

Operator's Manual

EX200-2

EX200LC-2

Excavator

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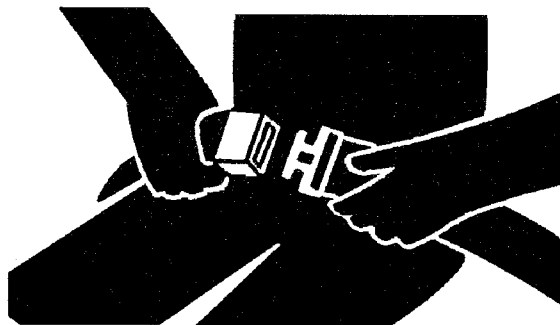
SAFETY

FASTEN YOUR SEAT BELT

Always check the condition of the seat belt, and mounting hardware before starting the machine.

A weak or damaged seat belt and mounting hardware can result in serious injury if it fails in the event of an accident.

Be sure to use the seat belt when operating the machine.



SA-237

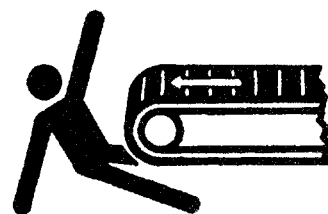
OPERATE ONLY FROM OPERATOR'S SEAT

Avoid possible injury or machine damage. Do not start the engine by shorting across starter terminals. (See ①)

NEVER start the engine while standing on ground. Start the engine only from operator's seat. (See ②)



①



②

SA-008

KEEP RIDERS OFF MACHINE

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

Riders on machine are vulnerable to injury such as being struck by foreign objects or being thrown off the machine. (See SA-017)

Riders also obstruct the operator's view, resulting in unsafe operation.

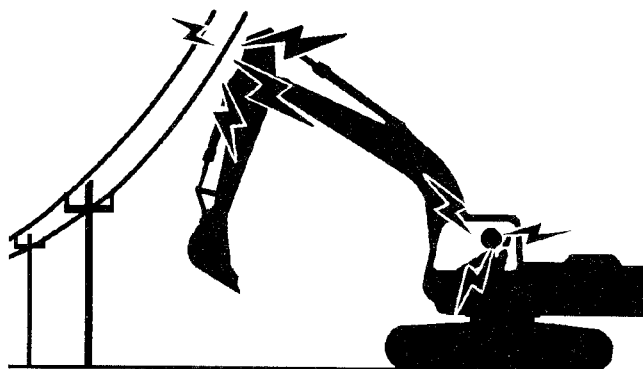


SA-017

AVOID POWER LINES

Serious injury or death can result from contact with electric lines. (See SA-013)

Never move any part of the machine or load closer to any electric line than 3 m (10 ft) plus twice the line insulator length.



SA-013

SAFETY

AVOID BURNS

After operation, the engine coolant is hot and under pressure. The engine, radiator and heater lines all contain not water or steam. (See SA-225)

Skin contact with escaping hot water or steam can cause severe burns.

Be sure to stop the engine, and let the engine and radiator cool.

After the system has cooled, slowly loosen the cap to release pressure, after the system has cooled, then remove it. (See SA-039)

Engine oil, gear oil and hydraulic oil becomes hot during operation.

The engine, hoses, lines and other parts become hot as well. (See SA-225)

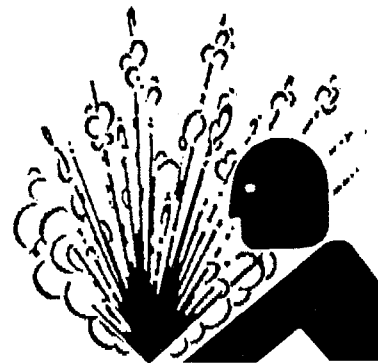
Wait for the oil and components to cool before starting work.

The hydraulic oil tank is pressurized. Be sure to release pressure before removing the cap.



Hot Surface

SA-225



SA-039

REMOVE PAINT BEFORE WELDING OR HEATING

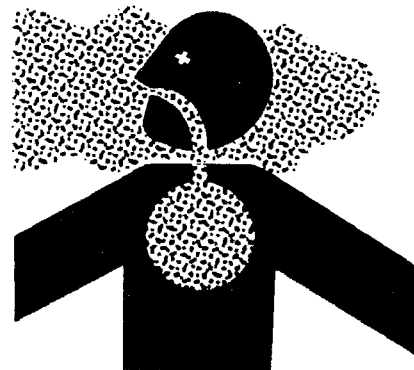
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all such work outside or in a well-ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

