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12) LIFT & TIE (item 18)

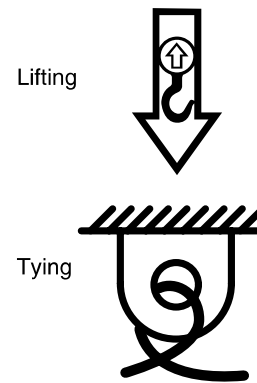
This label is positioned on the both side of the front and rear frame.

- Lifting point

In order to lift the machine, attach the lifting devices to the lifting points.

- Tying point

In order to tie down the machine, attach the tie-downs to the tying points.

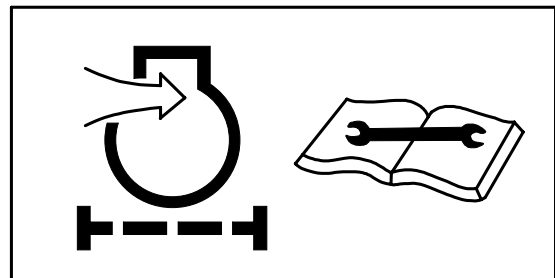


75790FW04

13) AIR CLEANER (item 19)

The warning label is positioned on the air cleaner.

- ▲ Periodic and proper inspection, cleaning and change of elements prolong engine life time and maintain the good performance of engine.



21070FW01

14) RADIATOR CAP (item 20)

This warning label is positioned on the radiator cover.

- ▲ Never open the filler cap while engine running or at high coolant temperature.

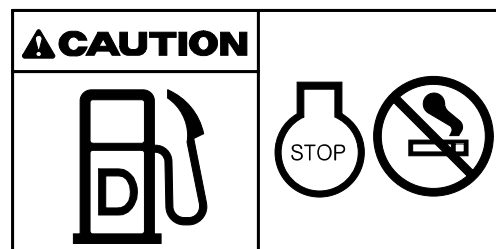


77070FW11

15) FUELING (item 21)

This warning label is positioned on the left side of the fuel filler neck.

- ▲ Stop the engine when refueling. All lights or flames shall be kept at a safe distance while refueling.



21070FW04

FIRE PREVENTION AND EXPLOSION PREVENTION

Regeneration

The exhaust gas temperatures during regeneration will be elevated. Follow proper fire prevention instructions and use the disable regeneration function when appropriate.

General

All fuels, most lubricants, and some coolant mixtures are flammable.

To minimize the risk of fire or explosion, the following actions are recommended.

Always perform a Walk-Around Inspection, which may help you identify a fire hazard.

Do not operate a machine when a fire hazard exists. Contact your dealer for service.



3001SH01

Understand the use of the primary exit and alternative exit on the machine.

Do not operate a machine with a fluid leak. Repair leaks and clean up fluids before resuming machine operation. Fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire. A fire may cause personal injury or death.

Do not weld on or drill holes in the engine cover. Flammable material such as leaves, twigs, papers, trash may accumulate in engine compartment.

Remove flammable material such as leaves, twigs, papers, trash and so on. These items may accumulate in the engine compartment or around other hot areas and hot parts on the machine.

Keep the access doors to major machine compartments closed and access doors in working condition in order to permit the use of fire suppression equipment, in case a fire should occur.

Clean all accumulations of flammable materials such as fuel, oil, and debris from the machine.

Do not operate the machine near any flame.

Keep shields in place. Exhaust shields (if equipped) protect hot exhaust components from oil spray or fuel spray in a break in a line, in a hose, or in a seal. Exhaust shields must be installed correctly.

Do not weld or flame cut on tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting. Ensure that the components are properly grounded in order to avoid unwanted arcs.

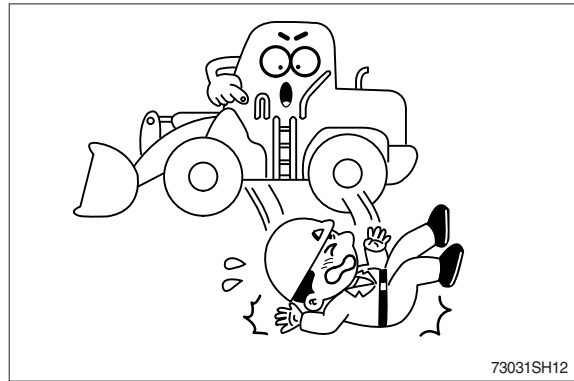
Dust that is generated from repairing nonmetallic hoods or fenders may be flammable and/or explosive. Repair such components in a ventilated area away from open flames or sparks. Use suitable Personal Protection Equipment (PPE).

Inspect all lines and hoses for wear or deterioration. Replace damaged lines and hoses. The lines and the hoses should have adequate support and secure clamps. Tighten all connections to the recommended torque. Damage to the protective cover or insulation may provide fuel for fires.

2. DURING OPERATING THE MACHINE

Use the handle and footstep when getting on or off the machine.

Do not jump on or off the machine.

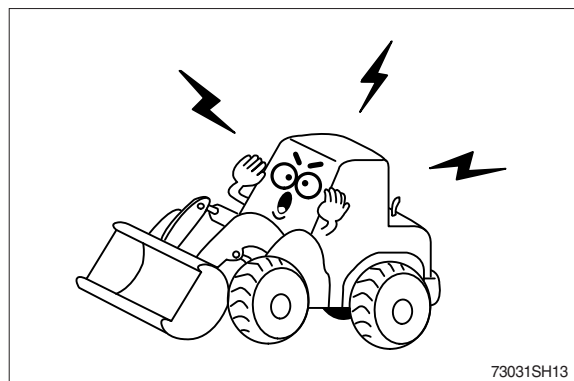


Sound the horn to warn nearby personnel before operating the machine.

