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## A MESSAGE TO HYUNDAI LIFT TRUCK OPERATORS

Lift trucks are specialized trucks 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 truck 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 truck 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 tightening torques.

**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
35/40/45D-9VB, 50DN-9VB 40/45D-9VC, 50DN-9VC	105 dB	84 dB

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





## 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 both side of the mast.

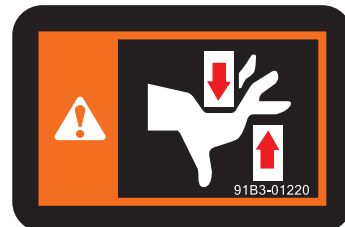
- ⚠ **Never stand or work under the raised forks at any circumstances without supporting with block.**
- ⚠ **In case of working under the forks, it is essential to support the carriage with blocks.**



### 2) HAND CAUTION (item 3)

This label is positioned on the center side of the mast cross plate.

- ⚠ **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.**



### 3) HOOK (item 4, 5)

This warning label is positioned on the both top side of mast and the near rear tire of the both side of the main frame.

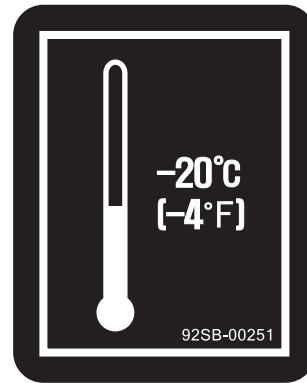
- ⚠ **Refer to page 5-30 for safe loading procedures.**



#### 4) TEMPERATURE (item 6)

This warning label is positioned on the sub-bonnet.

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



#### 5) RADIATOR & FAN (item 8)

This warning label is positioned on the cooling fan shroud of the radiator.

- ⚠ It warns of the danger or injury from spinning fan blades and forbid so 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.



#### 6) HYDRAULIC OIL (item 9)

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

- ※ Fill only the hydraulic oil.
- ※ Do not fill the diesel fuel.





## 7) DIESEL FUEL (item 10)

This warning label is positioned on the right side of the side cover.

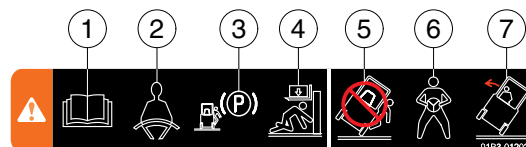
- ※ Fill only ultra low sulfur diesel.
- ※ Do not fill the gasoline.
- ※ Diesel engine must be operated only on commercially available diesel fuel that complies with EU standard or international standard. Do not use marine diesel fuel, heating oils, or non-approved fuel additives, as this will increase wear and cause damage to the engine and fuel system. The use of non-approved fuels and / or fuel additives will result in a limitation of your warranty rights.
- ※ If the engine is to be operated within the union on diesel or non-road gas-oil, a fuel with sulphur content not greater than 10 mg/kg (20 mg/kg at point of final distribution) and a FAME content not greater than 8 % v/v shall be used. Cetane number of 45 is minimum. Cetane number greater than 50 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).



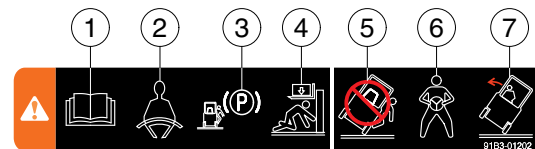
## 8) WARNING SAFETY (item 11)

This warning label is positioned on the inside of the upper left side of overhead guard.

- 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 press the parking brake switch 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 Lean the body to the opposite direction in order to avoid severe injury or death when the truck is tipped over.



**▲ 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 page 0-6 of this manual for the location of all decals.**

**▲ Operator/Tip-over warning decal**

This decal is located on the upper left side of the drivers overhead. 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.

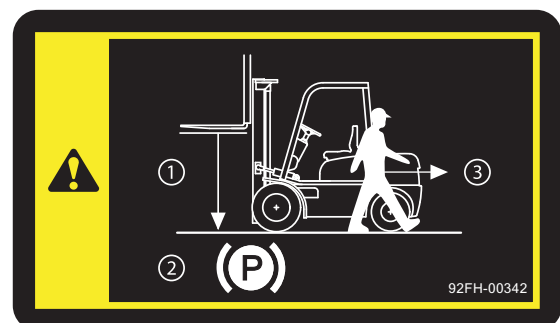
Lift trucks can be tipped over if operated improperly. Experience with lift truck accidents has shown that the driver cannot react quickly enough to jump clear of the truck and overhead guard as the truck tips. To protect operators from severe injury or death in the event of a tip over, it is best to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

**9) PARKING WARNING (item 12)**

This warning and caution plate are located on the right side of the dashboard.

Warnings before leaving the operator seat.

- ① Be sure to lower the attachment to the ground.
- ② Apply the parking brake.



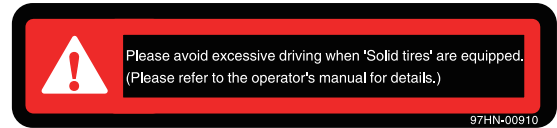
#### 10) SOLID TIRE (Item 13)

This decal is located on the right side of dashboard cover.

※ **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.
- (3) Do not drive on the road for automobile.

▲ **The durability of the solid tire is not guaranteed with non-compliance.**



#### 11) ENGINE WASH (item 15)

This warning label is located on the front left side of the bonnet.

▲ **Don't wash the engine room.**

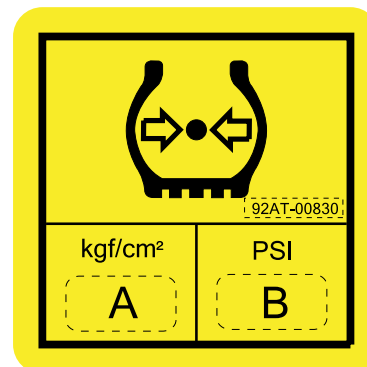


#### 12) TIRE AIR PRESSURE (item 16, 17)

This label is positioned on the front top side of the left and right fender and the both rear side of the main frame.

▲ **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).**

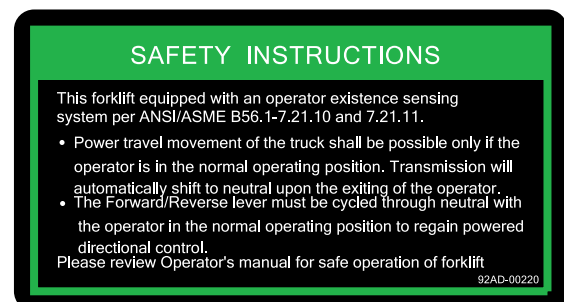


#### 13) SAFETY INSTRUCTION (item 18)

This warning label is positioned on the top right side of the bonnet if the truck is equipped with \*OPSS.

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

Truck for travel \*OPSS



- 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.
- The gear selector lever must be cycled through neutral with the operator in the normal operating position to regain powered direction control.
- 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. (Travel and mast OPSS only)

#### 14) PARKING SWITCH (item 22)

This decal is located on the front of steering column.

- ※ **Refer to the page 6-1 to release the parking brake manually for emergency towing.**

#### 15) FIRE EXTINGUISHER (item 23)

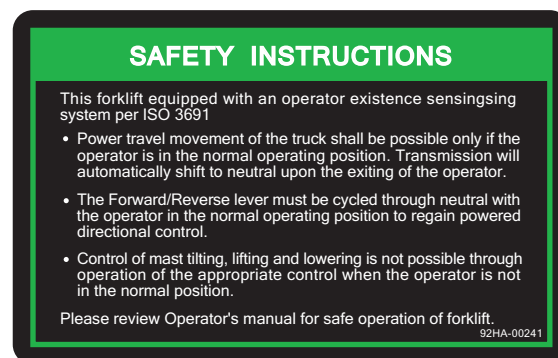
This label is positioned on the rear left side of the overhead guard above the fire extinguisher.

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

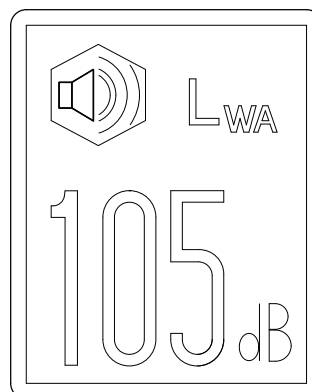
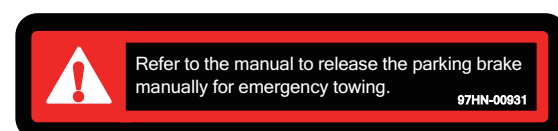
#### 16) NOISE (item 31)

This label is located on the front left side of the dashboard.

#### Truck for travel and mast \*OPSS



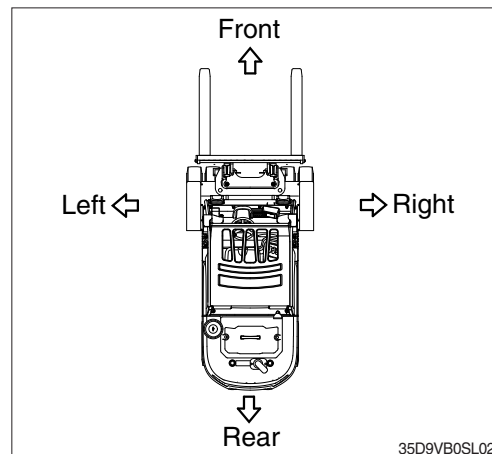
\*OPSS : Operator Presence Sensing System



91FU-00200

## 1. DIRECTION

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

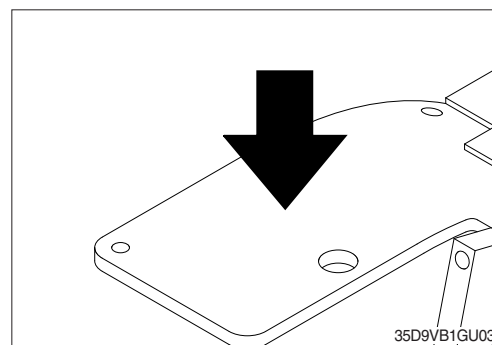


## 2. SERIAL NUMBER

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

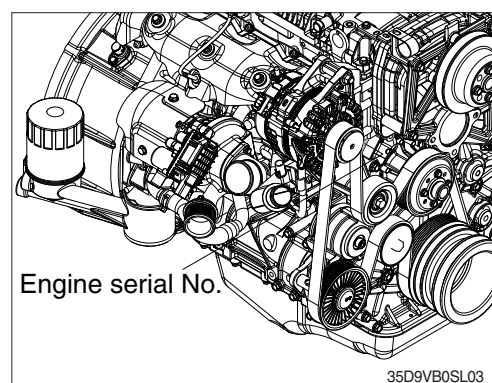
### 1) TRUCK SERIAL NUMBER

It is shown on the right fender.



### 2) ENGINE SERIAL NUMBER

The numbers are embossed in the location like the illustration.



## 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

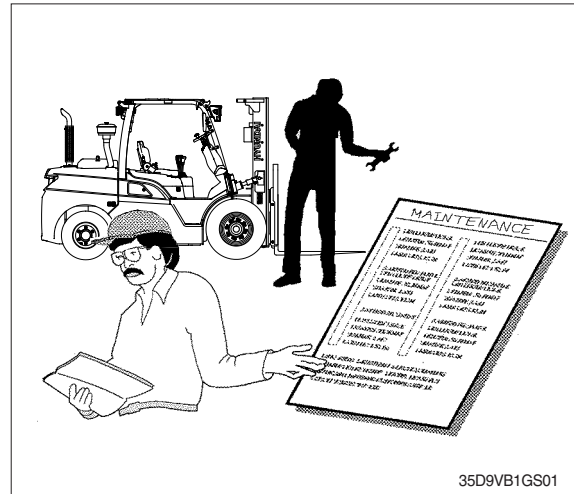
## 1. DAILY INSPECTION

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.

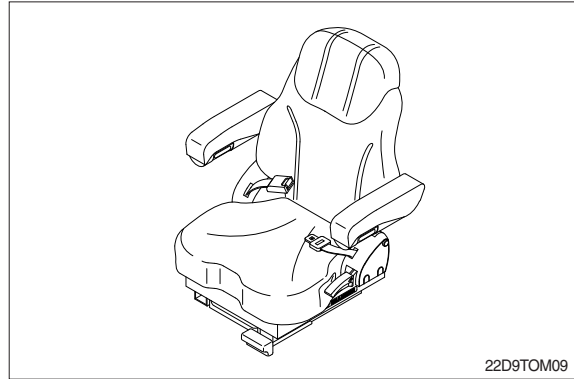
Do not operate the truck at the inhouse, if possible.

Provide adequate ventilation when working in a closed space.

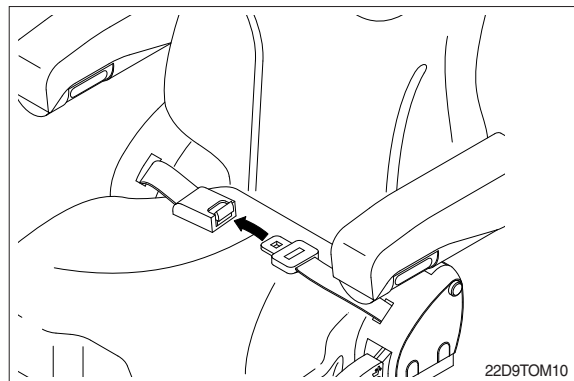


### 3. SEAT BELTS

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

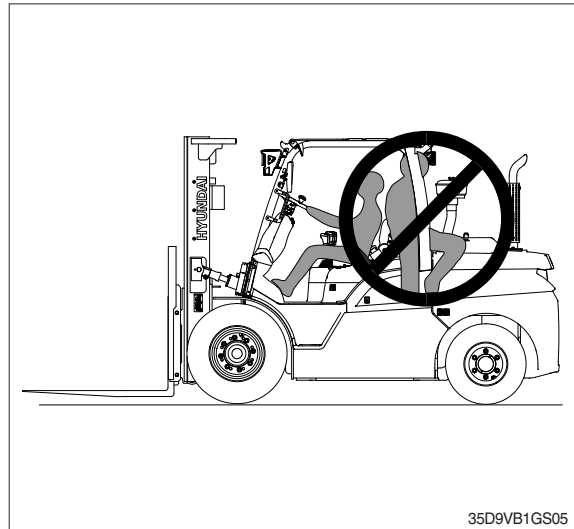


**⚠ Seat belts can reduce injuries.**

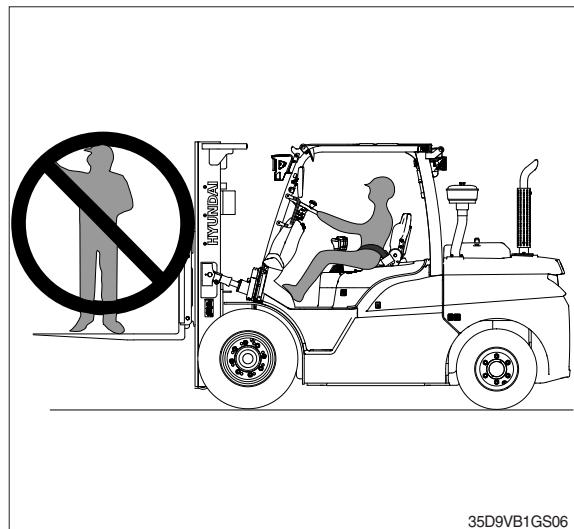


## 4. NO RIDERS

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

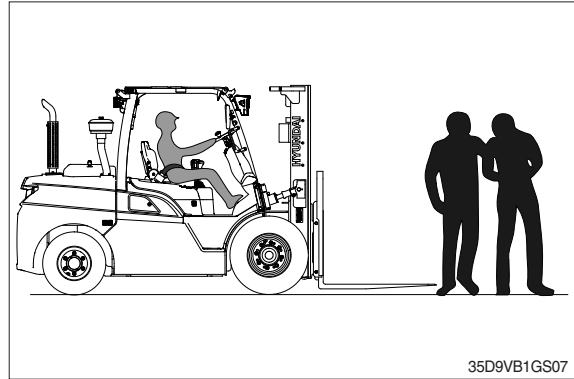


- 2) Never transport personnel on the forks of a lift truck.

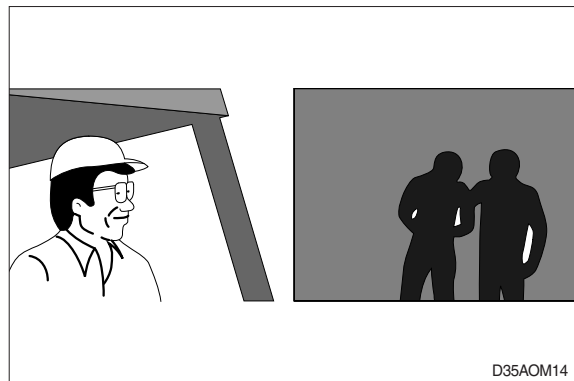


## 5. PEDESTRIANS

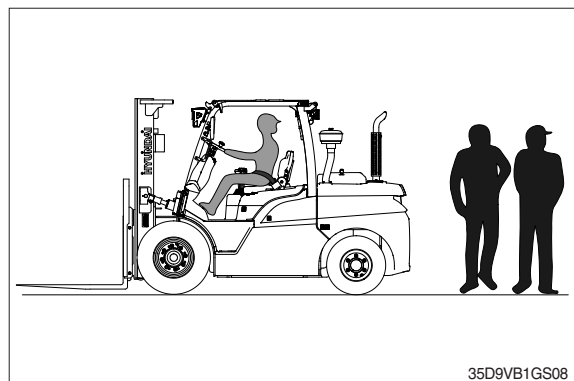
- 1) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



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

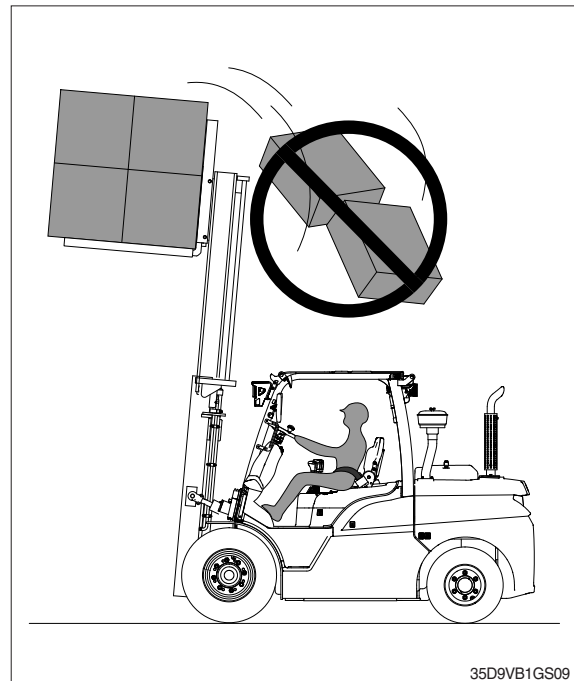


- 3) Watch for people standing back, even when you are parked.



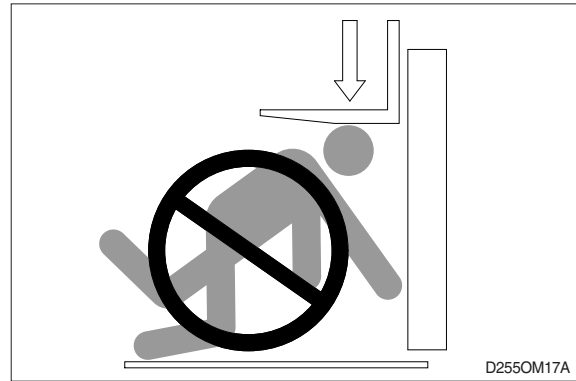
## 6. OPERATOR PROTECTION

- 1) Keep under the overhead guard.
  - 2) Always keep your body within the confines of the truck.
- ⚠ Do not operate truck without overhead guard, unless condition prevent use of a guard.**

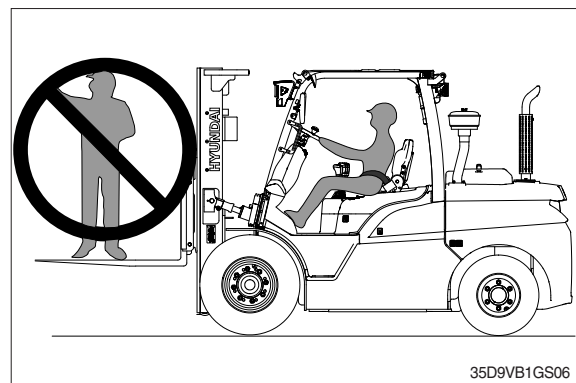


## 7. FORK SAFETY

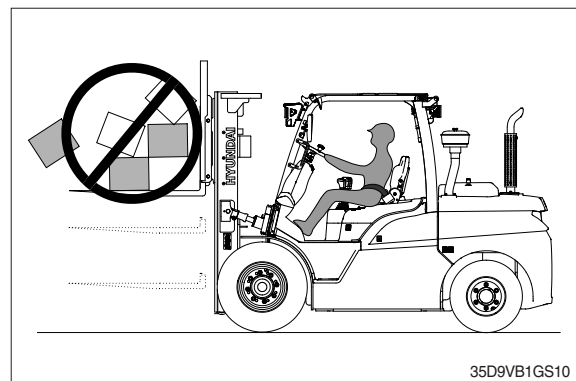
- ⚠ Never allow anyone to walk under raised forks.



- ⚠ There is special equipment to raise people for overhead work.  
DO NOT USE LIFT TRUCKS.

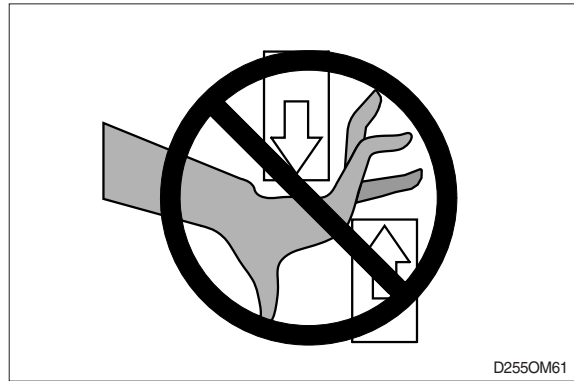


- ⚠ Always lower the load slowly.  
Raise and lower with mast vertical or tilted slightly back (Never forward).

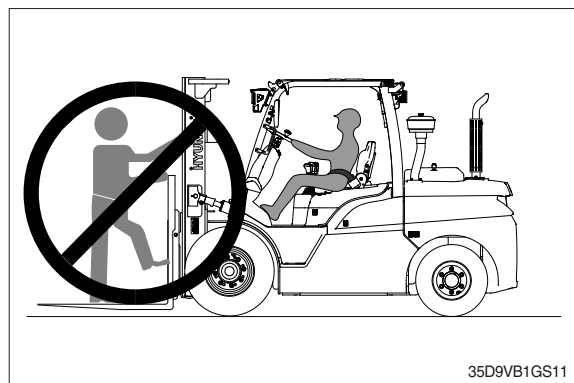


## 8. PINCH POINTS

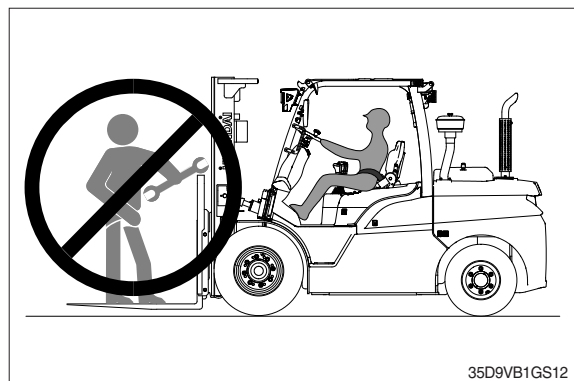
**⚠ Keep hands, feet and legs out of the mast.**



**⚠ Don't use the mast as a ladder.**



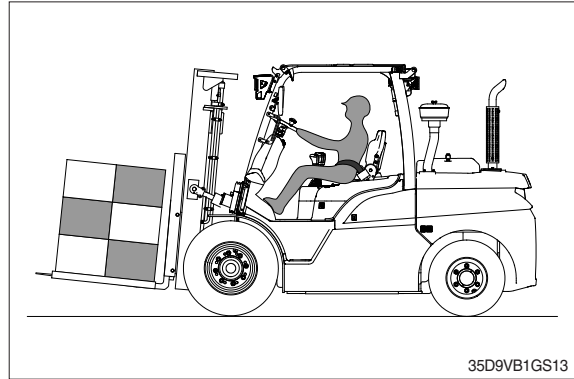
**⚠ Never try to repair the mast, carriage, chain, or attachment by yourself. Always get a trained mechanic.**



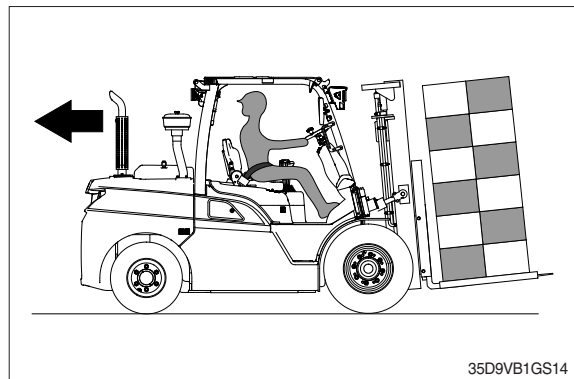
## 9. TRAVEL

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

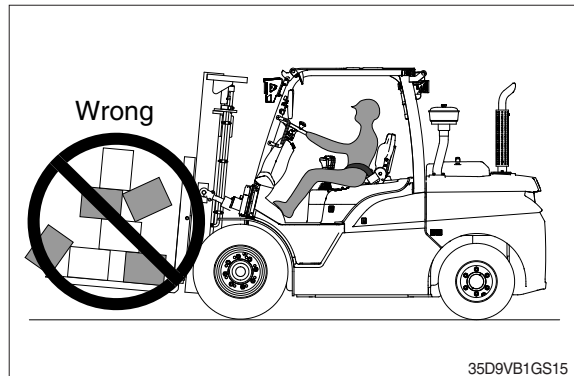
**⚠ Never lift or lower the load when the truck is in motion.**



- 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.



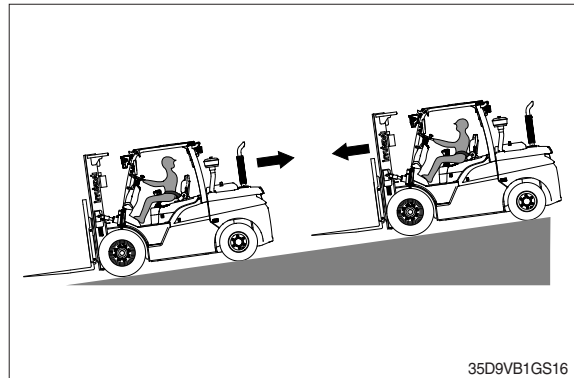
- 3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.



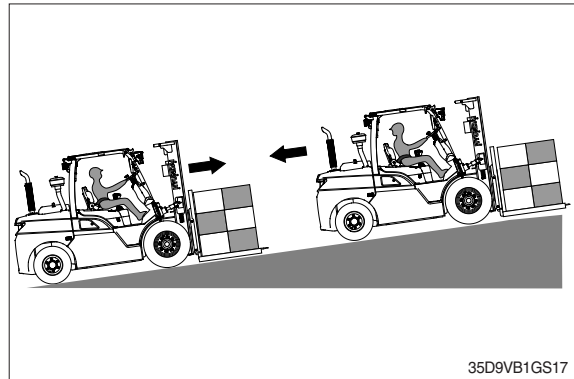
## 10. GRADES, RAMPS, SLOPES AND INCLINES

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

1) Unloaded - Forks downgrade



2) Loaded - Forks upgrade

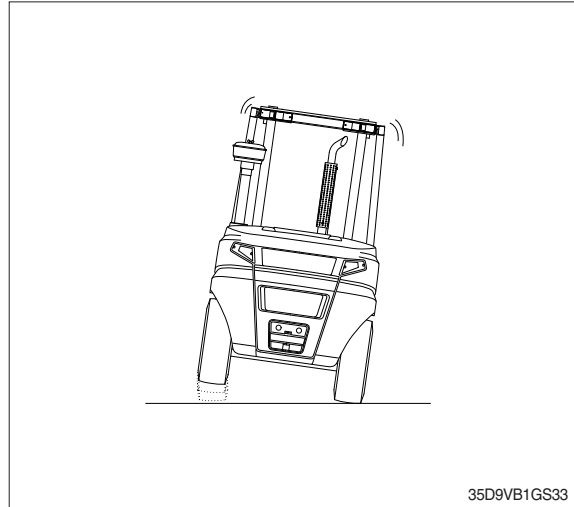




## 11. TIP OVER

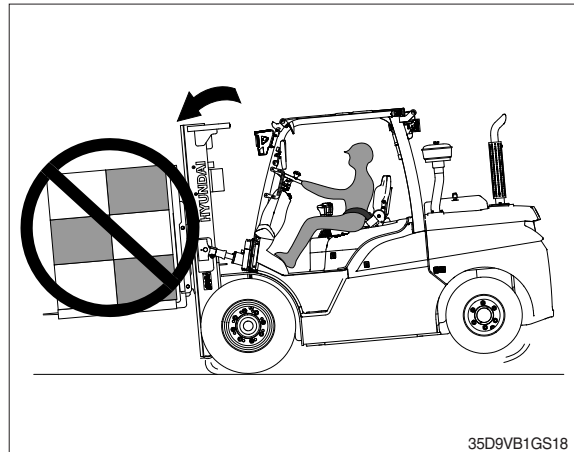
### 1) LATERAL TIP OVER

- (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.

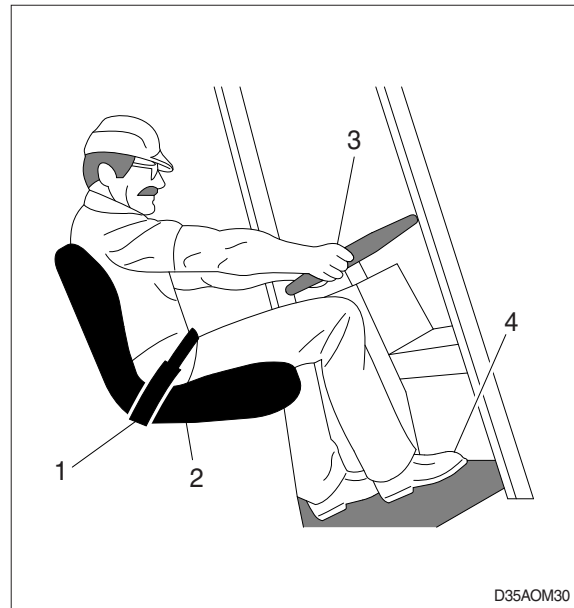
### 3) WHAT TO DO IN CASE OF A TIP OVER

⚠ 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.

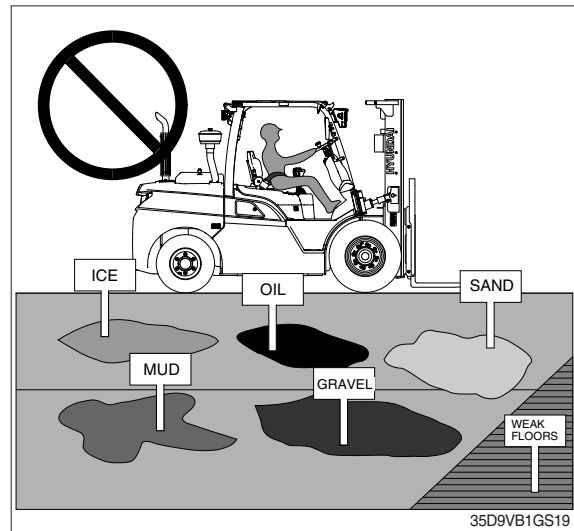
⚠ Your chances for survival in a tip-over are better if you stay with the truck, in your seat.



## 12. SURFACE AND CAPACITY

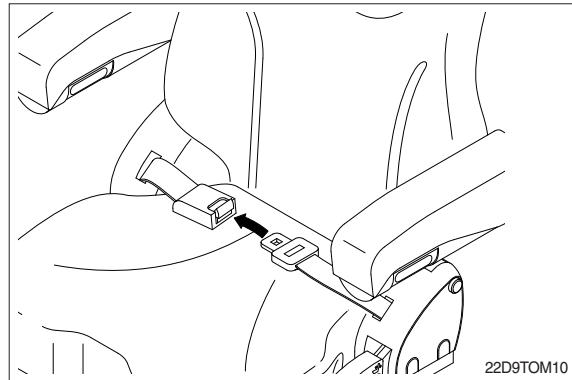
Avoid these conditions. They can cause a truck to tip over or lose traction for braking or driving.

- ⚠ **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.



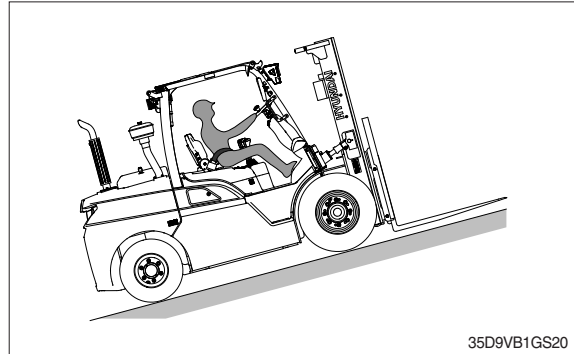
### TIPOVER

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

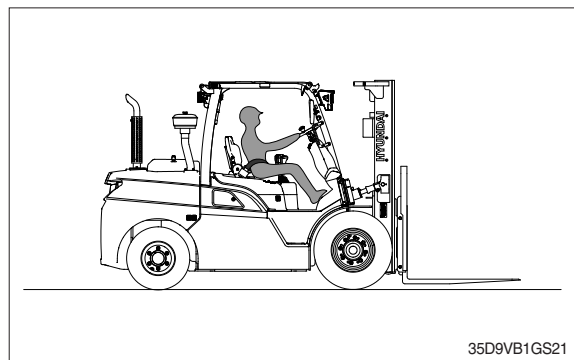


## 13. PARKING

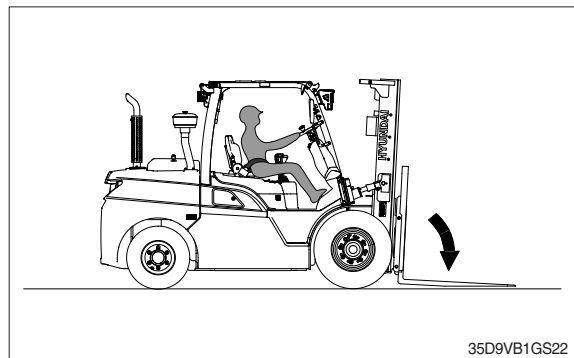
1) Never park on a grade.



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



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

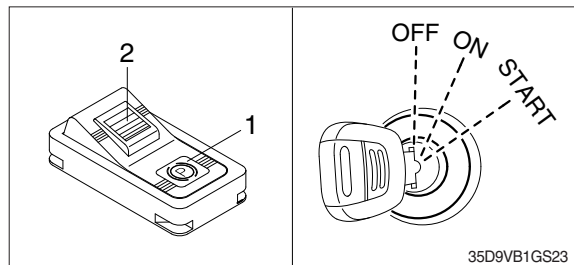


4) Put the parking brake switch in LOCK position.

Position 1 : Lock

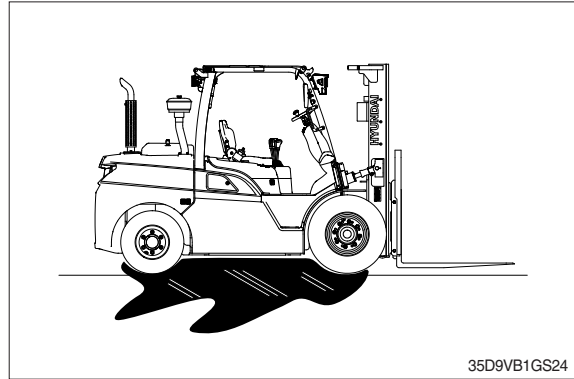
Position 2 : Release

5) Turn start switch to OFF position.

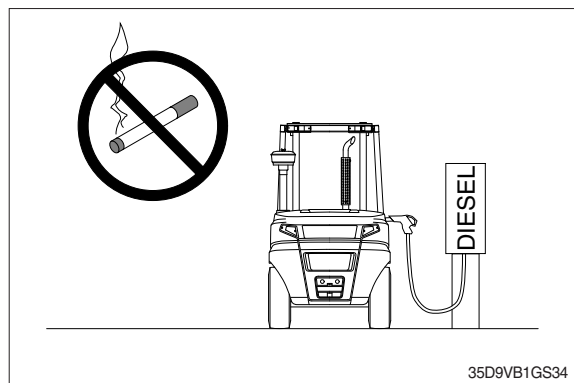


## 14. REFUELING

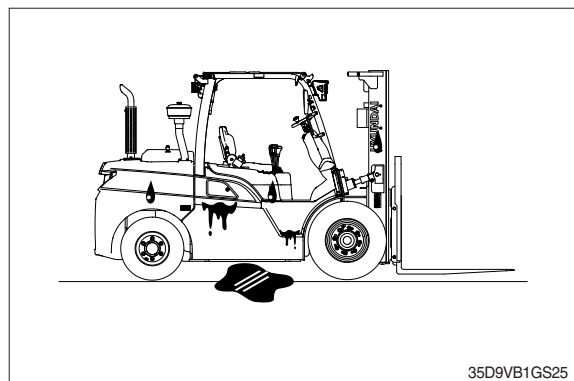
- 1) Before adding oil, check around truck for oil leakage.



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

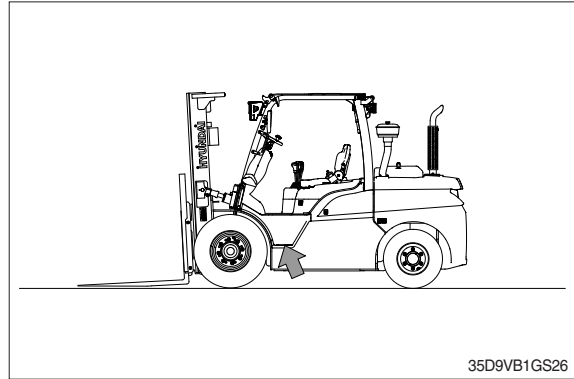


- 3) After adding oil, wipe off any oil spilled on the truck.

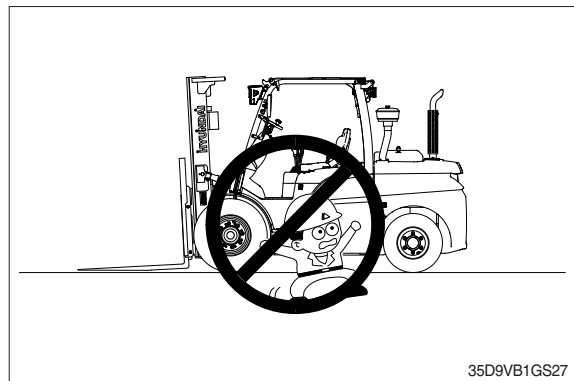


## 15. STEP

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



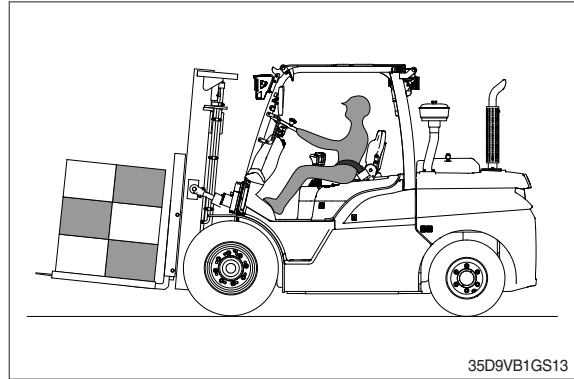
- 2) Do not jump up or down from the truck.



## 16. OPERATOR'S SAFETY RULES

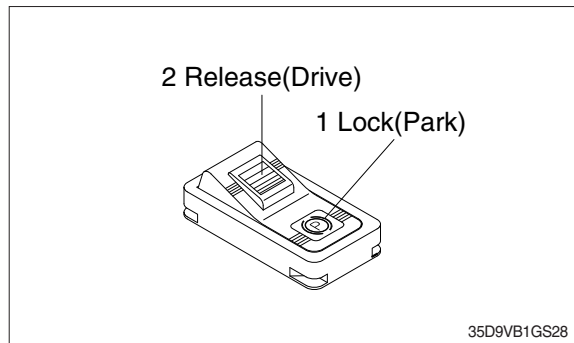
- 1) All operational functions require that the operator be seated in the operator's seat.

**▲ 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 (1) except when an operator is in the normal operating position.**



### 3) OPSS REGULATIONS

**▲ This forklift truck is equipped with an Operator Existence Sensing System per ANSI/ASME B56.1 ~ 7.21.10 and 7.21.11 (travel OPSS) or ISO 3961 (travel and mast OPSS) as a option.**

**\*OPSS : Operator Presence Sensing System**

#### (1) Traction safety warning

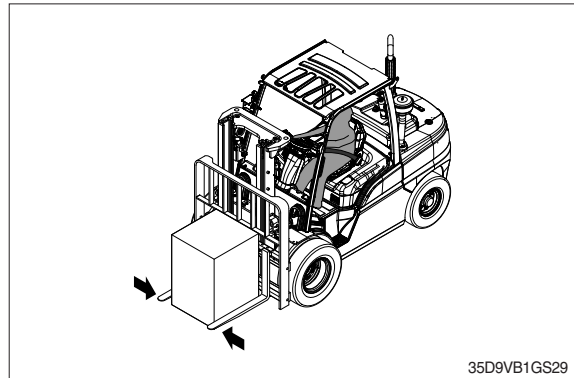
- ① This function works when the key switch is ON or START position.
- ② The transmission shifts automatically to neutral in 2 seconds from the driver's off the seat.
- ③ At the same time, the OPSS warning lamp ON and the alarm will sound intermittently if the gear selector lever was not return to the neutral position.
- ④ To release the function, the gear selector 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 placed to the PARK position.
- ④ When the key switch is OFF position, alarm will sound only for 30 seconds .

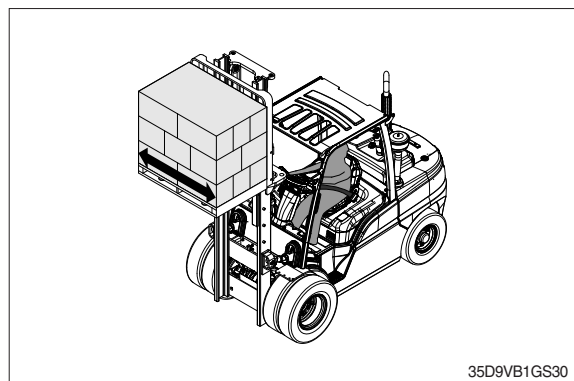
## 17. SIDE SHIFT

**⚠ Do not put side loads on the forks.**



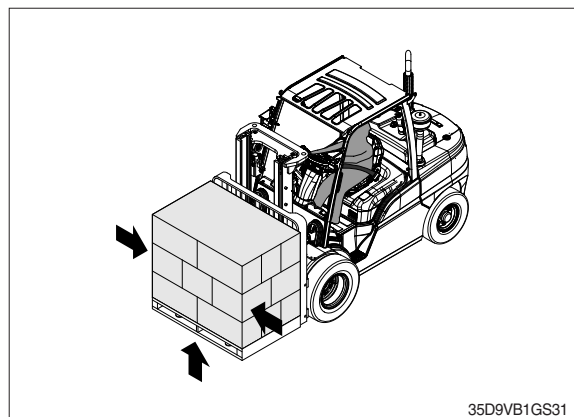
**⚠ Restrict the sideshift movement with raised load.**

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

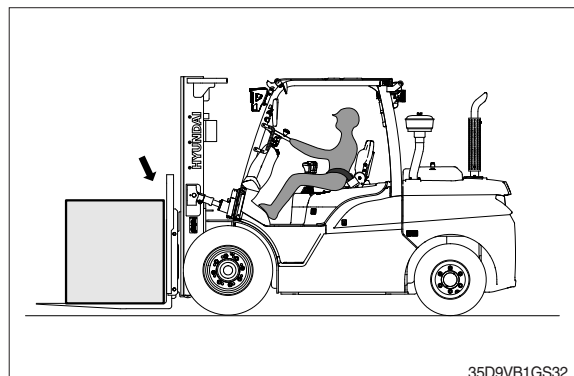


**⚠ Avoid overloading or uneven loading.**

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.**



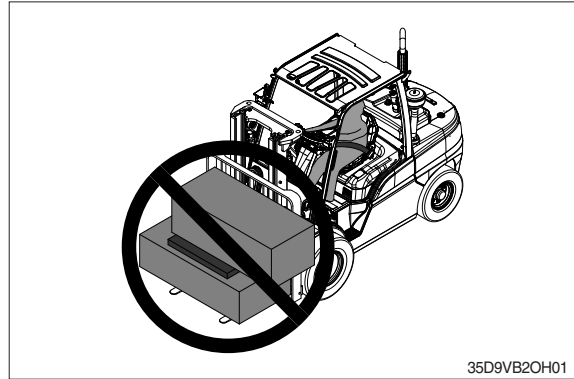


## 2. OPERATING HAZARDS

### 1. LOOSE LOADS

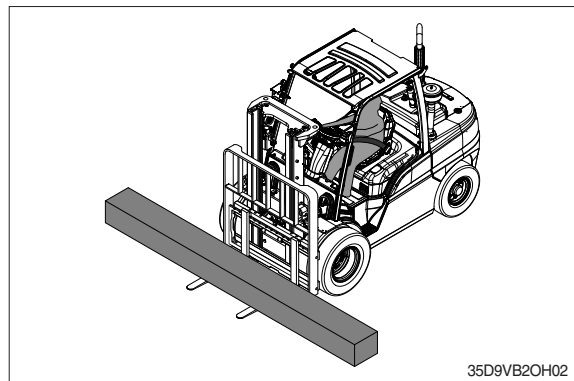
**▲ Loose or unbalanced loads are dangerous.**  
Observe these precautions.

Never carry loose or uneven material.



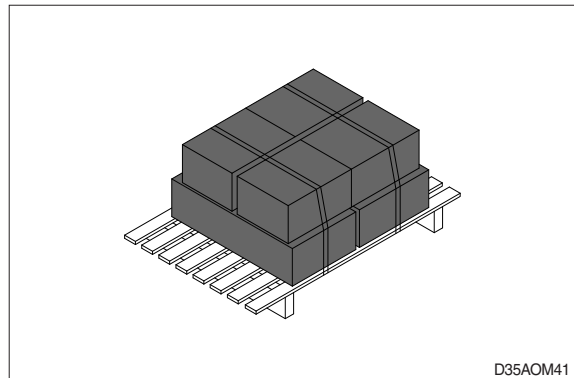
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Center wide loads.



35D9VB2OH02

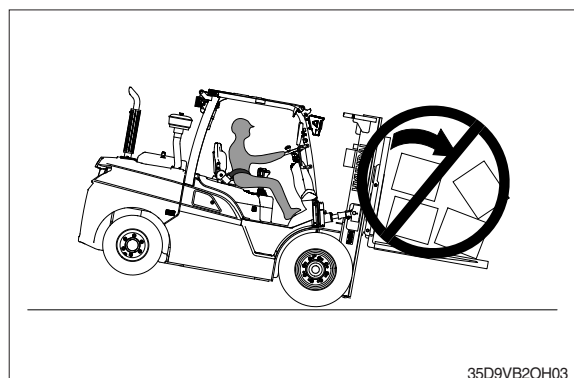
Stack and band loose material.



D35AOM41

Avoid sudden braking or starting.

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



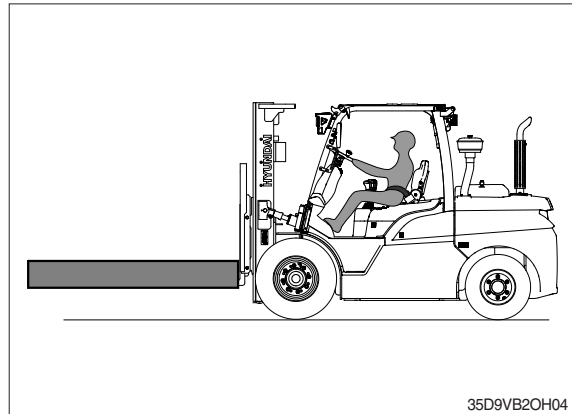
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## 2. LONG AND WIDE LOADS

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

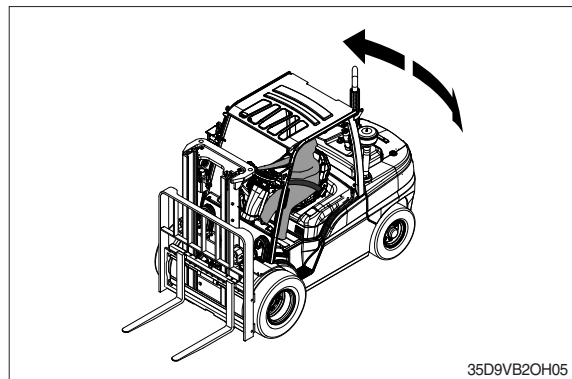
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

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



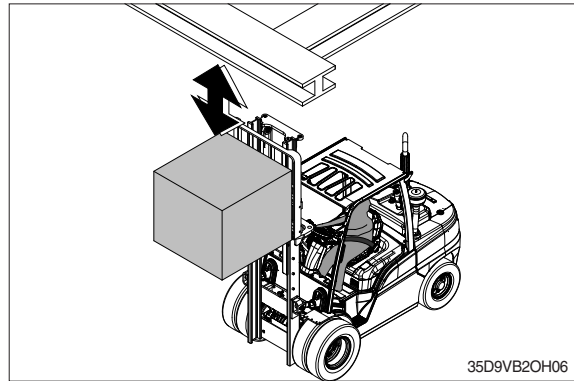
## 3. REAR SWING

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

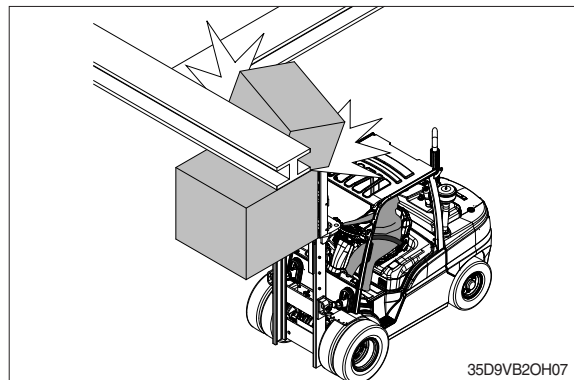


## 4. LOW OVERHEAD CLEARANCE

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

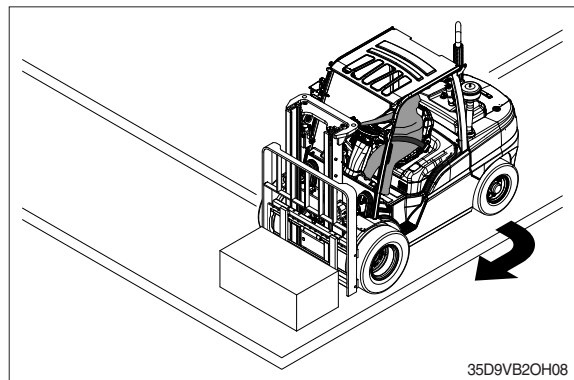


- ⚠ Watch overhead clearance: Moving into overhead structures can tip a truck over, or spill a load.

