Service Manual

JS130W
JS150W

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General Information 1
Care & Safety 2
Routine Maintenance 3
Optional Equipment A
Body & Framework B
Electrics C
Controls D
Hydraulics E
Transmission F
Brakes G
Engine K

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All construction and agricultural equipment can be hazardous. When a JCB Excavator is correctly operated and properly maintained, it is a safe machine to work with. But when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

BE CAREFUL
BE ALERT
BE SAFE

GEN-1-6

As well as the warnings in the following pages, specific warnings are given throughout the book. This section is designed to give a safety code for use of the machine generally and for operation and maintenance practices.

Note: This section includes a certain amount of operating safety information. But remember that whenever you drive the machine or operate its controls you are in effect a machine operator. Therefore you should read and understand the information given in the Operator Handbook before driving the machine or operating its controls.

General Safety

⚠ WARNING
Lifting Equipment

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

INT-1-3-7

⚠ WARNING
Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

⚠ WARNING
Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

⚠ WARNING
Raised Equipment

Raised equipment can fall and injure you. Do not walk or work under raised equipment unless safely supported.

13-1-1-6

⚠ DANGER

Before removing the boom from the machine, ensure that the counterweight is adequately supported as in certain ground conditions the machine could tip backwards. Never travel or transport the machine with the boom removed.

BF 6-3

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Every 10 Operating Hours or Daily
Whichever occurs first

1 **Clean**

- **a** Machine generally

2 **Grease**
(if operating in very wet conditions)

- **a** Bucket/dipper pivot points

3 **Check (Engine stopped)**

- **a** Generally for damage
- **b** For oil and coolant leakage
- **c** Security of bolts and nuts†
- **d** For disconnected or shorted wiring, loose terminals
- **e** Hydraulic fluid level
- **f** Engine oil level
- **g** Engine coolant level
- **h** Windscreen washer fluid level
- **j** Fuel system for leaks
- **k** Fuel level
- **l** Tyre pressures and condition
- **m** Seat belt condition and security
- **n** Tightness of wheel nuts
- **p** Fire extinguisher for condition and security

†Tapping with a hammer will identify any loose nuts and bolts. Tighten any loose nuts or bolts in accordance with the **Torque Settings** table in Section 1.

4 **Check (Engine running)**

- **a** Operation of warning lights and audible alarm
- **b** Operation of brake lights and reversing lights
- **c** Operation of other electrical equipment
- **d** Exhaust for excessive smoke
- **e** Excavator operation
- **f** Dozer, stabiliser and attachment operations
- **g** Transmission operation
- **h** Footbrake operation
- **l** Steering operation
- **j** Parking brake operation
- **k** Operation of swing brake
- **l** Operation of hourmeter

Every 50 Operating Hours or Weekly
Whichever occurs first

1 Do the Daily jobs plus:

2 **Clean**

- **a** Drain water and sediment from fuel tank
- **b** Drain fuel water separator

3 **Grease**

- **a** All pivot pins

Every 100 Operating Hours or 2-Weekly
Whichever occurs first

1 Do a 50 Hour Service plus:

2 **Clean**

- **a** Battery terminals (apply Petroleum Jelly)

3 **Grease**

- **a** Swing ring bearing

4 **Change**

- **a** Engine oil†
- **b** Hydraulic servo oil filter element†
- **c** Hydraulic return filter element†
- **d** Hydraulic drain filter element†
- **e** Swing gearbox oil†
- **f** Front and rear axle oil†
- **g** Drive gearbox oil†

5 **Check (Engine stopped)**

- **a** Hose and pipework for chafing or damage
- **b** Condition of ram piston rods
- **c** All grease seals
- **d** Tightness of engine mounting bolts
- **e** Wiring for chafing
- **f** Security of major unit mounting bolts and nuts†.

  If loose, tighten to specified torque.

6 **Check (Engine running)**

- **a** Accumulator operation

†These procedures are only to be carried out after the **first 100 hours** use of a new machine. Thereafter they are to be carried out as detailed in the following periodic checks.

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Torque Settings

Note 1: The figures quoted are for non-plated fasteners and are to be used only when there is no torque setting specified in the relevant procedure in this service manual.

Note 2: The 4T grade settings DO NOT APPLY to fasteners used on the engine. If any 4T specification fasteners are found on the engine these must be tightened to the figure quoted in the relevant engine manual.