KEEP RIDERS OFF MACHINE

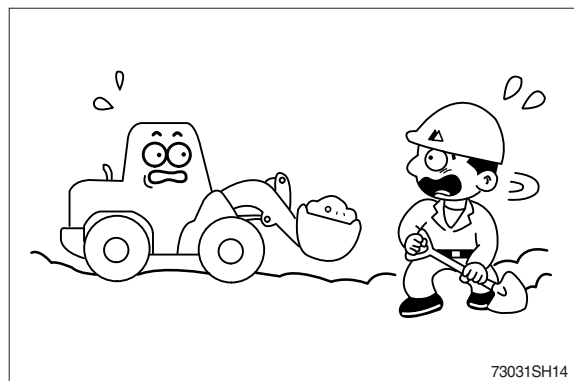
Riders on a machine are subject to injury such as being struck objects and being thrown off the machine.

Only allow the operator on the machine. Keep riders off.

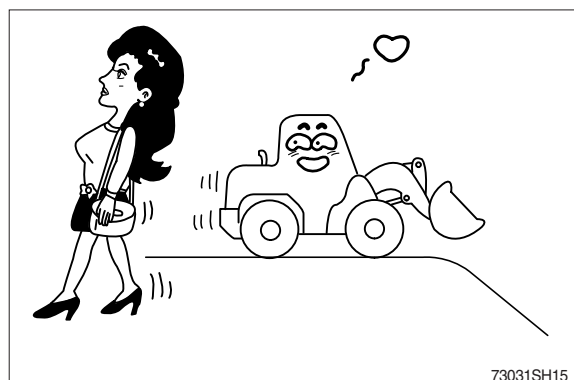


Operate carefully to make sure all personnel or obstacles are clear within the working range of the machine.

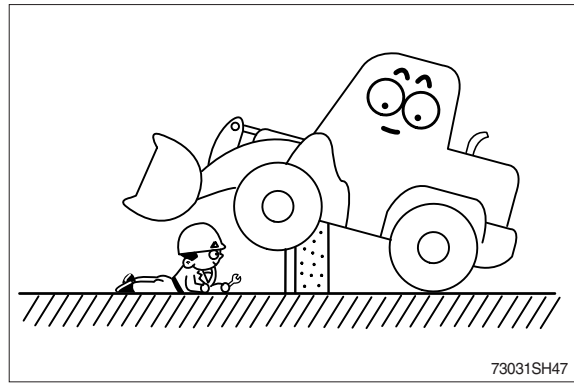
Place safety guards if necessary.



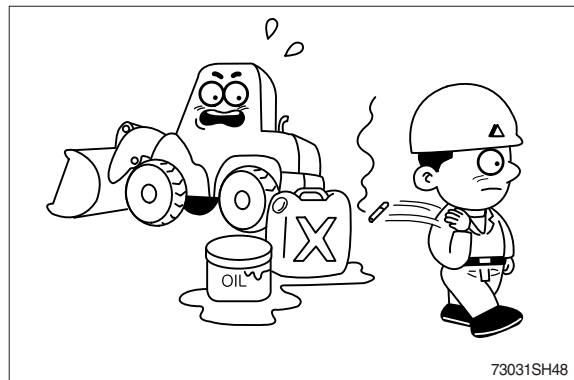
When using the work equipment, pay attention to jobsite.



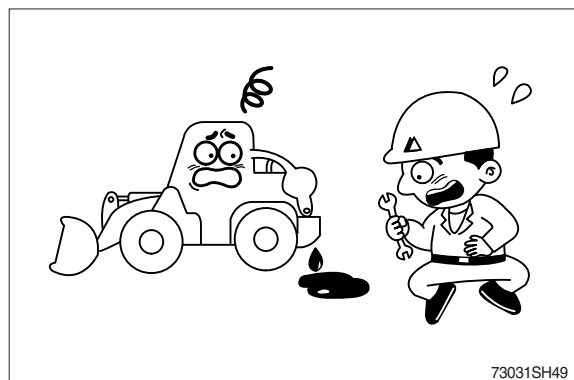
Do not work below the machine.
When working under or around the bucket or linkage, with the bucket raised, proper support must be provided for the bucket and / or the linkage.



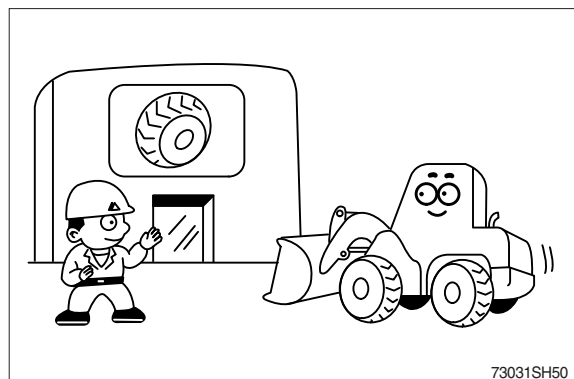
There is the danger of fire in fuel and oil.
Store in cool dry area, away from any open flames.
Do not refuel the machine while smoking or when near open flame or sparks.
Always stop engine before refueling machine.



Spilled grease and oil are dangerous to safety.
Keep your machine always clean and dry.



Disassembly, reassembly and repair of tire requires special skills and equipment.
Contact a tire repair shop.

