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8. SPECIFICATIONS

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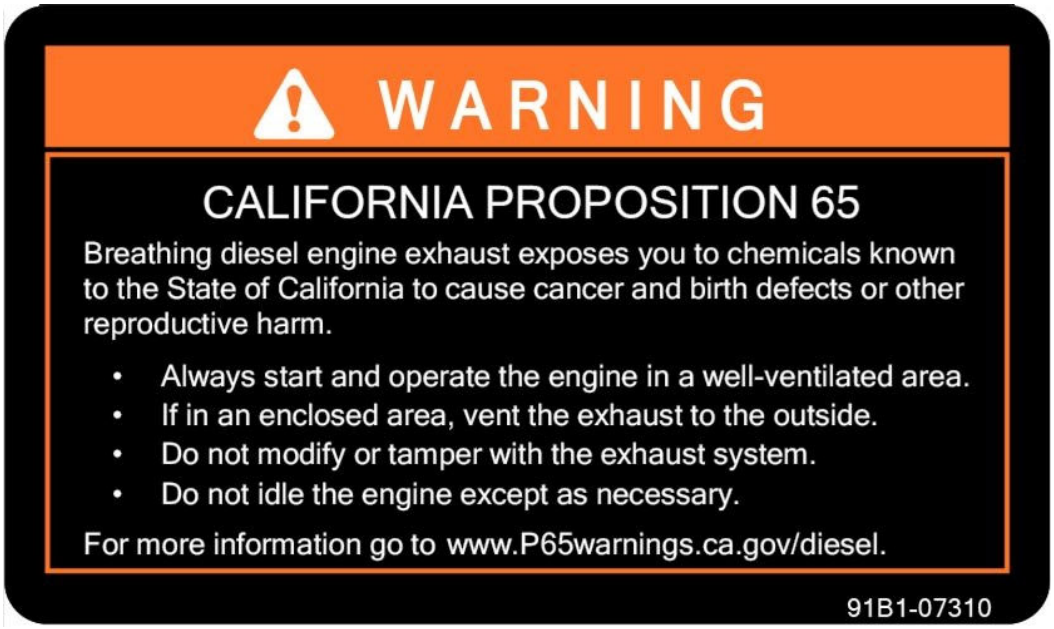

WARNING
CALIFORNIA PROPOSITION 65
Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
• Always start and operate the engine in a well-ventilated area.
• If in an enclosed area, vent the exhaust to the outside.
• Do not modify or tamper with the exhaust system.
• Do not idle the engine except as necessary.
For more information go to www.P65warnings.ca.gov/diesel.
91B1-07310

A MESSAGE TO HYUNDAI LIFT TRUCK OPERATORS

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

Safe operation of lift trucks is of primary importance to HYUNDAI.
Our experience with lift truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

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

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

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

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safety operate their lift truck by emphasizing and illustrating the correct procedures. However, it cannot cover every possible situation that may result in an accident. You must watch for hazards in your work areas and avoid or correct them. It is important that you know and understand the information in this manual and that you know and follow your company safety rules!
Be sure that your equipment is maintained in a safe condition. Do not operate a damaged or malfunctioning truck. Practice safe operation every time you use your lift truck. Let's join together to set high standards in safety.

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

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

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

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

INTRODUCTION

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

Your HYUNDAI lift truck has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, for some models, it meets all the applicable mandatory requirements of ANSI B56.1-1988 Safety Standard for Powered Industrial Trucks. Some trucks are also furnished with equipment to help you operate safety; 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 (Planed Maintenance) program.

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

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

Section10. 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 machine, but they are applicable to your machine.**

EC REGULATION APPROVED

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

Model	L_{WA} (EU only)	L_{PA}
35/40/45D-9, 50DA-9	106 dB	83 dB

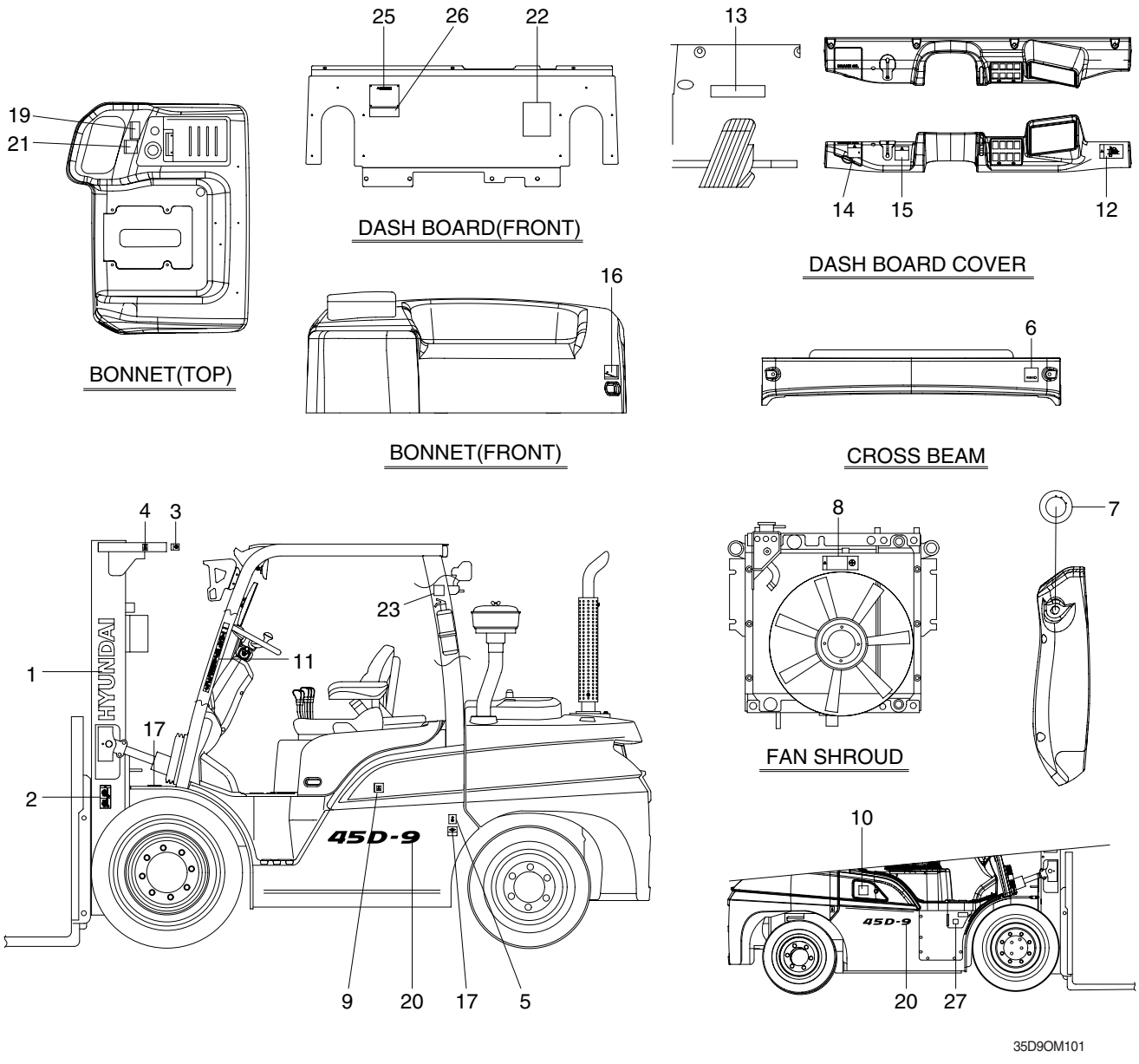
· The value of vibrations transmitted by the operator's seat are lower than standard value of (2005/88/EC)

CE

SAFETY LABELS

1. LOCATION

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



1	Logo	10	Diesel fuel	20	Model name
2	Warning plate	11	Warning safety	21	Load chart
3	Hand caution	12	Starting warning	22	Noise
4	Hook	13	Solid tire	23	Fire extinguisher
5	Hanger	14	Brake fluid	25	Name plate - CE or UL
6	Temperature	15	Parking brake	26	Label-UL
7	Start key	16	Engine wash	27	DEF/AdBlue®
8	Radiator & fan	17	Tire caution		
9	Hydraulic oil	19	Safety instruction		

2. DESCRIPTION

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

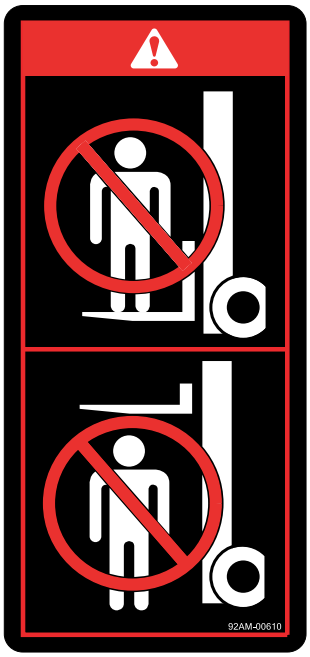
Replace any safety label that is damaged, or missing.

1) **WARNING PLATE** (item 2)

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

⚠ Never stand or work under the raised forks even if the hydraulic safety lock lever is applied.

⚠ In case of working under the forks, it is essential to support the carriage with blocks.

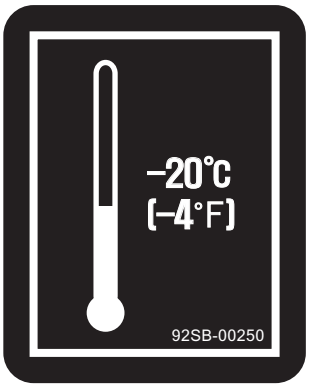


25L7A0OM06

2) **TEMPERATURE** (item 6)

This warning label is positioned on the right top side of cross beam.

⚠ Coolant must be checked as specified in planned maintenance intervals.



20DE0FW06

3) **RADIATOR CAP & FAN** (item 8)
This warning label is positioned on the cooling fan shroud of the radiator.

25L7A0OM07

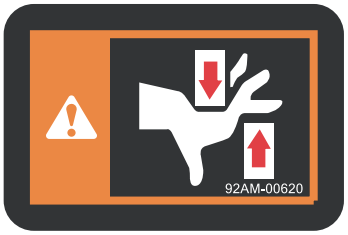
⚠ **It warns of the danger or injury from spinning fan blades and forbid so open the filler cap of the radiator because operator might get scalded due to spouting of hot water.**

⚠ **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.**

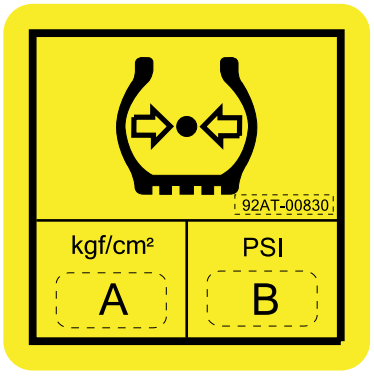
4) **HAND CAUTION** (item 3)
This label is positioned on the center side of the mast cross plate.



35DEOM103

⚠ **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.**

5) **TIRE CAUTION** (item 17)
This label is positioned on the front top side of the left fender and the left side of the frame.



20DEOM104

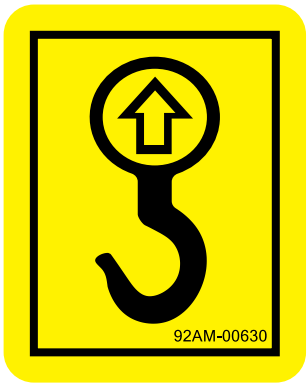
⚠ **Tire pressure must be checked in accordance with planned maintenance intervals.**

⚠ **Refer to page 5-3 for the regulated tire air pressure (A and B).**

6) **HOOK** (item 4)

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

⚠ **Refer to page 5-31 for safe loading procedures.**



92AM-00630

7) **SAFETY INSTRUCTION** (item 19)

This warning label is positioned on the bonnet if the truck is for USA or equipped with *OPSS.

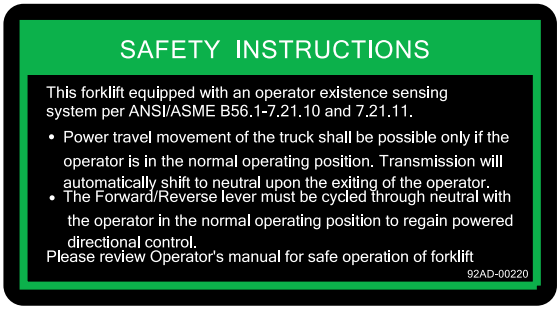
⚠ **This forklift is equipped with an operator existence sensing system per ANSI/ ASME B56.1-7.21.10 / 7.21.11 and ISO 3691.**

1. Powered travel movement of the truck shall be possible only if the operator is in the normal operating position. Transmission will automatically shift to neutral upon the exiting of the operator.

2. The forward/reverse lever must be cycled through neutral with the operator in the normal operating position to regain powered direction control.

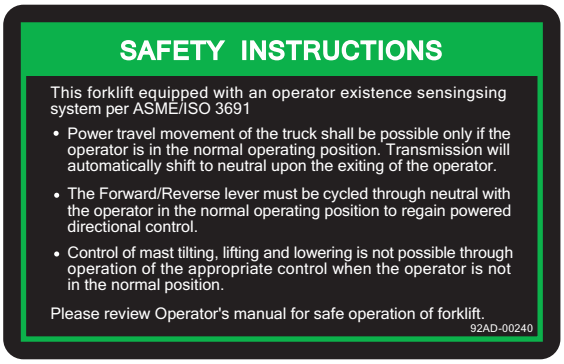
3. Control of mast tilting, lifting and lowering is not possible through operation of the appropriate control when the operator is not in the normal position.

Truck for USA or travel * OPSS



25L7A0OM02

Truck for travel and mast * OPSS



92AD-00240

* OPSS : Operator Presence Sensing System

8) **BRAKE FLUID** (item 14)

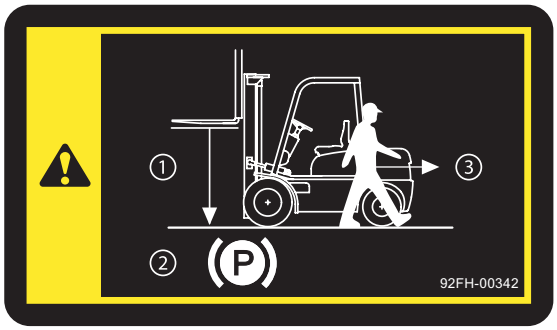
This warning label is located on the left side of dashboard cover.

92HN-00881

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

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

1. Warnings before leaving the operator seat.
   - Be sure to lower the attachment to the ground.
   - Apply the parking brake.



91FH-00342

10) **PARKING BRAKE** (item 15)

This warning plate is located on the left side of the dashboard.

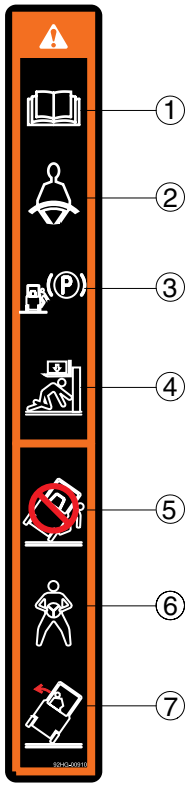
※ **Pull by sufficient tension for constant parking ability.**

25L7A0OM04

11) **WARNING SAFETY** (item 11)

This warning label is positioned on the front right of the inside of overhead guard stay.

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



25L7AOM09-1

※ **Refer to page 3-3 for details.**

12) **SOLID TIRE** (Item 13)

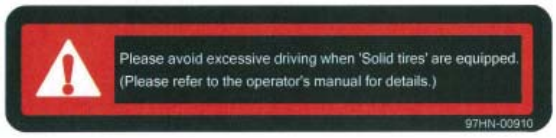
This decal located on the dashboard cover above the accelerator pedal.

※ **When "solid tires" are equipped.**

(1) Do not travel more than 25 kph (16 mph).

(2) Do not travel further than 8 km (5 miles) in an hour.

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



97HN-00910

13) **ENGINE WASH** (item 16)

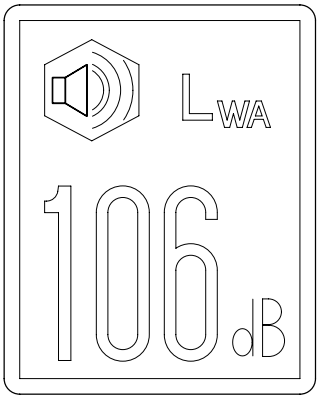
This warning label is located on the front right side of the bonnet.

⚠ **Don't wash the engine room.**

92HN-00261

14) **NOISE** (item 22)

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



93FV-00240

15) **DEF / ADBLUE®** (item 27)

This label is positioned on the right side of the frame.

※ **Fill the DEF / AdBlue® only.**

※ **Never use diesel oil.**

92HS-00121

16) **FIRE EXTINGUISHER** (item 23)

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

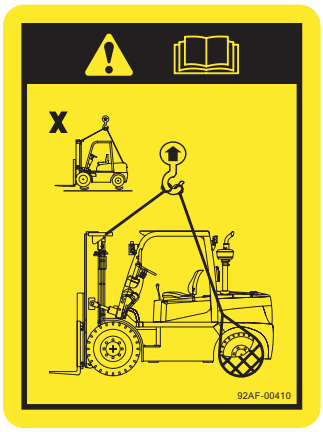
※ **Read and understand the instructions adhered decal on the fire extinguisher.**

91B1-01600

17) **HANGER** (item 5)

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

⚠ **Refer to page 5-31 for safe loading procedures.**



92AF-00410

18) **DIESEL FUEL** (item 10)

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

※ **Fill only ultra low sulfer diesel.**
※ **Do not fill the gasoline.**

92AF-00320

19) **HYDRAULIC OIL** (item 9)

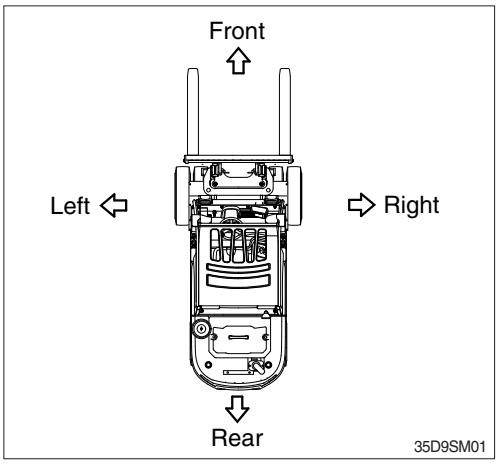
This warning label is positioned on the left side of the side cover.

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

92AF-00310

1. DIRECTION

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

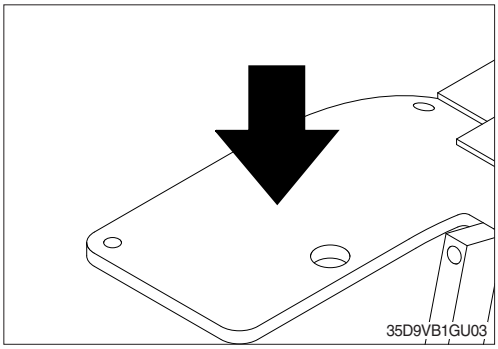


2. SERIAL NUMBER

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

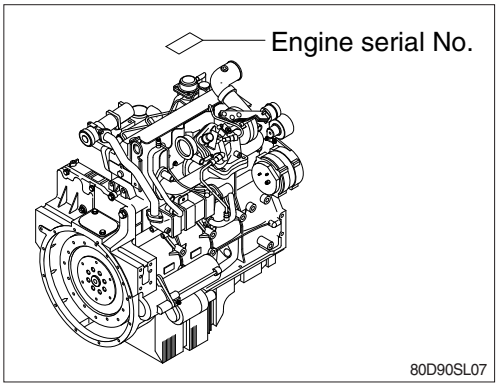
1) MACHINE SERIAL NUMBER

It is shown on the right fender.



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. SYMBOLS

⚠ Important safety hint

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

※ It indicates the useful information for operator

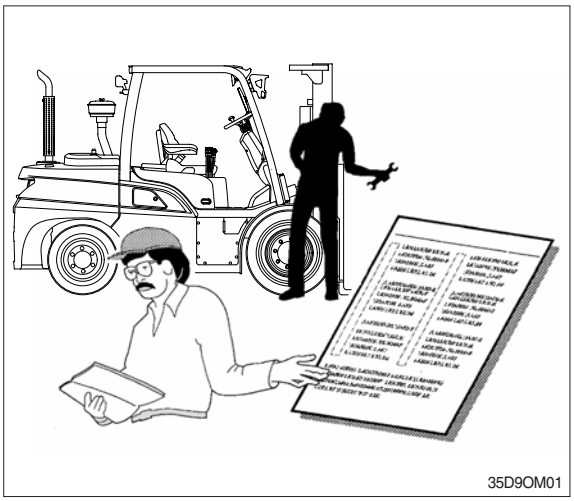
1. DAILY INSPECTION

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.

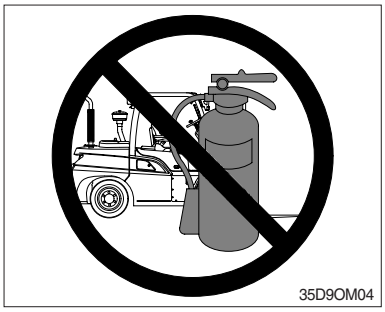


2. DO'S AND DON'TS

Do watch for pedestrians.

Do wear safety equipment when required.

Don't mix drugs or alcohol with your job.

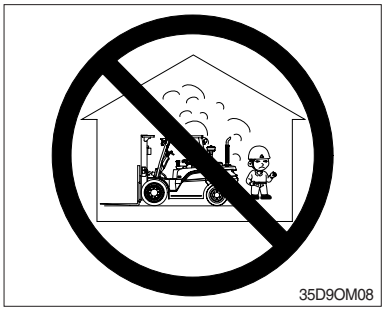


Don't block safety or emergency equipment.

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

Don't operate the truck outdoors in rainy day.

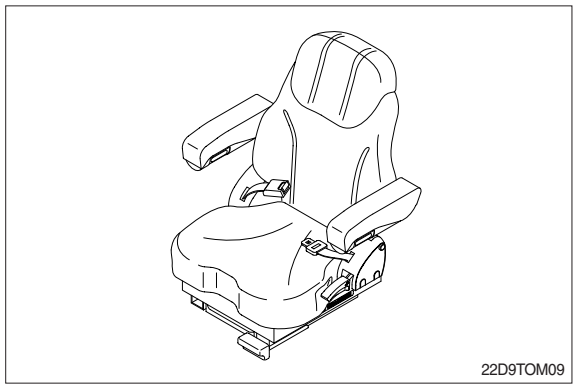
※ **Exclude the truck equipped cabin.**



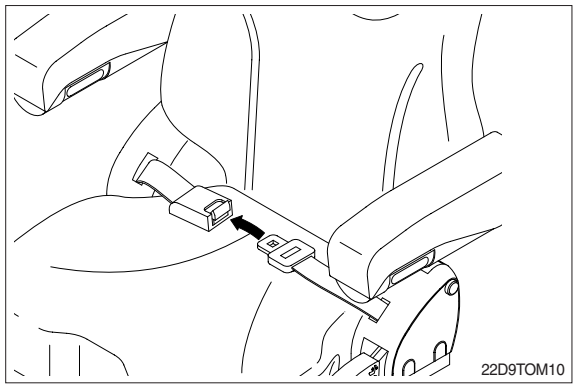
Exhaust gas is dangerous.
Do not operate the truck at the inhouse, if possible.
Provide adequate ventilation when working in a closed space.

3. SEAT BELTS

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

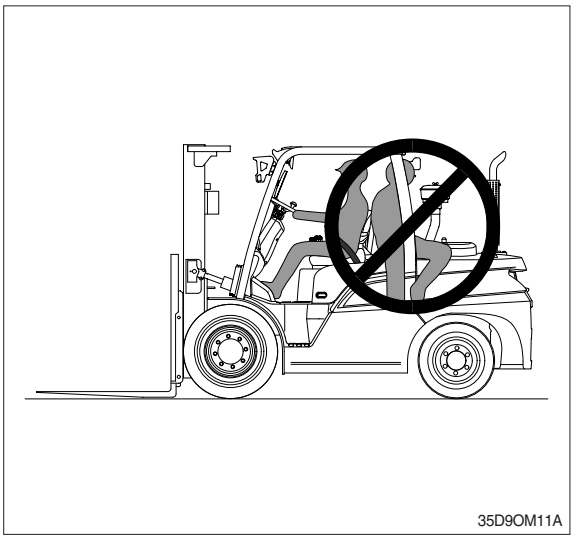


⚠ Seat belts can reduce injuries.

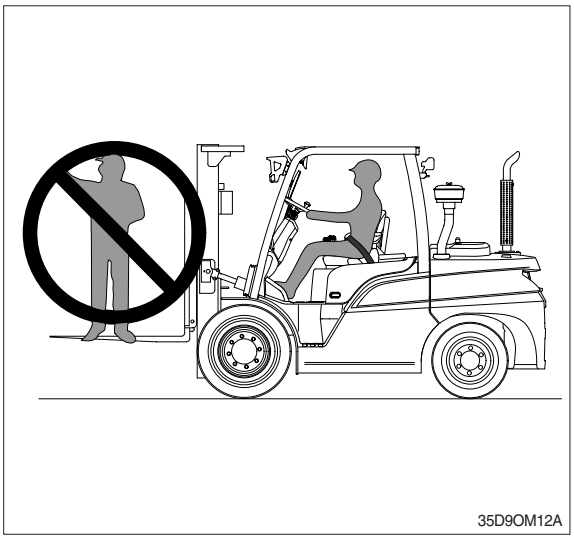


4. NO RIDERS

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

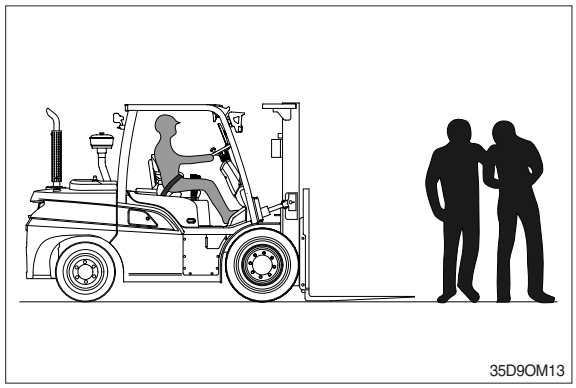


2) Never transport personnel on the forks of a lift truck.

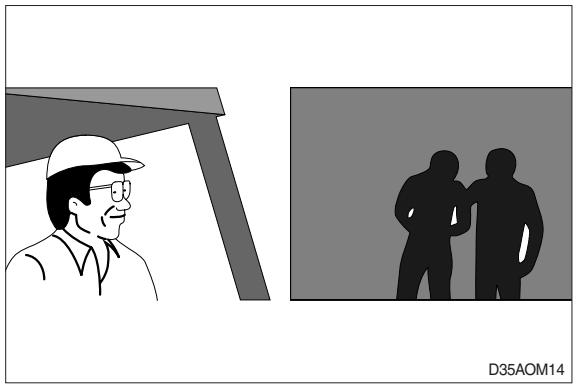


5. PEDESTRIANS

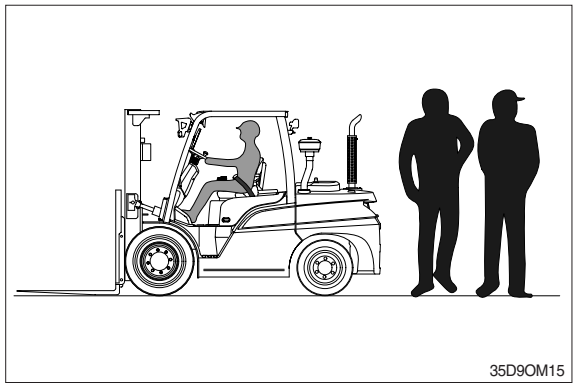
1) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



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.

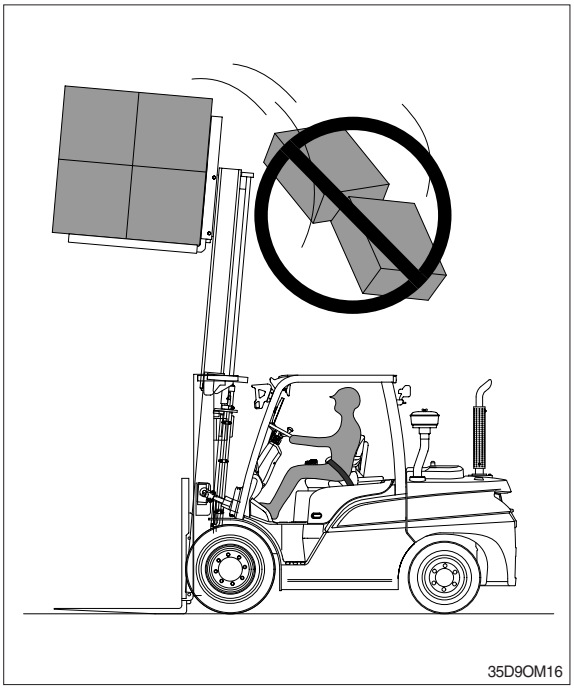


6. OPERATOR PROTECTION

1) Keep under the overhead guard.

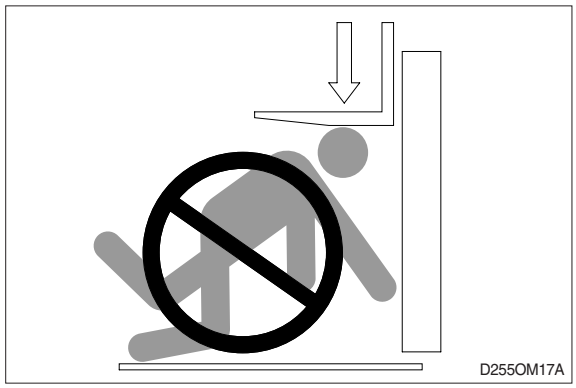
2) Always keep your body within the confines of the truck.

⚠ **Do not operate truck without overhead guard, unless condition prevent use of a guard.**

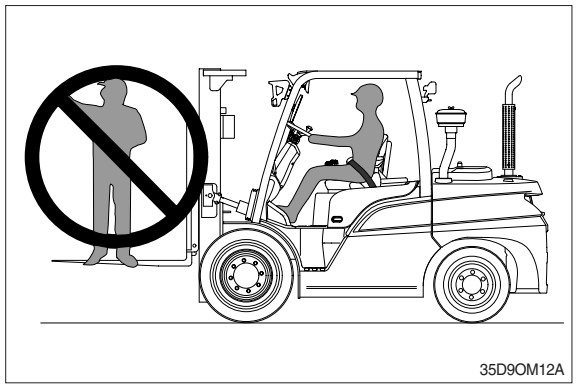


7. FORK SAFETY

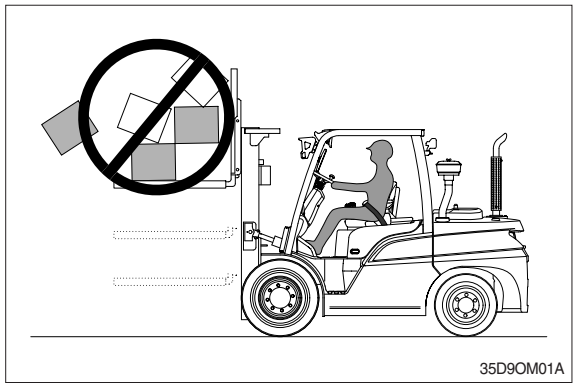
Never allow anyone to walk under raised forks.



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

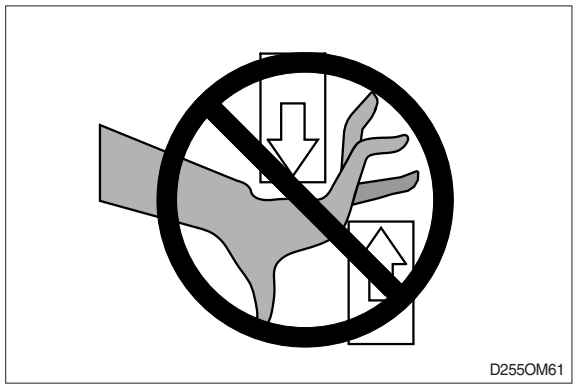


Always lower the load slowly.
Raise and lower with mast vertical or tilted slightly back (Never forward).

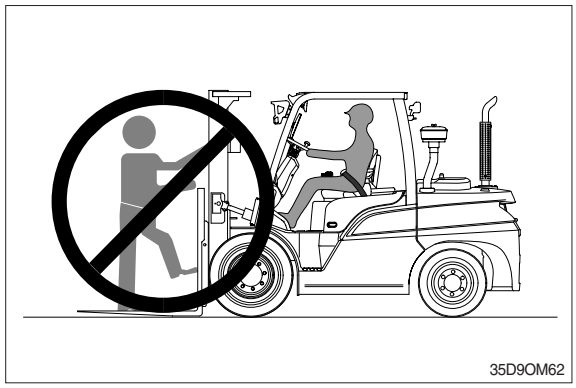


8. PINCH POINTS

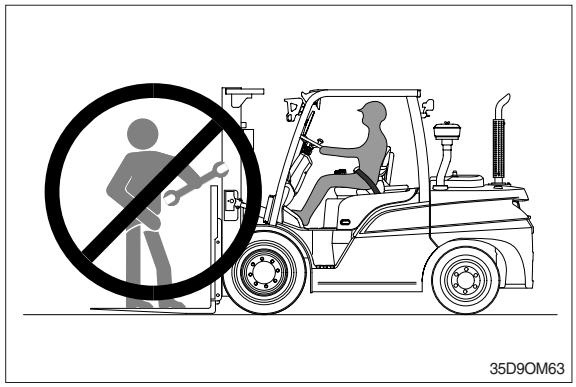
⚠ Keep hands, feet and legs out of the mast.



⚠ Don't use the mast as a ladder.



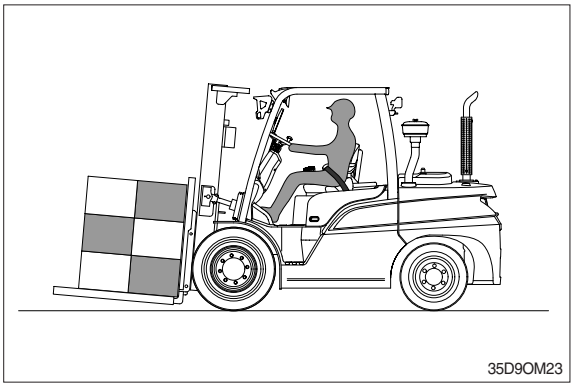
⚠ Never try to repair the mast, carriage, chain, or attachment by yourself. Always get a trained mechanic.



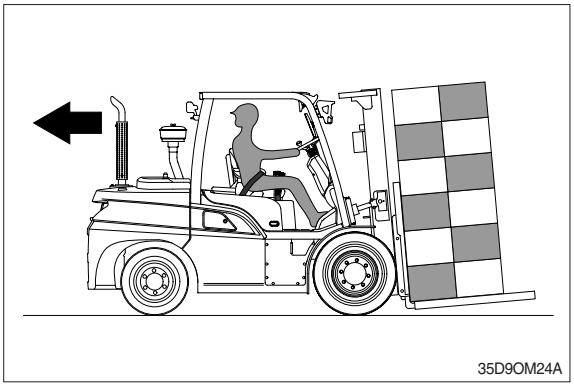
9. TRAVEL

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

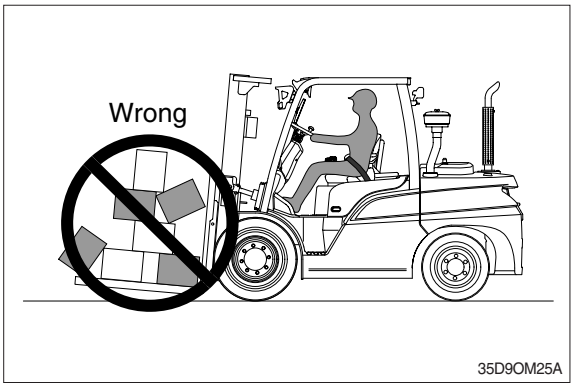
⚠ **Never lift or lower the load when the truck is in motion.**



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.



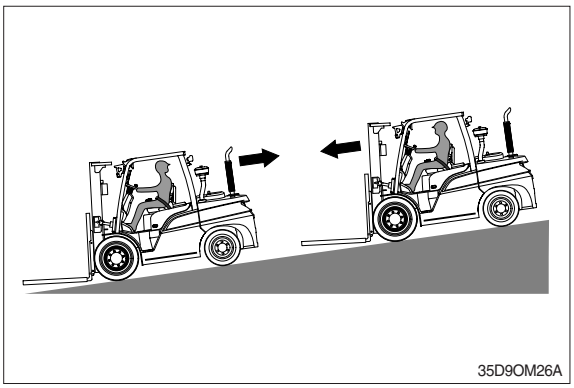
3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.



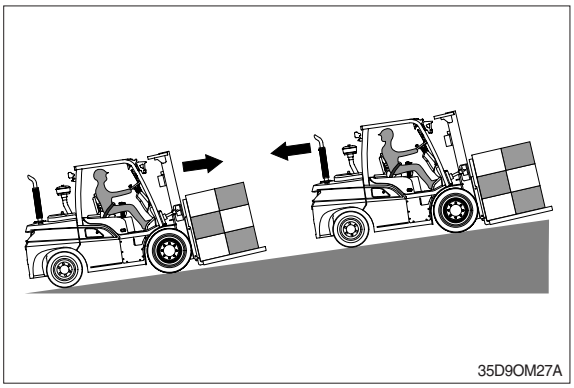
10. GRADES, RAMPS, SLOPES AND INCLINES

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

1) Unloaded-Forks downgrade



2) Loaded - Forks upgrade



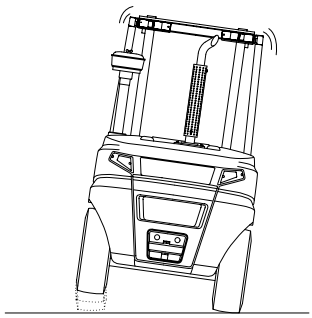
11. TIP OVER

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.



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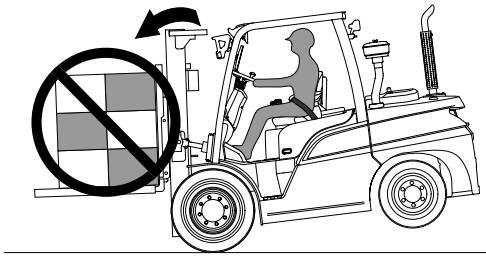
2) LONGITUDINAL TIP OVER

(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.



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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.

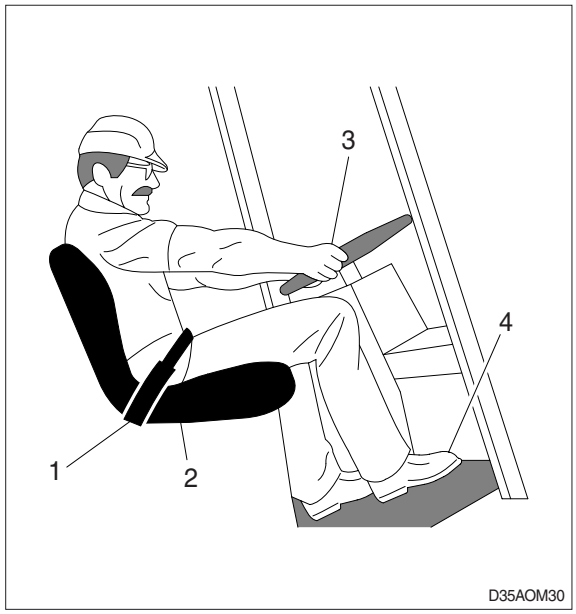
3) WHAT TO DO IN CASE OF A TIP OVER

⚠ 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.

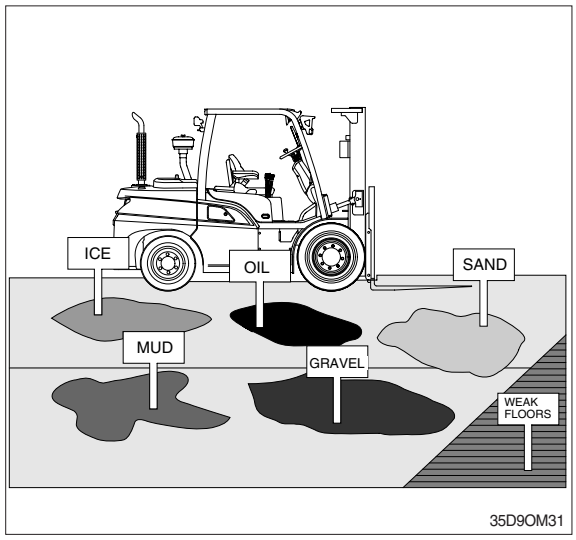
⚠ Your chances for survival in a tip-over are better if you stay with the truck, in your seat.



12. SURFACE AND CAPACITY

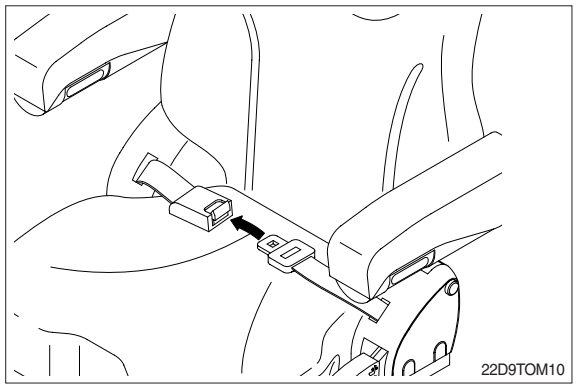
Avoid these conditions. They can cause a truck to tip over or lose traction for braking or driving.

⚠ **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.**



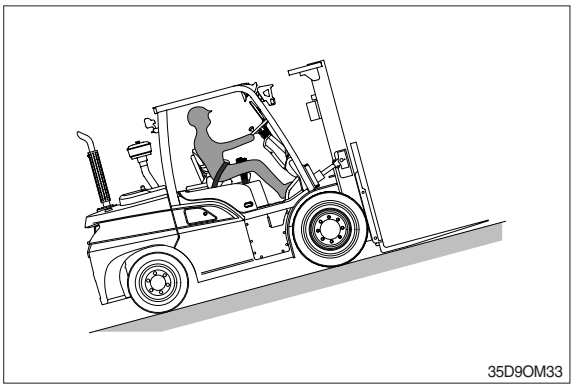
TIPOVER

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

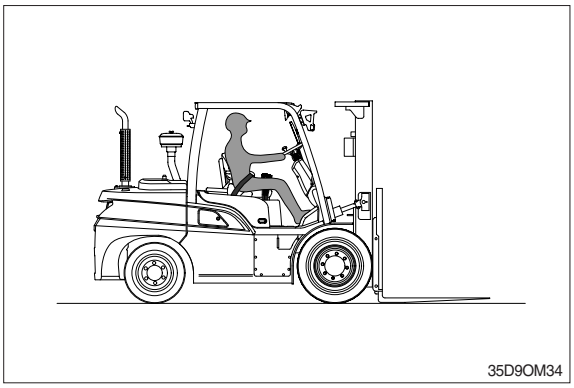


13. PARKING

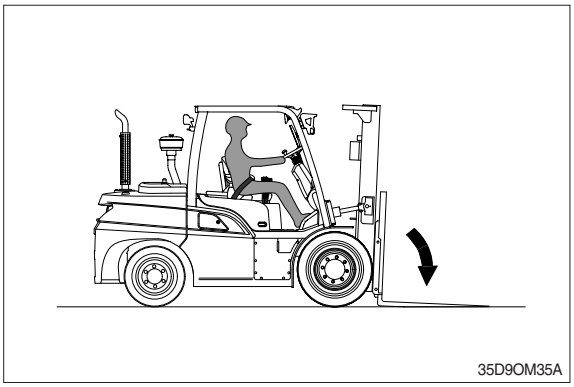
1) Never park on a grade.



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

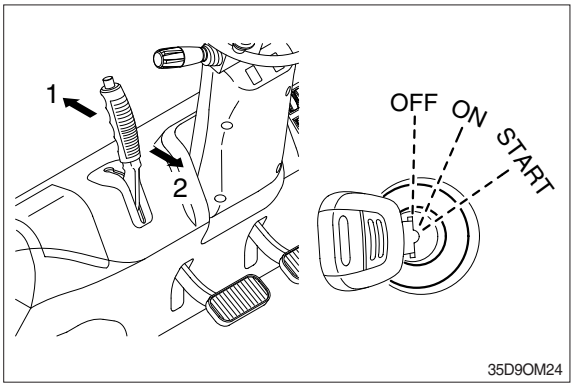


3) Lower forks fully to the floor and tilt forward.



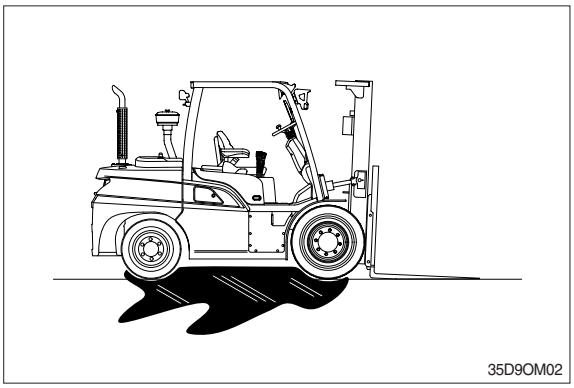
4) Set the parking brake.
   Position 1 : Release
   Position 2 : Lock

5) Turn key to OFF position.

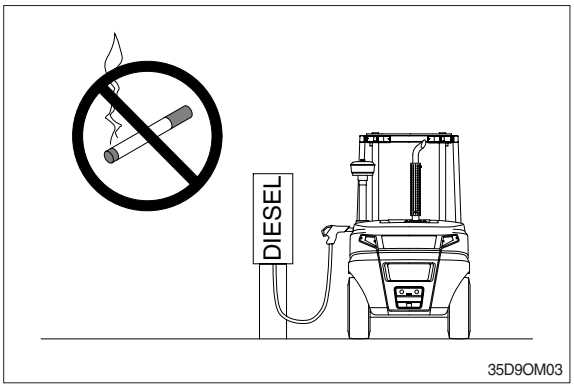


14. REFUELING

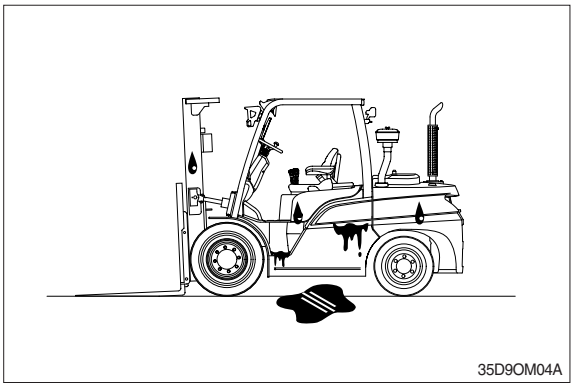
1) Before adding oil, check around truck for oil leakage.



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

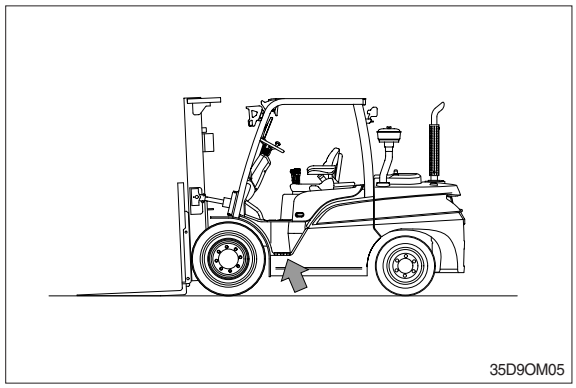


3) After adding oil, wipe off any oil spilled on the truck.

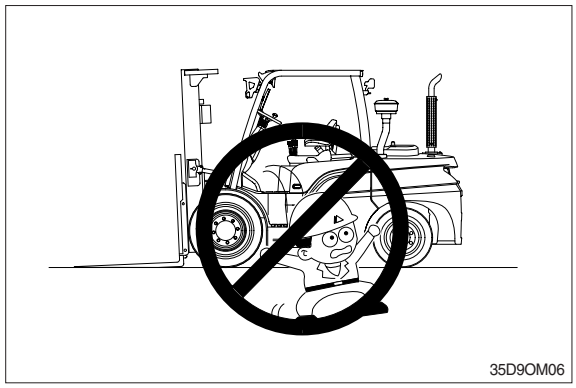


15. STEP

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



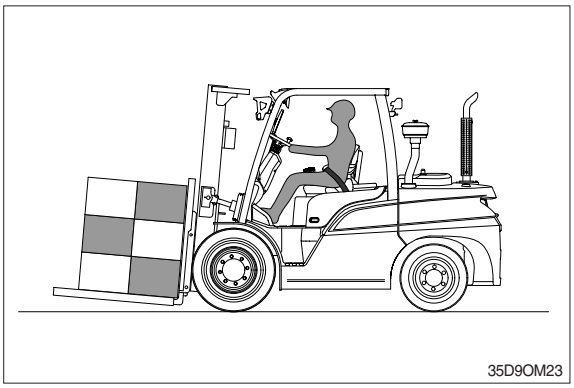
2) Do not jump up or down from the truck.



16. OPERATOR'S SAFETY RULES

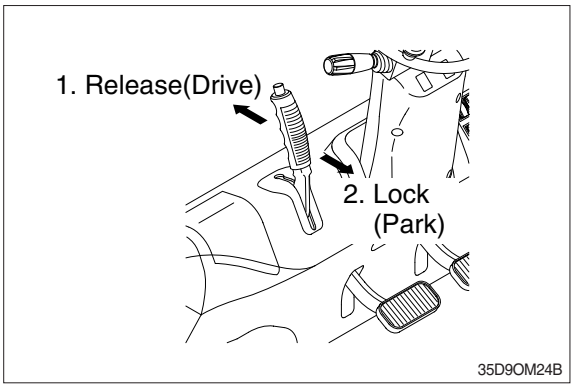
1) All operational functions require that the operator be seated in the operator's seat.

⚠ **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 (2) except when an operator is in the normal operating position.**



3) ANSI/ASME/ISO REGULATIONS

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

***OPSS : Operator Presence Sensing System**

(1) Traction safety warning

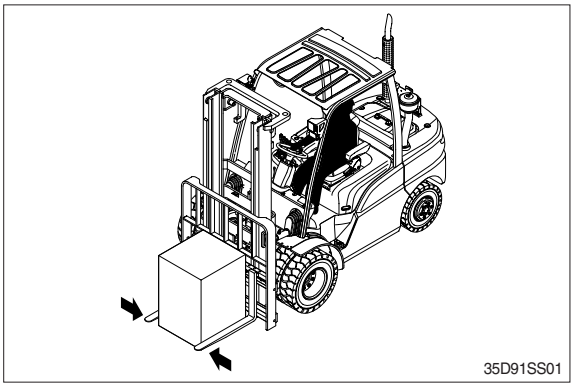
① This function works when the key switch is ON or START position.
② The transmission shifts automatically to neutral in 2 seconds from the driver's off the seat.
③ At the same time, the OPSS warning lamp ON and the alarm will sound intermittently if the gear selector lever was not return to the neutral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

(2) Parking brake warning

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

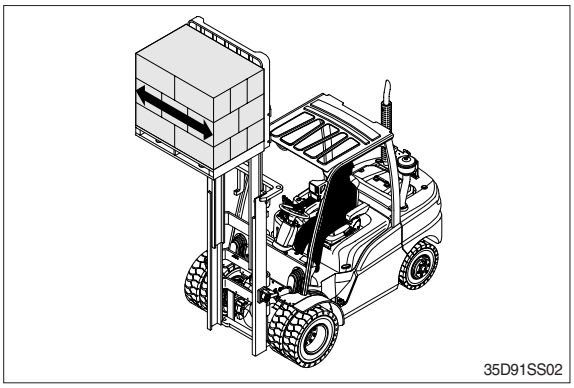
17. SIDE SHIFT

⚠ Do not put side loads on the forks.



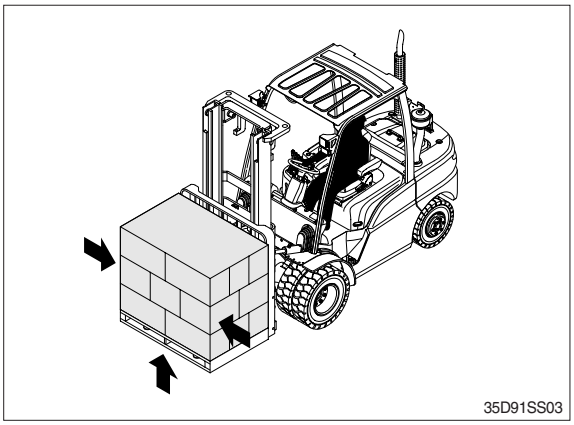
⚠ Restrict the sideshift movement with raised load.

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

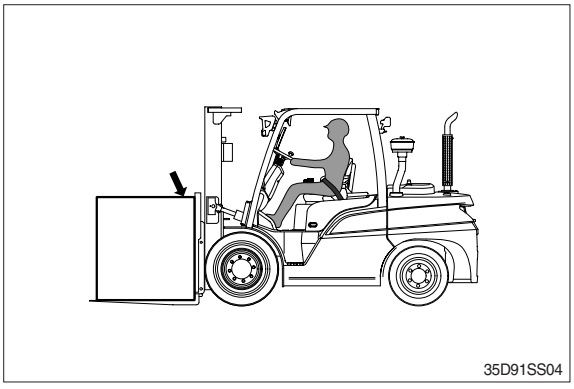


⚠ Avoid overloading or uneven loading.

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.



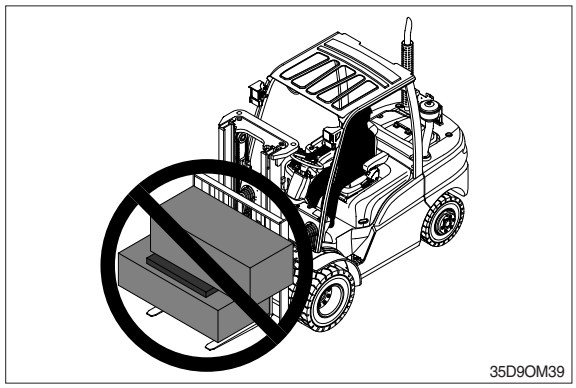
⚠ Top of the load should not extend above the backrest.



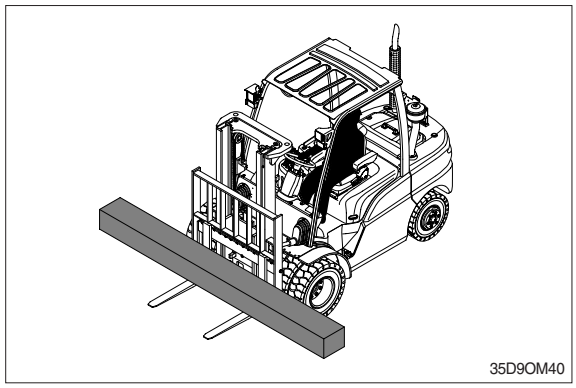
1. LOOSE LOADS

⚠ Loose or unbalanced loads are dangerous. Observe these precautions.

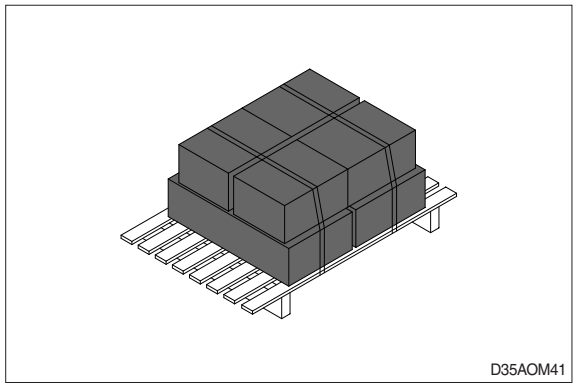
Never carry loose or uneven material.



Center wide loads.

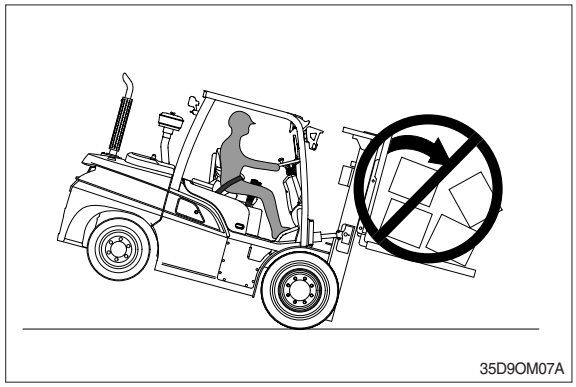


Stack and band loose material.



Avoid sudden braking or starting

⚠ When the machine is loaded, do not drive at maximum speed.

