When fixing the rear of the tractor, use the hitch or hitch support.
- When fixing the front of the 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.

⚠Caution	▶ 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. ▶ In case of turbocharger engine (where fitted), cover the exhaust outlet to protect that the turbocharger does not rotate by air without lubrication.

(7) Notices when servicing the 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.

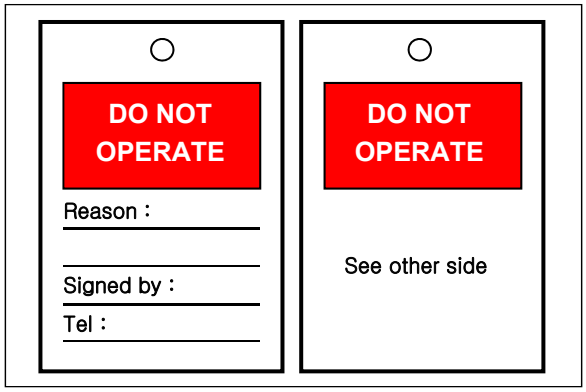
- Before checking or repairing hydraulic system and fuel system, make sure **the engine is stopped, and all the transmission gears are in neutral, and lower the implements to the ground**. The leaks of pressurized fluid can cause a fatal physical injury. If injured by leaking fluid, get medical attention immediately.

Warning	▶ Before removing hydraulic pipes or hoses and other parts, make sure to check that hydraulic pressure is relieved completely. The leaks of pressurized oil can cause a fatal physical injury. ▶ Use proper protection equipments, before servicing hydraulic system. ▶ Before connecting or disconnecting the hydraulic quick coupler, lower the implements to the ground, and check that hydraulic pressure is relieved.

- Keep an approved **fire extinguisher and First-aid-kit** on your tractor.
- Never fill the fuel tank while the engine is running or the engine is hot. And never smoke or have open flames around fuel tank.
- To prevent fire or explosion, keep flames or sparks away from battery. Do not grind, smoke, or weld near a battery. For further information, see section 5-13-(3), “Battery handling and Notices”.

Warning	▶ **Always remove grounded (-) battery clamp first and assemble it last**. If not, it can cause an explosion by spark. ▶ The gas generated from the battery is explosive. Keep cigarettes, sparks and flames away from battery. Never check battery charge by placing a metal object across the terminals. ▶ **Sulfuric acid in battery electrolyte is poisonous.** It is strong enough to burn skin, clothing and can cause blindness if splashed into eyes. Do not touch the battery or liquid by bare hand without gloves or any protection. Flush eyes with clean water for about 20 minutes If the electrolyte is splashed into the eyes. Get medical attention immediately. ▶ Do not short circuit the battery posts with metal items. ▶ Battery post, terminals and related accessories contain **lead and lead compounds**. **MUST WASH YOUR HANDS AFTER HANDLING.**

- Do not attempt to **remove or unfasten the air conditioning components arbitrary**. There is a possible to be severely frostbitten or injured by escaping refrigerant. Contact your authorized local dealer to work air conditioning systems. (if fitted)
- Before servicing the tractor, attach a "**DO NOT OPERATE**" warning tag to the tractor in an area that will be visible.
- **Keep the area used for servicing the tractor clean and dry**. Wet or oily floors are slippery. It can be dangerous when working with electrical equipment.
- Remove all litter or debris from the tractor. Especially check the engine area and exhaust system.
- Electric sensors, switches, harness and engine control unit (ECU) are very sensitive and delicate**. Strictly prohibit injecting water, mechanical impulse and any kind of welding on engine.**
- When lifting heavy parts like engine, axle, tire etc, make sure to **check the lifting facilities have enough strength and capacity.**

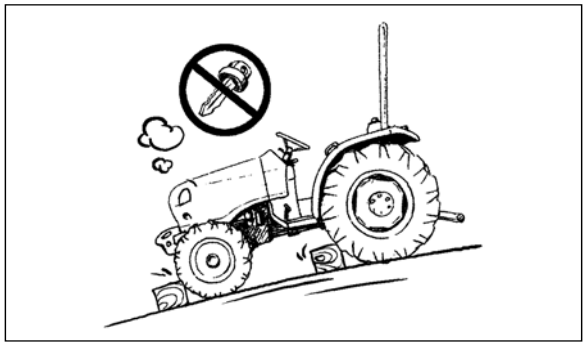


(8) Notices when handling Diesel Fuel

- 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. 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.
- Before operating with Bio-Diesel, contact your authorized local dealer for information relating to the use and storage of Bio-Diesel.

(9) Notices when leaving the tractor

- Stop the tractor on level ground.
- Place the transmission gear in neutral and put PTO switch to OFF position.
- Lower the mounted implements on the ground.
- Apply the parking brake.
- Stop the engine and remove the ignition key.
- Before you leave the operator's station, wait for engine and all moving parts to stop.
- Have to apply the wheel chock when parking the tractor on a slope unavoidably.



⚠Caution	▶ When parking the tractor on a slope unavoidably 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. -. Mechanical : downhill ⇒ Reverse 1gear / uphill ⇒ Forward 1gear -. HST type : Lowest gear

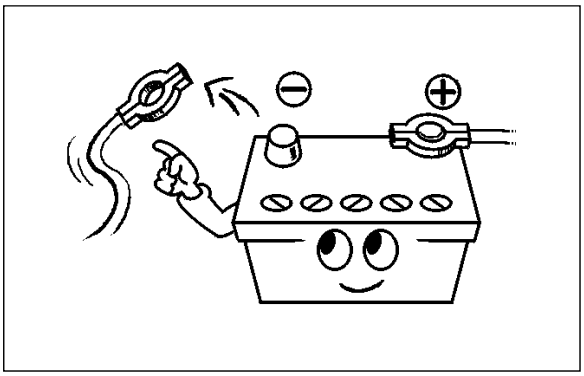
(10) Notices relating to Toxic substances

- Exhaust gas and some its constituents of the Diesel engine are known to the State of California to cause cancer, birth defects, and other reproductive harm. (California proposition 65)
- Battery post, terminals and related accessories contain lead and lead compounds. **MUST WASH YOUR HANDS AFTER HANDLING.**
- When handling engine oil, diesel fuel, anti-freeze solution and other chemical substances, wear protective clothes, mask and gloves.

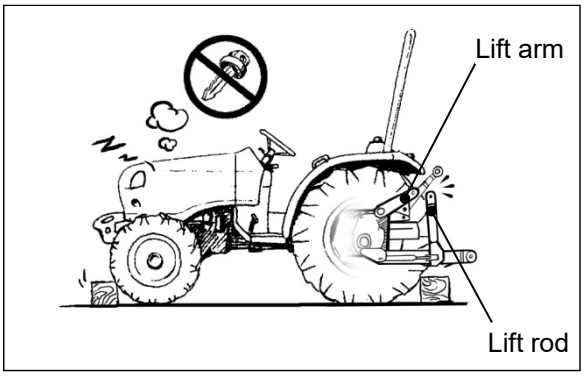
1-3. Long-term storage

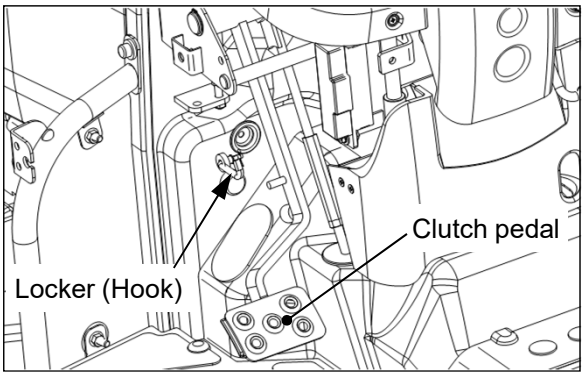
(1) Preparation for storage

※ 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℃ ~ 35℃ (50℉ ~ 95℉)
  Humidity : 45% ~ 70%
- Place all controls, including electrical switches, in neutral position and apply the wheel chocks to the tires and disengage the parking brake.
- Check the lubricant level of each parts 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 engine coolant completely. If the engine coolant is anti-freeze solution, it is not necessary to drain but check its density.
- 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 chamber 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.
- Remove the lift-rod and place the lift-arm to the highest position to lubricate the internal cylinder.
- Depress clutch pedal fully and apply the clutch pedal locker. This locker prevent clutch disk from sticking to engine. (Mechanical only)





- 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 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 engine at the end of long-term storage, follow the instructions of the “Preparation for Reuse” as below.

(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.
- Check if the tire air pressure is normal.
- **Have to start engine periodically, at least every 6 month** for lubrication in fuel injection pump.
- The battery should be charged about once a month not to be discharged entirely.

⚠Caution	▶ As the electrolyte of battery is sulfuric acid, it is emits the explosive and poisonous gas. It is strong enough to burn skin, clothing and can cause blindness if splashed into eyes. - Keep the sparks and flames and cigarettes away from the battery. - When handling the battery, wear safety glasses to protect the eyes. - If the electrolyte contacts the eyes and skin, wash with water immediately and go to see a doctor. ▶ When removing and storing battery, select dry and cool place out of reach of children.

(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 check the engine oil pressure indicator and battery charging indicator in the instrument panel. These indicators have to be turned off while engine is running.
- Run the engine at a fast idling speed (suggest 1000/1500 rpm) until normal operating temperature is registered, and check the surroundings for oil, fuel and coolant leakage.

1-4. Notices for ”Use & Disposal” related to the environment

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’d like to notify the following items for “Use & Disposal” related to environment preservation.

1. **Avoid the overloaded work** after reading the operator's manual.

   Overloaded 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 the exhausted waste oil to any place**.

   This may pollute the soil and water seriously and also is prohibited legally. If violating, 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) to any place. 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 local dealer nearby.

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

5. When handling fuel, lubricants oil and coolants, do not left to be 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 operator'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		Light switch
	Transmission oil pressure		Quick turn (optional)		Side lights
	Engine oil press-ure		Cruise drive (optional)		Headlights (downward)
	Diesel engine preheat		Cruise drive release (optional)		Headlights (upward)
	Parking brake		Position control (Up)		Work light
	Emergency lights		Position control (Down)		horn
	Engine start		Draft control (Deep)		Window wiper
	Engine stop		Draft control (Shallow)		Window wiper / Washer (front)
	PTO stop		Cylinder rod (shorten)		Window wiper / Washer (rear)
	PTO in operation		Cylinder rod (extend)		One side brake light (optional)
	Differential lock device		Cylinder rod (floating)		Engine warning
	DPF regeneration		DPF temperature		DPF inhibited

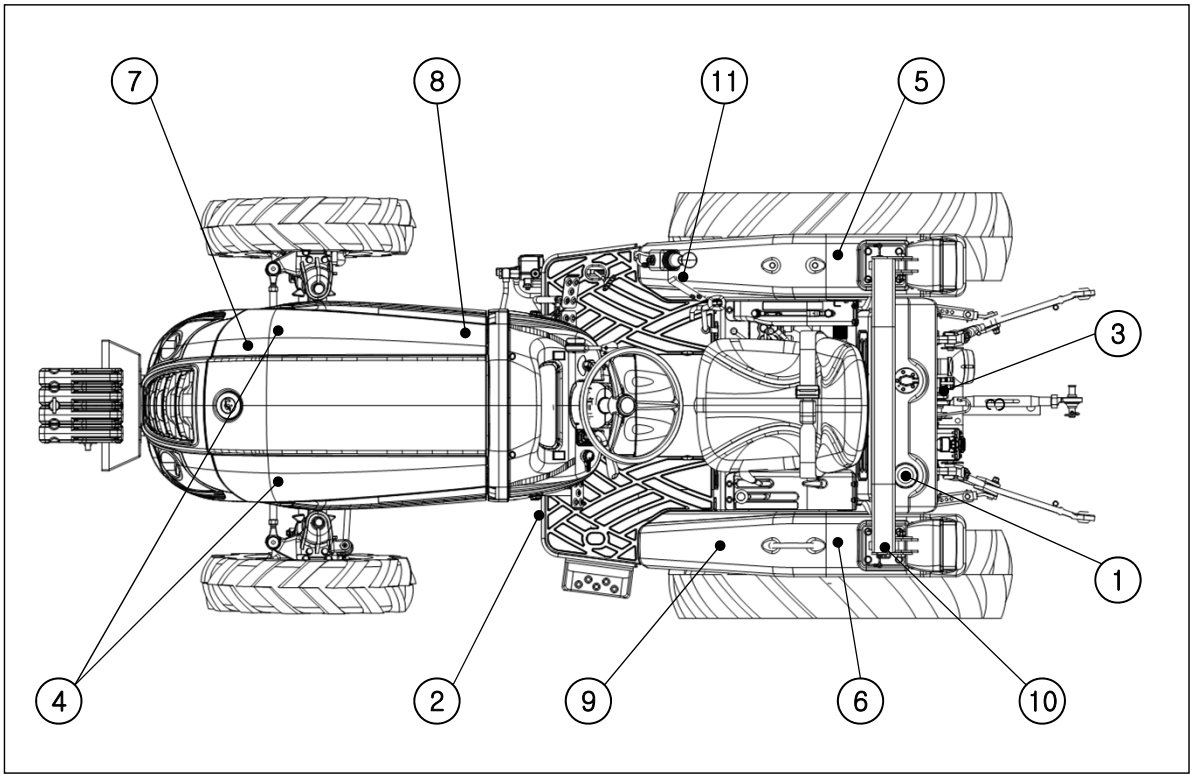
1-6. Safety Decals

(1) Handling and Maintenance of Safety Decals

- For intended 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 tractor, check the position and read the instructions carefully.
- If you find “Read Operator’s Manual” symbol (1) in the decals, refer to the appropriate page of the operator’s manual for further information regarding operation, adjustment and maintenance.

Caution	▶ 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. ▶ If the decals are dirty, wash them with soap water and wipe with soft rags. Do not use the thinner, acetone, or other harsh chemicals as it may erase the instructions. ▶ If the decal is detached or damaged, replace it with a new one on original position. ▶ When cleaning the tractor with pressurized water, the decals can be detached. ▶ If a decal is on a part that is replaced, make sure the decal is attached on the new part.

(2) Safety Decals and Attaching position



1. Location : On top of the Fuel Cap

- Ultra low sulfur diesel fuel only.
- Do not smoke while refueling and keep any type of flame away.
- Part No. : 40241059

2. Location : On the left-hand side of the operator's platform, at the front of the platform.

- RUN OVER HAZARD
- To prevent serious injury or death;
- Start only from seat with transmission and PTO in neutral.
- DO NOT short across starter terminals to start engine.
- Part No. : 40195651

3. Location : On top of rear PTO guard.

- Rotating driveline contact may cause serious injury or death.
- Keep all driveline, tractor and equipment shields in place during operation.
- Part No. : 40195650

4. Location : On the left/right-hand side of the fan shroud.

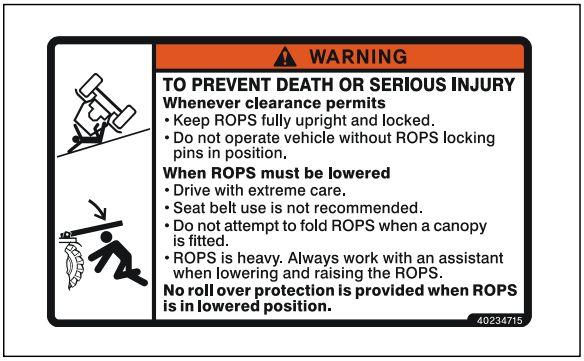
- Keep hands clothing away from the rotating fan and belts.
- Contact with moving parts may cause loss of fingers or a hand.
- Failure to comply could result in death or serious injury.
- Part No. : 40239638

5. Location : On top of left-hand fender.

- HIGH PRESSURE FLUID HAZARD
- To prevent serious injury or death;
- Relieve pressure on system before repairing, adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks, use wood or cardboard instead of hands.
- If hydraulic fluid or fuel sinks into skin, seek medical attention immediately.
- Part No. : 40195652

6. Location : On top of the left-hand fender

- TO PREVENT DEATH OR SERIOUS INJURY;
- Keep Roll-over Protective Structure fully upright and locked.
- Do not operate vehicle without ROPS locking pins in position.
- When ROPS must be lowered:
  - Drive with extreme care.
  - Seat belt use is not recommended.
  - Do not attempt to fold ROPS when a canopy is fitted.
  - ROPS is heavy. Always work with an assistant when lowering or raising the ROPS.
- No roll-over protection is provided when ROPS is in lowered position.
- Part No. : 40234715



7. Location : On top of air intake pipe.

- TO PREVENT DEATH OR SERIOUS INJURY; High pressure steam and hot water. Remove filler cap with extreme care.
- Failure to comply could result in death or serious injury.
- Part No. : 40297729

8. Location : Under the hood, in the middle of the bonnet hinge.

- TO PREVENT SERIOUS INJURY OR DEATH; Beware hot part. Keep clear of muffler to avoid injury.
- Failure to comply could result in serious injury.
- Part No. : 40239636

9. Location : On top of the left-hand fender

① CAUTION

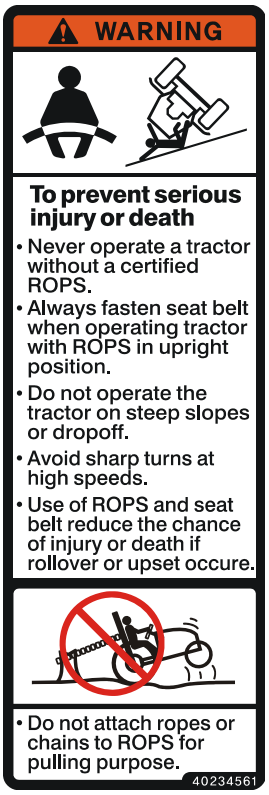
- PTO selector & lever must be in OFF position to start engine.
- Do not operate on hard surfaces with 4WD engaged.

② WARNING

- TO PREVENT SERIOUS INJURY OR DEATH;
- After first hour of operation and daily thereafter, check front and rear wheel lug nuts and bolts for proper torque.
- PTO - keep hands, feet and clothing away from PTO & other moving parts.
- Disengage PTO and shut off engine before servicing tractor or implements, or attaching / detaching implements.
- Keep all safety shields in place for your protection.
- Pull only from approved drawbar or lower links of 3-point hitch at horizontal position or below.
- Lock tractor brake pedals together for travel on roads or highways.
- Always apply parking brake and shift transmission to neutral before dismounting.
- Always use a seat belt when you operate the tractor.
- Allow no riders on tractor or implements.
- Do not use a seat belt when operating with folding ROPS in lowered position.
- Engine exhaust fumes can cause death or sickness. Always try to work in a ventilated area.
- Disengage the differential lock when turning the tractor. Always disengage the differential lock when driving on roads.
- Depress on or both brake pedals to disengage the differential lock.
- Failure to comply could result in death or serious injury.
- Part No. : 40195656

10. Location : On the left-hand side of the ROPS frame.

- TO PREVENT SERIOUS INJURY OR DEATH;
- Never operate a tractor without a certified ROPS.
- Always fasten seat belt when operating tractor with ROPS in upright position.
- Do not operate the tractor on steep slopes or drop-off.
- Avoid sharp turns at high speeds.
- Use of ROPS and seat belt reduce the chance of injury or death in roll-over or upset occur.
- Do not attach ropes or chains to ROPS for pulling purpose.
- Failure to comply could result in death or serious injury.
- Part No. : 40234561



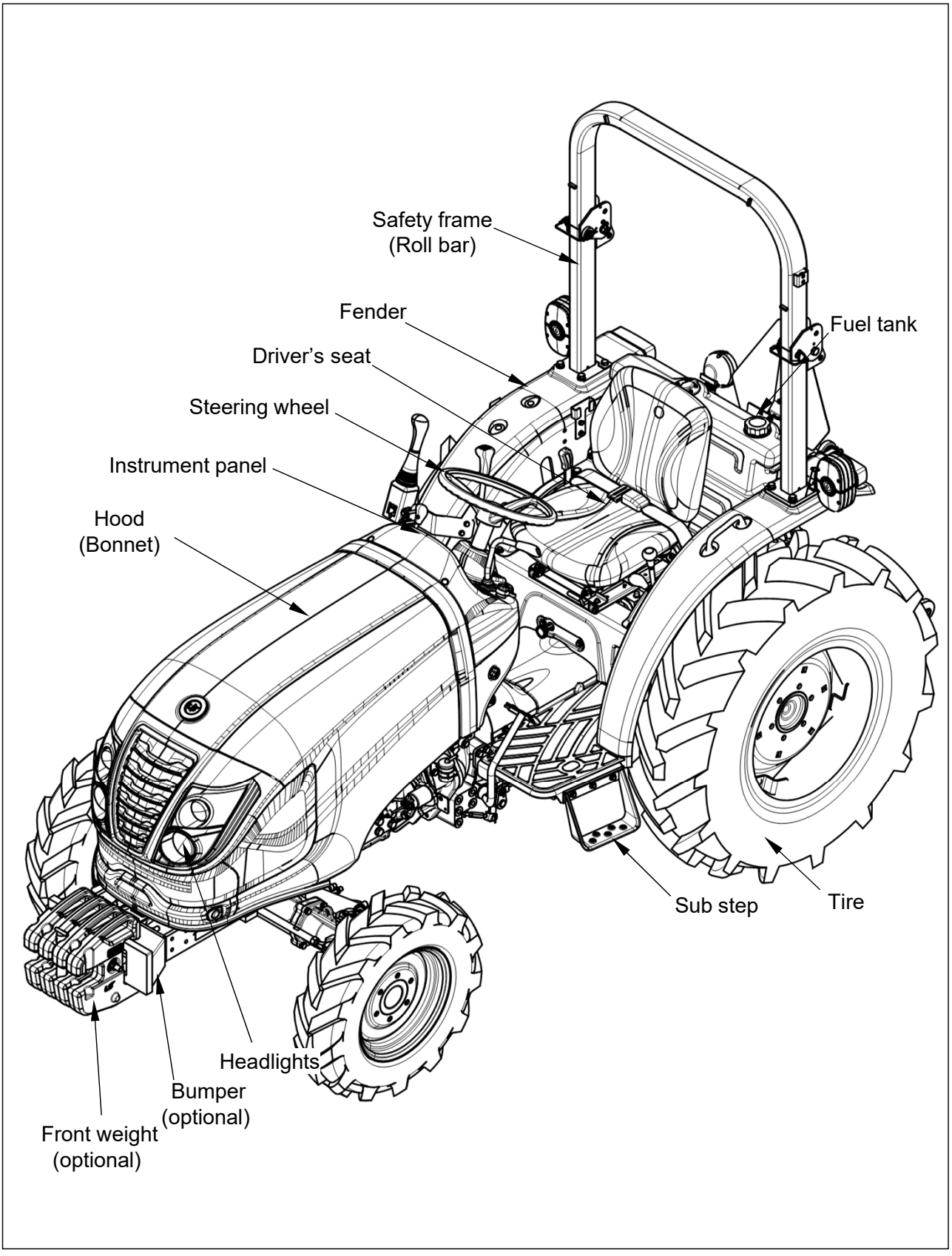
11. Location : On the right-hand fender. (optional)

- JOYSTICK LEVER USAGE.
- TO AVOID PERSONAL INJURY; Wrong operation causes serious injury easily. Push the lever(1) in to lock the joystick in neutral.
- Failure to comply could result in death or serious injury.
- Part number : 40226388

2. Instruction for Safe Operation

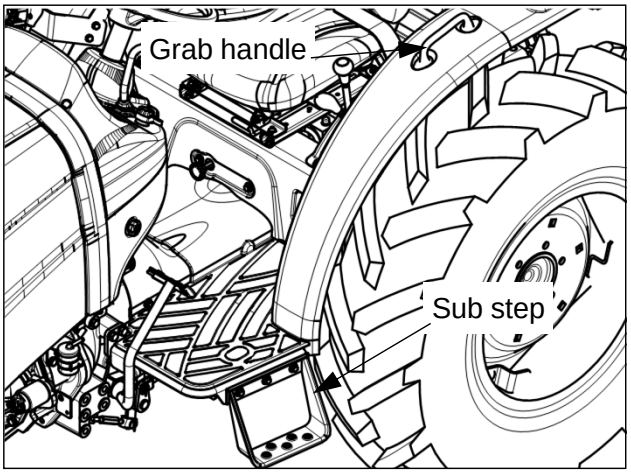
(1) The name of each part

① Roll-Bar type



2-1. Boarding and Exiting the tractor

(1) Boarding the tractor

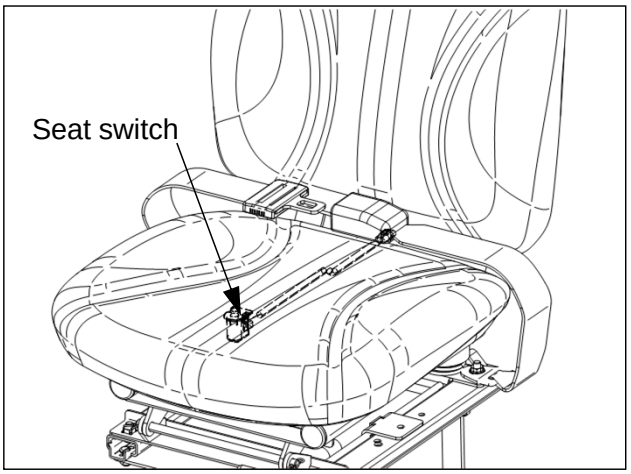


① Roll-Bar type

- Whenever possible, use the left-hand side step for boarding.
- When boarding the tractor, use the sub-step, grab handle and steering wheel on the left fender.
- Do not jump up/down for your safety.

Caution	▶ **Operator's condition :** The persons such as patients, drunks, people on drugs, etc. are never allowed to operate this tractor. Only well educated operators can use the tractor after learning the usage of controls for moving, stopping, turning and other operating. ▶ Do not grasp the gear levers when entering the cabin from the right-hand side.

(2) Driver's seat



- 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 ;
  ① getting up from the seat for more than 2 seconds with HST pedal NOT in neutral position.

  ② the HST pedal is in NEUTRAL and rear PTO is engaged without applying parking brake.

  ③ the Middle PTO lever (optional) is engaged.
- Before leaving the driver's seat,
  - turn the PTO switch to OFF.
  - place the middle PTO lever (optional) in OFF.
  - apply the parking brake.

warning	▶DO NOT arbitrarily remove the seat switch. When replacing the seat, check if the seat switch has been changed together. If not, the engine can not be started.

(3) Seat adjustment

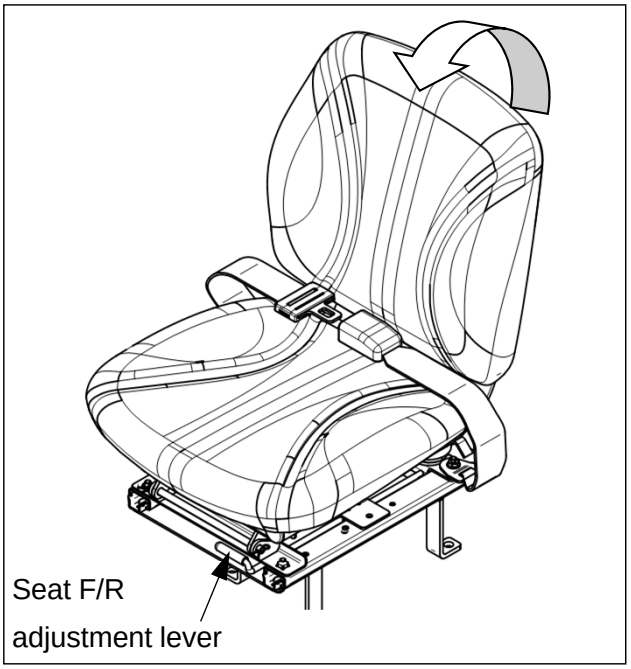
- Before operating the tractor, adjust the position of driver's seat according to body size and length.
- Seat F/R adjustment lever

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.

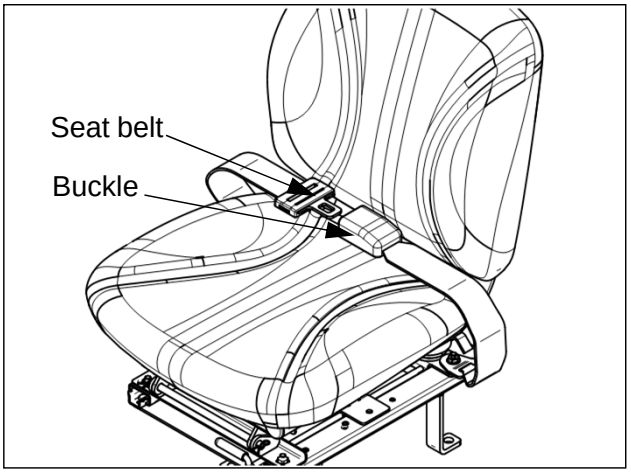
- Keep the released seat belt on the seat belt rest after working.
- To prevent weathering of driver's seat, raise the seat forward.



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.

(4) Seat belt

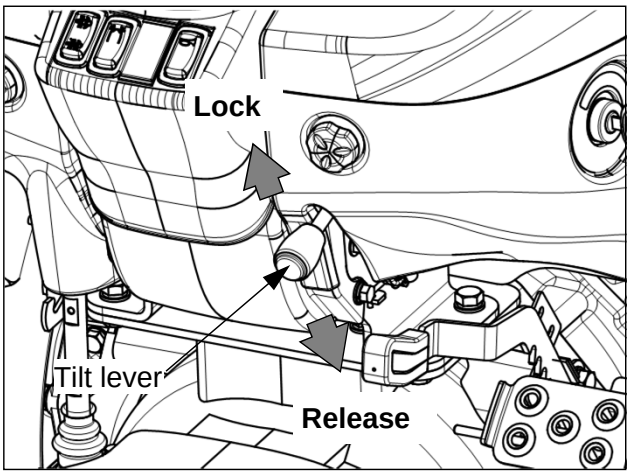
- Always wear the seat belt before operating the tractor and adjust the belt to fit the operator.
  1. Insert the seat belt end into the buckle until a "click" indicates it is properly engaged.
  2. To remove the seat belt from the buckle, press the red release button on the buckle.
- Check the seat 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.

(5) Tilting steering wheel

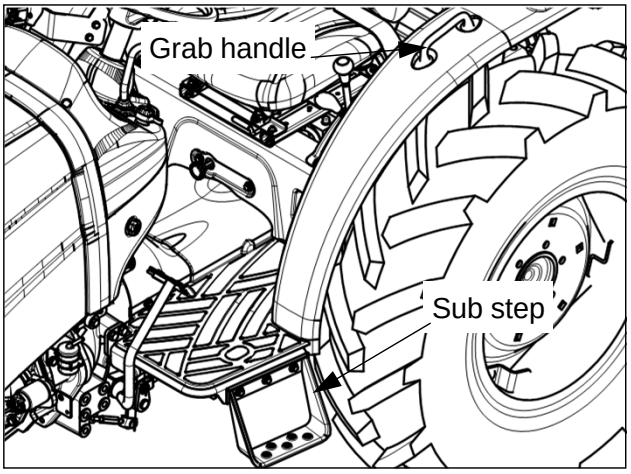
- Push the tilt lever downward to release the steering wheel and tilt the steering wheel to desired position.
- Release the tilt lever to lock the steering wheel in place, and check to make sure column does not move forward and backward.
- Adjust the steering wheel only when stopped.



⚠ Caution	▶ DO NOT adjust steering wheel while driving. It may cause a serious accident.

(6) Exiting the tractor

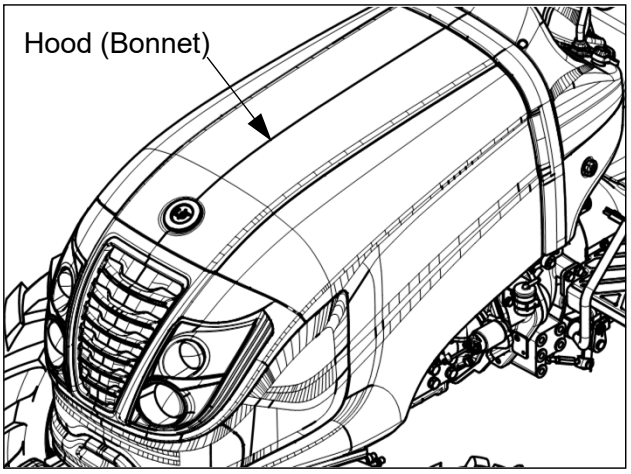
- Whenever possible, use the left-hand side step for boarding/exiting.
- When exiting the tractor, use the sub-step, grab handle and steering wheel on the left fender.
- Do not jump up/down for your safety.



2-2. Safety Device

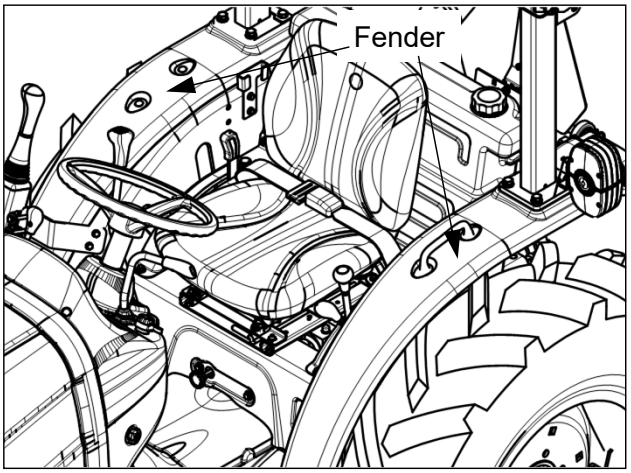
(1) Hood (Bonnet)

- Hood is a protection device to prevent an unintended access to the rotating parts around engine; cooling fan, fan belt and rotating shaft and pulley.
- Do not remove and modify the hood.



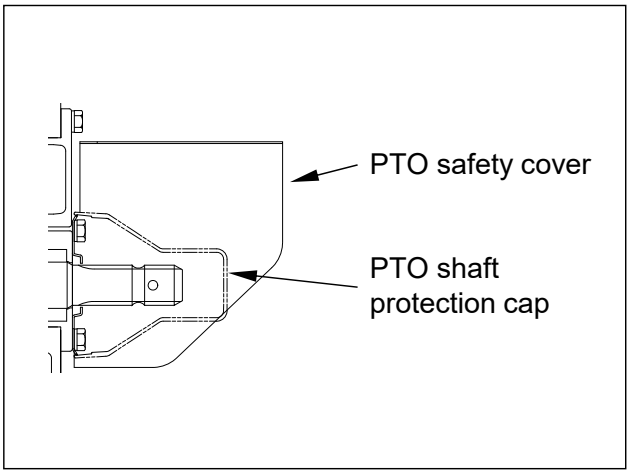
(2) Fender

- Fender is a protection device to prevent an unintended access to the rear tires and to prevent mud from irrupting to the driver.
- Do not remove and modify the fender.



(3) PTO safety cover and protection cap

- PTO safety cover is a protection device to prevent an unintended access to the PTO shaft and to prevent an accident causing by the rotating drive shaft.
- Do not remove the PTO safety cover. If the PTO safety cover or protection cap is damaged or removed, replace it with a genuine part.
- Do not step on the PTO safety cover.
- After using the PTO shaft, apply grease and insert the PTO shaft protection cap.

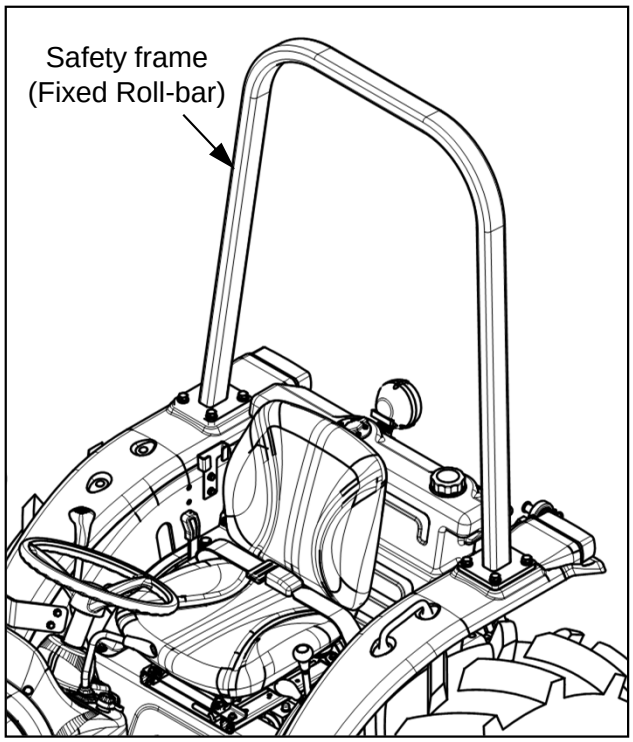


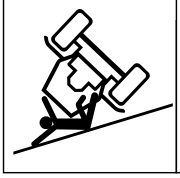
Warning	▶ If you contact the rotating shaft, it may cause a severe injury. - DO NOT touch shaft which is rotating. - DO NOT remove the safety cover. - Avoid loose clothes that can easily be rolled up in the revolving shaft.
	

(4) Roll-Over Protective Structure (ROPS) (optional)

① Safety frame (Fixed Roll-bar)

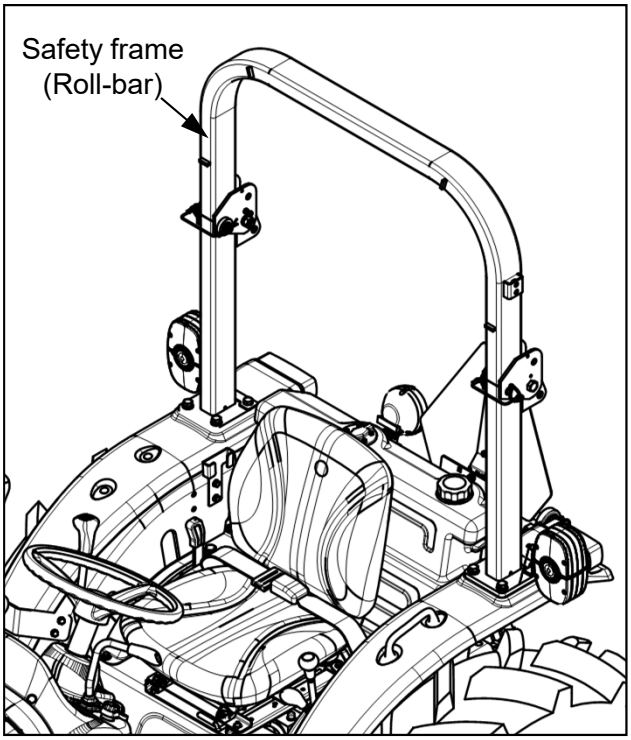
- DO NOT remove the safety frame arbitrary. This structure will reduce the risk of serious injury or death.
- DO NOT modify or repair the safety frame. The welding, bending, drilling, grinding, or cutting of any part of the safety frame, it can weaken the structure.
- If the safety frame is loosened 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.

② Safety frame (Foldable Roll-bar)

- 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.

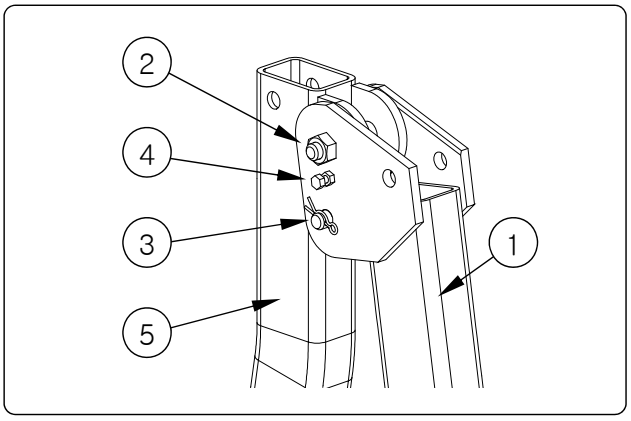


- How to fold the safety frame.

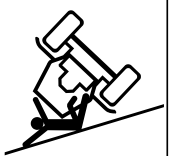
1. Loosen the safety frame bolts② ④ and nuts (both sides) loosely. (Do not unfasten it completely)
2. Remove the pins③ on the both side and fold the safety frame backward.

   - Be careful of the possibility that your head, hand and shoulder might be hurt by sudden folding result from the 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.

