

Accumulator - Check (A.14.A.30 - F.40.A.11)

CX225SR

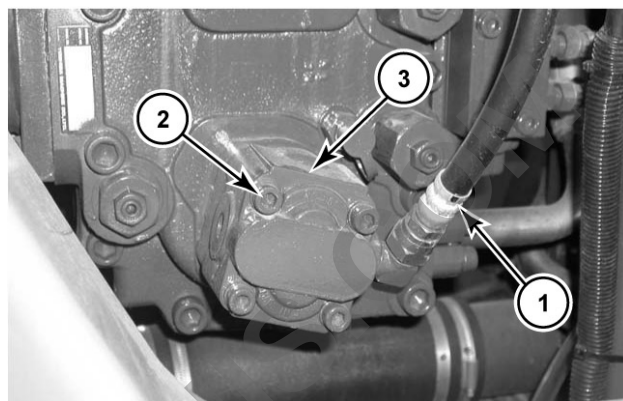
1. Start the engine.
Raise the boom completely and extend the dipper.
Shut down the engine.
2. Turn the starter switch key to the "ON" position
without starting the engine.
3. Operate the boom lowering or dipper retracting
control several times in succession.
4. The pressure in the accumulator should enable the
boom lowering or dipper retracting function to be
performed about six times.

Hydraulic pump - Remove (A.14.A.20 - F.10.A.10)

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Prior operation: PRIMARY HYDRAULIC POWER SYSTEM - Drain fluid (A.10.A - F.35.A.20)

1. Open the rear RH side door.
2. Mark, disconnect and plug hoses (1).
Remove screws (2) and remove hydraulic control pump (3).



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3. Remove bushing and coupling and discard the seal on the main pump.

Stack valve - Remove (A.10.A.18 - F.10.A.10)

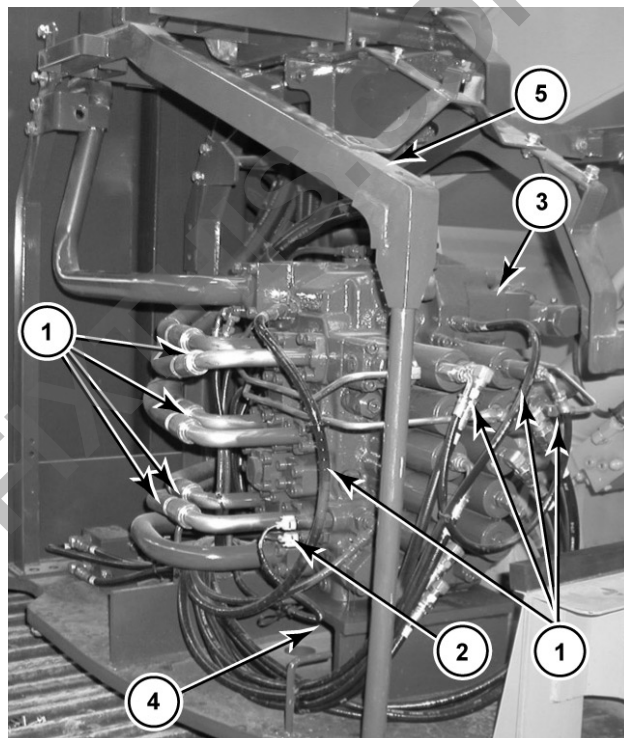
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Prior operation: To remove the side protection panels from the hydraulic control valve, refer to **Side shield - Remove (E.20.A.70 - F.10.A.10)**

Prior operation: To remove the valve bank hood, the front protection panels from the hydraulic control valve and the valve bank hood bracket, refer to **Upper shield - Remove (E.20.A.71 - F.10.A.10)**

Prior operation: PRIMARY HYDRAULIC POWER SYSTEM - Drain fluid (A.10.A - F.35.A.20)

1. Remove bracket fixtures (5), then remove the bracket.
2. Mark the position of the hoses (1) and electrical connectors (2) on control valve block (3).

