

## LIST OF START-UP CHECK POINTS

Item	Check points
-	Checking of repaired abnormalities detected on previous day
Walk around a lift truck	Leakage of oil, fuel, coolant and battery electrolyte
	Cracks, damages and the state of mounting (of overhead guard, fork, load backrest, etc.)
	Loose tilt cylinder rod lock nuts
	Contamination and/or damages of lamp, lens, etc.
	Contamination and/or damages of reflector and license number plate
	Loose hub nuts
	Deformed or damaged tyres and rims
	Inflation pressure of tyres
Open the engine hood	Hydraulic oil level
	Engine oil level and contamination
	Battery electrolyte level
	Coolant level
	Brake oil level
	Oil level of torque flow transmission case
Sit on the operator seat	Damages and performance of seat belt
	Seat and handle adjustment
	Brake pedal play and height
	Inching and clutch pedal play and height
	Parking brake lever operating effort
	Horn performance
	Rear view mirror contamination, damages and angle
Turn the starting switch to ON position	Performance of warning lamps on the instrument panel (Check by turning the starter switch ON and OFF)
	Operation of lamps
	Fuel level
	Backup buzzer performance
Start the engine	Abnormal noise and vibration
	Exhaust gas color
	Play of steering wheel
Travel slowly	Operating state of steering wheel (runout and unstable driving)
	Brake operating condition (response)
	Inching and clutch pedal operating condition (letting out the clutch, slip, inching travel)
Operating load handling	Mast operating condition
	Tension, damages and rusted condition of lift chain
Checking of safety function	Travel interlock function (TORQFLOW transmission lift truck only)
	Lift interlock function
	Neutral safety function
	Overlooking application of parking brake, warning buzzer function

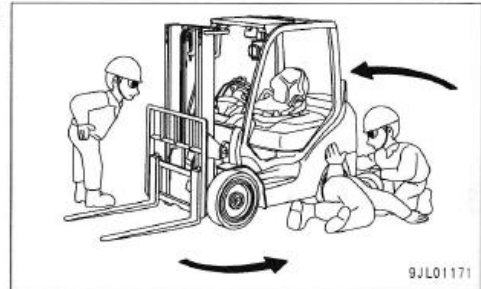
### 4.2.1 CHECKING ABNORMALITIES DETECTED ON THE PREVIOUS DAY

Check again the abnormal points detected during the operation and closing inspection on the preceding day. Double check that no abnormality persists to exist.

### 4.2.2 WALK AROUND A LIFT TRUCK

#### CHECKING FOR LEAKAGE OF FUEL, WATER, OR BATTERY ELECTROLYTE

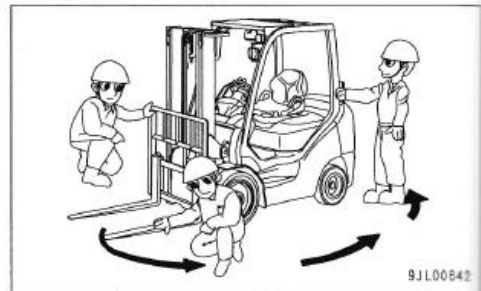
- Walk around the lift truck to check for leakage of oil, fuel, coolant and battery electrolyte.
- Look under the lift truck to check for oil or water leakage.



#### CHECKING OF CRACKS, DAMAGES AND THE STATE OF MOUNTING

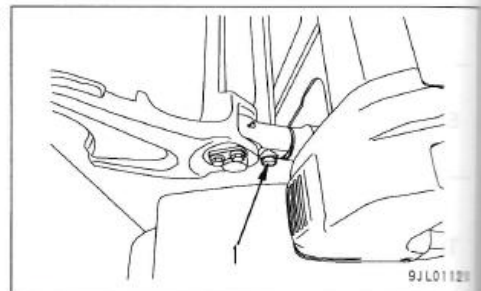
Visually check for any damages, cracks, loose mounting and/or play. Give priority in checking the following points particularly.

- Overhead guard
- Fork
- Load backrest
- Fork carriage
- Mast
- Fuel tank
- Hydraulic oil tank



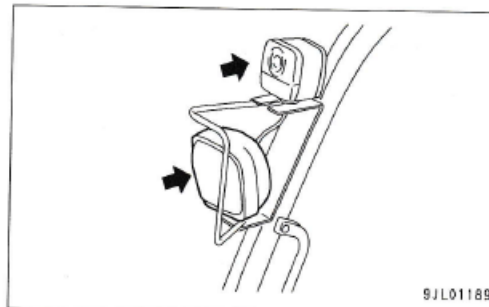
#### CHECKING OF LOOSE TILT CYLINDER ROD AND LOCK NUTS

Visually check if the tilt cylinder rod and the rod head are rotating in loose condition or if the lock nut (1) is loosened.



