DX480LC
DX520LC

Operation and Maintenance Manual

K1008702BE

DX480LC Serial Number 5001 thru 5220
DX520LC Serial Number 5001 thru 5116

February 2009

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This documentation may include attachments and optional equipment not available in your machine's package. Please call your distributor for additional items that you may require.

Illustrations used throughout this manual are used only as a representation of the actual piece of equipment, and may vary from the actual item.

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LOCATION OF SAFETY LABELS

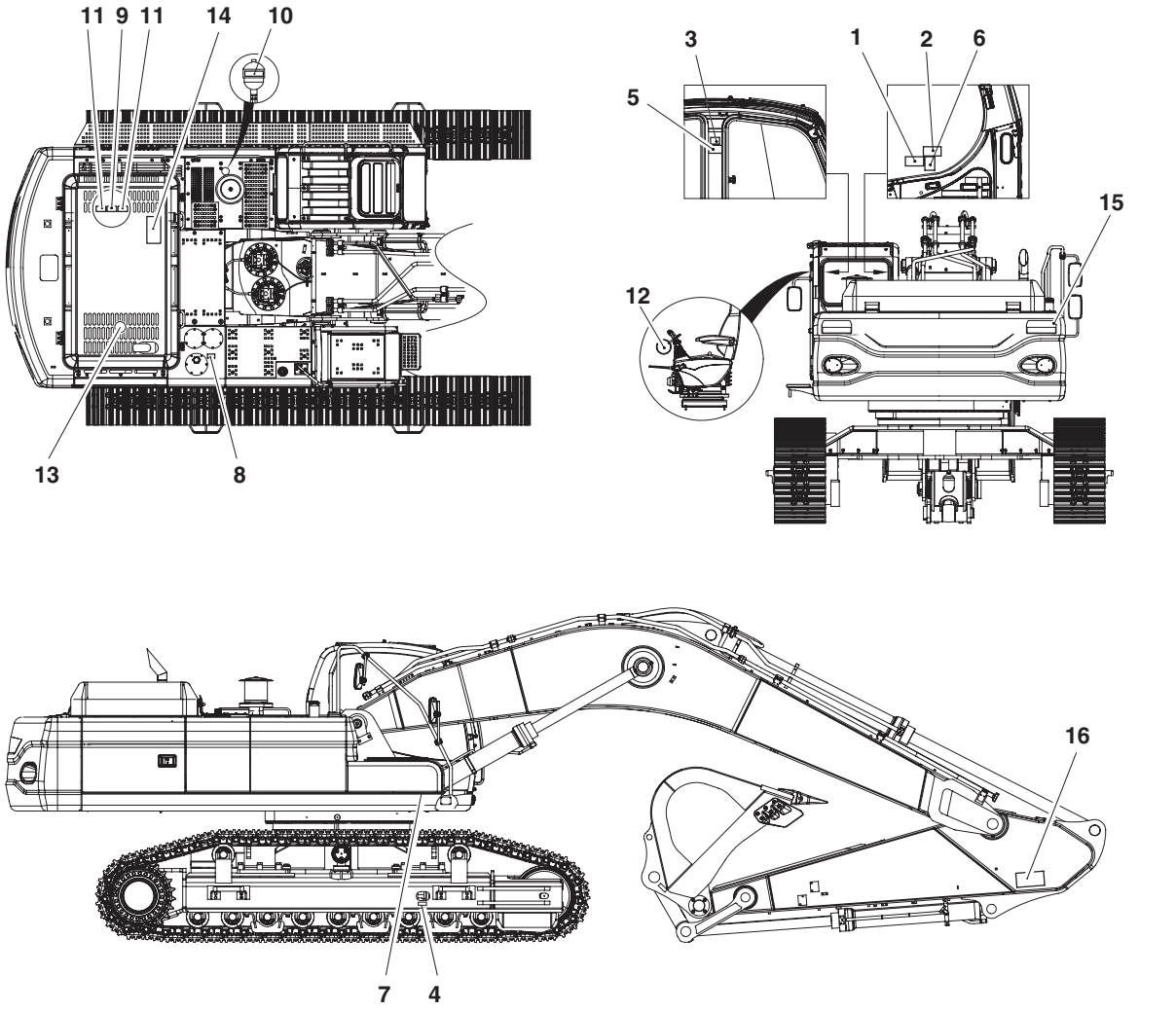


Figure 1

There are several specific warning signs on this machine. The exact location of hazards and the description of the hazards are reviewed in this section.

Please become familiarized with all warning signs.

Make sure that all the warning signs are legible. Clean the warning signs or replace the warning signs if you cannot read the words. Replace the illustrations if the illustrations are not visible. When you clean the warning signs, use a cloth, water and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the safety signs. Solvents, gasoline, or other harsh chemicals could loosen the adhesive that secures the warning sign. Loose adhesive will allow the warning sign to fall off.

Replace any safety sign that is damaged, or missing. If a safety sign is attached to a part that is replaced, install a safety sign on the replacement part.

UNAUTHORIZED MODIFICATIONS

Any modification made without authorization or written approval from *DOOSAN* can create a safety hazard, for which the machine owner will be held responsible.

For safety's sake, replace all OEM parts with the correct authorized or genuine *DOOSAN* part. For example, not taking the time to replace fasteners, bolts or nuts with the correct replacement parts could lead to a condition where the safety of critical assemblies are dangerously compromised.

GENERAL HAZARD INFORMATION

Safety Rules

Only trained and authorized personnel can operate and maintain the machine.

Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.

Do not operate the machine if you are not feeling well, if you are taking medication that makes you feel sleepy, if you have been drinking, or if you are suffering from emotional problems. These problems will interfere with your sense of judgment in emergencies and may cause accidents.

When working with another operator or with a person on work site traffic duty, be sure that all personnel know the nature of the work and understand all hand signals that are to be used.

Always observe strictly any other rules related to safety.

Safety Features

Be sure that all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.

Be sure that you understand the method of use of safety features such as safety lock lever and the seat belt, and use them properly.

Never remove any safety features. Always keep them in good operating condition.

Failure to use safety features according to the instructions in the Operation and Maintenance Manual could result in serious bodily injury.

Avoid operating your machine to close to the edge of cliffs, overhangs, and deep ditches. The ground may be weak in such areas. If the ground collapses, the machine could fall or tip over resulting in serious injury or death.

Remember that soil after heavy rain, blasting or after earthquakes, is weakened.

Newly laid earth and the soil near ditches is typically loose. It can collapse under the weight of vibration of your machine and cause your machine to tip over.

Install the head guard (FOPS) if working in areas where there is a danger of falling rocks.

Checks Before Starting Engine

Every day before starting the engine for the first time, carry out the following checks. If these checks are not carried out properly, there is a danger of serious injury.

Remove all wood chips, leaves, grass, paper and other flammable materials accumulated in the engine compartment and around the battery. They could cause a fire. Remove any dirt from the window glass, mirrors, handrails, and steps.

Do not leave tools or spare parts laying around in the operator's cabin. The vibration of the machine when traveling or during operations may cause them to fall and damage or break the control levers or switches. They may also get caught in the gap of the control levers and cause the work equipment to malfunction or move dangerously. This may lead to unexpected accidents.

Check the coolant, fuel, and hydraulic tank oil levels, and check for clogged air cleaner and damage to the electrical wiring.

Adjust the operator's seat to a position where it is easy to operate the machine, and check the seat belt and mounts for damage and wear.

Check the operation of the gauges and the angle of the mirrors, and check that safety lever is in "LOCKED" position.

If any abnormalities are found in the above checks, carry out repairs immediately.

Engine Starting

Walk around your machine before getting in the operator's cabin. Look for evidence of leaking fluid, loose fasteners, misaligned assemblies or any other indications of possible equipment hazard.

All equipment covers and machinery safety guards must be in place, to protect against injury while the machine is being operated.

Look around the work site area for potential hazards, people or property that could be at risk while operation is in progress.

Warning Tag

Alert others that service or maintenance is being performed and tag operator's cabin controls – and other machine areas if required – with a warning notice. OSHA mandated control lever lockout can be made with any OSHA certified lockout device and a length of chain or cable to keep the safety lever in the fully lowered, nonactive position.

Warning tags, for controls are available from *DOOSAN* distributors.

