

## A MESSAGE TO HYUNDAI LIFT TRUCK OPERATORS

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

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

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

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

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

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

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

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

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

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

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

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

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

## INTRODUCTION

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

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

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

### **Routine Servicing and Maintenance**

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

### **Operator Daily Inspection - Safety and Operating Checks**

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

### **Planned Maintenance**

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

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

### **Service Manual**

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

## HOW TO USE THIS MANUAL

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

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

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

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

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

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

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

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

**Section 8. Specifications**, provides reference information and data on features, components, and tightening torques.

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

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

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

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

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

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

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

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

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

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

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

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

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

## EC REGULATION APPROVED

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

| Model            | LWA (EU only) | LPA   |
|------------------|---------------|-------|
| 110D/130D/160D-9 | 105 dB        | 75 dB |

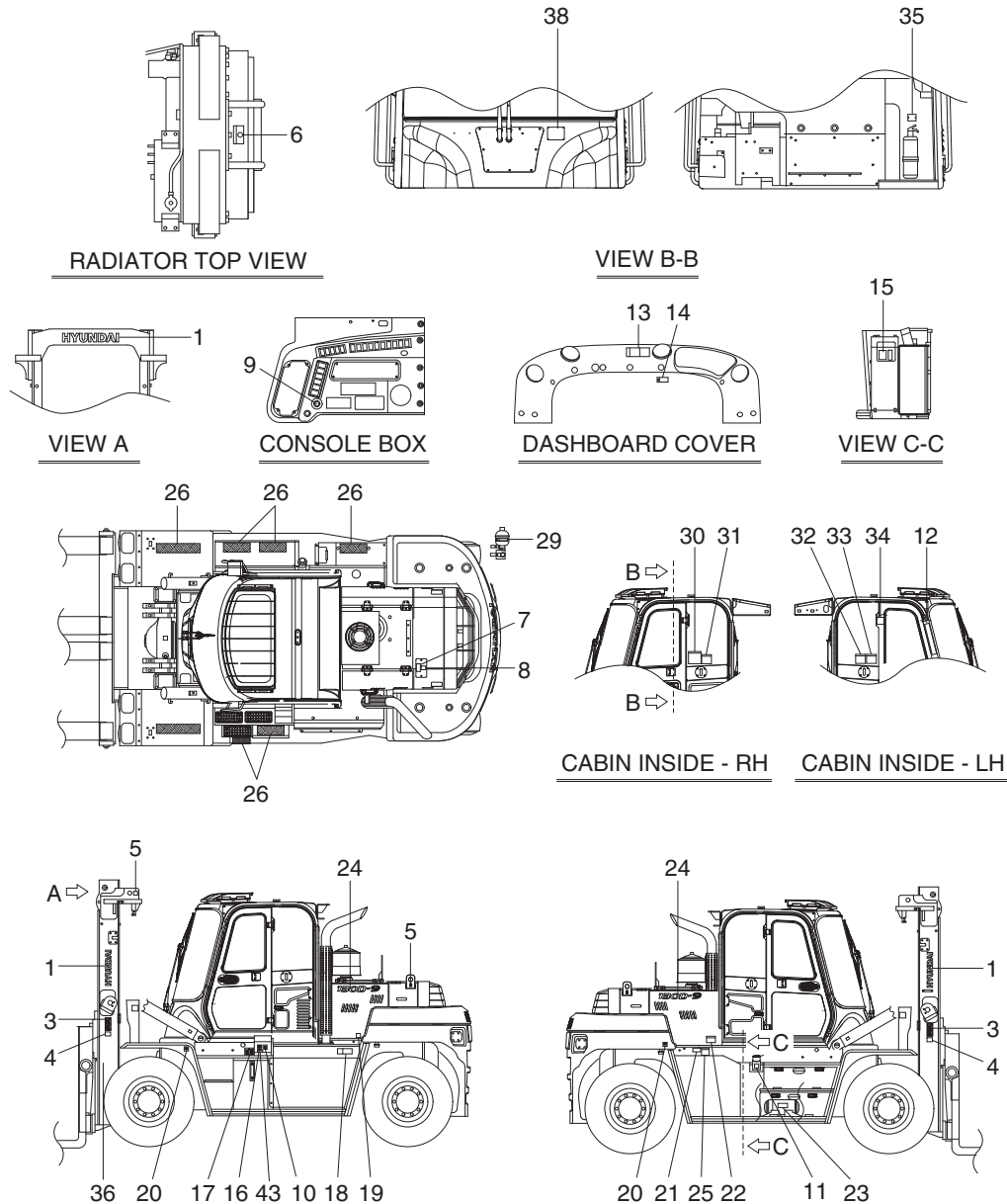
- The value of vibrations transmitted by the operator's seat are lower than standard value of (2005/88/EC)



