DX340LCA

Shop Manual

950106-00268E

Serial Number 5001 and Up

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This documentation may include attachments and optional equipment that is 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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SAFETY PRECAUTIONS

CAUTION

Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section.

Always use tools and equipment that are in good working order.

Use lifting and hoisting equipment capable of safely handling load.

Remember, that ultimately safety is your own personal responsibility.

APPLICABLE MODELS

The contents of this section apply to the following models and serial number ranges.

MODEL	SERIAL NUMBER RANGE
DX300LCA	5001 and Up
DX340LCA	5001 and Up

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Dim.	Boom Type	6.2 m (20' 4")	6.5 m (21' 4")	
	Arm Type	**2.6 m (8' 6")**	**2.6 m (8' 6")**	**3.2 m (10' 6")**
	Bucket Type (PCSA)	**1.83 m^3 (2.39 yd^3)**	**1.83 m^3 (2.39 yd^3)**	**1.48 m^3 (1.94 yd^3)**
A	Max. Digging Reach	10,200 mm (33' 5")	10,585 mm (34' 9")	11,170 mm (36' 8")
B	Max. Digging Reach (Ground)	9,990 mm (32' 9")	10,380 mm (34' 0")	10,975 mm (36' 0")
C	Max. Digging Depth	6,635 mm (21' 9")	6,930 mm (22' 9")	7,535 mm (24' 9")
D	Max. Loading Height	6,695 mm (21' 12")	6,880 mm (22' 7")	7,195 mm (23' 7")
F	Max. Digging Height	9,510 mm (31' 2")	9,995 mm (32' 9")	10,345 mm (33' 11")
G	Max. Bucket Pin Height	8,315 mm (27' 3")	8,585 mm (28' 2")	8,900 mm (29' 2")
H	Max. Vertical Wall	2,185 mm (7' 2")	5,120 mm (16' 9")	5,915 mm (19' 4")
I	Max. Radius Vertical	9,265 mm (30' 5")	7,710 mm (25' 3")	7,715 mm (25' 3")
J	Max. Depth to 8 ft Line	6,400 mm (20' 12")	6,705 mm (21' 12")	7,350 mm (24' 1")
K	Min. Radius 8 ft Line	3,085 mm (10' 1")	3,310 mm (10' 10")	3,355 mm (11' 0")
L	Min. Digging Reach	1,950 mm (6' 5")	2,180 mm (7' 1")	723 mm (2' 4")
M	Min. Swing Radius	4,275 mm (14' 0")	4,440 mm (14' 7")	4,415 mm (14' 6")

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REMOVAL

CAUTION

Avoid disassembling cabin if there are strong wind gusts, which could catch large surface area of cabin shell and push it sideways during lift.

1. Park on firm and level ground.
2. Lower front attachment (bucket) to ground.
3. Shut down engine.
4. Set safety lever on "RELEASED" position.
5. Turn starter switch to "I" (ON) position.

WARNING

If engine must be run while performing maintenance, use extreme care. Always have one person in the cabin at all times. Never leave the cabin with the engine running.

6. Fully stroke work levers (joysticks) in all directions to relieve pressure from accumulators.
7. Set safety lever on "LOCK" position.
8. Turn key to "O" (OFF) position and remove from starter switch.
9. Hang maintenance warning tag on controls.
10. Disconnect the battery cable from the negative (-) battery terminal.
11. Prepare cabin shell for removal by disconnecting wiring connectors for:
    A. Cabin interior lighting.
    B. External light wiring.
    C. Radio antenna and connections.
    D. Wiper/washer connections.

NOTE: *Control console wiring harnesses and hydraulic piping lines that pass through the floor of the cabin do not need to be disassembled.*

NOTE: *If unit is equipped with a cabin protective structure (for forestry, or hazardous working conditions), it must be removed.*

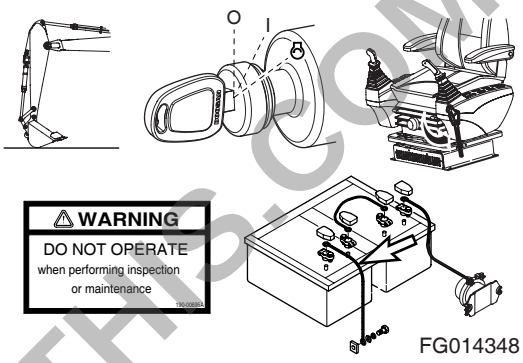


Figure 1

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HYDRAULIC SYSTEM - GENERAL NOTES

