

5. STARTING AND OPERATING PROCEDURES

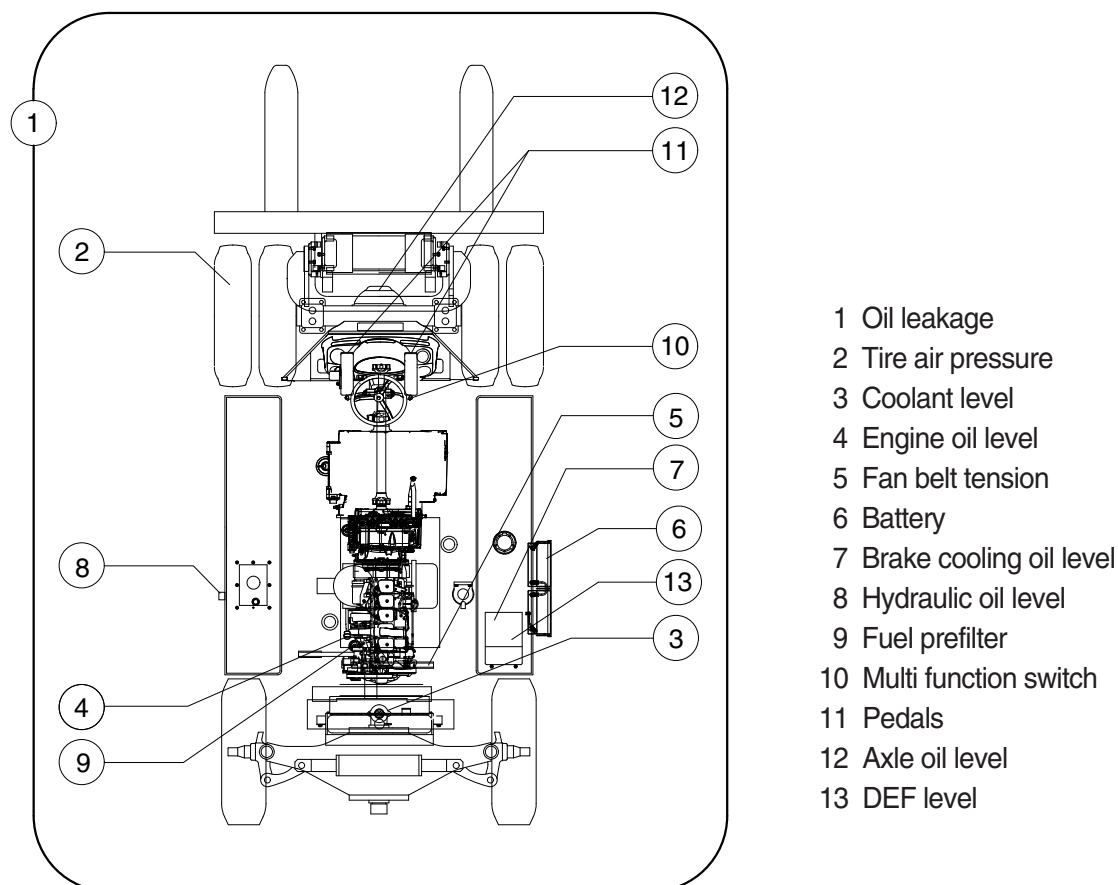
1. BEFORE OPERATING THE TRUCK

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

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

2. CHECK BEFORE OPERATION

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



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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 truck.

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

3. CHECK BEFORE STARTING ENGINE

1) CHECK FOR WATER OR OIL LEAKAGE

- (1) Walk around your HYUNDAI truck and check for water, oil or hydraulic leakage. Examine truck for obvious damage.
- (2) Check 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.

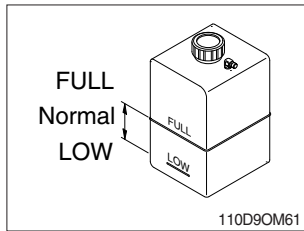
2) CHECK TIRE AIR PRESSURE AND TIRE RIM

• Air pressure and torque

Item	Unit	Front tire	Rear tire
		12.00 R20	12.00 R20
Tire air pressure	kgf/cm ²	10	10
	psi	142	142
	bar	9.58	9.58
Hub nut tightening torque	kgf · m	83.2 ± 10	
	lbf · ft	602 ± 72.3	
	N.m	816 ± 98.1	

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

3) CHECK COOLANT LEVEL



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

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

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

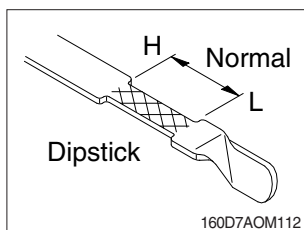
⚠ If the reservoir tank is completely empty, first add water directly to the surge tank. Then add water to the reservoir tank.

Always allow the radiator to cool down before adding water.

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

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

4) CHECK ENGINE OIL LEVEL



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

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

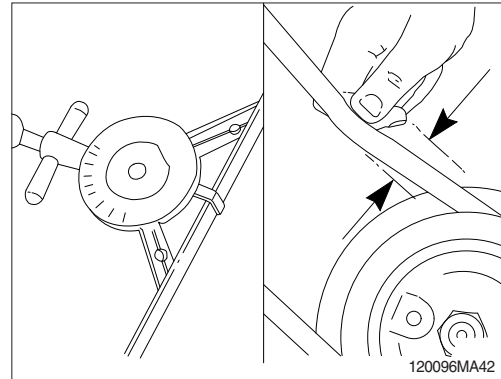
※ Change the oil if it is marked dirty or discolored.

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

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

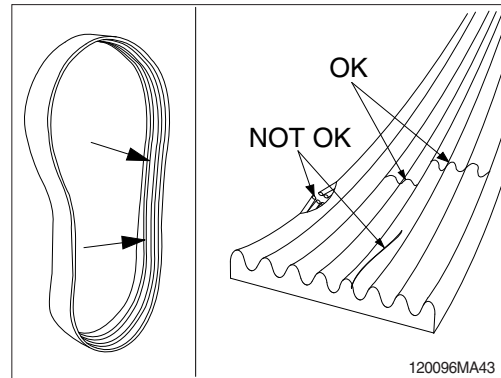
5) CHECK FAN BELT

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



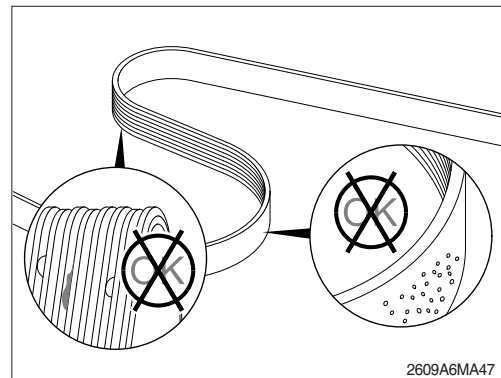
- (2) Inspect the fan belt for damage.

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



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

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



6) CHECK BATTERY

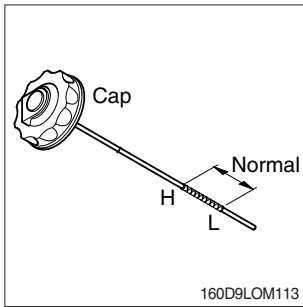
- (1) Check battery and recharge or replace the battery if necessary.

▲ Battery maintenance need serious care and safety service.

※ Refer to 10. REPLACEMENT AND CHECK in SECTION 7 and always keep the safety rules.



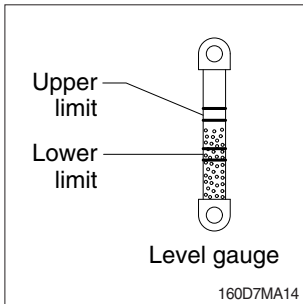
7) CHECK BRAKE COOLING OIL LEVEL



(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.

8) CHECK HYDRAULIC OIL LEVEL



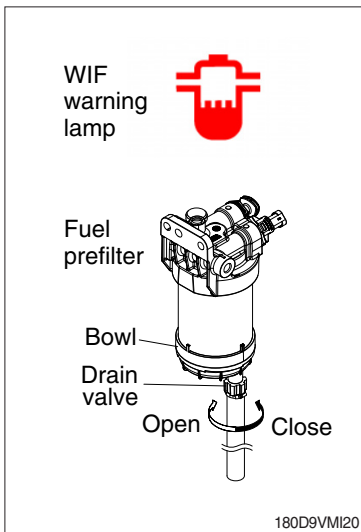
(1) Rest fork on ground and stop engine.