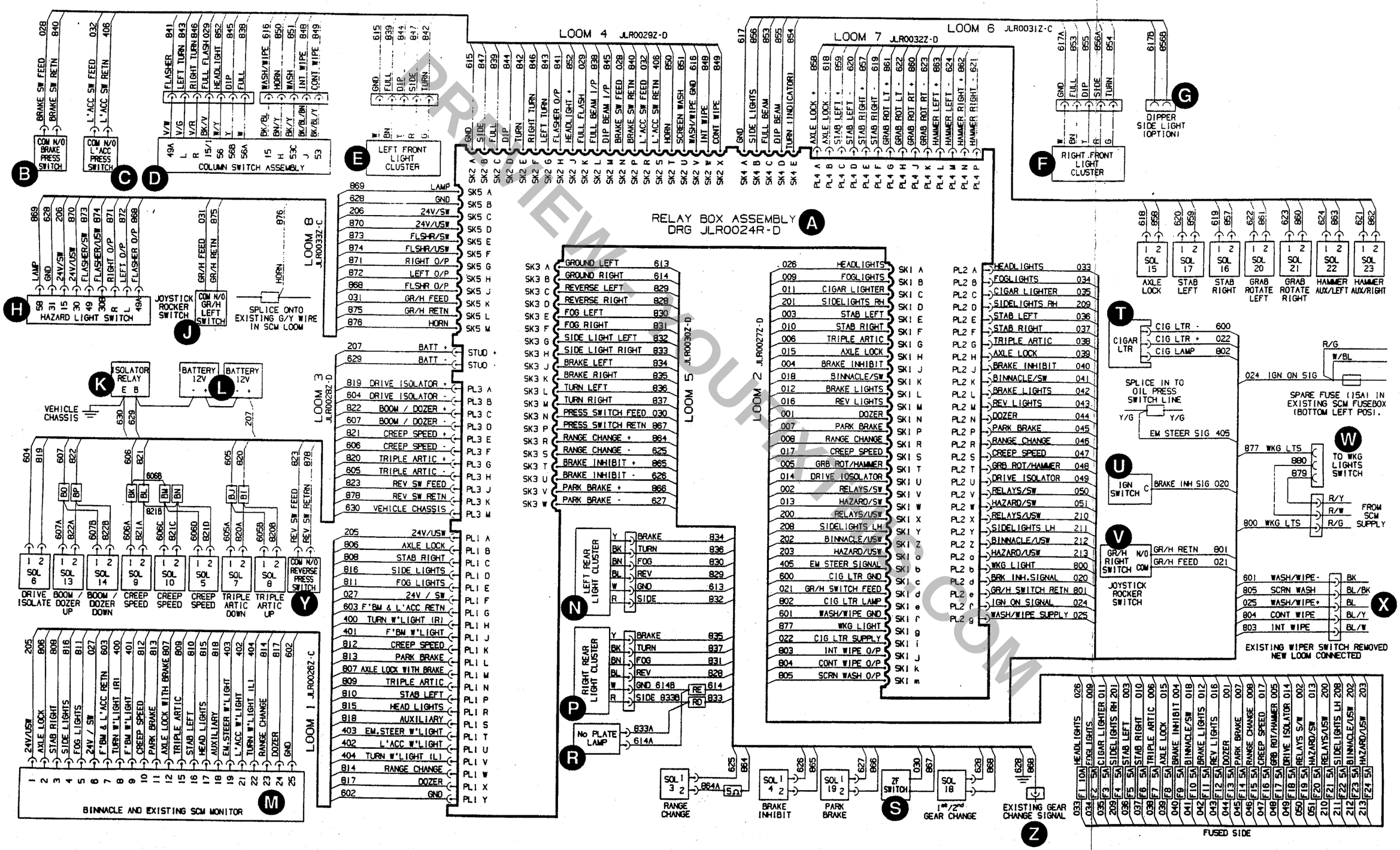
Bolt Size	Strength Grade of Bolt or Stud								
	4T			8.8			10.9		
	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M3	0.39	0.04	0.28	-	-	-	-	-	-
M4	0.78	0.08	0.57	-			-	-	-
M5	1.67	0.17	1.2	-	-	-	-	-	-
M6	2.84	0.29	2.1	8.04	0.82	5.9	11.3	1.15	8.3
M8	7.06	0.72	5.2	19.6	2.00	14.5	27.7	2.82	20.4
M10	14.0	1.43	10.3	39.1	3.99	28.8	55.0	5.61	40.6
M12	24.6	2.51	18.1	68.5	6.98	50.5	96.2	9.81	71
M16	61.9	6.31	45.7	173	17.6	127.6	242	24.7	178.5
M20	122	12.4	90	337	34.4	249	475	48.4	350
M22	167	17.0	123	464	47.3	342	652	66.5	481
M24	210	21.4	155	584	59.5	431	821	83.7	606
M27	311	31.7	229	864	88.1	637	1220	124	900
M30	420	42.8	310	1170	119	863	1650	168	1217
M33	576	58.7	425	1600	163	1180	2260	230	1667
M36	736	75.1	543	2050	209	1512	2880	294	2124
M39	961	98.0	709	2680	273	1977	3760	383	2773
M42	1190	121	878	3300	336	2434	4640	473	3422
M45	1490	152	1099	4140	422	3054	5820	593	4293
M48	1780	182	1312	4960	506	3659	6970	711	5141

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Schematic Wiring Diagram (additional to JS130, JS150 Tracked Excavator)

* **JS130W to S/N 716104, JS150W to S/N 718083**



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Plug Pin Connections

CN 2 (G)

1 SW 1 (Swing Pressure Switch)
2 Gearbox Range Change Switch
3 SW 3 (Engine STOP)
4 SW 4 (F2)
5 SW 5 (F1)
6 SW 6 (Idle)
7 No connection
8 Gearbox Ratio Change Solenoid Valve
9 Heat Relay
10 No Connection
11 Oil Pressure Switch
12 Air Filter
13 Reserve Fuel Tank Level Switch

CN 3

1 Fuel Level Sensor
2 Oil Temperature
3 Water Temperature
4 Battery Level Sensor
5 Engine Rotation
6 No Connection
7 AV
8 Throttle Sensor
9 AG