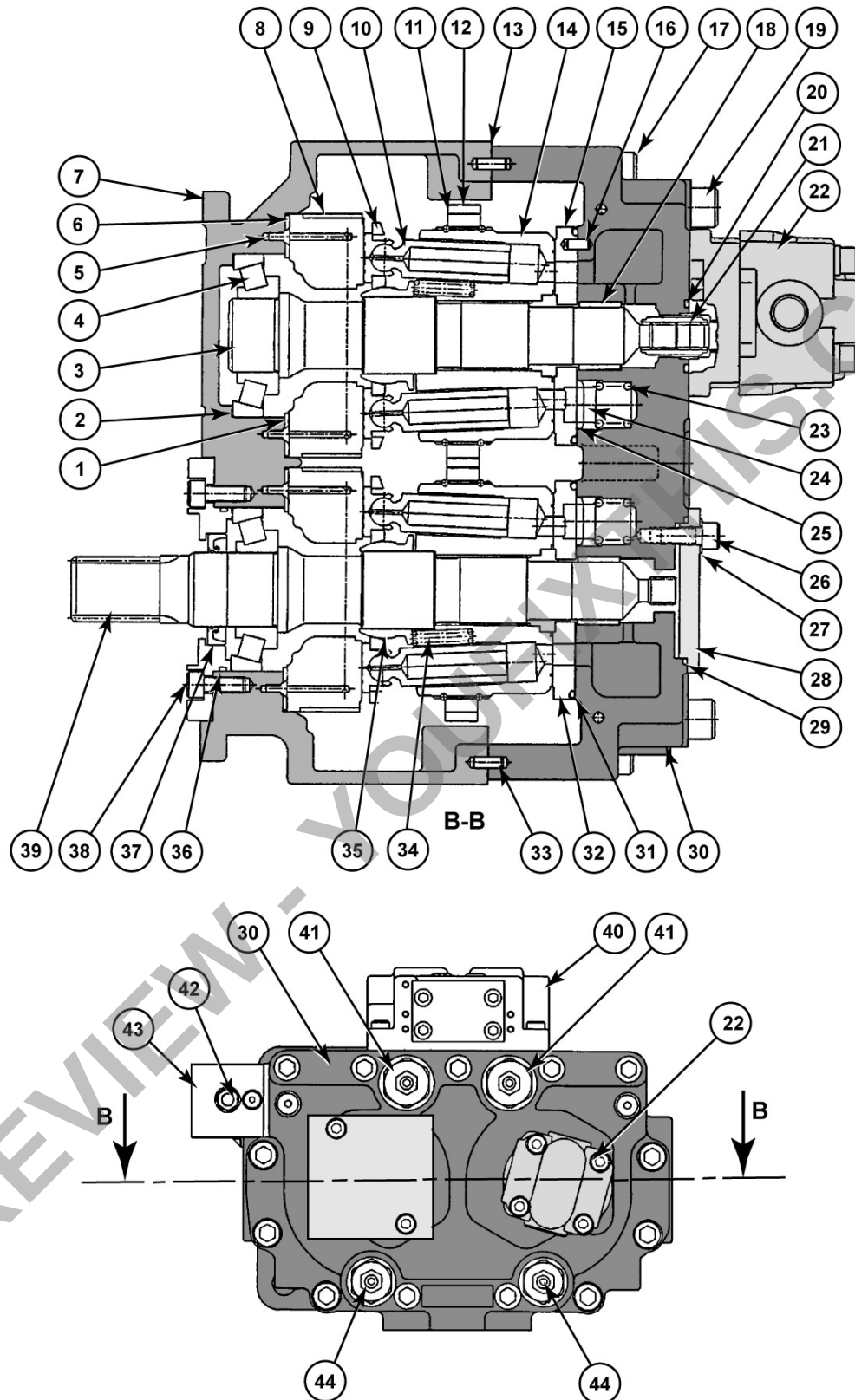


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3. Disconnect the electrical connectors (2) from the pressure switches.
4. Disconnect and plug hoses (1).
5. Plug the unions on control valve block (3).
6. Attach a suitable lifting device to the control valve block (3).
7. Remove screws and (4) control valve block (3).

Hydraulic pump - Sectional view (A.10.A.20 - C.10.A.30)

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- (1) Support
- (3) Take-off shaft
- (5) Screw
- (7) Body

- (2) Shim
- (4) Taper roller bearing
- (6) Support
- (8) Swash plate

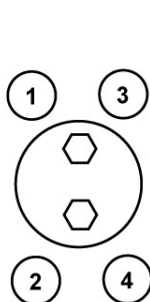
Torque (- A.90.A.10)

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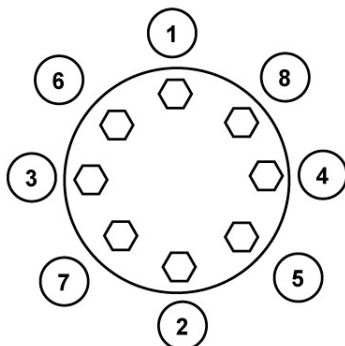
STANDARD TIGHTENING TORQUE

Order of tightening nuts and cap screws.

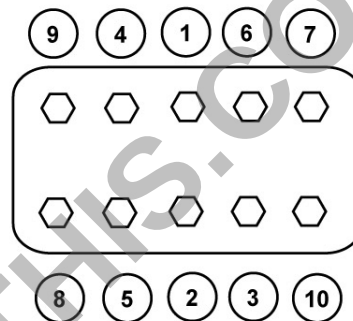
Tighten alternately so that torque remains uniform. Cap screws which are fitted with Loctite (look for traces of a white residue on the thread after removal), must be cleaned with a thin oil or a suitable solvent, then dried. Add two or three drops of Loctite to the cap screw thread, then fit the screw.