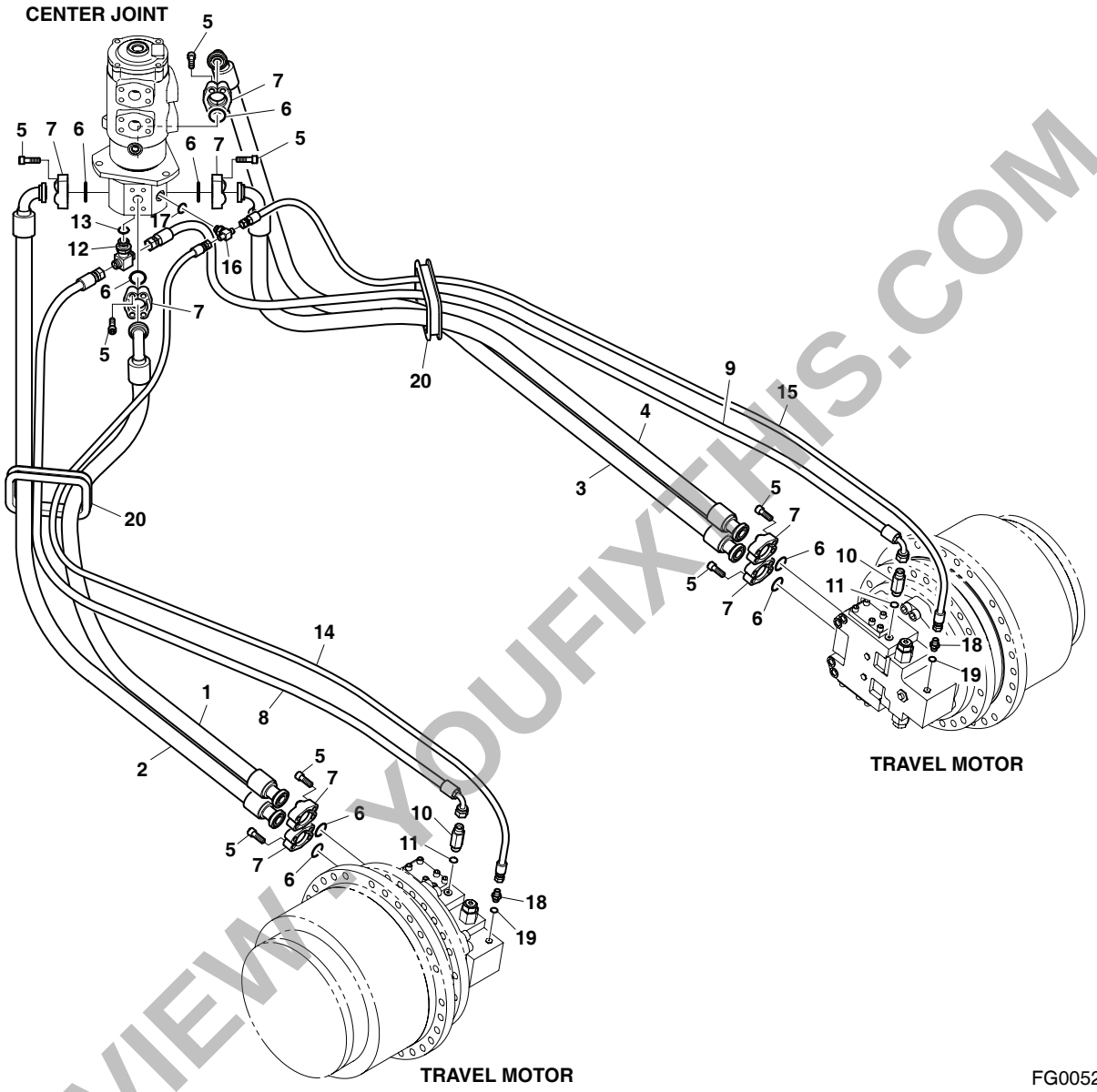


Figure 1

The hydraulic system has several improvements over conventional hydraulic systems - including cross-sensing total horsepower control - to maximize output efficiency.