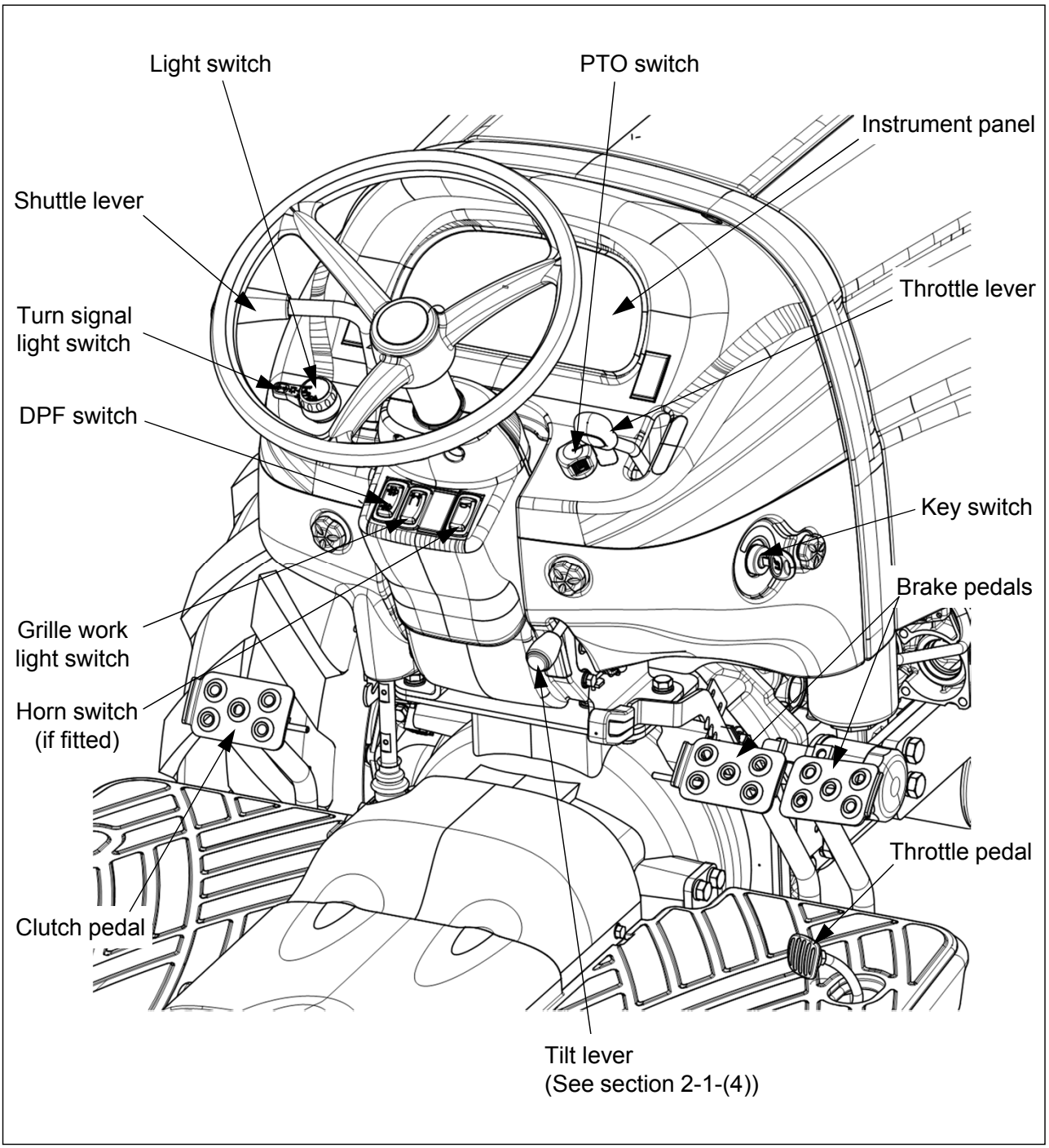
Warning	▶ Do not modify or remove safety frame arbitrarily for safety.
	▶ Unless the safety frame is applied correctly, it may cause a serious accident on tractor when being overturned. - Be sure to stand the safety frame up completely and tighten the bolts, pins and nuts correctly.
	▶ In case of folding the safety frame. - Do cooperate with more than 2 people when folding or standing up the safety frame as it's heavy. - Be careful not to be injured by sudden folding, which might occur when folding or standing up the safety frame, results from its weight. - Do not wear seatbelt when the safety frame is folded down. - Do stand the safety frame up again as soon as the work is finished.

3. Instruments and Controls

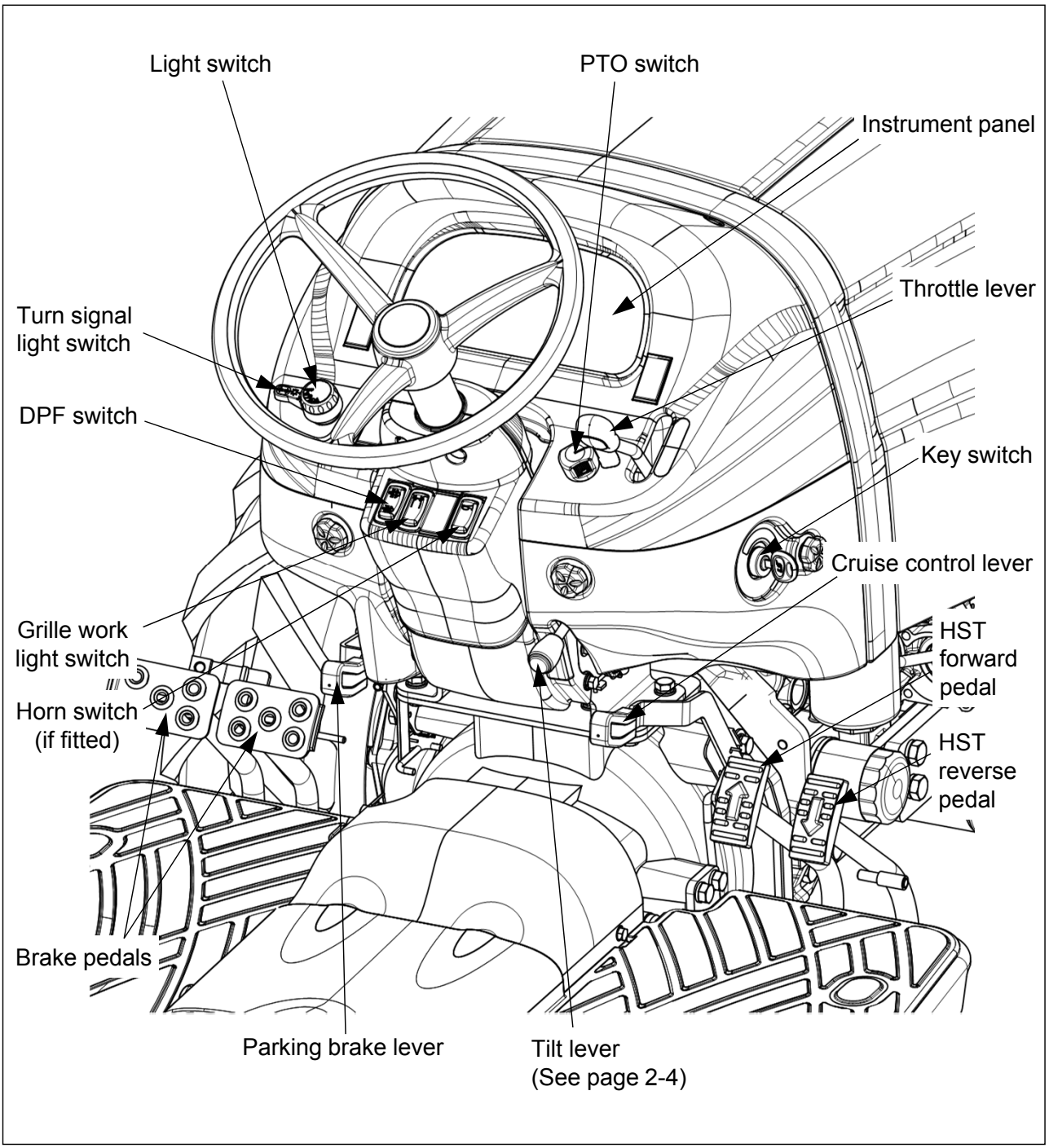
3-1. Instrument panel and Front controls

Important to owner, read carefully

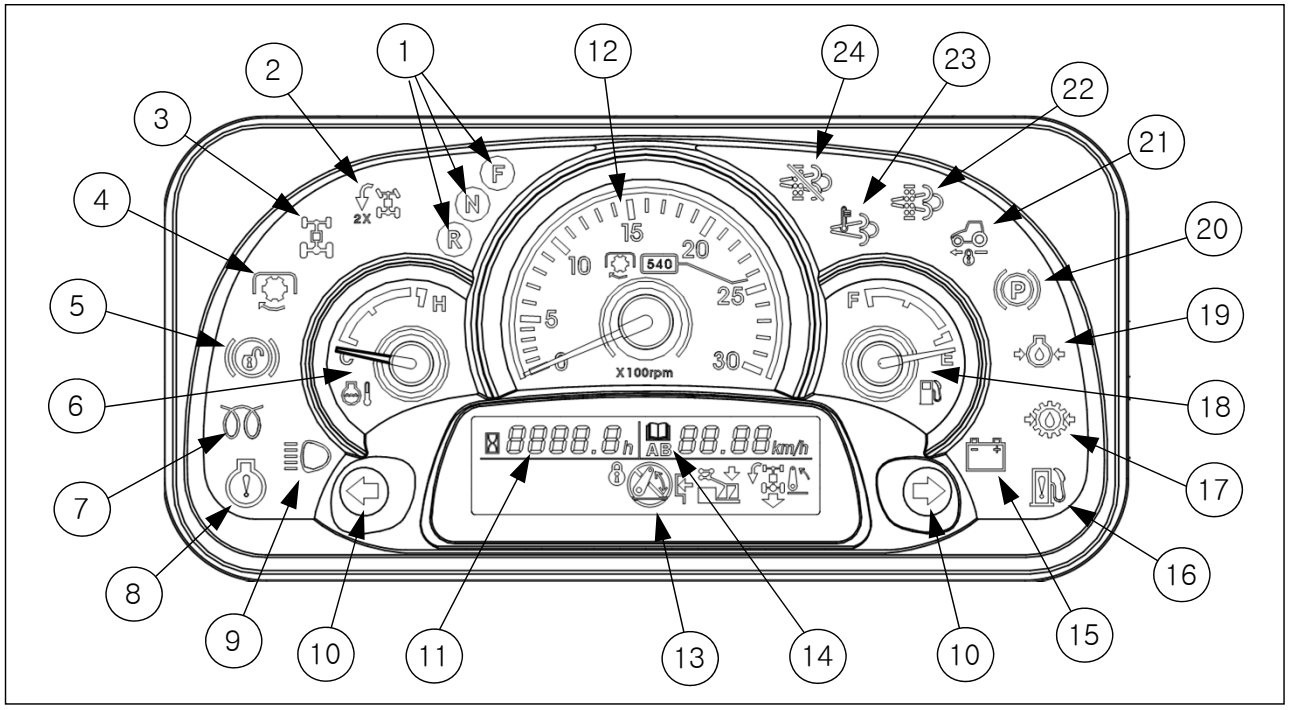
Mechanical type



HST type


Light switch
PTO switch
Instrument panel
Throttle lever
Turn signal light switch
DPF switch
Key switch
Cruise control lever
Grille work light switch
HST forward pedal
Horn switch (if fitted)
HST reverse pedal
Brake pedals
Parking brake lever
Tilt lever (See page 2-4)

(1) Instrument panel



1. Forward-reverse indicator (Not used)
2. Quick turn indicator (Not used)
3. 4WD indicator (Not used)
4. PTO operation indicator
5. One side brake indicator (Not used)
6. Engine coolant temperature gauge
7. Cold start aid indicator
8. Engine warning indicator
9. High beam indicator
10. Turn signal indicator (Left/Right)
11. Hour meter
12. Tachometer
13. EHL mode display (Not used)
14. Error diagnosis code display
15. Battery charging indicator
16. Fuel filter warning indicator
17. Hydraulic oil pressure indicator (Not used)
18. Fuel level gauge
19. Engine oil pressure indicator
20. Parking brake indicator
21. Cruise drive indicator (HST only)
22. DPF Regeneration indicator
23. DPF temperature indicator
24. DPF inhibited indicator

① Forward-reverse indicator (Not used)

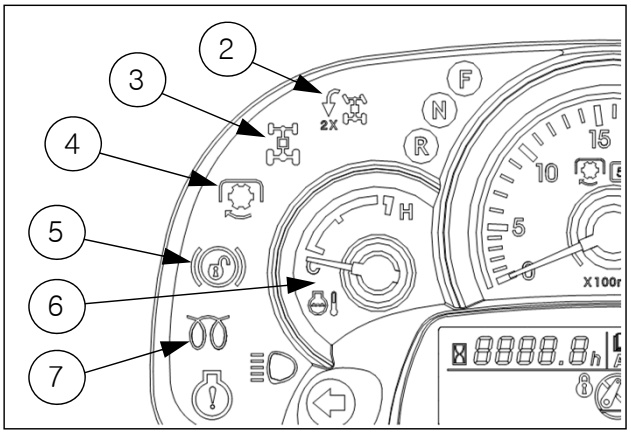
- This indicator is not used.

② Quick turn indicator (Not used)

③ 4WD indicator (Not used)

④ PTO operation indicator

- When key switch is ON and PTO switch is ON **,** this indicator shall be ON.
  (For further information, See section 3-1-(9))



⑤ One side brake indicator (Not used)

⑥ Engine coolant temperature gauge

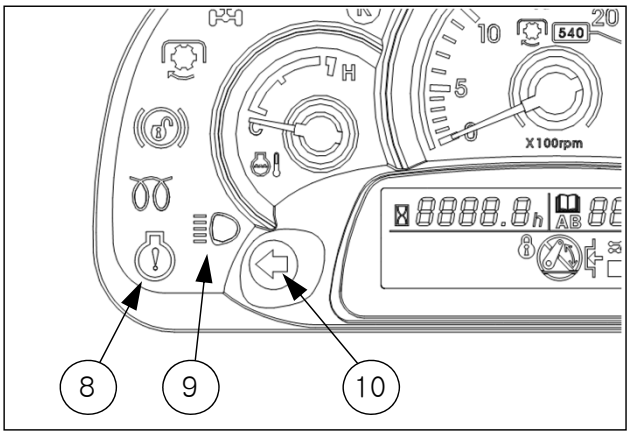
- This gauge indicates the temperature of coolant during operation.
- The closer the needle approaches "**H**", the higher the temperature of engine coolant is.
- The coolant is very hot. When checking the coolant, comply with instructions of the section 5, "Maintenance and Lubrication" in this manual.

⑦ Cold start aid indicator

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

⑧ Engine warning indicator

- If there is a fault on the engine control, this indicator shall be ON with continuous light or be blinking alone.
  Contact your authorized dealer for check.
- If this indicator and DPF regeneration indicator are blinking together, refer to the instructions of the DPF regeneration indicator. *(See page 3-14)*



⑨ High beam indicator

- When turning on high beam of the headlamp, this indicator shall be ON simultaneously.

⑩ Turn signal indicator (Left / Right)

- When turning the turn signal light switch to the left/right direction, the front/rear turn signal lights are blinked. At this time, this indicator shall blink simultaneously.

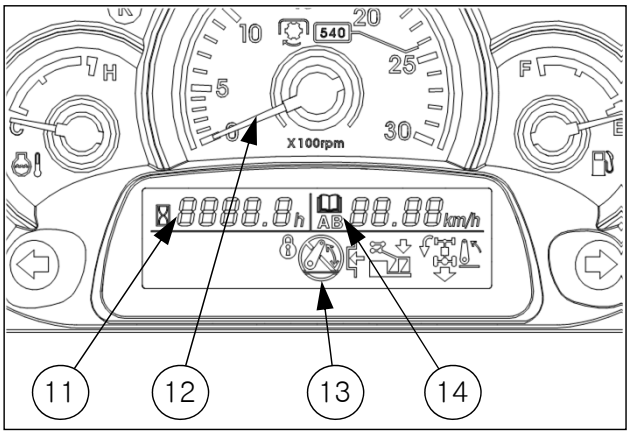
(11) Hour meter

- The operating hour 0019.1 means the tractor has been operated for 19.1hr (19 hours and 6 minutes).

(12) Tachometer

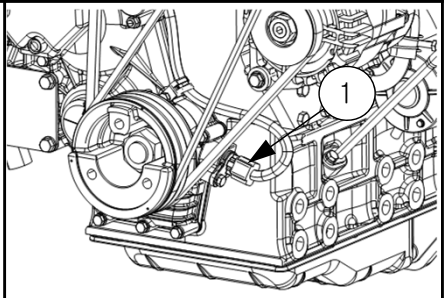
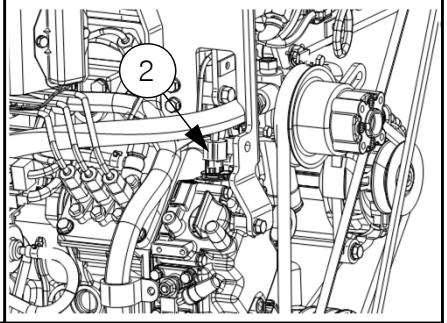
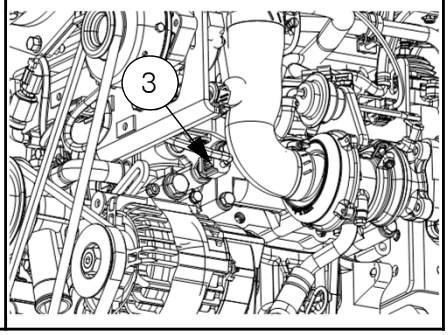
- The tachometer shows the engine revolutions per minute (“30” means 3000rpm).

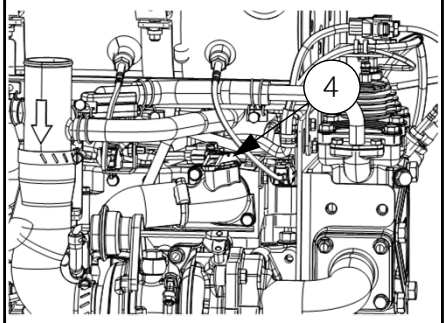
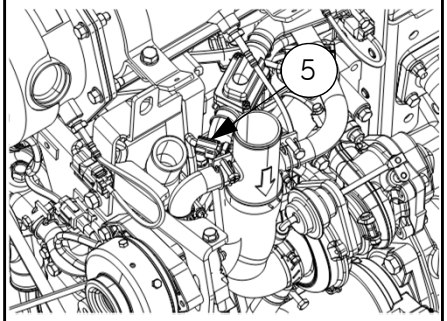
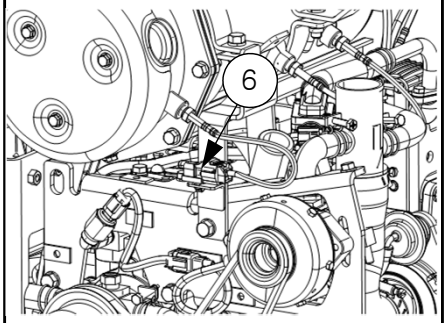
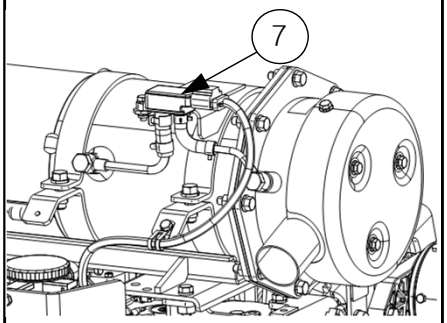
(13) EHL mode display (Not used)

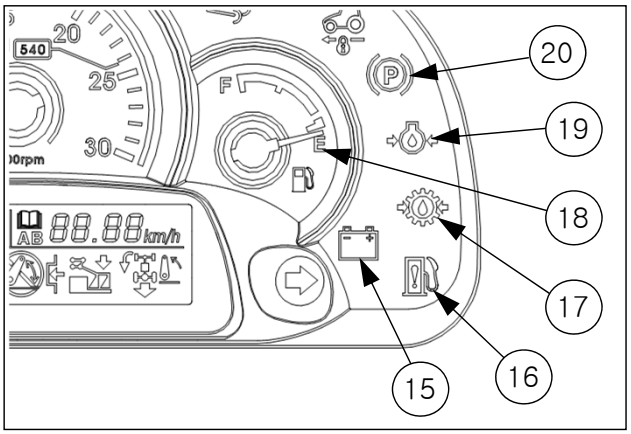


(14) Error diagnosis code display

- This cluster shows error diagnosis codes related to the engine control.
- For the detail check, service tool may be required. Contact your authorized local dealer.

Error Code	Failure part(s)	Check point(s)	Remark
AB02	- Main/Sub speed sensor(1, 2), - Engine harness	- Connector fitting - Wiring harness open/short circuit	 
AB04	- Accelerator pedal position sensor	- Normal sensor signal level : 0.2~4.25V - Connector fitting - Wiring harness open/short circuit	
AB07	- Thermo sensor(3), - Engine harness	- Normal sensor resistance (ohm) : 0.11~25.4Ω - Connector fitting - Wiring harness open/short circuit	

Error Code	Failure part(s)	Check point(s)	Remark
AB09	- ECU(Barometric pressure sensor)	- Normal sensor signal level : over 0.25V	
AB10	- ECU(Ambient air temperature sensor)	- Normal ECU temperature : less than 115℃	
AB11	- Boost pressure sensor(4) - Engine harness	- Normal sensor signal level : 0.5~4.5V - Connector fitting - Wiring harness open/short circuit	
AB12	- Intake manifold temperature sensor(5)	- Normal sensor signal level : 0.08~4.85V - Connector fitting - Wiring harness open/short circuit	
AB13	- Exhaust gas temperature sensor(6) Engine harness	- Normal sensor resistance (ohm) : 164.8~4,000Ω - Connector fitting - Wiring harness open/short circuit	
AB14	- DPF differential pressure sensor(7)	- Normal sensor signal level : 0.25~4.75V - Connector fitting - Wiring harness open/short circuit	
AB15	- Battery - Battery (+) cable - Battery (-) cable	- Normal battery voltage : 6~29V(Instant) - Connector fitting	



(15) Battery charging indicator

- This indicator shall be ON when turning the key switch to ON position, and shall be OFF after starting engine.
- If not, contact your authorized dealer for checking electrical charging system.

(16) Fuel filter warning indicator

- When there is excess water in the fuel filter, this indicator shall be ON.
- Remove the water in the fuel filter.
  (See section 5-5-(1) in this manual)

(17) Hydraulic oil pressure indicator (Not used)

(18) Fuel level gauge

- This gauge indicates the remaining amount of fuel.
- If the needle indicates "**E**", fill the fuel tank immediately.

(19) Engine oil pressure indicator

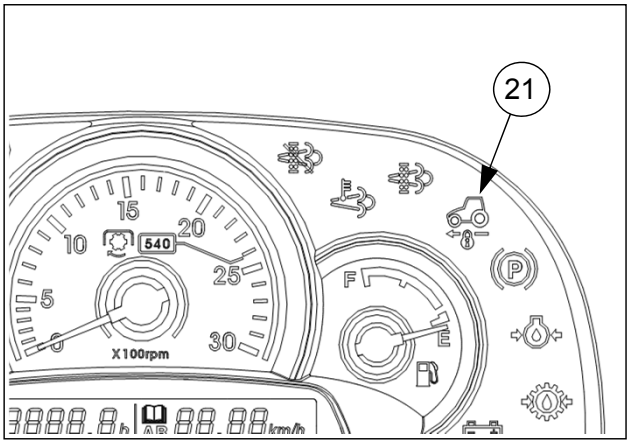
- This indicator shall be ON when turning the key switch to ON position, and shall be OFF after the engine starts. If not, stop the engine immediately, and check the engine lubrication system, engine oil level, engine oil pressure and so on.
- Contact your authorized dealer to check the engine lubrication system.

(20) Parking brake indicator

- This indicator shall be ON when applying the parking brake.

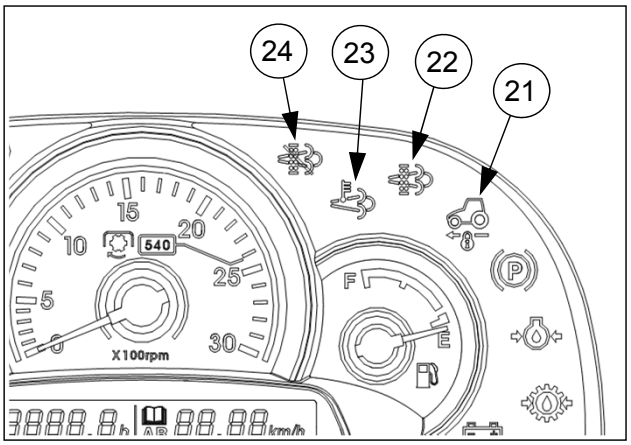
(21) Cruise drive indicator (HST only)

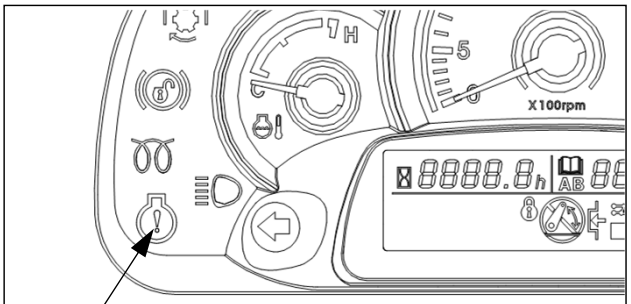
- This indicator shall be ON when pressing cruise control switch for applying cruise drive.



(22) DPF regeneration indicator

- When the regeneration of the DPF is being processed, this indicator shall be ON with continuous light or blink in various period according to the soot loaded in the DPF. *(For further information, see page 3-15)*
- Depending on the soot's rate, engine warning indicator may blink together. *(For further information, see page 3-15)*
- If the engine has been shut down, due to heavy soot's rate, contact your authorized dealer immediately. If restarting engine, the engine can be run for 30 seconds to escape the emergency state.





Engine warning indicator

(23) DPF temperature indicator

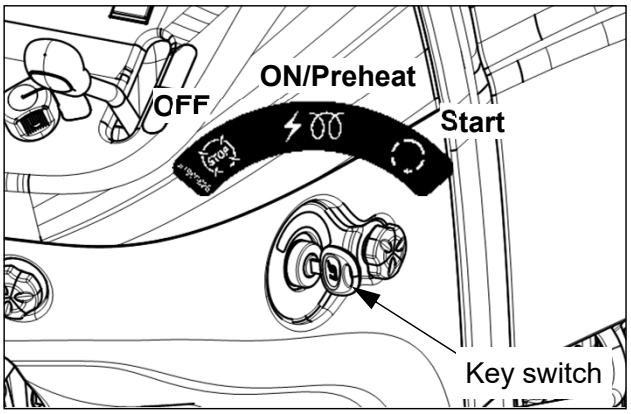
- If the soot loaded is over 60% and the DPF temperature is over the designated temperature, the regeneration shall start automatically and this indicator shall be ON. But if in INHIBITED mode, this indicator shall not be turned on. *(For further information, see page 3-16)*

(24) DPF inhibited indicator

- When the DPF switch is pressed to **INHIBITED** mode, this indicator shall be ON and the regeneration of the DPF shall be halted. *(See page 3-17)*

(2) Key switch

- **OFF** - power off (engine stop)
- **ON/Preheat** - power on & automatic glow
- **START** - engine start

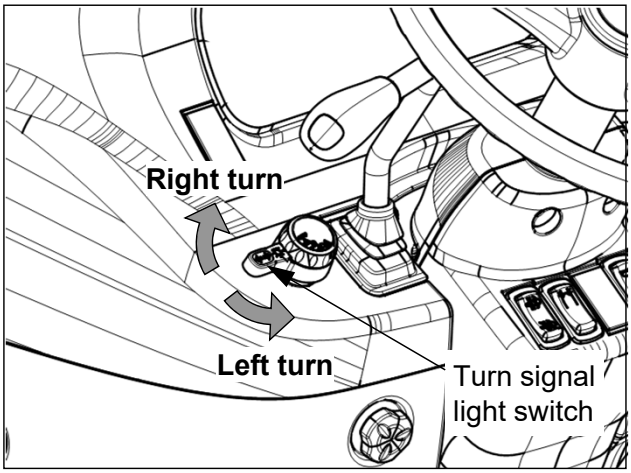


⚠Caution	▶ Because the safety switch for start is engaged, start the tractor after pressing clutch pedal. ▶ If the tractor is not in use, the ignition key should be removed.

(3) Turn signal light switch

- This switch is used to give information to other vehicles when turning to the left or right.
- If turning the switch to clockwise, the right turn signal lights are blinking.
  -If turning the switch to counter-clockwise, the left turn signal lights are blinking.

⚠Caution	▶ When changing direction during running on the road, operate the turn signal lights to inform other vehicles of your direction.



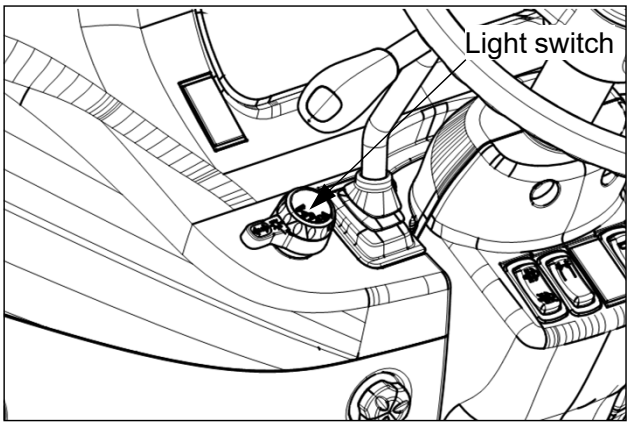
(4) Light switch

- **OFF** - Instrument panel and lights are OFF


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


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

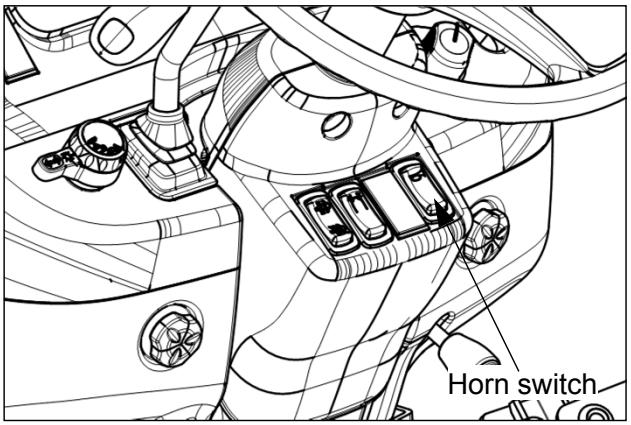

- Instrument panel, sidelights, headlights (low beam) and hazard warning lights are ON. (use when driving)



⚠Caution	▶When passing with other vehicles in the opposite lane at night, turn the headlights to low beam not to disturb oncoming cars.

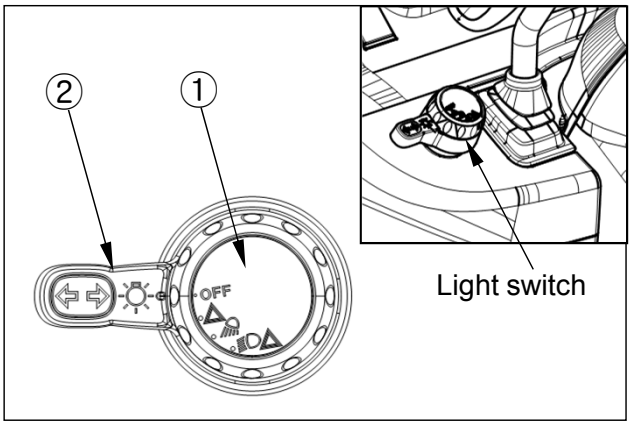
(5) Horn switch (if fitted)

- Press the upper side of the switch for sounding off the horn.



(6) Hazard warning light switch

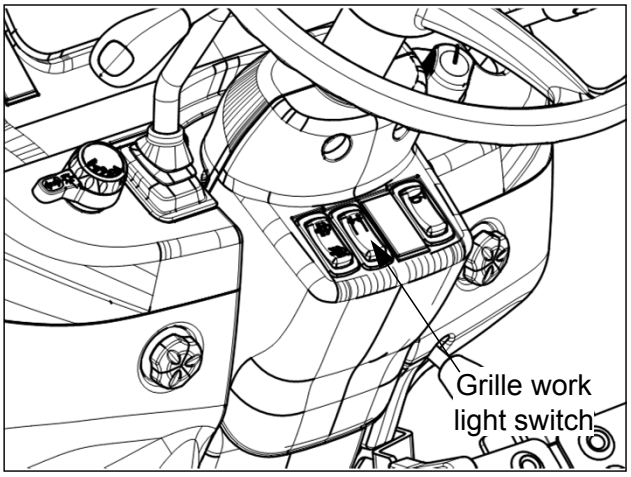
- This is used to warn other drivers to pay attention to emergency status.
- This function is integrated to the light switch for USA market.
- By turning the light switch (1) once to the clockwise, all turn signal lights are blinked.
- Hazard warning light is automatically on by turning on the driving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



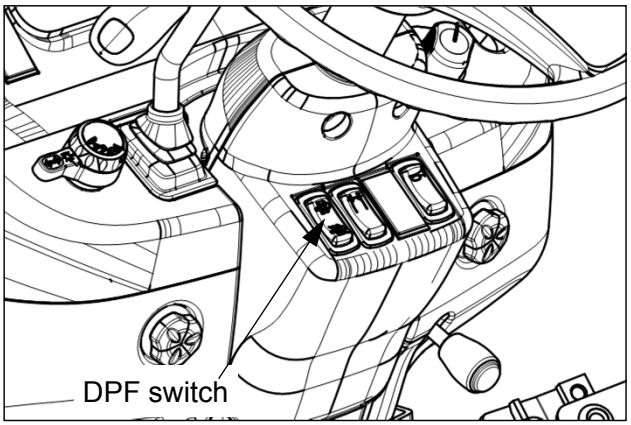
Notice	▶ If you use the hazard warning lights for a long time, it may cause a increase of electrical power consumption. Do not use the hazard warning lights for a long time.

(7) Grille work light switch

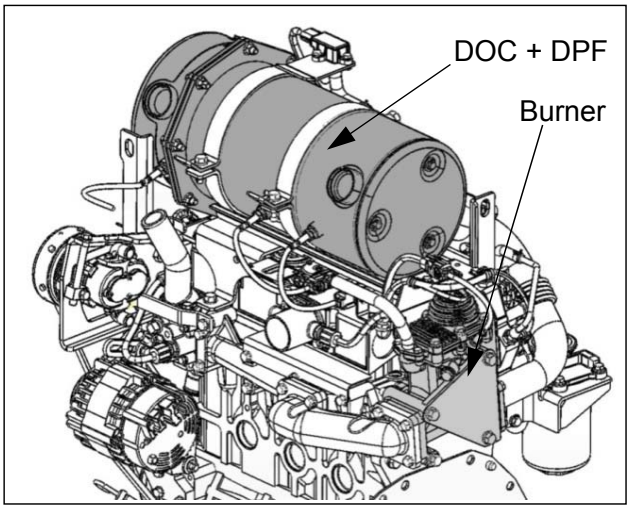
- This is used to turn on/off the work light of the front grille.
- **ON** - Press the upper side of the switch.
  OFF - Press the lower side of the switch.



(8) DPF switch



- This switch is used to stop/delay the auto regeneration process or to exit the inhibited regeneration mode.
  - **Auto regeneration mode** : normal status, and the inhibited regeneration mode is not set.
  - **Inhibited regeneration mode :** the auto regeneration mode is disabled.
- After starting engine, If pressing the lower side of the DPF switch for about 2 seconds, Inhibited regeneration mode shall be set, and DPF inhibited indicator shall be ON. *(See page 3-15)*
- For returning to auto generation mode, press and hold the upper side of the DPF switch for about 2 seconds.

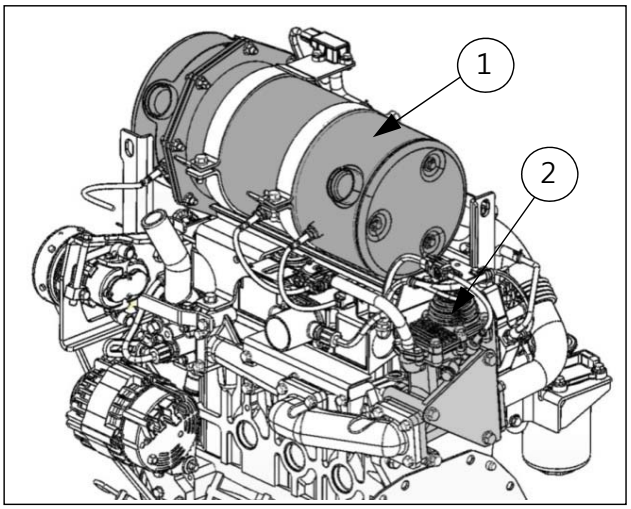


① Definitions of system components and operation

- The following terms will define the system components and operational modes.

System components and operation	Definition
Diesel Oxidation Catalyst (DOC)	a catalytic converter that reduces emission element such as hydrocarbons, carbon monoxide and unburned fuel.
Diesel Particulate Filter (DPF)	a filter that captures soot from the engine exhaust
Burner	This component generates the required heat to burn the soot that is contained in the (DPF) during the regeneration process.
(DPF) switch	Switch located on the right-hand side of the dash. This switch is used to stop or delay the regeneration process or to exit the inhibited regeneration process (to go to the auto regeneration mode).
Regeneration	This is the process of burning/cleaning of the soot that is contained in the (DPF) by the burner.
Inhibited Regeneration	The regeneration process is disabled by the use of the (DPF) switch.

② DOC and DPF



- The Diesel Oxidation Catalyst (DOC) and the Diesel Particulate Filter (DPF) function is to reduce engine exhaust hydrocarbons, carbon monoxide and other toxic gases. This system converts exhaust emissions to harmless carbon dioxide and water. The DPF also traps Particular Matter (PM)
- To meet Tier 4 emission regulations, the Diesel Oxidation Catalyst and Diesel Particulate Filter (1) and burner (2) are installed on your tractor and are located under the engine hood of the tractor.
- It is very important to read this operator's manual and understand the safe operation of your tractor. If you have any questions in the operation of this emission system, please contact an authorized LS tractor dealer.

⚠ Caution	▶ **Burn hazard !** During the Diesel Particulate Filter (DPF) regeneration process the exhaust stack And fixed hood area becomes extremely hot. Allow area to cool before servicing or working near the exhaust system components. Failure to comply could result in minor or moderate injury.

⚠ Warning	▶ **Fire hazard!** During the Diesel Particulate Filter (DPF) forced regeneration process the exhaust stack and fixed hood area becomes extremely hot. Park the machine outside and away from combustible or highly flammable material. Failure to comply could result in death or serious injury.

③ Fuel and engine lubrication oil specification

- Fuel specification
  Use only Ultra Low Sulfur diesel fuel (S15) in your tractor.

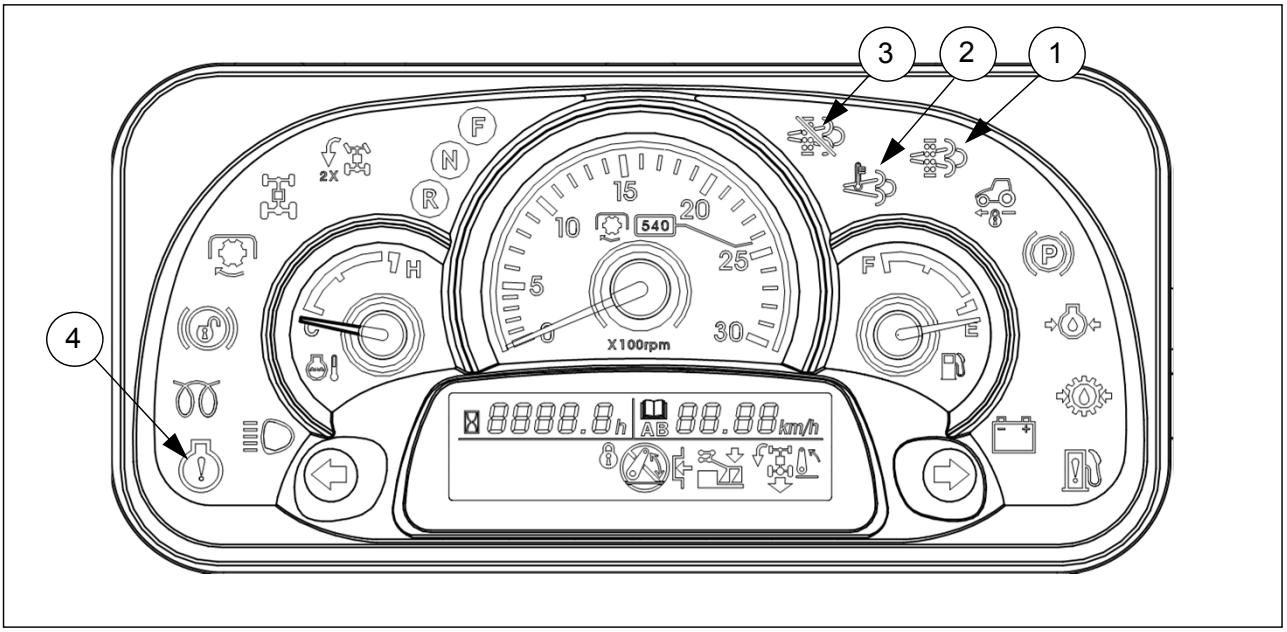
NOTICE	▶ Use of diesel fuel other than Ultra Low sulfur fuel may adversely affect the engine and the DPF performance.

