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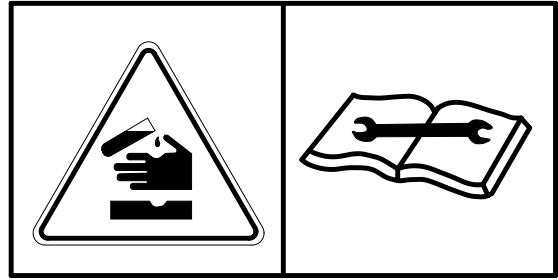
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14) BATTERY (Item 24)

This warning label is positioned on the battery box.

- ▲ **Electrolyte containing sulfuric acid cause severe burns. Avoid being in contact with skin, eyes or clothes. In the event of accident flush with sufficient water, call a physician immediately.**
- ※ **Maintain the electrolyte at the recommended level. Add distilled water to the battery only when starting up, never when shutting down. With electrolyte at proper level, less space may cause the gases to be accumulated in the battery.**



21070FW05

15) HYDRAULIC OIL LUB (Item 25)

This warning label is positioned on the top of the hydraulic oil tank.

Do not mix with different brand oils.

- ▲ **Never open the filler cap while engine running or at high coolant temperature.**
- ▲ **Loosen the cap slowly and release internal pressure completely.**

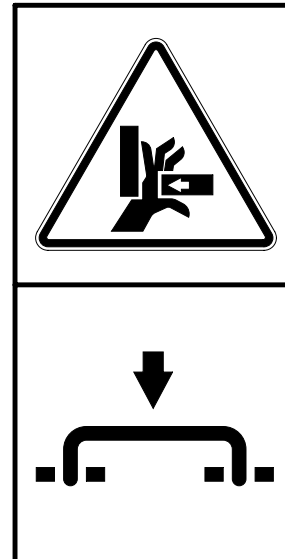


21070FW04

16) STAY FIX (Item 28)

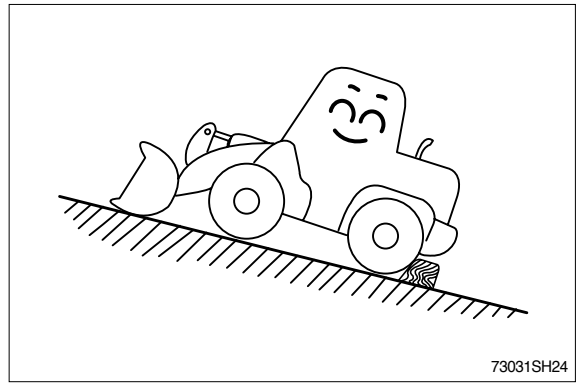
The warning label is positioned on the engine side door.

- ▲ **Be sure to support the stay when the door needs to be opened.**
- ▲ **Be careful that the opened door may be closed by the external or natural force like strong wind.**

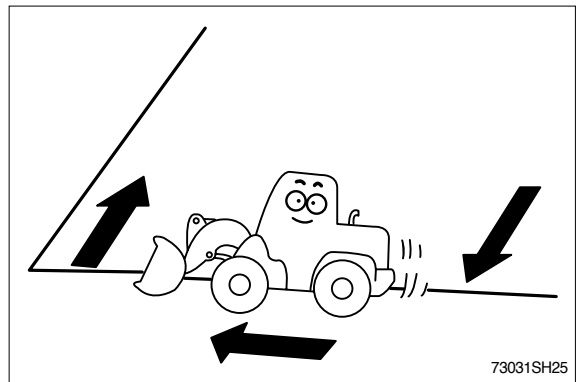


21070FW14

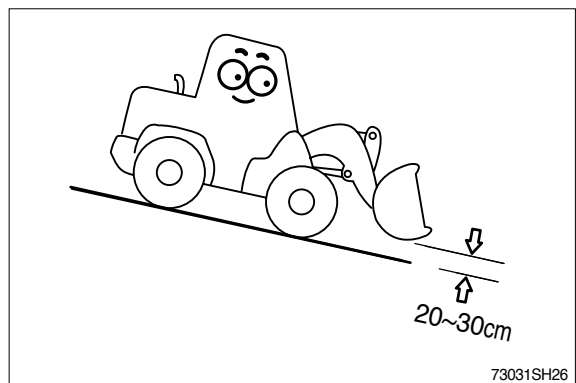
Avoid parking and stopping on a slope.
Lower the bucket to the ground and block the tire when parking.



