Service Manual

Rear Engine Loadalls

Section 1 - General Information

Section 2 - Care and Safety

Section 3 - Routine Maintenance

Section A - Attachments

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Steering

Section K - Engine



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Contents **Page No.**

Introduction
About This Manual ..... 1 - 1
Machine Model and Serial Number ..... 1 - 1
Using the Service Manual ..... 1 - 1
Units of Measurement ..... 1 - 1
Section Numbering ..... 1 - 1
Left Side, Right Side ..... 1 - 2
Cross References ..... 1 - 2
Identifying Your Machine ..... 1 - 3
Machine Identification Plate ..... 1 - 3
Component Identification Plates ..... 1 - 5

Standard Torque Settings
Zinc Plated Fasteners and Dacromet Fasteners ..... 1 - 8
Introduction ..... 1 - 8
Bolts and Screws ..... 1 - 8
Hydraulic Connections ..... 1 - 12
'O' Ring Face Seal System ..... 1 - 12
'Torque Stop' Hose System ..... 1 - 15

Service Tools
Numerical List ..... 1 - 16
Tool Detail Reference ..... 1 - 19
Section B - Frame and Bodywork ..... 1 - 19
Section C - Electrics ..... 1 - 23
Section E - Hydraulics ..... 1 - 24
Section F - Transmission ..... 1 - 30
Section H - Steering ..... 1 - 32
Section K - Engine ..... 1 - 33

Service Consumables
Sealing and Retaining Compounds ..... 1 - 34

Terms and Definitions
Colour Coding ..... 1 - 35
Hydraulic Schematic Colour Codes ..... 1 - 35

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Identifying Your Machine

Machine Identification Plate

Your machine has an identification plate mounted as shown. ⇒ *Fig 2. (1-3)*. The serial numbers of the machine and its major units are stamped on the plate.

Note: *The machine model and build specification is indicated by the VIN (earlier machines) or PIN (later machines). A detailed description of the VIN/PIN numbering system is included later in this section.*

The serial number of each major unit is also stamped on the unit itself. If a major unit is replaced by a new one, the serial number on the identification plate will be wrong. Either stamp the new number of the unit on the identification plate, or simply stamp out the old number. This will prevent the wrong unit number being quoted when replacement parts are ordered.

The machine and engine serial numbers can help identify exactly the type of equipment you have.

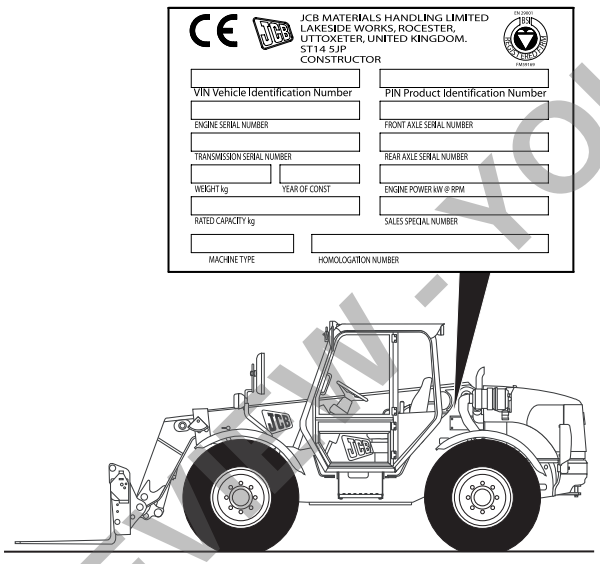
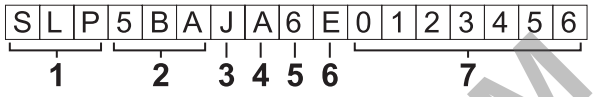


Fig 2.

Typical Vehicle Identification Number (VIN)



T011101-2

1 World Manufacturer Identification (3 Digits)

2 Machine Model (3 Digits)

5BA = 526
5BB = 528-70
5BC = 526 USA
5BD = 528S

3 Engine Type (1 Digit)

JCB Dieselmax:
J = SA Build
K = SB Build
L = SC Build

4 Gearbox Model (1 Digit)

A = 3 Speed
B = 5 Speed
C = 4 Speed

5 Year of Manufacture (1 Digit)

5 = 2005
6 = 2006
7 = 2007

6 Manufacturer Location (1 Digit)

E = England

7 Machine Serial Number (7 Digits)

Each machine has a unique serial number.

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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**
320/20050	Lifting Bracket Kit	**K**
460/15708	Flow Test Adapter	**F**
4104/1310	Hand Cleaner	**B**
892/00011	Spool Clamp	**E**
892/00041	De-glazing Tool	**K**
892/00137	Micro-Bore Hose	**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**
892/00273	Adapter	**E**
892/00274	Adapter	**E**

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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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Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	10	50	100(1)	500	1000	2000	6000
ENGINE								
Coolant Quality and Level	- Check	☐	☐	☐	☐	☐		
Cooling System	- Drain and Refill						☐	☐
Oil level	- Check	☐	☐					
Oil and Filter(2)(3)	- Change				☐	☐	☐	☐
Air Cleaner Dust Valve(4)	- Change				☐	☐	☐	☐
Air Cleaner Outer Element(4)	- Change				☐	☐	☐	☐
Air Cleaner Inner Element	- Change						☐	☐
Pre-Cleaner (if fitted)	- Check			☐				
Water Seperator and Engine Fuel Filter	- Drain		☐	☐	☐	☐	☐	☐
Water Seperator Fuel Filter(5)	- Change				☐	☐	☐	☐
Engine Fuel Filter(5)	- Change					☐	☐	☐
Front End Accessory Drive (FEAD) Belt Condition	- Check				☐	☐	☐	☐
Front End Accessory Drive (FEAD)	- Change							☐
Engine Mounting Bolts for Tightness	- Check			☐	☐	☐	☐	☐
All Hoses - Condition	- Check			☐	☐	☐	☐	☐
Radiator(4)	- Clean				☐	☐	☐	☐
Breather Gauze	- Clean						☐	☐
Valve Clearances(6)	- Check and Adjust						☐	☐
Oil Filler and Dipstick Seals	- Check and Adjust						☐	☐
Rocker Cover and Injector Seals(6)	- Change						☐	☐
Injectors(6)	- Change							☐
Injector(s) Leak Off Rail(6)	- Change							☐
High Pressure Fuel Lines(6)	- Inspect							☐
TRANSMISSION, AXLES AND STEERING								
Transmission Mount Security	- Check			☐				
Transmission Oil Level	- Check	☐	☐	☐	☐			
Transmission Oil(7)	- Change					☐	☐	☐
Transmission Oil Filter	- Change			☐	☐	☐	☐	☐
Axle Mount Security	- Check			☐				
Axle(s) Oil Level	- Check		☐	☐				
Axle(s) Oil	- Change				☐	☐	☐	☐
Hub Oil Level (Without Oil Immersed Brakes)	- Check			☐				
Hub Oil (Without Oil Immersed Brakes)(8)	- Change					☐	☐	☐
Hub Oil (With Oil Immersed Brakes)(8)	- Change			☐	☐	☐	☐	☐

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Fluids, Lubricants and Capacities

Table 1.