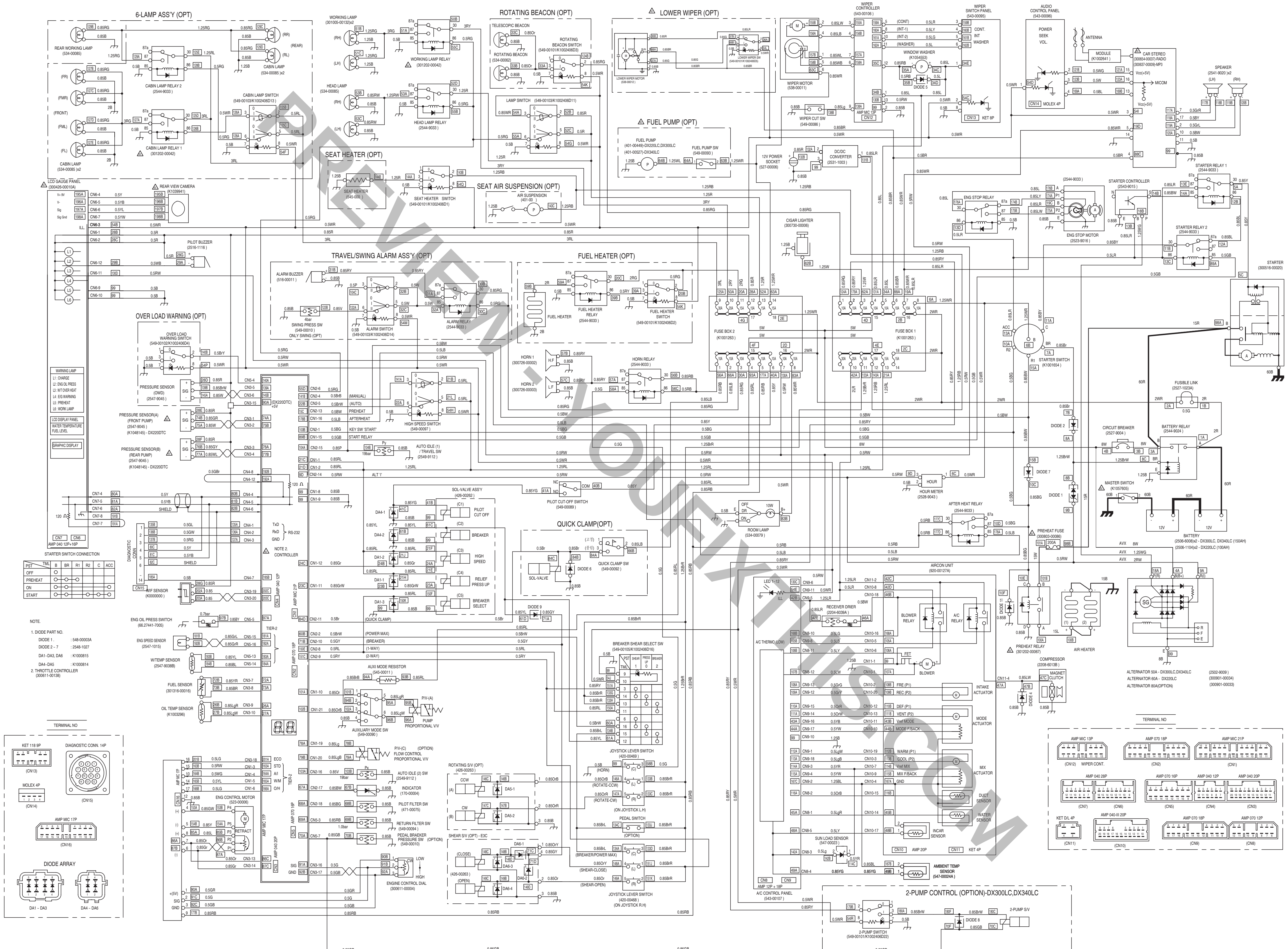
The system features an electronically controlled output optimization system, which allows the operator to choose between two, distinctly different power modes: high-output/rapid cycling maximum speed power mode, and a standard power mode for most types of general operation.

Electronic management of hydraulic control valves assists in optimizing the application speed and overall operator control of hydraulic actuators and functions.

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DX300LCA / DX340LCA



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FG021906

Figure 1

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Precautions When Towing

If any mistake is made in the method of selecting or inspecting the towing wire or in the method of towing, it may lead to serious personal injury. Always do the following:

- Always use the method of towing given in this Operation and Maintenance Manual. Do not use any other method.
- Use leather gloves when handling the wire rope.
- When carrying out the preparation work for towing with two or more workers, determine the signals to use and follow these signals correctly.
- Always fit the towing rope to the left and right hooks and secure in position.
- If the engine on the problem machine will not start or there is a failure in the brake system. always contact your *DOOSAN* distributor.
- Never go between the towing machine and the towed machine during the towing operation.
- It is dangerous to carry out towing on slopes, so select a place where the slope is gradual. If there is no place where the slope is gradual, carry out operations to reduce the angle of the slope before starting the towing operation.
- When towing a problem machine, always use a wire rope with a sufficient towing capacity.
- Do not use a frayed, kinked rope or a rope with any loss of diameter.
- Do not use the lightweight towing hook for towing another machine.