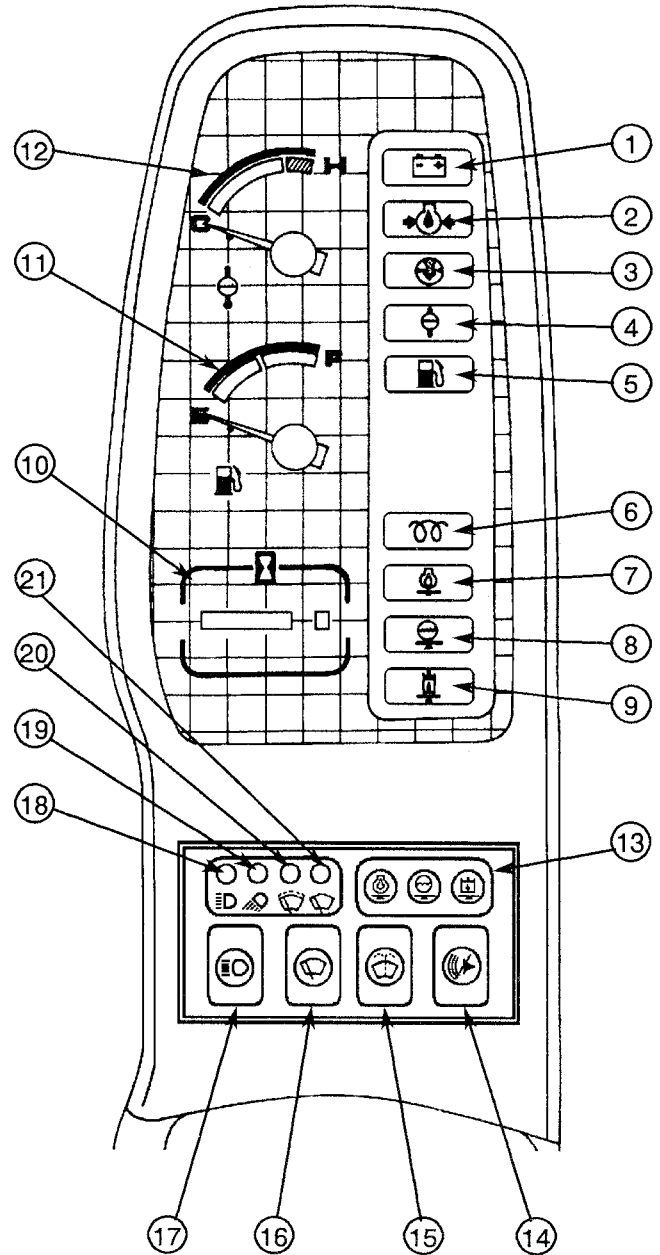


SA-029

OPERATOR'S STATION

MONITOR PANEL AND SWITCH PANEL 1

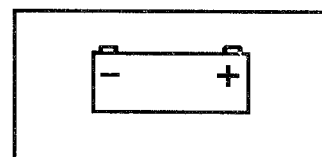
- 1 – Alternator Indicator
- 2 – Engine Oil Pressure Indicator
- 3 – Air Filter Restriction Indicator
- 4 – Overheat Indicator
- 5 – Fuel Level Indicator
- 6 – Preheat Indicator
- 7 – Engine Oil Level Indicator
- 8 – Coolant Level Indicator
- 9 – Hydraulic Oil Level Indicator
- 10 – Hour Meter
- 11 – Fuel Gauge
- 12 – Coolant Temperature Gauge
- 13 – Lever Check Switch
- 14 – Buzzer Stop Switch
- 15 – Washer Switch
- 16 – Wiper Switch
- 17 – Light Switch
- 18 – Head Light Indicator
- 19 – Work Light Indicator
- 20 – Wiper Indicator
- 21 – ~~Continuous~~ Wiper Indicator



M104-01-017

ALTERNATOR INDICATOR

Red indicator will light with low alternator output.
Check electrical system.

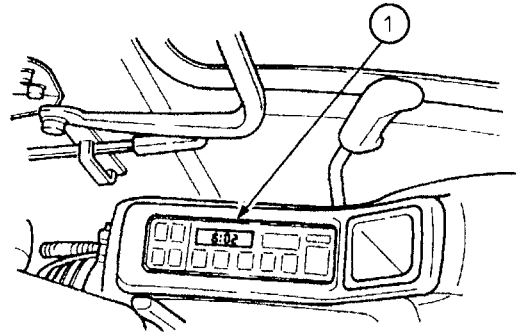


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OPERATOR'S STATION

LEFT CONSOLE

1 – RADIO / CLOCK

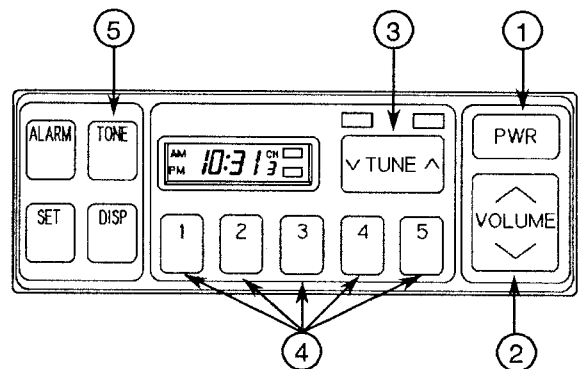


M104-01-024

RADIO OPERATION

1. The control buttons on the radio.

- a. Power switch ① (PWR)
: Used to turn radio on and off.
- b. Volume control button ②
: Used to increase and decrease loudness of radio.
- c. Tuning control switch ③
: Used to change radio frequency to desired station.
Preset tuning buttons ④
: Used to set desired frequencies to radio memory for quick selection.
Tone switch ⑤
: Used to select either music or news tones.