CN 4

1 A
2 GND
3 B
4 C Model
5 GND
6 D
7 H Mode
8 S
9 L
10 F (Model R3)
11 Battery Charge
12 No Connection
13 No Connection

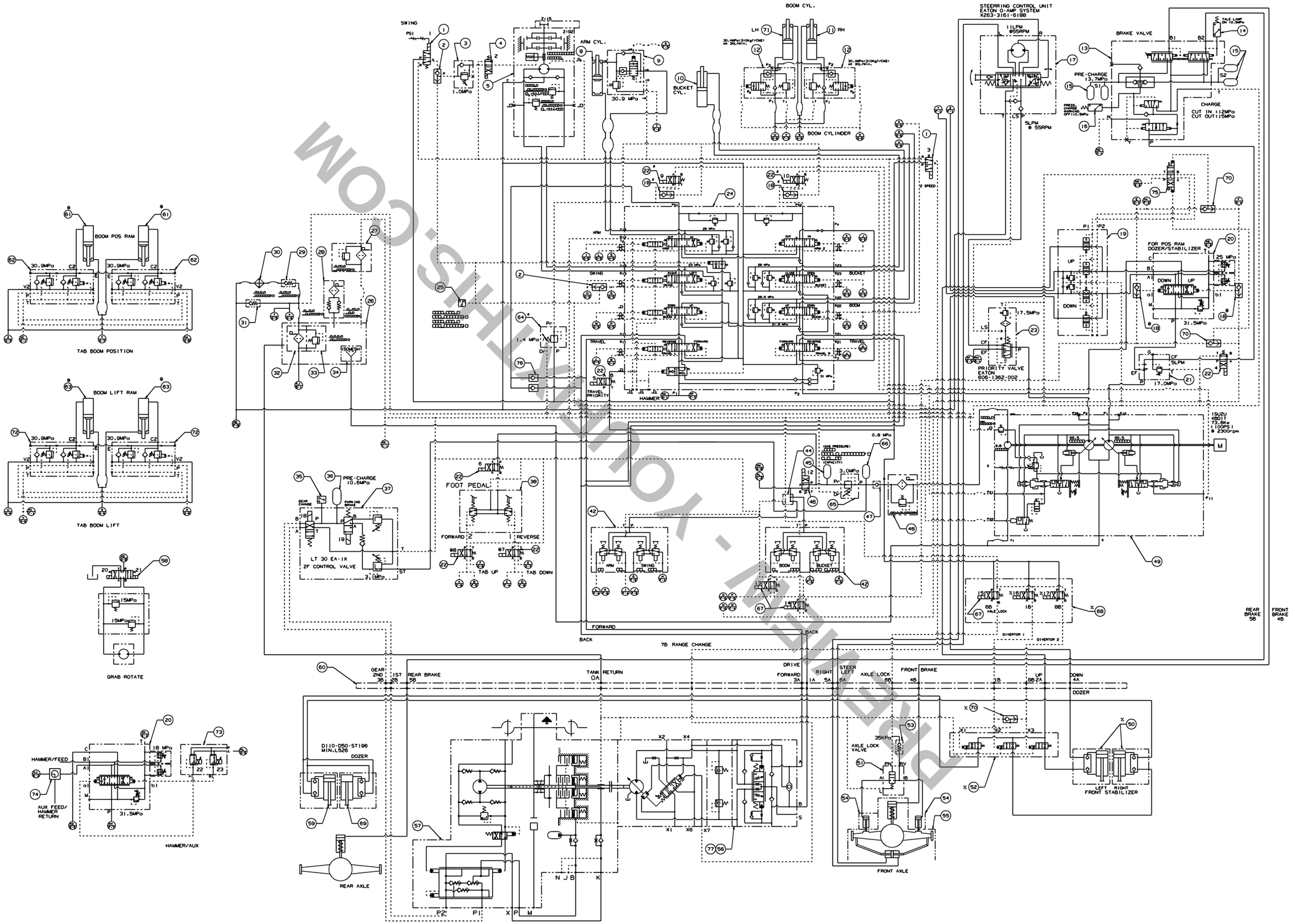
CN 1

1 AV
2 Throttle Volume
3 AG
4 Buzzer OFF Switch
5 Idle Switch
6 Manual Pre-heat
7 Proportional Solenoid Return
8 Out
9 Swing Brake
10 Throttle Left
11 Throttle Right
12 24V
13 Control
14 24V
15 Drive
16 GND
17 GND

