Service Manual

500 Series

From m/c No. 561001

This Service Manual covers the following Machines:-

505-19 - Serial Number 561001 - 579365
505-22 - Serial Number 561001 - 579365
508-40 - Serial Number 562601 - 579365
506-36 - Serial Number 563359 - 579999
510-40 - Serial Number 564542 - 579365
508-40, 508-40 - PlaceAce
505-19, 505-22 - Basic Servo Options
506-36, 508-40 - Servo Options
506B - Serial Number 570000 - 579766

Information covers two stage and three stage boom machines.

PREVIEW - YOUFIXTHIS.COM

JCB INC. 10939 Philadphia Road, White Marsh, MD 21162-0209, USA (410) 335-2800
JCB EXCAVATORS Ltd. 3375, North Service Road, Unit 6, Burlington, Ontario L7N, CANADA (905) 335-3441

Publication No. 9803/3600U Issue 16

Published by the Technical Publications Dept. of JCB Service, Rocester, Staffordshire, England.

Download full manual at youfixthis.com

General	1
Hydraulics	2
Body and Framework	3
PlaceAce Control System	4
Servo Control System	4A
Engine	5
Transmission	6
Axles	7
Brakes	8
Hydraulic Steering	9
Electrics	10
Service Tools	11
Boom Float, Return to Dig Option	12

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS (505-19, 505-22)

***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). Engines of new machines are filled at the factory with JCB 10W/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown in the lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours operation, it is essential that the 10W/30 oil is replaced by the lubricant recommended below.*

ITEM	CAPACITY US Gal (Litres)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel Tank	24 (90)	Diesel Oil (See **Types of Fuel**)	ASTM D975-66T Nos. 1D, 2D
Engine (Oil)	2.6 (10)	**JCB 15W/40 Multigrade** -10 °C to 50 °C (14 °F to 122 °F) **JCB Super Universal Agricultural** -15 °C to 30 °C (5 °F to 86 °F) **JCB Torque Converter Fluid** -18 °C to 0 °C (0 °F to 32 °F)	SAE15W/40, MIL-L-46152B, API CD/SE, MIL-L-2104 SAE10W/30, MIL-L-2105, MIL-L-46152 API CD/SE, MIL-L-2104C SAE10W, MIL-L-46152, MIL-L-2104D API CD/SE
Engine (Coolant)	4.4 (17)	**JCB Universal Antifreeze/water** (See **Coolant Mixtures**)	ASTM D3306-74
* **Gearbox**			
* **Syncro Shuttle**	4.0 (18.25)	**JCB Special Transmission Fluid**	ESP-M2C 33G
* **Powershift**	†4.8 (15.0)	**JCB Special Transmission Fluid**	ESP-M2C 33G
Front Axle			
Housing	4.6 (18)	**JCB Special Gear Oil**	ESEN-M2C 86A/B
Hubs (x2)	0.4 (2.0)	**JCB Special Gear Oil**	ESEN-M2C 86A/B
Rear Axle			
* **Housing**	3.3 (13)	**JCB Special Gear Oil**	ESEN-M2C 86A/B
* **Hubs (x2)**	0.4 (2.0)	**JCB Special Gear Oil**	ESEN-M2C 86A/B
Brake System		**JCB Light Hydraulic Fluid** DO NOT USE ORDINARY BRAKE FLUID	ISO VG15
Hydraulic Tank	*40.2 (152)	**JCB High Performance Hydraulic Oil** (Above 38 °C, 100 °F) **JCB Special Hydraulic Fluid** (Below 38 °C, 100 °F)	ISO VG46 ISO VG32
Grease Points		**JCB Special MPL Grease**	Lithium based, No. 2 consistency
Wear Pad Runways		**JCB Waxoyl**	
Boom Hoses		**JCB Special Slide Lubricant**	

***** ***Note**: This is nominal machine capacity. The total hydraulic system capacity depends on the equipment being used. Fill with all rams closed. Watch level sight glass when filling.*

*† **Note:** This is a system capacity. Use the '**MIN**' and '**MAX**' marks on the dipstick when refilling the system.*

Coolant Mixtures	%	Antifreeze	Starts to Freeze
	55	2.45 gal (9.35 litres)	-36° C (-33 °F)

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

Pre-start Cold Checks Service Points and Fluid Levels	Operation	Daily 10 Hr	Weekly 50 Hr	Initial 100 Hr	Monthly 250 Hr	6 Monthly 500 Hr	Yearly 1000 Hr	2 Yearly 2000 Hr
ENGINE								
Engine Air Filter Pre-cleaner	Clean	1	1		1	1	1	1
Coolant Level and Condition	Check	1	1	1		1	1	1
* Fuel System For Leaks and Contamination	Check			1				
Oil Level and Condition	Check	1	1	1	1	1	1	1
Fuel Filter	Drain		1		1	1	1	1
Fuel Sedimenter	Drain and Clean		1	1	1	1	1	1
Air Cleaner Dust Valve	Clean			1	1	1	1	1
* Oil and Filter	Change			1		1	1	1
Fuel Lift Pump	Clean			1		1	1	1
Engine Mounting Bolts	Check			1		1	1	1
Fuel Filter	Change			1		1	1	1
Air Cleaner Outer Element	Change					1	1	1
Valve Clearance	Check							1
Air Cleaner Inner Element	Change							1
Fan Belt Tension/Condition	Check			1		1	1	1
* Engine Exhaust for Security	Check			1		1	1	1
* Air Inlet for Security	Check			1		1	1	1
Radiator	Clean					1	1	1
All Hoses	Condition			1	1	1	1	1
TRANSMISSION AND AXLES								
Transmission Oil Level	Check	1	1	1	1	1	1	1
Tire Pressures and Condition (see Operator Manual)	Check	1	1	1	1	1	1	1
Tightness of Wheel Nuts	Check	1	1	1	1	1	1	1
Axle(s) Oil Level	Check			1	1	1	1	1
Axle Oil	Change					1	1	1
Hub Oil Levels	Check			1	1	1	1	1
Hub Oil	Change					1	1	1
Drive Shafts and Universal Joints	Grease		1	1	1	1	1	1
Steer Axle Pivots and Linkages	Grease		1	1	1	1	1	1
Wheel Alignment (see Handbook)	Check	1	1	1	1	1	1	1
Wheel Bearings	Check and Adjust					1	1	1
King Pin and Bushes	Check and Adjust					1	1	1
Transmission Oil Filter	Change			1		1	1	1
Transmission Oil	Change						1	1
Transmission Strainer	Clean						1	1
Axle Breathers	Check Clear			1				
Axle Security	Check			1				
Transmission Mount Security	Check			1				
Steering Stops (if fitted)				1				
HYDRAULICS								
Hydraulic Fluid Level	Check	1	1	1	1	1	1	1
System for Leaks	Check	1	1	1	1	1	1	
Oil Filter	Change			1	1	1	1	1
Oil (and clean suction strainers)	Change						1	