ARO1320L

Figure 30

Clean Before Inspection or Maintenance

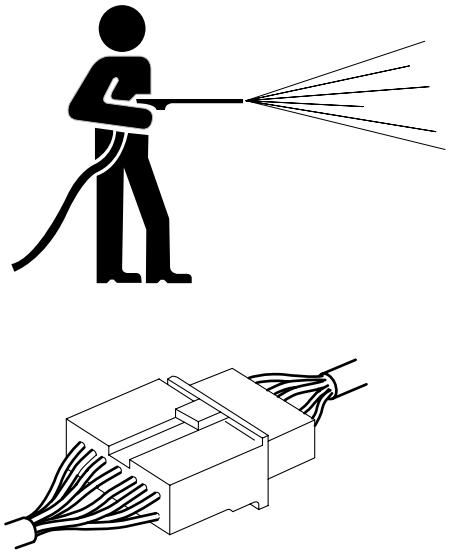
Clean the machine before carrying out inspection and maintenance. This prevents dirt from getting into the machine and ensures safety during maintenance.

If inspection and maintenance are carried out when the machine is dirty, it will become more difficult to locate the problems, and there is a danger that you may get dirt or mud in your eyes or that you may slip and injure yourself.

When washing the machine, do the following:

- Wear shoes with nonslip soles to prevent yourself from slipping and falling on wet places.
- Wear safety glasses and protective clothing when washing the machine with high-pressure steam.
- Take action to prevent touching high-pressure water and cutting your skin or having mud fly into your eyes.
- Do not spray water directly on electrical components (sensors, connector). If water gets into the electrical system, there is a danger that it will cause defective operation and malfunction.

Pick up any tools or hammers that are laying in the workplace, wipe up any grease or oil or any other slippery substances, and clean the area to make it possible to carry out the operation in safety. If the workplace is left untidy, you may trip or slip and suffer injury.



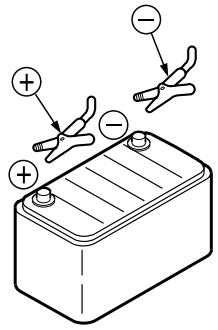
ARO1330L

Figure 31

Boost Starting or Charging Engine Batteries

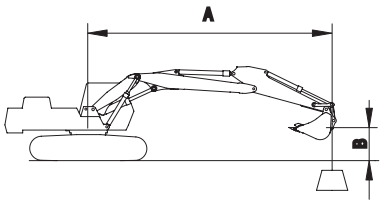
If any mistake is made in the method of connecting the booster cables, it may cause an explosion or fire. Always do the following:

- Turn off all electrical equipment before connecting leads to the battery. This includes electrical switches on the battery charger or boost starting equipment.
- When boost starting from another machine or vehicle do not allow the two machines to touch. Wear safety glasses or goggles while required battery connections are made.
- 24 volt battery units consisting of two series connected twelve volt batteries have a cable connecting one positive terminal on one of the 12 volt batteries to a negative terminal on the other battery. Booster or charger cable connections must be made between the nonseries connected positive terminals and between the negative terminal of the booster battery and the metal frame of the machine being boosted or charged. Refer to the procedure and illustration in “Starting Engine With a Booster Cable” on page 3-7 of this manual.
- Connect positive cable first when installing cables and disconnect the negative cable first when removing them. The final cable connection, at the metal frame of the machine being charged or boost started, should be as faraway from the batteries as possible.



HAOA310L

Figure 46



TRACK WIDTH : 3.9 m (12' 10") STD TRACK
BOOM : 6.3 m (20' 7")
ARM : 2.4 m (7' 10")
BUCKET : SAE 3.2 m^3 (CECE 2.87m^3)
SHOE : 600 mm (24")
: RATING OVER FRONT
: RATING OVER SIDE OR 360 degree
UNIT : 1,000 kg (1,000 lb)

METRIC

A(m) / B(m)	2		3		4		5		6		7		8		MAX. REACH		
																	A(m)
7											*11.30	*11.30			*11.29	*11.29	7.03
6											*11.67	*11.67			*11.33	*11.33	7.60
5							*15.78	*15.78	*13.69	*13.69	*12.34	*12.34	*11.48	10.87	*11.48	10.87	8.00
4					*23.56	*23.56	*18.06	*18.06	*15.06	*15.06	*13.18	*13.18	*11.94	10.68	*11.69	10.12	8.26
3							*20.22	*20.22	*16.40	*16.40	*14.03	12.99	*12.45	10.48	*11.96	9.69	8.39
2							*21.79	21.60	*17.51	16.16	*14.77	12.70	*12.89	10.30	*12.29	9.53	8.40
1					*23.65	*23.65	*22.59	21.20	*18.22	15.85	*15.27	12.48	*13.17	10.15	*12.67	9.61	8.28
0 (GROUND)					*28.50	*28.50	*22.65	21.00	*18.44	15.66	*15.43	12.33	*13.17	10.06	*13.08	9.98	8.04
-1	*19.31	*19.31	*23.74	*23.74	*27.21	*27.21	*22.05	20.97	*18.13	15.59	*15.16	12.28			*13.53	10.72	7.66
-2	*25.86	*25.86	*30.65	*30.65	*25.29	*25.29	*20.79	*20.79	*17.21	15.64	*14.29	12.33			*13.99	12.04	7.11
-3	*32.27	*32.27	*27.04	*27.04	*22.54	*22.54	*18.71	*18.71	*15.46	*15.46					*14.37	*14.37	6.36
-4			*21.90	*21.90	*18.56	*18.56	*15.41	*15.41							*14.45	*14.45	5.31

FEET

A (ft) / B (ft)	10'		15'		20'		25'		MAX. REACH		
											A (ft)
20'									*24.96	*24.96	24' 9"
15'			*40.30	*40.30	*31.04	*31.04	*26.46	25.85	*25.48	23.15	26' 8"
10'			*49.66	*49.66	*35.43	*35.43	*28.55	25.03	*26.35	21.40	28' 6"
5'			*54.83	54.67	*38.75	34.40	*30.28	24.31	*27.48	21.02	27' 5"
0 (GROUND)			*55.01	53.91	*39.92	33.67	*30.80	23.88	*28.84	22.01	26' 5"
-5'	*62.02	*62.02	*51.59	*51.59	*38.41	33.55			*30.36	24.96	24' 3
-10'	*58.66	*58.66	*44.38	*44.38	*33.18	*33.18			*31.71	*31.71	20' 9"
-15'									*30.94	*30.94	14' 9"

1. LOAD POINT IS THE HOOK ON THE BACK OF THE BUCKET.
2. * RATED LOADS ARE BASED ON HYDRAULIC CAPACITY.
3. RATED LOADS DO NOT EXCEED 87 % OF HYD. CAPACITY OR 75 % OF TIPPING CAPACITY.

FG003854

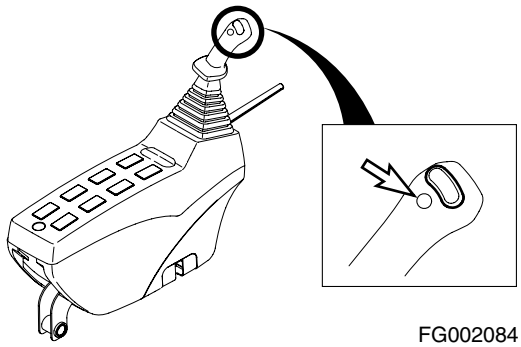
Reference Number	Description
1	Starter Switch
2	Engine Speed Control Dial
3	Quick Clamp Switch (Optional)
4	Auxiliary Mode Switch
5	Engine Emergency Stop Switch
6	Audio Control Panel
7	Travel Speed Selector Switch
8	Light Switch
9	Breaker / Booster / Shear Selector Switch
10	Cabin Work Light Switch (Optional)
11	Warning Light Switch (Optional)
12	Lower Wiper Switch (Optional)
13	Heater And Air Conditional Control Panel
14	Wiper Control Panel

Reference Number	Description
15	Cigar Lighter
16	Power Socket For 12v
17	Travel / Swing Alarm Switch (Optional)
18	Overload Warning Switch (Optional)
19	Fuel Heater Switch (Optional)
20	Seat Warmer Switch (Optional)
21	Horn Button
22	Rotating Switch
23	Breaker / Booster Switch
24	Shear Switch
25	Instrument Panel
26	Safety Lever
27	Photo Sensor
28	2-Pumps Flow Switch (Optional)
29	Reverse Fan Switch

21. Horn Button (Left-hand Work Lever)

Press the lower button on the top of the left-hand work lever (joystick) to sound horn.

