Service Manual

Loadall

Models:

520-50
from Serial No. 754001

525-50
from Serial No. 789308

525-50S
from Serial No. 1037581

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Safety Notices

In this handbook 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

⚠ WARNING

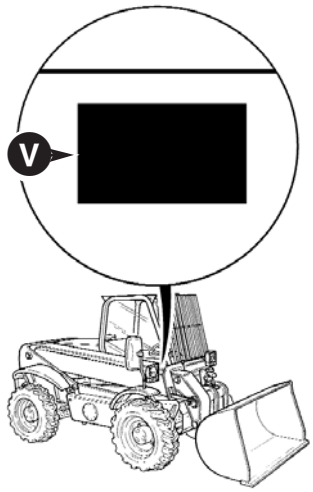
Study this Service Manual before carrying out any maintenance work on the machine. You must always understand and observe the relevant laws and regulations If you are unsure about anything, ask your JCB Distributor.

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Identification Plate

Your machine has an identification plate **V** mounted as shown. The serial numbers of the machine and its major units are stamped on the plate.



Explanation of Vehicle Identification Number (VIN)

SLP52050RE0754001

A B C D E

A	World Manufacturer Identification		SLP = JCB
B	Machine Model		520-50
C	Year of Manufacture		S
	P = 1993	V = 1997	1 = 2001
	R = 1994	W = 1998	2 = 2002
	S = 1995	X = 1999	3 = 2003
	T = 1996	Y = 2000	4 = 2004
D	Manufacturing Location		E = England
E	Machine Serial Number		0754001

Machine Model Explanation

520 - 50
F G H

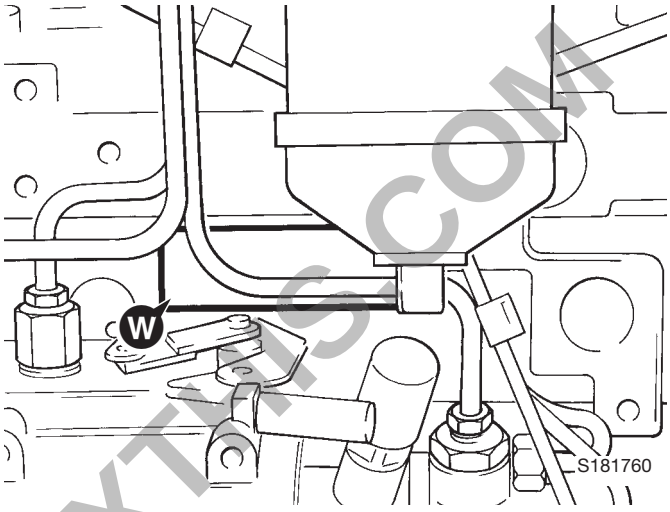
F 500 Series machine range
G 2.0 tonnes lift capacity
H 5.0 metres lift height

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.

Unit Identification

The engine serial number is stamped on label **W** which is fastened to the right side of the cylinder block, near the fuel filter.



Explanation of Engine Identification Number

AA 50261 U 500405 P
A B C D E

A Engine Type:
A series
AK = 4 cylinder turbo - low emission, stage 1
AR = 4 cylinder naturally aspirated - low emission, stage 1
R Series
RE = 4 cylinder naturally aspirated, low emission, stage 2
RG = 4 cylinder turbo, low emission stage 2
RJ = 4 cylinder air to air charge cooled, low emission, stage 2

B Build Number
C Country of Manufacture
D Engine Serial Number
E Year of Manufacture

If service information or parts are required, the complete engine number should be quoted.

