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A MESSAGE TO HYUNDAI LIFT TRUCK OPERATORS

Lift trucks are specialized machines with unique operating characteristics, designed to perform a specific job. Their function and operation is not like a car or ordinary truck. They require specific instructions and rules for safe operation and maintenance.

Safe operation of lift trucks is of primary importance to HYUNDAI.

Our experience with lift truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

- **Operator not properly trained**
- **Operator not experienced with lift truck operation**
- **Basic safety rules not followed**
- **Lift truck not maintained in safe operating condition**

For these reasons, HYUNDAI wants you to know about the safe operation and correct maintenance of your lift truck.

This manual is designed to help you operate your lift truck safely.

This manual shows and tells you about safety inspections and the important general safety rules and hazards of lift truck operation. It describes the special components and features of the truck and explains their function. The correct operating procedures are shown and explained. Illustrations and important safety messages are included for clear understanding. A section on maintenance and lubrication is included for the lift truck mechanic.

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safely operate their lift truck by emphasizing and illustrating the correct procedures. However, it cannot cover every possible situation that may result in an accident. You must watch for hazards in your work areas and avoid or correct them. It is important that you know and understand the information in this manual and that you know and follow your company safety rules!

Be sure that your equipment is maintained in a safe condition. Do not operate a damaged or malfunctioning truck. Practice safe operation every time you use your lift truck. Let's join together to set high standards in safety.

Remember, before you start operating this lift truck, be sure you understand all driving procedures. It is your responsibility, and it is important to you and your family, to operate your lift truck safely and efficiently.

△ Be aware that the Federal Occupational Safety and Health Act (OSHA) and state laws require that operators be completely trained in the safe operation of lift trucks; It is also an (OSHA) requirement that a machine inspection be performed before every shift. If you need training in operating or inspecting your lift truck, ask your supervisor.

HYUNDAI lift trucks are built to take hard work, but not abuse. They are built to be dependable, but they are only as safe and efficient as the operator and the persons responsible for maintaining them. Do not make any repairs to this truck unless you have been trained in safe lift truck repair procedures and are authorized by your employer.

This manual describes procedures for operation, handling, lubrication, maintenance, checking and adjustment. It will help the operator realize peak performance through effective, economical and safe machine operation.

INTRODUCTION

HYUNDAI welcomes you to the growing group of professionals who own, operate and maintain HYUNDAI lift trucks. We take pride in the long tradition of quality products and superior value the HYUNDAI name represents. This manual familiarizes you with safety, operating, and maintenance information about your new lift truck. It has been specially prepared to help you use and maintain your HYUNDAI lift truck in a safe and correct manner.

Your HYUNDAI lift truck has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, for some models, it meets all the applicable mandatory requirements of ANSI B56.1-1988 Safety Standard for Powered Industrial Trucks. Some trucks are also furnished with equipment to help you operate safely; for example, load back rest, parking brake and horn are standard equipment.

Safe, productive operation of a lift truck requires both skill and knowledge on the part of the operator. The operator must know, understand, and practice the safety rules and safe driving and load handling techniques described in this manual. To develop the skill required, the operator must become familiar with the construction and features of the lift truck and how they function, the operator must understand its capabilities and limitations, and see that it is kept in a safe condition.

Routine Servicing and Maintenance

Regular maintenance and care of your lift truck is not only important for economy and utilization reasons; it is essential for your safety. A faulty lift truck is a potential source of danger to the operator, and to other personnel working near it. As with all quality equipment, keep your lift truck in good operating condition by following the recommended schedule of maintenance.

Operator Daily Inspection - Safety and Operating Checks

A lift truck should always be examined by the operator, before driving, to be sure it is safe to operate. The importance of this procedure is emphasized in this manual with a brief illustrated review and later with more detailed instructions. HYUNDAI dealers can supply copies of a helpful **Drivers Daily Checklist**. It is an OSHA requirement.

Planned Maintenance

In addition to the daily operator inspection, HYUNDAI recommends that a planned maintenance and safety inspection program (PM) be performed by a trained and authorized mechanic on a regular basis. The PM will provide an opportunity to make a thorough inspection of the safety and operating condition of your lift truck. Necessary adjustments and repairs can be done during the PM, which will increase the life of components and reduce unscheduled downtime and increase safety. The PM can be scheduled to meet your particular application and lift truck usage.

The procedures for a periodic planned maintenance program that covers inspections, operational checks, cleaning, lubrication, and minor adjustments are outlined in this manual. Your HYUNDAI dealer is prepared to help you with a Planned Maintenance Program by trained service personnel who know your lift truck and can keep it operating safely and efficiently.

Service Manual

In-depth service information for trained service personnel is found in Service Manual.

HOW TO USE THIS MANUAL

This manual is a digest of essential information about the safe operation, the features and functions and explains how to maintain your lift truck. This manual is organized into ten major parts:

Section 1. Safety hints, reviews and illustrates accepted practices for safe operation of a lift truck.

Section 2. Operating Hazards, warns of conditions that could cause damage to the truck or injury to the operator or other personnel.

Section 3. Know Your Truck, describes the major operating components, systems, controls, and other features of your truck and tells how they function.

Section 4. Operator Maintenance and Care, presents details on how to perform the operator's daily safety inspection and refuel the lift truck.

Section 5. Starting and Operating Procedures, discusses specific instructions on the safe, efficient operation of your lift truck.

Section 6. Emergency Starting and Towing, gives instructions for towing your truck in an emergency and for using battery jumper cables to start your truck in an emergency.

Section 7. Planned Maintenance and Lubrication, describes the PM (Planned Maintenance) program.

Section 8. Specifications, provides reference information and data on features, components, and maintenance items.

Section 9. Troubleshooting, provides trouble symptoms, causes and methods of remedy.

Section 10. Testing and Adjusting, gives instructions for testing and adjusting.

※ **The descriptions and specifications included in this manual were in effect at the time of printing.** HYUNDAI reserves the right to make improvements and changes in specifications or design, without notice and without incurring obligation. Please check with your authorized HYUNDAI dealer for information on possible updates or revisions.

The examples, illustrations, and explanations in this manual should help you improve your skill and knowledge as a professional lift truck operator and take full advantage of the capabilities and safety features of your new lift truck.

The first section of the manual is devoted to a review, with illustrations and brief messages, of general safety rules and the major operating hazards you can encounter while operating a lift truck. Next, you will find description's of the components of your specific lift truck model and how the instruments, gauges, and controls operate. Then, you will find a discussion of safe and efficient operating procedures, followed by instruction's on how to tow a disabled lift truck. The later sections of the manual are devoted to maintenance and truck specifications.

Take time to carefully read the **Know Your Truck** section. By acquiring a good basic understanding of your truck's features, and how they function, you are better prepared to operate it both efficiently and safely.

In **Planned Maintenance**, you will find essential information for correct servicing and periodic maintenance of your truck, including charts with recommended maintenance intervals and component capacities. Carefully follow these instructions and procedures.

Each major section has its own table of contents, so that you can find the various topics more easily.

We urge you to first carefully read the manual from cover to cover. Take time to read and understand the information on general safety rules and operating hazards. Acquaint yourself with the various procedures in this manual. Understand how all gauges, indicator lights, and controls function. Please contact your authorized HYUNDAI dealer for the answers to any questions you may have about your lift truck's features, operation, or manuals.

Operate your lift truck safely; careful driving is your responsibility.

Drive defensively and think about the safety of people who are working nearby. Know your truck's capabilities and limitations. Follow all instructions in this manual, including all symbols (▲ △ ※) and messages to avoid damage to your lift truck or the possibility of any harm to yourself or others.

This manual is intended to be a permanently attached part of your lift truck. Keep it on the truck as a ready reference for anyone who may drive or service it. If the truck you operate is not equipped with a manual, ask your supervisor to obtain one and have it attached to the truck. And, remember, your HYUNDAI dealer is pleased to answer any questions about the operation and maintenance of your lift truck and will provide you with additional information should you require it.

※ **Illustrations may differ from your truck, but they are applicable to your truck.**

EC REGULATION APPROVED

- Noise level (2000/14/EC and EN 12053) are as followings.

Model	LWA (EU only)	LPA
50/60/70D-9	106 dB	80 dB
80D-9	107.2 dB	78.6 dB

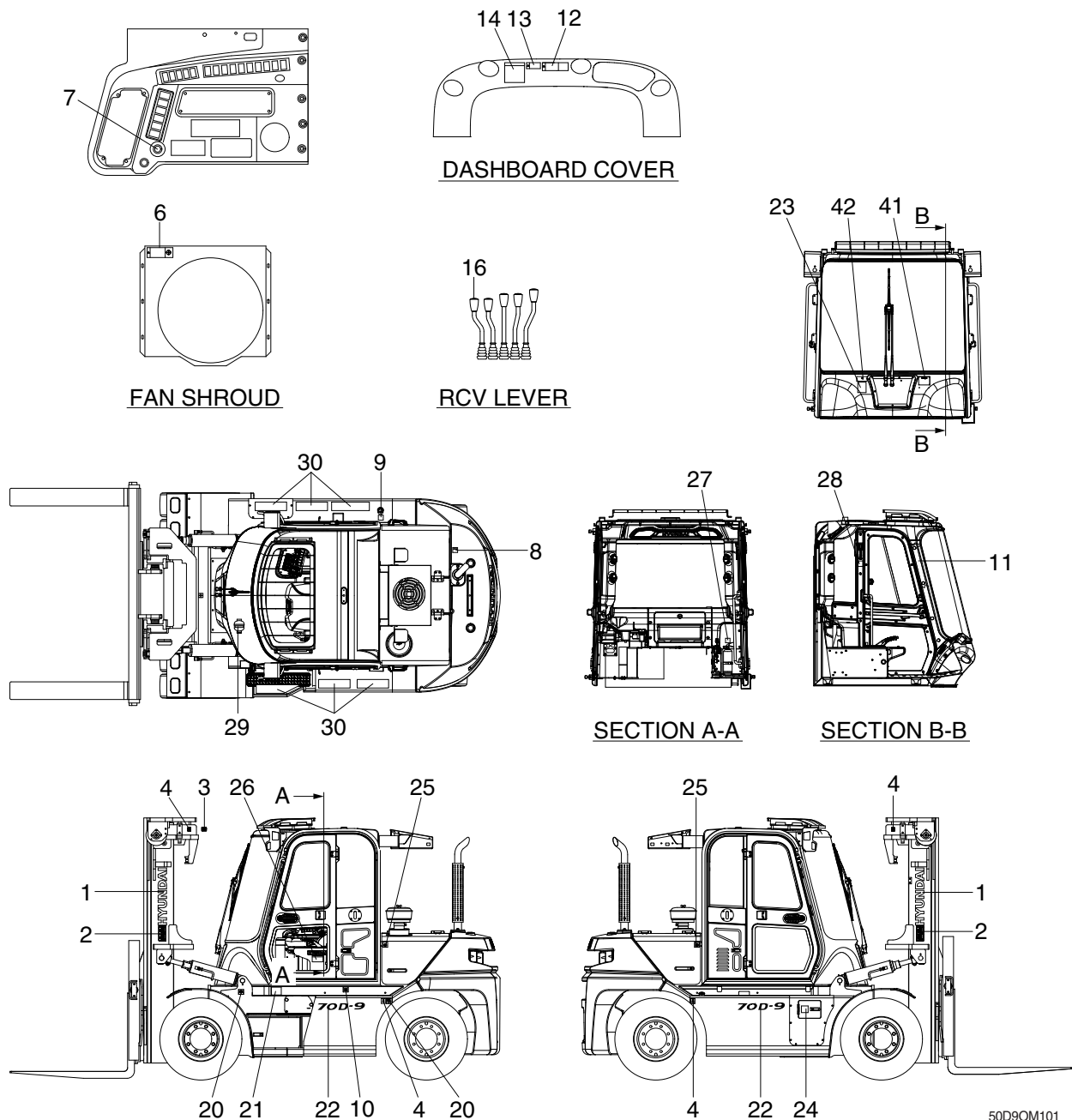
- The value of vibrations transmitted by the operator's seat are lower than standard value of (2005/88/EC)



SAFETY LABELS

1. LOCATION

Always keep these labels clean. If they are lost or damaged, attach them again or replace them with a new label.



50D9OM101

- | | | | | | |
|----|----------------|----|--------------------|----|---------------------------|
| 1 | Logo | 11 | Operator safety | 25 | Engine room |
| 2 | Mast warning | 12 | Start warning | 26 | Safety instruction (OPSS) |
| 3 | Hand caution | 13 | Solid tire | 27 | Fire extinguisher |
| 4 | Hook | 14 | Load capacity | 28 | Hammer |
| 5 | Hook | 16 | Attach | 29 | Accumulator |
| 6 | Radiator & Fan | 20 | Tire pressure | 30 | Safety work |
| 7 | Start key | 21 | Tilt cabin warning | 41 | Name plate-UL or CE |
| 8 | Temperature | 22 | Model name | 42 | Label-UL |
| 9 | Diesel fuel | 23 | Noise | | |
| 10 | Hydraulic oil | 24 | DEF/AdBlue® | | |

2. DESCRIPTION

There are several specific warning labels on this truck please become familiarized with all warning labels.

Replace any safety label that is damaged, or missing.

1) MAST WARNING (Item 2)

This warning label is positioned on the left and right side of the mast.

- ⚠ **Never stand or work under the raised forks even if the hydraulic safety lock lever is applied.**
- ⚠ **In case of working under the forks, it is essential to support the carriage with blocks.**

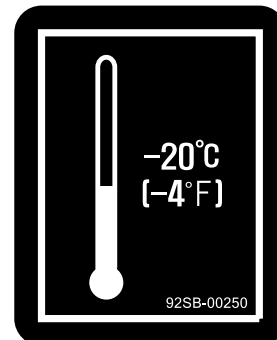


25L7A0OM06

2) TEMPERATURE (Item 8)

This warning label is positioned on the top side of the counterweight near the silencer.

- ⚠ **Coolant must be checked as specified in the maintenance chart.**



25L7A0OM10

3) RADIATOR CAP & FAN (item 6)

This warning label is positioned on the cooling fan shroud of the radiator to warn of the danger or injury from spinning fan blades and forbid to open the filler cap of the radiator because operator might get scalded due to spouting of hot water. When the engine is running, be sure that you keep your hands, fingers, arms, and clothing away from a spinning fan. Don't stand in line with a spinning fan. Fan blades can break at excessively high RPM and be thrown out of the engine compartment.

- ⚠ **Never open the filler cap while engine running or at high coolant temperature.**

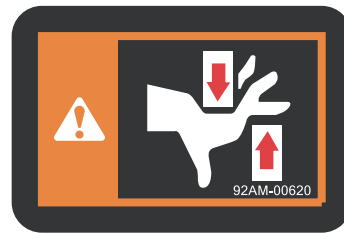


25L7A0OM07

4) HAND CAUTION (Item 3)

This warning label is positioned on the top side of mast.

- ⚠ It warns of the danger of injury from movement between rails, chains, sheaves, fork carriage, and other parts of the mast assembly. Do not climb on or reach into the mast. Personal injury will result if any part of your body is put between moving parts of the mast.

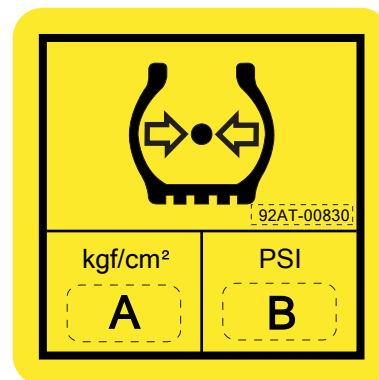


35DEOM103

5) TIRE PRESSURE (Item 20)

This label is positioned on the front and rear left fender.

- ⚠ Tire pressure must be checked in accordance with the maintenance chart.
- ⚠ Refer to page 5-3 for the regulated tire air pressure (A and B).



25L7A0OM08

6) HOOK (Item 4, 5)

This warning label is positioned on the frame and the top side of mast near the lifting bracket.

- ⚠ Refer to page 5-33 for safe loading procedures.



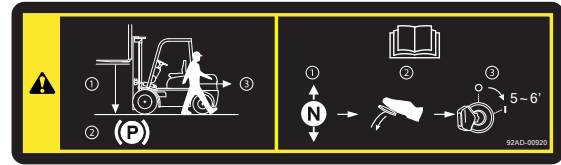
92AM-00630

7) START WARNING (Item 12)

This warning label is positioned on the middle side of dashboard cover.

※ **Start key switch after 5~6 seconds from ON position. It needs approx 5~6 seconds to set correct position of throttle.**

1. Warnings before leaving the operator seat.
 - Be sure to lower the attachment to the ground.
 - Apply the parking brake.
2. Cautions before starting or operating the truck.
 - Put the gear shift lever in the neutral.
 - Apply the parking brake.
 - Read this operator's manual carefully.



50DEFW55

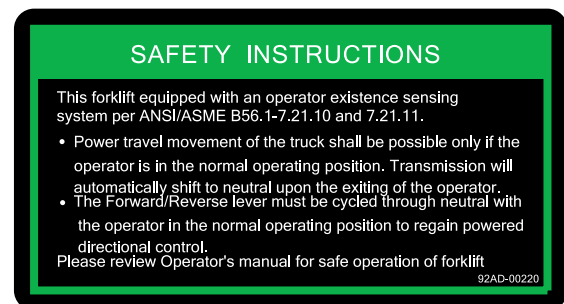
8) SAFETY INSTRUCTION (Item 26)

This warning label is positioned on the left inside of cabin door if the truck is for equipped with *OPSS.

⚠ **This forklift is equipped with an operator existence sensing system per ANSI/ ASME B56.1-7.21.10 / 7.21.11 and ISO 3691.**

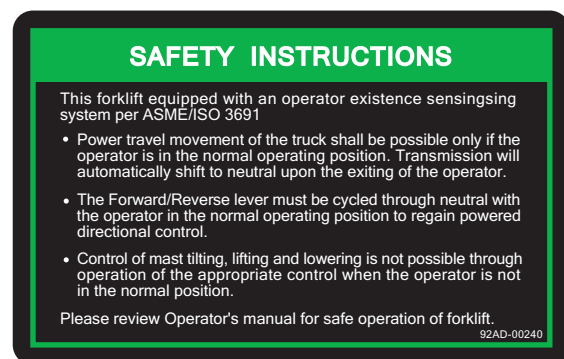
1. Powered travel movement of the truck shall be possible only if the operator is in the normal operating position. Transmission will automatically shift to neutral upon the exiting of the operator.
2. The forward/reverse lever must be cycled through neutral with the operator in the normal operating position to regain powered directional control.
3. Control of mast tilting, lifting and lowering is not possible through operation of the appropriate control when the operator is not in the normal position.

Truck for USA or travel * OPSS



25L7A0OM02

Truck for travel and mast * OPSS



92AD-00240

* OPSS : Operator Presence Sensing System

9) ENGINE ROOM (Item 25)

This warning label is positioned on the both side of engine hood.

⚠ Don't wash the engine room.



92HN-00261

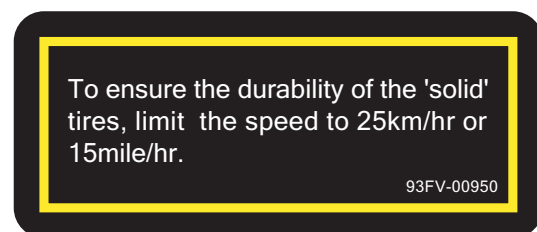
10) SOLID TIRE (Item 13)

This decal is positioned on the middle side of the dashboard.

When 'solid tires' are equipped.

- (1) Do not travel more than 25 kph (16 mph).
- (2) Do not travel further than 8 km (5 miles) in an hour.

⚠ Our warranty does not cover any damages caused by excessive driving.



93FV-00950

11) ACCUMULATOR (item 29)

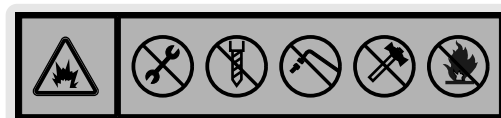
This warning label is positioned on the accumulator of the solenoid valve.

※ **The accumulator is filled with high-pressure nitrogen gas, and it is extremely dangerous if it is handled in the wrong way. Always observe the following precautions.**

⚠ Never make any hole in the accumulator expose it to flame or fire.

⚠ Do not weld anything to the accumulator.

※ **When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator, it is necessary to release the gas from the accumulator. A special air bleed valve is necessary for this operation, so please contact your Hyundai distributor.**

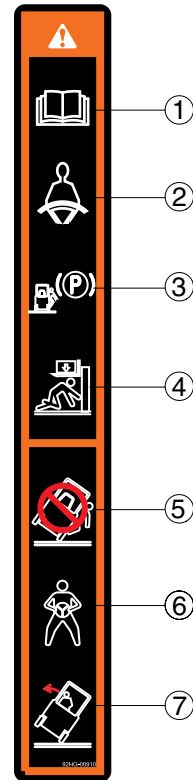


1107A0FW46

12) OPERATOR SAFETY (Item 11)

This warning label is positioned on the cabin's upper-left side frame.

- ① Refer to operator's manual in detail.
- ② Always buckle up the seat belt for safety operation.
- ③ When the operator get off the truck, always pull the parking brake lever so that the truck can keep with stopping condition.
- ④ The people should not pass through under forks and other attachments which are lifted or being lifted.
- ⑤ Do not jump down from the truck. It can be caused that the operator have severe injury or death in the event of a tip over.
- ⑥ Outstretch the legs as widely as possible and grasp firmly the steering handle.
- ⑦ Learn the body to the opposite direction in order to avoid severe injury or death when the truck is tipped over.

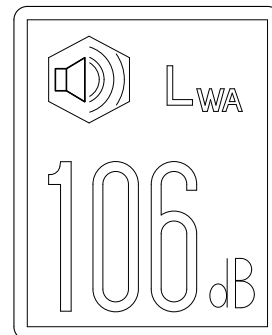


25L7A0OM09-1

※ Refer to page 3-3 for details.

13) NOISE (Item 23)

This label is located on the front side of dashboard.



93FV-00240

14) DEF / ADBLUE® (Item 24)

This label is positioned on the right side of frame.

- ※ Fill the DEF / AdBlue® only.
- ※ Never use diesel oil.

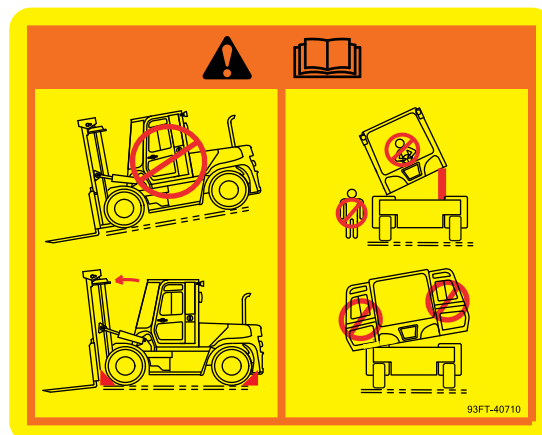


92HS-00121

15) TILT CABIN WARNING (Item 21)

This warning label is positioned on the left side of frame.

- ▲ **Refer to page 7-18 for safe tilting procedure.**



50D7EFW04

16) FIRE EXTINGUISHER (Item 27)

This label is adhered on the fire extinguisher.

- ※ **Read and understand the instructions adhered decal on the fire extinguisher.**



91B1-01600

17) HAMER (Item 28)

This label is positioned on the inside of left side door.

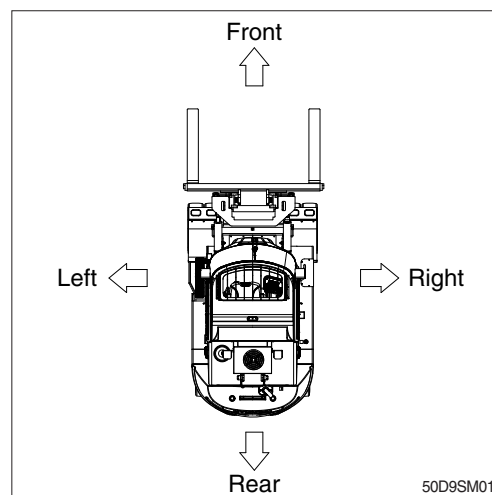
- ※ **The rear window serves as an alternate exit.**
- ※ **To remove rear window, pull the ring and push out the glass.**



91Q6-07280

1. DIRECTION

The directions of this truck indicate forward, backward, right and left when truck is in the travelling direction.

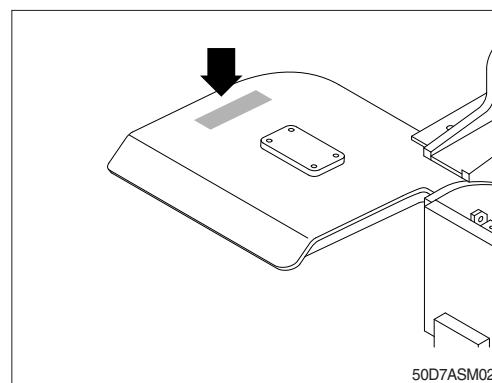


2. SERIAL NUMBER

Inform following when you order parts or the truck is out of order.

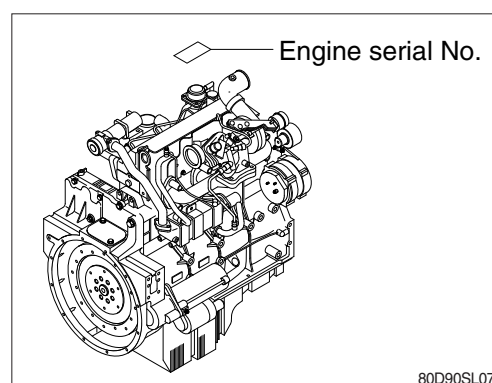
1) TRUCK SERIAL NUMBER

It's shown on front of the right side frame.



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. SYMBOLS

▲ Important safety hint.

△ It indicates matters which can cause the great loss on the truck or the surroundings.

※ It indicates the useful information for operator.

1. SAFETY HINTS

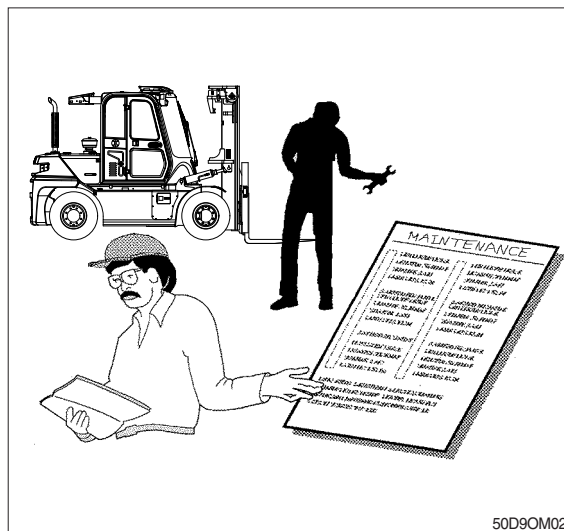
1. DAILY INSPECTION

At the beginning of each shift, inspect your truck and fill out a check, maintenance and lubrication table.

Check for damage and maintenance problems.

Have repairs made before you operate the truck.

Do not make repairs yourself. Lift truck mechanics are trained professionals. They know how to make repairs safely.



2. DO'S AND DON'TS



Do watch for pedestrians.



Do wear safety equipment when required.



Don't mix drugs or alcohol with your job.



Don't block safety or emergency equipment.

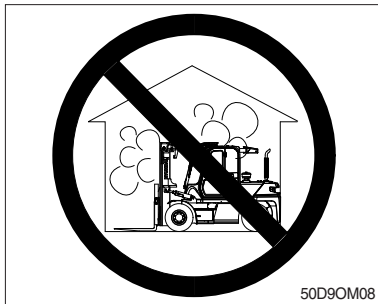


Don't smoke in NO SMOKING areas or when refueling.



Don't operate the truck outdoors in rainy day.

※ **Exclude the truck equipped cabin.**



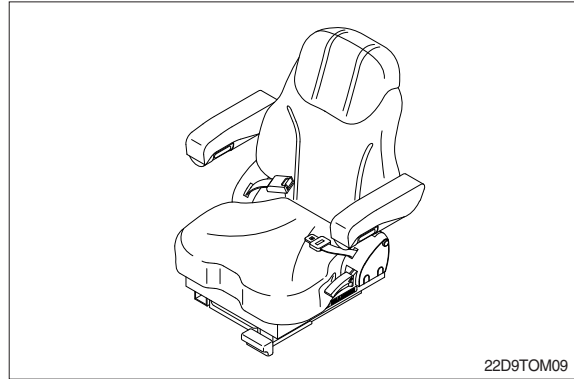
Exhaust gas is dangerous.

Do not operate the truck at the inhouse, if possible.

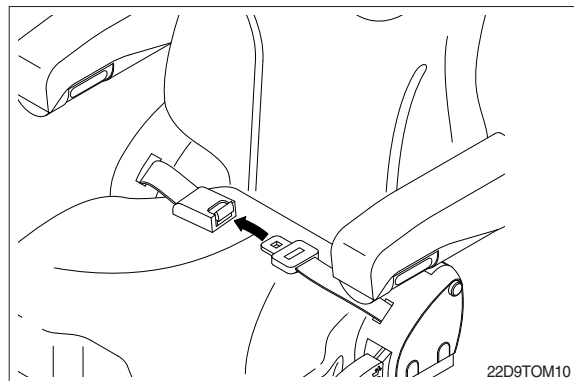
Provide adequate ventilation when working in a closed space.

3. SEAT BELTS

⚠ Always buckle up for the truck equipped with safety belt.

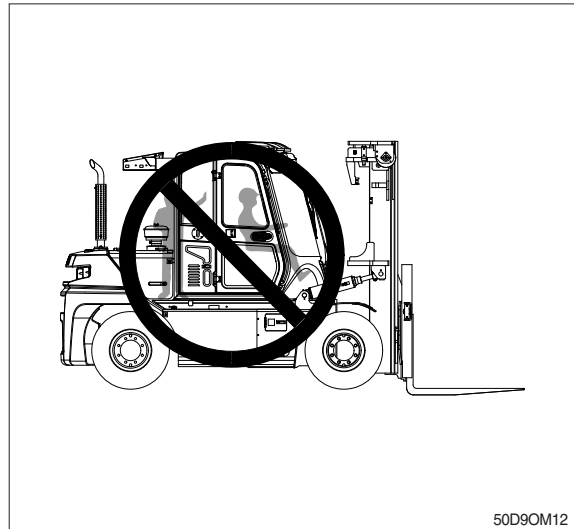


⚠ Seat belts can reduce injuries.

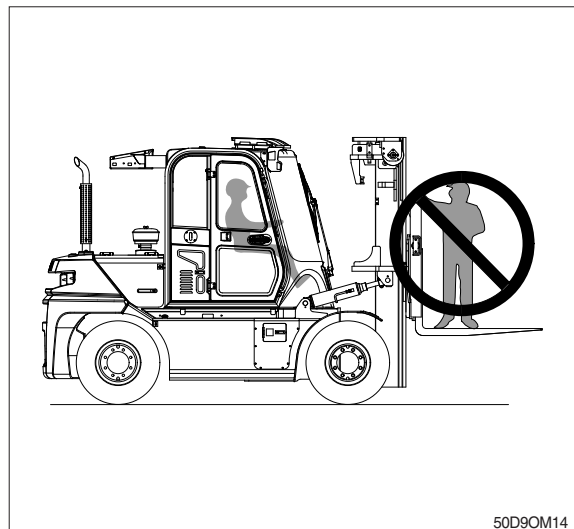


4. NO RIDERS

- 1) The operator is the only one who should be on a truck.

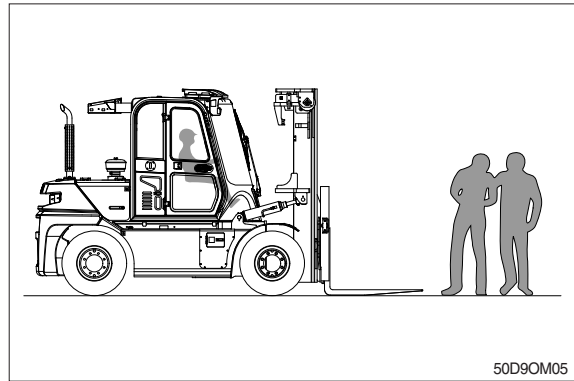


- 2) Never transport personnel on the forks of a lift truck.



5. PEDESTRIANS

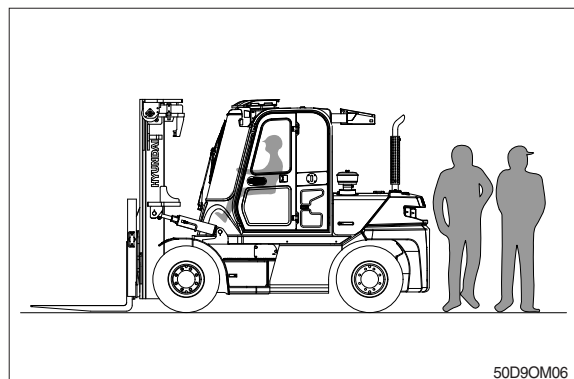
- 1) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



- 2) Watch for people in your work area even if your truck has warning lights or alarms. People may not watch for you.

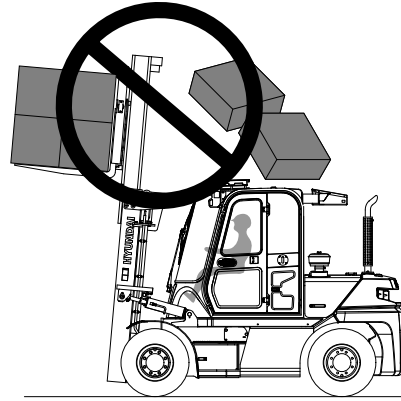


- 3) Watch for people standing back, even when you are parked.



6. OPERATOR PROTECTION

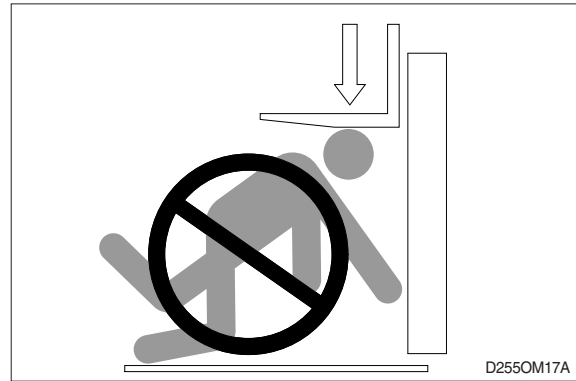
- 1) Stay inside the cabin.
 - 2) Always keep your body within the confines of the truck.
- ⚠ Do not operate truck without cabin or overhead guard, unless condition prevent use of it.**



50D9OM16

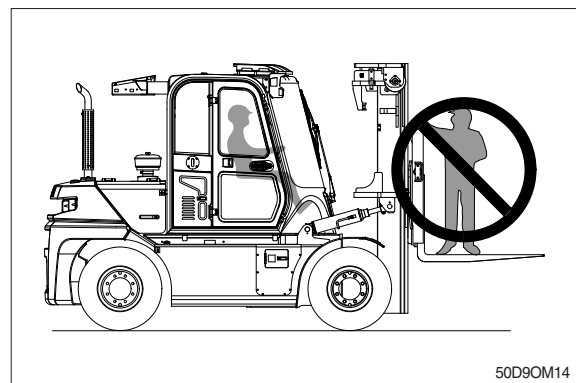
7. FORK SAFETY

Never allow anyone to walk under raised forks.



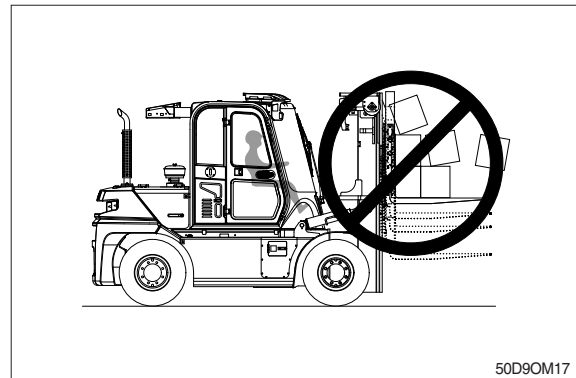
There is special equipment to raise people for overhead work.

DO NOT USE LIFT TRUCKS.



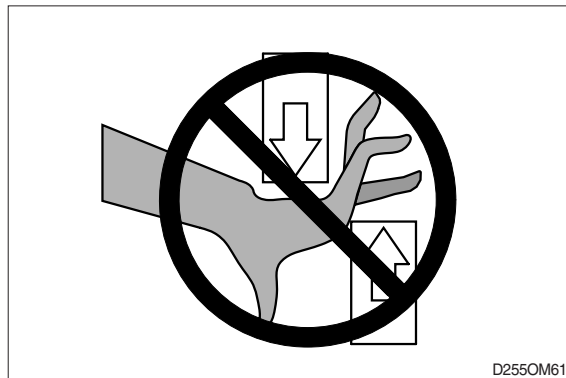
Always lower the load slowly.

Raise and lower with mast vertical or tilted slightly back (Never forward).

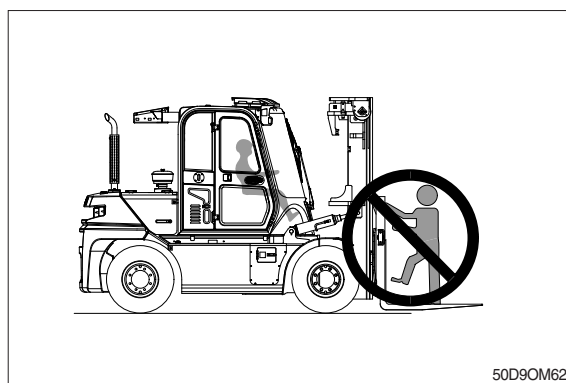


8. PINCH POINTS

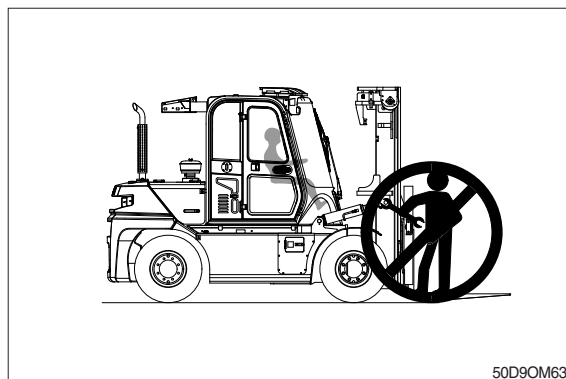
⚠ Keep hands, feet and legs out of the mast.



⚠ Don't use the mast as a ladder.



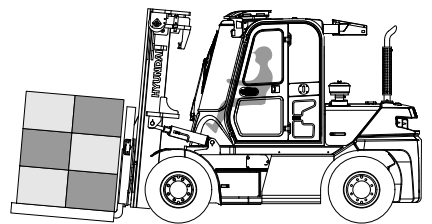
⚠ Never try to repair the mast, carriage, chain, or attachment by yourself. Always get a trained mechanic.



9. TRAVEL

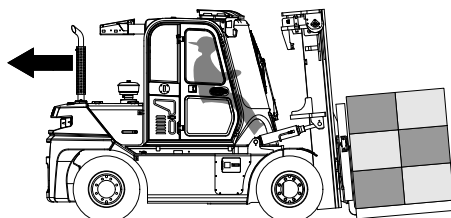
- 1) Travel with the load near the floor/ground, with mast tilted back to cradle the load whenever possible.

⚠ Never lift or lower the load when the truck is in motion.



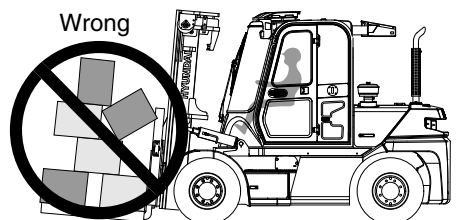
50D9OM18

- 2) When handling bulky loads that restrict your vision operate your truck in reverse to improve visibility. Be sure to pivot in the seat to give maximum visibility.



50D9OM25

- 3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.

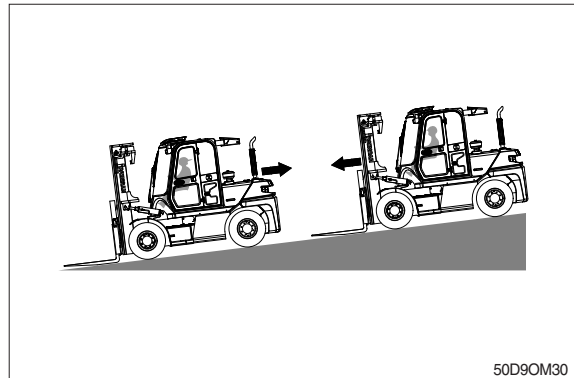


50D9OM26

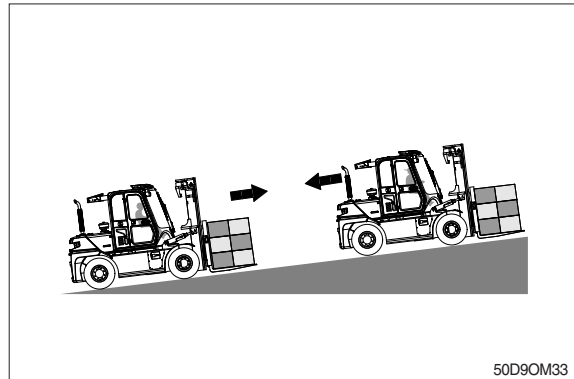
10. GRADES, RAMPS, SLOPES AND INCLINES

⚠ Never turn on a grade, either loaded or unloaded.

1) Unloaded-Forks downgrade



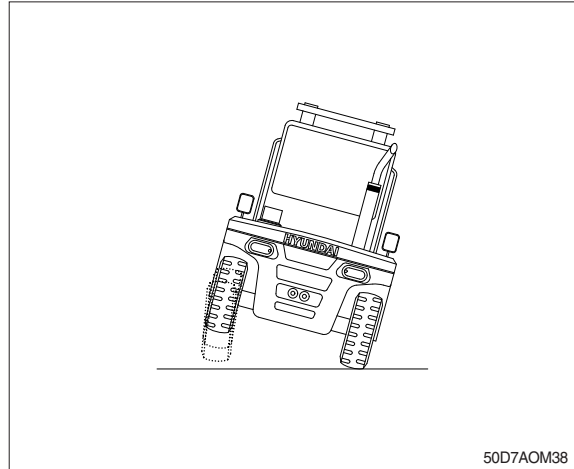
2) Loaded - Forks upgrade



11. TIP OVER

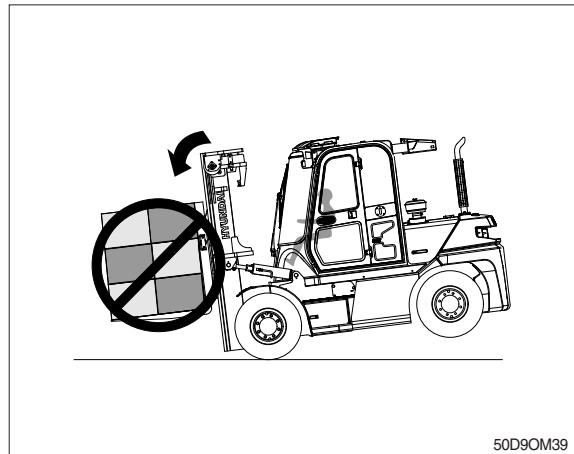
1) LATERAL TIP OVER

- (1) Lateral tip over can occur with a combination of speed and sharpness of turn. This combination will exceed the stability of the truck. This condition is even more likely with an unloaded truck.
- (2) With the load or mast raised, lateral tip over can occur while turning and/or braking when traveling in reverse or accelerating and turning while traveling forward.
- (3) Lateral tip over can occur loaded or unloaded by turning on an incline or ramp.



2) LONGITUDINAL TIP OVER

- (1) Longitudinal tip over can occur with combination of overloading and load elevated also with capacity load and elevated. This combination will exceed the stability of the truck. This condition is even more likely with excessive forward tilt, braking in forward travel or accelerating rearward.
- (2) Longitudinal tip over can occur by driving with the load down slope on a steep grade.



Lateral and longitudinal tip over can occur if the truck is driven over objects on the floor or ground, off the edge of improved surfaces, or into potholes in the road surface, or by running into overhead objects or collisions.

An off dock type of tip over can occur if the truck is steered too close to the dock edge, driven off the edge of the dock or ramp, or if the highway truck or trailer rolls away from the dock or is driven away during loading.

▲ The conditions listed above can be further aggravated by overloading, excessive tilt, or off center loads.

▲ Lift truck tip over can cause serious injury or death if the operator is trapped between the truck and the ground.

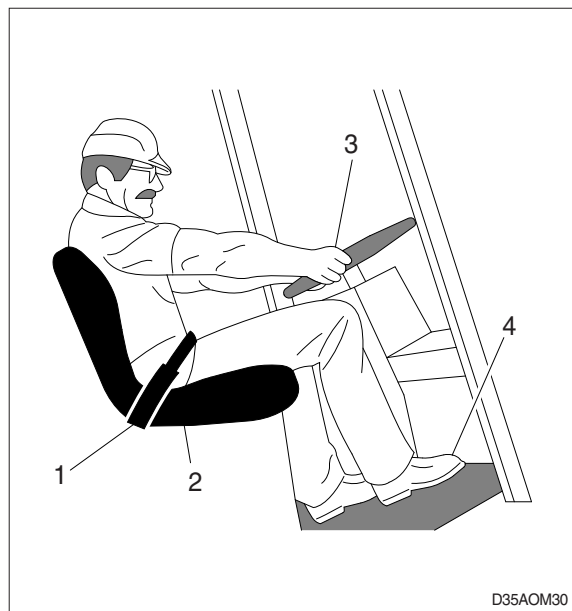
3) WHAT TO DO IN CASE OF A TIP OVER

⚠ If your truck starts to tip over, do not jump.

⚠ Brace yourself as illustrated right.

1. Make sure your seat belt is fastened securely, if the truck is equipped with seat belt.
2. Stay in your seat.
3. Grip the wheel.
4. Brace your feet.

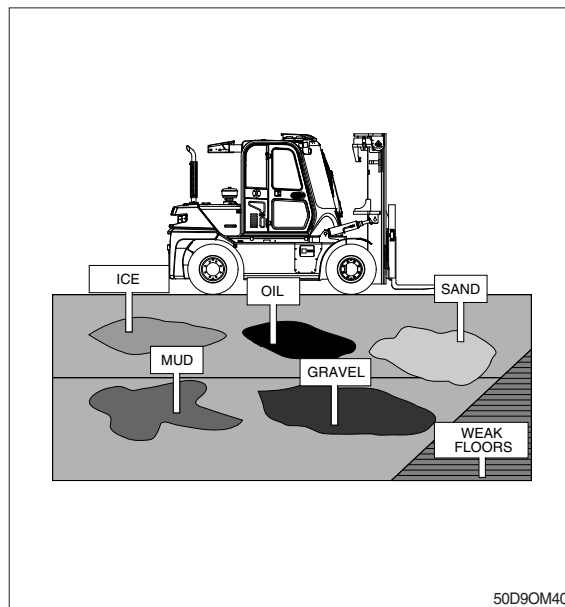
⚠ Your chances for survival in a tip-over are better if you stay with the truck, in your seat.



12. SURFACE AND CAPACITY

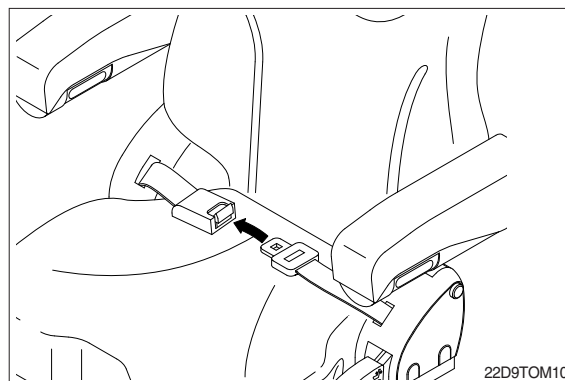
Avoid these conditions. They can cause a truck to tip over or lose traction for braking or driving.

- ⚠ **Know the weight of your truck and load.** Especially when using elevators, know the capacity of the elevator you intend to use. Do not overload.



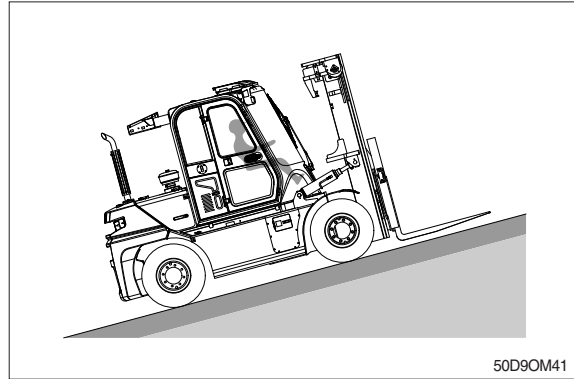
TIPOVER

- ⚠ **Seat belts can reduce injuries.**
ALWAYS BUCKLE UP

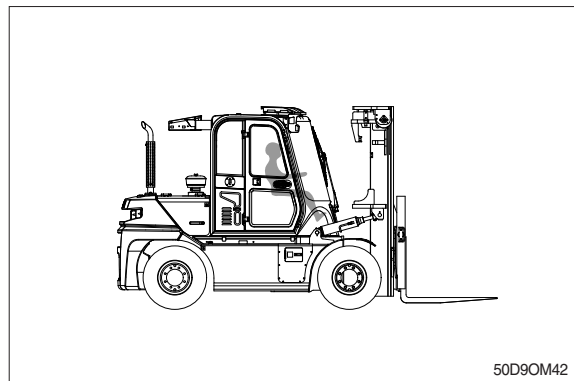


13. PARKING

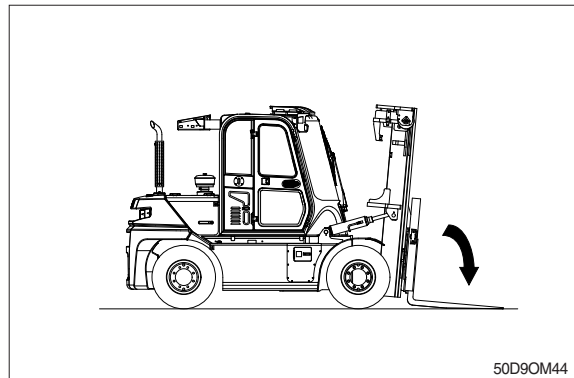
- 1) Never park on a grade.



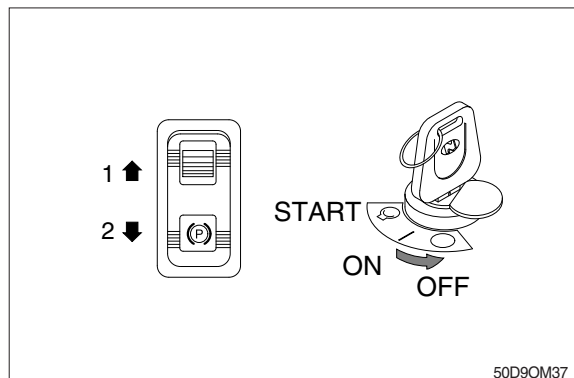
- 2) Always come to a complete stop before leaving the truck. Be sure the travel control is in NEUTRAL.



- 3) Lower forks fully to floor and tilt forward.

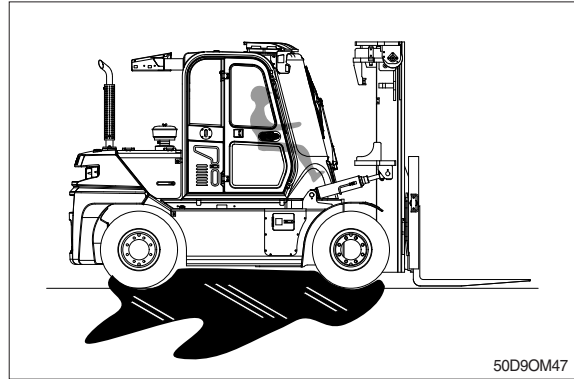


- 4) Set the parking brake.
Position 1 : OFF(Release)
Position 2 : ON(Lock)
- 5) Turn key to OFF position.

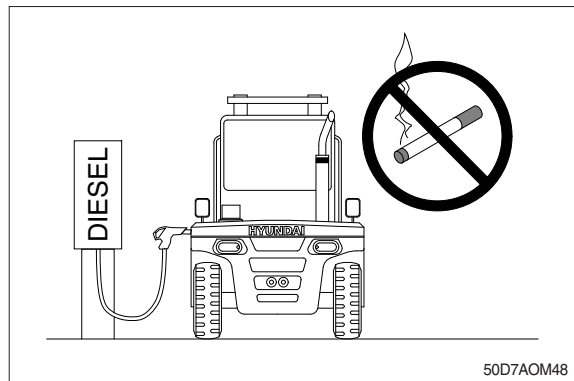


14. REFUELING

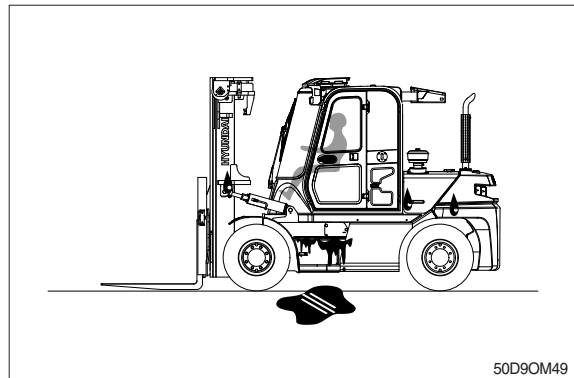
- 1) Before adding oil, check around the truck for oil leakage.



- 2) Keep away from fire when adding oil or during operation.

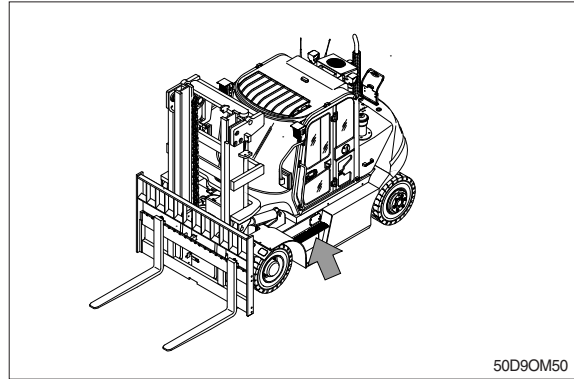


- 3) After adding oil, wipe off any oil spilled on the truck.

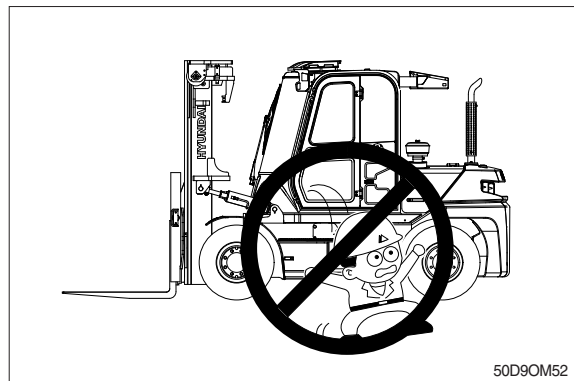


15. STEP

- 1) When getting on or off the truck, use the step provided.



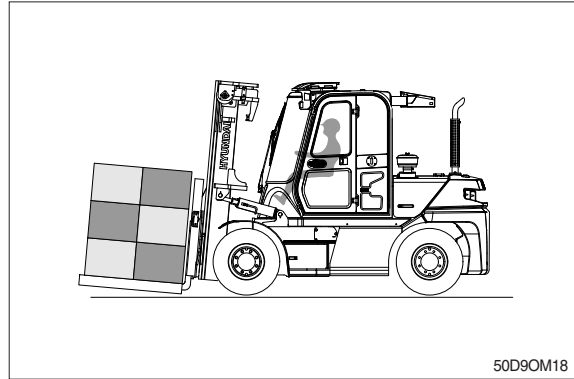
- 2) Do not jump up or down from the truck.



16. OPERATOR'S SAFETY RULES

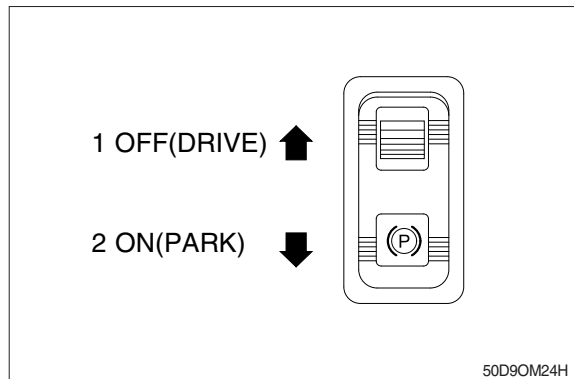
- 1) All operational functions require that the operator be seated in the operator's seat.

▲ Always buckle up if a seat belt is provided.



- 2) The parking brake must be locked in the PARK POSITION before exiting from the truck.

▲ The parking brake must remain locked in the park position (ON) except when an operator is in the normal operating position.



3) ANSI/ASME/ISO REGULATIONS (TRUCK FOR EQUIPPED WITH A *OPSS)

▲ This forklift truck is equipped with an Operator Existence Sensing System per ANSI/ASME/ISO.

(1) Traction safety warning

- ① This function works when the key switch is ON or START position.
- ② The transmission(power automatically cutoff) in 2 seconds from the driver's off the seat.
- ③ At the same time, the warning lamp ON and alarm will sound intermittently if the forward-reverse lever was not returned to neutral.
- ④ To release the function, the forward-reverse lever must be cycled through neutral with the operator in the normal operating position to regain powered directional control.

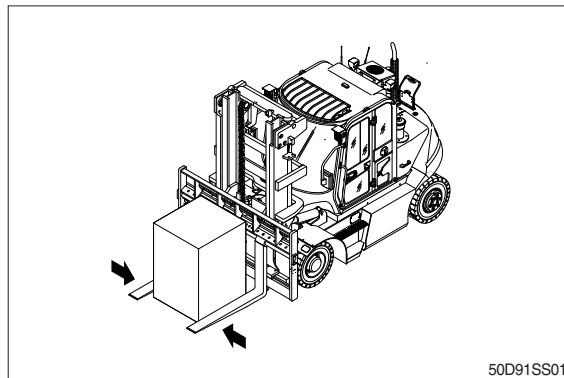
(2) Parking brake warning

- ① This function works when the key switch is not only ON or START position but also OFF position.
- ② Alarm sounds in 2 seconds from the driver's off the seat with the parking brake released.
- ③ To release the function, the parking brake switch must be turned to ON (PARK) position.
- ④ When the key switch is OFF position, alarm will sound only for 30 seconds .

*OPSS : Operator Presence Sensing System

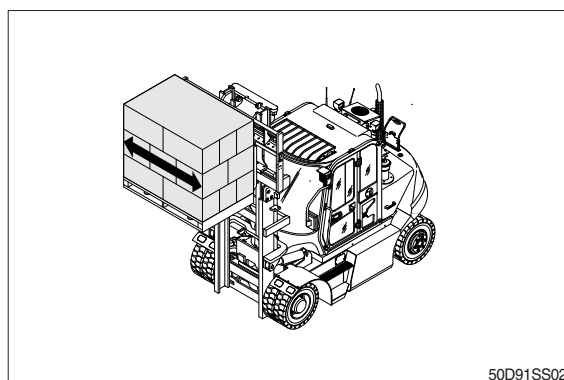
17. SIDE SHIFT

⚠ Do not put side loads on the forks.



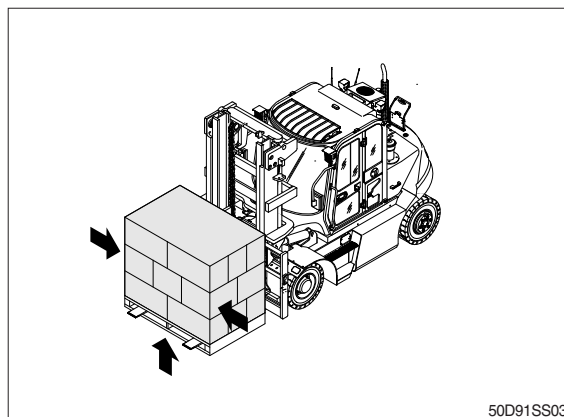
⚠ Restrict the sideshift movement with raised load.

Abrupt sideshifting under such condition will dramatically reduce the stability of the truck and may cause over-turning.

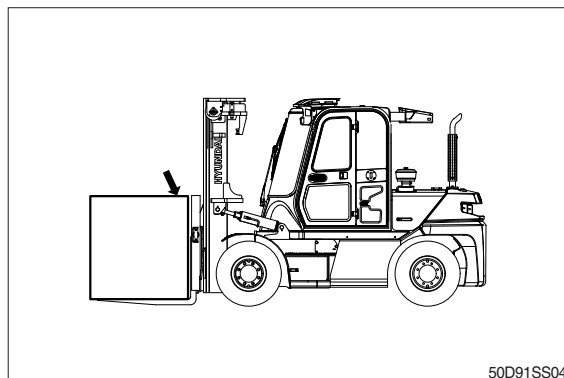


⚠ Avoid overloading or uneven loading.

Load on the forks according to load capacity mentioned on the truck name plate when sideshift is applied. Uneven loading will deteriorate the stability of the truck when the load is raised.



⚠ Top of the load should not extend above the backrest.



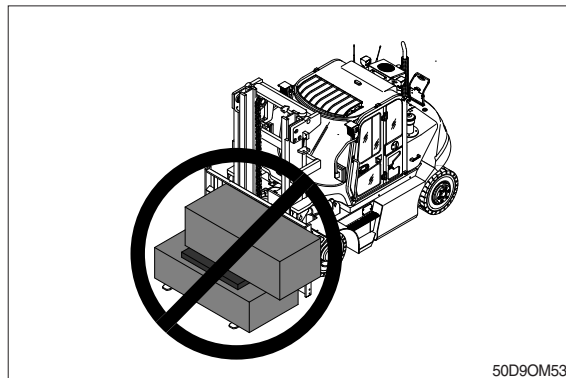
2. OPERATING HAZARDS

1. LOOSE LOADS

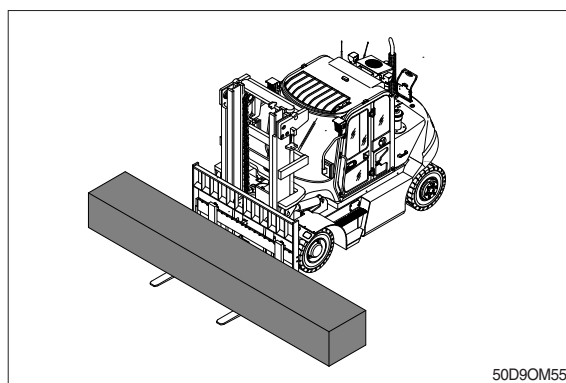
▲ Loose or unbalanced loads are dangerous.