NOTE: *The starter switch must be "ON."*



FG002084

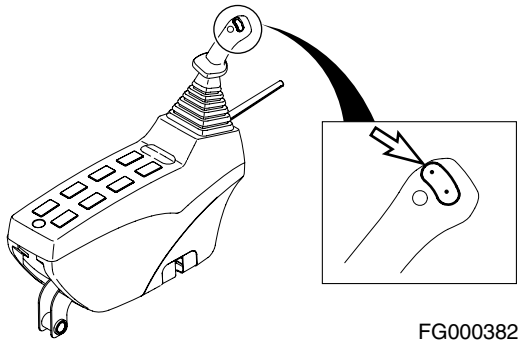
Figure 31

22. Rotating Buttons

For a machine equipped with an attachment that rotates, press the upper two buttons on the top of the left-hand work lever (joystick) to rotate the attachment clockwise or counterclockwise. Left button is for counterclockwise and the right one is for clockwise.

⚠ WARNING

Before using any attachment in a work application, be sure to check its functional control. Make sure that desired movement or action is being activated by the control. e.g. opening/closing, CW/CCW, crowd/dump, etc.



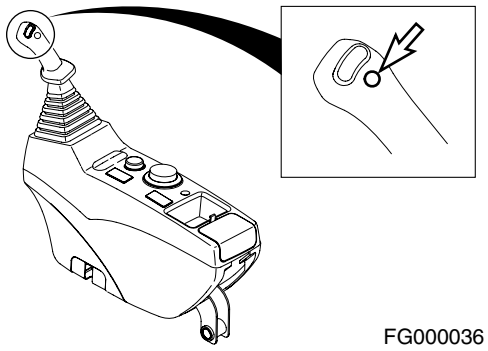
FG000382

Figure 32

23. Booster Button (Right-hand Work Lever)

Press the lower button on the top of the right-hand work lever (joystick) to boost the hydraulic pressure. Refer to the “Boost Mode” on page 3-22.

NOTE: *This button works with the breaker/boost/shear selector switch. See “9. Breaker / Boost / Shear Selector Switch” on page 2-14.*



FG000036

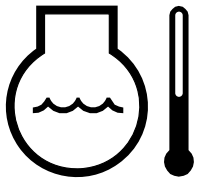
Figure 33

9. Engine Coolant Temperature Warning Light

If engine coolant overheats, this light will turn "ON," an alarm will sound, and the engine speed will be automatically reduced, until coolant temperature drops. Do not turn engine "OFF" because this will cause coolant temperature to rise and may cause engine to siege because of heat surge.

NOTE: *Check the engine coolant temperature gauge. If the gauge pointer moves into the red zone, the engine coolant temperature warning light will turn "ON," a warning buzzer will sound, and the engine speed will be automatically reduced. Allow the engine to run at low idle speed until the temperature gauge registers in the blue zone again. When the blue zone is reached, allow the engine to idle for an additional three - five minutes before shutting down the engine. If not allowed to idle, heat surge may develop which will damage the engine. Allowing the engine to idle will dissipate heat. Check the coolant level, look for a loose fan belt, inspect for debris around radiator, and so on.*

When the temperature reaches the normal range, the engine speed will automatically recover.



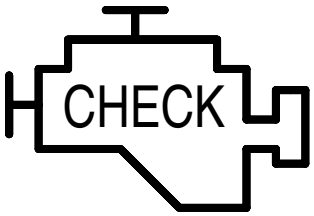
HAOD350L

Figure 49

10. Engine Check Warning Light

This indicator light will turn "ON," when the engine needs to be check.

NOTE: *If this light turns "ON" stop the machine and repair the cause of the fault.*



FG000045

Figure 50

2. Down Arrow Button

Down arrow button (▼), is used to move a menu item "Down" or to the "Right."

FG000069

Figure 76

3. Display Selector Button (ESC - Escape)

Display selector button ( ), is used to change the displayed information on the screen. Each time the display selector button is pressed, the digital readout changes.

NOTE: *When setting the main menu, this button is used as the menu / exit button (ESC). To access the menus the button must be pressed and held for three* seconds.

NOTE: *When this button is used for menu / exit button, it is used to access to main menu or return to a previous screen from each submenu.*

FG000070

Figure 77

4. Selection Button

Selection button (↵), is used to set a menu or clear the operating hour of filter/oil.

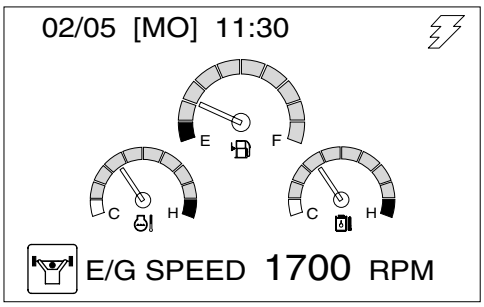
FG000071

Figure 78

OPERATION SELECTION DISPLAY

In the monitor you can see the application that is currently selected.

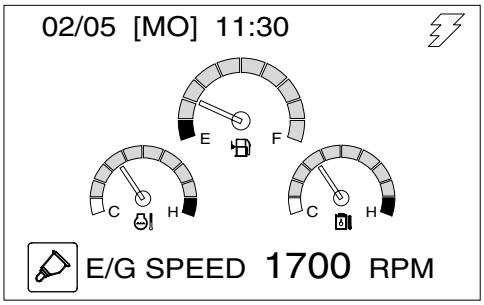
Power Boost Selection



FG000257

Figure 102

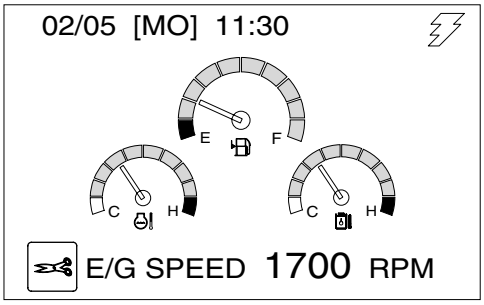
Breaker Selection



FG000258

Figure 103

Shear Selection



FG000259

Figure 104

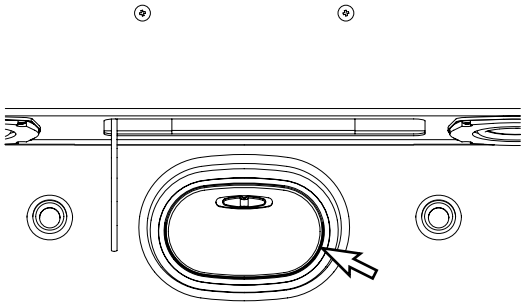
MISCELLANEOUS ELECTRICAL DEVICES

Cabin Light

A light is installed on the top of the operator's cabin.

The light will work despite starter switch position.

NOTE: *If light is left "ON" for a long time while the engine is not running, the battery will be discharged.*

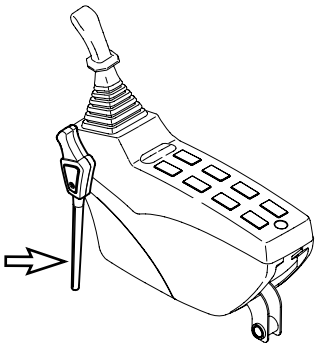


FG000417

Figure 126

Pilot Cutoff Switch

When the safety lever is put into the "LOCK" position, the switch deactivates the work and travel levers. With the work and travel levers deactivated, no digging/operational work can be done.



FG000211

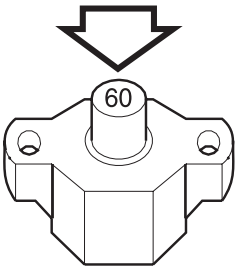
Figure 127

Circuit Breaker

A main circuit breaker is in the battery box. It will automatically cut off in case of an electrical short circuit or overload. This will prevent the electrical wiring and components from being burned or damaged.

If the circuit breaker is cut off, check all related circuits, this means something is wrong in the electrical circuit.

After maintenance, press the red button for normal operation of circuit breaker.



HAOB090L

Figure 128

CABIN STORAGE COMPARTMENTS

There are two storage compartments behind the operator's seat.

The large compartment (1, Figure 147) is for storing nonperishable items.

The covered other one (2, Figure 147) is interconnected with the air conditioner. So, it can be supplied with either warm or cool air when air conditioner is turned "ON."

