LS Tractor

OPERATOR'S MANUAL

MT463 • MT473

Stage V

LS Tractor

CALIFORNIA

PROPOSITION 65 WARNING

 **WARNING**: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information, go to www.P65warnings.ca.gov/diesel

WASH YOUR HANDS AFTER HANDLING.

FEDERAL and CALIFORNIA EMISSION CONTROL SYSTEM WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board (CARB), U.S. Environmental Protection Agency (EPA), and LS Mtron Ltd. (LS Mtron) are pleased to explain the emission control system warranty on your 2025 model year engine. New engines must be designed, built and equipped to meet stringent anti-smog standards. LS Mtron 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 or usage of your engine. Additional conditions and responsibilities are further outlined below. Where a warrantable condition exists, LS Mtron will repair your engine at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S LIMITED WARRANTY COVERAGE:

LS Mtron 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 CARB and EPA.

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

    - For engines rated at or above 19 kW (25 HP): five (5) years or 3,000 hours of operation, whichever occurs first.

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 LS Mtron engine were designed, built and tested using genuine LS Mtron parts, and the engine is certified as being in conformity with CARB and EPA emission control regulations. Accordingly, it is recommended that any replacement parts used for maintenance, repair, or replacement of emission control systems must be LS Mtron parts. Any replacement part may be used in the performance of any maintenance or repairs and will be provided without charge to the owner, although LS Mtron recommends that the owner obtain assurance that such parts are warranted by their manufacturer and LS Mtron to be equivalent to genuine LS Mtron parts. Such use shall not reduce the warranty obligations of LS Mtron, provided they are warranted to be equivalent to genuine LS Mtron parts.

Any warranted part which 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, and provided that there has been no abuse, neglect or improper maintenance or usage of your engine, 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 which is scheduled only for regular inspection in the written instructions shall be warranted for the warranty period defined above, provided that there has been no abuse, neglect or improper maintenance or usage of your engine. 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 which 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 LS Mtron under warranty, provided that there has been no abuse, neglect or improper maintenance or usage of your engine. 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.

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

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.

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

LS Mtron 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. Use of any other fuel may result in this engine no longer operating in compliance with CARB or EPA's emissions requirements.

The purchaser is responsible for initiating the warranty process. You must present the engine to a LS Mtron dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

Use of any add-on or modified parts that are not exempted from anti-tampering laws by CARB or EPA may reduce or eliminate your warranty coverage. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty claim. LS Mtron is not liable for failures of warranted parts caused by the use of a non-exempted add-on or modified part.

The emissions control parts covered by this Limited Emission Control System Warranty are listed under "What is covered by the Limited Emission Control System Warranty." You are

responsible for the performance of all scheduled maintenance or repairs on your new LS Mtron engine. LS Mtron may deny a warranty claim if failure to perform maintenance results in the failure of a warranted part. Receipts covering the performance of regular maintenance should be retained in the event of questions arise concerning maintenance. The receipts should be transferred to each subsequent owner of the equipment with the emission warranted engines.

Customer Assistance

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

1. LS Mtron Ltd.
   886, Gwahak-Ro, Bongdong-Eup
   Wanju-gun, Jeollabuk-Do, Korea
   Phone: 82-63-279-5824
   Fax: 82-63-279-5933

2. LS Tractor USA LLC
   Service Department
   6900 Corporation Parkway
   Battleboro, NC 27809
   Phone: 1-252-984-0700
   Fax: 1-252-984-0701

3. Big B Sales, Inc.
   674 Hwy 8,
   Sicily Island, LA 71368
   Phone: 1-318-389-5349
   Fax: 1-318-389-5181

4. Lane Tractor Sales
   7980 Hwy 99 East;
   Los Molinos, CA 96055
   Phone: 1-530-384-1016
   Fax: 1-530-384-0305

What is not covered by the Limited Emission Control System Warranty
This warranty does not cover:

1. Malfunctions in any part caused by any of the following: misuse, abuse, improper adjustments, modifications, alteration, tampering, disconnection, improper or inadequate maintenance, or use of fuels not recommended for the engine as described in the Maintenance Manual.

2. Damage resulting from accident, acts of nature or other events beyond the control of LS Mtron.

3. The replacement of expendable maintenance items such as exhaust system, filters, hoses, belts, oil, thermostat, and coolant made in connection with scheduled maintenance services once these parts have been replaced.

4. Replacement items which are not genuine LS Mtron parts or not authorized by LS Mtron.

5. Loss of time, inconvenience, loss of use of equipment, engine or commercial loss.

What is covered by the Limited Emission Control System 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 Limited Emission Control System Warranty for engines which were built to conform to CARB and EPA regulations:

IMPORTANT! This may not include expendable maintenance items such as nozzle assemblies and rubber flanges. Emission related parts requiring scheduled maintenance are warranted until their first scheduled replacement point only.

This Limited Emission Control System Warranty applies to the following emission control parts:

(1) Fuel System
- (A) Fuel injection pump.
- (B) Fuel Injectors.

(2) Air Induction System
- (A) Intake manifold.
- (B) Turbocharger
- (C) Air Control Valve
- (D) Exhaust Manifold

(3) Exhaust Gas Recirculation (EGR) System
- (A) EGR valve body

(4) Aftertreatment Devices
- (A) DOC
- (B) DPF

(5) Positive Crankcase Ventilation (PCV) System.
- (A) PCV Valve.
- (B) Oil Filler Cap.

(6) Miscellaneous items Used in Above Systems
- (A) Vacuum, temperature, and time sensitive valves and switches.
- (B) Electronic control units, sensors, solenoids, and wiring harnesses.
- (C) Hoses, belts, connectors, assemblies, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware.
- (D) Pulleys, belts and idlers.
- (E) Emission Control Information Labels.
- (F) Any other part with the primary purpose of reducing emissions or that can increase emissions during failure without significantly degrading engine performance.

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1. General Notices for Safety

1-1. Note to the owner – General information

Operator's manual

Please have all operators read this manual carefully and keep this manual available for ready reference. Read this manual to make sure that you have a complete understanding of how to operate this tractor safely, correctly, and for the most effective performance of the tractor.

NOTE: *This operator's manual may be available in other languages; see your authorized local dealer for ordering.*

This manual contains important information concerning the adjustment and maintenance of your new equipment.

NOTE: *Some images of the tractor in this manual may differ slightly in some detail. Any variations will be similar enough for you to understand the information or instructions.*

Throughout this operator's manual, references to the right-hand and left-hand sides of the tractor are determined by facing the forward operating direction of travel.

This is the safety alert symbol. The safety alert symbol alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Warning	▶ **Illustrations in this manual may show protective shielding open or removed to better illustrate a particular feature or adjustment.** **Replace all shields before operating the tractor.** **Failure to comply could result in death or serious injury.**

◆ 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 to the product or the contents marked with safety mark in this Operator's Manual.

Danger	**Danger** - This indicates an imminently fatal dangerous situation that may cause a serious injury or death if not avoided.
Warning	**Warning -** This indicates a potentially dangerous situation that may cause a serious injury or death if not avoided.
Caution	**Caution -** This indicates a potentially dangerous situation that may cause a light injury or damage to the property if not avoided.
Notice	**Notice -** This indicates the instructions for right use for the safety of persons or products.

Your authorized local dealer and service

Your authorized local dealer has performed a pre-delivery setup, inspection, and testing to make sure that your tractor operates at its best performance level.

Your authorized local dealer will instruct you in the general operation of your new equipment. Your dealer's staff of factory-trained service technicians will be glad to answer any questions that may arise regarding the operation of your tractor.

Your authorized local dealer carries a complete line of genuine service parts. These parts are manufactured and carefully inspected to ensure high quality and accurate fitting of any necessary replacement parts. Be prepared to give your dealer the model and product identification number of your new equipment when ordering parts. Locate these numbers now and record them below. Refer to the 'General Information' section of this manual for the location of the model and product identification numbers of your tractor.

ATTENTION: *The engine and fuel system on your tractor is designed and built to government emission standards. Tampering by dealers, customers, operators, and end users is strictly prohibited by law. Failure to comply could result in government fines, rework charges, invalid warranty, legal action, and possible confiscation of the tractor until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only!*

Improvements

We are continually striving to improve its products. We reserve the right to make improvements or changes when improvements or changes become practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

(1) Before using the tractor

※ Must 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 to 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 an overturning accident.
- Do not use the tractor at higher speeds than allowed by the load on the tractor and road conditions. Always choose **a suitable driving speed** to maintain 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 arbitrarily, 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 is 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 arbitrarily. *Any unauthorized modifications made to this tractor can have serious consequences. Consult an authorized dealer on changes, additions, or modifications that may be required for this tractor. Do not make any unauthorized modifications*.
- 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 to stand 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.
- Pay attention to **overhead power lines and hanging obstacles**. High voltage lines may require significant clearance for safety.
- Do not operate the tractor during an **electrical storm. (Lightening strikes)**
- 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).

(2) Manual scope and required training level

Introduction to this manual

This manual gives information about the use of your tractor as intended and under the conditions foreseen by manufacturer during normal operation, routine service, and maintenance.

This manual does not contain all the information that relates to periodic service, conversions, and repairs that only trained service personnel can perform. Some of these activities may require appropriate facilities, technical skills, and/or tools that manufacturer does not supply with the tractor.

The manual contains the chapters as shown on the Contents pages.

Normal operation

Normal operation consists of the use of this tractor for the purpose manufacturer intends by an operator that:

- Is familiar with the tractor and any mounted equipment or towed equipment.
- Complies with the information on operation and safe practices as specified by manufacturer in this manual and by the signs on the tractor.

Normal operation includes:

- Preparation and storage of the tractor.
- Addition and removal of ballast.
- Connection and disconnection of mounted equipment and/or towed equipment.
- Adjustment and configuration of the tractor and equipment for the specific conditions of the job site, field, and/or crop.
- Movement of components into and out of working positions.

Routine service and maintenance

Routine service and maintenance consists of the daily activities necessary to maintain the proper tractor function. The operator must:

- Be familiar with the tractor characteristics.
- Comply with the information on routine service and safe practices as specified by manufacturer in this manual and by the signs on the tractor.

Routine service can include:

- Fueling
- Cleaning
- Washing
- Topping up fluid levels
- Greasing
- Replacing consumable items such as light bulbs

Periodic service, conversions, and repairs

Periodic service consists of activities that are necessary to maintain the expected life of your tractor. These activities have defined intervals.

Trained service personnel familiar with the tractor characteristics must perform these activities at the defined intervals. Trained service personnel must comply with the information on periodic service and safe practices as partly specified by manufacturer in this manual and/or other company literature.

Periodic service includes:

- Oil change service for the engine, hydraulic circuits, or transmission.
- Periodic exchange of other substances or components as required.

Conversion activities rebuild your tractor in a configuration that is appropriate for a specific job site, crop, and/or soil conditions (e.g., installation of dual wheels). Conversion activities must be done:

- By trained service personnel familiar with the tractor characteristics.
- By trained service personnel that comply with the information on conversion as partly specified by manufacturer in this manual, assembly instructions, and/or other company literature.

Repair activities restore proper function to your tractor after a failure or degradation of performance. Dismantling activities occur during the scrapping and/or dismantling of the tractor.

Trained service personnel familiar with the tractor characteristics must perform these activities. Trained service personnel must comply with the information for repair as specified by manufacturer in the service manual.

Before you operate

Read this manual before you start the engine or operate this tractor. Contact your authorized local dealer if:

- You do not understand any information in this manual.
- You need more information.
- You need assistance.

All persons training to operate, or who will operate this tractor should be old enough to possess a valid local vehicle operating permit (or meet other applicable local age requirements). These persons must demonstrate the ability to operate and service the tractor in a correct and safe manner.

(3) Metric and Imperial units abbreviations

	Metric unit		Imperial unit	
	Name	**Symbol**	**Name**	**Symbol**
Area	Square meter	m^2	Square foot	ft^2
	Square centimeter	cm^2	Square inch	in^2
	Square millimeter	mm^2	Square inch	in^2
Electricity	ampere	A	ampere	A
	volt	V	volt	V
Force	kilonewton	kN	pound	lb
	newton	N	pound	lb
Frequency	megahertz	MHz	megahertz	MHz
	Kilohertz	kHz	Kilohertz	kHz
	hertz	Hz	hertz	Hz
Rotational frequency	Revolution per minute	rpm	Revolution per minute	rpm
Length	kilometer	Km	mile	mi
	meter	m	foot	ft
	centimeter	cm	inch	in
	millimeter	mm	inch	in
Mass	kilogram	kg	pound	lb
	gram	g	ounce	oz
Power	kilowatt	kW	horsepower	Hp or ps
	watt	W	Btu per hour Btu per minute	Btu/hr Btu/min
Pressure or stress (Force per area)	kilopascal	kPa	Pound per square inch	psi
	megapascal	MPa	Pound per square inch	psi
	bar	bar	Pound per square inch	psi
	Kilogram per square centimeter	Kg/cm^2	Pound per square inch	psi
Temperature	Degrees Celsius	°C	Degrees Fahrenheit	°F

	Metric unit		Imperial unit	
	Name	**Symbol**	**Name**	**Symbol**
Time	hour	hr	hour	hr
	minute	min	minute	min
	second	s	second	s
Torque	Newton meter	N.m	Pound foot	lb.ft
	Kilogram meter	Kg.m	Pound foot	lb.ft
Velocity	kilometer per hour	km/h	mile per hour	mph
	meter per second	m/s	foot per second	ft/s
Volume	Cubic meter	m^3	Cubic yard	yd^3
	liter	L	Cubic inch	in^3
	liter	L	US gallon	US gal
	cc	cc	Cubic inch	in^3
Flow rate	Liter per minute	L/min	US gallon per minute	US gal/min
Sound pressure level	decibel	dB	decibel	dB

Glossary

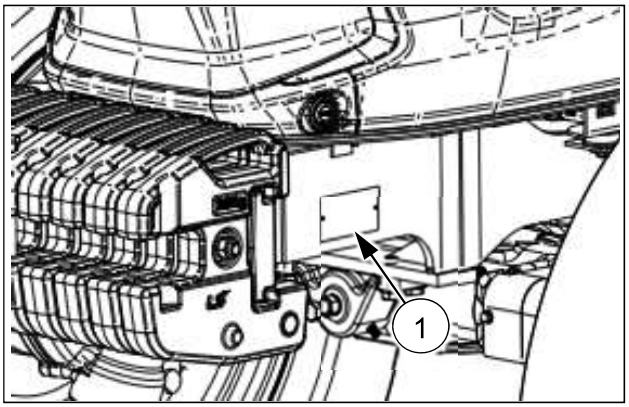
Acronym	Definition
MEC	Synchro shuttle transmission
HST	Hydrostatic transmission
PST	Power shuttle transmission
SPS	Semi-power shift transmission
MHL	Mechanical Hydraulic Lift
EHL	Electro-Hydraulic Lift
DEF	Diesel Exhaust Fluid
DPF	Diesel Particle Filter
ISO	International Organization for Standardization
MSDS	Material Safety Data Sheet
NOx	Nitrogen Oxide
PPE	Personal Protective Equipment
SCR	Selective Catalytic Reduction
<	Less than
>	Greater than

(4) Product Identification Number (PIN)

The tractor and major components are identified with Product Identification Number (PIN) plates. You should supply the PIN plate data to your authorized local dealer when requesting parts or service, and also to identify the tractor in case of theft.

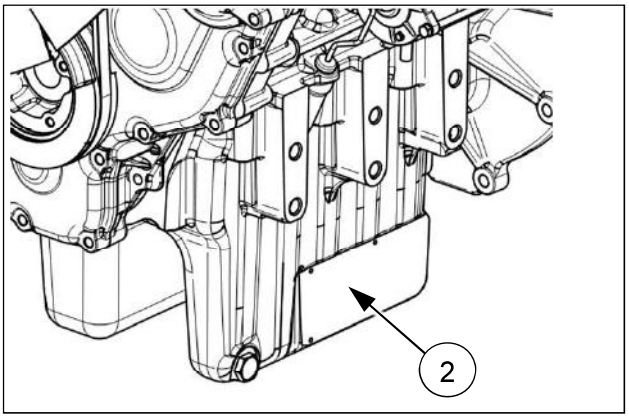
① Product Identification Number (PIN) plate

- The tractor PIN Plate **(1)** is located on the left-hand side of the engine frame.
- This may vary depending on the market.



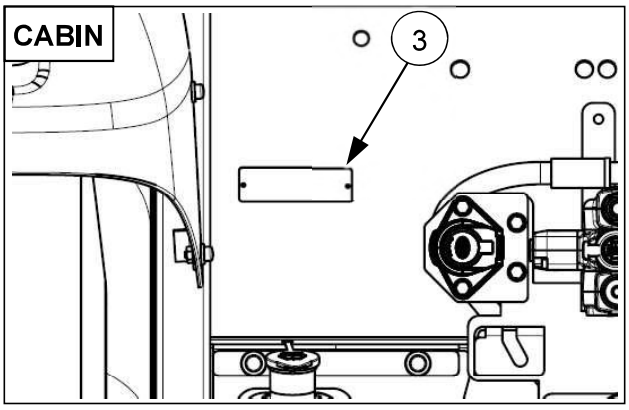
② Engine Product Identification Number (PIN)

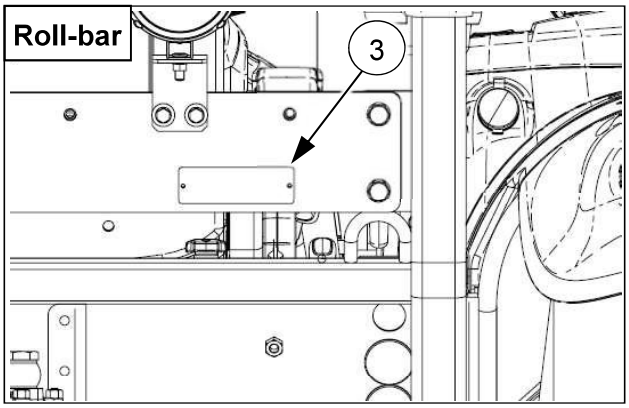
- The engine PIN plate **(2)** is located on the left-hand side of the engine oil sump.



③ Roll Over Protective Structure (ROPS) Product Identification Number (PIN)

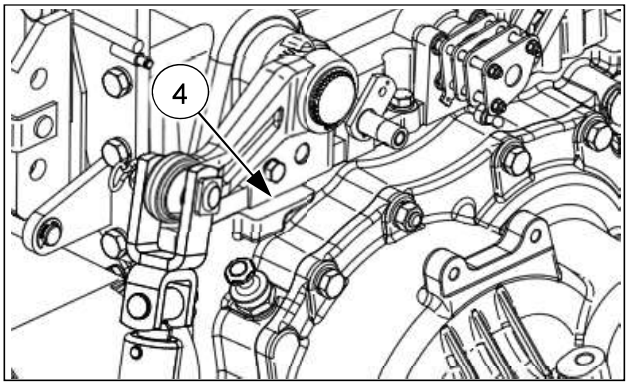
- The Roll Over Protective Structure (ROPS) PIN plate **(3)** is located on the left-hand side of the cabin rear steel plate for cabin models. For roll-bar models, it is located on the right-hand side of the ROPS connector plate.
- The ROPS PIN plate may vary depending on the market or ROPS type.

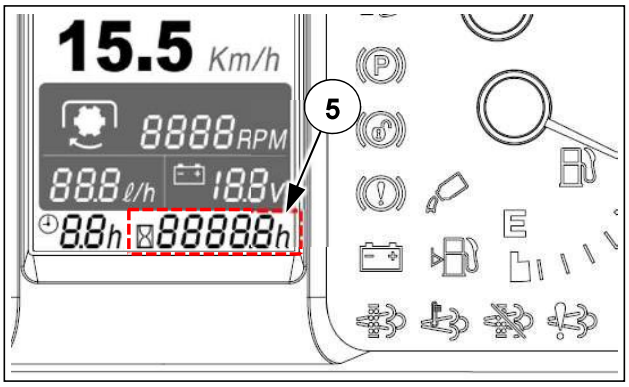




④ TM number and Running hours

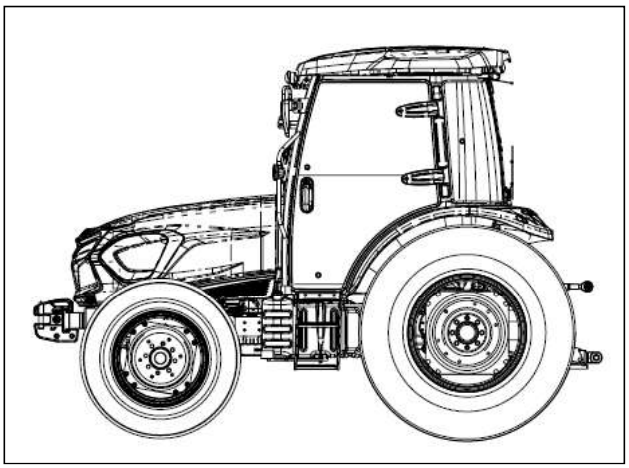
- In case of requesting service or parts from your dealer, the dealer may ask you to provide the TM number **(4)** and/or running hours **(5)** displayed on the instrument panel.



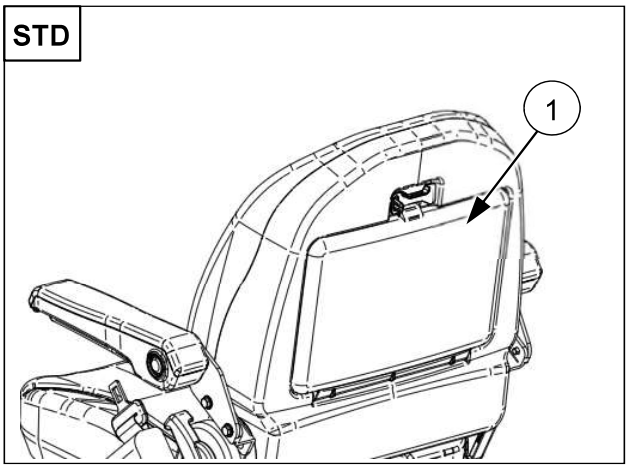


(5) Operator's manual storage

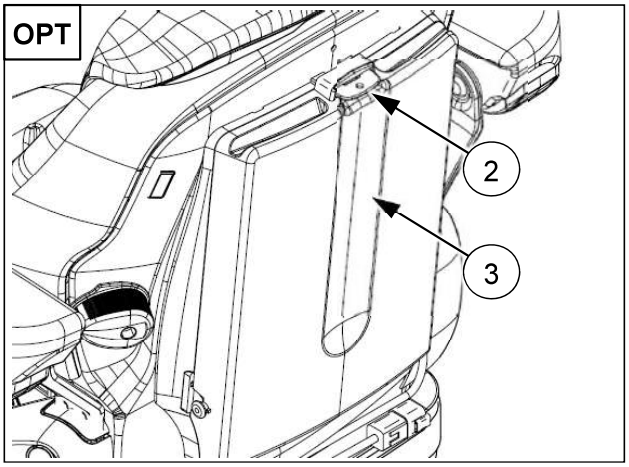
- The operator's manual must be stored in a secure place prior to operation and it must be kept available for use by all operators.



- Depending on the driver's seat, manual storage box is installed on the rear side of the driver's seat. To open the box, pull the upper side of the cover **(1)** rearward.



- Depending on the driver's seat, manual storage box is installed on the rear side of the driver's seat. To open the box, lift up the latch **(2)** and open the cover **(3)** rearward.

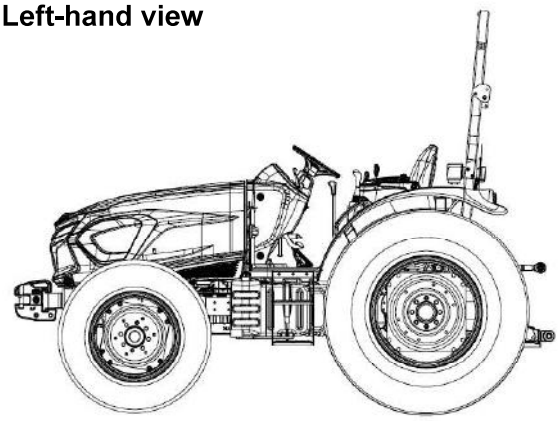


(6) Tractor orientation

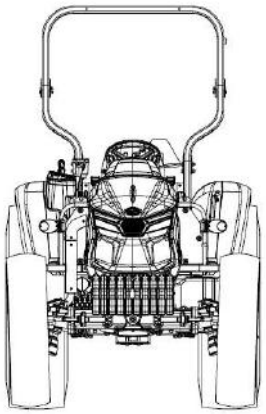
① Roll-bar model

NOTE: *On this equipment, left-hand and right-hand are determined by standing behind the unit, looking in the direction of travel.*

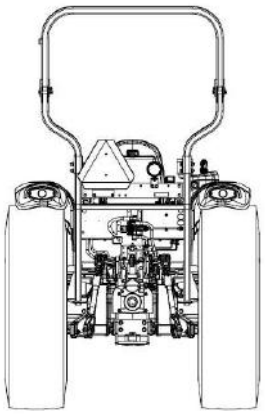
Left-hand view



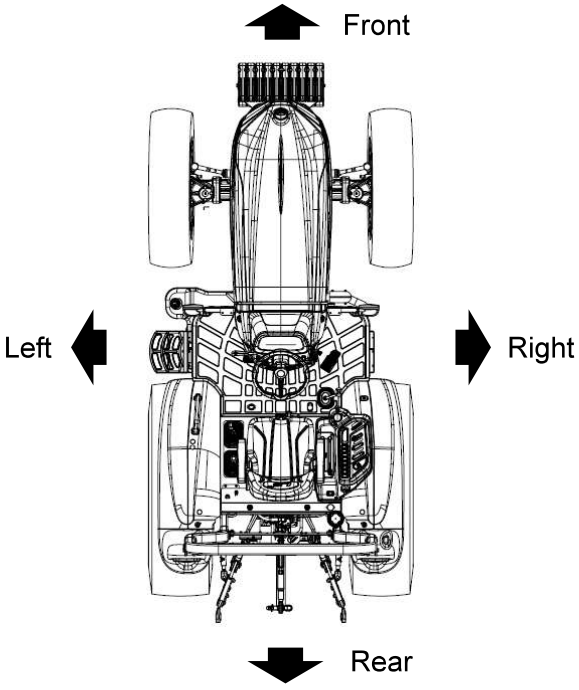
Front view



Rear view



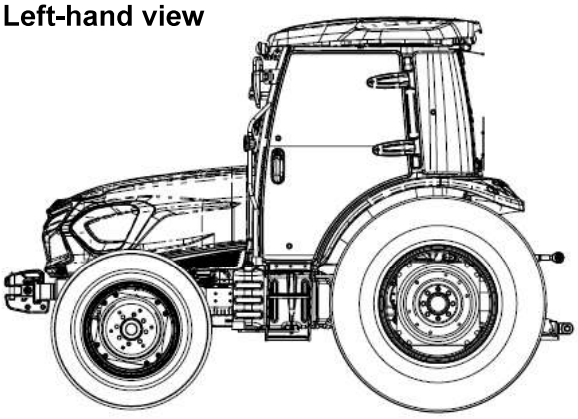
When reading this Operator's Manual, refer to the right figure for the discrimination of the directions.



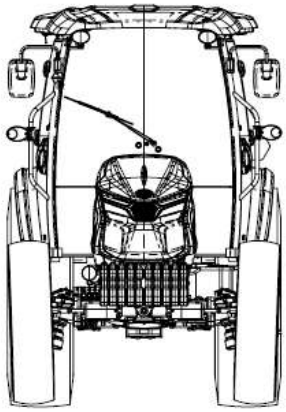
② Cabin model

NOTE: *On this equipment, left-hand and right-hand are determined by standing behind the unit, looking in the direction of travel.*

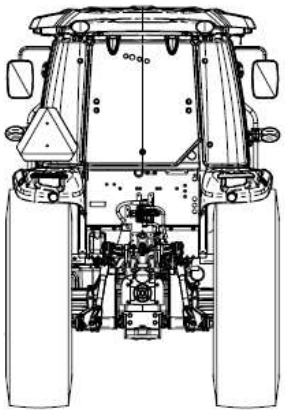
Left-hand view



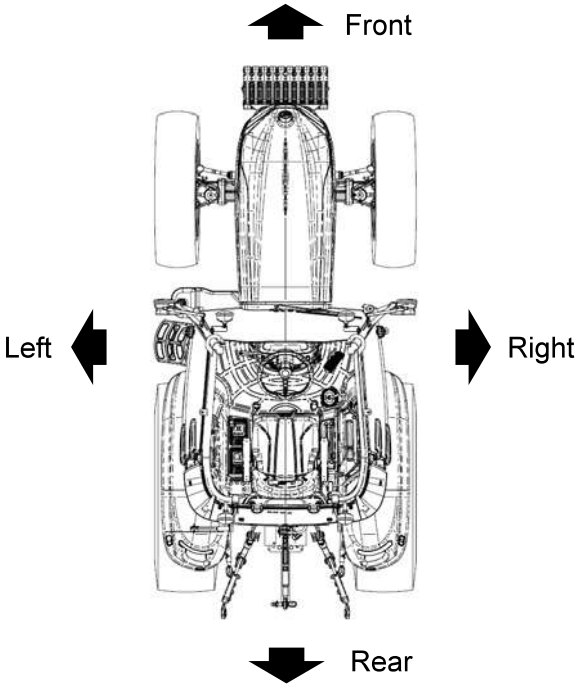
Front view



Rear view



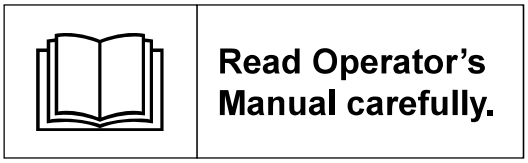
When reading this Operator's Manual, refer to the right figure for the discrimination of the directions.



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

(1) Notices before using the tractor

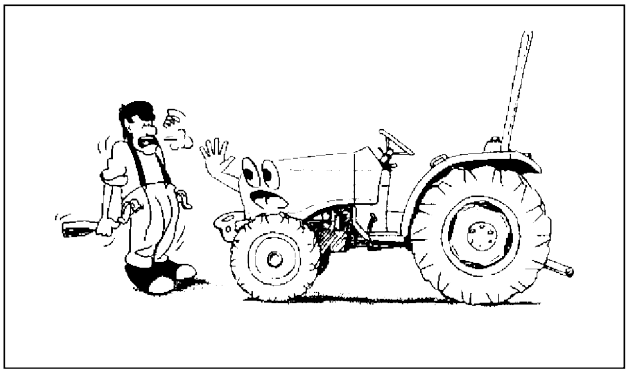
- **For Safety operation :** Before using this tractor, read carefully and understand this operator's manual and operator's manual of the mounted or trailed machinery on this tractor, and strictly follow the instructions outlined in the operator's manuals.



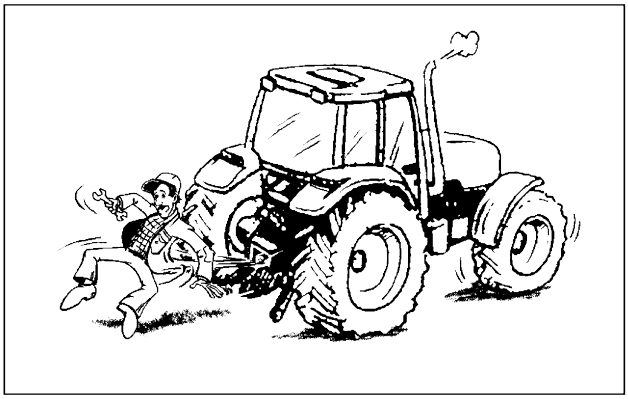
Especially, special cares must be taken for using the tractor in the places where the safety signs such as Danger, Warning, Caution etc. are marked. *(See page 1-1)*

- **Safety Decals :** For right use and personal safety of the operator, the safety decals are attached to the parts related with safety operation. Before using the tractor, comply with the safety instructions. (*For further information, refer to the chapter 1-2-(14). "Safety Decals" in this manual.*)

- **Operator's condition :** The persons such as patients, drunks, people on drugs, etc. are never allowed to operate this tractor.
  Only educated operators should 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(Mechanical models only) 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 the tractor. Contact your authorized local dealer. If not, it may cause a failure, reduction of product life or serious injury.

- **Restrict Maintenance :** If repairing or changing some components or settings arbitrarily, the performance of the tractor cannot be guaranteed, and may void the warranty. And also, maintenance of the heavy weighted parts without special tools may cause serious injury. These works should 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.

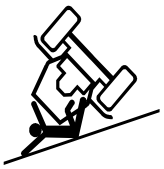
  ** The items that are not allowed to be modified or removed arbitrarily by user are as below :*
  - Protection structures such as PTO cover, Guards, Safety frame(Roll-bar), Cab, etc.
  - Engine components, Fuel injection control and setting, etc.
  - Automatic control equipment, Lamps, Transmission, 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 changed bulb capacity may cause a traffic accident by distracting 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 a 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):**
  - **For cabin model**, it does **NOT** provide any protection against falling objects. But it may only provide limited protection against light and small falling objects. It is recommended to use a certified FOPS structure when working with front-end loaders.
  - **For roll-bar model**, it does **NOT** provide any protection against falling objects. It is recommended to use a certified FOPS structure when working with front-end loaders.

  For further information about using front-end loader, see chapter 4-5-(7) in this manual.

- **Level of protection against hazardous substances:**
  - **For cabin model**, it does **NOT** provide any protection against hazardous substances. But it can provide only dust protection level by pressurizing air in the cabin with air filters. Do not use the tractor with crop sprayers in chemical hazardous area.
  - **For roll-bar model**, it does **NOT** provide any protection against hazardous substances. Do not use the tractor with crop sprayers in hazardous area.

  For further information about working in hazardous area, see chapter 4-5-(11) in this manual.

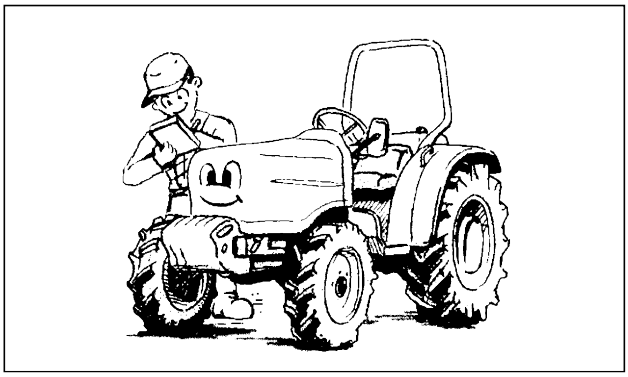
- When using the agricultural tractor with crop sprayers, the following hazards exist:
  • Risks due to spraying hazardous substances with a tractor (fitted with a cab or not).
  • Risks related to entering or exiting the cab(if fitted) during the application of hazardous substances.
  • Risks related to the possible contamination of the operating environment.
  • Risks related to cleaning the cab and maintaining the air filters (if fitted).

  For protection against hazardous dust, aerosols, and vapors, see the instructions provided by the chemical agent supplier, the sprayer manufacturer, and the basic rules contained in this manual. Always use the Personal Protective Equipment (PPE) and any other special devices as instructed by the chemical supplier's instructions during spraying operations.

- **Level of protection of the OPS (Operators Protection Structure) :** This tractor does **NOT** provide protection against
  - falling objects, such as branches, logs or tree limbs, low hanging wires in the forest, orchard or construction area.
  - 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.
  - steep slope or rough terrain working conditions.
  - potential risks by using any optional equipment that might be available to deal with those hazards.

  Your tractor is NOT EQUIPPED FOR FORESTRY APPLICATIONS. **NEVER enter or operate in these hazardous areas without a 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** with a securely fastened seat belt.
- 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 chapter 4-2, “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.

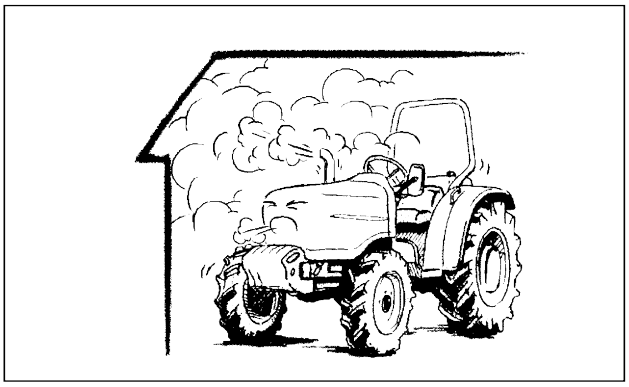
Starter motor

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

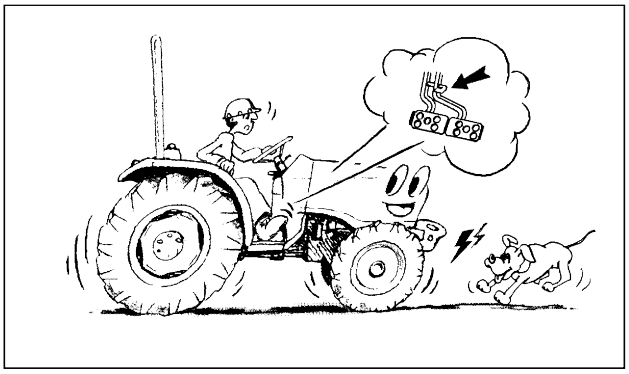
- **Ventilation**

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.

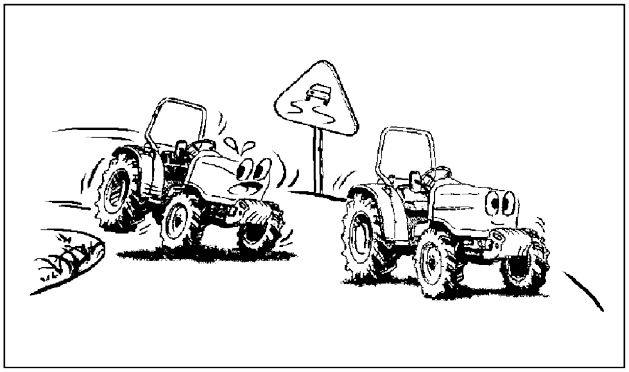


- **Noise and Vibration** : When working between buildings or in confined spaces, the sound pressure level can be increased. Wear suitable ear protectors in high noise level conditions. When working with equipment in the field, vibration intensity from equipment may be increased. To reduce the harm to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

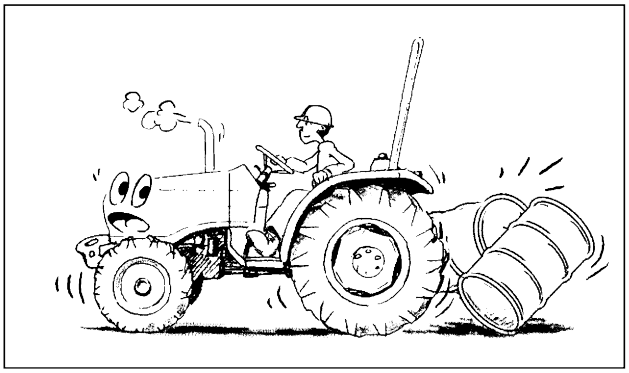
- Connect left and right brake pedal(s) while driving on the road. (if fitted)
- DO NOT use differential lock device while driving on the road or turning in the field.
- DO NOT ride your foot on the brake pedal(s) or clutch pedal.
- Do not jump up/down while tractor is moving. When getting on/off the tractor, use the grab rail and sub step to prevent falls.



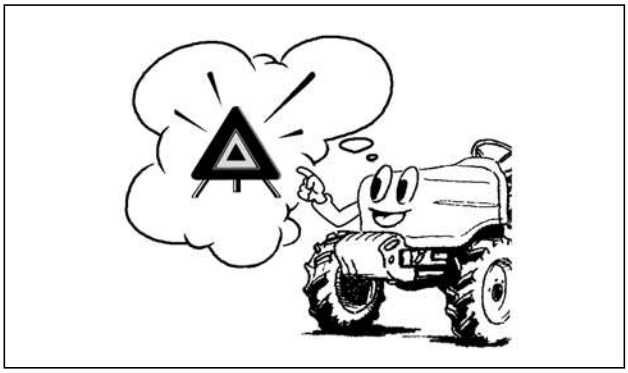
- Lower the driving speed enough before turning a sharp curve. Especially, when you drive the tractor with implements, make the turning radius wider.
- DO NOT start or stop the tractor suddenly. Engage the clutch and brake softly. If not, front wheels can be lifted up and it is very dangerous.
- While working, you must clean the spraying area, front/rear wheels, axles, mud guards and fenders regularly.



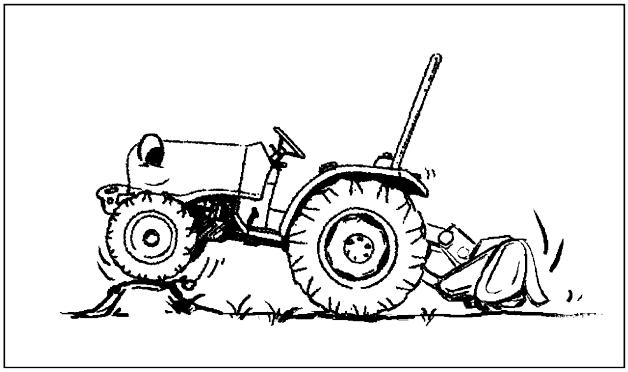
- When driving the tractor in reverse, lower the engine speed. Make sure to check if there is any obstacle or person in the rear.
- DO NOT permit other people and especially children approach within working area while operating tractor and equipment.



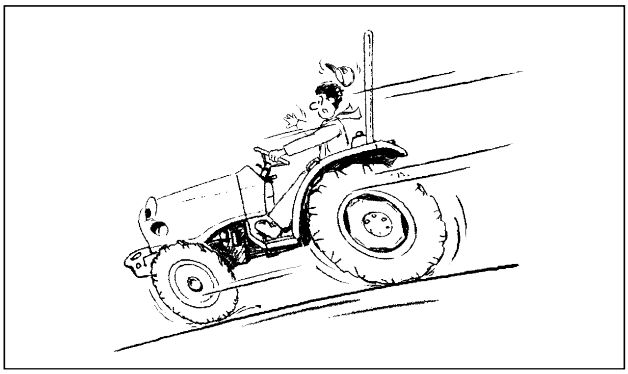
- Obey the traffic rules while driving on public roads. Do not exceed the local legal speed limit. Use a beacon or slow moving vehicle (SMV) to indicate that the vehicle is slow moving.
- If you cannot drive the tractor due to a failure, move the tractor to a safe place and install troubled vehicle (safety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



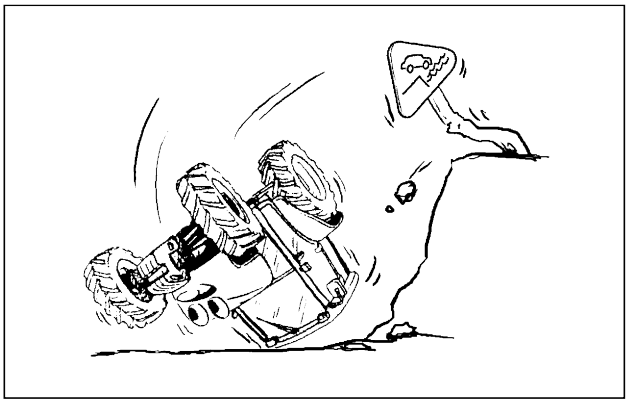
- Do not overuse the fuel, oil, etc and pay attention not to contact the skin directly. Generally, these materials contain harmful materials to the human body. When you work in a area where hazardous chemicals are sprayed, check the cabin filter (if fitted) and replace the filter with suitable one for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



- *When working with a front/rear implement, be careful not to touch the overhead power lines and hanging obstacles.*
- *Do not operate the tractor during an electrical storm. (Lightening strikes)*



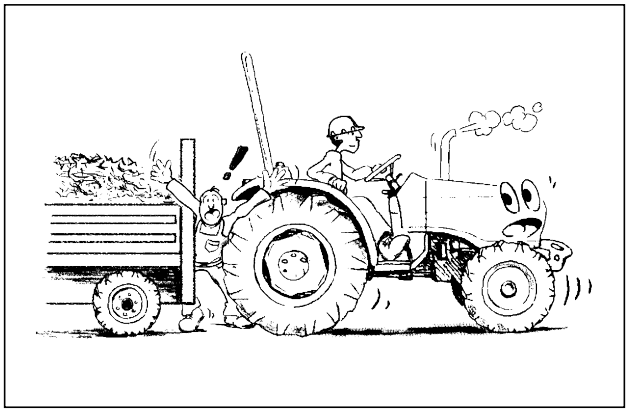
Overturning hazards



- To climb a steep slope, drive tractor slowly in reverse up the slope rather than forward. It is much safer.
- When turning tractor on a slope, the tractor can be overturned easily. Pay attention to the steering operation.
- When working at the edge of steep slope, especially, when using heavy attached implements, take special care about a turn-over.
- When working, wear the protection equipment and tighten the seat belt.
- If the authorized passenger seat is not installed, keep riders off.
- Do not use the tractor on slopes or in other conditions that exceed the stability limits in this manual. Using the tractor beyond these limits may cause the tractor to roll over or tip over. Follow the recommendations in this manual. Pay particular attention when the tractor travels down steep hills in a loaded condition.
- Do not drive the tractor on or near the edge of ditches, canals, dykes or embankments with ground that is unstable or dug out by rodents. The tractor may sink sideways and roll-over.
- Do not use the tractor on:
  - Unstable crossings or bridges.
  - Soft surfaces.
  - Surfaces that cannot support the weight of the tractor.
- These constructions may collapse and cause the tractor to roll over. Always inspect the condition and carrying capacity of bridges and ramps before you drive the tractor onto a bridge or ramp.
- Seat belts are part of your Roll Over Protective Structure (ROPS) and must be worn at all times. An operator must be held to the seat inside the frame in order for the protective system to work.
- Always respect the dynamic stability limits of the tractor. Abrupt, high-speed maneuvers increase the risk of tractor roll-over. Fast cornering and tight cornering increase the risk of tractor roll-over.
- Do not use the tractor for pulling operations where you do not know if the load will yield (for example, pulling stumps). The tractor may flip over backwards if the load does not yield.
- Be extremely cautious when you work with the tractor on forage silos without concrete sidewalls. Dual wheels or a wide track setting may improve the sideways stability of the tractor.
- Be aware that the tractor center of gravity may increase when you raise loads with a front-end loader or a three-point hitch. In these conditions, the tractor may roll over earlier than you expect.

NOTE: *the provided list does not contain all possible hazards. Always follow the instructions in this manual when you use the tractor.*

(4) Notices when connecting Implement

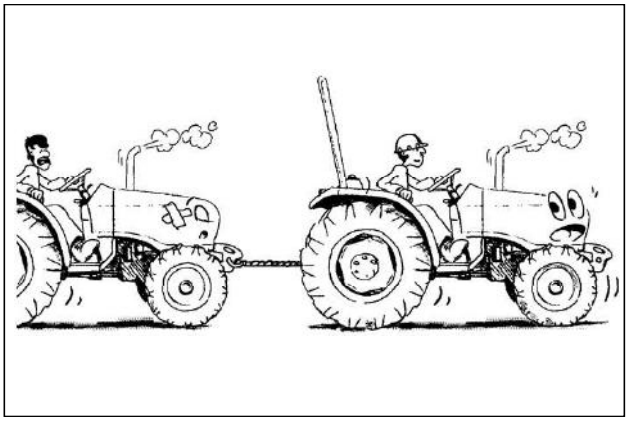


- Attach or detach the implement on wide and level ground.
- Do not use the tractor in combination with equipment arbitrarily, without having consulted the specific operator's manual provided with the equipment.
- You should stay clear from the three-point linkage when controlling it. Do not stay between 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 an approved hitch or drawbar. Do not tow by connecting to 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 couplers, lower the implement on the ground, turn off the engine and check if the pressure in the hydraulic lines is relieved. ▶ When installing the implement having big hydraulic cylinders or lines, check the oil level in the transmission housing after installing the implements.

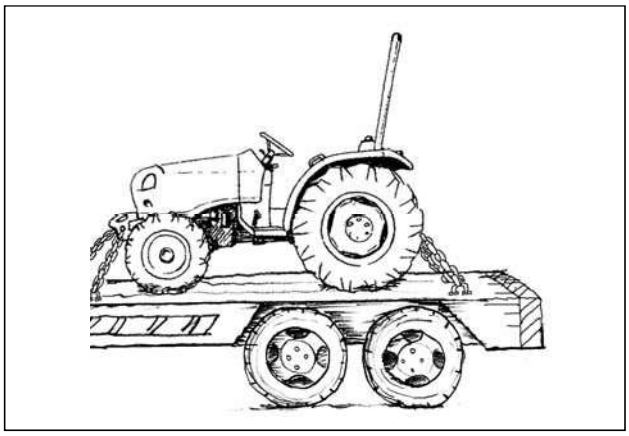
⚠ Warning	▶ Before connecting or checking the implement, put PTO switch to the "OFF" position and place PTO gear lever (optional) in the neutral position.
	▶ When attaching or detaching the implement, make sure to secure the implement and tighten the three point hitch pins correctly. Failure to do so can cause a serious failure or injury during operation.
	▶ If a heavy loaded trailer is connected to the 3-point linkage or any structure, it can cause a turnover or failure and serious injury. Make sure to use an approved towing hitch or 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 the other structure such as rear axle, ROPS, front axle, and steering components for towing.
- Your 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 the transmission gear levers in the neutral position.
- Do not use cables or rope to tow the machine. If the cable or rope breaks or slips, it may whip back with enough force to cause serious injury. When using a chain, attach the chain with the hook's open side facing UP. If the hook slips, it will drop down instead of flying up.
- Never attempt to start the machine by towing. The machine could start unexpectedly.
- Do not tow the machine on public roads. Towing could cause a safety hazard for other vehicles using the roadway. *For further information, see chapter 4-4-(4) in this manual.*

(6) Notices when transporting the tractor



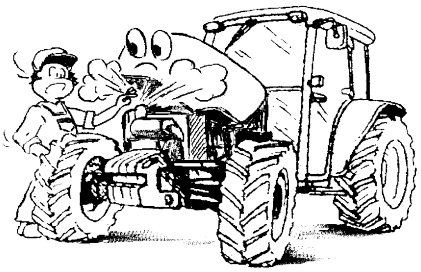
- When transporting the tractor by truck, trailer, etc., use suitable equipment or facilities to load or unload the tractor.
- Fix the tractor tightly to the vehicle with heavy-duty straps or chains.
- When fixing the rear of the tractor, use the hitch or hitch support.
- When fixing the front of the tractor, use the towing hook.
- When driving on public roads, the transporting vehicle must have signs and lights required by local regulations 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. ▶ For engines equipped with a turbocharger, cover the exhaust outlet to prevent the turbocharger from spinning due to air without lubrication.

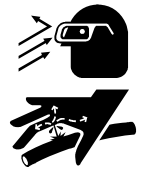
(7) Notices when servicing the tractor after work

- 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 engine is hot. The engine or radiator may crack.

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



- **Remove all mud and debris** from the tractor after working. Especially check the engine area and exhaust system.
- 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.

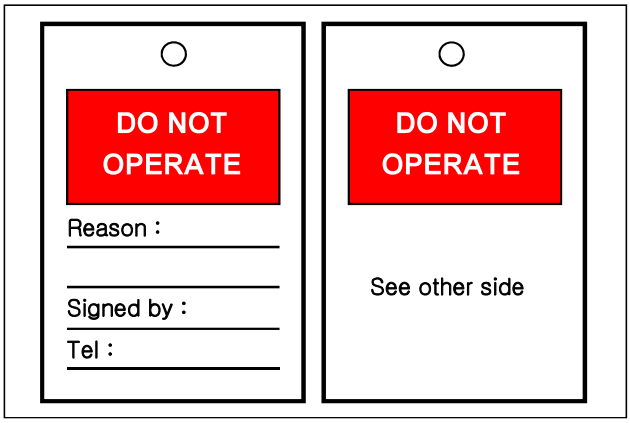
Warning 	▶ Before removing hydraulic pipes or hoses and other parts, make sure to check that hydraulic pressure is relieved completely. The leaks of pressurized oil can cause a fatal physical injury. ▶ Use proper protection equipment, before servicing hydraulic system. ▶ Before connecting or disconnecting 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.
- **To prevent an fire or explosion of the battery,** keep any type of flames or sparks away from battery. Do not grind, smoke, or weld near a battery. Do not short circuit the terminals with metal objects. *For further information, see chapter 5-15-(3), "Battery handling and Notices" in this manual.*

Warning 	▶ **Always remove grounded (-) battery clamp first and assemble it last**. ▶ **Sulfuric acid in battery electrolyte is poisonous.** It is strong enough to burn skin, clothing and can cause blindness if splashed into eyes ▶ 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(if fitted) arbitrarily**. There is a possible to be severely frostbitten or injured by escaping refrigerant. Contact your authorized local dealer to repair your air conditioning system.
- **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.
- When lifting heavy parts like engine, axle, tires etc., make sure to **check the lifting facilities have enough strength and capacity.**

- Before servicing the tractor, attach a "**DO NOT OPERATE**" warning tag to the tractor in an area that will be visible.
- Electric sensors, switches and harness, including engine control unit(if equipped) are very sensitive and delicate. Strictly **prohibit injecting water, mechanical impulse and any kind of welding on engine.**



- *When assembling, operating, or servicing the tractor, wear protective clothing and any Personal Protective Equipment (PPE) necessary for the particular procedure. The necessary PPE may include: - Protective shoes, Eye and/or face protection, Hard hat, Heavy gloves, Filter mask, Hearing protection.*
- *When tractor maintenance requires you to work at heights:*
  - Correctly use tractor steps, ladders, and/or hand holds.
  - Do not stand on tractor areas that are not designed as steps or platforms.
  - When necessary, use an appropriate ladder to reach components such as mirrors, rotating beacons, or air filters.
  - Never use steps, ladders, and/or hand holds when the tractor is in motion.
  - Do not use the tractor as a lift, ladder, or platform for working at heights.
- *If you do not understand a maintenance procedure, or doubt your ability to perform a maintenance procedure correctly, see your authorized dealer.*

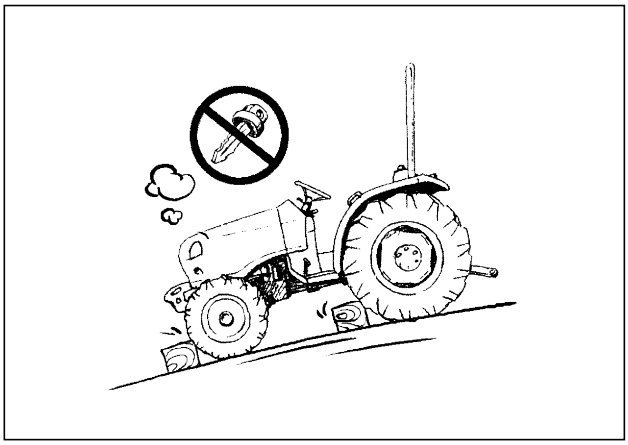
(8) Notices when handling Diesel Fuel

- *Before handling diesel fuel, refer to the chapter 5-1-(3), 5-1-(5) in this manual.*
- *Before handling Bio-diesel, refer to the chapter 5-1-(4) in this manual.*

⚠Warning	**Fire hazard!** ▶ When handling diesel fuel, observe the following precautions: 1. Do not smoke. Keep any type of flame away. 2. Never fill the tank when the engine is running. 3. Wipe up spilled fuel immediately. Always tighten the fuel tank cap securely. Failure to comply could result in death or serious injury.

(9) Notices when leaving the tractor

- Stop the tractor on a level ground.
- Place the transmission gears in the neutral position and put PTO switch to the 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 the engine and all moving parts to stop.
- Apply wheel chocks to the wheels when parking the tractor on a slope unavoidably.



⚠ Caution	▶ If it is necessary to park your tractor on a slope, furthermore with a loaded trailer, the tractor may roll down even if the parking brake is applied. In this case, additionally apply the lowest transmission gear and apply wheel chocks or blocks to the all tires. **-. Mechanical : downhill ⇒ Reverse 1st gear / uphill ⇒ Forward 1st gear** **-. Power shuttle : Engine brake by transmission gear is not available.**

(10) Notices relating to Toxic substances

⚠ **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.
- Battery post, terminals and related accessories contain lead and lead compounds.
- When handling engine oil, diesel fuel, anti-freeze solution and other chemical substances, wear protective clothes, mask and gloves.
- For more information, go to www.P65warnings.ca.gov/diesel

WASH YOUR HANDS AFTER HANDLING.

(11) Tractor stability

Warning	▶ **Driving hazard!** **To prevent tractor instability, ALWAYS consider and follow the tractor stability requirements in this manual.** **Failure to comply could result in death or serious injury.**

The following procedure describes the requirements for tractor stability and how to calculate the required front-mounted and rear-mounted ballast.

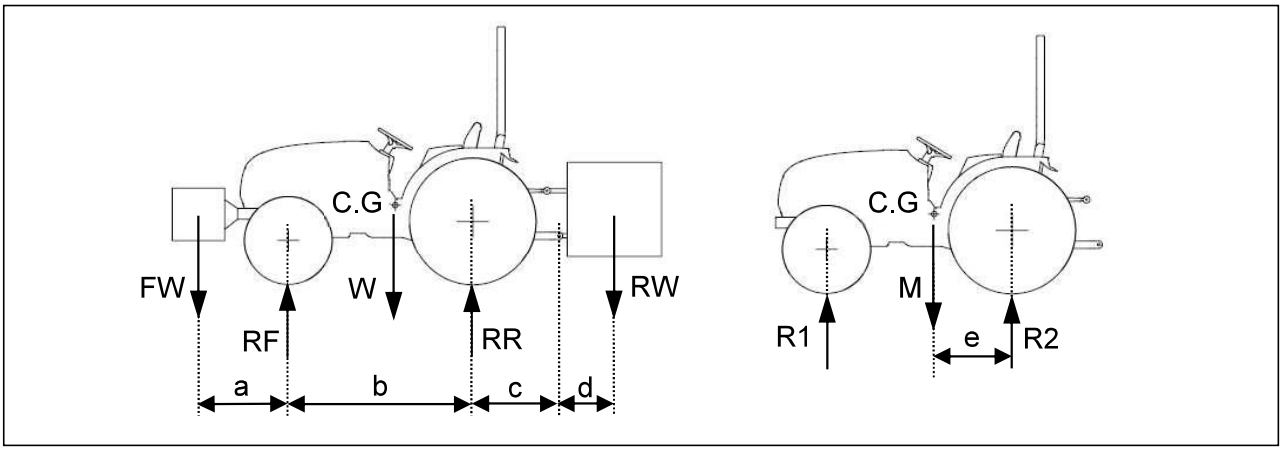
For additional ballast information, also refer to the ballast recommendations in this manual.

For the maximum permitted operating weights, refer to the vehicle weights in this manual.

The following procedure and calculation is based on a tractor on even ground.

Warning	▶ **Roll-over hazard!** **ALWAYS be aware of the effect of inclines and steep hills on tractor stability. Operating, handling, and braking performance may be affected. Adjust ballast and driving speed accordingly to ensure stable and accurate steering, and to ensure the required brake performance in critical situations.** **Failure to comply could result in death or serious injury.**

Necessary data to evaluate stability

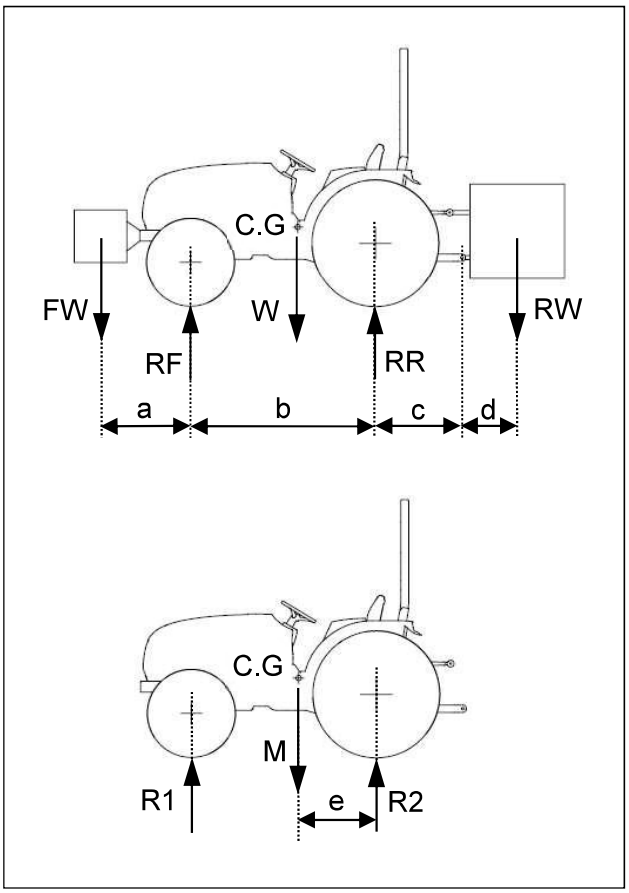


		To get this value refer to:
M	Mass of the unladen tractor = Tractor with standard equipment, minimum fuel, no weights or liquid ballast, no operator, and single wheel equipment	See chapter 7 in this manual.
R1	Front axle load of unladen tractor	See chapter 7
R2	Rear axle load of unladen tractor	See chapter 7
a	Distance, Center of gravity of front load to front axle center	Manual of the equipment or your measurement
b	Wheelbase	See chapter 7
c	Distance, rear axle center to lower hitch point of three-point linkage	See chapter 7 or your measurement
d	Distance, Center of gravity of rear load to lower hitch point of three-point linkage	Manual of the equipment or your measurement
e	Distance, rear axle center to center of gravity of mass of the unladen tractor (M)	Calculate using formula on the following pages
FW	Mass of front-mounted equipment or front-mounted ballast	Manual of the equipment or your measurement
RW	Mass of rear-mounted equipment or rear-mounted ballast	Manual of the equipment or to measurement
Wmax	Maximum permissible mass of the laden tractor	See chapter 4-5-(4)
RFmax	Maximum permissible front axle load	See chapter 4-5-(4)
RRmax	Maximum permissible rear axle load	See chapter 4-5-(4)

1. Equipment weight together with its filling must be added to laden values (seed drills, fertilizer spreaders, etc.).
2. Ballasting weight in the center of the front or rear tires, either solid or liquid, must be added to R1, R2, and M.
3. In case of an unbalanced trailer, the value c is the distance between the center of the rear axle and the hitching point, the value d is 0, and RW is the vertical load of the trailer on the hitch.

Constant parameters

0.2	Minimum ratio: actual axle load of laden front axle/ mass of the unladen tractor	Legal requirement
0.45	Minimum ratio: actual axle load of laden rear axle/ mass of the unladen tractor	Legal requirement



Required front ballast

To calculate	
FWr	Ballast required at the front when carrying a load RW at the rear

CALCULATION OF FWr
M*e = R1*b
e = (R1*b)/M
RW*(c+d) - (M *e) + (RF *b) = FWr*(a+b)
RF > 0.2*M RF value must be higher than 0.2*M
FWr>[RW*(c+d- (R1*b)+(0.2*M*b)]/(a+b)

Required rear ballast

To calculate	
RWr	Ballast required at the rear when carrying a load FW at the front

CALCULATION OF RWr
M*b (b- e) = R2*b
FW*a - M *(b- e)+ (RR*b) = RWr*(b+c+d)
RW*(c+d) - (M *e) + (RF *b) = FWr*(a+b)
RR > 0.45*M RR value must be higher than 0.45*M
RWr> [(FW*a) - (R2 *b)+(0.45 *M*b)]/(b+c+d)

Axle load limits

To calculate:	
RF	RF < RFmax
RR	RR < RRmax
W	W < Wmax

CALCULATION OF RF
(RF*B) - FW*(A + B) - (M*E)+ RW*(C + D)
RF = [FW *(A+B)+ (R1*B) - RW*(C+D)]/B < RFmax

CALCULATION OF W
W = FW + M + RW < Wmax

CALCULATION OF RR
R2T = W - RF < RRmax

(12) Ecology and the environment

Soil, air and water is 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.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation.

Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

We'd like to notify the following items for "Use & Disposal" related to environment preservation.

1. **Avoid the overload work** after reading the operator's manual.
   Overload work may reduce the life of the product as well as the unburned exhaust gas occurred during overload work becomes the major cause of air pollution.
2. When you replace various oils (engine oil, transmission oil, brake oil, and 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 you replace the fuel, lubricants oil and coolants, avoid spillage and do not allow to be absorbed into the ground. Do not mix drained brake fluids or fuels with lubricants. They must be collected safely 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. Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
7. Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your authorized local dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
8. Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
9. In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. We strongly recommends that you return all used batteries to your authorized local dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.

(13) Symbols

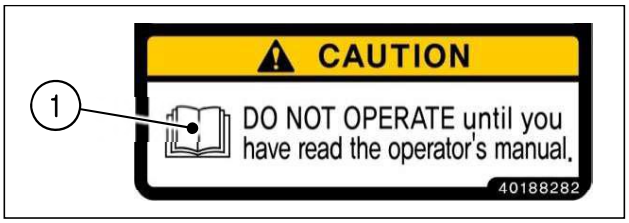
The followings show the symbols and its meaning used for the tractor.

	Refer to operator's manual.		Gear Neutral		Low speed
	Caution!		Forward/Reverse		High speed
	Battery charging		Forward		Engine speed control (throttle)
	Fuel level		Reverse		Engine speed control (throttle)
	Fuel filter		4WD engage		Turn signal light
	Engine coolant temperature		4WD disengage		Light switch
	Hydraulic oil pressure		Quick turn (optional)		Side lights
	Engine oil press-ure		Cruise drive (optional)		Headlights (Low beam)
	Engine preheat		Cruise drive release (optional)		Headlights (High beam)
	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)		Unlatched brake pedal (optional)
	Differential lock device		Cylinder rod (floating)		Engine warning
	DPF regeneration		DPF temperature		DPF inhibited

(14) Safety Decals

① Handling and Maintenance of Safety Decals

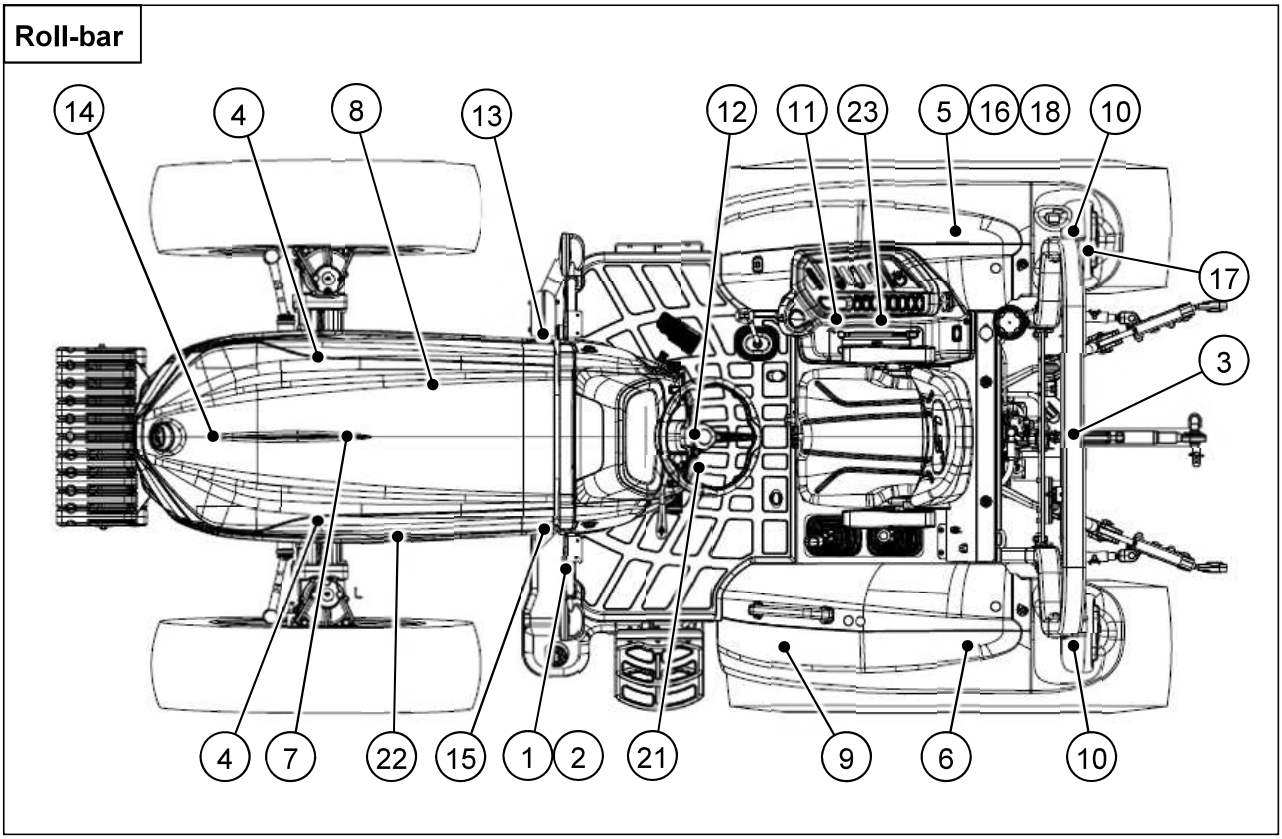
- For intended use and personal safety of the operator, the safety decals (labels) are attached to the parts related with safety operation.
- Before operating or maintaining the tractor, check the position and read the instructions carefully.
- If you find “Read Operator’s Manual” symbol **(1)** in the decals, refer to the appropriate page of the operator’s manual for further information regarding operation, adjustment, and maintenance.



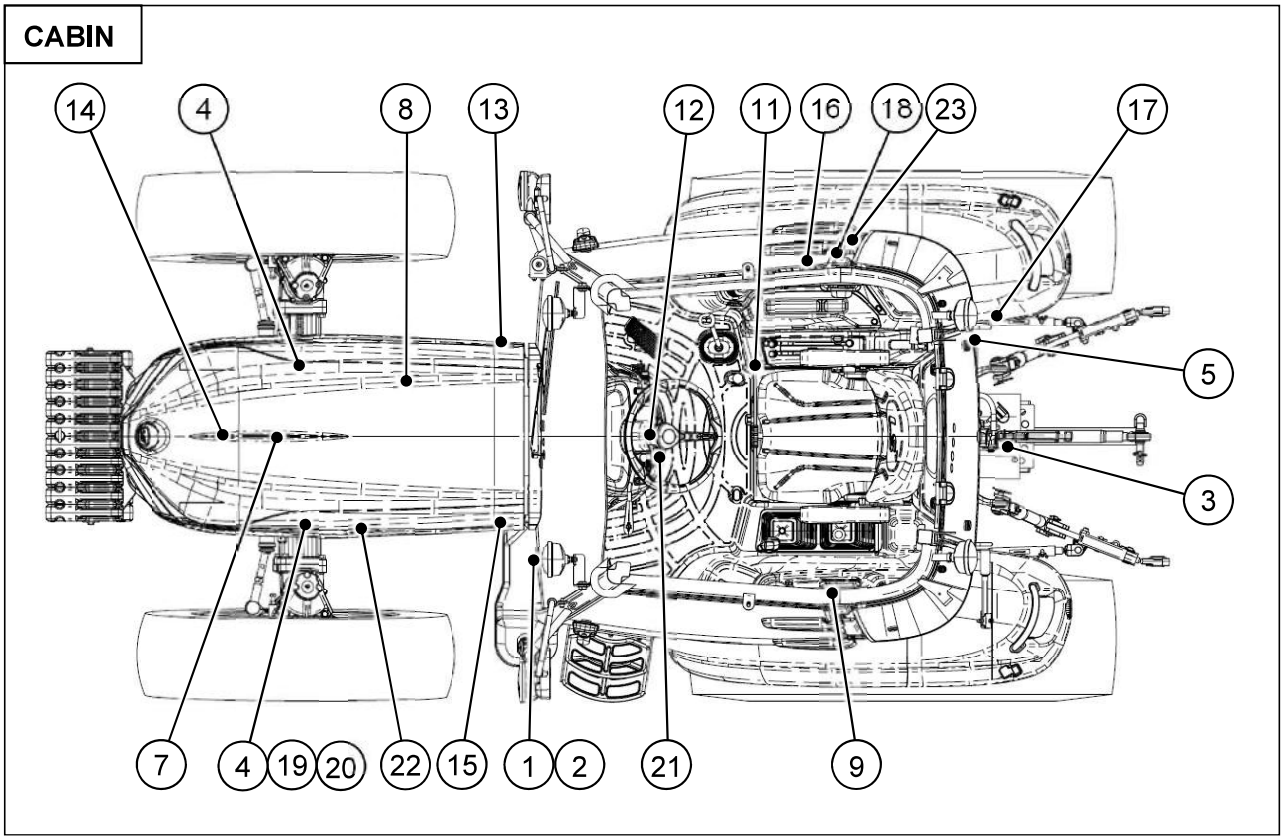
⚠ Caution	▶ The instructions described on the safety decals are very important for your safety and for those working with you. If ignored, it may cause death or serious injury. ▶ If the decals are dirty, wash them with soap water and wipe with soft rags. Do not use thinner, acetone, or other harsh chemicals that may damage the decals. ▶ If the decal is detached or damaged, replace it with a new one on the original position. ▶ When cleaning the tractor with pressurized water, the decals can be detached. ▶ If a safety decal is on a part that is replaced, make sure the decal is attached on the new part.

② Safety Decals and Attaching position

Roll-bar

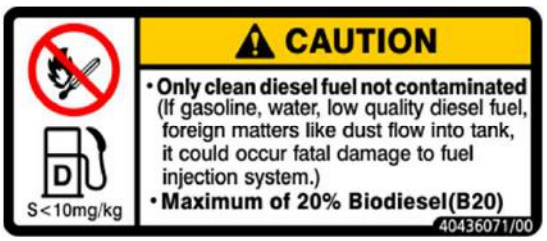


CABIN



1. Location : On the lower side of left-hand front wind shield.

- Only clean diesel fuel not contaminated.
- Ultra low sulfur diesel (S<10mg/kg).
- Do not smoke while refueling and keep any type of flame away.
- Maximum of 20% biodiesel(B20)
- Part No. : 40436071



2. Location : On the lower side of left-hand front wind shield.

- 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 radiator frame, inside the hood.

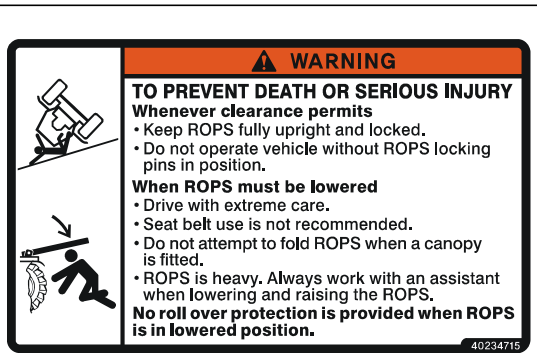
- Keep hands clothing away from the rotating fan and belts.
- Contact with moving parts may cause loss of fingers or a hand.
- Failure to comply could result in death or serious injury.
- Part No. : 40239638

5. Location: On the right-hand rear mud guard for Cab models / On top of right-hand fender for roll-bar models.

- 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. (Roll-bar models only)

- 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 radiator, in front of the radiator cap.

- 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: On the right-hand side of the DPF support.

- 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 the right-hand cabin pillar for cabin models / On top of left-hand fender for roll-bar models.

① CAUTION

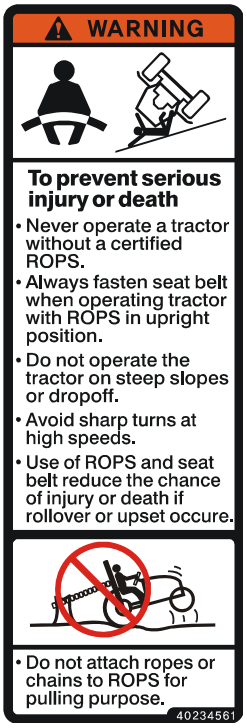
- PTO selector & lever must be in “OFF” position to start engine.
- Do not operate on hard surfaces with 4WD engaged.

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. : 40360330

10. Location: On the left/right-hand side of the ROPS frame. (Roll-bar model only)

- 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



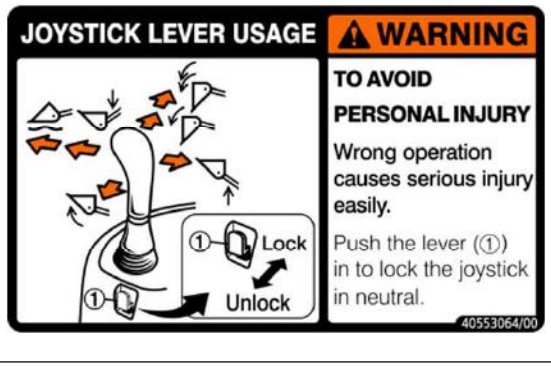
11. Location : On the right-hand console cover.

- 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 : 40536265 (for roll-bar models)

Roll-bar

- Part number : 40553064 (for cabin models)

CABIN

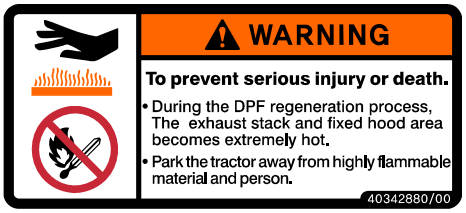


12. Location: On the lower side of rear steering column cover. (optional)

- CAUTION.
- To prevent unnecessary wear, never ride the clutch pedal for resting a foot.
- Part number : 40222778

13. Location: On the right-hand side of hood cover.

- TO PREVENT SERIOUS INJURY OR DEATH;
  • During the DPF regeneration process, the exhaust stack and surrounding hood area becomes extremely hot.
  • Park the tractor away from highly flammable materials and person.
- Failure to comply could result in serious injury.
- Part No. : 40342880

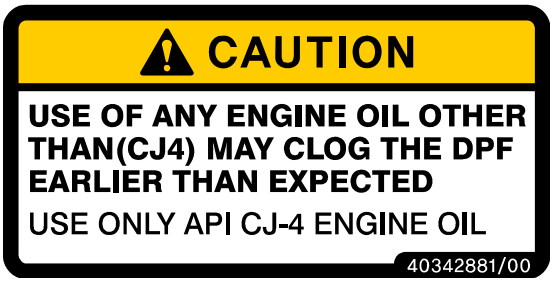


14. Location: On top of ECU cover, inside the hood.

- CAUTION;
  Avoid direct water spray on ECU. It may cause problems.
- Failure to comply could result in malfunction of ECU.
- Part No. : 40283939

15. Location: On the left-hand side of hood cover.

- CAUTION;
  Use of any engine oil other than CJ-4 may clog the DPF earlier than expected.
  Use only API CJ-4 engine oil.
- Failure to comply could result in malfunction of DPF.
- Part No. : 40342881



16. Location: On top of right-hand fender for roll-bar models / On the right-hand window glass for cabin models.

- CAUTION;

Periodically, the DPF will require the regeneration. This is an automatic function unless inhibited by operator.

1) Automatic : The DPF regeneration lamp will illuminate indicating the regeneration is needed. If the operator does not inhibit the regeneration, the DPF temperature will also come on and the engine control unit will automatically begin the regeneration.

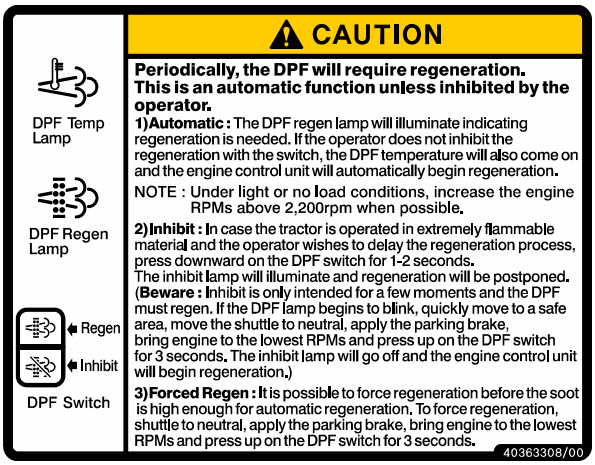
NOTE : Under light or no load conditions, increase the engine RPMs above 2,200rpm when possible.

2) Inhibit : In case the tractor is operated in extremely flammable materials, and the operator wishes to delay the regeneration process, press downward on the DPF switch for 1~2 seconds. The inhibit lamp will illuminate and the regeneration will be postponed.

(**Beware** : Inhibit is only intended for a few moments and the DPF must be regenerated. If the DPF lamp begins to blink, quickly move to a safe area, move the shuttle to neutral, apply the parking brake, bring engine to the lowest RPMs and press up on the DPF switch for 3 seconds. The inhibit lamp will go off and the engine control unit will begin the regeneration.)

3) Forced Regeneration : It is possible to force the regeneration before the shoot is highly enough for automatic regeneration. To force the regeneration, shuttle to neutral, apply the parking brake, bring engine to the lowest RPMs and press up on the DPF switch for 3 seconds.

- Failure to comply could result in malfunction of DPF.
- Part No. : 40363308



17. Location: On the right-hand rear cabin frame for cabin models / On the right-hand rear ROPS frame for roll-bar models.

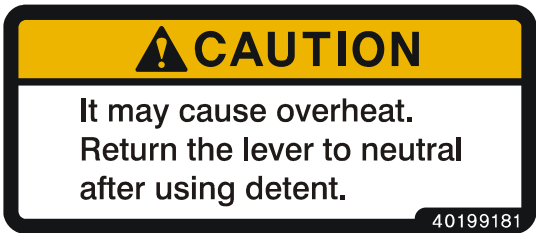
- WARNING
- Avoid injury !
- Activate the external hydraulic control switches only while standing to the side of the machine (outboard of the tires).
- DO NOT stand on or near the implement or between the implement and machine.
- Failure to comply could result in death or serious injury.
- Part No. : 40269462

18. Location: On the right-hand cabin pillar for cabin models / On top of right-hand fender for roll-bar models.

- CAUTION;

It may cause overheat.
Return the lever to neutral after using detent.
Failure to comply could result in malfunction of the hydraulic system and transmission.