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Hydraulics Section E



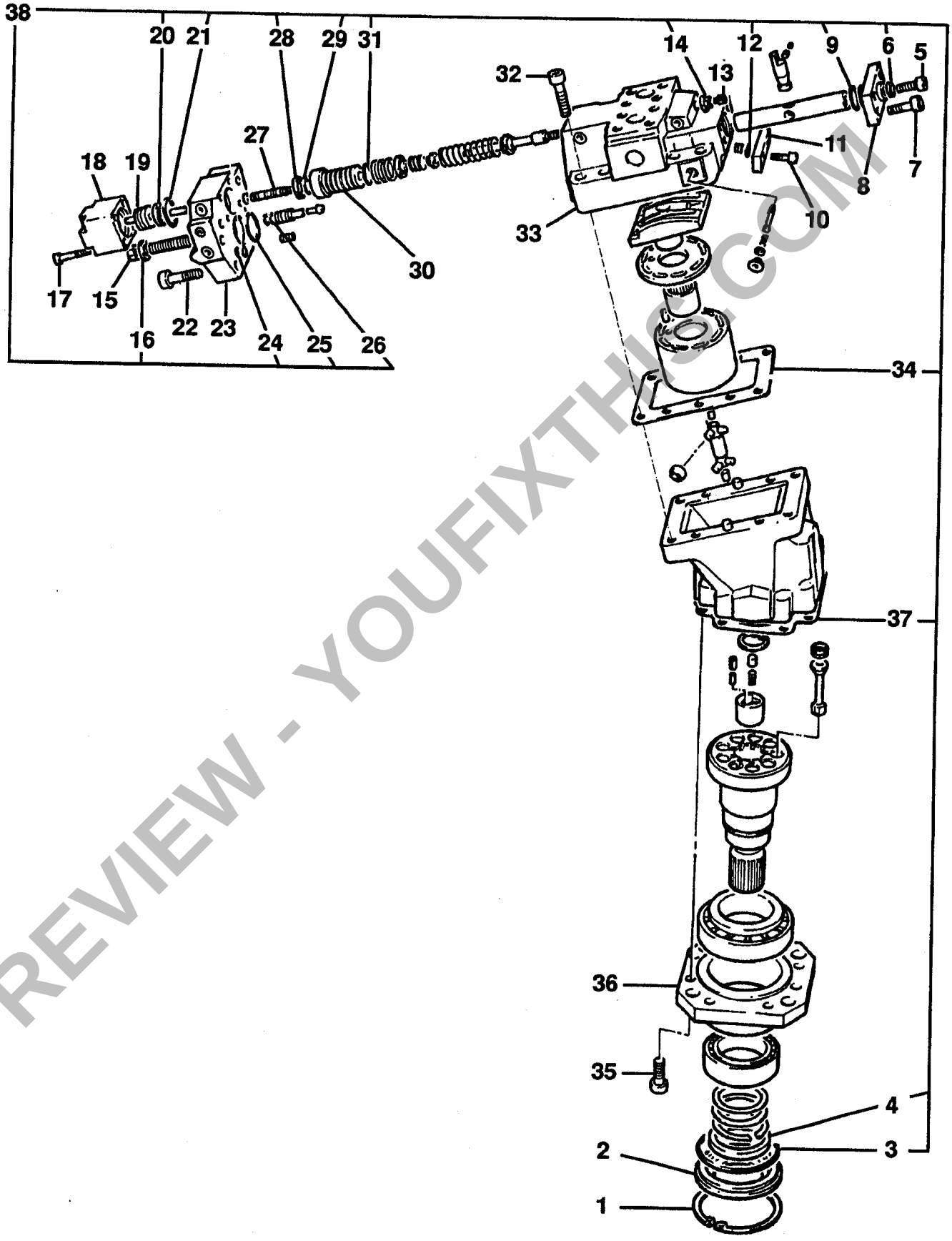
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Some problems which may occur in the hydraulic system are listed below, either for the system as a whole or for individual components.

SYMPTOM	POSSIBLE CAUSE	ACTION
1. Hydraulic System		
a. The hydraulic system is defective or does not operate at all.	1. The pump is defective.	Check pump pressure and replace if defective.
	2. Dirt is clogging the inside of the relief valve.	Dismantle and clean the relief valve.
	3. The relief valve is defective.	Strip and check the relief valve as detailed on page 26-1.
	4. A ram is worn.	Repair or replace the ram.
	5. Negative pressure is low.	Check circuit pressure.
	6. A valve is cracked.	Replace the valve.
	7. A spool is not operating over its full stroke.	Check the movement of the spool or the operational linkage.
	8. The oil level in the tank is too low.	Replenish the oil.
	9. Circuit filters are clogged.	Clean or replace filters.
	10. The circuit pipes are restricted.	Check the piping.
2. Hydraulic Pump		
a. Oil is not discharged from the pump.	1. The tank strainer or intake pipe is blocked or closed.	Clean the strainer and open the intake pipe.
	2. The end of the inlet pipe is above the tank oil level.	Replenish the oil tank.
	3. One or more of the pump major components is damaged or the input shaft or coupling are defective.	Dismantle and inspect pump as detailed on page 20-1. Renew damaged components and reassemble the pump. Renew shaft or coupling.
b. Pump output is low. Hydraulic pressure does not increase.	1. The pressure does not increase because of problems with the hydraulic pump or control valve.	Check hydraulic pump and control valve. Renew as required.
	2. Internal leakage within the hydraulic pump with excessive fluid drain from pump drain port.	Strip and inspect the hydraulic pump as detailed on page 20-1, paying particular attention to sliding surfaces. Repair or renew as necessary. Reassemble the pump.
	3. Air is being drawn into the pump from the inlet side.	Check tank oil level and strainer for clogging. Correct as necessary. If OK, check tightness of pump inlet connection.
	4. Inlet resistance causing cavitation.	Check correct oil . Check pump low pressure inlet pipe for collapse. Renew as required.
c. The pump makes an abnormal noise.	1. Oil level is low and the pump is drawing in air.	Check and replenish oil level. Run the pump under no load to bleed air from the hydraulic system.

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Dismantling - JS 130W, 150W

Refer to the sectional drawings of the pump on page 20-1 and the front regulator on page 20-2 and the rear regulator on page 20-3 as a guide to dismantling and assembling.

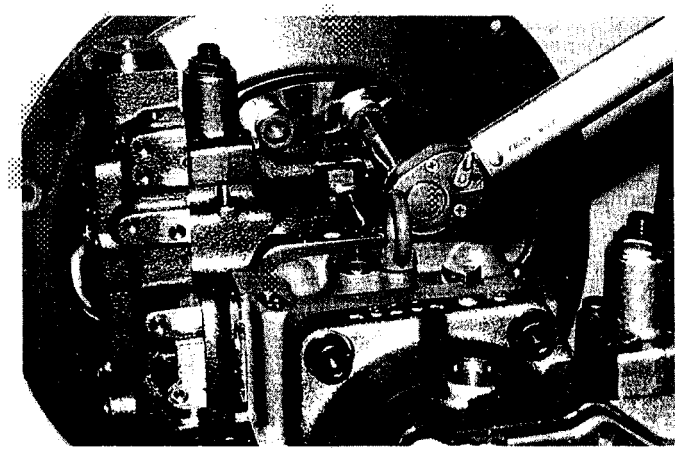
The numbers which identify those parts to be dismantled or assembled are prefixed with a **P** for pump items items and **R** for regulator items.