- Engine oil specification
  Use only DPF compatible (CJ-4) oil in your tractor engine.

NOTICE	▶ Use of any engine oil other than (CJ-4) may clog the DPF earlier than expected and fuel usage may increase.

④ Indicator light action on instrument panel

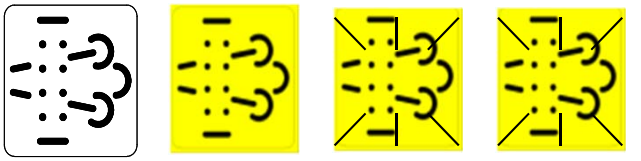
- On & Off light actions of DPF and engine warning indicator let operator know the status of the engine related with regeneration.



- The indicators and its descriptions used in the next page are as below.

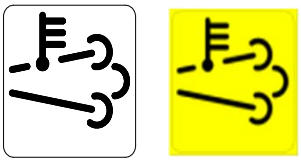
(1) (DPF) Regeneration indicator

- ON / OFF
- BLINK(2Sec) / BLINK(1Sec)



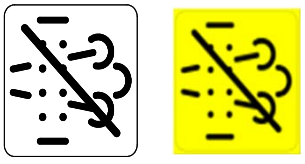
(2) (DPF) temperature indicator or HEST

- ON / OFF



(3) (DPF) Inhibition indicator

- ON / OFF

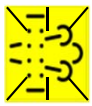
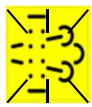


(4) Engine warning indicator

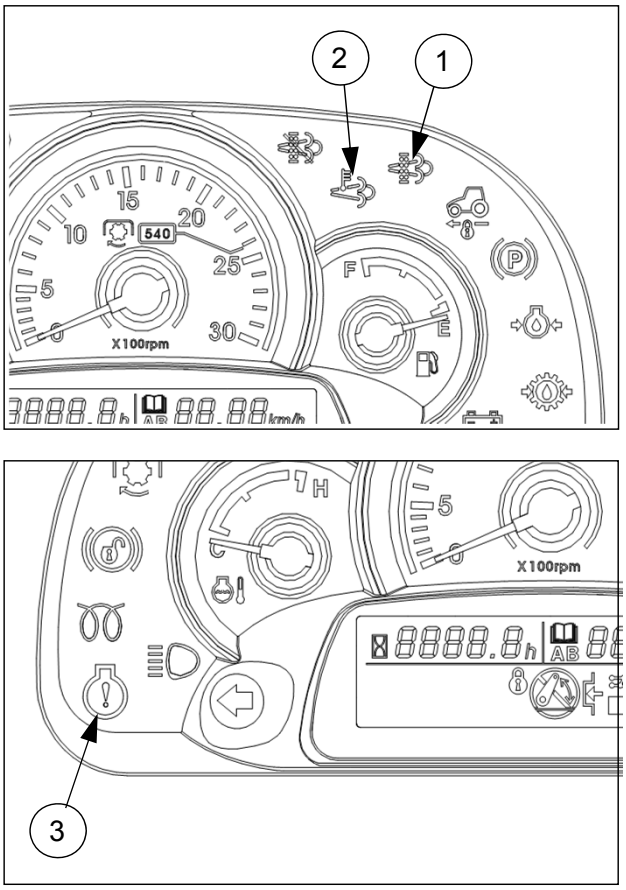
- OFF
- BLINK(2Sec) / BLINK(1Sec)

- Depending on the soot's rate, the DPF regeneration indicator shall show several different blink frequency before or during the regeneration. *See next page.*

The combination of (DPF) indicator lights in instrument panel

Engine warning indicator	(DPF) Temp. indicator	(DPF) Regen. indicator	(DPF) Inhibit. indicator	(DPF) regeneration mode	The (DPF) status and work restriction
				No regeneration mode	-. The soot load in the (DPF) is below 60%. -. Work is possible.
OFF	OFF	OFF	OFF		
				Auto-regeneration preparation mode	-. The soot load in the DPF is 60~80%. -. (DPF) will regenerate soon automatically after engine starting. -. Work is possible.
OFF	OFF	ON	OFF		
				Auto-regeneration preparation mode	-. The soot load n the DPF is 80~100%. -. (DPF) will regenerate soon automatically after engine starting. -. Work is possible.
OFF	OFF	Blink(2sec)	OFF		
				Power limit preparation mode	-. The soot load in the (DPF) is 100~140%. -. (DPF) will regenerate soon automatically after engine starting. -. It is possible to start work after auto regeneration, after all indicator lights are “OFF” and engine speed has returned to normal speed.
Blink(2sec)	OFF	Blink(1sec)	OFF		
				Auto-regeneration operation mode	-. The soot load in the (DPF) is less than 80% and (DPF) is regenerating automatically. -. Work is possible.
OFF	ON	ON	OFF		
				Auto-regeneration operation mode	-. The soot load in the (DPF) is 80~100% and (DPF) is regenerating automatically. -. Work is possible.
OFF	ON	Blink(2sec)	OFF		
				High Exhaust temperature mode	-. The temperature at DPF outlet is being over 300℃(572˚F) after auto regeneration. -. The indicator will be turned off under 300℃(572˚F). -. Work is possible.
OFF	ON	OFF	OFF		
				Power limit Operation mode	-. The soot load in the (DPF) is 100~140% and (DPF) is regenerating automatically. -. Engine power is de-rated 50% and engine speed is limited to 1,800rpm. -. Have to STOP work. -. It is possible to start work after auto regeneration, after all indicator lights are “OFF” and engine speed has returned to normal speed.
Blink(2sec)	ON	ON	OFF		
				Engine Shutdown mode	-. The soot load in the (DPF) is over 140% and engine has been shutdown. -. Contact your authorized dealer immediately. If restarting the engine, the engine can run for only thirty seconds to escape an emergency.
Blink(1sec)	OFF	Blink(1sec)	OFF		
				(DPF) inhibited Operation mode	-. Work is possible. -. Press the (DPF) switch to auto regeneration after entering a safe regeneration area.
OFF	OFF	OFF	ON		
				Engine shutdown mode	-. Engine shut down with other problems. -. Contact your authorized dealer for check.
Blink(1sec)	OFF	OFF	OFF		

⑤ Auto regeneration mode operation



- In this operational mode, the operator does not have to take any actions, the system is activated automatically by the engine electronic controller.

NOTE : *Auto regeneration is the normal operating mode.*

- The following conditions will activate the burner.;
  - When Soot load is **60% or more** of capacity.
  - **Every four hours** after last regeneration.
  - When engine operating temperature reaches **designated regeneration temperature**, set by engine controller.
  - When DPF inhibited switch is **NOT ON**.

NOTE : *Duration of burner operation is* ***approximately 30 to 40 minutes****.*

- During the regeneration operation, the (DPF) regeneration indicator light (1) and (DPF) temperature Indicator light (2) will both be illuminated.
- Depending on the soot rate of the (DPF) regeneration indicator light will show several different blinking frequencies during the regeneration process. *See previous page.*
- The engine warning indicator light (3) will blink when there is a excessive soot load in the (PDF). Stop working tractor and prepare for (DPF) regeneration.
- In case of turning off the engine running during regeneration mode, The regeneration is to resume again when restarting the engine.

NOTICE	▶ If engine is turned off during regeneration mode, soot will not be completely burned and may increase fuel consumption. KEY-OFF during regeneration mode is not recommendable because too short operation won't finish regeneration mode, So, we recommend to users to operate until all indicator lights are "OFF" without Key switch OFF.

NOTICE	▶ During DPF hot shut down, the fuel pump will continue to run to cool components in the fuel circuit. If there are any errors during this cooling action, the engine will not run. Start engine after this cooling operation has completed. This will lead to longer crank times before the engine runs. After heavy work of tractor, allow engine to run at idle for approximately five minutes to allow fuel system to cool down.

⚠ Warning	▶ **Fire hazard!** During the Diesel Particulate Filter (DPF) forced regeneration process the exhaust stack and fixed hood area becomes extremely hot. Park the machine outside and away from combustible or highly flammable material. Failure to comply could result in death or serious injury.

⑥ Inhibited regeneration mode operation

NOTICE : *Only use this mode when regeneration needs to be delayed or stopped because of an operation condition that may risk a fire hazard due to high exhaust temperatures during regeneration.*

NOTE : *When the DPF regeneration indicator light (1) and engine warning light (2) are blinking during the regeneration process, the inhibited regeneration mode cannot be set.*

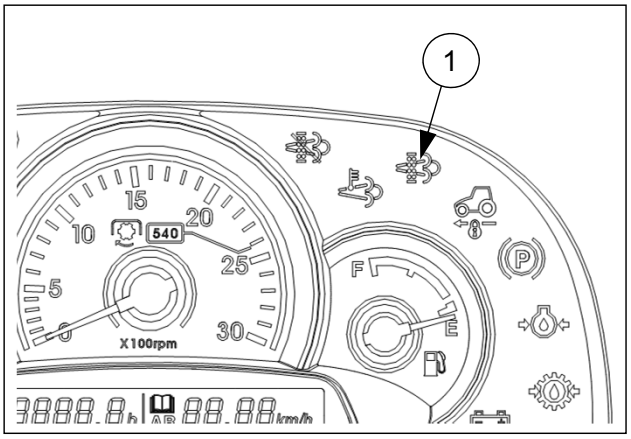
The regeneration mode can be delayed or stopped by the use of the (DPF) switch (3) that is located on the right-hand side of the dash.

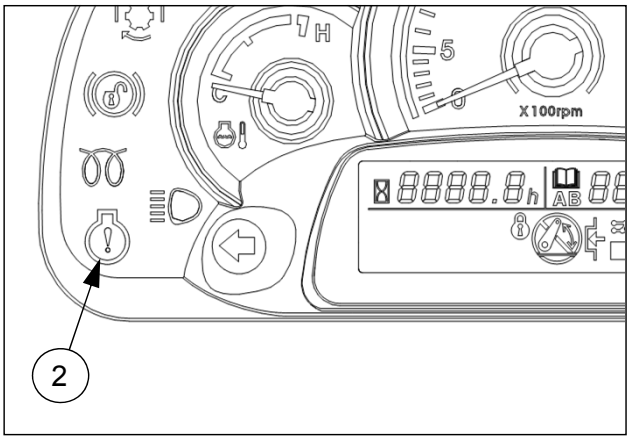
To set the inhibited regeneration mode :

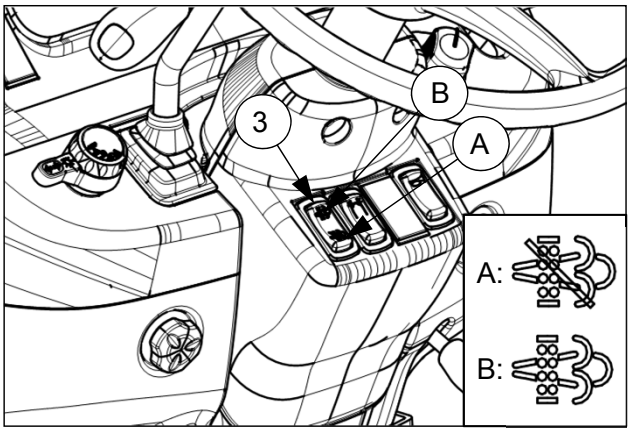
1. Press the lower side (A) of the (DPF) switch (3) for approximately two seconds.
2. When inhibited mode is activated the (DPF) inhibited indicator light (4) will be illuminated.

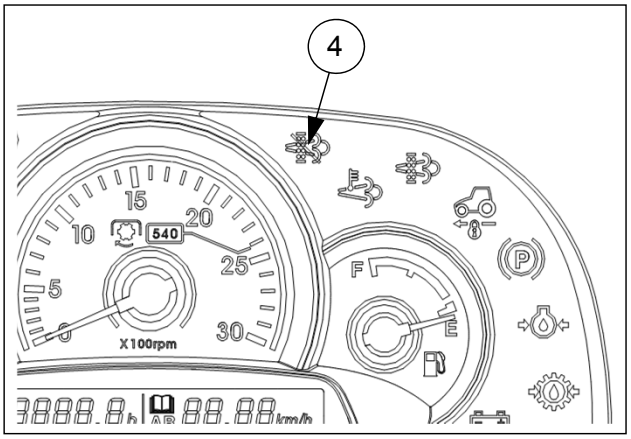
NOTICE : *When tractor arrives at a safe regeneration location, press the upper side (B) of the (PDF) switch for approximately two seconds to return the regeneration system to the auto regeneration mode.*
If regeneration system is not returned to auto mode, excessive soot in the (PDF) may overload the emission system and result in a reduction of engine power.

NOTICE *: If, when notified by the instrument panel (DPF) indicator lights that a regeneration of the (DPF) is needed and the operator does not proceed with a regeneration of the (DPF), the functionality of the (DPF) will be impaired.*
If the operator continues to ignore or interrupt the regeneration notification, the (DPF) may become damaged to such an extent as to require the (DPF) to be replaced by an authorized LS tractor dealer.





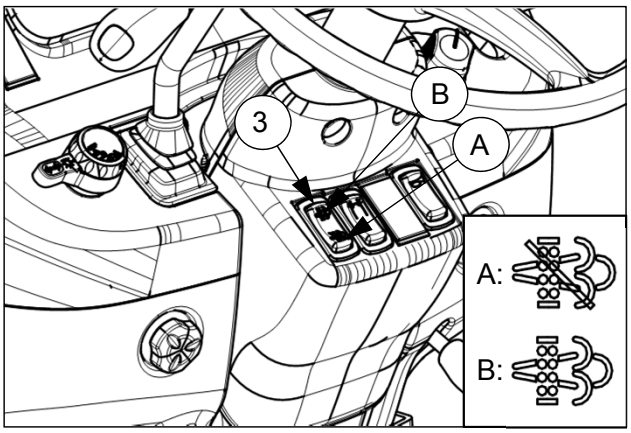


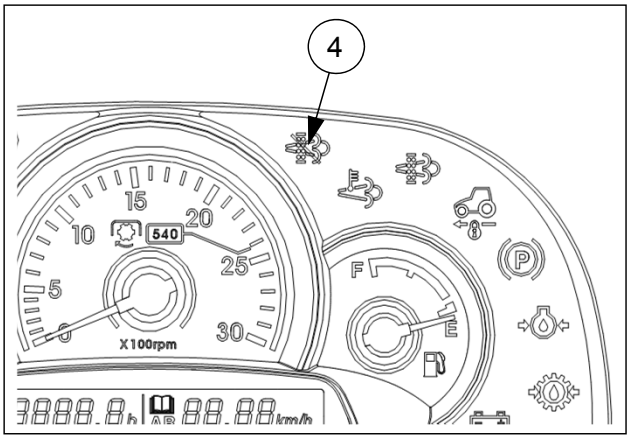


To exit the inhibited regeneration mode (To go to the auto regeneration mode) :

1. Press the upper side (B) of the (DPF) switch (3) for approximately two seconds.
2. When inhibited mode has been exited the (DPF) inhibited indicator light (4) will not be illuminated.

NOTE: *If the tractor is shut off during the inhibited mode, when restarting the tractor, the regeneration system will return to the auto regeneration mode.*





(9) PTO switch (Independent PTO)

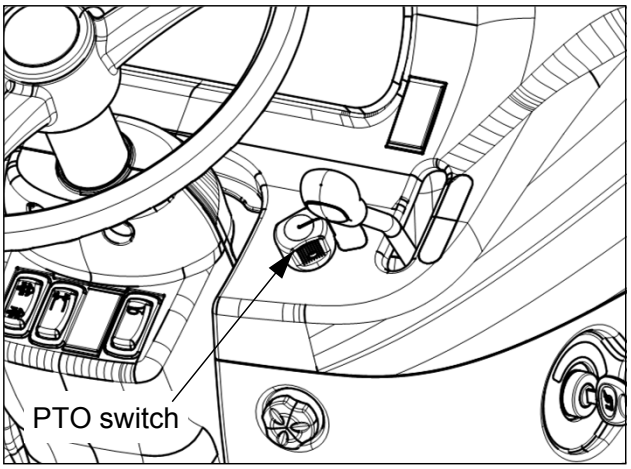
- The engine starts only when PTO switch is placed in OFF position for safety.
- After starting engine, you must comply with the following instruction about the PTO operation.
  1. Check the safety around the implement.

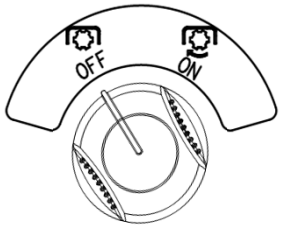
  2. Place the PTO gear lever (if fitted) to suitable position for your work condition.

  3. Place the PTO switch to ON position. The PTO shaft shall rotate.

  4. When the PTO is rotating, PTO operation indicator on the instrument panel shall be ON.

  5. If you want to stop the PTO temporarily while operating, push the PTO switch to OFF position.

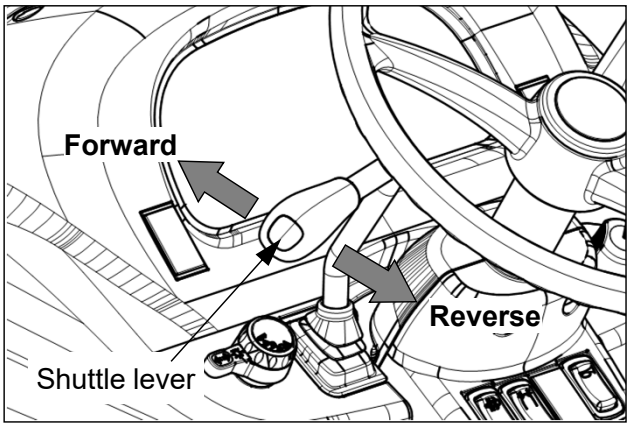




ON : PUSH AND TURN
OFF : PUSH

⚠Warning	▶ Before attaching or checking the PTO driven equipment, - Always place the PTO switch in OFF position, and PTO gear lever(if fitted) in NEUTRAL position. ▶ If the PTO mode switch is placed in **MANUAL** position, PTO rotates even if the implement moves up to upper limit. Pay attention to the surroundings to prevent a accident. ▶ Do not engage the PTO at high engine speed. Sudden engagement can cause damage to some implements and PTO clutch. Engage PTO at low RPM, and then raise the engine speed up.

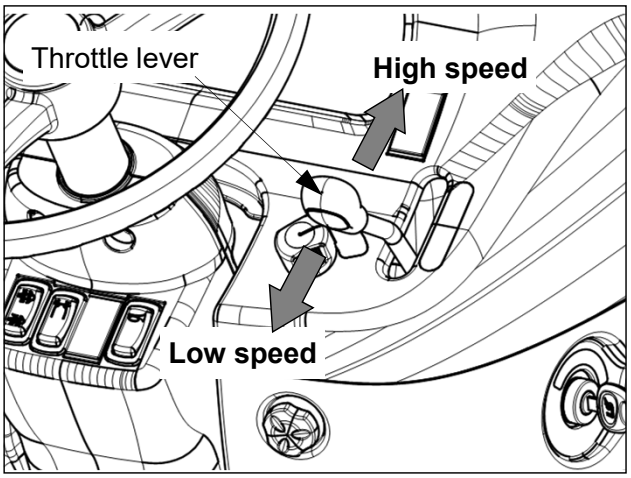
(10) Shuttle lever (Mechanical synchro-shuttle)



- This is used to select Forward or Reverse.
- **Forward** : Push the lever forward.
  Reverse : Pull the lever backward.
- Before reversing the tractor, lower the engine rpm and check the safety behind the tractor.

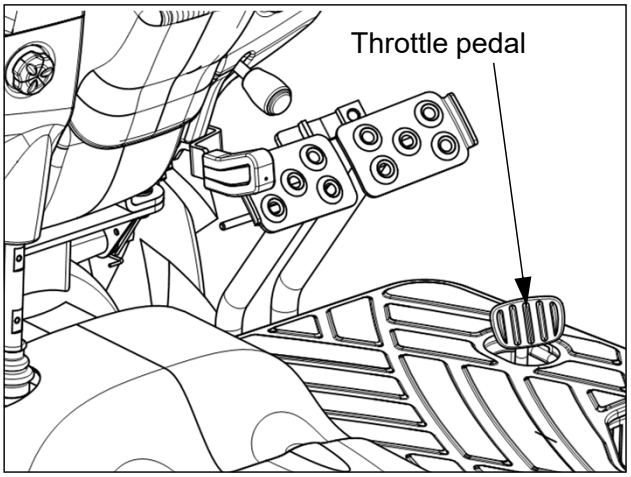
⚠Caution	▶ The synchro-shuttle shift lever allows any forward range or reverse to be shifted while the tractor is moving slowly. However, the clutch must be disengaged and the engaged by means of clutch pedal. Make sure to depress clutch pedal fully and release it gradually to take up load smoothly, but sudden gear shifting may cause transmission damage. It is recommended to stop the tractor before operating the shuttle lever.

(11) Throttle lever



- This lever is used to control engine speed.
  - Pull it backward for **Low** speed.
  - Push it forward for **High** speed.
- The throttle lever must be used only for work field. When driving on the road, place the throttle lever to low speed, and use the throttle pedal.
- For HST model, An electronic control sensor is attached on this lever. If there is an error relating with this sensor while the engine is running, the engine speed shall be fixed to 1500 rev/min, so called LIMP HOME mode. Contact your authorized dealer.

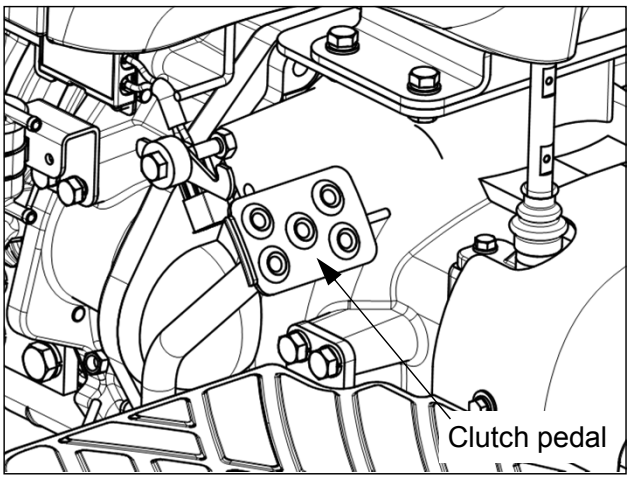
(12) Throttle pedal (Mechanical)



- This pedal is used to control engine speed when running on the road.
- When using the Throttle pedal, the throttle lever must be placed on **Low** speed.
- An electronic control sensor is attached on this pedal. If there is an error relating with this sensor while the engine is running, the engine speed shall be fixed to 1500 rev/min, so called LIMP HOME mode. Contact your authorized dealer.

(13) Clutch pedal (Mechanical)

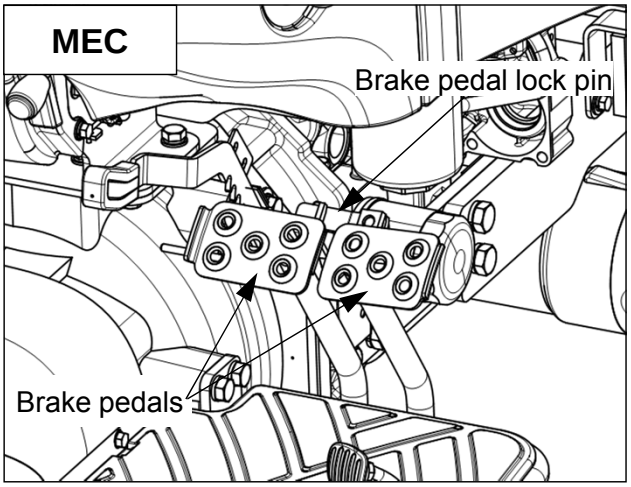
- This is used to engage or disengage the main transmission clutch for starting engine and shifting transmission gear.
- Depress the clutch pedal quickly and fully and release it slowly.
- Even if depressing clutch pedal, PTO shaft can not be stopped.
  Refer to the section 3-1-(9), "PTO switch" in this manual.

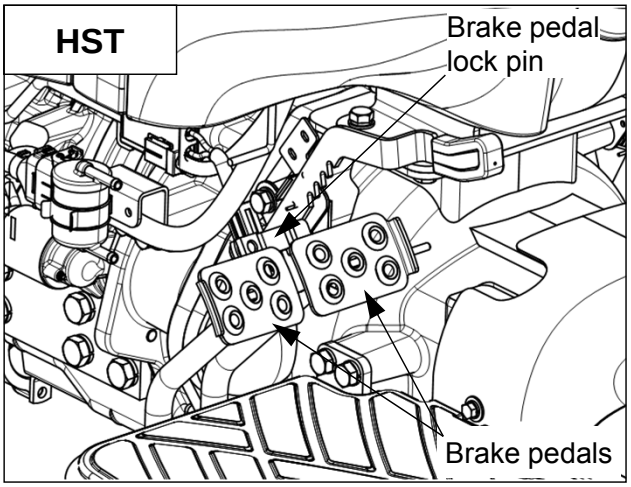


⚠Caution	▶ DO NOT ride your foot on the clutch pedal while driving. ▶ As the start safety switch is installed for the operator's safety, Have to depress the clutch pedal fully for starting engine.

(14) Brake pedals

- The brake pedals of your tractor can be operated independently after disconnecting the brake pedal lock pin. The left/right brake pedals transmit braking force on each wheel.
- When stopping the tractor, press both brake pedals together.
- To reduce the turning radius in the work field, remove the brake pedal lock pin, and press only the left/right pedal firmly.
- DO NOT press the one side brake pedal while the differential lock is engaged. It may cause damage or failure of the axles.

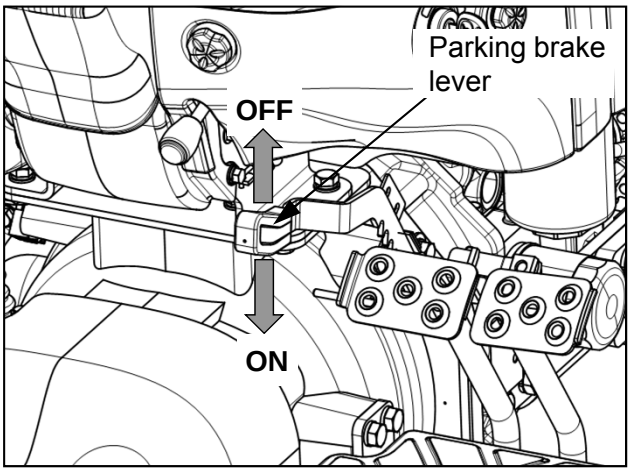


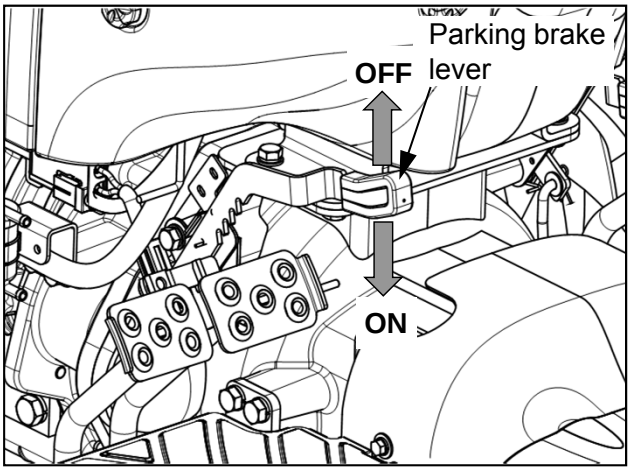


⚠Caution	▶When driving on the road, engage the left/right brake pedal by the lock pin. - If pressing one side of brake when running, the tractor may turnover. ▶ While driving, do not ride brake and clutch pedal.

(15) 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.

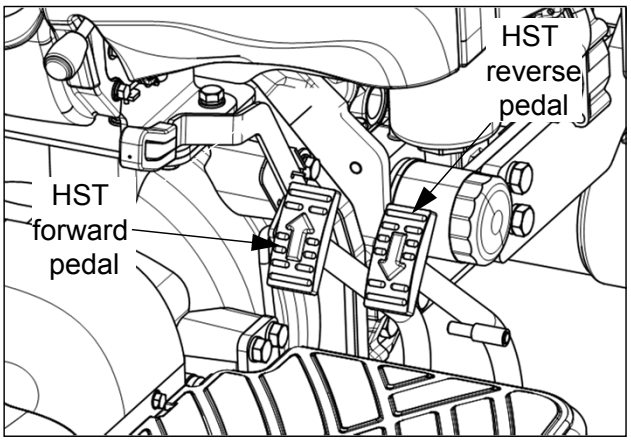




⚠ Caution	▶ DO NOT drive the tractor while parking brake is engaged. It may cause damage of brake or parking brake system.

(16) HST forward/reverse pedal (HST type)

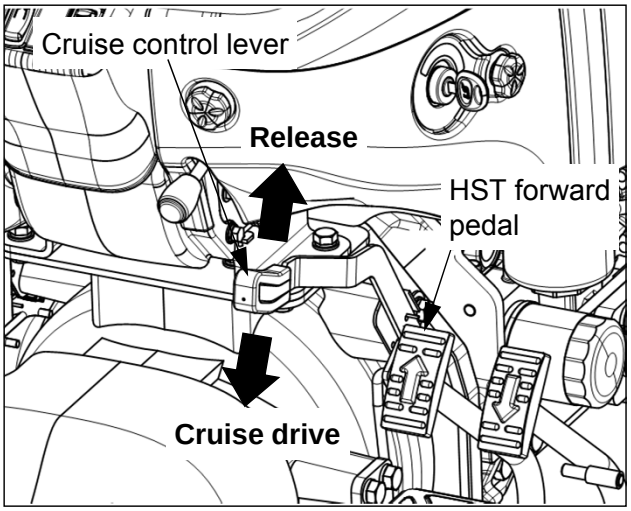
- Press the HST forward pedal slowly in order to move forward and if release the pedal, it returns back to the NEUTRAL position, and tractor stops.
- The HST reverse pedal is as same as the HST forward pedal operation.



⚠ warning	▶ Press the brake pedal to prevent stopping distance from being extended when driving in high speed . ▶ DO NOT operate the pedal hastily. It may cause a shock to you.

(17) Cruise control lever (HST Type)

- For cruise drive, push down the cruise control lever with pressing the HST forward pedal. And then, the HST pedal shall be fixed at that position and the driving speed of the tractor shall be maintained constantly.
- To exit the cruise control 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.

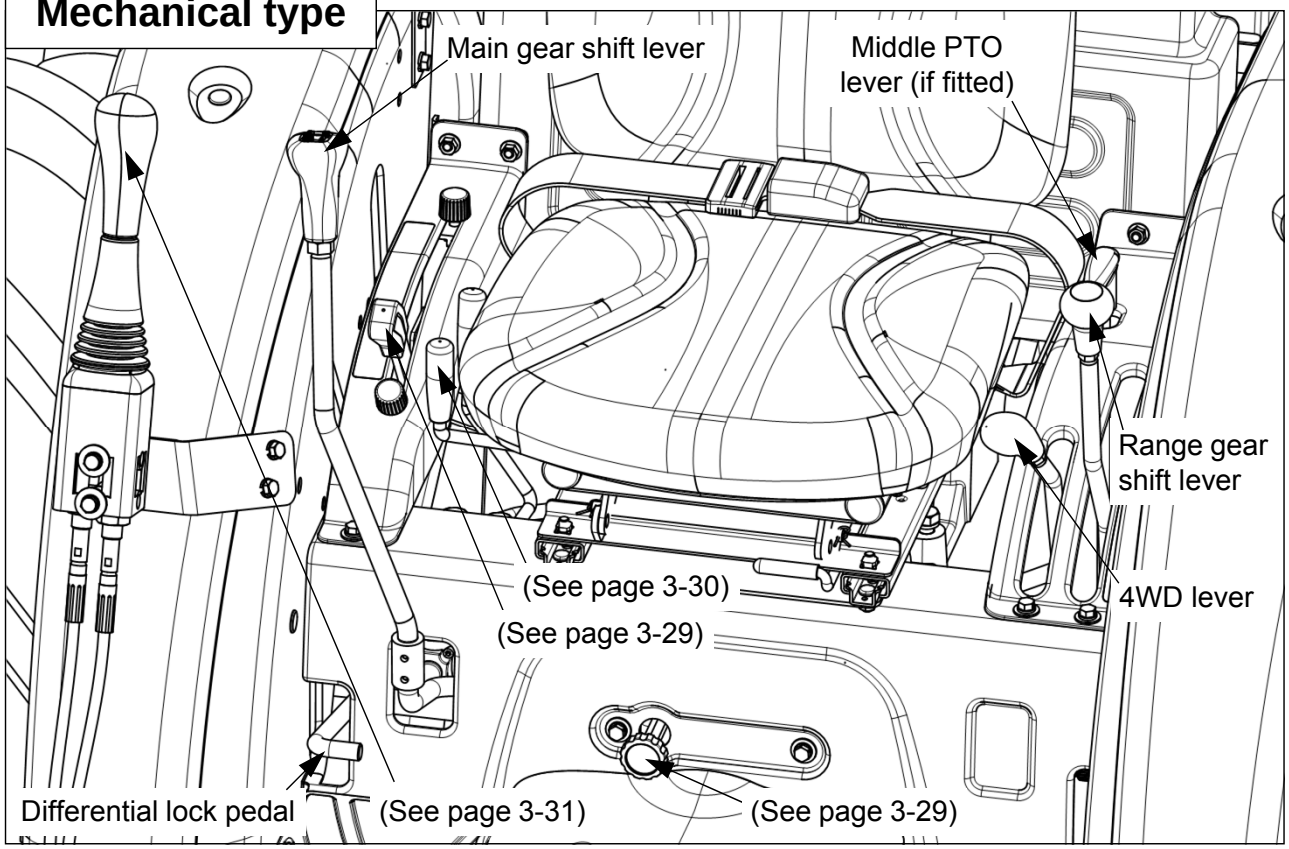


⚠warning	▶ During the cruise drive, DO NOT press the HST reverse pedal to release the cruise drive or to reverse the tractor. After stopping the cruise drive as above described, use the HST reverse pedal. ▶ DO NOT try to raise the cruise control lever up to quit the cruise control drive. It may cause a failure of the cruise control linkage system.

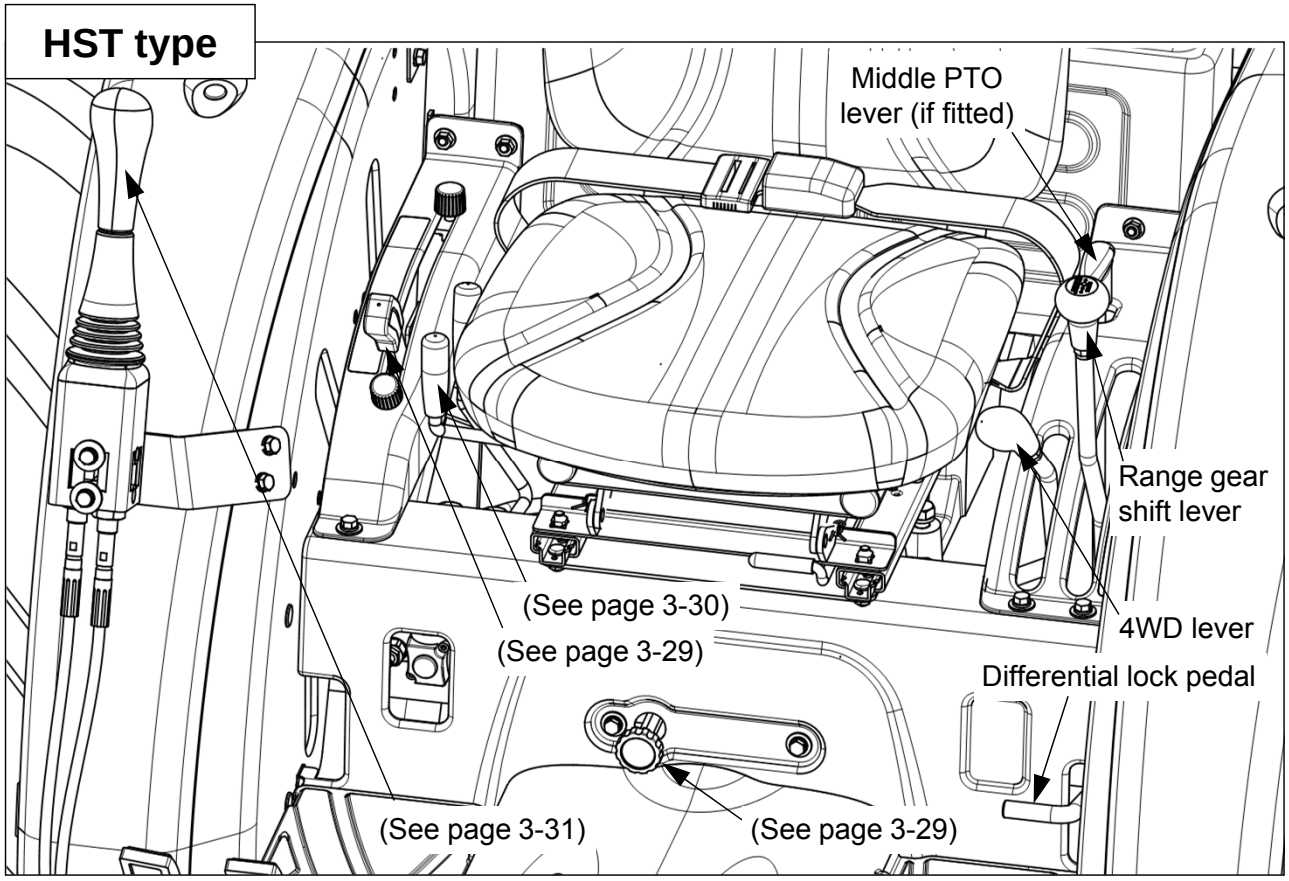
3-2. Left / Right-hand controls

Important to owner, read carefully

Mechanical type

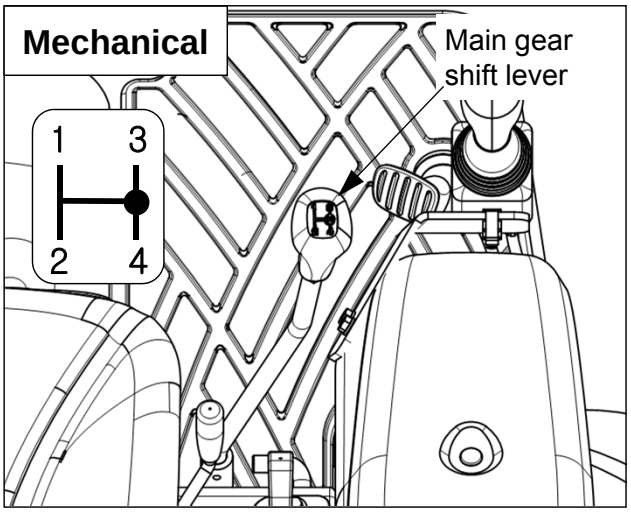


HST type



(1) Main gear shift lever (Mechanical)

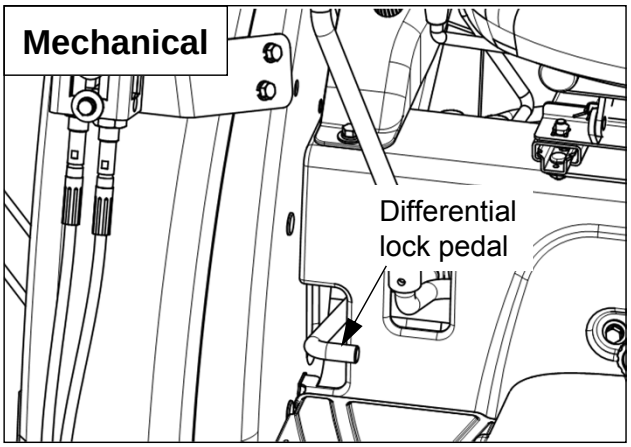
- Four speed gear shift is available.
- Main gear shift lever can be shifted with just depressing clutch pedal without stopping tractor.