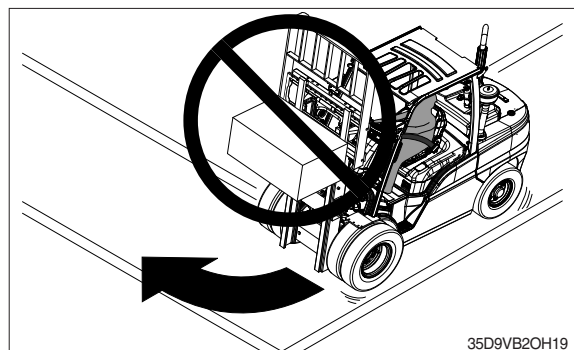


## 5. FAST TURNS AND HIGH LOADS

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



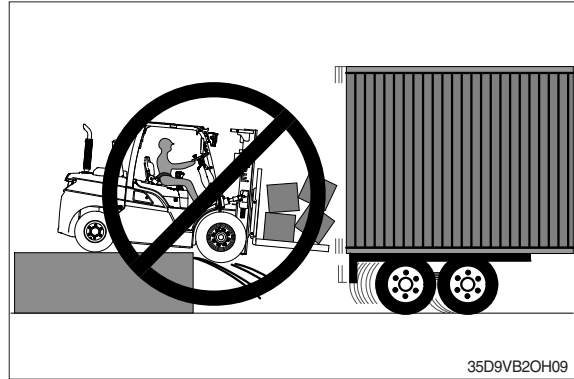
- ⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.



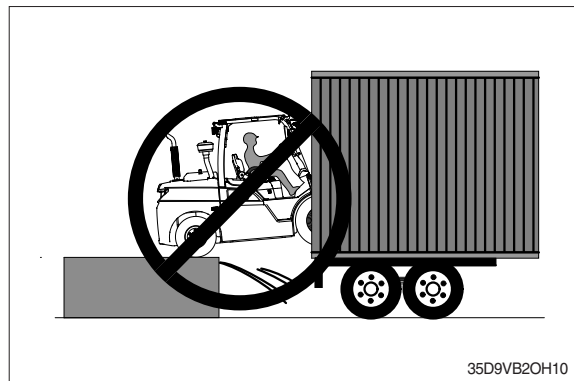
## 6. DROP-OFFS

**⚠ To avoid these hazards, you must:**

- 1) Talk to the truck driver yourself: make sure the driver does not move the trailer until you are done.
- 2) Apply trailer brakes.
- 3) Use wheel chocks.
- 4) Use trailer-to-dock locking system if available.

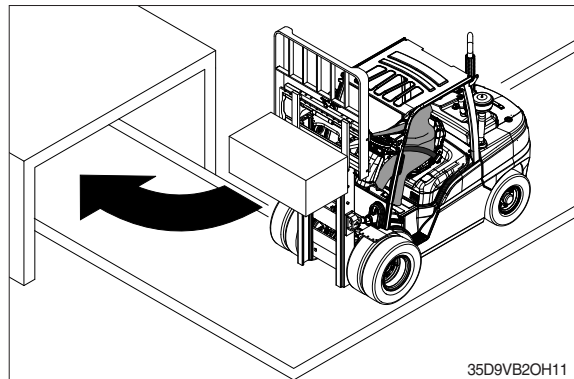


**⚠ The impact of moving in and out of a trailer may cause the trailer to creep or move.**



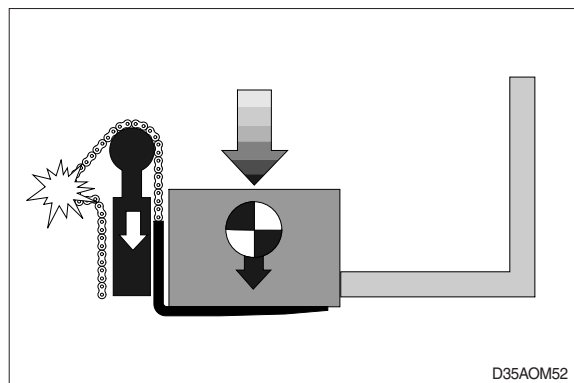
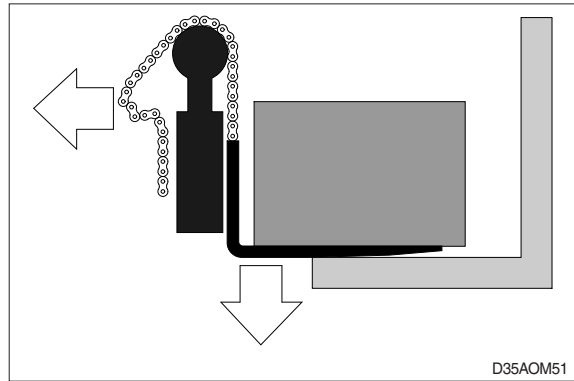
## 7. RIGHT ANGLE STACKING

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



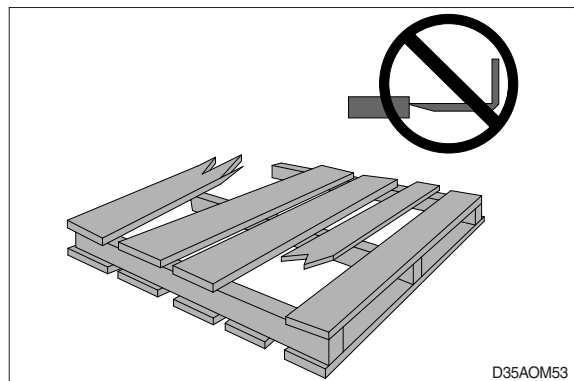
## 8. CHAIN SLACK

- ⚠ 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.



## 9. 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.



## 10. CAUTION FOR ELECTRICAL LINES

⚠ When moving the truck with the mast raised, watch out electrical lines over the truck.

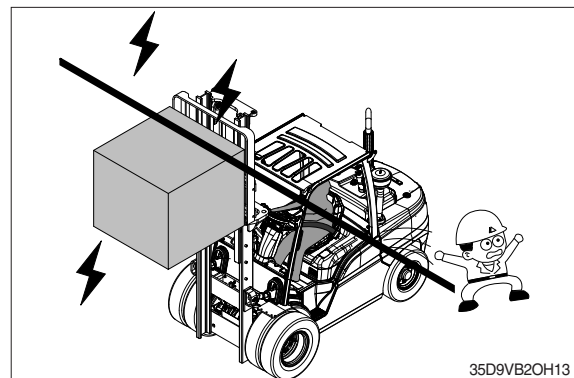
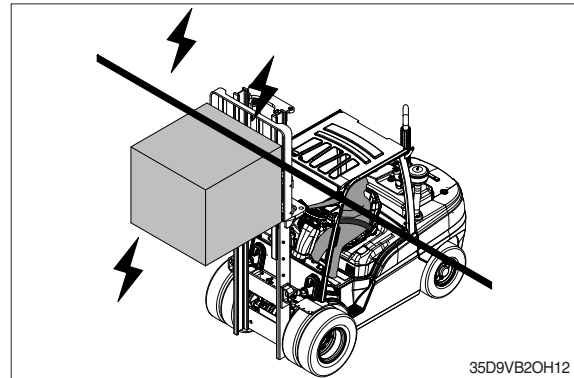
⚠ The operating near the electrical lines is very dangerous.

Operate within safe working permitted as below.

Supply voltage	Min safe distance
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)

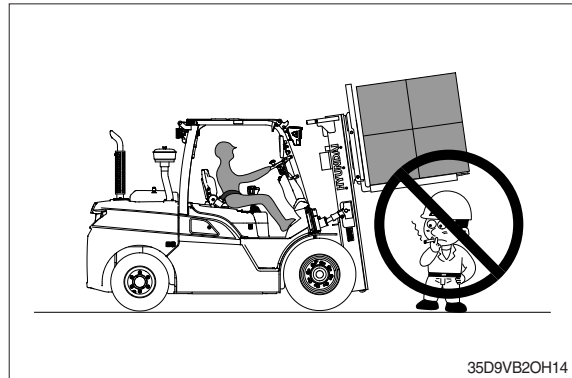
⚠ If the truck touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the truck until turning off the electric current.

Jump off the truck without contacting the truck when you need to get off.

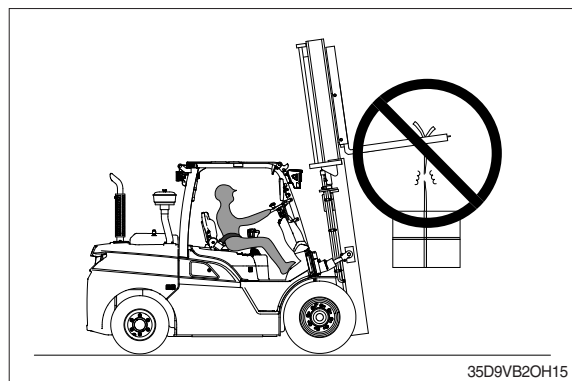


## 11. LIFTING LOADS

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



Never use wire rope to lift a load.



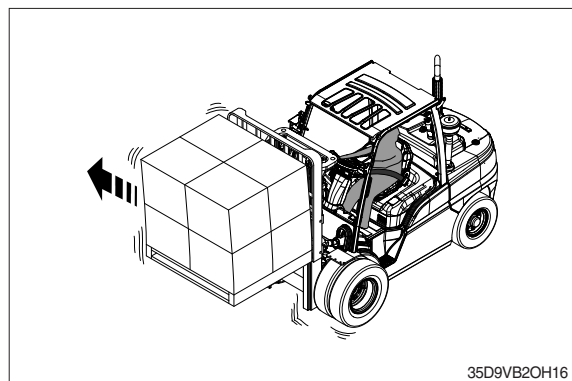
## 12. SIDE SHIFT

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.

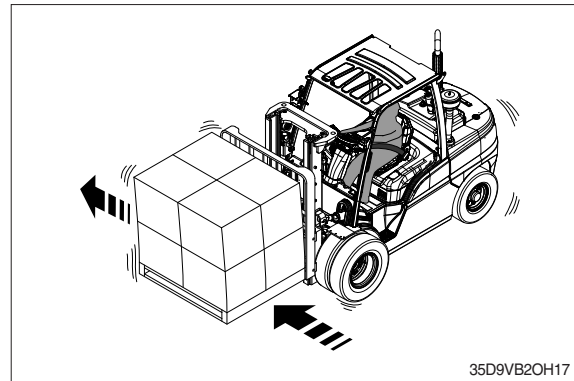
In case of moving the side shift with load, it can be caused load dropping or overturning of the forklift due to unbalanced weight.

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



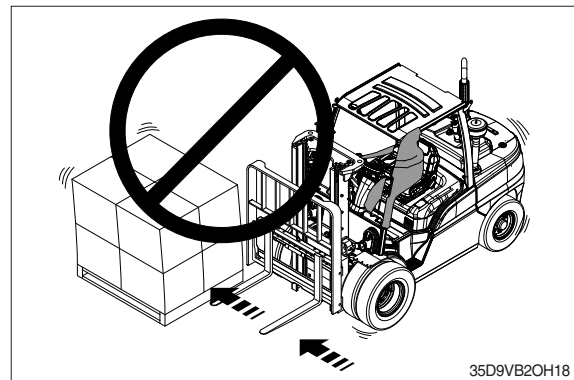
It should be observed that the side shift with load is operated in natural position before traveling.

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



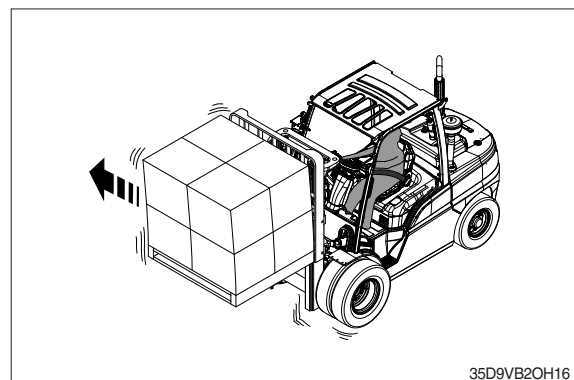
Never move the load to push or pull of it by the side shift.

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 natural 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 natural position.

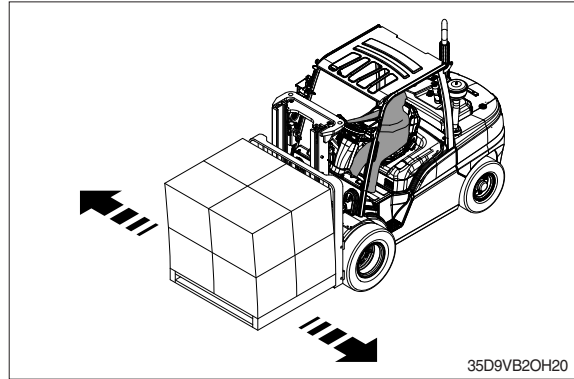




### 13. FORK POSITIONER

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.**



### 14. SOLID TIRE

- ※ **When 'Solid Tires' are equipped,**
  - Do not drive over 25 km/h (15.5 mph).
  - Do not drive on the road for automobile.
  - Do not drive more than 8 km (5 mile) in an hour.
- ⚠ **The durability of the solid tire is not guaranteed with non-compliance.**

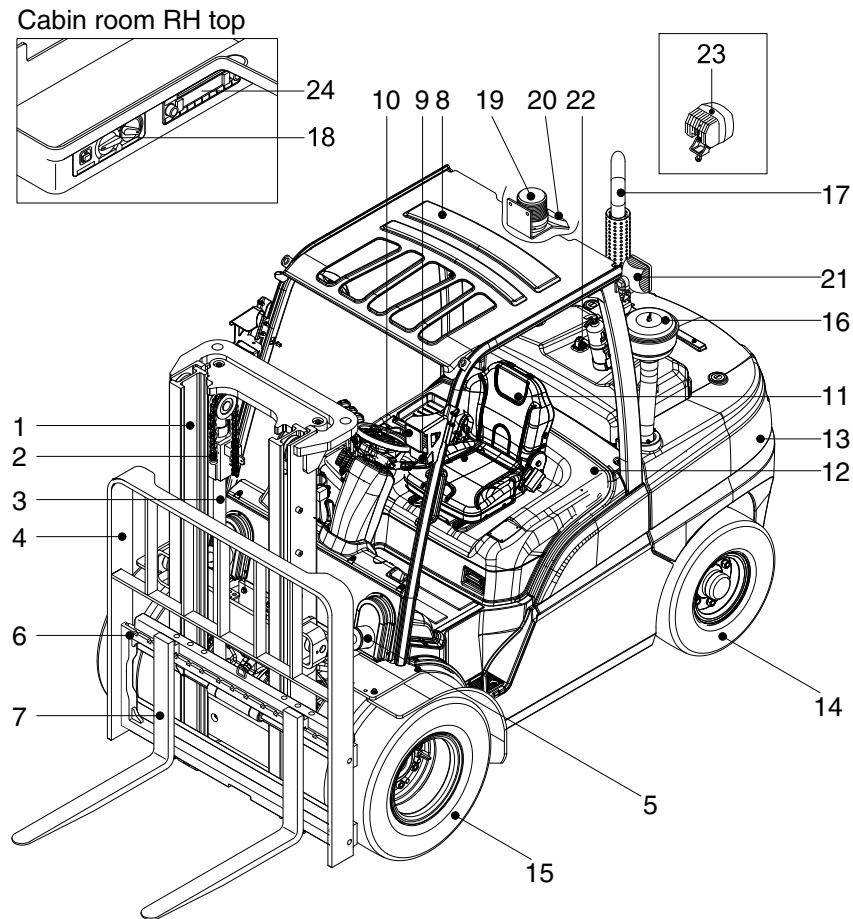
### 15. WEIGHT INDICATOR (OPTION)

This device prevents safety accident such as overload work or rollover. To measure the load, the drive and material handling is stopped. And mast is to be vertical and fork height is to be 300 ~ 500 mm (12 ~ 20 in).

- ※ **This function is not available for business dealings and certification.**
- ※ **This weight indicator measure the pressure of the lift cylinder and converts it into weight. So it should not be used to judge whether the overload value is near the allowable value.**
- ※ **At the highest end (under relief pressure condition), relief pressure will be measured. An overly large value is displayed.**
- ※ **The accuracy drops because of the influence of the mast deflection and friction at the high lift position.**

## 3. KNOW YOUR TRUCK

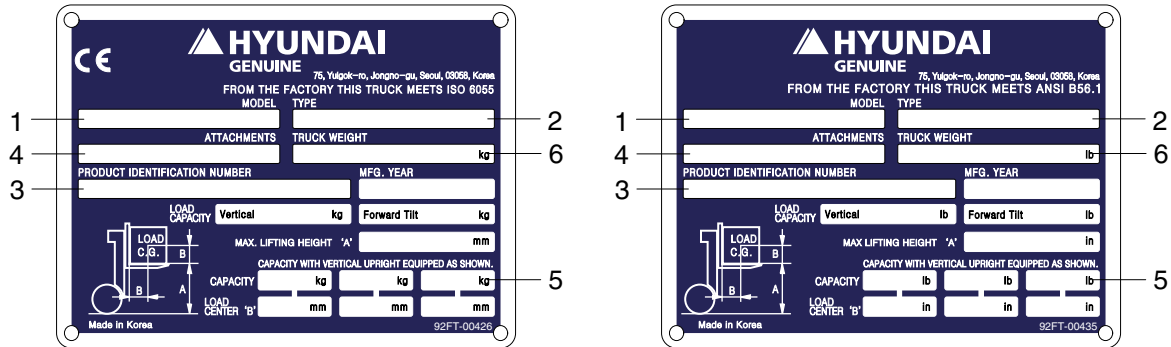
### 1. GENERAL LOCATIONS



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- |                  |                    |                                |
|------------------|--------------------|--------------------------------|
| 1 Mast           | 9 Turn signal lamp | 17 Silencer                    |
| 2 Lift chain     | 10 Head lamp       | 18 Aircon & heater (opt)       |
| 3 Lift cylinder  | 11 Operator's seat | 19 Beacon lamp (opt)           |
| 4 Backrest       | 12 Bonnet          | 20 Camera (opt)                |
| 5 Tilt cylinder  | 13 Counterweight   | 21 Rear work lamp (opt)        |
| 6 Lift bracket   | 14 Rear wheel      | 22 Rear handle with horn (opt) |
| 7 Forks          | 15 Front wheel     | 23 Blue spot (opt)             |
| 8 Overhead guard | 16 Precleaner      | 24 Radio & USB player (opt)    |

## 2. NAME PLATE



### 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.

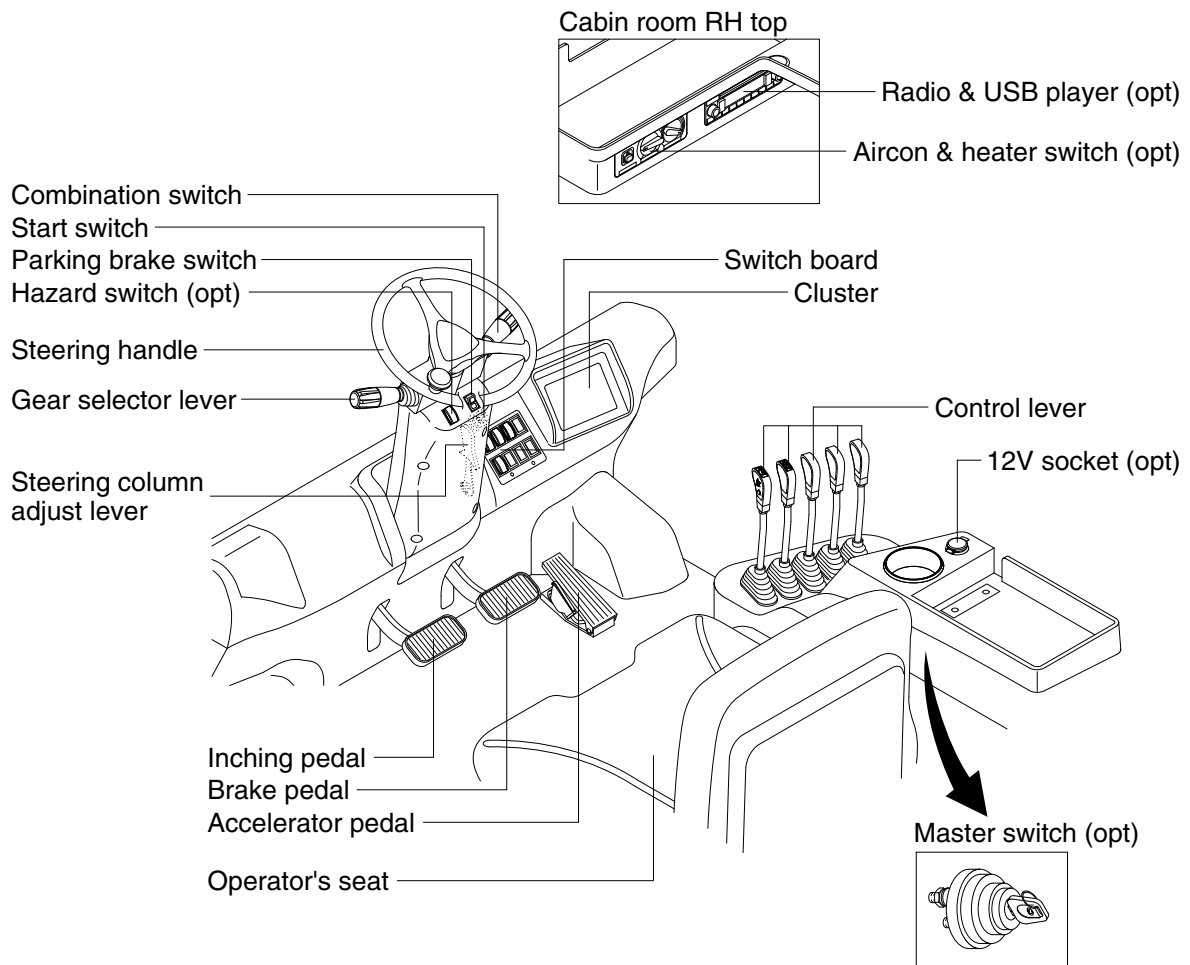
**▲ Before modifications that affect the stability of safety systems are made written approval from HYUNDAI. This is an OSHA requirement. Contact your authorized HYUNDAI dealer for a new nameplate showing the revised capacity.**

### 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.



35D9VB3KY02

## 4. CLUSTER

### 1) STRUCTURE

Like following figure, cluster is consisted of LCD and buttons. LCD will indicate the operation and abnormal status of truck to the driver in order to use and maintenance. Also, LCD allows to set and indicate the various modes, monitoring, and gadgets.

- ※ 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.



## 2) GAUGE

### (1) Operation screen

Operating screen will be displayed if turn on the start switch.



35D9VB3KY04

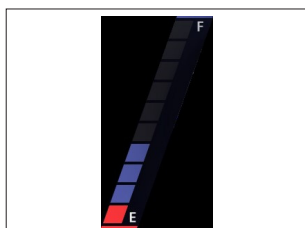
- |   |             |   |                           |
|---|-------------|---|---------------------------|
| 1 | Speed meter | 3 | Coolant temperature gauge |
| 2 | Fuel gauge  | 4 | Clock                     |

### (2) Speed meter


It indicates the speed of truck and calibrated in miles per hour (mph) or kilometer per hour (km/h).

※ **Speed unit can be set in the speed unit menu of display set up at page 3-32.**

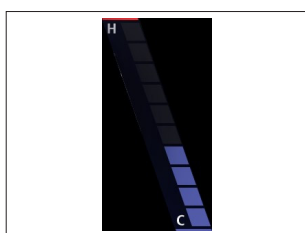
### (3) Fuel gauge




35D9VB3KY05

- Fuel gauge displays the approximate amount of fuel remaining in the fuel tank.
- It shall be obtained fuel as soon as warning lamp  lights on.

### (4) Coolant temperature gauge



35D9VB3KY06

- It indicates the temperature of the engine coolant.
  - White zone : 40 ~ 120 °C (104 ~ 248 °F)
  - Red zone : Over 120 °C (248 °F)
  - Warning lamp on : Over 115 °C (239 °F)
- If the gauge display in the red zone, or warning lamp  comes on, please stop the engine and inspect the coolant system.

### (5) Clock



35D9VB3KY07
















- It displays current time.
- The time can be adjusted at display Set Up > Time Set Up menu.



### 3) WARNING LAMPS

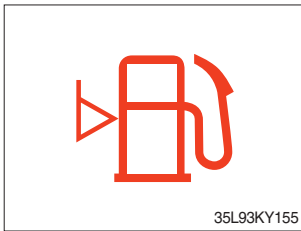


35D9VB3KY08

No.	Warning lamp		No.	Warning lamp	
1		Fuel Level warning lamp	9		Transmission oil temperature warning lamp
2		Coolant temperature warning lamp	10		DPF regeneration warning lamp
3		Engine oil pressure warning lamp	11		DPF inhibit warning lamp
4		Air cleaner warning lamp	12		DPF high temperature warning lamp
5		Water in fuel warning lamp	13		Clutch protection warning lamp
6		Engine check warning lamp	14		Communication error warning lamp
7		Engine stop warning lamp	15		Fingertip warning lamp
8		Battery charge warning lamp	-	-	-

※ Warning and indicator lamp will display only items that were set as ON, and all warning and indicator except fuel level warning and coolant temperature warning will be displayed in order from the left of screen. And directional indicator lamp will display at the center.

#### (1) Fuel level warning lamp



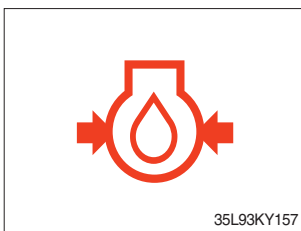
- Warning lamp will be displayed if fuel level is low.
- Please refuel immediately if the lamp is ON.

#### (2) Coolant temperature warning lamp



- Coolant temperature warning will be lit up when temperature is over 115 °C (239 °F).
- If the warning lamp is on continuously, please inspect the coolant system.

#### (3) Engine oil pressure warning lamp



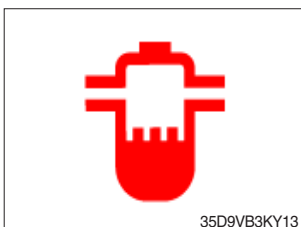
- This warning lamp will be lit up when engine oil pressure is low.
- Stop the engine immediately if the warning lamp is lit up. Please check the engine oil.

#### (4) Air cleaner warning lamp



- This warning lamp is lit when air cleaner filter is clogged up.
- Please clean up or replace the filter.

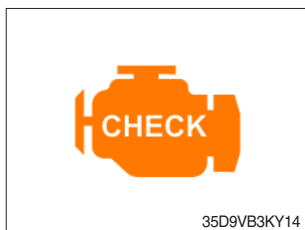
#### (5) Water in fuel warning lamp



- Light up when water in fuel.
- Stop the engine and please drain the water of the fuel filter.

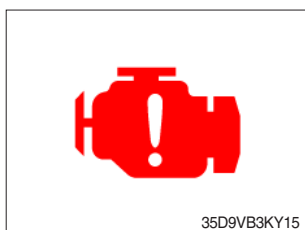


#### (6) Engine check warning lamp



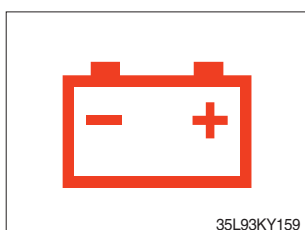
- When the engine is ON, it blinks for about 3 seconds. If the warning light remains on after 3 seconds, there is something wrong with the engine control, fuel supply and so on.
- Check the failure code of cluster.
- ※ **Some engine controls may not start if there is a problem.**
- ※ **Continued operation with the engine warning lamp ON or flashing can damage the exhaust control system, which affects operating performance and fuel consumption. You may also be subject to sanctions related to emission regulations, so be sure to check.**

#### (7) Engine stop warning lamp



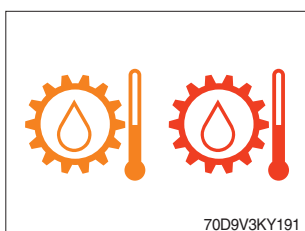
- If the lamp lights on, stop the engine immediately and check the engine.
- ※ **Please contact your Hyundai service center or local dealer.**

#### (8) Battery charge warning lamp



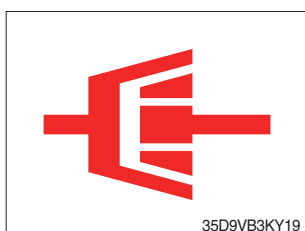
- This warning lamp is lit when battery charging voltage is low.
- Please inspect the battery charging circuit if the warning lamp is lit.

#### (9) Transmission oil temperature warning lamp



- Transmission oil temperature warning is consisted of two indications.
  - 110 °C (230 °F) or higher : Amber is light up
  - 120 °C (248 °F) or higher : Red is flashing
- When this lamp light up during operation, stop the engine and check the truck.

#### (10) Clutch protection warning lamp



- Warning lamp will be displayed if transmission oil pressure is not enough or while inching operation.
- Please check the transmission when the lamp is displayed without inching operation. If not, the brake performance can be decreased until the problem is resolved.

### (11) Communication error warning lamp



- This warning lamp will be lit up if the communication between cluster-CI and ECU is fail.
- Please check the communication line if the warning lamp is lit up.

### (12) DPF





- ※ During auto regeneration, it is possible to operate the truck (driving and handling the load).
- ※ Sufficient automatic regeneration could reduce the frequency of parked regeneration.

#### ① Inhibit regeneration switch : OFF

Level	Warning lamp				Stage of regeneration
	DPF inhibit	DPF regeneration	DPF high temp	Engine check	
Level 0 (No need regeneration)			★On		Regeneration is not required.
Level 1 (Auto regeneration)			★On		Regeneration starts automatically when the PM (particulate matter) level reaches to this level.
Level 2 (Request parked regeneration)		On	★On		ECU requests parked regeneration. Operator needs to follow parked regeneration method. Automatic regeneration does not stop in this level.
Level 3 (Parked regeneration)		On	★On	On	Automatic regeneration stops. Operator had better park the machine and start parked regeneration as soon as possible. During parked regeneration, machine operation is restricted. Engine output will be limited from Level 3.
Level 4 (Regeneration with service tools)		Blink	Blink	Blink	Parked regeneration is impossible. Regeneration is possible with service tools only.

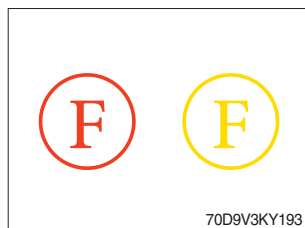
★ : When regenerating

## ② Inhibit regeneration switch : ON

Level	Warning lamp				Stage of regeneration
	DPF inhibit	DPF regeneration	DPF high temp	Engine check	
					
Level 0 (No need regeneration)	On				Regeneration is not required.
Level 1 (Auto regeneration)	On				Automatic regeneration inhibit.
Level 2 (Request parked regeneration)	On	Blink			ECU requests parked regeneration. Operator needs to follow parked regeneration method. (Automatic regeneration inhibit)
Level 3 (Parked regeneration)	On	Blink		On	Operator had better park the machine and start parked regeneration as soon as possible. During parked regeneration, machine operation is restricted. Engine output will be limited from Level 3.
Level 4 (Regeneration with service tools)	On	Blink		Blink	Parked regeneration is impossible. Regeneration is possible with service tools only.

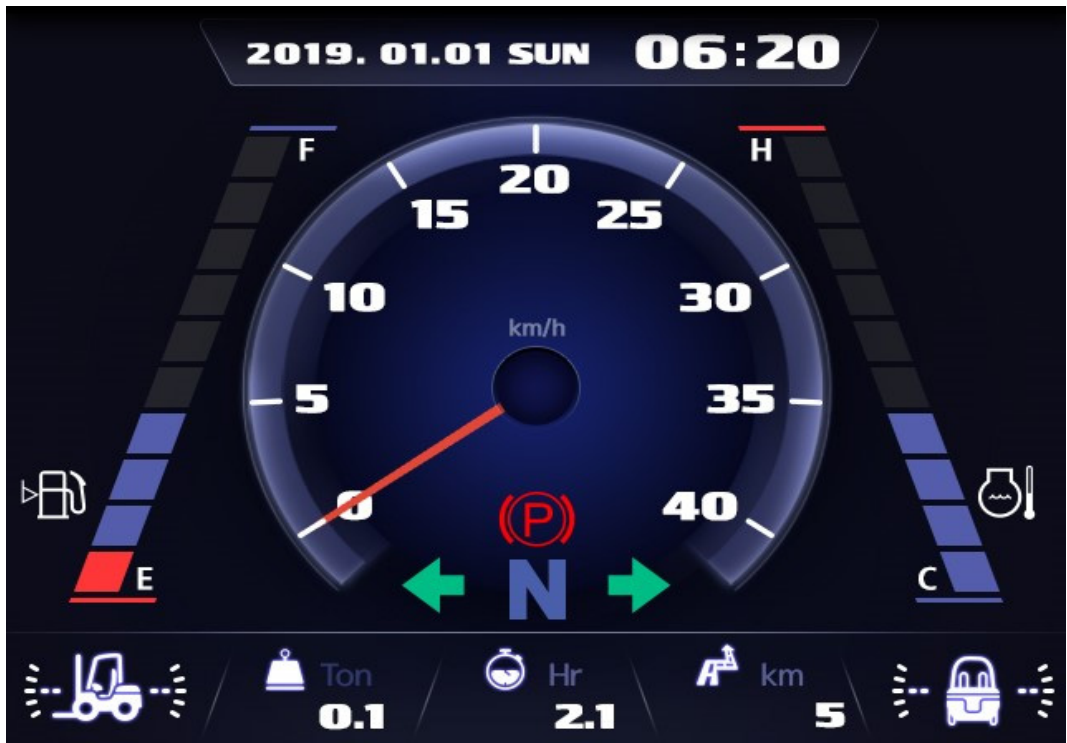
- ※ The hydraulic operation noise will be generated during automatic regeneration. During auto regeneration, it is possible to operate the truck (driving and handling the load), and hydraulic operation sound may change depending on the user operation.
- ※ Sufficient automatic regeneration could reduce the frequency of parked regeneration.

## (13)Fingertip warning lamp



- If this warning light is lighted, check the finger tips.
- If the warning lights are lit while driving, stop the engine and check the forklift.

#### 4) INDICATOR LAMPS



35D9VB3KY24

No.	Indicator lamp		No.	Indicator lamp	
1		Engine warning up indicator lamp	6		OPSS indicator lamp
2		Fuel warmer indicator lamp	7		Driving indicator lamp
3		Consumable replacement indicator lamp	8		
4		Parking brake indicator lamp	9		
5		Tilt lock indicator lamp	10		

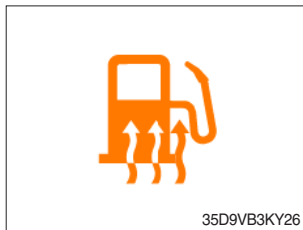
※ Warning and indicator lamps will display only items that were set as ON, and all warning and indicator except turning indicator lamp and driving indicator lamp will be displayed in order from the left of screen.

#### (1) Engine warm-up indicator lamp



- The truck senses the engine coolant temperature and warms-up engine when needed.
- When it is happening, the indicator lamp is ON.

#### (2) Fuel warmer indicator lamp



- Light up when fuel warmer is operating. (Controlled by ECU)

#### (3) Consumable replacement indicator lamp



- Light up if consumables which must be replaced are exist.
- The indicator lamp will light up only 3 minutes since start switch ON, and then light OFF.
- Please check the consumables management list in maintenance menu.

#### (4) Parking brake indicator lamp



- Light up when parking brake is ON.

#### (5) Tilt lock indicator lamp



- The Indicator lamp will be lit up if the tilt lock switch (option) is entered.
- Tilt action will be limited if this Indicator lamp is lit up and the mast is located at 90 degrees.

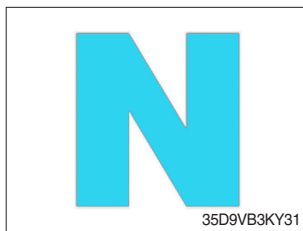
#### (6) OPSS indicator lamp



- Light up if driver leave seat during operation.
  - Truck driving and/or mast control will be blocked if lamp is lit up.
- ※ Please refer to page 0-11,12 for details.

#### (7) Driving indicator lamp

##### ① Neutral



- This indicator lamp will be lit up when direction lever is located in neutral.

##### ② Forward



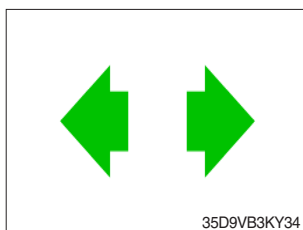
- This indicator lamp is displayed if the forward gear is selected.

##### ③ Reverse



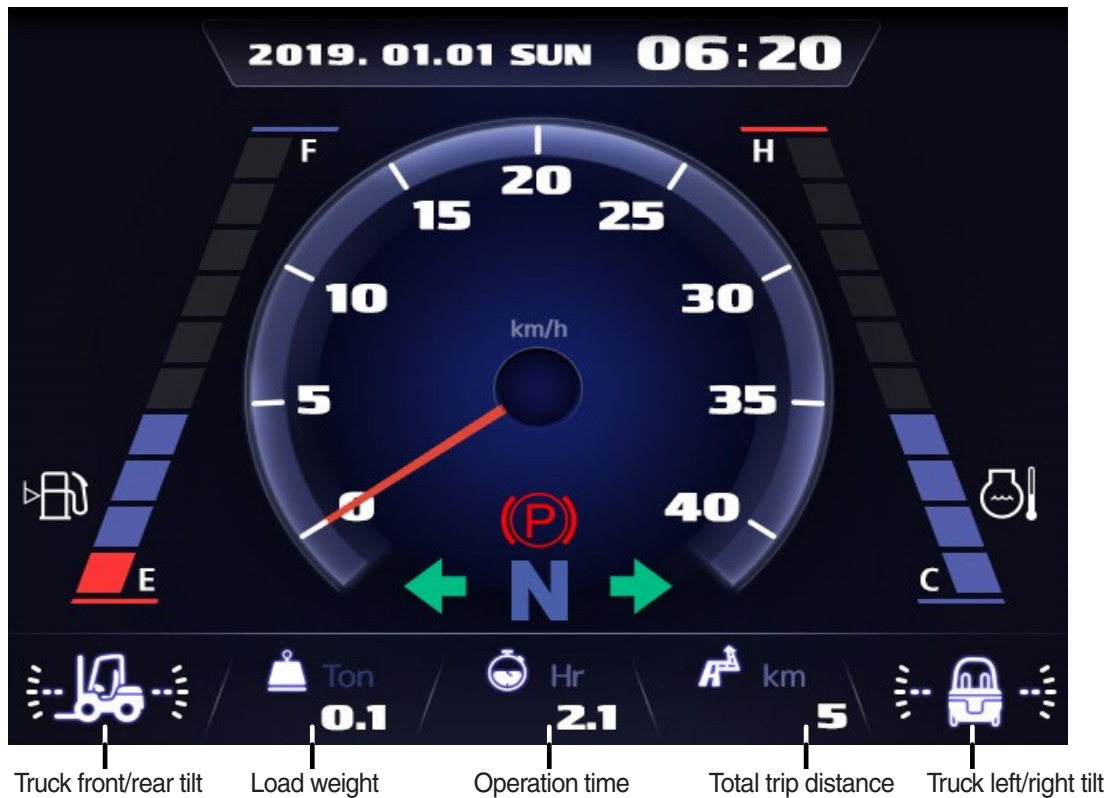
- This indicator lamp is displayed if the reverse gear is selected.

##### ④ Right or left turning indicator lamp



- This indicator lamp will flash if turns on the right or left turn signal.

## 5) INFORMATION DISPLAY



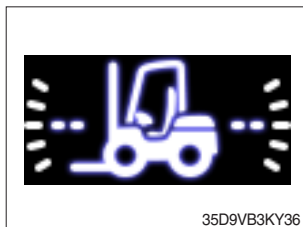
35D9VB3KY35

### (1) Mast front/rear tilt



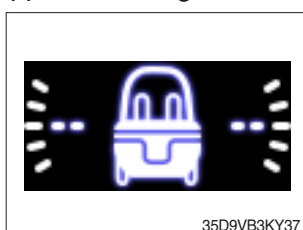
- Display the real time tilt of mast.

### (2) Truck front/rear tilt



- Display the front/rear tilt of truck in real time.
- The red warning symbol turned on condition.
  - Stop : Tilt angle is higher than 2.3°
  - Driving : Tilt angle is higher than 10.2°

### (3) Truck left/right tilt



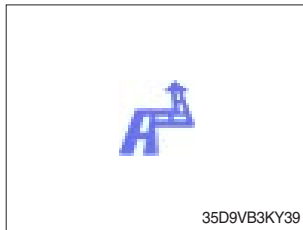
- Display the front/rear tilt of truck in real time.
- The red warning symbol turned on condition.
  - Stop : Tilt angle is higher than 3.4°
  - Driving : Tilt angle is higher than 28.0°

#### (4) Load weight (option)



- Display the load weight.
- Screen will display blurry if the weight sensor has not been mounted.

#### (5) Total trip distance



- Display total trip distance of the truck.
- Unit of distance is kilometer.

#### (6) Operation time



- Display the used time of the truck.

#### (7) Explanation of warning lamp and indicator lamp

- When warning lamp or indicator lamp comes on, please press the enter button to check detailed explanation.
- During pressing the enter button, it keeps the screen to be shown explanation for warning lamp or indicator.



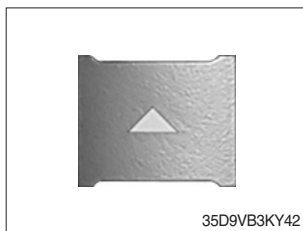
## 6) BUTTONS

### (1) Camera



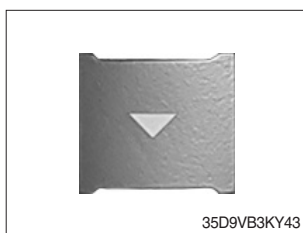
- This switch displays rear camera images. (if the camera is mounted)

### (2) UP/Left



- This switch is used to move upward or leftward in menu or increase the value.

### (3) Down/Right



- This switch is used to move downward or rightward in menu or decrease the value.

### (4) Select



- This switch is used to enter into the menu or to select.

### (5) Cancel (ESC)



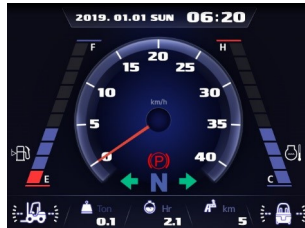
- This switch is used to cancel or move to upper menu.

## 7) MAIN MENU

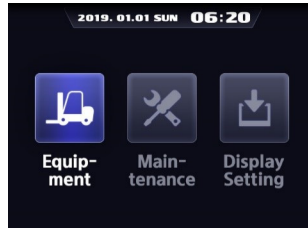
### (1) Structure

A menu consists of main menu and sub-menu.

Operation Screen




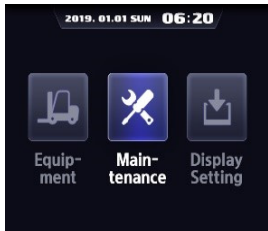
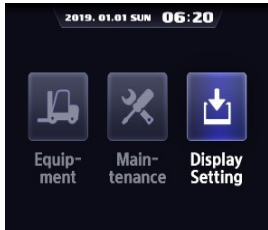
Main Menu Screen



Sub-Menu Screen



35D9VB3KY46

No.	Main menu	Sub menu	Explanation
1	 <p>35D9VB3KY47</p>	<ul style="list-style-type: none"> <li>Model select</li> <li>Tilt setting</li> <li>Weight sensor setting</li> <li>ESL setting</li> <li>Camera setting</li> <li>Auto-shift speed setting</li> <li>DCSR setting</li> <li>Limit warning speed setting</li> <li>MCU/Cluster information</li> </ul>	<ul style="list-style-type: none"> <li>Diesel, LPG</li> <li>Vehicle tilt Initialize</li> <li>Enter the cylinder cross section area , Adjust load weight, Weight display setup</li> <li>ESL setting, Delay time</li> <li>Interoperate with reverse gear</li> <li>1st gear-&gt; Switching speed to 2nd gear, 2nd gear -&gt; Switching speed to 1st gear</li> <li>DCSR On, Block driving speed, Restore driving speed</li> <li>Maximum speed limitation</li> <li>MCU/Cluster Information</li> </ul>
2	 <p>35D9VB3KY48</p>	<ul style="list-style-type: none"> <li>Failure History</li> <li>Maintenance</li> <li>Management</li> <li>Signal status</li> <li>User password change</li> </ul>	<ul style="list-style-type: none"> <li>Current engine failure, Engine failure history</li> <li>Change oil and filter replacement cycle</li> <li>Analog Input, Digital input/output</li> </ul>
3	 <p>35D9VB3KY49</p>	<ul style="list-style-type: none"> <li>Adjust LCD Brightness</li> <li>Time Setting</li> <li>Unit Setting</li> <li>Language Setting</li> <li>A/S phone No.</li> <li>ESL password change</li> <li>Maintenance management</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, Manual</li> <li>Clock</li> <li>Speed, Weight, Temperature, Pressure, Date type</li> <li>Korean, English</li> <li>Change A/S contact</li> <li>E/G starting password connect</li> <li>Maintenance parts management</li> </ul>

## (2) Equipment menu

### ① Model select (Required setting)

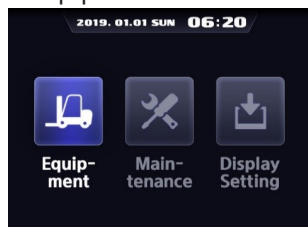
- How to check the Model Select (Check under the start switch ON status)
- Selection will be canceled if press the cancel button.

※ This is a required setting. Some functions may not be worked properly if you do not select the model.



35D9VB3KY50

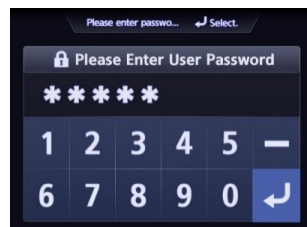
#### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

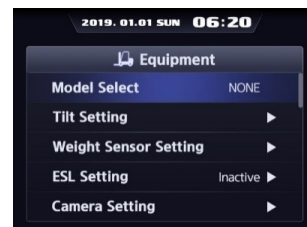
#### 2. Password



35D9VB3KY51

Enter the password.  
Default password is "00000".  
Password length must be 5~10 digits.

#### 3. Model select



35D9VB3KY52

Choose model select

#### 4. Diesel or LPG



35D9VB3KY53

Please select the fuel type.

#### 5. Truck weight



35D9VB3KY54

Please select the vehicle weight level.

#### 6. Truck model



35D9VB3KY55

Please select the exact model name.

#### 7. Confirm



35D9VB3KY56

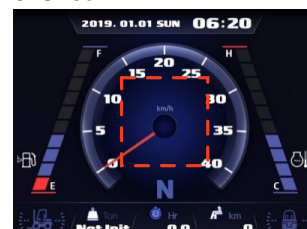
Model selection is completed.

#### 8. Completion



35D9VB3KY57

#### 9. Check



35D9VB3KY58

Check the phrases would be disappeared in the main screen.

- ※ If you want to move back to previous page, please enter ESC button in any stage.
- ※ It shall be selected right model to prevent malfunction of vehicle.

## ② Initialize truck tilt (as required setting)

How to check "the initialize truck tilt" (Check under the start switch ON status.)

- ※ The tilt sensor has already been initialized when deliver the vehicle from factory.
- ※ Initialize vehicle tilt if the tilt sensor figure or vehicle tilt is not horizontal in the flatland.

▲ You must set tilt in the flatland since this is a horizontal set up.