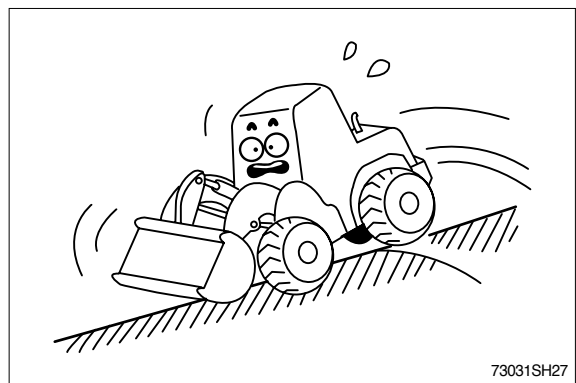
Avoid traveling in a cross direction on a slope as it can cause the danger of rolling over and sliding.



Traveling on the slope is dangerous.
Be sure to operate slowly when driving down a slope and maintain the bucket at a height of 20~30cm(1ft) above the ground so that it can be used as brake in an emergency.

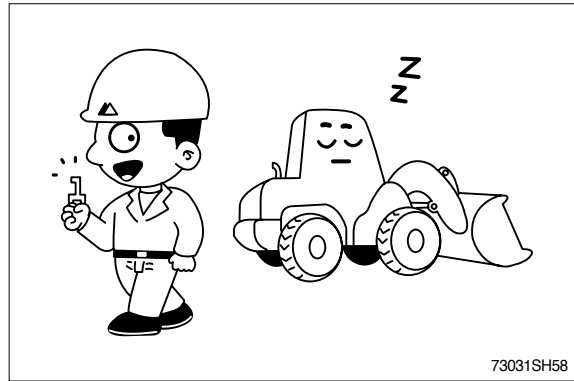


Steering of the machine while traveling on a slope is dangerous.
When an inevitable turning of direction is required, turn on the flat and solid ground.

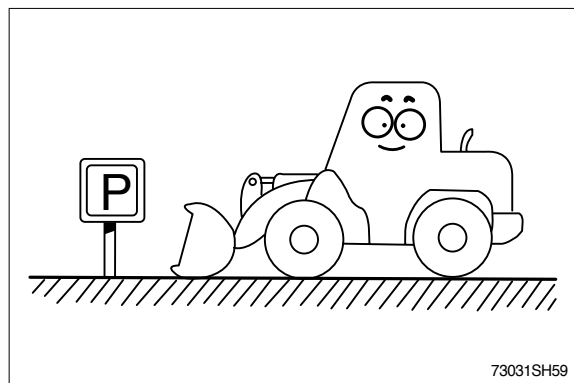


4. PARKING

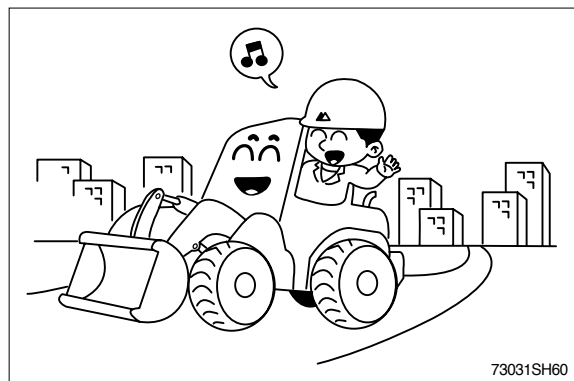
When leaving the machine lower the bucket to the ground completely and put the safety lever at parking position then remove the key. Lock the cab door.



Park the machine in the flat and safe place.



Hope you can work easily and safely observing safety rules.
For safe operation, observe all safety rules.