## SAFETY LABELS

### 1. LOCATION

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



110D9OM101

- |    |                 |    |                     |    |                           |
|----|-----------------|----|---------------------|----|---------------------------|
| 1  | Logo (HYUNDAI)  | 14 | Solid tire          | 26 | Safety work               |
| 3  | Mast warning    | 15 | DEF/AdBlue®         | 29 | Accumulator               |
| 4  | Hand caution    | 16 | Cab tilt (Up/Down)  | 30 | Start procedure           |
| 5  | Hook            | 17 | Tilt cabin warning  | 31 | Load capacity             |
| 6  | Radiator fan    | 18 | SCR                 | 32 | Air compressor-cab        |
| 7  | Radiator        | 19 | Engine wash         | 33 | Safety instruction (OPSS) |
| 8  | Temperature     | 20 | Tire pressure       | 34 | Hammer                    |
| 9  | Start key       | 21 | Brake cooling oil   | 35 | Fire extinguisher         |
| 10 | Hydraulic oil   | 22 | Noise level         | 36 | Grease                    |
| 11 | Diesel fuel     | 23 | Air compressor-tank | 38 | Name plate                |
| 12 | Operator safety | 24 | Model name          | 43 | Tilt warning              |
| 13 | Start warning   | 25 | ECU/TCU caution     |    |                           |

## 2. DESCRIPTION

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

Replace any safety label that is damaged, or missing.

### 1) MAST WARNING (Item 3)

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

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

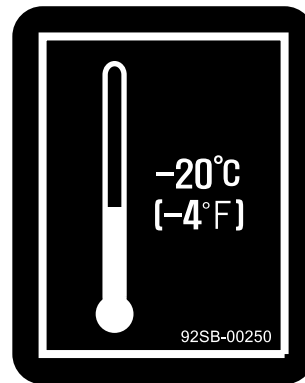


25L7A0OM06

### 2) TEMPERATURE (Item 8)

This warning label is positioned on the top side of engine hood rear cover.

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



25L7A0OM10

### 3) RADIATOR (Item 7)

This warning label is positioned on the top side of engine hood rear cover.

- ⚠ **It forbids to open the filler cap of the surge tank because operator might get scalded due to spouting of hot water when the engine is running.**
- ⚠ **Never open the filler cap while engine running or at high coolant temperature.**



93HS-00110

#### 4) RADIATOR FAN (Item 6)

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

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

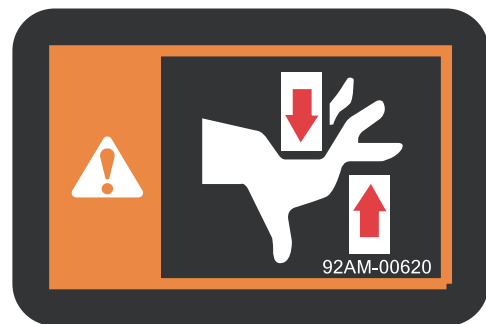


93HS-00120

#### 5) HAND CAUTION (Item 4)

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

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

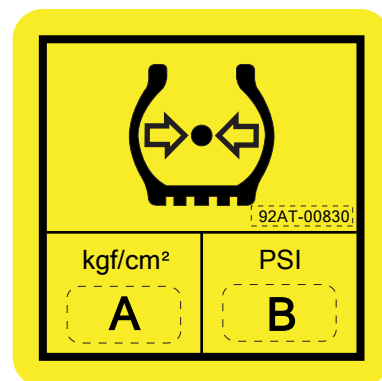


35DEOM103

#### 6) TIRE PRESSURE (Item 20)

This label is positioned on the both of the front fender and the both of the counterweight.

- ⚠ 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).



25L7A0OM08

#### 7) HOOK (Item 5)

This warning label is positioned near the lifting bracket on the engine hood rear cover and the top side of mast (LH and RH).

- ※ Refer to page 5-34 for safe loading procedures.



92AM-00630



## 8) START PROCEDURE (Item 30)

This warning label is positioned on the right window inside of cabin.