(2) Check the oil level from the level gauge of hydraulic oil tank.

(3) In accordance with the mast equipped, the oil level differs.

Model	Gauge	ℓ (U.S.gal)	V - mast	TS - mast
180D-9V	Lower limit	220 (58.1)	V300 ~ 600	-
160D-9LV (EU)	Upper limit	238 (62.9)	V650 ~ 700	TS395 ~ 700

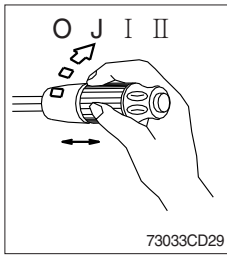
9) CHECK FUEL PREFILTER



(1) WIF (Water in fuel) warning lamp.

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

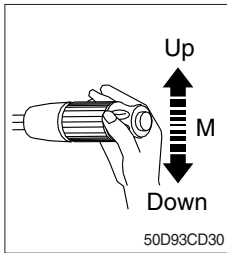
10) MULTI FUNCTION SWITCH



(1) Front wiper and washer switch

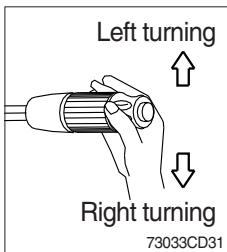
- ① When the switch is in J position, the wiper moves intermittently.
- ② When placed in I or II position, the wiper moves continuously.
- ③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

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



(2) Dimmer switch

- ① This switch is used to turn the head light direction.
- ② Switch positions
 - Up : To flash for passing
 - Middle : Head light low beam ON
 - Down : Head light high beam ON
- ③ If you release the switch when it's in up position, the switch will return to middle.



(3) Turning switch

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

11) CHECK PEDALS

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

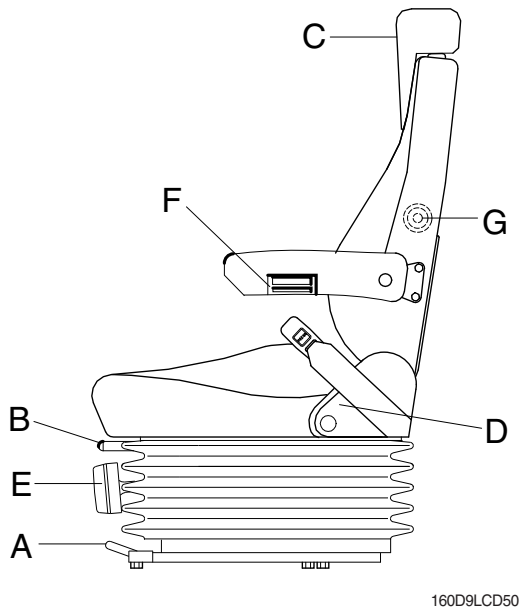
※ **Refer to page 10-5 for adjusting of the brake and inching pedal.**

4. SEAT ADJUSTMENT

1) SEAT ADJUSTMENT (STANDARD)

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

※ The seat belt reminder warning lamp pops up and the buzzer sounds until seat belt is fastened.



(1) Forward / Backward adjustment

- ① Pull lever A to adjust seat forward or backwards.

(2) Upward / Downward adjustment

- ① Push or pull the height adjuster lever (B) to adjust seat upward or downward.

(3) Reclining adjustment

- Pull lever (D) to adjust seat backrest.

(4) Arm rest adjustment

- This can be adjusted by turning the handle (F) to right and left.

(5) Cushion adjustment (E)

- Adjusting handle to the operator's weight.

(6) Shoulder rest (C)

- The shoulder rest can be adjust to upward.

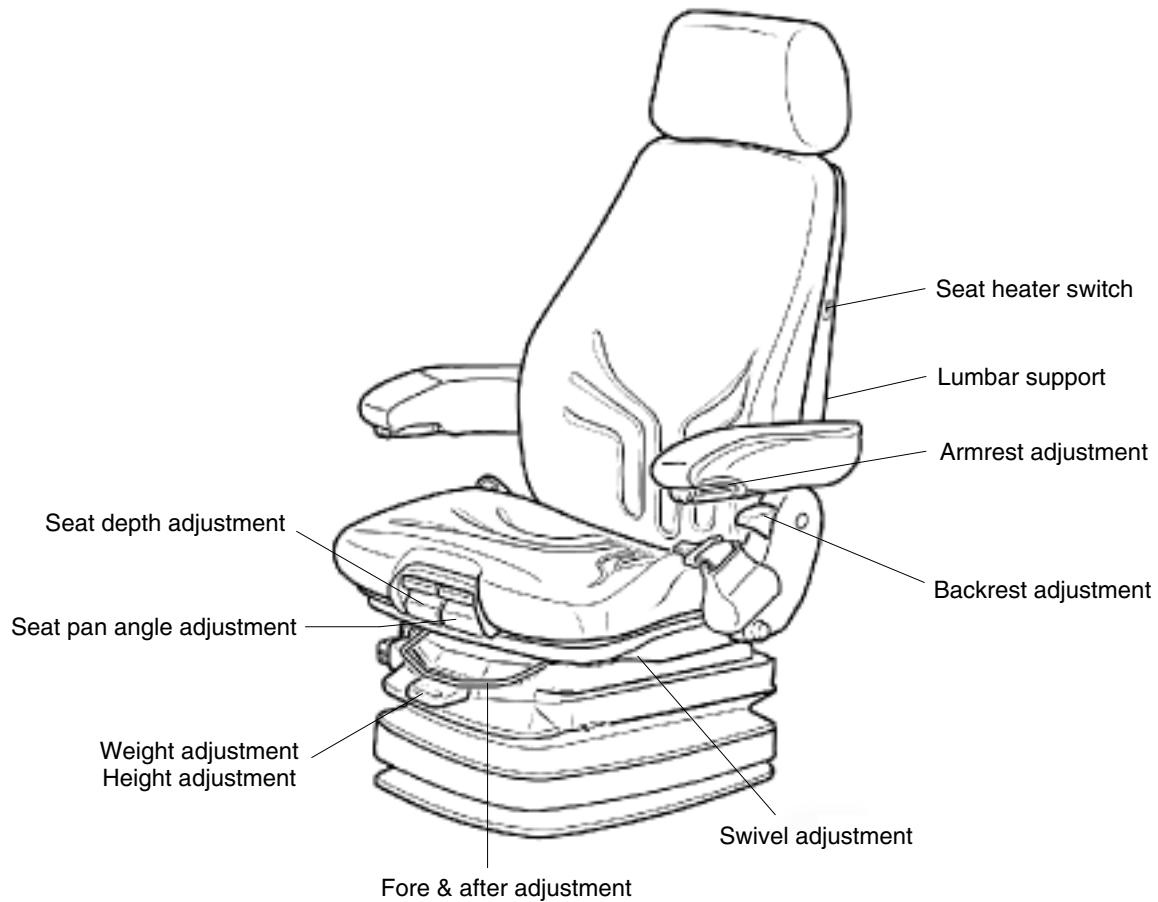
(7) Lumbar support (G)

- The curvature of the backrest cushion can be adjusted by turning the adjustment knob.

2) SEAT ADJUSTMENT (OPTION)

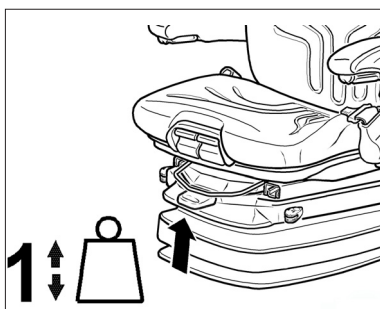
The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long work hours and enhance work efficiency.

※ The seat belt reminder warning lamp pops up and the buzzer sounds until seat belt is fastened.