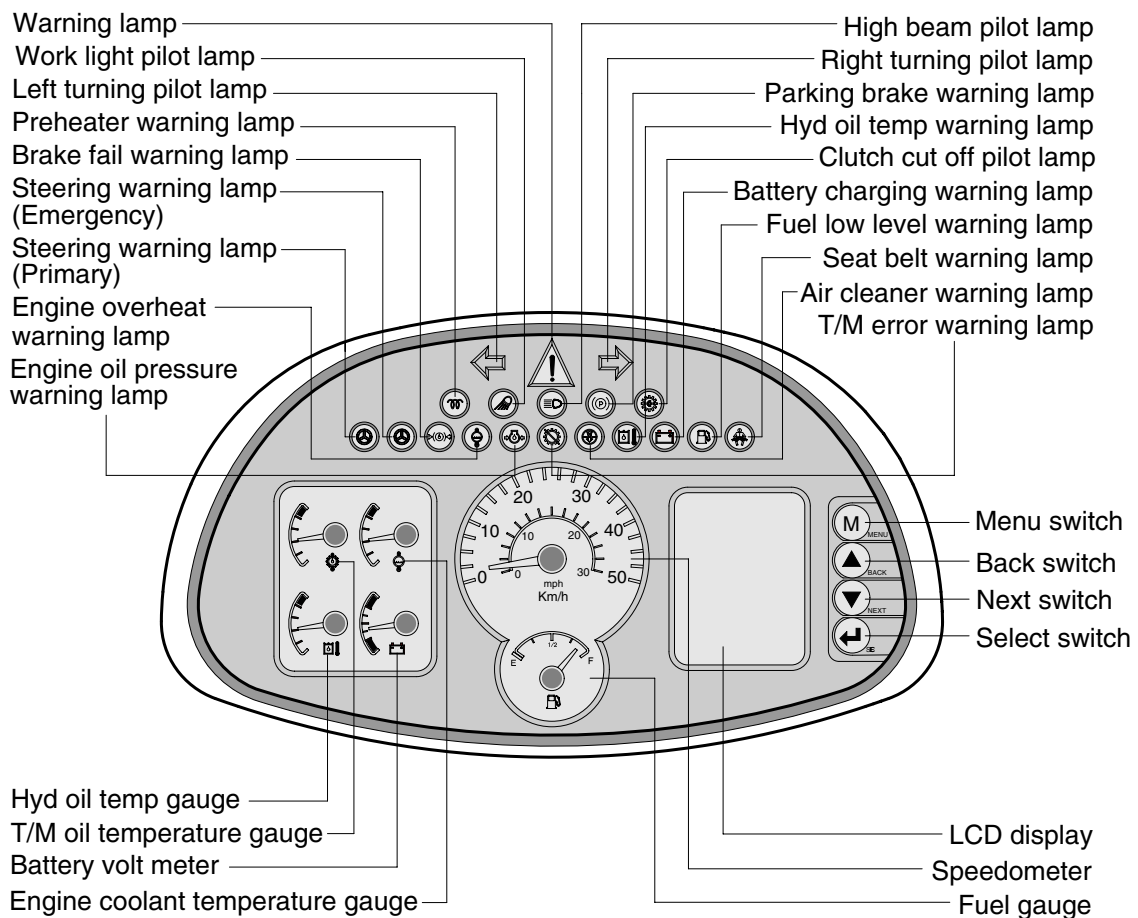


2. CLUSTER

The gauges panel consists of gauges and monitors as shown below, to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection.

- Gauges : Indicate operating status of the machine.
- Warning lamp : Indicate abnormality of the machine.
- Pilot lamp : Indicate operating status of the machine.
- ※ **The monitor installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to chapter 6, MAINTENANCE.**
- ※ **When the monitor provides a warning immediately check the problem, and perform the required action.**

■ Cluster(Machine serial no. ; -#0273)

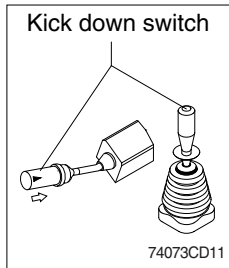


77073CD02

Description	Code	Meaning	Remark
Electrical system	010	Power input voltage low	Below 18V
	011	Power input voltage high	Above 38V
	012	Alternator voltage low	Below 5V
	013	Alternator voltage high	Above 36V
	014	Buzzer circuit open or short to ground	
	015	Buzzer circuit short to power	
Hydraulic system	020	Hydraulic oil temperature sensor open or short to power	
	021	Hydraulic oil temperature sensor short to ground	
Engine system	030	Fuel level sensor open or short to power	
	031	Fuel level sensor short to ground	
	034	Cooling fan driving valve open or short to ground	
	035	Cooling fan driving valve short to power	
	040	Coolant temperature sensor open or short to power	
	041	Coolant temperature sensor short to ground	
	042	Preheater relay open or short to ground	
	043	Preheater relay short to power	
T/M system	044	Engine speed signal bad	
	050	Auto select switch supply power open or short to power	
	051	Auto select switch supply power short to ground	
	052	Clutch cutoff supply power open or short to power	
Steering system	053	Clutch cutoff supply power short to ground	Option
	060	Emergency steering relay open or short to ground	Option
Communication	061	Emergency steering relay short to power	
	070	MCU communication error	
	071	TCU communication error	

MCU : Machine control unit TCU : Transmission control unit

14) KICK DOWN SWITCH



(1) Manual mode

It is effective 2nd speed to 1st speed only and recover to 2nd speed quickly when push the switch one more time.

(2) Automatic mode

① Mode 1(Down/Up)

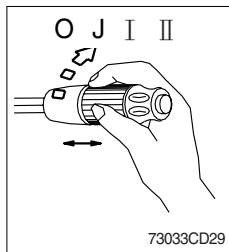
It shifts down quickly from current gear to one step lower speed by pushing the switch and recover to original speed quickly when push the switch one more time.

② Mode 2(Down)

It shifts down from current gear to one step lower speed when push the switch everytime.

Refer to page 3-10,14.

