Service Manual

3CX, 4CX, 214, 215, 217 & VARIANTS

Backhoe Loader

From M/c No.
460001 To 499999
920001 On
900001 On (N.Am only)

PUBLISHED BY THE
TECHNICAL PUBLICATIONS DEPARTMENT
OF JCB SERVICE; © WORLD PARTS CENTRE,
STAFFORDSHIRE, ST14 7BS, ENGLAND
Tel. (01889) 590312
PRINTED IN ENGLAND

Publication No. 9803/3270 & 9803/3270U

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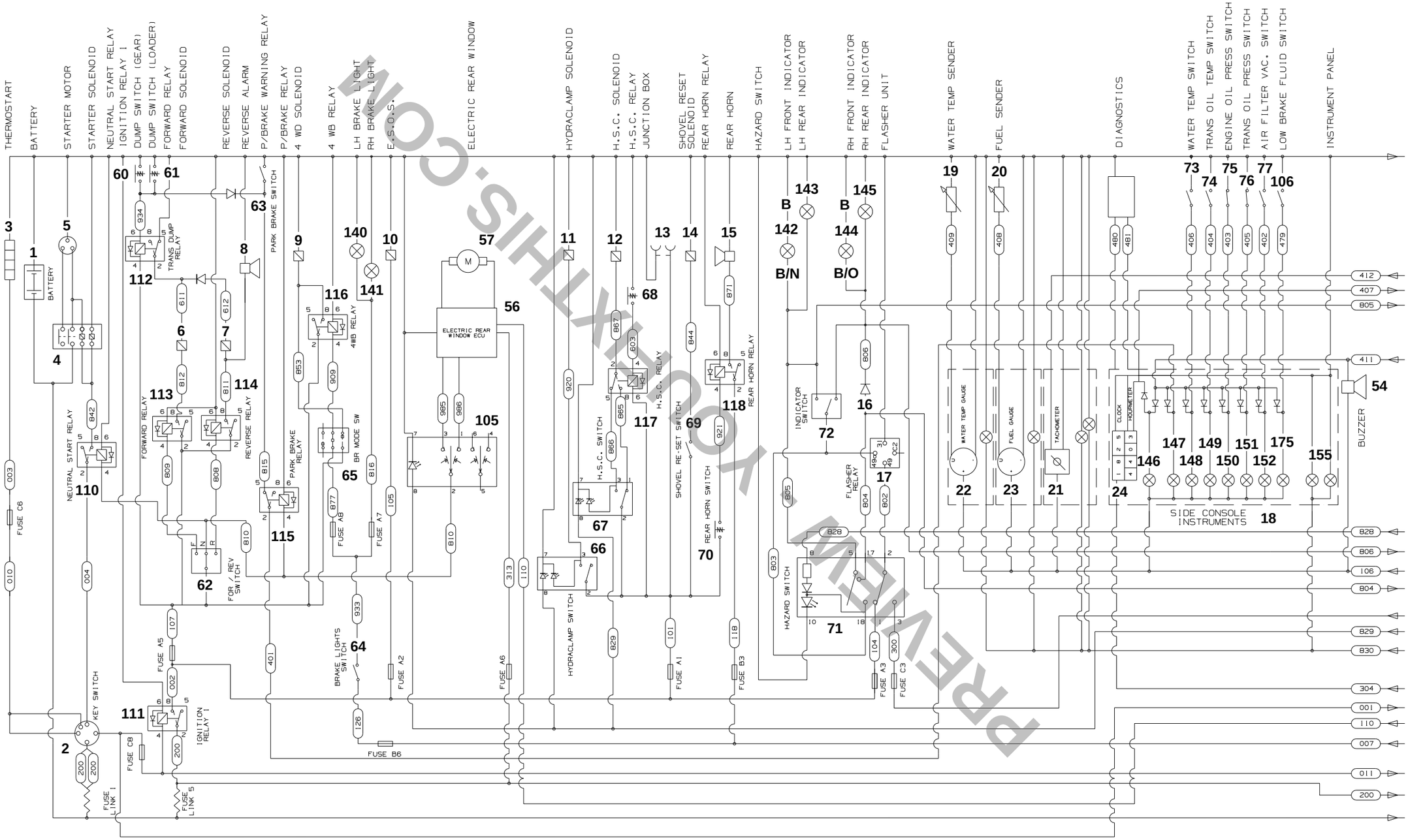
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Basic Machine

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(CAD 852/30214-sheet 1 issue 5)

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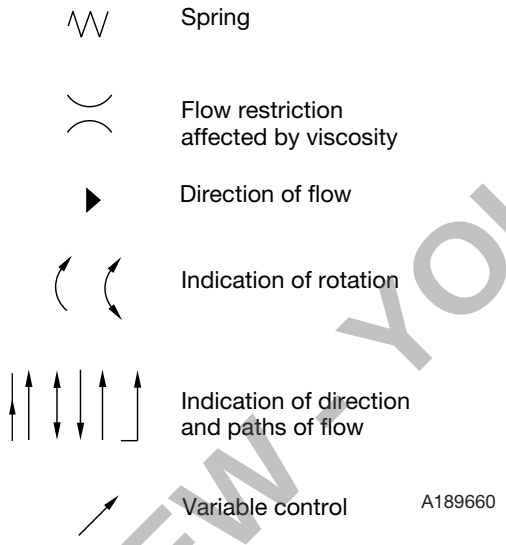
Introduction to Hydraulic Schematic Symbols

Complex hydraulic components and circuits can be described to the engineer by using graphical symbols. The following pages illustrate and give a brief description for some of the more common symbols used.

There are many symbols in use and it would be impossible to include them all here. However it should be noted that most are only variations or refinements on the basic principles explained here. If more detailed information is required you are recommended to obtain a copy of BS2917 or IS01219.

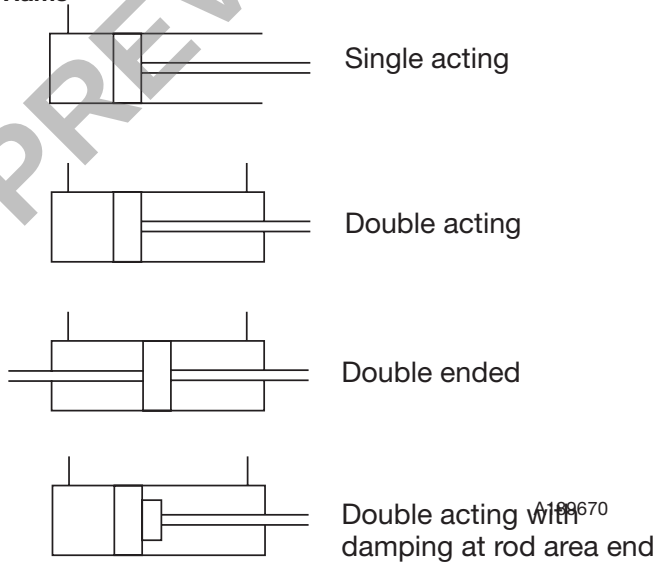
Once familiar with the symbols, the engineer can use hydraulic circuit diagrams as an aid to fault finding. It will be possible to see the complete hydraulic circuit and decipher the relationship between hydraulic components.

General (Basic & Functional Symbols)



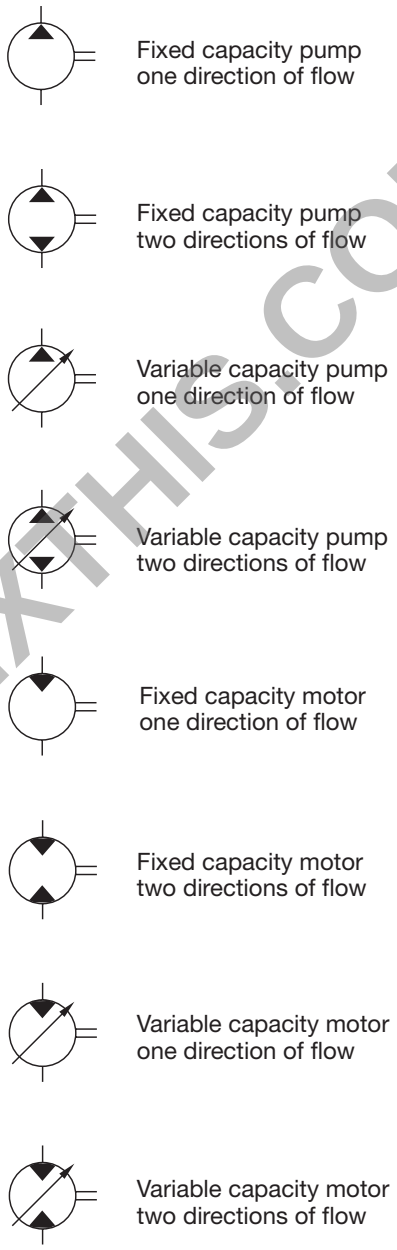
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Rams



