Service Manual

Compact Loadalls

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Safety Notices

Important Information

T1-015

The Operator Manual

⚠ WARNING

Study the Operator Manual before starting the machine. You must understand and follow the instructions in the Operator Manual. You must observe all relevant laws and regulations. If you are unsure about anything, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

INT-1-1-1_2

Do not operate the machine without an Operator Manual.

Treat the Operator Manual as part of the machine. Keep it clean and in good condition. Replace the Operator Manual immediately if it is lost, damaged or becomes unreadable.

Safety Warnings



This safety alert system identifies important safety messages in this manual. When you see this symbol, be alert, your safety is involved, carefuly read the message that follows, and inform other operators.

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

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Table 2. Torque Settings - UNF Grade 'S' Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.00	10.0	72.3	88.0	9.0	64.9
9/16	14.3	13/16	140.0	14.3	103.2	126.0	12.8	92.9
5/8	15.9	15/16	196.0	20.0	144.6	177.0	18.0	130.5
3/4	19.0	1 1/8	343.0	35.0	253.0	309.0	31.5	227.9
7/8	22.2	1 15/16	547.0	55.8	403.4	492.0	50.2	362.9
1	25.4	1 1/2	814.0	83.0	600.4	732.0	74.6	539.9
1 1/8	31.7	1 7/8	1181.0	120.4	871.1	1063.0	108.4	784.0
1 1/4	38.1	2 1/4	1646.0	167.8	1214.0	1481.0	151.0	1092.3

Table 3. Torque Settings - Metric Grade 8.8 Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	151.2	184.0	18.8	135.7
M20	20	30	400.0	40.8	295.0	360.0	36.7	265.5
M24	24	36	690.0	70.4	508.9	621.0	63.3	458.0
M30	30	46	1372.0	139.9	1011.9	1235.0	125.9	910.9
M36	36	55	2399.0	244.6	1769.4	2159.0	220.0	1592.4

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Service Tools

Numerical List

The tools listed in the table are special tools required for carrying out the procedures described in this manual. These tools are available from JCB Service.

Some tools are available as kits or sets, the part numbers for parts within such kits or sets are not listed here. For full details of all tools, including the content of kits and sets, refer to ***Tool Detail Reference, Section 1***.

Note: *Tools other than those listed will be required. It is expected that such general tools will be available in any well equipped workshop or be available locally from any good tool supplier.*

Part Number	Description	See Section
-	Bonded Washers - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Female Cone Blanking Plugs - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Female Connectors - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Hydraulic Flow Test Equipment - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Hydraulic Hand Pump Equipment - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Male Adapters - BSP x BSP - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Male Adapters - BSP x NPT (USA only) - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Male Cone Blanking Caps - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Pressure Test Points - Adaptors - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Pressure Test Points - 'T' Adaptors - see ***Tool Detail Reference (Section 1)*** for content	**E**
-	Rivet Nut Tool - see ***Tool Detail Reference (Section 1)*** for content	**B**
-	'T' Adaptors - see ***Tool Detail Reference (Section 1)*** for content	**E**
332/R5251	Engine Lifting Eye (JCB Dieselmax Engine)	**K**
4104/1310	Hand Cleaner	**B**
892/00039	Spool Clamp	**E**
892/00041	De-glazing Tool	**K**
892/00137	Micro-Bore Hose	**E**
892/00167	Ram Protection Sleeve for 90 mm Rod Diameter	**E**
892/00180	Seal Fitting Tool	**H**
892/00181	Plastic Boss	**H**
892/00223	Hand Pump	**E**
892/00253	Hydraulic Circuit Pressure Test Kit - see ***Tool Detail Reference (Section 1)*** for content	**E**
892/00254	Hose	**E**
892/00271	Adapter	**E**
892/00272	Adapter	**E**

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Fault Finding

Load Moment Indicator (LMI)

Fault Codes

When the system detects a fault, the audible alarm will sound and various combinations of LEDs on the display box will illuminate to indicate a fault code for approximately 10 seconds.

Note that the audible alarm and fault code cancel after 10 seconds, all the LEDs on the display box will then flash continuously as long as the fault remains. To show the fault code for a further 10 seconds, press and release button **2-A**.

When the fault clears, the display will return to normal.

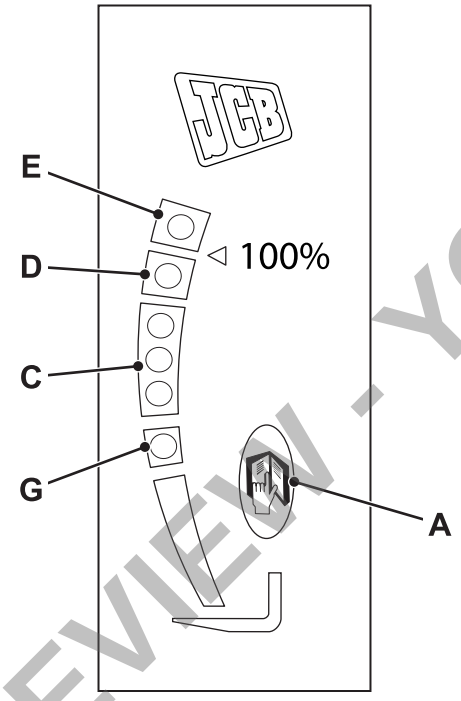


Fig 2. Typical Indicator Display Box

⚠ WARNING

If the Load Moment Indicator is faulty, contact your JCB Distributor. Do not try to repair it yourself.

12-2-1-1

Important: *A new display box will not be calibrated. Always calibrate the system when fitting a new display box.* ⇨ *Calibration Procedure (B-29).*