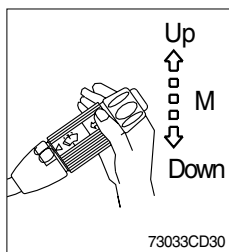
15) MULTI FUNCTION SWITCH



(1) Front wiper and washer switch

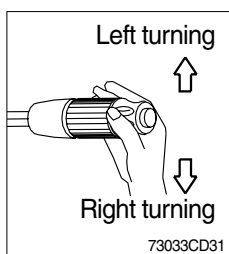
- ① When the switch is in J position, the wiper moves intermittently.
- ② When placed in I or II position, the wiper moves continuously.
- ③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

※ 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

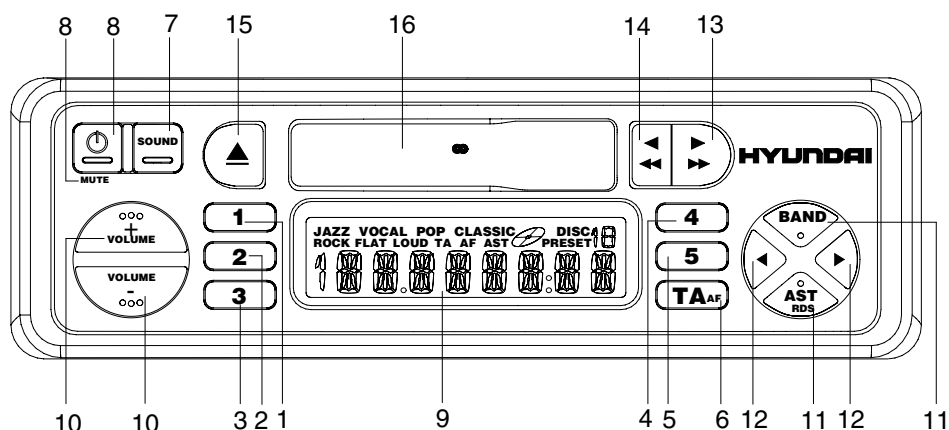
- ① This switch is used to turn the head lights direction.
- ② Switch positions
 - Up : To flash for passing
 - Middle : Head lights low beam ON
 - Down : Head lights high beam ON
- ③ If you release the switch when it's in up position, the switch will return to middle.



(3) Turning switch

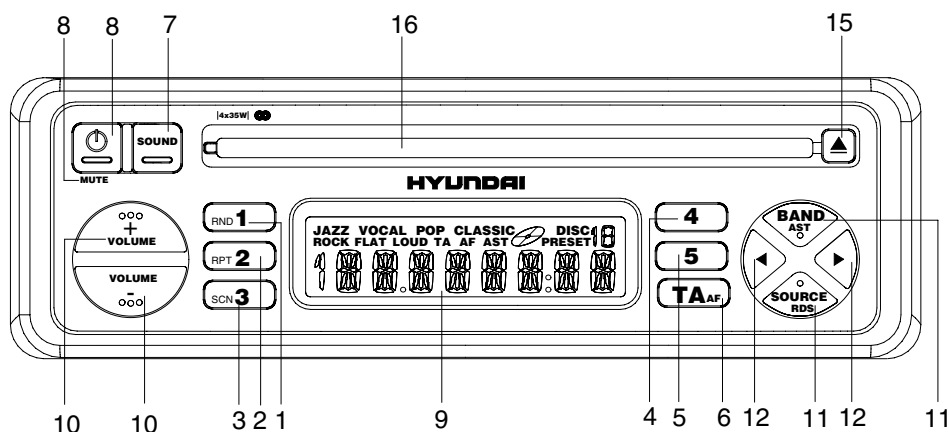
- ① This switch is used to warn or signal the turning direction of the machine to other vehicles or equipment.
- ② Push the lever up for turning left, pull the lever down for turning right.

RADIO AND CASSETTE(Standard, Machine serial no. ; #0196-)



7807A3CD81

RADIO AND CD PLAYER(Optional)



7807A3CD82

FRONT PANEL PRESENTATION

- | | | | |
|----|---|----|--|
| 1 | 1 Preset button 1 | 11 | SOURCE .. Short press : Change source(CD) |
| | RND CD random playback on/off | | RDS Long press : RDS on/off |
| 2 | 2 Preset button 2 | | BAND Short press : To select band |
| | RPT CD repeat track on/off | | AST Long press : Autostore(CD) |
| 3 | 3 Preset button 3 | | Short press : Autostore(Cassette) |
| | SCN CD's track scan | 12 | ◀▶ Tuner mode |
| 4 | 4 Preset button 4 | | Short press : Auto search up/down |
| 5 | 5 Preset button 5 | | Long press : Manual search up/down |
| 6 | TA AF Short press : TA on/off | | Cassette mode : No function |
| | Long press : AF on/off | | CD mode |
| 7 | SOUND Select sound/audio styles | | Short press : Next/previous track |
| 8 | ⏻ Short press : power on | | Long press : Fast forward or fast rewind |
| | Long press : power off | 13 | ▶▶ Fast forward(cassette deck) |
| | MUTE Short press : To mute or cancel mute. | 14 | ◀◀ Fast rewind(cassette deck) |
| 9 | Display | 15 | ▲ Disc eject(CD) |
| 10 | Volume knob : Press up/down to | | Eject cassette |
| | adjust the volume ; adjust selected | 16 | CD opening / Cassette opening |
| | audio mode | | |