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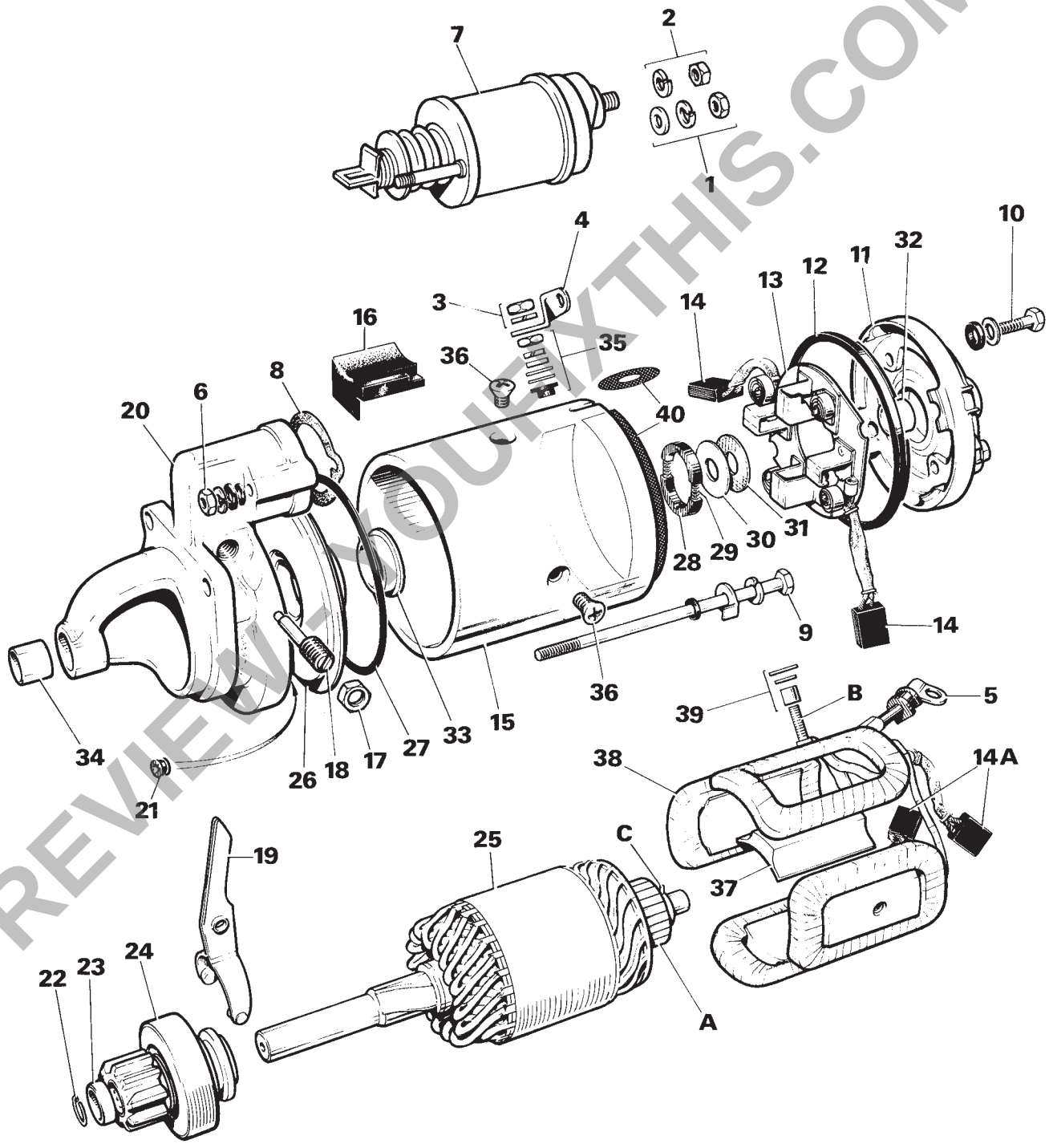
Pumps & Motors



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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)	11/8	407	41.5	300
7/8	(22.2)	15/16	650	66.3	480
1	(25.4)	11/2	970	99.0	715
11/4	(31.7)	17/8	1940	198.0	1430
11/2	(38.1)	21/4	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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Fault Finding Contents

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Introduction

The purpose of this section is to help you trace electrical faults to a faulty unit. Once you have traced the faulty unit, refer to the appropriate dismantling, inspecting and test instructions given elsewhere in the Service Manual.

To help identify circuits, refer to the electrical schematic diagrams.

Refer to Section F, Fault Finding also as this section will deal with the mechanical aspect.

1 Before you begin fault finding, read the Safety information at the beginning of this manual.

2 Make simple checks before say, stripping a major component.

3 Make any relevant electrical checks before commencing work.

Fault	Probable Cause	Action
No drive on power-up.	Blown ECU fuse.	Check ECU fuse A5
ECU.	ECU mainframe connector loose.	Check connector is mating correctly with
	Gear twist switch not in neutral.	Gear switch must be in neutral on power up before a gear can be selected.
No drive and continuous warning buzzer.	Attempting to select drive with the handbrake engaged.	Release handbrake.
No drive.	Faulty gear switch.	Check switches and wiring.
	Handbrake sticking.	Check handbrake assembly.
	Faulty gearbox harness.	Check gearbox harness and connector for continuity.
	Faulty dump input.	Check dump switch and wiring.
Missing gears	Faulty solenoid(s)	Check solenoid(s) and wiring.
	Fault gear switch	Check switch and wiring
	Low oil pressures	Check clutch pack pressures, see Section F. Check mainline pressure, see Section F.
	Mechanical failure	See Section F.
No 4th gear (4 speed machine only)	Faulty speed signal	Check speed sensor and wiring. Check speed sensor installation.

..... continued

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Installing

Install the loader arm safety strut as detailed below before working underneath raised loader arms.

⚠ WARNING

Raised loader arms can drop suddenly and cause serious injury. Before working under raised loader arms, fit the loader arm safety strut.
2-1-1-6

1 Empty the Shovel and Raise the Loader Arms fully.

2 Stop the Engine
Remove the starter key.

⚠ WARNING

You could be killed or injured if the loader control is accidentally operated. Make sure no-one comes near the machine while you release the safety strut.
2-3-1-2

3 Release the Strut
- **a** Release fastener **A**.
- **b** Remove strut **C** from its stowage bracket.

4 Install the Strut
- **a** Push strut **C** over the ram piston rod.
- **b** Secure the strut in position with strap **B**.

5 Lower the Strut Onto the Cylinder
To prevent any chance of the loader arms creeping down and trapping your fingers, the loader arms should be carefully lowered onto the safety strut as shown.

Start the engine and slowly lower the loader arms onto the safety strut, stop the movement immediately the weight of the loader arms is supported by the safety strut.

Note: When lowering the loader, operate the control lever carefully. 'Feather' the lever to lower the loader very slowly.

Removing

1 Fully Raise the Loader Arms
To take the weight off the safety strut.

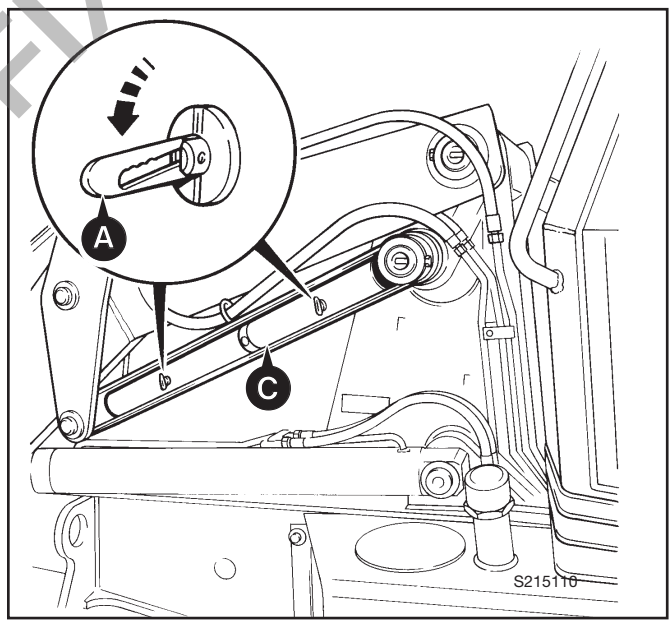
2 Stop the Engine
Remove the starter key.