Vehicle that has not applied the mast angle sensor

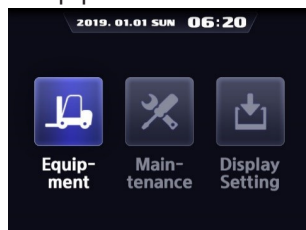


Vehicle that has applied the mast angle sensor



35D9VB3KY59

### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

### 2. Tilt setting



35D9VB3KY60

Please select the exact model name.

### 3. Instruction



35D9VB3KY61

Follow the instruction showing in the screen.

### 4. Completion



35D9VB3KY62

- ※ If tilt sensor for mast is mounted (option), locates the mast vertically.
- ※ Mast maximum angle depends on the vehicle.

#### a. Check functions

(a) Check the real time operation by changing angles of vehicle tilt and mast tilt.

#### (b) Auto-leveling (option)

- (a) Tilt mast forward or backward.
- (b) Start tilting mast toward its vertical position, pushing the auto tilt leveling switch.
- (c) Check if the mast stops traveling when it becomes vertical to ground.

#### (c) Forward or backward tilt warning (red)

- Stop :  $\pm 2.3^\circ$  (1.5 tons ~ 5.0 tons)
- Driving :  $\pm 10.2^\circ$  (1.5 tons ~ 5.0 tons)

#### (d) Left/Right Tilt Warning (red)

- Stop :  $\pm 3.4^\circ$  (1.5 tons~5.0 tons)
- Driving

Vehicle Weight	Warning Angles (Red)
1.5 tons ~ 2.0 tons	$\pm 20.3^\circ$
2.2 tons ~ 3.3 tons	$\pm 20.8^\circ$
3.5 tons ~ 4.5 tons	$\pm 24.2^\circ$
5.0 tons	$\pm 28.0^\circ$

### ③ Weight sensor set up

- How to check "the weight sensor set up" (Check under the start switch ON status)
- There are three settings for weight sensor. (unload, lad, initialization)

※ The weight sensor has already been set when deliver the vehicle from factory.

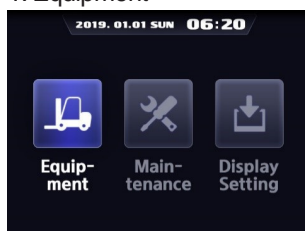
#### a. Setting cylinder cross section

Vehicle that has not applied the weight sensor



35D9VB3KY63

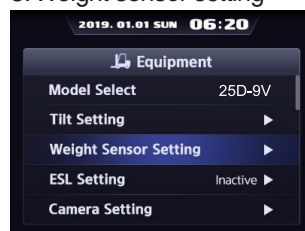
#### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

#### 3. Weight sensor setting



35D9VB3KY64

Choose weight sensor setting and enter.

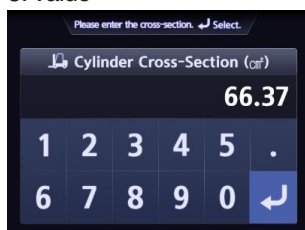
#### 4. Cylinder cross-section



35D9VB3KY65

Choose Cylinder Cross-Section. If Cylinder Cross-Section is already set up, setting value is shown in initial screen.

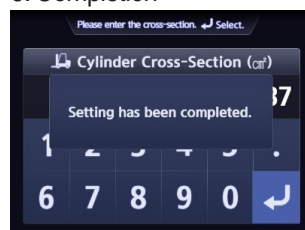
#### 5. Value



35D9VB3KY66

Enter cylinder cross-section value using up/down buttons.

#### 6. Completion



35D9VB3KY67

Setting has been completed.

#### 7. Check

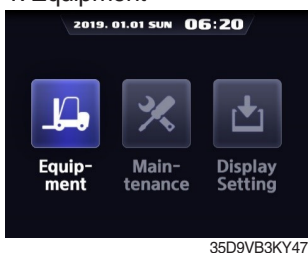


35D9VB3KY68

Check the value whether it is right.

## b. Unloaded status adjustment

### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

### 3. Weight sensor setting



35D9VB3KY64

Choose weight sensor setting and enter.

### 4. Load weight adjust



35D9VB3KY69

Choose load weight adjust and enter.

### 5. Unloaded status adjustment



35D9VB3KY70

Choose unloaded status adjustment and enter.

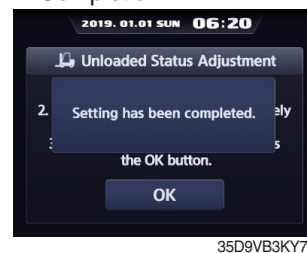
### 6. Instruction



35D9VB3KY71

Follow the instruction showing in the screen. After finish setting and press enter button

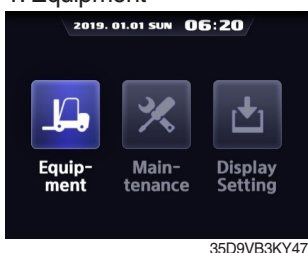
### 7. Completion



35D9VB3KY72

## c. Loaded status adjustment

### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

### 3. Weight sensor setting



35D9VB3KY64

Choose weight sensor setting and enter.

### 4. Loaded status adjustment



35D9VB3KY73

Choose loaded status adjustment and enter.

### 5. Value



35D9VB3KY74

Enter load weight using up/down buttons.

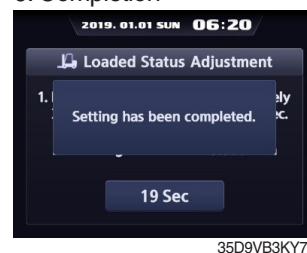
### 6. Instruction



35D9VB3KY75

Follow the instruction showing in the screen. After finish setting and press enter button. Please proceed the operation within 30 seconds.

### 6. Completion



35D9VB3KY76

- ※ Must be prepared to lift up by locating the load on the fork before enter the weight.
- ※ Must be performed within 30 seconds of lift task. If it is not completed within 30 seconds, this process will be canceled automatically.
- ※ Accurate weight value is not recognized if other pressure changes that are occurred besides salvage work.
- ※ Re-perform the "Load/No-Load Adjustment", if the measurement malfunction is occurred.



#### d. Initialization

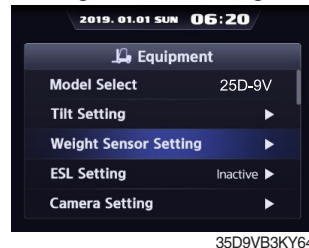
Initialize the all values of "No-Load Adjustment" and "Local Adjustment" that were entered previously. (Cylinder cross-sectional area is not initialized.)

##### 1. Equipment



Enter to equipment menu.

##### 3. Weight sensor setting



Choose weight sensor setting and enter.

##### 4. Initialization



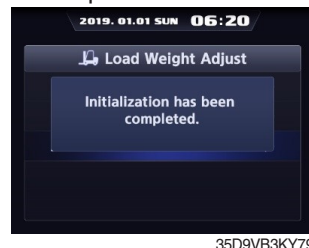
Enter to initialization.

##### 5. Check



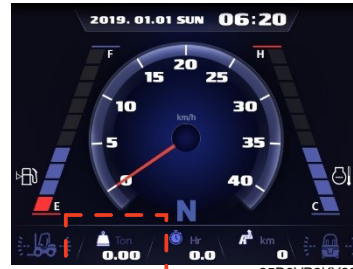
Press the enter button.

##### 7. Completion

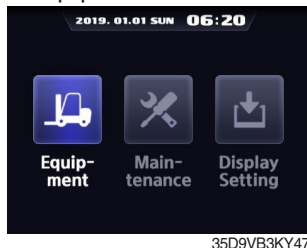


#### e. Weight display

Enable to adjust the digit-number of weight of main screen. Weight will be displayed as 1.5 tons if set as 100 kg unit. Weight will be displayed as 1.52 tons if set as 10 kg unit.



##### 1. Equipment



Enter to equipment menu.

##### 3. Weight sensor setting



Choose weight sensor setting and enter.

##### 4. Weight display setting



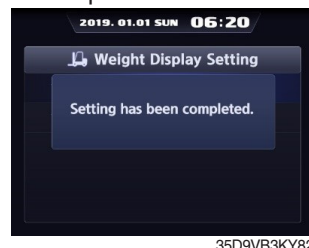
Enter to weight display setting.

##### 5. Unit



Choose unit what you want to use.

##### 6. Completion



#### ④ Startup control setting (standard) : Default is "Not use"

##### 1. Equipment



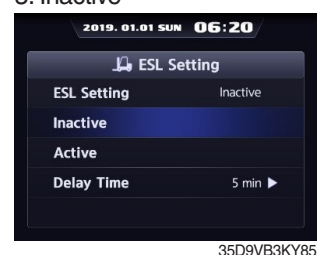
Enter to equipment menu.

##### 2. ELS setting



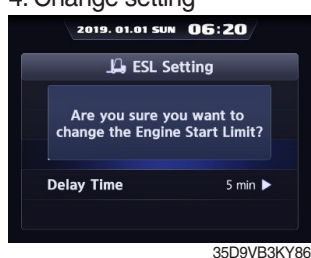
Choose ESL setting and enter.

##### 3. Inactive



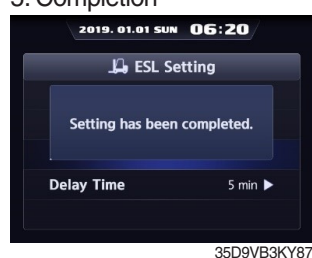
Choose inactive.

##### 4. Change setting

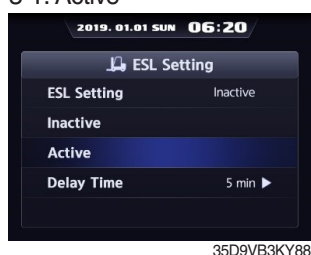


If you want to change setting, press enter button.

##### 5. Completion

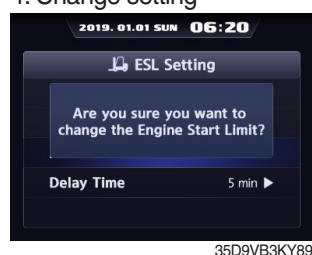


##### 3-1. Active



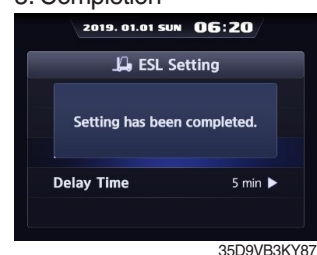
Choose active.

##### 4. Change setting



If you want to change setting, press enter button.

##### 5. Completion



Setting has been completed.

#### a. Check functions

- Set the mode as active and start switch OFF.
- Upon start switch ON, the password screen pops up and starting is prohibited until the right password has been offered. (But, driver still can start the vehicle if starts within 10 seconds from start switch OFF)
- Set the mode as 5 min of delay time and start switch OFF.
- check if vehicle can start within 5 min and start switch OFF.
- check if vehicle requests password after 5 min.

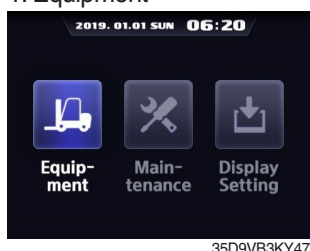
※ Start switch ON screen (When startup control mode is ON)





## Delay time

### 1. Equipment



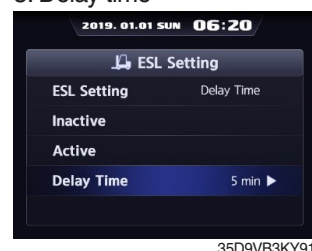
Enter to equipment menu.

### 2. ELS setting



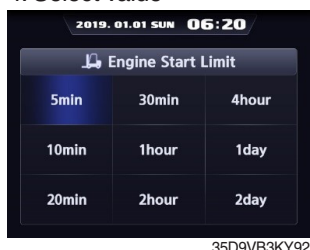
Choose ESL setting and enter.

### 3. Delay time



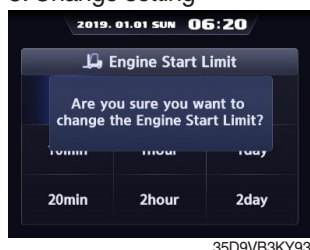
Choose delay time.

### 4. Select value



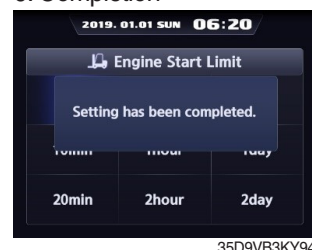
Select value you want to apply.

### 5. Change setting



If you are sure to change ESL, press enter.

### 6. Completion

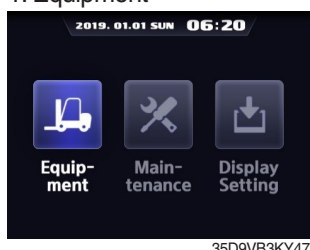


## ⑤ Camera setting

a. Device setup > Camera setup

b. After set the reverse gear interoperation as ON, the screen will be changed from main screen to camera mode if put gear into reverse, and if the gear is changed, screen will be back to the main screen.

### 1. Equipment



Enter to equipment menu.

### 2. Camera setting



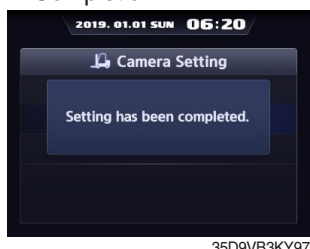
Choose camera setting and enter.

### 3. Reverse gear interworking



Choose ON or OFF.

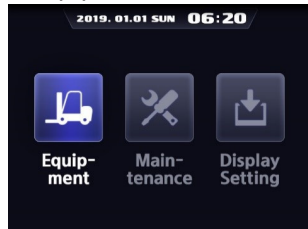
### 4. Completion



## ⑥ Auto shift setting

- ※ In automatic mode, the gear is switched automatically by vehicle speed.
- ※ Enable to set the gear switching speed.
- ※ Applied 3.5 tons ~ 5.0 tons T/M 2nd gear.

### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

### 2. Autoshift setting



35D9VB3KY99

Choose autoshift setting and enter.

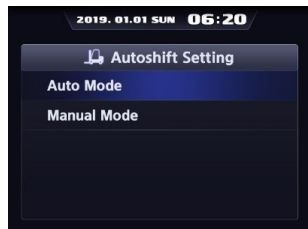
### 3. Mode



35D9VB3KY100

Choose mode.

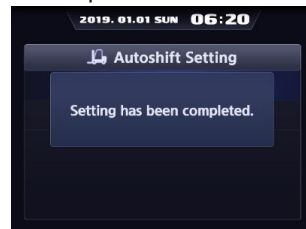
### 4. auto mode



35D9VB3KY101

Select mode. (auto/manual)

### 5. Completion



35D9VB3KY102

### 6. Speed set (auto)



35D9VB3KY103

When you change speed set, enter speed set.

### 7. Gear



35D9VB3KY104

Choose what you want to change.

### 8. Setting

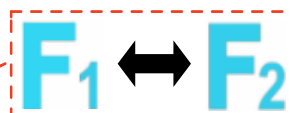


35D9VB3KY105

## a. Check functions

### (a) Select the "auto mode".

- During forward or reverse driving, a gear will be shifted automatically in accordance with gear speed.
- Not interworking with gear select switch (1st gear / 2nd gear) of gear selector.



35D9VB3KY106

### (b) Select the "manual mode".

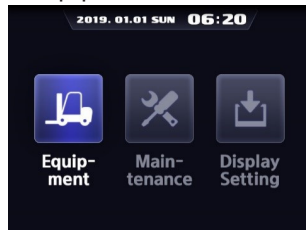
In accordance with gear select switch (1st gear / 2nd gear) of gear selector, T/M gear is shifted.

## ⑦ DCSR setting (Direction Change Shock Relief)

- Set the mode ON. Below is how this feature functions.
- If you are driving at over the block drive speed and then change gear from forward to reverse (or reverse to forward), the gear stays as neutral until the vehicle reaches the restore drive speed.
- The car changes direction and starts to travel.

※ Restore drive speed cannot be set over the block drive speed.

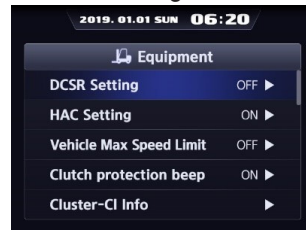
### 1. Equipment



35D9VB3KY47

Enter to equipment menu.

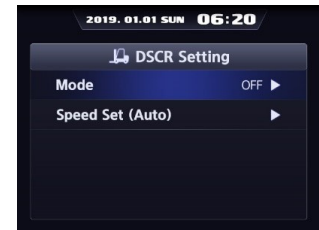
### 2. DCSR setting



35D9VB3KY107

Choose DCSR setting and enter.

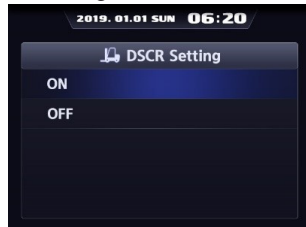
### 3. Mode



35D9VB3KY108

Choose mode.

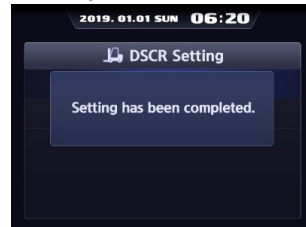
### 4. Setting



35D9VB3KY109

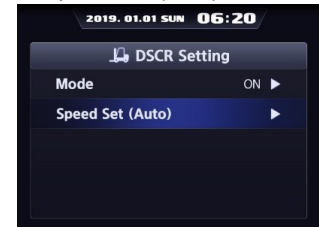
Select DCSR setting.

### 5. Completion



35D9VB3KY110

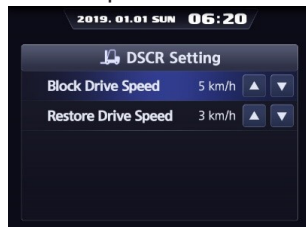
### 6. Speed set (auto)



35D9VB3KY111

If you want to change speed set, enter speed set (auto).

### 7. Drive speed



35D9VB3KY112

Change speed.

## ⑧ Vehicle max speed limit

### 1. Equipment



Enter to equipment menu.

### 2. Limit warning speed mode



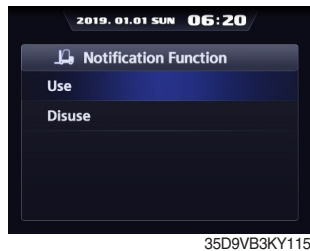
Choose warning speed mode and enter.

### 3. Notification function



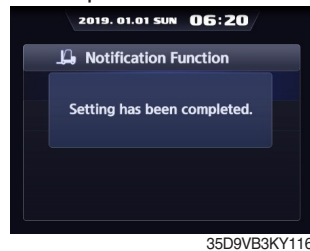
Enter to notification function.

### 4. Use



Select use.

### 5. Completion

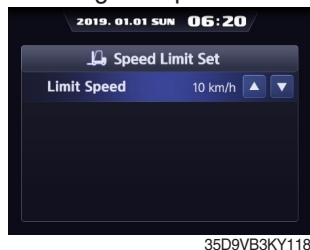


### 6. Limit speed



Enter to limit speed menu.

### 7. Setting limit speed



Set limit speed.

Driving speed < 10 km/h



Driving speed  $\geq$  10 km/h



## ⑨ MCU/Cluster Information

### 1. Equipment



Enter to equipment menu.

### 2. Cluster-ci info



Choose cluster-ci info and enter.

### 3. Information



## (2) Maintenance

### ① Engine failure history

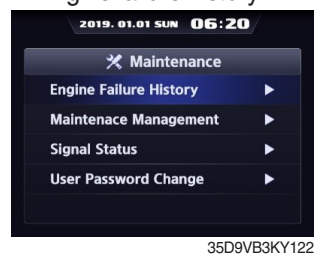
#### a. Check current engine failure

##### 1. Maintenance



Enter to maintenance menu.

##### 2. Engine failure history



Choose engine failure history and enter.

##### 3. Failure history



Enter to current engine failure history.

##### 4. Current engine failure



#### b. Check past failure history

##### 1. Maintenance



Enter to maintenance menu.

##### 2. Past engine failure



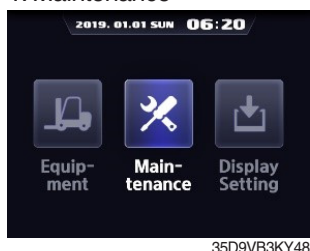
Enter to past engine failure history.

##### 3. Check the failure



### c. Delete failure history

#### 1. Maintenance



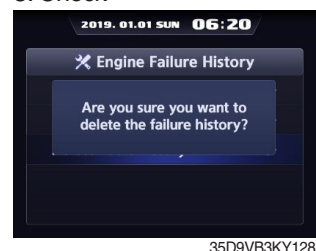
Enter to maintenance menu.

#### 2. Delete fault history



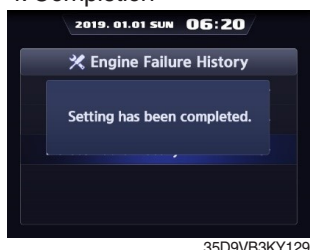
Choose delete fault history and enter.

#### 3. Check



If you are sure to delete the failure history, then push enter button

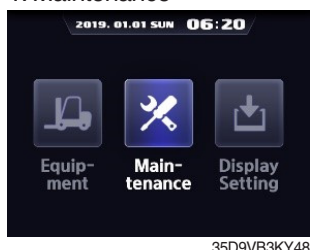
#### 4. Completion



### ② Consumables replacement management

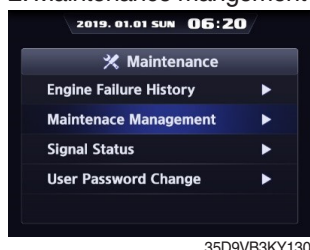
- If the consumables replacement cycle has been passed, alarm will be displayed as ON.
- Press the "Consumables replacement" if replaced the consumables.
- Information about recent replacement (Max. 9) will be displayed.
- If you want to change the cycle, please press the "Change cycle" button.

#### 1. Maintenance



Enter to maintenance menu.

#### 2. Maintenance mangement



Choose maintenance mangement and enter.

#### 3. Select replacement item.



Select the replace item.

#### 4. Replacement



Select replacement using Up/Down button and press enter button.

#### 5. Check.



If you are sure to replace supplies, press enter buttton.

#### 6. Select the item.



Select the item you want to change maintenance interval.



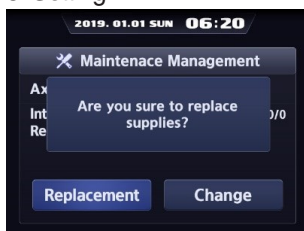
#### 4. Change



35D9VB3KY135

Select using Up/Down button and press enter button.

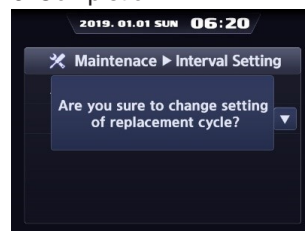
#### 5. Setting



35D9VB3KY136

Set the item value using Up/Down button and press enter button

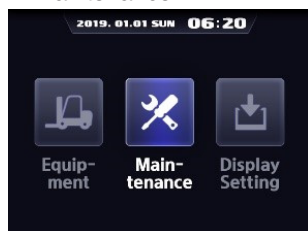
#### 6. Completion



35D9VB3KY137

### ③ Signal status

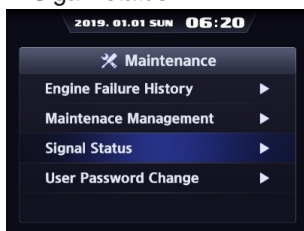
#### 1. Maintenance



35D9VB3KY48

Enter to maintenance menu.

#### 2. Signal status



35D9VB3KY138

Choose signal status and enter.

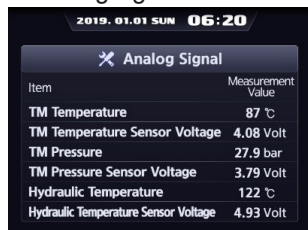
#### 3. Analog signal



35D9VB3KY139

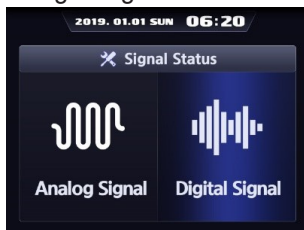
Enter to analog signal

#### 4. Analog signal list



35D9VB3KY140

#### 5. Digital signal



35D9VB3KY141

Enter to digital signal

#### 6. Digital signal list



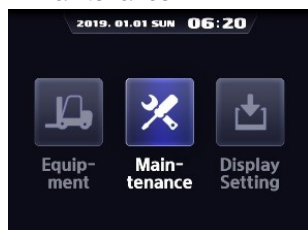
35D9VB3KY142

### ④ User password change

- This function is to allow to change password from default password to user defined password.
- Password length must be 5~10 digits.

※ Since, if you forget the password, you must request the A/S, do not forget the password.

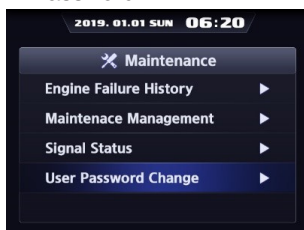
#### 1. Maintenance



35D9VB3KY48

Enter to maintenance menu.

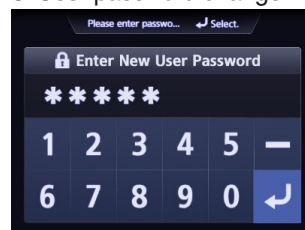
#### 2. Password



35D9VB3KY143

Choose password change and enter.

#### 3. User password change



35D9VB3KY144

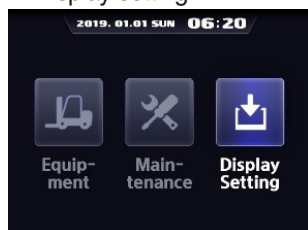
Enter new user password.

### (3) Display setting

#### ① Adjust LCD brightness

- LCD brightness has two options. Automatic mode and manual mode.
- Manual mode always keeps the selected brightness.
- Daytime brightness : 100%, Nighttime brightness : 50%, Daytime/Nighttime time zone : 06~18

##### 1. Display setting



35D9VB3KY49

Enter to display setting.

##### 2. LCD adjustment



35D9VB3KY145

Choose LCD adjustment and enter.

##### 3. LCD brightness



35D9VB3KY146

you can see this display when you choose display brightness is automatic.

##### 4. LCD Brightness (Day/Night)



35D9VB3KY147

##### 5. Brightness



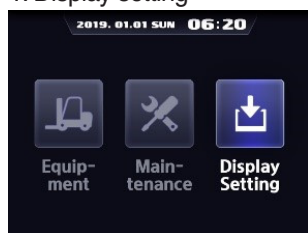
35D9VB3KY148

Brightness can be changed using Up/Down button when it is manual mode.

#### ② Time setting

Set time in following order. (year > month > day > hour > minute)

##### 1. Display setting



35D9VB3KY49

Enter to display setting.

##### 2. Time setting



35D9VB3KY149

Choose time setting and enter.

##### 3. Current time setting



35D9VB3KY150

Change time using Up/Down button and enter button.



### ③ Unit setting

#### 1. Display setting



Enter to display setting.

#### 2. Unit setting



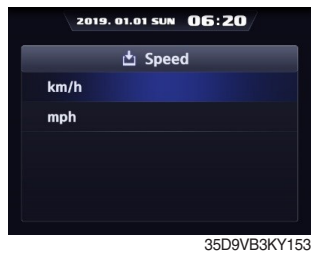
Choose Unit setting and enter.

#### 3. Setting list



Setting list

#### 4. Unit



Select unit what you want to use.

### ④ Language setting

#### 1. Display setting



Enter to display setting.

#### 2. Language setting



Choose language setting and enter.

#### 3. Select



Select language.

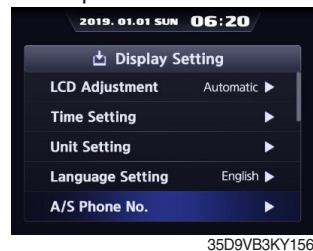
### ⑤ A/S phone No.

#### 1. Display setting



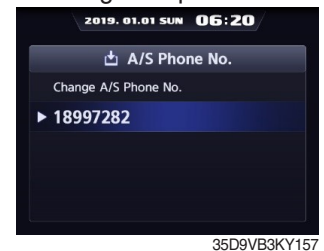
Enter to display setting.

#### 2. A/S phone No.



Choose A/S phone No. and enter.

#### 3. Change A/S phone No.



Select phone No. if you want to change.

## ⑥ ESL password change

### 1. Display setting



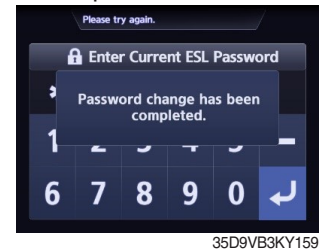
Enter to display setting.

### 2. ESL password change



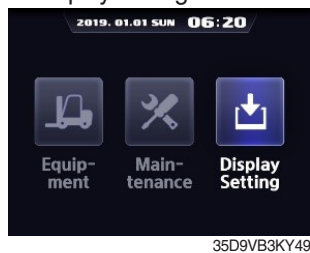
Choose ESL password change and enter.

### 3. Completion



## ⑦ Maintenance management

### 1. Display setting



Enter to display setting.

### 2. Maintenance











Choose maintenance and enter.

### 3. Maintenance management

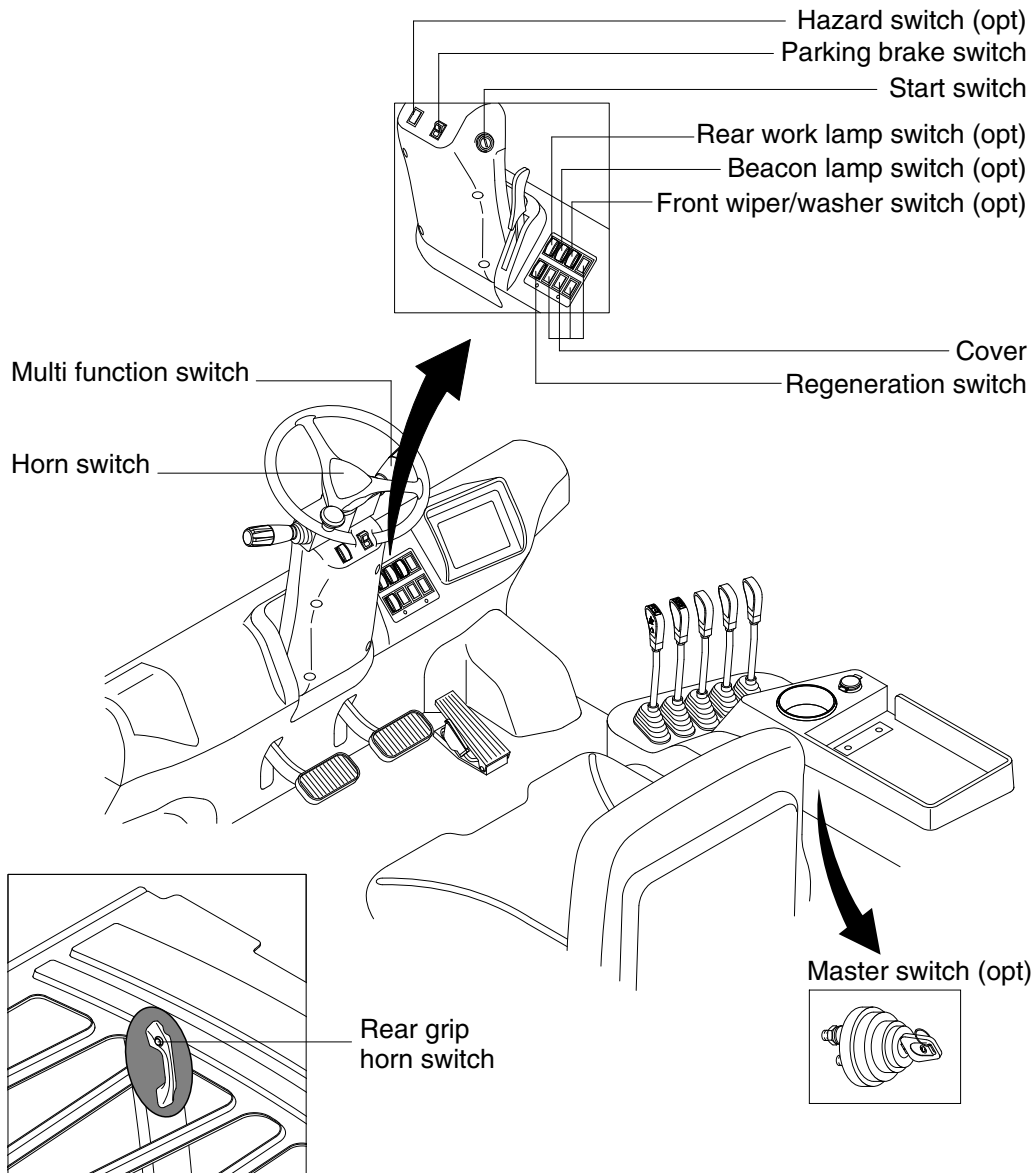


## 8) CAUSES AND CORRECTION OF CLUSTER WARNING LAMP

No.	Warning lamp types	Symbol	Warning and indicator lamp	Causes and correction
1	Engine oil pressure warning		Engine oil pressure warning lamp	Engine oil pressure is low. Please fill the engine oil
2	Engine warm-up indicator		Engine warm-up indicator lamp	Warm-up will be started.
3	Air cleaner warning		Air cleaner warning lamp	Replace the air cleaner filter.
4	Water in fuel warning		Water in fuel warning lamp	Please drain the water of the fuel filter.
5	Engine check warning		Engine check warning lamp	Check the failure code of cluster.
6	Engine stop warning		Engine stop warning lamp	Check the failure code of cluster.
7	DPF regeneration warning		DPF regeneration warning lamp	DPF regeneration is required.
8	DPF inhibit warning		DPF inhibit warning lamp	DPF regeneration is inhibited.
9	DPF High temp warning		DPF high temp warning lamp	High exhaust system temperature will be started.
10	Fuel warmer indicator		Fuel warmer indicator lamp	Warming up the fuel.
11	Transmission oil temperature warning		Transmission oil temperature warning lamp	T/M oil is over temperature condition. 110 °C (230 °F) or higher : Amber 120 °C (248 °F) or higher : Red
12	Parking brake indicator		Parking brake indicator lamp	Parking brake is the operational status.
13	Battery charging warning		Battery charging warning lamp	Battery is not being charged. Please check alternator and wiring.
14	Tilt lock indicator (if installed)		Tilt lock indicator lamp	Auto-leveling is the operational status.
15	OPSS indicator		OPSS indicator lamp	OPSS is working : Driving, lifting, and tilting is locked or the truck is parked status.
16	Fuel level warning		Fuel level warning lamp	Fuel level is low. Please fill the fuel.
17	Coolant temperature warning		Engine coolant temperature warning lamp	Engine coolant is over temperature condition.

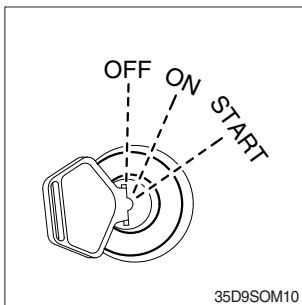
No.	Warning lamp types	Symbol	Warning and indicator lamp	Causes and correction
18	Clutch protection warning		Clutch protection warning lamp	Clutch protection warning operation
19	Consumables replacement indicator		Consumables replacement indicator lamp	Consumables replacement cycle has been passed.
20	LH Turn indicator		LH Turning indicator lamp	-
21	RH Turn indicator		RH Turning indicator lamp	-
22	Forward gear		Forward gear, 1 gear, and 2 gear indicator lamp	-
23	Reverse gear		Reverse gear, 1 gear, 2 and gear indicator lamp	-
24	Communication error warning (ECU)		Communication error warning lamp	Communication between cluster-CI and ECU has been failed. Check communication line.
25	Fingertip warning		Fingertip warning lamp	Check the fingertip.

## 5. SWITCHS



35D9VB3KY162

### 1) START SWITCH



(1) There are three positions, OFF, ON and START.

※ Before starting, set gear shift lever at NEUTRAL and pull parking brake lever to LOCK position.

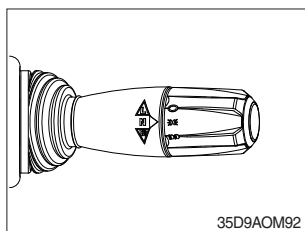
- OFF : None of electrical circuits activates.
- ON : All electrical systems are ON.
- START : Use when starting the engine.

Release key immediately after starting.

※ Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious truck damage.

## 2) MULTI FUNCTION SWITCH

### (1) Clearance lamp switch



① Clearance lamp lights up

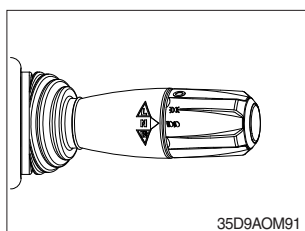
Twist the handle beneath steering wheel and make the notch align to ☸☹.

② Clearance lamp goes out

Twist the handle just opposite until the notch being aligned to ☉.

※ **When clearance lamp light up, then the clearance lamp and all panel lamps light up too.**

### (2) Head lamp switch



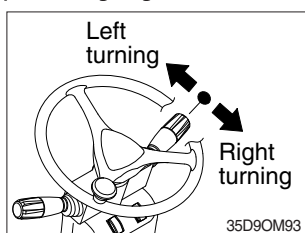
① Head lamp lights up

Twist the handle beneath steering wheel and make the notch align to ☸☹.

② Head lamp goes out

Twist the handle just the opposite until the notch being aligned to ☉.

### (3) Turning signal switch

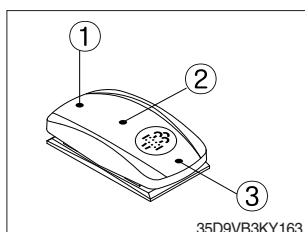


① This lever makes the turn signal lamp flash.

- Turning left : Push lever forward
- Turning right : Pull lever backward

※ **When the steering wheel is returned to straight, the turn signal is not cancelled. Return the lever to central position by hand.**

## 3) REGENERATION SWITCH



① **Parked Regeneration Position**

- (1) The regeneration applies if the truck is in a fireproof area and there is no plan to turn off.
- (2) Stop and park the machine.

▲ **The parking brake switch must be ON.**

(3) Put the gear in neutral position and wait until coolant temperature reaches 65°C. Push the regeneration switch ON button 3 seconds to initiate the parked regeneration of DPF. The engine speed may increase up to 2000 rpm and DPF regeneration begins and it will take approximately 20~40 minutes.

(4) The DPF regeneration and exhaust high temperature warning lamp will light ON during the regeneration function is operating.

(5) The DPF regeneration and(or) exhaust high temperature warning lamp will light OFF when the regeneration function is done.

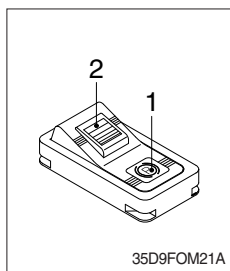
② **Auto Regeneration Position**

- (1) This position will initiate automatic DPF regeneration when needed.

③ **Inhibit Position**

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

#### 4) PARKING BRAKE SWITCH



##### (1) Position 1

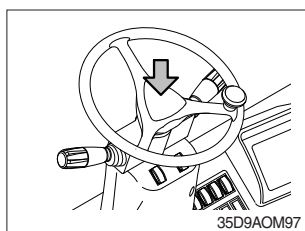
Parking brake is applied and front wheel is locked.

##### (2) Position 2

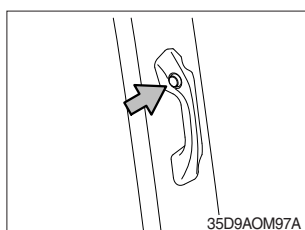
① Parking brake is released.

※ **Before moving the truck be sure the parking brake is released.**

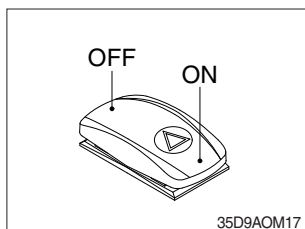
#### 5) HORN SWITCH



(1) The horn sounds when the button is pressed.



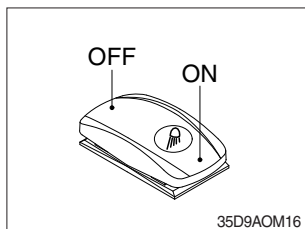
#### 6) HAZARD SWITCH (option)



(1) Use when emergency situation or while loading operation.

※ **If the switch is left on for a long time while the engine does not run, the battery would be dead(discharged).**

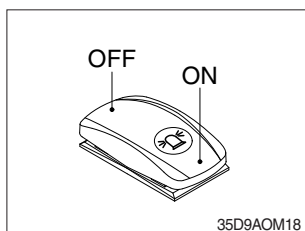
#### 7) REAR WORK LAMP SWITCH (option)



(1) This switch is used to operate work lamps.

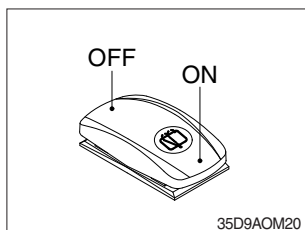
Press this switch to turn on work lamps.

#### 8) BEACON LAMP SWITCH (option)



(1) This switch turn ON the rotary light.

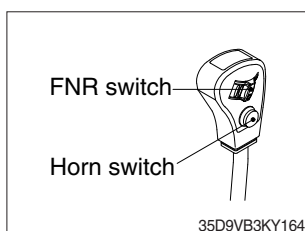
## 9) FRONT WIPER/WASHER SWITCH (option)



(1) This switch is used to operate the front wiper and washer by two steps.

- First step : The front wiper operates.
- Second step : The washer liquid is sprayed and the front wiper is operated only while pressing. If release the switch, return to the first step position.

## 10) FNR AND HORN SWITCH (option)



(1) FNR switch

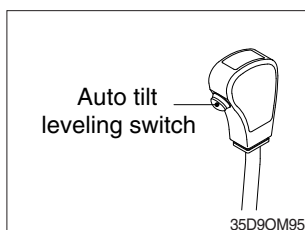
If you move the FNR switch forward, the truck moves forward, but if you move the FNR switch backward, the truck moves reverse.

※ **FNR switch has no speed select switch, thus use autoshift "ON" only.**

(2) Horn switch

The horn sounds when the button is pressed.

## 11) AUTO TILT LEVELING SWITCH (option)



(1) When the lever is operated on pressing this auto tilt leveling switch, the auto tilt leveling function is activated.

(2) Auto tilt leveling function

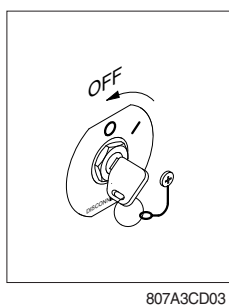
This function is mast tilt angle adjust to zero (0) degree (refer to the truck position).

※ **This function have to be used at the engine low idle rpm and stop position. If this function is activated at the high idle rpm or during starts, do not guarantee the mast stop at upright vertical position.**

※ **Operate the auto tilt function with unload conditions.**

▲ **When used in load condition, the load on the fork can fall down.**

## 12) MASTER SWITCH (option)



(1) This switch is used to shut off the entire electrical system.

When the truck is not operated for a long time, turn OFF the master switch for the safety purpose.

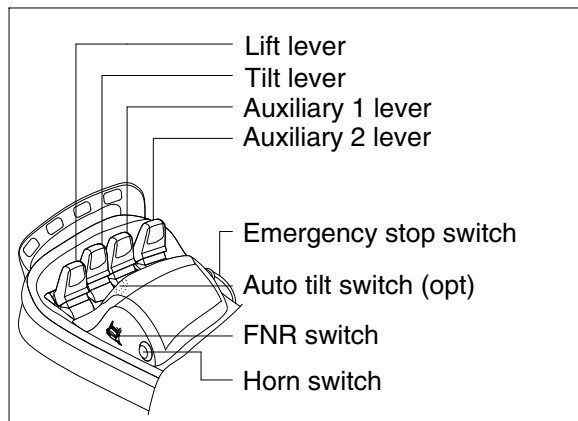
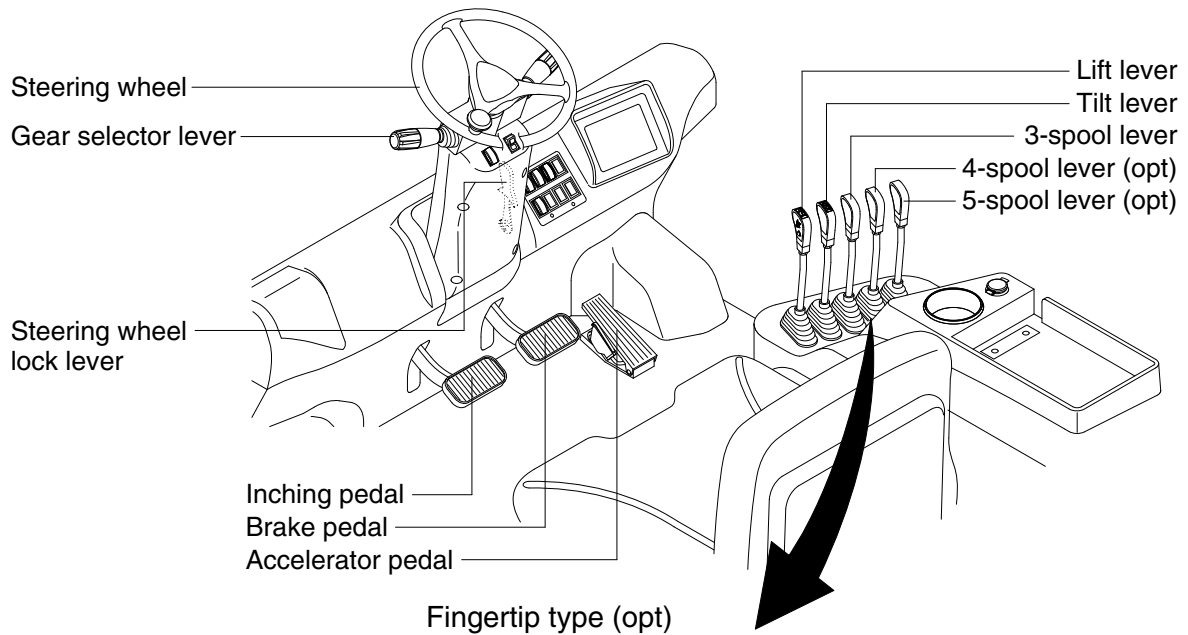
(2) I : The battery remains connected to the electrical system.

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.**

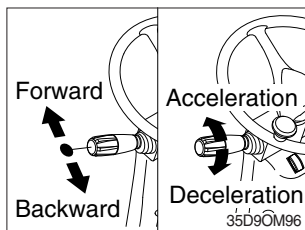


## 6. CONTROL DEVICE



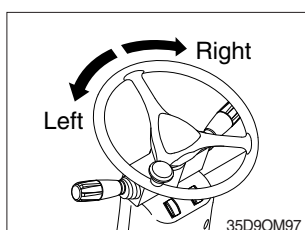
35D9VB3KY165A

### 1) GEAR SELECTOR LEVER



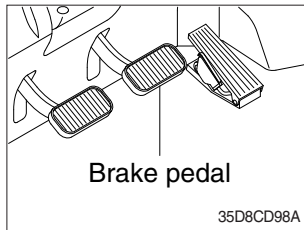
- (1) This lever is used for gear selection, forward 2 stages and reverse 2 stages.
- (2) If you push the gear selector lever, the truck moves forward, but pulling the gear selector lever, the truck moves backward.
- (3) If you turn the gear selector lever forward, the truck increases the speed, but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

### 2) 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.

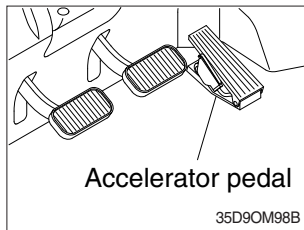
### 3) BRAKE PEDAL



(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.**

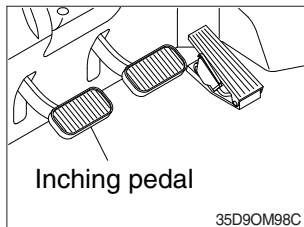
### 4) ACCELERATOR PEDAL



(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 engine will run at low idling.

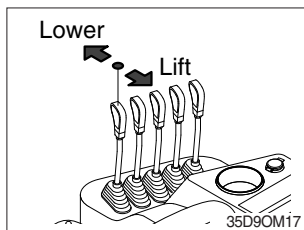
### 5) INCHING PEDAL



(1) The 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.**

### 6) LIFT LEVER



(1) Lift

PULL the lever BACK to LIFT the load.

(2) Lower

PUSH the lever FORWARD to LOWER the load.

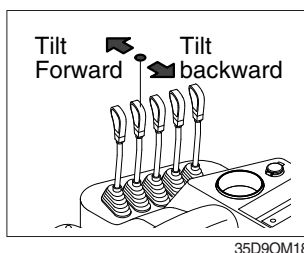
(3) Holding

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.**

### 7) TILT LEVER



(1) Tilt forward

PUSH the lever FORWARD to tilt mast FORWARD.

(2) Tilt back

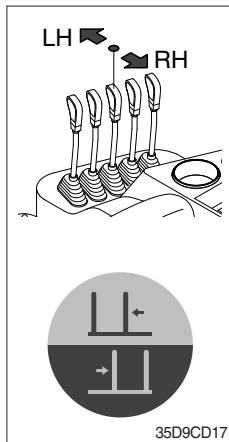
PULL the lever BACK to tilt mast BACKWARD.

(3) Holding

When the lever is released, tilting action stops.

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

## 8) LEVER FOR SIDE SHIFT



### (1) LH movement

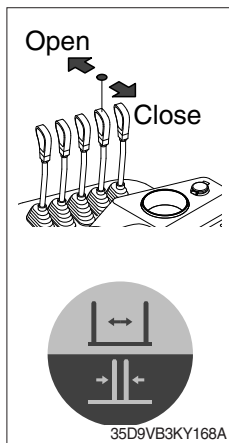
Push the lever forward to move the side shift to the left hand.