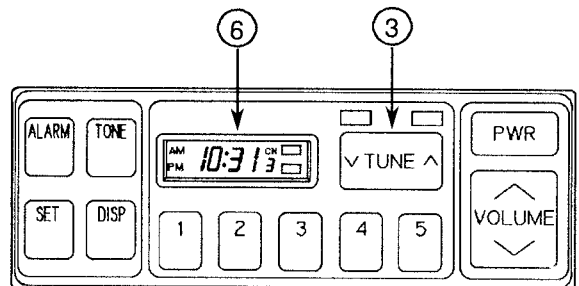


M104-01-025

2. Tuning switch operation.

Tuning switch ③ is a rocker type switch. Depressing the side of the switch marked (^) will increase the frequency. Depressing the side marked (V) will decrease the frequency. The switch also has two functions: a manual function and an automatic search function.

- a. The manual function allows the operator to select desired frequency by repeatedly tapping the switch. This will bypass unwanted stations until the desired station frequency is reached. The switch must be released in less than one half second or the automatic search function will be activated. To return to the manual function, tap tuning switch ③ again.



M104-01-025

OPERATING THE ENGINE

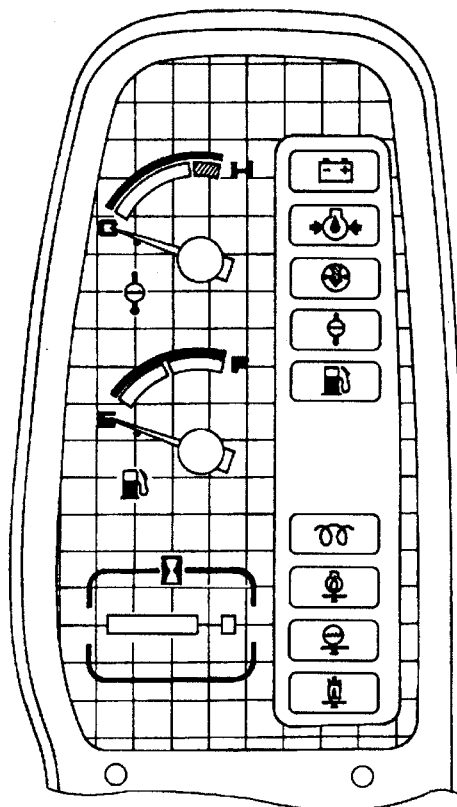
CHECK INSTRUMENTS BEFORE STARTING

Turn key switch to ON position. All indicator lights and warning lamps will come on. They will stay on for approximately 3 seconds, except for the alternator and engine oil pressure indicator, which will continue to stay on further. If any lamp fails to light, the bulb may be burned out.

The lamps also stay on for approximately 3 seconds when the key switch is turned to HEAT or START position.

Adjust the seat to allow full the pedal and the control levers stroke with operator's back against the seat back. Fasten the seat belt.

NOTE: Use a wet cloth when wiping dust off monitor or switch panels to prevent damaging the panel face.



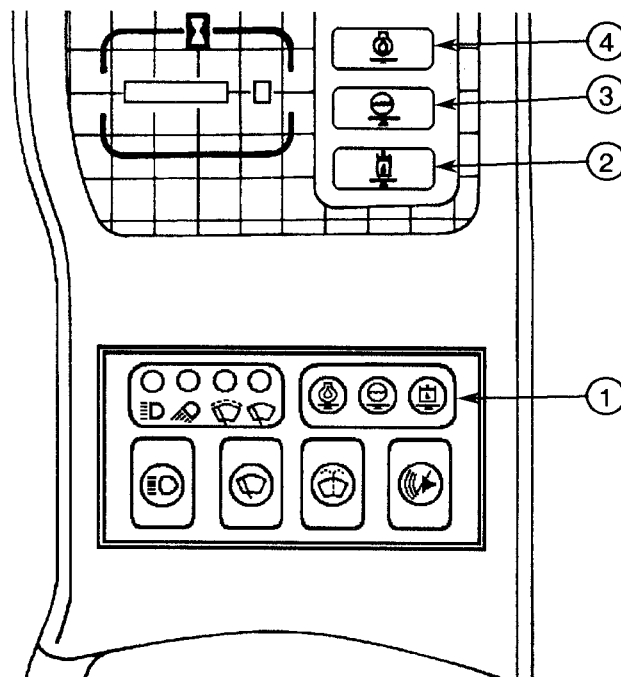
M104-01-003

LEVEL CHECK

1. Turn key switch to the ON position.
2. Depress level check switch ①.

Hydraulic oil level ②, coolant level ③ and engine oil level ④ indicators will light if levels are adequate for operation.

IMPORTANT: Prevent possible machine damage. Check fluid levels individually. The level check does not take the place of daily inspection at hydraulic oil level window, engine coolant reserve tank and engine oil level dipstick.



M104-03-001

OPERATING THE MACHINE

CONTROL LEVER (STANDARD PATTERN)

⚠ CAUTION: Never place any part of body beyond window frame. It could be crushed by the boom if boom control lever is accidentally bumped or otherwise engaged. If window is missing or broken replace immediately. Prevent possible injury from unexpected machine movement.

Make sure you know the location and function of each control before operating.

