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3. KNOW YOUR TRUCK

4. OPERATOR MAINTENANCE AND CARE

5. STARTING AND OPERATING PROCEDURES

6. EMERGENCY STARTING AND TOWING

7. PLANNED MAINTENANCE AND LUBRICATION

EC Declaration of conformity - update 05/01/'10

1. We hereby declare that the following machine comply with the machine directive 2006/42/EC, EMC-directive 2004/108/EC, Non-road mobile machinery emission directive 97/68/EC (amended by 2002/88/EC, 2004/26/EC, 2006/105/EC) and noise emission 2000/14/EC (amended by 2005/88/EC).

Forklifts	Model :	*******
	Serial Nr. :	***

2. Manufacturer

HYUNDAI CONSTRUCTION EQUIPMENT CO., LTD.
12th Fl., Hyundai Bldg. 75, Yulgok-ro, Jongno-gu,
Seoul 03058, Korea

Authorized representative :
Owner of the technical file for machine production.
(TCF : Technical Construction File)

HYUNDAI CONSTRUCTION EQUIPMENT EUROPE N.V.
Hyundailaan 4, 3980 Tessenderlo
Belgium

3. Harmonized European directives : ISO3691-1.3, ISO 20898:2008, EN ISO 2867:2008

4. Noise level :

Certain n° :	e13*2000/14*2005/88*0059*08	
Date :	2009-06-17	
Conformity assessment procedure :	Attachment VIII following the periodical inspection on technical extended with "Information on the scope of delivery" by TÜV Rheinland.	
Authorized entity :	Société Nationale de Certification et d'Homologation s.à r.l CE0499 11, route de Luxembourg 5230 Sandweiler Luxemburg	
Engine power :	***	kW
Guaranteed sound power level :	***	dB (A)

5. Remarks

*****
Managing Director

Tessenderlo, Belgium
//****

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}
22/25/30/33D-9	102 dB	80 dB

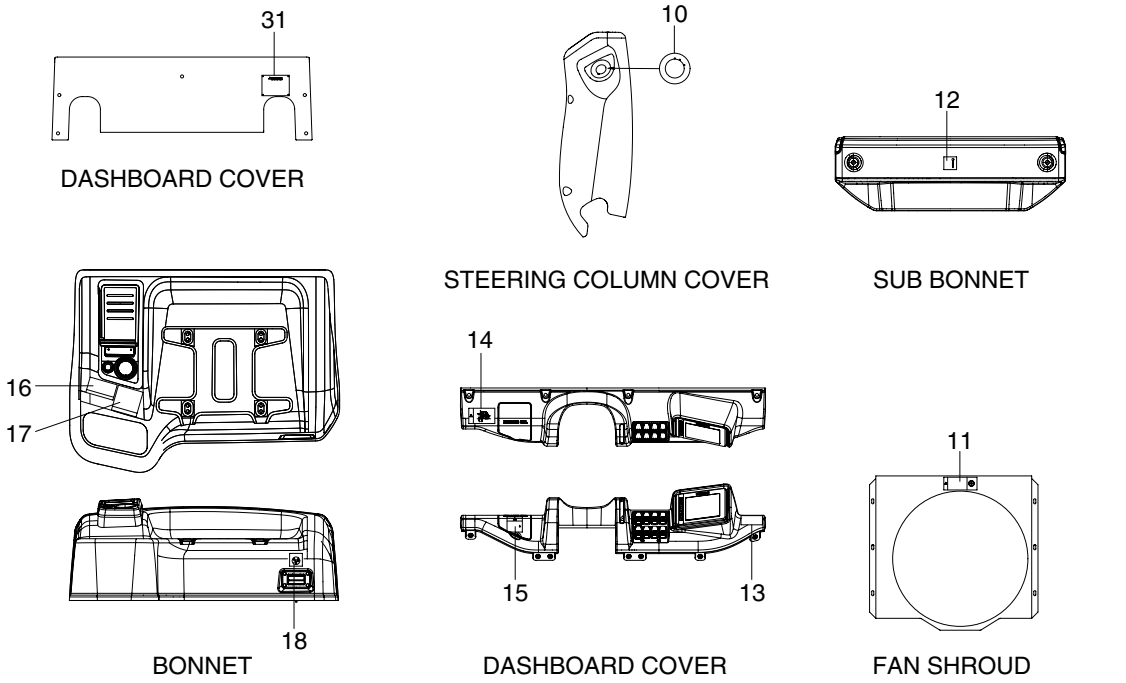
· The value of vibrations transmitted by the operator's seat are lower than standard value of (2005/88/EC)

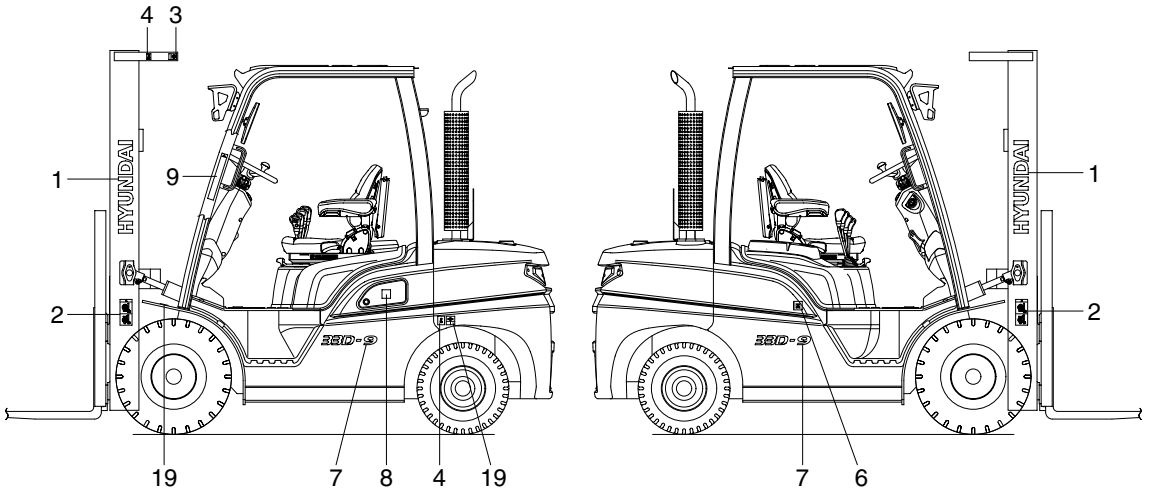
CE

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	9	Warning safety	16	Load chart
2	Warning plate	10	Start key	17	Safety instruction
3	Hand caution	11	Radiator cap & fan	18	Engine room
4	Hook	12	Temperature	19	Tire caution
6	Hydraulic oil	13	Solid tire (option)	31	Name plate
7	Model name	14	Operator warning		
8	Diesel fuel	15	Brake fluid		

2. DESCRIPTION

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

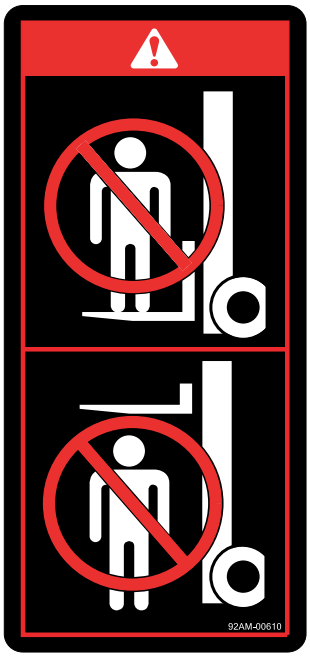
Replace any safety label that is damaged, or missing.

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.

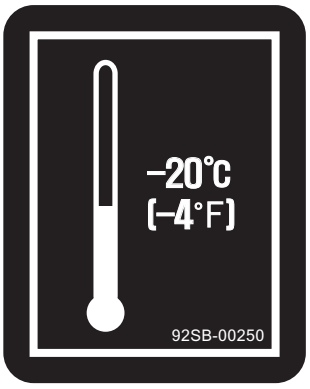


25L7A0OM06

2) **TEMPERATURE** (item 12)

This warning label is positioned on the left of top side of sub bonnet.

⚠ Coolant must be checked as specified in planned maintenance intervals



20DE0FW06

3) **RADIATOR CAP & FAN** (item 11)

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

25L7A0OM07

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

4) **HAND CAUTION** (item 3)

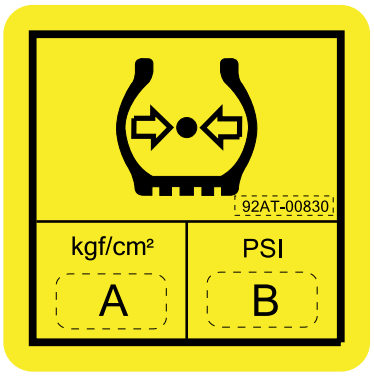
This label is positioned on respectively near the front fender and the rear fender of the left side of the main frame.

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 19)

This label is positioned on both side of main frame.



20DEOM104

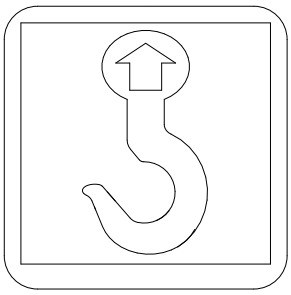
⚠ **Tire pressure must be checked in accordance with planned maintenance intervals**

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

6) **HOOK** (item 4)

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

⚠ **Refer to page 7-43 for safe loading procedures.**



50DEOM35

7) **SAFETY INSTRUCTION** (item 17)

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

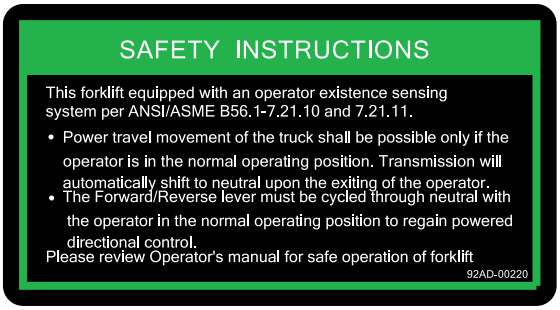
⚠ **This forklift is equipped with an operator existence sensing system per ANSI/ASME B56.1-7.21.10 / 7.21.11 and ISO 3691.**

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.

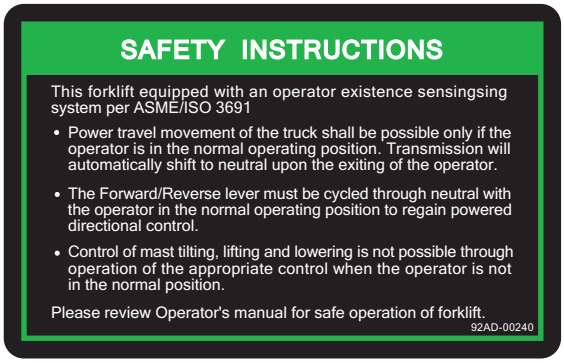
3. Control of mast tilting, lifting and lowering is not possible through operation of the appropriate control when the operator is not in the normal position.

Truck for USA or travel ∗OPSS



25L7A0OM02

Truck for travel and mast ∗OPSS



92AD-00240

∗OPSS : Operator Presence Sensing System

8) **BRAKE FLUID** (item 15)

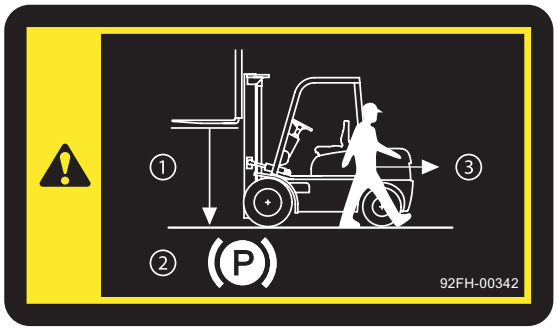
This warning label is located on the left side of dashboard cover.

92HN-00881

9) OPERATOR WARNING (item 14)

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.

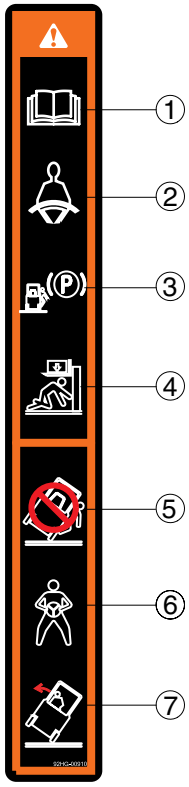


91FH-00342

10) WARNING SAFETY (item 9)

This warning label is positioned on the front outside of overhead guard stay-LH.

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

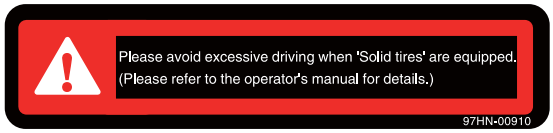
※ **Refer to page 3-3 for details.**

11) SOLID TIRE (item 13)

This decal located on the dashboard near 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.



93FV-00950

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

12) **ENGINE ROOM** (item 18)

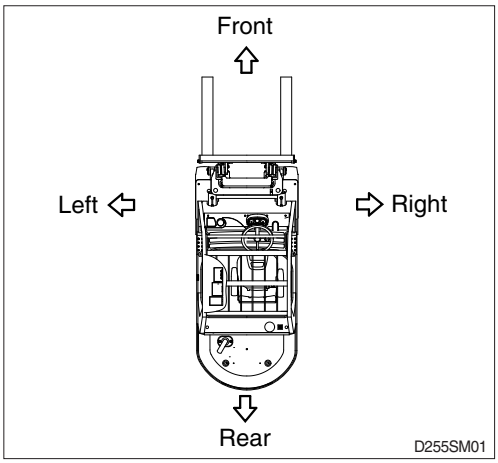
This warning label is located on the right side of the bonnet.

⚠ **Don't wash the engine room.**

92HN-00261

1. DIRECTION

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

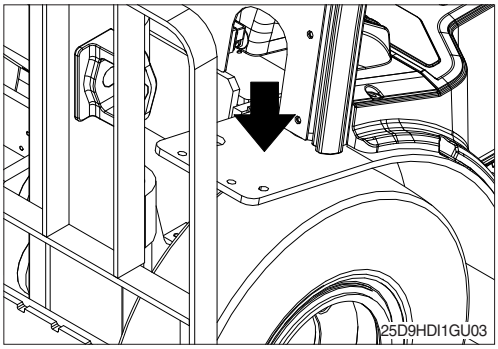


2. SERIAL NUMBER

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

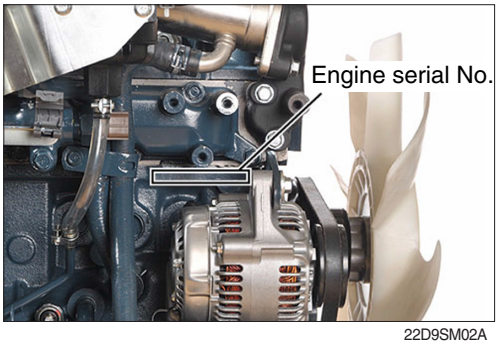
1) MACHINE SERIAL NUMBER

It is shown on the left fender.



2) ENGINE SERIAL NUMBER

It is shown on the name plate of the engine.



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

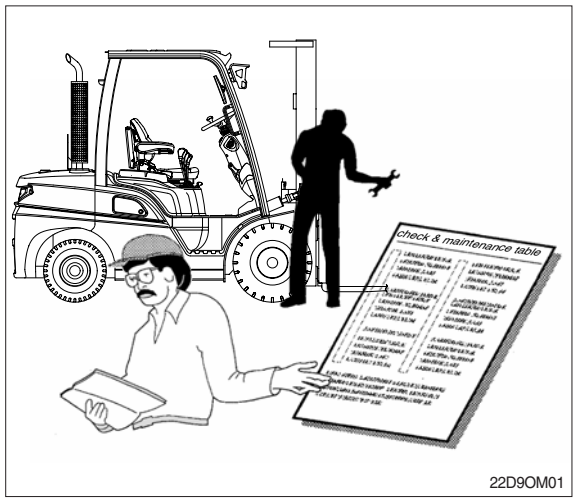
1. DAILY INSPECTION

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.

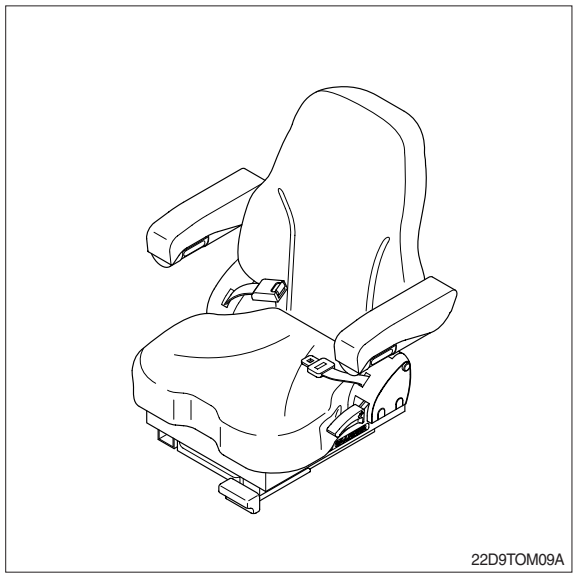
Don't operate the truck outdoors in rainy day.

※ **Exclude the truck equipped cabin.**

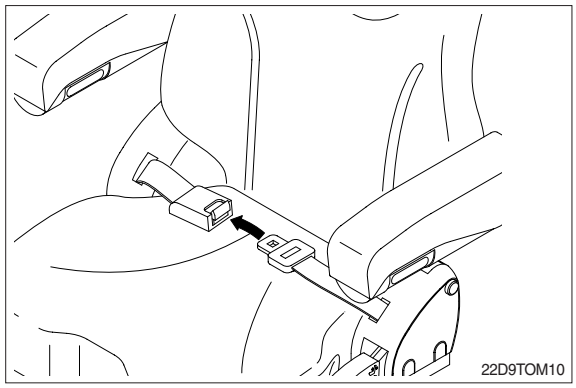
Exhaust gas is dangerous.
Do not operate the truck at the inhouse, if possible.
Provide adequate ventilation when working in a closed space.

3. SEAT BELTS

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

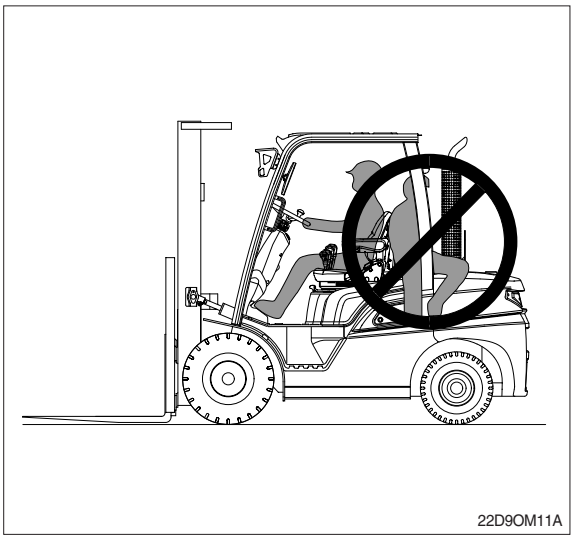


⚠ Seat belts can reduce injuries.

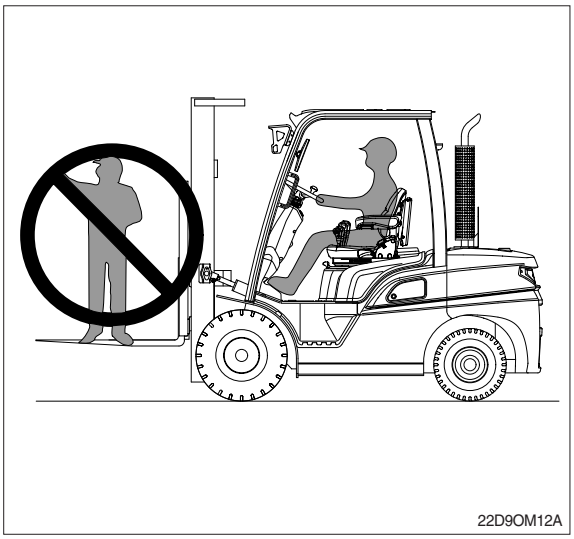


4. NO RIDERS

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

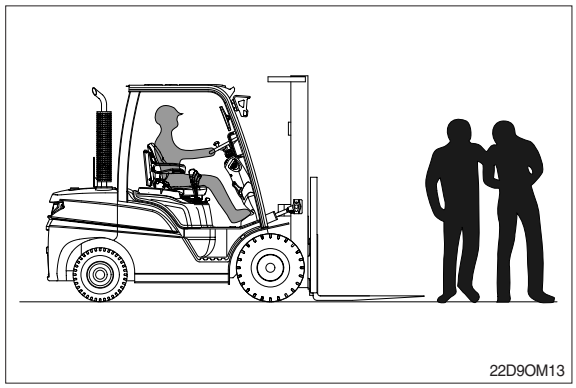


2) Never transport personnel on the forks of a lift truck.

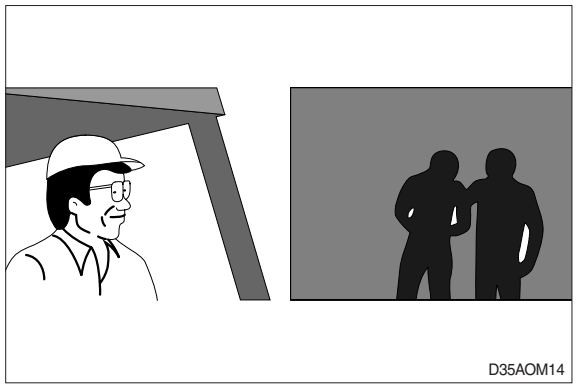


5. PEDESTRIANS

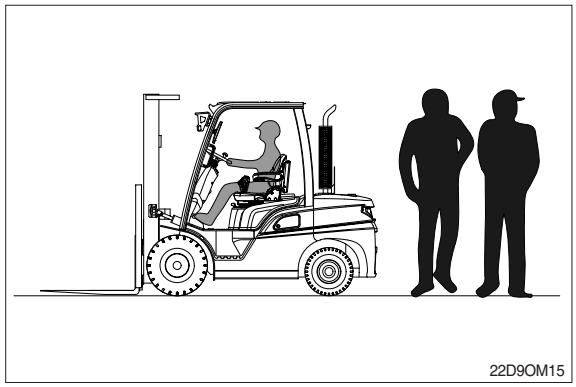
1) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



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.

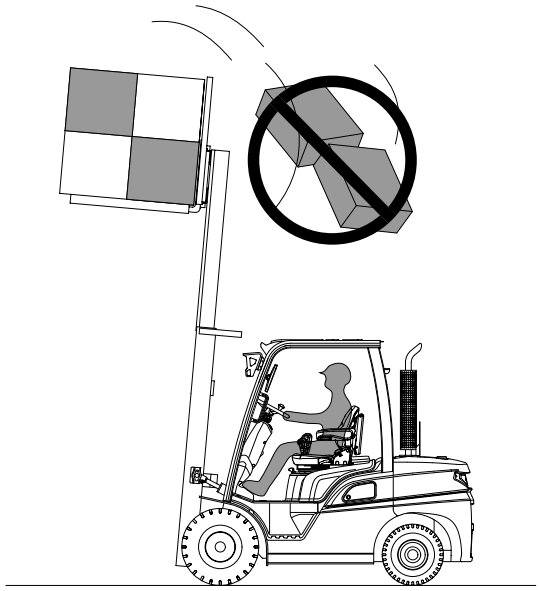


6. OPERATOR PROTECTION

1) Keep under the overhead guard.

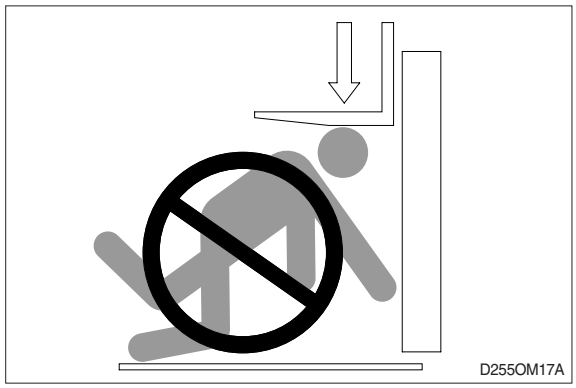
2) Always keep your body within the confines of the truck.

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

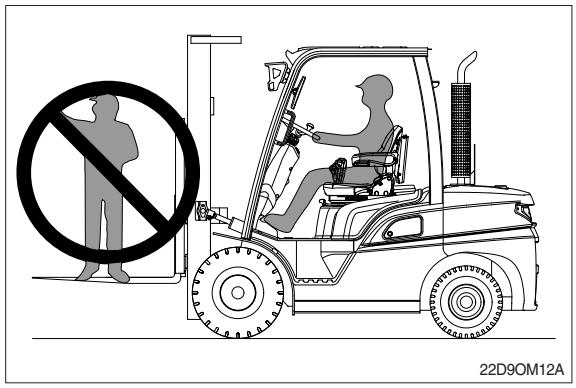


7. FORK SAFETY

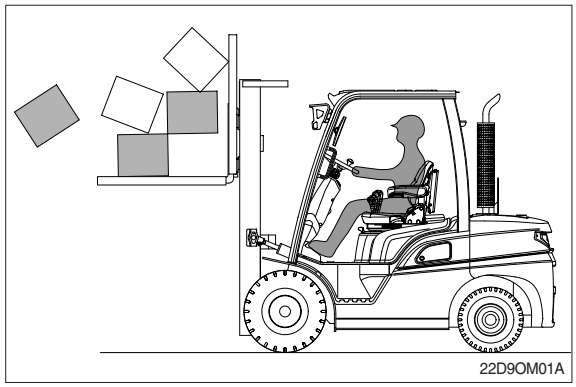
Never allow anyone to walk under raised forks.



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

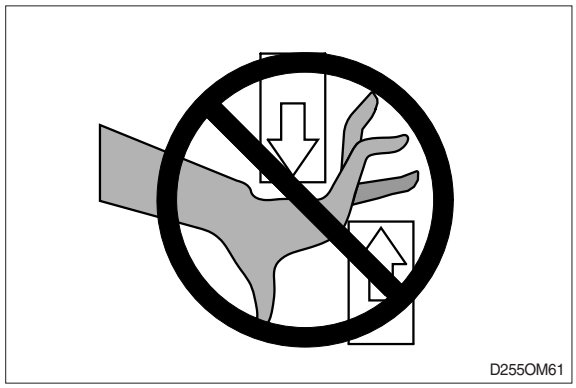


Always lower the load slowly.
Raise and lower with mast vertical or tilted slightly back (Never forward).

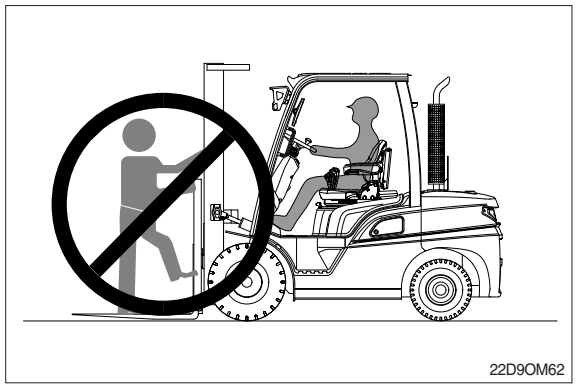


8. PINCH POINTS

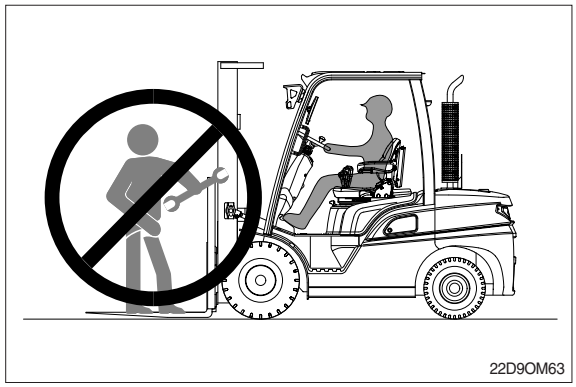
⚠ Keep hands, feet and legs out of the mast.



⚠ Don't use the mast as a ladder.



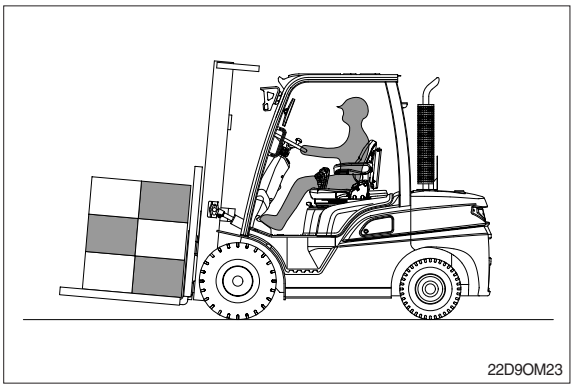
⚠ Never try to repair the mast, carriage, chain, or attachment by yourself. Always get a trained mechanic.



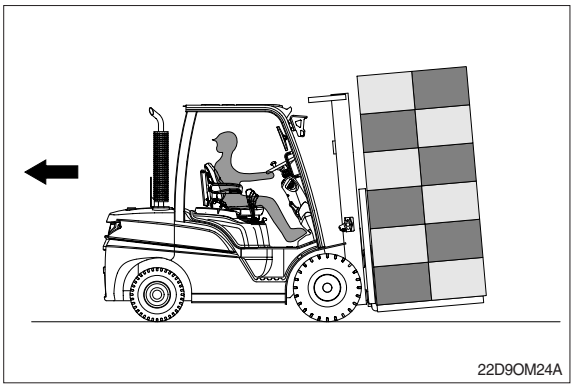
9. TRAVEL

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

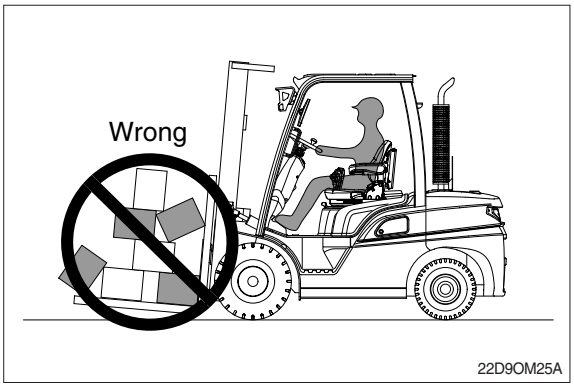
⚠ **Never lift or lower the load when the truck is in motion.**



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.



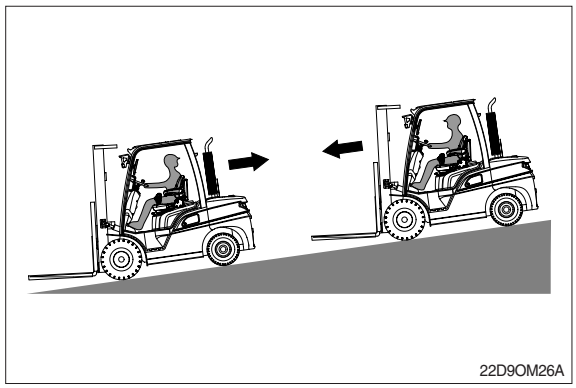
3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.



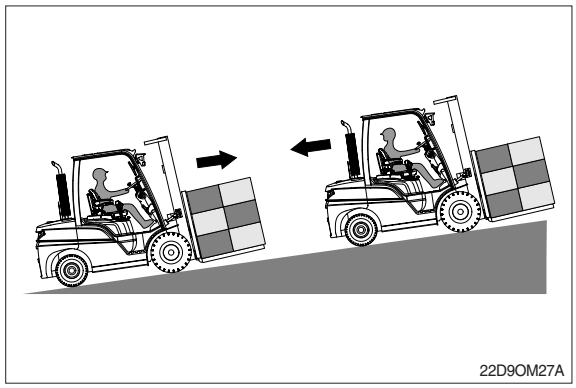
10. GRADES, RAMPS, SLOPES AND INCLINES

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

1) Unloaded-Forks downgrade



2) Loaded - Forks upgrade



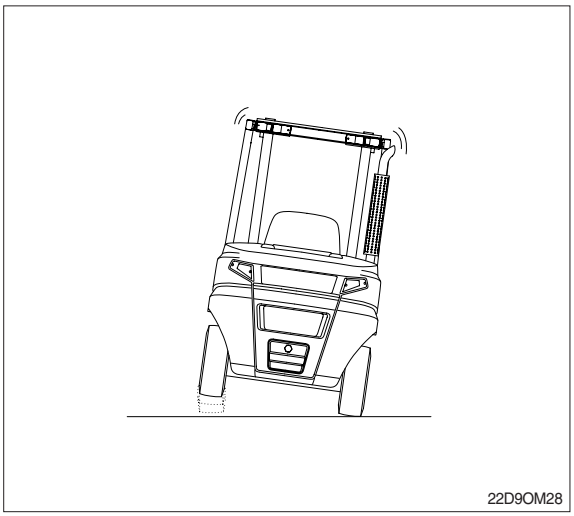
11. TIP OVER

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.



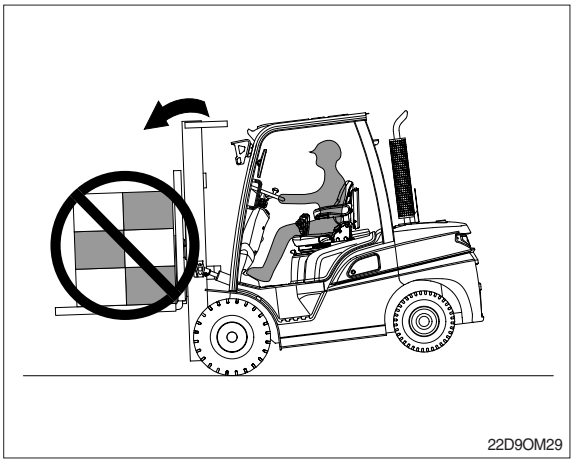
2) LONGITUDINAL TIP OVER

(1) Longitudinal tip over can occur with combination of overloading and load elevated also with capacity load and elevated. This combination will exceed the stability of the truck. This condition is even more likely with excessive forward tilt, braking in forward travel or accelerating rearward.

(2) Longitudinal tip over can occur by driving with the load down slope on a steep grade.

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

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



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

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

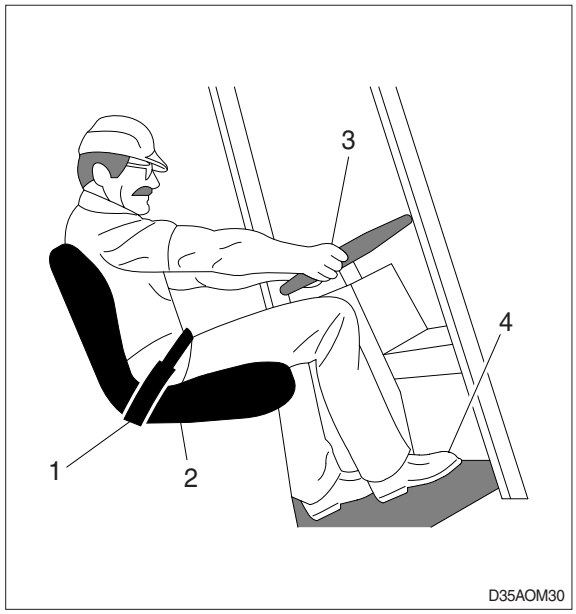
3) WHAT TO DO IN CASE OF A TIP OVER

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

⚠ Brace yourself as illustrated right.

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

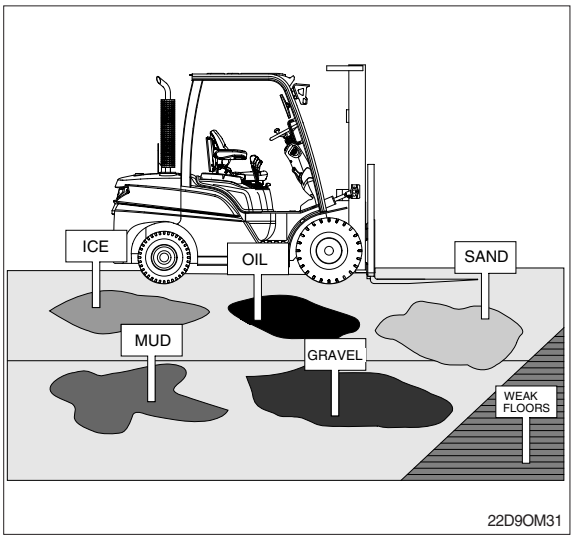
⚠ Your chances for survival in a tip-over are better if you stay with the truck, in your seat.



12. SURFACE AND CAPACITY

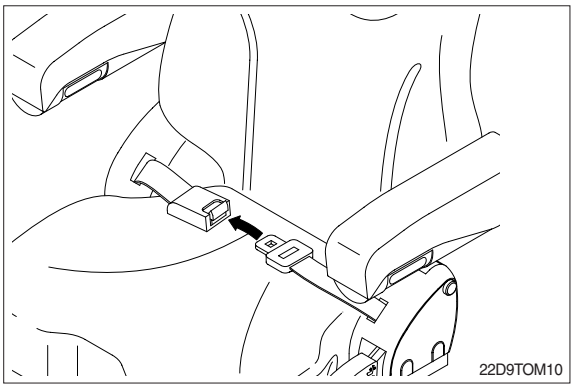
Avoid these conditions. They can cause a truck to tip over or lose traction for braking or driving.