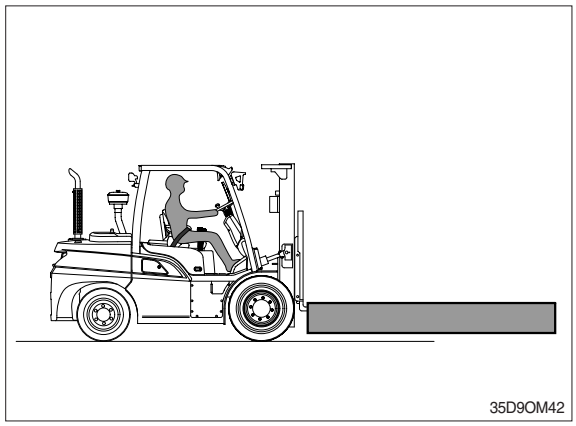


2. LONG AND WIDE LOADS

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

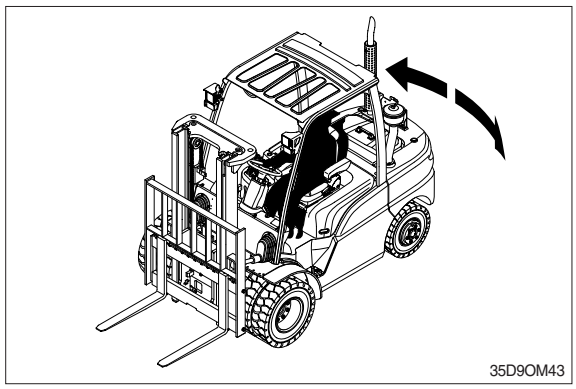
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

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



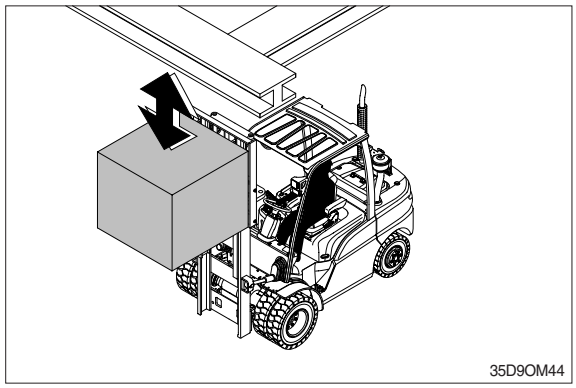
3. REAR SWING

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

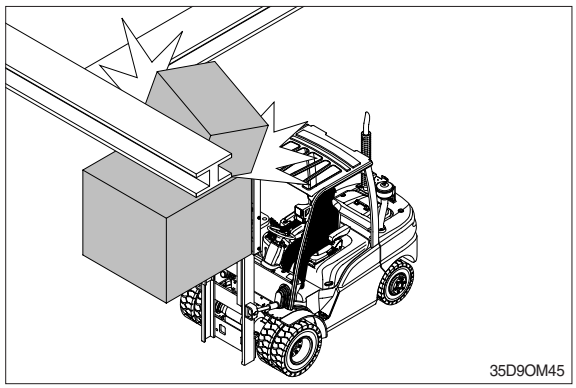


4. LOW OVERHEAD CLEARANCE

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

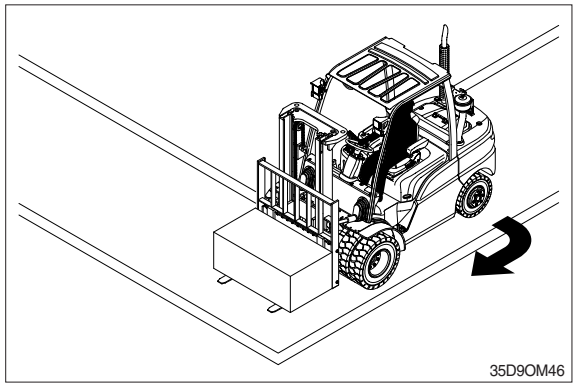


⚠ Watch overhead clearance:
Moving into overhead structures can tip a truck over, or spill a load.

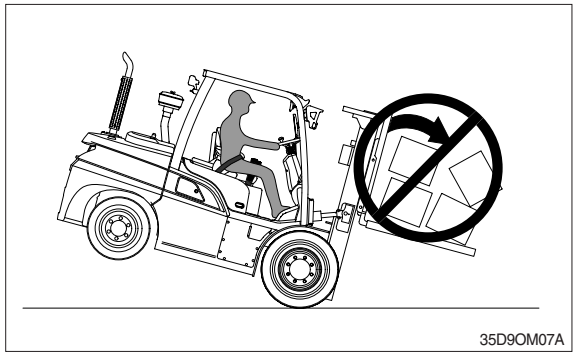


5. FAST TURNS AND HIGH LOADS

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



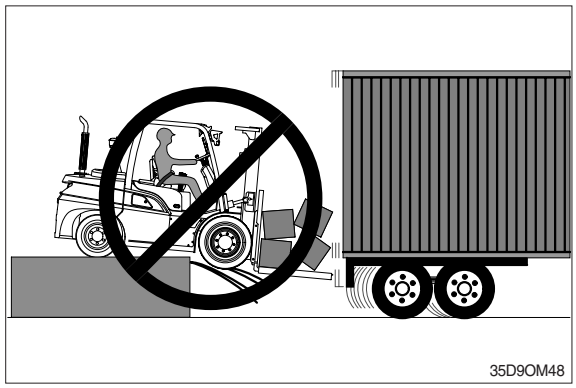
⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.



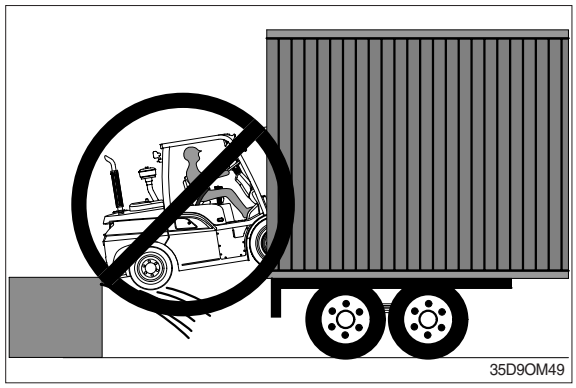
6. DROP-OFFS

⚠ **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.

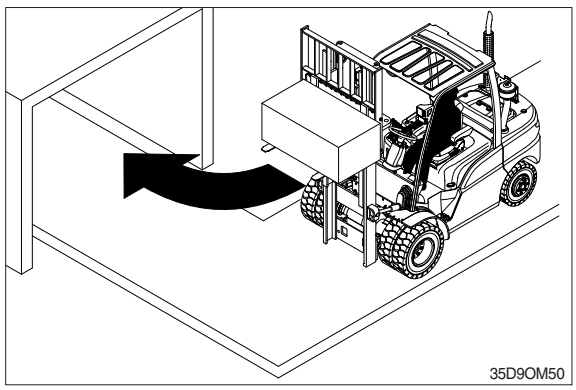


⚠ **The impact of moving in and out of a trailer may cause the trailer to creep or move.**



7. RIGHT ANGLE STACKING

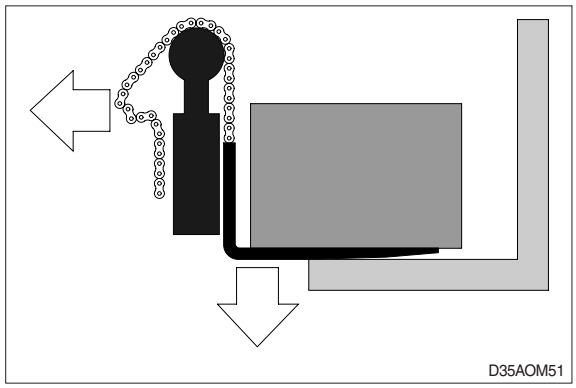
⚠ **When right angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.**

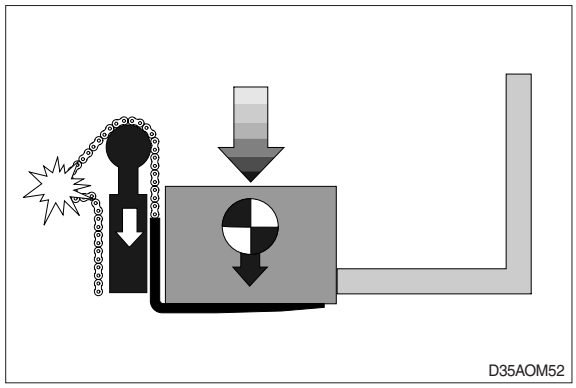


8. CHAIN SLACK

⚠ 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.

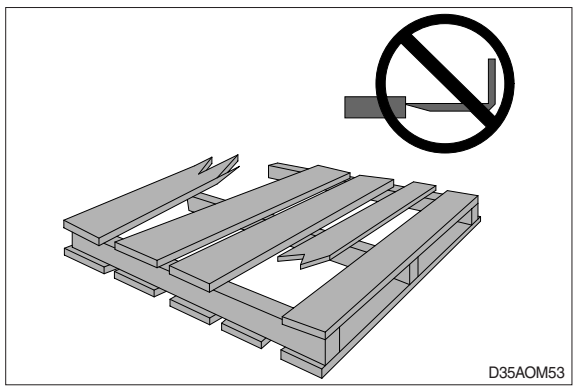




9. PALLETS AND SKIDS

⚠ 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.



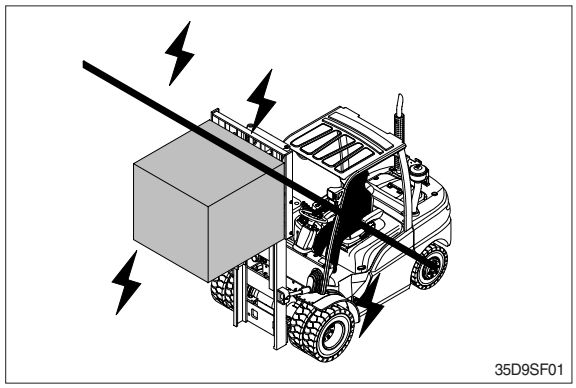
10. CAUTION FOR ELECTRICAL LINES

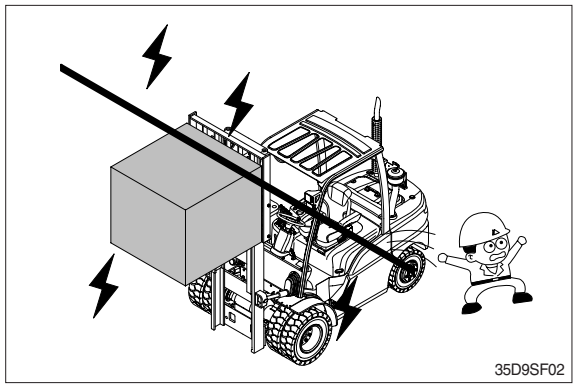
⚠ When moving the machine with the mast raised, watch out electrical lines over the machine.

⚠ The operating near the electrical lines is very dangerous.
Operate within safe working permitted as below.

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

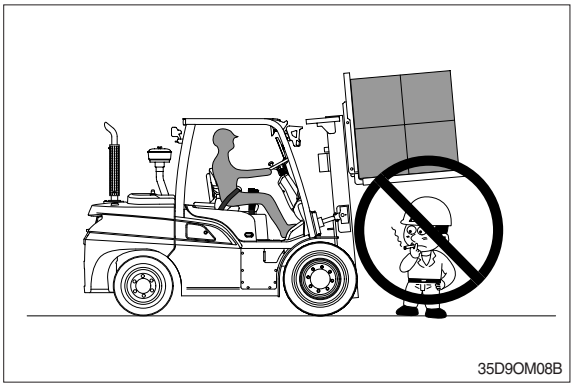
⚠ If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current.
Jump off the machine without contacting the machine when you need to get off.


35D9SF01

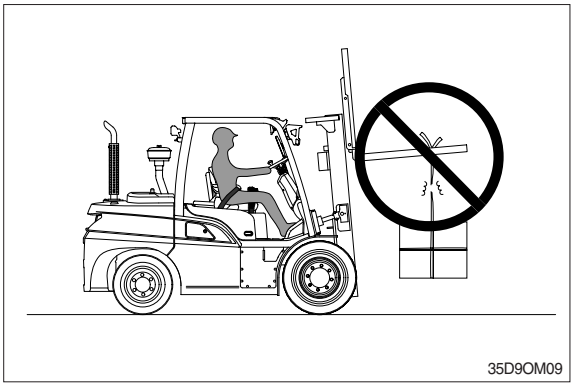

35D9SF02

11. LIFTING LOADS

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



Never use wire rope to lift a load.



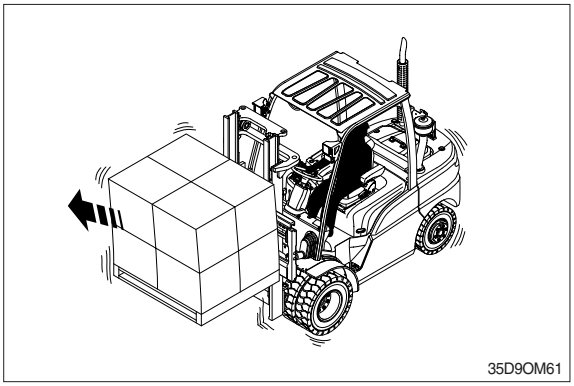
12. SIDE SHIFT

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.

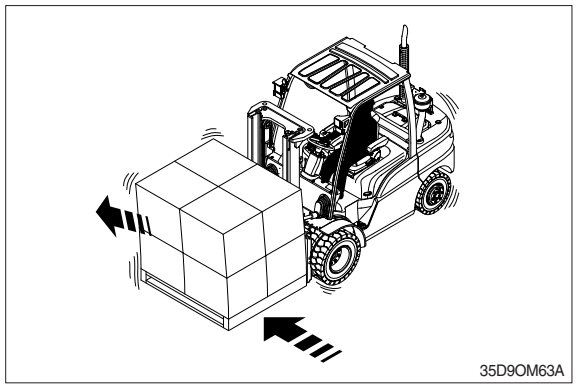
In case of moving the side shift with load, it can be caused load dropping or overturning of the forklift due to unbalanced weight.

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

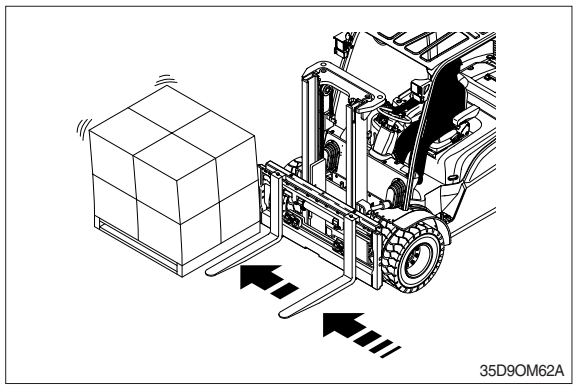


It should be observed that the side shift with load is operated in netural position before traveling.

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

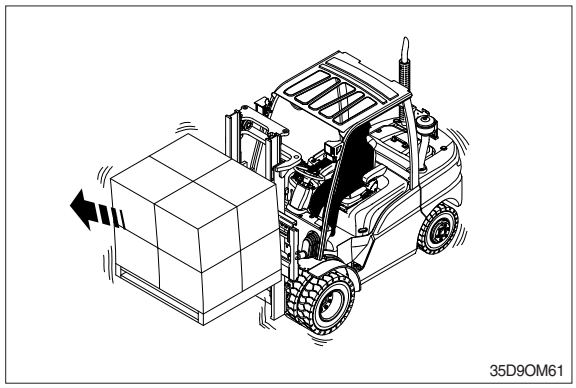


Never move the load to push or pull of it by the side shift.
It can be caused damaging of the loads or injuring of the people.



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

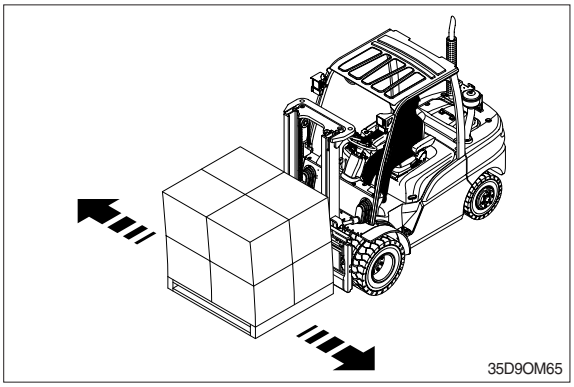
When lifting or lowering the side shift with load, it should be observed that the load is moved into the netural position.



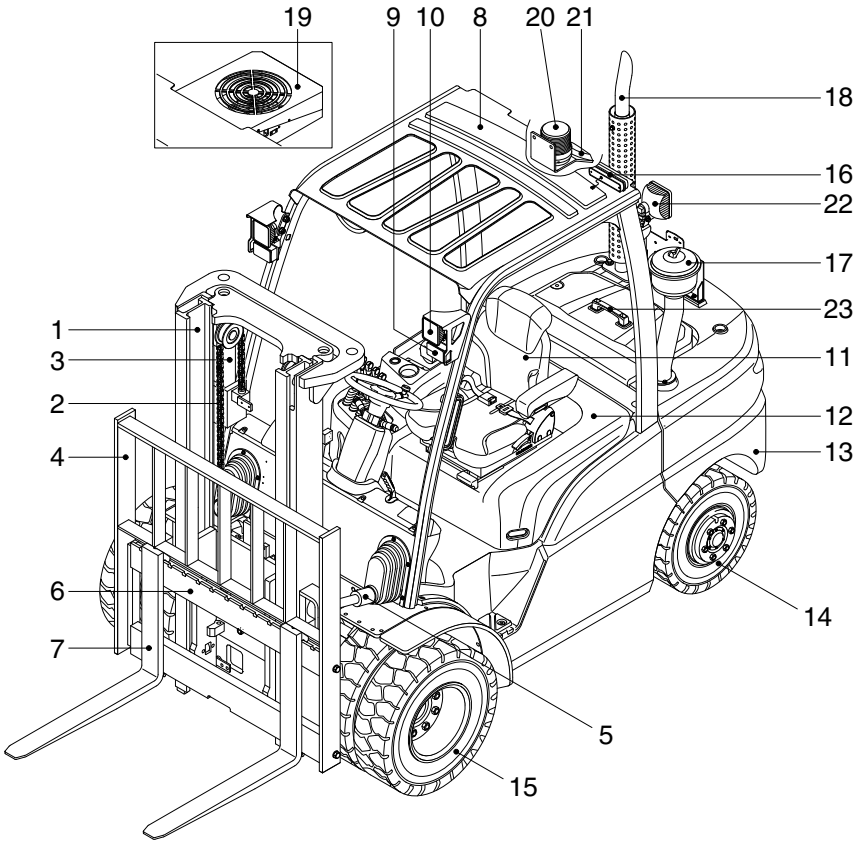
13. FORK POSITIONER

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.**



1. GENERAL LOCATIONS

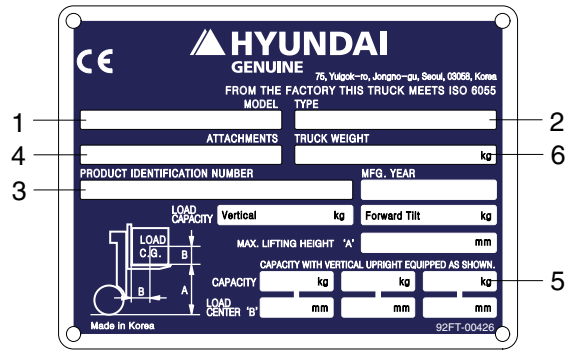


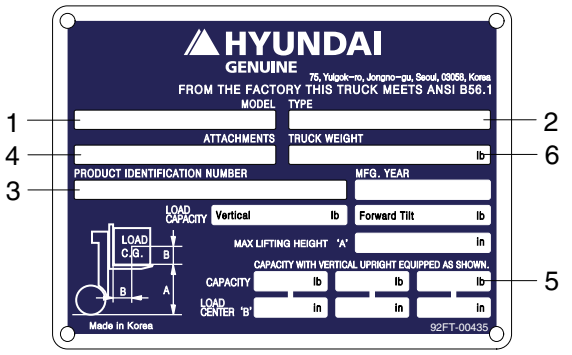
35D9OM54

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

2. DATA/SAFETY PLATES AND DECALS

1) TRUCK DATA AND CAPACITY 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.

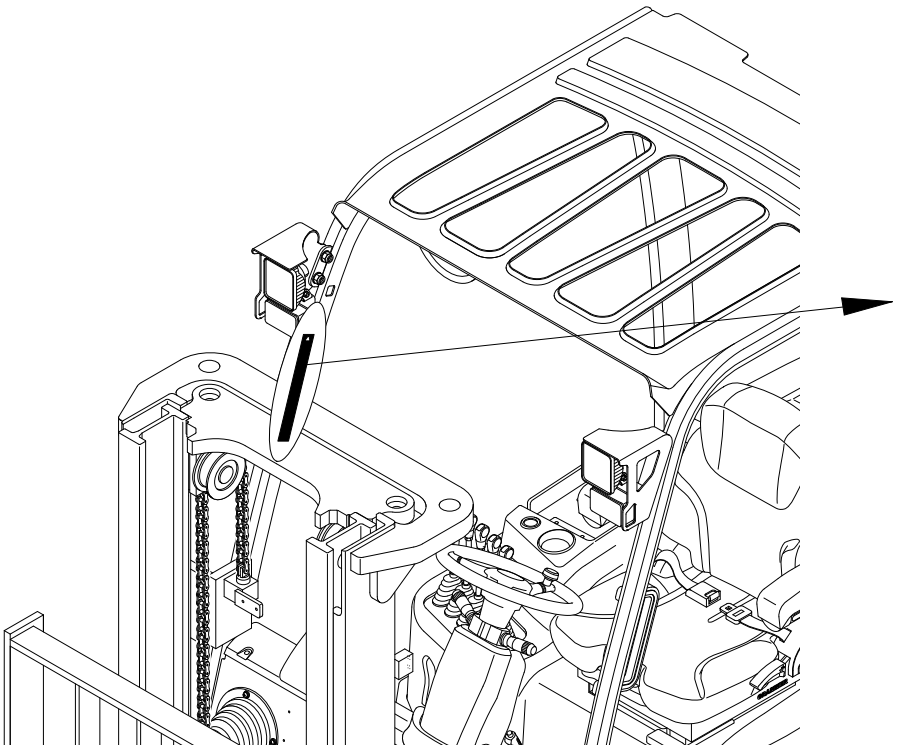
Do not exceed the maximum capacity specified.

(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. Contact your authorized HYUNDAI dealer for a new nameplate showing the revised capacity.

2) OPERATOR SAFETY WARNING DECAL



35D9OM59

35D9SOM09A

⚠ 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 your Service manual for the location of all decals.

⚠ Operator/Tip-over warning decal

This decal is located on the front right hand leg 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.

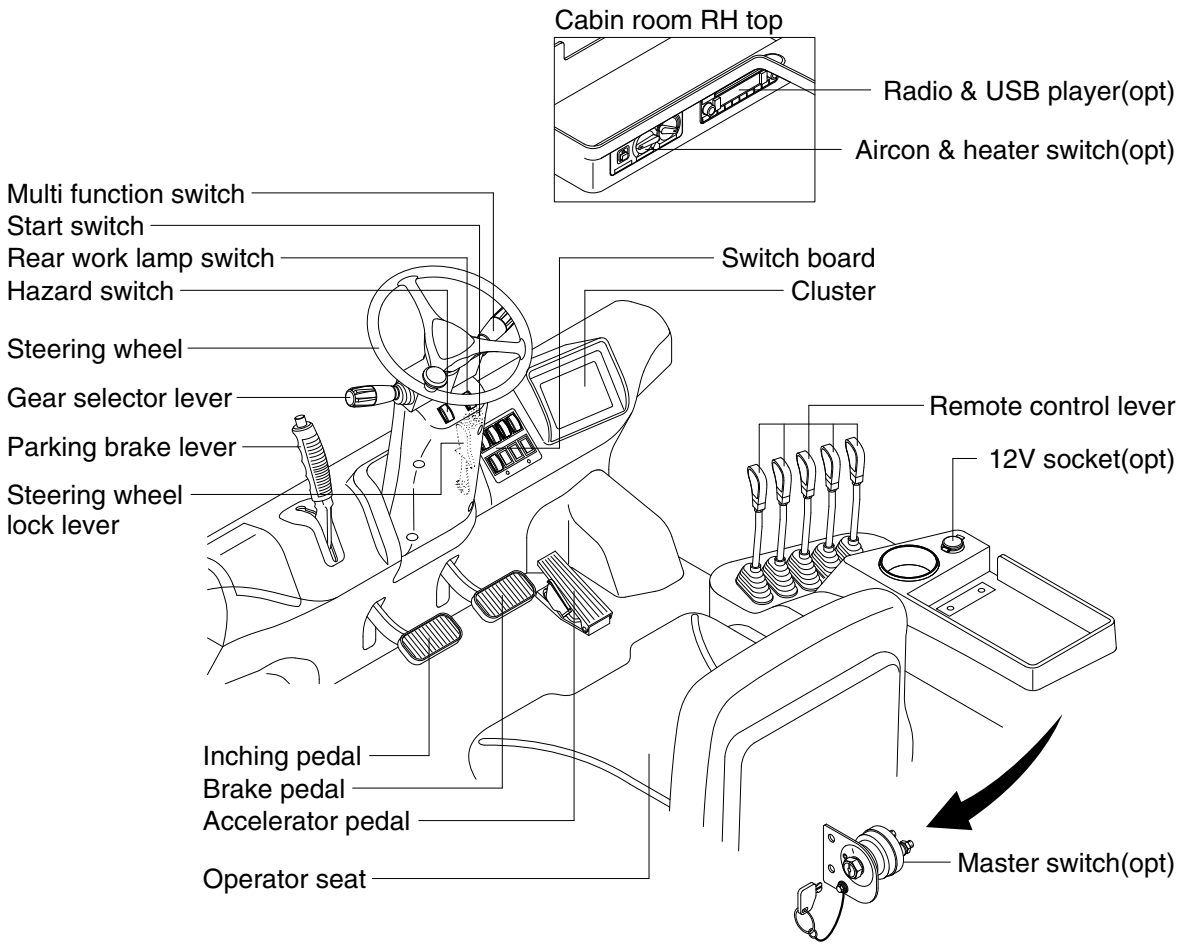
3. CAB DEVICES

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.



35D9CD01

4. CLUSTER

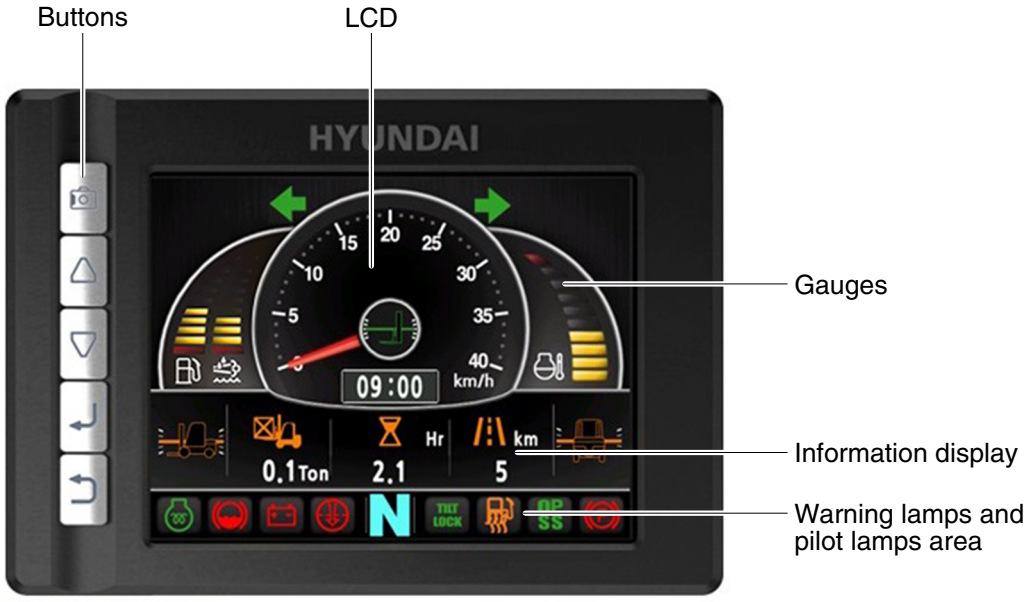
1) STRUCTURE

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.



35D9CL001

2) GAUGE

(1) Operation screen

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

35D9CL002

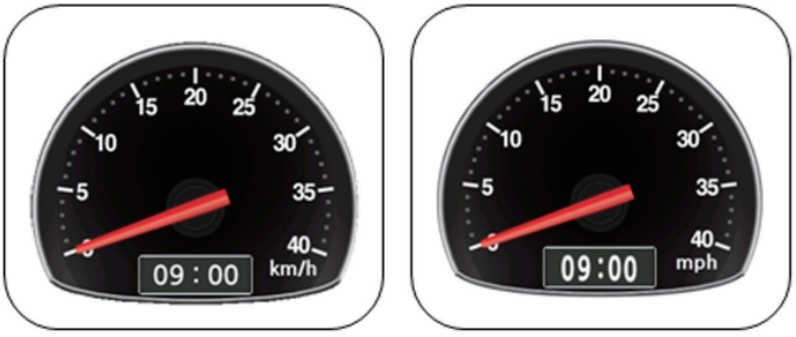
1	Speed meter	4	Clock
2	Fuel gauge	5	DEF level gauge
3	Coolant temperature gauge		

(2) Speed meter

① Display the trip speed of truck.

② Speed unit is km/h or mile.

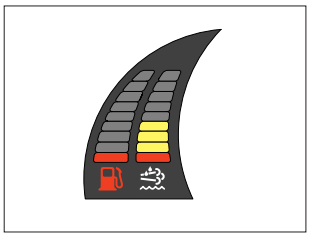
※ **Speed unit can be set in the speed unit menu of display set up.**



km/h mile

35D9SCL003K

(3) Fuel gauge



35D9CL004

① Display the remains of fuel tank.

② If the gauge displays in the red zone, or warning lamp will be lit up in red, please refuel.

(4) Coolant temperature gauge

35D9SCL005K

① Display the coolant temperature.

- White zone : 40 ~ 120˚C (104~248˚F)
- Red zone : Over 120˚C (248˚F)
- Warning lamp on : Over 115˚C (239˚F)

② If the gauge displays in the red zone, or warning lamp is on, please stop the engine and inspect the coolant system.

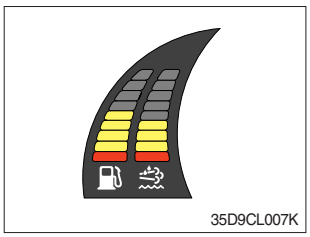
(5) Clock

35D9SCL006K

① Display current time.

② You can enter current time at display Set Up > Time Set Up menu.

(5) DEF level gauge



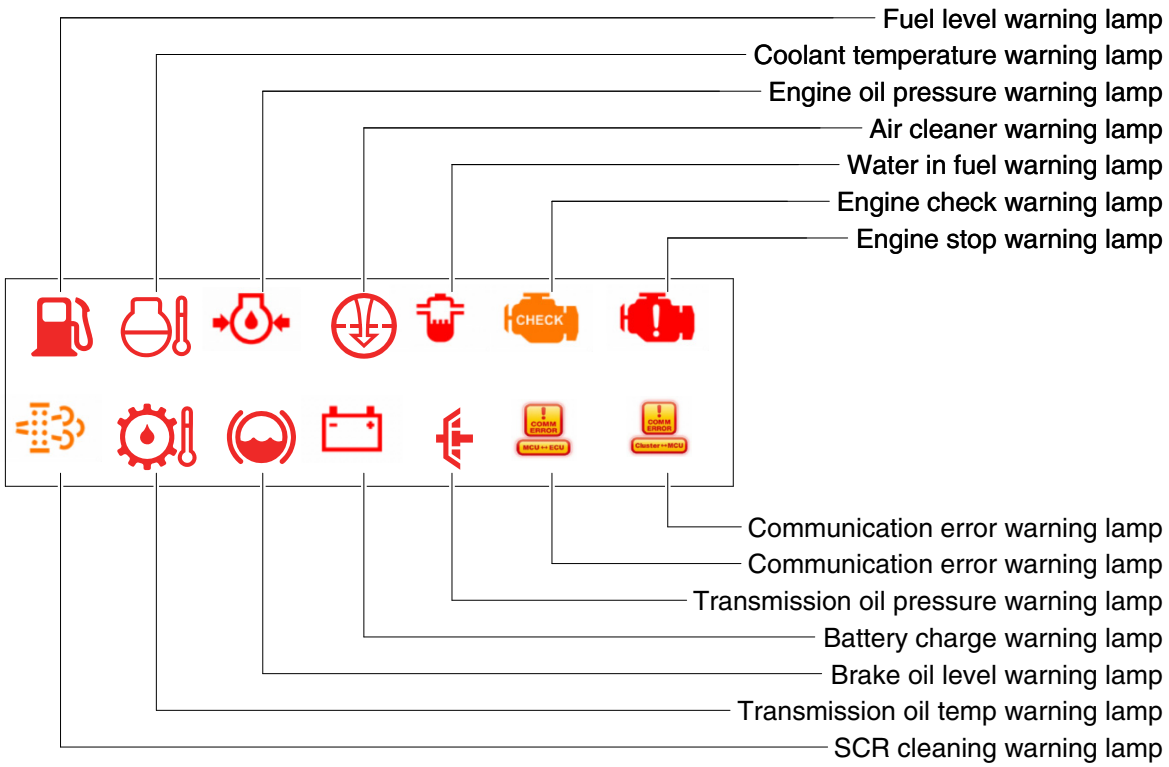
35D9CL007K

① Display the remains of the DEF tank.

② If the gauge displays in the red zone or warning lamp lights up in red, please fill the DEF.

3) WARNING LAMPS

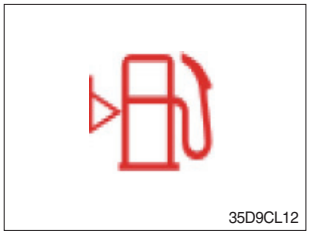
Warning lamps



35D9CL007

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

(1) Fuel level warning lamp



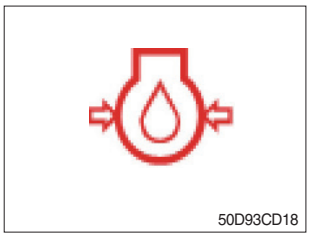
35D9CL12

① Warning lamp will be displayed if fuel level is low.
② Please refuel immediately if the lamp is on.

(2) Coolant temperature warning lamp

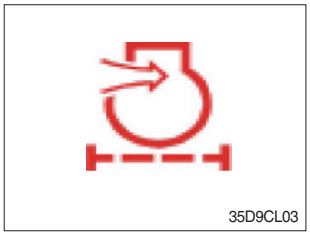
① Coolant temperature warning will be lit up when temperature is over 115˚C.
② If the warning lamp is on continuously, please inspect the coolant system.

(3) Engine oil pressure warning lamp



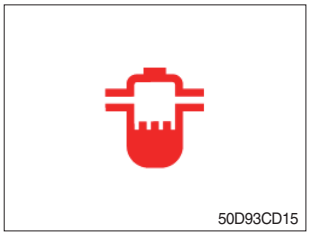
① This warning lamp will be lit up when engine oil pressure is low.
② Stop the engine immediately if the warning lamp is lit up.
③ Please check the engine oil.

(4) Air cleaner warning lamp



① This warning lamp is lit when air cleaner filter is clogged up.
② Please clean up or replace the filter.

(5) Water in fuel pilot lamp

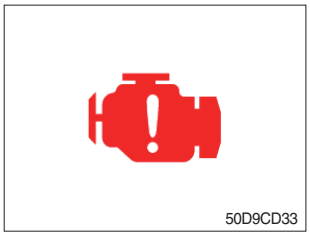


① Light up when water in fuel.
② Stop the engine and please drain the water of the prefilter.

(6) Engine check warning lamp

① If the lamp lights ON, check the engine.
Refer to the page 3-10.
② Check the failure code of cluster.

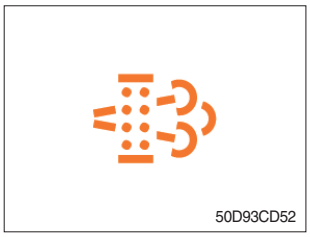
(7) Engine stop warning lamp



① If the lamp lights ON, stop the engine immediately and check the engine.
Refer to the page 3-10.

※ Please contact your Hyundai service center or local dealer.

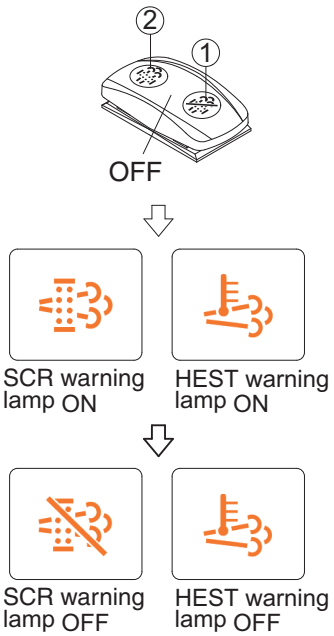
(8) SCR cleaning warning lamp



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

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

※ Manual SCR cleaning method



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

① Stop and park the machine.

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

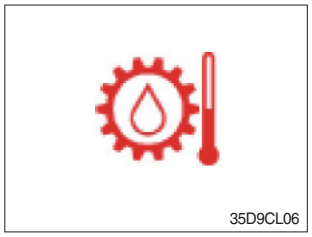
※ Refer to the page 3-45 for the switch operation.

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

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

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

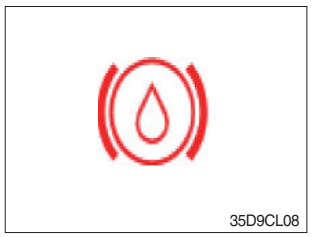
(9) TM oil temperature warning lamp



① Transmission oil temperature warning is consisted of two indications.
- 110˚C or higher : Amber is light up
- 120˚C or higher : Red is flashing

② When this lamp light up during operation, stop the engine and check the machine.

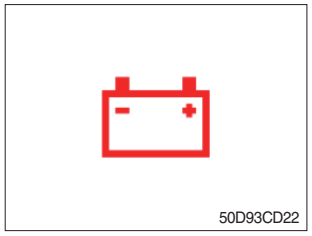
(10) Brake oil level warning lamp



① Warning lamp will be displayed if brake oil is low of reservoir tank.

② Please refill immediately if the lamp is on.

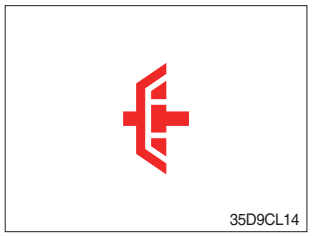
(11) Battery charge warning lamp



① This warning lamp is lit when battery charging voltage is low.

② Please inspect the battery charging circuit if the warning lamp is lit.

(12) T/M oil pressure warning lamp

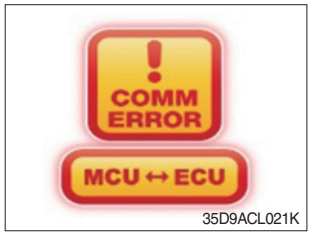


① Warning lamp will be displayed if transmission oil pressure is not enough.

② The lamp also will be displayed while inching operation.

③ Please check the transmission when the lamp is displayed without inching operation.

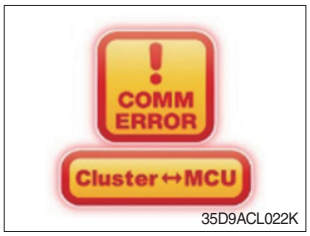
(13) Communication error warning lamp



① This warning lamp will be lit up if the communication between MCU and ECU is fail.

② Please check the communication line if the warning lamp is lit up.

(14) Communication error warning lamp



① This warning lamp will be lit up if the communication between MCU and cluster is fail.

② Please check the communication line if the warning lamp is lit up.

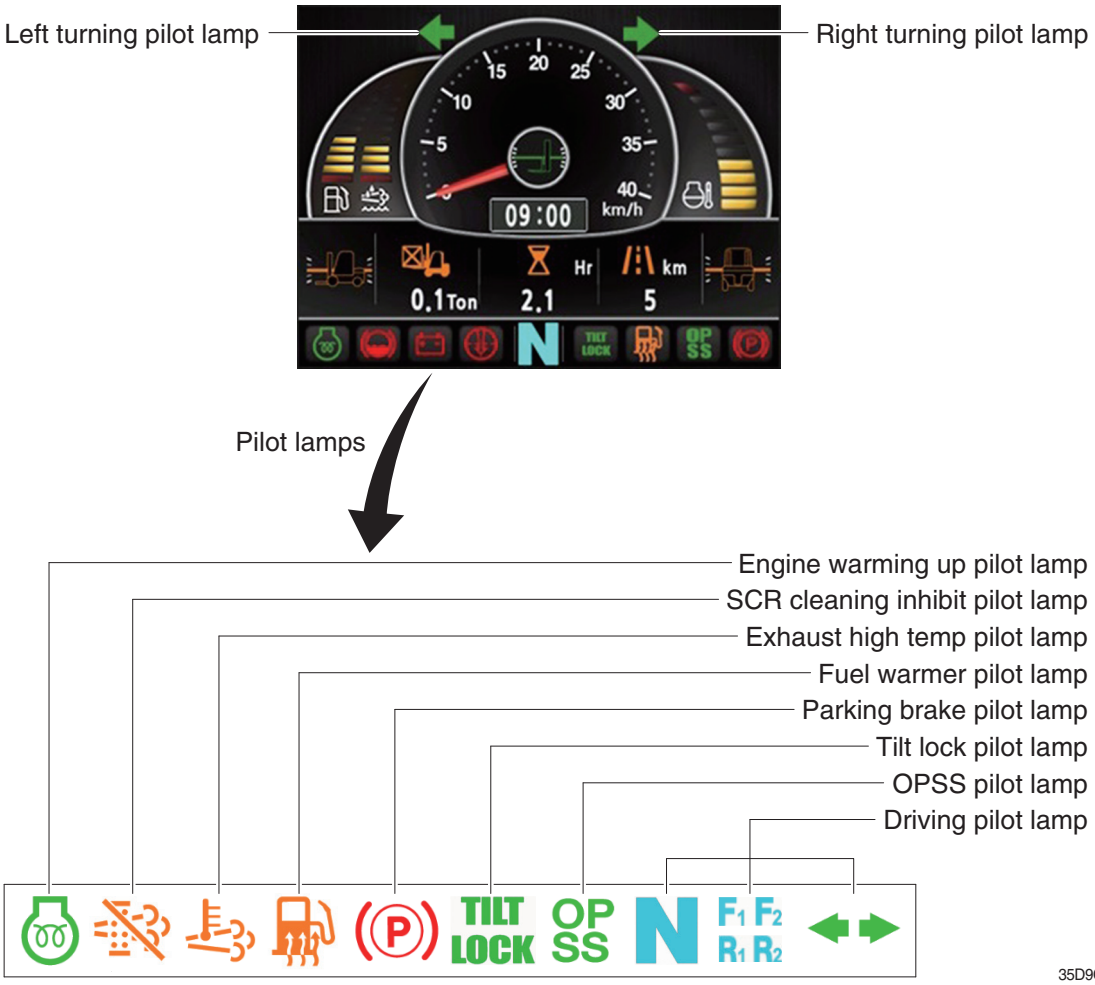
(15) DEF (Diesel Exhaust Fluid) low warning lamp

① This warning lamp indicates, when illuminated or flashing, that the diesel exhaust fluid level is low.

※ Add the diesel exhaust fluid into DEF tank.

※ Refer to the page 3-10 for detail.

4) PILOT LAMPS



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

(1) Engine warm-up pilot lamp

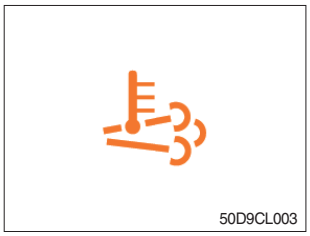
① The truck senses the engine coolant temperature and warms-up engine when needed. (coolant temperature < 0˚C).
② When it is happening, the indicator lamp is ON.

(2) SCR cleaning inhibit pilot lamp

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

※ **Refer to the page 3-45 for the SCR cleaning switch.**

(3) Exhaust high temperature pilot lamp



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

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

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

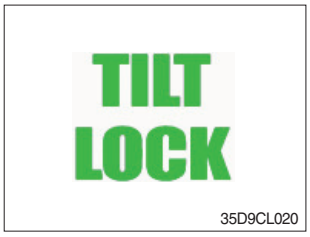
(4) Fuel warmer lamp

① Light up when operation the fuel warmer switch.

(5) Parking brake pilot lamp

① Light up when parking brake is ON.

(6) Tilt lock pilot lamp



① The Indicator lamp will be lit up if the tilt lock switch (optional) is entered.
② Tilt action will be limited if this Indicator lamp is lit up and the mast is located at 90 degrees.

(7) OPSS pilot lamp

① Light up if driver leave seat during operation.
② Machine driving and control will be blocked if lamp is lit up.
※ **Please refer to page 0-9 for details.**

(8) Driving pilot lamp

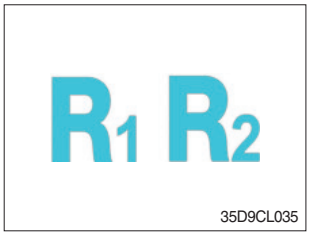
①Neutral

① This pilot lamp will be lit up when direction lever is located in neutral.

②Forward

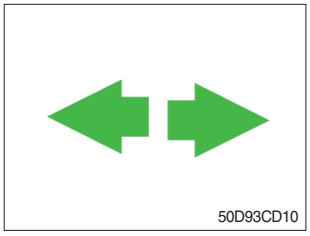
① This pilot lamp is displayed if the forward gear is selected.
② First gear will be displayed as F_1 , and second gear will be displayed as F_2 .

③Reverse



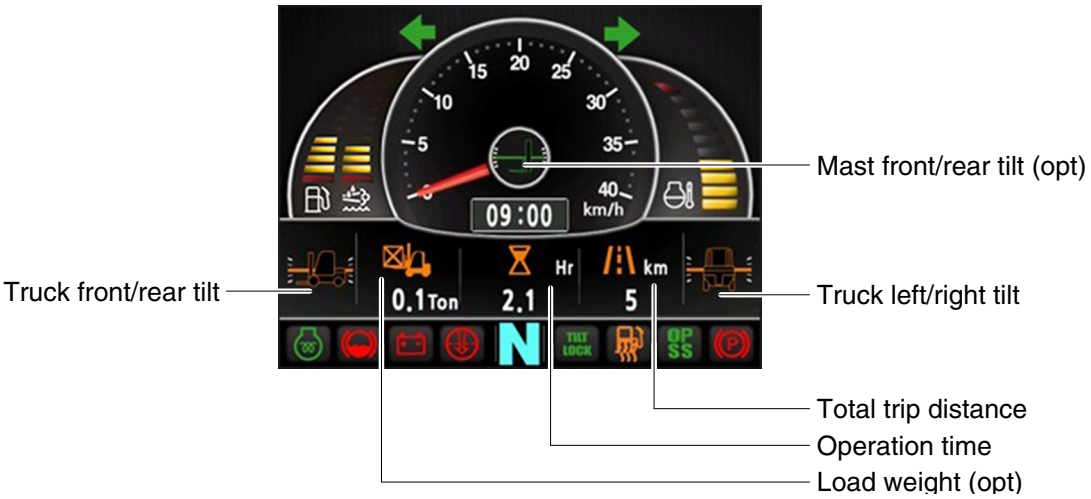
① This pilot lamp is displayed if the reverse gear is selected.
② First gear will be displayed as R_1 , and second gear will be displayed as R_2 .

④Right or left turning pilot lamp



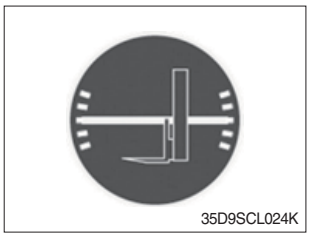
① This pilot lamp will flash if turns on the right or left turn signal.

5) INFORMATION DISPLAY



35D9CL023

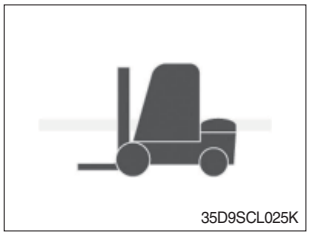
(1) Mast front/rear tilt (option)



35D9SCL024K

① Display the real time tilt of mast.

(2) Vehicle front/rear tilt



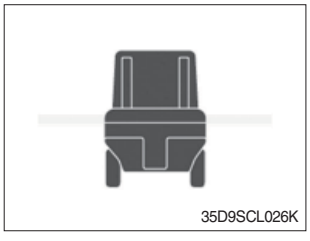
35D9SCL025K

① Display the front/rear tilt of vehicle in real time.

· Stop : Tilt angle is higher than 2.3˚ then the red warning symbol.

· Driving : Tilt angle is higher than 10.2˚ then the red warning symbol.

(3) Vehicle left/right tilt



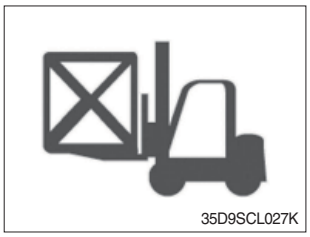
35D9SCL026K

① Display the left/right tilt of vehicle in real time.

· Stop : Tilt angle is higher than 3.4˚ then the red warning symbol.

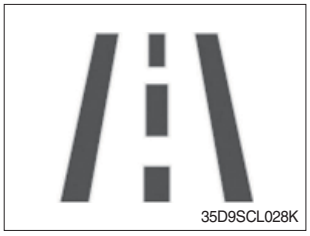
· Driving : Tilt angle is higher than 20.8˚ then the red warning symbol.

(4) Load weight (option)



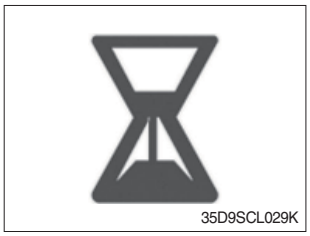
① Display the load weight.
② Screen will display blurry if the weight sensor has not been mounted.

(5) Total trip distance



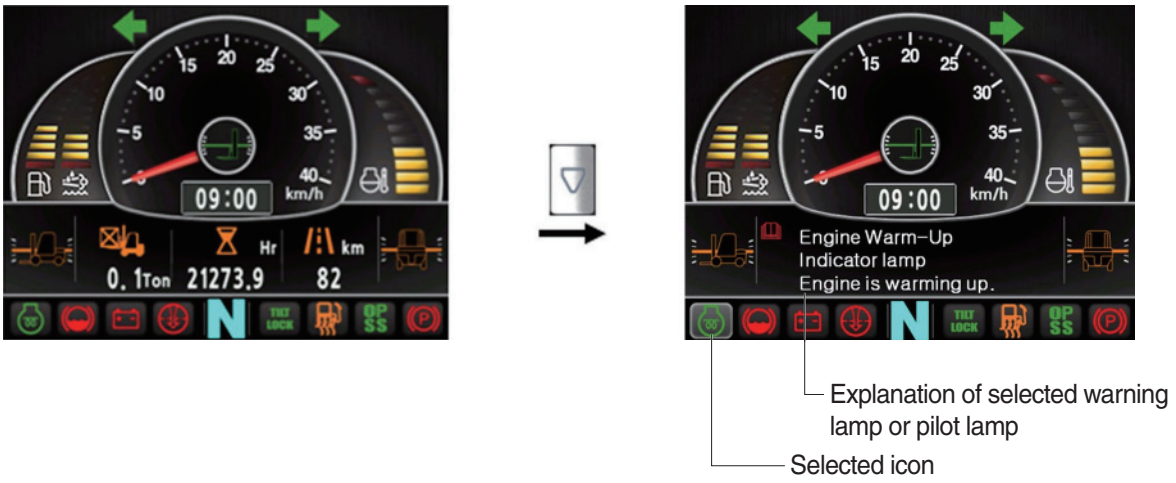
① Display total trip distance of the truck..
② Unit of distance is kilometer.

(6) Operation time



① Display the used time of the truck..
② Icon will be changed as follow if starts ignition.

(7) Explanation of warning lamp and pilot lamp

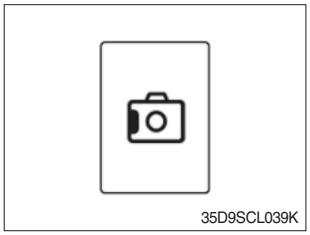


① Explanation will be displayed if press the arrow (refer to page 3-18) while warning lamp or pilot lamp is on.
② Explanation for warning lamp or pilot lamp that are shown on the screen will be displayed if press the arrow continuously.

6) BUTTONS

35D9CL038

(1) Camera

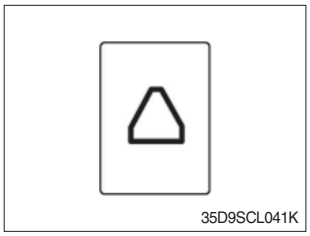


35D9SCL039K

① This switch displays rear camera images. (if the camera is mounted)

35D9CL040K

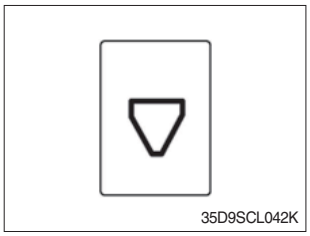
(2) UP/Left



35D9SCL041K

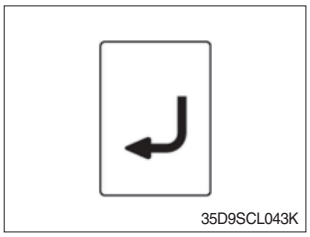
① This switch is used to move upward or leftward in menu or increase the value.

(3) Down/Right


35D9SCL042K

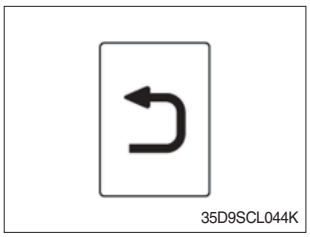
① This switch is used to move downward or rightward in menu or decrease the value.

(4) Select


35D9SCL043K

① This switch is used to enter into the menu or to select.

(5) Cancel (ESC)


35D9SCL044K

① This switch is used to cancel or move to upper menu.

35D9CL045

7) MAIN MENU

35D9CL046

A menu consists of main menu and sub-menu.

(1) Structure

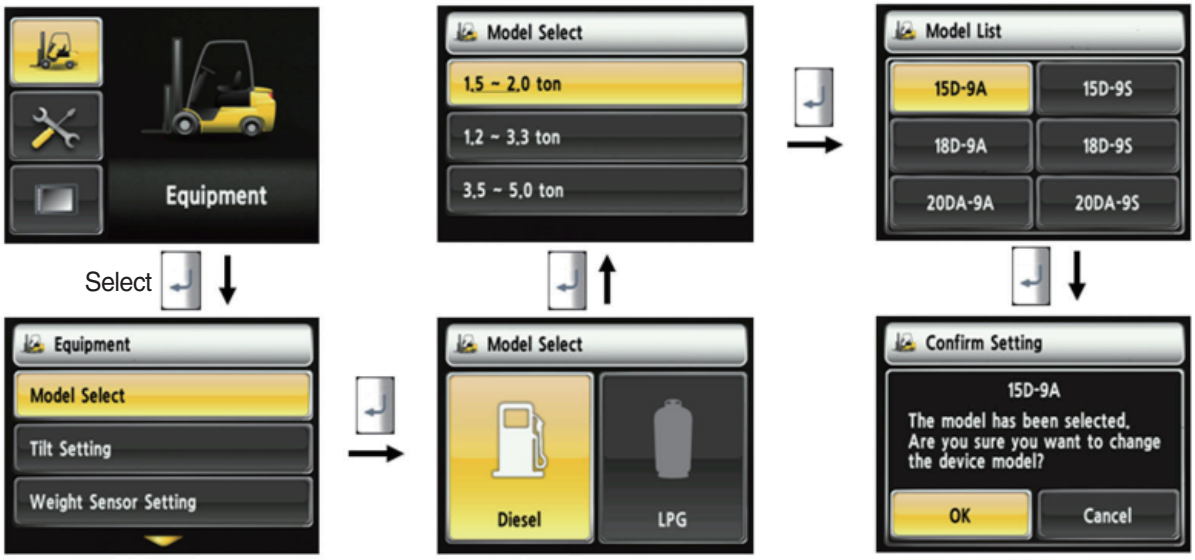
No	Main menu	Sub menu	Explanation
1		Model select	Diesel, LPG
		Vehicle tilt Initialize	Vehicle tilt Initialize
		Weight sensor setup	Enter the cylinder cross section area , Adjust load weight, Weight display setup
		Ignition control setup	Ignition control, Change password
		Camera setup	Interoperate with reverse gear
		Auto-shift speed setup	1st gear-> Switching speed to 2nd gear, 2nd gear -> Switching speed to 1st gear
		DCSR speed setup	DCSR On, Block driving speed, Restore driving speed
		Vehicle max speed limit	Maximum speed limitation
		MCU Cluster information	MCU/Cluster Information
2		Failure History	Current engine failure, Engine failure history
		Expendables management	Change oil and filter replacement cycle
		I/O Information	Analog Input, Digital input/output
3		LCD Brightness	Automatic, Manual
		Time Setup	Clock
		Unit Setup	Speed, Weight, Temperature, Pressure, Date type
		Language Setting	Korean, English
		A/S Contact	Change A/S contact
		ESL password	E/G starting password contect
		Maintenance management	Maintenance parts management

(2) Model select (a requid setting)

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

· **How to check the Model Select** (Check under the KEY ON status)

35D9CL070



35D9SCL047

· **How to select the model**

1. Device setup > Model select
2. Please select the fuel type.
3. Please select the vehicle weight level.
4. Please select the exact model name.
5. Selection will be cancelled if press the cancel button or ESC switch.
6. Check the phrases would be disappeared in the main screen.