### (2) RH movement

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

## 9) LEVER FOR SIDE SHIFT WITH FORK POSITIONER

### (1) Fork positioner (synchronizer type)



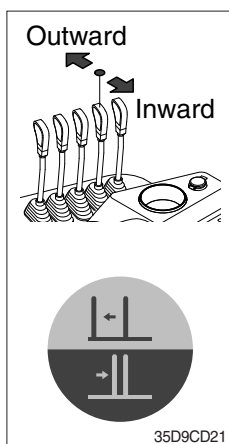
#### ① Open the forks

Push the lever forward to open both forks simultaneously.

#### ② Close up the forks

Pull the lever backward to close both forks simultaneously.

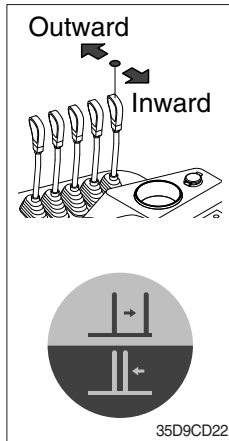
### (2) Fork positioner (independent type)



#### ① LH fork movement

- Push the lever forward to move the LH fork outward.

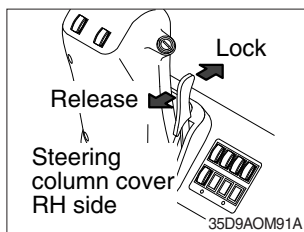
- Pull the lever backward to move the LH fork inward.



## ② RH fork movement

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

## 10) STEERING COLUMN ADJUST LEVER



(1) The angle of the steering column can be adjusted forward and backward to 13 degree.

- ① Release : Pull the lever backward.
- ② Lock : Release the lever.

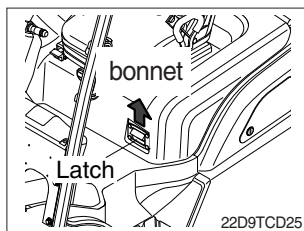
### ※ METHOD OF ADJUSTING STEERING COLUMN ANGLE

- (1) Pull the lock lever backward.
- (2) Move the steering column forward or backward to select the most suitable position.
- (3) Release the lever to lock the steering column in the desired position.

※ After adjusting, try to move the steering column backward and forward to check that it is locked in the selected position.

⚠ Always carry out the adjustment with the machine stopped. Never try to adjust the steering column when the machine is moving.

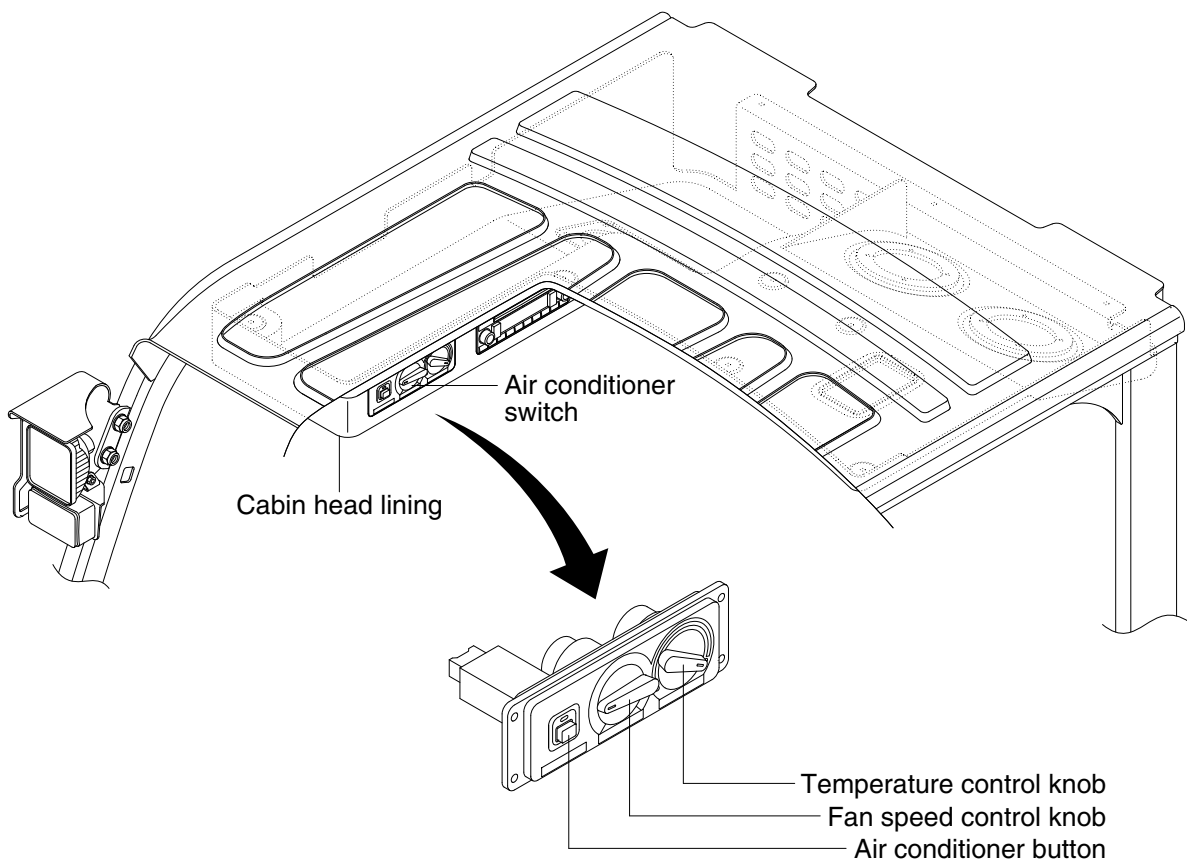
## 11) BONNET LATCH



- (1) Pull the latch and raise the bonnet to open it.
- (2) Inspection and maintenance can then be carried out easily.

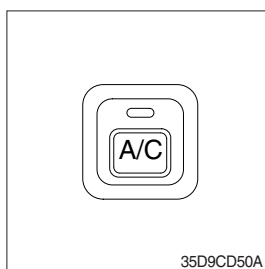
## 7. AIR CONDITIONER AND HEATER (OPTION)

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



35D9CD90

### 1) AIR CONDITIONER BUTTON



(1) When you push this button, air conditioner system is operated.

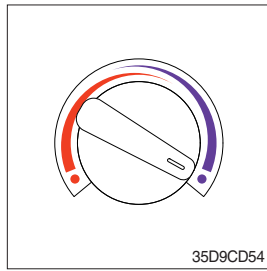
(2) **Determines whether to perform a cooling function of air conditioner.**

① Indicator lamp ON : Air conditioner operation

② Indicator lamp OFF : Fan only

※ **The indicator lamp ON when this button is pushed.**

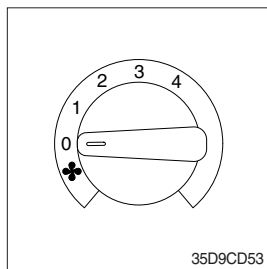
## 2) TEMPERATURE CONTROL KNOB



This knob regulates the temperature of air.

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

## 3) FAN SPEED CONTROL KNOB

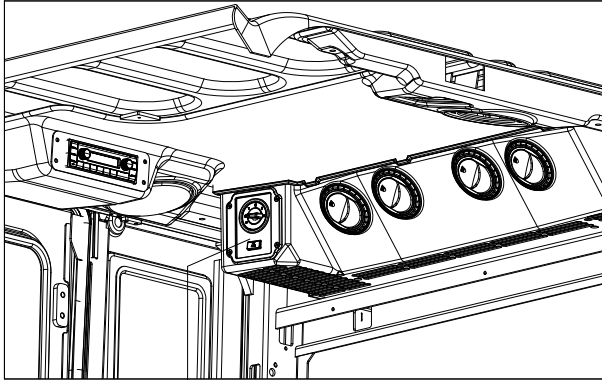


- ① It is possible to control the fan speed to four steps.

## 7. AIR CONDITIONER AND HEATER (OPTION)

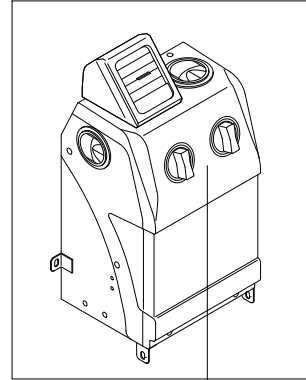
Full auto air conditioner and heater are equipped for pleasant operation against outside temperature and defrost on window glass.

Air conditioner



Air conditioner controller

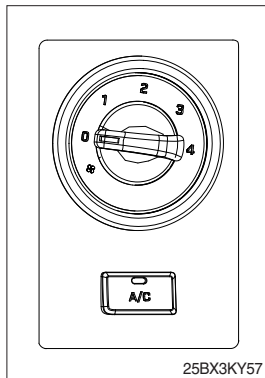
Heater



Heater controller

35D9VB3KY169

### 1) AIR CONDITIONER CONTROLLER



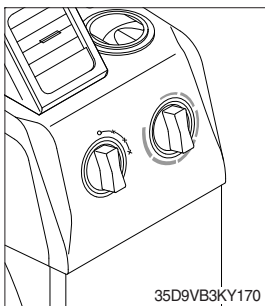
25BX3KY57

(1) The A/C button determines whether to perform a cooling function of the air conditioner. Push the button and the A/C lamp is ON or OFF.

- A/C lamp ON : Air conditioner operation
- A/C lamp OFF : Fan only

(2) The knob is possible to control fan speed to 4 steps.

### 2) HEATER CONTROLLER

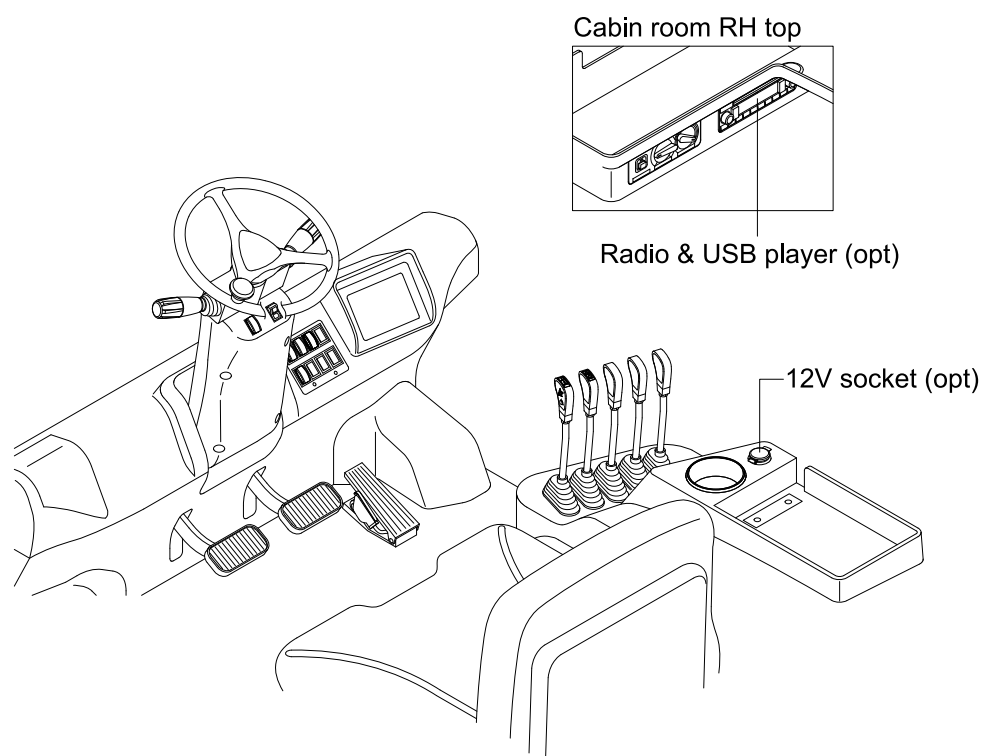


35D9VB3KY170

(1) The left knob turns the system ON/OFF and controls fan speed to 3 steps.

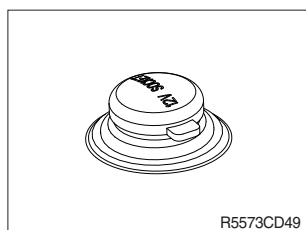
(2) The right knob controls the air temperature of the heater.

## 8. OTHERS



35D9VB3KY166

### 1) 12V SOCKET (option)



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



## 2) RADIO AND USB PLAYER (option)

### ■ BASIC FUNCTIONS



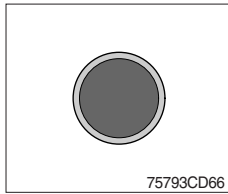
75793CD62-2

### ■ FRONT PANEL PRESENTATION

- |   |            |   |    |          |   |
|---|------------|---|----|----------|---|
| 1 |            | ..... Audio selection button                    | 9  |          | ..... Preset memory button 5                        |
|   |            | ..... Audio selection knob                      |    | D- ..... | Directory down                                      |
| 2 |            | ..... Power and volume button                   | 10 |          | ..... Preset memory button 6                        |
|   |            |   |    | D+ ..... | Directory up  |
| 3 |            | ..... Mode button<br>(select RADIO / USB / AUX) | 11 |          | ..... Aux function                                  |
| 4 |            | ..... UP / DOWN tuning button                   | 12 |          | ..... Preset scan (PS)<br>Best station memory (BSM) |
|   |            |   | 13 |          | ..... Audio mute button                             |
| 5 |            | ..... Preset memory button 1                    | 14 |          | ..... AM / FM button (radio)                        |
|   | DISP ..... | ID3 v2 display                                  | 15 |          | ..... Send  |
| 6 |            | ..... Preset memory button 2                    | 16 |          | ..... End   |
|   | SCN .....  | File scan                                       | 17 |          | ..... MIC (microphone)                              |
| 7 |            | ..... Preset memory button 3                    | 18 |          | ..... Aux connector                                 |
|   | RPT .....  | Repeat play selector                            |    |          |   |
| 8 |            | ..... Preset memory button 4                    |    |          |   |
|   | RDM .....  | Random play selector                            |    |          |   |

## ■ GENERAL

### (1) Power and volume button



#### ① Power ON/OFF button

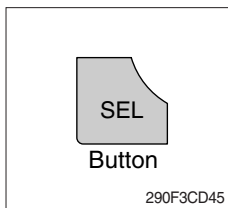
Press power button to turn the unit ON or OFF shortly.

When the power is ON, the previous mode (last memory) will appear.

#### ② Volume up / down control

Turn volume up / down button right to increase the volume level. The level will be shown in VOLUME xx on the LCD display. Turn it left to decrease the volume level. After 5 seconds of volume indication, display will return to the previous mode.

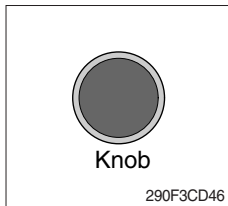
### (2) Sound function selection button/knob (audio selection)



#### ① This button is to adjust the sound. Each time you press SEL button shortly, LCD displays each mode as follows :

BASS → TREBLE → BAL → LOUD → EQ → BASS

※ When this button is pressed, LCD display shows selected function for 5 seconds and then returns back to the previous mode. On selected function, level can be controlled by turning this button. The display will automatically return to normal indication in 5 seconds after the last adjustment is made or when another function is activated.



#### ② Bass control

To adjust the bass level, first select the bass mode by pressing the SEL button until BASS indication appears on the LCD display. Within 5 seconds of choosing the bass mode, turn selection knob right / left to adjust the bass level as desired.

The bass level will be shown on the LCD display from a minimum of BASS -10 to a maximum of BASS +10.

The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

#### ③ Treble control

To adjust the treble level, first select the treble mode by pressing the SEL button until TREBLE indication appears on the LCD display. Within 5 seconds of choosing the treble mode, turn selection knob right / left to adjust the treble level as desired.

The treble level will be shown on the LCD display from a minimum of TREBLE -10 to a maximum of TREBLE +10.

The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

#### ④ Balance control

To adjust the left-right speaker balance, first select the balance mode by pressing the SEL button until the BAL indication appears on the LCD display.

Within 5 seconds of choosing the balance mode, turn selection knob right / left to adjust the balance as desired.

The balance position will be shown on the LCD display from BAL 10L (full left) to BAL 10R (full right).

When the volume level between the left and right speakers is equal, BAL L=R will be shown on the LCD display panel.

The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

#### ⑤ Loud control

When listening to music at low volume levels, this feature will boost the bass and treble response.

This action will compensate for the reduction in bass and treble performance experienced at low volume.

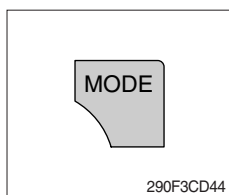
To select the loudness feature, press SEL button until LOUD ON or LOUD OFF is displayed, then turn selection knob left or right to activate or deactivate loudness.

#### ⑥ Equalizer (EQ)

You can select an equalizer curve designed for 4 music types (POP, ROCK, CLASSIC, JAZZ).

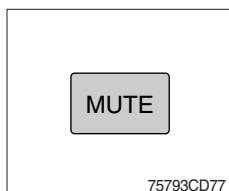
To select the desired curve, first select the EQ mode by pressing SEL button until the "EQ OFF" indication appears on the display panel. Within 5 seconds of choosing the EQ mode, turn selection knob to select an equalizer curve as desired.

### (3) Mode button



- ① Press mode button to select RADIO / USB / AUX / BT audio.

### (4) Audio mute button

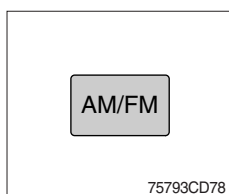


- ① Press mute button momentarily to mute volume and MUTE mark will blink on the LCD display.

Press the button again to return to the mode in use before the mute mode was activated.

## ■ RADIO

### (1) AM / FM / LW band selector

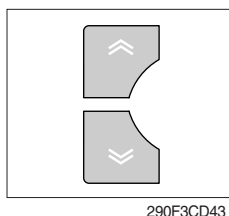




- ① Each time this button is pressed, the radio button is changed. Each time this button is pressed, LCD displays each band as follows :

FM1 → FM2 → FM3 → AM → LW → FM1

※ LW band is only available for Europe.

### (2) Up / down tuning

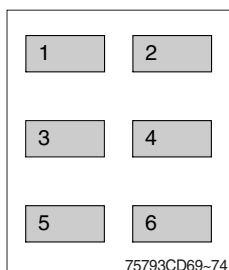


- ① To automatically select a radio station, momentarily press the up tune seek button  or down tune seek button  for less than 3 seconds to search for the closest radio station.

To manually select a radio station, press the up tuning & down tuning button for longer than 3 seconds.

The radio frequency will move up or down step by step each time you press button.

### (3) Station pre-set button

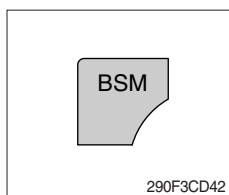


- ① Pressing these buttons shortly will recall your favorite pre-set radio stations.

To store your favorite stations into any of the 6 pre-set memories in each band (AM/FM/LW), use the following procedure :

- Turn the radio ON and select the desired band.
- Select the first station to be pre-set using the manual up/down or automatic seek tuning control button.
- Press the chosen pre-set button to store your selected station into and continue to hold it in. The beep sound will be momentarily heard and the pre-set number will appear on the LCD display indicating that the station is now set into that pre-set memory position and can be recalled at any time, by pressing that pre-set button.

#### (4) Pre-set scan (PS) / Best station memory (BSM) button



##### ① Pre-set scan (PS)

Press BSM button shortly to scan the 6 pre-set station stored the memories on each band (AM/FM/LW).

The unit will stop at each pre-set station (the pre-set number on the LCD display will flash during pre-set scan operation) and remain on the selected frequency. Press the button momentarily again to remain on the station currently being heard.

##### ② Best station memory (BSM)

Pressing BSM button for longer than 2 seconds will activate the BSM tuning feature which will automatically scan and enter each station into memory.

If you have already set the pre-set memories to your favorite stations, activating the BSM tuning feature will erase those stations and enter the new ones.

This BSM feature is most useful when traveling in a new area where you are not familiar with the local stations.

#### ■ USB PLAYER



75793CD81-1

##### (1) USB function

① Connect a USB device if you want to listen to MP3 file in a USB device.

② It will automatically play MP3 file in the USB device and the LCD display will show "READING USB".

※ If there are no files on USB device, playback will revert back to the previous mode after displaying "NO FILE".

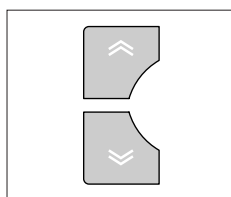
##### (2) AUX function

① If you want to listen to music of a external audio device, connect a external audio device through AUX cable.

② Change AUX mode by pressing MODE button.

If audio file of Audio device is playing, you can listen to music through speaker.

### (3) File selection & cue / review button



290F3CD43

#### ① File selection function

This button is used to select file up / down.

Each time the forward file select ⏮ is pressed, file number is increased.

Each time the backward file select ⏭ is pressed, file number is decreased.

#### ② Cue / review functions

High-speed audible search of file on a USB can be made by this button (the cue and review functions).

Press and hold the cue button ⏮ to advance rapidly in the forward direction or the review button ⏭ to advance rapidly in the backward direction.

### (4) MP3 directory / file searching

#### ① The D-, D+ button is used to select a particular directory and file.

Press and hold for more than 3 seconds while playing MP3 file.

Turn right / left the selection knob to search the directory. Press the button when you find the wanted directory.

For example, the directory search generally changes in two methods depending on the order of writing as follows.

· Method 1 : ROOT → Dir01 → Dir02 → Dir03 → Dir04 → Dir05 → Dir06 → Dir07 → ROOT

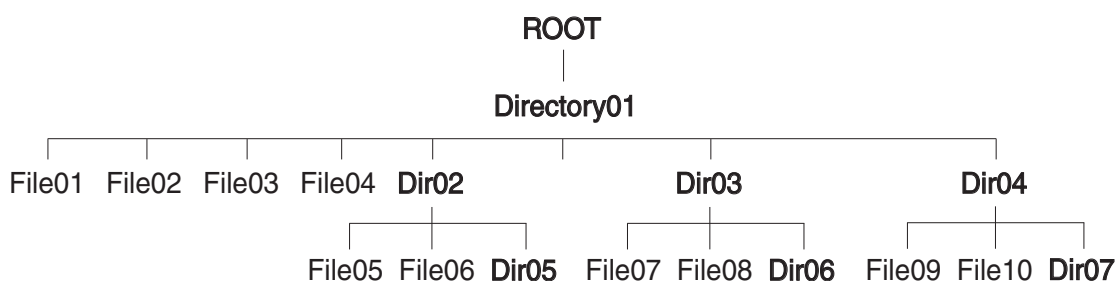
· Method 2 : ROOT → Dir01 → Dir02 → Dir05 → Dir03 → Dir06 → Dir04 → Dir07 → ROOT

If you want to search the file in the located directory, turn right / left the selection knob consecutively. Press the button when you find the wanted file. The unit will then play the selected file.

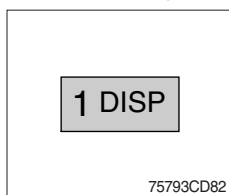
For instance, the file search changes in Dir01 as follows.

File01 → File02 → File03 → File04 → File01

#### ※ MP3 directory / file configuration



#### (5) ID3 v2 display



- ① Disp button is used to change the display information.  
While playing an MP3 file, you can change the file information shown on the LCD display.  
Each time you press DISP (display), the display changes to show the following.
- ※ **If the MP3 disc does not have any ID3 information, the display will show NO ID3 on LCD display.**

Directory name / file name (normal mode)



Album name / performer / title

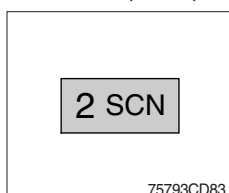


File number / elapsed time



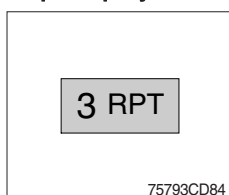
Directory name / file name (normal mode)

#### (6) File scan (SCN)



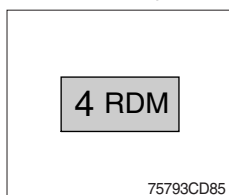
- ① During USB play, press SCN button to play the first 10 seconds of each file on the whole file on the USB (SCN mark will appear on the LCD display).  
When a desired file is reached, press the SCN button again to cancel the function.  
The unit will then play the selected file.
- ※ In case of playing MP3 file, when the SCN (scan) button is pressed and held for longer than 2 seconds, the SCN mark will blink on the LCD display and all files in the selected directory will be introduced until the file scan mode is cancelled by pressing the SCN button again or by activating the random or repeat functions.

#### (7) Repeat play selector (RPT)



- ① During USB play, press RPT button to play the selected file repeatedly (RPT will appear on the LCD display).  
Play of the file will continue to repeat until this button is pressed again and the RPT disappears from the LCD display.
- ※ **In case of playing MP3 file, when the RPT button is pressed and held longer than 2 seconds, the RPT mark will blink on the LCD display and play all files in the selected directory and will be repeated until the directory repeat mode is cancelled by pressing the repeat button again or by activating the scan or random functions (RPT mark will disappear from LCD display).**

#### (8) Random play selector (RDM)

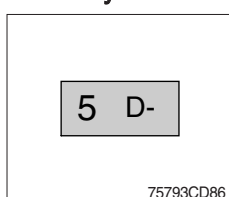


- ① During USB play, press RDM button to play the files on the USB in a random shuffled order (RDM will appear on the LCD display). The file select function will also select file in the random order instead of the normal process.

The random play mode can be cancelled by this button again.

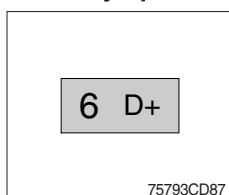
- ※ In case of MP3 file, when the random button is pressed and held longer than 2 seconds, the RDM mark will blink on the LCD display and play all files in directory randomly until the directory random mode is cancelled by pressing the random button again or by activating the scan or repeat functions (RDM mark will disappear from LCD display).

#### (9) Directory down



- ① Press D- button briefly while playing MP3. The previous directory is located each time you press this button.

#### (10) Directory up



- ① Press D+ button briefly while playing MP3 . The next directory is located each time you press this button.
- ※ If the MP3 file does not have a directory, the unit play MP3 at 10-file intervals.
- ※ If any MP3 file does not exist in USB, this button can not operate.



## ■BLUETOOTH

### (1) Introduce

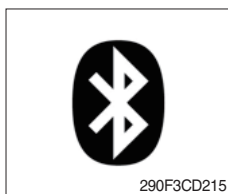
The bluetooth radio supports bluetooth wireless technology. Bluetooth technology provides a wireless link between a bluetooth mobile phone or bluetooth music player and the hyundai bluetooth radio.

The bluetooth radio features a hands-free system so that you may talk on the telephone without taking your eyes off the road or your hands off the wheel. A microphone built into the front of the radio receives your voice and the calling party can be heard through the speakers.

Additionally, a bluetooth music player can be wirelessly connected to be the bluetooth radio and playback music tracks in high quality sound through the speakers. Many bluetooth mobile phones include a music player and can provide both hands-free calling and music playback.

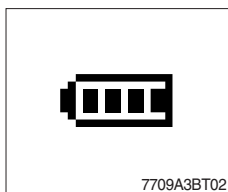
Check your mobile phone owner's manual for details.

- ※ When the starting switch is in the ON position, the bluetooth radio is on standby to connect with your mobile phone even if the radio is switched off. The truck battery may therefore become drained if the ignition switch remains in the ON position for an extended period of time.
- ※ Bluetooth technology uses low power radio transmission to connect to your bluetooth mobile phone or bluetooth music player. As radio signal strength reduces over distance, the quality of sound performance during phone calls and music playback may become poor if the distance between the radio and device widens. It is recommended that the mobile phone or music player is kept inside the cab for best results.
- ※ As a bluetooth wireless connection can extend to 10 meters, your bluetooth device may automatically connect to the bluetooth radio even if the device is not in the truck.
- ※ The bluetooth radio uses the latest digital noise & echo suppression system to provide the best sound clarity with little or no distortion, but in some conditions there may be some echo and noise experienced. It is recommended to keep the car windows closed during hands-free calls for best results.



#### ① Bluetooth indicator

The bluetooth logo is displayed when a bluetooth device is connected, and not displayed, when no bluetooth device is connected. If the bluetooth mobile phone is connected but the connection is not of satisfactory quality, the bluetooth logo is not displayed.



#### ② Battery strength indicator

This is an indication of your mobile phone battery condition. If your mobile phone is unable to transmit battery condition level, the indicator is not displayed.



#### ③ Single level indicator

This is an indication of the mobile phone network signal strength in your current location. If your mobile phone is not able to transmit signal level, the indicator is not displayed.

## (2) Bluetooth function

### ① Pairing a bluetooth mobile phone or music player

A bluetooth connection must first be established between your bluetooth mobile phone or bluetooth music player and the bluetooth radio. The first step to connecting the bluetooth radio and bluetooth device is to introduce or "Pair" the bluetooth radio and bluetooth device together.

It is recommended that you have the instruction manual for your bluetooth mobile phone or music player with you during the pairing process described below to understand how to set your device to pair with the bluetooth radio.

※ It is recommended that all other bluetooth devices other than mobile phones are switched off during the registration or pairing process.

#### a. Connection method

- a) Press SEND button for 2 seconds in any mode, **PAIRING** appears on the bluetooth radio display.
- b) Browse your mobile phone or music player menu to find the **SETTINGS** or **CONNECTIVITY** section to find the bluetooth connection section.
- c) Find the command that may be called search for bluetooth device or discovery mode so that your bluetooth device can locate all the bluetooth devices within range that may be connected.
- d) After the search is complete, **HFI AUDIO** should appear on your mobile phone or music player screen.
- e) Select **CONNECT** or **SELECT** on your mobile phone or music player.
- f) The mobile phone or music player should now prompt you to enter a PIN code. Enter 0000 into your bluetooth device and select OK.
- g) The mobile phone or music player should confirm that it has established a new paired connection with the bluetooth radio.
- h) The connecting process is now complete.
- i) If the connecting process is successful, the bluetooth logo appears on the radio display and paired phone name (e.g. Samsung or LG) and **CONNECTED** appear on the display for 2 seconds.
- j) Your bluetooth device is now ready for use with the bluetooth radio.
- k) If the pairing failed, **FAIL** appears on the bluetooth radio display.

※ (a) The bluetooth radio allows a maximum of 6 bluetooth devices to be paired.

(b) Bluetooth technology only allows one phone to be connected to your bluetooth radio at one time.

(c) If a bluetooth music player is to be connected together with a mobile phone, refer to the page 3-55, **PLAYING MUSIC USING BLUETOOTH AUDIO**.

(d) Bluetooth connection with a mobile phone is normally established using the Hands-Free Profile (HFP). However, in some cases, the connection may use Head Set Profile (HSP) and some functions may not be available.

(e) As each mobile phone or music player brand and model has a different menu structure and control names, you may need to refer to the user manual of your bluetooth device for the correct procedure to connect to another bluetooth device.

(f) Once the bluetooth pairing is complete, automatic connection between mobile phone and the bluetooth radio is possible whenever the starting switch is switched ON.

The mobile phone must be set to automatically connect to the bluetooth radio to allow this automatic connection.

- (g) The bluetooth radio will give connection priority to the last connected mobile phone.
- (h) It is recommended that all other bluetooth devices other than mobile phones are switched off during the registration or pairing process.

## ② Disconnecting a bluetooth device

If you need to disconnect your bluetooth mobile phone or music player with the bluetooth radio, follow the steps below.

- a. Press END button for 2 seconds in any mode.
- b. When the bluetooth connection is lost, bluetooth logo disappears and the previously connected device name (e.g. Samsung or LG) and **DISCONNECTED** appear on the display.

## ③ Select a bluetooth device


The bluetooth radio can pair up to 6 bluetooth devices. A previously paired mobile phone or music player can be selected for connection using the method described below. Refer to the table 2-1 for examples.

Preset No.	Bluetooth device name (for example)
1	Samsung
2	LG
3	Apple
4	Motorola
5	EMPTY
6	EMPTY

Table 2-1

- a. Press SEND button, to select **BLUETOOTH** mode.
- b. Press SEL button. **SELECT PHONE** will appear on the display.
- c. Turn selection knob, until **SELECT PHONE** is displayed.
- d. When **SELECT PHONE** appears on the display, press SEL button.
- e. Press the preset button to display the name of the bluetooth device name of the mobile phones or music players previously paired. You may also turn selection knob to display the paired devices.
  - Each time you turn or selection knob, the LCD displays as follows :

SAMSUNG → LG → APPLE → MOTOROLA → BACK → SAMSUNG

- f. If the bluetooth mobile phone name is Samsung as in the example of table 2-1, then **Samsung** appears on the display. When preset button  is pressed or selection knob is turned 1 click to the right.
- g. Once the name of the bluetooth device you wish to connect is displayed, in this example **Samsung**, press SEL button to have the Samsung device connected.
- h. If the connection is successful, the bluetooth logo appears on the display and paired phone name **Samsung** and **CONNECTED** appears on the display for 2 seconds.

#### ④ Deleting a previously paired bluetooth device

If you no longer need to use a paired bluetooth device with the bluetooth radio, it can be deleted. It is from the registration assignment for another mobile phone.  
Refer to the example of paired devices shown table 2-1.

- a. Press SEND button, to select **BLUETOOTH** mode.
- b. Press SEL button and **SELECT PHONE** appears on the display.
- c. Turn selection knob, until **DELETE PHONE** is displayed.
- d. When **DELETE PHONE** appears on the display, press SEL button.
- e. Press the preset button to display the name of the bluetooth device name of the mobile phones or music players previously paired. You may also turn selection knob to display the paired devices.
- f. Once the name of the bluetooth device you wish to delete is displayed, in this example **Samsung**, press SEL button to have the Samsung device deleted.
- g. The display will then show **DELETE NO** or if selection knob is turned, **DELETE OK** on the display.
- h. To confirm your wish to delete the selected device, when **DELETE OK** appears on the display press SEL button.
- i. If the bluetooth device being deleted (in this example) was connected, the display will show previous paired phone name "Samsung" and DISCONNECTED.
- j. In the example above, the number of paired devices is now reduced to 3, leaving 3 vacant memory locations for additional devices. Table 2-2 shows the example.

Preset No.	Bluetooth device name (for example)
1	LG
2	Apple
3	Motorola
4	EMPTY
5	EMPTY
6	EMPTY

Table 2-2

#### ⑤ Basic telephone operation

##### a. Using the bluetooth radio for hands-free calls

- a) When an INCOMING call arrives at the bluetooth radio via your connected bluetooth mobile phone, **INCOMING CALL** appears on the display for 3 seconds then the calling telephone number is shown.
- b) Press SEND button to answer the INCOMING call. **HANDSFREE** appears on the display.
- c) To end the call, press END button and the call will end and **END CALL** is displayed.
- d) If you wish to reject an INCOMING call, press END button.
- e) To make an OUTGOING call use the keypad of the connected bluetooth mobile phone to enter a number and press the **OFF-HOOK** (SEND) button on your mobile phone.
- f) **OUTGOING CALL** is displayed on the bluetooth radio and the call continues in hands-free mode.
- g) The call can be ended by pressing END button the **ON-HOOK** (END) button of the connected mobile phone.
- ※ Some mobile phones may not reject an INCOMING call using the action of d) above. In this case, press the **ON-HOOK** button on the connected mobile phone to reject.

#### b. Last call number redials

Select **BLUETOOTH** mode by pressing SEND button. To making a call to the last dialed number, press SEND button again. **OUTGOING CALL** appears on the radio display for 1 second.

- ※ Some mobile phones may require an additional press of SEND button to start the last number redial call.

#### c. Switching to private (headset) mode during a call

During an INCOMING or OUTGOING call started in hands-free mode, it is possible to switch to the private call mode using the mobile phone handset to speak and to hear the calling party in private.

- a) Press SEND button during the conversation ; **PRIVATE** appears on the display.
- b) To switch back to hands-free mode using the bluetooth radio, press SEND button again during the private conversation ; **HANDSFREE** is shown on the display and hands-free call operation continues.

- ※ The above switching function may cause disconnection of the bluetooth link between the bluetooth radio and some mobile phones.

If SEND button is pressed during the private conversation, the bluetooth connection will return automatically.

### (3) Function of bluetooth audio player

#### ① Playing music using bluetooth audio

The bluetooth radio supports the bluetooth profile Audio Advanced Distribution Profile (A2DP). If your mobile phone or music player supports this profile then it is possible to listen to music tracks located on your bluetooth device through the bluetooth radio and speakers.

Additionally, the bluetooth radio supports the Audio Video Remote Control Profile (AVRCP).

If your bluetooth mobile phone or music player supports this profile then it is possible to advance to the next track or replay previous tracks on using the buttons on the front of the bluetooth radio your truck.

- a. Press MODE button until **BT AUDIO** is displayed.
- b. When **BT AUDIO** appears on the display, select the music player feature on your bluetooth device. And then bluetooth device play automatically to begin playback.
- c. To pauses the bluetooth audio playback, press SEL button for 2 seconds. Press the knob again for 2 seconds to resume playback.
- d. Press buttons (⏮, ⏭) advance to the next or previous music track.

- ※ (a) Check your bluetooth device owner's manual for details of how to play music tracks via an external bluetooth audio system such as the bluetooth radio.
- (b) Some bluetooth mobile phones cannot play music at all or may play music tracks in low-quality audio through the bluetooth radio.
- (c) Some mobile phones require additional pairing to allow bluetooth audio playback.
- (d) Information about songs (ID3) (e.g. the elapsed playing time, song titles, song index, etc.) playing using bluetooth audio profile cannot be displayed on this bluetooth radio.

#### ② Connecting a bluetooth music player and mobile phone simultaneously

It is possible to connect a bluetooth mobile phone and a separate bluetooth music player to the bluetooth radio at the same time. Phone calls can be sent and received using the hands-free feature while music is playing using the bluetooth audio feature.

#### (4) Bluetooth setting

##### ① Setting the automatic call answer feature

If this function is selected, the bluetooth radio automatically answers all INCOMING calls.

This feature enhances safety as the driver does not need to take their hands from the steering wheel to accept an INCOMING call.

Note that this feature cannot be set at different settings for each of the paired mobile phones.

- a. Press SEND button to select BLUETOOTH mode.
- b. Turn selection knob until **SETTINGS** is displayed.
- c. Press SEL button until **AUTO ANSWERING** is displayed.
- d. Press SEL button and turn selection knob. The LCD then displays as follows :

ANSWER OFF → ANSWER 5 SEC → ANSWER 10 SEC → RETURN → ANSWER OFF

- ANSWER OFF = Automatic answer function is not active.
- ANSWER 5 SEC = Automatic answers all INCOMING calls after a 5 second delay.
- ANSWER 10 SEC = Automatic answers all INCOMING calls after a 10 second delay.
- RETURN = Return to previous menu.

- e. After making your selection, press SEL button to store the selection.
- f. **SETTINGS** is then displayed for adjustment if required.
- g. If you do not wish to adjust any further bluetooth settings, press END button to return to the last selected mode.

##### ② Setting calling voice volume

This function is to set the level of the mobile phone's calling voice volume to be heard through the bluetooth radio and speakers.

- a. Follow steps a. to c. of above setting below ①.
- b. When **VOICE VOLUME** appears on the display, press SEL button to display the current level of the calling voice. Turn selection knob right or left to adjust the calling voice volume as desired. This is the level the calling voice volume will be set to each time the bluetooth radio is used after the stating switch is turned off and then on again.
- c. After making your selection, press SEL button to store the selection.
- d. **SETTINGS** is then displayed for adjustment if required.
- e. If you do not wish to adjust any further bluetooth settings, press END button to return to the last selected mode.

##### ③ Setting the ring volume

This function is to set the level of the mobile phones ring tone volume to be heard through the bluetooth radio and speakers.

- a. After making your selection, press SEL button to store the selection.
- b. When **RING VOLUME** appears on the display, press the SEL button to display the current level of the ring tone. Turn selection knob right or left to adjust the ring tone volume as desired. This is the level the ringer volume will be set to each time the bluetooth radio is used after the starting switch is turned off and then on again.
- c. After making your selection, press SEL button to store the selection.
- d. The press END button to return to the last selected mode.

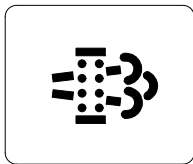


## 9. REGENERATION SYSTEM

Particulate matter (mainly soot) filtered in DPF (diesel particulate filter) occurs poor performance caused by increasing exhaust gas pressure, incinerating process to convert from accumulated soot to ash is required. When emissions are accumulated in the DPF, regenerative operation is carried out on a regular basis. This process named regeneration. The type of regeneration composes of automatic regeneration (active, auto-play by exhaust gas heat) and parked regeneration (passive play by the artificial aid).

- ※ The hydraulic operation noise will be generated during automatic regeneration. During auto regeneration, it is possible to operate the truck (driving and handling the load), and hydraulic operation sound may change depending on the user operation.
- ※ Sufficient automatic regeneration could reduce the frequency of parked regeneration.
- ▲ Regeneration generates hot exhaust and causes hot exhaust system components.
- ▲ Exhaust system components get very hot and can cause severe burns. Risk for fire.
- ▲ Do not touch the surface of the DPF muffler during or up to 30 minutes after operation.
- ▲ Do not perform regeneration in a flammable environment.

### (1) DPF (diesel particulate filter) regeneration lamp

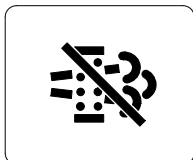


2609A3CD19

This warning lamp will light ON or blink during the regeneration function is operating.

- ※ Refer to the page 3-10 for details.
- ※ The machine must be in a fireproof area during the entire regeneration process.

### (2) DPF regeneration inhibit warning lamp



2609A3CD20

This warning lamp will light ON when the DPF switch is OFF position.

- ※ Refer to the page 3-10 for details.

### (3) Exhaust high temperature warning lamp

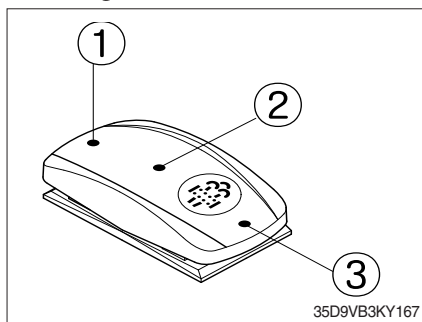


2609A3CD21

This warning lamp will light ON when the exhaust temperatures are high due to regeneration of the DPF.

- ※ Refer to the page 3-10 for details.

#### (4) Regeneration switch



This switch is used to select the regeneration function of the DPF.

※ Refer to the page 3-37 for details.

※ Recommend the regeneration inhibit function

(③ position) as below situations.

- High-temperature exhaust is generated during regeneration, so switch should be pressed in areas where fire is dangerous.
- Low-speed/low-load operation and short-term operation will reduce regeneration performance. In this case, use the inhibitor switch. When the DPF forced regeneration warning lamp blinks or turns on, it is recommended to regenerate when stop.

① Parked Regen. Position

② Auto Regen. Position

③ Inhibit Position

#### (5) DPF cleaning

Every 3000 hours.

※ Refer to the page 7-26 for details.



## 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 overhead guard, 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 :**

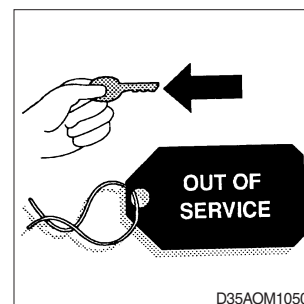
- ① Gauges, meters, and indicator lights
- ② Service brakes, inching pedal, and parking brake
- ③ Hydraulic controls : lift, tilt, and auxiliary (If installed)
- ④ Accelerator pedal
- ⑤ Gear selector lever
- ⑥ Steering system
- ⑦ Lift mechanism and any attachments.

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%

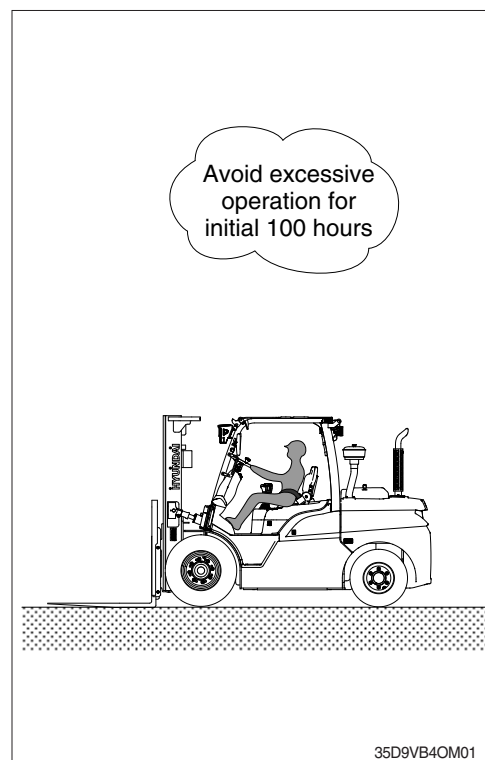
※ **Excessive operation may deteriorate the potential performance of truck and shorten lifetime of the truck.**

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.

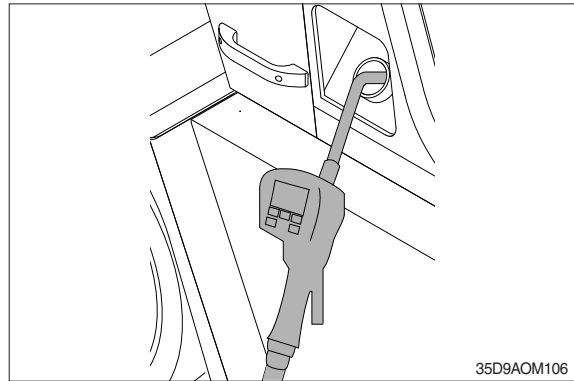
4) **Replace following after initial hours of operation**

Checking items	Hours
Engine oil	50
Engine oil filter	
Differential gear oil	100
Transmission oil	
Transmission oil filter	
Hydraulic oil return filter	250

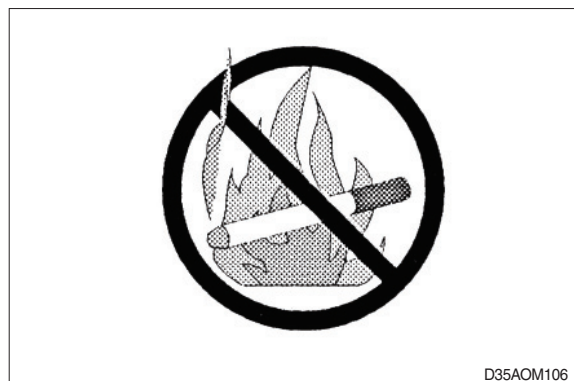


### 3. FUEL SAFETY PRACTICES

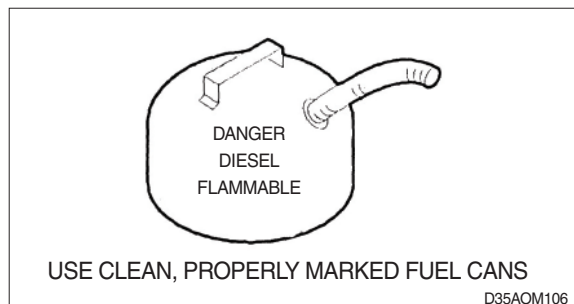
#### REFUELING DIESEL TRUCKS



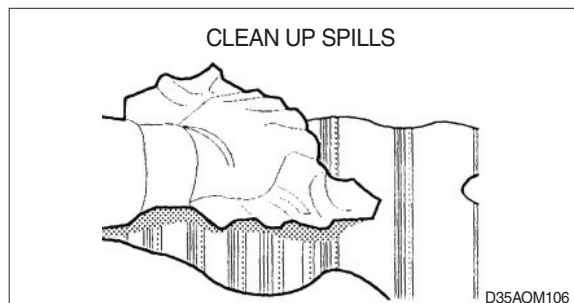
- ⚠ Stop the engine when refueling.  
All lights and flames shall be kept at a safe distance while refueling.



- ⚠ Make sure that the fuel oil cans are kept cleaned and attached safety indication or letters on the can.



- ⚠ Wipe off the spilt fuel oil immediately.



## 4. ENGINE OIL SERVICE INTERVAL AND MANAGEMENT

It is the operator's responsibility to check its condition and be sure it is safe to operate. Please check engine oil condition periodically.

### ▲ Daily check

- Engine oil should be checked once a day before operation.

### ▲ Periodic check

- Service should be done whichever comes first from operating hours or usage period.
- Be sure to use prescribed engine oil.

Service item	Action	Service interval	
		General condition	Harsh condition
Engine oil and oil filter	Replace	Every 500 hours or 1 year	Every 250 hours or 6 months

※ This oil service interval can be different by engine models.

Harsh condition is as follows.

1. Repeated short operation (repeated cold operation)
2. Frequent driving in sandy or dusty places
3. When using excessive engine idle
4. Frequent driving on uphill and downhill roads
5. Frequent driving with rapid acceleration/deceleration or continuous high-load
6. When operating in salt, corrosion or low temperature conditions

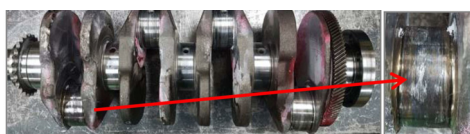
### ※ Problems with poor engine oil management

#### ▲ Excessive or little engine oil filling

Engine oil quantity (lower)	<ul style="list-style-type: none"> <li>① Damage on E/G moving parts with poor lubrication due to premature E/G oil deterioration</li> <li>☞ Crankshaft, camshaft, conrod bearing, piston scuffing, etc.</li> <li>② Damage on moving parts due to aeration in E/G oil, etc</li> </ul>	Oil level gauge unchecked after filling E/G oil
Engine oil quantity (over)	<ul style="list-style-type: none"> <li>① Damage on after-treatment unit due to excessive blow-by gas</li> <li>② Dieseling due to excessive blow-by gas</li> <li>③ Damage (melting) on piston due to E/G oil flow into combustion chamber</li> <li>④ Injector tip burnout and E/G hesitation due to abnormal combustion by E/G oil in combustion chamber</li> </ul>	

※ This service interval is for R-engine model.