- Part No. : 40199181 (optional)



19. Location: On the left-hand side of radiator frame, inside the hood. (Cabin models only)

- WARNING;

HFC-134a
0.8 kg
1.76 lb
GWP: 1.144 TON

- Part No. : 40360032

20. Location: On the left-hand side of radiator frame, inside the hood. (Cabin models only)

- WARNING;

AIR CONDITIONING SYSTEM
Fluid under high pressure.
Do not disconnect any lines.
Service, Repair or Recharging must be performed only by a trained service technician.
Refrigerant: R-134a

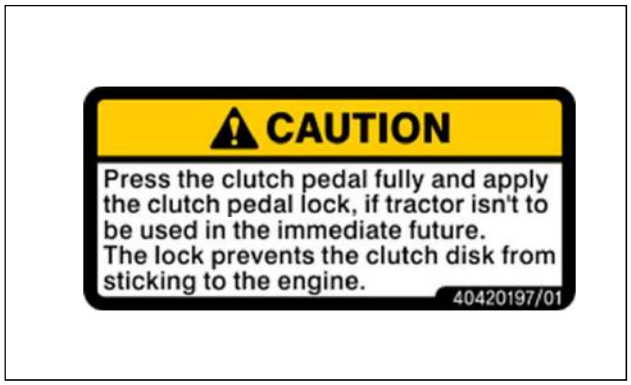
- Failure to comply could result in serious injury or death.
- Part No. : 40323653

21. Location: On the rear side of left-hand instrument panel cover.

- WARNING;

Press the clutch pedal fully and apply the clutch pedal lock, if tractor isn't to be used in the immediate future. The lock prevents the clutch disk from sticking to the engine.

- Failure to comply could result in malfunction of engine.
- Part No. : 40420197



22. Location: On the left-hand side of engine oil pan.

- WARNING;

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

▪ Always start and operate the engine in a well-ventilated area.

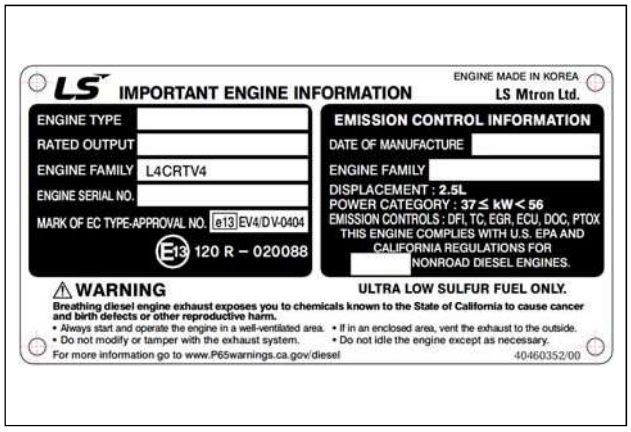
▪ If in an enclosed area, vent the exhaust to the outside.

▪ Do not modify or tamper with the exhaust system.

▪ Do not idle the engine except as necessary.

For more information, go to www.P65warnings.ca.gov/diesel

- Part No. : 40460352

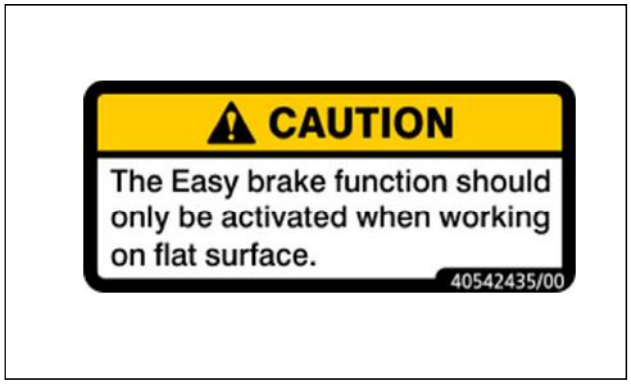


23. Location: On the right-hand cabin pillar for cabin models / On the right-hand console cover for roll-bar models.

- CAUTION;

The Easy brake function should only be activated when working on flat surface.

- Part No. : 40542435 (optional)



(15) Instructional Decals

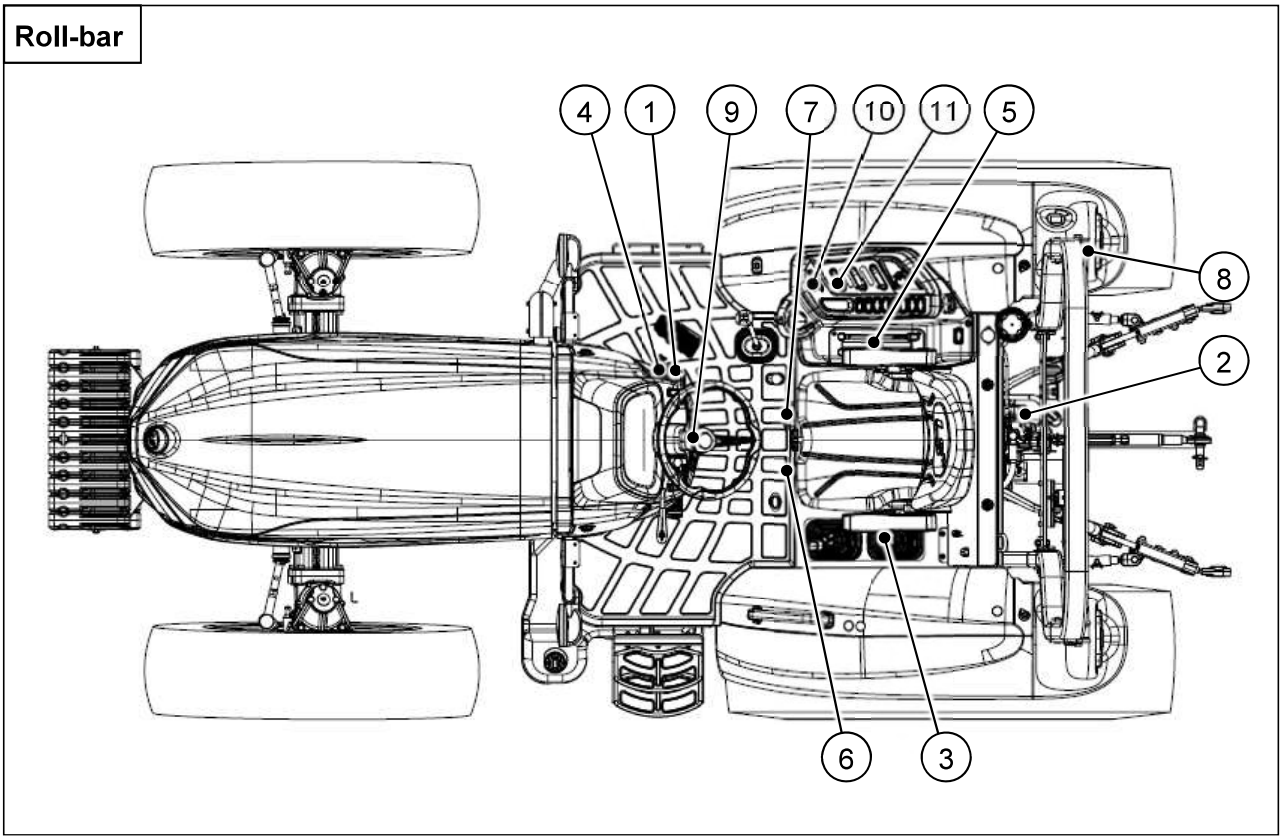
① Instructional Decals and Attaching position – Roll-bar model

The following instructional signs are placed on your tractor as a guide for your safety and for those working with you. Walk around the tractor and note the content and location of these instructional signs before operating your tractor.

Keep instructional signs clean and legible. Clean instructional signs with a soft cloth, water, and a gentle detergent. Do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove instructional signs.

Replace all instructional signs that are damaged, missing, painted over, or illegible. If an instructional sign is on a part that is replaced, make sure the instructional sign is installed on the new part. See your authorized local dealer for replacement instructional signs.

Roll-bar

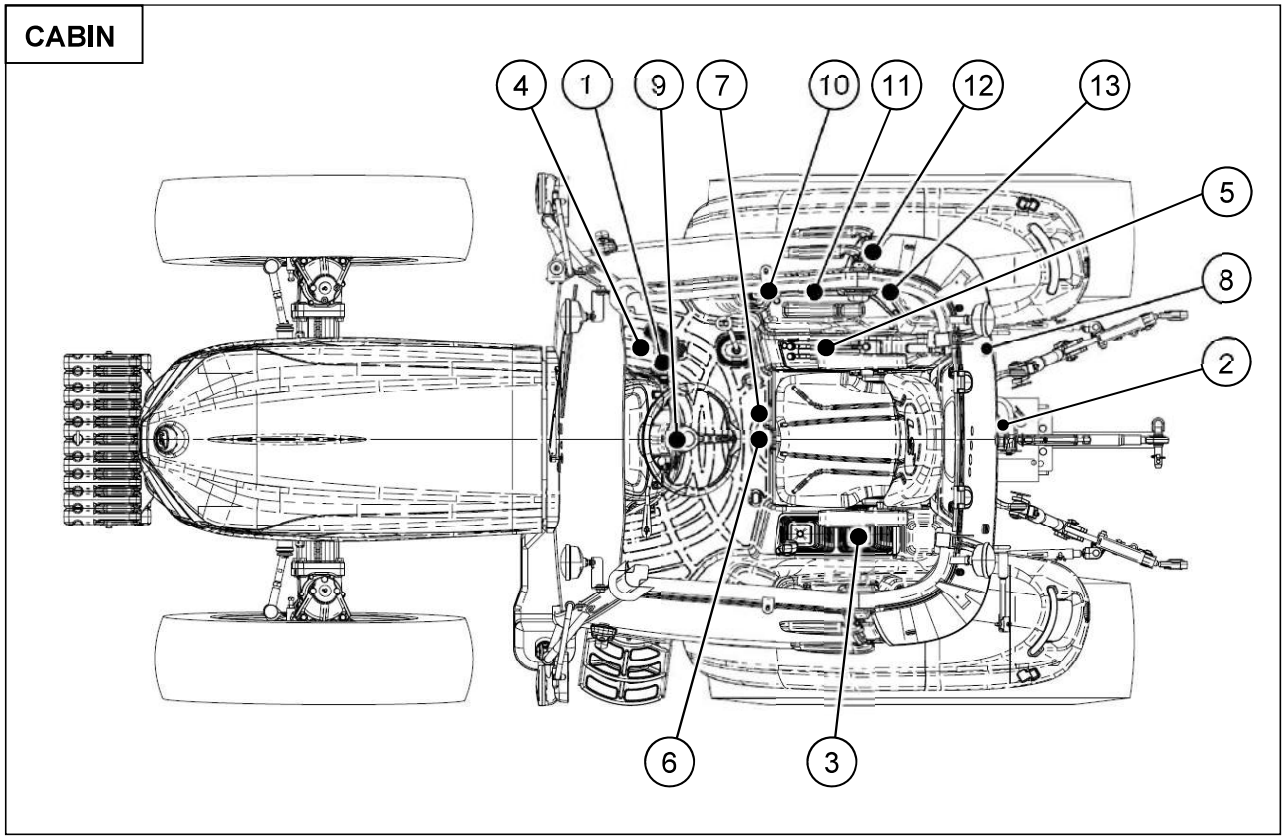


② Instructional Decals and Attaching position – Cabin model

The following instructional signs are placed on your tractor as a guide for your safety and for those working with you. Walk around the tractor and note the content and location of these instructional signs before operating your tractor.

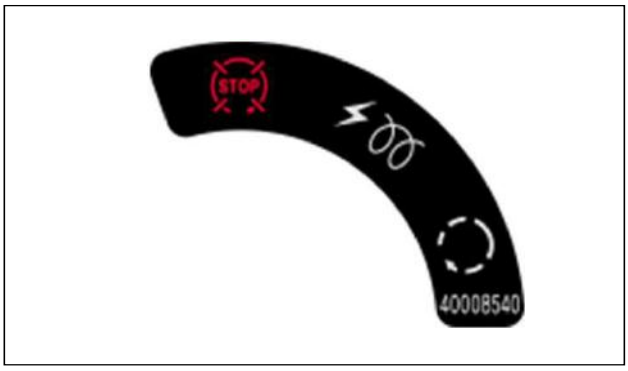
Keep instructional signs clean and legible. Clean instructional signs with a soft cloth, water, and a gentle detergent. Do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove instructional signs.

Replace all instructional signs that are damaged, missing, painted over, or illegible. If an instructional sign is on a part that is replaced, make sure the instructional sign is installed on the new part. See your authorized local dealer for replacement instructional signs.



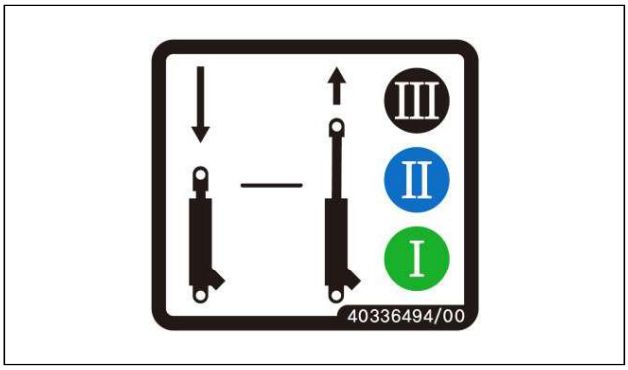
1. Location: On the right-hand side of the body panel cover under the instrument panel.

- Key switch.
- Part No. : 40008540



2. Location: On the remote valve cover.

- Remote valve quick couplers.
- Part No. : 40336494
- Cabin models only.



3. Location: On the PTO lever.

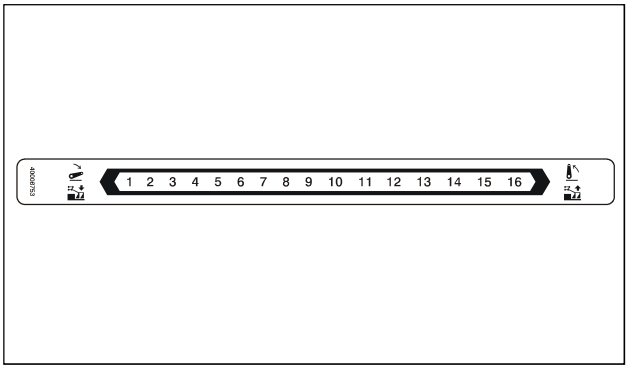
- PTO gear lever.
- Part No. : 40531372
- It may vary depending on the market.(optional)

4. Location: On the right-hand side of instrument cover.

- Start and stop of the turbocharger engine
- Part No. : 40394847

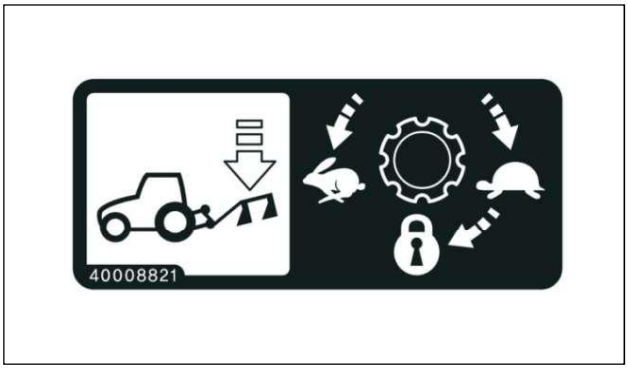
5. Location: On the right-hand side hydraulic lever guide.

- Hydraulic lift control (position and draft control lever)
- Part No. : 40008753
- Mechanical Hydraulic Lift (MHL) models only



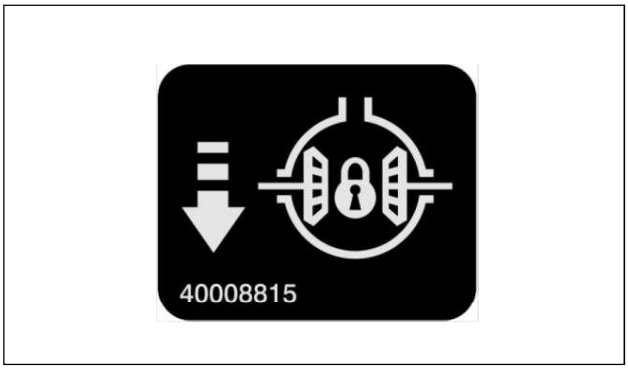
6. Location: below the driver's seat.

- Hydraulic lift control. (down speed control valve)
- Part No. : 40008821
- Mechanical Hydraulic Lift (MHL) models only



7. Location: On the right-hand side below the driver's seat.

- Differential lock pedal
- Part No. : 40008815



8. Location: On the right-hand rear cabin frame for cabin models / On the right-hand rear ROPS frame for roll-bar models.

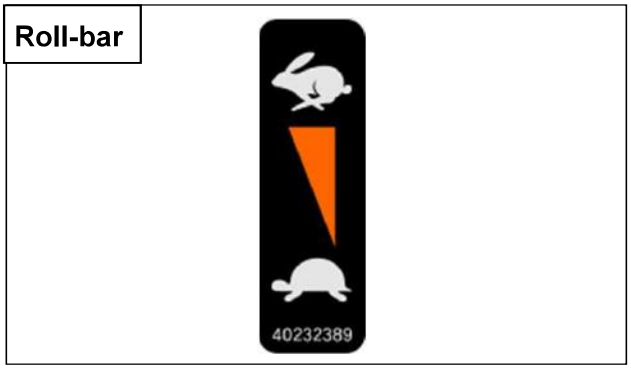
- Hydraulic lift control. (External position control lever)
- Part No. : 40353476
- It may vary depending on the market.(optional)

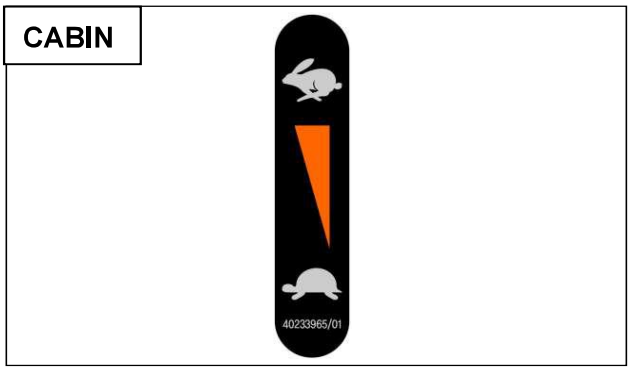
9. Location: On the lower side of rear steering column cover.

- Parking brake lever.
- Part No. : 40531371

10. Location: On the front side of right-hand lever guide.

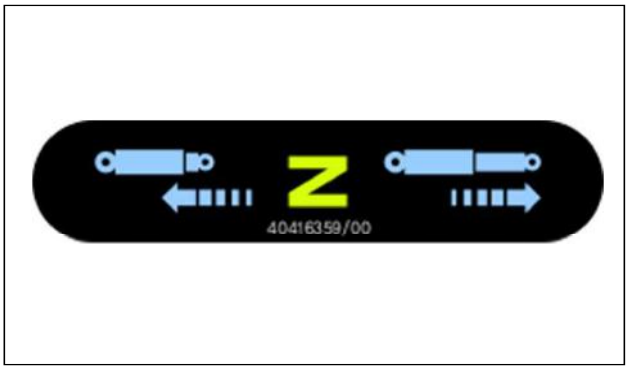
- Throttle lever.
- Part No. : 40232389 (Roll-bar)
  40233965 (Cabin)
- Mechanical models only.





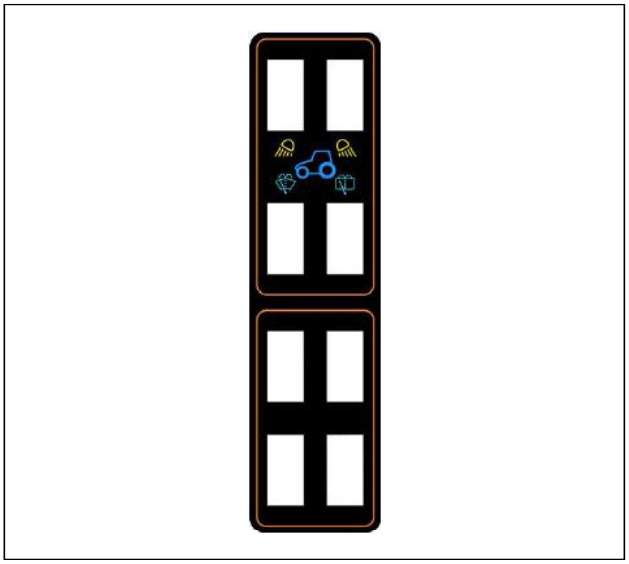
11. Location: On the front side of right-hand lever guide.

- Remote control lever
- Part No. : 40416359



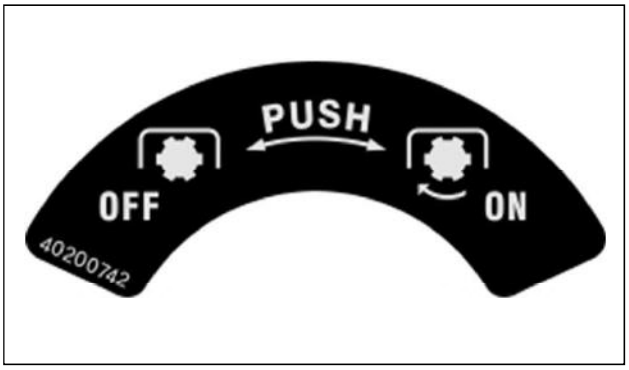
12. Location: On the right-hand cabin pillar for cabin models. (Cabin model only)

- Pillar switch
- Part No. : 40416357



13. Location: On the front side of right-hand lever guide. (Cabin model only)

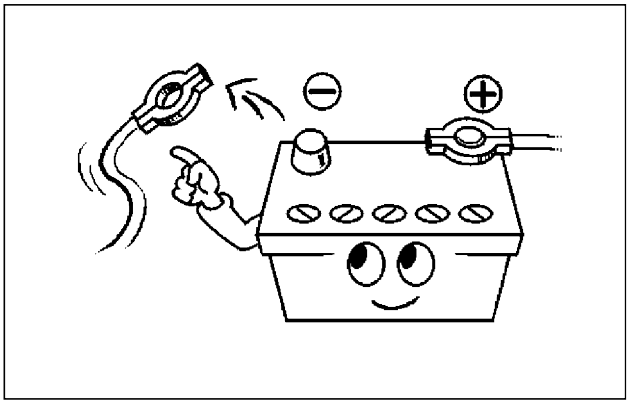
- PTO switch
- Part No. : 40200742



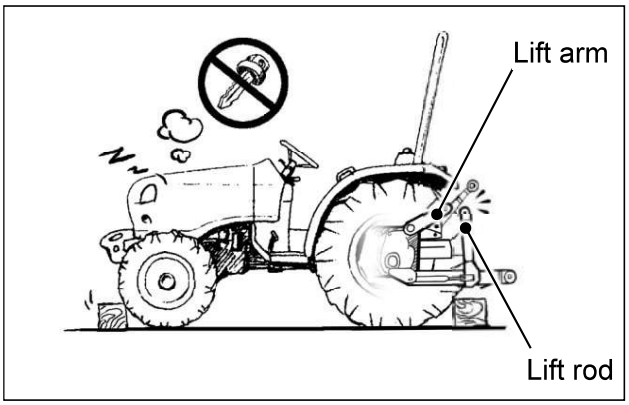
1-3. Long-term storage

(1) Preparation for storage

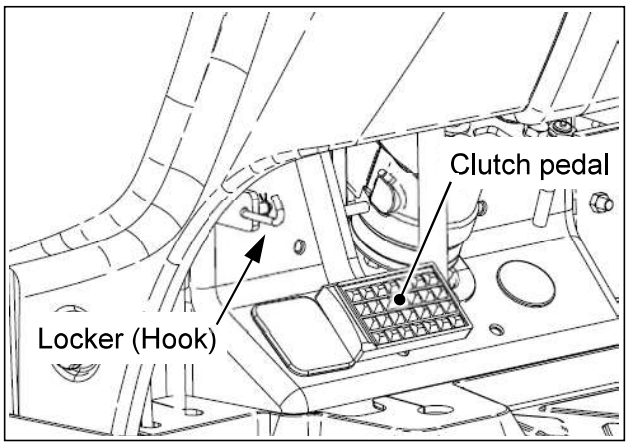
※ Wash your tractor cleanly and follow the procedure as below.



- 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 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 lift cylinder.
- Depress clutch pedal fully and apply the clutch pedal locker. This locker prevents the clutch disk from sticking to the engine. (Synchro-shuttle models 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

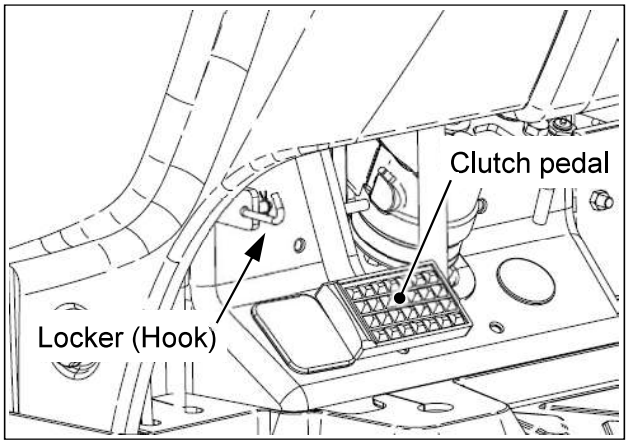
- Apply grease or lubricant oil regularly to the non-painted parts.
- Check the leakage of fuel, oil and coolant. If necessary, repair the damaged part.
- Check if the tire air pressure is normal.
- **Start the engine periodically for about 15 minutes, *at least once a month*** for circulation and lubrication in the fuel system and engine. This may vary depending on the engine, fuel system, fuel type and so on. Consult your authorized local dealer.
- 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.

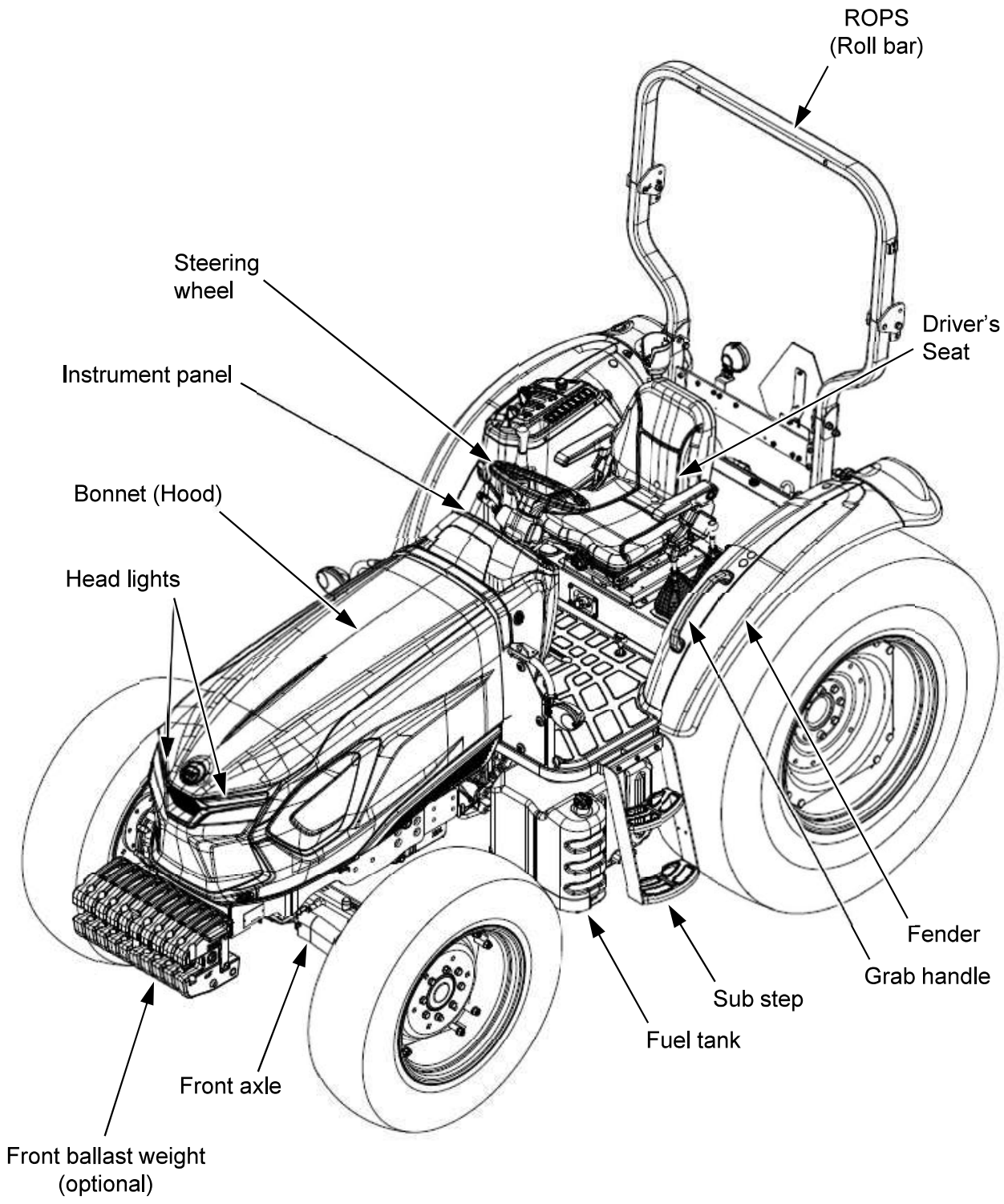
- Inflate the tires to the recommended pressures and remove the blocking.
- Check the damaged part or loosen part.
- Check the leakage of fuel, coolant, engine oil, transmission and front axle oil.
- Check the level and density of the engine coolant.
- Check the level of engine, transmission, rear and front axle oil, and fuel.
  (For further information, refer to the chapter 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?
- Depress the clutch pedal and disengage the clutch pedal locker. (Synchro-shuttle models only)
- Start the engine and allow it to idle for a few minutes. Ensure the engine is receiving lubrication and each control is functioning correctly.
- 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.
- Drive the tractor without a load and check if the tractor is operating satisfactorily.



2. Instruction for Safe Operation

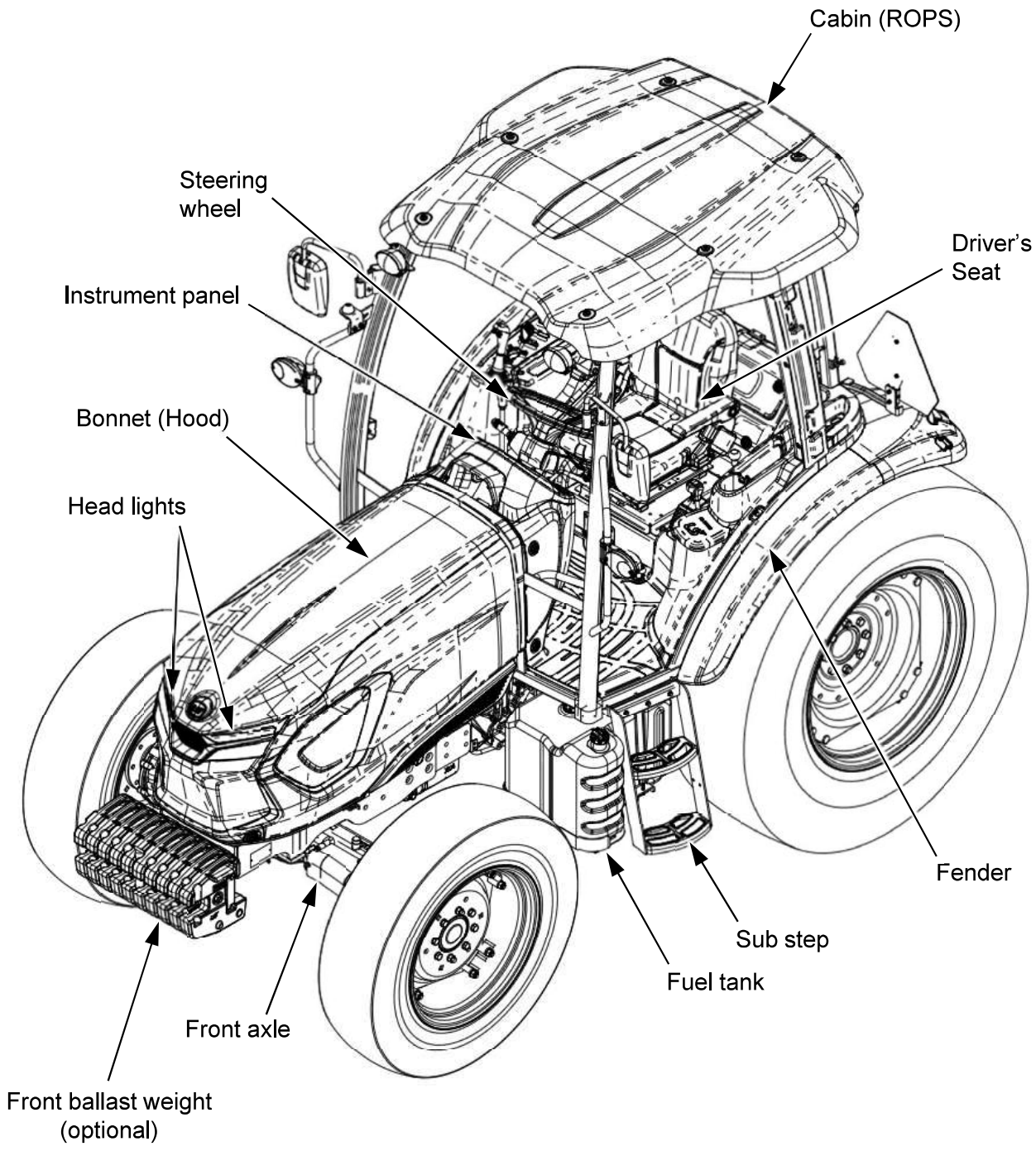
(1) The name of each part

① Roll-Bar type



***NOTE**: Some figures may be different from your tractor depending on optional specifications.*

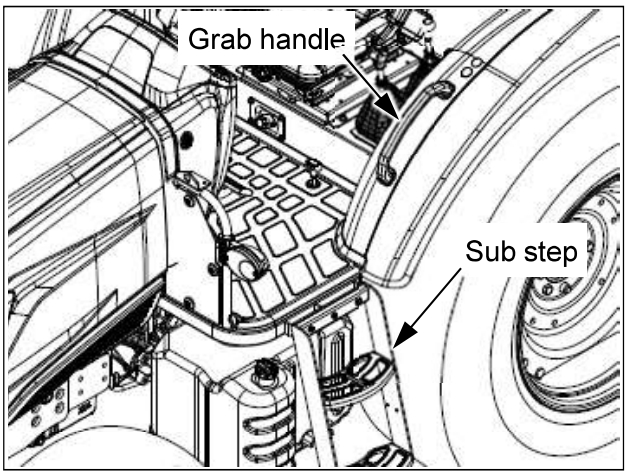
② Cabin type



***NOTE**: Some figures may be different from your tractor depending on optional specifications.*

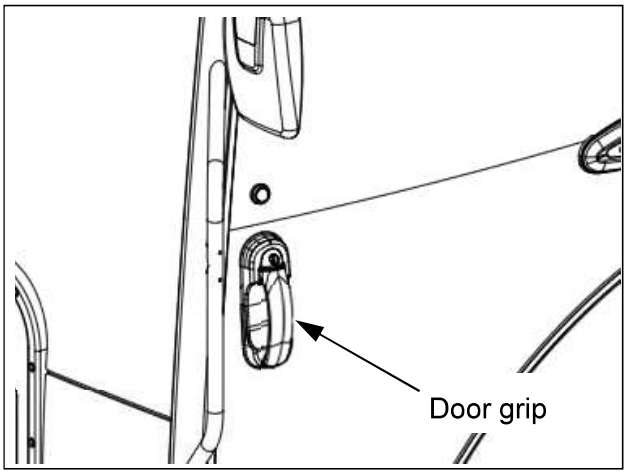
2-1. Boarding and Exiting the tractor

(1) Boarding the tractor



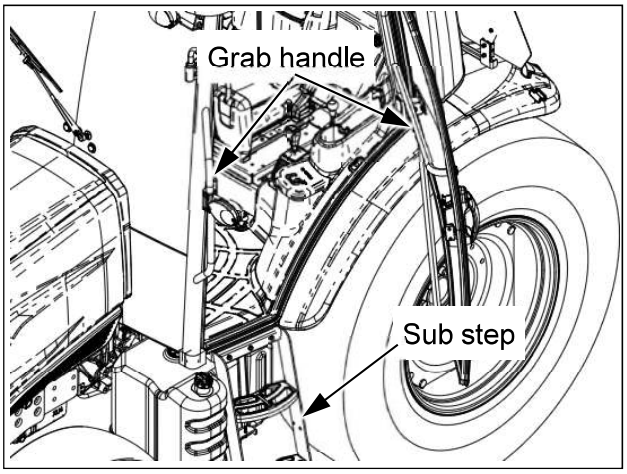
① Roll-Bar type

- Whenever possible, use the left-hand side step for entering.
- When boarding the tractor, use the sub-step , steering wheel and grab handle on the left fender.
- Do not jump up/down for your safety. *Jumping on/off the tractor could cause an injury. Always face the tractor, use the grab handle, steering wheel and steps, and get on/off slowly. Maintain a three-point contact to avoid falling: both hands on the grab handle and steering wheel and one foot on the step, or one hand on the grab handle and both feet on the steps.*



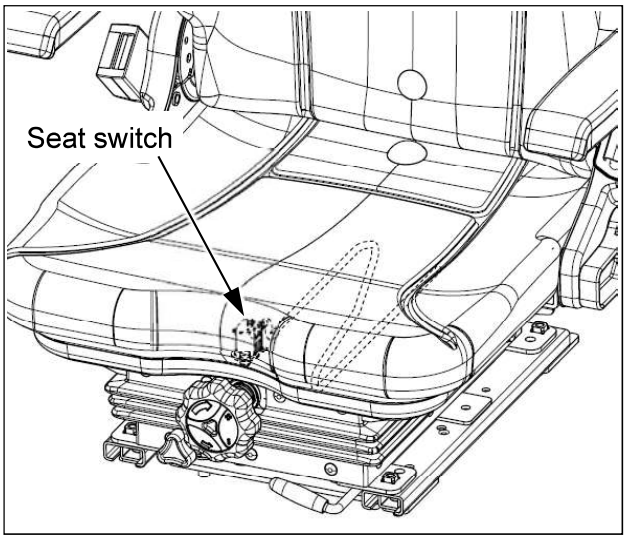
② Cabin type

- Whenever possible, use the left-hand side door for entering.
- To enter the cabin, release the cabin door lock with the provided key and *just pull the door grip outside.*
- When boarding the tractor, use the sub-step, steering wheel and grab handles provided on the cabin frame and door.
- Do not jump up/down for your safety. *Jumping on/off the tractor could cause an injury. Always face the tractor, use the grab handles and steps, and get on/off slowly. Maintain a three-point contact to avoid falling: both hands on the grab handles and one foot on the step, or one hand on the grab handle and both feet on the steps.*



⚠ 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 should 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 switch



- At the lower end of the driver's seat, there is a seat switch to detect operator's presence.
- ***If the operator gets up from the seat while engine is running***, the engine will stop automatically for safety in case that;

  ① Operator gets up from the driver's seat for more than 2 seconds while the F/R shuttle lever is NOT placed in the neutral position.

  ② The parking brake is not applied while the rear PTO is engaged.

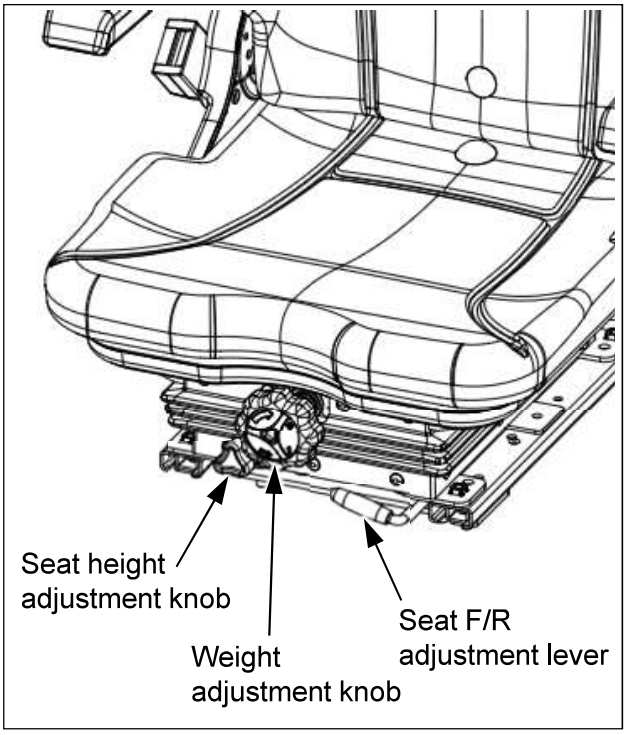
  ③ The Middle PTO lever (optional) is engaged.

- Before leaving the driver's seat, turn the PTO switch to the "OFF" position and apply the parking brake.

⚠warning	▶ Do not arbitrarily remove the seat switch. When replacing the driver's seat, make sure to check if the seat switch is correctly secured in place. Otherwise, the engine cannot be started.

(3) Seat adjustment

① Standard type



- Before operating the tractor, adjust the position of the driver's seat according to your body size and length.

- **Seat F/R adjustment lever**

1) After sitting on the driver's seat, move the seat F/R adjustment lever upward to release the lock.

2) Move the driver's seat forward or backward according to your body length.

3) Release the seat F/R adjustment lever and check if the driver's seat is locked in place.

- **Seat height adjustment knob**

1) If you turn the seat height adjustment knob clockwise, the seat height will be lowered.

- **Weight adjustment knob**

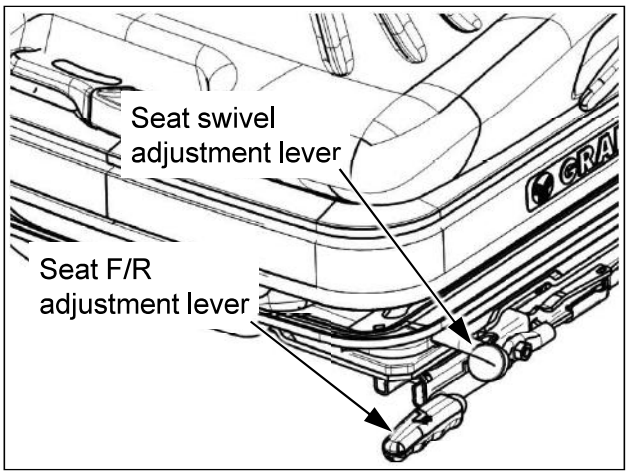
1) Adjust the seat suspension according to your body weight by using the weight adjustment knob.

2) If you turn the knob clockwise, the suspension stiffness will be increased and it's suitable for heavy operators.

⚠warning	▶DO NOT put your hand under the driver's seat while sitting. It may cause a serious injury by the seat suspension. ▶DO NOT adjust the seat position while driving.

② Premium type (optional)

● Before operating the tractor, adjust the position of the driver's seat according to your body size and length.

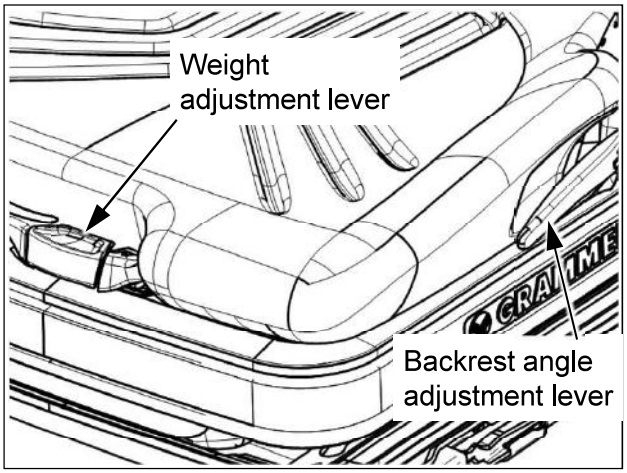


1) Seat F/R adjustment lever

- After sitting on the driver's seat, move the seat F/R adjustment lever upward to release the lock.
- Move the driver's seat forward or backward according to your body length.
- Release the seat F/R adjustment lever and check if the driver's seat is locked in place.

2) Seat swivel adjustment lever

- Pull the seat swivel adjustment lever to release the lock and rotate the seat to the right side.
- Release the lever and check if the driver's seat is locked in place.
- The swiveled position is allowed only while operating in the field, and so return the seat to the neutral position before driving on public roads.

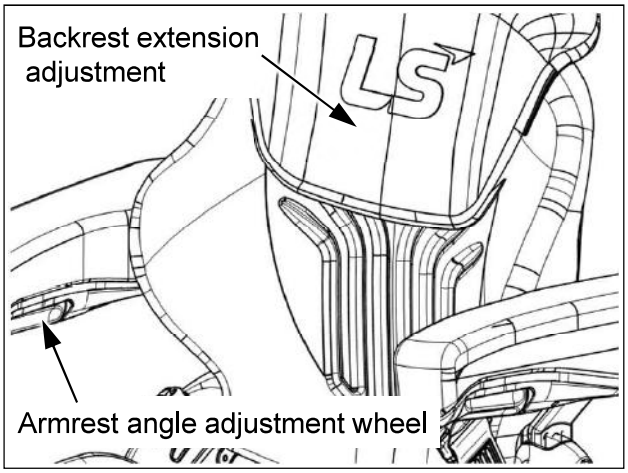


3) Weight adjustment lever

- PUSH the lever downward for light weight.
- PULL the lever upward for heavy weight after turning the key switch to the "ON" position.

4) Backrest angle adjustment lever

- Lift the lever upward to adjust the backrest angle.
- After adjusting, release the lever and check if the backrest is locked in place.



5) Armrest angle adjustment wheel

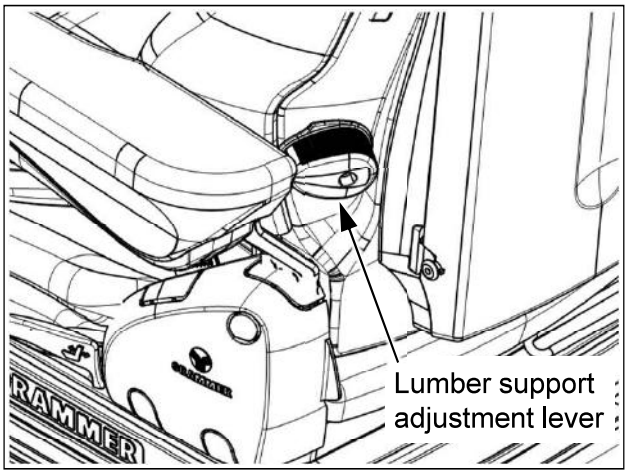
- It is used to lower/lift the armrest.
- Rotate the wheel inside to lower the armrest.
- Rotate the wheel outside to lift the armrest.

6) Backrest extension adjustment

- Pull or push down the backrest to fit your body.

7) Lumber support adjustment lever

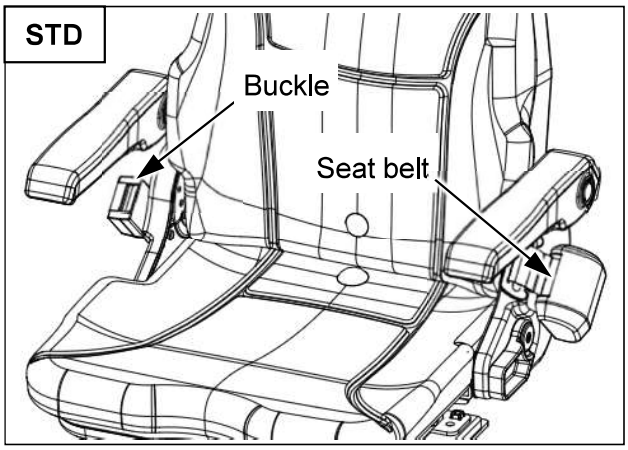
- Turn the lever counter-clockwise to raise the height of the lumber support.
- Turn the lever clockwise to lower the height of the lumber support.

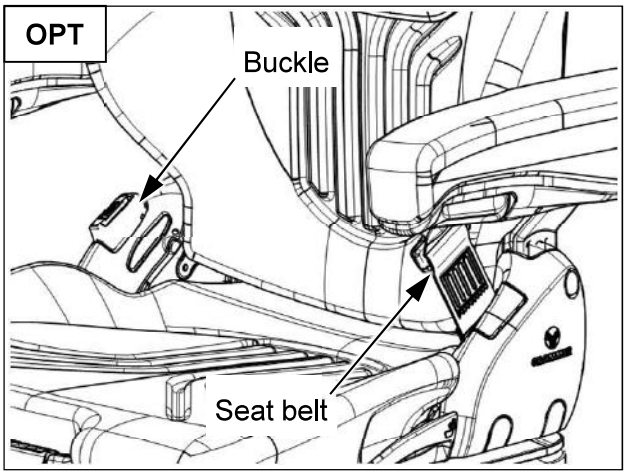


warning	▶ DO NOT put your hand under the driver's seat while sitting. It may cause a serious injury by the seat suspension. ▶ DO NOT adjust the seat position while driving.

(4) Seat belt

- Always wear the seat belt before operating the tractor and adjust the belt to fit your body.
  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.

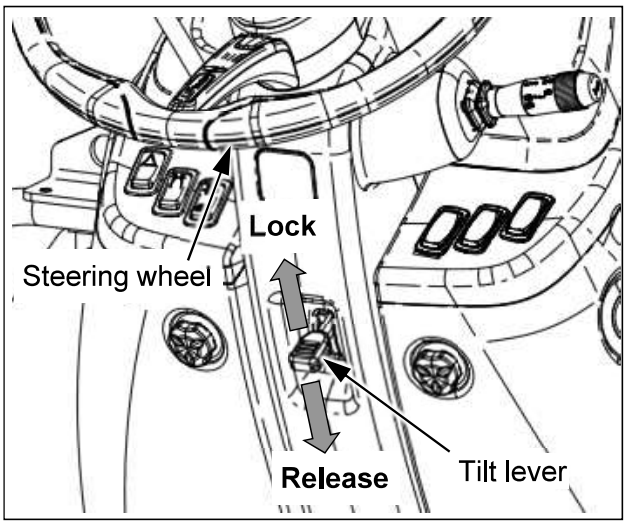




Warning 	▶ If not wearing the seat belt, it may cause a serious injury in case of an accident. - While operating in a cabin or with a roll bar installed, you must wear the seat belt. After wearing the seat belt, adjust the seat belt to fit your body. ▶ If the roll-bar is folded down or removed, do not wear the seat belt.

(5) Tilting steering wheel

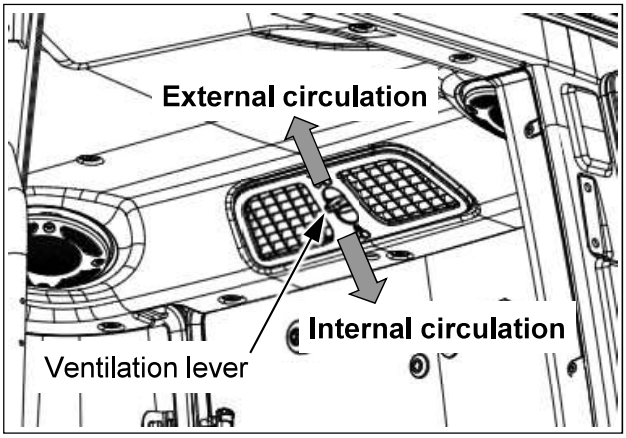
- Push the tilt lever downward to release the steering wheel and tilt the steering wheel to fit your body size.
- Release the tilt lever to secure the steering wheel in place, and make sure to check the steering wheel is locked in place.
- You must adjust the steering wheel only when the tractor has stopped completely.

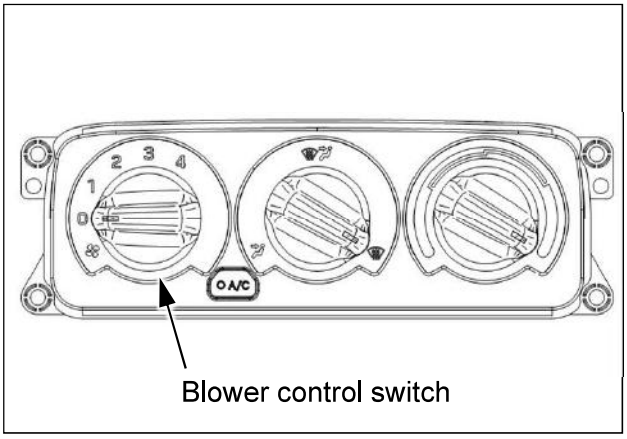


⚠ Caution	▶ DO NOT adjust the steering wheel while driving. It may cause a serious accident.

(5) Ventilation (Cabin only)

- You can adjust the ventilation lever to circulate air outside or inside the cabin.
  - **External circulation** : Air comes from outside through the cabin air filters.
  - **Internal circulation** : The air can be re-circulated inside the cabin.
- To increase the air pressure inside the cabin, move the ventilation lever to the external circulation position and turn the blower control switch clockwise fully.

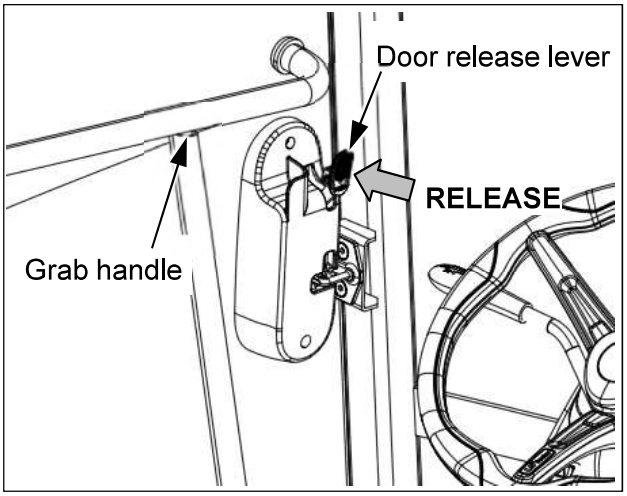




⚠ Warning	▶ DO NOT ventilate the cabin in pesticides or other hazardous chemical spraying area.

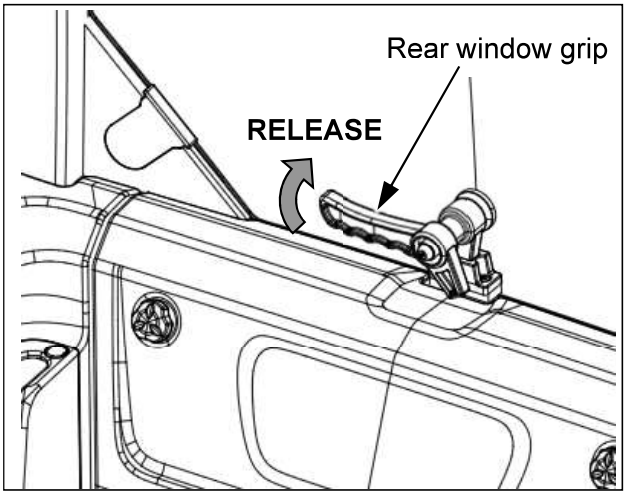
(6) Exiting the tractor

① Door (Left / Right)



- Whenever possible, use the left-hand side door for exiting the cabin.
- To open the left/right cabin door, push the door release lever outside, and use the grab handle to push the door outside.
- Do not jump up/down for your safety. *Jumping on/off the tractor could cause an injury. Always face the tractor, use the grab handles and steps, and get on/off slowly. Maintain a three-point contact to avoid falling: both hands on the grab handles and one foot on the step, or one hand on the grab handle and both feet on the steps.*
- Remove the starter key and lock the cabin doors before leaving the tractor.

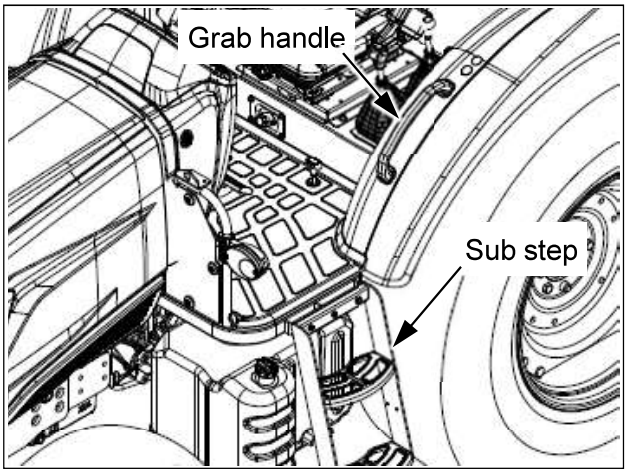
② Rear Window



- To open the rear window for ventilation, turn the rear window grip clockwise while pulling the grip.
- Push the grip outside slightly. This rear window is held open by gas cylinders.
- It can also be used for emergency exit.

⚠ Caution	▶ Do not grasp the transmission gear levers when entering/exiting the cabin .

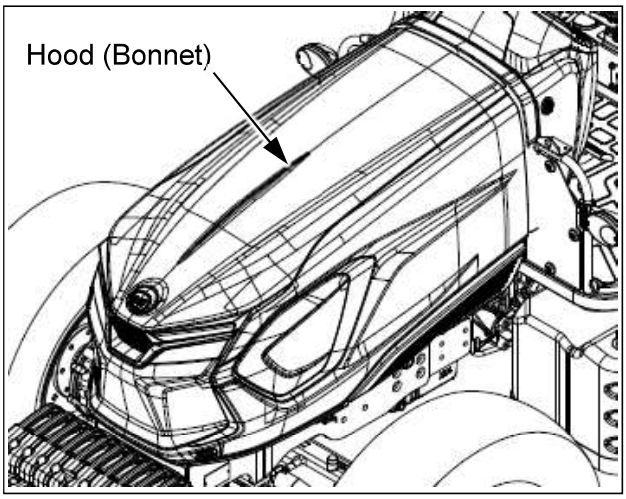
③ Roll-Bar type



- Whenever possible, use the left-hand side step for exiting. In an emergency situation, you can use the right-hand step for exiting.
- When exiting the tractor, use the sub-step , steering wheel and grab handle on the left fender.
- Do not jump up/down for your safety. *Jumping on/off the tractor could cause an injury. Always face the tractor, use the grab handle, steering wheel and steps, and get on/off slowly. Maintain a three-point contact to avoid falling: both hands on the grab handle and steering wheel and one foot on the step, or one hand on the grab handle and both feet on the steps.*
- Remove the starter key before leaving the tractor.

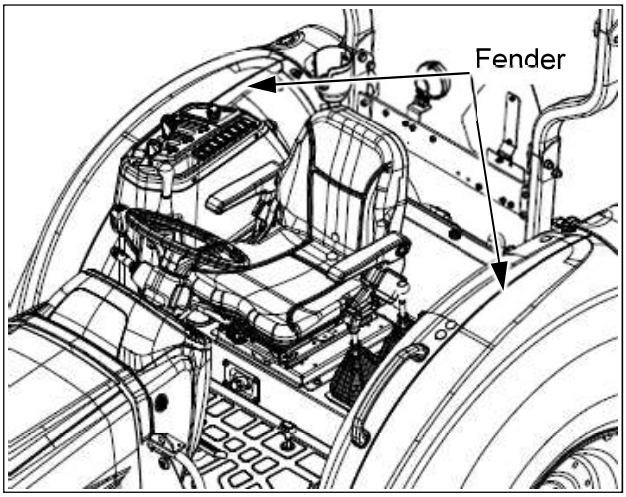
2-2. Safety device

(1) Hood (Bonnet)



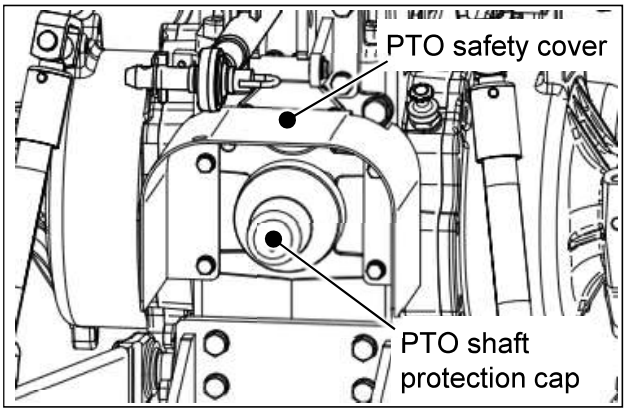
- Hood is a protection device to prevent an unintended access to the rotating parts around engine; cooling fan, fan belt and rotating shaft and pulley.
- Do not remove and modify the hood.

(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



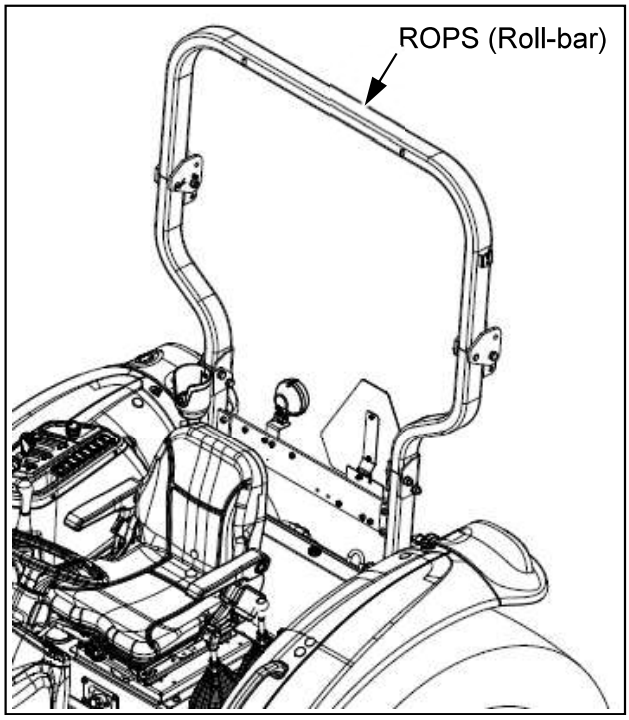
- The PTO safety cover is a protective device to prevent unintended access to the PTO shaft and to prevent accidents caused by the rotating drive shaft.
- Do not remove the PTO safety cover. If the PTO safety cover or protection cap is damaged or removed, replace it with a genuine part.
- Do not step 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 serious injury. - DO NOT try to touch the rotating shafts. - DO NOT remove the safety covers. - Avoid loose clothes that can easily be rolled up in the rotating shaft.

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

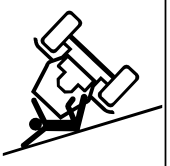
① Foldable roll-bar type

- The Roll-Over Protective Structure (ROPS) is integrated and certified structure for driver's safety. This structure will reduce the risk of serious injury or death when being over-turned.
- DO NOT remove, modify or repair the roll-bar arbitrarily. The welding, bending, drilling, grinding, or cutting of any part of the roll-bar, it can weaken the protective structure.
- If the roll-bar is loosened or removed for any reason, make sure that all parts reinstalled correctly before operating the tractor.



Warning

Roll-over hazard!
Failure to comply could result in death or serious injury.



▶ Do not modify or remove the Roll-Over Protective Structure(ROPS) arbitrarily for safety. Unless the ROPS is applied correctly, it may cause a serious accident or death when being overturned.

▶ Be sure to stand up the Roll-Over Protective Structure(ROPS) and check the bolts, pins and nuts correctly kept in place.

▶ Always wear the seat belt when operating the vehicle with the ROPS in the upright position.

▶ Do not connect chains or ropes to the ROPS for pulling purposes, as the vehicle could tip over.

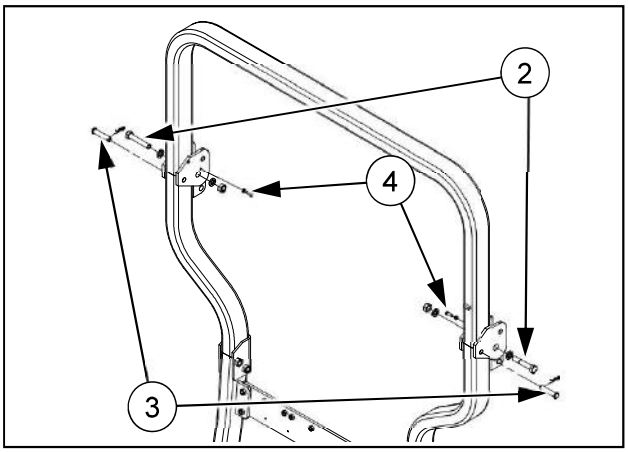
▶ When driving through door openings or under low overhead objects, make sure there is sufficient clearance for the ROPS.

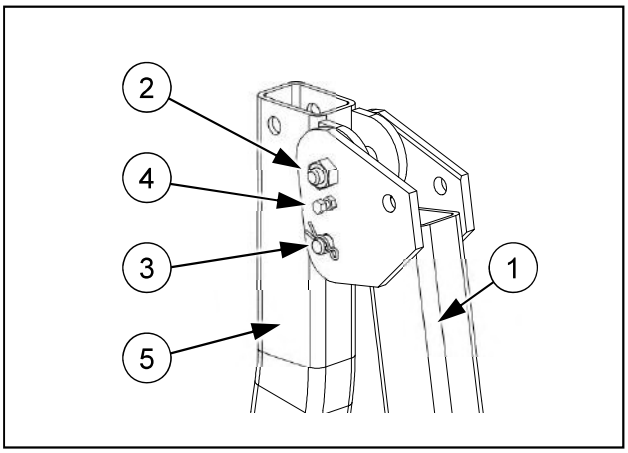
▶ In case of folding/standing the roll-over protective structure(ROPS).
- A folded ROPS does not provide roll-over protection. Do not operate the vehicle with the ROPS folded as a standard operating mode. Stand up the ROPS immediately as soon as the low clearance work is finished.
- The ROPS is a heavy assembly. Be careful not to be injured by sudden folding, which might occur when folding or standing up the ROPS by its own weight. If possible, do cooperate with other people for the folding/standing.
- Do not wear seatbelt when the ROPS is folded down.

● **How to fold the upper frame of the roll-bar.**

1. Loosen the bolts **(2)**, **(4)** and nuts on both sides. It is not necessary to remove them completely.
2. Remove the pins **(3)** on both sides and fold the upper frame backward. Be careful of the possibility that your body might be hurt by sudden folding due to its own weight.
3. Set the holes of the frame **(1)** and **(5)** in line, and insert the pins **(3)** into the hole and apply the snap pins.
4. Fasten the bolts **(2)**, **(4)** and nuts on both sides tightly.

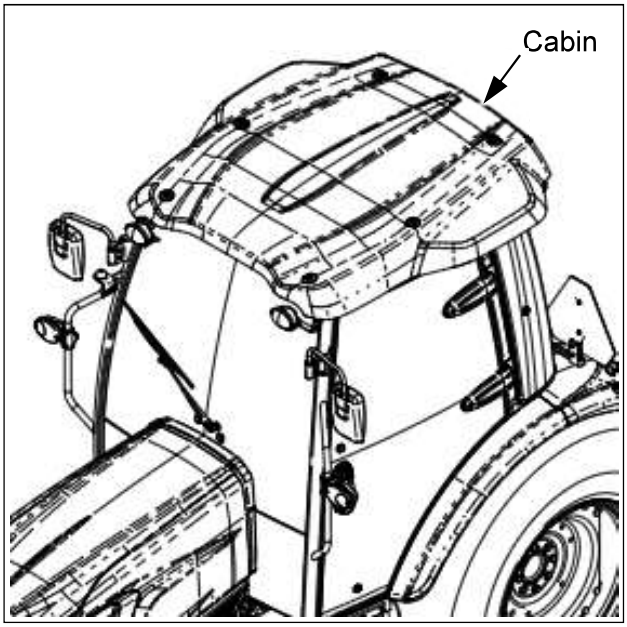
● When standing up the upper frame, follow the same procedure reversely.





② Cabin

- This Roll-Over Protective Structure, Cabin is an integrated and certified structure for driver's safety. This structure will reduce the risk of serious injury or death when being over-turned.
- DO NOT remove, modify or repair the cabin arbitrarily. Any damage of fire, corrosion, welding, bending, drilling, grinding and cutting of any part of the cabin, it can weaken the protective structure.
- If the cabin mounting bolts or other inter-connecting parts are loosened or removed for any reason, make sure that all the parts reinstalled correctly before operating the tractor.

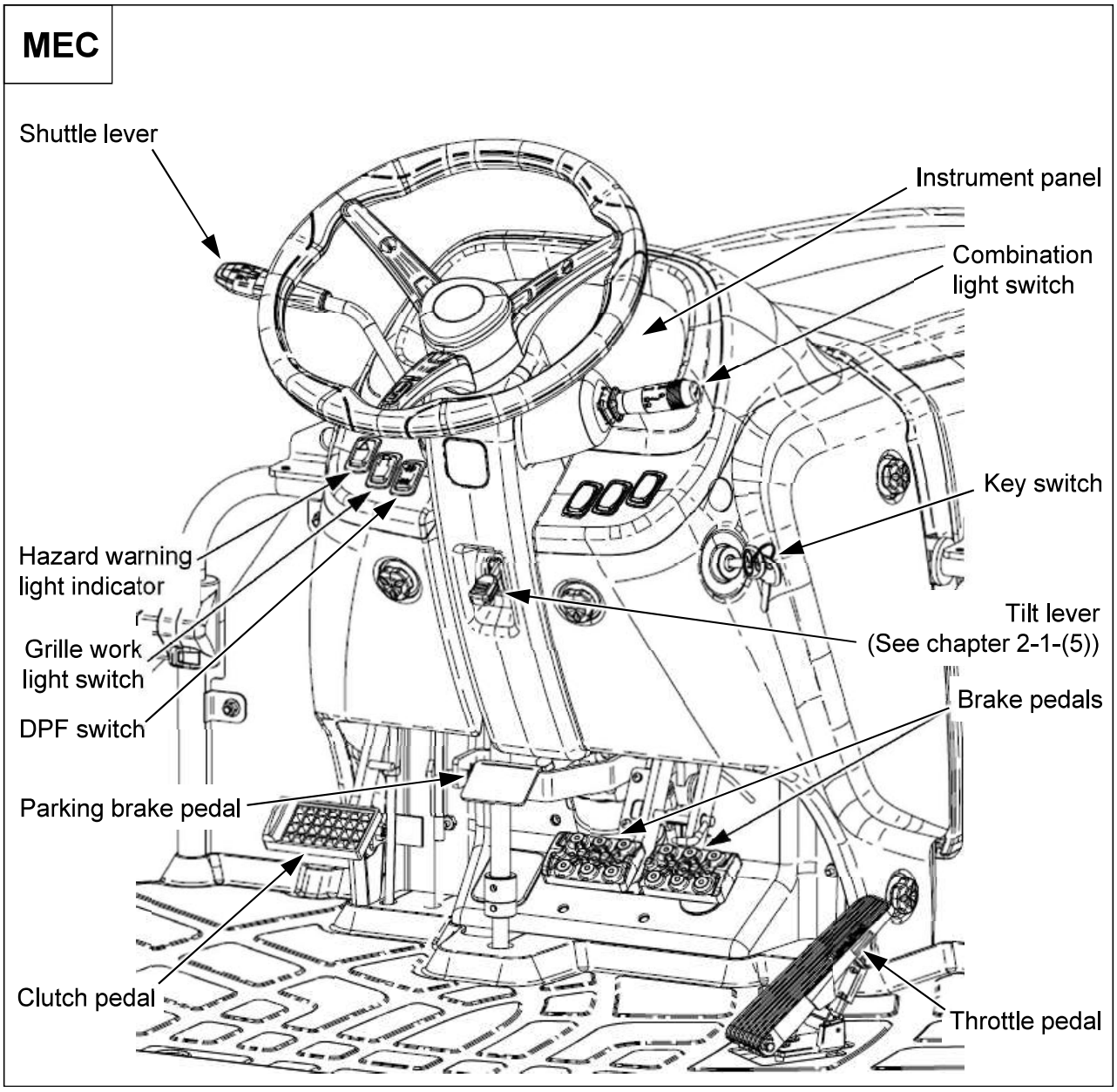


Warning	**Roll-over hazard!** Failure to comply could result in death or serious injury.
	▶ Do not modify or remove the Roll-Over Protective Structure(ROPS) arbitrarily for safety. Unless the ROPS is installed correctly, it may cause a serious accident or death when being overturned. ▶ Be sure to stand up the Roll-Over Protective Structure(ROPS) and check the bolts, pins and nuts correctly kept in place.
	▶ Always wear the seat belt when operating the vehicle in the cabin. ▶ Do not connect chains or ropes to the ROPS for pulling purposes, as the vehicle could tip over. ▶ When driving through door openings or under low overhead objects, make sure there is sufficient clearance for the ROPS. ▶ Do not step on the fender for the maintenance of cabin roof.

3. Instruments and Controls

3-1. Instrument panel and Front controls

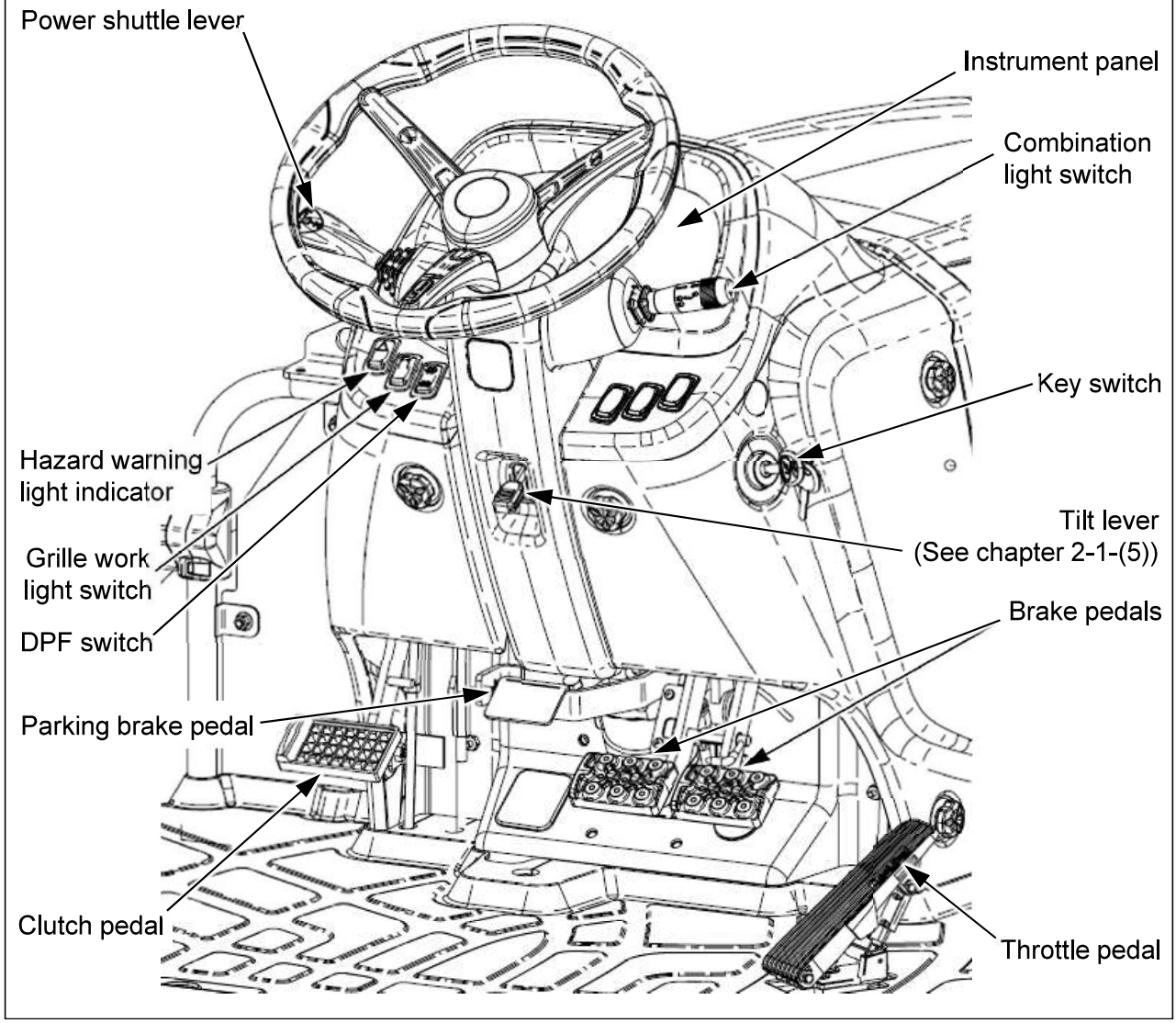
Important to owner, read carefully



***NOTE**: Depending on the optional specifications, some figures may be different from your tractor.*

Important to owner, read carefully

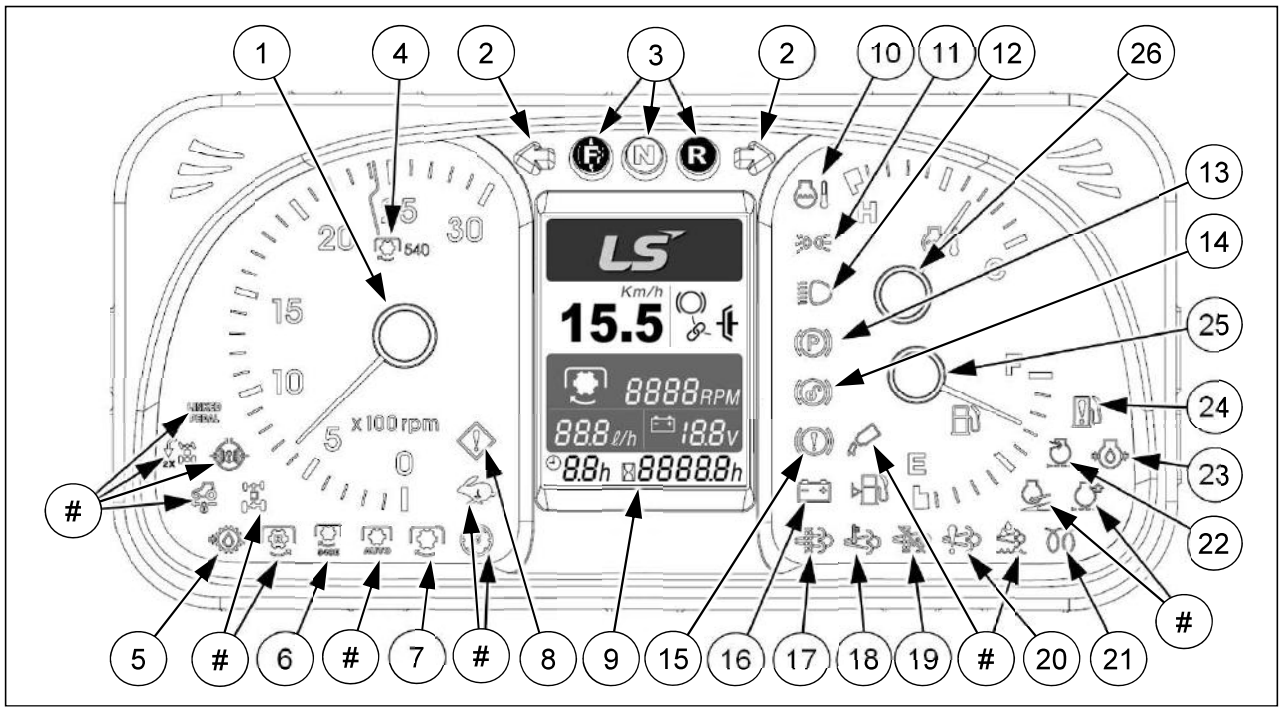
PST



***NOTE**: Depending on the optional specifications, some figures may be different from your tractor.*

(1) Instrument panel

NOTE: *Some of indicators on the instrument panel may be not available depending on the model.*

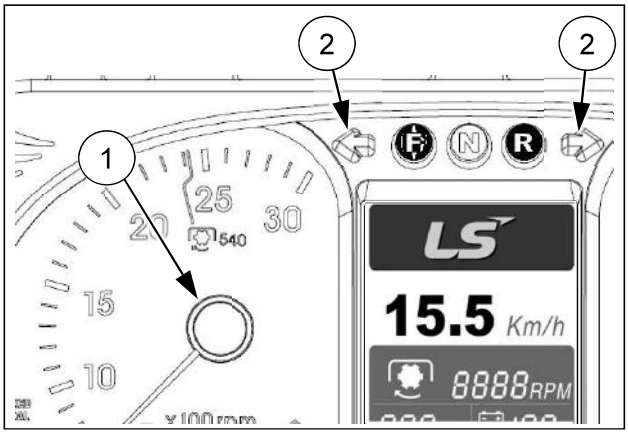


1. Tachometer
2. Turn signal indicators(Left/Right)
3. Forward-reverse indicator(optional)
4. PTO speed indicator
5. Hydraulic oil pressure indicator (optional)
6. 540E PTO operation indicator(optional)
7. PTO operation indicator
8. Vehicle control error warning indicator
9. LCD display panel
10. High temperature warning indicator
11. Tail light indicator
12. High beam indicator
13. Parking brake indicator
14. Brake pedals not latched indicator (optional)
15. Brake malfunction indicator (Not used)
16. Battery charging indicator
17. DPF regeneration indicator
18. DPF temperature indicator
19. DPF inhibited regeneration indicator
20. EGR system malfunction indicator
21. Cold start aid indicator
22. Air cleaner service indicator
23. Engine oil pressure indicator
24. Fuel filter warning indicator
25. Fuel level gauge
26. Engine coolant temperature gauge

Notice	▶"#" marked indicators on the instrument panel are not used in this model.