**CONTAMINATION AND/OR DAMAGES OF LAMP, LENS, ETC**

Visually check lamp, lens, etc. for any contamination and/or damages.



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**CHECKING OF CONTAMINATION AND/OR DAMAGES OF REFLECTOR**

Visually check the reflector for any contamination and/or damages.

**CHECKING OF LOOSE HUB NUTS**

Check for loose hub nuts by tightening them with a wrench.

**NOTICE**

Tighten the hub nuts to the specified torque.

For the right tightening torque, see "4.16 SERVICE DATA (PAGE 4-55)".

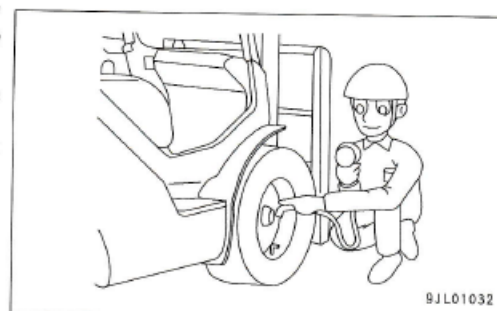
**CHECKING OF TYRES AND RIMS**

- Visually check for any excessive wear, damages, spikes and other foreign matters stuck to the tyres, deformation and damages of the rims.
- Replace a tyre if the tread depth becomes under 5 mm (0.2 in) or if the slip sign (wear limit mark) should appear.

**CHECKING OF INFLATION PRESSURE OF TYRES**
 **CAUTION**

Tyres have high pressure air inside. When checking the inflation pressure, position yourself to face the tyre tread surface (see the figure at right) while holding the tyre air gauge firmly.

Check the tyre inflation pressure with the tyre air gauge and adjust it to specified pressure. For the right tyre inflation pressure, see "4.16 SERVICE DATA (PAGE 4-55)".



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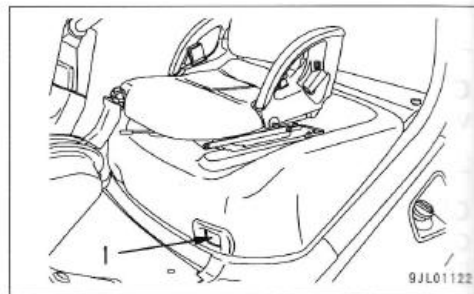
### 4.2.3 INSPECTION BY OPENING THE ENGINE HOOD

#### CAUTION

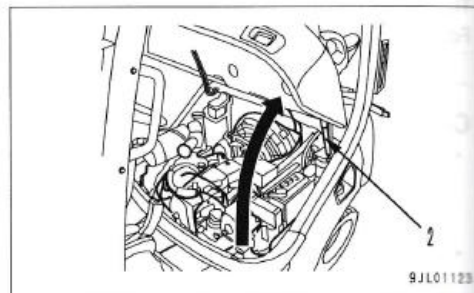
- Before opening the engine hood, always stop the engine.
- Be careful not to have hand caught when opening/closing the engine hood.
- Only the authorized people are allowed to open the engine hood.

#### HOW TO OPEN THE ENGINE HOOD

1. Push up lever (1) on the front left side of the engine hood to unlock the hood.

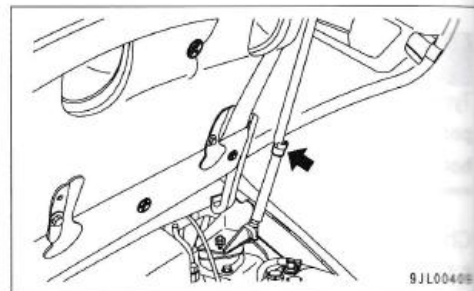


2. Push up the engine hood until red stopper (2) of the engine hood supporting stay is set.



#### HOW TO CLOSE THE ENGINE HOOD

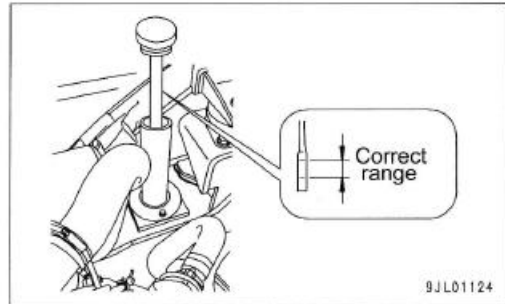
- Press in the red stopper of supporting stay (by the portion stamped "PRESS") to the arrow direction (backward), while closing the engine hood slowly with other hand.
- Check that the engine hood is closed completely and locked.