< Problem pictures >



< Crankshaft pin seizure >



< Engine oil in combustion chamber >



< Connecting rod bearing seizure >

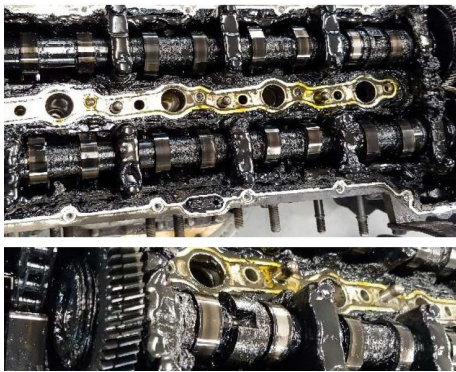


< Connecting rod broken >

**⚠ Engine oil contamination (neglecting daily and periodic check)**

Gelled	<ul style="list-style-type: none"> <li>① Excessive wear and seizure of turbocharger shaft bearings due to delayed oil supply to turbocharger</li> <li>② Excessive wear and seizure of crankshaft main bearing</li> <li>③ Excessive oil consumption due to piston scuffing and cylinder block bore scratches</li> </ul>	Checking and replacement not performed
Viscosity (high)	<ul style="list-style-type: none"> <li>④ Excessive wear and seizure of connecting rod bearings</li> <li>⑤ Excessive wear and seizure of cam shaft bearings</li> <li>⑥ Engine power reduction and hesitation due to poor autolash</li> <li>⑦ Excessive chain noise due to poor timing chain tensioner</li> <li>⑧ Wear and burnout due to lack of lubrication of timing chain lever, guide</li> </ul>	Water inflow etc

< Problem pictures >



< Contaminated and gelled engine oil >



< Excessive wear of moving parts >

## 5. STARTING AND OPERATING PROCEDURES

### 1. BEFORE OPERATING THE TRUCK

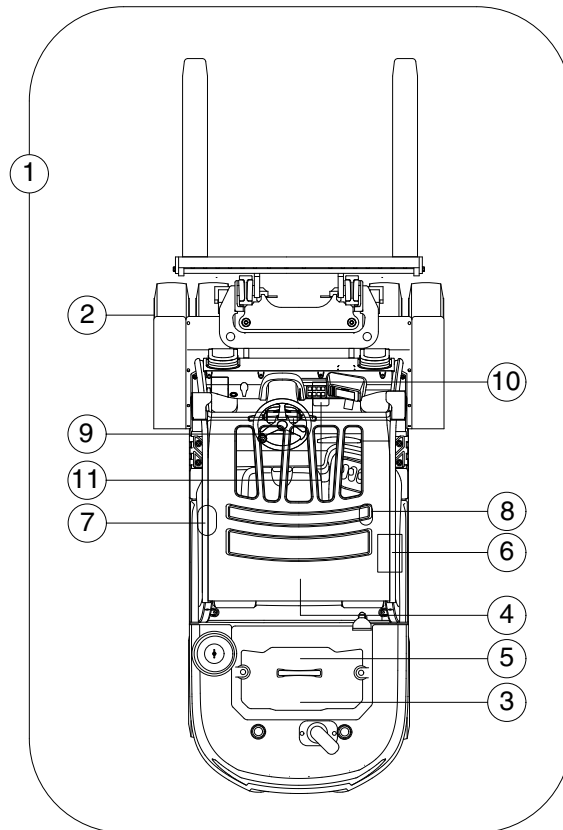
Be sure that you have read and understand the information in this Operator's Manual and are trained and authorized before operating the lift truck.

- ▲ 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 a DRIVER'S OVERHEAD GUARD unless conditions prevent its use. Do not remove overhead guard unless specifically authorized. Use special care if operation without this safety device is required.
- △ To maintain the emissions performance of the engine, engine including the emissions control system, shall be operated, used and maintained in accordance with the this manual.
- △ Do not deliberate tampering with or misuse of the engine emissions control system should take place; in particular with regard to deactivating or not maintaining an exhaust gas recirculation (EGR).



## 2. CHECK BEFORE STARTING

- 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.



- 1 Oil leakage
- 2 Tire air pressure
- 3 Coolant level
- 4 Engine oil level
- 5 Fan belt tension
- 6 Battery
- 7 Hydraulic oil level
- 8 Water separator
- 9 Parking brake
- 10 Multi function switch
- 11 Pedals

35D9VB5SO01

- 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 following 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 overhead guard, 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

##### (1) Front tire (Pneumatic type only)

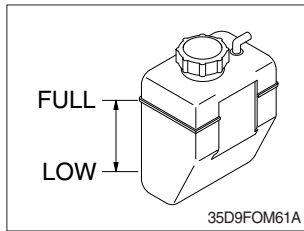
Item	Unit	Front tire	
		Single	Double
Tire air pressure	kgf/cm <sup>2</sup>	8.0	7.7
	psi	114	110
	bar	7.9	7.6
Hub nut tightening torque	kgf · m	53~71	53~71
	lbf · ft	383~513	383~513
	N.m	520~696	520~696

##### (2) Rear tire (Pneumatic type only)

Item	Unit	Rear tire
Tire air pressure	kgf/cm <sup>2</sup>	10
	psi	142
	bar	9.8
Hub nut tightening torque	kgf · m	30~40
	lbf · ft	217~289
	N.m	294~392

- ⚠ 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.

※ Always check the coolant level in the radiator reservoir tank prior to beginning of daily operation of the truck.

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

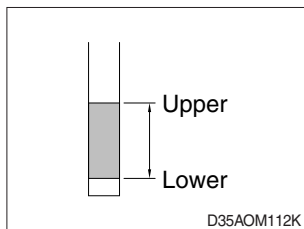
▲ If the reservoir tank is completely empty, first add water directly to the radiator. Then add water to the reservoir tank.

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 tank cap. Wait until the radiator is cool enough to be touched by hand before opening the radiator tank cap. Loosen the radiator tank cap slowly to release the pressure, then loosen the cap.

※ After filling the coolant into the radiator, check for leakage for the radiator, radiator hoses and other parts of the cooling system and also for traces of water leakage under the engine.

### 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 Upper and Lower.

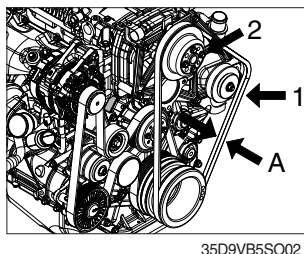
If below Lower, remove the filler cap and add engine oil through the oil level.

※ 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 Fan belt
- 2 Mounting bolt
- A Deflection

(1) The fan belt must depress the specified value when the midpoint between the alternator and fan pulley is depressed.

▲ If the belt is stretched beyond the adjustment allowance, or there are cuts or cracks, replace the V-belt.

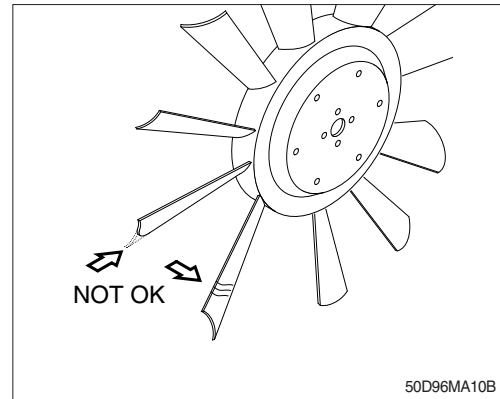
· Specification (under load of 10 kgf (22 lbf))

A : 12~16 mm (0.47~0.63 in)

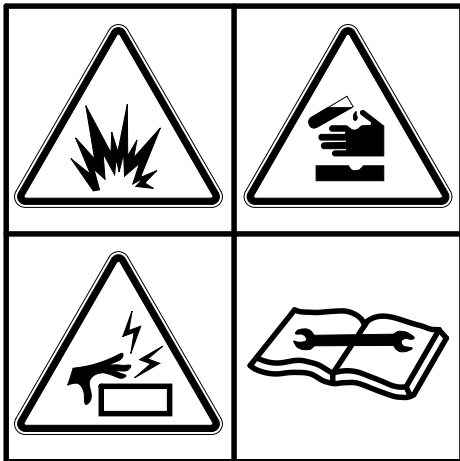
※ Refer to page 7-22.

## 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.



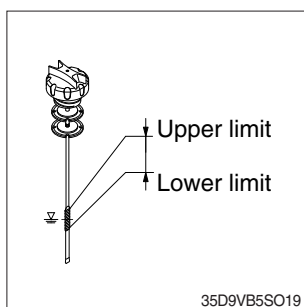
## 7) BATTERY



- (1) Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

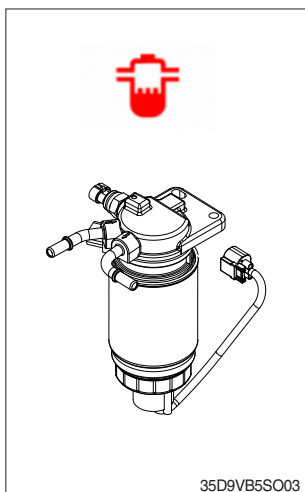
- ⚠ Battery gas can explode. Keep sparks and flames away from batteries.
- ⚠ Always wear protective glasses when working with batteries.
- ⚠ Do not stain clothes or skin with electrolyte as it is acid.  
Be careful not to get the electrolyte in eyes.  
Wash with clean water and go to the doctor if it enters the eyes.  
Make sure to keep the batteries fully charged at
- ※ all times, when operating the truck in cold weather.

## 8) CHECK HYDRAULIC OIL LEVEL



- (1) Rest fork on ground and stop the mast at upright vertical position and stop engine. Pull out dipstick and check oil level. If insufficient, add oil.
- ⚠ Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

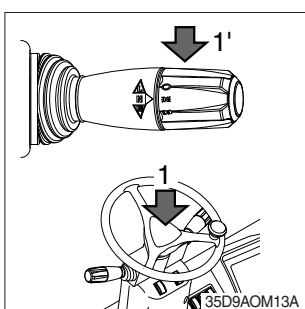
## 9) CHECK FUEL FILTER



(1) Water in fuel warning lamp.

If the warning lamp stays on, drain the water from the fuel filter.

## 10) CHECK HORN AND LAMPS



(1) Check horn button and lamp switch if operate normally or not.

1 : Horn button

1' : Lamp switch

(2) If horn and lamp are malfunctioning, contact your HYUNDAI forklift distributor.

## 11) CHECK PEDALS

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

(1) Inching pedal

	Unit	Specification
Free play	mm (in)	2~4 (0.07~0.16)
Interlock stroke with brake pedal	mm (in)	0

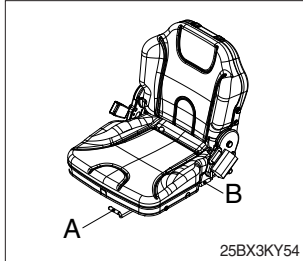
(2) Brake pedal

	Unit	Specification
Free play	mm (in)	0

## 4. SEAT ADJUSTMENT

It is allowed to adjust operator's seat adequate for body of operator to reduce fatigue during driving, and enhance work efficiency.

### 1) OPERATOR'S SEAT



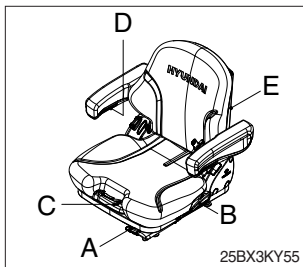
#### (1) Forward/Backward adjustment (A)

- ① Pull lever A to adjust seat forward or backwards.
- ② It is allowed to adjust forth up to 72 mm, and back up to 84 mm (stroke: 156 mm).

#### (2) Backrest adjustment (B)

Pull lever B to adjustment the angle of backrest.

### 2) OPERATOR'S SEAT (GRAMMER, OPTION)



#### (1) Forward/Backward adjustment (A)

- ① Pull lever A to adjust seat forward or backwards.
- ② It is allowed to adjust forth up to 120 mm, and back up to 90 mm (stroke: 210 mm).

#### (2) Backrest adjustment (B)

Pull lever B to adjustment the angle of backrest.

#### (3) Weight adjustment (C)

Turn screw C with socket wrenches without sitting on the seat to adjust weight.

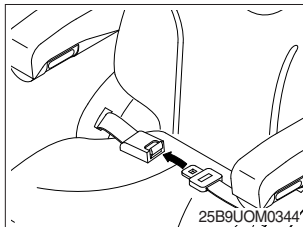
#### (4) Armrest adjustment (D)

Rotate adjustment knob D to adjust the angle.

#### (5) Heater switch (E, option)

Heater is turned on and off with the switch.

### 3) SEAT BELT



- (1) Never forget wearing the seat belt before starting the truck.  
Adjust tension of the seat belt before wearing it.

⚠ Always wear the seat belt before driving the truck to prevent safety accident. Failing in wearing the seat belt may cause personal injury in accident.

⚠ Check the seat belt for any abnormal conditions before starting the truck.

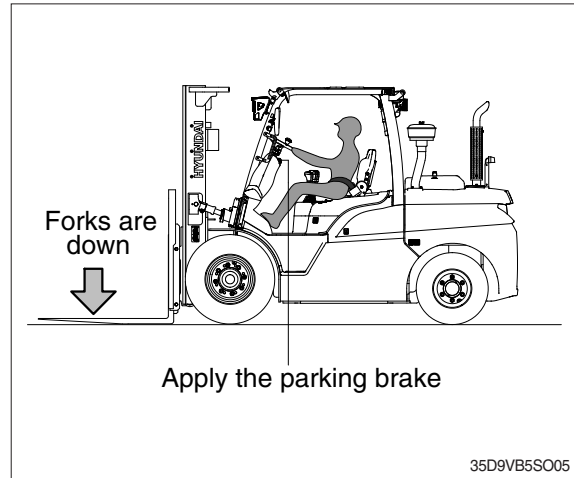
⚠ Replace the seat belt every three years even if there is no apparent defects on the belt.

## 5. STARTING FROM A SAFE CONDITION

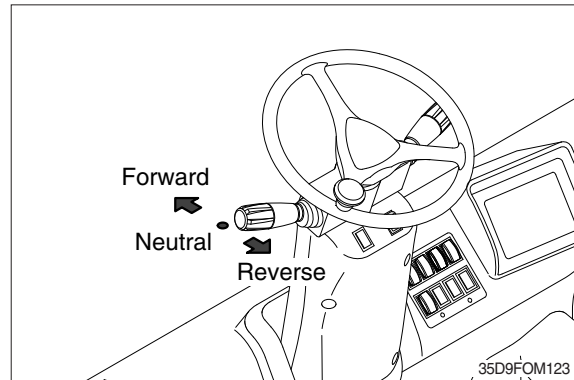
Always start from a safe condition.

Before operating a lift truck, make sure that :

- You are safely seated in the truck.
- 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 gear selector 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 gear selector lever 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 38 °C (100 °F). 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 THE ENGINE

### 1) START FROM A SAFE CONDITION

Before you start the truck, safely seat yourself on the truck, fasten seat belt, apply the parking brake, make sure all controls are in neutral or other correct position, lower the forks fully to floor or ground, put the gear selector lever in NEUTRAL, and make sure you know how to operate the truck and all its controls.

#### **Cold Start Preheating**

With the switch in the ON position the indicator will light up showing the glow plugs are pre-heating automatically, after 6 seconds the indicator light will go out. The engine can then be started. For improved starting, pre-heating is continued for about 5 seconds after the indicator light has gone out. To repeat the preheating process turn the key to the OFF and then into the ON position.

- ▲ DO NOT USE STARTING FLUID to help start an engine. The fluid contains ether or other explosive substances that could cause serious injury. Starting fluid is especially dangerous when used on engines with glow plugs. Never use starting fluid with a glow plug equipped engine.**
- 2) Turn the start switch to the START position to crank the engine. Release the key the ON position and return the accelerator to idle as soon as the engine starts.
- ※ **If the engine stalls or falters in starting, wait two to three minutes before re-engaging the starter. This prevents possible serious damage to the starter or engine.**
- 3) When starting a cold engine, increase the engine speed (rpm) slowly to be sure adequate lubrication is available to the bearings and to allow the oil pressure to stabilize.
- 4) Idle the engine three to five minutes at idle rpm before operating with a load.



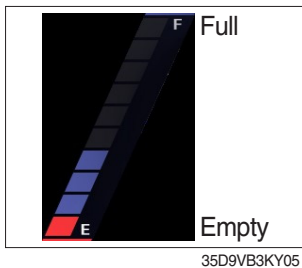
## 8. CHECK AFTER STARTING ENGINE

### 1) CHECK FOR ABNORMAL NOISE OR VIBRATION

### 2) CHECK ENGINE EXHAUST GAS COLOR

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

### 3) CHECK FUEL TANK LEVEL



If the indicator is in the **Full** range, the tank is full. If the indicator is in the **Empty** 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.

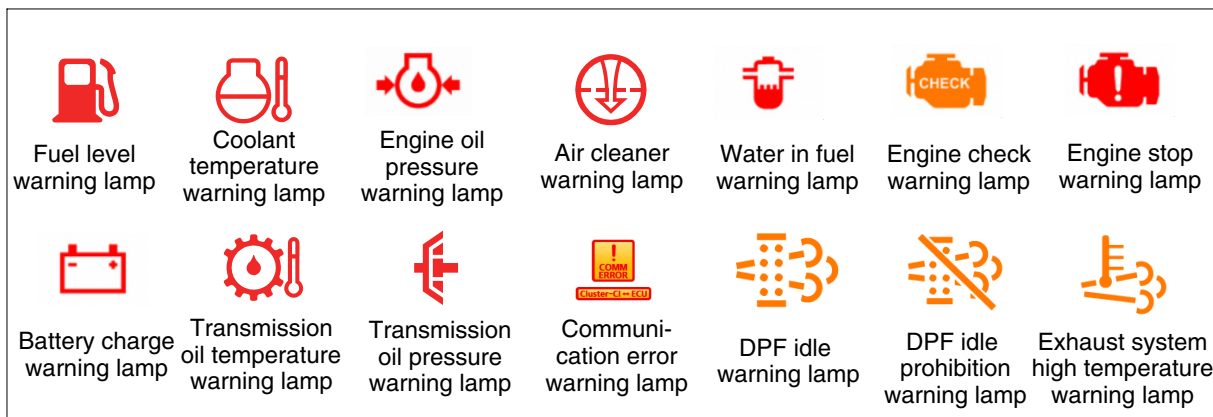
Always fill the tank at the end of the day's operation. If air remains in the tank, the moisture in the air will condense inside the tank and form water in the fuel.

※ The moisture in the fuel system can be caused a difficulty of the engine starting and may lead to a serious problem for the engine function.

▲ Do not smoke or allow any flame near the truck when refilling. Refilling produces explosive fumes. The truck should be refilled only at the specified refilling point. Stop the engine and get off the truck when refilling.

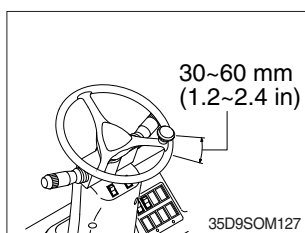
#### 4) CHECK CLUSTER

- ※ These lamps light up to indicate an abnormality.  
So, if one of these lamps is lighted, take appropriate service and maintenance.
- ※ Cluster warning lamps light up to indicate an abnormality. (refer to page 3-7~9)



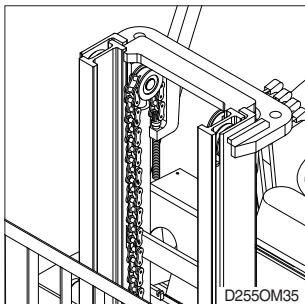
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#### 5) CHECK STEERING WHEEL PLAY



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

#### 6) CHECK LIFT CHAIN TENSION



Raise forks 100 to 150 mm (4 to 6 in) from ground. Push with a rod check that both chains have approximately same amount of slack.

· Adjusting lift chain

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

**▲ Do not put hands into the mast.**

#### 7) CHECK STEERING WHEEL

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

#### 8) CHECK REARVIEW MIRROR (option)

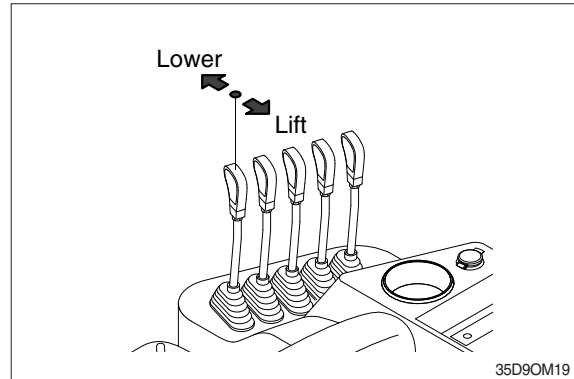
Adjust the rearview mirror for best rearward visibility.

## 9. LEVERS AND PEDALS

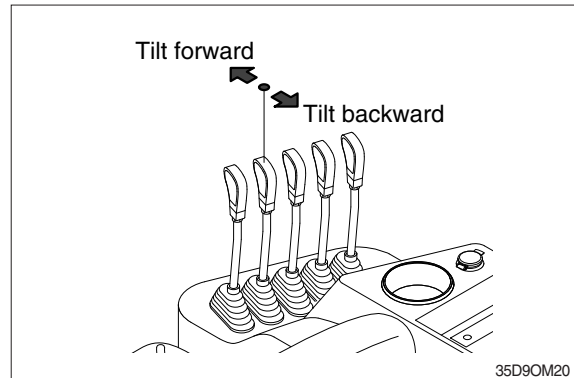
### 1) POSITIONING FORKS AND MAST

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

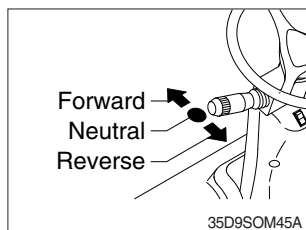


**⚠ When the mast (carriage and/or load) is raised into a high (elevated) position, the stability of the truck is reduced.**

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

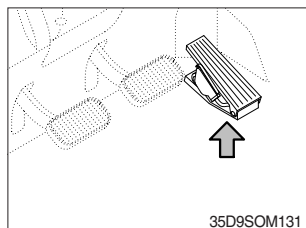


Push the gear selector lever forward, center it, or pull it back for FORWARD, NEUTRAL, or REVERSE, respectively.

Traction is disabled in NEUTRAL.

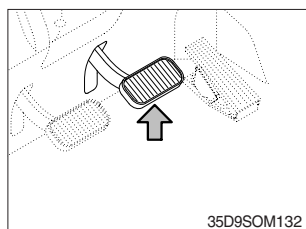
**⚠ During traveling in forward or reverse direction rapid turning of the truck can cause dropping of a load and damage of the truck.**

## 3) ACCELERATOR PEDAL



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

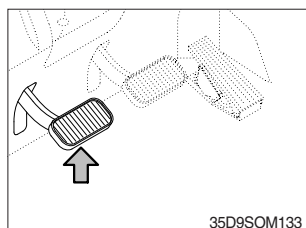
## 4) BRAKING PEDAL



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 lose 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.

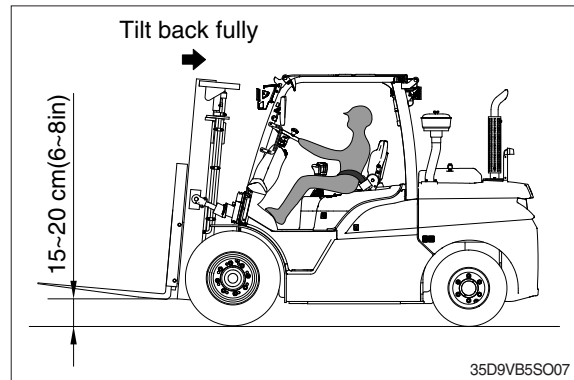
**⚠ When slipping the clutch, it can happen heating in the system and reduced a durability of the components. When operating accelerator, avoid frequent use and cut off the power of the traveling by pressing sufficiently the inching pedal.**

## 10. TRAVELING OF THE TRUCK

### 1) BASIC OPERATION

#### (1) Traveling posture

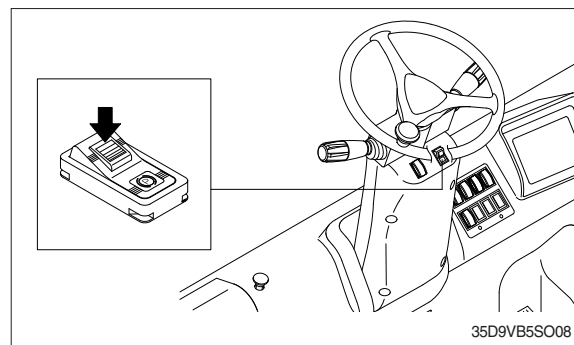
Lift the forks so that the forks are placed 15~20 cm (6~8 in) above the ground and tilt back the mast fully.



#### (2) Traveling operation

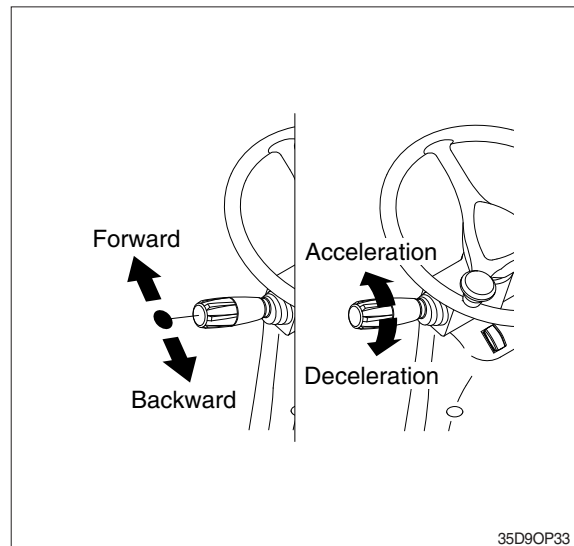
When warm-up operation is completed after the engine is started, move the truck according to the following procedures.

- 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

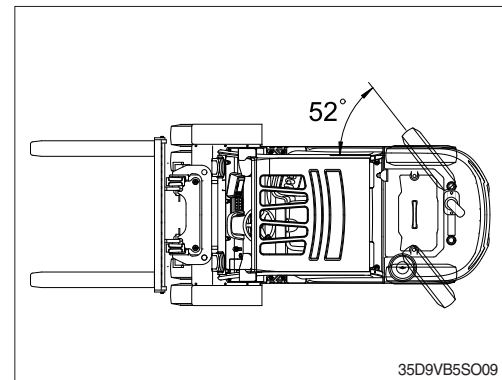
- ① The gear selector is designed for the mounting on the left side of the steering column.
- ② The positions (speeds) 1 to 2 are selected by a rotary motion, the driving direction Forward (F) - Neutral (N) - Reverse (R) by tilting the gear selector lever.
- ③ A neutral lock is installed as protection 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 gear selector 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.

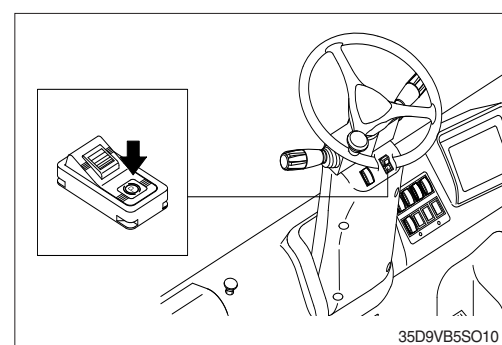


#### (5) Precautions when driving

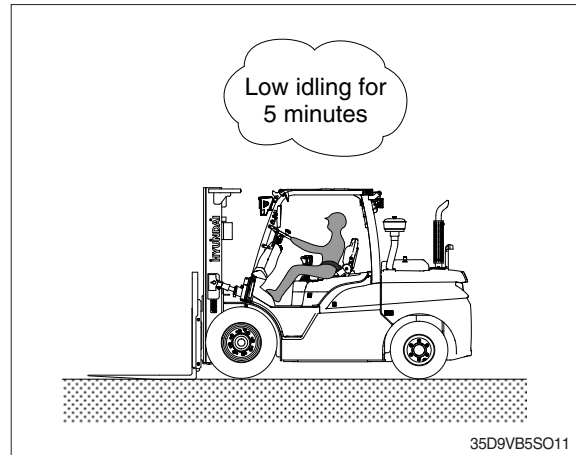
- ① If the monitor warning lamp lights up, put the gear selector lever in the neutral position and stop the truck. Stop the engine after running it at low idling. Then resolve any problems regarding operation of the truck.
- ② When operating the truck, if the load is lighten rapidly, the speed of the 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 Put the parking brake switch to the LOCK position.



- ④ Lower the forks to the ground.



### (7) Stopping engine

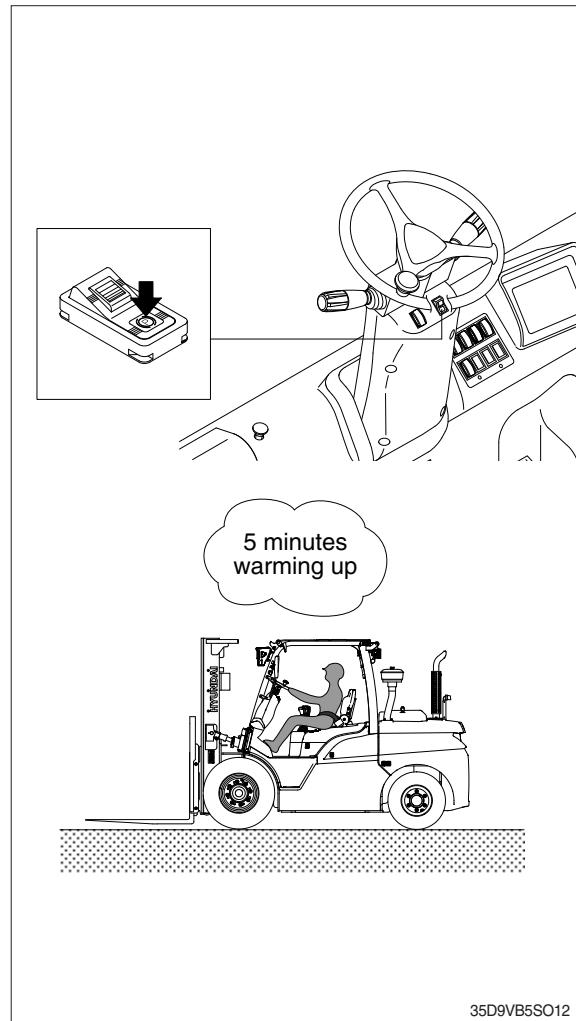
- ※ If the engine is abruptly stopped before it has cooled down, its service life may be shortened. Avoid sudden stop except an emergency.
- ※ When the engine is overheated, do not stop immediately. Run the engine at a mid range speed to allow it to cool down, then stop it.

- 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

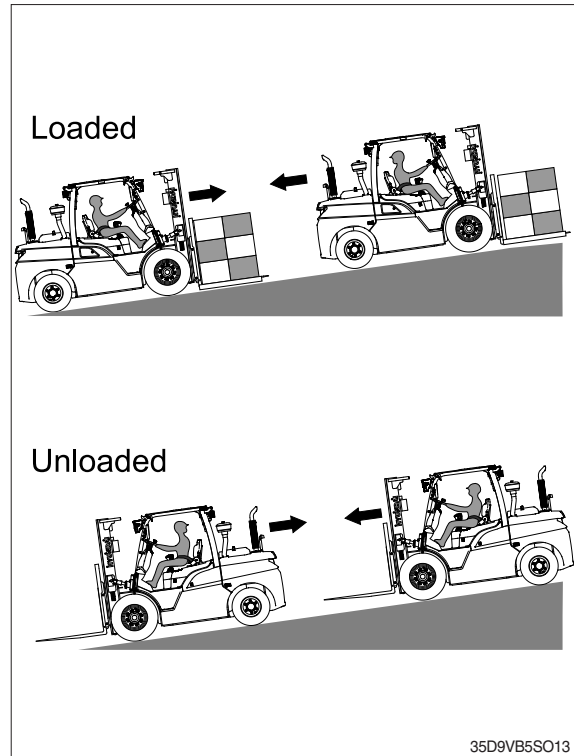
- ① Check the leakage of oil and water, the work equipment and the exterior of the truck.
- ② Refill the fuel tank.
- ③ Remove any debris inside of the engine room and attached to the truck.



## 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 under overhead guard.

※ An overhead guard 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.

## **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.**

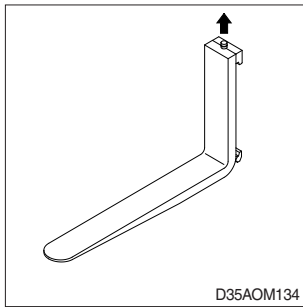
**DO NOT climb the mast or the truck.**

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



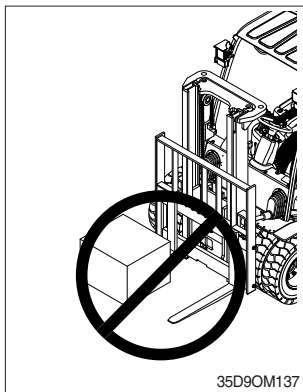
The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make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

Unlock the fork locking pins.

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

**▲ Make sure the load backrest or fork retaining bolts are fastened securely in place.**

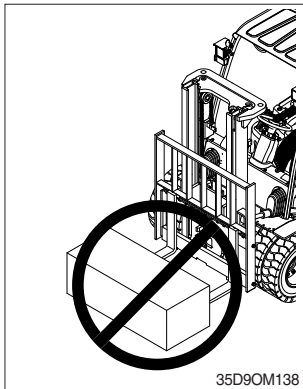
## 3) LOAD ON FORKS



- (1) Do not elevate the load with one forks.

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

This can cause the height difference between both fork tips due to overload.



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

This can cause the height difference between both fork 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.

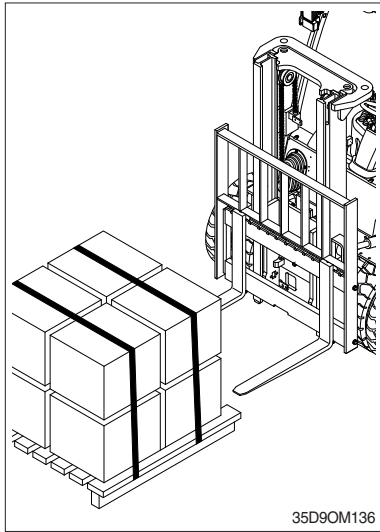
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

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.

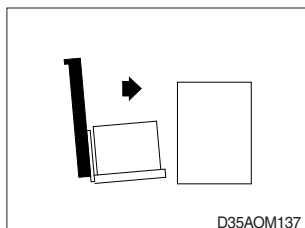
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (Pallet).

Carefully back away to clear the forks from the load.

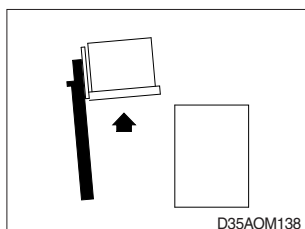
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

## 7) STACKING

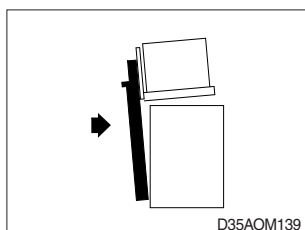
### (1) To put a load on a stack



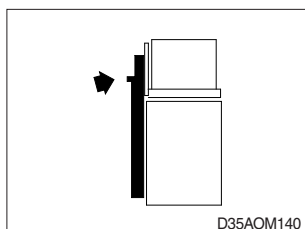
- ① Approach slowly and align the lift truck and load squarely with the stack.



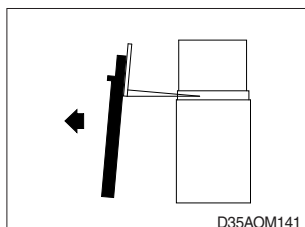
- ② Raise the load as the lift truck nears the stack.



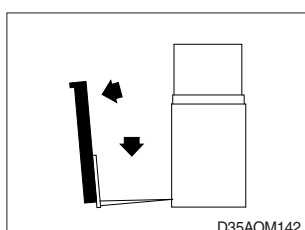
- ③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.



- 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.
- (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 gear selector lever in the NEUTRAL position.
- (3) Apply the parking brake.
- (4) Lower the lifting mechanism-carriage and forks or attachment fully to the ground.

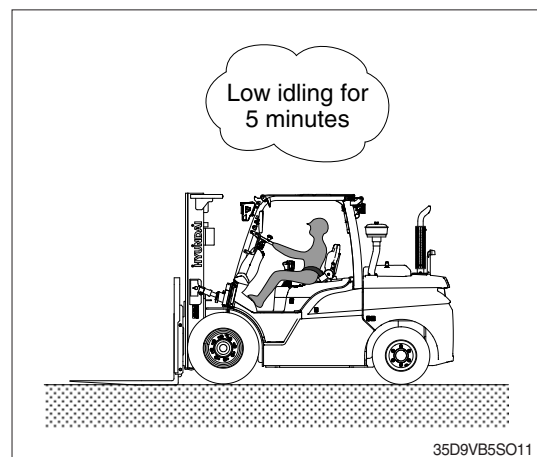
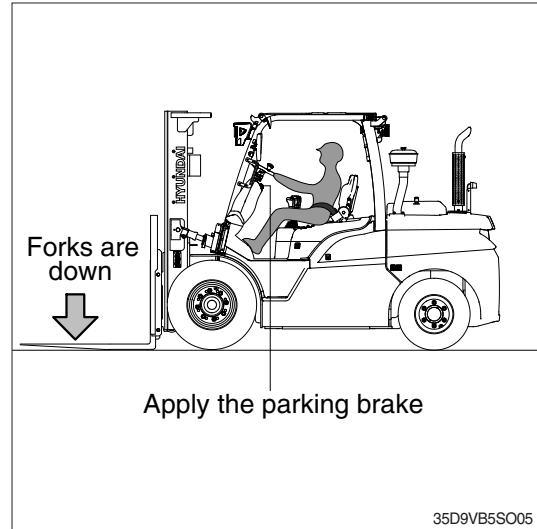
### 3) IN ADDITION, WHEN LEAVING THE TRUCK UNATTENDED

- (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 start 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 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 a 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.

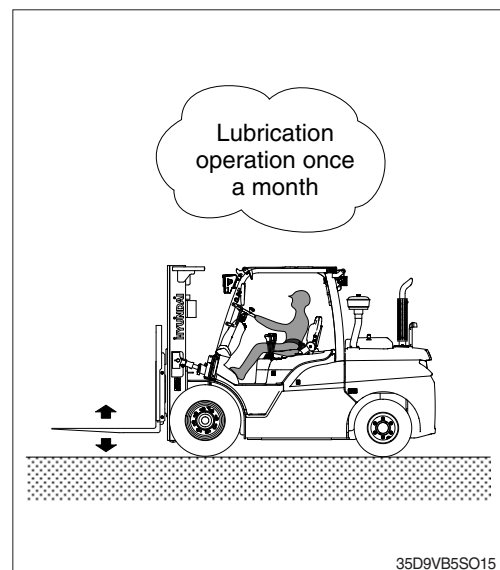
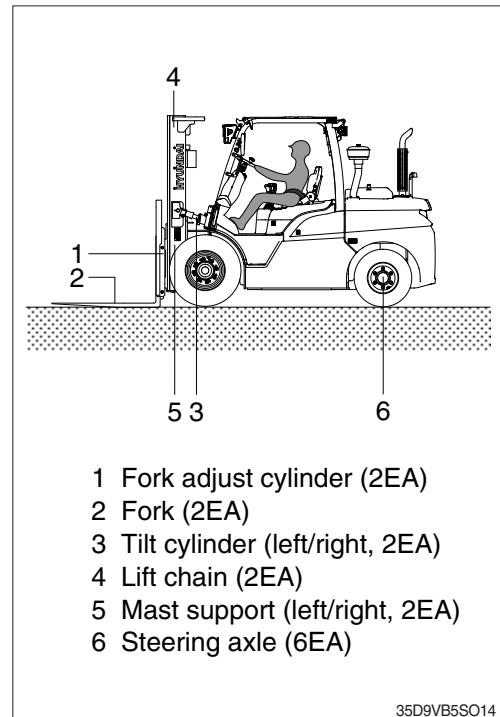
▲ **The above operations should be performed in the open. If they have to be performed inside a building, open the windows and doors to improve ventilation.**

**This is to avoid the danger of gas poisoning.**

### 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.

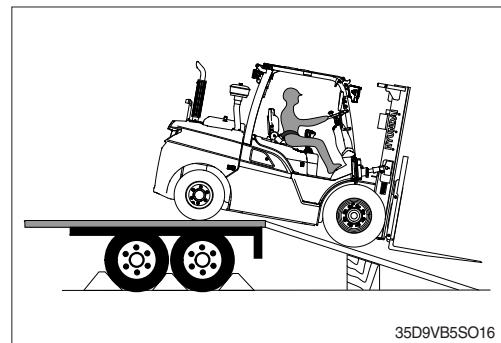
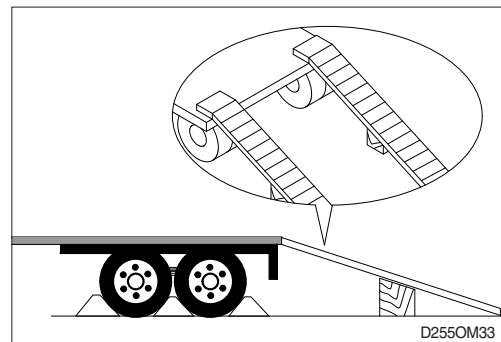
- (1) Ensure that the transporter cannot move by applying the brake and putting blocks under the wheels. Put the gear selector lever in the NEUTRAL position.

- (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.**

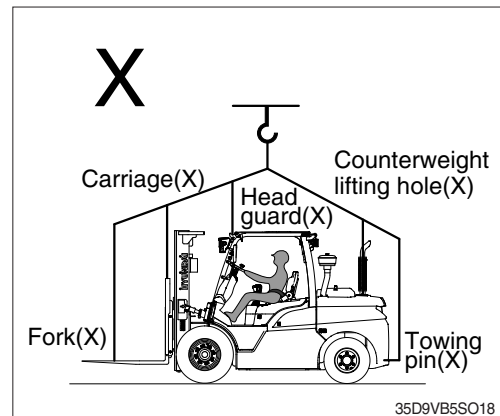
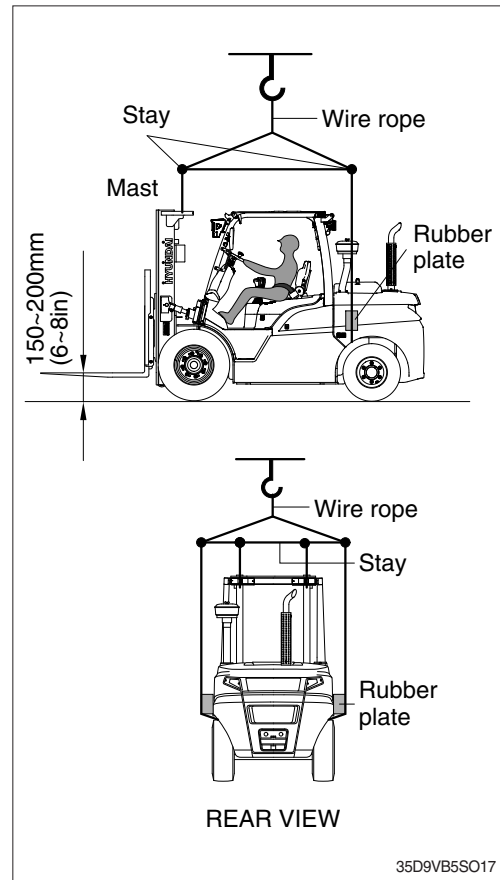


## 16. LOADING AND UNLOADING BY CRANE

- 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 truck as it should avoid touching with the truck body.
- 3) Put a rubber plate where the wire rope 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.

- ⚠ 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 PROCEDURES

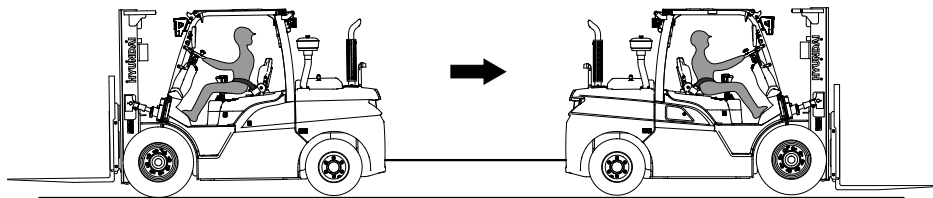
### 1. HOW TO TOW A DISABLED TRUCK

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 gear selector lever in the NEUTRAL position.



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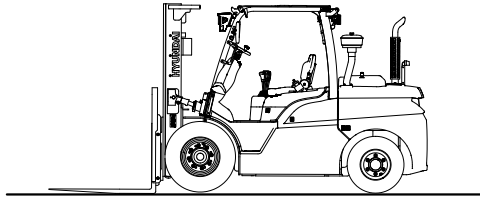
- 8) Tow the disabled truck backward. An operator must be on the towed truck.

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 gear selector lever in the NEUTRAL position and turn the starting switch to the OFF position. Apply the parking brake. Remove the start switch and, when necessary, block the wheels to prevent the truck from rolling.

#### Lift truck parking



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

## 2. 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 12 V, 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 12 V, NEGATIVE GROUND SYSTEM to jump your truck. You can injure yourself and permanently damage your truck's 12 V, starting motor and ignition system by connecting it to a 12 V, 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.

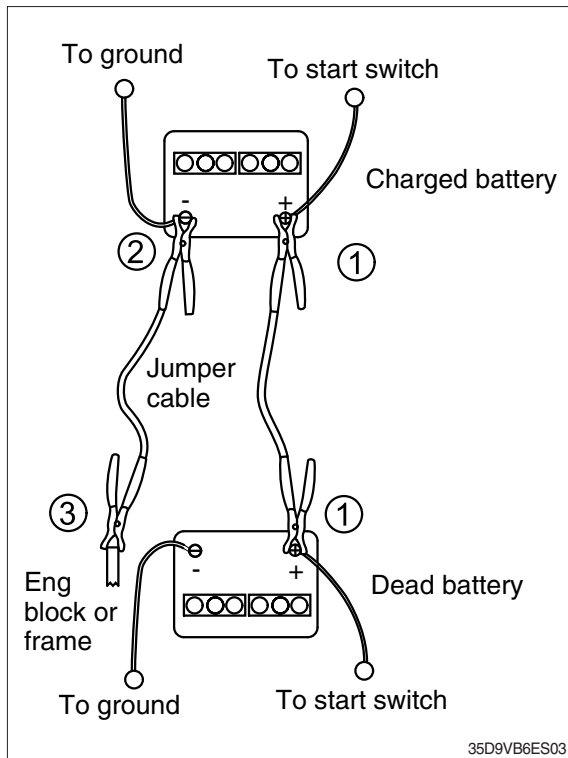
**▲ BATTERIES EMIT EXPLOSIVE GAS. Do not smoke or have open flames or sparks in battery charging areas or near batteries. An explosion can result and cause injury or death. Hydrogen gas is produced during normal battery operation. Hydrogen can explode if flames, sparks, or lighted tobacco are brought 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 Put the parking brake switch in LOCK position.
- ② Put the gear selector lever in the NEUTRAL position.
- ③ Turn the start 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.**



STALLED VEHICLE

**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 truck** battery.
  - ③ Connect the other end of the second cable to a stationary, solid metallic point on the engine of the **stalled truck**, not to the negative (-; black) terminal of its battery. Make this connection at a point at least 450mm (18in) 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 truck** and run the engine at a moderate speed for a minimum of five minutes.
  - 7) Start the engine on the **stalled truck**. 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.



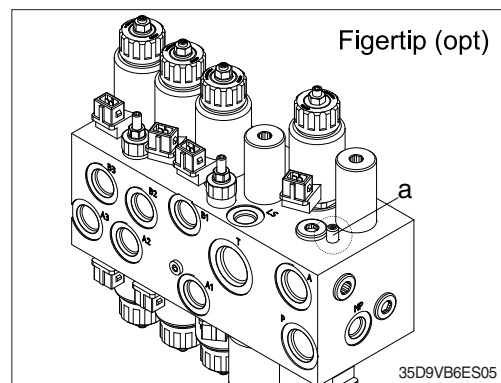
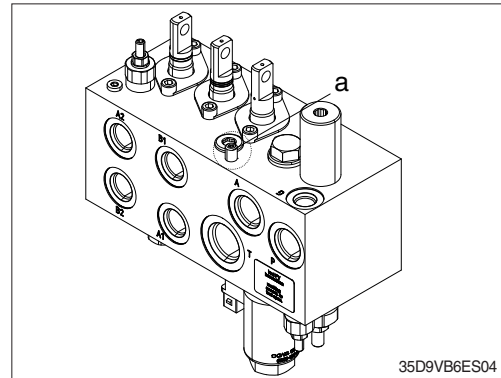
### 3. EMERGENCY FORK LOWERING

In case that the mast can't be lowered due to a problem in the controller, activate the emergency lowering valve on the MCV assy by rotating the valve (a).