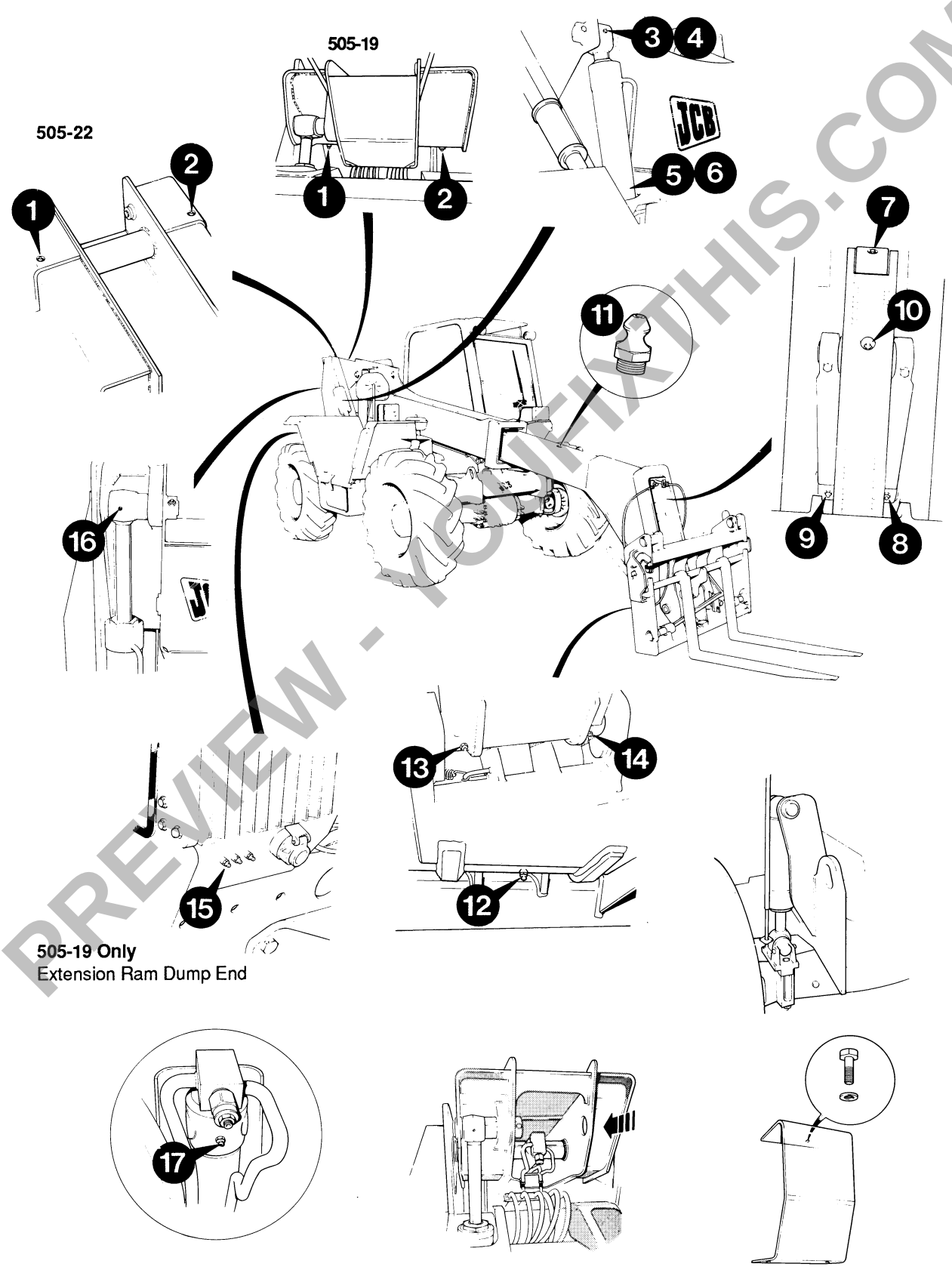
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

GREASING (505-19,22)

Pivot Pins - Grease Daily
16 or 17 Grease Points 505 - 19
15 or 16 Grease Points 505 - 22
17 or 18 Grease Points 505 - 22 (SWAY)

Note: On later machines grease points **12** and **13** are deleted



505-19 Only
Extension Ram Dump End

112022

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

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.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SCHEMATIC HYDRAULIC CIRCUIT

*** (505-19, 22 up to Machine serial number 567217)**

*** Note:** For machines from serial number 567218 and machines that have TI 5/033 (Revised Hydraulic Circuit) incorporated see page 2/10-3.