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



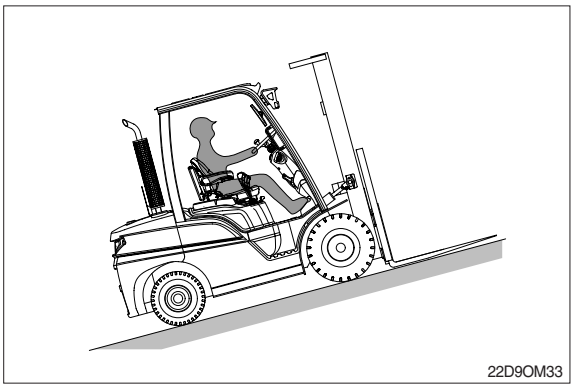
TIPOVER

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

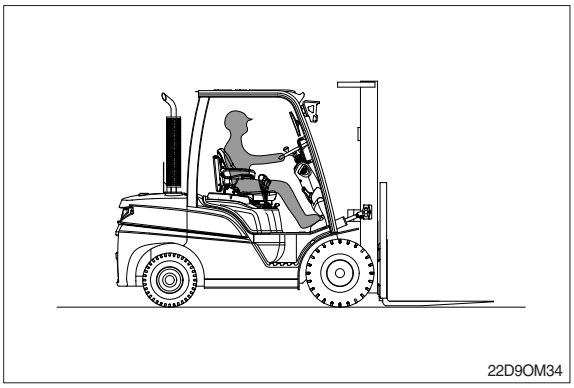


13. PARKING

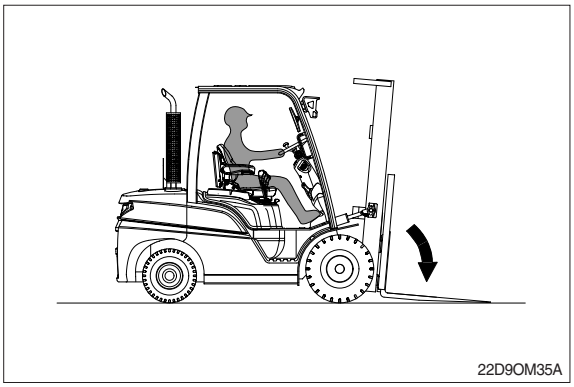
1) Never park on a grade.



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

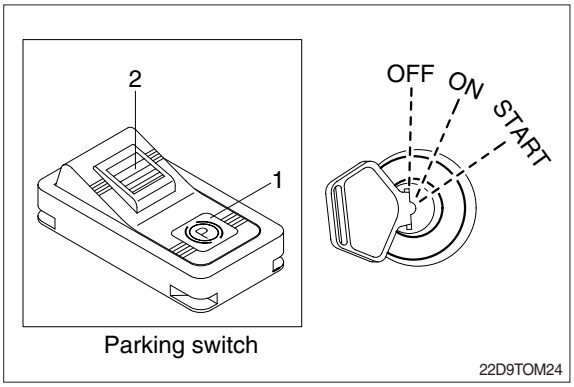


3) Lower forks fully to floor and tilt forward.



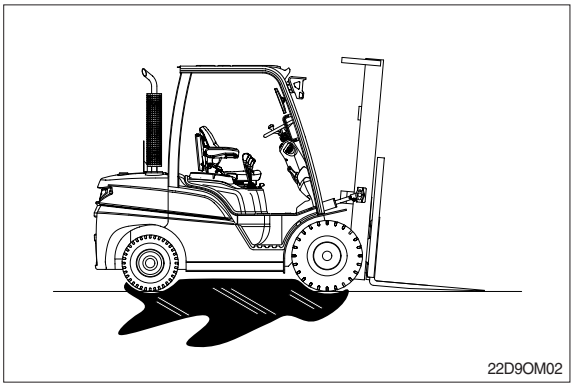
4) Set parking brake.
   Position 1 : Lock
   Position 2 : Release

5) Turn key to OFF position.

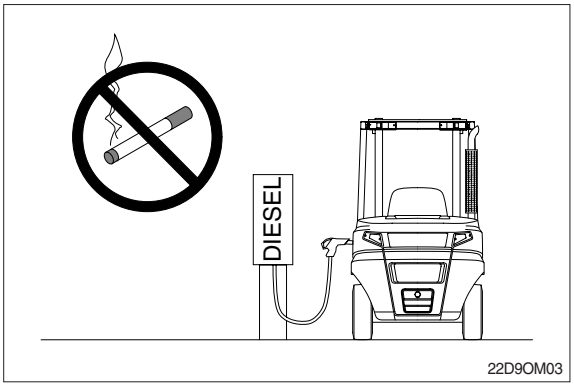


14. REFUELING

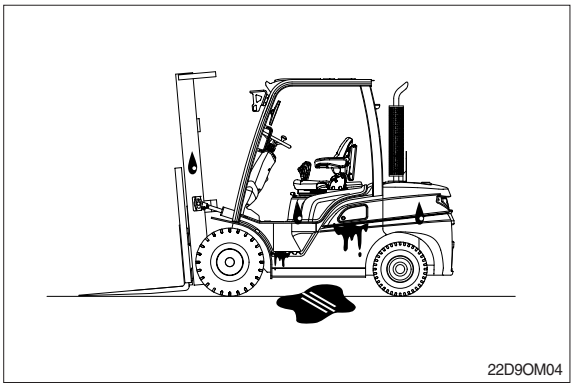
1) Before adding oil, check around machine for oil leakage.



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

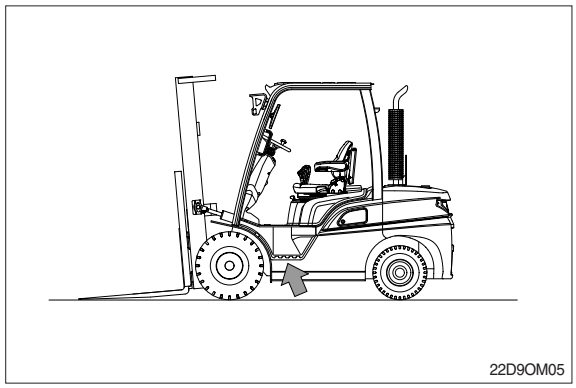


3) After adding oil, wipe off any oil spilled on machine.

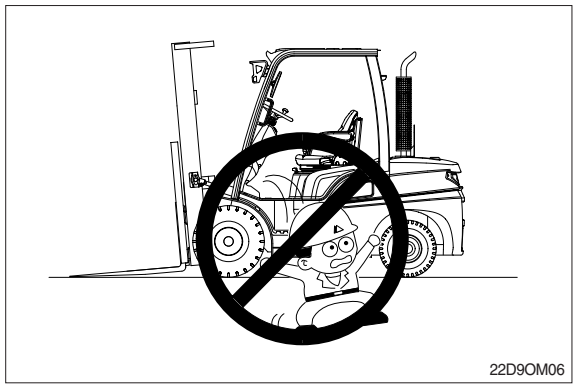


15. STEP

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



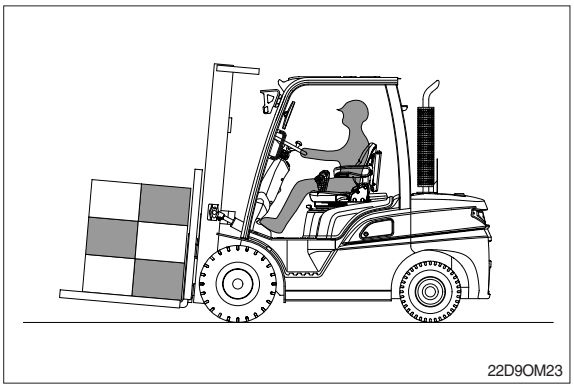
2) Do not jump up or down from the machine.



16. OPERATOR'S SAFETY RULES

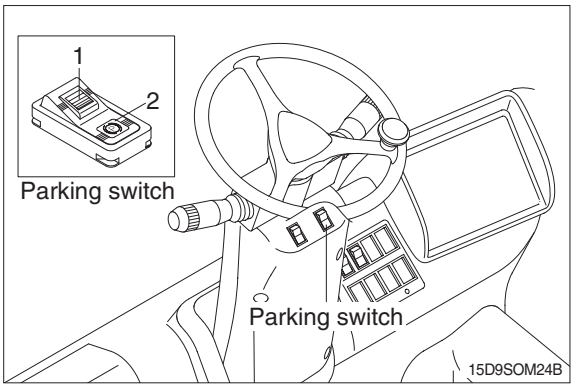
1) All operational functions require that the operator be seated in the operator's seat.

⚠ **Always buckle up if a seat belt is provided.**



2) Parking brake must be locked in the PARK POSITION before exiting from the truck.

⚠ **Parking brake must remain locked in the park position (2) except when an operator is in the normal operating position.**



3) ANSI/ASME REGULATIONS

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

(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 alarm will sound intermittently.
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.

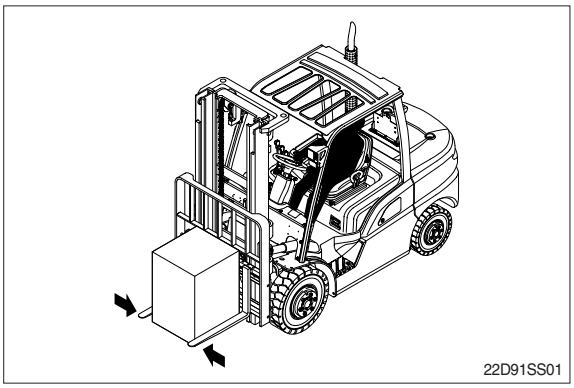
(2) Parking brake warning

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 lever released.
③ To release the function, the parking switch must be turned to ON (PARK) position.
④ When the key switch is OFF position, alarm will sound only for 30 seconds.

*OPSS : Operator Presence Sensing System

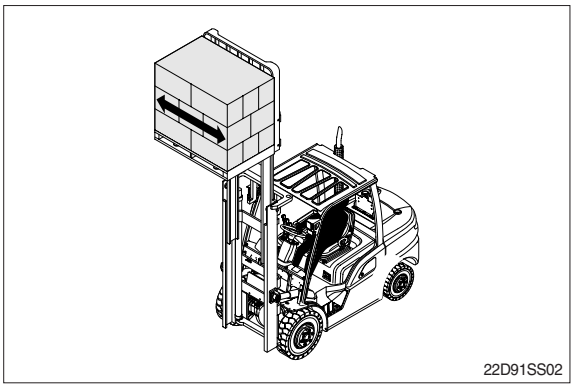
17. SIDE SHIFT

⚠ **Do not put side loads on forks.**



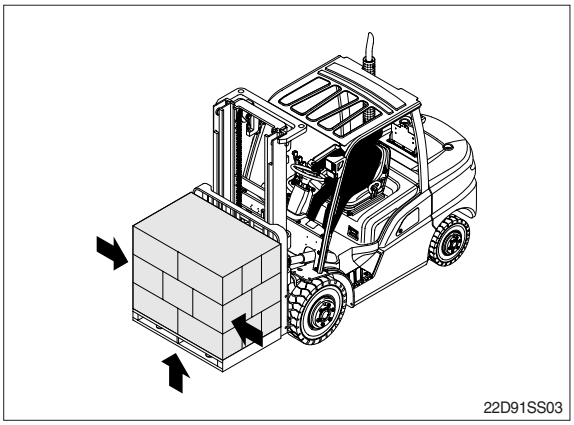
⚠ **Restrict the sideshift movement with raised load.**

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

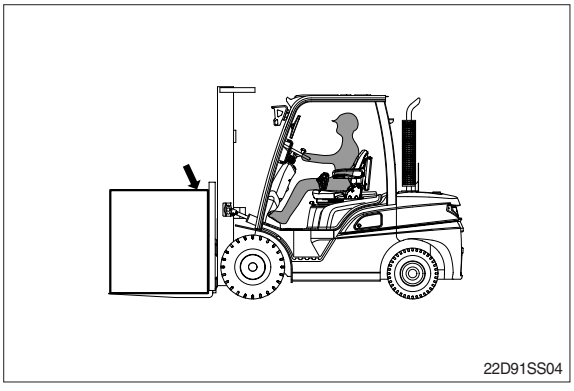


⚠ **Avoid overloading or uneven loading.**

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



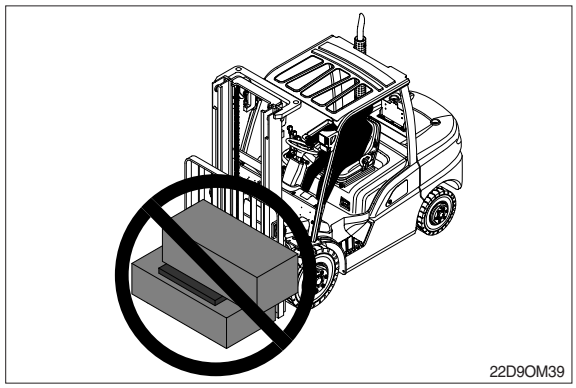
⚠ **Top of load should not extend above backrest.**



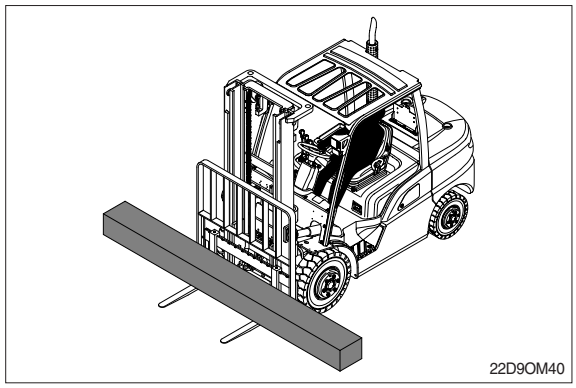
1. LOOSE LOADS

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

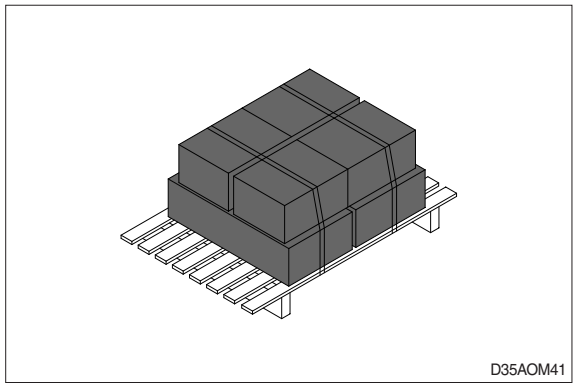
Never carry loose or uneven material.



Center wide loads.

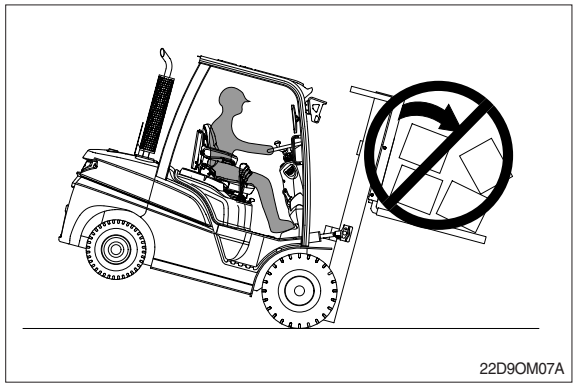


Stack and band loose material.



Avoid sudden braking or starting

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

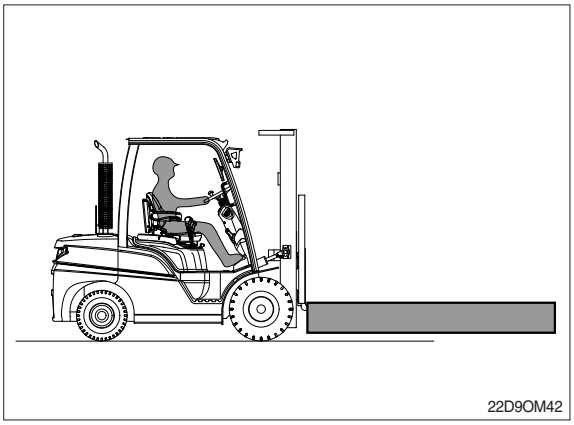


2. LONG AND WIDE LOADS

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

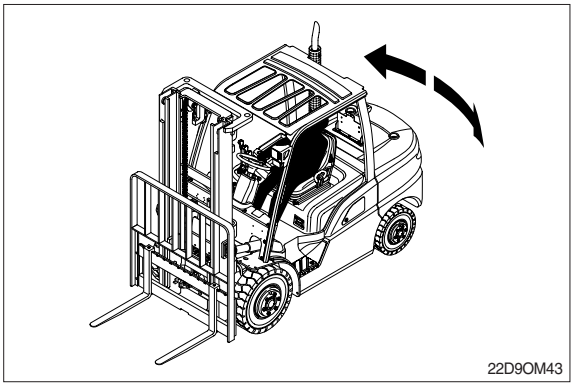
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

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



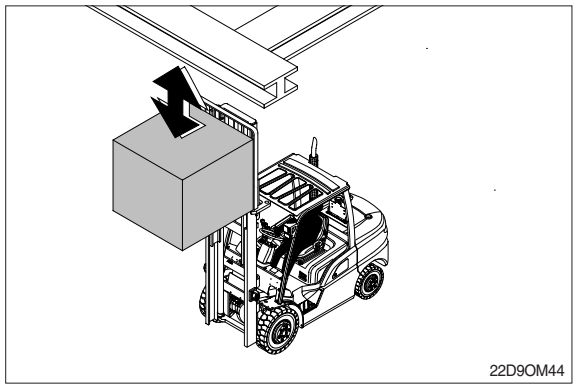
3. REAR SWING

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

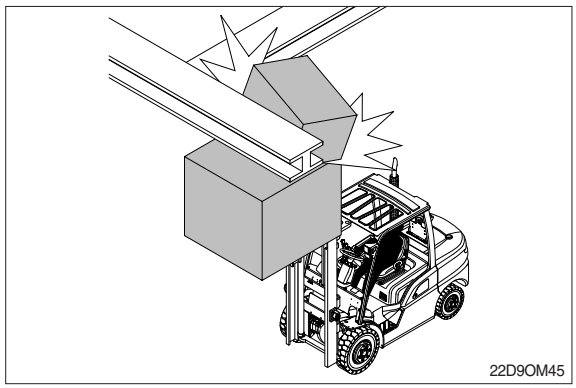


4. LOW OVERHEAD CLEARANCE

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

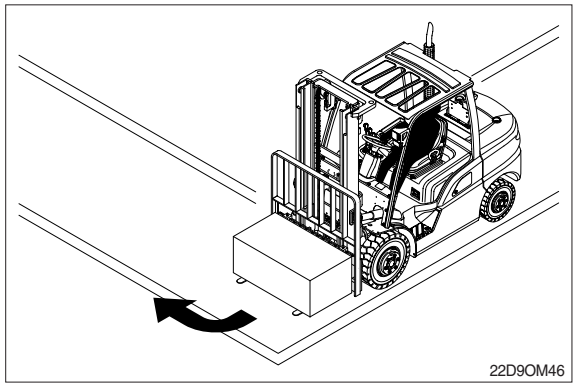


⚠ Watch overhead clearance:
Moving into overhead structures can tip a truck over, or spill a load.

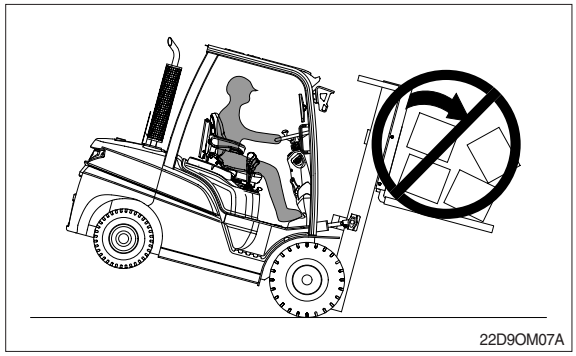


5. FAST TURNS AND HIGH LOADS

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



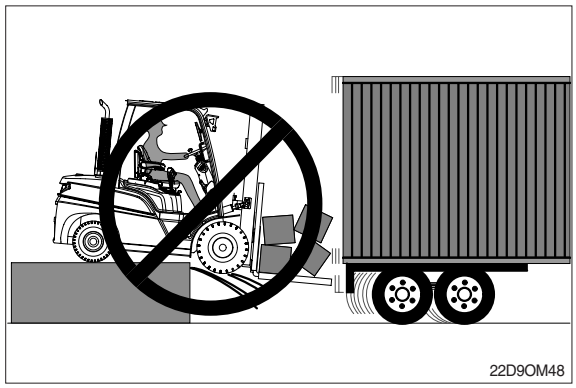
⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.



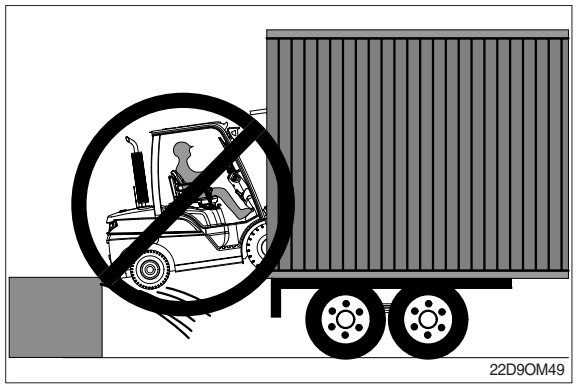
6. DROP-OFFS

⚠ 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.

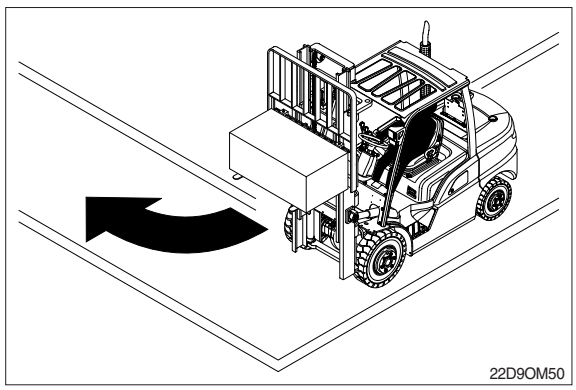


⚠ The impact of moving in and out of a trailer may cause the trailer to creep or move.



7. RIGHT ANGLE STACKING

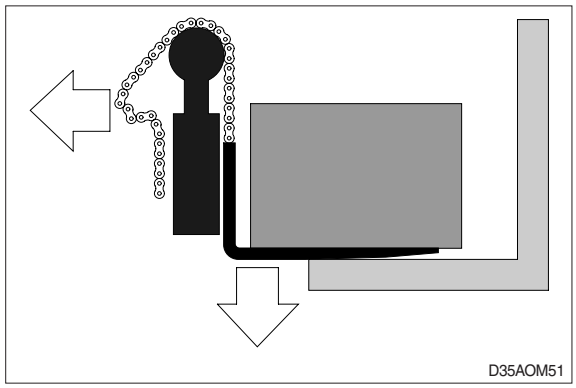
⚠ When right angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.

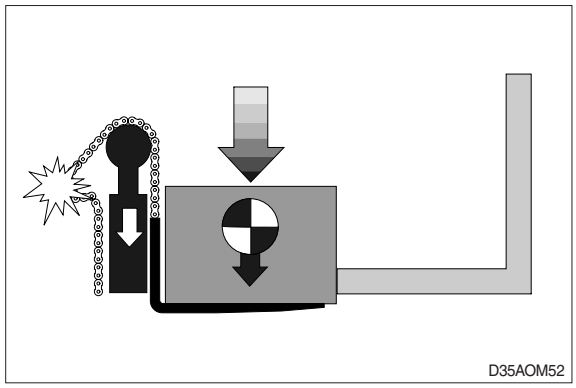


8. CHAIN SLACK

⚠ 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.

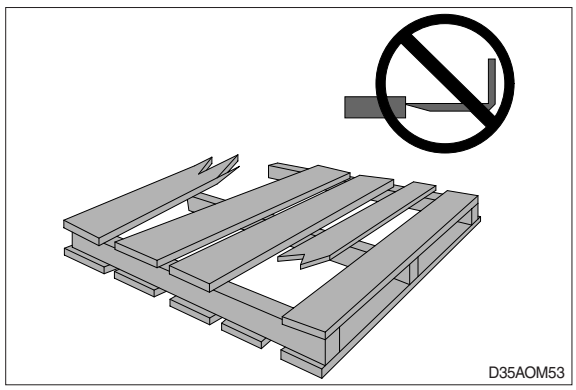




9. PALLETS AND SKIDS

⚠ 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.



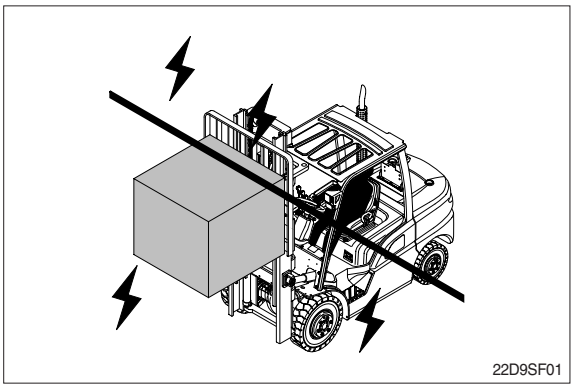
10. CAUTION FOR ELECTRICAL LINES

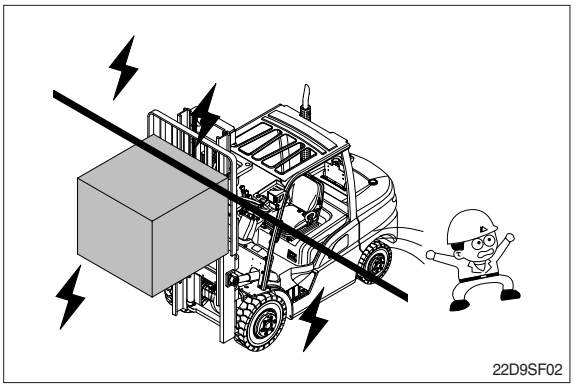
⚠ When moving the machine with the mast raised, watch out electrical lines over the machine.

⚠ 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)

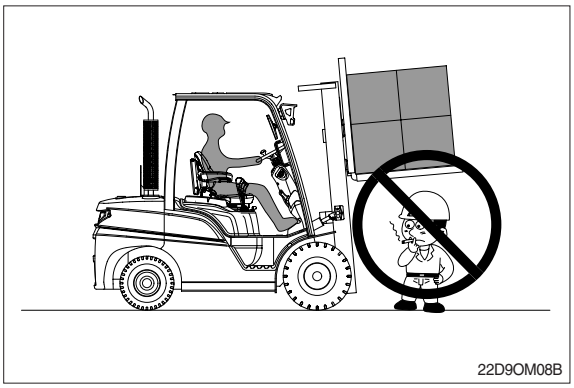
⚠ If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current.
Jump off the machine without contacting the machine when you need to get off.


22D9SF01

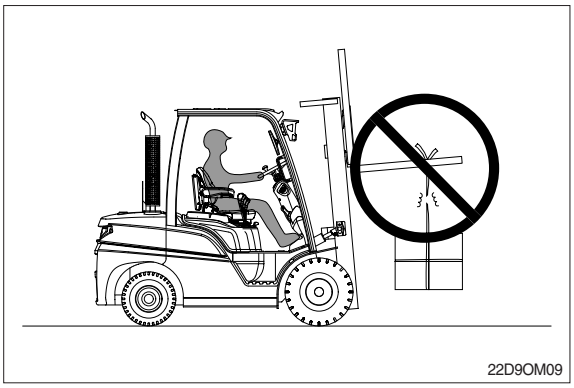

22D9SF02

11. LIFTING LOADS

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



Never use wire rope to lift a load.



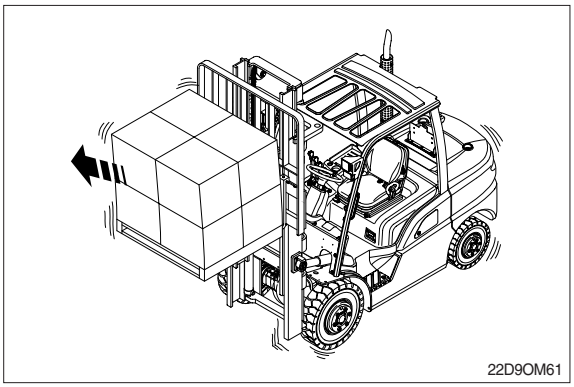
12. SIDE SHIFT

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.

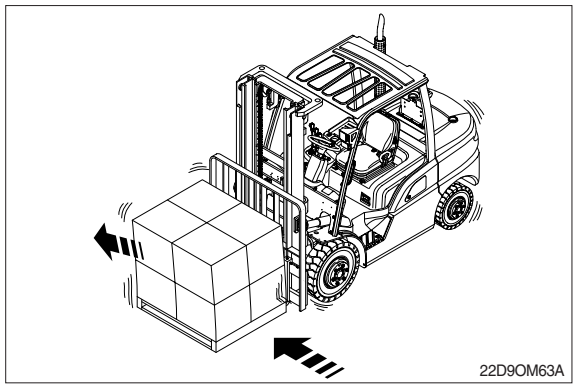
In case of moving the side shift with load, it can be caused load dropping or overturning of the forklift due to unbalanced weight.

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

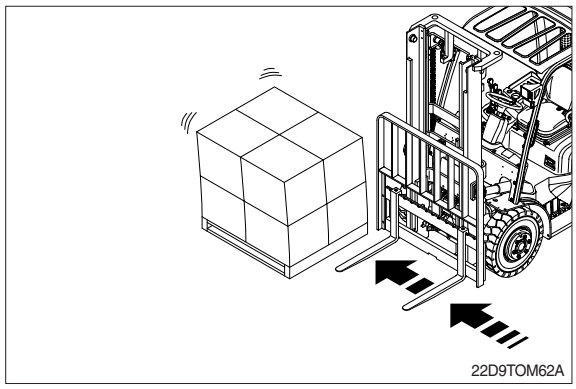


It should be observed that the side shift with load is operated in netural position before traveling.

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

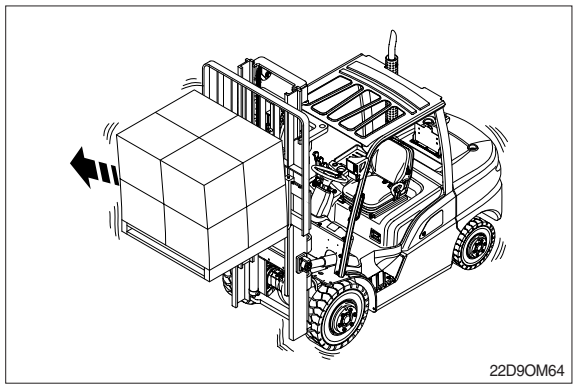


Never move the load to push or pull of it by the side shift.
It can be caused damaging of the loads or injuring of the people.



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.

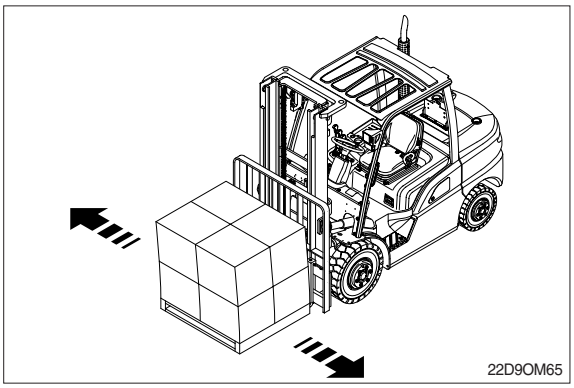
When lifting or lowering the side shift with load, it should be observed that the load is moved into the netural position.



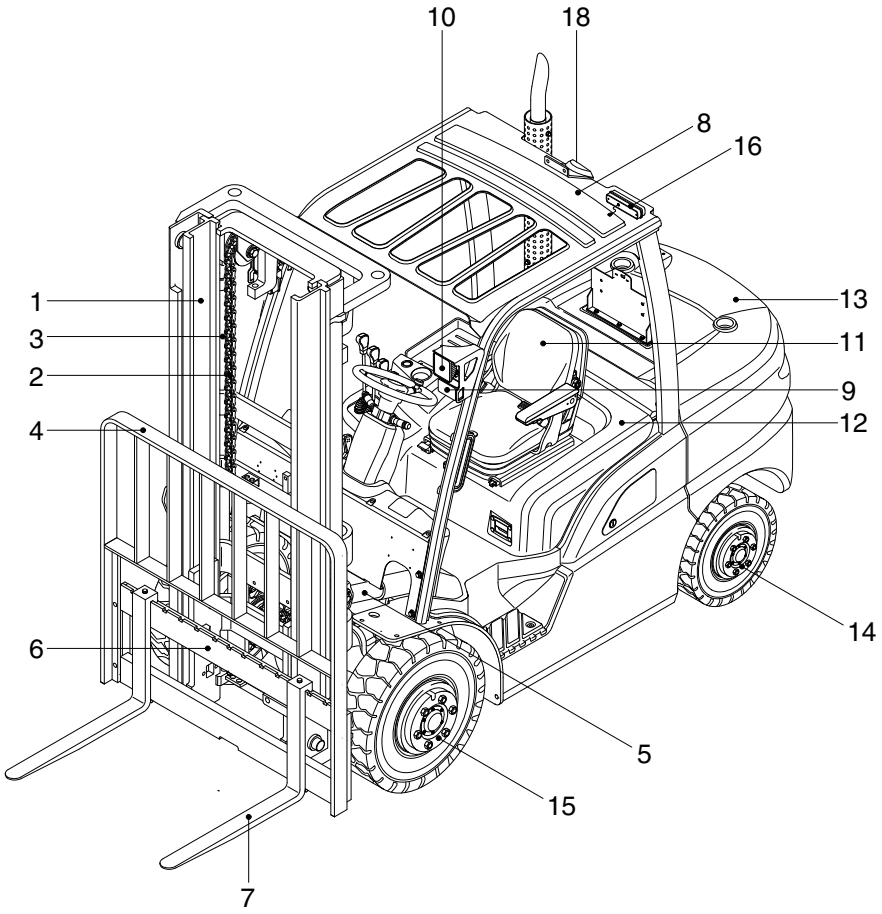
13. FORK POSITIONER

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

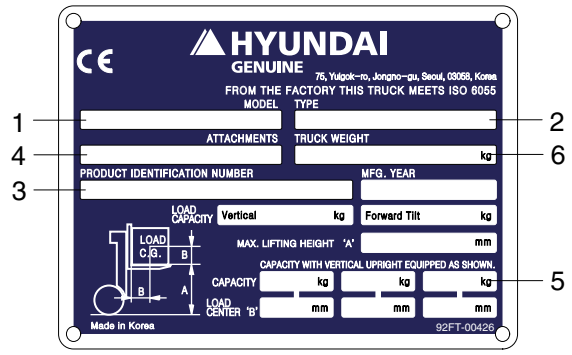


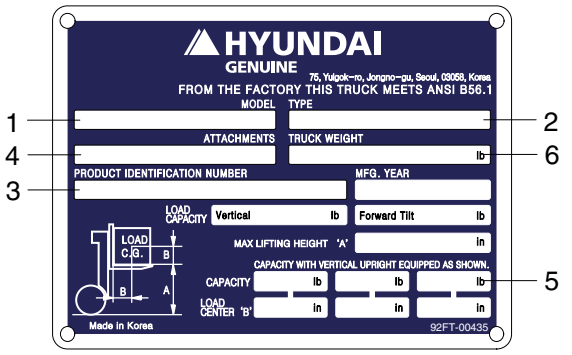
22D9OM54

1	Mast	7	Forks	13	Counterweight
2	Lift chain	8	Overhead guard	14	Rear wheel
3	Lift cylinder	9	Turn signal lamp	15	Front wheel
4	Backrest	10	Head lamp	16	Rear combination lamp
5	Tilt cylinder	11	Operator's seat	18	Rear camera
6	Lift bracket	12	Bonnet		

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.