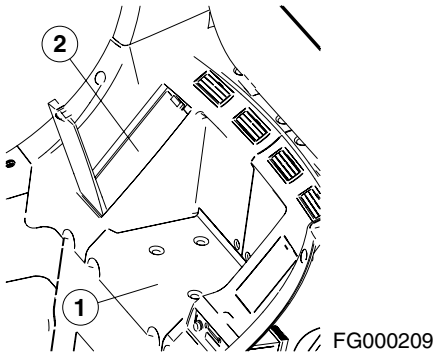


Figure 147

There is a separate small tray (3, Figure 148) on the right side of operator's seat.

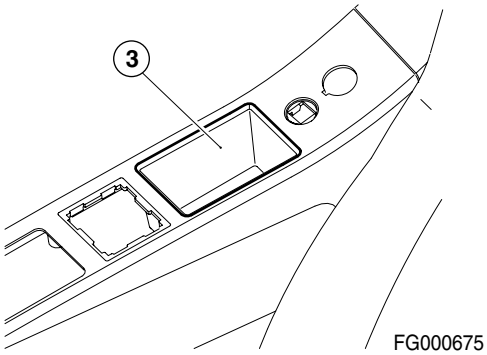


Figure 148

ASHTRAY

An ashtray (1, Figure 149) is to the right side of the operator's seat on the side of the cabin. Always close ashtray after putting out a cigarette.

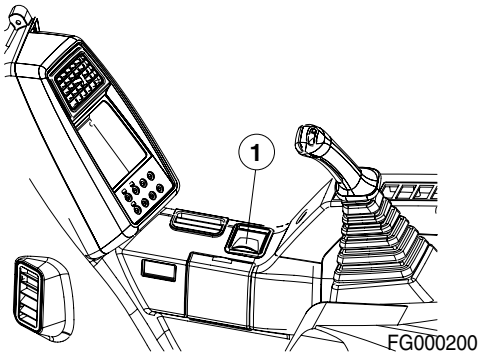
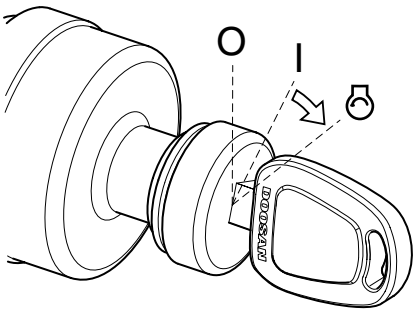


Figure 149

5. After the preheat completion, immediately turn starter switch to "⏻" (START) position (Figure 10). Engine should start in approximately five seconds.



FG000085

Figure 10

⚠ WARNING

If the engine does not start after approximately fifteen seconds of cranking, release the starter switch. Wait about five minutes and repeat above step.

6. After engine has started, release key. Key will return to the "I" (ON) position (Figure 10).
7. After the engine starts, check all operating indicators to make sure that all engine systems (oil pressure, coolant, etc.) are in the normal operating range. If any problems are noticed, shut down engine.
8. Follow "Hydraulic System Warm-up" procedures in this section. (See page 3-9)

Starting Engine With a Booster Cable

⚠ WARNING

1. **An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area.**
2. **Charge batteries in a well ventilated area.**
3. **Always wear eye protection when starting a machine with jumper cables.**
4. **Improper jump-starting procedures can cause an explosion resulting in personal injury.**
5. **Jump-start vehicles on dry ground or concrete. Do not jump-start the machine on a steel floor, because the floor is always grounded.**
6. **When starting from another machine, make sure the machines do not touch.**
7. **Always connect the auxiliary battery positive (+) terminal too depleted battery positive (+) terminal first. Then connect auxiliary battery negative (-) terminal to the frame of the depleted battery machine second.**
8. **Connect positive cable first when installing cables and disconnect the negative cable first when removing.**

HAOA440L

Figure 11

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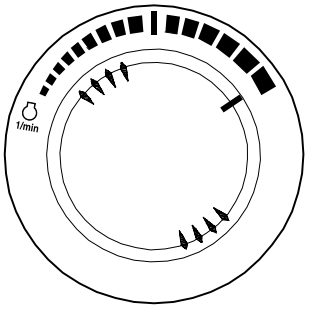
General Travel Instructions

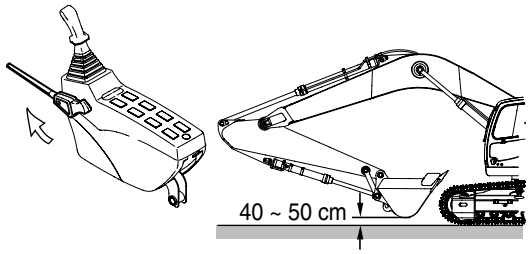
1. Set engine speed control dial (Figure 31) on desired speed.



HAOB550L

Figure 31

2. Set safety lever on "UNLOCK" position, and folding the front, raise it 40 - 50 cm (16 - 20 in) aboveground. See Figure 32.



FG000123

Figure 32

3. When possible, travel on firm, level ground. Avoid sudden movements and sharp turns.
4. When traveling on rough ground, travel at a slow speed [1.0 - 1.5 km/h (0.62 - 0.93 MPH)]. Reduced engine speed, to avoid shock loading the equipment. Be careful that an excessive force is not added to equipment by touching or climbing on rocks.

FG000423

Figure 33

6. Do not use machine travel or swing when the bucket is in the ground to provide additional breakout force. See Figure 56.

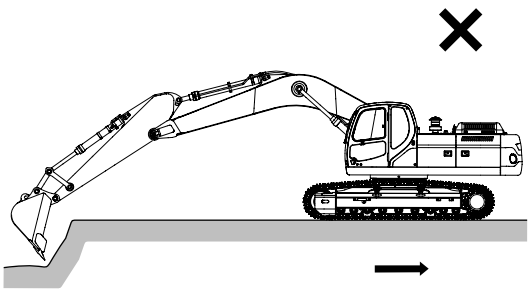


Figure 56

7. Do not use weight of machine to provide additional breakout force. See Figure 57.
8. When working on soft or muddy ground, make sure that machine is not sinking.

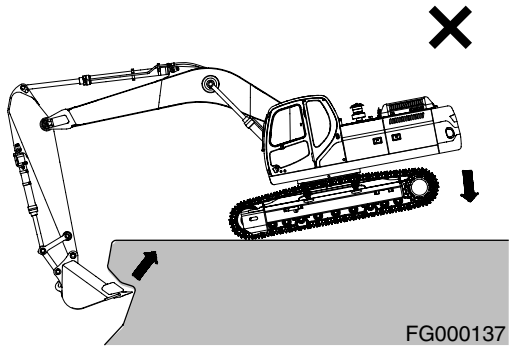


Figure 57

9. When working close to the excavated edge, make sure that ground the machine is sitting on is solid. Keep the travel motors (1, Figure 58) to the rear. See Figure 58.