※ **To use full function of vehicle, exact model must be selected.**

35D9CL071

(3) Initialize vehicle tilt (a requid setting)

· **How to check the "Initialize Vehicle Tilt"** (Check under the KEY ON status)

1) Vehicle that has not applied the mast angle sensor

2) Vehicle that has applied the mast angle sensor

35D9CL072

35D9CL048

· **Initialize vehicle tilt**

1. The tilt sensor has already been initialized when deliver the vehicle from factory.
2. Initialize vehicle tilt if the tilt sensor figure or vehicle tilt is not horizontal in the flatland.
   Vehicle set up > Initialize vehicle tilt
3. You must set tilt in the flatland since this is a horizontal set up.
4. If tilt sensor for mast is mounted (optional), locates the mast vertically.
5. Mast maximum angle depends on the vehicle.

· **Check functions**

(1) Check the real time operation by changing angles of vehicle tilt and mast tilt,

(2) Auto-leveling (option)

① Tilt mast inward or outward.

② Start tilting mast toward its vertical position, pushing the auto tilt leveling switch.

③ Check if the mast stops traveling when it becomes vertical to ground.

(3) Front/Rear Tilt Warning (red)

① Stop : ±2.3° (1.5 tons~5.0 tons)

② Driving : ±10.2° (1.5 tons~5.0 tons)

(4) Left/Right Tilt Warning (red)

① Stop : ±3.4° (1.5 tons~5.0 tons)

② Driving

Vehicle Weight	Warning Angles (Red)
1.5 tons~2.0 tons	±20.3°
2.2 tons~3.3 tons	±20.8°
3.5 tons~4.5 tons	±24.2°
5.0 tons	±28.0°

35D9CL073

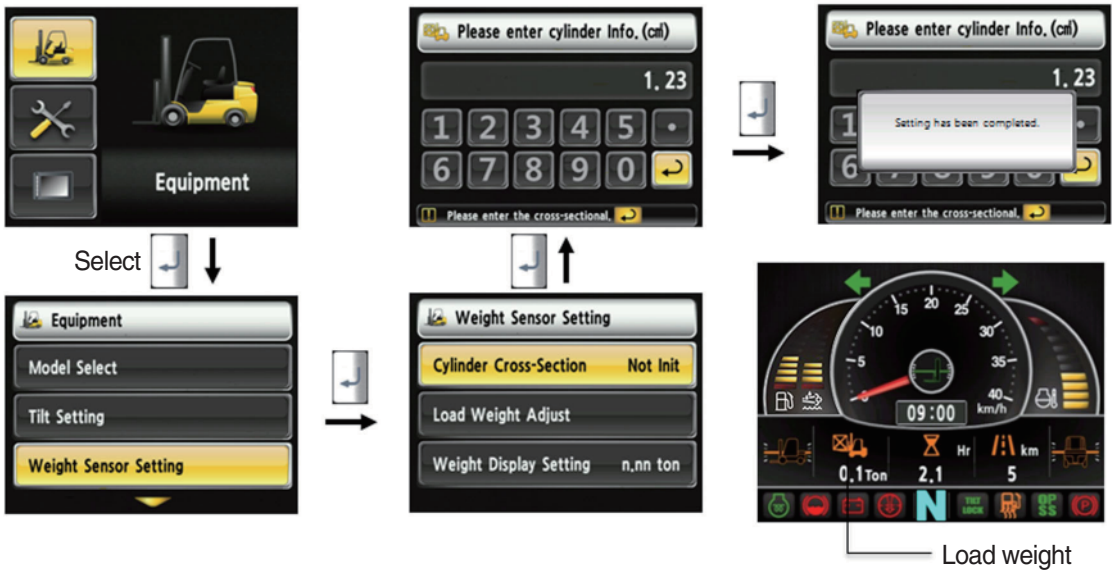
(4) Weight sensor set up (optional)

· **How to check the "Weight Sensor Setting"** (Check under the KEY ON status)

1) Vehicle that has not applied the weight sensor

2) Vehicle that has applied the weight sensor (not set)

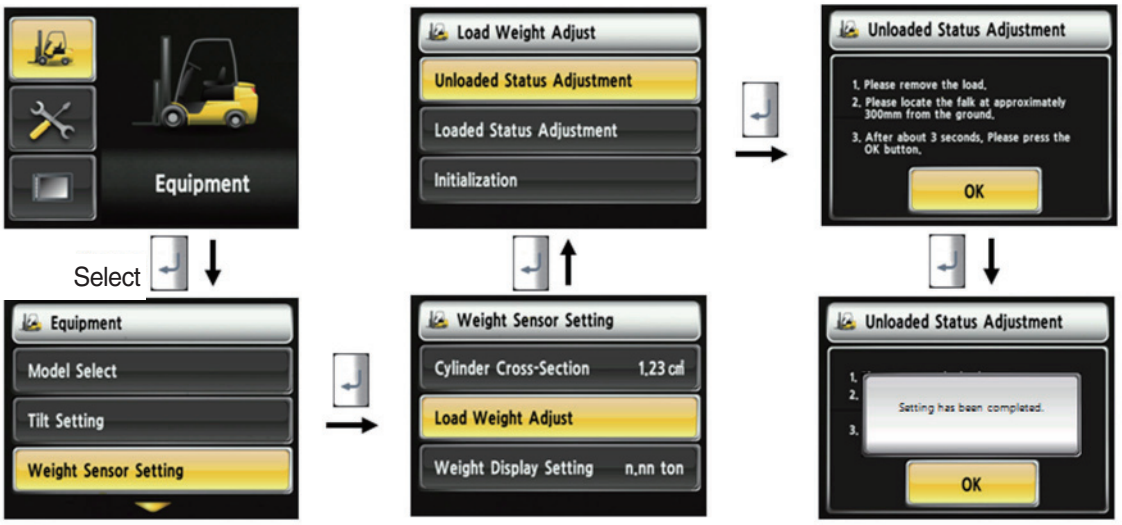
35D9CL074



35D9CL049

· **How to set weight sensor**

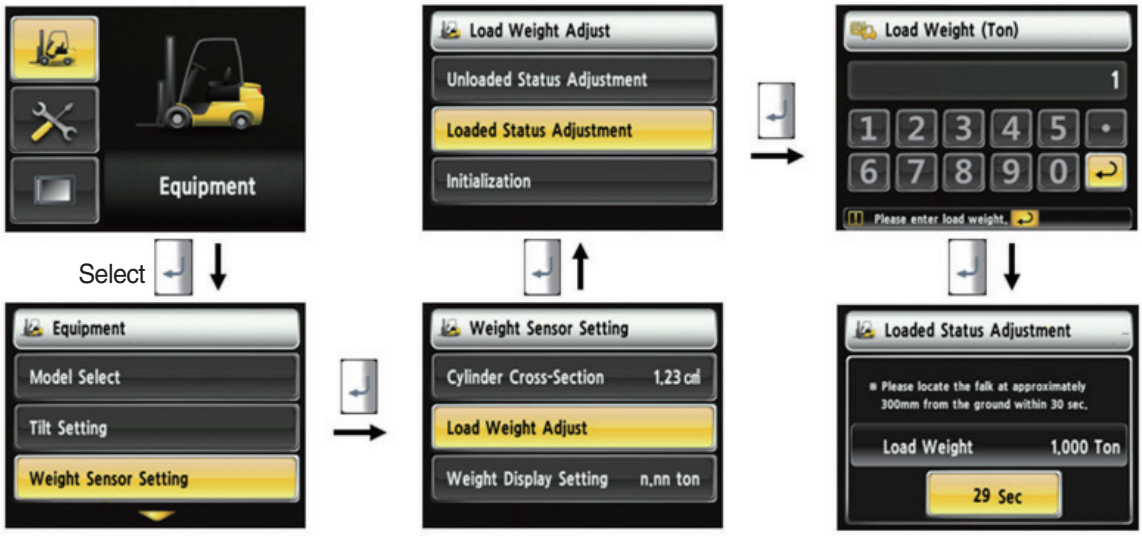
1. The weight sensor has already been set when deliver the vehicle from factory.
2. Device setup > Weight sensor setup
3. There are three ways to setup. (unload, load, initialization)
4. A cylinder cross sectional area value will be displayed in initial screen, please enter the cross sectional area using △ ▽ shift and ↵ select button if there are changes.
5. Please finish setup using ↵ enter button when input is done.



35D9SCL050

· **How to set weight sensor** (unload)

1. Device setup > Weight sensor setup
2. The way to adjust the no-load weight is as follow
3. First, please select the no-load adjust.
4. Wait 3 seconds after lifting no-load fork approximately 30 ㎝ from the ground level, then press OK button.



35D9KCL051

· **How to set weight sensor** (load)

1. Device Setup > Weight Sensor Setup
2. The way to adjust the load weight is as follow
3. First, please select the load adjust.
4. Please enter load weight.

※ **Must be prepared to lift up by locating the load on the fork before enter the weight.**

5. Please locate the loaded fork approximately 30 ㎝ from the ground level.

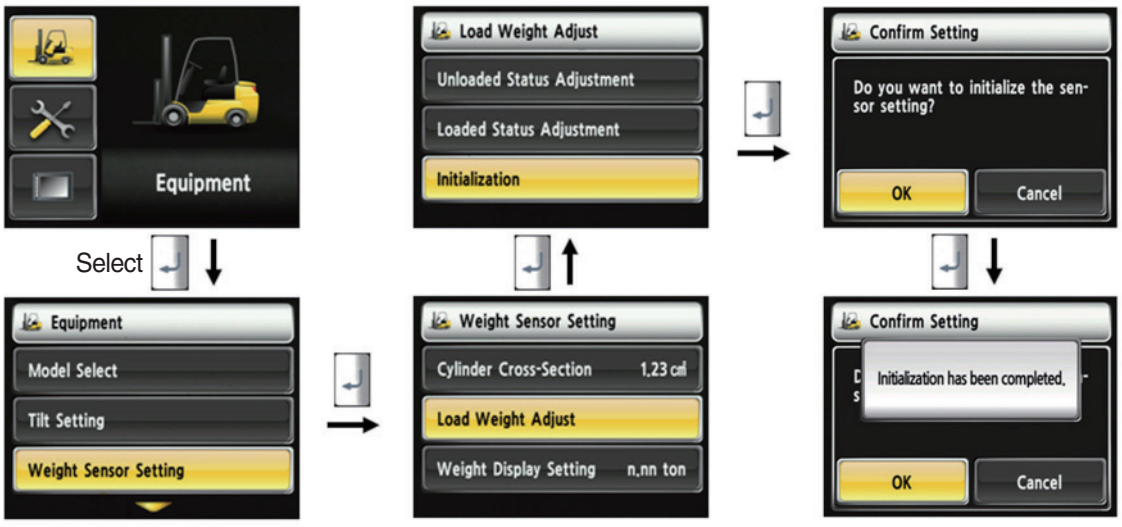
※ **MCU recognizes the weight automatically by detecting the pressure change.**

※ **Must be performed only the load lift task within 30 seconds.**

※ **Accurate weight value is not recognized if other pressure changes that are occured besides salvage work.**

※ **Re-perform the "Load/No-Load Adjustment" if the measurement malfunction is occurred.**

6. If set is completed, the screen will be switched automatically.
7. Please proceed the operation within 30 seconds.
8. Operating will be cancelled automatically if the time is elapsed longer than 30 seconds

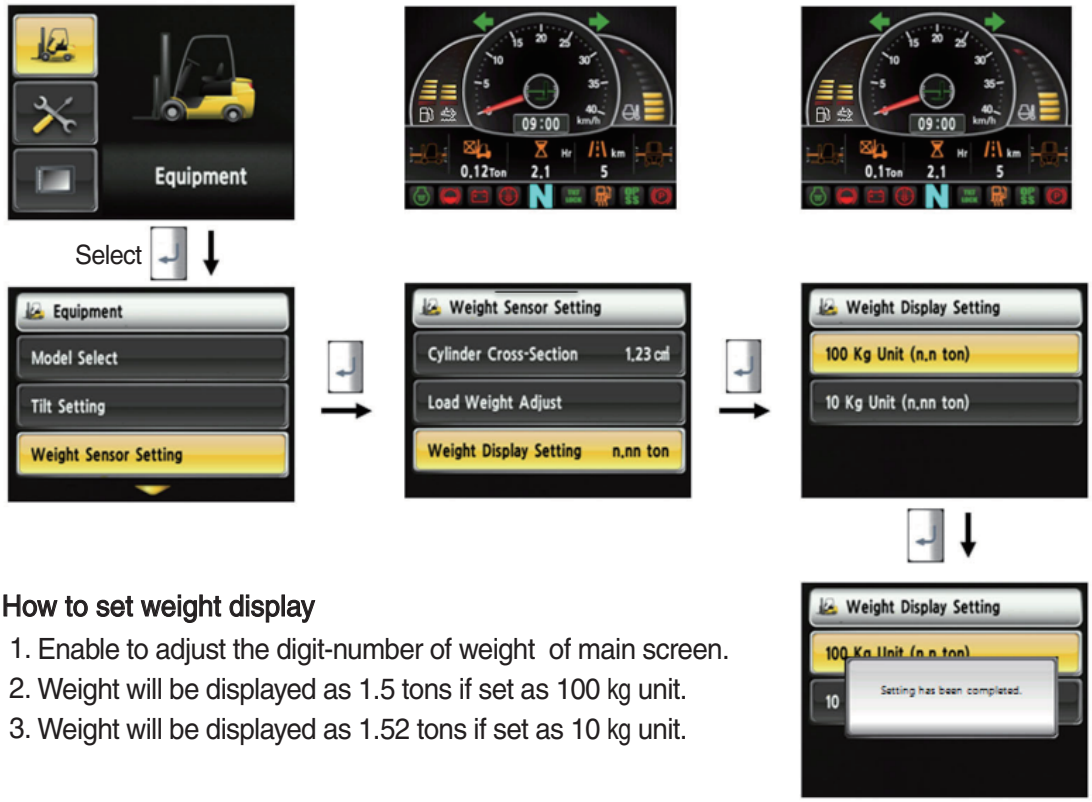


35D9KCL052

· **How to set weight sensor** (initialization)

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

(5) Weight setup

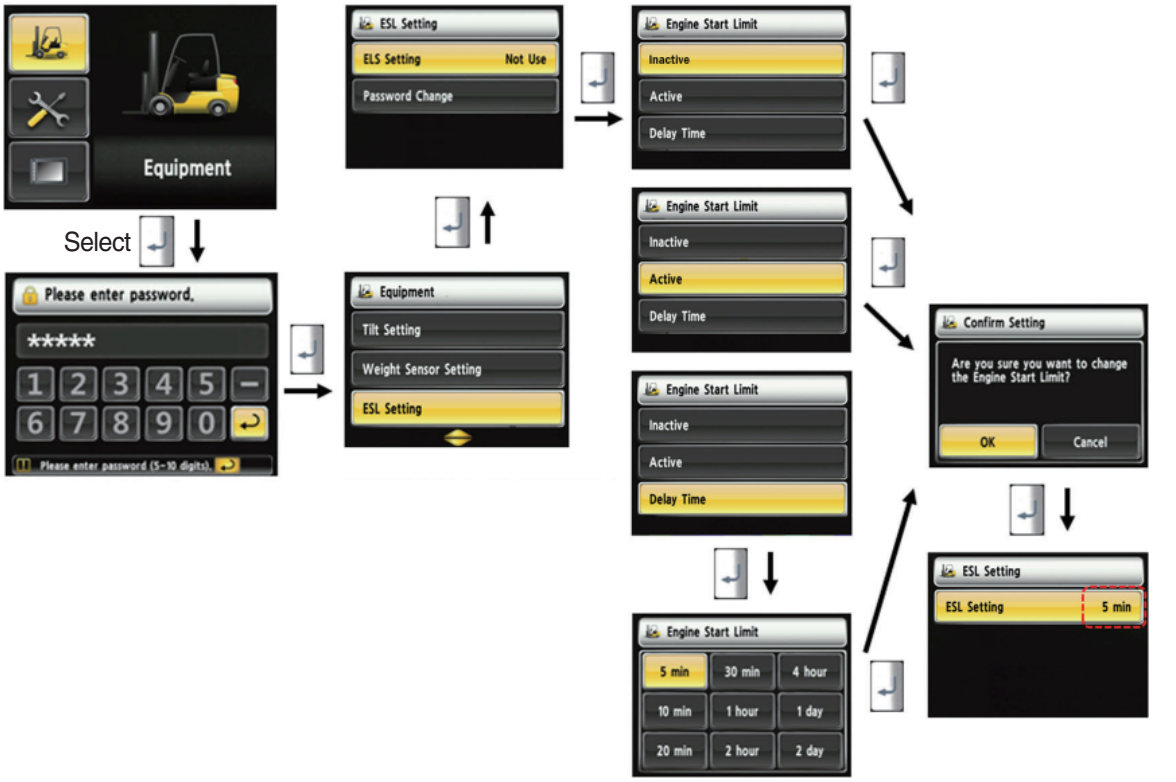


· **How to set weight display**

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

35D9CL053

(6) Startup Control Setting (Standard) : Default is "Not Use"



35D9KCL054

· **How to set ESL setting**

1. Device Setup > ESL setting
2. Password request screen will be displayed if you select the menu. Default password is “00000”.
3. Password length must be 5~10 digits.
4. Next step is allowed only if password is authenticated.
5. Check functions

① Set the mode as active and key-OFF.

② Upon key-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 key-off)

③ Set the mode as 5 min of delay time and key-OFF.

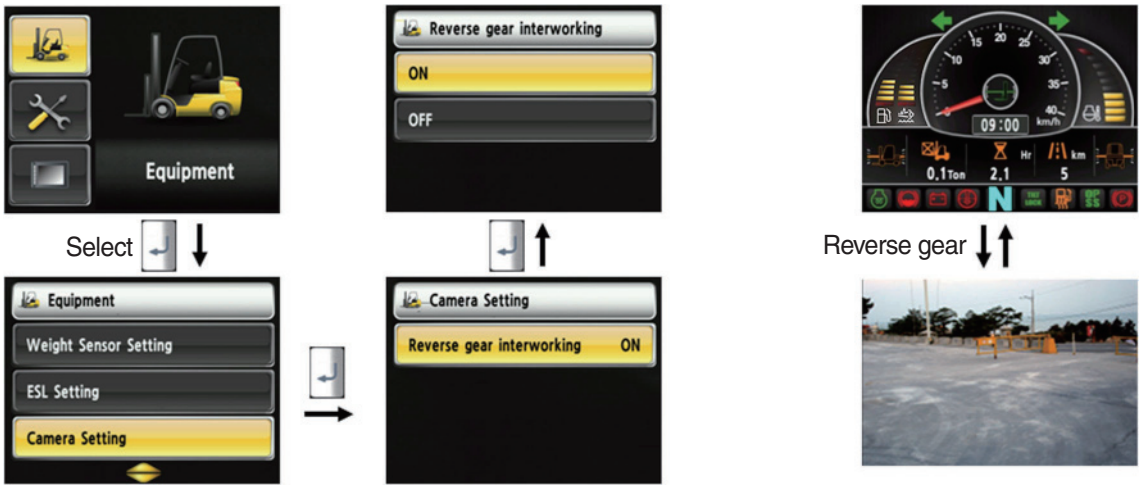
④ check if vehicle can start within 5 min and key-OFF.

⑤ check if vehicle requests password after 5 min.

※ **KEY-ON screen (When startup control mode is ON)**

35D9KCL075

(7) Camera setup

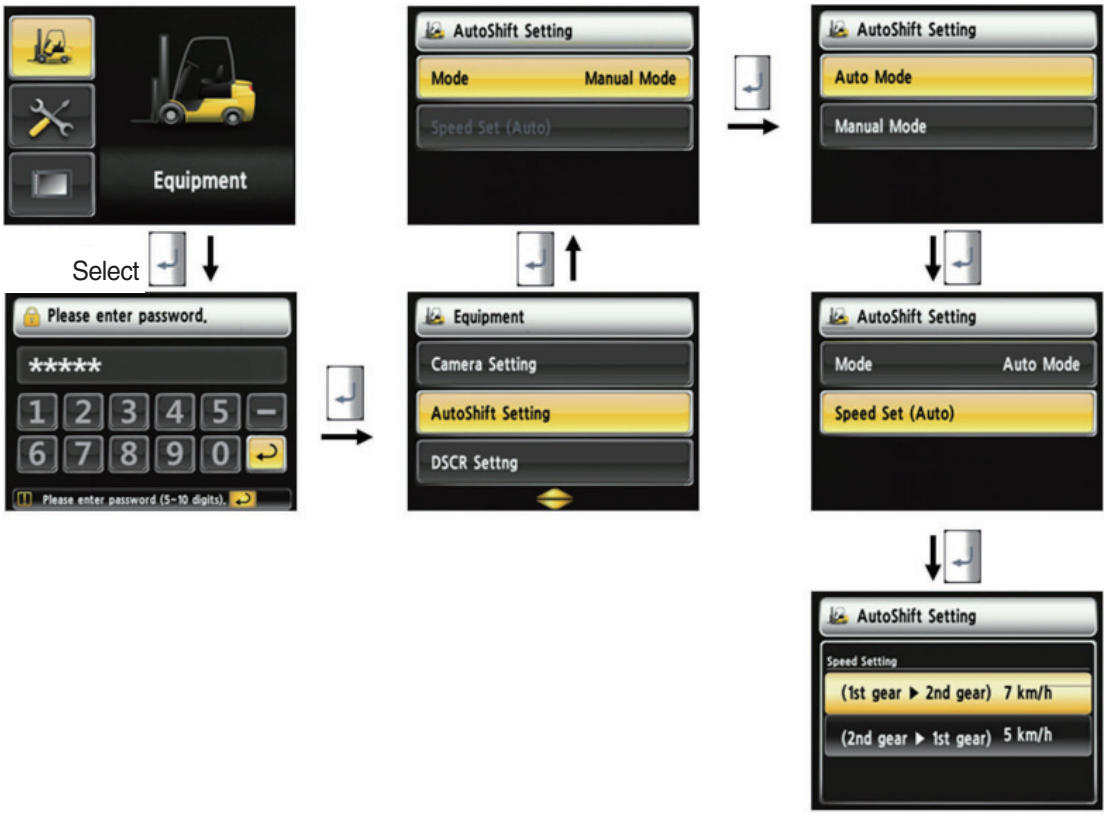


35D9CL056

· **How to set camera**

1. Device setup > Camera setup
2. 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.

(8) Auto-shift setup (standard)



35D9KCL057

· **How to set auto-shift**

1. Device Setup > Auto-Shift setup
2. User password is required in order to set this function.
3. In automatic mode, the gear is switched automatically by vehicle speed.
4. Enable to set the gear switching speed.
5. Applied 3.5 tons ~ 5.0 tons T/M 2nd gear.

· **Check functions**

1. Select the "Auto Mode"

① During forward or reverse driving, a gear will be shifted automatically in accordance with gear speed.

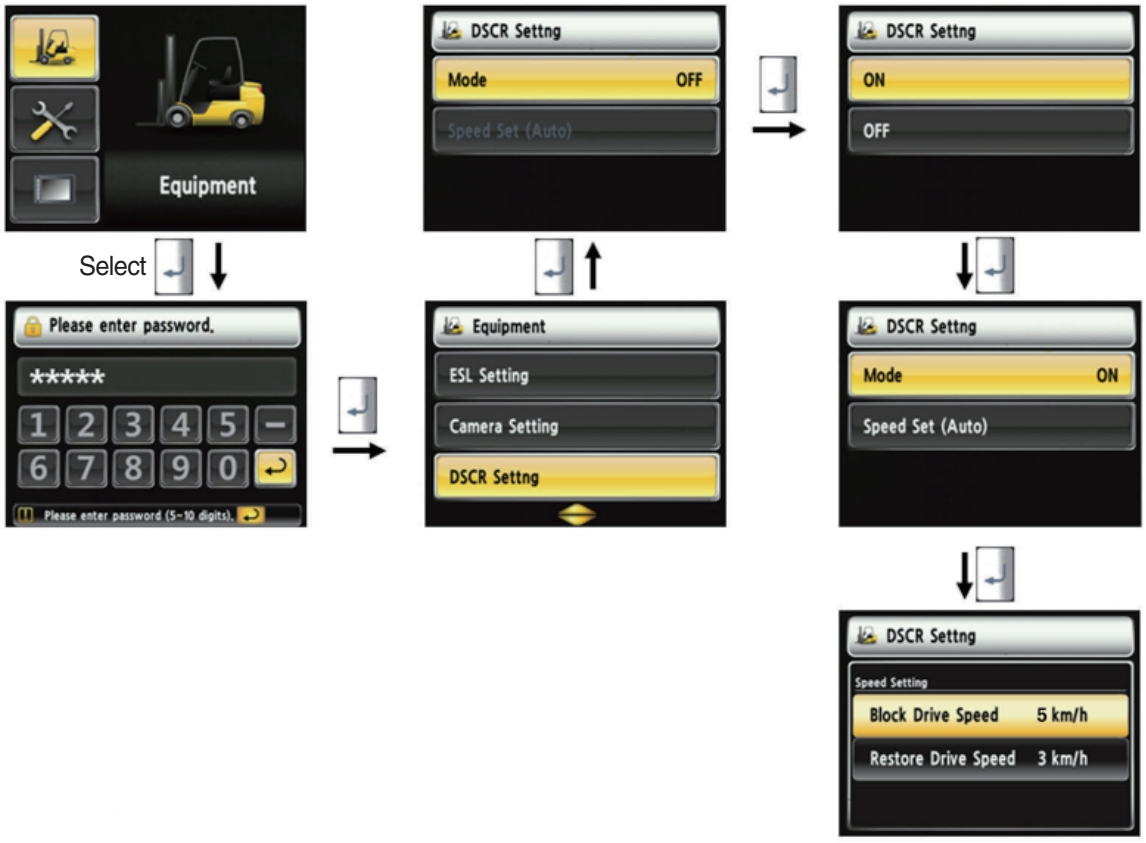
② Not interworking with gear select switch (1st gear / 2nd gear) of gear selector.

35D9CL076

2. Select the "Manual Mode"

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

(9) DCSR Setup (standard)



35D9KCL058

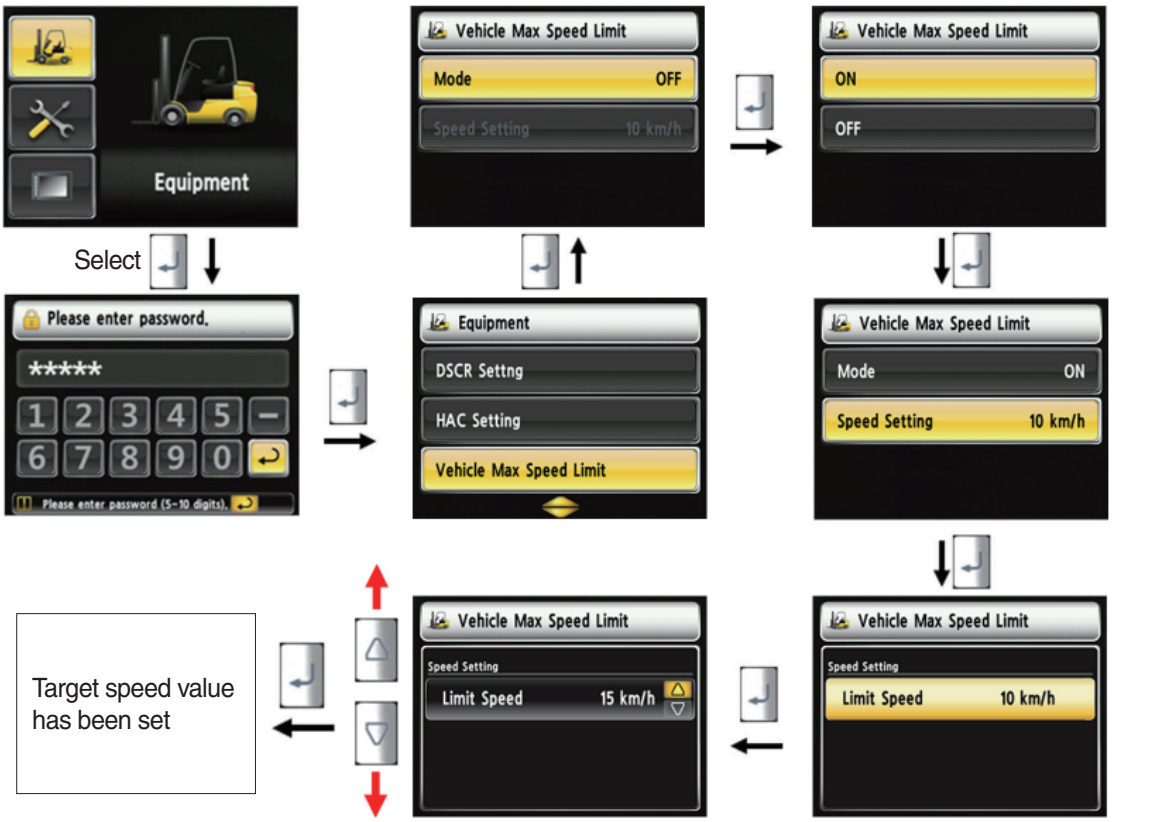
· **How to set DCSR**

1. Device setup > DCSR setup
2. User password is required in order to set this function.
3. Set the mode ON. Below is how this feature functions.
4. 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.
5. The car changes direction and starts to travel.

※ DCSR : Direction change shock relief

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

(10) Vehicle max speed limit

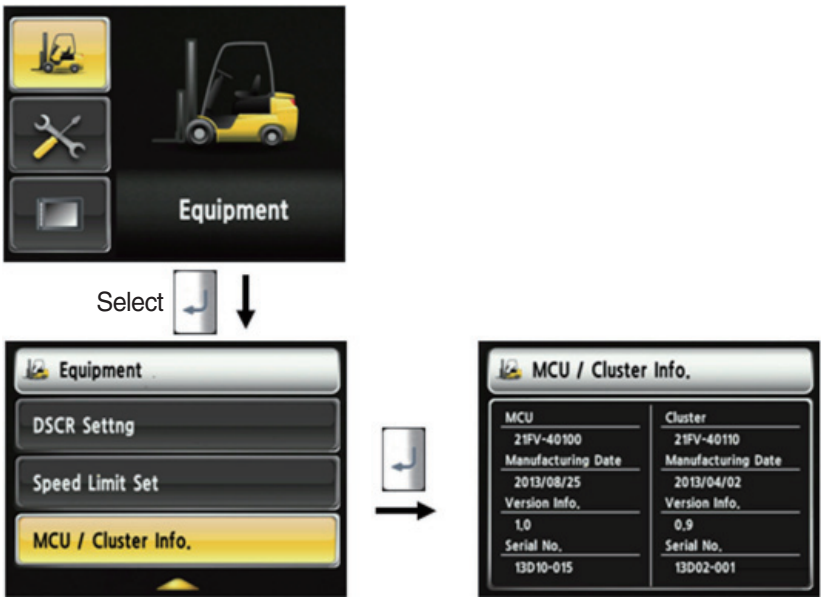


22D9CL059

· **How to set vehicle max speed limit**

1. Equipment > Vehicle max speed limit.
2. User password is required in order to set this function.
3. The defualt setting is off with the speed of 10 km/h.
4. The speed setting range is 8~20 km/h
5. The vehicle reaches smoothly to the target speed.

(11) MCU/Cluster information

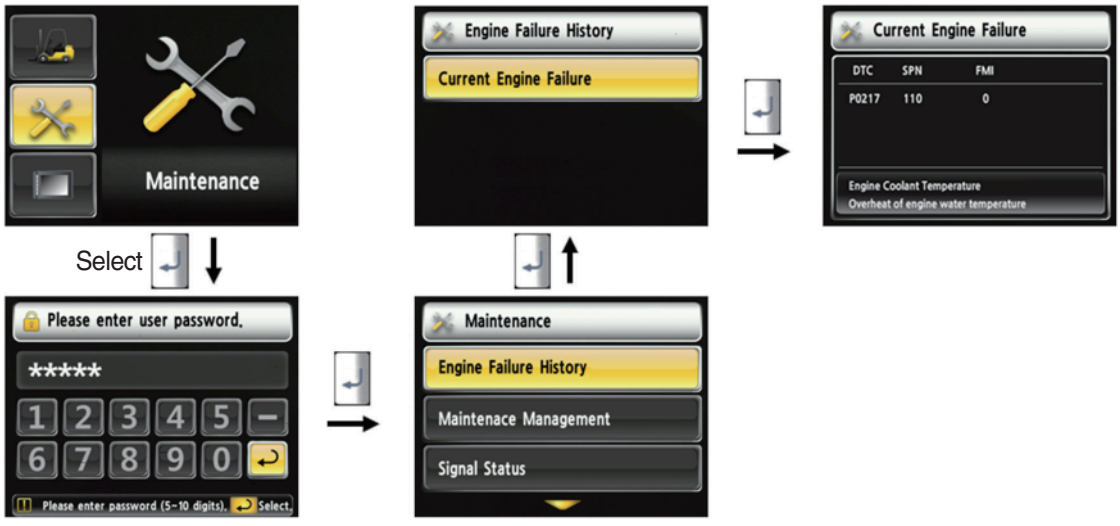


35D9SCL060

· **MCU / Cluster information**

1. Device Setup > MCU/Cluster information
2. MCU, manufactured date and version of cluster, and serial number will be displayed.

(12) Engine Failure History



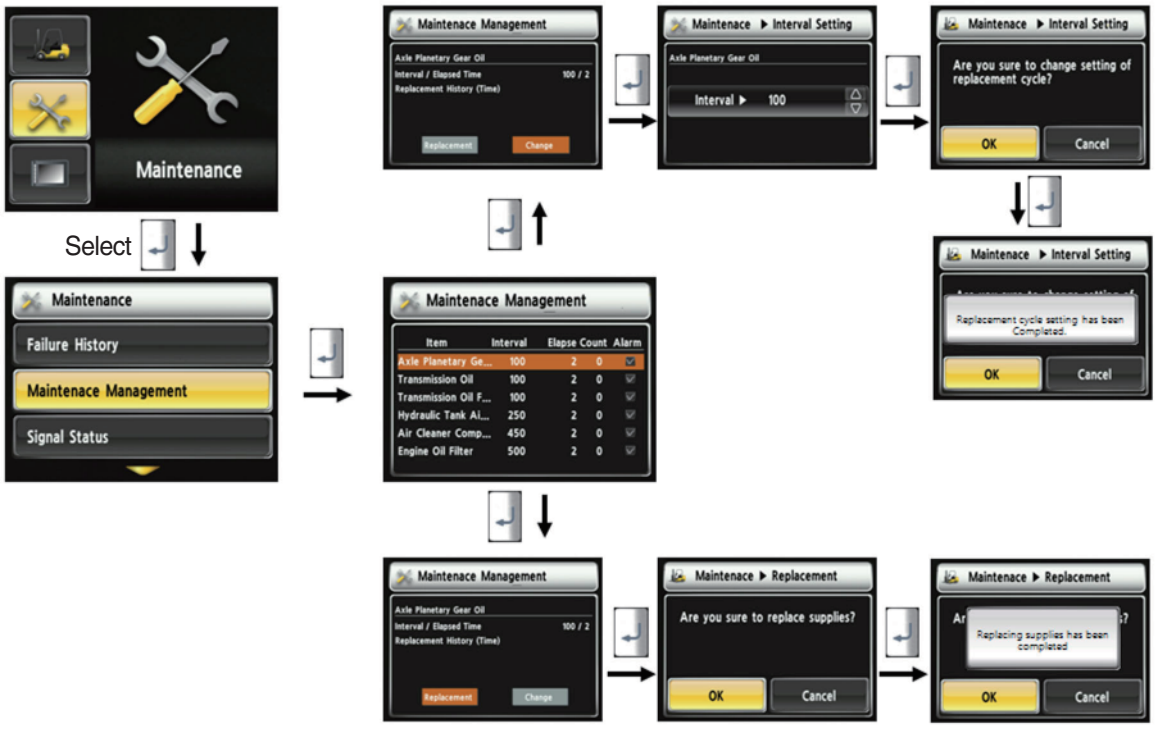
35D9KCL078

· **Engine failure history**

1. Device Setup > Engine failure history
2. Device that has an error code among the engine.

(13) Expendables replacement management

35D9CL079

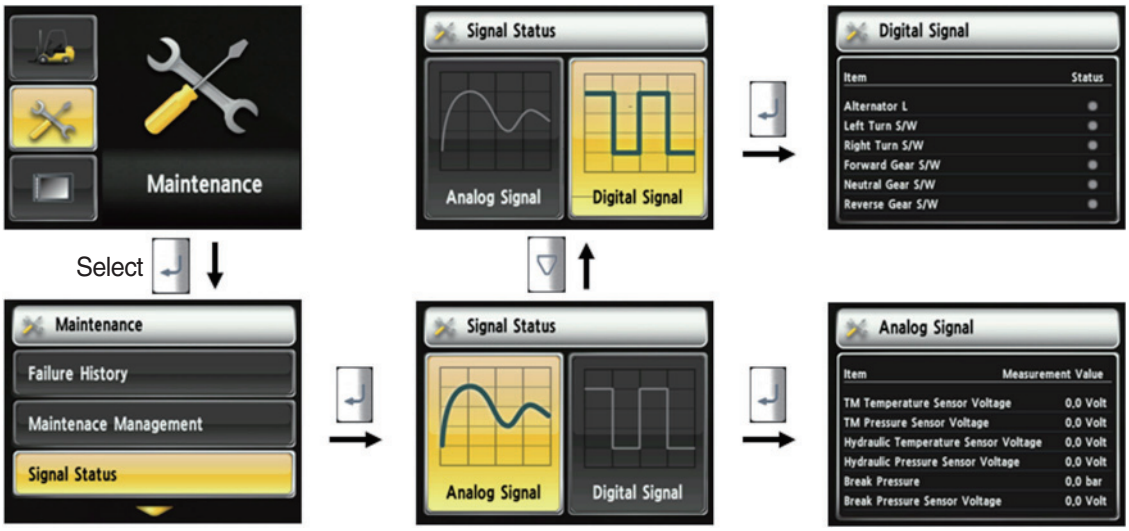


35D9SCL061

· **How to replace expendables**

1. Device setup > Expendables management
2. If the expendables replacement cycle has been passed, alarm will be displayed as ON
3. Press the "Expendables replacement" if replaced the expendables.
4. Information about recent replacement (max. 9) will be displayed.
5. If you want to change the cycle, please press the “Change cycle” button.

(14) I/O Information

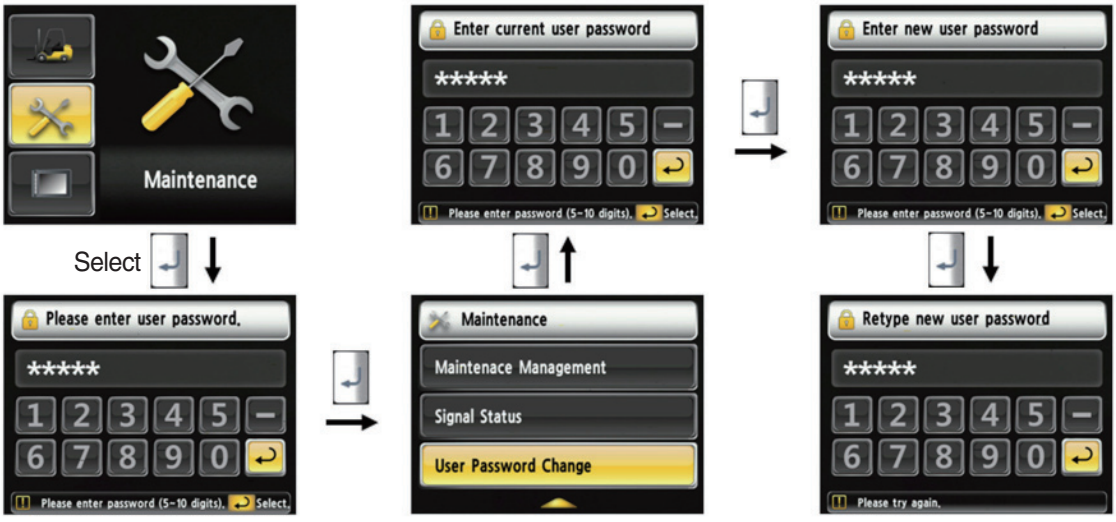


35D9SCL062

· **How to set I/O information**

1. Maintenance > I/O information
2. I/O information can be classified as two signals. Analog signal can see the numeric data. Digital signal can indicate only ON/OFF.
3. User can change the cycle.

(15) User password change

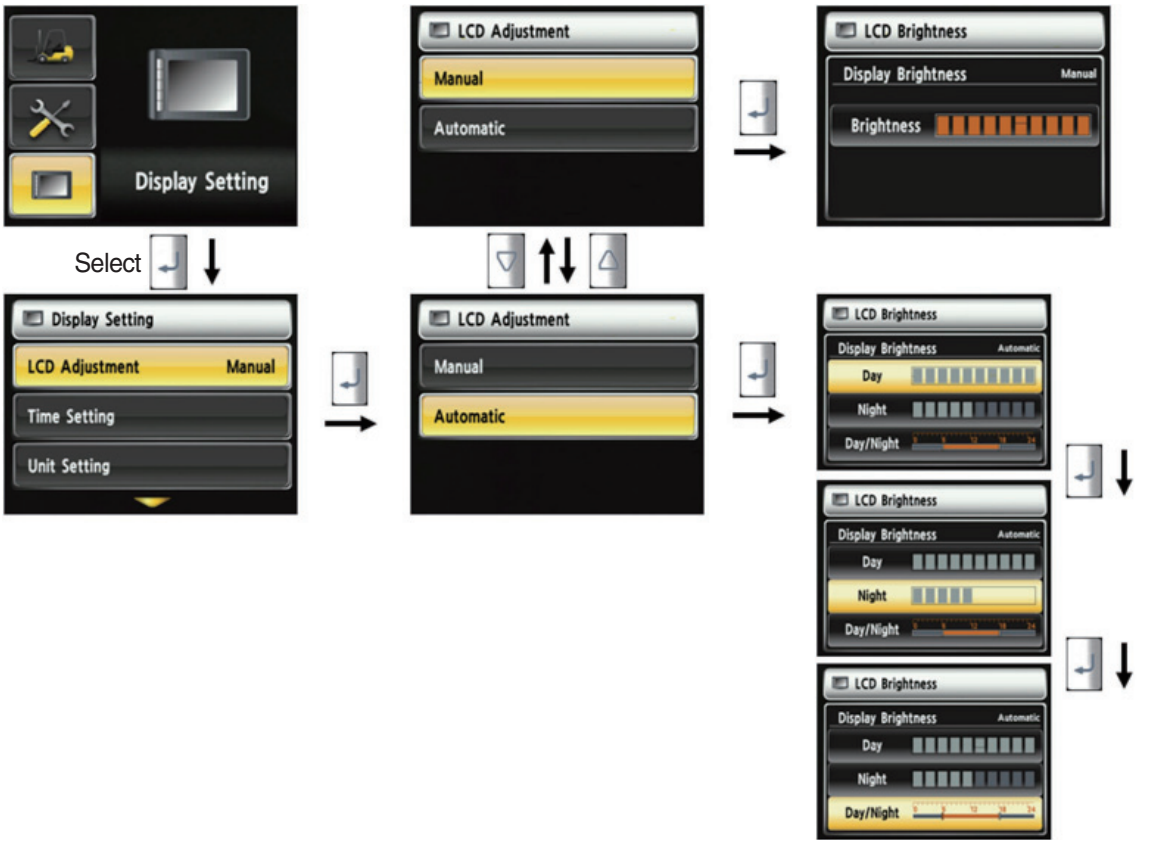


35D9KCL080

· **How to change "User Password"**

1. Device setup > User password set up
2. Change password
3. This function is to allow to change password from default password to user defined password.
4. Password length must be 5~10 digits.
5. Since, if you forget the password, you must request the A/S, do not forget the password.

(16) LCD brightness

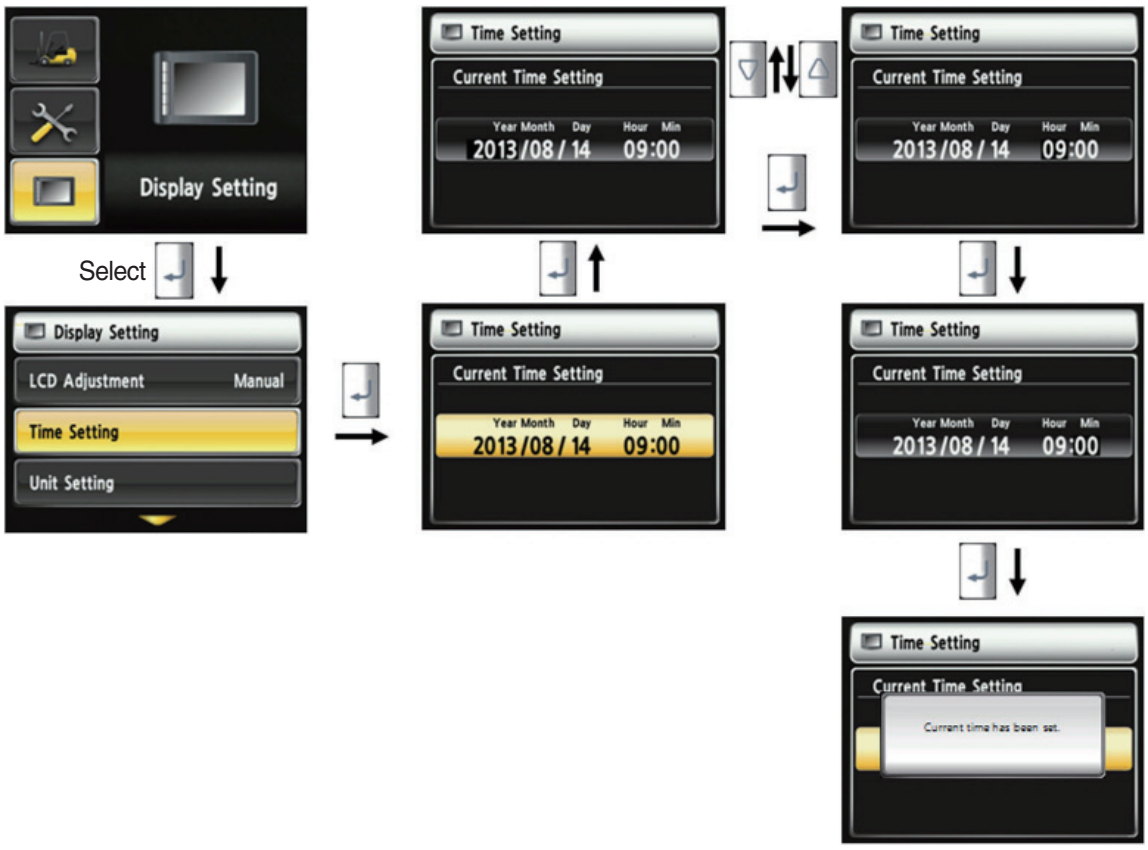


35D9SCL064

· **How to set LCD brightness**

1. Display > LCD brightness
2. LCD brightness has two options. Automatic mode and manual mode.
3. Manual mode always keeps the selected brightness.
4. Daytime brightness : 100%, Nighttime brightness : 50%, Daytiem/Nighttime time zone : 06~18

(17) Time setup

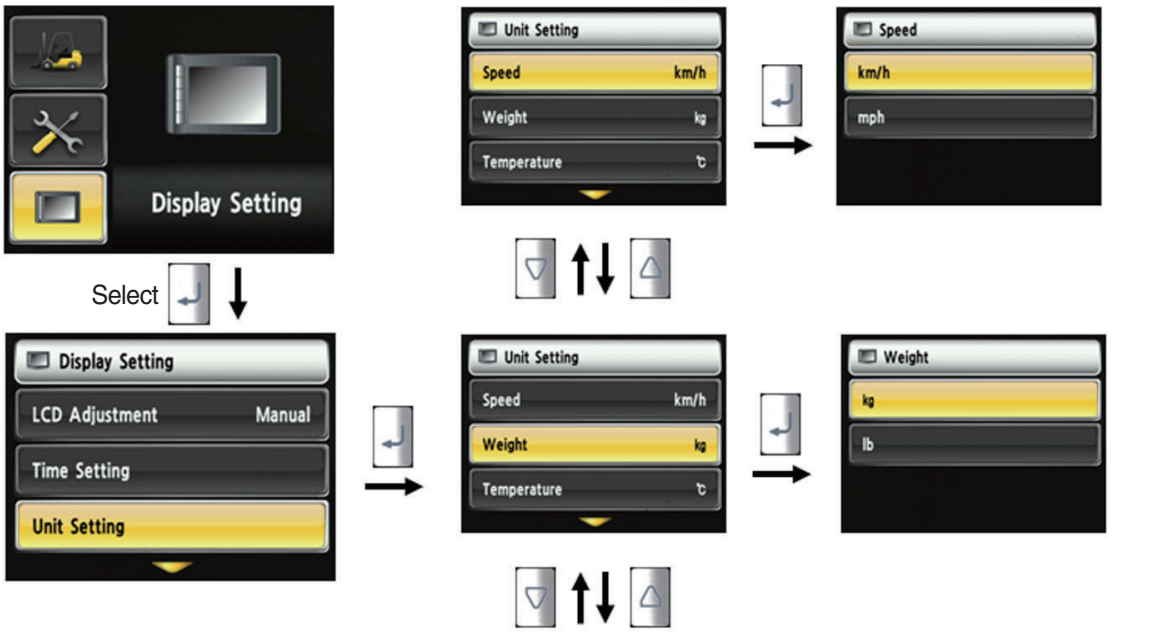


35D9SCL065

· **How to set current time**

1. Display setup > Time setup
2. Enable to set the time that is displayed in main screen.
3. Set time in following order. (year > month > day > hour > minute)

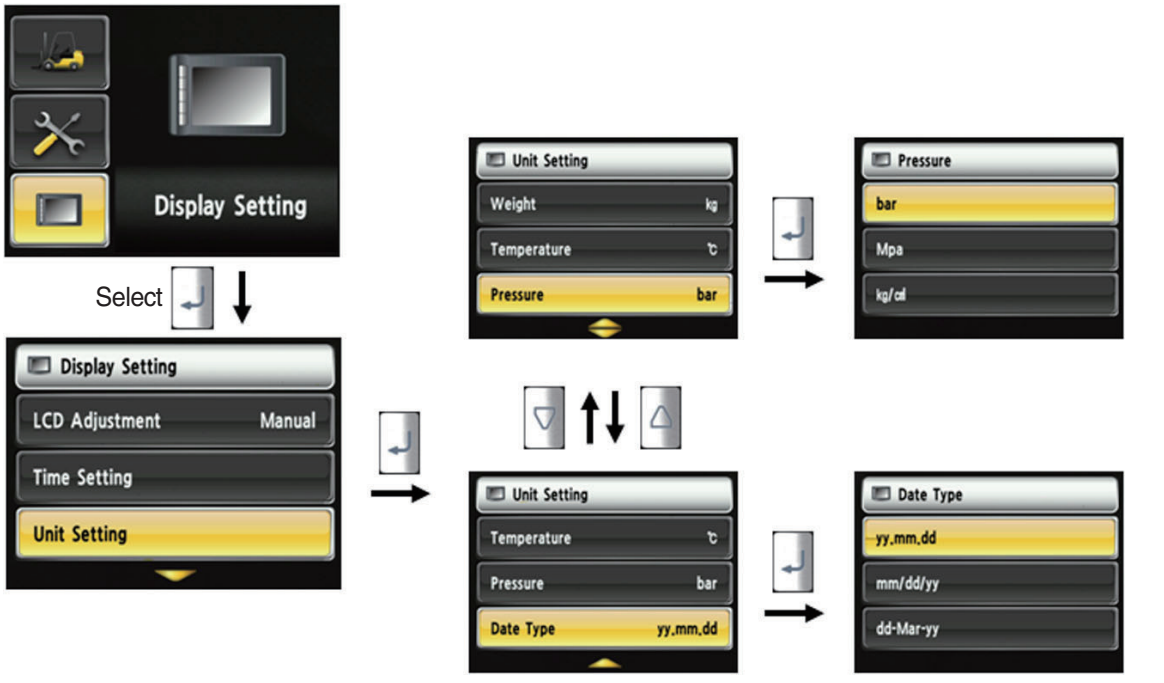
(18) Unit setup



· **Unit setup**

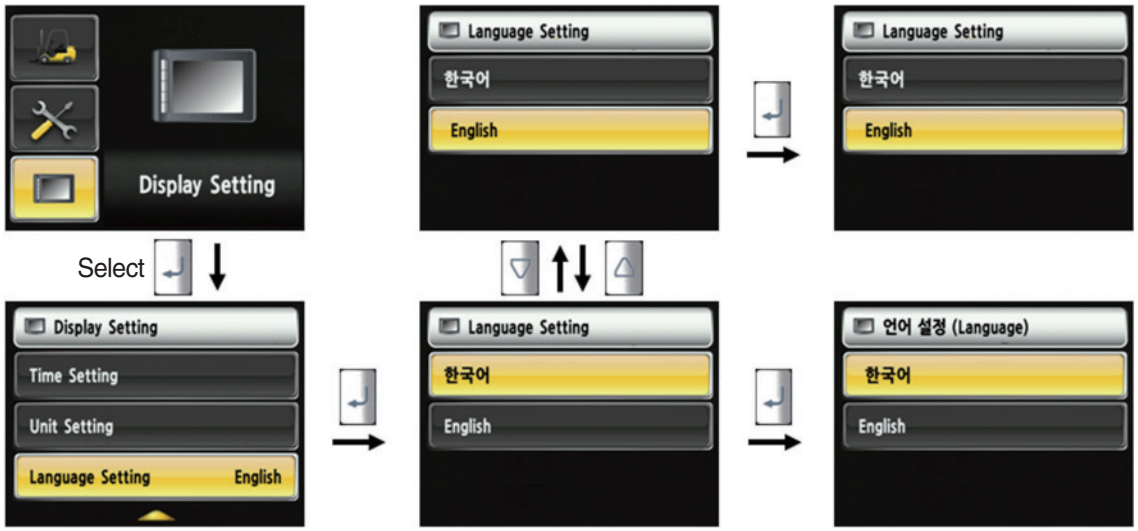
1. Display setup > Unit setup
2. Enable to set all unit values that displayed on screen.
3. It is displayed by calculating as setting unit.

35D9SCL066



35D9SCL067

(19) Language setup



35D9SCL068

· **How to set language**

1. Display Setup > Language setup
2. Language setup changes the language that is displayed on the screen to language that user defined.
3. Currently, supported language is Korean and English.