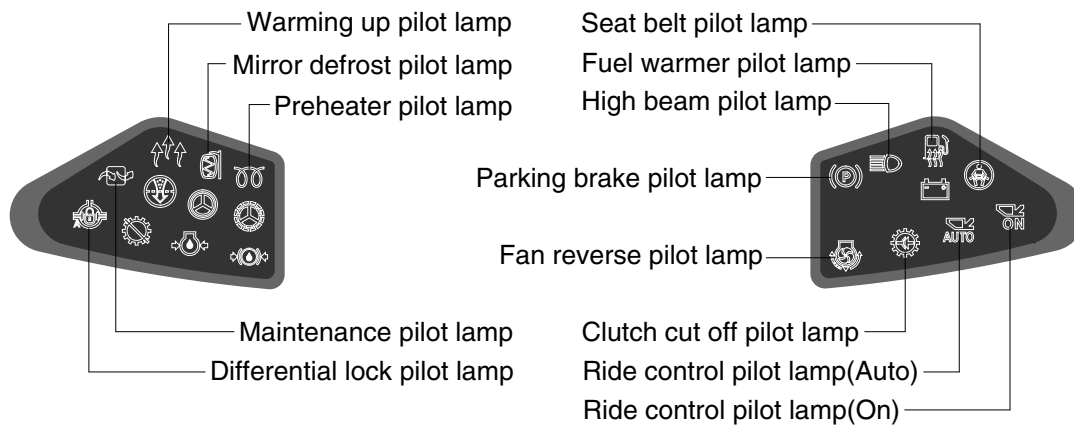


4. SPECIFICATION FOR MAJOR COMPONENTS

1) ENGINE

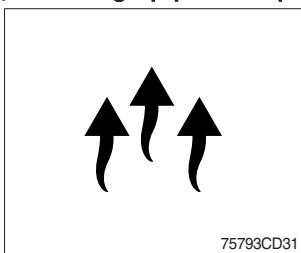
Item	Specification
Model	Cummins QSM 11
Type	4-cycle turbocharged, charge air cooled diesel engine
Control type	Electronic control
Cooling method	Water cooling
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	125 × 147 mm (4.92" × 5.79")
Piston displacement	10800 cc (659 cu in)
Compression ratio	16.3 : 1
Rated gross horse power	353 ps at 2000 rpm
Maximum gross torque at 1400 rpm	171 kgf · m (1237 lbf · ft)
Engine oil quantity	38 l (10 U.S. gal)
Wet weight	984 kg (2170 lb)
High idling speed	2130 ± 50 rpm
Low idling speed	800 ± 50 rpm
Rated fuel consumption	218 g/kw-hr
Starting motor	Delco Remy 39MT (24 V)
Alternator	Delco Remy 24SI (24 V - 70 Amp)
Battery	2 × 12V × 220Ah

4) PILOT LAMPS



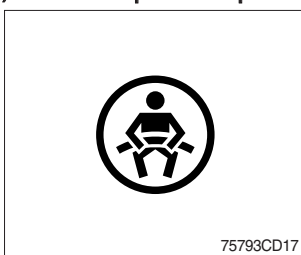
7809S3CD10

(1) Warming up pilot lamp



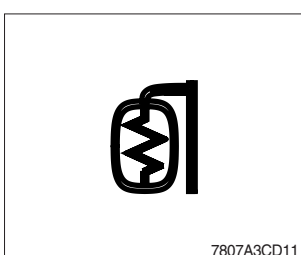
- ① This lamp is turned ON when the coolant temperature is below 30°C (86°F).
- ② The automatic warming up is cancelled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting the engine.

(2) Seat belt pilot lamp



- ① This lamp lights ON for the first five seconds after starting the engine.

(3) Mirror defrost pilot lamp



- ① This lamp comes ON when mirror defrost switch is pressed.
- ※ Refer to page 3-26 for details.

(4) Management

① Machine security



· ESL system setting

- ESL : Engine Starting Limit
- ESL mode is designed to be a theft deterrent or will prevent the unauthorized operation of the machine.
- If the ESL mode was selected Enable, the password will be required when the start switch is turned ON.
- Disable : Not used ESL function
- Enable : The password is required whenever the operator start engine.

Interval mode : The password is required when the operator start engine first. But the operator can restart the engine within the interval time without inputting the password.
The interval time can be set maximum 2 days.

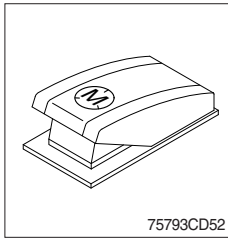
※ **Default password : 00000 ***

· Interval setting

- If set interval setting to 5 minutes, ESL system is activated after 5 minutes.
- Therefore, the password does not need to restart engine within 5 minutes.

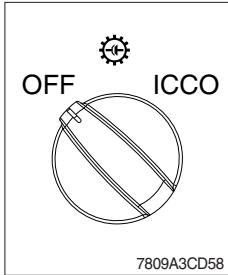


11) EMERGENCY TEST SWITCH (option)



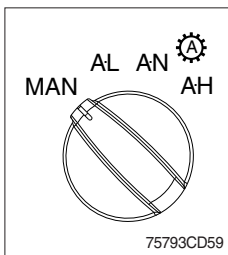
- (1) The emergency steering system can be manually tested. Push the switch in order to determine if the emergency steering and the emergency steering lamp are functional.
- (2) When the switch is pressed, the emergency steering pump motor will run. The emergency steering lamp will light. If the emergency steering lamp does not light, do not operate the machine.

12) CLUTCH CUT OFF MODE SWITCH



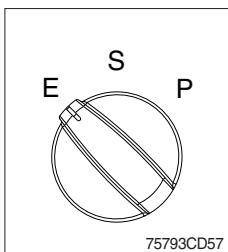
- OFF position : The clutch cut off function is disable.
- ICCO position : It will cut off the clutch when brake operation.