**CHECKING OF OIL LEVEL IN HYDRAULIC TANK**

Check if hydraulic oil is filled to the specified level.

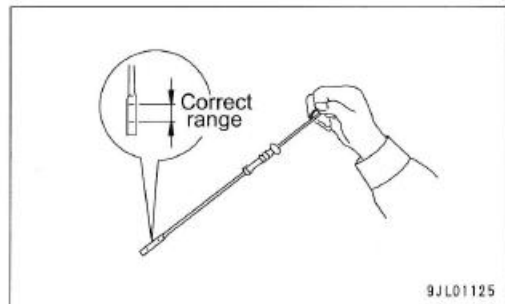
1. Lower the forks fully to the floor and hold the mast vertical on a flat site.
2. Withdraw the oil gauge (integrated with the breather) on the R.H. side of the lift truck body. Wipe hydraulic oil off the oil gauge with a clean cloth and insert the gauge into the tank.
3. Pull out the oil level gauge again and check that the stuck oil is within the normal range.
4. When hydraulic oil is low, replenish it. If the oil is spilt, wipe it off completely.

**NOTICE**

Always use Komatsu Genuine Hydraulic oil.

**CHECKING THE ENGINE OIL LEVEL IN THE OIL PAN**

1. Check if the engine oil is within the normal range.
2. Withdraw the oil gauge. Wipe hydraulic oil off the oil gauge with a clean cloth and insert the gauge back into the tank.
3. Pull out the oil level gauge again and check that the stuck oil is within the normal range.
4. When hydraulic oil is low, replenish it. If the oil is spilt, wipe it off completely.

**NOTICE**

- When the engine oil is considerably contaminated or has been discolored, replace with new oil.
- Always use Genuine Engine oil.

## CHECKING OF BATTERY ELECTROLYTE LEVEL

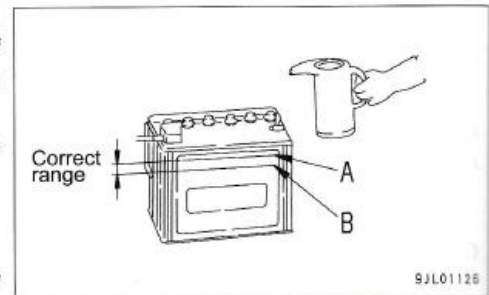
**CAUTION**

Batteries generate flammable hydrogen gas and may explode. Battery electrolyte also contains dilute sulfuric acid. Handling error may cause personal injuries, explosions and fires. Strictly follow the "2.7.14 CAUTION WHEN HANDLING BATTERY (PAGE 2-42)".

- Check whether the battery electrolyte level is within the normal range between the upper limit line (A) and lower limit line (B). If the level is low, refill it with distilled water until the level reaches the upper limit line (A).
- Always keep the breather and terminal of the battery cap on the top of the battery clean with no dust attachment.

## NOTICE

- If the battery electrolyte has spilled and the level has gone down, have your battery repair shop add dilute sulphuric acid of the same density.
- Do not use a metal funnel when adding distilled water or dilute sulphuric acid.



## CHECKING OF COOLANT LEVEL

**CAUTION**

Do not open the radiator cap immediately after the engine stops, since the coolant temperature is very high. Steam or boiling water may spurt out, causing burns. After the coolant temperature has gone down, turn the cap slowly to release the pressure before removing it.

1. Check whether the coolant level is within the normal range, i.e. between FULL and LOW when the coolant in the radiator reservoir tank in the engine hood is in a cooled state.

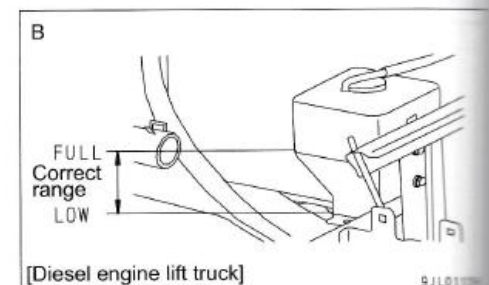
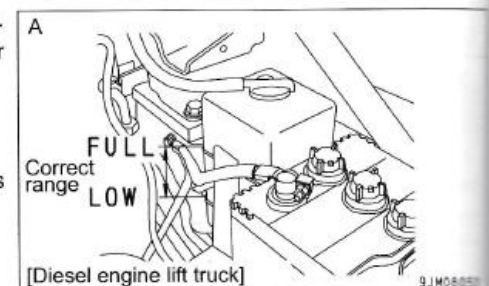
## REMARK