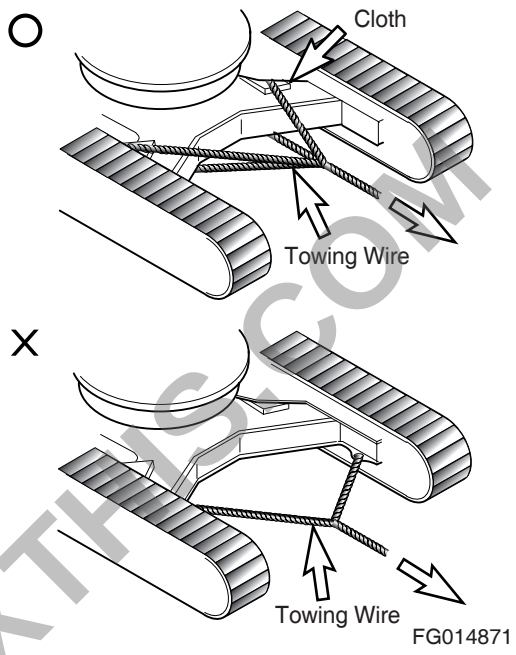


Figure 44

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After inspection lightly coat the bearing and related parts with oil and wrap in a clean lintless cloth or paper and protect them from moisture and other foreign materials until installation.

It is also important to inspect the bearing housing and/or shaft for grooved, galled or burred conditions that indicate that the bearing has been turning in its housing or on its shaft.

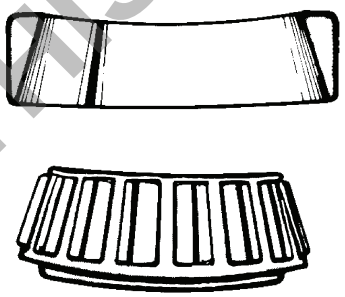
If available, use magna-flux or similar process for checking for cracks that are not visible to the naked eye.

The following illustrations will aid in identifying and diagnosing some of the bearing related problems.

NOTE: *The illustrations will only show tapered roller bearings, but the principles of identifying, diagnosing and remedying the defects are common to all styles and types of bearings.*

Normal Bearing

Smooth even surfaces with no discoloration or marks.

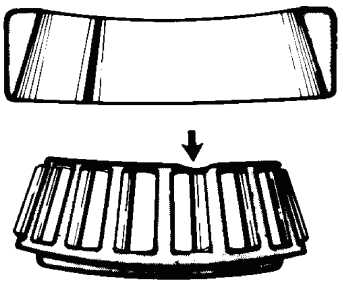


HASA620S

Figure 2

Bent Cage

Cage damage due to improper handling or tool usage.



HASA460S

Figure 3

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INSTALLATION

1. Using suitable lifting device capable of handling a heavy load, raise counterweight (1, Figure 5) into position just above support frame (4) leaving counterweight suspended. Verify that counterweight is level and even.

   NOTE: *Leave counterweight (1, Figure 5) suspended 3 mm (0.125") above support frame (4) until all four mounting bolts (2) are started in counterweight mounting holes.*

2. Slide washers (3, Figure 5) onto bolts (2). Apply Loctite #242 to mounting bolt threads.

3. Install four bolts (2, Figure 5) with washers (3) into counterweight until washers contact support frame. Fully lower counterweight onto support frame and finish tightening bolts.

   NOTE: *Torque bolts (2, Figure 5) to values shown in following table.*

Model	Bolt Torque
DX340LC	250 kg•m (1,807 ft lb)
DX340LCA	
DX350LC	

4. Remove lifting device and lifting eyes from counterweight lifting holes (5, Figure 5).

5. Install engine compartment cover.

6. Connect negative (-) battery cable to battery.

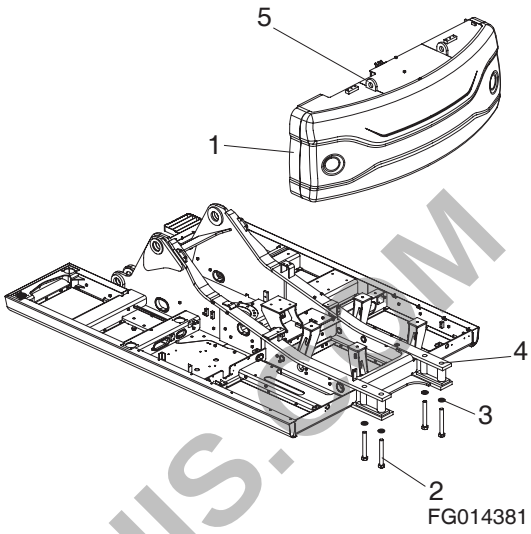


Figure 5

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REMOVAL

1. Park on firm and level ground.
2. Lower front attachment (bucket) to ground.
3. Shut down engine.
4. Set safety lever on "RELEASED" position.
5. Turn starter switch to "I" (ON) position.

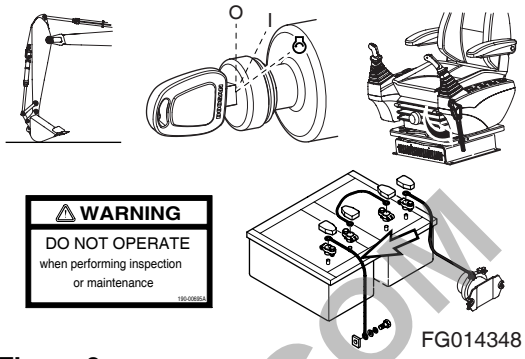
⚠ WARNING

If engine must be running while performing maintenance, always use extreme caution. Always have one person in cab at all times. Never leave cab with engine running.