Observe these precautions.

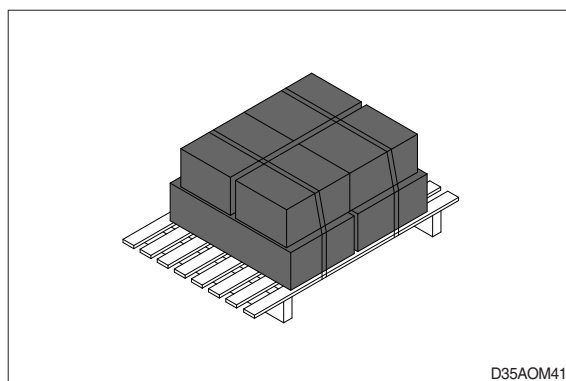
Never carry loose or uneven material.



Center wide loads.

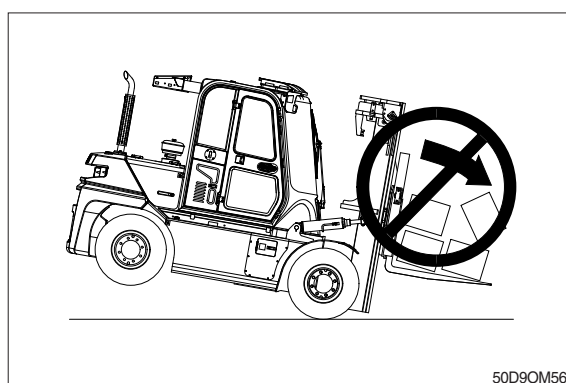


Stack and band loose material.



Avoid sudden braking or starting

▲ When the truck is loaded, do not drive at maximum speed.

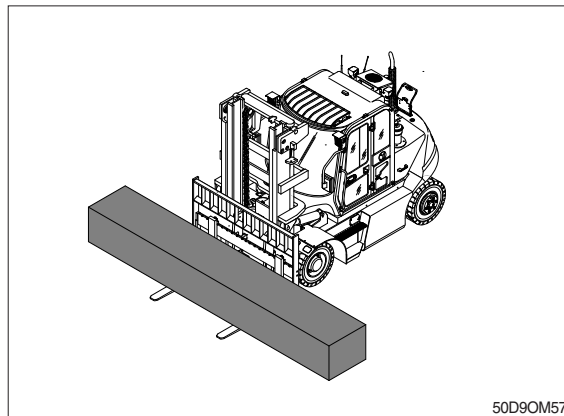


2. LONG AND WIDE LOADS

- ⚠ With long or wide loads, you need more room. So slow down and watch your clearance.

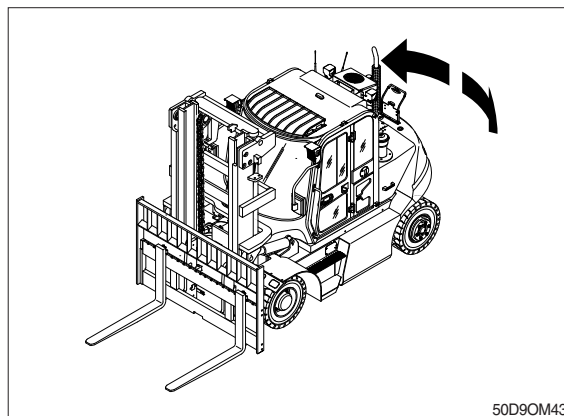
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

- ⚠ A long load reduces the capacity of the truck. Know and understand your truck load rating.



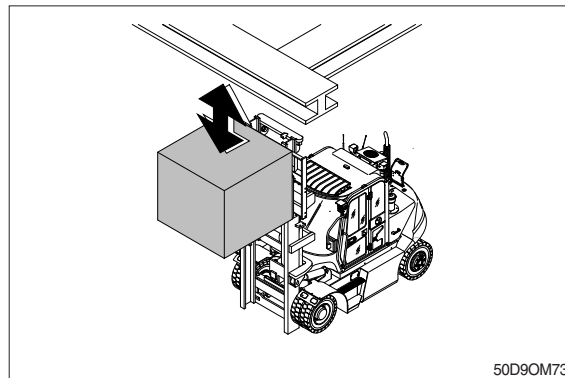
3. REAR SWING

- ⚠ When turning, be sure the rear end of the truck does not swing into racks, posts, etc. Watch for pedestrians beside the truck.

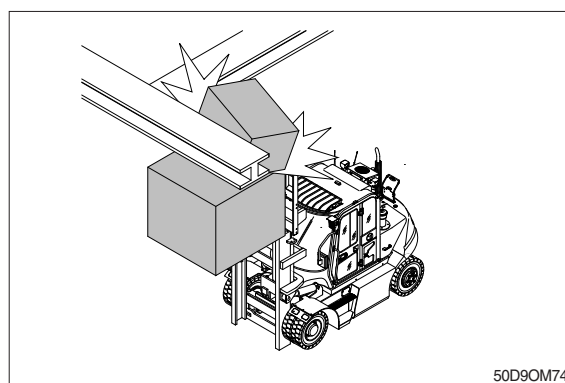


4. LOW OVERHEAD CLEARANCE

- ⚠ Know the height of your truck, with and without a load. Check your clearances. Keep the load low and tilted back.

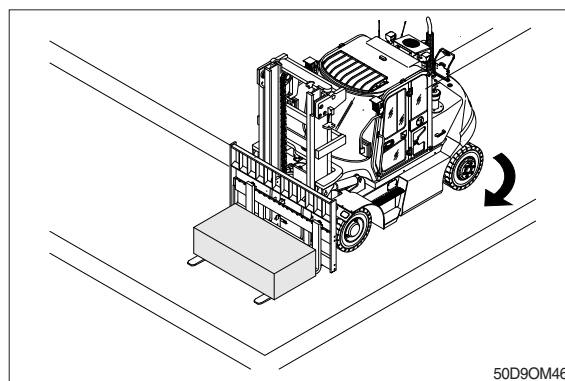


- ⚠ Watch overhead clearance: Moving into overhead structures can tip a truck over, or spill a load.

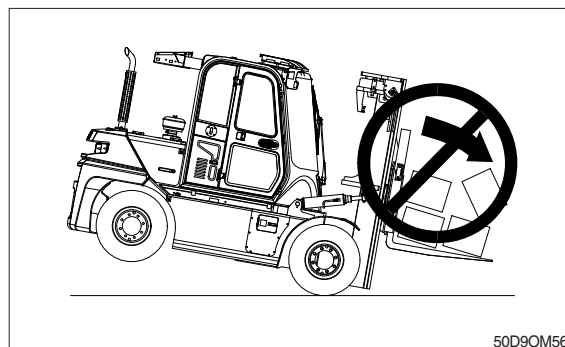


5. FAST TURNS AND HIGH LOADS

- ⚠ Slow down before turning. The truck can tip over.

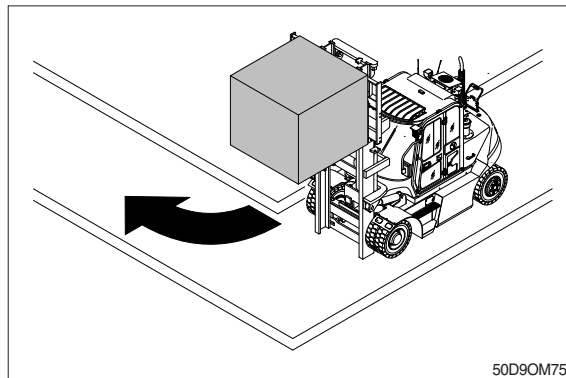


- ⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.



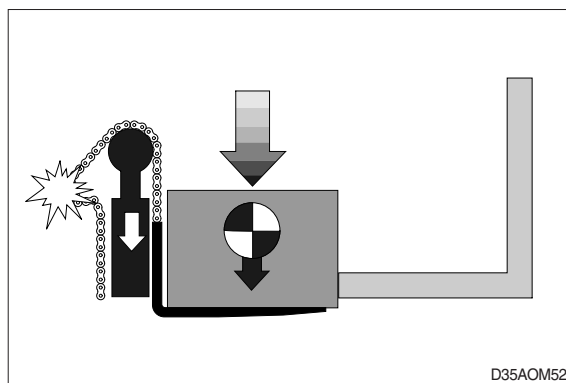
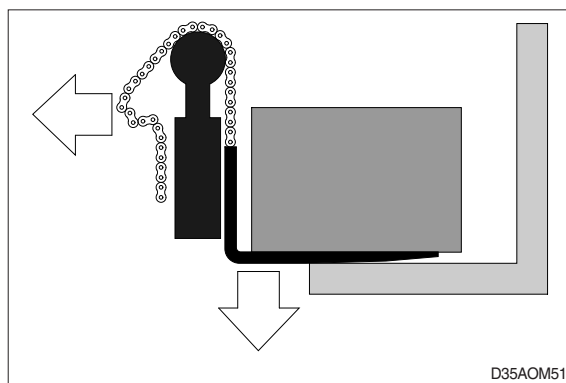
6. RIGHT ANGLE STACKING

- ⚠ When right angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.



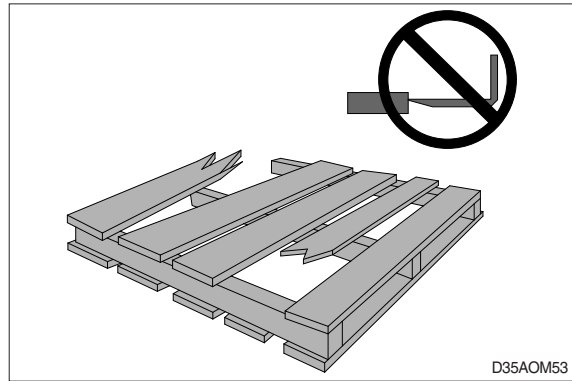
7. CHAIN SLACK

- ⚠ Slack chains mean rail or carriage hang-up.
Raise the forks before you move, or broken chains can result.
- ⚠ In case forks with loads are stuck while lowering the mast, lift the mast again and prevent chains from being slack.



8. PALLETS AND SKIDS

- ⚠ Do not move or store materials on damaged pallets or skids. Items can fall through them causing severe injury or death.
- ⚠ Be sure the pallet or skid you are using is in good condition and does not have defective or missing components and fasteners.

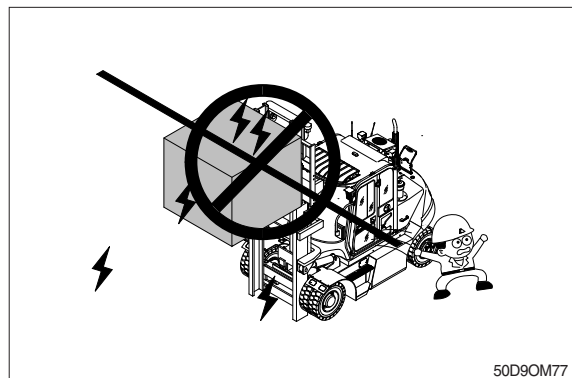
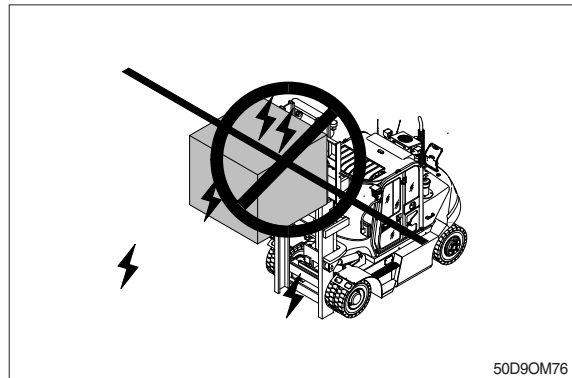


9. CAUTION FOR ELECTRICAL LINES

- ⚠ When moving the truck with the mast raised, watch out electrical lines over the truck.
- ⚠ The operating near the electrical lines is very dangerous.
Operate within safe working permitted as below.

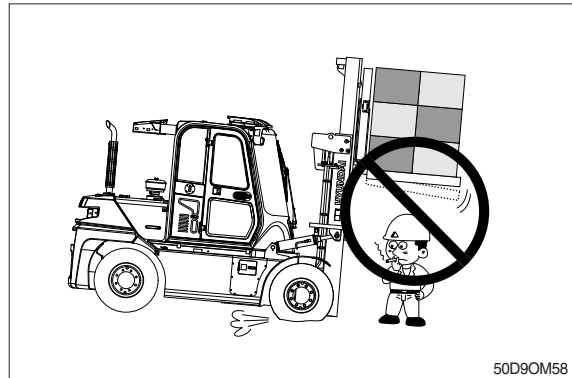
Supply voltage	Min safe separation
6.6 kV	3 m (10 ft)
33.0 kV	4 m (13 ft)
66.0 kV	5 m (16 ft)
154.0 kV	8 m (26 ft)
275.0 kV	10 m (33 ft)

- ⚠ If the truck touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the truck until turning off the electric current.
Jump off the truck without contacting the truck when you need to get off.

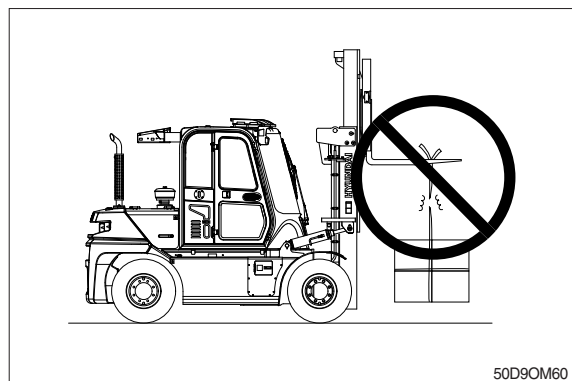


10. LIFTING LOADS

Never permit any persons to stand or pass under lifted load.



Never use wire rope to lift a load.



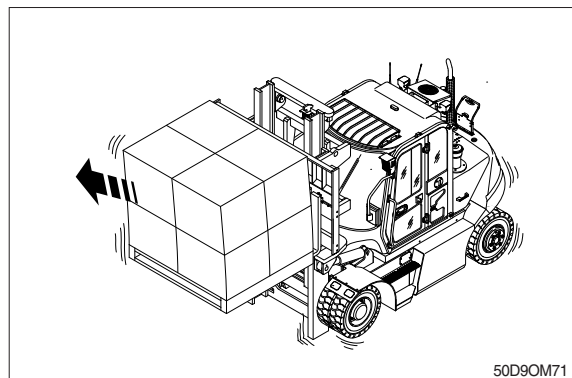
11. SIDE SHIFT

Never operate the side shift while the forks are not equipped with supports such as a load table for the load.

Never travel the forklift while the side shift is moved with load.

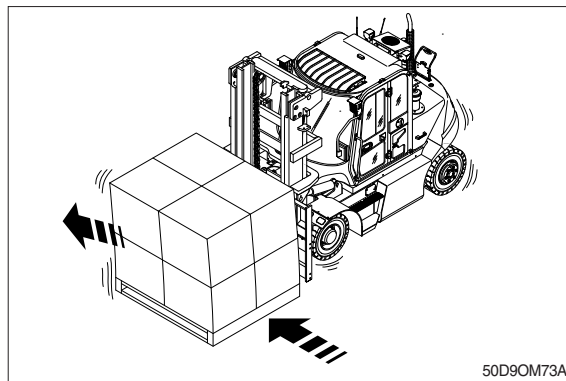
In case of moving the side shift with load, it can be caused load dropping or overturning of the forklift due to unbalanced weight.

▲ The forklift can be overturned due to the unbalanced load.



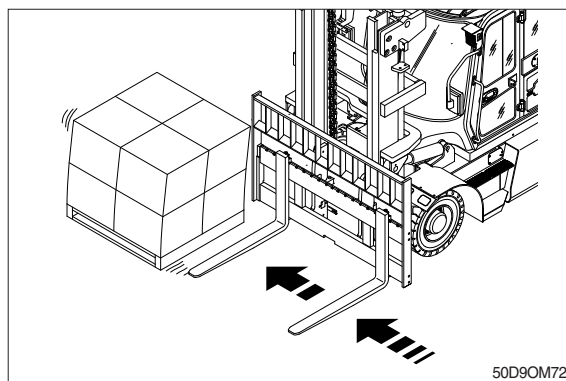
It should be observed that the side shift with load is operated in neutral position before traveling.

When operating side shift with load, operate slowly so that it can not avoid from dropping of the load or overturning of the forklift.



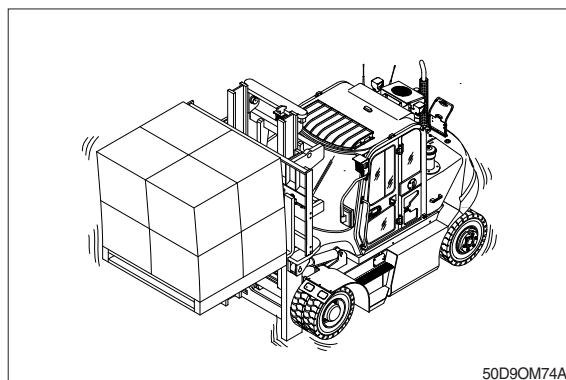
Never move the load to push or pull of it by the side shift.

It can be caused damaging of the loads or injuring of the people.



While traveling the forklift with the load on the side shift, if the operator lift or lower the load without shifting it in the neutral position, it can be overturned the forklift due to unstabled load.

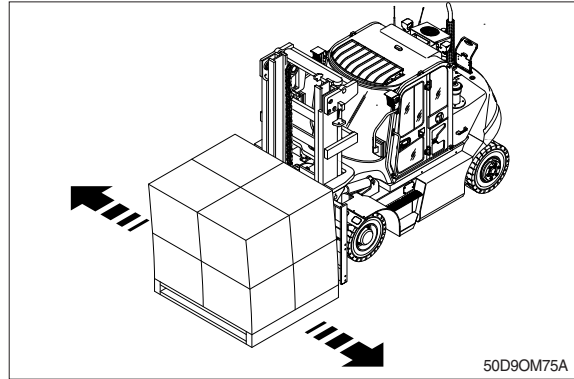
When lifting or lowering the side shift with load, it should be observed that the load is moved into the neutral position.



12. FORK POSITIONER

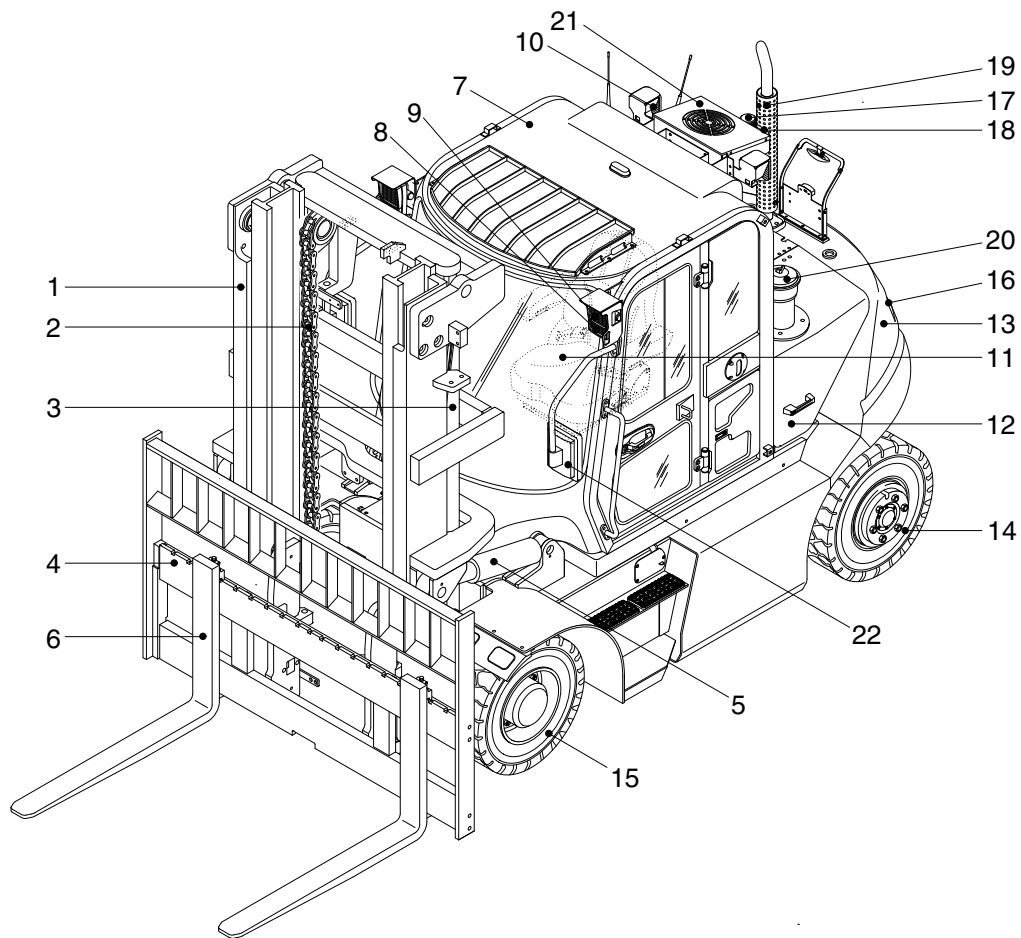
Do not operate the fork positioner with a load, or with the fork arm on the ground.

- ⚠ **Never move the levers to operate the fork positioner suddenly and quickly. It can be caused to drop the load.**



3. KNOW YOUR TRUCK

1. GENERAL LOCATIONS



50D9OM54

- | | | |
|-----------------------|--------------------------|--------------------------|
| 1 Mast | 9 Head lamp | 17 Beacon lamp (opt) |
| 2 Lift chain | 10 Rear work lamp (opt) | 18 Camera (opt) |
| 3 Lift cylinder | 11 Operator's seat | 19 Silencer |
| 4 Carriage & backrest | 12 Bonnet | 20 Pre-cleaner |
| 5 Tilt cylinder | 13 Counterweight | 21 Air conditioner (opt) |
| 6 Forks | 14 Rear wheel | 22 Rear view mirror |
| 7 Cabin | 15 Front wheel | |
| 8 Turn signal lamp | 16 Rear combination lamp | |

2. DATA/SAFETY PLATE AND DECAL

1) TRUCK DATA AND CAPACITY PLATE

The image shows two versions of a Hyundai truck data and capacity plate. The left version is for metric units (kg and mm), and the right version is for imperial units (lb and in). Both plates include fields for Model, Type, Attachments, Truck Weight, Product Identification Number, Mfg. Year, and Load Capacity (Vertical and Forward Tilt). A diagram of a truck with load center points A, B, and C is included on both plates.

80D90M56

(1) Truck model number or registered name

(2) Truck type

The type is indicated a type of the truck such as diesel, LPG or battery.

(3) Truck serial number

An identification number assigned to this particular truck and should be used when requesting information or ordering service parts for this truck from your authorized HYUNDAI dealer. The serial number is also stamped on the frame.

(4) Attachment description (If any installed)

The user must see that the truck is marked to identify the attachment (s), including the weight of the truck/attachment combination and truck capacity with the attachment.

(5) Capacity rating, load center, and lifting height data

Shows the maximum load capacity of this truck with relation to load centers and fork heights (See diagram on plate). Personal injury and damage to the truck can occur if these capacities are exceeded.

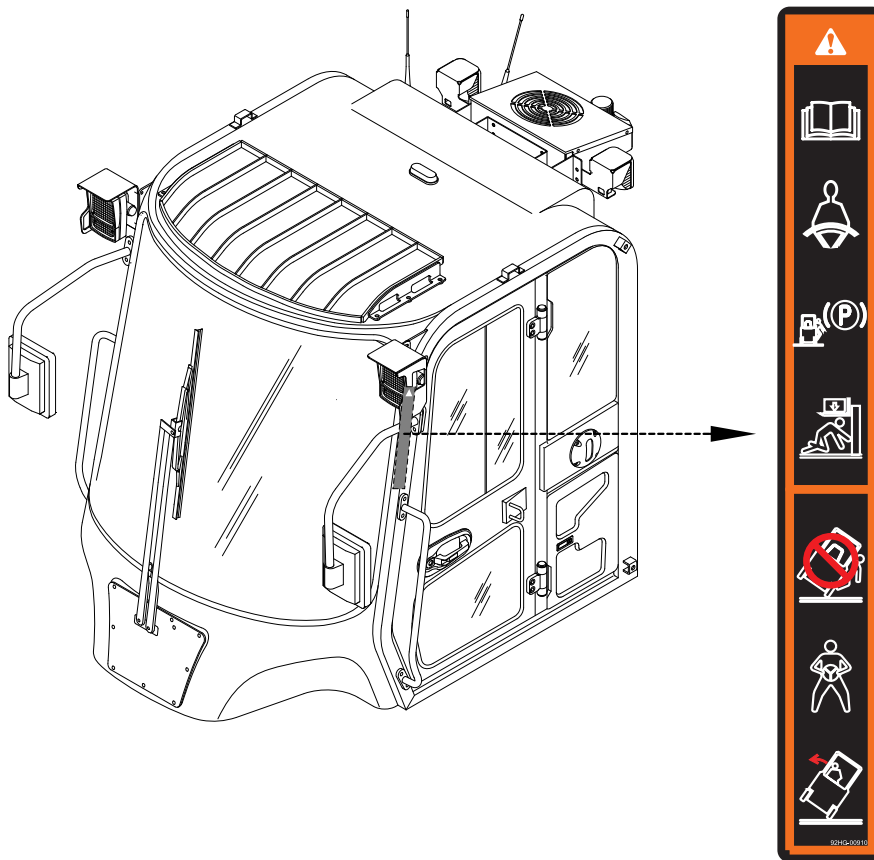
Do not exceed the maximum capacity specified.

(6) Truck weight

The approximate weight of the truck without a load on the forks. This weight plus the weight of the load must be considered when operating on elevators, elevated floors, etc. to be sure they are safe.

▲ Before modifications that affect the stability of safety systems are made written approval from HYUNDAI. This is an OSHA requirement. Contact your authorized HYUNDAI dealer for a new nameplate showing the revised capacity.

2) OPERATOR SAFETY WARNING DECAL



50D9OM59

▲ Safety and warning decals are placed in conspicuous locations on the truck to remind you of essential procedures or to prevent you from making an error that could damage the truck or possibly cause personal injury. You should know, understand, and follow these instructions. Safety and warning decals. Should be replaced immediately if missing or defaced (Damaged or illegible). Refer to the page 0-6 for the location of all decals.

▲ Operator/Tip-over warning decal

This decal is located on cabin's upper-left side frame. Its purpose is to remind the operator that staying in the seat provides the best chance of avoiding injury in the event of a truck-tipping or driving off a dock mishap.

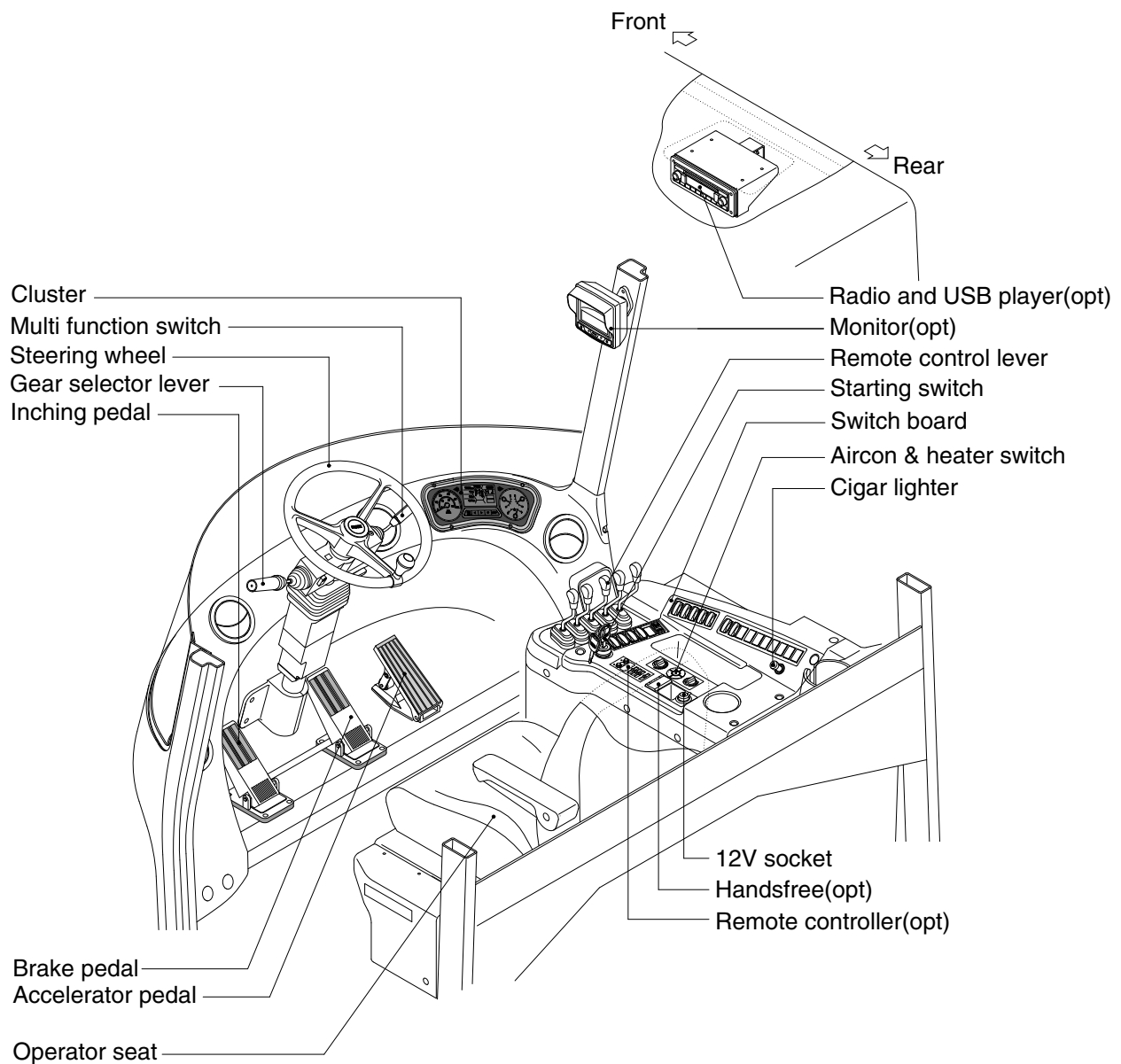
Lift trucks can be tipped over if operated improperly. Experience with lift truck accidents has shown that the driver cannot react quickly enough to jump clear of the truck and cabin as the truck tips. To protect operators from severe injury or death in the event of a tip over, it is best to be held securely in the seat. So, please, always buckle up when driving your lift truck.

3. CAB DEVICES

- 1) The ergonomically designed console box and suspension type seat provide the operator with comfort.

2) ELECTRONIC MONITOR SYSTEM

- (1) The centralized electronic monitor system allows the status and conditions of the truck to be monitored at a glance.
- (2) It is equipped with a safety warning system for early detection of truck malfunction.



50D9CD01

4. CLUSTER

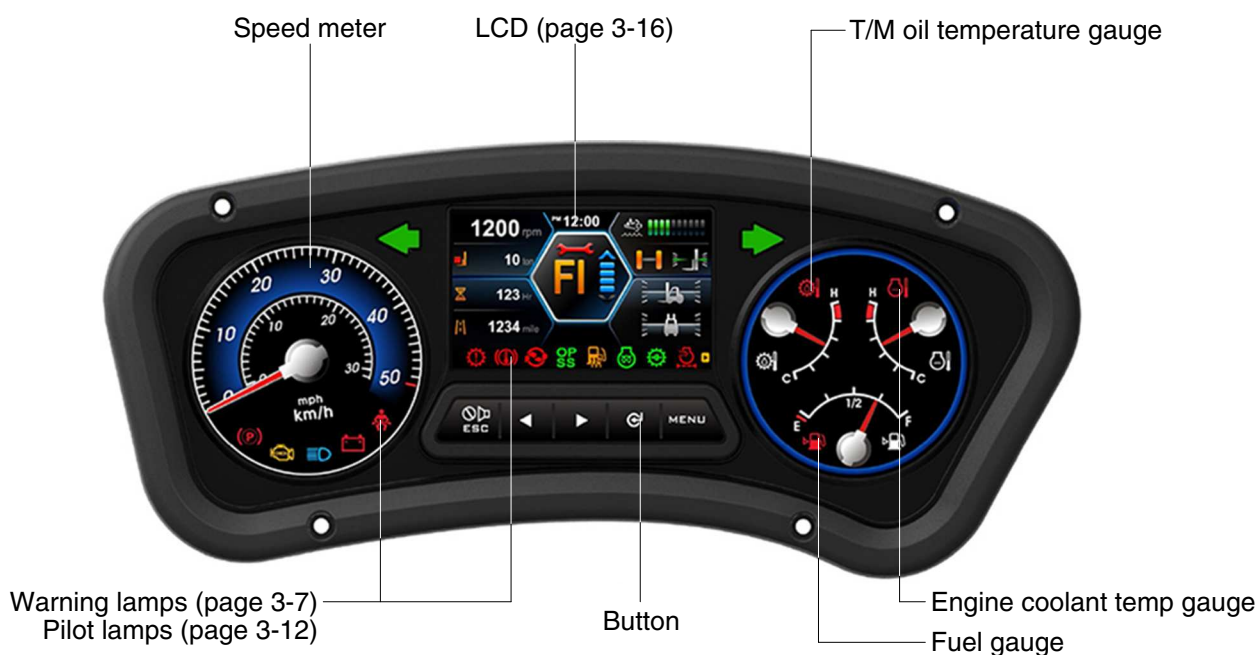
1) STRUCTURE

The cluster consists of gauges, lamps, buttons and LCD as shown below, to warn the operator in case of abnormal truck operation or conditions for the appropriate operation and inspection.

- Gauges : Indicate operating status of the truck.
- Warning lamps : Indicate abnormality of the truck.
- Pilot lamps : Indicate operating status of the truck.
- LCD : Display the truck model, error code and engine speed etc.
- Buttons : Select the truck model, error code and engine speed etc and stop the buzzer sound.

※ The cluster installed on this truck does not entirely guarantee the condition of the truck. Daily inspection should be performed according to chapter 7. **PLANNED MAINTENANCE AND LUBRICATION.**

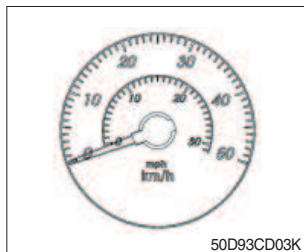
※ When the cluster provides a warning immediately check the problem, and perform the required action.



50D9CD02

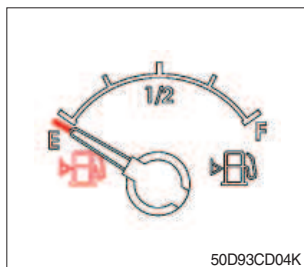
2) GAUGE

(1) Speed meter



- ① The speed meter displays the speed of truck in mph and km/h.
 - 0~50 km/h
 - 0~31 mph

(2) Fuel gauge



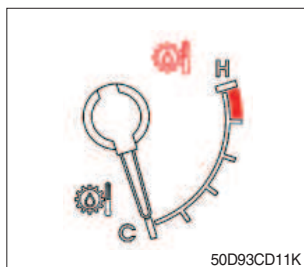
- ① This gauge indicates the amount of fuel in the fuel tank.
- ② Fill the fuel when the indicator moves E point, refuel as soon as possible to avoid running out of fuel.
- ※ If the gauge indicates below E point even though the truck is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

(3) Engine coolant temperature gauge



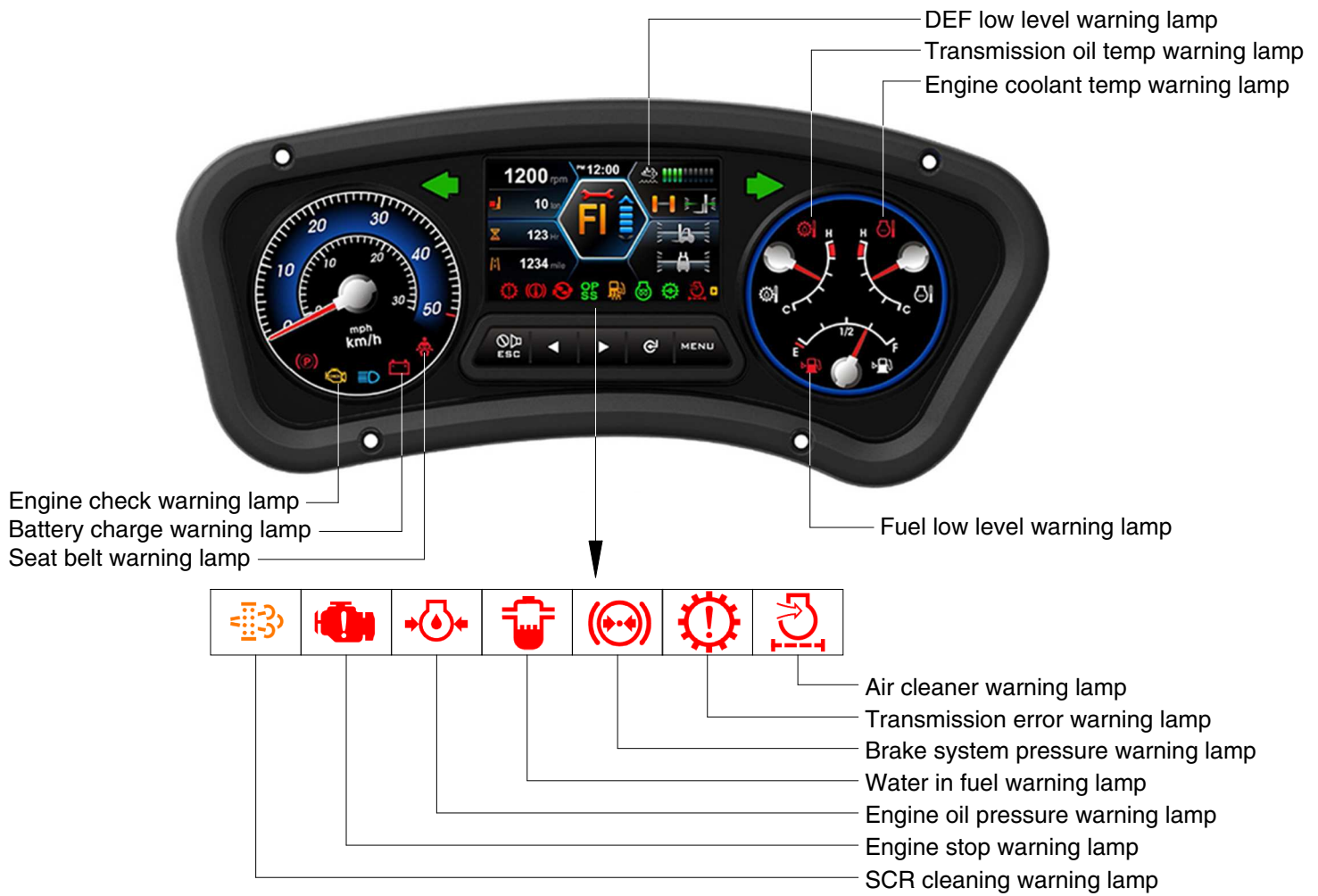
- ① This indicates the temperature of coolant.
 - White range : 40~104°C
 - Red range : Above 104°C (219°F)
- ② Keep idling engine at low speed until the indicator is in the operating range.
- ③ If the indicator is in the red range, turn OFF the engine and check the radiator and engine.
- ※ If the gauge indicates red range even though the truck is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

(4) Transmission oil temperature gauge



- ① This range indicates the temperature of transmission oil.
 - White range : 40~107°C
 - Red range : Above 107°C (225°F)
- ② Keep idling engine at low speed until the indicator is in the operating range.
- ③ If the indicator is in the red range, it means the transmission is overheated. Be careful that the indicator does not move into the red range.

3) WARNING LAMPS



50D9CD02-1

※ When the warning and pilot lamps occur over eight, you can display next lamps by push the button (▶).

(1) Engine check lamp



- ① This lamp lights ON during a nonfatal engine system error. The engine can still be run, but the fault should be corrected as soon as possible.

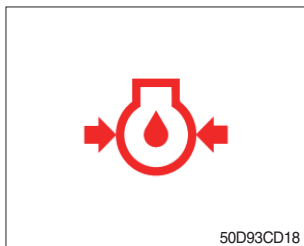
(2) Brake fail warning lamp



- ① The lamp lights ON when the oil pressure of service brake drops below the normal range.
- ② When the lamp is ON, stop the engine and check for its cause.

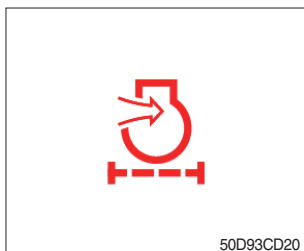
※ Do not operate until the problems are corrected.

(3) Engine oil pressure warning lamp



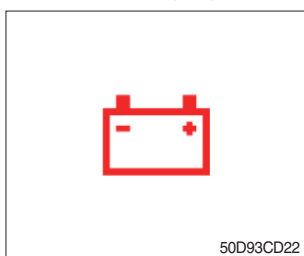
- ① This lamp comes ON for a while after starting the engine because of the low oil pressure.
- ② If the lamp comes ON during engine operation, shut OFF engine immediately. Check oil level.

(4) Air cleaner warning lamp



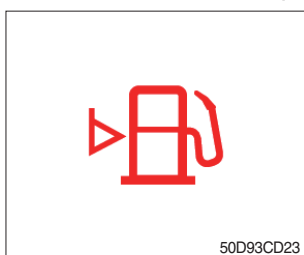
- ① This lamp operates by the vacuum caused inside when the filter of air cleaner is clogged.
- ② Check the filter and clean or replace it when the lamp is ON.

(5) Battery charging warning lamp



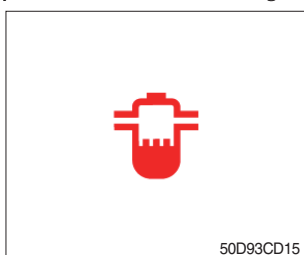
- ① This lamp is ON after key switch is turned ON, it is turned OFF after starting the engine.
- ② Check the battery charging circuit when this lamp comes ON during engine operation.

(6) Fuel low level warning lamp



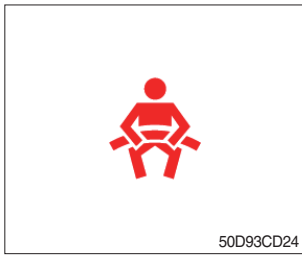
- ① Fill the fuel immediately when the lamp is turned ON.

(7) Water in fuel warning lamp



- ① This lamp lights up when the prefilter is filled with water or malfunctioning.
- ※ **When this lamp lights up, stop the truck and spill water out of the prefilter.**

(8) Seat belt warning lamp



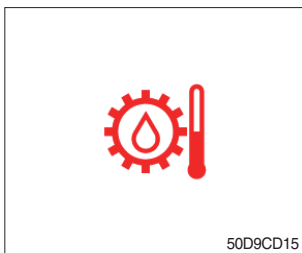
- ① This lamp lights ON for the first five seconds after starting the engine.

(9) Engine coolant temperature warning lamp



- ① This lamp is turned ON when the temperature of cooling water is over the normal temperature(104°C, 219°F).
② Check the cooling system when the lamp is ON.

(10) Transmission oil temperature warning lamp



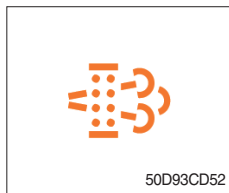
- ① This lamp informs the operator that transmission oil is above the specified temperature (107°C, 225°F).
· Lamp ON : Abnormal
· Lamp OFF : Normal
※ **When this lamp lights up during operation, stop the engine and check the truck.**

(11) Transmission error warning lamp



- ① This lamp lights ON and the information window of the LCD shows the error code when an error occur in the transmission.
② Immediately pull the truck to a convenient stop. Stop the engine. Investigate the cause.
※ **Consult a HYUNDAI dealer to investigate the cause.**
※ **Do not operate until the cause has been corrected.**

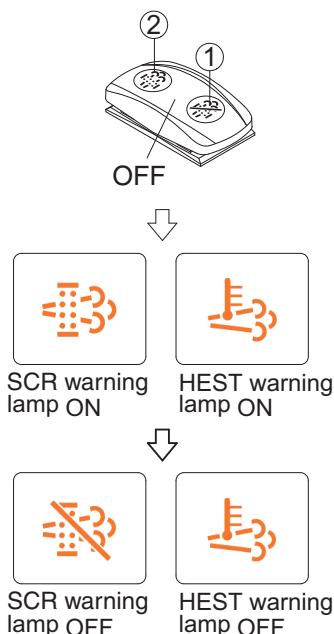
(12) SCR (Selective Catalytic Reduction) CLEANING WARNING LAMP



- ① This lamp lights ON when the SCR cleaning is needed and lamp flashes when manual SCR cleaning is activated as table below.

Condition	Warning lamp				Remark
	SCR cleaning lamp	DEF Low Lamp	Engine Check Lamp	Engine Stop Lamp	
					
SCR needs to be cleaned	On	-	-	-	1. Change to a more challenging duty cycle. 2. Perform manual SCR cleaning.
SCR needs to be cleaned immediately	On	-	On	-	Manual SCR cleaning is required.
Stationary SCR cleaning status	Flash	-	-	-	-
DEF level initial warning	-	On	-	-	DEF level 10% Engine error code 3497
DEF level critical warning	-	Flash	-	-	DEF level 5% Engine error code 3498
DEF level initial warning	-	Flash	On	-	DEF level 2.5% Engine error code 1673, 25% derate
DEF level secondary derate warning	-	Flash	On	-	DEF level 0% Engine error code 3547, 3714 50% derate, 30 min.
DEF level final derate warning	-	Flash	On	On	Engine error code 3712 Contact Hyundai service center or dealer.

※ Manual SCR cleaning method



50D93CD143

※ Manual SCR cleaning applies if the machine is in a fireproof area and there is no plan to turn off the machine during the SCR cleaning.

① Stop and park the machine.

② Push the switch to position ② to initiate the manual SCR cleaning.

※ Refer to the page 3-29 for the switch operation.

※ The engine speed may increase during SCR cleaning and it will take approximately 20~60 minutes depending on condition.

③ The SCR cleaning lamp flash and HEST warning lamp will light on during the manual SCR cleaning function is operating.

④ The SCR cleaning and/or HEST warning lamp will light OFF when the SCR cleaning function is completed.

(13) DEF (Diesel Exhaust Fluid) low warning lamp



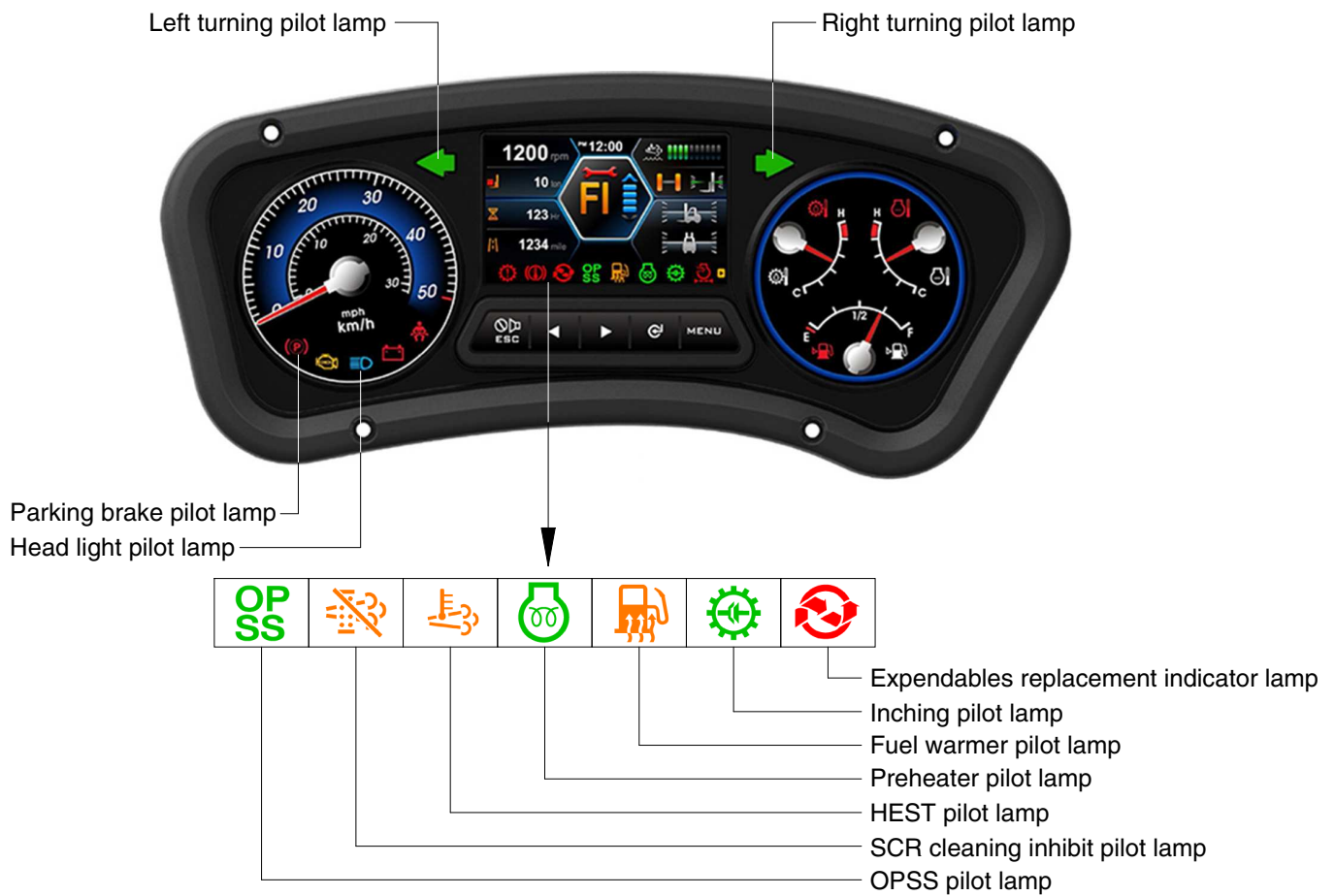
- ① This warning lamp indicates, when illuminated or flashing, that the diesel exhaust fluid level is low.
- ※ **Add the diesel exhaust fluid into DEF tank.**
- ※ **Refer to the page 3-10 for detail.**

(14) Engine stop warning lamp



- ① When this warning lamp lights ON, stop the engine immediately and check the DEF level and related parts of the engine.
- ※ **Please contact your Hyundai service center or local dealer.**

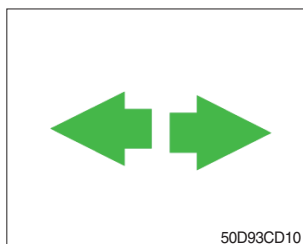
4) PILOT LAMPS



50D9CD02-2

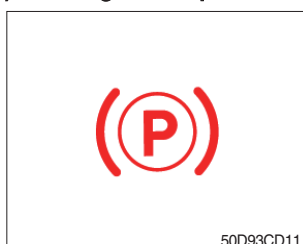
※ When the warning and pilot lamps occur over eight, you can display next lamps by push the button (▶).

(1) Direction pilot lamp



① This lamp flashes when the signal indicator lever is moved.

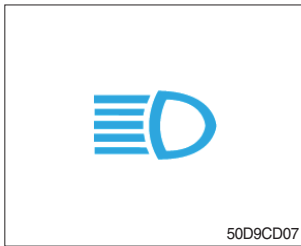
(2) Parking brake pilot lamp



① When the parking brake is actuated, the lamp lights ON.

※ Check the lamp is OFF before driving.

(3) Head light pilot lamp



- ① This lamp comes ON when the main light switch is operated to 2nd step.

(4) Preheater pilot lamp



- ① This lamp lights ON when start switch is turned clockwise to the ON position. Light will turn off after approximately 15~45 seconds, depending on engine coolant temperature, indicating that preheating is completed.
- ② When the lamp goes out the operator should start cranking the engine.

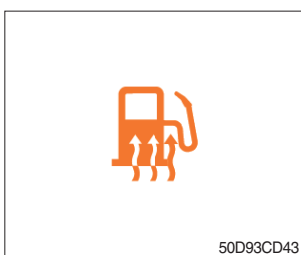
※ Refer to page 5-12.

(5) Inching pilot lamp



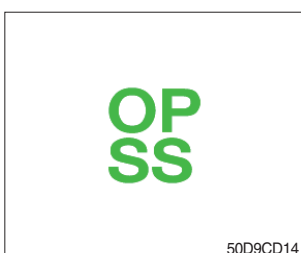
- ① When the inching switch is pressed, the lamp lights ON.

(6) Fuel warmer pilot lamp



- ① This lamp lights ON when the fuel warmer switch is pressed.

(7) OPSS pilot lamp



- ① This signal lamp lights ON when the operator leaves the seat.
- ② Powered travel movement of the truck shall be possible only if the operator is in the normal operating position. Transmission will automatically shift to neutral upon the exiting of the operator.
- ③ The forward/reverse lever must be cycled through neutral with the operator in the normal operating position to regain powered direction control.

(8) SCR cleaning inhibit pilot lamp



- ① This pilot lamp lights ON when the SCR cleaning switch is pushed inhibit position, therefore automatic and manual SCR cleaning can not occur. It should be inhibited, before caused fire due to the exhaust gas in high temperature.

※ Refer to the page 3-37 for the SCR cleaning switch.

(9) HEST (High exhaust system temperature) pilot lamp

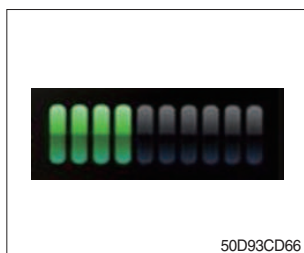


- ① This warning lamp indicates, when illuminated, that exhaust temperatures are high due to SCR cleaning.
- ② The lamp will also illuminate during a manual SCR cleaning.
- ③ When this lamp is illuminated, be sure the exhaust pipe outlet is not directed at any surface or material that can melt, burn, or explode.

▲ When this lamp is illuminated, the exhaust gas temperature could reach 800°C [1500°F], which is hot enough to ignite or melt common materials, and to burn people.

※ The lamp does not signify the need for any kind of equipment or engine service; It merely alerts the equipment operator to high exhaust temperatures. It will be common for the lamp to illuminate on and off during normal equipment operation as the engine completes the SCR cleaning.

(10) DEF (Diesel Exhaust Fluid) level pilot lamp



- ① This gauge indicates the level of DEF (10 steps).
- ② Fill the DEF when the level is low.

(11) Expendables replacement indicator lamp



- ① This lamp lights ON if expendables which must be replaced exist.
- ② The lamp will light up only 3 minutes since KEY ON, and then light off.
- ③ Please check the expendables management list in maintenance menu.

4) CLUSTER BUTTON

Each button has the following function.



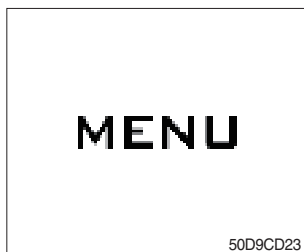
50D9CD121

(1) Buzzer stop/ESC button



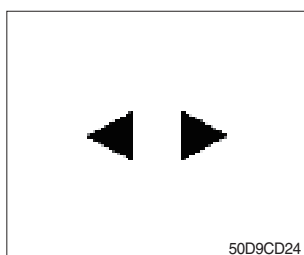
- ① This button is used to stop the buzzer sound.
- ② If another alarm condition occurs after this button has been pressed, the alarm buzzer will re-sound.

(2) Menu button



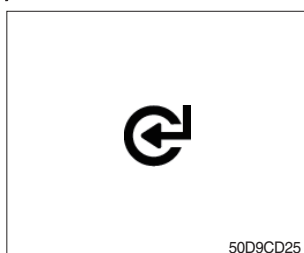
- ① Move in menu (left, up / right, down).

(3) Move button



- ① Move in menu (left, up / right, down).
- ② Decrease / Increase input value.
- ③ When the warning and pilot lamps occur over six, you can display next lamps by push the button (▶).

(4) Enter button

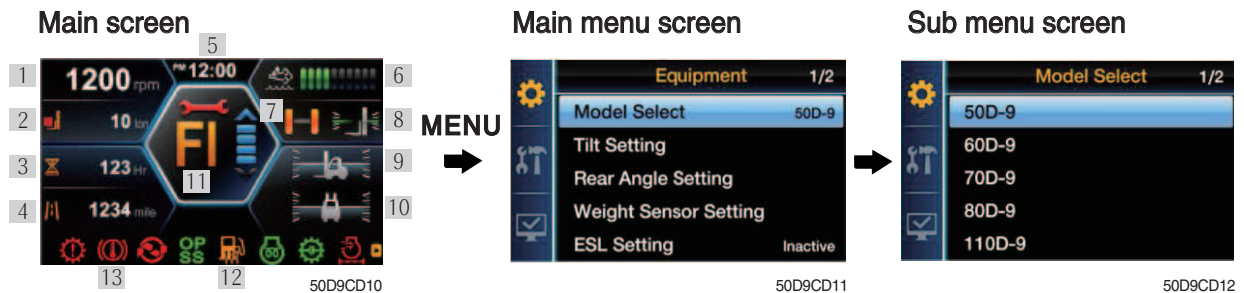


- ① This button is used to select menu.

5) LCD

(1) Main screen

- ※ You can select or set the menu by the button of the cluster.
- ※ Please refer to the page 3-15 for the selection and change of the menu and input value.



Communication error



50D9CD13

- ※ Main screen when occurred communication error between the cluster and TCU/ MCU / ECU

- | | |
|--------------------------|--|
| 1 Engine rpm | 8 Mast angle (opt) |
| 2 Load indicator (opt) | 9 Vehicle angle X (opt) |
| 3 Hour meter | 10 Vehicle angle Y (opt) |
| 4 Odometer | 11 T/M info (error code, gear, warning) |
| 5 Current time | 12 Temperature (outdoor temp., setting temp) |
| 6 DEF level gauge | 13 Warning and pilot lamps |
| 7 Rear wheel angle (opt) | |

(2) Main menu

No.	Main menu	Sub menu	Description
1	 Equipment 50D9CD14K	Model select Tilt setting Rear angle setting Weight sensor setting ESL setting Vehicle max speed limit AEB setting (R) MCU/cluster information	Model select Tilt setting (mast and vehicle angle) Rear angle setting Cross-section, load weight adjust, weight display setting, load indicator buzzer ESL setting Vehicle max speed limit (10~30 km) AEB setting (R)MCU/cluster information
2	 Maintenance 50D9CD15K	Current failure history Maintenance management Signal statue User password change RMCU comm	Display failure status (engine, transmission) Replacement, Change interval oils and filters Display information of sensors User password change (5~10 digit) Orbcomm, GPS antenna
3	 Display setting 50D9CD16K	LCD adjustment Time setting Unit setting Language setting AS phone number ESL password change Maintenance management	LCD brightness setting Time setting Unit setting (temp, speed, weight, pressure) Language setting (13 languages) Check and change AS phone number ESL password change (5~10 digit) Maintenance information (cycle, elapsed time, change count, alarm info)

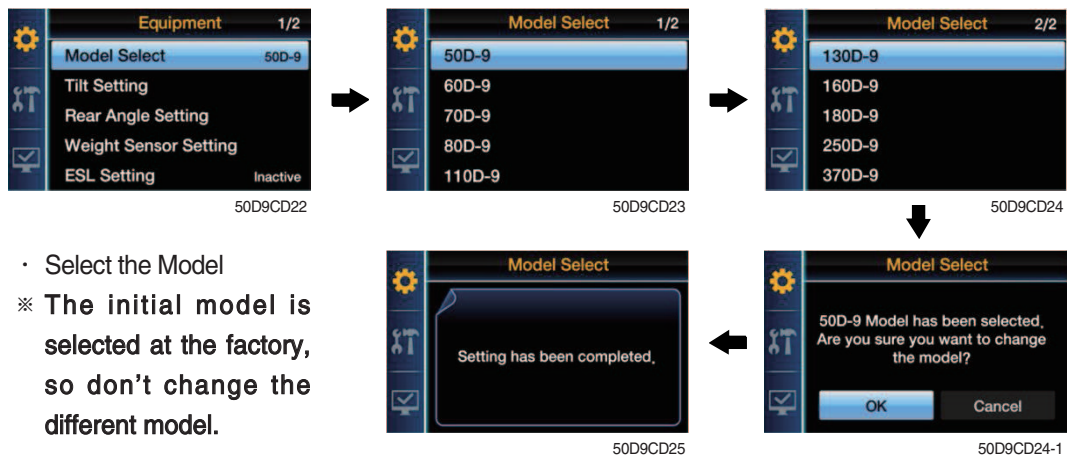
(3) Equipment

① Choose the equipment



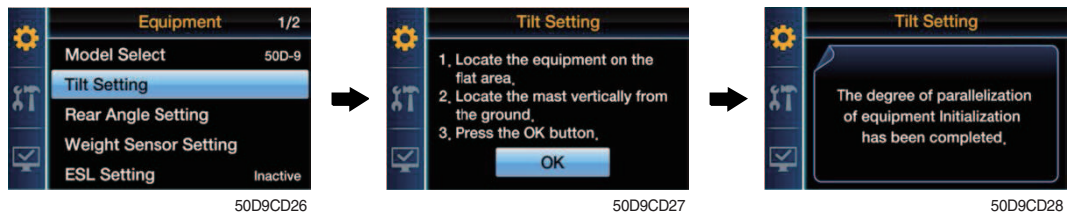
- To enter the menu, you must input user password.
- Default password is '00000'
- You should set password by five to ten digit.

② Model select



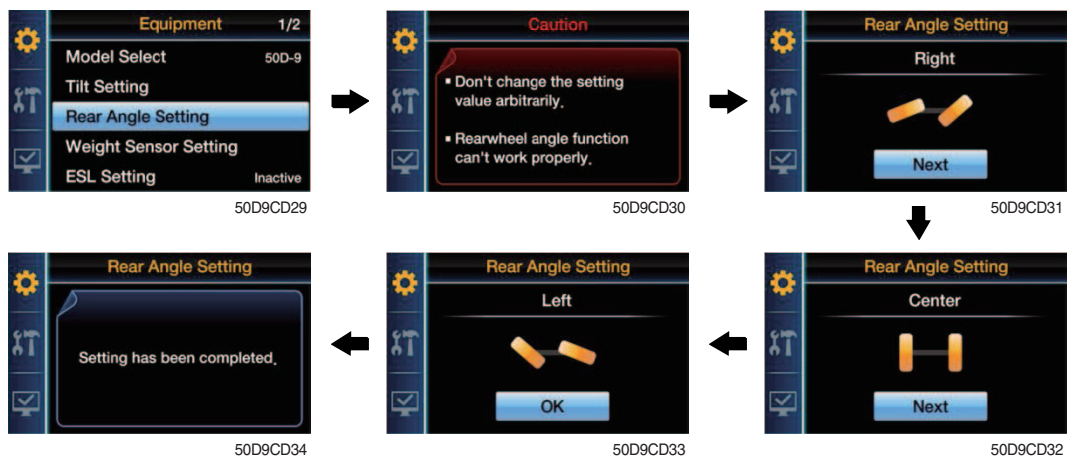
- Select the Model
- ※ The initial model is selected at the factory, so don't change the different model.