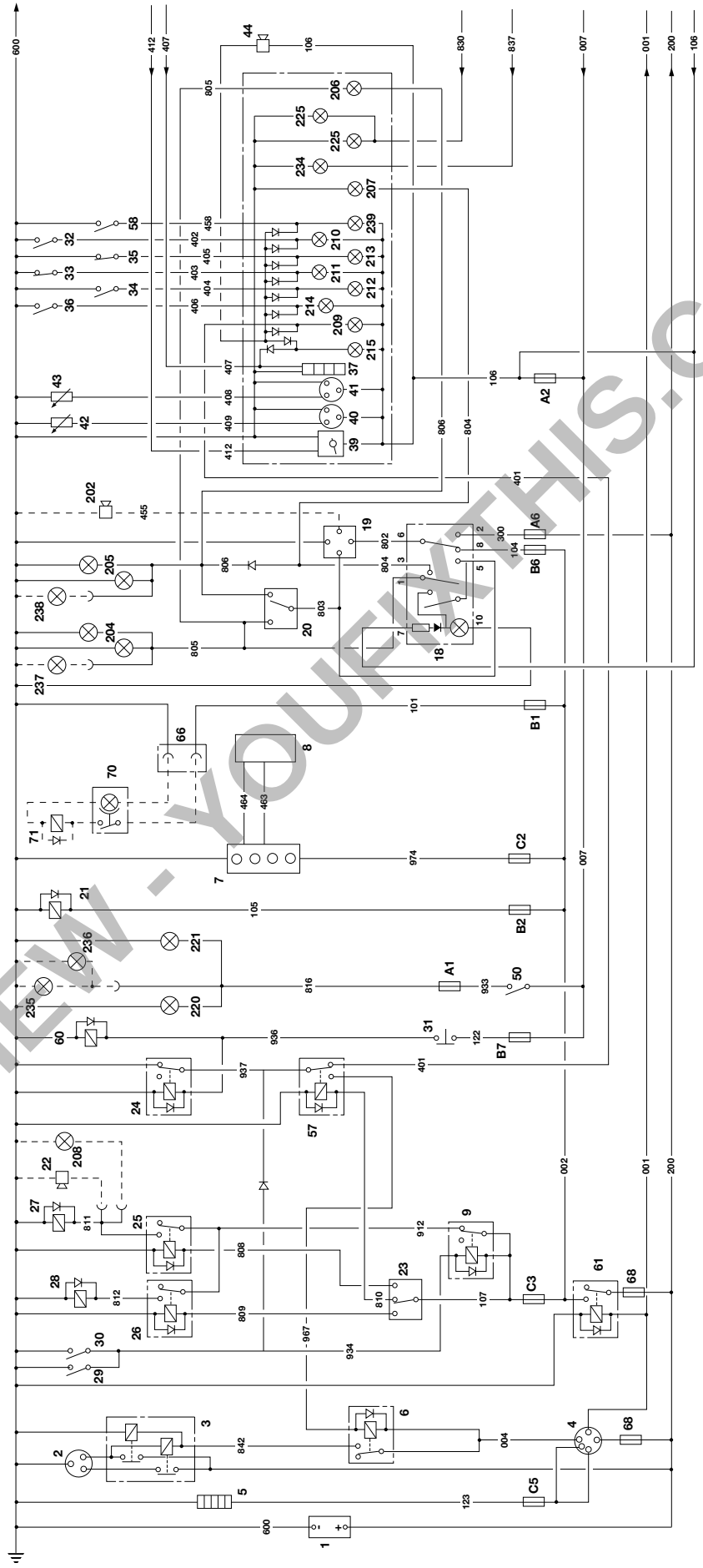
If there is also a number marked 'TPL No', this should be quoted also.

If a short engine has been fitted in service, two engine serial numbers and a TPL No. are stamped on the serial number plate as at **Z**. All the numbers should be quoted when requiring parts or information.

Note: *Where the procedures in this manual differ according to engine types, the text and/or illustrations will specify which engine types apply.*