6. Fully stroke work levers (joysticks) in all directions to relieve any pressure from accumulators.
7. Set safety lever on "LOCK" position.
8. Turn key to "O" (OFF) position and remove from starter switch.
9. Hang a maintenance warning tag on controls.
10. Disconnect negative (-) battery cable leading to frame from battery.
11. Tag and disconnect hoses from swing motor (1, Figure 3). Plug and cap hoses and ports to prevent contamination from entering hydraulic system or component.
12. Disconnect tube (2) from drain cock (3) and hose fitting (7) from fill hole.
13. Remove twelve bolts and washers (4, Figure 3) holding swing reduction gearbox (5) to frame.
14. Using a suitable lifting device, sling swing motor (1, Figure 3) and remove swing motor and reduction gearbox (5) as an assembly from unit.

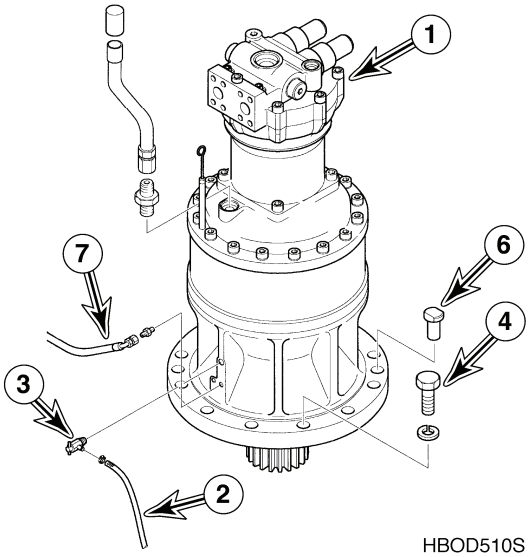
NOTE: *A drain cock (3*, Figure 3*) and tube are on side of gearbox. Be careful not to damage valve or tube.*

NOTE: *There are two alignment pins (6*, Figure 3*), one on each side of reduction gearbox flange.*



FG014348

Figure 2



HBOD510S

Figure 3

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REASSEMBLY

CAUTION

Apply active oil to every functional (moving) part before assembly to reduce any assembly friction as much as possible.

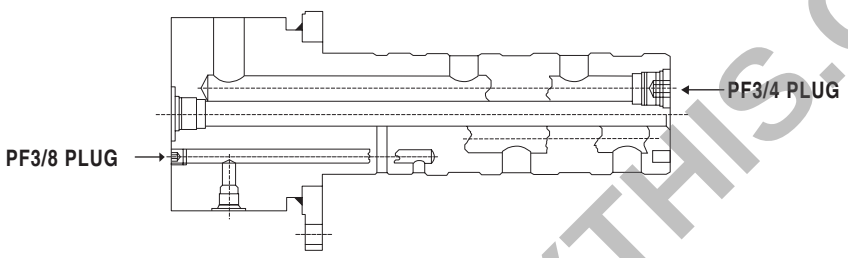


Figure 7

1. Wrap the Teflon tape around the PT3/8 about 6 times.
2. Assemble the PT and PF plugs into the washed shaft.

Internal sealing PF3/4: 12 mm wrench	External sealing PT3/8: 8 mm wrench
Engagement torque: 15±1.09 Kg m	Engagement torque: 4.5 ~ 9.5 kg m

3. Assemble the sliper seal, the wear ring, and the O-ring into the body.
4. Assemble the 1AP - 120 O-ring the outside of the body.

CAUTION

After assembling the sliper seal, a manual test should be performed to ensure that every part is assembled for its position properly.

CAUTION

For any sliper seal which is protruded, press it with finger to seat it in its position. Care should be taken when using a driver or a metal tool, which may cause damage to it.

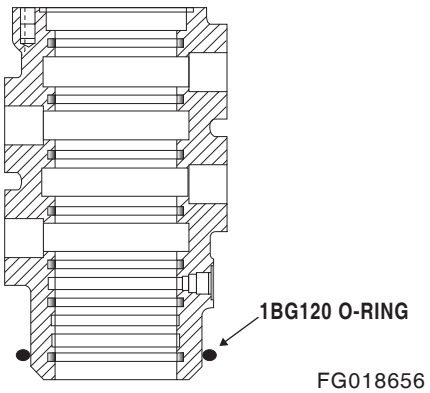


Figure 8

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TROUBLESHOOTING, TESTING AND ADJUSTMENT

General Precautions

1. Observe any abnormalities and any possible causes that have noting to do with the motor before starting work.
2. Make sure that no foreign substance is involved when disassembling the machine, which is the most frequent cause of its wear.
3. Treat carefully and pay attention to avoid any damage against it that is machined precisely.