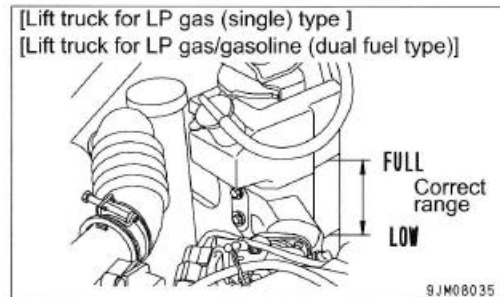
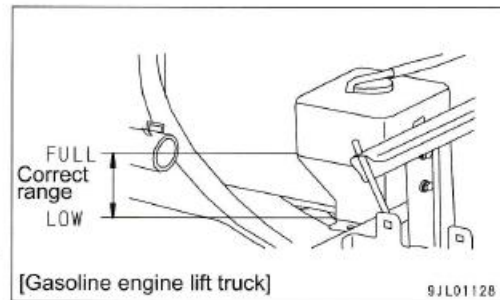
These instructions apply to the following diesel engine lift trucks (see illustrations at right):

A : FD20/FD20H/FD25/FD25H/FD30/FD30H/FD35A-17

B : FD10/FD15/18-21

2. If not in normal range, refill coolant to FULL position.
3. Check the radiator and radiator hose for any water leakage.

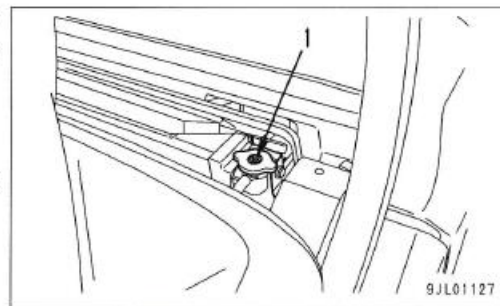




4. When the cooling water in the sub-tank is all gone, open radiator cap (1) to refill the radiator tank and sub-tank with coolant.

**REMARK**

Radiator cap (1) is on the left side of the diesel engine lift truck and on the right side of the gasoline engine lift truck.

**CHECK DEFLECTION OF V-BELT**

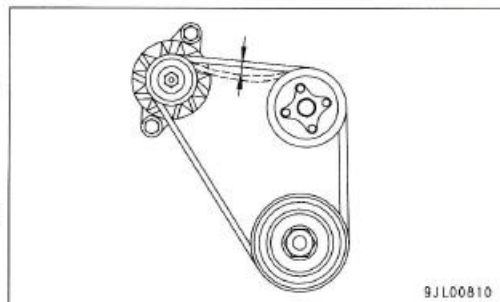
For the inspection of V belt tension, depress the belt center with force of 98 N (10 kgf).

For the inspection of V belt deflection, refer to "4.16 SERVICE DATA (PAGE 4-55)".

**NOTICE**

Replace the belt if the belt is stretched and there is no allowance for adjustment, or if the belt is cut or cracked.

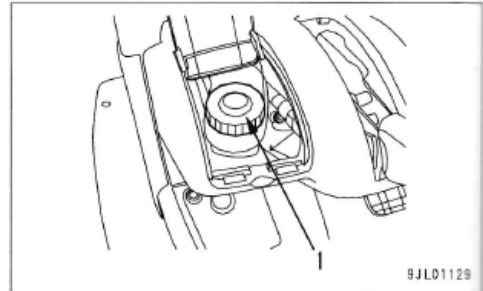
Contact your FORKLIFT distributor for the replacement of belts.



**CHECKING OF OIL LEVEL IN THE BRAKE RESERVOIR TANK****⚠ WARNING**

Using wrong brake fluid causes leakage to disable braking function. Always use specified brake fluid (non-mineral oil brake fluid for vehicles).

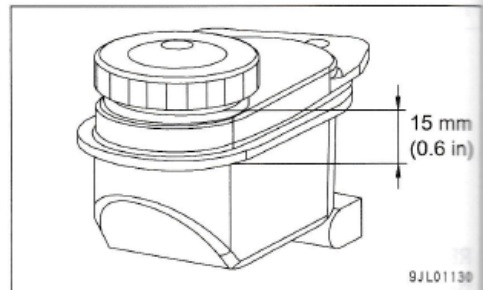
1. Open the cover on the top left end of the dashboard to locate brake reservoir tank (1).