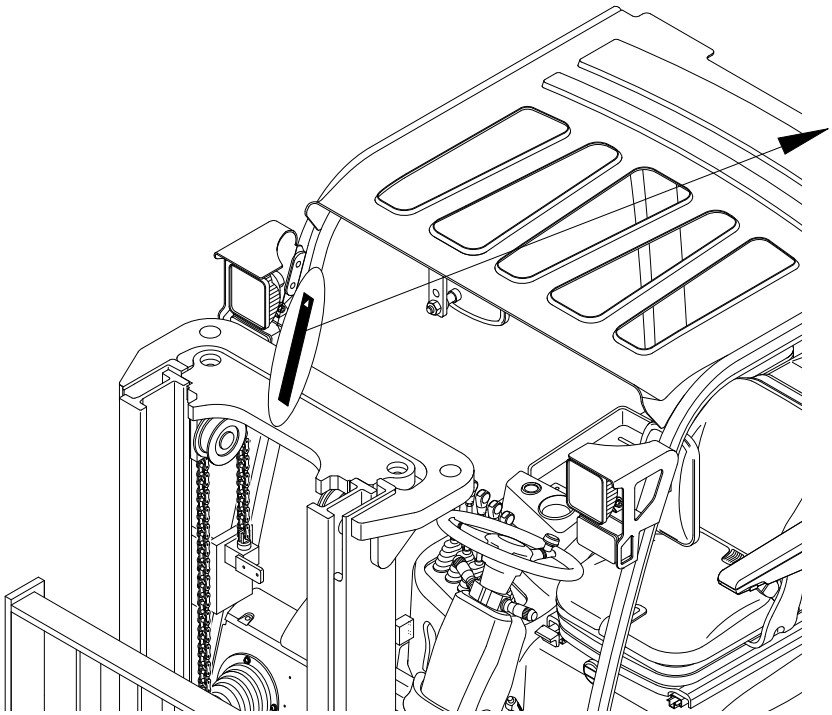
Do not exceed the maximum capacity specified.

(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



15D9SOM59K

35D9SOM09A

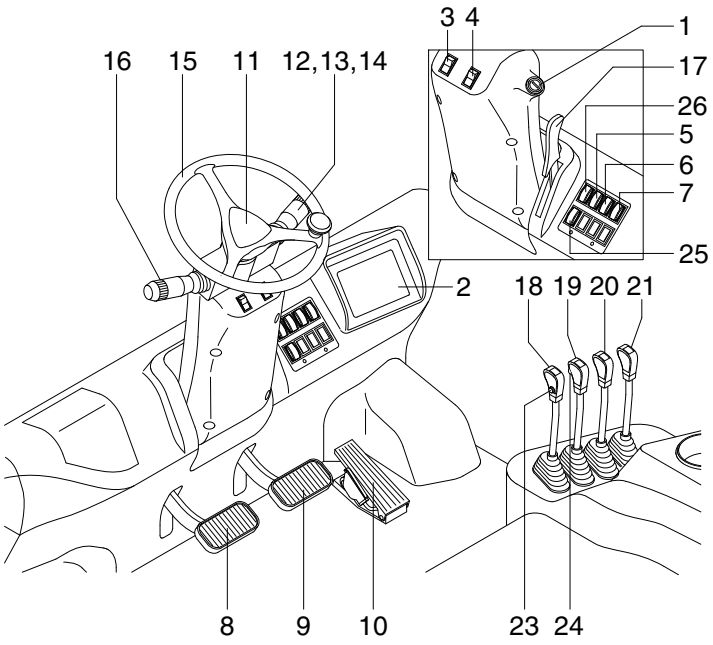
⚠ **Safety and warning decals are placed in conspicuous locations on the truck to remind you of essential procedures or to prevent you from making an error that could damage the truck or possibly cause personal injury. You should know, understand, and follow these instructions. Safety and warning decals. 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. INSTRUMENTS AND CONTROLS



22D9OM64T

1	Start switch	10	Accelerator pedal	19	Tilt lever
2	Cluster	11	Horn button	20	Attach lever 1 (opt)
3	Hazard lamp switch (opt)	12	Head lamp switch	21	Attach lever 2 (opt)
4	Parking brake switch	13	Clearance lamp switch	23	FNR and horn switch (opt)
5	Rear work lamp switch (opt)	14	Turn signal switch	24	Auto tilt leveling switch (opt)
6	Beacon switch (opt)	15	Steering wheel	25	Heater switch (opt)
7	Front wiper/washer switch (opt)	16	Forward-reverse lever	26	Fuel warmer switch
8	Inching pedal	17	Steering wheel lock lever		
9	Brake pedal	18	Lift lever		

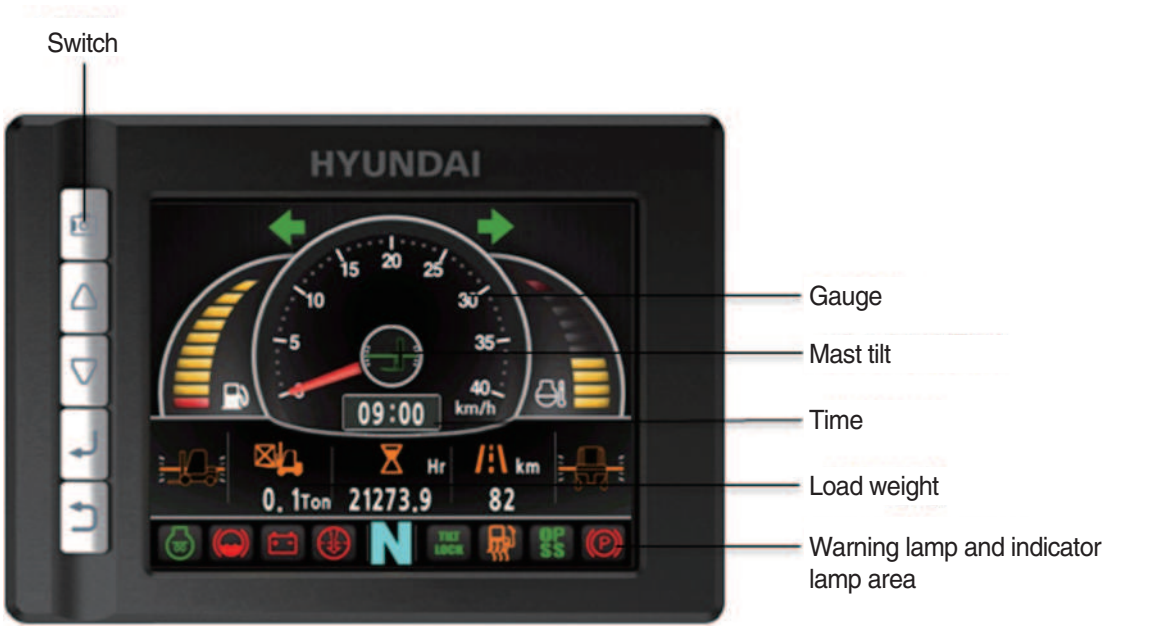
△ Familiarize yourself with the controls and follow safe operating procedures.

4. CLUSTER

1) STRUCTURE

Like following figure, cluster is consisted of LCD and switch. 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.



35D9SCL001

2) GAUGE

(1) Operation screen

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

35D9SCL002K

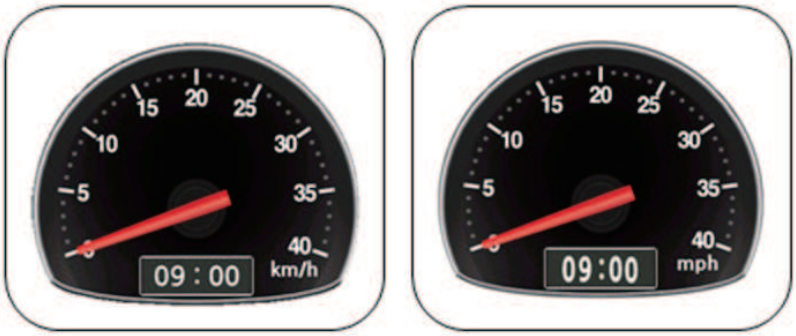
1	Speed meter	3	Coolant temperature indicator
2	Fuel indicator	4	Clock

(2) Speed meter

① Display the trip speed of vehicle.

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 indicator

35D9SCL004K

① Display the remains of fuel tank.

② If the indicator point to the red zone, or warning lamp will be lit up in red, please refuel.

(4) Coolant temperature indicator

35D9SCL005K

① Display the coolant temperature.

- While zone : 40 ~ 120˚C
- Red zone : Over 120˚C
- Warning lamp on : Over 115˚C

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

(5) Clock

35D9SCL006K

① Display current time.

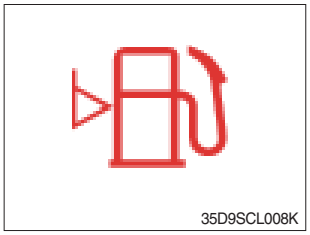
② You can enter current time at display Set Up > Time Set Up menu.

3) WARNING LAMP AND INDICATOR LAMP

35D9SCL007K

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

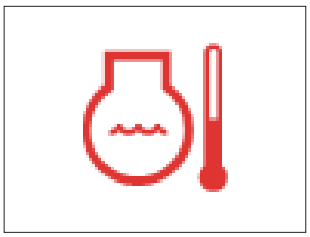
(1) Fuel level warning lamp



35D9SCL008K

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



35D9SCL009K

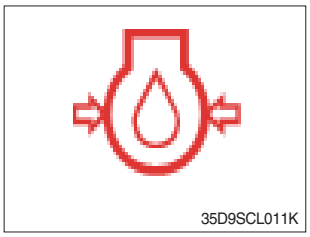
① Coolant temperature warning will be lit up when temperature is over 115˚C.
② If the warning lamp is on continuously, please inspect the coolant system.

(3) Expendables replacement indicator lamp

35D9SCL010K

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

(4) Engine oil pressure warning lamp

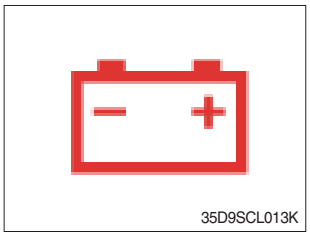


① This warning lamp will be lit up when engine oil pressure is low.
② Stop the engine immediately if the warning lamp is lit up.
③ Please check the engine oil.

(5) Engine check warning lamp

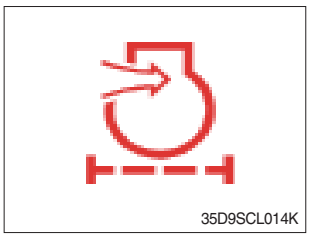
① This warning lamp will be lit up if the engine ECM sends a failure code to cluster or receives the signal.
② Check the failure code of cluster.

(6) 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.

(7) Air cleaner warning lamp

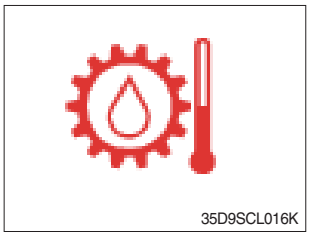


① This warning lamp is lit when air cleaner filter is clogged up.
② Please clean up or replace the filter.

(8) Engine warm-up Indicator lamp

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

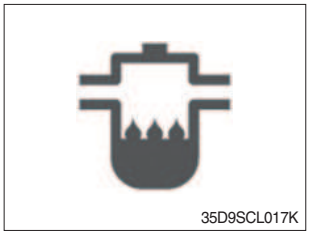
(9) TM oil temperature warning lamp



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

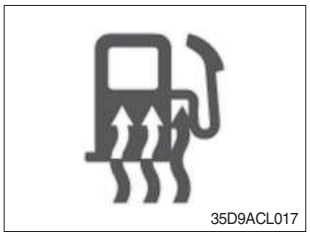
② When this lamp light up during operation, stop the engine and check the machine.

(10) Water in fuel indicator lamp



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

(11) Fuel warmer lamp



① Light up when operation the fuel warmer switch.

(12) OPSS Indicator lamp

① Light up if driver leave seat during operation.
② Machine driving and control will be blocked if lamp is lit up.

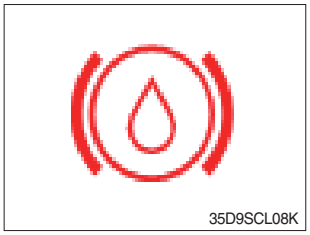
(13) Parking indicator lamp

① Light up when parking brake is ON.

(14) Tilt lock (auto tilt leveling) Indicator 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.

(15) Brake oil level warning lamp

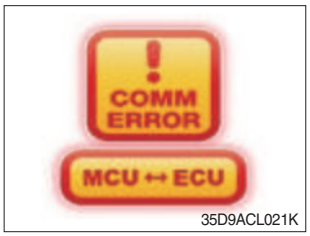


① Warning lamp will be displayed if brake oil is low of reservoir tank.
② Please refill immediately if the lamp is on.

(16) T/M oil pressure warning lamp

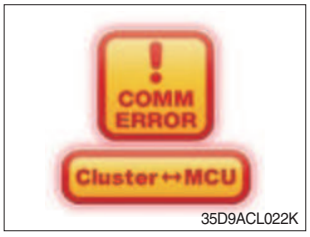
① Warning lamp will be displayed if transmission oil pressure is not enough.
② The lamp also will be displayed while inching operation.
③ Please check the transmission when the lamp is displayed without inching operation.

(17) Communication error warning lamp



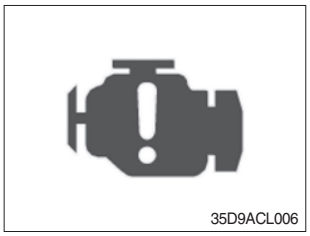
① This warning lamp will be lit up if the communication between MCU and ECU is fail.
② Please check the communication line if the warning lamp is lit up.

(18) 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.

(19) Engine stop warning lamp

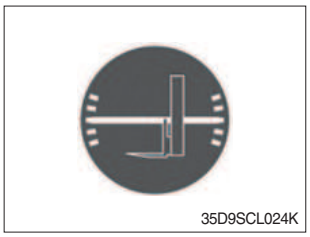


① If the lamp lights ON, stop the engine immediately and check the engine.

※ **Please contact your Hyundai service center or local dealer.**

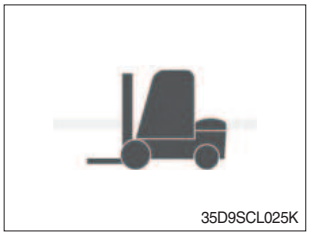
4) INFORMATION DISPLAY

(1) Mast front/rear tilt (optional)



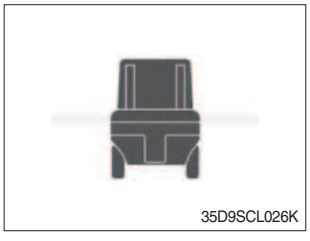
① Display the real time tilt of mast.

(2) Vehicle front/rear tilt



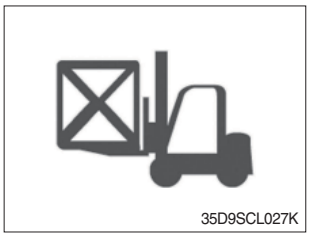
① Display the front/rear tilt of vehicle in real time.
- Stop : Tilt angle is higher than 2.3˚ then the red warning symbol.
- Driving : Tilt angle is higher than 10.2˚ then the red warning symbol.

(3) Vehicle left/right tilt



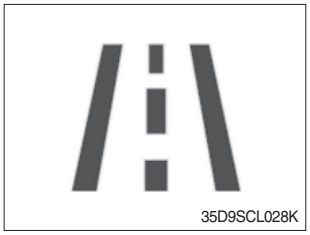
① Display the left/right tilt of vehicle in real time.
- Stop : Tilt angle is higher than 3.4˚ then the red warning symbol.
- Driving : Tilt angle is higher than 20.8˚ then the red warning symbol.

(4) Load weight (optional)



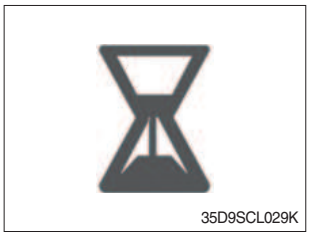
① Display the load weight.
② Screen will display blurry if the weight sensor has not been mounted.

(5) Total trip distance



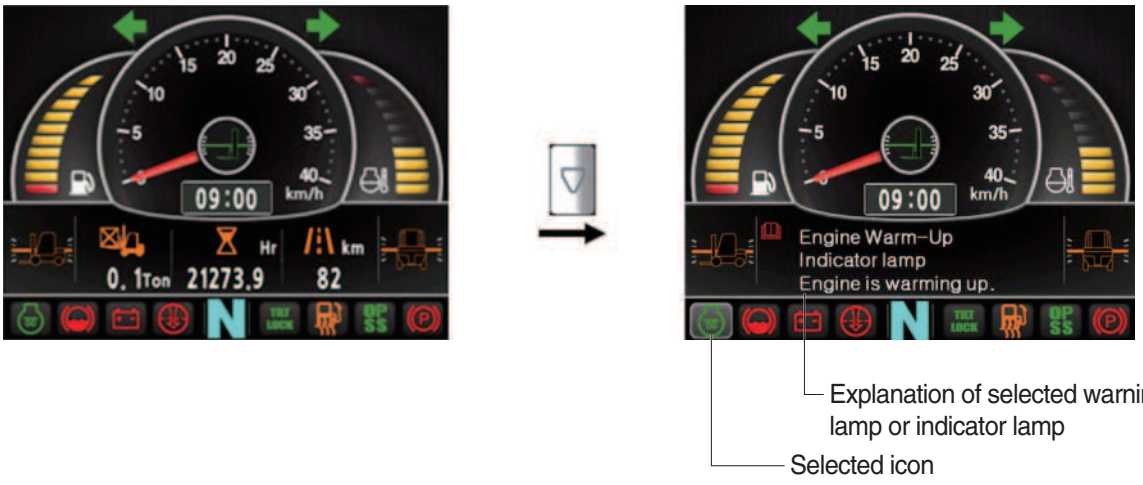
① Display total trip distance of vehicle.
② Unit of distance is kilometer.

(6) Operation time



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

(7) Explanation of warning lamp and indicator lamp



① Explanation will be displayed if press the arrow (refer to page 3-16) while warning lamp or indicator lamp is on.
② Explanation for warning lamp or indicator lamp that are shown on the screen will be displayed if press the arrow continuously.

5) DRIVING INDICATOR LAMP

35D9SCL032K

(1) Neutral

35D9SCL033K

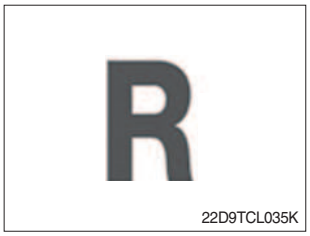
① This Indicator lamp will be lit up when direction lever is located in neutral.

(2) Forward

22D9TCL034K

① This indicator lamp is displayed if the forward gear is selected.
② First gear will be displayed as **F**.

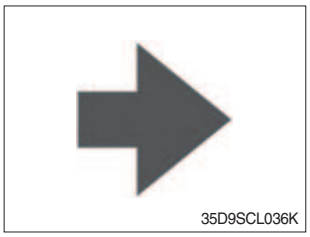
(3) Reverse



22D9TCL035K

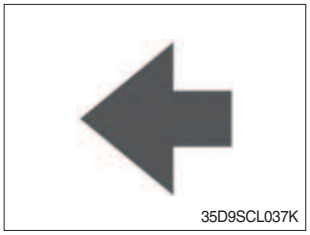
① This indicator lamp is displayed if the reverse gear is selected.
② First gear will be displayed as **R**.

(4) Right turning pilot lamp



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

(5) Left turning pilot lamp

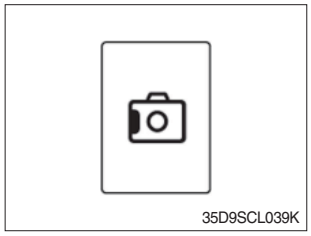


① This pilot lamp will flash if turns on the left turn signal.

6) SWITCH

35D9SCL038K

(1) Camera

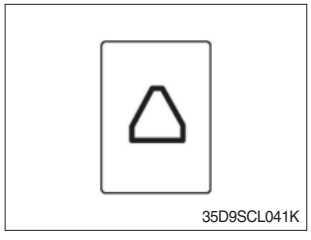


35D9SCL039K

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

35D9SCL040K

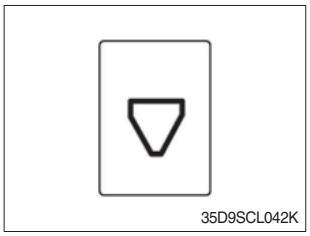
(2) UP/Left



35D9SCL041K

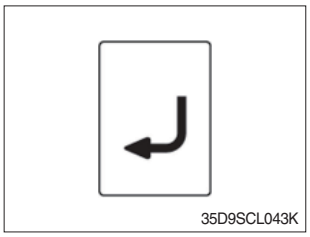
① This switch is used to move upward or leftward in menu or increase the value.

(3) Down/Right


35D9SCL042K

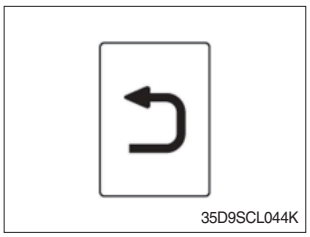
① This switch is used to move downward or rightward in menu or decrease the value.

(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.

35D9SCL045

7) MAIN MENU

35D9SCL046

A menu consists of main menu and sub-menu.

(1) Structure

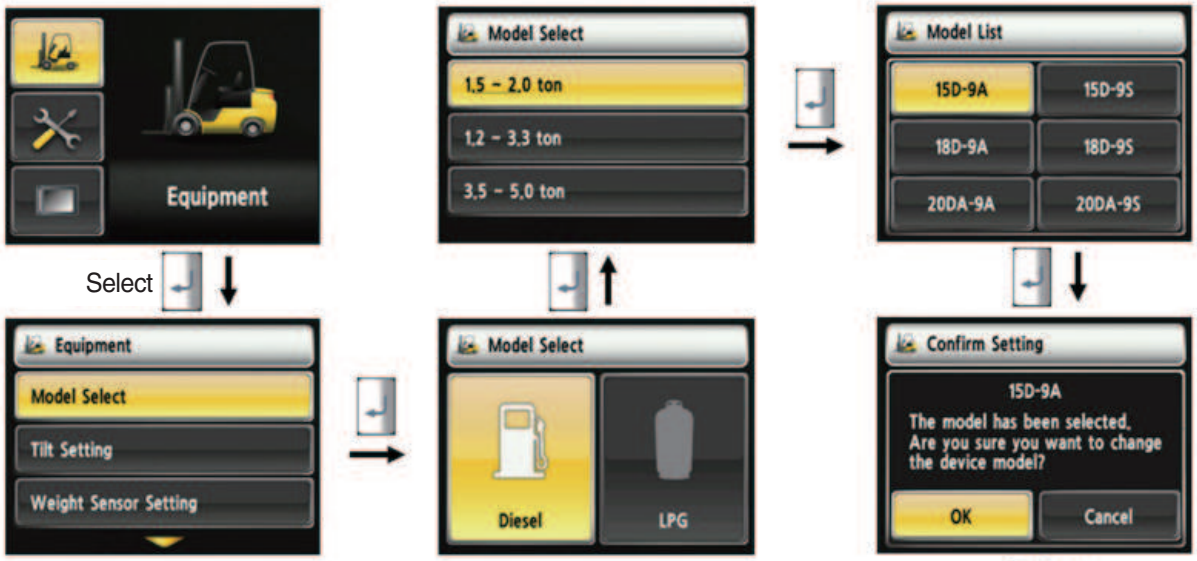
No	Main menu	Sub menu	Explanation
1		Model select	Diesel, LPG
		Vehicle tilt Initialize	Vehicle tilt Initialize
		Weight sensor setup	Enter the cylinder cross section area , Adjust load weight, Weight display setup
		Ignition control setup	Ignition control, Change password
		Camera setup	Interoperate with reverse gear
		Auto-shift speed setup	Null
		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
		A/S Contact	Change A/S contact
3		LCD Brightness	Automatic, Manual
		Time Setup	Clock
		Unit Setup	Speed, Weight, Temperature, Pressure, Date type
		Language Setting	Korean, English
		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)

35D9KCL070



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.**

35D9KCL071

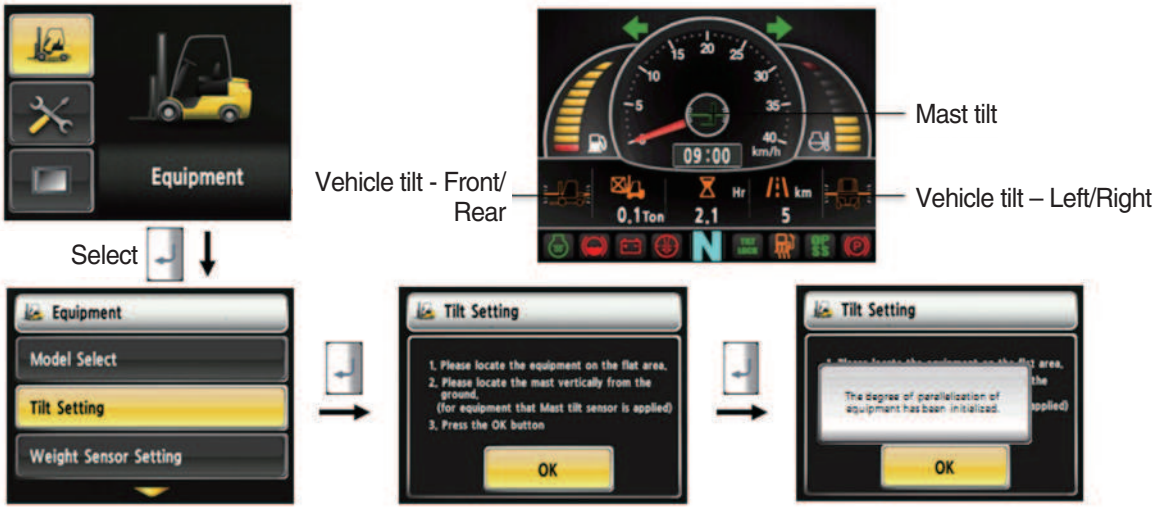
(3) Initialize vehicle tilt (a requid setting)

· **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

35D9KCL072



35D9SCL048

· **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°

35D9KCL073

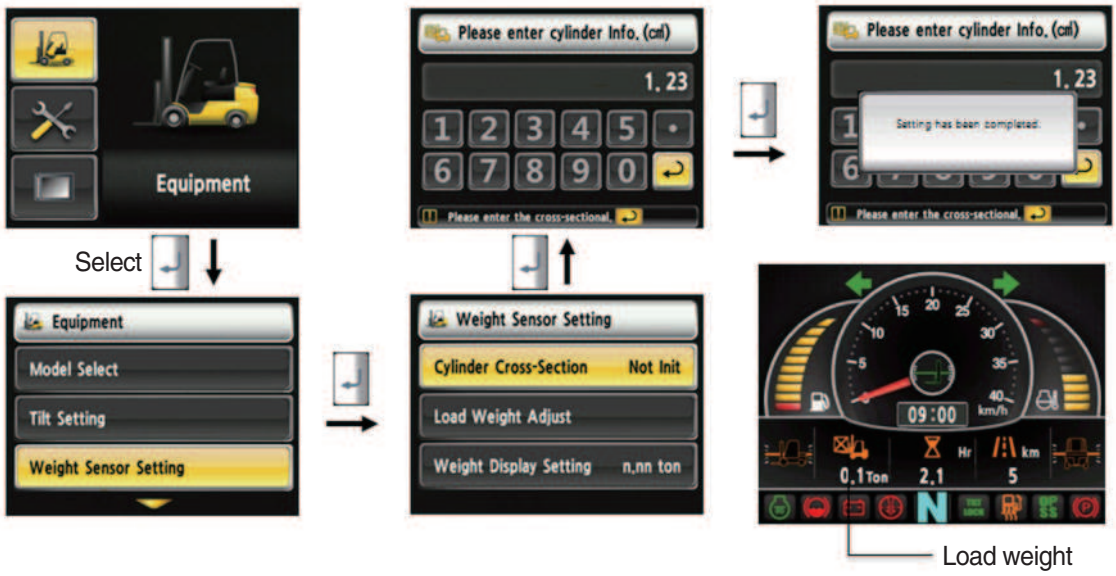
(4) Weight sensor set up (optional)

· **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)

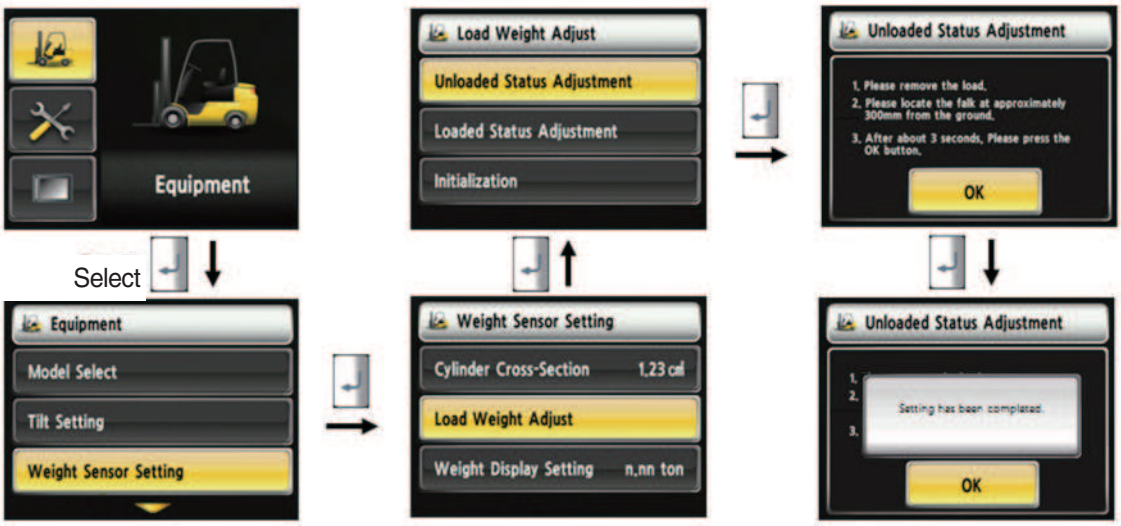
35D9KCL074



35D9SCL049

· **How to set weight sensor**

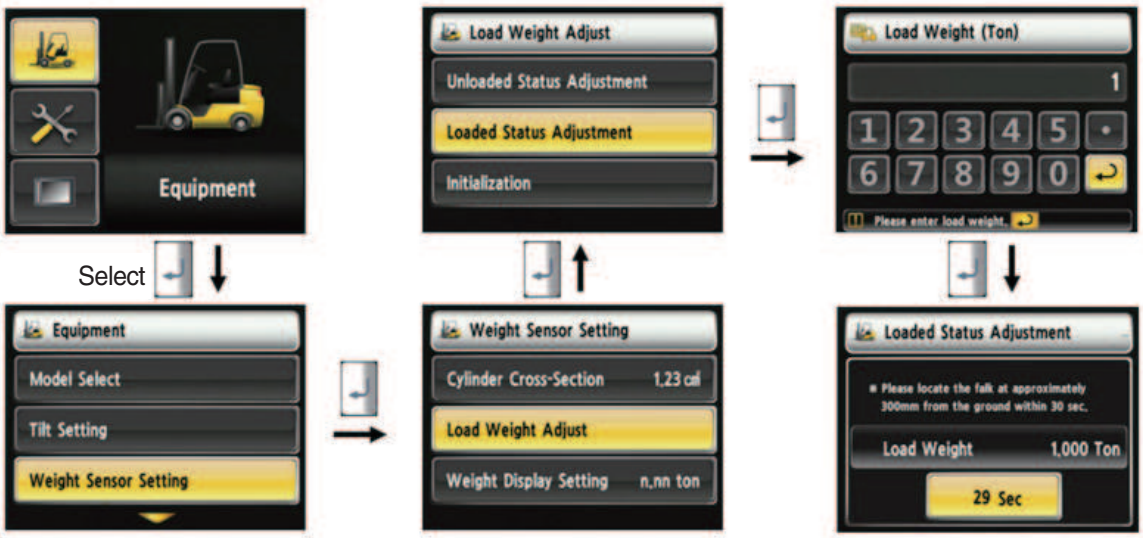
1. The weight sensor has already been set when deliver the vehicle from factory.
2. Device setup > Weight sensor setup
3. There are three ways to setup. (unload, load, initialization)
4. A cylinder cross sectional area value will be displayed in initial screen, please enter the cross sectional area using △ ▽ 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.

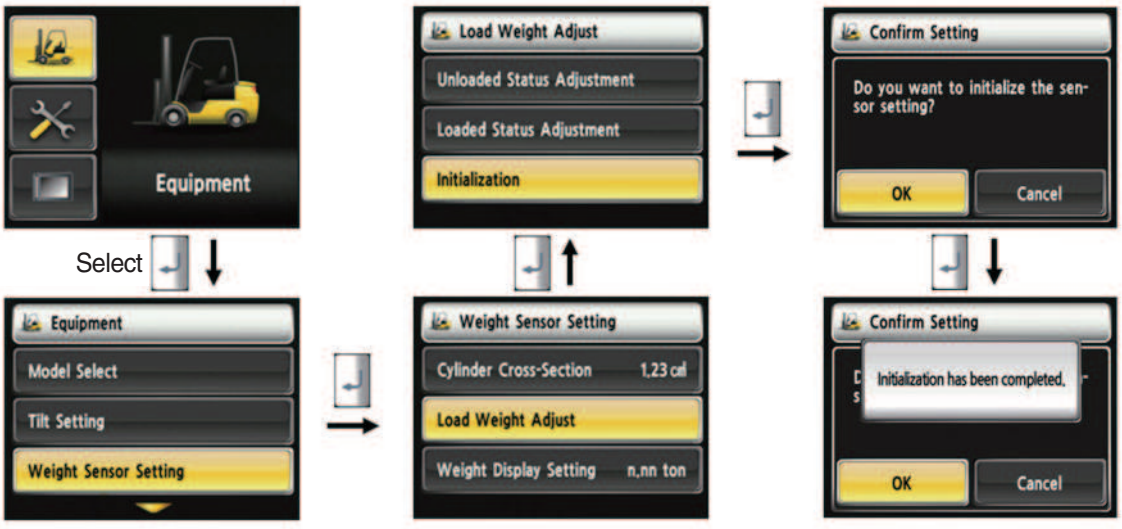
※ **MCU recognizes the weight automatically by detecting the pressure change.**

※ **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

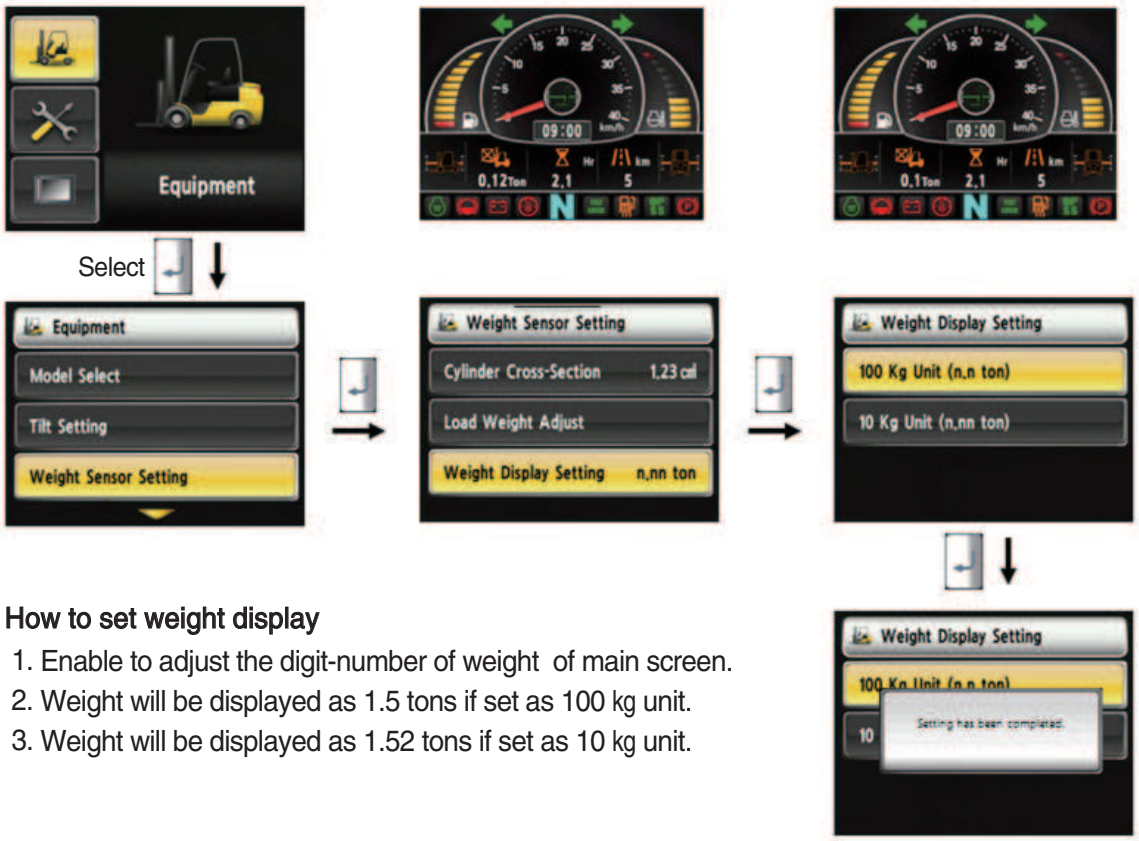


35D9KCL052

· **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

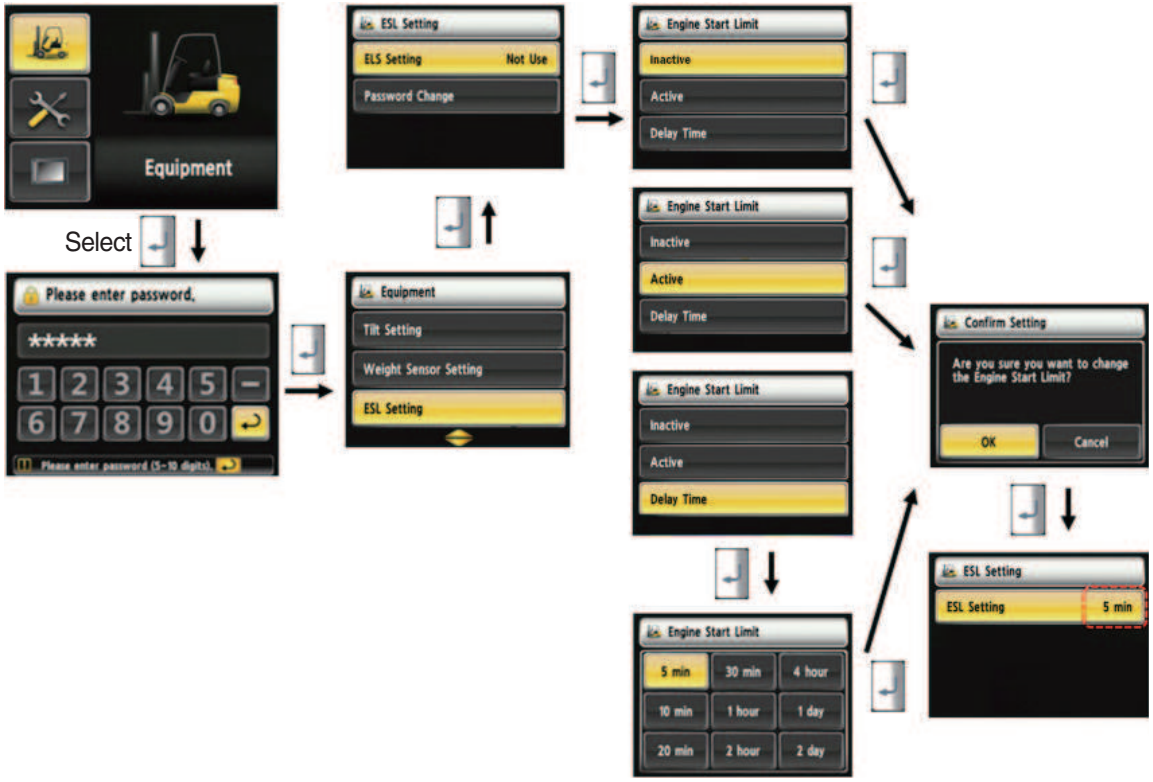


· **How to set weight display**

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.