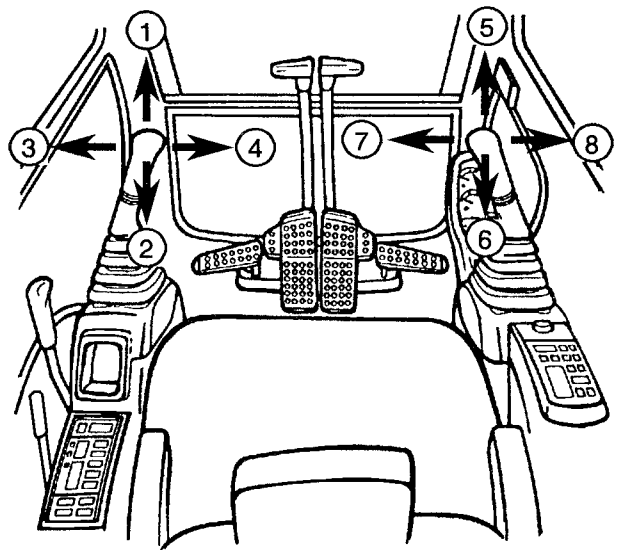
The machine is equipped with a label showing the control patterns of the levers and pedals.

IMPORTANT: When digging, avoid hitting tracks with boom cylinders.

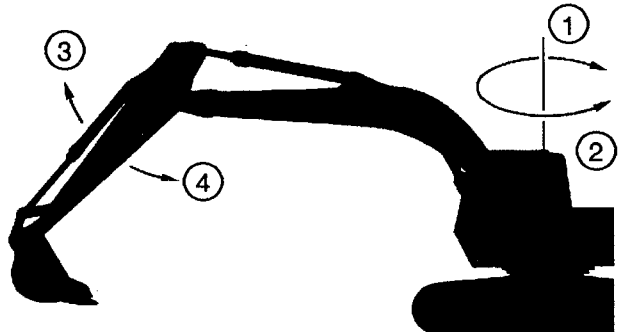
When digging over the end of the tracks, travel motors should be at the rear to minimize chain and sprocket loading and to maximize machine stability and lift capacity.

When a lever is released, it will automatically return to neutral, and that machine function will stop.

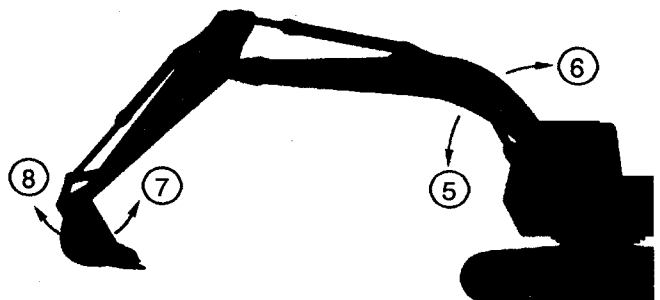
- 1 – Swing Right
- 2 – Swing Left
- 3 – Arm Roll-Out
- 4 – Arm Roll-In
- 5 – Boom Lower
- 6 – Boom Raise
- 7 – Bucket Roll-In.
- 8 – Bucket Roll-Out.



M104-01-001



M104-05-001



M104-05-002

OPERATING THE MACHINE

OPERATING ON SOFT GROUND

Avoid traveling on very soft ground that does not have sufficient strength to firmly support the machine.

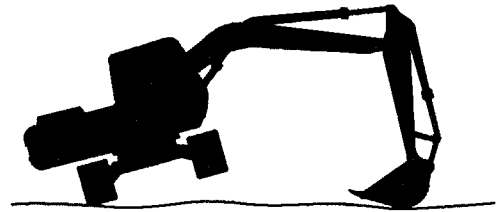
If the machine is operated on very soft ground or becomes stuck, it may be necessary to clean the track frame area.

Swing the upperstructure 90° and lower the bucket to raise one track off the ground. Make sure to keep the angle between the boom and arm 90 to 110° and position the bucket's round side on the ground.

Rotate the raised track back and forth to remove mud and dirt.

After lowering the track to the ground, select L (light) mode and slow travel speed. Carefully move the machine to firm ground.

Tow the machine if it becomes stuck but can still operate its engine. Be sure to attach a towing wire correctly.



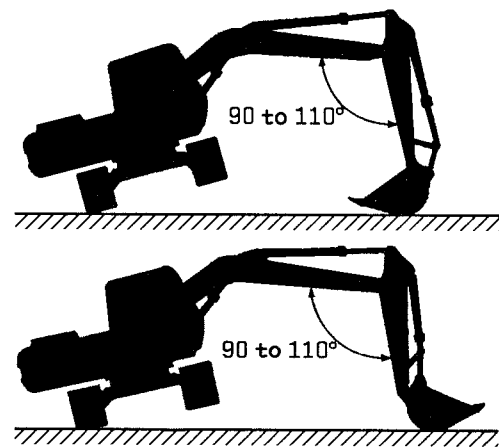
M104-05-012

RAISE ONE TRACK USING BOOM AND ARM

CAUTION: Keep the angle between boom and arm 90 to 110° and position the bucket's round side on the ground.

Swing the upperstructure 90° and lower the bucket to raise track off ground. Do not dig bucket teeth into the ground when using the hoe bucket reversed.

Place blocks under machine frame to support the machine.