Component Key

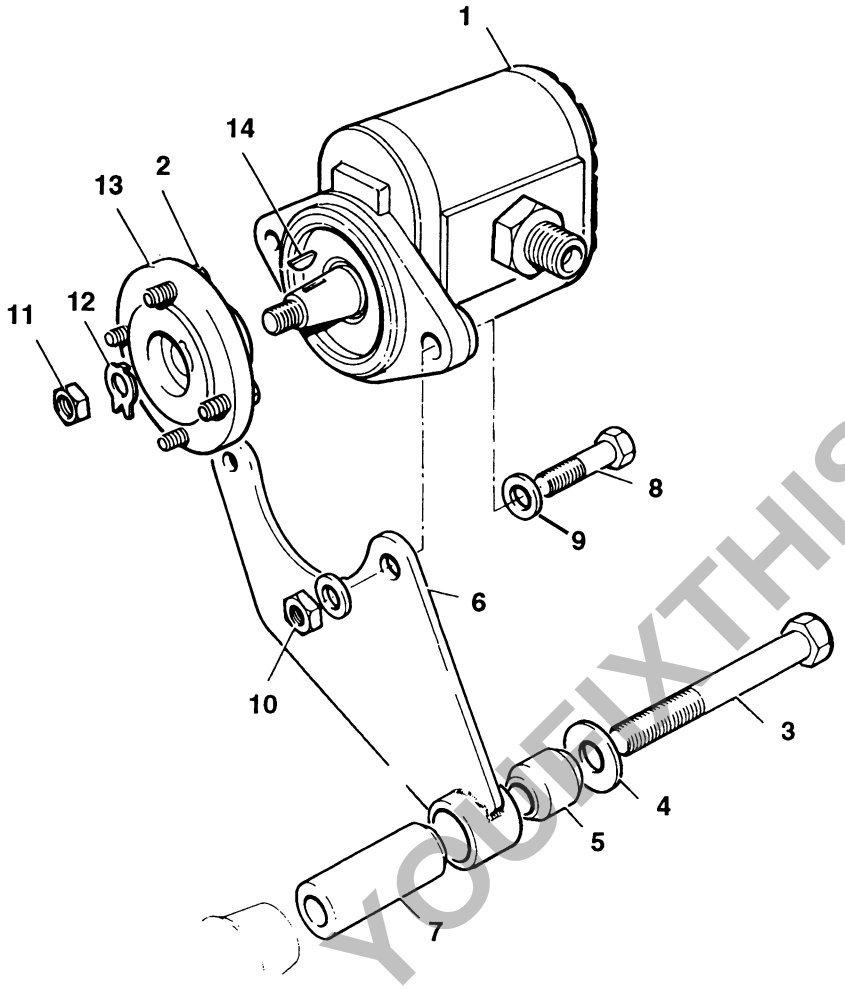
F Filter
P1 Main pump
P2 Steering pump
P3 Cooling fan pump
S1 Main pump suction line
S2 Steering pump suction line
S3 Cooling fan pump suction line
T Tank
1A Neutral circuit feed line
1B Neutral circuit return line
2 Valve block
2A Main relief valve (M.R.V.)
2B Lift spool
2C Extension spool
2D Auxiliary spool
2E Tilt spool
2F Auxiliary spool
2G Sway spool
(see note)
2H
2J
2K
2L
2M
2N
2P
2Q
Auxiliary relief valves (A.R.V's)
2R
2S
2T
2U
2V
2W
Load hold check valves (L.H.C.V's)
2X Pressure test point
10 Lift rams
10A Lift ram check valves
11 Displacement ram
12 Extension ram
12A Extension ram check valve
13 Tilt ram
13A Tilt ram check valve
14 Non-return valve (505-19 Only)
15 Sway ram
15A Sway ram check valve
Optional
29 Steering Anti-cavitation valve (if fitted)
30 Steering flow control valve
31 Steering pressure relief valve
32 Steering pressure test point
33 Steering unit
34 Steering mode valve
35 Front axle steering rams
36 Rear axle steering rams
40 Cooling fan pressure test point
41 Cooling fan motor
41A Cooling fan motor relief valve
42 Auxiliary attachment ram

Note: The circuit illustrated includes most of the services likely to be found on these machines. The exact order of the spools in the valve block may vary from machine to machine.

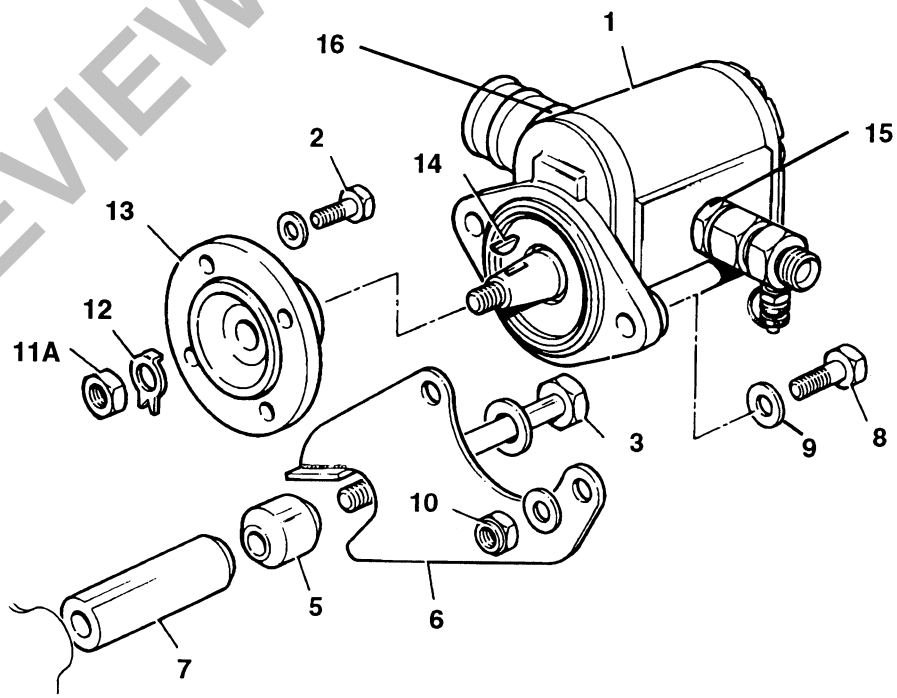
* The test point may be at the valve block or the hydraulic pump.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



S183120



S187830

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Fault Finding Contents

	Page No.
Introduction	4/6 - 1
Symptoms	
Display Unit lights and the alarm sounds momentarily, then the ERROR and CALIBRATE lights remain 'On'.	4/6 - 2
Lights flash and alarm sounds momentarily, then the ERROR light only remains 'On'	4/6 - 2
Lights and alarm never operate	4/6 - 2
Alarm and lights except ERROR operate and stay on but system seems dead	4/6 - 2
ERROR lights remain 'On' but rest of system seems dead.	4/6 - 3
ERROR light illuminates when the machine is operating	4/6 - 3
No boom lift movement	4/6 - 4
Slow motion in manual mode	4/6 - 5
No tilt movement in conventional mode	4/6 - 5
Component Testing	
Enerpac control valve and pulsars	4/6 - 7
Joystick control lever	4/6 - 8
Stabiliser control lever	4/6 - 10
Attitude sensor harness	4/6 - 12
Boom angle sensor and harness	4/6 - 14
Boom extension sensor	4/6 - 16
Display unit and harness	4/6 - 18

Introduction

The purpose of this section is to help you trace PlaceAce faults to a faulty unit (joystick, sensor, motion pac etc). Once you have traced the faulty unit, refer to the appropriate dismantling, inspecting and test instructions given elsewhere in this section.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

*** WIRING DIAGRAM (Machines without IP67 electrics)**

(With roadlights)