How to Check Faults of Hydraulic Motor

1. Remove the drain plug and check oil in the case. Too much chips and metal dust in oil causes the possible wear of parts in the motor.
2. Abnormal noise. Check any abnormal noise from the main body of the motor.
3. Pressure measurement at each part. Check any possible faults by measuring circuit pressure up to the hydraulic motor before disassembling the motor.

Troubleshooting

Problem	Possible Cause	Remedy
Abnormal operation of driving devices.		
Motor pressure does not increase.	Oil bypassing in relief valve (30)	Replace or repair relief valve.
	Check spring broken.	Replace check spring.
	Oil channel inside the rear cover cracked.	Replace rear cover
	Abnormal wear on check surface.	Replace check.
Pressure increases but hydraulic motor does not rotate.	Friction and/or separation plates stuck.	Replace friction and/or separation plates.
	Slideway stuck.	Replace stuck slideway.
Number of rotations is below specification.		
Insufficient rotation.	Lack of incoming oil.	Check hydraulic circuits up to motor.
	Too high oil temperature.	Low oil temperature.
	Too much leakage.	Replace or repair faulty parts.
Low-pressure.	Low set pressure in relief valve.	Adjust pressure.
Brake released but weak driving force.	Sticking or abnormal wear of slideways.	Replace or repair slideway.
Hard to control brake.		

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TROUBLESHOOTING, TESTING AND ADJUSTMENT

General Precautions

1. If a defect is identified, check to see if same problem has ever occurred before.
2. When taking corrective action, handle each part carefully. Use care not to cause possible damage or rust to/on sliding parts, gear surfaces, bearings, and pins.

Troubleshooting

Refer to following tables.

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GENERAL REPAIR GUIDELINES

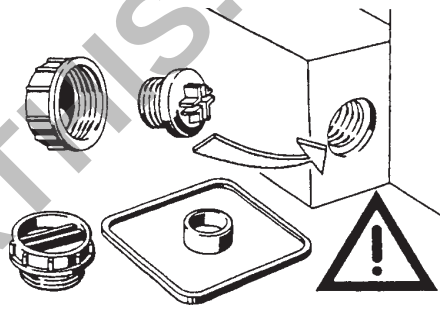
NOTE: *Observe the following cautions when carrying out repairs on hydraulic units.*



ASS1140L

Figure 3

1. Close off all openings of hydraulic unit.

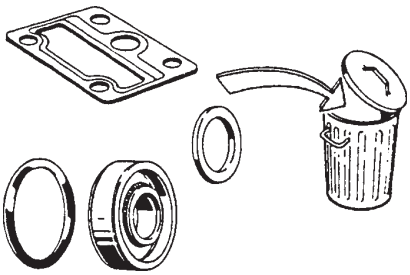


ASS0030L

Figure 4

2. Replace all seals.

   Use only original spare parts

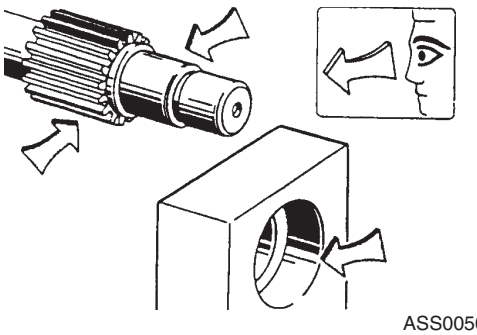


ASS0040L

Figure 5

3. Check all sealing and sliding surfaces for wear.

   NOTE: *Rework of sliding surfaces using crocus cloth or other similar materials, can damage the surface.*



ASS0050L

Figure 6

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ASSEMBLY GUIDELINES FOR TIGHTENING TORQUES

Bolts (To N 08.001)

Values stated are valid for bolts with metric ISO threads to DIN 13 part 13, as well as head areas to DIN 912 socked head cap screws, DIN 931 hexagon bolt or DIN 933 hexagon bolts with threads up to the head.



ASS1110L

Figure 112

Thread	Tensile Strength Class		
	8.8	10.9	12.9
	Tightening Torque M_A In Nm		
M 3	1.1	1.6	1.9
M 4	3.1	4.5	5.3
M 5	6.1	8.9	10.4
M 6	10.4	15.5	18
M 8	25	37	43
M 10	51	75	87
M 12	87	130	150
M 14	140	205	240
M 16	215	310	370
M 18	300	430	510
M 20	430	620	720
M 22	480	830	970
M 24	740	1060	1240

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Swing Compound Operation

The valve's swing Section (Section 3) is equipped with the control valve that adjusts the flux that flows into the swing when combined operating with the Section (travel, boom 2, arm 1) of P1.