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The numbers in the diagrams represent the order of tightening.

Tightening torque

Where there are no special instructions, tighten cap nuts screws to the torques given in the table below.

Standard torque setting table.

Designation of cap screws (dimensions)		M6	M8	M10	M12	M14	M16	M18	M20
Cap screw	Spanner in mm	10	13	17	19	22	24	27	30
	Torque setting in Nm	6.9	19.6	39.2	58.8	98.1	157.2	196	274
Socket head screw	Wrench in mm	5	6	8	10	12	14	14	17
	Torque setting in Nm	8.8	21.6	42.1	78.4	117.6	176.4	245	343

PRIMARY HYDRAULIC POWER SYSTEM - Troubleshooting (A.10.A - G.40.A.10)

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NOTE: This table summarises the main symptoms relating to the hydraulic circuit in general.

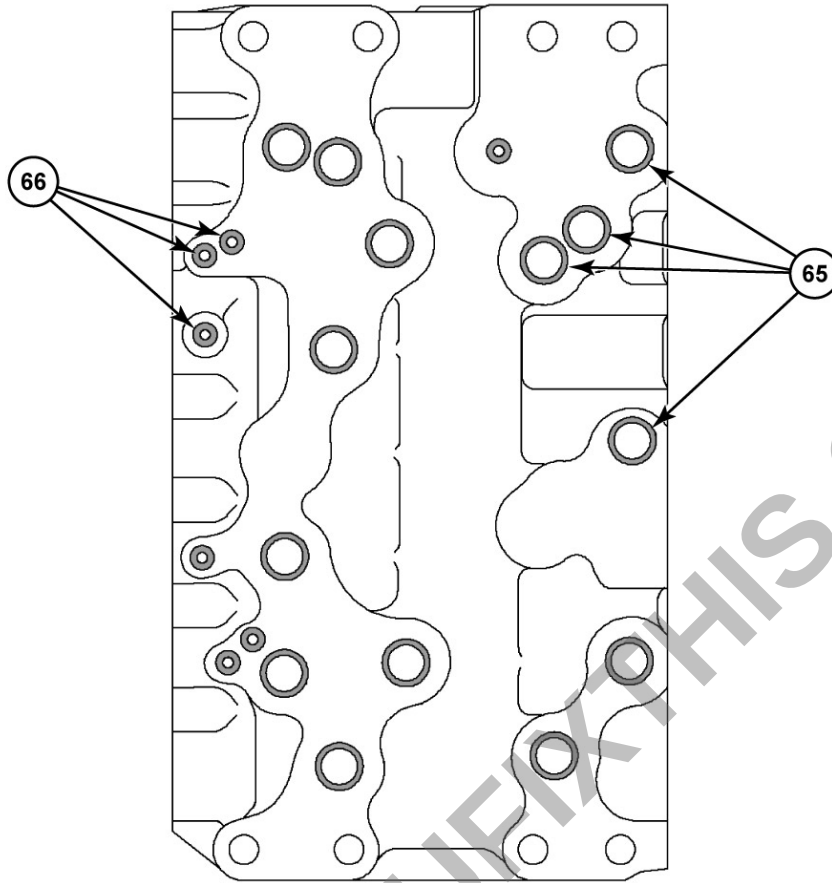
Problem	Possible Cause	Correction
The hydraulic system is not operating or is operating incorrectly.	Oil level in reservoir too low	Refill the tank
	Insufficient pilot pressure	Refer to HYDRAULIC COMMAND SYSTEM - Troubleshooting (A.14.A - G.40.A.10)
	Pump faulty	Check the pressures Test the pump
	Main relief valve faulty	Refer to Relief valve - Troubleshooting (A.10.A.16 - G.40.A.10)
	Cylinder faulty	Check for leaks, traces of flaking or scratches on the cylinder rods.
	Pump charge pressure too high	Check the pressure
	Valves or control valve cracked	Replace cracked components
	Spool stroke incomplete	Refer to Stack valve - Troubleshooting (A.10.A.18 - G.40.A.10)
	Filter clogged in the circuit	Clean and replace filters
	Blockage in the system	Locate and remove the cause of the blockage

Stack valve - Troubleshooting (A.10.A.18 - G.40.A.10)

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NOTE: This table summarises the main symptoms relating to the control valve block in general.