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(1) Weight adjustment

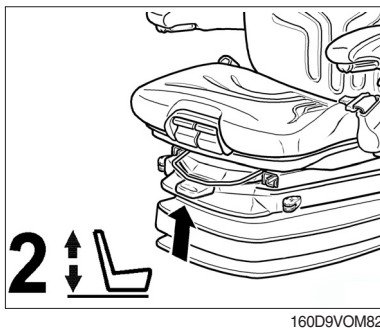


- ① The seat should be adjusted for the operator's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the vehicle at a standstill and the operator sitting on the seat.

The operator sit absolutely still during adjustment.

- ※ To prevent damage to the health, the setting for the
- ※ operator's weight must be checked and adjusted as necessary before the vehicle is driven.

(2) Height adjustment



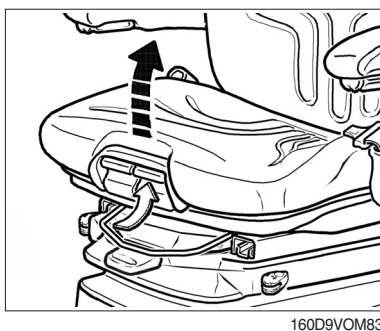
① The seat height can be set pneumatically and is continuously adjustable.

② The seat height can be altered by pulling or pressing the actuator lever fully out or in (arrow).

If the adjustment reaches the top or bottom endstop, the height is adjusted automatically in order to guarantee a minimum spring travel.

※ **In order to avoid damage, do not operate compressor for more than 1 minute.**

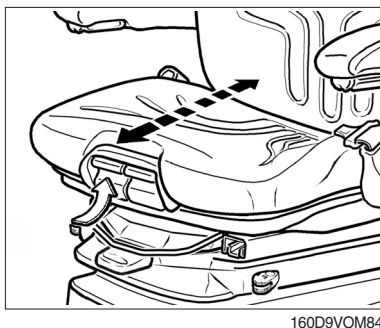
(3) Seat pan angle adjustment



① The angle of the seat pan can be individually adjusted.

② To adjust the angle of the seat pan, lift the LH handle (see arrow). By exerting pressure on or off the seat pan it can be moved to the desired angle position.

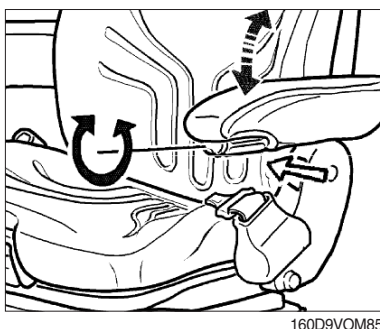
(4) Seat depth adjustment



① The depth of the seat pan can be individually adjusted.

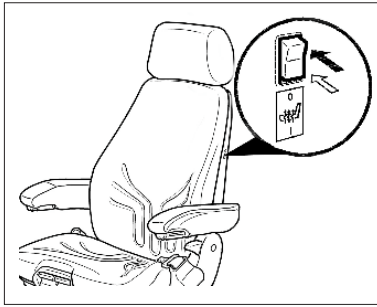
② To adjust the depth of the seat cushion, lift the RH handle (see arrow). By moving the seat cushion backwards or forwards the desired seating position can be reached.

(5) Armrest adjustment



① The inclination of the armrests can be modified by turning the adjustment knob (arrow).

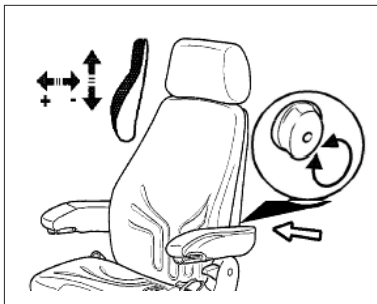
(6) Seat heater switch



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- ① The seat heater is turned on by pressing the switch.

(7) Lumbar support



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- ① By turning the adjustment knob (arrow) to the left or right, both the height and curvature of the backrest cushion can be individually adjusted.
- ② This increases both the seating comfort and the performance of the operator.

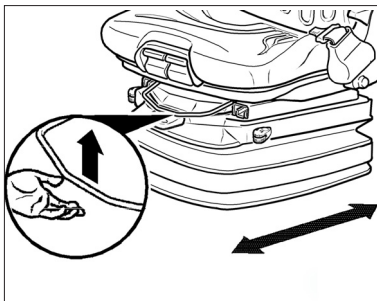
(8) Backrest adjustment



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- ① The backrest is adjusted using the locking lever (arrow).
- ※ The locking lever must latch into the desired position. It should not be possible to move the backrest into another position when it is locked.

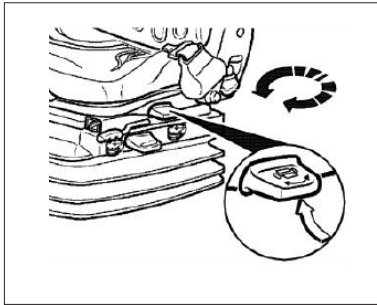
(9) Fore and after adjustment



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- ① The fore/aft adjustment is released by lifting the locking lever.
- ※ The locking lever must latch into the desired position. It should not be possible to move the operator seat into another position when it is locked.

(10) Swivel adjustment

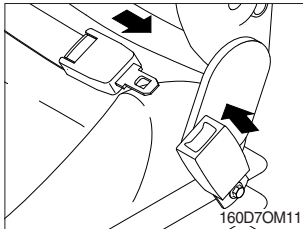


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- ① The swivel is released by pulling the locking lever (see arrow). The seat can then be swivelled 20° to the right or 10° to the left. It can be locked into every 10° position.

※ The locking lever must latch audibly into place. The swivel should be in the central position for driving.

3) BUCKLING UP



160D7OM11

- (1) 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 truck.

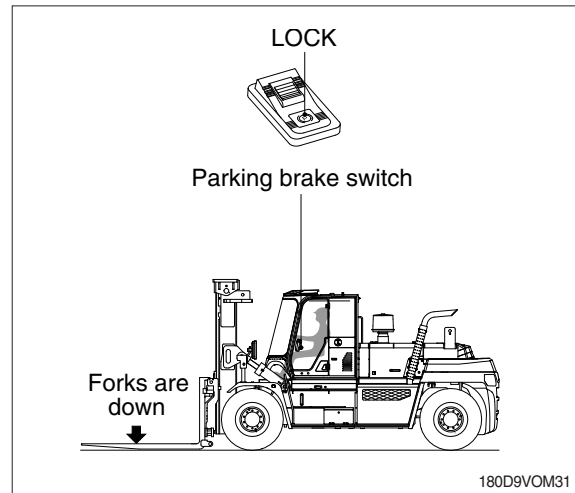
⚠ Replace the seat belt when it has been used in a severe accident or shows signs of severe fraying or having been cut.

5. STARTING FROM A SAFE CONDITION

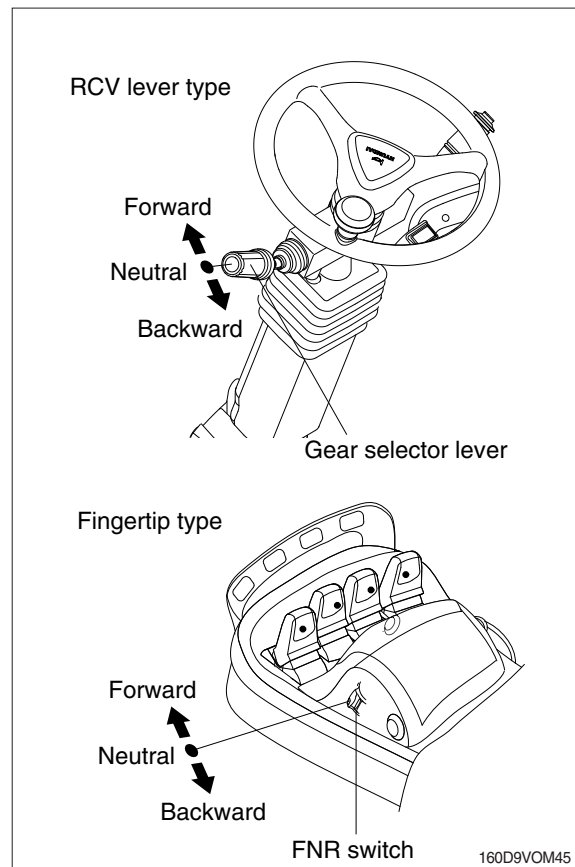
1) Always start from a safe condition.