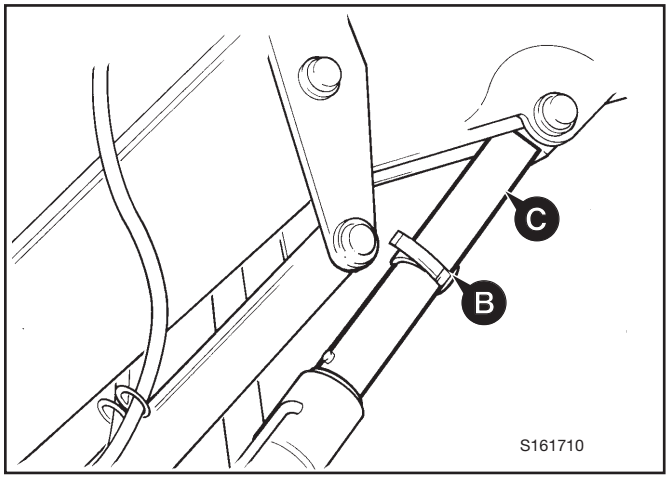
⚠ WARNING

You could be killed or injured if the loader control is accidentally operated. Make sure no one comes near the machine while you remove the safety strut.
2-3-1-3

3 Remove the Strut
- **a** Undo the strap **B**.
- **b** Remove the strut **C** from the ram piston rod.

4 Stow the Strut
Secure the strut in its stowage position with fastener **A**.





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3CX, 4CX AND VARIANTS

ITEM	CAPACITY Litres	CAPACITY UK Gal	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
†Fuel Tank (with toolbox)	110	24.2	Diesel Oil	ASTM D975-66T Nos. 1D, 2D
†Fuel Tank (without toolbox)	150	33	Diesel Oil	ASTM D975-66T Nos. 1D, 2D
Fuel Tank (All later m/c's)	130	28.6	Diesel Oil	ASTM D975-66T Nos. 1D, 2D
†Initial build machines only, all machines built after Feb. 1997 have a 130 litre (28.6 gal.) capacity tank.				
* Engine (Oil) ①			**JCB 15W/40 Multigrade**	SAE15W/40
2 Wheel Steer Machines			-10 °C to 50 °C (14 °F to 122 °F)	API CF4/SG
- Build AA	9.7	2.1		
- Build AA (Hot Climate)	11.0	2.4	**JCB Super Universal Agricultural**	SAE10W/30
- Build AB	10	2.2	-15 °C to 30 °C (5 °F to 86 °F)	API CE/SF
4 Wheel Steer Machines			**JCB Torque Converter Fluid**	SAE10W
- Build AB	10.0	2.2	-18 °C to 0 °C (0 °F to 32 °F)	API CD/SF
2 Wheel Steer Machines				
- Build AR	11.0	2.4	**JCB Super Multigrade 15W/40**	SAE15W/40
- Build AK	10	2.2	-10°C to +50°C (14°F to 122°F)	CF-4/SG
4 Wheel Steer Machines			**JCB Super Multigrade 10W/30**	SAE10W/30
- Build AK	10.0	2.2	-15°C to +40°C (5°F to 104°F)	CF-4/SG
Engine (Coolant)	23.0	5.1	**JCB Four Seasons Antifreeze & Summer Coolant/Water** (see Coolant Mixtures)	ASTM D3306, BS6580
Syncro Shuttle (2WD) ②	14.4	3.2	**JCB Special Transmission Fluid**	ESP-M2C 33G
Syncro Shuttle (4WD) ②	15.4	3.4	Friction modified oils MUST NOT be used (eg. Dexron ATF type)	
Powershift ②	14.75	3.25	**JCB Special Transmission Fluid**	ESP-M2C 33G
	15.4	3.4	Friction modified oils MUST NOT be used (eg. Dexron ATF type).	
Front Axle (4WD)			**JCB HD90 Gear Oil** (without LSD)	API-GL-5
Housing (2WS)	13	2.86	**JCB Special Gear Oil Plus** (with LSD)	API-GL-4
Housing (4WS) ⑥	18	3.96	Must be suitable for use with limited slip differentials (LSD).	
Hubs (x2)	2.0	0.44		
Rear Axle (4WS)			**JCB Special Gear Oil Plus**	API-GL-4
Housing	18	3.96	Must be suitable for use with oil immersed brakes and limited slip differentials (LSD).	
Hubs (x2)	2.0	0.44		
Rear Axle (2WS)	23	5.0		
Brake System				
- Standard	1.2	0.26	**JCB Light Hydraulic Fluid**	ISO VG15
- Servo	1.4	0.31	⚠ **CAUTION: DO NOT USE ORDINARY BRAKE FLUID**	
Hydraulic System ③	130	28.6	**JCB High Performance Hydraulic Oil** (Above 38 °C, 100 °F)	ISO VG46
			JCB Hydraulic Fluid HP32 (Below 38 °C, 100 °F)	ISO VG32

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A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in the service schedules are done to keep the machine in a safe and efficient working condition.

⚠ WARNING

Maintenance

Maintenance must be done by suitably qualified personnel. Before attempting any maintenance work, make sure the machine is safe. Park on level ground. If it is necessary to work with the loader arms raised, then the loader arm safety strut must be fitted as shown in *Loader Arm Safety Strut in MAINTENANCE section*.

2-3-1-1

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

Calendar equivalents:

10 Hours	=	Daily
50 Hours	=	Weekly
500 Hours	=	Six Months
1000 Hours	=	Yearly
2000 Hours	=	2 Years

Pre-start Cold Checks Service Points and Fluid Levels	**Operation**	**10 Hr**	**50 Hr**	**†100 Hr**	**500 Hr**	**1000 Hr**	**2000 Hr**
ENGINE							
Oil level	- Check	•	•				
Oil and Filter ④	- Change			•	•	•	•
Air Cleaner Outer Element ⑥	- Change					•	•
Air Cleaner Inner Element	- Change						•
Fuel Filter	- Change			•	•	•	•
Fuel Filter	- Drain		•				
Coolant Quality/Level	- Check	•	•	•	•	•	•
Fuel Sedimenter	- Drain and Clean		•	•	•	•	•
Fan Belt Tension/Condition	- Check		•	•	•	•	•
Valve Clearances and Clean Breather Gauze (if fitted)③	- Check and Adjust						•
Engine Mounting Bolts for Tightness ③	- Check			•	•	•	•
Radiator	- Clean				•	•	•
All Hoses - Condition	- Check			•	•	•	•
TRANSMISSION, AXLES AND STEERING							
Transmission Oil Level	- Check	•	•	•	•		
Transmission Oil	- Change					•	•
Transmission Filter	- Change			•	•	•	•
Axle Oil Level (incl. Hubs when applicable) ①	- Check			•	•		
Axle Oil (incl. Hubs when applicable)	- Change					•	•
Axle Oil - Limited Slip Differential	- Change				•	•	•
Tyre Pressures/Condition	- Check		•	•	•	•	•
Front Hub Bearings ③	- Check			•	•	•	•
Transmission Strainer	- Clean					•	•
Drive Shafts	- Examine/Grease			•	•	•	•
Steer Axle Movement/Shimming ③	- Check			•	•	•	•
Steer Axle Pivots and Linkages ⑦	- Grease			•	•	•	•
Front Axle Main Pivot	- Grease	•	•	•	•	•	•
HYDRAULICS							
Oil Level ②	- Check	•	•	•	•	•	
Oil ③	- Sample/Change						•
Oil Filter	- Change			•	•	•	•
* Rams - Chrome Condition	- Check			•	•	•	•
Pilot Filter	- Change			•	•	•	•

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Safety Notices

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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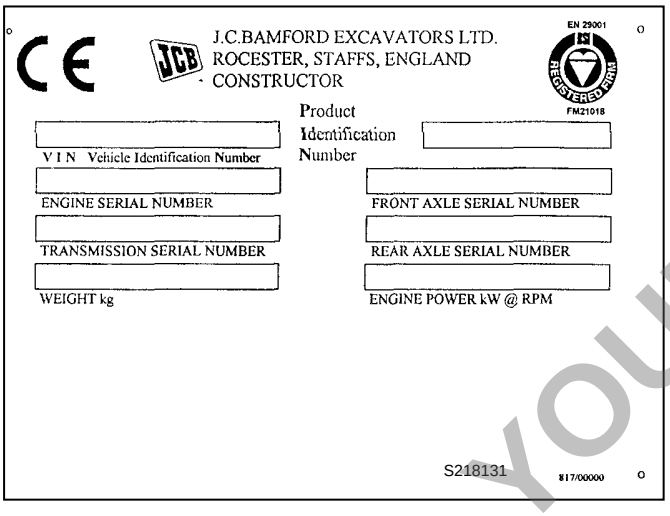
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Machine Identification Plate

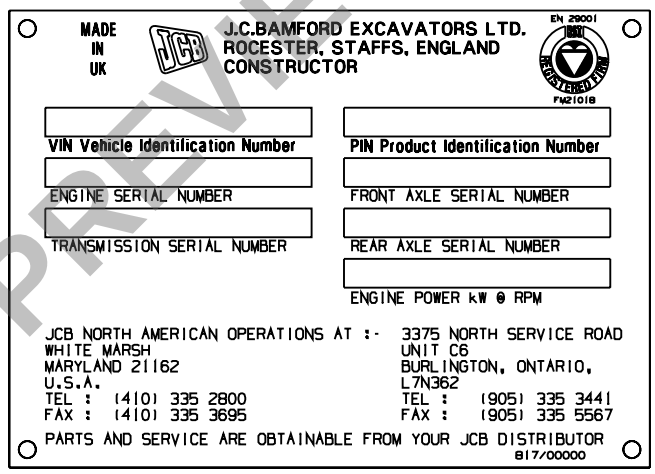
Your machine has an identification plate mounted on the loader tower. The serial numbers of the machine and its major units are stamped on the plate.