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4. OPERATION

1. SUGGESTION FOR NEW MACHINE

- 1) It takes about 100 operation hours to enhance its designed performance.
- 2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

Service meter	Load
Until 10 hours	About 60%
Until 100 hours	About 80%
After 100 hours	100%

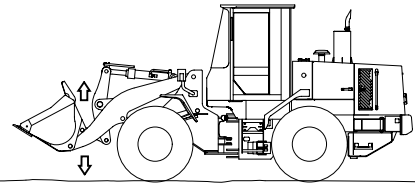
Excessive operation may deteriorate the potential performance of machine and shorten lifetime of the machine.

- 3) Be careful during the initial 100 hours operation.
 - (1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.
 - (2) Check regularly the lubrication and fill. Grease daily all lubrication points.
 - (3) Tighten bolts.
 - (4) Warm up the machine fully before operation.
 - (5) Check the gauges during operation.
 - (6) Check if the machine is operating normally during operation.

4) Replace following after initial 50 hours of operation

Checking items	Service
Engine oil	Replace
Engine oil filter element	

Avoid excessive operation for initial 100 hours



73074OP01

(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.

Check if the parking brake is in the lock position.
Check if the gear selector lever is in the neutral position.

Check if the hydraulic safety lock lever is in the LOCK position.

Run the engine at low speed without operating the equipment for about 5 minutes.

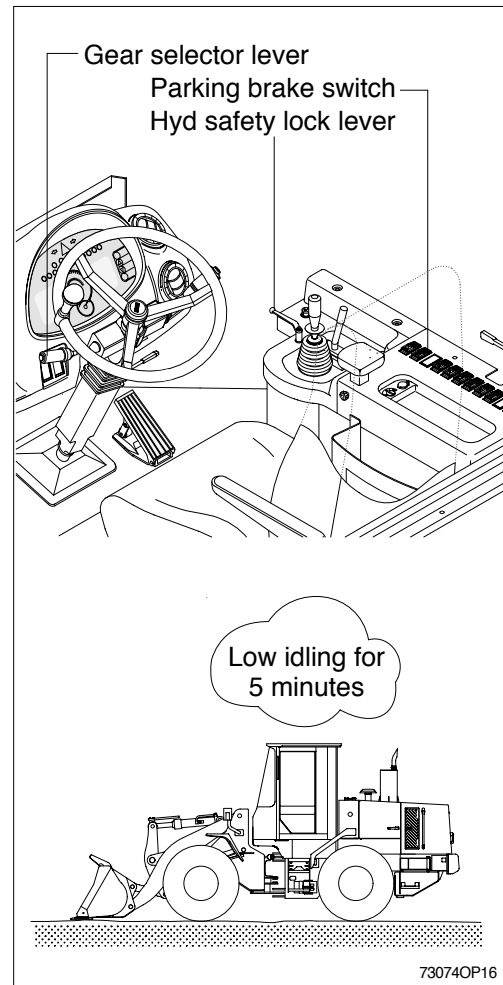
Turn the starting key to the OFF position and remove the key.

(8) Checks after the engine stopped

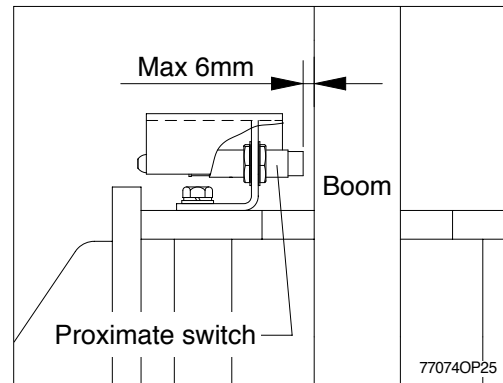
Check the leakage of oil and water, the work equipment and the exterior of the machine.

Refill the fuel tank.

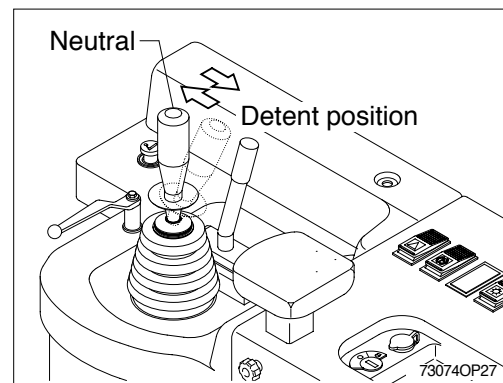
Remove any debris inside of the engine room and attached to the machine.