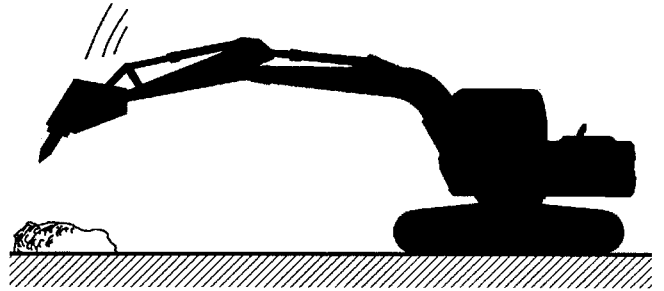


M104-05-054

OPERATING THE MACHINE

3. Avoid using the breaker for hammering operations. Do not use boom and arm functions to crush objects. Machine damage may result.

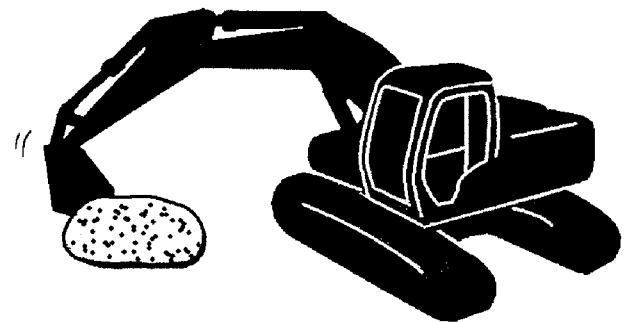
WRONG



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4. Do not use breaker to move objects. Machine damage may result.

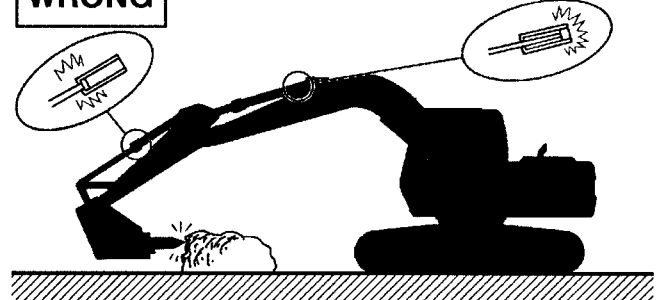
WRONG



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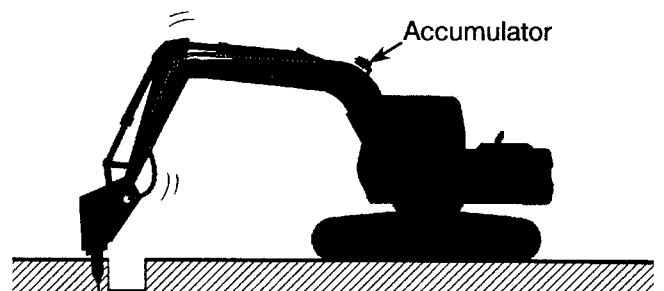
5. To prevent cylinder/machine damage, do not operate the breaker with the hydraulic cylinder rod fully retracted or fully extended.

WRONG



M104-05-057

6. Stop operation if breaker hydraulic hoses jump abnormally. Change in breaker accumulator pressure or damaged accumulator will cause abnormal hose jumping and may cause breaker and/or machine damage. Immediately contact your authorized dealer if this happens.



M104-05-058

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MAINTENANCE

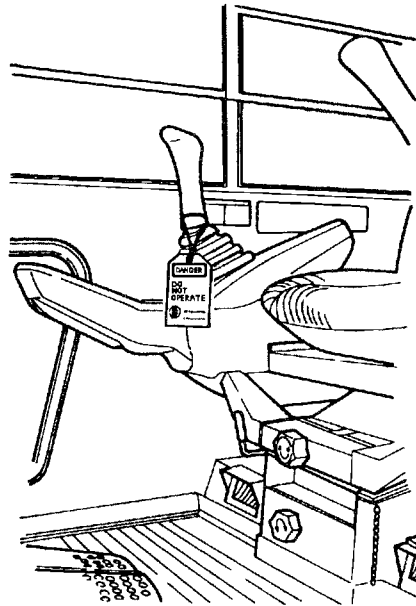
PREPARE MACHINE FOR MAINTENANCE

Before performing the maintenance procedures given in the following chapters, park the machine as described below, unless otherwise specified.

1. Park the machine on a level surface.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

4. Run the engine at slow idle speed without load for three minutes.
5. Turn the key switch OFF. Remove key from switch. (If maintenance must be performed with engine running, do not leave machine unattended.)
6. Pull the pilot control shut-off lever to the LOCK position.
7. Before performing any work on the machine, attach a "Do Not Operate" tag on the right control lever.

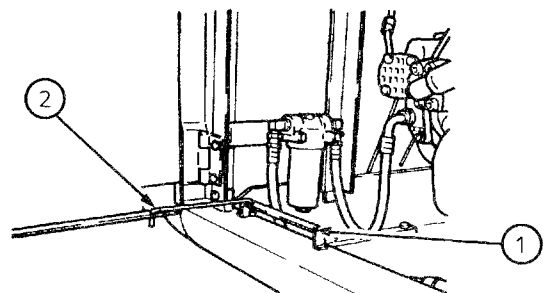


SA-109

OPEN ACCESS DOORS FOR SERVICE

To hold door open, remove rod from stored position ① and insert it in tab ②.