2. Check if the fluid level is within the normal range of up to 15 mm (0.6 in) from the under side of the cap. If the brake fluid is low, remove the cap and refill the fluid to the upper limit of the normal range.

**NOTICE**

When replenishing brake fluid, be careful not to allow sands and dirt to enter the brake reservoir tank.

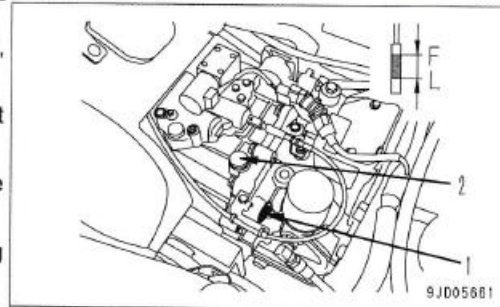




**CHECK TORQFLOW TRANSMISSION CASE OIL LEVEL****⚠ CAUTION**

Immediately after the machine is moved, the oil is still very hot. Wait for the temperature to go down before starting the work.

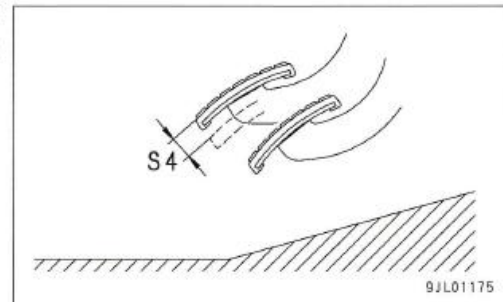
1. Place the machine on a level ground before starting the work, apply the parking brake securely.
2. Close the engine hood and start the engine. Run the engine at low idle for approximately 3 minutes.
3. After stopping the engine, open the engine hood, and remove floor mat and floor plate.
4. Leave the machine for approximately 5 minutes after stopping the engine to stabilize the oil level.
5. Pull out dipstick (1) and wipe the oil off with a clean cloth. Then insert it to the original position.
6. It is normal if the oil level is between F and L. If the oil level is below the L mark, add oil through oil filler port (2).

**NOTICE**

- If oil is spilled, wipe it off completely.
- If the oil is at high temperature, oil level becomes higher than usual because of thermal expansion. Accordingly, wait for the temperature to go down before checking.

**CHECKING THE CLUTCH PEDAL (CLUTCH TYPE LIFT TRUCK)**

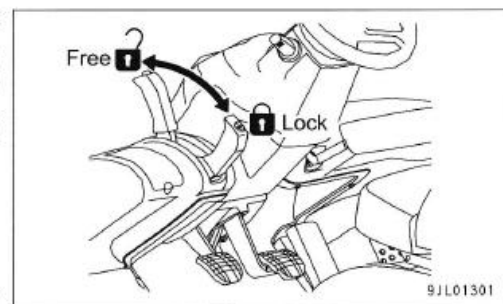
Check the clutch pedal for correct application and play dimension with the clutch pedal. For the standard value for the clutch pedal play dimension (S4), see "4.16 SERVICE DATA (PAGE 4-55)".

**CHECKING THE PARKING BRAKE LEVER**

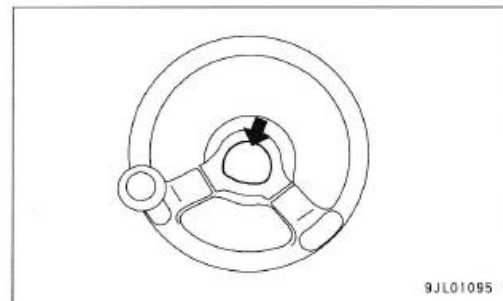
Check if the parking brake lever can be pull back fully toward the rear of lift truck. Also check if the parking brake lever returns fully and smoothly when released toward the front of the lift truck. For the standard value of the lever operating effort, see "4.4.5 ADJUSTING PARKING BRAKE LEVER OPERATING EFFORT (PAGE 4-33)".

**NOTICE**

If the value of the lever operating effort is not within the standard range, contact your FORKLIFT distributor for repair.

**CHECKING THE HORN**

Check if the horn sounds normally when switched ON.

**CHECKING THE REARVIEW MIRROR (OPTION)**

Check if the mirror is set at an easy angle for the operator to see the rear. Also check for any contamination or damages.