Main Components

1 Battery
2 Starter Motor
3 Starter Switch
4 Fuses - Row A
5 Horn Push
6 Thermostart
7 Safe Load Indicator (Not USA)
8 Auxiliary Circuit Relay
9 Horn
10 Fuel Shut-off Solenoid
11 Washer Pump
12 Front Wiper Motor
13 Heater Motor
14 Heater Resistor
15 Heater Switch
16 Wash/Wipe Switch
17 Indicator Relay
18 Hazard Switch
19 Indicator Switch
20 Diode
21 Road Light Switch
22 Headlamp Dip Switch
23 Headlamp Flasher
24 Fuses - Row B
25 Seat/Parking Brake Horn Relay
26 Seat Relay
27 Seat Switch
(25, 26, 27: Not USA machines)
28 Reverse Alarm
29 Reverse Alarm Relay
30 Forward/Reverse Switch
31 Neutral Start Relay
32 Reverse Solenoid
*32A Reverse Relay
33 Forward Solenoid
*33A Forward Relay
34 Transmission Dump Switch
35 Parking Brake Switch
36 Parking Brake Warning Relay
37 Side Lights Relay
38 Warning Buzzer
39 Air Filter Switch
40 Engine Oil Pressure Switch
41 Transmission Oil Temperature Switch
42 Transmission Oil Pressure Switch
43 Water Temperature Switch
44 Hourmeter
45 Alternator
46 L. H. Stabiliser Switch
47 R. H. Stabiliser Switch
48 Speed Transducer
49 Speedometer
50 Fuel Gauge
51 Fuel Gauge Sender
52 Water Temperature Gauge
53 Water Temperature Gauge Sender
54 Roof Wiper
55 Rear Wiper
56 Beacon Switch
57 2/4 Wheel Drive Solenoid
58 2/4 Wheel Drive Switch
59 2/4 Wheel Drive Brake Switch
(57, 58, 59: Not required on manual shift or permanent 4WD machines)
60 Front Axle Proximity Switch
61 Rear Axle Proximity Switch
62 Steering Mode Switch
63 Crab Steer Solenoid
64 4 Wheel Steer Solenoid
65 Crab Steer Relay
66 4 Wheel Steer Relay
67 Trailer Socket
68 Fuses - Row C
69 Working Light Switch
70 Radio (Optional)

Lamps

80 Indicator Warning
81 L.H. Front Indicator
82 L.H. Rear Indicator
83 Hazard Warning
84 R.H. Front Indicator
85 R.H. Rear Indicator
86 Trailer Indicator Warning
87 Reversing
88 L.H. Headlamp Dip Beam
89 R.H. Headlamp Dip Beam
90 Parking Brake Warning
91 Air Filter Blocked Warning
92 Engine Oil Pressure Warning
93 Transmission Oil Temperature Warning
94 Transmission Oil Pressure Warning
95 Water Temperature Warning
96 Alternator Warning
97 Stabiliser Warning
98 Interior
99 Beacon
100 Beacon Warning
101 2 Wheel Drive Warning
102 L.H. Stop
103 R.H. Stop
104 Crab Steer Warning
105 2 Wheel Steer Warning
106 4 Wheel Steer Warning
107 Instrument Panel Illumination
108 Inclinometer Illumination
109 L.H. Side
110 L.H. Rear
111 R.H. Side
112 R.H. Rear
113 Number Plate
114 Working Light Warning
115 L.H. Working
116 R.H. Working
117 L.H. Headlamp Main Beam
118 R.H. Headlamp Main Beam
119 Main Beam Warning

Cable Colour Code

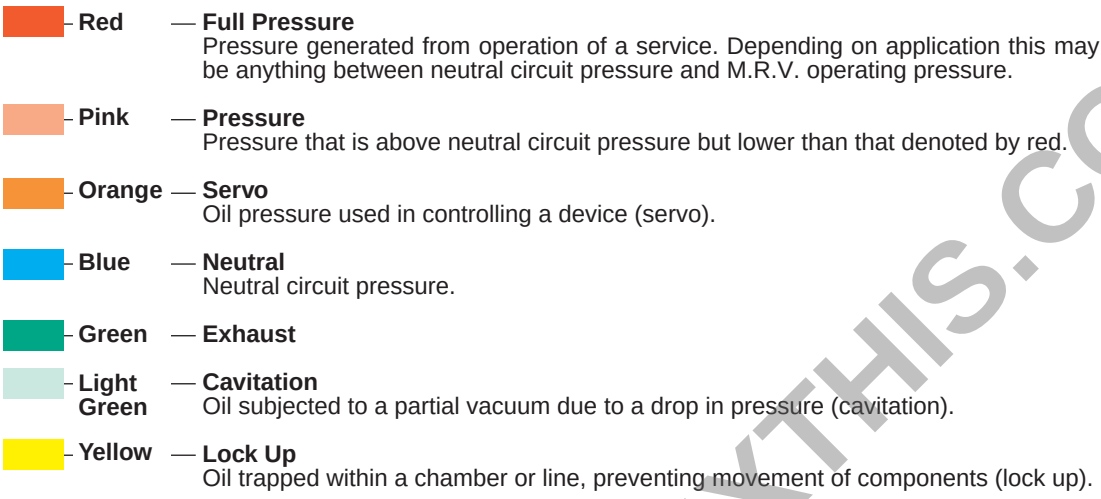
B Black	N Brown	S Slate
G Green	O Orange	U Blue
K Pink	P Purple	W White
LG Light Green	R Red	Y Yellow

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Colour Coding

The following colour coding, used on illustrations to denote various conditions of oil pressure and flow, is standardised throughout JCB Service publications.



A390940

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

HYDRAULIC PUMP

(See Section Contents for machine models)

Note: Before removing and dismantling the pump, check flow and pressure. If either of these are low and cannot be corrected at the relief valve, the appropriate pump section must be renewed completely. Renewal of components such as gears, bearings and housing will not effect a permanent cure. If the pump output is satisfactory but there is external leakage, the pump should be removed and dismantled for re-sealing only.

* Leaks from the rivets holding the data plate in position and from under the bolt heads is not an indication of a cracked body. Remove and dismantle pump to determine cause of leak.

Removal

1 Drain hydraulic tank (see page 2/2 - 2).

2 Disconnect and plug feed hose and suction hose.

3 Undo bolts **1**,remove pump from the machine.

Replacement

Replacement is a reversal of the removal procedure.