ITEM	CAPACITY Litres (Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel Tank	160 (35.2)	Diesel Oil	⇨ *Types of Fuel (3-41)*
Engine (Oil)		JCB Extreme Performance -15°C to 50°C (-5°F to 122°F)(1)	SAE15W/40, ACEA E5/B3/A3, API CH-4/SG
		JCB High Performance -20°C to 40°C (-4°F to 104°F)(1)	SAE10W/30, ACEA E2/B2/A2, API CF-4/SJ
- MIN	12 (2.64)		
- MAX	15 (3.3)		
Engine (Coolant)	20 (4.4)	JCB High Performance Antifreeze and Inhibitor/Water. ⇨ *Coolant Mixtures (3-12)*.	ASTM D6210
Transmission (Syncro Shuttle and Powershift)	17 (3.7)	JCB Extreme Performance Transmission Fluid(2)	
		-32°C to 40°C (-25°F to 104°F)	10W, EL4117
		-5°C to 40°C (-25°F to 104°F)	SAE30, EL4118
Front Axle			
Housing	9 (1.98)	JCB Special Gear Fluid Plus	API-GL-4(3)
Hubs (x2)	2 (0.44)		
Rear Axle			
Housing	8.4 (1.85)	JCB Gear Oil HP 90	API-GL-5
Hubs (x2)	2 (0.44)		
Brake System		JCB Light Hydraulic Fluid(4)	ISO VG15
Hydraulic Tank	110 (24.2)(5)	JCB High Performance Hydraulic Oil	
		- Above 100 °F, 38 °C	ISO VG46
		- Below 100 °F, 38 °C	ISO VG32
Grease Points		JCB Special HP or MPL-EP Grease(6)	Lithium based, No. 2 consistency(7)
Wear Pad Runways		JCB Waxoyl	
Boom Hoses		JCB Special Slide Lubricant	

(1) !CAUTION: Do not use ordinary engine oil.
(2) Friction modified oils must not be used (eg Dexron ATF type).
(3) Must be suitable for use with oil immersed brakes and limited slip differentials (LSD).
(4) !CAUTION: Do not use ordinary brake fluid.
(5) This is nominal tank capacity. The total hydraulic system capacity depends on the equipment being used. Fill with all cylinders closed. Watch level sight glass when filling.
(6) JCB HP Grease is the recommended specification grease, if using JCB Special MPL-EP Grease then the greasing must be carried out more frequently.
(7) Includes extreme performance additives.

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Component Identification Plates

Typical Engine Identification Number

T1-005_2

Engine data labels **A** are located on the cylinder block at position **C** and rocker cover **D** (if fitted). ⇒ *Fig 3. (1-5)*. The data label contains important engine information and includes the engine identification number **E**.

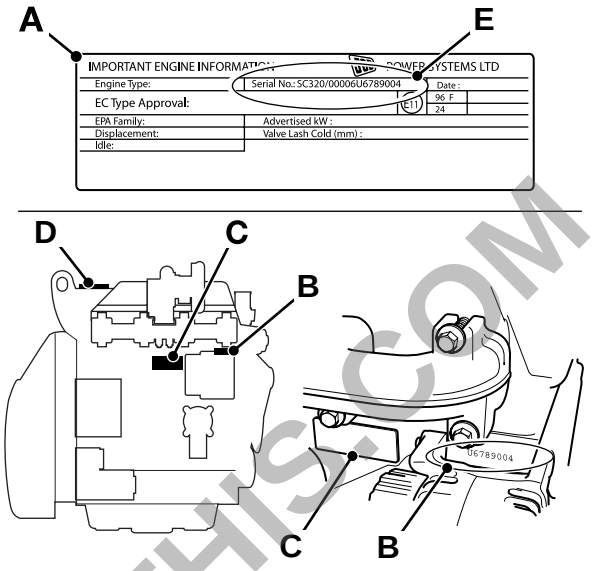


Fig 3. Engine

A typical engine identification number is explained as follows:

SA	320/40001	U	00001	04
1	2	3	4	5

1 Engine Type

S = 4.4 litre series.

A = Naturally aspirated.

B = Turbocharged.

C = Turbocharged and intercooled.

E = Electronic common rail fuel injection.

2 Engine part number

3 Country of manufacture

U = United Kingdom

4 Engine Serial Number

5 Year of Manufacture

The last three parts of the engine identification number are stamped on the cylinder block at position **B**.

U	00001	04

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Fault Finding

Air Conditioning (Option)

General Fault Indications

The system will not function in very low ambient temperatures, therefore tests should be carried out in a warm environment.

It is recommended that, to locate faults on the system accurately and quickly, an electronic leak detector and a refrigerant pressure gauge should be used. However, leaks can be detected on the system by using soapy water applied to the suspected leak area. The following sections of the manual deal with the major components of the air conditioning systems and give further fault finding and maintenance information.

There are several indications that may help to determine the fault area on a system not working efficiently:

For details of the electrical circuit and connections, see ***Electrical Connections***.

Fault(s)

⇨ *Table 1. Poor performance (B-12)*
⇨ *Table 2. Warm or slightly cool air emitted from unit (B-12)*
⇨ *Table 3. Blower operates on fan speed 2 only (B-12)*
⇨ *Table 4. Blower does not operate (B-12)*
⇨ *Table 5. Compressor clutch continually cuts out (B-13)*
⇨ *Table 6. No air conditioning (B-13)*

Table 1. Poor performance

Possible Cause	Action
Low system pressure.	Discharge and recharge the system.
Condenser matrix air flow restricted.	Remove debris from matrix using compressed air.
Air filter blocked.	Clean with detergent and water.
Compressor drive belt too slack.	Check condition of front end accessory drive belt (FEAD) and auto tensioner mechanism.

Table 2. Warm or slightly cool air emitted from unit

Possible Cause	Action
Expansion valve stuck open or closed.	Renew expansion valve.

Table 3. Blower operates on fan speed 2 only

Possible Cause	Action
Blower resistor failed.	Renew resistor.
Blower motor failed.	Renew complete blower motor unit.

Table 4. Blower does not operate

Possible Cause	Action
Fuse blown.	Replace fuse and re-test.

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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 **15-A**.