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.



U.K. and R.O.W.



North America A246740

Typical Vehicle Identification Number (VIN)

SLP	3CX	T	S	V	E	0460001
A	B	C	D	E	F	G

A World Manufacturer Identification

B Machine Model

C Steer Type (T= 2WS, F=4WS)

D Build Type (S=Sideshift, C=Centremount, L=Loader)

E Year of Manufacture:

R = 1994	1 = 2001
S = 1995	2 = 2002
T = 1996	3 = 2003
V = 1997	4 = 2004
W = 1998	5 = 2005
X = 1999	6 = 2006
Y = 2000	7 = 2007

F Manufacturer Location (E = England)

G Product Identification Number (PIN)

Typical Engine Identification Number

AB	50262	U	500405	P
A	B	C	D	E

A Engine Type
AB = 4 cylinder turbo

B Build Number

C Country of Origin

D Engine Sequence Number

E Year of Manufacture

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Changing the Elements

⚠ CAUTION

The outer element must be renewed immediately if the warning light on the instrument panel illuminates.
2-3-3-1

Note: Do not attempt to wash or clean the elements - they must only be renewed.

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

Note: A new inner element must be fitted at least every third time the outer element is changed. As a reminder, mark the inner element with a felt tipped pen each time the outer element is changed.

1 Stop the engine.

2 Remove the engine side panel (left hand side).

3 If changing the inner element, disconnect induction hose from stub pipe **A**. Cover the end of the hose to prevent rain and dirt from getting into the engine.

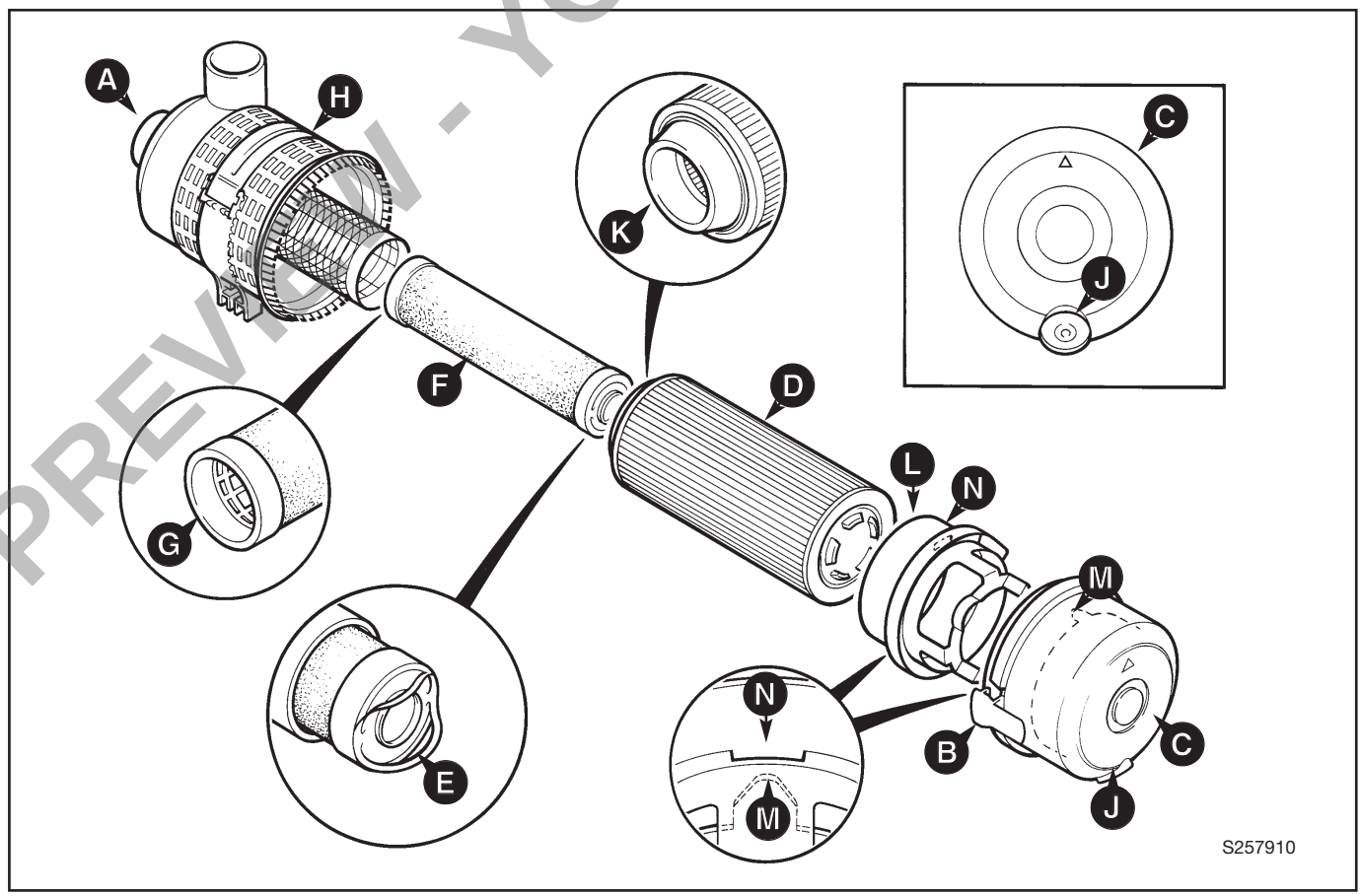
4 Depress clips **B** and lift off cover **C**. Remove outer element **D**. Take care not to tap or knock the element. If the inner element is to be changed, lift up pulls **E** and remove inner element **F**. On turbocharged engines, remove pulsation ring **L**.

5 Clean inside the canister **H**, pulsation ring **L**, cover **C** and dust valve **J**.

6 Insert the new elements into the canister, pushing them firmly in so that seals **G** and **K** are fully seated. On turbocharged engines, assemble the pulsation ring **L** into the cover, making sure that tongue **M** fits into slot **N**. Fit cover **C** with dust valve **J** at the bottom. Push the cover firmly into position and make sure it is secured by clips **B**.

* **Note**: On later machines the pulsation ring L is not fitted.

7 Refit the induction hose to stub pipe **A**. Make sure that the wire is connected to the **Air Filter Blocked** switch.



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Blower Motor

Removal

1 Disconnect the battery.

2 Loosen and remove the side console screws **A** and remove side console **B**.

3 Loosen and remove bottom console screws **C** and remove the bottom console **D**.

4 Disconnect the electrical connector to the heater blower.

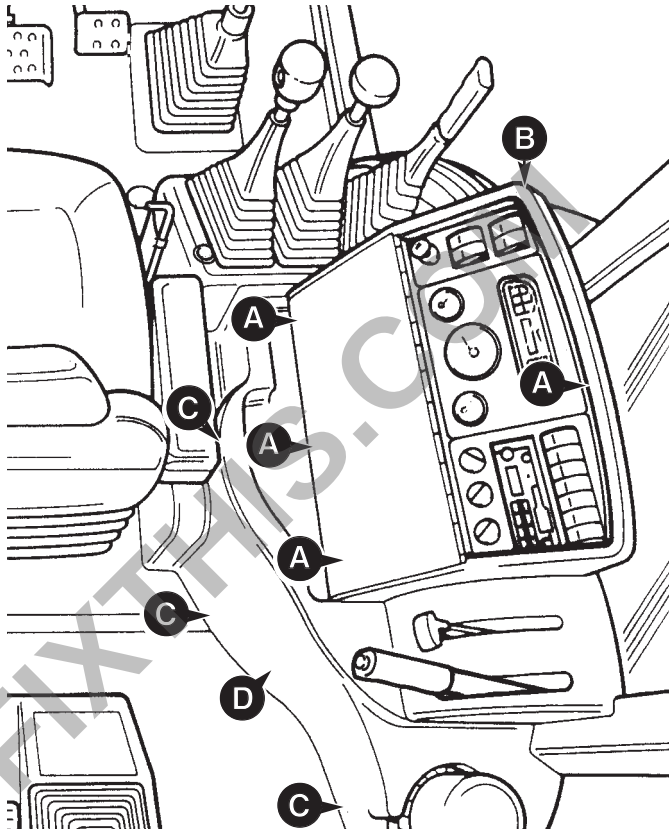
5 Loosen and remove bolts **E**.