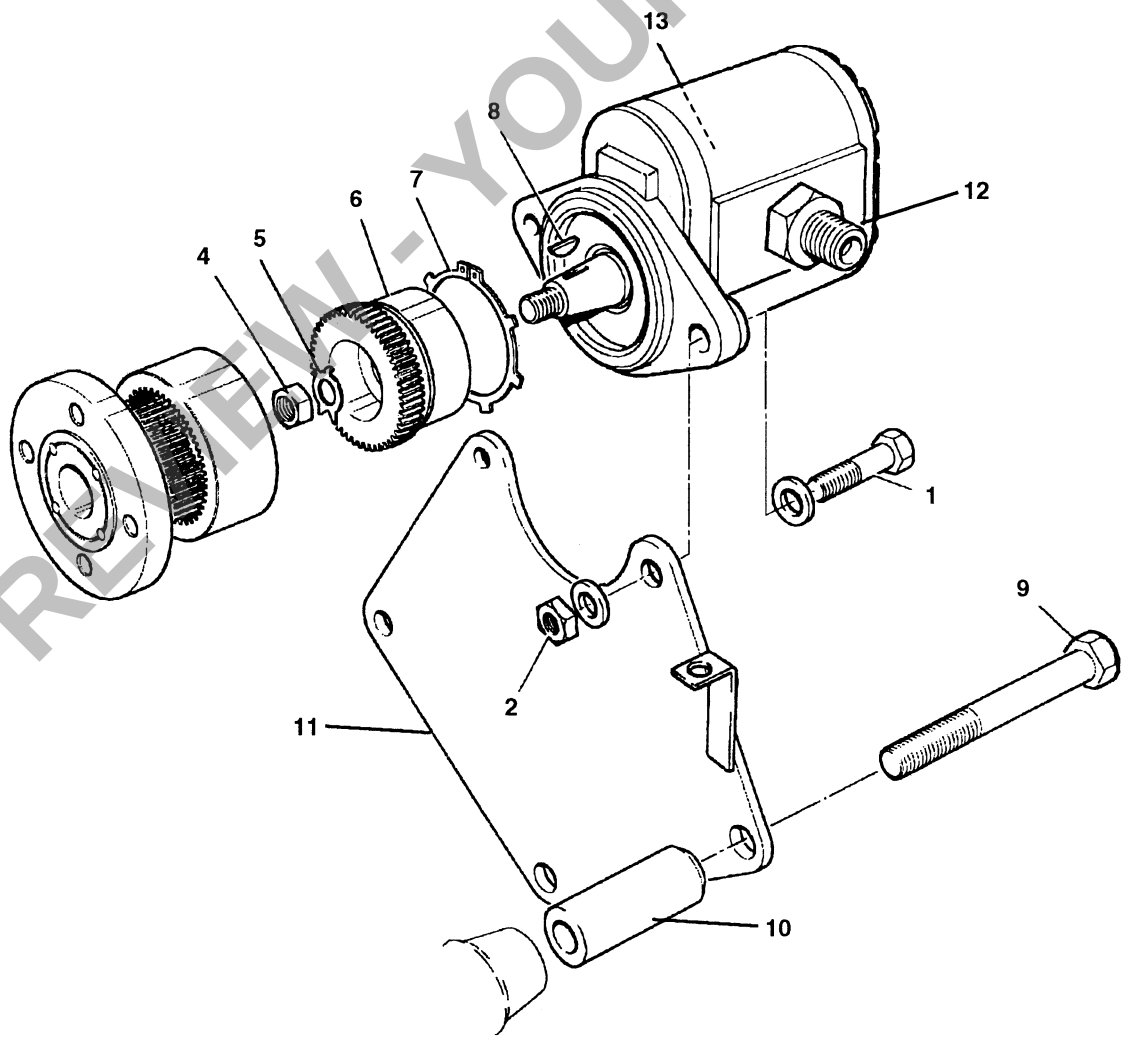
* Ensure that tab washer **5** is located in the keyway, and bend up tabs after torque tightening nut **4**.

* Assemble sleeve **10** with chamfered end towards bracket **11**.

After fitting a new or serviced pump and before starting the engine screw the MRV out 4 full turns. Adjust the MRV, *see **PRESSURE TESTING**, page 2/6-1.*

Torque Settings

Item	Nm	kgf m	lbf ft
1	118	12.0	87
4	95 - 100	9.7 - 10.2	70 - 74
9	118	12.0	87
12/13	95 - 100	9.7 - 10.2	70 - 74



S188320

Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM

BOOM EXTEND REGENERATIVE

(See Section Contents for machine models)

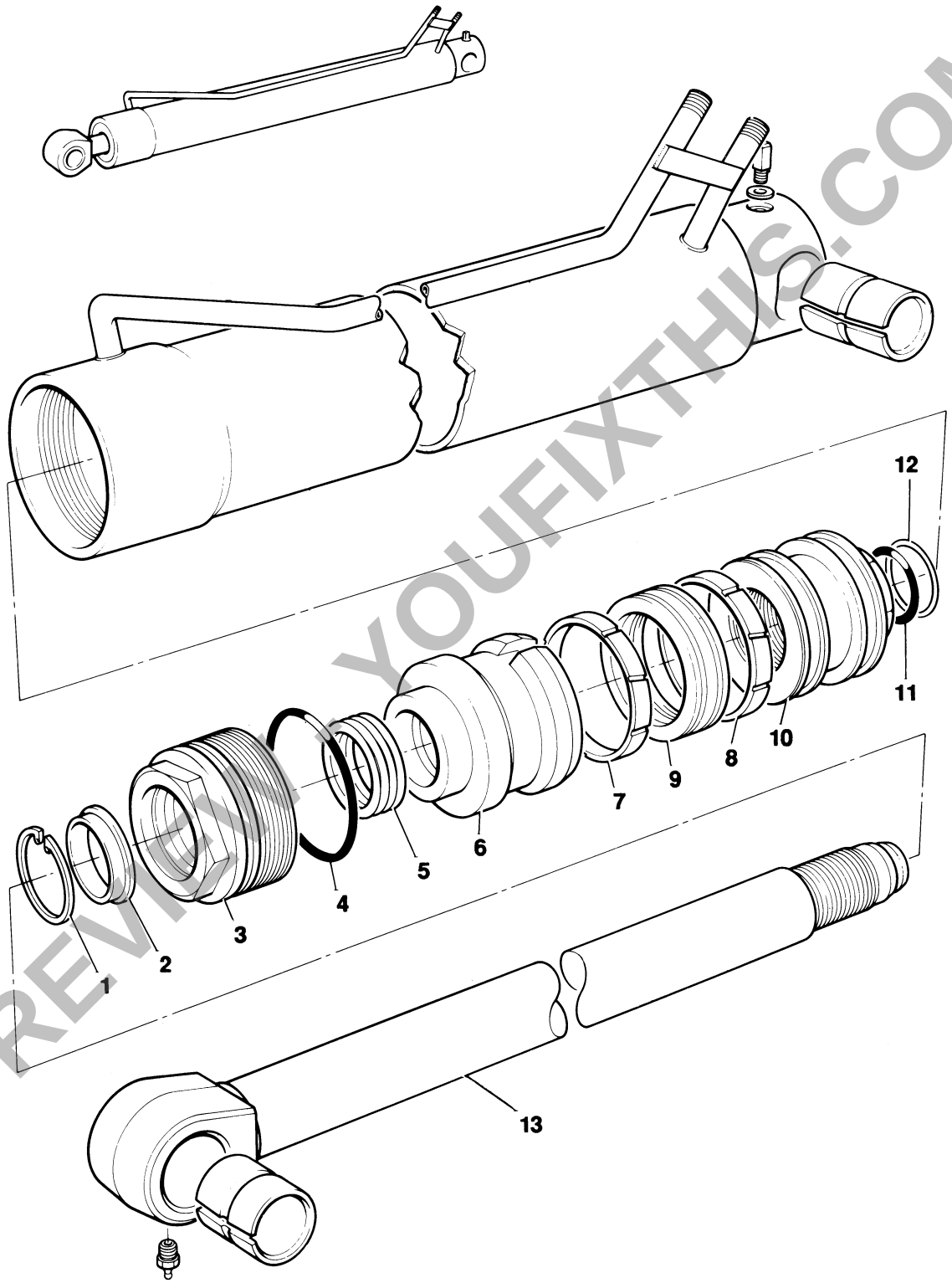
With the forks of the machine lightly loaded, the pressure required to extend the three stage boom remains below the relief valve setting of the regenerative control valve **16**. The illustration shows boom extend service selected at spool **2F**, oil is supplied to the extension cylinder **12** via hose burst protection valve **17** and regenerative control block **16** which houses check valve **16C**, relief valve **16B** and non-return valve **16D**.