Before operating a lift truck, make sure that :

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



2) Put the gear selector lever (FNR switch, option) in the NEUTRAL position, before starting. The truck should start only in the NEUTRAL position. If it starts in gear, have the truck serviced.



6. GENERAL STARTING AND OPERATING TIPS

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

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

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

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

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

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

- Warm the engine up before driving or applying a load. Idle engine at low idle rpm for a few minutes to circulate and warm the oil. Then increase speed to approximately half-throttle for a short period or until the engine coolant reaches approximately 38 °C (100 °F). This procedure helps prolong engine life.
- Let the engine run until the normal operating temperature is reached. Then operate the controls and check all gauges and warning indicators to be sure they are functioning properly. Stop the engine and make a visual inspection for oil, water, or fuel leaks.
- Do not operate the engine at speeds above idle for more than brief periods without a load.
- Do not run the engine at maximum power continuously until the engine is fully warmed up.
- Never operate the engine at more than the regular no-load governed speed. Excessive speeds are harmful.

※ **The governor is set at the factory and should 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.

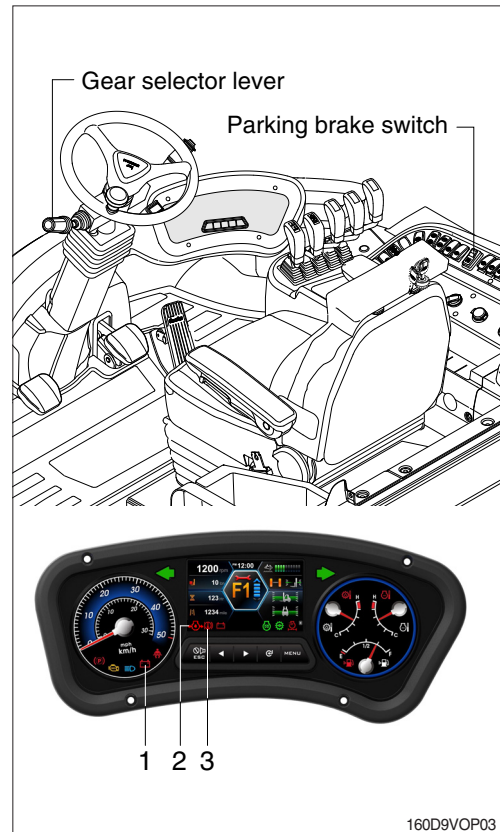
▲ Exhaust gases are harmful and can cause serious injury or death. Proper ventilation is always necessary for safe inside operation or warm-up.

▲ 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 AND STOPPING THE ENGINE

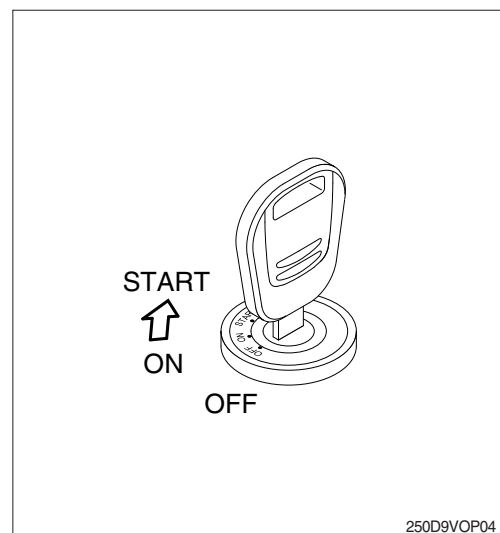
1) CHECK INDICATOR LIGHTS

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





2) STARTING ENGINE IN NORMAL TEMPERATURE

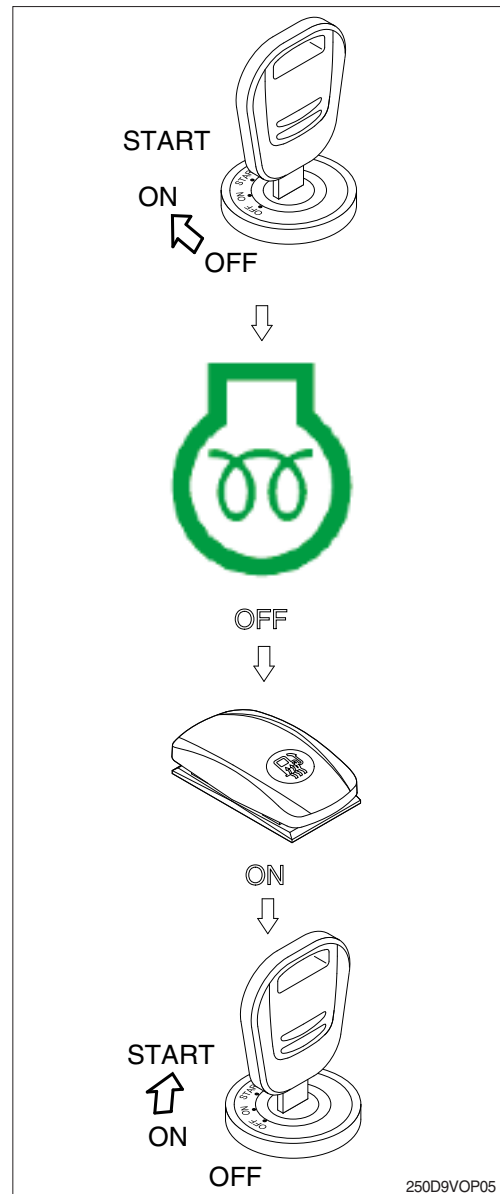
- ※ Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.
- (1) Turn the starting switch to START position to start the engine.
 - ※ If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.
 -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



3) STARTING ENGINE IN A COLD WEATHER

- ※ Sound horn to warn surroundings after checking if there are obstacles in the area.
- ※ Replace the engine oil and fuel referring to recommended oils at page 7-61.
Fill the anti-freeze solution to the coolant as required.

- (1) Check if the parking brake switch is in the LOCK position.
- (2) Check if the gear selector lever is in the neutral position.
- (3) Starting the engine while the ambient temperature is below 0 °C.
 - ① Turn the start switch to "ON" position.
 - ② Wait until the gauge of the cluster should be set.
 - ③ Push down the OK symbol () on the fuel warmer switch so that it can heat the fuel oil after the heating pilot lamp () on the cluster goes out and then wait for 5 minutes.
 - ④ Turn the start key switch to "Start" position.
 - ⑤ Release the start switch when the engine is started.
 - ⑥ Keep sufficiently idling condition after starting the engine.
Travelling the truck or operation of the attachments could be caused shut-down of the engine.



- ※ In the event of the winter season, the fuel oil happens WAX from -6 °C.

When the ambient temperature is below -6 °C, do not operate the truck under high load condition so that it can operate normally the fuel system of the engine, and operate the truck after keeping idle condition of the engine in a way.

- (4) Starting the engine at freeze-up (severe cold winter season) condition.
 - ① When the ambient temperature is below 0 °C, carry out the same method according to above procedure.
 - ② Operate the engine in a way so that it can supply a sufficient oil to the engine and hydraulic system due to heating the oil under low speed and low load condition after starting the engine.
 - ③ At the severe cold condition below -15 °C, do not operate the truck under the high load condition after starting the engine in a way.
Keep the idle condition of the engine for 20~30 minutes at the severe cold condition (freeze-up condition).

4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

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

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

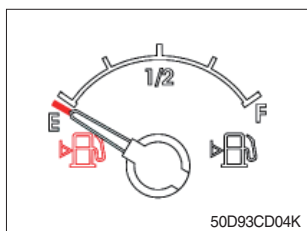
※ **If there are problems in the control panel, stop the engine immediately and correct problem as required.**



- (5) Check engine exhaust color.

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

- (6) Check fuel tank level.