Problem	Possible Cause	Correction
The spool does not move	Abnormal rise in oil temperature (flow is encountering resistance in the lines)	Eliminate the cause of the flow resistance
	Contaminated hydraulic oil	Clean the circuit and replace the hydraulic oil
	Lines with over-tightened port unions	Loosen and retighten the unions to the required torque
	Control valve body deformed during installation	Loosen the fixing screws and inspect
	Excessive pressure	Check the inlet (pump side) and supply pressures
	Spool not straight	Replace the control valve assembly
	Return spring damaged	Replace the spring
	Spring or cap deformed	Loosen the cap fixing screws and retighten them to the required torque
	Uneven temperature distribution in the control valve	Warm up the oil by operating all the controls
	Control valve obstructed by oil pollution	Clean out the control valve and the hydraulic circuit
	Insufficient pilot pressure	Check the pilot circuit main relief valve
		Check the spool
Does not hold the load	Oil leak in the spool	Check the spool
	Leak in the main relief valve	Remove the valve and clean the seats of the valve and the control valve
	Leak in the load holding valve	Remove the valve and clean the seats, replacing them if necessary
	Leak in the cylinder	Check that the cylinder rings are not leaking



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Section M-M - Watertight seal between the two control valve blocks

(65) Seal

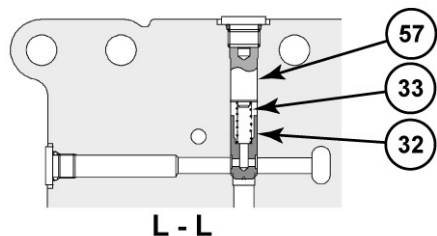
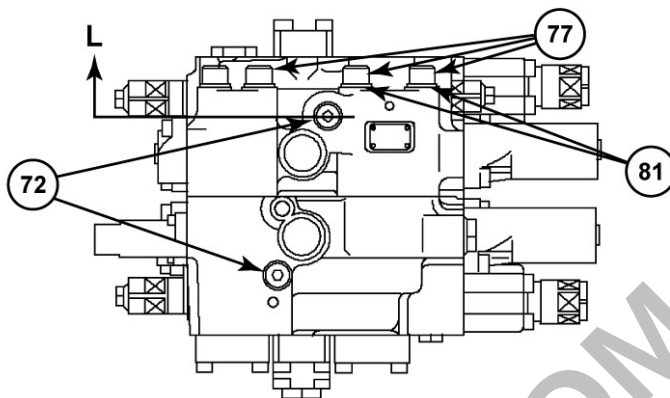
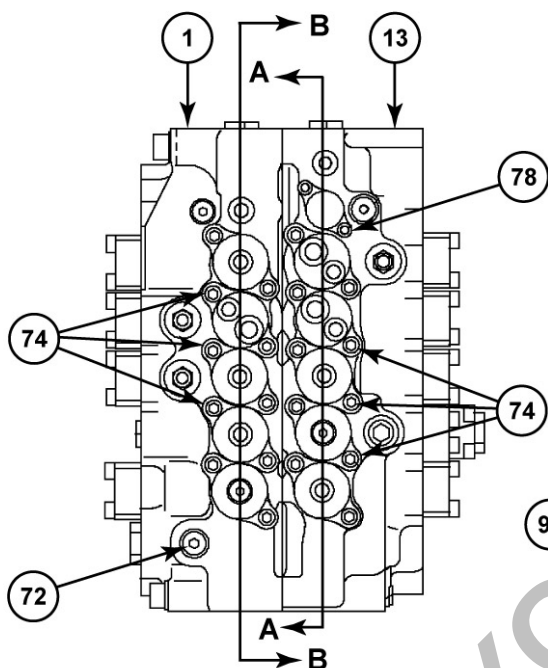
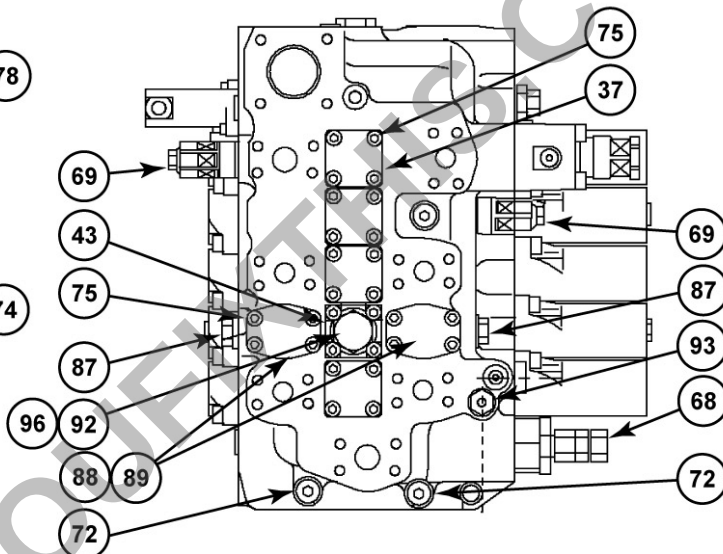
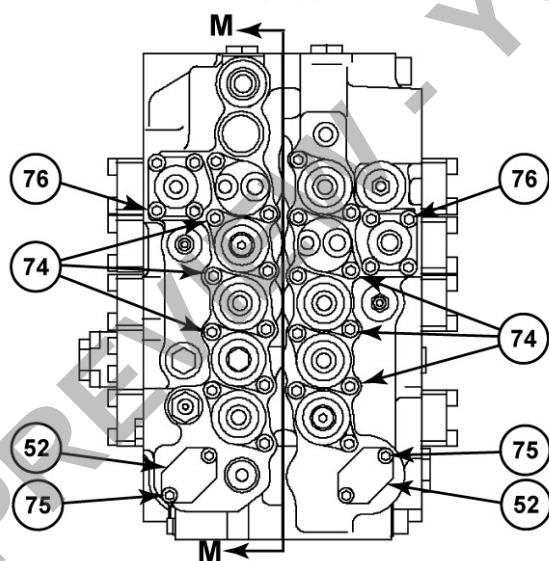
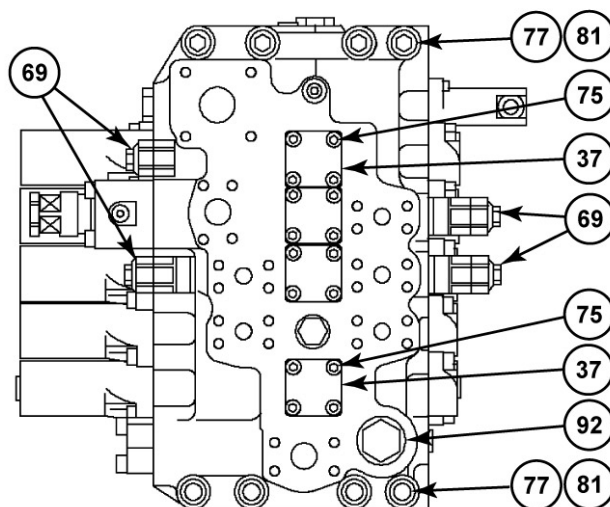
(66) Seal