1. The fuel transfer pump is self-priming.  
When the start switch is in ON position, the fuel transfer pump operates for 2 seconds & then shuts off.
2. Wait up to 45 sec for grid heater operation depending on ambient temperature.
3. Start cranking.  
If the engine would not start, release the start switch to ON position for fuel transfer pump operation for 25 seconds.
4. If the engine still does not start, turn the start switch to OFF position, and loosen the banjo bolt of injection pump at the fuel supply line.
5. Repeat the previous steps until fuel is exiting at the supply line.
6. Tighten the banjo bolt at the supply line.
7. Re-cranking.
8. If the engine still would not start, please contact the nearest HYUNDAI or Cummins dealers.

### Start Procedure

1. The fuel transfer pump is self-priming.  
When the Keyswitch is in ON position, the fuel transfer pump operates for 2 seconds & then shuts off.
2. Wait up to 45sec. for grid heater operation depending on ambient temperature.
3. Start cranking.  
If the engine would not start, release to ON position for fuel transfer pump operation for 25 seconds.
4. If the engine still does not start, turn the Keyswitch to OFF position, and loosen the banjo bolt of injection pump at the fuel supply line.
5. Repeat the previous steps until fuel is exiting at the supply line.
6. Tighten the banjo bolt at the supply line.
7. Re-cranking.
8. If the engine still would not start, please contact the nearest HYUNDAI or Cummins dealers.

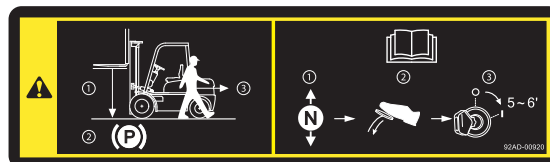
91LC-11170

## 9) START WARNING (Item 13)

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

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

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



50DEFW55

#### 10) SAFETY INSTRUCTION (Item 33)

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

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

#### 11) ECU/TCU CAUTION (Item 25)

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

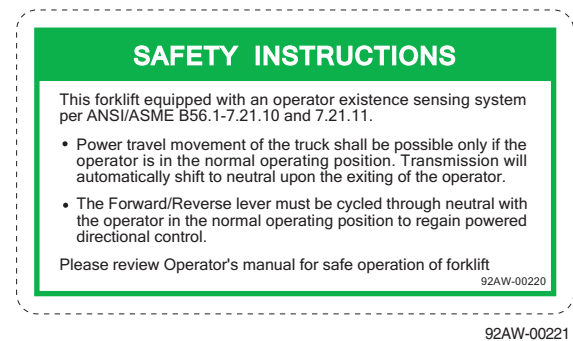
※ **Connector ①, ②, ③, ④ should be separated from ECU and TCU before any kind of welding.**

#### 12) ENGINE WASH (Item 19)

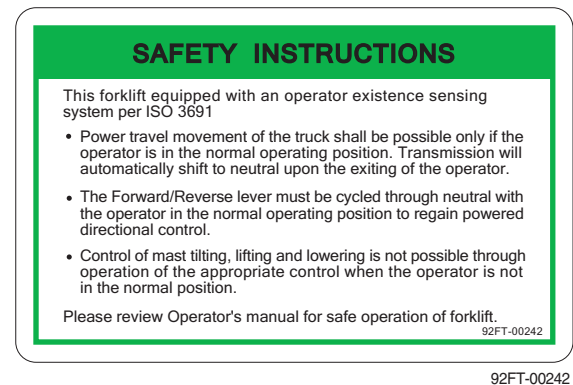
This warning label is positioned on the both side of engine hood.

**▲ Don't wash the engine room.**

Truck for equipped with travel OPSS.



Truck for equipped with travel and mast OPSS.



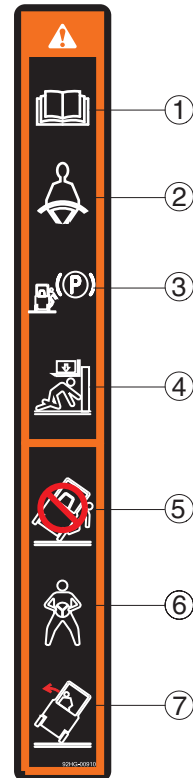
\*OPSS : Operator Presence Sensing System



### 13) OPERATOR SAFETY (Item 12)

This warning label is positioned on the left stay of cabin inside

- (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 turn the parking brake switch in LOCK position so that the truck can keep with stopping condition.
- (4) The people should not pass through under forks and other attachments which are lifted or being lifted.
- (5) Do not jump down from the truck. It can be caused that the operator have severe injury or death in the event of a tip over.
- (6) Outstretch the legs as widely as possible and grasp firmly the steering handle.
- (7) Lean the body to the opposite direction in order to avoid severe injury or death when the truck is tipped over.



25L7A0OM09-1

※ Refer to page 3-3.