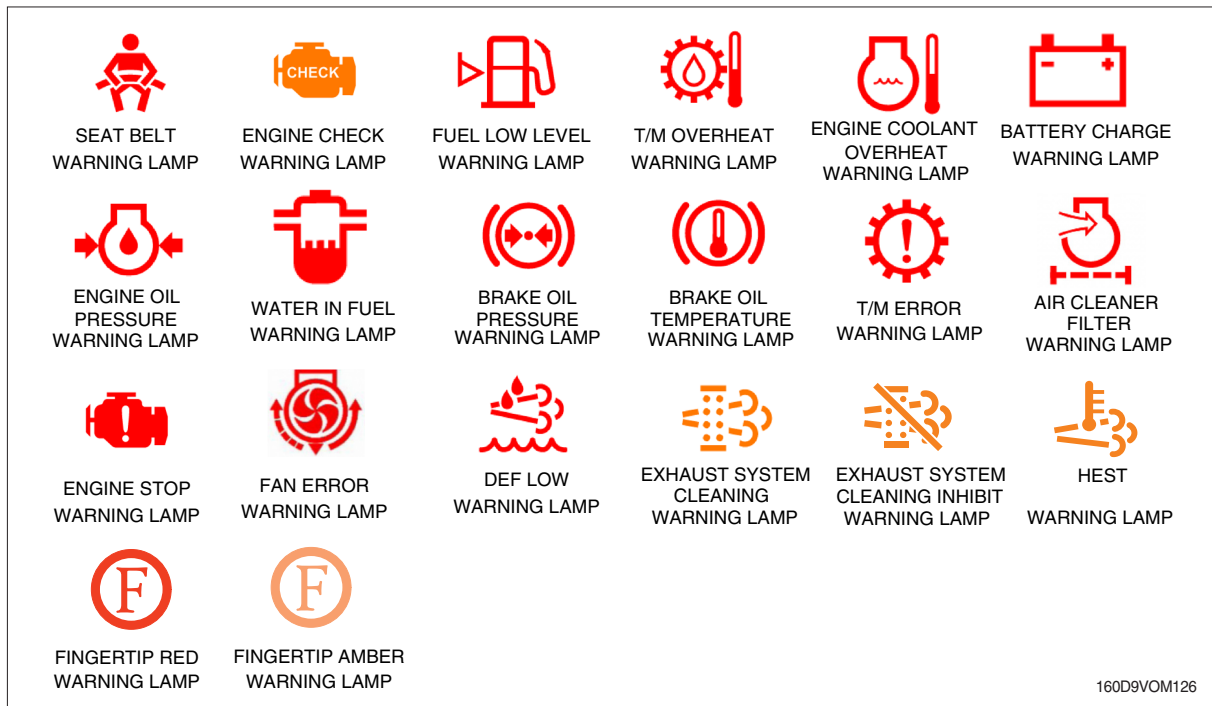
If the indicator points to F, the tank is full. If the indicator enters the E range, refill the fuel tank immediately. Do not operate the truck below this level. Do not use low quality fuel or fuel mixed with kerosene. Clean the area around the cap before adding fuel to prevent dirt from entering the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

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

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

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

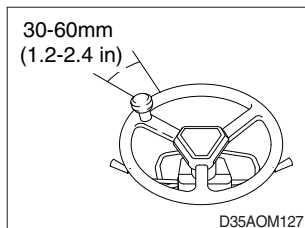
(7) Check warning lamps.



※ These lamps light up to indicate an abnormality.

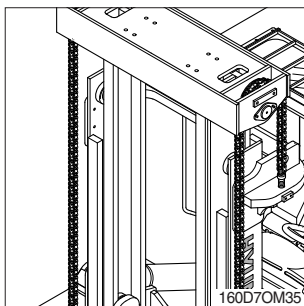
So, if one of these lamps is lighted, take appropriate service and maintenance.

(8) Check steering wheel play.



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

(9) Check lift chain tension.



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

· Adjusting lift chain

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

⚠ Do not put hands into the mast.

(10) Check steering wheel.

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

(11) Check rear view mirror.

Adjust the rearview mirror for best rearward visibility.

5) TRANSMISSION COLD STARTING

- (1) At an oil temperature in the shifting circuit $< -12^{\circ}\text{C}$, the transmission must be warmed-up for some minutes.
- (2) This must be carried out in neutral with an increased engine speed.
- (3) Until this oil temperature is reached, the electronics remains in neutral, and the symbol of the cold start phase will be indicated on the display.

· Indication on the display : * *

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

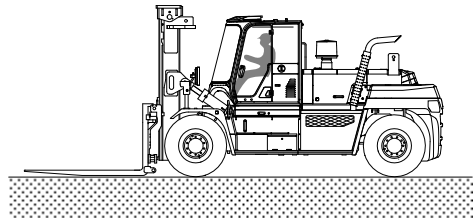


50D9ECD17

6) TO STOP THE ENGINE

- ※ If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.
- ※ In particular if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop it.

- (1) Place the gear selector lever in neutral.
- (2) Place the parking brake switch in the LOCK position.
- (3) Run the engine for five minutes at low idle with no load.
- (4) Return the key of starting switch to the OFF position.
- (5) Remove the key to prevent other people using the truck.
- (6) Lock the cab door.



180D9VOP07

8. WARMING-UP OPERATION

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

It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25 °C (77 °F).

The temperature must be raised to at least 25 °C (77 °F) before starting work.

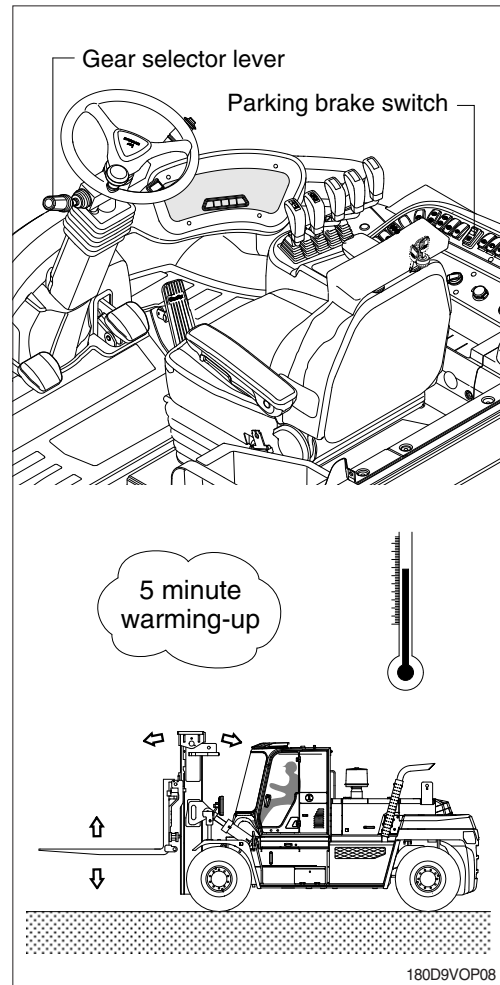
- 1) Run the engine at low idling for 5 minutes.
- 2) Speed up the idling and run the engine at mid-range speed.
- 3) Lift the forks slightly and tilt the mast forward to the stroke end to relieve hydraulic pressure.

※ **Do not leave hydraulic pressure relieved for more than 30 seconds.**

- 4) Tilt back to the stroke end to relieve hydraulic pressure.

※ **Do not leave hydraulic pressure relieved for more than 30 seconds.**

- 5) Repeat the procedure 3) - 4) several times until warm-up operation is completed.

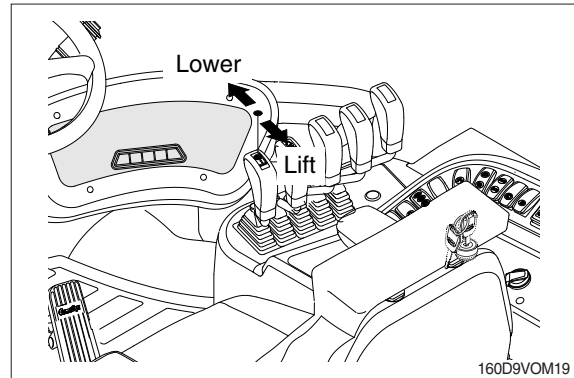


9. LEVERS AND PEDALS

1) POSITIONING FORKS AND MAST

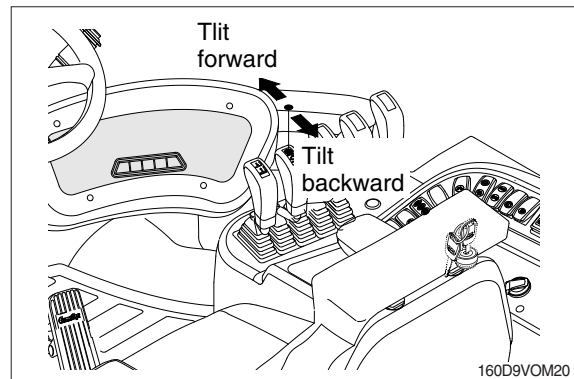
When driving, with or without a load, it is a good practice to always raise the forks slightly and tilt the mast backward. Raising the forks and tilting them back prevents the fork tips from catching on possible obstructions and reduce the wear on the fork blades from striking or dragging on the floor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

Pull back on the lift control lever and raise the forks 150 to 200 mm (6 to 8 inch) above the floor.