Oil is fed to the hose burst check valve **17**, the pressurised oil opens check valve sleeve **17A** against spring **17B** to open up a passage for the oil to act on the head side of the extension ram **12**, to extend the cylinder.

Oil displaced from rod side of extension cylinder **12** flows to the regenerative control valve **16**.

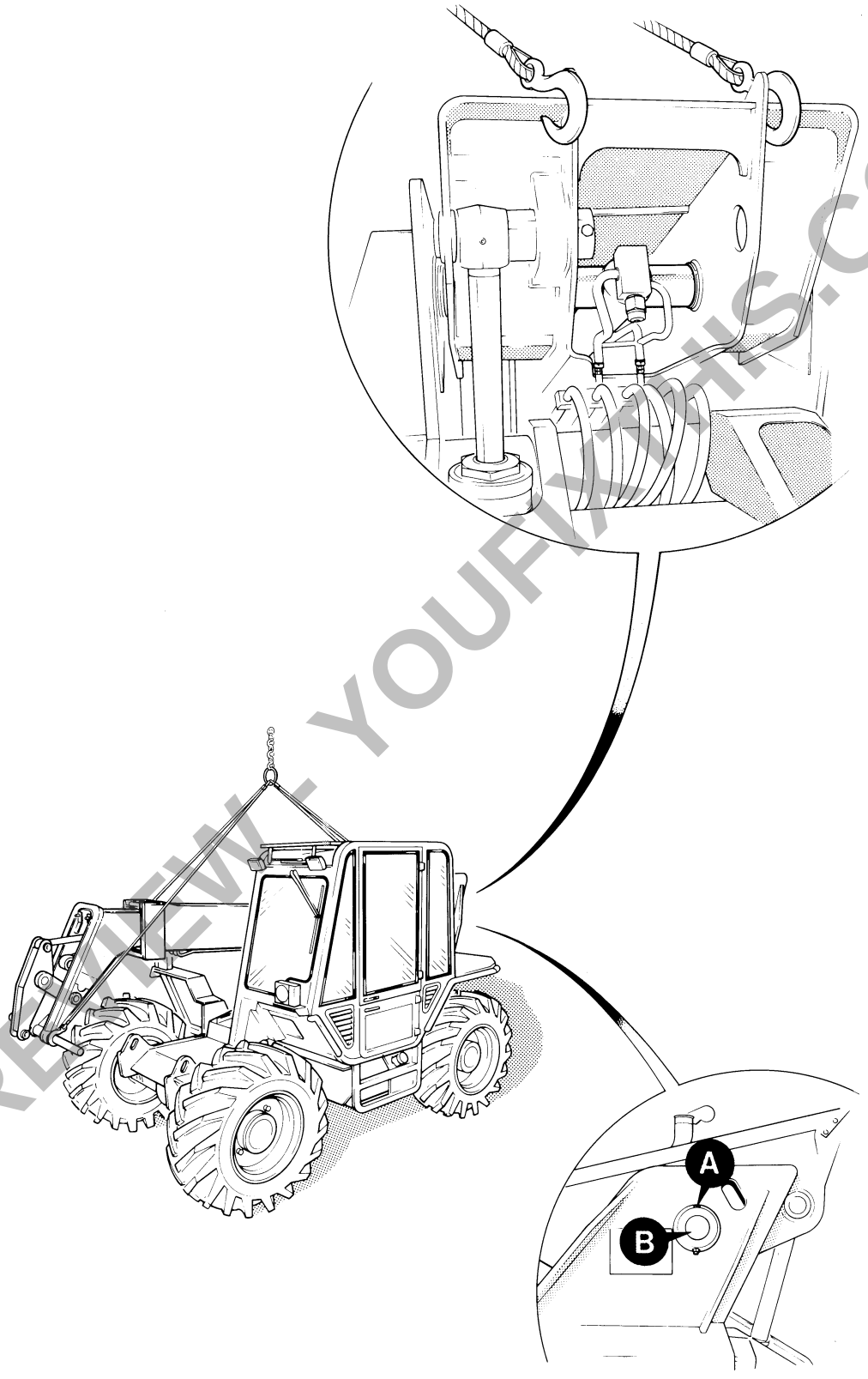
Delivery pressure is felt under piston of check valve **16C** via pilot line from the inlet port, the piston moves up until it contacts and opens the plunger. Because passage back to tank via extension spool **2F** is blocked by the closed relief valve **16B**, the oil flows past the open check valve **16C** and non-return valve **16D** to supplement pump flow in extending the extension cylinder **12**.