### 14) CABIN TILT (UP/DOWN) (Item 16)

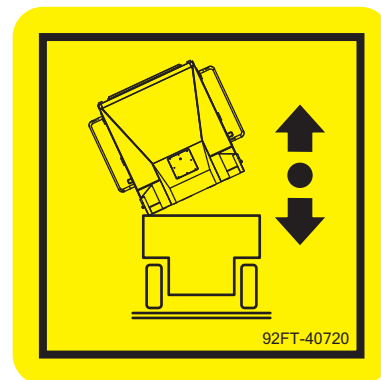
This warning label is positioned on the left side of frame.

When tilting cab for service, the cab must be fully extended up or down.

1. To raise cab, depress switch down until fully raised.
2. To lower cab, depress switch down until fully lowered.

**▲ To prevent cab from lowering unexpectedly, do not change the hand pump lever manually when opening cab.**

※ Refer to page 3-32 for cabin tilt switch.

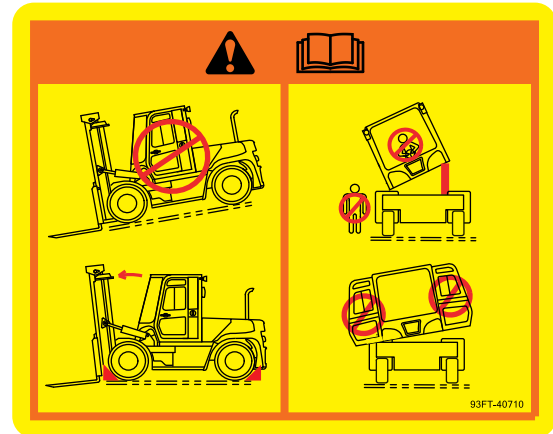


92FT-40720

#### 15) TILT CABIN WARNING (Item 17)

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

- ⚠ **Refer to page 7-15 for safe tilting procedure.**

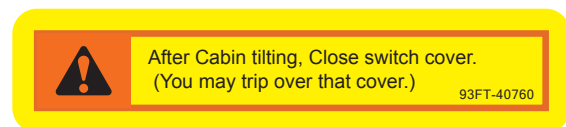


50D7EFW04

#### 16) TILT WARNING (Item 43)

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

- ⚠ **After cabin tilting, close switch cover.**  
**You may trip over that cover.**

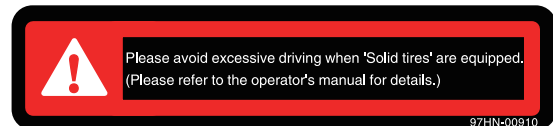


93FT-40760

#### 17) SOLID TIRE (Item 14)

This warning label is positioned on the center side of dashboard.

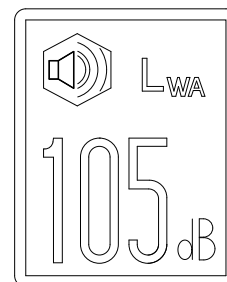
- ⚠ **Please avoid excessive driving when "solid tires" are equipped.**
- ※ **Do not drive on the road for automobile.**
- ※ **Please refer to the page 2-8 for details.**



97HN-00910

#### 18) NOISE LEVEL (Item 22)

This warning label is located on the right side of the engine hood.



91FU-00200

#### 19) FIRE EXTINGUISHER (Item 35)

This label is located on the rear left of the cabin inside.

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



91B1-01600

## 20) DIESEL FUEL (Item 11)

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

- ※ Fill only the diesel fuel.
- ※ Do not fill the gasoline.



92AF-00320

## 21) HYDRAULIC OIL (Item 10)

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

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



92AF-00310

## 22) ACCUMULATOR (item 29)

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

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

- ▲ Never make any hole in the accumulator expose it to flame or fire.
- ▲ Do not weld anything to the accumulator.
- ※ When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator, it is necessary to release the gas from the accumulator. A special air bleed valve is necessary for this operation, so please contact your Hyundai distributor.