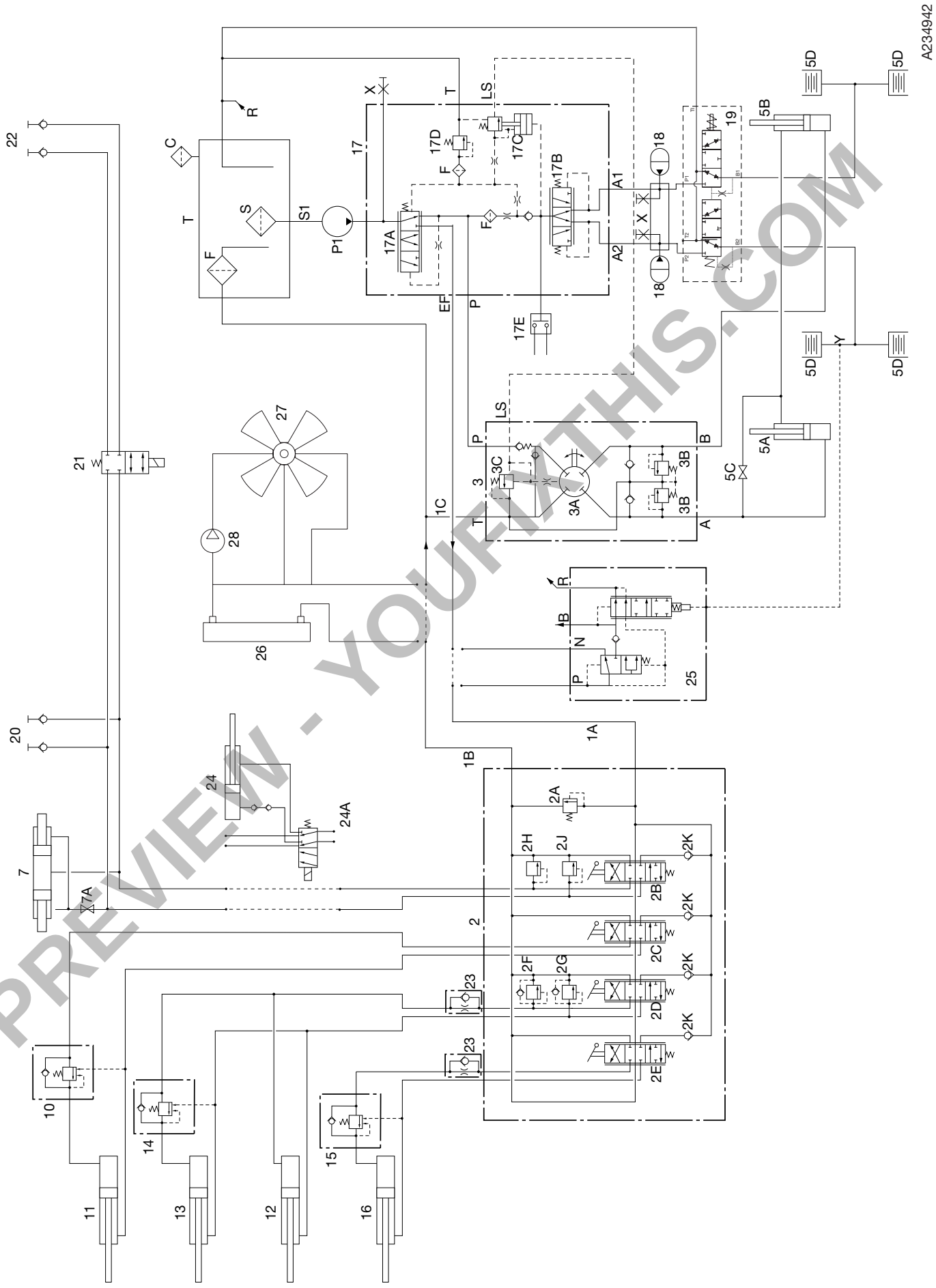
Transmission and axle identification is shown on the next page.