Before attempting to dismantle the hydraulic pump, blank all inlet and outlet ports and wash the outer surfaces with a suitable solvent to remove all dirt and dust. Dry using compressed air.

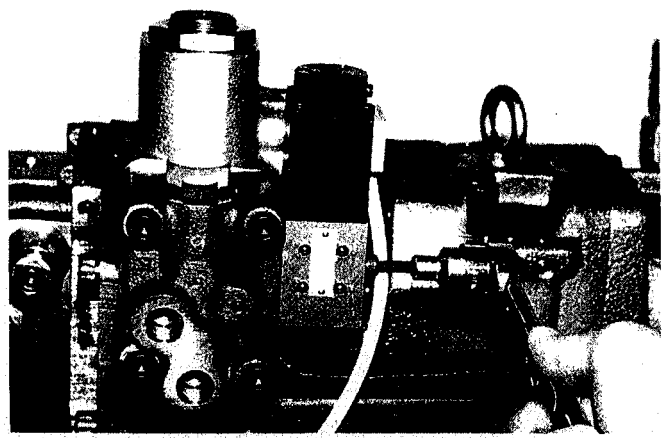
Make different alignment marks across each sub-assembly joint face as an aid to assembly.

1. Remove drain plug **P50** from the oil drain port and drain the hydraulic fluid from the pump. When draining is complete, refit drain plug **P50** and part tighten.

2. Fasten the pump unit in a vice or jig. Remove the mounting flange securing bolts and remove the flange.



3. Remove the SPPC valve retaining bolts **R47** and remove SPPC valve **R43**.



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Technical Data

Type	Isuzu 4BD1, 4 cylinder turbocharged
Model	
- JS130W	4BD1PTA-14
- JS150W	4BD1PTA-15
Bore	102 mm (4.016 in)
Stroke	118 mm (4.646 in)
Swept Volume	3856 cm^3 (235.3 in^3)
Compression Ratio	17.5 : 1
Compression Pressure at 200 rev/min	30 bar (440 lbf/in^2)
Firing Order	1,3,4,2
Valve Clearance (cold)	
- Inlet	0.4 mm (0,016 in)
- Exhaust	0.4 mm (0.016 in)
Dry Weight (approximately)	350 kg

Fuel System

Max. Speed (No Load)	
- JS130W	Less than 2425 rev/min
- JS150W	Less than 2550 rev/min
Injection Timing (static)	18° BTDC
Injector Opening Pressure	180 bar (2630 lbf/in^2)

Induction System

Air Cleaner Type	2 stage, dry element

For further details, see engine service manual, Publication No. 9803/6910

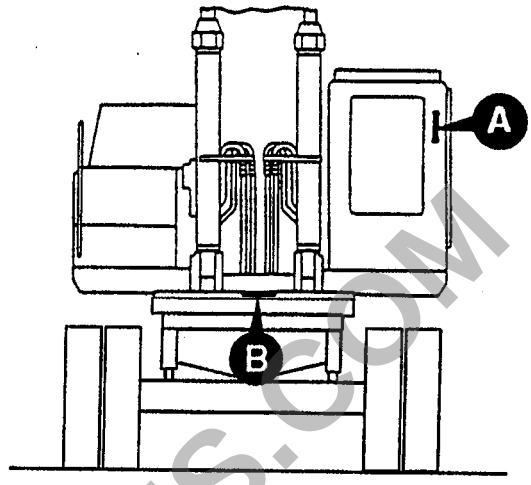
Note: New engines **DO NOT** require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the cylinder bores resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load).

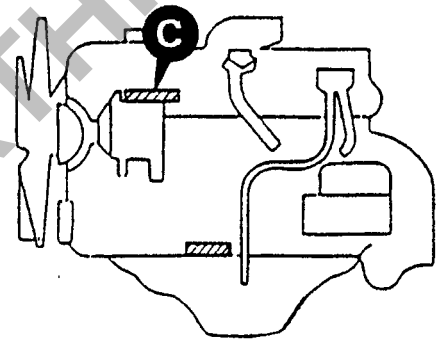
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Each machine has a Data Plate, located to the rear left, inside the cab as shown at **A**. The machine serial number is inscribed at **B** and the engine number at **C**.

If the engine is replaced by a new one, the data plate serial number will be wrong. Either stamp the new number on the plate or stamp out the old one. This will prevent the wrong number being quoted when ordering replacement parts.