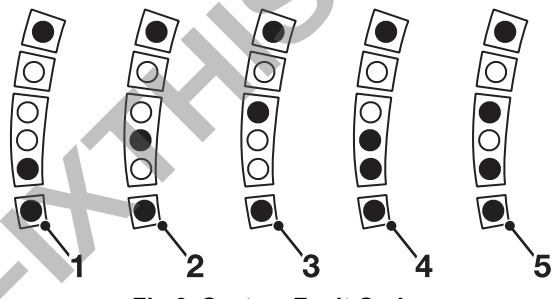


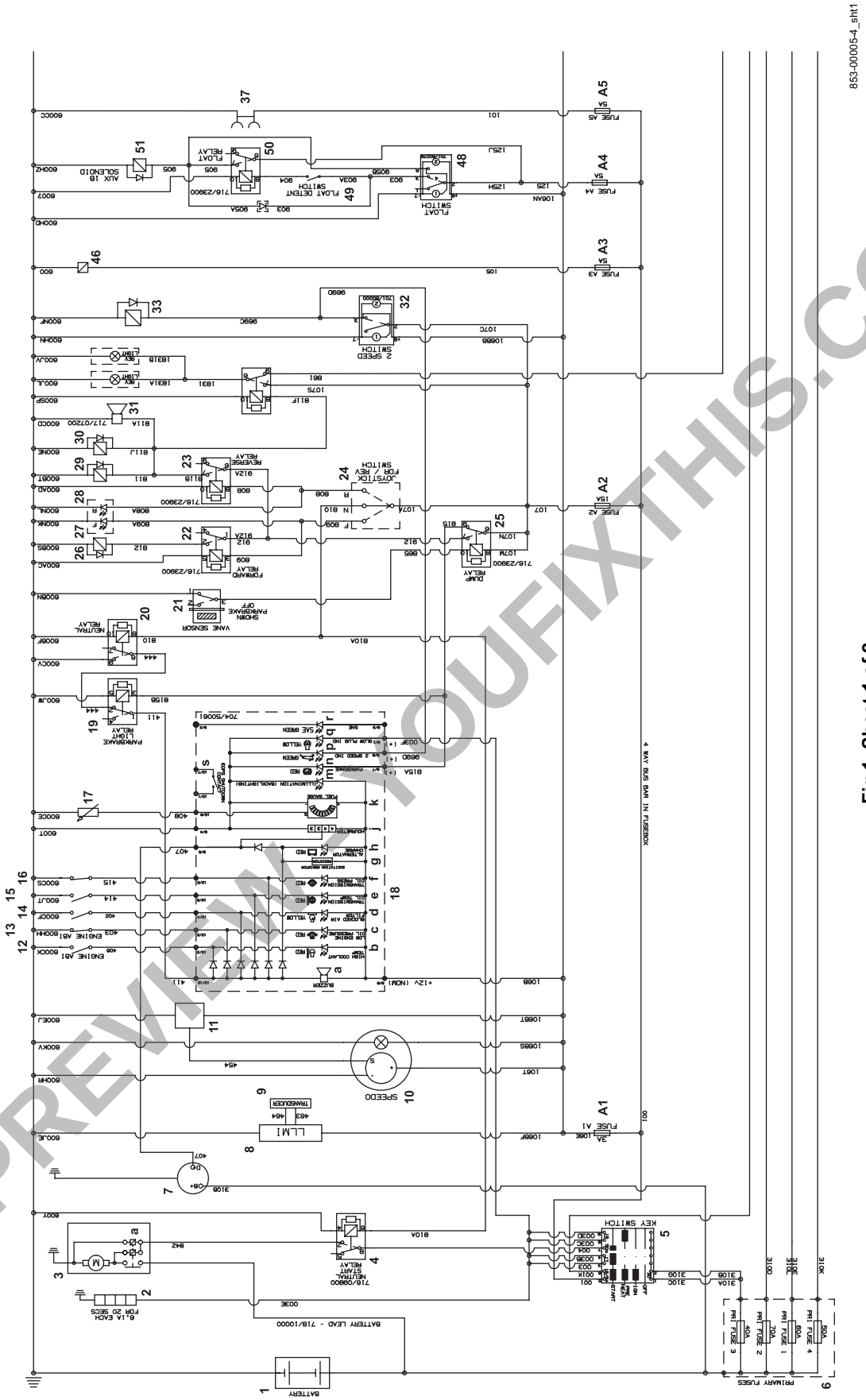
Fig 3. System Fault Codes

Fault Code	Description
1	⇨ *Table 1. Transducer signal fault (B-5)*
2	⇨ *Table 2. Calibration out of range (B-5)*
3	⇨ *Table 3. Calibration required (B-5)*
4	⇨ *Table 4. Indicator display box faulty (B-5)*
5	⇨ *Table 5. Low battery voltage (B-5)*

If any fault codes are displayed, turn the Ignition key switch to OFF and then ON again. If the fault does not clear, ⇨ *Diagnostic Tests (B-8)*.

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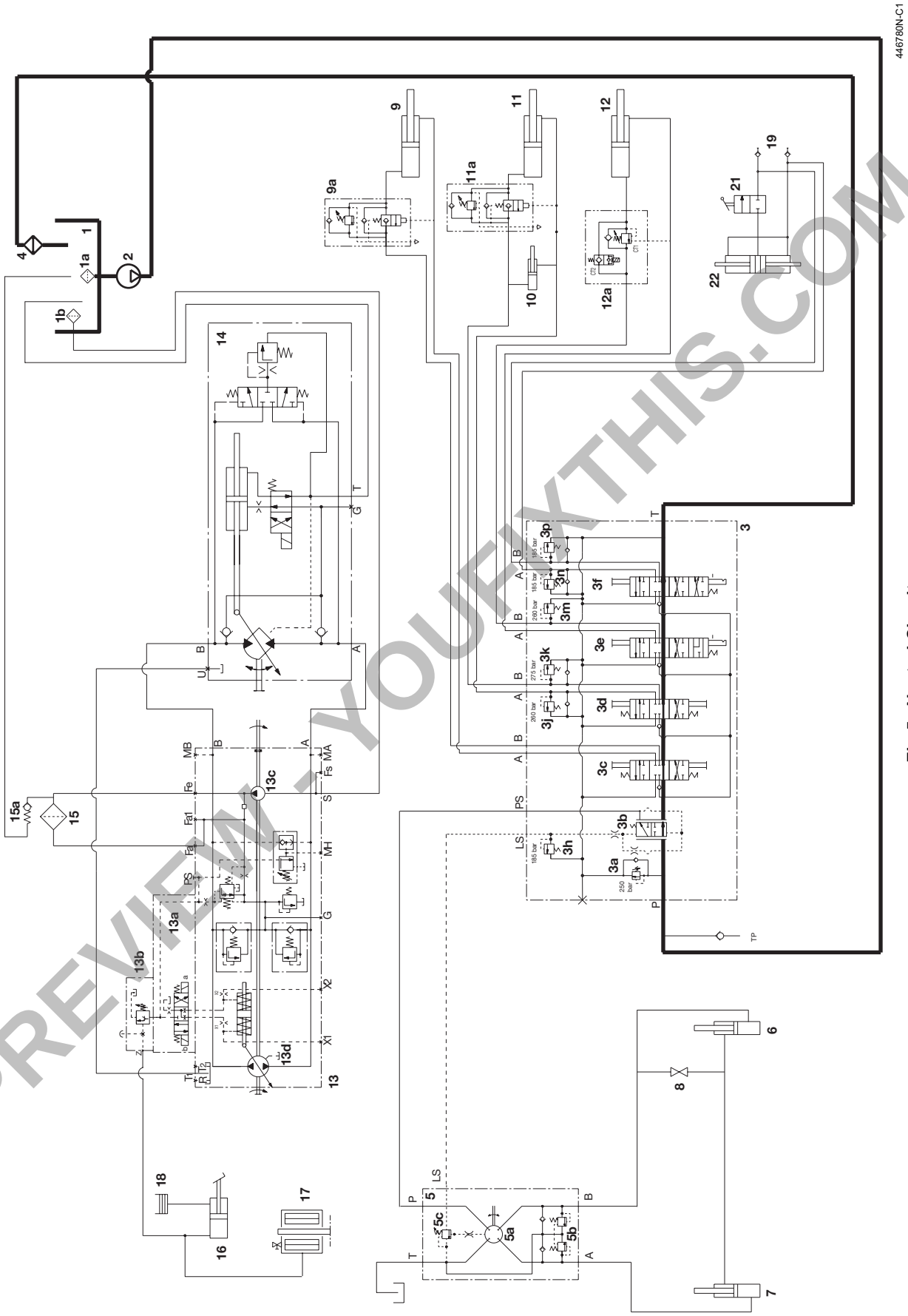