③ Tilt setting



- Set the offset about mast angle sensors and vehicle angle sensors.

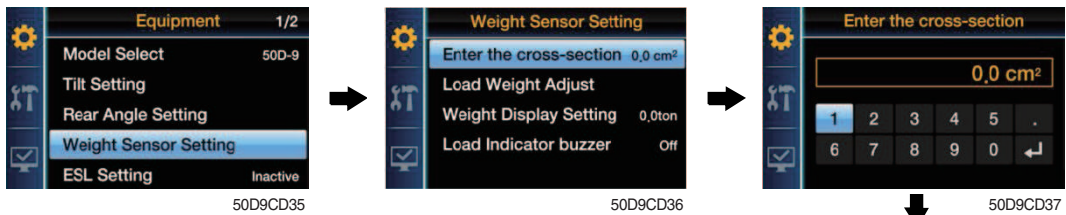
④ Rear angle setting



- The user revises a forklift truck steering angle.
- Display set to approve a condition.
 - Right set rear wheel calibration.
 - Center set rear wheel calibration.
 - Left set rear wheel calibration.

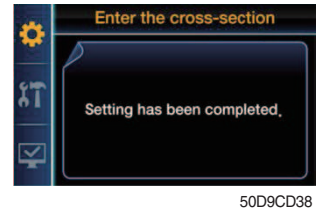
⑤ Weight sensor setting

a. Cross-section



- Enter the designated cross-section (cm²).

Mast spec	50/60/70/80D-9
V mast	113.49
TS mast	141.76
TF mast	132.73



b. Load weight adjust

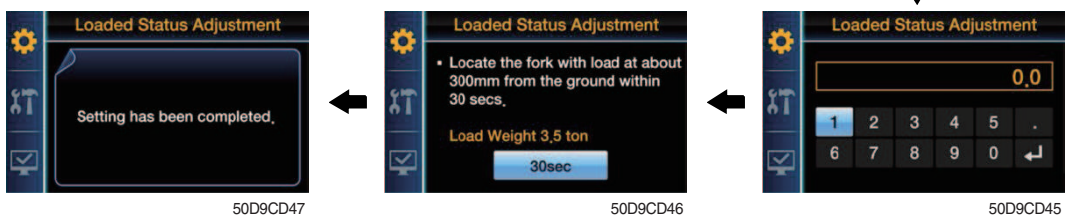
- Unloaded status adjustment

In the unloaded from the ground waiting 5 seconds after lift 30 cm, and tare ON.



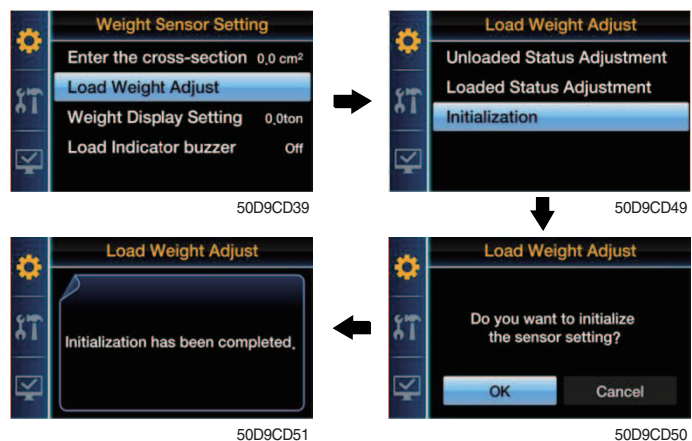
- Loaded status adjustment

Loaded enter the weight.
-> In the loaded from the ground waiting 5 seconds after lift 30 cm.
-> Weight correction ON.

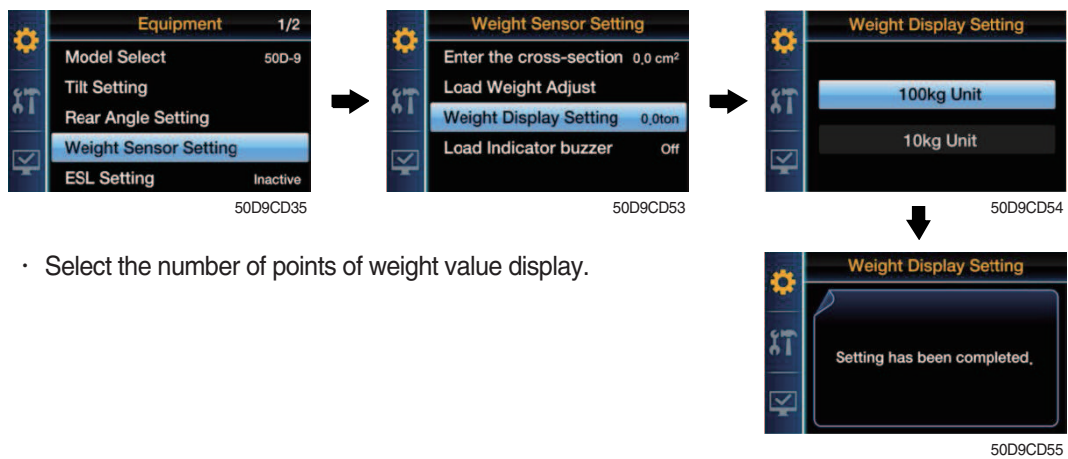


- Initialization

It is initialized loaded status and unloaded status.

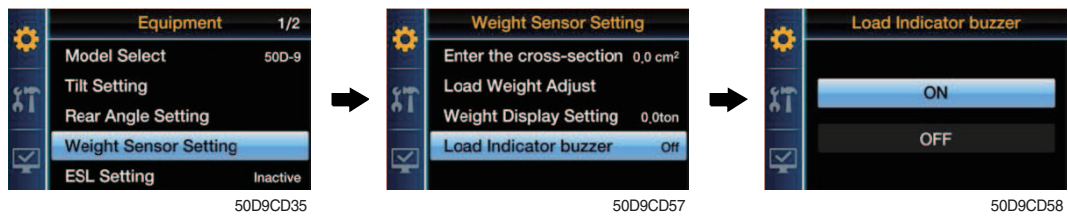


c. Weight display setting



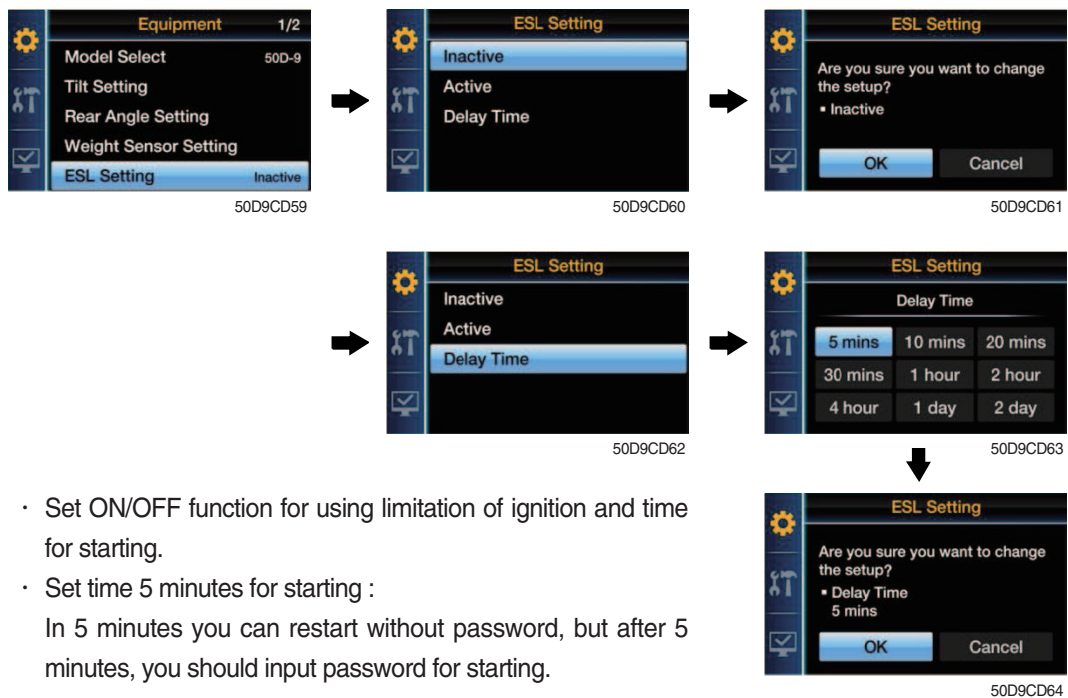
- Select the number of points of weight value display.

d. Load indicator buzzer



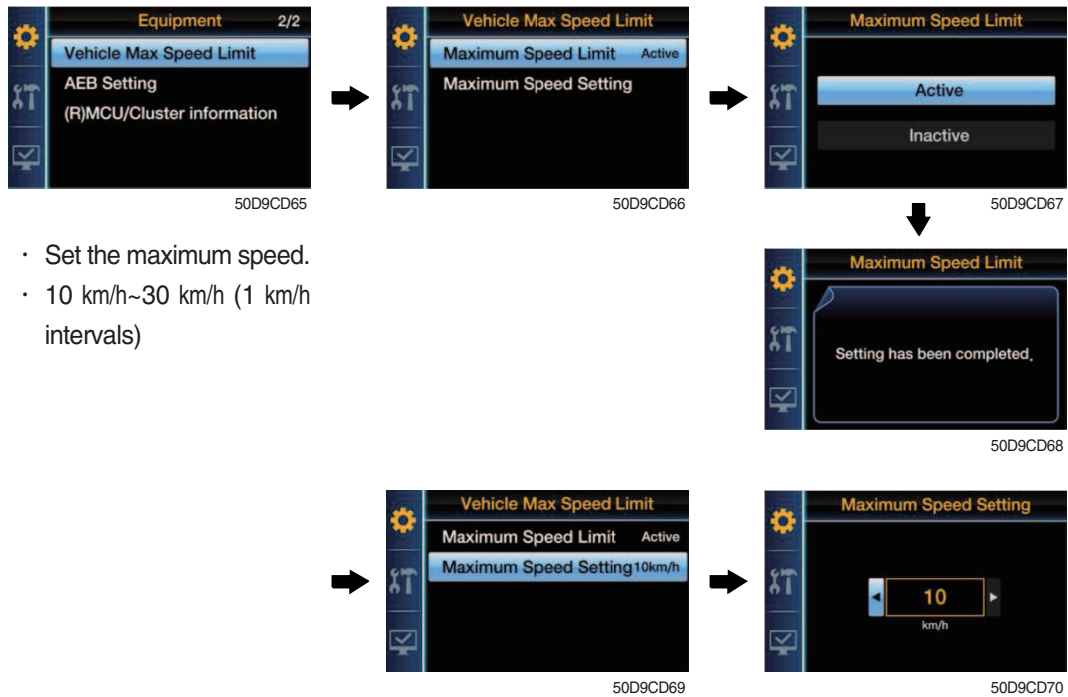
- Choose using buzzer when over weight.

⑥ ESL setting

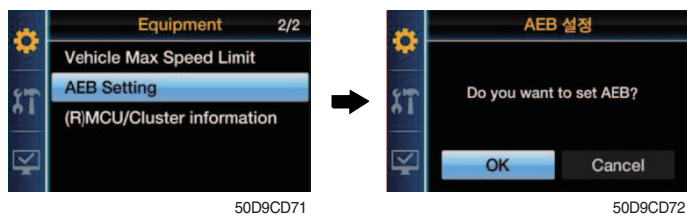


- Set ON/OFF function for using limitation of ignition and time for starting.
- Set time 5 minutes for starting :
In 5 minutes you can restart without password, but after 5 minutes, you should input password for starting.

⑦ Vehicle max speed limit



⑧ AEB setting



- Press OK button, then calibration will be started, for cancel, press Menu/ECS/Enter button.
- When it is finished (OK sign at gear box), Press Menu/ECS/Enter button.
- Start the engine : AEB start
- KEY ON : Brake pedal sensor calibration

⑨ (R) MCU / Cluster information



- Software version check for MCU/Cluster/RMCU.

⑩ Finger tip setting

a. Lever position setting



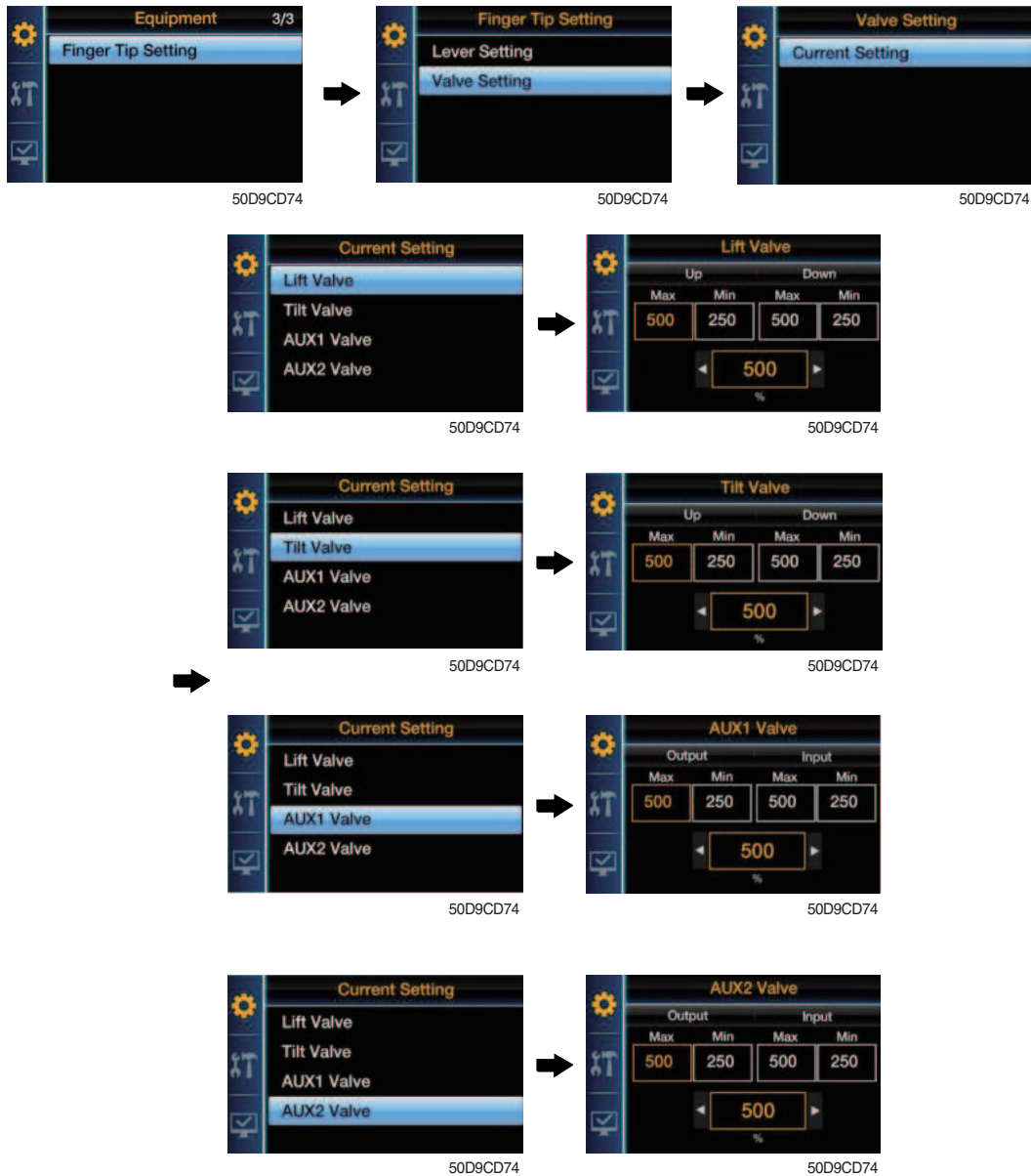
- Ability to set up the maximum Pull, Push (Min,Max) value and neutral value (Mid) of lever.
- Finger Tip lever set up about 0.5V~2.5V~4.5V.
You must be to move with actual Lever. (Unit V)
ex) Min 0.48, Mid 2.52, Max 4.52

b. Lever deadzone setting



- Ability to prevent the Value output due to a tiny error of the neutral Lever state (2.5V)
 ex) If you set up the Upper : 0.26, Lower : 0.24, Lever operating range will be
 Upper zone : 2.76V ($2.5 + 0.26$) ~ 4.5V (Lever Max value)
 Lower zone : 2.26V ($2.5 - 0.24$) ~ 0.5V (Lever Min value)

c. Valve setting



- Current Setting : Current setting for input each Valve Coil, it is to set up each maximum value of movements according of the current value (Unit % (Over 110D-9 only), mA (Under 80D-9 Only))
ex) If the Max value increase, the maximum speed will also increase.
If the Min value increase, the minimum speed will also increase.

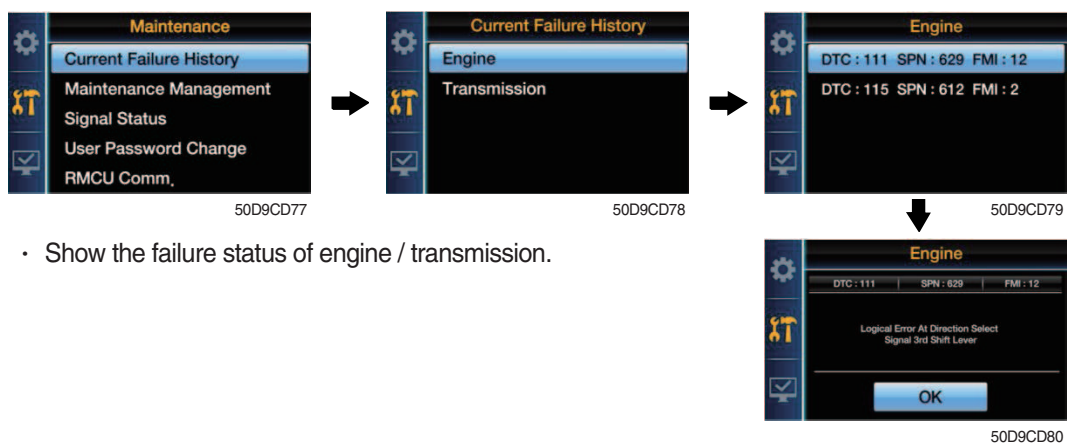
(4) Maintenance

① Choose the maintenance



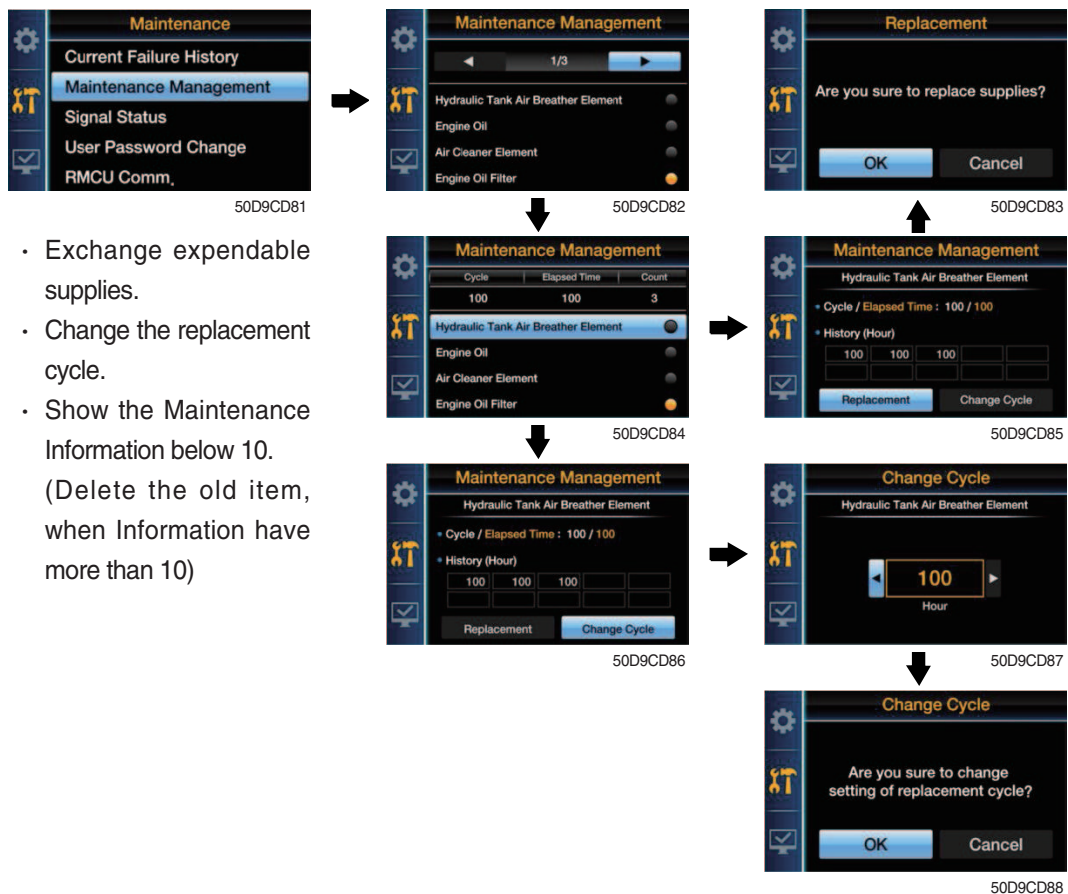
- To enter the Menu, you must input user password.
- Default password is '00000'
- You should set password by five to ten digit.

② Current failure history



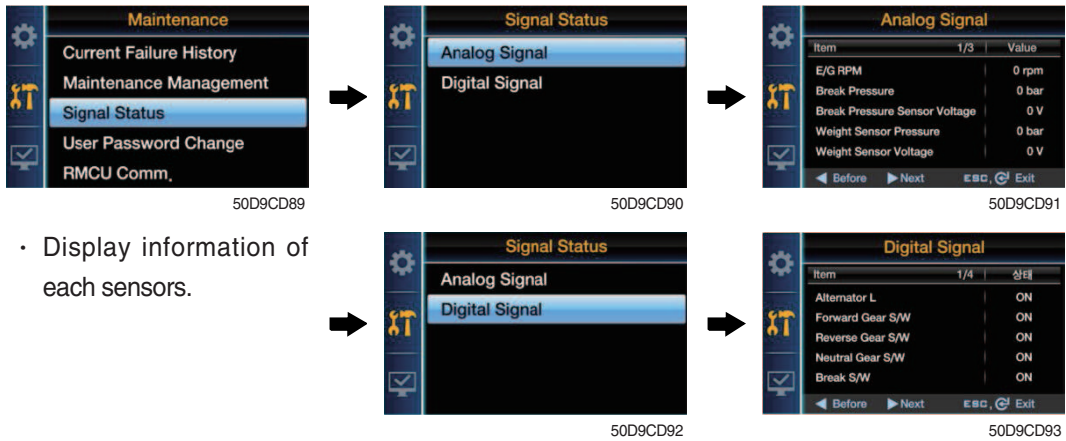
- Show the failure status of engine / transmission.

③ Maintenance management



- Exchange expendable supplies.
- Change the replacement cycle.
- Show the Maintenance Information below 10.
(Delete the old item, when Information have more than 10)

④ Signal status



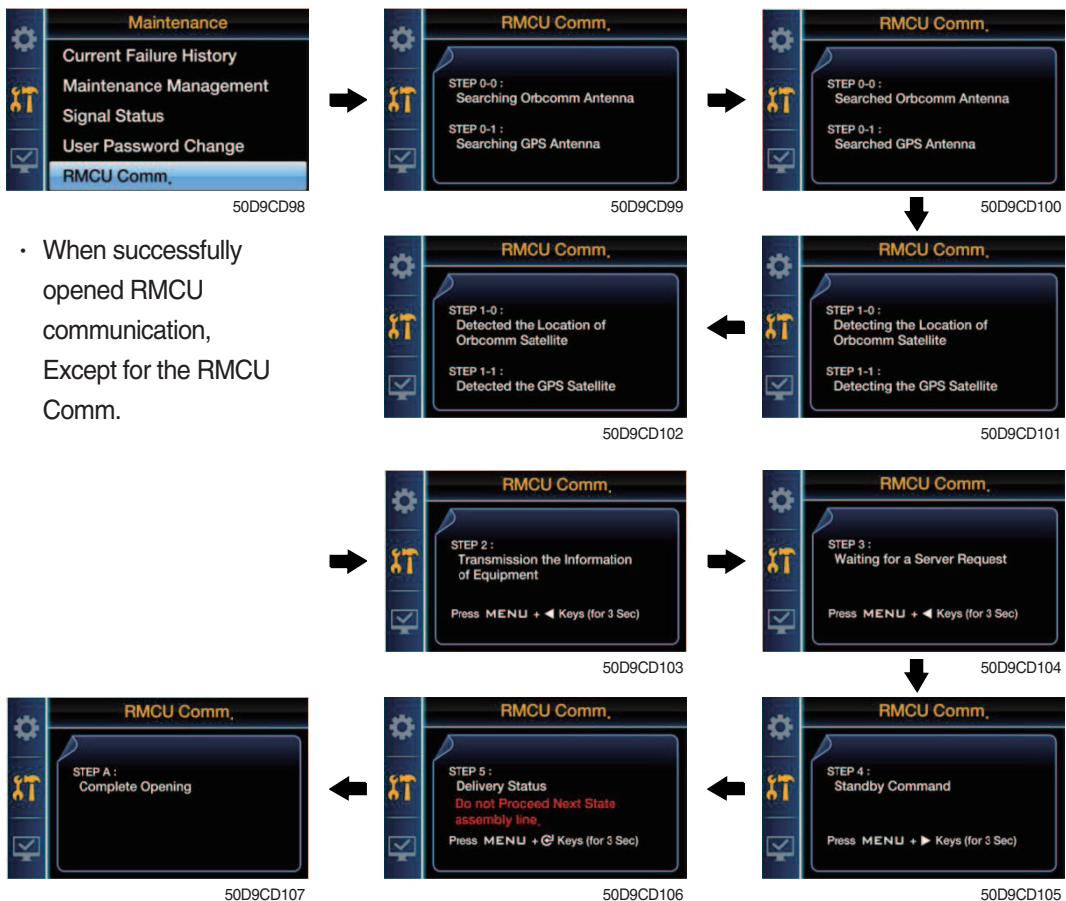
- Display information of each sensors.

⑤ User password change



- You should set password by five to ten digit.

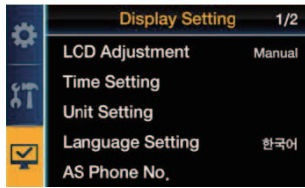
⑥ RMCU Comm



- When successfully opened RMCU communication, Except for the RMCU Comm.

(5) Display setting

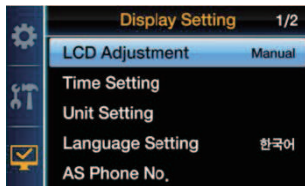
① Choose the display setting



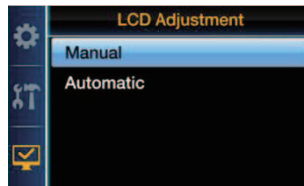
50D9CD108

- No password is required.

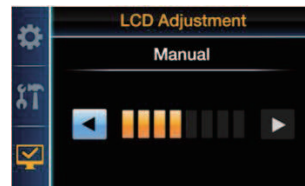
② LCD adjustment



50D9CD109



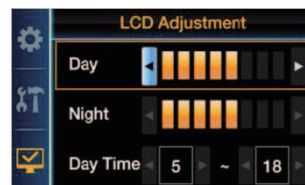
50D9CD110



50D9CD111

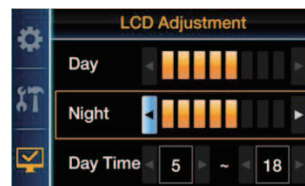


50D9CD112

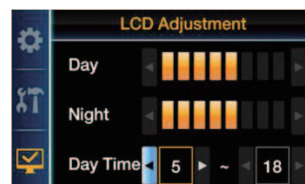


50D9CD113

- Manual : Manual setting for LCD brightness.
- Automatic : Automatic control of LCD brightness as set level of Day/Night.
- Setting day time : Set the time for daylight.
(If you set the time for daylight, the rest time will be night.)

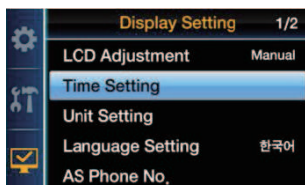


50D9CD114

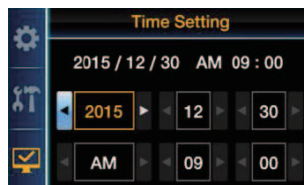


50D9CD115

③ Time setting



50D9CD116



50D9CD117

- Set the time (Year, Month, Day, Hour, Minute, AM/PM).

④ Unit setting



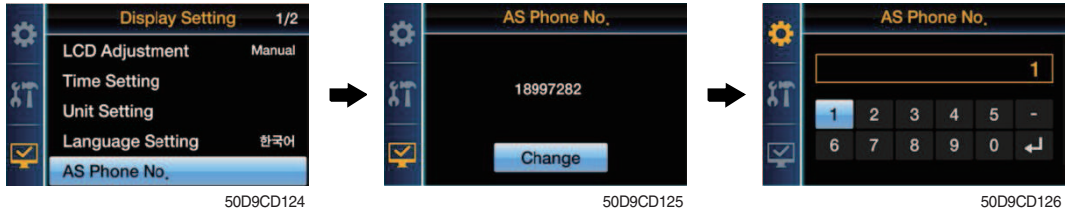
- Change units of temperature / speed / wight / pressure.

⑤ Language setting



- Set the language used by your device.
(13 Multiple language)

⑥ A/S phone number



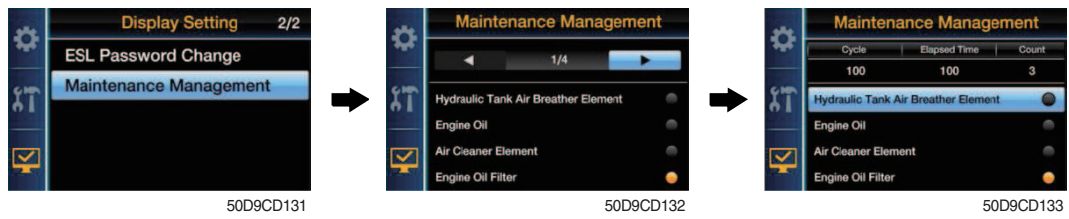
- Check and change of contact information for customer service.

⑦ ESL password change



- You should set password by five to ten digit.

⑧ Maintenance management



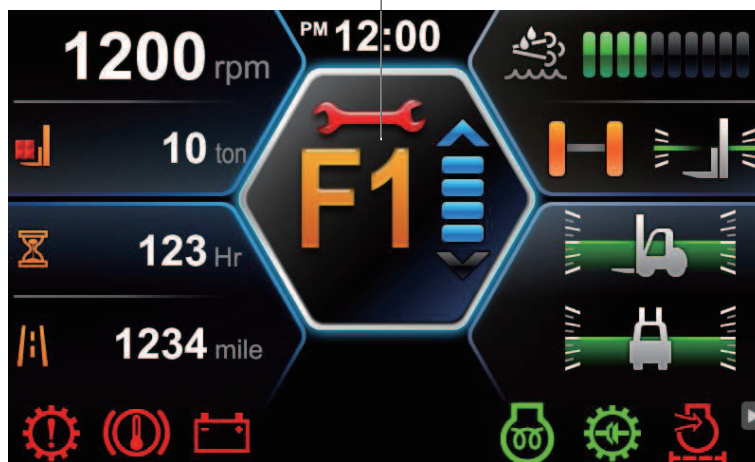
- Show the maintenance information (replacement cycle, elapsed time, change count, alarm information).

5.TRANSMISSION MESSAGE DISPLAY

1) FUNCTION

The display can be used with the gear selector (DW-3). It indicates speed and driving direction. When driving in the automatic mode, a bar indicator gives additionally also information about the selected driving range; The automatic range is symbolized by arrows above and below the bar indicator. In case of possible errors in the system, a wrench appears on the display, combined with indication of the error number. Also sporadically occurring errors can be indicated.

Transmission message display



50D93ACD33

※ If it happens error codes, consult with Hyundai service center to repair the fault.

(2) Display during operation

Symbol	Meaning	Remarks
F, N, R 1, 2, 3	Actual gear and direction Central side shows actual gear Right side shows actual direction	
NN (Central and right side)	Not neutral, waiting for neutral after power up or a severe fault	To engage a gear, first move shift selector to neutral position and again to F to R position
1 bar	Manual mode 1st gear	
2 bar	Manual mode 2nd gear	
3 bar	Manual mode 3rd gear	
3 bars and 2 arrows	Automatic mode	a, b, c, d, f
※ ※	Transmission neutral	Cold start phase
Bars flashing	Downshift mode active	
Spanner flashing	At least on fault active	Select neutral to get fault code displayed
WT	Warning torque converter temperature	Changes between actual gear/direction while driving, in neutral only displayed if no fault is detected (spanner)
WS	Warning sump temperature	Changes between actual gear/direction while driving, in neutral only displayed if no fault is detected (spanner)
WE	Warning high engine speed	Changes between actual gear/direction while driving, in neutral only displayed if no fault is detected (spanner)
PN	Direction F or R selected while parking brake engaged	Transmission in neutral until parking brake is released. ※ Machine starts to move after release of parking brake.
F or R flashing	Direction F or R selected while turbine speed is too high	※ Gear will engage when turbine speed drops

(3) Definition of the error codes

① Introduction

The error codes consists of two hexadecimal numbers.

The first number shows the type of signal, the second number shows signal and the type of the error.

② Description of error codes

First No.	Meaning of number
1 hex	Digital input signals
2 hex	Analog input signals
3 hex	Speed signals
4 hex	Speed signals
7 hex	Analog current output signals
8 hex	Analog current output signals
9 hex	Digital output signals
A hex	Digital output signals
B hex	Clutch errors
D hex	Power supply
E hex	High speed signals
F hex	General errors

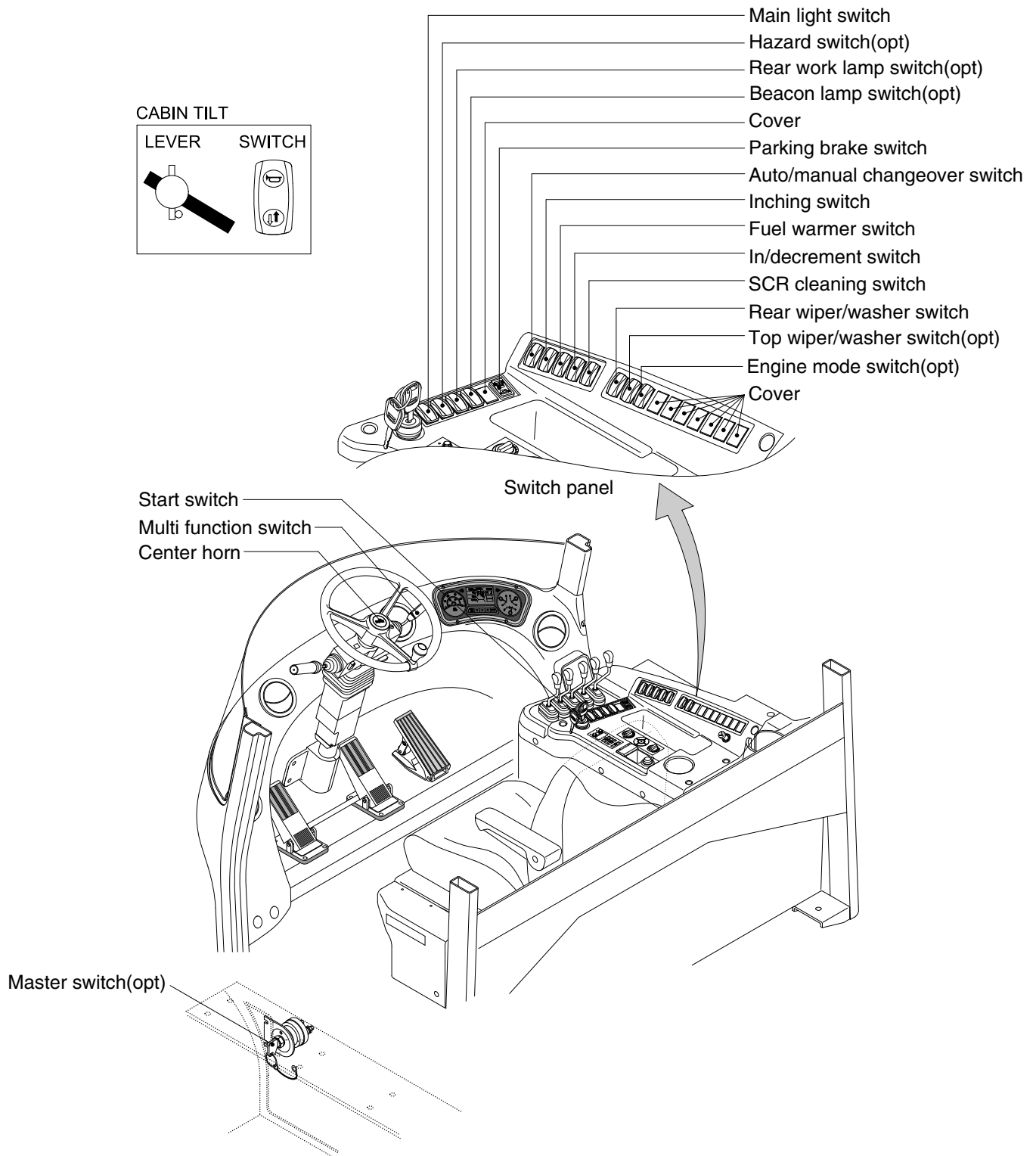
③ List of error codes

Number	Meaning of error code
11 hex	Logical error at gear range signal
12 hex	Logical error at direction select signal
21 hex	Short circuit to battery voltage at clutch cutoff input
22 hex	Short circuit to ground or open circuit at clutch cutoff input
25 hex	Short circuit to battery voltage or open circuit at temperature sensor input
26 hex	Short circuit to ground at temperature sensor input
31 hex	Short circuit to battery voltage at engine speed input
32 hex	Short circuit to ground or open circuit at engine speed input
33 hex	Logical error at engine speed input
34 hex	Short circuit to battery voltage at turbine speed input
35 hex	Short circuit to ground or open circuit at turbine speed input
36 hex	Logical error at turbine speed input
37 hex	Short circuit to battery voltage at internal speed input
38 hex	Short circuit to ground or open circuit at internal speed input
39 hex	Logical error at internal speed input

Number	Meaning of error code
3A hex	Short circuit to battery voltage or open circuit at output speed input
3B hex	Short circuit to ground or open circuit at output speed input
3C hex	Logical error at output speed input
71 hex	Short circuit to battery voltage at clutch KC
72 hex	Short circuit to ground at clutch KC
73 hex	Open circuit at clutch KC
74 hex	Short circuit to battery voltage at clutch KD
75 hex	Short circuit to ground at clutch KD
76 hex	Open circuit at clutch KD
77 hex	Short circuit to battery voltage at clutch KE
78 hex	Short circuit to ground at clutch KE
79 hex	Open circuit at clutch KE
84 hex	Short circuit to battery voltage at clutch KV
85 hex	Short circuit to ground at clutch KV
86 hex	Open circuit at clutch KV
87 hex	Short circuit to battery voltage at clutch KR
88 hex	Short circuit to ground at clutch KR
89 hex	Open circuit at clutch KR
91 hex	Short circuit to ground at relay reverse warning alarm
92 hex	Short circuit to battery voltage at relay reverse warning alarm
93 hex	Open circuit at relay reverse warning alarm
94 hex	Short circuit to ground at relay starter interlock
95 hex	Short circuit to battery voltage at relay starter interlock
96 hex	Open circuit at relay starter interlock
97 hex	Short circuit to ground at park brake solenoid
98 hex	Short circuit to battery voltage at park brake solenoid
99 hex	Open circuit at park brake solenoid
B1 hex	Slippage at clutch KC
B2 hex	Slippage at clutch KD
B3 hex	Slippage at clutch KE
B5 hex	Slippage at clutch KV
B6 hex	Slippage at clutch KR

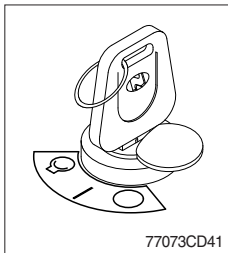
Number	Meaning of error code
D1 hex	Short circuit to battery voltage at power supply for sensors
D2 hex	Short circuit to ground at power supply for sensors
D3 hex	Low voltage at battery
D4 hex	High voltage at battery
D5 hex	Error at valve power supply 1
D6 hex	Error at valve power supply 2
E5 hex	Communication failure on devicenet
F1 hex	General EEPROM fault
F2 hex	Configuration lost
F3 hex	Application error

6. SWITCHES



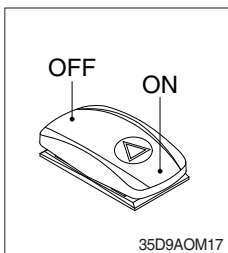
50D9CD05

1) START SWITCH



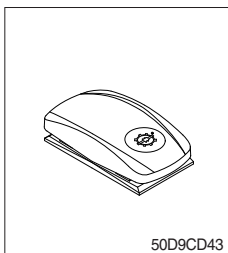
- (1) There are three positions, OFF, ON and START.
- ○ (OFF) : None of electrical circuits activate.
 - | (ON) : All the systems of truck operate.
 - ⦿ (START) : Use when starting the engine.
Release key immediately after starting.

2) HAZARD SWITCH (OPTION)



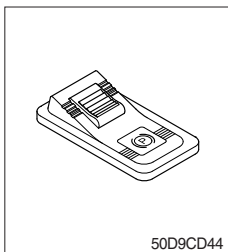
- (1) Use for parking, or loading truck.
- ※ If the switch is left ON for a long time, the battery may be discharged.

3) INCHING SWITCH



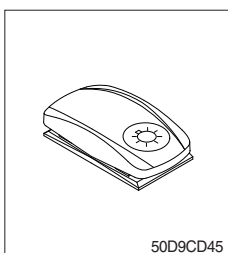
- (1) If this switch is pressed, inching operation is applied to inching pedal.
- (2) Also, inching lamp on the cluster is illuminated.

4) PARKING BRAKE SWITCH



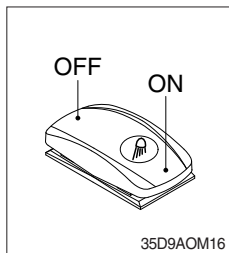
- (1) This switch is used to parking brake lock or release.
- (2) If this switch is pressed, the parking brake is applied and the warning lamp on the cluster will comes ON.
- ※ When operating the gear selector lever, be sure to release the parking brake. If the truck is operated with the parking brake engaged, the brake will overheat and may cause the brake system to go out of order.

5) MAIN LIGHT SWITCH



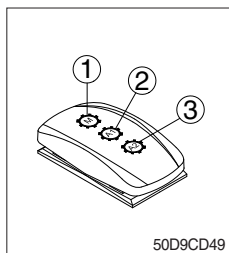
- (1) This switch is used to operate the head light by one steps.
- ① First step : Tail lamp comes ON.
 - ② Second step : Head lamp comes ON.

6) REAR WORK LAMP SWITCH (OPTION)



- (1) This switch is used to operate the work lamps.
Press this switch to turn on work lamps.

7) AUTO/MANUAL CHANGEOVER SWITCH



(1) Manual mode (①)

Press the top of the switch for the manual mode of the autoshift function. The operator selects the desired speed and the desired direction in the manual mode with the gear selector lever.

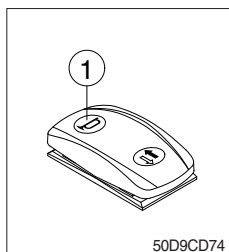
(2) Automatic 1st mode (②)

Place the switch in the middle position for the autoshift function changing from 1st to 3rd gear shift mode.

(3) Automatic 2nd mode (③)

Press the bottom of the switch fully for the autoshift function changing from 2nd to 3rd gear shift mode.

8) CABIN TILT SWITCH



(1) Horn (🔊)

By pressing position ①, the horn sounds and by releasing, the horn stops.

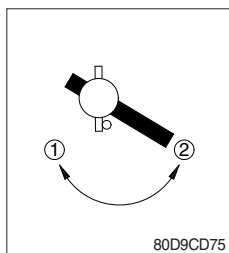
▲ Sound the horn to warn near by personnel, before tilting the cabin.

(2) Tilting of the cabin (⬆, ⬇)

Press the cabin tilt switch in order to tilt the cabin to right side or return to original location.

※ Refer to page 7-18 for the tilting method of the cabin.

9) HAND PUMP LEVER

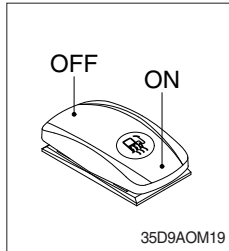


(1) This lever is used when tilting the cabin.

(2) Turn the hand pump lever to counterclockwise direction (①), the cabin shall be tilted to right side by the cabin tilt switch.

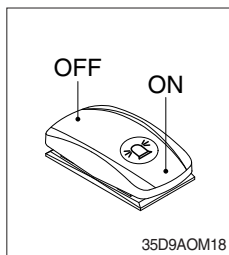
(3) Turn the hand pump lever to clockwise direction (②), the cabin shall be returned to original location by the cabin tilt switch.

10) FUEL WARMER SWITCH



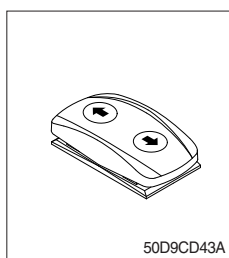
- (1) This switch is used to heat the fuel of pre-heater.

11) BEACON SWITCH (OPTION)



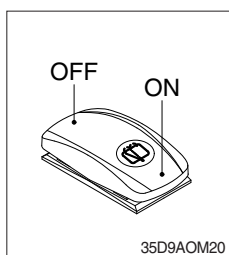
- (1) This switch turn ON the strobe light.

12) INC/DECREMENT SWITCH



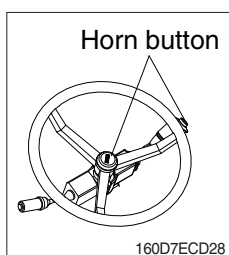
- (1) When engine running, the low rpm of engine increase or decrease by 25 rpm by operating this switch.
(2) Engine low rpm returns to normal value when engine restarted.

13) TOP WIPER AND WASHER SWITCH (OPTION)



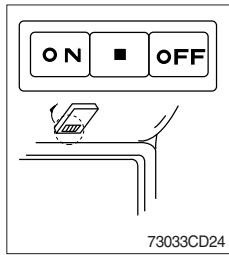
- (1) This switch is used to operate the wiper and washer on the top of the cab.
(2) The washer liquid is sprayed and the wiper is operated only while pressing this switch.

14) HORN BUTTON



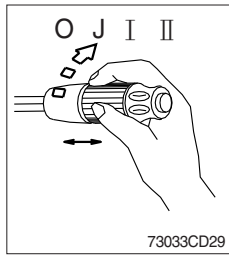
- (1) If you press the button on the top of the multifunction switch and the center of the steering wheel, the horn will sound.

15) CAB LAMP SWITCH



- (1) This switch turns ON the cab room lamp.

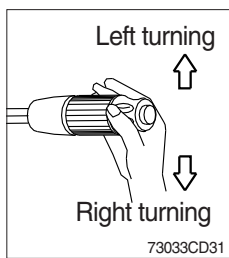
16) MULTI FUNCTION SWITCH



- (1) Front wiper and washer switch

- ① When the switch is in J position, the wiper moves intermittently.
- ② When placed in I or II position, the wiper moves continuously.
- ③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

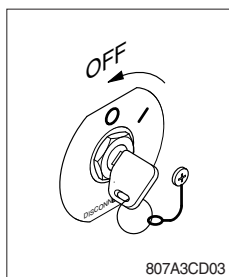
※ **Check the quantity of washer liquid in the tank. If the level of the washer liquid is LOW, add the washer liquid (In cold, winter days) or water. The capacity of the tank is 1 liter.**



- (2) Turning switch

- ① This switch is used to warn or signal the turning direction of the truck to other vehicles or equipment.
- ② Push the lever up for turning left, pull the lever down for turning right.

17) MASTER SWITCH (OPTION)

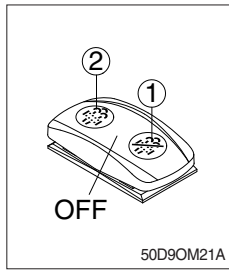


- (1) This switch is used to shut off the entire electrical system.
When the machine is not operated for a long time, turn OFF the master switch for the safety purpose.

- (2) I : The battery remains connected to the electrical system.
O : The battery is disconnected to the electrical system.

※ **Never turn the master switch to O (OFF) with the engine running. Engine and electrical system damage could result.**

18) SCR (Selective Catalytic Reduction) CLEANING SWITCH



(1) This switch is used to select the cleaning function of the SCR.

(2) Inhibit position (①)

- ① The inhibit position disallows any automatic or manual SCR cleaning.
- ② This may be used by operator to prevent SCR cleaning when the machine is operating in a hazardous environment is concerned about high temperature.
- ③ It is strongly recommended that the this position is only activated when high temperatures may cause a hazardous condition.

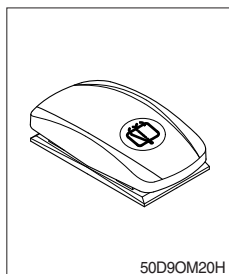
(3) OFF position

This position will initiate a automatic SCR cleaning when needed.

(4) Manual SCR cleaning position (②)

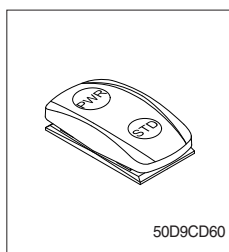
- ① This position will only initiate a manual SCR cleaning and the SCR cleaning lamp is illuminated.
- ② HEST lamp will be illuminated during the entire SCR cleaning.
- ※ Refer to the page 3-24 for details.
- ※ This switch can be move to the manual SCR cleaning position (②) only when the safety button is pulled to backward.
- ※ Also, this switch return to the OFF position when released the manual SCR cleaning position (②).

19) REAR WIPER/WASHER SWITCH



- (1) This switch is used to operate the wiper and washer on the rear of the cab.
- (2) The washer liquid is sprayed and the wiper is operated only while pressing this switch.

20) ENGINE MODE SWITCH



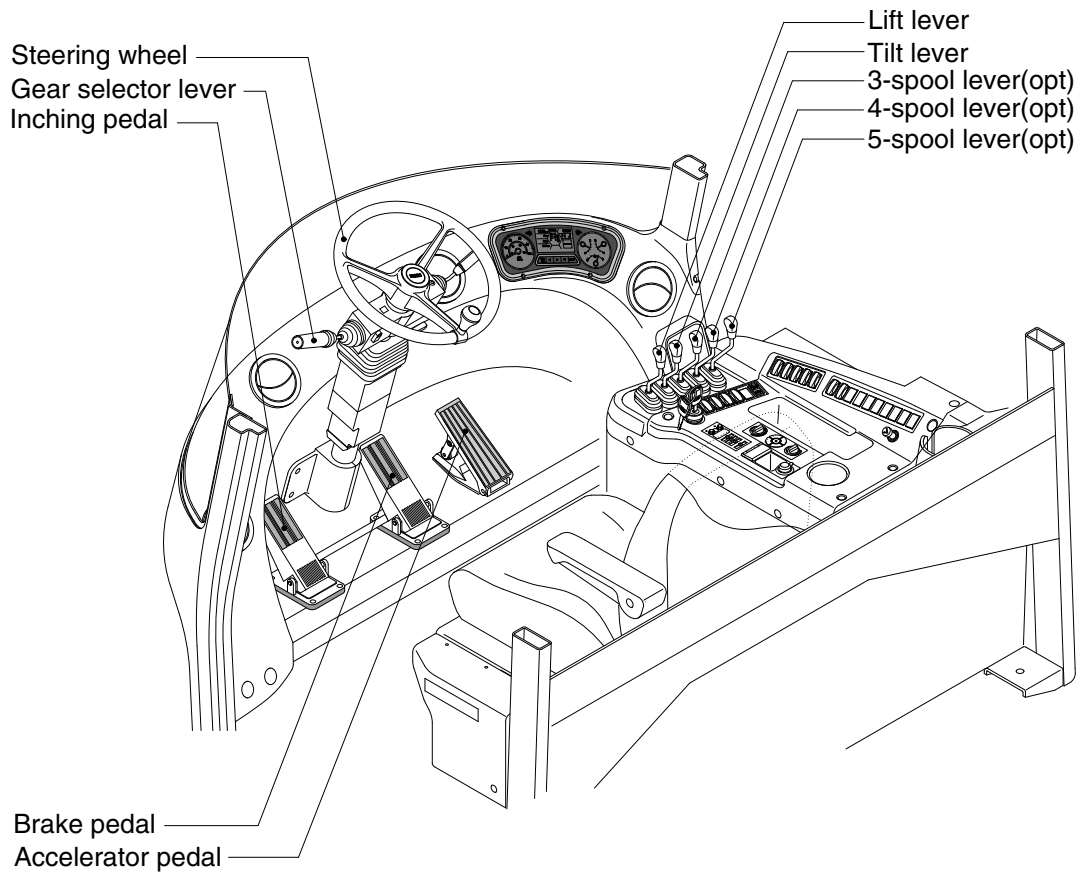
(1) This switch offers two selectable operating mode.

The operator can adjust the truck's performance with this selection switch.

(2) Function

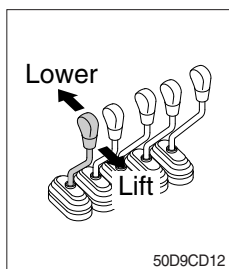
- ① STD MODE : This mode provides maximum fuel efficiency for general loading.
- ② PWR MODE : This mode provides maximum power output for heavy loading or hill climb.

7. CONTROL DEVICE



50D9CD08

1) LIFT LEVER



(1) LIFT

PULL the lever BACK to LIFT the forks.

(2) LOWER

PUSH the lever FORWARD to LOWER the load.

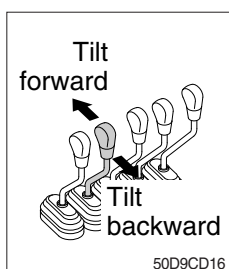
(3) HOLDING

When the lever is released, the lifting or lowering action stops.

※ Lifting speed is controlled by accelerator pedal.

Lowering speed is controlled by lever only.

2) TILT LEVER



(1) TILT FORWARD

PUSH the lever FORWARD to tilt mast FORWARD.

(2) TILT BACKWARD

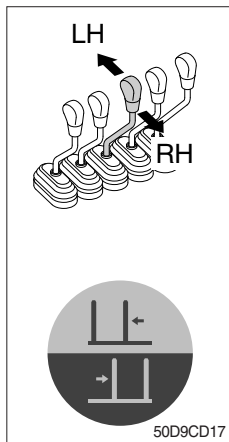
PULL the lever BACK to tilt mast BACKWARD.

(3) HOLDING

When the lever is released, tilting action stops.

※ Forward and backward tilting speeds are controlled by tilt lever and accelerator pedal.

3) LEVER FOR SIDE SHIFT



(1) LH MOVEMENT

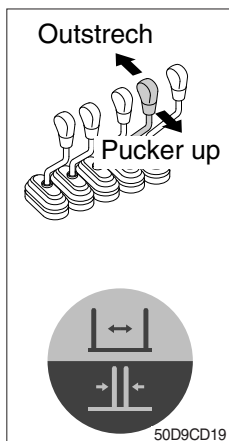
Push the lever forward to move the left hand for the side shift.

(2) RH MOVEMENT

Pull the lever backward to move the right hand for the side shift.

4) LEVER FOR SIDE SHIFT WITH FORK POSITIONER

(1) FORK POSITIONER (SYNCHRONIZER TYPE)



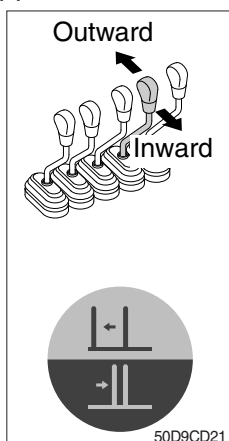
① OUTSTRECH THE FORKS

Push the lever forward to outstreich simultaneously outward of the both forks.

② PUCKER UP THE FORKS

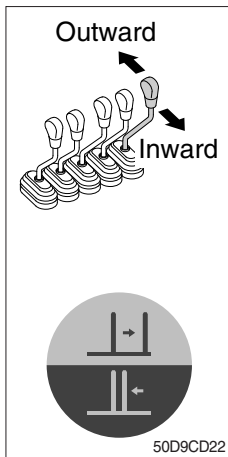
Pull the lever backward to pucker up simultaneously inward of the both forks.

(2) FORK POSITIONER (INDEPENDENT TYPE)



① LH FORK MOVEMENT

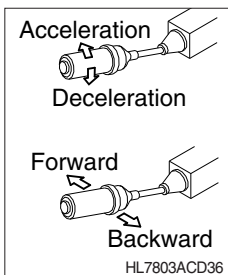
- Push the lever forward to move outward for the LH fork.
- Pull the lever backward to move inward for the LH fork.



② RH FORK MOVEMENT

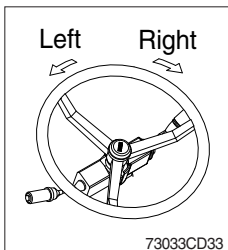
- Push the lever forward to move outward for the RH fork.
- Pull the lever backward to move inward for the RH fork.

5) GEAR SELECTOR LEVER



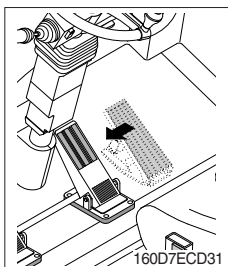
- (1) This lever is used for gear selection, forward 3 stages and reverse 3 stages.
- (2) If you push the gear selector lever, the truck moves forward, but pulling the gear selector lever, the truck moves backward.
- (3) If you turn the gear selector lever forward, the truck increases the speed, but if you turn the gear selector lever backward, the truck reduces the speed.

6) STEERING WHEEL



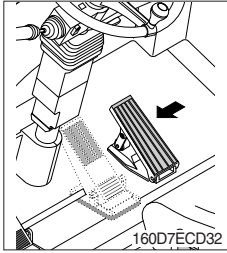
- (1) A steering cylinder in the center of the steering axle will operate the steering function.
- (2) Turning the steering wheel left, the truck moves to the left side and turning it right, the truck moves to the right side.

7) BRAKE PEDAL



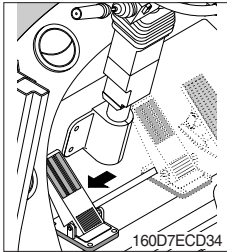
- (1) If the pedal is pushed, braking force is generated and bring the truck to a stop.
- ※ Do not operate the truck with stepping on the brake pedal unnecessarily, or bring premature wear of brake disc.

8) ACCELERATOR PEDAL



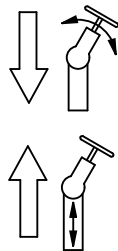
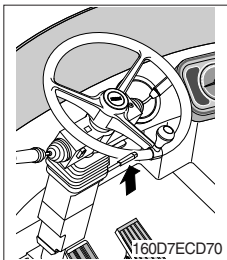
- (1) This pedal controls the engine speed. The engine speed will increase in proportion to the degree of force applied to this pedal.
- (2) Unless this pedal is pressed, the truck will run at low idling.

9) INCHING PEDAL



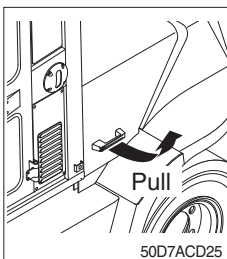
- (1) Inching pedal is used for fine control of forward and reverse movement when lifting up or putting down loads.
- ※ Do not put your foot on the inching pedal or brake pedal unless using it.

10) STEERING WHEEL LEVER



- (1) By pulling down the lever, the wheel is adjustable to tilt.
- (2) By pulling up the lever, the wheel is adjustable to telescope.
- (3) Adjustable steering wheel
Accommodates various operator's conditions.
 - Tilting angle : 40°
 - Telescopic stroke : 80 mm

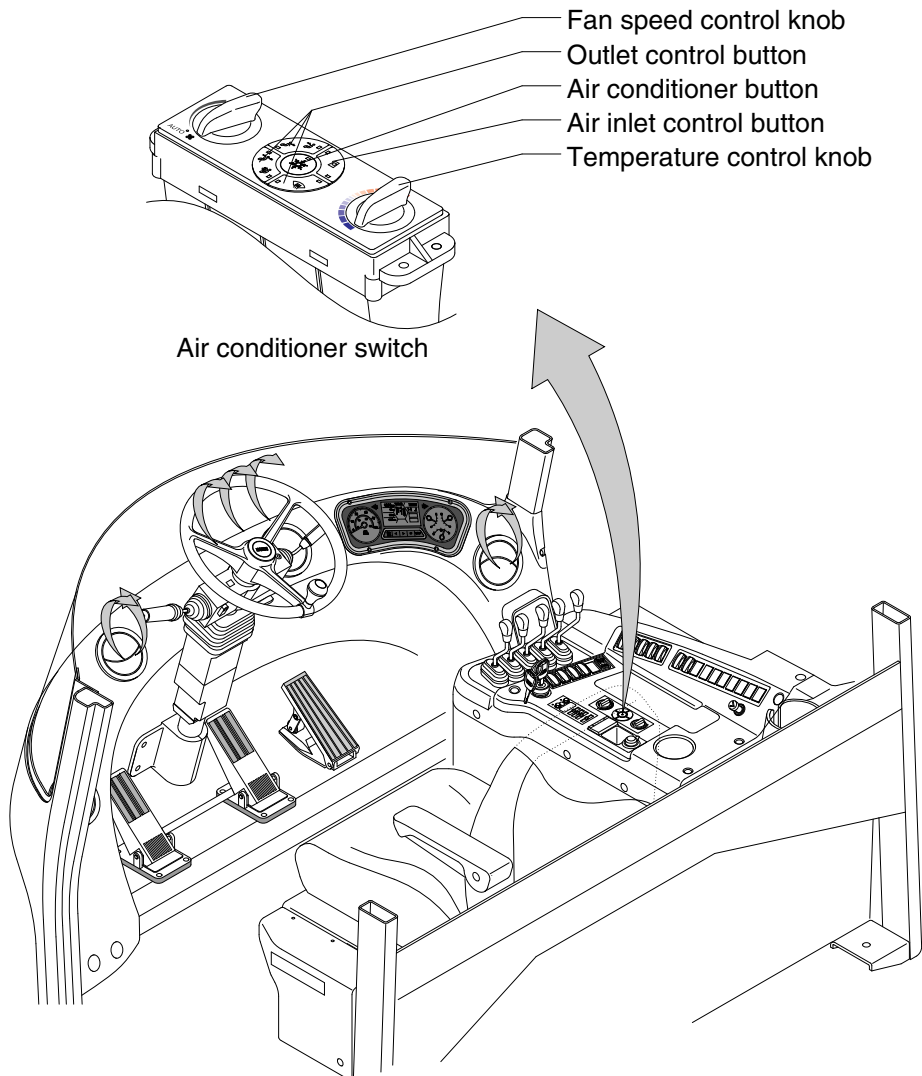
11) ENGINE HOOD



- (1) Pull the handle attached on the bolt side of engine hood to open it.