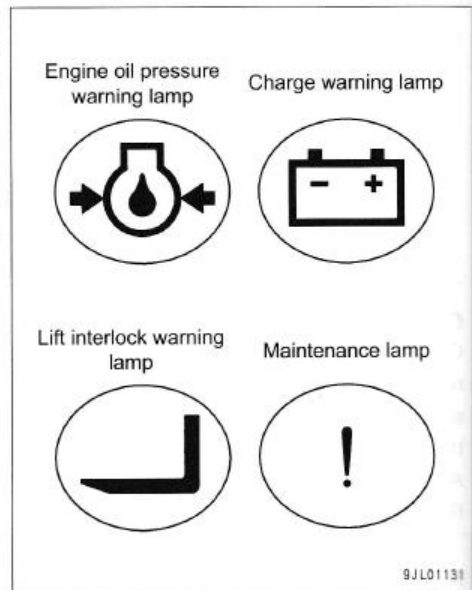


**4.2.5 CHECK BY SETTING THE STARTER SWITCH TO [ ] (ON) POSITION****CHECKING PERFORMANCE OF WARNING LAMPS ON THE INSTRUMENT PANEL**

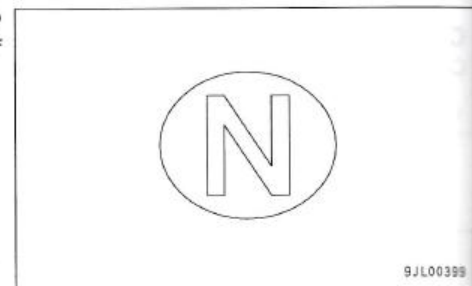
Check that the following lamps are ON when the starter switch is set to the [ ] (ON) position: engine oil pressure warning, charge warning, load handling interlock indicator and the safety control system abnormality warning.

**REMARK**

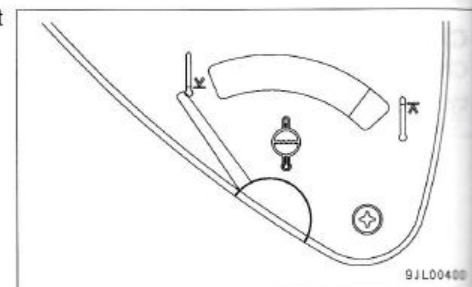
Lift interlock warning lamp will flash if the operator fails to sit on the seat correctly. For more details on the function of load handling interlocking, see "LIFT INTERLOCK (PAGE 3-34)".

**NEUTRAL INDICATOR LAMP**

The neutral indicator lamp is functioning normally when it lights up as the starter switch is set to the [ ] (ON) position, and goes off when forward/reverse lever is set to forward (F) or rear (R).

**COOLANT TEMPERATURE GAUGE**

The pointer points to the left when the engine is cold, and points at the white range when warmed up.



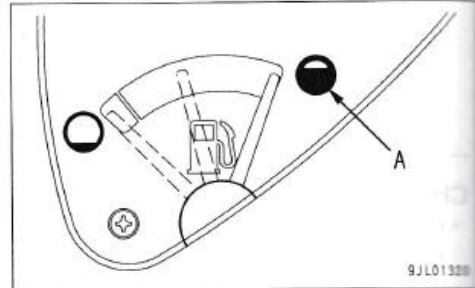
## CHECKING OF FUEL TANK LEVEL AND REPLENISHMENT

**CAUTION**

- Before refilling fuel, always stop the engine and keep fire away.
- When refilling fuel, never let the fuel overflow. This may cause a fire. If the fuel is spilt, wipe it off completely.

Check the fuel gauge to see if the fuel tank contains enough fuel for the day's work.

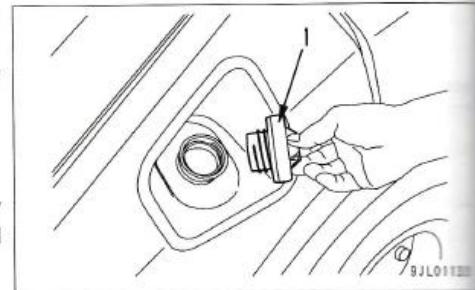
- When fuel level gauge needle points to (A), the fuel tank is full.
- If the fuel level is low, stop the engine and refill fuel from the fuel filler port. For the type of fuel, see "LUBRICANT LIST (PAGE 4-28)".



- When refilling, remove dirt in and around the filler port cap (1) to prevent the dirt from entering the fuel tank.
- After refilling, tighten the filler port cap (1) securely and wipe off spilt fuel without fail.