35D9SCL053

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



35D9KCL054

· **How to set ESL setting**

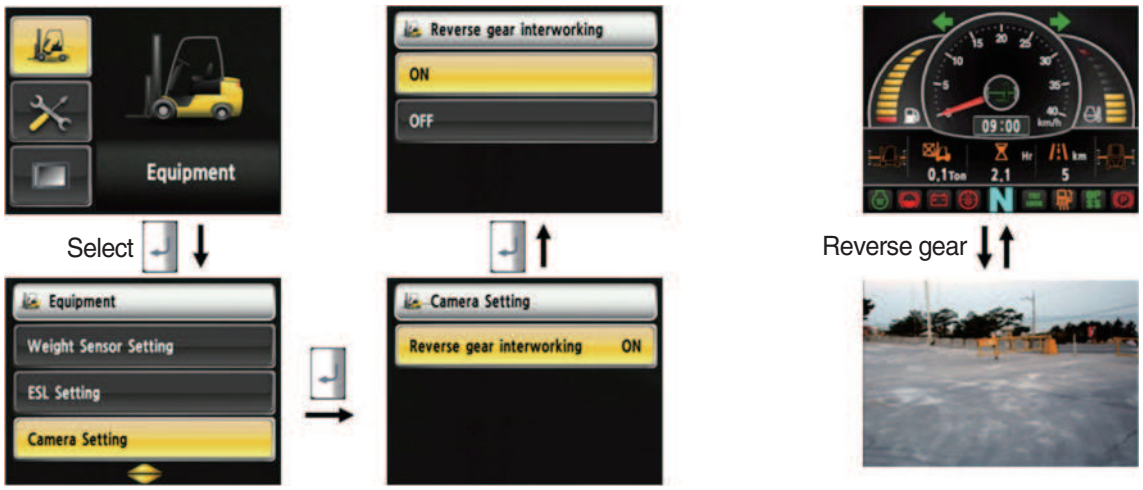
1. Device Setup > ESL setting
2. Password request screen will be displayed if you select the menu. Default password is “00000”.
3. Password length must be 5~10 digits.
4. Next step is allowed only if password is authenticated.
5. Check functions

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

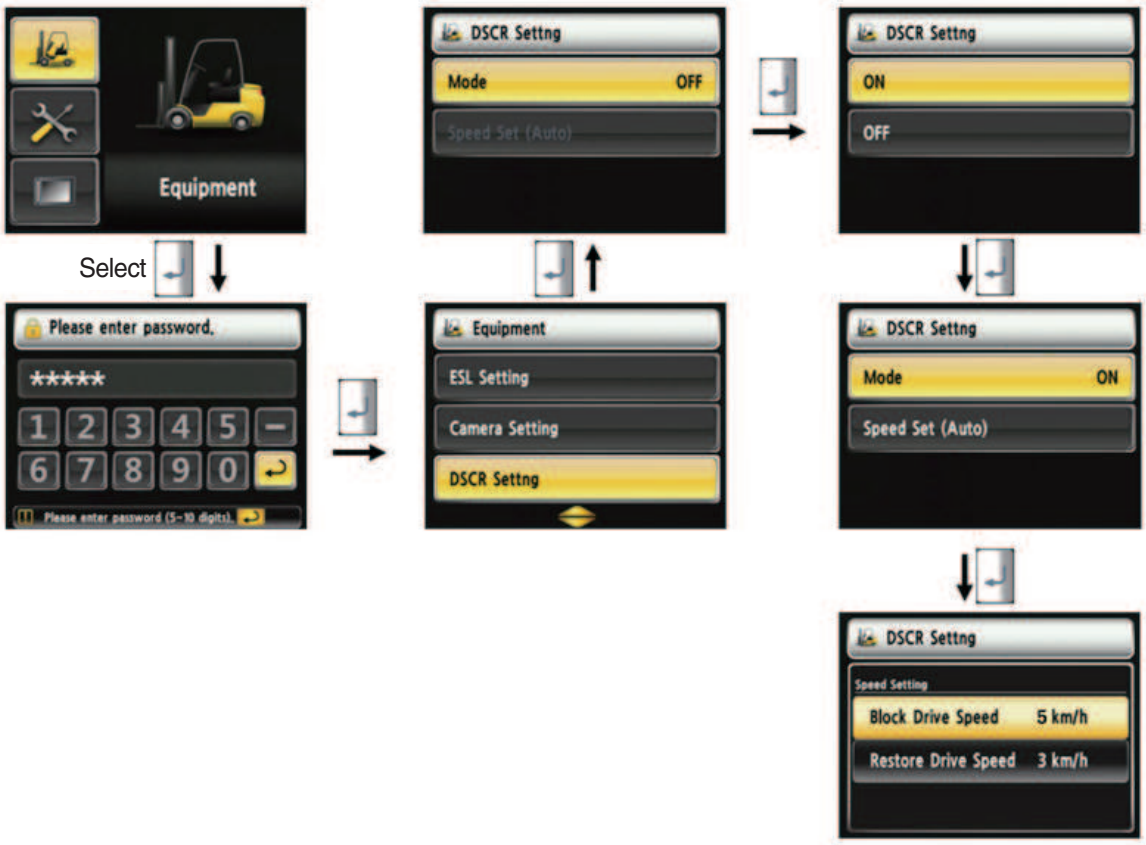


35D9SCL056

· **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) DCSR Setup (standard)



35D9KCL058

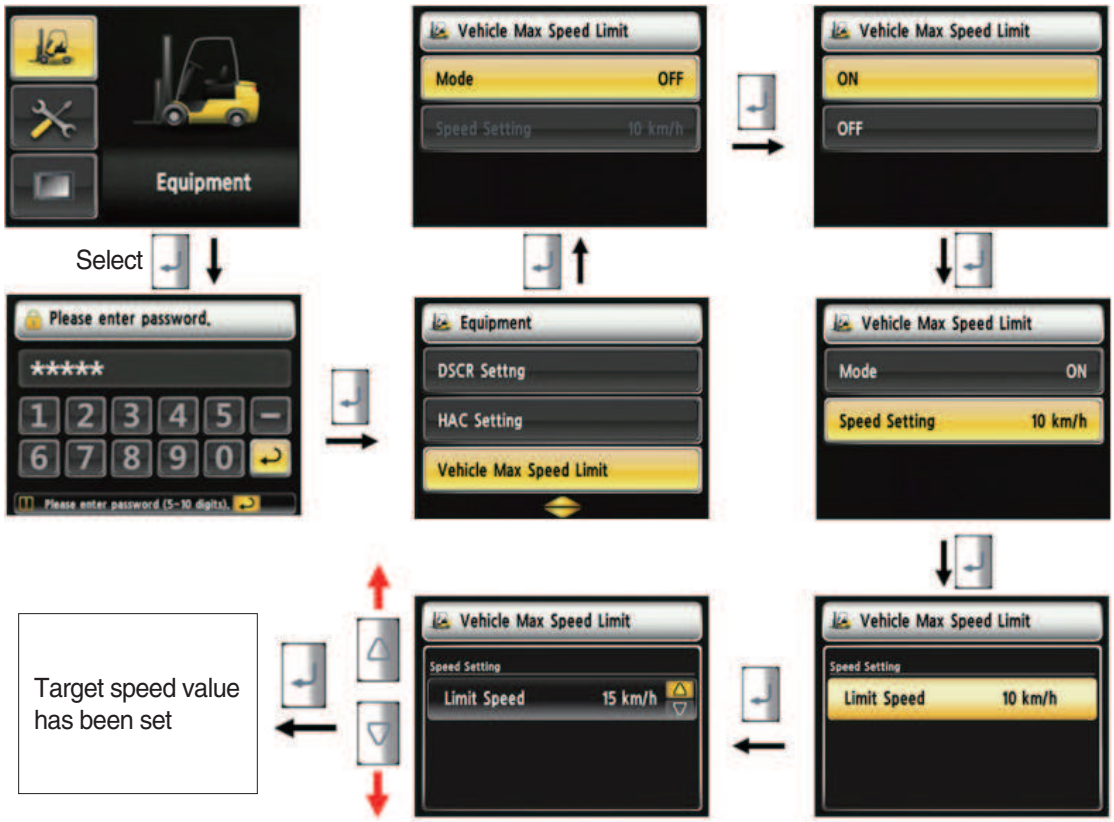
· **How to set DCSR**

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.

(9) Vehicle max speed limit

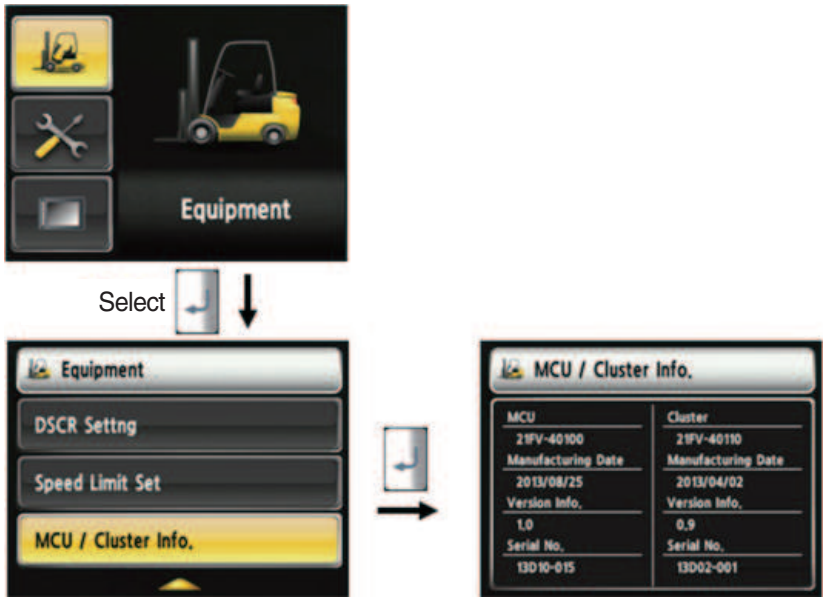


22D9CL059

· **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.

(10) MCU/Cluster information

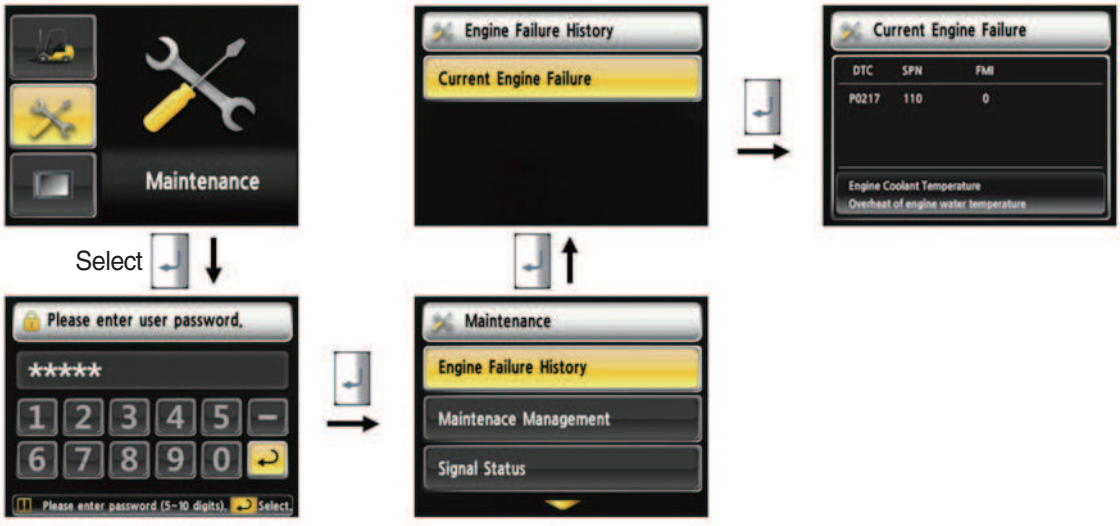


35D9SCL060

· **MCU / Cluster information**

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

(11) Engine Failure History



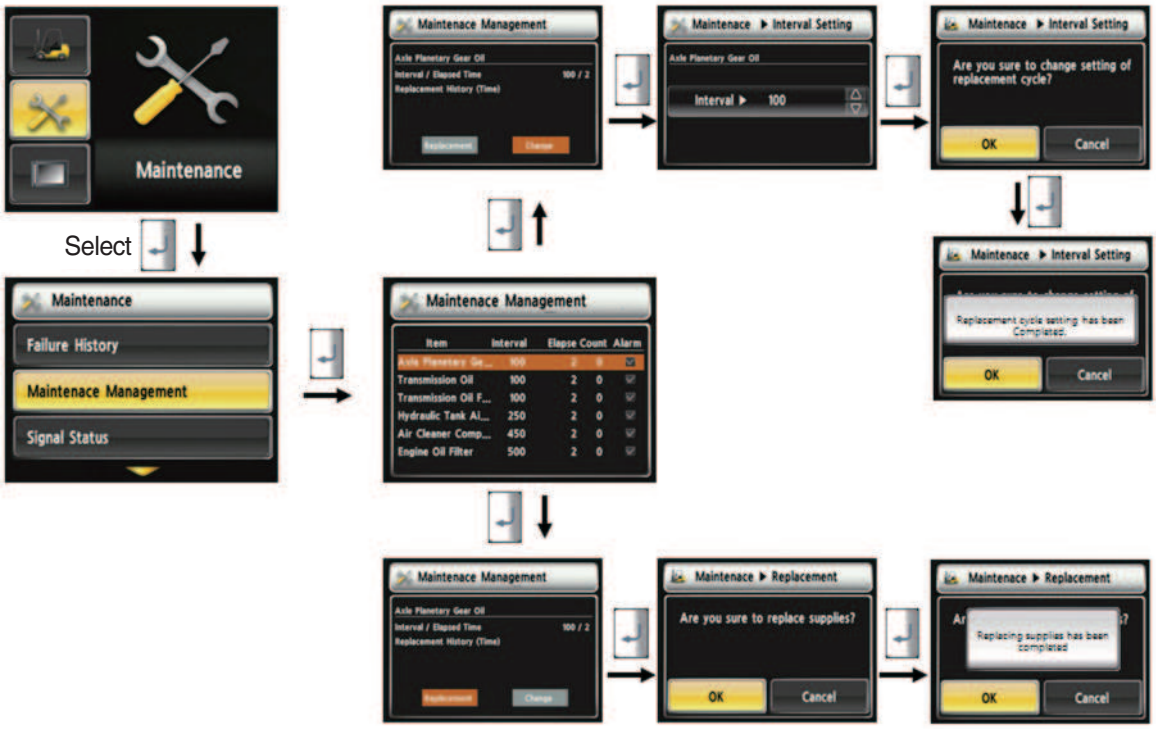
35D9KCL078

· **Engine failure history**

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

(12) Expendables replacement management

35D9KCL079

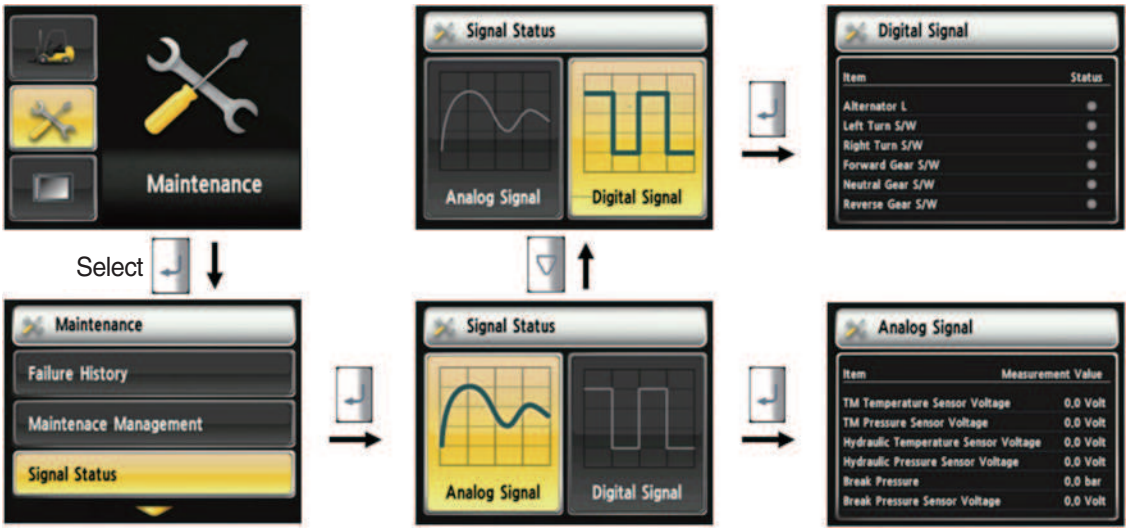


35D9SCL061

· **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.

(13) I/O Information

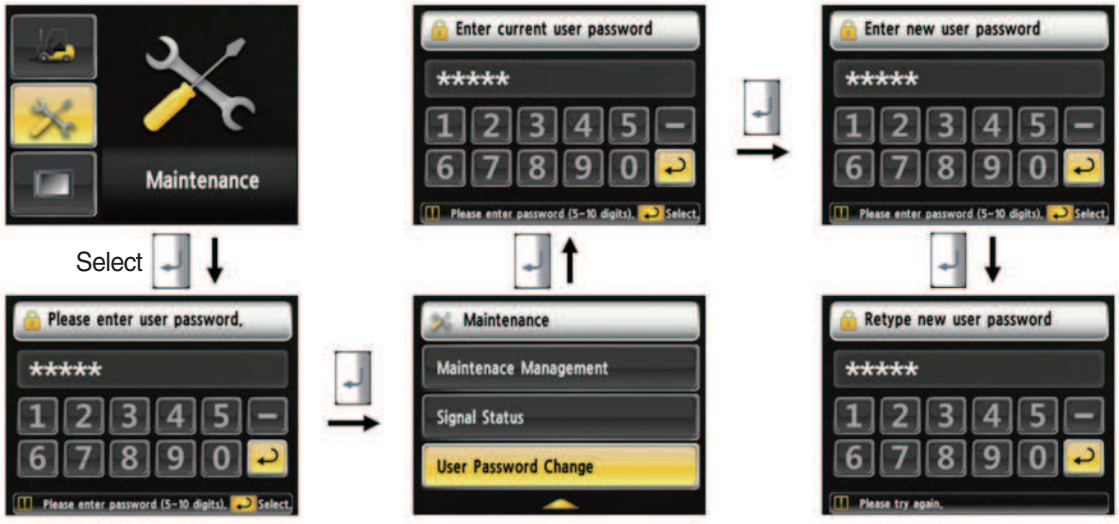


35D9SCL062

· **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.

(14) User password change

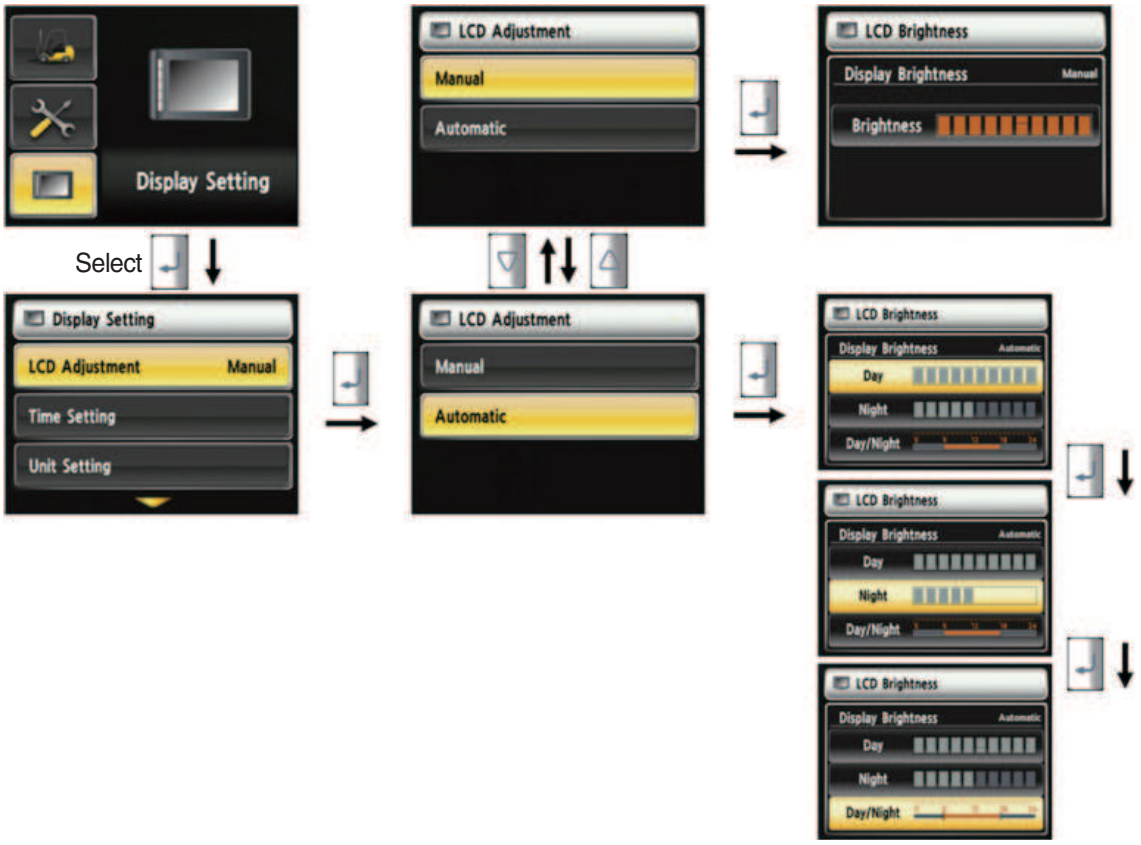


35D9KCL080

· **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.

(15) LCD brightness

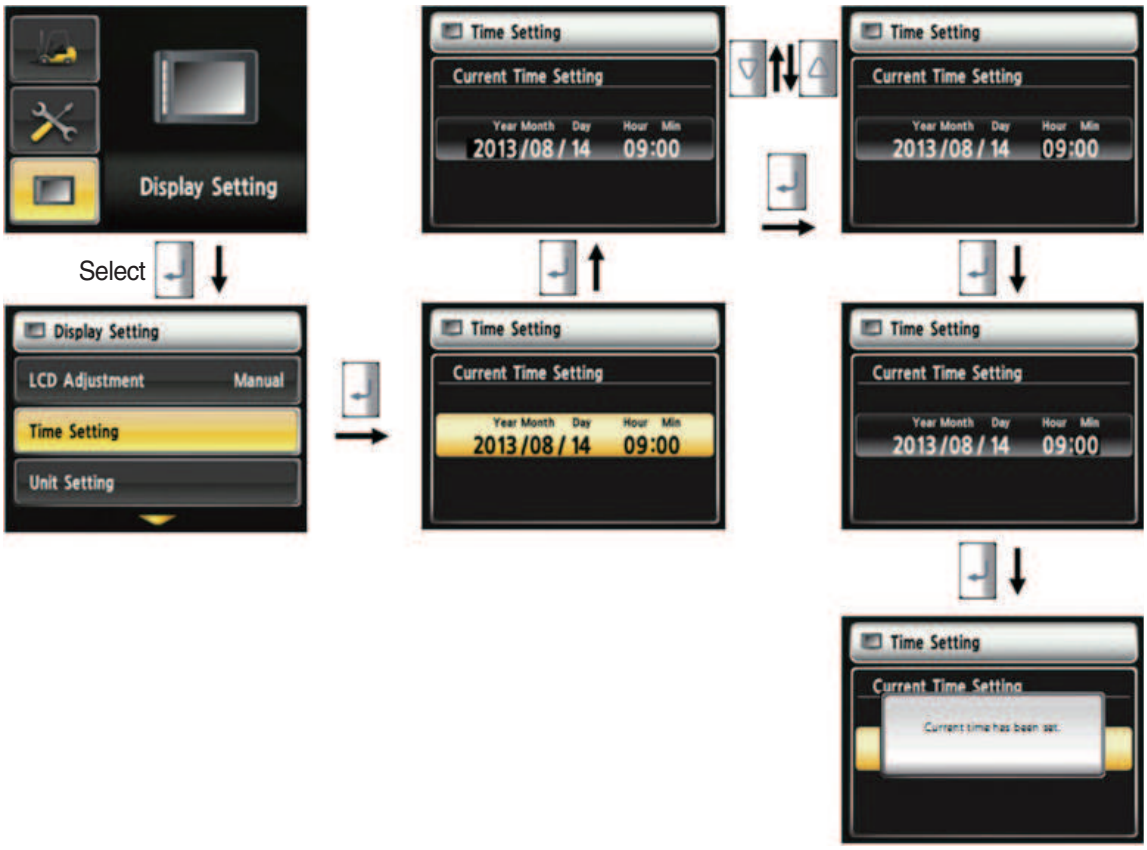


35D9SCL064

· **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%, Daytime/Nighttime time zone : 06~18

(16) Time setup

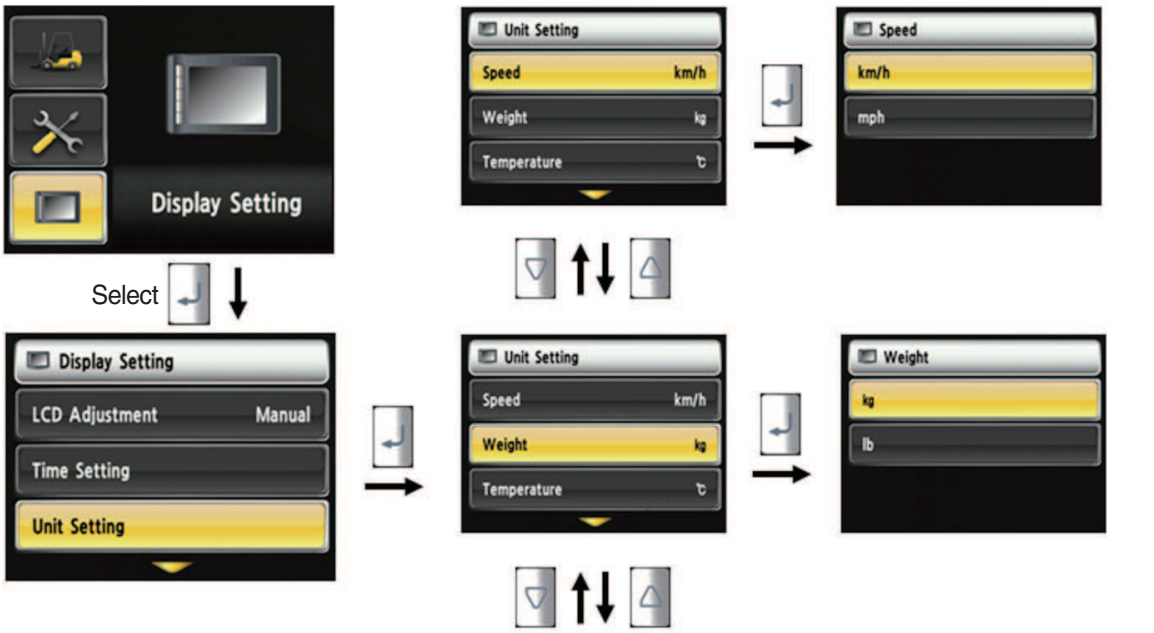


35D9SCL065

· **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)

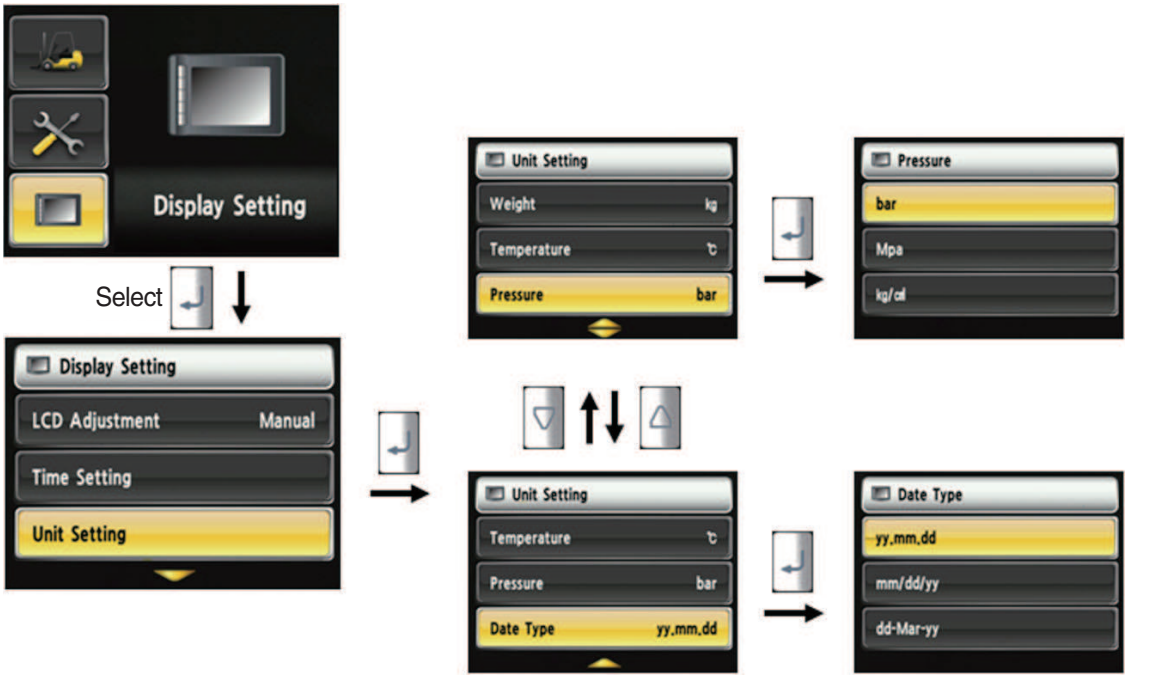
(17) Unit setup



· **Unit setup**

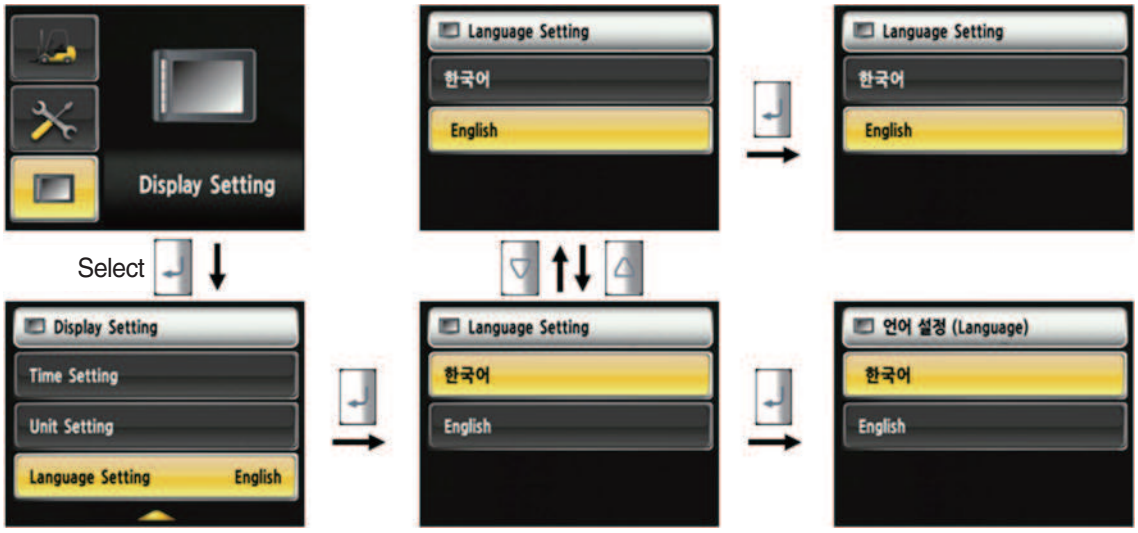
1. Display setup > Unit setup
2. Enable to set all unit values that displayed on screen.
3. It is displayed by calculating as setting unit.

35D9SCL066



35D9SCL067

(18) Language setup

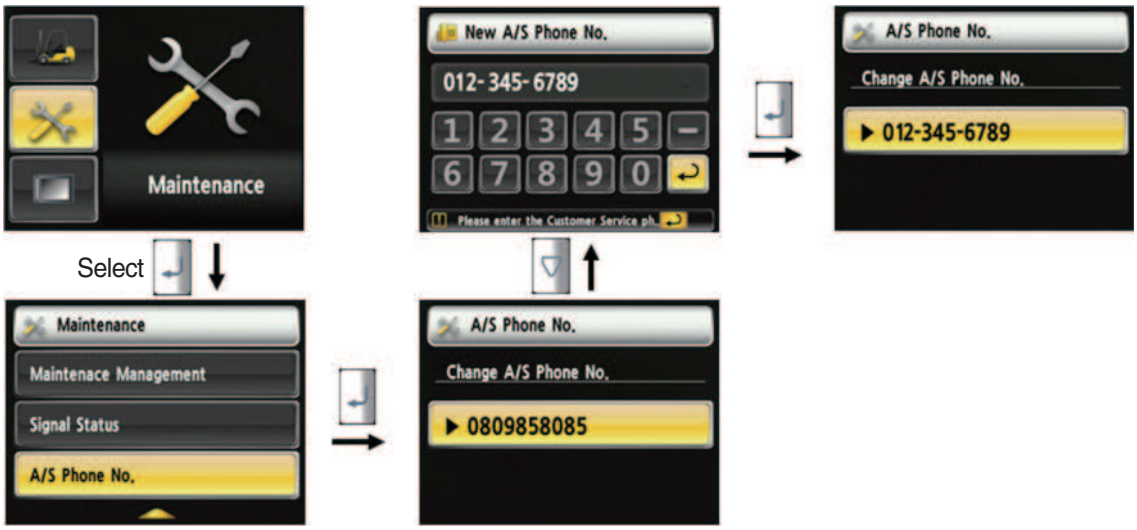


35D9SCL068

· **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.