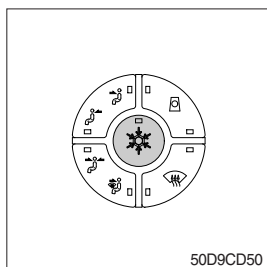
8. AIR CONDITIONER AND HEATER

Fuel auto air conditioner and heater are equipped for pleasant operation against outside temperature and defrost on window glass.



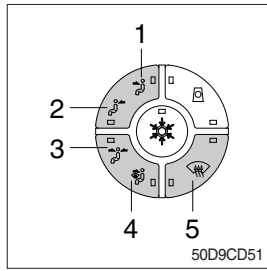
50D9CD90

1) AIR CONDITIONER BUTTON



- (1) When you push this button, air conditioner system is operated.
 - (2) Determines whether to perform a cooling function of air conditioner.
 - ① Pilot lamp ON : Air conditioner operation
 - ② Pilot lamp OFF : Fan only
- ※ The AUTO pilot lamp ON when this button is pushed.

2) OUTLET CONTROL BUTTON

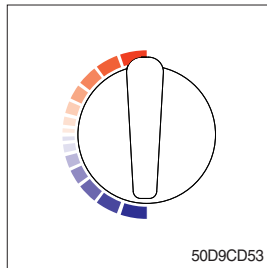


There are five kinds of air flow.

- ① Face
- ② Rear
- ③ Face and rear
- ④ Face and defrost
- ⑤ Defrost

※ The pilot lamp is turned ON when the button is pushed.

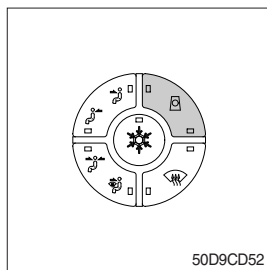
3) TEMPERATURE CONTROL KNOB



This knob regulates the temperature of air.

- ① Right side (red zone) : Cool down air temperature
- ② Left side (blue zone) : Heat up air temperature

4) AIR INLET CONTROL BUTTON



This button regulates the inlet air.

- ① Pilot lamp ON : Fresh air intake.
- ② Pilot lamp OFF : The air circulates in the cab.

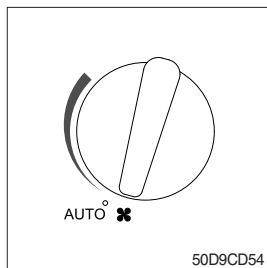
※ The pilot lamp is turned ON when the button is pushed.

※ Check out the fresh air filter periodically to keep a good efficiency.

※ Change air occasionally when using recirculation for a long time.

※ Check out the recirculation filter periodically to keep a good efficiency.

5) FAN SPEED CONTROL KNOB



- ① Fan speed is controlled automatically by set temperature.

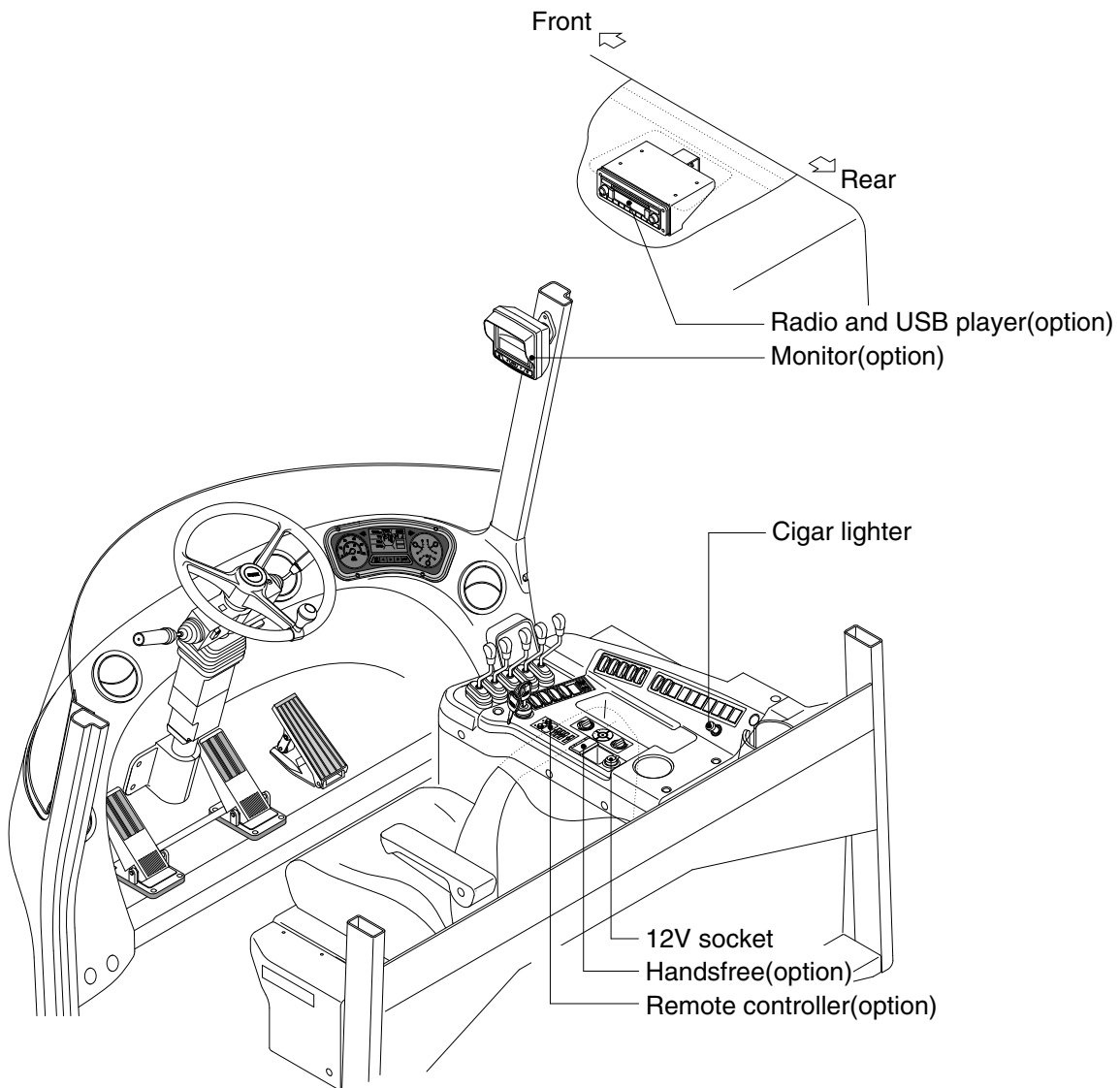
※ The AUTO pilot lamp ON when the air conditioner button is pushed.

- ② This knob controls fan speed manually.

※ The AUTO pilot lamp OFF when this knob is operated.

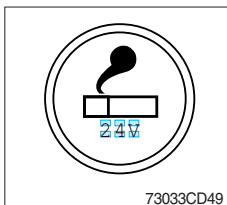
- ③ This knob makes the system ON.

9. OTHERS



50D9CD09

1) CIGAR LIGHTER



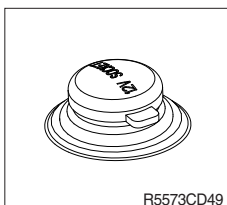
73033CD49

- (1) This can be used when the engine starting switch is ON.
- (2) The lighter can be used when it springs out in a short while after being pressed down.

※ Service socket

**Use cigar lighter socket when you need emergency power.
Do not use the lighter exceeding 24 V, 100 W.**

2) 12V SOCKET

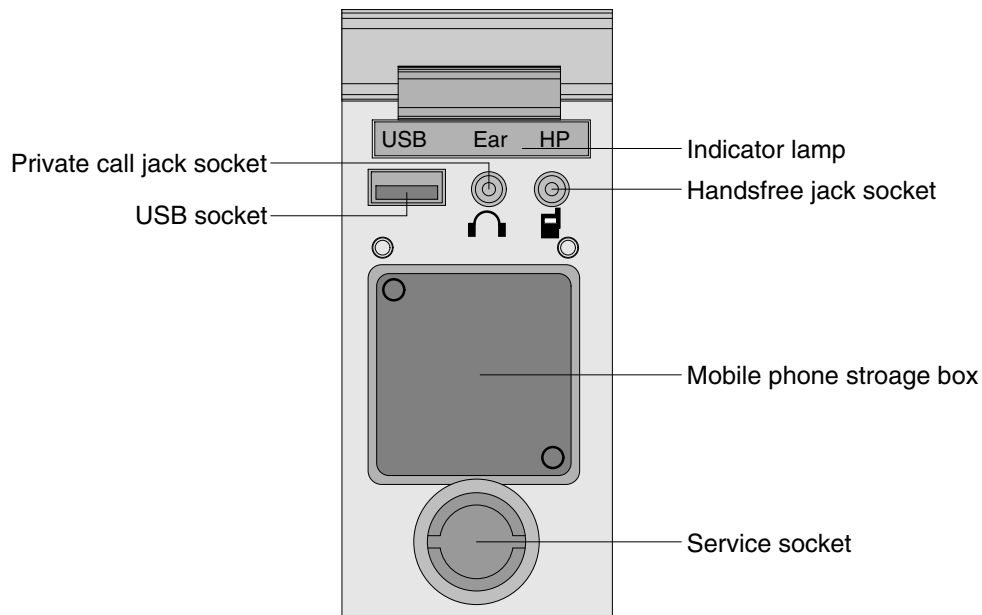


R5573CD49

- (1) Utilize the power of 12 V as your need and do not exceed power of 12 V, 120 W.

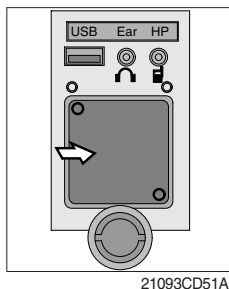
4) HANDSFREE (OPTION)

Allow you to dial a call or to have a conversation without holding your handset. Use the remote controller when making and answering a calls or ring off.



21093CD51

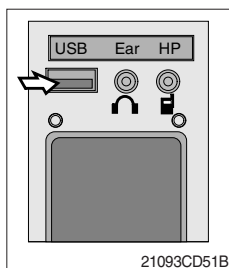
(1) Mobile phone storage box



21093CD51A

- ① Mobile phone can be stored when call by handsfree.

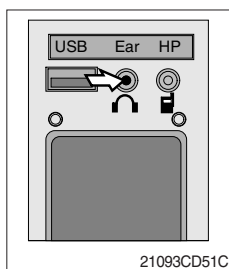
(2) USB socket



21093CD51B

- ① This socket is used to charging the mobile phone.

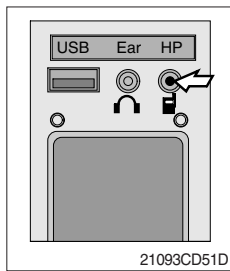
(3) Private call jack socket



21093CD51C

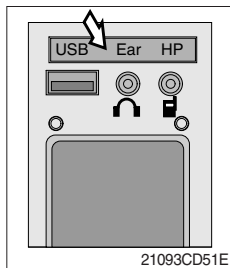
- ① This can be used protect you privacy calling by using ear phone.
- ② The mobile phone must be connected handsfree jack socket.

(4) Handsfree jack socket



- ① Connect the jack cable when call by handsfree.
- ② Use the special adapter when jack cable is not interchangeable.
- ③ Check the jack type of mobile phone before use.

(5) Indicator lamp



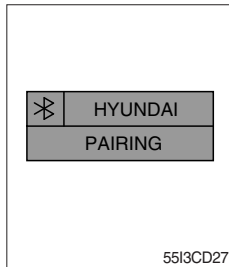
- ① This lamp is turned ON when the handsfree mode selected.

(7) Wireless handsfree

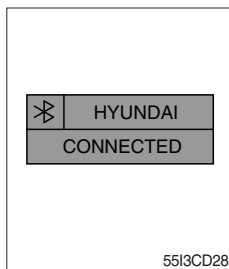


- ① Select the handsfree mode by pressing bluetooth button on the mobile phone.

Press the **CALL** button for more than 6 seconds for pairing (connection process of the mobile phone and handsfree), you can hear beep sounds three times.

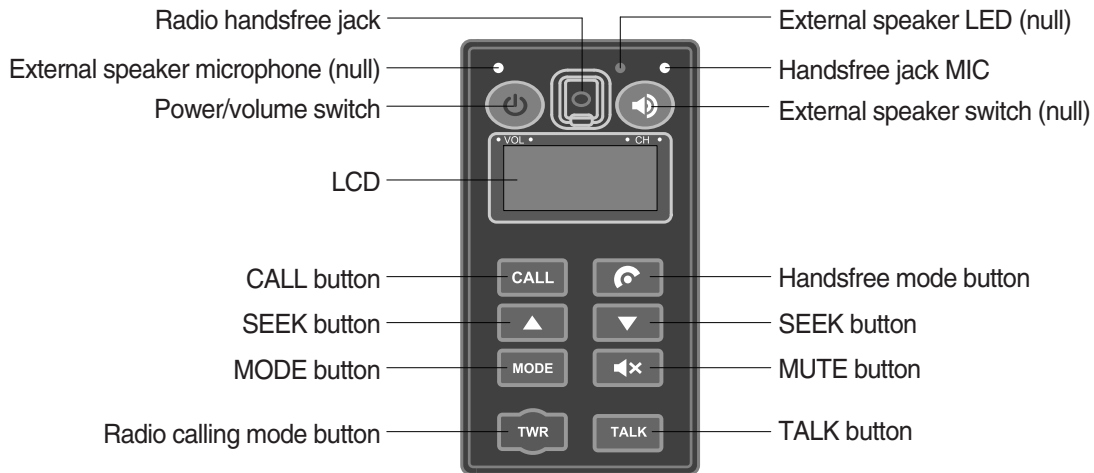


- ② The mobile phone finds bluetooth named "HYUNDAI".
Select "HYUNDAI" and set "connect with Bluetooth on the mobile phone".
· Default password : 0000



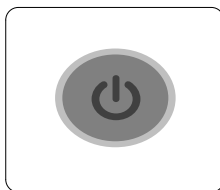
- ③ The Bluetooth pairing is made, the LCD screen shows "CONNECTED".
- ④ Once the Bluetooth pairing is made, they will be automatically connected after 20 seconds when start key ON.
- ⑤ When you want to deactivate the pairing, press and hold the **CALL** button for more than 3 seconds then you can hear beep sounds twice and the function will be deactivated.

5) REMOTE CONTROLLER (OPTION)



55I3CD31

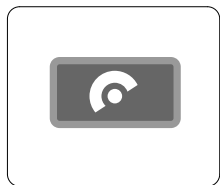
(1) Power and volume switch



55I3CD31A

- ① This switch is used to turn the audio or handsfree ON or OFF.
 - ② This switch is turned to right, the handsfree volume is increased over 7 steps.
 - ③ If it is turned to left, volume will be decreased.
- ※ **This switch adjust the audio volume when selected audio mode.**

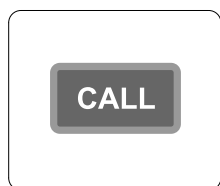
(2) Mode change button



55I3CD31B

- ① This button is to select the handsfree mode or audio mode.
 - Lamp ON : Handsfree mode ("TEL MUTE" displayed ON audio LCD)
 - Lamp OFF : Audio mode

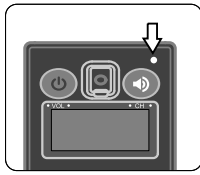
(3) Call button



55I3CD31C

- ① This button is used answer a call, last number radial, ring off.
 - ② For calling, press the button 0.5~1.5 seconds until the beep sounds.
- ※ **This can be used when the starting switch is ON.**

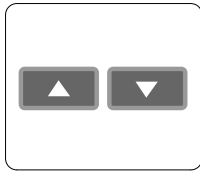
(4) Handsfree MIC



55I3CD31D

- ① This MIC transfers user voice to receiver of the call when making a call by handsfree.

(5) Seek button



55I3CD31E

- ① If this button pressed, the radio automatically stops at the next frequency of broadcasting for your listening.
- ② This button enable to select the song of the MP3 from USB.
 - ▲ : Turn a station of higher frequency and the next song of the MP3.
 - ▼ : Turn a station of lower frequency and the previous song of the MP3.

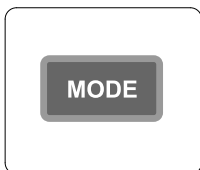
(6) Mute button



55I3CD31F

- ① Short press this button to mute or cancel the mute (silence) while broadcasting.

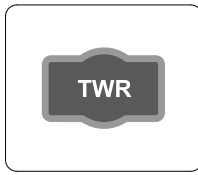
(7) Mode button



55I3CD31G

- ① Press the mode button to select the desired mode.
- ② Radio → MP3 → AUX
 - ※ **The LCD displayed each mode.**

(8) Radio calling mode button



55I3CD31H

- ① Press this button, activated or deactivated the radio handsfree function.
- ② As long as you do not press this button, you can hear the other party.
- ③ The LED is turned ON when this button is activated.
The LED turned OFF when the audio mode or the mobile phone handsfree calling mode is activated.

※ Radio handsfree

You can make a call to external worker without holding the radio by hand. (The radio is not installed to the machine).

(9) Talk button



55I3CD31J

- ① The call is connected while pressing this button (when TALK button is activated).
- ※ Unlike mobile phones, when you want to talk through the radio, you need to press the button (Push-to-talk method).
While one is talking through the radio, the other party can only listen to him/her.

(10) Handsfree jack



55I3CD31K

- ① Connect the jack cable when call by radio handsfree.

6) MONITOR

· Adjusting the angle

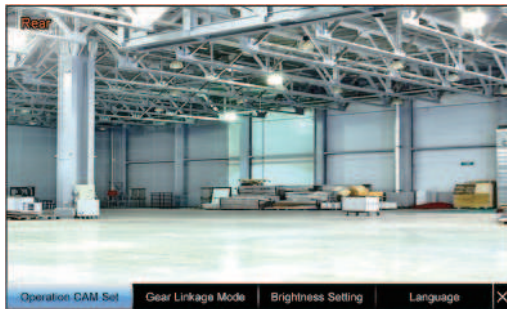
Upwards and downwards up to 7°, swivels left and right up to 15°.



50D9CD211

No.	Symbol	Name	Description
1	◀	LEFT	- Move the Menu (left). Lower the value.
2	○	MENU / ENTER	- Enter the OSD menu - Choose the menu
3	▶	RIGHT	- Move the Menu (right). Upper the value.

(1) Operation CAM set



50D9CD200



50D9CD201

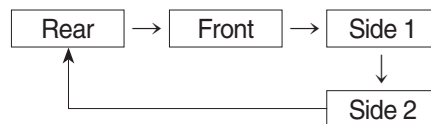
- Set the number of camera channels on screen.

① 1 CH (standard)



50D9CD202K

- Display one camera image on screen.
- Press left or right key to change the camera channel.

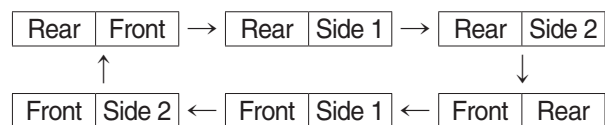


② 2 CH (dual)



50D9CD203K

- Display two camera images on screen.
- Press left or right key to change the camera channel.

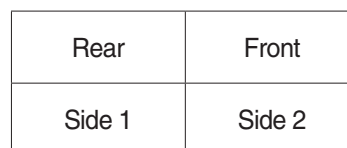


③ 4 CH (quad)

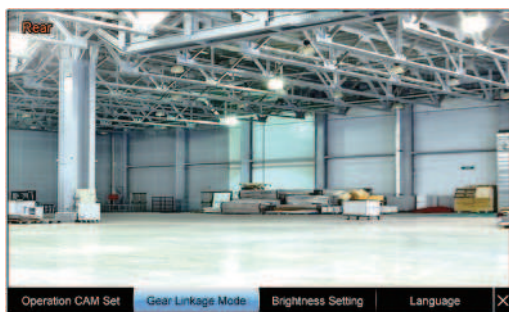


50D9CD204K

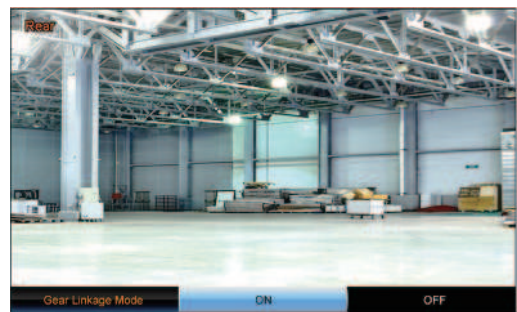
- Display four camera images on screen.



(2) Gear linkage mode



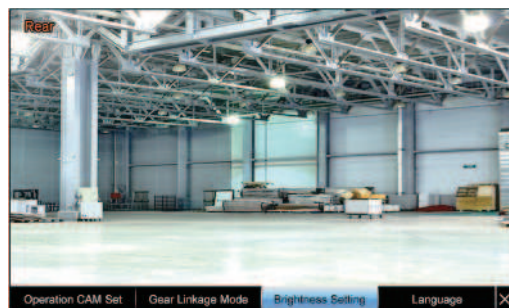
50D9CD205



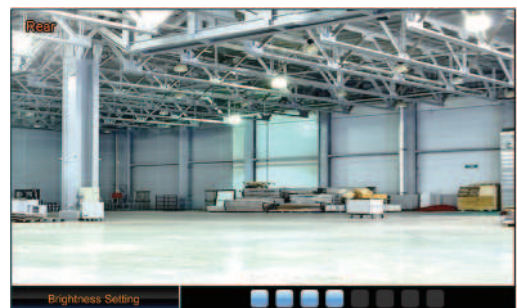
50D9CD206

- Depending on the gear state (forward/ backward), camera channel is switched automatically.

(3) Brightness setting



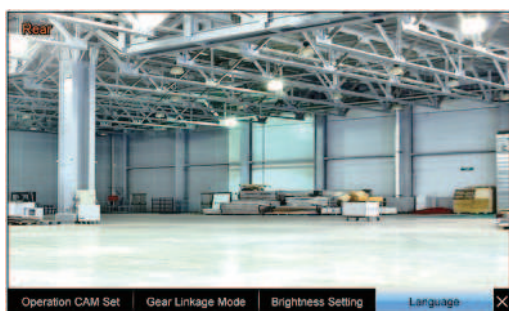
50D9CD207



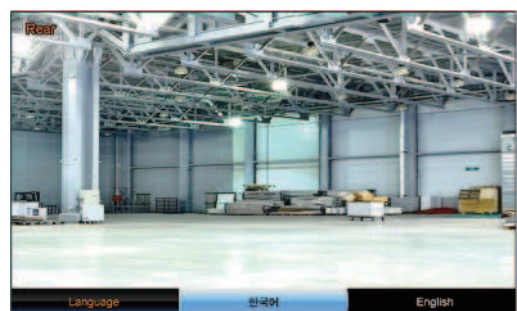
50D9CD208

- Adjust the display brightness.

(4) Language



50D9CD209



50D9CD210

- Set the language (13 multiple language).

4. OPERATOR MAINTENANCE AND CARE

1. DAILY SAFETY INSPECTION

Before using a lift truck, it is the operator's responsibility to check its condition and be sure it is safe to operate.

Check for damage and maintenance problems; have repairs made before you operate the truck. Unusual noises or problems must be reported immediately to your supervisor or other designated authority.

Do not make repairs yourself unless you are trained in lift truck repair procedures and authorized by your employer. Have a qualified mechanic make repairs using genuine HYUNDAI or HYUNDAI-approved parts.

▲ Do not operate a truck if it is in need of repair. If it is in an unsafe condition, remove the key and report the condition to the proper authority. If the truck becomes unsafe in any way while you are operating it, stop operating the truck, report the problem immediately, and have it corrected.

Lift trucks should be inspected every eight hours, or at the start of each shift. In general, the daily inspection should include the visual and functional checks described on the followings.

▲ Leaking hydraulic oil may be hot or under pressure. When inspecting a lift truck, wear safety glasses and do not check for leaks with bare hands.

1) VISUAL CHECKS

First, perform a visual inspection of the truck and its major components;

- (1) Walk around your lift truck and take note of obvious damage that may have been caused by operation during the last shift.
- (2) Check that all capacity, safety, and warning plates or decals are attached and legible.
- (3) Check before and after starting engine for leaking fuel, engine coolant, transmission fluid, etc.
- (4) Check for hydraulic oil leaks and loose fittings.

▲ Do not use bare hands to check. Oil may be hot or under pressure.

- (5) Be sure that the driver's cabin load back rest and all other safety devices are in place, securely fastened and undamaged. Inspect for damaged or missing parts, corrosion, cracks, breaks etc.
- (6) Check all of the critical components that handle or carry the load.
- (7) Look the mast and lift chains over. Check for obvious wear and maintenance problems such as damaged or missing parts, leaks, slack or broken chains, rust, corrosion, bent parts, cracks, etc.
- (8) Carefully inspect the load forks for cracks, breaks, bending, twists, and wear. Be sure that the forks are correctly installed and locked in their proper position.
- (9) Inspect the wheels and tires for safe mounting, wear condition, and air pressure.
- (10) Check the hydraulic sump oil level, engine oil level, and fuel level.

2) FUNCTIONAL CHECKS

Check the operation of the truck as follows.

※ **Before performing these checks, familiarize yourself with the starting, operating, and shutdown procedures in Section 5 of this manual. Also, know the safety rules given in Section 1 of this manual.**

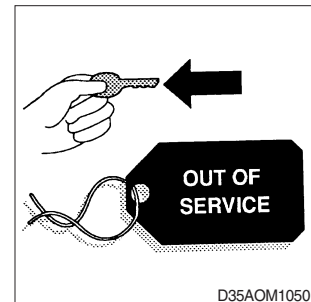
- (1) Test warning devices, horn, light, and other safety equipment and accessories.
- (2) Start the engine and be sure all controls and systems operate freely and return to neutral properly. Check the:
 - ① Gauges, meters, and indicator lights
 - ② Service brakes, inching pedal, and parking brakes
 - ③ Hydraulic controls: lift, tilt, and auxiliary (If installed)
 - ④ Accelerator
 - ⑤ Directional control
 - ⑥ Steering system
 - ⑦ Lift mechanism and any attachments.

When the functional check are completed, follow the **standard shutdown procedures** given in Section 5, **Starting and operating procedures**.

3) CONCLUDING THE INSPECTION

▲ **Do not operate a lift truck that has a maintenance problem or is not safe to operate.**

- (1) Instead, remove the key from the starting switch and put an **Out of service tag** on the truck.
- (2) If all of the daily inspection checks were normal or satisfactory, the truck can be operated.



2. SUGGESTION FOR NEW TRUCK

- 1) It takes about 100 operation hours to enhance its designed performance.
- 2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

Service meter	Load
Until 10 hours	About 60%
Until 100 hours	About 80%
After 100 hours	100%

※ **Excessive operation may deteriorate the potential performance of truck and shorten lifetime of the truck.**

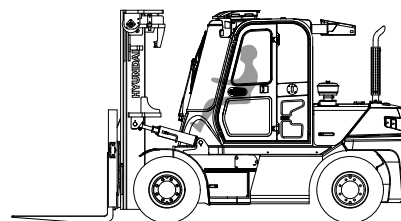
- 3) Be careful during the initial 100 hours operation.

- (1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.
- (2) Check regularly the lubrication and fill. Grease daily all lubrication points.
- (3) Tighten bolts.
- (4) Warm up the truck fully before operation.
- (5) Check the gauges during operation.
- (6) Check if the truck is operating normally during operation.

4) Replace following after initial hours of operation

Checking items	Service
Engine oil	50
Engine oil filter element	
Pilot line filter	
Differential gear oil	100
Transmission oil	
Transmission oil filter	
Brake oil	

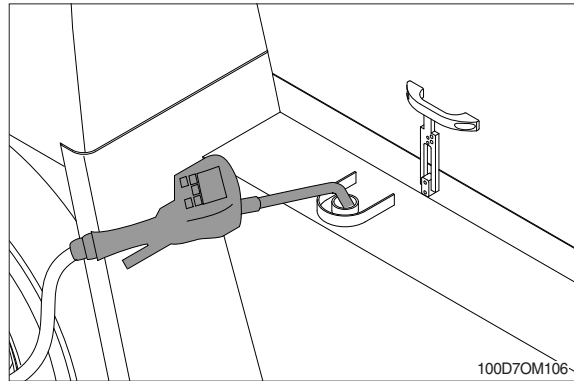
Avoid excessive operation for initial 100 hours



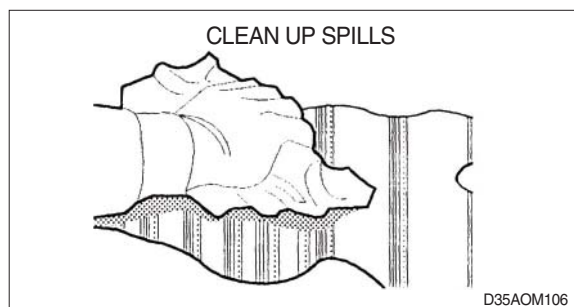
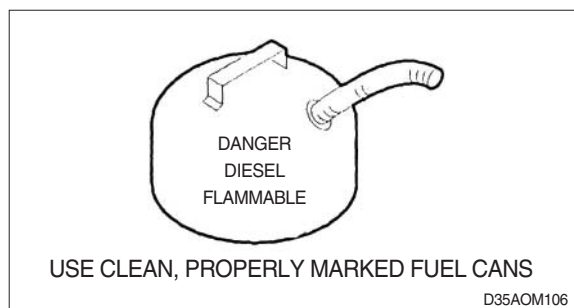
50D9OP01

3. FUEL SAFETY PRACTICES

REFUELING DIESEL TRUCKS



- ▲ Stop the engine when refueling.
All lights and flames shall be kept at a safe distance while refueling.



5. STARTING AND OPERATING PROCEDURES

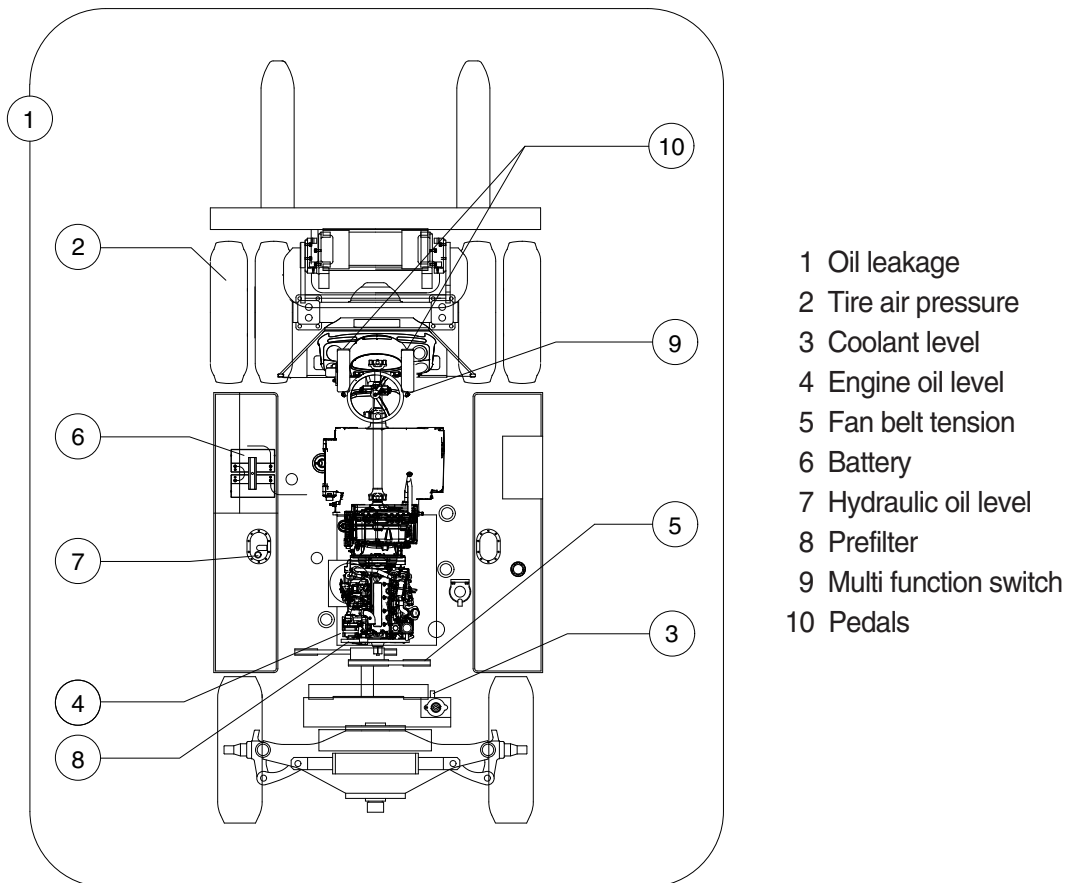
1. BEFORE OPERATING THE TRUCK

Be sure that you have read and understand the information in this Operator's Manual and are trained and authorized before operating the lift truck.

- ▲ A lift truck can be dangerous if not used properly. Safe operation is the responsibility of the operator.**
- ▲ Do not start or operate the truck, or any of its functions or attachments, from any place other than the designated operator's position.**
- ▲ Inspect your lift truck before operating at the start of each shift. Before putting your truck to use, check the operation of the controls and all systems.**
- ▲ Protect yourself. Do not operate truck without closing the cabin door or without fastening seat belt unless conditions prevent its use.**
Use special care if operation without these safety rules are required.

2. CHECK BEFORE OPERATION

- 1) The Occupational Safety and Health Act (OSHA) required that truck users examine their trucks before each shifts to be sure they are in safe working order. Defects when found shall be immediately reported and corrected. The truck shall be taken out of service until it has been restored to safe operating condition.



50D9QM51

- 2) A thorough walk-around check should be made BEFORE starting engine. This is required for your personal safety and to realize maximum service life for your truck.

- ① The numbers on the inspection chart show the order of inspection
- ② These numbers correspond to the check item numbers given on the next pages.
- ③ Hang a caution sign on the truck (for example, **Do not start** or **Maintenance in progress**). This will prevent anyone from starting or moving the truck by mistake.

3. CHECK BEFORE STARTING ENGINE

1) CHECK FOR WATER OR OIL LEAKAGE

- (1) Walk around your HYUNDAI truck and check for water, oil or hydraulic leakage. Examine truck for obvious damage.
- (2) Check cabin, backrest and forks for crack or obvious damage.
- (3) If any damage or leaks are detected contact your HYUNDAI dealer or tire repair shop.

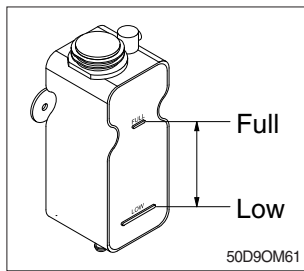
2) CHECK TIRE AIR PRESSURE/CHECK TIRE RIM

- Air pressure and torque

Item	Unit	Front tire / Rear tire	
		50/60/70D-9	80D-9
		8.25-15, 14PR	9.0-20, 14PR
Tire air pressure	kgf/cm ²	8.0	7.5
	psi	114	107
	bar	7.9	7.35
Hub nut tightening torque	kgf · m	52~70	49 ~ 73
	lbf · ft	376 ~ 506	356 ~ 530
	N.m	510 ~ 686	480 ~ 716

- ⚠ The tires are under high inflation pressure, so failure to follow the correct procedures when changing or servicing tires and rims could cause the tire to explode, causing serious injury or damage. The tires and rims should always be serviced or changed by trained personnel using the correct tools and procedures. For details of procedures, contact your HYUNDAI dealer or tire repair shop.
- ⚠ If there is any deformation, damage, or wear of the rim, or any doubt about the condition, always replace the rim. Never try repairing, welding, or heating.

3) CHECK COOLANT LEVEL



- (1) If the cooling water in the radiator reservoir tank is not within normal range when cool, add water to the FULL line.

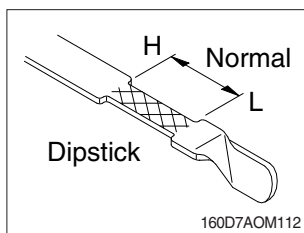
⚠ In antifreeze is being used, pay careful attention to the ratio of antifreeze and water when adding coolant.

⚠ If the reservoir tank is completely empty, first add water directly to the radiator. Then add water to the reservoir tank.

Always allow the radiator to cool down before adding water.

At the operating temperature, the engine cooling water is at high temperature and pressure, so it is dangerous to try to open the radiator cap. Wait until the radiator is cool enough to be touched by hand before opening the radiator cap. Loosen the radiator cap slowly to release the pressure, then loosen the cap.

4) CHECK OIL LEVEL IN ENGINE OIL PAN



- (1) Stop the engine, pull out the dipstick and check the oil level.
- (2) The oil surface line on the dipstick should be between H and L. If below L, remove the filler cap and add engine oil through the oil level.

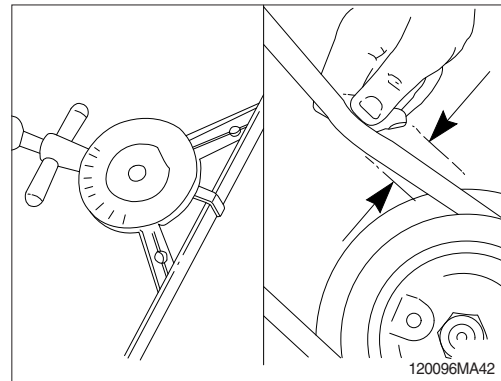
※ Change the oil if it is marked dirty or discolored.

⚠ Oil level is to be checked with the truck placed at flat level and at least 3 minutes after the engine stopped.

⚠ Do not touch hot components or allow hot oil to contact your skin.

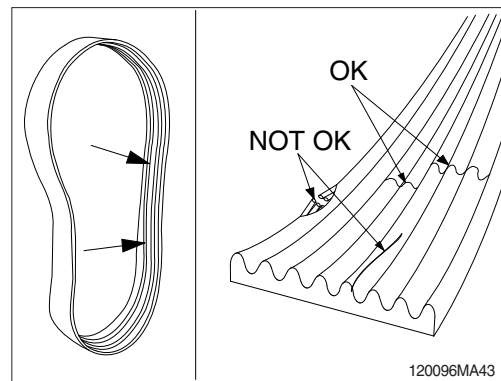
5) CHECK FAN BELT

- (1) A deflection method can be used to check belt tension by applying 11 kgf (25 lbf) force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



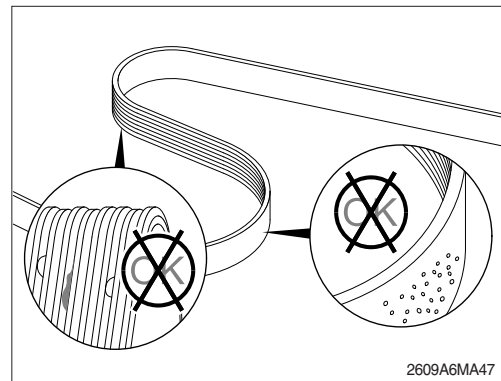
- (2) Inspect the fan belt for damage.

- ① Transverse (across the belt) cracks are acceptable.
- ② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



- ③ Inspect the belt
 - Embedded debris
 - Uneven/excessive rib wear
 - Exposed belt cords
 - Glazing (high heat)

※ If any of the above conditions are present, the belt is unacceptable for reuse and must be replaced.



6) INSPECTION OF COOLING FAN

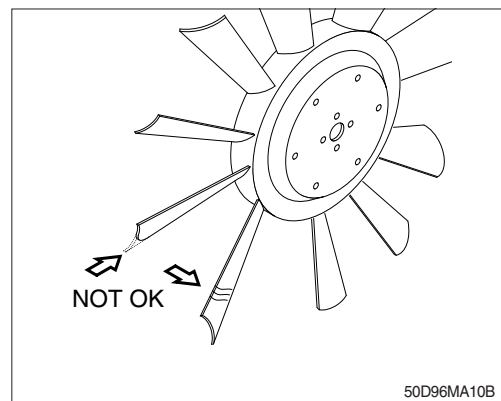
▲ Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade and cause fan failure.

※ Rotate the crankshaft by using the engine barring gear.

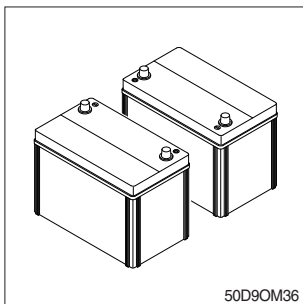
※ A visual inspection of the cooling fan is required daily.

Check for cracks, loose rivets, and bent or loose blades.

Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary. Replace any fan that is damaged.

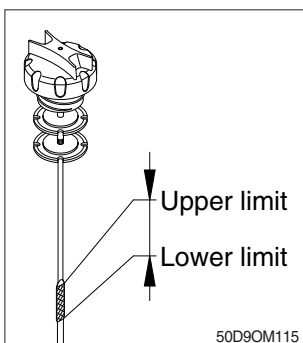


7) CHECK BATTERY



▲ Battery maintenance need serious care and safety service. Refer to 10. REPLACEMENT AND CHECK in SECTION 7. and always keep the safety rules.

8) CHECK HYDRAULIC OIL LEVEL

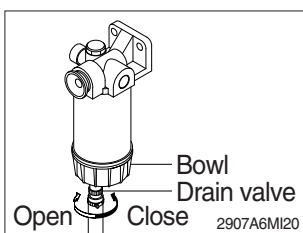


- (1) Rest fork on ground and stop engine.
- (2) Check the oil level from the level gauge of hydraulic oil tank.

9) CHECK PREFILTER

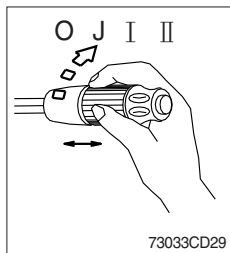


- (1) WIF (Water in fuel) warning lamp.
If the warning lamp stays on, drain the water from the fuel prefilter.



- (2) When the float of prefilter meets the red line (drain level), drain water.

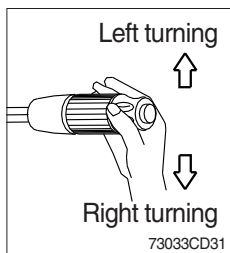
10) MULTI FUNCTION SWITCH



(1) Front wiper and washer switch

- ① When the switch is in J position, the wiper moves intermittently.
- ② When placed in I or II position, the wiper moves continuously.
- ③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

※ **Check the quantity of washer liquid in the tank. If the level of the washer liquid is LOW, add the washer liquid (In cold, winter days) or water. The capacity of the tank is 1 liter.**



(2) Turning switch

- ① This switch is used to warn or signal the turning direction of the truck to other vehicles or equipment.
- ② Push the lever up for turning left, pull the lever down for turning right.

11) CHECK PEDALS

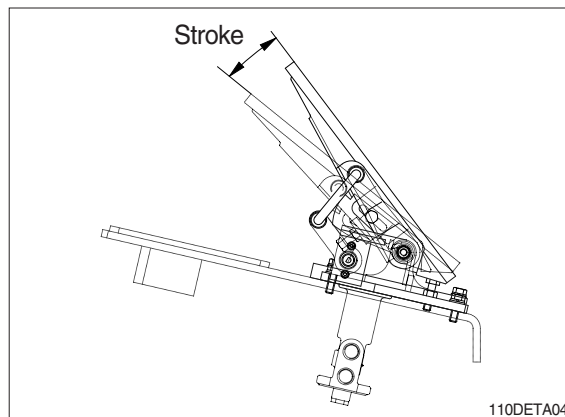
Check for any catching or abnormal heaviness when depressing the pedals.

(1) Inching pedal

- ① Free play : Max 1°
- ② Interlock stroke with brake pedal : 7°

(2) Brake pedal

- ① Free play : Max 1°

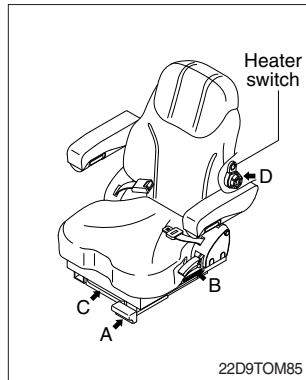


4. SEAT ADJUSTMENT

1) SEAT ADJUSTMENT

The seat adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long works hours and enhance work efficiency.

Grammer seat



(1) Forward/Backward adjustment (A)

- ① Pull lever A to adjust seat forward or back ward.

(2) Reclining adjustment (B)

Pull lever B to adjustment seat back rest.

(3) Weight adjustment (C)

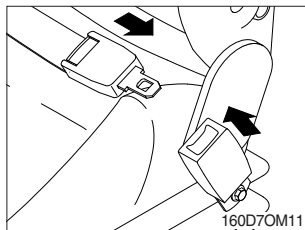
(4) Lumbar adjustment (D)

Turn line knob D to adjust lumbar support up and down.

(5) Heated seat switch (option)

Press this switch in order to heat the seat.

2) BUCKLING UP



- (1) Buckling up. Be sure that you put on the seat belt. Connect and adjust the seat belt strap to a snug, comfortable position.

⚠ Always wear your seat belt when operating a lift truck.

Failure to wear seat belt will result in injury or death in an event of an accident.

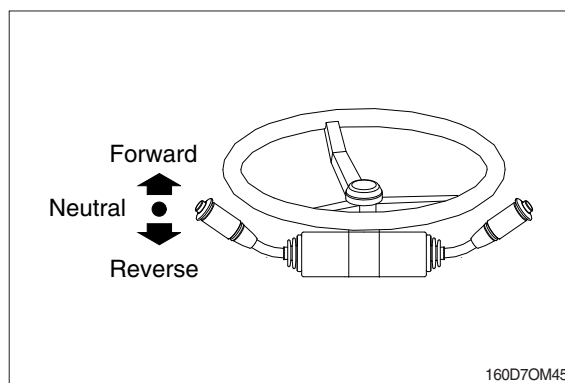
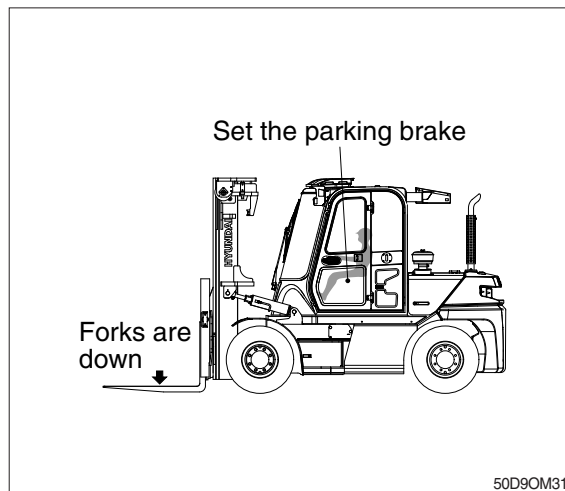
5. STARTING FROM A SAFE CONDITION

Always start from a safe condition.

Before operating a lift truck, make sure that :

- You are safely seated in the truck.
- Seat belt is buckled up.
- The parking brake is applied.
- The forks are fully lowered to the floor or ground.
- You are familiar with how all the controls function.
- All controls are in neutral or other correct position.
- The truck has received its daily inspection and ready and safe to operate.

Put the direction control lever in the **NEUTRAL** position, before starting. The truck should start only in the **NEUTRAL** position. If it starts in gear, have the truck serviced.



6. GENERAL STARTING AND OPERATING TIPS

Before you start the truck, make sure that you have taken all the above-mentioned precautions, you have read this manual, you are starting from a safe condition, with the directional control in NEUTRAL, the seat adjusted, and your seat belt buckled.

▲ INSPECT YOUR LIFT TRUCK BEFORE OPERATING at the start of each shift. Before you put your truck to use, check the operation of the controls and all systems.

Turn off any lights or optional electrical equipment while you crank the engine. This reduces the electrical load on your battery.

Avoid excessive starter cranking (In excess of 30 seconds). To avoid starter overheating or damage, do not crank the starter continuously for more than 30 seconds at a time. If the engine fails to start, wait two to three minutes before again attempting to start your lift truck.

If your battery is **run down** (discharged) or becomes discharged while you try to start your truck, please refer to Section 6, **Emergency Starting and Towing**, in this manual.

To avoid damage to your truck or possible harm to yourself. Follow these recommendations :

- Warm the engine up before driving or applying a load. Idle engine at low idle rpm for a few minutes to circulate and warm the oil. Then increase speed to approximately half-throttle for a short period or until the engine coolant reaches approximately 37.8°C. This procedure helps prolong engine life.
- Let the engine run until the normal operating temperature is reached. Then operate the controls and check all gauges and warning indicators to be sure they are functioning properly. Stop the engine and make a visual inspection for oil, water, or fuel leaks.
- Do not operate the engine at speeds above idle for more than brief periods without a load.
- Do not run the engine at maximum power continuously until the engine is fully warmed up.
- Never operate the engine at more than the regular no-load governed speed. Excessive speeds are harmful.

※ **The governor is set at the factory and should need no adjustment.**

- Avoid extended (in excess of 10 minutes) and unnecessary idling of the engine. Turn off the engine instead.
- **Carbon monoxide** is colorless and odorless, but can be present with all other exhaust fumes.

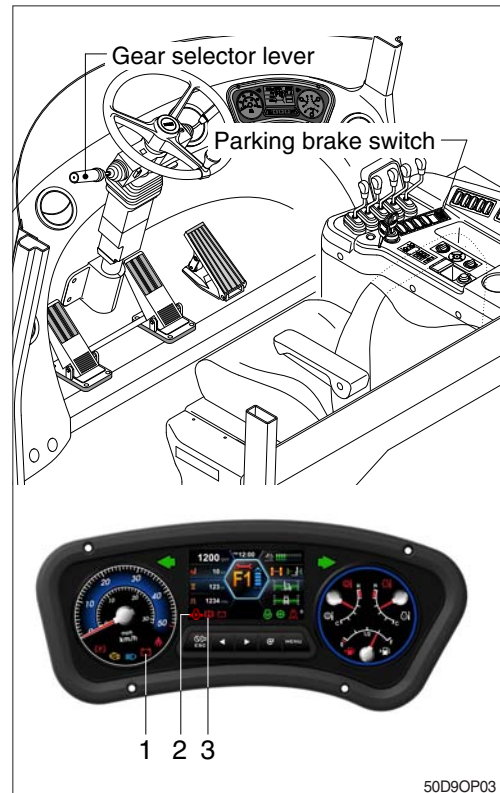
▲ Exhaust gases are harmful and can cause serious injury or death. Proper ventilation is always necessary for safe inside operation or warm-up.

▲ Due to the precise tolerances of diesel injection systems, it is extremely important that the diesel fuel be kept clean and free of dirt or water. Dirt or water in the system can cause severe damage to both the injection pump and the injection nozzles.

7. STARTING AND STOPPING THE ENGINE

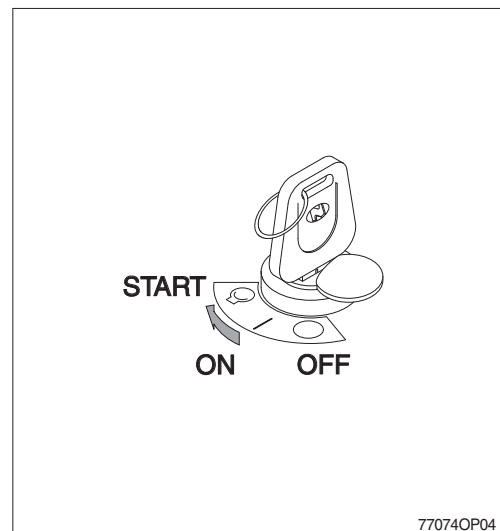
1) CHECK INDICATOR LIGHTS

- (1) Check if parking brake switch is LOCK position.
- (2) Check if gear selector lever is in neutral position.
- (3) Turn the key to the ON position, and check following.
 - ① If all the lamps light ON after sounding buzzer for 3 seconds.
 - ※ **If the lamps do not light or the buzzer is not sounded, check disconnection of wire.**
 - ② Only below lamps will light ON and all the other light will be turned OFF after 3 seconds.
 - Charging warning lamp (1)
 - Engine oil pressure warning lamp (2)
 - Brake fail warning lamp (3)
- ※ **Start the engine after all of the lamps OFF.**
(Only above 3 lamps remain ON)



2) STARTING ENGINE IN NORMAL TEMPERATURE

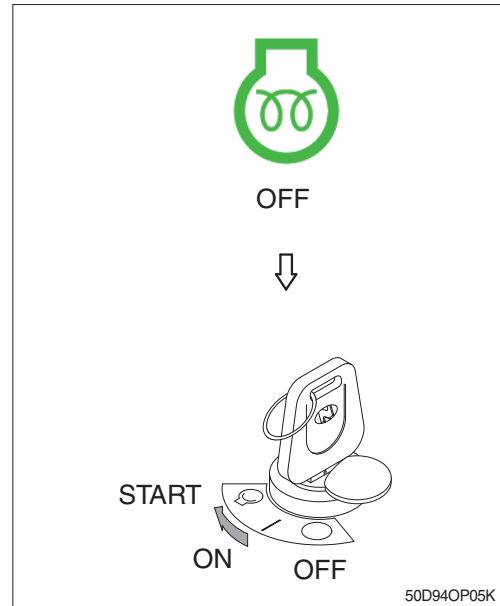
- ※ **Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.**
- (1) Turn the starting switch to START position to start the engine.
 - ※ **If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.**
 - (2) Release the starting switch instantly after the engine starts to avoid possible damage to the starting motor.
 - (2) The starting switch will automatically return to the ON position.



3) STARTING ENGINE IN A COLD WEATHER

- ※ Sound horn to warn surroundings after checking if there are obstacles in the area.
- ※ Replace the engine oil and fuel referring to recommended oils at page 7-65.
- Fill the anti-freeze solution to the coolant as required.

- (1) Check if the parking brake is locked (With the parking switch ON).
- (2) Check if the gear selector lever is in the neutral position.
- (3) Turn the starting switch to ON position, and wait the preheater pilot lamp OFF.



- ※ When the preheater warning lamp is turned ON, the preheating function is actuated within 10~45 seconds in accordance with temperature of the air intake manifold.

- (4) Start the engine by turning the starting switch to START position after the preheater pilot lamp OFF.
- (5) Release starting switch immediately after starting engine. The starting switch will automatically return to the ON position.

- ※ After engine started, the preheating function is actuated to reduce the white smoke.

4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

- (1) Is the level gauge of hydraulic oil tank in the normal level?
- (2) Are there leakages of oil or water?
- (3) Are all the warning lamps OFF?
- (4) Check the following after warming up operation.
 - ① Is the indicator of engine coolant temperature gauge (1) in the operating range?
 - ② Is the indicator of transmission oil temperature gauge (2) in the operating range?
 - ③ Is the engine sound and the color of exhaust gas normal?
 - ④ Are the sound and vibration normal?



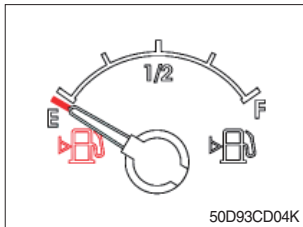
- ※ Do not increase engine speed quickly after starting, it can make damage engine or turbocharger.

- ※ If there are problems in the control panel, stop the engine immediately and correct problem as required.

(5) Check engine exhaust color.

Exhaust gas color	Criteria
Colorless, light blue	OK
Black	Check for incomplete combustion
White	Check for oil leakage

(6) Check fuel tank level.



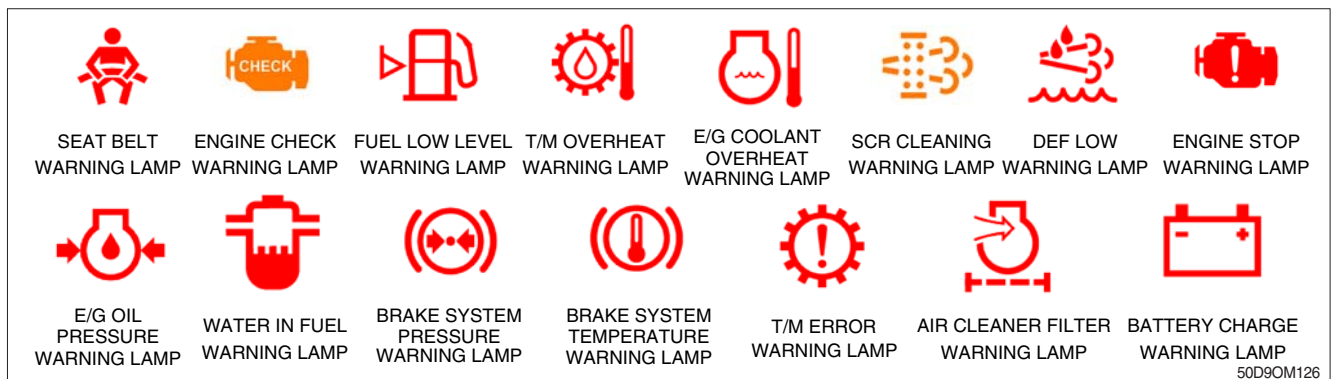
If the indicator points to F, the tank is full. If the indicator enters the E range, refill the fuel tank immediately. Do not operate the truck below this level. Do not use low quality fuel or fuel mixed with kerosene. Clean the area around the cap before adding fuel to prevent dirt from entering the tank.

Always fill the tank at the end of the day's operation. If air remains in the tank, the moisture in the air will condense inside the tank and form water in the fuel.

▲ Do not smoke or allow any flame near the truck when refueling. Refueling produces explosive fumes. The truck should be refueled only at the specified refueling point.

▲ Stop the engine and get off the truck when refueling.

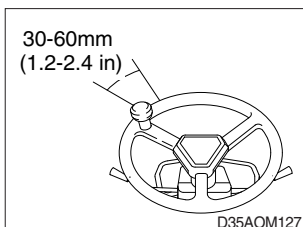
(7) Check warning lamps.



※ These lamps light up to indicate an abnormality.

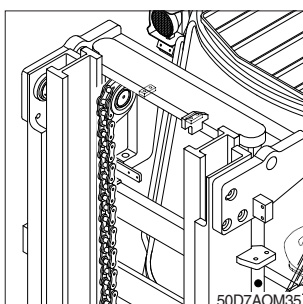
So, if one of these lamps is lighted, take appropriate service and maintenance.

(8) Check steering wheel play.



If the steering wheel play is over 30~60 mm (1.2-2.4 in), check or repair it.

(9) Check lift chain tension.



Raise forks 10 to 15 cm (4 to 6 in) from ground. Push with a rod to check that both chains have approximately same amount of slack.

· Adjusting lift chain

- ① Loosen locknut and turn the adjust nut.
- ② Equalize tension on the lift chain.

▲ Do not put hands into the mast.

(10) Check steering wheel.

Check that steering wheel does not wobble or suddenly pull to one side. Check also for any abnormal heaviness in steering.

(11) Check rear view mirror.

Adjust the rearview mirror for best rearward visibility.

5) TRANSMISSION COLD STARTING

(1) At an oil temperature in the shifting circuit < -12°C, the transmission must be warmed-up for some minutes.

(2) This must be carried out in neutral with an increased engine speed.

(3) Until this oil temperature is reached, the electronics remains in neutral, and the symbol of the cold start phase will be indicated on the display.

• Indication on the display : * *

(4) After the indication on the display is extinguished, the full driving program can be utilized out of NEUTRAL.



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6) TO STOP THE ENGINE

※ If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.

※ In particularly if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop it.

(1) Place the gear selector lever in neutral.

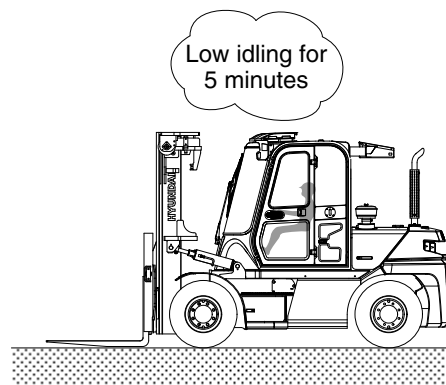
(2) Turn the parking brake switch ON.

(3) Run the engine for five minutes at low idle with no load.

(4) Return the key of starting switch to the OFF position.

(5) Remove the key to prevent other people using the truck.

(6) Lock the cab door.



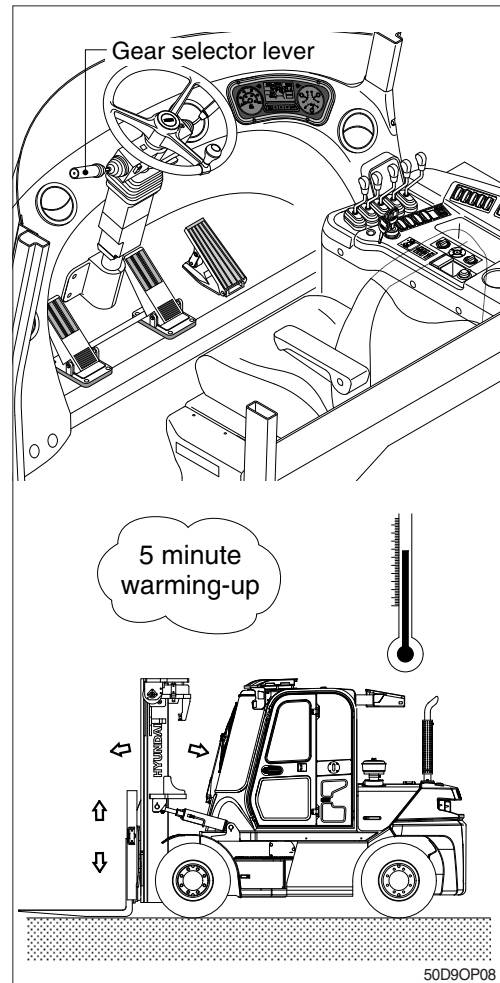
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8. WARMING-UP OPERATION

※ The most suitable temperature for the hydraulic oil is about 50°C (112°F).

It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25°C (77°F). The temperature must be raised to at least 25°C (77°F) before starting work.