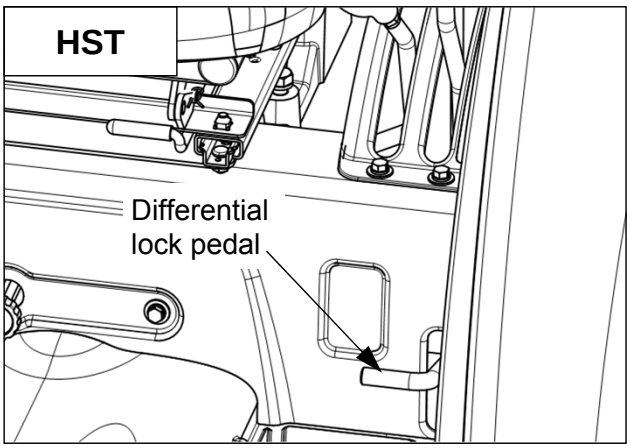


Notice	▶ Operate main gear shift lever by correct **H** pattern. If operated diagonally, it may cause a failure.

(2) Differential lock pedal

- When the rear wheel is slipping and the tractor can not move forward, stop the tractor temporarily and press the differential lock pedal.
- Differential lock is effective for working on slippery ground.
- 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. the turning radius is larger than normal and the turning is not smooth), depress the clutch pedal and/or press left/right one-side brake pedal slightly for a second each other.
- This pedal is installed on the step floor, but the location is ;
  - the right-hand side for mechanical model
  - the left-hand side for HST model.

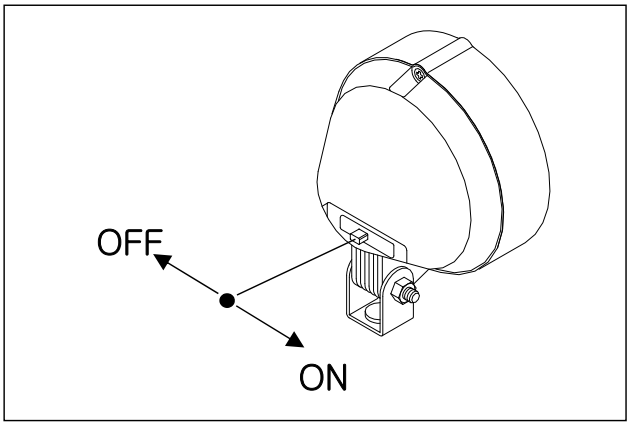




Warning	▶ Do not turn the tractor with pressing the differential lock pedal. ▶ Do not use this differential lock pedal while driving on public road. ▶ Do not engage differential lock when one wheel is spinning.

(3) 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.

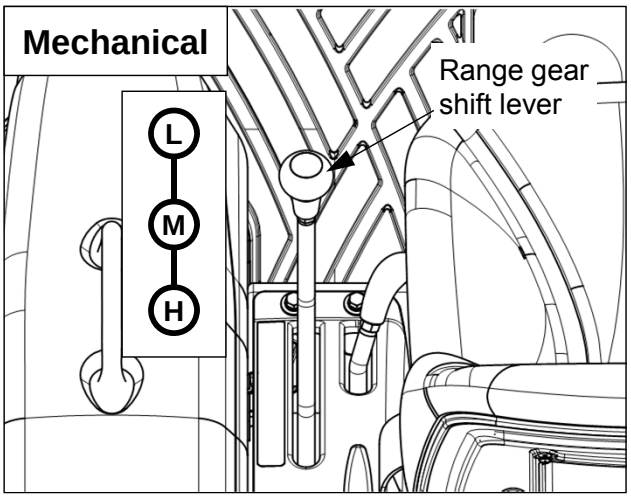


Caution	▶ When driving on the road at night, do not let the rear work light stay ON. It may cause a disturbance to the driver of the following car.

(4) Range gear shift lever

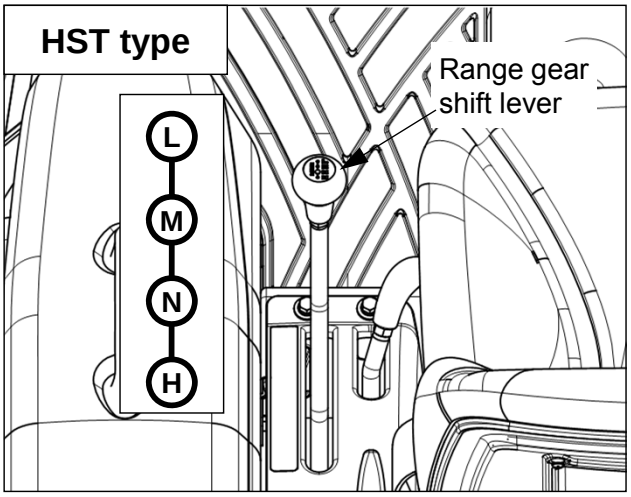
① Mechanical type

- Three speed gear shift is available.
- Before operating range gear shift lever, HAVE TO STOP the tractor completely.



② HST type

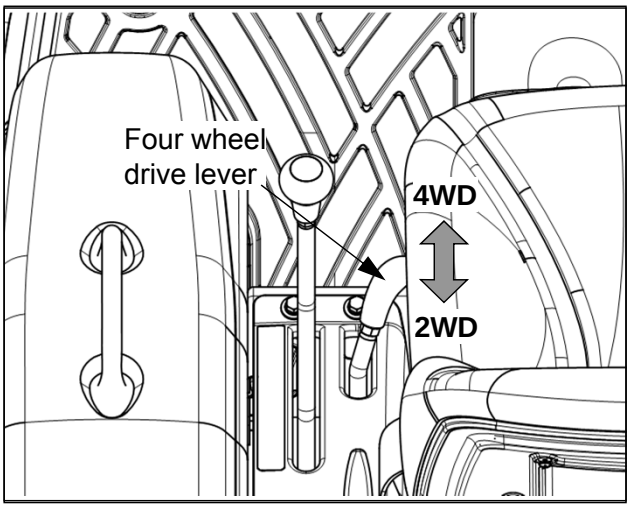
- Three speed gear shift and NEUTRAL position is available.
- Before operating range gear shift lever, HAVE TO STOP the tractor completely.



Notice	▶ Operate range gear shift lever correctly. If operated diagonally, it may cause a failure.

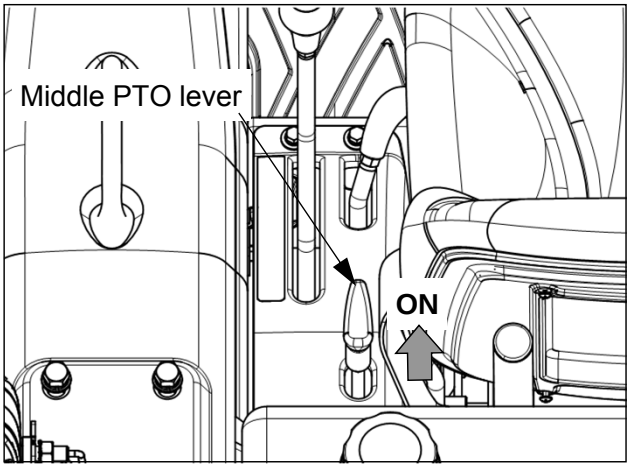
(5) Four wheel drive lever (4WD)

- This lever is used to engage/disengage the four wheel drive (4WD).
- Before operating the 4WD lever, press the clutch pedal and stop the tractor completely.
- Pull the 4WD lever upward for engaging 4WD.
- 4WD is very effective in the following cases.
  - When increasing the towing power for heavy work.
  - In case of working in sandy soil.
  - To prevent tractor from spinning in wet land.



(6) Middle PTO lever (if fitted)

- This lever is used to engage/disengage the middle PTO shaft (optional).
- Before operating the Middle PTO lever, place the PTO switch in OFF position and wait until the shaft is stopped completely.
- Pull the middle PTO lever upward to engage the middle PTO gear.
- For further the middle PTO shaft, see section 4-4-(2), “Power take-off(PTO) shaft”



3-3. Hydraulic system

(1) Safety precautions

- Hydraulic oil leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury, comply with as below.
  -. Relieve all pressure before disconnecting hydraulic lines.
  -. Before applying pressure, make sure all connections are tight and components are in good condition.
  -. Never use your hand to check for suspected leaks under pressure.
  -. If injured by leaking fluid, get medical attention immediately.
- The hydraulic hoses and fittings on your tractor meet engineering specifications for the particular function. When replacing damaged parts, use only manufacture authorized service parts.
- Care in hydraulic hose installation is a must:
  -. Make sure pressure is relieved before starting installation procedure.
  -. DO NOT kink or twist a hose, failure may occur. Properly route the hose.
  -. Have a certified hydraulic technician install the hose.
  -. Remove air from the hydraulic system after installing any hydraulic component.
- Periodically check hydraulic system for leaks or damaged parts - kinked, crushed, flattened, hard blistered, heat cracked, charred, twisted, soft or loose covered hoses and fittings.
- DO NOT pull or apply external forces to the hose. The hose may fail and cause injury.
- Keep all persons away from the working area. If a hose fails, mechanisms controlled by fluid power can become hazardous. Lifted mechanisms can fall to the ground, steering system may fail, etc.
- Stay clear of a pressurized hose assembly that has blown apart. Hose fittings can be thrown off at high speed and a loose hose can whip around with great force.
- Hydraulic oil can reach high temperatures. Allow fluid to cool before servicing the system.
- Vibration can reduce hose service life. Make sure all retaining clamps and/or devices are secured.
- Environmental conditions can cause hose and fittings to deteriorate. Inspect hydraulic hoses periodically. Replace worn or damaged hoses and fittings.
- Before checking or repairing the hydraulic system, make sure the engine is stopped, and all the transmission gears are in neutral, and lower the implements to the ground.

Warning 	▶ Before removing hydraulic pipes or hoses and other parts, make sure to check that hydraulic pressure is relieved completely. The leaks of pressurized oil can cause a fatal physical injury. ▶ Use proper protection equipments, before servicing hydraulic system. ▶ Before connecting or disconnecting the hydraulic quick coupler, lower the implements to the ground, and check that hydraulic pressure is relieved.

(2) Steering system

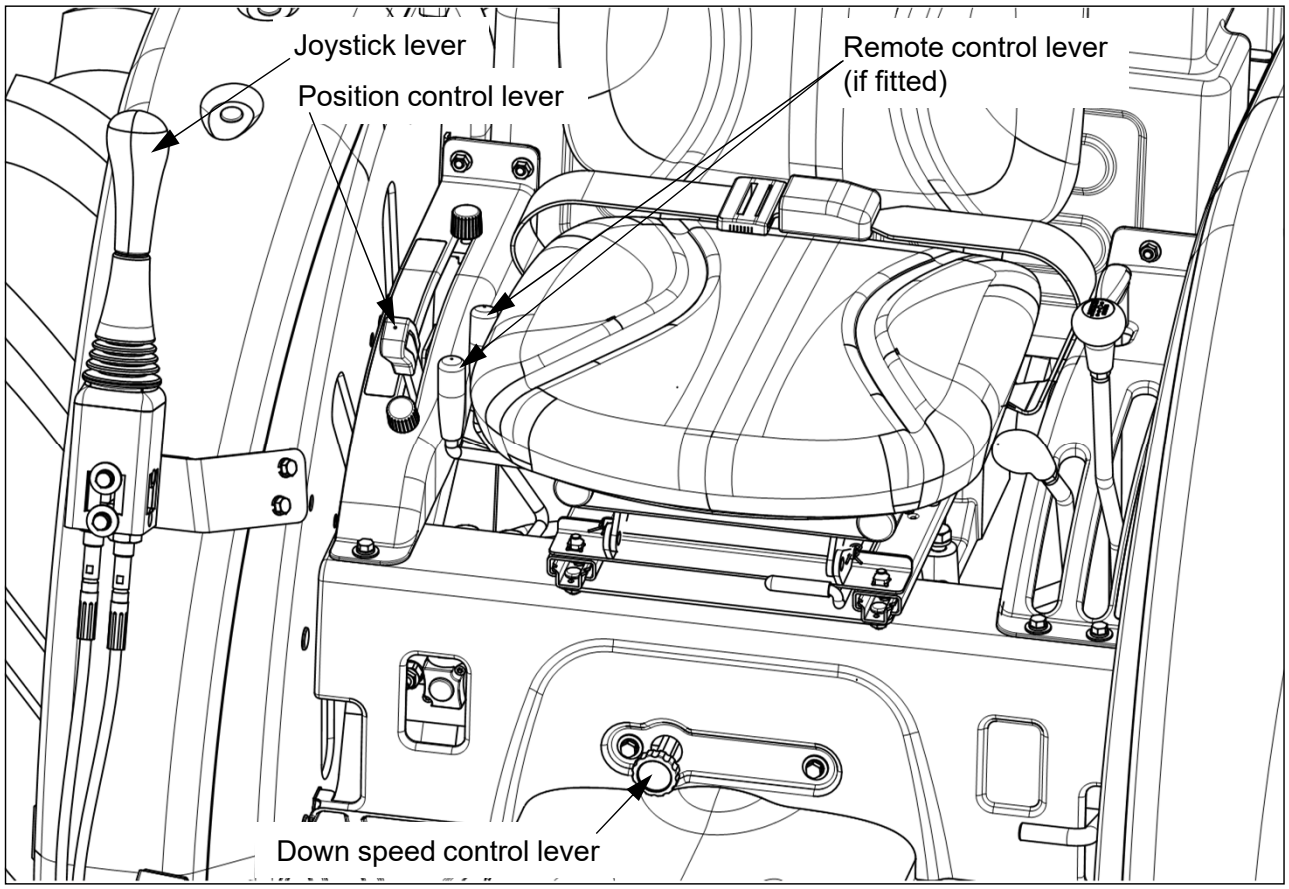
- As the steering system of your tractor has a hydraulic pump, valve and etc., it provides you more convenience to operate the steering wheel.
- Notices when using the steering system.

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, and the air shall bleed out and the abnormal noise shall disappear. If it's not cleared, contact your authorized local dealer for repair.
4. When starting engine in cold weather, an 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	▶ If the engine is stopped, the steering wheel is not turned easily because hydraulic pump does not work. But this is not a pump failure. ▶ After turning the steering wheel while driving, the steering wheel is not returned back to neutral automatically.

(3) Hydraulic lift Control (Mechanical Hydraulic Lift, MHL)

- The hydraulic lift system is operated by the position control and draft control lever.



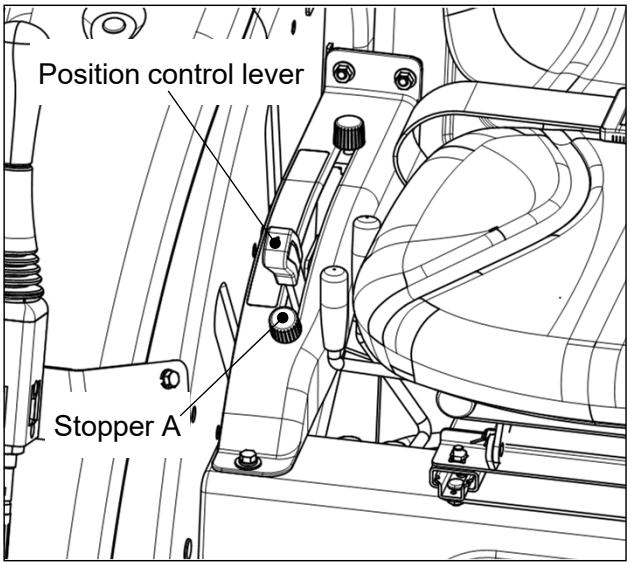
① Position control

- 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 the position control lever forward and let the implement down by its own weight.

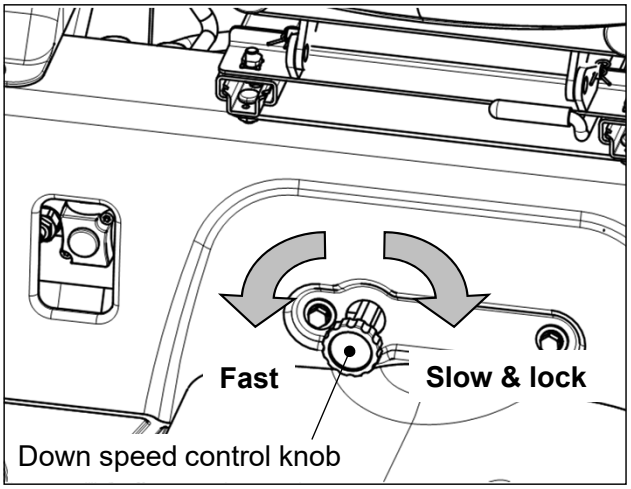
2.Move up the lever to the desired position, the rear implement shall be located on the position corresponding to the lever position.

3.If necessary, fix the lowest position of the lever with the stopper A at the desired position.



② Down speed control knob

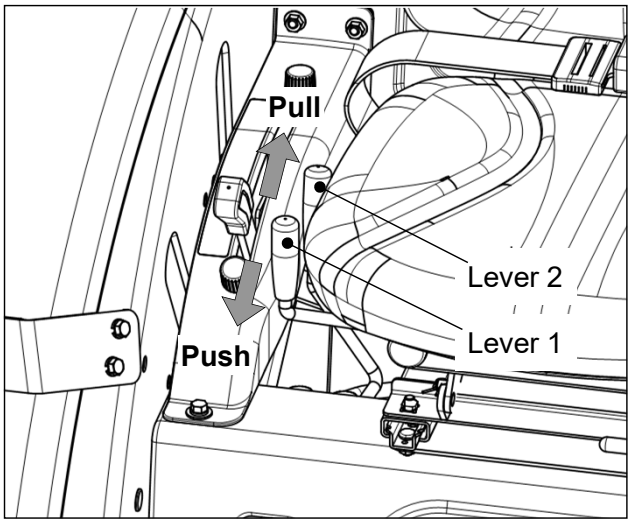
- Turn the knob to the clockwise to lower the implement slowly and to the counter-clockwise to rise speed faster. If turning it clockwise to the end, the implement is fixed and even if lowering down the position control lever, the implement does not let down.
  - Tiller : Slow in down speed
  - Plough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

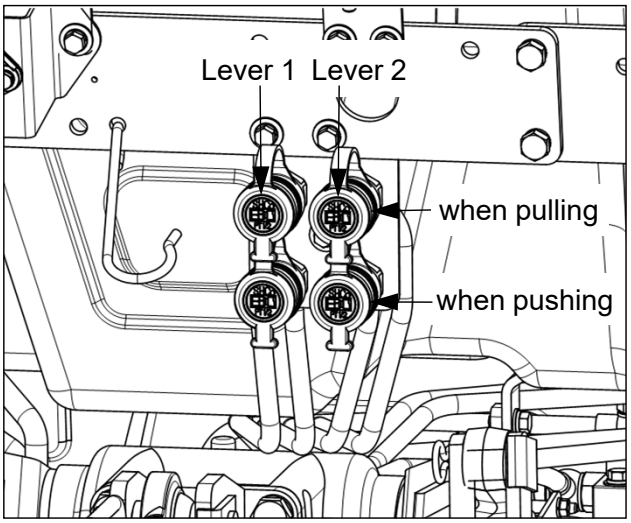


⚠ Warning	▶ When driving on the road, replacing tiller blades or removing grass around the tiller blades, turn the down-speed control knob clockwise slightly to lock. ▶ The knob may turn about two revolutions. Do not over-tighten the knob.

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

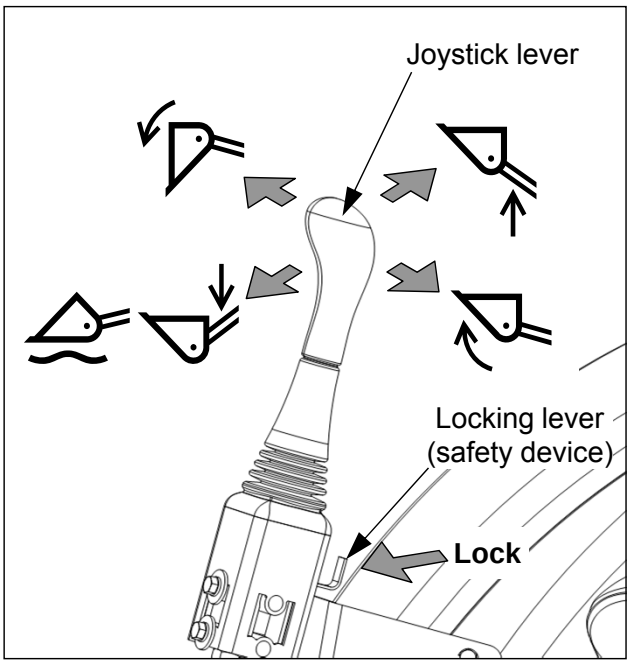
- These levers are used to operate the hydraulic cylinder and/or motor of the implement attached to the tractor.
- **Pull** the remote control lever **backward**, and the hydraulic pressure can be delivered **to the upper coupler** of the related lever and **lower coupler** shall be connected **to the oil tank**.
- Each lever of the remote control valve can be operated respectively, and when operating the levers at the same time, the one received less pressure begins to start first.
- After connecting and preliminary operating the hydraulic equipment, check again transmission oil level of the tractor.

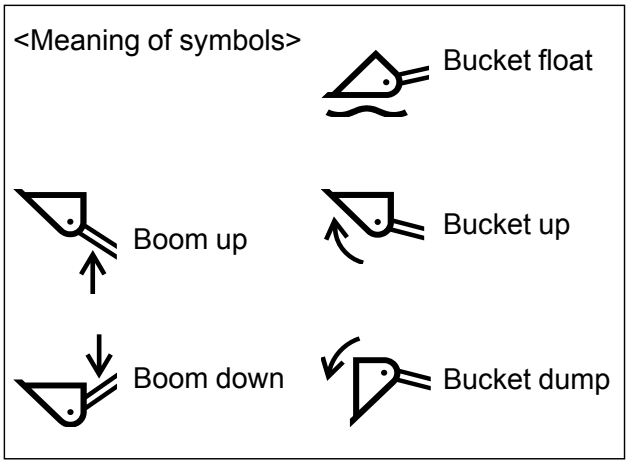




(4) Joystick lever (if fitted)

- Remote joystick lever helps to operate front-end loader comfortably.
- Joystick can be operated at 4 directions as shown in the right figure.
- If you move joystick diagonally, boom and bucket may be operated at the same time. In this case, less loaded cylinder may be moved first.
- When you want to float bucket, lower the loader and push forward the lever at floating position. After finishing work, pull the lever and place it in neutral position.
- Locking lever shown in the right figure is used to lock the joystick lever.
  - Pull from the joystick : Unlock
  - Push to the joystick : Lock
- *For further information, See section 4-4-(8), "Using Front-end loader" in this manual.*

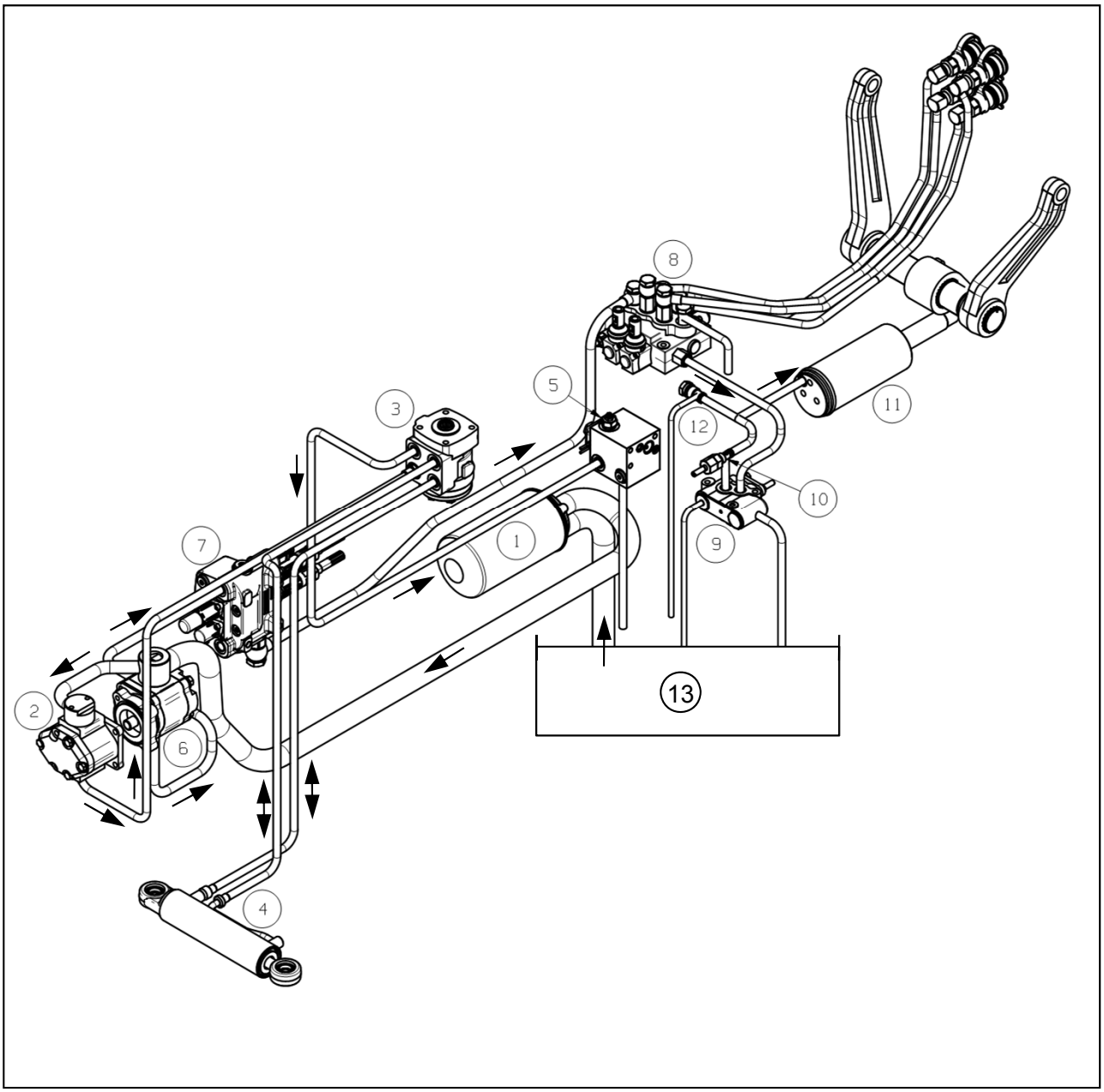




Warning	▶ To prevent an accident, place the locking lever to lock position when you do not use the joystick lever.

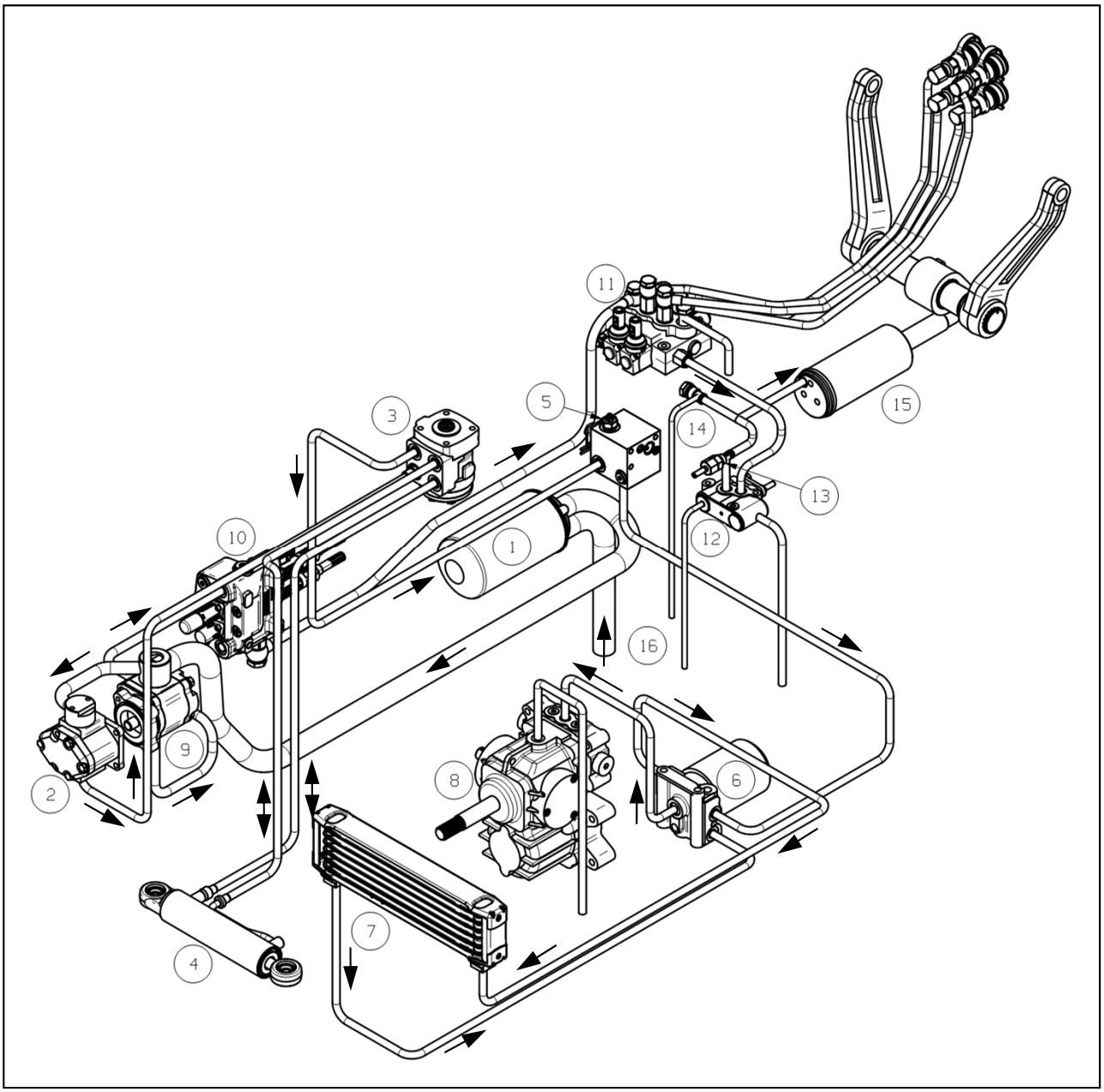
(5) Hydraulic System Diagram

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 or Front loader valve (optional)
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)

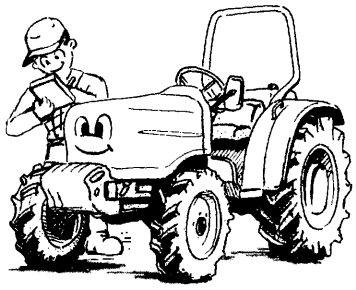
HST



1. Hydraulic filter
2. Steering pump
3. Steering unit
4. Steering cylinder
5. Independent PTO valve
6. HST filter
7. Oil cooler
8. HST unit
9. Hydraulic lift pump
10. Front outlet valve or Front loader valve (optional)
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

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.

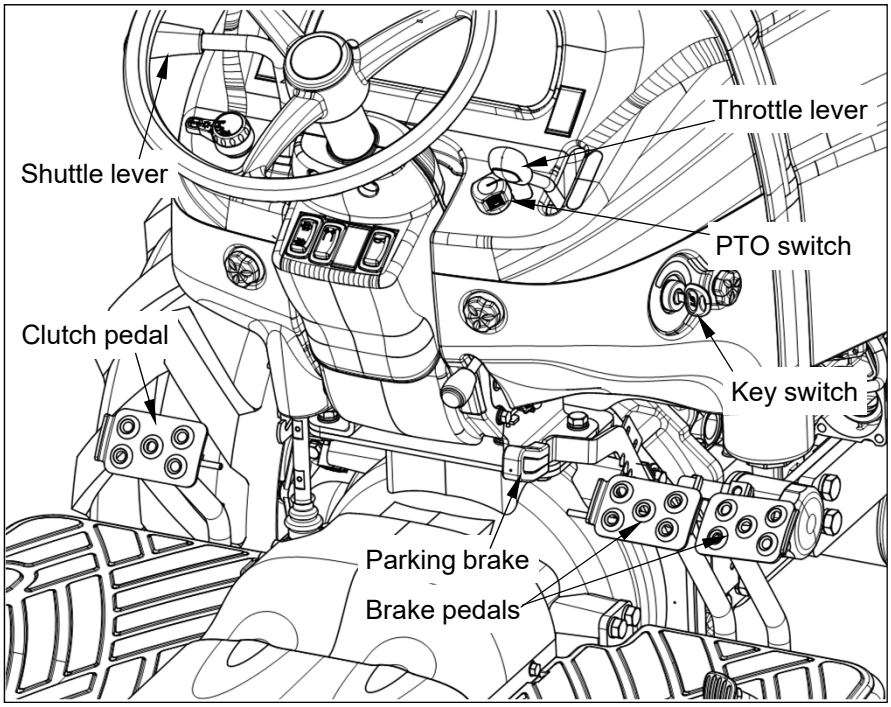
(1) Engine start

Mechanical type

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

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

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



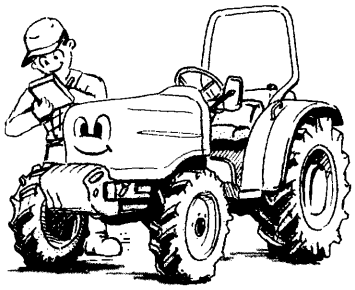
4. Turn key switch to **ON** and check if the battery charging indicator and cold start aid indicator are ON.

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

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

7. Check if the battery charging indicator and engine oil pressure indicator are OFF.
If not, stop the engine immediately and check the problem.

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



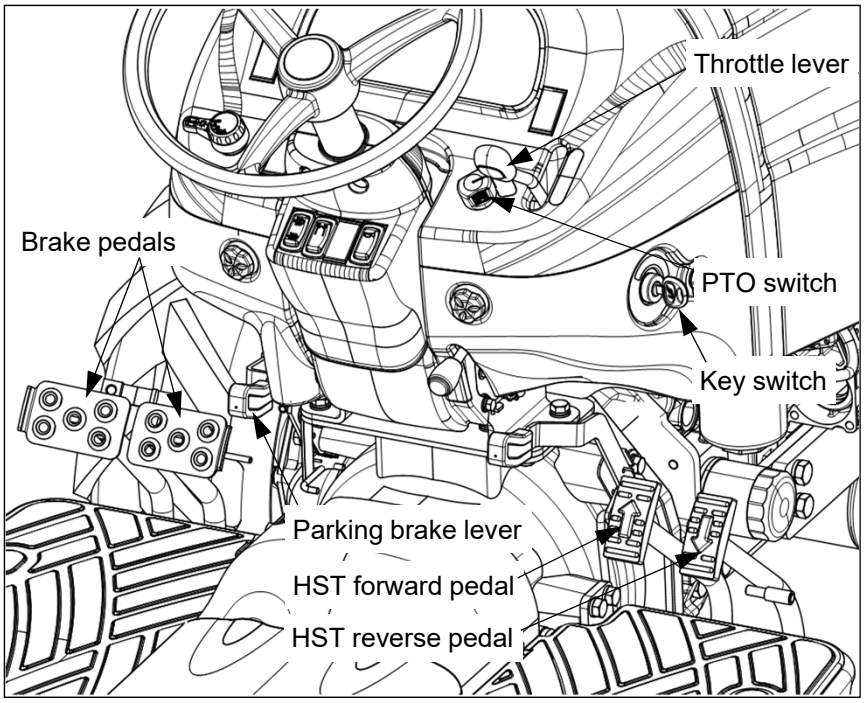
Caution	▶Check each part before starting engine. ▶Check if there is some other people around before starting. ▶Place all the levers and switches in **NEUTRAL** or **OFF** position.

HST type

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

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

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



4. Turn key switch to **ON** and check if the battery charging indicator and cold start aid indicator are ON.

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

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

7. Check if the battery charging indicator and engine oil pressure indicator are OFF.
If not, stop the engine immediately and check the problem.

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

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

⚠ Caution	▶ If clutch pedal is not depressed fully or PTO switch is not OFF, the engine can not be started even if turning the key switch to START position. (for mechanical type) ▶ 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 can not be started even if turning the key switch to START position. (for HST type) ▶ DO NOT operate starter motor more than 10 seconds. If the engine does not start, wait for 1~2 minutes before restarting. ▶ When the engine is running, DO NOT turn the key switch to START position. It may cause a failure of the starter motor. ▶ In the cold weather, warm-up the engine. If using the tractor suddenly in the cold weather, the engine life can be reduced.

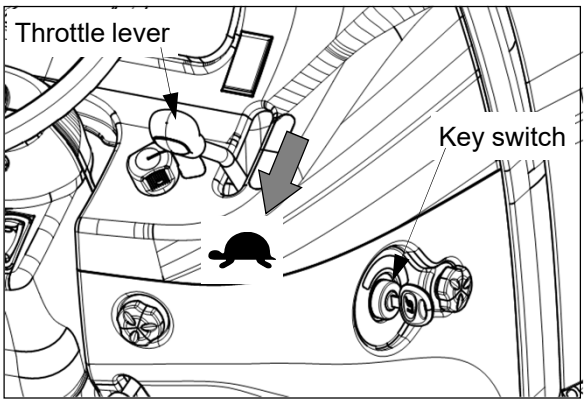
(2) Start in cold weather

- 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 5-3, "Lubricants and Capacity" or the last page in this manual.
- Use the diesel for winter when it is very cold weather. It is much easier to start engine.

⚠ Caution	▶ 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. ▶ Allowing engine to idle for a long time will waste fuel and cause a build up of carbon.

(3) Engine Stop

- Pull the throttle lever backward to reduce the engine speed and place the key switch on “OFF” position to stop the engine.



Notice	▶ To stop the engine after finishing heavy work, run engine for 5 minutes in low idle rpm. If you stop the engine suddenly, the engine life could be reduced.

4-2. How to drive and stop

(1) How to drive

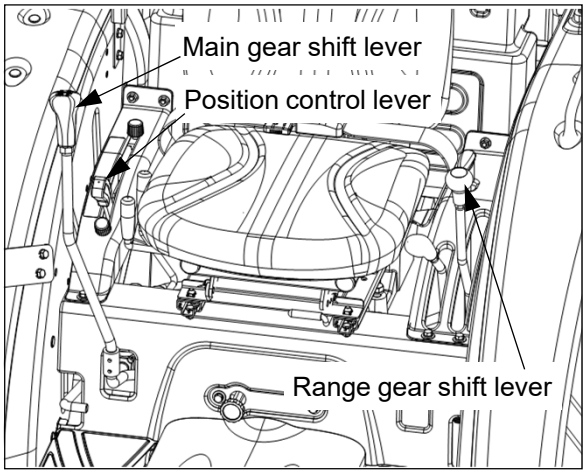
Mechanical type

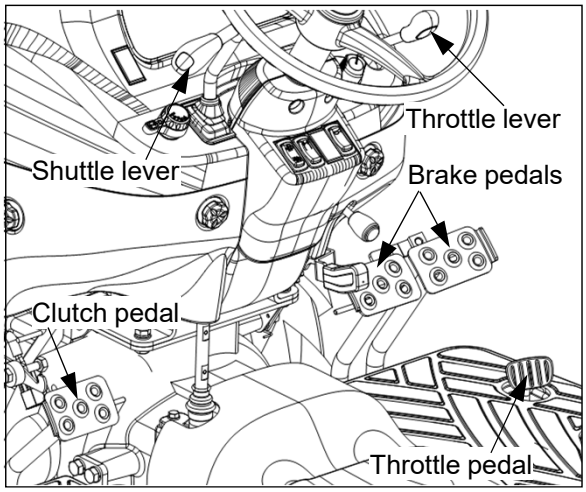
1. Pull position control lever backward to lift the implement after starting engine.

2. Press clutch pedal fully and place all the transmission gear levers (main, range, shuttle lever) on the suitable position.

3. Pressing brake pedals, and release parking brake lever.

4. Release clutch pedal slowly with pressing throttle pedal slowly.





Notice	▶ Release clutch pedal slowly. If releasing the clutch pedal suddenly, the gear life can be reduced and it may cause sudden start.