(19) A/S Contact Setup

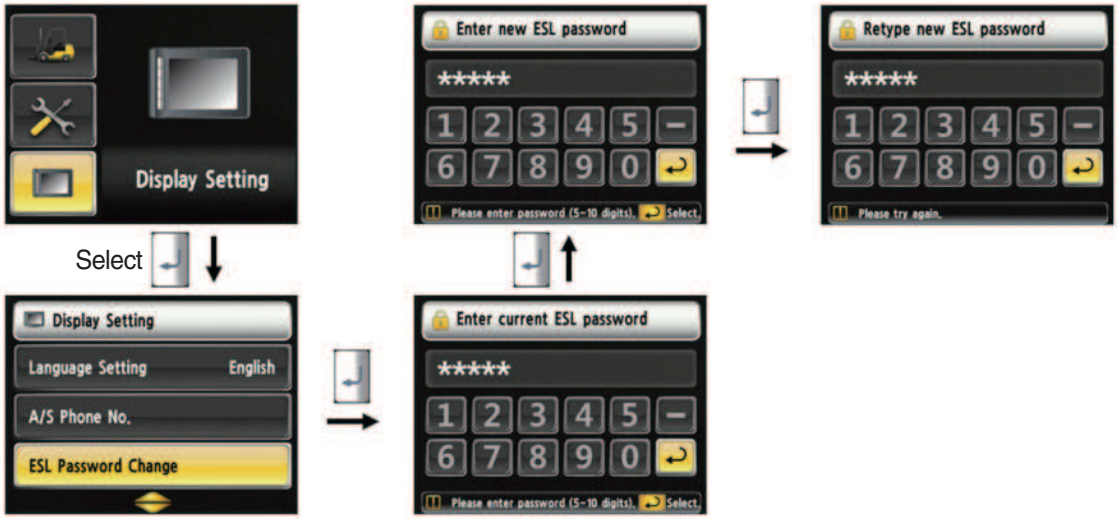


35D9SCL063

· **How to set A/S contact**

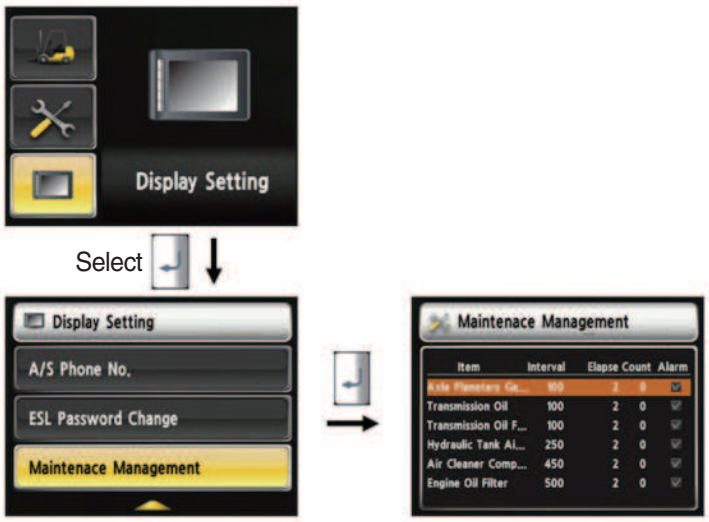
1. Maintenance > A/S Contact
2. User can change the A/S contact when deliver the vehicle from factory.
3. If user moves numeric number using arrow, and press the select button, number will be displayed on the screen.
4. If user press the enter key, the value will be set.
5. Contact will be displayed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

(20) ESL password change



35D9KCL081

(21) Maintenance management



35D9KCL082

※ Only viewing is available in this menu

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

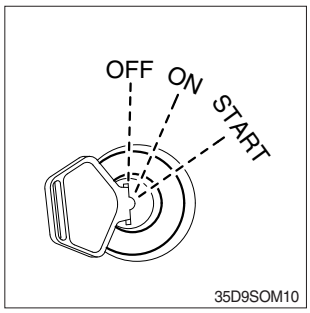
8) CAUSES AND CORRECTION OF CLUSTER WARNING LAMP

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 indicator		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	Fuel warmer indicator		Fuel warmer indicator lamp	warming up the fuel.
8	TM oil temperature warning		TM oil temperature warning lamp	TM oil is over temperature condition.
9	Parking brake indicator lamp		Parking brake indicator lamp	Parking brake is operating.
10	Brake oil level warning		Brake oil level warning lamp	Brake oil level is low. Please refill the brake oil.
11	Battery charging warning		Battery charging warning lamp	Battery is not being charged. Please check alternator and wiring.
12	Tilt lock indicator		Tilt lock indicator lamp	Auto-leveling is the operational status.
13	OPSS indicator		OPPS indicator lamp	OPPS is working : Driving, tilting, lifting locked and vehicle parked.
14	Fuel warning		Fuel warning lamp	Fuel level is low. Please refill the diesel oil.
15	Coolant temperature warning		Engine coolant temperature warning lamp	Engine coolant is over temperature condition.
16	T/M oil pressure warning		Clutch oil pressure warning lamp	Inching operation. Check T/M to find out pressure drop.

S/No.	Warning lamp types	Symbol	Warning and indicator	Causes and correction
17	Communication error warning		Communication error warning lamp	Communication between MCU and ECU has been failed. Check communication line.
18	Communication error warning		Communication error warning lamp	Communication between CLUSTER and MCU has been failed. Check communication line.
19	LH Turn indicator		LH Turning pilot lamp	-
20	RH Turn indicator		RH Turning pilot lamp	-
21	Forward gear		Forward gear indicator lamp	-
22	Reverse gear		Reverse gear indicator lamp	-

5. OPERATING LEVER AND SWITCH

1) START SWITCH



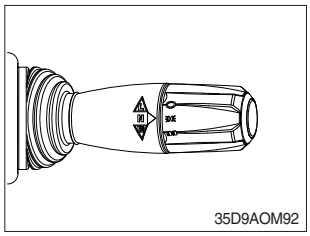
(1) There are three positions, OFF, ON and START.

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

- OFF : None of electrical circuits activates.
- ON : All the 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) CLEARANCE LAMP SWITCH



(1) Clearance lamp lights up

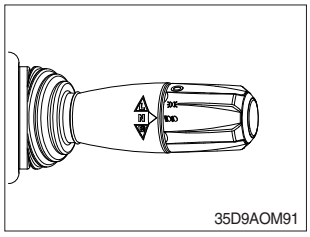
Twist the handle beneath steering wheel and make the notch align to ≡D(.

(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.

3) HEAD LAMP SWITCH



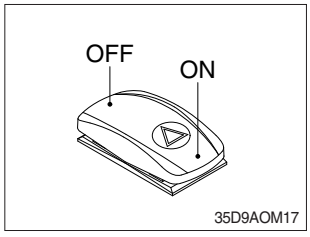
(1) Head lamp lights up

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 ◎.

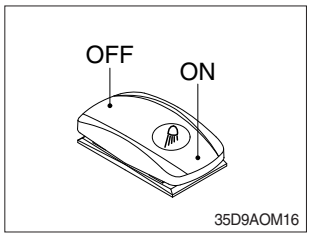
4) HAZARD LAMP SWITCH (option)



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

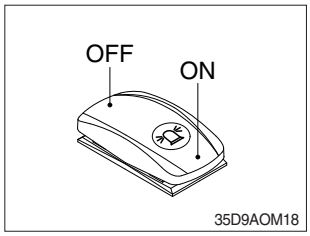
※ If the switch is left on for a long time while the engine does not run, the battery would be dead (discharged).

5) REAR WORK LAMP SWITCH (option)



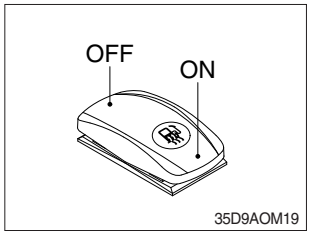
(1) This switch is used to operate work lamps.
Press this switch to turn on work lamps.

6) BEACON SWITCH (option)



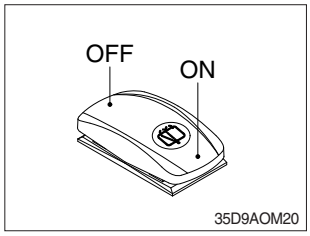
(1) This switch turn ON the rotary light.

7) FUEL WARMER SWITCH



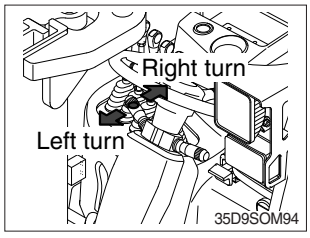
(1) This switch is used to heat the fuel of pre-heater.

8) 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.

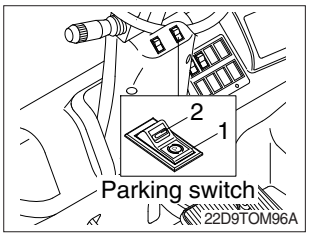
9) TURN SIGNAL SWITCH



(1) This lever makes the turn signal lamp flash.
① Turning LEFT : Push lever forward
② 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.**

10) PARKING BRAKE SWITCH



(1) Position 1

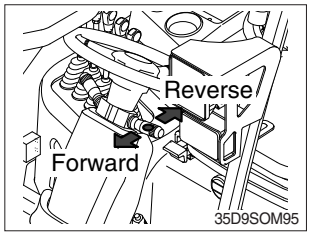
Parking brake is applied and front wheel is locked.

(2) Position 2

Parking brake is released.

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

11) FORWARD-REVERSE LEVER

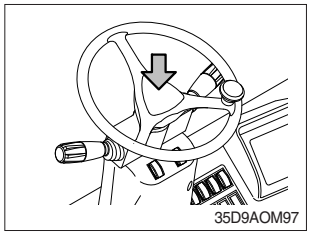


(1) Push lever for forward driving.

(2) Pull lever for reverse driving.

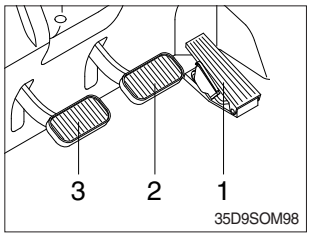
※ **When changing direction or speed, there can be some sound but it's nothing to do with performance.**

12) HORN BUTTON



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

13) PEDALS

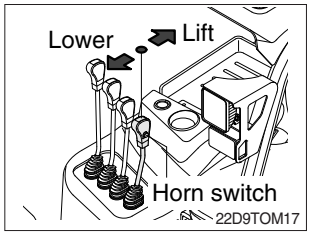


(1) **1** : Accelerator pedal
2 : Brake pedal
3 : Inching pedal

※ **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.**

14) LIFT LEVER



(1) LIFT

PULL the lever BACK to LIFT the load.

(2) LOWER

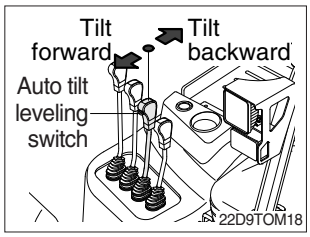
PUSH the lever FORWARD to LOWER the load.

(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.

15) TILT LEVER



(1) TILT FORWARD

PUSH the lever FORWARD to tilt mast FORWARD.

(2) TILT BACK

PULL the lever BACK to tilt mast BACKWARD.

(3) HOLDING

When the lever is released, tilting action stops.

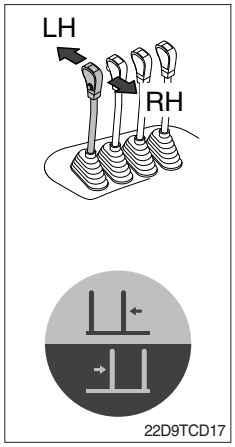
※ **Forward and backward tilting speeds are controlled by tilt lever and accelerator pedal.**

(4) TILT LOCK (OPTION)

When the lever is operated on pressing tilt switch, auto tilt leveling function activated.

※ **Auto tilt leveling : This function is mast tilt angle adjust to 0 degree(refernce to truck 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.**

16) LEVER FOR SIDE SHIFT



(1) LH MOVEMENT

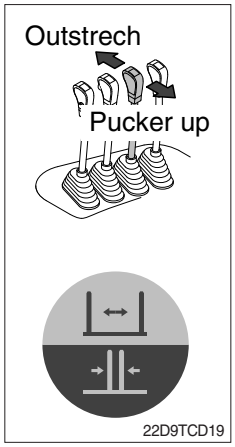
Push the lever forward to move the left hand for the side shift.

(2) RH MOVEMENT

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

17) LEVER FOR SIDE SHIFT WITH FORK POSITIONER

(1) Fork positioner (synchronizer type)



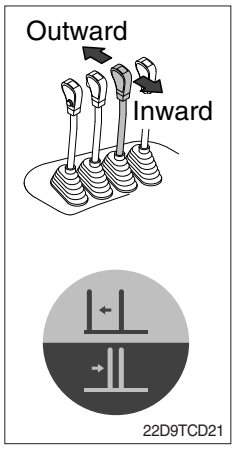
① OUTSTRECH THE FORKS

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

② PUCKER UP THE FORKS

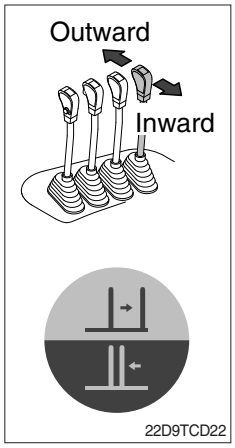
Pull the lever backward to pucker up simultaneously inward of the both forks.

(2) Fork positioner (independent type)



① **LH FORK MOVEMENT**

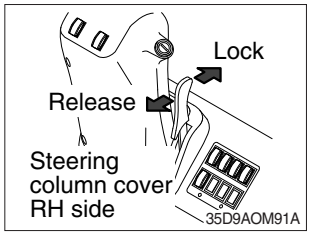
- Push the lever forward to move outward for the LH fork.
- Pull the lever backward to move inward for the LH fork.



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.

18) STEERING WHEEL LOCK LEVER

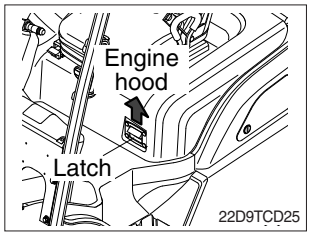


(1) The angle of the steering shell can be adjusted forward and backward.

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

② **Lock** : Release the knob.

19) ENGINE HOOD



(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.

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 brakes
③ Hydraulic controls: lift, tilt, and auxiliary (If installed)
④ Accelerator
⑤ Directional control
⑥ Steering system
⑦ Lift mechanism and any attachments.

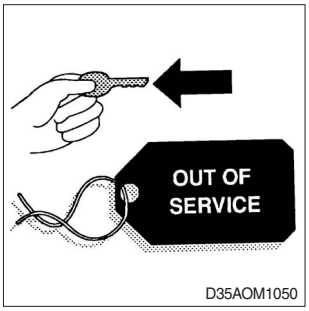
When the functional check are completed, follow the **standard shutdown procedures** given in Section 5, **Starting and operating procedures.**

3) CONCLUDING THE INSPECTION

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

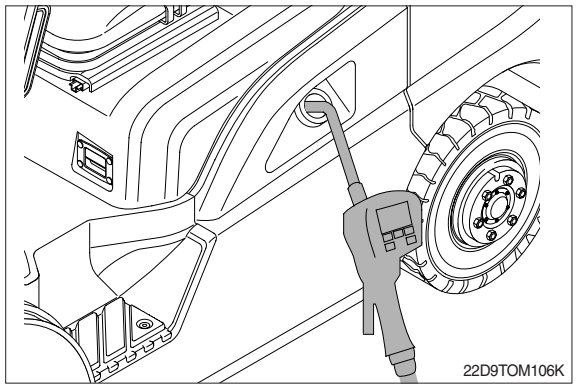
(1) Instead, remove the key from the starting switch and put an **Out of service tag** on the truck.

(2) If all of the daily inspection checks were normal or satisfactory, the truck can be operated.

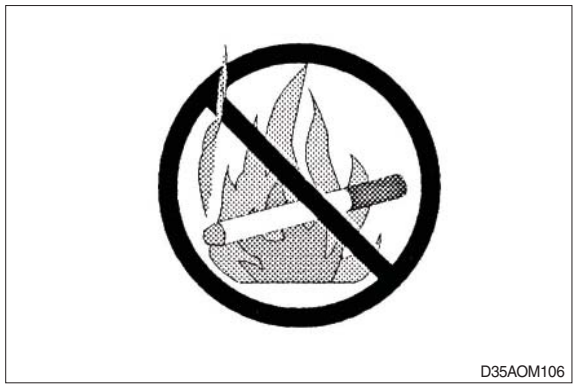


2. FUEL SAFETY PRACTICES

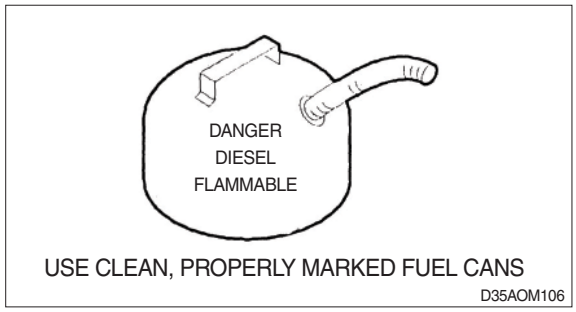
REFUELING DIESEL TRUCKS



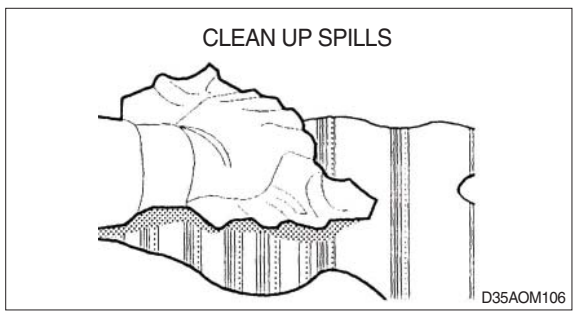
⚠ Stop the engine when refueling.
All lights and flames shall be kept at a safe distance while refueling.



⚠ 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.



3. 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 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

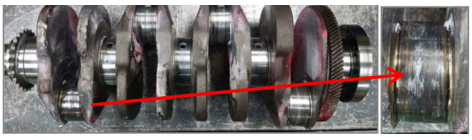
※ Problems with poor engine oil management

⚠ 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	

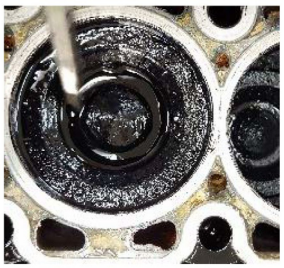
※ This service interval is for R-engine model.

< Problem picutres >



< Crankshaft pin seizure >

< Connecting rod bearing seizure >



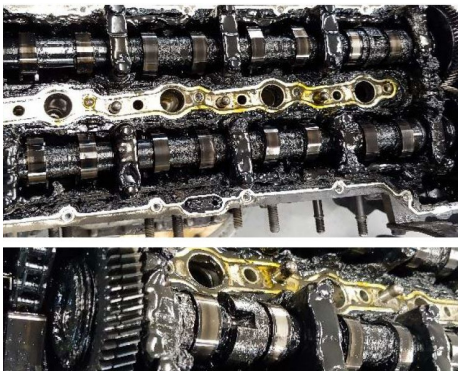
< Engine oil in combustion chamber >

< Connecting rod broken >

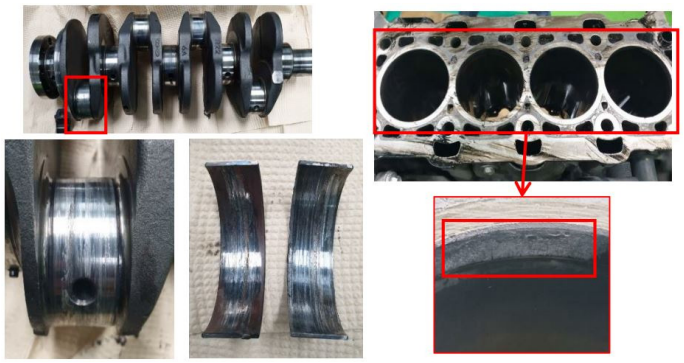
⚠ Engine oil contamination (neglecting daily and periodic check)

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.**

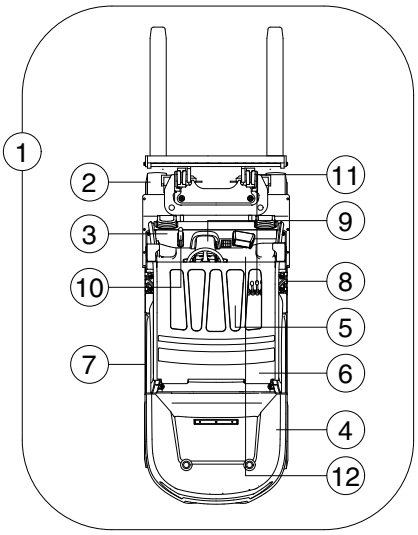
⚠ **Do not start or operate the truck, or any of its functions or attachments, from any place other than the designated operator's position.**

⚠ **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.



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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
		2.2/2.5 ton	3.0/3.5 ton	2.2~3.5 ton
Tire air pressure	kgf/cm^2	9.0	10	8.25
	psi	128	142	117
	bar	8.8	9.8	8.1
Hub nut tightening torque	kgf · m	30~50		30~50
	lbf · ft	217~362		217~362
	N.m	294~490		294~490

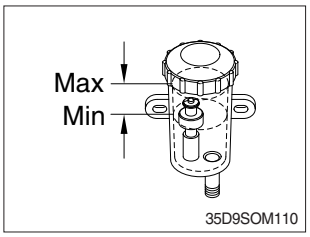
(2) Rear tire (Pneumatic type only)

Item	Unit	Rear tire	
		Single	Double
Tire air pressure	kgf/cm^2	10	9
	psi	142	128
	bar	9.8	8.8
Hub nut tightening torque	kgf · m	16~20	
	lbf · ft	116~145	
	N.m	157~196	

⚠ 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.

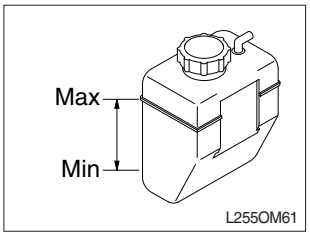
3) CHECK BRAKE FLUID



(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.

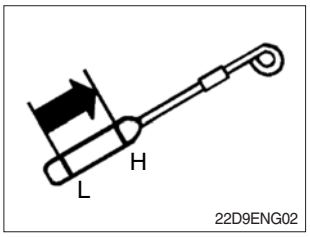
※ **Always check the coolant level in the radiator reservoir tank prior to beginning of daily operation of the machine.**

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

※ **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.

(3) Take the oil level gauge out again, and check 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.**

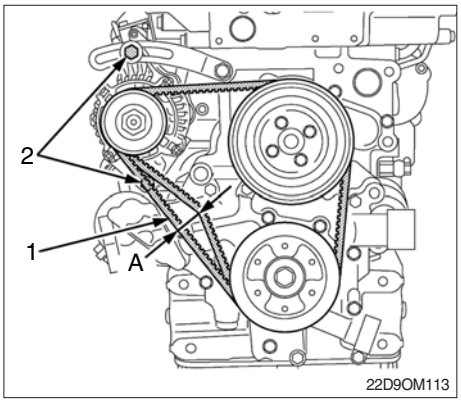
⚠ **Do not touch hot components or allow hot oil to contact your skin.**

※ **When using oil of different brands from the previous one, be sure to drain all the previous oil before adding the new engine oil.**

※ **On DPF-equipped engines, part of the fuel may get mixed with engine oil during the regenerating process.**
This may dilute the oil and increase its quantity. If the oil rises above the oil level gauge upper limit, it means the oil has been diluted too much, resulting in a trouble. In such case, immediately change the oil for new one.

※ **If the interval of DPF regeneration becomes 5 hours or less, be sure to change the oil for new one.**

6) CHECK FAN BELT TENSION



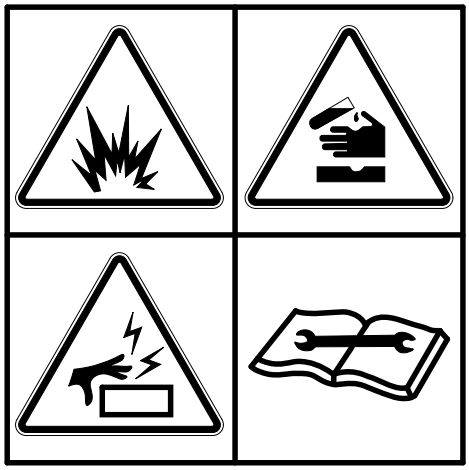
1 Fan belt
2 Alternator mounting screw
A Deflection

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

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

· Specification : 10~12 mm (0.39~0.47 in)

7) BATTERY



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

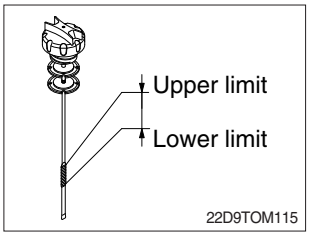
⚠ **Battery gas can explode. Keep sparks and flames away from batteries.**

⚠ **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.**

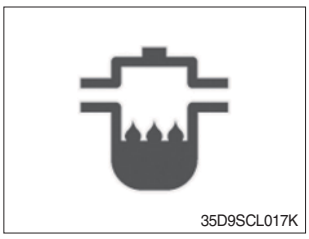
8) CHECK HYDRAULIC OIL LEVEL



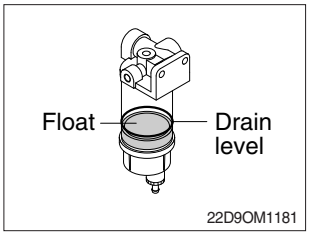
(1) Rest fork on ground and stop engine. Pull out dipstick and check oil level. If insufficient, add oil.

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

9) CHECK GAUGES

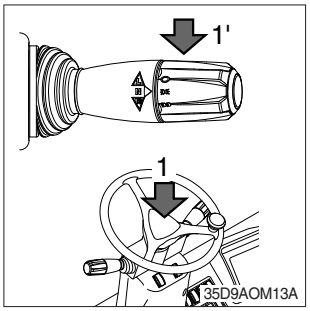


(1) Separator warning lamp (For diesel type/trucks with separator).
If the warning lamp stays on, drain the water from the fuel filter.



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

10) CHECK HORN AND LAMPS



(1) Check horn button and lamp switch if operate normally or not.
1 : Horn button
1' : Lamp switch

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

11) CHECK PEDALS

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

(1) Inching pedal

	Unit	Specification
Free play	mm (in)	2~4 (0.07~0.16)
Interlock stroke with brake pedal	mm (in)	15~20 (0.59~0.79)

(2) Brake pedal

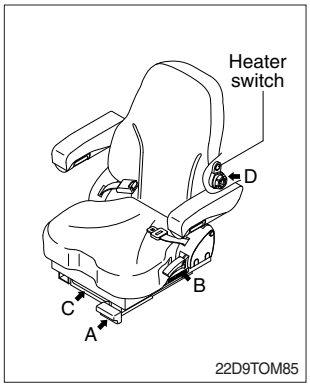
	Unit	Specification
Free play	mm (in)	2~4 (0.07~0.16)

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)

Pull lever A to adjust seat forward or backwards.

(2) Reclining adjustment (B)

Pull lever B to adjust seat backrest.

(3) Weight adjustment (C)

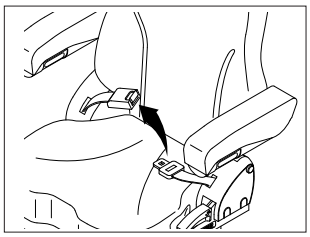
(4) Lumbar adjustment (D)

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



(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.

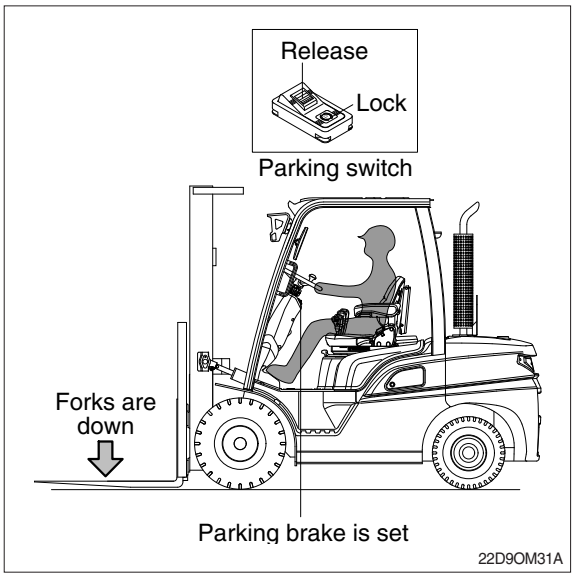
⚠ Always check the condition of the seat belt and mounting hardware before operating the machine.

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

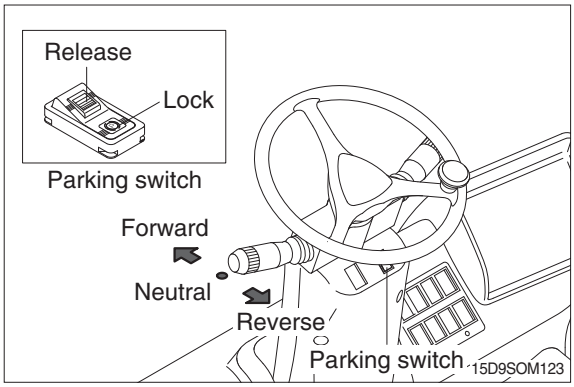
5. STARTING FROM A SAFE CONDITION

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



6. GENERAL STARTING AND OPERATING TIPS

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

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

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

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

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

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

- Warm the engine up before driving or applying a load. Idle engine at low idle rpm for a few minutes to circulate and warm the oil. Then increase speed to approximately half-throttle for a short period or until the engine coolant reaches approximately 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 direction control 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.

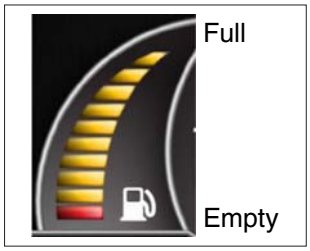
8. CHECK AFTER STARTING ENGINE

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.**

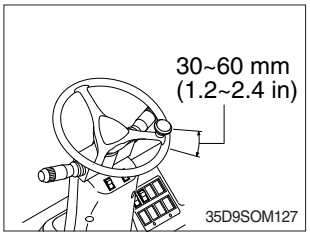
⚠ **Do not smoke or allow any flame near the truck when refilling. Refilling produces explosive fumes. The truck should be refilled only at the specified refilling point.**
Stop the engine and get off the truck when refilling.

4) CHECK MONITOR

These lamps light up to indicate an abnormality.

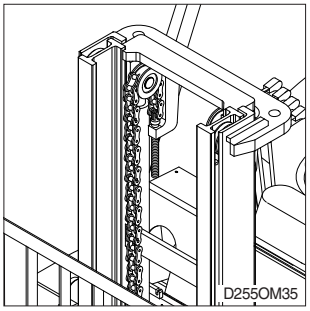
※ **Cluster warning lamps light up to indicate an abnormality. (refer to page 3-39)**

5) CHECK STEERING WHEEL PLAY



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

6) CHECK LIFT CHAIN TENSION



Raise forks 100 to 150 ㎜ (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)

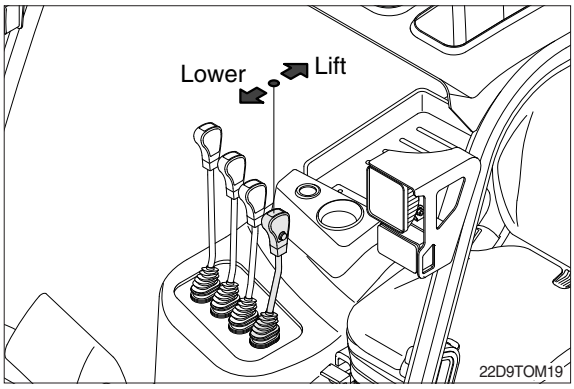
Adjust the rearview mirror for best rearward visibility.

9. LEVERS AND PEDALS

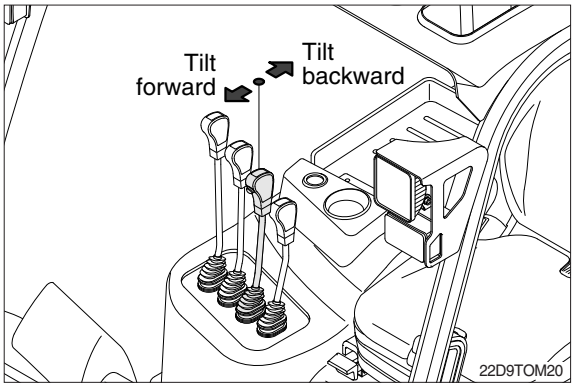
1) POSITIONING FORKS AND MAST

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.



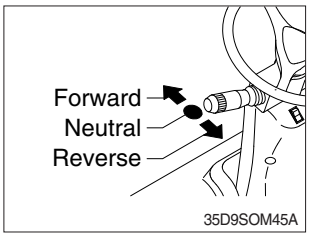
⚠ Illustrations may differ from your machine, but the operation is common each other.

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

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

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

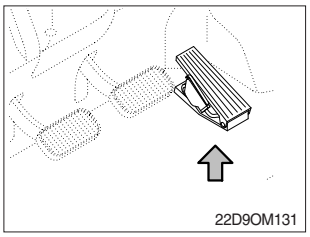
2) SELECTING DIRECTION OF TRAVEL



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

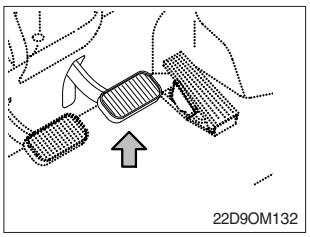
⚠ During traveling in forward or reservers direction rapid turning of the machine can cause dropping of a load and damage of the machine.

3) USING THE ACCELERATOR PEDAL



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

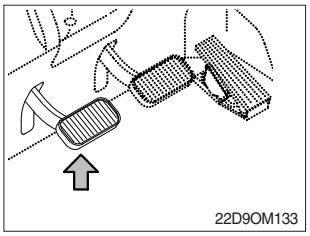
4) BRAKING PEDAL



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

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

5) INCHING PEDAL



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

⚠ 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. 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 instrument panel 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.

11. 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.

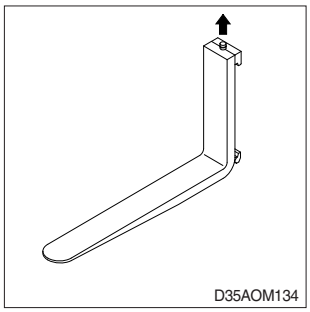
⚠ Slack chains mean rail or carriage hang-up. Raise the mast before you move. If the mast malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains by raising the carriage. DO NOT go under a raised mast or forks to attempt repairs.
DO NOT climb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



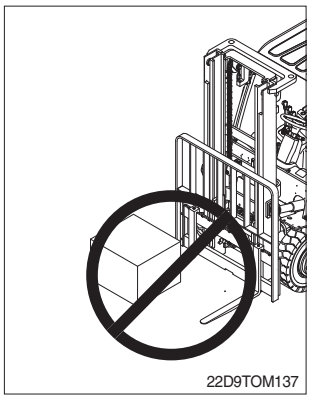
The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make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

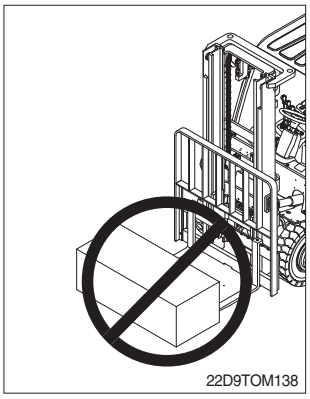
3) LOAD ON FORKS



(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.

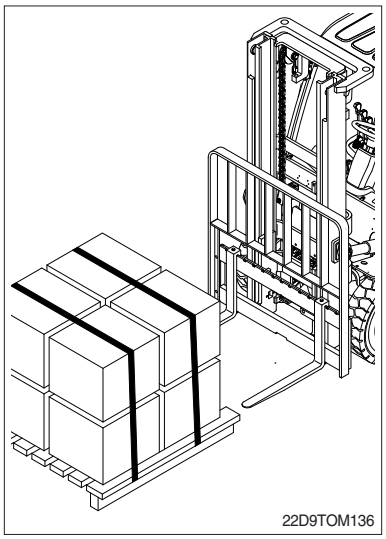
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

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.

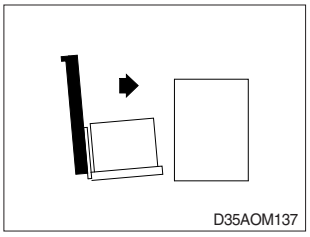
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (Pallet).

Carefully back away to clear the forks from the load.

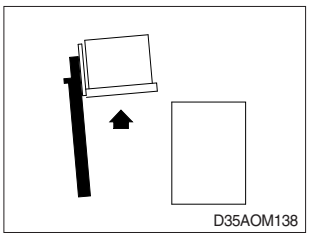
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

7) STACKING

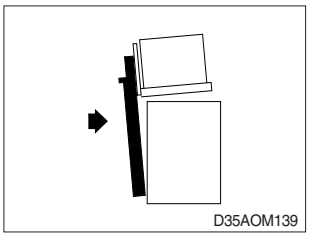
(1) To put a load on a stack



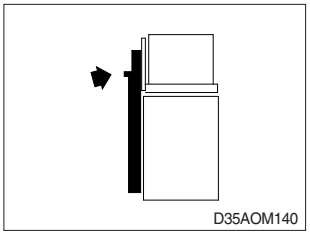
① Approach slowly and align the lift truck and load squarely with the stack.