If port (Pi) is pressurized when operating swing function, piston (S3-6) is pushed to have the poppet assembly (S3-2) to be pressed under the seat part of the valve housing through the piston (S3-5) and plug (S3-4). In this way, the oil in the parallel passage (L3) is flowing into the passage (S3-1) by pushing up the poppet (S3-3) inside the poppet assembly.

As a result, the passage at the time of compound operation is tightened more than when single operation that the flux flowing into A3 (B3) is reduced, and the surplus flux is advanced to the section that P1 is simultaneously operated through the parallel passage (L3).

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GENERAL DESCRIPTION

Theory of Operation

Structure

The remote control valve contains four push rods, spring holders, spools and return springs, which are in the valve casing. The valve works as a pressure reduction valve.

The housing has six ports, which include input port P, tank port T, and four secondary pressure ports.

The electric horn button is installed in the valve handle.

Gear pump pressure is used for operating control spools.

Function

1. Neutral Position

   When the lever is in neutral mode, the spool is pushed upward by return spring. The force of balancing spring, which determines the secondary discharge pressure, is not transmitted to the spool. The input port is closed and the pressure of the output port is the same as the pressure of the tank port T.

2. Control Switch

   Pressing of the push rod starts to press the balance spring, whose force is transferred to the spool to connect the P and T ports, transferring the pilot pressure. Output pressure acts on the bottom of the spool and press the spool upwards until it is balanced with the force of the balance spring.

   In short, the second pressure (output pressure) changes in proportion to the pressing force of the balance spring.

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ENGINE STARTING CIRCUIT

Start Operation

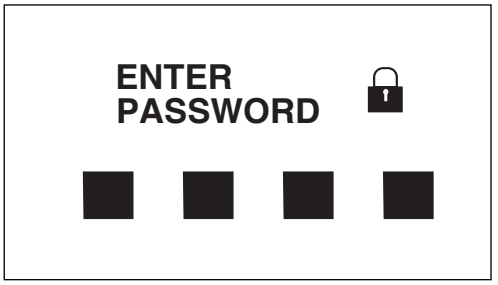
When the starter switch is turned to the "START" position, the "S" and "E" terminals of the starter controller (7) are connected. At this time the contacts in the starter relay (8) are closed by the current flow from the battery (1) →fusible link (3) →fuse box (6) → "B" terminal of starter switch (5) →"C" terminal of starter switch (5) →"30" terminal of starter relay (12) - "87a" terminal →"C" terminal of starter relay (8) - "D" terminal →"S" terminal of starter controller (7) - "E" terminal →ground.

When the contact point "B" and "PP" of starter relay (8) are connected, the pinion gear of the starter (9) is pushed forward and makes contact with the ring gear of the flywheel and the internal contacts of the starter are connected. The current flows from the battery (1) →"A" terminal of the battery relay (2) →"B" terminal of the battery relay (2, Figure 3) →"B" terminal of the starter (9). The starter motor is rotated and the engine is started.

If the instrument panel has the password function activated, input number should match the set number, otherwise the start circuit closes and the engine does not start.

NOTE: *If the security system is "LOCKED," a four-digit password will be required to start the engine. If the system is "UNLOCKED," no password will be required and this display screen will not appear.*

In the event the security system is locked, current flows from battery (1) →fusible link (3) →fuse box (6) →"B" terminal of starter switch (5) →"ACC" terminal of starter switch (5) →"86" terminal of starter relay (12) →"85" terminal of starter relay (12) →"CN1-15" terminal of e-EPOS (13) →ground. This current flow causes the coil in starter relay (12) to be activated, opening contacts at "87a" terminal. This prevents starter relay (8) from functioning.



FG013717

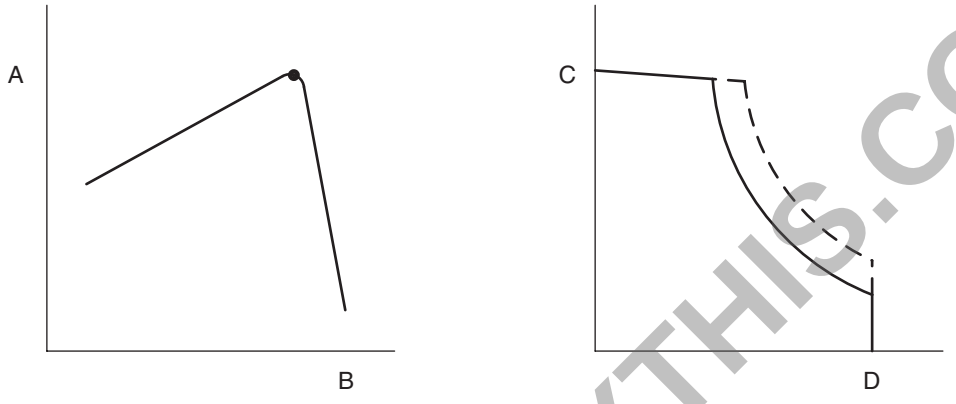
Figure 2

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2. Standard Mode

Standard Mode is used for general work. When this mode is selected it will reduce noise and fuel consumption in comparison with Power Mode. The epos controller compares the target engine speed with the actual engine speed and controls the signal to the E.P.P.R. valve which in turn varies the pump output quantity and it is the same method with power volume.