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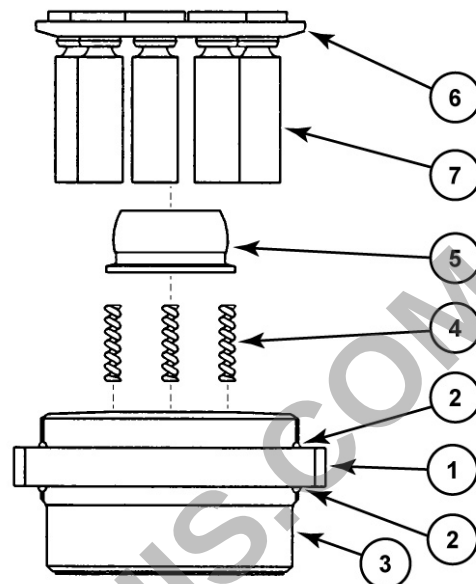
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Control valve block - description

Description of control valve block

(1)	Control valve block (P1)	(13)	Control valve block (P2)
(32)	Valve	(33)	Spring
(37)	Flange	(43)	Flange
(52)	Flange	(57)	Spacer
(68)	Main safety valve	(69)	Secondary relief valve

4. Install on cylinder barrel (3) pinion (1) using snap rings (2).
Install springs (4) and spherical bushing (5).
Install in barrel (2) retaining plate (6) fitted with pistons (7) following the marks made during removal.

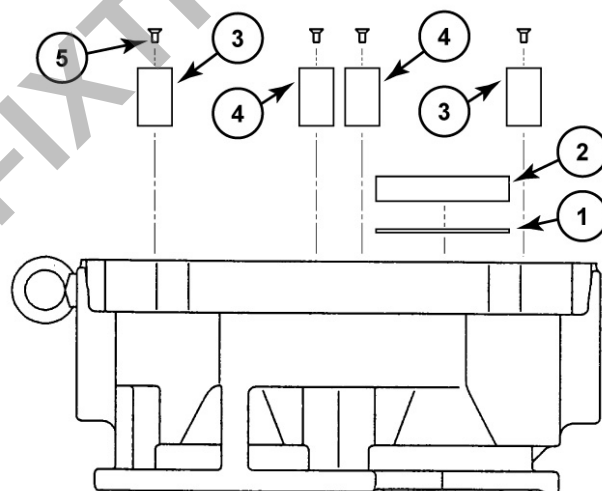


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5. Install shims (1), outer ring (2) of the taper roller bearing.
Install brackets (3) and (4) following the marks made during removal.
Tighten screws (5) by hand.
Coat the brackets with clean hydraulic oil. Mount the swash plate temporarily on the brackets to position them correctly.
Remove the swash plate.

Tighten screws (5) to a torque of **5.9 Nm**.