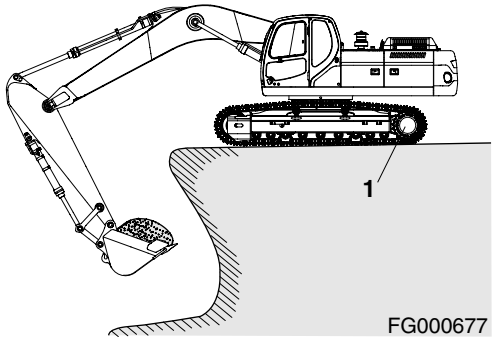


Figure 58

10. Do not excavate underneath the machine. See Figure 59.

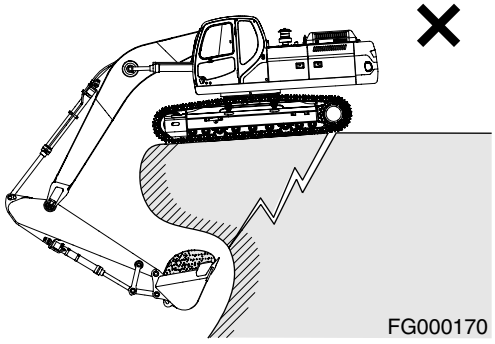
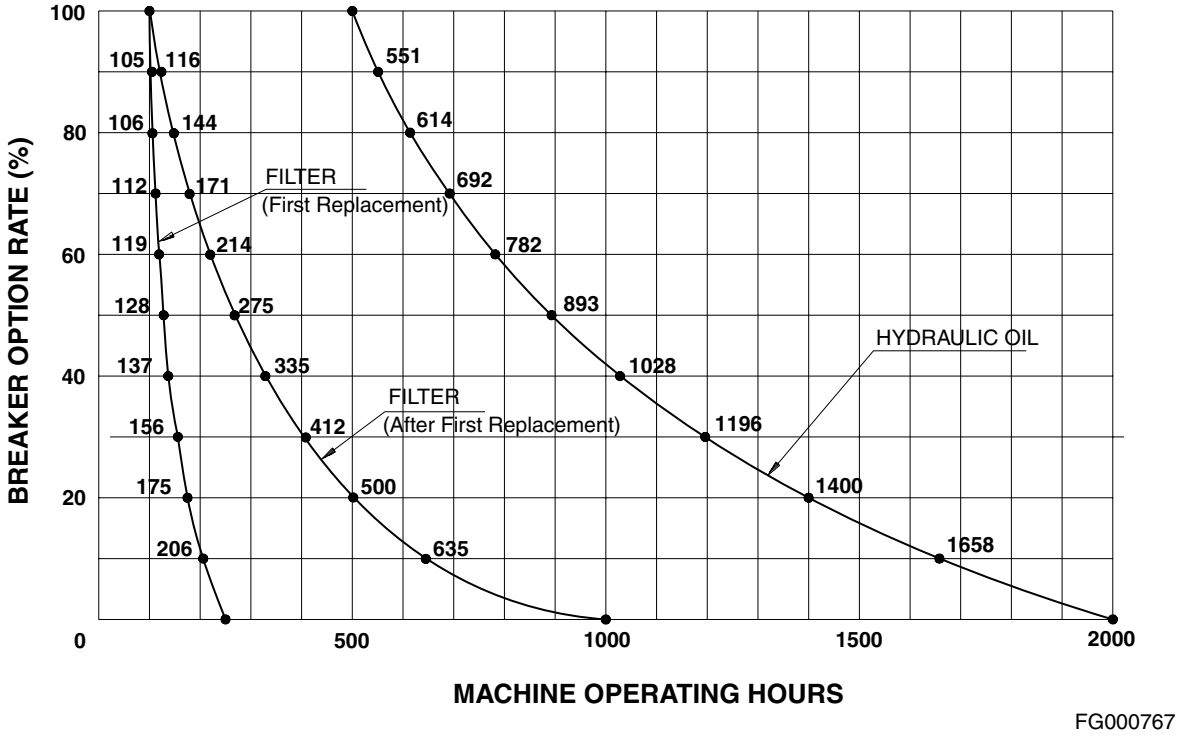


Figure 59

Hydraulic Oil and Filter Service Intervals

When using a hydraulic breaker, the viscosity breakdown and contamination of hydraulic oil is faster because the work condition is more severe than during normal digging work. To prevent the hydraulic components (especially pump) from having a shortened life cycle, replace the hydraulic oil and main hydraulic oil return filter using the following schedule.

Attachment	Operation Rate	Hydraulic Oil	Filter
Bucket Work	100%	2,000 Hours	250 Hours (First Replacement) 1,000 Hours (After First Replacement)
Hydraulic Breaker Work	100%	500 Hours	100 Hours
* These service intervals only apply, when a genuine *DOOSAN* oil and filter are used. If any other brands are used, the guaranteed changed interval should be reduced in half.			



FG000767

Figure 81

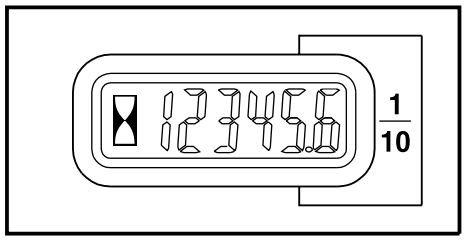
NOTE: *The replacement intervals of hydraulic oil and filter depend upon the amount of time the hydraulic breaker is being used. These intervals should be followed as opposed to regularly scheduled maintenance.*

Inspection, Maintenance and Adjustment

PREVENTIVE MAINTENANCE

Routine maintenance and inspections are required to keep your machine in the correct operating condition. The following pages list the inspection intervals, the system or component checks, and location references.

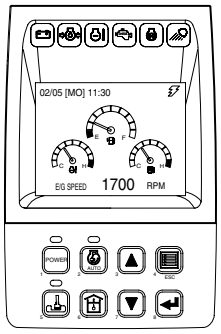
NOTE: *The following pages list the service checks and their required intervals. The service cycles may need to be shortened depending on the working conditions. Extremely hot or dusty conditions will require more frequent service. Operational hours are determined by the amount of time accumulated on the engine hour meter on the control console in the cabin.*



HAOA601L

Figure 1

NOTE: *Besides the normal hour meter, the multifunction gauge can be used to keep track of the hours on individual filters. See “Filter / Oil Info” on page 2-42.*



FG000037

Figure 2

SERVICE DATA									
No.	Items to Check	Service	Qty.	Service Interval					
				10	50	250	500	1000	2000
1	Front Joint Pin (1)	Grease	11	F100		W10			
2	Front Joint Pin (2)	Grease	6	F100	W10				
3	Swing Bearing	Grease	3		W10				
4	Swing Gear	Grease	1						
5	Swing Reduction Gear	Grease	2					W10	
6	Swing Device	Gear Oil (80W90)	2X4 L	V		F			
7	Track Spring	Grease	2				W10		
8	Travel Reduction Device	Gear Oil (80W90)	2X6 L			F, V			
9	Engine Oil	Engine Oil (10W40)	44 L	V	F				
10	Hydraulic Oil Tank	Hydraulic Oil	500 L	V					
11	Fuel Tank	Diesel	620 L	V					
12	Fuel Prefilter	Cartridge	1	V					
13	Radiator	Coolant (Antifreeze)	40 L	V					PG
14	Hydraulic Oil Return Filter	Element	2			F			
15	Pilot Filter	Element	1			F			
16	Hydraulic Oil Suction Strainer	Strainer	1						C
17	Engine Oil Filter	Cartridge	1		F				
18	Fuel Filter	Cartridge	1						
19	Air Cleaner (Outer)	Element	1				C		
	Air Cleaner (Inner)	Element	1						
20	Air Conditioner Filter (Outer)	Cartridge	1				C		
	Air Conditioner Filter (Inner)	Cartridge	1				C		

V: Maintenance and Refill.

C: Cleaning.

F: First Time Exchange Only.

F100: Every 10 Hours For First 100 Hours.

W10: Every 10 Hours If Operating In Water.

PG: Propylene Glycol - Extended Life Antifreeze (Drain and replace using this interval.) See “Engine Cooling System” on page 4-81, for further explanation.

: Replacement On Every Interval.

NOTE: *For additional service items see list of “Maintenance Intervals” on page 4-12.*

Check Cooling System and Refill As Required

WARNING

Allow the engine to cool before releasing the radiator cap. Make sure to loosen the cap slowly to release any remaining pressure.

Radiator cleaning is performed while the engine is running. Take extreme caution when working on or near a running engine. Make sure to lock out and tag the controls notifying personnel that service work is being performed.

Do not remove radiator cap unless it is required. Observe the coolant level in the coolant recovery tank.

NOTE: *Do not mix ethylene glycol and propylene glycol antifreeze together. If the two are mixed, the protection level will be reduced to the level of the ethylene glycol.*

1. When the engine is cold, remove radiator cap and check the coolant level inside the radiator. Do not rely on the level of coolant in the coolant recovery tank. Refill radiator as required. Refer to coolant concentration table. (See page 4-84)
2. Check to make sure that coolant transfer line from the coolant recovery tank to the radiator is free and clear of obstructions, or not pinched.
3. Observe the level of coolant in the coolant recovery tank. The normal cold engine fluid level should be between "FULL" and "LOW" marks on tank.
4. If the coolant is below the "LOW" mark, add coolant to this tank.