Fig 5. Neutral Circuit

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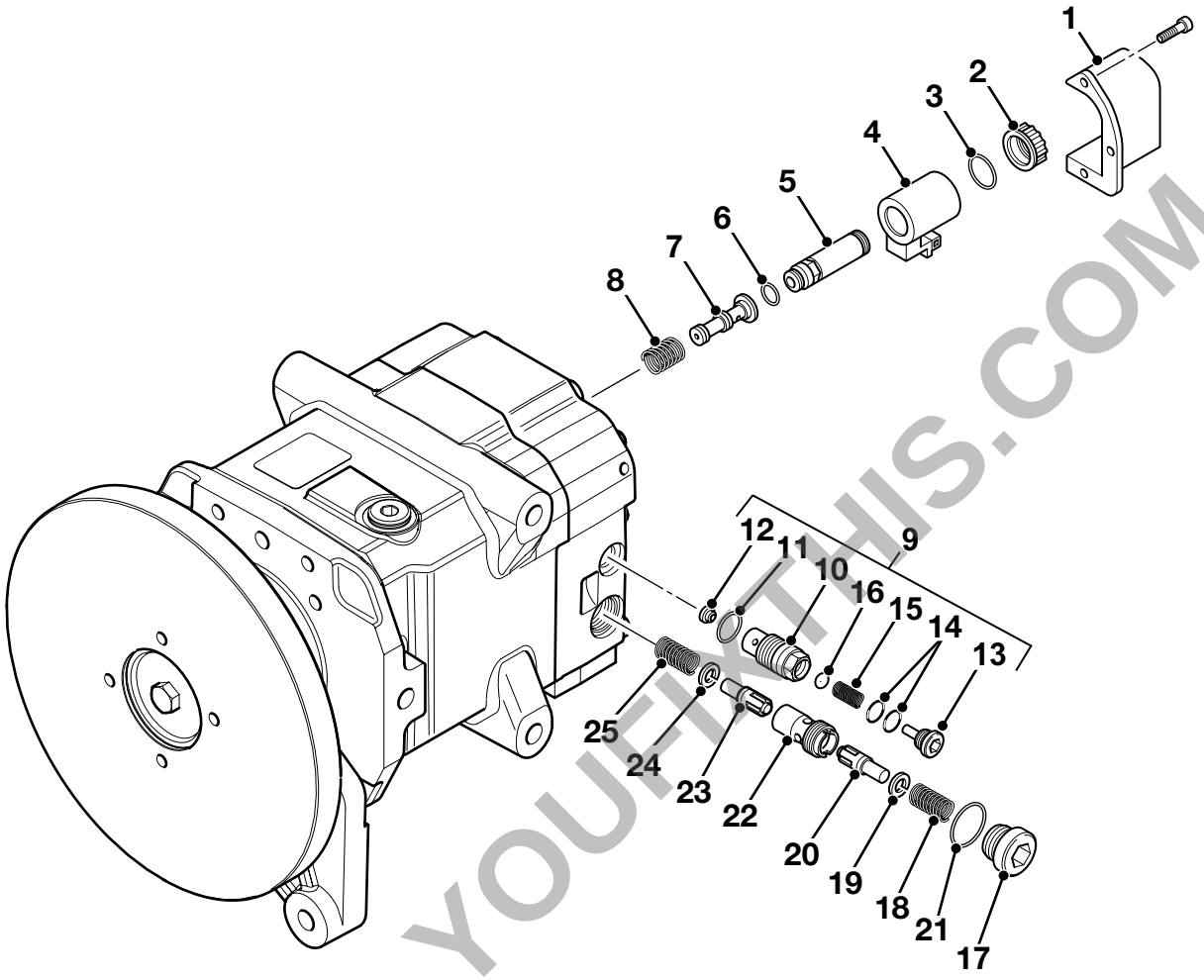


Fig 85.

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Fault Finding

Main Hydraulic Services

Symptom:

⇨ *Table 13. Lack of power in all hydraulic functions (E-79)*
⇨ *Table 14. All hydraulic rams slow to operate (E-79)*
⇨ *Table 15. One hydraulic service fails to operate or is slow to operate. (E-79)*
⇨ *Table 16. The engine tends to stall when hydraulics are under load. (E-80)*
⇨ *Table 17. Ram creep. (E-80)*

Table 13. Lack of power in all hydraulic functions

Possible Cause	Action
Insufficient hydraulic fluid.	Check for leaks and top up as required.
Hydraulic leaks in system.	Check hoses, replace as required.
Engine performance.	Check engine performance.
M.R.V. setting incorrect.	Check and adjust as required.
Low pump flow.	– Check for external leaks, replace seals. – Charge/Priority valve sticking. – Replace pump.

Table 14. All hydraulic rams slow to operate

Possible Cause	Action
Neutral circuit or low pressure lines leaking, damaged, trapped or kinked.	Check pipe lines and replace as required.
M.R.V. setting incorrect.	Check and adjust as required.
Low pump flow.	– Check pump flow. – Check for external leaks, replace seals. – Priority valve sticking. – Replace pump.

Table 15. One hydraulic service fails to operate or is slow to operate.