① Tachometer

- The tachometer shows the engine revolutions per minute (“30” means 3000rpm). The display will return to zero when the engine is not running.

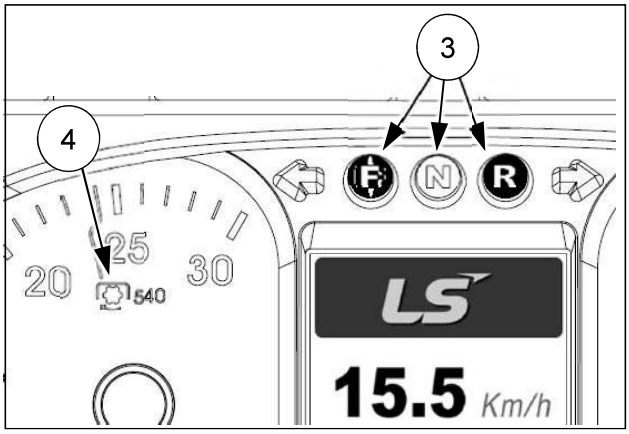


② Turn signal indicators (Left/Right)

- When turning on the turn signal lights with the combination switch, the front/rear turn signal lights and this indicator will flash simultaneously. The key switch should be in the “ON” or “Start” position. Before turning the vehicle while driving on public roads, turn on the turn signal lights.
- When turning on the hazard warning light switch, all the turn signal lights will flash simultaneously regardless of the key switch position. Use the hazard warning light switch in an emergency situation according to your local traffic regulations.

③ Forward-reverse indicator (optional)

- For power shuttle models, it displays the position of power shuttle lever and travel direction.

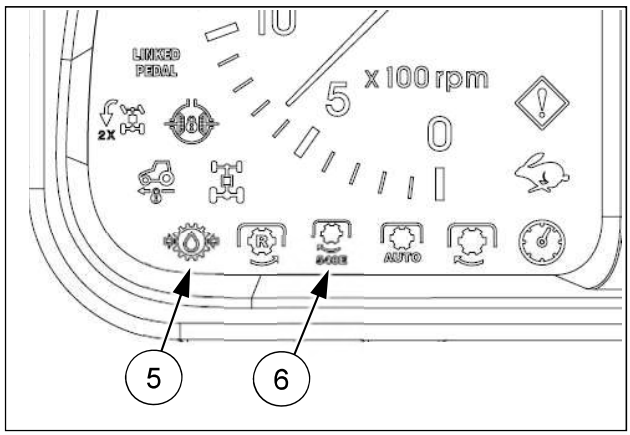


④ PTO speed indicator

- It is determined by the position of the needle on the tachometer. The tachometer is marked to indicate 540 RPM of rear PTO.
- If the tachometer registers above the 540 RPM mark for rear PTO operation, this indicates a dangerous over-speed condition. Reduce the engine speed immediately.

5 Hydraulic oil pressure indicator (optional)

- If the PTO oil pressure is lower than designated pressure, the PTO is turned off by the warning module, and then this indicator will be turned on.
- *For further information, see chapter 5-5-(2) in this manual.*

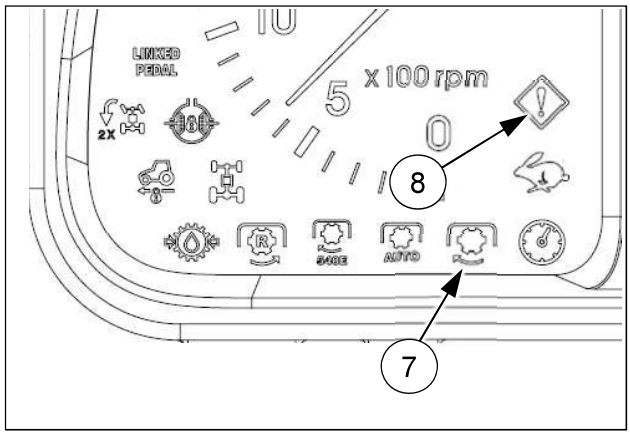


6 540E PTO operation indicator(optional)

- When the rear PTO is working in 540E PTO mode, this indicator will be turned on.
- *For further information, refer to the chapter 3-3-(2), "PTO gear lever" in this manual.*

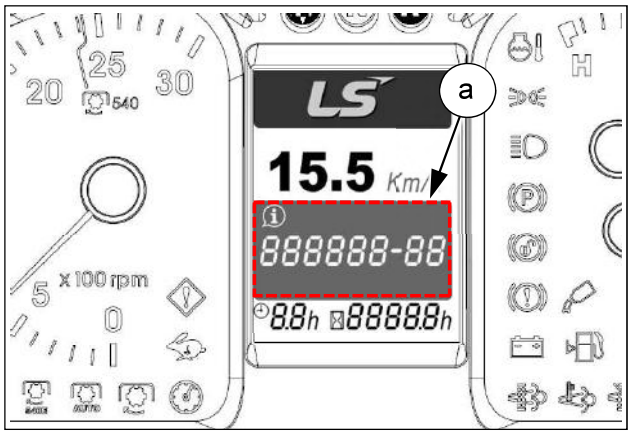
7 PTO operation indicator

- When the key switch is in the "**ON**" position, the PTO switch is placed in the "**ON**" position**,** this indicator will be turned on and the rear PTO will rotate.



8 Vehicle control error warning indicator

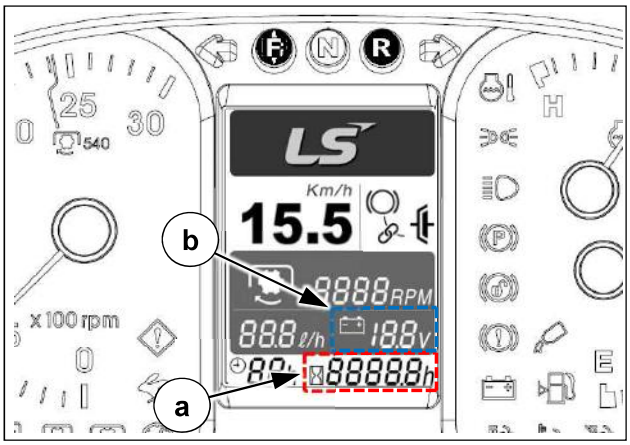
- If there is a serious error in the engine and vehicle controls, this indicator lights up red and a diagnostic trouble code flashes on the LCD panel (a). After escaping from the emergency situation, immediately contact your authorized local dealer for inspection.
- If there is a minor error in the engine and vehicle controls, this indicator lights up orange and a diagnostic trouble code flashes on the LCD panel. Please contact your authorized local dealer for inspection at your convenience.



⑨ LCD display panel

ⓐ Hourmeter

- If your tractor is working on the normal conditions, the operating hours will be displayed as shown in the right figure.
- It records the hours that your tractor has been operated regardless of the engine RPM. Use the hourmeter as a guide to determine hourly service and maintenance intervals.
- The number, 0019.1 in hourmeter means the tractor has been used for 19.1 hours so far. (19 hours and 6 minutes)



ⓑ Battery voltage

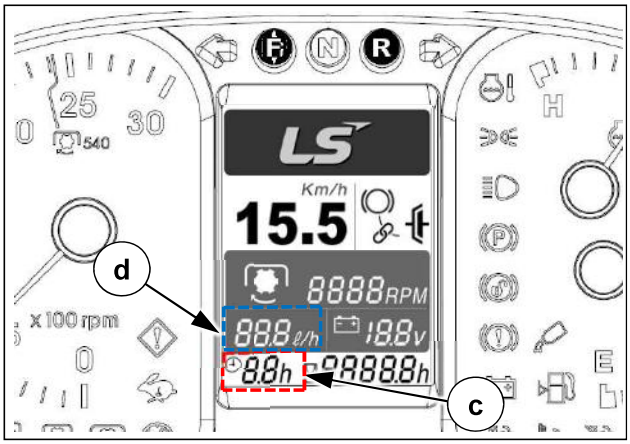
- Current available battery voltage is displayed.

ⓒ Working hour

- Continuous operating hours from turning the key switch to the ON position until now is displayed.

ⓓ Fuel consumption rate

- Average fuel consumption rate is displayed.

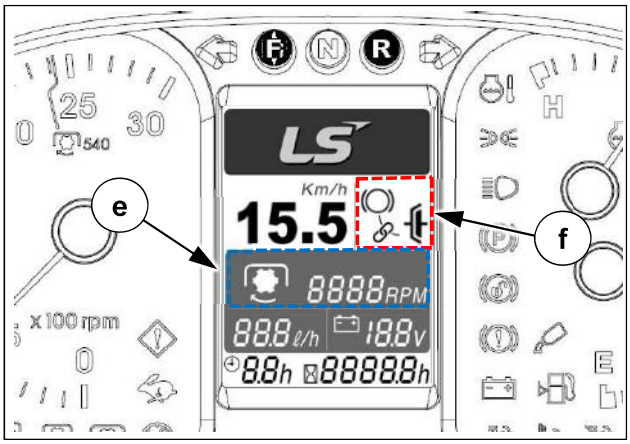


ⓔ PTO RPM indicator

- This indicator displays the rotational speed of the rear PTO when the PTO shaft rotates.

ⓕ Brake Clutch linked indicator

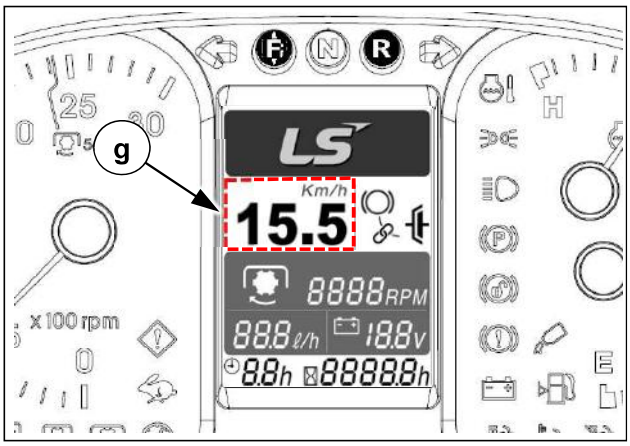
- This indicator is turned on when the brake clutch linked switch is activated and the key switch is placed in the ON position.

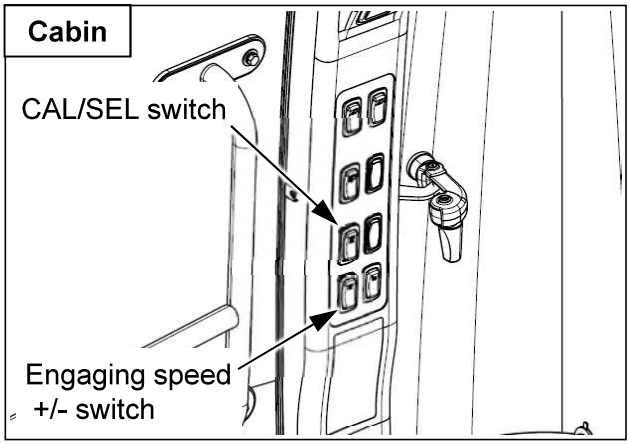


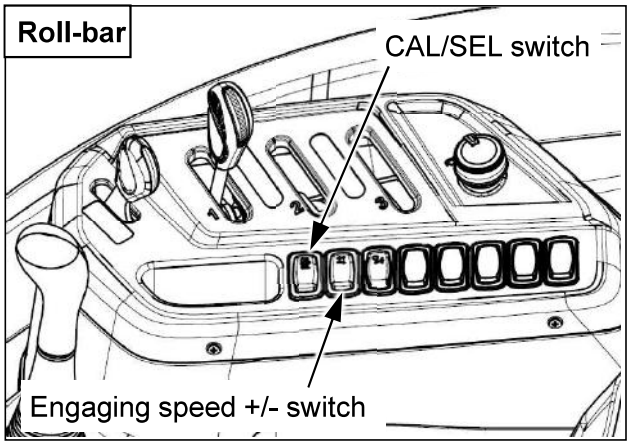
⑨ Speedometer

- Current vehicle speed is displayed in km/h or mph(mile/h) unit. This is theoretically calculated from the tire rolling circumference and the display unit can be changed as below.
- *Changing Unit(km/h ←→ mph, mm←→inch)*:

1. Turn off the engine, and apply the parking brake.
2. *Entering edit mode*: Turn the key switch to the "ON" position with pressing the upper side of the CAL/SEL switch. At this time, the "*Tire RC Setting*" will be displayed on the LCD display.
3. Press the upper side of the CAL/SEL switch shortly(within one second). The units of the tire rolling circumference and vehicle speed will be changed.
4. *Editing tire rolling circumference*: In edit mode, the first digit will blink at first. If pressing the upper side of the engaging speed +/- switch, the next digit will blink. If pressing the lower side of the switch, the number is changed from "9" to "0" each time when you press.
5. If pressing the upper side of the CAL/SEL switch for over two seconds, your data will be saved and the edit mode will be exited. If pressing the lower side of the CAL/SEL switch or turn key switch to the "OFF" position, your input data will not be saved and the edit mode will be exited.

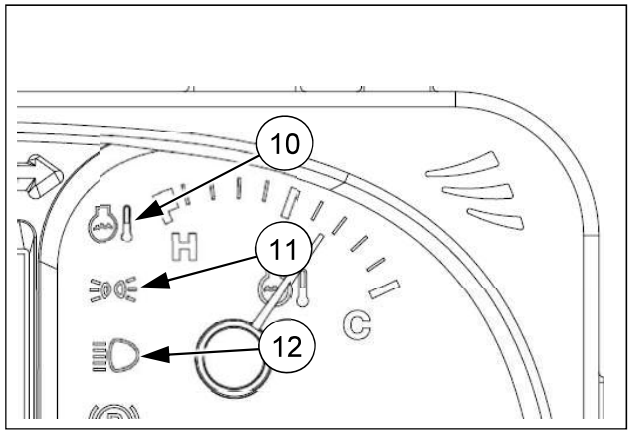






(10) High temperature warning indicator

- If the engine coolant temperature is over the designated level, this indicator will be turned on. At this time, stop the engine immediately and check the engine cooling system including engine coolant level and engine belt.
- *If not cleared, contact your authorized local dealer for check.*



(11) Tail light indicator

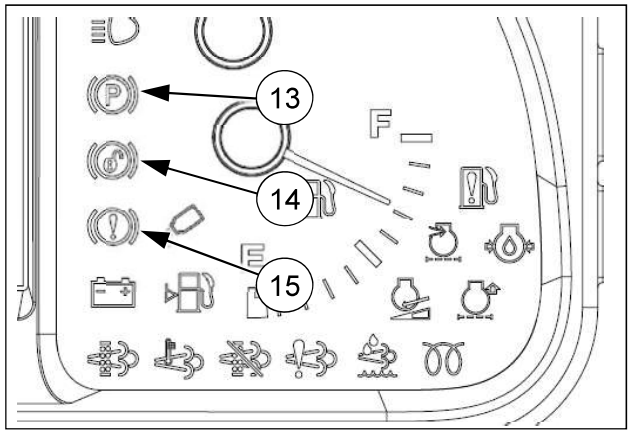
- When turning the key switch to the ON position and turning on the combination light switch, the side lights, tail lights and this indicator will be turned on at the same time.

(12) High beam indicator

- When turning on the high beam of the headlamps, this indicator will be turned on simultaneously. Do not turn on the high beam when a vehicle comes in the opposite lane.

(13) Parking brake indicator

- This indicator will be turned on when applying the parking brake. Do not drive the vehicle with the parking brake applied.



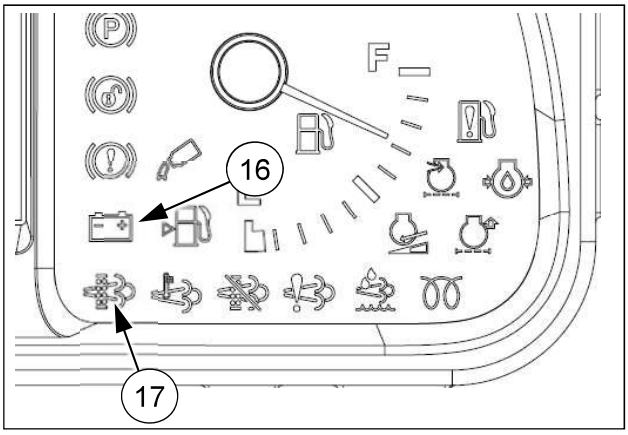
(14) Brake pedals not latched indicator (optional)

- When the brake pedals are not connected with the brake pedal latch, the left-hand and right-hand brake pedals can be operated separately, and this indicator will be turned on.

(15) Brake malfunction indicator (Not used)

- This indicator is not used in this model.

(16) Battery charging warning indicator

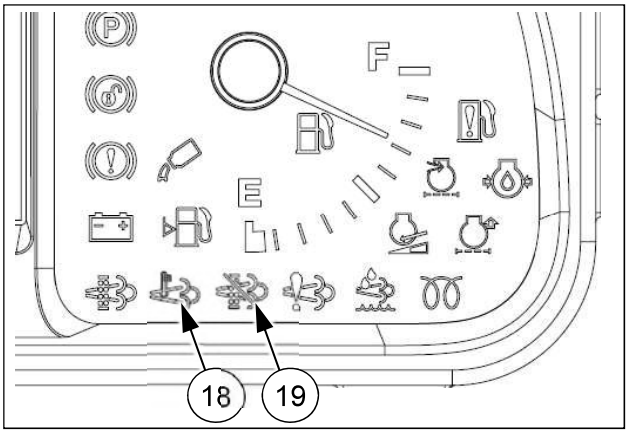


- This indicator will be turned on when turning the key switch to the “ON” position and it will be turned off after the engine starts.
- If this bulb becomes lit during operation, it indicates that the charging system is not operating normally. As the battery can be completely discharged under these conditions, contact your authorized local dealer for checking the electrical charging system.

(17) DPF Regeneration indicator

- When the regeneration process in the DPF is working, this indicator will be turned on with continuous light. It is not a failure but normal operation.
- ***If this indicator is blinking, it means that the soot is over accumulated in the DPF. Comply with the instructions of the chapter 3-1-(8), “DPF switch” in this manual.***
- *For further information about this indicator, see chapter 3-1-(8) in this manual.*

(18) DPF temperature indicator

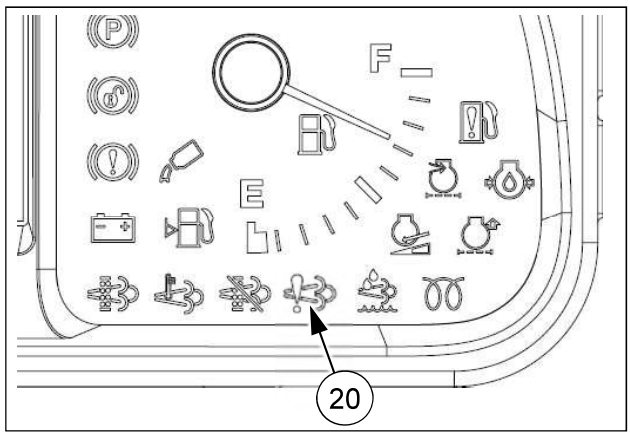


- When the regeneration process in the DPF is working and the DPF temperature is over the designated temperature, this indicator will be turned on with continuous light.

(19) DPF inhibited regeneration indicator

- When the DPF switch is pressed to **Inhibited regeneration mode**, this indicator will be turned on and the regeneration of the DPF will be inhibited or stopped.

(20) EGR system malfunction indicator

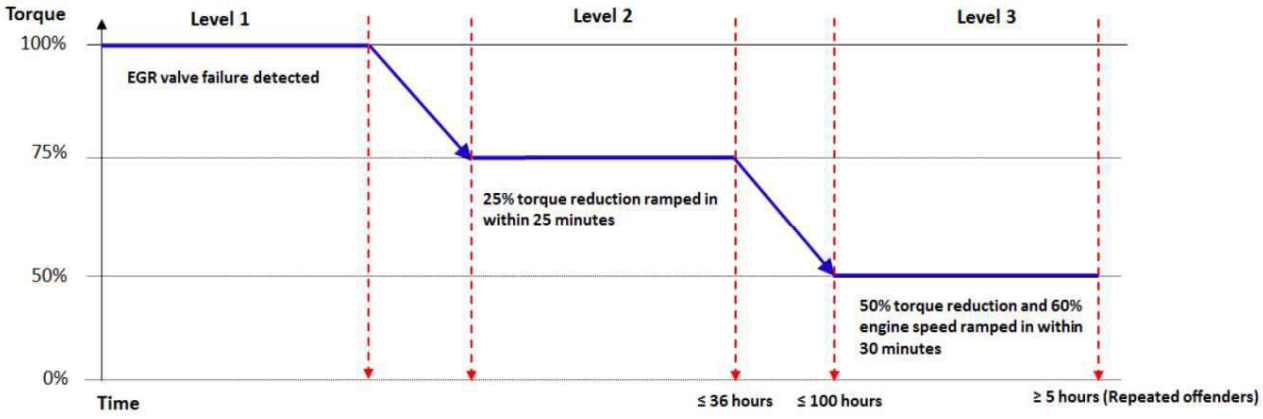


- This indicator is turned on or flashed when the EGR valve or EGR control system can not be activated normally. Contact your authorized local dealer for check in the near future when this indicator is turned on. If this indicator is flashed, visit your authorized local dealer immediately.

1. *Failure categories*
   - EGR valve electrical failure.
   - Monitors of failures that can be attributed to tampering.
   - Monitors that require EGR valve closure as recovery action.

2. *Up to three inducement levels*
   - Alert information to the driver.
   - Low-level inducement: 25% torque reduction.
   - Severe inducement: 50% torque reduction and 60% engine speed reduction.

- EGR inducement torque limitations

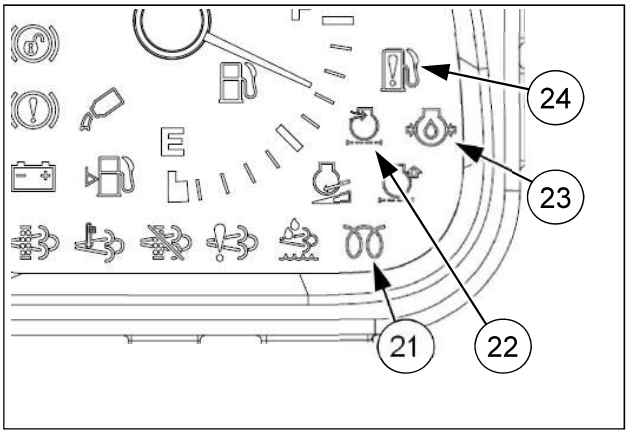


3. EGR inducement levels for tampering failures
- Warning & inducement for technical failures tampering detection.

	Level 1	Level 2	Level 3
Symbol			
Dashboard	- Warning indicator lights. - EGR valve failure was detected.	- Warning indicator flashes. - EGR valve and system has not been improved within 36 hours.	- Warning indicator flashes, and vehicle control error warning indicator lights. - EGR valve and system has not been improved within 100 hours.
Power reduction	- No power reduction.	- 25% torque reduction.	- 50% torque reduction. - 60% engine speed reduction.

(21) Cold start aid indicator

- When the cold start aid device is working, this indicator will be turned on, and it will be turned off about some seconds later. The duration of the illumination may vary depending on the coolant temperature. After this indicator is turned off, start the engine.



(22) Air cleaner service indicator

- If the air cleaner element is clogged, and the differential pressure is increased over the designated level, this indicator will be turned on. After stopping the engine, clean or replace the filter element with a new one.

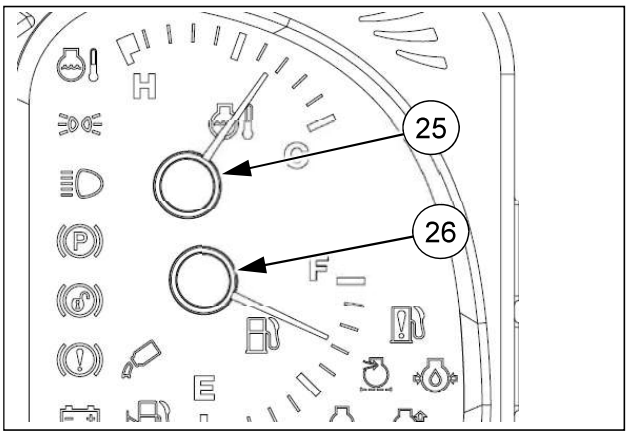
(23) Engine oil pressure indicator

- The light indicates oil pressure only and goes out when sufficient oil pressure is present at the oil sender.
- This indicator will be turned on when turning the key switch to the “ON” position and it will be turned off after starting engine.
- If the indicator is turned on during operation, stop the engine immediately and check the engine oil level. If the engine oil level is normal, contact your authorized local dealer for checking the engine lubrication system.

(24) Fuel filter warning indicator

- When there is excess water in the fuel filter, this indicator will be turned on. If this indicator is turned on, remove the water in the fuel filter. *(See chapter 5-5-(1) in this manual.)*

(25) Fuel level gauge



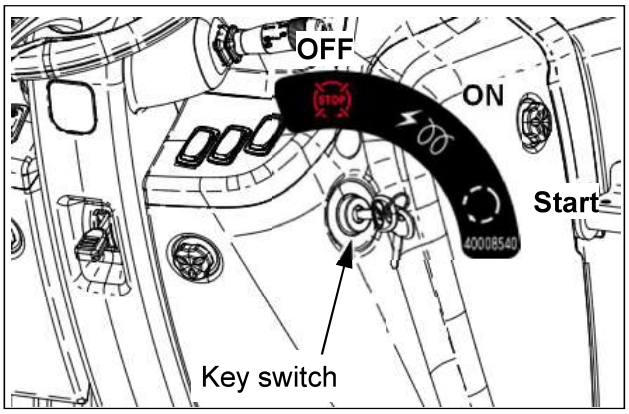
- This gauge displays the fuel level in the fuel tank. If the needle indicates "**E**", fill the fuel tank immediately with fuel.
- The gauge activates when the key switch is in the ON position. It will register "empty" with the key switch in the OFF position.

(26) Engine coolant temperature gauge

- This gauge indicates the engine coolant temperature during operation. It activates when the operator turns the key switch to the ON position. The gauge will register cold with the key switch in the OFF position.
- The closer the needle approaches "**H**" mark, the higher the temperature of engine coolant is. If the needle moves to red portion of the gauge, this indicates an overheated condition. Stop the engine immediately and check the problem.
- Coolant is very hot. When checking the coolant, *comply with the instructions of the chapter 5-13-(1), "Replacement of Engine coolant" in this manual.*

(2) Key switch

- **OFF** - power off (engine stop)
- **ON/Preheat** - power on & automatic glow
- **Start** - engine start
- As soon as the engine starts, turn the ignition key to the ON position immediately. Otherwise, it may cause damage to the starter motor.



⚠Caution	▶ To start the engine, the start-up safety switches should be engaged. - sit in the driver's seat and put the PTO switch to the "OFF" position. - place the F/R shuttle lever in the neutral position and depress the clutch pedal fully. And then, turn the key switch to the "Start" position. *See chapter 4-2-(1), "Engine Start" in this manual.* ▶ If the tractor is not in use, the ignition key should be removed.

(3) Combination light switch

① Turning ON/OFF the lights

- Combination light switch is used to turn on/off the following lights.

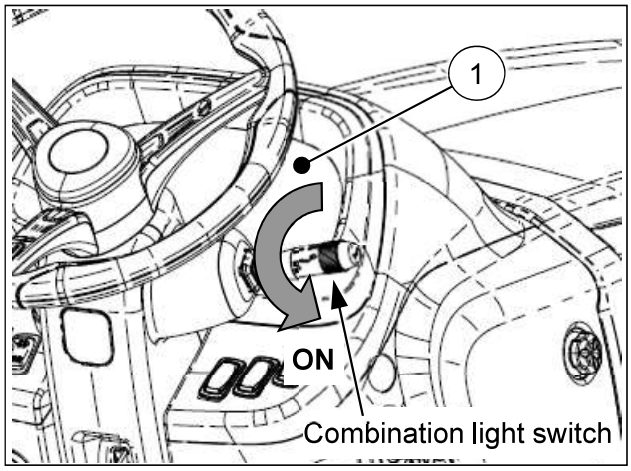
① Instrument panel lights. ② Side lights. ③ Tail lights. ④ Headlights.

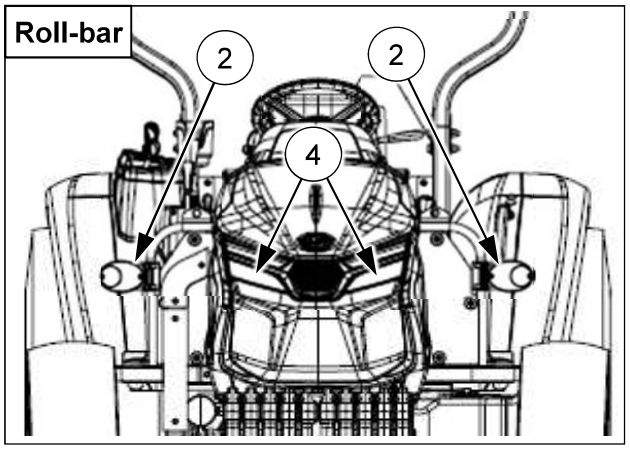
- To turn on/off the lights described as below, turn the switch to the position where the related symbol is marked.

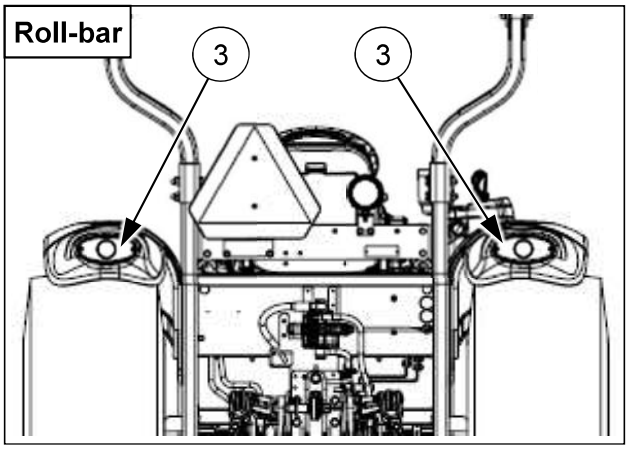

- Instrument light and all lights are OFF.

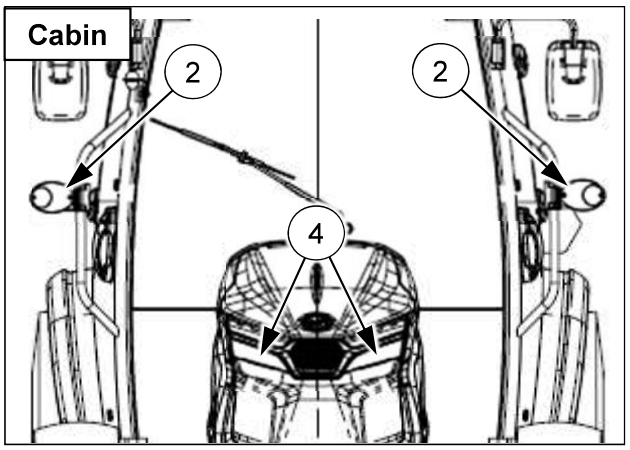

- Instrument light, side lights and tail lights are turned on.

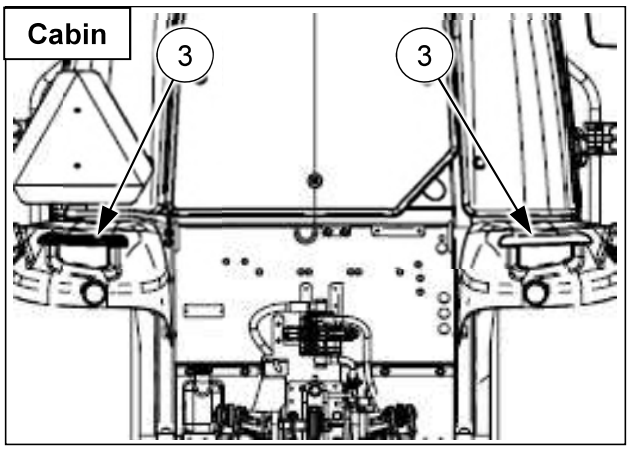

- Instrument light, side lights and tail lights and headlights(Low beam) are turned on.









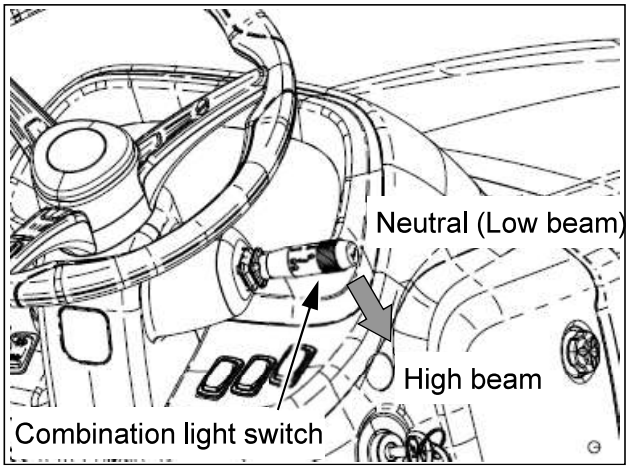


Caution	▶ When passing with other vehicles in the opposite lane at night, turn the headlights to the low beam not to distract oncoming cars.

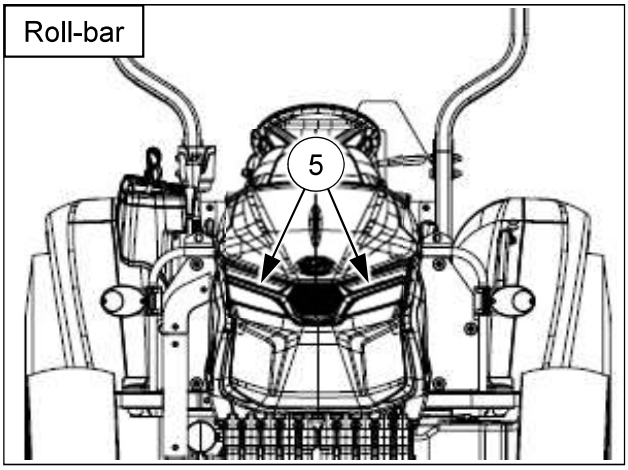
② Turning ON/OFF High beam

- When pushing the switch downward from the neutral position, the high beam of the headlights ⑤ will be turned on and the switch will be held at that position.
- To turn off the high beam, return the switch to the neutral position manually.
- When the high beam is turned on, the high beam indicator on the instrument panel also comes on.

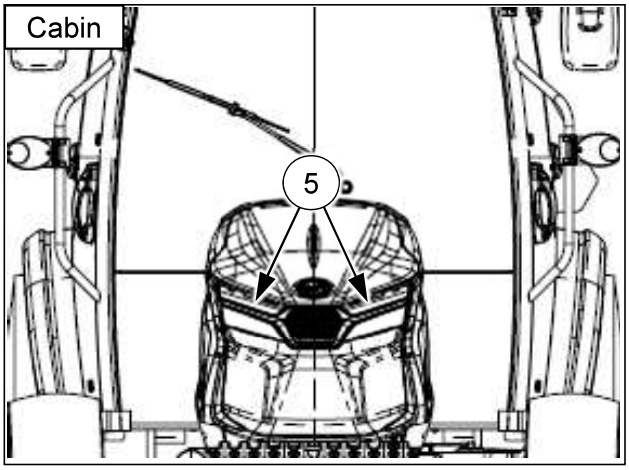
 - High beam indicator



Roll-bar



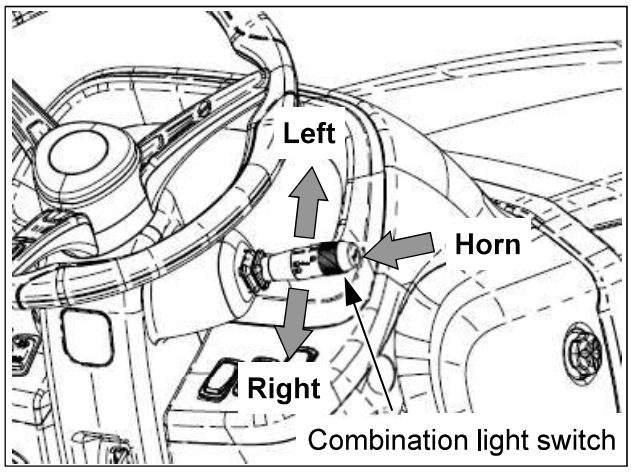
Cabin



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

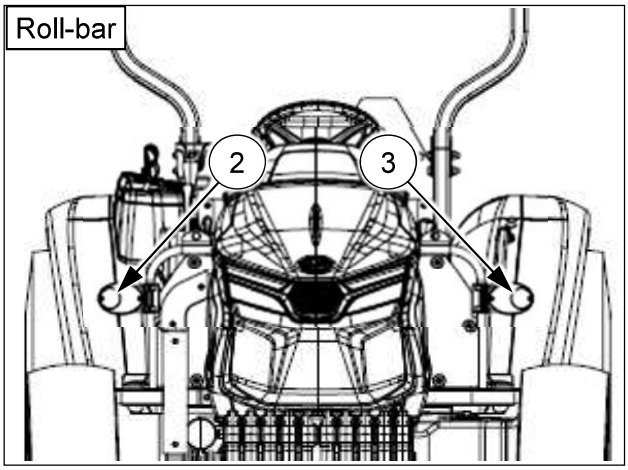
③ Horn operation

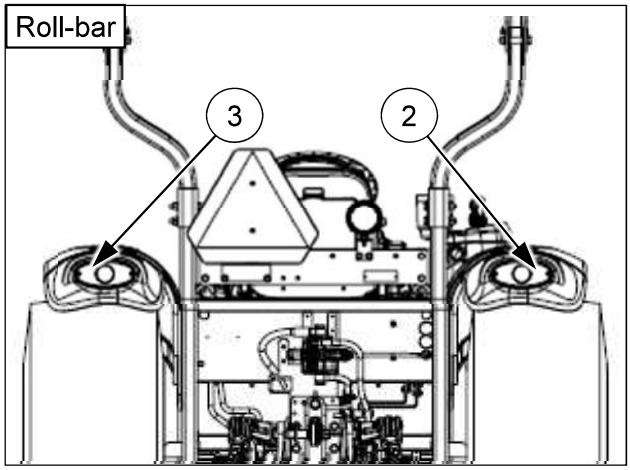
- To sound off the horn, press the switch end to the inside.
- If releasing the switch, it will return to the original position and the horn will stop working.

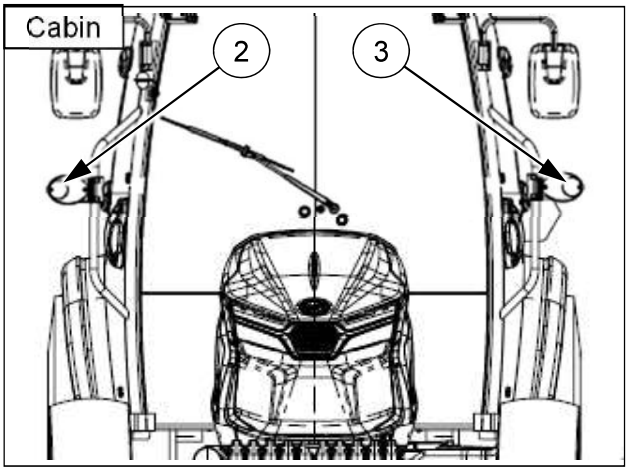


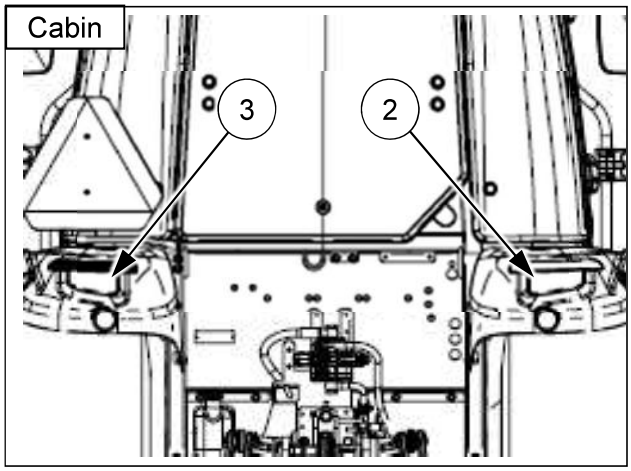
④ Operating turn signal lights

- This switch is used to give information to other vehicles when turning to the left or right.
- When the key switch is placed in the ON position,
- - If turning the switch clockwise, the right turn signal lights② and indicator will flash, and the left turn signal lights on the opposite side of turning direction will illuminate continuously.
  - If turning the switch counter-clockwise, the left turn signal lights③ and indicator will flash, and the right turn signal lights on the opposite side of turning direction will illuminate continuously.
- If turning the turn signal light switch left or right while the hazard warning lights are activated, the hazard warning lights on the opposite side of turning direction will stop flashing and illuminate continuously.





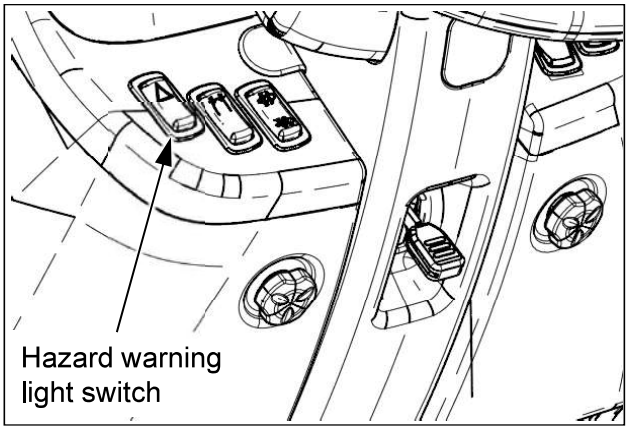


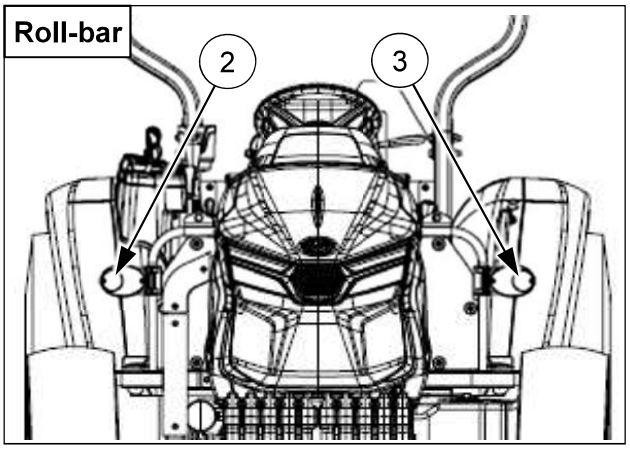


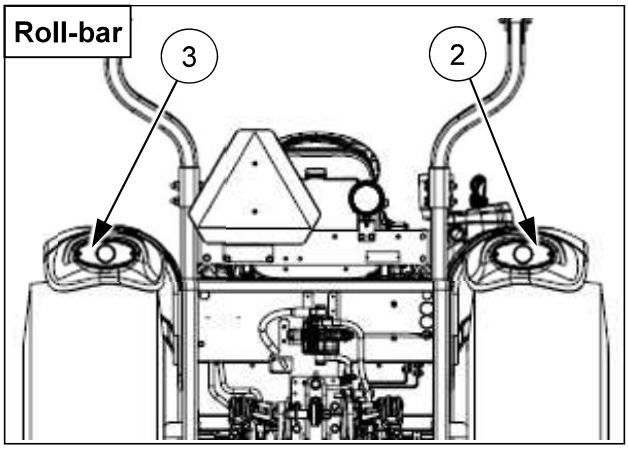
Notice	▶ When driving on public roads, operate the turn signal lights to give information to other vehicles before changing your direction.

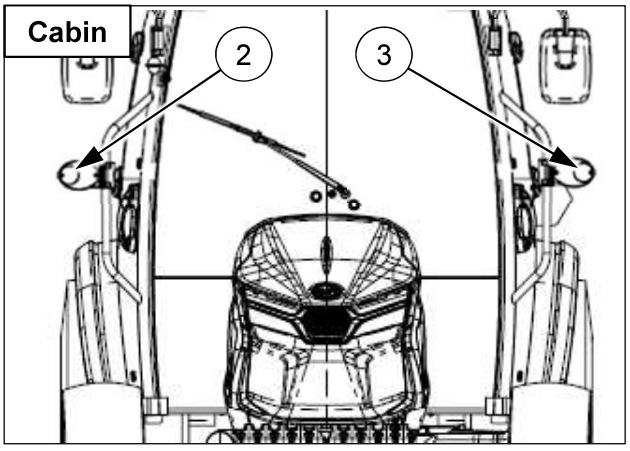
(4) Hazard warning light switch

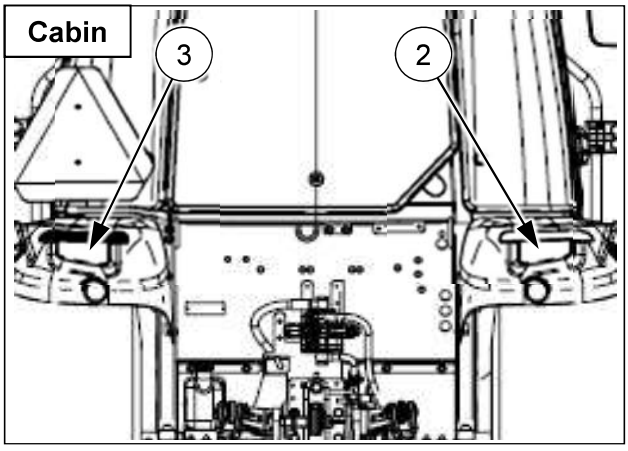
- This is used to give information to other vehicles in case of an emergency situation.
- This function is integrated to the multi-functional light switch.
- If pressing down the hazard warning light switch, all the turn signal lights② ,③ will flash.
- Use this hazard warning light switch in emergency situations according to your local traffic regulations.
- If the hazard warning lights are operated at the same time when the turn signal lights are activated, flashing speed of the turn signal lights will increase by approximately 50% for North American version.









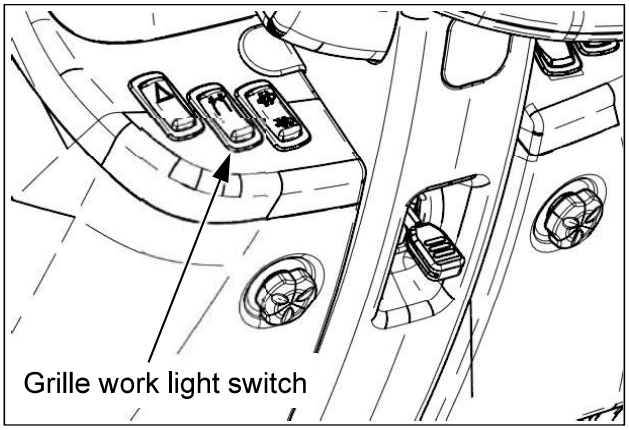


⚠ Caution	▶ If using the hazard warning lights for a long time while the engine is stopped, the battery can be discharged due to high electrical power consumption.

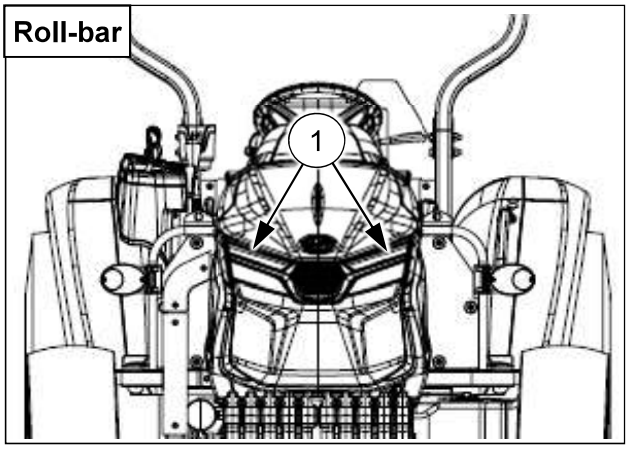
Notice	▶ The hazard warning lights can be turned on regardless of the key switch position.

(5) Grille work light switch

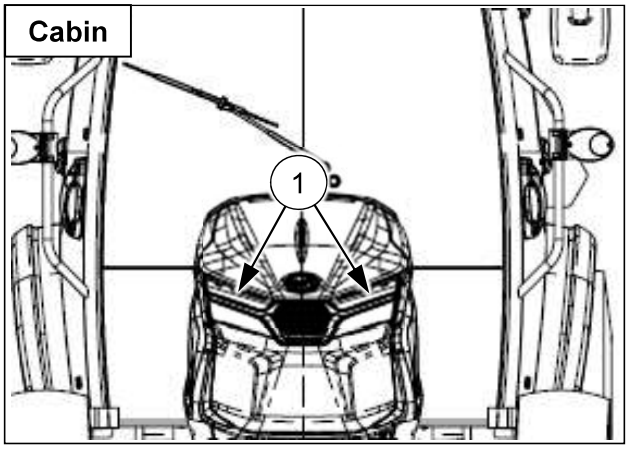
- This is used to turn on/off the grille work lights① of the front grille.
- **ON** - Press the upper side (symbol part) of the switch.
  OFF - Press the lower side of the switch.



Roll-bar



Cabin



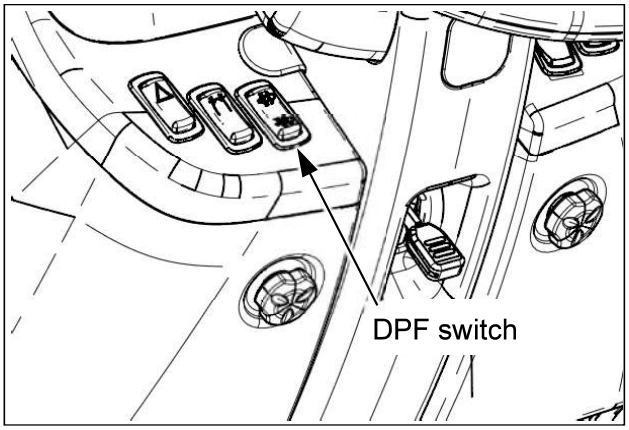
⚠ Caution	▶ When driving on public roads at night, do not leave the work lights on. It may cause a distraction to the drivers of the oncoming cars.

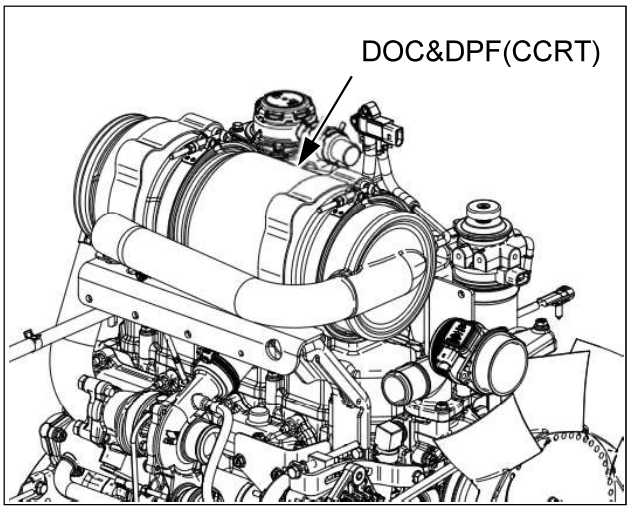
(6) DPF switch

- The regeneration process is the process of burning and cleaning the soot accumulated in the DPF while driving.
- This switch is used to select the **Regeneration mode** or **Inhibited regeneration mode**.

  - **Regeneration mode: If** the soot is loaded over the designated level and the engine is warmed up enough, the DPF regeneration will be processed automatically by ECU. *For more information, see page 3-21, 22 in this manual.*

  - **Inhibited regeneration mode:** The regeneration mode is disabled manually until operator inputs the signal to exit this mode. *For more information, see page 3-23 in this manual.*
- And, this switch is used to process the regeneration manually. *For the detailed operating methods, see page 3-22 in this manual.*





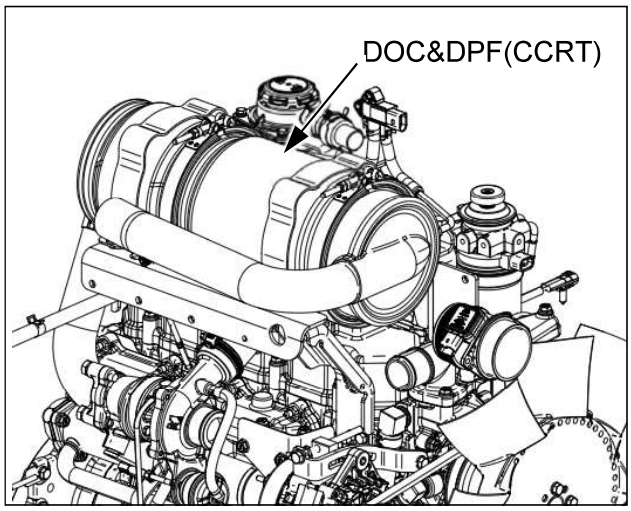
① Definitions of system components and operation

- The following terms will define the system components and functional descriptions.

System component	Description
Diesel Oxidation Catalyst (DOC)	This is a catalytic converter that designed specifically for diesel engines to reduce the emission element such as hydrocarbons(HC), carbon monoxide(CO), and to do exothermic reaction for DPF regeneration.
Diesel Particulate Filter (DPF)	This is a filter and an after-processing component that captures soot in the engine exhaust gas, and to prevent the filter from clogging, the particulate matter will be automatically burned into CO_2 at a high temperature by regeneration process.

② DOC&DPF(CCRT)

- The Diesel Oxidation Catalyst (DOC) and the Diesel Particulate Filter (DPF) 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 the emission regulations, the CCRT(Catalyzed continuous regenerating trap) integrated with DOC and DPF combination is installed on your engine.
- It is very important to read this operator's manual and understand the safe operation of your tractor. If you have any questions about the operation of this emission system, please contact your authorized local 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) 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.

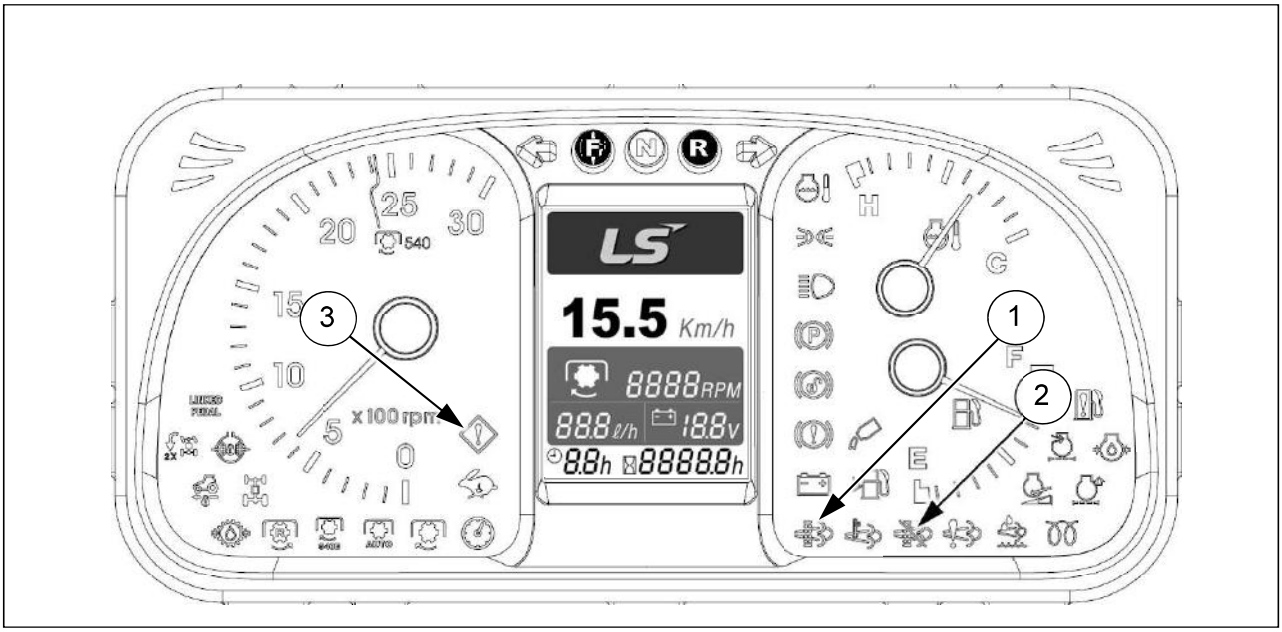
NOTICE	▶Use of diesel fuel other than Ultra low sulfur fuel may adversely affect the engine and the DPF performance.

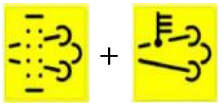
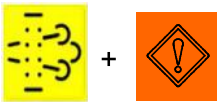
- Engine oil specification
  Use only DPF compatible (CJ-4) oil in your tractor engine.

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

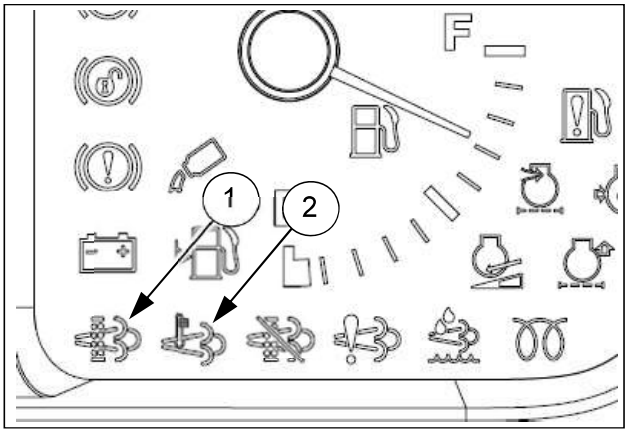
④ Indicator illumination on instrument panel

- The indicators related to the DPF regeneration have several illumination figures and its meanings as follows. Read carefully and keep in mind the instructions well.



Indicators	figures	Possible cause	Symptom & Actions	Remarks
1. DPF regeneration indicator **(1)**	Continuous ON	When the regeneration is processing.	- Normal state	 ON ON
	BLINK(1sec)	When the soot's rate is over 120%	- Press and hold the upper side of the DPF switch over three second for regeneration.	 BLINK (1sec)
	BLINK(0.5sec) + Engine error warning indicator **(3)**	When the soot's rate is over 150%	Engine power reduction. Contact your authorized local dealer for check.	 BLINK (0.5sec) ON
2. DPF inhibited regeneration indicator **(2)**	Continuous ON	When the Inhibited regeneration mode is working	DPF regeneration is delayed or stopped.	 ON

⑤ Regeneration mode



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

NOTE : The regeneration is the normal operating mode.

- The regeneration will be activated by ECU ;
  - When soot's rate **reaches 100% or more.**
  - When the engine **is warmed up enough.**
  - When **the DPF switch is not pressed to the Inhibited regeneration mode.**

NOTE : Regeneration will last for ***approximately 15 to 25 minutes.***

- If pressing and holding the upper part of the DPF switch over 3 seconds, the regeneration can be activated manually. In this case, if the soot's rate is reached over minimum 30%, the regeneration will be activated.
- During the regeneration, the DPF regeneration indicator **(1)** and DPF temperature indicator **(2)** will be turned on.
- In case of turning off the engine while the regeneration is processing, the regeneration is to resume again when restarting the engine.

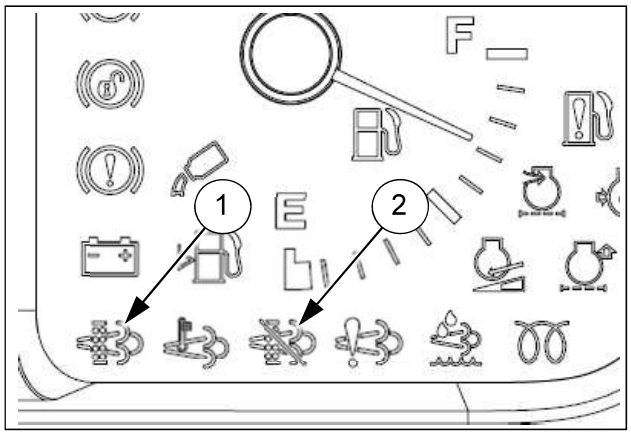
NOTICE	▶ If engine is turned off during the regeneration, soot will not be completely burned and may increase fuel consumption. KEY-OFF during regeneration mode is not recommendable because too short operation won't finish regeneration mode, So, we recommend to users to operate until all indicator lights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

⚠Warning	▶ Fire hazard! During the Diesel Particulate Filter(DPF) 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.

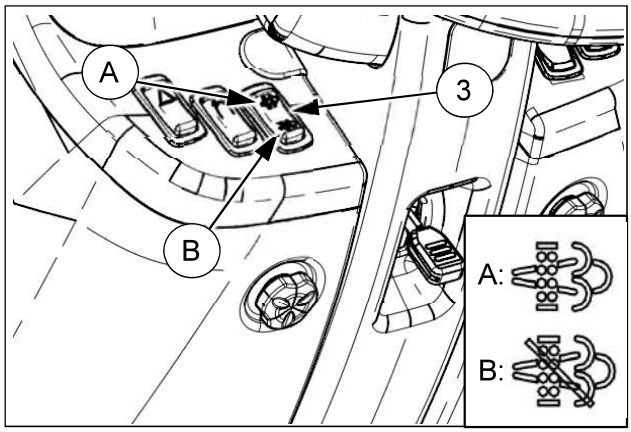
⑥ Inhibited regeneration mode

***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** : Even if the DPF regeneration indicator **(1)** is ON during the regeneration process, the inhibited regeneration mode can be set.*



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



To set the inhibited regeneration mode :

1. Press down the lower side **(B)** of the DPF switch **(3)**. And then DPF inhibited regeneration indicator **(2)** will be turned on.

***NOTICE** : When tractor arrives at a safe regeneration location, press again the lower side **(B)** of the DPF switch to exit the Inhibited regeneration mode.*
If not, excessive soot in the DPF may overload the emission system and result in a reduction of engine power.

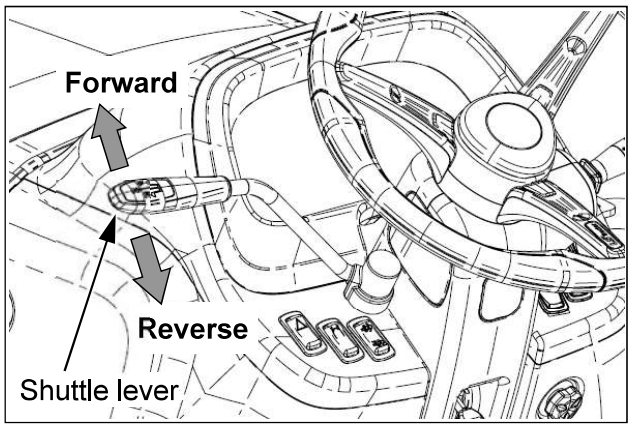
To exit the Inhibited regeneration mode (To go to the regeneration mode) :

1. Press down the lower side **(B)** of the DPF switch **(3)** again for only exiting the inhibited regeneration mode.
2. Press and hold the upper side **(A)** of the DPF switch **(3)** for over one second to exit the Inhibited regeneration mode and to execute the regeneration mode.
3. When inhibited regeneration mode has been exited, the DPF inhibited regeneration indicator **(2)** will be turned off.

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

(7) Shuttle lever (Synchro-shuttle)

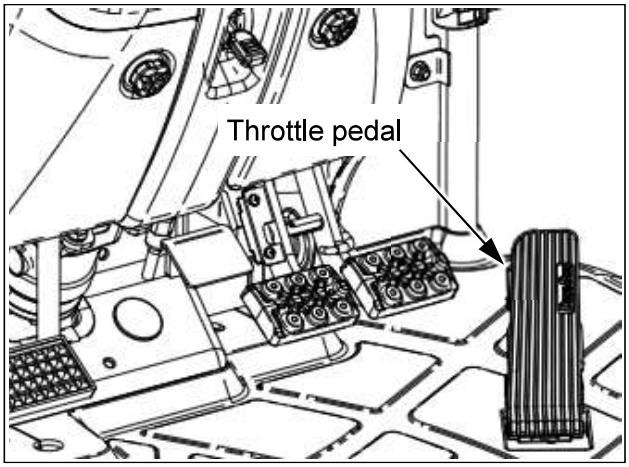
- This is used to select the Forward or Reverse after depressing the clutch pedal fully.
- **FORWARD** : Push the lever forward.
  REVERSE : Pull the lever backward.
- Before reversing the tractor, lower the engine speed and check the safety conditions behind your tractor.
- Before starting the engine, be sure to place the shuttle lever in the neutral position.



⚠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 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.

(8) Throttle pedal

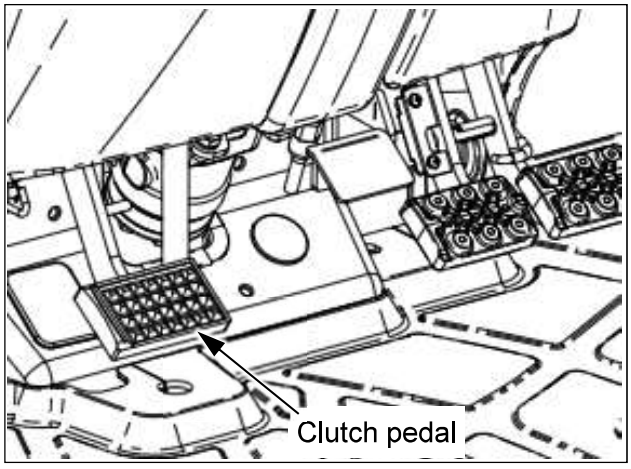
- This pedal is used to control the engine speed when driving on the road.
- When pressing the throttle pedal, the engine speed will be increased.
- When using the throttle pedal, the throttle lever must be placed on the **LOW** speed position.
- There is a sensitive electronic sensor on the throttle pedal. Do not remove or modify the throttle pedal arbitrarily.
- If there is an error related to this sensor while the engine is running, the engine speed will be fixed to 1500 rev/min, so called LIMP HOME mode. Contact your authorized local dealer.



⚠ Caution	▶ When driving on the road, place the throttle lever to the low speed position and use this throttle pedal.

(9) Clutch pedal (Synchro-shuttle)

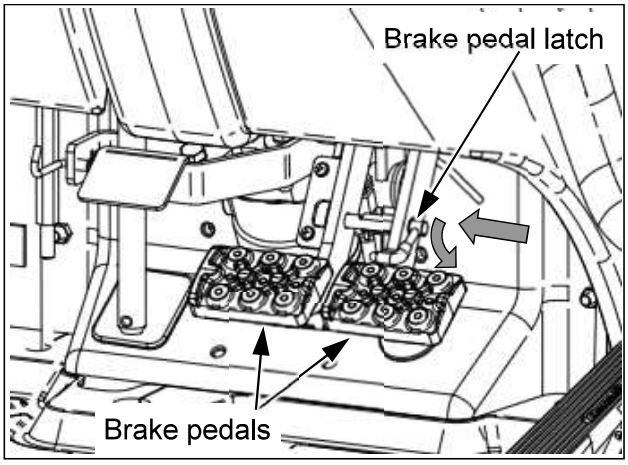
- This is used to engage or disengage the main transmission clutch for starting engine or shifting transmission gears.
- Depress the clutch pedal quickly and fully, and release it slowly.
- If the PTO mode switch (optional) is not installed, the PTO shaft cannot be stopped when depressing the clutch pedal. Use the PTO switch to stop the PTO.

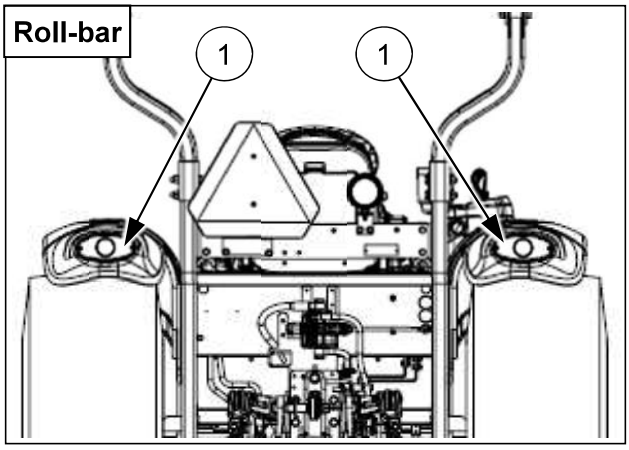


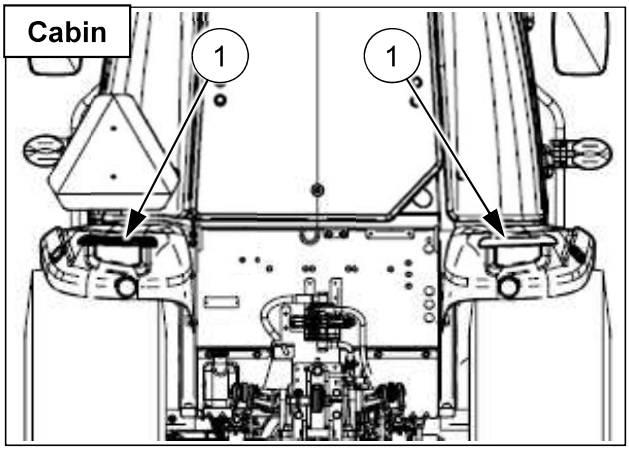
⚠ Caution	▶ DO NOT ride your foot on the clutch pedal while driving. ▶ As a start safety switch is installed for operator's safety, depress the clutch pedal fully to start the engine.

(10) Brake pedals

- The brake pedals of your tractor can be operated independently after disconnecting the brake pedal latch. The left/right brake pedals transmit the braking force on each wheel.
- When stopping the tractor, press both brake pedals together after depressing the clutch pedal fully.
- To reduce the turning radius in the work field, release the brake pedal latch, and press only the left/right pedal firmly.
- When driving on public roads, connect the brake pedals with the brake pedal latch.
- DO NOT press the one-side brake pedal while the differential lock is engaged. It may cause damage or a failure of the axles.
- The brake lights① will illuminate when the brake pedal is depressed and the key switch is in the "ON" position.



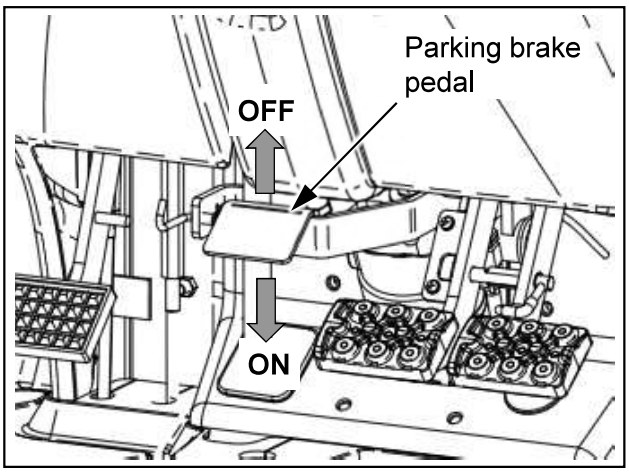




⚠Caution	▶ When driving on public roads, engage the left/right brake pedal with the brake pedal latch. If pressing the one-side brake pedal while driving, the tractor may turnover. ▶ DO NOT ride your foot on the brake pedals while driving to prevent the brake disks or other brake system components from being damaged.

(11) Parking brake pedal

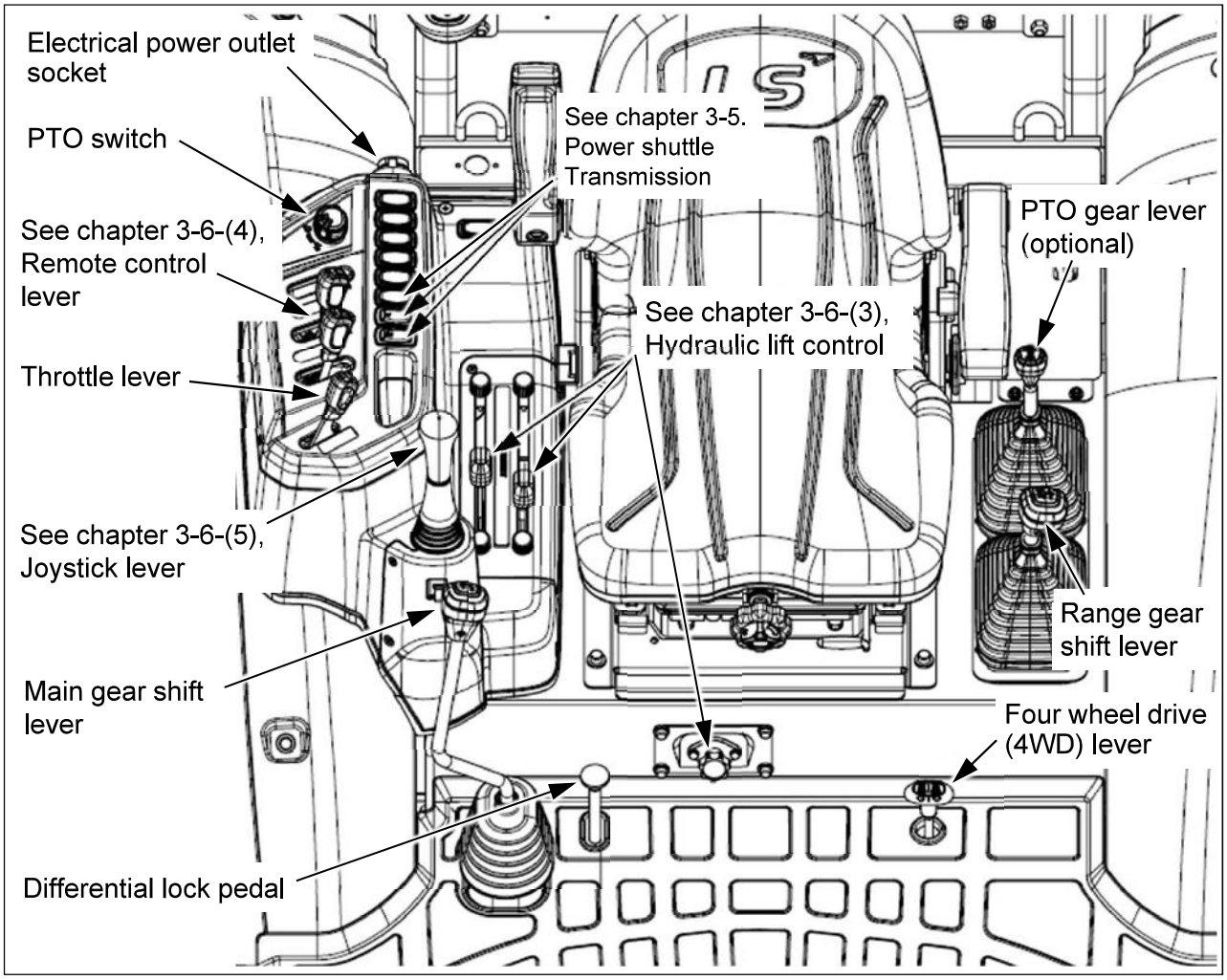
- This pedal is used to apply the parking brake.
- Connect the brake pedals each other with the brake pedal latch before applying the parking brake.
- Press down and hold the brake pedals.
- Press the parking brake pedal and engage the slot of the parking brake pedal to the pin of the left-hand brake pedal.
- Release the brake pedals slowly while checking slippage of the tractor.
- To release the parking brake, just press the brake pedals little harder and check if the parking brake returns to its original position by spring.



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

3-2. Left / Right-hand controls (Roll-bar models)

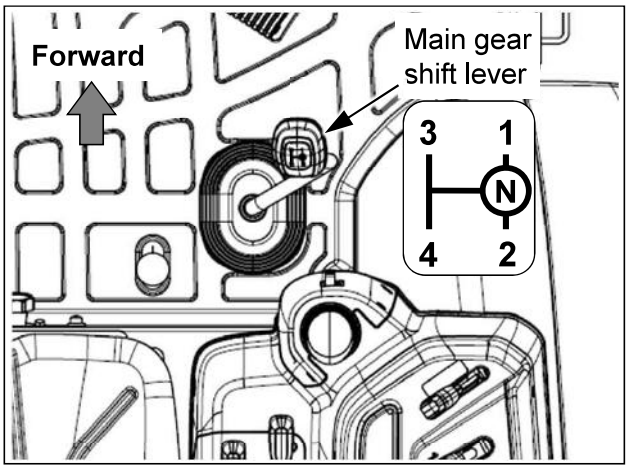
Important to owner, read carefully



***NOTE**: Depending on the optional specifications, some figures may be different from your tractor.*

(1) Main gear shift lever

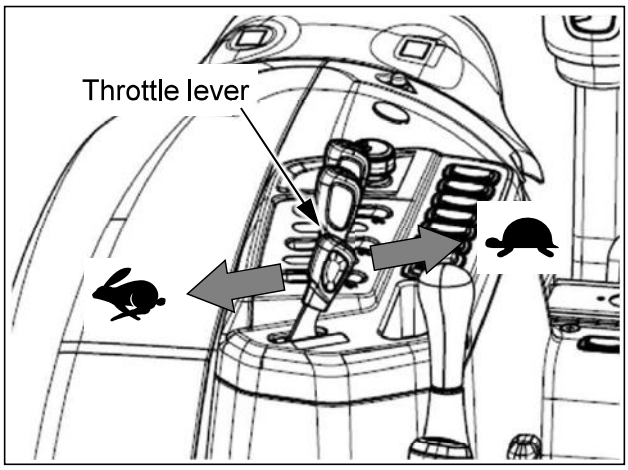
- Four speed gear shift and neutral positions are available.
- The main gear shift lever can be operated while driving after depressing clutch pedal. It is not necessary to stop the tractor completely due to the synchromesh gears.



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

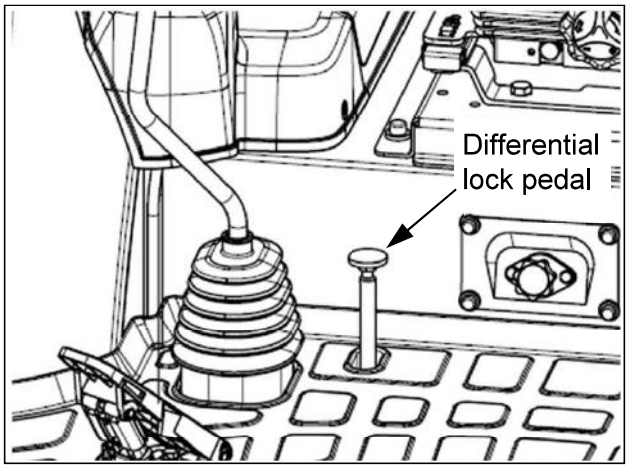
(2) Throttle lever

- This lever is used to control engine speed.
  - push it forward for **HIGH** engine speed.
  - pull it backward for **LOW** engine speed.
- The throttle lever must be used only for work field. When driving on public roads, place the throttle lever to the low speed position and use the throttle pedal.



(3) Differential lock pedal

- When a rear wheel is slipping and the tractor cannot move forward, stop the tractor and press down the differential lock pedal. The differential lock is useful when working on slippery ground.
- If the differential lock is engaged, both rear wheels are connected and rotate at the same speed, allowing you to move forward. But, this interferes with the steering operation. You cannot turn smoothly.
- Take your foot off the pedal to release the differential lock. If the differential force is reduced to some extent, the differential lock is released automatically.
- If the differential lock does not disengaged (i.e. the turning radius is larger than normal operation and the turning is not smooth), depress the clutch pedal and/or press the left/right one-side brake pedal slightly for a second each other.

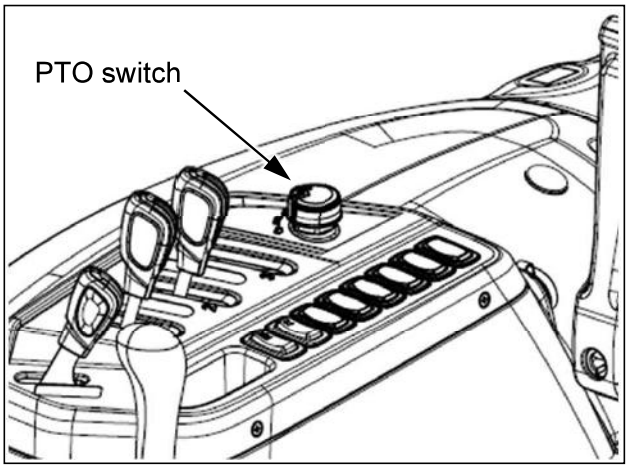


⚠Warning	▶ Do not turn the tractor while the differential lock is engaged. ▶ Do not use this differential lock pedal while driving on public roads. ▶ Do not engage the differential lock when one wheel is spinning.

(4) PTO switch (Independent PTO)

- The engine can be started only when the PTO switch is placed in the OFF position for safety. *For the details of the engine start, see chapter 4-2-(1), "Engine start" in this manual.*
- After starting the engine, you must comply with the following instructions to operate the PTO.

1. Check the safety conditions around the implement.
2. Place the PTO gear lever (if equipped) to the desired position.
3. Push and turn the PTO switch to the ON position to operate the PTO shaft.
4. When the PTO shaft begins to rotate, the PTO operation indicator on the instrument panel will be turned on.
5. If you want to stop the PTO shaft temporarily, push the PTO switch to the OFF position.