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com



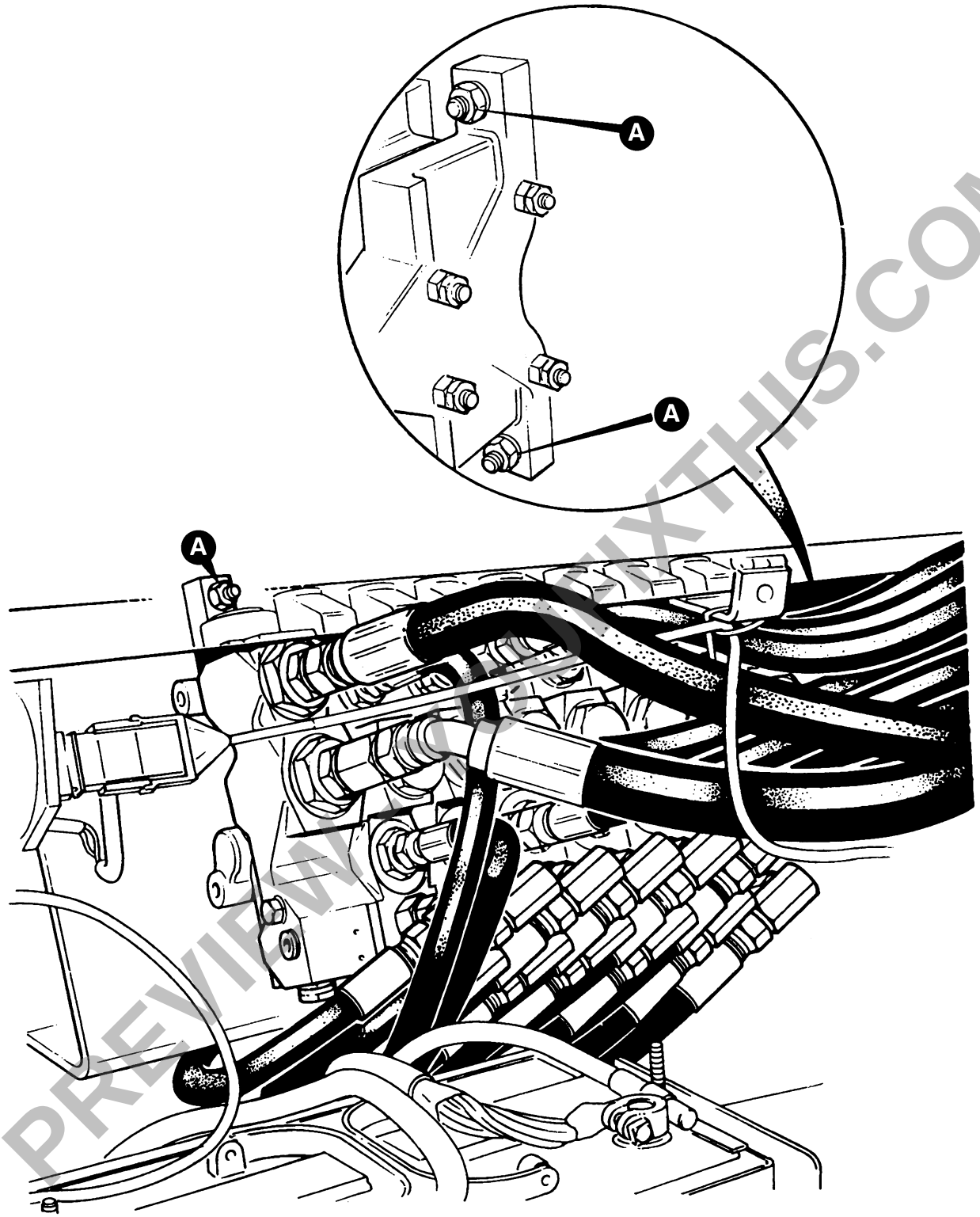
PREVIEW YOUFIXTHIS.COM

Download full manual at youfixthis.com



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



S152610

PREVIEW ONLY
YOUFIXTHIS.COM

Download full manual at youfixthis.com

BOOM ANGLE SENSOR AND HARNESS

The following procedure is to prove the boom angle sensor is giving the correct voltage signal to the motion pac control unit and the harness is serviceable.

Supply voltage Check

Ensure the machine is on level ground.

Disconnect boom angle sensor and install test lead **A**.

Using a multimeter select voltage.

Turn the starter switch to 'ON'.

Connect positive lead to the red wire and negative lead to the black wire, must be 4.9 - 5.1 volts.

Boom Angle Sensor Voltage Checks

Ensure the machine is on level ground.

Disconnect boom angle sensor and install test lead **A**.

Connect positive lead to the white wire and negative lead to the black wire.

Turn the starter switch to 'ON'.

Start the engine and lower the boom until the M.R.V operates.

* Measure voltage reading, must be 0.03 to 0.59 volts.

Raise the boom fully until the M.R.V operates.

* Measure voltage reading, must be 4.40 to 4.95 volts.

Note: If the machine boom is not fully raised and fully lowered the boom angle sensor will give incorrect readings.

Boom Angle Sensor Harness Continuity Checks

Disconnect boom angle sensor and disconnect interconnecting harness from the M.P.C.U plug.

Check for continuity between the three way connector **B** pin A (Red) and the four way interconnecting connector **C** pin A (Red) .

Check for continuity between the three way connector **B** pin B (White) and the four way interconnecting connector **C** pin B (White).

Check for continuity between the three way connector **B** pin C (Black) and the four way interconnecting connector **C** pin C (Black).

Disconnect the M.P.C.U harness plug.

Check for continuity between the four way connector **D** pin A (Red) and the M.P.C.U plug **E** pin C2 .

Check for continuity between the four way connector **D** pin B (White) and the M.P.C.U plug **E** pin A2.

Check for continuity between the four way connector **D** pin C (Black) and the M.P.C.U plug **E** pin C4.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Valve Block Checks

1	Check supply to valve block electrical connection. Disconnect valve block electrical plug and move the control lever from the neutral position. At valve block plug is there battery voltage (approx) between pin 1 (black wire) and pin 2 (red wire)?	**Yes:** **No:**	Check 2 Change harness after checking connections and earth for continuity.
2	Check signal supply to valve block electrical connection. Move the control lever from the neutral position. At valve block plug is there 9 volts or 3 volts between pin 1 (black wire) and pin 4 (green wire)?	**Yes:** **No:**	Check 3 Change harness after checking connections and earth for continuity.
3	Check the connections between the plug and the valve block are clean and not damaged. Reconnect the plug to the valve block, does the service operate?	**Yes:** **No:**	Resume normal operations. Check 4
4	Disconnect the faulty service plug from the valve block and connect to a service that operates correctly. Does the control lever operate this service?	**Yes:** **No:**	Check 5 Change harness after checking connections and earth for continuity.
5	Operate the faulty service valve block section with a manual control lever. Does the service operate correctly?	**Yes:** **No:**	Check 6 Hydraulic fault with valve block, check pressures and relief valves.
6	Remove the Proportional Valve Electric (PVE). Is the filter clean?	**Yes:** **No:**	Change the PVE. Check 7
7	Change the filter and seals, refit the PVE. Refit the original plug. Does the service operate correctly?	**Yes:** **No:**	Resume normal operations. Change the PVE.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Contents **Page No.**

Powershift
- Removal & Replacement 12 - 1
- Dismantling 13 - 1
- Assembly 14 - 1
- Clutch Dismantling 15 - 1
- Clutch Assembly 16 - 1
- Mainshaft Dismantling 19 - 1
- Mainshaft Assembly 20 - 1
- Layshaft Dismantling 21 - 1
- Layshaft Assembly 22 - 1
- Solenoid Identification 23 - 1
- Torque Converter Stall Test 23 - 1
- Clutch Leak Testing 24 - 1
- Pressure and Flow Testing 25 - 1