HST type

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

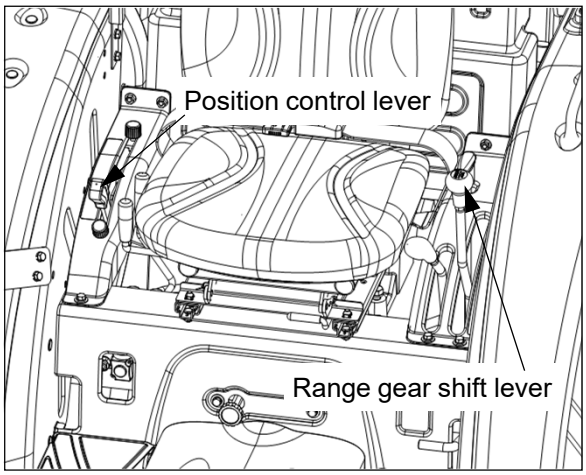
2. Set the engine speed more than 1500 rev/min.

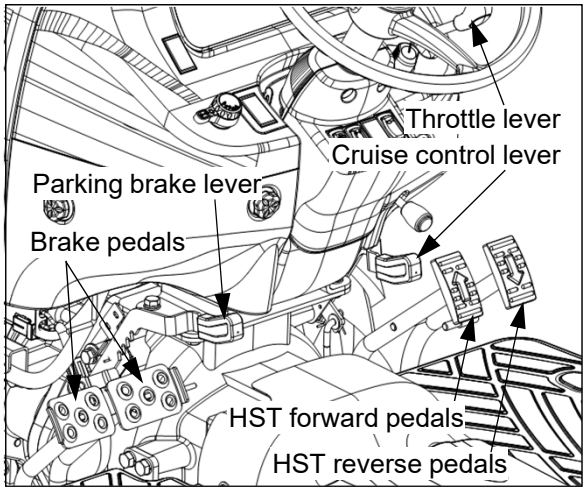
3. Place the range gear shift lever to the suitable position.

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

5. Press the HST forward/reverse pedal down slowly to move the tractor.

6. If necessary, move the cruise control lever downward to fix the driving speed constantly.



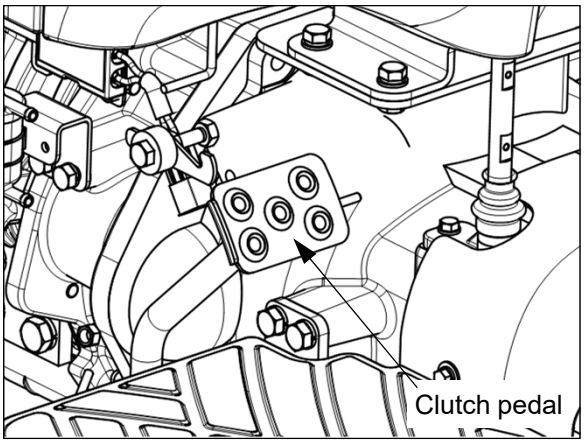


⚠ Caution	▶ If pressing brake pedals or HST forward pedal down deeper, the cruise control drive shall be stopped. ▶ For HST model, there is a switch on the driver's seat to control engine cut-off for driver's safety. If the operator leaves the driver's seat without safety measures, the engine shall be stopped automatically. *For further information, see section 2-1-(2).* ▶ When driving or working with a tractor, operate it more than 1500 rev/min. ▶ Press the HST forward/reverse pedal slowly. If pressing these pedals hastily, the tractor can be started suddenly.

(2) Changing speed

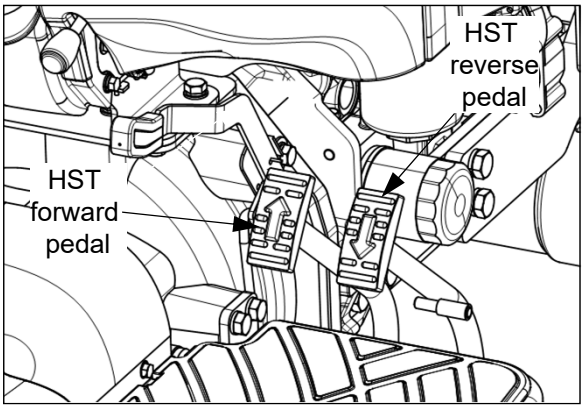
Mechanical type

- Depress the clutch pedal fully and operate all the shift lever correctly.
- Before operating all the transmission gear levers including main gear shift lever, HAVE TO STOP the tractor completely.



HST type

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



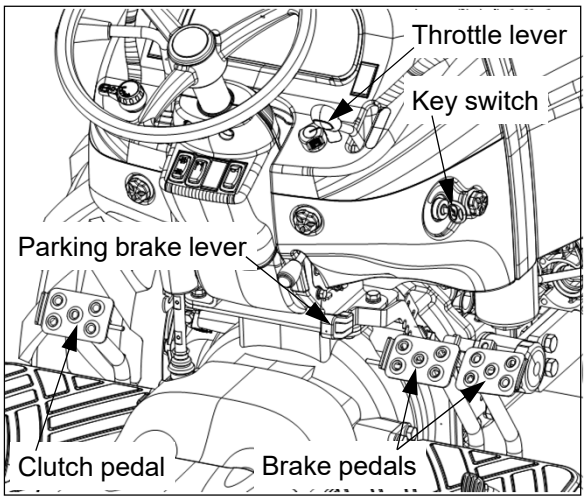
(3) Emergency Stop

Mechanical type

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

2. DO NOT release clutch pedal until all moving parts have been stopped.

3. Apply parking brake.

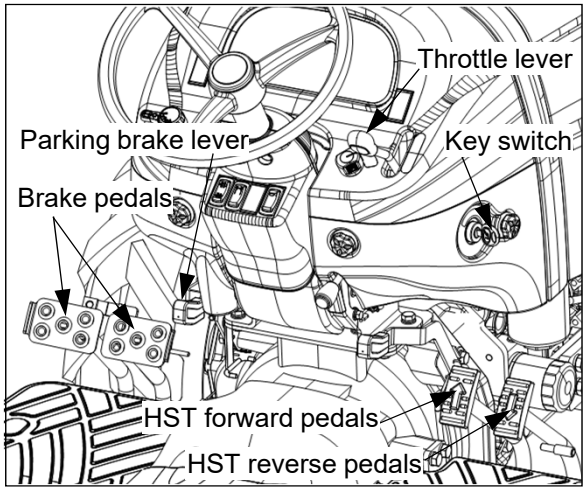


HST type

1. Release HST forward/reverse pedal and press down the brake pedals immediately.

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

3. Apply parking brake.



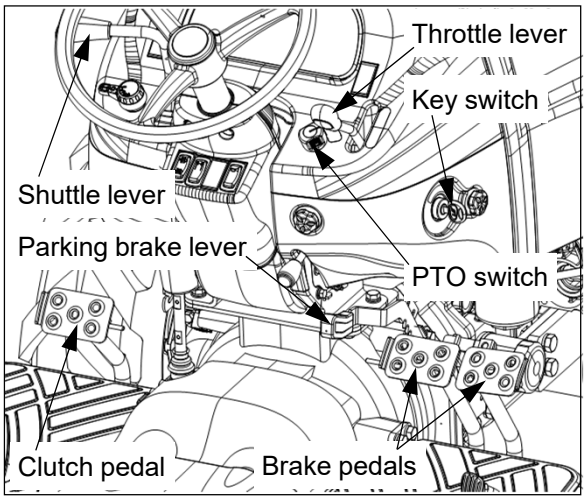
(4) Stopping tractor

Mechanical type

1. Press clutch and brake pedals. Place all the transmission gear levers in neutral and PTO switch to OFF and release the clutch pedal.

2. Lower implements to the ground and turn key switch to OFF position.

3. Apply parking brake and release brake pedals slowly.

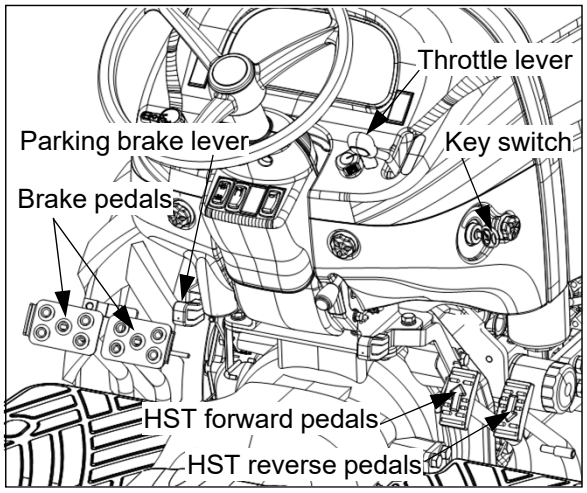


HST Type

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

2. Lower implements to the ground and turn key switch to OFF position..

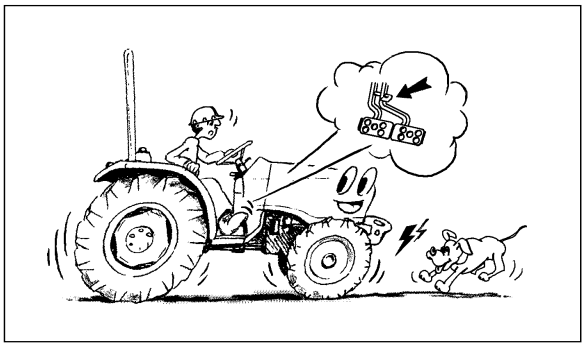
3. Apply parking brake and release brake pedals slowly.



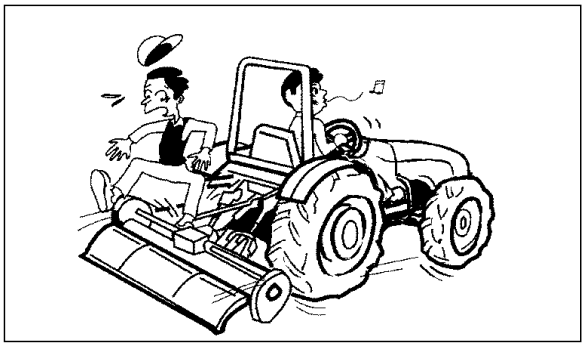
⚠Caution	▶ DO NOT depart from the tractor with the transmission gear placed in NEUTRAL and the parking brake is not applied. The tractor may move down. Apply parking brake at all times before leaving the tractor. ▶ Remove ignition key always after stopping engine.

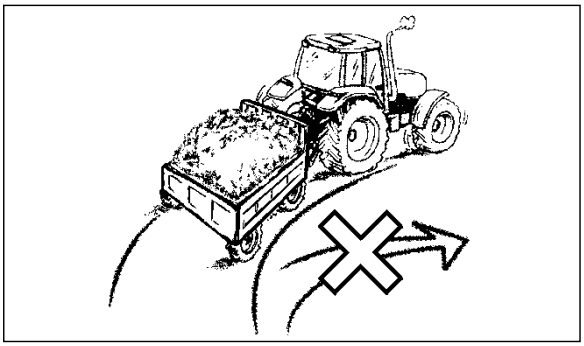
(5) Driving tractor on the road

- 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 ¾ rising position of full stroke for safety.)



DO NOT USE DIFF-LOCK

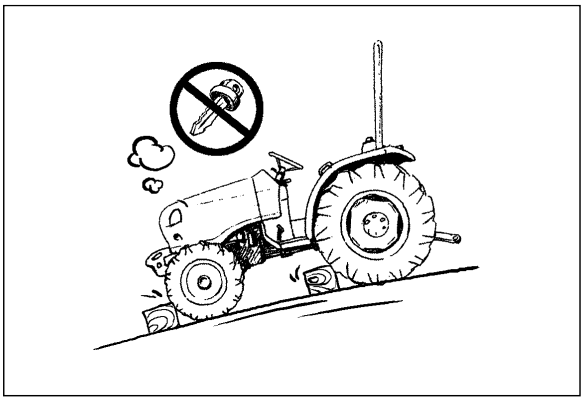




⚠Caution	▶ Connect left/right brake pedals with brake pedal connecting pin before driving. (if fitted). ▶ Avoid a sudden start, sudden brake and sudden turning. ▶ DO NOT allow people on the tractor or other implements. ▶ DO NOT place the baggage on the tractor or implement. ▶ Place PTO gear lever in neutral (if fitted) and put PTO switch in “OFF” position. ▶ DO NOT use differential lock pedal and move 4WD lever to “2WD” position. ▶ When traveling with implement on the 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

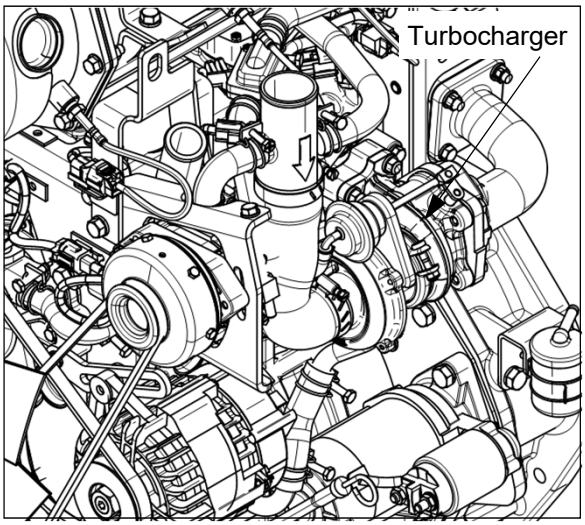
- Stop the tractor on a level surface, not a slope.
- Disengage PTO and place all the transmission shift levers in NEUTRAL position.
- Lower the mounted implements on the ground.
- Apply parking brake.
- Stop engine and remove ignition key.
- Before you leave the operator's station, wait for engine and all moving parts to stop.
- Have to apply the wheel chocks when parking the tractor on a slope unavoidably.



⚠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 all the gears in lowest speed and apply chocks or blocks to all the tires. - Mechanical : downward slope ⇒ reverse 1 gear / upward slope ⇒ forward 1 gear. - HST type : Apply the lowest gear of the range gear lever.

(7) Handling the Turbocharger (if fitted)

- Before accelerating or working the tractor fitted with the turbocharger, allow the engine to idle at 1000 rpm for about 30 seconds to ensure that the turbocharger is correctly lubricated.
- Before stopping engine fitted with the turbocharger, allow the engine to idle at low rpm for several minutes. This allows the turbocharger and manifold to cool, preventing deformation of the components.
- After stopping engine fitted with the turbocharger, cover the exhaust tail pipe to prevent the turbocharger rotating in the wind, resulting in possible damage to the bearings. The turbocharger turbine must be prevented from rotating freely with the engine off, as the shaft bearings will not be lubricated.

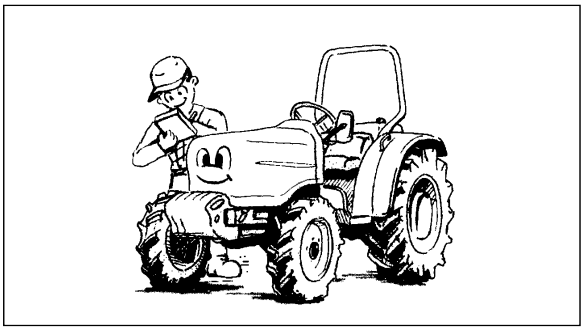


4-3. How to handle new tractor

(1) Check points

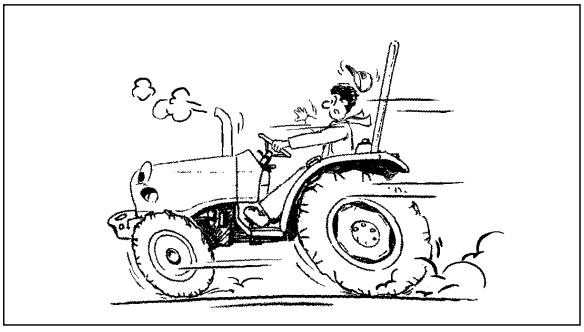
※ For new tractor, the following must be checked once again even though there was sufficient quality management, inspection, regulating of each part in the factory.

- 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

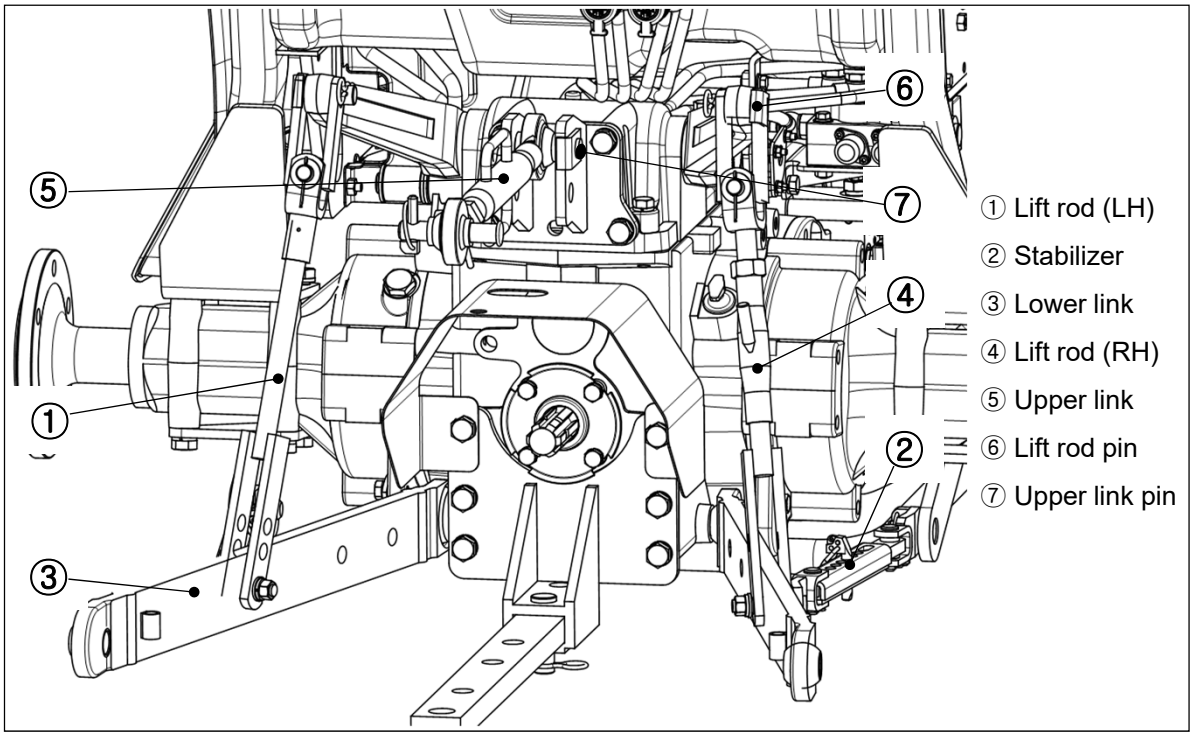
- To get the best performance, comply with the following instructions.
  - DO NOT start or stop the tractor suddenly.
  - DO NOT carry out heavy loaded work and DO NOT increase the engine rpm to high speed suddenly.
  - Despite warm temperature outside, carry out warming up the engine for approximately 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 5-4, “First 50 hour check” in this manual.
  - If possible, contact your authorized dealer for “First 50 hour check”.

4-4. Attaching Implement

(1) 3-point linkage

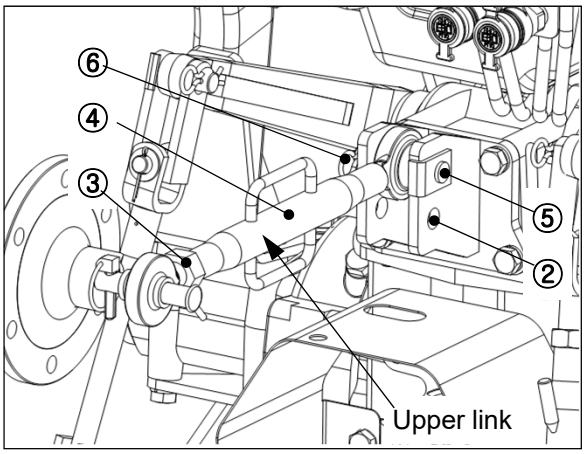


- When attaching the implement, comply with the followings.
  1. Set the implement upright on a level surface and approach the implement in reverse.
  2. Stop the tractor on attaching position and apply the parking brake.
  3. Connect the lower link(3) to implement and insert firmly the lock pin. (left, right)
  4. Connect the upper link(5) to implement and insert firmly the lock pin. Wide adjustable range of the upper link provides you easier attachment.
  5. Fix the implement firmly with stabilizer(2).(left, right).

⚠ Warning	▶ Before attaching/detaching implement, place PTO switch in OFF position and PTO gear lever (if fitted) in neutral position, and apply parking brake. ▶ When attaching/detaching implement, make 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 3-point linkage. If not, it may cause tipping or turnover. ▶ DO NOT connect implements that require more power than can be generated by your tractor. ▶ Never stand between implement and tractor when connecting implement. ▶ DO NOT change the setting pressure of the relief valve arbitrarily to increase the lift capacity of the 3-point linkage. It can cause fatal damage to the hydraulic system.

① Upper link installation and adjustment

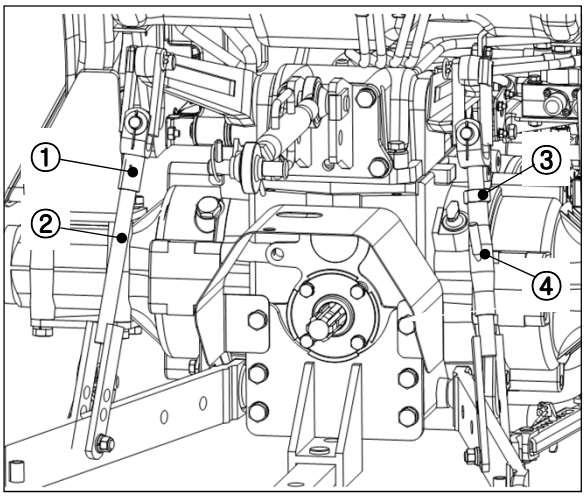
- Select the suitable attaching hole(2) depending on the implement.
- Adjust the length of the upper link by turning the sleeve(4) after releasing the locking nut (3).
- Fasten the locking nut (3).
- Adjustment range : 400~750mm (15.7~29.5 in)



Notice	▶ Insert the snap-pin(6) firmly to prevent the upper link pin(5) from being escaped.

② Adjustment of lift-rod (Left/Right)

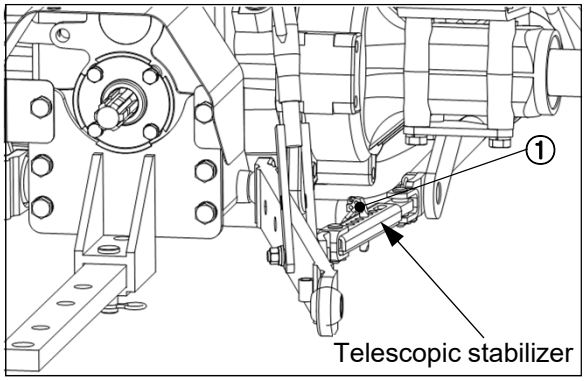
- For lift rod (LH), detach the upper side from the lift arm and adjust the length by turning the upper side (1).
  -Adjustment range : 492~502mm (19.4~19.8 in)
- For lift rod (RH), turn the handle(4) to the right to shorten the rod. If turning it to the left, the rod is elongated. After adjustment, tighten the locking nut(3).
  - Adjustment range : 445~538mm (17.5~21.2 in)
- If assembling the lower link to the upper hole of the lift rod, it can additionally shorten the length by 63mm(2.5 in).



③ Adjustment of stabilizer (optional)

- Telescopic type

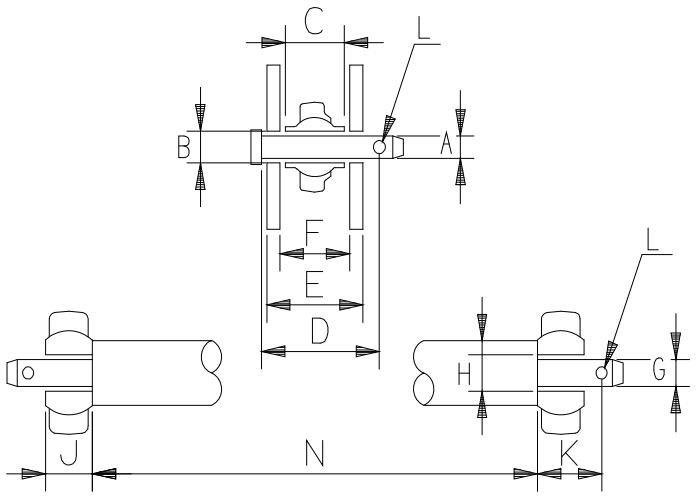
- Pull up the link pin(1) and find a suitable hole with adjusting the stabilizer's length.
- Insert the link pin(1) into the hole and let it tightened firmly by locking spring.



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.

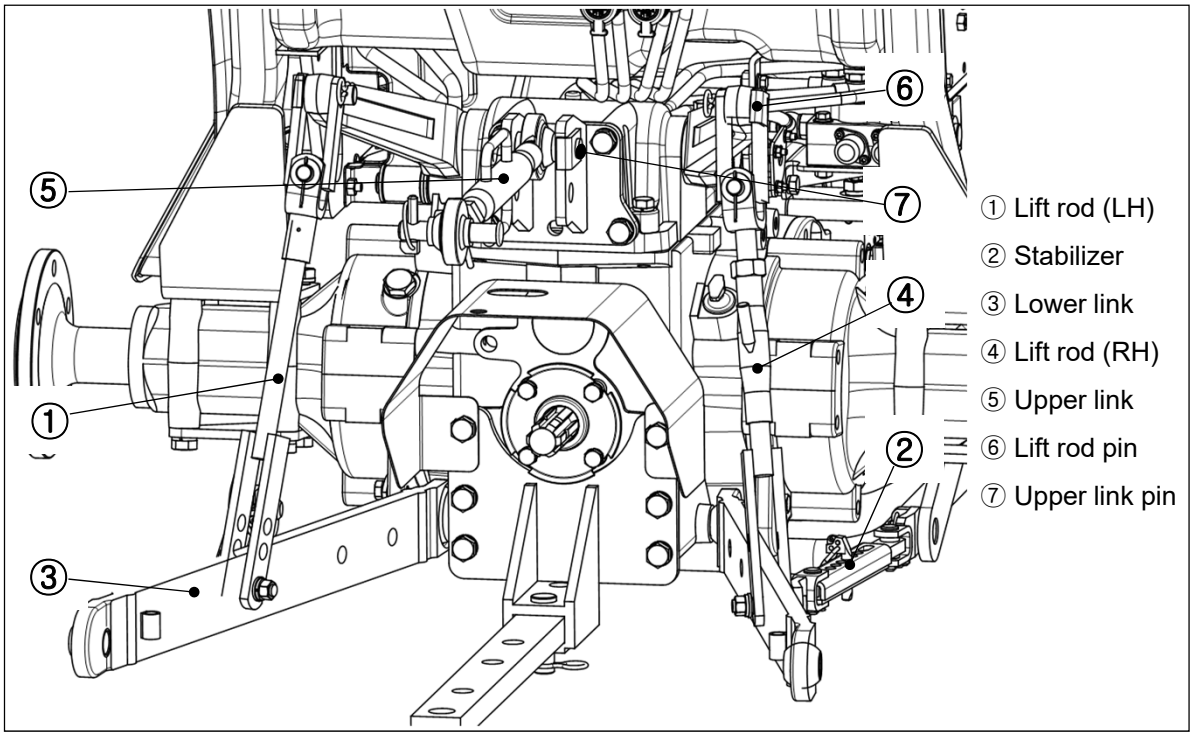
④ Reference of Implement installation part

	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)



Unit : mm
(unit : inch)

⑤ Handling of the 3-point linkage



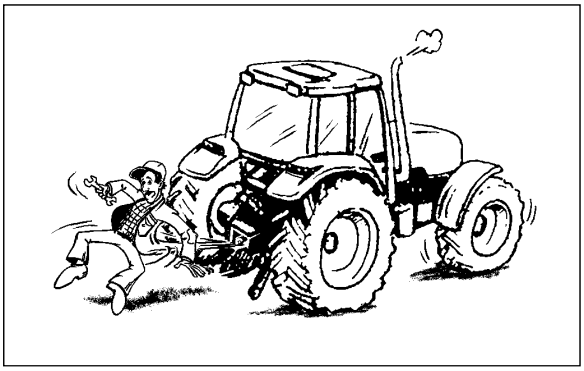
- When driving without attached implement, comply with the followings.
  1. Fix upper link(5) with the fixing hook.
  2. Connect stabilizer(2) to the lower link(3) to avoid the lateral movement of the lower link.
  3. Connect lower link strap to both lower links(3) (if fitted, chain type stabilizer only)

- 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.

(2) Power take-off (PTO) shaft

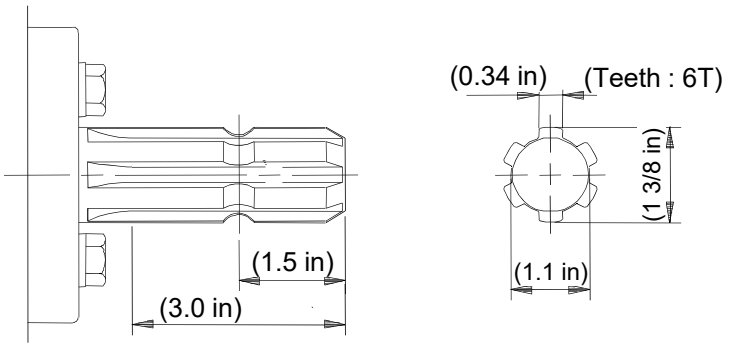
① Safety precautions

- When PTO shaft is rotating, NEVER APPROACH the shaft.
- Check if PTO shield is attached correctly. If the shield is removed or damaged, replace it with a new one.
- **Suitable Clothes & Protect Entanglement :** When checking or attaching implement to the PTO shaft, wear tight fitting clothes and safety equipment instead of loose or long clothes. Also, slippers, high heel shoes are not suitable. Wear the suitable clothes.

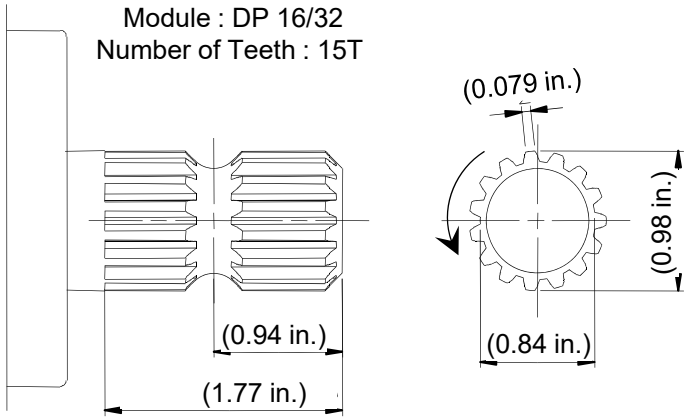


Warning 	▶ Do not approach the rotating shaft such as PTO shaft or cooling fan, especially, with loose clothing and long clothes. The entanglement in rotating shaft can cause serious injury or death. ▶ Stop the engine and be sure PTO shaft is stopped before getting near it.

② Specification and Dimension of the rear PTO shaft

PTO gear(s)	1
PTO / Engine speed	540 / 2509 rpm
Rotation direction	Clockwise (When looking at PTO shaft end)
Shaft dimension (Unit : inch)	

③ Specification and Dimension of the middle PTO shaft (optional)

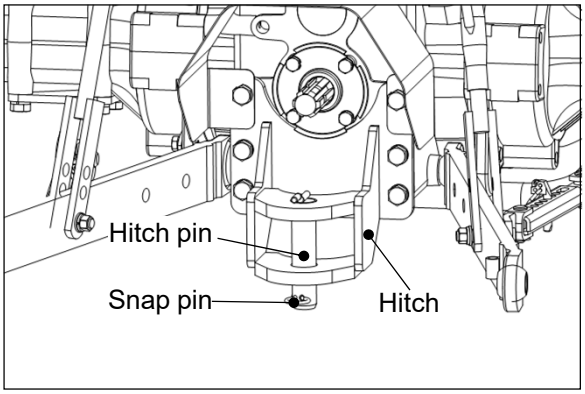
MID PTO	1 speed gear (15T)
PTO / Engine speed	2000 / 2545 rpm
Rotation direction	Counter clockwise (When looking at PTO shaft end)
Shaft dimension (Unit : inch)	

④ Attaching the PTO drive shaft

- When connecting PTO drive shaft to the PTO shaft and implement, make sure to check the fixing status of the locking pins.
- When attaching implements with power take-off drive shafts, refer to the drawings as below.
- After installing implements,
  - check the inclination of the PTO drive shaft,
  - check the interference with PTO safety cover and other structure,
  - check the effective engaging length of the PTO drive shaft according to the position of the 3-point linkage.
- The stiff inclination of the drive shaft makes a loud noise and may cause a failure of the driveline.

(3) 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 be overturned.
- Insert the hitch pin and snap pin correctly after attaching/detaching equipment.
- DO NOT exceed maximum permissible vertical and horizontal load as below.

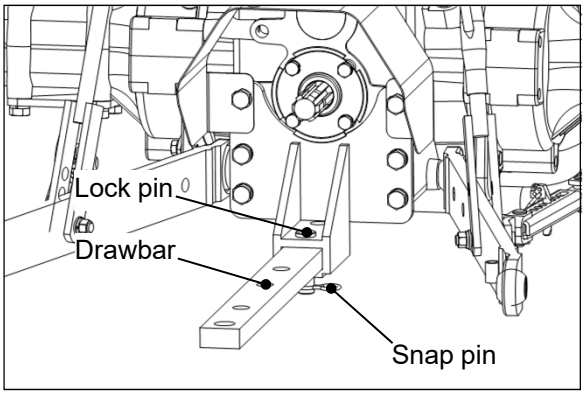


① Hitch

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

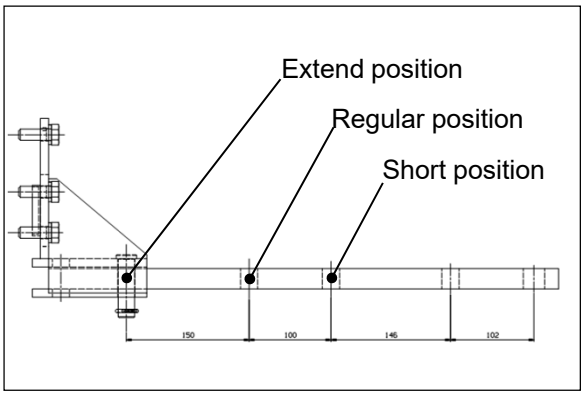
② Drawbar

- It is used to tow the equipments having 2 axles.
- It is available to adjust the length of the draw bar after removing snap pin and lock-pin in the right figure. After adjusting, assemble the pins firmly.
- Vertical load : 344kg(758 lb) (extend position)
  504kg(1111 lb) (regular position)
  730kg(1609 lb) (short position)
- Horizontal load : 2600kg (5732 lb)



- Technically permissible maximum towable mass(es) are as below .

	Hitch	Drawbar
Unbraked towable mass	1690kg (3726 lb)	1300kg (2866 lb)
Independently braked towable mass	3380kg (7452 lb)	2600kg (5732 lb)
Inertia-braked towable mass	3380kg (7452 lb)	2600kg (5732 lb)
Hydraulic or pneumatic braked towable mass	N/A	N/A



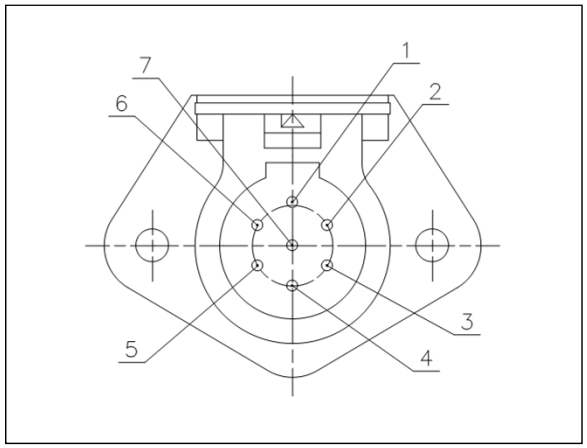
⚠ Caution	▶ Pulling from the tractor rear axle or any point above the axle may cause the tractor to overturn. Use always the drawbar or hitch for pulling work. ▶ Do not tow equipment without brakes, weighing more than twice the tractor weight. ▶ When locking the hitch or drawbar with pin after aligning 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.

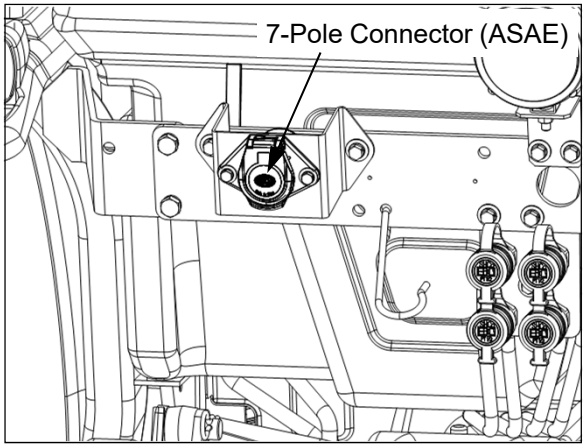
(4) 7-Pole connector (optional)

- 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;

● 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





(5) 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 the front loader, place the attached rear weight to the highest position and turn the down speed control knob to the “lock” position.
- **DO NOT exceed the total maximum permissible mass and/or permissible maximum mass on each axle** declared by manufacturer as below, **even if the load capacity of the tire is sufficient**.
- **If the load capacity of the tires is lower than maximum permissible mass on each axle,** the maximum mass on each axle must be loaded **under the load capacity of the tire.**
  Check the load capacity of the tires.

	All models	Remarks
Technically total maximum permissible mass	2508kg (5529 lb)	It may depend on the load capacity of the tires. (See next page)
Front axle (*)	1163kg (2564 lb)	
Rear axle	1755kg (3869 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 (*refer to the section 4-4-(7), “Adjusting wheel track and tire replacement” in this manual*), intermittent maximum permissible load of the front axle can be ;
  1732kg (3820 lb) for all models. Have to check the load capacity of the tires. (See next page).

⚠Caution	▶ 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. ▶ **Do not exceed the maximum permissible mass above and/or the load capacity of the tires.** Overloaded operation may invalidate the warranty. ▶ 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.

(6) Tires and Load capacity

Axle No. (*)	Tires	Standard tire air pressure (kg/cm2)	Load capacity (x2) (kg)	Maximum mass(es) (kg)
1	7-14 4PR	1.8 (180 KPa, 26 psi)	740 (1786 lb)	2495kg (5500 lb)
2	11.2-24 8PR	2.4 (240 KPa, 35 psi)	2470 (4894 lb)	
1	7-16 4PR	1.8 (180 KPa, 26 psi)	810 (1786 lb)	2508kg (5529 lb)
2	12.4-24 6PR	1.6 (160 KPa, 23 psi)	2400 (4806 lb)	
1	6-14 4PR	2.0 (200 KPa, 28 psi)	610 (1786 lb)	2365kg (5214 lb)
2	9.5-24 6PR	2.1 (210 KPa, 30 psi)	1880 (3505 lb)	
Optional Tire				
1	200/70R16	2.4 (240 KPa, 35 psi)	1340 (2954 lb)	2508kg (5529 lb)
2	320/70R24	1.6 (160 KPa, 23 psi)	2500 (5512 lb)	
1	240/70R16	2.4 (240 KPa, 35 psi)	1800 (3968 lb)	2508kg (5529 lb)
2	380/70R24	1.6 (160 KPa, 23 psi)	3300 (7275 lb)	
1	25x8.50-14-4PR	1.5 (150 KPa, 22 psi)	1198 (2641 lb)	2508kg (5529 lb)
2	41x14.00-20-4PR	1.8 (180 KPa, 25 psi)	2794 (6160 lb)	
1	25x8.50-14-6PR	3.5 (350 KPa, 50 psi)	1814 (3999 lb)	2508kg (5529 lb)
2	43x16.00-20-4PR	1.4 (140 KPa, 20 psi)	4118 (9079 lb)	

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

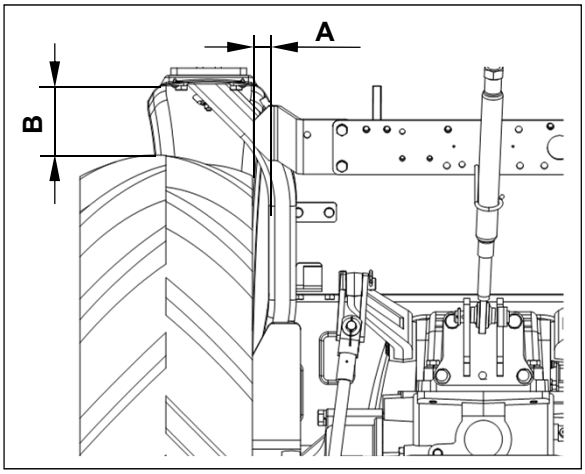
(7) Adjusting Wheel tracks and tire replacement

① Front wheel

- The rim and disk assembly of the front wheel is not adjustable type.
  See next page for the details.