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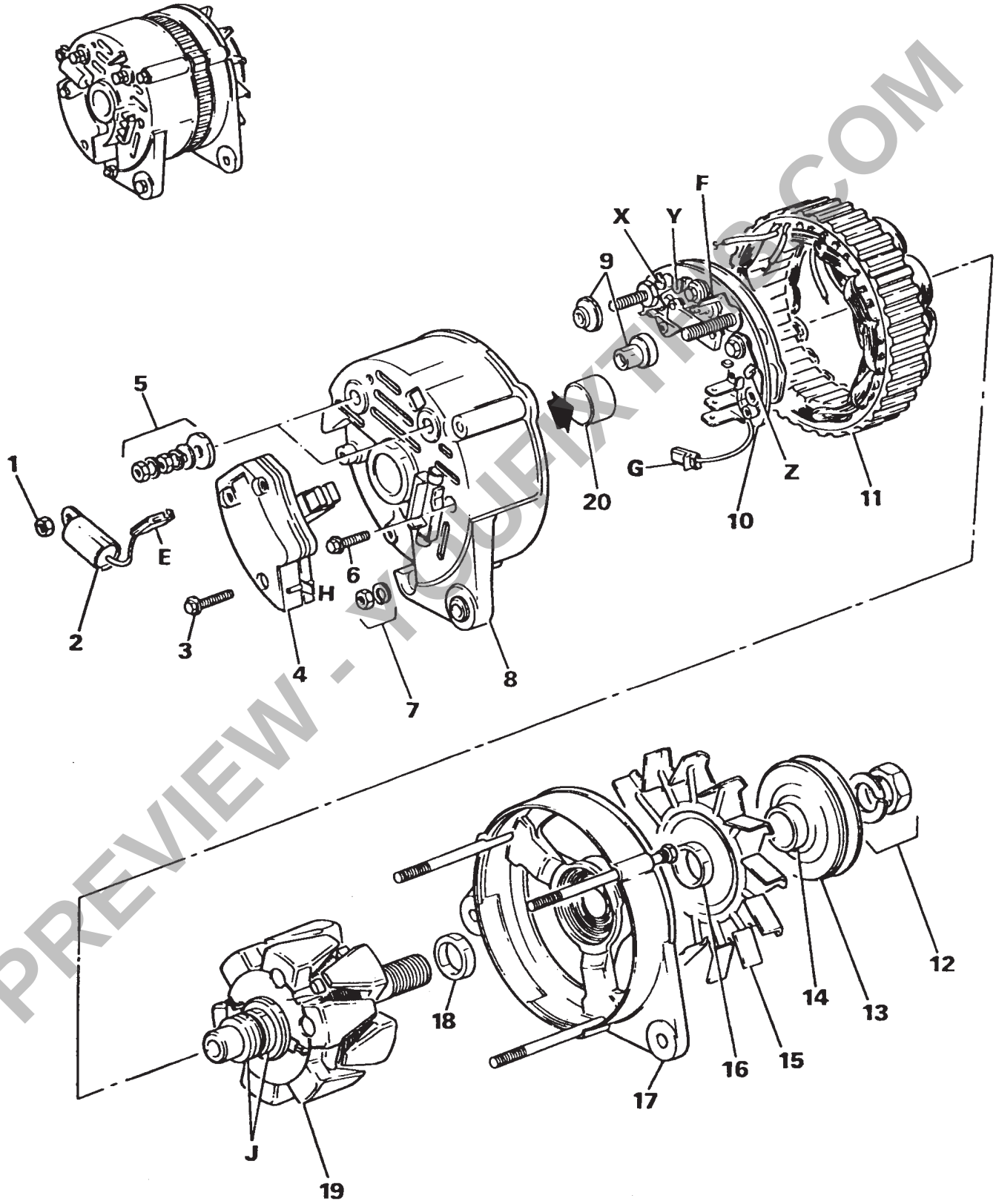
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Torque Settings

Use only where no torque setting is specified in the text. Values are for dry threads and may be within three per cent of the figures stated. For lubricated threads the values should be REDUCED by one third.

UNF Grade 'S' Bolts

Bolt Size		Hexagon (A/F)	Torque Settings		
in	(mm)	in	Nm	kgf m	lbf ft
1/4	(6.3)	7/16	14	1.4	10
5/16	(7.9)	1/2	28	2.8	20
3/8	(9.5)	9/16	49	5.0	36
7/16	(11.1)	5/8	78	8.0	58
1/2	(12.7)	3/4	117	12.0	87
9/16	(14.3)	13/16	170	17.3	125
5/8	(15.9)	15/16	238	24.3	175
3/4	(19.0)	1 1/8	407	41.5	300
7/8	(22.2)	1 5/16	650	66.3	480
1	(25.4)	1 1/2	970	99.0	715
1 1/4	(31.7)	1 7/8	1940	198.0	1430
1 1/2	(38.1)	2 1/4	3390	345.0	2500

Metric Grade 8.8 Bolts

Bolt Size		Hexagon (A/F)	Torque Settings		
	(mm)	mm	Nm	kgf m	lbf ft
M5	(5)	8	7	0.7	5
M6	(6)	10	12	1.2	9
M8	(8)	13	28	3.0	21
M10	(10)	17	56	5.7	42
M12	(12)	19	98	10	72
M16	(16)	24	244	25	180
M20	(20)	30	476	48	352
M24	(24)	36	822	84	607
M30	(30)	46	1633	166	1205
M36	(36)	55	2854	291	2105

Rivet Nut Bolts/Screws

Bolt Size		Torque Settings (for steel rivet nuts)		
	(mm)	Nm	kgf m	lbf ft
M3	(3)	1.2	0.12	0.9
M4	(4)	3.0	0.3	2.0
M5	(5)	6.0	0.6	4.5
M6	(6)	10.0	1.0	7.5
M8	(8)	24.0	2.5	18.0
M10	(10)	48.0	4.9	35.5
M12	(12)	82.0	8.4	60.5

Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

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* **Diagnostic Fault Codes - LMI System Only**

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

The alarm will cancel after 10 seconds and all the lights on the display will flash as long as the fault remains. Press and release the display button **A** to show the fault for a further 10 seconds. When the fault clears, the display will return to normal.