6 Carefully remove the heater assembly **F** from its housing.

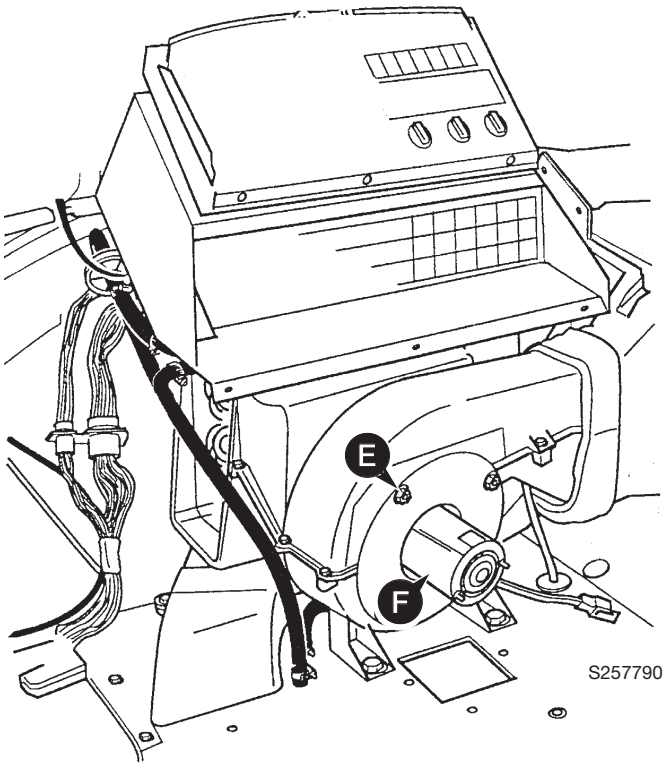
Replacement

Replacement is a reversal of the removal procedure, make sure that the seal located between the housing and heater is in good condition - replace if necessary.

Note: The heater assembly is of a modular design. This enables the air conditioning evaporator matrix to be housed next to the standard heater matrix. Complete removal of the air conditioning unit will require the refrigerant to be drained from the system.



S210343



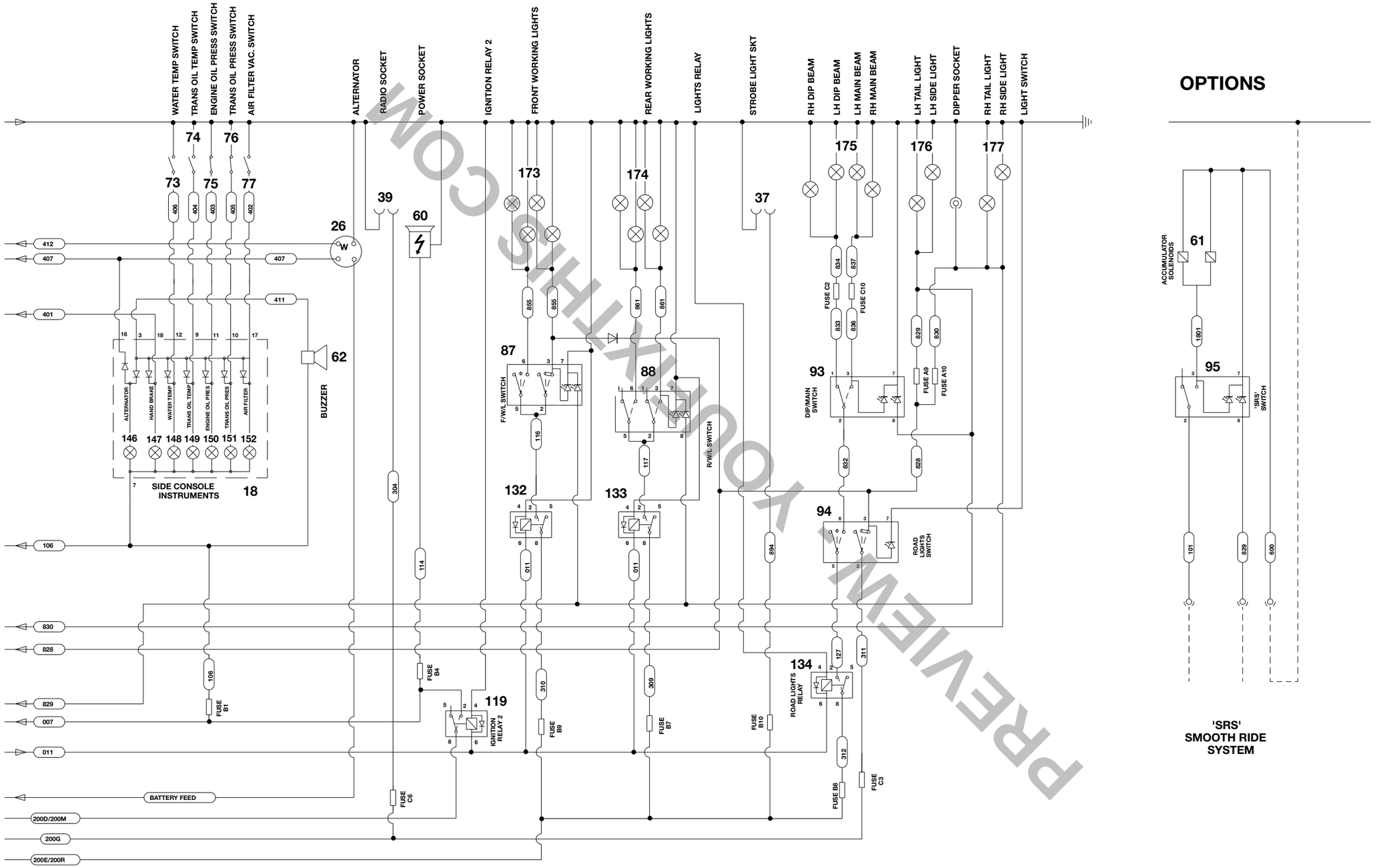
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Electrics Section C
Circuit Diagrams and Components Lists 18 - 14C

214Se Machines Only



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Backhoe Valve

The illustration shows the control rods and linkages for the backhoe control valve. Use the illustration and the parts descriptions as an aid to the correct assembly of the rods and linkages.

Apply item **24** to the external threads of ball joints of items **3** and **4**.

When setting the backhoe levers, set initially with control lever plates parallel to mount plate (as shown at **X**). Then achieve the correct setting dimension **S** by equal adjustment of the left hand and right hand control rods.

Setting Dimensions

Control Pattern	**Dim. 'S' ± 5mm (0.196 in.)**
JCB + Pattern	300 mm (11.810 in.)
JCB X Pattern	336 mm 13.228 in.)
ISO + Pattern	300 mm (11.810 in.)

Item	**Description**	**Remarks**
1	Stabiliser Lever	left hand
2	Stabiliser Lever	right hand
3	Control Rod	
4	Control Rod	
6	Gaiter	
7	Universal Joint	
10	Lock Washer	
13	Clevis Pin	
14	Safety Clip	
15	Bolt	
16	Lock Washer	
18	Lock Nut	
20	Plug	
21	Bearing	
22	Washer	
23	Safety Clip	
24	JCB Lock & Seal	A/R
28	Lever	right hand
29	Lever	left hand
A	Thin Nut	
B	Nut	left hand thread
C	Ball Joint	
D	Clevis	left hand thread
E	Ball Joint	left hand thread
F	U.J. Mount for Diagonal Pattern	
G	U.J. Mount for Plus Pattern	

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Servo Pilot Circuit

The servo command hydraulic neutral circuit is as described by machine series type.

Servo command differs in that the spools are moved by pilot pressure and not mechanical lever. Spools movement is controlled by a joystick control lever or an electrical switch.