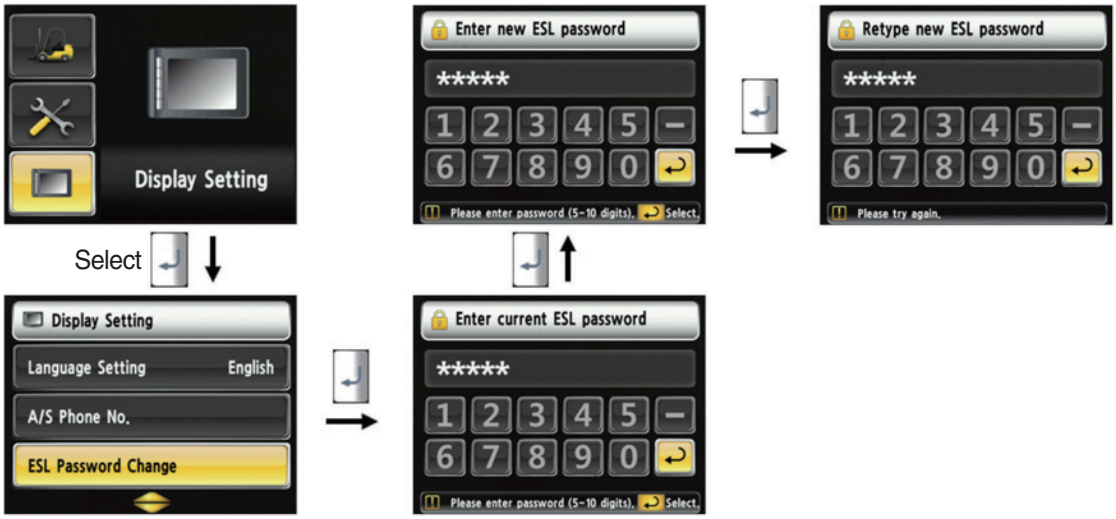
(20) A/S Contact Setup

35D9SCL063

· **How to set A/S contact**

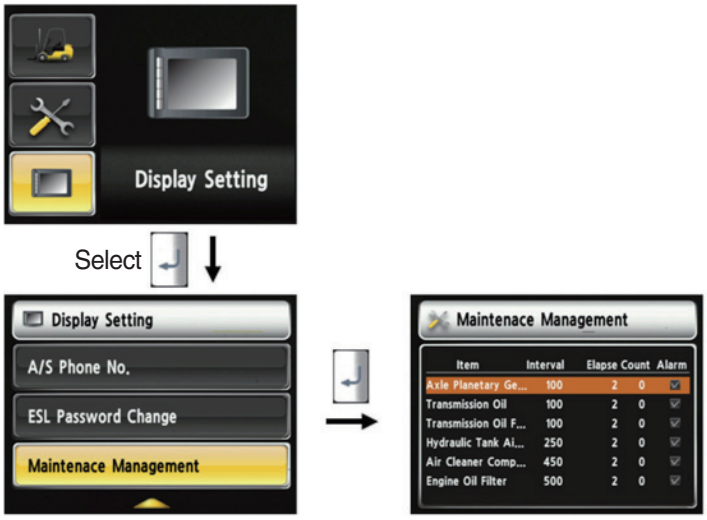
1. Maintenance > A/S Contact
2. User can change the A/S contact when deliver the vehicle from factory.
3. If user moves numeric number using arrow, and press the select button, number will be displayed on the screen.
4. If user press the enter key, the value will be set.
5. Contact will be displayed as the modified value.

(21) ESL password change



35D9KCL081

(22) Maintenance management



35D9KCL082

※ Only viewing is available in this menu

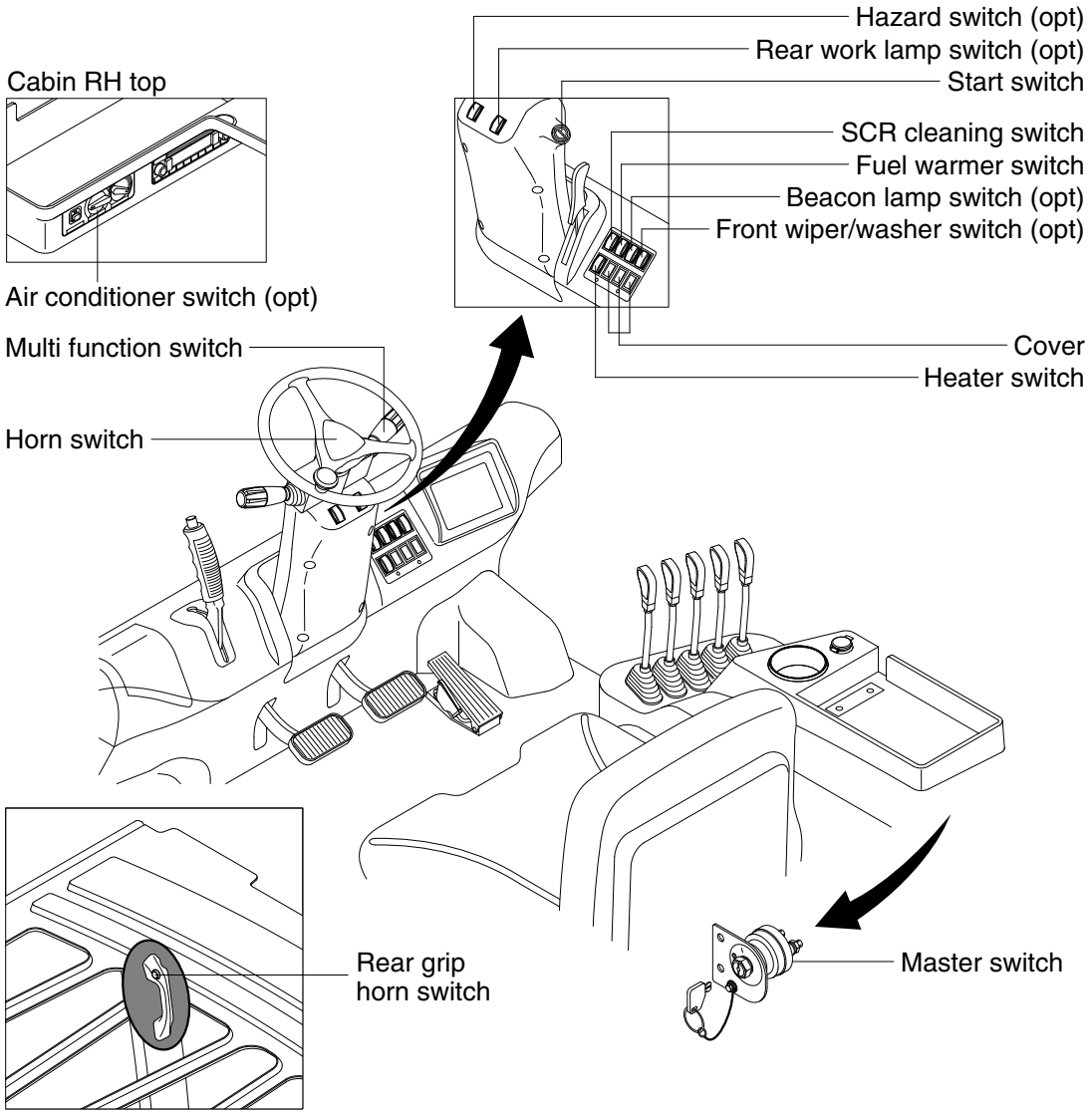
※ Other management options can be accessed from the Maintenance → Maintenance management menu

8) CAUSES AND CORRECTION OF CLUSTER WARNING LAMP

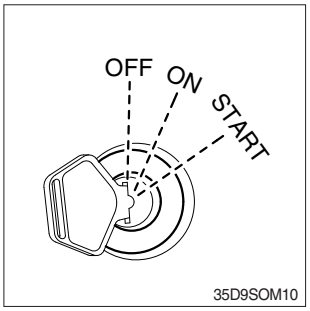
S/No.	Warning lamp types	Symbol	Warning and indicator lamp	Causes and correction
1	Engine oil pressure warning		Engine oil pressure warning lamp	Engine oil pressure is low. Please the engine oil refill.
2	Engine warm-up pilot		Engine warm-up indicator lamp	Warm-up will be started.
3	Air cleaner warning		Air cleaner warning lamp	Replace the filter.
4	Water in fuel warning		Water in fuel warning lamp	Please drain the water of water separator.
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	SCR cleaning warning		SCR cleaning warning lamp	If necessary, display the SCR cleaning.
8	SCR cleaning inhibit pilot		SCR cleaning inhibit pilot lamp	SCR claening status is prohibited.
9	Exhaust high temperature pilot		Exhaust system high temperature pilot lamp	High temperature state of exhaust system.
10	Fuel warmer pilot		Fuel warmer pilot lamp	warming up the fuel.
11	TM oil temperature warning		TM oil temperature warning lamp	TM oil is over temperature condition.
12	Parking brake pilot		Parking brake pilot lamp	Parking brake is operating.
13	Brake oil level warning		Brake oil level warning lamp	Brake oil level is low. Please refill the brake oil.
14	Battery charging warning		Battery charging warning lamp	Battery is not being charged. Please check alternator and wiring.
15	Tilt lock pilot		Tilt lock pilot lamp	Auto-leveling is the operational status.
16	OPSS pilot		OPSS pilot lamp	OPSS is working : Driving, Tilltig, Lifting locked and truck parked.
17	Fuel warning		Fuel warning lamp	Fuel level is low. Please refill the diesel oil.

S/No.	Warning lamp types	Symbol	Warning and indicator	Causes and correction
18	Coolant temperature warning		Engine coolant temperature warning lamp	Engine coolant is over temperature condition.
19	T/M oil pressure warning		Clutch oil pressure warning lamp	Inching operation. Check T/M to find out pressure drop.
20	Communication error warning		Communication error warning lamp	Communication with between MCU and ECU has been failed. Check communication line.
21	Communication error warning		Communication error warning lamp	Communication between CLUSTER and MCU has been failed. Check communication line.
22	LH Turn indicator		LH Turning pilot lamp	-
23	RH Turn indicator		RH Turning pilot lamp	-
24	Forward first gear		Forward first gear indicator lamp	-
25	Forward second gear		Forward second gear indicator lamp	-
26	Reverse first gear		Reverse first gear indicator lamp	-
27	Reverse second gear		Reverse second gear indicator lamp	-

5. SWITCHS



1) START SWITCH



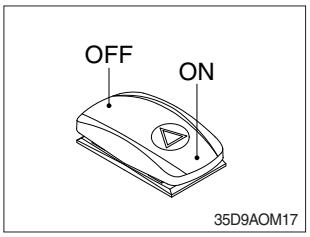
(1) There are three positions, OFF, ON and START.

※ Before starting, set gear shift lever at N, and pull parking brake.

- 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 machine damage.

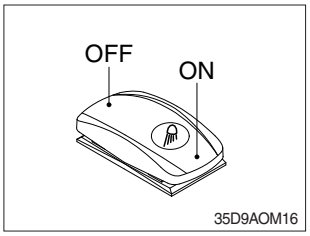
2) HAZARD LAMP SWITCH (option)



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

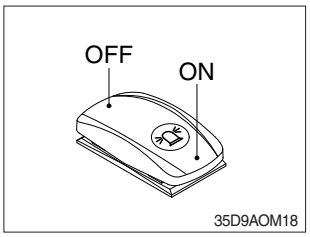
※ **If the switch is left on for a long time while the engine does not run, the battery would be dead(discharged).**

3) REAR WORK LAMP SWITCH (option)



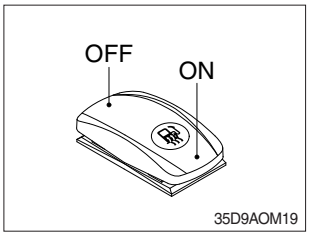
(1) This switch is used to operate work lamps.
Press this switch to turn on work lamps.

4) BEACON SWITCH (option)



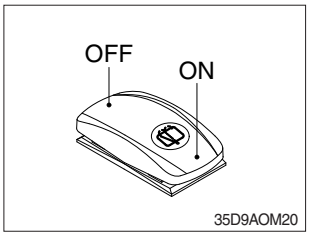
(1) This switch turn ON the rotary light.

5) FUEL WARMER SWITCH



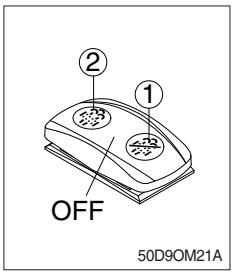
(1) This switch is used to heat the fuel of pre-heater.

6) 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.

7) SCR (Selective Catalytic Reduction) CLEANING SWITCH



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

(2) Inhibit position (①)

① The inhibit position disallows any automatic or manual SCR cleaning.

② This may be used by operator to prevent SCR cleaning when the machine is operating in a hazardous environment is concerned about high temperature.

③ It is strongly recommended that the this position is only activated when high temperatures may cause a hazardous condition.

(3) OFF position

This position will initate a automatic SCR cleaning when needed.

(4) Manual SCR cleaning position (②)

① This position will only initate a manual SCR cleaning and the SCR cleaning lamp is illuminated.

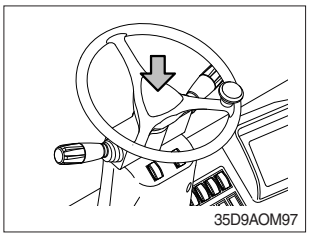
② HEST lamp will be illuminated during the entire SCR cleaning.

※ Refer to the page 3-14 for details.

※ This switch can be move to the manual SCR cleaning position (②) only when the safety button is pulled to backward.

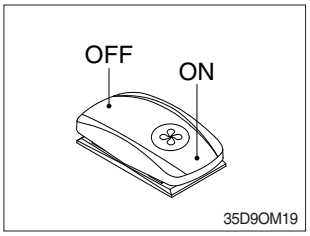
※ Also, this switch return to the OFF position when released the manual SCR cleaning position (②).

8) HORN SWITCH



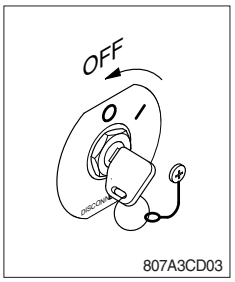
(1) The horn sounds when the button is pressed.

9) HEATER SWITCH (option)



(1) This switch is used to heat the cabin room.

10) MASTER SWITCH (option)



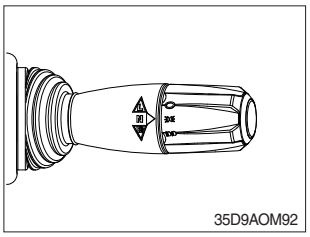
(1) This switch is used to shut off the entire electrical system.
When the machine is not operated for a long time, turn OFF the master switch for the safety purpose.

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

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

11) MULTI FUNCTION SWITCH

(1) Clearance lamp switch

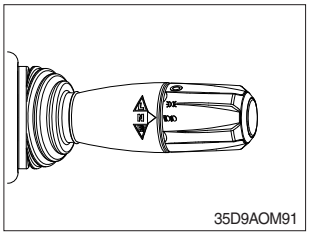


① **Clearance lamp lights up**
Twist the handle beneath steering wheel and make the notch align to ≡D(E.

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.

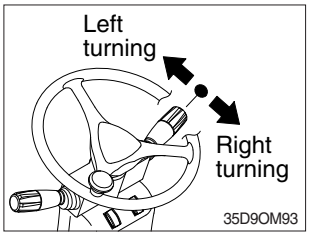
(2) Head lamp switch



① **Head lamp lights up**
Twist the handle beneath steering wheel and make the notch align to ≡D≡ .

② **Head lamp goes out**
Twist the handle just the opposite until the notch being aligned to ◎.

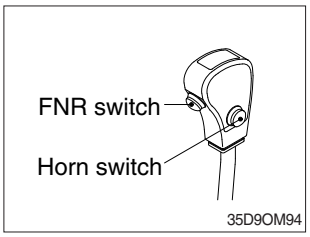
(3) Turning switch



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.

12) FNR AND HORN SWITCH (option)

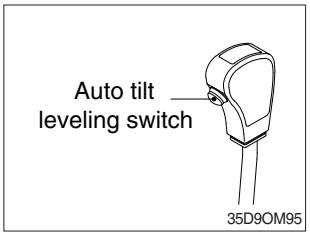


(1) FNR switch

(2) Horn switch

The horn sounds when the button is pressed.

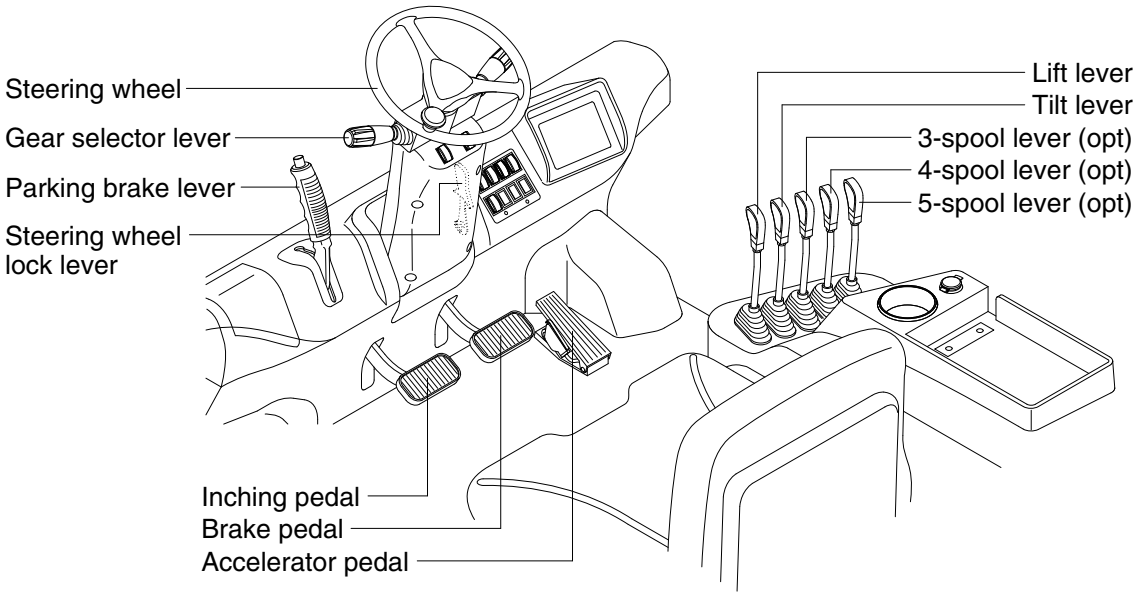
13) AUTO TILT LEVELING SWITCH (option)



(1) This switch is used to return mast to upright vertical position.

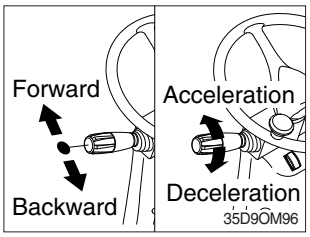
※ **This function have to be used at the engine low idle rpm and stop position. If this is activated at the high idle rpm or driving status, Don't gurantee the mast stop at upright vertical position.**

6. CONTROL DEVICE



35D9CD08

1) GEAR SELECTOR LEVER

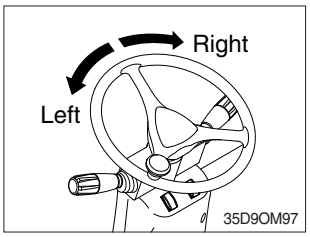


(1) This lever is used for gear selection, forward 2 stages and reverse 2 stages.

(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.

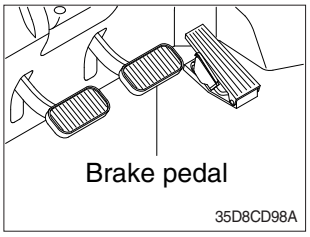
2) SREERING WHEEL



(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.

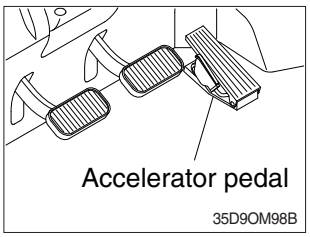
3) BRAKE PEDAL



(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.**

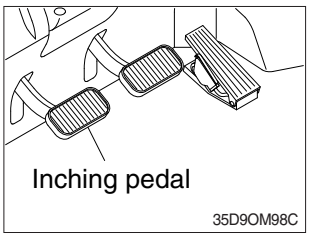
4) ACCELERATOR PEDAL



(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 truck will run at low idling.

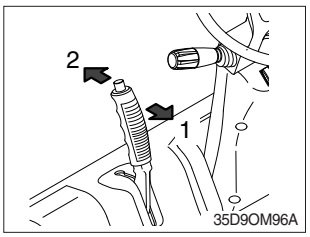
5) INCHING PEDAL



(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) PARKING BRAKE LEVER



(1) Position 1

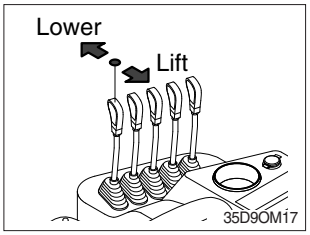
Parking brake is applied and front wheel is locked.

(2) Position 2

Parking brake is released.

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

7) LIFT LEVER



(1) Lift

PULL the lever BACK to LIFT the load.

(2) Lower

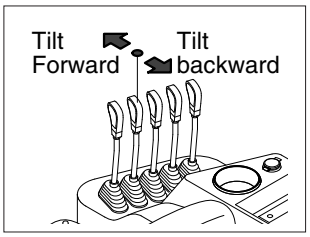
PUSH the lever FORWARD to LOWER the load.

(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.

8) TILT LEVER



35D9OM18

(1) Tilt forward

PUSH the lever FORWARD to tilt mast FORWARD.

(2) Tilt back

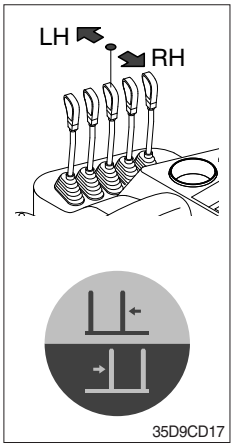
PULL the lever BACK to tilt mast BACKWARD.

(3) Holding

When the lever is released, tilting action stops.

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

9) LEVER FOR SIDE SHIFT



35D9CD17

(1) LH movement

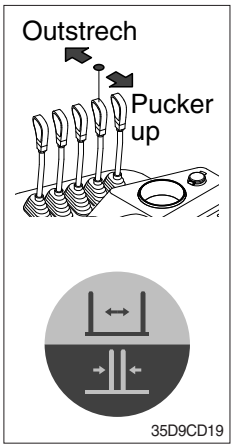
Push the lever forward to move the left hand for the side shift.

(2) RH movement

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

10) LEVER FOR SIDE SHIFT WITH FORK POSITIONER

(1) Fork positioner (synchronizer type)



35D9CD19

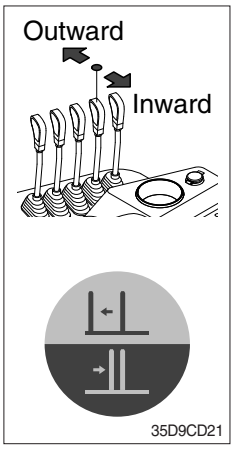
① **Outstrech the forks**

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

② **Pucker up the forks**

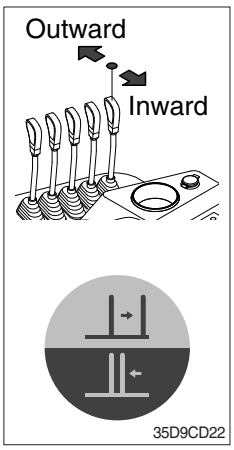
Pull the lever backward to pucker up simultaneously inward of the both forks.

(2) Fork positioner (independent type)



① **LH fork movement**

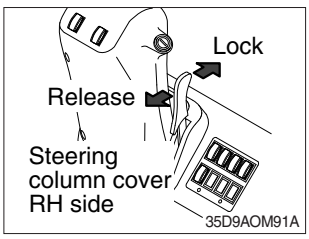
- Push the lever forward to move outward for the LH fork.
- Pull the lever backward to move inward for the LH fork.



② **RH fork movement**

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

11) STEERING WHEEL LOCK LEVER



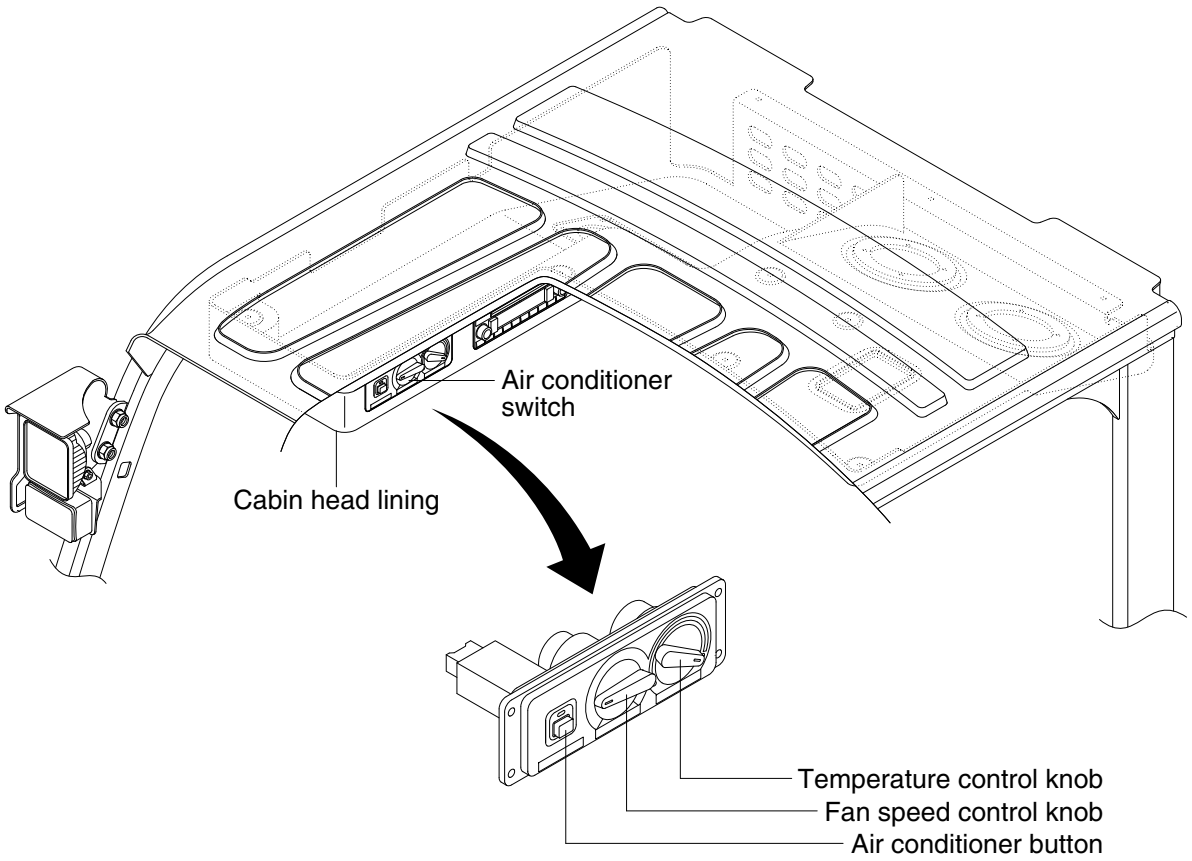
(1) The angle of the steering wheel can be adjusted forward and backward.

① **Release** : Pull the lever backward.

② **Lock** : Release the lever.

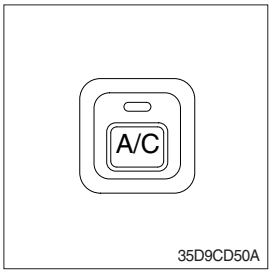
7. AIR CONDITIONER AND HEATER (OPTION)

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



35D9CD90

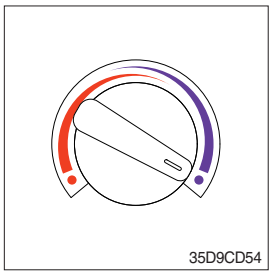
1) AIR CONDITIONER BUTTON



35D9CD50A

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

2) TEMPERATURE CONTROL KNOB

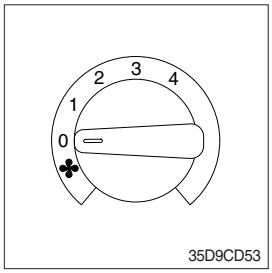


This knob regulates the temperature of air.

① Left side (red zone) : Heat up air temperature

② Right side (blue zone) : Cool down air temperature

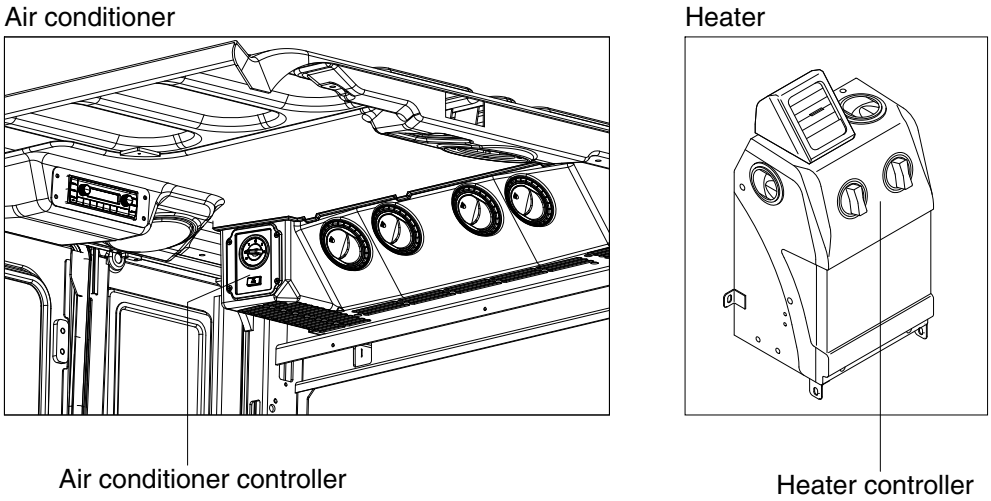
3) FAN SPEED CONTROL KNOB



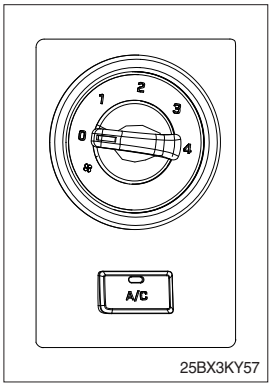
① It is possible to control the fan speed to four steps.

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.



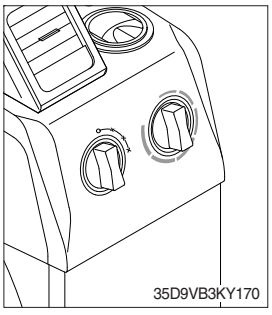
1) AIR CONDITIONER CONTROLLER



(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.

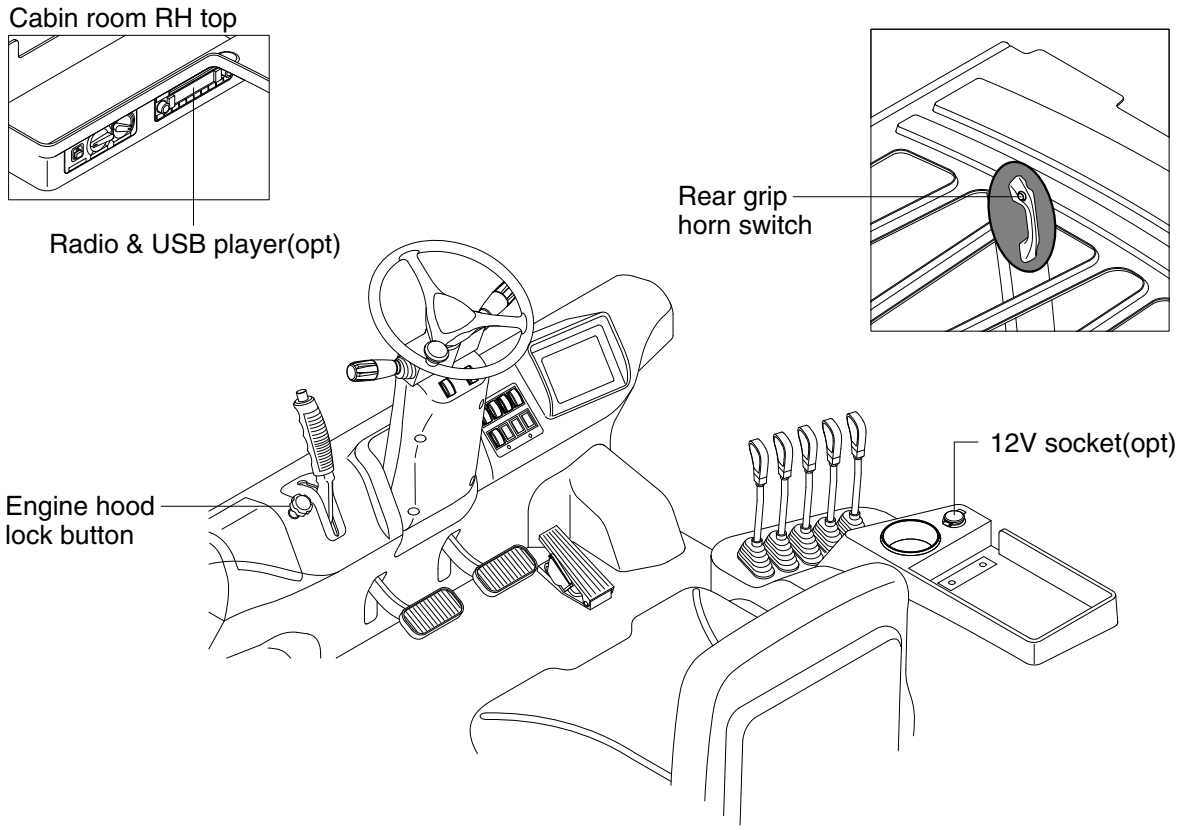
2) HEATER CONTROLLER



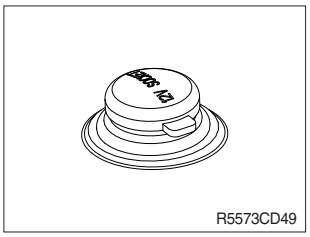
(1) The left knob turns the system ON/OFF and controls fan speed to 3 steps.

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

8. OTHERS

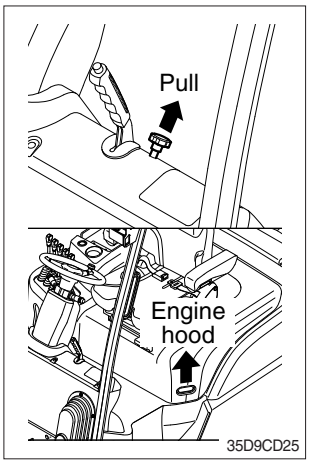


1) 12V SOCKET (OPT)



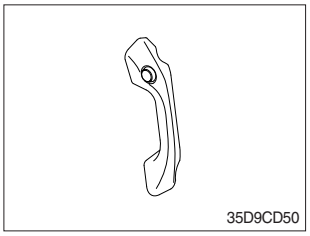
(1) Utilize the power of 12 V as your need and do not exceed power of 12 V, 120 W.

2) ENGINE HOOD LOCK BUTTON



(1) Pull the knob on the dashboard and raise the engine hood to open it.
(2) Inspection and maintenance can then be carried out easily.

3) REAR GRIP WITH HORN (option)

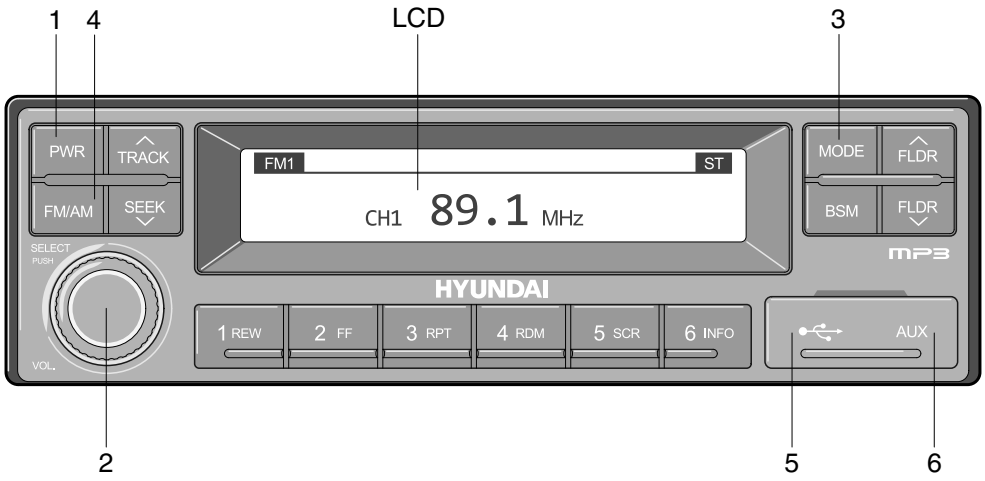


(1) This grip is used for easily riding.
(2) The horn sounds when the button is pressed.

4) RADIO AND USB PLAYER (OPT)

(MACHINE SERIAL NO. 35D-9 : -#0365, 40D-9 : -#0210, 45D-9 : -#1421, 50DA-9 : -#0988)

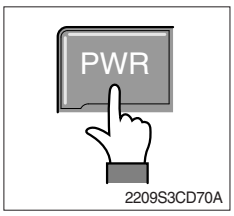
■BASIC FUNCTIONS



2209S3CD70

1 Power (PWR) button
2 Volume/Sound setting button
3 Mode selection button
4 Radio (FM/AM) selection button
5 USB slot
6 AUX terminal

(1) Power (PWR) button

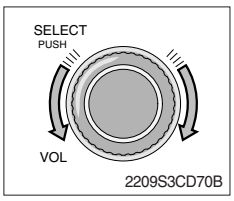


2209S3CD70A

① Press the PWR button to turn on the audio. While the audio is operating, press the button to turn the power off.

(2) Volume/Sound setting button

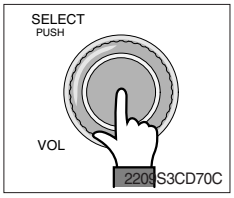
· Volume (VOL) button



2209S3CD70B

① Turn the VOL button clockwise to increase the volume and counter-clockwise to decrease the volume.

· Sound setting



① Press the SELECT button to conduct sound setting.
Each press of the button will change the sound setting in the following order.
BASS → MIDDLE → TREBLE → BALANCE → EQ → BEEP

② After selecting the desired setting, turn the SELECT button clockwise/counter-clockwise to adjust the sound setting value.

③ **BASS adjustment**
Turn the SELECT button clockwise to increase the bass and counter-clockwise to decrease the bass. BASS can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

④ **MIDDLE adjustment**
Turn the SELECT button clockwise to increase the middle and counter-clockwise to decrease the middle. MIDDLE can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

⑤ **TREBLE adjustment**
Turn the SELECT button clockwise to increase the treble and counter-clockwise to decrease the treble. TREBLE can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

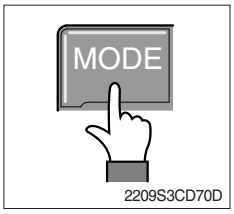
⑥ **Left/Right BALANCE adjustment**
Turn the SELECT button clockwise to increase the right-side speaker volume and counter-clockwise to increase the left-side speaker volume. BALANCE can be adjusted from 10L/10R. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

⑦ **EQ (EQUALIZER) adjustment**
Turn the SELECT button clockwise/counter-clockwise to select the desired EQ. EQ settings are as shown below.
Cls (classic) → Pop → Rock → Jazz → off
If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

※ Upon selecting EQ, the BASS, MIDDLE and TREBLE values will be turned off.
The BASS, MIDDLE, TREBLE values can be set only when EQ Off is selected.

⑧ **BEEP sound adjustment**
Turn the SELECT button clockwise/counter-clockwise to the beep sound ON/OFF. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

(3) MODE selection button



① Pres the MODE button to change to RADIO/USB/AUX/iPod modes. However, the mode can be selected only when the respective media is connected.

② If iPod is connected to the audio, the mode will change in the following order.
RADIO → iPod → USB (handfree)

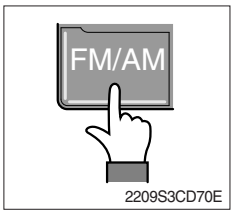
③ If USB, AUX is connected to the audio, the mode will change in the following order.
RADIO → USB(front) → USB(handfree) → AUX

※ USB and AUX mode will operate only when corresponding devices are connected.

※ When connecting iPod, AUX and front USB cannot be connected.

※ The iPod is connected to the USB in the machine handfree.

(4) Radio (FM/AM) selection button



① Each press of the FM/AM button will change the radio mode in the following order.
FM1 → FM2 → FM3 → AM

② Preset memory of up to FM : 18 stations, AM : 6 stations

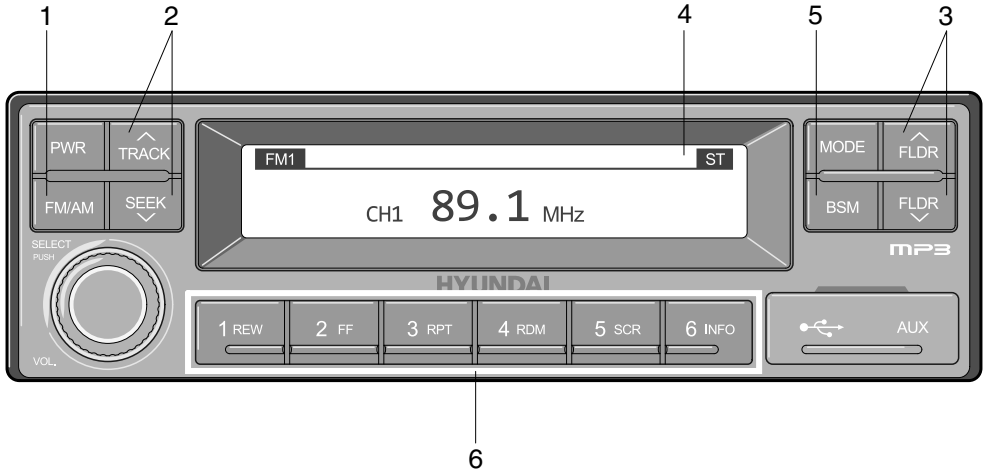
(5) USB slot

Connects USB to play USB music files.

(6) AUX terminal

Connects AUX cable to play AUX music files.

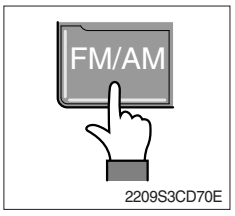
■RADIO



2209S3CD71

1 Radio (FM/AM) selection button
2 TRACK/SEEK button
3 Broadcast manual search (FLDR) button
4 LCD display
5 BSM (Best Station Memory) button
6 Saving broadcast frequencies to PRESET numbers

(1) Radio (FM/AM) selection button



2209S3CD70E

① Each press of the FM/AM button will change the radio mode in the following order.
FM1 → FM2 → FM3 → AM

② In addition, pressing the FM/AM button when the starting switch is in ON state will turn the power on and activate the radio.

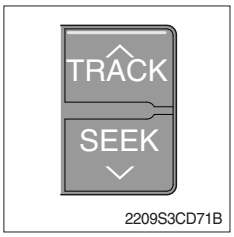
③ **Setting regional Radio Frequency**

▶ North America Frequency
Press the FM/AM and Preset 1 button simultaneously to set frequency in accordance to the North America Frequency settings. “nA” will become displayed on the LCD for one second.
FM : 87.7 ~ 107.9 MHz (200 KHz)
AM : 530 ~ 1710 KHz (10 KHz)

▶ Local/Middle East/Asia Frequency
Press the FM/AM and Preset 2 button simultaneously to set frequency in accordance to the Local/Middle East/Asia Frequency settings. “lnT” will become displayed on the LCD for one second.
FM: 87.5 ~ 108 MHz (100 KHz)
AM: 531 ~ 1602 KHz (9 KHz)

▶ Europe Frequency
Press the FM/AM and Preset 3 button simultaneously to set frequency in accordance to the North America Frequency settings. “Eu” will become displayed on the LCD for one second.
FM: 87.5 ~ 108 MHz (50 KHz)
MW: 531 ~ 1602 KHz (9 KHz)
LW: 153 ~ 279 KHz (1 KHz)

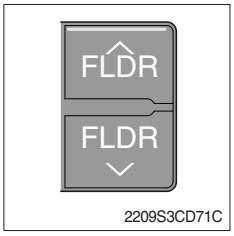
(2) TRACK/SEEK button



① As buttons used to automatically search broadcasts, pressing the button will automatically search and stop at a frequency with superior reception.
TRACK ∧ : Searches frequencies higher than current frequency
SEEK ∨: Searches frequencies lower than current frequency

※ When frequencies cannot be properly found due to weak broadcast reception, try using manual FLDR button. (Refer to manual FLDR button explanation below)

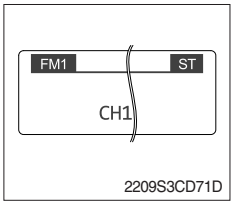
(3) Broadcast manual search (FLDR) button



① As button used to search frequencies manually, a press of the SEEK step (refer to note below) will change the frequency.
Pressing and holding the button will continue changing the frequency. Releasing the button will stop the search at the current frequency.
FLDR ∧: Searches frequencies higher than current frequency
FLDR ∨: Searches frequencies lower than current frequency

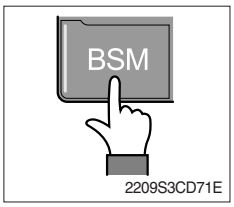
※ SEEK STEP : FM-100KHz, AM-9KHz

(4) LCD display



① The currently received broadcast frequency info and status are displayed.

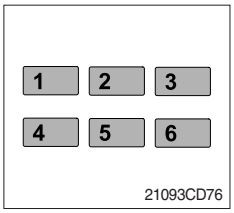
(5) BSM (Best Station Memory) button



① Press and hold the BSM button to listen to the presets saved in FM BAND FM1, FM2, and FM3 or AM BAND AM for 5 seconds each. When you find a station you wish to listen to, press the BSM button again to receive the selected broadcast.

② Shortly press the BSM button to automatically save frequencies with superior reception in presets (1REW~6INFO). The BSM feature will save AM frequencies in AM mode and FM frequencies in FM mode.

(6) Saving broadcast frequencies to PRESET numbers



Up to 18 FM broadcasts and 6 AM broadcasts can be saved.

① Use the auto/manual search buttons to find the desired frequency.

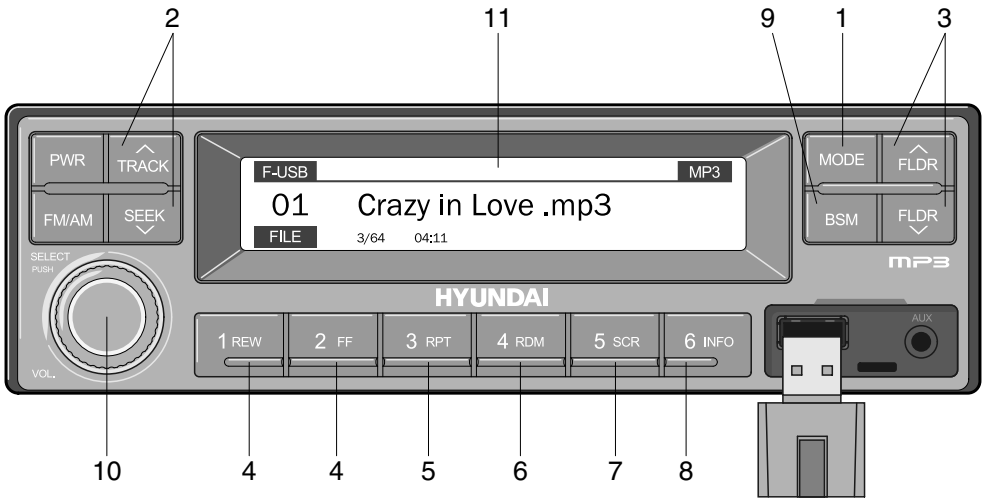
② Select the preset button (1REW~ 6INFO) to which you wish to save the selected frequency. Press and hold the preset button.

③ The frequency will be saved to the preset button to a sound of a beep. The saved frequency number will be displayed on the LCD DISPLAY. (However, the beep will not sound if the beep function has been turned off in sound setting.)

④ After saving is complete, pressing the preset button will play the corresponding broadcast frequency.

※ No beep sound signifies that the preset has not been saved. In this case, try again from the first step. (However, the beep will not sound if the beep function has been turned off in sound setting.)

■USB CONNECTION



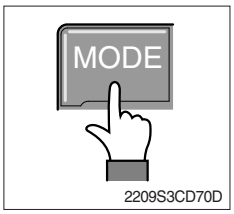
2209S3CD72

1 USB selection button
2 TRACK UP/SEEK DOWN button
3 FLDR UP/DOWN button
4 FF/REW button
5 RPT/FOLDER RPT button
6 RDM/FOLDER RDM button
7 Scroll (SCR) button
8 View music info (INFO) button
9 Scan button (BSM)
10 Finding and playing file (SELECT) button
11 LCD display

· Operates only when a USB is connected. Connecting a USB to the audio will automatically convert to USB mode.

· Connecting the USB when the starting switch is in ON state will turn the power on and automatically play the songs within the USB.

(1) USB selection button

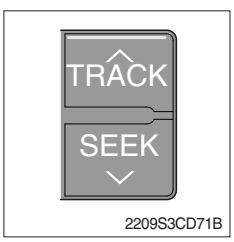


2209S3CD70D

① While playing a different mode, press the MODE button to convert to USB mode. Connecting a USB to the audio will automatically convert to USB mode even if another mode is playing and automatically play the songs within the USB.

② If the USB is connected to both the front USB and handfree, then MODE is converted in the following order.
RADIO → USB(front) → USB(handfree)

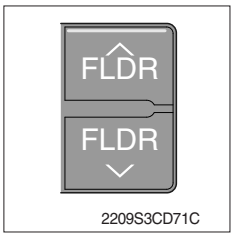
(2) TRACK UP/SEEK DOWN button



2209S3CD71B

① While playing USB, press the TRACK∧ button to play the beginning of the next song.
Press the SEEK∨ button to return to the beginning of the current song. Press the button again to play the beginning of the previous song.

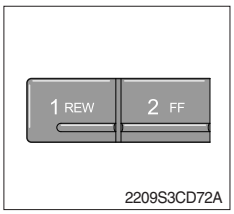
(3) FLDR UP/DOWN button



① If there are more than 2 folders in the USB, pressing the FLDR UP/ DOWN button will move to the previous or next folder.

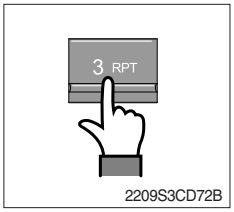
② If there are no folders in the USB, then pressing the button will move up/down within the folder in 10 file increments.

(4) FF/REW button



① While a USB is operating, press and hold the FF button to fast-forward the song. When fast-forward is complete, the next song will properly play from the beginning even if you continue holding the button. Press and hold the REW button to rewind the song. When rewind is complete, the current song will properly play from the beginning even if you continue holding the button. Shortly pressing the buttons will not operate the FF/REW.

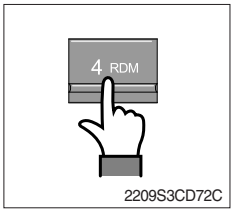
(5) RPT/FOLDER RPT button



① While music is playing, shortly press the RPT button to repeat the currently playing song.

② (RPT function) Press and hold the RTP button to sequentially repeat all songs within the current folder. (FOLDER RPT, however, music files in the USB must be saved in folder format.)

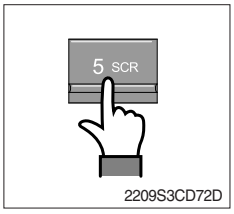
(6) RDM/FOLDER RDM button



① While music is playing, shortly press the RDM button to randomly play the songs in the current folder. (RDM)

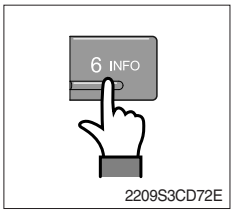
② While music is playing, press and hold the RDM button to randomly play the songs in the current folder. (FOLDER RDM, however, music files in the USB must be saved in folder format.)

(7) Scroll (SCR) button



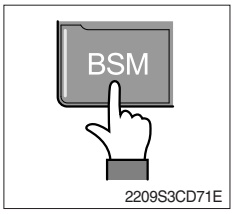
① Press the SCR button to turn ON/OFF the scroll function which scrolls the file name of the currently playing song on the LCD from right to left.

(8) View music info (INFO) button



① Each time the INFO button is pressed, the info on the currently playing song will be displayed in the following order.
FILE NAME → TITLE → ARTIST → ALBUM → DIR

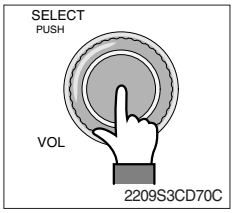
(9) Scan button (BSM)



① While music is playing, shortly press the BSM button to scan each song within the USB for 10 seconds in sequential order. (SCN)

② Press and hold the BSM button to scan each song within the current folder for 10 seconds in sequential order. (FOLDER SCN, however, music files in the USB must be saved in folder format.)

(10) Finding and playing file (SELECT) button

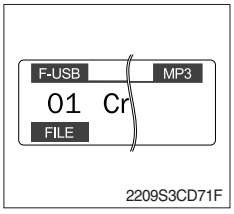


① While USB is playing, press and hold the SELECT button for over 3 seconds to enter FILE BROWER mode and search for desired files.

② After entering FILE BROWSER mode, turn the SELECT button left/right to find the desired folder. After finding the folder, press the SELECT button to select the folder. Turn the SELECT button left/right to find the desired song and press the SELECT button to play.

③ If there are no adjustments for 3 seconds after pressing the SELECT button, the function will be turned off and the USB play screen will be displayed.

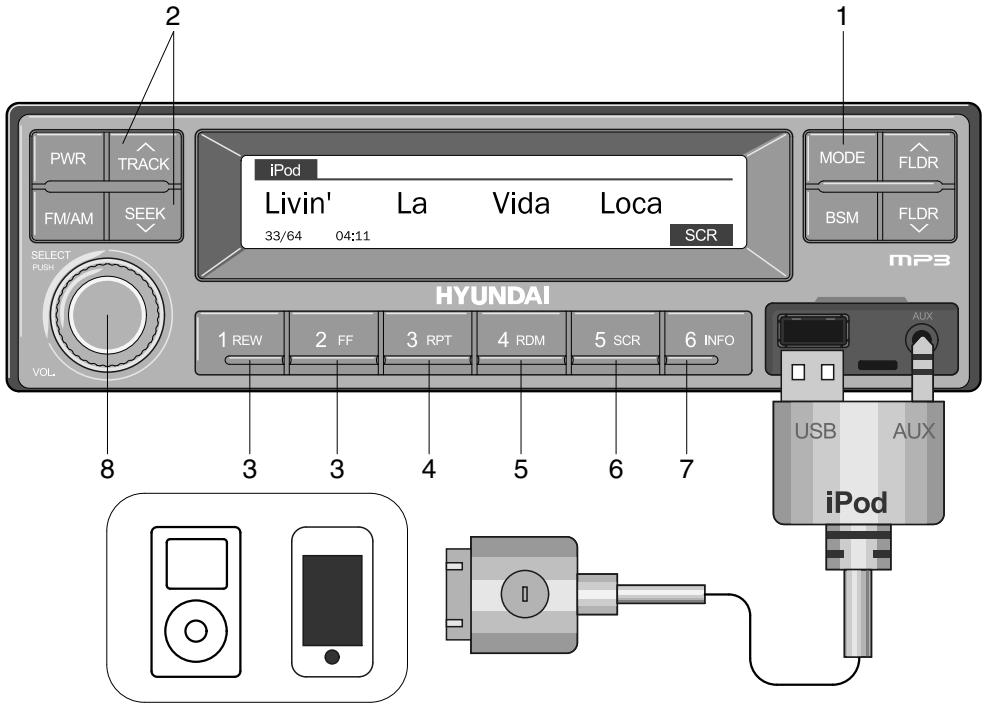
(11) LCD display



① Displays the info of the currently playing song.

- F-USB : Displays USB is connected to the Audio Front
- R-USB : Displays USB is connected to the handfree
- RPT : Displays that repeat function is turned on
- RPT : Displays that folder repeat function is turned on
- RDM : Displays that random play is turned on
- RDM : Displays that folder random play is turned on
- SCR : Displays that SCROLL is turned on

■iPOD CONNECTION



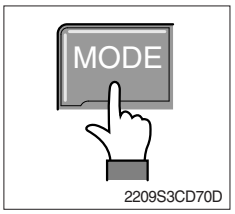
2209S3CD73

1 iPod selection button
2 TRACK UP/SEEK DOWN button
3 FF/REW button
4 Repeat (RPT) button
5 Random play (RDM) button
6 Scroll (SCR) button
7 View music info (INFO) button
8 Finding and playing file (SELECT) button

· Operates only when an iPod is connected. Connecting an iPod to the audio will automatically convert to iPod mode. Connecting the USB when the starting switch is in ON state will turn the power on and automatically play the songs within the iPod.

· The iPod cable is supplied separately.

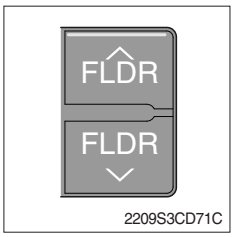
(1) iPod selection button



2209S3CD70D

① While playing a different mode, press the MODE button to convert to iPod mode. Connecting an iPod to the audio will automatically convert to iPod mode even if another mode is playing and automatically play the songs within the iPod.

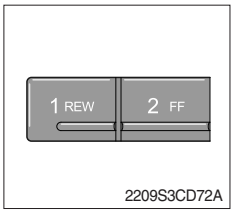
(2) TRACK UP/SEEK DOWN button



2209S3CD71C

① While playing music, press the TRACK∧ button to play the beginning of the next song.
Press the SEEK∨ button to return to the beginning of the current song. Press the button again to play the beginning of the previous song.

(3) FF/REW button



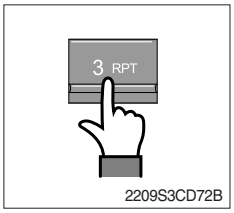
① While an iPod is operating, press and hold the FF button to fast-forward the song.