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

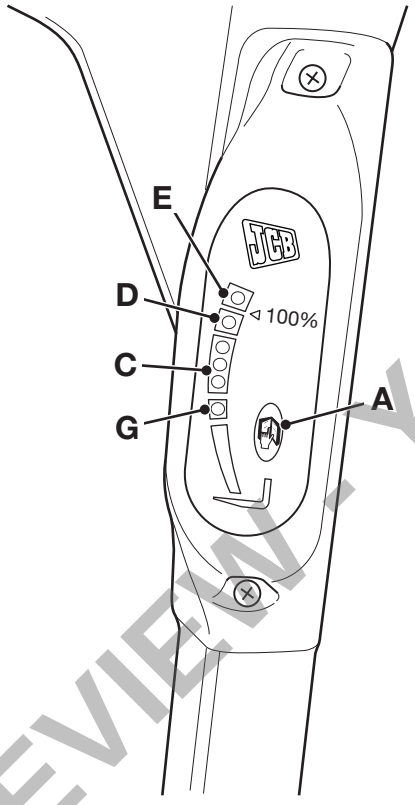


Fig 15. Typical Indicator Display Box

⚠ 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, see* ***Service Procedures****.*

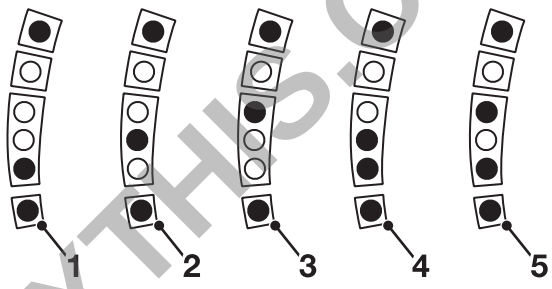


Fig 16. System Fault Codes

Fault Code	Description
1	⇨ *Table 18. Transducer signal fault (B-22)*
2	⇨ *Table 19. Calibration out of range (B-22)*
3	⇨ *Table 20. Calibration required (B-22)*
4	⇨ *Table 21. Indicator display box faulty (B-22)*
5	⇨ *Table 22. Low battery voltage (B-22)*

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-25)*.

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Fitting Procedure

1 Drill a hole in the machine body/framework where the rivet nut is to be fitted. De-burr hole edges.

2 Screw the rivet nut onto the mandrel of the installation tool. The bottom of the mandrel should be in line with the bottom of the rivet nut **30-A**.

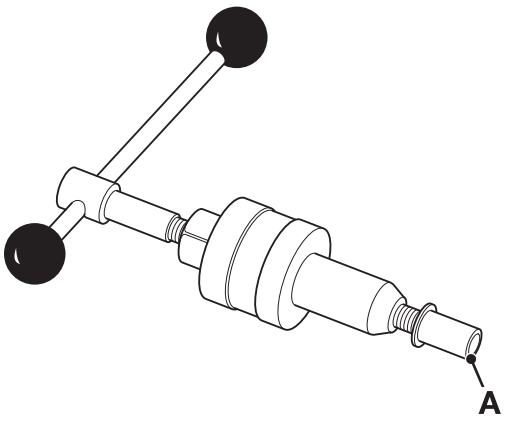


Fig 30.

3 Wind the body of the installation tool down the threaded mandrel until it touches the head of the rivet nut **31-B**.

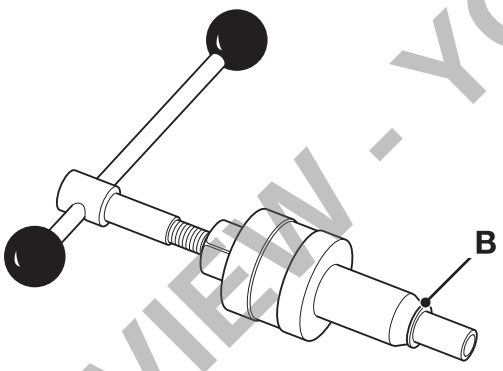


Fig 31.

4 Insert the rivet nut (assembled to the tool) into the hole drilled in step 1.

5 Hold handle **32-C** and at the same time draw the mandrel into the installation tool by turning nut **32-D**. The rivet nut will contract in length and form an 'upset' (smooth bulge) seating itself against the body/framework **32-E**.

Note: *The thread of the rivet nut must not be stripped, take care when 'upsetting' the rivet nut.*

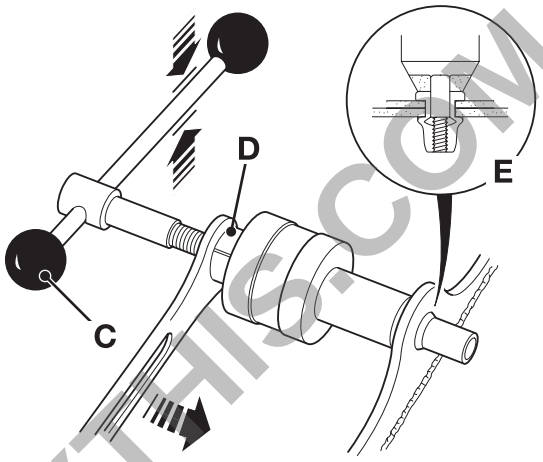


Fig 32.

6 Remove the installation tool.

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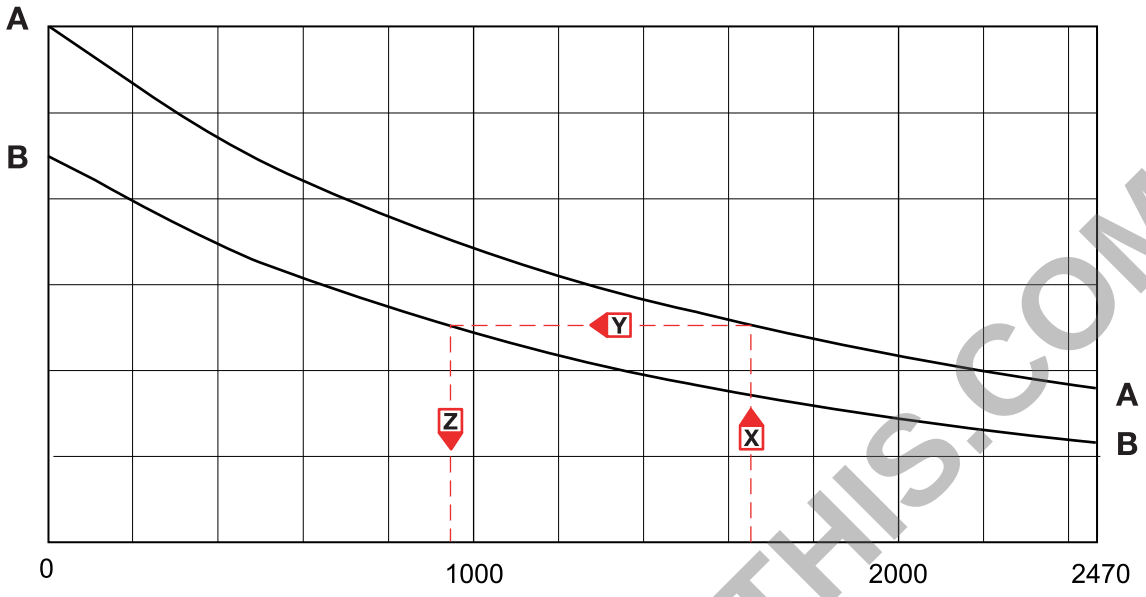