Then, using the tilt control, tilt the mast back slightly to raise the fork tips.

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

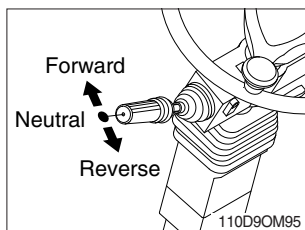


⚠ When the mast (carriage and/or load) is raised into a high (Elevated) position, the stability of the truck is reduced.

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

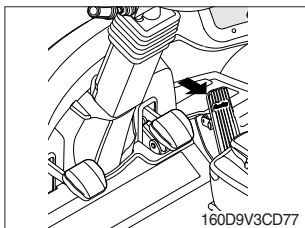
⚠ For stability, do not travel with the load or carriage in a highly elevated position. Travel with the lift mechanism raised only enough to clear the ground or obstacles.

2) SELECTING DIRECTION OF TRAVEL



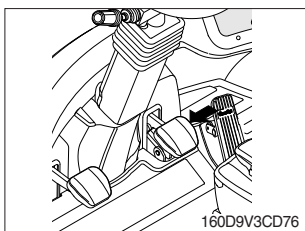
Push the gear selector lever forward, center it , or pull it back for FORWARD, NEUTRAL, or REVERSE, respectively.
Traction is disabled in NEUTRAL.

3) USING THE ACCELERATOR PEDAL



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

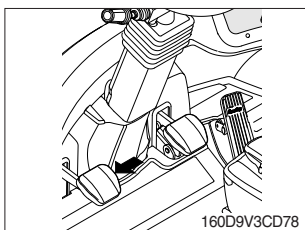
4) BRAKING PEDAL



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

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

5) INCHING PEDAL



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

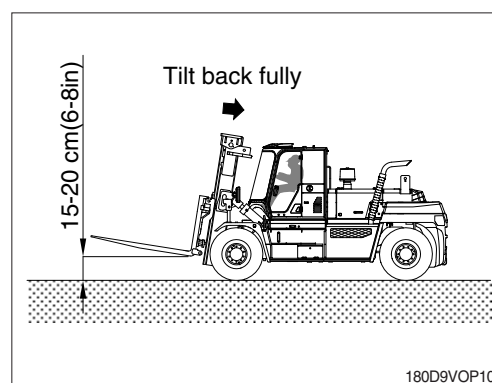
- ※ In case of slipping the clutch, it can be caused to happen heating problem in the system due to excessive friction of the discs, and reduced a durability or a lifetime of the components as result.
- ※ Pay particularly careful attention to do not press repeatedly the pedal and it is essential to cut off the power for travelling by pressing the pedal sufficiently to prevent from heating problem.

10. TRAVELING OF THE TRUCK

1) BASIC OPERATION

(1) Traveling posture

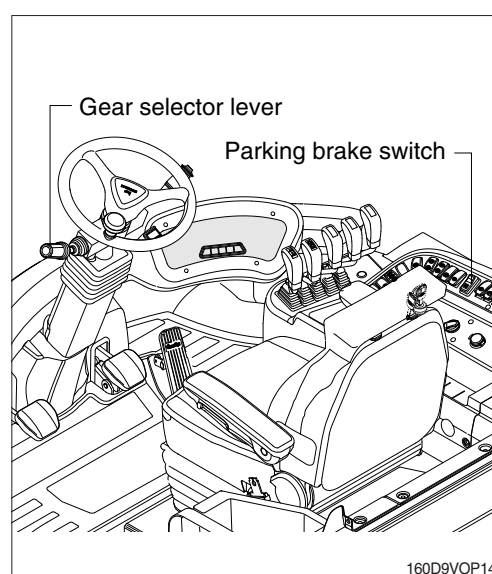
Lift the forks so that the forks are placed 15~20 cm (6~8 in) above the ground and tilt back the mast fully.



(2) Traveling operation

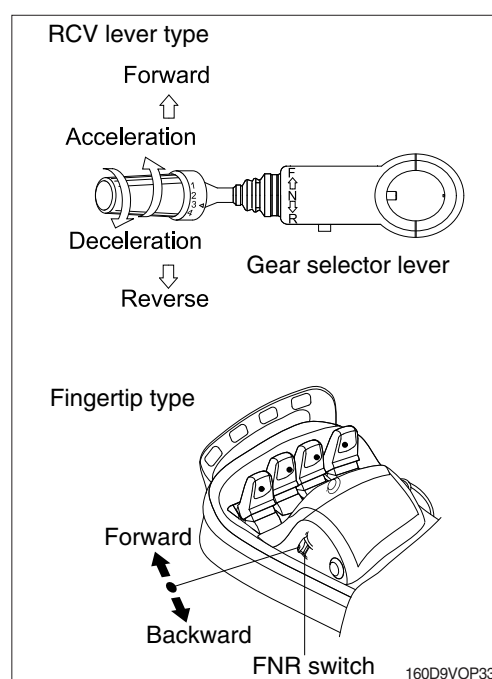
When warm-up operation is completed after the engine is started, move the truck according to the following procedure.

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



(3) Changing direction and speed

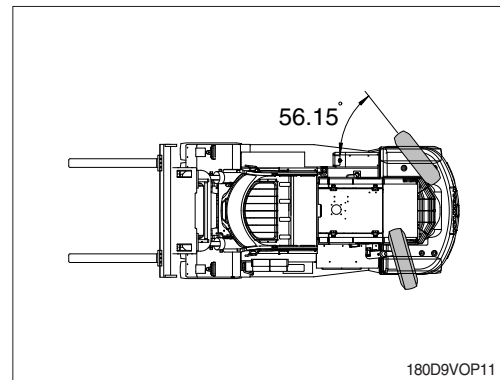
- ① The gear selector lever (FNR switch, opt) is designed for the mounting on the left side of the steering column.
- ② The positions (speeds) 1 to 3 are selected by a rotary motion, the driving direction Forward (F) - Neutral (N) - Reverse (R) by tilting the gear selector lever.
- ③ When doing work, run the truck in the 1st or 2nd speed.



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

(4) Turning the truck

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

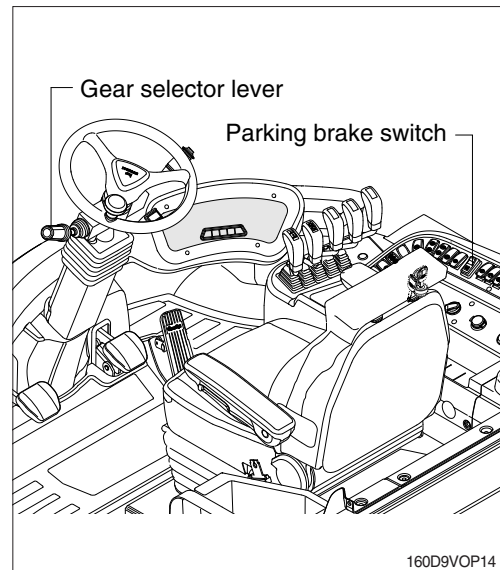


(5) Precautions when driving

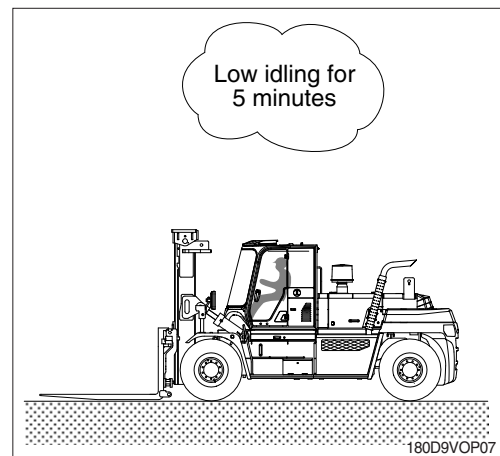
- ① If the monitor warning lamp lights up, put the gear selector lever in the neutral position and stop the truck. Stop the engine after running it at low idling. Then resolve any problems regarding operation of the truck.
- ② When operating the truck, if the load is lighten rapidly, the speed of the truck will increase. So, be careful.
- ③ When the truck travels on uneven ground, keep the truck traveling at low speed.
- ※ Do not drive the forklift more than 30 minutes without idling.
If the truck is driven 30 minutes, stop driving and keep it 10 minutes under idle condition.
Excessive driving may cause overheating of brake and tires and this may result in short life cycle of those parts.