13) TRANSMISSION SHIFT MODE SWITCH



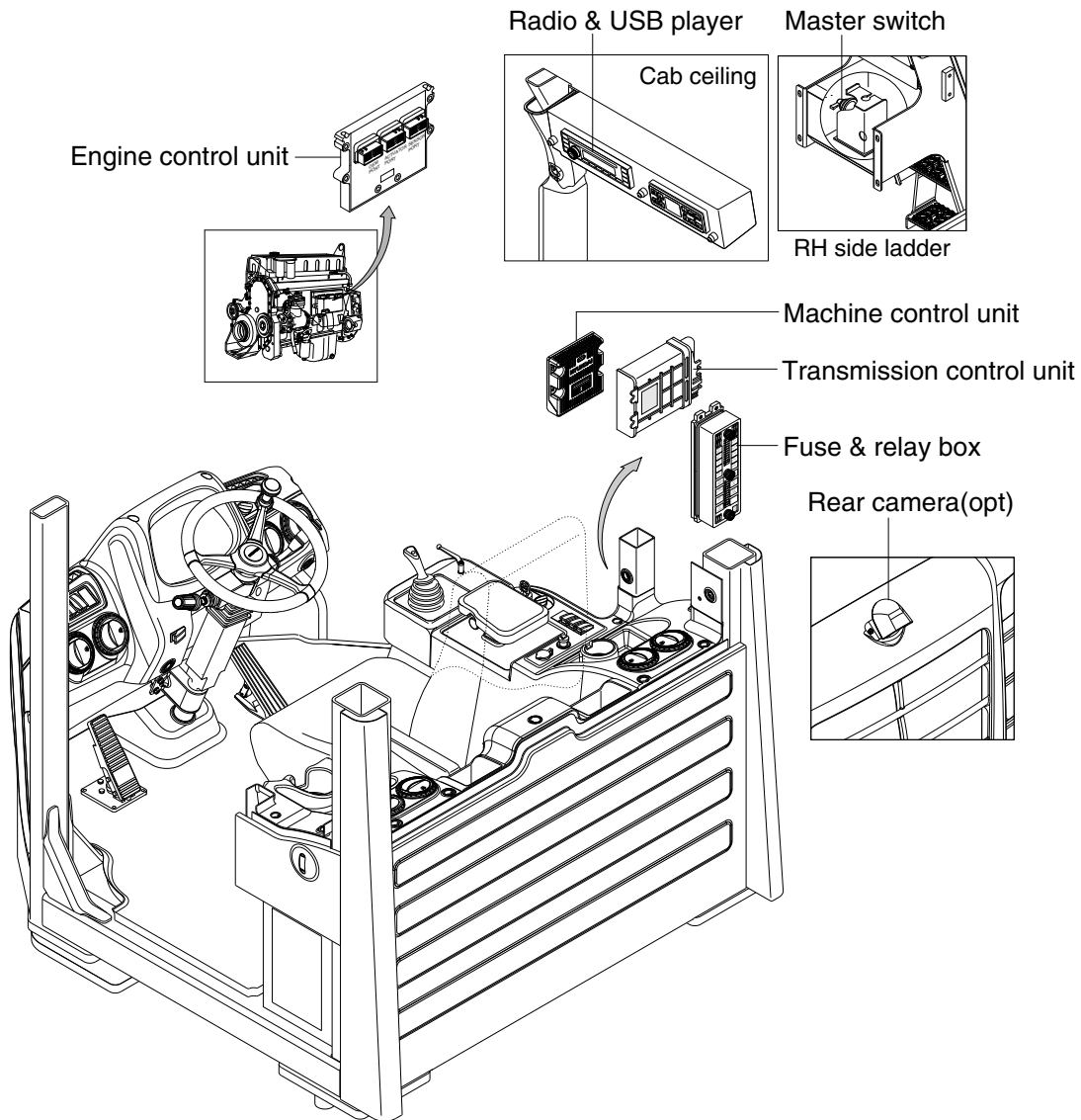
- (1) Four modes are available for operator's preference and job condition.
 - MAN (Manual) : Machine is operated by selected gear on lever.
 - AL (Auto Light) : Automatic shifting point is fast for long-distance transportation and fuel efficiency.
 - AN (Auto Normal) : Automatic shifting point is normal without automatic kick-down to 1st gear for general digging and loading operation.
 - AH (Auto Heavy) : Automatic shifting point is normal with automatic kick-down to 1st gear for more powerful operation.

14) ENGINE MODE SWITCH



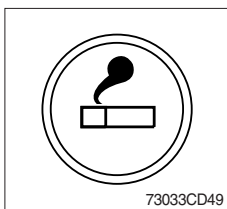
- (1) The operator can adjust the machine's performance with this dial switch.
 - P (Power) : Maximum power output for hard digging operation or hill climb.
 - S (Standard) : General digging and loading operation.
 - E (Econo) : Maximum fuel efficiency for general loading.

7. OTHERS



7809S3CD38

1) CIGAR LIGHTER



- (1) This can be used when the engine starting switch is ON.
- (2) The lighter can be used when it springs out in a short while after being pressed down.

※ **Service socket**

**Use cigar lighter socket when you need emergency power.
Do not use the lighter exceeding 24 V, 100 W.**

• Type B



75793CD81-1

① USB function

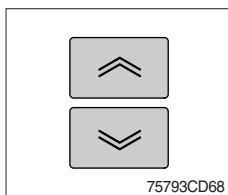
- a. Connect a USB device if you want to listen to MP3 file in a USB device.
- b. It will automatically play MP3 file in the USB device and the LCD display will show “READING USB”.