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

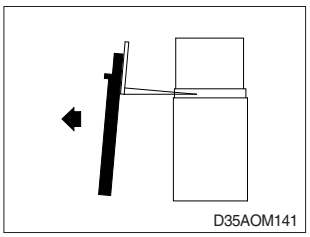


③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.

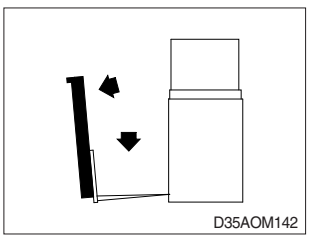


④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.

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.**

12. 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.

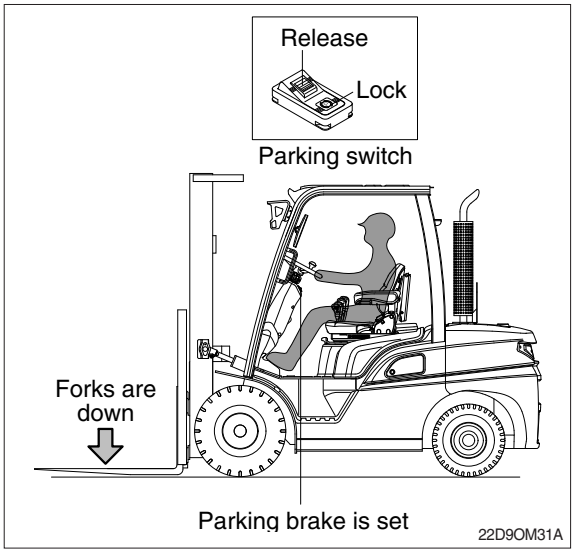
2) BEFORE LEAVING THE OPERATOR'S POSITION

(1) Bring the truck to a complete stop.
(2) Put the directional control 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 starting switch to the OFF position and remove the key.
(3) Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.

※ **If the lift 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.

6. EMERGENCY STARTING AND TOWING

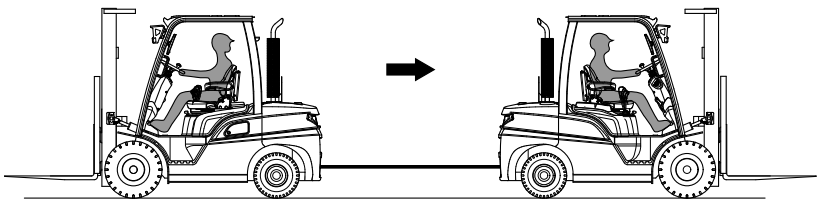
1. HOW TO TOW A DISABLED TRUCK

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. (Refer to page 6-3)
7) Put the directional control lever in the NEUTRAL position.



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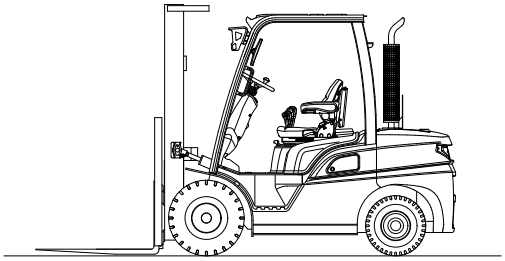
8) Tow the disabled truck backward. An operator must be on the towed truck.

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

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

9) Park the disabled truck in authorized areas only. Fully lower the forks to the floor, put the directional control lever in the NEUTRAL position and turn the starting switch to the OFF position. Engage 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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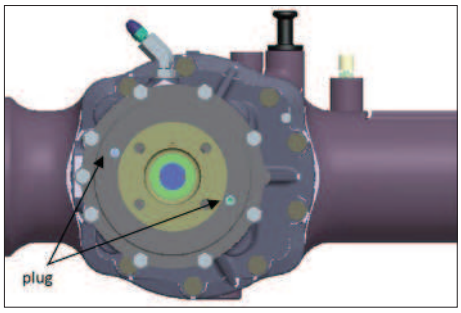
⚠ **Always engage the parking brake when parking a lift truck. The truck can move and cause injury or death to personnel near it.**

2. PARKING BRAKE RELEASE

In case of malfunction of transmission, it's hard to supply pressure at parking brake.
Using function of parking force release at carrier sub assembly of drive axle, it is possible to tow the truck.

1) DISASSEMBLE PLUG

Must wash surrounding plug before disassembly
Tool : Use 5 mm six-angular lench or bitsocket



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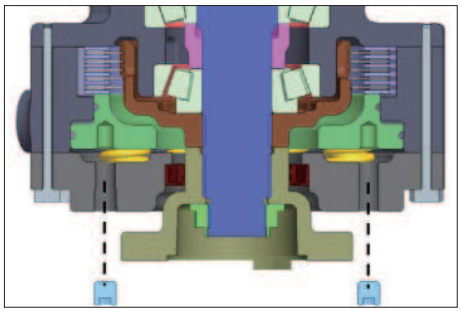
※ Correspond with hole of assembly and tap hole of piston by guide pin.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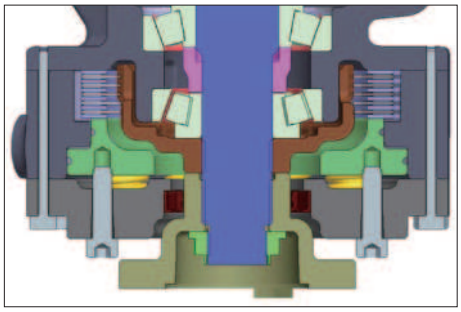
2) ASSEMBLE BOLT OF RELEASED PARKING

(1) Assemble bolt for released parking at hole of plug by disassemble.
Bolt spec : M8x1.25P × 30L
Socket-bolt, S109-080304
(2) Assemble bolt by hand to reach axle housing.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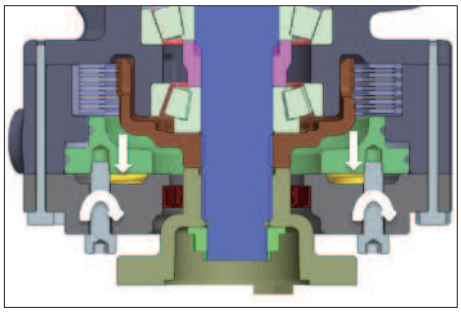
(3) Tighten two bolt like clockwise rotation.
According to the force of tighten bolt, pull piston and release parking brake.
Tool : Use 6 mm six-angluar lench or bitsocket
(4) Rotate 1.5~2 times by clockwise direction, and then release parking brake.
Do not exceed tightening torque 400 kgf-cm
(5) Check parking to rotate flange shaft by hand.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3. HOW TO USE BATTERY JUMPER CABLES

If your lift truck battery is discharged (dead), you can start your lift truck by jumping it from another lift truck that has a 12V, 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 12V, 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 12V, power supply or to a positive ground system.**

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

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

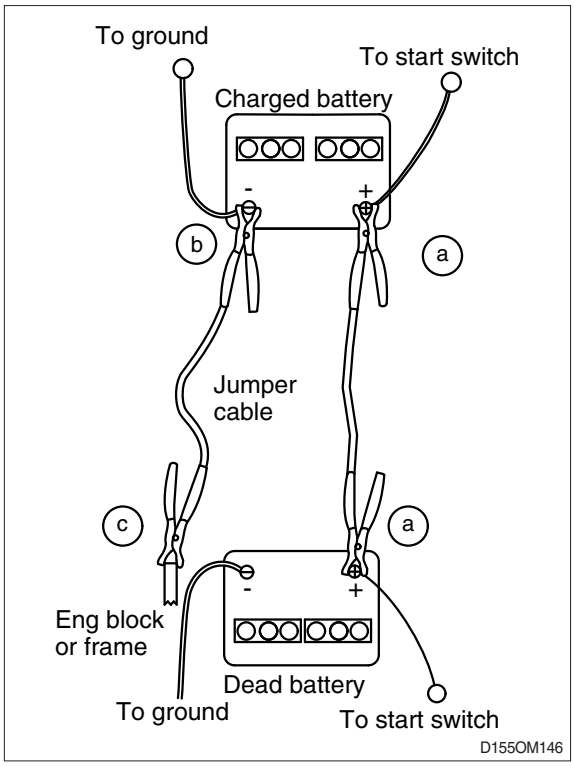
2) Do not jump start, charge, or test a sealed type battery if the test indicator looks illuminated or has a bright color. Install a new battery.

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

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

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

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



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 vehicle** battery.
   ⓒ Connect the other end of the second cable to a stationary, solid metallic point on the engine of the **Stalled vehicle**, not to the negative(-; black) terminal of its battery. Make this connection at a point at least 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** vehicle and run the engine at a moderate speed for a minimum of five minutes.
7) Start the engine on the **Stalled vehicle**. Follow the starting instructions in section 5, **Starting and Operating Procedures** in this manual. Be sure that the engine is at idle speed before disconnecting the jumper cables.
8) Remove the jumper cables by reversing the installation sequence exactly. Start by removing the last jumper cable from the stalled vehicle first. Remove the cable end from the engine block first, then the other end of the negative (-; black) cable.
9) Remove both ends of the positive (+; red) cable.

7. PLANNED MAINTENANCE AND LUBRICATION

1. INTRODUCTION

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

⚠ Powered industrial trucks may 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 direction control in NEUTRAL.

(4) Start the engine.

(5) Check functioning of lift and tilt systems, direction and speed controls, steering, brakes, warning devices, and load handling attachments.

11) Before leaving the truck.

(1) Stop the truck.

(2) Fully lower the load-engaging means: mast, carriage, forks or attachments.

(3) Put the directional control in NEUTRAL.

(4) Apply the parking brake.

(5) Stop the engine.

(6) Turn the key switch to the OFF position.

(7) Put blocks at the wheels if the truck must be left on an incline.

12) Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops, load backrest, 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 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
12	Intake air line	Every 2 years
13	Coolant	Every 2 years
14	Radiator hoses and clamps	Every 2 years

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

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

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

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

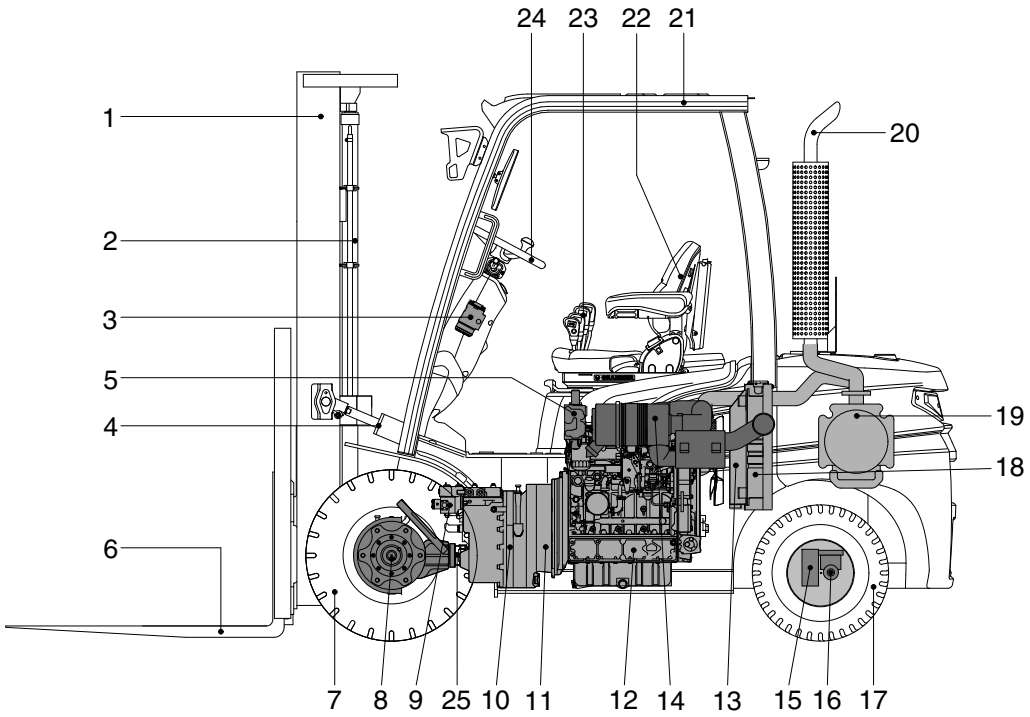
Naturally, this warranty does not cover to damage arising from accident, misuse or negligence, use of non-Hyundai parts, or from alterations not authorized by Hyundai.

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

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

4. PLANNED MAINTENANCE INTERVALS

1) MAJOR COMPONENT LOCATIONS



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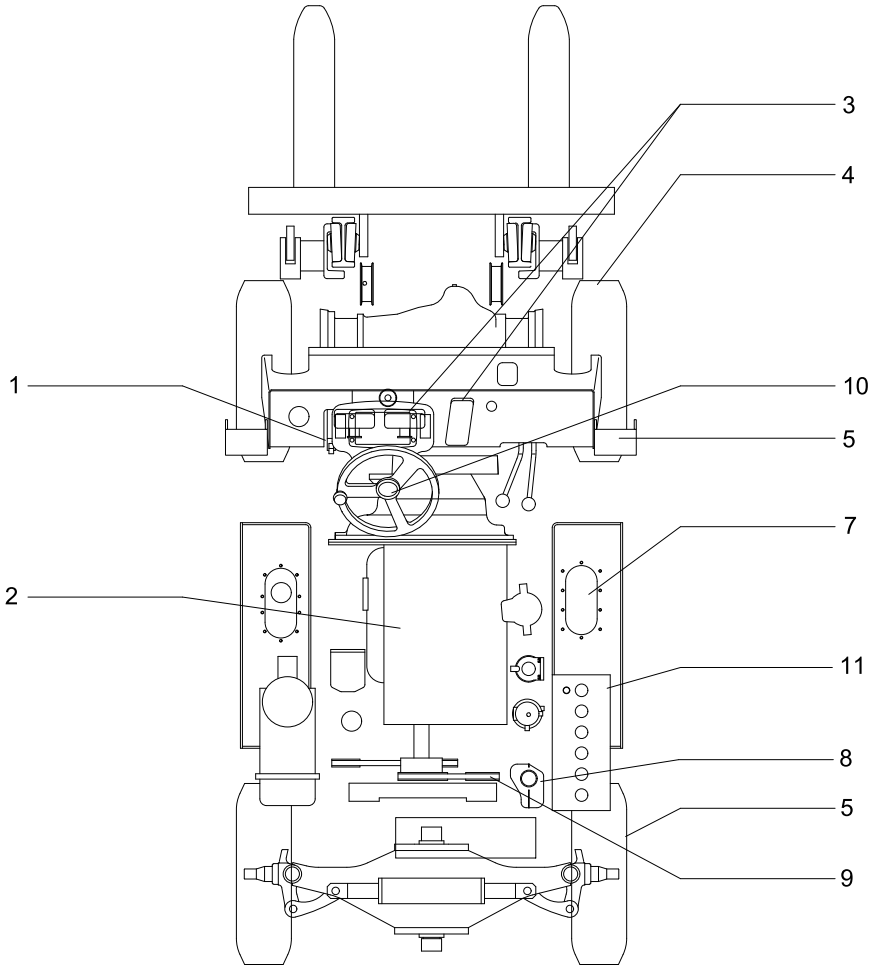
1	Mast	10	Transmission	19	DOC assy
2	Lift cylinder	11	Torque converter	20	Silencer
3	Steering unit	12	Engine	21	Overhead guard
4	Tilt cylinder	13	Exhaust pipe	22	Seat
5	Control valve	14	Air cleaner	23	Control lever
6	Fork	15	Steering axle	24	Steering wheel
7	Front wheel	16	Steering cylinder	25	Drive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

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	7-30
2	Engine oil level	Check, Add	EO	11.2 (3.0)	1	7-17
3	Pedal linkage operation	Check, Adjust	-	-	1	7-30
4	Drive rim and tire air pressure	Check, Add	-	-	2	5-3, 7-14
5	Steer rim and tire air pressure	Check, Add	-	-	2	5-3, 7-14
6	Lamp operation	Check, Replace	-	-	9	7-29
7	Fuel level	Check, Add	DF	60 (15.9)	1	5-12
8	Radiator coolant	Check, Add	C	9.4 (2.48)	1	5-4
9	Fan belt tension and damage	Check, Adjust, Replace	-	-	1	7-21
10	Horn operation	Check, Replace	-	-	1	7-29
11	Battery	Check, Clean	-	-	1	7-15

※ Oil symbol
Refer to the recommended lubricants for specification.
DF : Diesel fuel HO : Hydraulic oil EO : Engine oil GO : Gear oil
MO : Transmission oil BF : Brake fluid C : Coolant G : Grease

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	Brake oil	BF				R							
	Engine oil	EO			R						R		
	Engine oil filter				R						R		
	Fuel filter				R								
	Water separator 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	
	Radiator coolant	C								R			
	Valve clearance					C							
	Injector tip						C						
	EGR cooler						C						
	EGR system								C				
	Oil separator element						R						
	Turbocharger								C				
	Fork condition and wear				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

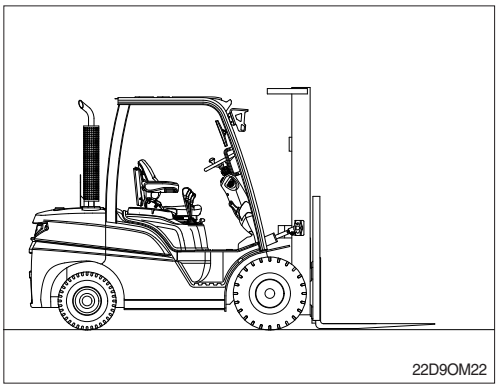
I : Visual inspection (repair or replace if required) M : Measurement (adjust if required)

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.**

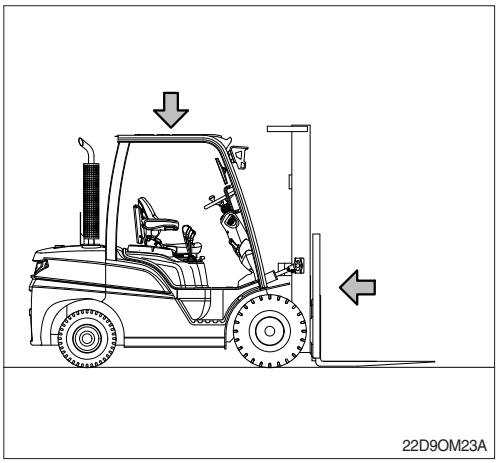
Inspect the truck, before and after starting the engine, for any sign of external leakage of fuel, engine coolant, transmission fluid, etc..

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 (LBR), 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.

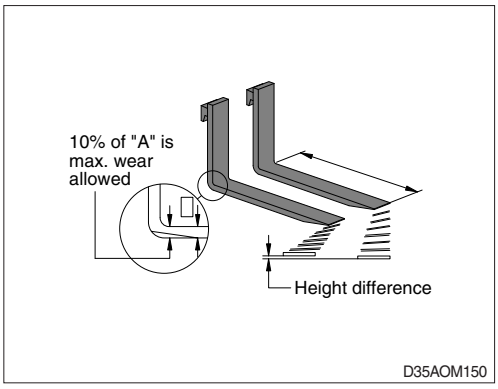
△ **Mast and lift chains require special attention and maintenance to remain in safe operating condition. Refer to lift chain maintenance in this section for additional information.**

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.

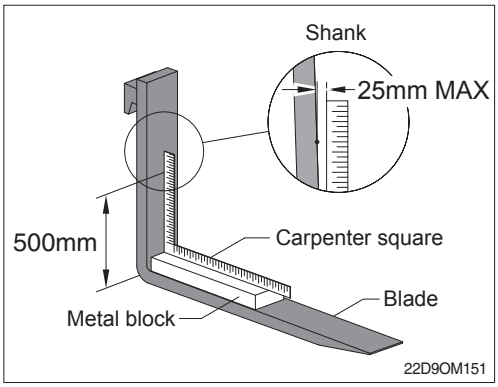
mm

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.

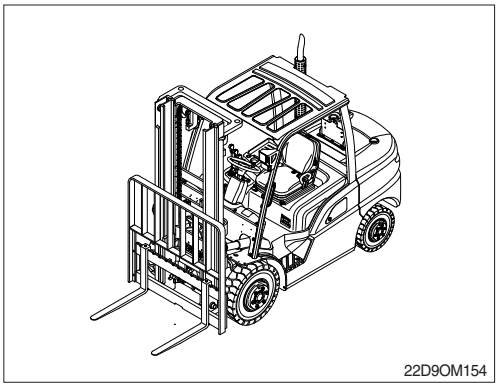


※ **If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.**

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

5) SIDE SHIFT

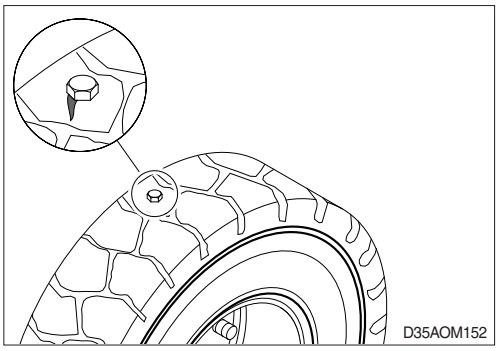
When operating the lever for the side shift and the hanger bar which the forks and the backrest are mounted on it, operator can accurately insert the forks under pallets or stack loads correctly without moving the fork lift.



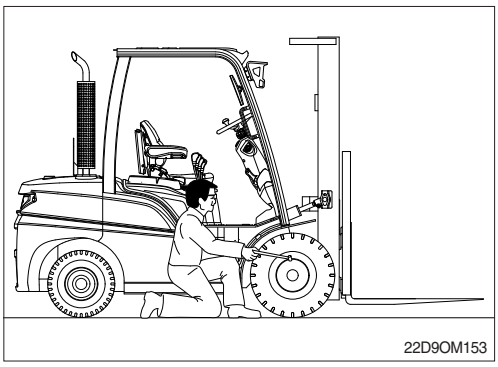
6) WHEEL AND TIRES

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.

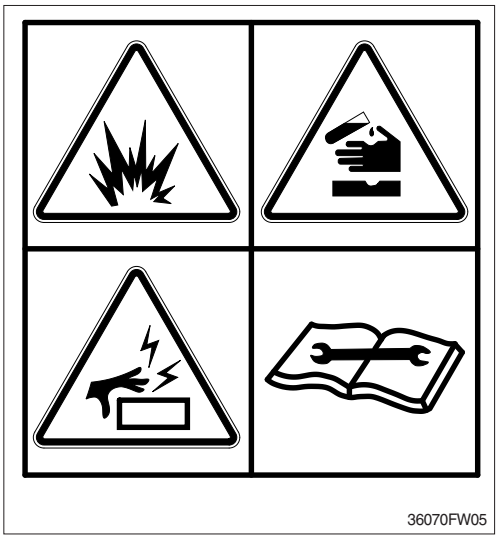


⚠ Check tire pressure from a position facing the tread of the tire, not form the side. Use a long handled gauge to keep your body away from the side. If tires are low, do not operate and do not add air. Check with a mechanic. The tire may require removal and repair.
Incorrect (low) tire pressure can reduce the stability of your lift truck. Do not operate truck with low tire pressure. Proper cold inflation is 689 kpa (100 psi).



6. REPLACEMENT AND CHECK

1) BATTERY



(1) Clean

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.

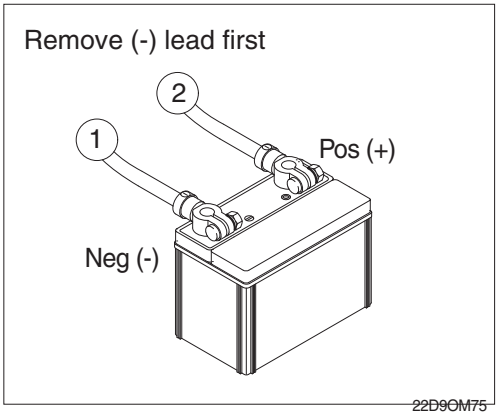
(2) Recycle

Cleaning with compressed air

Never discard a battery.
Always return used batteries to one of the following locations.

- A battery supplier
- An authorized battery collection facility
- Recycling facility

2) REMOVING AND INSTALLING

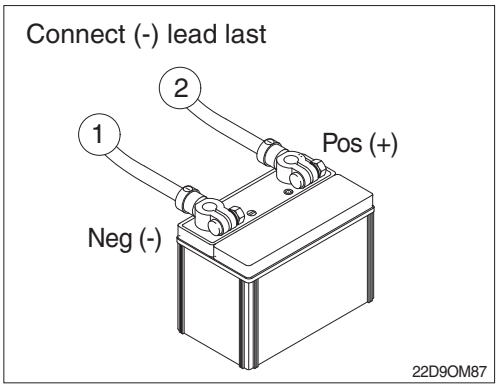


① Remove the lead from the ground side (Normally the (-) terminal side) of the battery. It is dangerous to let a tool, etc., touch the (+) terminal and the body at the same time, since this causes a spark.

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.



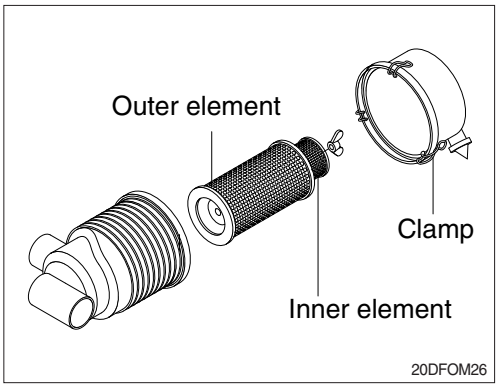
3) AIR CLEANER ELEMENT

(1) Removal

① Double element type

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

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



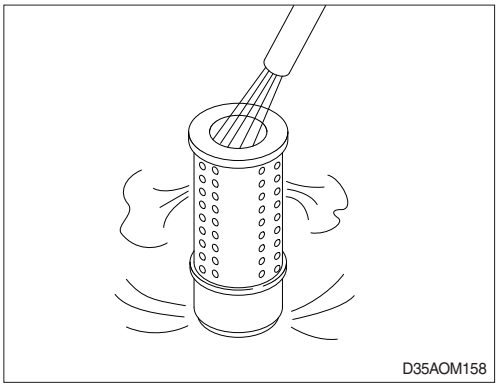
(2) Cleaning

① Cleaning with compressed air

Blow dry compressed air (Max 2 kg/cm^2, 30 psi) from inside along pleats. Next blow air form outside along pleats, then blow from inside again and check element.

② Cleaning with cleaning agent

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



※ Keep clean condition for the air cleaner element all the times.
A dirty air cleaner could be decreased output power of the engine at worst and it also will be caused to increase fuel consumption and black smoke.

(3) Installation

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

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

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

⚠ OSHA approved eye protection rated for 200 kPa (30 psi) is required for air cleaning operation. Replace element if exhaust is black, or if lack of engine power is noted even after cleaning element. When cleaning the element or element housing, cover the air flow outlet port of the housing with a clean cloth or tape to prevent dirt or dust from entering. Do not clean the elements by bumping or tapping them.

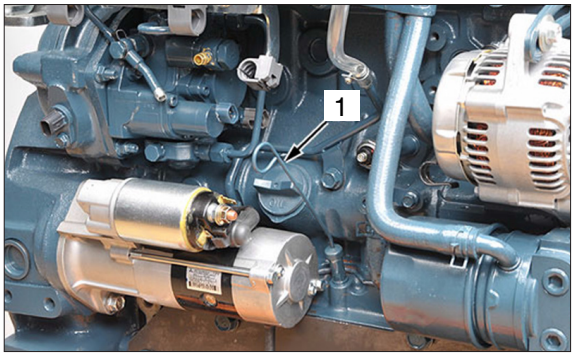
4) ENGINE

(1) Check of engine oil level

① Make the engine level.

② Pull out the dipstick (1) and clean it. Put in and pull it out again.
Make sure that the oil level is between the 2 notches.

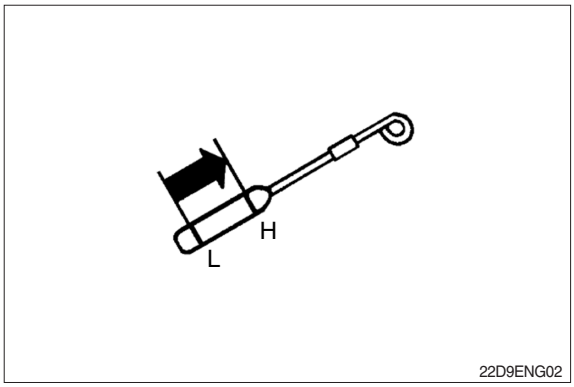
③ If the level is too low, add new oil to the specified level.



1 Dipstick 22D9ENG01

※ On Diesel Particulate Filter (DPF) equipped engines, part of the fuel may get mixed with engine oil during the regenerating process. This may dilute the oil and increase its quantity. If the oil rises above the dipstick upper limit, it means the oil has been diluted too much, resulting in a trouble. In such case, immediately change the oil for new one.

※ When you use an oil of different brand or viscosity from the previous, drain the remaining oil. Do not mix 2 different types of oil.



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※ When you examine the engine oil level, make sure that you put it in a level position. If not, you cannot measure oil quantity accurately.

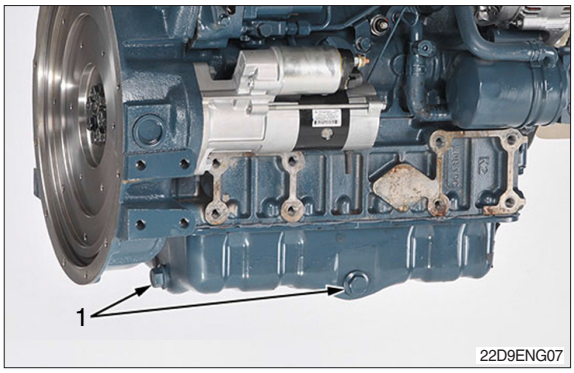
※ Make sure that you keep the oil level between the upper and lower lines of the dipstick.
Too much oil can decrease the output or cause too much blow-by gas.
On the closed breather type engine, the port absorbs the mist and too much oil can cause oil hammer. But if the oil level is not sufficient, the moving parts of engine can get a seizure.

(2) Change of engine oil

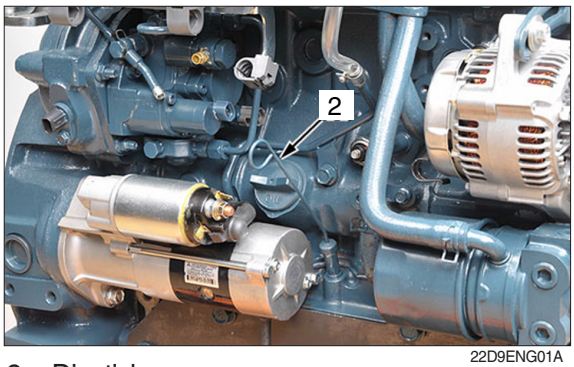
⚠ Make sure that you stop the engine before you change the engine oil.

① Start and warm-up the engine for approximately 5 minutes.
② Put an oil pan below the engine.
③ Remove the drain plug (1) at the bottom of the engine and drain the oil fully.
④ Tighten the drain plug (1).
⑤ Fill new oil until the upper line on the dipstick (2).

※ When you use an oil of different brand or viscosity from the previous, drain the remaining oil.
※ Do not mix 2 different types of oil.
※ Engine oil must have the properties of API classification CJ-4. Use the correct SAE engine oil by reference to the ambient temperature.



1 Drain plug



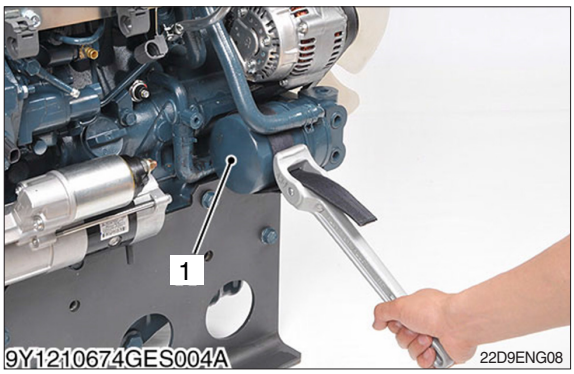
2 Dipstick

(3) Replacement of oil filter cartridge

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

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

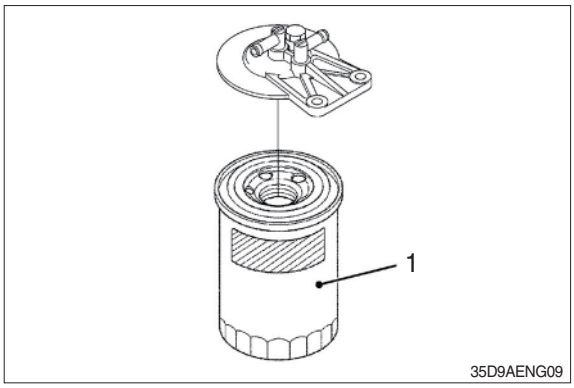
※ To prevent serious damage to the engine, replacement element must be highly efficient. Use only a Hyundai genuine filter or its equivalent.



1 Oil filter cartridge

(4) Replacement of fuel filter cartridge

⚠ Replace the fuel filler when the engine is cool. Carry out this maintenance in a place away from fire. Removing the fuel filler will produce explosive fumes. Wipe off any spilled fuel or oil immediately from the truck or surrounding area.



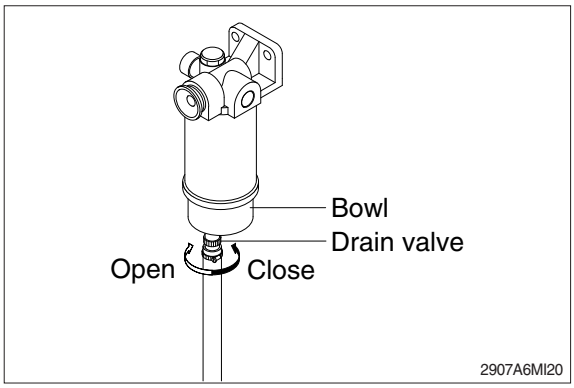
1 Fuel filter cartridge

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

※ When the fuel filter is replaced, the fuel system should be bled to remove air if the fuel supply is exhausted during driving.

(5) Check and draining of water separator

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

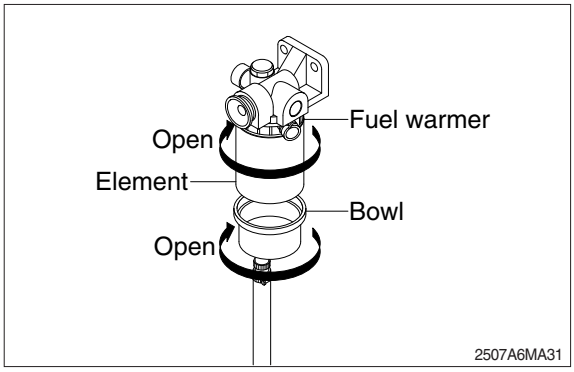


① Drain water

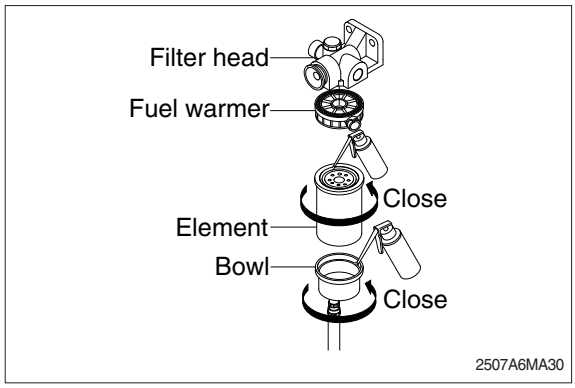
a. Open bowl drain valve to evacuate water.
b. Close drain valve.

② Replace element

a. Drain the unit of fuel. Follow "Drain water" instructions above.
b. Remove element, fuel warmer and bowl from filter head.
※ The bowl is reusable, do not damage or discard.
c. Separate element from bowl. Clean bowl and seal gland.

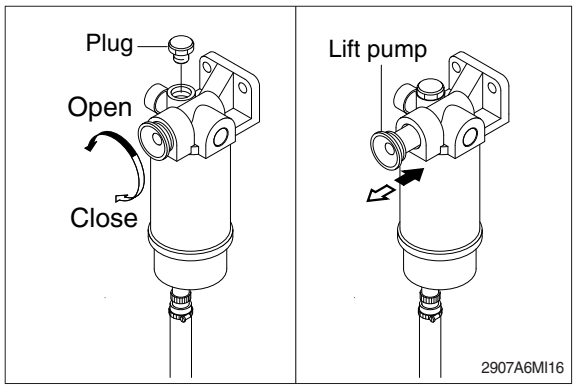


d. Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.
e. Attach bowl to new element firmly by hand.
f. Lubricate new element seal and place in element top gland.
g. Attach the element, fuel warmer and bowl to the head.



(6) 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.



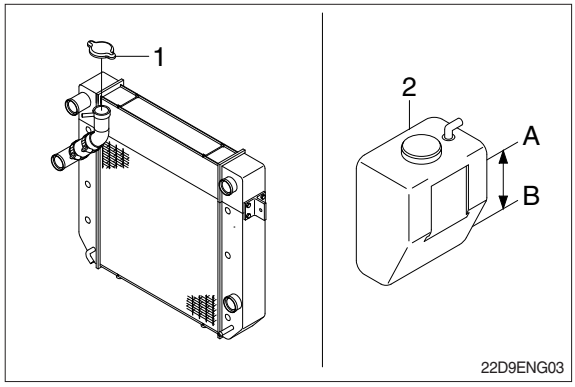
⚠ The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel.