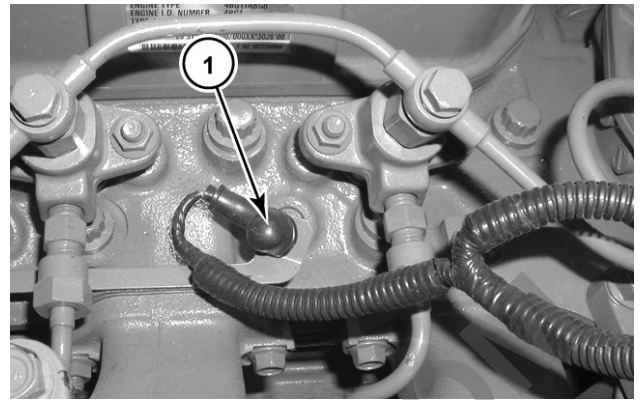
NOTE: If an inspection reveals that one of the following parts needs replacing - the shaft, the cylinder barrel, the valve plate, the taper roller bearing or housing - it will be necessary to add or remove shims according to the following procedure.



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5. Mark and disconnect the glow plugs (1).



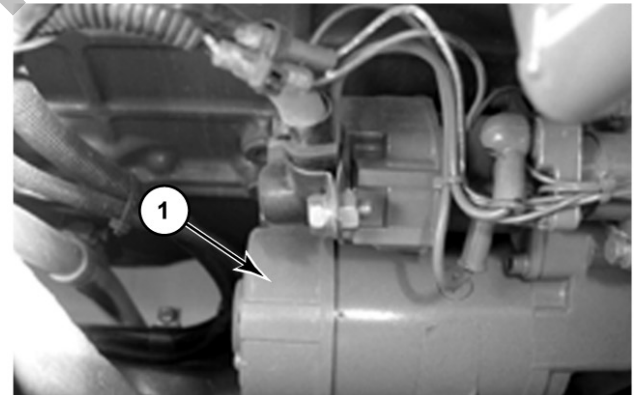
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6. Mark and disconnect engine oil pressure switch and engine rpm sensor (1).



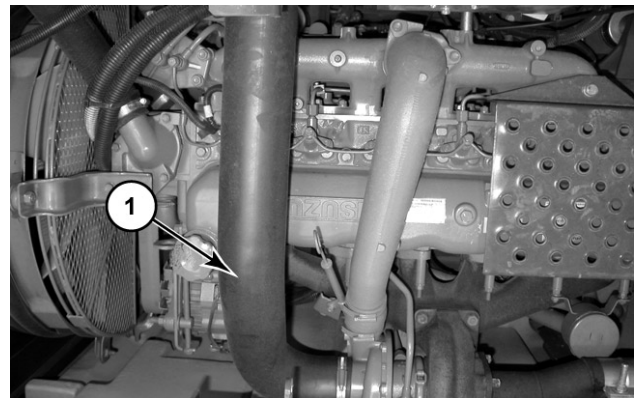
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7. Mark and disconnect starter motor (1).
Remove the earthing braid at the engine end.



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8. Remove and plug hose (1) connecting the turbocharger to the air filter.

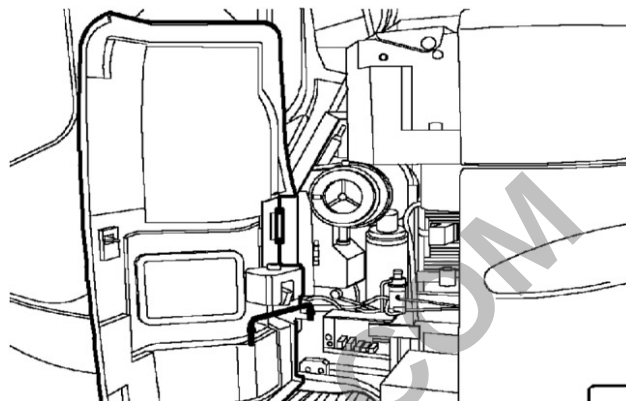


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Air cleaner - Remove (B.30.A.25 - F.10.A.10)

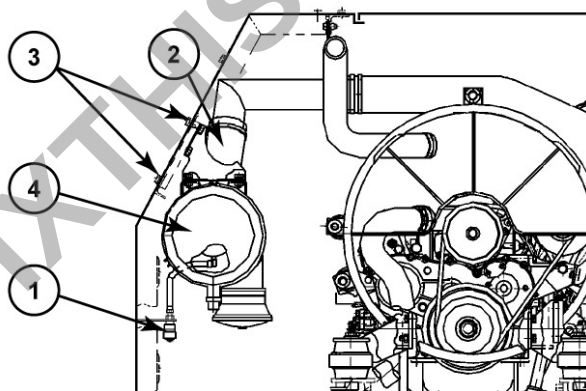
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1. Open the rear LH side door.



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2. Disconnect restriction indicator (1).
Disconnect air intake hose (2).
Plug the ports.
Remove screws (3) and air filter assembly (4).