A tool box is provided in the right front compartment.



M107-07-103

MAINTENANCE

B. ENGINE OIL

Parts		Quantity	Interval (hours)						
			8	50	100	250	500	1 000	2 000
1. Engine Oil	Oil Level Check	1							
2. Engine Oil	Change	25.0 L (6.6 US gal)							
3. Engine Oil	Replacement	1							
4. Engine Oil	Replacement	1							

Recommended Engine Oil

Depending upon the expected air temperature range between oil changes, use the oil viscosity shown on the temperature chart below.

API CD Class

SAE 30 or equivalent (both summer and winter)

High temperature areas, SAE 40 or equivalent

Low temperature areas, SAE 10W or equivalent

Brand Names of Recommended Engine Oil

Kind of Oil	Engine Oil		
Application Air Temp.	Engine Crank Case Fuel Injection Pump and Governor		
	- 20 to 0 °C (- 6 to 32 °F)	- 10 to 35 °C (14 to 95 °F)	25 to 40 °C (77 to 104 °F)
British Petroleum	BP Vanellus C3		
	10W	30	40
Caltex Oil	RPM DELO 300 Oil		
	10W	30	40
Esso	Essolube D-3		
	10W	30	40
Idemitsu Kosan	Apoll oil diesel motive		
	S-310	S-330	S-340
	- 15 to 40 °C (5 to 104 °F) Apoll oil custom wide 15W-40 Apoll oil super wide 15W-40*		
Mobil Oil	Mobil Delvac		
	1310	1330	1340
Nippon Oil	Hidiesel S 3		
	-20 to 35 °C (-6 to 95 °F) 10W-30	-10 to 40 °C (14 to 104 °F) 15W-40	
Shell Oil	Rymla zoil white pilot super		
	10W	30	40

- The machine shipped from the factory is filled with lubricants marked with*.

MAINTENANCE

2 Drain Hydraulic Tank Sump — every 250 hours

IMPORTANT: Never run the engine without oil in hydraulic oil tank.

1. Park the machine on a level surface with the upperstructure rotated 90° for easier access.
2. Lower the bucket to the ground.
3. Turn the auto-idle switch off.

IMPORTANT: The turbocharger may be damaged if the engine is not properly shut down.

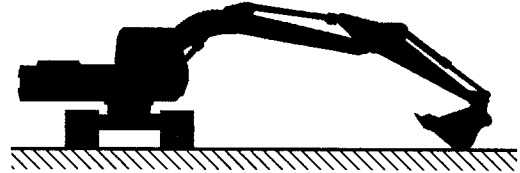
4. Run the engine at slow idle speed without load for three minutes.
5. Turn the key switch OFF. Remove the key from the key switch.
6. Pull the pilot shut-off lever to the LOCK position.

CAUTION: The hydraulic oil tank is pressurized. Push the pressure release button on the tank cap to release pressure.

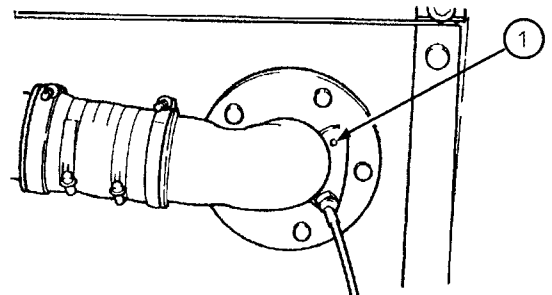
7. Push the pressure release button on the cap to release pressure.

CAUTION: Do not loosen the drain plug until oil is cool. Hydraulic oil may be hot, potentially causing serious injury.

8. After oil is cool, loosen drain plug ① to drain water and sediment. Do not remove the plug completely, only loosen it enough to drain water and sediment.
9. After draining water and sediment, retighten the plug.



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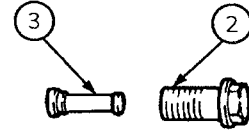


M107-07-022

MAINTENANCE

4 Clean Feed Pump Strainer — every 1 000 hours,

1. Remove the feed pump inlet hose joint bolt, located at the water separator inlet.
2. Remove strainer ③ from joint bolt ② using a screw driver.
3. Clean strainer ③ using diesel fuel.
4. Install and tighten strainer ③ in joint bolt ②.
5. Install and tighten joint bolt ②. Then, bleed air from the fuel system.

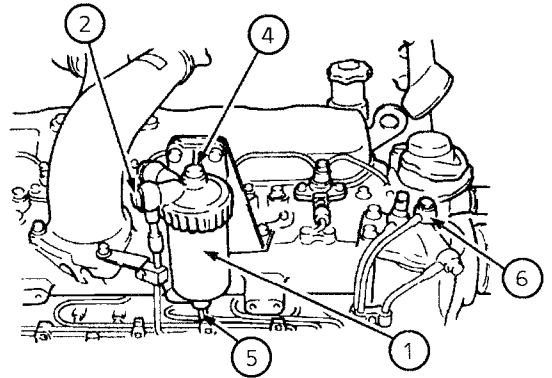


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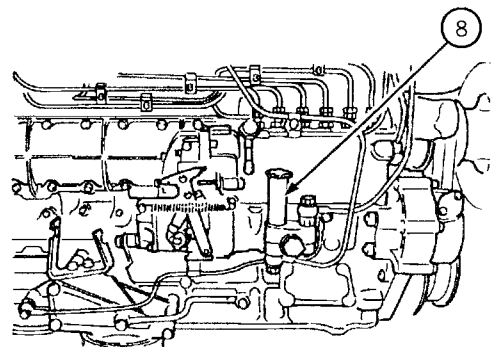
Bleed Air from Fuel System

IMPORTANT: Air in the fuel system may make the engine hard to start or make it run irregularly. After draining water and sediment from the water separator, replacing the fuel filter, cleaning the feed pump strainer or running the fuel tank dry, be sure to bleed the air from the fuel system.