Fig 56. Example Calibration Chart

7 Using the calibration chart, mark the distance the boom is extended (ie. the extension figure measured at step 6) on the horizontal scale.

a Read vertically from the extension figure (example line **X**) to the 'Tipping Line' **AA**.

Note: *For this example refer to the example calibration chart. When calibrating a machine, first identify the correct calibration chart for the machine concerned.* ⇨ *Calibration Charts (B-52)*.

b Read horizontally (example line **Y**) to the 'Maximum Working Limit Line' **BB**.

c Read down to the horizontal scale (example line **Z**) to obtain the dimension for the boom extension **'Maximum Working Limit'**.

8 Draw a mark on the boom at the dimension obtained from the calibration chart. Raise and retract the boom to the mark drawn on the boom.

9 Press and release the button **55-A**. The display unit will revert to normal operation. The setting of the 100% point is now complete.

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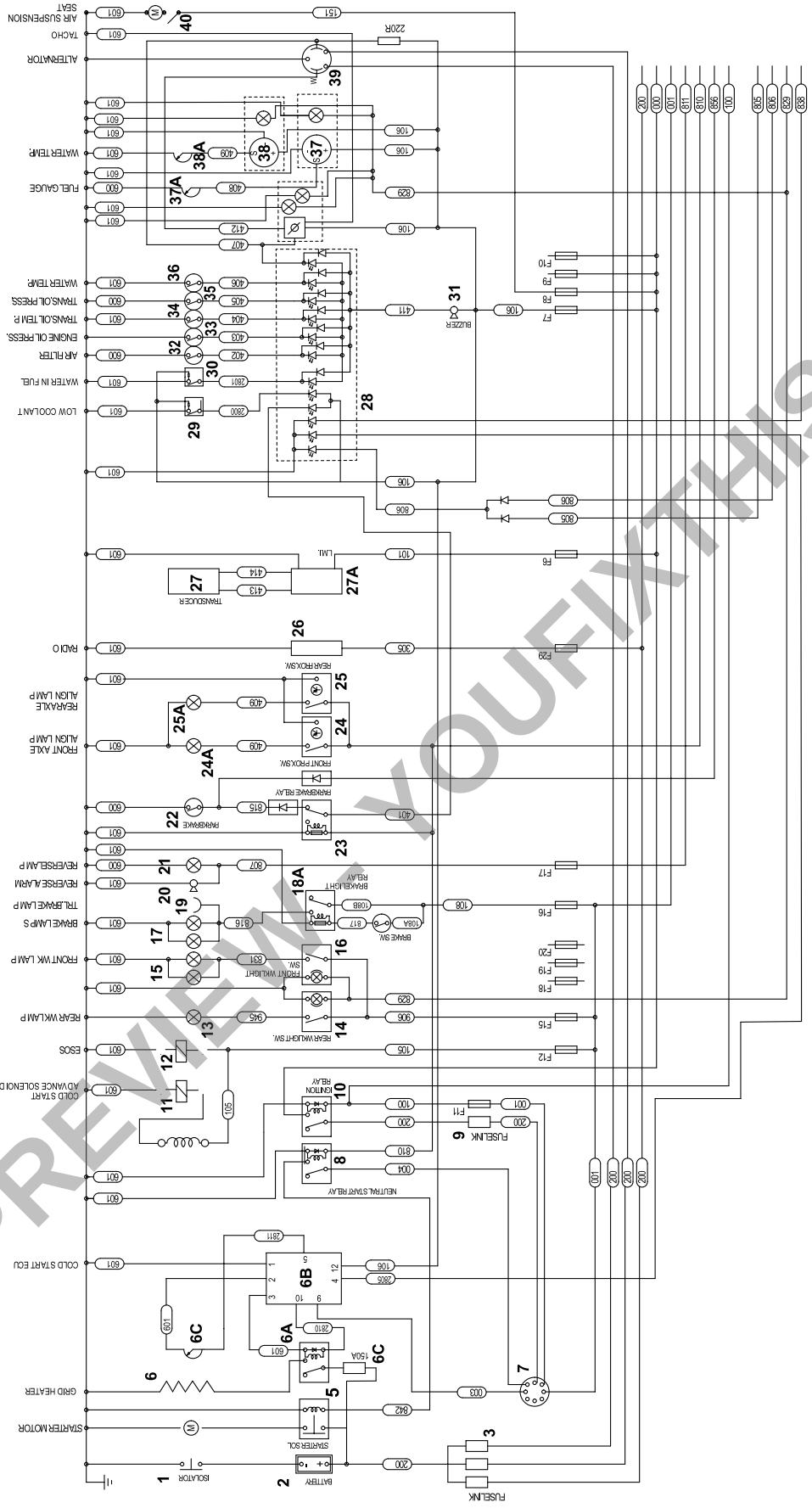


Fig 6.

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Panel/Cab - CAD 721/11875 Issue 4

⇒ *Fig 44. (C-49)*

Key to Connectors:

DL	Temperature Gauge Illumination
DM	Temperature Gauge
DN	Fuel Gauge
DP	Fuel Gauge Illumination
DR	Tachometer
DS	Tachometer Illumination
DT	Tachometer Illumination
PA	Headlight - LH
PB	Air Conditioning Relay
	Side Lights Relay
PC	Spare
	Park Brake Relay
PD	Transmission Dump Relay
	Auxiliary C/O Relay
PE	Reverse Relay
	Forward Relay
PH	Brake Lights Relay
	Spare
PJ 1	Interior Light +Ve
PJ 2	Interior Light -Ve
PK	Rear Wiper
PL	Park Brake Switch
PM	Washer Pump
PP	Foot Brake Switch
PR	Diode Gate (Transmission Dump)
PS	Front Wiper
PT	Column Switch - LH
PX	Column Switch - RH
PZ	Chassis Harness Connector
RA	Chassis Harness Connector
RB	Heater
RC 1	Ignition Switch
RC 2	Ignition Switch
RD	Warning Lights
RF	LMI Transducer
RG	Work Lights - LH
RH	Roof Wiper
RJ	Work Lights - RH
RM	Face Level Fan
RN	Radio
RP	Warning Buzzer
RQ	Neutral Start Relay
RR	Ignition Relay
RS	Direction Indicators Relay
RT	Fuse Box `A'
RU	Fuse Box `B'
RV	Fuse Box `C'
RW	Rear Work Light
RX	Seat - Air Suspension
RY	Immobiliser
RZ 1	Dallas Key
RZ 2	Dallas Key Ground
TA	Headlights Switch
TB	Work Lights Switch
TC	Beacon Switch
TD	Roof Wiper Switch
TE	Hazard Warning Switch
TF	Heater Blower Switch
TG	Air Conditioning Switch
TH	Trailer Hitch Switch
TJ	Rear Wheels Aligned Lamp
TK	Front Wheels Aligned Lamp
TL	Loader Lever Isolation Switch
TM	Trailer Indicator lamp
TN	Rear Work Light Switch
TP	Fog Light Switch
TR	Ground
TS	Immobiliser link
TT	Diode Gate (Indicator)

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Basic Operation

Component Location and Neutral Circuit Description

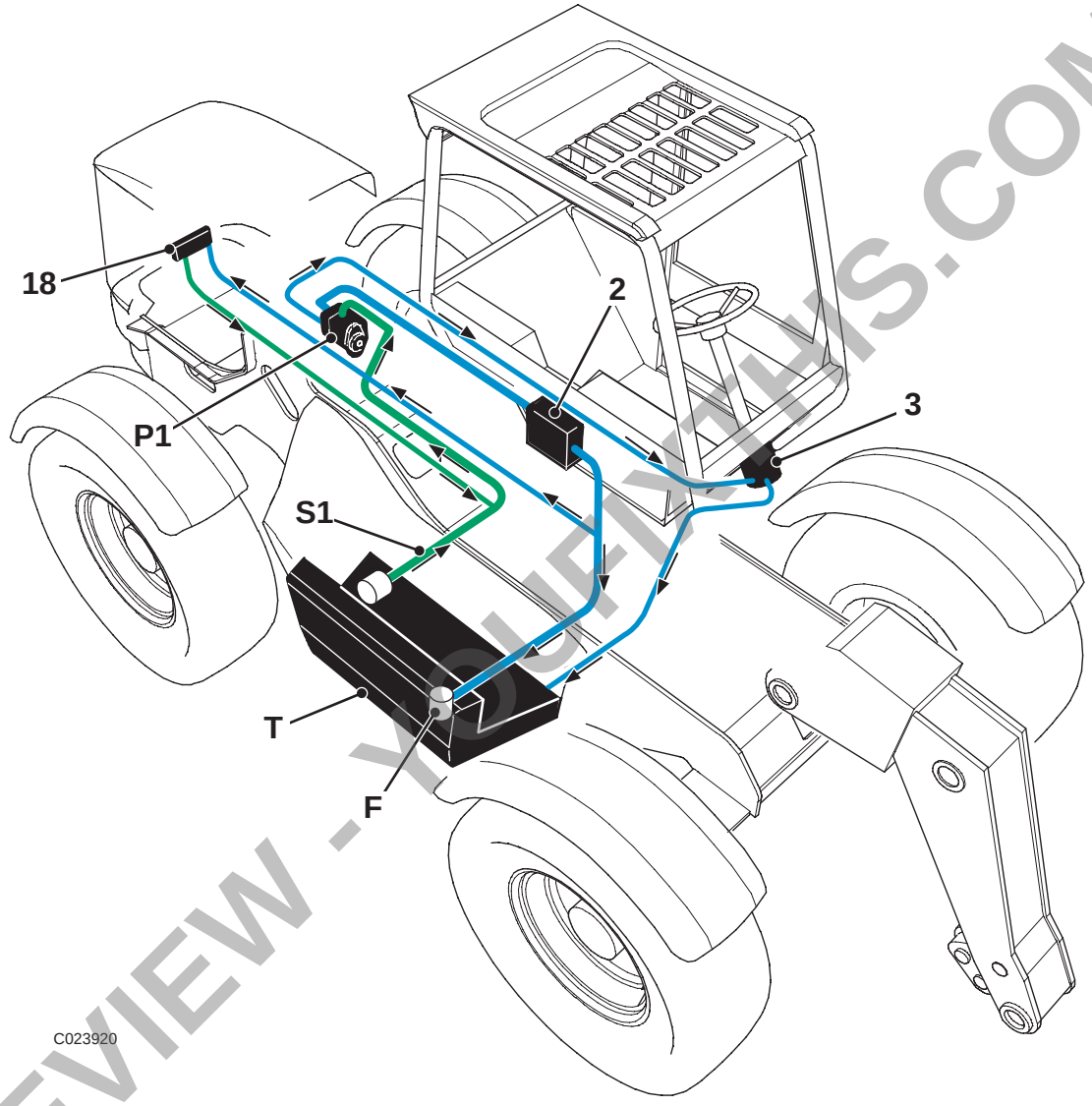


Fig 5. Typical Machine

Oil is drawn from tank **5-T** by engine driven pump **5-P1** via suction line **5-S1**. Pump **5-P1** has an integral priority valve which always gives priority demand to the steer circuit.

With the steering in the straight ahead position pump **5-P1** delivers oil to the control valve block **5-2**. In neutral circuit conditions (no service selected), the oil flows through the valve block, past the M.R.V. into the return or exhaust line and back to tank **5-T** via filter **5-F**.

On some machine variants an oil cooler **5-18** is fitted in the return line.

The steer circuit is fed via the integral priority valve in pump **5-P1** and delivers oil to the steering unit **5-3**. This controls oil flow and pressure in the system and exhausts surplus oil back to tank **5-T** via filter **5-F**.