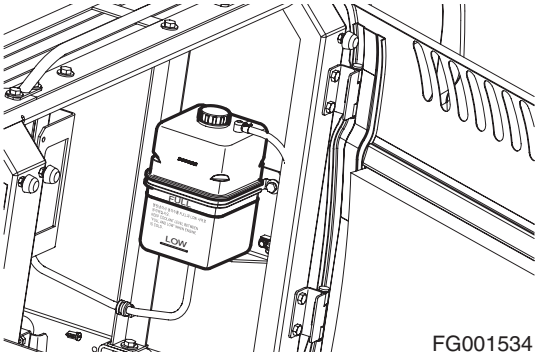


Figure 31

Check Level of Window Washer Liquid

1. Open left front access door and check fluid level in windshield washer tank.
2. Open fill cap and add fluid.

   NOTE: *Use a washer liquid that is rated for all seasons. This will prevent freezing during cold weather operation.*

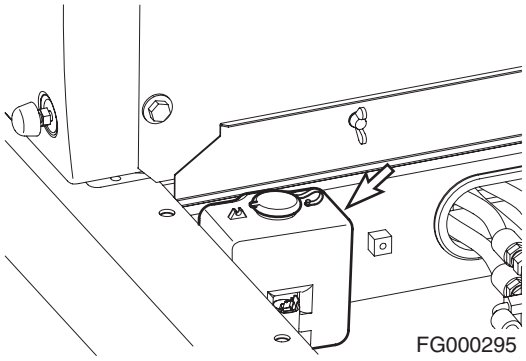


Figure 32

Check Engine Fan Belt Wear

WARNING

Keep clear of engine fan and fan drive belts when the engine is running. Rotating fan and belt contact can cause injury.

WARNING

When checking, adjusting or replacing drive belts, care must be taken to prevent accidental cranking of the engine. Be sure the starter switch is in the "OFF" position and the controls are tagged.

1. Replace badly worn, greasy or severely cracked belts immediately. These conditions prevent proper belt function. Visually inspect the belt. Check the belt for intersecting cracks. Transverse (across the belt width) cracks are acceptable. Longitudinal (direction of belt length) cracks that intersect with transverse cracks are not acceptable. Replace the belt if it is frayed or has pieces of material missing.
2. Before installing new belts, make sure all pulley grooves are clean and not worn. Replace pulley, if damaged, or if the grooves are worn.
3. All pulley support bearings, shafts, and brackets must be in working order.
4. When replacing belts and pulleys, pulley alignment must be checked with belts tensioned and brackets securely clamped. A misalignment that can be detected by the eye is detrimental to belt performance.
5. Do not force the belts into the pulley grooves by prying with a screwdriver or pry bar. This will damage the belt side cords which will cause the belts to turn and result in complete destruction of the belts in operation.
6. Belts on new machines and replacement belts lose their tension as they seat into the pulley grooves. Check the tension of new belts at 50 hour intervals until tension is stabilized and thereafter, every 250 hours. If the tension falls below the required minimum, the belt slips damaging the belts and pulley grooves.

   NOTE: *When operating in abrasive conditions, check tension every 100 hours.*

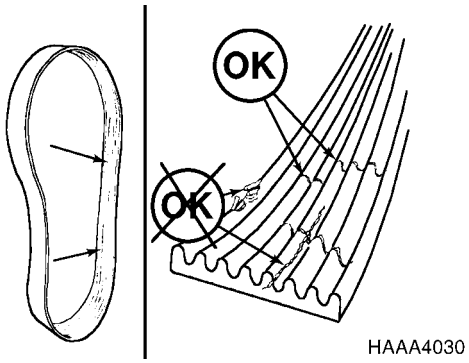


Figure 47

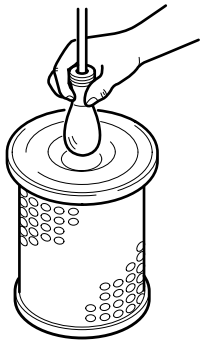
5. Clean the outer filter (4, Figure 64) by blowing compressed air from the inside of the filter towards the outside. Do not use more than 205 kPa (30 psi) air pressure.

HAOC570L

Figure 65

6. Check outer filter by shinning a light through it. If small holes or thinner parts are found on the element after cleaning it, replace the filter.
7. Clean the inside of the air cleaner body and the inside of the air cleaner cover. Do not use compressed air.
8. Properly install the air filter and cover.
9. After filter service be sure to install cover with arrows pointing "UP."

   NOTE: *If after cleaning the outer filter, the air cleaner clogged indicator remains "ON," replace the outer and inner filters. Do not clean inner filter.*



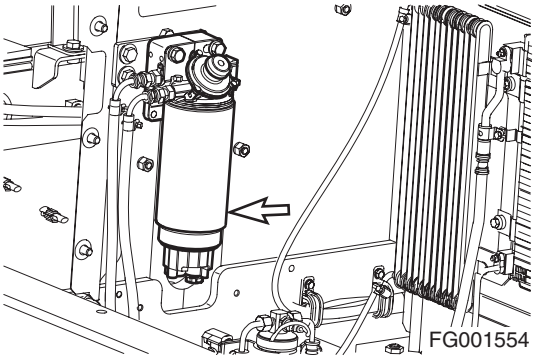
FG000412

Figure 66

Change of Fuel Prefilter

1. Open the left rear side door to access fuel prefilter.
2. Position a small container under prefilter. Drain fuel by opening drain valve on bottom of filter.

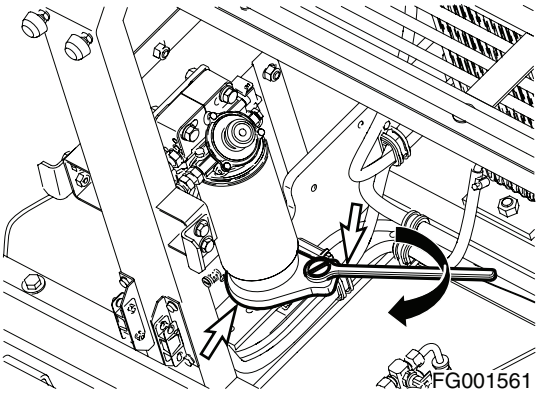
   NOTE: *Dispose of drained fluids according to local regulations.*



FG001554

Figure 67

3. Remove bowl using supplied tool.
4. Remove cartridge.



FG001561

Figure 68

2,000 HOUR / YEARLY SERVICE

Perform All Daily, 50, 250, 500 and 1,000 Hour Service Checks

Change Swing Reduction Device Oil

NOTE: *Change swing reduction device oil after first 250 hours of operation or rebuild and every 2,000 hours thereafter.*

WARNING

The gear oil is very hot after the machine has been operating. Shut all systems down and allow them to cool.

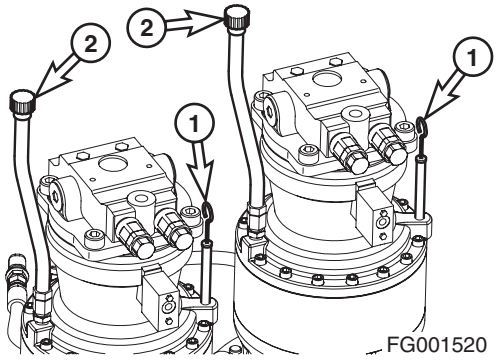


Figure 86

1. Set a container under excavator.
2. Remove cap (3, Figure 87) and install hose (4) to drain the swing reduction device oil.

   NOTE: *Dispose of drained fluids according to local regulations.*
3. After draining oil, remove hose and install cap.

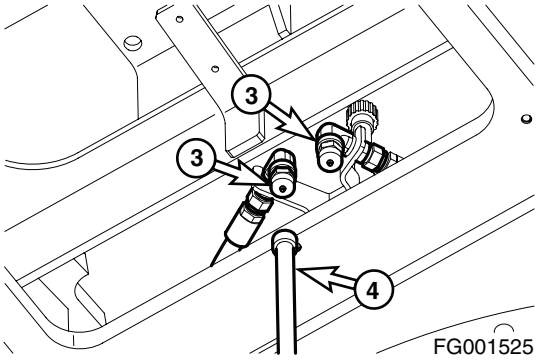


Figure 87

4. Remove breather/fill cap (2, Figure 86) and add oil to "H" mark on dipstick (1).

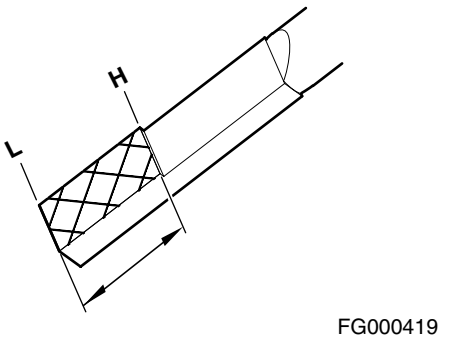


Figure 88

BOLT AND NUT INSPECTION

Inspect ALL fasteners after the first 50 hours of operation and every 250 hours thereafter. If any are loose or are missing tighten them or install new hardware. Always use a calibrated torque wrench.