Pilot pressure is generated by tapping into the steer neutral circuit at the steer priority valve **7**, the oil is directed to the manifold block **5**. The pressure reducing valve **5H** provides a pilot circuit of 30 bar (435 lbf in^2).

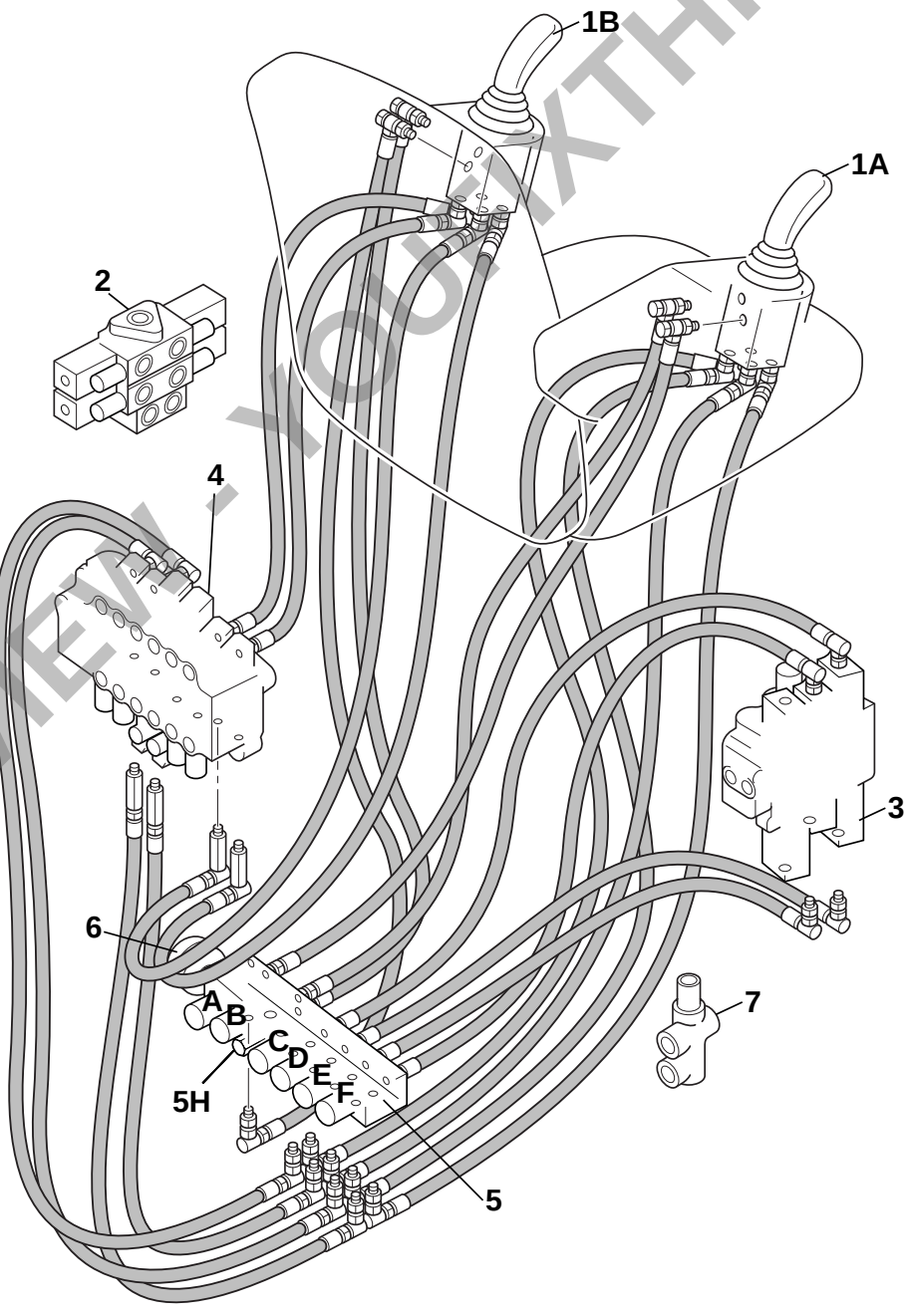
The manifold block houses a pilot filter to protect the circuit and solenoid valves which direct pilot pressure to the various controls.

Solenoid **5A** provides pilot pressure to the right hand joystick control lever **1A**, loader and backhoe valve block electrical selections.

Solenoid **5B** provides pilot pressure to the left hand joystick contol lever **1B**.

Solenoids **5C** to **5F** are changeover solenoids and operate when the seat is rotated or when the mode changeover switch is operated.

In the event of engine failure or hydraulic pump failure the accumulator **6** provides sufficient pilot pressure to allow several operations in order to make the machine safe ie. lower machine to ground or lower loader arms and boom/dipper.



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Float Spool Servo

Dismantling and Assembly

It is possible to remove a spool without removing the valve block. Springs are fitted to both ends of the spool so both end caps **2** and **17** need to be removed. Whichever bolt comes undone **11** or **19** will determine which direction the spool can be removed. If the spool has to be removed from the top, the fuse and relay panel will also have to be removed

The numerical sequence shown on the illustration is intended as a guide to dismantling.

For assembly the sequence should be reversed.

The following points MUST be avoided when dismantling and assembling the valve:

- CONTAMINATION
- DAMAGE TO SPOOL
- DAMAGE TO SEAL GROOVES

All or any of the above points may result in possible problems with the valve.

When Dismantling

Carefully remove collar **4** and collect four detent balls **7**.

* Do not dismantle items **5** to **9** unless there is a detent problem, treat as an asembly. If required, use tool 992/10100 to hold the spool, remove circlip **5**, plug **6**, ball **8** and spring **9**.

Use a spanner to hold adaptor **12** unscrew detent sleeve **10**.

Unscrew bolt **11**, remove adaptor **12**, spring **13** and spring seat **14**.

Undo bolt **19**, remove spring seat **20**, spring **21** and spring seat **22**.

Care must be taken to ensure that the spool **24** is not damaged when removing it from the valve block.

Check for surface contamination on the under side of the end caps **2**, **15** and **17**.

When Assembling

Renew 'O' ring seals **3**, **16** and **23**. Make sure the 'O' ring seals are not trapped or damaged.

When fitting detent sleeve **10**, and bolts **11** and **19** clean the threads thoroughly using Super Clean Safety Solvent, leave it for 10 minutes then apply a small quantity of JCB Lock and Seal to the threads of the spool.

Apply grease liberally to balls **7**, this will help to hold the balls in position whilst assembling.

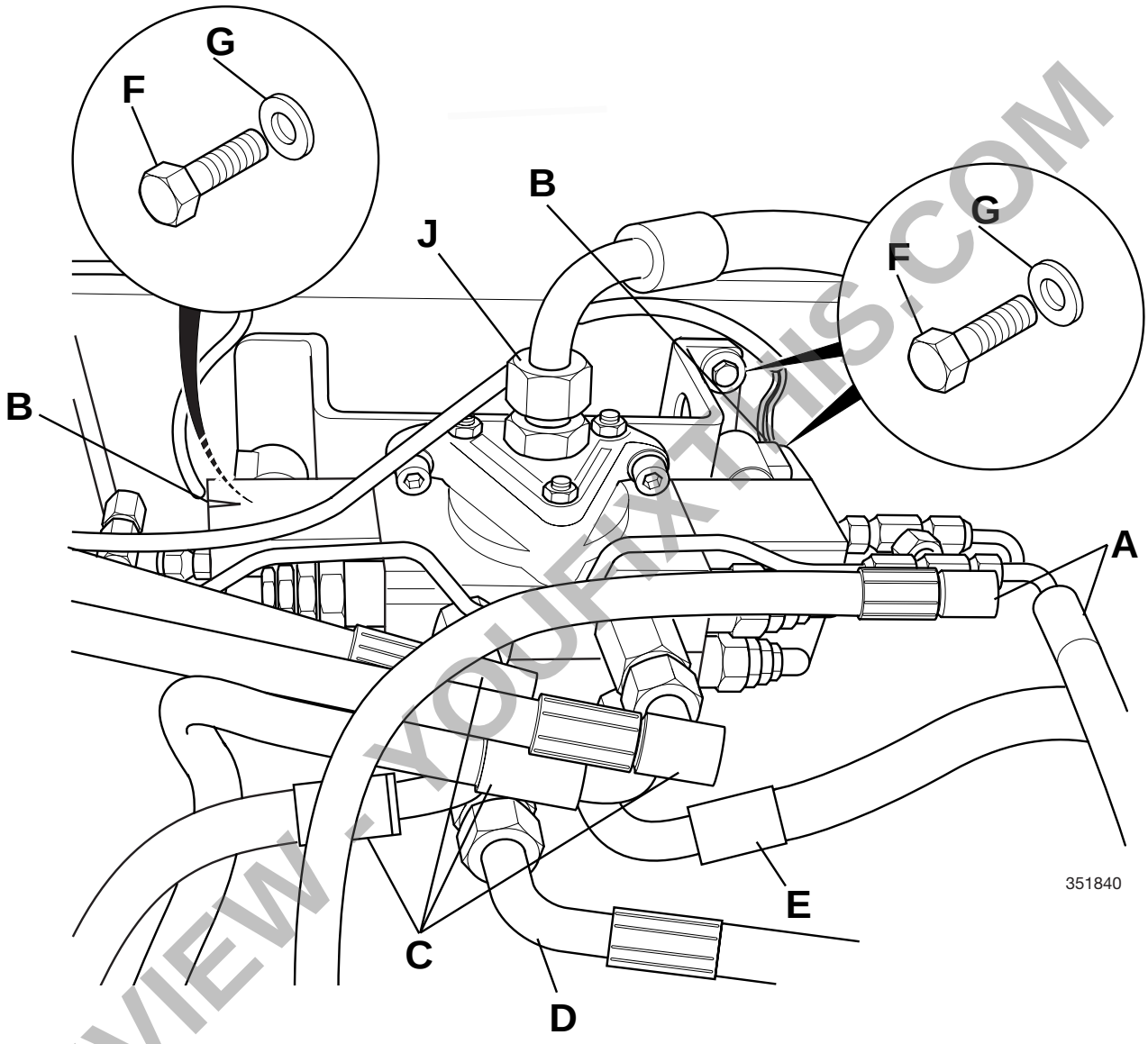
Run the engine and inspect the valve for external leaks.