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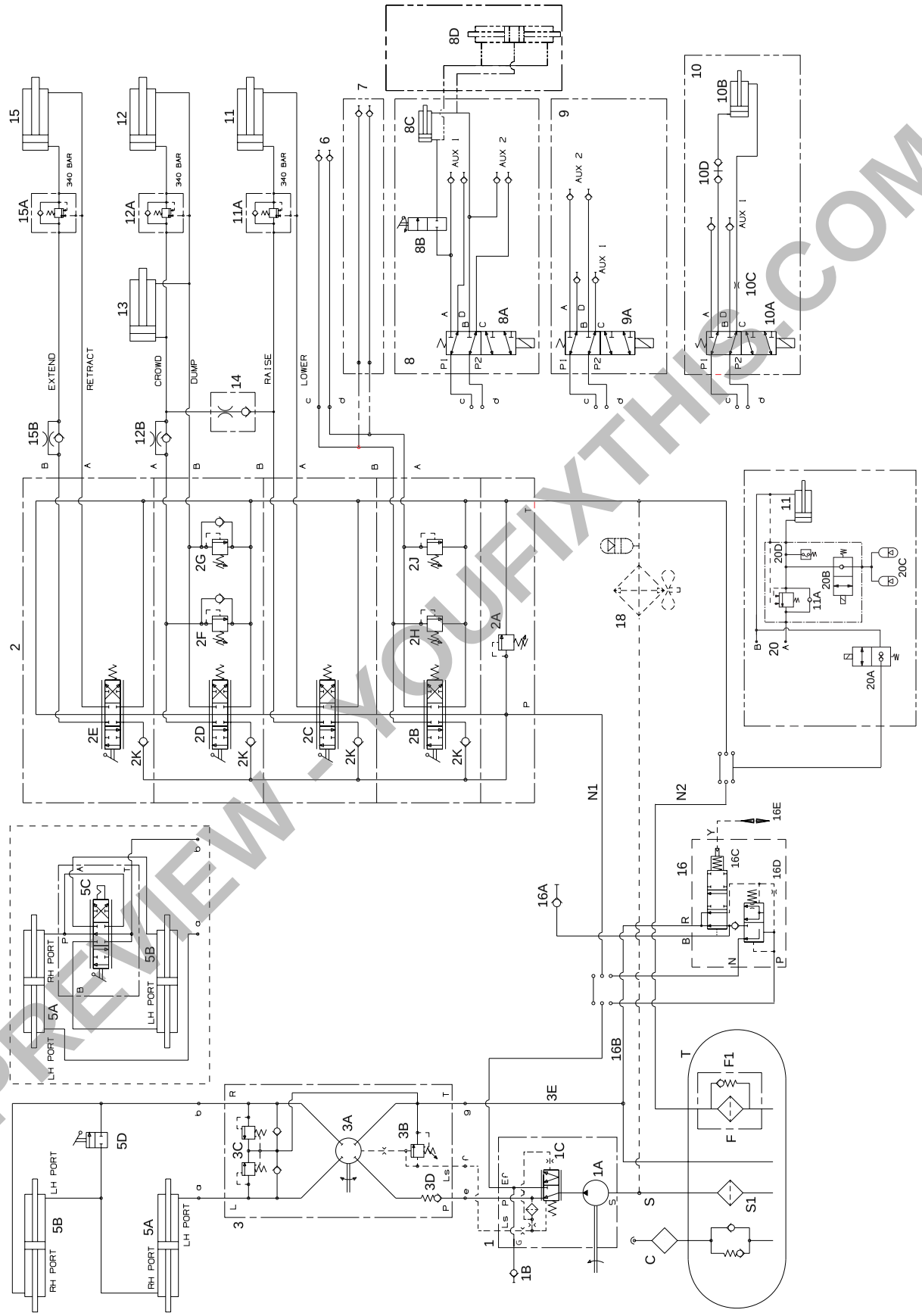


Fig 13. Machines with Dual Lever Controls (Sheet 1 of 1)

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Normally Functioning Air Conditioning System

Normal gauge readings will depend on system components and ambient conditions. ⇨ *Table 7. Normally Functioning Air Conditioning System Gauge Readings (B-15)*.

Make sure that the valves are closed and the readings are stable and that the system has a full charge.

Table 7. Normally Functioning Air Conditioning System Gauge Readings

Ambient Temp °C (°F)	Relative Humidity %	Suction Pressure (Low Side)	Discharge Pressure (High Side)	Vent Temp °C (°F)
18 (64.4)	55	1.32 bar (1.34 kgf cm²)(19 lbf in²)	8.76 bar (9 kgf cm²)(127 lbf in²)	8 (46.4)
25 (77)	55	1.53 bar (1.56 kgf cm²)(22 lbf in²)	10.8 bar (11 kgf cm²)(156.6 lbf in²)	8.8 (47.8)
32 (89.6)	55	1.3 bar (1.33 kgf cm²)(18.6 lbf in²)	13.5 bar (13.77 kgf cm²)(195.8 lbf in²)	3.6 (38.5)
38 (100.4)	40	1.5 bar (1.53 kgf cm²)(21.75 lbf in²)	16.3 bar (16.6 kgf cm²)(236.4 lbf in²)	5.6 (42)
46 (114.8)	28	1.9 bar (1.94 kgf cm²)(27.56 lbf in²)	19.8 bar (20.19 kgf cm²)(287.2 lbf in²)	11.9 (53.4)

Example - The pressures on the manifold at 25 °C and 55% relative humidity with the engine at 1500 rpm, the blower on maximum, the heater turned off with the door closed and 10 minutes allowed for stabilisation, should be approximately:

Table 8. Gauge Readings

Gauge	Pressure
Low Side **LS**	Normal: 1.53 bar (1.56 kgf/cm²) (22.2 lbf/in²)
High Side **HS**	Normal: 10.8 bar (11 kgf/cm²) (156.6 lbf/in²)

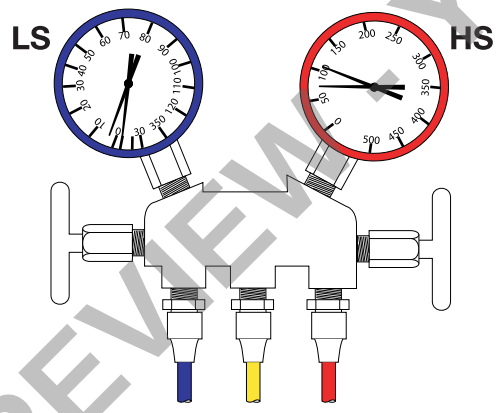


Fig 6.

Typically, the high pressure is 6 - 8 times the low pressure.

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Boom

Wear Pad Renewal

Note: *The boom extension ram must be removed to gain access to the rear wear pads, see* ***Section E, Hydraulics****.*

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

Shims are fitted under the pads for adjustment of boom clearance, and when new pads are fitted, to restore correct boom clearance.

Renew the wear pads when, or before they are worn down to depth of chamfer as shown at **59-A**.

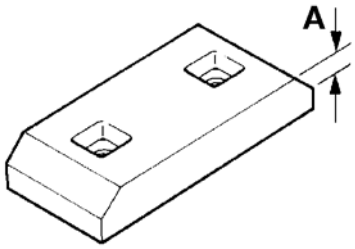


Fig 59.

Front Wear Pads

Make a note of the total thickness of shims and the number of washers used in each location, so that the same size shims and number of washers can be refitted.