1. Confirm that drain plug ⑤ and bleeding plug ④ on water separator ① is tight. If plug ④ is not tight air will not bleed from the fuel system.
2. Loosen joint bolt ⑥ on the fuel filter.
3. Loosen fuel feed pump ⑧ knob, raise and lower the plunger until no more air bubbles can be seen in the fuel.
4. Tighten joint bolt ⑥ on the fuel filter plunger. Raise and lower the plunger until the load become heavy.
5. Push fuel feed pump ⑧ knob down and tighten.
6. Start the engine and run at slow idle.
7. Put a "Do Not Operate" tag on the right control lever.
8. Pull the pilot control shut-off lever to the LOCK position.
9. Inspect the fuel system for leaks.



M107-07-101



M107-07-043

MAINTENANCE

REPLACE BATTERIES

Your machine has two 12 volt batteries with negative (-) ground.

If one battery in a 24-volt system has failed but the other is still good, replace the failed battery with one of the same type. For example, replace a failed maintenance-free battery with a new maintenance-free battery. Different types of batteries may have different rates of charge. This difference could overload one of the batteries and cause it to fail.

CONNECTING BATTERIES

After batteries are disconnected, engine speeds must be recalibrated.

1. Turn the key switch to the ON position.
2. Press the max. power (P) mode switch to automatically recalibrate engine speeds.
3. Turn the key switch OFF.

The machine can now be started and operated as usual.

MAINTENANCE

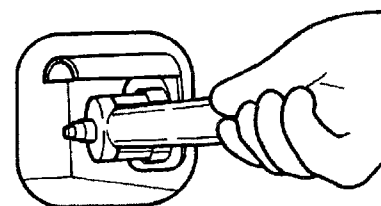
Loosen the Track

⚠ CAUTION: Do not loosen valve ① quickly or loosen it too much as high-pressure grease in the adjusting cylinder may spout out. Loosen carefully, keeping body parts and face away from valve ①.

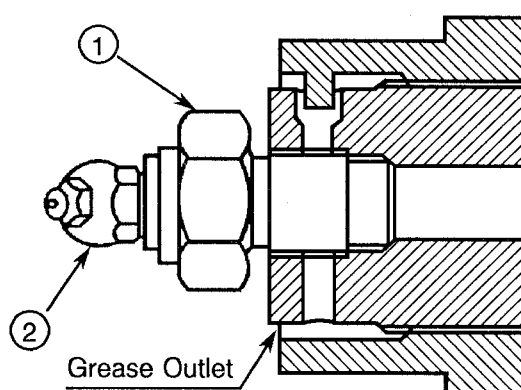
Never loosen grease fitting ②.

IMPORTANT: When gravel or mud is packed between sprockets and track links, remove it before loosening.

1. To loosen the track, slowly turn valve ① counterclockwise using long socket 24; grease will escape from the grease outlet.
2. Between 1 to 1.5 turns of valve ① is sufficient to loosen the track.
3. If grease does not drain smoothly, slowly rotate the raised track.
4. When proper track sag is obtained, turn valve ① clockwise and tighten to 147 N·m (15 kgf·m, 108 lbf·ft).



M107-07-075

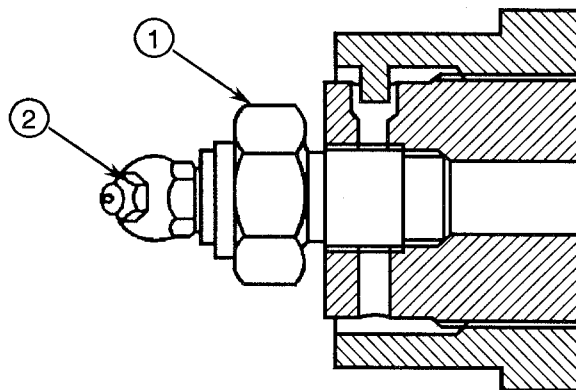


M104-07-119

Tighten the Track

⚠ CAUTION: It is abnormal if the track remains tight after turning valve ① counterclockwise or if the track is still loose after charging grease to fitting ②. In such cases, **NEVER ATTEMPT TO DISASSEMBLE** the track shoes or track adjuster, because of dangerous high-pressure grease inside the track adjuster. See your authorized dealer immediately.

To tighten the track, connect a grease gun to grease fitting ② and add grease until the sag is within specifications.