Torque Settings

Item	Nm	kgf m	lbf ft
1	9.5	0.96	7.0
11	9.5	0.96	7.0
18	9.5	0.96	7.0
19	9.5	0.96	7.0

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Technical Data

Gas — Air Free Dry Nitrogen

* Accumulator Charge Pressure	**3CX, 214, 215**	**4CX, 3CX Super, 214S, 215S, 217, 217S**
GP Buckets without forks except 1.2m³ (1.5yd³) 96 inch	13.75 bar (200 lbf/in²)	13.75 bar (200 lbf/in²)
GP Buckets with forks and 1.2m³ (1.5yd³) 96 inch without forks	19 bar (275 lbf/in²)	13.75 bar (200 lbf/in²)
All Multipurpose Buckets except 1.3m³ (1.6yd³)	24 bar (350 lbf/in²)	19 bar (275 lbf/in²)
Multipurpose Bucket 1.3m³ (1.6yd³)	24 bar (350 lbf/in²)	24 bar (350 lbf/in²)

As a general guide for given attachment weights see the table below:

3CX, 214, 215			**4CX, 3CX Super, 214S, 215S, 217, 217S**		
up to 500 kg (1100 lb)	500 to 700 kg (1100 - 1540 lb)	over 700 Kg (1540 lb)	up to 700 kg (1540 lb)	700 to 950 kg (1540 - 2100 lb)	over 950 Kg (2100 lb)
13.75 bar (200 lbf/in²)	19 bar (275 lbf/in²)	24 bar (350 lbf/in²)	13.75 bar (200 lbf/in²)	19 bar (275 lbf/in²)	24 bar (350 lbf/in²)

Note: Replacement accumulators will only be supplied in an uncharged, non pressurised condition to meet Health and Safety/Airfreight hazardous goods requirements.

Capacity — 1.0 litre, 58 in³

Weight — 4.4 Kg, 9.75 lb

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Removal and Replacement (cont'd)

⚠ 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

Removal

⚠ WARNING

When the propshaft is disconnected the parking brake will no longer function. The machine must be securely chocked to prevent any machine movement before disconnecting the propshaft.
TRAN 1-3

Removing

1 Using tool 892/00822 remove bolts **A** to disconnect the drive shaft from the axle.

2 Disconnect the brake pipes from the brake piston housings, shown at **H**. Remove tee piece **B** retaining bolt and remove the tee piece. Blank off exposed connections.

3 Remove the cover **C** from the proximity switch and then remove the bracket and switch assembly.

4 Label and then disconnect hydraulic pipes **D** from the steer rams, blank off all exposed connections.

5 Loosen the road wheel retaining nuts **E**.

6 Make sure that the front wheels are blocked, use the stabiliser legs to raise the rear end of the machine.

7 Prop the machine on each side as shown at **F**.

8 Remove the rear road wheels.

9 Position a jack underneath the balance point (centre) of the axle and support the axle weight.

Note: Attach a 'cradle' to the jack that will partially embrace the axle.

10 Remove nuts **G**, bolts **J** and washers **K**.

11 Lower the jack and remove the axle.

Replacement

Replacement is the reverse of the removal sequence.

⚠ WARNING

If, for whatever reason, a wheel stud is renewed, all the studs for that wheel must be changed as a set, since the remaining studs may have been damaged.
2-3-2-8

Whenever a wheel has been removed, check the wheel nut torques every two hours until they stay correct.

⚠ WARNING

Bleed the brake system before driving the machine.
BRAK 1-6

Bleed the brake system as described on page G/11-1.

Apply JCB Lock & Seal to the threads of bolts **A**.

If the setting of the steering proximity switch has been disturbed, then complete the rear axle proximity switch setting procedure, as described on page H/35-1.

Torque Settings

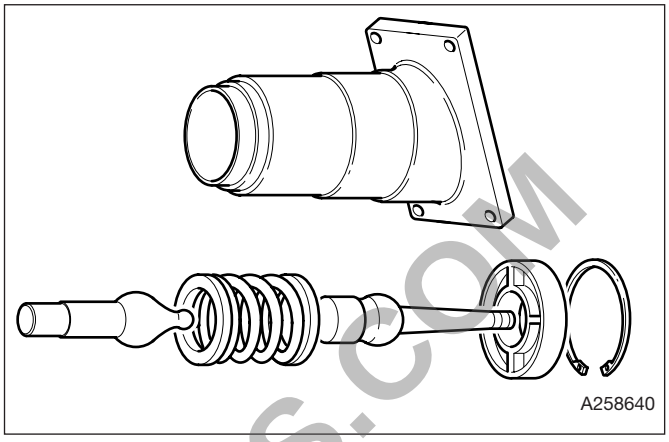
Item	Nm	kgf m	lbf ft
A	79	8	58
E	680	69	500
G	607	62	448

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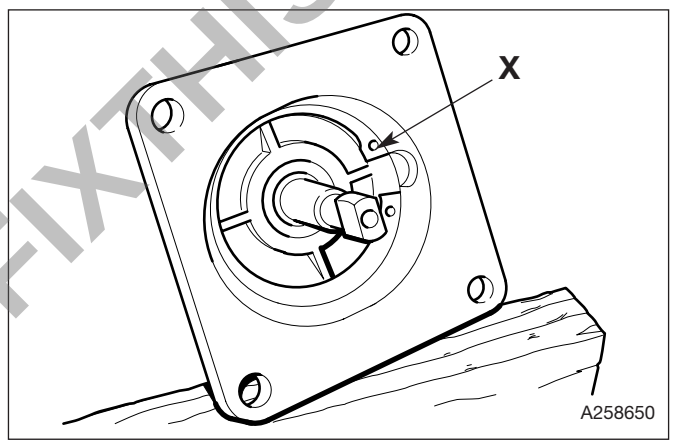
Gearbox - Assembly (cont'd)

47 Assemble gear lever components, applying grease liberally to the working surfaces.

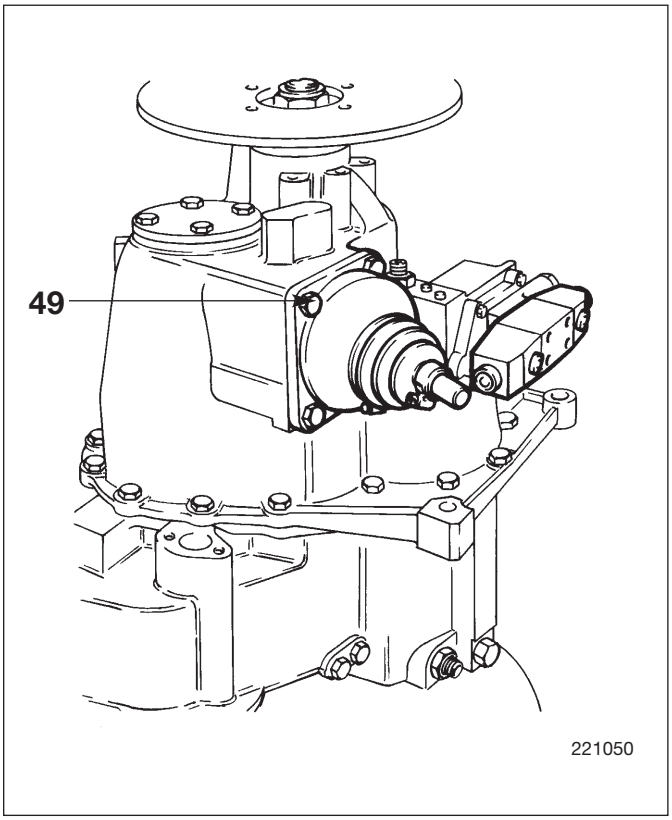


48 Refit components into gear lever housing, secure in position with retaining circlip **X.**

Note: If necessary use a bench press to compress the spring to allow fitting of the retaining circlip.