**NOTICE**

Using kerosene-mixed fuel with a diesel engine lift truck results in early degradation of the fuel injection system. Never use kerosene-mixed fuel with the diesel engine lift truck.

**REMARK**

The following indicate approximate fuel capacity when the fuel gauge needle points at the center of the scale

Model	Center (ℓ)	Full (ℓ)
1 - 1.75 ton	24	40
2 - 3.5 ton	34	58
2 - 3 ton (Compact model)	24	40

Compact model : FG20N - 30N - 17

## CHECKING BACKUP BUZZER PERFORMANCE

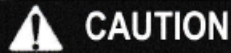
**CAUTION**

Check the backup buzzer performance under the following conditions

- For TORQFLOW transmission lift trucks, pull the parking brake lever in the direction to the rear of the lift truck and step on the inching pedal.
- For clutch type lift trucks, pull the parking brake lever in the direction to the rear of the lift truck and step on the clutch pedal after setting the high/low speed lever to the neutral position.

Check that the backup buzzer sounds when the forward/reverse lever is set to the REVERSE position.

### 4.2.6 CHECKING WITH THE ENGINE STARTED



Exhaust gas is toxic. When starting engine indoors or in a poorly-ventilated site, take extreme care for ventilation.

#### CHECKING THE GOING OFF OF WARNING LAMPS ON THE INSTRUMENT PANEL

- Check that the warning lamps on the instrument panel go off immediately upon starting the engine.
- Engine pressure warning lamp may go off with slight time lag, which does not mean a failure.

#### CHECKING ABNORMAL NOISE AND VIBRATION

Check in particular that there is no abnormal noise or abnormal vibration from the engine or hydraulic pump.

#### CHECKING ENGINE EXHAUST GAS COLOR

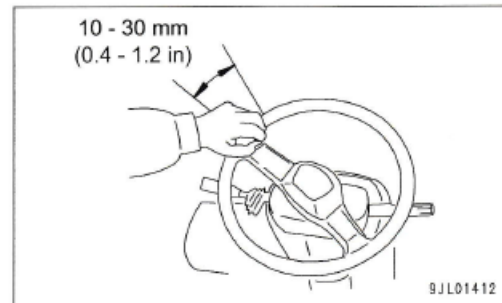
Check if the color of exhaust gas is not in black or white.

##### REMARK

- For diesel engines, some black or white exhaust gas may be emitted immediately after the engine start, which is not abnormal.
- Black or white exhaust may be caused by the following:
  - Black: Incomplete combustion
  - White: Engine oil scraped up or scraped down

#### CHECK THE STEERING WHEEL FOR PLAY

- Check the play of steering handle by operating it in the direction of a turn. Play should be normal if within 10 - 30 mm (0.4 - 1.2 in).
- Check if it is free of looseness by shaking it in the vertical and longitudinal directions.



### 4.2.7 CHECKING WHILE TRAVELING SLOWLY

#### CHECKING OF THE STEERING WHEEL FUNCTION

Check the following points by operating the wheel while traveling slowly.

Make sure that:

- The steering wheel does not have any 'play'.
- The steering wheel is stable (ie: does not move left or right) when the vehicle traveling in a straight line.
- The steering wheel does not have any abnormal swing or does not seem heavy when it is turned.

#### CHECKING OF BRAKE FUNCTION

Check the brake response by stepping on the brake pedal while traveling slowly.

Make sure that:

- The brakes are operating effectively.
- Both brakes are responding, (not just one side).

#### CHECKING THE INCHING PEDAL FUNCTION (TORQFLOW TRANSMISSION LIFT TRUCK)

Check the inching function by stepping on the inching pedal while traveling slowly.

- Can the travel speed be adjusted according to the stepping effort of the inching pedal?
- Does the lift truck stop when the inching pedal is fully stepped on?

#### CHECKING THE CLUTCH PEDAL FUNCTION (CLUTCH TYPE LIFT TRUCK)

Check the clutch pedal function by stepping on the clutch pedal while traveling slowly.

- Can the travel speed be adjusted according to the stepping effort of the clutch pedal?
- When the clutch pedal is fully stepped on, is the clutch completely released and that it does not slip while in operation?

#### CHECKING OF ABNORMAL NOISE AND ODOR

Check that no abnormal sound or odor is emitted while traveling slowly.

### 4.2.8 CHECKING BY OPERATING THE WORK EQUIPMENT LEVER

#### CHECKING OF MAST FUNCTION AND ABNORMAL NOISE AND ODOR

- Check that the forks lift and lower smoothly and the mast tilts forward and backward smoothly during operation of the work equipment lever from the operator seat. Always make full stroke operation of cylinder piston two to three times everyday before starting work.
- Check that no abnormal sound or odor is emitted while operating the work equipment lever.