**▲ Manual override features are intended for emergency use, not for continuous-duty operation.**

- 1) Open the bonnet.
- 2) Use the L-wrench (3 mm) to slowly undo the screw for the emergency lowering feature in an anti-clockwise direction until lowering begins.
  - ※ **Do not undo the screw more than 1.5 turns.**
  - ※ **If lowering still does not begin, there is a mechanical block. Do not under any circumstances continue to unscrew the emergency lowering feature.**
- 3) After lowering is complete, the screw must be screwed back in again
  - ※ **Do not exceed a tightening torque of maximum 0.25 kgf·m (1.81 lbf·ft).**

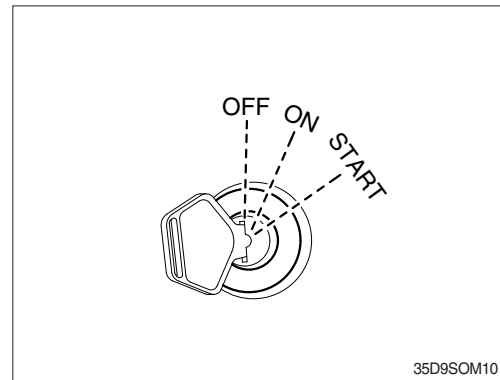
**▲ When operating the emergency lowering valve in order to lower the mast inevitably, always make certain that any person should not stand or pass under the mast, the fork and platform so as to avoid from unexpected accident such as severe personal injury or death.**



## 4. KEY-LOWERING INTERLOCK

When the engine is OFF, the truck will not descend even if the lift lever is lowered. However, if the operator sits properly in the seat and turns the engine start key ON, the truck can be lowered even if the engine is off.

- ※ **When the truck will not lower due to system malfunction or other reasons, it can be lowered by loosening the emergency lowering valve. (refer to the page 6-5 for details.)**



## 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 thorough 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 depends on the particular application and lift truck usage.

Planned maintenance is the normal maintenance necessary to provide proper and efficient trucks operation. To protect your investment and prolong the service life of your trucks, follow the scheduled maintenance check list.

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 gear selector lever 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.**

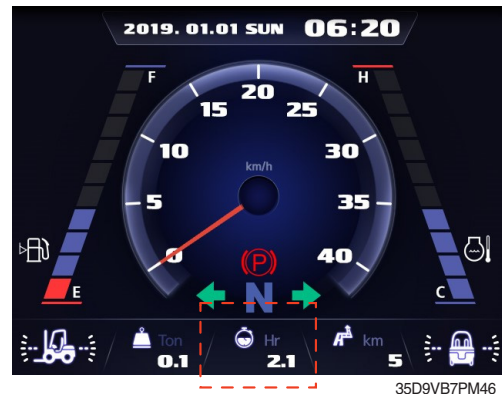
- (1) Stop the truck.
  - (2) Fully lower the load-engaging means: mast, carriage, forks or attachments.
  - (3) Put the gear selector lever in NEUTRAL.
  - (4) Apply the parking brake.
  - (5) Stop the engine.
  - (6) Turn the start switch to the OFF position.
  - (7) Put blocks at the wheels if the 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, overhead guard 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 100 hours and daily service at the same time.



※ Time intervals between maintenance 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 ;

##### ① Normal operation

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

##### ② Harsh operation

- a. All harsh working environment
- b. Long term heavy load operation
- c. High and low temperature working environment
- d. Sudden change in temperature
- e. Dusty or sandy working environment
- f. Highly corrosive chemical working environment
- g. Damp working environment

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 Hyundai 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 recommend replacement interval.

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

No.	Periodical replacement of safety parts	Interval
1	Master cylinder and wheel cylinder caps dust seals	Every 1 years
2	Lift cylinder hose	Every 1 years (harsh operation) Every 2 years (normal operation)
3	Tilt cylinder hose	
4	Side shift cylinder hose	
5	Brake hose or tube	
6	Hydraulic pump hose	Every 2 years
7	Power steering hose	
8	Coolant hose and clamps	
9	Fuel hose	Every 2 years (harsh operation) Every 4 years (normal operation)
10	Packing, seal, and O-ring of steering cylinder	
11	Lift chain	
12	Hydraulic pump seal kit	Every 3 years
13	Pressure sensor	Every 5 years
14	Mast accumulator (piston type)	Every 10 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.**

※ **Refer to the page 7-5 about the harsh and normal operation.**

## 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.

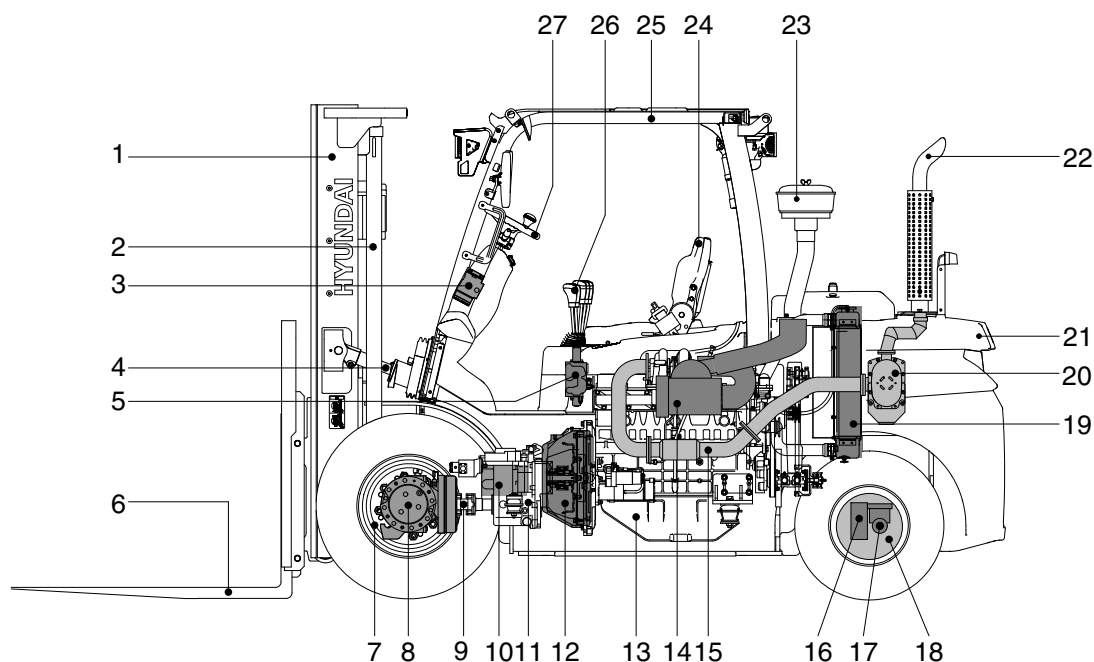
Naturally, this warranty does not cover to damage arising from accident, misuse or negligence, use of non-Hyundai parts, or from alterations not authorized by Hyundai.

※ **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

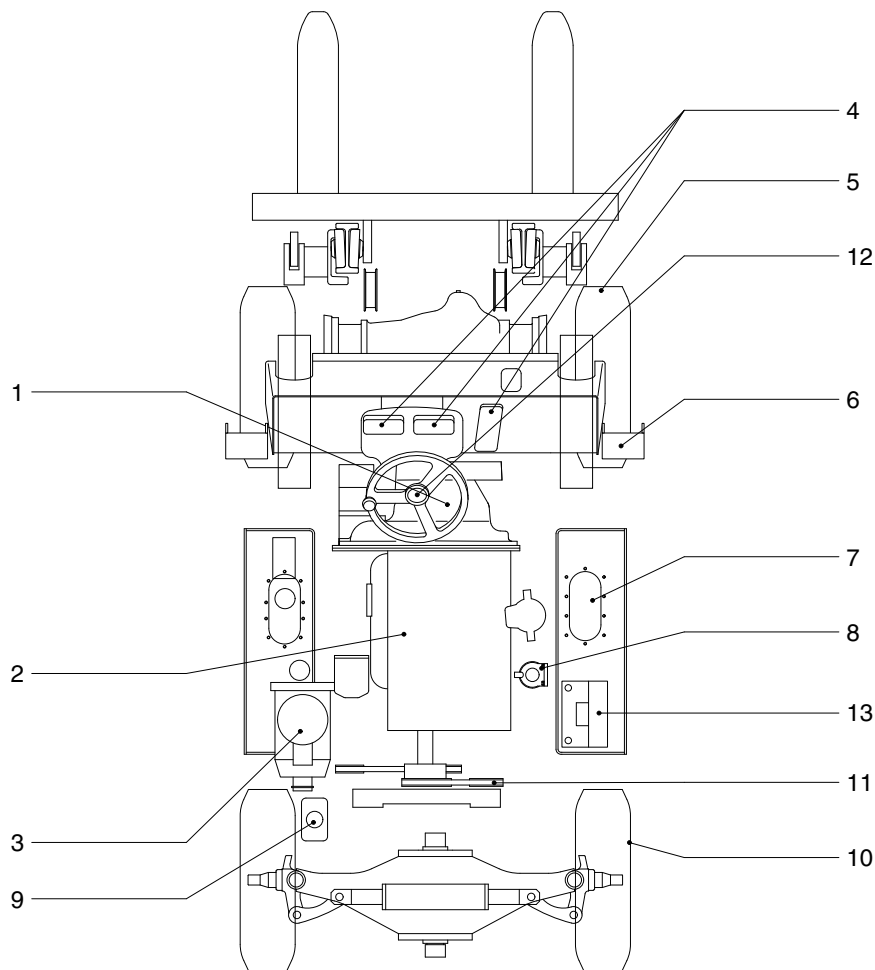
### 1) MAJOR COMPONENT LOCATIONS



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1 Mast	10 Hydraulic pump	19 Radiator
2 Lift cylinder	11 Transmission	20 Aftertreatment device
3 Steering unit	12 Torque converter	21 Counterweight
4 Tilt cylinder	13 Engine	22 Silencer
5 Control valve	14 Air cleaner	23 Precleaner
6 Fork	15 Exhaust pipe	24 Seat
7 Front wheel	16 Steering axle	25 Overhead guard
8 Drive axle	17 Steering cylinder	26 Control lever
9 Drive shaft	18 Rear wheel	27 Steering wheel

## 2) SERVICE LOCATIONS



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- ※ 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.
- ※ Depending on the ambient and operation conditions, the replacement cycle may be shortened.
  - All harsh working environment
  - Long term heavy load operation
  - High and low temperature working environment
  - Sudden change in temperature
  - Dusty or sandy working environment
  - Highly corrosive chemical working environment
  - Damp working environment
- ※ For other details, refer to the service manual.

### 3) DAILY(OR EVERY 10 HOURS) CHECK LIST

Item No.	Description	Service Action	Oil symbol	Capacity ( ℓ )	Service point	Remark
1	Parking brake operation	Check, Adjust	-	-	1	7-43
2	Engine oil level	Check, Add	EO	9.1	1	7-16
2	Engine & Electrical wiring	Check	-	-	1	7-36
3	Air cleaner element	Check, Clean(by hand)	-	-	1	7-23
4	Pedal linkage operation	Check, Adjust	-	-	2	7-42
5	Drive rim & Tire air pressure	Check, Add	-	-	2	5-3, 7-15
6	Lamp operation	Check, Replace	-	-	9	7-42
7	Fuel level	Check, Add	DF	3.5/4.0 ton : 134 4.0/4.5 ton : 139	1	7-24
8	Water separator	Check, Drain	-	-	1	7-24
9	Radiator coolant	Check, Add	C	12.5	1	7-18
10	Steer rim & Tire air pressure	Check, Add or Replace	-	-	2	5-3, 7-15
11	Fan belt tension	Check, Adjust	-	-	1	7-22
12	Horn operation	Check, Replace	-	-	1	7-42
13	Battery	Check	-	-	1	7-45
All	Obvious damage and leakage	Check, Repair	-	-	Whole of truck	4-1

※ Oil symbol

Refer to the recommended lubricants for specification.

DF : Diesel fuel

HO : Hydraulic oil

EO : Engine oil

GO : Gear oil

MO : Transmission oil

C : Coolant

G : Grease

#### 4) PERIODICAL CHECK LIST

Service item		Oil Symbol	Service interval Hours								Initial Hours		
			50	250	500	1000	1500	2000	3000	4000	50i	100i	250i
Tightening (Mounting bolt)	Tilt cylinder pin, rod-eye				T								T
	Hydraulic pump, MCV							T					T
	Steering unit, Priority valve							T					T
	Pressured forced valve							T					T
	Lift, Attachment, Steering cylinder							T					T
	Mast				T								
	Drive and steering axle				T								
	Drive and steering axle wheel		T										
	Counterweight, Cabin		T										
	Engine, Radiator, Transmission		T										
Lubrication	Tilt pin & Mast roller	G			L								L
	Lift chain	EO			L								L
	Steering axle linkage	G	L										
	Attachment cylinder rod&tube end			L									
	Steering axle kingpin bearing				L*1	L*2							
	Pedal pivot				L								
	Drive shaft			L*1	L*2								
	Tilt cylinder rod-end	G		L*1	L*2								
	Tilt cylinder tube-end	G			L								
	Steering unit spline (Column shaft)	G						L					
	Manual hydraulic levers; Du-bush	G						L					
Oli Leakage	Hydraulic tank				I								I
	Valve (MCV, Priority, Brake, PF)				I								I
	Pump, Steering unit				I								I
	Lift, Tilt, Steering cylinder			I*1	I*2								I
Function test	Steering wheel operation				I								I
	Manual hydraulic lever operation				I								
	Fork Natural drop & forward tilt							I					
	Mast Tilt angle measurement							M					
	Fork load indicator (opt)							I					
	Lift cushion; accumulator (opt) (N2 gas pre-charge checking)							I					

\*1 Harsh condition \*2 Normal condition \*3 Conventional hydraulic oil \*4 Hyundai genuine long life hydraulic oil

T : Retightening L : Lubrication A : Add R : Replacenet C : Checking

I : Visual inspection (Repair or replace if required) M : Measurement (Repair or adjustment if required)

Service item		Oil	Service interval Hours										Initial Hours		
		Symbol	250	500	1000	1500	2000	3000	4000	1year	2year	50i	100i	250i	
Periodic replacement parts	Engine oil	EO	R*1	R*2								R			
	Engine oil filter		R*1	R*2								R			
	Fuel filter			R*1	R*2										
	Air cleaner element		Clean (by airgun)				R								
	Transmission oil	MO		A	R								R		
	Transmission oil filter				R								R		
	Differential gear oil	GO		A	R								R		
	Radiator coolant	C							R						
	Water seperator			R											
	Valve clearance				C										
	Injector tip					C									
	EGR cooler					C									
	EGR system							C							
	Turbocharger							C							
	DPF ash							Clean, R							
	Condition of DPF muffler									C					
	DPF differential pressure sensor and piping for gas leak									C					
	DPF exhaust gas temperature sensor									C					
	DPF exhaust gas temperature sensor rubber piping (front, back)										R				
	Engine fully clean										Clean				
	Exhaust manifold (crack, gas leakage, mounting screw									C					
	Intake air line for air leaks									C					
	Boost sensor and AFS (Air Flow Sensor)									C					
	Alternator and starter motor										C				
	PCV valve						C								
	Brake condition & wear					C									
	Fork condition & wear				C										
	Fan belt				Adjust	R									
	Drive belt					C									
	Hydraulic oil tank air breather filter			R*1	R*2										
	Hydraulic oil return filter					R								R	
	Hydraulic oil suction strainer							R							
	Hydraulic oil	HO	A					R*3		R*4 (5000)					

\*1 Harsh condition \*2 Normal condition \*3 Conventional hydraulic oil \*4 Hyundai genuine long life hydraulic oil

T : Retightening L : Lubrication A : Add R : Replenish C : Checking

I : Visual inspection (Repair or replace if required) M : Measurement (Repair or adjustment if required)

## 5. 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 FLUID PRESSURE:** Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.

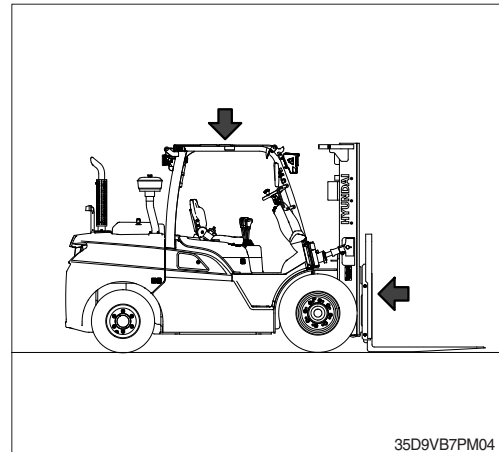
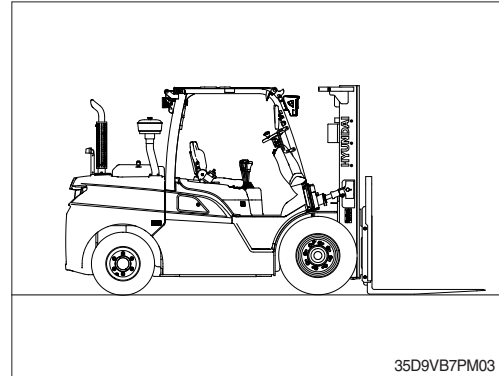
### 2) OVERHEAD GUARD

Be sure that the driver's overhead guard and any safety devices are in place, undamaged, and attached securely. Check the overhead guard 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.**

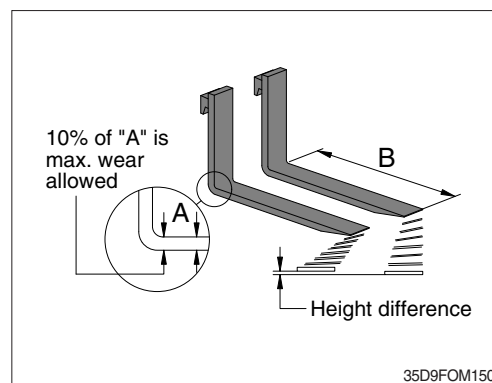


#### 4) FORKS

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.

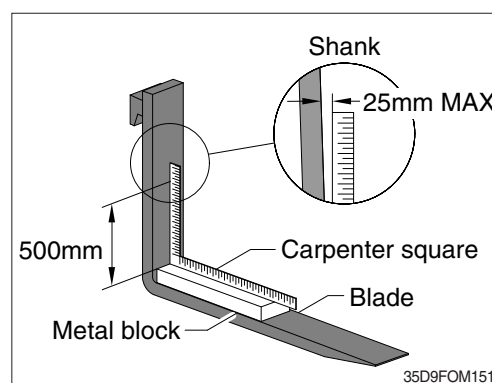
Units : mm

Fork length (B)	Height difference
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 50 mm (2 in) thick metal block, at least 100 mm (4 in) wide by 600 mm (24 in) long with parallel sides, on the blade of the fork with the 100 mm (4 in) surface against the blade. Put a 600 mm (24 in) carpenter's square on the top of the block and against the shank. Check the fork 500 mm (20 in) above the metal block to make sure it is not bent more than 25 mm (1 in) maximum.

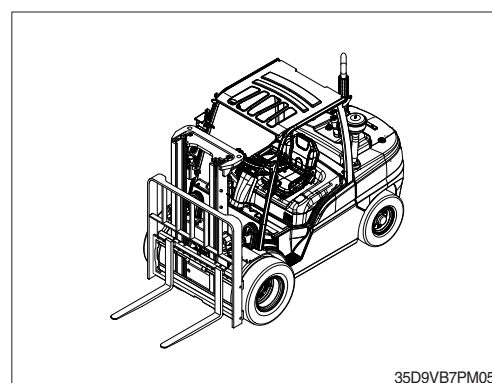


- ※ If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.

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.



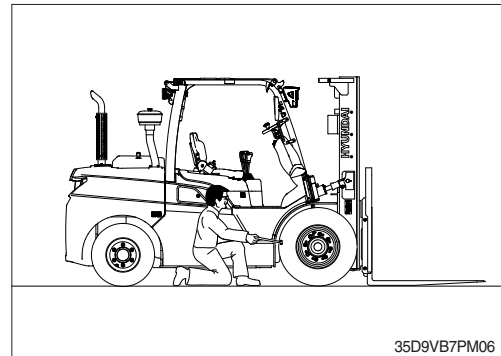
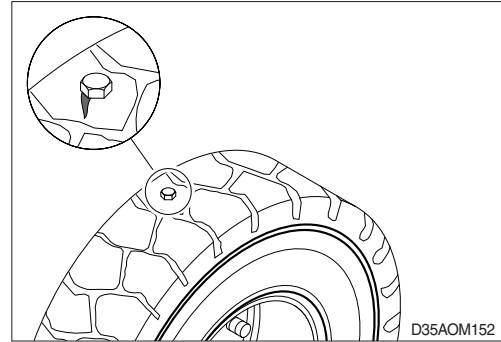


## 6) WHEEL AND TIRES

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 is 689 kpa (100 psi).

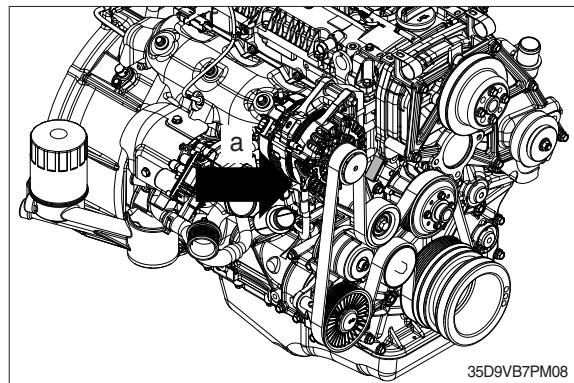


## 6. SERVICE INSTRUCTION

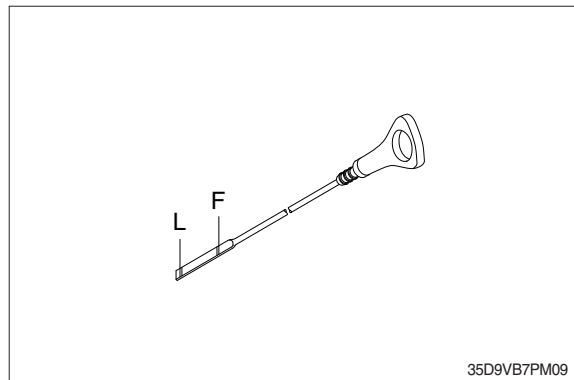
- ※ Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used oil contains potentially harmful contaminants which may cause skin cancer.
- ※ Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner, to remove any used oil. Do not use gasoline, thinners, or solvents.
- ※ Be careful not to contaminate near parts when replacing oil.
- ※ In order to preserve the environment, used oil and used oil filter must be disposed of only at designated disposal sites.

### 1) CHECK OF ENGINE OIL LEVEL

- (1) After engine warm up stop the engine wait 10 minutes then check the oil level.
  - (2) Remove the dipstick (a), wipe it clean and reinstall it.
  - (3) Take the dipstick (a) out again, and check the oil level is between the "F" and "L" mark.
  - (4) If the level is too low, add oil up to the "F" mark.
- ※ Don't fill with engine oil above the "F" mark.
  - ※ Check the oil deterioration, entry of water discoloring of thinning. If the quality is visibly poor, change the oil.



a Dipstick

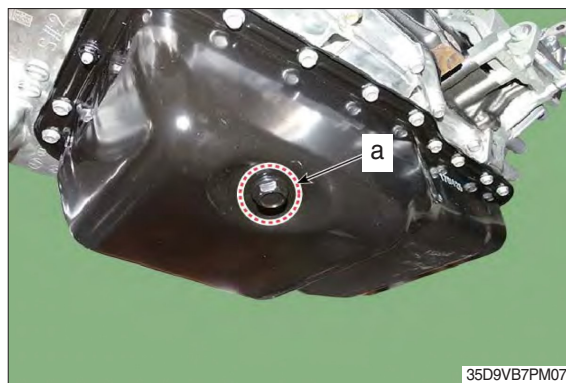


## 2) CHANGE OF ENGINE OIL

**▲ Make sure that you stop the engine before you change the engine oil.**

- (1) Remove the oil filler cap, the oil drain plug (a) and drain oil.
- (2) Replace the oil filter and install the drain plug (a) with the new drain plug gasket.
  - Torque : 3.5~4.5 kgf·m (25.3~32.5 lb·ft)
- (4) After removing the dipstick, fill the new oil.
- (5) Wipe the dipstick clean and install the oil filler cap and the dipstick.
- (6) Start engine and check for oil leaks.
- (7) Recheck the engine oil level.

- ※ Fill half amount of total oil first and then do the rest after 1 minute or more.
- ※ Do not over fill. This will cause oil aeration and loss of oil pressure.
- ※ Check the engine oil level after warming up the engine sufficiently. If warming up engine insufficiently, engine oil level may be checked below the specified value.



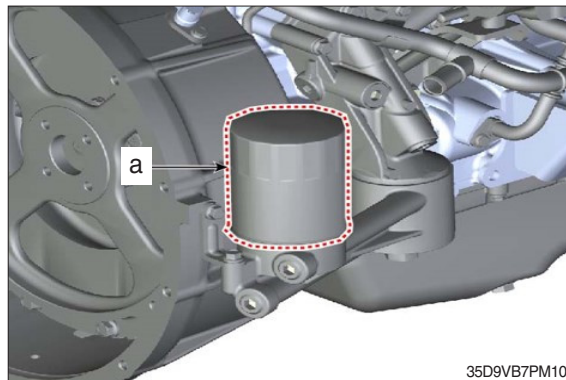
a Drain plug

## 3) REPLACEMENT OF OIL FILTER

**▲ Make sure that you stop the engine before you replace the oil filter cartridge.**

- (1) Remove the oil filter (a).
- (2) Install the new oil filter by hand. Do not tighten too much because it can cause deformation of the rubber gasket.
- (3) After you replace the oil filter, the engine oil usually decrease by a small level.
- (4) Make sure that the engine oil does not flow through the seal and read the oil level on the dipstick. Fill the engine oil until the specified level.

- ※ To prevent serious damage to the engine, replacement of the oil filter must be highly efficient. Use only a Hyundai genuine filter or its equivalent.
- ※ Wipe off any oil sticking to the truck completely.



a Oil filter

#### 4) CHECK COOLANT LEVEL

**⚠ Do not remove the radiator cap when the engine is hot.**

**Then loosen the cap slightly to release unwanted pressure before you remove the cap fully.**

- (1) Make sure that the coolant level is between Full A and Low B.
- (2) If the coolant level is too low, find out the cause that there is less coolant.

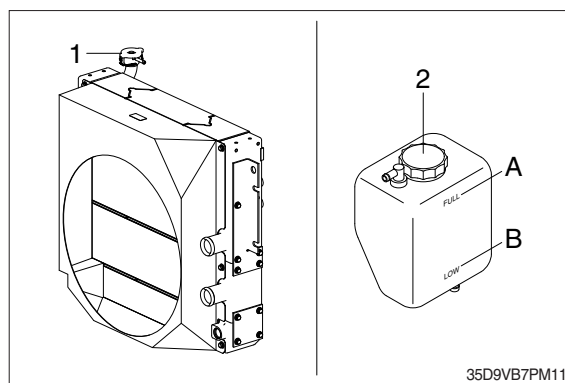
##### Case 1

If the coolant decreases by evaporation, add only clean and soft water.

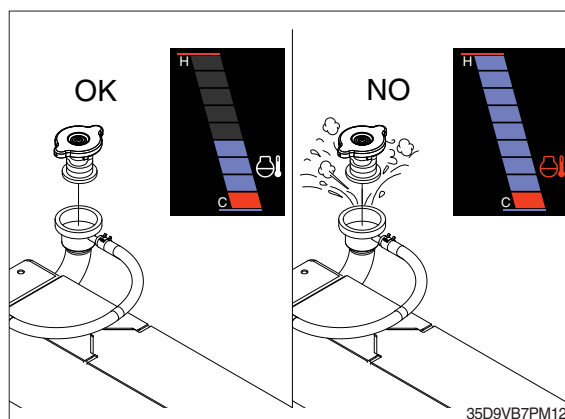
##### Case 2

If the coolant decreases by leak, add coolant of the same manufacturer and brand in the specified mixture ratio (clean, soft water and L.L.C.). If you cannot identify the coolant brand, drain all the remaining coolant and add a new brand of coolant mix.

- ※ **When you add the coolant, release the air from the engine coolant channels. The engine releases the air when it shakes the radiator upper and lower hoses.**
- Make sure that you close the radiator cap correctly. If the cap is loose or incorrectly closed, coolant can flow out and the engine can overheat.**
- Do not use an anti-freeze and scale inhibitor at the same time.**
- Do not mix the different type or brand of L.L.C..**



1	Radiator tank cap	A	Full
2	Reservoir tank	B	Low



## 5) 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.

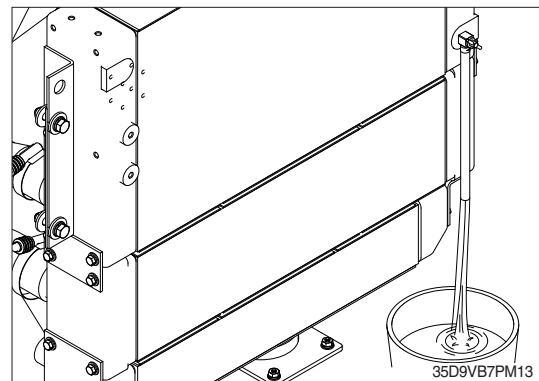
If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.

- ▲ 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.

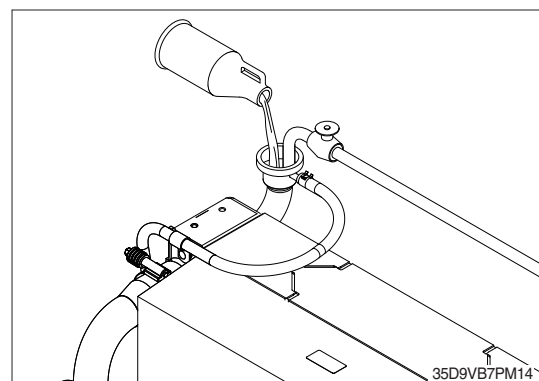


### (2) Flushing of cooling system

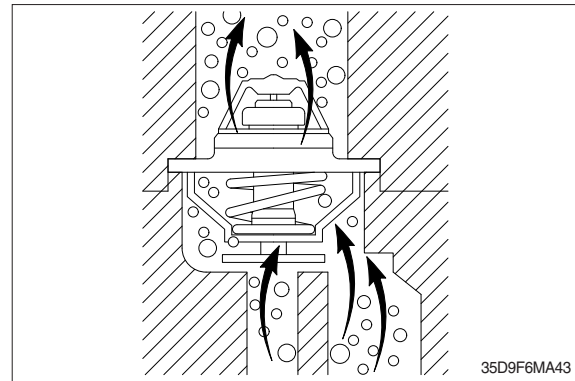
- ① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

- ※ Use 0.5 kg (1.0 lb) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.

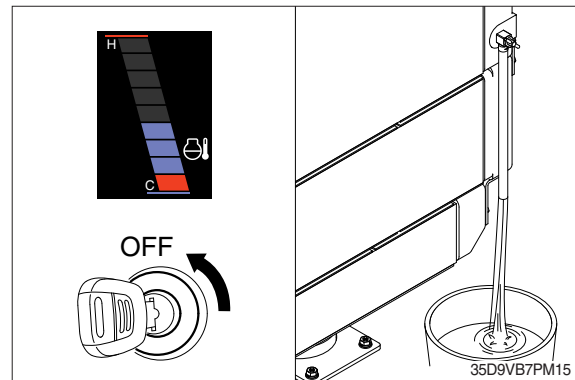
- ※ Do not install the radiator tank cap. The engine is to be operated without the cap for this process.



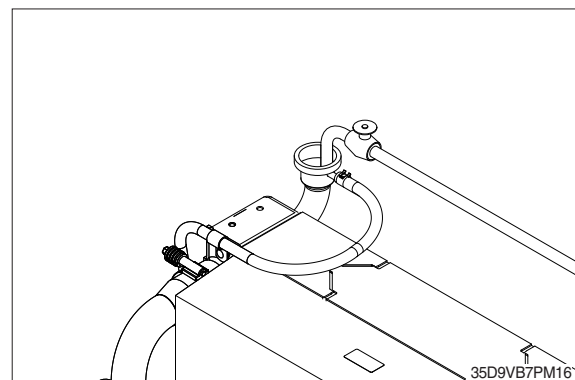
- ※ During filling, air must be vented from the engine coolant passages.  
The system must be filled slowly to prevent air locks or serious engine damage can result. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



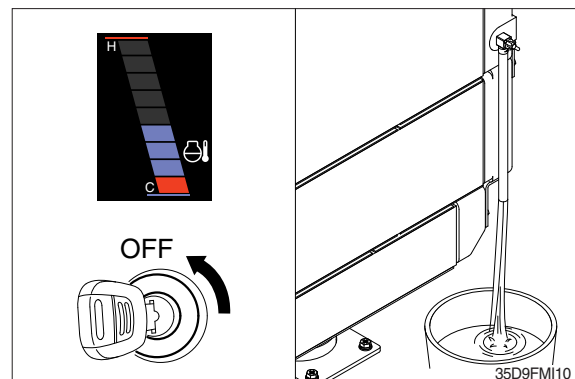
- ② Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F).  
Shut the engine off, and drain the cooling system.



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



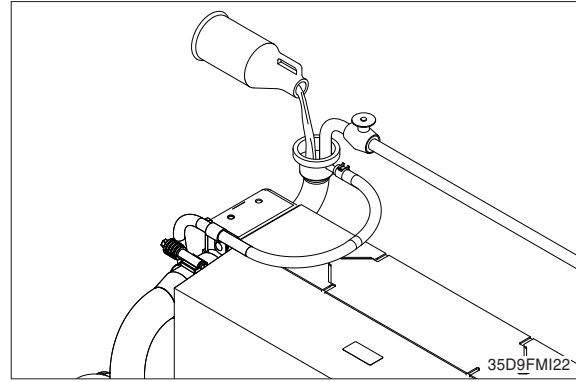
- ④ Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F).  
Shut the engine off, and drain the cooling system.
- ※ If the water being drained is still dirty, the system must be flushed again until the water is clean.



### (3) Cooling system filling

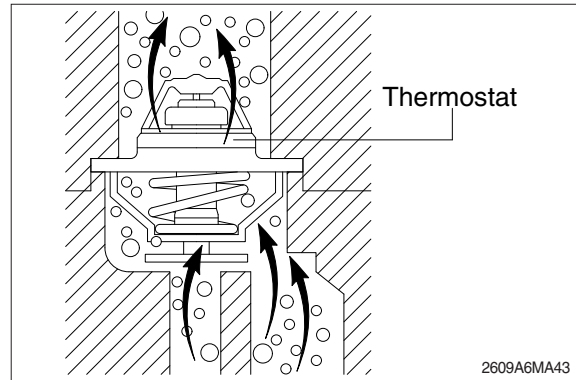
- ① Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 7-53.

- ※ **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.**

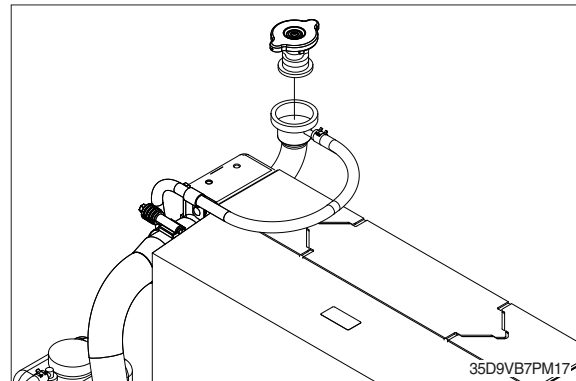


- ② The system has a maximum fill rate of 12.5 liters (3.3 U.S. gallons) per minute. Do not exceed this fill rate.

- ※ **The system must be filled slowly to prevent air locks.**  
**During filling, air must be vented from the engine coolant passage.**



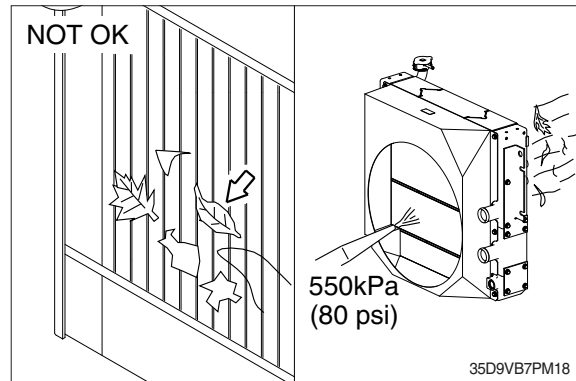
- ③ Install the pressure cap. Operate the engine until it reaches a temperature 80 °C (176 °F), and check for coolant leaks. Check the coolant level again to make sure the system is full of coolant.



### 6) 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.

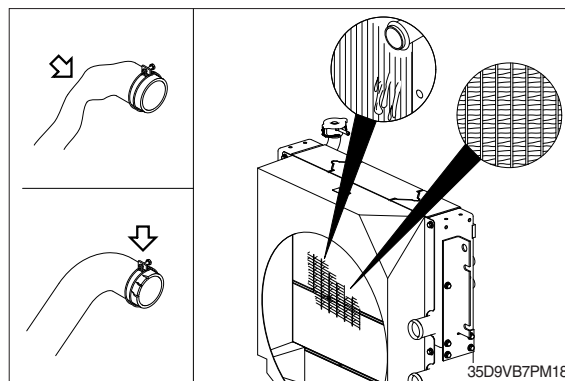




(3) Visually inspect the radiator for bent or broken fins.

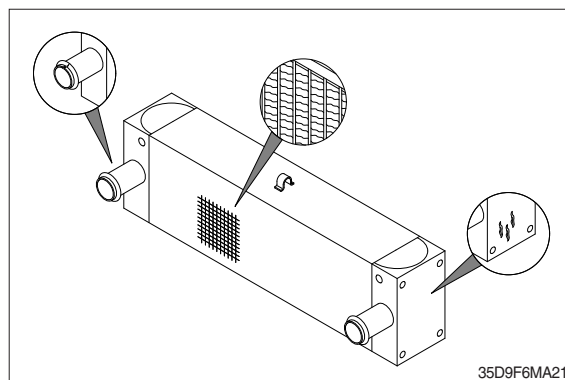
※ If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement procedures.

(4) Visually inspect the radiator for core leaks.



## 7) 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.



## 8) FAN BELT TENSION

(1) Stop the engine and remove the start switch.

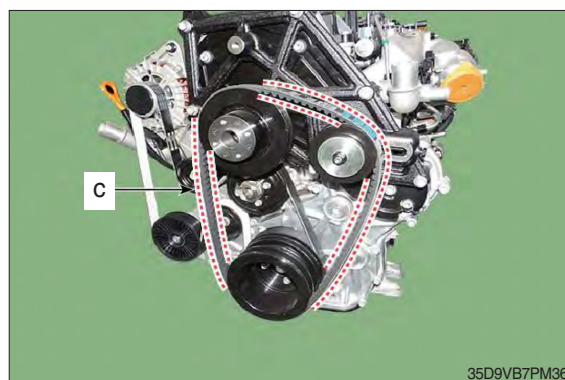
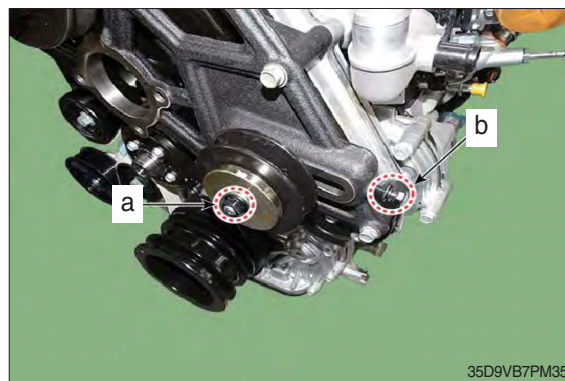
(2) Release the fan belt tensioner mounting nut (a). Then, adjust the tension of the fan belt by adjusting the fan belt adjustment bolt (b).

(3) Replace the fan belt (c) if it is damaged or stretched beyond the acceptable limits.

※ If belt is loosen or damaged and the fan is damaged, it could result in overheats or insufficient charging.

▲ If the belt is stretched beyond the adjustment allowance, or there are cuts or cracks, replace the V-belt.

- Specification (under load of 10 kgf (22 lbf))  
C : 12~16 mm (0.47~0.63 in)

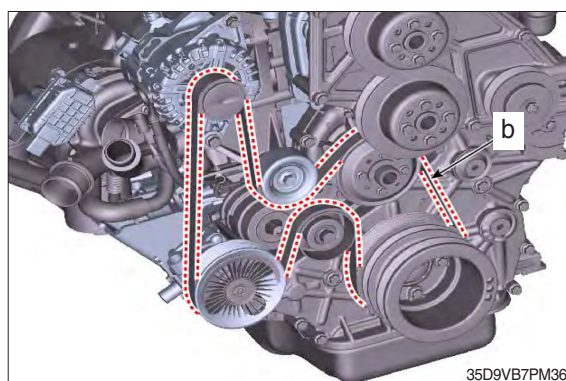
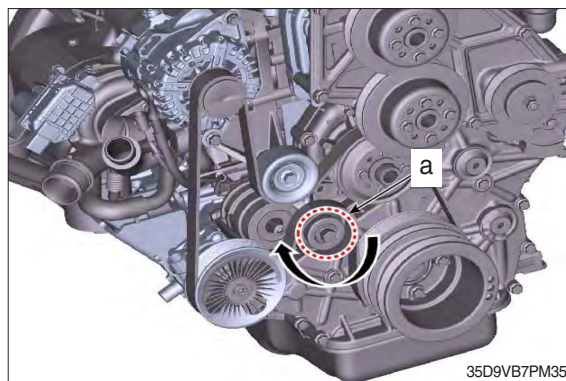




## 9) DRIVE BELT TENSION

- (1) Stop the engine and remove the start switch.
- (2) Turn the auto tensioner pulley (a) clockwise to install the lock-pin. Then, adjust the tension of the drive belt by turning the auto tensioner pulley (a).
- (3) Replace the drive belt (b) if it is damaged or stretched beyond the acceptable limits.

※ If belt is loosen or damaged and the fan is damaged, it could result in overheats or insufficient charging.  
Correct or replace belt.



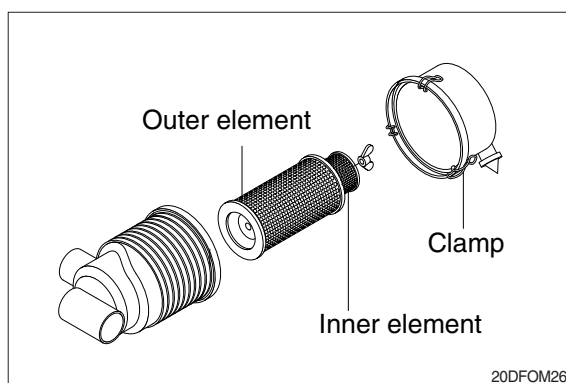
## 10) AIR CLEANER ELEMENT

### (1) Removal

#### ① Double element type

Remove the cover by pulling off the clamps, and loosen the wing nut to pull out the outer element.

※ During periodic service, replace only the outer element. Do not replace the inner element unless damaged.



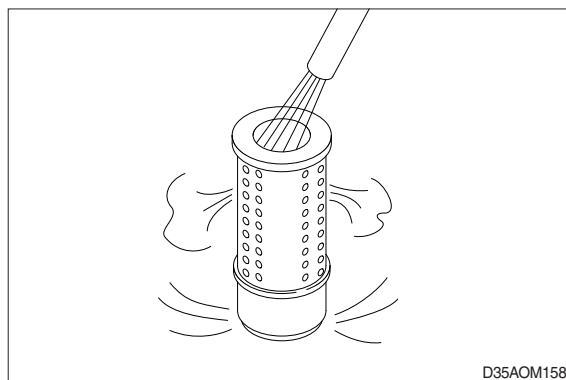
### (2) Cleaning

#### ① Cleaning with compressed air

Blow dry compressed air (Max 30 psi) from inside along pleats. Next blow air from outside along pleats, then blow from inside again and check element.

#### ② Cleaning with cleaning agent

If there is grease or carbon on the element, use a special element cleaner, following the instruction given with the cleaner. Have a spare element ready so that the truck can start working again immediately.



- ※ Keep clean condition for the air cleaner element all the times.

A dirty air cleaner could be decreased output power of the engine at worst and it also will be caused to increase fuel consumption and black smoke.

### (3) Installation

When installing the element, check that the cleaner housing and element cover are completely in close contact then tighten the nut.

- ※ Make sure that vacuum valve is securely installed. If it is loosely installed, dust will be drawn in and air cleaner will fail to function properly.

▲ When using compressed air, use safety glasses, face shield and other protective clothes. Never point the air nozzle at anyone. Never clean or replace air cleaner while engine is running.

▲ OSHA approved eye protection rated for 200 kPa (30 psi) is required for air cleaning operation.

Replace element if exhaust is black, or if lack of engine power is noted even after cleaning or element. When cleaning the element or element housing, cover the air flow outlet port of the housing with a clean cloth or tape to prevent dirt or dust from entering. Do not clean the elements by bumping or tapping them.

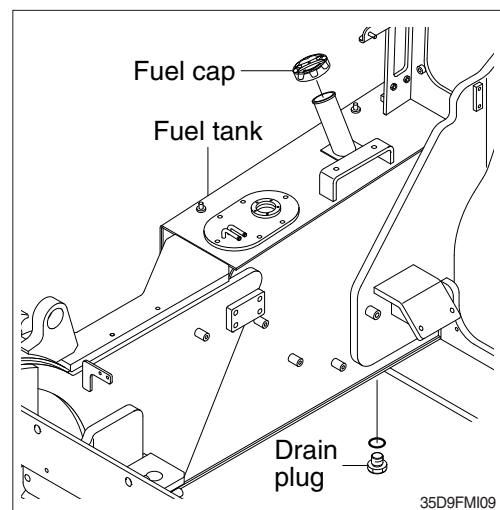
## 11) FUEL TANK

(1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the truck.

(2) Drain the water and sediment in the fuel tank by opening the drain plug.

- ※ 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.

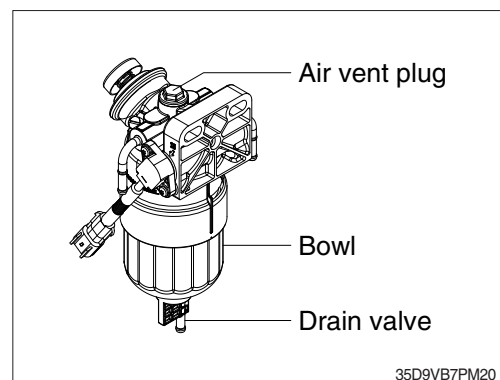


## 12) WATER SEPARATOR

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

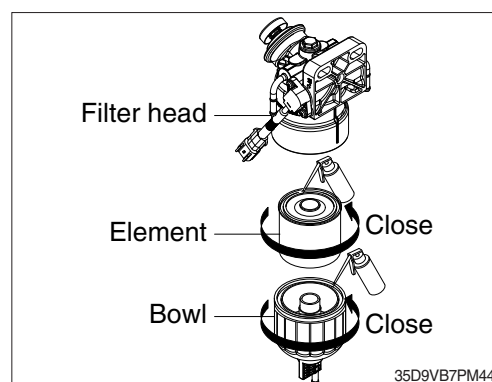
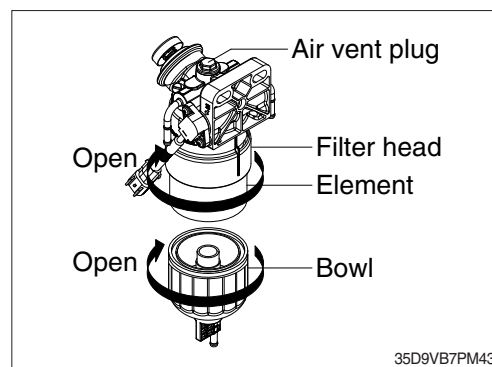
### (1) Drain water

- 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.
  - ※ When the floater in bowl float, drain water.



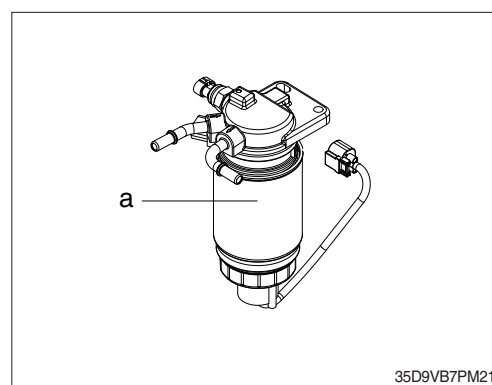
## (2) Replace element

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



## 13) REPLACEMENT OF FUEL FILTER

- (1) Remove the fuel filter cartridge (a) with a filter 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.

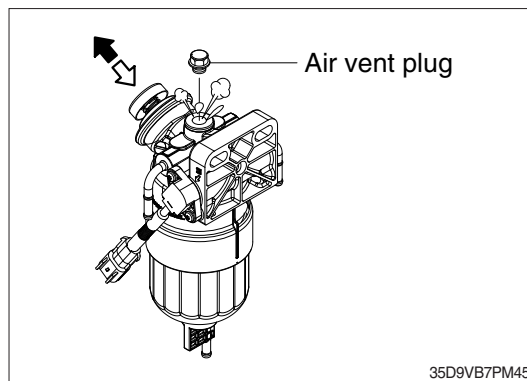


a Fuel filter cartridge

#### 14) BLEEDING THE FUEL SYSTEM

- (1) Loosen air vent plug at the outlet of water separator.
- (2) Do hand-priming the lift pump repeatedly until air bubbles comes out from air vent plug hole completely.
- (3) Tighten air vent plug 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.**

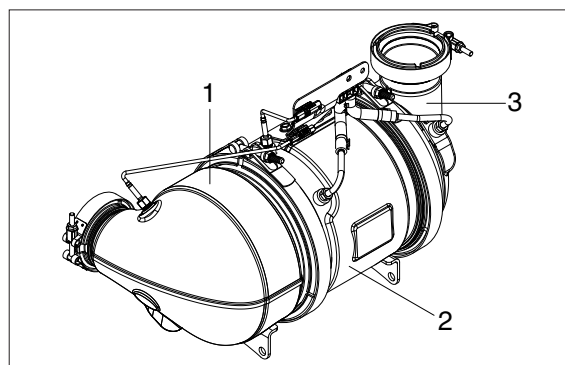


#### 15) DPF (DIESEL PARTICULATE FILTER) CLEANING

The diesel particulate filter can not be cleaned for maintenance purpose using conventional tools.