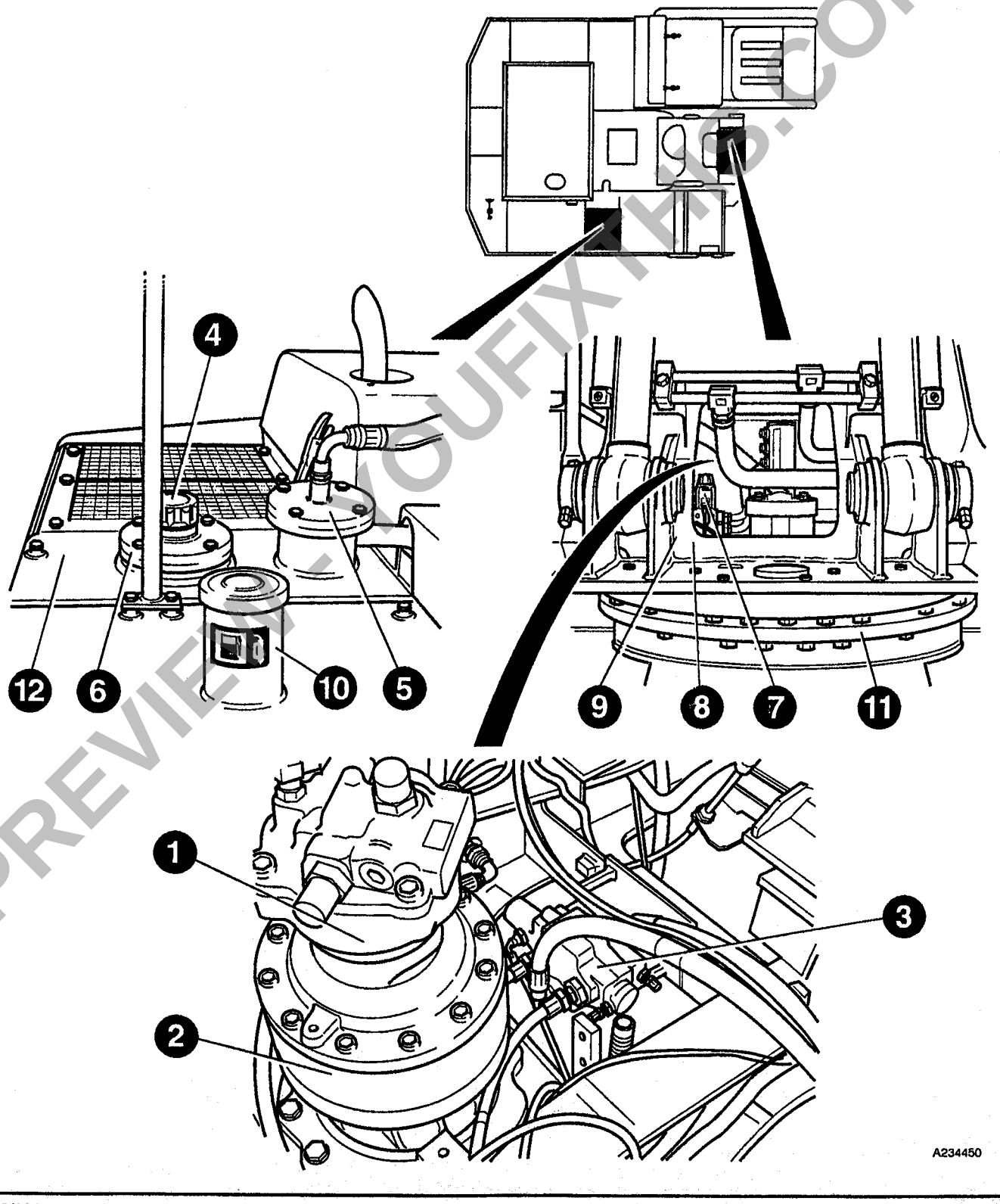


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Upper Frame (2)

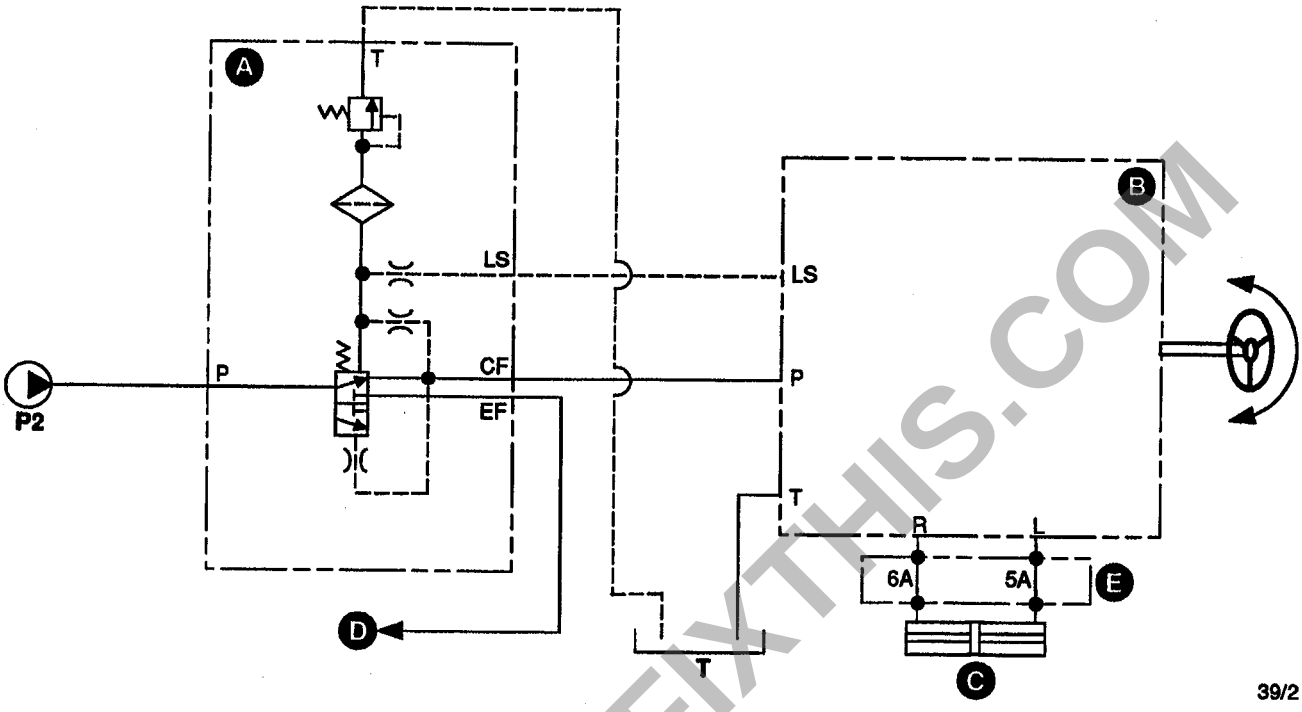
Item	Description
1	Swing Motor
2	Swing Gearbox
3	Dozer Valve
4	Filter/Breather
5	Main Return Filter
6	Suction Strainer (internal)
7	Solenoid Valve - Left Hand Stabiliser
8	Solenoid Valve - Right Hand Stabiliser/Dozer (not visible on illustration)
9	Solenoid Valve - Axle Lock (not visible on illustration)
10	Fuel Tank Filler Cap
11	Swing Ring Gear
12	Hydraulic Oil Tank