※ If there are no files on USB device, playback will revert back to the previous mode after displaying “NO FILE”.

② AUX function

- a. If you want to listen to music of a external audio device, connect a external audio device through AUX cable.
- b. Change AUX mode by pressing MODE button.
If audio file of Audio device is playing, you can listen to music through speaker.

(2) File selection & cue / review button



① File selection function

This button is used to select file up / down.

Each time the forward file select \wedge is pressed, file number is increased.

Each time the backward file select \vee is pressed, file number is decreased.

② Cue / review functions

High-speed audible search of file on a USB can be made by this button (the cue and review functions).

Press and hold the cue button \wedge to advance rapidly in the forward direction or the review button \vee to advance rapidly in the backward direction.

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













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RADIO AND USB PLAYER (WITH BLUETOOTH) : MACHINE SERIAL NO.: #0146~



9403CD100

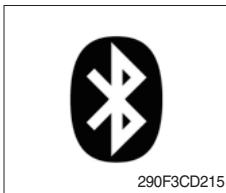
■ FRONT PANEL PRESENTATION

- | | |
|---|---|
| <p>1  Power ON/OFF,
Volume UP/DOWN button</p> <p>2  Manual UP/DOWN Tuning,
File search, SEL button</p> <p>3  Mode button,
Audio mute button</p> <p>4  Call & Pair button</p> <p>5  Call end button</p> <p>6  Station preset 1
DIS Display button</p> <p>7  Station preset 2</p> <p>8  Station preset 3
RPT Repeat play button</p> <p>9  Station preset 4
RDM Random play button</p> | <p>10  Station preset 5
DIR- Directory down button</p> <p>11  Station preset 6
DIR+ Directory up button</p> <p>12  Scan play button (SCAN)
Best station memory (BSM) button</p> <p>13  Auto tune up, Seek up button</p> <p>14  Auto tune down, Track down button</p> <p>15  USB connector</p> <p>16  AUX IN Jack</p> <p>17  MIC hole</p> |
|---|---|

■ **BLUETOOTH** (if equipped)

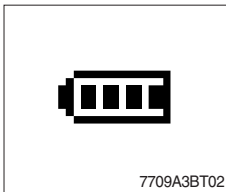
1) Using a bluetooth wireless connection

- (1) Your audio unit supports bluetooth wireless technology. You can set up a wireless link with bluetooth cellular phone.
- (2) Keep PAIRING the cellular phone with audio unit in a few minutes as the phone are being switched on well enough.
- ※ **Since this audio unit is on standby to connect with your cellular phone via bluetooth wireless technology, using this audio unit without running the engine can result battery drainage.**
- ※ **This audio unit phone call reception is on standby when ignition switch is set to ACC OFF or ON.**
- ※ **The line-of-sight distance between this audio unit and your cellular phone must be 10 meters or less for sending and receiving voice and data via bluetooth wireless technology. However the transmission distance may become shorter than the estimated distance depending on the environment in use.**
- ※ **Digital Noise & Echo suppression system provides the best sound clarity with little or no distortion (Echo & side tone will happen depending on cellular phone or service network).**
- ※ **To ensure the quality of calling, you should select a proper bluetooth VR level. This audio unit has already set with the best bluetooth VR level.**



① **Bluetooth icon**

It will blink while establishing the bluetooth pairing.
It will light after a bluetooth device connected.



② **Battery icon**

It indicates the battery status of the connected bluetooth device.



③ **Single strength icon**

It indicates the signal strength of the connected bluetooth device.

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, coolant and fuel referring to recommended oils at page 6-9.

Fill the anti-freeze solution to the coolant as required.

If you turn ON the starting switch, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature.

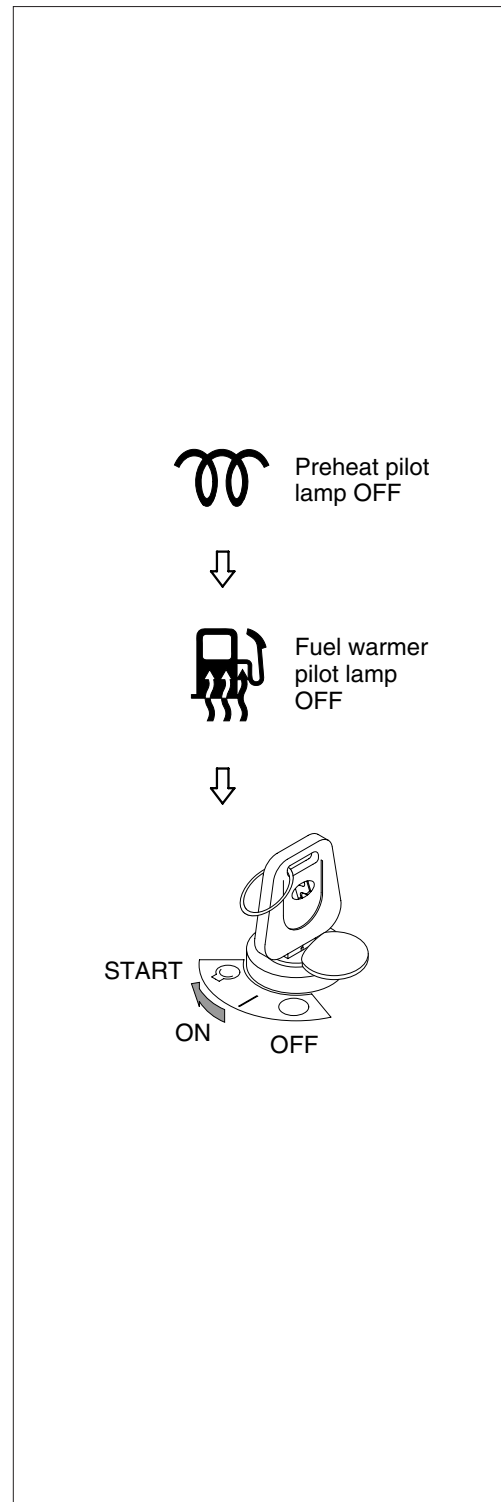
If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.