(6) Stopping the truck

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



- ④ Lower the forks to the ground.



(7) Stopping engine

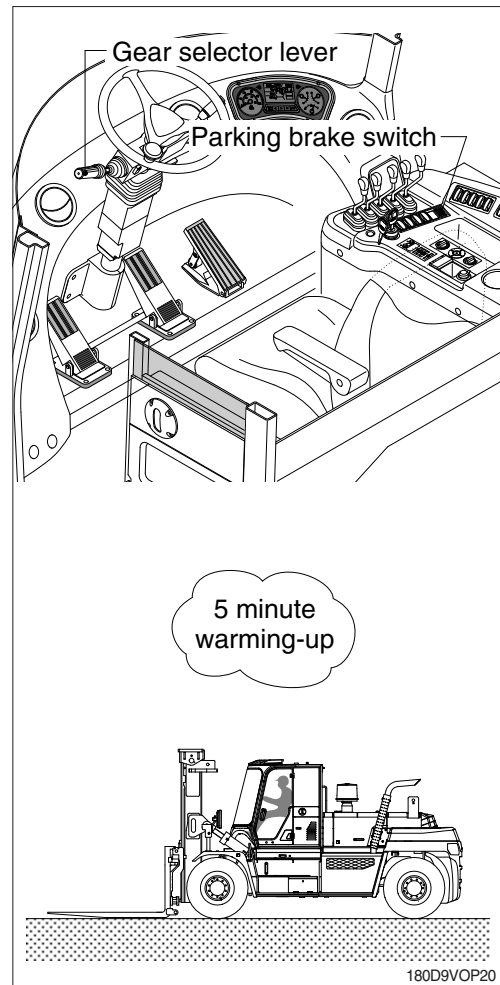
※ If the engine is abruptly stopped before it has cooled down, its service life may be shortened. Avoid sudden stop except an emergency.

※ When the engine is overheated, do not stop immediately. Run the engine at a mid range speed to allow it to cool down, then stop it.

- ① Check if the parking brake switch is in the lock position.
- ② Check if the gear selector lever is in the neutral position.
- ③ Run the engine at low speed without operating the equipment for about 5 minutes.
Turn the starting key to the OFF position and remove the key.

(8) Checks after the engine stopped

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

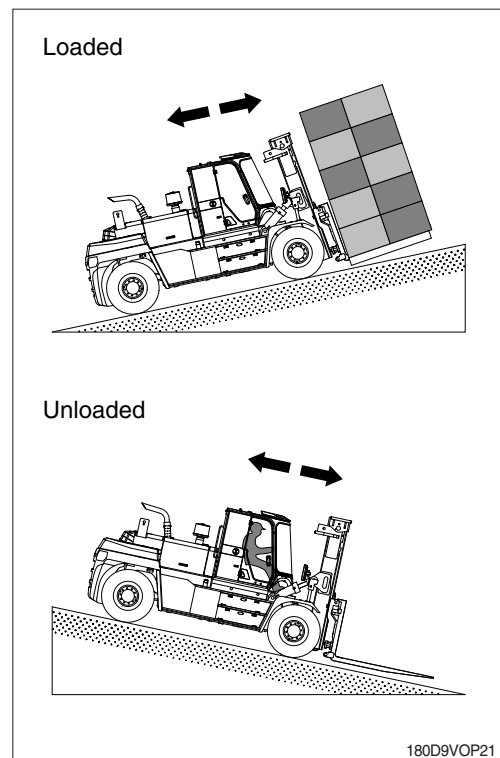


2) TRAVELING ON A SLOPE

- (1) Never travel down a slope in neutral.
- (2) Lower the forks 15-20 cm (6~8 in) to the ground.
- (3) Never turn on a slope, either loaded or unloaded.
- (4) Never park on a slope.
- (5) **Loaded** - move with forks upgrade
Unloaded - move with forks downgrade

▲ Truck cannot travel effectively on a slope when the oil temperature is low. Do the warming-up operation when it is going to travel on a slope.

▲ Be careful when working on slopes. It may cause the truck to lose its balance and turn over.



11. OPERATING SAFELY

Safe operation is the responsibility of the operator.

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

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

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

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

2) PROTECT YOURSELF AND THOSE AROUND YOU...

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

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

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

Don't use the mast as a ladder.

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

3) NO RIDERS...

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

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

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

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

5) GRADES, RAMPS, AND INCLINES...

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

▲ Do not travel down incline with neutral gear state.

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

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

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

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

▲ Always wear your seat belt when operating your truck.

12. LOAD HANDLING

1) GENERAL

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

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

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

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

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

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

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

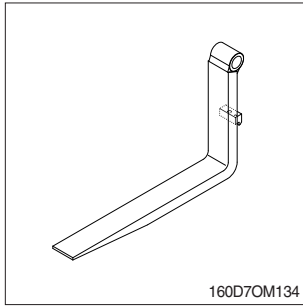
DO NOT climb the mast or the truck.

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

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

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

2) ADJUSTING THE LOAD FORKS

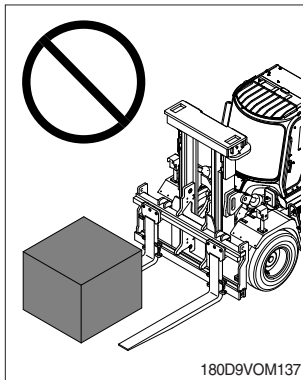


The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make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

Unlock the fork locking pins.

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

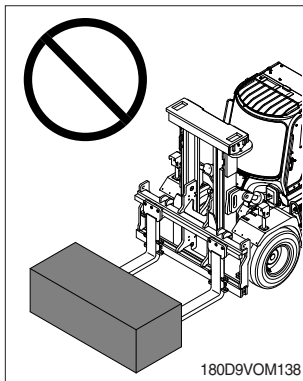
3) LOAD ON FORKS



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

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

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



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

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

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

4) TRAVELING WITH LOAD

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

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

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

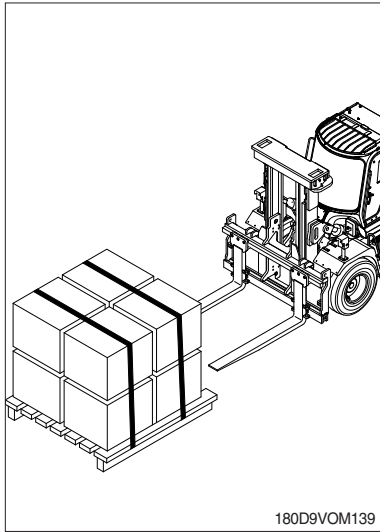
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

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

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

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

5) PICKING UP AND MOVING LOADS



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

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

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

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

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

6) UNLOADING

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

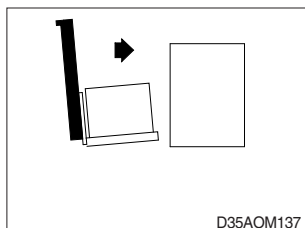
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (Pallet).

Carefully back away to clear the forks from the load.

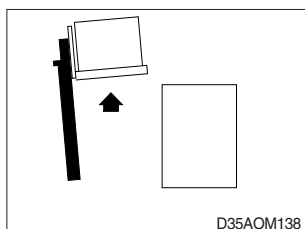
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

7) STACKING

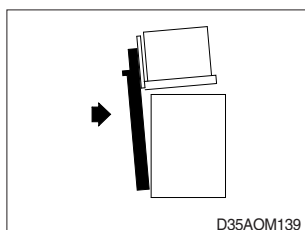
(1) To put a load on a stack



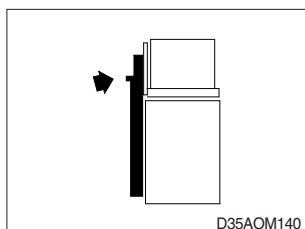
- ① Approach slowly and align the lift truck and load squarely with the stack.