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Hydraulic Circuit



39/2

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Low Pressure Relief Valve

Dismantling

1 Pull plug 1 from plug 4 and remove poppet 3.

2 Unscrew plug 5 and remove spring 6 and poppet 2.

3 Remove all 'O' rings and discard.

Cleaning and Checking

1 Clean all components in clean mineral oil and dry with compressed air.

2 Check that the seat surface of the poppet is defect-free and that the contact surface is uniform.

3 Check that the poppet slides smoothly and freely.

4 Check that springs are not broken, worn or deformed.

5 Remove any minor flaws by rubbing with polishing powder. Ensure that all powder is removed after polishing.

6 Renew the relief valve if any abnormal parts are found.

Assembly

1 Fit poppet 2 and spring 6 in plug 1.

2 Fit 'O' ring 8 on plug 5. Fit plug 5 and torque tighten to 88.3 to 98.0 Nm (65.1 to 72.3 ft. lbs.).

3 Fit poppet 3 and plug 4 into plug 1.

4 Fit 'O' ring 8 onto plug 1 and fit the relief valve into the control valve. Adjust pressure (see **Pressure Testing** in this Section).

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Hook Spanners

Ram	Cylinder Bore Diameter mm	ins	Spanner Size mm	ins
Bucket	105	4.13	125	4.92
Boom	110	4.33	130	5.12
Dipper	120	4.72	140	5.51

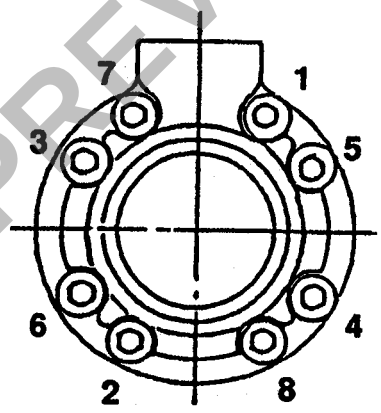
Torque Settings (JS130W)

Item	Boom Ram		Dipper Ram		Bucket Ram	
	Nm	lbf ft	Nm	lbf ft	Nm	lbf ft
1	824 ± 185	608 ± 136	1059 ± 238	781 ± 176	735 ± 165	542 ± 122
5	32 ± 6	24 ± 4	57 ± 10	42 ± 7	32 ± 6	24 ± 4
7	2300 ± 414	1696 ± 305	4820 ± 868	3555 ± 640	2620 ± 472	1933 ± 348

Torque Settings (JS150W)

Item	Boom Ram		Dipper Ram		Bucket Ram	
	Nm	lbf ft	Nm	lbf ft	Nm	lbf ft
2	442 ± 82	326 ± 60	442 ± 82	326 ± 60	311 ± 58	229 ± 43
5	57 ± 10	42 ± 7	57 ± 10	42 ± 7	57 ± 10	42 ± 7
7	3580 ± 644	2641 ± 475	6220 ± 1120	4588 ± 826	3480 ± 626	2567 ± 462

Bolts 2 Tightening Sequence

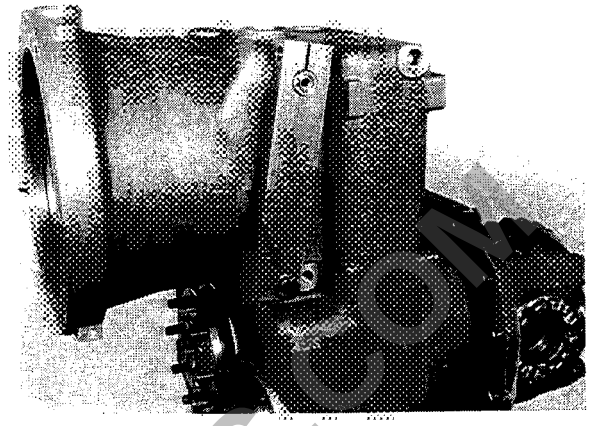


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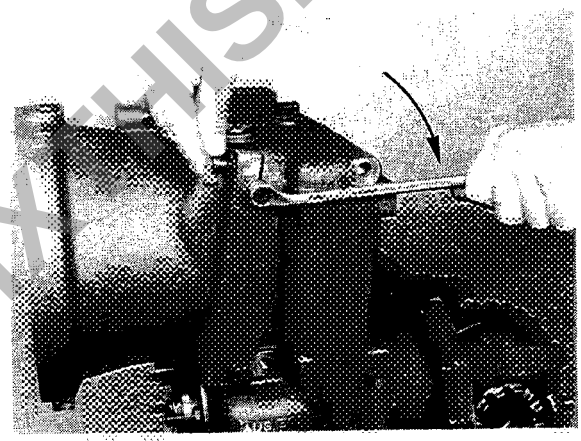
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Assembly (cont'd)

69 Fit the shift dog shift lever onto the operating shaft and fix it in the 'OFF' position by means of the screw arrowed.