The diesel particulate filter needs to be cleaned and checked using an approved cleaning machine at a authorized service center.

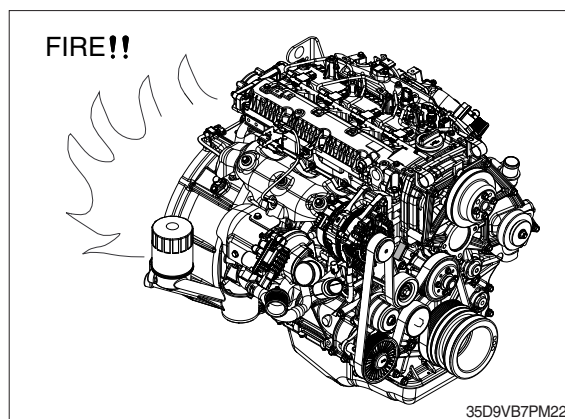
- ※ **The diesel particulate filter shall be cleaned every 3000 hours.**
- ※ **Please contact your Hyundai service center or local dealer.**



- 1 Catalyst (DOC) ASSY
- 2 DPF ASSY COVER
- 3 DPF ASSY

#### 16) LEAKAGE OF FUEL

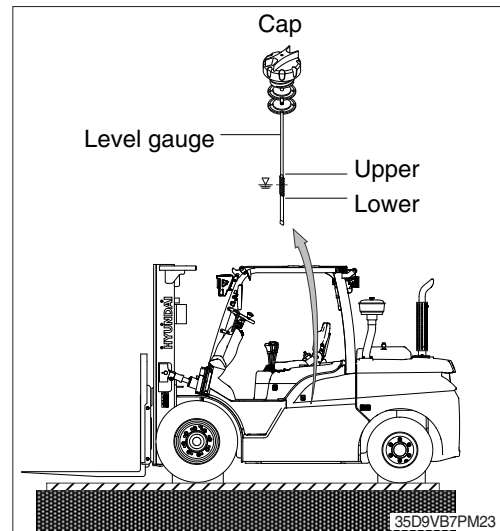
**▲ Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.**



## 17) HYDRAULIC OIL CHECK

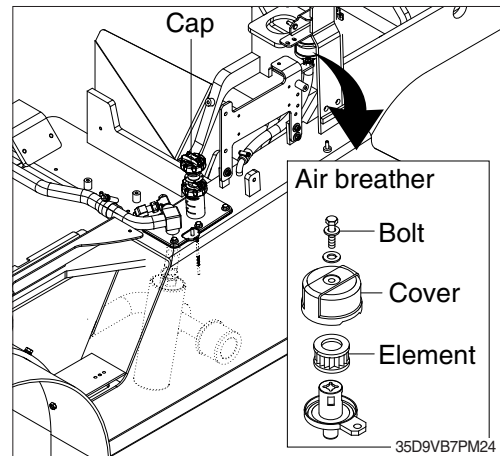
- (1) Lower the forks on the ground at a flat location as in the illustration.
- (2) Loosen the cap and check the oil level at the level gauge. The cap is located on the flange of the hydraulic oil tank.

※ Add hydraulic oil, if necessary.



## 18) FILLING HYDRAULIC OIL

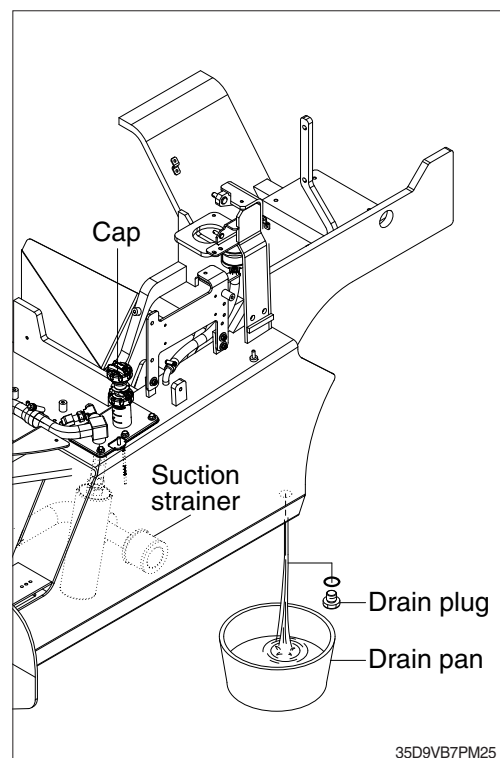
- (1) Stop the engine to the position of level check.
- (2) Check air breather filter element and replace it if necessary.
- (3) Loosen cap and fill the oil to the specified level.
- (4) Start engine after filling and operate the work equipment several times.
- (5) Check the oil level at the level check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



## 19) 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) Remove the suction strainer and clean it.
- (7) Fill proper amount of recommended oil.
- (8) 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.

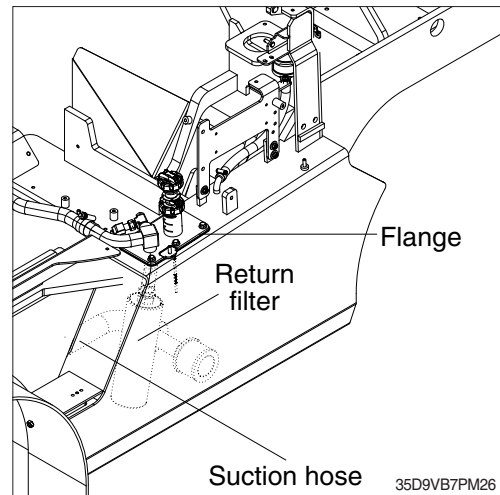




## 20) CLEANING AND REPLACING RETURN FILTER

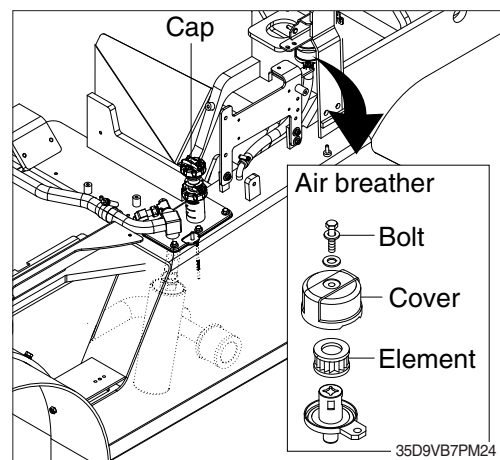
Clean and replace the return filter in the following manner.

- (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 flange on the tank.
  - Tightening torque : 2.5~3.0 kgf · m  
(18.0~21.6 lbf · ft)



## 21) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

- (1) Loosen the cap and relieve the pressure in the tank.
- (2) Loosen the bolt 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 : 1.5~2 kgf · m  
(10.8~14.4 lbf · ft)

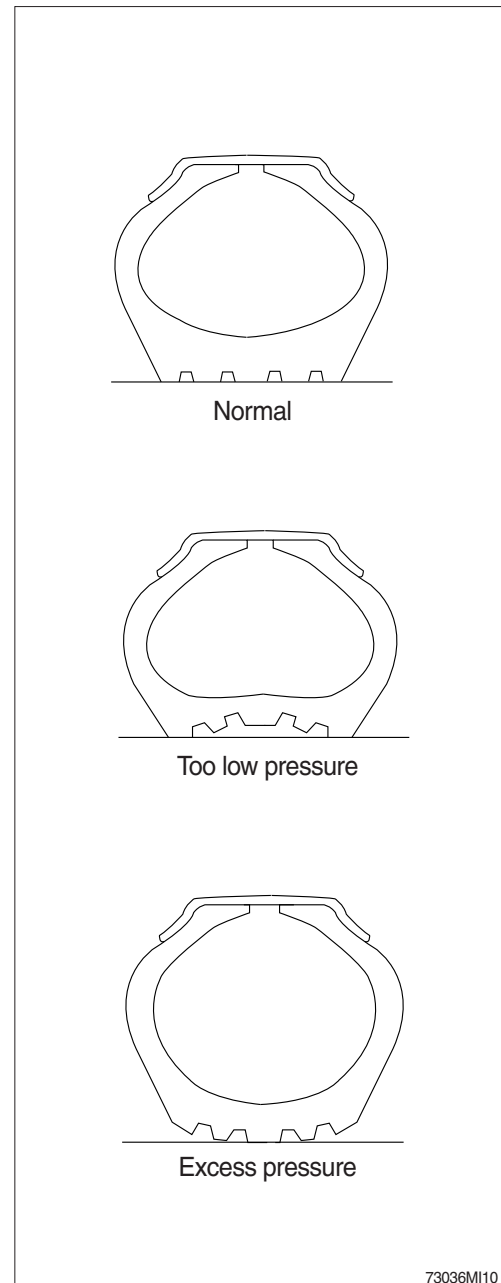


## 22) TIRE PRESSURE

- (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)

Item	Pressure
Front single	8.0 kgf/cm <sup>2</sup> (114 psi)
Front double	7.7 kgf/cm <sup>2</sup> (110 psi)
Rear	10 kgf/cm <sup>2</sup> (142 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.**



- ⚠ 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.

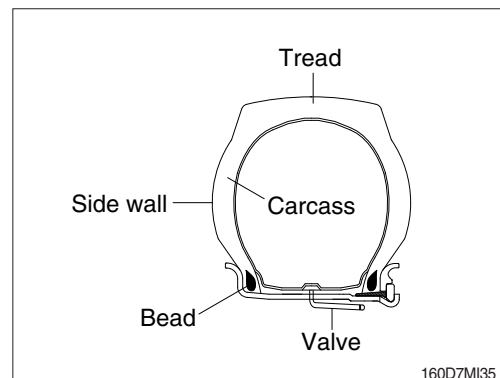
- ① Rubbing tires against road bank or rack at cargo-unloading spot.
- ② Tires slippage during working.
- ③ Abrupt starting of the truck.
- ④ When oil, grease or gasoline smeared on tire, clean those. Otherwise it may cause of permanent deformation.

## 23) REPLACEMENT OF TIRE

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

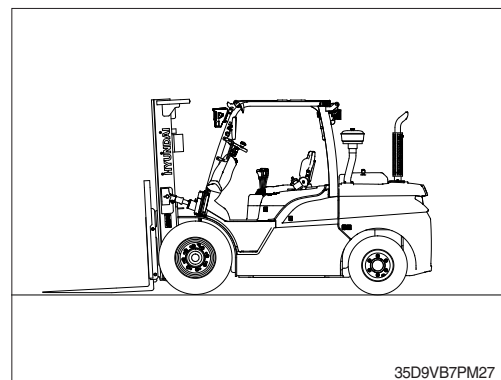
### (1) Tires to be replaced

- 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.



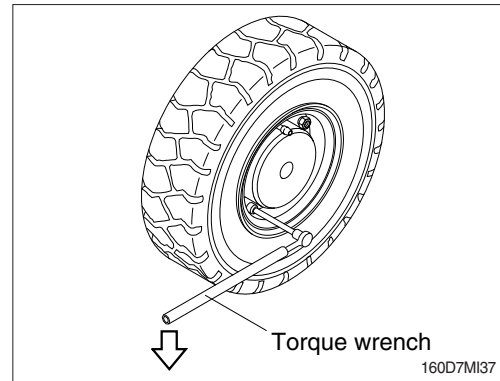
### (2) Separation of tire

- ① After moving the truck to flat ground, lower the fork to the ground and put the parking brake switch to LOCK position.



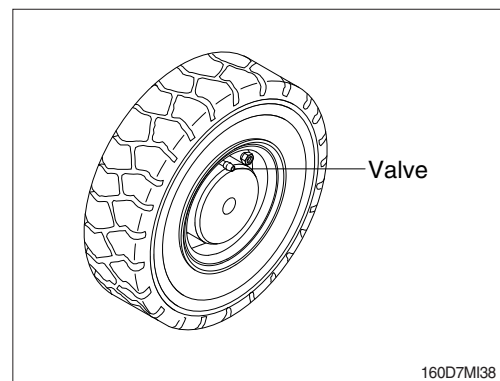


- ② Loosen slightly all wheel mounting.
  - Tools : Socket 36 mm
  - Torque wrench
  - Extension bar
- ③ Lift the truck with a jack.
- ④ Loosen all wheel mounting nuts and replace the tire.



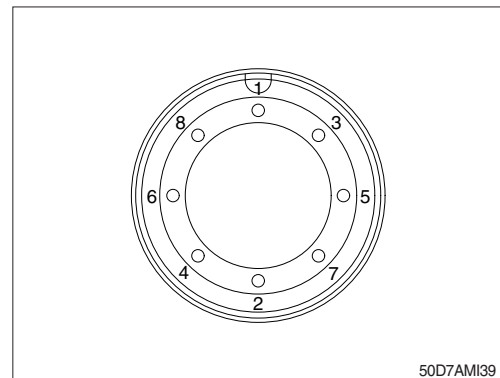
### (3) Direction of tire to be installed

- 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 : 62.0 kgf · m (448 lbf · ft)

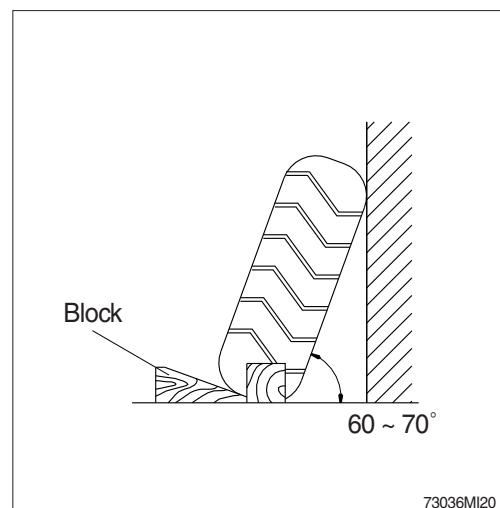


## 24) STORING TIRES AFTER REMOVAL

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.



## 25) TRANSMISSION

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

### (1) Prepare

- ① Park the truck in a level place and lower the forks.
- ② Apply the parking brake.
- ③ Place the gear selector lever in neutral position.

### (2) Oil level check

- ① Run the engine at low idling speed.
- ② Pull out the dipstick and check the oil level.
- ③ Add oil through oil dipstick hole if necessary.
- ④ Always check oil level using dipstick after add oil.

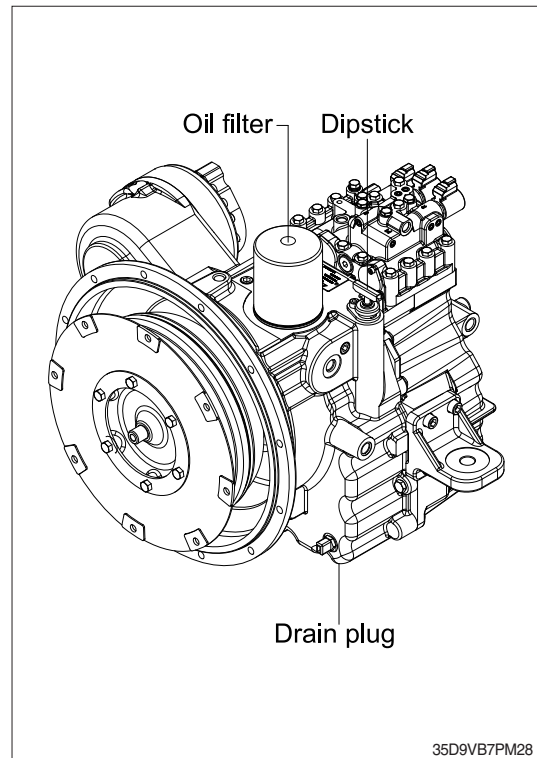
### (3) Change (oil and filter)

- ① Remove drain plug and drain the oil into a suitable container.
  - ※ **When changing oil, remove screen and clean it with flushing oil.**
- ② Remove the filter cartridge.  
Dispose of the used oil filter cartridge properly.
- ③ Apply a light coat of oil to the gasket of a new oil filter cartridge.
- ④ Install the new 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.
- ⑤ Mount the drain plug of the transmission after cleaning it.
- ⑥ Fill the oil through the dipstick hole and check if the oil is at the appropriate level.
- ⑦ The proper oil amount is 17 or 18.5 liters (4.5 or 4.9 U.S. gallons).
- ⑧ Bleed air of service brake after turning on the ignition.

※ It is imperative to pay attention to absolute cleanliness of oil and filter.

▲ OSHA approved eye protection rated for 200 kPa (30 psi) is required for air cleaning operation.

※ Dispose of used oil in locally approved manner.



## 26) DIFFERENTIAL CASE

### (1) Prepare

- ① Park the truck in a level place.
- ② Set the mast vertical, and raise the forks approx. 1m.
- ③ Put blocks under the fork carriage.
- ④ Stop the engine and apply the parking brake.

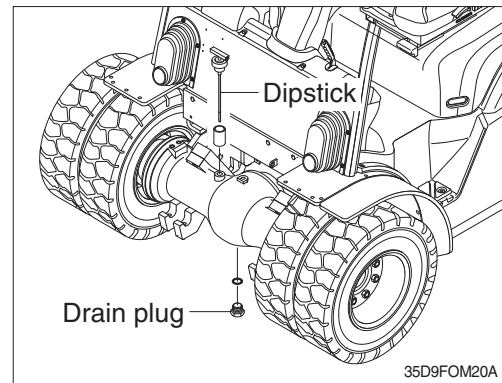
### (2) Oil level check

- ① Pull out the dipstick and check that the oil level is between the normal range.
- ② If necessary, add oil through the dipstick hole and check if the oil is at the appropriate level.

### (3) Change

- ① Remove drain plug and drain the oil into a suitable container.
- ② Mount the drain plug after cleaning it.
- ③ Fill the axle oil with a clean oil to the proper level.
  - Quantity : 13 ℓ (3.4 U.S.gallons)

※ **Dispose of used oil in locally approved manner.**



## 27) LUBRICATION

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

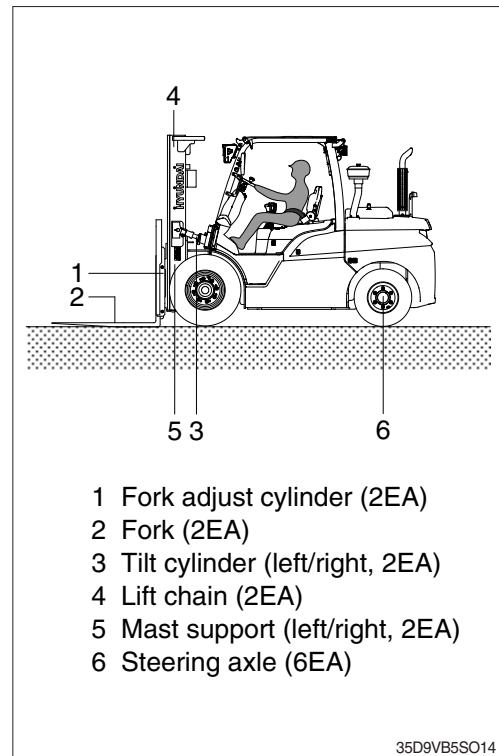
(2) After lubricating, clean off spilled grease.

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

**▲ Set the mast and forks in a stable position.**

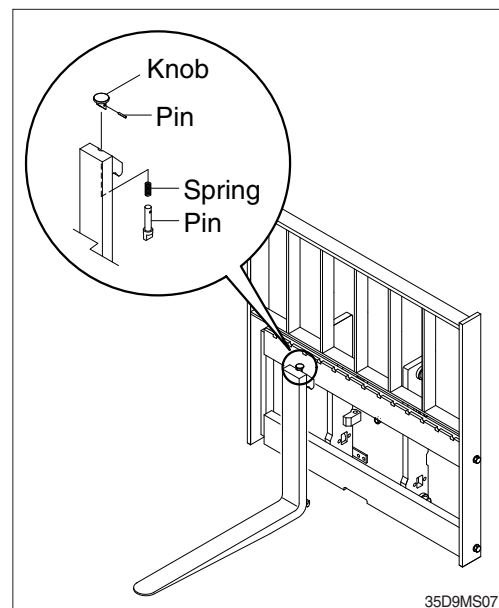
### (3) Lubrication points

- ① Fork 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



## 28) FORKS REPLACEMENT

- ① Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.
- ② Turn knob up and slide one fork at a time toward the center of the carriage where a notch has been cut in the bottom plate for easy removal.
- 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.



## 29) 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

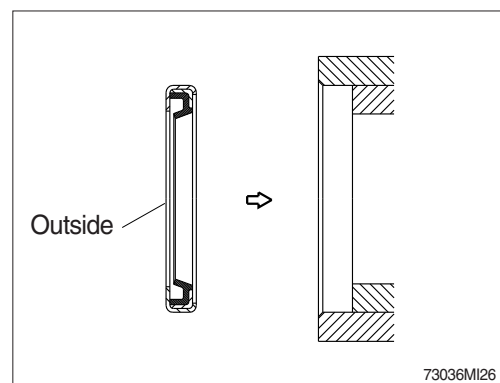
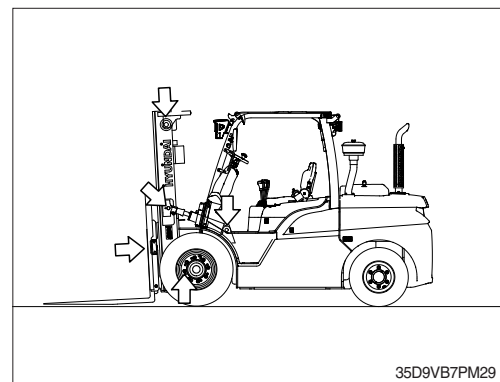
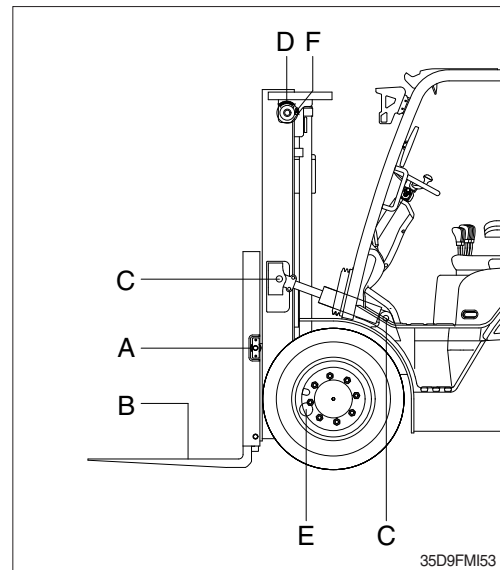
※ **Shorten lubricating interval when working in the water or dusty place.**

- (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.**

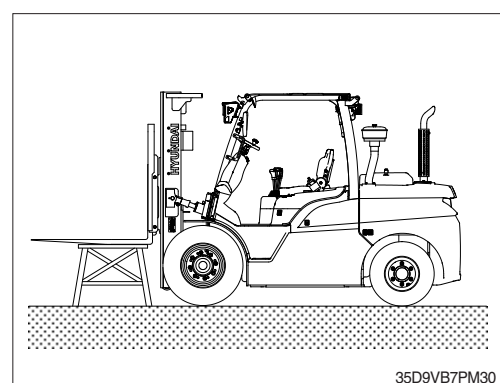
- (4) Dust seal are mounted on the rotating part of working device to extend the lubricating interval.

- ※ **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.**



## 30) WORK EQUIPMENT SUPPORT

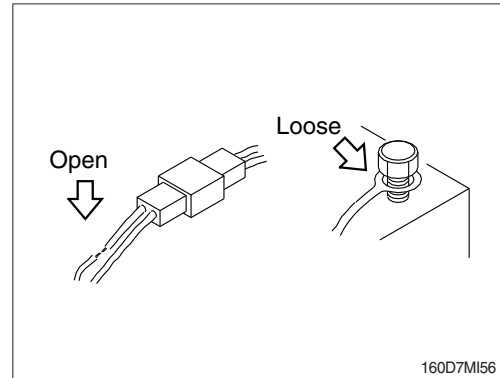
When carrying out inspection and maintenance with the forks raised, fit a stand under the forks securely to prevent the work equipment from coming down. In addition, set the work equipment control levers to the hold position.



## 7. ELECTRICAL SYSTEM

### 1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



### 2) WELDING REPAIR

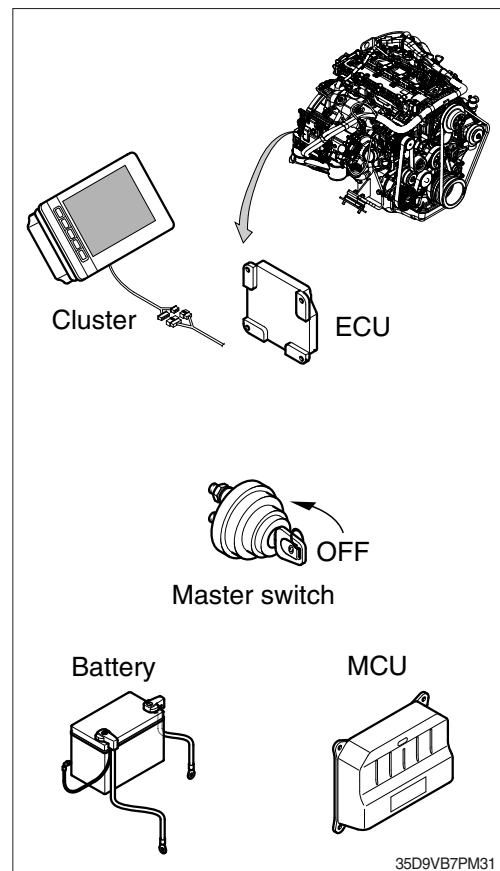
Before start to welding, follow the below procedure.

- (1) Shut off the engine and remove the start switch.
- (2) Disconnect ground cable from battery by master switch.
- (3) Before carrying out any electric welding on the truck, the battery cables should be disconnected and the connectors pulled out of the electronic control units (MCU, ECU, 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.



## 8. AIR CONDITIONER AND HEATER

### 1) 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.

### 2) CHECK DURING SEASON

Ask the service center for replenishment of refrigerant or other maintenance service so that the cooling performance is not damaged.

### 3) 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.

### 4) REFRIGERANT

#### (1) Equipment contains fluorinated greenhouse gas.

Type	Quantity	GWP
HFC-134a	0.55 kg (1.21 lb)	787 CO <sub>2</sub> 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 (CO<sub>2</sub>). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO<sub>2</sub>.

#### (2) Envior

The air conditioning system of the machine is filled with HFC-134a refrigerant at the factory. HFC-134a refrigerant is a flourinated 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 preform 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.

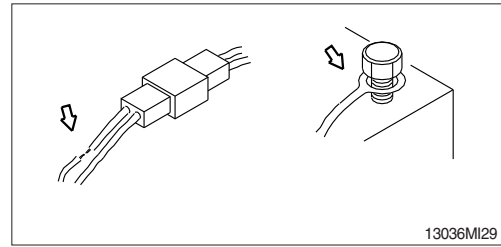
#### (4) Action in case of exposure

- 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.

## 9. REPLACEMENT AND CHECK

### 1) WIRING, GAUGES

Check regularly and repair the loose or malfunctioning gauges when found.



### 2) BATTERY

#### (1) Clean

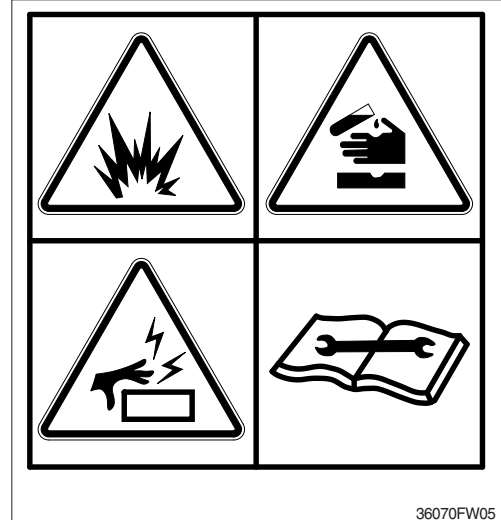
- ① Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

▲ 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.



#### (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

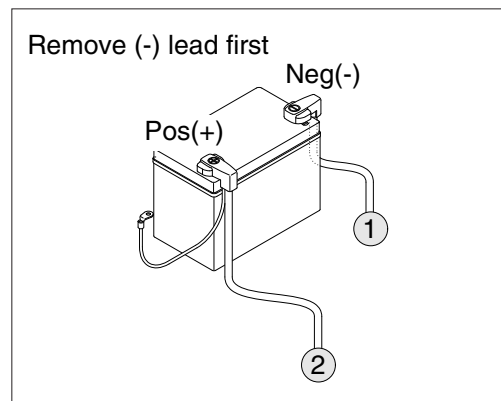
#### (3) Removing and installing

- 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

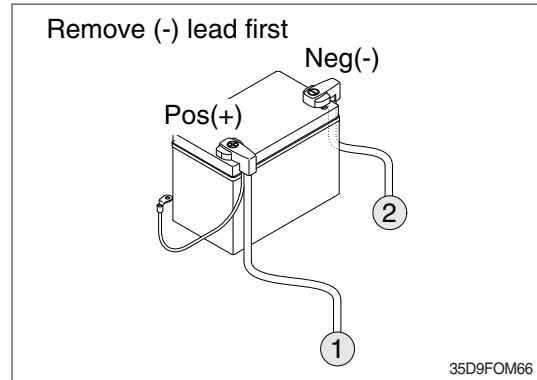
▲ Do not allow tools to touch the (+) terminal and the body of the truck at the same time. This can cause sparking and explosion.

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.





▲ 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) COOLING SYSTEM

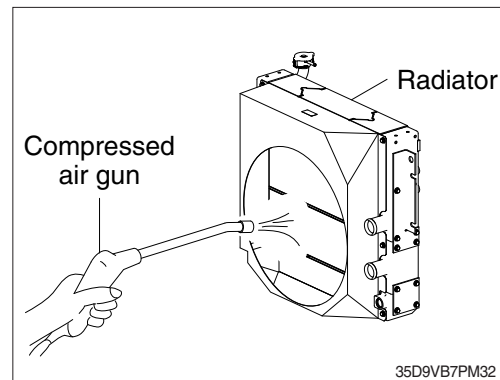
#### (1) Radiator fins cleaning

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/cm<sup>2</sup> (28 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.

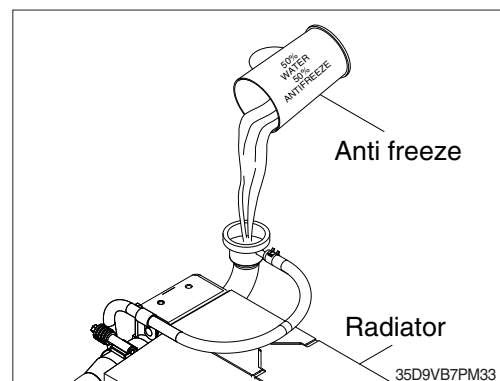
#### (2) Radiator cleaning

- 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.



#### 4) 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.

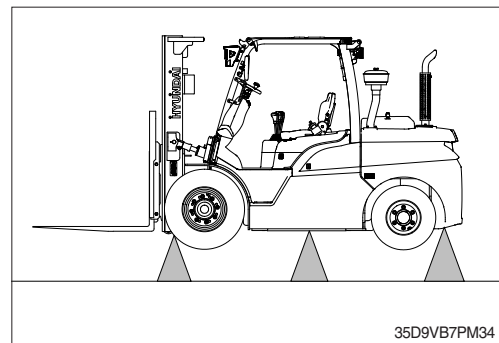
**※ Points to fit jack when jacking up**

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.**

## 5) FUSES REPLACEMENT

### 16 FUSE BOX COVER SILK 인쇄 사양 (P/NO: 2YFV-55010)

	ECU (B+)	ECU PERMANENT (B+)	FUEL HEATER	CLUSTER C/B (+)	FLASHER UNIT	HORN	AIRCON1 B(+)	AIRCON2 B(+)	FUEL PUMP (B+)	OHG/CABIN
	전원 제이기	전원 상시전원	인료 히터	클러스터	플래셔 유닛	장음기	에어컨1	에어컨2	인료펌프	OHG/캐빈
	30A	15A	30A	5A	5A	10A	20A	20A	20A	10A
	GEAR SELECTOR	HYD REGEN SOL	OPS SOLENOID	ECU (IG)	COMBI. SWITCH	FUEL HEATER	-	-	AIRCON	GLOW RELAY UNIT
	기어 선택	유압 제생 솔레노이드	운전제 착석 솔레노이드	전원 제이기	공비 스위치	인료 히터	-	-	에어컨	글로우 릴레이 유닛
	5A	5A	5A	10A	15A	30A	-	-	5A	5A
	CLUSTER C/FDCU (IG)	OHG/CABIN	BRAKE LAMP	SEAT HEATER	WORK/BEACON LAMP	PARKING	SIGNAL POWER	START RELAY	VGT POWER	-
	클러스터/FDCU	OHG/캐빈	브레이크 램프	열한 시트	작업등/광장등	주차	신호 전원	스타트 릴레이	가변형성터분리제전원	-
	10A	15A	5A	10A	10A	5A	5A	5A	20A	-

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### 17 RELAY BOX COVER SILK 인쇄 사양 (P/NO: 2YFV-55020)

	STARTER RELAY	SECRET START RELAY	FUEL PUMP RELAY	FUEL HEATER RELAY	-
	스타터 릴레이	비밀 시동 릴레이	인료 펌프 릴레이	인료 히터 릴레이	-
	CR-23	CR-5	CR-55	CR-49	-
	ECU B+ RELAY	AUTO PARKING RELAY	BRAKE RELAY	HYD AUTO REGEN RELAY	-
	전원 제이기 릴레이	자동 램프 릴레이	장지동 릴레이	유압 자동 제생 릴레이	-
	CR-43	CR-34	CR-16	CR-71	-

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### 18 RELAY BOX COVER SILK 인쇄 사양 (P/NO: 2YFV-55030)

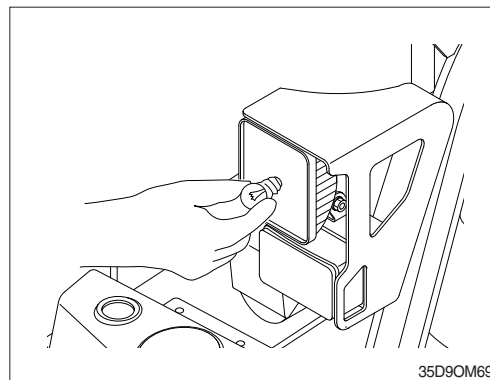
	HEAD LAMP RELAY	GEAR SHIFT RELAY 1	TAIL RELAY	GEAR SHIFT RELAY 2	-
	헤드 램프 릴레이	기어 전환장치 릴레이 1	테일 램프 릴레이	기어 전환장치 릴레이 2	-
	CR-13	CR-57	CR-40	CR-58	-
	TRAVEL CUT RELAY	ATTACH CUT RELAY	BRAKE LAMP RELAY	-	-
	주행 차단 릴레이	주행 차단 릴레이	장지동 릴레이	-	-
	CR-50	CR-51	CR-80	-	-

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- ① Turn the starting switch OFF.
  - ② Open the cover of the fuse box or relay box, and replace fuses or relays inside (to open the cover of the fuse box or relay box, push the side of the cover lightly with a finger, and pull the cover forward to remove it.)
- ▲ When replacing the fuse or relay, check the relationship between the fuse or relay and the electrical components it protects. Always replace fuses or relays with a same capacity. Always turn the start switch OFF before replacing any fuse or relay.

## 7) LAMP BULBS REPLACEMENT

Lamp	Spec (12V)
Head lamp	55 W
Turn signal lamp	LED
Clearance lamp	LED
Stop lamp	LED
Backup lamp	LED
License lamp (option)	3.4 W
Beacon lamp (option)	LED
Rear work lamp	55 W



**▲ 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:

- Put the parking brake lever (switch) is LOCK position.
- Put the gear selector lever 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 gear selector lever 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.

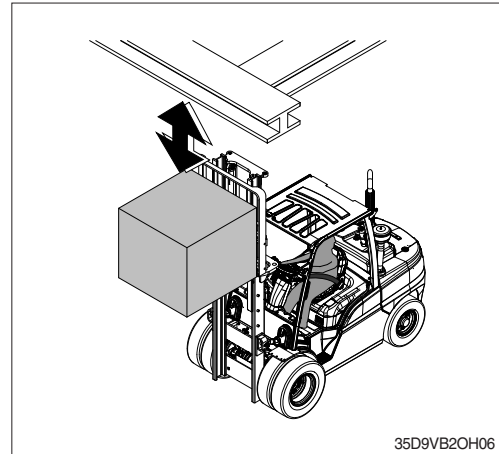
**⚠ Be sure that there is adequate overhead clearance before raising the mast.**

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 gear selector 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 gear selector 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 gear selector lever in FORWARD. Press the inching pedal fully down and hold. Depress the accelerator pedal. The truck should not move. Now, with the accelerator pedal 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 bonnet 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 cleaner warning lamp.

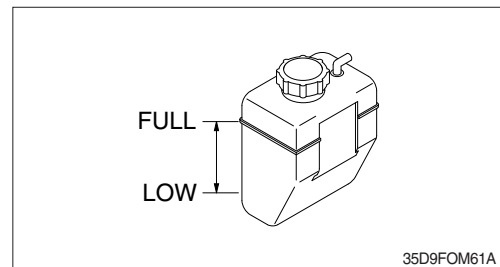
## (3) Battery

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.
- 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, check the engine oil condition regularly.**

**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 ACEA service classification ACEA C2/C3 or better (SAE 5W-30) for the diesel engines.

- ※ Diesel fuel containing much sulfur will deteriorate engine oil sooner, and it requires earlier replacement of engine oil with new one. Accordingly, it is recommended to use fuel oil with cetane number of 45 or more of well-known maker's products or reference to the appropriate EU or international standard in order to maintain performance of the emissions control system of engine.**
- ※ If the engine is to be operated within the Union on diesel or non-road gas-oil, a fuel with sulphur content not greater than 10 mg/kg (20 mg/kg at point of final distribution) and a FAME content not greater than 8 % v/v shall be used.**
- ※ Only use officially sold fuel. Using bad fuel can cause fatal damage to the engine.**
- ※ Cetane number greater than 50 is preferred, especially for temperatures below -20 °C (-4 °F) or elevations above 1500 m (5000 ft).**

## **(6) Hydraulic oil tank**

Check the hydraulic oil tank oil level. Correct oil level is important for proper system operation. Low oil level can cause pump damage. Over filling can cause loss of oil or lift system malfunction. Hydraulic oil expands as its temperature rises. Therefore, it is preferable to check the oil level at operating temperature (after approximately 30 minutes of truck operation). To check the oil 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 filter cap) 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 oil only, as required. **Do not overfill.**

Check the condition of the hydraulic oil (age, color or clarity, contamination). Change the oil as necessary.



**(7) Hydraulic oil and filter change**

Drain and change the hydraulic oil every 5000 operating hours. (Severe service or adverse conditions may require more frequent oil change). Replace the hydraulic return filter element at every oil change. Remove, clean, and reinstall the hydraulic suction line screens every 2000 hours. Check for leaks after installation of the filter. Also, check that the hydraulic line connections at the filter adapter are tightened correctly.

**(8) Hydraulic tank air breather maintenance and inspection**

Remove the air breather and inspect for excessive (obvious) contamination and damage. Replace the air breather, per recommended PM schedule or as required by operating conditions.

**(9) Transmission oil check**

To check the transmission oil 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 oil on the dipstick. Fill, if necessary, to the HOT zone on the dipstick, using the transmission oil recommended by HYUNDAI.

- ※ Check the planned maintenance interval (operating hours) or the condition of the oil to determine if the transmission oil 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 page 7-40 for additional information on truck blocking and jacking. Also refer to page 7-35 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/cm<sup>2</sup> (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
- Overhead guard or cabin
- Drive and steering wheel mounting
- Tilt cylinder mounting and yokes
- Counterweight mounting
- Mast mounting and components

## 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) 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

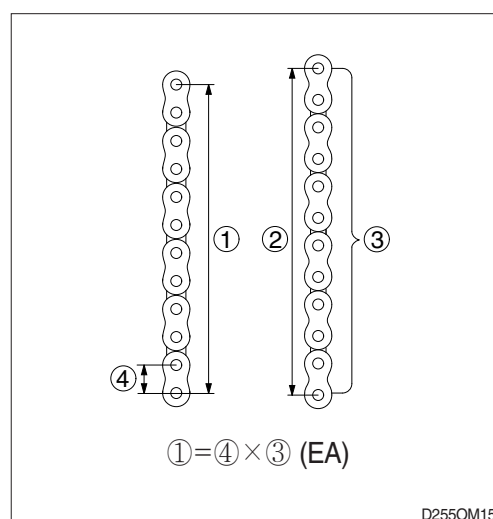
The number of pins in the length (segment) of chain to be measured.

### 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.



## 10. 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.

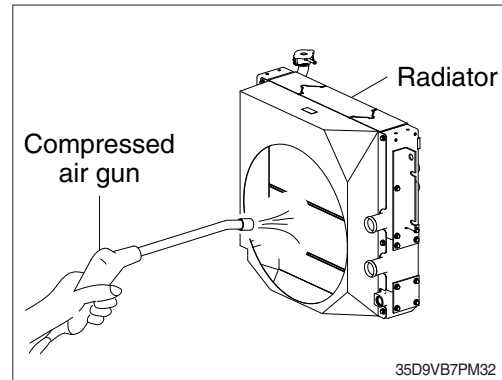
· Air pressure max : 2 kgf/cm<sup>2</sup> (28 psi)

- 3) Check the fan belt tension. If it is too slack, adjust the tension. (see page 7-22)

**4) In case of overheating, do not stop the engine immediately.**

- (1) Run the engine at low idling.
- (2) Open the bonnet 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.**



## 11. 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) Use a mixture of 50 percent soft water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 7-53.

**▲ Use ethylene glycol base antifreeze.**

**▲ Use soft water (city water, etc.) as mixing water.**

**▲ Cooling system must be thoroughly flushed before filling with antifreeze mixture.**

**▲ 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.**

## 12. RECOMMENDATION TABLE FOR LUBRICANTS

### 1) NEW TRUCK

New truck uses following fuel, coolant and lubricant.

Description	Specification
Engine oil	SAE 5W-30 (ACEA C2/C3)
Transmission oil	ATF DEXRON III
Axle oil	SHELL DONAX TD or Hyundai oilbank Xteer THF 75W-80
Hydraulic oil	ISO VG32/VG46/VG68, Hyundai genuine long life hydraulic oil ISO VG15, Conventional hydraulic oil★ <sup>1</sup>
Grease	Lithium base grease NLGI No.2
Fuel	ASTM D975-No.2 ★ <sup>2</sup> Ultra low sulfur diesel
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water

- SAE : Society of Automotive Engineers
- ISO : International Organization for Standardization
- NLGI : National Lubricating Grease Institute
- ACEA : European Automobile Manufacturers Association
- ASTM : American Society of Testing and Material

- ★<sup>1</sup> : Cold region  
Russia, CIS, Mongolia
- ★<sup>2</sup> Ultra low sulfur diesel  
- sulfur content ≤ 15 ppm

## 13. FUEL AND LUBRICANTS

Service point	Kind of fluid	Capacity ℓ (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	9.1 (2.4)	★SAE 5W-40									
			SAE 10W									
			SAE 10W-30									
			SAE 5W-30									
			SAE 15W-40									
							SAE 30					
Torque converter transmission	Transmission oil	17 (4.5)										
		18.5 (4.9) (35D-9V: #3~ 40D-9VB: #10~ 45D-9VB: #12~ 50DN-9VB: #39~)	ATF DEXRON III									
Axle	Gear oil	13 (3.4)		SHELL DONAX TD or HUYNDAI OILBANK XTEER THF 75W-80								
Hydraulic tank	Hydraulic oil	76 (20)	★ISO VG 15									
			ISO VG 32									
			ISO VG 46									
			ISO VG 68									
Fuel tank	Diesel fuel★ <sup>1</sup>	3.5/4.0 ton : 134 (35)	★ASTM D975 NO.1									
		4.5/5.0 ton : 139 (47)					ASTM D975 NO.2					
Fitting (Grease nipple)	Grease	-	★NLGI NO.1									
			NLGI NO.2									
Radiator	Antifreeze : Water	12.5 (3.3)	Ethylene glycol base permanent type ( 50:50)									
			★Ethylene glycol base permanent type (60 : 40)									

### NOTES :

- Engine oil should be ACEA classification C2/C3.
- Change the type of engine oil according to the ambient temperature.
- When using oil of different brands from the previous one, be sure to drain all the previous oil before adding the new engine oil.