If any of the fault codes are displayed, switch the starter key off and on again. Refer to the list of fault codes below if the fault does not clear.

Note: A new display box will not be calibrated. Always calibrate the system when fitting a new display box.

	FAULT CODE	POSSIBLE CAUSE	REMEDY
	**Fault Code 1** **Transducer signal fault**	Transducer not connected. Faulty harness. Faulty transducer.	Check transducer connection. Check for trapped or damaged wires. Check for water ingress. Replace transducer.
	**Fault Code 2** **Calibration out of range**	System is incorrectly calibrated. Transducer not fixed down correctly. Faulty transducer.	Re-calibrate system. Check mounting surfaces are clean and flat. Check mounting bolts are not bottoming-out. Check tightness of transducer mounting bolts (70 Nm). Replace transducer.
	**Fault Code 3** **Calibration required**	System not calibrated.	Calibrate system.
	**Fault Code 4** **Display unit faulty**	The display box has detected an internal error.	Switch the starter key off and then on again. Replace the display box if the fault does not clear.
	**Fault Code 5** **Low battery voltage**	Battery voltage is below 9 Volts.	Do 12V supply test at display box. Check battery voltage.

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The machine must be made safe before carrying out any servicing.

General Safety

Read Section 2, Care and Safety.

Position the machine on firm level ground. Apply the parking brake.

Chock both sides of all four wheels.

Make sure the transmission selector and gear lever are in the neutral position.

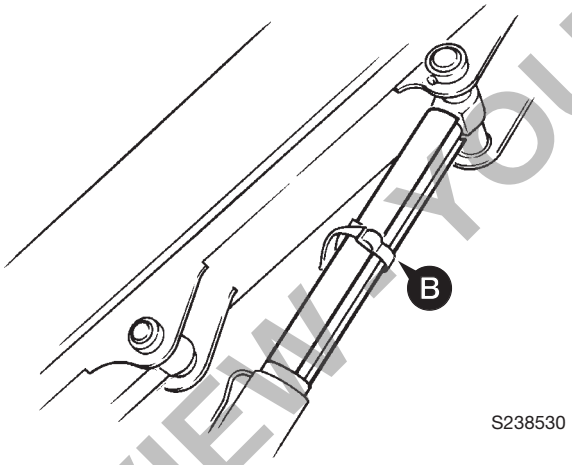
Fully retract the boom and lower to the ground.

Switch OFF the engine and remove the starter key.

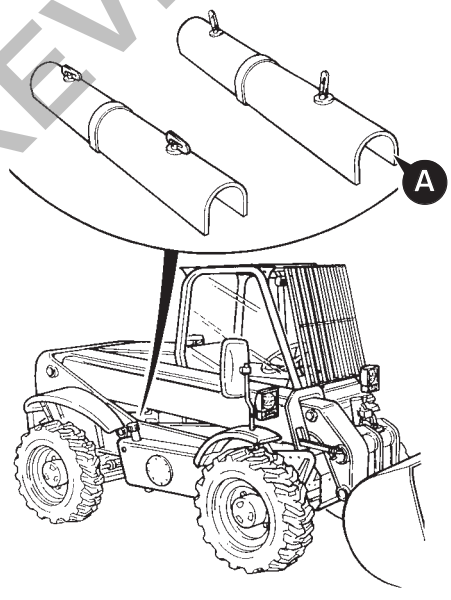
Operate the controls to vent residual pressure.

Release the hydraulic tank filler cap to release residual tank pressure.

When welding electrically disconnect the alternator.



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S238530

Working with Boom Raised

Fitting Safety Strut

Carry out General Safety and the following procedure:

⚠ WARNING

You could be killed or injured if the boom drops while you are working under it. Install the safety strut as instructed below before doing any maintenance work with the boom raised.
5-3-1-2

Fully retract the boom (unless it needs to be extended for maintenance). Raise the boom just far enough to install the strut.

Make sure the parking brake is engaged and the transmission is in neutral. Switch OFF the engine and remove the starter key.