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POWER PRODUCTION - B

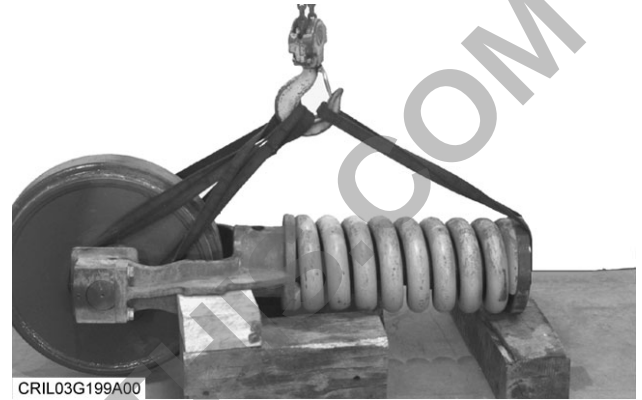
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Track tensioning mechanism Shock absorber - Install (D.50.B.48.70 - F.10.A.15)

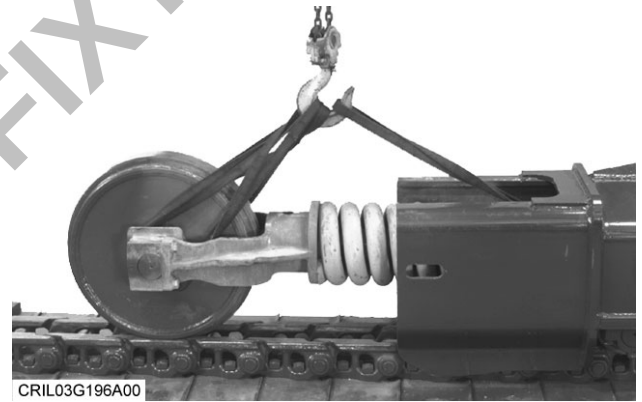
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1. Attach a suitable lifting device to the idler wheel and bring it into position on the shock absorber yoke. Apply thread locking fluid to the screws fitted with washers and tighten to a torque of **267 - 312 Nm**
2. Attach a sling from the lifting equipment to the idler wheel and shock absorber assembly.



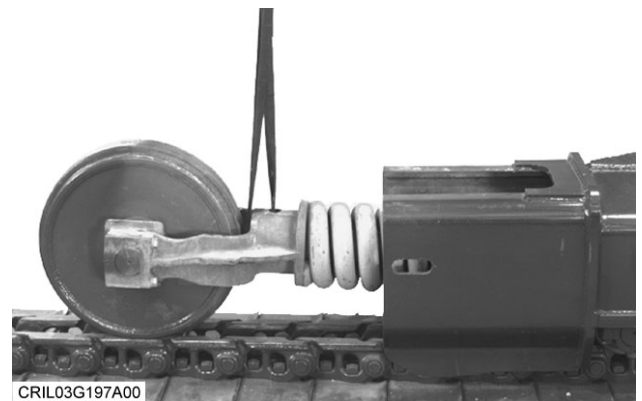
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3. Raise the idler wheel and shock absorber assembly and install it in the chassis housing. Push the idler wheel and the shock absorber into the chassis. Remove the lifting equipment from the idler wheel and the back of the shock absorber.



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4. Insert the lifting equipment sling into the central orifice of the shock absorber yoke.



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BODY AND STRUCTURE - E

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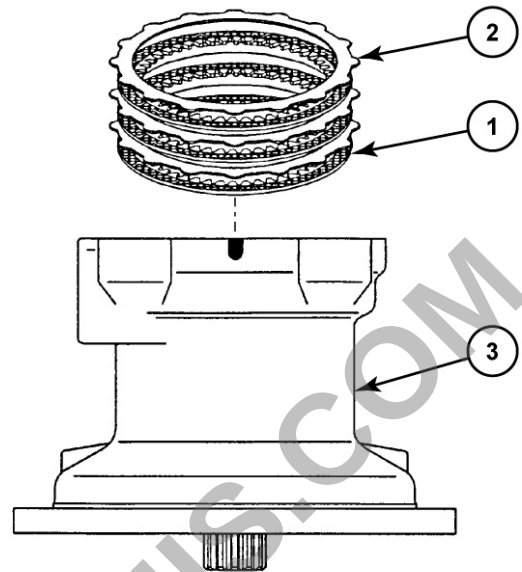
LH travel spool**Torque settings**

Plug (46)	107 - 117 Nm
Plug (73)	19 - 22 Nm
Screw (74)	39 - 44 Nm
Screw (75)	58 - 64 Nm
Spool screw (D)	20 - 22 Nm

1. Install check valve **(49)** and spring **(48)**.
Install plug **(46)** fitted with new seal **(47)**.
2. Install plugs **(73)** fitted with new seals and tighten to the required torque.
3. Install valve **(51)** and spring **(35)**.
Install new seals **(36)**.
Install flanges **(37)** with screws **(75)**.
Tighten screws **(75)** to the required torque.
4. Coat the threaded parts of spools **(5R)**, **(5L)** and **(6)** with thread lock fluid.
Place the spool ends (spring side) in a soft-jawed vice.
Fit springs **(B)** and seats **(C)** on screws **(D)**.
Install and tighten the screws to the required torque.
Install spools **(5R)**, **(5L)** and **(6)** in their respective housings.
5. Install caps **(8)** and **(12)** fitted with new seals **(7)**.
Install and tighten screws **(74)** to the required torque.