Possible Cause	Action
Associated service pipe lines leaking, damaged, trapped or kinked.	Check hoses, replace as required.
Associated ram leaking.	Replace seals.
A.R.V. setting incorrect.	Check and adjust as required.
Associated valve block section leaking or not operating.	– Check for leaks, rectify as required. – Check that the control lever is operating the spool, rectify as required.

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Fluids, Lubricants and Capacities

Table 1. 520-40 (All) and 524-50, 527-55 (Up to SN 1069456)

Item	Capacity Litres (Gal)	Fluid/Lubricant	International Specification
Fuel Tank - 520-40 - 524-50, 527-55	 61 (13.4) 75 (16.5)	Diesel Oil	⇨ *Acceptable and Unacceptable Fuels (🗋 3-21)*
Engine (Oil) - 520-40 - 524-50, 527-55	 10.5 (2.3) 8.5 (1.9)	JCB High Performance 15W/40	ACEA E2:B2:A2, API CF4/SG
Engine (Coolant)	8 (1.8)	JCB HP Performance Antifreeze and Inhibitor/Water. ⇨ *Coolant Mixtures (🗋 3-20)*.	ASTM D6210
Transfer Gearbox	0.75 (0.17)	JCB HD90 Gear Oil	API GL 5
Axles - Housing (x 2) - Hubs (x4)	 5.0 (1.1) 0.5 (0.1)	JCB HD90 Gear Oil	API GL 5
Hydraulic Tank(1) - 520-40 - 524-50, 527-55	 68 (15) 33 (7.3)	JCB High Performance 10W/30	ACEA E2:B2:A2, API CF4/SG
Grease Points(2)		JCB HP Grease JCB Special MPL-EP Grease	Lithium complex NLGI No. 2 consistency including extreme pressure additives. Lithium based NLGI No. 2 consistency including extreme pressure additives.
Wear Pad Runways		JCB Waxoyl	
Braking System - 520-40 - 524-50, 527-55	 2.0 (0.4)	JCB Light Hydraulic Fluid(3)	ISO 15

(1) This is a tank capacity. The total hydraulic system capacity depends on the equipment being used. Fill and check with all rams closed. Watch level sight glass when filling.

(2) If JCB MPL Grease is used, all 50 hour greasing operations must be carried out at TEN (10) HOUR intervals; all 500 hour greasing operations must be carried out at 50 HOUR intervals.

(3) CAUTION: DO NOT USE ORDINARY BRAKE FLUID

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520-40 (All) and 524-50, 527-55 (Up to SN 1069456)

Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	10	50	500	1000	2000
ENGINE						
Oil Level	Check	☐	☐			
Oil and Filter	Change(1)			☐	☐	☐
Engine Breather	Change					☐
Air Cleaner Dust Valve	Clean		☐	☐	☐	☐
Air Cleaner Outer Element	Change(2)				☐	☐
Air Cleaner Inner Element	Change					☐
Fuel Filter	Drain		☐	☐	☐	☐
Fuel Filter	Change			☐	☐	☐
Fuel Sedimenter	Drain and clean		☐	☐	☐	☐
Coolant Level	Check	☐	☐	☐	☐	☐
Coolant	Change					☐
Antifreeze Strength	Check			☐	☐	☐
Fan Belt Tension/Condition	Check		☐	☐	☐	☐
Fan Belt	Change				☐	☐
Valve Clearances (520-40)	Check/Adjust(3)				☐	☐
Valve Clearances (524-50, 527-55)	Check/Adjust(3)					☐
Engine and Pump Mount Security	Check			☐	☐	☐
TRANSMISSION AND AXLES						
Transfer Gearbox Oil Level	Check			☐		
Transfer Gearbox Oil	Change				☐	☐
Axles Differential Oil Level	Check(4)			☐		
Axles Differential Oil	Change				☐	☐
Hub Oil Level	Check(4)			☐		
Hub Oil	Change(5)				☐	☐
Drive Shafts and Universal Joints(6)	Security/Grease		☐	☐	☐	☐
Axle Pivots and Linkages	Grease		☐	☐	☐	☐
Axle Breathers	Check			☐	☐	☐

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How to Make the Machine Safe (Boom Lowered)

Important: *You can complete most of the maintenance procedures with the boom lowered. Unless a maintenance procedure instructs you differently, you must lower the boom.*

1 Park the machine on level, solid ground.

If necessary, refer to ***Stopping and Parking the Machine*** in the Operator Manual.

2 Retract then lower the boom.

3 Put the attachment flat on the ground.

4 Stop the engine and remove the starter key.

5 Disconnect the battery to prevent accidental operation of the engine.

6 If necessary, put chocks against the two sides of the wheels before you get below the machine.

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Battery

⚠ WARNING

Batteries give off an explosive gas. Do not smoke when handling or working on the battery. Keep the battery away from sparks and flames.

Battery electrolyte contains sulphuric acid. It can burn you if it touches your skin or eyes. Wear goggles. Handle the battery carefully to prevent spillage. Keep metallic items (watches, rings, zips etc) away from the battery terminals. Such items could short the terminals and burn you.

Set all switches in the cab to OFF before disconnecting and connecting the battery. When disconnecting the battery, take off the earth (-) lead first.

Re-charge the battery away from the machine, in a well ventilated area. Switch the charging circuit off before connecting or disconnecting the battery. When you have installed the battery in the machine, wait five minutes before connecting it up.

When reconnecting, fit the positive (+) lead first.

First Aid - Electrolyte

Do the following if electrolyte:

GETS INTO YOUR EYES

Immediately flush with water for 15 minutes, always get medical help.

IS SWALLOWED

Do not induce vomiting. Drink large quantities of water or milk. Then drink milk of magnesia, beaten egg or vegetable oil. Get medical help.

GETS ONTO YOUR SKIN

Flush with water, remove affected clothing. Cover burns with a sterile dressing then get medical help.

5-3-4-3_1

Warning Symbols

The following warning symbols may be found on the battery.

Symbol	Meaning
	Keep away from children.
	Shield eyes.
	No smoking, no naked flames, no sparks.
	Explosive Gas.
	Battery acid.
	Note operating instructions.

⚠ CAUTION

Do not disconnect the battery while the engine is running, otherwise the electrical circuits may be damaged.

INT-3-1-14

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520-40 Machines

1 Make the machine safe with the boom lowered. Refer to ***Prepare the Machine for Maintenance***.

2 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

3 Release three clips **A** and remove cover **B**.

4 Remove outer element **C**. Take care not to tap or knock the element. If necessary, remove inner element **D**.

5 Clean inside the canister **E**, cover **B** and dust valve **F**.

6 Carefully insert the new elements into the canister. Ensure they are pushed fully into their spigots. Fit cover **B** with dust valve **F** at the bottom.