② When fast-forward is complete, the next song will properly play from the beginning even if you continue holding the button. Press and hold the REW button to rewind the song.

③ When rewind is complete, the current song will properly play from the beginning even if you continue holding the button.

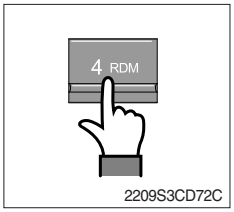
④ Shortly pressing the buttons will not operate the FF/REW.

(4) Repeat (RPT) button



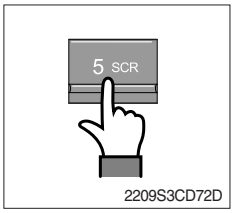
① While music is playing, press the RPT button to repeat the currently playing song.

(5) Random play (RDM) button



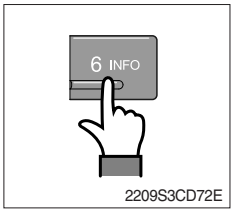
① While music is playing, press the RDM button to randomly play the songs.

(6) Scroll (SCR) button



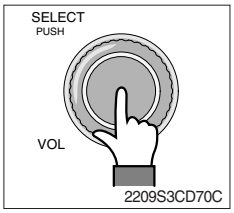
① Displays the file name of the currently playing song on the LCD. Here, the SCR button turns the file name SCROLL ON/OFF.

(7) View music info (INFO) button



① Each time the INFO button is pressed, the info on the currently playing song will be displayed in order of ARTIST → ALBUM → TITLE.

(8) Finding and playing file (SELECT) button



① While iPod is playing, press and hold the SELECT button for over 3 seconds to enter CATEGORY mode and search for desired files.

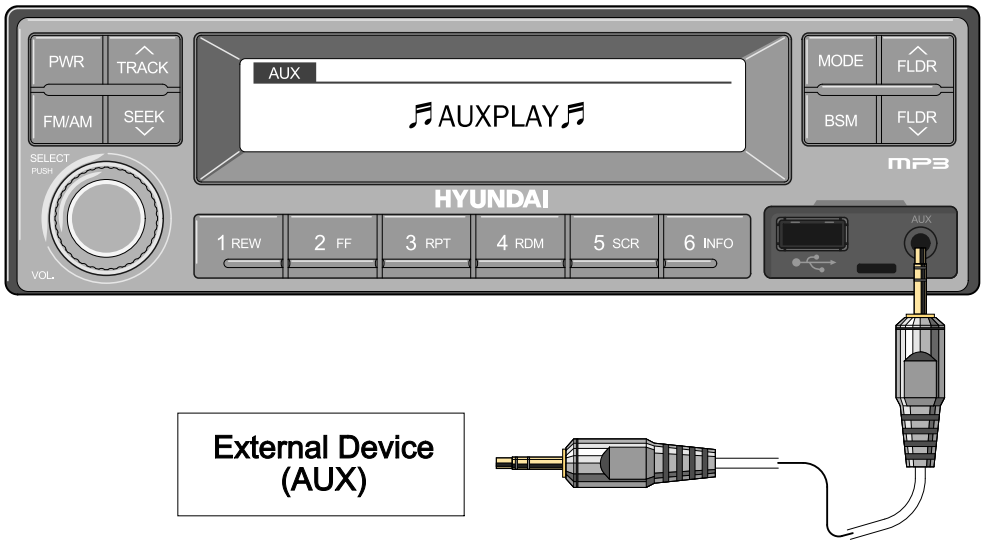
② After entering CATEGORY mode, turn the SELECT button left/right to find the desired category.

③ Category will be displayed in the following order.
PLAYLISTS → ARTISTS → ALBUMS → GENRES → SONGS → COMPOSERS → AUDIOBOOKS → PODCACSTS

④ After finding the category, press the SELECT button to select the category. Turn the SELECT button left/right to find the desired song and press the SELECT button to play.

⑤ If there are no adjustments for 3 seconds after pressing the SELECT button, the function will be turned off and the iPod play screen will be displayed.

■AUX connection



2209S3CD74

· Operates only when an external device is connected to AUX. Connecting an AUX device to the audio using the AUX cable will automatically convert to AUX mode.

· When an external device is connected, only the PWR, FM/AM, MODE, and VOL buttons can be operated.

· Settings can be made only through the external device connected to AUX.

· The AUX cable is supplied separately.

(1) Connecting an external device using the AUX cable

① While playing a different mode, press the MODE button to convert to AUX mode.

② If an external device is connected to the Audio through the AUX terminal, AUX mode will automatically be converted and play music from AUX. Connecting the AUX when the starting switch is in ON state will turn the power on and automatically play the songs within the AUX.

4) RADIO AND USB PLAYER (WITH BLUETOOTH, OPT)

(MACHINE SERIAL NO. 35D-9 : #0366-, 40D-9 : #0211-, 45D-9 : #1422-, 50DA-9 : #0989-)

9403CD100

■FRONT PANEL PRESENTATION

1 ····· Power ON/OFF,
Volume UP/DOWN button

2 ····· Manual UP/DOWN Tuning,
File search, SEL button

3 ····· Mode button,
Audio mute button

4 ····· Call & Pair button

5 ····· Call end button

6 ····· Station preset 1
DIS ····· Display button

7 ····· Station preset 2

8 ····· Station preset 3
RPT ····· Repeat play button

9 ····· Station preset 4
RDM ····· Random play button

10 ····· Station preset 5
DIR- ····· Directory down button

11 ····· Station preset 6
DIR+ ····· Directory up button

12 ····· Scan play button (SCAN)
Best station memory (BSM) button

13 ····· Auto tune up, Seek up button

14 ····· Auto tune down, Track down button

15 ····· USB connector

16 ····· AUX IN Jack

17 ····· MIC hole

RADIO AND USB PLAYER (WITHOUT BLUETOOTH, OPT)
(MACHINE SERIAL NO. 35D-9 : #0366-, 40D-9 : #0211-, 45D-9 : #1422-, 50DA-9 : #0989-)

9403CD101

■FRONT PANEL PRESENTATION

1 ····· Power ON/OFF, Volume UP/DOWN button

2 ····· Manual UP/DOWN Tuning, File search, SEL button

3 ····· Mode button, Audio mute button

4 ····· Radio seek up button

5 ····· Radio seek down button

6 ····· Station preset 1
DIS ····· Display button

7 ····· Station preset 2

8 ····· Station preset 3
RPT ····· Repeat play button

9 ····· Station preset 4
RDM ····· Random play button

10 ····· Station preset 5
DIR- ····· Directory down button

11 ····· Station preset 6
DIR+ ····· Directory up button

12 ····· Scan play button (SCAN)
Best station memory (BSM) button

13 ····· Track up button

14 ····· Track down button

15 ····· USB connector

16 ····· AUX IN Jack

■GENERAL

(1) Power and volume button

① Power ON / OFF button

Press power button (1) to turn the unit on or off.

② Volume UP/DOWN control knob

Turn VOL knob (1) right to increase the volume level.
Turn VOL knob (1) left to decrease the volume.
After 5 seconds the display will return to the previous display mode.

③ Initial volume level set up

I-VOL is the volume level the unit will play at when it is next turned on. To adjust the I-VOL level, press and hold VOL button (1) for longer than 2 seconds. The current volume level displays on the display panel.
Then turn button (1) right or left to set the volume level as the I-VOL level.

④ Clock ON/OFF control

The CLOCK was default at off status. To turn CLOCK ON, press and hold VOL button (1) for longer than 2 seconds to display I-VOL, then short press VOL again, turn VOL knob while CLOCK OFF display, then the CLOCK ON will be displayed.

※ Due to time tolerance, the clock display on the Audio unit might have slight difference.

⑤ Clock adjustment

With CLOCK ON selected, press VOL knob again after CLOCK ON display, the hour will blink, turn VOL knob right or left to adjust hour.
Simply press VOL again, the minute will blink, turn VOL knob to adjust minute. Then press VOL again to confirm the clock once finished.

(2) Menu Selection

① This button can adjust the effect of the sound and other things.
Each time you press this button (2), LCD displays as follows :

BAS → TREB → BAL L=R → FAD F=R → EQ → LOUD ON → BEEP 2ND

On each setting, the level can be controlled by turning TUNE knob (2). When the last adjustment is made, after 5 seconds, the display will automatically return to the previous display mode.

② Bass control

To adjust the bass tone level, first select the bass mode by pressing SEL button (2) repeatedly until BASS appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the bass level as desired. The bass level will be shown on the display panel from a minimum of BASS-7 to a maximum of BASS+7.

③ Treble control

To adjust the treble tone level, first select the treble mode by pressing SEL button (2) repeatedly until TREB appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the treble level as desired. The treble level will be shown on the display panel from a minimum of TREB -7 to a maximum of TREB +7.

④ Balance control

To adjust the left-right speaker balance, first select the balance mode by pressing SEL button (2) repeatedly until BAL indication appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the balance as desired. The balance position will be shown by the bars on the display panel from BAL 10R (full right) to BAL 10L (full left).

⑤ Fader control

To adjust the front-rear speaker balance, first select the fader mode by pressing SEL button (2) repeatedly until FADER indication appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the front-rear speaker level as desired. The fader position will be shown by the bars on the display panel from FAD 10F (full front) to FAD 10R (full rear).

⑥ EQ control

You can select an equalizer curve for 4 music types (CLASSIC, POP, ROCK, JAZZ). Press button (2) until EQ is displayed, then turn knob (2) right or left to select the desired equalizer curve. Each time you turn the knob, LCD displays as follows :

EQ OFF → CLASSIC → POP → ROCK → JAZZ

※ When the EQ mode is activated, the BASS and TREBLE modes are not displayed.

⑦ **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 button (2) until LOUD is displayed, then turn knob (2) right or left to activate or deactivate loudness.

⑧ **Beep control**

To adjust the BEEP mode, first select the BEEP mode by pressing button (2) repeatedly until BEEP indication appears on the display panel. Then turn knob (2) left or right within 5 seconds to select BEEP 2ND, BEEP OFF or BEEP ON.

- BEEP 2ND : You will only hear the beep sound when the buttons are held down for more than 2 seconds.
- BEEP OFF : You can not hear the sound beep when you press the buttons.
- BEEP ON : You can hear the beep sound each time you press the buttons.

(3) Mute control

① Press and hold MUTE button (3) for over 2 seconds to mute sound output and MUTE ON will blink on the LCD. Press the button again to cancel MUTE function and resume to normal playing mode.

(4) Mode selection

① Repeat press MODE button (3) to switch between FM1, FM2, AM, USB, AUX, BT MUSIC.

※ If there is no USB, AUX, Bluetooth Phone connected, it would not display USB, AUX, BT when you press button (3).

■RADIO

(1) Mode button

① Repeat press MODE button to select FM1, FM2 or AM.

(2) Manual tuning button

① To manually tune to a radio station, simply turn encoder TUNE (2) left or right to increase or decrease the radio frequency.

(3) Auto tuning button

① To automatically select a radio station, simply press Seek up or Track down button.

(4) Station preset button

① In radio mode, pressing buttons (6) to (11) will recall the radio stations that are memorized. To store desired stations into any of the 6 preset memories, in either the AM or FM bands, use the following procedure :

a. Select the desired station.
b. Press and hold one of the preset buttons for more than 2 seconds to store the current station into preset memory. Six stations can be memorized on each of FM1, FM2, and AM.

(5) Preset scan (PS) / Best station memory (BSM) button

① Press BSM button (12) momentarily to scan the 6 preset stations stored in the selected band. When you hear your desired station, press it again to listen to it.
Press BSM button (12) for longer than 2 seconds to activate the Best Station Memory feature which will automatically scan and enter each station into memory.

※ If you have already set the preset memories to your favorite stations, activating the BSM tuning feature will erase those stations and enter into the new ones. This BSM feature is most useful when travelling in a new area where you are not familiar with the local stations.

■USB PLAYER

(1) USB playback


9403CD110

① The unit was equipped with a front USB jack and also a rear USB Jack.
With a USB device plugged in the front USB jack, it will be detected as front USB mode. And with a USB device plugged in the rear USB jack, it will be detected as rear USB. To get to a USB mode, press MODE (3) button momentarily or insert the USB device in front or rear USB jack.

※ If there are no mp3 or wma files in USB device, it will revert to the previous mode after displaying NO FILE.

(2) Track Up / Down button

9403CD106

① Press SEEK up (13) or TRACK down (14) to select the next or previous track. Press and hold the buttons to advance the track rapidly in the forward or backward direction.

9403CD107

(3) MP3 directory / File searching

9403CD111

① Button (2) is used to select a particular directory and file in the device. Turn button (2) right or left to display the available directories. Press button (2) momentarily when the desired directory is displayed, then turn button (2) right or left again to display the tracks in that directory. Press button (2) to begin playback when the desired file is displayed.

(4) Directory Up / Down button

9403CD112

① During MP3/WMA playback, simply press DIR- button (10) to select the previous directory (if available in the device); simply press DIR+ button (11) to select the next directory (if available in the device).

※ If the USB device does not contain directories, it would play MP3/WMA tracks at 10- file when you press DIR- button (10), and play MP3/WMA tracks at 10+ file when you press DIR+ (11) button.

(5) Track Scan Play (SCAN) button

- SCAN playback : Simply press SCAN (12) button to play the first 10 seconds of each track.
- SCAN folder : Press and hold SCAN button for longer than 2 seconds to scan play the tracks in current folder.
- SCAN off : Simply press it again to cancel SCAN feature.

(6) Track Repeat Play (RPT) button

- REPEAT playback : Simply press RPT (8) button to play current track repeatedly.
- REPEAT folder : Press and hold RPT for longer than 2 seconds to repeat play the tracks in current folder.
- REPEAT off : Simply press it again to cancel REPEAT feature.

(7) Track Random Play (RDM) button

- RANDOM playback : Simply press RDM (9) button to play the tracks in the device in a random sequence.
- RANDOM folder : Press and hold RDM button for longer than 2 seconds to randomy play the tracks in the current folder.
- RANDOM off : Simply press it again to cancel RANDOM feature.

(8) ID3 v2 (DISP)

① While a MP3 file is playing, press DISP button (6) to display ID3 information. Repeat push DISP button (6) to show directory name / file name and album name / performer / title.

※ If the MP3 disc does not have any ID3 information, it will show NO ID3.

* USB Information and Notice

a. Playback FILE SYSTEM and condition allowance.
   - FAT, FAT12, FAT16 and FAT32 in the file system.
   - V1.1, V2.2 and V2.3 in the TAG (ID3) version.

b. Display up to 32 characters in the LCD display.

c. No support any of MULTI-CARD Reader.

d. No high speed playback but only playing with normal full speed.

※ DRM files in the USB may cause malfunction to playback in the radio unit.

※ In temperatures below -10℃ (14°F), the audio unit with USB hook up may be affected and not play well.

■AUX OPERATION

It is possible to connect your portable media player to the audio system for playback of the audio tracks via the cab speakers.

To get the best results when connecting the portable media to the audio system, follow these steps :

- Use a 3.5 mm stereo plug cable to connect the media player headphone socket at each end as follows.
- Adjust the portable media player to approximately 3/4 volume and start playback.
- Press the MODE button (3) on the audio unit to change into AUX mode.
- The volume and tone can now be adjusted on the audio unit to the desired level.

※ The audio quality of your media player and the audio tracks on it may not be of the same sound quality as the audio system is CD Player.

※ If the sound of the media player is too low compared with the radio or CD, increase the volume of the player.

※ If the sound of the media player is too loud and/or distorted, decrease the volume of the player.

※ When in AUX mode, only the Volume, Bass, Treble, EQ and Mode functions of the audio unit can be used.

■BLUETOOTH (if equipped)

(1) Using a bluetooth wireless connection

① Your audio unit supports bluetooth wireless technology. You can set up a wireless link with bluetooth cellular phone.

② Continue to pair the cellular phone with the audio unit. Within a few moments the two should be able to connect.

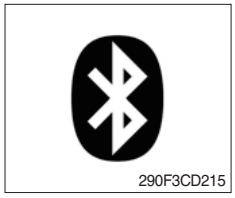
※ Since this audio unit is on standby to connect with your cellular phone via bluetooth wireless technology, using this audio unit without running the engine can result in battery drainage.

※ This audio units phone call reception is on standby when ignition switch is set to ACC OFF or ON.

※ The line-of-sight distance between this audio unit and your cellular phone must be 10 meters or less for sending and receiving voice and data via bluetooth wireless technology. However the transmission distance may become shorter than the estimated distance depending on the environment where it is being used.

※ Digital Noise & Echo suppression system provides the best sound clarity with little or no distortion (Echo & side tone will happen depending on cellular phone or service network).

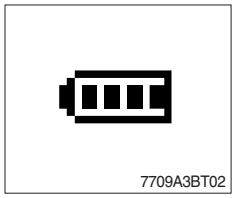
※ To ensure the quality of calling, you should select a proper bluetooth VR level. This audio unit is already equipped with the best bluetooth VR level.



a. Bluetooth icon

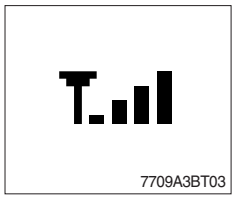
It will blink while establishing the bluetooth pairing.

It will light up after a bluetooth device connected.



b. Battery icon

It indicates the battery status of the connected bluetooth device.



c. Single strength icon

It indicates the signal strength of the connected bluetooth device.

(2) Pairing in hands free modes

① Press and hold CALL button (4) for 2 seconds until you hear beep sound, then PAIR STR will appear on the display.

② For the next procedure, go to cellular phone pairing mode.

③ If it is in pairing status with audio unit and cellular phone, PAIRING will show on the display.

④ If you want to exit pairing mode, press CALL END button (5) briefly while pairing, then it will show PAIR CLR on the display.

⑤ Bluetooth Icon and PAIR OK appear on the display when pairing is successful.

(3) Cellular phone pairing mode

① Browse your cellular phone menu and find the connectivity or bluetooth connection section.

② Select search for a new handsfree device function and allow the phone to find the mobile.

③ HYUNDAI should appear on your cellular phone screen.

④ Press connect menu among the handsfree option on your cellular phone.

⑤ The cellular phone should prompt for a pin code. Insert the pin code 1234.

⑥ The cellular phone should confirm that it has established a new paired connection.

⑦ Close the menu. The pairing is now completed. It appears PAIR FAIL on the display for 3 seconds.

※ Each cellular phone type has distinct phone menu so you may need to refer to your manufactures instruction for the correct procedure on how to connect a new bluetooth device.

※ Please retry the pairing instruction if HYUNDAI does not appear on the cellular phone screen.

※ Please select authorized, if there is authorized menu in the menu of bluetooth connection in your cellular phone.

※ Once the bluetooth pairing is completed between your cellular phone and this audio unit, both units will be automatically recognized on its paring like when you turn on the key in your car even though the audio unit is turned off.

※ This audio unit can store up to 6 phones pairings. If the memory is full, the first stored paired phone will be deleted.

※ The connecting priority will be given to the last connected cellular phone.

※ If you want to change the connecting priority, try to connect this audio unit from the cellular phone you want.

(4) Bluetooth connection and disconnection

① When established bluetooth connection is made between this audio unit and the cellular phone, bluetooth icon on the display appears and then the display shows HF/AV CONN when handsfree & AV profile is connected.


9403CD118

② To disconnect bluetooth link
Press and hold CALL END button (5) for 2 seconds, it shows DIS CON and bluetooth Icon disappears on the display.


9403CD117

③ To connect bluetooth link
Press CALL button (4) briefly, it blinks bluetooth Icon on the display while bluetooth is being connected. If the connection is completed, bluetooth Icon displays on the display.

※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.

※ In case of failure of bluetooth pairing :
- **Delete item in paired list on your phone.**
- **Reset both phone by power off/on and the audio unit by ACC off/on.**

※ Connecting priority of handsfree profile is higher than headset profile.

※ The headset mode does not support caller ID, reject call and call Transfer.

(5) Using the audio unit as a handsfree device

① When the audio unit is ringing, it shows CALL and follows with the phone number ********** on the display.


9403CD117/8

② To accept call
Press CALL button (4), ANSWER CALL followed by TALKING will show in the display.

③ To end call
To end call, press CALL END button (5), REJECT appears on the display.

※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

(6) Audio transfer between the audio unit and phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

① Press CALL button (4) briefly during conversation, it appears CALL TRANS on the display. To switch back to the audio unit, press button (4) briefly during private conversation, then it appears CALL TRANS on the display again.

※ This function will be a cause of disconnection of bluetooth link in some nokia phones, but do not worry, just press button (4) during private conversation, then switch back to the audio unit automatically.

※ The quality of calling between cellular phone and audio unit is better than calling between one audio unit and another one.

(7) Last call number dialing

① Press CALL button (4) briefly, it appears CALL TO on the display, then simply press CALL button once again, it would make the last call with phone number displayed on LCD.
If Reject call is activated in your phone, then your cellular phone does not support Reject Call function.

※ If you are using SAMSUNG phone, then you may need to press send button once more. With the first press of button it should show contact list in your phone, then if you press again you should be ready to make the last call.

(8) To make a call by cellular phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

① The audio unit will be activated automatically when you make a call with cellular phone.
② When you make a call processing by cellular phone, it shows CALLING on the display.
③ When you receive a call, the phone number ******** appears on the display.

(9) Using the audio unit as bluetooth music

The audio unit supports A2DP (Audio Advanced Distribution Profile) and AVRCP (Audio Video Remote Control Profile), and both profiles are available to listen music at the audio unit via cellular phone which is supporting the two profiles above.

① To play music, search the menu on your cellular phone as below :
i.e : Menu→ File manager→ Music→ Option→ Play via bluetooth.
It appears BT MP3 on the display.

② During BT MP3 playing, you could select the previous or next track by pressing SEEK up or TRACK down button on audio unit or operate via your cellular phone.

③ To stop music, press button (5) briefly and it will automatically switch into the previous mode.

④ To resume music playing, press the play button on your cellular phone.

※ This function may be different depending on cellular phone. Please follow the cellular phone menu. Some types of phones need to pair once more for bluetooth MP3 connection.

※ This function will be caused to disconnect A2DP, AVRCP depends on cellular phone.

※ Information about songs (e.g.: the elapsed playing time, song title, song index, etc.) cannot be displayed on this audio unit.

■RESET AND PRECAUTIONS

(1) Reset function

Interfering noise or abnormal compressed files in the MP3 disc or USB instrument may cause intermittent operation (or unit frozen/locking up). It is strongly recommended to use appropriate USB storage to not cause any malfunction to the audio unit. In the unlikely event that the player fails to operate correctly, try to reset unit by any of following two methods.

① press and hold 

simultaneously for about 5 seconds. (without Bluetooth)

② Press and hold 


simultaneously for about 5 seconds. (with Bluetooth)

※ Take out the fuse for the audio system in the vehicle once and then plug it back in.

※ It will be necessary to re-enter the radio preset memories as these will have been erased when the microprocessor was reset.

After resetting the player, ensure all functions are operating correctly.

(2) Precautions

When the inside of the cab is very cold and the player is used shortly after switching on the heater, moisture may form on the disc or the optical parts of the player and proper playback may not be possible.

If moisture forms on the optical parts of the player, do not use the player for about one hour. The condensation will disappear naturally allowing normal operation.

① Operation voltage : 9~32 volts DC, negative

② Output power : 40 watts maximum (20 watts x 2 channels)

③ Tuning range

Area	Band	Frequency range	Step
USA	FM	87.5~107.9 MHZ	200K
	AM	530~1710 KHZ	10K
EUROPE	FM	87.5~108.0 MHZ	50K
	AM	522~1620 KHZ	9K
ASIA	FM	87.5~108.0 MHZ	100K
	AM	531~1602 KHZ	9K
LATIN	FM	87.5~107.9 MHZ	100K
	AM	530~1710 KHZ	10K

● AREA Selection :

- To select an area, press and hold related buttons at FM1 band for about 3 seconds.
- USA Area: Press and hold mode + 1DIS buttons for 3 seconds
- EUROPE Area: Press and hold mode + 2 buttons for 3 seconds
- ASIA Area: Press and hold mode + 3RPT buttons for 3 seconds
- LATIN Area: Press and hold mode + 4RDM buttons for 3 seconds.

④ USB version : USB 1.1

⑤ Bluetooth version : V2.1

⑥ Bluetooth supported profile :

- A2DP : Advanced Audio Distribution Profile
- AVRCP : Audio/Video Remote Control Profile
- HFP : Hands-Free Profile

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
⑤ Gear selector lever
⑥ Steering system
⑦ Lift mechanism and any attachments.

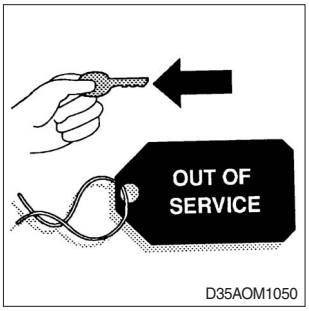
When the functional check are completed, follow the **standard shutdown procedures** given in Section 5, **Starting and operating procedures.**

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.

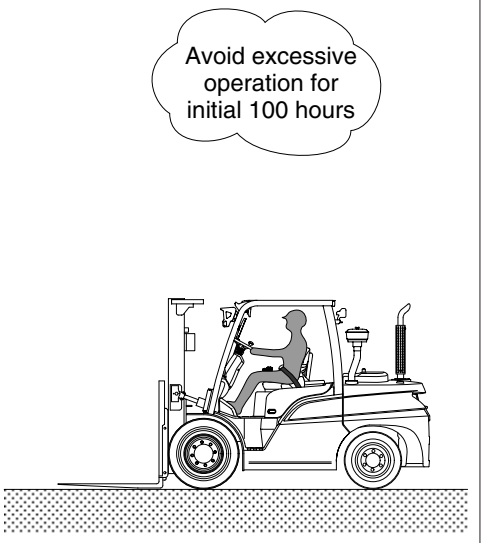
(4) Warm up the truck fully before operation.

(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	Service
Engine oil	50
Engine oil filter element	
Differential gear oil	100
Transmission oil	
Transmission oil filter	



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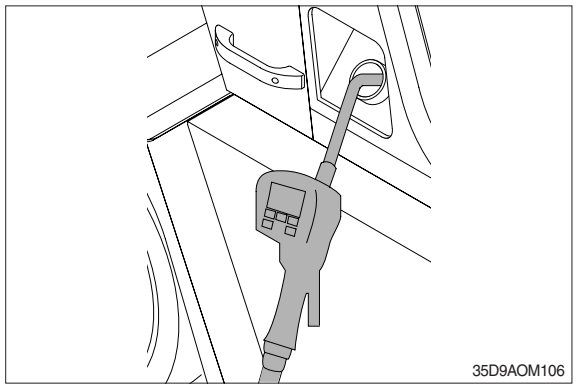
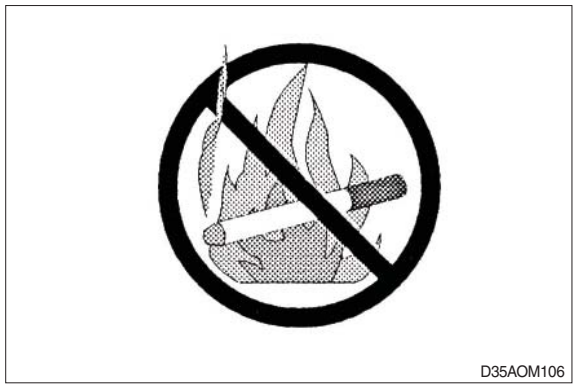
3. FUEL SAFETY PRACTICES

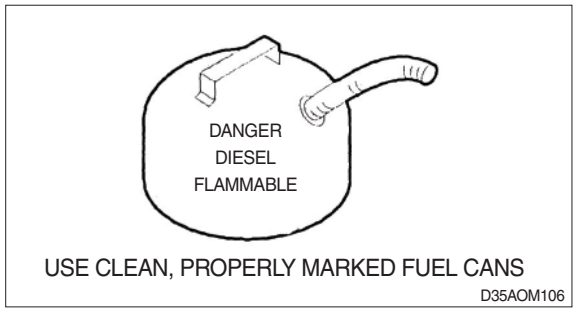
REFUELING DIESEL TRUCKS



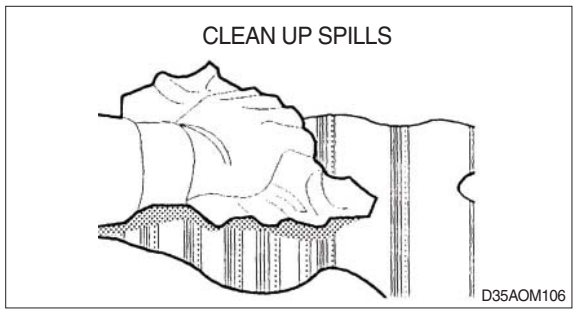
⚠ Stop the engine when refueling.
All lights and flames shall be kept at a safe distance while refueling.



⚠ 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 engie oil.

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

※ This service interval is for R-engine model. 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 temerature conditions

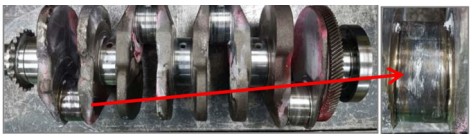
※ Problems with poor engine oil management

⚠ Excessive or little engine oil filling

Engine oil quantity (lower)	① Damage on E/G moving parts with poor lubrication due to premature E/G oil deterioration ☞ Crankshaft, camshaft, conrod bearing, piston scuffing, etc. ② Damage on moving parts due to aeration in E/G oil, etc	Oil level gauge unchecked after filling E/G oil
Engine oil quantity (over)	① Damage on after-treatment unit due to excessive blow-by gas ② Dieseling due to excessive blow-by gas ③ Damage (melting) on piston due to E/G oil flow into combustion chamber ④ Injector tip burnout and E/G hestiation due to abnormal combustion by E/G oil in combustion chamber	

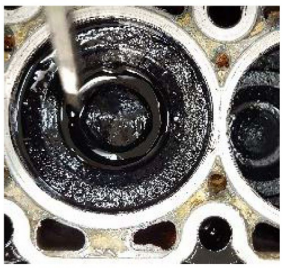
※ This service interval is for R-engine model.

< Problem picutres >



< Crankshaft pin seizure >

< Connecting rod bearing seizure >



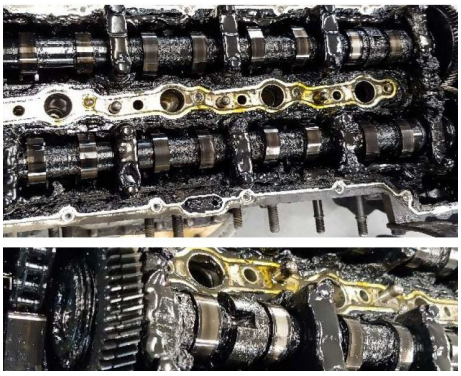
< Engine oil in combustion chamber >

< Connecting rod broken >

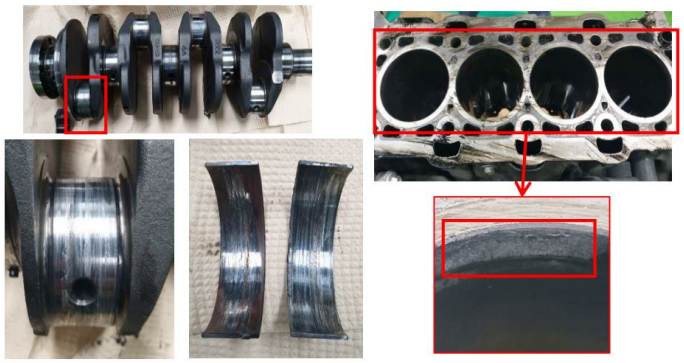
⚠ Engine oil contamination (neglecting daily and periodic check)

Gelled	① Excessive wear and seizure of turbocharger shaft bearings due to delayed oil supply to turbocharger ② Excessive wear and seizure of crankshaft main bearing ③ Excessive oil consumption due to piston scuffing and cylinder block bore scratches ④ Excessive wear and seizure of connecting rod bearings ⑤ Excessive wear and seizure of cam shaft bearings ⑥ Engine power reduction and hesitation due to poor autolash ⑦ Excessive chain noise due to poor timing chain tensioner ⑧ Wear and burnout due to lack of lubrication of timing chain lever, guide	Checking and replacement not performed Water inflow etc
Viscosity (high)		

< Problem picutres >



< 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.

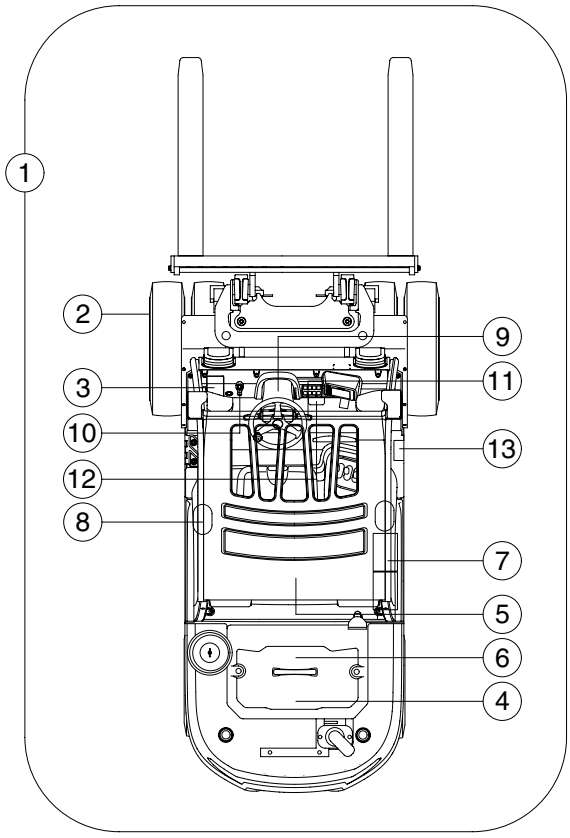
⚠ Do not start or operate the truck, or any of its functions or attachments, from any place other than the designated operator's position.

⚠ 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.

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 Brake fluid
4 Coolant level
5 Engine oil level
6 Fan belt tension
7 Battery
8 Hydraulic oil level
9 Prefilter
10 Parking brake
11 Multi function switch
12 Pedals
13 DEF level

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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 machine.
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, forks, mast and lift chains 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^2	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

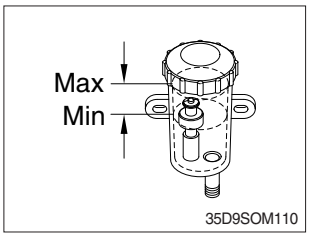
(2) Rear tire (Pneumatic type only)

Item	Unit	Rear tire	
		35/40D-9	45D-9, 50DA-9
Tire air pressure	kgf/cm^2	8.5	10
	psi	121	142
	bar	8.3	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.

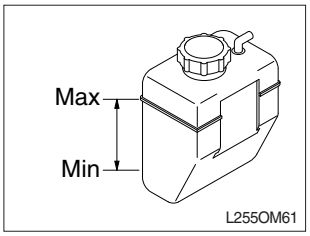
3) CHECK BRAKE FLUID



(1) Check level when the brake oil level warning lamp is turned ON. If necessary, add brake fluid.

Type	Brake fluid
Wet type	Azolla ZS32 or hyd oil ISO VG32

4) CHECK COOLANT LEVEL



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

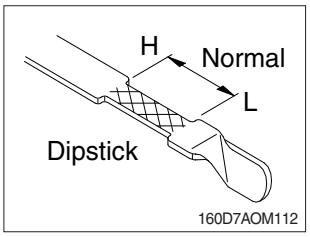
※ **Always check the coolant level in the radiator reservoir tank prior to beginning of daily operation of the machine.**

⚠ **If 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 surge tank cap. Wait until the radiator is cool enough to be touched by hand before opening the surge tank cap. Loosen the surge 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.**

5) CHECK OIL LEVEL IN ENGINE OIL PAN



(1) Stop the engine, pull out the dipstick and check the oil level.

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

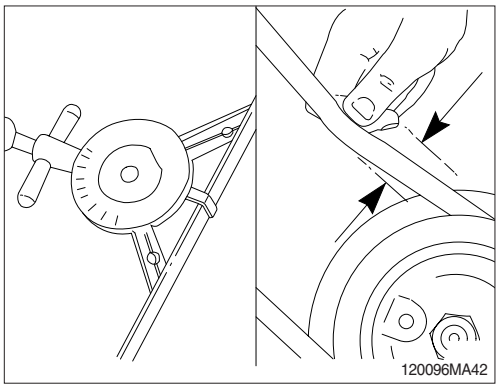
※ **Change the oil if it is marked dirty or discolored.**

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

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

6) CHECK FAN BELT

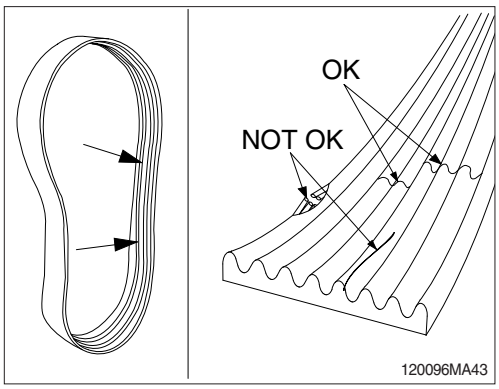
(1) An deflection method can be used to check belt tension by applying 11 kgf (25 lbf) force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



(2) Inspect the fan belt for damage.

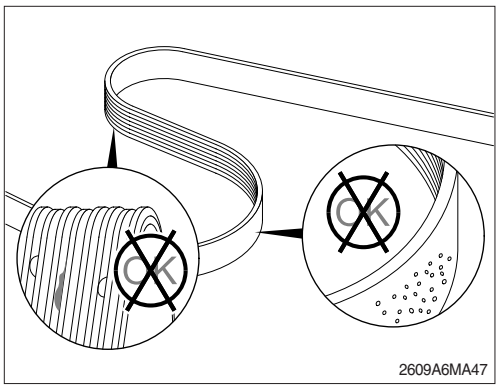
① Transverse (across the belt) cracks are acceptable.

② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



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

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



7) 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.**

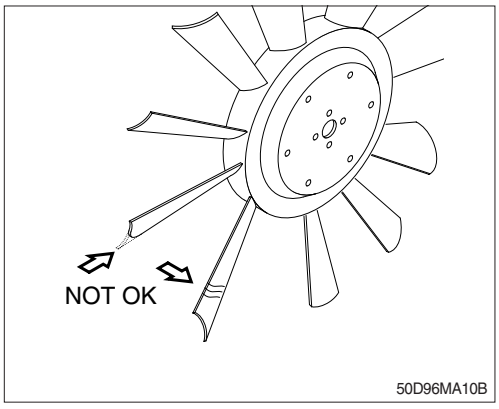
※ **Rotate the crankshaft by using the engine barring gear.**

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

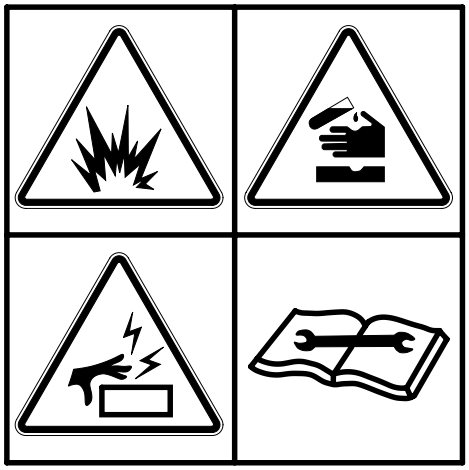
Check for cracks, loose rivets, and bent or loose blades.

Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary.

Replace any fan that is damaged.



8) BATTERY



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(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.**

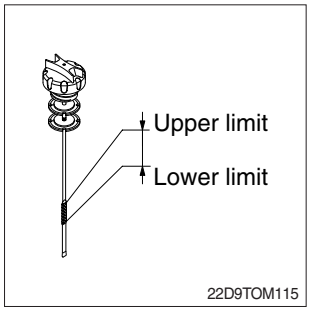
Do not stain clothes or skin with electrolyte as it is acid.

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 machine in cold weather.

9) CHECK HYDRAULIC OIL LEVEL



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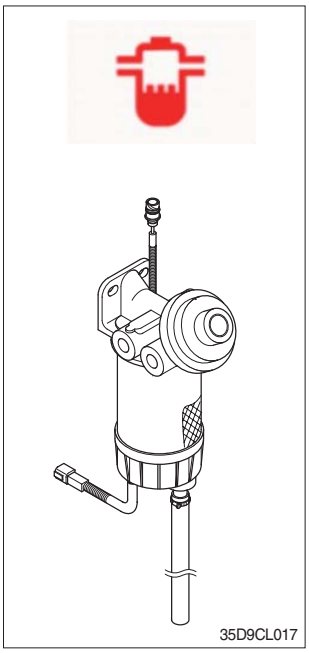
(1) Rest fork on ground and stop engine. Pull out dipstick and check oil level. If insufficient, add oil.

⚠ **Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.**

10) CHECK GAUGES



35D9CL017

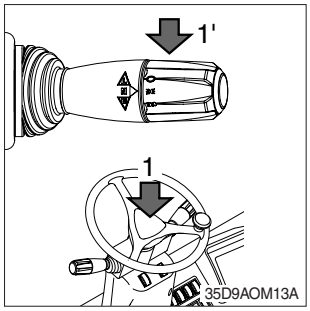
(1) Water in fuel warning lamp.
If the warning lamp stays on, drain the water from the prefilter.

11) CHECK PARKING BRAKE

Operating force	20~30 kg (44~66 lb)

(1) If the operating force is below 20-30kg (44-66 lb), contact your HYUNDAI forklift distributor.

12) 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.

13) 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

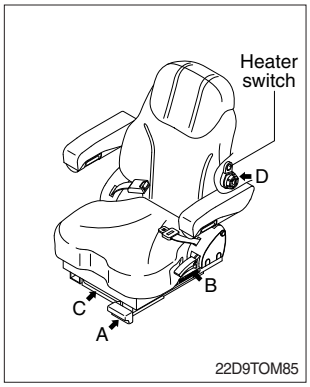
	Unit	Specification
Free play	mm (in)	2~4 (0.07~0.16)

4. SEAT ADJUSTMENT

1) SEAT ADJUSTMENT

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

Grammer seat



(1) Forward/Backward adjustment (A)

① Pull lever A to adjust seat forward or backwards.

(2) Reclining adjustment (B)

Pull lever B to adjust seat backrest.

(3) Weight adjustment (C)

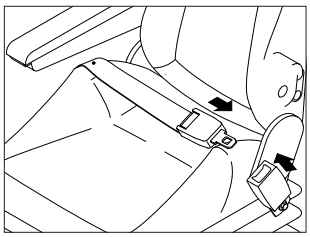
(4) Lumbar adjustment (D)

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

(5) Heated seat switch (option)

Press this switch in order to heat the seat.

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

⚠ Always wear your seat belt when operating a lift truck. Failure to wear seat belt will result in injury or death in an event of an accident.

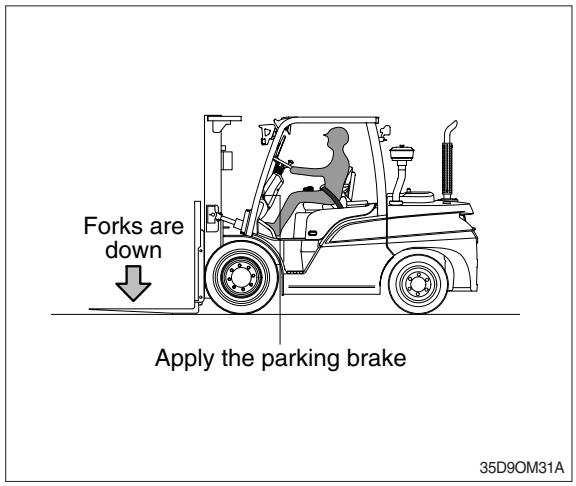
⚠ Always check the condition of the seat belt and mounting hardware before operating the machine.

⚠ Replace the seat belt at least once every three years, regardless of appearance.

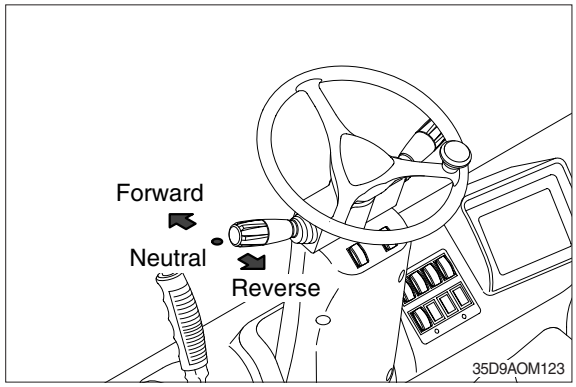
5. STARTING FROM A SAFE CONDITION

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 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 not need 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.

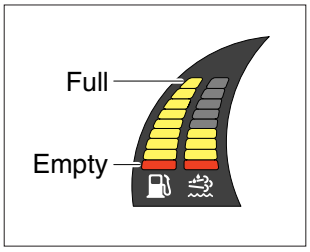
8. CHECK AFTER STARTING ENGINE

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



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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.

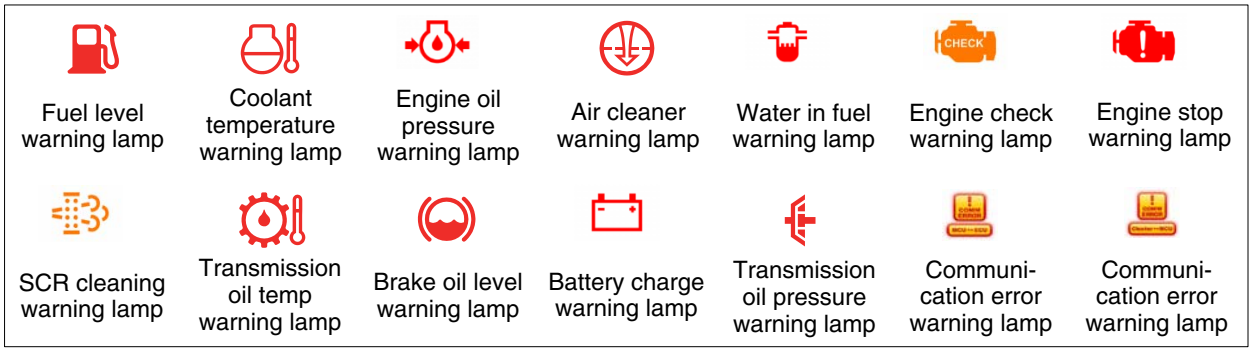
※ **The moisture in the fuel system can be caused a difficulty of the engine starting and may lead to a serious problem for the engine function.**

⚠ **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 approriate service and maintenance.

※ Cluster warning lamps light up to indicate an abnormality. (refer to page 3-8)



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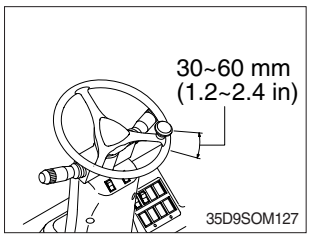
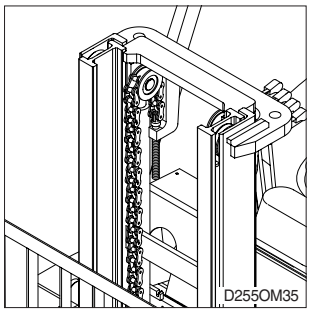
5) CHECK STEERING WHEEL PLAY



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)

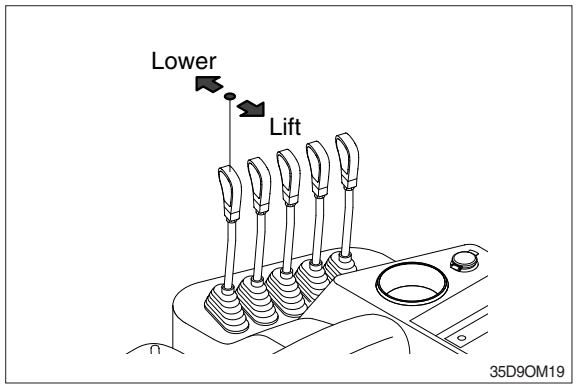
Adjust the rearview mirror for best rearward visibility.

9. LEVERS AND PEDALS

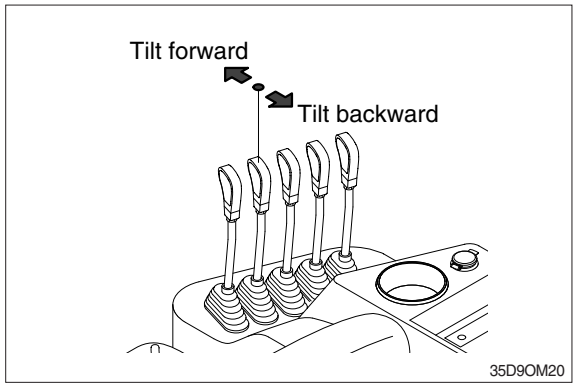
1) POSITIONING FORKS AND MAST

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.

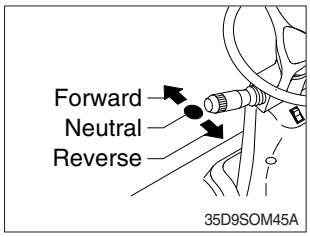


⚠ When the mast (carriage and/or load) is raised into a high (elevated) position, the stability of the truck is reduced.

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.

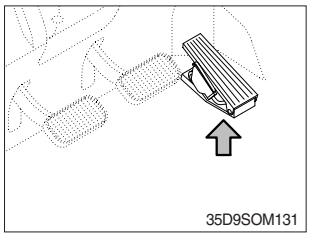
2) SELECTING DIRECTION OF TRAVEL



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

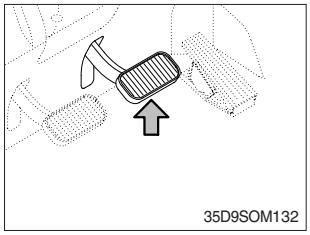
⚠ **During traveling in forward or reservers direction rapid turning of the machine can cause dropping of a load and damage of the machine.**

3) USING THE 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.

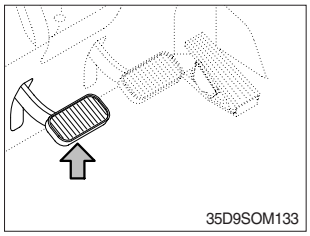
4) BRAKING PEDAL



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 loose a load and damage to the lift truck. Can cause tip-over.**

5) INCHING PEDAL



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

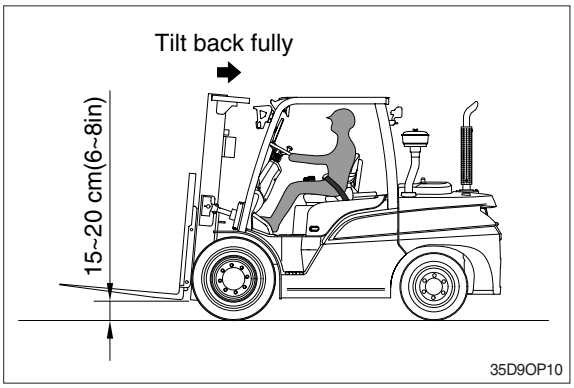
⚠ **When slipping the clutch, it can happen heating in the system and reduced a durability of the components. When operating accelerator, avoid frequent use and cut off the power of the traveling by pressing sufficiently the inching pedal.**

10. TRAVELING OF THE TRUCK

1) BASIC OPERATION

(1) Traveling posture

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

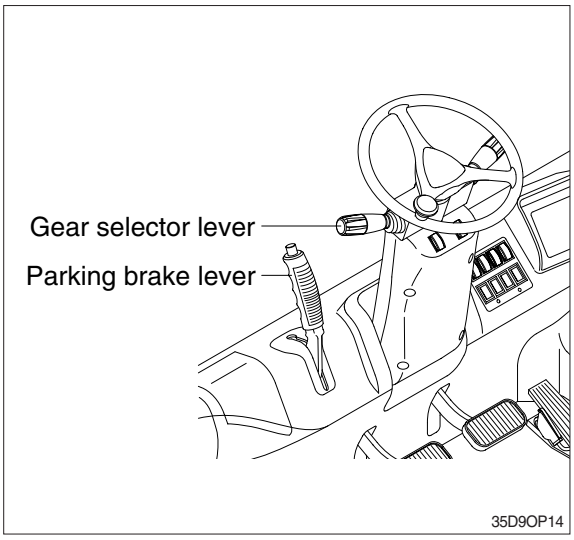


(2) Traveling operation

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

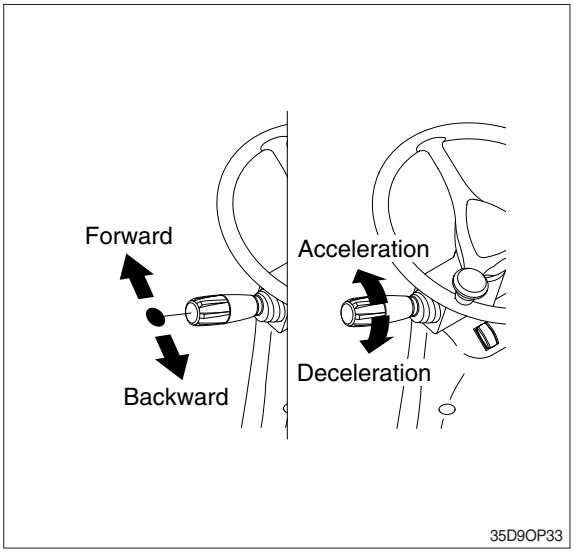
① The gear selector is designed for the mounting on the left side of the steering column.

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.

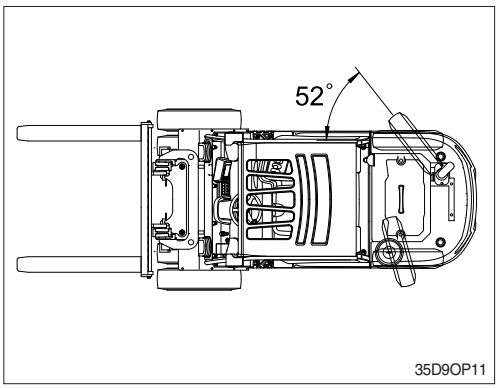
(4) Turning the truck

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.

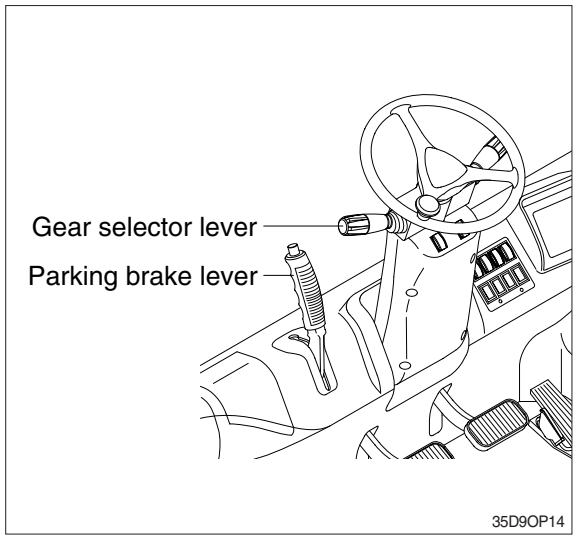
⚠ Do not drice the forklift more than 30 minutes without idling.

If the truck is driven 30 mminutes, stop driving and keep it 10 minutes under idle condition.

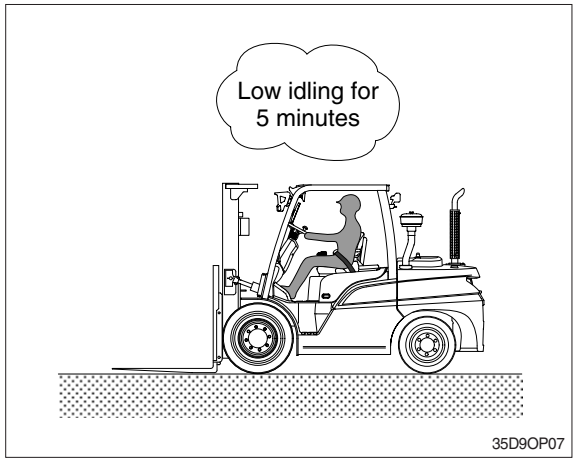
Excessive Driving may cause the overheating of brake and ties and this may result in short like cycle those parts.

(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 lever 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 lever is in the lock (ON) position.

② Check if the gear selector lever is in the neutral position.