### 4.2.9 CHECKING OF SAFETY FUNCTION



#### CAUTION

- Check this function by placing the lift truck on a level, hard flat road surface.
- Secure enough traveling space without human beings and other obstacles around the lift truck.

#### CHECKING OF TRAVEL INTERLOCK FUNCTION (TORQFLOW TRANSMISSION LIFT TRUCK)

Check the safety function to disable the lift truck to travel when the operator is away from the seat.

##### CHECKING PROCEDURE

1. Park the lift truck in a level, flat and hard surface and apply the parking brake. (Parking brake activated)
2. Set the forward/reverse lever to the N (neutral) position, and raise the forks 15 cm (6 in) above the ground.
3. Step the foot off the brake pedal, inching pedal and accelerator pedal.
4. Set the forward/reverse lever to F (forward) or R (reverse) and lift the hip from the seat.
5. Check that the travel interlock warning lamp (with N mark) on the instrument panel starts flashing about 3 seconds later.
6. In this condition, release the parking brake. (Parking brake being released)
7. Depress the accelerator pedal with your hip lifted from the seat, and check that the lift truck does not travel.
8. Releasing travel interlock function  
*Sit on the seat correctly and set the forward/reverse lever to N (Neutral) position. Flashing travel interlock warning lamp turn out and the lift truck returns to normal operating conditions.*

#### CHECKING OF LIFT INTERLOCK FUNCTION

Check the safety function to disable the lift operation when the operator is away from the seat.

##### CHECKING PROCEDURE

1. Park the lift truck in a level, flat and hard surface and apply the parking brake. (Parking brake activated)
2. Set the forward/reverse lever to the neutral position, and raise the fork to a position about 1 meter from the ground which is visible to the operator.
3. Step foot from every pedal and lift the hip from the seat.
4. Check that the lift interlock warning lamp on the instrument panel starts flashing about 3 seconds later.
5. Check the following in this state:
  - The forks do not rise or lower if the lift lever is operated.
  - The mast does not tilt forward or backward if the tilt lever is operated.
6. Releasing lift interlock function.  
*Take a right posture in the operator's seat. Flashing lift interlock warning lamp turn out and the lift truck returns to normal operating conditions.*





### CHECKING OF NEUTRAL SAFETY FUNCTION

Check the neutral safety function to prevent the risk of the lift truck suddenly traveling when the engine is started with the forward/reverse lever set in either forward (F) or reverse (R) position.

#### CHECKING PROCEDURE

1. Park the lift truck in a level, flat and hard surface and apply the parking brake. (Parking brake activated)
2. Set the forward/reverse lever to N (neutral) and stop the engine.
3. Check that the starter motor does not run and the engine does not start if the starter switch is set to [ ] (START) position and the forward/reverse lever set to either forward (F) or reverse (R) position.
4. Releasing neutral safety function  
After checking the neutral safety function, set the forward/reverse lever to the neutral position. The neutral safety function is released and the engine returns to normal state. The engine starts when the starter switch is set to [ ] (START) position.

### CHECKING OF WARNING BUZZER AGAINST OVERLOOKING APPLICATION OF PARKING BRAKE LEVER

Check the warning function that sounds buzzer if operator left the seat without pulling the parking brake lever to the rear direction of the lift truck.

#### CHECKING PROCEDURE

1. Park the lift truck in a level, flat and hard surface and apply the parking brake. (Parking brake activated)
2. Set the forward/reverse lever to the neutral position, and lower the forks to the ground. Tilt the mast forward until the fork is in contact with the ground.
3. Stop the engine. Pull out the starter switch. Return the parking brake lever to the forward direction of the lift truck (release) and leave the seat.
4. Check that the warning buzzer sounds about 3 seconds later.
5. Stopping the sound of warning buzzer  
Pull the parking brake lever to the rear direction of the lift truck. The buzzer stops sounding and the system returns to normal state.

## 4.3 CHECKING AND REPORTING AFTER OPERATION

Checking and reporting after the day's operation are important job for getting the lift truck ready for operation on the following day. Before washing and storing the lift truck after the day's operation, take the following check procedure and always report to the administrator on the finding.

1. Checking of leakage of oil, fuel, coolant and battery electrolyte.
2. Checking of cracks, damages and loosened parts, etc.
3. Grease up and lubricate the parts if necessary.
4. Checking of abnormal points detected during the operation.