7 Make sure that the wire is connected to the Air Filter Blocked switch **G**.

8 Close the engine cover.

Note: *Do not run the engine with the dust valve* ***F*** *removed.*

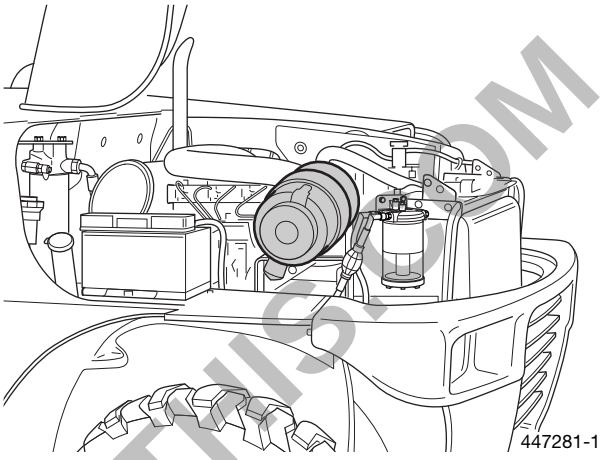


Fig 50.

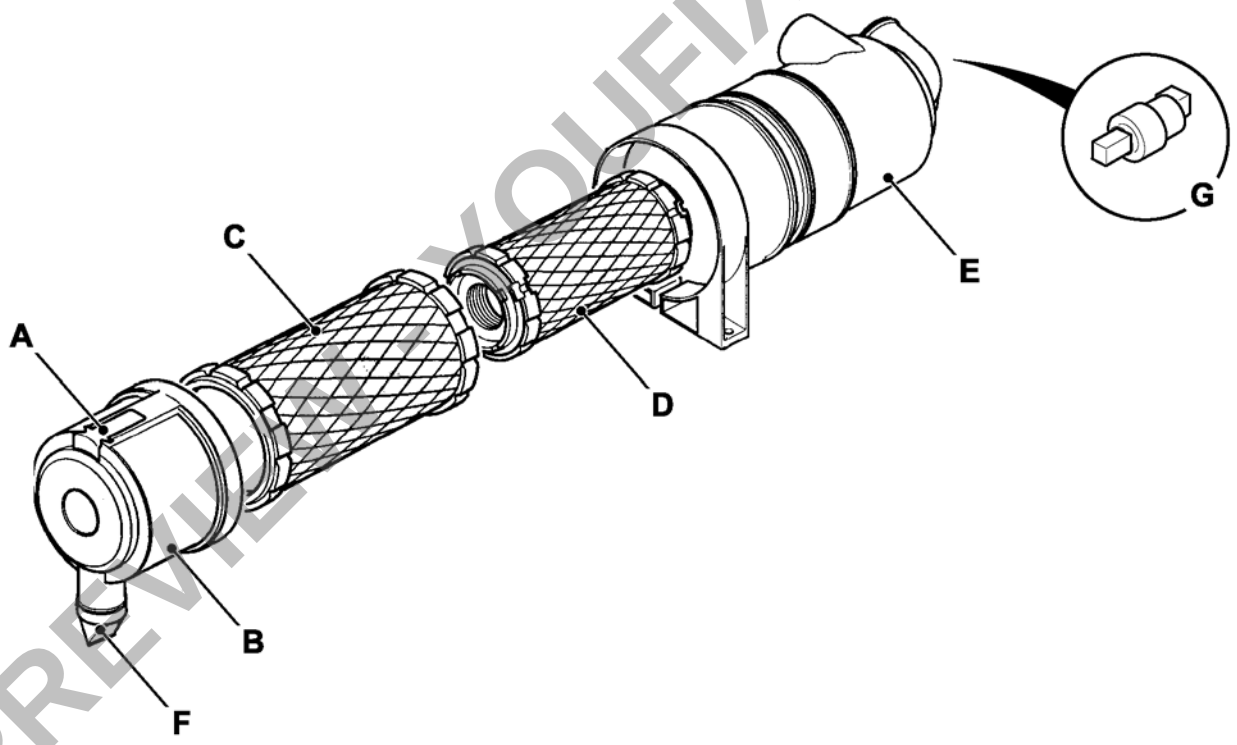


Fig 51.

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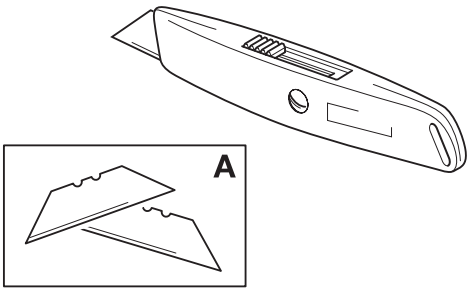


Fig 24. Craft Knife

4 Laminated glass - lift out the broken pane using glass lifters.

Toughened glass - remove the cut off sealant and all remaining particles of shattered glass.

5 If necessary, trim off the remaining old sealant to leave approximately 1 to 2 mm on the upright face of the cab frame aperture. ⇨ *Fig 25. (B-20)*

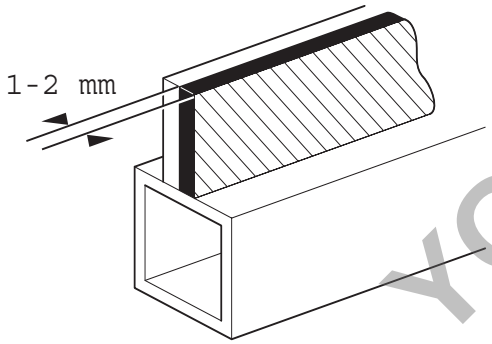


Fig 25.

6 Apply a coat of 'Black Primer 206J' to the paintwork if:

a Paintwork was damaged or scratched during the glass/sealant removal procedures.

b The old sealant was inadvertently cut back to the cab frame during the glass/sealant removal procedures.

Preparing the Cab Frame Aperture

1 If damp or wet, dry the aperture area using a hot air gun (sourced locally).

2 Use 'Active Wipe 205' to thoroughly clean and 'prime' the trimmed sealant. Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: *Do not use any other type of cleaning fluids, otherwise they may be absorbed into the old sealant and ultimately prevent the new glass from bonding.*

Preparing the New Glass

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

1 Make sure that the new glass correctly fits the frame aperture **26-A**.

a Put two spacer blocks **26-B** onto the bottom part of the frame aperture.

b Install the new glass on the spacer blocks - Always use glass lifters **26-C**. Check that there is an equal sized gap all round the edge of the glass.