IMPORTANT

Always clean fasteners before tightening.

If counterweight is loose, contact a *DOOSAN* distributor or sales agent.

NO.	POINT TO BE INSPECTED		BOLT DIA. MM	QTY.	BOLT HEAD SIZE	TORQUE		
						kg•m	Nm	ft lb
1	Joint bolt with engine mounting bracket and engine	pump side	16	8	24	21	205	152
		fan side	12/14	4/4	19/22	10.5/17	103/167	76/123
2	Joint bolt and nut between engine mounting bracket and frame	pump side	20	2	30	46	451	333
		fan side	20	2	30	46	451	333
3	Radiator mounting bolt		16	4	24	27	265	195
4	Tightening bolt for hydraulic oil tank		16	6	24	27	265	195
5	Tightening bolt for fuel tank		16	6	24	27	265	195
6	Tightening bolt for pump		12	4/8	19	11/9	108/88	80/65
7	Tightening bolt for control valve		20	4	30	55	539	398
8	Tightening bolt for swing reduction device		20	22	30	55	539	398
9	Tightening bolt for swing motor		12	32	10	14.4	141	104
10	Tightening bolt for battery		10	2	17	5	49	36
11	Joint bolt with cabin mounting rubber and frame		10	20	17	6.5	64	47
	Joint bolt with cabin mounting rubber and cabin		16	5	24	21	206	152
12	Joint bolt with swing bearing and upper frame		24	44	36	95	931	687
	Joint bolt with swing bearing and bottom frame		24	44	36	95	931	687
13	Tightening bolt for travel device		20	48	30	60	585	433
	Tightening bolt for sprocket		20	48	30	60	585	433
14	Tightening bolt for upper roller (Inner flange)		22	16	32	75	735	542
	Tightening bolt for upper roller (Outer flange)		16	8	24	27	265	195
15	Tightening bolt for bottom roller		22	72	32	75	735	542
16	Tightening bolt for track guard		22	24	32	75	735	542
17	Bolt for track shoes		22	424	32	105	1029	759

23. Attaching bolt for main frame and RCW support (Optional)

- Tool: 36 mm ( )
- Torque: 95 kg•m (931 Nm, 687 ft lb)

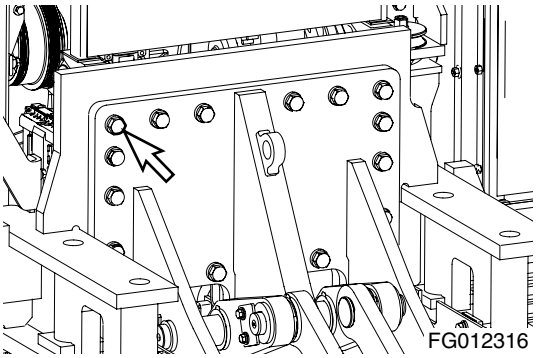


Figure 135

24. Attaching bolt for RCW cylinder pin (a) (Optional)

- Tool: 19 mm ( )
- Torque: 11 kg•m (108 Nm, 80 ft lb)

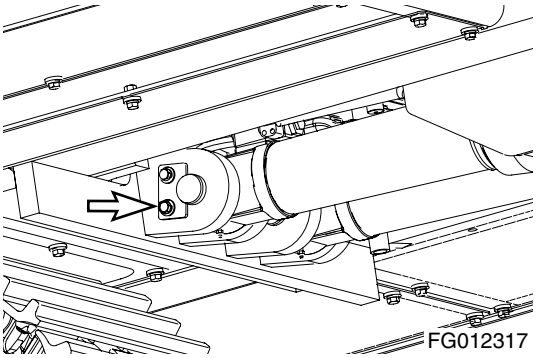


Figure 136

- Attaching bolt for RCW cylinder pin (b) (Optional)

- Tool: 19 mm ( )
- Torque: 11 kg•m (108 Nm, 80 ft lb)

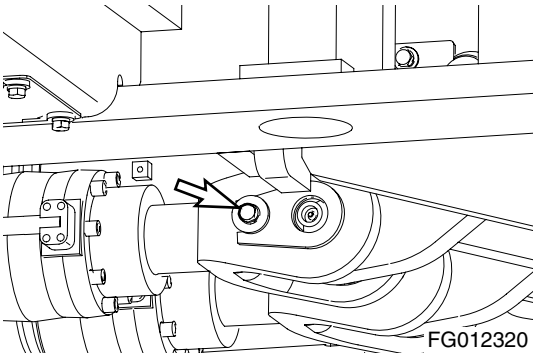


Figure 137

25. Attaching bolt for RCW link pin (a) (Optional)

- Tool: 19 mm ( )
- Torque: 11 kg•m (108 Nm, 80 ft lb)

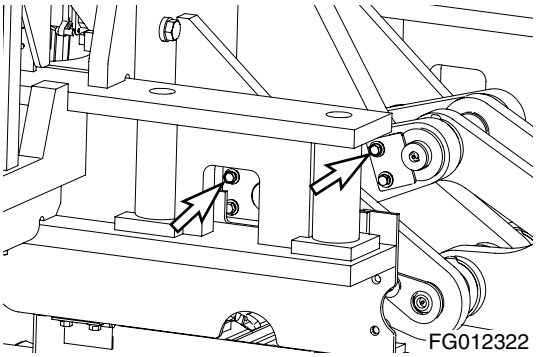


Figure 138

ENGINE COOLING SYSTEM

General

Keeping an engine's cooling system in peak operating condition can have many benefits in keeping a machine in good operating condition. A properly functioning cooling system will; improve fuel efficiency, reduce engine wear, and extend component life.

Always use distilled water in the radiator. Contaminants in tap water neutralize the corrosion inhibitor components. If tap water must be used, it should not exceed 300 ppm hardness, or contain more than 100 ppm of either chloride or sulfate. Water that has been treated with a water softener also contains salt that will cause corrosion of components. Water from creeks and stagnant pools usually contains dirt, minerals and/or organic material that are deposited in the cooling system and impair cooling efficiency. Distilled water is the best.

Make at least a minimum mixture of 40% antifreeze with 60% distilled water for adding additional fluid to the system during normal maintenance. This level will help maintain the additive concentration of the system. Check the coolant every 500 hours.

Engine overheating is often caused by bent or clogged radiator fins. The spaces between the fins can be cleaned by use of air or water under pressure. When straightening bent fins, use care not to damage the tubes or break the bond between the fins and the tubes.

CAUTION

Maintaining the proper anticorrosive additive levels in antifreeze will help protect the engine and other components from becoming corroded.

If anticorrosive additive levels are not properly maintained and monitored, server damage to the cooling pump and cylinder liners may result. This corrosion can also result in the radiator tubes becoming clogged and loosing their heat transfer efficiency. The engine (Model: DV11) uses a wet-type cylinder liner design, which requires, a high efficiency cooling system flow, to maintain proper engine temperatures.

The coolant and its additives can be checked by using coolant test paper (No: 60.99901-0038).

VENTING AND PRIMING HYDRAULIC SYSTEM

Main System Pump

NOTE: *If pump is run without sufficient oil in the main hydraulic pump, damage can occur. Always vent pump of air after draining hydraulic system.*

1. Shut down engine.
2. Remove flushing hose (1) from the adapter (2).
3. Remove adapter (2) and O-ring from the pump housing.
4. Fill pump housing with hydraulic oil.
5. Install new O-ring onto adapter (2) and assemble adapter on pump housing.
6. Connect flushing hose (1) to adapter (2).
7. Start engine, and run at "LOW IDLE." Raise boom to its maximum height.
8. Very slowly loosen negative control hose connector (3) until hydraulic oil start to leak from connection.
9. When hydraulic oil begins to leak, tighten hose connector.
10. Shut down engine, turn starter switch "ON," and slowly lower the boom until the bucket pin touches the ground. (This will increase the air pressure in the hydraulic tank)
11. Slowly loosen air bleeding plug (4) until hydraulic oil leaks out.
12. When hydraulic oil begins to leak, then tighten plug (4).