49 Using a new gasket fit gear lever turret to transmission. Apply JCB Lock and Seal to mounting bolts and tighten to 56 Nm (42 lbf ft). Check for gear selection.

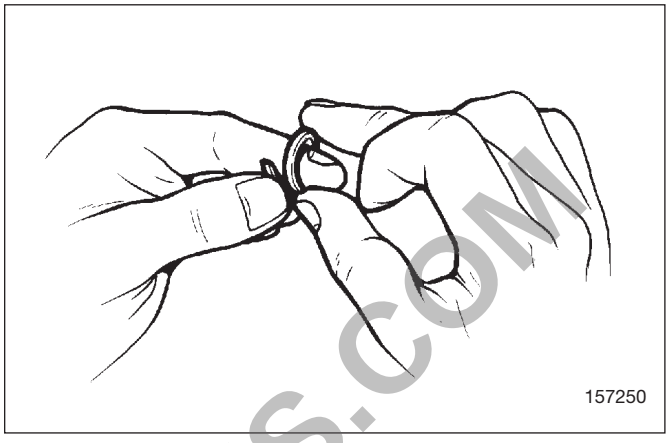


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Polytetrafluoroethene (PTFE) Piston Ring Seals - Fitting Procedure

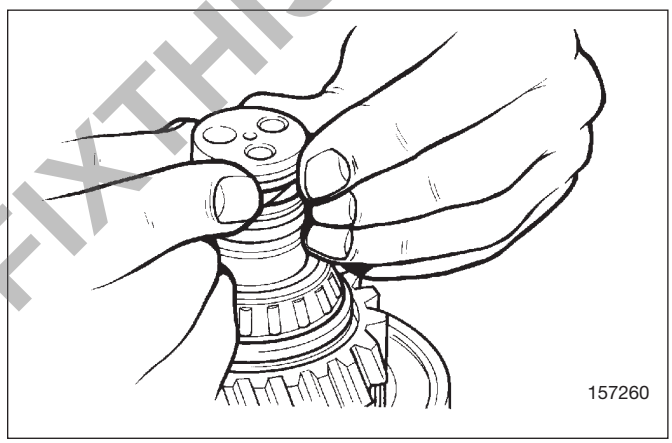
1 Wind the PTFE piston ring seal around your finger as shown, so that the seal forms a 'coil'.



2 Smear the seal with grease and then fit the seal to the shaft.

Make sure that the seal sits below or flush with the outer diameter of the shaft. If necessary, use finger pressure as shown to make the seal flush with the shaft.

CAUTION: If the seal is not set below or flush with the outer diameter of the shaft, then the seal will 'cut' when the shaft is fitted to its mating component.



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Assembly (cont'd)

28 If the end float checking kit is not available, use the following procedure:

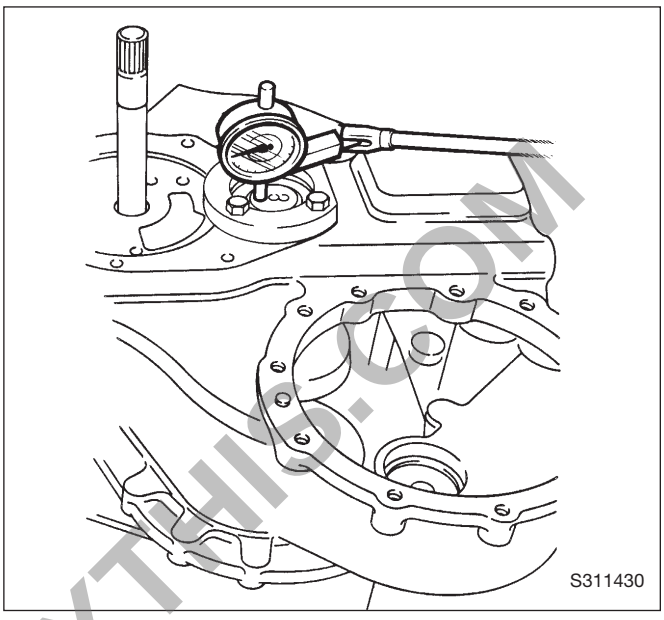
a Carry out items **a** and **b** of step **27**.

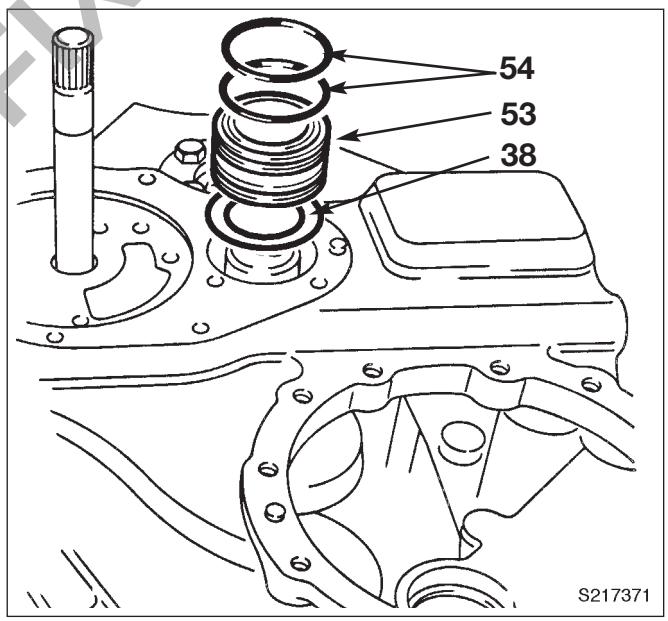
b Screw a suitable bolt into the tapped hole in the end of the mainshaft and using a suitable lever under the bolt, move the mainshaft back and forth when setting the end float.

c Set up a DTI as shown and measure mainshaft end float which should be 0.03 to 0.08 mm (0.001 to 0.003 in). Rotate mainshaft whilst measuring in order to seat bearings fully.

Note: To rotate the mainshaft gain access through the 4WD cover. On 2WD transmissions use an airline and adaptor tool, see page F/121-7 step 20.

d Add or subtract shims **38** to correct the end float. (The end float should be set as near as possible to the minimum tolerance.) The shims must only be fitted between the bearing outer race and spacer. When the correct end float has been established - REFIT THE SPACER **53** WITH NEW 'O' RINGS **54**.



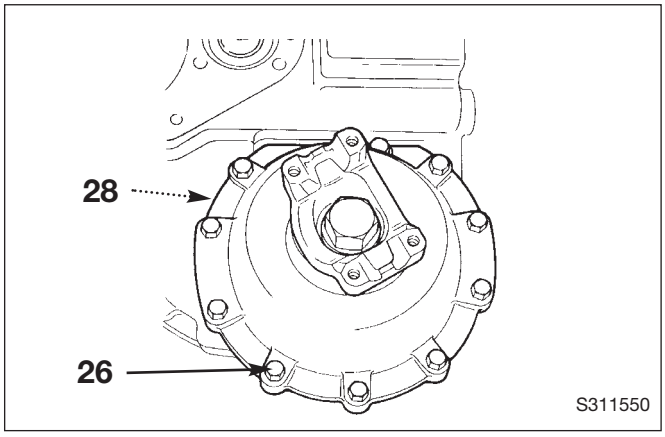


29 Using a new gasket **28**, install the 4WD unit. Apply JCB Threadlocker and Sealer to bolts **26** and tighten to 56 Nm (42 lbf ft).

Note: On 2WD machines, the 4WD cover may be sealed with a either a blanking plate or a 2WD type casing.

Note: Depending on the type of machine, the yoke is secured by either a nut or flanged bolt.

For end float setting and dismantle/assembly procedure, see **Hydraulic 2/4 Wheel Drive Unit**.



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