Note: *The spacer blocks are rectangular in section to give two common gap widths. If necessary they can be trimmed to a smaller size to give an equal sized gap around the glass.*

Important: *The glass edges must not touch the frame, otherwise movement of the frame will chip and eventually break the newly installed glass.*

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control method also compensates for changes in resistance of the valve coil windings due to temperature and for fluctuations in the vehicle supply voltage.

Output Inhibit

Both the "extend / aux out" and the "retract / aux in" outputs are switched off during the "bulb check" period.

They will also remain off until after the first time thumbwheel is in the "neutral" position. This is to prevent valve operation if there is a thumbwheel voltage "out of range" fault or a mechanical fault that is preventing the thumbwheel from returning to the neutral position.

Current Control Algorithm

Every 250ms the current control algorithm is executed.

The required PWM value is first obtained by use of a look up table. This stores the PWM value required for a desired current for the valve being used. These values were obtained at a standard voltage and temperature. Any variations will cause a proportional error in the desired current.

To compensate for this along with other small errors, a compensation value is calculated. This is the target current divided by the actual measured current, multiplied by 128. If no compensation is required then the compensation value is 128. The compensation value is allowed to be between 64 and 255, which allows the PWM value to be between half and double the uncompensated value to achieve the target current.

First, the compensation value is set to 128 (no compensation). The next time the algorithm is executed the new compensation value is calculated. This is then subjected to a filtering algorithm, which calculates a rolling average of the last 6 compensation values. This average compensation value is then multiplied to the lookup table PWM value then divided by 128. This is the new PWM value to use. This is repeated each time the algorithm is executed,

If the target valve current is 0mA the algorithm is disabled and the compensation values is "frozen". Also, the compensation algorithm does not change the compensation value if the PWM output is already at its maximum value.

Diagnostic Output

Bulb Check

When the module is powered up, pin 4 of the ECU outputs 12v d.c. for 2.5s. This is to check operation of any lamp connected to this output.

During this "bulb check" period the valve outputs are switched off.

Continuous diagnostic monitoring commences at the end of this period.

Fault Detection

When a fault condition is detected, pin 4 of the ECU becomes a diagnostic output and the "extend / aux out" and "retract / aux in" outputs are switched off.

In this mode a blink code sequence will operate to show the detected fault conditions.

Fault Detection

Fault Detection During Power Up

When the ECU is switched on the valve outputs are switched to non-PWM mode and are switched off.

The "extend / aux out" output is then switched on for 50ms. At the end of this period the ECU output driver status line is then monitored for an open or short circuit condition. The output is then switched off. This test is repeated for the "retract / aux in" output.

The outputs are switched back to PWM mode but will remain off until the end of the bulb check period. ⇨ ***Bulb Check (C-19)***.

For any fault condition that was detected during the power up check, a blink code will be operated on the diagnostic output (pin 4).

When the blink code has completed the ECU repeats the check cycle until the fault has cleared. Normal operation is then resumed.

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Starter Motor

Removal and Replacement

Removal

1 Disconnect cables and remove battery.

2 Remove cables from main starter terminal **A** and solenoid terminal **B**.

3 Unscrew three securing nuts **C** and remove starter motor.

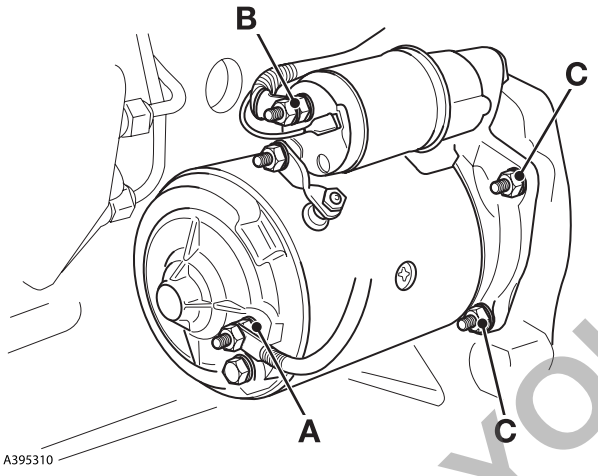


Fig 1.

Replacement

Replace by reversing the removal sequence.

Table 1. Torque Settings

Item	Nm	kgf m	lbf ft
C(1)	43	4.4	31.7

(1) Apply JCB Threadlocker and Sealer.

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Fig 50. Cab Panel 524-50, 527-55 (from SN 1418025) - Sheet 4 of 6