1 Raise boom slightly so that the tool carrier is just off the ground.

2 Remove the upper wear pads **60-4** and side wear pads **60-5**.

3 Rest the tool carrier on the ground so that there is no weight on the front lower wear pads.

4 Place wedges under the inner boom before removing the lower wear pads **60-6**.

5 Fit new wear pads **60-6**, fit spring washer **60-2**, existing washers **60-2A** and shims **60-3**. Remove wedges.

6 Raise boom slightly so that the tool carrier is just off the ground.

7 Fit new wear pads **60-4** and **60-5**, fit spring washer **60-2**, existing washers **60-2A** and shims **60-3**.

Rear Wear Pads

Make a note of the total thickness of shims and the number of washers used in each location, so that the same size shims and number of washers can be refitted.

1 Remove the extension ram, see ***Section E, Hydraulics***.

2 Rest the tool carrier on the ground so that there is no weight on the upper wear pads.

3 Remove the upper wear pads **60-7** and **60-8** and side wear pads **60-9**.

4 Raise boom slightly so that the tool carrier is just off the ground.

5 Place wedges under the inner boom before removing the lower wear pads **60-9**.

6 Fit new wear pads **60-9**, fit spring washer **60-2**, existing washers **60-2A** and shims **60-3**. Remove wedges.

7 Rest the tool carrier on the ground so that there is no weight on the upper wear pads.

8 Fit new wear pads **60-7**, **60-8** and **60-9**, fit spring washer **60-2**, existing washers **60-2A** and shims **60-3**.

Note: *The top rear wear pads* ***60-7*** *and* ***60-8*** *are handed left and right, make sure the wear pads are fitted in their correct positions.*

Clearance Measurments

1 Check the front and rear wear pad clearance which should not exceed a total of 1.5 mm (0.05 in) form side to side or top to bottom.

Add or remove shims as required. Divide the number of shims required equally between top and bottom

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Front End Accessory Drive Belt

The front end accessory drive belt (FEAD) drives the alternator, water pump and the air conditioning compressor (if fitted).

The belt is automatically kept in tension so will not need to be adjusted.

Inspecting the Drive Belt

At the recommended service interval, visually inspect the belt for damage.

⚠ WARNING

Make sure the engine cannot be started. Disconnect the battery before doing this job.

2-3-3-5

⚠ WARNING

Turning the Engine

Do not try to turn the engine by pulling the fan or fan belt. This could cause injury or premature component failure.

0094

1 Park the machine on firm level ground, engage the park brake and set the transmission to neutral. Lower the attachments to the ground, switch OFF the engine and remove the starter key.

2 Raise the engine cover. ⇨ *Engine Cover (3-28)*.

3 Disconnect the battery to prevent the engine from being started.

4 Inspect the belt for cracks **A**, fraying **B** or missing pieces **C**. ⇨ *Fig 34. (3-39)*. Fit a new belt as required.

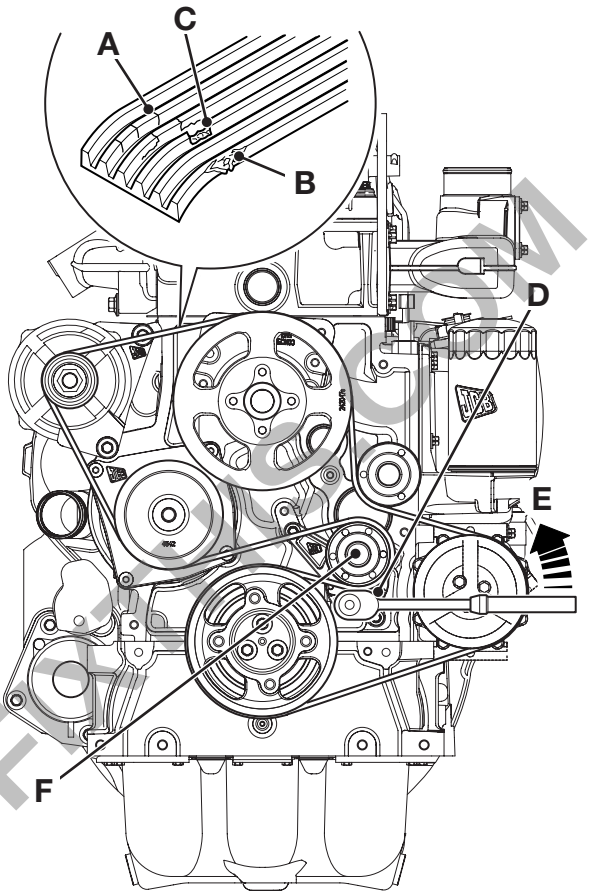


Fig 34.

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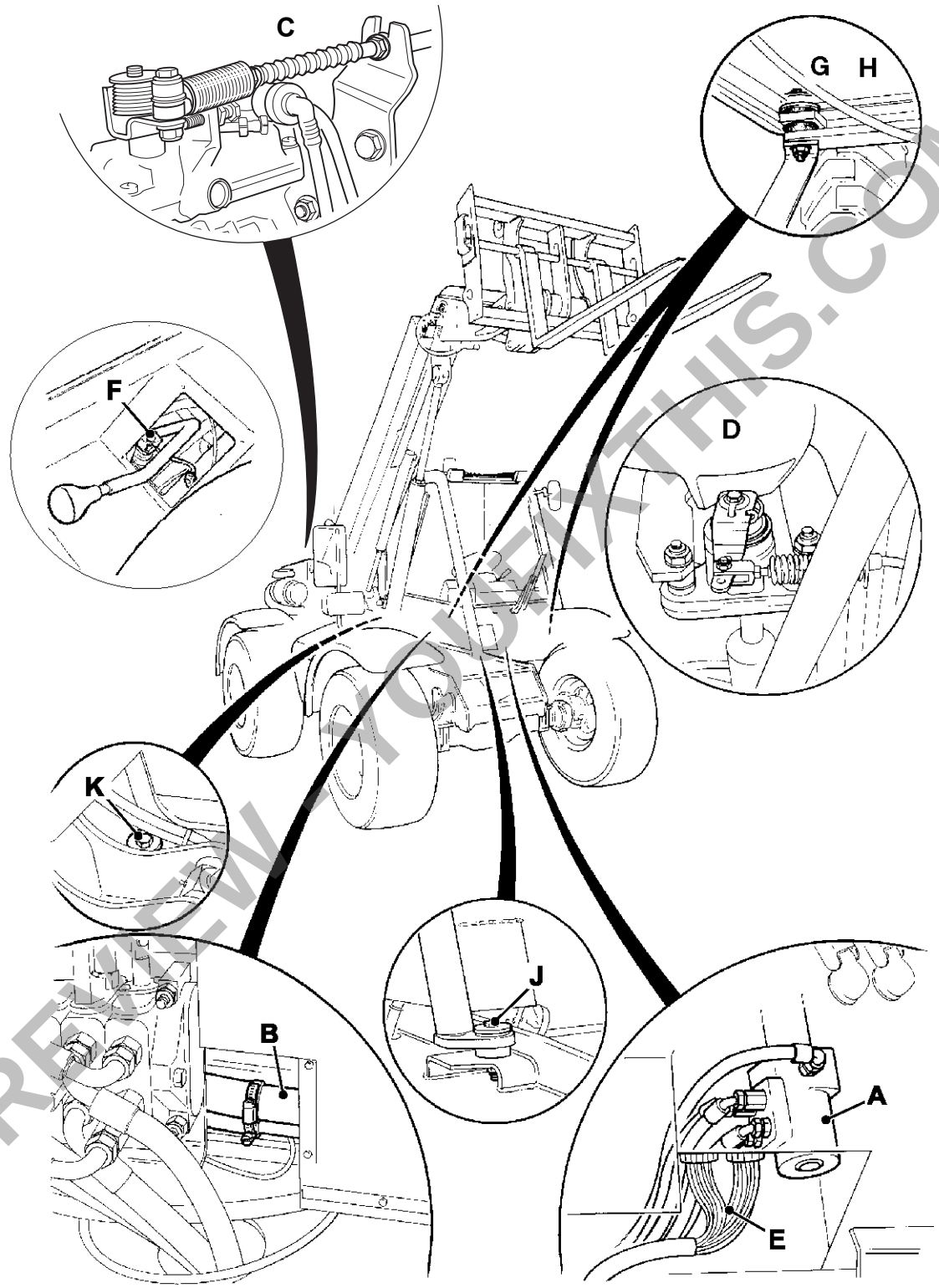