- 1) Run the engine at low idling for 5 minutes.
 - 2) Speed up the idling and run the engine at mid-range speed.
 - 3) Lift the forks slightly and tilt the mast forward to the stroke end to relieve hydraulic pressure.
- ※ **Do not leave hydraulic pressure relieved for more than 30 seconds.**
- 4) Tilt back to the stroke end to relieve hydraulic pressure.
- ※ **Do not leave hydraulic pressure relieved for more than 30 seconds.**
- 5) Repeat the procedure 3) - 4) several times until warm-up operation is completed.

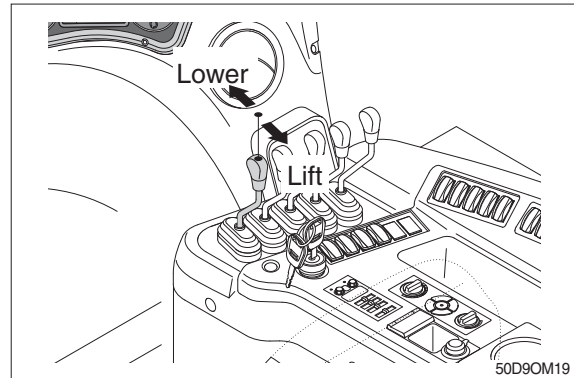


9. LEVERS AND PEDALS

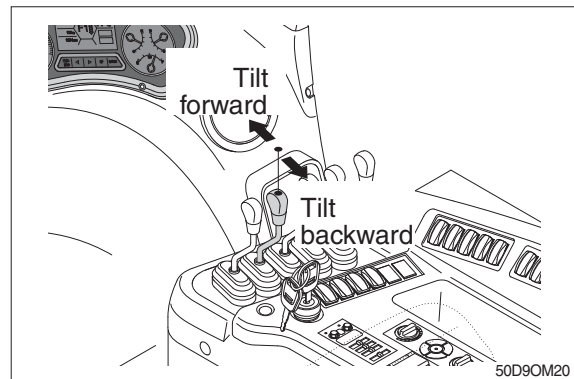
1) POSITIONING FORKS AND MAST

When driving, with or without a load, it is a good practice to always raise the forks slightly and tilt the mast (forks) backward. Raising the forks and tilting them back prevents the fork tips from catching on possible obstructions and reduce the wear on the fork blades from striking or dragging on the floor or ground. See safety messages on next page.

Pull back on the lift control lever and raise the forks 150 to 200 mm (6 to 8 inch) above the floor. Then, using the tilt control, tilt the mast back slightly to raise the fork tips.



The amount of forward and backward tilt to be used is governed by the application.

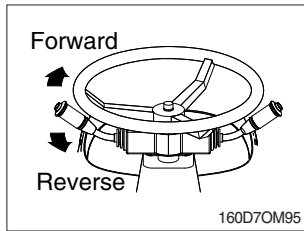


⚠ When the mast (carriage and/or load) is raised into a high (Elevated) position, the stability of the truck is reduced.

Some of the other conditions that may affect stability are ground and floor conditions, grade, speed, loading, dynamic and static forces, and the judgement exercised by the operator. Trucks equipped with attachments behave as partially loaded trucks even when operated without a load on the attachment. Also, improper operation, faulty maintenance, or poor housekeeping may contribute to a condition of instability.

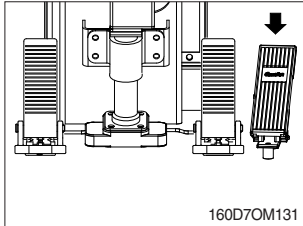
⚠ For stability, do not travel with the load or carriage in a highly elevated position. Travel with the lift mechanism raised only enough to clear the ground or obstacles.

2) SELECTING DIRECTION OF TRAVEL



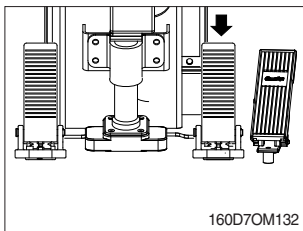
Push the direction control lever forward, center it , or pull it back for FORWARD, NEUTRAL, or REVERSE, respectively.
Traction is disabled in NEUTRAL.

3) USING THE ACCELERATOR PEDAL



With the parking brake released and the direction control in FORWARD or REVERSE, put your foot on the accelerator pedal and push down smoothly until the truck is moving at the desired speed.

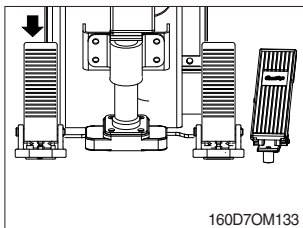
4) BRAKING PEDAL



To stop the truck, lift your foot from the accelerator pedal and put it on the brake pedal. Push down on the brake pedal in a smooth, firm motion until the truck is stopped.

**▲ Stop the lift truck as gradually as practical. Hard braking and wheel sliding are dangerous, increase wear, and can cause you to loose a load and damage to the lift truck.
Can cause tip-over.**

5) INCHING PEDAL



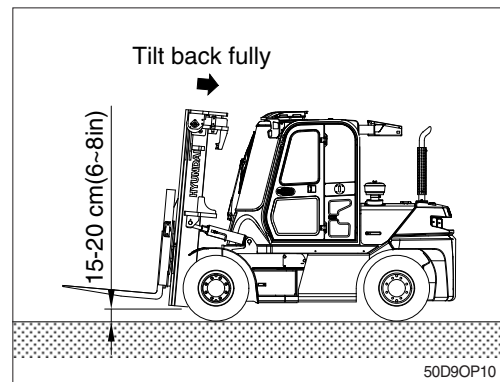
Use the inching pedal and the accelerator pedal in combination to vary lift and travel speeds independently. The further you depress the inching pedal, the more the driving clutch slips, reducing travel motion. With the inching pedal fully depressed, the brakes fully engage. You operate the inching pedal with your left foot for precise control of travel speed, while you operate the accelerator pedal together with the lift control to vary lift speed.

10. TRAVELING OF THE TRUCK

1) BASIC OPERATION

(1) Traveling posture

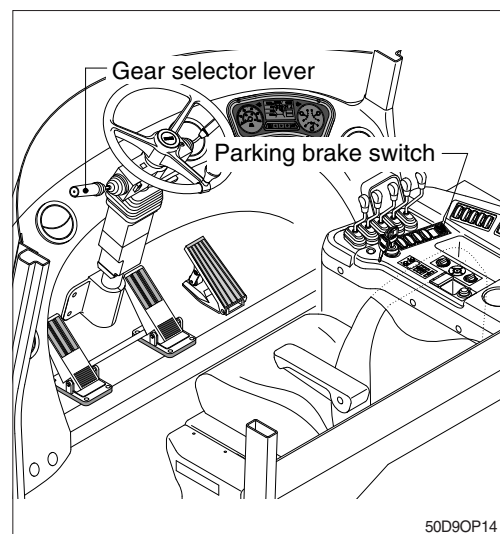
Lift the forks so that the forks are placed 15~20 cm (6~8 in) above the ground and tilt back the mast fully.



(2) Traveling operation

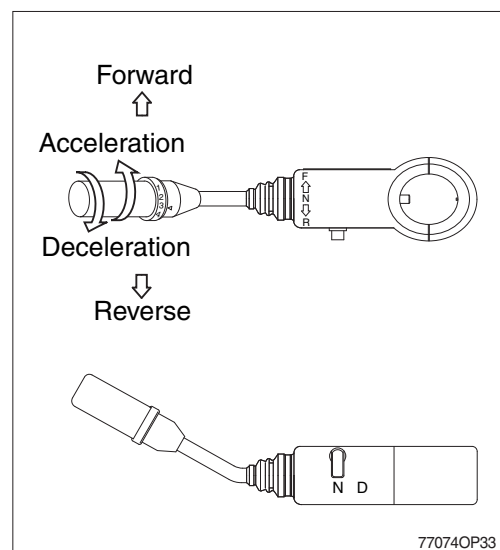
When warm-up operation is completed after the engine is started, move the truck according to the following procedures.

- ① Release the parking brake.
- ② Put the gear selector lever in the 1st stage of forward or backward direction and press gently the accelerator pedal to move the truck.



(3) Changing direction and speed

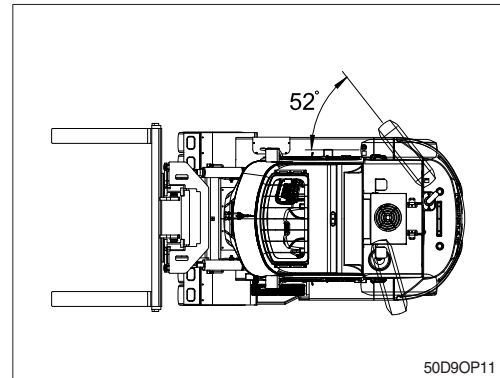
- ① The gear selector is designed for the mounting on the left side of the steering column.
- ② The positions (speeds) 1 to 3 are selected by a rotary motion, the driving direction Forward (F) - Neutral (N) - Reverse (R) by tilting the gear selector lever.
- ③ A neutral lock is installed as protection against inadvertent drive off.
 - Position N - Gear selector lever blocked in this position
 - Position D - Driving
- ④ When doing work, run the truck in the 1st or 2nd speed.



- ▲ When traveling at high speed, do not abruptly decelerate by using the transmission lever, to slow down instead press the brake pedal.
- ▲ When changing direction, check beforehand there is no obstacle in the direction you will be headed.
- ▲ Avoid changing direction at high speed.

(4) Turning the truck

- ① Turn the truck by moving the steering wheel into the desired direction.
- ② You can turn the truck to the left or right by 52 degree.
- ※ Do not turn the truck abruptly when traveling at high speed and avoid turn on a slope.
- ▲ Steering does not function with engine OFF.

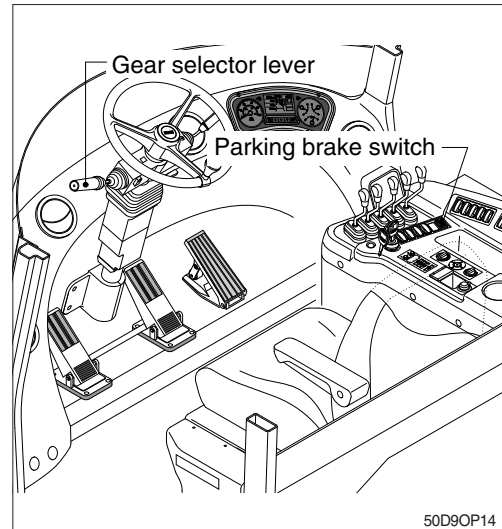


(5) Precautions when driving

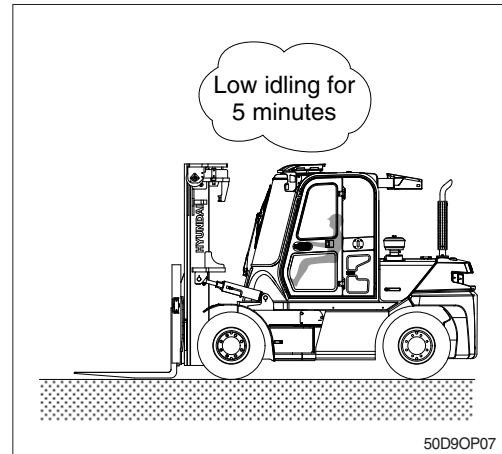
- ① If the monitor warning lamp lights up, put the gear selector lever in the neutral position and stop the truck. Stop the engine after running it at low idling. Then resolve any problems regarding operation of the truck.
- ② When operating the truck, if the load is lighten rapidly, the speed of the truck will increase. So, be careful.
- ③ When the truck travels on uneven ground, keep the truck traveling at low speed.

(6) Stopping the truck

- ① Press the brake pedal to stop the truck.
- ② Put the gear selector lever in the neutral position.
- ③ Turn the parking brake switch ON.



- ④ Lower the forks to the ground.

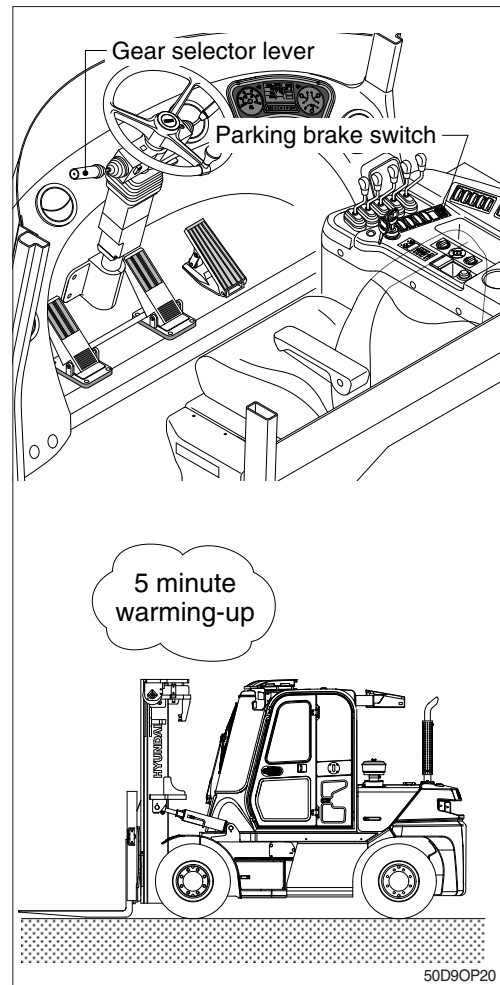


(7) Stopping engine

- ※ If the engine is abruptly stopped before it has cooled down, its service life may be shortened. Avoid sudden stop except an emergency.
 - ※ When the engine is overheated, do not stop immediately. Run the engine at a mid range speed to allow it to cool down, then stop it.
- ① Check if the parking brake switch is in the lock (ON) position.
 - ② Check if the gear selector lever is in the neutral position.
 - ③ Run the engine at low speed without operating the equipment for about 5 minutes. Turn the starting key to the OFF position and remove the key.

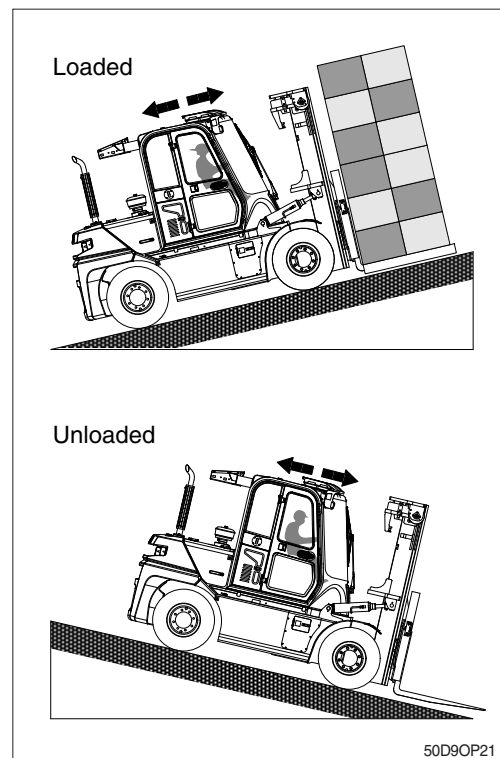
(8) Checks after the engine stopped

- ① Check the leakage of oil and water, the work equipment and the exterior of the truck.
- ② Refill the fuel tank.
- ③ Remove any debris inside of the engine room and attached to the truck.



2) TRAVELING ON A SLOPE

- (1) Never travel down a slope in neutral.
 - (2) Lower the forks 15-20 cm (6~8 in) to the ground.
 - (3) Never turn on a slope, either loaded or unloaded.
 - (4) Never park on a slope.
 - (5) **Loaded** - move with forks upgrade
Unloaded - move with forks downgrade
- ※ Truck cannot travel effectively on a slope when the oil temperature is low. Do the warming-up operation when it is going to travel on a slope.
 - ▲ Be careful when working on slopes. It may cause the truck to lose its balance and turn over.



11. OPERATING SAFELY

Safe operation is the responsibility of the operator.

1) WATCH WHERE YOU ARE GOING. DON'T GO IF YOU CAN'T SEE...

- (1) Before driving, check all around to be sure that your intended path of travel is clear of obstructions and pedestrians.

▲ LOOK WHERE YOU DRIVE. Watch out for pedestrians, other vehicles, obstructions (especially overhead), and drop-offs. If the load blocks your view, drive backwards, except up slopes.

- (2) Do not allow anyone to stand or pass under the load or raised forks.
Watch for people in your work area even if your truck has warning lights or alarms. They may not watch for you.
- (3) Sound horn at intersections and wherever vision is obstructed.
Do not drive a truck up to anyone standing in front of an object.

2) PROTECT YOURSELF AND THOSE AROUND YOU...

- (1) Operate the truck only from the designated operator's position. Stay within the confines of the lift truck profile dimensions. Keep all body parts inside the operator's compartment and away from the danger of passing obstructions. Keep inside the cabin.

※ A cabin is intended to offer protection to the operator from falling objects, but cannot protect against every possible impact. Therefore, it should not be considered a substitute for good judgement and care in loading, handling, storage, etc.

▲ Keep clear of the mast and lift mechanism. NEVER reach into or put hands, arms, legs, or head into or through the mast structure or near the carriage or lift chains. Never put any part of your body between the mast and the truck.

Don't use the mast as a ladder.

Keep all other persons clear of the load and mast mechanism while attempting to handle a load.

3) NO RIDERS...

- (1) Do not carry passengers. The operator is the only one who should be on the truck.

4) ALWAYS BE IN FULL CONTROL OF YOUR LIFT TRUCK...

- (1) Never operate a lift truck or its attachments if you are not in the designated operator's position.
- (2) Never operate a lift truck when your hands and feet are wet or greasy.
- (3) Always pick the smoothest travel route for your lift truck. Avoid bumps, holes, slick, spots, and loose objects or debris in your path that may cause the truck to swerve or tip. If these conditions are unavoidable, slow down and carefully drive past them. Slow down for wet or slippery surfaces.
- (4) Avoid any sudden movement, it can cause the truck to tip-over.
Start, stop, travel, steer, and brake smoothly.
- (5) Operate your lift truck under all conditions at a speed that will permit it to be brought safely to a stop.

- (6) Travel with the fork carriage tilted back and raised only enough to fully clear the ground or obstacles. When the carriage (load) is in an elevated position the stability of the truck is reduced.
- (7) Do not elevate the load except during stacking.

5) GRADES, RAMPS, AND INCLINES...

- (1) Use special care when operating on ramps, inclines, and uneven areas. Travel slowly. Travel straight up and down. Do not turn or drive at an angle across an incline or ramp. Do not attempt to operate on grades in excess of those specified and/or recommended by the manufacturer.
- (2) When the truck is loaded, travel with the load upgrade. When the truck is empty, travel with lifting mechanism (mast) downgrade.
- (3) Always brake with the right foot pedal(Not with the inching pedal) when travelling down incline. If you should travel down incline for long distance, apply the engine brake with lower gear. Brake malfunction such as performance drop, excessive wear of friction material and disc stick can be caused by continuous brake operation making the oil overheating. In that case, stop traveling, apply parking brake with neutral gear position and stay during 10 minutes with engine idle speed.

▲ Do not travel down incline with neutral gear state.

It makes the brake oil overheated due to excessive brake operation.

6) PRACTICE SAFE OPERATION EVERY TIME YOU USE YOUR TRUCK...

- (1) Careful driving and operation is your responsibility. Be completely familiar with all the safe driving and load handling techniques in this Operator's Manual. Use common sense. Drive carefully do not indulge in stunt driving or horseplay. Observe traffic rules. Watch for people and hazards. Slow down, be in full control of your lift truck at all times.
- (2) Follow the instructions in this manual to avoid damage to your truck or the possibility of injury to yourself or others.
- (3) During your work, observe all functions of your lift truck. This allows you to immediately recognize a problem or irregularity that could affect the safe operation of your truck.
- (4) Periodically check the gauges and warning indicator lights in the cluster to be sure they indicate a normal condition. If an abnormal condition appears bring the truck to a safe condition and safe location, shut off the starting switch immediately and report the problem.

▲ Do not continue to operate a truck that has a malfunction. Stop and have it fixed.

▲ Always wear your seat belt when operating your truck.

12. LOAD HANDLING

1) GENERAL

Handle only loads that are within the truck rated capacity as shown on the nameplate. This rating specifies the maximum load that should be lifted. However, other factors such as special load handling attachments, load having a high center of gravity, or uneven terrain may dictate that the safe working load be less than the rated capacity. Under these conditions, the operator must reduce the load carried so that the lift truck remains stable.

Handle only stable or safely arranged loads. Do not handle loads made up of loose, unevenly stacked, or unstable items that can easily shift and fall. Take the time to stack correctly and handle loose items. Center the load on the forks.

Do not lift anything that might fall on the operator or a bystander. Do not handle loads that are higher than the fork carriage unless the load is secured so that no part of it can fall backward.

Keep the load back against the load backrest. Loads placed out on the ends of the forks can make the lift truck less stable and more likely to tip up.

Lift and lower with the mast vertical or tilted slightly back-never tilted forward.

Operate lift and tilt controls slowly and smoothly. Never tilt the mast forward when the carriage (load) is raised, except to pick up or deposit a load over a rack or stack.

▲ Slack chains mean rail or carriage hang-up. Raise the mast before you move. If the mast malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains by raising the carriage. DO NOT go under a raised mast or forks to attempt repairs.

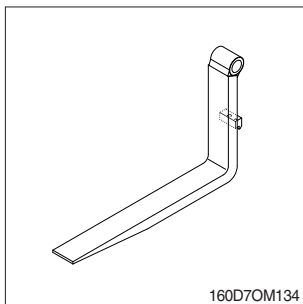
DO NOT climb the mast or the truck.

Remember your truck is designed to carry loads forward of the front wheels so that the weight of the load is counterbalanced by the weight of the truck.

The farther the load is carried from the pivot point (Center of front wheels), the less the weight on the steer wheels. Therefore, always carry the load as close to the front wheels as possible (Back and flush against the face of the forks.)

The capacity load shown on the nameplate is represented by a cube in weight is evenly distributed, with the center of gravity located a standard distance from the face of the forks. If the weight of the actual load to be handled is not evenly distributed, put the heaviest part closest to the carriage.

2) ADJUSTING THE LOAD FORKS

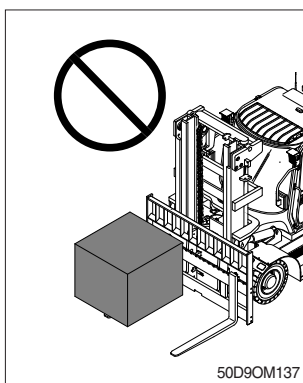


The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make the fork slide easier.

Unlock the fork locking pins.

Position the forks by pushing them away from you. Secure the fork locking pins.

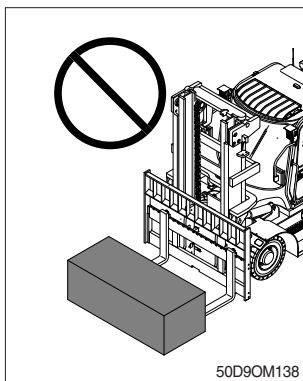
3) LOAD ON FORKS



(1) Do not elevate the load with one fork.

Loading with one fork cause the tip over, serious injury or death of operator.

The work can cause the height difference between both fork tips.



(2) Do not elevate the load with the ends of the forks.

This work can cause the height difference tips due to overload in the end of the forks.

The load should be loaded at least over 2/3 of fork length.

4) TRAVELING WITH LOAD

Travel with load or carriage as low as possible and tilted back. Never travel with the load or carriage raised (elevated) in a high position. Do not elevate the load except during stacking.

Observe all traffic regulations and watch for other traffic, pedestrians, and safe clearances. Always look in the direction of travel. Keep a clear view of the path of travel and when the load blocks your visibility, travel in reverse with load trailing (Except when climbing an incline).

Avoid sudden movements when carrying a load-start, stop, travel, steer, and brake smoothly. Steer clear of bumps, holes, and loose materials or debris on the ground. Lift and tilt slowly and smoothly. Go slowly when turning. Cross railroad tracks slowly and at an angle wherever possible.

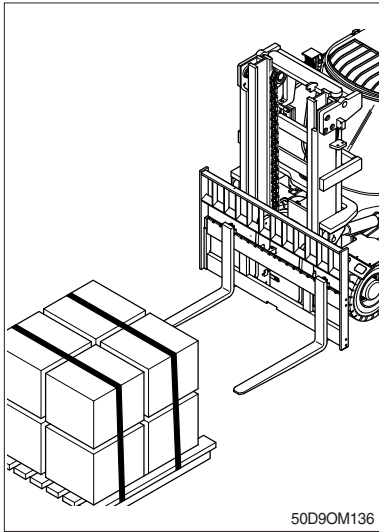
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

Watch clearances around the truck and load as you travel. Raise the forks or attachment only to pick up or stack a load. Look out for obstructions, especially overhead.

Be aware that exaggerated tail swing, when turning while traveling forward, is a characteristic of lift trucks that are steered by the rear wheels. Accordingly, you need to become accustomed to tail swing and always check the tail swing area of the counterweight to be sure it is clear before you turn.

Always be concerned about the stability of your lift truck. When attachments are used, extra care should be taken in securing, manipulating, positioning, and transporting the load. Because attachments generally add extra weight and complexity to the truck, operate trucks equipped with attachments as partially-loaded trucks when not handling load.

5) PICKING UP AND MOVING LOADS



When picking up a load from the ground, approach the load slowly and carefully align the truck square with the load. The forks should be adjusted to fit the load or pallet being handle and spread as wide as possible to provide good stability and balance. Before lifting, be sure the load is centered and the forks are fully under and supporting the load. Fork length should be at least 2/3 of load length. With the lift and tilt controls, adjust the forks to the correct height and angle for freely engaging the load pallet. Move forward until the forks are squarely and completely under the load.

▲ Be sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved.

If the forks are longer than the load, move the tips partially under the load without extending beyond the load. Raise the load to clear the ground. Back out several inches, or whatever distance is necessary, then set the load down and move forward until the load is positioned against the carriage.

Raise the load from the ground or stack by tilting the mast back just enough to lift the load from the surface. When stacking or tiering, use only enough backward tilt to stabilize the load.

Then raise the load to traveling height and tilt fully back to travel (Except for loads that must be transported as level as possible).

6) UNLOADING

To deposit a load on the floor after being moved into the correct position, tilt the mast forward to a vertical position and lower the load.

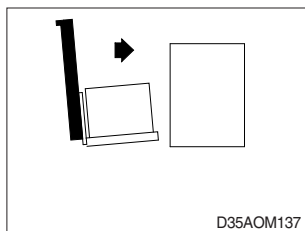
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (Pallet).

Carefully back away to clear the forks from the load.

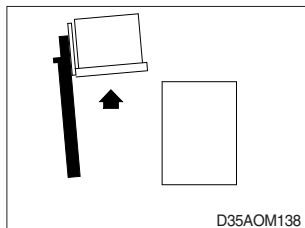
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

7) STACKING

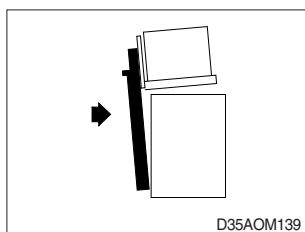
(1) To put a load on a stack



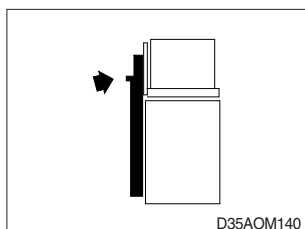
- ① Approach slowly and align the lift truck and load squarely with the stack.



- ② Raise the load as the lift truck nears the stack.

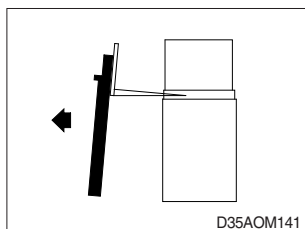


- ③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.

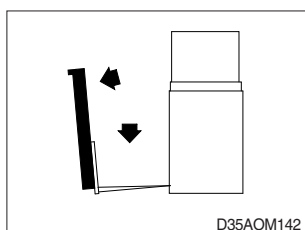


- ④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.

- ⑤ When the load is aligned with the stack beneath it, tilt the mast to the vertical position and carefully lower the load onto the top of the stack.



- ⑥ Lower the forks slightly to clear the load pallet. Tilt the forks forward slightly, if necessary.



- ⑦ Check your travel path, then carefully back away until the forks are clear of the stack. Stop and lower the forks to the travel position [150~200 mm (6~8 in) above the ground], then tilt back for travel.

(2) To move a load from a stack

Approach the stack carefully, truck lined up squarely with the load. With mast vertical, raise the forks to the correct height for freely engaging the load pallet. Adjust fork angle as necessary to fit squarely under the load. Move (inch) forward until the forks are under the load.

Be sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved. If the forks are longer than the load, move the tips partially under the load without extending beyond the load.

Raise the load to clear the under surface. Back out several inches, then set the load down and move forward until the front face of the forks contacts the load. Be careful that the fork tips now clear the adjacent load or material behind the load being moved.

Raise the load from the stack by tilting the mast back just enough to lift the load from the surface. Or, with the mast still vertical, raise the forks until they begin to lift the load. At this point, apply the minimum back tilt that will stabilize the load.

Check your travel path, slowly back up until clear of the stack, stop, and then lower the load to the travel position [150~200 mm (6~8 in) off the ground]. Tilt full back to travel (Except for certain loads that may have to be transported as level as possible). Be sure the load is back flush against the carriage or front face of the forks.

※ **Certain loads must be transported as level as possible.**

13. SHUT DOWN PROCEDURE

※ Always leave your lift truck in a safe condition.

1) WHEN YOU LEAVE YOUR TRUCK, OR PARK IT, FOLLOW THESE SAFETY RULES

- (1) Park in a safe area away from normal traffic.
- (2) Never park on a grade or a slope.
- (3) Never park in areas that block emergency routes or equipment, access to fire aisles, or stairways and fire equipment.

2) BEFORE LEAVING THE OPERATOR'S POSITION

- (1) Bring the truck to a complete stop.
- (2) Put the directional control lever in the NEUTRAL position.
- (3) Set the parking brake switch the ON (LOCK) position.
- (4) Lower the lifting mechanism-carriage and forks or attachment fully to the ground.

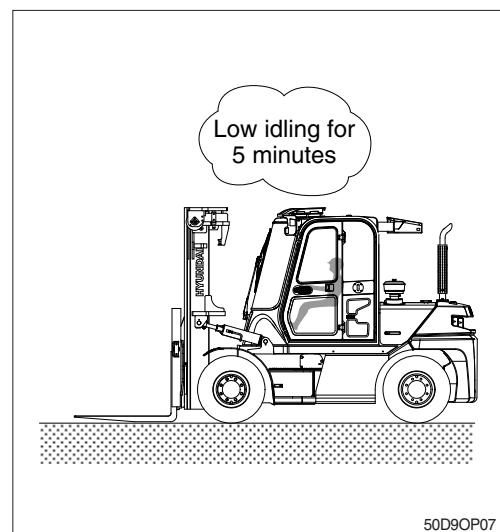
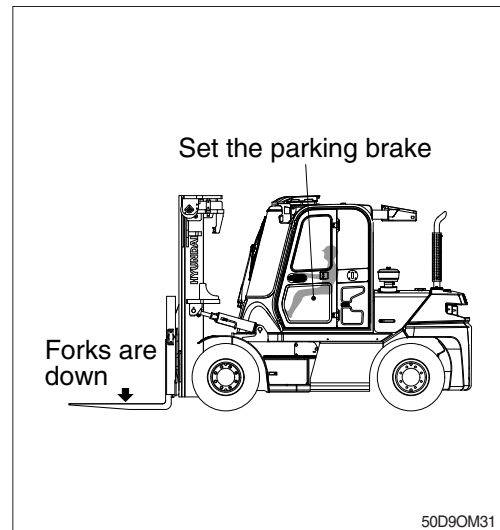
3) IN ADDITION, WHEN LEAVING THE TRUCK UNATTENDED

- (1) Tilt the mast forward until the forks are level and flat on the ground. Let the engine run at idle speed.
- (2) Turn the starting switch to the OFF position and remove the key.
- (3) Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.

※ If the lift truck has been working hard, let the engine idle a few minutes before shutting it off.

▲ CAUTION FOR TURBOCHARGER PROTECTION

In order to prevent turbocharger failure, please let the engine idle for more than 5 minutes before shutting it off.



14. STORAGE

1) BEFORE STORAGE

When you keep your forklift truck in storage for an extended period of time, observe the following safeguard instructions:

- (1) Wash and tidy the truck and house it in a dry building.
- (2) When the truck has to be placed outdoors, park it on an even ground and cover it securely with canvas.
- (3) Give enough fuel, grease, lubricant and oil.
- (4) Coat exposed piston rods of all hydraulic cylinders fully with grease.
- (5) Cover batteries after removing terminals, or remove battery from the truck and store separately.
- (6) When the atmospheric temperature is anticipated to drop below 0°C, add antifreeze. (Refer to COLD WEATHER OPERATION about ratio of water and antifreeze.)

2) DURING STORAGE

- (1) Operate the engine and move the truck for a short distance once a month so that a new oil film will be coated over movable parts and component surfaces. Remove and storage the battery at the same time.

▲ The above operations should be performed in the open. If they have to be performed inside a building, open the windows and doors to improve ventilation.

This is to avoid the danger of gas poisoning.

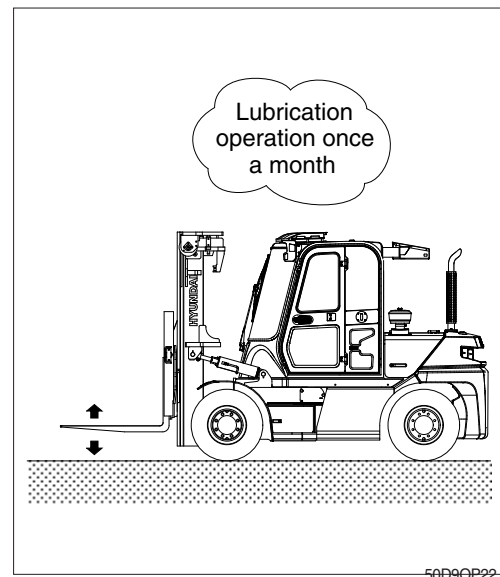
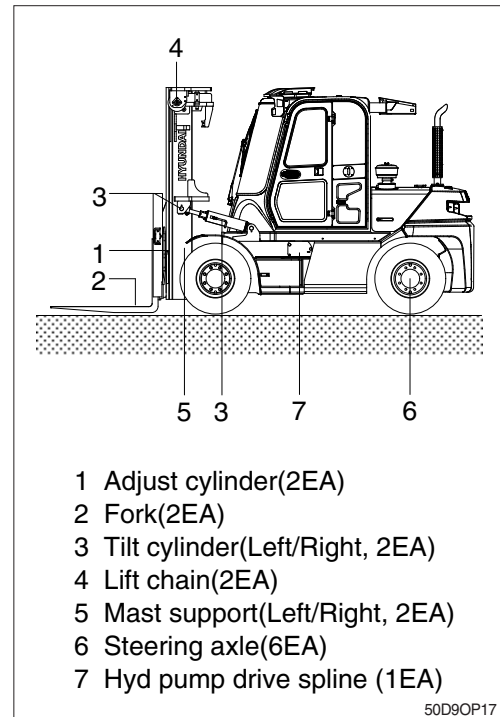
※ BATTERY

- ① Once a month, start the engine for 15 minutes (or use a charger) to charge the battery.
- ② Every 2 months, check the battery voltage and keep battery voltage over 25.08V.
- ③ If the machine stock period is over 6 months, disconnect the battery negative (-) terminal.

3) AFTER STORAGE

After storage (When it is kept without cover or the rust-preventive operation once a month is not carried out), you should apply the following treatment before operation.

- (1) Remove the drain plugs from the oil pan and other cases and drain any water.
- (2) Remove the rocker housing cover and lubricate the valves and rocker arms well. Inspect the valve operation.
- (3) After the engine is started, run it at idling speed until it is warmed up completely.



15. TRANSPORT

1) PRECAUTIONS FOR LOADING AND UNLOADING

Contact your HYUNDAI forklift distributor for advice regarding transportation of the truck.

When loading or unloading the truck on or from a transporter, using loading ramp, the following precautions must always be observed.

▲ Check travel route for overpass clearance.

Make sure there is adequate clearance if the lift truck being transported is equipped with a high mast or cab.

Remove ice, snow or other slippery material from the shipping lift truck and the loading dock.

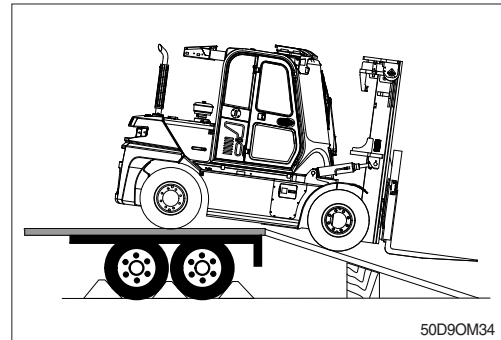
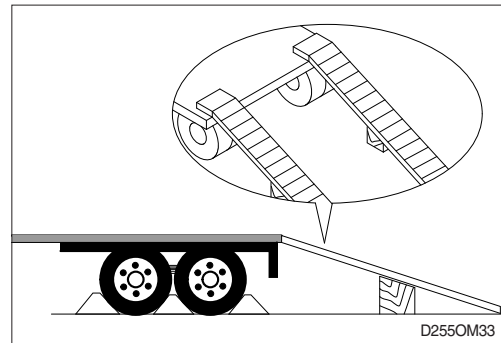
- (1) Ensure that the transporter cannot move by applying the brake and putting blocks under the wheels. Put the directional control lever in the NEUTRAL position.

- (2) Fix the loading ramps securely so that the centers of the transporter and truck are aligned. (The loading ramps should be of sufficient width, length and thickness to permit safe loading or unloading.)

- (3) After checking that the truck is aligned with the loading ramps, back the truck slowly up the ramps to load it on the transporter.

▲ When on the loading ramps, never change direction. If it is necessary to change direction, drive off the ramp and realign the truck.

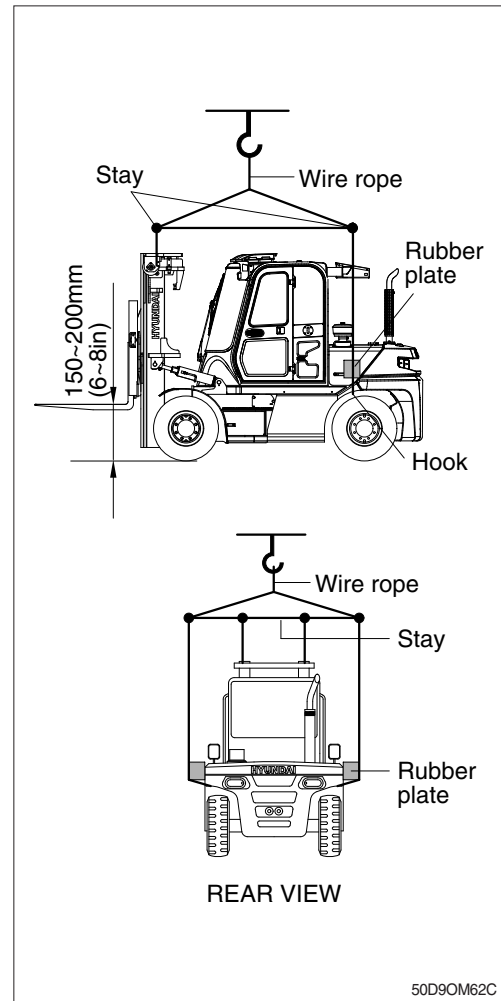
Block the wheels and secure the lift truck with tiedowns.



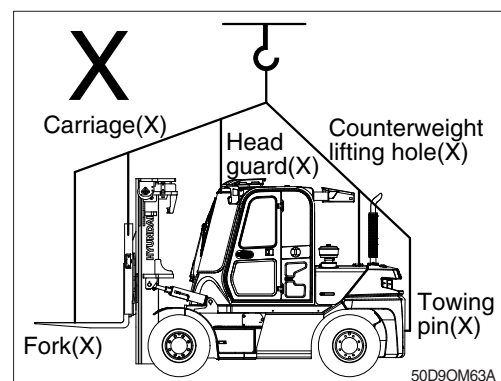
16. LOADING AND UNLOADING BY CRANE

- 1) Check the specification of the truck when you are going to hoist the truck.
- 2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the truck body.
- 3) Put a rubber plate or special stay where contact with the truck's body to prevent damage.
- 4) Place crane on the proper place.
- 5) Install the wire rope and stay like the illustration.

- ⚠ Make sure wire rope is proper size.
- ⚠ Make sure that the truck is shut down before hoisting. Lifting the truck with engine running can cause serious accident.
- ⚠ The wrong hoisting method or installation of wire rope can cause damage to driver and truck.
- ⚠ Do not load abruptly.
- ⚠ Keep area clear of personnel.
- ⚠ Recommend to manufacture the stays separately as per lifting conditions.
- ⚠ Before and after loading, perform a basic inspection. Check the torque and clearance of the mast and major parts.



- ⚠ Do not install the wire to unsafe position such as forks, carriage, head guard, counterweight lifting hole or towing pin, etc.. It can cause serious injury or damage to driver and truck.
- ⚠ If there is any problem to lift a truck, please contact your dealer.
- ⚠ Perform the lifting service with skilled service men.



6. EMERGENCY STARTING AND TOWING

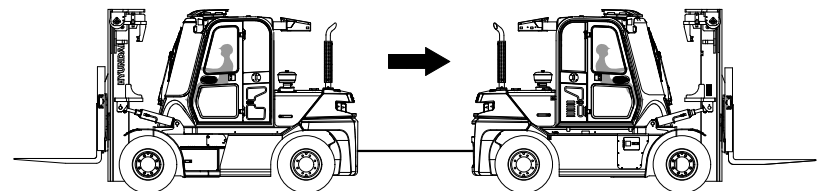
1. HOW TO TOW A DISABLED TRUCK

If your lift truck becomes disabled but it can be moved freely on its own wheels without further damage, use the following procedures to tow it safely to a repair area.

△ It is important for your safety and the care of your lift truck to use the proper equipment and carefully follow these recommendations for safe towing.

▲ DO NOT tow a lift truck if there is a problem with the brakes or tires or the steering cannot be operated. DO NOT tow up or down ramps and steep inclines. DO NOT attempt to tow a lift truck if traction or weather conditions are poor.

- 1) Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.
- 2) When possible, raise the carriage (forks) on the disabled truck about 300 mm (12 in) from the floor or ground. Secure the carriage with a chain.
- 3) Obtain another lift truck of equal or larger size carrying a partial load for traction.
- 4) Check that the counterweight bolts are in place and properly torqued. (This bolt is made of a special high tensile steel and is not commercially available. Replace it, when necessary, only with a genuine HYUNDAI replacement part).
- 5) Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.
- 6) Release the parking brake on the towed truck.
- 7) Put the directional control lever in the NEUTRAL position.



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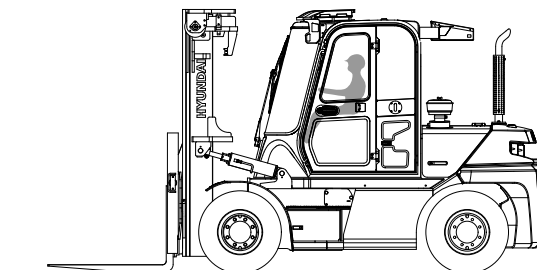
- 8) Tow the disabled truck backward. An operator must be on the towed truck.

Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at a speed of less than 8 km/h (5 mph) with a driver in the seat. Do not lift the truck or any wheels off the floor or ground while the truck is being towed.

▲ The power steering will not operate on the disabled truck when the engine is not running.

- 9) Park the disabled truck in authorized areas only. Fully lower the forks to the floor, put the directional control lever in the NEUTRAL position and turn the starting switch to the OFF position. Set the parking brake switch the ON (LOCK) position. Remove the key and, when necessary, block the wheels to prevent the truck from rolling.

Lift truck parking



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- ⚠ Always engage the parking brake when parking a lift truck. The truck can move and cause injury or death to personnel near it.**

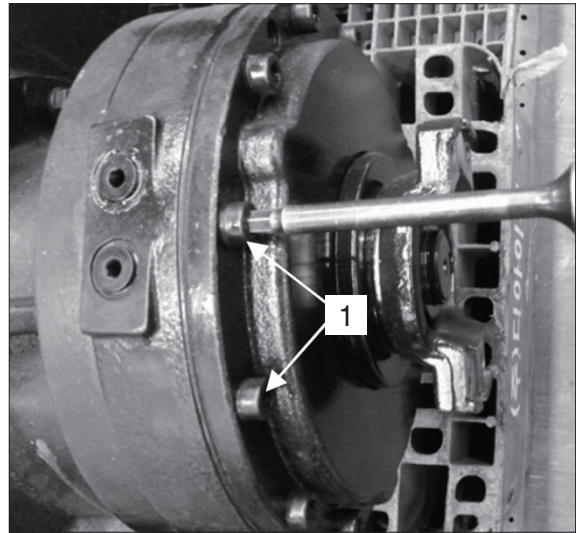
2. PARKING BRAKE RELEASE

In case of malfunction of transmission, it's hard to supply pressure at parking brake.

Using function of parking force release at carrier sub assembly of drive axle, it is possible to tow the truck.

- 1) Loosen the 12 socket bolt (1) to minimum 3 mm.

※ If the socket bolt (1) is loosened then the clearance is no more formed because the the dust cover (5) functions as a stopper.

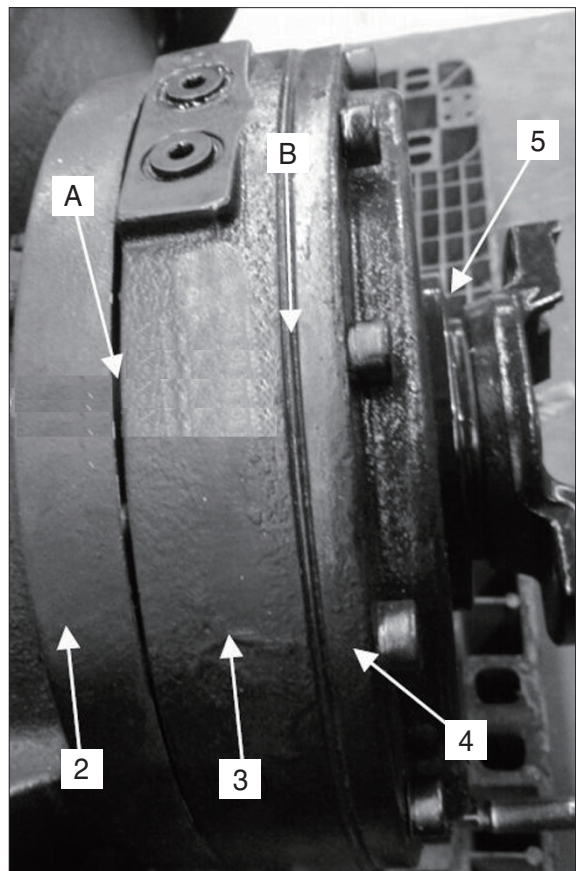


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- 2) Check the clearance (A) between the differential carrier (2) and the piston housing (3) and the clearance (B) between the cover (4) and the piston housing (3).

Clearance (A+B) = minimum 3 mm

※ The parking brake will be released when the clearance is formed anyone of A or B.



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3. HOW TO USE BATTERY JUMPER CABLES

If your lift truck battery is discharged (dead), you can start your lift truck by jumping it from another lift truck that has a 24V negative-ground electrical system. The "Booster" battery must be fully charged and in good condition. This section explains how to perform this procedure safely. To avoid damage to your lift truck and your battery or the possibility of harm to yourself, follow the instructions and warnings carefully. If you have any doubts, ask for help from an experienced mechanic.

If your truck has a battery with terminals on the side you will need a set of jumper cables with matching connector clamps or cable adapters for side mounted battery terminals.

△ Use only a 24V NEGATIVE GROUND SYSTEM to jump your truck. You can injure yourself and permanently damage your truck's 24V starting motor and ignition system by connecting it to a 24V power supply or to a positive ground system.

▲ BATTERIES CONTAIN SULFURIC ACID. Avoid acid contact with skin, eyes, or clothing. If acid contacts your eyes or skin, flush immediately with water and get medical assistance. Wear safety glasses when working near the battery to protect against possible splashing of the acid solution.

1) If the discharged battery has filler caps, check the fluid level. Do not use an open flame to check and do not smoke. If low, add distilled water to the correct level. Be sure to install the caps before jump starting.

2) Do not jump start, charge, or test a sealed type battery if the test indicator looks illuminated or has a bright color. Install a new battery.

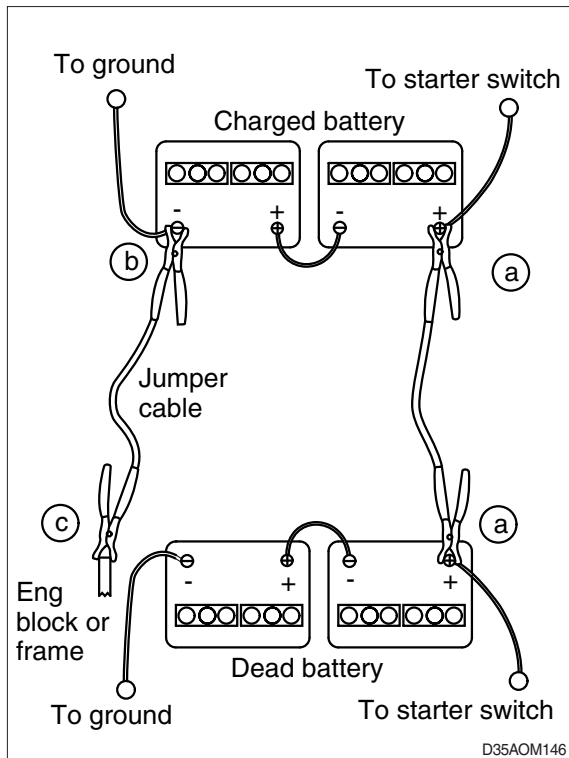
▲ BATTERIES EMIT EXPLOSIVE GAS. Do not smoke or have open flames or sparks in battery charging areas or near batteries. An explosion can result and cause injury or death. Hydrogen gas is produced during normal battery operation. Hydrogen can explode if flames, sparks, or lighted tobacco are brought near the battery. When charging or using a battery in an enclosed space, always provide ventilation and shield your eyes. Wear safety glasses when working around batteries.

3) Put the truck with the booster battery as near to the other truck as necessary for the jumper cables to reach both batteries. Check and make sure that the trucks do not touch each other. Use particular care when connecting a booster battery to prevent sparks.

4) On both trucks:

- ① Apply the parking brake.
- ② Put the directional control lever in the NEUTRAL position.
- ③ Turn the starting switch to the OFF position.
- ④ Turn all accessories to the OFF position and leave them off until after the engine has been started and the jumper cables have been removed.

▲ To avoid short circuits, remove all jewelry and do not permit any metal tools to make contact between the positive battery terminal and other metal on the truck. When you connect jumper cable clamps to the positive terminals of the two batteries, make sure that neither clamp contacts any other metal. Injury can occur from electrical shock or explosion.



5) Connect the jumper cables in the following sequence:

- ① Connect a jumper cable from the positive (+; red) terminal on one battery to the positive (+; red) terminal on the other battery. Never connect positive (+; red) to negative (-; black), or negative to positive.
- ② Connect one end of the second cable to the grounded negative (-; black) terminal of the jumper vehicle battery.
- ③ Connect the other end of the second cable to a stationary, solid metallic point on the engine of the stalled vehicle, not to the negative (-; black) terminal of its battery. Make this connection at a point at least 450 mm (18 in) away from the battery, if possible. Do not connect it to pulleys, fans or other parts that move. Do not touch hot manifolds that can cause severe burns.

6) Start the engine on the jumper vehicle and run the engine at a moderate speed for a minimum of five minutes.

7) Start the engine on the stalled vehicle. Follow the starting instructions in section 5, Starting and Operating Procedures in this manual. Be sure that the engine is at idle speed before disconnecting the jumper cables.

8) Remove the jumper cables by reversing the installation sequence exactly. Start by removing the last jumper cable from the stalled vehicle first. Remove the cable end from the engine block first, then the other end of the negative (-; black) cable.

9) Remove both ends of the positive (+; red) cable.

7. PLANNED MAINTENANCE AND LUBRICATION

1. INTRODUCTION

ONLY TRAINED AND AUTHORIZED PERSONNEL should perform planned maintenance. Local HYUNDAI dealers are prepared to help customers put in place a planned maintenance program for checking and maintaining their lift trucks according to applicable safety regulations.

▲ Powered industrial trucks may become hazardous if maintenance is neglected.

As outlined in section 4, **operator maintenance and care**, the operator should make a safety inspection of the lift truck before operating it. The purpose of this daily examination is to check for any obvious damage and maintenance problems, and to have minor adjustments and repairs made to correct any unsafe condition.

In addition to the operator's daily inspection, HYUNDAI recommends that the owner set up and follow a periodic planned maintenance (PM) and inspection program. Performed on a regular basis by trained personnel, the program provides through truck. The **PM** identifies needed adjustments, repairs, or replacements so they can be made before failure occurs. The specific schedule (frequency) for the PM inspections depend on the particular application and lift truck usage.

This section recommends typical planned maintenance and lubrication schedules for items essential to the safety, life, and performance of the truck. It also outlines safe maintenance practices and gives brief procedures for inspections, operational checks, cleaning, lubrication, and minor adjustments.

Specifications for selected components, fuel, lubricants, critical bolt torques, refill capacities, and settings for the truck are found in section 8.

If you have needed for more information on the care and repair of your truck, see your HYUNDAI dealer.

2. SAFE MAINTENANCE PRACTICES

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operation and maintenance. These recommended procedures specify conditions, methods, and accepted practices that aid in the safe maintenance of industrial trucks. They are listed here for the reference and safety of all workers during maintenance operations. Carefully read and understand these instructions and the specific maintenance procedures before attempting to do any repair work. When in doubt of any maintenance procedure, please contact your local HYUNDAI dealer.

- 1) Powered industrial trucks can become hazardous if maintenance is neglected. Therefore, suitable maintenance facilities and trained personnel and procedures shall be provided.
- 2) Maintenance and inspection of all powered industrial trucks shall be performed in conformance with the manufacturer's recommendations.
- 3) Follow a scheduled planned maintenance, lubrication, and inspection system.
- 4) Only trained and authorized personnel are permitted to maintain, repair, adjust, and inspect industrial trucks and must do so in accordance with the manufacturer's specifications.
- 5) Always wear safety glasses. Wear a safety (hard) hat in industrial plants and in special work areas where protection is necessary and required.
- 6) Properly ventilate work area, vent exhaust fumes, and keep shop clean and floors dry.
- 7) Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level or leakage fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
- 8) Before starting work on truck.
 - (1) Raise drive wheels free of floor and use oak blocks or other positive truck positioning devices.
 - (2) Remove all jewelry(watches, rings, bracelets, etc.).
 - (3) Put oak blocks under the load engaging means, inner masts, or chassis before working on them.
 - (4) Disconnect the battery ground cable (-) before working on the electrical system.
※ **Refer to the jacking and blocking section in the service manual for proper procedures.**
- 9) Operation of the truck to check performance must be conducted in an authorized, safe, clear area.
- 10) Before starting to operate the truck.
 - (1) Be seated in a safe operating position and fasten your seat belt.
 - (2) Make sure parking brake is applied.
 - (3) Put the direction control in NEUTRAL.
 - (4) Start the engine.
 - (5) Check functioning of lift and tilt systems, direction and speed controls, steering, brakes, warning devices, and load handling attachments.

- 11) Before leaving the truck.
 - (1) Stop the truck.
 - (2) Fully lower the load-engaging means: mast, carriage, forks or attachments.
 - (3) Put the directional control in NEUTRAL.
 - (4) Apply the parking brake.
 - (5) Stop the engine.
 - (6) Turn the key switch to the OFF position.
 - (7) Put blocks at the wheels if the truck must be left on an incline.
- 12) Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops, load backrest, cab and frame members must be carefully and regularly inspected and maintained in a safe operating condition.
- 13) Special trucks or devices designed and approved for hazardous area operation must receive special attention to insure that maintenance preserves the original approved safe operating features.
- 14) Fuel systems must be checked for leaks and condition of parts. Extra special consideration must be given in the case of a leak in the fuel system. Action must be taken to prevent the use of the truck until the leak has been corrected.
- 15) All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt and lift cylinders, valves, and other parts must be checked to assure that drift or leakage has not developed to the extent that it would create a hazard.
- 16) When working on the hydraulic system, be sure the engine is turned off, mast is in the fully-lowered position, and hydraulic pressure is relieved in hoses and tubing.
- ▲ Always put oak blocks under the carriage and mast rails when it is necessary to work with the mast in an elevated position.**
- 17) The truck manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals must be maintained in legible condition.
- 18) Batteries, limit switches, protective devices, electrical conductors, and connections must be maintained in conformance with good practice. Special attention must be paid to the condition of electrical insulation.
- 19) To avoid injury to personnel or damage to the equipment, consult the manufacturer's procedures in replacing contacts on any battery connection.
- 20) Industrial trucks must be kept in a clean condition to minimize fire hazards and help in detection of loose or defective parts.
- 21) Modifications and additions that affect capacity and safe truck operation must not be done without the manufacturer's prior written approval. This is an OSHA requirement.
Capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

- 22) Care must be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment. Parts, including tires, are to be installed per the manufacturer's procedures. Always use genuine HYUNDAI or HYUNDAI-approved parts.
- 23) When removing tires follow industry safety practices. Most importantly, deflate pneumatic tires completely prior to removal. Following assembly of tires on multi-piece rims, use a safety cage or restraining device while inflating.
- 24) Use special care when removing heavy components, such as counterweight, mast, etc.. Be sure that lifting and handling equipment is of the correct capacity and in good condition.

3. INSTRUCTIONS BEFORE MAINTENANCE

1) INTERVAL OF MAINTENANCE

- (1) You may inspect and service the truck by the period as described at based on service meter of LCD.
- (2) Shorten the interval of inspect and service depending on site condition.(Such as dusty area, quarry, sea shore and etc.)
- (3) Practice the entire related details at the same time when the service interval is doubled.
For example, in case of 250 hours, carry out all the maintenance each 250hours, each 100hours and daily service at the same time.



※ Time intervals between maintenances are largely determined by operating conditions. For example, operation in sandy, dusty locations requires shorter maintenance intervals than operation in clean ware-houses. The indicated intervals are intended for normal operation. The operating condition classifications are ;

- **NORMAL OPERATION**

Eight hour material handling, mostly in buildings or in clean, open air on clean paved surfaces.

- **SEVERE OPERATION**

Prolonged operating hours or constant usage.

- **EXTREME OPERATION**

- In sandy or dusty locations, such as cement plants, lumber mills, and coal dust or stone crushing sites.
- High-temperature locations, such as steel mills and foundries.
- Sudden temperature changes, such as constant trips from buildings into the open air, or in refrigeration plants.
- If the lift truck is used in severe or extreme operating conditions, you must shorten the maintenance intervals accordingly.

※ Since the operating environment of lift trucks varies widely, the above descriptions are highly generalized and should be applied as actual conditions dictate.

2) PRECAUTION

- (1) Start maintenance after you have the full knowledge of truck.
- (2) The monitor installed on this truck does not entirely guarantee the condition of the truck.
Daily inspection should be performed according to maintenance.
- (3) Engine and hydraulic components have been preset in the factory.
Do not allow unauthorized personnel to reset them.
- (4) Ask to your local dealer or Hyundai for maintenance advise it unknown.
- (5) Drain the used oil and coolant in a container and handle according to the method of handling for industrial waste to meet with regulations of each province or country.

3) PROPER MAINTENANCE

- (1) Replace and repair of parts
It is required to replace the wearable and consumable parts such as hose, tube and filter etc., regularly. Replaced damaged or worn parts at proper time to keep the performance of truck.
- (2) Use genuine parts.
- (3) Use the recommended oil.
- (4) Remove the dust or water around the inlet of oil tank before supplying oil.
- (5) Drain oil when the temperature of oil is warm.
- (6) Do not repair anything while operating the engine.
- (7) Stop the engine when you fill the oil.
- (8) Relieve hydraulic system of the pressure by opening of breather when repairing the hydraulic system.
- (9) Confirm if the cluster is in the normal condition after completion of service.
- (10) For more detail information of maintenance, please contact local Hyundai dealer.

※ **Be sure to start the maintenance after fully understanding the section 1, safety hints.**

4) PRECAUTION WHEN INSTALLING HYDRAULIC HOSES OR PIPE.

- (1) Be particularly careful that joint of hose, pipe and functioning item are not damaged.
Avoid contamination.
- (2) Assemble after cleaning the hose, pipe and joint of function item.
- (3) Use Hyundai genuine parts.
- (4) Do not assemble the hose in the condition of twisted or sharp radius.
- (5) Keep the specified tighten torque.

5) PERIODICAL REPLACEMENT OF SAFETY PARTS

- (1) These are the parts which the operator cannot judge the remained lifetime of them by visual inspection.
- (2) Repair or replace if an abnormality of these parts is found even before the recommended replacement interval.

※ **Replacement of consumable service parts is not covered under warranty.**

Periodical replacement of safety parts		Interval
1	Fuel hose	Every 2 to 4 years
2	Hydraulic pump hose	Every 2 years
3	Power steering hose	Every 2 years
4	Packing, seal, and O-ring of steering cylinder	Every 2 to 4 years
5	Lift chain	Every 2 to 4 years
6	Lift cylinder hose	Every 1 to 2 years
7	Tilt cylinder hose	Every 1 to 2 years
8	Side shift cylinder hose	Every 1 to 2 years
9	Master cylinder and wheel cylinder caps dust seals	Every 1 years
10	Brake hose or tube	Every 1 to 2 years
11	Brake reservoir tank tube	Every 2 to 4 years
12	Intake air line	Every 2 years
13	Coolant hose and clamps	Every 2 years

※ **Replace the O-ring and gasket at the same time when replacing the hose.**

※ **Replace clamp at the same time if the hose clamp is cracked when checking and replacing hose.**

6) EMISSION-RELATED COMPONENTS WARRANTY (USA AND CANADA ONLY)

Hyundai shall have obligation under the EPA (Environmental Protection Agency) regulation of warranty about Emission-related components. This warranty shall exist for 3,000 hours or five years, whichever occurs first.