Sheet 3 of 6: ⇒ *Fig 49. (C-139)*

Sheet 5 of 6: ⇒ *Fig 51. (C-141)*

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Operation

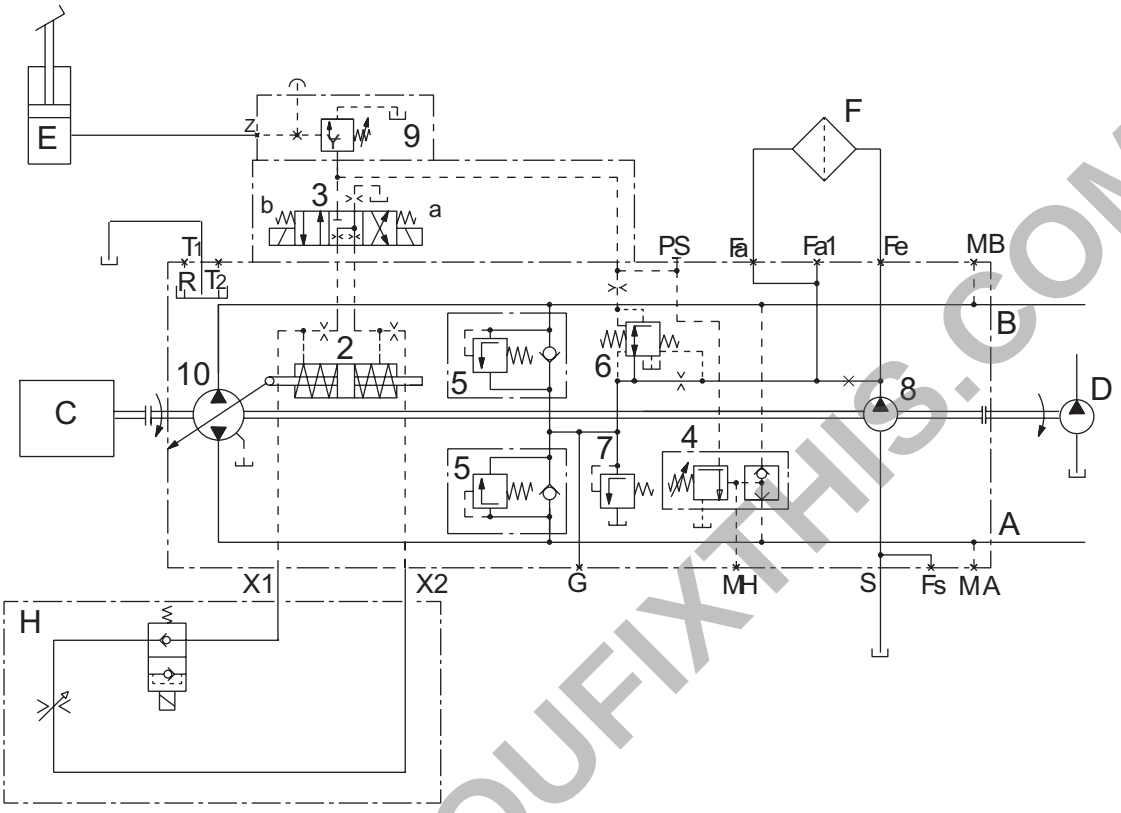


Fig 36.

The transmission pump is a variable displacement axial piston pump **10**, and associated control circuits.

Forward/reverse control is provided by a solenoid operated directional control valve (DCA) **3**, which acts on the swash angle control piston **2**. This switches the swash plate **11** in the pump from one direction to the other. Swivelling the swash plate over centre changes the direction of flow smoothly.

The swash angle is also affected by the displacement angle control valve **6**, which compensates for changes in load, e.g. 'pull down' of the engine speed due to increased load or a hydraulic service demand.

The charge pump **8** provides the control pressure for the pump operation.

The inching valve **9** uses pressure from the master brake cylinder **E** to give smooth progressive braking.

Oil flow to drive the transmission motor leaves via port A and returns via port B or vice versa, depending on the direction of drive.

Filtration is provided by an external high pressure (control pressure) filter **F**.

Case drain is from port T, via the transmission motor case drain, to tank.

Associated Components

C	Engine
D	Main services pump
E	Brake master cylinder
F	High pressure filter
H	Creep speed build option (524-50, 527-55)

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Transmission Pump

Removal and Replacement

Note: *The transmission pump and main services pump are mounted together in-line onto the engine. The main services pump can be removed on its own, see* ***Main Services Pump*** *(this section) or both pumps can be removed as one unit.*

Carry out ***General Safety*** procedures, see ***Machine Safety, Section 3***.

When disconnecting hydraulic pipework ensure that sufficient receptacles are in place to catch any leakages of hydraulic fluid.

Preparation

Park the machine on firm, level ground, lower the boom, switch off the engine and operate the hydraulic controls to vent system pressure.

Remove the seat and seat base.

Note: *Unless the hydraulic tank is drained, fluid will gush from the suction hose when it is removed.*

Removal

Note: *The following procedure details the removal of the transmission Pump and Main Hydraulic Pump Assembly*

1 Label all hydraulic hoses/pipework at the transmission pump **T**.

2 Disconnect and plug all hoses/pipework at the transmission pump. Cap open ports.

3 Disconnect and plug all hoses/pipework at the main services pump **M**. Cap open ports.

4 Disconnect the electrical connections at the transmission pump.

5 Attach suitable lifting equipment to the pump set.

6 Remove the 2 bolts **F** securing the pump set to the casing of the pump/engine coupling.

7 Withdraw the pump assembly horizontally until the inner coupling is clear before lifting out.

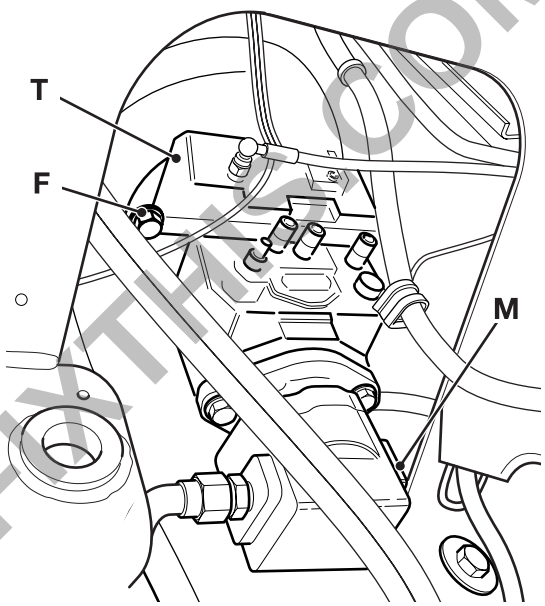


Fig 81.

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Wheel Hub Bearing Removal

Careless removal of the wheel bearing can cause damage to the bearing and seal shoulders. This can result in excessive pre-load on the wheel bearings, or hub oil leaks from scoring under the inner diameter of the seal as shown at **A**.

The following procedures should be used to prevent damage to the hub swivel and axle-arm wheel bearing/seal shoulders during an axle repair.

Any of the following procedures may be used to remove the inner wheel bearing from the hub swivel as an alternative to using a cold chisel behind the bearing.

1 Remove the bearing using a bearing puller. ⇒ *Fig 23. (F-26)*.

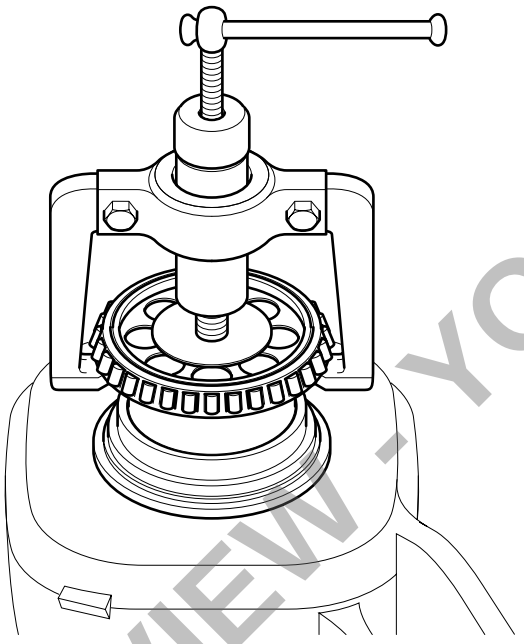


Fig 23.

2 Cut-off the bearing cage to expose the cone. Use heat expansion by applying a seam of weld around the bearing cone to allow to cool. Remove the bearing carefully using a cold chisel. ⇒ *Fig 24. (F-26)*.