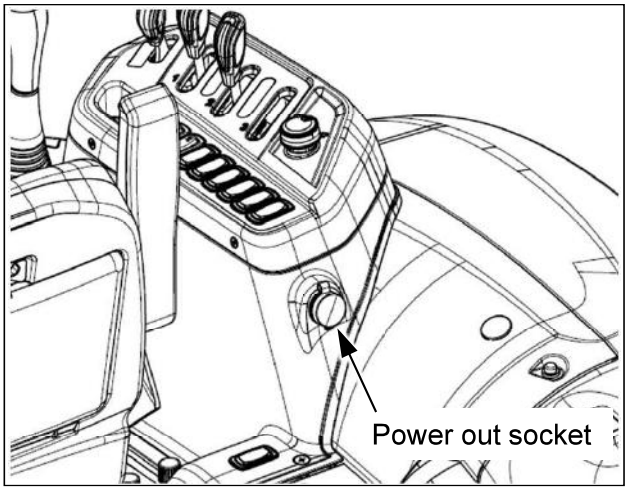


ON : PUSH AND TURN
OFF : PUSH

⚠Warning	▶ Before attaching, detaching or checking the PTO driven equipment, always place the PTO switch in the OFF position and PTO gear lever in the neutral position. ▶ Even if depressing the clutch pedal or lifting up the 3-point linkage to the upper limit, the PTO shaft will not be stopped. Pay attention to the surroundings to prevent an accident. ▶ Do not engage the PTO clutch at high engine speed. Sudden engagement can cause damage to the implement and PTO drive lines. Engage the PTO at low idle rpm, and then raise the engine speed.

(5) Electrical power outlet socket

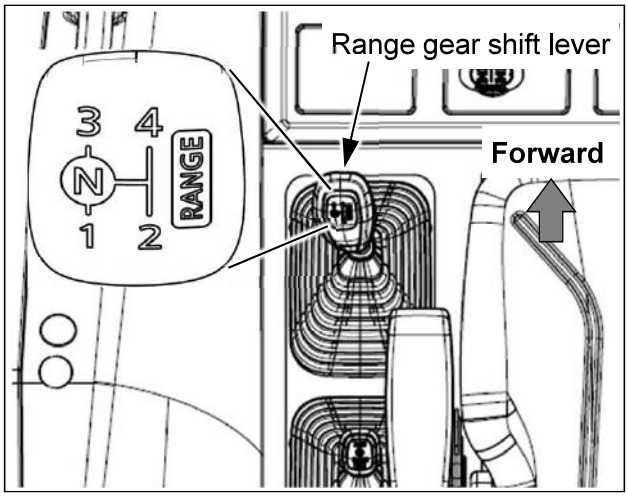
- This is used to withdraw electric power for charging of a cigarette lighter jack or cellular phone.
- In case of using a cigarette lighter jack(optional), push the cigarette lighter jack into the socket to heat the coil. If the heating process is finished, the jack is retracted automatically, and it can be used as a substitute for a lighter.
- In case of using it as a power supply(12V), use a electrical equipment less than 8A of current flow.



Caution	▶ When using the cigarette lighter jack, cares must be taken not to touch the heating coil. The heated coil is very hot and it may cause a serious burn.

(6) Range gear shift lever

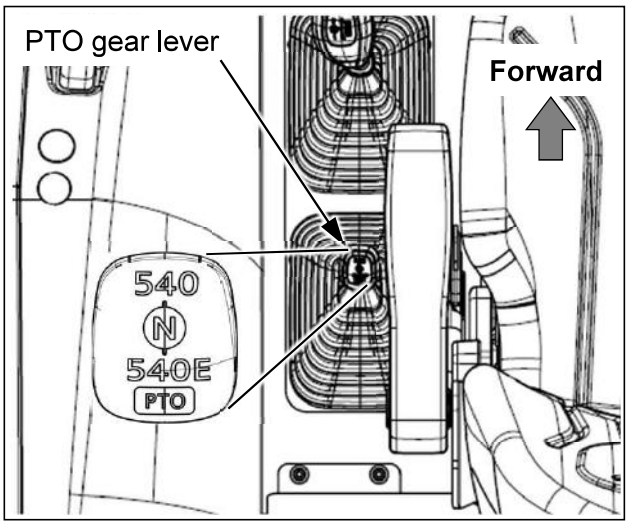
- Four speed gear shift and neutral positions are available.
- Before operating the range gear shift lever, press down the clutch pedal and brake pedals, and stop the tractor completely.



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

(7) PTO gear lever (optional)

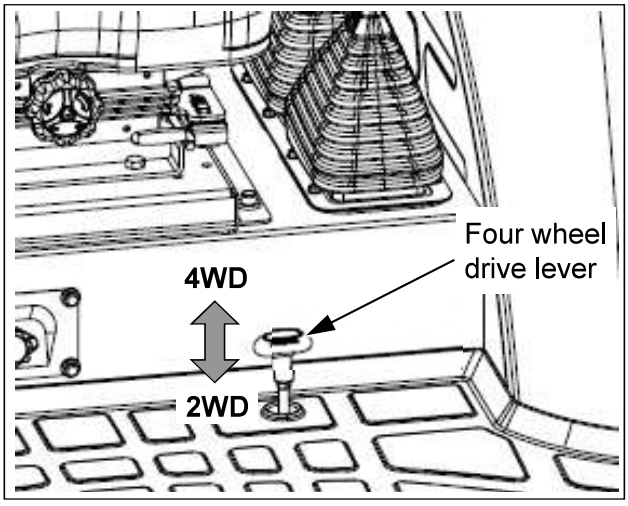
- From the front, 540 / Neutral / 540E PTO positions are available.
- Before operating the lever, depress the clutch pedal and put the PTO switch to the "**OFF"** position, and stop the PTO shaft completely.
- When attaching/detaching the rear implement, place the PTO gear lever to the neutral position.
- If you turn on the PTO switch when this lever is placed in the 540E PTO position, the rear PTO begins to work, but the engine speed is limited to approximately 1789 rev/min for economic PTO operation.
- *For further information about the PTO shaft, see chapter 4-5-(2) in this manual.*



Notice	▶ Operate the PTO gear lever by correct "I" pattern. If operated diagonally, it may cause a failure. ▶ If the PTO gear lever is not engaged smoothly, shift the lever again after lifting up the implement from the ground to align the drive shaft.

(8) Four wheel drive lever (4WD)

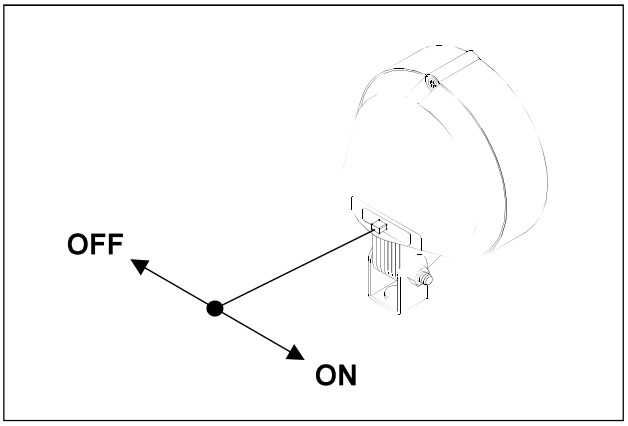
- This lever is used to engage/disengage the four wheel drive (4WD). Pull it upward to engage the 4WD.
- Before operating the 4WD lever, press down the clutch pedal and brake pedals, and stop the tractor completely.
- The four wheel drive(4WD) is very effective for the followings.
  - When increasing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



⚠Caution	▶ When driving on public roads, disengage the 4WD. If not, it may cause damage to the tires and transmission drive lines and a serious accident. After working in the field, disengage the 4WD before coming out from the field. ▶ If you drive the tractor at high speed while the 4WD is engaged, sharp steering may cause a serious accident. ▶ *Only operate four wheel drive lever by hand. If stepping on it , it may cause a failure.*

(9) Work light switch

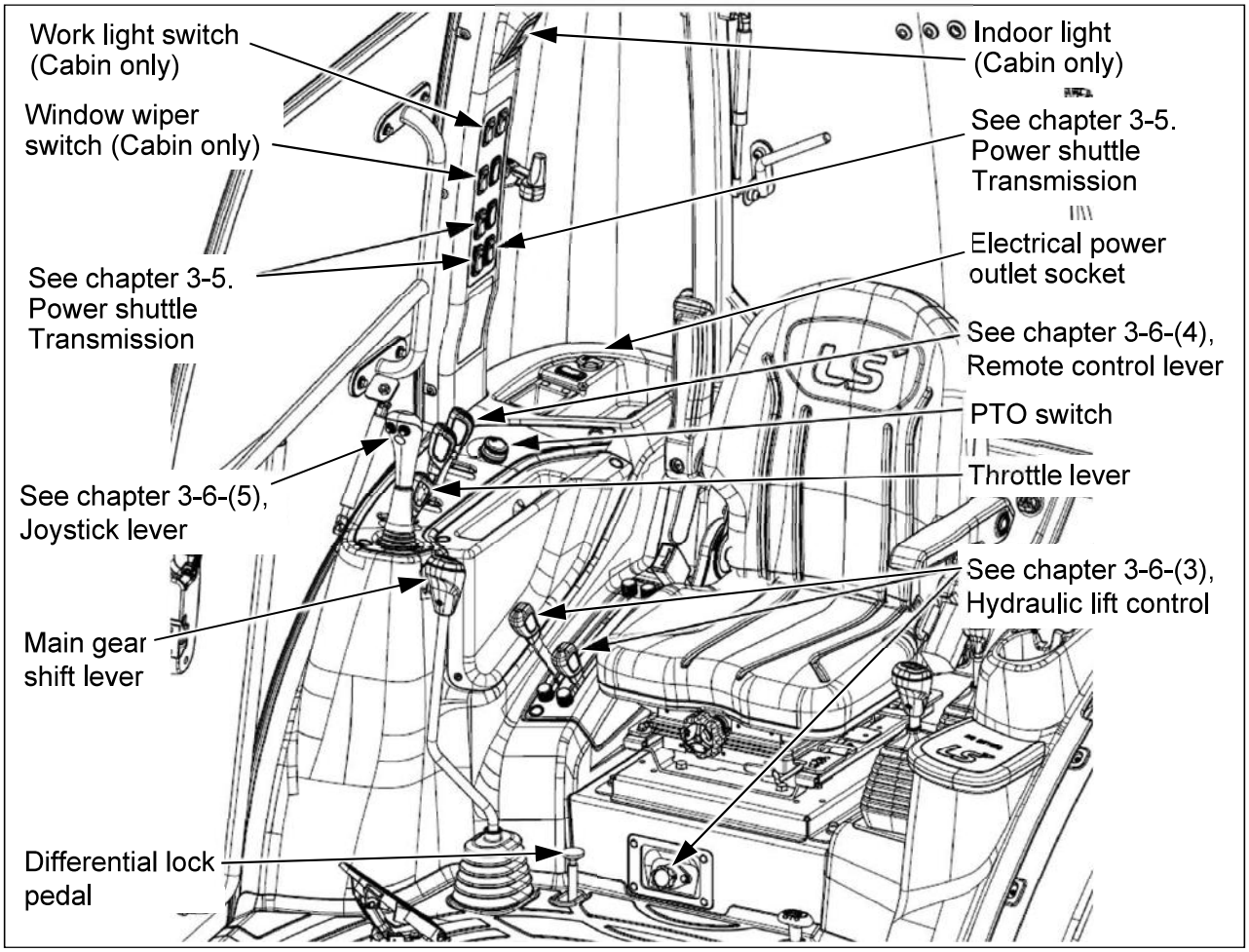
- The rear work light has a switch on its back. To turn on/off the rear work light, operate the switch as shown in the right figure.



⚠ Caution	▶ When driving on public roads at night, do not leave the rear work light on. It may cause a distraction to the drivers of the following cars.

3-3. Right-hand controls and Cabin pillar (Cabin models)

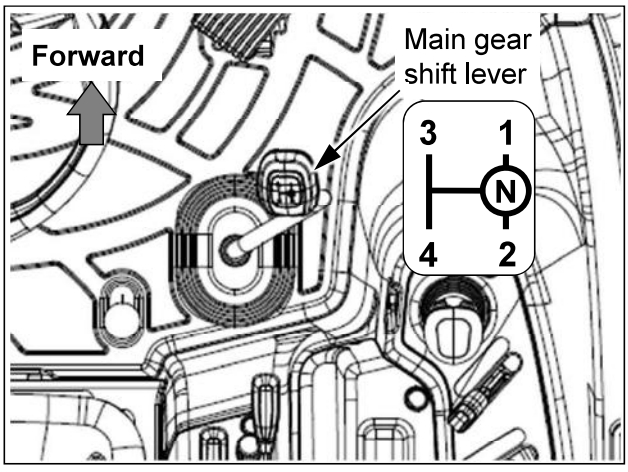
Important to owner, read carefully



***NOTE**: Depending on the optional specifications, some figures may be different from your tractor.*

(1) Main gear shift lever

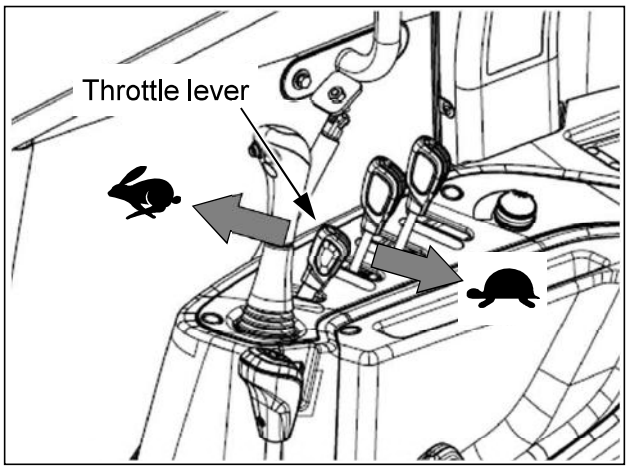
- Four speed gear shift and neutral positions are available.
- The main gear shift lever can be operated while driving after depressing clutch pedal. It is not necessary to stop the tractor completely due to the synchromesh gears.



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

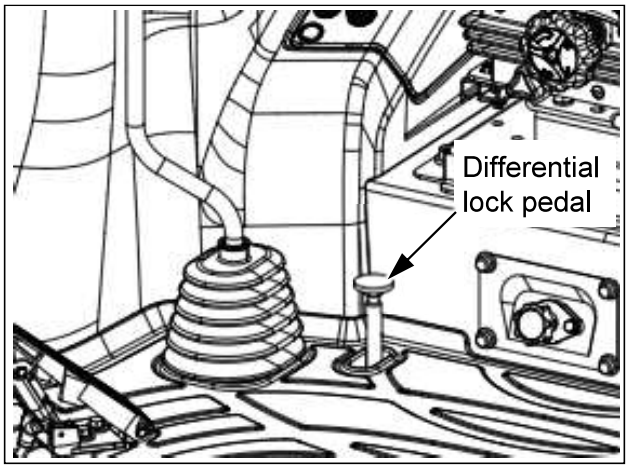
(2) Throttle lever

- This lever is used to control engine speed.
  - push it forward for **HIGH** engine speed.
  - pull it backward for **LOW** engine speed.
- The throttle lever must be used only for work field. When driving on public roads, place the throttle lever to the low speed position, and use the throttle pedal.



(3) Differential lock pedal

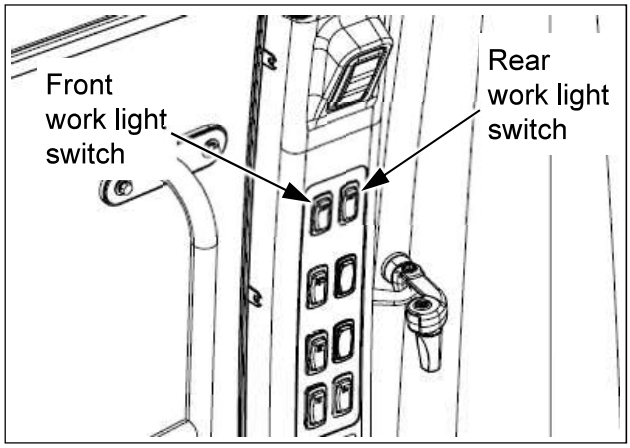
- When a rear wheel is slipping and the tractor cannot move forward, stop the tractor and press down the differential lock pedal. The differential lock is useful when working on slippery ground.
- If the differential lock is engaged, both rear wheels are connected and rotate at the same speed, allowing you to move forward. But, this interferes with the steering operation. You cannot turn smoothly.
- Take your foot off the pedal to release the differential lock. If the differential force is reduced to some extent, the differential lock is released automatically.
- If the differential lock does not disengaged (i.e. the turning radius is larger than normal operation and the turning is not smooth), depress the clutch pedal and/or press the left/right one-side brake pedal slightly for a second each other.

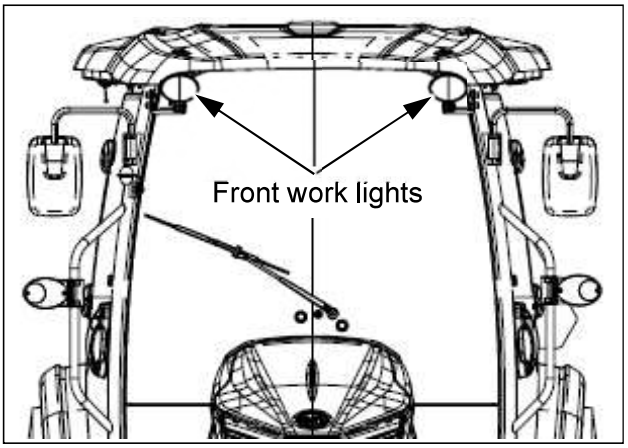


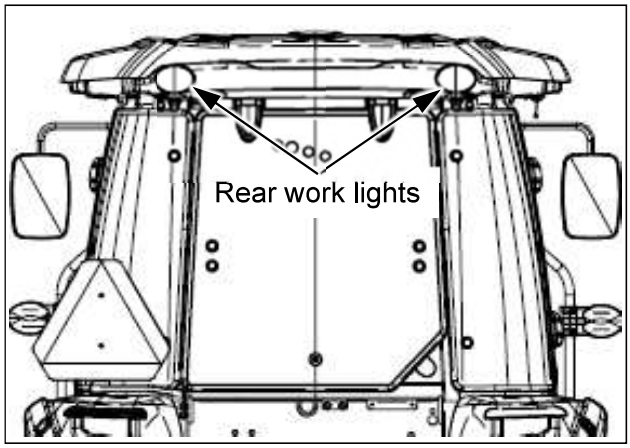
⚠Warning	▶ Do not turn the tractor while the differential lock is engaged. ▶ Do not use this differential lock pedal while driving on public roads. ▶ Do not engage the differential lock when one wheel is spinning.

(4) Work light switch

- This is used to turn on/off the front/rear work lights.
- **ON** - Press the upper side (symbol part) of the switch.
- **OFF** - Press the lower side of the switch.



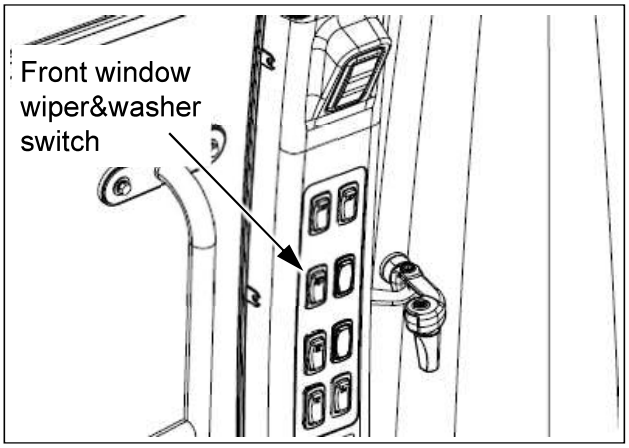


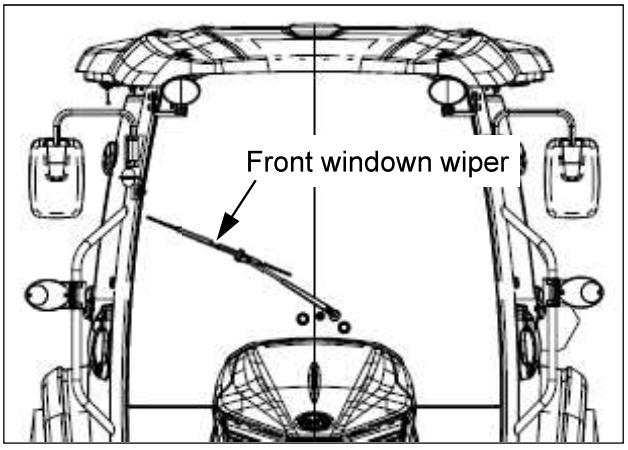


⚠ Caution	▶ When driving on public roads at night, do not leave the front/rear work lights on. It may cause a distraction to the drivers of the oncoming/following cars.

(5) Window wiper&washer switch (Cabin type)

- This switch is used to operate the front window wiper.
- Press the upper side (symbol part) of the switch to operate only the front wiper.
- If pressing and holding the upper side of the switch again, the washer liquid will be sprayed out.

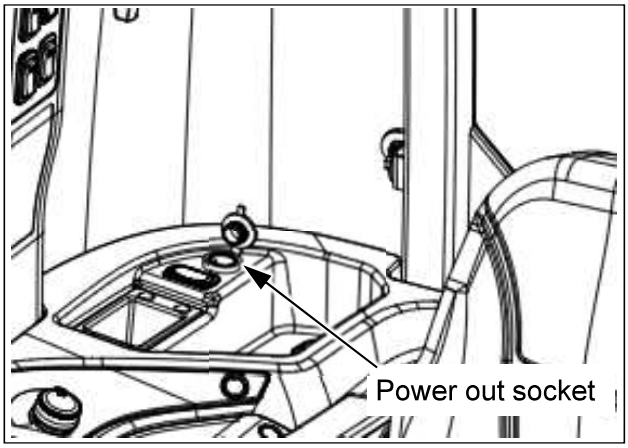




⚠Caution	▶ Use windshield washer liquid for automobile in wintertime. ▶ Do not operate the wiper without windshield washer liquid, it may cause damage to the wiper motor.

(6) Electrical power outlet socket

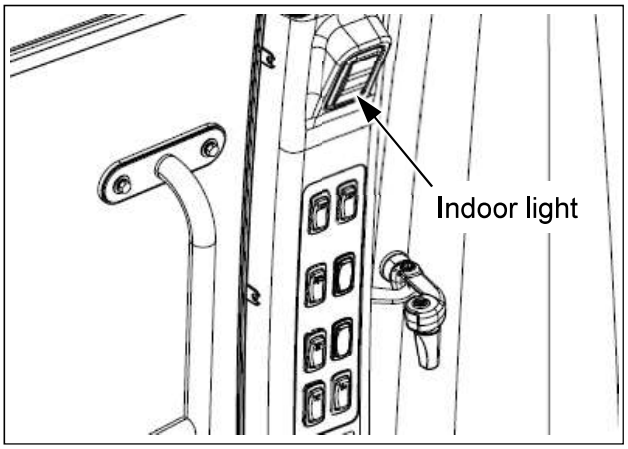
- This is used to withdraw electric power for charging of a cigarette lighter jack or cellular phone.
- In case of using a cigarette lighter jack(optional), push the cigarette lighter jack into the socket to heat the coil. If the heating process is finished, the jack is retracted automatically, and it can be used as a substitute for a lighter.
- In case of using it as a power supply(12V), use a electrical equipment less than 8A of current flow.



Caution	▶ When using the cigarette lighter jack, cares must be taken not to touch the heating coil. The heated coil is very hot and it may cause a serious burn.

(7) Indoor light (Cabin only)

- Press the lower side of the indoor light to turn on the light.
- Press the lower side again to turn off the light.



(8) Audio player (Cabin only) (if fitted)

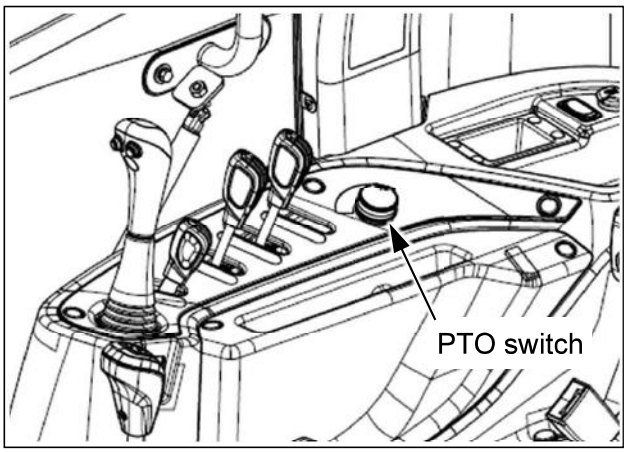
- Refer to the attached user's manual for your audio player.

Caution	▶ To ensure safe operation, avoid turning up the audio player volume so high/loud. ▶ Do not use a headset while driving the tractor.

(9) PTO switch (Independent PTO)

- The engine can be started only when the PTO switch is placed in the OFF position for safety. *For the details of the engine start, see chapter 4-2-(1), "Engine start" in this manual.*
- After starting the engine, you must comply with the following instructions to operate the PTO.

1. Check the safety conditions around the implement.
2. Place the PTO gear lever (if equipped) to the desired position.
3. Push and turn the PTO switch to the ON position to operate the PTO shaft.
4. When the PTO shaft begins to rotate, the PTO operation indicator on the instrument panel will be turned on.
5. If you want to stop the PTO shaft temporarily, push the PTO switch to the OFF position.

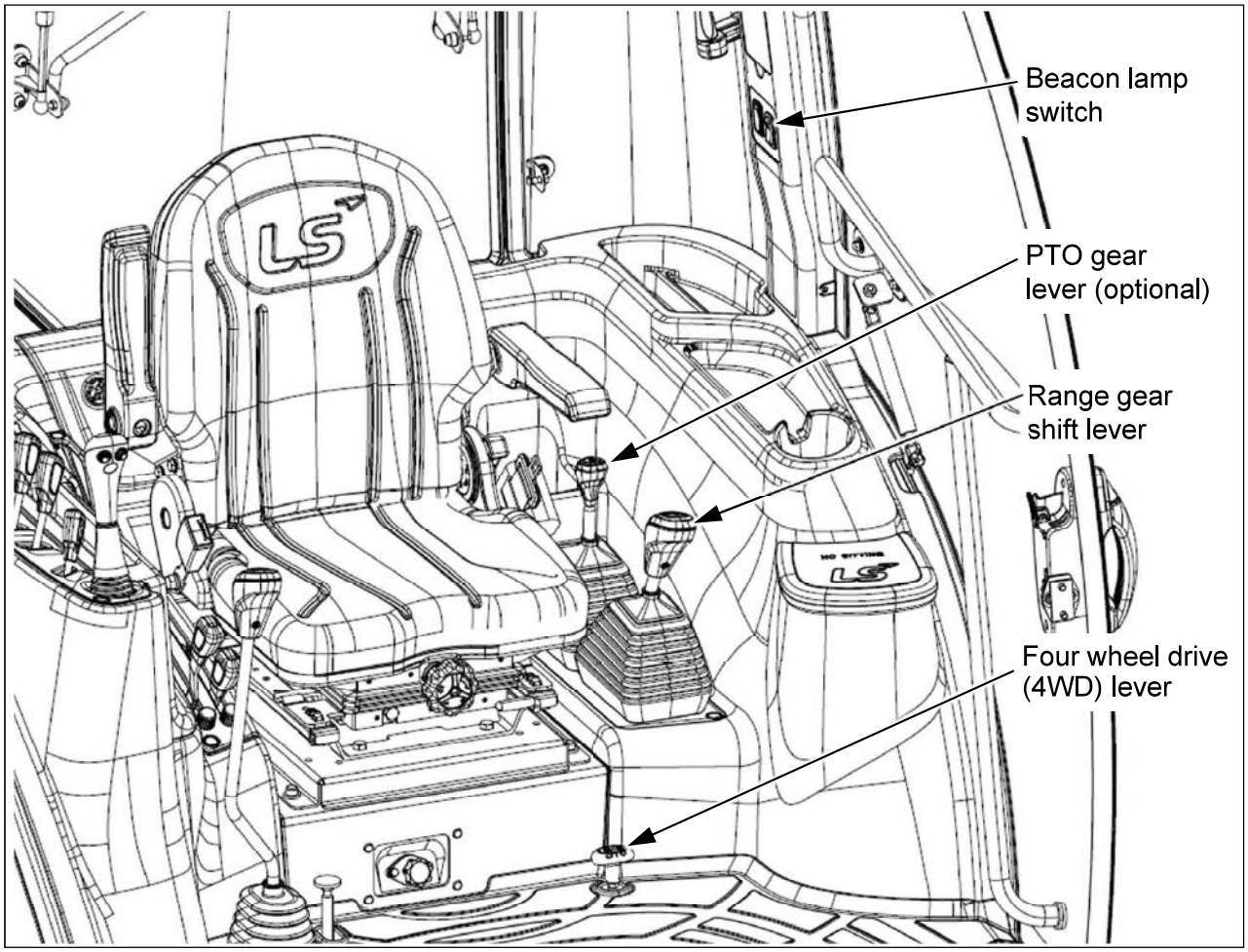


ON : PUSH AND TURN
OFF : PUSH

⚠Warning	▶ Before attaching, detaching or checking the PTO driven equipment, always place the PTO switch in the OFF position and PTO gear lever in the neutral position. ▶ Even if depressing the clutch pedal or lifting up the 3-point linkage to the upper limit, the PTO shaft will not be stopped. Pay attention to the surroundings to prevent an accident. ▶ Do not engage the PTO clutch at high engine speed. Sudden engagement can cause damage to the implement and PTO drive lines. Engage the PTO at low idle rpm, and then raise the engine speed.

3-4. Left-hand controls and Cabin pillar (Cabin models)

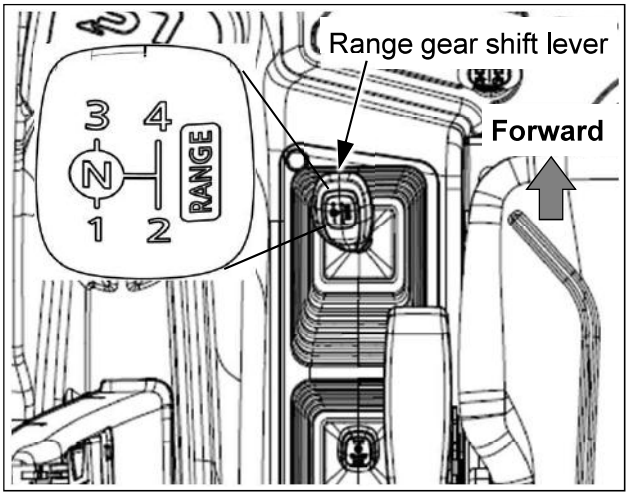
Important to owner, read carefully



***NOTE**: Depending on the optional specifications, some figures may be different from your tractor.*

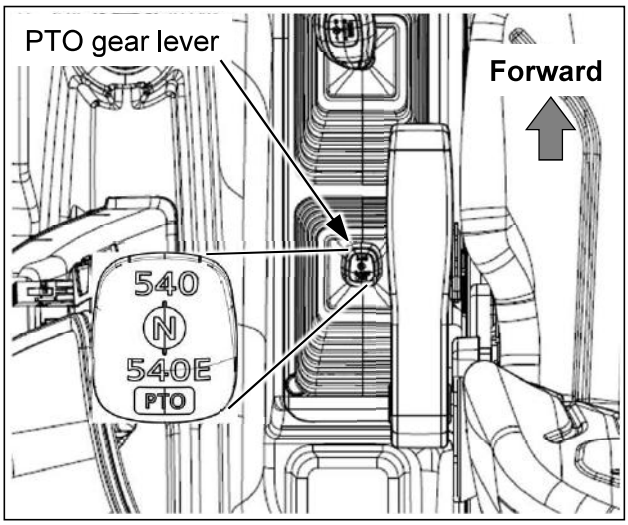
(1) Range gear shift lever

- Four speed gear shift and neutral positions are available.
- Before operating the range gear shift lever, press down the clutch pedal and brake pedals, and stop the tractor completely.



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

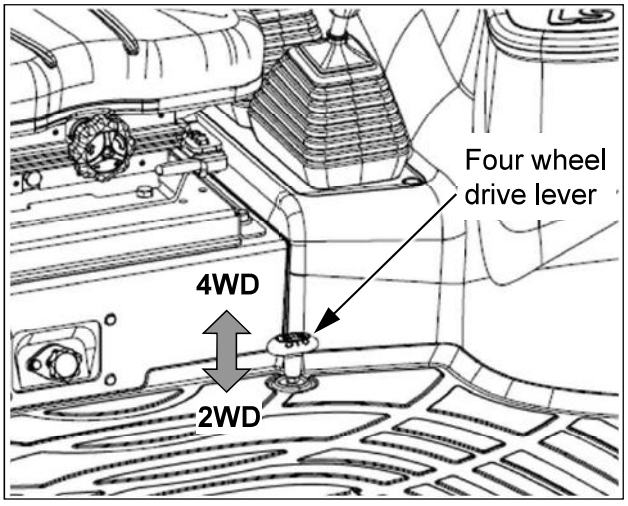
(2) PTO gear lever (optional)



- From the front, 540 / Neutral / 540E PTO positions are available.
- Before operating the lever, depress the clutch pedal and put the PTO switch to the "**OFF**" position, and stop the PTO shaft completely.
- When attaching/detaching the rear implement, place the PTO gear lever to the neutral position.
- If you turn on the PTO switch when this lever is placed in the 540E PTO position, the rear PTO begins to work, but the engine speed is limited to approximately 1789 rev/min for economic PTO operation.
- *For further information about the PTO shaft, see chapter 4-5-(2) in this manual.*

Notice	▶ Operate the PTO gear lever by correct "I" pattern. If operated diagonally, it may cause a failure. ▶ If the PTO gear lever is not engaged smoothly, shift the lever again after lifting up the implement from the ground to align the drive shaft.

(3) Four wheel drive lever (4WD)

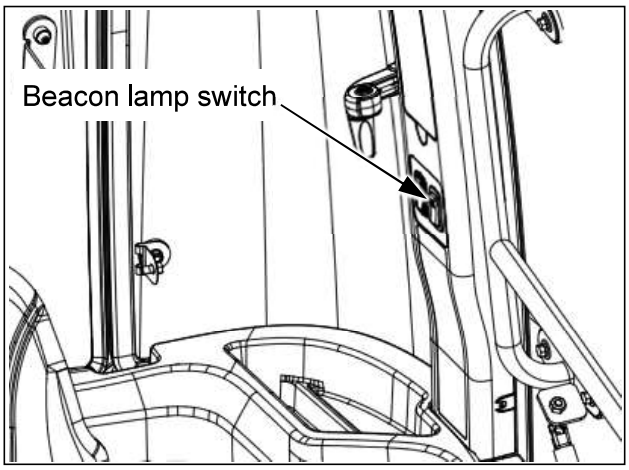


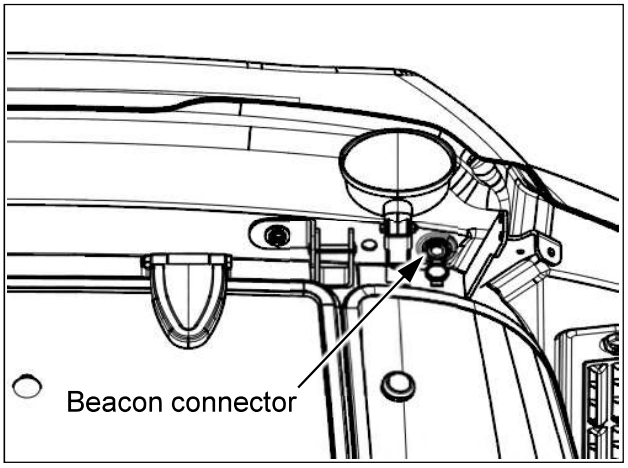
- This lever is used to engage/disengage the four wheel drive (4WD). Pull it upward to engage the 4WD.
- Before operating the 4WD lever, press down the clutch pedal and brake pedals, and stop the tractor completely.
- The four wheel drive(4WD) is very effective for the followings.
  - When increasing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

⚠Caution	▶ When driving on public roads, disengage the 4WD. If not, it may cause damage to the tires and transmission drive lines and a serious accident. After working in the field, disengage the 4WD before coming out from the field. ▶ If you drive the tractor at high speed while the 4WD is engaged, sharp steering may cause a serious accident. ▶ *Only operate four wheel drive lever by hand. If stepping on it , it may cause a failure.*

(4) Beacon lamp switch (optional)

- It is used to turn on/off the beacon lamp connected to the beacon connectors. (if equipped)
- The beacon connectors are installed on the left and right-hand side under the cabin roof.
- **ON** - press the upper side (symbol part) of the switch.
  OFF - press the lower side of the switch.

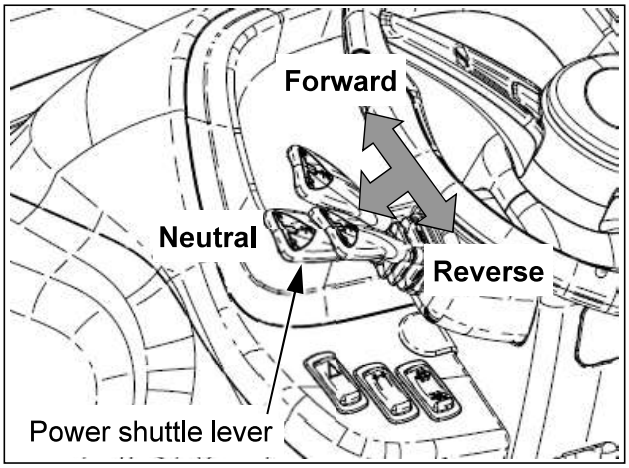


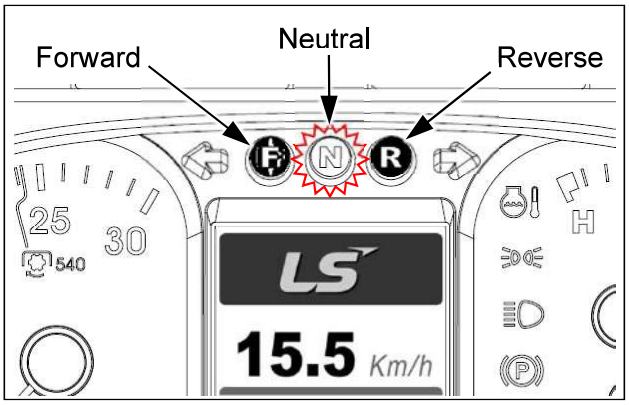


3-5. Power Shuttle Transmission (PST) (optional)

(1) Power shuttle lever (PST)

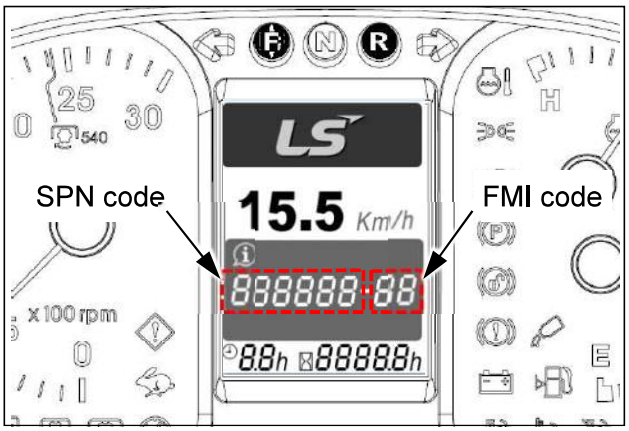
- Your tractor has an advanced electro-hydraulic forward and reverse system which controls the movement (Forward/Reverse/Stop) of the tractor by engaging or disengaging the multi-disk clutches.
- This system will provide you more convenient forward-reverse operation than mechanical synchro-shuttle system.
- To change the forward or reverse, *lift up the power shuttle lever and just push it forward or pull it back* without depressing the clutch pedal.
- Before reversing the tractor, lower the engine speed and check behind you.
- If the transmission oil temperature is low, the neutral (N) indicator light on the instrument panel will flash to remind you that a warm-up is required. The light will automatically turn off when the oil temperature is above the specified temperature.
- If the oil temperature is considerably lower than proper level, a shock due to sudden engagement of the power shuttle clutch may occur. Before operating the power shuttle lever, be sure to warm-up the engine and transmission oil sufficiently in cold weather.
- If shifting the power shuttle lever forward or reverse in the state of vacant driver's seat, the tractor does not move with alarming buzzer. Be sure to SEAT IN THE DRIVER'S SEAT.
- If shifting the power shuttle lever forward or reverse when the parking brake is engaged, the parking brake indicator will blink with alarming buzzer. Before shifting the power shuttle lever, you should RELEASE THE PARKING BRAKE.





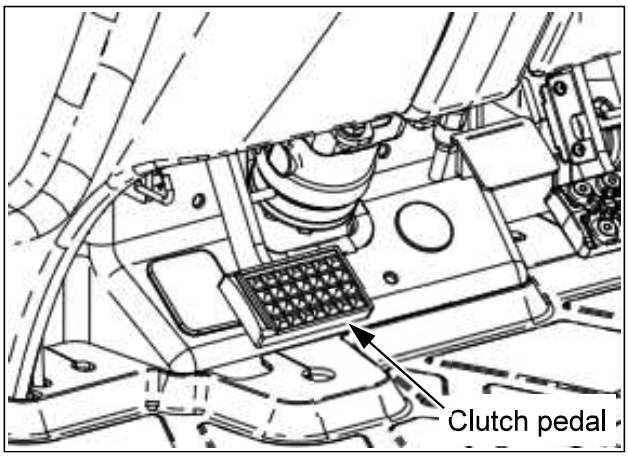
⚠ Warning	▶ *When starting or shifting the power shuttle lever on a slope, always press down the brake pedals first, and release them at the moment when the vehicle starts. The vehicle can be moved forward or slipped backward during the engaging time of the clutch. It may cause roll-over accident. PLEASE BE CAREFUL !*

- If the hydraulic pressure of the power shuttle system goes lower than proper level during operation, corresponding error codes (SPN, FMI code) will be displayed on the instrument panel with continuous alarm. At this time, move the power shuttle lever to the neutral position first. DO NOT try to operate the tractor any more, because the clutch engagement under a lower pressure can cause damage to the clutch disk plates even for a few seconds. Contact your authorized local dealer immediately to get some instructions or to check the problem. Even though the alarm sounds, the tractor can be moved restrictively for escaping from an emergency situation.



⚠ Caution	► In case of shifting other transmission gear levers except this power shuttle lever, depress the clutch pedal fully to disengage the power shuttle clutch. Otherwise, it may cause damage to the transmission drive lines. ► To start the engine, you should place the power shuttle lever in the neutral position and place the PTO switch in the OFF position, and then depress the clutch pedal fully. ► Before operating the power shuttle lever, you should sit correctly in the driver's seat. ► Before changing direction of the tractor by using the power shuttle lever, be sure to check the safety conditions of your directions, especially in reverse. ► It is dangerous to shift the power shuttle lever at high speeds. Before changing your direction, it is necessary to reduce the driving speed. Otherwise, it may cause damage to the power shuttle clutch and transmission drive lines and a serious accident. ► Proper transmission oil temperature is necessary to the performance of the power shuttle system. Be sure to warm-up the tractor until the neutral indicator stops blinking and do not operate the tractor hastily, especially in cold weather. ► Park the tractor on a level ground and apply the parking brake. If you need to park the tractor on a slope, apply the parking brake, and apply the wheel chocks to all the wheels. The engine brake by engaging low speed gears is NOT available for this power shuttle system.

(2) Clutch pedal (PST)

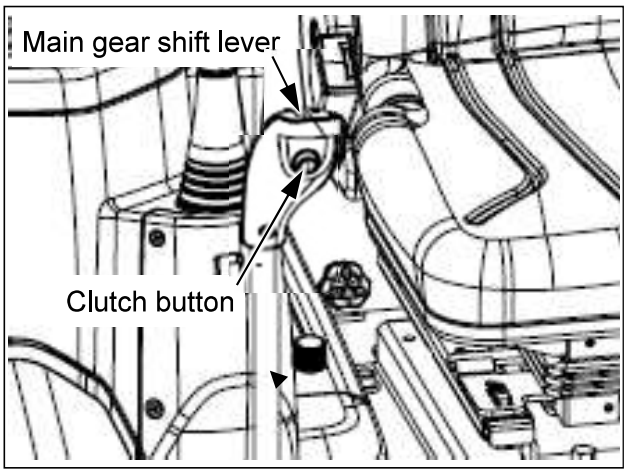


- This pedal is used to engage or disengage the engine power for engine start, transmission gear shift and stopping tractor.
- Depress the clutch pedal quickly and fully, and release it slowly.
- If the PTO mode switch (optional) is not installed, the PTO shaft cannot be stopped when depressing the clutch pedal. Use the PTO switch to stop the PTO.
- If the clutch pedal sensor has trouble or an error, the engagement or disengagement of the clutch is NOT smoothly operated and it's corresponding error code is displayed on the instrument panel with an intermittent alarming beep. In this case, the tractor can be moved by using the power shuttle lever. After moving the tractor to the safe area, contact your authorized dealer for check.
- To protect the radical wear of the clutch, if the engagement time is lasted over 6 seconds, an alarming buzzer will sound off, and if lasted over 8 seconds, the clutch will be disengaged completely. In this case, operate the power shuttle lever again from the neutral position or depress the clutch pedal fully one time to recover the power shuttle system.
- When driving the tractor on a slope, especially with heavy loaded implements, select a suitable driving speed to start the tractor. Long-lasted clutch engagement at a high transmission gear ratio and high engine speed can cause serious damage to the clutch pack.

⚠Caution	► Depress the clutch pedal quickly and fully, and release it slowly. ► When starting the engine, depress the clutch pedal fully. Otherwise, the engine may not start due to interlocking system for user's safety. ► Do not ride your foot on the clutch pedal while driving. ► If the engagement time is lasted over 8 seconds on a slope, the engine power will be cut off by the safety interlock system. It means that tractor can slip down and your special care must be taken. At this time, press the brake pedals immediately and recover the power shuttle system by depressing the clutch pedal fully or re-operating the shuttle lever from the neutral position.

(3) Clutch button (PST)

- It is used to engage/disengage the main clutch before shifting the main gear shift lever instead of the clutch pedal.
- If pressing/releasing the clutch button, the engine power will be disengaged/engaged.
- When pressing this button, the neutral indicator on the instrument panel will blink.



⚠Caution	▶ Be careful that this clutch button is NOT pressed by unintended operation. ▶ Use this button only for shifting the main gear shift lever while driving. If using this button when starting, the engagement shock can be increased considerably.

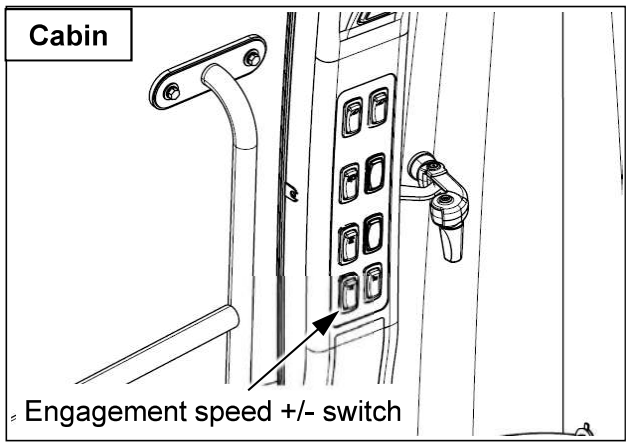
(4) Engagement speed +/- switch (Shifting time level switch)(PST)

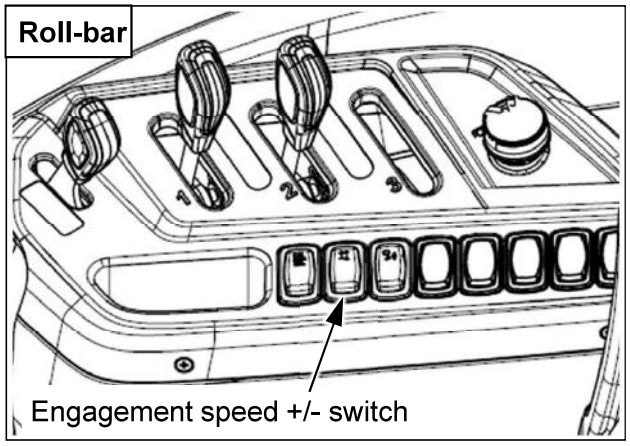
- It is used to adjust the engaging speed of the power shuttle clutch when operating the clutch pedal or power shuttle lever.
- **Engaging speed adjustment of the clutch pedal;**

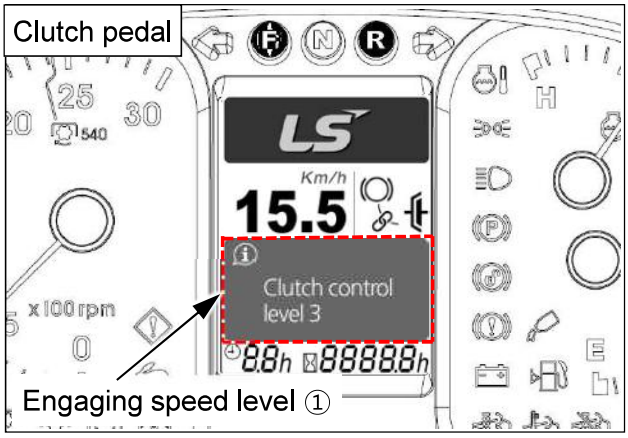
1. Press the upper side (symbol part) of the engagement speed +/- switch ***while depressing clutch pedal fully.***
2. The engaging speed level① will be displayed on the instrument panel from level 1 to level 3 for 10 seconds. The higher the number is, the faster the engaging speed is.
3. If pressing the upper side (symbol part) of this switch within 5 seconds, the engaging speed level is increased. If pressing the lower side of the switch, the speed level is decreased.
4. The changed level is saved after blinking 3 times.

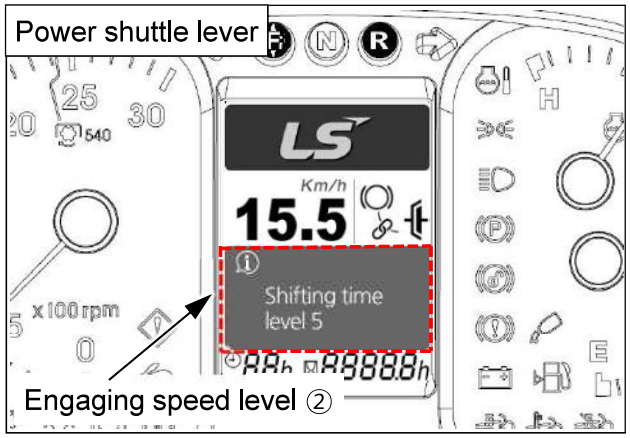
- **Engaging speed adjustment of the power shuttle lever;**

1. Comply with the same process of the clutch pedal engaging speed adjustment ***without depressing clutch pedal.***
2. The engaging speed level② will be displayed from level 1 to level 5 for 10 seconds.







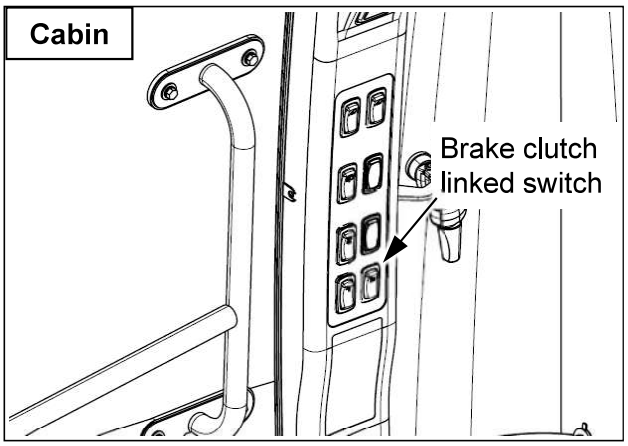


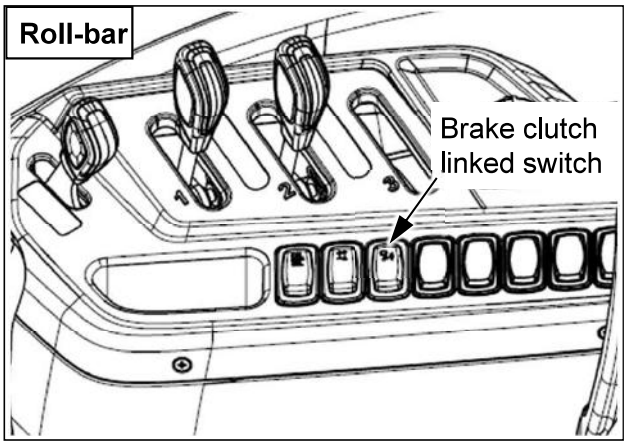
⚠Caution	▶If pressing this switch over 10 seconds, it will be a useless thing and it may cause malfunction. Be careful that this switch is not pressed by unintended operation.

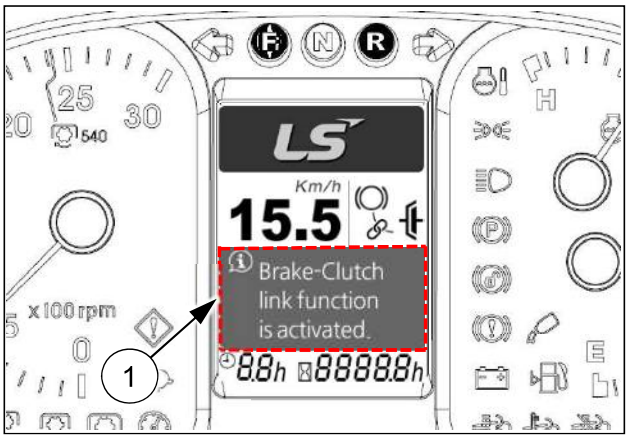
(5) Brake Clutch linked switch (EZ Brake system switch) (PST)

- The Brake Clutch linked system makes it possible to stop and start the vehicle with only the brake pedals without using the clutch pedal. When you press down the brake pedals, the system will disengage the main clutch automatically and the tractor can be stopped.
- **To activate the brake-clutch linked system, comply with the following instructions.;**

1. Engage the left/right brake pedals with the brake pedal latch.
2. Shift the range gear lever to the 1st , 2nd , 3rd or 4th range gears.
3. To activate the brake-clutch linked system, press the upper part of the switch. If the system is activated, a guidance message **(1)** will appear in the LCD display as shown in the right figure.
4. To exit (To deactivate) the system, press the lower part of the switch.





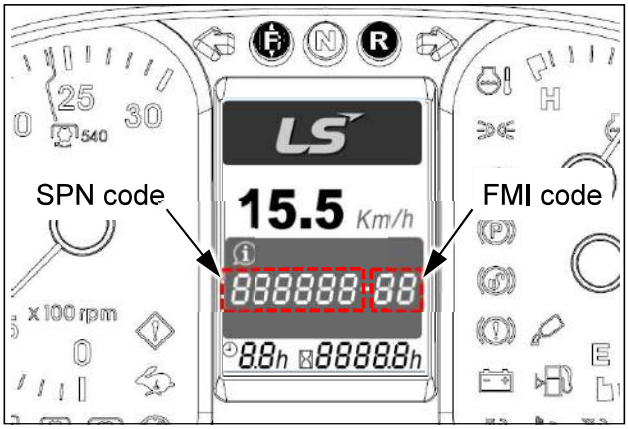


⚠ Caution	▶ If you operate this switch on a slope, a warning sound will sound and a message notifying you of disabling the function will be displayed on the instrument panel. The EZ brake function should only be activated when working on flat surface.

⚠ Caution	▶ If the brake clutch linked system is deactivated when the tractor has been stopped by the brake clutch linked system, first of all, place the power shuttle lever in the neutral position to restore the tractor operating system.

(6) Diagnostic Trouble Code (DTC) (PST)

- If a failure occurs in the sensor or control valve related to the power shuttle system, the related error code (SPN code and FMI code) will be displayed on the instrument LCD panel as shown in the right figure.
  SPN : Suspect Parameter Number
  FMI : Failure Mode Identifier
- In case of several errors, the error codes will be displayed by turns every second. In this case, record all the error codes.
- If any error code is displayed, contact your authorized local dealer for check and repair.



3-6. Hydraulic system

(1) Safety precautions

- Hydraulic oil leaks under high pressure can penetrate skin and cause infection or other injury. To prevent personal injury, comply with the instructions 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. *Wait for all components to cool before you perform any maintenance or adjustment operation. Do not handle any service fluid (engine coolant, engine oil, hydraulic oil, etc.) at temperatures that exceed 50 °C (122 °F). Allow fluids to cool.*
- 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. *You must periodically inspect the hydraulic hoses. See the Maintenance chapter for general inspection precautions. The hoses do not require any operator-performed maintenance. Always see your authorized local dealer for hydraulic hose repair or replacement.* 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 equipment, before servicing the hydraulic system. ▶ Before connecting or disconnecting the hydraulic quick couplers, lower the implements to the ground, and check if the hydraulic pressure is relieved.

(2) Steering system

- The hydraulic steering system controlled by fluid power provides you more convenience to operate the steering wheel.
- Notices when using the steering system.

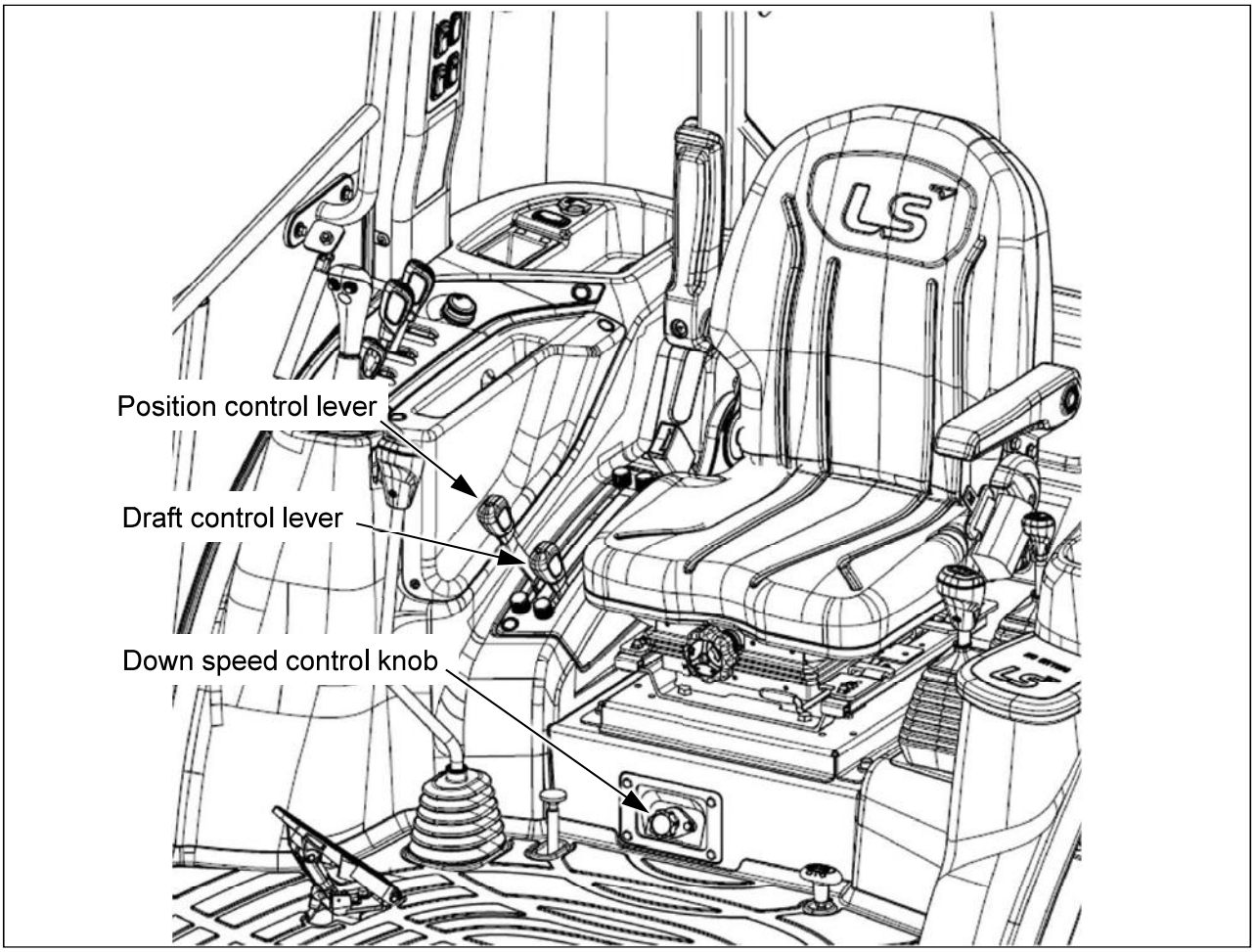
1. If there is too much of a load in front-end loader bucket, it could be difficult to operate the steering wheel. In this case, it is necessary to reduce the size of the load.
2. Do not operate the tractor unnecessarily in a state of fully steered front wheels for a long time. As unnecessary hydraulic force is applied to the steering linkage, it may cause damage to the steering system and excessive increase of the hydraulic oil temperature which may cause reduction of the product life or a failure of the hydraulic and steering system. Especially, DO NOT operate the steering wheel excessively when a front wheel is mired in a ditch. The rim and disk of the wheel could be damaged or deformed.
3. If an abnormal noise sounds off when operating the steering wheel, this may mean that there is some air in the steering components or lines. In this case, turn the steering wheel to the left and right direction fully about 2~3 times. It will exhaust the air and the abnormal noise will disappear. If it's not cleared, contact your authorized local dealer for check.
4. When starting the engine in cold weather, an abnormal noise may occur. In this case, warm up the tractor before using in order to reduce the oil viscosity.

Notice	▶ When the engine is stopped, the steering wheel becomes hard to turn. But this does not mean a failure. It can be only used in an emergency situation. ▶ When releasing the steering wheel after steering operation while driving, the steering wheel does not return to neutral position automatically.

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

- The hydraulic lift system for controlling the rear three-point linkage is operated by the position control lever and/or draft control lever.
- To lower the 3-point linkage, first make sure the down speed control knob is open, and then move the position control lever forward. To raise the 3-point linkage, move the position control lever rearward.
- An adjustable lower stopper is installed for returning the lever to a preset lowering position of the 3-point linkage. An adjustable upper stopper prevents the control lever from exceeding the lift limit and causing the tractor hydraulic system to go over the relief valve setting. (If equipped)
- The hydraulic lift system provides accurate, smooth, and instant hydraulic power for raising a variety of compatible equipment whenever the engine is running. The position control mode maintains the selected height or depth of three-point linkage equipment in relation to the tractor. When the operator moves the position control lever to a higher or lower position, the system repositions the equipment to a higher or lower position and maintains the selected position.

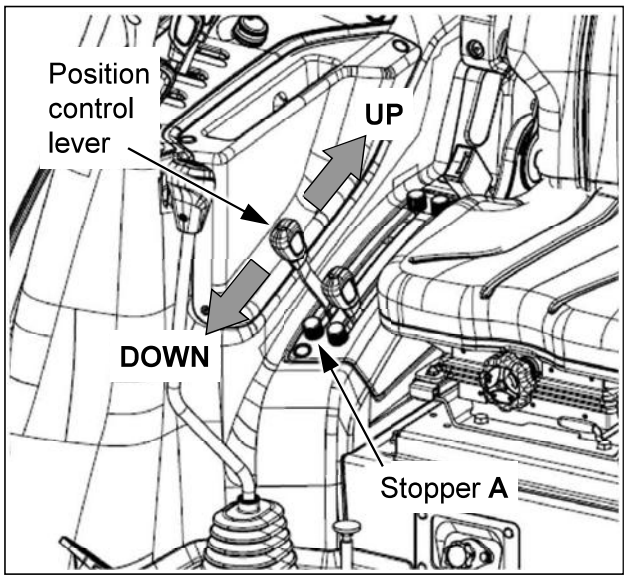
⚠ Danger	**Crushing hazard!** ▶ Make sure area is clear of all persons before lowering equipment. Failure to comply will result in death or serious injury.



① Position control

- Position control provides easy, accurate control of the three-point linkage equipment, which is operated above the ground, such as tiller, sprayers, rakes, mowers etc. It also provides uniform depth when using a blade or similar equipment on ground level.
- When operating in position control, there is a definite relationship between the position of the control lever and the position of the equipment.

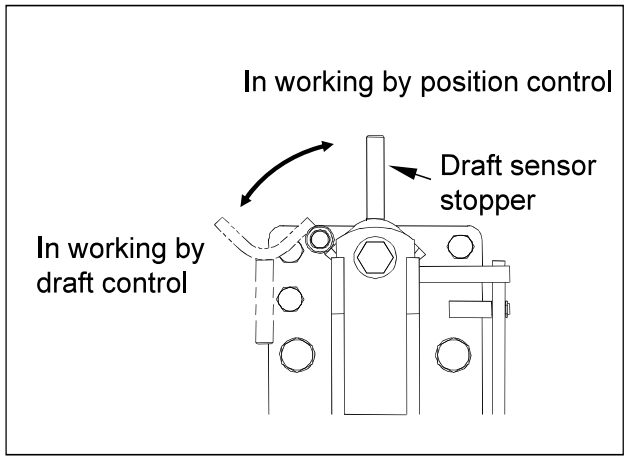
1. Move the position control lever to change the position of the equipment relative to the tractor.
2. The system will automatically maintain the equipment in the selected position.
3. You can limit the range of the position control lever operation by moving and tightening the stopper A.

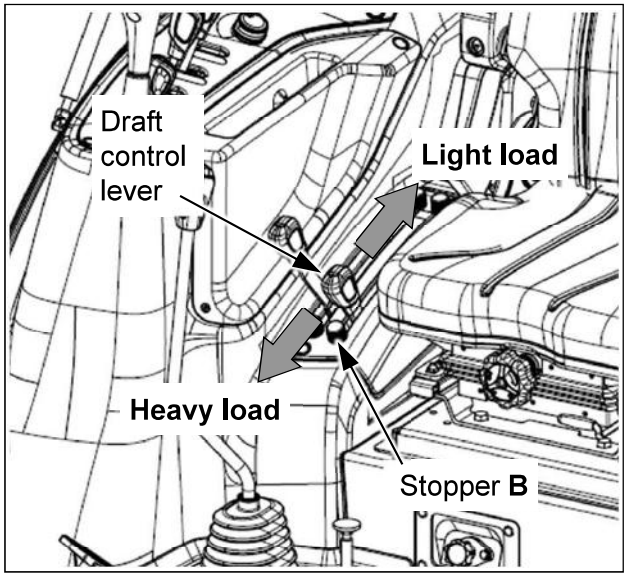


② Draft control

- The draft control lever sets the desired depth of the attached implement. Draft control is best when using implements that operate in the ground, such as plows, harrows, or cultivators. The amount of draft loading on the implement will increase or decrease as the working depth or the soil resistance changes.

1. To set the draft control, move the position control lever to its full forward position.
2. Then set the implement draft depth lower by moving draft control lever forward, or set it higher by moving lever rearward.
3. Implement depth will be determined, depending on the soil conditions. The hydraulic lift system keeps the tractive effort steady automatically in draft control.
4. You can limit the range of the draft control lever operation by moving and tightening the stopper B.
5. If you want to lift the rear implement, use the position control lever instead of the draft control lever.





③ Mixed control

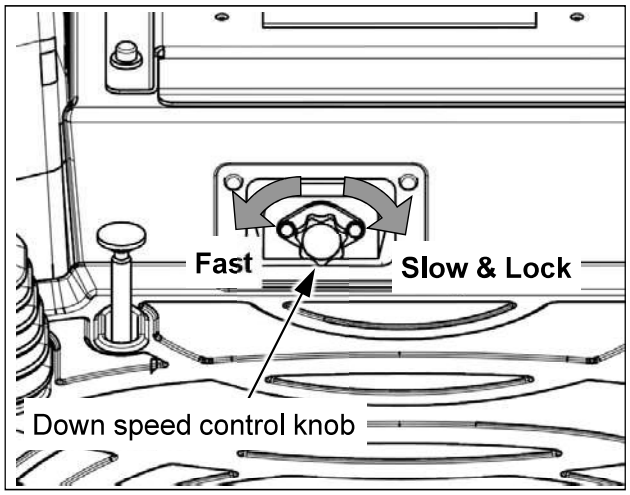
- You can use draft and position control together to operate in draft control but prevent the implement from sinking excessively when soil conditions change. First, set the draft control lever with the position control lever fully forward. Then move the position control lever back until the 3-point linkage start to rise. The position control lever sets the lowered position of the hydraulic lift system.

④ Float operation

- Move the draft control lever and position control lever fully forward. The three-point linkage will now be free to “float” or follow the ground contour. This mode is useful for scraper blades, etc.

⑤ Down speed control knob (MHL)

- It is used to adjust the down speed of the rear 3-point linkage. Turn the down speed control knob clockwise to decrease the down speed of the implement and turn the knob counter-clockwise to increase the down speed.
- If turning the knob clockwise fully, the implement will be fixed and even if lowering down the position control lever, the implement does not let down.
  - Tiller work: Slow in down speed.
  - Plough work: Fast in down speed.
- When working in hard ground, slow down the down speed to avoid bounding of the implement.

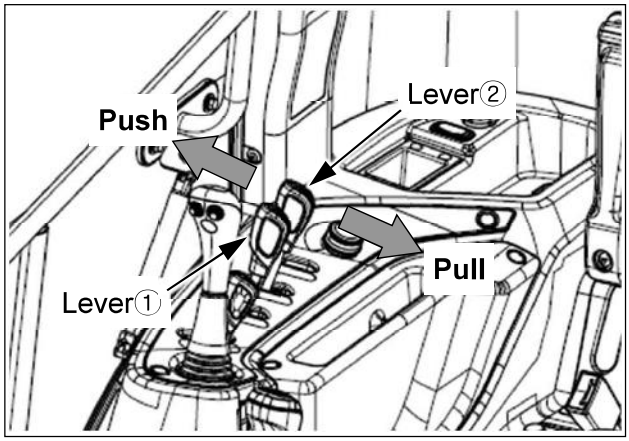


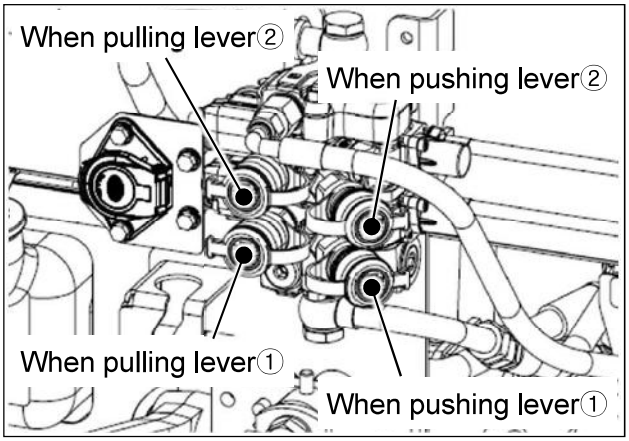
⚠Warning	▶When driving on the road, replacing tiller blades or removing grass around the tiller blades, turn the down-speed control knob clockwise slightly to lock. ▶The knob rotates about two revolutions. Do not over-tighten the knob. It may cause damage to the control valve and connection parts.

(4) Remote control lever and Quick coupler (optional)

① Cabin type

- These remote control levers are used to operate the hydraulic cylinder and/or motor of the implement attached to your tractor.
- If you **push** the remote control lever(s) **forward**, the hydraulic pressure works **to the right-hand coupler** of the related lever, and **the left-hand coupler** is connected **to the drain line.**
- Each lever of this parallel circuit remote control valve can be operated independently. But, when operating these levers at the same time, the quick coupler under less pressure may begin to work first.
- After connecting and preliminary operating the hydraulic equipment, check again the transmission oil level of the tractor.
- Depending on the type of remote control valve, a spring-return type, detent type or a combination of these types will be installed on your tractor. (optional)
  - Spring-return type: When releasing the lever after pushing/pulling fully, the lever returns to the neutral position automatically.
  - Detent type: When releasing the lever after pushing/pulling fully, the lever is fixed on that position. In this case, you must move the lever to the neutral position manually after using it. *If leaving this lever on, it may cause an over-heat and serious damage to the hydraulic system.*



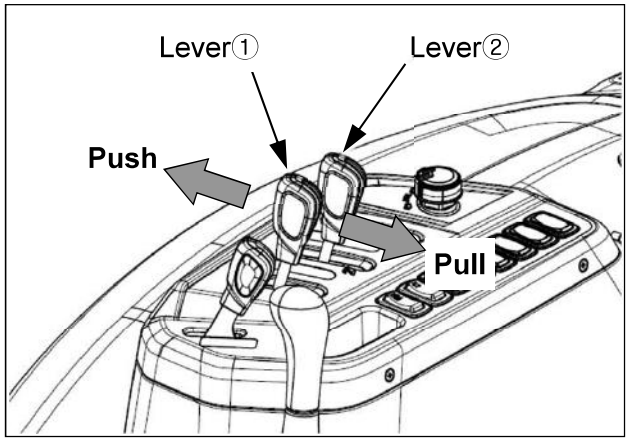


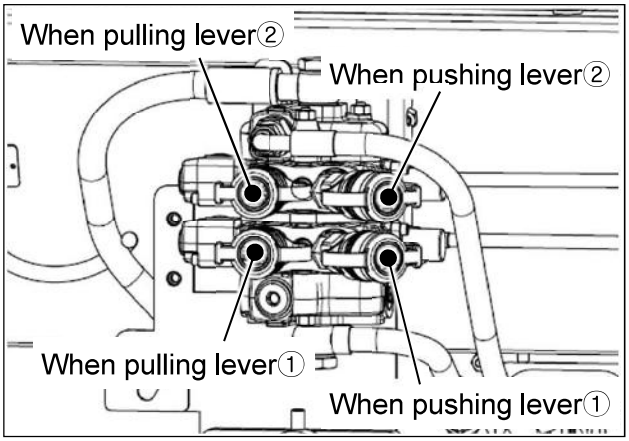
Warning	▶ Before removing the hydraulic pipes, hoses or other parts, make sure to check that the hydraulic pressure in the hydraulic lines is relieved completely. The leaks of pressurized oil can cause a fatal physical injury. ▶ Use proper personal protection equipment before servicing the hydraulic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

Caution	▶ When connecting a high volumetric capacity cylinder to the remote control system, lower the implement to the ground, and check if the transmission oil level is marked between “Min” and “Max” scale on the oil gauge. If necessary, add new oil.

② Roll-bar type

- These remote control levers are used to operate the hydraulic cylinder and/or motor of the implement attached to your tractor.
- If you **push** the remote control lever(s) **forward**, the hydraulic pressure works **to the right-hand coupler** of the related lever, and **the left-hand coupler** is connected **to the drain line.**
- Each lever of this parallel circuit remote control valve can be operated independently. But, when operating these levers at the same time, the quick coupler under less pressure may begin to work first.
- After connecting and preliminary operating the hydraulic equipment, check again the transmission oil level of the tractor.
- Depending on the type of remote control valve, a spring-return type, detent type or a combination of these types will be installed on your tractor. (optional)
  - Spring-return type: When releasing the lever after pushing/pulling fully, the lever returns to the neutral position automatically.
  - Detent type: When releasing the lever after pushing/pulling fully, the lever is fixed on that position. In this case, you must move the lever to the neutral position manually after using it. *If leaving this lever on, it may cause an over-heat and serious damage to the hydraulic system.*



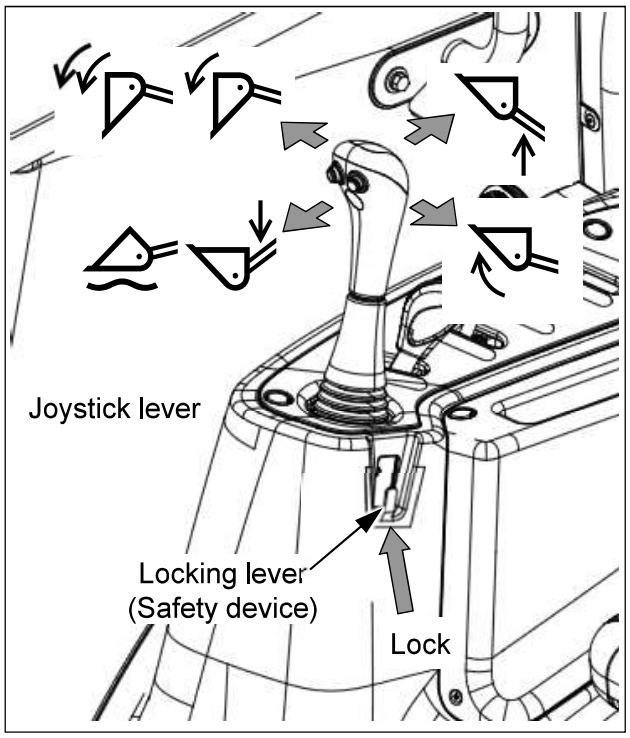


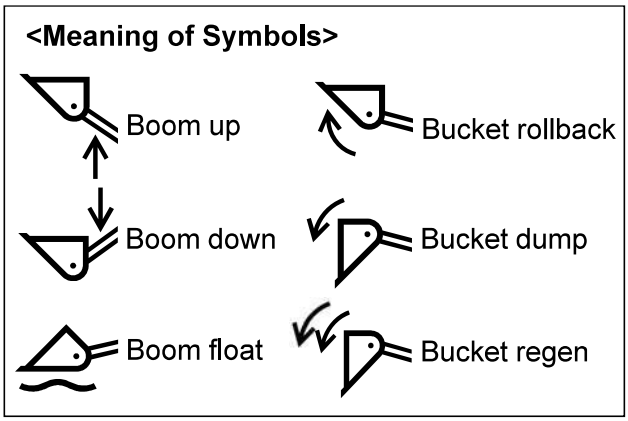
Warning 	▶ Before removing the hydraulic pipes, hoses or other parts, make sure to check that the hydraulic pressure in the hydraulic lines is relieved completely. The leaks of pressurized oil can cause a fatal physical injury. ▶ Use proper personal protection equipment before servicing the hydraulic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

Caution	▶ When connecting a high volumetric capacity cylinder to the remote control system, lower the implement to the ground, and check if the transmission oil level is marked between “Min” and “Max” scale on the oil gauge. If necessary, add new oil.

(5) Joystick lever (optional)

- The multi-functional joystick lever helps you operate the front-end loader comfortably.
- The joystick lever can be operated basically in four directions as shown in the right figure.
- If you move the joystick lever diagonally, the boom and bucket cylinders will be operated at the same time. In this case, the cylinder with a relatively light load may be moved first.
- If you want to float the bucket along the ground, lower the front-end loader and push forward the joystick lever to the float position. After finishing work, pull the lever and place it in the neutral position.
- The switches (optional) in front of the joystick lever are used to operate the 3-rd function solenoid type loader valve additionally installed by user and they are used to operate the auxiliary cylinder or motor additionally attached to the loader or bucket. For the details, please contact your authorized local dealer.
- The locking lever shown in the right figure is used to lock the joystick lever when you are not using the joystick lever.
  - Pull away from the joystick: Unlock
  - Push towards the joystick : Lock
- *For further information, see chapter 4-5-(7) "Using Front-end loader" in this manual.*

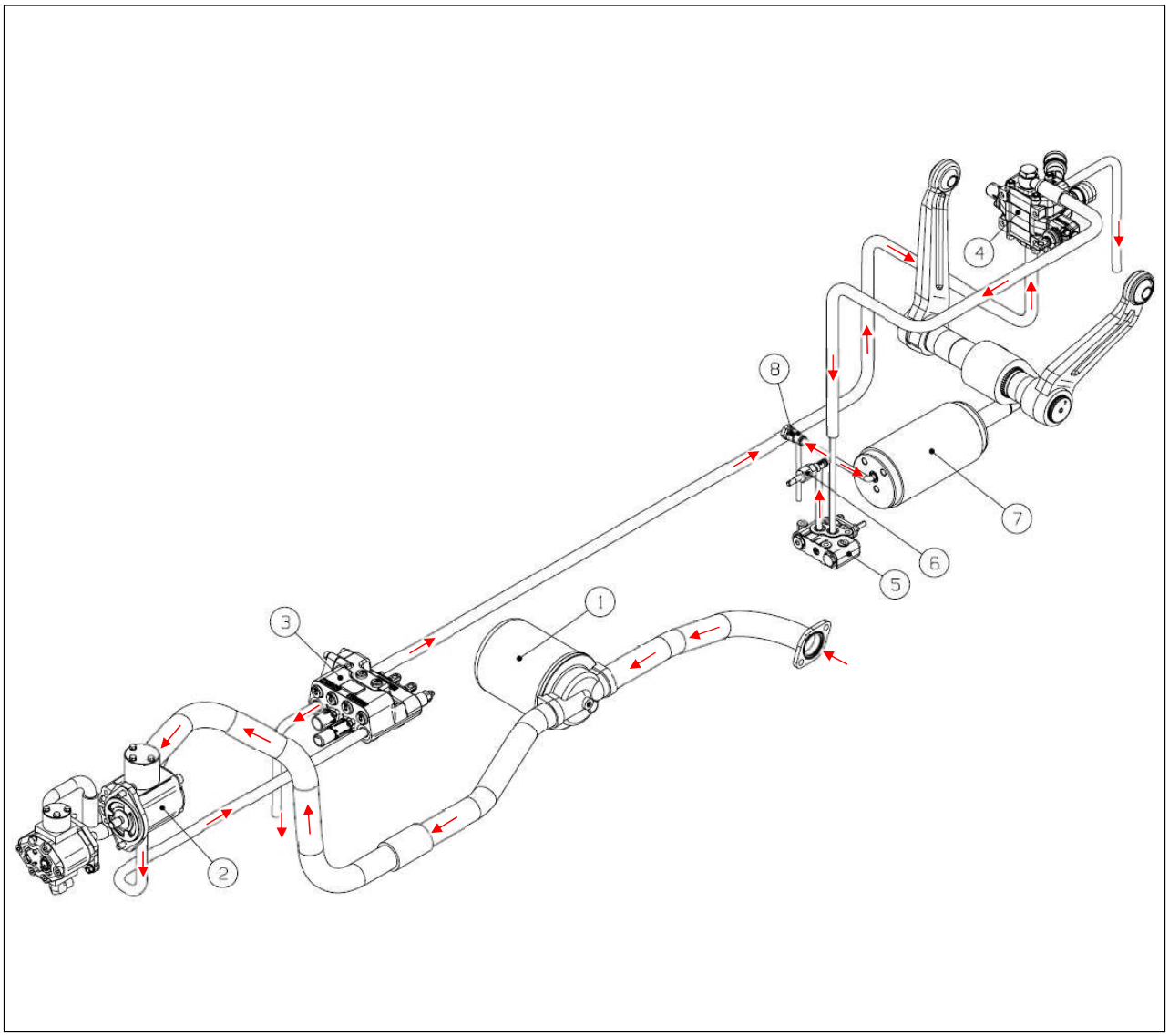




Warning	▶ To prevent an accident, secure the joystick lever with the locking lever when the joystick lever is not in use.