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.

(7) Check of coolant level

⚠ Do not remove the radiator cap when the engine is hot.
Then loosen the cap slightly to release unwanted pressure before you remove the cap fully.

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



1	Radiator cap	A	Full
2	Reservoir tank	B	Low

Case 1
If the coolant decreases by evaporation, add only clean and soft water.
Case 2
If the coolant decreases by leak, add coolant of the same manufacturer and brand in the specified mixture ratio (clean, soft water and anti-freeze). If you cannot identify the coolant brand, drain all the remaining coolant and add a new brand of coolant mix.

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

(8) Fan belt and adjustment

① Check and adjustment

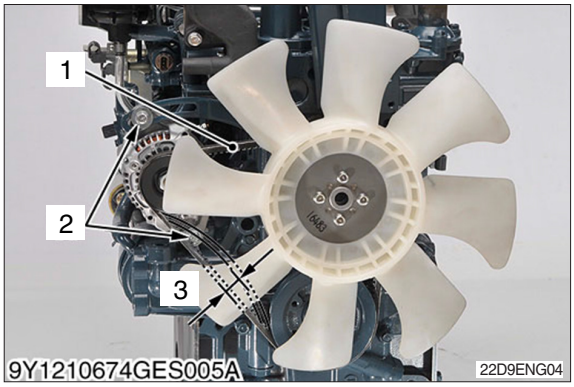
a. Examine if the fan belt is worn out and sunk in the pulley groove, and if it is, replace it.
b. Push the belt halfway between the fan drive pulley and alternator pulley at a specified force 10 kgf (22 lbf) to measure the deflection (3).
c. If the measurement is out of the factory specifications, loosen the alternator mounting screws and adjust its position.

Deflection (3)	Specification	10~12 mm (0.40~0.47 in)

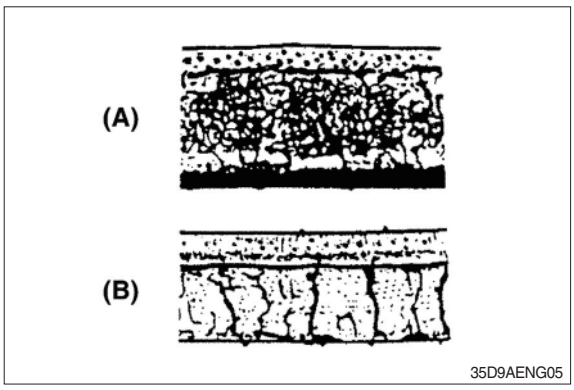
(A) OK (B) Wear

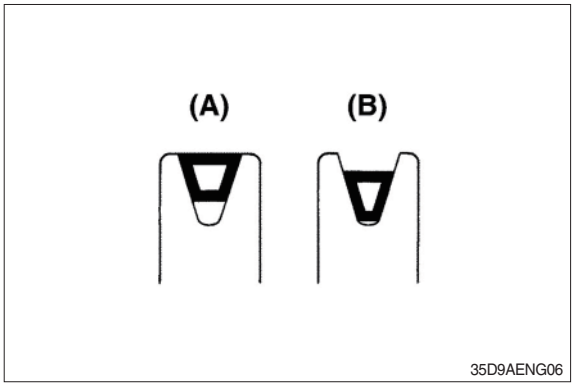
② Replacement of fan belt

a. Remove the alternator.
b. Remove the fan belt (1).
c. Replace the fan belt with a new one.
d. Install the alternator.
e. Check the deflection (3) of fan belt.



1 Fan belt
2 Alternator mounting screw
3 Deflection





(9) Check of EGR cooler

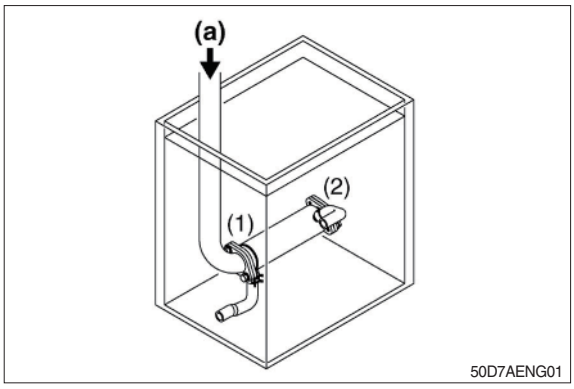
① Exhaust gas passage

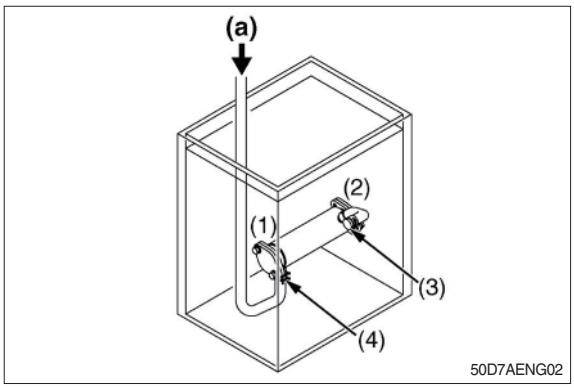
a. Block the EGR cooler exhaust gas outlet (2).
b. Attach an air hose to the EGR cooler exhaust gas inlet (1) and then submerge it in a water tank.
c. Check that the coolant passage is full of water.
d. Apply the specified amount of air pressure (a, 3.0 kgf/cm², 43 psi) to the air hose side, and check that there are no air leaks in any of the EGR cooler parts.
e. If there are air leaks, replace the EGR cooler.

② Coolant passage

a. Block the EGR cooler exhaust gas inlet (1), EGR cooler exhaust gas outlet (2), and the coolant outlet (3).
b. Attach an air hose to the EGR cooler coolant inlet (4), and then submerge it in a water tank.
c. Apply the specified amount of air pressure (a, 2.5 kgf/cm², 36 psi) to the air hose side, and check that there are no air leaks in any of the EGR cooler parts.
d. If there are air leaks, replace the EGR cooler.

EGR cooler leakage test pressure	Factory specification	Exhaust gas passage	3.0 kgf/cm² (43 psi)
		Coolant passage	2.5 kgf/cm² (36 psi)



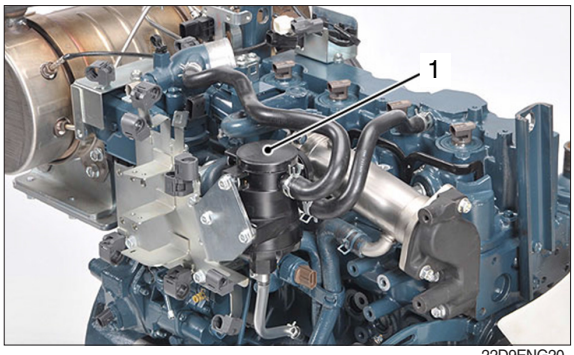


1 Exhaust gas Inlet
2 Exhaust gas outlet
3 Coolant outlet
4 Coolant inlet
a Air pressure

(10) Replacement of oil separator element

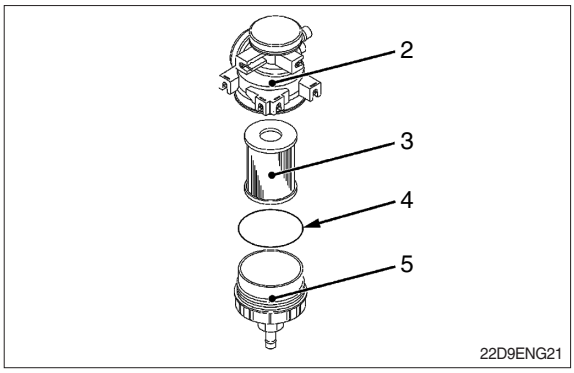
⚠ Be sure to stop the engine before replacement the oil separator element.

① Remove the case (5).
② Remove the oil separator element (3) and O-ring (4).
③ Replace the oil separator element and O-ring with a new one.



22D9ENG20

1 Oil separator

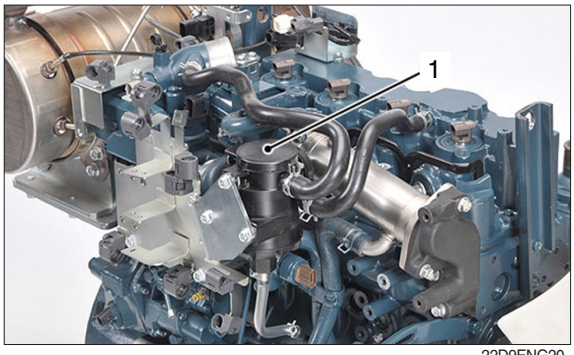


22D9ENG21

2 Body
3 Element
4 O-ring
5 Case

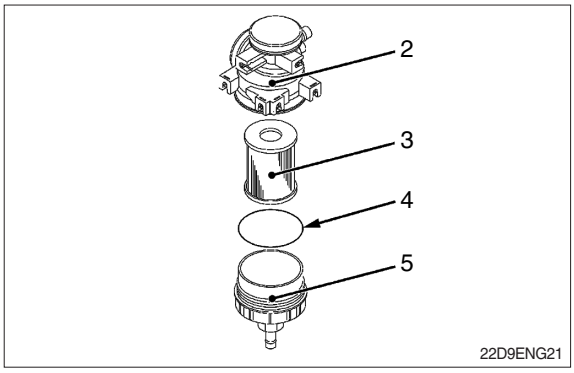
(11) Check of PCV valve (Positive Crankcase Ventilation)

① After you remove the oil separator case (5) and element (3), look into the hole leading to the PCV valve of the oil separator body (2) inside, and then check if there is no crack, break or abnormal sediment in the PCV valve.
② Check the oil separator assembly (1) for crack, oil leakage and loose connections.
③ If you find a crack or oil leakage, replace the oil separator assembly (1) with a new one.
④ If you find loose connections, tighten the clamp or replace the hoses.



22D9ENG20

1 Oil separator

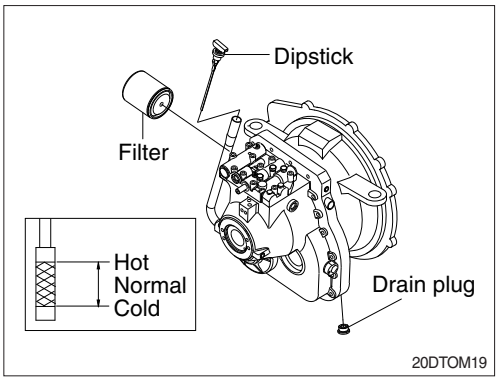


22D9ENG21

2 Body
3 Element
4 O-ring
5 Case

5) 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.

(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.

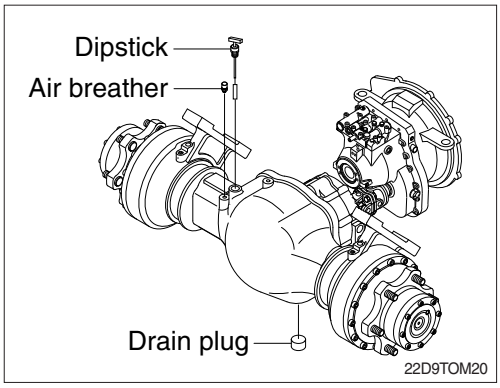
(3) Change

① Remove drain plug.
② When changing oil, remove strainer and clean it with flushing oil.

⚠ **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.

6) DIFFERENTIAL CASE



(1) Differential oil

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

Then stop the engine and apply the parking brake.

(2) Oil level check

Remove level plug, and check that oil is filled up to hole.

(3) Change

Change oil after removing drain plug.

Add oil until it just begins to flow out of the oil level.

Dispose of used oil in locally approved manner.

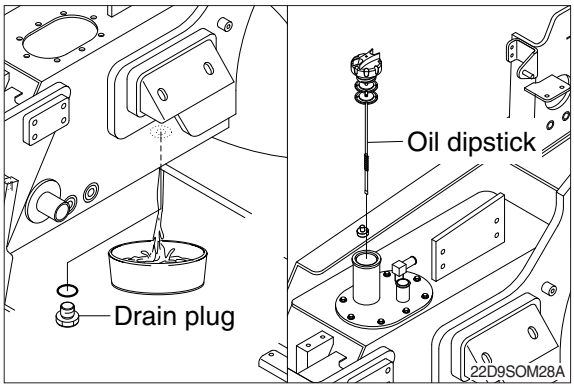
7) HYDRAULIC TANK

(1) Hydraulic oil change

Park the truck in a level place and lower the forks.

Then stop the engine and apply the parking brake.

Change oil after removing drain plug on tank bottom.



(2) Strainer Cleaning

⚠ OSHA-approved eye protection rated for 2 kg/cm² (30 psi) is required for air cleaning operation.

① When changing oil, remove strainer and clean it with flushing oil. Blow dry compressed air from inside of strainer to outside and install when completely dry.
Dispose of oil in locally approved manner.

② Bleed the air after checking the oil level as below;

- Start engine.
- Check for mast overhead clearance.
- Fully raise and lower mast and also fully tilt it forward and backward several times.
- Recheck oil level.

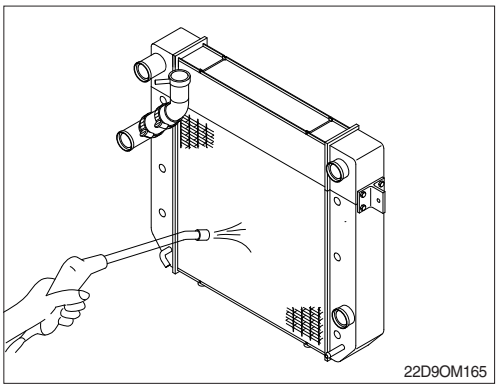
8) COOLING SYSTEM

(1) Radiator fins cleaning

Remove dust between radiator fins with compressed air. Steam or water may be used instead of compressed air. Air pressure should be less than 2 kg/cm² (30 psi). Nozzle of cleaning device should be held about 50 mm (2 in) from radiator fins. Also, check rubber hose connected to radiator. Replace if cracked or deteriorated. Check that hose clamps are tight.

⚠ Be sure to keep air or steam nozzle at right angles to radiator. Wear safety glasses and a face shield when using compressed air.

(2) Radiator Cleaning



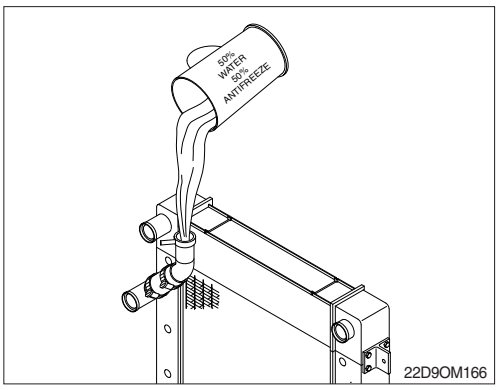
① Close drain valves and add clean, soft water (city water, etc.) through water filler. Add radiator cleaner and run the engine at idling speed for 15 minutes.

② Stop engine and drain water from drain valves.

③ Add clean water and run at idling speed (5 to 10 minutes). Then stop the engine and drain water.

④ Close drain valves and fill radiator with clean water.

※ Do not pour cold water in an overheated engine. It can be caused the crack of the engine block due to sudden cooling.



⚠ For low temperatures, add antifreeze.(See cold weather operation for details). When not using antifreeze, add anticorrosive compound. Park truck on level ground and clean radiator.

※ Replace the coolant from time to time to clean up the cooling system so that it can prevent the engine from overheating problem and always keep the specified level for the coolant.

※ Dispose of used antifreeze mixture in locally approved manner.

9) 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 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**

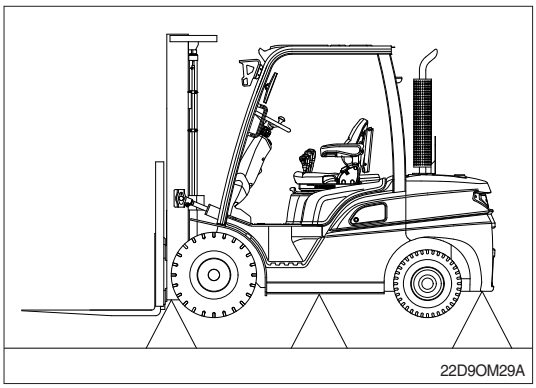
Front tires : Bottom of outer mast or bottom of frame.

Rear tires : Bottom of counterweight or bottom of 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).

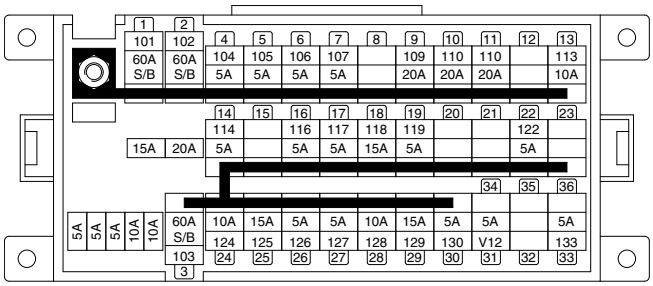
⑧ Check and adjust the inflation pressure.
Tire inflation pressure : For details, see 5-3 page, CHECK BEFORE STARTING ENGINE.

⚠ **Precautions for adjusting the inflation pressure when repairing a puncture.**

※ **The tires used on forklift trucks have a high inflation pressure, so any cracks or deformation of the rim are extremely dangerous. When adjusting the inflation pressure, do not raise the pressure above the correct level under any circumstances. If the pressure of the compressor is not adjusted beforehand, the pressure inside the tire will rise to the maximum air pressure of the compressor, and this may cause a serious accident. Therefore, always be extremely careful when carrying out this work.**

10) FUSES REPLACEMENT

No.	Capacity	Related electrical component
①	60A	Alternator
②	60A	Glow plug
③	60A	Main power
④	5A	Horn
⑤	5A	Flasher unit
⑥	5A	Warning buzzer
⑦	5A	MCU
⑧	-	-
⑨	20A	ECU
⑩	20A	Air conditioner 1
⑪	20A	Air conditioner 2
⑫	-	-
⑬	10A	OHG/Cabin
⑭	5A	Gear selector
⑮	-	-
⑯	5A	OPSS solenoid
⑰	5A	Parking
⑱	15A	Combi switch
⑲	5A	Alternator IG
⑳	-	-
㉑	-	-
㉒	5A	Air conditioner
㉓	-	-
㉔	10A	MCU/Cluster
㉕	15A	OHG/Cabin (IG)
㉖	5A	Brake lamp
㉗	5A	Seat heater
㉘	10A	Work/beacon lamp
㉙	15A	Fuel warmer
㉚	5A	Signal power
㉛	5A	Start relay
㉜	-	-
㉝	5A	ECU
㉞	5A	Start relay
㉟	-	-
㊱	5A	ECU



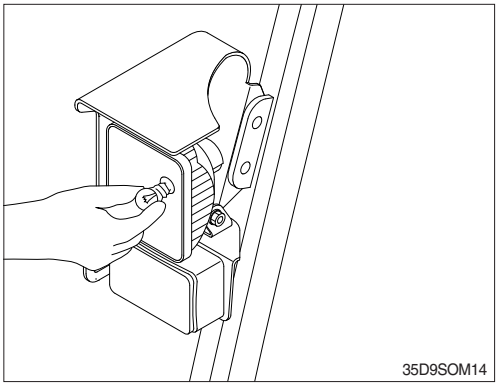
① Turn the starting switch OFF.

② Open the cover of the fuse box, and replace fuses inside (To open the cover of the fuse box, push the side of the cover lightly with a finger, and pull the cover forward to remove it.)

⚠ When replacing the fuse, check the relationship between the fuse and the electrical components it protects. Always replace fuses with a fuse of the same capacity. Always turn the starting switch OFF before replacing any fuse.

11) LAMP BULBS REPLACEMENT

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



⚠ After checking that the fuse is not blown and that there is no disconnection in the wiring harness, replace the lamp bulb.

12) FUNCTIONAL TESTS

You will start the engine to complete the functional tests, so be sure that:

- The parking brake is applied.
- Directional control is in NEUTRAL.
- Forks are fully lowered to the floor or ground.
- All controls are in neutral or other correct position.
- You are familiar with the safety procedures given in section 5, **Starting and operating procedures**, in this manual.

As you test the following components, be sure they are properly mounted and working correctly.

(1) Horn

Press the horn button to check horn function. If the horn or any other part does not operate, report the failure and have it repaired before the truck is put into operation.

(2) Hour meter

Start the engine and let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal. Check the hour meter for operation with the engine running. Write the hour meter reading on the PM report form. Report any malfunction or damage.

(3) Indicator lights

Check that all lights are functioning and indicate normal truck operation as described in section 3, Know your truck, in this manual.

(4) Service brakes and inching pedal

With the direction control in NEUTRAL and the engine running, push the service brake pedal fully down and hold. The brakes should apply before the pedal reaches the floor plate. If the pedal continues to creep downward, report the failure immediately. Do not operate the truck until the brakes are repaired. Perform the same check with the inching pedal. (Additional braking/inching checks will follow).

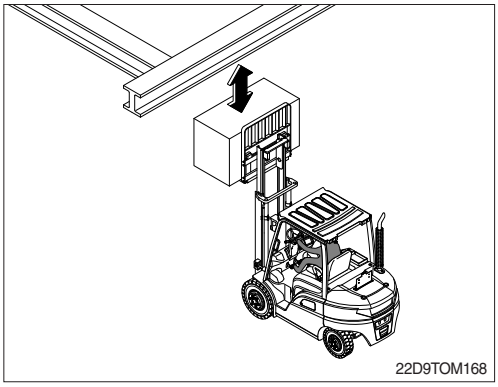
(5) Parking brake

Check the function of the parking brake. Release, then reapply. To check parking brake holding capability, park the lift truck on a grade and apply the parking brake. The parking brake should hold a lift truck with rated load on a 15% grade.

⚠ Do not operate a lift truck if the service or parking brakes are not operating properly.

(6) Lift mechanisms and controls

Pull back on the tilt control lever and hold until the mast reaches the full back tilt position. Push forward on the lever to return the mast to the vertical position. Release the lever.



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

Pull back on the lift control lever and raise the fork carriage to full height. Watch the mast assembly as it rises. Release the lever.

If the maximum fork height is not reached, this indicates there is an inadequate (low) oil level in the hydraulic sump tank or severe binding within the mast.

Push forward on the lift control lever. Watch the mast as it lowers. When the forks reach the floor, release the lever.

All movements of the mast, fork carriage, and lift chains must be even and smooth, without binding or jerking. Watch for chain wobble or looseness; the chains should have equal tension and move smoothly without noticeable wobble.

(7) Auxiliary controls (Option)

If your lift truck is equipped with an attachment, test the control lever for correct function and briefly operate the attachment.

(8) Steering system

※ **The steering system, steering axle, and steering linkage on your truck should be inspected periodically for abnormal looseness and damage, leaking seals, etc.. Also, be alert for any changes in steering action. Hard steering, excessive freeplay (looseness), or unusual sound when turning or maneuvering indicates a need for inspection or servicing.**

Check the steering system by moving the steering handwheel in a full right turn and then in a full left turn. Return the handwheel to the straight ahead position. The steering system components should operate smoothly when the handwheel is turned. Never operate a truck that has a steering system fault.

⚠ **Fasten your seat belt before driving the truck.**

(9) Direction control, braking and inching

※ **Be sure that the travel area is clear in front of the truck.**

① Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from NEUTRAL to FORWARD.

② Remove your right foot from the service brake pedal and put it on the accelerator pedal. Push down until the truck moves slowly forward. Remove your foot from the accelerator pedal and push down on the service brake pedal to stop the truck. The brakes should apply smoothly and equally.

※ **Be sure that the travel area is clear behind the truck.**

③ Put the directional control lever in the REVERSE travel position. Release the service brake and push down on the accelerator pedal until the truck moves slowly in the reverse direction. Remove your foot from the accelerator pedal and push down on the service brake pedal to stop the truck. The brakes should apply smoothly and equally.

④ Put the directional control in FORWARD. Press the inching pedal fully down and hold. Depress the accelerator. The truck should not move. Now, with the accelerator still depressed, slowly release the inching pedal until the truck Inches forward smoothly and slowly.

※ **Report any problems.**

※ **When you have completed the operational tests, park and leave the truck according to standard shut down procedure as described in section 5 of this manual. Be sure to make a record of all maintenance and operating problems you find.**

13) 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 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 deposit on tube or hose surfaces indicate a leak.

Change or service the air cleaner element every one year, depending upon your application. Service intervals may also be determined by the air restriction indicator.

(3) Battery

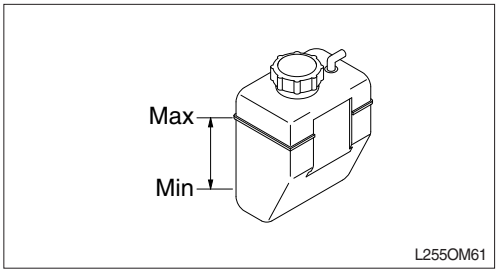
Inspect the battery for damage, cracks, leaking condition, etc.. If the terminals are corroded, clean and protect them with HYUNDAI battery saver (Available from your HYUNDAI dealer). If your battery has removable cell caps, check to be sure the cells are all filled. Refill them with distilled water.

⚠ When refill the distilled water in the battery, be careful not to allow the fluid to come in contact with eyes, skin, clothing and metal surface. If the fluid has come in contact with them, wash it out immediately with water.

⚠ EXPLOSIVE GASES : Do not smoke or have open flames or sparks near batteries. An explosion can cause injury or death.

(4) Engine cooling system

To check 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 fill 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 engine oil for presence of coolant leaking into 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 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 oil level.

It is normal to add some oil between oil changes. Keep the oil level between the Full 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 :

- Check and add the engine crankcase oil every day (Depending on application).
- Replace the diesel engine oil filter every 500 hours.
- Remove the oil pan drain plug to drain old oil after the truck has been in operation and the engine (oil) is operating temperature.

⚠ **Engine oil at operating temperature is hot and can cause burns. Beware of splashing oil.**

- Carefully check for leaks after changing oil and installing 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 diesel engines, HYUNDAI recommends that you use motor oil that meets API CJ-4, SAE 10W-30.

(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 dipstick and check 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 replace the hydraulic sump fluid every 2000 or 5000 operating hours. (Severe service or adverse conditions may require more frequent fluid change). Please to the page 7-11 for service interval. 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 2000 hours thereafter.

Check for leaks after installation of the filter. Also, check that the hydraulic line connections at the filter adapter are tightened correctly.

(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 minimum of 65˚C (150˚F) to 120˚C (250˚F) maximum, 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 FULL mark 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.

14) LUBRICATION

(1) Truck chassis inspection and lubrication

Lubrication and inspection of truck chassis components, including 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 machine 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 trunnion bushings.

(3) Lift chains

Lubricate the entire length of the mast rail lift and carriage chains with HYUNDAI chain and cable lube.

15) 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.

16) 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 components that directly support, handle, or control the load and protect the operator. (SEE 8. SPECIFICATIONS)

Critical items include:

- Drive axle mounting
- Overhead guard
- Drive and steering wheel mounting
- Tilt cylinder mounting and yokes
- Counterweight mounting
- Mast mounting and components

Torque specifications are in your service manual.

17) 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. Do not piece chains together.

(1) Lift chain inspection and measurement

Inspect and lubricate the lift chains every PM (250 hours). When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following conditions:

· Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear, and worn pins or holes.

· When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.

· Chain wear can be measured by using a chain scale or a steel tape measure. When checking chain wear, be sure to measure a segment of chain that moves over a sheave. Do not repair chains by cutting out the worn section and joining in a new piece. If part of a chain is worn, replace all the chains 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**

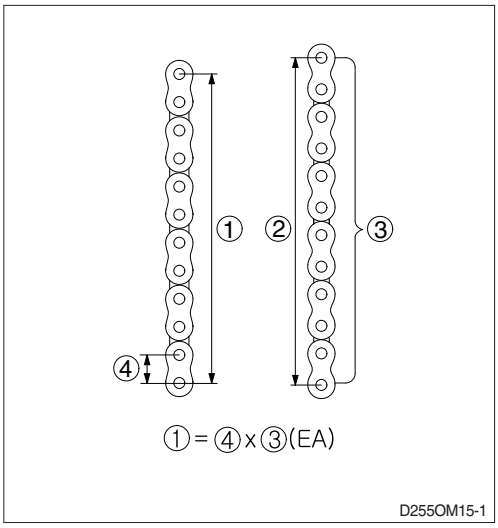
The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.

③ **Span**

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

④ **Pitch**

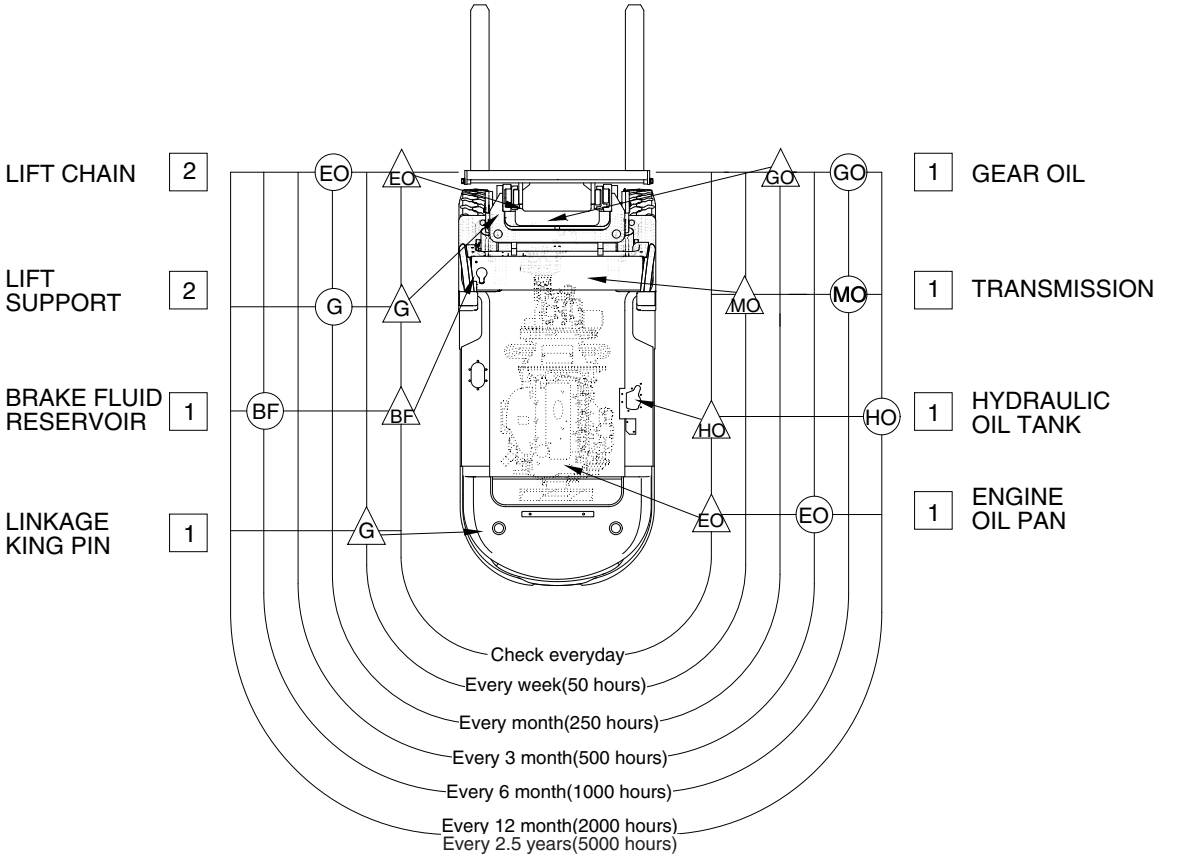
The distance from the center of one pin to the center of the next pin.



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.

7. LUBRICATION CHART



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NOTES

① △: Check, add oil when needed.

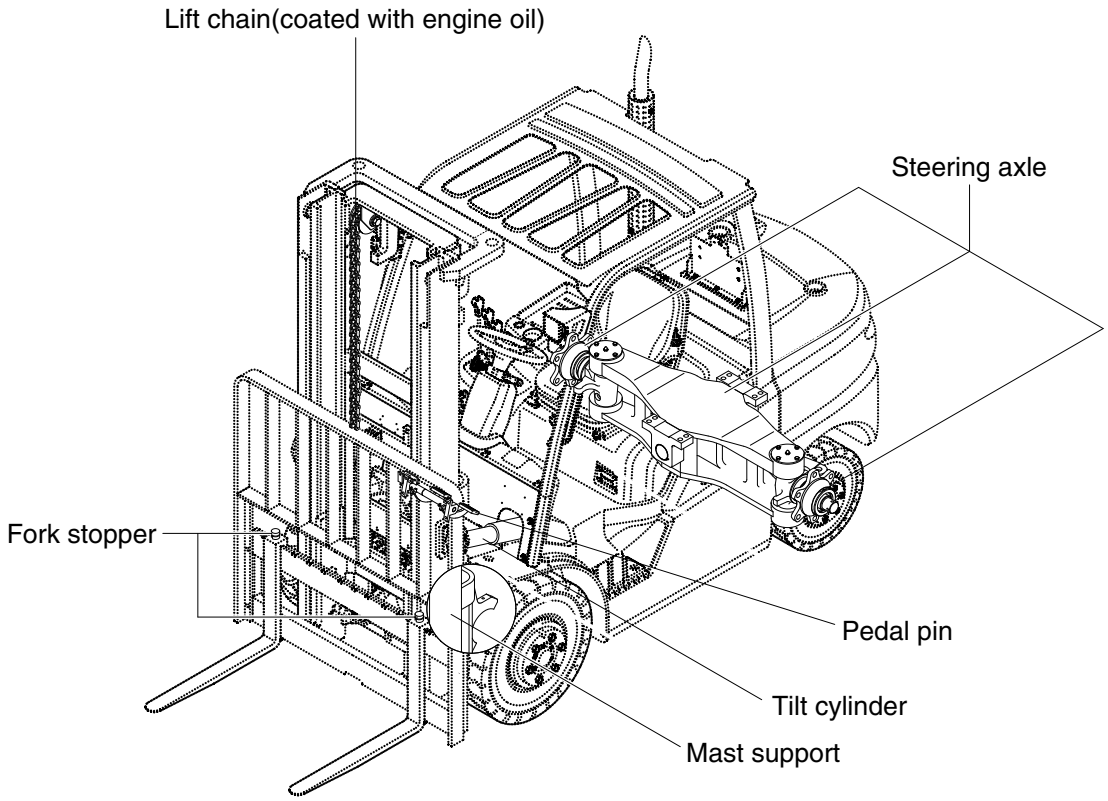
② ○: Change oil or add oil.

③ Figures in squares indicate number of lubricating points.

④ All service intervals in the chart are based on daily, 2 weeks, 1 month, 3 months, 6 months, and service meter readings.

Mark	Kind of lubricants	In moderate weather	Cold region
EO	Engine oil	API CJ-4 class	
MO	T/M oil	ATF DEXRON III	
GO	Gear oil	Shell DONAX TD	
HO	Hydraulic oil	ISO VG 46, VG68	ISO VG 15
BF	Brake fluid	AZOLLA ZS32 (Hydraulic oil ISO VG32)	
G	Grease	NLGI No. 2	NLGI No.1

8. GREASING POINT



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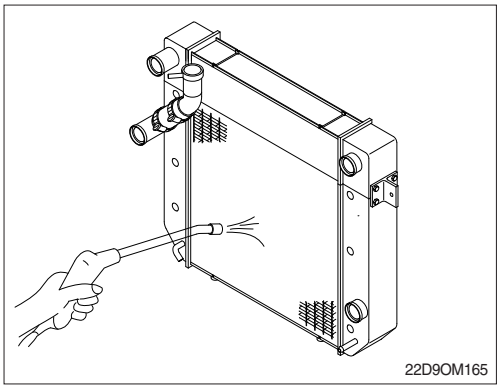
9. HANDLING MACHINE IN EXTREMELY HOT PLACES

Pay careful attention particularly to the following points when handling the machine in extremely hot places.



■ **Cooling system**

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 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.**

※ **Always keep fill the coolant to specified level and check for coolant leaks if necessary.**

■ **Battery**

In case of operating the machine in hot weather, it will be fallen fast the electrolyte level of the battery. Always check the electrolyte level of the battery and make sure that the level is kept near the upper level.

10. 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 ambient temperature drops, battery capacity will drop and electrolyte may sometimes freeze if battery charge is low. Maintain battery at a charge level of over 75% and insulate it against cold temperature so that machine 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 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.**

11. STORAGE

1) BEFORE STORAGE

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

(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.