Fig 67. Typical Machine

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Circuit Descriptions

Pump Operation

The pump is a gear type and driven by the engine.

The working principle of a gear pump depends on the meshing of two spur gears **15-A** and **15-B**. Oil is picked up on the suction side of the pump by the gears and carried round between the gear teeth and pump body. As the gears come into mesh the oil is forced through the outlet port, or through an internal port into the integral priority valve depending on the type of pump. The illustration shows a pump without a steer priority valve, for priority valve operation, see ***Section H, Steering***.

Some oil is allowed to circulate behind the bushes **15-C** and **15-D** to hold them in balance against the gears and minimise oil slippage.

Lubrication is provided by hydraulic oil which is directed around the unit, via oilways, by the motion of the meshing gears.

Table 7. Key to Oil Flow and Pressure

	Full Pressure
	Pressure
	Servo
	Neutral
	Exhaust
	Cavitation
	Lock Up

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Hydraulic Operation

Oil from the pump **B** is fed through an internal passage via the filter to the pressure maintenance valve **D**, which maintains pressure to the solenoid valve **E** for clutch selection. Excess oil from the maintenance valve flows back through the casing to the torque converter **S**. Oil enters the converter between the converter hub and the stator support, and leaves between the stator and the input shaft. Pressure in the converter is controlled by a regulating valve **C** which dumps oil from the converter line back to the sump.

Torque converter relief valve **V** acts as a safety valve should the system pressure suddenly rise above normal, protecting the torque converter from being damaged.

Oil from the torque converter **S** flows out of the transmission to the external oil cooler **Z**, returning at the rear of the transmission unit to pass through the centre of the reverser shaft for clutch lubrication.

Pressurised oil at the solenoid valve **E** is used to control the forward/reverse clutches **A1** and A**2**.

Solenoid Valve (E) Operation

Forward: In the diagram, electrical solenoid **E1** is energised by the forward/reverse control lever in the cab. Pressurised oil is diverted to the forward clutch **A1** and forward is selected. **A** restrictor orifice in the feed to the solenoid valve modulates the pressure to the clutch to smooth engagement. At the same time oil from reverse clutch **A2** is diverted back to the sump via solenoid valve **E**.

Reverse: When the reverse is selected electrical solenoid **E2** is energised and pressurised oil is diverted to the reverse clutch **A2**. At the same time oil from clutch **A1** is diverted back to the sump.

Neutral: When neutral is selected (via the control lever or the transmission dump button), the flow of the pressurised oil is blocked at the solenoid valve. No solenoids are energised and no clutches engaged.

For a further detailed description, see ***Systems Description, Synchro Shuttle Gearbox***.

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Rear Axle SD55

Removal and Replacement

⚠ WARNING

A raised and badly supported machine can fall on you. Position the machine on a firm, level surface before raising one end. Ensure the other end is securely chocked. Do not rely solely on the machine hydraulics or jacks to support the machine when working under it.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-1-1

Fully retract the boom. Raise the boom and fit the safety support.

Removal ⇨ *Fig 67. (F-125)*.

1 Disconnect the propshaft coupling from the axle by unscrewing bolts **A**.

2 Disconnect and plug the hydraulic hoses to the power track rod.

3 Uncouple the steer proximity switch electrical connector (if fitted).

4 Uncouple the Load Moment Indicator (LMI) transducer electrical connector.

5 Slacken off the roadwheel retaining nuts then raise and support the rear end of the machine on axle stands or blocks positioned under the chassis. Remove the rear roadwheels.

6 Remove the rear mudguards. Undo the bracket retaining nuts **E** at the steering trunnions.

7 Support the axle on a trolley jack.

8 Undo the six trunnion nuts **C**.

9 Lower the axle down from the machine. Be sure to retrieve dowels **J**. If shims are fitted record their positions. Use some wire to tie the trunnions to the axle.

Replacement

Replacing is generally the reverse of the removal sequence.

Make sure you re-fit dowels **J** together with any shims in their original positions.

Make sure that the axle oscillates freely before final tightening of the fixing bolts.

If applicable, before fitting the Load Moment Indicator (LMI) transducer remove any rust, dirt or paint from transducer mounting faces. Make sure that the mounting faces are flat and level, remove any burrs. Place the transducer in position, check that the bolt holes align and the mating faces are flush. Secure transducer in place with bolts **B**, torque load and tighten evenly.

Refit the road wheels and carry out the tightness checks as detailed in ***Section 3, Routine Maintenance***.

Before driving the machine:

- Bleed the brake system, see ***Section G, Brakes***.
- Bleed the steering system, see ***Section H***, ***Steering***.
- Re-phase the steering system, see ***Section H***, ***Steering***.
- Grease the axle pivot trunnions.
- Calibrate the Load Moment Indicator (LMI), see ***Section B, Body and Framework***.

Table 29. Torque Settings

Item	Nm	kgf m	lbf ft
A	75 - 85	7.7 - 8.7	55 - 63
B	70	7.1	51.6
C	476	48	352
E	98	10	72

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