M104-07-119

STORAGE

STORING THE MACHINE

1. Inspect the machine. Repair worn or damaged parts. Install new parts if necessary.
2. Clean the primary air cleaner element.
3. Retract all hydraulic cylinders, if possible. If not, coat exposed cylinder rods with grease.
4. Lubricate all grease points.
5. Park the tracks on long stable blocks.
6. Wash the machine.
7. Remove the batteries and store them in a dry protected place after charging fully. If not removed, disconnect the negative battery cable from the (-) terminal.
8. Add an antirust agent to the coolant. In cold weather, add an antifreeze, or drain the coolant completely. Be sure to attach a "No Water in Radiator" tag on a clearly visible location if the system is drained.
9. Loosen the alternator belt and fan belt.
10. Paint necessary areas to prevent rust.
11. Store the machine in a dry, protected place. If stored outside, cover with a waterproof cover.
12. If the machine is stored for a long time, operate hydraulic functions for travel, swing and digging 2 to 3 times for lubrication, at least once a month.
Be sure to check the coolant level and lubrication conditions before operating.

REMOVING THE MACHINE FROM STORAGE



CAUTION: Start the engine **ONLY** in a well-ventilated place.

1. Remove grease from the cylinder rods if coated.
2. Adjust alternator and fan belt tension.
3. Fill the fuel tank. Bleed air from the fuel system. Check all fluid levels.
4. Start the engine.
Run the engine at half speed for several minutes before full load operation.
5. Cycle all hydraulic functions several times.
6. Carefully check all systems before operating the machine at full load.

NOTE: When the machine has been stored for a long time, be sure to perform the following steps as well:

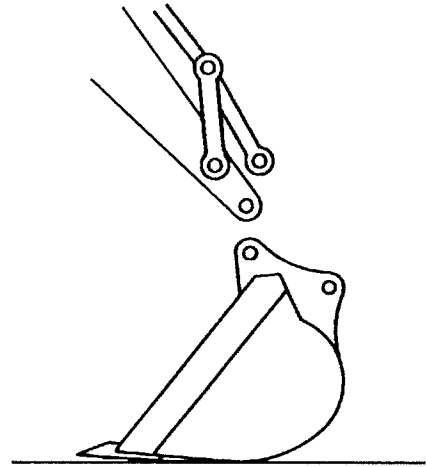
- (a) Check condition of all hoses and connections.
- (b) Warm up the engine.
- (c) Stop the engine.
- (d) Install new fuel filters. Replace the engine oil filter and fill the engine with oil.

IMPORTANT: If the machine has not been used for a long time, oil films on sliding surfaces may have broken down. Cycling hydraulic functions for travel, swing and digging 2 to 3 times is necessary to lubricate the sliding surfaces.

ASSEMBLY OF FRONT-END ATTACHMENT

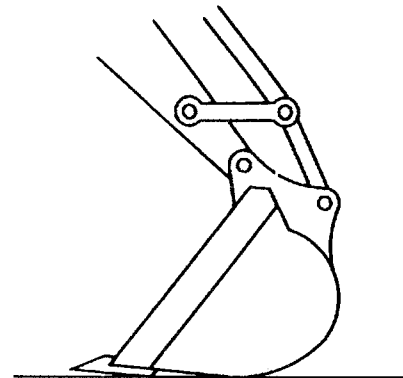
MOUNT THE BUCKET

1. Position the bucket on a firm, level surface.
2. Slowly operate the machine to align the arm with the bucket.
3. Connect the arm and bucket (for backhoe use) as shown.



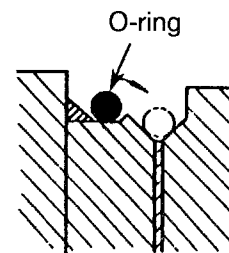
M107-13-009

4. Connect the links and bucket.



M107-13-010

NOTE: At steps (3) and (4) above, carefully install O-rings (4 × 4089028) on the groove between the boss of the bucket and arm or links.



M107-13-011

TROUBLESHOOTING

CONTROL LEVERS

Problem	Cause	Solution
Moves Hard	Corroded joint	See your authorized dealer.
	Worn out pusher	See your authorized dealer.
Does Nothing	Worn out pusher	See your authorized dealer.
	Pilot valve	See your authorized dealer.
Does Not Return To Neutral	Pilot valve	See your authorized dealer.
Too Much Play	Worn out pivot joint	See your authorized dealer.
Lever Is Not Vertical In Neutral	Pilot valve	See your authorized dealer.

HYDRAULIC SYSTEM

Problem	Cause	Solution
Hydraulic Functions Are Slow	Low oil level	Fill reservoir to full mark.
	Cold oil	Push hydraulic warm up switch.
	Wrong oil	Drain tank. Use correct oil.
	Engine speed too low	Increase speed or see your authorized dealer.
	Pilot circuit	See your authorized dealer.
	Worn pump	See your authorized dealer.
	Restricted pump suction line	See your authorized dealer.
Hydraulic Oil Overheats	Wrong oil	Use correct oil.
	Air leak in pump suction line	See your authorized dealer.
	Oil lines restricted	See your authorized dealer.
	Low oil level	Fill reservoir to full mark.
	Plugged filters	Install new filters.
	Worn pump	See your authorized dealer.
	Plugged radiator or oil cooler	Clean and straighten fins.
Oil cooler bypass	See your authorized dealer.	

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