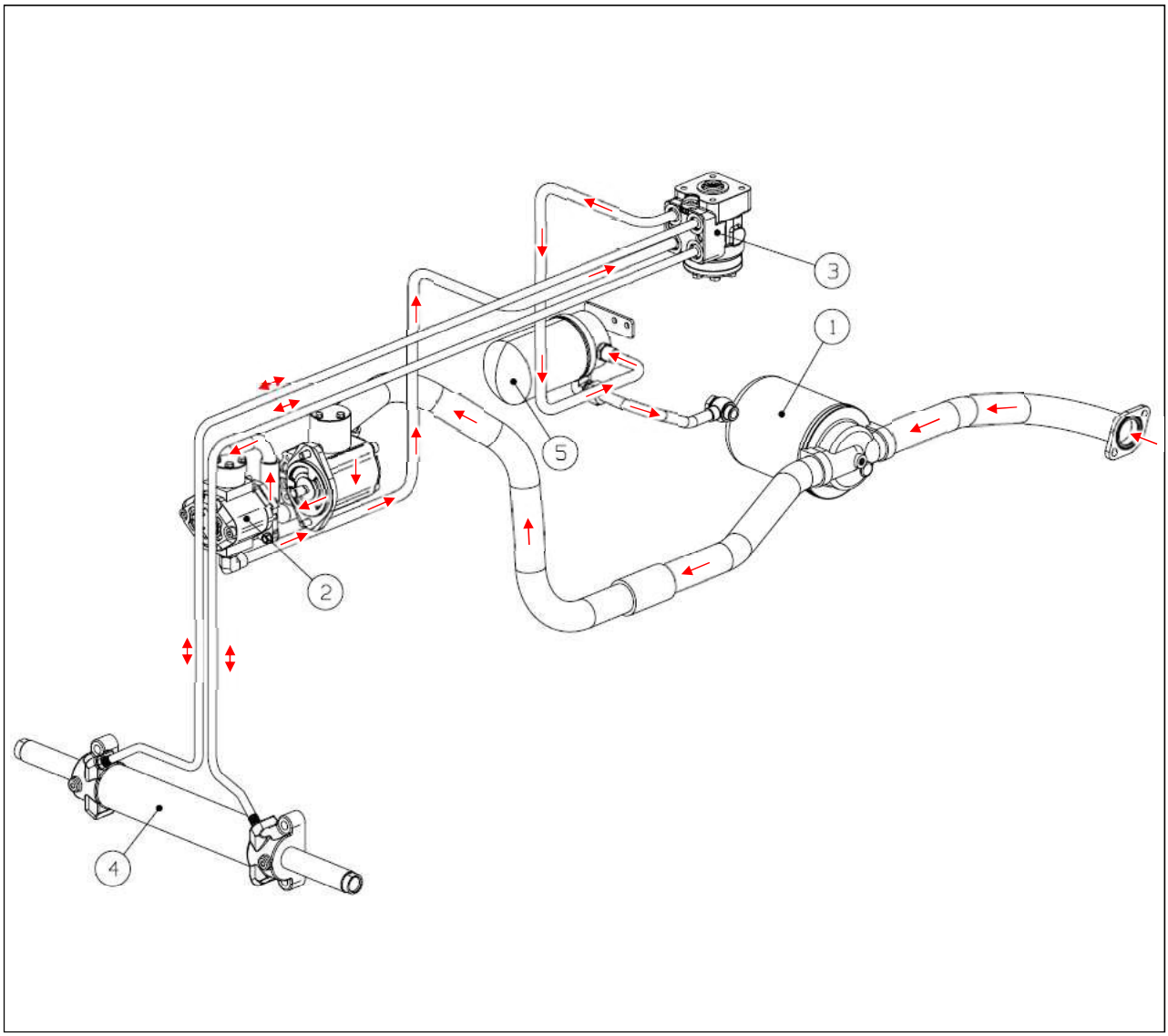
(6) Hydraulic System Diagram

① Mechanical Hydraulic Lift (MHL)



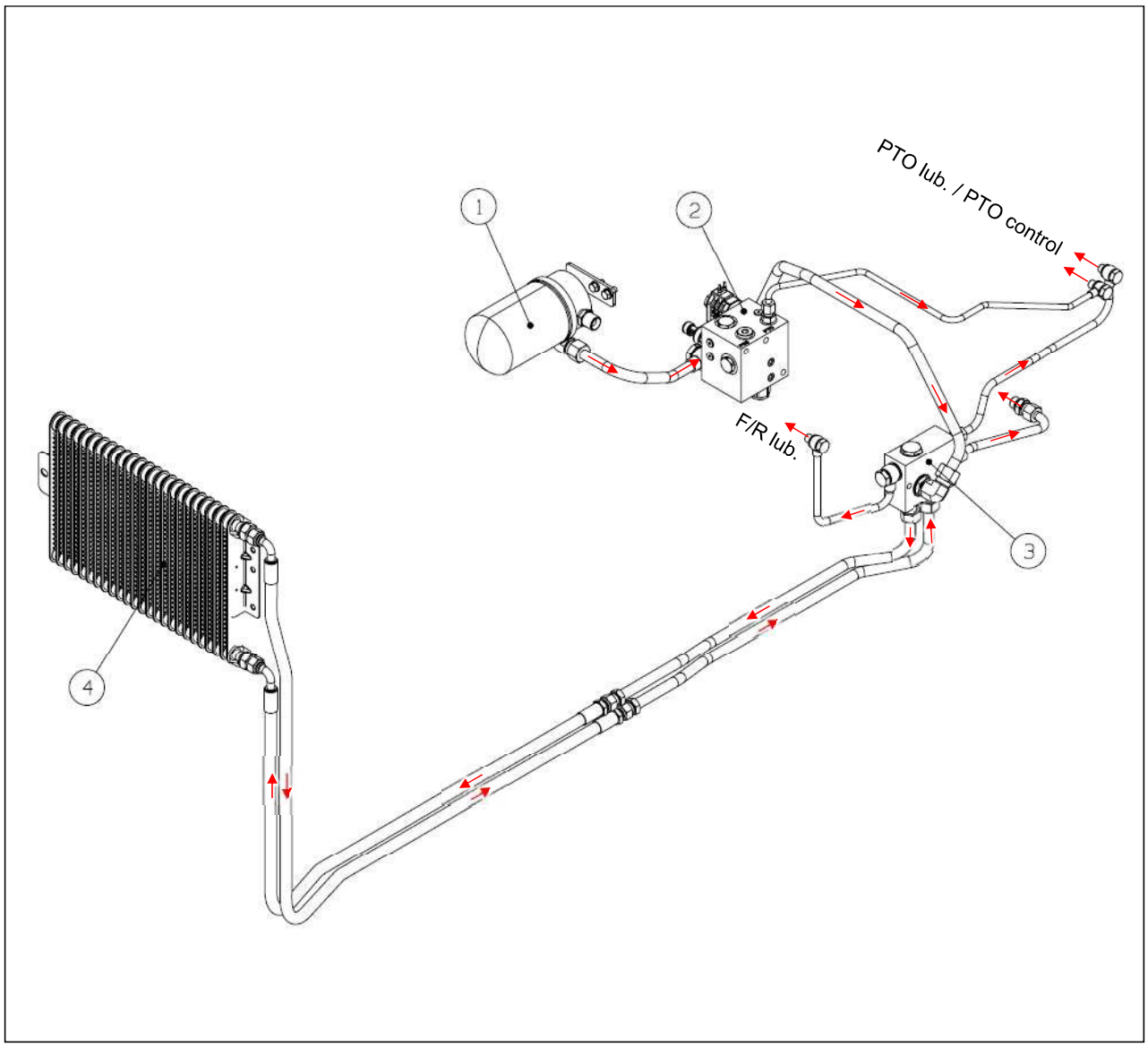
1. Hydraulic oil filter
2. Hydraulic lift pump
3. Front loader valve
4. Remote control valve (optional)
5. Hydraulic lift control valve (MHL)
6. Down speed control valve (MHL)
7. Hydraulic lift cylinder
8. Safety valve

② Steering system hydraulic line



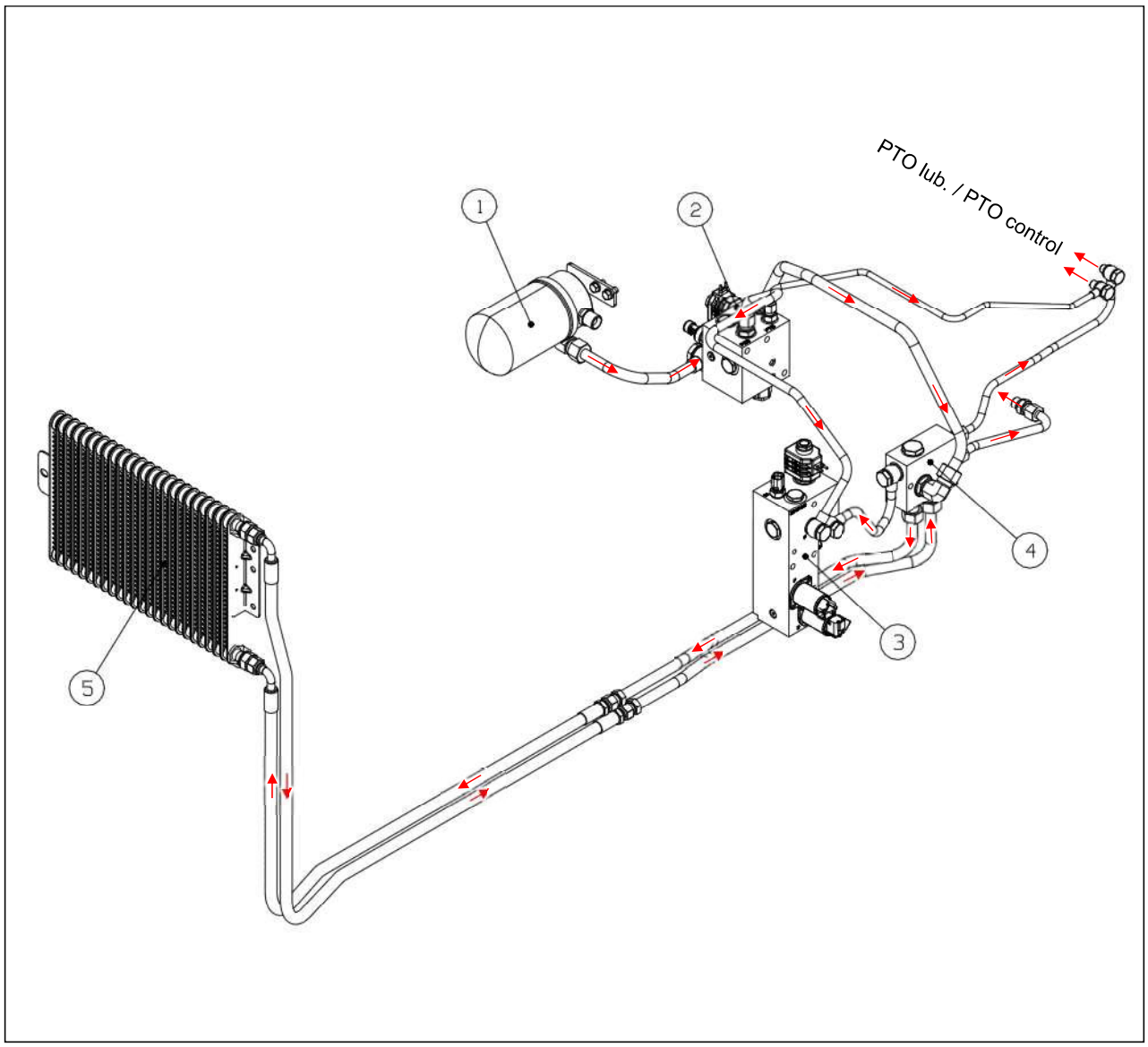
1. Hydraulic oil filter
2. Steering pump
3. Steering unit
4. Steering cylinder
5. TM control oil filter

③ Synchro-shuttle transmission hydraulic line (MEC)



1. TM control oil filter
2. Sequence valve
3. Oil cooler valve
4. Oil cooler

④ Power shuttle transmission hydraulic line (PST, optional)



1. TM control oil filter
2. Sequence valve
3. Power shuttle valve
4. Oil cooler valve
5. Oil cooler

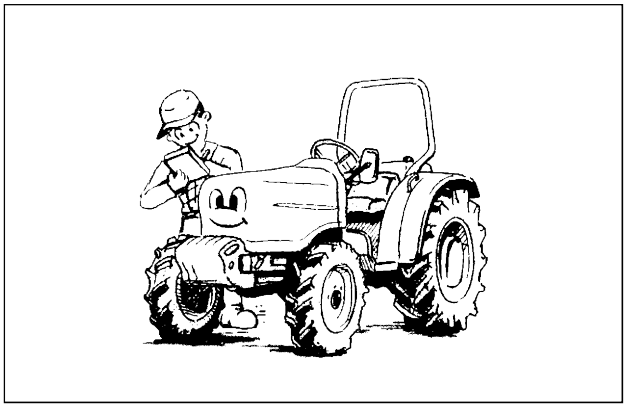
4. Operation and Work

4-1. How to handle new tractor

(1) Check points

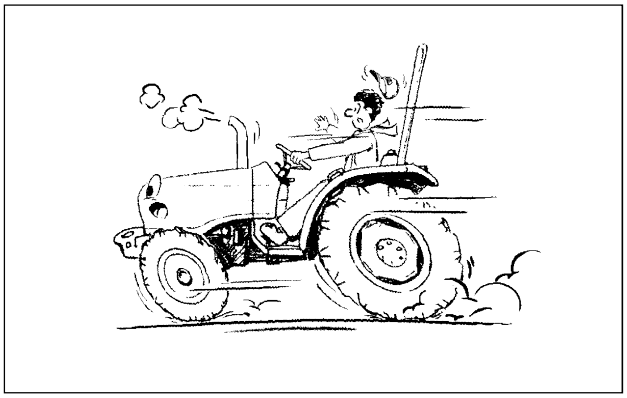
※ For new tractor, the followings must be checked once again even though there was sufficient quality management, inspection, regulating of each part in the factory.

- Appearance check
  - Is there any damage while transporting?
- Engine cooling system check
  - Is there anti-freeze solution in the radiator? And any leakage?
- Fuel system check
  - Is there any leakage of fuel in the fuel system?
- Oil level check
  - Is there optimal oil amount in each part ?
- Electric system check
  - Is there any cut-off or any other problem in the wiring?
  - Is there any problem to operate the instruments?
  - Is the state of battery charging sufficient?



(2) Notices in handling new tractor (Engine brake-in procedure)

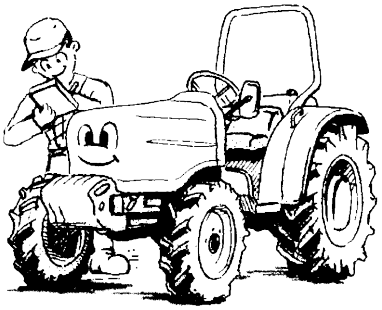
- To get the best performance, comply with the followings.
  - DO NOT start or stop the tractor suddenly.
  - DO NOT operate heavy loaded work and do not increase the engine rpm to high speed suddenly.
  - Despite warm ambient temperature, warm up the engine for about 5 minutes at low idle rpm.
  - Use the lower gear ratios when pulling heavy loads and avoid continuous operation at constant engine speeds. You will save fuel and minimize engine wear by selecting the correct gear ratio for a particular operation.



  - Avoid prolonged operation at either high or low engine speeds without a load on the engine.
  - Check the instruments frequently and keep the radiator and oil reservoirs filled to recommended levels. Daily checks include the engine oil level, radiator coolant, and air cleaner.
  - After using the first 50 hours, be sure to perform the maintenance items listed in the maintenance schedule. *Refer to the chapter 5-4, "First 50 hour check" in this manual.* If possible, contact your authorized local dealer for "First 50 hour check".

4-2. Engine Start and Stop

Caution	▶ Check each part before starting the engine. ▶ Check if there are any other people around before starting. ▶ Place all the transmission gear levers and switches in the NEUTRAL or “OFF” position.

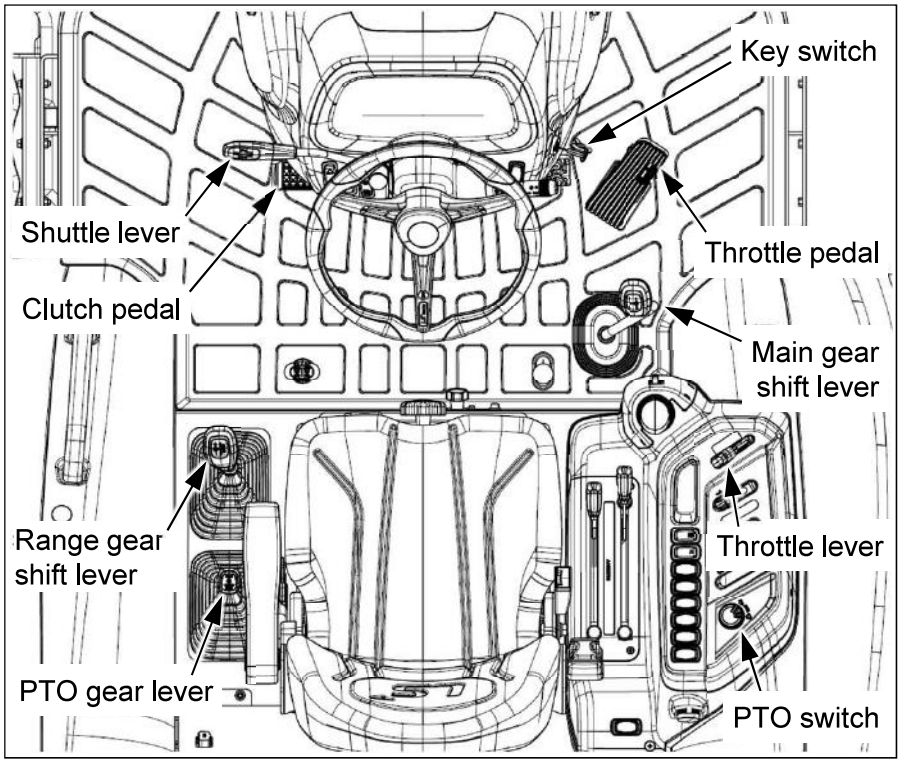


(1) Engine start

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

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

3. Pull the throttle lever to the lowest speed position and don’t step on the throttle pedal.



4. Turn the key switch to the “ON” position and check if the engine oil pressure indicator, battery charging indicator, and cold start aid indicator are turned on.

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

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

7. Check if the battery charging indicator and engine oil pressure indicator are turned off after starting engine. Otherwise, stop the engine immediately and check the problem.

8. Run the engine for a few minutes to allow the engine oil and transmission oil to warm up. *For the details, see chapter 4-3-(1) in this manual.*

⚠ Warning	▶ Only start the 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 the engine. ▶ Start the engine only from the driver's seat while all the transmission gear levers are placed in the neutral position. ▶ DO NOT start the engine by shorting across the terminals of the starter motor. If the engine starts, the tractor can be moved suddenly.

⚠ Caution	▶ To start the engine, - be sure to depress the clutch pedal fully, place the F/R shuttle lever in the neutral position, and put the PTO switch in the "OFF" position. Otherwise, the engine cannot start even if turning the key switch to the "Start" position. ▶ When the engine is started where the throttle lever or throttle pedal is actuated, - No engine response of throttle lever and throttle pedal. - Engine speed is oscillated slightly for warning to the user. - After the throttle lever and throttle pedal are moved to the lowest speed positions, all function of throttle will work properly. ▶ DO NOT operate the 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 the "Start" position. It may cause a failure of the starter motor. ▶ In cold weather, be sure to warm up the engine sufficiently. If using the tractor suddenly in cold weather, the engine life can be reduced. *For the details, see chapter 4-3-(1) in this manual.* **Especially for power shuttle models, sudden start without warming-up can cause damage to the power shuttle clutch and reduce it's reliability. You should warm up the engine until the neutral indicator on the instrument panel stops blinking.**

(2) Start in cold weather

- Push the throttle lever to the low idle position.
- Start the engine after the cold start aid indicator is turned off according to the right table.
- After starting the engine, carry out warm-up for about 5~10 minutes at low idle position. *For the details, see chapter 4-3-(1) in this manual.*
- Use the engine oil for winter in cold weather. Refer to "Lubricants and Capacity" at the end of this manual.
- Use the diesel for winter when it is very cold weather. It is much easier to start engine.

Coolant Temp.	Preheat time(s)
60℃(140℉)	0
40℃(104℉)	0
30℃(86℉)	0
20℃(68℉)	8
10℃(50℉)	15
0℃(32℉)	18
-10℃(14℉)	25
-20℃(-4℉)	30
-30℃(-13℉)	40

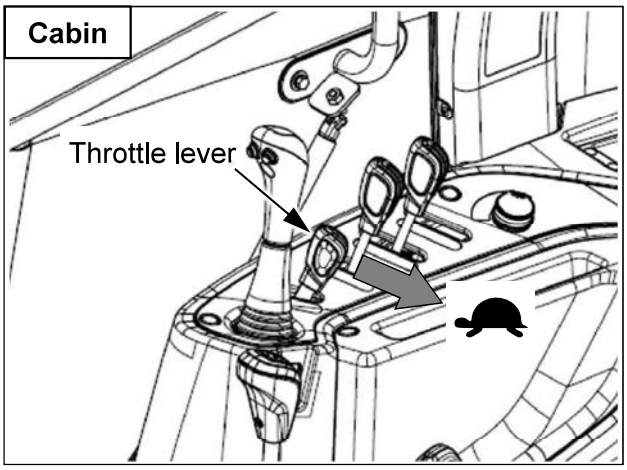
- *NOTE: In wintertime below -20℃(-4℉), use a block heater to start the engine (if applicable). To purchase the block heater parts, contact your authorized local dealer or service center.*

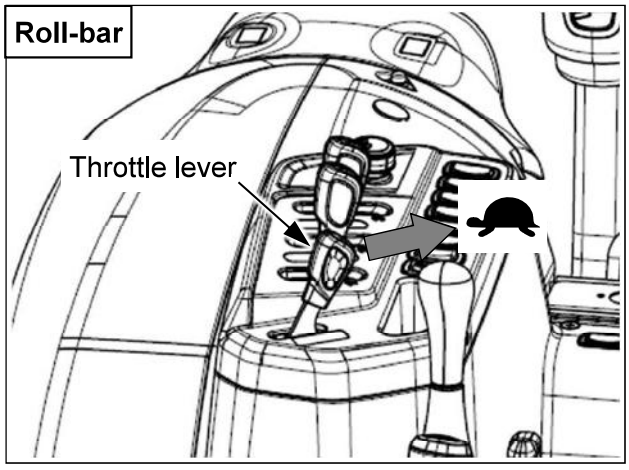
⚠Caution	▶ **Safety Interlock !** Depending on the ambient temperature, the engine speed will not be increased over 1250 rpm for about maximum 1 minute after the engine starts. But, it is normal operation to prevent an engine failure.

⚠Caution	▶When storing the tractor in cold weather, the battery must be removed and stored in a cool, dry place that is not frozen away from children. ▶Allowing engine to idle for a long time will waste fuel and cause a build-up of carbon.

(3) Engine Stop

- Place all the transmission gear levers or switches in their “NEUTRAL” or “OFF” positions.
- Push the throttle lever forward to reduce the engine speed and turn the key switch to the **OFF** position to stop the engine.
- Remove the ignition key after stopping engine.





⚠Caution	▶ To stop the engine after finishing heavy work, run the engine at low idle speed for about 2 minutes to cool down the engine. If you stop the engine suddenly, the engine life could be reduced.

4-3. How to drive and stop

(1) Engine and transmission Warm-up

***- Engine warm-up*:** We strongly recommend that you should always warm-up the engine basically for five minutes after starting to lubricate and protect the engine. In cold weather, comply with the below table.

- Transmission warm-up: The tractor hydraulic oil also serves as the tractor transmission fluid. During cold weather operation, the hydraulic oil viscosity increases. This increase in oil viscosity restricts the oil's ability to flow and lubricate in the transmission and hydraulic circuits. The cold oil can result in abnormal noises and delay or slower operation times due to the increased oil viscosity.

NOTE: A warm up time at 50% rated engine speed is recommended to assure proper vehicle functionality, transmission lubrication and operation.

NOTE: Do not operate the tractor under full load condition until the hydraulic oil is sufficiently warmed up.

Ambient Temperature	Recommended Warm-Up Time
Above 0 °C (32 °F)	Minimum of 5 minutes
0 – -10 °C (32 – 14 °F)	5 to 10 minutes
-10 – -20 °C (14 – -4 °F)	10 to 15 minutes
Below -20 °C (-4 °F)	More than 15 minutes

⚠Warning	▶ Unexpected movement! During the warm-up operation, do the following: Engage the parking brake, set all shift levers to their NEUTRAL positions, and place the Power Take-Off (PTO) switch in the OFF position. Failure to comply could result in death or serious injury.

(2) How to drive

① Synchro-shuttle model

1. Lift up all the implements (front/middle/rear) from the ground after starting engine.

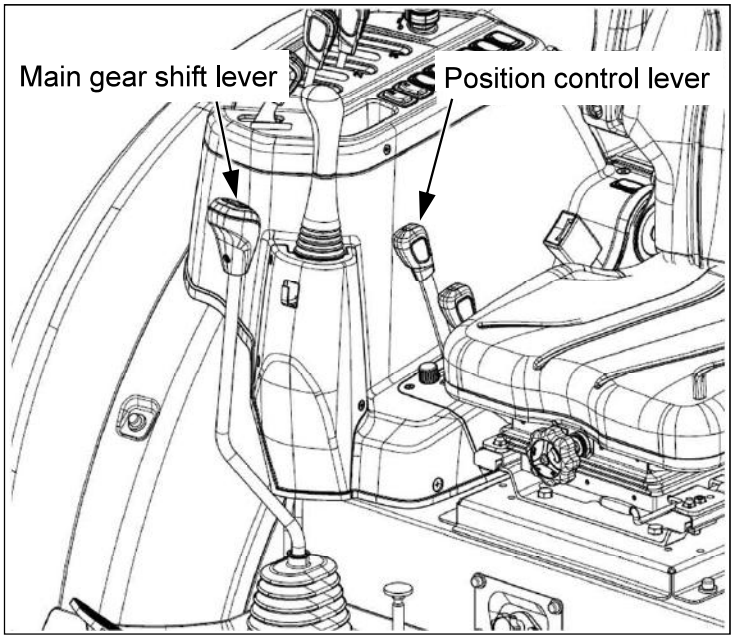
2. Place the throttle lever to the low speed position.

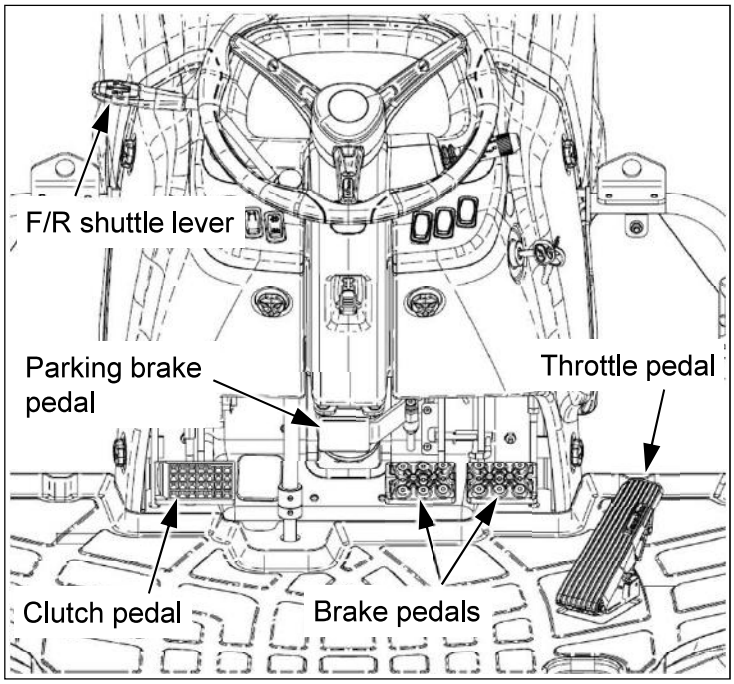
3. Depress the clutch pedal fully.

4. Place all the transmission gear levers (Main, Range, Shuttle lever) on a suitable position.

5. Press down the brake pedals and release the parking brake.

6. Release the clutch pedal slowly while pressing down the throttle pedal slowly.





Notice	▶ Release the clutch pedal slowly. Otherwise, the transmission gear life will be reduced and it may cause a sudden start.

② Power-shuttle model

1. Lift up all the implements (front/middle/rear) from the ground after starting engine.

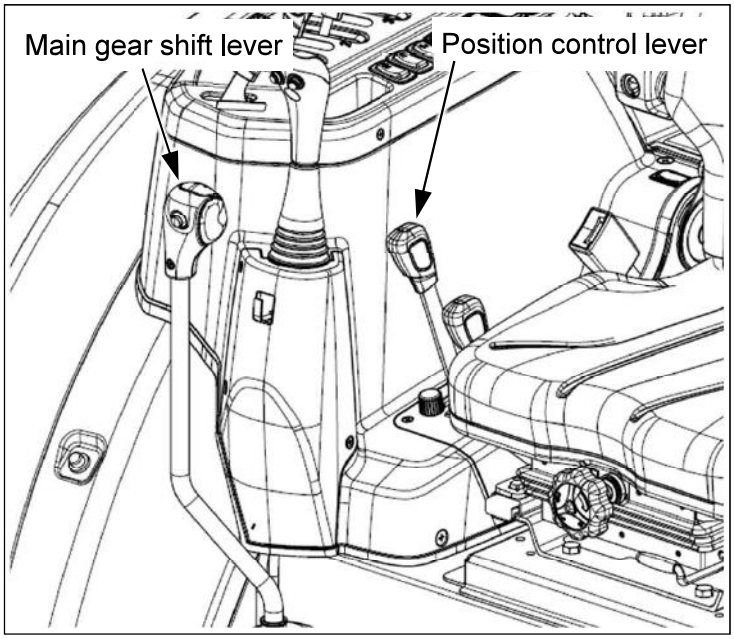
2. Place the throttle lever to the low speed position.

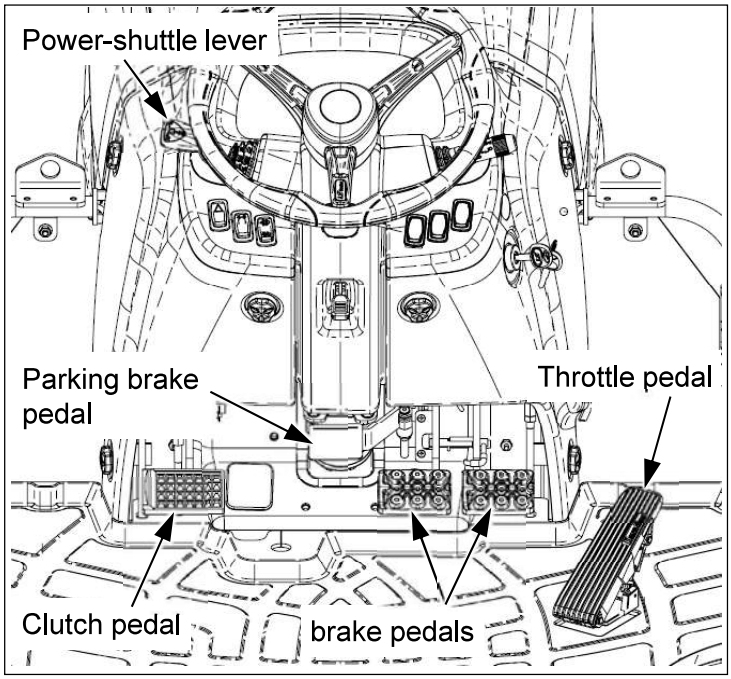
3. Place the power-shuttle lever in the neutral position.

4. Place all the transmission gear levers (Main, Range, Shuttle lever) on a suitable position.

5. Press down the brake pedals and release the parking brake.

6. Place the power-shuttle lever to the forward or reverse position, and press down the throttle pedal slowly when the vehicle begins to start.

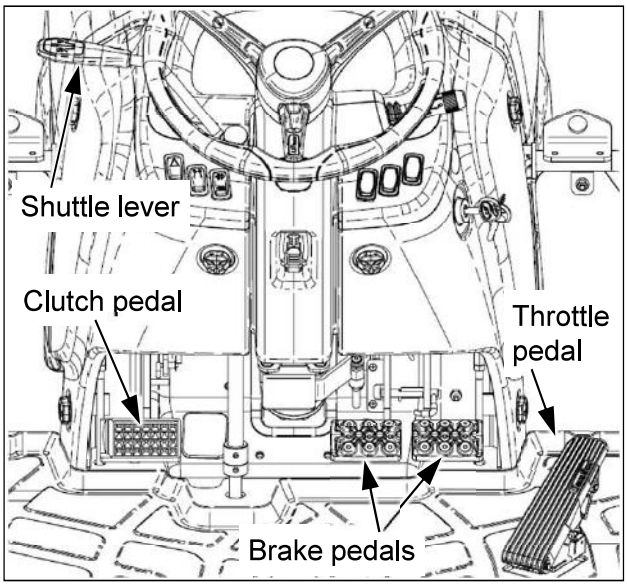




Notice	▶When starting the power-shuttle models normally, use the power-shuttle lever without depressing clutch pedal.

(3) Changing speed

- Depress the clutch pedal fully and operate all the shift levers correctly.
- Before shifting F/R Shuttle lever, Range gear lever, Creeper gear (if fitted), press down the brake pedals and stop the tractor completely.
- The power shuttle lever can be shifted while the tractor is moving slowly without depressing the clutch pedal.
- Set an appropriate driving speed according to the road conditions.

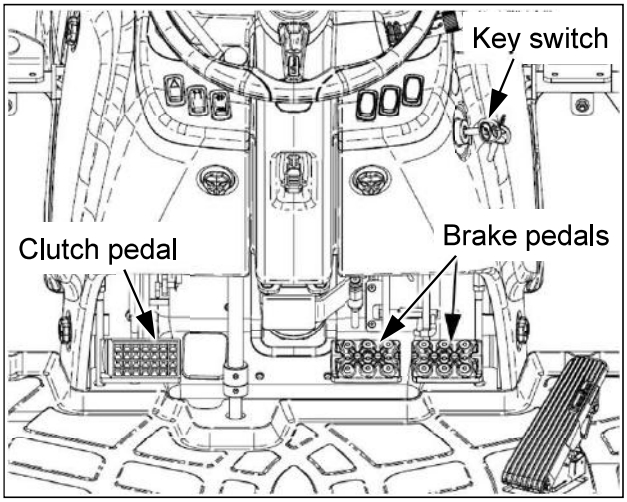


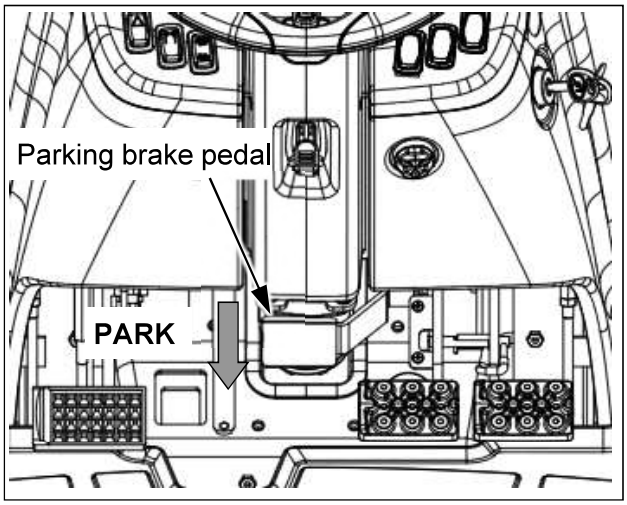
(4) Emergency Stop

1. Depress the clutch pedal and brake pedals at the same time to stop the tractor. Turn the key switch to the “OFF” position.

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

3. Apply the parking brake.



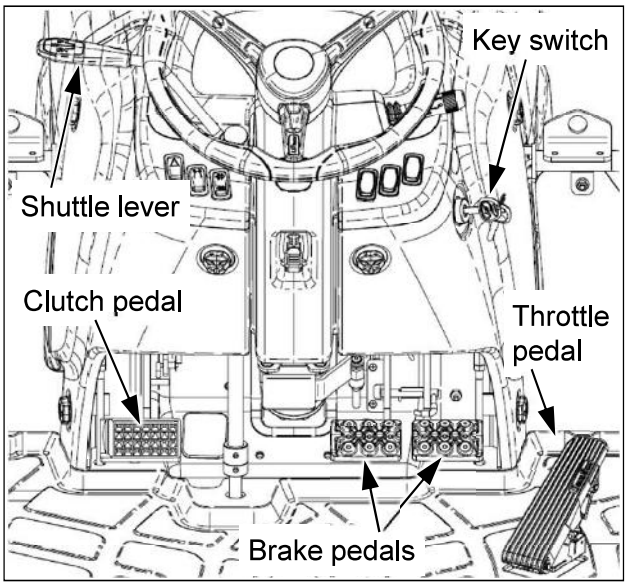


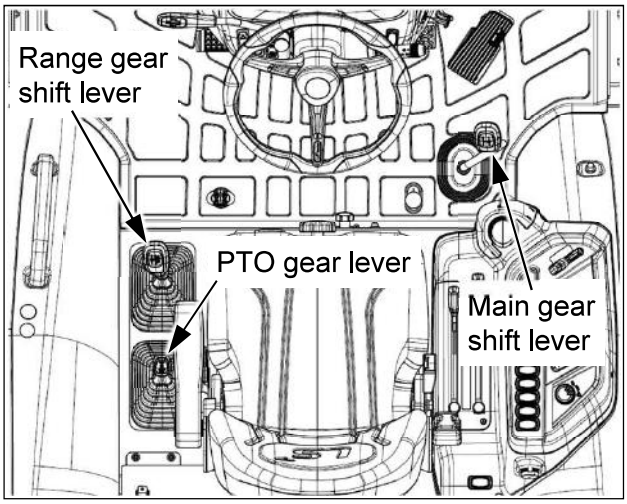
(5) Stopping tractor

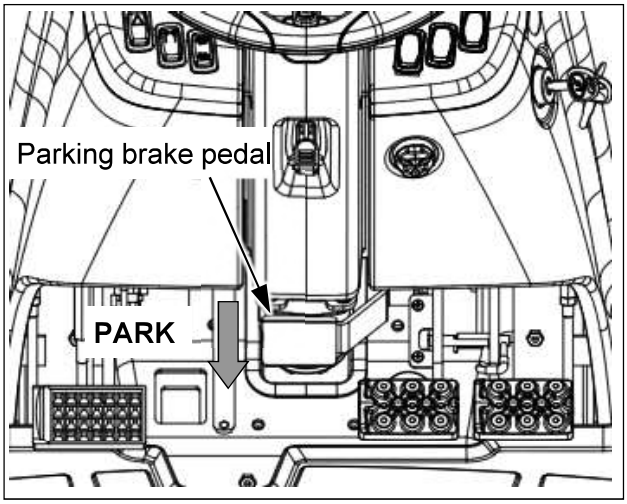
1. Depress the clutch and brake pedals. Push the throttle lever to the “Low” speed position. Place all the transmission gear levers in their neutral positions and put the PTO switch to the “OFF” position.

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

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



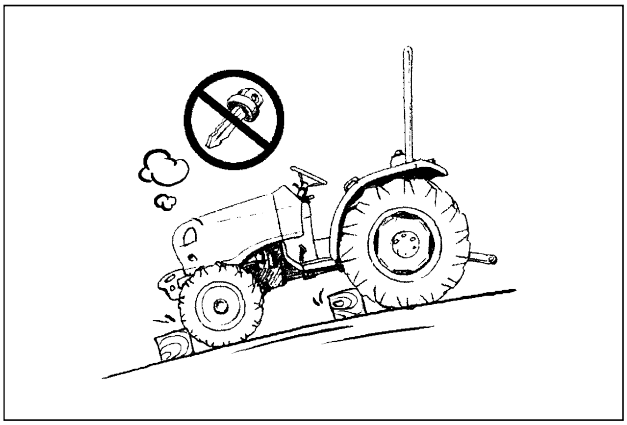




⚠ Caution	▶ DO NOT leave the tractor while the transmission gear is placed in the neutral position and the parking brake is not applied. The tractor may roll down. Apply the parking brake at all times before leaving the tractor. ▶ Remove the ignition key always after stopping engine.

(6) Parking

- Stop the tractor on a level surface, not on a slope.
- Disengage the PTO and place all the transmission shift levers in the neutral 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 the engine and all moving parts to stop.
- Apply the wheel chocks to the wheels when parking the tractor on a slope unavoidably.

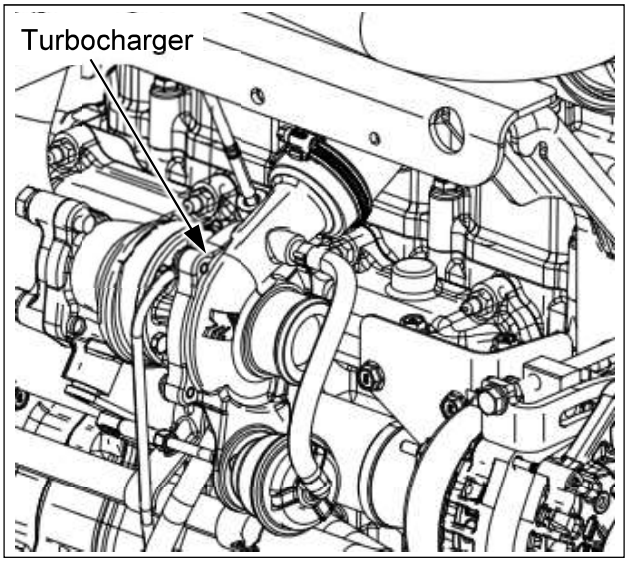


- **In case of power shuttle models, engaging the lowest gear for engine brake after the engine is stopped is NOT available. When parking the tractor on a hill, you should apply the parking brake and wheel chocks to the wheels.**

⚠Caution	▶ If it is necessary to park your tractor on a slope, furthermore with a loaded trailer, the tractor may roll down, even though the parking brake is applied. In this case, apply all the transmission gears in their lowest speed positions and apply the wheel chocks or blocks to the all tires. **- Mechanical : downhill ⇒ reverse 1st gear / uphill ⇒ forward 1st gear.** **- Power shuttle : Engine brake by low speed gear is NOT available.**

(7) Handling Turbocharger (if fitted)

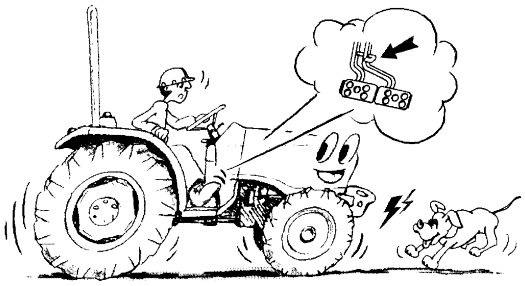
- The turbine of the turbocharger is a highly precise part that rotates at high speed.
- Before accelerating or working the tractor fitted with the turbocharger, allow the engine to idle at 1000 rpm for about 1 minute to ensure that the turbocharger is correctly lubricated.
- Before stopping engine fitted with the turbocharger, allow the engine to idle at low idle rpm for about 2 minutes. This allows the turbocharger and manifold to cool, preventing deformation of the components.



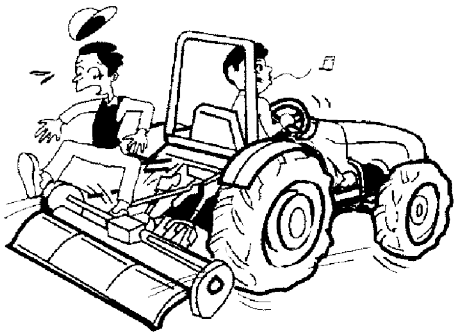
4-4. Transport on public roads

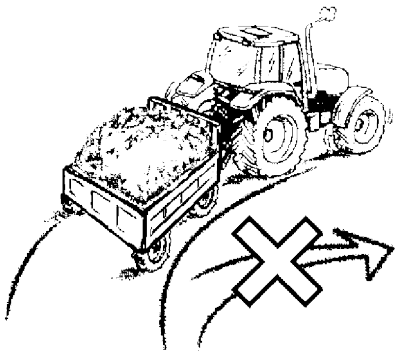
(1) Safety rules when driving tractor on the roads

- When facing downhill, DO NOT place the transmission gear lever in the neutral position.
- When driving the tractor on an unpaved road with a heavy rear implement on the 3-point linkage, do not drive fast and do not lift up the implement to the highest position. The hydraulic lift system may be damaged by vibration and impact. In this case, place the position control lever on the 3/4 rising position of the full stroke and select an appropriate driving speed before entering the unpaved road.



DO NOT USE DIFF-LOCK





⚠Caution	▶ Connect the left/right brake pedals with brake pedal latch before driving. ▶ Avoid a sudden start, sudden brake and sharp turning. ▶ DO NOT allow people or baggage on the tractor or implement. ▶ Place the PTO gear lever in the neutral position and put the PTO switch in the “OFF” position. ▶ DO NOT use the differential lock and four wheel drive(4WD) on the road. ▶ When traveling with an implement on the rear 3-point linkage, tighten the stabilizers to avoid lateral movement. ▶ When traveling with a long and heavy implement, turn slowly with a wide turning radius, and do not operate any implement such as tiller, loader and etc. ▶ While traveling, do not ride your foot on the clutch pedal or brake pedals. ▶ When starting the tractor on a slope, select a suitable driving speed to avoid damage to the transmission drive lines. **Specially, for power shuttle models, the power shuttle clutch can be seriously damaged due to long-lasted engagement.**

(2) Light operation

① Cabin models

- Your tractor is equipped with the following lights.

① Headlights

② Side lights, Front turn signal lights and Hazard warning lights

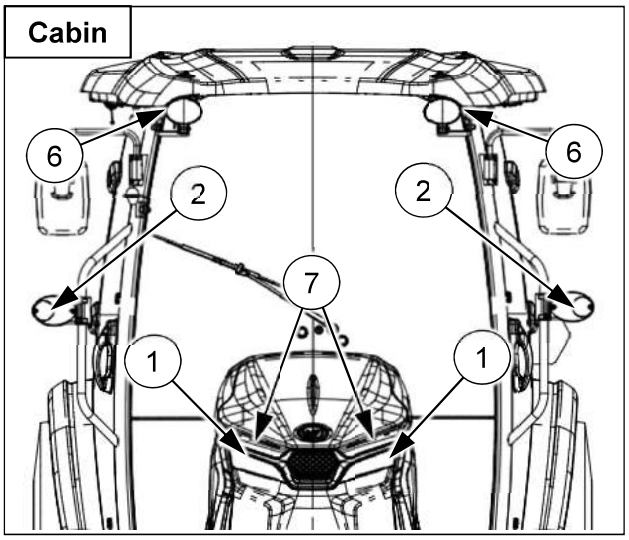
③ Rear turn signal lights and Hazard warning lights

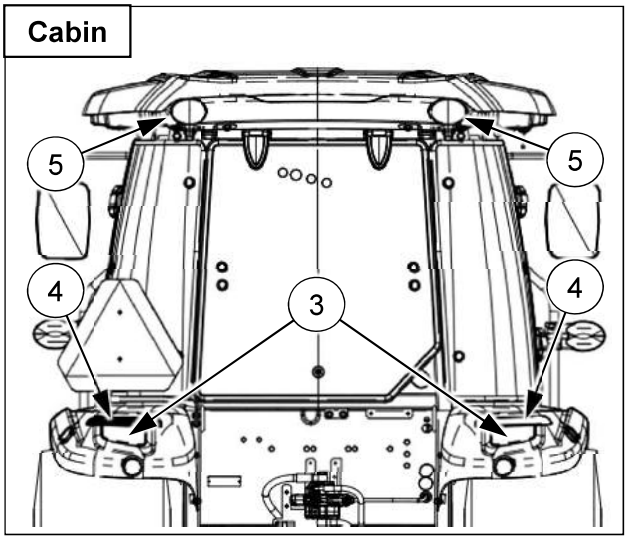
④ Tail lights and Brake lights

⑤ Rear work lights

⑥ Front work lights

⑦ Grille work lights





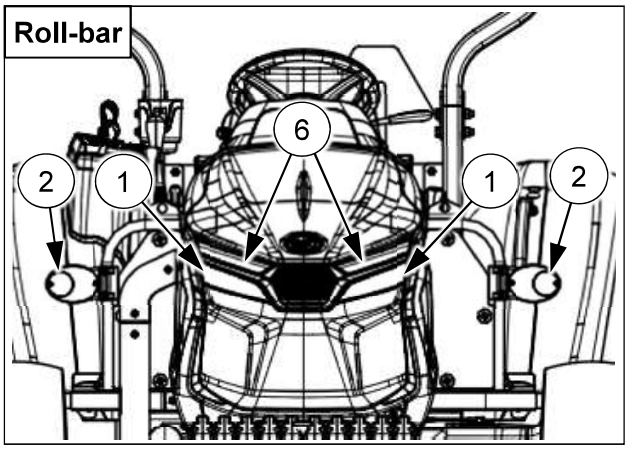
- Use the hazard warning lights and headlights (low beam) when you are traveling on public roads day or night. (North America only)
- Do not modify the lamps or change the bulb capacity arbitrarily.
- When driving the tractor on public roads, operate the lights according to your local traffic regulations.
- *For the details about light operation, refer to the chapter 3 in this manual.*

Warning	▶ Modified lamps or changed bulb capacity may cause a traffic accident by distracting 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.

Caution	▶ If using the hazard warning lights for a long time while the engine is stopped, the battery can be discharged completely due to high electrical power consumption.

② Roll-bar models

- Your tractor is equipped with the following lights.



① Headlights

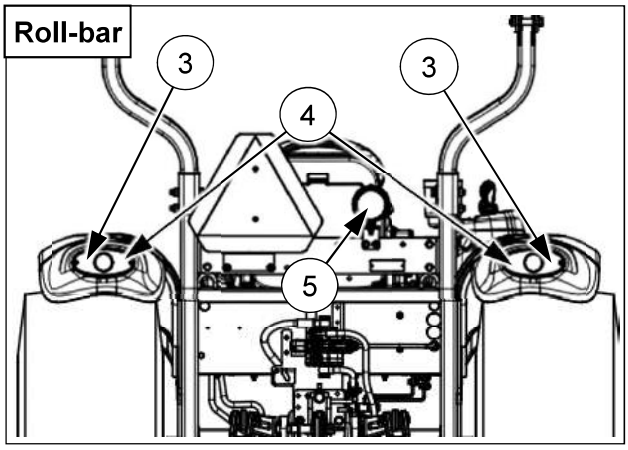
② Side lights, Front turn signal lights and Hazard warning lights

③ Rear turn signal lights and Hazard warning lights

④ Tail lights and Brake lights

⑤ Rear work lights

⑥ Grille work lights



- Use the hazard warning lights and headlights (low beam) when you are traveling on public roads day or night. (North America only)
- Do not modify the lamps or change the bulb capacity arbitrarily.
- When driving the tractor on public roads, operate the lights according to your local traffic regulations.
- *For the details about light operation, refer to the chapter 3 in this manual.*

⚠Warning	▶ Modified lamps or changed bulb capacity may cause a traffic accident by distracting 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.

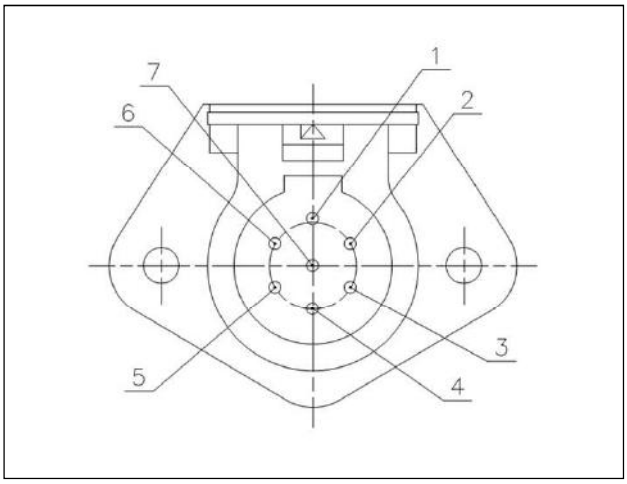
⚠Caution	▶ If using the hazard warning lights for a long time while the engine is stopped, the battery can be discharged completely due to high electrical power consumption.

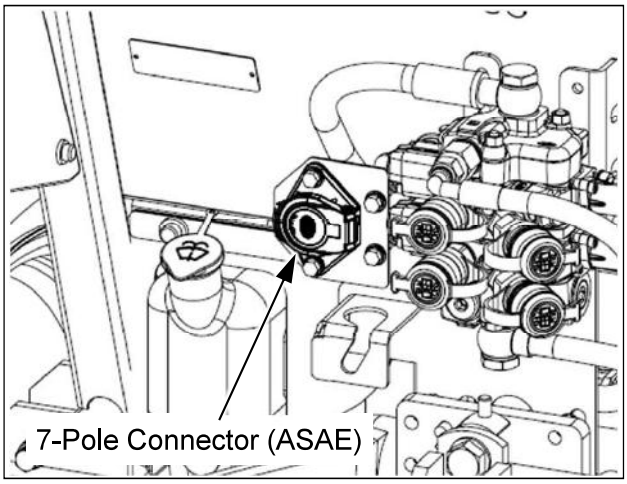
(3) 7-Pole connector (optional)

- 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 (as viewed from rear of tractor) are as follows;

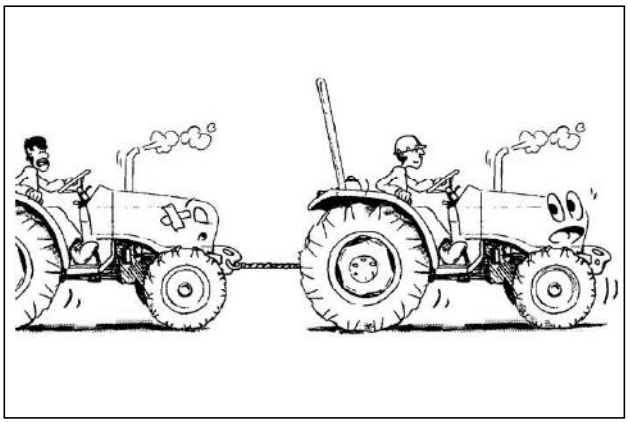
● ASAE Version

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





(4) 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 the other structure such as rear axle, ROPS, front axle, and steering components for towing. These components could be damaged by the chain or by excessive strain.
- Your 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 followings;
  - Front wheel drive (4WD)
  - Differential lock
  - Parking brake,

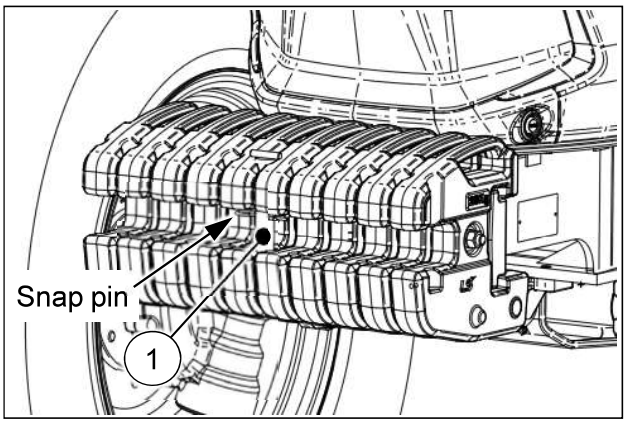
  and place all the transmission gear levers in the neutral position.
- Check the horizontal and vertical permissible load of the hitch (or drawbar), and total weight of the towed vehicle before towing. (*See chapter 4-5-(3). "Hitch and Drawbar" in this manual.*)
- Make sure to install the towing pins and locking pins after connecting the chain.
- Tow the tractor slowly in a longitudinal straight line.

⚠Warning	▶ **Unexpected machine movement!** Never attempt to start the machine by towing. The machine could start unexpectedly. Failure to comply could result in death or serious injury.
⚠Warning	▶ **Transport hazard!** Do not tow the machine on public roads. Towing could cause a safety hazard for other vehicles using the roadway. Failure to comply could result in death or serious injury.
⚠Warning	▶ **Hazard to bystanders!** Do not use cables or rope to tow the machine. If the cable or rope breaks or slips, it may whip back with enough force to cause serious injury. When using a chain, attach the chain with the hook's open side facing UP. If the hook slips, it will drop down instead of flying up. Failure to comply could result in death or serious injury.
Notice	▶ If it is necessary to tow the tractor, all the transmission gear levers must be moved to their neutral positions before stopping the engine. Otherwise, it can cause damage to the transmission components during towing.

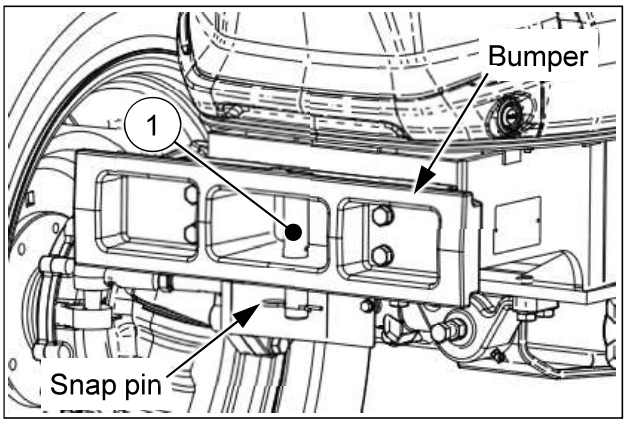
- Use a strong chain when towing the tractor. Tow the tractor from the rear using only the drawbar. Tow the tractor from the front using the tow pin in the front weights or front support. Have an operator steer and brake the tractor. If possible, run the engine to provide lubrication to the transmission and power steering.

  NOTE: The tractor should only be towed a short distance, such as out of a building. Do not tow on roadways or as a method of transport.

- When connecting a chain to the front towing hook on the front ballast weights, make sure to check the snap pin is installed in place firmly on the front towing hook pin①. Otherwise, the front towing hook pin may be out of place while towing and it may cause a serious injury or death.

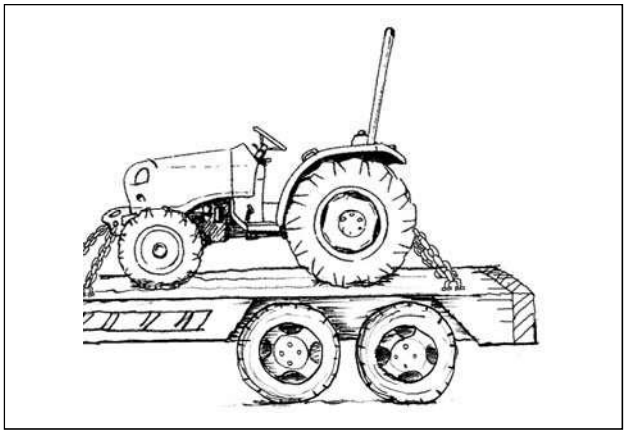


- When the front ballast weights are removed, use the bumper for front towing device.
- Insert the front towing hook pin① to the bumper and assemble the snap pin as shown in the right figure.
- Make sure to check the snap pin is installed in place firmly on the front towing hook pin①. Otherwise, the front towing hook pin may be out of place while towing and it may cause a serious injury or death.



(5) 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.

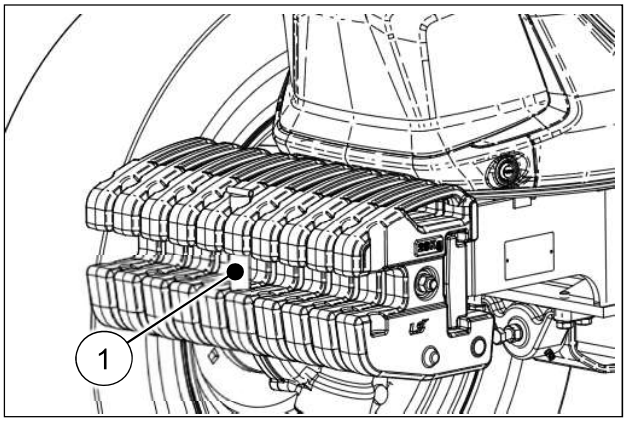


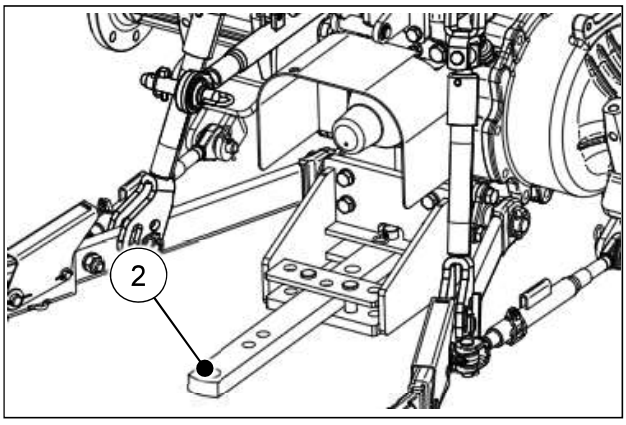
⚠Caution	▶ When fixing the tractor, do not hook or connect chains to the 4WD shaft, steering cylinder, tie-rod or front axle. These can be damaged by the chain or excessive strain. ▶ In case of turbocharger engine (where fitted), cover the exhaust outlet to protect that the turbocharger does not rotate by air without lubrication.

- Transport the tractor with all four wheels on a flatbed trailer or truck. Secure the tractor as follows:

  - Secure the front of the tractor at the front towing hook① of the front ballast weights or bumper. (optional)

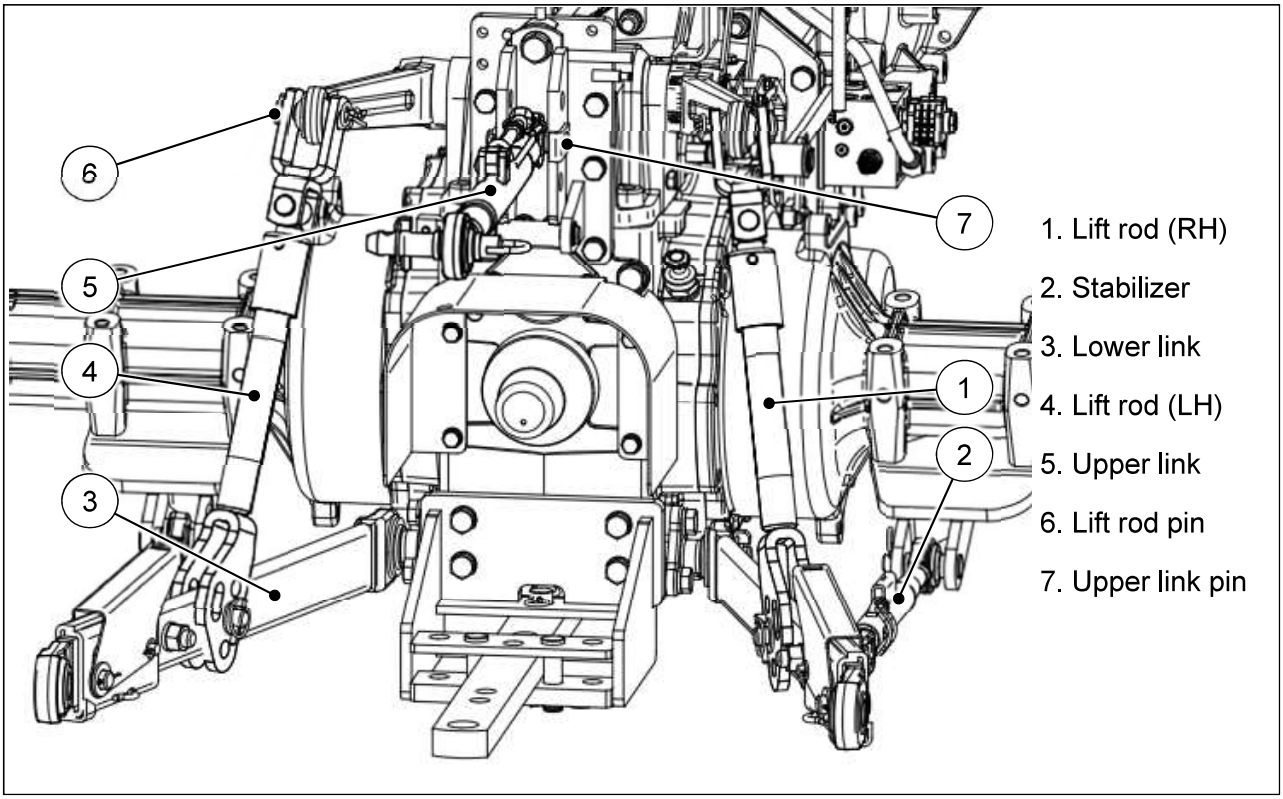
  - Secure the rear of the tractor at the rear drawbar or hitch②. (optional)





4-5. Field Operations

(1) Rear 3-point linkage

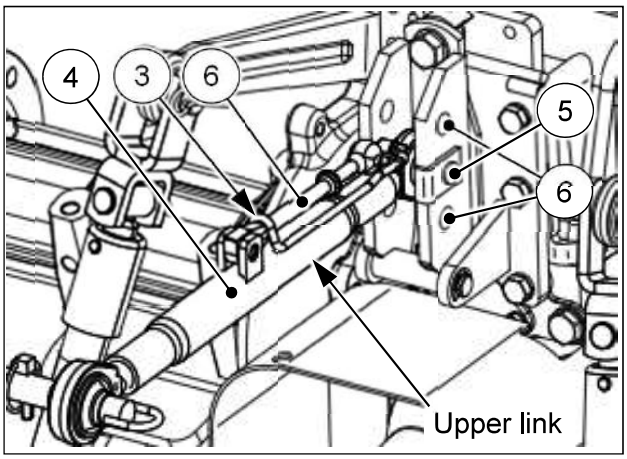


- When attaching a rear implement, comply with the followings.
  1. Set the rear implement upright on a level surface and approach the implement in reverse.
  2. Stop the tractor on an adaptable attaching position and apply the parking brake.
  3. Connect the lower links **(3)** to the implement and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

Warning	▶ Before attaching/detaching an implement, place the PTO switch in the OFF position and the PTO gear lever (if fitted) in the neutral position, and apply the parking brake. ▶ When attaching/detaching an implement, make sure to assemble and tighten the connecting parts correctly. ▶ If your tractor is used to tow heavy loads, always use an approved drawbar or hitch to avoid a tipping, turnover and personal injury. Never connect the loads to the 3-point linkage, rear axle, or other parts. ▶ Never connect an implement that requires more power than capacity of your tractor. ▶ Never stand between implement and tractor when connecting implement. ▶ Do not change the pressure set 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 a suitable attaching hole **(2)** depending on the implement. The upper hole is more sensible than lower one for draft load control.
- To adjust the length of the upper link, release the locking spring **(3)** and turn the sleeve **(4)** with handle **(6)**.
- Fix the handle **(6)** with locking spring **(3)** after adjusting.
- **Adjustment range: 520~780mm (20.5~30.7 in)**

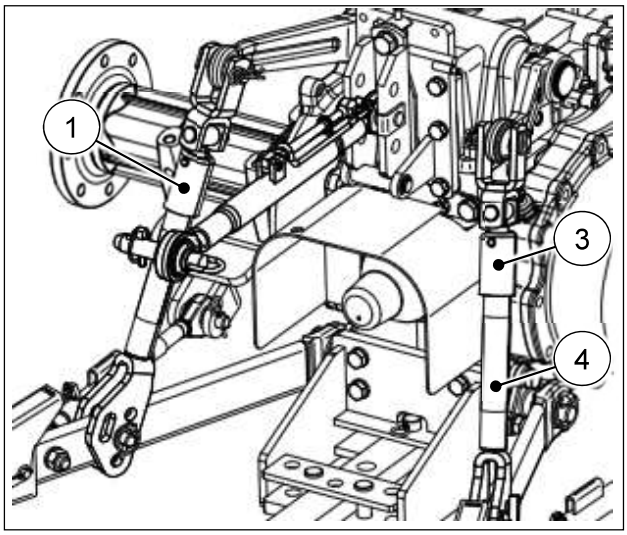


⚠Caution	▶ Do not adjust the length of the upper link and lift-rod over the maximum limit. It may cause fatal injury or death by falling object.

② Adjustment of lift-rod (Left/Right)

- For lift rod (LH), detach the lower side of the lift-rod(LH) from the lower link and reassemble it to the other hole.
- For lift rod (RH), lift up the handle **(4)** and turn it to the left or right to adjust the length. Secure the handle **(4)** in place after adjusting.

Lift rod(LH)	Lift rod(RH)
502~573mm (19.8~22.6 in)	502~628 mm (19.8 ~ 24.7 in)

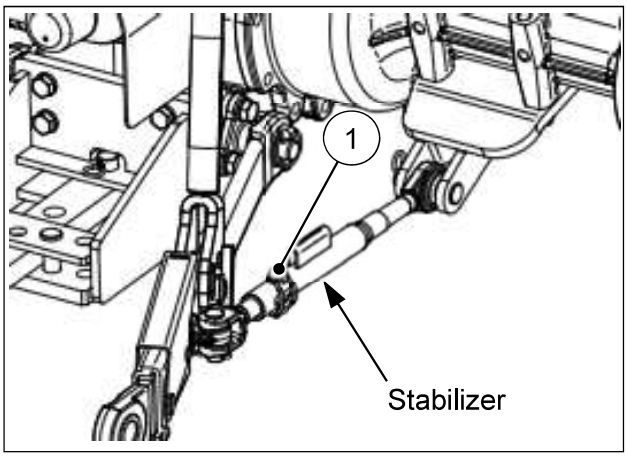


Notice	▶ When adjusting the stabilizer's length, set the lateral swinging clearance of the implement to be 20~40mm. (0.8~1.6 in.)

③ Adjustment of stabilizer (optional)

- Check link type

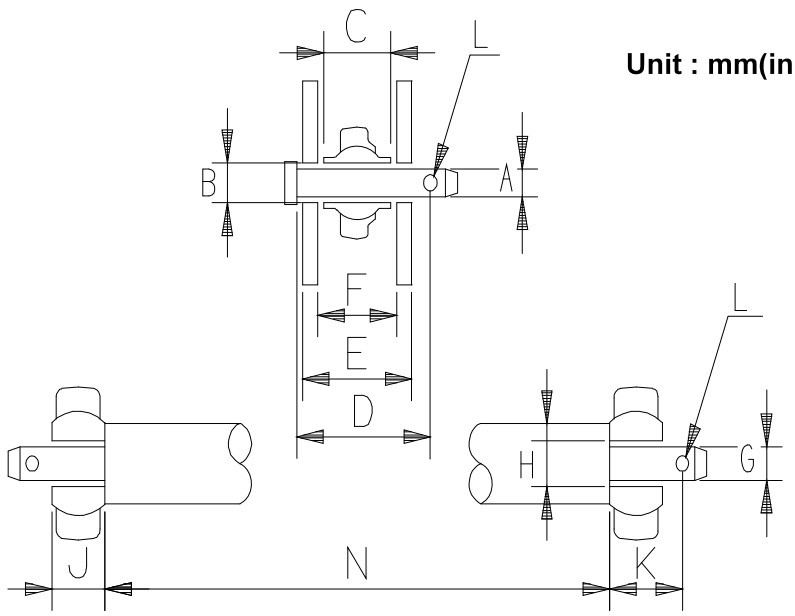
- Pull up the link pin **(1)** and turn the grip of the stabilizer clockwise/counter-clockwise to adjust the stabilizer length.
- Insert the link pin **(1)** into the hole and tighten it securely with the locking spring.



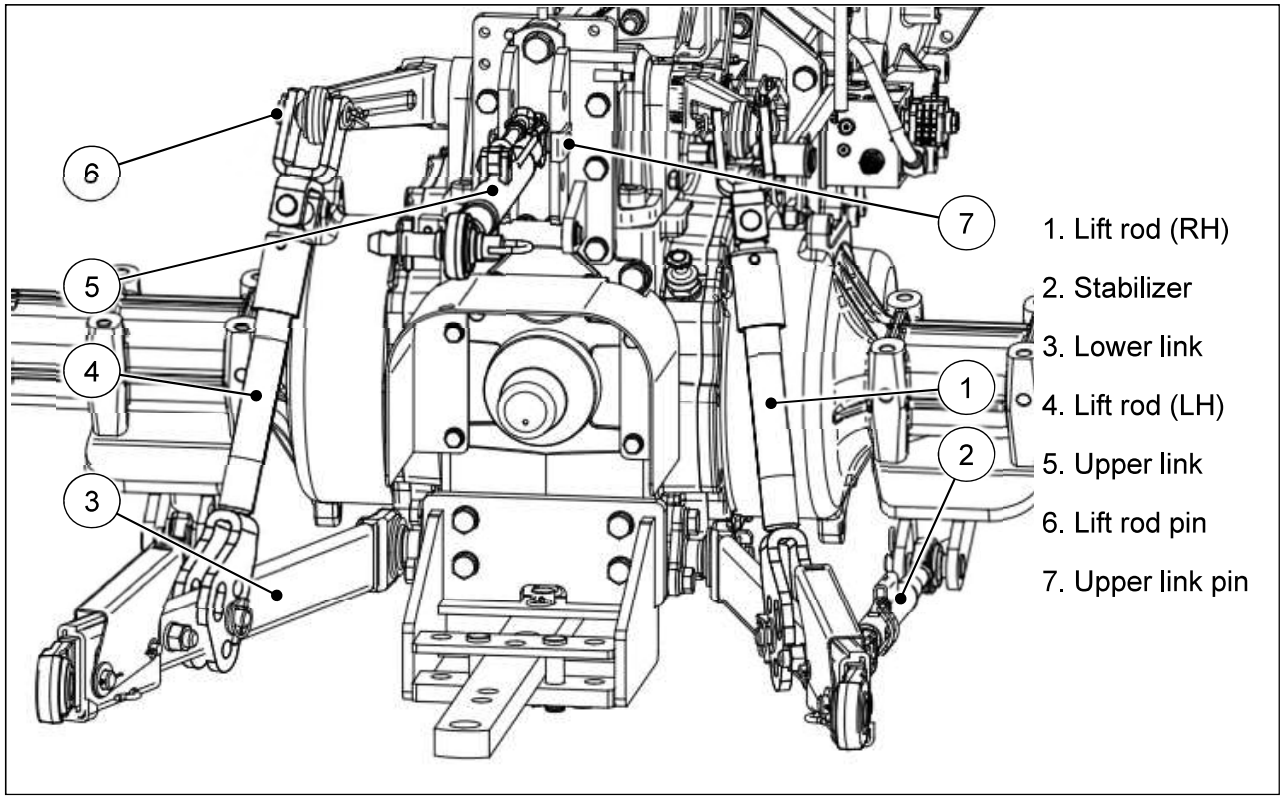
④ Reference of implement installation part

	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 (1.38)	39 (1.53)	12 (0.47)	683 (26.8)
CAT.2	25.4 (1.00)	25.7 (1.01)	51 (2.00)	93 (3.66)	86 (3.38)	52 (2.04)	28 (1.10)	28.7 (1.12)	45 (1.77)	49 (1.92)	12 (0.47)	825 (32.4)

Unit : mm(inch)



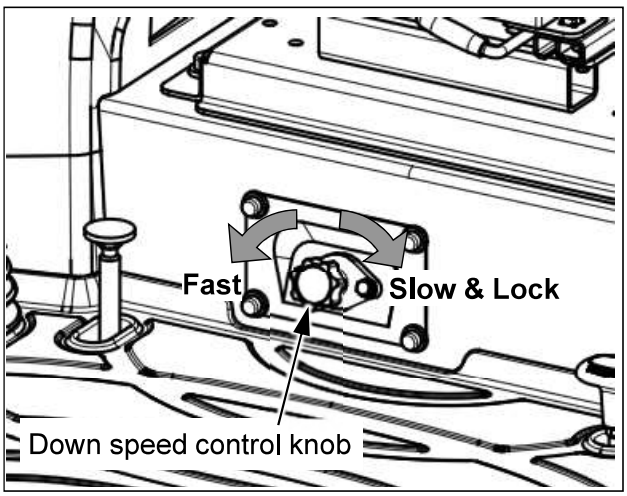
⑤ Handling of the 3-point linkage



- When driving the tractor without attaching implement, comply with the followings.
  1. Secure the upper link **(5)** with the fixing hook installed in front of the upper link.
  2. Connect the stabilizers **(2)** to the lower links **(3)** to avoid lateral movement of the lower links.

- If the 3-point linkage is not necessary, remove it as follow.
  1. Pull out the upper link pin **(7)** and remove the upper link **(5)**.
  2. Detach the rear side of the stabilizer **(2)** from the lower link **(3)**.
  3. Detach the lower side of the lift-rod(LH)/(RH) while holding the lower link **(3)** tightly not to fall down.
  4. Remove the lift rod (LH), lift rod (RH) and stabilizers **(2)** step by step.
  5. Remove the lower links **(3)** carefully not to get hurt due to its own weight.

- When using the hitch/drawbar, or driving on the road, lift up the 3-point linkage and fix it by turning the down speed control knob to the locking position.



⚠ Caution	▶ The parts of the 3-point linkage are very heavy. When handling them, take care not to get injury. PLEASE BE CAREFULL !

(2) Power take-off (PTO) operation

① Safety precautions

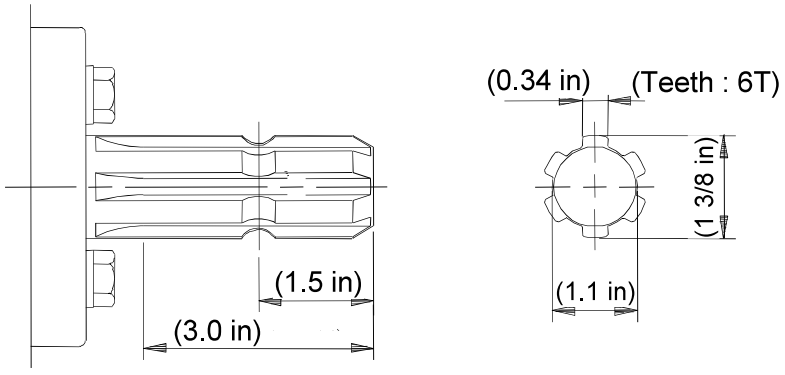
- When PTO shaft is rotating, NEVER APPROACH the shaft.
- Check if the PTO shield and protection cap is attached correctly. If they are removed or damaged, replace it with a new one. After using the PTO shaft, reinstall the PTO protection cap originally.
- **Suitable Clothes & Protect Entanglement :** 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 and long clothes. The entanglement in rotating shaft can cause serious injury or death. Stop the engine and be sure to check that the PTO shaft has been stopped completely before getting near it.

② Specification and Dimension of Rear PTO shaft

- Check the specification of the rear PTO shaft before attaching an implement. The spline teeth may be different depending on the market.