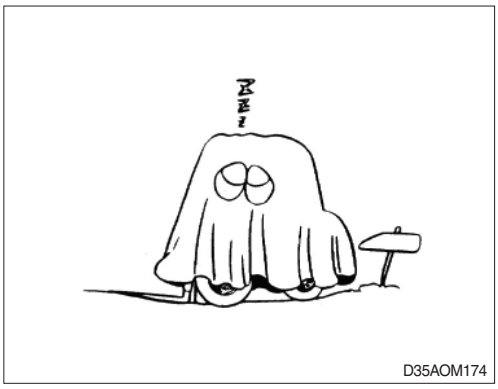
(4) Coat exposed piston rods of all hydraulic cylinders fully with grease.

(5) Cover batteries after removing terminals, or remove battery from the machine and store separately.

(6) When the atmospheric temperature is anticipated to drop below 0˚C , add antifreeze. (Refer to COLD WEATHER OPERATION about ratio of water and antifreeze.)

2) DURING STORAGE

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



⚠ The above operations should be performed in the open. If they have to be performed inside a building, open the windows and doors to improve ventilation.
This is to avoid the danger of gas poisoning.

※ BATTERY

① Once a month, start the engine for 15 minutes (or use a charger) to charge the battery.
② Every 2 months, check the battery voltage and keep battery voltage over 12.54V.
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.

12. TRANSPORT

1) PRECAUTIONS FOR LOADING AND UNLOADING

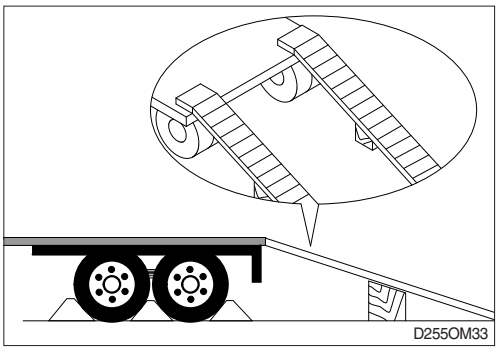
Contact your HYUNDAI forklift distributor for advice regarding transportation of the machine.
When loading or unloading the machine on or from a transporter, using loading ramp, the following precautions must always be observed.

⚠ **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. Place the transmission control in NEUTRAL.

(2) Fix the loading ramps securely so that the centers of the transporter and machine are aligned. (The loading ramps should be of sufficient width, length and thickness to permit safe loading or unloading.)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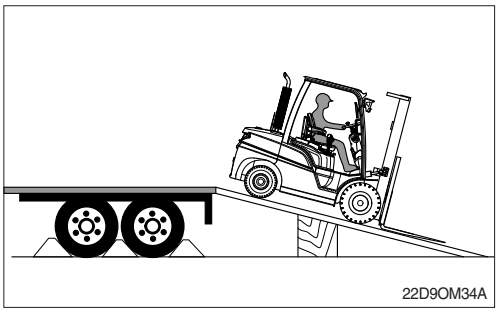
(3) After checking that the machine is aligned with the loading ramps, back the machine slowly up the ramps to load it on the transporter.

⚠ **When on the loading ramps, never change direction. If it is necessary to change direction, drive off the ramp and realign the machine.**
Block the wheels and secure the lift truck with tiedowns.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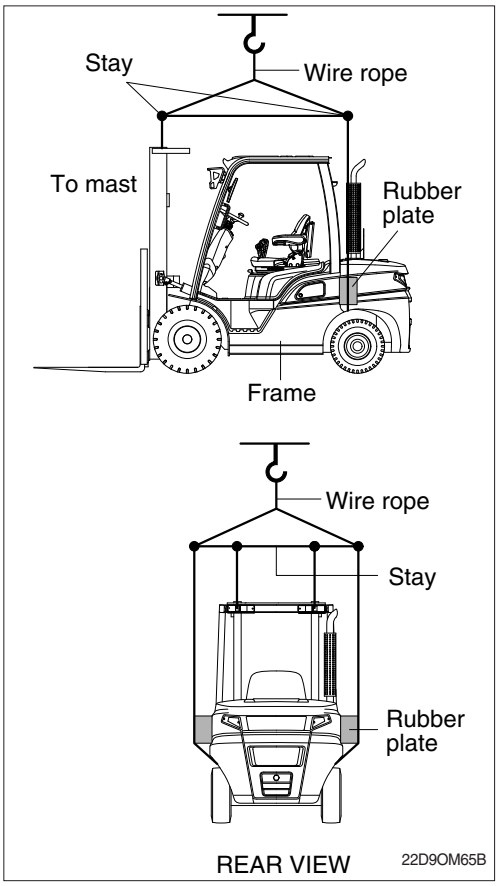
13. LOADING AND UNLOADING BY CRANE

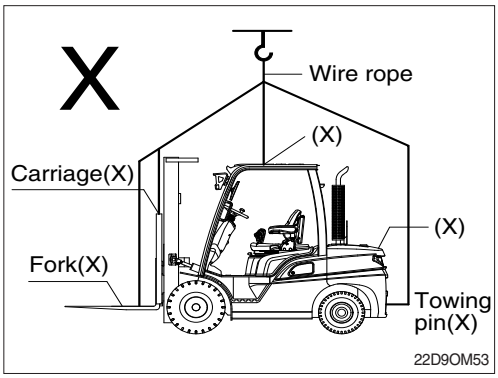
1) Check the specification of the truck when you are going to hoist the truck.
2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the truck body.
3) Put a rubber plate where the wire rope contact with the truck's body to prevent damage.
4) Place crane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

6) If there is lifting brackets on the truck's body, use them to lift a truck.

⚠ Use appropriate method for your forklift truck.
⚠ 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.



14. 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
Gear 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
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water

- SAE : Society of Automotive Engineers
- API : American petroleum Institute
- ISO : International Organization for Standardization
- NLGI : National Lubricating Grease Institute
- ASTM : American Sociery of Testing and Material

★1 : Cold region
Russia, CIS, Mongolia

15. 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	11.2 (3.0)	★SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Torque converter transmission	Transmission oil	10 (2.6)	ATF DEXRON III
Axle	Gear oil	5 (1.3)	Shell DONAX TD
Hydraulic tank	Hydraulic oil	40 (10.6)	★ISO VG 15 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel★1	60 (15.9)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (Grease nipple)	Grease	-	★NLGI NO.1 NLGI NO.2
Brake reservoir tank	Brake oil	0.5 (0.13)	★AZOLLA ZS10 (Hydraulic oil, ISO VG10) AZOLLA ZS32 (Hydraulic oil, ISO VG32)
Radiator	Antifreeze : Water	9.4 (2.48)	Ethylene glycol base permanent type (50:50) ★Ethylene glycol base permanent type (60 : 40)

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

16. 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
22/25/30/33D-9/35DA-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

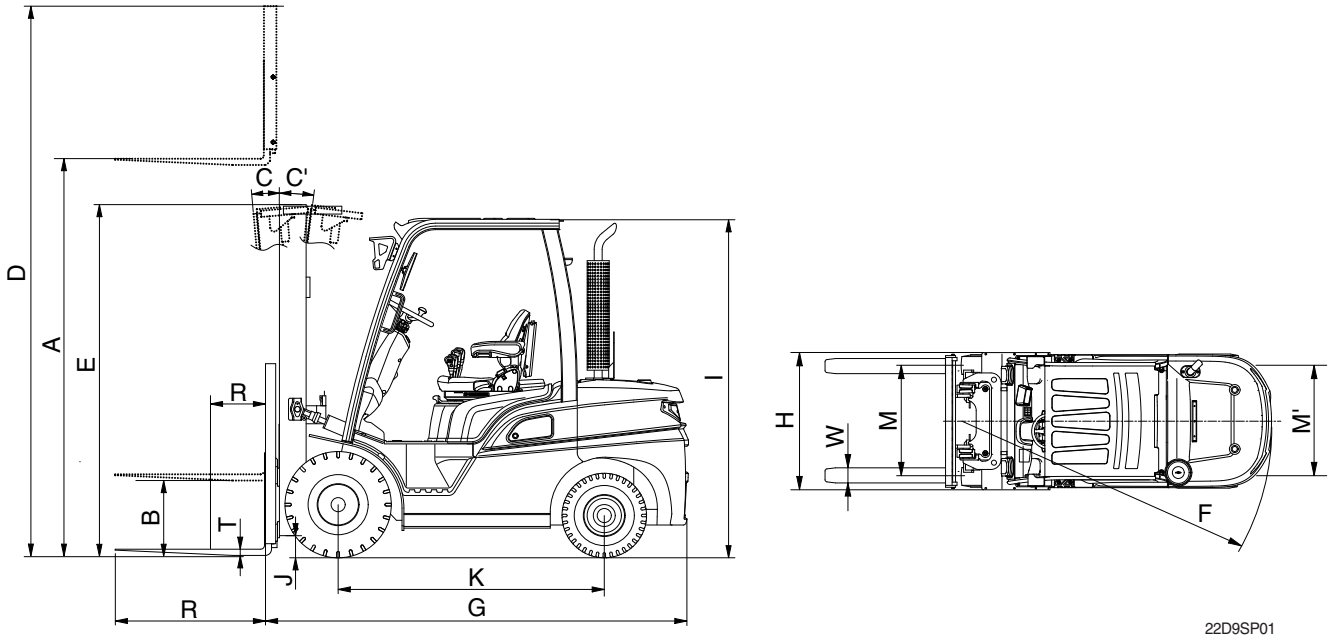
① Eye contact / Limited skin contact
Rinse with warm water and apply a light bandage. Seek medical attention immediately.

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.

8. SPECIFICATIONS

1. SPECIFICATION TABLE



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Model				Unit	22D-9	25D-9	30D-9	33D-9	35DA-9
Capacity				kg (lb)	2200 (4400)	2500 (5000)	3000 (6000)	3300 (6500)	3500 (7000)
Load center			R	mm (in)	500 (24")	←	←	←	←
Weight (Unloaded)				kg (lb)	3573 (7880)	3888 (8570)	4282 (9440)	4561 (10060)	4698 (10360)
Fork	Lifting height		A	mm (ft·in)	3305 (10' 10")	←	←	←	←
	Free lift		B	mm (in)	155 (6.1")	←	←	←	←
	Lifting speed (Unload/Load)	Non-booster		mm/sec	640/570	640/560	530/470	530/460	530/450
		Booster		mm/sec	610/550	610/540	500/450	500/440	470/420
	Lowering speed (Unload/Load)			mm/sec	450/500	←	←	←	←
	L × W × T		L,W,T	mm (in)	1050×100×45 (41.3×3.9×1.8)	←	1050×122×45 (41.3×4.8×1.8)	←	←
Mast	Tilt angle (forward/backward)		C/C'	degree	6/10	←	←	←	←
	Max height		D	mm (ft·in)	4485 (14' 9")	←	←	←	←
	Min height		E	mm (ft·in)	2175 (7' 2")	←	2190 (7' 2")	2260 (7' 5")	←
Body	Travel speed (Unload)			km/h	18.5	←	20	←	←
	Gradeability (Load)			%	45.8	40.7	31.9	29	27.7
	Min turning radius (Outside)		F	mm (ft·in)	2286 (7' 6")	2342 (7' 8")	2413 (7' 11")	2463 (8' 1")	2490 (8' 2")
ETC	Operating pressure			kgf/cm²	200	←	←	←	←
	Hydraulic oil tank			ℓ (usgal)	36	←	38	←	←
	Fuel tank			ℓ (usgal)	60	←	←	←	←
Overall length			G	mm (ft·in)	2577 (8' 5")	2607 (8' 7")	2676 (8' 9")	2732 (9' 0")	2766 (9' 1")
Overall width			H	mm (ft·in)	1200 (3' 11")	←	1228 (4' 0")	←	←
Overhead guard height			I	mm (ft·in)	2160 (7' 1")	←	2180 (7' 2")	←	←
Ground clearance			J	mm (in)	130 (3.1")	←	145 (5.7")	←	←
Wheel base			K	mm (ft·in)	1650 (5' 5")	←	1700 (5' 7")	←	←
Wheel tread front/rear			M/M'	mm (ft·in)	999/980 (3' 3"/3' 3")	←	1005/980 (3' 6"/3' 3")	←	←

2. SPECIFICATION FOR MAJOR COMPONENTS

1) ENGINE

Item	Unit	Specification
Model	-	KUBOTA V3307
Type	-	Vertical, water-cooled, 4-cycle diesel
Cooling Method	-	Water cooling
Number of cylinders and arrangement	-	4 cylinders, in-line
Firing order	-	1-3-4-2
Combustion type	-	Center direct injection system (E-CDIS)
Cylinder bore X stroke	mm (in)	94×120 (3.7×4.7)
Piston displacement	cc (cu in)	3331 (203)
Compression ratio	-	17.5
Rated gross horse power	ps/rpm	68/2300
Maximum gross torque at rpm	kgf · m/rpm	23.3/1500
Engine oil quantity	ℓ (U.S.gal)	11.2 (2.95)
Dry weight	kg (lb)	305 (672)
High idling speed	rpm	2500
Low idling speed	rpm	900±50
Rated fuel consumption	g/ps.hr	173
Starting motor	V-kW	12-3
Alternator	V-A	14-45
Battery	V-AH	12-100
Fan belt deflection	mm (in)	10~12 (0.39~0.47)

2) MAIN PUMP

Item	Unit	Specification
Type	-	Fixed displacement gear pump
Capacity	cc/rev	32
Maximum operating pressure	bar	250
Rated speed (Max/Min)	rpm	2700/500

3) MAIN CONTROL VALVE

Item	Unit	Specification
Type	-	Sectional
Operating method	-	Mechanical
Main relief valve pressure	kg/cm^2	200/165
Flow capacity	lpm	80

4) POWER TRAIN DEVICES

Item			Specification
Torque converter	Model		KAPEC 280DB / ★280DJ
	Type		3 Element, 1 stage, 2 phase
	Stall ratio		2.87
Transmission	Type		Power shift
	Gear shift (FWD/REV)		1/1
	Control		Solenoid ON/OFF type
	Overhaul ratio	FWD	1.143 / ★1.4375
		REV	1.143 / ★1.4375
Axle	Type		Front-wheel drive type, fixed location
	Gear ratio		14.2 : 1 / ★11.568 : 1
	Gear		Spiral bevel gear type
Wheels	Q'ty (FR/RR)		Single : 2/2, Double : 4/2
	Front (drive)	2.2 (-#0079)	Single : 7.00-12-14 PR Double : 6.00-15-10 PR
		2.5 (-#1193)	
		3.0 (-#3048)	Single : 28×9-15-14 PR Double : 6.00-15-10 PR
		3.3 (-#0687)	
		3.5 (-#0255)	
	Rear (steer)	2.2 (-#0079)	Single : 6.50-10-14 PR
		2.5 (-#1193)	
		3.0 (-#3048)	
		3.3 (-#0687)	
		3.5 (-#0255)	
	Front (drive)	2.2 (#0080-)	Single : 7.00-12-12 PR Double : 6.00-15-10 PR
		2.5 (#1194-)	
		3.0 (#3049-)	Single : 8.15-15-14 PR Double : 6.00-15-10 PR
		3.3 (#0688-)	
		3.5 (#0256-)	
	Rear (steer)	2.2 (#0080-)	Single : 6.50-10-12PR
		2.5 (#1194-)	
		3.0 (#3049-)	
		3.3 (#0688-)	
		3.5 (#0256-)	
Brakes	Travel		Front wheel, wet disk brake
	Parking		Wet disk (negative brake)
Steering	Type		Full hydraulic, power steering
	Steering angle		78.9˚ to both right and left angle, respectively

★ : Option

3. TIGHTENING TORQUE

No.	Items		Size	kgf · m	lbf · ft
1	Engine	Engine mounting nut (bracket-engine mount)	M12×1.25	9.7±1.9	70±13.7
2		Engine mounting bolt (engine-bracket)	M14×1.5	12.3±2.4	89±17.4
3		Radiator mounting nut	M10×1.5	5±1	36.2±7.2
4		Torque converter mounting bolt (8EA)	M10×1.25	7.4±1.5	53.5±10
5	Hydraulic system	MCV mounting bolt	M10×1.5	4±0.5	29±3.6
6		Steering unit mounting bolt	M10×1.5	4±0.5	29±3.6
7		Pump mounting bolt	M10×1.5	5.3±0.5	38.3±3.6
8	Power train system	Transmission mounting bolt, nut	M16×2.0	7.5	54
9		Drive axle mounting bolt, nut	M20×1.5	65±3	470±21
10		Steering axle mounting bolt	M20×2.5	58±8.5	420±61
11		Front wheel mounting nut	M20×1.5	40±10	289±72
12		Rear wheel mounting nut	M16×1.5	18±2	130±14
13		Separated rim assembling bolt, nut	M10×1.25	6.15±0.5	45±4
14		Separated rim assembling bolt, nut	M12×1.25	13.3±2.7	96±20
15		Separated rim assembling bolt, nut	M16×1.5	31.3±4.7	226±34
16	Others	Counterweight mounting bolt	M30×3.5	199±30	1439±217
17		Operator's seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
18		Head guard mounting bolt, nut	M12×1.75	12.3±1.2	89.0±8.7

1. ENGINE SYSTEM

Trouble symptom	Probable cause	Remedy
Oil pressure warning lamp fails to go out.	· Low oil level in oil pan. · Oil filter element clogged. · Loose or worn oil pipe joint leaks oil.	· Add oil. · Replace element. · Check and repair.
Radiator pressure valve spouts steam.	· Lack of cooling water or water leakage. · Loosen fan belt. · Dust and scale accumulated in cooling system.	· Add water or repair. · Adjust belt. · Change water and clean the interior of cooling system.
Water temp gauge indicates red range, on right.	· Radiator fin clogged or fin damaged. · Thermostat or water temp gauge faulty. · Radiator filler cap loosening.	· Clean or repair. · Replace · Retighten cap or replace packing.
Water temp gauge indicates red range, on left.	· Thermostat faulty. · Water temperature gauge faulty.	· Replace · Replace
Engine fails to start.	· Lack of fuel. · Air mixed in fuel system. · Fuel injection pump or nozzle defective. · Starting motor rotates slowly. · Engine compression insufficient. · Valve clearance out of adjustment.	· Add fuel. · Repair. · Replace. · See " Electrical system." · Adjust clearance
Engine emits whitish or bluish smoke.	· Excessive quantity of oil in oil pan. · Poor quality of fuel.	· Reduce oil quantity. · Replace with specified fuel.
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 light during normal engine operation.	· Charge lamp defective. · Faulty wiring.	· Replace. · Check and repair.
Alternator makes abnormal sounds.	· Alternator defective.	· Replace
Starting motor fails to run.	· Faulty wiring. · Insufficient battery voltage.	· Check and repair. · Recharge battery.
Starting motor pinion repeats going in and out.	· Insufficient battery voltage.	· Recharge battery.
Excessively low starting motor speed.	· Insufficient battery voltage. · Starting motor defective.	· Recharge battery. · Replace
Starting motor comes to a stop before engine starts up.	· Faulty wiring. · Insufficient battery voltage.	· Check and repair. · Recharge battery.
Heater signal does not become red. * Heater functions only when the coolant temperature is below 0˚C.	· Faulty wiring. · Glow plug damaged.	· Check and repair. · Replace
Engine oil pressure warning lamp does not light when engine is stopped (with starting switch left in"ON" position).	· Caution lamp defective. · Caution lamp switch defective.	· Replace · Replace

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 truck 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

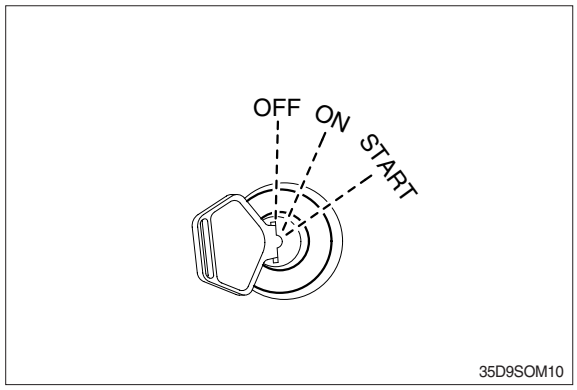
Trouble symptom	Probable cause	Remedy
1. Large fork lowering speed.	· Seal inside control valve defective. · Oil leaks from joint or hose. · Seal inside cylinder defective.	· Replace spool or valve body. · Replace. · Replace packing.
2. Large spontaneous tilt of mast.	· Tilting backward : Check valve 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 hydraulic oil viscosity. · Oil filter clogged.	· Add oil. · Change to SAE10W, class CF engine oil. · Clean filter.

1. ENGINE SYSTEM

1) EASE OF STARTING, NOISE

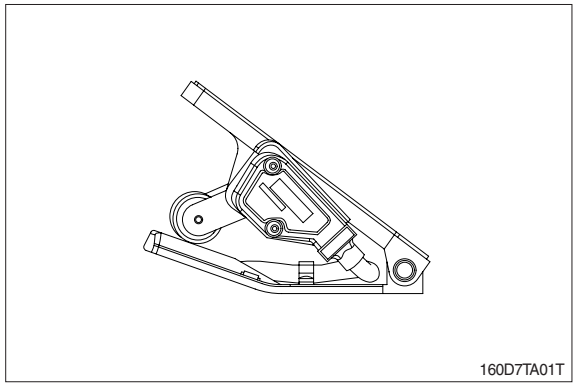
(1) Set gear shift lever at N, and pull parking brake.
(2) Turn start switch ON.
(3) When heater signal lamp goes out, turn key to START, and start engine.
(4) When engine starts, check if it starts smoothly, and if it makes any abnormal noise.

※ Refer to page 3-41.



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

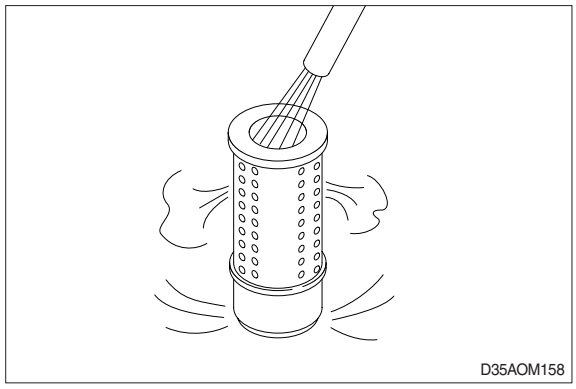
(1) Check that accelerator pedal does not catch when depressed.
(2) Check that engine speed increases in accordance with amount pedal is depressed.
(3) When doing this, check that engine speed changes without gasping, abnormal noise, abnormal explosions, or irregular vibration.
(4) Check that exhaust gas is colorless when the engine is idling, and a thin black color when accelerator pedal is depressed.
(5) Max speed : SEE 8. SPECIFICATION

4) AIR CLEANER ELEMENT

(1) Blow dry compressed air (max 2.1 kgf/cm², 30 psi) from inside along pleats. Next blow air from outside along pleats, then blow from inside again.

(2) Replace element if it is dirty, clogged or damaged.

※ **Always keep clean condition for the air cleaner element so that it can avoid from increasing in harmful contents of the exhaust emission and black smoke.**

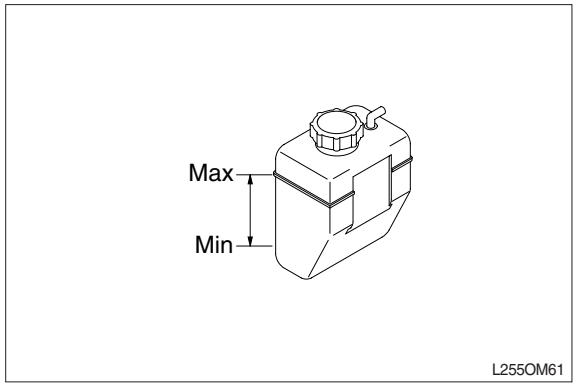


5) COOLANT

Check coolant level. If the cooling water in the radiator sub-tank is not within the normal range, add water to the MAX line.

※ **If antifreeze is being used, pay careful attention to the ratio of antifreeze and water when adding coolant.**

※ **Check the coolant level all the times prior to daily initial operating of the engine.**



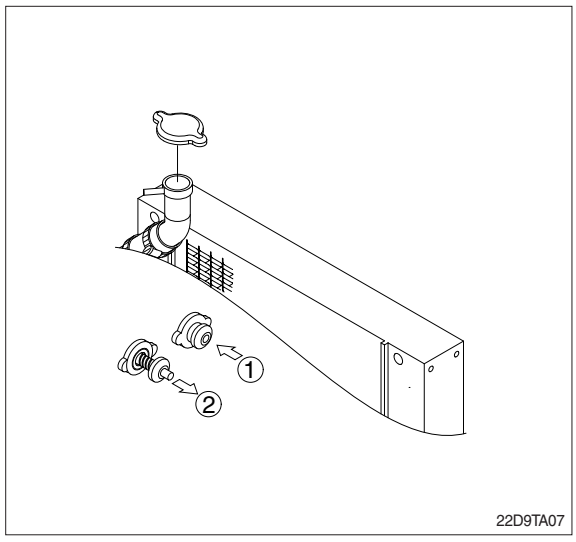
6) RADIATOR CAP

(1) Push pressure regulator spring with finger and check that tension is correct (①).

(2) Pull negative pressure valve, and check that it is closed when released (②).

(3) If packing is damaged, replace whole radiator cap assembly.

⚠ **While the coolant in the radiator is retained hot temperature, do not open the radiator cap.**
It will gush out the hot water and someone might get scalded or severe injured.



7) FUEL FILTER

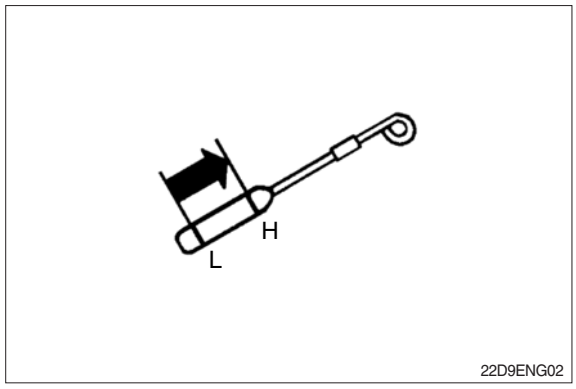
(1) The fuel filter element cannot be inspected from the outside, so replace it periodically. (Refer to 7. PLANNED MAINTENANCE AND LUBRICATION)

(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.

8) ENGINE OIL

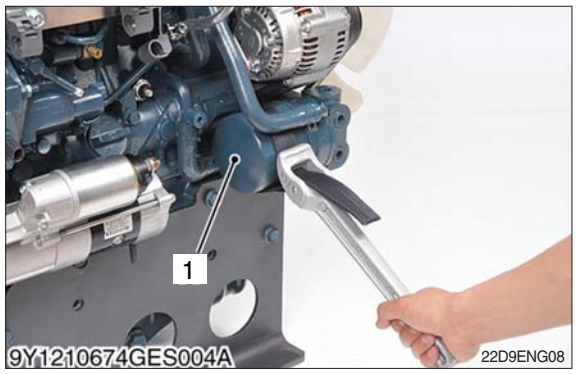
(1) Check oil level with dipstick and add oil if necessary.
(2) Check oil for discoloration or deterioration.
(3) Change oil if discolored or deteriorated.
· Engine oil quantity : 11.2 ℓ (3.0 U.S.gal)



9) ENGINE OIL FILTER

The condition of the oil filter element cannot be inspected from the outside so replace the engine oil filter periodically. Refer to 7. PLANNED MAINTENANCE AND LUBRICATION.
Use a filter wrench and remove the whole cartridge assembly.

⚠ If a spilt oil on the engine is left as it is after replacing the engine oil filter, there is dangerous material for a fire.
Make sure that the spilt oil is wiped thoroughly away.

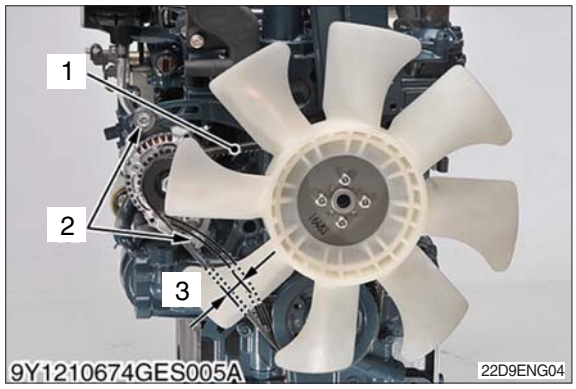


1 Oil filter cartridge

10) FAN BELT

(1) Check that fan belt is not damaged.
(2) Check inside of belt also. If bottom of pulley groove is shining, belt will slip so replace.
(3) Check deflection when fan belt is pushed with a finger pressure at a point midway between fan pulley and alternator pulley.
(4) If fan belt tension is not correct, loosen the alternator mounting screws, using a lever placed between the alternator and the engine block, pull the alternator out until the deflection of the belt falls within acceptable limits.
· Fan belt deflection : 10~12 mm
(under load of 10 kg)

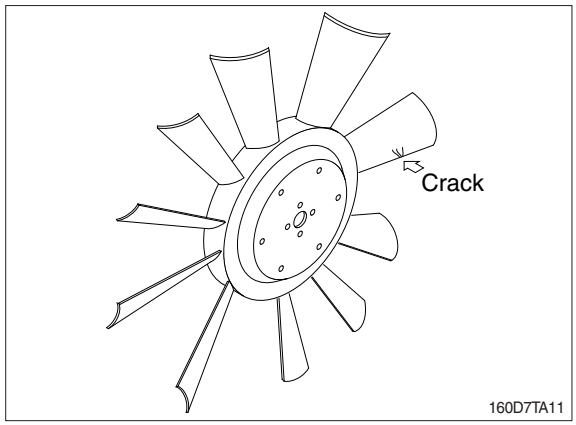
※ **Keep the fan belt free from oil and grease so that it can prevent the fan belt from slippage.**



1 Fan belt
2 Alternator mounting screw
3 Deflection

11) 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.

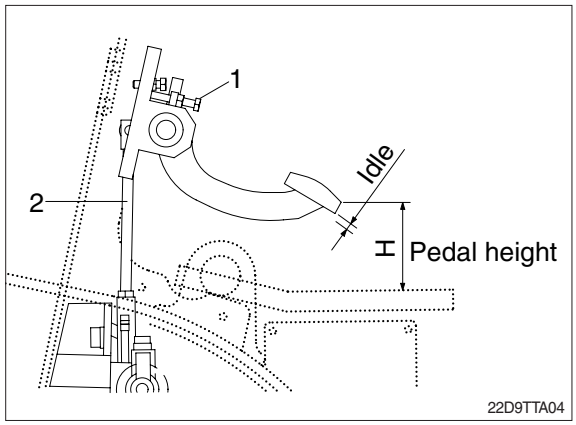
3) ADJUSTMENT OF PEDAL

(1) Brake pedal

- Adjust stopper bolt (1) so that pedal height is "H".
- Adjust push rod (2) so that pedal play is idle stroke.

Unit : mm

Item	H	IDLE
Specification	119±2	2~4

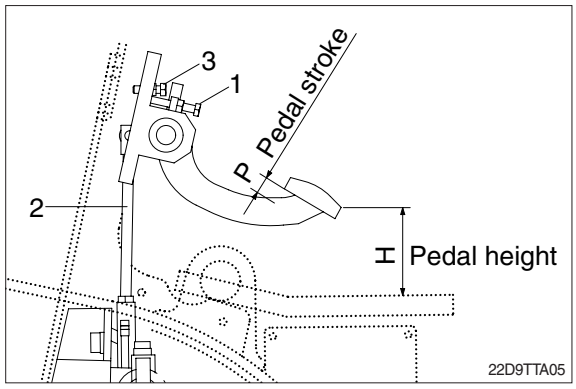


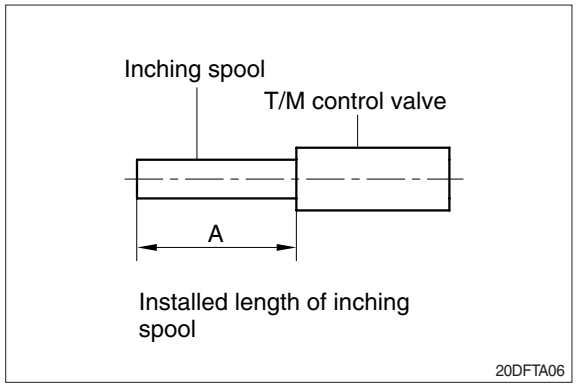
(2) Inching pedal

- Adjust stopper bolt (1) so that pedal height is "H".
- Adjust rod (2) so that length of inching spool is "A" when pedal height is "H".
- Adjust bolt (3) so that brake pedal interconnects with inching pedal at inching pedal stroke "P".

Unit : mm

Item	H	P	IDLE	A
Specification	119±2	15~20	1~3	33



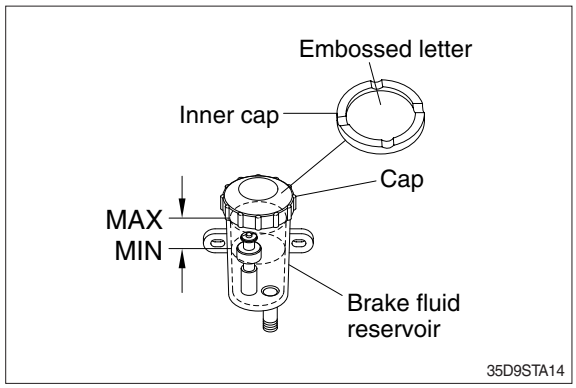


4) CHECK OIL LEVEL

Stop the machine in a flat place and check the oil level with the dipstick.

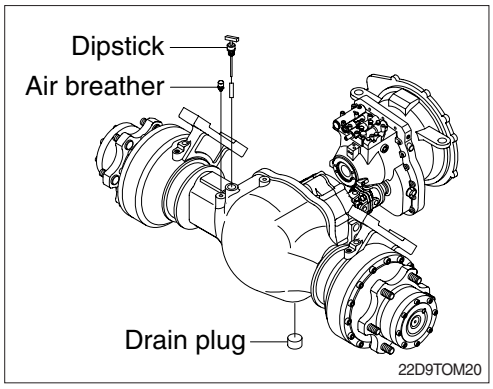
(1) Brake reservoir

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.

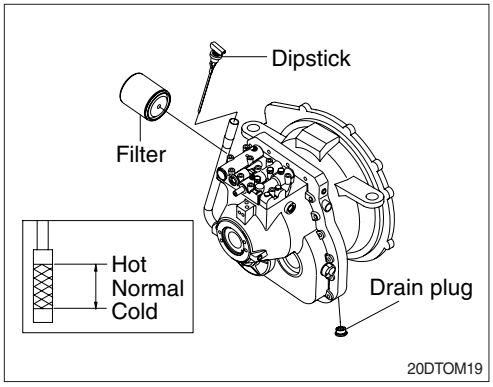
It can cause to happen unexpected accidents such as personal injury due to slippage on the oil or fire.

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

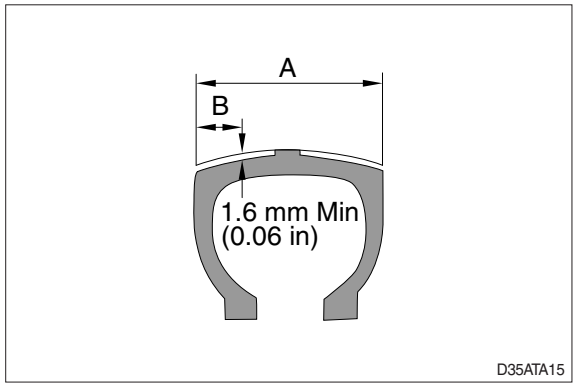
(1) Check tire pressure using tire gauge : SEE CHECK BEFORE STARTING ENGINE, page 5-3.

(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 1.6mm (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 mm. If clearance is more than 2mm, insert shim to reduce clearance to within 0.7 mm.

· Mounting bolt torque : SEE 8. SPECIFICATION

(2) Measure clearance between center pin and bushing. Check that clearance is within 0.5 mm (0.02 in). If clearance is more than 0.5 mm, replace the bushing.

5) DRIVE AXLE

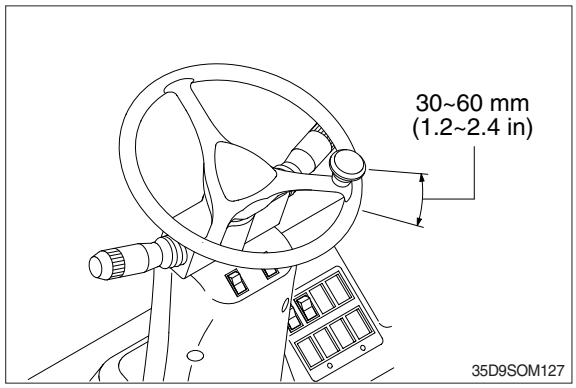
Check that there is no deformation or crack around mounting bolts of front axle and main frame and at welds. Check visually or use crack detection method.

Mounting bolt torque : SEE 8. SPECIFICATION

4. STEERING SYSTEM

1) STEERING WHEEL

Set rear wheels facing straight forward, then turn steering wheel to left and right. Measure range of steering wheel movement before rear wheel starts to move. Range should be 30~60 mm at rim of steering wheel. If play is too large, adjust at gearbox. Test steering wheel play with engine at idling.



2) KNUCKLE

Check knuckle visually or use crack detection method. If the knuckle is bent, the tire wear is uneven, so check tire wear.