After engine started, the preheating function is actuated to reduce the white smoke.

Before the warming-up operation is completed, do not operate the equipment.

Operate machine at less than normal loads and at slow idle speed, right after engine warming-up.

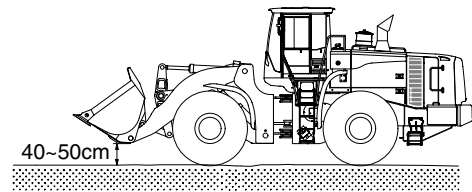
Run the engine for 10~15 minutes at low idle when the ambient temperature is below -15°C .



7. EFFICIENT WORKING METHOD

1) GENERAL

- (1) Lift the bucket about 40-50 cm (2 ft) above the ground to ensure safety and to gain a good range of view.
- (2) Clear the jobsite and level the ground.
- (3) Be careful that excessive force is not applied to the bucket.
- (4) When handling hard materials, use bucket teeth or bolt on cutting edge.
- (5) When doing dumping work, put the control lever in the DUMP position, then return it to a former state. Repeat this procedure until the work is finished.
- (6) Position the machine with its back against the wind so that dust does not get into the engine.
- (7) Check if the proper bucket is used for the work.
If the capacity of the bucket exceeds that of the machine, the machine's service life may be shortened.



78094OP10

3) SEA SHORE OPERATION

- (1) Prevent ingress of salt by securely tightening plugs, cocks and bolts of each part.
- (2) Wash machine after operation to remove salt residue.
Pay special attention to electrical parts and hydraulic cylinders to prevent corrosion.
- (3) Inspection and lubrication must be carried out more frequently.
Supply sufficient grease to replace all old grease in bearings which have been submerged in water for a long time.

- (6) Keep the tow line angle to a minimum. Do not exceed a 30 degree angle from the straight ahead position.
 - (7) Quick machine movement could overload the tow line or the tow bar. This could cause the tow line or the tow bar to break. Gradual, steady machine movement will be more effective.
 - (8) Normally, the towing machine should be as large as the disabled machine. Make sure that the towing machine has enough brake capacity, enough weight, and enough power. The towing machine must be able to control both machines for the grade that is involved and for the distance that is involved.
 - (9) You must provide sufficient control and sufficient braking when you are moving a disabled machine downhill. This may require a larger towing machine or additional machines that are connected to the rear of the disabled machine. This will prevent the machine from rolling away out of control.
 - (10) All situation requirements cannot be listed. Minimal towing machine capacity is required on smooth, level surfaces. On inclines or on surfaces in poor condition, maximum towing machine capacity is required.
 - (11) When any towed machine is loaded, this machine must be equipped with a brake system that is operable from the operator compartment.
- ※ **Consult your HYUNDAI dealer for the equipment that is necessary for towing a disabled machine.**

2) WHEN THE ENGINE WORKS

- (1) When the transmission system or steering wheel is workable and the engine is running, the machine can be towed only for a short distance.
For example, pull the machine out of mud or pull the machine to side of the road.
- (2) The operator of the towed machine should turn the steering wheel into the direction in which the machine is towed.

2) RECOMMENDED LUBRICANTS

Use only oils listed below or equivalent.

Do not mix different brand oil.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F)						
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)
Engine oil pan	Engine oil	38 (10.0)	* ¹ SAE 5W-40						
			SAE 30						
			SAE 10W						
			SAE 10W-30						
			SAE 15W-40						
Transmission	Engine oil	43 (11.4)	SAE 10W-30						
			SAE 15W-40						
Axle	UTTO	Front : 58 (15.3) Rear : 58 (15.3)	*Refer to below list						
Hydraulic tank	Hydraulic oil	Tank: 203 (53.6) System: 336 (88.8)	* ¹ ISO VG 15						
			ISO VG 46						
			ISO VG 68						
Fuel tank	Diesel fuel	450 (118.8)	* ¹ ASTM D975 NO.1						
			ASTM D975 NO.2						
Fitting (grease nipple)	Grease	As required	* ¹ NLGI NO.1						
			NLGI NO.2						
Radiator (reservoir tank)	Mixture of antifreeze and soft water* ²	65 (17.1)	Ethylene glycol base permanent type (50 : 50)						
			* ¹ Ethylene glycol base permanent type (60 : 40)						

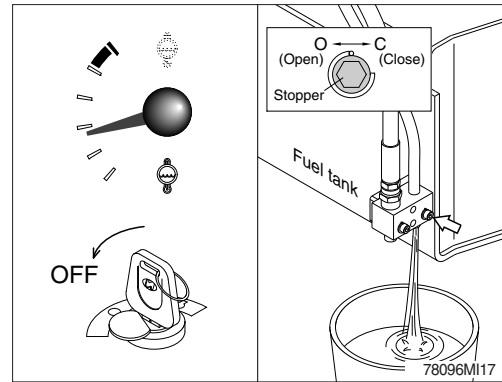
- SAE : Society of Automotive Engineers
- API : American Petroleum Institute
- ISO : International Organization for Standardization
- NLGI : National Lubricating Grease Institute
- ASTM : American Society of Testing and Material
- UTTO : Universal Tractor Transmission Oil