② Rear wheel

- When altering 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)



- When refitting the wheels or/and rim disk, tighten the bolts and nuts to the following torques then check periodically as the instructions of section 5 in this manual.

  ① Rim-disk nuts (M16) : 220 ~ 270 N.m
  (163 ~ 199 lbf.ft)
  ② Wheel nuts (M16) : 216 ~ 245 N.m
  (159 ~ 181 lbf.ft)

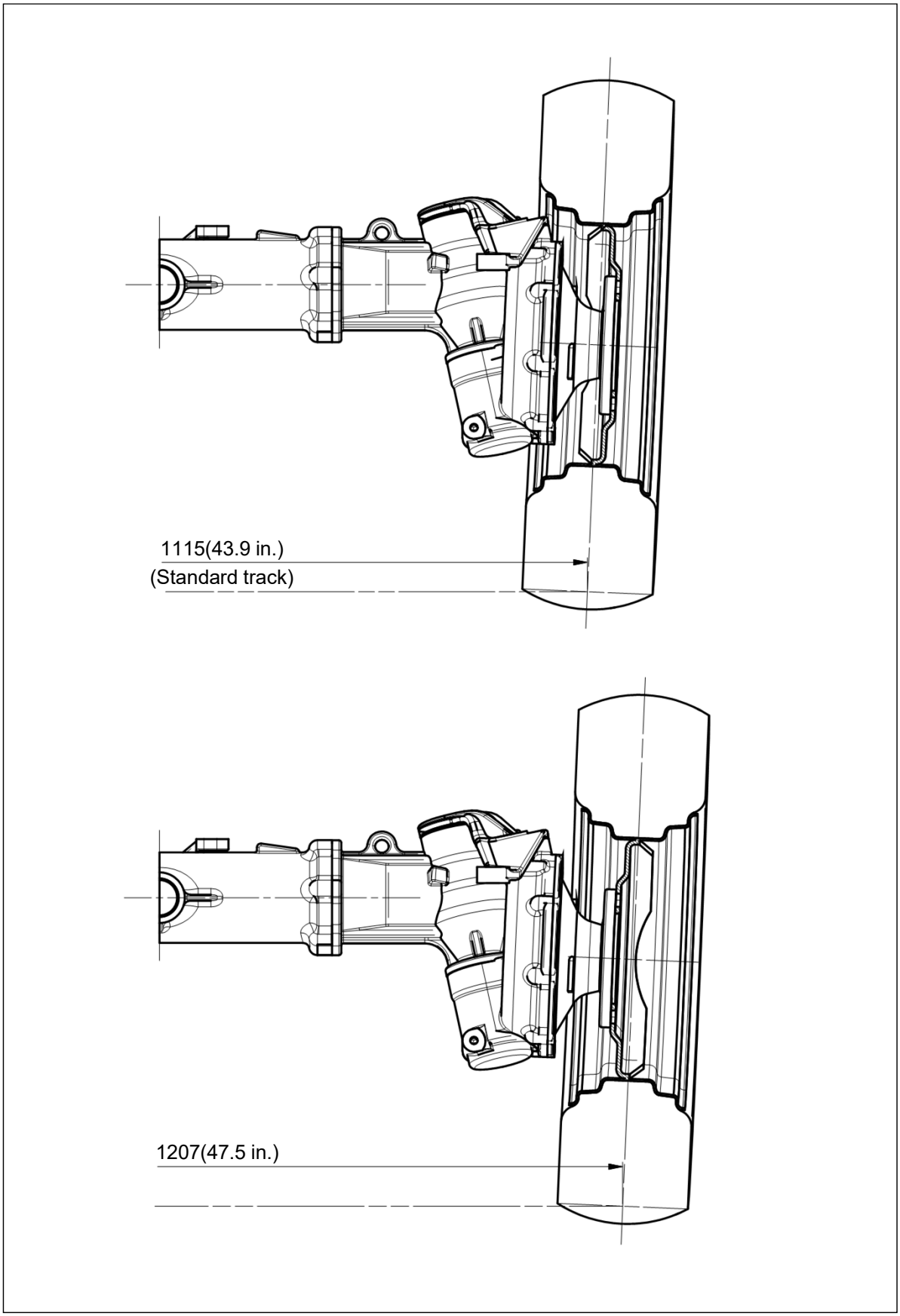
- The track widths in the following pages are only for specific wheels (7-14 4PR / 11.2-24 8PR) and may vary by depending on tire size.

⚠ Warning	▶ The tractor wheels are very heavy, BE CAREFUL. ▶ When removing the wheels, proceed with extreme caution, use a suitable hoist and specific equipment to move the heavy parts.

Notice	▶ When adjusting the wheel track, pay attention to the direction of tire lugs. If it shows **"/\" shape** when looked behind, it is correct. ▶ **Actual settings may vary depending on the brand of the rim and type of tire.**

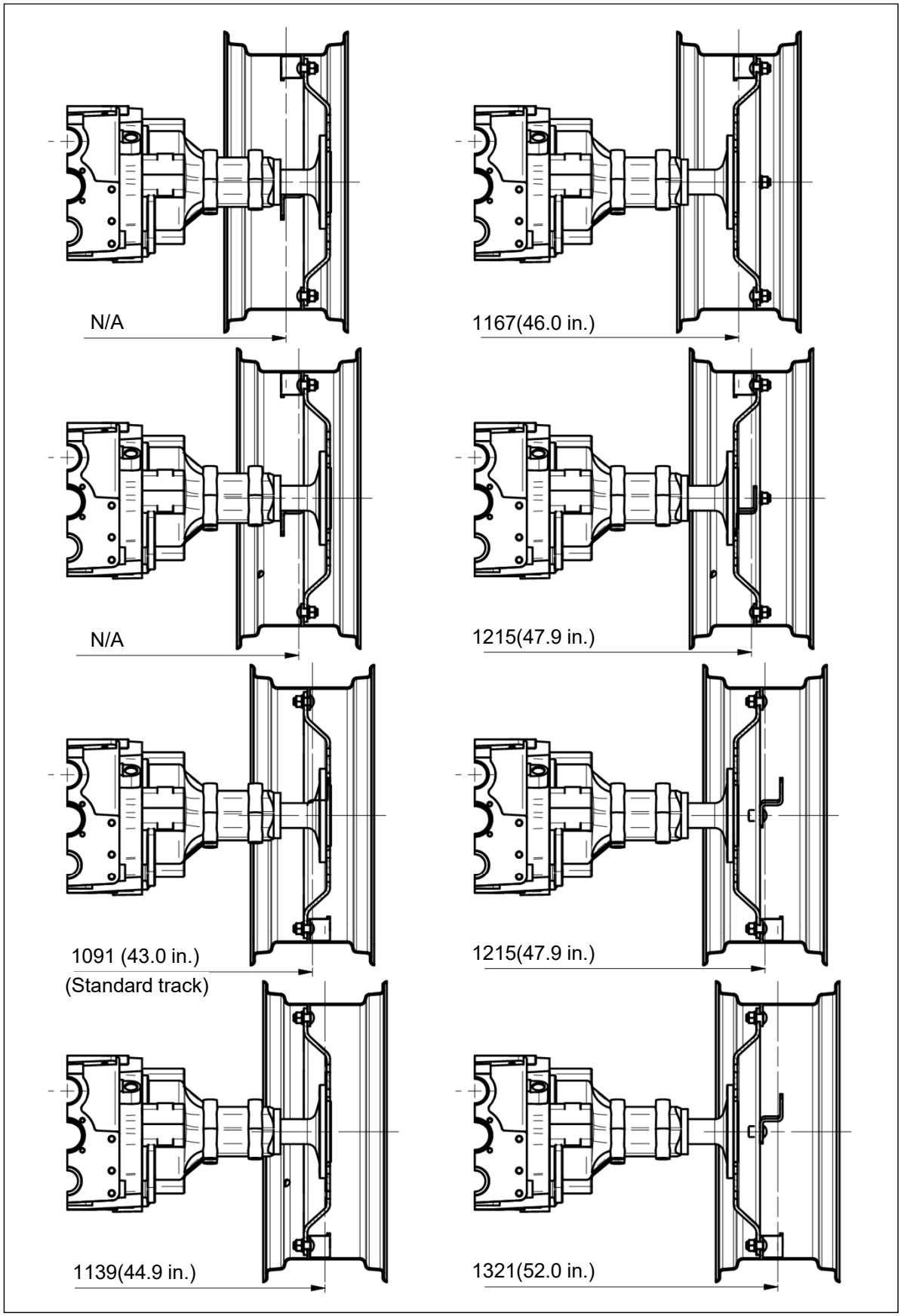
① Front wheel track – 7-14 4PR with rim & disk (W5x14)

Unit : mm (inch)



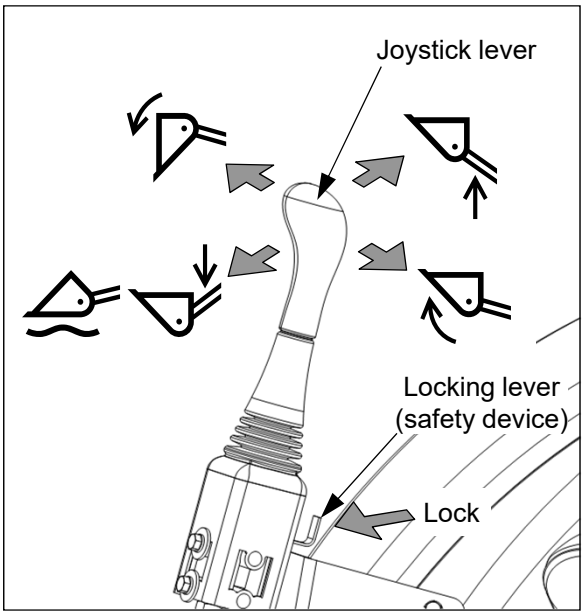
② Rear wheel track - 11.2-24 8PR with rim & disk (W10x24)

Unit : mm (inch)



(8) Using Front-end loader (optional)

① Safety precautions



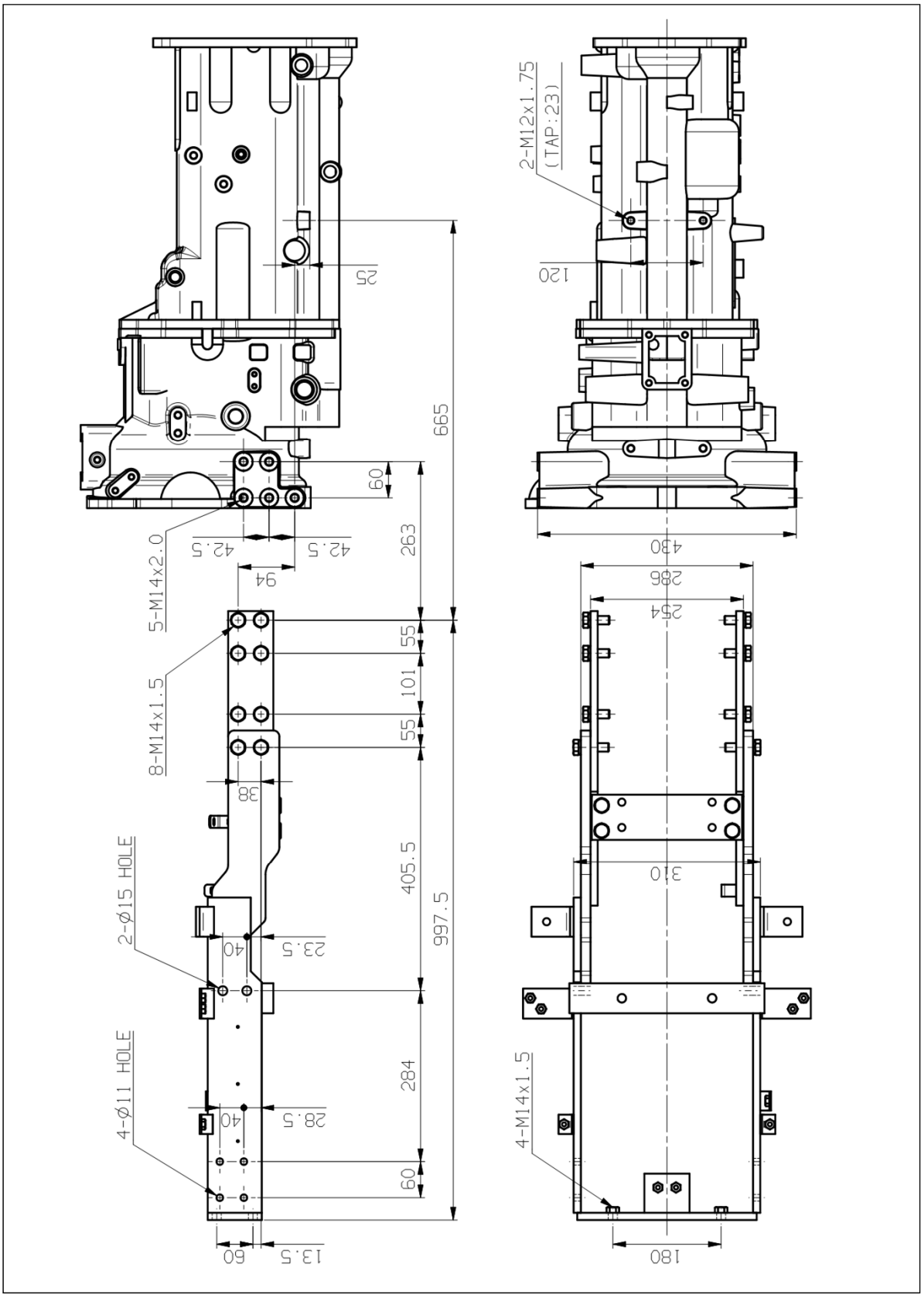
- Multi-functional joystick lever provides you more convenient operation for front-end loader.
- When operating the tractor with front-end loader, the center of gravity of the tractor may be higher, and the stability of the vehicle may be worse than unattached vehicle.
  -. DO NOT drive fast on a traffic load. The rolling or tipping of the tractor can be happened easily.
  -. When loading/unloading the bucket on a slope, move the tractor straight against the slope.
  -. DO NOT try to approach a stiff slope.
  -. Attach the ballast weight on the 3-point linkage to prevent the overload of the front axle, and to improve the stability of the vehicle.
- When working with front-end loader, the front visibility of the tractor may be worse than unattached vehicle. Have to observe people and other vehicles around the tractor.
- DO NOT allow people to pass under the front-end loader.
- DO NOT allow people on the bucket.

⚠Warning	▶After using the front-end loader, lock the joystick lever to prevent the accident. (if fitted) ▶When leaving the tractor, lower down the front-end loader on the ground.

⚠Warning	▶Have to strictly observe the following precautions; - Do not lift the front-end loader to a height from which objects may fall or roll onto the driver. - Use always the correct attachment (grab forks, buckets.. etc) for the specific task to perform and ensure that the load is securely kept in place.

② Attaching points for Front-end loader

- When attaching the front-end loader, refer to the drawings as below.



(9) Adjusting Steering Angle

① 4WD models

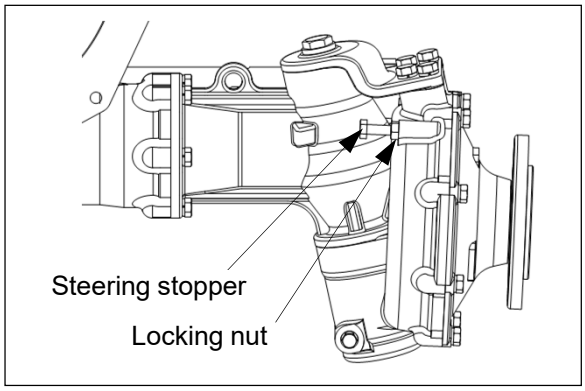
- If the front wheel track is altered or front tires are replaced with bigger ones than current specifications, or in case that a front equipment is attached, the steering angle must be checked and/ or adjusted as required.

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 (0.8in.) 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 at maximum steering condition, it can damage the steering cylinder or tie-rod.

(10) Recommended Maximum Specification of Implements

- When attaching implements to the tractor, refer to the followings recommended as maximum specification of each implement. DO NOT attach bigger implements than this specification. For other implements, contact your authorized local dealer.

No.	Implements	Specification	XG3032	XG3037
1	Trailer (with 4-wheel)	Max volume	3.0 m³ (105 ft³)	
2	Trailer (with 2-wheel)	Max vertical load	See section 4-4-(3) in this manual	
3	Mid mower	Max cutting width	1676 mm (66 in.)	
4	Rear mounted mower	Max cutting width	1676 mm (66 in.)	
5	Flail Mower	Max cutting width	1500 mm (59 in.)	
6	Sickle Bar	Max cutting width	1676 mm (66 in.)	
7	Rear mounted Sprayer	Max tank capacity	-	
8	Pull type Sprayer	Max tank capacity	-	
9	Rotary Tiller	Max tilling width	1520 mm (59.0 in.)	1600 mm (63 in.)
10	Bottom Plow	Max size	1250 mm (49 in.)	
11	Disk harrow (pull type)	Max working width	-	
12	Manure Spreader	Max volume	2.5 m³ (88 ft³)	
13	Front blade	Max working width	1660 mm (65 in.)	
14	Rear blade	Max working width	1524 mm (60 in.)	
15	Front loader	Max lift capacity (Bucket pivot point)	990 kg (2182 lb)	
16	Landscape Rake	Max working width	1829 mm (72 in.)	
17	Box blade	Max working width	1372 mm (54 in.)	
18	Backhoe	Max weight (W/O Bucket)	470 kg (1036 lbs)	
19	Snow Blade	Max. width	1600 mm (63 in.)	
20	Snow Blower	Max. working width	1727 mm (68 in.)	

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

Front tire : 7-14 4PR, Rear tire : 11.2-24 8PR

Range gear	1				2				3			
Main gear	1	2	3	4	1	2	3	4	1	2	3	4
Forward	1.18 (0.74)	1.73 (1.07)	2.24 (1.39)	2.76 (1.72)	3.23 (2.01)	4.71 (2.93)	6.12 (3.80)	7.54 (4.68)	9.89 (6.14)	14.42 (8.95)	18.71 (11.61)	23.07 (14.33)
Reverse	1.13 (0.70)	1.64 (1.02)	2.13 (1.32)	2.63 (1.63)	3.07 (1.91)	4.48 (2.78)	5.81 (3.61)	7.17 (4.46)	9.40 (5.84)	13.71 (8.52)	17.78 (11.05)	21.93 (13.63)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 526mm (20.7 in.)

HST Type

Front tire : 7-14 4PR, Rear tire : 11.2-24 8PR

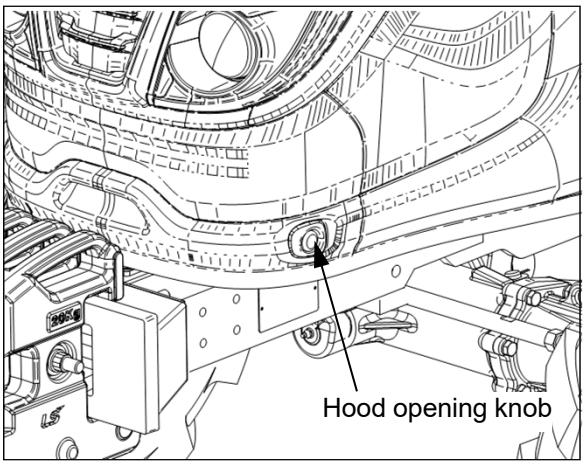
Range gear	1	2	3
Forward	0~5.23 (0~3.25)	0~10.69 (0~6.64)	0~24.07 (0~14.96)
Reverse	0~5.23 (0~3.25)	0~10.69 (0~6.64)	0~24.07 (0~14.96)

Note) Engine rated speed : 2600 rev/min, Dynamic load radius : 526mm (20.7 in.)

5. Lubrication and Maintenance

5-1. Access for maintenance

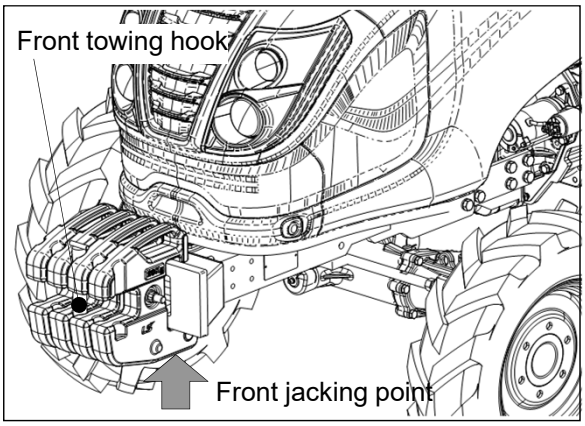
① Opening Hood



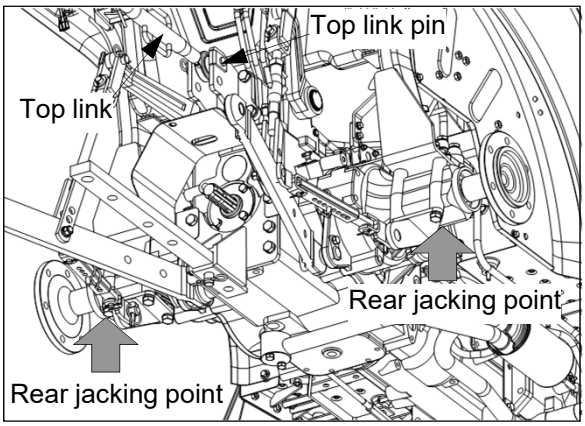
- For safety, the hood must be closed and correctly latched before operating the tractor.
- The hood is hinged at the rear and a gas cylinder is attached to provide easy access to the engine for check and maintenance.
- To open the hood, push hood opening knob and lift the hood up.
- To close the hood,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

② Jacking points



- The jacking points for maintenance is depending on serviced parts case by case. Do not hesitate to contact your authorized dealer for asking.
- Do not use the front axle assembly or steering linkage and cylinder for jacking point. These components have some rotating pivots and/or does not have enough structural strength.
- For general maintenance, use flat surface under the engine frame end or bumper for jacking point, and connect additionally hoist to the front towing hook for safety.

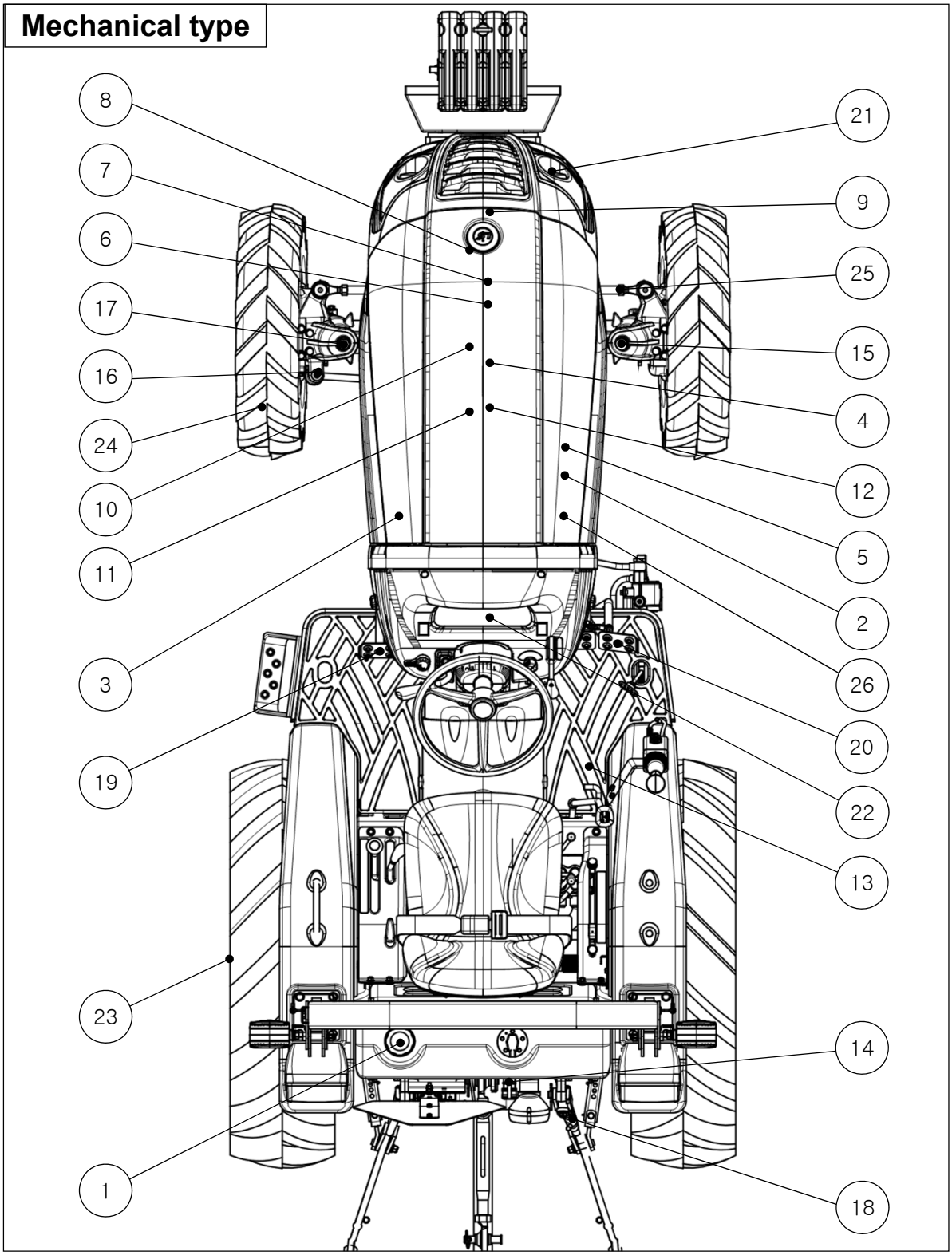


- For rear jacking points, flat surface under the rear axle housing is recommended, and additionally use the top-link bracket and its pin for lifting point after removing the top-link.

⚠Caution	▶ When lifting the rear of the tractor, apply chocks to the slots between front axle and engine frame symmetrically to prevent the rolling of the front axle.

5-2. Maintenance chart

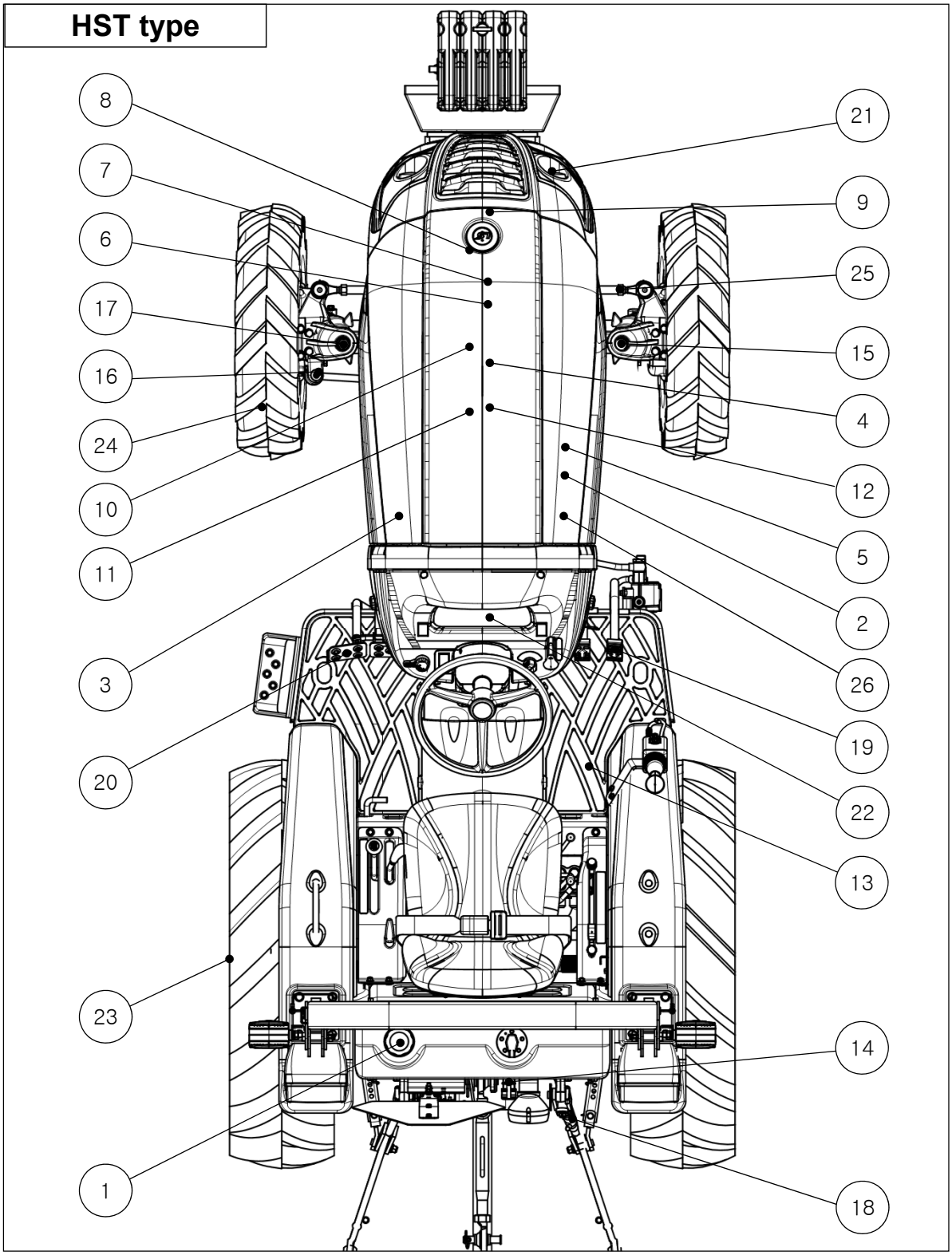
- Periodic maintenance not only extends the service life of the tractor but also serves to ensure safe operation. **The maintenance chart shows the standard service intervals. If you notice any abnormal symptoms, make sure to carry out the inspection and maintenance work, regardless of recommended service intervals** in this maintenance chart.
- Appropriate service intervals vary depending on the usage and operating conditions. In extreme dusty/dirty environments, the service intervals have to be shorter than normal condition.



No.	Checking Parts	Page No.	Check period (hr)						
			Daily	50	100	250	300	500	2-yr
1	Fuel tank	5-10	▲						
2	Fuel filter	5-25						●	
3	Fuel pre-filter	5-7, 5-19, 5-23		★	▲		●		
4	Engine oil	5-7, 5-9, 5-20	▲	★		●			
5	Engine oil filter	5-7, 5-20		★		●			
6	Engine coolant	5-12, 5-26	▲						●
7	Radiator screen	5-13, 5-17	▲	■					
8	Air cleaner	5-12, 5-18, 5-23	▲	■		●			
9	Battery	5-18		▲					
10	Engine belt tension	5-22	▲			●			
11	Valve clearance	5-25						▲	
12	Nozzle injection pressure	5-25						▲	
13	Hydraulic oil filter	5-7, 5-21		★		●			
14	Transmission oil	5-18, 5-24		▲				●	
15	Front axle oil	5-18, 5-24		▲				●	
16	Steering cylinder	5-17		▲					
17	Front axle holder & Steering arm	5-17		▲					
18	3-Point linkage	5-17		▲					
19	Clutch pedal play	5-14	▲						
20	Brake pedal play	5-15	▲						
21	Turn signal lights, Lights, Horn	5-11	▲						
22	Instrument panel & Indicators	5-10	▲						
23	Bolts and Nuts	5-14	▲						
24	Tire air pressure	5-13	▲						
25	Toe-in	5-22				▲			
26	Hydraulic hoses	5-18		▲					

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

- Periodic maintenance not only extends the service life of the tractor but also serves to ensure safe operation. **The maintenance chart shows the standard service intervals. If you notice any abnormal symptoms, make sure to carry out the inspection and maintenance work, regardless of recommended service intervals** in this maintenance chart.
- Appropriate service intervals vary depending on the usage and operating conditions. In extreme dusty/dirty environments, the service intervals have to be shorter than normal condition.



No.	Checking Parts	Page No.	Check period (hr)						
			Daily	50	100	250	300	500	2-yr
1	Fuel tank	5-10	▲						
2	Fuel filter	5-25						●	
3	Fuel pre-filter	5-7, 5-19, 5-23		★	▲		●		
4	Engine oil	5-7, 5-9, 5-20	▲	★		●			
5	Engine oil filter	5-7, 5-20		★		●			
6	Engine coolant	5-12, 5-26	▲						●
7	Radiator screen	5-13, 5-17	▲	■					
8	Air cleaner	5-12, 5-18, 5-23	▲	■		●			
9	Battery	5-18		▲					
10	Engine belt tension	5-22	▲			●			
11	Valve clearance	5-25						▲	
12	Nozzle injection pressure	5-25						▲	
13	Hyd. oil filter & HST filter	5-7, 5-21		★		●			
14	Transmission oil	5-18, 5-24		▲				●	
15	Front axle oil	5-18, 5-24		▲				●	
16	Steering cylinder	5-17		▲					
17	Front axle holder & Steering arm	5-17		▲					
18	3-Point linkage	5-17		▲					
19	HST Pedal Neutral state	5-16	▲						
20	Brake pedal play	5-15	▲						
21	Turn signal lights, Lights, Horn	5-11	▲						
22	Instrument panel & Indicators	5-10	▲						
23	Bolts and Nuts	5-14	▲						
24	Tire air pressure	5-13	▲						
25	Toe-in	5-22				▲			
26	Hydraulic hoses	5-18		▲					

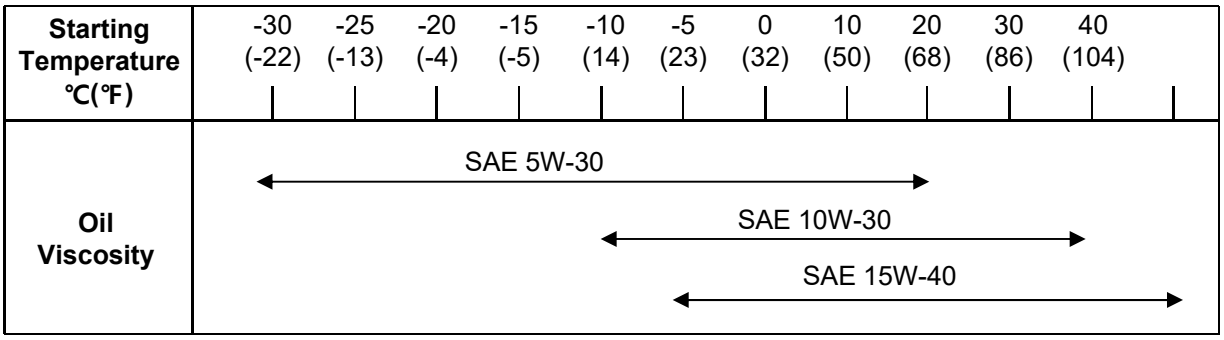
★ First Replacement ● Replacement ▲ Check, Adjustment and Supply ■ Clean up

5-3. Lubricants and Capacity

Lubricants	Capacity	International Standard	Recommended products
Engine coolant (Radiator)	**5.1 L** (1.3U.S.gals.)	ASTM D5216	Soft water (50%) + Anti-freeze (50%)
Fuel	**28 L** (7.4 U.S.gals.)	ASTM D975 No.2	Ultra low sulfur diesel fuel
Engine oil (Crank case)	**4.0 L** (1.1U.S.gals.)	API CJ-4 (~ -10℃ : SAE 5W-30 -10℃ ~ 40℃ : SAE 10W-30 40℃ ~ : SAE 15W-40)	KIXX DL (Manufacturer : GS Caltex)
Transmission oil (common use for hydraulic lift and steering system)	**32 L** (8.5 U.S.gals.)	API GL4 ISO VG 46/68	LSTH570 (Manufacturer : GS Caltex or S-OIL TOTAL Co. Ltd.)
Front axle oil	**6.5 L** (1.7 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	

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. Contact your authorized local dealer.



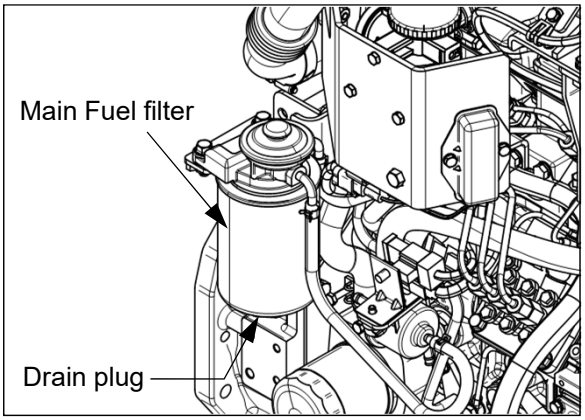
5-4. First 50 hour check

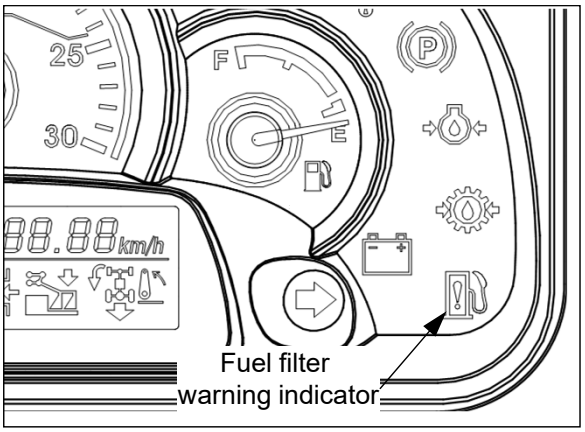
- After using first 50 hours, contact your authorized dealer for maintenance if possible.
  - Replace engine oil & engine oil filter. (⇒ Refer to Every 250 hour check.)
  - Replace hydraulic oil filter. (⇒ Refer to Every 500 hour check.)
  - Replace fuel pre-filter. (⇒ Refer to Every 300 hour check.)
  - 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. (Where fitted)
  - Check torque of wheel bolts and nuts.
  - Check tire pressures and condition.
  - Clean radiator, oil cooler and A/C condenser cores.(Where fitted)
  - Check radiator coolant level and specific gravity.
  - Check clutch pedal free play. (Mechanical synchro-shuttle models)
  - 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

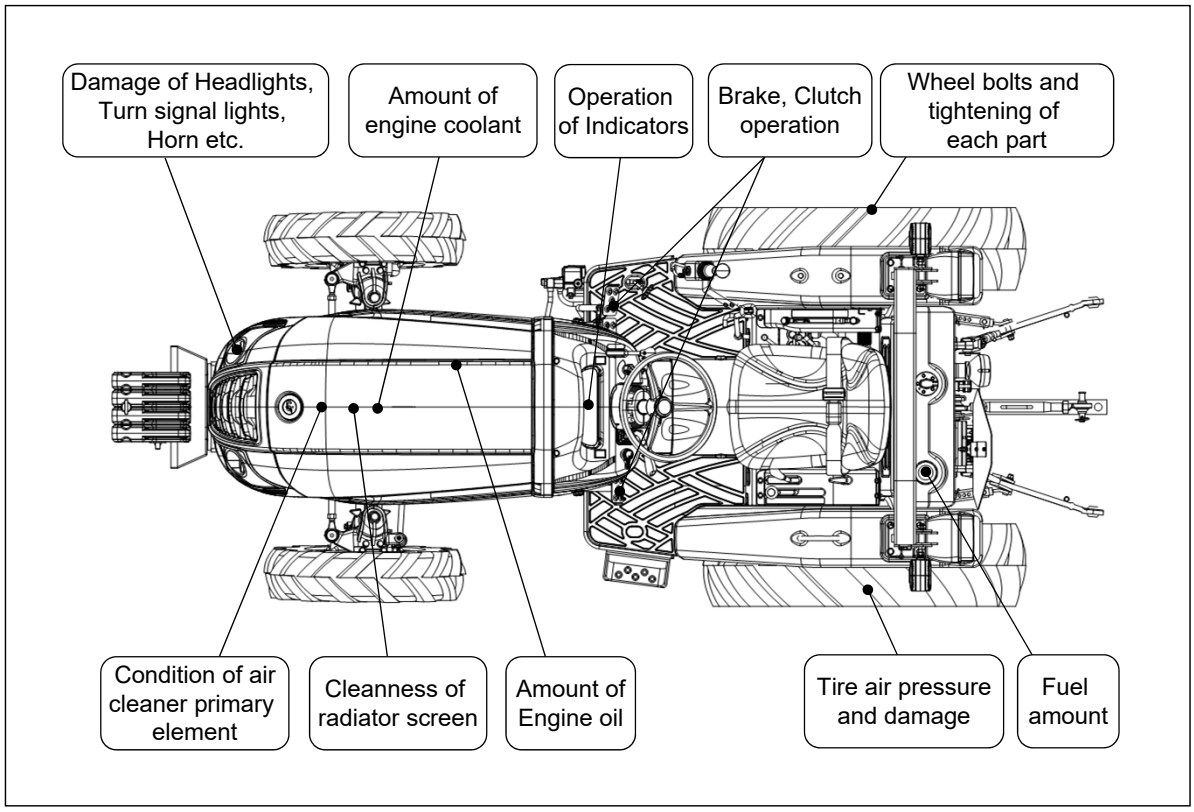
1. Loosen the drain plug and drain water inside of the filter. (Approx. 150cc(9.1 in³))
2. Tighten the drain plug and bleed the air from the fuel filter.
   (*See section 5-13-(1), "Air-bleeding from fuel system" in this manual)*





5-6. Check before starting (Daily check)

- Check the following check points before using to avoid a failure.