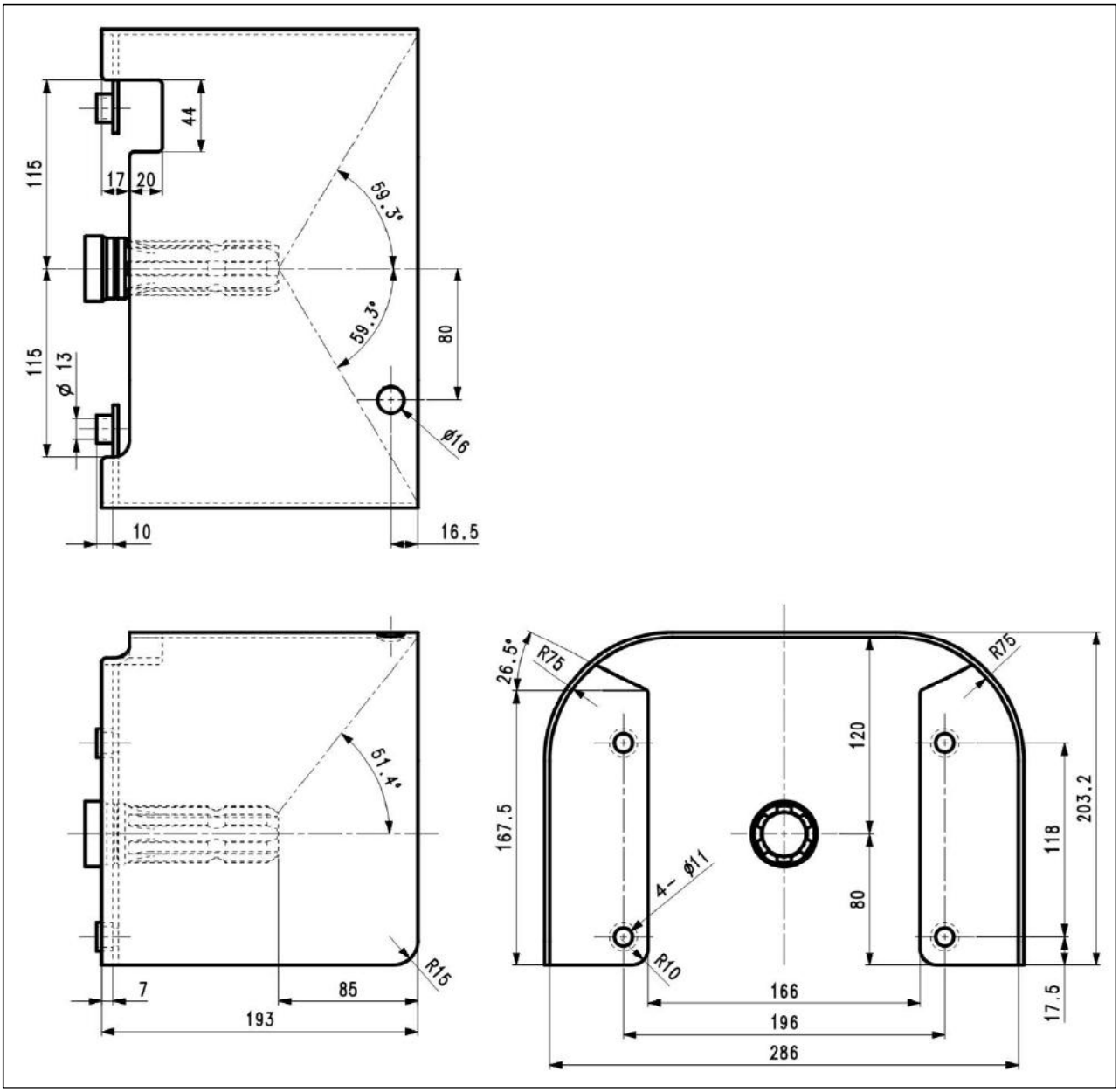
- Spline Teeth : 6T, in conformity with ISO 500-3:2004, Type 1

PTO gear(s)	1	2(optional)
PTO / Engine speed	540 / 2409 rpm	540E / 1789 rpm
Direction of rotation	Clockwise (as viewed from rear of tractor)	
Shaft dimension (Unit : inch)		

③ Attaching power take-off(PTO) drive shaft

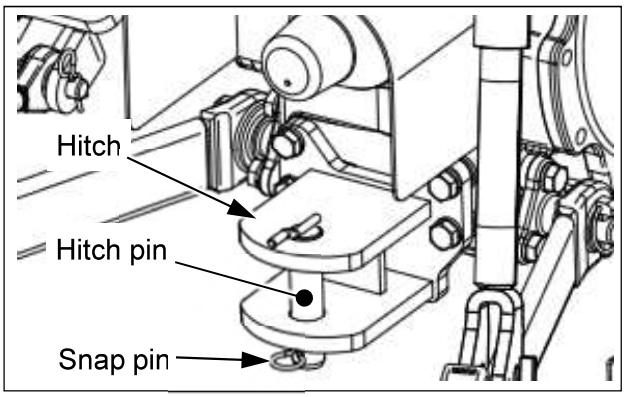
- When connecting PTO drive shaft to the PTO shaft and implement, make sure to check that the locking pin of the PTO drive shaft is locked in place.
- When attaching PTO drive shaft, refer to the drawings as below for safety clearance zone.
- After installing implement(s), check the followings according to the position of the 3-point linkage.
  - check the articulation angle of the PTO drive shaft and rotating noise is suitable.
  - check the interference with PTO safety cover and other structure.
  - check the effective engaging length of the PTO drive shaft.
  - check the working position of the automatic PTO ON/OFF system. (if fitted)

⚠Caution	▶ The steep inclination of the PTO drive shaft makes a loud noise and cause a failure of the PTO driveline. When working in the field, do not lift up the rear implement over the manufacture's limitation ***that the maximum articulation angle of the PTO drive shaft is 18 degree when the PTO drive shaft is rotating.***



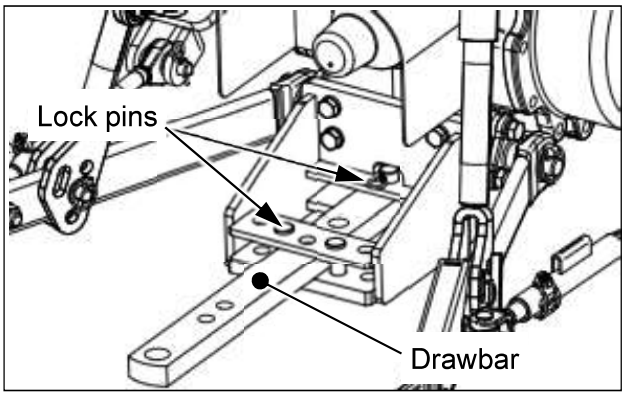
(3) Hitch and Drawbar (optional)

- When attaching towed equipment, use an approved hitch or drawbar. DO NOT use the 3-point linkage or other parts. If so, the tractor could be overturned.
- When attaching/detaching towed equipment, be sure to check the pins locked in place correctly.
- DO NOT exceed the maximum permissible vertical and horizontal load of the couplings.



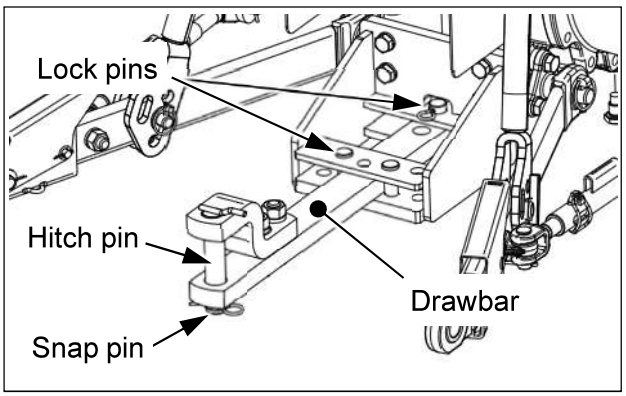
① Hitch

- Vertical load: **1500kg** (3307 lb)
- Horizontal load: **5 tonnes** (11023 lb)

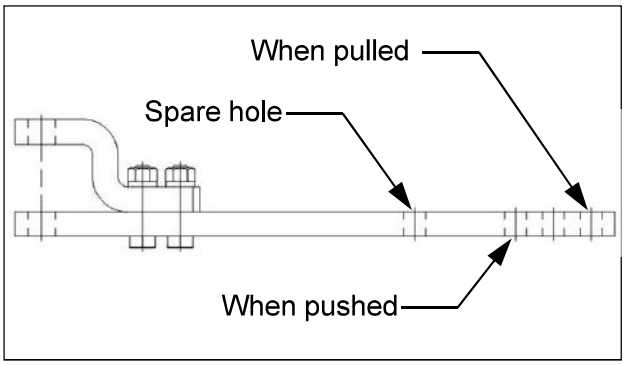


② Drawbar (w/clevis)

- It is used to connect two-axle towed equipment.
- It is available to adjust the position of the drawbar after removing the snap pin and lock-pin as shown in the right figure. After adjusting, assemble the pins firmly.
- Vertical load: **400kg** (882 lb) - at second hole.
- Horizontal load: **4.5 tonnes** (9921 lb).



- The maximum permissible towable mass is depending on the brake system type on the towed equipment as below. Check the brake system of your towed equipment.



	Hitch	Drawbar (w/clevis)
Unbraked towable mass	N/A	N/A
Inertia-braked towable mass	5000kg (11023 lb)	4500kg (9921 lb)
Hydraulic & Pneumatic braked towable mass	N/A	N/A

⚠Caution	▶ Vertical loads on the coupling point of the drawbars, it may vary depending on the tire load rating. Consult your authorized local dealer. ▶ Use always the drawbar or hitch for pulling work. DO NOT use the 3-point linkage, rear axle or other parts. If so, the tractor could be overturned. ▶ When attaching/detaching towed equipment, apply the parking brake and stop the engine before applying the locking pins manually. ▶ Before transporting equipment on public roads, make sure you comply with your local traffic regulations.

(4) Technically maximum permissible mass

- When working with a front-end loader or a rear heavy loaded attachment installed to the 3-point linkage, install the ballast weights on the counter-part axle to maintain front and rear weight balance of the tractor. If not, the front or rear axle can be strained and damaged by the overloaded weight.
- When working with a front-end 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	4740kg (10450 lb)	It depends on the load capacity of the tires. (See next chapter)
Front axle (*)	2600kg (5732 lb)	
Rear axle	2440kg (5379 lb)	

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

- **Restrict operation**: In case that driving speed of the tractor does not exceed 8km/h (5 mph) and standard front/rear wheel tracks (*refer to the chapter 4-5-(6), "Adjusting wheel track and tire replacement" in this manual*) are applied, the intermittent maximum permissible load of the front axle can be **3300kg (7275 lb)**. But, it is restricted by the load capacity of the tires.

Caution	▶ Maximum permissible mass is measured with only the front or rear wheels on the scales inclusive of ballasts and with mounted equipment 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.

(5) Tires and Load capacity

- For safe operation and secure the reliability of the transmission driveline, use only approved tire combinations and manage the specified tire air pressure regularly as below table. If using an unapproved tire combination or unsuitable tire air pressure, it may cause a failure of the front/rear axle and reduce the reliability of the transmission driveline.

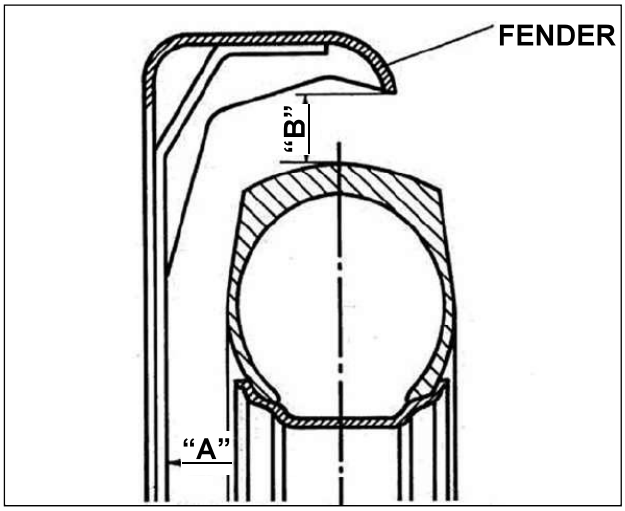
Axle No. (*)	Tires	Standard air pressure (kg/cm2)	Load rating per tire (kg)	Max. mass per axle (kg)	Maximum mass (kg)
1	11.2-24 8PR (HUNG-A)	2.4 (235 KPa, 34 psi)	1135 (2502 lb)	2270 (5004 lb)	4710 (10384 lb)
2	16.9-30 8PR (HUNG-A)	1.8 (177 KPa, 26 psi)	2245 (4949 lb)	2440 (5379 lb)	
1	11.2-24 8PR (TITAN)	2.5 (248 KPa, 36 psi)	1152 (2540 lb)	2304 (5079 lb)	4740 (10450 lb)
2	16.9-30 8PR (TITAN)	1.7 (165 KPa, 24 psi)	1996 (4400 lb)	2440 (5379 lb)	
1	9.5-24 6PR (TITAN)	2.1 (207 KPa, 30 psi)	848 (1870 lb)	1696 (3739 lb)	4136 (9118 lb)
2	16.9-28 8PR (TITAN)	1.7 (165 KPa, 24 psi)	1950 (4300 lb)	2440 (5379 lb)	

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

⚠ Caution	▶ Do not exceed the maximum permissible mass(Total/Front/Rear) declared by manufacturer. Overloaded operation may invalidate the warranty. *For further information, refer to the chapter 4-5-(4) in this manual.* ▶ If the front/rear tires have enough load capacity, the permissible mass on each axle can be restricted by the maximum permissible mass of the front/rear axle.

(6) Adjusting wheel track and tire replacement

- If the front wheel track is adjusted, check the clearances between tires and tractor body case by case. If necessary, the steering angle must be adjusted.
  (Refer to the chapter 4-5-(8), "Adjusting steering angle" in this manual.)
- When adjusting rear wheel track, check the radial and lateral clearance between rear tire and tractor chassis as below.
  - A : 40mm (1.6 in) (Minimum)
  - B : 60mm (2.4 in) (Minimum)
- Depending on rim or disk type, the front and rear wheel tracks may vary. For the details, contact your authorized local dealer.



① Front wheel track

- 11.2-24 with rim & disk (W10x24)

② Rear wheel track

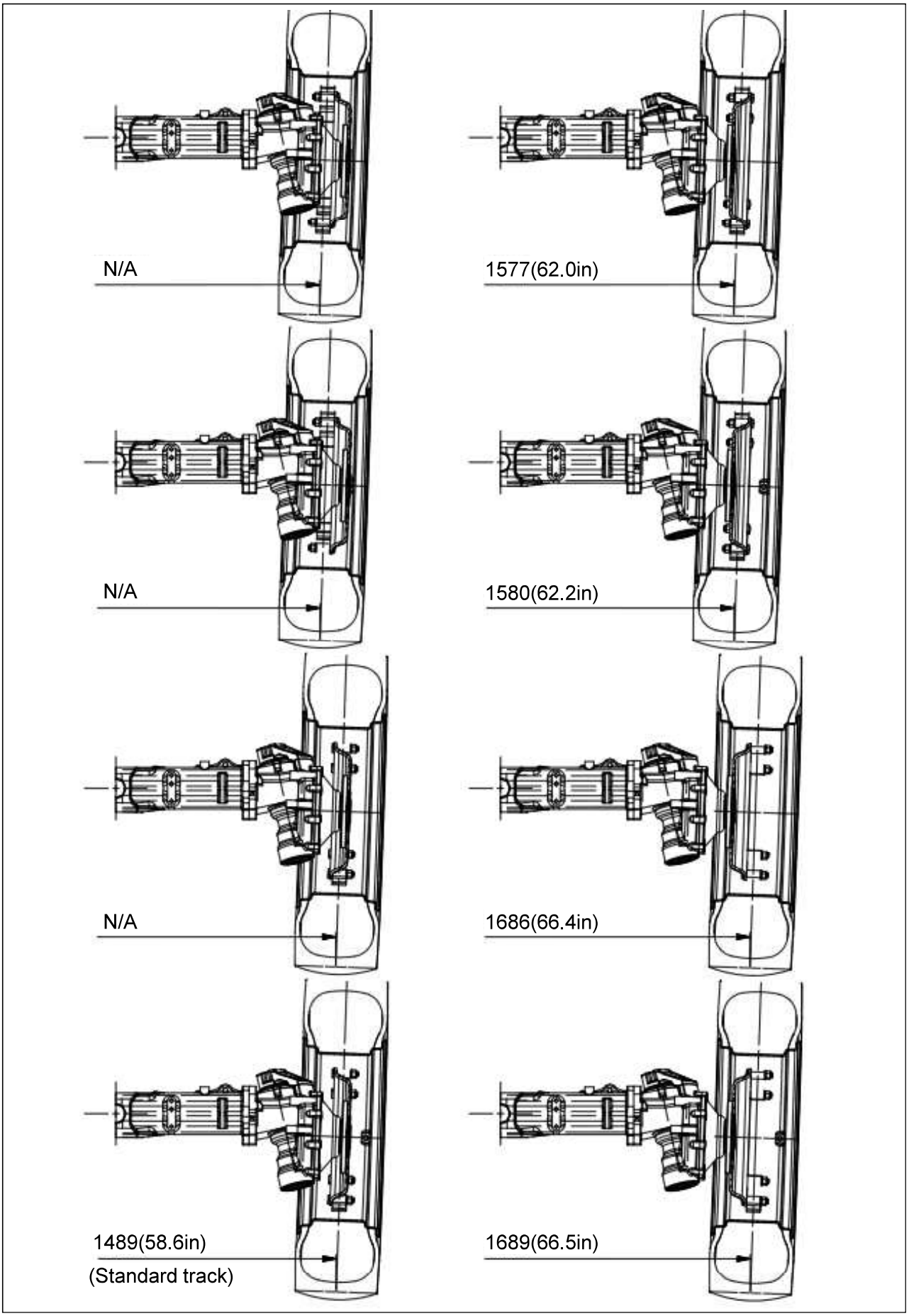
- 16.9-30 with rim & disk (W15x30)

⚠ Warning	▶ The tractor wheels are very heavy, PLEASE 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. For agricultural tires, 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.**

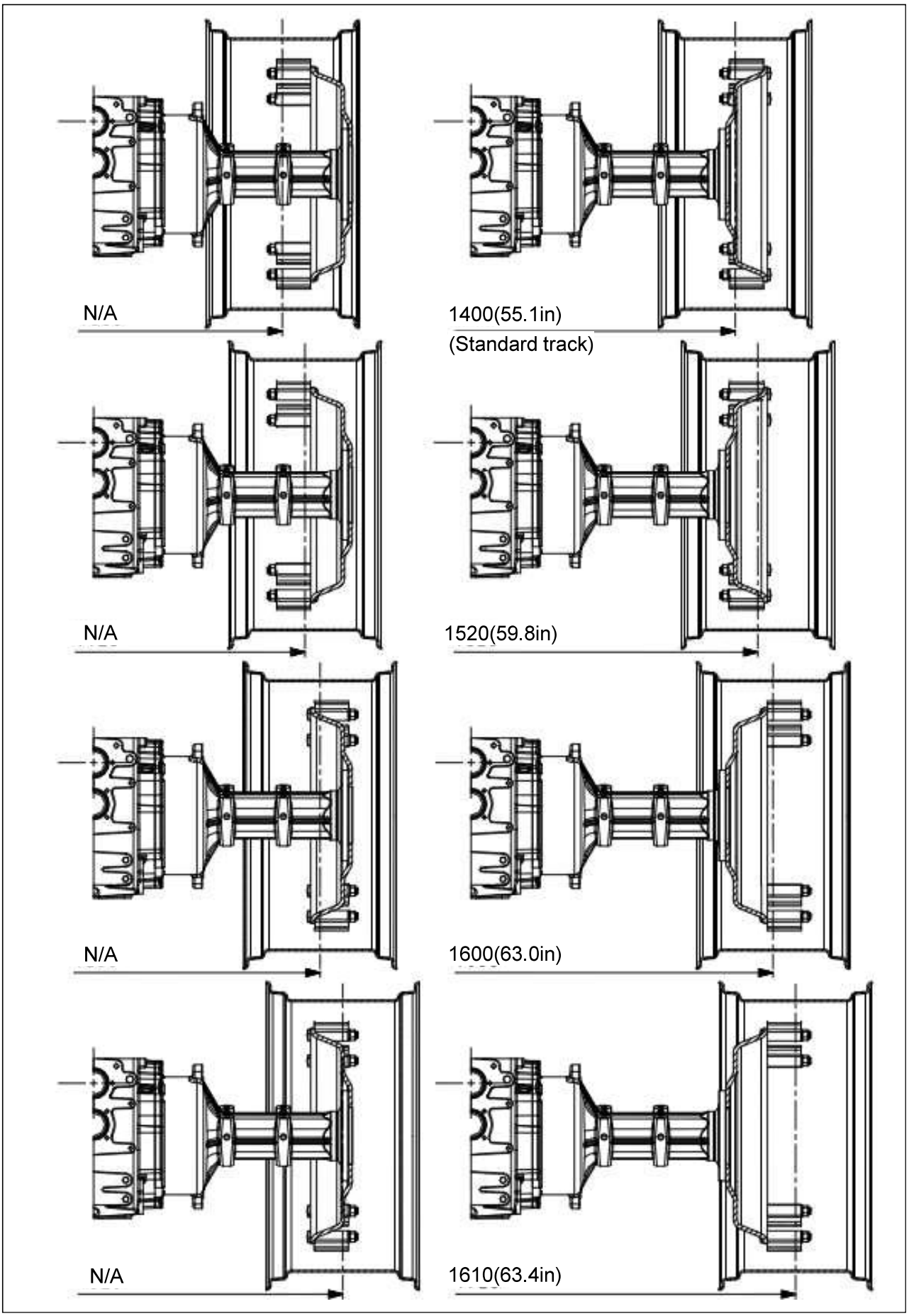
① Front wheel track – 11.2-24 with rim & disk (W10x24)

Unit : mm (inch)



② Rear wheel track – 16.9-30 with rim&disk(W15x30)

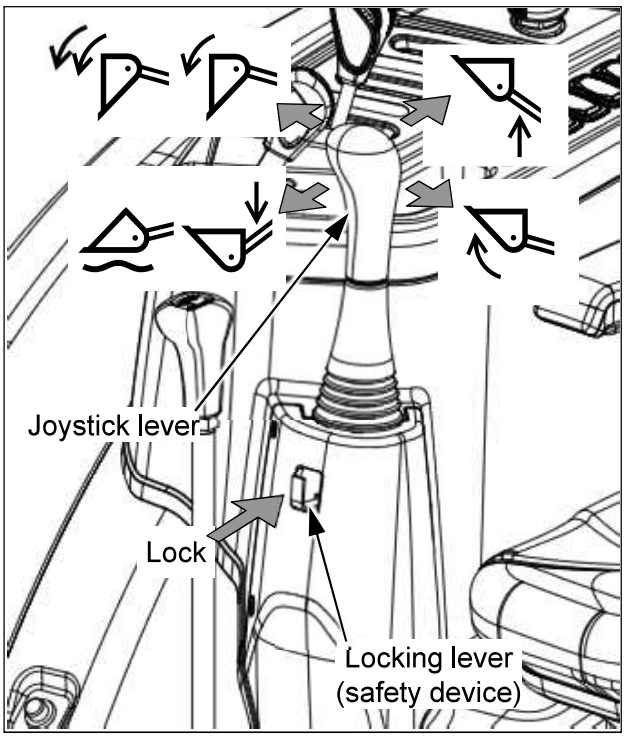
Unit : mm (inch)



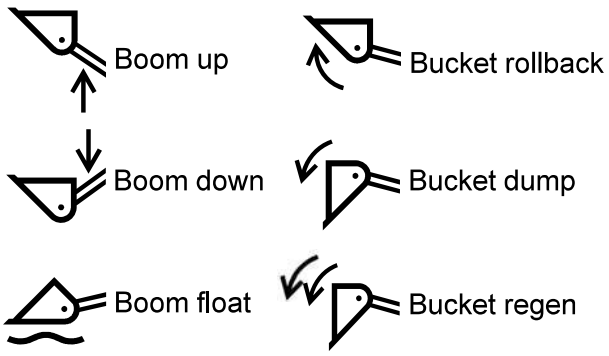
(7) Using Front-end loader (optional)

① Safety precautions

- If attaching a non-approved front-end loader or heavy front-mounted implement, the engine block or front axle can be damaged or broken. Contact your authorized local dealer.
- Do not attach any non-approved front-mounted implement by manufacturer. If it is ignored, any warranty is not effective no longer.
- If an approved front-end loader is attached, multi-functional joystick lever in the right figure can provide you more convenient operation.
- When operating the tractor with a 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 rear ballast on the 3-point linkage or rear wheels(if applicable) to prevent 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. Make sure to observe people and other vehicles around the tractor.
- DO NOT allow people under the front-end loader while lifted.
- DO NOT allow people on the bucket.



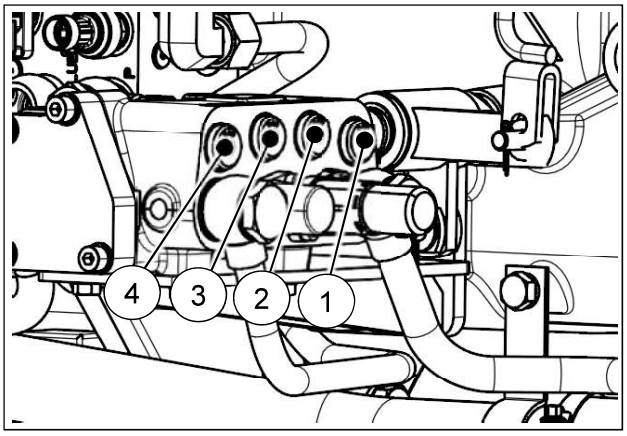
<Meaning of Symbols>



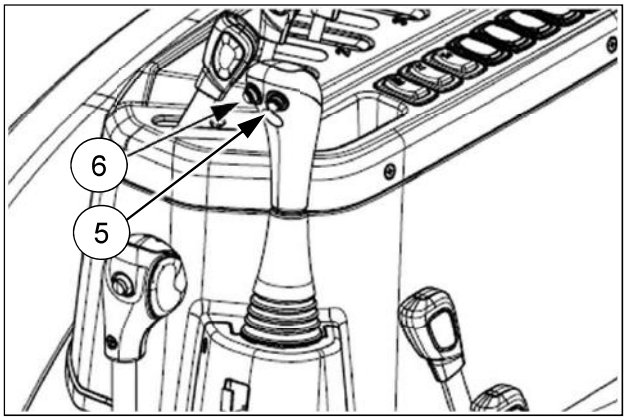
⚠Warning	**TO AVOID PERSONAL INJURY !** ▶ After using the front-end loader, secure the locking lever to the lock position. ▶ When leaving the tractor, lower down the front-end loader on the ground. ▶ Do not lift the front-end loader to a height from which objects may fall or roll onto the driver. ▶ Use always the correct attachment (grab forks, buckets.. etc.) for the specific task to perform and ensure that the load is securely kept in place.

⚠Caution	**PRE-OPERATION CHECK, REAR BALLAST !** ▶ For tractor stability and operator's safety, when attaching a front-end loader or an attachment, rear ballast should be added to the rear of the tractor in the form of implements as counter weight like Back Hoe, Rotary Tiller, etc. The amount of rear ballast will be depend on the application. ▶ Also, you should detach the front ballast weight plates and bumper(if fitted) when attaching the front-end equipment.

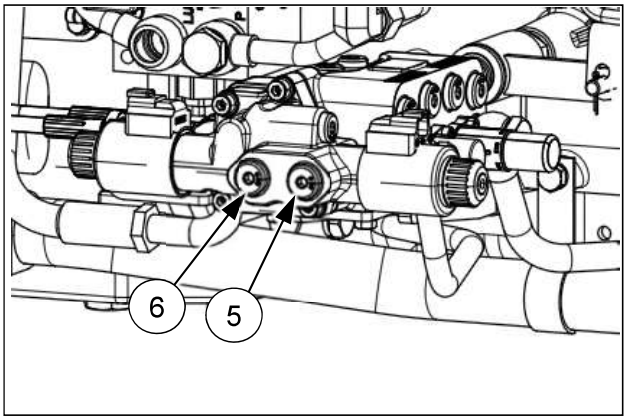
② Connection of hydraulic hoses



- Refer to the following instruction for connections of hydraulic hoses.
- For basic joystick lever;
  Boom down ------ outlet ①
  Boom up ---------- outlet ②
  Bucket up --------- outlet ③
  Bucket dump ----- outlet ④
- The thread specification of outlet ports is PF 3/8. Use suitable quick couplers for hose connection. If possible, contact your authorized local dealer.

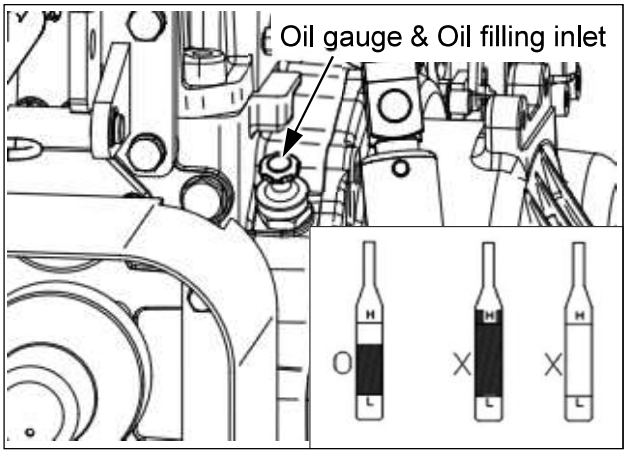


- The electric switches(if fitted) installed on the joystick lever are used to operate the solenoid valve having outlet ports ⑤,⑥ as below. When pressing these switches;
  Left-hand switch : oil flows to outlet ⑤
  Right-hand switch : oil flows to outlet ⑥



- After connecting the hoses, start the engine and check the leakage of the hydraulic lines.

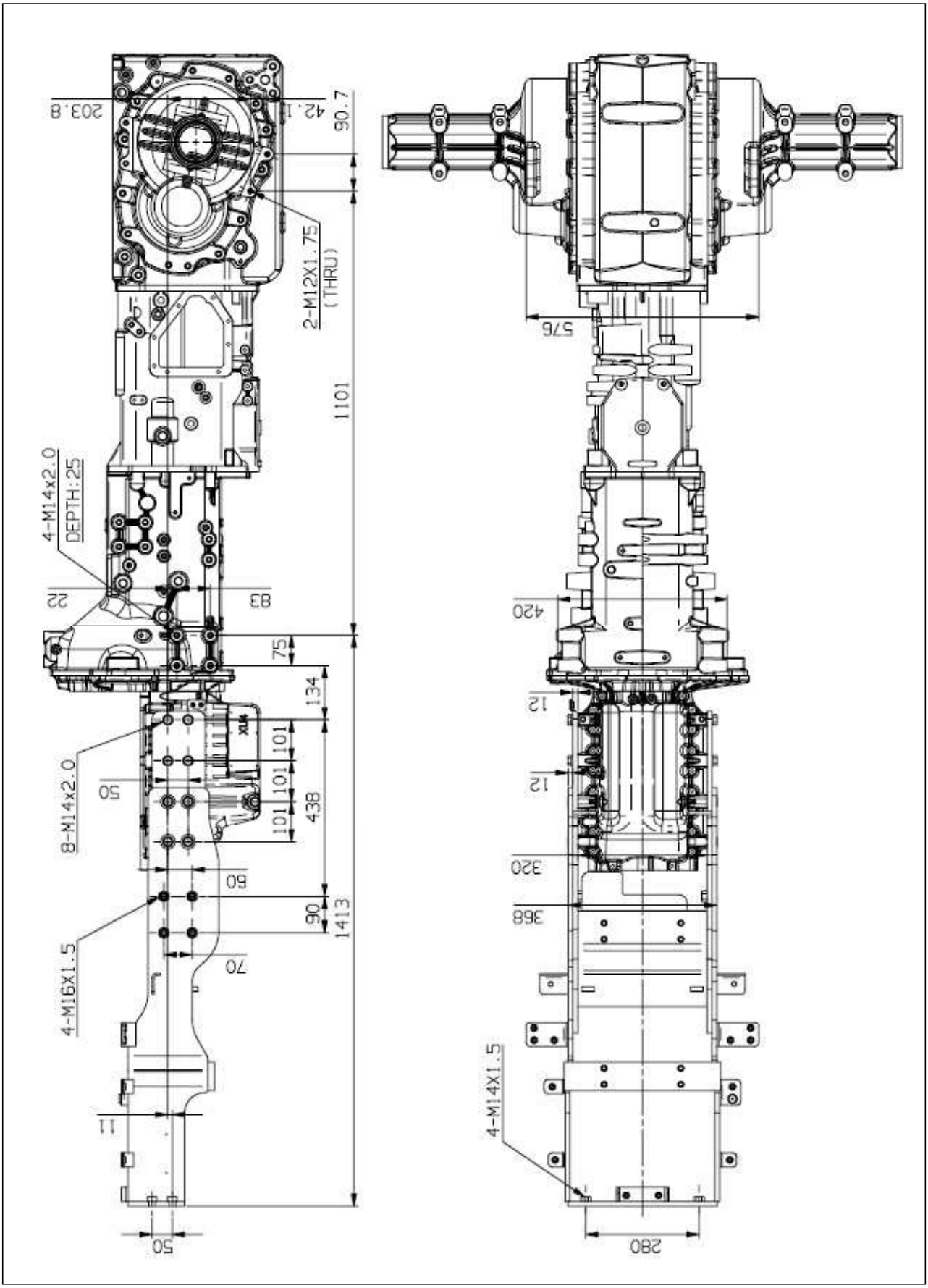
NOTICE: *After lowering the front implement, check if the transmission oil level is marked between "Min" and "Max" scale on the oil gauge. If necessary, add new oil.*



③ Attaching points for Front-end loader

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

(Unit : mm)



(8) Adjusting Steering Angle

- The steering angle must be checked or adjusted in the following cases;
  - When the front wheel track is adjusted.
  - When the front tires are replaced with new tires of larger diameter or width.
  - When installing a front equipment such as front-end loader.
- Comply with the following instructions.

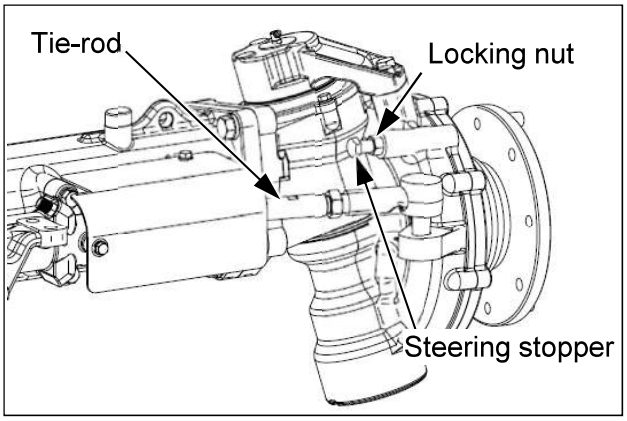
1) Loosen the locking nut on both sides.

2) Connect the front hook of the tractor to the suitable hoist by using a 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 tires and other parts are ***over 20mm (0.8 in.) at least.***

4) At this time, set each steering stopper on 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 on both sides.



Notice	▶ DO NOT shorten the length of the steering stopper beyond the factory condition. If the stopper does not contact the cast at maximum steering condition, it can cause damage to the steering cylinder or linkage.

(9) Recommended maximum Specification of Implements

- When attaching an implement to the tractor, refer to the following specifications recommended for the maximum capacity of each implement. DO NOT attach any bigger implement than these specifications. For other implements not mentioned, contact your authorized local dealer.

No.	Implements	Specification	MT463	MT473
1	Trailer	Total weight	See chapter 4-5-(3) in this manual	
2	Mid mower	Max cutting width	-	-
3	Rear mounted mower	Max cutting width	2134 mm (84 in.)	2134 mm (84 in.)
4	Flail Mower	Max cutting width	2200 mm (86 in.)	2200 mm (86 in.)
5	Sickle Bar	Max cutting width	2134 mm (84 in.)	2134 mm (84 in.)
6	Rear mounted Sprayer	Total weight (Sprayer+Liquid)	700 kg (1543 lb)	700 kg (1543 lb)
7	Pull type Sprayer	Total weight	See chapter 4-5-(3) in this manual	
8	Rotary Tiller	Max tilling width	2134 mm (84 in.)	2134 mm (84 in.)
9	Furrow Plow	Max tilling width	2000mm (79 in.)	2000mm (79 in.)
10	Bottom Plow	Maximum size	1550 mm (61 in.)	1550 mm (61 in.)
11	Disk harrow (pull type)	Max harrowing width	2134 mm (84 in.)	2134 mm (84 in.)
12	Chisel Plow	Maximum width	2000 mm (79 in.)	2000mm (79 in.)
13	Front grader	Max working width	2100 mm (82 in.)	2100 mm (82 in.)
14	Rear blade	Max working width	2134 mm (84 in.)	2134 mm (84 in.)
15	Front loader	Max lift capacity (Bucket pivot point)	1227 kg (2705 lbs)	1227 kg (2705 lbs)
16	Landscape Rake	Max working width	2136 mm (84 in.)	2136 mm (84 in.)
17	Box blade	Max working width	2136 mm (84 in.)	2137 mm (84 in.)
18	Backhoe	Max weight (W/O Bucket)	-	-
19	Snow Blade	Max. width	2135 mm (84 in.)	2135 mm (84 in.)
20	Snow Blower	Max. working width	2100 mm (83 in.)	2100 mm (83 in.)

(10) Ballasting weights (optional)

Tractor ballasting

For sufficient traction and maximum performance in heavy draft operations, and to counterbalance rear-mounted equipment, weight should be added to the tractor in the form of liquid ballast, cast iron weights, or a combination of both. Only enough weight should be added to provide good traction and stability. Adding more weight than is needed results in unnecessary soil compaction, increased rolling resistance, and higher fuel consumption.

NOTE: *When adding weight to the tractor, verify the tire pressure is correct. See chapter 4-5-(5), "Tires and Load capacity" in this manual for tire pressures and permissible loads.*

Front end ballast may be required for stability and steering control when weight is transferred from the front wheels to the rear wheels as an implement is raised by the tractor's three-point hitch.

Use the following as a general guide:

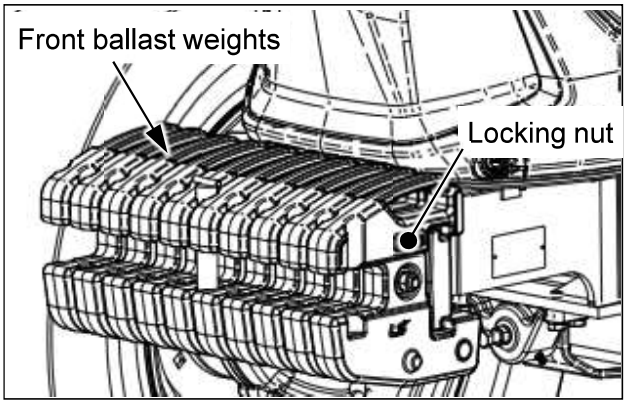
- Ballast the tractor (less implement) so that approximately one-third of the tractor weight is on the front wheels. For optimum traction, tractors equipped with 4WD should be ballasted so that **40 – 45%** of machine weight is on the front wheels.
- When a rear mounted implement is raised to the transport position, the front wheel reaction should be at least **20%** of tractor weight.
- Add additional front end ballast as required for stability during operation and transport. Tractor front end ballast may not always maintain satisfactory stability if the tractor is operated at high speed on rough terrain. Reduce tractor speed and exercise caution under these conditions.
- When using front-mounted equipment, add weight to the rear axle to maintain good traction and stability. Front-mounted equipment varies in weight. Refer to equipment manual for ballasting.

Weighting limitations

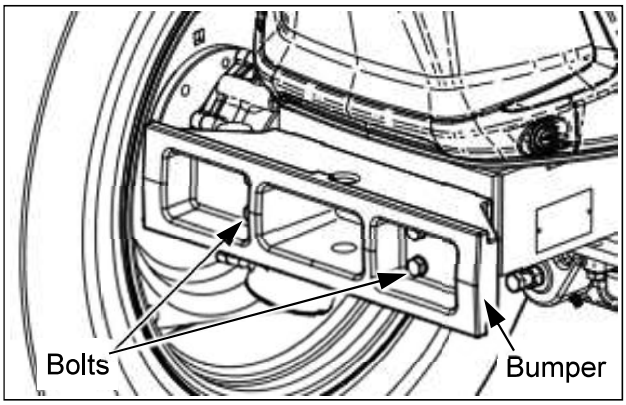
The weighting limitations that follow are limitations only. They do not imply that the tractor should be weighted to attain the weights given. Use only enough weight to obtain good performance.

① Front ballasting weights (optional)

- It is used to balance the front/rear weight of the tractor.
- To remove the front ballast weights, unscrew the locking nut of the front ballast weights and disassemble the weight plates one by one.
  Front ballast weight (kg):
  20kg x 4ea = 80kg
  20kg x 6ea = 120kg
  20kg x 8ea = 160kg
  20kg x 10ea = 200kg



- To remove the bumper, connect the bumper to a suitable hoist and unscrew the bolts as shown in the right figure.
  Bumper weight (kg): 33kg



- When assembling the ballast weights, comply with the reverse procedure of disassembly.
- For additional ballast weights and adjustments, contact your authorized local dealer.

⚠ Warning	**Heavy parts!** ▶ The ballast weights are very heavy. When removing/attaching the ballast weights, please be careful and use a suitable hoist and specific equipment to move the heavy parts. Failure to comply could result in death or serious injury.

⚠ Caution	▶ You should detach the front ballast weight plates and bumper(if fitted) when attaching the front-end equipment.

② Rear ballasting weights (optional)

- Rear wheel weights

NOTE: *Rear wheel weights are not available.*

- Rear ballast weights on the 3-point linkage

- To mount the ballast weights on the rear of the tractor, an additional weight bracket must be installed on the rear three-point hitch.
- Contact your authorized local dealer for the bracket.
- If you hard to get the bracket, you can use an equivalent weight rear implement as the ballasting weight.

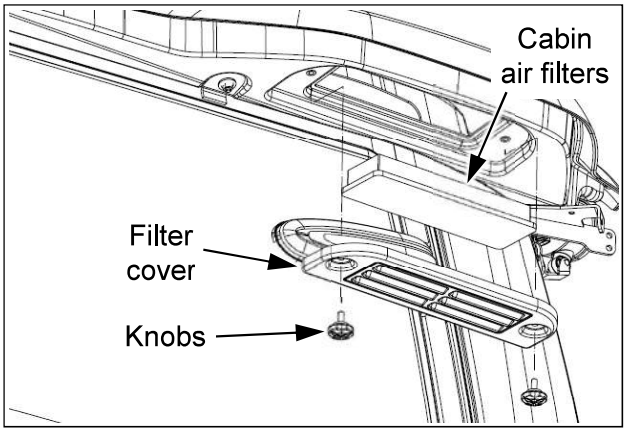
⚠Warning	**Heavy parts!** ▶ The ballast weights are very heavy. When removing/attaching the ballast weights, please be careful and use a suitable hoist and specific equipment to move the heavy parts. Failure to comply could result in death or serious injury.

(11) Working in hazardous area

- **Level of protection against hazardous substances: For cabin models**, it does **NOT** provide any protection against hazardous substances. But it can provide only dust protection level by pressurizing air in the cabin with air filters. Do not use the tractor with crop sprayers in hazardous area. If unavoidable, comply with the following instructions.

① Cabin air filters (LH/RH)

- When operating with pesticides, cabin air filters should be replaced with specific charcoal filters. Contact your authorized local dealer.
- In additional, you should wear the protective clothing, globes, mask, etc. before operating in such a hazardous spraying area.
- These filters must only be fitted when working with pesticides and replaced with the normal paper filters at the end of work.



⚠Caution	▶ Do not use these filters during other work, as they will quickly become clogged with dust. When replacing the charcoal filters at the end of spraying work, return them to the original packaging and make sure that they are carefully sealed. ▶ The charcoal filters last for approximately 50 hours of work. They must, however, be replaced each year. If, when working with pesticides, toxic odors are noted, stop the work immediately and replace the filters with new ones. ▶ These filters must never be washed or cleaned with compressed air. Discarded filters must not be thrown away. Take disposed filters to authorized collection points.

⚠Warning	▶ The charcoal filters do not guarantee full protection against all pesticides. ▶ These specific filters only reduce the harmful effects of these products. As a result, operator has to comply with the safety rules recommended for using each single product. Wear the protection clothing, globes, mask, etc. before operating in that area. ▶ DO NOT operate the tractor in heavy pesticides or other hazardous spraying area.

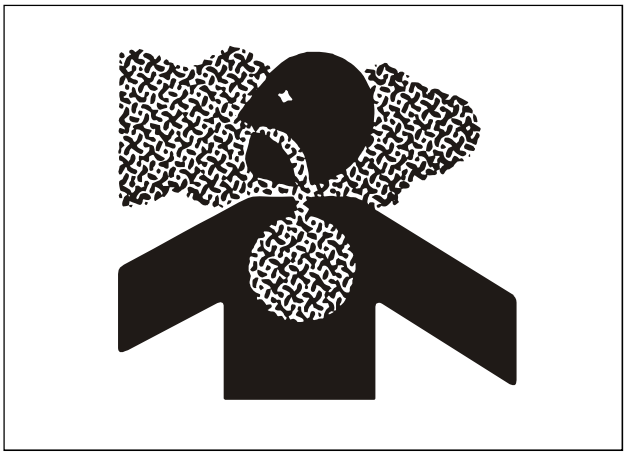
Notice	▶ The filters are made of specially treated media with a rubber sealing strip bonded around the sides. Take care not to damage the element during installation.

② Cleaning the cabin inside

- Protective clothing worn when handling the sprayer with pesticides or when carrying out external works, must be removed and stored away carefully before re-entering the cabin.
- After working with pesticides, ventilate the cabin and clean the inside parts (interior trim, panels, step, etc.) of the cabin with clean damp cloth to remove the chemical residue.

- **Level of protection against hazardous substances:**

- **For roll-bar models**, it does NOT provide any protection against hazardous substances. Do not use this tractor with crop sprayers in hazardous area.



4-6. Driving speed

- Driving speed of the tractor or revolution speed of the PTO shaft must be selected appropriately depending on the type of work, tires or ground conditions. For safety, operate the tractor at a suitable speed. **(Unit : Km/h -> Mile/h)**

(1) Front tire : 11.2-24 / Rear tire : 16.9-30

① F16xR16 – Synchro shuttle / Power shuttle transmission

Range gear shift		1				2				3				4			
Main gear shift		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
For-ward	Km/h	1.21	1.44	1.69	2.26	2.74	3.25	3.82	5.12	6.06	7.19	8.45	11.32	15.69	18.61	21.87	29.29
	mph	*0.75*	*0.89*	*1.05*	*1.41*	*1.70*	*2.02*	*2.38*	*3.18*	*3.77*	*4.47*	*5.25*	*7.03*	*9.75*	*11.56*	*13.59*	*18.20*
Rev-erse	Km/h	1.07	1.27	1.49	2.00	2.43	2.88	3.38	4.53	5.36	6.36	7.47	10.01	13.88	16.46	19.34	25.90
	mph	*0.67*	*0.79*	*0.93*	*1.24*	*1.51*	*1.79*	*2.10*	*2.81*	*3.33*	*3.95*	*4.64*	*6.22*	*8.62*	*10.23*	*12.02*	*16.10*

NOTE: *Engine rated speed 2500 rpm, dynamic load radius 712mm(28.0in)*

5. Lubrication and Maintenance

5-1. General information

- Adequate lubrication and maintenance on a regular schedule is vital to maintaining your equipment. To ensure long service and efficient operation, follow the lubrication and maintenance schedules outlined in this manual. The use of proper fuels, oils, grease and filters, as well as keeping the systems clean, will also extend tractor and component life.

NOTICE: *While any company can perform necessary maintenance or repairs on your equipment, we strongly recommend that you use only authorized local dealers and products that meet the given specifications. Improperly or incorrectly performed maintenance and repair voids the equipment warranty and may affect service intervals.*

NOTICE: *Always use genuine replacement parts, oils and filters to ensure proper operation, filtration of engine and hydraulic systems. See your authorized local dealer for additional oil quantities. Regular lubrication is the best insurance against delays and repairs. Proper lubrication will extend tractor life. Refer to the following charts for lubricants and service intervals.*

NOTICE: *Failure to complete the required maintenance at the recommended intervals can cause unnecessary downtime.*

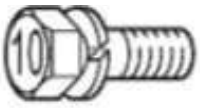
- The intervals listed in the Lubrication Chart are guidelines to be used when operating in normal conditions. Adjust the intervals for operating in adverse environmental and working conditions. The intervals should be shortened for sandy, dusty and extremely hot operating conditions.

⚠Warning	▶ **Avoid injury!** **1. Disengage all drives.** **2. Engage parking brake.** **3. Lower all attachments to the ground, or raise and engage all safety locks.** **4. Shut off engine.** **5. Remove key from key switch.** **6. Wait for all tractor movement to stop.** **Failure to comply could result in death or serious injury.**
⚠Warning	▶ **Entanglement hazard!** **Disengage the Power Take-Off (PTO), turn off the engine, and remove the key. Wait for all movement to stop before leaving the operator's position. Never adjust, lubricate, clean, or unplug tractor with the engine running. Failure to comply could result in death or serious injury.**
⚠Warning	▶ **Illustrations in this manual may show protective shielding open or removed to better illustrate a particular feature or adjustment.** **Replace all shields before operating the tractor.** **Failure to comply could result in death or serious injury.**

- Always clean the area around dipsticks, fill caps, and check plugs when checking fluid levels. Failure to clean these areas may allow contamination to enter the system. Drain, flush and refill the system any time you suspect it is contaminated.

(1) Tightening Torque for normal assembly

- Check if the bolts or nuts of each part are loosened. If necessary, tighten it again as referring to the following table. For additional hardware, contact your authorized local dealer.

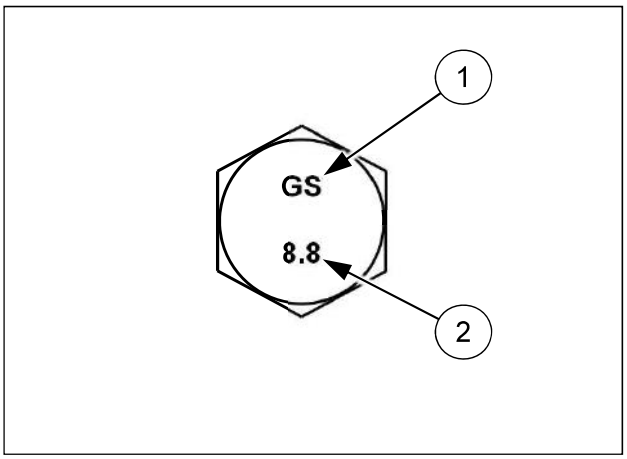
Strength class marks		
4T	8T	10.9T
		

Spec.	Tool (mm)	Strength	Hardware tightening torque, Unit : N.m(lbf-ft)		
			Re-use	Permanent	Maximum
M8 X 1.25	12	8.8	20(15)	24(18)	26(19)
		10.9	28(21)	34(25)	39(28)
		12.9	33(25)	40(29)	45(33)
M10 X 1.25	17	8.8	43(31)	51(38)	56(42)
		10.9	61(45)	73(54)	83(61)
		12.9	71(53)	86(63)	97(71)
M12 X 1.25	19	8.8	75(56)	90(67)	100(74)
		10.9	108(80)	129(95)	147(108)
		12.9	126(93)	151(112)	171(126)
M12 X 1.75	19	8.8	68(50)	82(60)	90(67)
		10.9	98(72)	117(86)	133(98)
		12.9	114(84)	137(101)	155(114)
M14 X 1.5	22	8.8	119(87)	142(105)	157(116)
		10.9	170(125)	204(150)	231(170)
		12.9	198(146)	238(176)	270(199)
M16 X 1.5	24	8.8	180(133)	216(159)	238(176)
		10.9	257(190)	309(228)	350(258)
		12.9	301(222)	361(266)	409(301)
M18X 1.5	27	8.8	271(200)	325(240)	358(264)
		10.9	375(276)	450(332)	510(376)
		12.9	438(323)	526(388)	595(439)
M20 X 1.5	30	8.8	379(279)	454(335)	500(369)
		10.9	523(386)	628(463)	712(525)
		12.9	612(451)	734(542)	832(613)
M22 X 1.5	32	8.8	506(373)	608(448)	668(493)
		10.9	700(516)	840(619)	952(702)
		12.9	818(603)	982(724)	1112(820)
M24 X 2	36	8.8	643(474)	771(569)	848(625)
		10.9	888(655)	1066(786)	1208(891)
		12.9	1038(766)	1246(919)	1411(1041)
M30 X 2	46	8.8	1311(967)	1573(1160)	1729(1276)
		10.9	1812(1336)	2174(1604)	2465(1818)
		12.9	2118(1562)	2542(1875)	2878(2123)

Identification markings

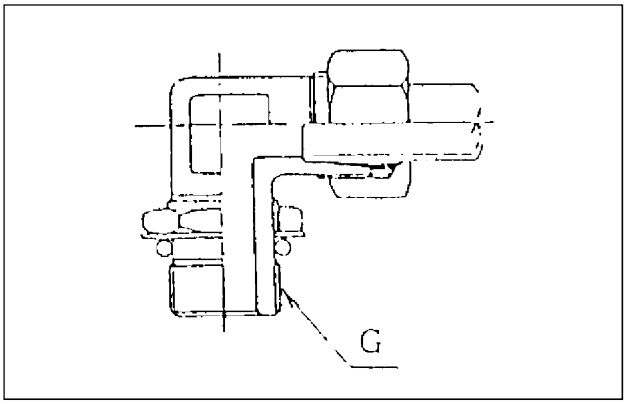
Metric hex bolt head

1. Manufacturer's identification
2. Property class



(2) Standard torque data for hydraulics

Installation of adjustable fittings in straight thread O-ring bosses



1. Lubricate the O-ring by coating it with a light oil or petroleum.

2. Install the O-ring in the groove adjacent to the metal backup washer which is assembled at the extreme end of the groove.

3. Install the fitting into the straight thread boss until the metal backup washer contacts the face of the boss.

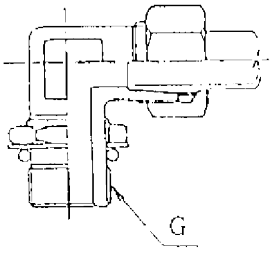
NOTICE: *Do not over tighten and distort the metal backup washer.*

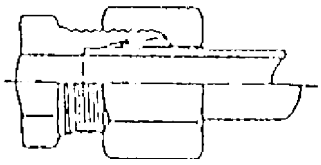
4. Position the fitting by turning out (counterclockwise) up to a maximum of one turn.

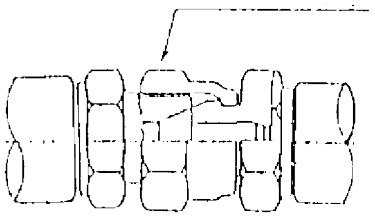
5. Holding the pad of the fitting with a wrench, tighten the locknut and washer against the face of the boss.

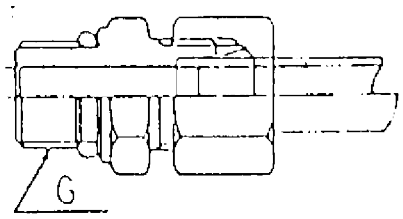
Standard torque data for hydraulic tubes and fittings

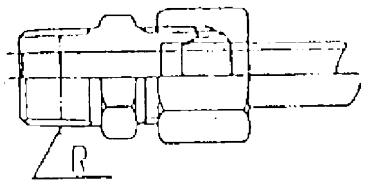
NOTICE: *These torques are recommended for hydraulic tubes of your tractor. When assemble the hydraulic lines, refer to the following torques on each application. Before installing and torquing pipe fittings, Clean the threads and faces.*

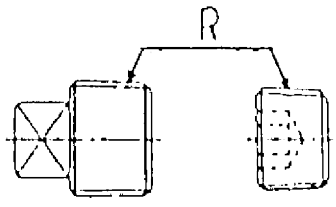
Thread	Torque		Figure	Remarks
	N · m	{kgf · m}		
G 1/4	49~69	5~6		1. Materials of threaded hole: Cast or steel.
G 3/8	59~69	6~7		
G 1/2	78~88	8~9		

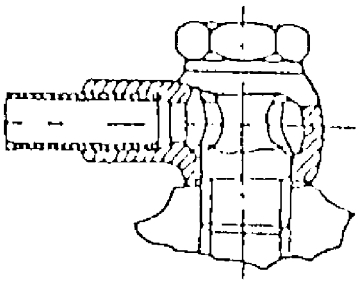
Pipe spec.		Pre-torque		Tightening torque		Figure	Remarks
Outer dia.	Thickness	N · m	{kgf · m}	N · m	{kgf · m}		
8	1~1.5	29~34	3~3.5	29~34	3~3.5		Pipe material: OST
10	1~1.5	29~39	3~4	34~49	3~3.5		
12	1~2.5	44~59	4.5~6	49~69	5~7		
15	1~2.5	69~98	7~10	88~118	9~12		
18	1.5~2	118~147	12~15	146~167	15~17		
20	2~3	147~177	15~18	167~206	17~21		
22	2	177~206	18~21	196~235	20~24		
27.2	2.8	323~343	33~35	343~373	35~38		SGP

Thread	Torque		Figure	Remarks
	N · m	{kgf · m}		
G 1/8	15	1.5		
G 1/4	25	2.6		
G 3/8	49	5		
G 1/2	59	6		
G 3/4	118	12		

Thread	Torque		Figure	Remarks
	N · m	{kgf · m}		
G 1/8	20~25	2~2.5		1. Materials of threaded hole: Cast or steel.
G 1/4	39~49	4~5		
G 3/8	49~59	5~6		
G 1/2	59~69	6~7		
G 3/4	118~127	12~13		

Thread	Torque		Figure	Remarks
	N · m	{kgf · m}		
G 1/8	15	1.5		1. Apply seal tape before assembling 2. Threaded hole: Taper or parallel steel or cast
G 1/4	25	2.6		
G 3/8	49	5		
G 1/2	59	6		

Thread	Torque		Figure	Remarks
	N · m	{kgf · m}		
G 1/8	15	1.5		1. Apply seal tape before assembling 2. Threaded hole: Taper or parallel steel or cast
G 1/4	25	2.6		
G 3/8	49	5		
G 1/2	59	6		
G 3/4	118	12		

Thread	Holes	Torque		Figure	Remarks
		N · m	{kgf · m}		
G 1/4	2	39~44	4.0~4.5		1. Materials of threaded hole: Cast or steel. 2. Assemble with packing washers. 3. Holes: Number of holes on the same section plane.
G 3/8	2	47~54	4.8~5.5		
	4	39~44	4.0~4.5		
G 1/2	4	47~54	4.8~5.5		
G 3/4	4	59~69	6.0~7.0		
M 12	2	20~27	2.0~2.8		
M 14	2	34~39	3.5~4.0		
	4	29~34	3.0~3.5		
M 16	2	49~59	5.0~6.0		
	4	39~44	4.0~4.5		

(3) General specification - Diesel fuel

- Only use diesel fuel that conforms to "**Lubricants and Capacity**" in this manual or equivalent in your engine. Do not use any other low grade diesel fuel.

NOTICE: *Use of other low grade diesel fuels will result in loss of engine power, high fuel consumption, and damage to the exhaust after-treatment system (if equipped).*

NOTE: *When operating the tractor in very cold climates, the use of winter blended fuel is permitted for a short period of time. See your fuel supplier for winter fuel requirements in your area.*

Fuel conditioner

- Diesel fuel conditioner is available from your authorized local dealer. Instructions for the use of the fuel conditioner are on the container.
- The use of diesel fuel conditioner will:
  - Clean fuel injectors, valves, and manifolds for increased service life.
  - Disperse insoluble gummy deposits that form in the fuel system.
  - Separate moisture from the fuel.
  - Stabilize fuel in storage.

NOTICE: *Use only manufacturer approved biocide additives to prevent damage to the exhaust after-treatment system (if equipped).*

(4) Biodiesel fuel

Fatty Acid Methyl Ester Biodiesel (Biodiesel Fuel) consists of a family of fuels derived from vegetable oils treated with methyl esters.

NOTICE: *Biodiesel Fuel blends are approved for your engine only if they comply with* ***EN14214*** *Specification Standards or* ***ASTM D6751****.*

NOTICE: *It is imperative that you check which blend is approved for your engine with your authorized local dealer. Be aware that the use of Biodiesel Fuel that does not comply with the Standards mentioned above could lead to severe damage to the engine and fuel system of your tractor. The use of fuels that are not approved may void manufacturer warranty coverage.*

Biodiesel approved blend

The use of biodiesel blends meeting Specification Standards ASTM 6751 or EN14214 is approved for your engine ***up to B7 (7% blend ratio)***. It is highly recommended to use biodiesel fuel from accredited suppliers to maintain quality and consistency of the fuel.

Biodiesel Fuel Usage Conditions

NOTICE: *The Biodiesel Fuel must meet the fuel Specification mentioned above.*

Biodiesel Fuel must be purchased from a trusted supplier that understands the product and maintains good fuel quality. Biodiesel Fuel must be pre-blended by the supplier. Mixing Biodiesel Fuels on-site can result incorrect mixture that can lead to problems with both engine and fuel system.

Engine performance is affected by the use of Biodiesel Fuel. There may be up to **12%** reduction in power or torque depending on the blend used.

NOTICE: *DO NOT modify the engine and/or injection pump settings to recover the reduced performance.*

The reduced power must be accepted if using any Biodiesel Fuel blend.

Some modification may be required to allow your engine to run Biodiesel Fuel. Consult your dealer for complete information on these modifications.

Biodiesel Fuel has a higher cloud point than Diesel Fuel.

NOTICE: *The use of high Biodiesel Fuel blends is not recommended in cold weather conditions.*

With Biodiesel Fuels, it may be necessary to change the engine oil, engine oil filter and fuel filter elements more frequently than with Diesel Fuels. For maintenance interval of the fuel filter, refer to the following table.

Biodiesel Fuel	Maintenance Interval of the fuel filter
≤ BD 7	500 hours
≤ BD 12	400 hours
≤ BD 20	250 hours

Biodiesel Fuel can remove rust and particles from the inside of on-site fuel storage tanks that would normally adhere to the sides of the tank. Like particle deposits that commonly occur with Diesel Fuel, these particles can become trapped by the tractor fuel filters, causing blockage and shortening filter life. In cold weather, this is more likely to happen. Consult your authorized local dealer for information on cold weather operation and proper maintenance intervals when using any Biodiesel Fuel blend.

When handling Biodiesel Fuel, care must be taken not to allow water into the fuel supply. Biodiesel Fuel will actually attract moisture from the atmosphere.

Fuel tanks must be kept as full as possible to limit the amount of air and water vapors in them. It may be necessary to drain the fuel filter water tap more frequently.

Potential oxidation and stability could be a problem with the fuel stored in the tractor.

NOTICE: *Tractor must not be stored for more than three months with Biodiesel Fuel blends in the fuel system.*

If long storage periods are necessary, the engine must run on Diesel Fuel for 20 hours to flush the Biodiesel Fuel out of the engine fuel system prior to storage.

NOTICE: *Biodiesel Fuel must not be stored in on-site storage tanks for more than three months.*

Any spillage of Biodiesel Fuel must be cleaned up immediately before it can cause damage to the environment and the paint finish of the tractor.

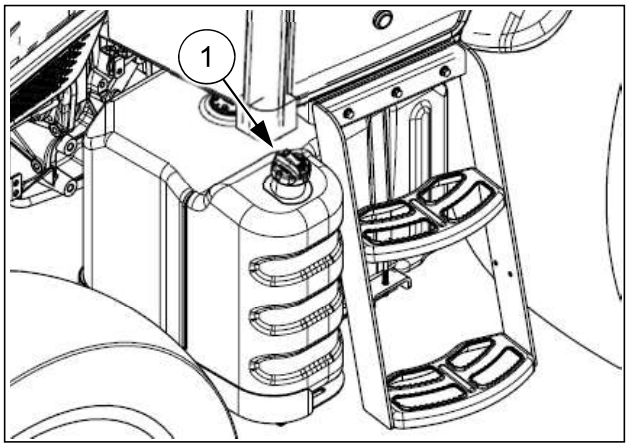
Before using Biodiesel Fuel blends you should consult with your dealer to receive full information about the approved blend for your tractor and any detailed conditions of its usage.

NOTICE: *Be aware that not fulfilling the requirements and conditions of Biodiesel Fuel usage will void your tractor's Warranty coverage.*

(5) Refueling the tractor

Warning	**Fire hazard!**
	▶ When handling diesel fuel, observe the following precautions: 1. Do not smoke. Keep any type of flame away. 2. Never fill the tank when the engine is running. 3. Wipe up spilled fuel immediately. Always tighten the fuel tank cap securely. Failure to comply could result in death or serious injury.

- The fuel tank filler cap① is installed as shown in the right-hand figure. Observe the following:



1. Before removing the cap, wipe all dust and dirt from around the cap to prevent debris from falling into the tank while filling.
2. Use an approved fuel container and check the inside of the container periodically for cleanliness.
   For fuel tank capacity, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.
3. If there is no filter on the storage tank or fuel container, filter the fuel through a 100-mesh or finer screen when filling the tractor fuel tank.
4. Keep the tractor tank as full as possible (without filling to capacity) to minimize condensation. Fill to the bottom of the filler neck to allow room for expansion.

NOTE: *It is a good practice to fill the fuel tank at the end of each day, as this will reduce overnight condensation.*

NOTE: *The fuel cap is a vented-type. Use only an approved replacement cap to prevent fuel system-related problems.*

- 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.
- Maintain control of the fuel filler nozzle when filling the fuel tank.
- Never use fuel for cleaning purposes.
- Arrange fuel purchases so that summer grade fuels are not held over and used in the winter.
- *Before handling Bio-diesel, refer to the chapter 5-1-(4) in this manual.*

(6) Change engine coolant to Organic Acid Technology (OAT) coolant

- Depending on the date of manufacture, your cooling system may be equipped with conventional ethylene glycol coolant or an Organic Acid Technology (OAT) coolant solution. You can easily identify **OAT coolant solution** by its yellow color. You should never mix the coolant types.
- The coolant solution used must meet the manufacturer's material specifications for either coolant type. Refer to the chapter 5-3, "Lubricants and Capacity" in this manual.

NOTICE: *NEVER mix OAT coolant with conventional coolant. Under no circumstances should you top off a cooling system with only water. You can use a refractometer to check the concentration level. You should not use Supplemental Coolant Additives (SCA) when using* **OAT coolant solution***. Change the coolant solution at the recommended change interval.*

If you need to change a tractor from conventional coolant to OAT coolant or vice versa, you should follow the "Changing coolant types" procedure below to attain the full benefit of the coolant.

Changing coolant types

To change coolant from OAT coolant to conventional coolant (or vice versa):

1. Empty the engine cooling system by draining the coolant into a suitable container.
2. Fill the system with clean water.
3. Start the engine and run the engine for at least **30 min**.

   NOTE: *Make sure that you activate the heating system (if equipped) to circulate fluid through the heater core.*

4. Repeat Steps 1 to 3 for a total of two washes.
5. Fill the system with conventional coolant (or OAT coolant).
6. Operate the engine until it is warm. Inspect the tractor for leaks.
7. If you are changing to OAT coolant, then attach the decal to indicate the use of OAT coolant in the cooling system.

Definitions

Conventional coolant:

A coolant that relies on inorganic inhibitors such as silicates, nitrites, and phosphates for corrosion and cavitation protection.

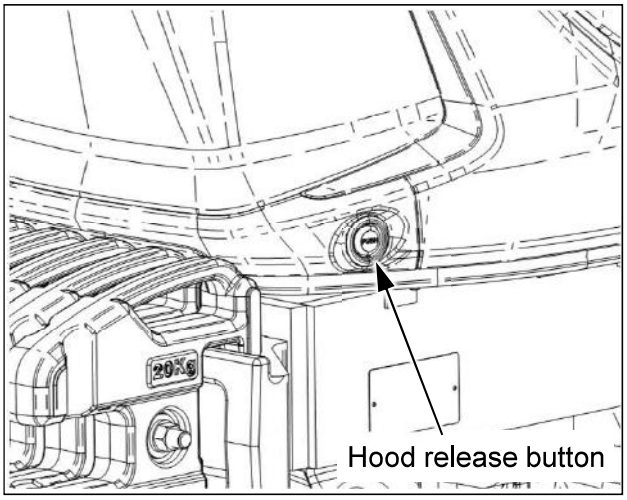
Organic Acid Technology (OAT) coolant:

A coolant that relies on inhibitors such as organic acid salts for corrosion and cavitation protection.

(7) Access for maintenance

① Opening Hood

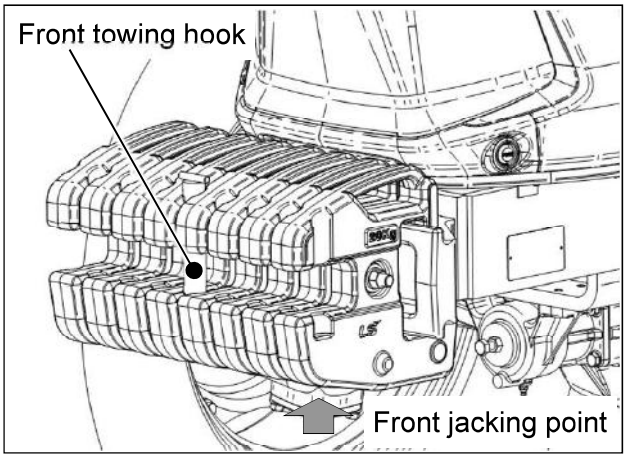
- For safety, the hood must be closed and correctly latched before operating the tractor.
- The hood is hinged at the rear and a gas cylinder is attached to provide easy access to the engine for check and maintenance.
- To open the hood, push the hood release button inward and lift the hood up.
- To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

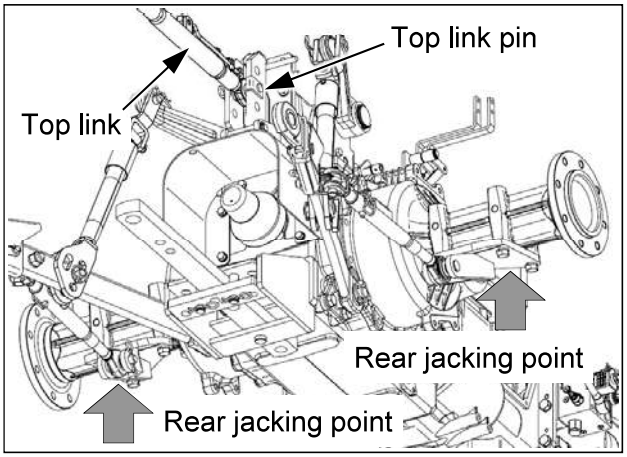


⚠Caution	▶ After the engine has stopped completely, you should open the hood for checking. ▶ If you open the hood while the engine is running, it can cause serious damage by intended or unintended access to the rotating shaft, pulley, V-belt, cooling fan of the engine or engine application parts. PLEASE 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 local 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 a flat surface under the engine frame end or bumper for jacking point, and additionally connect the front towing hook to the hoist for safety.
- For rear jacking points, two flat surfaces under the rear axle housings are recommended, and additionally use the top-link bracket and its pin for lifting point after removing the top-link.

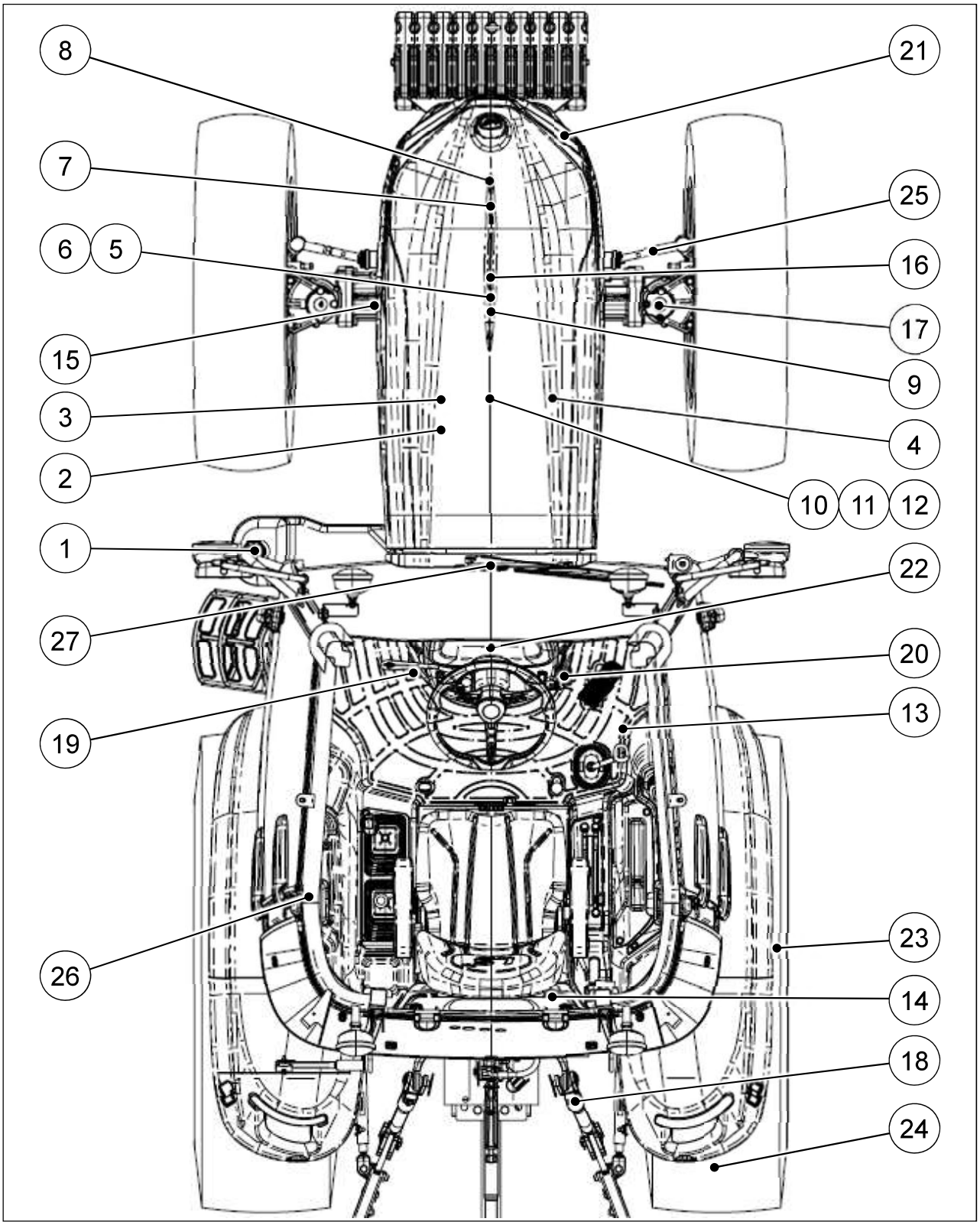




⚠Caution	▶ When lifting the rear of the tractor, apply chocks to the slots between front axle and engine frame symmetrically to prevent the tractor from rolling.

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 should be shorter than normal condition.



No.	Checking Parts	Page No.	Check period (Every ---- (hr))								
			Daily	50	100	300	500	600	1000 or 1-yr	1500 or 2-yr	3000
1	Fuel tank	5-20, 5-35	▲			■					
2	Fuel filter	5-27, 5-36	▲				●				
3	Engine oil	5-16, 19, 31, 32	▲	★	▲	●					
4	Engine oil filter	5-16, 5-32		★		●					
5	Engine coolant	5-22, 5-42	▲							●	
6	Radiator screen	5-23, 5-28	▲	■							
7	Air cleaner	5-22, 30, 37	▲	■			●				
8	Battery	5-30		▲							
9	Fan belt tension	5-16, 5-34		▲ (First)		▲					
10	Valve clearance	5-41							▲		
11	EGR Cooler, Injector Tips	5-45								■	
12	Fuel injector, DOC&DPF, Turbocharger, ECU, etc	5-46									■
13	Hydraulic oil filter	5-16, 5-33		★		●					
14	Transmission oil	5-29, 5-40		▲				●			
15	Front axle oil	5-29, 5-39		▲				●			
16	Front axle holder	5-28		▲							
17	Steering arm	5-28		▲							
18	3-Point linkage	5-28		▲							
19	Clutch pedal play	5-25	▲								
20	Brake pedal play	5-26	▲								
21	Turn signal lights, Lights, Horn	5-21	▲								
22	Instrument panel & Indicators	5-20	▲								
23	Bolts and Nuts retighten	5-24	▲							▲	
24	Tire air pressure	5-23	▲								
25	Toe-in	5-34				▲					
26	Cabin air filter	5-30, 5-38		■			●				
27	Hydraulic hoses	5-30		▲							

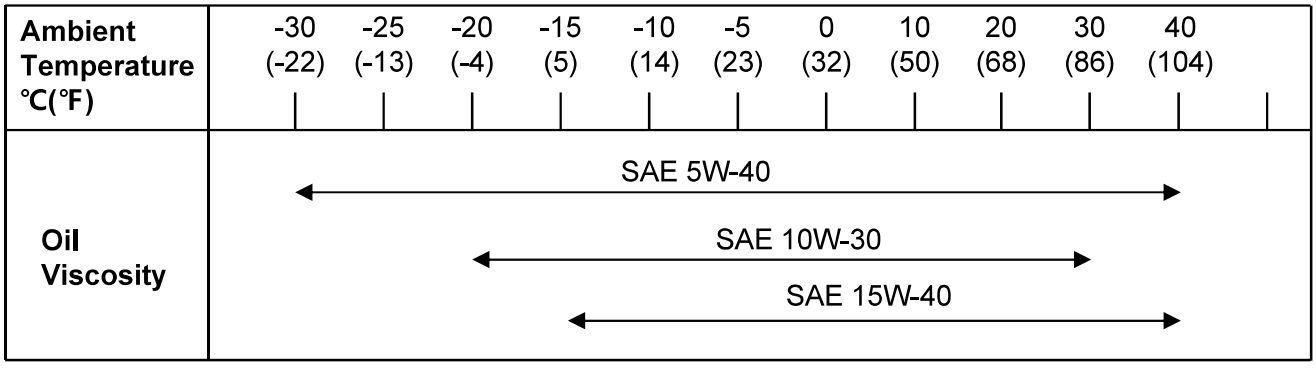
★ First Replacement ● Replacement ▲ Check, Adjustment and Supply ■ Clean up

5-3. Lubricants and Capacity

LUBRICANTS	CAPACITY	INTERNATIONAL STANDARD	RECOMMENDED ITEMS
Engine coolant	**11.5 ℓ** (3.0U.S.gals)	ASTM D6210	Soft water (50%)+ Anti-freeze (50%)
Fuel	**92 ℓ** (24.3U.S.gals)	- ASTM D975-08a Grade 2 - EN590 : 2009 Diesel fuel - BS2869 : 2006 Class A2	Ultra low sulfur diesel fuel, below 15 ppm
Engine oil	**7.0 ℓ** (1.8U.S.gals)	API CJ-4, ACEA E6/E9	KIXX DL (Maker : GS Caltex)
Transmission oil (common use for Hydraulic lift, hydraulic steering device)	**MEC : 62.5 ℓ** (16.5U.S.gals) **PST : 63.5 ℓ** (16.8U.S.gals)	API GL4 ISO VG 32/46	**LSTH400G** (Maker : GS Caltex)
Front axle oil	**8.6 ℓ** (2.3U.S.gals)	API-GL4 SAE 80W-90	EPK 80W90 (Maker : S-OIL TOTAL Co. Ltd.)
Grease (Front axle arm holder, Steering cylinder pin, 3-point linkage)	Proper amount	NLGI 2	MAHWAK Multi purpose or MAHWAK All purpose (Caltex)

RECOMMENDED ENGINE OIL VISCOSITIES

The correct engine oil viscosity grade is dependent upon ambient temperature. Refer to the below chart when selecting engine oil for your tractor.
In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable. Contact your authorized local dealer.



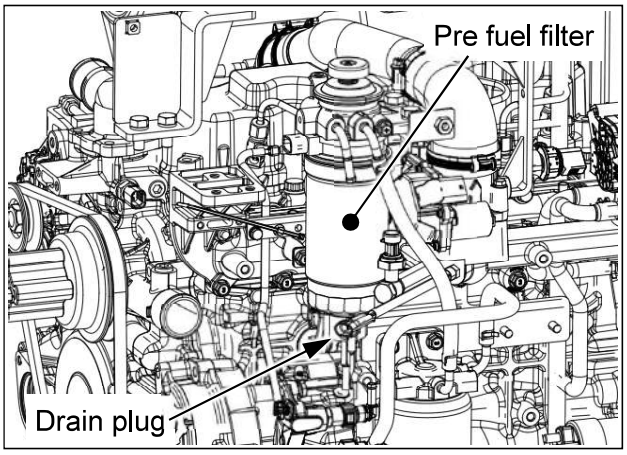
5-4. First 50 hour check

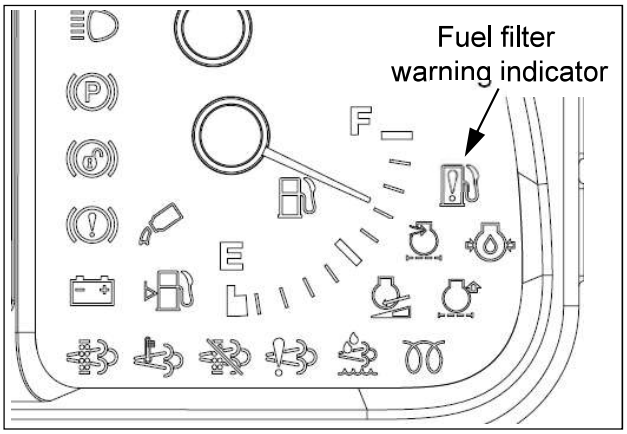
- After using first 50 hours, contact your authorized local dealer for maintenance if possible.
  - Replace engine oil & engine oil filter. (⇒ Refer to Every 300 hour check. *See page 5-32*)
  - Replace hydraulic oil filter. (⇒ Refer to Every 300 hour check. *See page 5-33*)
  - Check transmission / 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 (Where fitted)

5-5. When the warning indicator lights

(1) Drain water from Fuel filter

1. Loosen the drain plug and drain water from the inside of the filter. (Approx. 150cc(9.1 in³))
2. Tighten the drain plug and bleed air from the fuel filter. (*See page 5-47*)





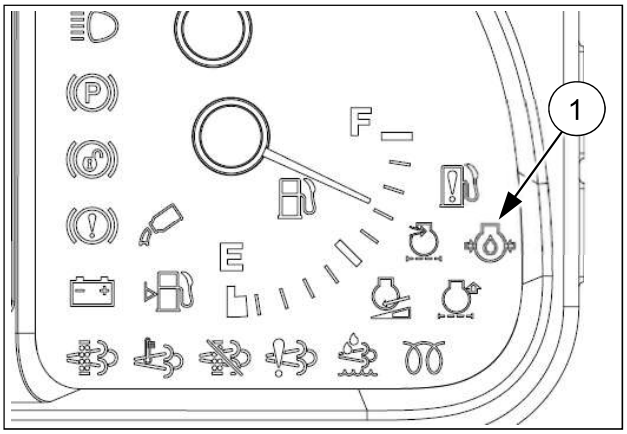
⚠Warning	▶ Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the key switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

⚠Caution	▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover disconnected fuel system component. Do not fill the new filter with fuel. Invisible fine contaminants can enter the injection pump and it may cause damage to the fuel injection system.