- * Recommended oil list
 - BP TERRAC SUPER TRANSMISSION 10W-30
 - CASTROL AGRI TRANS PLUS 10W-30
 - MOBILFLUID 426
 - SHELL DONAX TD 10W-30
 - TOTAL DYNATRANS MPV

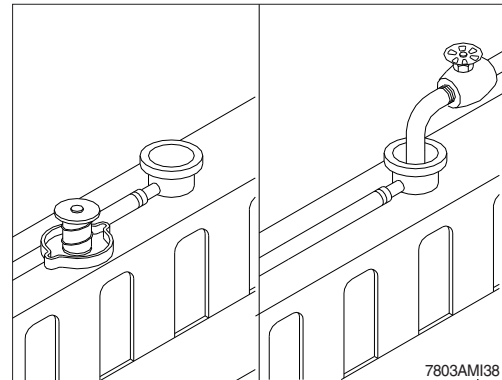
*¹ Cold region
Russia, CIS, Mongolia

*² Soft water
City water or distilled water

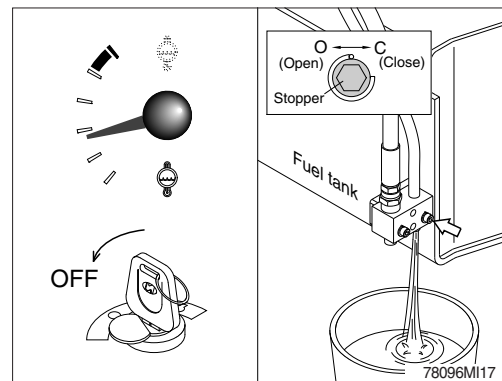
- ② Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F). Shut the engine off, and drain the cooling system.



- ③ Fill the cooling system with clean water.
- ※ Be sure to vent the engine and aftercooler for complete filling.
 - ※ Do not install the radiator cap or the new coolant filter.

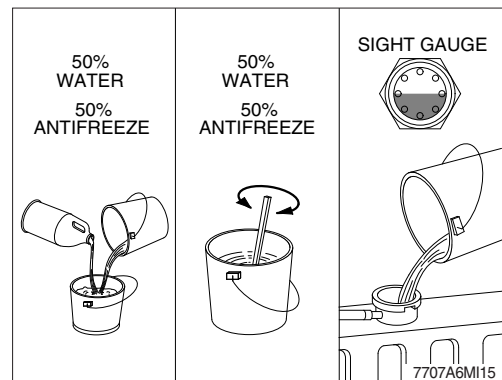


- ④ Operate the engine for 5 minutes with the coolant temperature above 80°C(176°F). Shut the engine off, and drain the cooling system.
- ※ If the water being drained is still dirty, the system must be flushed again until the water is clean.



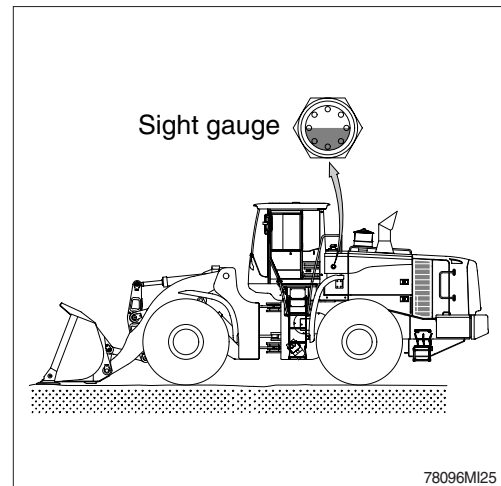
(3) Cooling system filling

- ① Use a mixture of 50 percent soft water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 6-9.
- ※ Never use water alone for coolant. This can result in damage from corrosion.
 - ※ Do not use hard water such as river water or well water.



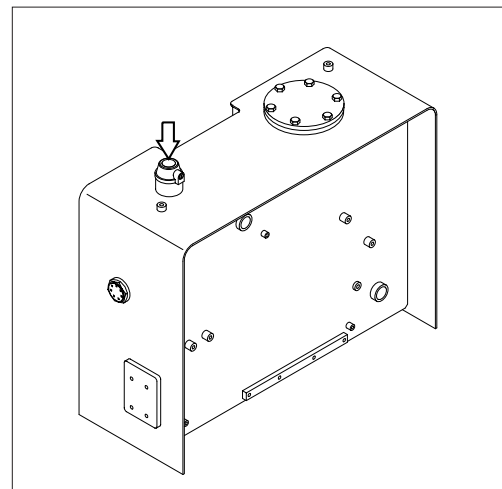
16) HYDRAULIC OIL CHECK

- (1) Lower the bucket on the ground at a flat location as in the illustration.
Stop the engine and then leave for about 5 minutes.
 - (2) Check the oil level at the sight gauge. The sight gauge is located on the left side of the hydraulic oil tank.
 - (3) The sight gauge should indicate the middle position.
- ※ **Add hydraulic oil, if necessary.**