(1) Engine oil

- **Oil specification and capacity :**
  See section 5-3, "Lubricants and Capacity" or the last page in this manual.

- **Using engine oil**
  Select engine oil depending on the temperature as shown in the right table.

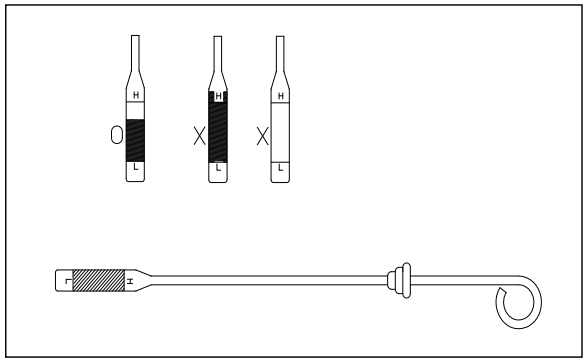
Temperature	Lubricant No.
Below -10℃ (Below 14℉)	SAE 5W-30
-10℃ ~ 40℃ (14℉ ~ 104℉)	SAE 10W-30
Above 40℃ (Above 104℉)	SAE 15W-40

- **Checking oil level**

  - Check oil level before starting engine or at 5 minutes later after stopping engine.

  - Check if the oil is between MAX and MIN mark of the oil gauge. If necessary, add new oil.

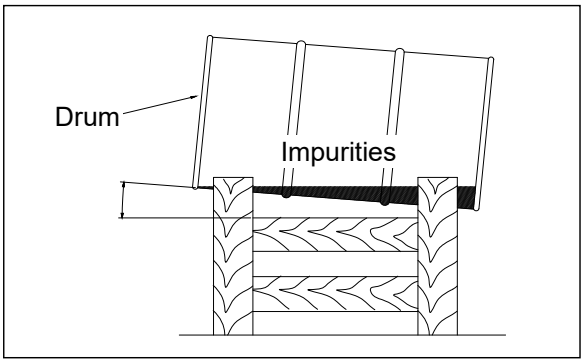
  - It must only be performed while the engine is stopped.



(2) Fuel tank

① Fuel specification and capacity :

- *See section 5-3, "Lubricants and Capacity" or the last page in this manual.*



② Storing Fuel

- 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 right 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°C(5℉), it is advised to mix diesel with kerosene as shown on the right.

Temp.	≥ -15℃ (5℉)	≤-15℃ (5℉)
Fuel	100% Diesel fuel for winter	20% kerosene added

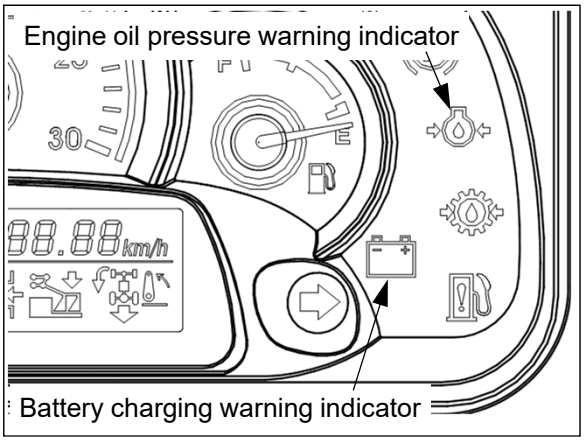
④ Checking fuel level

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

Notice	▶ If the engine stops after finishing work, fill the tank fully. As the temperature drops down, the humidity in the fuel tank is condensed and may mix with the fuel.

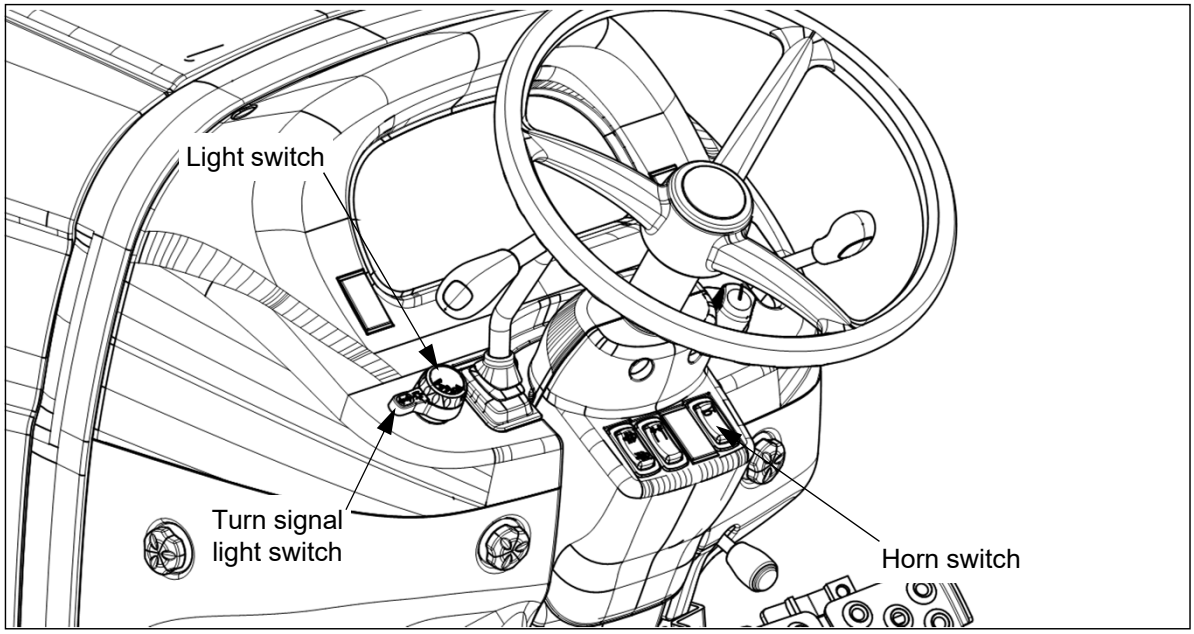
(3) Instrument panel & Indicators

- Check if the indicators are normally turned on/off before starting engine or while operating engine frequently and periodically.
- If the engine oil pressure warning indicator and battery charging warning indicator are turned on while the engine is running, stop the engine immediately and check the engine lubrication system and battery charging system. If possible, contact your authorized local dealer for check.



(4) Turn signal lights, Lights and Horn

● Check the operation status of light, turn signal lights, horn etc.



● If the light is OFF suddenly when operating the switch, check the problems as followings.

1. Check the relating fuse in the fuse box.
2. Check the light bulb. If necessary, replace it by a new one as referring to below.

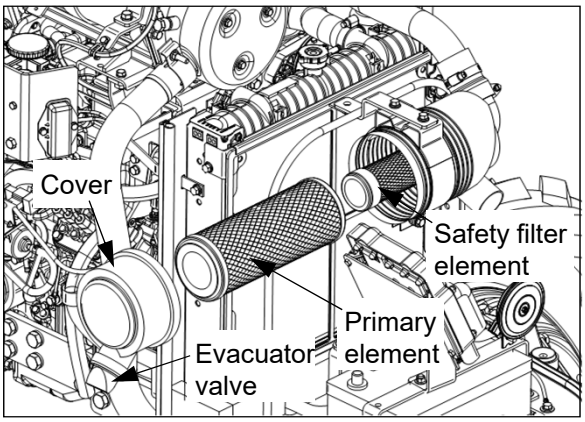
Illumination lights	Light bulb specification
Head lights (Low beam / High beam)	12V 55W / 60W
Turn signal lights (front)	12V 21W
Side lights(front)	12V 10W
Turn signal lights (rear)	12V 10W
Brake lights / Tail lights(rear)	12V 21W / 5W
Work lights	12V27W (Grille) / 27W (Roll-bar)
Indoor light	N/A
Instrument panel lights and indicators	LED

Notice	▶ Use the bulb of rated capacity. ▶ In case of using the improper bulb, it may cause a failure of electric system.

(5) Engine coolant

- *See section 5-12-(1), Replacement of engine coolant" in this manual.*

(6) Air cleaner (Dry type)

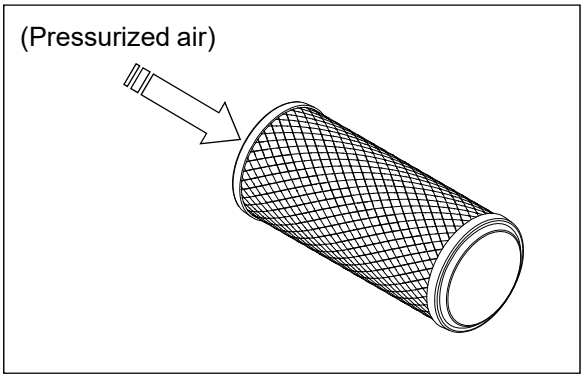


① Cleaning filter element

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

Notice	▶ Do not tap the element on a hard place when cleaning. ▶ If the element is cracked, change it with new one.

- 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 to remove the dust and foreign materials. And clean inside the filter element with a clean damp cloth.



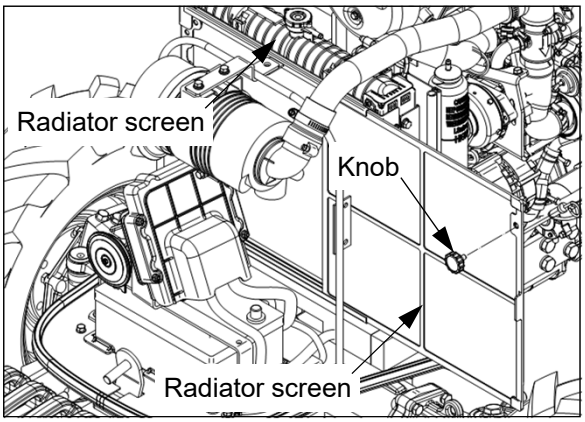
Notice	▶ Do not assemble a wet filter element. ▶ Do not dry the wet filter element by using the compressed air. ▶ Do not start the engine if air filter element is not assembled.

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

(7) Cleaning of Radiator and Radiator screen

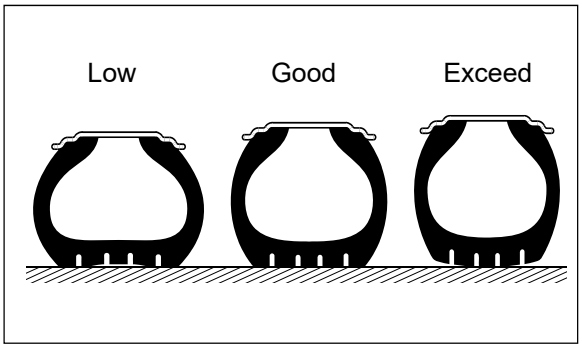


- Remove dust or dry grass stuck to the radiator or radiator screen daily.
- Loosen the knob and pull radiator screen outside.
- When cleaning the radiator with water, let water flow from the fan side.

⚠ Caution	▶ If there are lots of dry grasses and dusts stuck to the radiator and radiator screen, the cooling efficiency will be reduced and the engine may be overheated. ▶ Clean the radiator only while the engine is stopped.

(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.

⚠ Caution	▶ 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. ▶ When checking tire pressures, keep the body away from the valve mechanism or cap. ▶ The tire pressures vary depending on the load weighing on the axles.

② Standard air pressure - *See section 4-4-(6), “Tires and Load capacity” in this manual.*

(9) Tightening state of bolts and nuts of each part

- Check if the bolts or nuts of each part are loosened. If necessary, tighten it again as referring to the following table.
- Especially, check the bolts and nuts of the tires before starting engine, if necessary, tighten them.

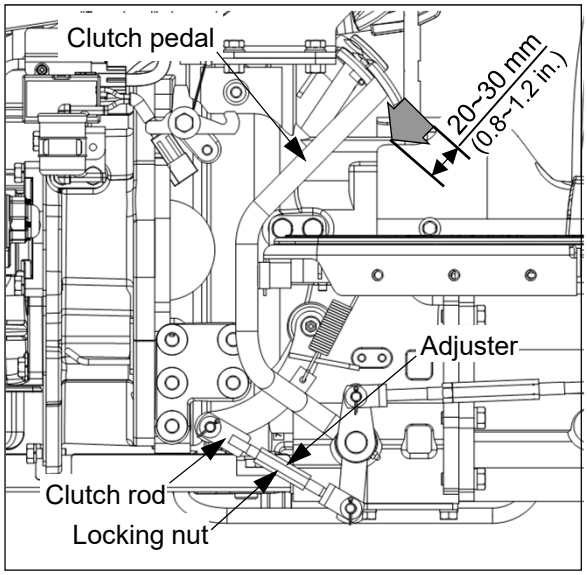
※ Tightening torques for general maintenance

	Strength classification								
	4T			8T			10.9T		
									
	N.m	kgf.m	lbf.ft	N.m	kgf.m	lbf.ft	N.m	kgf.m	lbf.ft
M6	4.9~6.9	0.5~0.7	3.6~5.1	11.8~13.7	1.2~1.4	8.7~10.1	14.7~16.7	1.5~1.7	10.8~12.3
M8	11.8~16.7	1.2~1.7	8.7~12.3	29.4~34.3	3.0~3.5	21.7~25.3	36.3~41.2	3.7~4.2	26.8~30.4
M10	20.6~29.4	2.1~3.0	15.2~21.7	49.0~53.9	5.0~5.5	36.2~39.8	72.6~82.4	7.4~8.4	53.5~60.8
M12	44.1~53.9	4.5~5.5	32.5~39.8	93.2~108	9.5~11.0	68.7~79.6	123~137	12.5~14.0	90.4~101
M14	63.7~78.5	6.5~8.0	47.0~57.9	132~147	13.5~15.0	97.6~108	206~226	21.0~23.0	152~166
M16	88.3~108	9.0~11.0	65.1~79.6	177~196	18.0~20.0	130~145	314~343	32.0~35.0	231~253
M18	118~137	12.0~14.0	86.8~101	245~275	25.0~28.0	180~203	441~471	45.0~48.0	325~347

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

- Check the distance of clutch pedal play.
- **Normal distance : 20~30mm (0.8~1.2 in.)**
  If the distance is over **30mm (1.2 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.

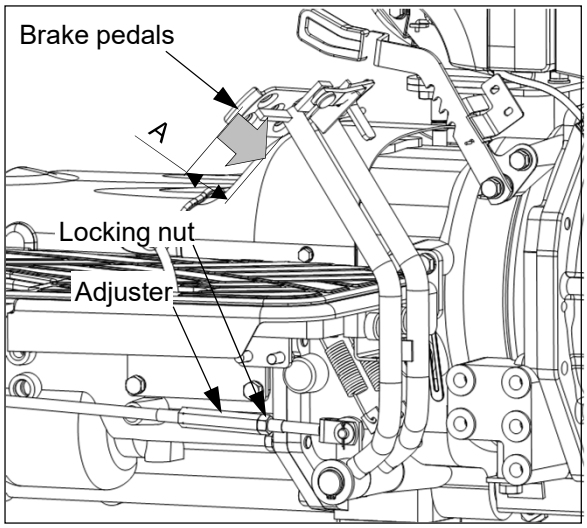


(11) Adjustment of Brake pedal play

● Check the distance of brake pedal play (A).

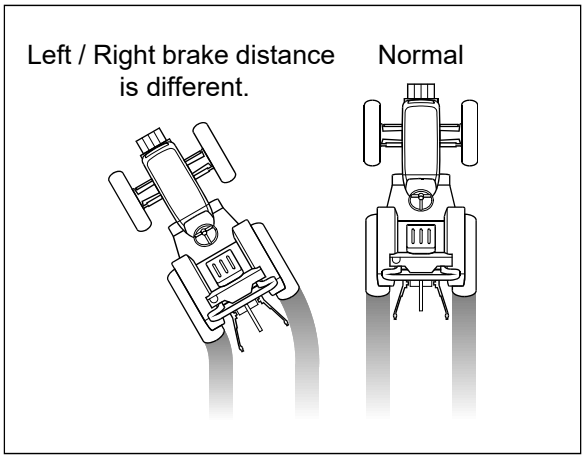
● **Normal distance : 50~60mm. (2.0~2.4 in.)**
If the pedal play distance is over **60mm (2.4 in.),** adjust it as below.

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

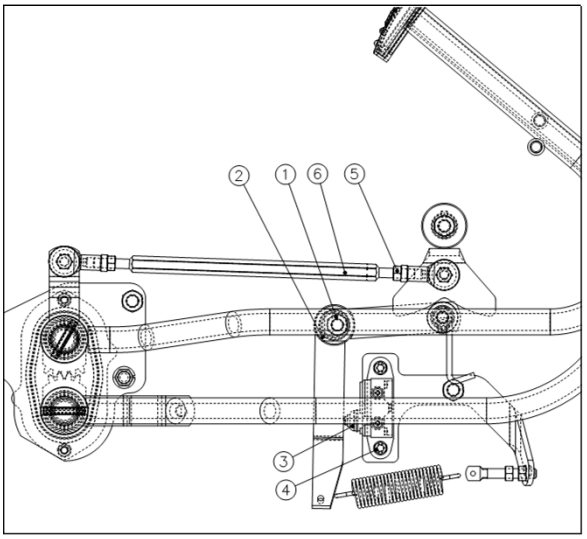
1. Connect left and right brake pedal using connecting pin.
2. Check the skid mark of the tire or stability of the tractor while driving at a suitable speed.
3. If the brake distance is different as shown in the right figure, adjust the pedal play again.



(12) 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 the 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 wheels of the tractor off the ground sufficiently by using a hoist. If there is no hoist, use a suitable device to lift the tractor safely.
   For tractor weight, refer to the section 6, "Dimension and Specification" in this manual.
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).

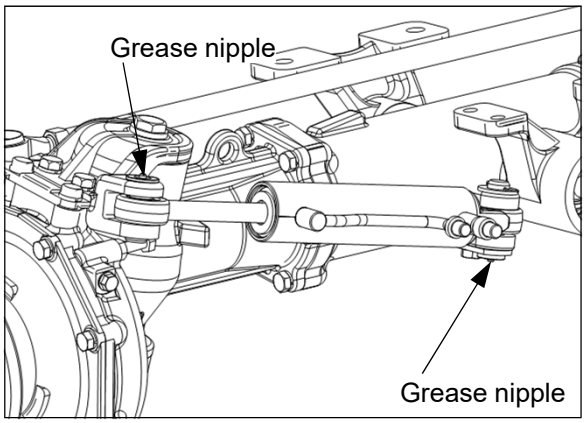
⚠ Caution	▶ When lifting the rear of the tractor, the tractor may incline to the left or right by oscillating angle of the front axle. Insert the chock between the front axle and engine frame tightly.

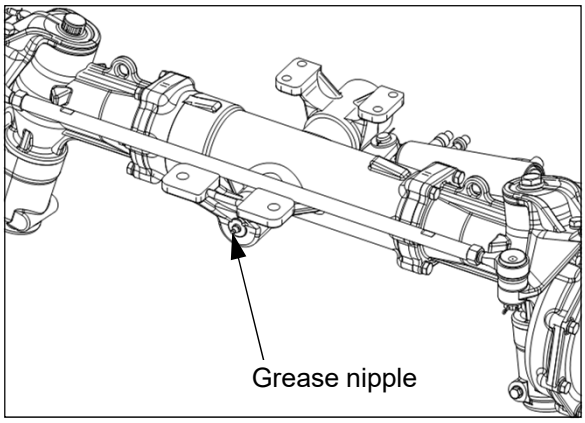
5-7. Every 50 hour check

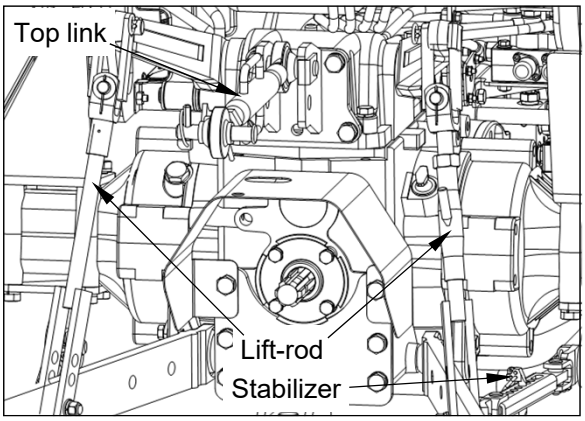
(1) Lubricating grease nipple

① 4WD Model

- Steering cylinder pins (4WD model)
- Front axle pivot (4WD model)
- Thread or sliding parts on 3-point linkage.







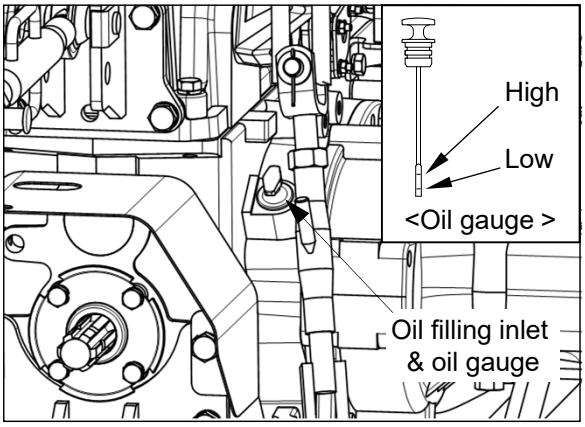
(2) Cleaning of Radiator and Radiator screen

- *See section 5-6-(7) in this manual.*

(3) 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, see section 5-3, "Lubricants and Capacity" or the last page in this manual.*

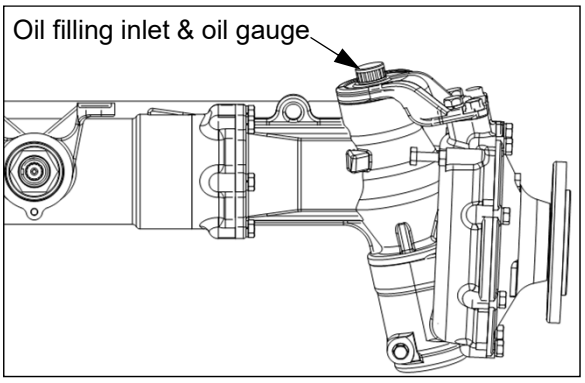


⚠ Caution	▶ The contaminated oil may reduce the durability of transmission and cause a failure of hydraulic system. Clean around oil filling inlet and then open the cap.

(4) Checking Front axle oil (4WD)

- 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, see section 5-3, "Lubricants and Capacity" or the last page in this manual.*



(5) Battery check

- *Refer to the section 5-13-(3), "Batter handling and Notices" in this manual.*

(6) Air cleaner (Dry type)

- *Refer to the section 5-6-(6) in this manual.*

(7) Hydraulic hoses and Leakage

- Stop the engine and place all the transmission gears in neutral and lower down the implement to the ground.
- Periodically check hydraulic system for leaks or damaged parts - kinked, crushed, flattened, hard blistered, heat cracked, charred, twisted, soft or loose covered hoses and fittings.
- Before removing hydraulic components, make sure to check that hydraulic pressure is relieved completely. The leaks of pressurized oil can cause a fatal physical injury.
  For further information, refer to the section 3-3, "Hydraulic system" in this manual.

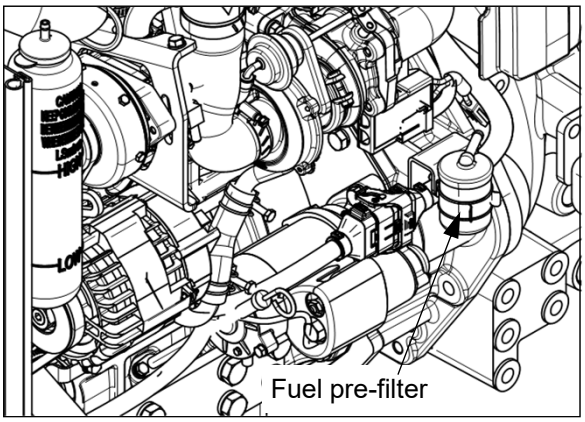
5-8. Every 100 hour check

(1) Visually Inspecting fuel pre-filter

① Check

- It is recommended to visually inspect the pre-fuel filter for contamination.
- If necessary, replace it with a new one.

⚠Caution	▶ In extreme dusty/dirty environments, the service intervals have to be shorter than normal condition.



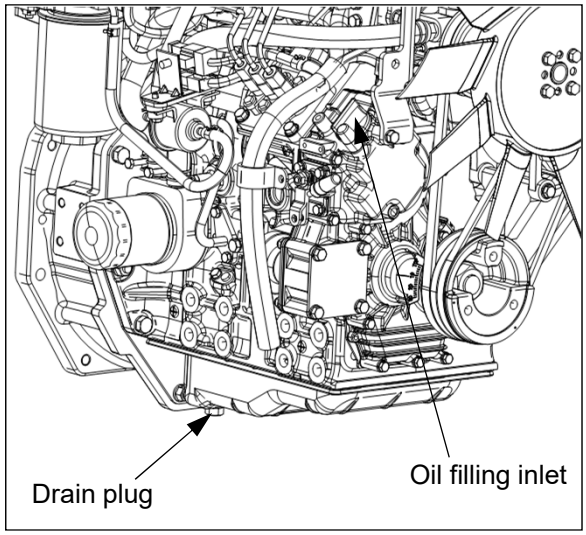
5-9. Every 250 hour check

(1) Replacing Engine oil and Filter

① Drain Engine oil

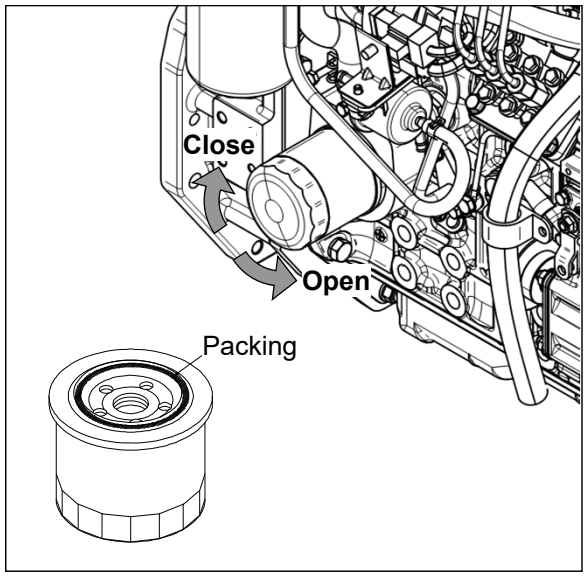
- Run engine for a few minutes to warm oil.
- Park the tractor on a level surface.
- Remove a drain plug of oil pan and drain the oil completely.

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



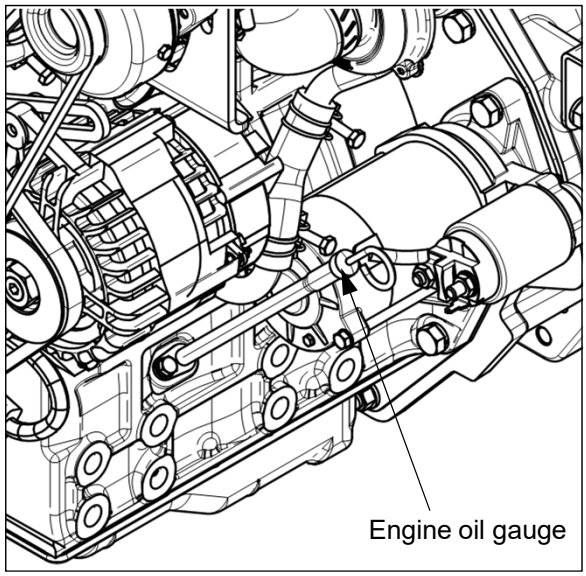
② Replace Engine oil filter

- 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 ¾ 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

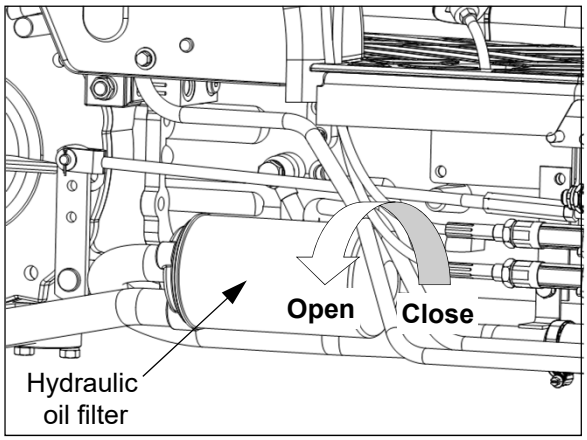
- Tighten the drain plugs. (Tightening torque : 40±5 N.m) (29.5±5 lbs-ft)
- Add engine oil and check if the oil level is between MIN and MAX mark on gauge.
- *For oil specification, see section 5-3, "Lubricants and Capacity" or the last page in this manual.*
- Check any leakage of the engine while running the engine for several minutes at idle rpm.
- Stop the engine. After about 5~10 minutes later, check the oil level again.
- Install the oil gauge.



(2) Replacing Hydraulic Oil Filter

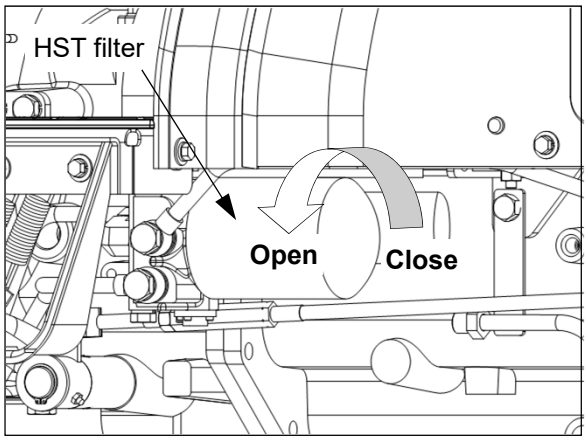
① Hydraulic oil filter (Main)

- 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 ¾ 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

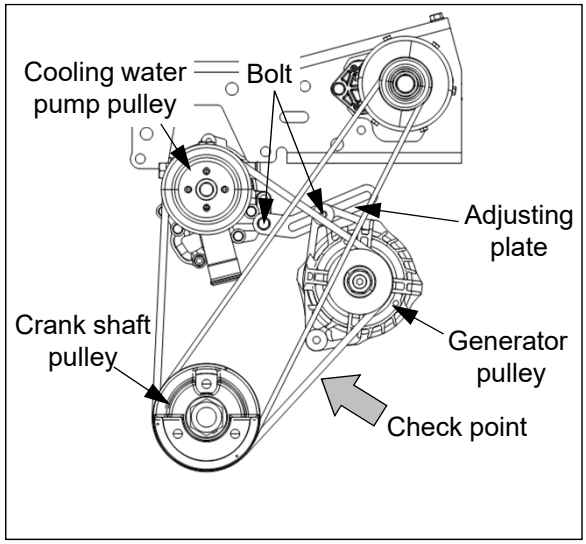
- Replace the HST filter according to the same procedure of the hydraulic oil filter.



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) Tension adjustment of Engine belt

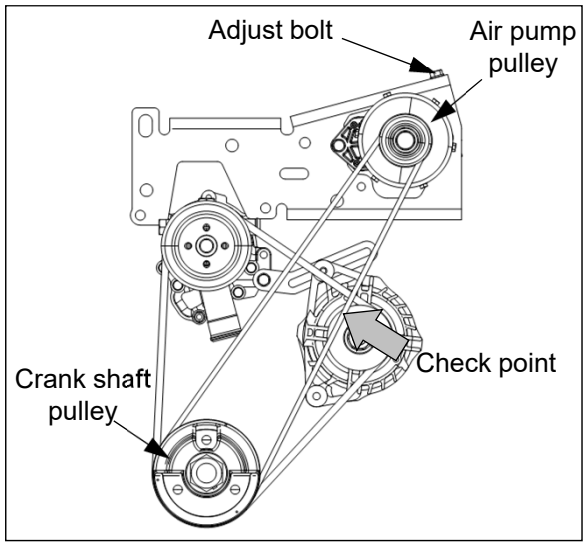
① Fan belt



- If the tension of fan belt exceeds the normal value, loosen the bolt and adjust the tension.
  - Belt tension : crank shaft pulley ~ alternator pulley
  - **Normal : approx. 5mm (0.2 in)**
    (if pressed by 50N (11.2 lb))
- When adjusting the tension,

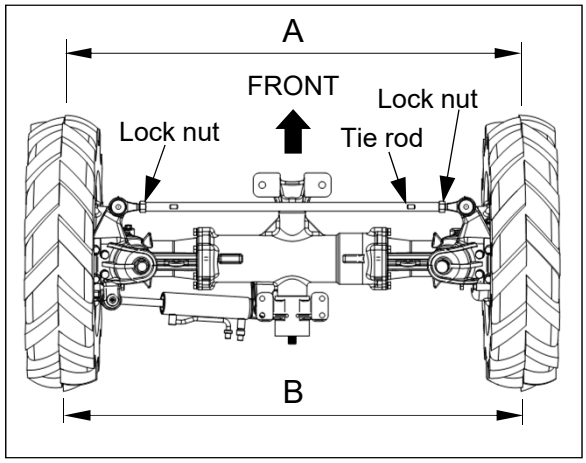
1. Loosen two bolts of alternator and the hinge bolt of the adjusting plate. insert the bar between crank case and pull the bar to apply tension to the belt.
2. With proper tension, tighten the bolts attached to the adjusting plate of alternator.
3. If the belt tension becomes normal, tighten the other bolts and check the tightening torque.

② Air pump belt



- Turn adjust bolt clockwise to tighten the tension in the right figure.
- **Normal : approx. 10mm (0.4 in)**
  (if pressed by 50N (11.2 lb))

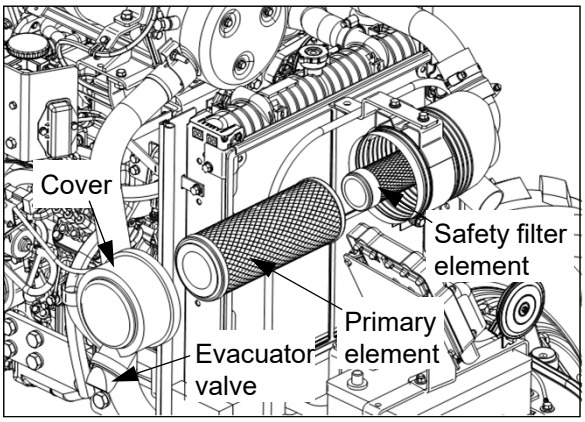
(4) Toe-in



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

(5) Replacing Air cleaner element (Dry type)

- Remove the cover and pull the primary element straight out, ensuring the safety filter 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.



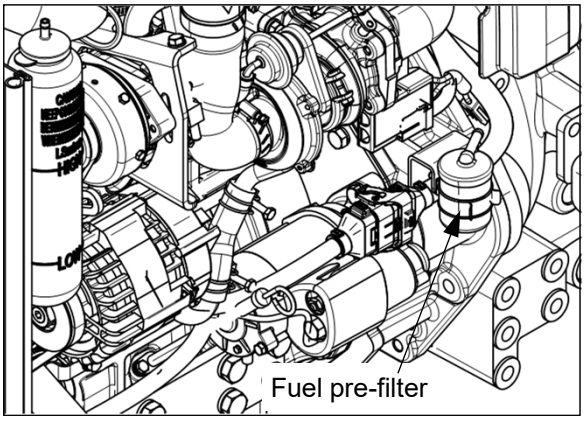
- Insert the filter element by pushing it deeply into the filter housing.
- Remove the dust of the evacuator valve and clean the inside of the cover.
- Assemble the cover with the evacuator valve placed downward.

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

5-10. Every 300 hour check

(1) Replacing fuel pre-filter

- Set a container under the fuel pre-filter.
- Loosen the hose clamps connected to inlet/outlet of the fuel pre-filter.
- Replace fuel pre-filter with a new one and tighten the hose clamps.



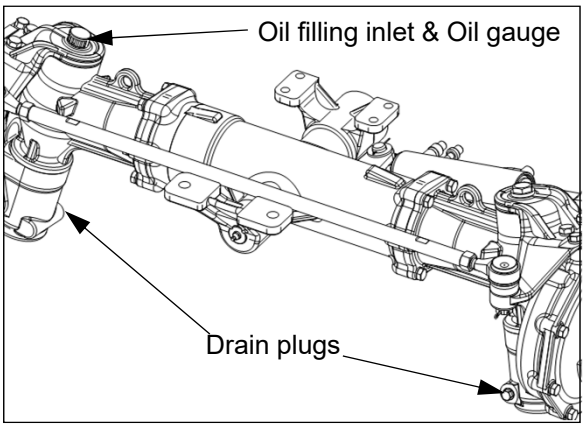
⚠Caution	▶ Gathered fuel in the container has to be disposed in suitable manner. ▶ In extreme dusty/dirty environments, it is recommended to replace fuel pre-filter every 200 hours.

5-11. Every 500 hour check

(1) Changing Front axle oil (4WD)

- Stop tractor on a level surface and apply parking brake.
- Clean around oil filling inlet and drain plugs.
- Remove both LH and RH drain plugs and oil gauge to drain oil completely.
- Tighten the drain plugs with new copper seals.
- Add new oil into the oil filling inlet.
- Check if the oil level is between “MIN” and “MAX” marks after about 5 minute later.
- Tighten the oil gauge.

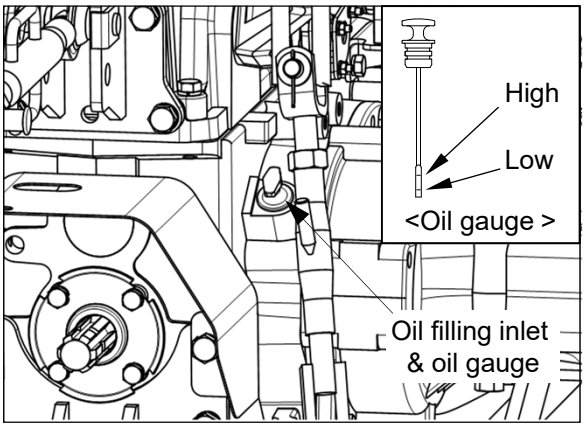
● *For oil specification, see section 5-3, “Lubricants and Capacity” or the last page in this manual.*

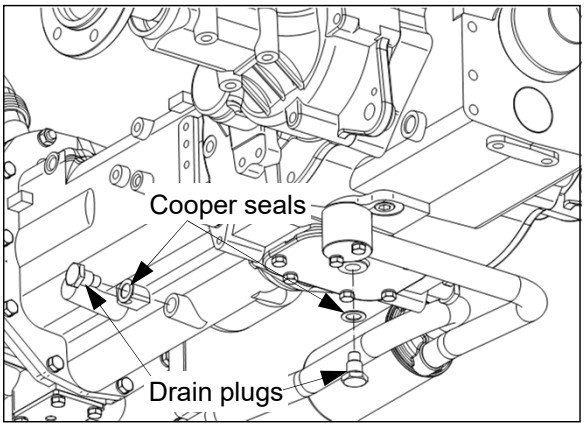


(2) Changing Transmission oil

- 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 plugs and remove drain plugs under the transmission and drain oil completely.
- Clean metal powder stuck to the drain plugs and tighten drain plugs again with new cooper seals.
- Add new oil until the oil level is between “MIN” and “MAX” marks of the oil gauge.