- (4) Loosen the nuts so that a clearance between the boom and the probe of the proximity switch are maximum 6mm.

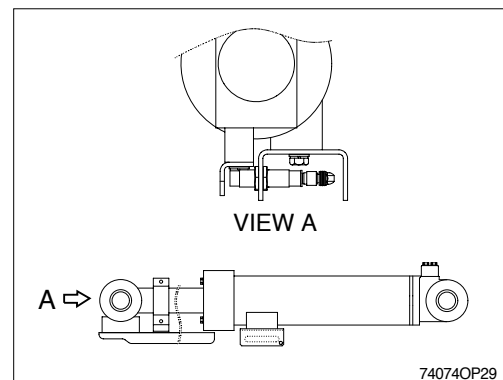


- (5) To check the adjustment, start the engine. Position the bucket on the ground. Then lift the bucket to a desired height by using the control lever and release the hand. Confirm the lever automatically returns to the neutral position and the boom(the bucket) stop at the adjusted position.



2) BUCKET LEVELER

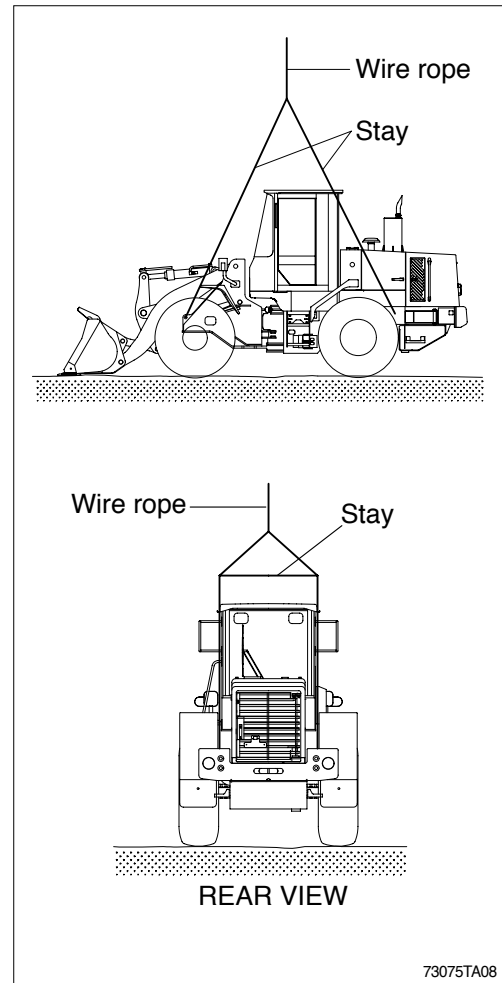
- (1) The excavation angle of this machine is set to be in parallel to the surface.



5. LOADING AND UNLOADING BY CRANE

- 1) Check the weight, length, width and height of the machine referring to chapter 2, **Specification** when you are going to hoist the machine.
- 2) Use long wire rope and stay to keep the distance with the machine as it should avoid to touch with the machine.
- 3) Put a rubber plate contact with wire rope and machine 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.**
- ▲ **Place the safety lock bar and hydraulic safety lock lever to LOCK position to prevent the machine moving when hoisting the machine.**
- ▲ **The wrong hoisting method or installation of wire rope can cause damage to the machine.**
- ▲ **Do not load abruptly.**
- ▲ **Keep area clear of personnel.**