⚠Caution	▶Do not throw the exhausted waste fuel 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 environmental laws.

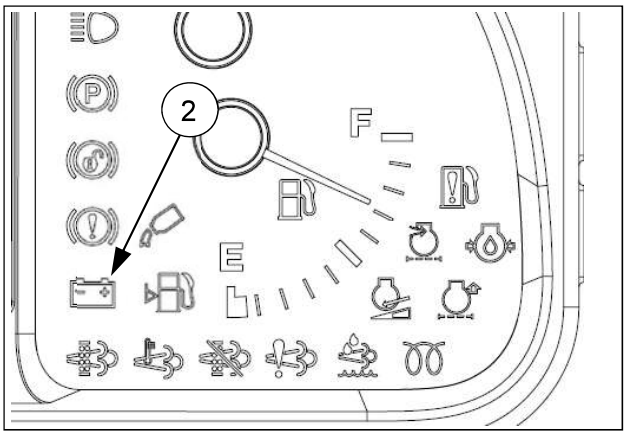
(2) Engine oil pressure indicator

- This indicator① will be turned on when turning the key switch from “OFF” to “ON” position. After starting engine, this indicator must be turned off.
- If this indicator turns on while the engine is running, STOP THE ENGINE IMMEDIATELY.
- Check the engine oil level first, and if necessary, add new engine oil and recheck the indicator.
- If the engine oil level is normal, it means that there is a problem on the lubrication system, contact your authorized local dealer for check.



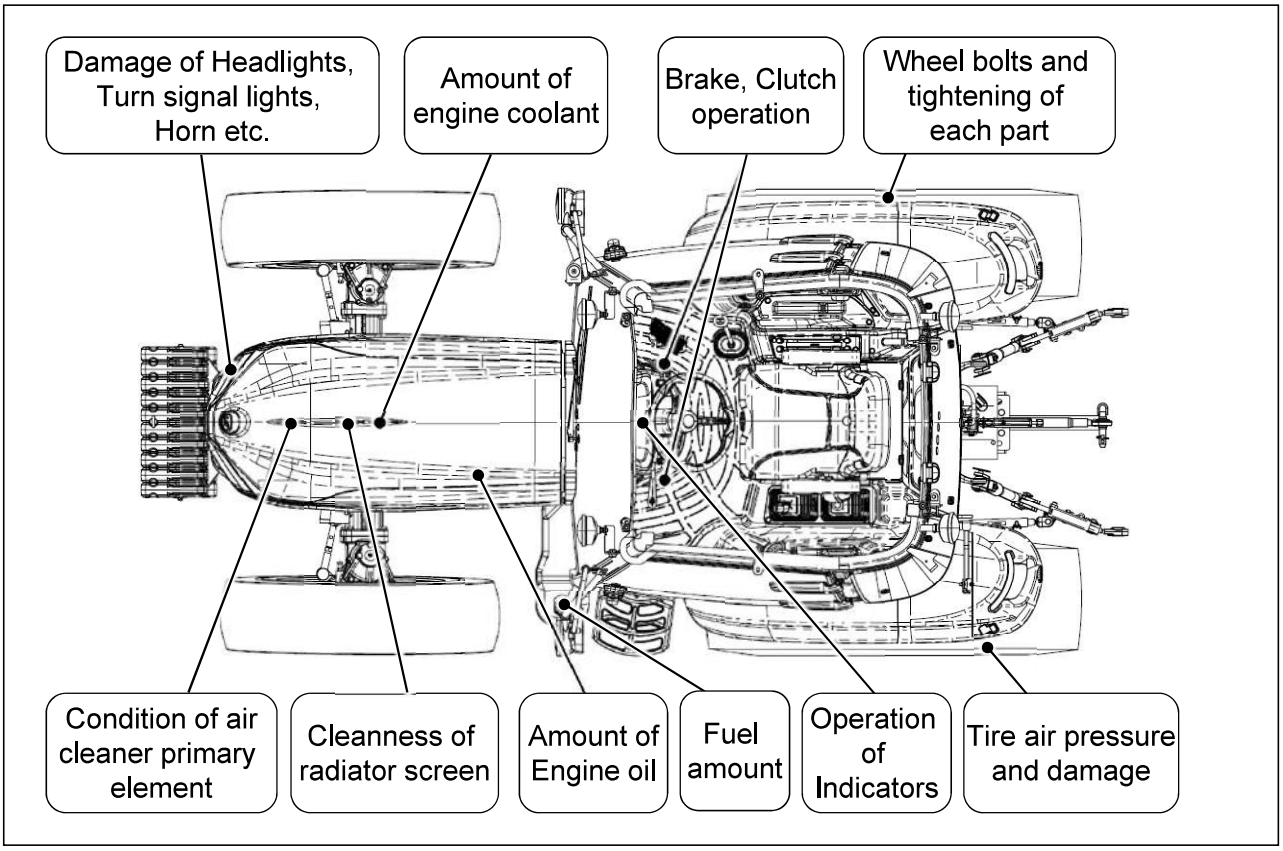
(3) Battery charging indicator

- This indicator② will be turned on when turning the key switch from “OFF” to “ON” position. After starting engine, this indicator must be turned off.
- If this indicator turns on while engine is running, it means that there is a problem on the electric charging system.
- If the problem is not cleared, stop the engine and contact your authorized local dealer for check.



5-6. Check before starting (Daily check)

● Before starting engine, check the followings carefully to avoid a failure or damage.

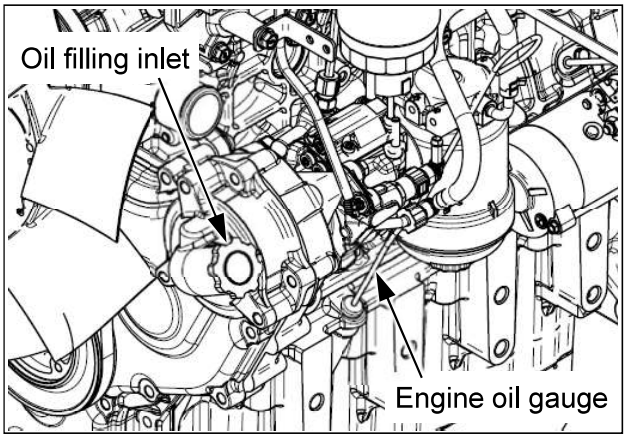


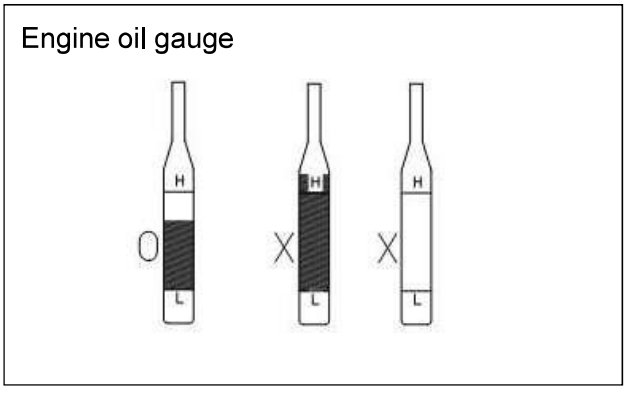
(1) Engine oil

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

● **Checking engine oil level**

- Check the engine oil level before starting engine or about 5 minutes later after stopping engine.
- Check if the oil level is between MAX and MIN marks of the oil gauge. If necessary, add new oil.
- If the oil level goes over the MAX level mark, contact your authorized local dealer for check.
- It must only be checked while the engine is stopped.
- If your engine is used in dusty/dirty conditions, the service interval must be shorter than normal condition.
- Replace the engine oil and engine oil filter after the first 50 hours of use.

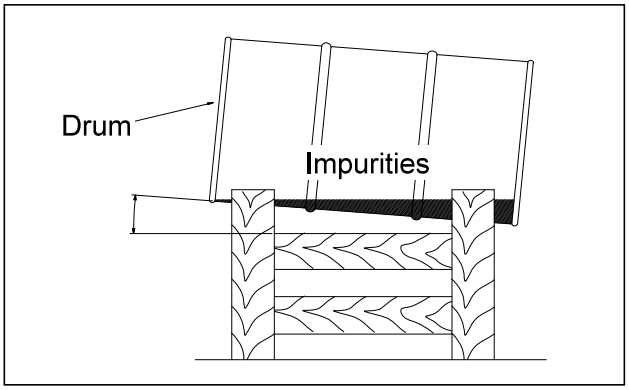




(2) Fuel tank

① Fuel specification and capacity :

- *See chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*
- If contaminants such as dust or water are mixed with the fuel, it can cause serious 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 with fuel at the gas station.



② Using diesel for winter

- General diesel fuel tends to generate paraffin dregs in cold weather which may cause a bad engine start. Thus, it is recommended to use diesel for winter in cold weather.

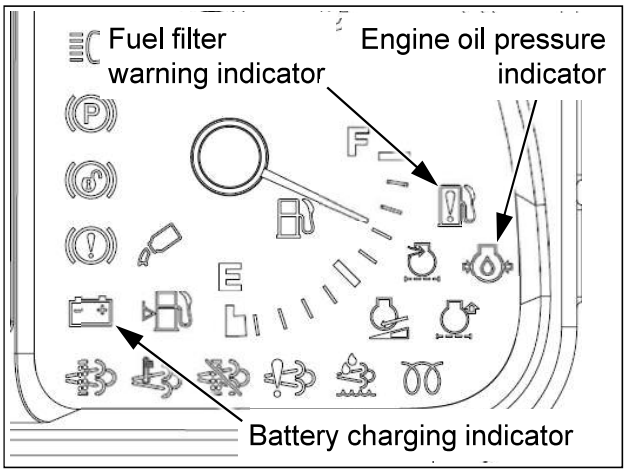
③ Checking fuel level and filling the tank

- Check the fuel gauge on the instrument panel on a daily basis and if it's not sufficient, fill the fuel tank with diesel fuel. *For further information about diesel fuel, see chapter 5-1-(3), 5-1-(4), 5-1-(5) in this manual.*

Notice	▶ After finishing work, fill the fuel tank fully. As the temperature drops down during the night, the humidity in the fuel tank is condensed and it may be mixed with the fuel.

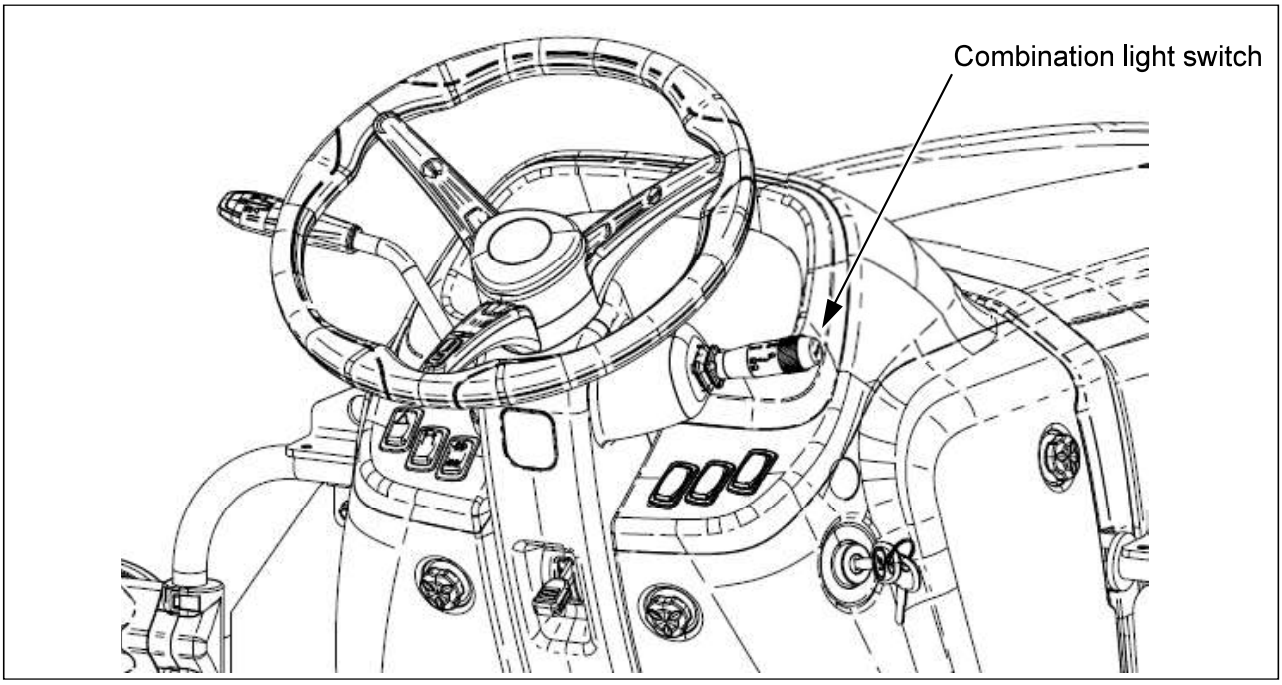
(3) Instrument panel & Indicators

- Check if the instruments and indicators are normally turned on/off before starting engine or while operating frequently and periodically.
- If the **engine oil pressure indicator** and **battery charging 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.
- You must drain water in the fuel filter when the fuel filter warning indicator lights. Refer to the chapter 5-5-(1) in this manual.
- *For further information about indicators, refer to the chapter 3-1-(1), "Instrument panel" in this manual.*



(4) Turn signal lights, Lights, Horn

● Check the operational status of the headlights, turn signal lights, horn and other illuminating lights.



● If any of these lights are not turned on when operating the switch, check the problem as followings.

1. Check the related fuse in the fuse box. *See chapter 5-15-(2), "Fuse & Main fuse" in this manual.*
2. Check the light bulb. If damaged, replace it with a rated new one. *See below table and refer to the chapter 5-15-(5), 5-15-(6) in this manual.*

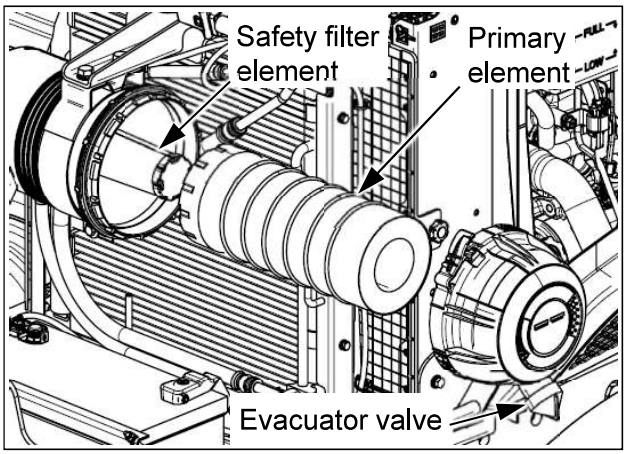
Illuminating Lights	Light bulb specification
Headlights (low beam / high beam)	12V LED 8.5W / 22W
Turn signal lights (front)	12V 12W
Side lights (front)	12V 5W
Turn signal lights (rear)	12V P21W (Cabin) / 12V 21W (Roll-bar)
Brake lights / Tail lights	12V LED 4.3W / 0.5W (Cabin) / 12V 21W / 5W (Roll-bar)
Work lights	12V 18W(Grille) / 27W(Roll-bar) / 37.5W(Cabin)
Indoor light (cabin type only)	12V 10W
Instrument panel lights & Indicators	LED

Notice	▶ Use the bulb of rated capacity. If using an improper bulb arbitrarily, it may cause a failure of the electric system.

(5) Engine coolant

- Before opening the radiator cap, cool down the engine sufficiently.
- *Refer to the chapter 5-13-(1), " Replacement of engine coolant " in this manual. (See page 5-42)*

(6) Air cleaner (Dry type)

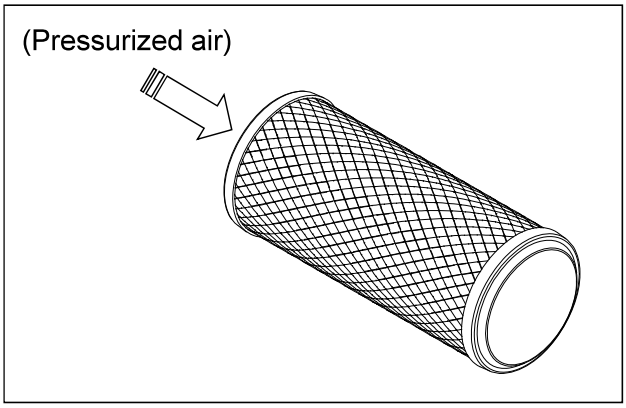


① Cleaning filter element

- 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, replace it with a 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 debris. And, clean the inside of the filter element with a clean damp cloth.



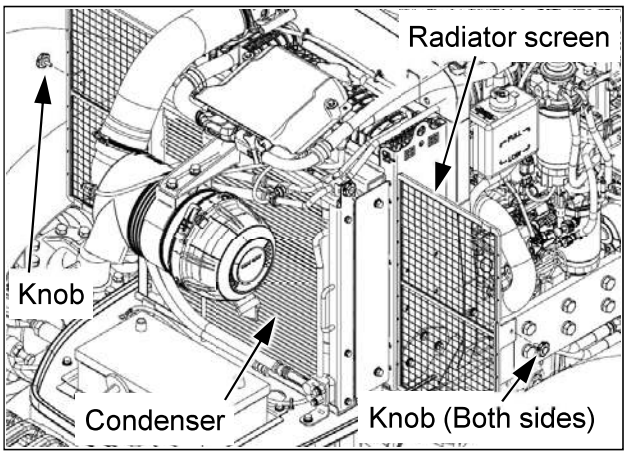
Notice	▶ Do not assemble a wet filter element. ▶ Do not dry the wet filter element with compressed air. It may cause damage to the filter element. ▶ Do not start the engine or close the hood if the filter element is not assembled.

② Assembling filter element

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

(7) Cleaning Radiator and Radiator screen

- Inspect the radiator and radiator screen for these items on a daily basis: Damaged fins, corrosion, dirt, grease, insects, leaves, oil, and other debris. Clean the radiator and radiator screen, if necessary.
- To access the engine radiator, remove the knobs and pull out the radiator screen.
- When cleaning the radiator with compressed air, make sure the air flows from the engine towards the fan.
- Check and clean the other heat exchangers(if equipped) around the engine radiator.

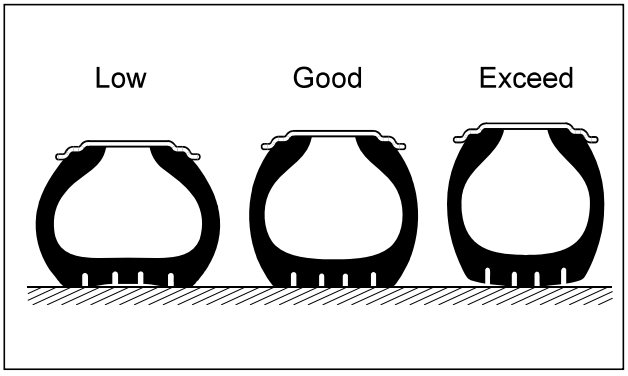


⚠ Caution	▶ The dust and dirt, other debris, and damaged fins can cause that cooling efficiency of the radiator is reduced and the engine can be overheated. ▶ Clean the radiator only after stopping engine. ▶ If cleaning with water, take care not to spray water to the hot engine block, electric and electronic parts. If possible, DO NOT USE WATER.

(8) Tire air pressure and damage

① Check

- Check the air pressure or damage of the tires on a daily basis. Always manage the correct pressure of the front/rear tires, and if the tires are damaged, replace them with 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 cause to damage in the event of impact and, in extreme conditions, the rim and disk may be deformed or the tires may burst.

⚠ Caution	▶ Do not assemble/disassemble the tires arbitrarily. Only qualified service personnel should perform this maintenance in a tire repair center equipped with special tools. ▶ When checking tire air pressure, keep the body away from the valve mechanism or cap. Tire air pressure vary depending on the load weighing on the axles.

② Standard air pressure - *See chapter 4-5-(5), "Tires and Load capacity" in this manual.*

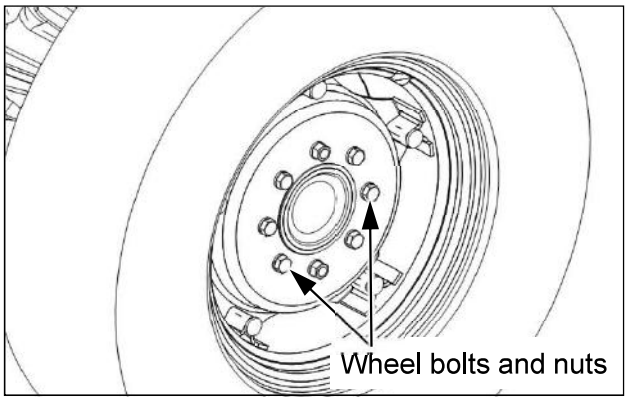
(9) Tightening state of bolts and nuts of each part

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

⚠Warning	▶ **Roll-over hazard!** **Never operate the machine with a loose wheel rim or disc. Always tighten nuts and/or bolts to the specified torque value and at the recommended intervals.** **Failure to comply could result in death or serious injury.**

Tighten the wheel bolts and nuts to the specified torque any time you remove the wheel assembly from the machine or loosen the wheel bolts or nuts.

Front Wheel Torque: M16x1.5P
1800~2000 kgf.cm
(177~196N.m, 130~145 lb.ft)



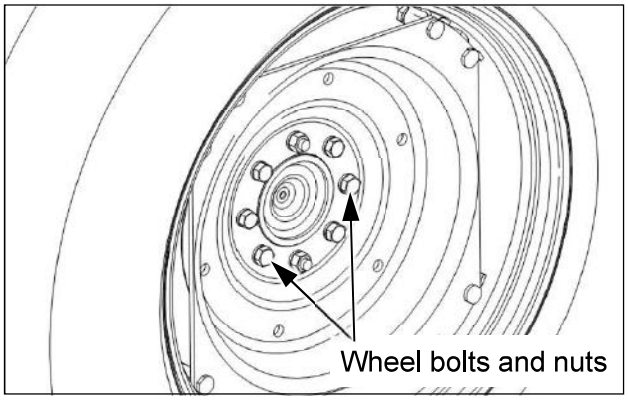
Rear Wheel Torque: M18x1.5P
2500~2800 kgf.cm
(245~275 N.m, 181~203 lb.ft)

NOTICE: *Check and tighten wheel bolts and nuts to proper torque specifications after the following hours of use:*

• First 5 hours

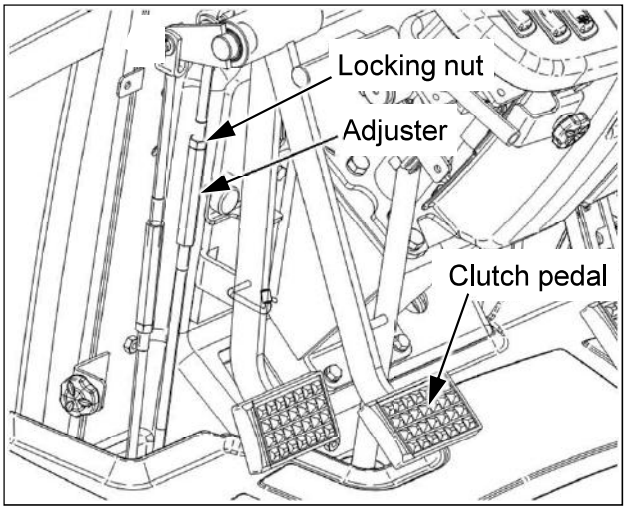
• First 50 hours

• Every 300 hours



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

① Synchro-shuttle (Mechanical)



- Check the distance of clutch pedal play before using the tractor.
- **Normal distance: 20~30mm (0.8~1.2 in.)**
- If the distance of the clutch pedal play is over the normal distance, adjust it as below.

1. Loosen the locking nut(s) and turn the adjuster clockwise/counter-clockwise.
2. If the adjuster is tightened, the pedal play will be decreased, and if loosened, it will be increased.
3. After adjusting the pedal play, tighten the locking nut(s).
4. Check if the clutch is disengaged completely.

② Power shuttle (PST)

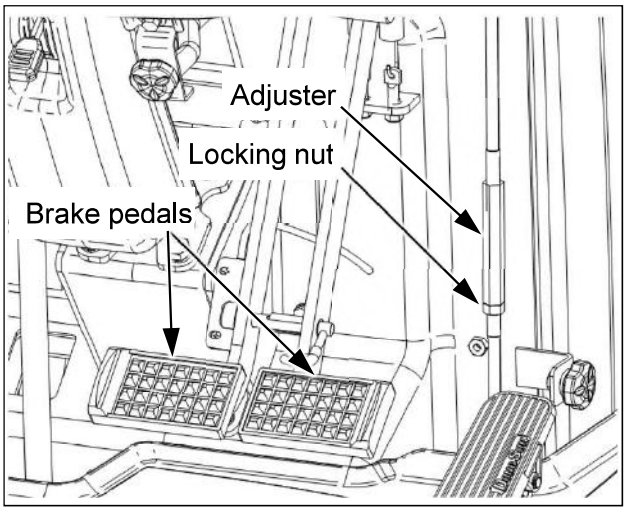
- In case of power shuttle models, an electric sensor to control the power shuttle clutch pack is attached and tuned specially on the clutch pedal linkage system.
  If this linkage system is changed or modified arbitrarily, it may cause a serious fault or malfunction to the power shuttle clutch pack.
- If you need any service for power shuttle system, do not hesitate to contact your authorized local dealer for check.

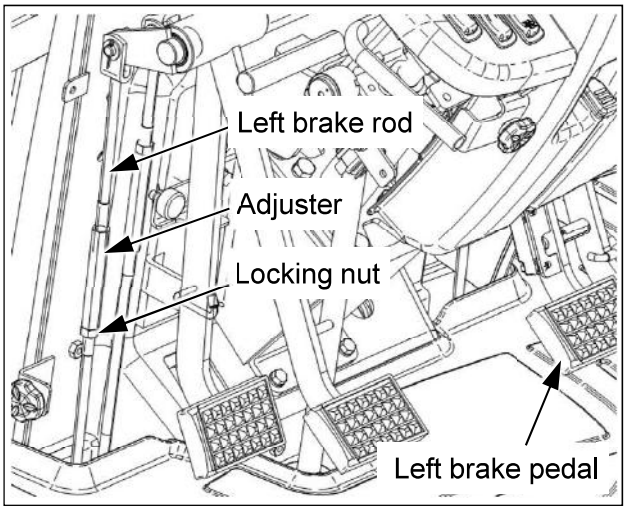
⚠ Caution	▶ If you need to adjust the clutch pedal play of your power shuttle model, contact your authorized local dealer or service team. Arbitrary disassembly or adjustment may cause fatal damage to the power shuttle clutch.

(11) Adjustment of Brake pedal play

- Check the distance of brake pedal play before using the tractor.
- **Normal distance: 40~50mm. (1.6~2.0 in.)**
- If the brake pedal play is over the normal distance, adjust it as below.

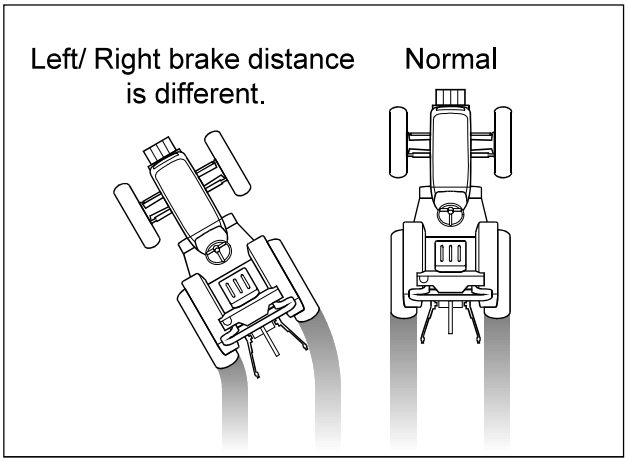
1. Loosen the locking nut(s) and turn the adjuster clockwise/counter-clockwise.
2. If the adjuster is tightened, the pedal play will be decreased, and if loosened, it will be increased.
3. After adjusting the pedal play, tighten the locking nut(s).
4. Check if the brake distance of the left and right brake is same as below.





- **Checking the brake distance**

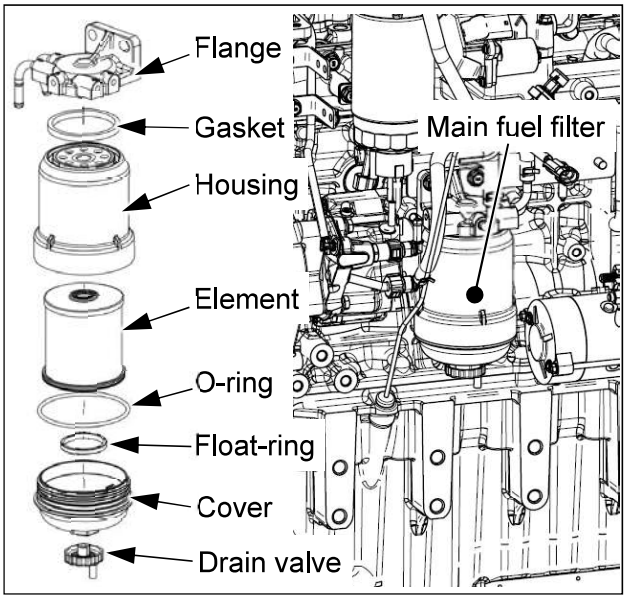
1. Connect the left and right brake pedals with the brake pedal latch.
2. Check the skid marks of the tires or stability of the tractor when stopping the tractor in a suitable speed range.
3. If the brake distance is different as shown in the right figure, adjust the pedal play again.
4. If the vehicle is turned to the left-hand side when checking the braking distance, loosen the left-hand brake rod or tighten the right-hand brake rod with checking the brake pedal play distance.



(12) Checking Main fuel filter

- Check visually if the water is in the main fuel filter on a daily basis. If the float-ring is floating on the layer between fuel and water, it indicates that there is water in the fuel filter. Throw away the water as followings.

1. Stop the engine and cool it down sufficiently. Apply the parking brake.
2. Carefully clean around the main fuel filter and set a clean container under the fuel filter.
3. Turn the drain plug counter-clockwise and throw away the water in the fuel filter.
4. Tighten the drain plug.
5. If necessary, bleed air in the main fuel filter. *Refer to the chapter 5-11-(1), "Air-bleeding from Fuel system" in this manual.*



⚠Caution	▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover disconnected fuel system component. Do not fill the new filter with fuel. Invisible fine contaminants can enter the injection pump and it may cause damage to the fuel injection system.

⚠Caution	▶Do not throw the exhausted waste fuel 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 environmental laws.

5-7. Every 50 hour check

(1) Lubricating grease nipple

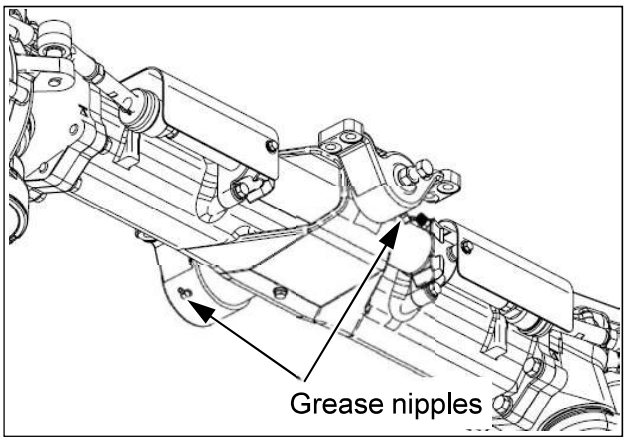
- Front axle holder (Front/Rear)
- Steering arm (LH/RH)
- 3-point linkage

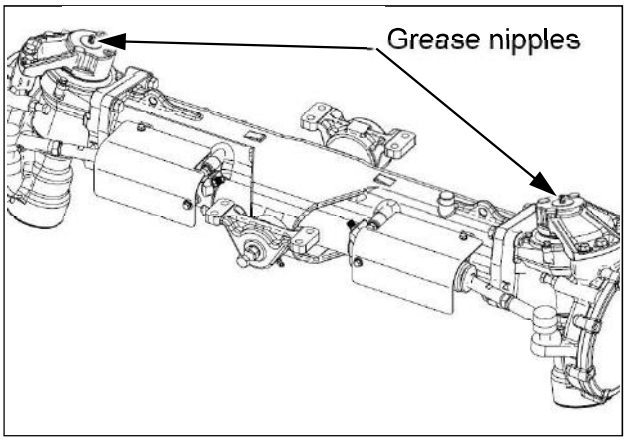
1.Wipe dirt from fittings before greasing.

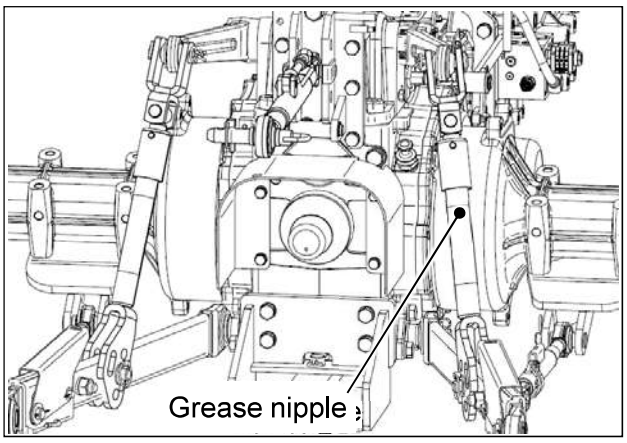
2.Use a grease gun containing clean high grade of grease.
For grease specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.

3.Pump fresh grease into fitting to adequately lubricate the component and force out any contamination from the grease passage.

4.Wipe off excess grease.





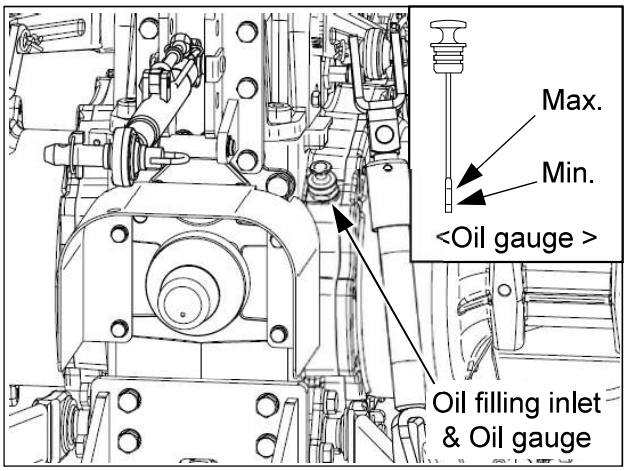


(2) Cleaning Radiator and Radiator screen

- *See chapter 5-6-(7) in this manual. (See page 5-23)*

(3) Checking Transmission oil

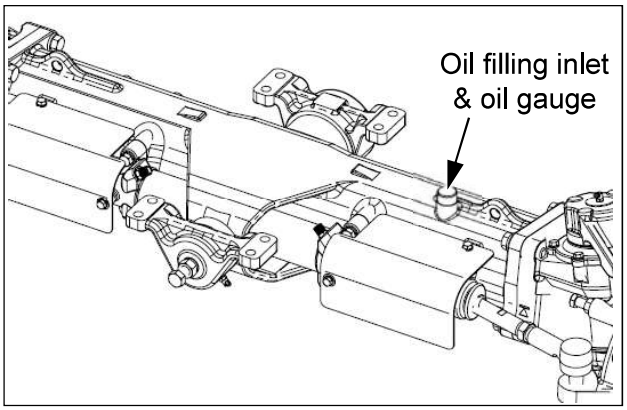
- Stop the tractor on a level surface and apply the parking brake and lower the implements to the ground.
- Clean around the oil filling inlet and pull the gauge straight out.
- Check If the oil level is between MIN and MAX marks of oil gauge. If necessary, add new oil.
- *For oil specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*

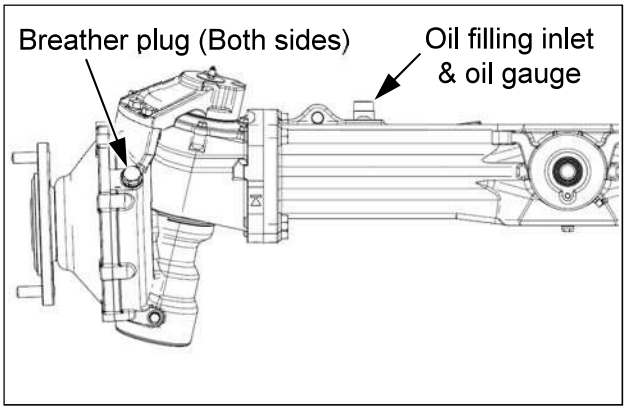


⚠ Caution	▶ Contaminated oil may reduce the durability of power drive lines and it can cause a failure of the transmission and hydraulic system. Clean around the oil filling inlet before opening the oil gauge.

(4) Checking Front axle oil

- Stop the tractor on a level surface and apply the parking brake and lower the implements to the ground.
- Clean around the oil gauge and breather plugs on both sides. Open the oil gauge.
- Check the oil level. If the oil level is between MIN and MAX marks of the oil gauge, it is okay.
- If the oil level is low, remove the breather plugs and add new oil into the oil filling inlet with checking the oil level.
- Check the oil level again after 5~10 minutes later.
- Install the oil gauge and breather plugs.
- *For oil specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*





⚠ Caution	▶ Contaminated oil may reduce the durability of power drive lines and it can cause a failure of the front axle. Clean around the oil filling inlet and oil check port before opening the plugs.

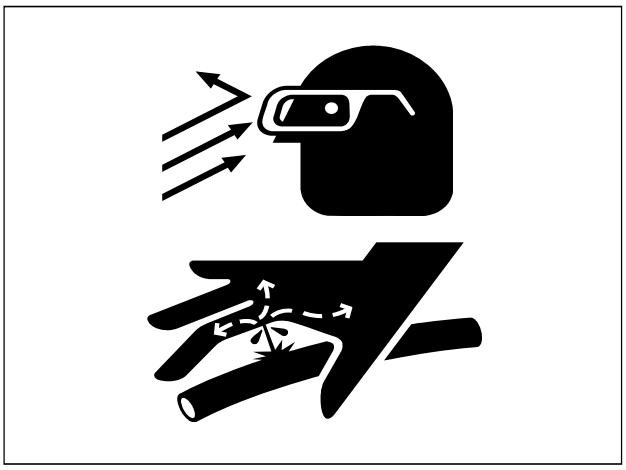
(5) Battery check

- *Refer to the chapter 5-15-(3), "Batter handling and Notices" in this manual. (See page 5-54)*

(6) Air cleaner (Dry type)

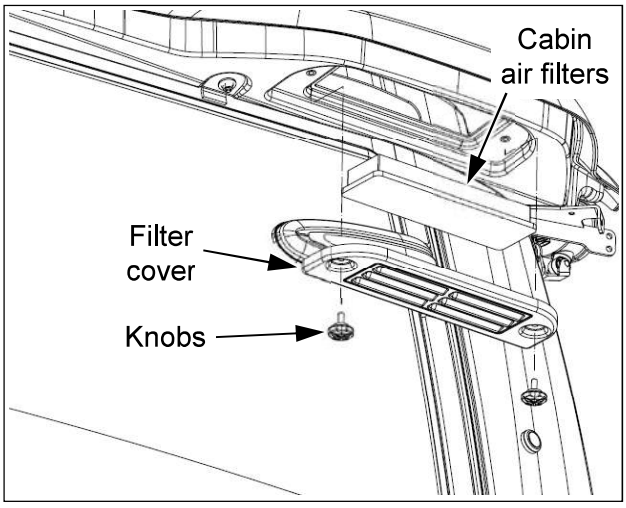
- *Refer to the chapter 5-6-(6) in this manual. (See page 5-22)*

(7) Hydraulic hoses and Leakage



- Stop the engine and place all the transmission gears in their neutral positions and lower down the implement to the ground.
- Periodically check the 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 the hydraulic pressure is relieved completely. The leaks of pressurized oil can cause a fatal physical injury.
  For further information, see chapter 3-5, "Hydraulic system" in this manual.

(8) Cleaning Cabin air filters



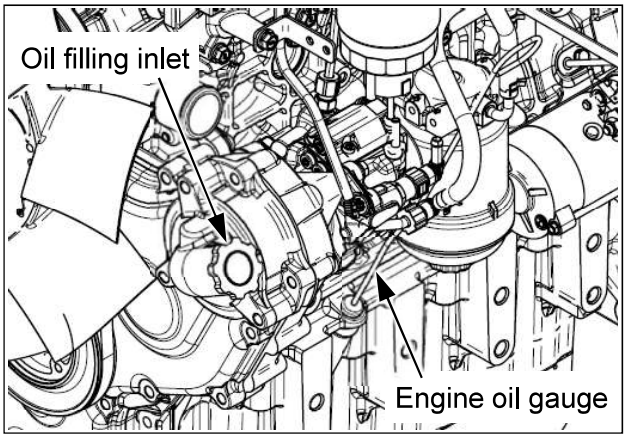
- Before servicing the filters, switch off the blower and close all the cabin doors and windows.
- Unscrew the knobs under the roof and remove the cover and filter element as shown in the right figure.
- Clean the elements by blowing with compressed air not exceeding 30psi (2bar). Blow the dust from the upper surface through the element to the underside. Hold the nozzle at least 12 in. (300mm) from the element to prevent damage to the filter media.
- Clean all filter chambers with a damp, lint-free cloth. Re-install the filter elements.
- Re-install the filter cover and tighten the knobs.

Notice	▶ The filters are made of specially treated media with a rubber sealing strip bonded around the sides. Take care not to damage the element during installation.

5-8. Every 100 hour check

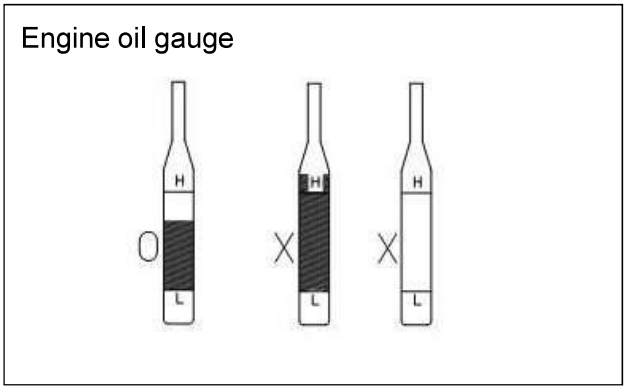
(1) Checking and adding Engine oil

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



- **Checking engine oil level**

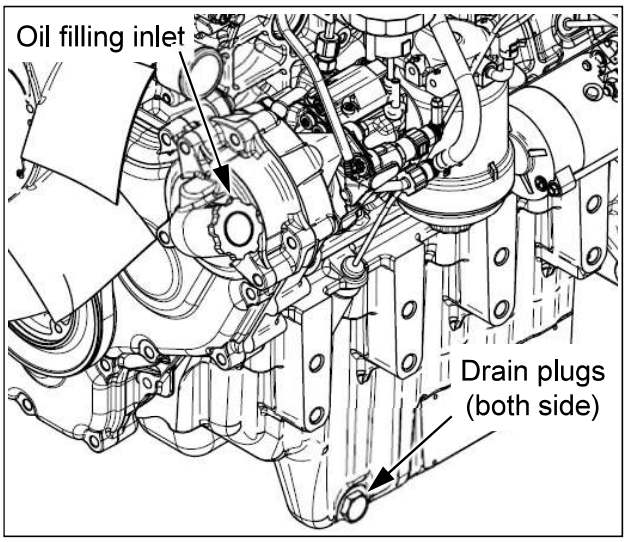
- Check and add the engine oil **every 100 hours of operation.**
- Check it before starting engine or at 5 minutes later after stopping engine.
- It must only be checked while the engine is stopped.
- Check if the oil level is between MAX and MIN marks of the engine oil gauge. **If the engine oil level is under the minimum mark, add new engine oil up to the maximum mark as much as possible.**
- If your engine is operated in dusty/dirty conditions, the service interval must be shorter than normal condition.



⚠Caution	▶ The amount of engine oil consumed may vary depending on the operating conditions. Check the amount of engine oil regularly and if necessary add new engine oil. Otherwise, the engine can be stuck or broken by engine oil shortage.

5-9. Every 300 hour check

(1) Replacing Engine oil and Filter

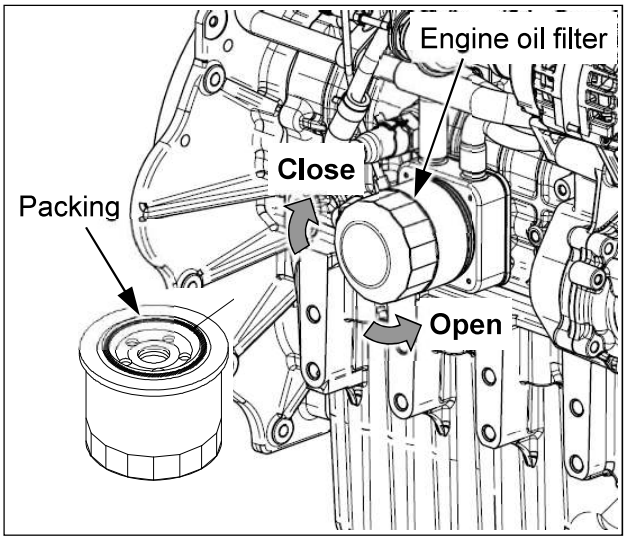


① Drain Engine oil

- Run the engine for a few minutes to warm oil.
- Park the tractor on a level surface.
- Set a clean container under the drain plugs and remove both LH and RH drain plugs of oil pan and drain the oil completely.

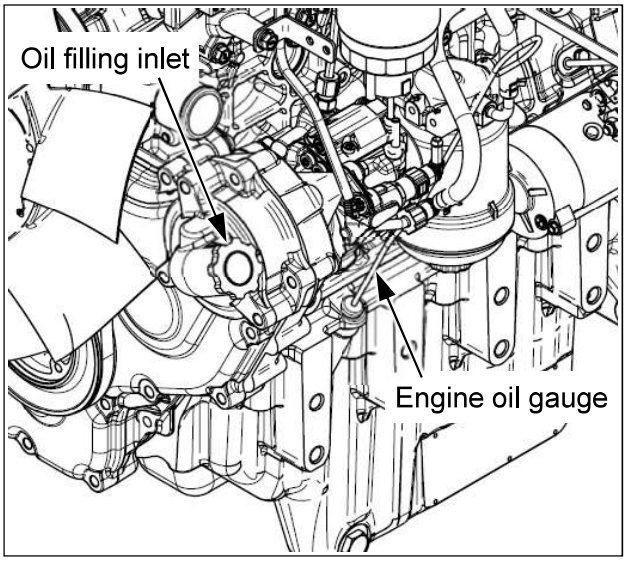
NOTE: *When the engine oil is warm, the impurities can be drained completely.*

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 it with a filter wrench.
- Turn the new filter clockwise to assemble it until the packing makes contact with the mounting flange. Tighten ¾ to 1 turn more after the contact.
- If some metal chips are attached to the element of used filter, contact your authorized local dealer.

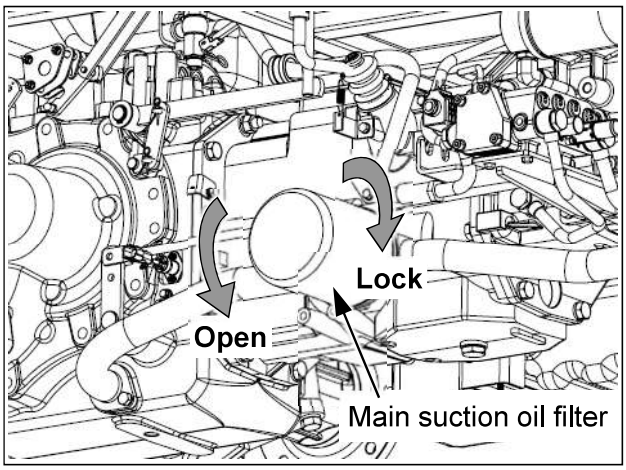
③ Fill Engine oil



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

(2) Replacing Hydraulic Oil Filter

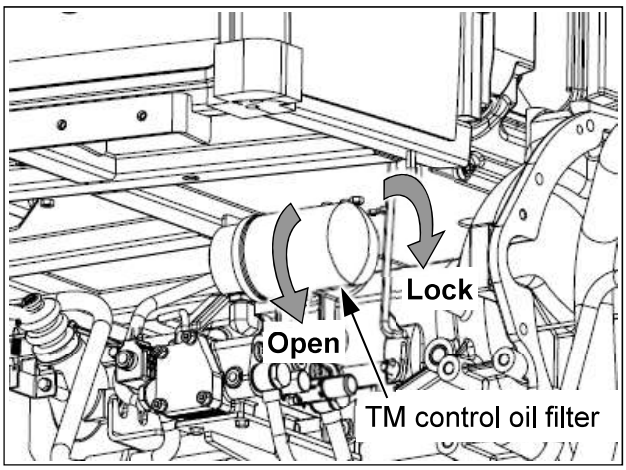
① Main suction oil filter



- Park tractor on a level surface and apply the parking brake and lower the implements. Stop the engine and cool down the tractor sufficiently.
- This filter is attached under the right-hand floor.
- 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 counter-clockwise to remove it with a filter wrench.
- Turn the new filter clockwise to assemble it until the packing makes contact with the mounting surface. Tighten 3/4 to 1 turn more after the packing contacts.
- Run the engine at low idle rpm and check any leakage.
- Check the oil level. If necessary, add new oil. *For oil specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*

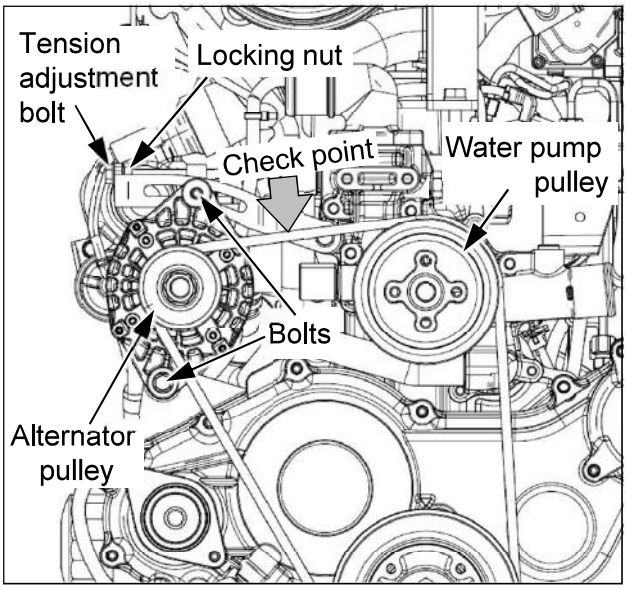
Warning	▶ Be sure to stop the engine before loosening the oil filter.
	▶ If the filter or oil is very hot, it may cause serious burns. After cooling down the tractor sufficiently, replace the filters. ▶ Do not throw the exhausted waste oil to any place. This may pollute the soil and water seriously and also is prohibited legally. If violating, you would be responsible for that by civil or criminal case.

② TM control oil filter



- This filter is installed under the right-hand floor to improve filtration performance of the TM control hydraulic lines.
- Replace the TM control oil filter with a new one in the same way as the replacement procedure of the main suction oil filter.

(3) Tension adjustment of Fan belt



- Check if the tension of the fan belt is normal as follows.
  - Check point : Water pump pulley ~ Alternator pulley (Refer to the right figure.)

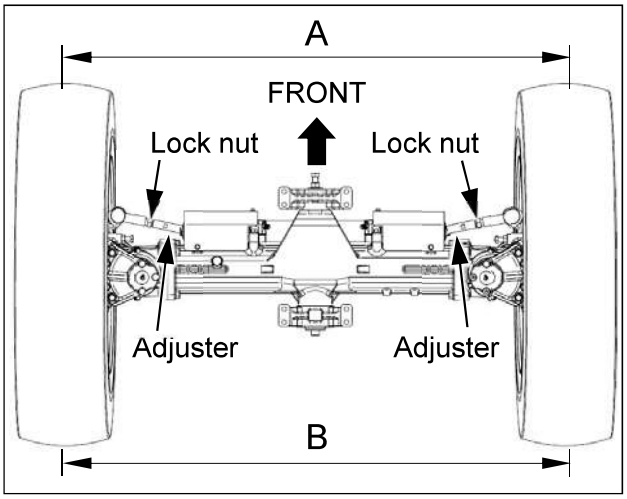
1. If you press the check point by hand, the normal pressed depth;
   - **8mm** when the used belt is pressed by 5 kgf.
   - **5mm** when a newly installed belt is pressed by 5 kgf.
2. If using a belt tension meter, the normal tension value is;
   - **30±5 kgf** (When checking the used belt)
   - **50±5 kgf** (When installing a new belt)

- If the tension of the fan belt exceeds the normal range, adjust the tension as follows.

1. Loosen two bolts of alternator and a locking nut that fixing the tension adjustment bolt.
2. Adjust the belt tension by turning the tension adjustment bolt. Turning the bolt clockwise increases the tension.
3. If the belt tension becomes normal, tighten the two bolts and locking nut and check the tightening torque.

- Check the fan belt for wear or cracks. If there is a problem, replace it with a new one.

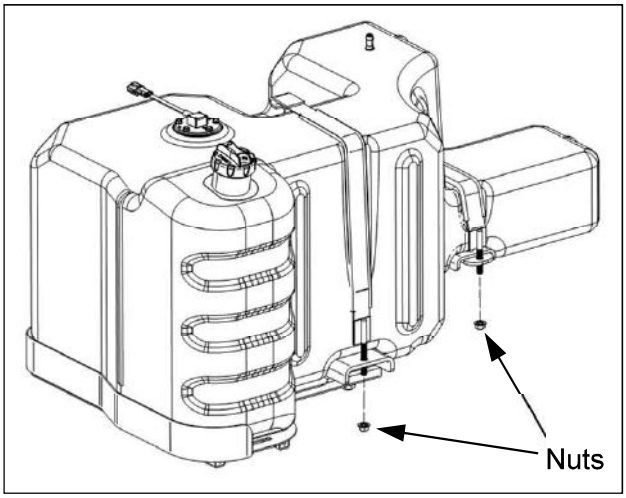
(4) Toe-in



- Check the toe-in of the front wheels and if necessary, adjust it as follows.
  Normal value(B-A) = 2~8 mm (0.1~0.3 in.)
- Loosen the lock nuts of the tie-rods. (both sides)
- Fix the steering cylinder and turn the adjuster clockwise, the toe-in (“B-A”) will be increased.
- Turn the adjuster of the other side by the same displacement.
- After checking if the toe-in is correct, tighten the lock nuts.

(5) Cleaning fuel tank

- Contaminants such as dust, water and sediment in the fuel tank will cause to malfunction of the fuel injection system.
- Clean fuel tank periodically.
- The fuel tank is very heavy. Cooperate with other people to lift up/down the fuel tank after loosening nuts as shown in the right figure.
- Use clean diesel or approved detergent by manufacturer to clean the inside of the fuel tank.



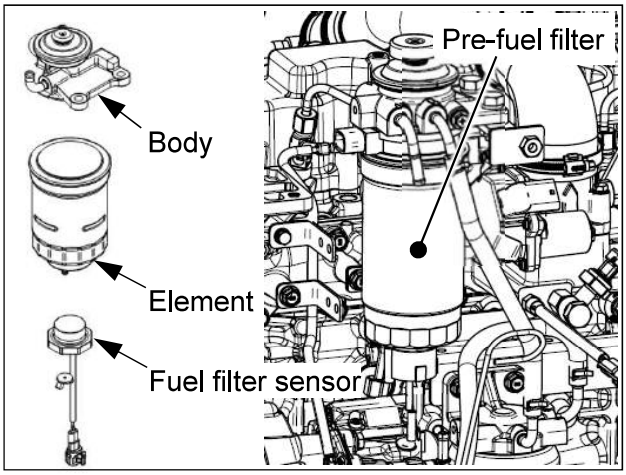
⚠Warning	**Heavy parts!** ▶The fuel tank is very heavy. When removing/attaching the fuel tank, please be careful and cooperate with other people, and use suitable equipment to move the heavy part. Failure to comply could result in death or serious injury.

⚠Caution	▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover disconnected fuel system component. ▶Do not throw the exhausted waste fuel 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 environmental laws.

5-10. Every 500 hour check

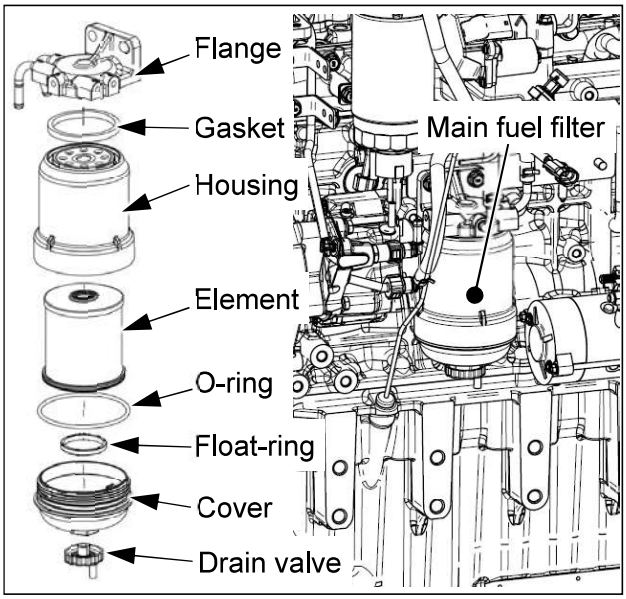
(1) Replacing Fuel filter cartridge

① Pre-fuel filter



- Stop the engine and cool it down sufficiently. Set a clean container under the pre-fuel filter.
- Disconnect the electric harness connector of the fuel filter sensor and loosen the fuel filter sensor while making sure to collect the fuel.
- Remove the filter element from the body.
- Assemble the fuel filter sensor to the new element.
- Install the new element assembly to the body.
- Connect the electric wire connector of the fuel filter sensor.
- Bleed air from the fuel filter. *See chapter 5-15-(1), "Air-bleeding from fuel system" in this manual.*

② Main fuel filter



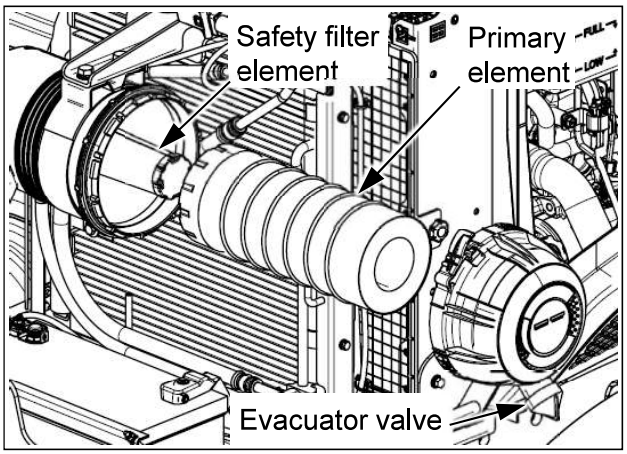
- Stop the engine and cool it down sufficiently. Set a clean container under the main fuel filter.
- Loosen the drain valve while making sure to collect the fuel.
- Turn the housing counter-clockwise to remove the filter assembly from the filter flange.
- Turn the cover counter-clockwise to remove it from the housing.
- Replace the filter element, O-ring, and gasket with a new one.
- Check the float ring in the cover and assemble the cover to the housing.
- Assemble the filter assembly to the filter flange.
- Tighten the drain valve.
- Bleed air from the fuel filter. *See chapter 5-15-(1), "Air-bleeding from fuel system" in this manual.*

⚠Warning	▶ Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the key switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

⚠Caution	▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover disconnected fuel system component. Do not fill the new filter with fuel. Invisible fine contaminants can enter the injection pump and it may cause damage to the fuel injection system.

(2) 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 with a clean damp cloth, being careful not to damage the safety element.
- Check if there is damage of the filter element by using a light. If finding tiny cracks or small holes in the filter element or damage of the gasket, replace it with a new one.

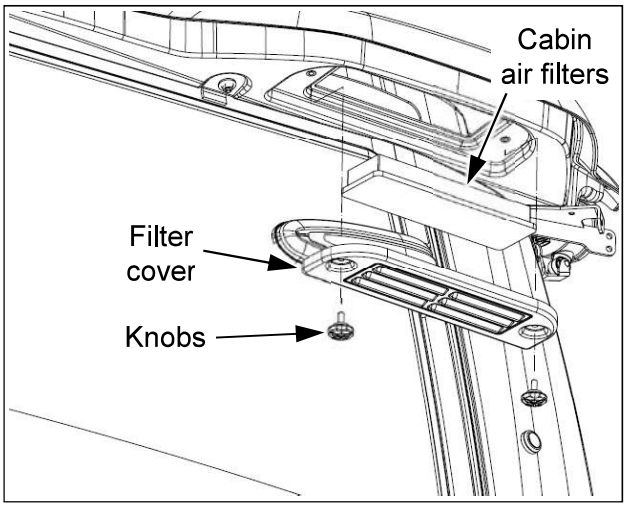


- Insert the new filter element deeply into the filter housing.
- Remove the dust from the evacuator valve and clean the inside of the cover.
- Assemble the cover with the evacuator valve facing downwards.

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

(3) Replacing Cabin air filters

- Before servicing the filters, switch off the blower and close all the cabin doors and windows.
- Cabin air filters are installed on the left and right-hand side under the cabin roof.
- Unscrew the knobs under the roof and remove the cover and filter elements as shown in the right figure.
- Clean both filter chambers with a damp, lint-free cloth.
- Replace the cabin air filters with a new ones.
- Re-install the filter covers and tighten the knobs.
- If you use charcoal filters (active carbon filters), you should replace the filters sooner than regular filters.



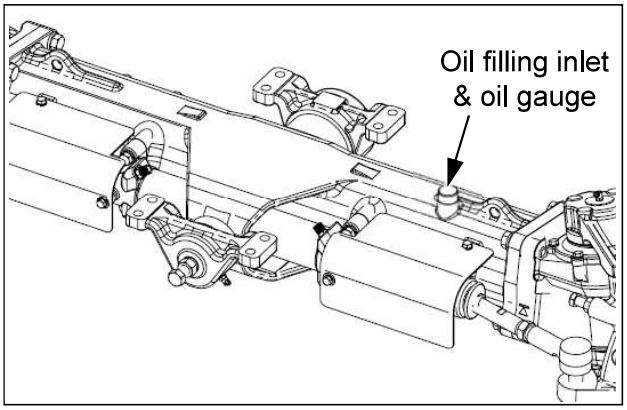
⚠Caution	▶ The charcoal filters (active carbon filters) last for approximately 50 hours of work. They must, however, be replaced each year. If, when working with pesticides, toxic odors are noted, stop the work immediately and replace the filters with new ones. *For further information for charcoal filters, refer to the chapter 4-5-(11), "Working in hazardous area" in this manual.*

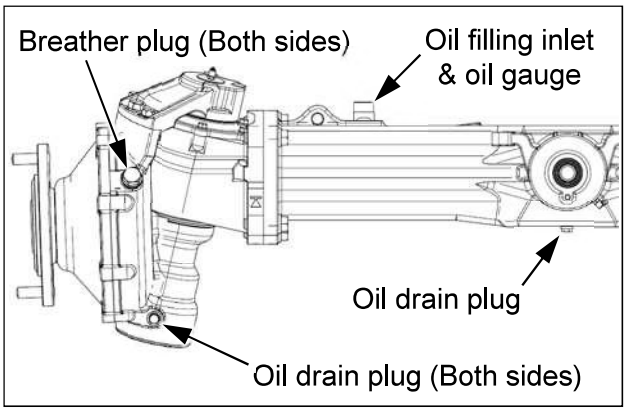
Notice	▶ The filters are made of specially treated media with a rubber sealing strip bonded around the sides. Take care not to damage the element during installation.

5-11. Every 600 hour check

(1) Changing Front axle oil

- Stop the tractor on a level surface and apply the parking brake and lower the implement to the ground.
- Clean around the oil filling inlet, breather plugs and drain plugs.
- Remove the oil gauge and breather plugs on both sides.
- Set a clean container under the drain plugs and remove the left/center/right drain plugs. Drain the oil completely.
- Replace the seals on the drain plugs (if necessary) with a new one and tighten all the drain plugs to its original position.
- Add new oil slowly into the oil filling inlet of the center housing with checking the oil level.
- Add new oil slowly and fully into the breather hole of the final gear housing on both sides.
- *For oil specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*
- Install the oil gauge and breather plugs on both sides.

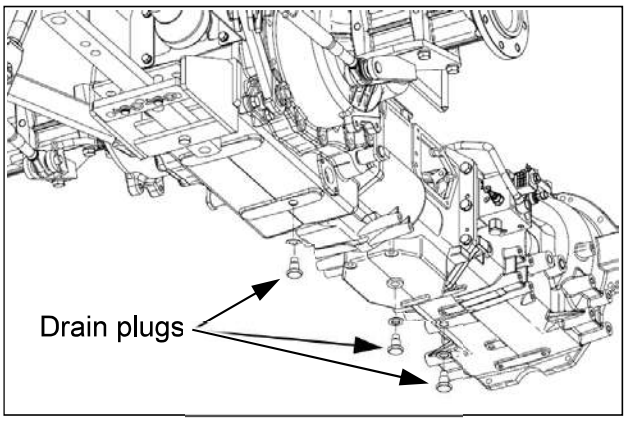


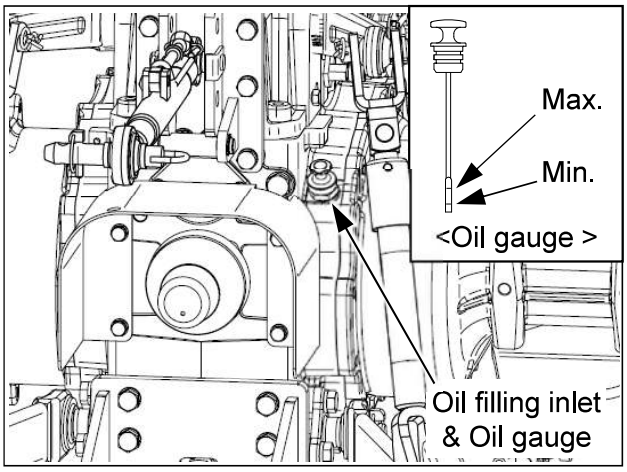


⚠ Caution	▶ Contaminated oil may reduce durability of the power drive lines and it can cause a failure of the front axle. Clean around the oil filling inlet and oil check port before opening the plugs.

(2) Changing Transmission oil

- Stop the tractor on a level surface and apply the parking brake. Run the engine for several minutes to warm oil and lower the implements. Stop the engine.
- Clean around the oil filling inlet and drain plugs.
- Set a clean container under the drain plugs and remove the drain plugs. Drain the oil completely.
- Remove metal chips and sludge from the drain plugs and tighten the drain plugs again with new copper seals.
- Add new oil until the oil level is between MIN and MAX marks of the oil gauge.
- *For oil specification, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*



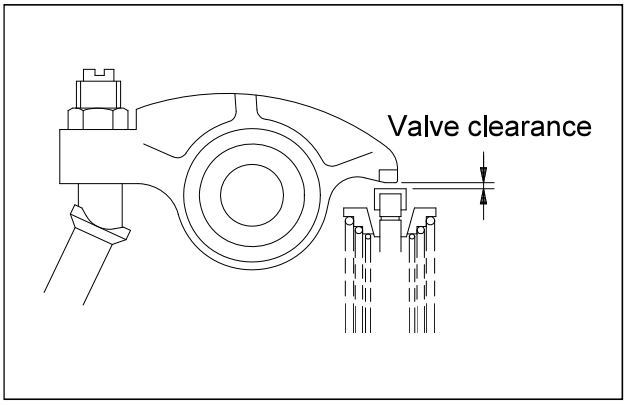


⚠ Caution	▶ Contaminated oil may reduce the durability of transmission drive lines and it can cause a failure of the hydraulic system. Clean around the oil filling inlet and then pull the oil gauge.

5-12. Every 1000hr or 1-year check

(1) Adjusting Engine valve clearance

- Contact your authorized dealer to check the valve clearance.
  Normal: 0.25mm (0.0098 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.



⚠ Warning	▶ Ensure that the engine cannot be started while this maintenance is being performed. To help prevent possible injury, do not use the starting motor to turn the flywheel. ▶ Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting valve lash clearance.

⚠ Caution	▶ Only qualified service personnel should perform this maintenance. Contact your authorized local dealer for this maintenance. Operation of engines with incorrect valve lash can reduce engine efficiency, and also reduce engine component life.

(2) Checking Nozzle injection pressure

- Contact your authorized local dealer for check.
  Normal injection pressure (Common rail): 180MPa (26100 psi)

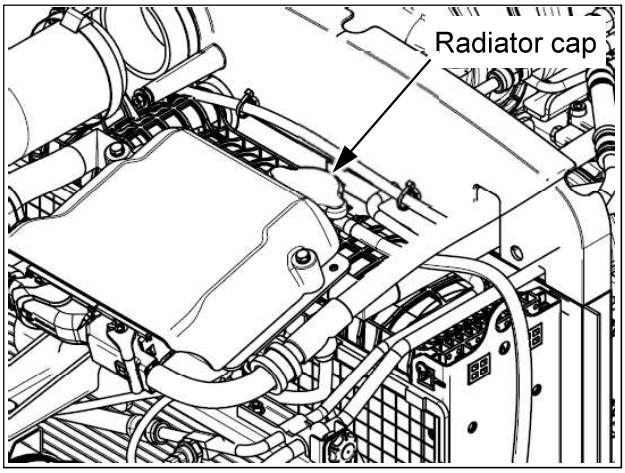
⚠ Warning	▶ Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. ▶ Work carefully around an engine that is running. Engine parts that are hot, or parts that are moving, can cause personal injury. ▶ Make sure that you wear eye protection at all times during testing. When fuel injection nozzles are tested, the high pressure test fluid can pierce the skin and cause serious injury to the operator. Always keep the tip of the fuel injection nozzle pointed away from the operator and into the fuel collector.

⚠ Caution	▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component. ▶ If a fuel injector is suspected of operating outside of normal parameters, it should be removed by a qualified technician. The suspect fuel injector should be taken to an authorized agent for inspection.

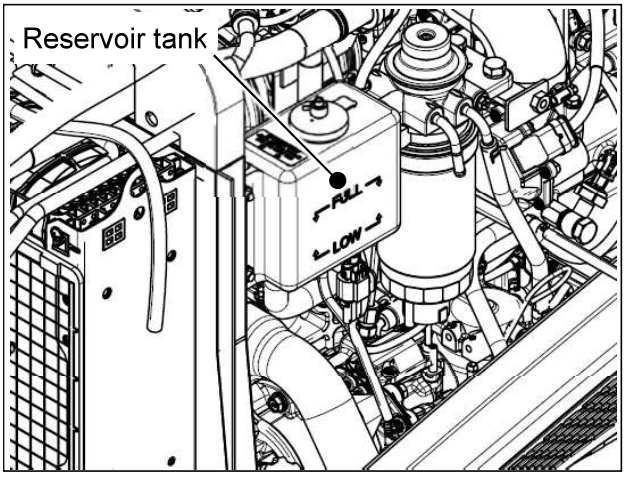
5-13. Every 1500hr or 2-year check

(1) Replacement of Engine coolant

① Check



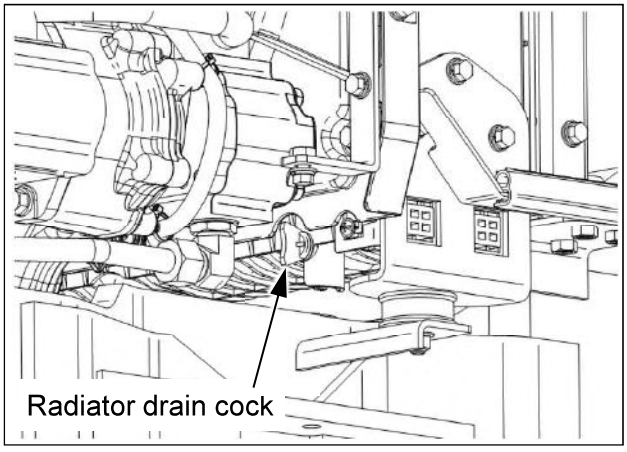
- Stop the engine and allow the engine to cool down. Loosen the radiator cap slowly in order to relieve any pressure. Remove the radiator cap.
- Check if the coolant of the radiator and reservoir tank is insufficient or not on a daily basis. Check if the coolant level of the reservoir tank is between “Min” and “Max” marks.
- If necessary, add new engine coolant.
- Do not open the radiator cap except to check the coolant or change it.



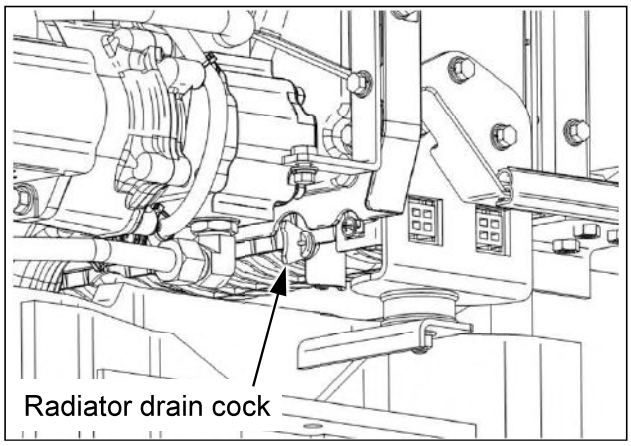
Caution	▶ *NEVER mix OAT coolant with conventional coolant. For further information about OAT, see chapter 5-1-(6) in this manual.*

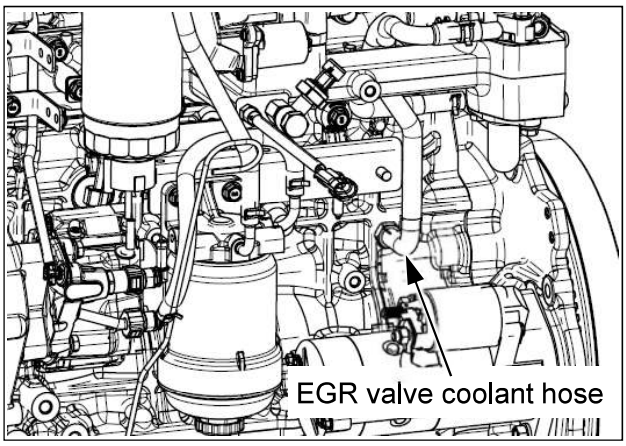
Warning 	▶ **Pressurized System**: When opening the radiator cap, be careful of the escaping hot water or steam. Hot coolant can cause serious burns. To open the radiator cap, stop the engine and wait until the cooling system components are cool down. Loosen the radiator cap slowly in order to relieve the pressure. ▶ Wear the protection globes or cover the radiator cap with a rag before opening the radiator cap.

② Drain



- Stop the engine and allow the engine to cool down. Loosen the radiator cap slowly in order to relieve any pressure. Remove the radiator cap.
- Set a suitable clean container under the radiator drain cock and EGR valve coolant hose on the engine. See next page for the coolant hose.
- Open the radiator drain cock and remove the EGR valve coolant hose on the engine.
- Allow the coolant to drain completely.





⚠Caution	▶ Care must be taken to ensure that fluids are contained during performance of inspection and maintenance of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids. ▶ Dispose of all fluids according to Local regulations and mandates. ▶ Keep all parts clean from contaminants. Contaminants may cause rapid wear and shortened component life.

③ Flush

- Flush the cooling system 2~3 times with clean water in order to remove any debris.
- Close the radiator drain cock and install the EGR valve coolant hose on the engine.
- Fill the cooling system with clean water. Install the radiator cap.
- Start and run the engine at low idle until the temperature reaches 49 to 66 °C (120 to 150 °F).
- Stop the engine and allow the engine to cool. Loosen the radiator cap slowly in order to relieve any pressure. Remove the radiator cap. Open the radiator drain cock or remove the EGR valve coolant hose on the engine. Allow the water to drain.

⚠Caution	▶ Do not fill the cooling system faster than 5 L (1.3 US gal.) per minute to avoid air locks. Cooling system air locks may result in engine damage.

④ Fill

- Close the radiator drain cock and install the EGR valve coolant hose on the engine.
- Fill the cooling system with the designated coolant. Do not install the radiator cap. *For coolant specification and capacity, see chapter 5-3, "Lubricants and Capacity" or the last page in this manual.*
- Start and run the engine at low idle. Increase the engine rpm to high idle. Run the engine at high idle for one minute in order to purge the air from the cavities of the engine block. Stop the engine.
- Check the coolant level. Maintain the coolant level within 13mm (0.5 in.) below the bottom of the pipe for filling. Maintain the coolant level in the reservoir tank at the correct level.
- Clean the radiator cap. Inspect the gasket that is on the radiator cap. If the gasket is damaged, install a new radiator cap.
- Start the engine. Inspect the cooling system for leaks and for correct operating temperature.
- Use the coolant with anti-freeze solution in cold weather.
- Anti-freeze solution is filled up from the factory. After first winter, change the coolant to remove the debris or corrosion.

⚠ Caution	▶ Do not fill the cooling system faster than 5 L (1.3 US gal.) per minute to avoid air locks. Cooling system air locks may result in engine damage.

※ Anti-freeze

- The amount of anti-freeze in the coolant must be determined on the ambient temperature. If the amount of anti-freeze in the coolant is low, the coolant can be frozen and the engine and radiator may be damaged.
- 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)	

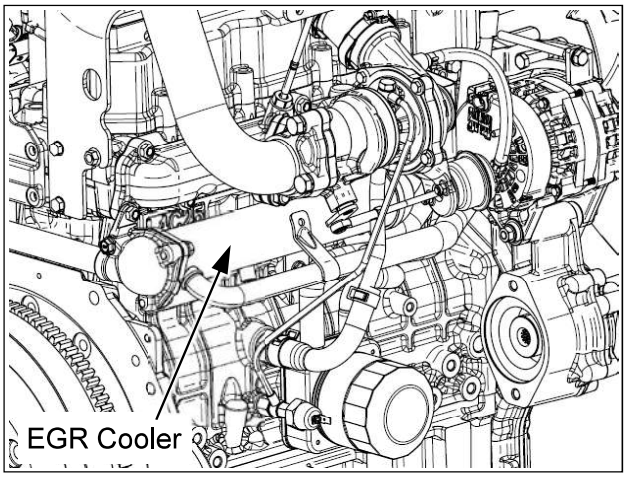
- If possible, always use the anti-freeze solution. If not, change the coolant with anti-freeze solution before winter time.
- Run the engine for about 5 minutes after filling anti-freeze to mix it with water well.

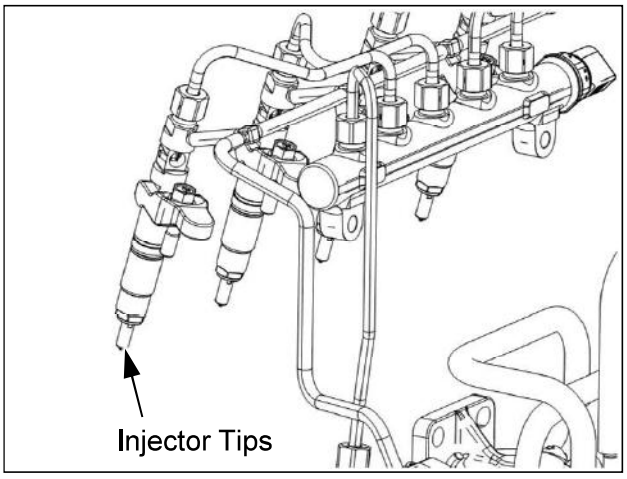
(2) Cleaning Emission related parts

- The following items are major engine emission related parts. These items are checked and cleaned periodically. But it is performed by special engine service experts. Contact your authorized local dealer for check.

-. EGR Cooler

-. Injector Tips





5-14. Every 3000hr check

(1) Cleaning Emission related parts

- The following items are major engine emission related parts. These items are checked and cleaned periodically. But it is performed by special engine service experts. Contact your authorized local dealer for check.