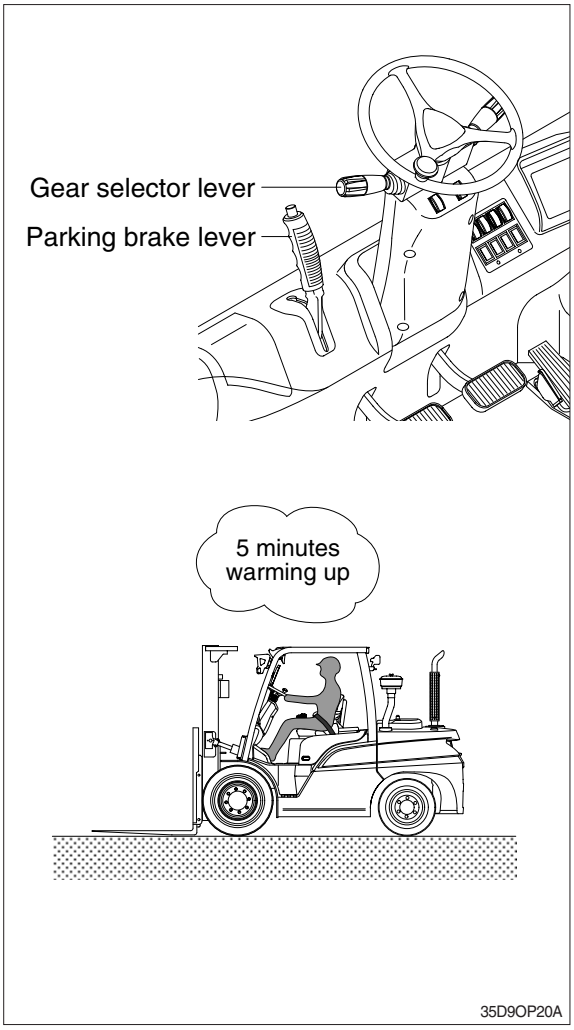
③ Run the engine at low speed without operating the equipment for about 5 minutes.
Turn the starting key to the OFF position and remove the key.

(8) Checks after the engine stopped

① Check the leakage of oil and water, the work equipment and the exterior of the

② truck.

③ Refill the fuel tank.
Remove any debris inside of the engine room and attached to the truck.



35D9OP20A

2) TRAVELING ON A SLOPE

(1) Never travel down a slope in neutral.

(2) Lower the forks 15-20 ㎝ (6~8 in) to the ground.

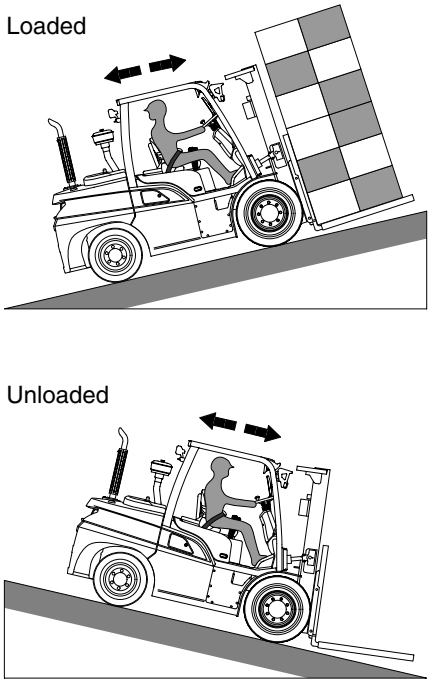
(3) Never turn on a slope, either loaded or unloaded.

(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.**



35D9OP21

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 machine 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 of 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 machine 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.

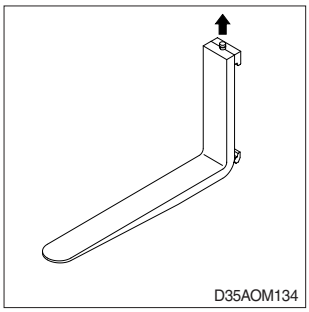
⚠ Slack chains mean rail or carriage hang-up. Raise the mast before you move. If the mast malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains by raising the carriage. DO NOT go under a raised mast or forks to attempt repairs.
DO NOT climb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



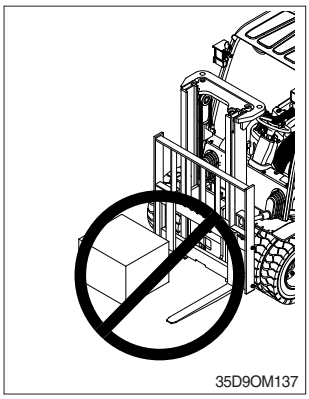
The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make 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 (LBR) or fork retaining bolts are fasten securely in place.

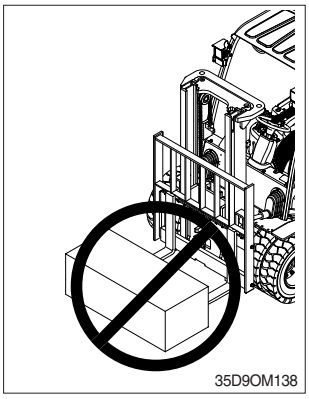
3) LOAD ON FORKS



(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.

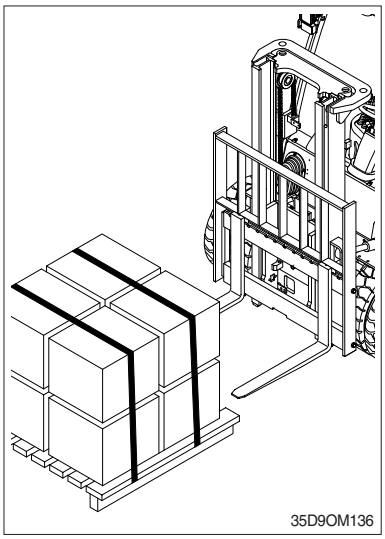
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

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.

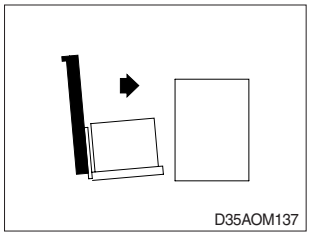
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (Pallet).

Carefully back away to clear the forks from the load.

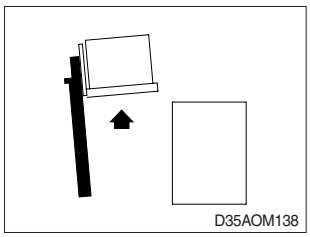
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

7) STACKING

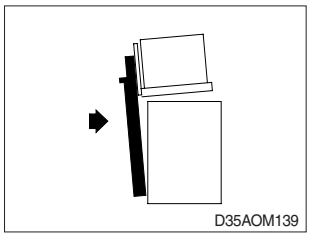
(1) To put a load on a stack



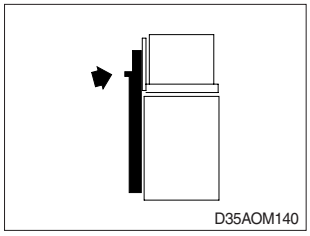
① Approach slowly and align the lift truck and load squarely with the stack.



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

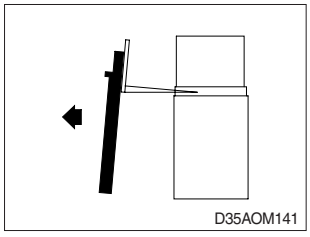


③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.

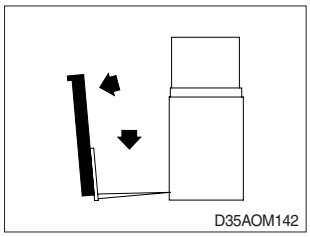


④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.

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.

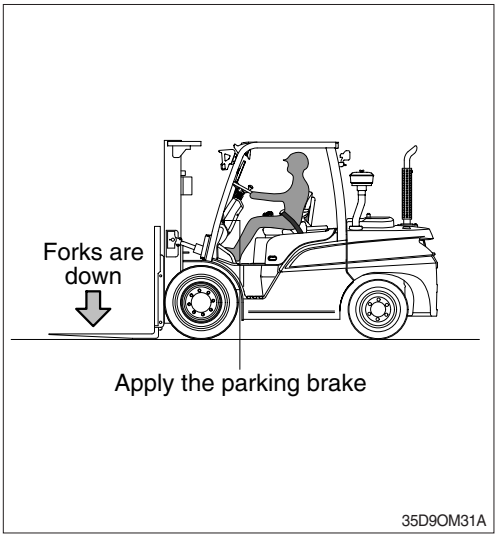
2) BEFORE LEAVING THE OPERATOR'S POSITION

(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.

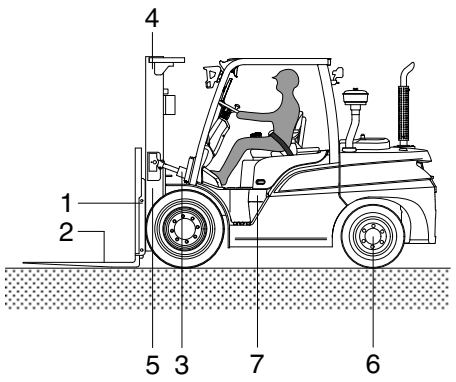
(3) Give enough fuel, grease, lubricant and oil.

(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.**



1 Adjust cylinder(2EA)
2 Fork(2EA)
3 Tilt cylinder(Left/Right, 2EA)
4 Lift chain(2EA)
5 Mast support(Left/Right, 2EA)
6 Steering axle(6EA)
7 Hyd pump drive spline (1EA)

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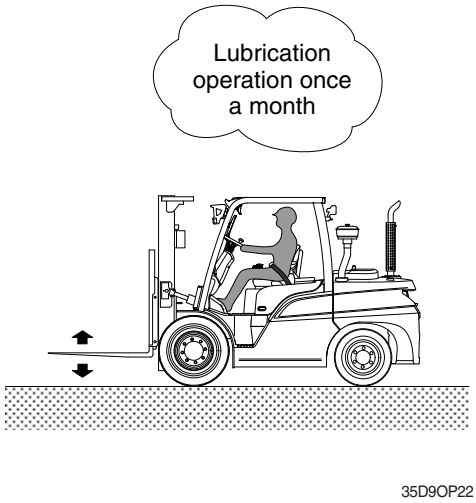
2) DURING STORAGE

(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.



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※ BATTERY

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

3) AFTER STORAGE

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

(1) Remove the drain plugs from the oil pan and other cases and drain any water.

(2) Remove the rocker housing cover and lubricate the valves and rocker arms well. Inspect the valve operation.

(3) After the engine is started, run it at idling speed until it is warmed up completely.

15. TRANSPORT

1) PRECAUTIONS FOR LOADING AND UNLOADING

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

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

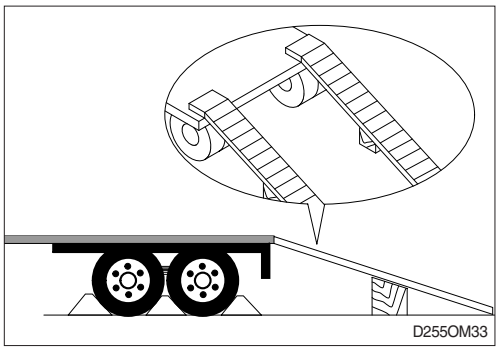
⚠ Check travel route for overpass clearance.

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

Remove ice, snow or other slippy 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.)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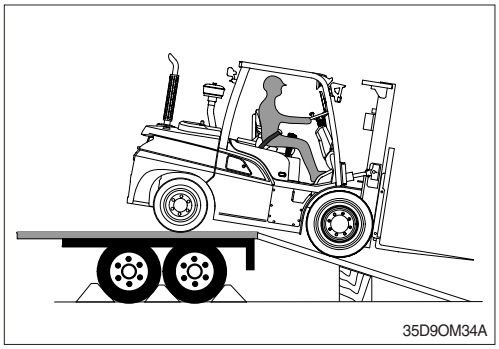
(3) After checking that the truck is aligned with the loading ramps, back the truck slowly up the ramps to load it on the transporter.

⚠ 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.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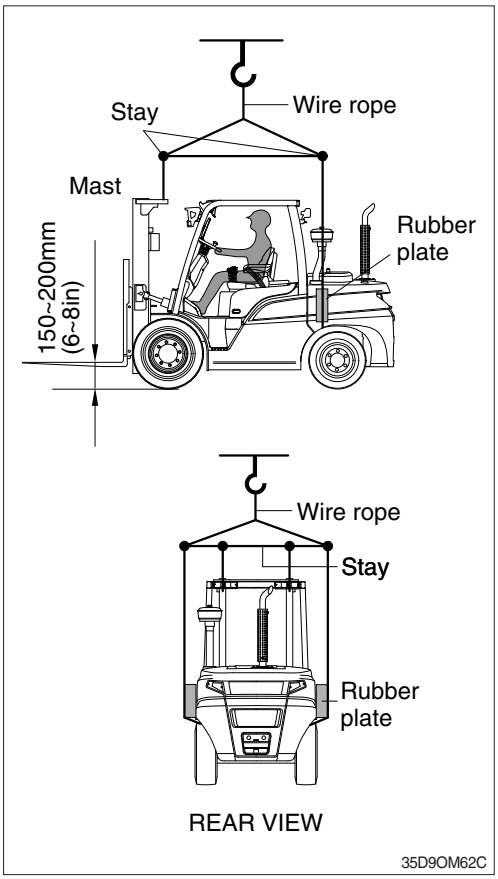
16. LOADING AND UNLOADING BY CRANE

1) Check the specification of the truck when you are going to hoist the truck.
2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the truck body.
3) Put a rubber plate 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.

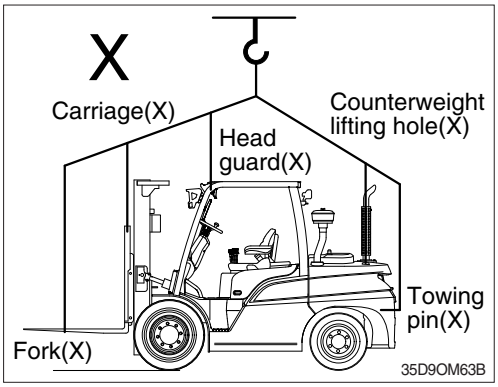


⚠ **Make sure wire rope is proper size.**
⚠ **Make sure that the truck is shut down before hoisting. Lifting the truck with engine running can cause serious accident.**
⚠ **The wrong hoisting method or installation of wire rope can cause damage to driver and truck.**
⚠ **Do not load abruptly.**
⚠ **Keep 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 STARTING AND TOWING

1. HOW TO TOW A DISABLED TRUCK

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

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

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

1) Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.

2) When possible, raise the carriage (forks) on the disabled truck about 300 mm (12 in) from the floor or ground. Secure the carriage with a chain.

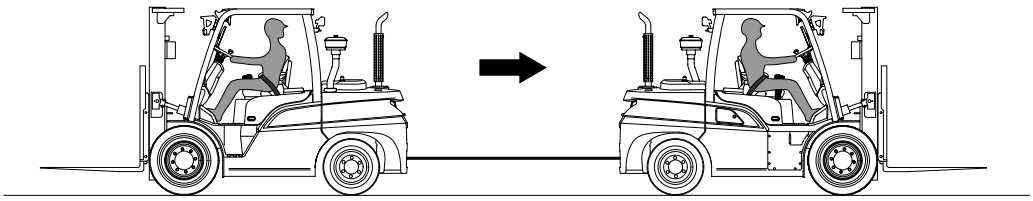
3) Obtain another lift truck of equal or larger size carrying a partial load for traction.

4) Check that the counterweight bolts are in place and properly torqued. (This bolt is made of a special high tensile steel and is not commercially available. Replace it, when necessary, only with a genuine HYUNDAI replacement part).

5) Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.

6) Release the parking brake on the towed truck.

7) Put the gear selector lever in the NEUTRAL position.



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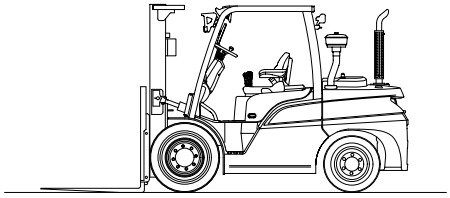
8) Tow the disabled truck backward. An operator must be on the towed truck.

   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 8km/h(5mph) 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 key 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 24V, negative-ground electrical system. The "Booster" battery must be fully charged and in good condition. This section explains how to perform this procedure safely. To avoid damage to your lift truck and your battery or the possibility of harm to yourself, follow the instructions and warnings carefully. If you have any doubts, ask for help from an experienced mechanic.

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

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

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

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

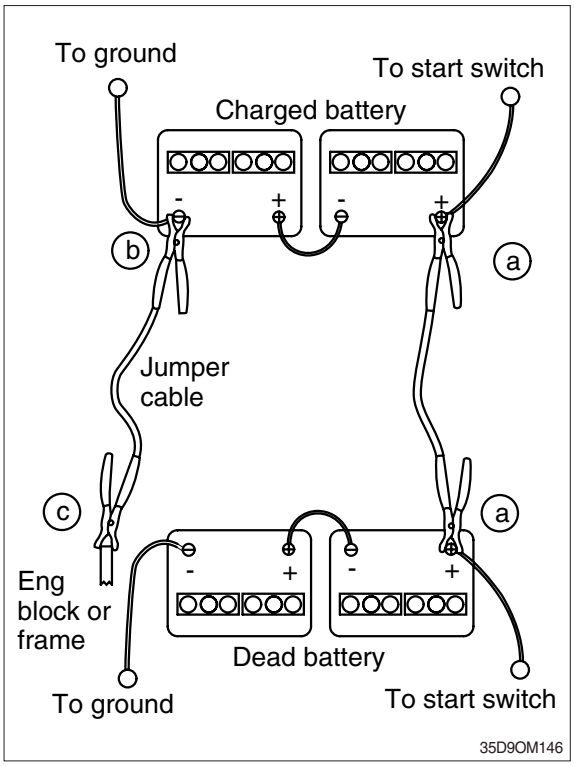
2) Do not jump start, charge, or test a sealed type battery if the test indicator looks illuminated or has a bright color. Install a new battery.

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

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

4) On both trucks:
   ① Apply the parking brake.
   ② Put the 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:
   ⓐ 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.
   ⓑ Connect one end of the second cable to the grounded negative (-; black) terminal of the **jumper truck** battery.
   ⓒ 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 sever 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.

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 becomes 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. 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 machines operation. To protect your investment and prolong the service life of your machine, 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.

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※ 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	Fuel hose	Every 2 to 4 years
2	Hydraulic pump hose	Every 2 years
3	Power steering hose	Every 2 years
4	Packing, seal, and O-ring of steering cylinder	Every 2 to 4 years
5	Lift chain	Every 2 to 4 years
6	Lift cylinder hose	Every 1 to 2 years
7	Tilt cylinder hose	Every 1 to 2 years
8	Side shift cylinder hose	Every 1 to 2 years
9	Master cylinder and wheel cylinder caps dust seals	Every 1 years
10	Brake hose or tube	Every 1 to 2 years
11	Brake reservoir tank tube	Every 2 to 4 years

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

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

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

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

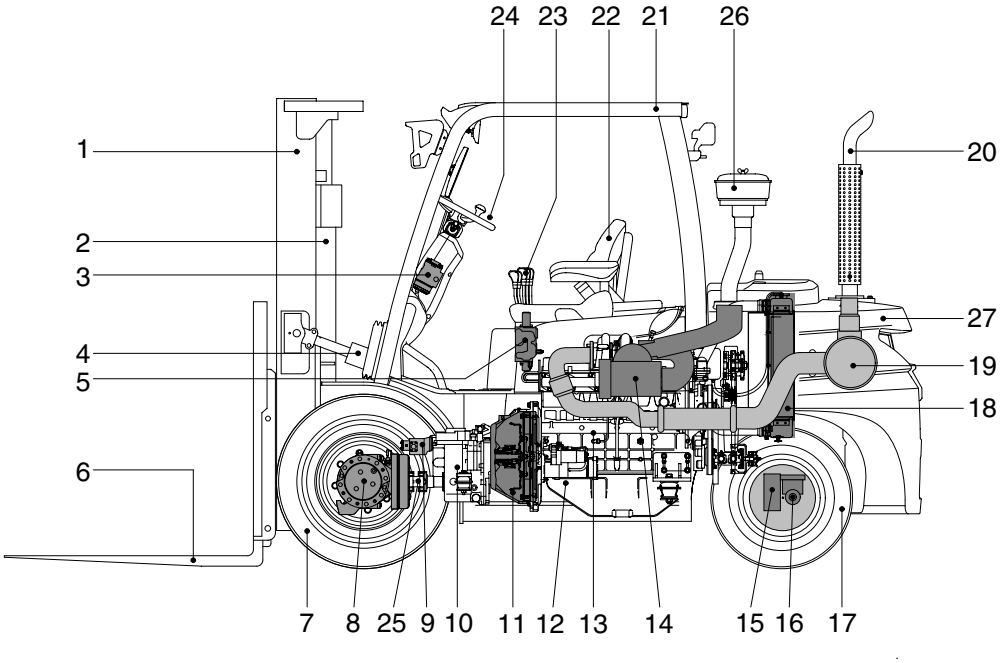
Naturally, this warranty does not cover to damage arising from accident, misuse or negligence, use of non-Hyundai parts, or from alterations not authorized by Hyundai.

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

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

4. PLANNED MAINTENANCE INTERVALS

1) MAJOR COMPONENT LOCATIONS



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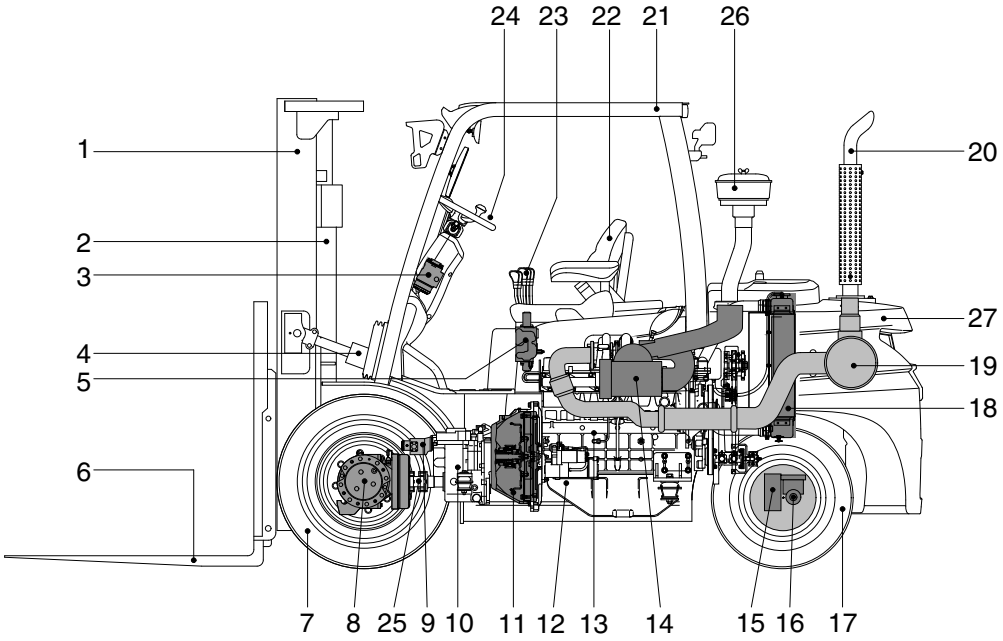
1	Mast	10	Transmission	19	Aftertreatment device
2	Lift cylinder	11	Torque converter	20	Silencer
3	Steering unit	12	Engine	21	Overhead guard
4	Tilt cylinder	13	Exhaust pipe	22	Seat
5	Control valve	14	Air cleaner	23	Control lever
6	Fork	15	Steering axle	24	Steering wheel
7	Front wheel	16	Steering cylinder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

4. PLANNED MAINTENANCE INTERVALS

1) MAJOR COMPONENT LOCATIONS



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1	Mast	10	Transmission	19	Aftertreatment device
2	Lift cylinder	11	Torque converter	20	Silencer
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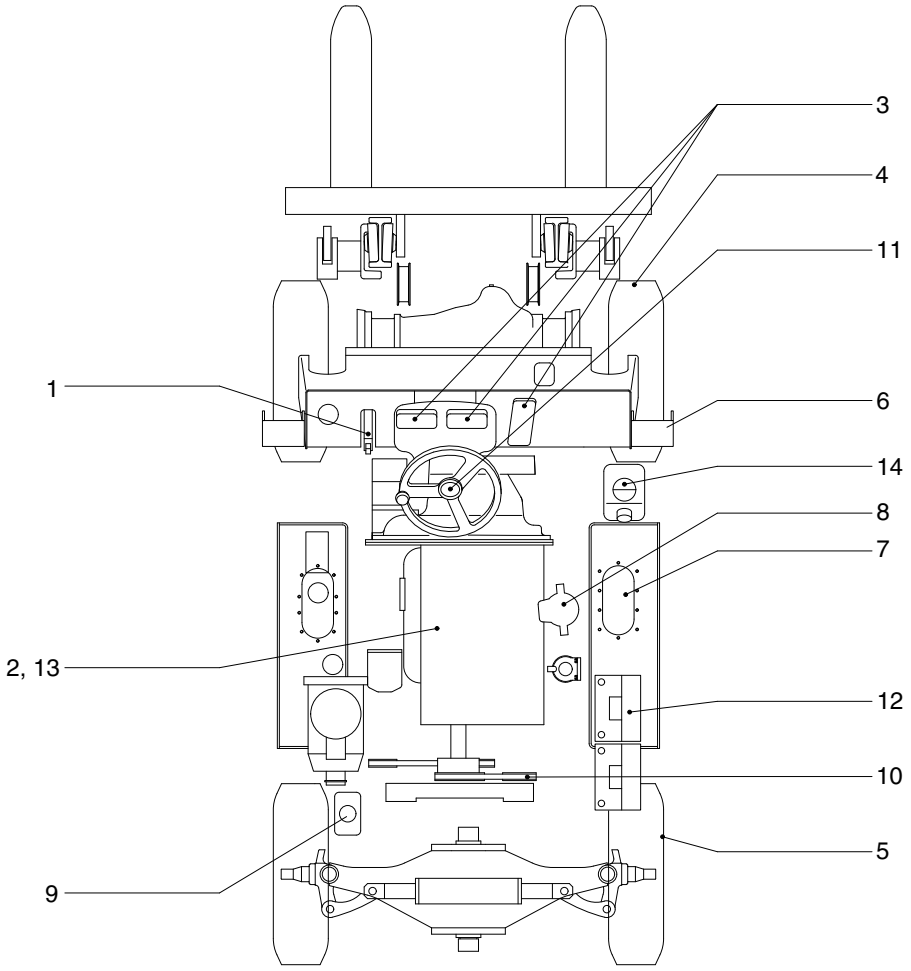
5	Control valve	14	Air cleaner	23	Control lever
6	Fork	15	Steering axle	24	Steering wheel
7	Front wheel	16	Steering cylinder	25	Drive shaft
8	Drive axle	17	Rear wheel	26	Precleaner
9	Hydraulic pump	18	Radiator	27	Counterweight

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 contions, 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 (U.S. gal)	Service point	Remark
1	Parking brake operation	Check, Adjust	-	-	1	7-45
2	Engine oil level	Check, Add	EO	12 (3.2)	1	5-4
3	Pedal linkage operation	Check, Adjust	-	-	1	7-45
4	Drive rim and tire air pressure	Check, Add	-	-	2	5-3, 7-14
5	Steer rim and tire air pressure	Check, Add or Replace	-	-	2	5-3, 7-14
6	Lamp operation	Check, Replace	-	-	9	7-44
7	Fuel level	Check, Add	DF	72 (19.0)	1	5-12
8	Prefilter	Check, Drain	-	-	1	7-24
9	Radiator coolant	Check, Add	C	21.5 (5.7)	1	7-17
10	Fan belt tension and damage	Check, Adjust, Replace	-	-	1	7-22
11	Horn operation	Check, Replace	-	-	1	7-44
12	Battery	Check, Clean	-	-	1	7-39
13	Crankcase breather hose	Check	-	-	1	-
14	DEF level	Check, Add	DEF	18.9 (5)	1	7-27

※ Oil symbol

Refer to the recommended lubricants for specification.

DF : Diesel fuel HO : Hydraulic oil EO : Engine oil GO : Gear oil G : Grease

MO : Transmission oil BF : Brake fluid C : Coolant DEF : Diesel Exhaust Fluid

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)	Pump, MCV, steering unit, priority valve				T								T
	Tilt cylinder rod cover				T								T
	Lift, attachment, steering cylinder							T					
	Mast				T								
	Drive and steering axle				T								
	Drive and steering axle wheel		T										
	Counterweight, cabin		T										
	Engine, radiator, transmission		T										
	Hose, fitting, clamp (fuel, coolant, hydraulic)							T					
Lubrication	Tilt pin and mast roller	G			L								L
	Lift chain	EO			L								L
	Steering axle (linkage, kingpin, trunnion	G		L									
	Attachment cylinder rod and tube end			L									
	Pedal pivot				L								
	Drive shaft			L*1	L*2								
	Tilt cylinder rod	G		L*1	L*2								
	Tilt cylinder tube end	G			L								
	Steering unit spline (column shaft)	G						L					
Oli Leakage	Hydraulic tank				I								I
	Valve (MCV, priority, brake)				I								I
	Pump, steering unit				I								I
	Lift, tilt, steering cylinder			I*1	I*2								I
Function test	Steering wheel operation				I								I
	Natural drop and forward tilt							I					
	Fork load indicator (option)							I					
	Mast tilt angle measurement							M					
Periodic replacement parts	Engine oil	EO			R						R		
	Engine oil filter				R						R		
	Fuel filter				R								
	Prefilter element				R								
	Air cleaner element			Clean		R							
	Transmission oil	MO			A	R						R	
	Transmission oil filter					R						R	
	Differential gear oil	GO			A	R						R	
	Brake oil	BF				R							
	Radiator coolant	C						R					
	Aftertreatment DEF dosing unit filter	C								R			
	Fork condition and wear				C								
	Fan belt tensioner					C							
	Fan belt					R							
	Hydraulic oil tank air breather filter			R*1	R*2								
	Hydraulic oil return filter					R							
	Hydraulic oil suction strainer							Clean					
	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

A : Aid C : Checking L : Lubrication R : Replacement T : Retightening

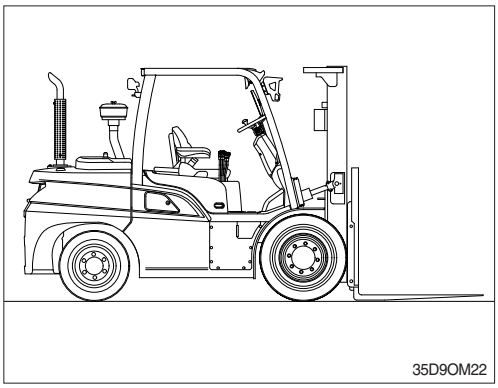
I : Visual inspection (repair or replace if required) M : Measurement (adjust if required)

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

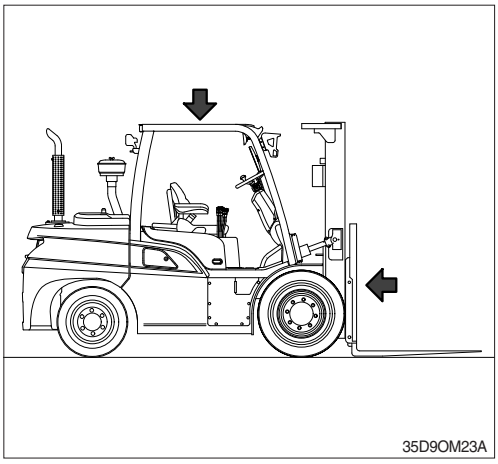
Inspect the truck, before and after starting the engine, for any sign of external leakage of fuel, engine coolant, transmission fluid, etc..

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.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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.

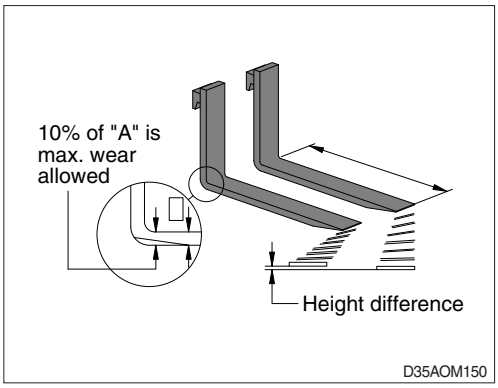
△ **Mast and lift chains require special attention and maintenance to remain in safe operating condition. Refer to lift chain maintenance in this section for additional information.**

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.

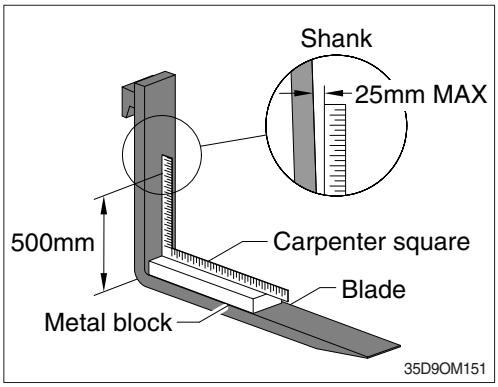
mm

Model	Fork length	Height difference
All models	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 blade to make sure it is not bent more than 25 mm (1 in) maximum.

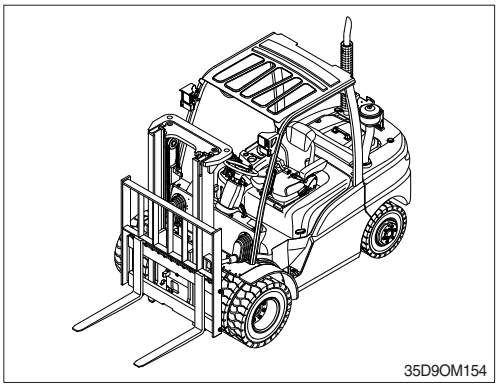


※ If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.

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

5) SIDE SHIFT

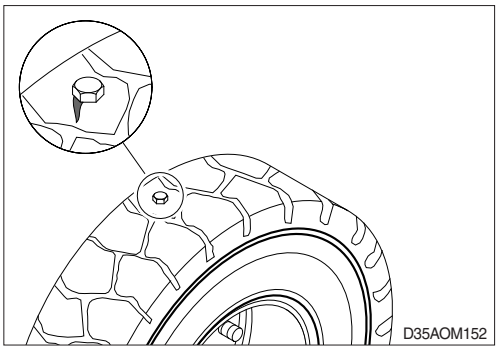
When operating the lever for the side shift and the hanger bar which the forks and the backrest are mounted on it, operator can accurately insert the forks under pallets or stack loads correctly without moving the fork lift.



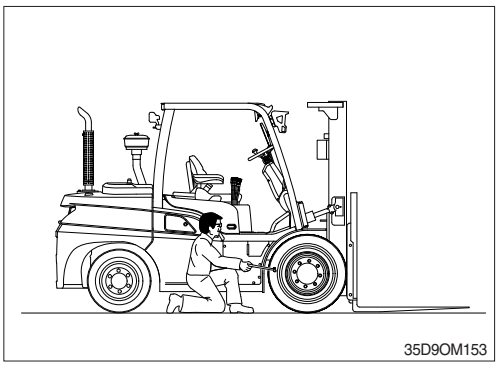
6) WHEEL AND TIRES

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 form 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).



1) CHECK ENGINE OIL LEVEL

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

(1) Pull out the dipstick and wipe with a clean cloth.

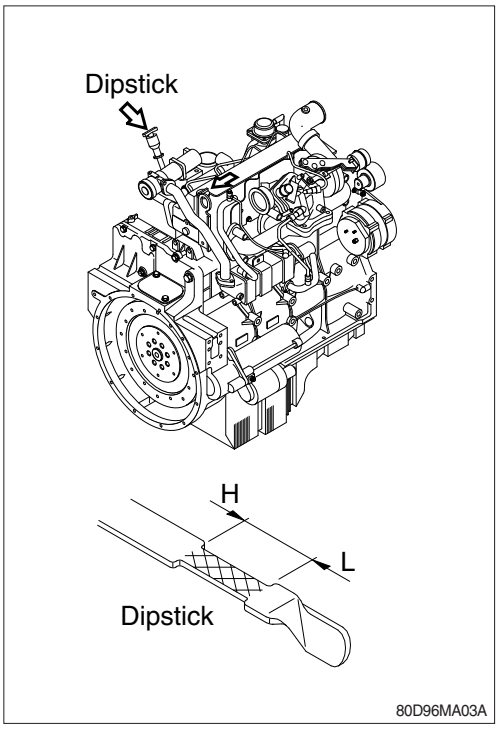
(2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.

(3) If oil level is LOW, add oil and then check again.

※ **If the oil is contaminated or diluted, change the oil regardless of the regular change interval.**

※ **Check oil level after engine has been stopped for 15 minutes.**

⚠ **Do not operate unless the oil level is in the normal range.**

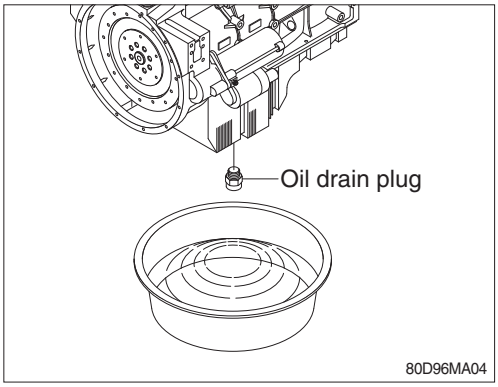


2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

(1) Warm up the engine until the water temperature reaches 60˚C (140˚F).

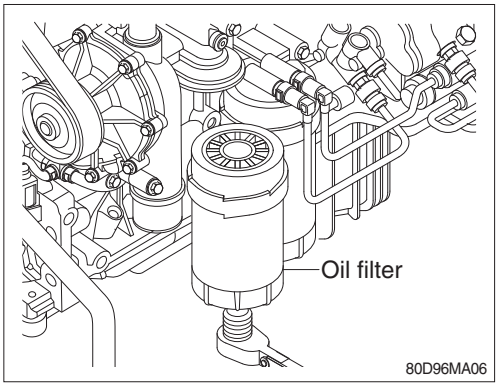
(2) Remove the oil drain plug. Drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine.

※ **A drain pan with a capacity of 30 liters (7.9 U.S. gallons) will be adequate.**



(3) Clean around the filter head, remove the filter by the 1/2" socket wrench and clean the gasket surface.

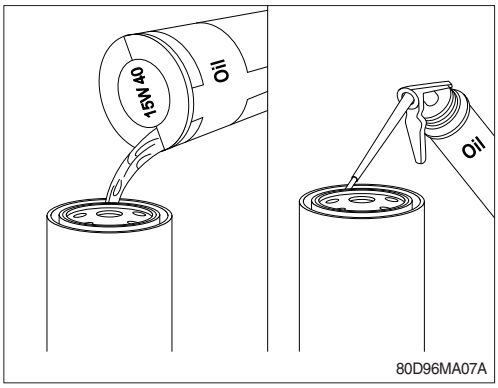
※ **The O-ring can stick on the filter head. Be sure it is removed before installing the new filter.**



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

※ **Fill the filter with clean lubricating oil.**

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

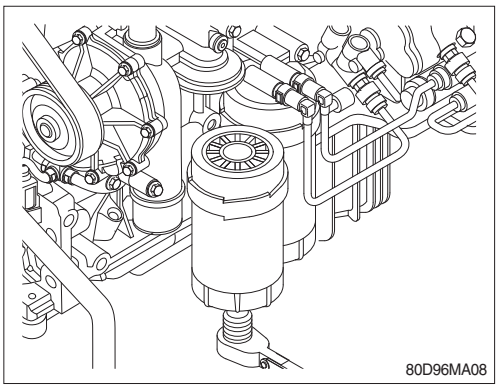


(5) Install the filter to the filter head.

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

· Tighten the filter until the gasket contacts the filter head surface.

· Tighten 3/4 to 1 turn after gasket makes contact with the filter head.

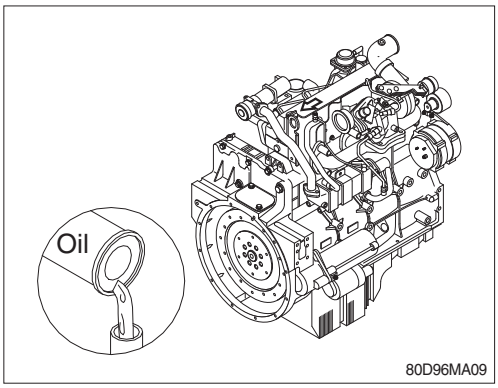


(6) Tighten the engine oil drain plug.

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

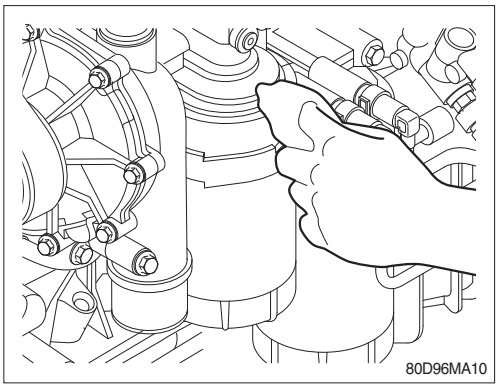
(7) Fill the engine with clean oil to the proper level.

· Quantity : 12 ℓ (3.2 U.S.gallons)



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

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



3) CHECK COOLANT LEVEL

(1) Check the coolant level at reservoir tank.

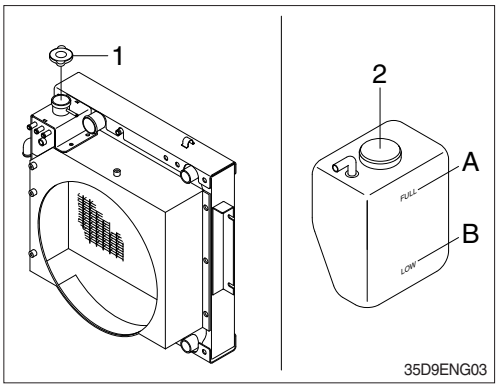
(2) Add the mixture of antifreeze and water after if coolant is not sufficient.

(3) The coolant level should indicate between Full and Low.

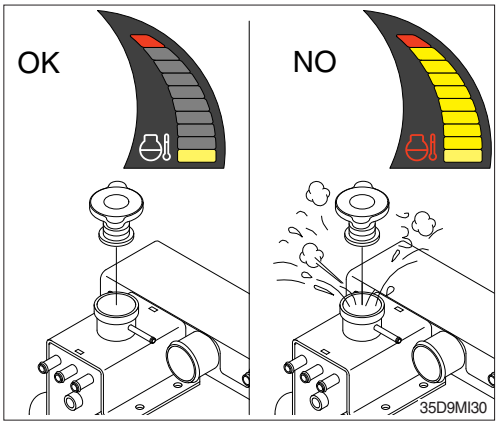
(4) Replace gasket of surge tank cap when it is damaged.

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

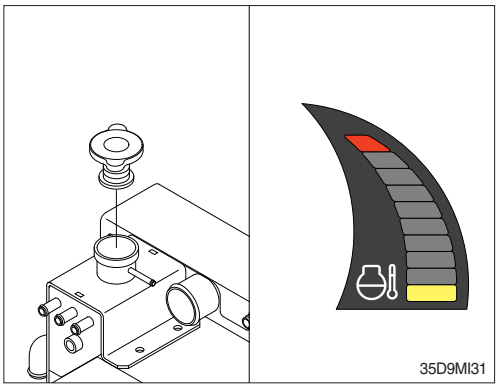
※ **Do not add cold coolant to a hot engine ; engine castings can be damaged. Allow the engine to cool to below 50˚C (120˚F) before adding coolant.**



1	Surge tank cap	A	Full
2	Reservoir tank	B	Low



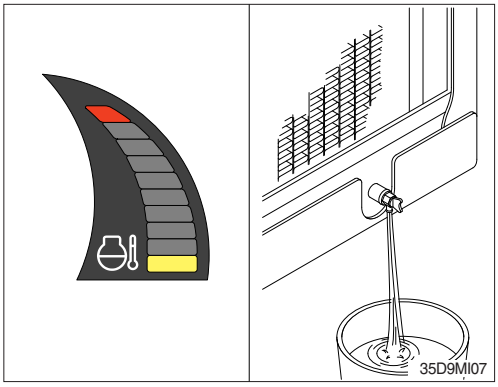
4) FLUSHING AND REFILLING OF RADIATOR



(1) Change coolant

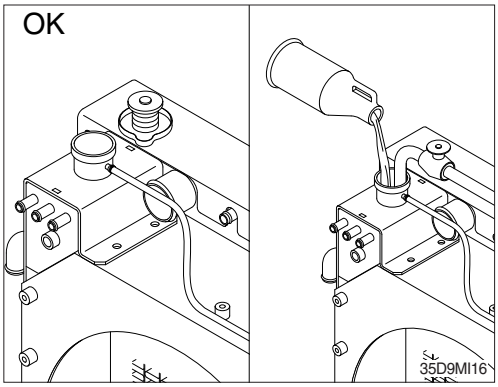
⚠ Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.
Avoid excessive contact-wash thoroughly after contact.
Keep out of reach of children.

※ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.
Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.
If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.



⚠ Wait until the temperature is below 50˚C (122˚F) before removing the coolant system pressure cap.
Failure to do so can cause personal injury from heated coolant spray.
Drain the cooling system by opening the drain valve on the radiator and opening the drain valve on the bottom of the engine oil cooler housing.
A drain pan with a capacity of 45 liters (11.9 U.S. gallons) will be adequate.

(2) Flushing of cooling system

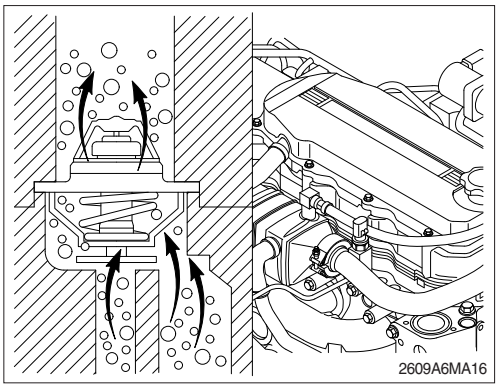


① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

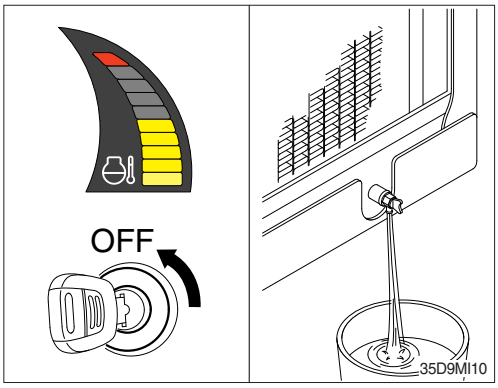
※ Use 0.5 kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.

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

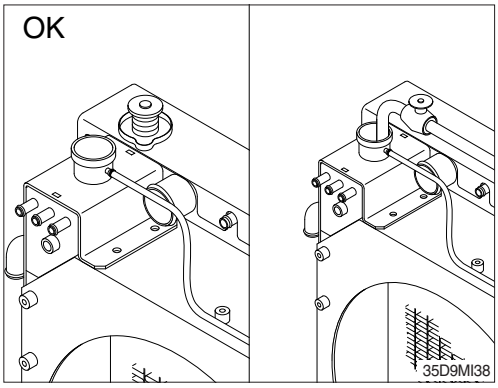
※ **During filling, air must be vented from the engine coolant passages.**
The system must be filled slowly to prevent air locks or serious engine damage can result. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



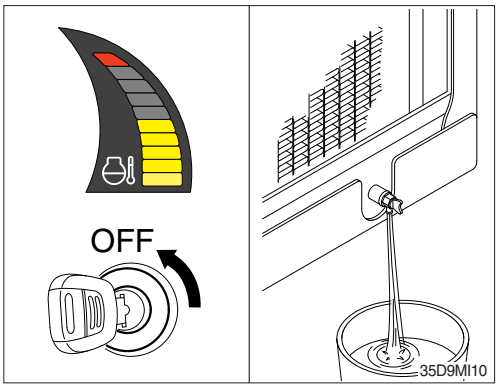
② Operate the engine for 5 minutes with the coolant temperature above 80˚C (176˚F).
Shut the engine off, and drain the cooling system.



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



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

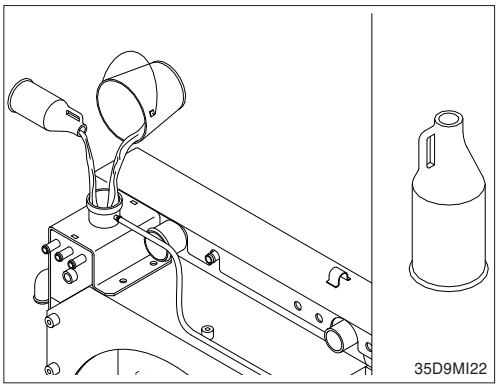


(3) Cooling system filling

① Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 7-55.

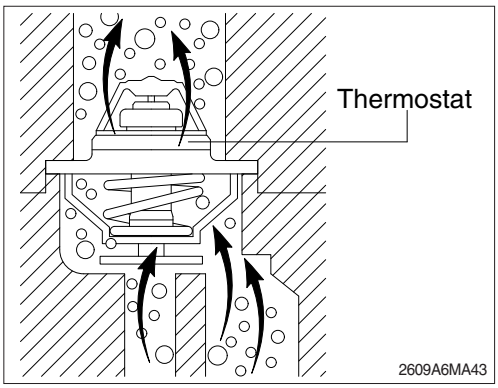
※ **Use the correct amount of DCA4 corrosion inhibitor to protect the cooling system.**

※ **Do not use hard water such as river water or well water.**

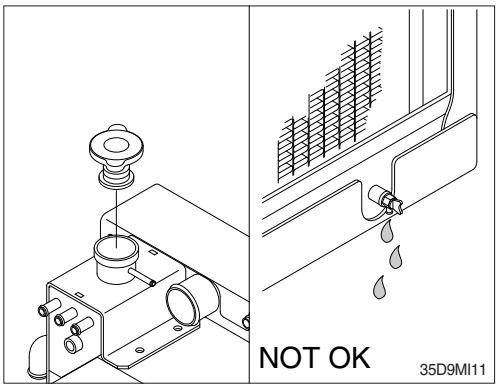


② The system has a maximum fill rate of 19 liters (5.0 U.S. gallons) per minute.
Do not exceed this fill rate.

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



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

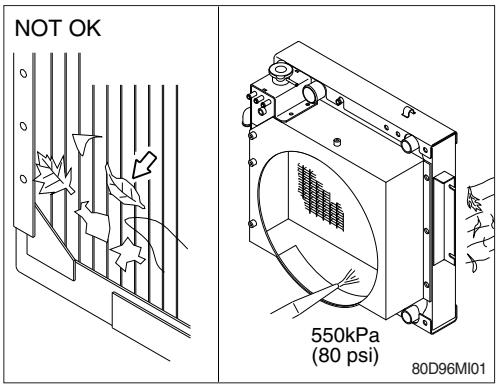


5) CLEAN RADIATOR AND OIL COOLER

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

(1) Visually inspect the radiator for clogged radiator fins.

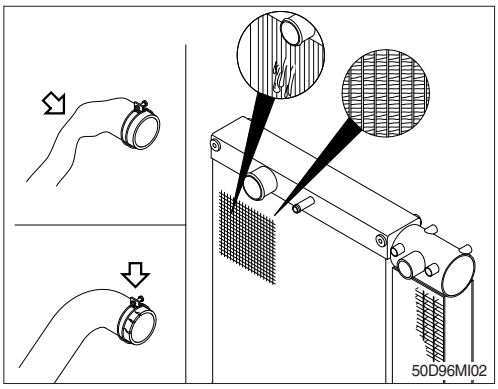
(2) Use 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.
Blow the air in the opposite direction of the fan air flow.



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

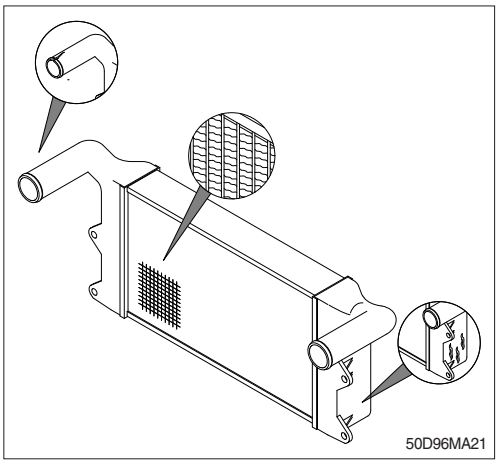
※ **If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement procedures.**

(4) Visually inspect the radiator for core leaks.



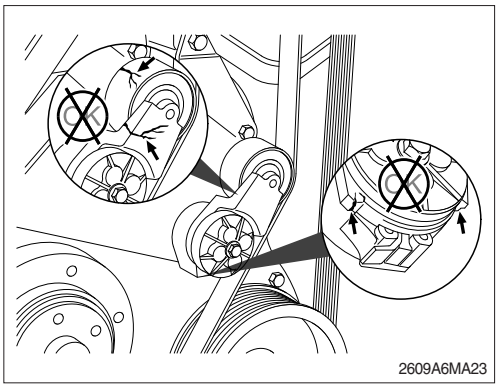
6) CHECK CHARGE AIR COOLER

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

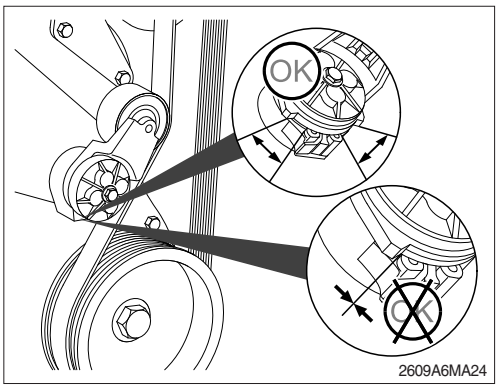


7) FAN BELT TENTIONER

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

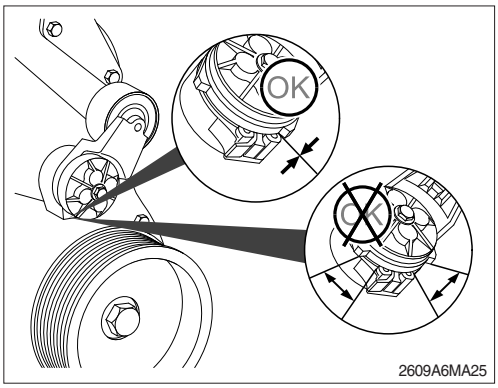


(2) With the belt installed, verify that neither tensioner arm stop is in contact with the spring case stop.
After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, replace the tensioner.

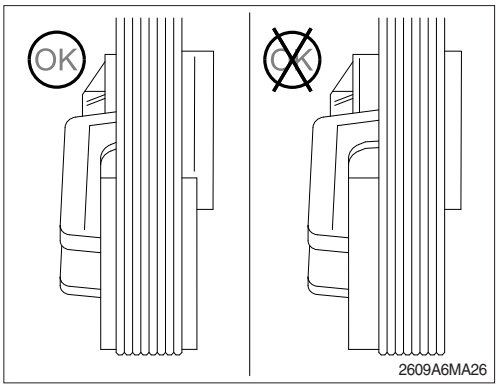


(3) With the belt removed, verify that the tensioner arm stop is in contact with the spring case stop.
If these two are not touching, the tensioner must be replaced.

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



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



8) CLEANING OF AIR CLEANER

(1) Primary element

① Open the cover and remove the element.

② Wipe all contaminant and debris from inside the housing body.

③ Do not clean the filter element by striking or hitting the filter against any object to shake the debris from the filter element.

④ Clean the filter element with compressed air.

a. Remove dust from filter element by directing the compressed air into the opening of the air filter element.

b. Use 3 kg/cm^2 (40 psi) maximum air pressure and hold the compressed air nozzle at least 2.5 cm (1") away from the pleats while cleaning. Make sure to keep the clean side of air filter free of debris.

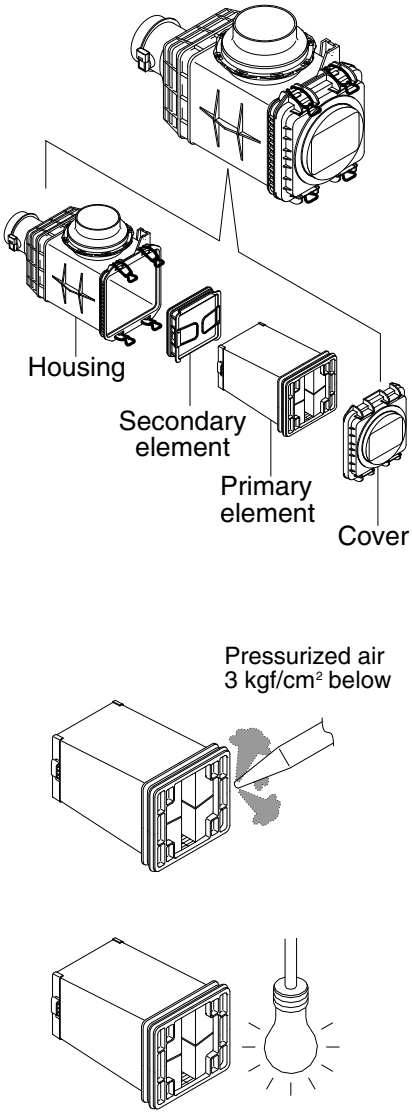
⑤ Visually inspect for damage to the filter elements and components. Use a light source to help identify any defects in the media. If any defects are observed discard the filter element and replace with a new primary filter element.

a. Before any type of cleaning, a visual inspection of the filter is needed. If there is any damage to the filter body, gaskets or endplates, do not clean or reuse; the filter should be discarded. Always clean filters in a clean environment, observe strict inspection procedures and repackage filters immediately after the cleaning process with appropriate materials.

b. Use observe proper safety precautions and dispose of waste materials in an environmentally compliant manner.