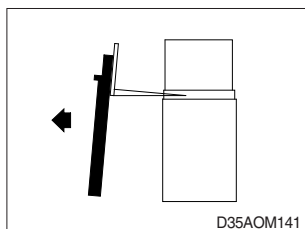
- ② Raise the load as the lift truck nears the stack.



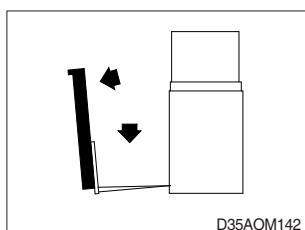
- ③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.



- ④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.
- ⑤ When the load is aligned with the stack beneath it, tilt the mast to the vertical position and carefully lower the load onto the top of the stack.



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



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

(2) To move a load from a stack

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

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

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

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

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

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

13. SHUT DOWN PROCEDURE

※ Always leave your lift truck in a safe condition.

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

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

2) BEFORE LEAVING THE OPERATOR'S POSITION

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

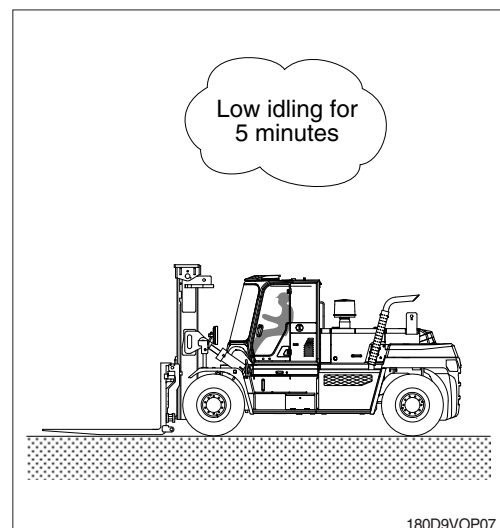
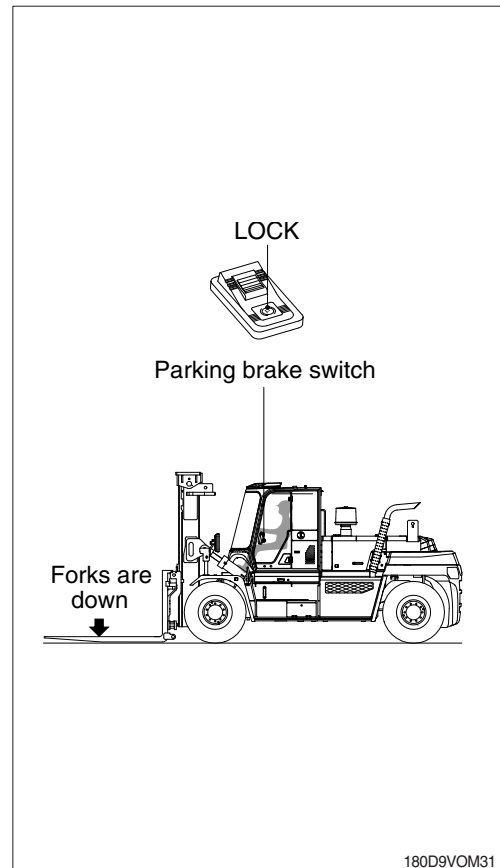
3) IN ADDITION, WHEN LEAVING THE TRUCK UNATTENDED

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

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

▲ CAUTION FOR TURBOCHARGER PROTECTION

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



14. STORAGE

1) BEFORE STORAGE

When you keep your forklift truck in storage for an extended period of time, observe the following safeguard 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 truck and store separately.
- (6) When the atmospheric temperature is anticipated to drop below 0 °C, add antifreeze.

※ **Refer to COLD WEATHER OPERATION** about ratio of water and antifreeze.

2) DURING STORAGE

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

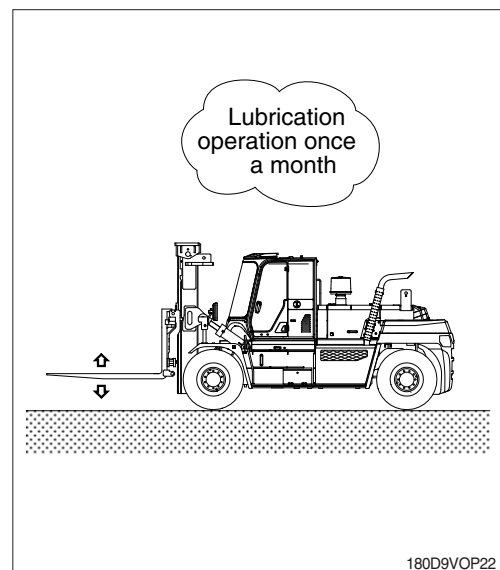
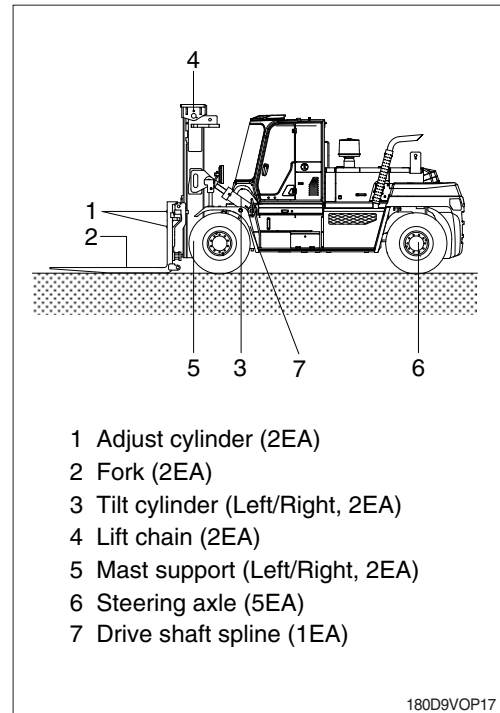
▲ **The above operations should be performed in the open. If they have to be performed inside a building, open the windows and doors to improve ventilation.**

This is to avoid the danger of gas poisoning.

3) AFTER STORAGE

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

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



15. TRANSPORT

1) PRECAUTIONS FOR LOADING AND UNLOADING

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

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

▲ Check travel route for overpass clearance.

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

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

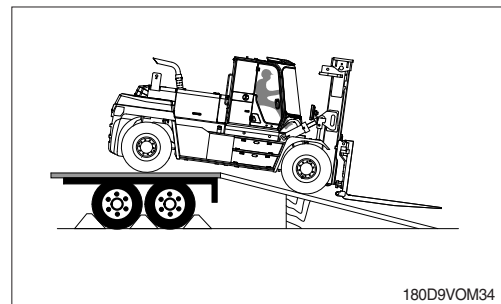
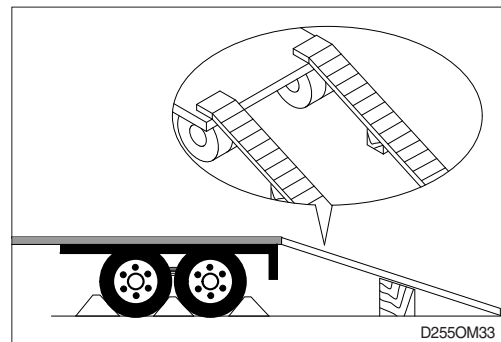
- (1) Ensure that the transporter cannot move by applying the brake and putting blocks under the wheels. Put the gear selector lever in the NEUTRAL position.

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

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

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

Block the wheels and secure the lift truck with tiedowns.



16. LOADING AND UNLOADING BY CRANE

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

- ⚠ Make sure wire rope is proper size.
- ⚠ Make sure that the truck is shut down before hoisting. Lifting the truck with engine running can cause serious accident.
- ⚠ The wrong hoisting method or installation of wire rope can cause damage to driver and truck.
- ⚠ Do not load abruptly.
- ⚠ Keep area clear of personnel.
- ⚠ Recommend to manufacture the stays separately as per lifting conditions.

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