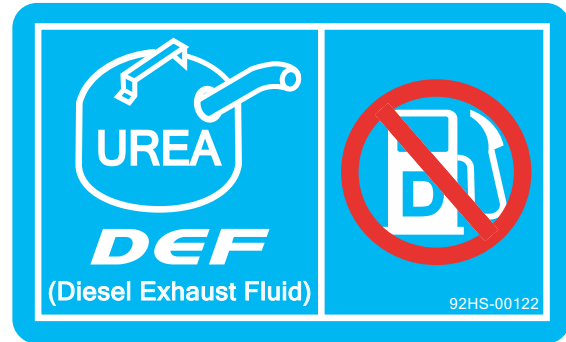


1107A0FW46

### 23) DEF / ADBLUE® (Item 15)

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

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



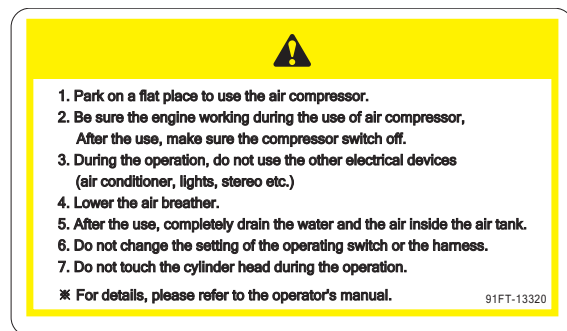
92HS-00122

### 24) AIR COMPRESSOR-CABIN (Item 32)

This warning label is positioned on the left side of cabin inside.

- (1) Park on a flat place to use the air compressor.
- (2) Be sure the engine working during the use of air compressor. After the use, make sure the compressor switch off.
- (3) During the operation, do not use the other electrical devices (air conditioner, lights, stereo etc.)
- (4) Bleed the air breather.
- (5) After the use, completely drain the water and the air inside the air tank.
- (6) Do not change the setting of the operating switch or the harness.
- (7) Do not touch the cabin tilting cylinder head during the operation.

- ※ Refer to page 3-36 for air compressor switch.



91FT-13320

### 25) AIR COMPRESSOR-TANK (Item 23)

This label is positioned on the top side of the air tank.

- ▲ Do not touch the cylinder head during the operation or it may cause severe burn.



91Q4-13300

## 26) BRAKE COOLING OIL (Item 21)

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

- ※ Fill only the DOANX TD only.
- ※ Never use others oil.



92FT-40810

## 27) HAMMER (Item 34)

This label is located on the left stay of the cabin inside.

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



91Q6-07280

## 28) SCR (Item 18)

This label is located on the left side of the frame

- ⚠ Do not touch the aftertreatment device or it may cause severe burn. When the engine is running or immediately after engine shut down.

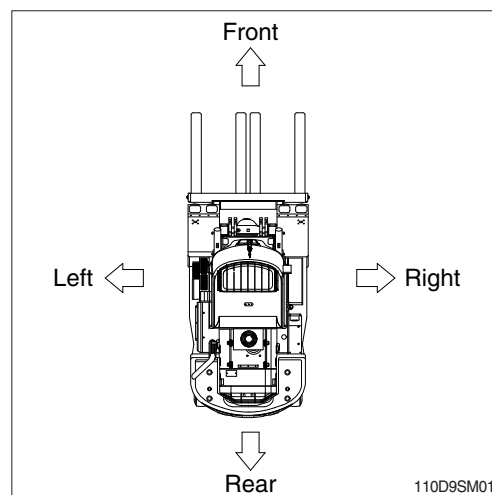
- ※ SCR : Selective Catalytic Reduction



92HV-00170

## 1. DIRECTION

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

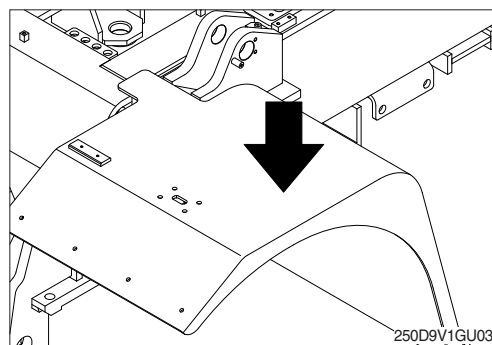


## 2. SERIAL NUMBER

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

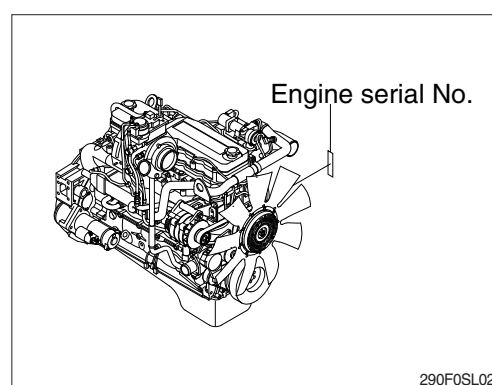
### 1) TRUCK SERIAL NUMBER

It is shown on the left fender.



### 2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



## 3. SYMBOLS

▲ Important safety hint.

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

※ It indicates the useful information for operator.