-. Fuel injector

-. DOC&DPF assembly

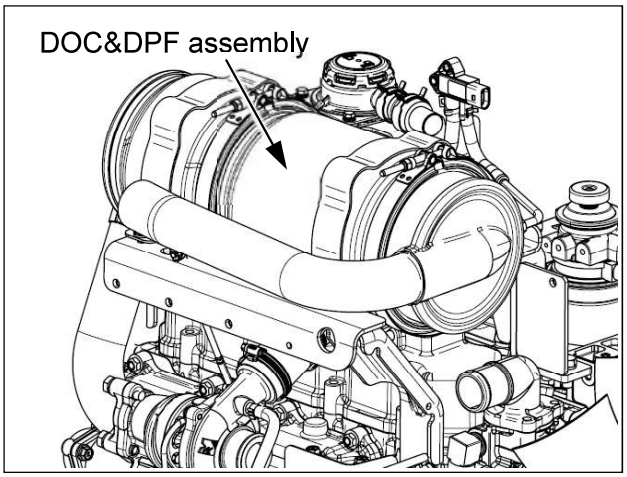
-. Turbocharger

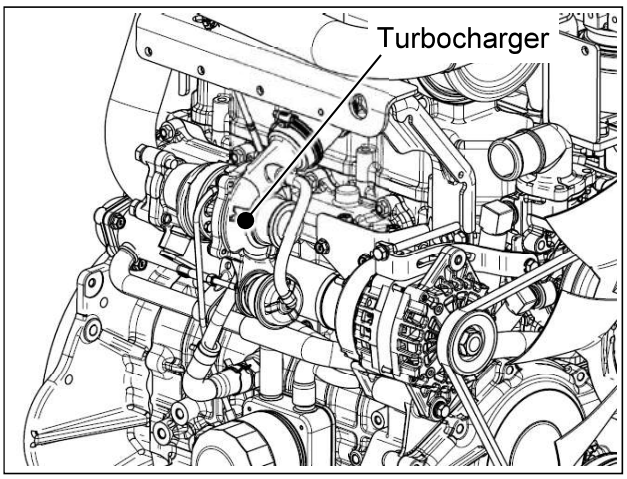
-. ECU

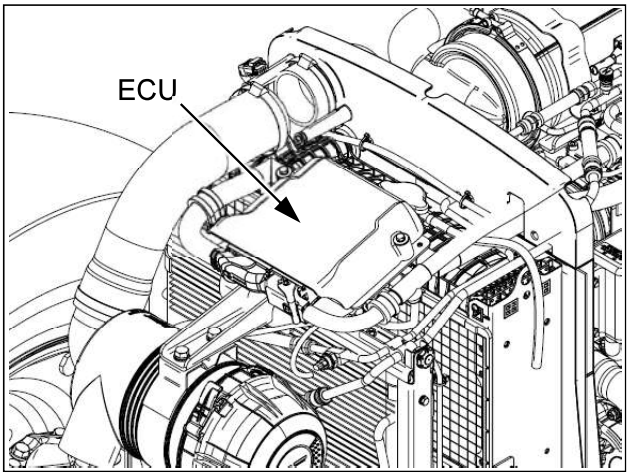
-. EGR valve

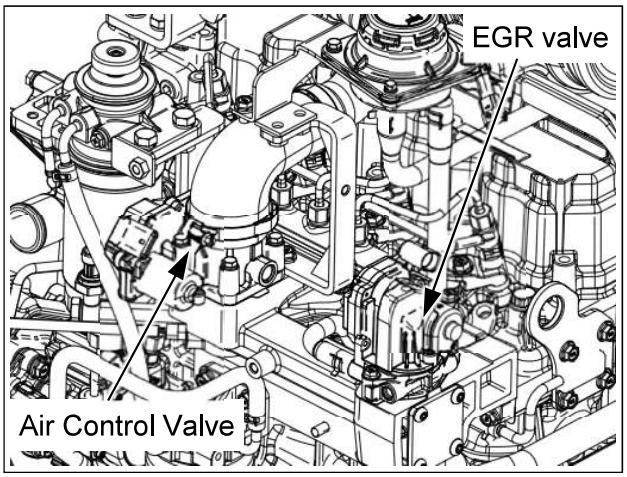
-. Sensors

-. Air Control Valve (ACV)





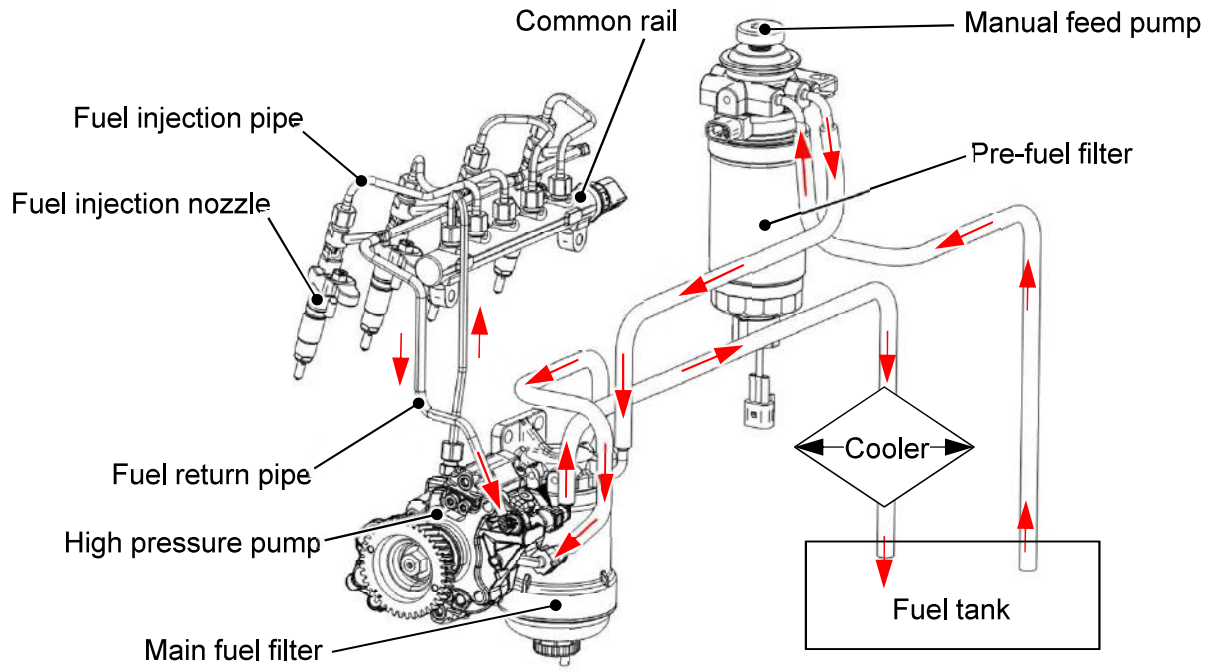




5-15. General maintenance (When required)

(1) Air-bleeding from Fuel system

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



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

⚠ Warning	▶ Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the key switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

⚠ Caution	▶ Do not adjust or modify the fuel injection system arbitrarily. It can cause a serious fault related to engine performance and increase of excessive exhaust emissions. ▶ Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover disconnected fuel system component. Do not fill the new filter with fuel. Invisible fine contaminants can enter the injection pump and it may cause damage to the fuel injection system.

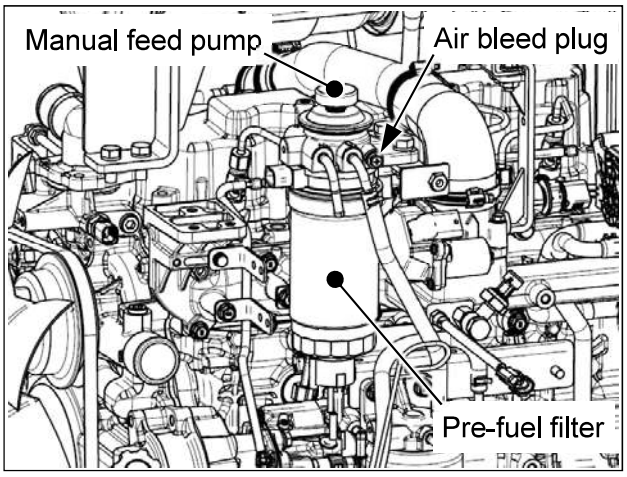
Notice	▶ When changing the fuel filter only, it is not necessary to bleed air from the fuel injection pipes.

⚠Caution	▶Cover the bleeding fuel with a rag so that it does not flow into other components. ▶Do not throw the exhausted waste fuel 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 environmental laws.

① Air-bleeding from Fuel filter

- After replacing fuel filter, bleed air from the fuel system.

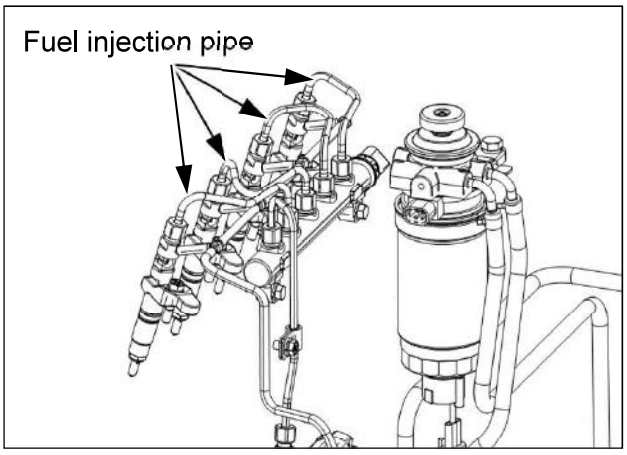
1. Place a rag or clean container under the air bleed plug and press down the manual feed pump several times.
2. Unscrew the air bleed plug installed on the fuel filter flange. After bleeding the air bubbles, tighten the air bleed plug slightly.
3. Repeat the procedure 1 and 2 until there is no more fuel containing air bubbles.
4. If there are no air bubbles in the fuel flowing out, make sure to tighten the air bleed plug.



Notice	▶ If dust and dirt is stuck to the air bleed plug, it may prevent the air-bleeding. In this case, unscrew the air bleed plug and clean it.

② Air-bleeding from Fuel injection pipe

- DO NOT loosen the high-pressure fuel lines in order to purge air from the fuel system. This procedure is not required.



⚠Warning	▶ **Escaping fluid!** Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately. Failure to comply could result in death or serious injury.

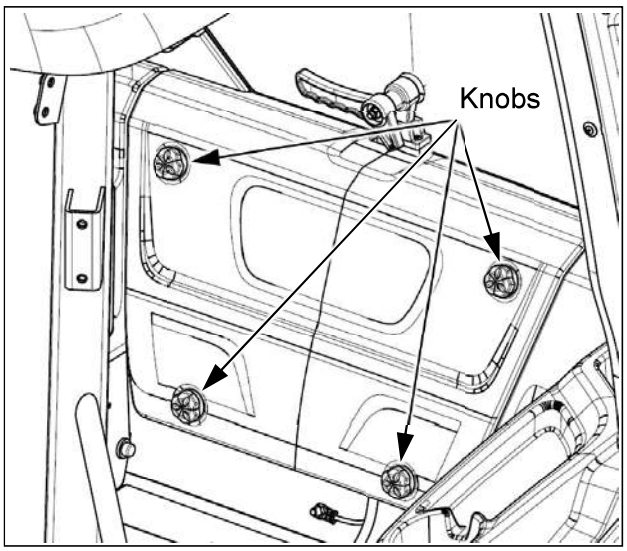
(2) Fuse & Main fuse

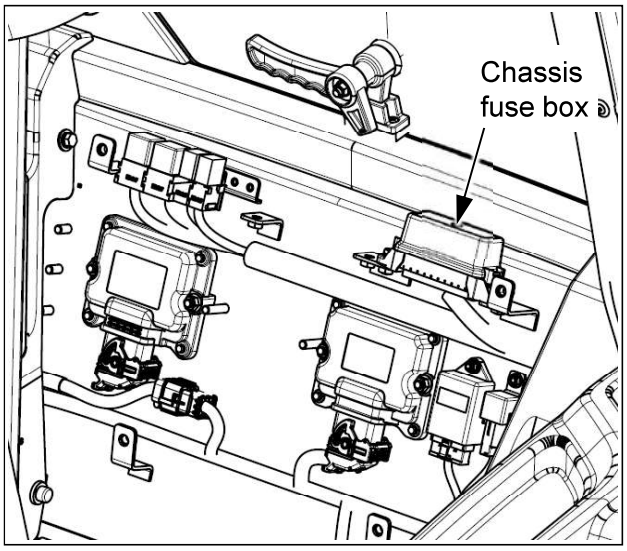
① Chassis fuse check and replacement

- How to replace the fuse

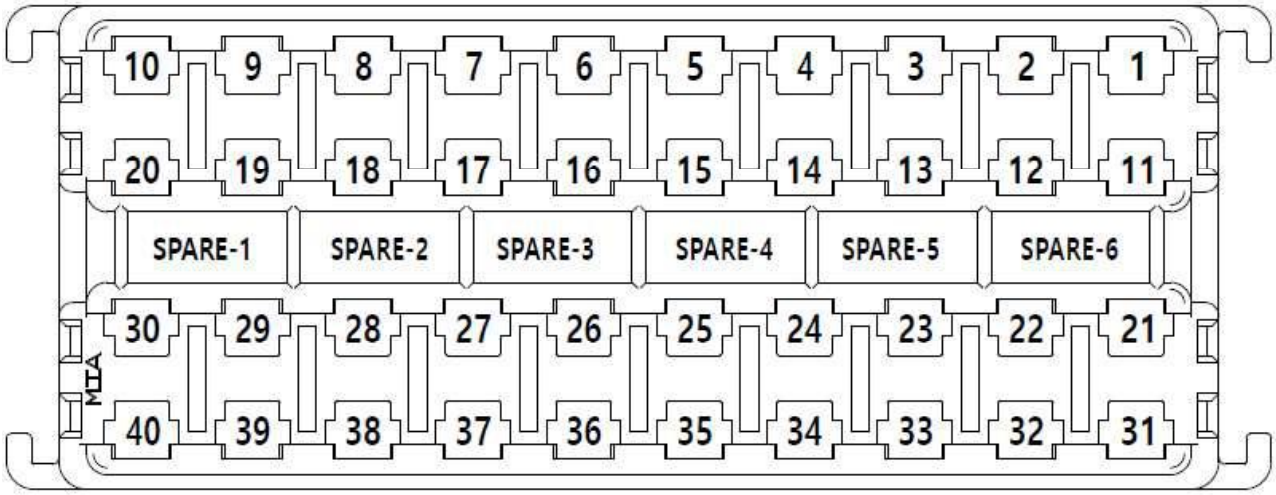
1. Remove the fuse box cover.
2. Check each fuse and remove the damaged one.
3. Replace it with a new one of the same capacity as the damaged fuse.

- The chassis fuse box is installed inside the rear cover behind the driver's seat. To access the chassis fuse box, unscrew the knobs and remove the rear cover.
- Depending on the optional specification, some figures may be different from your tractor.
- The capacity and function of each fuse is described on the fuse box cover. For further information, see next page.





⚠Caution	▶ If the same function fuse is damaged repeatedly, contact your authorized local dealer for check instead of using a substitute such as wire or aluminum foil. ▶ If using the substitute instead of the rated capacity fuse, it may cause a fire which results in damage of the tractor or serious personal injury.



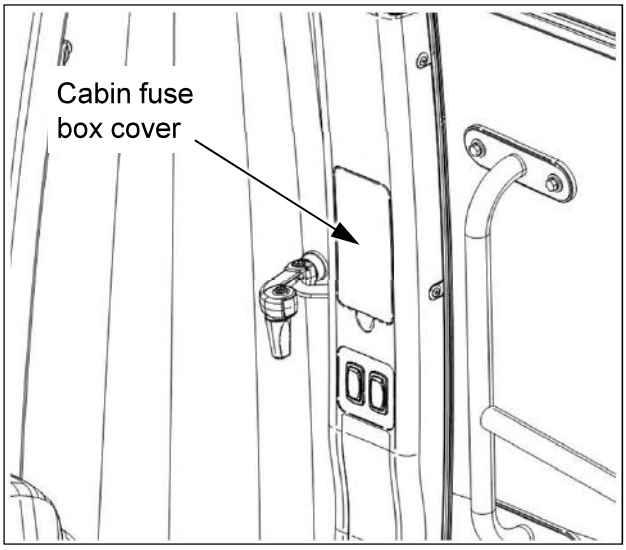
COM	PIN	—	PIN	FUSE	PART NUMBER	REMARK
●	11	—	1	10A	40370238	Controller
●	12	—	2	10A	40370238	Hyd. valve
●	13	—	3	10A	40370238	Loader valve
●	14	—	4	5A	40370237	Sensor
●	15	—	5	10A	40370238	Cluster
●	16	—	6	10A	40370238	Head lamp
●	17	—	7	10A	40370238	Signal lamp
●	18	—	8	10A	40370236	Work lamp
●	19	—	9	20A	40370240	Air suspension seat
●	20	—	10	15A	40370239	Power outlet(Socket)
●	21	—	31	15A	40370239	Power outlet(Implement)
●	22	—	32	10A	40370238	Power shuttle(IG)
●	23	—	33	10A	40370238	Power shuttle(Valve)
●	24	—	34	10A	40370236	Hazard(B+)
●	25	—	35	5A	40370237	Controller(B+)
●	26	—	36	30A	40370242	Fuel heater
●	27	—	37	15A	40370239	Power outlet(3P socket)
●	28	—	38	30A	40370242	ECU power
●	29	—	39	10A	40370238	Engine sensor
●	30	—	40	5A	40370237	Engine control
		—		5A	40370237	SPARE #1
		—		10A	40370238	SPARE #2
		—		10A	40370238	SPARE #3
		—		15A	40370239	SPARE #4
		—		20A	40370239	SPARE #5
		—		30A	40370242	SPARE #6

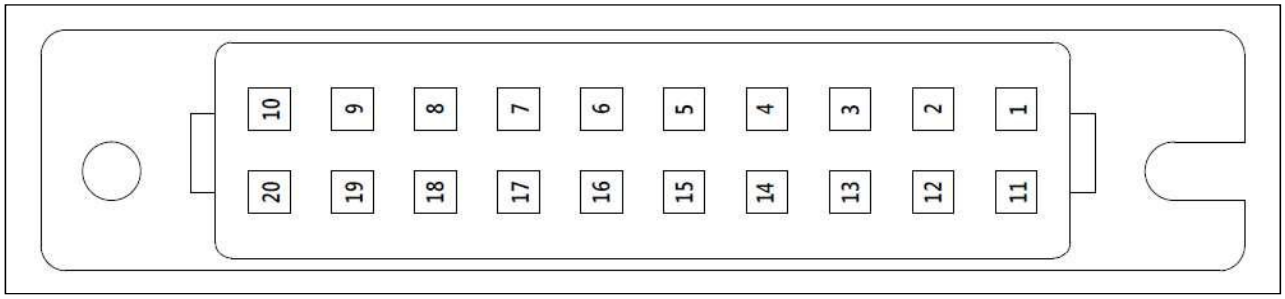
② Cabin fuse check and replacement

- How to replace the fuse

1. Remove the fuse box cover.
2. Check each fuse and remove the damaged one.
3. Replace it with a new one of the same capacity as the damaged fuse.

- The cabin fuse box is installed on the left cabin pillar.
- The capacity and function of each fuse is described on the fuse box cover.



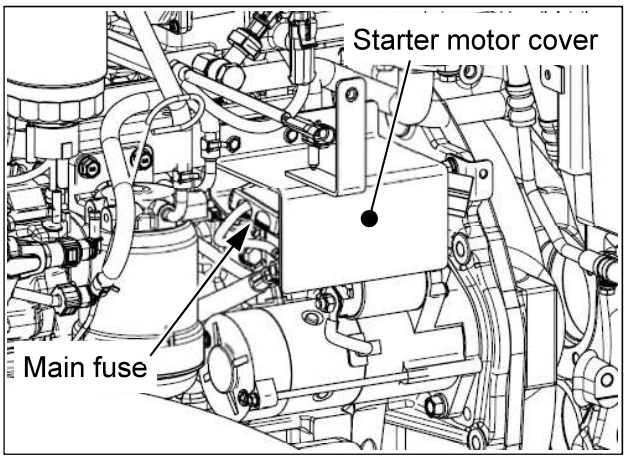


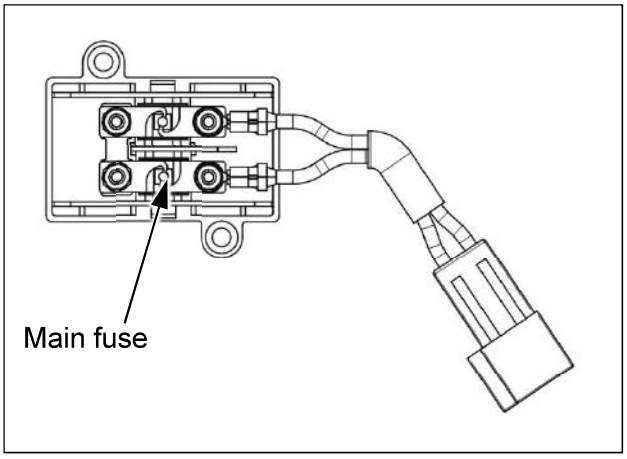
Pin	Pin	Fuse	Remarks
20	10	10A	Beacon lamp
19	9	10A	Spare
18	8	15A	Rear work lamp
17	7	30A	Air conditioner
16	6	15A	Spare
15	5	10A	Audio
14	4	15A	Front work lamp
13	3	10A	Rear wiper motor
12	2	10A	Front wiper motor
11	1	10A	Air-con. compressor

⚠ Caution	▶ If the same function fuse is damaged repeatedly, contact your authorized local dealer for check instead of using a substitute such as wire or aluminum foil. ▶ If using the substitute instead of the rated capacity fuse, it may cause a fire which results in damage of the tractor or serious personal injury.

③ Main fuse

- The main fuse is attached to the left side of the engine, under the starter motor cover.
- Remover the fuse box cover and pull out the chassis main fuse. If necessary, replace it with a genuine part.
  Rated capacity : 60 A
- The chassis main fuse is an important part to protect the electric system of the driver station and lights. if damaged, check if there is a trouble in the electric system. Contact your authorized local dealer for check.





⚠Caution	▶ If the main fuse is burn out often, contact your authorized local dealer in order to check the electric system. ▶ Do not use a substitute instead of the rated genuine fuse. Do not connect electric wires to the battery terminals directly. It may cause a fire and serious injury.

(3) Battery handling and Notices

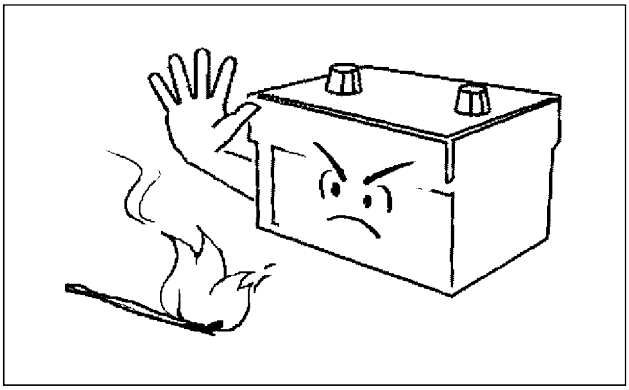
※ **Battery fluid (Electrolyte) is a solution of water and sulfuric acid. It makes poisonous gas which is very harmful to eyes, skin and clothing. And also this gas is explosive. Read the following instructions thoroughly before handling the battery.**

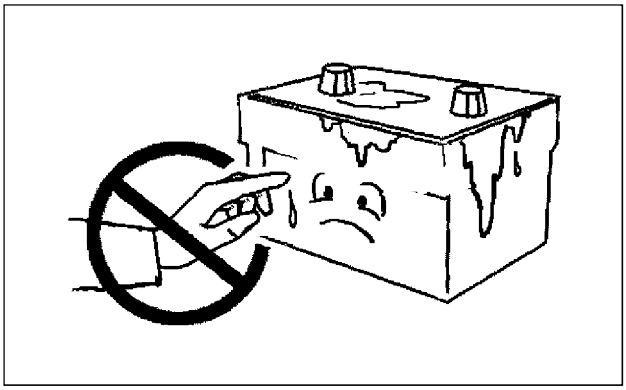
① Battery check

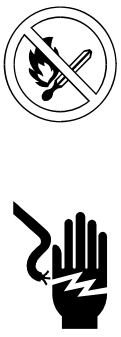
● Indicator(if fitted) on the top of the battery displays the battery state. If the indicator color is;

- **GREEN** : Normal state.
  If the engine does not start despite of green color, contact your authorized 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.

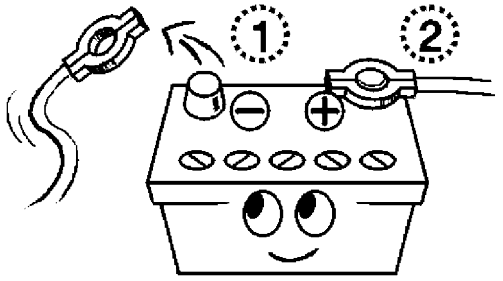




⚠ Caution	▶ The poisonous gases from the battery are explosive. Comply with the following instructions. - Keep cigarettes, sparks and flames away from the battery. Use a flashlight to check the battery electrolyte level or indicator. - Never check the battery voltage by shorting the terminals with metal objects. Use a voltmeter or hydrometer. - Always remove the grounded (-) battery clamp first and assemble it last. If not, it can cause an explosion by spark.
	▶ Sulfuric acid in the battery electrolyte is poisonous. It is strong enough to burn skin, clothing and it 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 your eyes, and get medical attention immediately.
	▶ Charge the battery in an area with good ventilation and DO NOT charge a frozen battery. ▶ Replace the old battery with a same capacity genuine product.

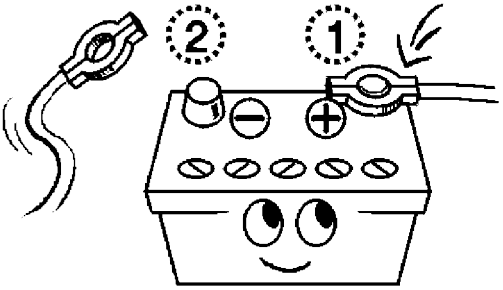
② Notices in attaching/detaching the battery

- When detaching 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.



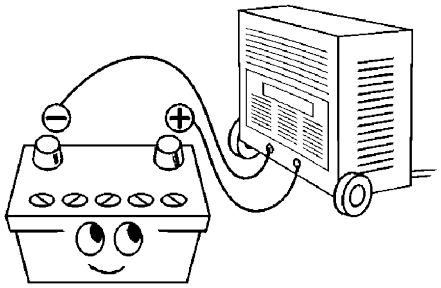
< When attaching >

Caution	▶ Stop engine and apply parking brake and remove the ignition key before replacing the battery.
	▶ Put on eye protection and globes to protect your 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 charge the battery.
	▶ Replaced old battery must be disposed of in a suitable manner, according to the national legislation or local regulations. Contact your authorized dealer. ▶ Replace the old battery with a same capacity genuine product.

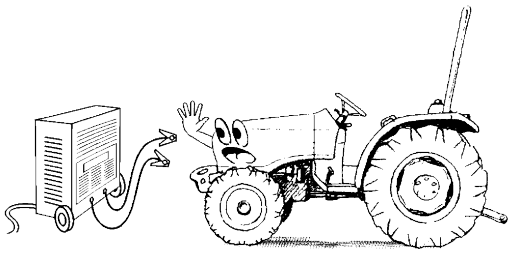
③ Notices in charging the battery using separate charger

- 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”.
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 your 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.
	▶ Detach the battery from your 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 the battery voltage by shorting the terminals with metal objects.

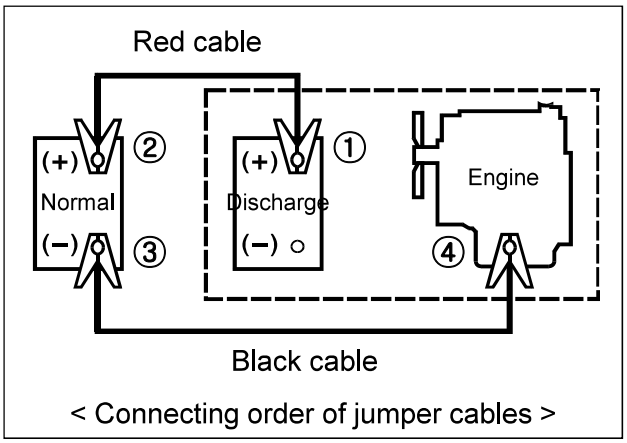
④ How to use jumper cables

※ If the battery which is attached to the tractor is discharged and needs to connect an 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. Start engine. If the engine does not start, check the electrolyte level of each battery.

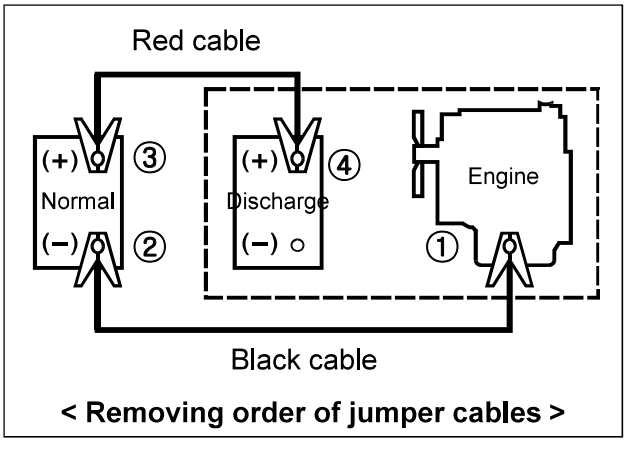


< Connecting order of jumper cables >

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

ⓑ Removing Jumper cables

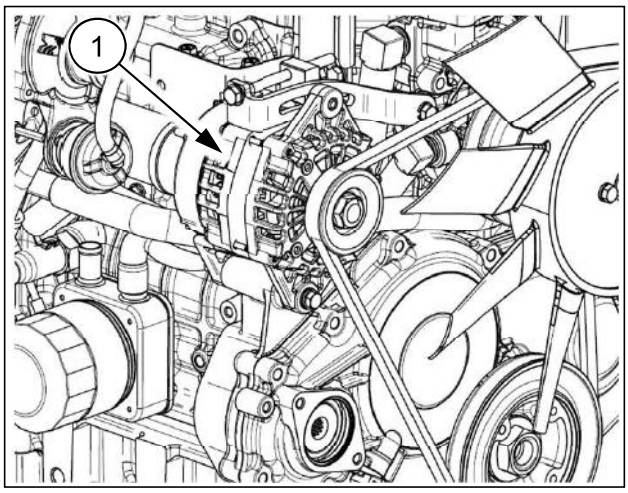
- Remove jumper cables as referring to the right figure, “Removing order of jumper cables”.



< Removing order of jumper cables >

Notice	▶ Pay attention not to change the (+) and (-) pole. Otherwise, it may cause a failure of electric circuit or damage of the wire and even the polarity of the battery can be changed in an over-discharged state.

(4) Alternator and drive belt - Check

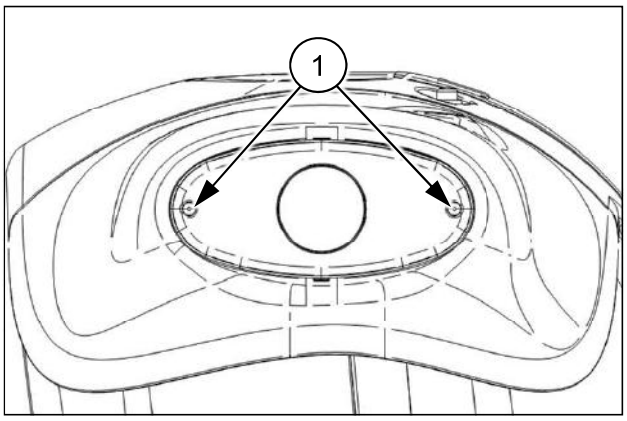


- The tractor alternator① is belt-driven from the engine crankshaft pulley. It is important that belt slippage does not occur, or the charging system will be affected.
  To adjust the fan belt, see page 5-34.
- Required alternator periodical maintenance:
  - Belt adjustment
  - Inspect alternator terminals
  - Clean alternator cooling fan fins
- When working on or checking the alternator, adhere to following precautions. Otherwise, alternator damage may occur:
  - Do not UNDER ANY CIRCUMSTANCES short the field terminal of the alternator to ground.
  - Do not disconnect the alternator output lead or battery cables while the alternator is operating.
  - Do not remove the alternator from the tractor without first disconnecting the negative (-) battery cable. When removing the battery, disconnect the negative (-) cable first.
  - To install a battery, MAKE SURE that the positive (+) cable is connected first and that the negative terminal is connected to ground. Reverse polarity will destroy the rectifier diodes in the alternator.

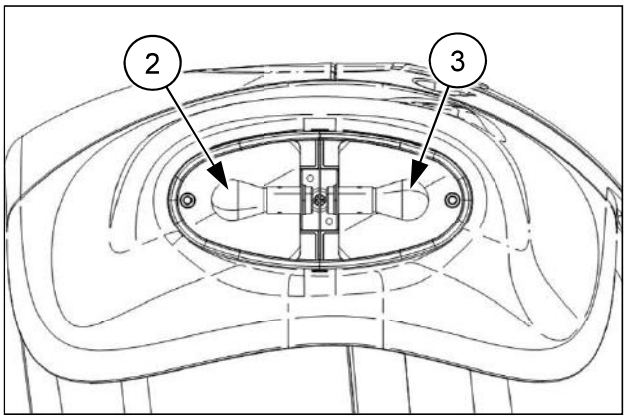
NOTE: *If the battery charge warning indicator illuminates, indicating that the alternator is not charging the battery, check the fan belt and the wiring connections. If these items are in satisfactory condition and the warning light continues to indicate no charge, contact your authorized local dealer.*

(5) Tail/brake light bulb and turn signal light bulb- Replace

① Tail/brake light bulb and rear turn signal light bulb replacement (Roll-bar models)



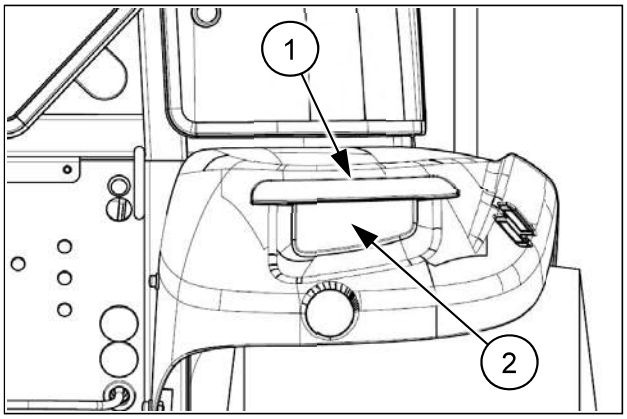
1. Remove the two screws① retaining the taillight lens and remove the lens.



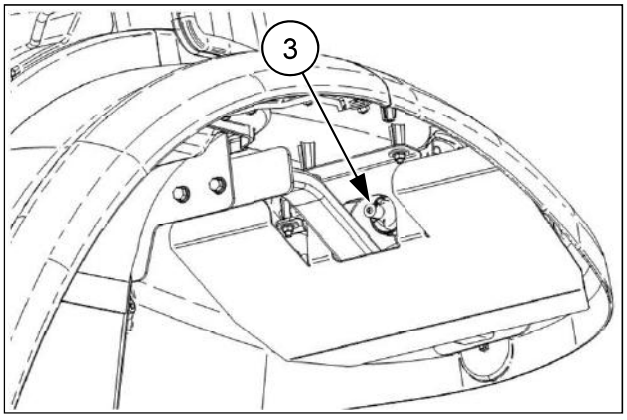
2. Push in on the tail/brake light bulb② or turn signal light bulb③ and rotate counter-clockwise in the socket to remove the old bulb.
3. Insert the new bulb into the socket and turn the bulb in a clockwise direction until tightened.
4. Install lenses and retaining screws①.

NOTE: *For about bulb specification, refer to the chapter 5-6-(4) in this manual.*

② Tail/brake light bulb and rear turn signal light bulb replacement (Cabin models)



1. This tail/brake light is an LED type lamp and the bulb cannot be replaced. If the light fails to operate, you should replace the light with a new one. Contact your authorized local dealer.

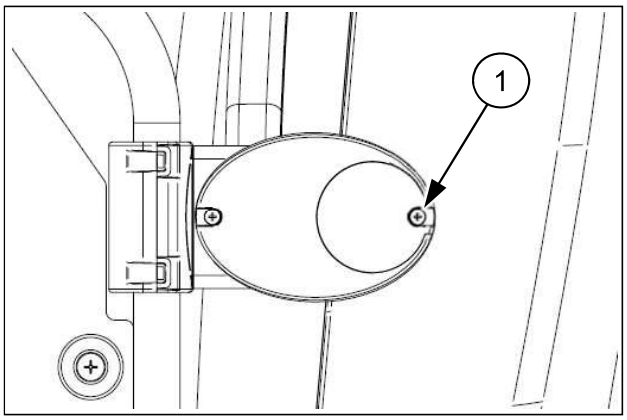


2. Turn the turn signal light bulb socket③ counter-clockwise and remove it from the housing.
3. Push in on the turn signal light bulb and rotate counter-clockwise in the socket to remove the old bulb.
4. Insert the new bulb into the socket and turn the bulb in a clockwise direction until tightened.
4. Install the socket③ to the lamp housing.

NOTE: *For about bulb specification, refer to the chapter 5-6-(4) in this manual.*

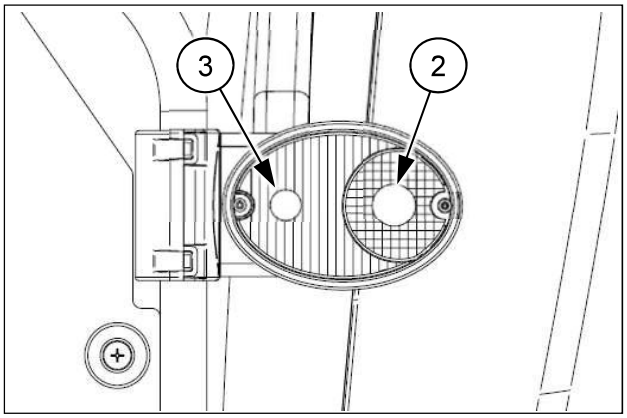
③ Side light/Front turn signal light bulb replacement (Roll-bar models)

1. Remove the two screws① retaining the turn signal light lens and remove the lens.



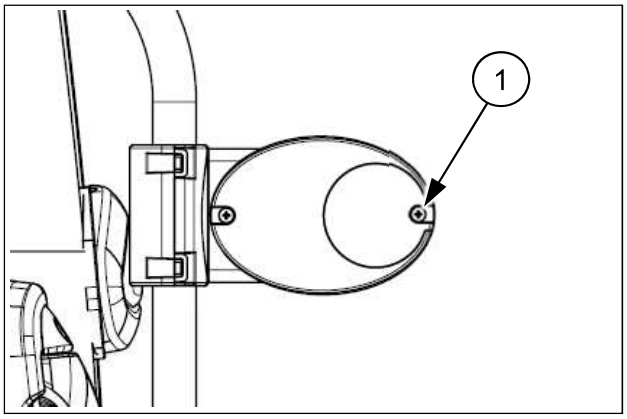
2. Push in on the turn signal light bulb② or side light bulb③ and rotate counterclockwise in the socket to remove the old bulb.
3. Insert the new bulb into the socket and turn the bulb in a clockwise direction until tightened.
4. Install lenses and retaining screws①.

NOTE: *For about bulb specification, refer to the chapter 5-6-(4) in this manual.*



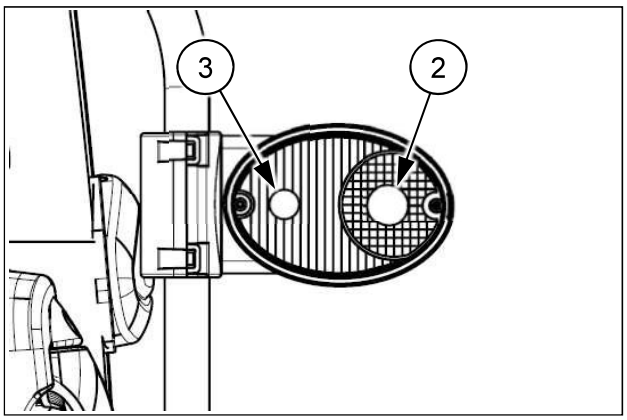
④ Side light/Front turn signal light bulb replacement (Cabin models)

1. Remove the two screws① retaining the turn signal light lens and remove the lens.



2. Push in on the turn signal light bulb② or side light bulb③ and rotate counterclockwise in the socket to remove the old bulb.
3. Insert the new bulb into the socket and turn the bulb in a clockwise direction until tightened.
4. Install lenses and retaining screws①.

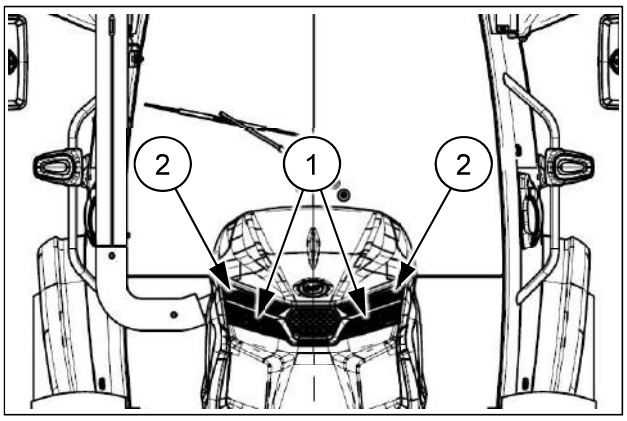
NOTE: *For about bulb specification, refer to the chapter 5-6-(4) in this manual.*



(6) Headlight bulb - Replace

- This headlights are LED type lamps and the bulb cannot be replaced. If a light fails to operate, you should replace the light with a new one. Contact your authorized local dealer.
  ① Headlight (low beam)
  ② Headlight (high beam) and work light

NOTE: *For about bulb specification, refer to the chapter 5-6-(4) in this manual.*



(7) Touch-up paint color

- The following color specifications are recommended for touch-up paint repairs. For the details, contact your authorized local dealer.
- You can use acryl urethane paint.

Color for Cabin models	Parts	Munsell number
Deep Sky Blue	Hood, Fenders, Roof	8.41B 3.59/10.99
LS Gray N2	Instrument panel covers, Steering column covers, Left/Right-hand interior trims, Cabin left-hand/right-hand pillar, Left-hand/right-hand lever guide.	N2.0
Dark Metallic Silver	Instrument panel bezel, Remote control lever guide.	-
LS Metallic Silver	Front and rear wheels	-
Black	Transmission case, Front axle	N1.0

Color for Roll-bar models	Parts	Munsell number
Deep Sky Blue	Hood, Fenders	8.41B 3.59/10.99
LS Gray N2	Instrument panel covers, Right-hand control cover	N2.0
Dark Metallic Silver	Instrument panel bezel	-
LS Metallic Silver	Front and rear wheels	-
Black	Transmission case, Front axle	N1.0

5-16. Troubleshooting

⚠ Warning	▶ To avoid injury due to sudden start, apply the parking brake and place the transmission gears in the 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 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 High pressure 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.	▲ 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

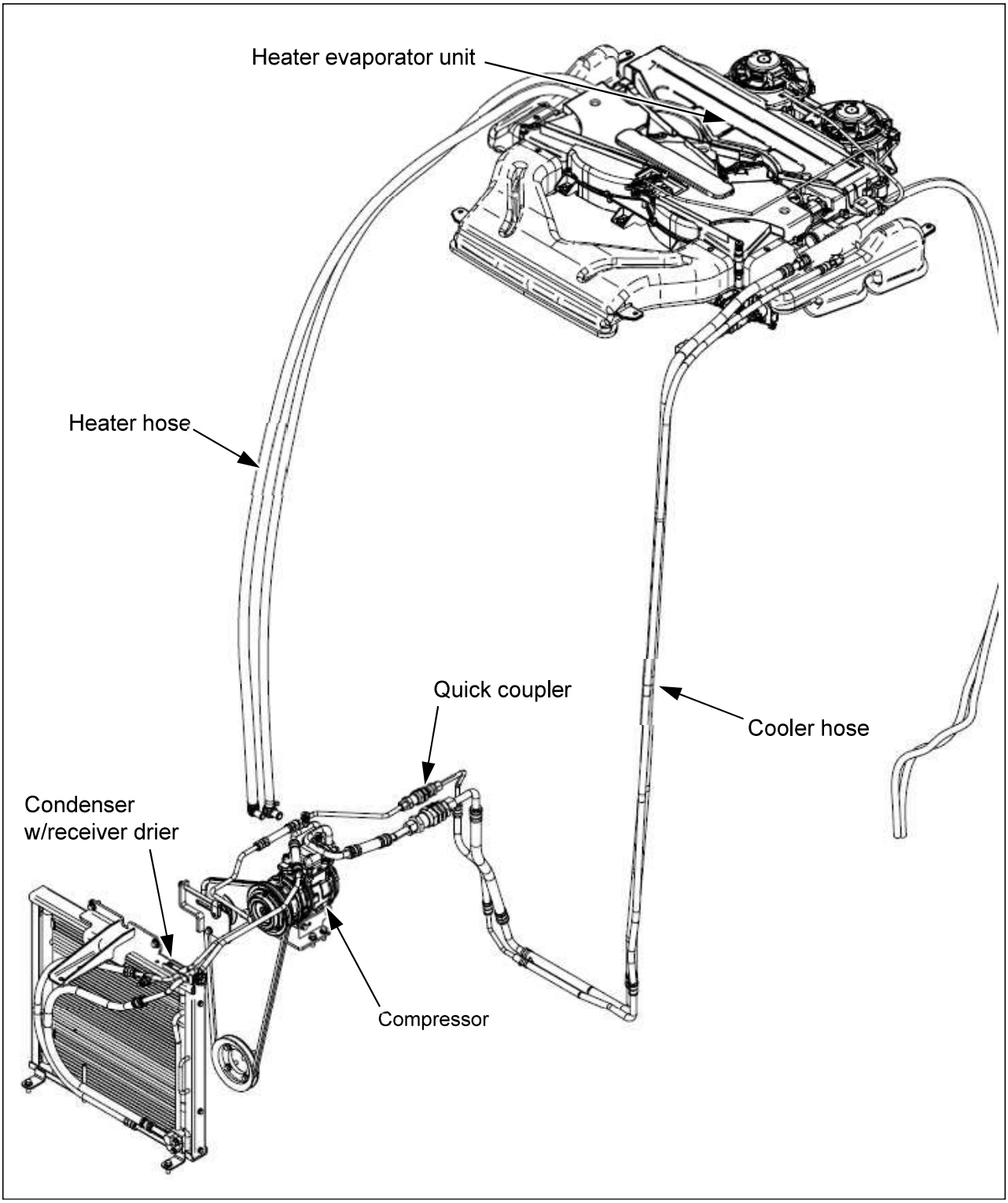
System	Faults	Possible causes	Solutions
Brake	Brake does not work or only one side works.	▲ Wrong brake pedal play ▲ Lining worn or broken ▲ Left/right pedal play is different	▲ Adjust ▲ Replace ▲ Adjust
	After brake pedal working, it does not return.	▲ Return spring damaged ▲ Lack of grease in shaft parts	▲ Replace the spring ▲ Remove the rust, apply grease
Hydraulic Lift System	Lift arm does not raise.	▲ 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 parts ▲ 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, and relief valve sound off.	▲ Upper limit of position control lever is changed	▲ Adjust the upper limit
	Lift arm does not lower	▲ Down speed control valve locked ▲ Control valve failure ▲ Cylinder damaged ▲ Lift shaft turning 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 is not aligned - Spool and sleeve damaged by foreign material - Excessive tightening torque of end cap bolt ▲ Pump - Low speed - Wearing or 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 or repair pump ▲ Bleed air

System	Faults	Possible causes	Solutions
Electric System	Battery is not charge	▲ Abnormal wiring ▲ Alternator failure ▲ Lack of fan belt tension or broken ▲ Abnormal battery	▲ Check the tightening state of terminal 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 does not ON.	▲ Light bulb cut-off ▲ Fuse blown	▲ Replace ▲ Check the cause, and replace
	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 does not ON. (option)	▲ Relay or timer damaged ▲ Bad connection of preheat plug wiring	▲ Replace ▲ Check and tighten
	Other illuminating and indicator does not ON.	▲ Fuse blown ▲ Light bulb cut-off	▲ After removing the cause, and replace ▲ Replace

6. Air Conditioning System

6-1. The name of each part of cooling and heating system

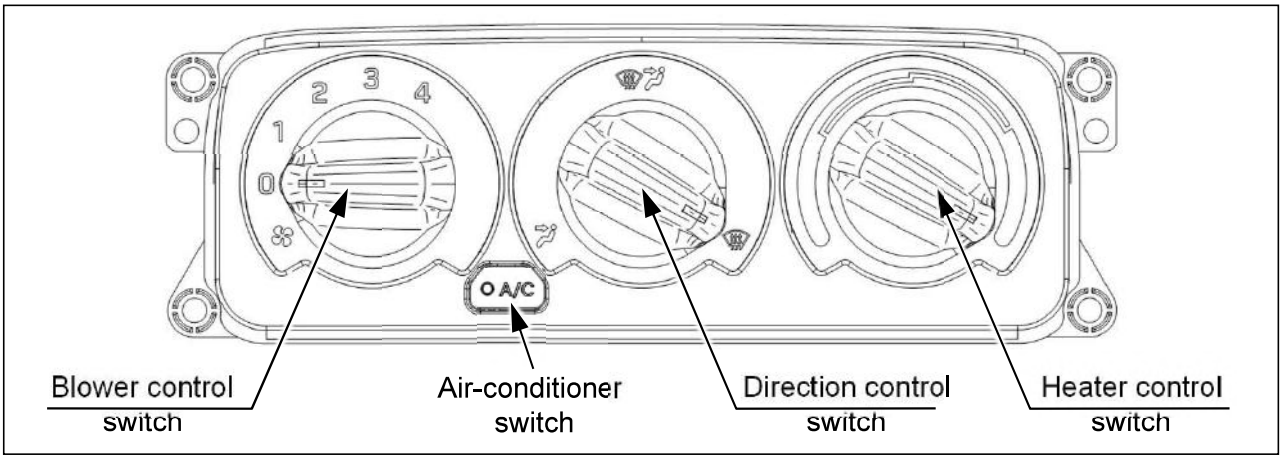


⚠Caution	▶ Maintenance of the air conditioning system and components (Compressor, Receiver drier, Condenser, Heater evaporator unit and connection parts) must be performed in a designated dealer. DO NOT disassemble the components arbitrarily.

6-2. How to use Air conditioner and Heater

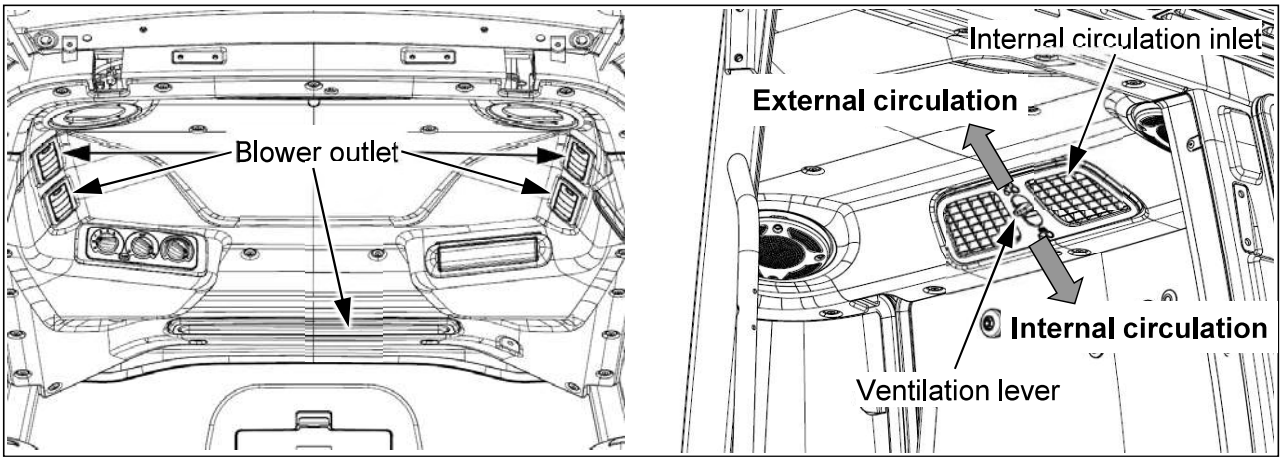
(1) How to operate air conditioner and heater

- **Air conditioner switch**
  - It is used to operate the air conditioner. If you press the switch button and turn the blower control switch to 1, 2, 3 or 4 position, the operation lamp will be ON and the air conditioner begins to work.
- **Blower control switch and direction control switch**
  - These are used to control the amount and direction of air flow respectively.
- **Heater control switch**
  - It is used to select warm or cool air. Turn the switch clockwise (blue) for cool air, and otherwise, turn it counter-clockwise (red).



(2) Air direction control

- To control the air flow direction, adjust the blade angle of the blower outlets.
- For internal circulation, move the ventilation lever to the internal circulation position.
- When operating the air conditioner or heater, open the blower outlets always.



⚠ Caution	▶ Never sleep in the cabin with the air conditioner or heater turned on. It may cause suffocation. ▶ When operating in the cabin for a long time, ventilate the cabin frequently.

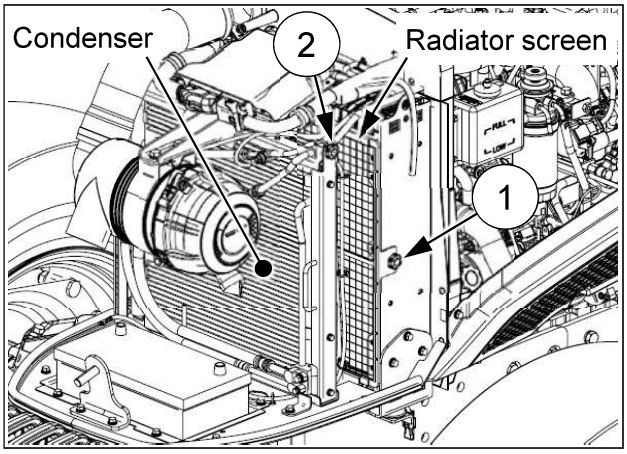
6-3. Every 6 month check

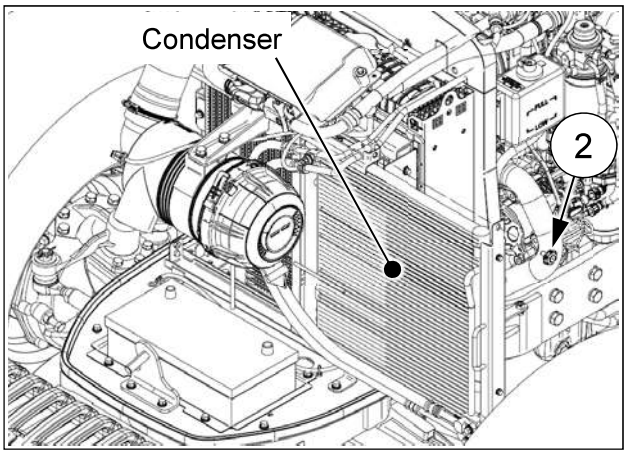
(1) Checking refrigerant amount

- Check the refrigerant amount periodically. Contact your authorized local dealer for check up. The components of the air conditioning system should be handled by an authorized service expert.
- **Refrigerant and capacity: R-134a (HFC-134a), 750g (26.5 oz)**

(2) Cleaning Condenser and Radiator screen

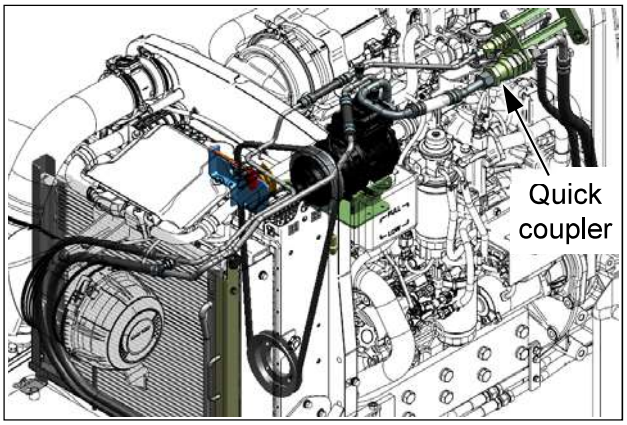
- Stop engine and allow the engine to cool down. Open the hood(bonnet).
- Unscrew the knobs **(1)** installed on the left-hand and right-hand radiator side panel and pull out the radiator screen to the left and right-hand side. To access the condenser, unscrew the knob **(2)** and pull it out slowly to the left-hand side.
- Remove dust and dirt, dry grass, and other debris stuck to the condenser, fuel cooler (if fitted), TM oil cooler (if fitted), radiator and radiator screen with soft brush or low pressurized air or water.
- Be careful not to deform the cooling fins while cleaning. If necessary, repair the deformed fins.
- Depending on the working conditions, shorten the service interval reasonably.





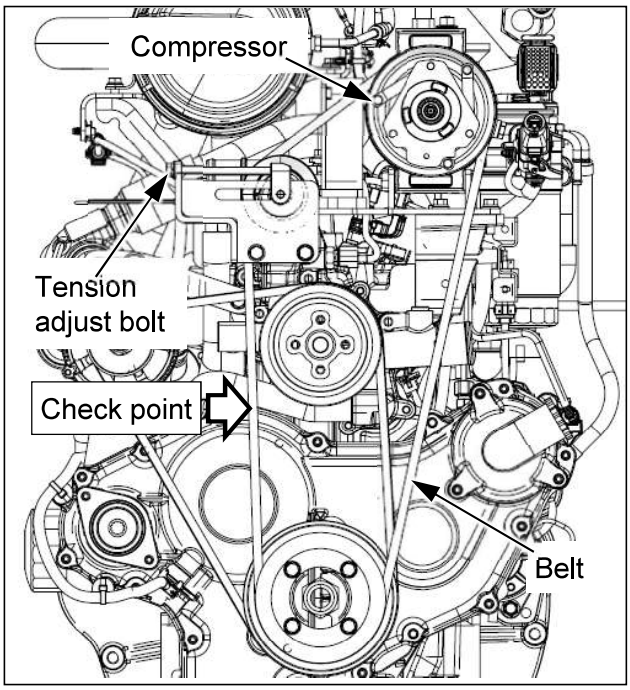
(3) Checking Leakage

- Check the tightening torque and oil leakage of the connecting parts.
- Oil spots or stains on the connecting parts may indicate a possible refrigerant leak. Contact your authorized local dealer to check the refrigerant amount.



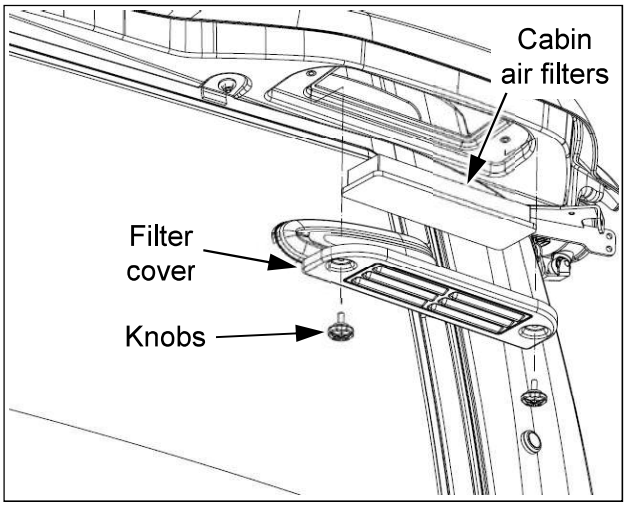
(4) Belt tension adjustment

- Check if the belt tension is suitable or not. If necessary, adjust the belt tension with the tension adjust bolt.
- **Tension : approx. 10~12 mm (0.4~0.5 in.) (when pressed by 50N (11 lb))**
- Check the belt for damage. If necessary, check the pulley alignment and replace it with a new one.



(5) Cleaning and replacing cabin air filters

- Check, clean and replace the cabin air filters periodically after referring to the chapter 5 in this manual.
- Refer to the chapter 5-2, “Maintenance chart” in this manual.



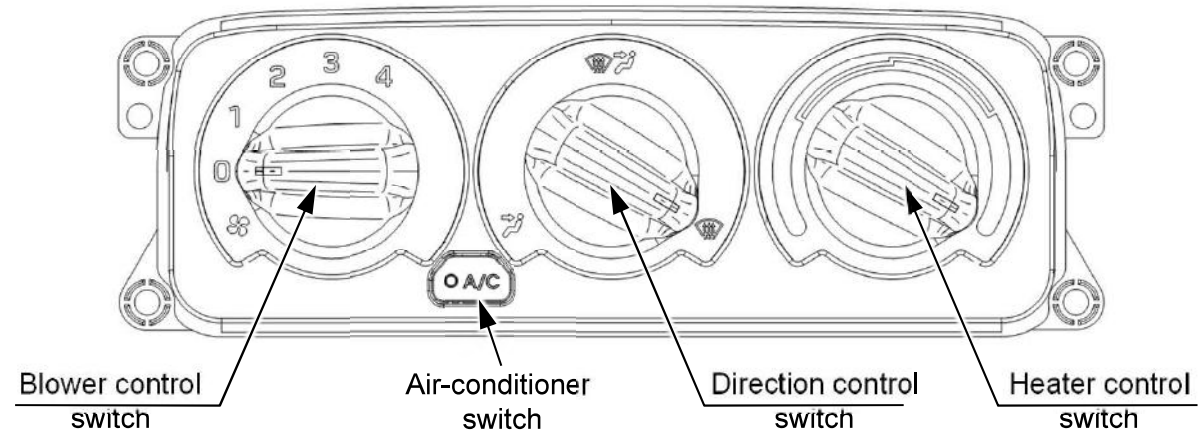
6-4. Every year check

(1) Compressor check

- Check the oil leakage on the magnet clutch in front of the compressor.
- Check the abnormal noise sounds and if necessary, contact your authorized local dealer for check.

(2) Control switch check

- Check the electric switches of the control panel is normally operated.



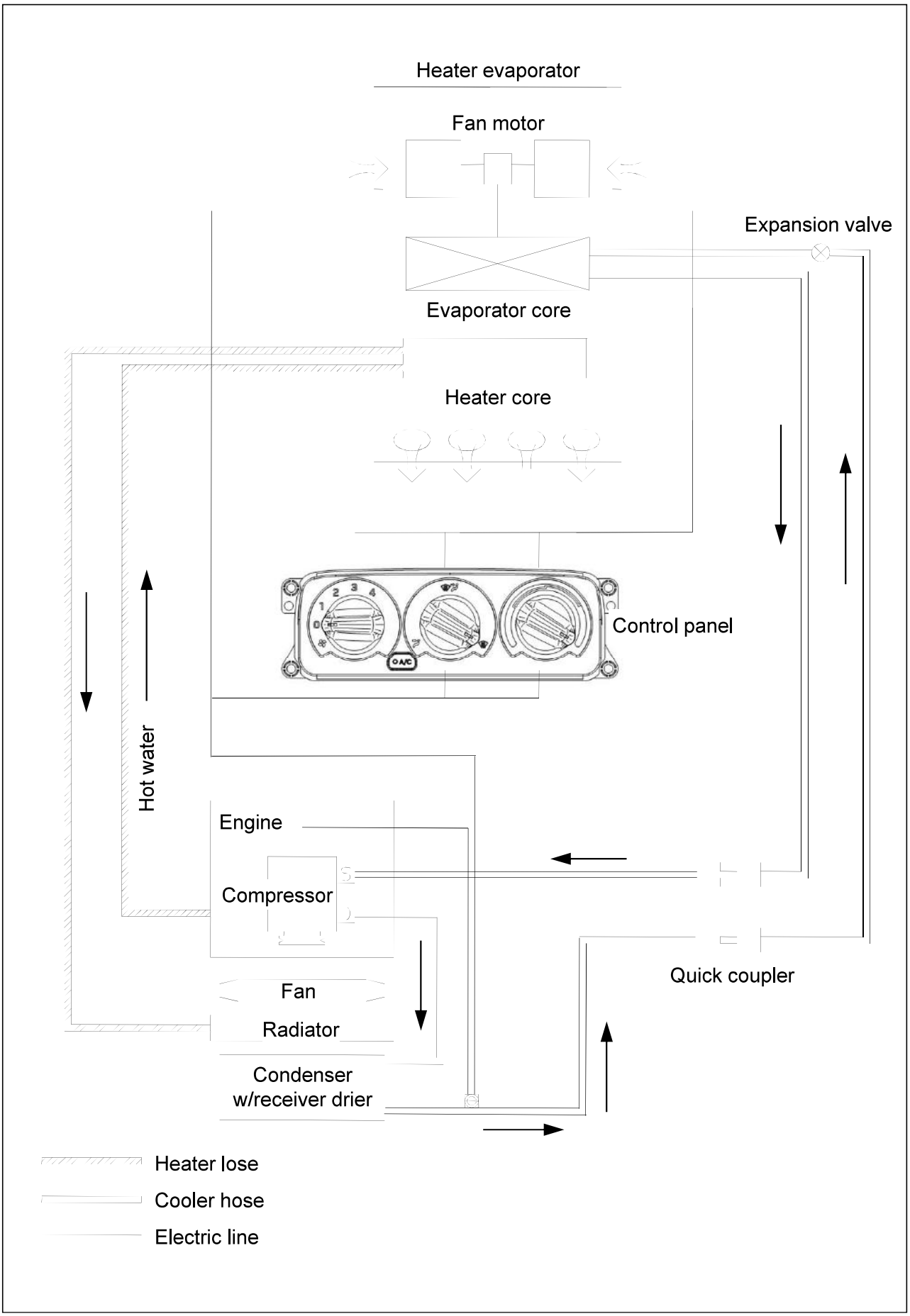
Caution	▶ If there is a problem with the air conditioning system, do not disassemble the components arbitrarily, but contact your authorized dealer for check.

6-5. Troubleshooting

No.	Failures		Cause	Actions
1	Fan motor does not turn.		Fuse blown.	Check and replace.
			Wiring cut off and poor connection.	Repair the wiring or connect right.
			Failure of fan motor.	Replace.
			Resistor, relay and switch cut off.	Replace.
2	Fan motor is normal but the air volume is small.		Evaporator or heater core was clogged.	Remove the obstacles and clean the cores.
			Duct was misaligned.	Repair the duct.
			Fan damaged or Fan motor failure.	Replace.
			Filter was clogged.	Clean or replace.
3	Air conditioning is insufficient despite of the normal operation of compressor and blower.	Low and high pressure is low.	Leakage of refrigerant.	Contact your authorized local dealer.
		Low and high pressure is high.	Refrigerant overcharged.	Contact your authorized local dealer.
			Condenser or radiator screen was clogged.	Clean condenser and the screen.
			Air is in air conditioning line.	Contact your authorized local dealer.
			Expansion valve does not control the refrigerant flow.	Contact your authorized local dealer.
		Low pressure is high, high pressure is low.	Compressor leakage.	Contact your authorized local dealer.
		Low pressure is vacuum intermittently.	Water is in air conditioning line.	Contact your authorized local dealer.
		Low pressure is vacuum, high pressure is low.	Receiver dryer, pipe or expansion valve is clogged.	Contact your authorized local dealer.

No.	Failures	Cause	Actions
4	The compressor does not rotate or it is hard to rotate.	Belt loosened.	Adjust the belt tension.
		Temperature switch or pressure switch is “ON”.	Check refrigerant amount.
		Coil of magnet clutch was shorted or cut off.	Contact your authorized local dealer.
		Compressor failure.	Contact your authorized local dealer.
		Wiring cut off or poor connection such as ground.	Check and repair.
5	No warm air does not come out.	The amount of warm water is small.	Check and add the engine coolant.
		Heater line is clogged or distorted.	Check and repair.
		Poor operation of the thermostat of engine coolant.	Repair or replace.

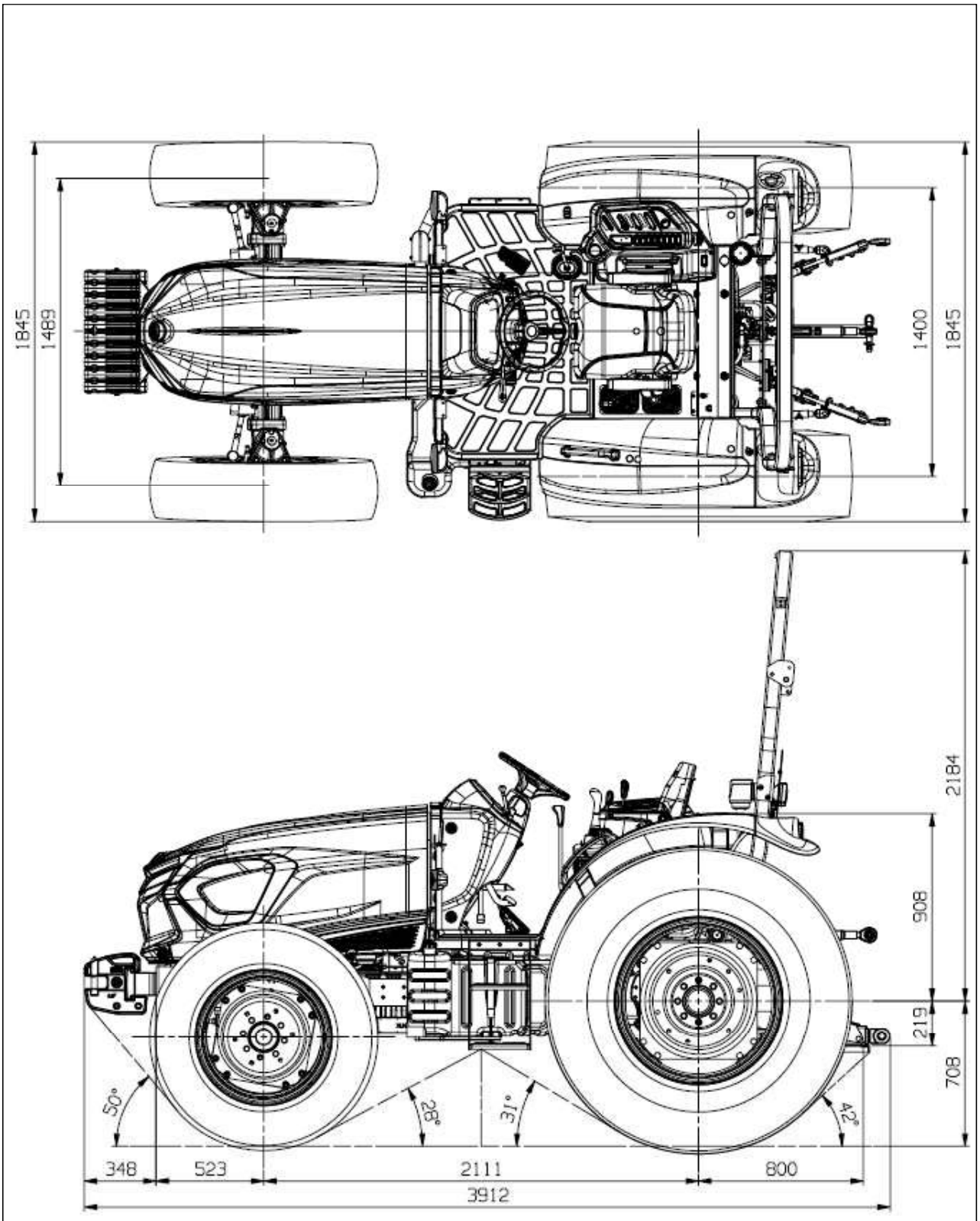
6-6. System diagram



7. Dimension and Specification

① Roll-bar type

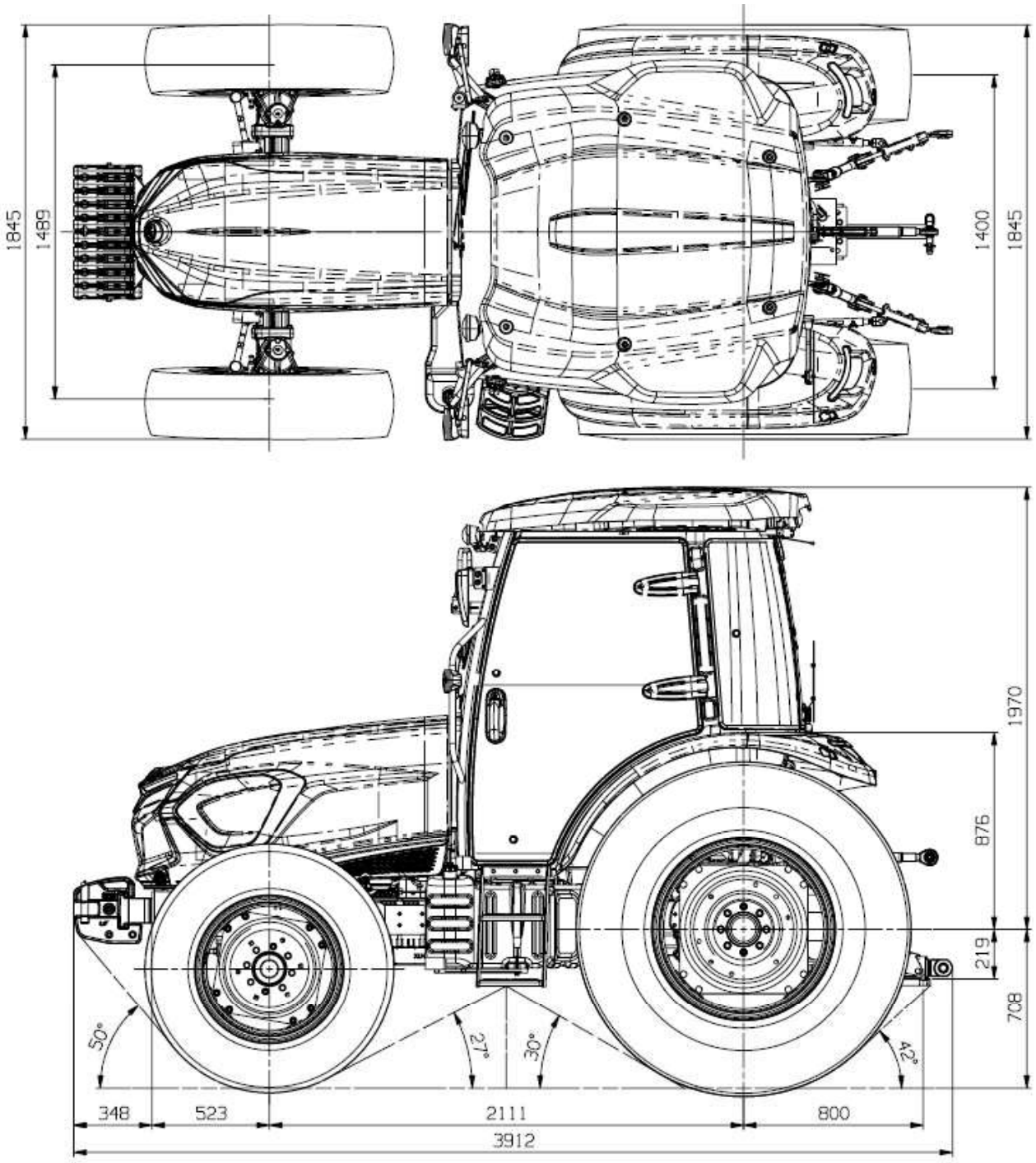
(Unit : mm)



* When applying front tires: 11.2-24 8PR / rear tires: 16.9-30 8PR

② Cabin type

(Unit : mm)



* When applying front tires: 11.2-24 8PR / rear tires: 16.9-30 8PR

		MT463	MT473
WEIGHT	Roll-bar Type	2460kg (5423 lb)	
	Cabin Type	2670kg (5886 lb)	
	Weight distribution	Front : Rear = 0.42 : 0.58(Roll-bar), Front : Rear = 0.42 : 0.58(Cabin)	
	Bumper/Front weight	33kg (72.8 lb) / 20kg (44.1 lb) x 4,6,8,10ea (optional)	
ENGINE	Model	L4CRV-T3	L4CRV-T1B
	Type	In-line vertical, Water cooled 4-cycle diesel, CRDI	
	No. of cylinder	4	
	Diameter x stroke	88x103 (3.46x4.06 in)	
	Displacement	2505cc (152.86 in^3)	
	Compression ratio	17:1	
	Engine speed	850 ~ 2700 rpm	
	Maximum torque	221N.m @1600rpm	260N.m @1600rpm
	Rated power	47.0kW @2500rpm	54.4kW @2500rpm
FUEL INJECTION SYSTEM	Type	CRDI	
	Fuel filter	Replaceable cartridge type	
	Injection order	1-3-4-2	
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	F16xR16 Mechanical transmission / F16xR16 Power shuttle (optional)	
	Main clutch	Dry single clutch (Mechanical) / Wet clutch disks (Power shuttle)	
	Forward / Reverse	Synchro-shuttle type / Power shuttle (optional)	
	Differential lock	Mechanical pedal type	

			MT463	MT473
PTO	Type		Independent PTO	
	No. of speed		2 speed gears	
	PTO / Engine		1st : 540 rpm / 2409 rpm 2nd : 540E rpm / 1789 rpm	
HYDRAULIC LIFT	Type		Open center system, Position & draft control	
	3 Point linkage		CAT. 2, in conformity with ISO 730:2014	
	Draft load detection		Upper link	
	Lowering speed control and cylinder fixing device		Down speed control valve	
	Pump		Gear type, Engine drive	
	Rated flow		56.4LPM (14.9GPM)	
	System pressure		17.5MPa (2538psi)	
	Lift capacity	Lower link end	1850 kgf (4079 lbf)	
		24” behind lift point	1580 kgf (3483 lbf)	
REMOTE CONTROL	Type		Double acting / spring return type	
	No. of Q/coupler		2EA	
	F/loader coupler		Joystick loader valve (optional)	
STEERING SYSTEM	Type		Hydrostatic	
	Oil		Transmission oil	
	Min. turning radius (with/without brake)		3.4 m (11.2 ft) / 3.9 m (12.8 ft)	
	Max. steering angle		50° / 40°	
	No. of steering turns		3.8 turns (lock to lock)	
	Rated oil flow		25.7 LPM (6.8 GPM)	
	System pressure		16.7 MPa (2418 psi)	

			MT463	MT473
ALTERNATOR	Rated output		12V, 70A	
	Voltage control		Built-in (IC type)	
BATTERY	Voltage		12V	
	Capacity		100Ah	
START MOTOR	Output power		12V, 2.2kW	
	Operation		Solenoid	
LIGHTS	Headlights (Lower / Upper)		12V LED 8.5W / 22W	
	Turn signal lights (front)		12V 12W	
	Side lights (front)		12V 5W	
	Turn signal lights (rear)		12V P21W (Cabin) / 12V 21W (Roll-bar)	
	Stop light / Taillight (rear)		12V LED 4.3W / 0.5W (Cabin) / 12V 21W / 5W (Roll-bar)	
	Work light		12V 18W(Grille) / 27W(Roll-bar) / 37.5W(Cabin)	
	Instrument lights		LED	
	Indoor light		12V 10W (Cabin only)	
	Instrument indicator light		LED	
	Cold start aid		Glow plug	
STD.AGRI. TIRE	Front		11.2-24 (8PR)	
	Rear		16.9-30 (8PR)	
WHEEL TRACK ADJUSTMENT	Front	Tracks	8	
		Dimension	1377~1689mm (54.2 ~ 66.5 in.)	
	Rear	Tracks	4	
		Dimension	1400~1720mm (55.1 ~ 67.7 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 **

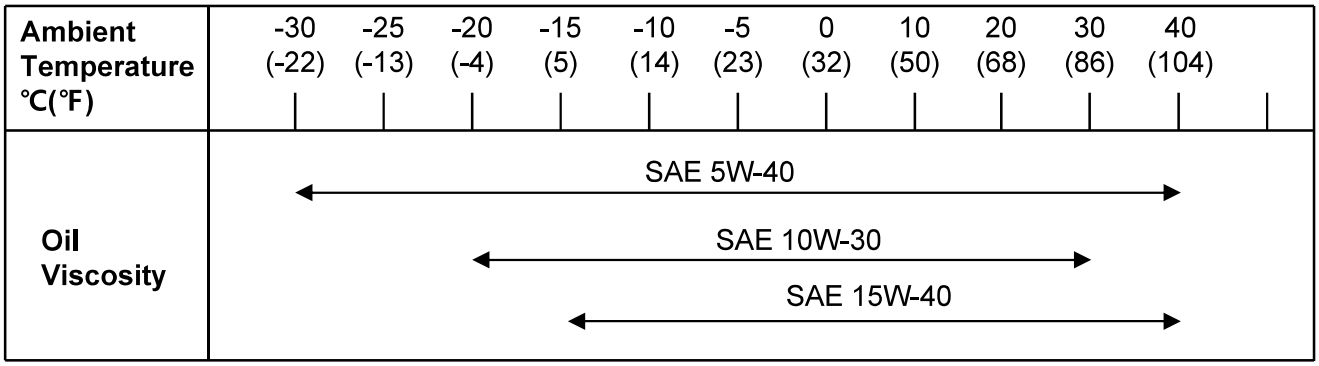
Lubricants and Capacity

LUBRICANTS	CAPACITY	INTERNATIONAL STANDARD	RECOMMENDED ITEMS
Engine coolant	**11.5 ℓ** (3.0U.S.gals)	ASTM D6210	Soft water (50%)+ Anti-freeze (50%)
Fuel	**92 ℓ** (24.3U.S.gals)	- ASTM D975-08a Grade 2 - EN590 : 2009 Diesel fuel - BS2869 : 2006 Class A2	Ultra low sulfur diesel fuel, below 15 ppm
Engine oil	**7.0 ℓ** (1.8U.S.gals)	API CJ-4, ACEA E6/E9	KIXX DL (Maker : GS Caltex)
Transmission oil (common use for Hydraulic lift and power steering system)	**MEC : 62.5 ℓ** (16.5U.S.gals) **PST : 63.5 ℓ** (16.8U.S.gals)	API GL4 ISO VG 32/46	**LSTH400G** (Maker : GS Caltex)
Front axle oil	**8.6 ℓ** (2.3U.S.gals)	API-GL4 SAE 80W-90	EPK 80W90 (Maker : S-OIL TOTAL Co. Ltd.)
Grease (Front axle holder, Gear case upper arm, 3-point linkage)	Proper amount	NLGI 2	MAHWAK Multi purpose or MAHWAK All purpose (Caltex)

RECOMMENDED ENGINE OIL VISCOSITIES

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

In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable. Contact your authorized local dealer.



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