⑥ Re-install filter element into the air housing.

⑦ Replace the primary element at the fourth cleaning.



(2) Safety element

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

9) FUEL TANK

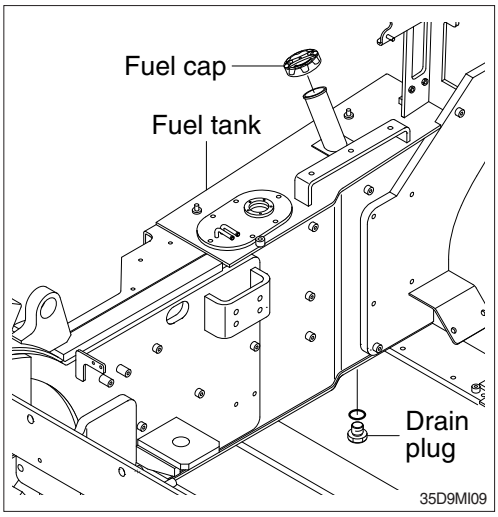
(1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the truck.

(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.



10) PREFILTER

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

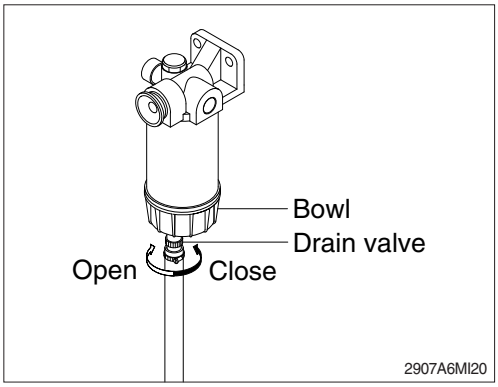
(1) Drain water

① Open bowl drain valve to evacuate water.

② Close drain valve.

※ **Don't tighten up a drain valve so strong.**

※ **Please inspect and drain water frequently for remain water volume to be less than 1/3 volume of a collection bowl.**



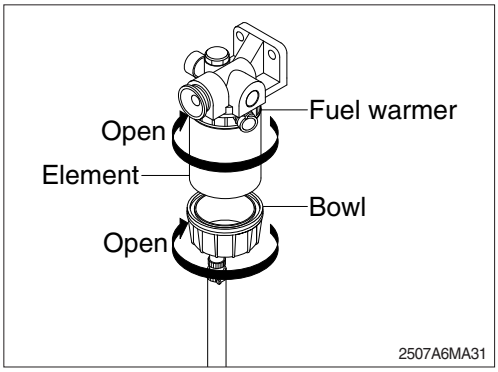
(2) Replace element

① Drain the unit of fuel. Follow "Drain water" instructions above.

② Remove element, fuel warmer and bowl from filter head.

※ **The bowl is reusable, do not damage or discard.**

③ Separate element from bowl. Clean bowl and seal gland.

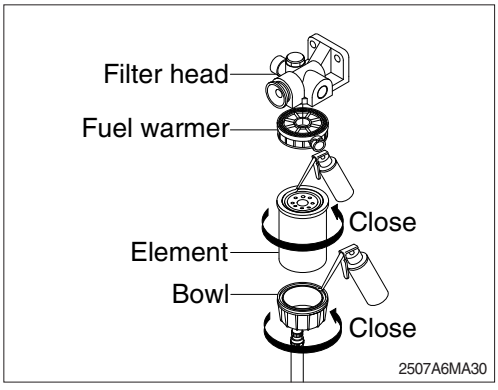


④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.

⑤ Attach bowl to new element firmly by hand.

⑥ Lubricate new element seal and place in element top gland.

⑦ Attach the element, fuel warmer and bowl to the head.



11) REPLACEMENT OF FUEL FILTER

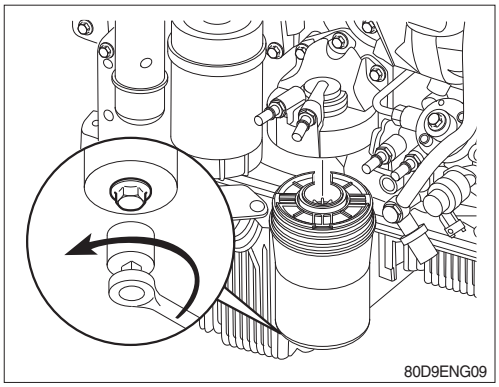
(1) Remove the fuel filter cartridge (1) with 32 mm hex wrench.

(2) Apply a thin layer of fuel to the surface of the new filter cartridge gasket before you put it on.

(3) Tighten the new cartridge by hand.

(4) Open the fuel valve and bleed the fuel system.

(5) Operate the engine for a while and check if there is not the fuel leakage from the filter.



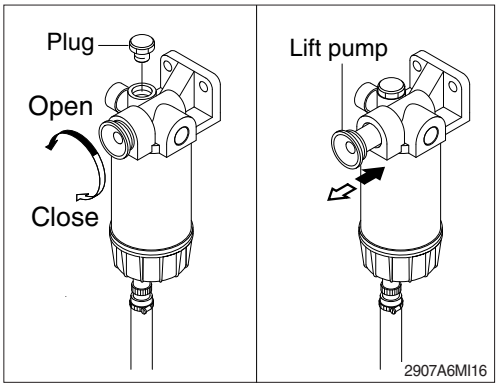
1 Fuel filter cartridge

12) BLEEDING THE FUEL SYSTEM

(1) Loosen fuel supply line plug at the outlet of prefilter.

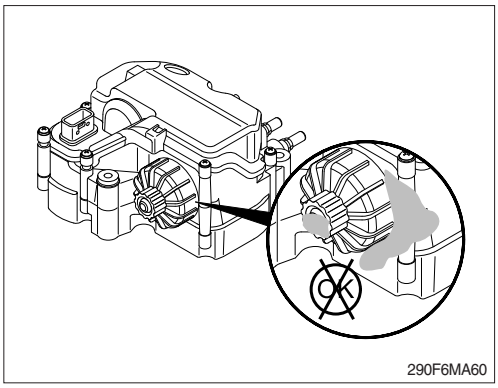
(2) Do hand-priming the lift pump repeatedly until air bubbles comes out from fuel supply line completely.

(3) Tighten fuel supply line to its origin position.



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

13) AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT FILTER



(1) Remove

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

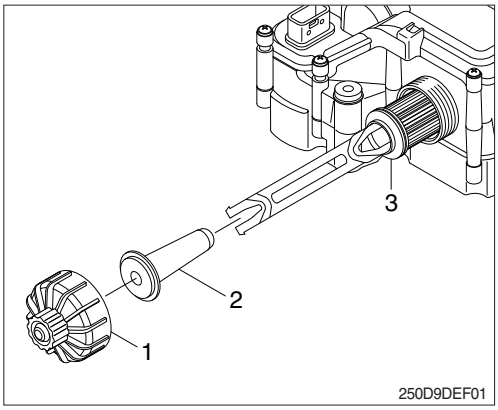
① Inspect the area around the seal and vent of DEF/AdBlue® supply module filter cap for signs of leakage.

② Unscrew the DEF filter cap (1). A 27 mm wrench can be used on the cap to aid in removal.

③ Remove the aftertreatment DEF filter equalizing element (2).

④ Remove the old aftertreatment DEF dosing unit filter element (3). A disposable service tool is included with the filter to aid in filter removal.
Use the appropriate end of the tool, depending on the color of the plastic on the filter. When inserting the tool, a "click" sound can be heard which indicates proper engagement with the filter.

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



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

(2) Clean and inspect for reuse

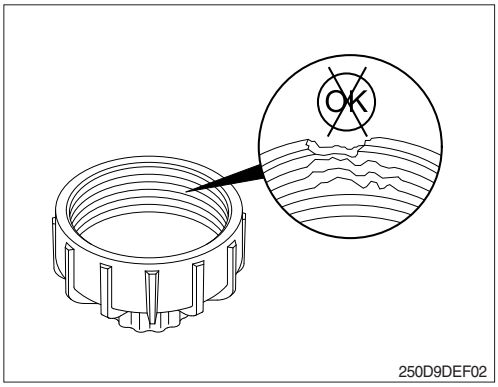
① Inspect the aftertreatment DEF dosing unit filter cap for cracks or holes that could create a DEF leak path.

② Check the condition of the threads on the aftertreatment DEF dosing unit cap.

※ If the threads are damaged, replace the aftertreatment DEF dosing unit filter cap.

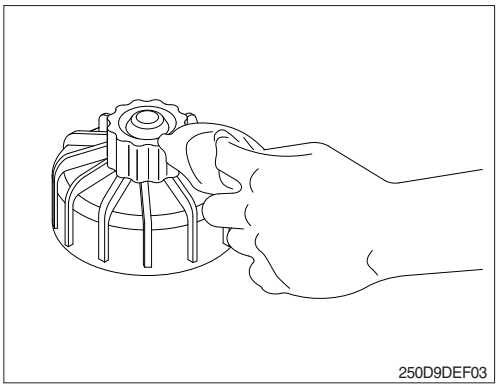
③ Inspect the aftertreatment DEF dosing unit threads. This is especially important if the aftertreatment DEF dosing unit cap was damaged.

※ If the aftertreatment DEF dosing unit threads are damaged, replace the entire aftertreatment DEF dosing unit.



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

※ Never operate the truck with the DEF cap removed.



(3) Install

① Slide the DEF filter equalizing element (2) into the DEF filter cartridge (3).

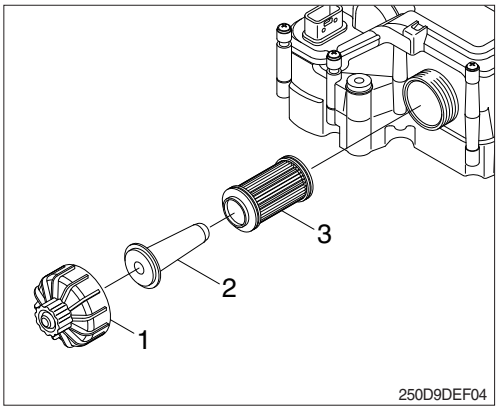
② Insert the assembly into the aftertreatment DEF dosing unit.

③ Install and tighten the cap (1). A 27 mm wrench can be used to install and tighten the filter cap.

· Tightening torque : 2.0 kgf · m (14.5 lbf · ft)

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

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

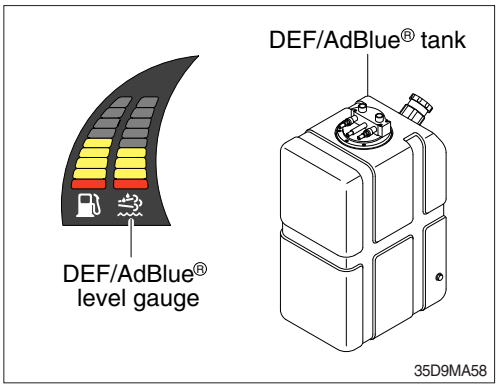


1 DEF dosing unit filter cap
2 DEF filter equalizing element
3 DEF dosing unit filter cartridge

14) DEF/AdBlue® TANK

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

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



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

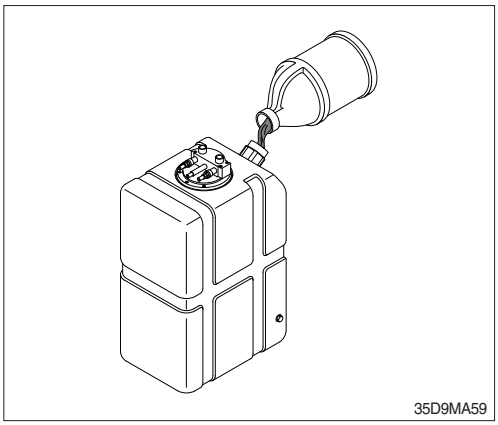
Before filling the tank

① Switch off the engine.

② Secure the truck against rolling away. Always fill the tank with at least 5 liters, as smaller amounts could cause malfuctions.

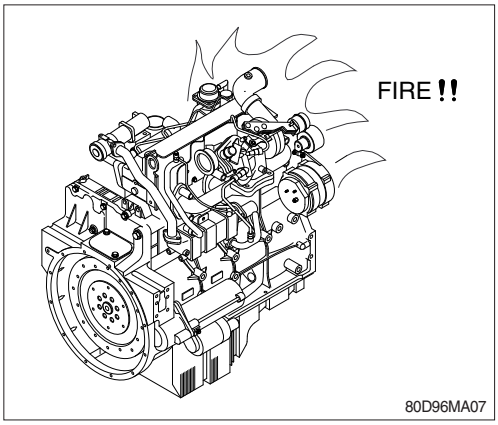
⚠ Do not allow diesel fuel to run into the DEF/AdBlue® tank. Otherwise, you could damage the exhaust gas aftertreatment system.

⚠ Do not mix additives to DEF/AdBlue®.



15) LEAKAGE OF FUEL

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

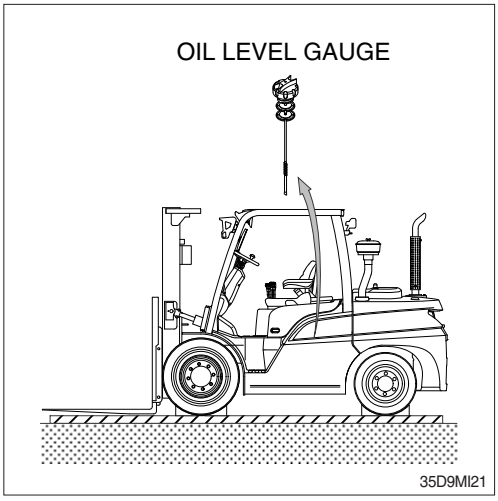


16) HYDRAULIC OIL CHECK

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

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

※ Add hydraulic oil, if necessary.



17) FILLING HYDRAULIC OIL

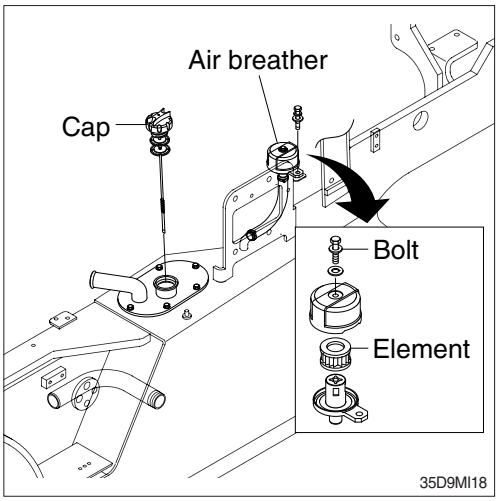
(1) Stop the engine to the position of level check.

(2) Check air breather filter element and replace it if necessary.

(3) Loosen cap and fill the oil to the specified level.

(4) Start engine after filling and operate the work equipment several times.

(5) Check the oil level at the level check position after engine stops.



18) CHANGE THE HYDRAULIC OIL

(1) Lower the forks on the ground and extend the tilt cylinder to the maximum.

(2) Loosen the cap and relieve the pressure in the tank.

(3) Prepare a suitable drain pan.

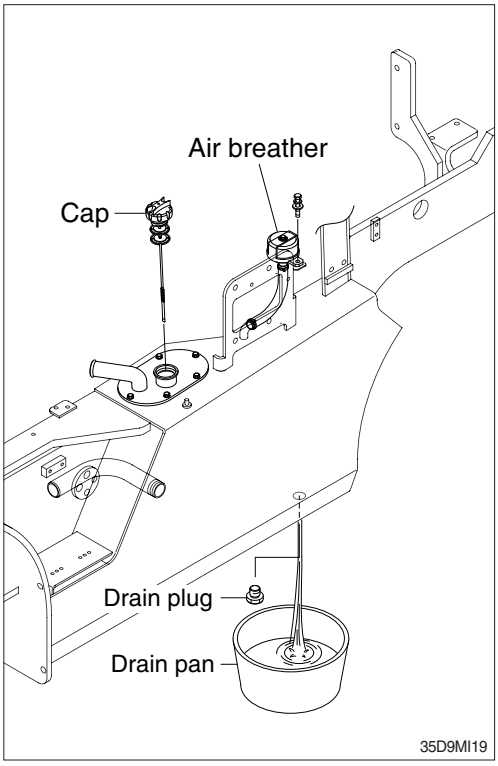
(4) To drain the oil loosen the drain plug.

(5) After draining oil, tighten the drain plug.

(6) Fill proper amount of recommended oil.

(7) Start engine and run continually. Release the air by full stroke of control lever.

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



19) CLEANING AND REPLACING RETURN FILTER

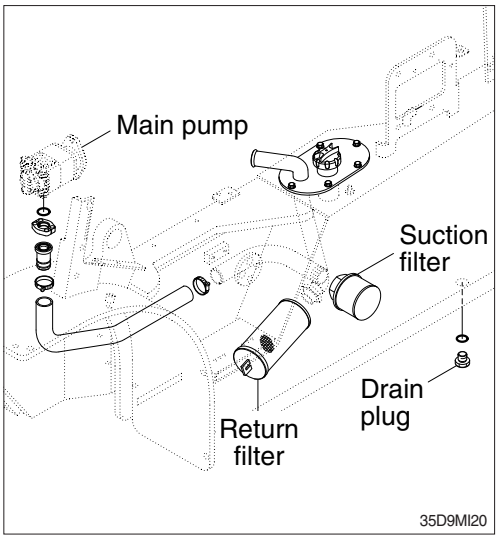
Clean and replace the return filter in the following manner.

(1) Remove the flange by loosening the mounting bolt.

(2) Remove the return filter from the tank.

(3) Replace the return filter element with a new one.

(4) Install the cover on the tank.
· Tightening torque : 3.4±0.7kgf · m
(24.6±5.0lbf · ft)



20) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

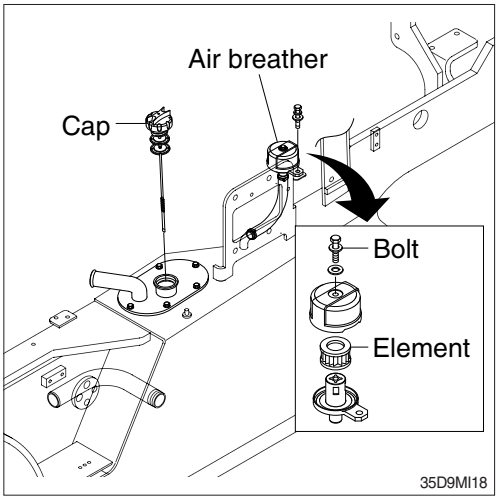
(1) Loosen the cap and relieve the pressure in the tank.

(2) Loosen the screw and remove the cover.

(3) Pull out the element.

(4) Replace the element with a new one.

(5) Reassemble by reverse order of disassembly.
· Tightening torque : 1.14~1.74kgf · m
(8.2~12.6lbf · ft)



21) TIRE PRESSURE

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

(2) Recommended tire pressure (When tire is cooled)

Model	Item	Pressure
35/40/45D, 50DA-9	Front single	8.0 kgf/cm^2 (114 psi)
	Front double	7.7 kgf/cm^2 (110 psi)
35/40D-9	Rear	8.5 kgf/cm^2 (121 psi)
45D-9, 50DA-9	Rear	10 kgf/cm^2 (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.

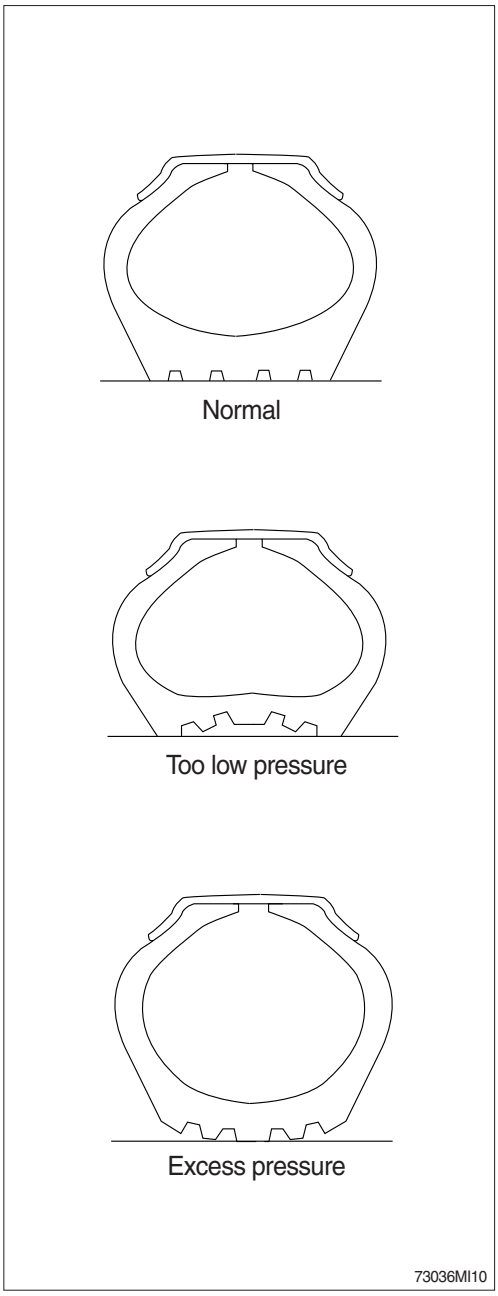
(4) The three major causes for excessive heat and pressure of tire are insufficient pressure, excessive load and overspeed. Avoid excessive load and overspeed in order to keep tires in good shape.

⚠ 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.

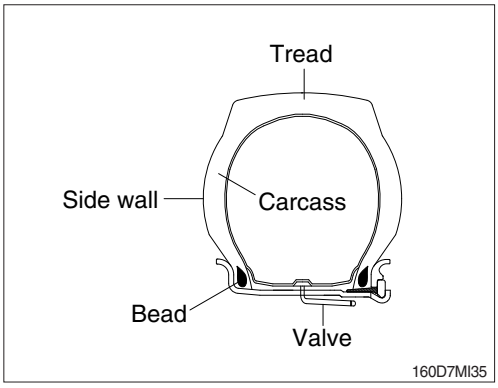
① Rubbing tires against road bank or rack at cargo-unloading spot.
② Tires slippage during working.
③ Abrupt starting of the truck.
④ When oil, grease or gasoline smeared on tire, clean those. Otherwise it may cause of permanent deformation.

22) REPLACEMENT OF TIRE

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

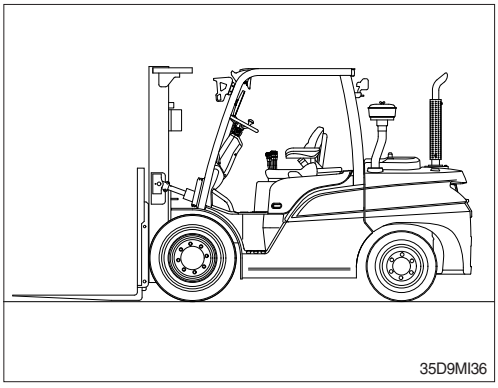
(1) Tires to be replaced

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

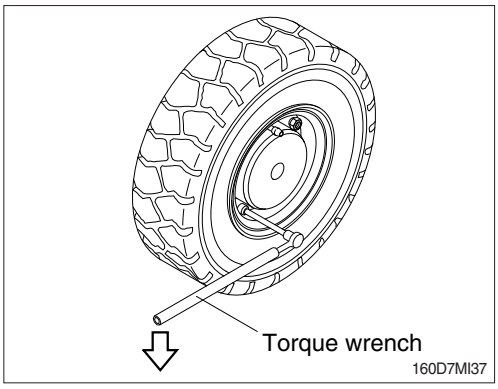


(2) Separation of tire

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

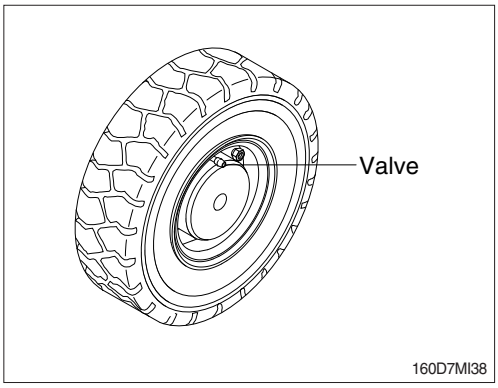


② Loosen slightly all wheel mounting.(Front)
· Tools : Socket 36 ㎜ (Front)
32 ㎜ (Rear)
Torque wrench
Extension bar
③ Lift the truck with a jack.
④ Loosen all wheel mounting nuts and replace the tire.



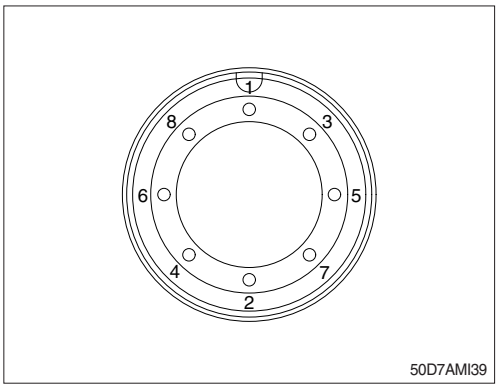
(3) Direction of tire to be installed

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 :
Front : 62.0 kgf · m (448 lbf · ft)
Rear : 35.0 kgf · m (253 lbf · ft)

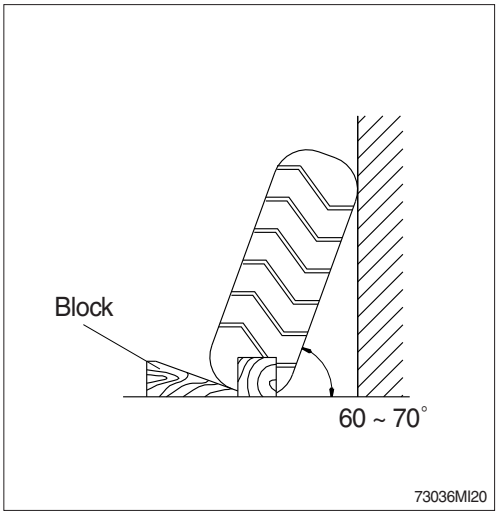


23) STORING TIRES AFTER REMOVAL

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.

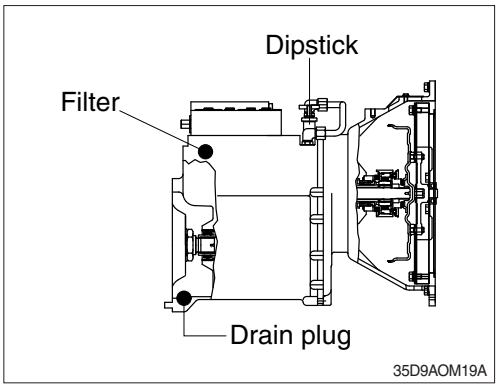
Stand the tire on level ground, and block it securely so that it cannot roll or fall over.

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.



24) TRANSMISSION OIL

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



(1) Transmission oil

Park the truck in a level place and lower the forks. Apply the parking brake. Gear selector lever in neutral position.

(2) Oil level check

① At engine idling speed.
② Open inspection plate, and oil level can be checked using dipstick.
③ Add oil through oil filler plug if necessary.
④ Always check oil level using dipstick after add oil.

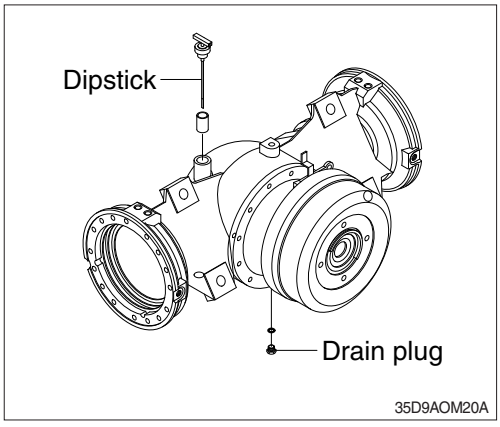
(3) Change (oil and filter)

① Remove drain plug.
② When changing oil, remove strainer and clean it with flushing oil.
③ Remove the filter and install a new filter.

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

- Blow dry compressed air from the inside of strainer to outside and install when completely dry.
- Dispose of used oil in locally approved manner.

25) DIFFERENTIAL CASE



(1) Differential oil

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

Then stop the engine and apply the parking brake.

(2) Oil level check

Pull out the dipstick and check that the oil level is between the normal range. If necessary, add oil.

(3) Change

① Drain oil after removing drain plug.
② Fill the axle oil with a clean oil to the proper level.
- Quantity : 10 ℓ (2.6 U.S.gallons)

※ Dispose of used oil in locally approved manner.

26) LUBRICATION

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

(2) After lubricating, clean off spilled grease.

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

⚠ Set the mast and forks in a stable position.

(3) Lubrication points

① Adjust cylinder : 2EA

② Forks : 2EA

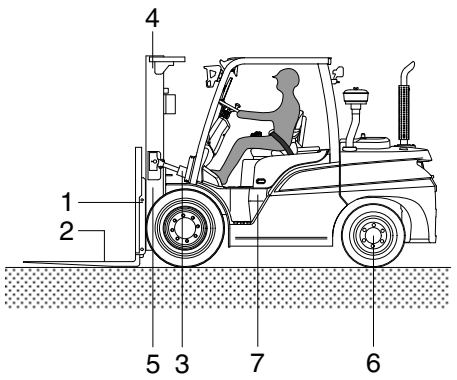
③ Tilt cylinder : Left/Right, 2EA

④ Lift chain : 2EA

⑤ Mast support : Left/Right, 2EA

⑥ Steering axle : 6EA

⑦ Hydraulic pump drive spline : 1EA



1 Adjust cylinder(2EA)
2 Fork(2EA)
3 Tilt cylinder(Left/Right, 2EA)
4 Lift chain(2EA)
5 Mast support(Left/Right, 2EA)
6 Steering axle(6EA)
7 Hyd pump drive spline (1EA)

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27) FORKS REPLACEMENT

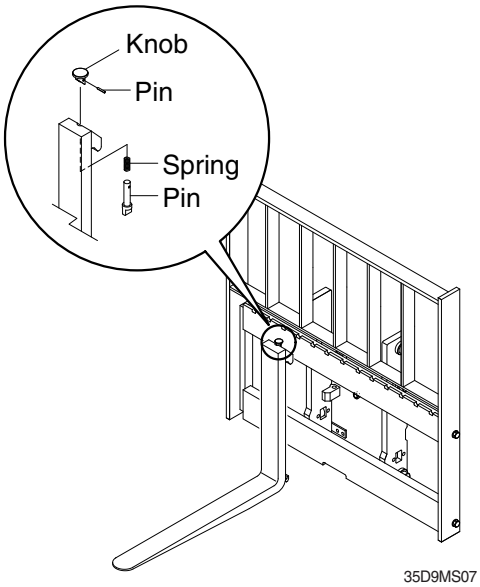
① Lower the fork carriage until the forks are approximately 25 mm (1 in) from the floor.

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.



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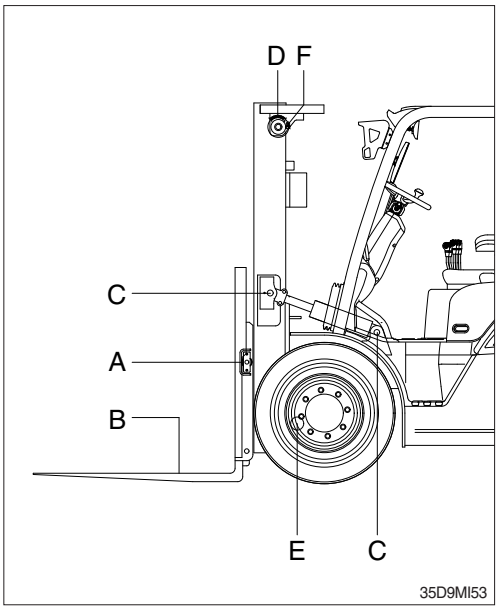
28) MAINTENANCE OF WORK EQUIPMENT

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

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

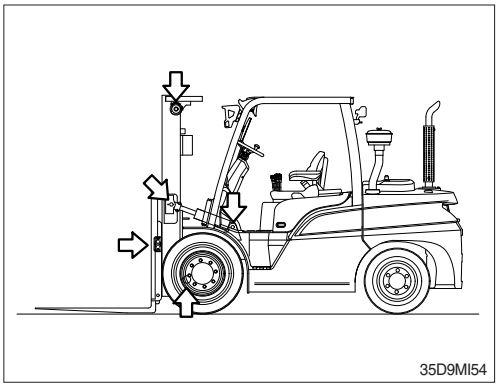


※ **Shorten lubricating interval when working in the water or dusty place.**

(2) Check for wear and tear of work equipment pins and bushings.

(3) Check for damage of forks and mast linkage part.

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

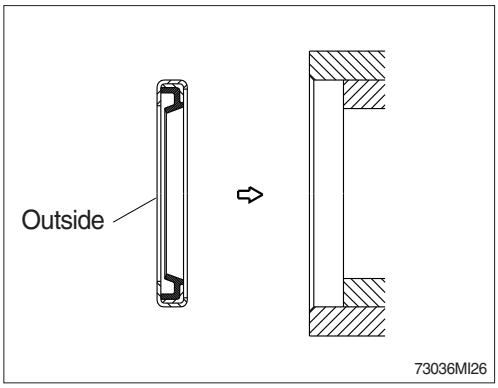


(4) Dust seal are mounted on the rotating part of working device to extend the lubricating interval.

※ **Mount the lip to be faced out side when replace the dust seal.**

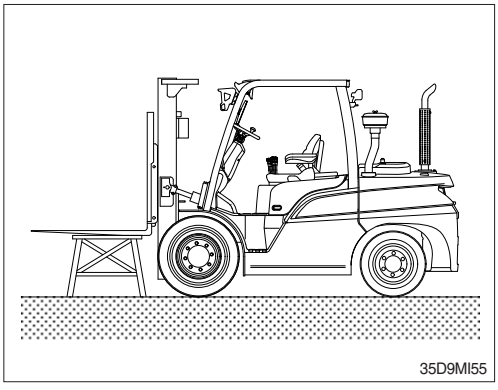
※ **If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.**

※ **Make sure the seals are not damaged or deformed.**



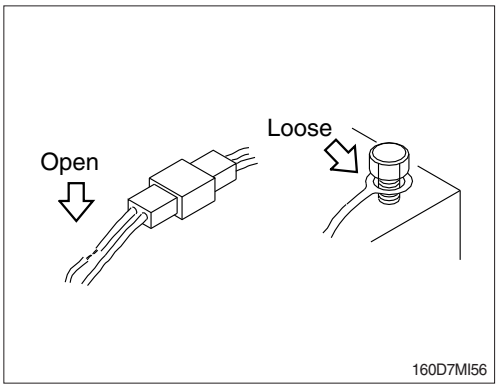
34) WORK EQUIPMENT SUPPORT

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



1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



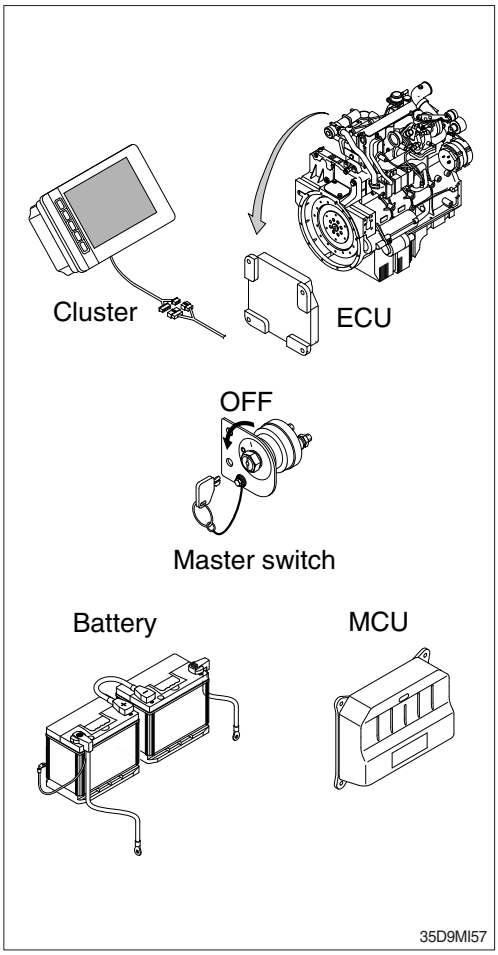
2) WELDING REPAIR

Before start to welding, follow the below procedure.

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

※ Do net 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.

Model	Type	Quantity	GWP
35/40/45D-9,50DA-9	HFC-134a	0.55 kg (1.21 lb)	787 CO_2 eq.

※ GWP

Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO2). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO2.

(2) Envior

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

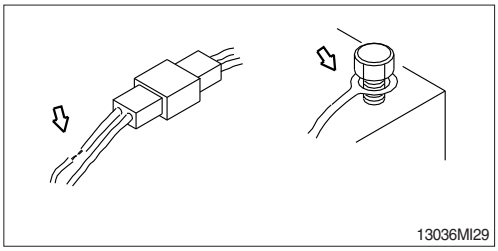
② Extensive skin contact
Rinse with warm water and carefully heat the area with warm water or warm clothing.
Seek medical attention immediately.

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

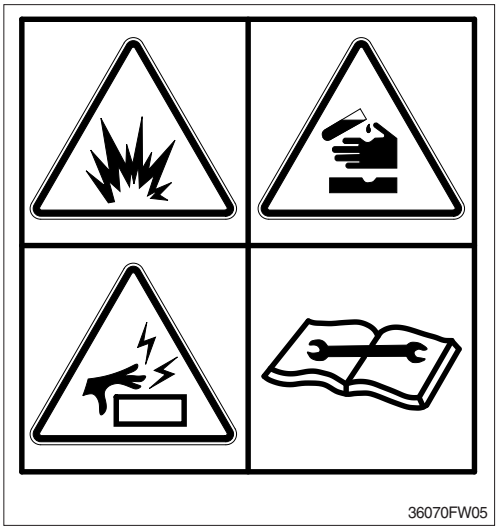
(1) Clean

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.

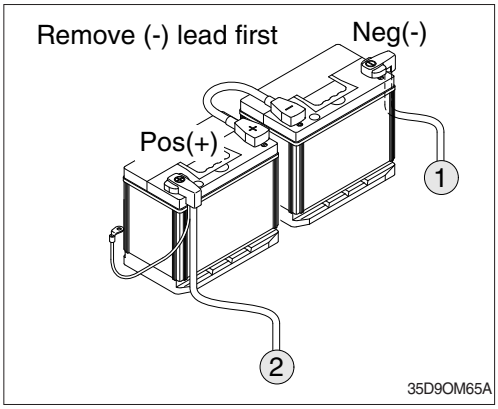
- A battery supplier
- An authorized battery collection facility
- Recycling facility

(3) Removing and installing

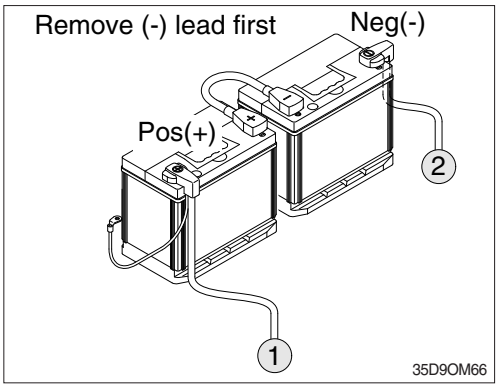
① Remove the lead from the ground side (Normally the (-) terminal side) of the battery. It is dangerous to let a tool, etc., touch the (+) terminal and the body at the same time, since this causes a spark.

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 somedangerous to use it. Do consult an expert about this matter when you are not able to judge its condition. It is strongly recommended to keep the surroundings of the battery cables clean so that the machine can be freed from the risk of firing by eliminating the flammable contaminations such as oil, dust and etc. acting as a fire developer. Dispose of the old battery in locally approved manner.



3) TRANSMISSION OIL

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

(1) Transmission oil

Park the truck in a level place and lower the forks. Apply the parking brake. Gear selector lever in neutral position.

(2) Oil level check

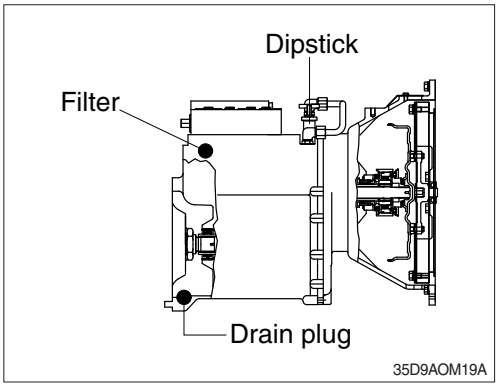
① At engine idling speed.
② Open inspection plate, and oil level can be checked using dipstick.
③ Add oil through oil filler plug if necessary.
④ Always check oil level using dipstick after add oil.

(3) Change (oil and filter)

① Remove drain plug.
② When changing oil, remove strainer and clean it with flushing oil.
③ Remove the filter and install a new filter.

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

· Blow dry compressed air from the inside of strainer to outside and install when completely dry.
· Dispose of used oil in locally approved manner.



4) COOLING SYSTEM

(1) Radiator fins cleaning

Remove dust between the radiator fins with compressed air. The steam or water may be used instead of compressed air. Air pressure should be less than 2 kgf/cm² kPa (30 psi). The nozzle of the cleaning device should be held about 50 mm (2 in) from the radiator fins. Also, check the rubber hose connected to the radiator. Replace if cracked or deteriorated. Check that the hose clamps are tight.

⚠ Be sure to keep the air or steam nozzle at right angles to the radiator. Wear the safety glasses and a face shield when using the compressed air.

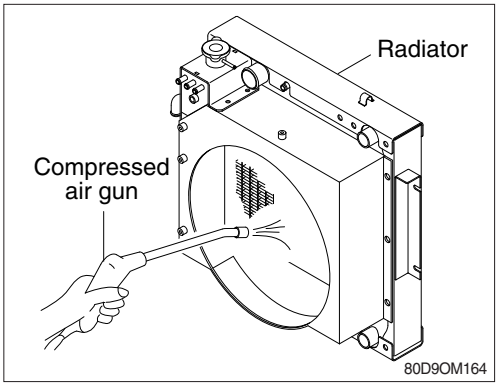
(2) Radiator cleaning

① Close the drain valves and add clean, soft water (City water, etc.) through the water filler. Add the radiator cleaner and run the engine at idling speed for 15 minutes.

② Stop the engine and drain water from the drain valves.

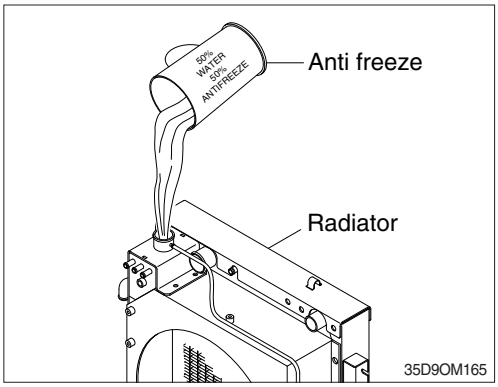
③ Add clean water and run at idling speed (5 to 10 minutes). Then stop the engine and drain water.

④ Close the drain valves and fill the radiator with clean water.



⚠ For low temperatures, add antifreeze. (See the cold weather operation for details). When not using antifreeze, add anticorrosive compound. Park the truck on level ground and clean the radiator.

※ Dispose of old antifreeze mixture in locally approved manner.



5) TIRE REPLACEMENT

① Park the truck in a safe and level place suitable for changing the tire. Then lower the forks, stop the engine, and apply the parking brake.

⚠ The tires are under high inflation pressure, so failure to follow the correct procedures, when changing or servicing the tires and rims could cause the tire to explode, causing serious injury or damage. The tires and rims should always be serviced or changed by trained personal using the correct tools and procedures. For details of procedures, contact your HYUNDAI dealer. Wear safety glasses and a face shield when using compressed air.

② Block the tire at the opposite corner from the tire to be replaced.

③ Loosen the lug nuts slightly with a lug nut wrench.

④ Jack up the truck to raise the tire from the ground, then remove the lug nuts and take off the tire.

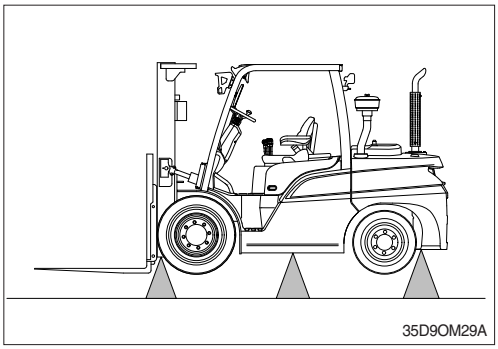
※ Points to fit jack when jacking up

Front tires: Bottom of outer mast or bottom of the frame.

Rear tires: Bottom of counterweight or bottom of the rear axle.

⚠ When jacking up the truck, always check carefully that the jack does not come out of position. When jacking up the truck, never go under the truck. For wheels using a separate type rim, check first that the rim nut is not loose before loosening the lug nuts. Be careful not to mistake the rim nuts and lug nuts.

When assembling separated type rims with bolts and nuts, check any damage and tighten them to the specified tightening torque. Change the bolts and nuts with new ones after using twice for your safety.



⑤ Replace the tire and tighten the lug nuts partially. The mounting faces of the wheel, lug nuts and wheels must be free from any dirt or lubricant of any kind.

⑥ Tighten the lug nuts on opposite sides in turn,
and check that there is no play in the wheel.

⑦ Lower the jack to lower the truck to the ground, then tighten the lug nuts to the specified tightening torque (For details, see service data).

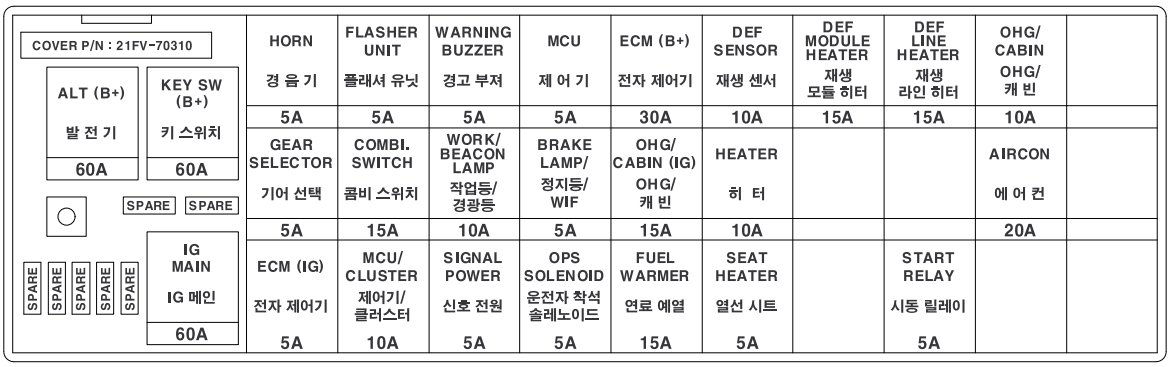
⑧ Check and adjust the inflation pressure.
Tire inflation pressure : For details, see page, 5-3 CHECK BEFORE STARTING ENGINE.

⚠ Precautions for adjusting the inflation pressure when repairing a puncture.

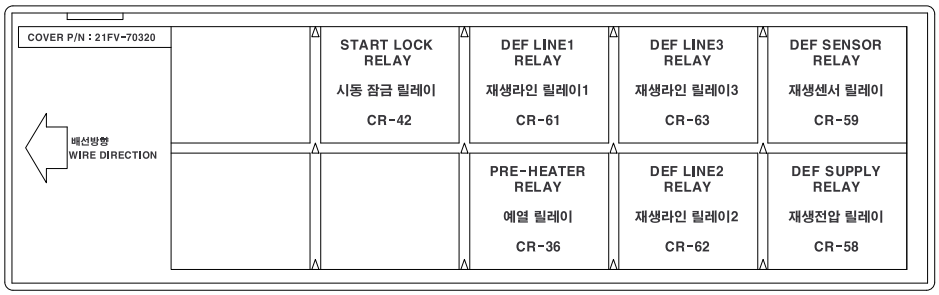
※ The tires used on the forklift trucks have a high inflation pressure, so any cracks or deformation of the rim are extremely dangerous. When adjusting the inflation pressure, do not raise the pressure above the correct level under any circumstances. If the pressure of the compressor is not adjusted beforehand, the pressure inside the tire will rise to the maximum air pressure of the compressor, and this may cause a serious accident. Therefore, always be extermely careful when carrying out this work.

6) FUSES REPLACEMENT

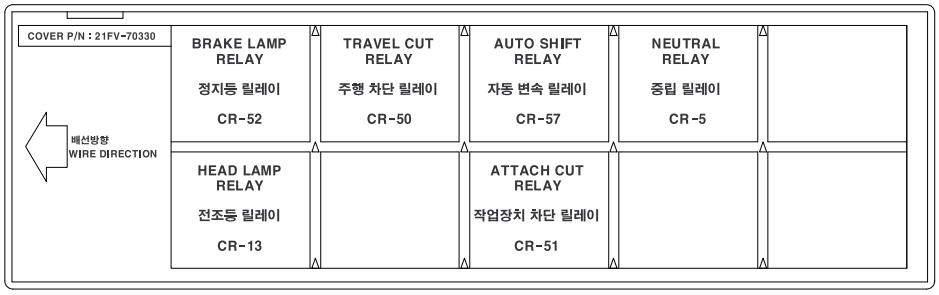
Fuse box



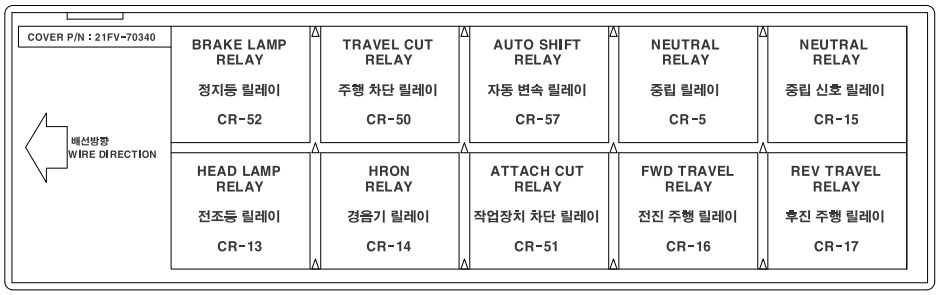
Relay #1



Relay #2 (standard)



Relay #2 (option, knob gear selector)



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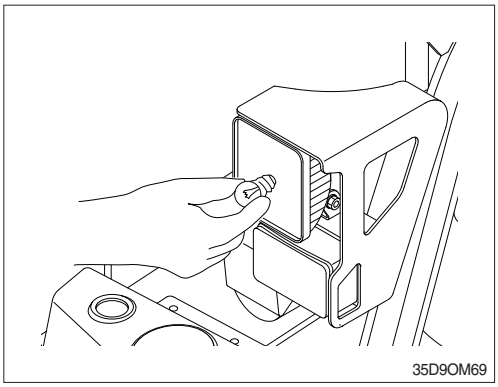
① Turn the starting swich OFF.

② Open the cover of the fuse box, and replace fuses inside (To open the cover of the fuse box, push the side of the cover lightly with a finger, and pull the cover forward to remove it.)

⚠ When replacing the fuse, check the relationship between the fuse and the electrical components it protects. Always replace fuses with a fuse of the same capacity. Always turn the starting switch OFF before replacing any fuse.

7) LAMP BULBS REPLACEMENT

Lamp	Spec (24V)
Head lamp	75W
Turn signal lamp	LED 14.4W
Clearance lamp	LED 14.4W
Stop lamp	LED 14.4W
Backup lamp	LED 14.4W
License lamp (option)	5W
Beacon lamp (option)	LED
Rear work lamp	75W



⚠ **After checking that the fuse is not blown and that there is no disconnection in the wiring harness, replace the lamp bulb.**

8) FUNCTIONAL TESTS

You will start the engine to complete the functional tests, so be sure that:

- The parking brake is applied.
- The gear selector lever is in NEUTRAL.
- Forks are fully lowered to the floor or ground.
- All controls are in neutral or other correct position.
- You are familiar with the safety procedures given in section 5, **Starting and operating procedures**, in this manual.

As you test the following components, be sure they are properly mounted and working correctly.

(1) Horn

Press the horn button to check the horn function. If the horn or any other part does not operate, report the failure and have it repaired before the truck is put into operation.

(2) Hour meter

Start the engine and let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal. Check the hour meter for operation with the engine running. Write the hour meter reading on the PM report form. Report any malfunction or damage.

(3) Indicator lights

Check that all lights are functioning and indicate normal truck operation as described in section 3, **Know your truck**, in this manual.

(4) Service brakes and inching pedal

With the gear selector lever in NEUTRAL and the engine running, push the sevice 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).

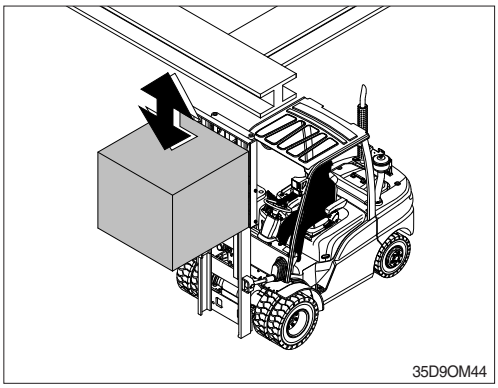
(5) Parking brake

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 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. The truck should not move. Now, with the accelerator still depressed, slowly release the inching pedal until the truck **Inches** forward smoothly and slowly.

※ **Report any problems.**

※ **When you have completed the operational tests, park and leave the truck according to standard shut down procedure as described in section 5 of this manual. Be sure to make a record of all maintenance and operating problems you find.**

9) FLUIDS, FILTERS AND ENGINE ACCESSORIES

To check fluid levels and other components within the engine compartment, unlatch and open the hood to access the engine compartment.

⚠ **To avoid the possibility of personal injury, never work in the engine compartment with the engine running, except when it is absolutely necessary to check or make adjustments. Take extreme care to keep hands, tools, loose clothing, etc., away from the fan and drive belts. Also remove watches, bracelets, and rings.**

(1) Engine accessories

Inspect the engine coolant hoses and fan belt (s). Look for leaking and obvious damage, worn (frayed) condition, breaks, etc. that could cause failure during operation.

(2) Engine air cleaner

Check the engine air cleaner for damage and contamination(excessive dirt build-up and clogging). Be sure that the air cleaner hose is securely connected(not loose or leaking). Fan or cone shaped dust deposite on tube or hose surfaces indicate a leak.

Change or service the air cleaner element every 500 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator.

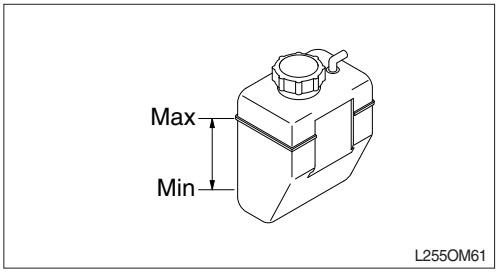
(3) Battery

Inspect the battery for damage, cracks, leaking condition, etc.. If the terminals are corroded, clean and protect them with HYUNDAI battery saver(Available from your HYUNDAI dealer).

⚠ EXPLOSIVE GASES : Do not smoke or have open flames or sparks near the batteries. An explosion can cause injury or death.

(4) Engine cooling system

To check the engine coolant level open the hood to the engine compartment. Visually inspect the recovery bottle, locate the Max and Min marks. The Max mark indicates maximum level at operating temperature. The Min mark indicates additional coolant needs to be added to the system.



△ A level anywhere between the Max and Min marks is normal.

※ Inspect the coolant level in the overflow bottle only.

⚠ Do not remove the radiator cap when the radiator is hot. STEAM from the radiator will cause severe burns. Do not remove the radiator cap to check the coolant level.

⚠ Never remove the radiator cap while the engine is running. Stop the engine and wait until it has cooled. Failure to do so could result in serious personal injury from hot coolant or steam blowout and/or damage to the cooling system or engine.

If the level is low, add a 50/50 mixture of specified coolant and water to the correct level. If you have to add coolant more than once a month or if you have to add more than one quart at a time, check the coolant system for leaks.

- Check the engine oil for presence of coolant leaking into the engine.
- Inspect the coolant for condition. Look for excessive contamination or rust or oil in the coolant solution.
- Check the PM time interval for need to change the coolant.
- Check the condition of radiator cap rubber seal and radiator filler neck for damage. Be sure they are clean.
- Check overflow hose for logging or damage.