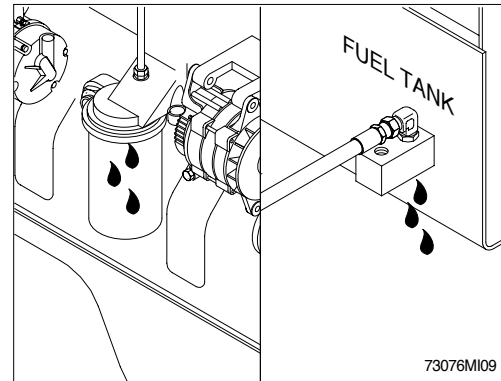


4) TIGHTENING TORQUE OF MAJOR COMPONENT

No	Items	Size	kgf · m	lbf · ft	
1	Engine	Engine mounting bolt, nut(4EA)	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
2		Engine mounting bolt(Bracket)	M12 × 1.75	10.7 ± 1.6	77.4 ± 11.6
3		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
4		Fuel tank mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
5		Air cleaner mounting bolt(4EA)	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6
6	Hydraulic system	Main pump housing mounting bolt	M14 × 2.0	19.6 ± 2.9	142 ± 20.9
7		Main control valve mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7
8		Steering unit mounting bolt	M10 × 1.5	6.9 ± 1.4	49.9 ± 10.1
9		Priority valve	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6
10		Brake valve mounting bolt	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6
11		Fan and brake pump mounting bolt	M10 × 1.5	6.9 ± 1.4	49.9 ± 10.1
12		Cut-off valve mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7
13		Remote control lever mounting bolt	M 6 × 1.0	1.1 ± 0.2	8.0 ± 1.4
14		Pilot supply unit mounting bolt	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6
15		Safety valve	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6
16		Hydraulic oil tank mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
17	Power train system	Transmission mounting bolt(Bracket, front)	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
18		Transmission mounting bolt(Bracket, rear)	M16 × 2.0	18.4 ± 2.0	133 ± 14.5
19		Front axle mounting bolt, nut	M24 × 2.5	100 ± 15	723 ± 109
20		Rear axle support mounting bolt, nut	M24 × 2.0	100 ± 15	723 ± 109
21		Tire mounting nut(17.5-25, 12PR, L3)	M22 × 1.5	70 ± 2.0	506 ± 15
22		Drive shaft joint mounting bolt	3/8-24UNF	6.0 ± 0.8	43.4 ± 5.8
23	Others	Counterweight mounting bolt, nut	M24 × 2.0	107 ± 16	773 ± 116
24		Operator's seat mounting bolt	M 8 × 1.25	3.4 ± 0.8	24.6 ± 5
25		ROPS Cab mounting bolt(4EA)	M24 × 3.0	27.5 ± 2.5	199 ± 18.1

- (10) Operate the engine at low idle and inspect for leaks at the filter and the drain plug.
Shut the engine off and check oil level with dipstick. Allow 15 minutes for oil to drain down before checking.

※ **Do not overfill the engine with oil.**

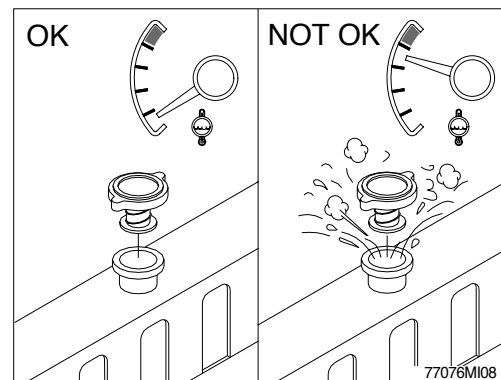
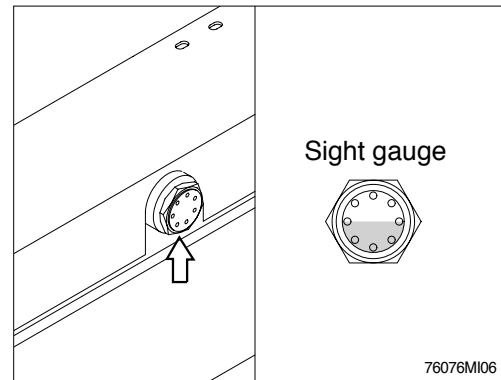


3) CHECK COOLANT LEVEL

- (1) Check the coolant level at the sight gauge.
- (2) Add the mixture of antifreeze and water after if coolant is not sufficient.
- (3) The sight gauge should indicate the middle position.
- (4) Replace gasket of radiator cap when it is damage.

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

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

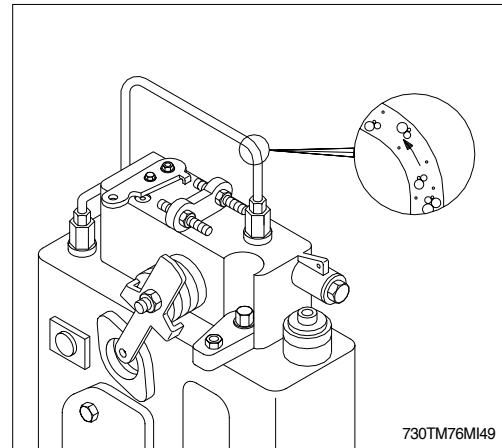


13) BLEEDING THE FUEL SYSTEM

(1) Controlled venting is provided at the injection pump through the fuel drain manifold. Small amounts of air introduced by changing the filters or injection pump supply line will be vented automatically, if the fuel filter is changed in accordance with the instructions.