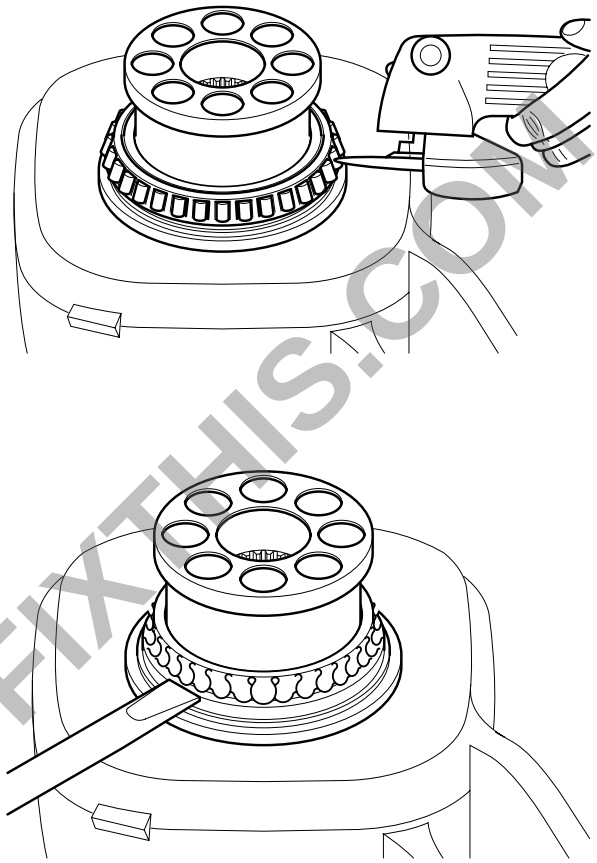


Fig 24.

3 Wear eye protection when using an angle grinder. Grind a diagonal channel into the side of the bearing race using an angle grinder as shown (do not grind completely through). ⇒ *Fig 25. (F-27)*. Split the care and remove the bearing carefully using a cold chisel.

Remove any burrs or scoring. Make sure all bearing and seal surfaces are smooth before assembling the hub.

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Electrical Circuits

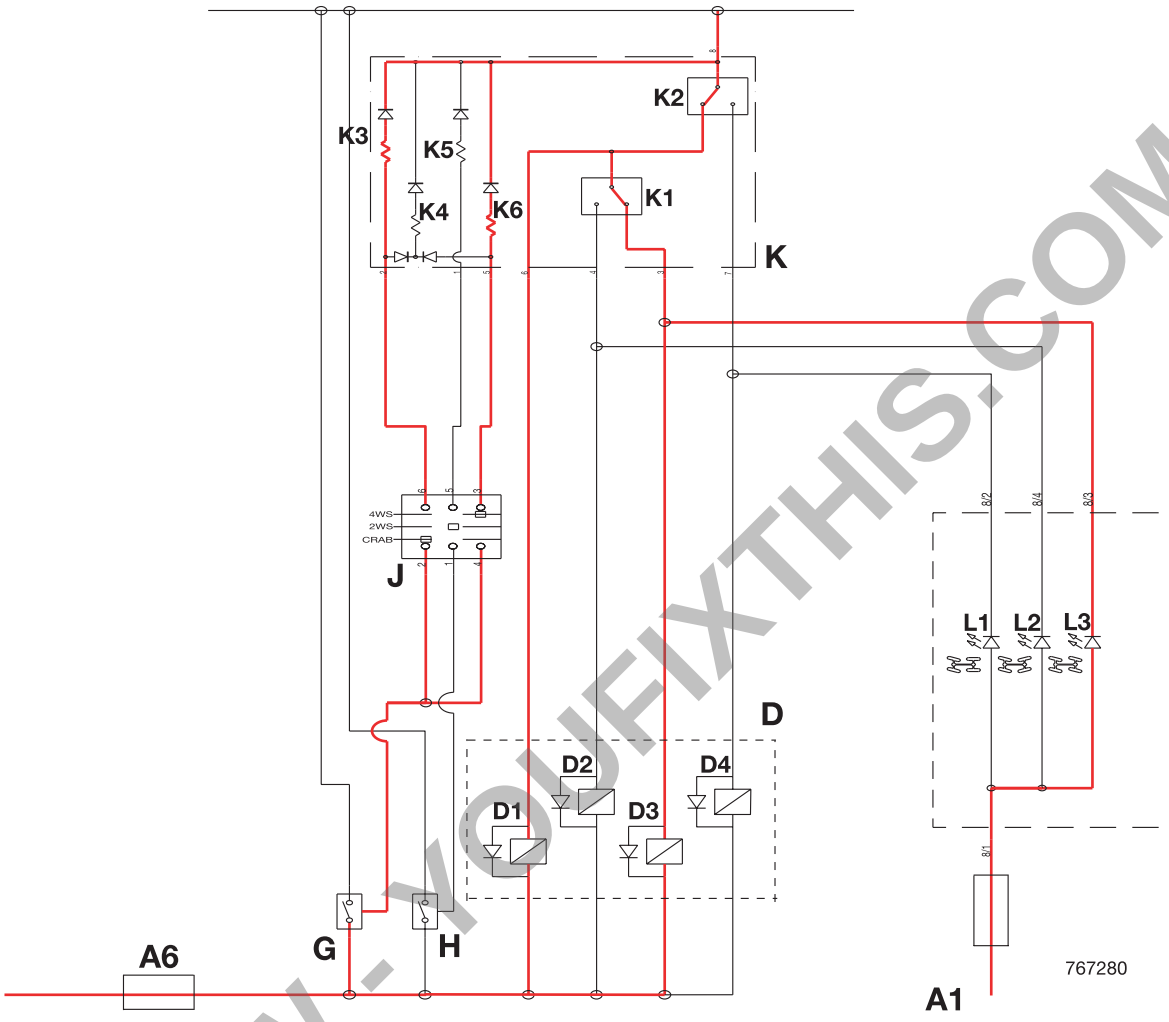


Fig 8.

With the front axle in the straight ahead position and selector switch **J** in the crab steer position, current flows from fuse **A6** through the front axle proximity switch G, then selector switch **J**, to energise relays **K3** and **K6**. Relay switches **K1** and **K2** contacts move to the positions shown. Current flows to energise solenoid **D3**, going to earth through relay switches **K1** and **K2**. Current also energises solenoid **D1**, going to earth through relay switch **K2**. Current flows from fuse **A1** and illuminates the crab steer LED **L3**, going to earth through relay switches **K1** and **K2**.

If the front axle is not in the straight ahead position when crab steer is selected, the system remains in 2 or 4-wheel steer until the front axle is in the straight ahead position when the front axle proximity switch **G** is activated. The sequence is then as described in the first paragraph.

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