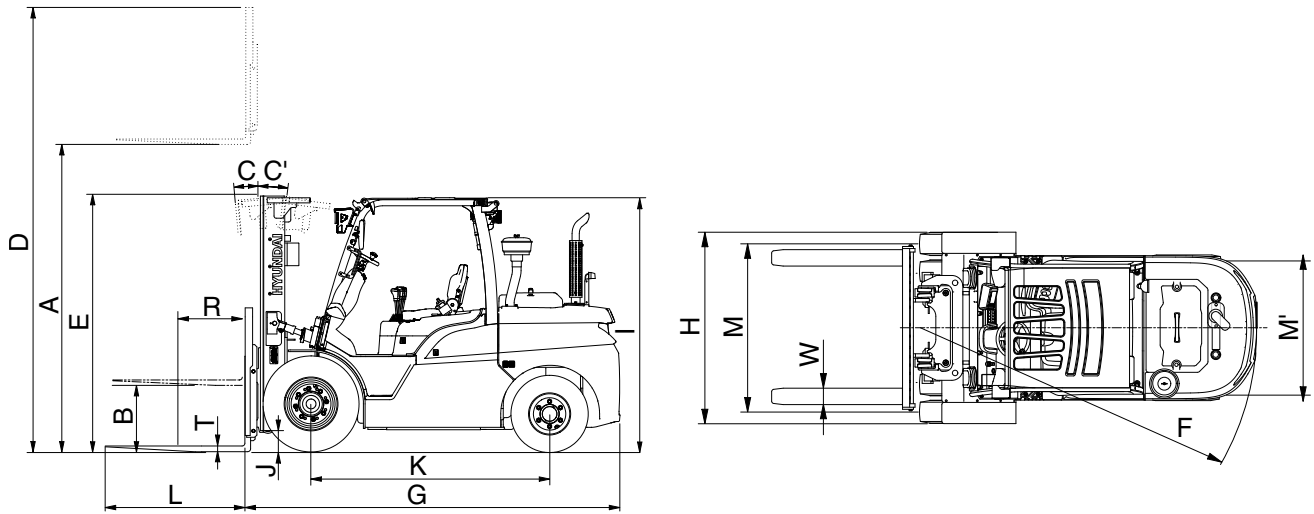
★<sup>1</sup> : Ultra low sulfur diesel  
- sulfur content ≤ 15 ppm

★ : Cold region  
Russia, CIS, Mongolia

## 8. SPECIFICATIONS

### 1. SPECIFICATION TABLE

#### 1) 35/40/45D-9VB, 50DN-9VB

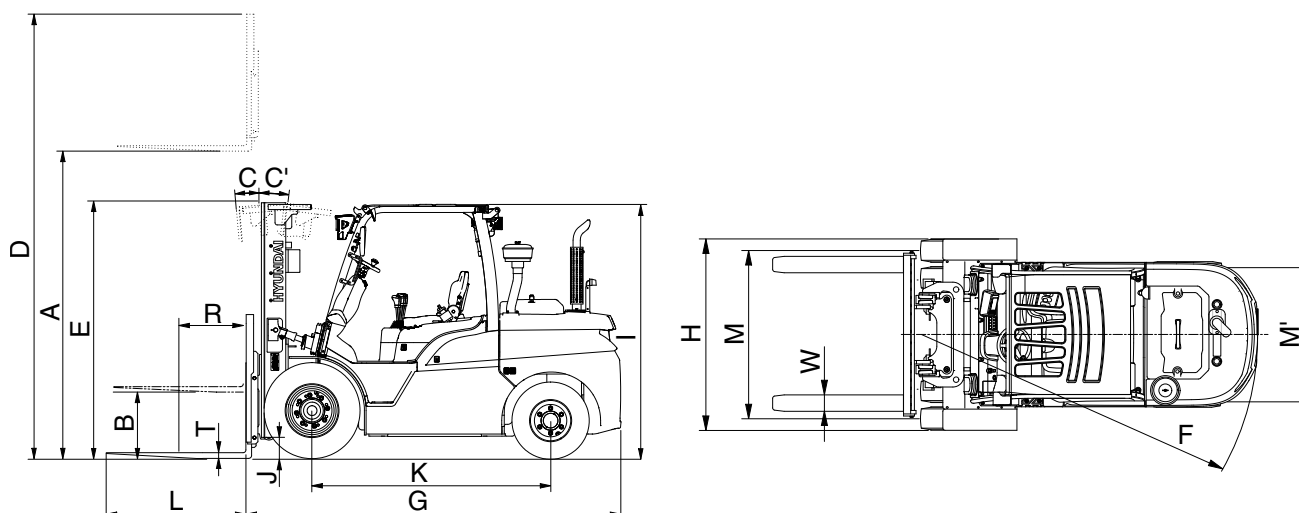


35D9VB8SP01

Model			Unit	35D-9VB	40D-9VB	45D-9VB	50DN-9VB
Capacity			kg (lb)	3500 (8000)	4000 (9000)	4500 (10000)	5000 (11000)
Load center		R	mm (in)	600 (24")	←	←	←
Weight (Unloaded)			kg (lb)	5851 (12899)	6405 (14121)	6860 (15124)	7264 (16014)
Fork	Lifting height	A	mm (ft. in)	3020 (9' 11")	←	←	2930 (9' 7")
	Free lift	B	mm (in)	120 (4.7")	←	←	←
	Lifting speed (Unload/Load)		mm/sec (ft/min)	540/520 (106/102)	540/510 (106/100)	←	460/410 (91/81)
	Lowering speed (Unload/Load)		mm/sec (ft/min)	550/550 (109/108)	←	←	500/550 99/109
	L × W × T	L,W,T	mm (in)	1070 × 122 × 50 (42 × 4.8 × 2)	1070 × 150 × 50 (42 × 5.9 × 2)	1220 × 150 × 50 (48 × 5.9 × 2)	1200 × 150 × 60 (47 × 5.9 × 2.4)
Mast	Tilt angle (forward/backward)	C/C'	degree	8/10	←	←	←
	Max height	D	mm (ft. in)	4234 (13' 11")	←	←	4147 (13' 7")
	Min height	E	mm (ft. in)	2235 (7' 4")	2220 (7' 3")	←	←
Body	Travel speed (Unload/Load)		km/h (mph)	29.2/26.8 (18.2/16.6)	28.4/26.5 (17.6/16.4)	28.2/26.1 (17.5/16.6)	28.1/25.8 (17.5/16.0)
	Max gradeability (Unload/Load)		%	25.1/44.5	24.1/39.2	23.4/35.4	22.3/32.6
	Min turning radius (Outside)	F	mm (ft. in)	2895 (9' 6")	2944 (9' 8")	3038 (10')	3081 (10' 1")
ETC	System set pressure		bar (psi)	210 (3050)	←	←	←
Length to face of forks		G	mm (ft. in)	3149 (10' 4")	3204 (10' 6")	3284 (10' 9")	3347 (11')
Overall width		H	mm (ft. in)	1370 (4' 6")	1746 (5' 9")	←	←
Overhead guard height		I	mm (ft. in)	2230 (7' 4")	2220 (7' 3")	←	←
Ground clearance		J	mm (in)	170 (6.7")	155 (6.1")	←	←
Wheel base		K	mm (ft. in)	2030 (6' 8")	←	2100 (6' 11")	←
Wheel tread front/rear		M/M'	mm (ft. in)	1132/1140 (3' 9"/3' 9")	1282/1140 (4' 2"/3' 9")	←	←
Max drawbar pull (Unload/Load)			kg (lb)	4223/4017 (9311/8856)	4218/4121 (9300/9086)	4221/4113 (9306/9068)	4226/4104 (9317/9048)



## 2) 40/45D-9VC, 50DN-9VC



35D9VB8SP01

Model		Unit	40D-9VC	45D-9VC	50D-9VC
Capacity		kg (lb)	4000 (9000)	4500 (10000)	4990 (11000)
Load center	R	mm (in)	500 (20")	←	←
Weight (Unloaded)		kg (lb)	5851 (12899)	6405 (14121)	6860 (15124)
Fork	Lifting height	A	mm (ft. in)	3020 (9' 11")	←
	Free lift	B	mm (in)	120 (4.7")	←
	Lifting speed (Unload/Load)		mm/sec (ft/min)	540/520 (106/102)	←
	Lowering speed (Unload/Load)		mm/sec (ft/min)	550/550 (109/108)	←
	L × W × T	L, W, T	mm (in)	1070 × 122 × 50 (42 × 4.8 × 2)	1220 × 150 × 50 (48 × 5.9 × 2)
Mast	Tilt angle (forward/backward)	C/C'	degree	8/10	←
	Max height	D	mm (ft. in)	4234 (13' 11")	←
	Min height	E	mm (ft. in)	2235 (7' 4")	←
Body	Travel speed (Unload/Load)		km/h (mph)	29.2/26.8 (18.2/16.6)	28.2/26.1 (17.5/16.6)
	Max gradeability (Unload/Load)		%	25.1/44.5	24.1/39.2
	Min turning radius (Outside)	F	mm (ft. in)	2895 (9' 6")	3038 (10')
ETC	System set pressure		bar (psi)	210 (3050)	←
Length to face of forks		G	mm (ft. in)	3149 (10' 4")	3284 (10' 9")
Overall width		H	mm (ft. in)	1370 (4' 6")	←
Overhead guard height		I	mm (ft. in)	2230 (7' 4")	←
Ground clearance		J	mm (in)	170 (6.7")	←
Wheel base		K	mm (ft. in)	2030 (6' 8")	←
Wheel tread front/rear		M/M'	mm (ft. in)	1132/1140 (3' 9"/3' 9")	←
Max drawbar pull (Unload/Load)			kg (lb)	4223/4017 (9311/8856)	4221/4113 (9306/9068)

## 2. SPECIFICATION FOR MAJOR COMPONENTS

### 1) ENGINE

Item	Unit	Specification
Model	—	HMC D4CC
Type	—	Vertical, 4 cycle DI, EU Stage V 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 X stroke	mm (in)	95 × 102 (3.74 × 4.02)
Piston displacement	cc (cu in)	2891 (176.4)
Compression ratio	—	15.8 :1
Rated gross horse power	hp/rpm	73.2/2200
Maximum torque at rpm	kgf · m/rpm	34.5/1500
Engine oil quantity	ℓ (U.S.gal)	9.1 (2.4)
Dry weight	kg (lb)	266 (586)
High idling speed	rpm	2450
Low idling speed	rpm	850
Rated fuel consumption	g/kWh	207
Starting motor	V-kW	12-2.0
Alternator	V-A	13.5-130
Battery	V-AH	12-100
Fan belt deflection	mm (in)	10~12 (0.40~0.47)
CO <sub>2</sub>	g/kWh	594.2

※ This CO<sub>2</sub> measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

### 2) MAIN PUMP

Item	Unit	Specification
Type	—	Axial piston variable pump
Capacity	cc/rev (in <sup>3</sup> /rev)	45 (2.75)
Maximum operating pressure	bar (psi)	280 (4060)
Engine idling speed (High/Low)	rpm	2450/850
Weight	kgf (lbf)	15 (33)

### 3) MAIN CONTROL VALVE

Item	Unit	Specification
Type	—	Mono-block (3spool / 4spool / 5spool)
Operating method	—	Manual (hand lever)
Maximum flow rated (Lift/Tilt)	lpm (US. gpm)	110/40 (29/11)
Main relief valve set pressure (DV1)	bar (psi)	210 (3050)
Attachment oil flow rated (Aux1/2/3)	lpm (US. gpm)	60/60/60 (16/16/16)
Attachment relief valve pressure (DV2)	bar (psi)	140~180 (2030~2610)
Weight	kgf (lbf)	3spool : 11 (24) / 4spool : 13 (29) 5spool : 15 (33)

### 4) FINGERTIP CONTROL VALVE (ECV, option)

Item	Unit	Specification
Type	—	Mono-block (4spool)
Operating method	—	Electro-Hydraulic control
Maximum flow rated (Lift/Tilt)	lpm (US. gpm)	110/40 (29/11)
Main relief valve set pressure (DV1)	bar (psi)	210 (3050)
Attachment oil flow rated (Aux1/2)	lpm (US. gpm)	45/45 (12/12)
Attachment relief valve pressure (DV2)	bar (psi)	140~180 (2030~2610)
Weight	kgf (lbf)	4spool : 14 (31)

### 5) STEERING UNIT

Item	Unit	Specification
Type	—	Load sensing, Non-load reaction
Capacity	cc/rev (in <sup>3</sup> /rev)	125 (7.63)
Steering relief valve set pressure	bar (psi)	135 (1960)
Weight	kgf (lbf)	5.5 (12)

### 6) PRIORITY VALVE

Item	Unit	Specification
Type	—	Load sensing, dynamic signal
Rated input flow	lpm (US.gpm)	150 (40)
Max. inlet and EF Pressure	bar (psi)	310 (4500)
Max. CF Pressure	bar (psi)	276 (4000)
Weight	kgf (lbf)	6 (13)

## 7) POWER TRAIN DEVICES

Item			Specification	
Torque converter	Model		AEROSPACE	
	Type		3 Element, 1 stage, 2 phase	
	Stall ratio		2.21 : 1	
Transmission	Type		Power shift	
	Gear shift(FWD/REV)		2/1	
	Control		Electrical single lever type	
	Overhaul ratio	FWD	1st : 2.667	2nd : 1.024
		REV	1.838	
Axle	Type		Front-wheel drive type, fixed location	
	Gear ratio		11.692	
Wheels	Q'ty(FR/RR)		Single : 2/2, Double : 4/2	
	Front(drive)	Single	8.25-15-14 PR	
		Double	7.50-16-12 PR	
	Rear(steer)		7.00-12-14 PR	
Brakes	Travel		Front wheel, wet disk brake	
	Parking		SAHR (Spring Actuate Hydraulic Release) type	
Steering	Type		Full hydraulic, power steering	
	Steering angle		74.8° to both right and left angle, respectively	
	Relief valve presssure		135 bar (1960 psi)	

### 3. TIGHTENING TORQUE

NO	Item		Size	kgf · m	lbf · ft
1	Engine	Engine mounting bolt	M10×1.25	7.4±1.4	53.7±10.7
2		Engine bracket mounting nut	M10×1.5	6.9±1.4	49.9±10.1
3		Radiator mounting bolt, nut	M10×1.5	6.9±1.4	49.9±10.1
4	Hydraulic system	Hydraulic pump mounting bolt	M14×1.5	7.0±0.5	51±3.6
5		MCV mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
6		PF valve mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
7		Steering unit mounting bolt	M10×1.5	4.0±0.5	28.9±3.6
8		Priority valve mounting bolt, nut	M 8×1.25	2.5±0.5	18.1±3.6
9		Tilt cylinder; rod-end bolt, nut	M14×2.0	15±1.5	147±14
10		Tilt cylinder pin; mounting bolt	M10×1.5	4.0±1.5	28.9±3.6
11	Power train system	Transmission mounting bolt, nut	M16×2.0	7.5±1.5	54.2±10.8
12		Torque converter mounting bolt	M10×1.5	6.9±1.4	50±10
13		Drive axle mounting bolt, nut	M24×2.0	62.5±9.5	452±68.7
14		Drive shaft mounting bolt	3/8-24 UNF	7.0±0.7	50.6±5.1
15		Steering axle mounting bolt, nut	M14×2.0	19.6±2.9	142±21
16		Front wheel mounting nut	M22×1.5	62.0±9.3	448±67.3
17		Rear wheel mounting nut	M22×1.5	62.0±9.3	448±67.3
18	Others	Counterweight mounting bolt	M30×3.5	100±15	723±108
19		Operator's seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
20		Head guard mounting bolt	M12×1.75	12.8±3.0	92.6±21.7
21		Cabin mounting bolt	M12×1.75	12.8±3.0	92.6±21.7

## 9 . TROUBLESHOOTING

### 1. ENGINE SYSTEM

#### 1) Trouble symptom

Trouble symptom	Probable cause	Remedy
Oil pressure caution lamp fails to go out.	<ul style="list-style-type: none"> <li>· Low oil level in oil pan.</li> <li>· Oil filter element clogged.</li> <li>· Loose or worn oil pipe joint leaks oil.</li> </ul>	<ul style="list-style-type: none"> <li>· Add oil.</li> <li>· Replace element.</li> <li>· Check and repair.</li> </ul>
Radiator pressure valve spouts steam.	<ul style="list-style-type: none"> <li>· Lack of cooling water or water leakage.</li> <li>· Loosen fan belt.</li> <li>· Dust and scale accumulated in, cooling system.</li> </ul>	<ul style="list-style-type: none"> <li>· Add water or repair.</li> <li>· Adjust belt.</li> <li>· Change water and clean the interior of cooling system.</li> </ul>
Water temp gauge indicates red range, on right.	<ul style="list-style-type: none"> <li>· Radiator fin clogged or fin damaged.</li> <li>· Thermostat or water temp gauge faulty.</li> <li>· Radiator filler cap loosening.</li> </ul>	<ul style="list-style-type: none"> <li>· Clean or repair.</li> <li>· Replace</li> <li>· Retighten cap or replace packing.</li> </ul>
Water temp gauge indicates red range, on left.	<ul style="list-style-type: none"> <li>· Thermostat faulty.</li> <li>· Water temperature gauge faulty.</li> </ul>	<ul style="list-style-type: none"> <li>· Replace</li> <li>· Replace</li> </ul>
Engine fails to start.	<ul style="list-style-type: none"> <li>· Lack of fuel.</li> <li>· Air mixed in fuel system.</li> <li>· Fuel injection pump or nozzle defective.</li> <li>· Starting motor rotates slowly.</li> <li>· Engine compression insufficient.</li> <li>· Valve clearance out of adjustment.</li> </ul>	<ul style="list-style-type: none"> <li>· Add fuel.</li> <li>· Bleed air.</li> <li>· Replace.</li> <li>· See "Electrical system."</li> <li>· Consult dealer</li> <li>· Adjust clearance</li> </ul>
Engine emits whitish or bluish smoke.	<ul style="list-style-type: none"> <li>· Excessive quantity of oil in oil pan.</li> <li>· Poor quality of fuel.</li> </ul>	<ul style="list-style-type: none"> <li>· Reduce oil quantity.</li> <li>· Replace with specified fuel.</li> </ul>
Engine emits blackish smoke.	<ul style="list-style-type: none"> <li>· Air cleaner element clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Clean or replace element.</li> </ul>
Irregular fuel feeding sound heard.	<ul style="list-style-type: none"> <li>· Fuel feed pump faulty.</li> </ul>	<ul style="list-style-type: none"> <li>· Replace pump.</li> </ul>
Abnormal sound heard. (Fuel combustion or mechanical sound)	<ul style="list-style-type: none"> <li>· Poor quality of fuel.</li> <li>· Overheating</li> <li>· Muffler interior damaged.</li> <li>· Excessively large valve clearance.</li> </ul>	<ul style="list-style-type: none"> <li>· Replace with specified fuel.</li> <li>· See Symptom "Radiator pressure valve spouts steam".</li> <li>· Replace</li> <li>· Adjust clearance.</li> </ul>

※ If the engine oil pressure warning lamp does not go off after replenishment, have it serviced.  
Continued operation with the warning lamp on can cause engine failure.

## 2) Warning code

The operator will be informed by the operator warning system when the emission control system does not function correctly.

※ In the event of deformation/damage/leakage/clogging or no using genuine part in the following systems, the following malfunctions can be diagnosed, and the power limit may limit the operation of the equipment.

※ If you operate as shown below, you may be diagnosed with malfunction due to poor performance of the regenerative system, and there may be limitations in operation of the device due to the power limit.

Problem cause	Warning Code	Detail	Remedy
Intake system	P0101	MAF Sensor Performance Invalid during running	Contact to dealer for repair
	P0402	EGR Excessive Flow	
	P0401	EGR Insufficient Flow	
	P0420	DOC / Conversion Performance Invalid	
	P242F	DPF / Clogging	
	P24A2	DPF / Incomplete Regeneration	
Exhaust system	P0402	EGR Excessive Flow	
	P0401	EGR Insufficient Flow	
	P2033	T4 sensor DOC inlet / Too High	
	P2471	T5 sensor DPF inlet / Too High Voltage	
	P246F	T5 temp. sensor mutual error	
	P2455	Differential press. Sensor Too High	
	P2454	Differential press. Sensor Too Low	
	P2002	Diff. Pressure Sensor / Tube inverted	
	P0420	DOC / Conversion Performance Invalid	
	P226D	DPF / missing substrate	
	P242F	DPF / Clogging	
	P24A2	DPF / Incomplete Regeneration	
	P2453	Differential Pressure Sensor performance invalid	
Operation for a short time or at low speed and low load for a long time	P0420	DOC / Conversion Performance Invalid	
	P242F	DPF / Clogging	
	P24A2	DPF / Incomplete Regeneration	
	P2453	Differential Pressure Sensor performance invalid	

※ If you ignore the problem and use it as it is In the event of a failure, the engine check lamp and code are switched on and the driver can check the fault code and contents. Equipment operation may be restricted due to the power limit depending on the failure details.

※ It is essential that each warning code takes prompt action (e.g. by contacting an authorized dealer for inspection) to correct immediately the incorrect operation, use or maintenance of the exhaust control system.

## 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 not 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 caution lamp does not light when engine is stopped (with starting switch left in "ON" position).	· Caution lamp defective. · Caution lamp switch defective.	· Replace · Replace



### 3. TORQUE FLOW SYSTEM

※ After disassembling the transmission or changing the oil, be sure to bleed air of brake.

Trouble symptom	Probable cause	Remedy
<b>1. Excessive oil temperature rise</b> 1) Torque converter           2) Transmission	<ul style="list-style-type: none"> <li>Improper oil level.</li> <li>Impeller interfering with surroundings.</li> <li>Stator and free wheel malfunctioning.</li> <li>Air sucked in.</li> <li>Water intruding into transmission case.</li> <li>Bearing worn or seizing.</li> <li>Gauge malfunctioning.</li> <li>Clutch dragging.</li> <li>Bearing worn or seized.</li> </ul>	<ul style="list-style-type: none"> <li>Check oil level. Add or drain oil as necessary.</li> <li>After draining oil from oil tank and transmission, check and replace interfering parts.</li> <li>Check engine (stalling) speed. If necessary, replace.</li> <li>Check the inlet side joint or pipe. If necessary, retighten joint or replace gasket.</li> <li>Check drained oil. If necessary, change oil.</li> <li>Disassemble, inspect, repair or replace.</li> <li>Check and, if necessary, replace.</li> <li>Check to see whether or not truck moves even when transmission is placed in neutral position. If so, replace clutch plate.</li> <li>Disassemble, check and replace.</li> </ul>
<b>2. Noise operation</b> 1) Torque converter           2) Transmission	<ul style="list-style-type: none"> <li>Cavitation produced.</li> <li>Flexible plate damaged.</li> <li>Bearing damaged or worn.</li> <li>Gear damaged.</li> <li>Impeller interfering with surroundings.</li> <li>Bolt loosening.</li> <li>Spline worn.</li> <li>Noise gear pump operation.</li> <li>Dragging caused by seizing clutch.</li> <li>Bearing worn or seizing.</li> <li>Gear damaged.</li> <li>Bolt loosening.</li> <li>Spline worn.</li> </ul>	<ul style="list-style-type: none"> <li>Change oil, replace parts leaking air.</li> <li>Listen to rotating sound at lowspeed operation. If necessary, replace flexible plate.</li> <li>Disassemble, check and replace.</li> <li>Disassemble, check and replace.</li> <li>Check impeller or check drained oil for mixing of foreign matter. If necessary, change oil.</li> <li>Disassemble and check. If necessary, retighten or replace.</li> <li>Disassemble, check and replace.</li> <li>Disassemble, check and replace.</li> <li>Check to see whether or not truck moves even when transmission is in neutral position. If so, replace clutch plate.</li> <li>Disassemble, check and replace</li> <li>Disassemble, check and replace</li> <li>Disassemble, check and retighten or replace</li> <li>Disassemble, check and replace</li> </ul>

Trouble symptom	Probable cause	Remedy
<b>3. Low output power</b> 1) Torque converter	<ul style="list-style-type: none"> <li>· Insufficient hydraulic pressure :               <ul style="list-style-type: none"> <li>– Low oil level.</li> <li>– Air sucked in.</li> </ul> </li> <li>– Oil filter clogging.</li> <li>– Oil pump worn. (Low delivery flow)</li> <li>– Regulator valve coil spring fatigued.</li> <li>– Control valve spool malfunctioning.</li> <li>– Piston or O-ring worn.</li> <li>· Stator free wheel cam damaged.</li> <li>· Stator free wheel seizing.</li> <li>· Impeller damaged for interfering with the surroundings.</li> <li>· Flexile plate deformed</li> <li>· Use of poor quality of oil or arising of air bubbles.               <ul style="list-style-type: none"> <li>– Air sucked in from inlet side.</li> </ul> </li> <li>– Low torque converter oil pressure accelerates generation of air bubbles.</li> <li>– Oil mixing with water.</li> <li>– Inching rod out of adjustment.</li> <li>· Clutch slipping               <ul style="list-style-type: none"> <li>– Lowering of power.</li> <li>– Piston ring or O-ring worn.</li> </ul> </li> <li>– Clutch piston damaged.</li> <li>– Clutch plate seizing or dragging.</li> </ul>	<ul style="list-style-type: none"> <li>– Check oil level and add oil</li> <li>– Check joints and pipes. If necessary, retighten joint or replace packing.</li> <li>– Check and replace</li> <li>– Check oil pressure. If necessary replace pump.</li> <li>– Check spring tension. If necessary, replace.</li> <li>– Disassemble, check and repair or replace.</li> <li>– Disassemble, check measure and replace.</li> <li>– Check stalling speed. (Increased engine load will cause excessive drop of stalling speed.)</li> <li>– Check oil temperature rise. If any, replace free wheel.</li> <li>– Check temperature plate. (No-load will cause temperature rise)</li> <li>– Replace free wheel if a drop of starting output is found.</li> <li>– Check drained oil for foreign matter. If any, change oil.</li> <li>· Replace flexible plate</li> <li>– Check and change oil.</li> <li>– Check joints and pipes. If necessary, retighten joint or replace packing.</li> <li>– Check oil pressure.</li> <li>– Check drained oil and change oil.</li> <li>– Check and adjust.</li> <li>– Check oil pressure.</li> <li>– Disassemble, check, measure and replace.</li> <li>– Disassemble, check and replace.</li> <li>– Check to see whether or not truck moves even when transmission is in neutral position. If so, replace.</li> </ul>
2) Transmission		

Trouble symptom	Probable cause	Remedy
<b>4. Unusual oil pressure</b> 1) Oil pressure is high           2) Oil pressure is low           3) Transmission	<ul style="list-style-type: none"> <li>Control valve malfunctioning.</li> <li>Cold weather. (high oil viscosity)</li> <li>Use of improper oil.</li> <li>Gear pump malfunctioning (worn).</li> <li>Oil leaks excessively :               <ul style="list-style-type: none"> <li>(1) Control valve oil spring defective.</li> <li>(2) Control valve spool defective.</li> </ul> </li> <li>Air sucked in.</li> <li>Low oil level.</li> <li>Oil filter clogging.</li> <li>Oil leaks excessively.</li> </ul>	<ul style="list-style-type: none"> <li>(1) Check for spool operation. If necessary, replace valve.</li> <li>(2) Check for clogging of small hole in valve body. If necessary, clean or repair.</li> <li>When atmospheric temp is below freezing point (when normal oil pressure is recovered if heated to 60~80 °C), change oil.</li> <li>Check and change oil.</li> <li>Disassemble, check and replace.</li> <li>Check spring tension (see spring specification). If necessary replace.</li> <li>Disassemble, check, and repair or replace valve.</li> <li>Check joints and pipes. If necessary, retighten joint or replace packing.</li> <li>Check oil level and add oil.</li> <li>Check and replace.</li> <li>Disassemble, check (piston ring and O-ring for wear and other defects), and replace.</li> </ul>
<b>5. Power is not transmitted</b> 1) Torque converter           2) Transmission	<ul style="list-style-type: none"> <li>Clutch plate damaged.</li> <li>Low oil level.</li> <li>Oil pump driving system faulty.</li> <li>Shaft broken.</li> <li>Lack of oil pressure.</li> <li>Low oil level.</li> <li>Inching valve and link lever improperly positioned.</li> <li>Forward/reverse spool and link lever improperly positioned.</li> <li>Clutch fails to disengage :               <ul style="list-style-type: none"> <li>(1) Clutch case piston ring defective.</li> <li>(2) Main shaft plug slipping out.</li> </ul> </li> <li>Clutch seizing.</li> <li>Shaft broken off.</li> <li>Clutch drum damaged (spring groove).</li> <li>Clutch snap ring broken.</li> </ul>	<ul style="list-style-type: none"> <li>Check for damage by listening to abnormal sounds at a low converter speed and replace.</li> <li>Check oil level and add oil</li> <li>Disassemble and check for wear of pump gear, shaft and spline. Replace defective parts.</li> <li>Check and replace.</li> <li>Check oil pump gear for wear and for oil suction force. If necessary, replace pump.</li> <li>Check oil level and add oil.</li> <li>Check measure and adjust.</li> <li>Check and adjust.</li> <li>Disassemble, check and replace</li> <li>Disassemble, check and repair or replace</li> <li>Check to see whether or not truck moves even then transmission is in neutral position. If so, replace.</li> <li>Disassemble, check(main shaft, etc.), and replace.</li> <li>Disassemble, check and replace.</li> <li>Disassemble, check and repair or replace.</li> </ul>

Trouble symptom	Probable cause	Remedy
<b>5. Power is not transmitted</b> (Continue)	<ul style="list-style-type: none"> <li>· Foreign matter intruding into oil passage to clutch.</li> <li>· Shaft spline worn.</li> </ul>	<ul style="list-style-type: none"> <li>· Disassemble, check and repair or replace.</li> <li>· Disassemble, check and replace.</li> </ul>
<b>6. Oil leakage</b> (Transmission and torque converter)	<ul style="list-style-type: none"> <li>· Oil leaks from oil seal.</li> <li>· Oil leaks from case joining surfaces.</li> <li>· Oil leaks from joint or pipe.</li> <li>· Oil leaks from drain plug.</li> <li>· Oil leaks from a crack.</li> </ul>	<ul style="list-style-type: none"> <li>· Disassemble and check for wear of seal lips and mating sliding surfaces (pump boss, coupling etc.) Replace oil seal, pump boss, coupling, etc.</li> <li>· Check and retighten or replace packing.</li> <li>· Check and repair or replace gasket.</li> <li>· Check and retighten or gasket.</li> <li>· Check and replace cracked part.</li> </ul>

## 4. STEERING SYSTEM

Trouble symptom	Probable cause	Remedy
1. Steering wheel drags.	<ul style="list-style-type: none"> <li>· Low oil pressure.</li> <li>· Bearing faulty.</li> <li>· Spring spool faulty.</li> <li>· Reaction plunger faulty.</li> <li>· Ball-and-screw assembly faulty.</li> <li>· Sector shaft adjusting screw excessively tight.</li> <li>· Gears poorly meshing.</li> <li>· Flow divider coil spring fatigued.</li> <li>· Brake valve spool malfunctioning.</li> </ul>	<ul style="list-style-type: none"> <li>· Check locknut. Repair.</li> <li>· Clean or replace.</li> <li>· Clean or replace.</li> <li>· Replace.</li> <li>· Clean or replace.</li> <li>· Adjust.</li> <li>· Check and correct meshing.</li> <li>· Replace.</li> <li>· Clean or replace.</li> </ul>
2. Steering wheel fails to return smoothly.	<ul style="list-style-type: none"> <li>· Bearing faulty.</li> <li>· Reaction plunger faulty.</li> <li>· Ball-and-screw assy faulty.</li> <li>· Gears poorly meshing.</li> </ul>	<ul style="list-style-type: none"> <li>· Clean or replace.</li> <li>· Replace.</li> <li>· Clean or replace.</li> <li>· Check and correct meshing.</li> </ul>
3. Steering wheel turns unsteadily. Steering system makes abnormal sound or vibration.	<ul style="list-style-type: none"> <li>· Locknut loosening.</li> <li>· Metal spring deteriorated.</li> <li>· Gear backlash out of adjustment.</li> <li>· Locknut loosening.</li> <li>· Air in oil circuit.</li> </ul>	<ul style="list-style-type: none"> <li>· Retighten.</li> <li>· Replace.</li> <li>· Adjust.</li> <li>· Retighten.</li> <li>· Bleed air.</li> </ul>
4. Abnormal sound heard when steering wheel is turned fully	<p>Valve</p> <ul style="list-style-type: none"> <li>· Faulty. (Valve fails to open.)</li> </ul> <p>Piping</p> <ul style="list-style-type: none"> <li>· Pipe (from pump to power steering cylinder) dented or clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Adjust valve set pressure and check for specified oil pressure.</li> <li>· Repair or replace.</li> </ul>
5. Piping makes abnormal sounds.	<p>Oil pump</p> <ul style="list-style-type: none"> <li>· Lack of oil.</li> <li>· Oil inlet pipe sucks air.</li> <li>· Insufficient air bleeding.</li> </ul>	<ul style="list-style-type: none"> <li>· Add oil.</li> <li>· Repair.</li> <li>· Bleed air completely.</li> </ul>
6. Valve or valve unit makes abnormal sounds.	<p>Oil pump</p> <ul style="list-style-type: none"> <li>· Oil inlet pipe sucks air.</li> </ul> <p>Valve</p> <ul style="list-style-type: none"> <li>· Faulty. (Unbalance oil pressure)</li> </ul> <p>Piping</p> <ul style="list-style-type: none"> <li>· Pipe (from pump to power steering) dented or clogged.</li> <li>· Insufficient air bleeding.</li> </ul>	<ul style="list-style-type: none"> <li>· Repair or replace.</li> <li>· Adjust valve set pressure and check specified oil pressure.</li> <li>· Repair or replace.</li> <li>· Bleed air completely.</li> </ul>
7. Insufficient or variable oil flow.	<ul style="list-style-type: none"> <li>· Flow control valve orifice clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Clean.</li> </ul>
8. Insufficient or variable discharge pressure.	<p>Piping</p> <ul style="list-style-type: none"> <li>· Pipe (from tank to pipe) dented or clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Repair or replace.</li> </ul>

## 5. BRAKE SYSTEM

※ Before bleed air, be sure to turn on the ignition.

Trouble symptom	Probable cause	Remedy
1. Insufficient braking force	<ul style="list-style-type: none"> <li>Hydraulic system leaks oil.</li> <li>Hydraulic system has air in line.</li> <li>Friction plate worn.</li> <li>Brake valve or brake piston mal-functioning.</li> <li>Hydraulic system clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Repair and check transmission oil level.</li> <li>Bleed air and check transmission oil level.</li> <li>Replace.</li> <li>Repair or replace.</li> <li>Clean.</li> </ul>
2. Brake acting unevenly. (Truck is turned to one side during braking.)	<ul style="list-style-type: none"> <li>Tires unequally inflated.</li> <li>Brake out of adjustment.</li> <li>Friction plate worn.</li> <li>Disc worn or damaged (distortion or rusting).</li> <li>Piston in axle mal-functioning.</li> <li>Hydraulic system clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust tire pressure.</li> <li>Adjust (Refer to service manual).</li> <li>Replace.</li> <li>Replace.</li> <li>Repair or replace.</li> <li>Clean.</li> </ul>
3. Brake trailing.	<ul style="list-style-type: none"> <li>Pedal has no play.</li> <li>Piston in axle mal-functioning.</li> <li>Return spring damaged.</li> <li>Parking brake fails to return or out of adjustment.</li> <li>Brake valve return port clogged.</li> <li>Hydraulic system clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust.</li> <li>Repair or replace.</li> <li>Relace.</li> <li>Repair or adjust.</li> <li>Clean.</li> <li>Clean.</li> </ul>
4. Brake chirps	<ul style="list-style-type: none"> <li>Brake trailing.</li> <li>Piston fails to return.</li> <li>Friction plate worn.</li> </ul>	<ul style="list-style-type: none"> <li>See 3. Brake trailing.</li> <li>Replace.</li> <li>Replace.</li> </ul>
5. Brake noise	<ul style="list-style-type: none"> <li>Incorrect axle oil.</li> <li>Oil change interval passed.</li> <li>Friction plate worn.</li> </ul>	<ul style="list-style-type: none"> <li>Replace with approved oil.</li> <li>Replace.</li> <li>Replace.</li> </ul>
6. Large pedal stroke	<ul style="list-style-type: none"> <li>Brake out of adjustment.</li> <li>Hydraulic line sucking air.</li> <li>Oil leaks from hydraulic line, or lack of oil.</li> <li>Friction plate worn.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust.</li> <li>Bleed air and check transmission oil level.</li> <li>Check and repair or check transmission oil level.</li> <li>Replace.</li> </ul>
7. Pedal dragging.	<ul style="list-style-type: none"> <li>Twisted push rod caused by improperly fitted brake valve.</li> <li>Brake valve seal faulty.</li> <li>Flow control valve orifice clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust.</li> <li>Replace.</li> <li>Clean or replace.</li> </ul>

## 6. HYDRAULIC SYSTEM

Trouble symptom	Probable cause	Remedy
1. Large fork lowering speed.	<ul style="list-style-type: none"> <li>Seal inside control valve defective.</li> <li>Oil leaks from joint or hose.</li> <li>Seal inside cylinder defective.</li> </ul>	<ul style="list-style-type: none"> <li>Replace spool or valve body.</li> <li>Replace.</li> <li>Replace packing.</li> </ul>
2. Large spontaneous tilt of mast.	<ul style="list-style-type: none"> <li>Tilting backward : Check valve defective.</li> <li>Tilting forward : tilt lock valve defective.</li> <li>Oil leaks from joint or hose.</li> <li>Seal inside cylinder defective.</li> </ul>	<ul style="list-style-type: none"> <li>Clean or replace.</li> <li>Clean or replace.</li> <li>Replace.</li> <li>Replace seal.</li> </ul>
3. Slow fork lifting or slow mast tilting.	<ul style="list-style-type: none"> <li>Lack of hydraulic oil.</li> <li>Hydraulic oil mixed with air.</li> <li>Oil leaks from joint or hose.</li> <li>Excessive restriction of oil flow on pump suction side.</li> <li>Relief valve fails to keep specified pressure.</li> <li>Poor sealing inside cylinder.</li> <li>High hydraulic oil viscosity.</li> <li>Mast fails to move smoothly.</li> <li>Oil leaks from lift control valve spool.</li> <li>Oil leaks from tilt control valve spool.</li> </ul>	<ul style="list-style-type: none"> <li>Add oil.</li> <li>Bleed air.</li> <li>Replace.</li> <li>Clean filter.</li> <li>Adjust relief valve.</li> <li>Replace packing.</li> <li>Change to SAE10W, class CF engine oil.</li> <li>Adjust roll to rail clearance.</li> <li>Replace spool or valve body.</li> <li>Replace spool or valve body.</li> </ul>
4. Hydraulic system makes abnormal sounds.	<ul style="list-style-type: none"> <li>Excessive restriction of oil flow pump suction side.</li> <li>Gear or bearing in hydraulic pump defective.</li> </ul>	<ul style="list-style-type: none"> <li>Clean filter.</li> <li>Replace gear or bearing.</li> </ul>
5. Control valve lever is locked	<ul style="list-style-type: none"> <li>Foreign matter jammed between spool and valve body.</li> <li>Valve body defective.</li> </ul>	<ul style="list-style-type: none"> <li>Clean.</li> <li>Tighten body mounting bolts uniformly.</li> </ul>
6. High oil temperature.	<ul style="list-style-type: none"> <li>Lack of hydraulic oil.</li> <li>High oil viscosity.</li> <li>Oil filter clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Add oil.</li> <li>Change to SAE10W, class CF engine oil.</li> <li>Clean filter.</li> </ul>

## 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

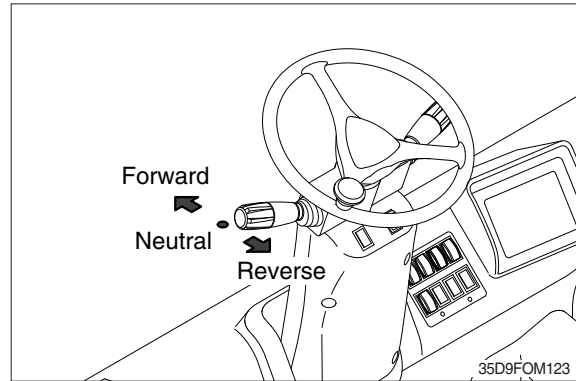
Problem	Cause	Remedy						
Abrasion	Long-time operations causes the fork to wear and reduces the thickness of the fork. Inspection for thickness is needed. · Wear limit : Must be 90% of fork thickness	If the measured value is below the wear limit, replace fork.						
Distortion	Forks are bent out of 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 border="1"><tr><td>Fork length (mm)</td><td>Height difference (mm)</td></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

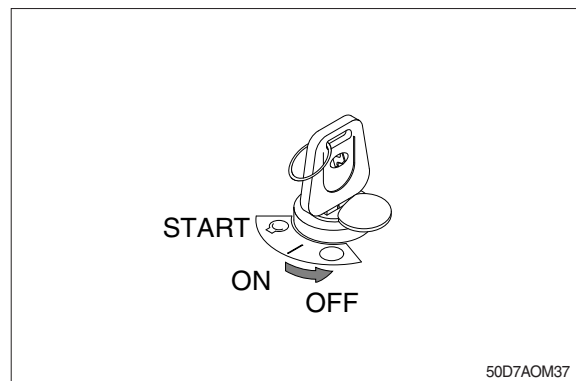
### 1. ENGINE SYSTEM

#### 1) EASE OF STARTING, NOISE

- (1) Set gear selector lever at NEUTRAL.

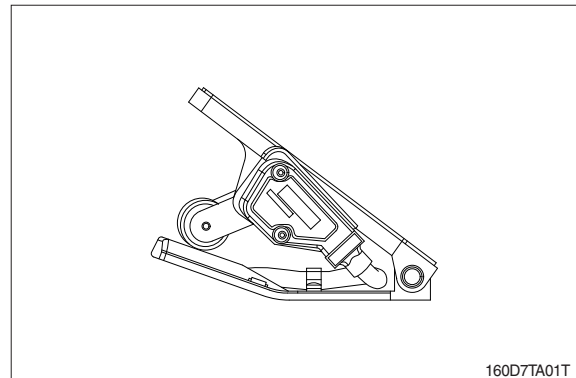


- (2) Put the parking brake switch in LOCK position.
  - (3) Turn ON start switch, automatically heating operated.
  - (4) When heater indicator lamp goes out, turn start switch to START, and start engine.
- ※ **When engine starts, check if it starts smoothly, and if it makes any abnormal noise.**



#### 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

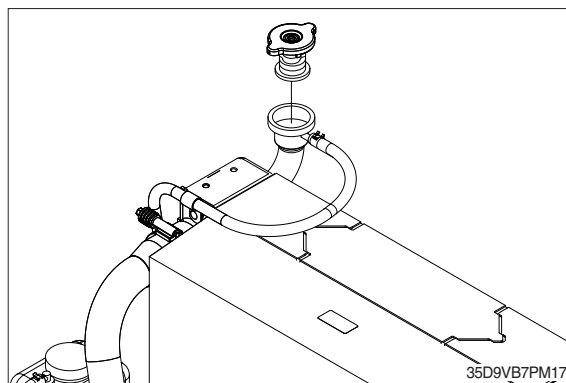
- (1) Check that accelerator pedal does not catch when depressed.
- (2) Check that engine speed increases in accordance with amount pedal is depressed.
- (3) When doing this, check that engine speed changes without gasping, abnormal noise, abnormal explosions, or irregular vibration.
- (4) Check that 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 tank cap.**

**It will gush out the hot water and someone might get scalded or severe injured.**



#### 5) FUEL FILTER

- (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

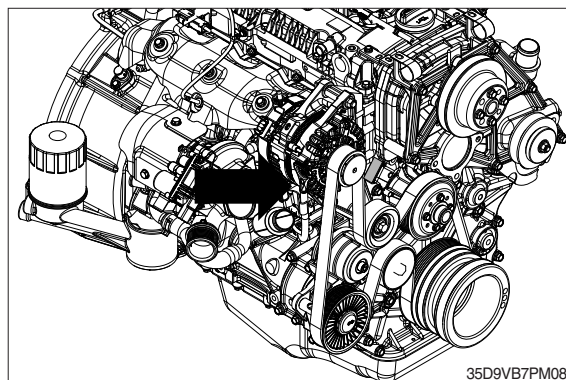
#### 7) ENGINE OIL FILTER

The condition of the oil filter element cannot be inspected from the outside so replace the engine oil filter periodically. Refer to 7. PLANNED MAINTENANCE AND LUBRICATION.

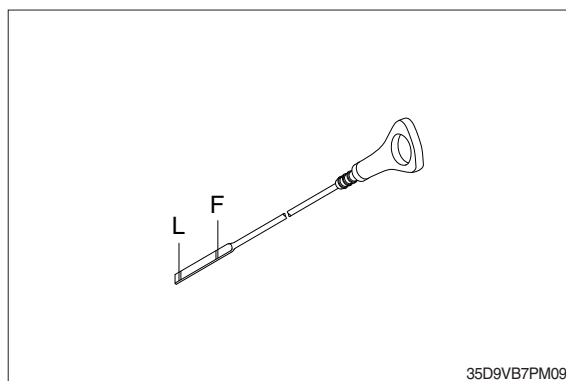
Use a filter wrench and remove the whole cartridge assembly.

**⚠ If a spilt oil on the engine is left as it is after replacing the engine oil filter, there is dangerous material for a fire.**

**Make sure that the spilt oil is wiped thoroughly away.**



a Dipstick



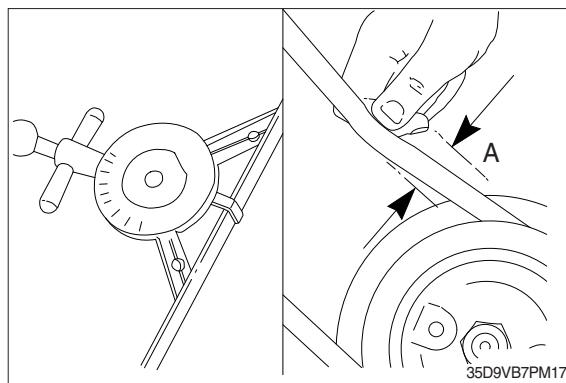
## 8) FAN BELT

- (1) Stop the engine and remove the start switch.
- (2) Apply moderate thumb pressure to belt between the pulleys.
- (3) If tension is incorrect, adjust the fan belt tension. (refer to page 7-25.)
- (4) Replace fan belt if it is damaged or stretched beyond the acceptable limits.

※ If belt is loosen or damaged and the fan is damaged, it could result in overheats or insufficient charging.

**Correct or replace belt.**

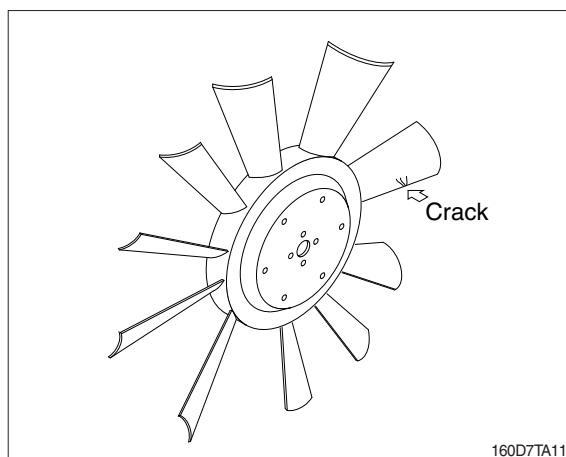
- Specification [under load of 10 kgf (22 lbf)]  
A : 12~16 mm (0.47~0.63 in)



## 9) FAN

Move fan backwards and forwards by hand to check for looseness.

Tighten mounting bolt with a spanner.



## 2. DRIVE SYSTEM

### 1) GEAR SELECTOR LEVER

#### (1) Neutral starting

Engine can be started only when the gear selector lever is in neutral position.

#### (2) Shifting forward/reverse

##### 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

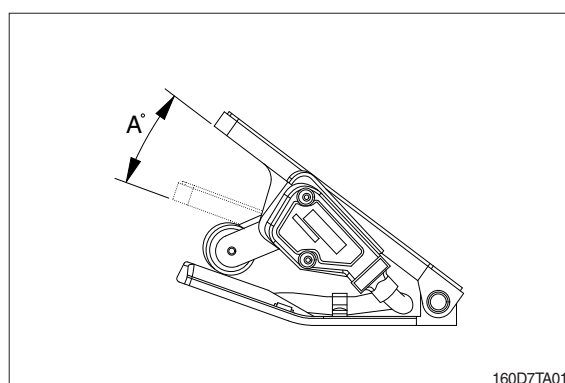
Check that there is no oil leakage from torque converter, transmission or control valve. If oil oozes out and forms drops, replace packing.

### 3) ADJUSTMENT OF PEDAL

#### (1) Electric accelerator pedal

Pedal operating range is "A°".

· Operating range (A°) :  $17.5 \pm 2$

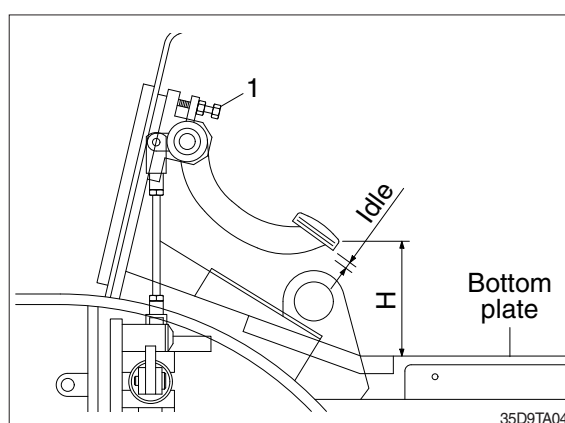


#### (2) Brake pedal

- Adjust stopper bolt (1) so that pedal height is "H".
- Adjust nut at the push rod of brake valve so that pedal play is idle stroke.

Unit : mm

H	Idle
$135 \pm 4$	2~4

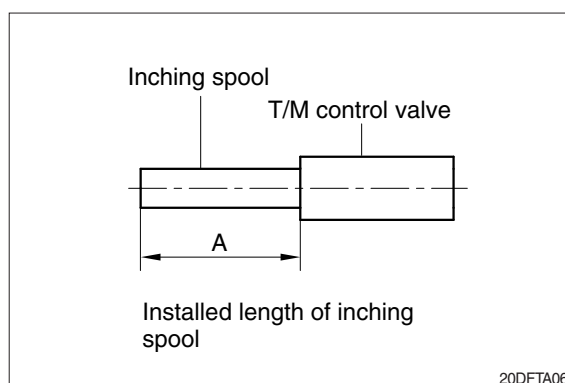
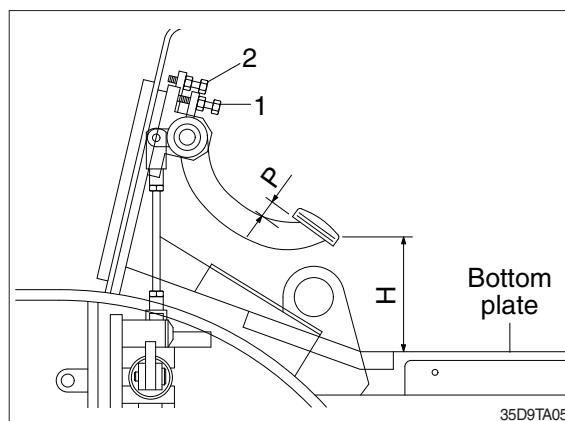


#### (4) Inching pedal

- Adjust stopper bolt (1) so that pedal height is "H".
- Adjust rod of inching cable so that inching pedal play is idle stroke when pedal height is "H".
- Adjust bolt (2) so that brake pedal interconnects with inching pedal at inching pedal stroke "P".

Unit : mm

H	P	IDLE	A
135±4	0	3	24



#### 4) CHECK OIL LEVEL

Since the brake system of this machine uses transmission oil, check the transmission oil level.

- ※ Be sure to bleed the air after replacing the transmission oil or repairing the transmission. Air bleeding must be done after ignition.

### 3. TRAVEL SYSTEM

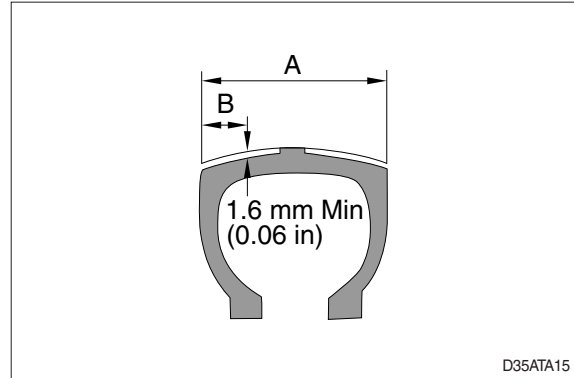
#### 1) TIRES

- (1) Check tire pressure using tire gauge : SEE 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 8. SPECIFICATION

#### 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 8. SPECIFICATION

#### 4) STEERING AXLE

- (1) Push axle from one side or measure front to rear clearance with feeler gauge. Check that clearance is within 2 mm. If clearance is more than 2 mm, insert shim to reduce clearance to within 0.7 mm.
  - Mounting bolt torque : SEE 8. SPECIFICATION
- (2) Measure clearance between center pin and bushing. Check that clearance is within 0.5 mm (0.02 in). If clearance is more than 0.5 mm, replace the bushing.

#### 5) DRIVE AXLE

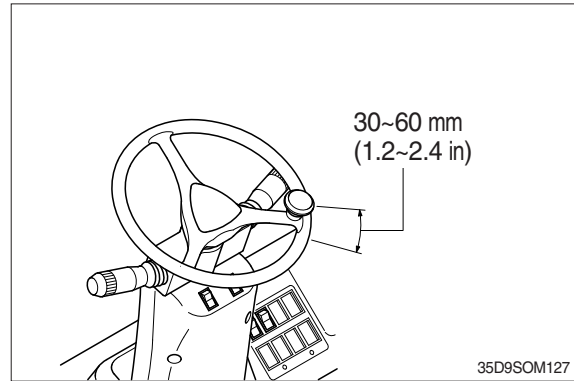
Check that there is no deformation or crack around mounting bolts of front axle and main frame and at welds. Check visually or use crack detection method.

Mounting bolt torque : SEE 8. SPECIFICATION

## 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.