FG000581

Figure 53

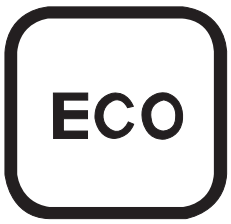
Reference Number	Description
A	Engine Horsepower (hp)
B	Engine Speed (rpm)

Reference Number	Description
C	Pump Discharge Volume (lpm)
D	Pump Discharge Pressure (kg/cm^2)

3. Economy Mode

Economy mode is used for light load work. When this mode is selected, it will reduce noise and fuel consumption in comparison with standard mode. The current to the E.P.P.R. valve is shut off and pump discharge volume is controlled by pump regulator.

The e-EPOS controller compares the target engine speed with the actual engine speed and controls the signal to the E.P.P.R. valve which in turn varies the pump output quantity and it is the same method with power volume.

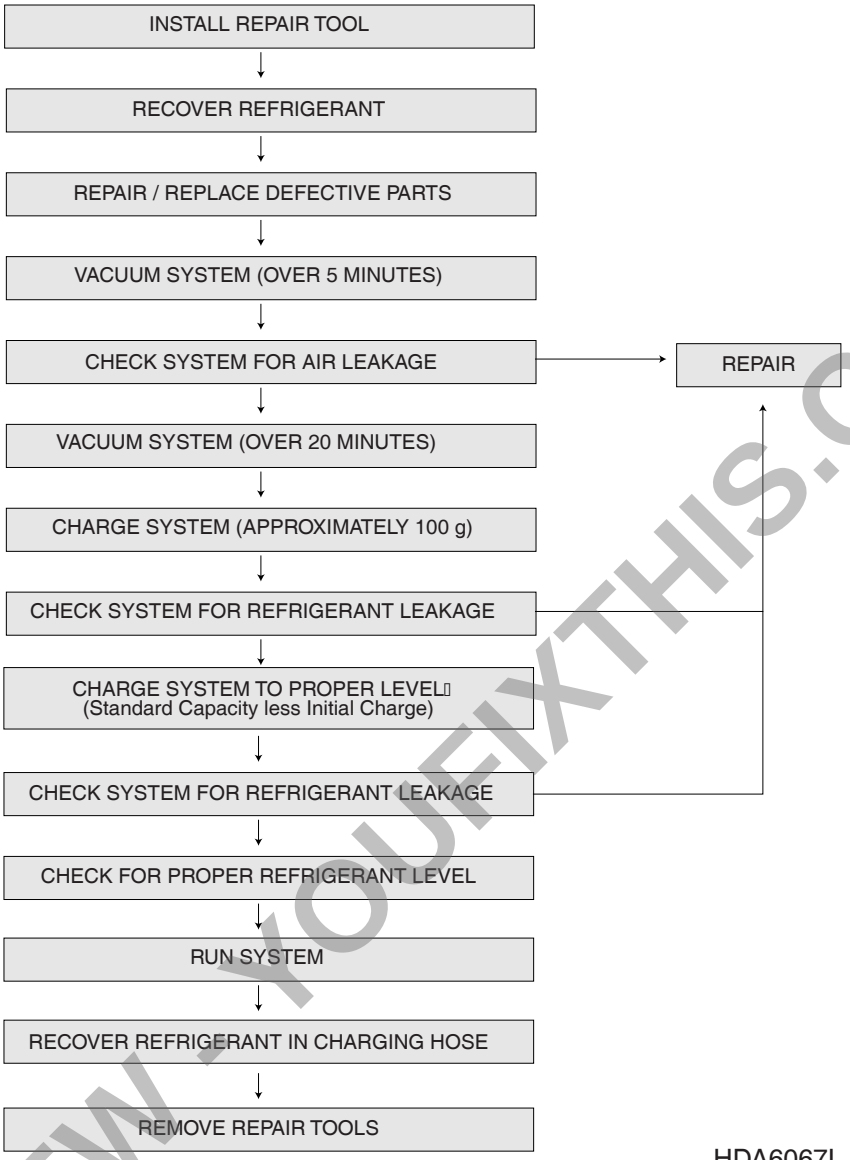


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Figure 54

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Figure 99

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