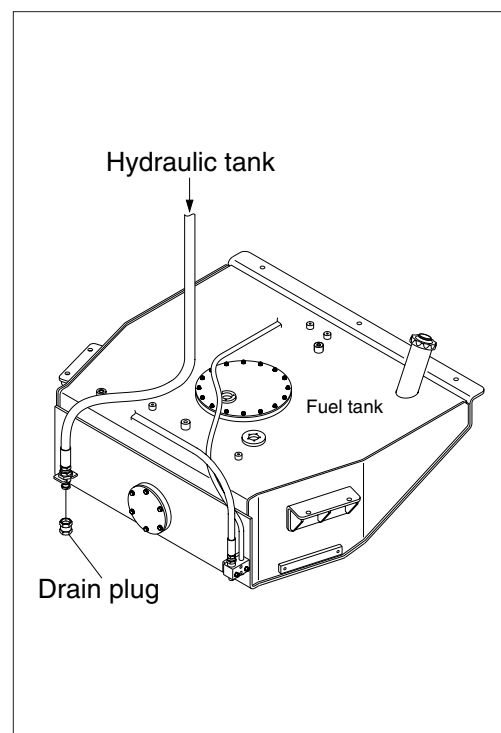
17) FILLING HYDRAULIC OIL

- Stop the engine to the position of level check.
- Relieve the pressure in the tank by pushing the top of the air breather.
- Remove the breather on the top of oil tank and fill the oil to the specified level.
- Start engine after filling and operate the work equipment several times.
- Check the oil level at the level check position after engine stops.



18) CHANGE THE HYDRAULIC OIL

- (1) Lower the bucket on the ground extend the bucket cylinder to the maximum.
 - (2) Relieve the pressure in the tank by pushing the top of the breather.
 - (3) Prepare a suitable container.
 - (4) To drain the oil loosen the drain plug at the fuel tank block.
 - (5) Tighten the drain plug.
 - (6) Fill proper amount of recommended oil.
 - (7) Put the breather in the right position.
 - (8) Start engine and run continually. Release the air by full stroke of control lever.
- ※ **The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps.**



33) LUBRICATION

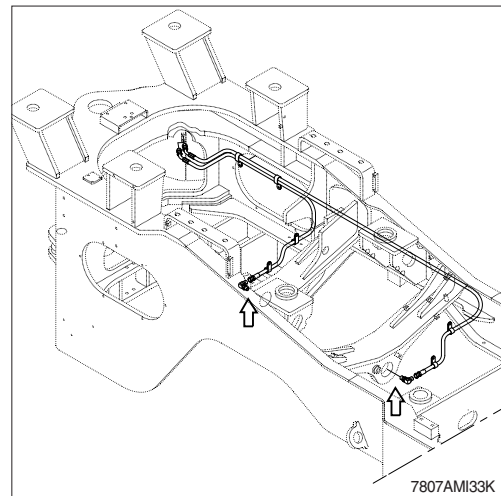
(1) Supply grease through the grease nipple, using grease gun.

(2) After lubricating, clean off spilled grease.

▲ Press the parking brake switch and fix front and rear frames using the safety lock bar.

▲ Set the work equipment in a stable position and put the pilot cut off switch in the OFF position.

(3) Rear axle pivot : 2EA

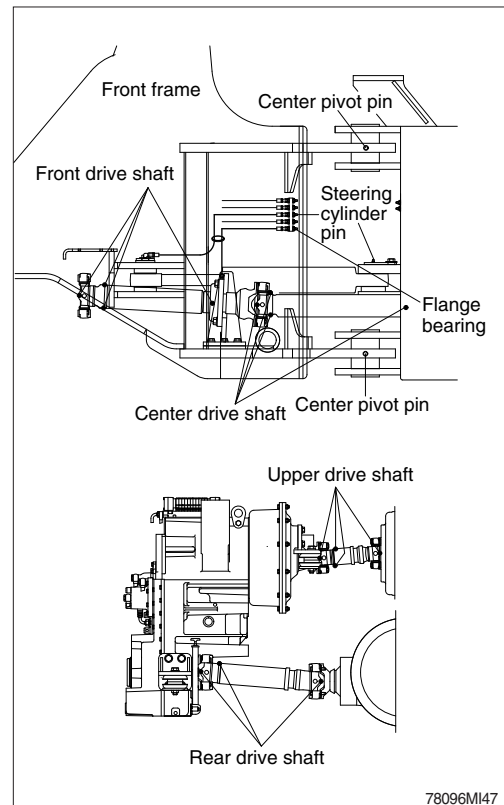


(4) Center pivot pin : 2EA

(5) Steering cylinder pin : 4EA

(6) Drive shaft

- Front (sleeve yoke, journal bearing) : 4EA
- Center (sleeve yoke, journal bearing) : 4EA
- Rear (sleeve yoke, journal bearing) : 3EA
- Upper (sleeve yoke, journal bearing) : 4EA
- Flange bearing : 1EA



2. ELECTRICAL SYSTEM

Trouble	Service	Remark
Voltmeter fluctuates largely even with the engine running at a constant speed. Lamp does not glow brightly even when engine runs at high speed. Lamp flickers while engine runs.	<ul style="list-style-type: none"> · Check for loose terminals open-circuit wiring. · Adjust belt tension. 	
Voltmeter does not fluctuate even with an increase in the engine speed.	<ul style="list-style-type: none"> · Check the alternator. · Inspect and repair wiring. 	
Starting motor does not turn when starting switch is turned on.	<ul style="list-style-type: none"> · Inspect and repair the wiring. · Charge the battery. · Check starting switch. · Check battery relay switch. · Place the gear selector lever in the neutral. 	
Starting motor turns the engine sluggishly.	<ul style="list-style-type: none"> · Charge the battery. · Check the starting motor. 	
Starting motor disengages before the engine starts up.	<ul style="list-style-type: none"> · Check and repair the wiring. · Charge the battery. 	
Engine oil pressure lamp does not light up when engine is stationary (When the starting switch is in ON position).	<ul style="list-style-type: none"> · Check the lamp. · Check the oil pressure switch. 	
Charge lamp does not light up when the engine is stationary. (When the starting switch is in ON position.)	<ul style="list-style-type: none"> · Check the lamp. · Check and repair the wiring. 	

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