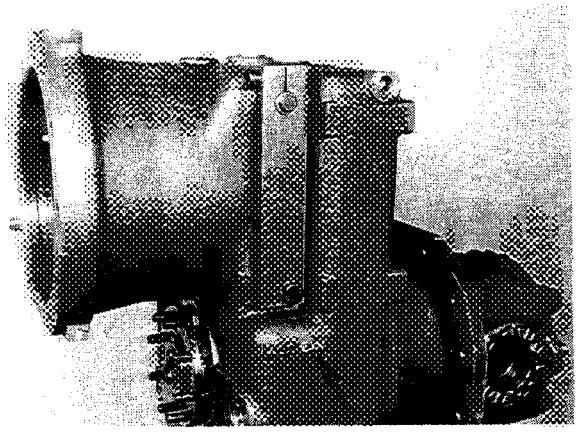


70 Insert an M8 screw fully into the end of the operating shaft and using a spanner, rotate the shaft clockwise until it reaches a stop. Hold the shaft in this position and clamp the shift lever to it using a screw and flat washer. Tighten the screw to 46 Nm (34 lbf ft).



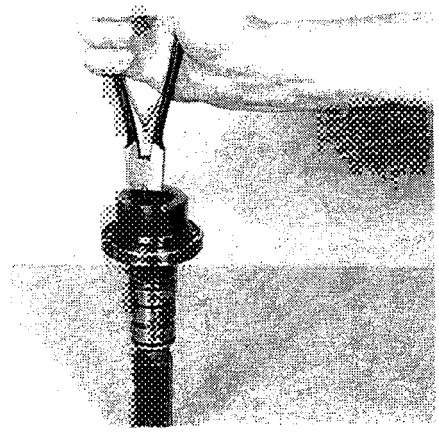
71 Remove the shift lever locking screw (see step 69) and move the lever to the 'ON' position (arrowed).

Lock the lever in the 'ON position using the locking screw tightened to a torque of 46 Nm (34 lbf ft).



72 Steps 72 to 99 are concerned with the assembly and setting up of the road clutch unit.

Press the bearing assembly firmly against the shoulder of the drive shaft. Secure it with the circlip.



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Axle Hub and Driveshaft - Assembly (cont'd)

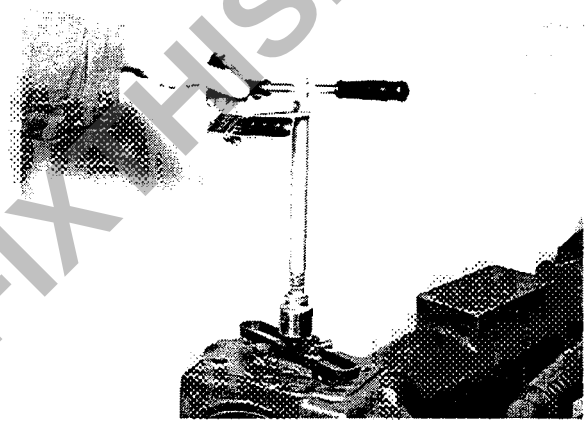
11 Install the two trunnions in their original positions (see **Dismantling**, step **20**), including any shim(s) (arrowed) to the top trunnion. Tighten the trunnion mounting screws to the torque indicated below.

Torque Setting 185 Nm (136 lbf ft)

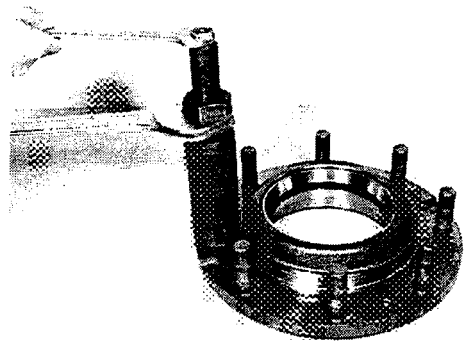


12 Starting with the hub carrier turned as far anti-clockwise as possible connect a torque spanner to the hub carrier as shown. Read off the spanner scale the deflection as the hub carrier starts to turn. This reading is the rolling moment which should be as indicated below. Adjust the shim thickness, if necessary, and aim for the higher end of the permitted range.

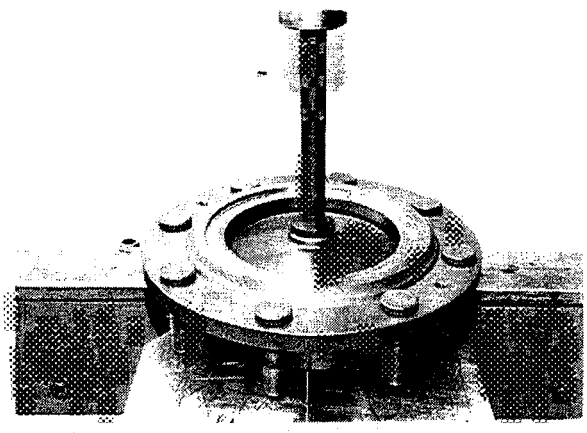
Rolling Moment 23 - 30 Nm (17 - 22 lbf ft)



*13 If it is necessary to replace any of the hub wheel studs, knock out the damaged studs and replace using the wheel stud puller SSP0033 (see **Service Tools**, Section 1) and M18 x 1,5 insert.



14 If either or both of the hub bearings are being replaced, insert the bearing outer race(s). Use driver SST0006 (see **Service Tools**, Section 1) to knock in the outer race(s) until contact is made with the internal shoulder in the hub.



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