● *For oil specification, see section 5-3, “Lubricants and Capacity” or the last page in this manual.*

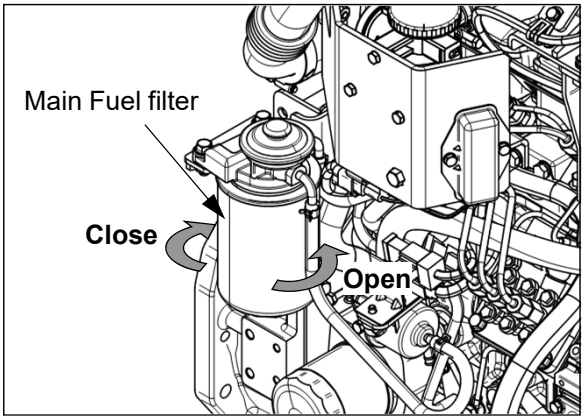




⚠ Caution	▶ The contaminated oil may reduce the durability of transmission and cause the failure of hydraulic system. Clean around oil filling inlet and then open the cap.

(3) Replacing Fuel filter cartridge

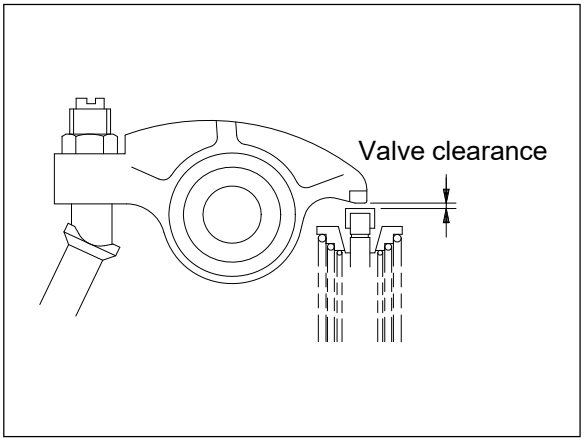
1. Stop engine and set a container under the fuel filter.
2. Turn the filter counter-clockwise to remove with using a filter wrench.
3. Coat the seal of new filter with a little fuel.
4. Assemble new filter.
5. Bleed air in fuel system.
   (*See section 5-13-(1), "Air-bleeding from fuel system" in this manual)*



⚠ Warning	▶ Do not fill the new element with fuel. It may cause damage to the injection system by the invisible filthy materials.

(4) Adjusting Engine valve clearance

● Contact your authorized local dealer to check the valve clearance.
Normal : 0.2mm (0.0079 in)
If the gap is large, valves makes a loud tapping noise and if the gap is too small, it is hard to compress by which the engine output falls down or burns a valve.



(5) Checking Nozzle injection pressure

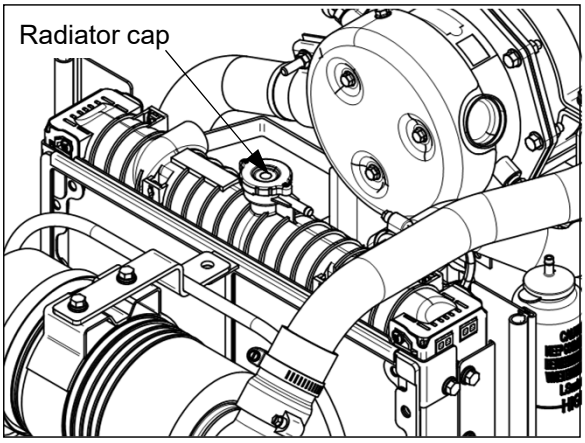
● Contact your authorized dealer for check.
Normal injection pressure : 14.7 MPa (2132 psi)

5-12. Every 2-year check

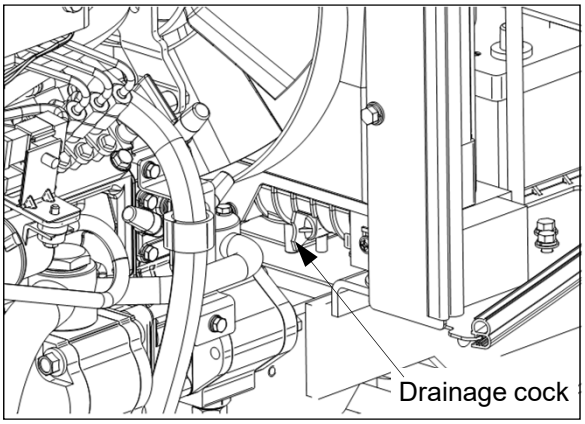
(1) Replacing Engine coolant

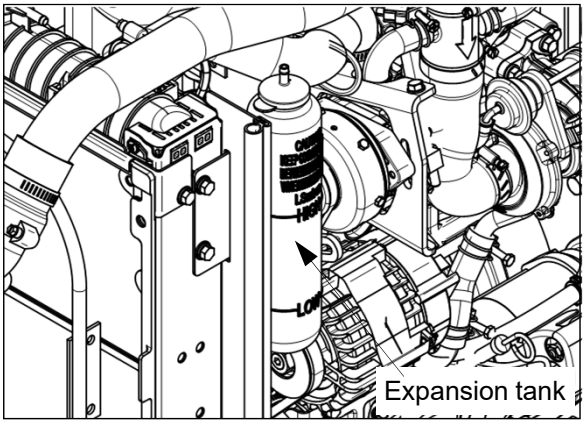
- After cooling down the engine enough, open the radiator cap slowly.
- Set a clean container under radiator drainage cock.

Warning	▶ When opening the radiator cap, be careful of the escaping hot water or steam. ▶ Cool down the coolant sufficiently before opening.



- Loosen radiator drainage cock and drain engine coolant completely.
- Before adding new coolant, wash out the radiator with clean water 2~3 times.
- Apply the overflow tube and add new coolant up to the filler neck. Fill up the expansion tank with coolant between “LOW” and “HIGH” marks.
- *Capacity : refer to the section 5-3 or the last page in this manual.*
- Add clean soft water as the coolant, not hard water like well water. If not, the radiator shall be corroded or rusted.
- Change the coolant with anti-freeze solution in cold weather.
- Anti-freeze solution is filled up from the factory. After first winter, replace the engine coolant to remove foreign materials.





※ Anti-freeze

- The amount of anti-freeze in the engine 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.
- Mix the water and anti-freeze with 40%~60% according to operating condition as below table and fill radiator and engine the mixture after checking the volume and capacity.

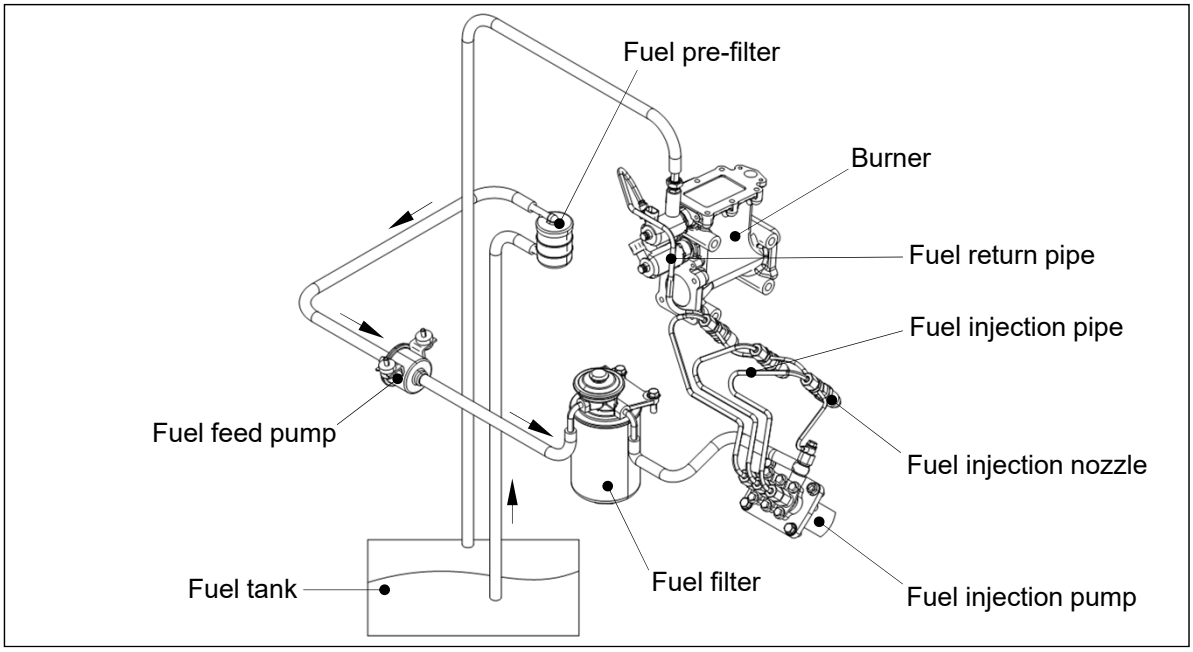
Anti-freeze (%)	Freezing point °C (°F)	Boiling point °C (°F)	Remark
40	-24 (-11)	106 (223)	
50	-37 (-35)	108 (226)	
60	-52 (-62)	111 (232)	

- If possible, always use anti-freeze solution. if not, change the coolant with anti-freeze solution before winter time.
- Run engine for 5 minutes after filling the anti-freeze to mix it with water well.

5-13. General maintenance (When required)

(1) Air-bleeding from Fuel system

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



Notice	▶When changing the fuel filter only, it is not necessary to bleed air from the fuel injection pipes.

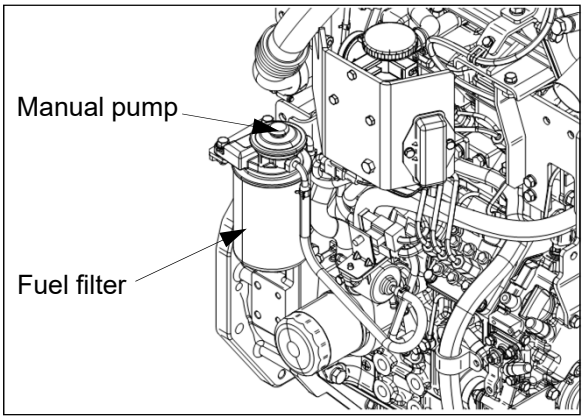
⚠Danger	▶ HIGH PRESSURE FUEL. When the engine is running, do not loosen the fuel injection pipes to bleed air from the fuel system.

- After replacing fuel pre-filter or fuel filter, bleed air in the fuel system.

1) Turn key switch ON position.

2) DO NOT open fuel lines to bleed air from the system.

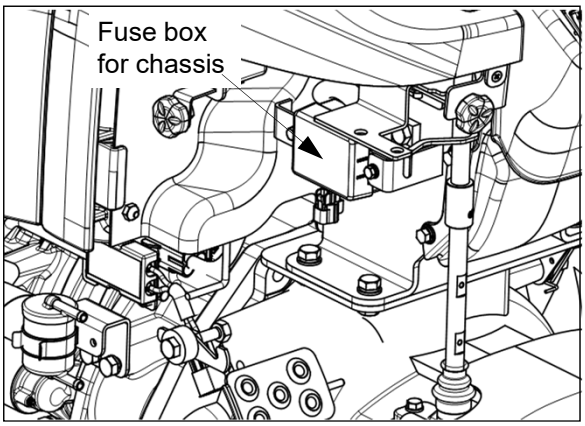
3) Press down the manual pump in the right figure several times to fill the fuel system with fuel. The air shall bleed out from fuel system.



(2) Fuse & Main fuse

① Fuse check and replacement

- How to change the fuse
  1. Remove the cover of fuse box.
  2. Check each fuse and remove the damaged fuse.
  3. Change with new one same as damaged one.
- **Chassis fuse box is installed inside front console in the right figure.**
- The capacity and function of each fuse is described on the fuse box cover.



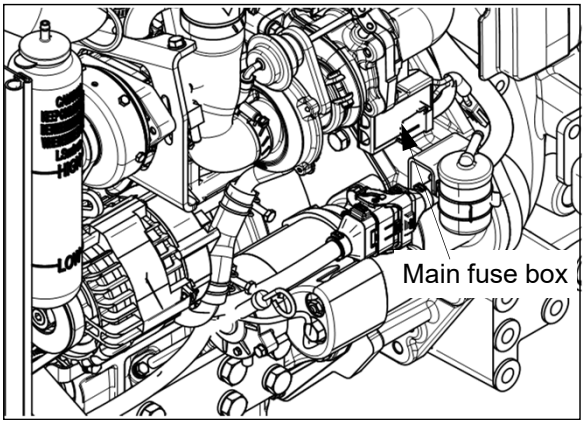
No.	Fuse	Descriptions
1	5A	ECU power#1
2	15A	ECU power#2
3	15A	ECU power#3
4	15A	Engine control
5	5A	Controller
6	5A	Control switch
7	10A	Independent PTO
8	10A	Work lamp
9	**20A**	Head lamp
10	10A	Directional lamp
11	10A	Hazard lamp

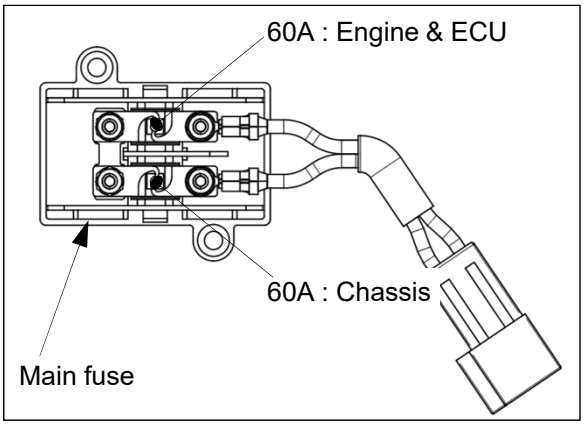
< Fuse box for chassis >

Notice	▶ If the same function fuse is damaged often, contact your authorized dealer for check instead of using the alternatives such as wire or aluminum foil. ▶ If using the alternatives instead of the rated capacity fuse, it may cause fire which results in the damage of tractor or injury.

② Main fuse

- Main fuse box is attached to the right side of the engine.
- There are two main fuses in the main fuse box.
- Remove the cover from fuse box, and pull out the relating main fuse. If necessary, replace it with a genuine part.
  Rated capacity for chassis : 60 A
  Rated capacity for engine & ECU : 60 A
- As the main fuses are parts to protect electric system and wirings, if damaged, check if there is any problem in the electric system. Contact your authorized local dealer for check.





Notice	▶ If the main fuse is burn out often, contact your authorized local dealer to check the problem. ▶ Do not use alternatives instead of the genuine fuse. And, do not connect electric wire to the battery terminals directly. It may cause fire and serious injury.

(3) Battery handling and Notices

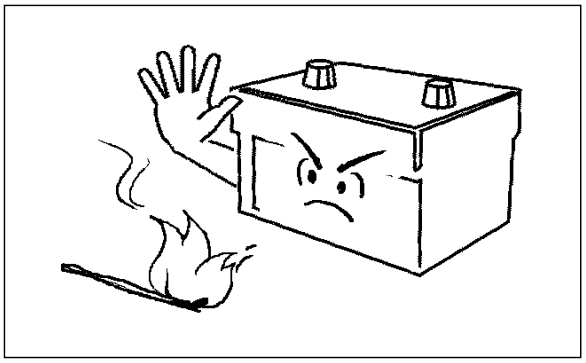
※ **Battery fluid (Electrolyte) is a solution of water and sulfuric acid. It makes poisonous gas which is very harmful to eyes, skin and clothing. And also this gas is explosive. Read the following instructions thoroughly before handling the battery.**

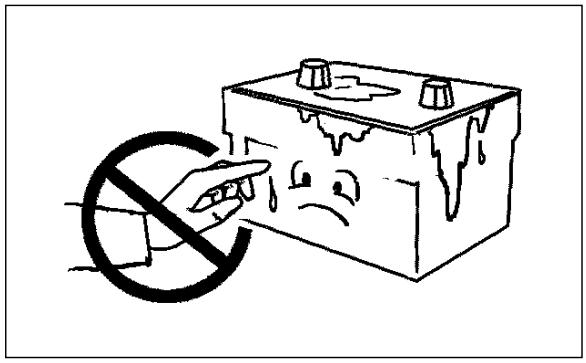
① Battery check

● Indicator(if fitted) 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 local 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.

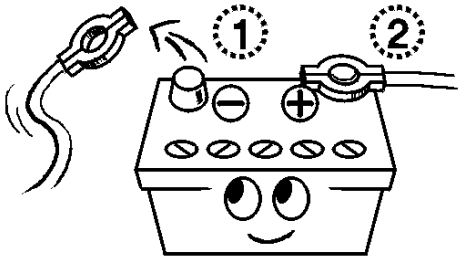




Caution	
	▶ The gas generated from the battery is explosive. Comply with following instructions. - Keep cigarettes, sparks and flames away from the battery. Use a flashlight to check battery electrolyte level or indicator. - Never check battery charge by placing a metal object across the terminals. Use a voltmeter or hydrometer. -Always remove grounded (-) battery clamp first and assemble it last. If not, it can cause explosion by spark.
	▶ Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and can cause blindness if splashed into the eyes. - Never disassemble the battery. - Do not touch the battery or liquid by bare hand without gloves or any protection. - Flush eyes with clean water for about 20 minutes, if the electrolyte is splashed into the eyes, and get medical attention immediately.
	▶ Charge the battery in an area with good ventilation and DO NOT charge a frozen battery. ▶ Replace it with LS tractor genuine products or the battery with the same capacity.

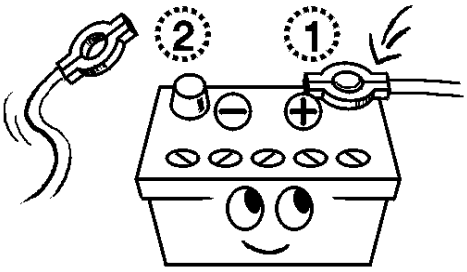
② Notices in attaching/detaching the battery

- 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 detaching >

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



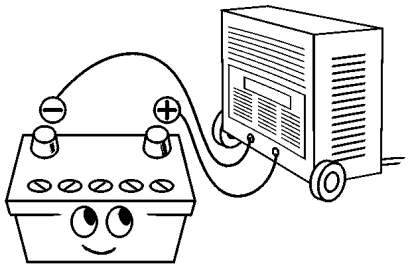
< When attaching >

Caution	▶ Stop engine and apply parking brake and remove the ignition key before replacing the battery.
	▶ Put on eye protection and globes to protect human body from poisonous sulfuric acid before handling the battery.
	▶ Always remove grounded (-) battery clamp first and assemble it last. If not, it can cause an explosion by spark.
	▶ Keep all flames and sparks away and DO NOT smoke while charging the battery.
	▶ Replaced old battery must be disposed of in a suitable manner, according to the national legislation or local regulations. Contact your authorized local dealer.
	▶ Replace it with LS tractor genuine products or the battery with the same capacity.

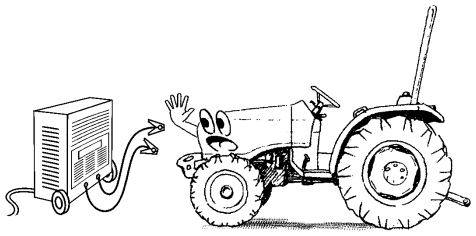
③ Notices in charging the battery using separate charger

● 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.



< when connecting the charger >



< Do not charge the attached battery>

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

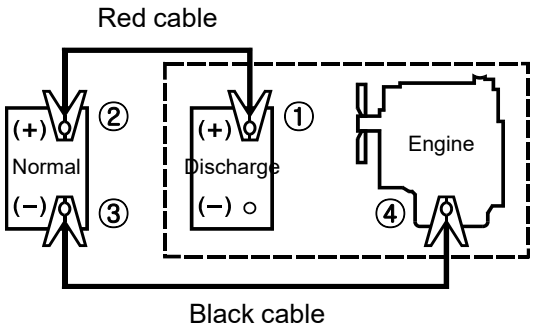
④ How to use jumper cables

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

ⓐ Connecting Jumper cables

- Check the 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.

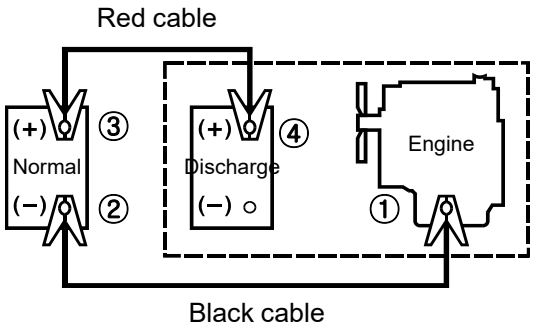


< Connecting order of jumper cables >

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

ⓑ Removing Jumper cables

- Remove jumper cables as referring to the right figure.



< Removing order of jumper cables >

Notice	▶ 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.

5-14. Troubleshooting

⚠ Warning	▶ To avoid injury due to sudden start, apply parking brake and place the transmission gear in NEUTRAL position before checking and repairing.

System	Faults	Possible causes	Solutions
Engine	The start motor does not turn when turning the key switch.	▲ Start safety switch is not contacted ▲ PTO switch is not on “OFF” position ▲ Discharge of battery ▲ Terminal loosened ▲ Key switch failure ▲ Start motor failure	▲ Depress the clutch pedal fully ▲ Place PTO switch on “OFF” position ▲ Charge or replace ▲ Tighten ▲ Repair or replace ▲ Repair or replace
	The start motor turns but the engine does not start.	▲ The battery is weak ▲ bad ground ▲ Improper viscosity of engine oil ▲ Air in fuel system ▲ Fuel filter clogged ▲ Error in engine body ▲ Fuel cock closed	▲ Charge or replace ▲ Tighten the ground ▲ Replace the oil with proper viscosity ▲ Bleed the air ▲ Wash or replace the filter ▲ Repair ▲ Open the cock
	Engine revolution is irregular.	▲ Air in fuel system ▲ Fuel filter clogged ▲ Injection nozzle clogged ▲ Fuel leakage ▲ Irregular fuel injection	▲ Bleed air ▲ Clean or replace the filter ▲ Repair or replace ▲ Repair ▲ Repair
	Engine turns more than maximum speed.	▲ Impurities in governor	▲ Repair
	Engine stops suddenly during operation.	▲ Fuel shortage ▲ Fault of nozzle ▲ moving parts failure due to bad lubrication	▲ Add fuel and bleed air ▲ Repair or replace ▲ Repair
	Engine stops at low rpm.	▲ Fault of injection pump ▲ Valve gap is not correct ▲ Poor nozzle pressure	▲ Repair ▲ Adjust the gap ▲ Repair

System	Faults	Possible causes	Solutions
Engine	Engine overheat	▲ Lack of engine coolant ▲ Bad fan belt tension or broken ▲ Dirt attached to the radiator	▲ Supplement ▲ Adjust belt tension or replace ▲ Clean
	The color of exhausted smoke is white.	▲ Air cleaner clogged ▲ Engine oil exceeded ▲ Lack of fuel supply	▲ Wash element ▲ Adjust in proper level ▲ Repair
	The color of exhausted smoke is black.	▲ Bad quality of fuel ▲ Oversupply of fuel ▲ Fault of nozzle	▲ Use good quality fuel ▲ Repair ▲ Repair
	Engine power is low.	▲ Injection nozzle clogged ▲ Carbon piled to valve seat ▲ Bad adjustment of valve gap ▲ Bad injection timing ▲ Lack of fuel supply ▲ Air cleaner clogged	▲ Repair ▲ Repair ▲ Repair ▲ Repair ▲ Check fuel system ▲ Clean or replace
	Engine oil pressure indicator is ON during operation.	▲ Lack of engine oil ▲ Low viscosity of engine oil ▲ Warning light switch error ▲ Fault of oil pump ▲ Oil filter element is clogged	▲ Supplement ▲ Replace the proper oil viscosity ▲ Replace ▲ Repair ▲ Replace element
	Battery charging indicator is ON during operation	▲ Abnormal wiring ▲ Fault of alternator ▲ Fault of battery ▲ Bad fan belt tension or broken	▲ Check battery terminals and ground, repair ▲ Repair or replace ▲ Replace ▲ Adjust belt tension or replace
	Electronic control errors related with TIER4 engine.	Fault of electric sensors or wire harness or ECU	▲ Contact your authorized local dealer.
Clutch	Clutch is slipped.	▲ Wrong clutch pedal play ▲ Friction lining worn or broken	▲ Adjust ▲ Replace
	Clutch does not cut-off.	▲ Lining damaged ▲ Wrong clutch pedal play	▲ Repair or replace ▲ Adjust

System	Faults	Possible causes	Solutions
Brake	Brake does not work or only one side works.	▲ Wrong brake pedal play ▲ Lining worn or broken ▲ Left/right pedal play is different	▲ Adjust ▲ Replace ▲ Adjust
	After brake pedal working, it does not return.	▲ Return spring damaged ▲ Lack of grease in shaft parts	▲ Replace the spring ▲ Remove the rust, apply grease
Hydraulic lift system	The linkage does not move up.	▲ Lack of transmission oil ▲ Air in the suction pipe ▲ Hydraulic filter clogged ▲ Hydraulic pump failure ▲ Control valve failure ▲ Cylinder or cylinder related parts broken	▲ Aid oil ▲ Tighten the filter or replace seal of connecting part ▲ Clean the filter or replace ▲ Repair or replace ▲ Repair or replace ▲ Repair or replace
	Oil leakage	▲ Connecting part loosened ▲ Oil seal damaged ▲ Pipe cracked	▲ Tighten ▲ Replace ▲ Replace
	If lever is placed on the raising position, relief valve sounds off.	▲ Upper limit of position control lever is changed	▲ Adjust the upper limit
	The linkage does not move down.	▲ Down speed control valve locked ▲ Control valve failure ▲ Cylinder damaged ▲ Lift shaft moving part damaged	▲ Turn the knob counter-clockwise ▲ Repair or replace ▲ Replace ▲ Repair or replace

System	Faults	Possible causes	Solutions
Steering System	Hydraulic steering system does not work.	▲ Pump worn or part damaged ▲ Steering unit damaged or worn ▲ Oil leakage by steering cylinder piston seal damaged or worn ▲ Oil leakage by pipe damage	▲ Repair or replace ▲ Repair or replace ▲ Repair ▲ Repair or replace
	Hard to operate the steering wheel.	▲ Steering unit - Steering unit spline and column spline does not aligned - Spool and sleeve damaged by foreign material - Excessive tightening torque of end cap bolt ▲ Pump - Low speed - Wearing, failure ▲ Relief valve - Valve spool clogged - Setting pressure too low	▲ - Check mounted condition of steering unit and column - Replace - Apply regular torque ▲ - Adjust RPM or Repair - Repair or replace ▲ - Repair or replace - Reset or adjust
	Cylinder does not work smoothly as steering wheel movement	▲ Air in steering line if not used for a long time ▲ Air in suction pipe ▲ Piston seal damaged	▲ Bleed air ▲ Repair ▲ Replace
	Steering wheel turns to the opposite direction.	▲ Bad assembly of steering gear ▲ Bad assembly of steering hose	▲ Repair ▲ Repair
	Oil leakage of steering pump, steering unit, cylinder and fittings	▲ Seal damaged	▲ Replace seal
	Abnormal noise	▲ Lack of oil ▲ Exceeding resistance of suction line ▲ Air in system	▲ Aid oil ▲ Replace filter ▲ Bleed air

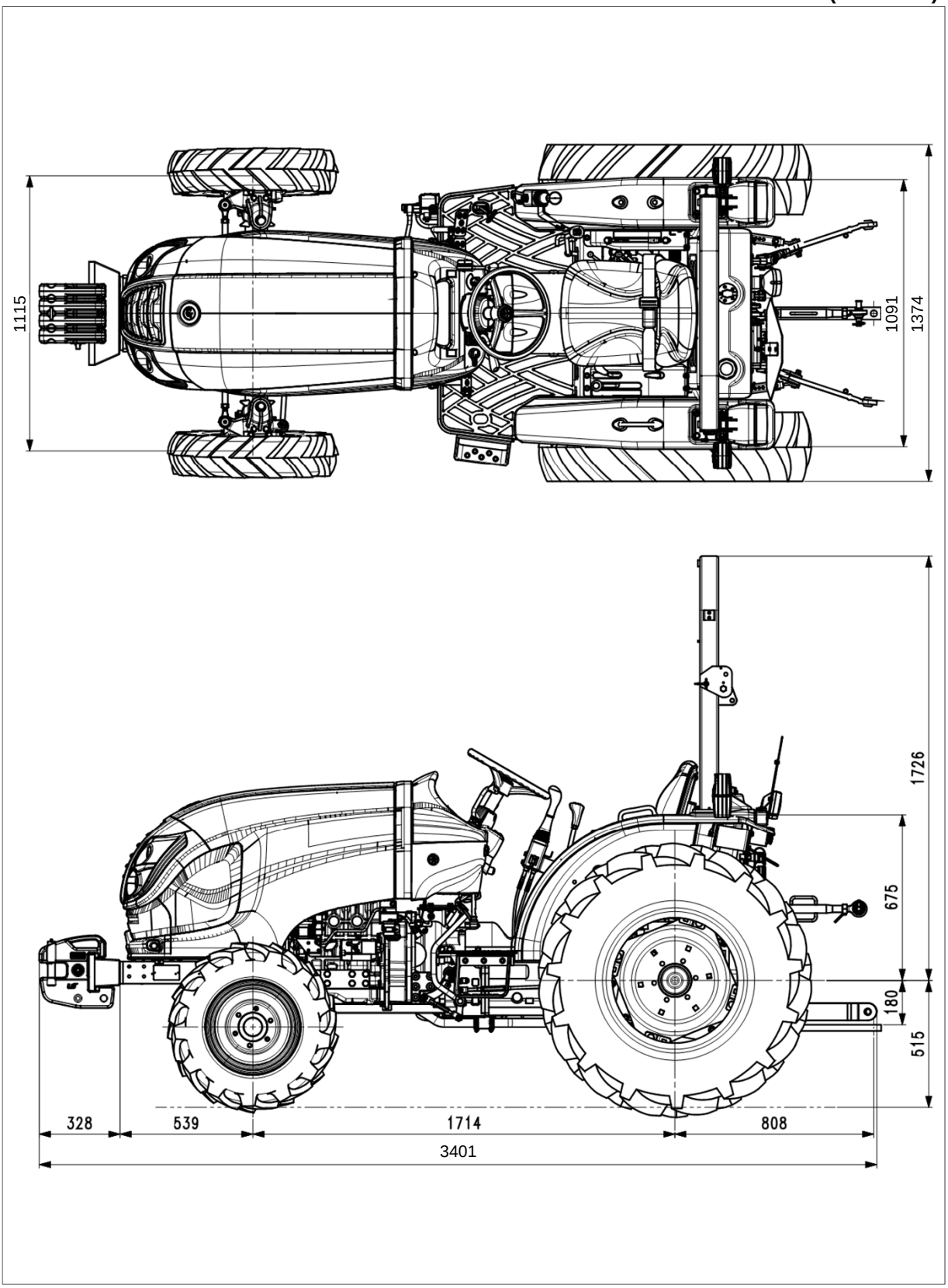
System	Faults	Possible causes	Solutions
HST	When operating HST pedal, tractor dose not start.	▲ Low pressure relief set is too low ▲ High pressure relief set is too low ▲ HST charger valve fault ▲ Filter clogged ▲ Pump worn or part damaged ▲ HST moving part worn or damaged	▲ Check and repair ▲ Check and repair ▲ Replace ▲ Replace filter ▲ Repair or replace ▲ Repair or replace after check the circuit
	Tractor is still moving despite pedal bring in neutral position on HST pedal.	▲ Neutral position of HST pedal is changed. ▲ HST pedal linkage damaged ▲ HST arm bolt loosened	▲ Adjust neutral position ▲ Replace damaged part ▲ Fasten the bolt with adhesive
	HST power is too low	▲ Oil shortage ▲ Air in HST circuit ▲ Transmission oil temperature is too high. ▲ HST moving part worn ▲ HST filter clogged	▲ Add oil ▲ Check and repair the hydraulic suction line. ▲ Stop engine to cool the oil, and restart ▲ Repair or replace ▲ Replace the filter
	Abnormal noise	▲ Engine speed is too low ▲ Oil temperature is too low ▲ Hydraulic oil filter clogged ▲ Oil shortage	▲ Set engine rpm over 1500 rev/min ▲ Run engine to warm up the oil. ▲ Replace the filter ▲ Add oil

System	Faults	Possible causes	Solutions
Electric System	Battery does not charge	▲ Abnormal wiring ▲ Alternator failure ▲ Lack of fan belt tension or broken ▲ Abnormal battery	▲ Check the tightening state of terminals and ground ▲ Repair or replace ▲ Adjust fan belt tension or replace ▲ Replace
	Headlight is dark.	▲ Battery capacity is low ▲ Bad wiring and contact	▲ Charge or replace ▲ Check and repair
	Headlight is not ON.	▲ Light bulb cut-off ▲ Fuse blown	▲ Replace ▲ Check the cause, and replace it
	Horn does not sound.	▲ Switch failure ▲ Abnormal wiring ▲ Horn failure	▲ Replace ▲ Repair ▲ Replace
	Turn signal light does not work.	▲ Light bulb cut-off ▲ Bad connection ▲ Fuse blown	▲ Replace ▲ Tighten terminals ▲ Check the cause, and replace it
	Cold start aid indicator is not ON.	▲ Relay and timer damaged ▲ Bad connection of preheat plug wiring	▲ Replace ▲ Check and tighten
	Other illuminating light or indicator is not ON.	▲ Fuse blown ▲ Light bulb cut-off	▲ Check the cause, and replace it ▲ Replace

6. Dimension and Specification

① 4WD model

(Unit : mm)



		XG3032	XG3032H	XG3037	XG3037H
WEIGHT	Roll-bar type	1360kg (2999 lb)	1370kg (3020 lb)	1360kg (2999 lb)	1370kg (3020 lb)
	Cabin type	N/A	N/A	N/A	N/A
	Bumper	21kg (46.3 lb) (optional)			
	Front weight	20kg (44.1 lb) x 4 (optional)			
ENGINE	Model	N843T-F-24		N843T-F-27	
	Type	4-stroke, vertical, water cooling			
	No. of cylinder	3			
	Diameter x stroke	84x90 (3.31x3.54 in)		84x90 (3.31x3.54 in)	
	Displacement	1496cc (91.3 in^3)		1496cc (91.3 in^3)	
	Compression ratio	22.2:1		22.2:1	
	Engine speed	1000 ~ 2800 rev/min		1000 ~ 2800 rev/min	
	Maximum torque	112 N.m / 1600 rpm		112 N.m / 1600 rpm	
	Engine rated power	24 kW / 2600 rpm		27 kW / 2600 rpm	
FUEL INJECTION PUMP	Type	Mechanical PFR			
	Fuel filter	Replaceable cartridge type			
	Injection order	1-2-3			
LUBRICATION SYSTEM	Type	Forced circulation			
	Pump	Trochoid gear pump			
	Filter	Replaceable cartridge type			
COOLING SYSTEM	Pump	Centrifugal type			
	Temperature control	Thermostat			
	Air cleaner	Dry			
TRANSMISSION	Type	F12xR12 Mechanical / HST			
	Main clutch	Dry single clutch for Mechanical only			
	Forward / Reverse	Synchro-shuttle type for Mechanical / HST pedals			
	Differential lock	Mechanical pedal type			

			XG3032	XG3032H	XG3037	XG3037H
REAR PTO	Type		Independent PTO with wet disk clutch			
	No. of speed		1 speed gear			
	PTO / Engine		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 pump type, Engine drive			
	Rated flow		30.9LPM (8.2GPM)			
	System pressure		16.7MPa (2418psi)			
	Lift capacity	Lower link end	820 kgf (1808 lbf)			
		24” behind lift point	650 kgf (1433 lbf)			
REMOTE CONTROL	No. of spool		Double acting , Spring return type (optional)			
	No. of Q/coupler		N/A / 2EA / 4EA (optional)			
	F/Loader coupler		Front outlet valve / Joystick loader valve (optional)			
STEERING SYSTEM	Type		Hydrostatic			
	Oil		Transmission oil			
	Min. turning radius (without brake)		LH : 3.0m (10.0 ft) RH : 3.3m (10.8 ft)			
	Min. turning radius (with brake)		LH : 2.8m (9.1 ft) RH : 2.9m (9.6 ft)			
	Max. steering angle		48°			
	No. of steering turns		3.9 (right) / 3.3 (left) turns (lock to lock)			
	Rated flow		15.9 LPM (4.2 GPM)	19.9 LPM (5.3 GPM)	15.9 LPM (4.2 GPM)	19.9 LPM (5.3 GPM)
	System pressure		11.8MPa (1707 psi)			

			XG3032	XG3032H	XG3037	XG3037H
ALTERNATOR	Rated output		12V, 1.0kW (85A)			
	Voltage control		Built-in (IC type)			
BATTERY	Voltage		12V			
	Capacity		80AH			
START MOTOR	Output power		12V-2.2kW			
	Operation		Solenoid			
LIGHTS	Headlights (Low / High beam)		12V 55W / 60W			
	Turn signal lights / Side lights (front)		12V 21W / 10W			
	Turn signal lights (rear)		12V 10W			
	Stop light / Taillight (rear)		12V 21W / 5W			
	Work light		12V 27W(Front grille), 27W(Rear roll-bar)			
OTHERS	Instrument lights		LED			
	Indoor light (CAB)		N/A			
	Instrument & indicator lights		LED			
	Cold start aid		Glow plug			
STD. AGRI. TIRE	Front		7-14 (4PR)		7-14 (4PR)	
	Rear		11.2-24 (8PR)		11.2-24 (8PR)	
WHEEL TRACK ADJUSTMENT	Front	Tracks	2		2	
		Dimension	1115~1207mm (43.9~47.5 in.)		1115~1207mm (43.9~47.5 in.)	
	Rear	Tracks	6		6	
		Dimension	1091~1321mm (43.0~52.0 in.)		1091~1321mm (43.0~52.0 in.)	

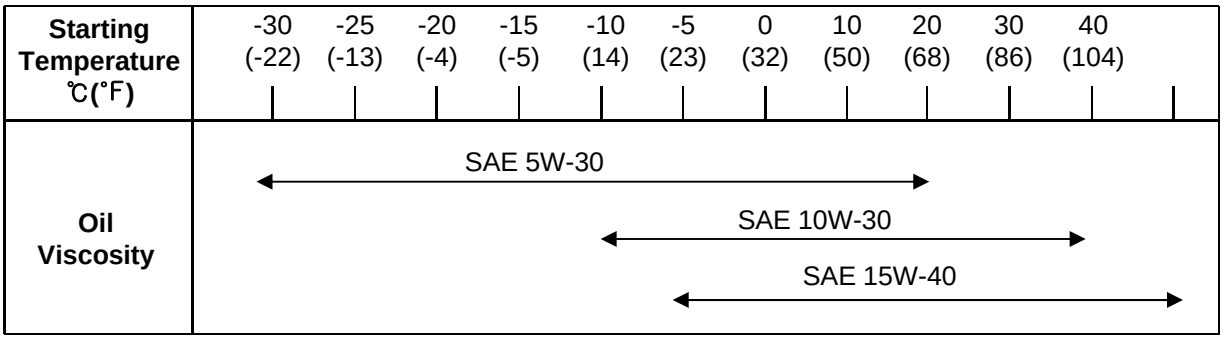
** These specifications are only general product information about standard model. Actual data may vary depending on the various optional product, and also can be changed at any time to improve the product qualification without any prior notification **

Lubricants and Capacity

Lubricants	Capacity	International Standard	Recommended products
Engine coolant (Radiator)	**5.1 L** (1.3U.S.gals.)	ASTM D5216	Soft water (50%) + Anti-freeze (50%)
Fuel	**28 L** (7.4 U.S.gals.)	ASTM D975 No.2	Ultra low sulfur diesel fuel
Engine oil (Crank case)	**4.0 L** (1.1U.S.gals.)	API CJ-4 (~ -10℃ : SAE 5W-30 -10℃ ~ 40℃ : SAE 10W-30 40℃ ~ : SAE 15W-40)	KIXX DL (Manufacturer : GS Caltex)
Transmission oil (common use for hydraulic lift and steering system)	**32 L** (8.5 U.S.gals.)	API GL4 ISO VG 46/68	LSTH570 (Manufacturer : GS Caltex or S-OIL TOTAL Co. Ltd.)
Front axle oil	**6.5 L** (1.7 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	

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. Contact your authorized local dealer.



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