※ Your lift truck cooling system is filled with a factory installed solution of 50% water and 50% permanent-type antifreeze containing rust and corrosion inhibitors. You should leave the solution in year around. Plain water may be used in an emergency, but replace it with the specified coolant as soon as possible to avoid damage to the system. Do not use alcohol or methanol antifreeze.

(5) Engine oil and filter

Locate the engine oil dipstick. Pull the dipstick out, wipe it with a clean wiper, and reinsert it fully into the dipstick tube. Remove the dipstick and check the oil level.

It is normal to add some oil between oil changes. Keep the oil level between the High and Low mark on the dipstick by adding oil as required. **Do not overfill**. Use the correct oil as specified under lubricant specification.

It is recommended to:

- Drain and replace the engine crankcase oil initial 50 hours and every 500 operating hours (Depending on application).
- Remove the oil pan drain plug to drain old oil after the truck has been in operation and the engine (oil) is operating temperature.

⚠ **Engine oil at operating temperature is hot and can cause burns. Beware of splashing oil.**

- Carefully check for leaks after changing oil and installing a new filter.

※ **The time interval for changing engine oil depends upon your application and operating conditions. To determine the correct schedule for your truck, it is suggested that you periodically submit engine oil samples to a commercial laboratory for analysis of the condition of the oil.**

OIL PERFORMANCE DESIGNATION: To help achieve proper engine performance and durability, use only engine lubricating oils of the proper quality. For the diesel engines, HYUNDAI recommends that you use motor oil that meets API service classification API CJ-4 or better (SAE 15W-40) for the diesel engines.

(6) Hydraulic sump tank

Check the hydraulic sump tank fluid level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage. Over filling can cause loss of fluid or lift system malfunction. Hydraulic fluid expands as its temperature rises. Therefore, it is preferable to check the fluid level at operating temperature (after approximately 30 minutes of truck operation). To check the fluid level, first park the truck on a level surface and apply the parking brake.

Put the mast in a vertical position and lower the fork carriage fully down. Pull the dipstick out, (attached to the sump breather) wipe it with a clean wiper, and reinsert it. Remove the dipstick and check the oil level. Keep the oil level above the LOW mark on the dipstick by adding recommended hydraulic fluid only, as required. **Do not overfill.**

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

(7) Hydraulic fluid and filter change

Drain and change the hydraulic sump fluid every 2000 operating hours. (Severe service or adverse conditions may require more frequent fluid change). Replace the hydraulic oil filter element at every oil change. Remove, clean, and reinstall the hydraulic and steer system suction line screens at first PM and every 500 hours thereafter. Check for leaks after installation of the filter. Also, check that the hydraulic line connections at the filter adapter are tightened correctly. The procedure for draining hydraulic sump tank is in your service manual.

(8) Sump tank breather maintenance and inspection

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

(9) Transmission fluid check

To check the transmission fluid locate the dipstick. The dipstick is located on the driver's left hand side under the floor plate near the transmission valve. Before checking, run the engine until the unit is at operating temperature. This is important since transmission oil temperature should be 66~121˚C (150~250˚F), the engine should also be at operating temperature. Apply the parking brake.

With the engine operating at idle and the transmission in NEUTRAL, and the parking brake set, check the fluid on the dipstick. Fill, if necessary, to the HOT zone on the dipstick, using the transmission fluid recommended by HYUNDAI.

※ Check the planned maintenance interval (operating hours) or the condition of the oil to determine if the transmission fluid needs to be changed.

10) LUBRICATION

(1) Truck chassis inspection and lubrication

Lubrication and inspection of the truck chassis components, including the steering wheels, steering axle linkage, steering cylinder, and wheel bearings are easier if the truck is raised and blocked up under the frame. Refer to your service manual for additional information on truck blocking and jacking. Also refer to your service manual for the location of grease fittings.

Inspect the steering cylinder piston rods, seals, and fasteners for damage, leaks, and looseness. Lubricate the steering axle linkage rod ends and linkage pivot points. Be sure to clean the grease fittings before lubricating, and remove the excess grease from all points after lubricating. Lubricate miscellaneous linkage as needed.

(2) Mast and tilt cylinder lubrication

Clean the fittings and lubricate the tilt cylinder rod end bushings (forward end) and both the base rod-end bushings (rear end). Clean and lubricate the mast support bushings.

(3) Lift chains

Lubricate the entire length of the mast rail lift and carriage chains with HYUNDAI chain and cable lube.

11) AIR CLEANING

Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint, or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry, and safe. A clean truck makes it easier to see leakage and loose, missing, or damaged parts, and helps prevent fires. A clean truck runs cooler. The environment in which a lift truck operates determines how often and to what extent cleaning is necessary.

For example, trucks operating in manufacturing plants that have a high level of dirt, dust, or lint (for example, cotton fibers or paper dust) in the air or on the floor or ground, require more frequent cleaning. The radiator especially may require daily air cleaning to ensure correct cooling.

If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use steam or liquid spray cleaner.

※ **Lift trucks should be air cleaned at every PM interval, or more often if necessary.**

Use an air hose with special adapter or extension, a control valve, and a nozzle to direct the air properly. Use clean, dry, low pressure, compressed air. Restrict air pressure to 2.0 kgf/cm^2 (30 psi), maximum (OSHA requirement).

⚠ **Wear suitable eye protection and protective clothing when air cleaning. Never point the air nozzle at anyone.**

Air clean the mast assembly, drive axle, radiator- from both counterweight and engine side, engine and accessories, drive line and related components, and steering axle and cylinder.

12) CRITICAL FASTENER TORQUE CHECKS

Fasteners in highly loaded (critical) components can quickly fail if they become loosened. Also, loose fasteners can cause damage or failure of the component. For safety, it is important that the correct torque be maintained on all critical fasteners of the components that directly support, handle, or control the load and protect the operator. (SEE SECTION 8. SPECIFICATIONS)

Critical items include:

- Drive axle mounting
- Cabin
- Drive and steering wheel mounting
- Tilt cylinder mounting and yokes
- Counterweight mounting
- Mast mounting and components

Torque specifications are in your service manual.

13) LIFT CHAIN MAINTENANCE

The chain system on the mast was designed for safe, efficient, and reliable transmission of lifting force from hydraulic cylinder to the forks. Safe use of your truck with minimum down time depends on the correct care and maintenance of the lift chains. Most complaints of unacceptable chain performance are a result of poor maintenance. Chains need periodic maintenance to give maximum service life.

⚠ **Do not attempt to repair a worn chain. Replace worn or damaged chains with a set (LH & RH). Do not piece chains together.**

(1) Lift chain inspection and measurement

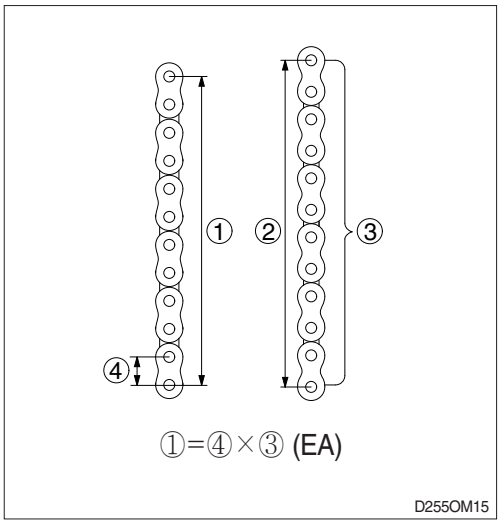
Inspect and lubricate the lift chains every 10 hours or daily and check tension every 250 hours or monthly. When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following conditions:

- Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear, and worn pins or holes.
- When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.
- Chain wear can be masured 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**

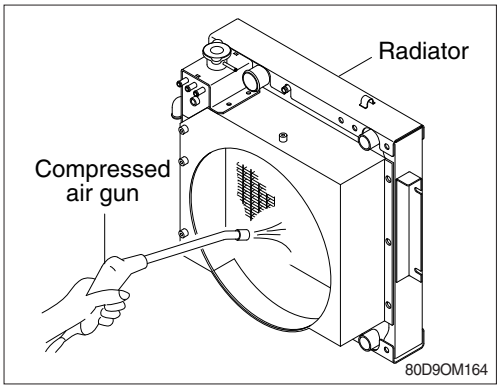
The distance from the center of one pin to the center of the next pin.

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^2 (30 psi)

3) Check the fan belt tension. If it is too slack, adjust the tension. (SEE SECTION 8. SPECIFICATIONS)

4) In case of overheating, do not stop the engine immediately.
   (1) Run the engine at low idling.
   (2) Open the hood to ventilate the engine compartment.
   (3) When the water temperature drops, stop the engine.
   (4) Check the cooling water level. If it is low, add more water.

⚠ Wear safety glasses and a face shield when using compressed air. Never touch the radiator cap while the engine is hot. Steam may spurt out. Wait until the water temperature drops. It is extremely dangerous to try to check the fan belt tension while the engine is running. When inspecting the fan belt or other moving parts, or near such parts, always stop the engine first.

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) When ambient temperatures are below use an anti-freeze mixture per the above table to prevent freezing of the cooling system.

Min ambient temperature (˚C)	-5	-10	-15	-20	-25	-30	-50
Amount of antifreeze (%)	25	30	35	40	45	50	60
Amount of water (%)	75	70	65	60	55	50	40

⚠ **Use permanent type antifreeze.**
⚠ **Use soft water (city water, etc.) as mixing water.**
⚠ **Cooling system must be thoroughly flushed before filling with antifreeze mixture.**
⚠ **When the climate becomes warmer and antifreeze is not needed, replace with soft water (city water, etc.) after thoroughly cleaning the cooling system.**
⚠ **Do not expose antifreeze to flame. It is inflammable.**

※ **Dispose of old antifreeze mixture in locally approved manner.**

2) BATTERY

As the ambient temperature drops, the battery capacity will drop and the electrolyte may sometimes freeze if the battery charge is low. Maintain the battery at a charge level of over 75% and insulate it against cold temperature so that the truck can be readily started the next morning.

※ **When the electrolyte level is low, add distilled water in the morning before work instead of after the day's work. This is to prevent fluid from freezing at night.**

3) CARE AFTER DAILY OPERATION

(1) Drain water from the fuel system to prevent freezing.
(2) Fill the tank at the end of each day of operation to drive out moisture laden air to prevent condensation.
Do not fill the tank to top.

⚠ **Explosive fumes may be present during refueling.**

12. RECOMMENDATION TABLE FOR LUBRICANTS

1) NEW MACHINE

New machine uses following fuel, coolant and lubricant.

Description	Specification
Engine oil	SAE 15W-40 (API CJ-4 class)
T/M oil	ATF DEXRON III
Axle oil	SHELL DONAX TD
Hydraulic oil	ISO VG46/VG68, Hyundai genuine long life hydraulic oil ISO VG15, Conventional hydraulic oil★1
Brake oil	AZOLLA ZS32 (Hydraulic oil ISO VG32)
Grease	Lithium base grease NLGI No.2
Fuel	ASTM D975-No.2 ★2 Ultra low sulfur diesel
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water
DEF/AdBlue®	ISO 22241 (High-purity urea + deionized water (32.5:67.5))

- SAE : Society of Automotive Engineers
- API : American petroleum Institute
- ISO : International Organization for Standardization
- NLGI : National Lubricating Grease Institute
- ASTM : American Sociery of Testing and Material

★1 : Cold region
Russia, CIS, Mongolia

★2 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	12 (3.2)	★SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Torque converter transmission	Transmission oil	12 (3.2)	ATF DEXRON III
Axle	Gear oil	10.5 (2.8)	SHELL DONAX TD
Hydraulic tank	Hydraulic oil	66 (17.4)	★ISO VG 15 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel★1	72 (19.0)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (Grease nipple)	Grease	-	★NLGI NO.1 NLGI NO.2
Brake reservoir tank	Brake oil	-	★AZOLLA ZS10 (Hydraulic oil, ISO VG10) AZOLLA ZS32 (Hydraulic oil, ISO VG32)
Radiator	Antifreeze : Water	21.5 (5.7)	Ethylene glycol base permanent type (50:50) ★Ethylene glycol base permanent type (60 : 40)
DEF/AdBlue® tank	Mixture of urea and deionized water	18.9 (5)	ISO 22241 (High-purity urea + deionized water (32.5:67.5))

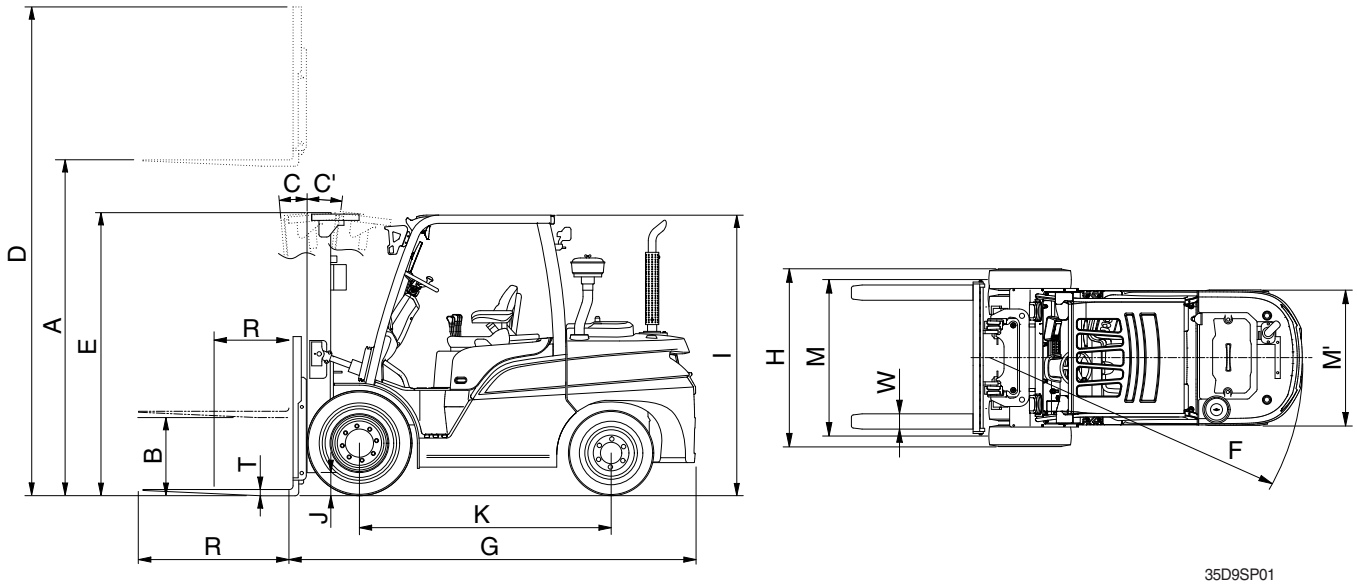
NOTES :

- Engine oil should be API classification CJ-4.
- 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.

★1 : Ultra low sulfur diesel
- sulfur content ≤ 15 ppm

★ : Cold region
Russia, CIS, Mongolia

1. SPECIFICATION TABLE



35D9SP01

Model			Unit	35D-9	40D-9	45D-9	50DA-9
Capacity			kg (lb)	3500 (8000)	4000 (9000)	4500 (10000)	5000 (11000)
Load center		R	mm (in)	600 (24")	←	←	←
Weight (Unloaded)			kg (lb)	5934 (13080)	6484 (14290)	6900 (15210)	7317 (16130)
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	540/520	540/510	540/500	460/420
	Lowering speed (Unload/Load)		mm/sec	500/500	←	←	←
	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)	4235 (13' 11")	←	←	4147 (13' 7")
	Min height	E	mm (ft·in)	2235 (7' 4")	2220 (7' 3")	←	←
Body	Travel speed (Unload)		km/h (mph)	26.6 (16.5)	25.7 (16.0)	25.6 (15.9)	←
	Gradeability (Load)		%	40.9	36.4	33.2	30.6
	Min turning radius (Outside)	F	mm (ft·in)	3006 (9' 10")	3005 (9' 10")	3040 (10' 0")	←
ETC	Operating pressure		kgf/cm² (psi)	210 (2990)	←	←	←
	Hydraulic oil tank		ℓ (U.S. gal)	64 (16.9)	←	←	←
	Fuel tank		ℓ (U.S. gal)	72 (19.0)	←	←	←
Overall length		G	mm (ft·in)	3225 (10' 7")	←	3264 (10' 9")	3300 (10' 10")
Overall width		H	mm (ft·in)	1373 (4' 6")	1746 (5' 9")	←	←
Overhead guard height		I	mm (ft·in)	★1 2220 (7' 3") ★2 2350 (7' 7")	★1 2210 (7' 3") ★2 2340 (7' 7")	←	←
Ground clearance		J	mm (in)	170 (6.7")	155 (6.1")	←	←
Wheel base		K	mm (ft·in)	2000 (6' 7")	←	←	←
Wheel tread front/rear		M/M'	mm (ft·in)	1132/1140 (3' 9"/3' 9")	1282/1140 (4' 2"/3' 9")	←	←
Max drawbar pull (load)			kg (lb)	3970 (8750)	3994 (8810)	4000 (8820)	4006 (8830)

★1 : Low ★2 : High

2. SPECIFICATION FOR MAJOR COMPONENTS

1) ENGINE

Item	Unit	Specification
Model	-	Cummins QSF 3.8
Type	-	Vertical, 4 cycle DI, Tier 4 final diesel engine
Cooling Method	-	Water cooling
Number of cylinders and arrangement	-	4 cylinders, In-line
Firing order	-	1-3-4-2
Combustion chamber type	-	Direct injection
Cylinder bore X stroke	mm (in)	100 × 120 (3.94 × 4.72)
Piston displacement	cc (cu in)	3800 (232)
Compression ratio	-	17.5 : 1
Rated gross horse power	hp/rpm	102/2200
Maximum torque at rpm	kgf · m/rpm	42.3/1600
Engine oil quantity	ℓ (U.S.gal)	13.2 (3.49)
Dry weight	kg (lb)	316 (697)
High idling speed	rpm	2400
Low idling speed	rpm	900
Rated fuel consumption	g/kw.hr	231 (at 1700 rpm)
Starting motor	V-kW	24-3.2
Alternator	V-A	24-80
Battery	V-AH	24-75
Fan belt deflection	mm (in)	10~12 (0.40~0.47)

2) MAIN PUMP

Item	Unit	Specification
Type	-	Fixed displacement gear pump
Capacity	cc/rev	46.1
Maximum operating pressure	kgf/cm^2 (psi)	235 (3340)
Rated speed (Max/Min)	rpm	3000/600

3) MAIN CONTROL VALVE

Item	Unit	Specification
Type	-	Sectional
Operating method	-	Mechanical
Relief valve pressure (Main/Aux)	kgf/cm^2 (psi)	210/150 (2990/2130)
Flow capacity	lpm	125

(4) POWER TRAIN DEVICES

Item			Specification
Torque converter	Model		DE 280 (KAPEC)
	Type		3 Element, 1 stage, 2 phase
	Stall ratio		2.25 : 1
Transmission	Type		Power shift
	Gear shift(FWD/REV)		2/2
	Control		Electrical single lever type
	Overhaul ratio	FWD	1st : 2.550 2nd : 1.218
		REV	1st : 2.550 2nd : 1.218
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	3.5 ton : 8.25-15-14 PR 4.0~5.0 ton : 300-15-18 PR
		Double	7.50-16-12 PR
	Rear(steer)		3.5/4 ton : 7.00-12-12 PR 4.5/5 ton : 7.00-12-14 PR
Brakes	Travel		Front wheel, wet disk brake
	Parking		Ratchet, drum brake
Steering	Type		Full hydraulic, power steering
	Steering angle		74.8˚ to both right and left angle, respectively
	Relief valve presssure		135 kgf/cm^2 (1920 psi)

3. TIGHTENING TORQUE

NO	Item		Size	kgf · m	lbf · ft
1	Engine	Engine mounting bolt	M12×1.75	6.9±1.4	50±10
2		Engine bracket mounting nut	M10×1.5	6.9±1.4	50±10
3		Radiator mounting bolt, nut	M10×1.5	6.9±1.4	50±10
4	Hydraulic system	MCV mounting bolt, nut	M12×1.75	5±1.0	36.2±7.2
5		Steering unit mounting bolt	M10×1.5	4.0±0.5	28.9±3.6
6		Hydraulic pump mounting bolt	M14×1.5	9.5±1.3	68.7±9.5
7	Power train system	Transmission mounting bolt, nut	M16×2.0	7.5±1.5	54.2±10.8
8		Torque converter mounting bolt	M10×1.5	6.9±1.4	50±10
9		Drive axle mounting bolt, nut	M24×2.0	62.5±9.5	452±68.7
10		Drive shaft mounting bolt	3/8-24 UNF	7.0±0.7	50.6±5.1
11		Steering axle mounting bolt, nut	M14×2.0	19.6±2.9	142±21
12		Front wheel mounting nut	M22×1.5	62.0±9.3	448±67.3
13		Rear wheel mounting nut	M20×1.5	35.0±5.0	253±36.2
14	Others	Counterweight mounting bolt	M30×3.5	199±29.9	1439±216
15		Operator's seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
16		Head guard mounting bolt	M12×1.75	12.8±3.0	93±22
17		Cabin mounting bolt	M12×1.75	12.8±3.0	93±22

1. ENGINE SYSTEM

Trouble symptom	Probable cause	Remedy
Oil pressure caution lamp fails to go out.	· Low oil level in oil pan. · Oil filter element clogged. · Loose or worn oil pipe joint leaks oil.	· Add oil. · Replace element. · Check and repair.
Radiator pressure valve spouts steam.	· Lack of cooling water or water leakage. · Loosen fan belt. · Dust and scale accumulated in, cooling system.	· Add water or repair. · Adjust belt. · Change water and clean the interior of cooling system.
Water temp gauge indicates red range, on right.	· Radiator fin clogged or fin damaged. · Thermostat or water temp gauge faulty. · Radiator filler cap loosening.	· Clean or repair. · Replace · Retighten cap or replace packing.
Water temp gauge indicates red range, on left.	· Thermostat faulty. · Water temperature gauge faulty.	· Replace · Replace
Engine fails to start.	· Lack of fuel. · Air mixed in fuel system. · Fuel injection pump or nozzle defective. · Starting motor rotates slowly. · Engine compression insufficient. · Valve clearance out of adjustment.	· Addfuel. · Repair. · Replace. · See " Electrical system." · Adjust clearance
Engine emits whitish or bluish smoke.	· Excessive quantity of oil in oil pan. · Poor quality of fuel.	· Reduce oil quantity. · Replace with specified fuel.
Engine emits blackish smoke.	· Air cleaner element clogged.	· Clean or replace element.
Irregular fuel feeding sound heard.	· Fuel feed pump faulty.	· Replace pump.
Abnormal sound heard. (Fuel combustion or mechanical sound)	· Poor quality of fuel. · Overheating · Muffler interior damaged. · Excessively large valve clearance.	· Replace with specified fuel. · See Symptom "Radiator pressure valve spouts steam". · Replace · Adjust clearance.

2. ELECTRICAL SYSTEM

Trouble symptom	Probable cause	Remedy
Lamps dimming even at maximum engine speed.	· Faulty wiring.	· Check for loose terminal and disconnected wire.
Lamps flicker during engine operation.	· Improper belt tension.	· Adjust belt tension.
Charge lamp does not light du -ring 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

Trouble symptom	Probable cause	Remedy
1. Excessive oil temperature rise		
1) Torque converter	· Improper oil level.	· Check oil level. Add or drain oil as necessary.
	· Impeller interfering with surroundings.	· After draining oil from oil tank and transmission, check and replace interfering parts.
	· Stator and free wheel malfunctioning.	· Check engine (stalling) speed. If necessary, replace.
	· Air sucked in.	· Check the inlet side joint or pipe. If necessary, retighten joint or replace gasket.
	· Water intruding into transmission case.	· Check drained oil. If necessary, change oil.
	· Bearing worn or seizing.	· Disassemble, inspect, repair or replace.
	· Gauge malfunctioning.	· Check and, if necessary, replace.
2) Transmission	· Clutch dragging.	· Check to see whether or not machine moves even when transmission is placed in neutral position. If so, replace clutch plate.
	· Bearing worn or seized.	· Disassemble, check and replace.
2. Noise operation		
1) Torque converter	· Cavitation produced.	· Change oil, replace parts leaking air.
	· Flexible plate damaged.	· Listen to rotating sound at lowspeed operation. If necessary, replace flexible plate.
	· Bearing damaged or worn.	· Disassemble, check and replace.
	· Gear damaged.	· Disassemble, check and replace.
	· Impeller interfering with surroundings.	· Check impeller or check drained oil for mixing of foreign matter. If necessary, change oil.
	· Bolt loosening.	· Disassemble and check. If necessary, retighten or replace.
	· Spline worn.	· Disassemble, check and replace.
	· Noise gear pump operation.	· Disassemble, check and replace.
2) Transmission	· Dragging caused by seizing clutch.	· Check to see whether or not machine moves even when transmission is in neutral position. If so, replace clutch plate.
	· Bearing worn or seizing.	· Disassemble, check and replace
	· Gear damaged.	· Disassemble, check and replace
	· Bolt loosening.	· Disassemble, check and retighten or replace
	· Spline worn.	· Disassemble, check and replace

Trouble symptom	Probable cause	Remedy
3. Low output power		
1) Torque converter	· Insufficient hydraulic pressure :	
	- Low oil level.	- Check oil level and add oil
	- Air sucked in.	- Check joints and pipes. If necessary, retighten joint or replace packing.
	- Oil filter clogging.	- Check and replace
	- Oil pump worn. (Low delivery flow)	- Check oil pressure. If necessary replace pump.
	- Regulator valve coil spring fatigued.	- Check spring tension. If necessary, replace.
	- Control valve spool malfunctioning.	- Disassemble, check and repair or replace.
	- Piston or O-ring worn.	- Disassemble, check measure and replace.
	· Stator free wheel cam damaged.	- Check stalling speed. (Increased engine load will cause excessive drop of stalling speed.)
		- Check oil temperature rise. If any, replace free wheel.
	· Stator free wheel seizing.	- Check temperature plate. (No-load will cause temperature rise)
		- Replace free wheel if a drop of starting output is found.
	· Impeller damaged for interfering with the surroundings.	- Check drained oil for foreign matter. If any, change oil.
2) Transmission	· Flexile plate deformed	· Replace flexible plate
	· Use of poor quality of oil or arising of air bubbles.	- Check and change oil.
	- Air sucked in from inlet side.	- Check joints and pipes. If necessary, retighten joint or replace packing.
	- Low torque converter oil pressure accelerates generation of air bebbles.	- Check oil pressure.
	- Oil mixing with water.	- Check drained oil and change oil.
	- Inching rod out of adjustment.	- Check and adjust.
	· Clutch slipping	
	- Lowering of power.	- Check oil pressure.
	- Piston ring or O-ring worn.	- Disassemble, check, measure and replace.
	- Clutch piston damaged.	- Disassemble, check and replace.
	- Clutch plate seizing or dragging.	- Check to see whether or not machine moves even when transmission is in neutral position. If so, replace.

Trouble symptom	Probable cause	Remedy
4. Unusual oil pressure		
1) Oil pressure is high	· Control valve malfunctioning.	(1)Check for spool operation. If necessary, replace valve. (2)Check for clogging of small hole in valve body. If necessary, clean or repair.
	· Cold weather. (high oil viscosity)	· When atmospheric temp is below freezing point (when normal oil pressure is recovered if heated to 60~80˚C), change oil.
	· Use of improper oil.	· Check and change oil.
2) Oil pressure is low	· Gear pump malfunctioning (worn).	· Disassemble, check and replace.
	· Oil leaks excessively : (1) Control valve oil spring defective.	· Check spring tension (see spring specification). If necessary replace.
	(2) Control valve spool defective.	· Disassemble, check, and repair or replace valve.
	· Air sucked in.	· Check joints and pipes. If necessary, retighten joint or replace packing.
	· Low oil level.	· Check oil level and add oil.
	· Oil filter clogging.	· Check and replace.
3) Transmission	· Oil leaks excessively.	· Disassemble, check (piston ring and O-ring for wear and other defects), and replace.
5. Power is not transmitted		
1) Torque converter	· Clutch plate damaged.	· Check for damage by listening to abnormal sounds at a low converter speed and replace.
	· Low oil level.	· Check oil level and add oil
	· Oil pump driving system faulty.	· Disassemble and check for wear of pump gear, shaft and spline. Replace defective parts.
	· Shaft broken.	· Check and replace.
	· Lack of oil pressure.	· Check oil pump gear for wear and for oil suction force. If necessary, replace pump.
2) Transmission	· Low oil level.	· Check oil level and add oil.
	· Inching valve and link lever improperly positioned.	· Check measure and adjust.
	· Forward/reverse spool and link lever improperly positioned.	· Check and adjust.
	· Clutch fails to disengage : (1) Clutch case piston ring defective.	· Disassemble, check and replace
	(2) Main shaft plug slipping out.	· Disassemble, check and repair or replace
	· Clutch seizing.	· Check to see whether or not machine moves even then transmission is in neutral position. If so, replace.
	· Shaft broken off.	· Disassemble, check(main shaft, etc.), and replace.
	· Clutch drum damaged (spring groove).	· Disassemble, check and replace.
	· Clutch snap ring broken.	· Disassemble, check and repair or replace.

Trouble symptom	Probable cause	Remedy
5. Power is not transmitted (Continue)	· Foreign matter intruding into oil passage to clutch. · Shaft spline worn.	· Disassemble, check and repair or replace. · Disassemble, check and replace.
6. Oil leakage (Transmission and torque converter)	· Oil leaks from oil seal.	· Disassemble and check for wear of seal lips and mating sliding surfaces (pump boss, coupling etc.) Replace oil seal, pump boss, coupling, etc.
	· Oil leaks from case joining surfaces.	· Check and retighten or replace packing.
	· Oil leaks from joint or pipe.	· Check and repair or replace gasket.
	· Oil leaks from drain plug.	· Check and retighten or gasket.
	· Oil leaks from a crack.	· Check and replace cracked part.

4. STEERING SYSTEM

Trouble symptom	Probable cause	Remedy
1. Steering wheel drags.	· Low oil pressure. · Bearing faulty. · Spring spool faulty. · Reaction plunger faulty. · Ball-and-screw assembly faulty. · Sector shaft adjusting screw excessively tight. · Gears poorly meshing. · Flow divider coil spring fatigued. · Brake valve spool malfunctioning.	· Check locknut. Repair. · Clean or replace. · Clean or replace. · Replace. · Clean or replace. · Adjust. · Check and correct meshing. · Replace. · Clean or replace.
2. Steering wheel fails to return smoothly.	· Bearing faulty. · Reaction plunger faulty. · Ball-and-screw assy faulty. · Gears poorly meshing.	· Clean or replace. · Replace. · Clean or replace. · Check and correct meshing.
3. Steering wheel turns unsteadily. Steering system makes abnormal sound or vibration.	· Locknut loosening. · Metal spring deteriorated. · Gear backlash out of adjustment. · Locknut loosening. · Air in oil circuit.	· Retighten. · Replace. · Adjust. · Retighten. · Bleed air.
4. Abnormal sound heard when steering wheel is turned fully	Valve · Faulty. (Valve fails to open.) Piping · Pipe (from pump to power steering cylinder) dented or clogged.	· Adjust valve set pressure and check for specified oil pressure. · Repair or replace.
5. Piping makes abnormal sounds.	Oil pump · Lack of oil. · Oil inlet pipe sucks air. · Insufficient air bleeding.	· Add oil. · Repair. · Bleed air completely.
6. Valve or valve unit makes abnormal sounds.	Oil pump · Oil inlet pipe sucks air. Valve · Faulty. (Unbalance oil pressure) Piping · Pipe (from pump to power steering) dented or clogged. · Insufficient air bleeding.	· Repair or replace. · Adjust valve set pressure and check specified oil pressure. · Repair or replace. · Bleed air completely.
7. Insufficient or variable oil flow.	· Flow control valve orifice clogged.	· Clean.
8. Insufficient or variable discharge pressure.	Piping · Pipe (from tank to pipe) dented or clogged.	· Repair or replace.

5. BRAKE SYSTEM

Trouble symptom	Probable cause	Remedy
1. Insufficient braking force	· Hydraulic system leaks oil. · Hydraulic system has air in line. · Friction plate worn. · Brake valve or brake piston mal-functioning. · Hydraulic system clogged.	· Repair and add oil. · Bleed air. · Replace. · Repair or replace. · Clean.
2. Brake acting unevenly. (Machine is turned to one side during braking.)	· Tires unequally inflated. · Brake out of adjustment. · Friction plate worn. · Disc worn or damaged (distortion or rusting). · Piston in axle mal-functioning. · Hydraulic system clogged.	· Adjust tire pressure. · Adjust(Refer to service manual). · Replace. · Replace. · Repair or replace. · Clean.
3. Brake trailing.	· Pedal has no play. · Piston in axle mal-functioning. · Return spring damaged. · Parking brake fails to return or out of adjustment. · Brake valve return port clogged. · Hydraulic system clogged.	· Adjust. · Repair or replace. · Relace. · Repair or adjust. · Clean. · Clean.
4. Brake chirps	· Brake trailing. · Piston fails to return. · Friction plate worn.	· See 3. Brake trailing. · Replace. · Replace.
5. Brake noise	· Incorrect axle oil. · Oil change interval passed. · Friction plate worn.	· Replace with approved oil. · Replace. · Replace.
6. Large pedal stroke	· Brake out of adjustment. · Hydraulic line sucking air. · Oil leaks from hydraulic line, or lack of oil. · Friction plate worn.	· Adjust. · Bleed air. · Check and repair or add oil. · Replace.
7. Pedal dragging.	· Twisted push rod caused by improperly fitted brake valve. · Brake valve seal faulty. · Flow control valve orifice clogged. · Lack of grease on pivot.	· Adjust. · Replace. · Clean or replace. · Add grease.

6. HYDRAULIC SYSTEM

Trouble symptom	Probable cause	Remedy
1. Large fork lowering speed.	· Seal inside control valve defective. · Oil leaks from joint or hose. · Seal inside cylinder defective.	· Replace spool or valve body. · Replace. · Replace packing.
2. Large spontaneous tilt of mast.	· Tilting backward : Check valve defective. · Tilting forward : tilt lock valve defective. · Oil leaks from joint or hose. · Seal inside cylinder defective.	· Clean or replace. · Clean or replace. · Replace. · Replace seal.
3. Slow fork lifting or slow mast tilting.	· Lack of hydraulic oil. · Hydraulic oil mixed with air. · Oil leaks from joint or hose. · Excessive restriction of oil flow on pump suction side. · Relief valve fails to keep specified pressure. · Poor sealing inside cylinder. · High hydraulic oil viscosity. · Mast fails to move smoothly. · Oil leaks from lift control valve spool. · Oil leaks from tilt control valve spool.	· Add oil. · Bleed air. · Replace. · Clean filter. · Adjust relief valve. · Replace packing. · Change to SAE10W, class CF engine oil. · Adjust roll to rail clearance. · Replace spool or valve body. · Replace spool or valve body.
4. Hydraulic system makes abnormal sounds.	· Excessive restriction of oil flow pump suction side. · Gear or bearing in hydraulic pump defective.	· Clean filter. · Replace gear or bearing.
5. Control valve lever is locked	· Foreign matter jammed between spool and valve body. · Valve body defective.	· Clean. · Tighten body mounting bolts uniformly.
6. High oil temperature.	· Lack of hydraulic oil. · High oil viscosity. · Oil filter clogged.	· Add oil. · Change to SAE10W, class CF engine oil. · Clean filter.

7. MAST AND FORK

1) MAST

Problem	Cause	Remedy
Forks fail to lower.	· Deformed mast or carriage.	· Disassemble, repair or replace.
Fork fails to elevate	· Faulty hydraulic equipment.	· See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system.
	· Deformed mast assembly.	· Disassemble mast and replace damaged parts or replace complete mast assembly.
Slow lifting speed and insufficient handling capacity.	· Faulty hydraulic equipment.	· See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system.
	· Deformed mast assembly.	· Disassemble mast and replace damaged parts or replace complete mast assembly.
Mast fails to lift smoothly.	· Deformed masts or carriage.	· Disassembly, repair or replace.
	· Faulty hydraulic equipment.	· See Troubleshooting Hydraulic Cylinders, pump and control valve in section 6, hydraulic system.
	· Damaged load and side rollers.	· Replace.
	· Unequal chain tension between LH & RH sides.	· Adjust chains.
	· LH & RH mast inclination angles are unequal. (Mast assembly is twisted when tilted)	· Adjust tilt cylinder rods.
Abnormal noise is produced when mast is lifted and lowered.	· Broken load roller bearings.	· Replace.
	· Broken side roller bearings.	· Replace.
	· Deformed masts.	· Disassemble, repair or replace.
	· Bent lift cylinder rod.	· Replace.
	· Deformed carriage.	· Replace.
	· Broken sheave bearing.	· Replace.
Abnormal noise is produced during tilting operation.	· Insufficient lubrication of anchor pin, or worn bushing and pin.	· Lubricate or replace.
	· Bent tilt cylinder rod.	· Replace.

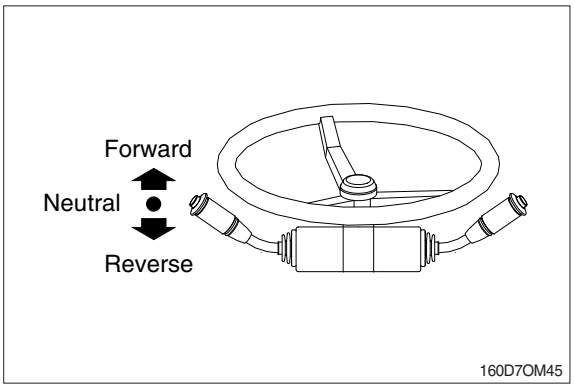
2) FORKS

<table>
<tr><th>Problem</th><th>Cause</th><th>Remedy</th></tr>
<tr><td>Abrasion</td><td>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</td><td>If the measured value is below the wear limit, replace fork.</td></tr>
<tr><td>Distortion</td><td>Forks are bent out of shape by a number of reasons such as overloading, glancing blows against walls and objects, and picking up load unevenly.
· Difference in fork tip height
<table>
<tr><th>Fork length (mm)</th><th>Height difference (mm)</th></tr>
<tr><td>equal or below 1500</td><td>3</td></tr>
<tr><td>above 1500</td><td>4</td></tr>
</table></td><td>If the measured value exceeds the allowance, replace fork.</td></tr>
<tr><td>Fatigue</td><td>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.</td><td>Repair fork by expert.
In case of excessive distortion, replace fork.</td></tr>
</table>

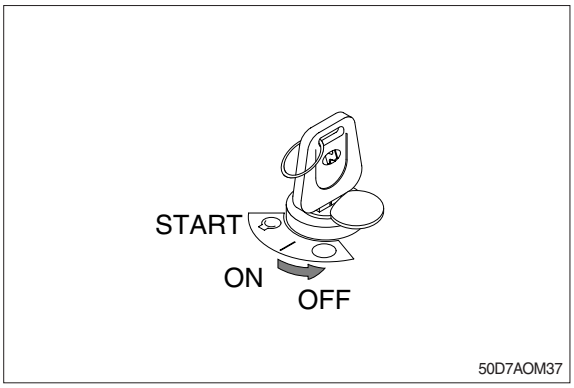
1. ENGINE SYSTEM

1) EASE OF STARTING, NOISE

(1) Set gear selector lever at NEUTRAL.

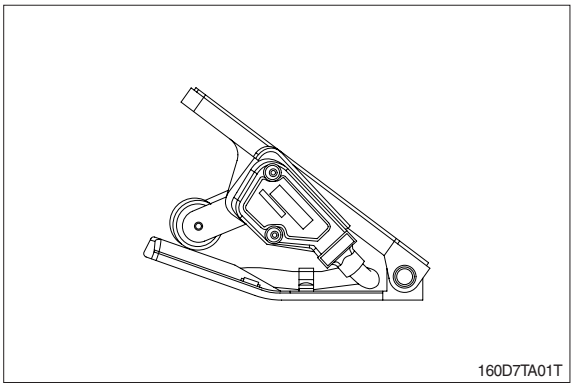


(2) Put the parking brake lever to LOCK position.
(3) Turn ON start switch, automatically heating operated.
(4) When heater signal lamp goes out, turn key to START, and start engine.
※ **When engine starts, check if it starts smoothly, and if it makes any abnormal noise.**



2) IDLING

(1) After warming up engine, run at idling.
(2) Check that engine maintains steady, smooth rotation without gasping, abnormal noise, abnormal explosions, or irregular vibration.
(3) Check that idling speed is within specified range.
(4) Idle rpm : SEE 8. SPECIFICATION



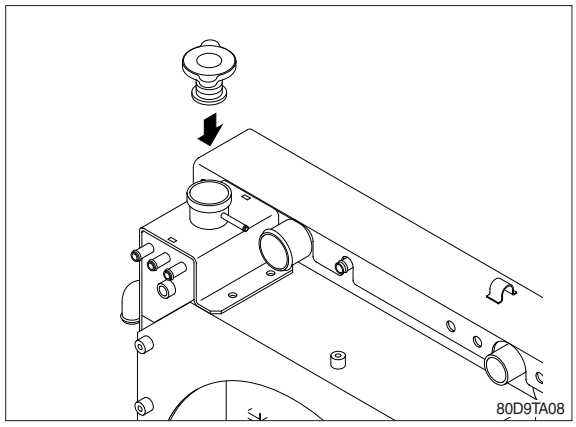
3) WHEN ACCELERATOR PEDAL IS DEPRESSED

(1) Check that accelerator pedal does not catch when depressed.
(2) Check that engine speed increases in accordance with amount pedal is depressed.
(3) When doing this, check that engine speed changes without gasping, abnormal noise, abnormal explosions, or irregular vibration.
(4) Check that exhaust gas is colorless when the engine is idling, and a thin black color when accelerator pedal is depressed.
(5) Max speed : SEE SECTION 8. SPECIFICATIONS

4) RADIATOR CAP

(1) Push pressure regulator spring with finger and check that tension is correct.
(2) Pull negative pressure valve, and check that it is closed when released.
(3) If packing is damaged, replace whole radiator cap assembly.

⚠ While the coolant in the radiator is retained hot temperature, do not open the surge tank cap.
It will gush out the hot water and someone might get scalded or severe injured.



5) FUEL FILTER (DIESEL)

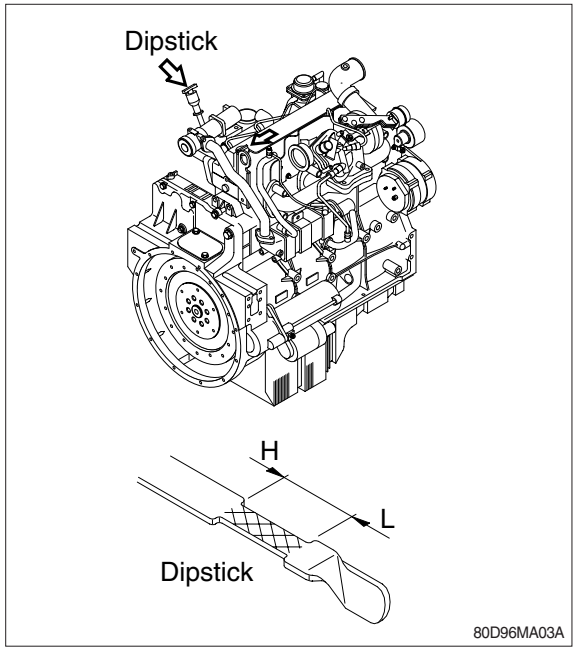
(1) The fuel filter cartridge cannot be inspected from the outside, so replace it periodically (refer to 7. PLANNED MAINTENANCE AND LUBRICATION).
(2) Always use HYUNDAI Forklift genuine parts when replacing the element.
(3) After replacing the element, run the engine and check for oil leakage from the filter mount.

6) ENGINE OIL

(1) Check oil level with dipstick and add oil if necessary.
(2) Check oil for discoloration or deterioration. Change oil if discolored or deteriorated.
(3) Engine oil quantity : See section 8. Specification

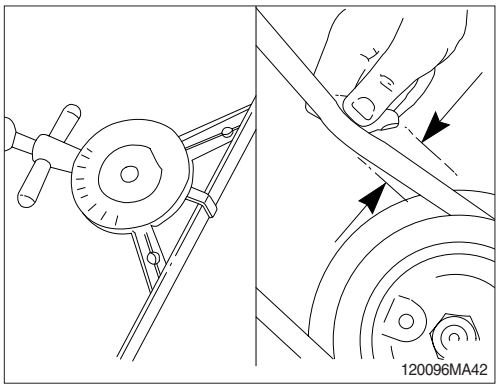
7) ENGINE OIL FILTER

The condition of the oil filter cartridge cannot be inspected from the outside so replace the engine oil filter (refer to section 7. Maintenence and lubrication).
Use a filter wrench and remove the whole cartridge assembly.



8) CHECK FAN BELT TENSION

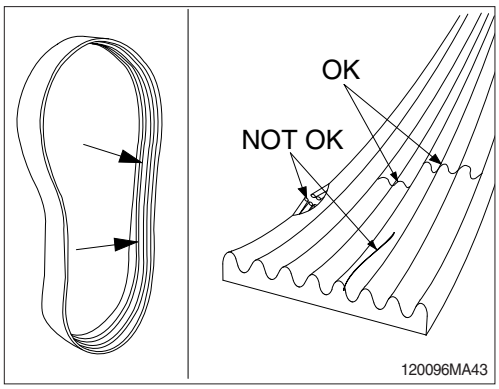
(1) An deflection method can be used to check belt tension by applying 11 kgf (25 lbf) force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



(2) Inspect the fan belt for damage.

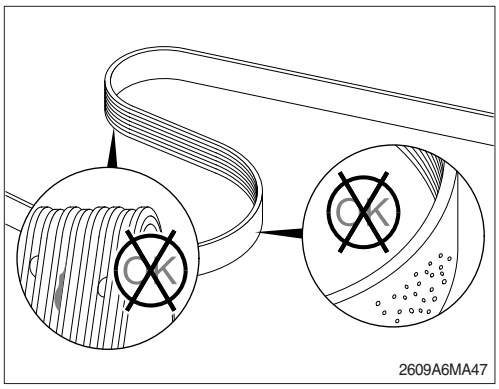
① Transverse (across the belt) cracks are acceptable.

② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



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

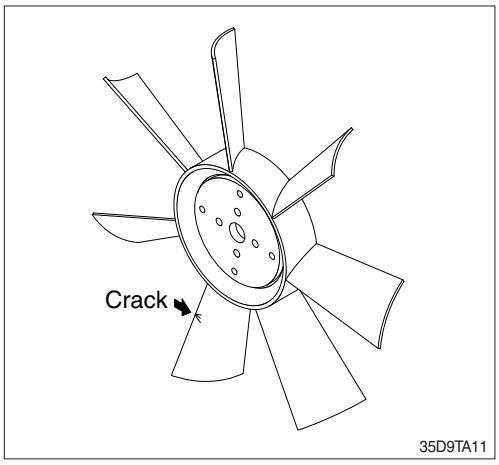
※ **If any of the above conditions are present, the belt is unacceptable for reuse and must be replaced.**



9) FAN

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

Tighten mounting bolt with a spanner.



2. DRIVE SYSTEM

1) GEAR SHIFT LEVER

(1) Neutral starting

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

(2) Shifting FWD/REV lever

① **Forward**

Push the lever forward then forward solenoid valve operates and oil comes to forward clutch thus the truck will run forward.

② Reverse

Pull the lever backward then reverse solenoid valve operates and oil comes to reverse clutch thus the truck will run backward.

2) OIL LEAKAGE

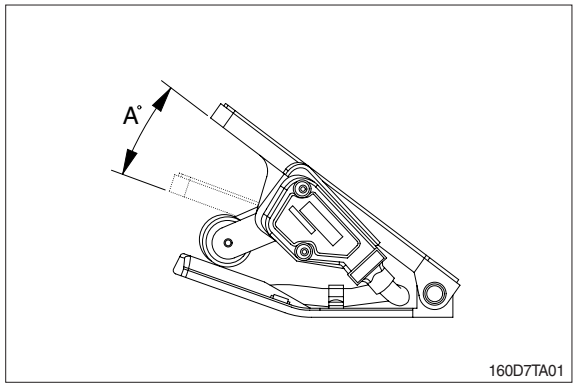
Check that there is no oil leakage from torque converter, transmission or control valve. If oil oozes out and forms drops, replace packing.

3) ADJUSTMENT OF PEDAL

(1) Electric accelerator pedal

Pedal operation range is "A˚".

· Operation range (A˚) : 17.5±2



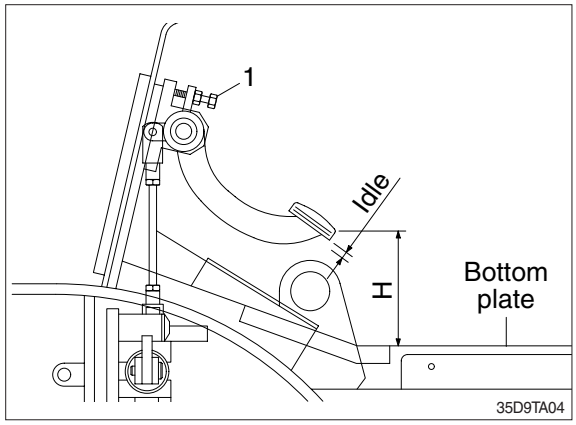
(2) Brake pedal

· 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

Model	H	Idle
35/40/45D-9, 50DA-9	130±4	2~4

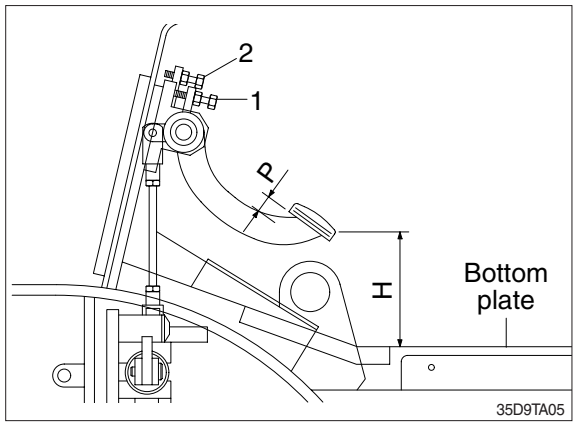


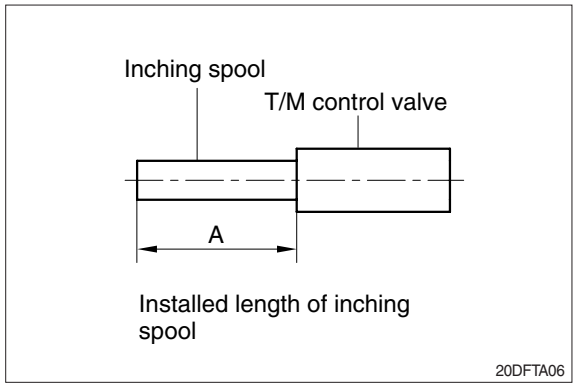
(4) Inching pedal

- 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

Model	H	P	IDLE	A
35/40/45D-9, 50DA-9	130±4	0	5	33



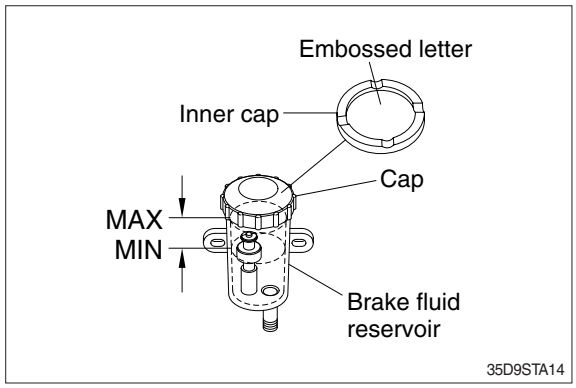


4) CHECK OIL LEVEL

Stop the machine in a flat place and check the oil level with the dipstick.

(1) Brake reservoir

Check the brake reservoir, and add brake fluid, if necessary. The embossed letter facing up.



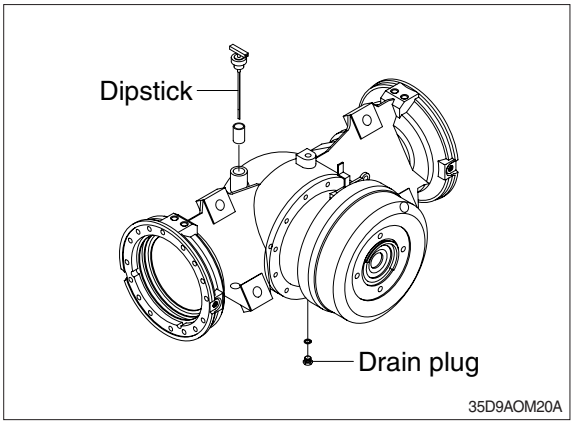
(2) Differential case

Remove the dipstick at front face of the differential case. The oil should be leveled with the marking on the dipstick. If the oil level is too low, add oil through the dipstick hole at the top of the differential case.

⚠ **When filling the oil in the differential case, take to extreme care not to spill it on the floor.**

It can cause to happen unexpected accidents such as personal injury due to slippage on the oil or fire.

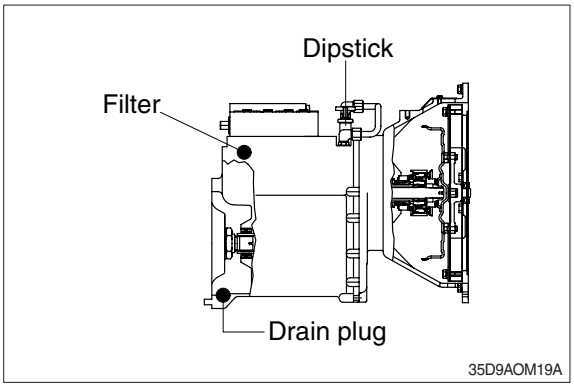
If the oil is spilt on the floor, wipe it off immediately.



(3) TORQUE FLOW Transmission

Check the oil level with the oil gauge below the floor plate. If the oil level is too low, add oil through the oil gauge hole.

※ **Follow the same procedure as for the differential case when checking the oil level or adding oil to the clutch transmission case.**



3. TRAVEL SYSTEM

1) TIRES

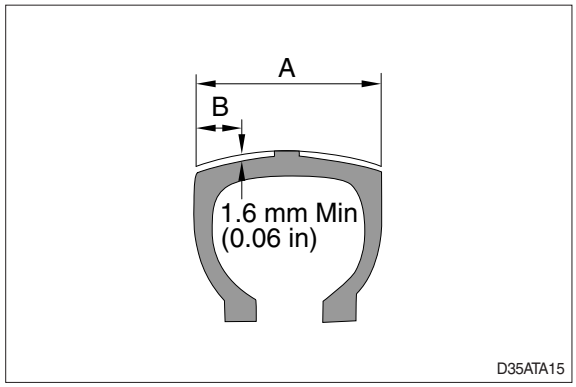
(1) Check tire pressure using tire gauge : SEE 5-3 CHECK BEFORE STARTING ENGINE

(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㎜ (0.06in) at point 1/4 across width of tread. A/B≒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 ㎜. If clearance is more than 2 ㎜, insert shim to reduce clearance to within 0.7 ㎜.

· Mounting bolt torque : SEE 8.SPECIFICATION

(2) Measure clearance between center pin and bushing. Check that clearance is within 0.5 ㎜ (0.02 in). If clearance is more than 0.5 ㎜, replace the bushing.

5) DRIVE AXLE

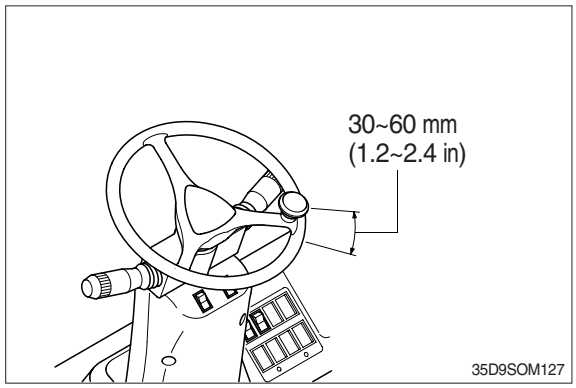
Check that there is no deformation or crack around mounting bolts of front axle and main frame and at welds. Check visually or use crack detection method.

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.

3) STEERING AXLE

(1) Put camber gauge in contact with hub and measure camber. If camber is not within 1.5˚, rear axle is bent.
(2) Ask assistant to drive machine at minimum turning radius.
(3) Fit bar and a piece of chalk at outside edge of counterweight to mark line of turning radius.
(4) If minimum turning radius is not within ±100 mm (±4 in) of specified value, adjust turning angle stopper bolt.

5. ADJUSTMENT OF PARKING BRAKE LEVER

1. RATCHET TYPE PARKING LEVER

1) Put the lever to the brake released position.
2) Pull the parking lever up to the specified stroke which is respectively and the fix the adjust nut.
   · Operate range : 23˚