⚠ CAUTION

You will have to climb onto the machine to fit or remove the safety strut. Take care, especially if the machine is wet. Remove mud and oil before climbing onto the machine.
5-3-1-11

⚠ WARNING

You could be killed or injured if the boom is lowered while you are under it. Keep people away from the machine while you fit the strut.
5-3-1-3

Remove the strut from its stowage position **A**.

Place the strut around the ram piston rod as shown. Fix it in place with strap **B**.

The strap fitted to the safety strut must be in a serviceable condition, if not fit a new strap.

To prevent any chance of the boom creeping down and trapping your fingers, the boom should be lowered onto the strut.

***Note**: Lower the boom carefully, to prevent possible damage to the strut. Stop as soon as the weight of the boom is on the strut.*

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* Fault Finding

The purpose of this section is to help in identifying problems in the system. Once a problem is identified, refer to the test procedures in this section.

FAULT	POSSIBLE CAUSE	REMEDY
Display box does not work.	Blown fuse.	Check fuse 3.
	Display box faulty.	Do Display Box Functional Test.
	Display box not receiving 12V supply.	Do 12V Supply and Fuse Test.
The display box alarm is sounding and LEDs are continuously illuminated. (SLI only)	Transducer not connected.	Check transducer is connected.
	Faulty harness.	Check for trapped or damaged wires.
	Display box out of calibration (eg) transducer has slipped.	Check display box. Check transducer mounting.
	Faulty transducer.	Check for water ingress.
	Faulty display box.	Re-calibrate system. Do Display Box Functional Test.
The display box works backwards or seems to be out of calibration. (SLI only)	Display box out of calibration. Transducer may have slipped.	Re-calibrate system. Check transducer mounting.
The display box seems to go out of calibration.	Transducer not fixed down correctly.	Check torque of transducer fixing screws (70Nm). Check transducer fixing screws are not bottoming out in their holes. Check mounting surfaces are clean and flat.
	Faulty transducer.	Replace transducer.
	Rear axle oscillation trunnions out of alignment (530 only).	Tip machine forward. Check axle oscillates freely. Shim trunnions if required. (T.I. Ref: 5/186; F.136 N. Am)

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*520-50, 525-50 & 525-50S Machines (All Engine Builds)

***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 piston 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).*

ITEM	CAPACITY Ltr	UK Gal	US Gal	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel Tank	90	20	23.8	Diesel Oil (See **Types of Fuel**)	ASTM D975-66T Nos. 1D, 2D
Engine (Oil)					
Engine Type					
A Series	10	2.2	2.6	**JCB High Performance Engine Oil** -10 °C to 50 °C (14 °F to 122 °F)	SAE15W/40 API CF4/SG (ACEA E2:B2:A2)
	10	2.2	2.6	**JCB High Performance Engine Oil** -15 °C to 40 °C (5°F to 104°F)	SAE10W/30 API CF4/SG (ACEA E2:B2:A2)
R Series	10	2.2	2.6	**JCB Extreme Performance Engine Oil** 15W40	CH4/SJ (ACEA E5-B3-A3)
Engine (Coolant)	20 4.	4	5.3	**JCB Four Seasons Antifreeze And Summer Coolant** (See **Coolant Mixtures**)	ASTM D3306-74
Gearbox	17.5	3.8	4.6	**JCB High Performance Transmission Fluid**	JCB 4000/0900 Friction modified oils MUST NOT be used (eg. Dexron ATF type).
Axles					
Housing (520-50)	4.0	0.88	1.00	**JCB High Performance Gear Oil Plus**	JCB 4000/2200 MUST be suitable for use with oil immersed brakes and limited Slip differentials (LSD).
Housing (525-50)	8.8	1.94	2.30		
Hubs (x4 - 520-50)	1.0	0.22	0.26		
Hubs (x4 - 525-50)	1.8	0.40	0.47		
Hydraulic Tank†	70	15.4	18.5	**JCB High Performance Hydraulic Fluid 46** (Above 38 °C, 100 °F)	ISO VG46
				JCB High Performance Hydraulic Fluid 32 (Below 38 °C, 100 °F)	ISO VG32
Grease Points				††**JCB HP Grease**	Lithium based
Wear Pad Runways				**JCB Waxoyl**	

†**Note**: 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.

††**Note:** 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.

Coolant Mixtures	%	Antifreeze	Starts to Freeze
	55	9.35 litres; 2.04 UK gal; 2.47 US gal	-36 °C (-33 °F)

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