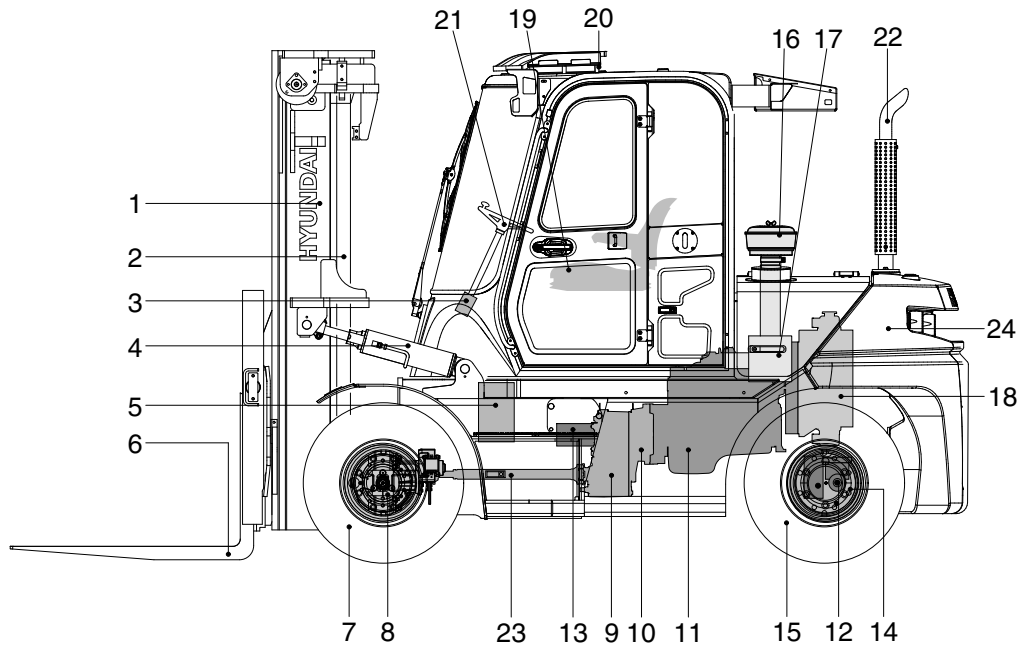
Naturally, this warranty does not cover to damage arising from accident, misuse or negligence, use of non-Hyundai parts, or from alterations not authorized by Hyundai.

※ **Emission-related components according to the EPA regulation.**

1. Air-induction system.
2. Fuel system.
3. Ignition system.
4. Exhaust gas recirculation systems.
5. After treatment devices.
6. Crankcase ventilation valves.
7. Sensors.
8. Electronic control units.

4. PLANNED MAINTENANCE INTERVALS

1) MAJOR COMPONENTS LOCATION



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1 Mast	9 Transmission	17 Air cleaner
2 Lift cylinder	10 Torque converter	18 Radiator
3 Steering unit	11 Engine	19 Seat
4 Tilt cylinder	12 Steering cylinder	20 Cabin
5 Main control valve	13 Hydraulic pump	21 Steering wheel
6 Fork	14 Steering axle	22 Silencer
7 Front wheel	15 Rear wheel	23 Propeller shaft
8 Drive axle	16 Precleaner	24 Counterweight

2) MAINTENANCE CHECK LIST

(1) Every 10 hours service

Check items	Service	Remarks
Visual inspection		
• Truck for obvious damage and leaks.	Check, Repair or Replace	7-15
• Warning plates and decals.	Check, Replace	7-15
• Condition of tires and air pressure, wheels & nuts.	Check, Refill or Tighten	7-17
• Lift chain and fastener.	Check, Adjust	7-61
• Carriage, attachment and forks.	Check, Repair or Replace	7-44
• Fuel level	Check, Refill	5-13
• Engine oil level	Check, Refill	7-20
• Coolant level (Radiator & reservoir tank).	Check, Refill	7-22
• Prefilter.	Check, Drain	7-29
• DEF level	Check, Add	7-32
• Hydraulic oil level.	Check, Refill	7-33
• Fan and fan belt damage and tension	Check, Adjust, Replace	5-5
Function tests		
• Horn and lamp	Check, Repair or Replace	4-2
• Gauges and instrument panel.	Check, Repair or Replace	4-2
• Warning light.	Check, Repair or Replace	4-2
• Service brake and inching operation.	Check, Repair or Replace	4-2
• Parking brake operation.	Check, Repair or Replace	4-2
• Accelerator and engine speed operation.	Check, Adjust or Replace	4-2
• Directional and speed control operation.	Check, Repair or Replace	4-2
• Steering wheel operation.	Check, Repair or Replace	4-2
• Noise and vibration.	Check, Repair or Replace	5-12

(2) Every 50 hours service

Check items	Service	Remarks
Transmission oil level.	Check, Refill	7-40
Lubrication		
• Steering axle linkage and support	Check, Clean, Lubricate	7-43
• Hydraulic pump drive spline	Check, Clean, Lubricate	7-43
• Propeller shaft	Check, Lubricate	7-57
Tightening torques		
• Pump mounting bolt	Check, Tight	8-6
• Tilt cylinder mounting and yoke bolt	Check, Tight	8-6
• Drive & steering axle wheel mounting bolt & nut	Check, Tight	8-6
• Counterweight mounting bolt	Check, Tight	8-6
• Cabin mounting bolt	Check, Tight	8-6
• Main pump & MCV mounting bolt	Check, Tight	8-6
• Engine & radiator mounting bolt	Check, Tight	8-6
• Transmission mounting bolt	Check, Tight	8-6
• Steering axle mounting bolt	Check, Tight	8-6

(3) Initial 50 hours service

Check items	Service	Remarks
Engine oil	Change	7-20
Engine oil filter	Replace	7-20
Pilot line filter element	Replace	7-35

(4) Initial 100 hours service

Check items	Service	Remarks
Differential gear oil	Change	7-42
Differential gear oil strainer	Clean	7-42
Transmission oil	Change	7-40
Transmission oil filter	Replace	7-40

(5) Every 250 hours service

Check items	Service	Remarks
Air cleaner element	Check, Clean	7-28
Hydraulic oil air breather element	Replace	7-35
Differential gear oil	Check, Refill	7-42
Brake line filter (strainer)	Check, Clean	7-36
Charge air cooler	Check, Clean	7-26
Air conditioner filter	Check, Clean	7-46
Lubrication		
· Lift chain	Check, Lubricate	7-57, 7-43
· Mast roller and pin	Check, Lubricate	7-57, 7-43
· Lift cylinder rod end	Check, Lubricate	7-57, 7-43
· Lift cylinder tube end	Check, Lubricate	7-57, 7-43
· Tilt cylinder rod end	Check, Lubricate	7-57, 7-43
· Tilt cylinder tube end	Check, Lubricate	7-57, 7-43
· Steering cylinder rod end	Check, Lubricate	7-57, 7-43
· Steering cylinder tube end	Check, Lubricate	7-57, 7-43
· Attachment option cylinder rod end	Check, Lubricate	7-57, 7-43
· Attachment option cylinder tube end	Check, Lubricate	7-57, 7-43
· Steering axle wheel bearing	Check, Lubricate	7-57, 7-43
· Pedal pivot	Check, Lubricate	7-57, 7-43

(6) Every 500 hours service

Check items	Service	Remarks
Battery	Check, Clean	7-47
★ Engine oil filter	Replace	7-20
★ Engine oil	Change	7-20
Fuel filter	Replace	7-30
Prefilter	Replace	7-29
Fan belt tensioner	Check, Adjust	7-27
Drive axle mounting bolt and nut	Check, Tight	8-6
Mast mounting bolt	Check, Tight	8-6

★ In case of the hard operating condition or use high sulfur containing fuel above than 0.5% or use low grade of engine oil requires reduced oil change intervals.

(7) Every 1000 hours service

Check items	Service	Remarks
Air cleaner element (*1)	Replace	7-28
Hydraulic oil return filter	Replace	7-35
Pilot line filter element	Replace	7-35
Transmission oil & filter	Change	7-40
Differential gear oil	Change	7-42
Differential gear oil strainer	Clean	7-42

*1 When the air cleaner warning lamp is ON, replace the air cleaner element.

(8) Every 2000 hours service

Check items	Service	Remarks
Hyd suction strainer	Clean	7-35
Radiator coolant	Replace	7-23
Hydraulic oil (*2)	Replace	7-34

*2 Conventional hydraulic oil

(9) Every 4000 hours service

Check items	Service	Remarks
Aftertreatment DEF dosing unit filter	Replace	7-31
Urea level sensor suction filter	Replace	7-31

(10) Every 5000 hours service

Check items	Service	Remarks
Hydraulic oil (*3)	Replace	7-34

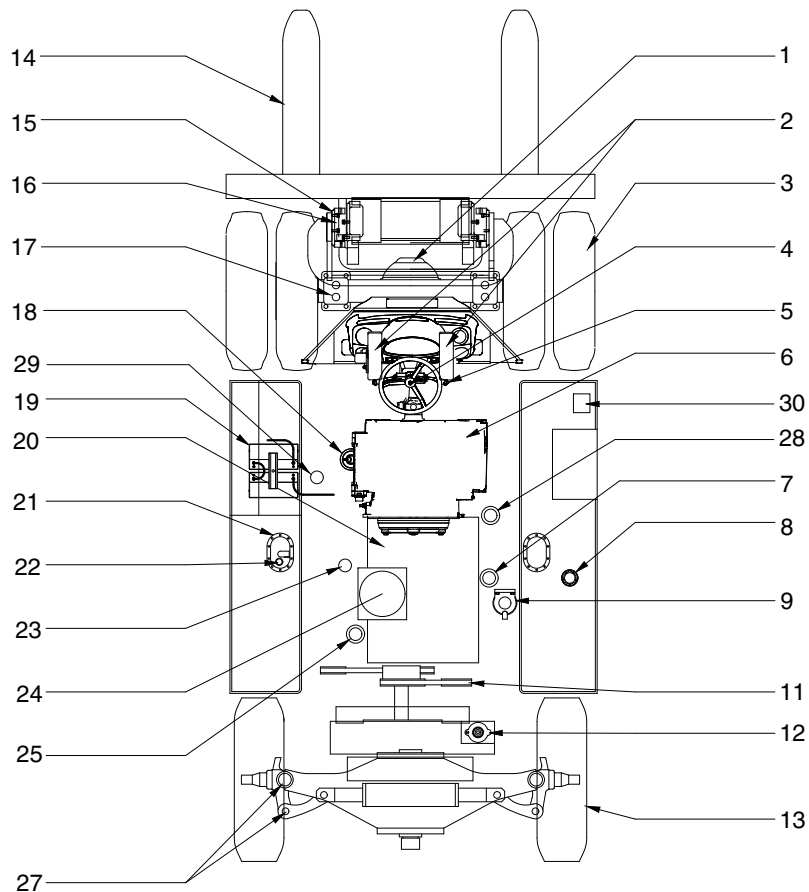
*3 Hyundai genuine long life hydraulic oil

(11) When required

Check items	Service	Remarks
Fuel system		
· Fuel tank	Drain or Clean	7-29
· Prefilter	Drain or Clean	7-29
· Fuel filter	Replace	7-30
Engine lubrication system		
· Engine oil	Replace	7-20
· Engine oil filter cartridge	Replace	7-20
Engine cooling system		
· Coolant	Refill, Replace	7-22
· Radiator	Clean	7-26
· Fan belt	Replace	7-27
Engine air intake system		
· Air cleaner element	Replace	7-28
Engine exhaust system		
· Aftertreatment DEF dosing unit filter	Replace	7-32
Hydraulic tank		
· Hydraulic oil	Refill or Replace	7-36
· Hydraulic oil suction strainer	Check, Clean	7-35
· Return oil filter element	Refill, Replace	7-35
· Air breather element	Refill, Replace	7-35
Hand pump (cabin tilt)		
· Hydraulic oil	Refill or Replace	7-19
Tire air pressure	Check, Refill	5-3

5. MAINTENANCE CHART

1) MAINTENANCE LOCATIONS



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CAUTION

- ※ Service intervals are based on the hourmeter reading.
- ※ Stop the engine when servicing.
- ※ Do not open the cap or drain plug to avoid injury by unexpected spouting of high temperature fluid or gas.
- ※ Open the cap slowly to relieve pressure.
- ※ Always keep the surface of control & instrument panels clean in case of damage or malfunction detected in panel, replace it with a new one.
- ※ For other details, refer to the service manual.

2) MAINTENANCE CHART

Service interval	Item No.	Description	Service Action	Oil symbol	Capacity (ℓ)	Service point No.
10 Hours or daily	2	Pedal linkage	Check, Adjust	-	-	1
	3	Drive rim & Tire air pressure	Check, Add	-	-	2
	4	Horn operation	Check, Replace	-	-	2
	5	Lamp operation	Check, Replace	-	-	10
	8	Fuel level	Check, Add	DF	171.5	1
	9	Prefilter	Check, Drain	-	-	1
	11	Fan and fan belt tension	Check, Adjust	-	-	1
	12	Radiator coolant	Check, Add	C	20.4	1
	13	Steer rim & Tire air pressure	Check, Add	-	-	2
	14	Carriage, attachment and forks	Check, Replace	-	-	2
	15	Lift chain and fastener	Check, Lubricate	EO	-	2
	16	Tilt pin & Mast roller	Check, Lubricate	G	-	2
	20	Engine oil level	Check, Add	EO	12	1
	21	Hydraulic oil level	Check, Add	HO	132	1
	30	DEF level	Check, Add	DEF	18.9	1
Initial 50 Hours	20	Engine oil	Change	EO	12	1
	25	Engine oil filter	Replace	-	-	1
	29	Pilot line filter element	Replace	-	-	1
50 Hours or weekly	6	Transmission oil level	Check, Add	EO	18	1
	27	Steering axle linkage and support	Check, Lubricate	G	-	6
Initial 100 Hours	1	Differential gear oil	Change	GO	12.5	1
	1	Differential gear oil strainer	Clean	-	-	1
	6	Transmission oil	Change	EO	18	1
	18	Transmission oil filter	Replace	-	-	1
250 Hours or monthly	1	Differential gear oil	Check, Refill	GO	12.5	1
	12	Charge air cooler	Check, Clean	-	-	1
	15	Lift chain tension	Check, Replace	-	-	2
	23	Hydraulic oil air breather element	Check, Replace	-	-	1
	24	Air cleaner element	Check, Clean	-	-	1
	28	Brake line filter (strainer)	Check, Clean	-	-	1
	-	Air conditioner filter	Check, Clean	-	-	1
500 Hours or 3 monthly	7	Fuel filter	Replace	-	-	1
	9	Prefilter	Replace	-	-	1
	11	Fan belt tensioner	Check, Adjust	-	-	1
	17	Mast & Drive axle mounting bolt	Check, Tight	-	-	4
	19	Battery	Check, Clean	-	-	2
	25	Engine oil and oil filter	Change, Replace	-	-	1
1000 Hours or 6 monthly	1	Differential gear oil	Change	GO	12.5	1
	1	Differential gear oil strainer	Clean	-	-	1
	6	Transmission oil	Change	EO	18	1
	18	Transmission oil filter	Replace	-	-	1
	22	Hydraulic oil return filter	Replace	-	-	1
	24	Air cleaner element	Replace	-	-	1
	29	Pilot line filter element	Replace	-	-	1
2000 Hours	12	Radiator coolant	Replace	C	20.4	1
	21	Hydraulic strainer	Check, Clean	-	-	1
	21	Hydraulic oil *1	Change	HO	132	1
4000 Hours	30	Aftertreatment DEF dosing unit filter	Replace	-	-	1
	30	Urea level sensor suction filter	Replace	-	-	1
5000 Hours	21	Hydraulic oil *2	Change	HO	132	1

*1 Conventional hydraulic oil *2 Hyundai genuine long life hydraulic oil

※ Oil symbol

Refer to the recommended lubricants for specification.

DF : Diesel fuel HO : Hydraulic oil EO : Engine oil GO : Gear oil
MO : Transmission oil BF : Brake fluid C : Coolant G : Grease

6. HOW TO PERFORM PLANNED MAINTENANCE

1) VISUAL INSPECTION

First, perform a visual inspection of the lift truck and its components. Walk around the truck and take note of any obvious damage or maintenance problems.

Check to be sure all capacity, safety, and warning plates are attached and legible.

- ※ **NAMEPLATES AND DECALS:** Do not operate a lift truck with damage or lost decals and nameplates. Replace them immediately. They contain important information.

Inspect the truck, before and after starting the engine, for any sign of external leakage of fuel, engine coolant, transmission fluid, etc..

Check for hydraulic oil leaks and loose fittings.

- ▲ **HYDRAULIC FUILD PRESSURE:** Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.

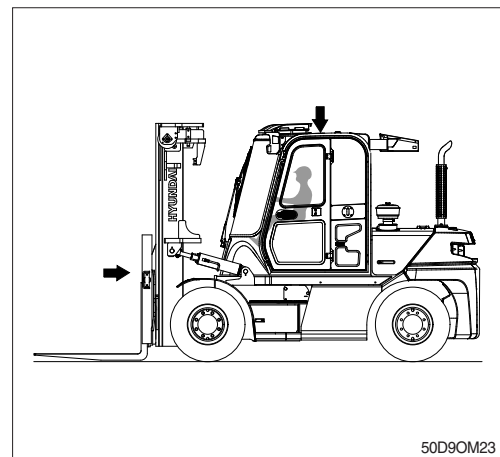
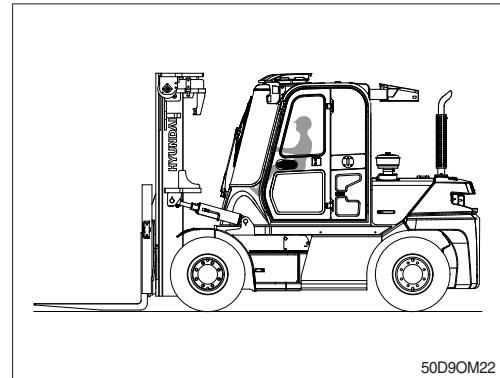
2) CABIN

Be sure that the driver's cabin and any safety devices are in place, undamaged, and attached securely. Check the cabin for damage. Be sure that it is properly positioned and all mounting fasteners are in place and tight.

3) LOAD HANDLING COMPONENTS

Inspect the mast assembly, load backrest, rails, carriage rollers, lift chains, and lift and tilt cylinders. Look for obvious wear and maintenance problems and damaged or missing parts. Check for any loose parts or fittings. Check for leaks, damaged or loose rollers, and rail wear (metal flaking). Carefully check the lift chains for wear, rust, corrosion, cracked or broken links, stretching etc.. Check that the lift and carriage chains are correctly adjusted to have equal tension. Check that the lift chain anchor fasteners and locking means are in place and tight. Inspect all lift line hydraulic connections for leaks.

- △ **Mast and lift chains require special attention and maintenance to remain in safe operating condition. Refer to lift chain maintenance in this section for additional information.**



4) FORKS

Inspect the load forks for cracks, breaks, bending, and wear. The fork top surfaces should be level and even with each other. The height difference between both fork tips refer to below table.

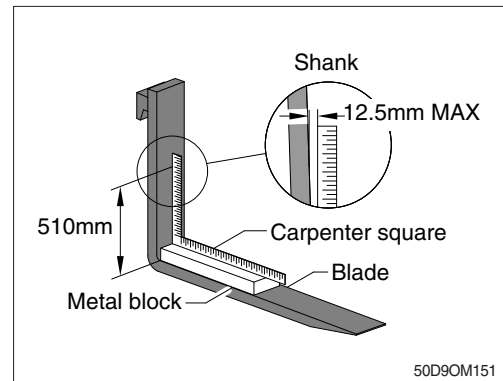
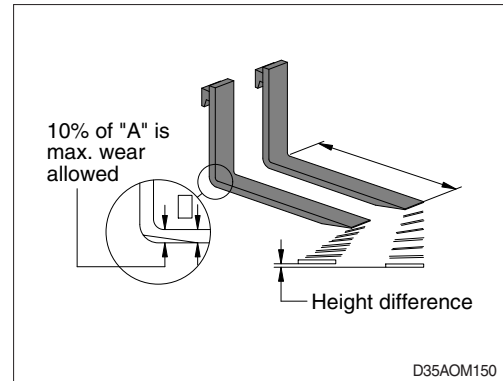
Model	Fork length (mm)	Height difference (mm)
50/60/70D-9	equal or below 1500	3
	above 1500	4

▲ If the fork blade at the heel is worn down by more than 10%, the load capacity is reduced and the fork must be replaced.

Inspect the forks for twists and bends. Put a 5 cm (2 in) thick metal block, at least 10 cm (4 in) wide by 61 cm (24 in) long with parallel sides, on the blade of the fork with the 10 cm (4 in) surface against the blade. Put a 61 cm (24 in) carpenter's square on the top of the block and against the shank. Check the fork 51cm (20 in) above the blade to make sure it is not bent more than 12.5 mm (0.5 in) maximum.

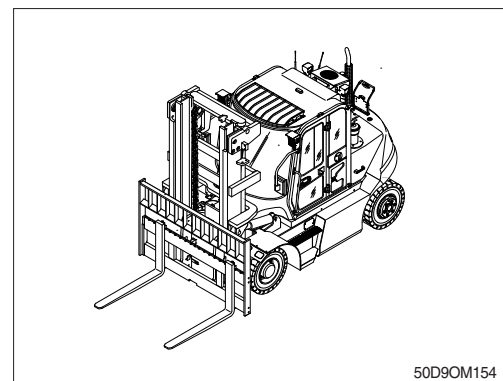
※ If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.

Inspect the fork locking pins for cracks or damage. Reinsert them and note whether they fit properly.



5) SIDE SHIFT

When operating the lever for the side shift and the hanger bar which the forks and the backrest are mounted on it, operator can accurately insert the forks under pallets or stack loads correctly without moving the fork lift.



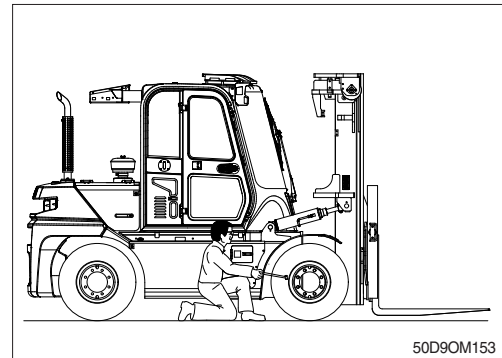
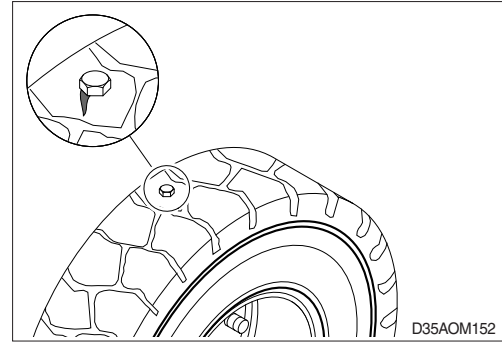
6) WHEEL AND TIRES

Check the condition of the drive and steering wheels and tires. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or **chunking out**.

Check all wheel lug nuts or bolts to be sure none are loose or missing. Replace missing bolts or lug nuts. Torque loose or replaced items to specifications.

- ⚠ Check tire pressure from a position facing the tread of the tire, not from the side. Use a long handled gauge to keep your body away from the side. If tires are low, do not operate and do not add air. Check with a mechanic. The tire may require removal and repair. Incorrect (low) tire pressure can reduce the stability of your lift truck. Do not operate truck with low tire pressure.

- Proper cold inflation : Refer to attached decal.

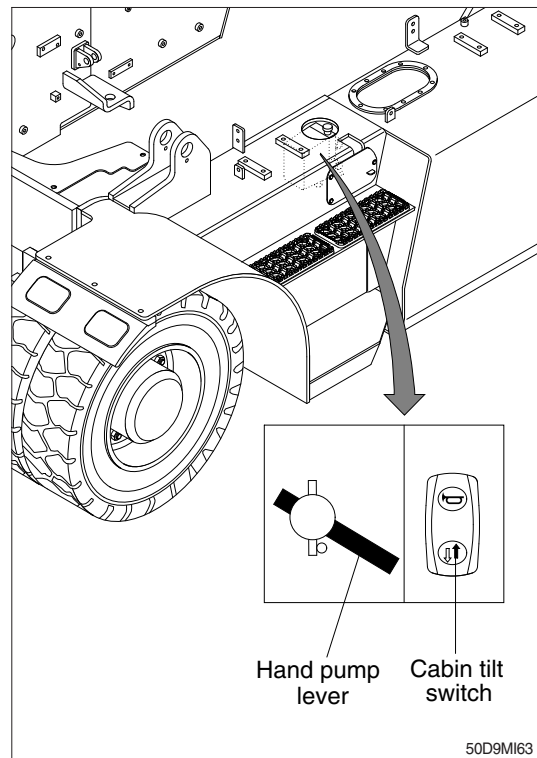


7) TILTING CABIN

▲ **Keep clearance of people except the operator before tilting the cabin.**

▲ **Before tilting the cabin, make sure that the mast is vertical or tilted forward. Otherwise, the operation could be blocked by mast tilt cylinders.**

- (1) Locate the truck on the plain and stable floor.
※ **Apply parking brake before servicing.**
- (2) Turn the start switch to OFF position.
Remove the frame cover (LH) by removing the mounting bolts. The cabin tilt switch is located between cabin and side frame.
- (3) By tilting the cabin, service of hydraulic and electric system such as hydraulic components, hydraulic pipings, electric components, and electric wirings can be easily performed. It is recommended that the service requiring tilting cabin must be carefully performed with a skilled service man.



(4) Tilting and returning cabin

① Tilting cabin

After keeping clearance of the people except the operator along with sounding horn, turn the hand pump lever clockwise and then, continuously press the cabin tilt switch to tilt the cabin to right side.

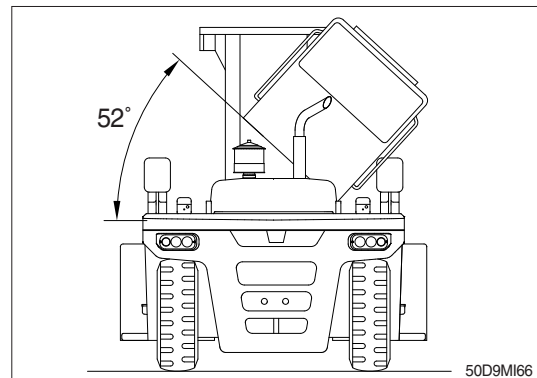
② Returning cabin

After keeping clearance of the people except the operator along with sounding horn, turn the hand pump lever counterclockwise and then, continuously press the cabin tilt switch to return the cabin to original location.

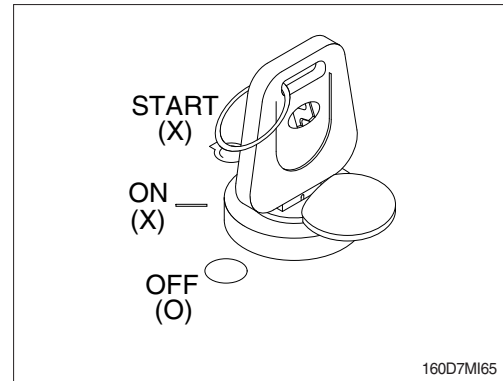
Take care that it must perform by a trained people in order to prevent from abnormal operation.

Refer to page 3-26 for the cabin tilt switch

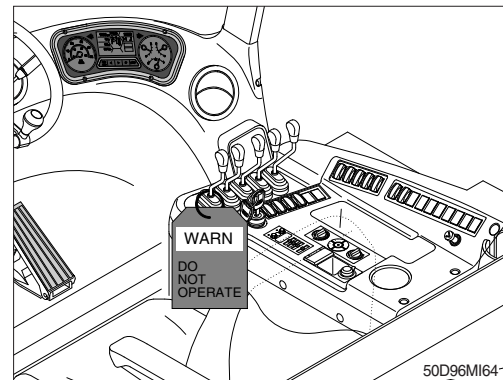
※ **and hand pump lever.**



- ⚠ Do not operate cabin tilting function while the power is ON or engine is running.



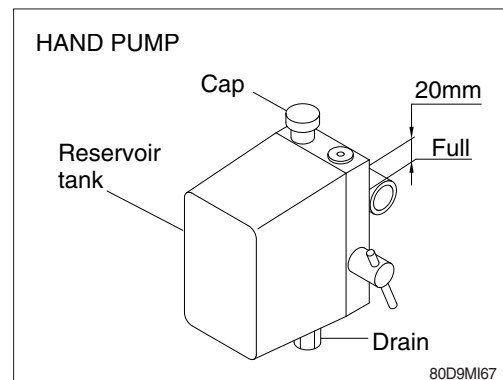
- ⚠ Do not operate the cabin tilt switch or any control parts while servicing under the tilted cabin. It can cause severe injury or death.



(5) Fill and check hydraulic oil for hand pump

Open upper cap and fill 0.8 l by using funnel. After filling, operate tilt cylinder 2~3 times and close the cabin completely to check the oil level in tank. If necessary, fill more oil to keep the level.

- Tank capacity : 0.7 l
- System total capacity : 1.2 l

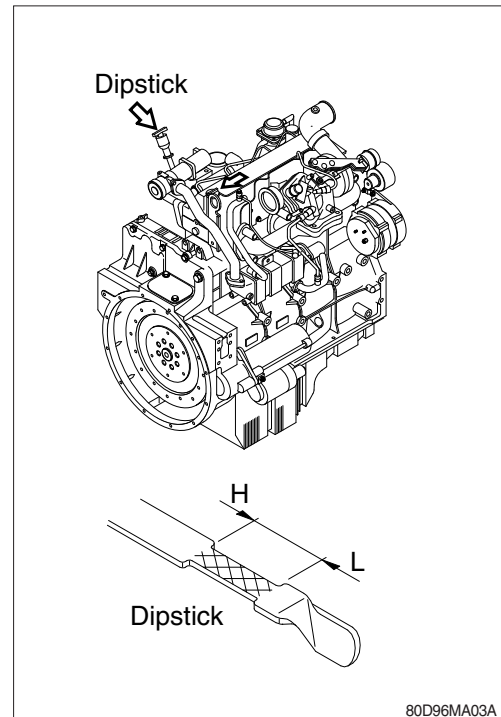


7. SERVICE INSTRUCTION

1) CHECK ENGINE OIL LEVEL

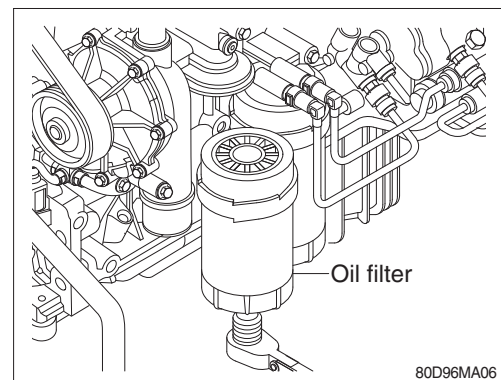
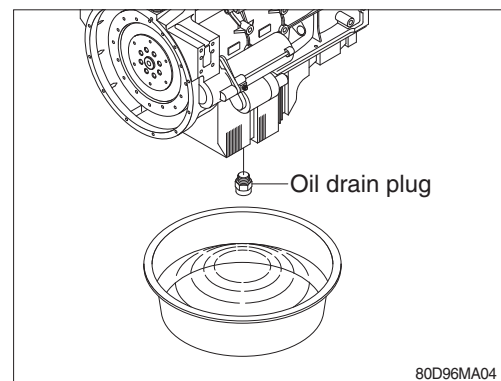
Check the oil level with the truck on a flat ground before starting engine.

- (1) Pull out the dipstick and wipe with a clean cloth.
 - (2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.
 - (3) If oil level is LOW, add oil and then check again.
- ※ If the oil is contaminated or diluted, change the oil regardless of the regular change interval.
 - ※ Check oil level after engine has been stopped for 15 minutes.
 - ▲ Do not operate unless the oil level is in the normal range.



2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

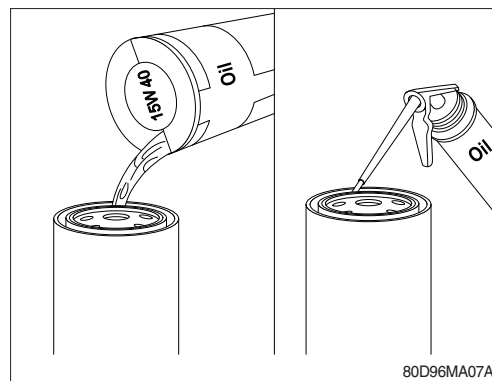
- (1) Warm up the engine until the water temperature reaches 60°C (140°F).
 - (2) Remove the oil drain plug. Drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine.
- ※ A drain pan with a capacity of 30 liters (7.9 U.S. gallons) will be adequate.
- (3) Clean around the filter head, remove the filter by the 1/2" socket wrench and clean the gasket surface.
- ※ The O-ring can stick on the filter head. Be sure it is removed before installing the new filter.



- (4) Apply a light film of lubricating oil to the gasket sealing surface before installing the filter.

※ Fill the filter with clean lubricating oil.

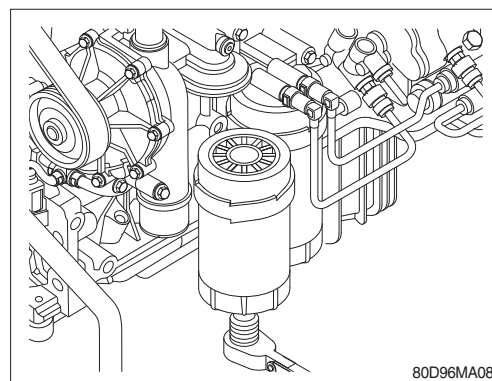
▲ The lack of lubrication during the delay until the filter is pumped full of the start-up can damage the engine.



- (5) Install the filter to the filter head.

※ **Mechanical over-tightening may distort the threads or damage the filter element seal.**

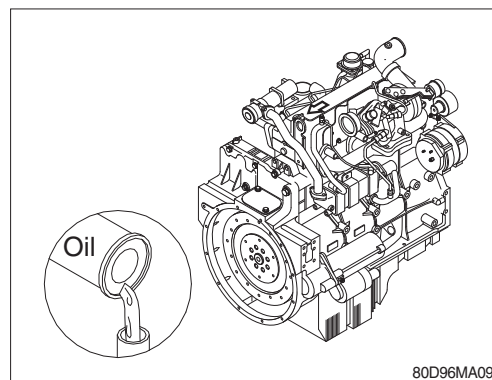
- Tighten the filter until the gasket contacts the filter head surface.
- Tighten 3/4 to 1 turn after gasket makes contact with the filter head.



- (6) Tighten the engine oil drain plug.

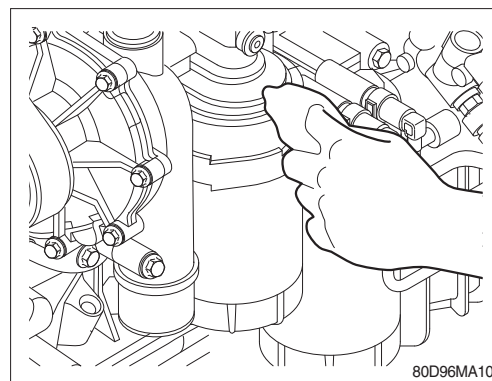
※ **Plastic oil pan drain plug torque 2.4 kgf · m (17.7 lbf · ft)**

- (7) Fill the engine with clean oil to the proper level.
- Quantity : 12 l (3.2 U.S.gallons)



- (8) Operate the engine at low idle and inspect for leaks at the filter and the drain plug.

Shut the engine off and check the oil level with the dipstick. Allow 15 minutes for oil to drain down before checking.

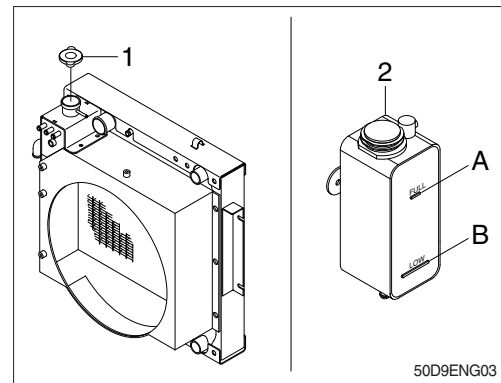


3) CHECK COOLANT LEVEL

- (1) Check the coolant level at reservoir tank.
- (2) Add the mixture of antifreeze and water after if coolant is not sufficient.
- (3) The coolant level should indicate between Full and Low.
- (4) Replace gasket of surge tank cap when it is damaged.

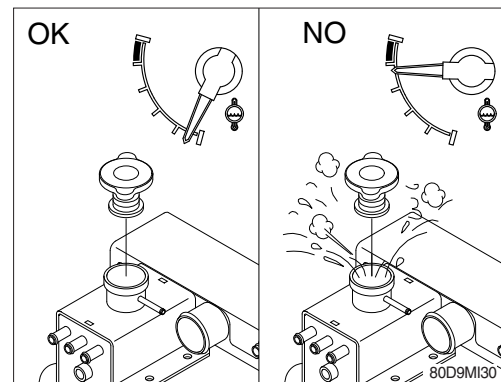
▲ Do not remove the surge tank cap from a hot engine. Wait until the coolant temperature is below 50°C (120°F) before removing the radiator cap. Heated coolant spray or steam can cause personal injury.

※ Do not add cold coolant to a hot engine ; engine castings can be damaged. Allow the engine to cool to below 50°C (120°F) before adding coolant.



- 1 Surge tank cap
2 Reservoir tank

- A Full
B Low



4) FLUSHING AND REFILLING OF RADIATOR

(1) Change coolant

- ▲ Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.

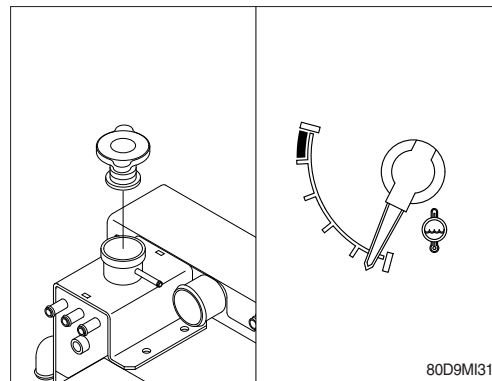
Avoid excessive contact-wash thoroughly after contact.

Keep out of reach of children.

- ※ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.

Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.

If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.

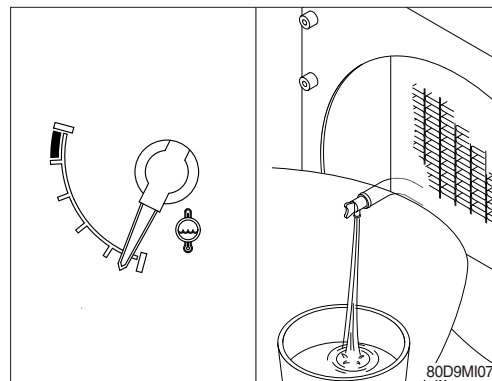


- ▲ Wait until the temperature is below 50°C (122°F) before removing the coolant system pressure cap.

Failure to do so can cause personal injury from heated coolant spray.

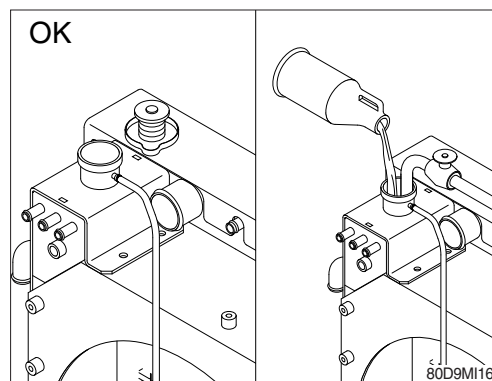
Drain the cooling system by opening the drain valve on the radiator and opening the drain valve on the bottom of the engine oil cooler housing.

A drain pan with a capacity of 45 liters (11.9 U.S. gallons) will be adequate.



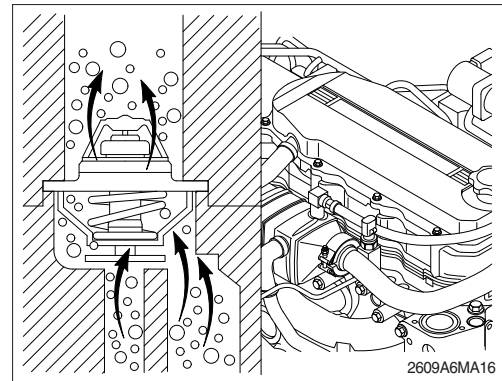
(2) Flushing of cooling system

- ① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).
- ※ Use 0.5 kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.
- ※ Do not install the surge tank cap. The engine is to be operated without the cap for this process.

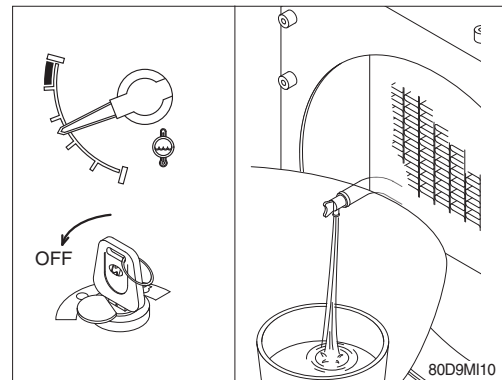


- ※ During filling, air must be vented from the engine coolant passages.

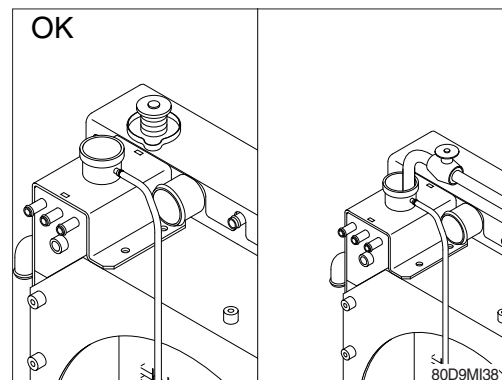
The system must be filled slowly to prevent air locks or serious engine damage can result. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



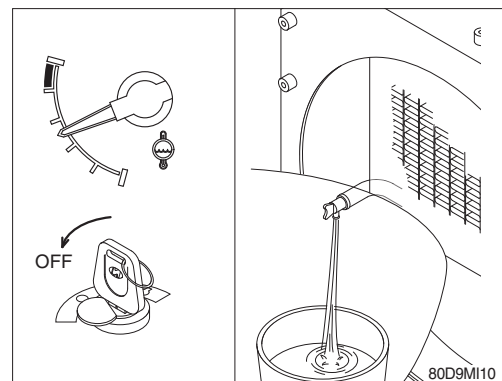
- ② Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F). Shut the engine off, and drain the cooling system.



- ③ Fill the cooling system with clean water.
 - ※ Be sure to vent the engine and aftercooler for complete filling.
 - ※ Do not install the surge tank cap or the new coolant filter.

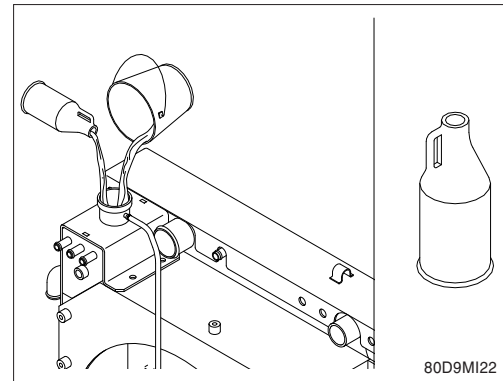


- ④ Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F). Shut the engine off, and drain the cooling system.
 - ※ If the water being drained is still dirty, the system must be flushed again until the water is clean.

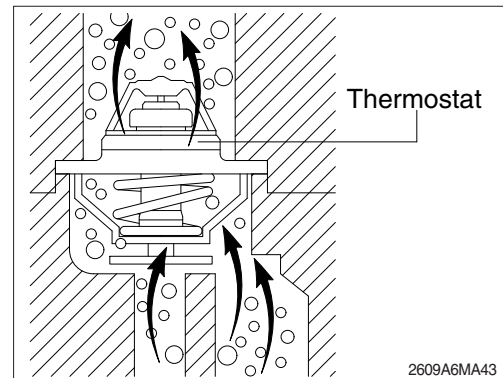


(3) Cooling system filling

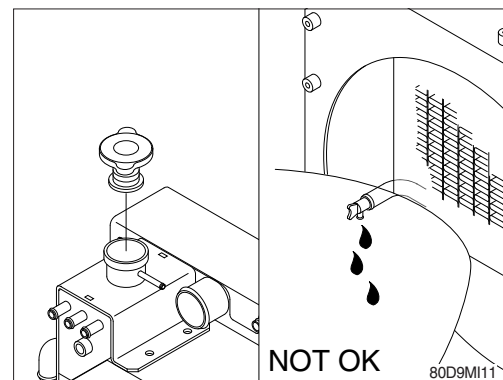
- ① Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 7-64.
 - ※ Use the correct amount of DCA4 corrosion inhibitor to protect the cooling system.
 - ※ Do not use hard water such as river water or well water.



- ② The system has a maximum fill rate of 19 liters (5.0 U.S. gallons) per minute. Do not exceed this fill rate.
 - ※ The system must be filled slowly to prevent air locks.During filling, air must be vented from the engine coolant passage.



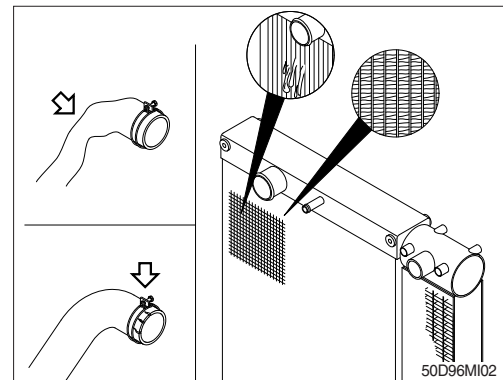
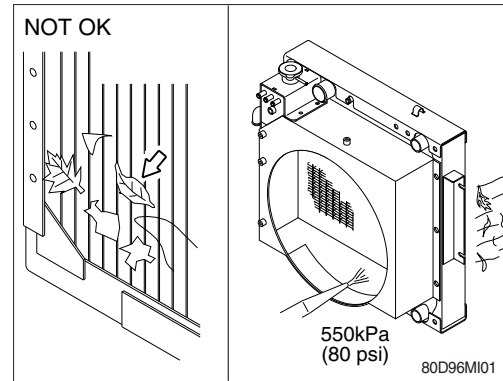
- ③ Install the pressure cap. Operate the engine until it reaches a temperature 80°C (176°F), and check for coolant leaks. Check the coolant level again to make sure the system is full of coolant.



5) CLEAN RADIATOR AND OIL COOLER

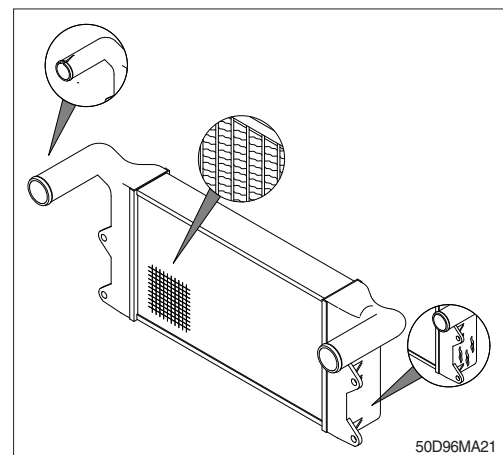
Check, and if necessary, clean and dry outside of radiator and oil cooler. After working in a dusty place, clean radiator more frequently.

- (1) Visually inspect the radiator for clogged radiator fins.
- (2) Use 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.
Blow the air in the opposite direction of the fan air flow.
- (3) Visually inspect the radiator for bent or broken fins.
※ If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement procedures.
- (4) Visually inspect the radiator for core leaks.



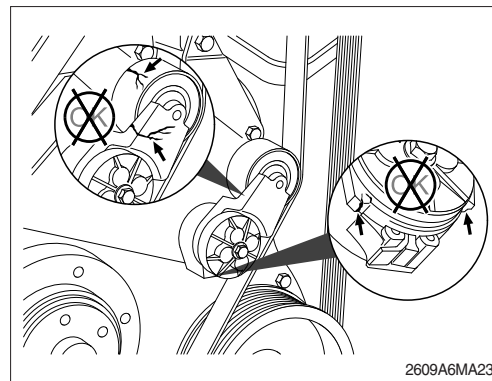
6) CHECK CHARGE AIR COOLER

Inspect the charge air cooler for dirt and debris blocking the fins. Check for cracks, holes, or other damage. If damage is found, please contact Hyundai distributor.



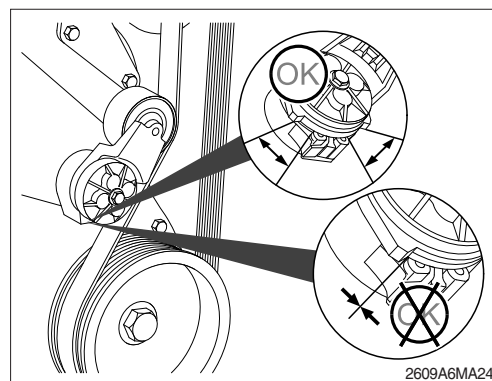
7) FAN BELT TENSIONER

- (1) With the engine stopped, check the tensioner arm, pulley, and stops for cracks. If any cracks are found, the tensioner must be replaced.



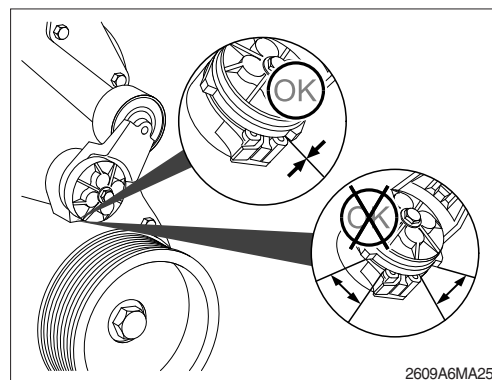
- (2) With the belt installed, verify that neither tensioner arm stop is in contact with the spring case stop.

After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, replace the tensioner.

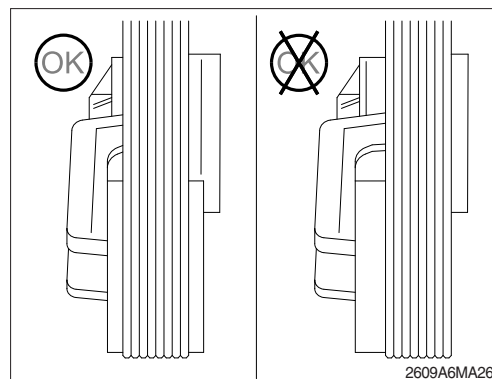


- (3) With the belt removed, verify that the tensioner arm stop is in contact with the spring case stop. If these two are not touching, the tensioner must be replaced.

※ **After replacing the belt, if the tensioner arm stop is still in contact with the spring case stop, the tensioner must be replace.**



- (4) Check the location of the drive belt on the belt tensioner pulley. The belt should be centered on, or close to the middle of, the pulley. Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-offs, or increase uneven tensioner bushing wear.



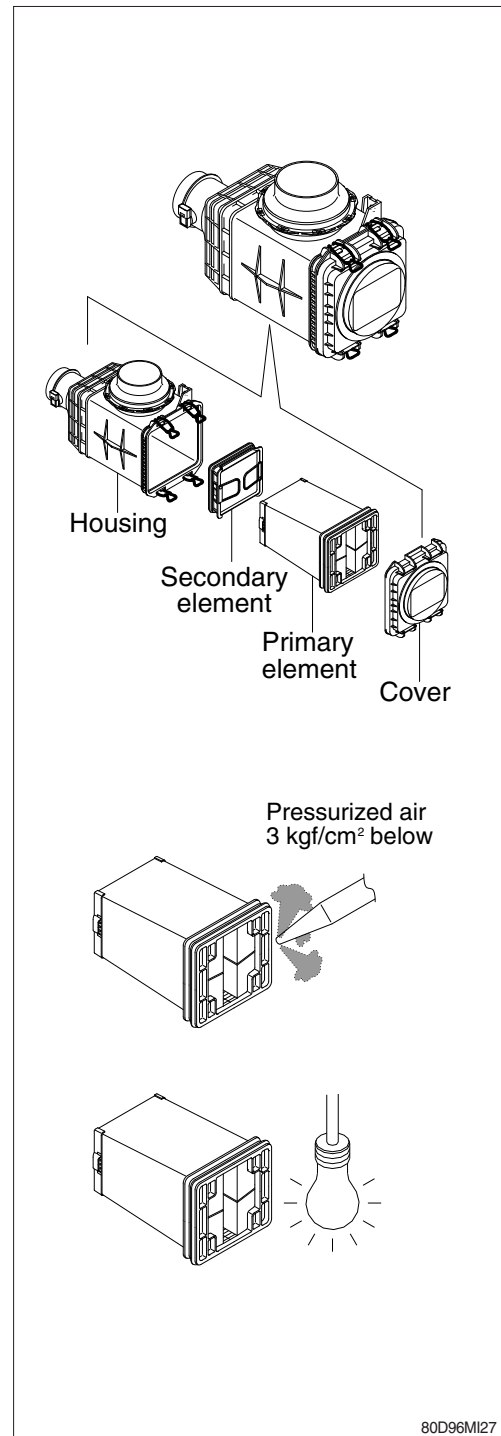
8) CLEANING OF AIR CLEANER

(1) Primary element

- ① Open the cover and remove the element.
- ② Wipe all contaminant and debris from inside the housing body.
- ③ Do not clean the filter element by striking or hitting the filter against any object to shake the debris from the filter element.
- ④ Clean the filter element with compressed air.
 - a. Remove dust from filter element by directing the compressed air into the opening of the air filter element.
 - b. Use 3 kg/cm^2 (40 psi) maximum air pressure and hold the compressed air nozzle at least 2.5 cm (1") away from the pleats while cleaning. Make sure to keep the clean side of air filter free of debris.
- ⑤ Visually inspect for damage to the filter elements and components. Use a light source to help identify any defects in the media. If any defects are observed discard the filter element and replace with a new primary filter element.
 - a. Before any type of cleaning, a visual inspection of the filter is needed. If there is any damage to the filter body, gaskets or endplates, do not clean or reuse; the filter should be discarded. Always clean filters in a clean environment, observe strict inspection procedures and repackage filters immediately after the cleaning process with appropriate materials.
 - b. Use observe proper safety precautions and dispose of waste materials in an environmentally compliant manner.
- ⑥ Re-install filter element into the air housing.
- ⑦ Replace the primary element at the fourth cleaning.

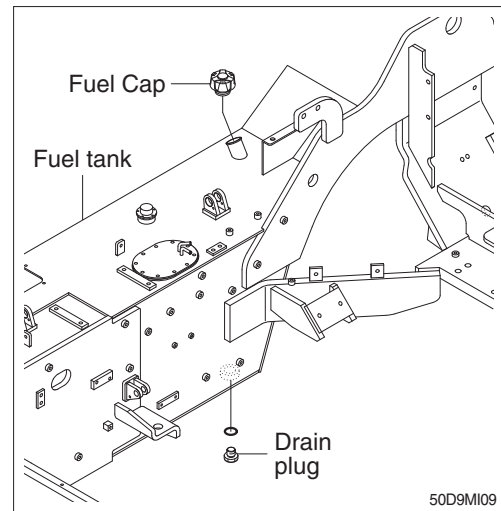
(2) Safety element

The safety filter element should never be cleaned since the safety filter is the last barrier to contaminant before it reaches engine/equipment. The useful life of the safety filter is equivalent to that of the primary air filter only if the primary filter element is being regularly cleaned. If the primary filter element is not cleaned, the safety filter should be changed at every third primary air filter change or after one year of continuous service, whichever occurs first.



9) FUEL TANK

- (1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the machine.
- (2) Drain the water and sediment in the fuel tank by opening the drain cock.
 - ※ **Be sure to LOCK the cap of fuel tank.**
 - ※ **Remove the strainer of the fuel tank and clean it if contaminated.**
- ▲ **Stop the engine when refueling.**
 All lights and flames shall be kept at a safe distance while refueling.

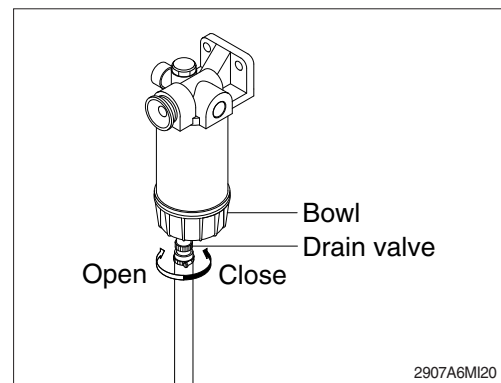


10) PREFILTER

- ※ **Inspect or drain the collection bowl of water daily and replace the element every 500 hours.**

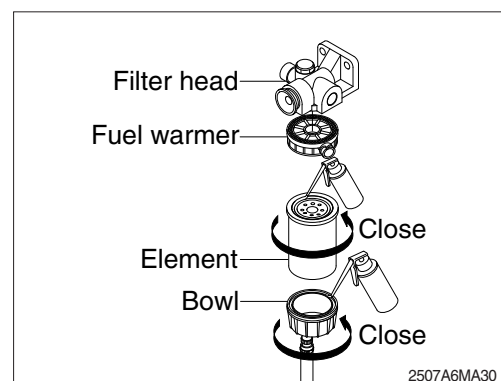
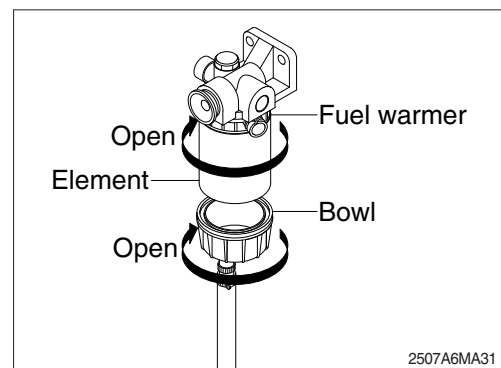
(1) Drain water

- ① Open bowl drain valve to evacuate water.
 - ② Close drain valve.
- ※ **Don't tighten up a drain valve so strong.**
 - ※ **Please inspect and drain water frequently for remain water volume to be less than 1/3 volume of a collection bowl.**



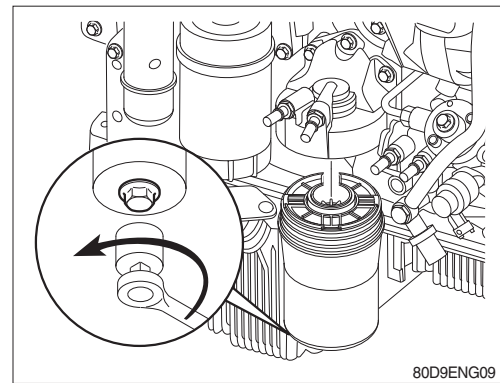
(2) Replace element

- ① Drain the unit of fuel. Follow "Drain water" instructions above.
- ② Remove element, fuel warmer and bowl from filter head.
- ※ **The bowl is reusable, do not damage or discard.**
- ③ Separate element from bowl. Clean bowl and seal gland.
- ④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.
- ⑤ Attach bowl to new element firmly by hand.
- ⑥ Lubricate new element seal and place in element top gland.
- ⑦ Attach the element, fuel warmer and bowl to the head.



11) REPLACEMENT OF FUEL FILTER

- (1) Remove the fuel filter cartridge (1) with 32 mm hex wrench.
- (2) Apply a thin layer of fuel to the surface of the new filter cartridge gasket before you put it on.
- (3) Tighten the new cartridge by hand.
- (4) Open the fuel valve and bleed the fuel system.
- (5) Operate the engine for a while and check if there is not the fuel leakage from the filter.

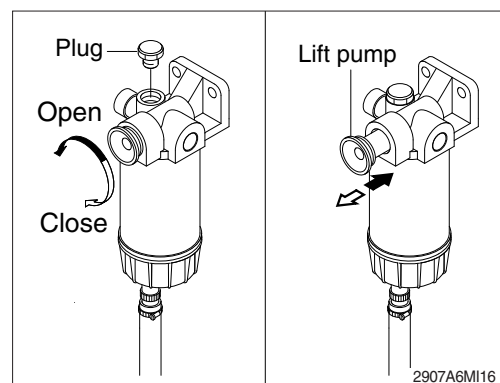


1 Fuel filter cartridge

12) BLEEDING THE FUEL SYSTEM

- (1) Loosen fuel supply line plug at the outlet of prefilter.
- (2) Do hand-priming the lift pump repeatedly until air bubbles comes out from fuel supply line completely.
- (3) Tighten fuel supply line to its origin position.

▲ The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Personal injury and property damage can result. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease to a lower level.



13) AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT FILTER

(1) Remove

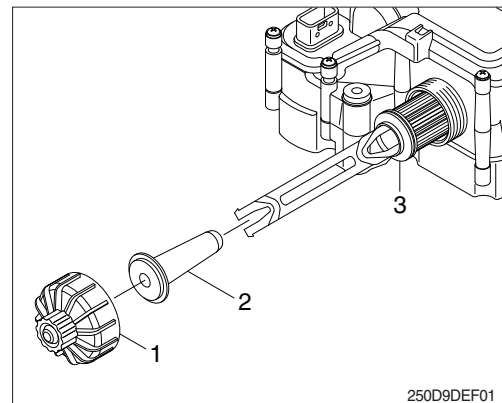
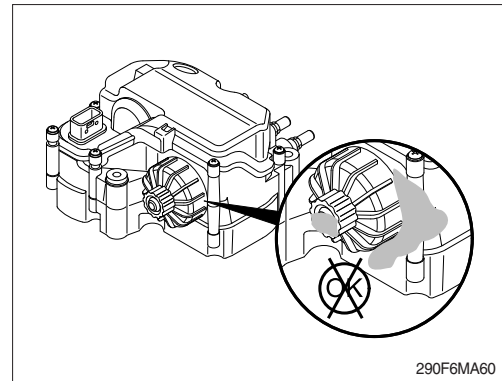
※ There may be residual DEF in the filter housing. A collection container placed below the DEF filter cap is recommended.

- ① Inspect the area around the seal and vent of DEF/AdBlue® supply module filter cap for signs of leakage.
- ② Unscrew the DEF filter cap (1). A 27 mm wrench can be used on the cap to aid in removal.
- ③ Remove the aftertreatment DEF filter equalizing element (2).
- ④ Remove the old aftertreatment DEF dosing unit filter element (3). A disposable service tool is included with the filter to aid in filter removal. Use the appropriate end of the tool, depending on the color of the plastic on the filter. When inserting the tool, a "click" sound can be heard which indicates proper engagement with the filter.

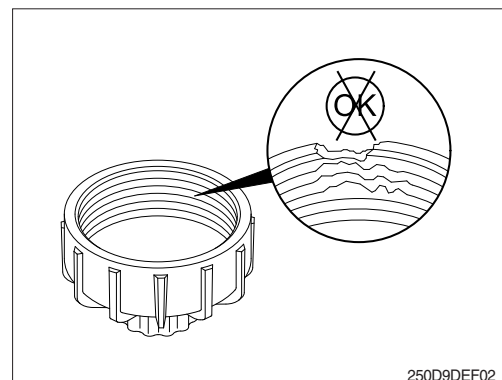
※ If the filter element and equalizing element are removed from the aftertreatment DEF dosing unit, they must be discarded and replaced; regardless of condition.