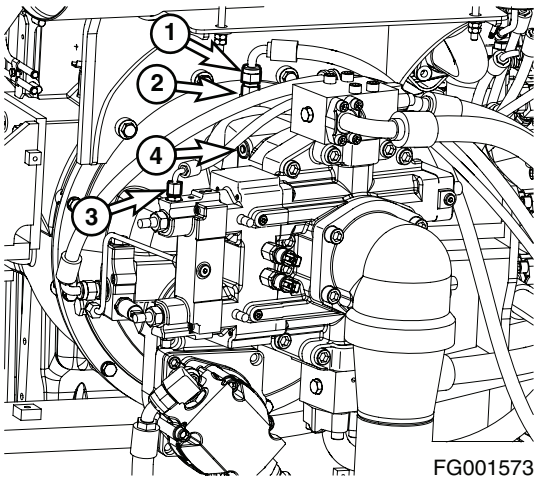


Figure 158

Hydraulic Cylinders

IMPORTANT

If cylinders are operated in high idle after the hydraulic system has been drained or the cylinder has been rebuilt, damage to piston packing and seals may occur. Always vent air from cylinders at low idle and at a slow speed.

1. Run engine at low idle. Extend and retract each cylinder to within 100 mm (4 in) of fully stroking it 4 - 5 times.
2. Operate fully extend and retract each cylinder 3- 4 times.
3. Repeat procedure until cylinders extend and retract smoothly.

17. The counterweight cannot be placed directly on ground. Set counterweight on adequately sized and structurally sound pallet or trailer. (See “Position a trailer or support pallet behind machine.” on page 5-5.)

    NOTE: *Proper support pallet height: minimum 450 mm. (17.7 in)*

18. Lower counterweight to pallet or trailer.

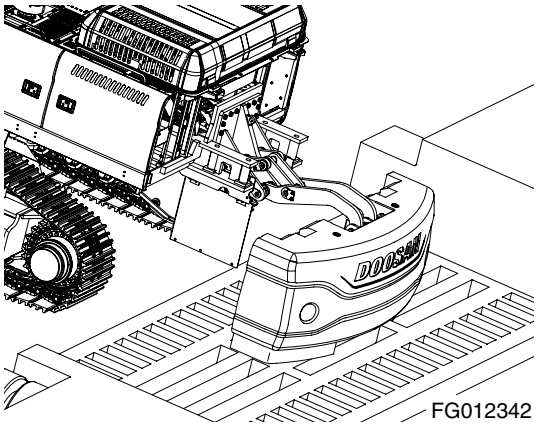


Figure 15

19. Without operating solenoid valve switch, push or pull removal control valve lever and then look for position where lifting arms (5, Figure 17) are loose on counterweight.

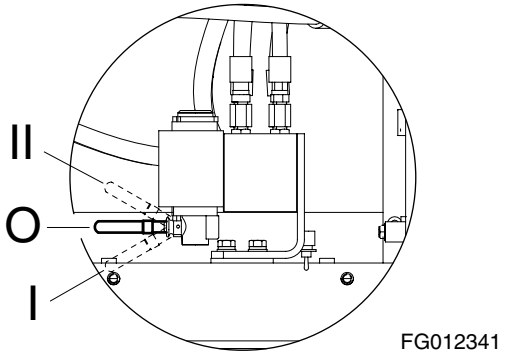


Figure 16

20. Remove hair pin (1, Figure 17) pins (2), from lifting arm (3) connected to counterweight.

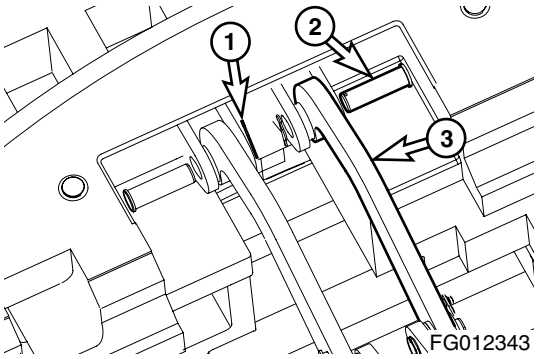


Figure 17

21. Move removal control valve lever to "II" (UPWARD) position, to raise lift arms above counterweight.
22. Install pins (2, Figure 17), hair pins (1) on lifting arms (3).

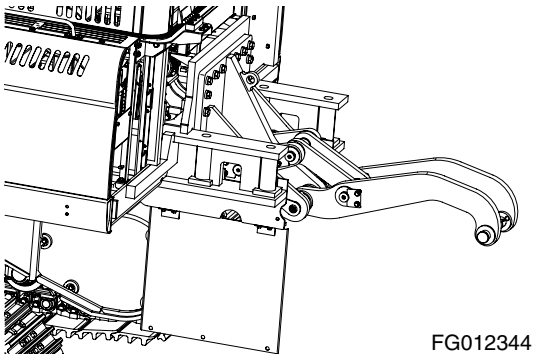


Figure 18

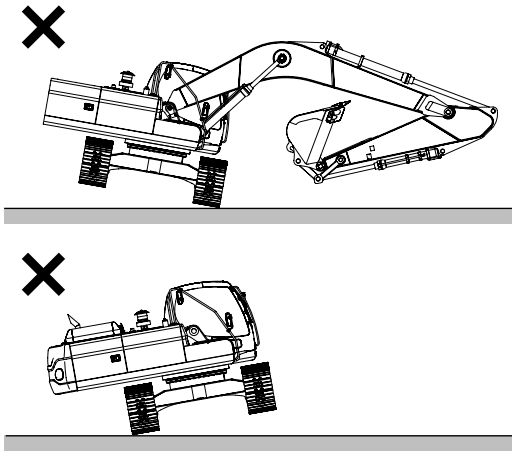
Warning for Counterweight and Front Attachment Removal

DANGER

DOOSAN **warns any user, that removal of counterweight from machine, front attachment or any other part, may affect stability of machine. This could cause unexpected movement, resulting in death or serious injuries.** ***DOOSAN*** **is not liable for any misuse.**

Never remove counterweight or front attachment unless upper structure is in-line with lower structure.

Never rotate upper structure once counterweight or front attachment has been removed.



FG000371

Figure 42

WARNING

When transporting machine, know width, height, length and weight.

Loading or unloading machine can be a dangerous operation. Make sure to run engine at lowest speed setting, and travel at slowest speed possible.

Make sure that ramp being used can handle weight of machine. If required, add blocking under ramp for additional support.

Make sure that ramp surface is free of grease or mud that could cause machine to slip or slide.

Make sure that trailer is parked on firm, level ground before attempting to load/unload excavator.

If it is required to turn machine while it is on trailer, make sure to do this at slowest engine and travel speeds possible.

Make sure to secure excavator onto trailer as required by local transportation laws.

Specification

DX480LC

Standard Specification

COMPONENT			SPECIFICATION	
			METRIC	ENGLISH
Bucket capacity	CECE		1.9 m^3	2.47 yd^3
	PCSA		2.15 m^3	2.81 yd^3
Equipment weight			47.5 metric tons	52.3 tons
Engine	Model		DV11	
	Type		Water cooled - 6 cylinders	
	Rated output		333 ps @1,800 rpm	328 hp @1,800 rpm
	Maximum torque		157 kg•m @ 1,300 rpm	1,136 ft lb @ 1,300 rpm
	Fuel tank capacity		620 liters	164 U.S. gal.
Hydraulic pump	Type		Axial piston	
	Discharging pressure		350 kg•cm^2	5,000 psi
	Maximum discharge quantity		2 x 355 lpm	2 x 93.7 U.S. gpm
	Hydraulic oil capacity	Tank Level	265 liters	70 U.S. gal.
		System	500 liters	132 U.S. gal.
Performance	Digging capability	Bucket	27.6 metric tons	30.4 tons
		Arm	22.0 metric tons	24.2 tons
	Swing speed		8.8 rpm	
	Travel speed	High-speed	5.0 km/h	3.11 MPH
		Low speed	3.1 km/h	1.92 MPH
	Traction force	High-speed	17.8 metric tons	19.6 tons
		Low speed	33.6 metric tons	37 tons
	Gradeability		35° (70% slope)	
	Ground pressure		0.81 kg•cm^2	11.8 psi
Ground clearance			770 mm	30.3 in
Track shoe width			600 mm	23.6 in
Upper roller qty.			3 per side	
Bottom roller qty.			9 per side	

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