However, manual bleeding will be required if :

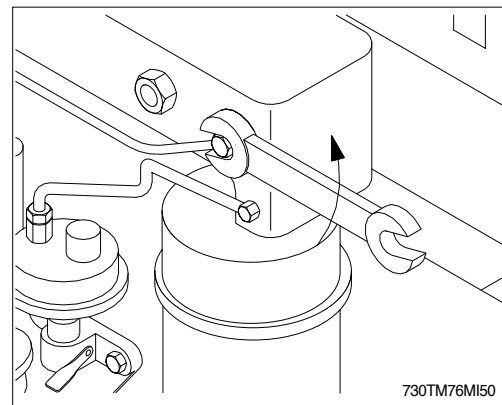
- The fuel filter is not filled prior to installation.
- Injection pump is replaced.
- High pressure fuel lines are replaced.



(2) Venting the low pressure lines and fuel filter

Open the bleed screw.

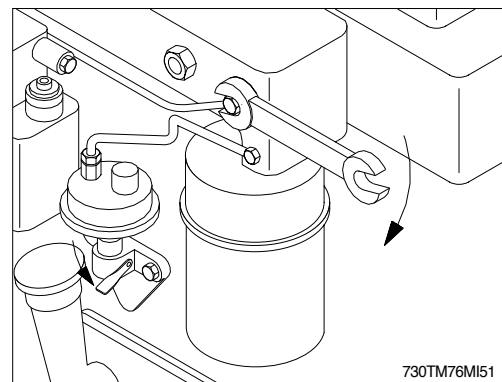
- Wrench size : 8mm



Operate the hand lever until the fuel flowing from the fitting is free of air.

Tighten the bleed screw.

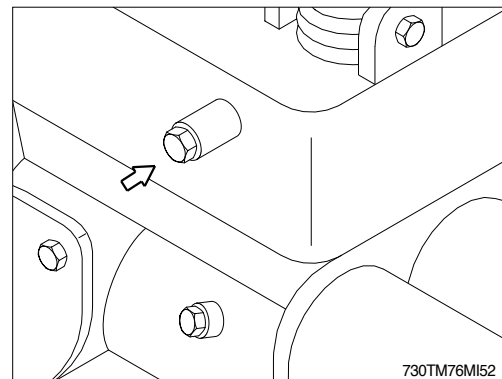
- Torque : 0.97kgf · m (7lbf · ft)



(3) Venting at the injection pumps

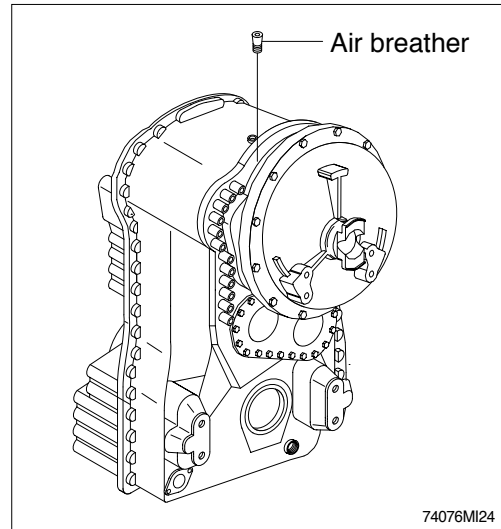
Bleed the Lucas CAV pump in this illustration.

- Wrench size : 8mm



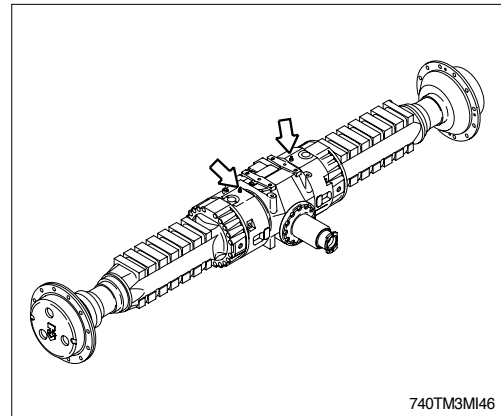
28) CLEANING TRANSMISSION AIR BREATHER

- (1) Remove dust or debris around the air breather.
- (2) Remove the air breather and wash it with cleaning oil.

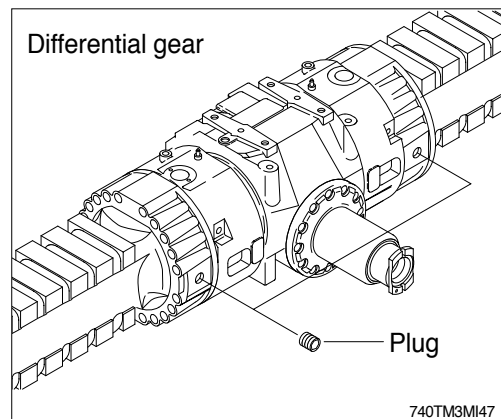


29) CHECK AND SUPPLYING AXLE OIL

- (1) Move the machine to flat ground.
- (2) Open the axle air breather to relieve internal air pressure.



- (3) Remove the plug and check the oil amount.
If the oil level is at the hole of the plug, it is normal.



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