(2) Clean and inspect for reuse

- ① Inspect the aftertreatment DEF dosing unit filter cap for cracks or holes that could create a DEF leak path.
 - ② Check the condition of the threads on the aftertreatment DEF dosing unit cap.
- ※ If the threads are damaged, replace the aftertreatment DEF dosing unit filter cap.
- ③ Inspect the aftertreatment DEF dosing unit threads. This is especially important if the aftertreatment DEF dosing unit cap was damaged.
- ※ If the aftertreatment DEF dosing unit threads are damaged, replace the entire aftertreatment DEF dosing unit.

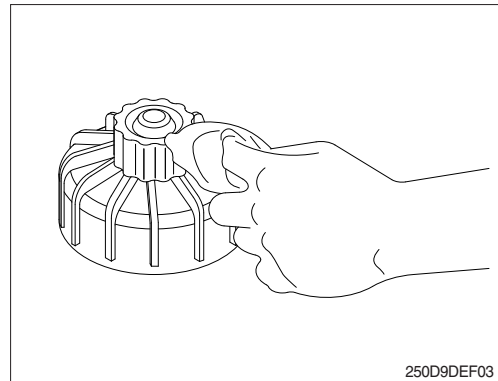


- 1 DEF dosing unit filter cap
- 2 DEF filter equalizing element
- 3 DEF dosing unit filter element



- ④ Clean the aftertreatment DEF dosing unit cap and threads on the dosing unit with warm water and a clean cloth.

※ **Never operate the truck with the DEF cap removed.**

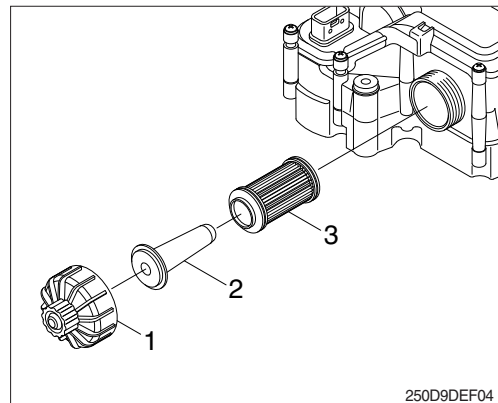


(3) Install

- ① Slide the DEF filter equalizing element (2) into the DEF filter cartridge (3).
- ② Insert the assembly into the aftertreatment DEF dosing unit.
- ③ Install and tighten the cap (1). A 27 mm wrench can be used to install and tighten the filter cap.
 - Tightening torque : 2.0 kgf · m (14.5 lbf · ft)

※ **Lubrication of the DEF filter O-rings is not required.**

※ **The aftertreatment DEF dosing system will not prime until the correct SCR temperatures are reached. To verify that there are no DEF leaks, test drive the truck for a minimum of 15 minutes to get the SCR system up to temperature.**

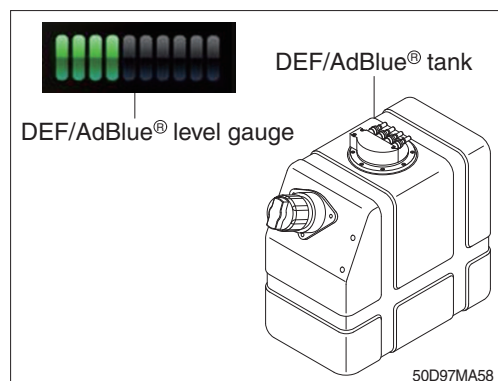


- 1 DEF dosing unit filter cap
- 2 DEF filter equalizing element
- 3 DEF dosing unit filter cartridge

14) DEF/AdBlue® TANK

- (1) The DEF/AdBlue® tank level must be checked daily with DEF/AdBlue® level gauge.

▲ **It is unlawful to tamper with or remove any component of the aftertreatment system. It is also unlawful to use a catalyst solution that does not meet the specifications provided or the operate the machine with no catalytic solution.**



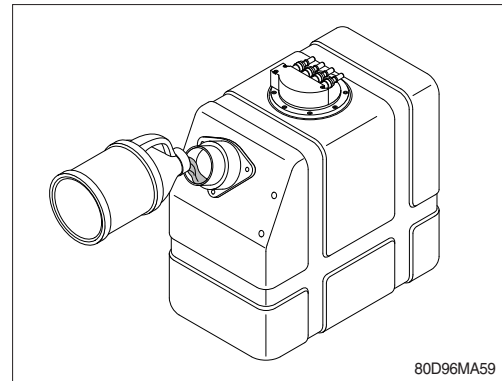
- (2) If the DEF/AdBlue® level is found to be below, DEF/AdBlue® must be added.

Before filling the tank

- ① Switch off the engine.
- ② Secure the truck against rolling away. Always fill the tank with at least 5 liters, as smaller amounts could cause malfunctions.

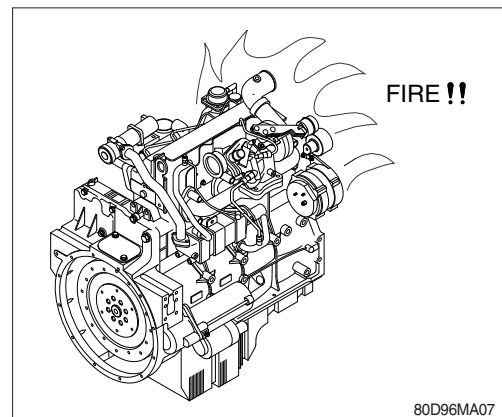
▲ Do not allow diesel fuel to run into the DEF/AdBlue® tank. Otherwise, you could damage the exhaust gas aftertreatment system.

▲ Do not mix additives to DEF/AdBlue®.



15) LEAKAGE OF FUEL

- ▲ Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these parts can cause fire.

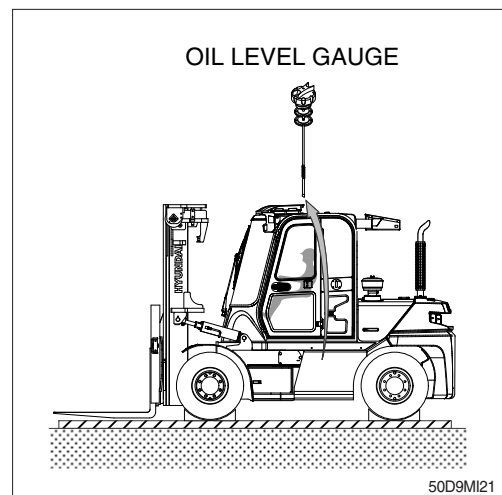


16) HYDRAULIC OIL CHECK

- (1) Lower the forks on the ground at a flat location as in the illustration. Stop the engine and then leave for about 5 minutes.

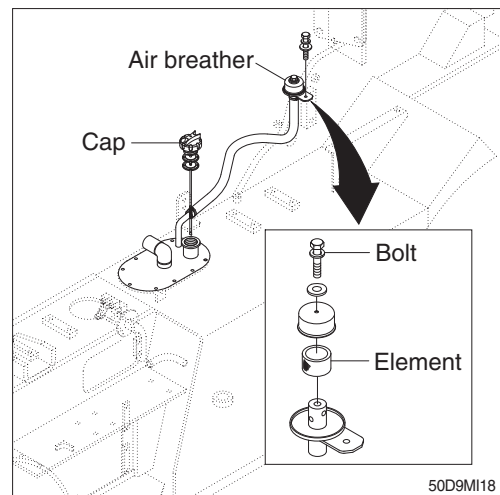
- (2) Check the oil level at the level gauge. The level gauge is located on the left side of the hydraulic oil tank.

※ Add hydraulic oil, if necessary.



17) FILLING HYDRAULIC OIL

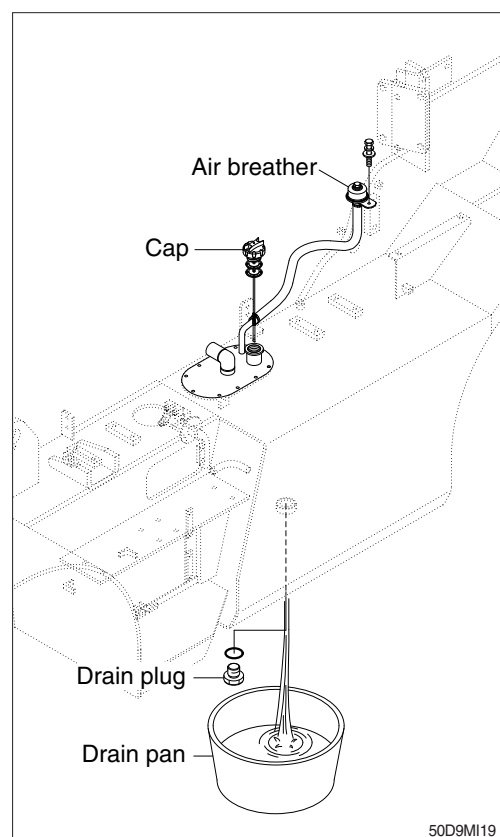
- (1) Stop the engine to the position of level check.
- (2) Check air breather filter element and replace it if necessary.
- (3) Loosen cap and fill the oil to the specified level.
- (4) Start engine after filling and operate the work equipment several times.
- (5) Check the oil level at the level check position after engine stops.



18) CHANGE THE HYDRAULIC OIL

- (1) Lower the forks on the ground and extend the tilt cylinder to the maximum.
- (2) Loosen the cap and relieve the pressure in the tank.
- (3) Prepare a suitable drain pan.
- (4) To drain the oil loosen the drain plug.
- (5) After draining oil, tighten the drain plug.
- (6) Fill proper amount of recommended oil.
- (7) Start engine and run continually. Release the air by full stroke of control lever.

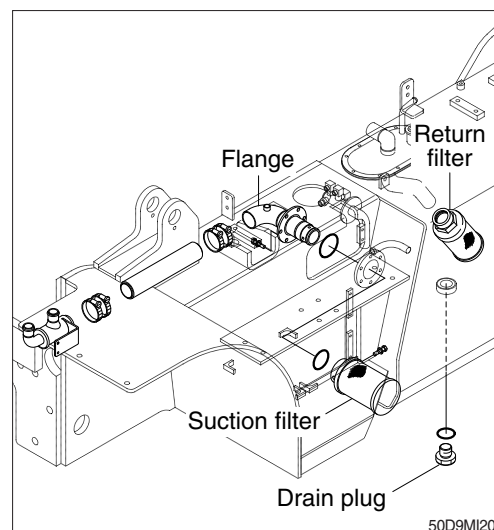
※ **The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps for leakage or damage.**



19) CLEANING AND REPLACING RETURN FILTER

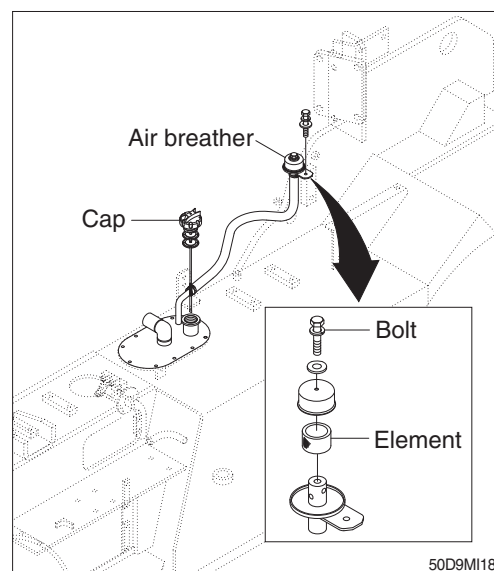
Clean and replace the return filter in the following manner.

- (1) Remove the flange by loosening the mounting bolt.
- (2) Remove the return filter from the tank.
- (3) Replace the return filter element with a new one.
- (4) Install the cover on the tank.
 - Tightening torque : $3.4 \pm 0.7 \text{ kgf} \cdot \text{m}$
($24.6 \pm 5.0 \text{ lbf} \cdot \text{ft}$)



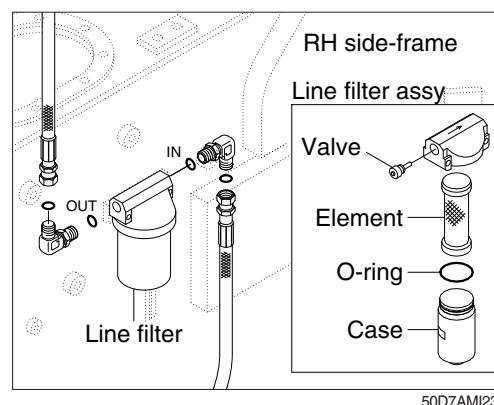
20) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

- (1) Loosen the cap and relieve the pressure in the tank.
- (2) Loosen the screw and remove the cover.
- (3) Pull out the element.
- (4) Replace the element with a new one.
- (5) Reassemble by reverse order of disassembly.
 - Tightening torque : $1.14 \sim 1.74 \text{ kgf} \cdot \text{m}$
($8.2 \sim 12.6 \text{ lbf} \cdot \text{ft}$)



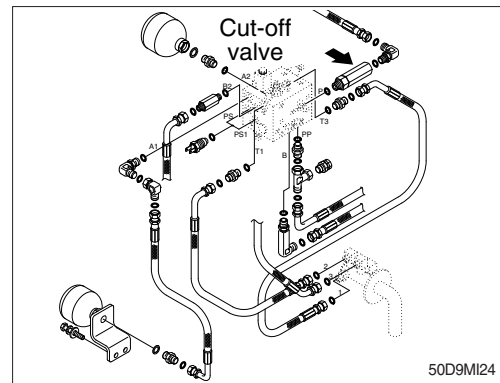
21) REPLACE OF PILOT LINE FILTER

- (1) Loosen the filter case.
- (2) Pull out the filter element and clean the filter case.
- (3) Replace the filter element and O-ring with new parts.
- (4) Reassemble the line filter.



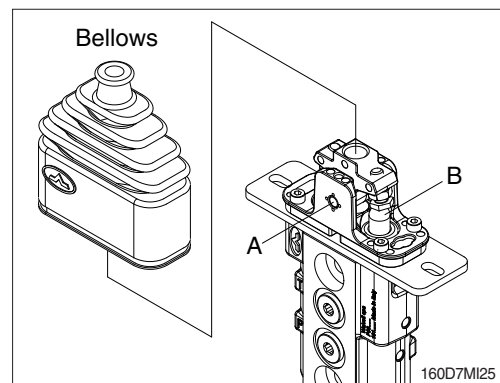
22) CLEANING BRAKE LINE FILTER

- (1) Remove the strainer from the filter body.
- (2) Wash the strainer with cleaning oil.
- (3) Install and tighten with specified torque.
 - Tightening torque : 4.5~5.5 kgf · m
(32.5~39.8 lbf · ft)



23) LUBRICATE RCV LEVER

Remove bellows and grease the joint (A) and the sliding parts (B).



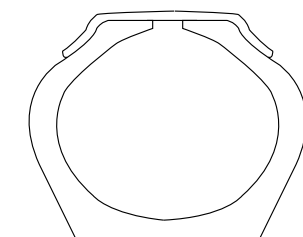
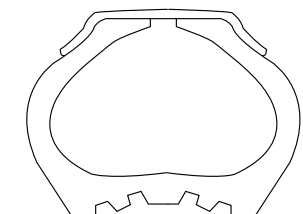
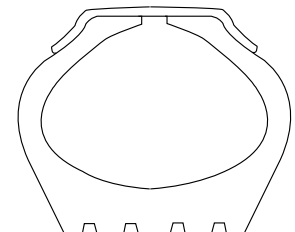
24) TIRE PRESSURE

- (1) Inappropriate tire pressure is a primary cause for tire damage. Insufficient tire pressure will damage internal carcass of tire. Repeated excessive bending will damage or break the carcass. Excessive pressure will also cause premature damage of tire.
- (2) Recommended tire pressure (When tire is cooled)

Model	Size	Pressure
50/60/70D-9	8.25-15, 14PR	8.0 kgf/cm ² (114 psi)
80D-9	9.00-20, 14PR	7.5 kgf/cm ² (107 psi)

- (3) Continuous operation will produce heat and increase pressure on tire. But such phenomenon was already taken into account when designing a tire. Do not try to remove normally increased air because tires may be crushed or overinflated.
- (4) The three major causes for excessive heat and pressure of tire are insufficient pressure, excessive load and overspeed. Avoid excessive load and overspeed in order to keep tires in good shape.

- ⚠ **Do not inflate tires using flammable gases or alcohol injector.**
This cause explosion or personal injury.
- ⚠ **Inflate tires at the pressure level recommended by the manufacturer, and check periodically pressure and wear of tires.**
- ⚠ **When replacing the inflated tire, do not stand near the tire.**
- ※ **Check the tire when the tire is at normal temperature and the truck is not loaded.**



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- ⚠ **Do not use recycled wheel parts.**
- ⚠ **When removing lockering or inflating tire, use safety cable or chain to ensure safety.**
Be sure to bleed air before removing lockering. Never inflate tires unless the lockering is assembled in its place.

※ **Avoid the followings when traveling.**

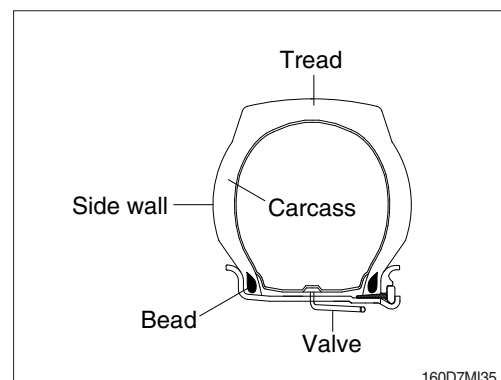
- ① Rubbing tires against road bank or rack at cargo-unloading spot.
- ② Tires slippage during working.
- ③ Abrupt starting of the truck.
- ④ When oil, grease or gasoline smeared on tire, clean those. Otherwise it may cause of permanent deformation.

25) REPLACEMENT OF TIRE

- ⚠ **Disassembly, reassembly, replacement and repair of tire requires special skills and equipment. Contact a tire repair shop.**

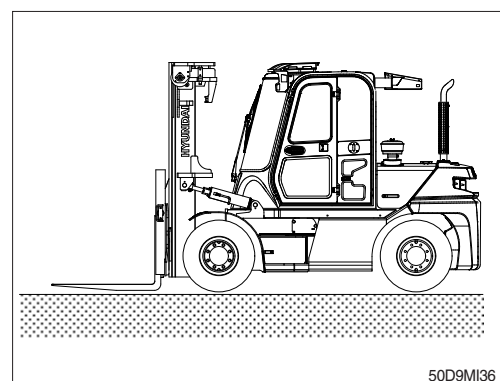
(1) Tires to be replaced

- ① Tires with broken or bent bead wires
- ② Tires exposed more than 1/4 of carcass fly.
- ③ Tires whose carcass is damaged more than 1/3 of the tire width.
- ④ Tires which show fly separation.
- ⑤ Tires which has a radial crack near the carcass.
- ⑥ Tires which are judged to be unsuitable for use because of deformation or damage.

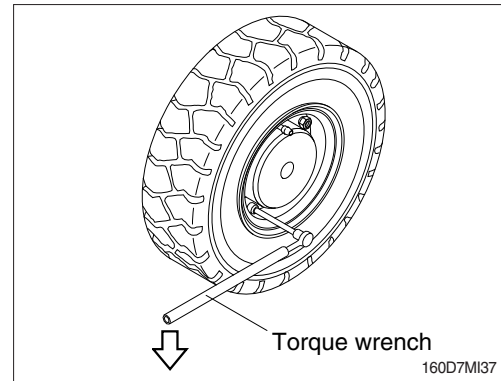


(2) Separation of tire

- ① After moving the truck to flat ground, lower the fork to the ground and pull the parking brake lever to lock position.

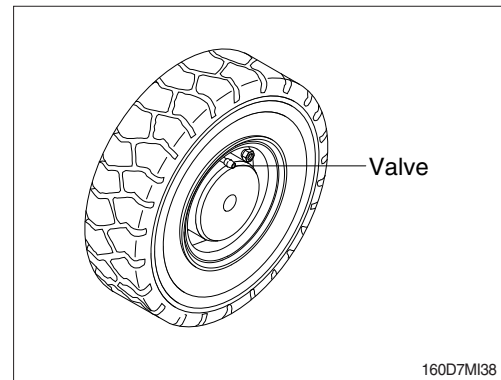


- ② Loosen slightly all wheel mounting.
 - Tools : Socket 32mm
 - Torque wrench
 - Extension bar
- ③ Lift the truck with a jack.
- ④ Loosen all wheel mounting nuts and replace the tire.



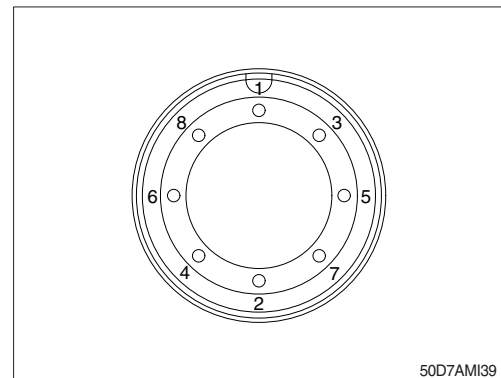
(3) Direction of tire to be installed

- ① Be careful that the valve should be facing the outside.



(4) Mounting of tire

- ① Lightly tighten nuts as shown in the illustration.
- ② Lower the jack after tire is replaced.
- ③ Tighten nuts according to the specified tighten torque.
 - Tightening torque : 61.2 kgf · m (443 lbf · ft)

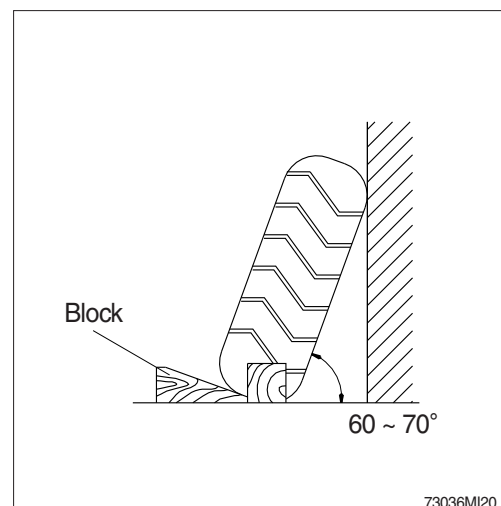


26) STORING TIRES AFTER REMOVAL

As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter. If the tire are stored outside, always erect a fence around the tires and put up "No Entry" and other warning signs that even young children can understand.

Stand the tire on level ground, and block it securely so that it cannot roll or fall over.

If the tire should fall over, get out of the way quickly. The tires for industrial truck are extremely heavy, so trying to hold the tire may lead to serious injury.

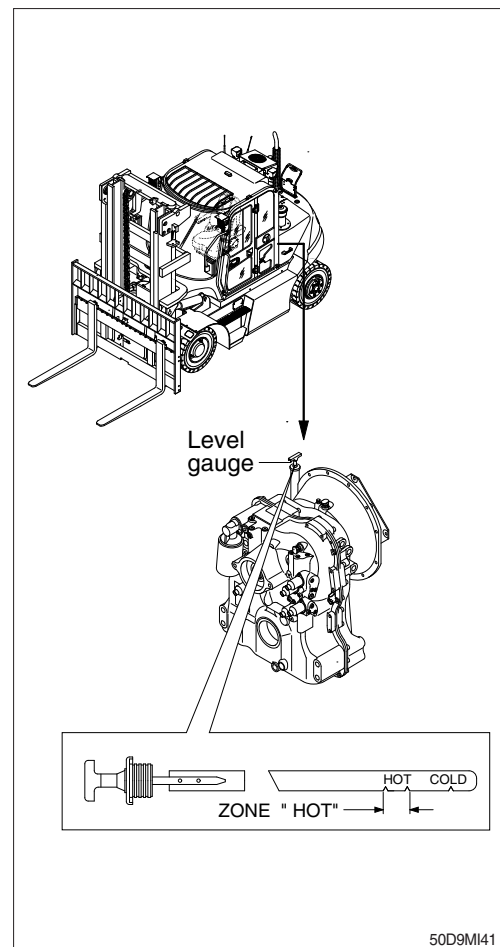


27) CHECK TRANSMISSION OIL LEVEL

The oil level check must be carried out as follows;

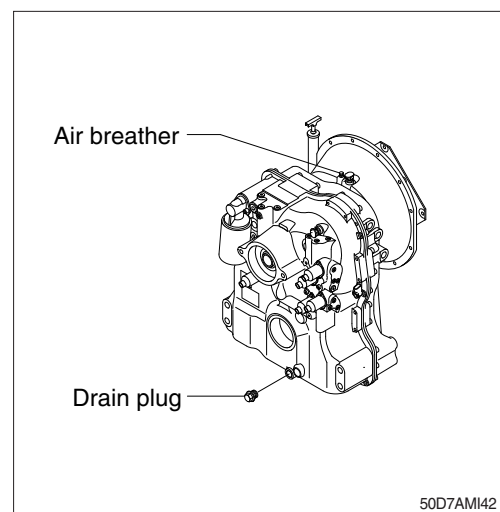
- (1) Oil level check (weekly).
- (2) At horizontally standing the truck.
- (3) Transmission in neutral position.
- (4) In cold start phase, the engine must be running about 2~3 minutes at idling speed, and the marking on the oil level gauge must then be lying above the cold start mark COLD.
- (5) Check oil level at operating temperature of the transmission (about 80~90°C) and the engine idling speed.
 - ① Loosen oil level gauge by counterclockwise rotation, remove and clean it.
 - ② Insert oil level gauge slowly into the oil level tube until contact is obtained, and pull it out again.
 - ③ On the oil level gauge, the oil level must be lying in the zone HOT.
 - ④ Insert the oil level gauge again, and tighten it by clockwise rotation.

▲ When checking, apply the parking brake and fix the tires with blocks.

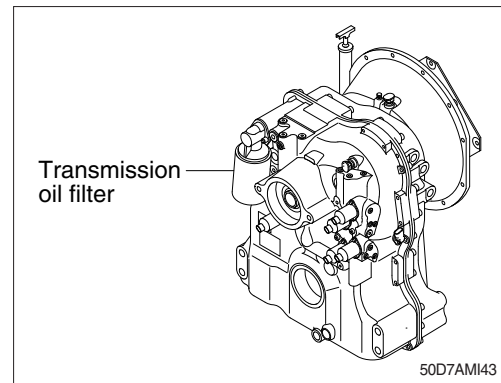


28) REPLACEMENT OF TRANSMISSION OIL AND FILTER ELEMENT

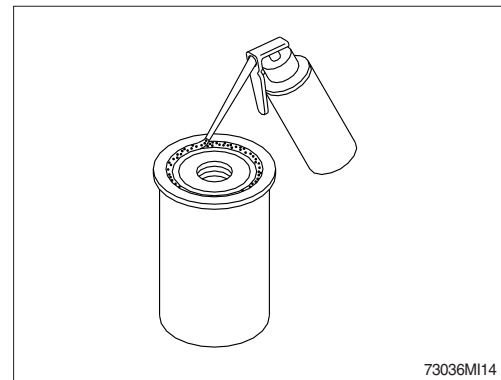
- (1) Operate the truck for a few minutes in order to warm the transmission oil.
- (2) Move the truck to flat ground. Lower the forks to the ground and slightly apply downward force.
- (3) Apply the parking brake and stop the engine.
- (4) Open transmission air breather to relieve internal air pressure.
- (5) Remove the transmission drain plug. Allow the transmission oil to drain into a suitable container.



- (6) Remove the transmission oil filter cartridge.
Dispose of the used transmission oil filter cartridge properly.
- (7) Clean the filter cartridge mounting base.
Remove any part of the filter cartridge gasket that remains on the filter cartridge mounting base.



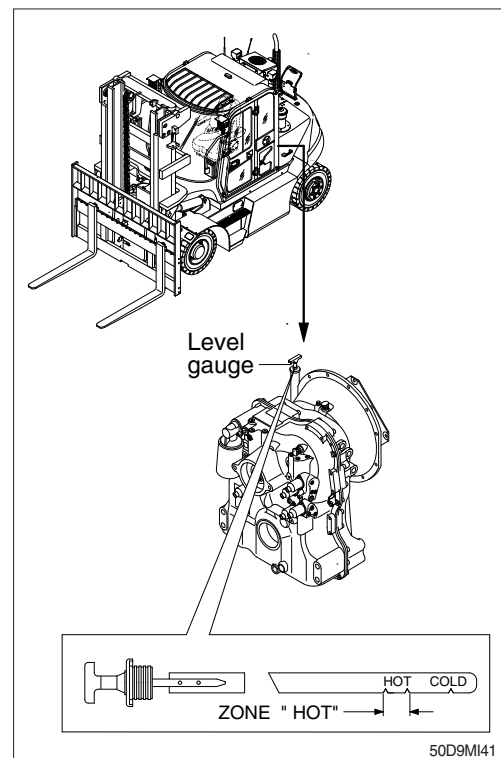
- (8) Apply a light coat of oil to the gasket of a new transmission oil filter cartridge.
- (9) Install the new transmission oil filter cartridge.
Screw the filter in until contacts with the sealing surface is obtained and tighten it now by hand about 1/3 to 1/2 turn.



- (10) Mount the drain plug of the transmission after cleaning it.
- (11) Fill the oil through the level gauge inlet and check if the oil is at the appropriate level.
- (12) The proper oil amount is 18 liters (4.8 U.S. gallons)

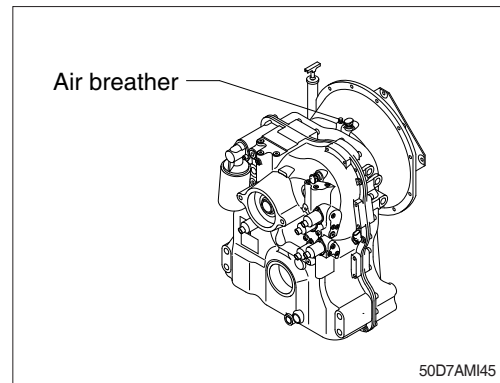
⚠ As the truck is hot after operation wait until the temperature has dropped.

⚠ It is imperative to pay attention to absolute cleanliness of oil and filter.
Binding is in any case the marking on the oil level gauge.



29) CLEANING TRANSMISSION AIR BREATHER

- (1) Remove dust or debris around the air breather.
- (2) Remove the air breather and wash it with the cleaning oil.



30) DIFFERENTIAL CASE

(1) Differential oil

Park the truck in a level place. Set the mast vertical, and raise the forks approx. 1m. Put blocks under the fork carriage.

Then stop the engine and apply the parking brake.

(2) Oil level check

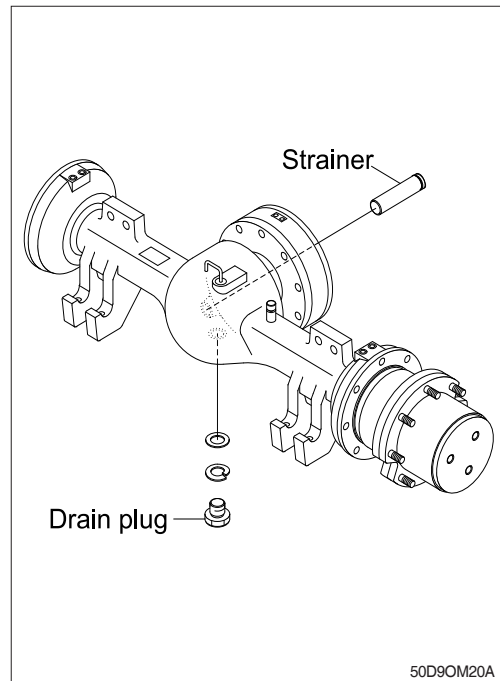
Remove the level gauge, and check the oil level. In case of planetary gears, remove the plug and check that the oil is filled up to the hole.

(3) Change

Change oil after removing the drain plug.

Clean the drain plug and the strainer. and then assemble them. Add oil to the proper height of the gauge through the hole in the level gauge.

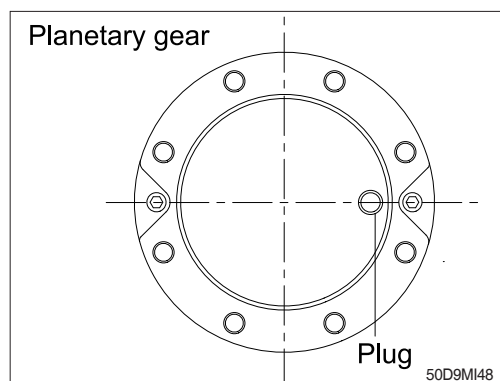
In the case of planetary gears, add oil until oil flows through the plug hole. Dispose of the used oil in locally approved manner.



⚠ When checking the oil level, apply the parking brake and fix the tires with blocks.

⚠ As the machine is hot after operation, wait until the temperature has dropped.

※ Set the plug of planetary gear in parallel to the ground.



31) LUBRICATION

(1) Supply grease through the grease nipple, using the grease gun.

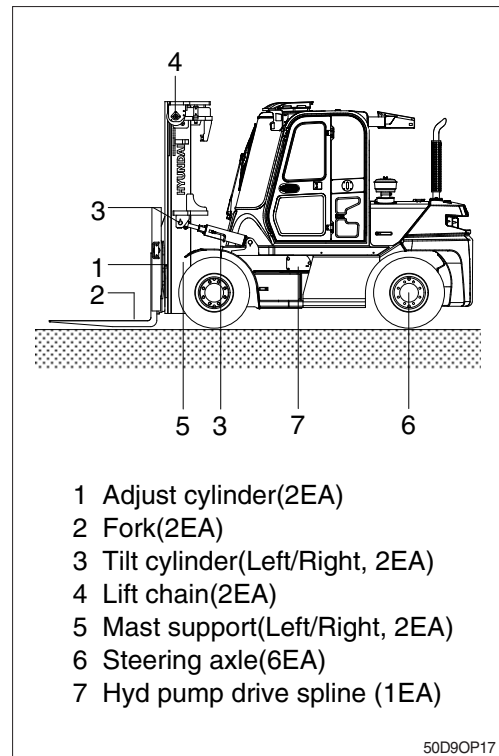
(2) After lubricating, clean off spilled grease.

▲ Apply the parking brake and fix the front and rear tires with blocks.

▲ Set the mast and forks in a stable position.

(3) Lubrication points

- ① Adjust cylinder : 2EA
- ② Forks : 2EA
- ③ Tilt cylinder : Left/Right, 2EA
- ④ Lift chain : 2EA
- ⑤ Mast support : Left/Right, 2EA
- ⑥ Steering axle : 6EA
- ⑦ Hydraulic pump drive spline : 1EA



32) FORKS REPLACEMENT

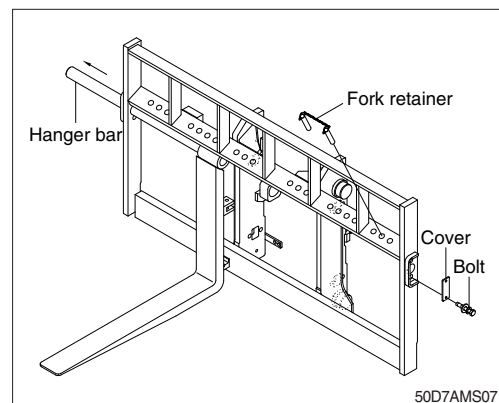
① Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.

② Release the fork retainer and remove the cover. Slide one hanger bar at a time out of carriage assembly.

③ Remove only one fork at a time.

※ On larger forks it may be necessary to use a block of wood.

④ Reverse the above procedure to install the forks.



33) MAINTENANCE OF WORK EQUIPMENT

- (1) Lubricate to each point of working device.
Lubricate the grease to grease nipple in accordance with lubrication intervals.

No.	Description	Qty
A	Fork adjustment cylinder pin	2
B	Fork shaft	1
C	Tilt cylinder pin	2
D	Load chain	2
E	Mast support pin	2
F	Chain sheave pin	2

- ※ **Shorten lubricating interval when working in the water or dusty place.**

- (2) Check for wear and tear of work equipment pins and bushings.
(3) Check for damage of forks and mast linkage part.

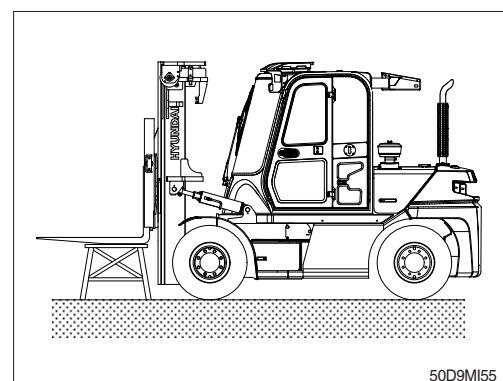
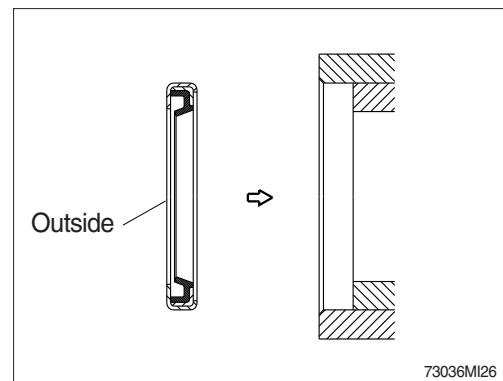
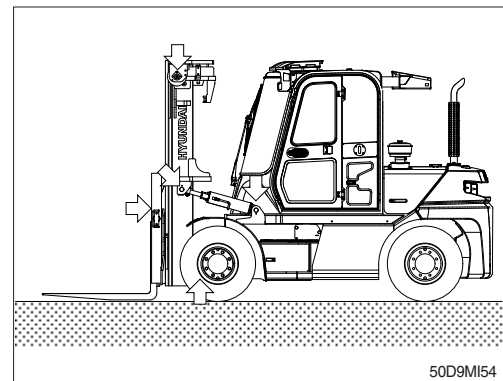
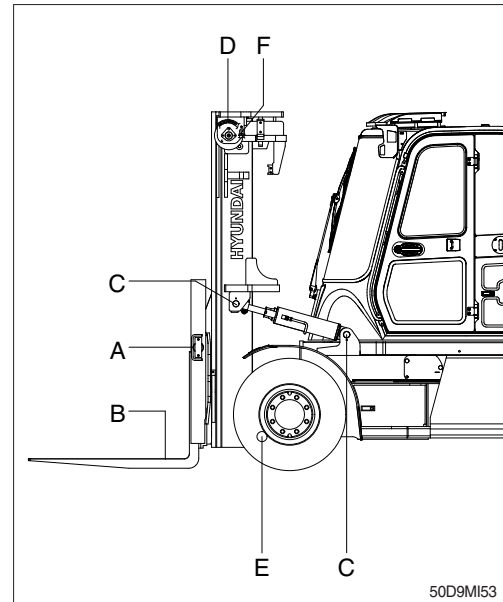
- ※ **Check daily and lubricate the fork positioner hanger bar and bottom plate where the fork is contacted, or the forks may vibrate temporarily while positioning.**

- (4) Dust seal are mounted on the rotating part of working device to extend the lubricating interval.

- ※ **Mount the lip to be faced out side when replace the dust seal.**
※ **If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.**
※ **Make sure the seals are not damaged or deformed.**

34) WORK EQUIPMENT SUPPORT

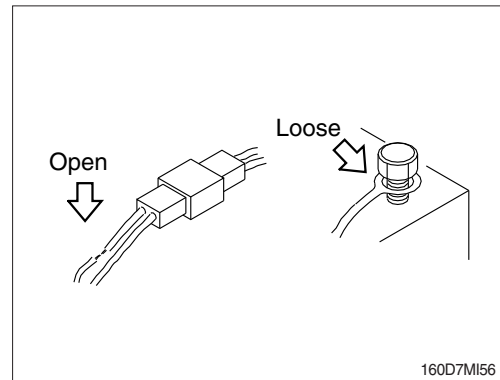
When carrying out inspection and maintenance with the forks raised, fit a stand under the forks securely to prevent the work equipment from coming down. In addition, set the work equipment control levers to the hold position.



8. ELECTRICAL SYSTEM

1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



2) WELDING REPAIR

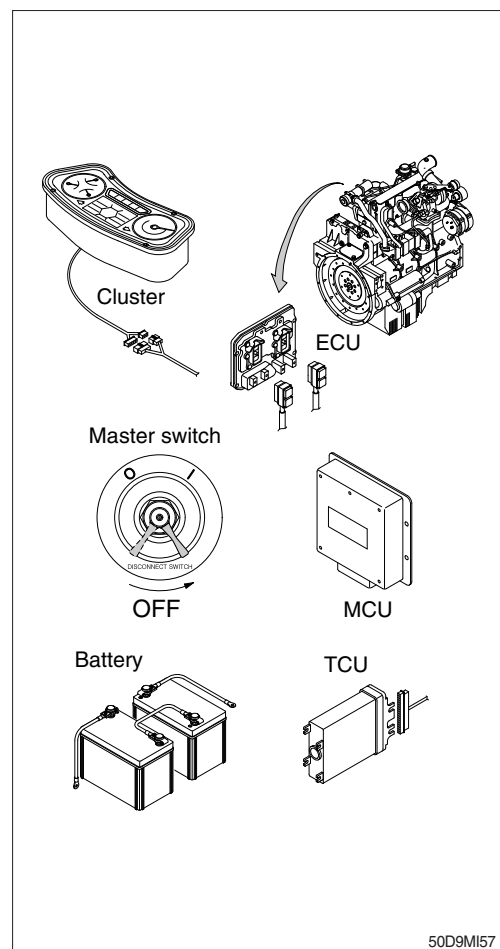
Before start to welding, follow the below procedure.

- (1) Shut off the engine and remove the starting switch.
- (2) Disconnect ground cable from battery by master switch.
- (3) Before carrying out any electric welding on the machine, the battery cables should be disconnected and the connectors pulled out of the electronic control units (MCU, ECU, TCU, cluster etc).
- (4) Connect the earth (ground) lead of the welding equipment as close to the welding points as possible.

※ Do not weld or flame cut on pipes or tubes that contain flammable fluids. Clean them thoroughly with nonflammable solvent before welding or flame cutting on them.

▲ Do not attempt to welding work before carry out the above.

If not, it will caused serious damage at electric system.

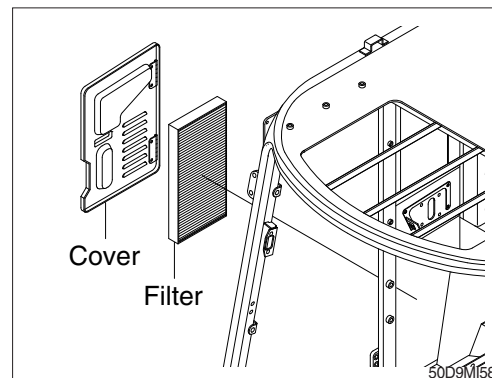


9. AIR CONDITIONER AND HEATER

1) CLEANING AND REPLACING FILTER

※ Always stop the engine before servicing.

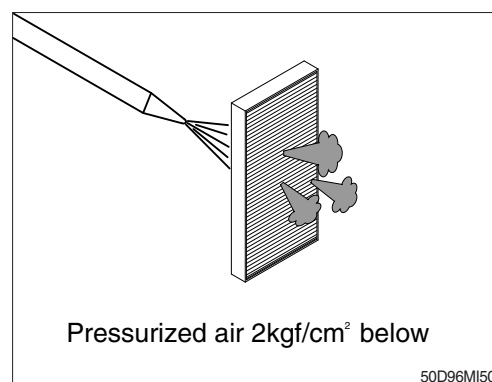
- (1) Open the door, loosen the wing bolt and remove the recircular plenum assembly.



- (2) Clean the recircular plenum using a pressurized air (Below 2 kgf/cm², 28 psi).

△ When using pressurized air, be sure to the safety glasses.

- (3) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



2) PRECAUTIONS FOR USING AIR CONDITIONER

- (1) When using the air conditioner for a long time, open the window once every one hour.
- (2) Be careful not to overcool the cab.
- (3) The cab is properly cooled if the operator feels cool when entering there from outside (About 5°C lower than the outside temperature).
- (4) When cooling, change air occasionally.

3) CHECK DURING SEASON

Ask the service center for replenishment of the refrigerant or other maintenance service so that the cooling performance is not damaged.

4) CHECK DURING OFF-SEASON

Operate the air conditioner 2 or 3 times a month (Each for a few minutes) to avoid loss of oil film in the compressor.

5) REFRIGERANT

(1) Equipment contains fluorinated greenhouse gas.

Model	Type	Quantity	GWP
50/60/70/80D-9	HFC-134a	0.55 kg (1.21 lb)	787 CO ₂ eq.

※ GWP

Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO₂). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO₂.

(2) Envior

The air conditioning system of the machine is filled with HFC-134a refrigerant at the factory. HFC-134a refrigerant is a fluorinated greenhouse gas and contributes to global warming. Do not release refrigerant into the environment.

(3) Safety precautions

Work on the air conditioning system must only be performed by a qualified service technician. Do not attempt to perform work on the air conditioning system. Wear safety goggles, chemical resistant gloves and appropriate personal protective equipment to protect bare skin when there is a risk of contact with refrigerant.

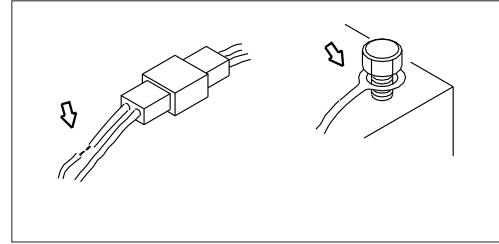
(4) Action in case of exposure

- ① Eye contact / Limited skin contact
Rinse with warm water and apply a light bandage. Seek medical attention immediately.
- ② Extensive skin contact
Rinse with warm water and carefully heat the area with warm water or warm clothing. Seek medical attention immediately.
- ③ Inhalation
Leave the area and find fresh air. Seek medical attention immediately.

10. REPLACEMENT AND CHECK

1) WIRING, GAUGES

Check regularly and repair the loose or malfunctioning gauges when found.



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2) BATTERY

(1) Clean

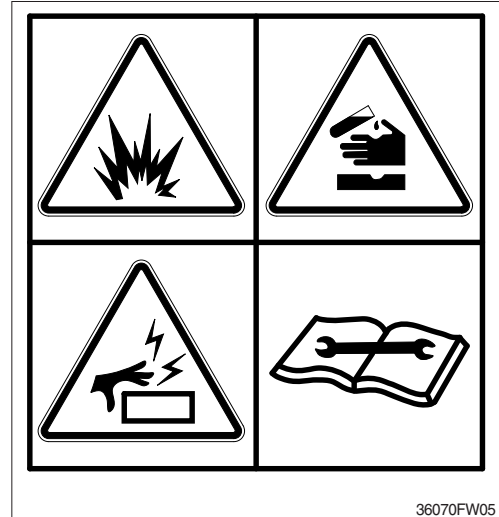
- ① Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

▲ The battery gas can explode. Keep sparks and flames away from the batteries.

▲ Always wear protective glasses when working with the batteries.

▲ Do not stain clothes or skin with the electrolyte as it is acid.

Be careful not to get the electrolyte in the eyes. Wash with clean water and go to the doctor if it enters the eyes.



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(2) Recycle

Never discard a battery.

Always return used batteries to one of the following locations.

- A battery supplier
- An authorized battery collection facility
- Recycling facility

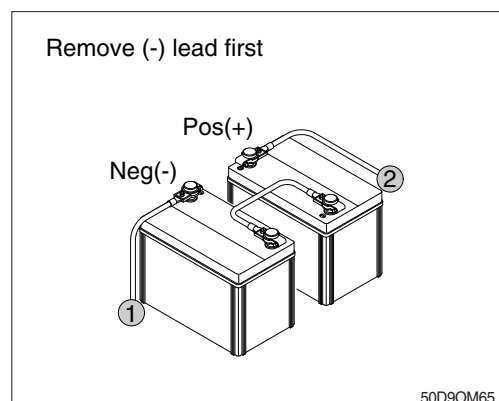
(3) Removing and installing

- ① Remove the lead from the ground side (Normally the (-) terminal side) of the battery. It is dangerous to let a tool, etc., touch the (+) terminal and the body at the same time, since this causes a spark.

- ② When remounting, connect the ground connection last

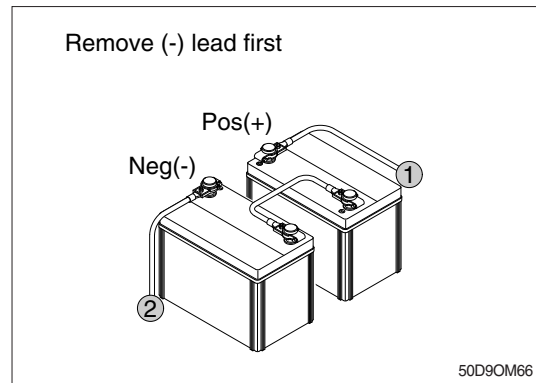
▲ Do not allow tools to touch the (+) terminal and the body of the truck at the same time. This can cause sparking and explosion.

When reinstalling the cables after replaced the battery, pay close attention to maintaining the same alignment state of the cables as it was when supplied. Otherwise, the machine can be exposed to the fire hazards.



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▲ Prior to reinstall the cable, inspect in detail and confirm the condition of the cables and replace it when the cables possess any kind of abnormal damages such as cracking and wear out of the cable sheath that make you feel some dangerous to use it. Do consult an expert about this matter when you are not able to judge its condition. It is strongly recommended to keep the surroundings of the battery cables clean so that the machine can be freed from the risk of firing by eliminating the flammable contaminations such as oil, dust and etc. acting as a fire developer. Dispose of the old battery in locally approved manner.



3) TRANSMISSION OIL

▲ Do not touch hot components or allow hot oil to contact your skin.

(1) Transmission oil

Park the truck in a level place and lower the forks. Apply the parking brake. The gear selector in neutral position.

(2) Oil level check

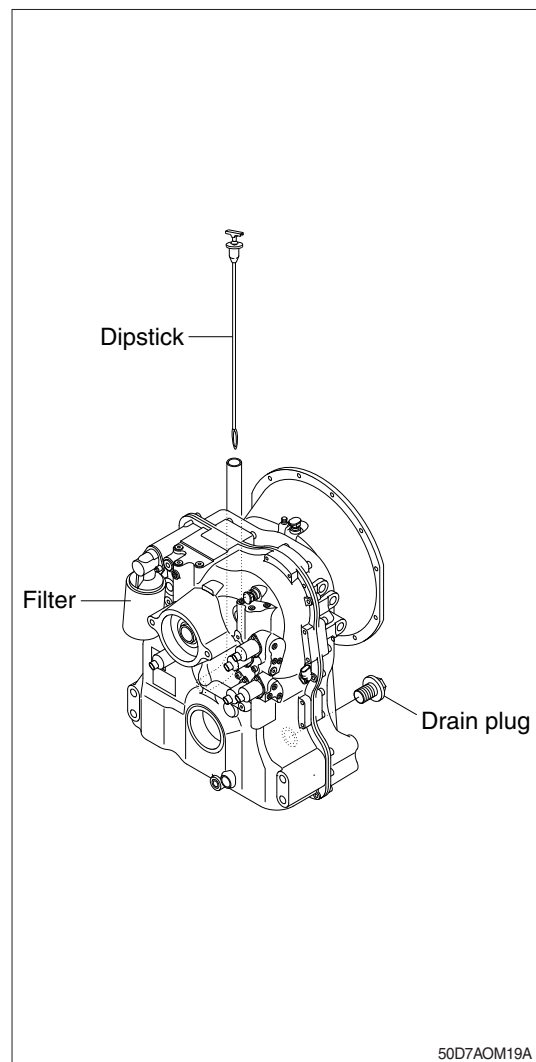
- ① At the engine idling speed.
- ② Open inspection plate, and oil level can be checked using the dipstick.
- ③ Add oil through the oil filler plug if necessary. Always check the oil level using the dipstick
- ④ after add oil.

(3) Change

- ① Remove the drain plug.
- ② When changing oil, remove the strainer and clean it with flushing oil.

▲ OSHA approved eye protection rated for 2 kgf/cm² (30 psi) is required for the air cleaning operation.

- Blow dry compressed air from the inside of strainer to outside and install when completely dry.
- Dispose of the old oil in locally approved manner.



4) COOLING SYSTEM

(1) Radiator fins cleaning

Remove dust between the radiator fins with compressed air. The steam or water may be used instead of compressed air. Air pressure should be less than 2 kgf/cm² kPa (30 psi). The nozzle of the cleaning device should be held about 50 mm (2 in) from the radiator fins. Also, check the rubber hose connected to the radiator. Replace if cracked or deteriorated. Check that the hose clamps are tight.

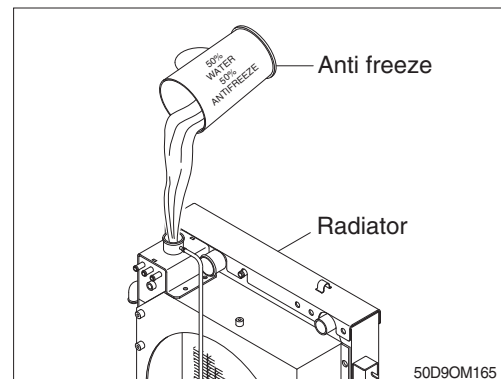
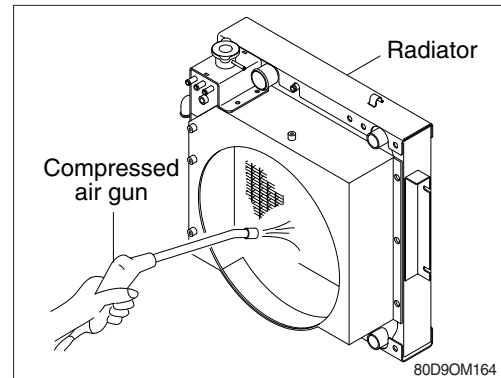
▲ Be sure to keep the air or steam nozzle at right angles to the radiator. Wear the safety glasses and a face shield when using the compressed air.

(2) Radiator cleaning

- ① Close the drain valves and add clean, soft water (City water, etc.) through the water filler. Add the radiator cleaner and run the engine at idling speed for 15 minutes.
- ② Stop the engine and drain water from the drain valves.
- ③ Add clean water and run at idling speed (5 to 10 minutes). Then stop the engine and drain water.
- ④ Close the drain valves and fill the radiator with clean water.

▲ For low temperatures, add antifreeze. (See the cold weather operation for details). When not using antifreeze, add anticorrosive compound. Park the truck on level ground and clean the radiator.

※ Dispose of old antifreeze mixture in locally approved manner.



5) TIRE REPLACEMENT

- ① Park the truck in a safe and level place suitable for changing the tire. Then lower the forks, stop the engine, and apply the parking brake.

▲ The tires are under high inflation pressure, so failure to follow the correct procedures, when changing or servicing the tires and rims could cause the tire to explode, causing serious injury or damage. The tires and rims should always be serviced or changed by trained personal using the correct tools and procedures. For details of procedures, contact your HYUNDAI dealer. Wear safety glasses and a face shield when using compressed air.

- ② Block the tire at the opposite corner from the tire to be replaced.
- ③ Loosen the lug nuts slightly with a lug nut wrench.
- ④ Jack up the truck to raise the tire from the ground, then remove the lug nuts and take off the tire.

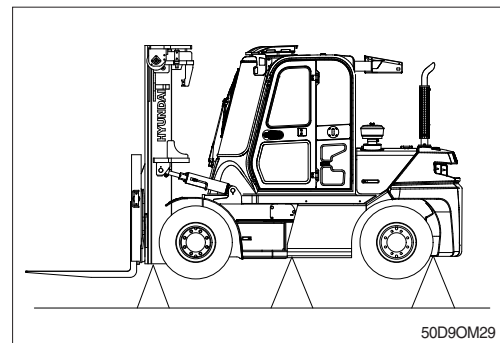
※ **Points to fit jack when jacking up**

Front tires: Bottom of outer mast or bottom of the frame.

Rear tires: Bottom of counterweight or bottom of the rear axle.

▲ When jacking up the truck, always check carefully that the jack does not come out of position. When jacking up the truck, never go under the truck. For wheels using a separate type rim, check first that the rim nut is not loose before loosening the lug nuts. Be careful not to mistake the rim nuts and lug nuts.

When assembling separated type rims with bolts and nuts, check any damage and tighten them to the specified tightening torque. Change the bolts and nuts with new ones after using twice for your safety.



- ⑤ Replace the tire and tighten the lug nuts partially. The mounting faces of the wheel, lug nuts and wheels must be free from any dirt or lubricant of any kind.
- ⑥ Tighten the lug nuts on opposite sides in turn, and check that there is no play in the wheel.
- ⑦ Lower the jack to lower the truck to the ground, then tighten the lug nuts to the specified tightening torque (For details, see service data).
- ⑧ Check and adjust the inflation pressure.

Tire inflation pressure : For details, see page, 5-3 CHECK BEFORE STARTING ENGINE.

▲ Precautions for adjusting the inflation pressure when repairing a puncture.

※ **The tires used on the forklift trucks have a high inflation pressure, so any cracks or deformation of the rim are extremely dangerous. When adjusting the inflation pressure, do not raise the pressure above the correct level under any circumstances. If the pressure of the compressor is not adjusted beforehand, the pressure inside the tire will rise to the maximum air pressure of the compressor, and this may cause a serious accident. Therefore, always be extremely careful when carrying out this work.**

6) FUSES REPLACEMENT

COVER P/N : 2DFQ-10300		HORN/ CAB TILT 경음기/ 캐빈탈탈	STOP LAMP 정지등	RMCU/ MONITOR 알림세유/ 모니터	CLUSTER/ MCU 클러스터/ 제어기	TCU B+ 트랜스미션 컨트롤러 상시전원	DEF SENSOR 재생 센서	DEF MODULE HEATER 재생 모듈 히터	DEF LINE HEATER 재생 라인 히터	AIRCON 에어컨	ROOM LAMP 실내등
		10A	10A	10A	10A	10A	10A	10A	20A	5A	5A
		CLUSTER/ RADIO 계기판/ 라디오	FUEL HEATER 연료예열	ECM IG 전자 제어기	TCU IG 트랜스미션 컨트롤러	HEAD LAMP 전조등	REAR WORK LAMP 미등/ 작업등	TAIL/ BEACON LAMP 미등/ 경광등	TURN/ BACK UP LAMP 방향 지시등/ 후진등	WIPER MOTOR 와이퍼 모터	MCU/ MONITOR 제어기/ 모니터
		10A	20A	10A	10A	15A	10A	10A	10A	10A	10A
		AIR CON MAIN 에어컨	AIR COMP/ CONDENSER 에어 컴프/ 콘덴서	CIGAR/ ATTACH CUT 시가/ 작업장치 차단	CONVERTOR/ LOAD SENSOR 컨버터/ 부하 센서	TOP WIPER/ PARK SOL 와이퍼/ 주차 솔레노이드		OPTION 옵션	START RELAY 시동 릴레이	ECM B+ 제어기	
		20A	15A	10A	10A	15A		10A	10A	30A	

COVER P/N : 2DFQ-10310		DEF HEATER2 RELAY 히터재생 릴레이2 CR-62	AUTO-PARK RELAY 자동 주차 릴레이 CR-56	WIPER Lo RELAY 와이퍼 (Lo) 릴레이 CR-4	PREHEAT AUX RELAY 보조 예열 릴레이 CR-42	NEUTRAL RELAY 중립 릴레이 CR-5
		DEF HEATER3 RELAY 히터재생 릴레이3 CR-63	DEF HEATER1 RELAY 히터재생 릴레이1 CR-61	WIPER RELAY 와이퍼 릴레이 CR-26	WIPER HI RELAY 와이퍼 (HI) 릴레이 CR-39	STARTER LOCK RELAY 시동 잠금 릴레이 CR-36

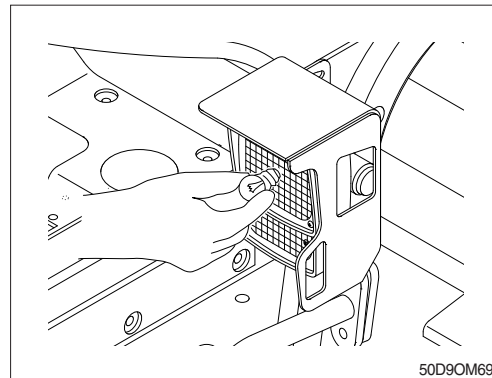
2DFQ-10101

- ① Turn the starting switch OFF.
- ② Open the cover of the fuse box, and replace fuses inside (To open the cover of the fuse box, push the side of the cover lightly with a finger, and pull the cover forward to remove it.)

▲ When replacing the fuse, check the relationship between the fuse and the electrical components it protects. Always replace fuses with a fuse of the same capacity. Always turn the starting switch OFF before replacing any fuse.

7) LAMP BULBS REPLACEMENT

Lamp	Spec (24V)
Head lamp	70W
Turn signal lamp	LED
Clearance lamp	LED
Stop lamp	LED
Backup lamp	10W
License lamp (option)	10W
Beacon lamp (option)	Strobe type
Rear work lamp	70W



▲ After checking that the fuse is not blown and that there is no disconnection in the wiring harness, replace the lamp bulb.

8) FUNCTIONAL TESTS

You will start the engine to complete the functional tests, so be sure that:

- The parking brake is applied.
- Directional control is in NEUTRAL.
- Forks are fully lowered to the floor or ground.
- All controls are in neutral or other correct position.
- You are familiar with the safety procedures given in section 5, **Starting and operating procedures**, in this manual.

As you test the following components, be sure they are properly mounted and working correctly.

(1) Horn

Press the horn button to check the horn function. If the horn or any other part does not operate, report the failure and have it repaired before the truck is put into operation.

(2) Hour meter

Start the engine and let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal. Check the hour meter for operation with the engine running. Write the hour meter reading on the PM report form. Report any malfunction or damage.

(3) Indicator lights

Check that all lights are functioning and indicate normal truck operation as described in section 3, **Know your truck**, in this manual.

(4) Service brakes and inching pedal

With the direction control in NEUTRAL and the engine running, push the service brake pedal fully down and hold. The brakes should apply before the pedal reaches the floorplate. If the pedal continues to creep downward, report the failure immediately. Do not operate the truck until the brakes are repaired. Perform the same check with the inching pedal. (Additional braking/inching checks will follow).

(5) Parking brake

Check the function of the parking brake. Release, then reapply. To check parking brake holding capability, park the lift truck on a grade and apply the parking brake. The parking brake should hold a lift truck with rated load on a 15% grade.

⚠ Do not operate a lift truck if the service or parking brakes are not operating properly.

(6) Lift mechanisms and controls

Pull back on the tilt control lever and hold until the mast reaches the full back tilt position. Push forward on the lever to return the mast to the vertical position. Release the lever.