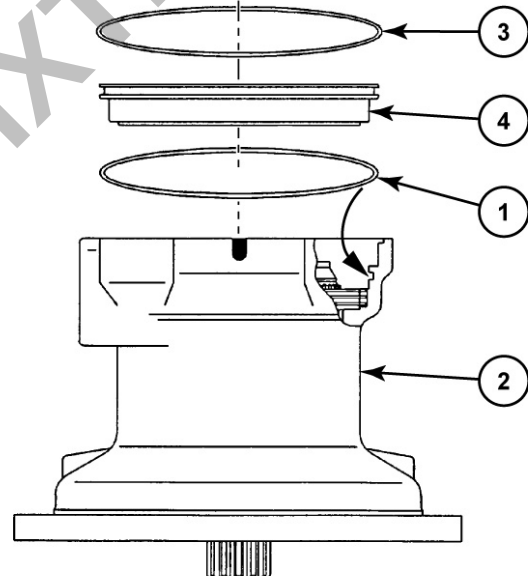
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10. Apply clean hydraulic fluid to both surfaces of friction plates (1) and steel plates (2). Install steel plates (2) and friction plates (1) alternately following the marks made during disassembly.



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11. Install seal (1) in housing (2). Install seal (3) on piston brake (4).



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- Boom raising (large cylinder chamber) **(25)** and **(26)** is supplied by outputs from pumps **(D1)** and **(D2)**.
- The flow from pump **(D2)** arriving through port **(P1)** passes through straight-line travel valve **(1)** or RH travel valve spool **(2)** then via the parallel passage to pass through boom valve spool 2 **(3)**, and arrives at the outlet of boom valve spool 1 **(4)**.
- The output from pump **(D1)** arriving through port **(P2)** passes through the 2nd parallel passage and boom valve spool 1 **(4)** to join the output from pump **(D2)**.
- The outputs from pumps **(P1)** and **(P2)** supply the large boom cylinder chambers **(25)** and **(26)** by passing through the boom load holding valve **(32)**.

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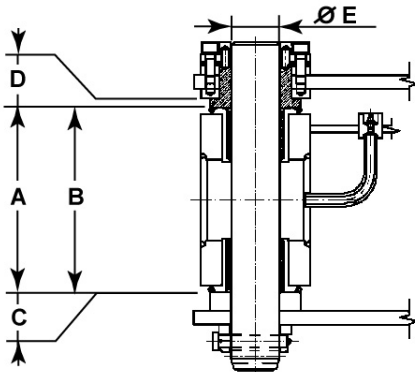


WORKING ARM - H

DIPPER Lift - 25.B

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5. **Bucket on bucket head**

		
MARKING	STANDARD DIMENSION	WEAR LIMIT
(A) bucket	307 mm	313 mm
(B) bucket head	306 mm	304 mm
(C) (a-b)	1 - 3.5 mm	shims
(D)	16 mm	8 mm
(E) pin diameter	80 mm	79 mm
(E) dipper head bushing diameter	80 mm	81.5 mm
(E) bucket bushing diameter	80 mm	81.5 mm

Command valve Hand control valve - Torque (H.30.C.12.10 - D.20.A.10)

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NOTE: Refer to *Command valve Hand command valve - Torque (F.40.C.12.10 - D.20.A.10)*

Command valve Foot command valve - Troubleshooting (J.20.E.12.10 - G.40.A.10)

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NOTE: The table below shows a list of common problems. This list is not exhaustive.

Problem	Possible Cause	Correction
External oil leaks	O-ring bearing surfaces scratched	Repair or replace the parts
	Defective seals	Replace the seals
The secondary pressure does not increase gradually or is out of tolerance.	Worn or broken spool return spring	Replace the spring
	Dirt on the spool.	Disassemble, clean and repair. Replace the assembly if necessary
The lever does not move freely or does not return to the neutral position	Dirt in the piston	Disassemble, clean and repair. Replace the assembly if necessary
	Dirt in the pushrod	Disassemble, clean and repair. Replace the assembly if necessary
	Dirt on the pivot pin and cam	Disassemble, clean and repair. Replace the assembly if necessary
	Worn or broken piston return spring	Replace the spring
Damping force too weak	Broken damper pin	Replace the pin.
	Dirt in the piston	Disassemble, clean and repair. Replace the assembly if necessary
Damping force too strong	Piston restrictor port blocked	Disassemble, clean and repair. Replace the assembly if necessary

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