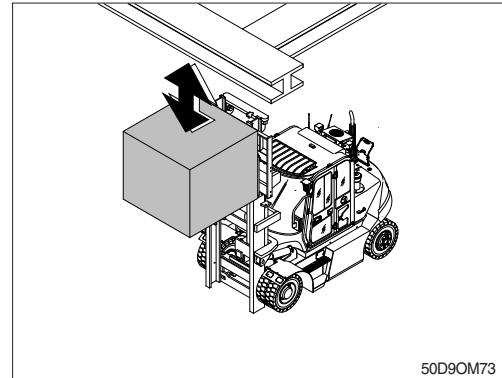
⚠ Be sure that there is adequate overhead clearance before raising the mast.

Pull back on the lift control lever and raise the fork carriage to full height. Watch the mast assembly as it rises. Release the lever.

If the maximum fork height is not reached, this indicates there is an inadequate(low) oil level in the hydraulic sump tank or severe binding within the mast.

Push forward on the lift control lever. Watch the mast as it lowers. When the forks reach the floor, release the lever.

All movements of the mast, fork carriage, and lift chains must be even and smooth, without binding or jerking. Watch for chain wobble or looseness; the chains should have equal tension and move smoothly without noticeable wobble.



(7) Auxiliary controls (Option)

If your lift truck is equipped with an attachment, test the control lever for correct function and briefly operate the attachment.

(8) Steering system

- ※ **The steering system, steering axle, and steering linkage on your truck should be inspected periodically for abnormal looseness and damage, leaking seals, etc.. Also, be alert for any changes in steering action. Hard steering, excessive freeplay (Looseness), or unusual sound when turning or maneuvering indicates a need for inspection or servicing.**

Check the steering system by moving the steering handwheel in a full right turn and then in a full left turn. Return the handwheel to the straight ahead position. The steering system components should operate smoothly when the handwheel is turned. Never operate a truck that has a steering system fault.

▲ Fasten your seat belt before driving the truck.

(9) Direction control, braking and inching

- ※ **Be sure that the travel area is clear in front of the truck.**

- ① Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from NEUTRAL to FORWARD.
- ② Remove your right foot from the service brake pedal and put it on the accelerator pedal. Push down until the truck moves slowly forward. Remove your foot from the accelerator pedal and push down on the service brake pedal to stop the truck. The brakes should apply smoothly and equally.

- ※ **Be sure the travel area is clear behind the truck.**

- ③ Put the directional control lever in the REVERSE travel position. Release the service brake and push down on the accelerator pedal until the truck moves slowly in the reverse direction. Remove your foot from the accelerator pedal and push down on the service brake pedal to stop the truck. The brakes should apply smoothly and equally.
- ④ Put the directional control in FORWARD. Press the inching pedal fully down and hold. Depress the accelerator. The truck should not move. Now, with the accelerator still depressed, slowly release the inching pedal until the truck **Inches** forward smoothly and slowly.

- ※ **Report any problems.**

- ※ **When you have completed the operational tests, park and leave the truck according to standard shut down procedure as described in section 5 of this manual. Be sure to make a record of all maintenance and operating problems you find.**

9) FLUIDS, FILTERS AND ENGINE ACCESSORIES

To check fluid levels and other components within the engine compartment, unlatch and open the hood to access the engine compartment.

▲ To avoid the possibility of personal injury, never work in the engine compartment with the engine running, except when it is absolutely necessary to check or make adjustments. Take extreme care to keep hands, tools, loose clothing, etc., away from the fan and drive belts. Also remove watches, bracelets, and rings.

(1) Engine accessories

Inspect the engine coolant hoses and fan belt (s). Look for leaking and obvious damage, worn (frayed) condition, breaks, etc. that could cause failure during operation.

(2) Engine air cleaner

Check the engine air cleaner for damage and contamination(excessive dirt build-up and clogging). Be sure that the air cleaner hose is securely connected(not loose or leaking). Fan or cone shaped dust deposits on tube or hose surfaces indicate a leak.

Change or service the air cleaner element every 500 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator.

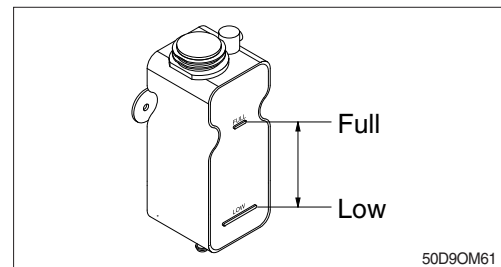
(3) Battery

Inspect the battery for damage, cracks, leaking condition, etc.. If the terminals are corroded, clean and protect them with HYUNDAI battery saver(Available from your HYUNDAI dealer).

▲ EXPLOSIVE GASES : Do not smoke or have open flames or sparks near the batteries. An explosion can cause injury or death.

(4) Engine cooling system

To check the engine coolant level open the hood to the engine compartment. Visually inspect the recovery bottle, locate the Full and Low marks. The Full mark indicates maximum level at operating temperature. The Low mark indicates additional coolant needs to be added to the system.



△ A level anywhere between the Full and Low marks is normal.

※ Inspect the coolant level in the overflow bottle only.

▲ Do not remove the radiator cap when the radiator is hot. STEAM from the radiator will cause severe burns. Do not remove the radiator cap to check the coolant level.

▲ Never remove the radiator cap while the engine is running. Stop the engine and wait until it has cooled. Failure to do so could result in serious personal injury from hot coolant or steam blowout and/or damage to the cooling system or engine.

If the level is low, add a 50/50 mixture of specified coolant and water to the correct level. If you have to add coolant more than once a month or if you have to add more than one quart at a time, check the coolant system for leaks.

- Check the engine oil for presence of coolant leaking into the engine.
- Inspect the coolant for condition. Look for excessive contamination or rust or oil in the coolant solution.
- Check the PM time interval for need to change the coolant.
- Check the condition of radiator cap rubber seal and radiator filler neck for damage. Be sure they are clean.
- Check overflow hose for logging or damage.

※ Your lift truck cooling system is filled with a factory installed solution of 50% water and 50% permanent-type antifreeze containing rust and corrosion inhibitors. You should leave the solution in year around. Plain water may be used in an emergency, but replace it with the specified coolant as soon as possible to avoid damage to the system. Do not use alcohol or methanol antifreeze.

(5) Engine oil and filter

Locate the engine oil dipstick. Pull the dipstick out, wipe it with a clean wiper, and reinsert it fully into the dipstick tube. Remove the dipstick and check the oil level.

It is normal to add some oil between oil changes. Keep the oil level between the High and Low mark on the dipstick by adding oil as required. **Do not overfill.** Use the correct oil as specified under lubricant specification.

It is recommended to:

- Drain and replace the engine crankcase oil initial 50 hours and every 500 operating hours (Depending on application).
- Remove the oil pan drain plug to drain old oil after the truck has been in operation and the engine (oil) is operating temperature.

▲ Engine oil at operating temperature is hot and can cause burns. Beware of splashing oil.

- Carefully check for leaks after changing oil and installing a new filter.

※ **The time interval for changing engine oil depends upon your application and operating conditions. To determine the correct schedule for your truck, it is suggested that you periodically submit engine oil samples to a commercial laboratory for analysis of the condition of the oil.**

OIL PERFORMANCE DESIGNATION: To help achieve proper engine performance and durability, use only engine lubricating oils of the proper quality. For the diesel engines, HYUNDAI recommends that you use motor oil that meets API service classification API CJ-4 or better (SAE 15W-40) for the diesel engines.

(6) Hydraulic sump tank

Check the hydraulic sump tank fluid level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage. Over filling can cause loss of fluid or lift system malfunction. Hydraulic fluid expands as its temperature rises. Therefore, it is preferable to check the fluid level at operating temperature (after approximately 30 minutes of truck operation). To check the fluid level, first park the truck on a level surface and apply the parking brake.

Put the mast in a vertical position and lower the fork carriage fully down. Pull the dipstick out, (attached to the sump breather) wipe it with a clean wiper, and reinsert it. Remove the dipstick and check the oil level. Keep the oil level above the LOW mark on the dipstick by adding recommended hydraulic fluid only, as required. **Do not overfill.**

Check the condition of the hydraulic fluid (age, color or clarity, contamination). Change the oil as necessary.

(7) Hydraulic fluid and filter change

Drain and change the hydraulic sump fluid every 1000 operating hours. (Severe service or adverse conditions may require more frequent fluid change). Replace the hydraulic oil filter element at every oil change. Remove, clean, and reinstall the hydraulic and steer system suction line screens at first PM and every 500 hours thereafter. Check for leaks after installation of the filter. Also, check that the hydraulic line connections at the filter adapter are tightened correctly. The procedure for draining hydraulic sump tank is in your service manual.

(8) Sump tank breather maintenance and inspection

Remove the sump tank fill cap/breather and inspect for excessive (obvious) contamination and damage. Replace the fill cap/breather, per recommended PM schedule or as required by operating conditions.

(9) Transmission fluid check

To check the transmission fluid locate the dipstick. The dipstick is located on the driver's left hand side under the floor plate near the transmission valve. Before checking, run the engine until the unit is at operating temperature. This is important since transmission oil temperature should be 66~121°C (150~250°F), the engine should also be at operating temperature. Apply the parking brake.

With the engine operating at idle and the transmission in NEUTRAL, and the parking brake set, check the fluid on the dipstick. Fill, if necessary, to the HOT zone on the dipstick, using the transmission fluid recommended by HYUNDAI.

- ※ Check the planned maintenance interval (operating hours) or the condition of the oil to determine if the transmission fluid needs to be changed.

10) LUBRICATION

(1) Truck chassis inspection and lubrication

Lubrication and inspection of the truck chassis components, including the steering wheels, steering axle linkage, steering cylinder, and wheel bearings are easier if the truck is raised and blocked up under the frame. Refer to your service manual for additional information on truck blocking and jacking. Also refer to your service manual for the location of grease fittings.

Inspect the steering cylinder piston rods, seals, and fasteners for damage, leaks, and looseness. Lubricate the steering axle linkage rod ends and linkage pivot points. Be sure to clean the grease fittings before lubricating, and remove the excess grease from all points after lubricating. Lubricate miscellaneous linkage as needed.

(2) Mast and tilt cylinder lubrication

Clean the fittings and lubricate the tilt cylinder rod end bushings (forward end) and both the base rod-end bushings (rear end). Clean and lubricate the mast support bushings.

(3) Lift chains

Lubricate the entire length of the mast rail lift and carriage chains with HYUNDAI chain and cable lube.

11) AIR CLEANING

Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint, or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry, and safe. A clean truck makes it easier to see leakage and loose, missing, or damaged parts, and helps prevent fires. A clean truck runs cooler. The environment in which a lift truck operates determines how often and to what extent cleaning is necessary.

For example, trucks operating in manufacturing plants that have a high level of dirt, dust, or lint (for example, cotton fibers or paper dust) in the air or on the floor or ground, require more frequent cleaning. The radiator especially may require daily air cleaning to ensure correct cooling.

If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use steam or liquid spray cleaner.

- ※ **Lift trucks should be air cleaned at every PM interval, or more often if necessary.**

Use an air hose with special adapter or extension, a control valve, and a nozzle to direct the air properly. Use clean, dry, low pressure, compressed air. Restrict air pressure to 2.0 kgf/cm² (30 psi), maximum (OSHA requirement).

▲ Wear suitable eye protection and protective clothing when air cleaning. Never point the air nozzle at anyone.

Air clean the mast assembly, drive axle, radiator- from both counterweight and engine side, engine and accessories, drive line and related components, and steering axle and cylinder.

12) CRITICAL FASTENER TORQUE CHECKS

Fasteners in highly loaded (critical) components can quickly fail if they become loosened. Also, loose fasteners can cause damage or failure of the component. For safety, it is important that the correct torque be maintained on all critical fasteners of the components that directly support, handle, or control the load and protect the operator. (SEE SECTION 8. SPECIFICATIONS)

Critical items include:

- Drive axle mounting
- Cabin
- Drive and steering wheel mounting
- Tilt cylinder mounting and yokes
- Counterweight mounting
- Mast mounting and components

Torque specifications are in your service manual.

13) LIFT CHAIN MAINTENANCE

The chain system on the mast was designed for safe, efficient, and reliable transmission of lifting force from hydraulic cylinder to the forks. Safe use of your truck with minimum down time depends on the correct care and maintenance of the lift chains. Most complaints of unacceptable chain performance are a result of poor maintenance. Chains need periodic maintenance to give maximum service life.

▲ Do not attempt to repair a worn chain. Replace worn or damaged chains with a set (LH & RH). Do not piece chains together.

(1) Lift chain inspection and measurement

Inspect and lubricate the lift chains every 10 hours or daily and check tension every 250 hours or monthly. When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following conditions:

- Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear, and worn pins or holes.
- When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.
- Chain wear can be measured by using a chain scale or a steel tape measure. When checking chain wear, be sure to measure a segment of chain that moves over a sheave. Do not repair chains by cutting out the worn section and joining in a new piece. If part of a chain is worn, replace all the chains of both sides on a truck.

(2) Lift chain lubrication

Lift chain lubrication is an important part of your maintenance program. The lift chains operate under heavy loadings and function more safely and have longer life if they are regularly and correctly lubricated. HYUNDAI chain lubricant is recommended; it is easily sprayed on and provides superior lubrication. Heavy motor oil may also be used as a lubricant and corrosion inhibitor.

(3) Lift chain wear and replacement criteria

① New chain length

The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.

② Worn chain length

The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.

③ Span

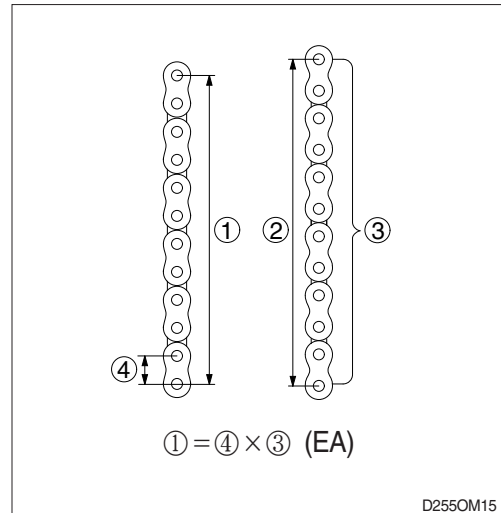
The number of pins in the length(Segment) of chain to be measured.

④ Pitch

The distance from the center of one pin to the center of the next pin.

All chains must be replaced if any link has wear of 3% or more, or if any of the damaged conditions notes above are found during inspection. Order replacement chains from your HYUNDAI dealer. Replace all chains as a set. Do not remove factory lubrication or paint new chains. Replace anchor pins and worn or broken anchors when installing new chains. Adjust tension on new chains. Lubricate chains when they are installed on the mast.

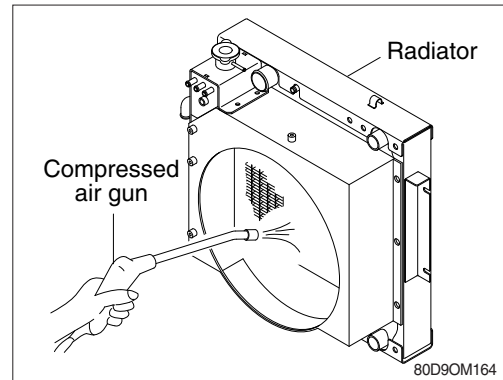
※ Please refer to your service manual for additional information on lift chain measurement and maintenance.



11. HANDLING TRUCK IN EXTREMELY HOT PLACES

Pay careful attention particularly to the following points when handling the truck in extremely hot places.

- 1) Scale and rust form more easily in the cooling system, so wash with anticorrosion liquid. Always try to have clean and soft water circulating in the system.
- 2) Clogging of the radiator fins is one cause of overheating, so use air or water jets to clean the fins. When doing this, the air nozzle must be at right angles to the radiator.
 - Air pressure max : 2 kgf/cm² (30 psi)
- 3) Check the fan belt tension. If it is too slack, adjust the tension. (SEE SECTION 8. SPECIFICATIONS)
- 4) In case of overheating, do not stop the engine immediately.
 - (1) Run the engine at low idling.
 - (2) Open the hood to ventilate the engine compartment.
 - (3) When the water temperature drops, stop the engine.
 - (4) Check the cooling water level. If it is low, add more water.



⚠ Wear safety glasses and a face shield when using compressed air. Never touch the radiator cap while the engine is hot. Steam may spurt out. Wait until the water temperature drops. It is extremely dangerous to try to check the fan belt tension while the engine is running. When inspecting the fan belt or other moving parts, or near such parts, always stop the engine first.

12. COLD WEATHER OPERATION

1) PREPARATION FOR LOW TEMPERATURE

- (1) Replace lubrication oil with oil of the prescribed viscosity.
- (2) Fuel of low pour point must be used. ASTM D975 No.1 diesel fuel should be used at ambient temperature lower than -5°C.
- (3) When ambient temperatures are below use an anti-freeze mixture per the above table to prevent freezing of the cooling system.

Min ambient temperature (°C)	-5	-10	-15	-20	-25	-30	-50
Amount of antifreeze (%)	25	30	35	40	45	50	60
Amount of water (%)	75	70	65	60	55	50	40

- ▲ Use permanent type antifreeze.
- ▲ Use soft water (city water, etc.) as mixing water.
- ▲ Cooling system must be thoroughly flushed before filling with antifreeze mixture.
- ▲ When the climate becomes warmer and antifreeze is not needed, replace with soft water (city water, etc.) after thoroughly cleaning the cooling system.
- ▲ Do not expose antifreeze to flame. It is inflammable.
- ※ Dispose of old antifreeze mixture in locally approved manner.

2) BATTERY

As the ambient temperature drops, the battery capacity will drop and the electrolyte may sometimes freeze if the battery charge is low. Maintain the battery at a charge level of over 75% and insulate it against cold temperature so that the truck can be readily started the next morning.

- ※ When the electrolyte level is low, add distilled water in the morning before work instead of after the day's work. This is to prevent fluid from freezing at night.

3) CARE AFTER DAILY OPERATION

- (1) Drain water from the fuel system to prevent freezing.
 - (2) Fill the tank at the end of each day of operation to drive out moisture laden air to prevent condensation.
Do not fill the tank to top.
- ▲ Explosive fumes may be present during refueling.

13. RECOMMENDATION TABLE FOR LUBRICANTS

1) NEW TRUCK

New truck uses following fuel, coolant and lubricant.

Description	Specification
Engine oil	SAE 10W-30/15W-40 (API CJ-4 class or better)
T/M oil	Shell DONAX TD
Axle oil	Shell DONAX TD
Hydraulic oil	ISO VG46/VG68, Hyundai genuine long life hydraulic oil ISO VG15, Conventional hydraulic oil★ ¹
Grease	Lithium base grease NLGI No.2
Fuel	ASTM D975-No.2
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water

- SAE : Society of Automotive Engineers
- API : American petroleum Institute
- ISO : International Organization for Standardization
- NLGI : National Lubricating Grease Institute
- ASTM : American Society of Testing and Material

★¹ : Cold region
Russia, CIS, Mongolia

14. FUEL AND LUBRICANTS

Service point	Kind of fluid	Capacity <i>l</i> (U.S. gal)	Ambient temperature °C (°F)								
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil pan	Engine oil	12 (3.2)	★SAE 5W-40								
								SAE 30			
				SAE 10W							
				SAE 10W-30							
				SAE 15W-40							
Torque converter transmission	Transmission oil	18 (4.8)	SHELL DONAX TD								
Axle	Gear oil	12.5 (3.3)		SHELL DONAX TD							
Hydraulic oil tank	Hydraulic oil	132 (34.9)	★ISO VG 15								
Cabin tilt hand pump	Hydraulic oil	0.7 (0.2)		ISO VG 46							
				ISO VG 68							
Fuel tank	Diesel fuel★ ¹	171.5 (45.3)	★ASTM D975 NO.1								
				ASTM D975 NO.2							
Fitting (Grease nipple)	Grease	-	★NLGI NO.1								
				NLGI NO.2							
Brake oil	Hydraulic oil	-	★AZOLLA ZS10 (ISO VG10)								
				AZOLLA ZS32 (Hydraulic oil, ISO VG32)							
Radiator	Antifreeze : Soft water	20.4 (5.4)	Ethylene glycol base permanent type (50:50)								
			★Ethylene glycol base permanent type (60 : 40)								
DEF/AdBlue® tank	Mixture of urea and deionized water	18.9 (5)	ISO 22241 (High-purity urea + deionized water (32.5:67.5))								

NOTES :

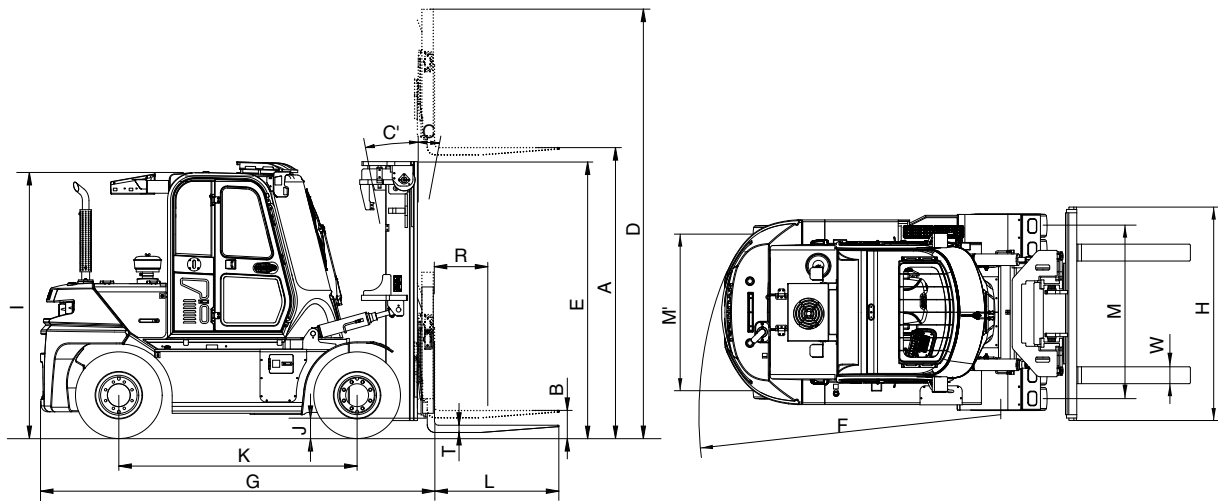
- ① SAE numbers given to engine oil should be selected according to ambient temperature.
- ② For engine oil used in engine oil pan, use SAE 10W-30 oil when the temperature at the time of engine start up is below 0°C, even if the ambient temperature in daytime is expected to rise to 10°C or more.
- ③ Use engine oil of API service class CJ-4.

★¹ : Ultra low sulfur diesel
- sulfur content ≤ 15 ppm

★ : Cold region
Russia, CIS, Mongolia

8. SPECIFICATIONS

1. SPECIFICATION TABLE



50D9SP011

Model			Unit	50D-9	60D-9	70D-9	80D-9
Capacity			kg (lb)	5000 (11000)	6000 (13500)	7000 (15500)	8000 (17600)
Load center			mm (in)	600 (24")	←	←	←
Weight(Unloaded)			kg (lb)	8844 (19500)	9591 (21145)	10399 (22926)	11608 (25591)
Fork	Lifting height	A	mm (ft·in)	3030 (9' 11")	←	←	3040 (10' 0")
	Free lift	B	mm (in)	140 (5.5")	←	←	145 (5.7")
	Lifting speed (Unload/Load)		mm/sec	460/440	460/430	460/420	480/410
	Lowering speed (Unload/Load)		mm/sec	450/500	←	←	500/500
	L × W × T	L,W,T	mm (in)	1200 × 150 × 60 (47.2 × 5.9 × 2.4)	1200 × 150 × 65 (47.2 × 5.9 × 2.6)	←	1200 × 180 × 70 (47.2 × 7.1 × 2.8)
Mast	Tilt angle (forward/backward)	C/C'	degree	15/10	←	←	←
	Max height	D	mm (ft·in)	4275 (14' 0")	←	←	4375 (14' 4")
	Min height	E	mm (ft·in)	2515 (8' 3")	←	←	2675 (8' 9")
Body	Travel speed (Unload)		km/h	33.9	33.7	33.6	35
	Gradeability (Load)		%	58.7	50.6	44.4	35.2
	Min turning radius (Outside)	F	mm (ft·in)	3314 (10' 10")	3374 (11' 1")	3436 (11' 3")	3700 (12' 2")
ETC	Max hydraulic pressure		kgf/cm ²	210	←	←	←
	Hydraulic oil tank		l (USgal)	132 (34.9)	←	←	←
	Fuel tank		l (USgal)	171.5 (45.3)	←	←	←
Overall length			G	mm (ft·in)	3516 (11' 8")	3591 (11' 9")	3666 (12' 0")
Overall width			H	mm (ft·in)	2087 (6' 10")	←	2194 (7' 2")
Cabin height			I	mm (ft·in)	2649 (8' 8")	←	←
Ground clearance			J	mm (in)	195 (7.7")	←	250 (9.8")
Wheel base			K	mm (ft·in)	2300 (7' 7")	←	2500 (8' 2")
Wheel tread front/rear			M/M'	mm (ft·in)	1580 / 1604 (5' 2" / 5' 3")	←	1632 / 1700 (5' 4" / 5' 7")

2. SPECIFICATION FOR MAJOR COMPONENTS

1) 50/60/70D-9

(1) Engine

Item	Unit	Specification
Model	—	Cummins QSF3.8
Type	—	Vertical, water-cooled, 4-cycle DI, Tier 4 final diesel engine
Cooling method	—	Water cooling
Number of cylinders and arrangement	—	4-cylinders, In-line
Firing order	—	1-3-4-2
Combustion chamber type	—	Direct injection
Cylinder bore × stroke	mm (in)	102 × 115 mm (4.0" × 4.5")
Piston displacement	cc (cu in)	3800 (232)
Compression ratio	—	17.2 : 1
Rated gross horse power	ps/rpm	102/2200
Maximum gross torque at rpm	kgf · m/rpm	42.3/1600
Engine oil quantity	ℓ (U.S.gal)	12 (3.2)
Dry weight	kg (lb)	348 (767)
High idling speed	rpm	2450
Low idling speed	rpm	850
Rated fuel consumption	g/kw.hr	220 (at 1600 rpm)
Starting motor	V-kW	24-4.8
Alternator	V-A	24-80
Battery	V-AH	24-80

(2) Main pump

Item	Unit	Specification
Type	—	Axial piston variable gear pump
Displacement	cc/rev	35+35+9.0
Maximum operating pressure	kgf/cm ²	250
Rated speed (Max/Min)	rpm	3000/600

(3) Main control valve

Item	Unit	Specification
Type	—	Sectional
Operating method	—	Hydraulic pilot
Relief valve pressure (Main/Aux)	kgf/cm ²	188/153
Flow capacity	lpm	160

(4) Steering unit

Item	Unit	Specification
Type	-	Load sensing/Non load reaction/Dynamic signal
Capacity	cc/rev	160
Rated flow	lpm	22.7
Relief pressure	kgf/cm ²	145

(5) Power train deviced

Item		Specification		
Torque converter	Model	ZF 3WG94		
	Type	3 Element, 1 stage, 2 phases		
	Stall ratio	2.395 : 1		
Transmission	Type	Full auto, power shift		
	Gear shift (FR/RR)	3/3		
	Adjustment	Electrical single lever type		
	Overhaul ratio	FR	1 : 4.714	2 : 2.341
		RR	1 : 4.711	2 : 2.340
Axle	Type	Front-wheel drive type, fixed location		
	Gear ratio	10.545		
	Gear	Ring & pinion gear type		
Wheels	Q'ty (FR/RR)	Double : 4/2		
	Front (drive)	8.25-15-14 PR		
	Rear (steer)	8.25-15-14 PR		
Brakes	Travel	Front wheel, wet disc brake		
	Parking	Wet disc (negative brake)		
Steering	Type	Full hydraulic, power steering		
	Steering angle	75.87° to both right and left angle, respectively		

2) 80D-9

(1) Engine

Item	Unit	Specification
Model	—	Cummins QSF3.8
Type	—	Vertical, water-cooled, 4-cycle DI, Tier 4 final diesel engine
Cooling method	—	Water cooling
Number of cylinders and arrangement	—	4-cylinders, In-line
Firing order	—	1-3-4-2
Combustion chamber type	—	Direct injection
Cylinder bore × stroke	mm (in)	102 × 115 mm (4.0" × 4.5")
Piston displacement	cc (cu in)	3800 (232)
Compression ratio	—	17.2 : 1
Rated gross horse power	ps/rpm	102/2200
Maximum gross torque at rpm	kgf · m/rpm	42.3/1600
Engine oil quantity	ℓ (U.S.gal)	12 (3.2)
Dry weight	kg (lb)	348 (767)
High idling speed	rpm	2450
Low idling speed	rpm	850
Rated fuel consumption	g/kw.hr	220 (at 1600 rpm)
Starting motor	V-kW	24-4.8
Alternator	V-A	24-80
Battery	V-AH	24-80

(2) Main pump

Item	Unit	Specification
Type	—	Axial piston variable gear pump
Displacement	cc/rev	35.6+33+7.6
Maximum operating pressure	kgf/cm ²	210
Rated speed (Max/Min)	rpm	3000/600

(3) Main control valve

Item	Unit	Specification
Type	—	Sectional
Operating method	—	Hydraulic pilot
Relief valve pressure (Main/Aux)	kgf/cm ²	188/153
Flow capacity	lpm	160

(4) Steering unit

Item	Unit	Specification
Type	—	Load sensing/Non load reaction/Dynamic signal
Capacity	cc/rev	200
Rated flow	lpm	32
Relief pressure	kgf/cm ²	135

(5) Power train deviced

Item		Specification		
Torque converter	Model	ZF 3WG94		
	Type	3 Element, 1 stage, 2 phases		
	Stall ratio	2.395 : 1		
Transmission	Type	Full auto, power shift		
	Gear shift (FR/RR)	3/3		
	Adjustment	Electrical single lever type		
	Overhaul ratio	FR	1 : 4.714	2 : 2.341
		RR	1 : 4.711	2 : 2.340
Axle	Type	Front-wheel drive type, fixed location		
	Gear ratio	12.4		
	Gear	Ring & pinion gear type		
Wheels	Q'ty (FR/RR)	Double : 4/2		
	Front (drive)	9.00-20-14 PR		
	Rear (steer)	9.00-20-14 PR		
Brakes	Travel	Front wheel, wet disc brake		
	Parking	Wet disc (negative brake)		
Steering	Type	Full hydraulic, power steering		
	Steering angle	75.04° to both right and left angle, respectively		

3. TIGHTENING TORQUE

NO	Item		Size	kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut	M12×1.25	12.3±3.0	89±21.7
2		Engine bracket mounting bolt	M10×1.5	6.9±1.4	50±10.1
3		Radiator mounting bolt, nut	M10×1.5	6.9±1.4	50±10.1
4	Hydraulic system	Hydraulic pump mounting bolt	M16×2.0	29.7±4.5	215±32.3
5		MCV mounting bolt, nut	M12×1.75	12.8±3.0	93±21.7
6		Steering unit mounting bolt	M10×1.5	6.9±1.4	50±10.1
7	Power train system	Transmission mounting bolt, nut	M16×2.0	7.5	54
8		Torque converter mounting bolt	M10×1.5	6.9±1.4	50±10.1
9		Drive axle mounting bolt, nut	M27×3.0	150±15	1085±109
10		Steering axle mounting bolt, nut	M18×2.5	41.3±6.2	299±44.8
11		Front/Rear wheel mounting nut	M22×1.5	61.2±12	443±86.8
12		Propeller shaft (To axle/TM)	3/8-24UNF	7±0.7	50.6±5.0
13	Others	Counterweight mounting bolt	M30×3.5	199±30	1439±217
14		Operator's seat mounting nut	M 8×1.25	3.4±0.7	24.6±5.1
15		Cab mounting nut	M20×2.5	57.9±8.7	419±63
16		Mast mounting bolt	M20×2.5	57.9±8.7	419±63

9 . TROUBLESHOOTING

1. ENGINE SYSTEM

Trouble symptom	Probable cause	Remedy
Oil pressure warning lamp fails to go out.	• Low oil level in oil pan. • Oil filter element clogged. • Loose or worn oil pipe joint leaks oil.	• Add oil. • Replace element. • Check and repair.
Radiator pressure valve spouts steam.	• Lack of cooling water or water leakage. • Loosen fan belt. • Dust and scale accumulated in cooling system.	• Add water or repair. • Adjust belt. • Change water and clean the interior of cooling system.
Water temp gauge indicates red range, on right.	• Radiator fin clogged or fin damaged. • Thermostat or water temp gauge faulty. • Radiator filler cap loosening.	• Clean or repair. • Replace • Retighten cap or replace packing.
Water temp gauge indicates red range, on left.	• Thermostat faulty. • Water temperature gauge faulty.	• Replace • Replace
Engine fails to start.	• Lack of fuel. • Air mixed in fuel system. • Fuel injection pump or nozzle defective. • Starting motor rotates slowly. • Engine compression insufficient. • Valve clearance out of adjustment.	• Add fuel. • Repair. • Replace. • See "Electrical system." • Adjust clearance
Engine emits whitish or bluish smoke.	• Excessive quantity of oil in oil pan. • Poor quality of fuel.	• Reduce oil quantity. • Replace with specified fuel.
Abnormal sound heard. (Fuel combustion or mechanical sound)	• Poor quality of fuel. • Overheating • Muffler interior damaged. • Excessively large valve clearance.	• Replace with specified fuel. • See Symptom "Radiator pressure valve spouts steam". • Replace • Adjust clearance.

2. ELECTRICAL SYSTEM

Trouble symptom	Probable cause	Remedy
Lamps dimming even at maximum engine speed.	• Faulty wiring.	• Check for loose terminal and disconnected wire.
Lamps flicker during engine operation.	• Improper belt tension.	• Adjust belt tension.
Charge lamp does light during normal engine operation.	• Charge lamp defective. • Faulty wiring.	• Replace. • Check and repair.
Alternator makes abnormal sounds.	• Alternator defective.	• Replace
Starting motor fails to run.	• Faulty wiring. • Insufficient battery voltage.	• Check and repair. • Recharge battery.
Starting motor pinion repeats going in and out.	• Insufficient battery voltage.	• Recharge battery.
Excessively low starting motor speed.	• Insufficient battery voltage. • Starting motor defective.	• Recharge battery. • Replace
Starting motor comes to a stop before engine starts up.	• Faulty wiring. • Insufficient battery voltage.	• Check and repair. • Recharge battery.
Heater signal does not become red. * Heater functions only when the coolant temperature is below 0°C	• Faulty wiring. • Glow plug damaged.	• Check and repair. • Replace
Engine oil pressure warning lamp does not light when engine is stopped (with starting switch left in "ON" position).	• Caution lamp defective. • Caution lamp switch defective.	• Replace • Replace

9-3

Trouble symptom	Probable cause	Remedy
3.Low output power 1) Torque converter	• Insufficient hydraulic pressure : - Low oil level. - Air sucked in. • Oil filter clogging. • Oil pump worn. (Low delivery flow) • Regulator valve coil spring fatigued. • Control valve spool malfunctioning. • Piston or O-ring worn. • Stator free wheel cam damaged. • Stator free wheel seizing.	- Check oil level and add oil - Check joints and pipes. If necessary, retighten joint or replace packing. - Check and replace - Check oil pressure. If necessary replace pump. - Check spring tension. If necessary, replace. - Disassemble, check and repair or replace. - Disassemble, check measure and replace. - Check stalling speed. (Increased engine load will cause excessive drop of stalling speed.) - Check oil temperature rise. If any, replace free wheel. - Check temperature plate. (No-load will cause temperature rise) - Replace free wheel if a drop of starting output is found.
2) Transmission	• Impeller damaged for interfering with the surroundings. • Flexile plate deformed • Use of poor quality of oil or arising of air bubbles. - Air sucked in from inlet side. • Low torque converter oil pressure accelerates generation of air bubbles. • Oil mixing with water. • Inching rod out of adjustment. • Clutch slipping - Lowering of weight. - Piston ring or O-ring worn. • Clutch piston damaged. • Clutch plate seizing or dragging.	- Check drained oil for foreign matter. If any, change oil. - Replace flexible plate - Check and change oil. - Check joints and pipes. If necessary, retighten joint or replace packing. - Check oil pressure. - Check drained oil and change oil. - Check and adjust. - Check oil pressure. - Disassemble, check, measure and replace. - Disassemble, check and replace. - Check to see whether or not truck moves even when transmission is in neutral position. If so, replace.

Trouble symptom	Probable cause	Remedy
4.Unusual oil pressure 1) Oil pressure is high 2) Oil pressure is low 3) Transmission	• Control valve malfunctioning. • Cold weather. (high oil viscosity) • Use of improper oil. • Gear pump malfunctioning(worn). • Oil leaks excessively : (1)Control valve oil spring defective. (2)Control valve spool defective. • Air sucked in. • Low oil level. • Oil filter clogging. • Oil leaks excessively.	(1)Check for spool operation. If necessary, replace valve. (2)Check for clogging of small hole in valve body. If necessary, clean or repair. • When atmospheric temp is below freezing point (when normal oil pressure is recovered if heated to 60 ~ 80°C), change oil. • Check and change oil. • Disassemble, check and replace. • Check spring tension (see spring specification). If necessary replace. • Disassemble, check, and repair or replace valve. • Check joints and pipes. If necessary, retighten joint or replace packing. • Check oil level and add oil. • Check and replace. • Disassemble, check (piston ring and O-ring for wear and other defects), and replace.
5.Power is not transmitted 1) Torque converter 2) Transmission	• Clutch plate damaged. • Low oil level. • Oil pump driving system faulty. • Shaft broken. • Lack of oil pressure. • Low oil level. • Inching valve and link lever improperly positioned. • Forward/reverse spool and link lever improperly positioned. • Clutch fails to disengage : (1)Clutch case piston ring defective. (2)Main shaft plug slipping out. • Clutch seizing. • Shaft broken off. • Clutch drum damaged (spring groove). • Clutch snap ring broken.	• Check for damage by listening to abnormal sounds at a low converter speed and replace. • Check oil level and add oil • Disassemble and check for wear of pump gear, shaft and spline. Replace defective parts. • Check and replace. • Check oil pump gear for wear and for oil suction force. If necessary, replace pump. • Check oil level and add oil. • Check measure and adjust. • Check and adjust. • Disassemble, check and replace • Disassemble, check and repair or replace • Check to see whether or not truck moves even then transmission is in neutral position. If so, replace. • Disassemble, check(main shaft, etc.), and replace. • Disassemble, check and replace. • Disassemble, check and repair or replace.

Trouble symptom	Probable cause	Remedy
5. Power is not transmitted (Continue)	• Foreign matter intruding into oil passage to clutch. • Shaft spline worn.	• Disassemble, check and repair or replace. • Disassemble, check and replace.
6. Oil leakage (Transmission and torque converter)	• Oil leaks from oil seal. • Oil leaks from case joining surfaces. • Oil leaks from joint or pipe. • Oil leaks from drain plug. • Oil leaks from a crack.	• Disassemble and check for wear of seal lips and mating sliding surfaces (pump boss, coupling etc.) Replace oil seal, pump boss, coupling, etc. • Check and retighten or replace packing. • Check and repair or replace gasket. • Check and retighten or gasket. • Check and replace cracked part.

4. STEERING SYSTEM

Trouble symptom	Probable cause	Remedy
1. Steering wheel drags.	• Low oil pressure. • Bearing faulty. • Spring spool faulty. • Reaction plunger faulty. • Ball-and-screw assembly faulty. • Sector shaft adjusting screw excessively tight. • Gears poorly meshing. • Flow divider coil spring fatigued.	• Check locknut. Repair. • Clean or replace. • Clean or replace. • Replace. • Clean or replace. • Adjust. • Check and correct meshing. • Replace.
2. Steering wheel fails to return smoothly.	• Bearing faulty. • Reaction plunger faulty. • Ball-and-screw assy faulty. • Gears poorly meshing.	• Clean or replace. • Replace. • Clean or replace. • Check and correct meshing.
3. Steering wheel turns unsteadily. Steering system makes abnormal sound or vibration.	• Locknut loosening. • Metal spring deteriorated. • Gear backlash out of adjustment. • Air in oil circuit.	• Retighten. • Replace. • Adjust. • Bleed air.
4. Abnormal sound heard when steering wheel is turned fully	Valve • Faulty. (Valve fails to open.) Piping • Pipe (from pump to power steering cylinder) dented or clogged.	• Adjust valve set pressure and check for specified oil pressure. • Repair or replace.
5. Piping makes abnormal sounds.	Oil pump • Lack of oil. • Oil inlet pipe sucks air. • Insufficient air bleeding.	• Add oil. • Repair. • Bleed air completely.
6. Valve or valve unit makes abnormal sounds.	Oil pump • Oil inlet pipe sucks air. Valve • Faulty. (Unbalance oil pressure) Piping • Pipe (from pump to power steering) dented or clogged. • Insufficient air bleeding.	• Repair or replace. • Adjust valve set pressure and check specified oil pressure. • Repair or replace. • Bleed air completely.
7. Insufficient or variable oil flow.	• Flow control valve orifice clogged.	• Clean.
8. Insufficient or variable discharge pressure.	Piping • Pipe (from tank to pipe) dented or clogged.	• Repair or replace.

5. BRAKE SYSTEM

Trouble symptom	Probable cause	Remedy
1. Insufficient braking force	• Hydraulic system leaks oil. • Hydraulic system sucks air. • Disk worn. • Brake valve malfunctioning • Hydraulic system clogged	• Repair and add oil. • Bleed air. • Replace • Repair or replace. • Clean.
2. Brake acting unevenly. (Truck is turned to one side during braking.)	• Tires unequally inflated. • Brake out of adjustment. • Disk surface roughened. • Wheel bearing out of adjustment. • Hydraulic system clogged.	• Adjust tire pressure. • Adjust. • Repair by polishing or replace. • Adjust or replace. • Clean.
3. Brake trailing.	• Pedal has no play. • Piston cup faulty. • Brake valve return port clogged. • Hydraulic system clogged. • Wheel bearing out of adjustment.	• Adjust. • Replace. • Clean. • Clean. • Adjust or replace.

6. HYDRAULIC SYSTEM

Trouble symptom	Probable cause	Remedy
1. Large fork lowering speed.	• Seal inside control valve defective. • Oil leaks from joint or hose. • Seal inside cylinder defective.	• Replace spool or valve body. • Replace. • Replace packing.
2. Large spontaneous tilt of mast.	• Tilting backward : Check valve defective. • Tilting forward : Tilt lock valve defective. • Oil leaks from joint or hose. • Seal inside cylinder defective.	• Clean or replace. • Clean or replace. • Replace. • Replace seal.
3. Slow fork lifting or slow mast tilting.	• Lack of hydraulic oil. • Hydraulic oil mixed with air. • Oil leaks from joint or hose. • Excessive restriction of oil flow on pump suction side. • Relief valve fails to keep specified pressure. • Poor sealing inside cylinder. • High hydraulic oil viscosity. • Mast fails to move smoothly. • Oil leaks from lift control valve spool. • Oil leaks from tilt control valve spool.	• Add oil. • Bleed air. • Replace. • Clean filter. • Adjust relief valve. • Replace packing. • Change to SAE10W, class CF engine oil. • Adjust roll to rail clearance. • Replace spool or valve body. • Replace spool or valve body.
4. Hydraulic system makes abnormal sounds.	• Excessive restriction of oil flow pump suction side. • Gear or bearing in hydraulic pump defective.	• Clean filter. • Replace gear or bearing.
5. Control valve lever is locked	• Foreign matter jammed between spool and valve body. • Valve body defective.	• Clean. • Tighten body mounting bolts uniformly.
6. High oil temperature.	• Lack of hydraulic oil. • High hydraulic oil viscosity. • Oil filter clogged.	• Add oil. • Change to SAE10W, class CF engine oil. • Clean filter.

7. MAST AND FORK

1) MAST

Problem	Cause	Remedy
Forks fail to lower.	Deformed mast or carriage.	Disassemble, repair or replace.
Fork fails to elevate	- Faulty hydraulic equipment. - Deformed mast assembly.	- See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system. - Disassemble mast and replace damaged parts or replace complete mast assembly.
Slow lifting speed and insufficient handling capacity.	- Faulty hydraulic equipment. - Deformed mast assembly.	- See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system. - Disassemble mast and replace damaged parts or replace complete mast assembly.
Mast fails to lift smoothly.	- Deformed masts or carriage. - Faulty hydraulic equipment. - Damaged load and side rollers. - Unequal chain tension between LH & RH sides. - LH & RH mast inclination angles are unequal. (Mast assembly is twisted when tilted)	- Disassembly, repair or replace. - See Troubleshooting Hydraulic Cylinders, pump and control valve in section 6, hydraulic system. - Replace. - Adjust chains. - Adjust tilt cylinder rods.
Abnormal noise is produced when mast is lifted and lowered.	- Broken load roller bearings. - Broken side roller bearings. - Deformed masts. - Bent lift cylinder rod. - Deformed carriage. - Broken sheave bearing.	- Replace. - Replace. - Disassemble, repair or replace. - Replace. - Replace. - Replace.
Abnormal noise is produced during tilting operation.	- Insufficient lubrication of anchor pin, or worn bushing and pin. - Bent tilt cylinder rod.	- Lubricate or replace. - Replace.

2) FORKS

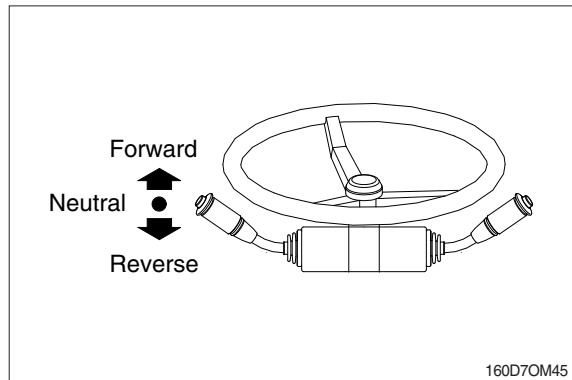
Problem	Cause	Remedy						
Abrasion	Long-time operations causes the fork to wear and reduces the thickness of the fork. Inspection for thickness is needed. Wear limit : Must be 90% of fork thickness	If the measured value is below the wear limit, replace fork.						
Distortion	Forks are bent out of shape by a number of reasons such as overloading, glancing blows against walls and objects, and picking up load unevenly. Difference in fork tip height <table><tr><th>Fork length (mm)</th><th>Height difference (mm)</th></tr><tr><td>equal or below 1500</td><td>3</td></tr><tr><td>above 1500</td><td>4</td></tr></table>	Fork length (mm)	Height difference (mm)	equal or below 1500	3	above 1500	4	If the measured value exceeds the allowance, replace fork.
Fork length (mm)	Height difference (mm)							
equal or below 1500	3							
above 1500	4							
Fatigue	Fatigue failure may result from the fatigue crack even though the stress to fork is below the static strength of the fork. Therefore, a daily inspection should be done. - Crack on the fork heel. - Crack on the fork weldments.	Repair fork by expert. In case of excessive distortion, replace fork.						

10. TESTING AND ADJUSTING

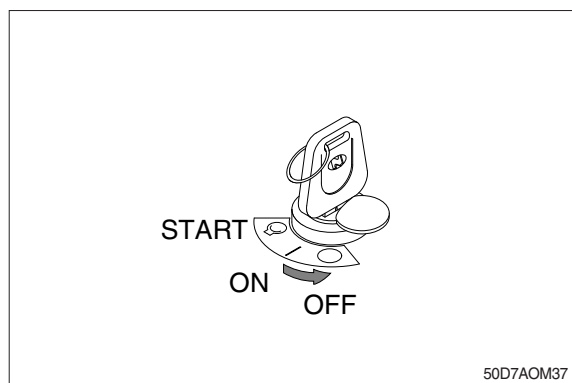
1. ENGINE SYSTEM

1) EASE OF STARTING, NOISE

- (1) Set gear shift lever at NEUTRAL.

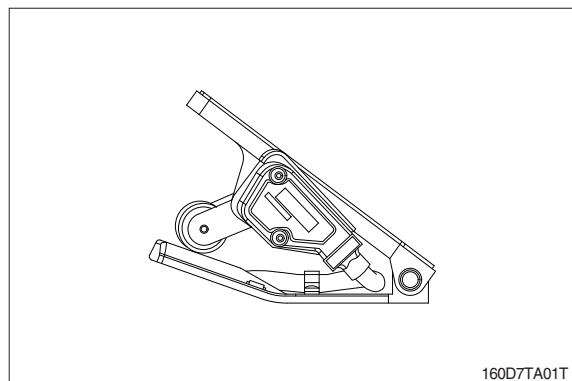


- (2) Turn the parking brake switch ON.
 - (3) Turn ON start switch, automatically heating operated.
 - (4) When heater signal lamp goes out, turn key to START, and start engine.
- ※ **When engine starts, check if it starts smoothly, and if it makes any abnormal noise.**



2) IDLING

- (1) After warming up engine, run at idling.
- (2) Check that engine maintains steady, smooth rotation without gasping, abnormal noise, abnormal explosions, or irregular vibration.
- (3) Check that idling speed is within specified range.
- (4) Idle rpm : SEE 8. SPECIFICATION



3) WHEN ACCELERATOR PEDAL IS DEPRESSED

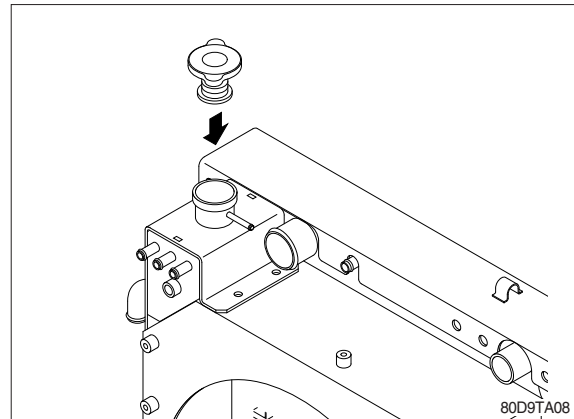
- (1) Check that accelerator pedal does not catch when depressed.
- (2) Check that engine speed increases in accordance with amount pedal is depressed.
- (3) When doing this, check that engine speed changes without gasping, abnormal noise, abnormal explosions, or irregular vibration.
- (4) Check that exhaust gas is colorless when the engine is idling, and a thin black color when accelerator pedal is depressed.
- (5) Max speed : SEE SECTION 8. SPECIFICATIONS

4) RADIATOR CAP

- (1) Push pressure regulator spring with finger and check that tension is correct.
- (2) Pull negative pressure valve, and check that it is closed when released.
- (3) If packing is damaged, replace whole radiator cap assembly.

⚠ While the coolant in the radiator is retained hot temperature, do not open the radiator cap.

It will gush out the hot water and someone might get scalded or severe injured.



5) FUEL FILTER (DIESEL)

- (1) The fuel filter cartridge cannot be inspected from the outside, so replace it periodically (refer to 7. PLANNED MAINTENANCE AND LUBRICATION).
- (2) Always use HYUNDAI Forklift genuine parts when replacing the element.
- (3) After replacing the element, run the engine and check for oil leakage from the filter mount.

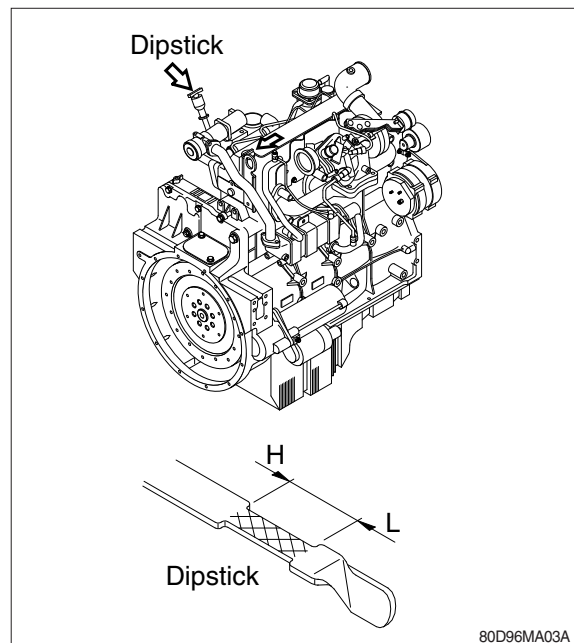
6) ENGINE OIL

- (1) Check oil level with dipstick and add oil if necessary.
- (2) Check oil for discoloration or deterioration. Change oil if discolored or deteriorated.
- (3) Engine oil quantity : See section 8. Specification

7) ENGINE OIL FILTER

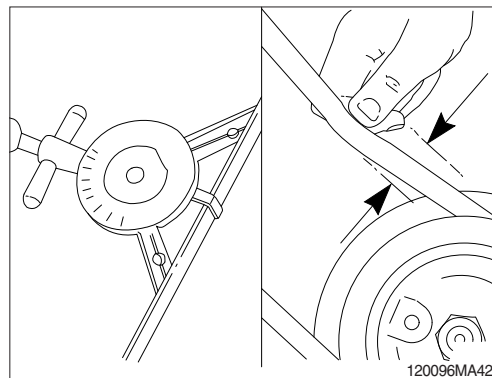
The condition of the oil filter cartridge cannot be inspected from the outside so replace the engine oil filter (refer to section 7. Maintenance and lubrication).

Use a filter wrench and remove the whole cartridge assembly.



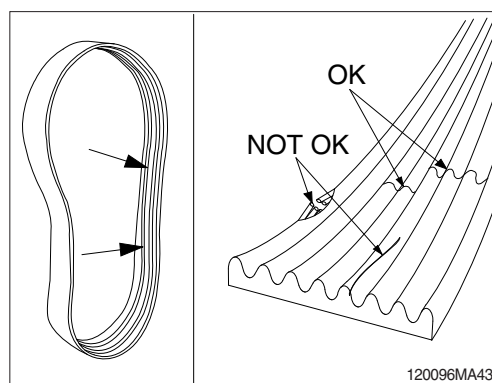
8) CHECK FAN BELT TENSION

- (1) A deflection method can be used to check belt tension by applying 11 kgf (25 lbf) force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



- (2) Inspect the fan belt for damage.

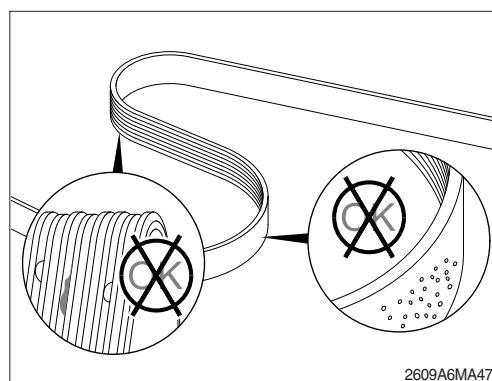
- ① Transverse (across the belt) cracks are acceptable.
- ② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



- ③ Inspect the belt

- Embedded debris
- Uneven/excessive rib wear
- Exposed belt cords
- Glazing (high heat)

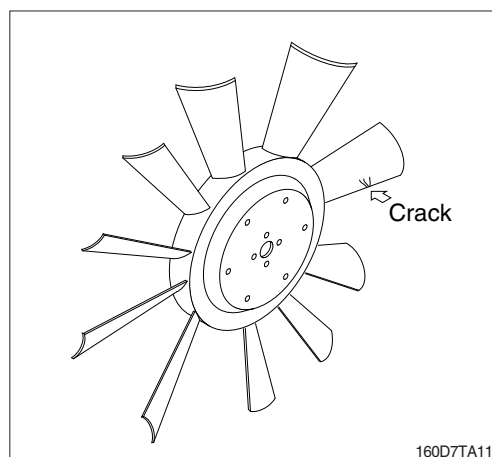
- ※ If any of the above conditions are present, the belt is unacceptable for reuse and must be replaced.



9) FAN

Move fan backwards and forwards by hand to check for looseness.

Tighten mounting bolt with a spanner.



2. DRIVE SYSTEM

1) GEAR SHIFT LEVER

(1) Neutral starting

Engine can be started only when the shifting lever is in neutral position.

(2) Shifting FWD/REV lever

① Forward

Push the lever forward then forward solenoid valve operates and oil comes to forward clutch thus the truck will run forward.

② Reverse

Pull the lever backward then reverse solenoid valve operates and oil comes to reverse clutch thus the truck will run backward.

2) OIL LEAKAGE

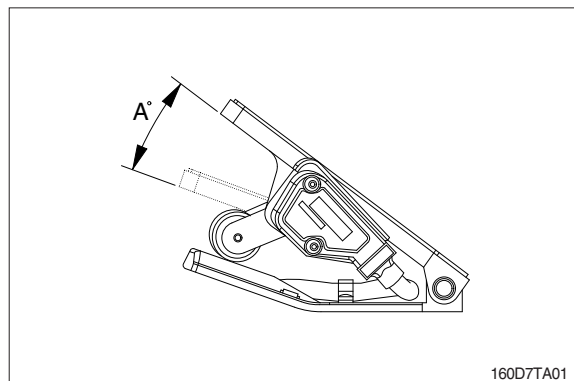
Check that there is no oil leakage from torque converter, transmission or control valve. If oil oozes out and forms drops, replace packing.

3) ADJUSTMENT OF PEDAL

(1) Accelerator pedal

Pedal operation range is "A". If the range is differ much from specification, replace the pedal immediately.

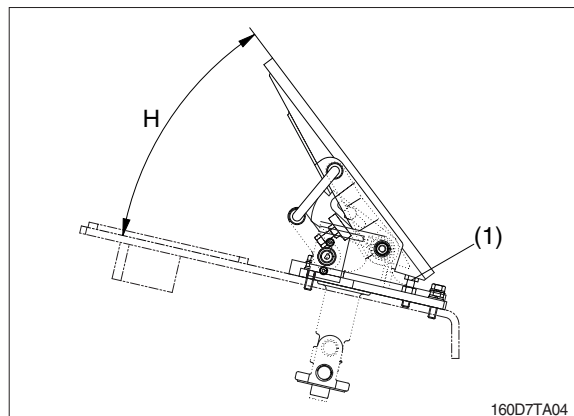
- Pedal angle(A) : $17.5 \pm 2^\circ$



(2) Brake pedal

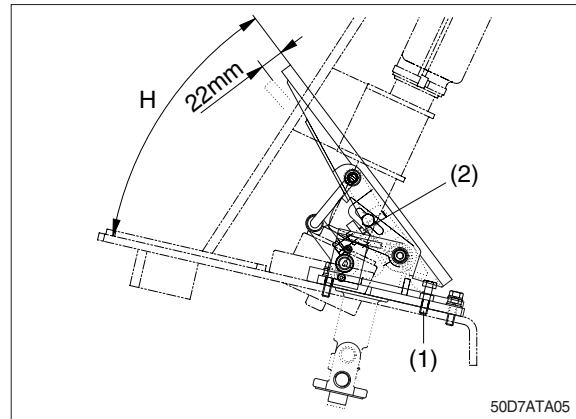
- Adjust stopper bolt (1) so that pedal angle is "H".

- Pedal angle (H) : $35^\circ \pm 1^\circ$



(3) Inching pedal

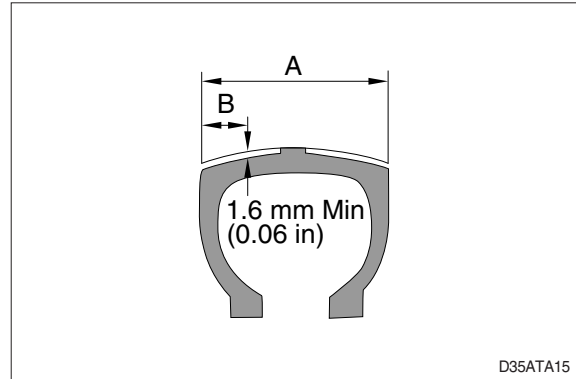
- Adjust stopper bolt (1) so that pedal angle is "H".
- Pedal angle (H) : $35^\circ \pm 1^\circ$
- Adjust bolt (2) so that brake pedal interconnects with inching pedal at inching pedal stroke, 20~24 mm (0.8~0.9 in).



3. TRAVEL SYSTEM

1) TIRES

- (1) Check tire pressure using tire gauge : SEE page 5-3 CHECK BEFORE STARTING ENGINE.
- (2) Check visually for cracks and damage to tread and side wall. If crack or damage is serious, replace tire.
- (3) Wear
Measure tread of pneumatic tires(tires with air). Depth of tread must be at least 1.6 mm (0.06 in) at point 1/4 across width of tread. $A/B \div 4$.
- (4) Check tire visually for uneven wear, stepped wear or any other abnormal wear. Check also for pieces stuck in tire.



2) HUB NUTS

Use wrench to check for loose hub nuts.

Tighten any loose hub nuts to specified tightening torque : SEE SECTION 8. SPECIFICATIONS

3) RIM SIDE RING

Check rim side ring for deformation or cracks. Check visually or use crack detection method.

- Rear rim connecting nut torque : SEE SECTION 8. SPECIFICATIONS

4) STEERING AXLE

- (1) Push axle in from one side or measure front to rear clearance with feeler gauge. Check that clearance is within 2 mm. If clearance is more than 2mm, insert shim to reduce clearance to within 0.7 mm.
 - Mounting bolt torque : SEE SECTION 8. SPECIFICATIONS
- (2) Measure clearance between center pin and bushing. Check that clearance is within 0.5 mm (0.02 in) and that there is an oil groove on the bushing.

5) DRIVE AXLE

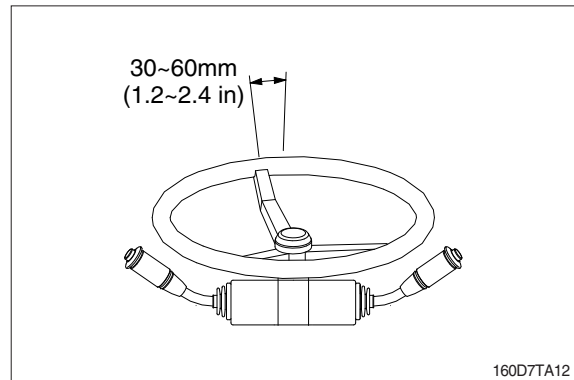
Check that there is no deformation or crack around mounting bolts of front axle and main frame and at welds. Check visually or use crack detection method.

Mounting bolt torque : SEE SECTION 8. SPECIFICATIONS

4. STEERING SYSTEM

1) STEERING WHEEL

Set rear wheels facing straight forward, then turn steering wheel to left and right. Measure range of steering wheel movement before rear wheel starts to move. Range should be 30 ~ 60 mm at rim of steering wheel. If play is too large, adjust at gearbox. Test steering wheel play with engine at idling.



2) KNUCKLE

Check knuckle visually or use crack detection method. If the knuckle is bent, the tire wear is uneven, so check tire wear.

3) STEERING AXLE

- (1) Put camber gauge in contact with hub and measure camber. If camber is not within $1 \pm 0.5^\circ$, rear axle is bent.
- (2) Ask assistant to drive truck at minimum turning radius.
- (3) Fit bar and a piece of chalk at outside edge of counterweight to mark line of turning radius.
- (4) If minimum turning radius is not within ± 100 mm (± 4 in) of specified value, adjust turning angle stopper bolt.