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

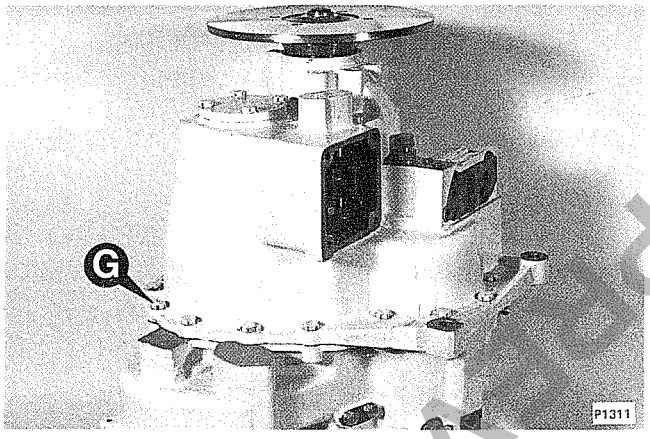
Download full manual at youfixthis.com

SYNCRO SHUTTLE - ASSEMBLY (cont'd)

15 Assemble two halves of the casing together and tighten bolts **G** to 56 Nm (42 lbf ft).

* **Note:** Assembling the case halves at this stage is a temporary arrangement to enable measurement of the reverser shaft end float. DO NOT apply JCB Lock & Seal to the bolts at this stage or bond the mating faces.

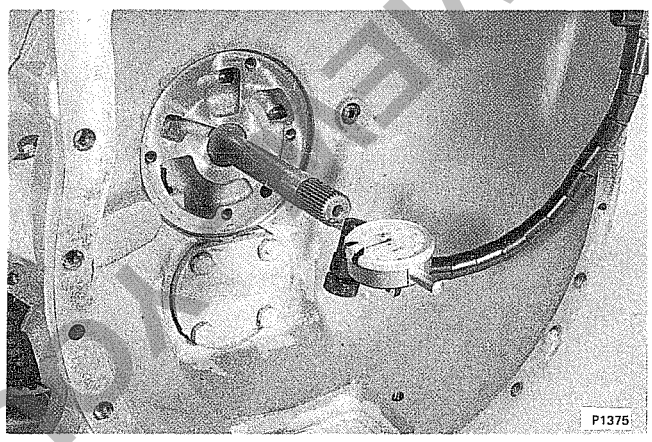
* **Note:** To prevent damaging reverser unit piston ring seals it is permissible to remove the seals prior to assembling the case halves. However this is applicable only whilst measuring reverser shaft end float. REFIT THE SEALS BEFORE FINAL ASSEMBLY.



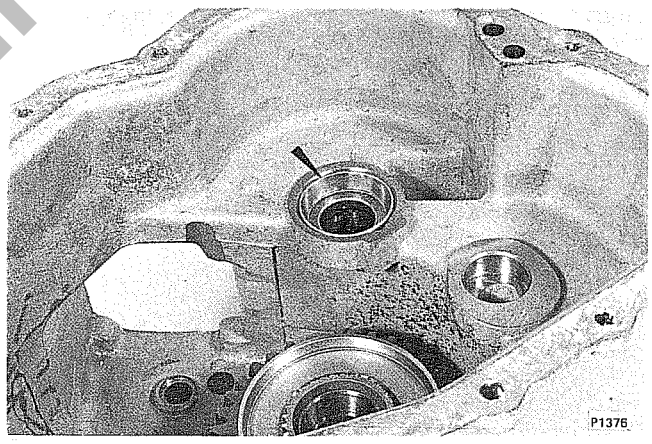
16 Measure end float of reverser shaft which should be 0.03 to 0.08 mm (0.001 to 0.003 in).

Note: Rotate shaft before measuring to fully seat bearings.

* Position pointer of dial test indicator on the chamfer of the shaft, not the end face. This will ensure a constant reading is given.

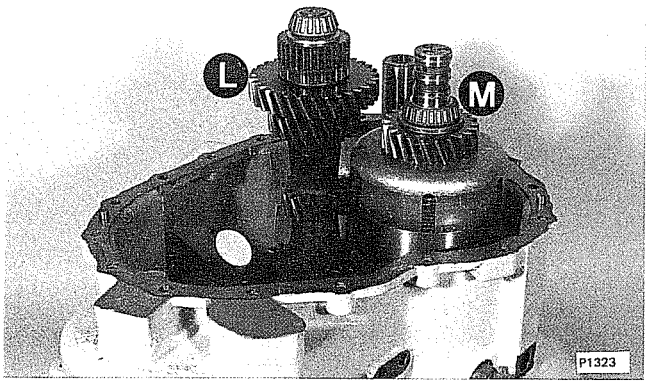


17 Separate two halves of casing and add or subtract shims fitted beneath the solenoid end bearing outer race to correct reverser shaft end float.



18 Pack mainshaft output end bearing with HP grease and place mainshaft **L** into position followed by reverser assembly **M**.

Note: It will be necessary to lift the reverser assembly slightly to allow gears to mesh.



PRINTED BY YOUFIXTHIS.COM

HYDRAULIC 2/4 WHEEL DRIVE UNIT - IP67 MACHINES

Dismantling

Note: The removal procedure for the hydraulic 4 WD unit is the same as for the mechanical unit (see page 6/8-1). - loosen the output retaining nut before removal.

Remove bearing **1**, only if it is to be renewed.

Remove seal ring **2**.

Note: If the piston ring seal is damaged or excessively worn then check for burrs or damage on the shaft groove. Remove burrs with fine grade abrasion paper and oil.

Pull off the 4WD output gear **5**, together with its bearing **3**, needle roller bearing **6** and thrust washer **4**.

Using a suitable press, compress disc springs **8A**, **8B** and remove the circlip **7**.

⚠ CAUTION

The spring force is approximately 22240N (5000 lbf 2270 kgf). Proceed Carefully.
TRAN 6-3

Remove disc springs **8A** and **8B**, pressure plate **9**, shim(s) **10** (keep the shim(s) separate from the counter plates), and clutch pack friction plates and counter plates **11**.

Remove the clutch drum retaining circlip **12** and support washer **13**.

Remove clutch drum **14** and actuating sleeve **15**.

Remove disc spring **16**.

Remove the piston **17** and its spring steel ring **18**.

Remove and discard piston 'O' rings **19** and **20**.

Remove the piston housing **21** only if necessary, the housing is press fit on the shaft **22**.

Assembling

* **Note:** There is now a pressure test adaptor and clamp assembly that can be used to 'bench test' the clutch. Bench testing will ensure the clutch operates correctly prior to re-assembling and installing in the machine. Refer to 'Pressure Testing the 2/4WD Clutch' on page 6/8-15.

Renew all 'O' rings.

Grease the shaft **22** then fit the piston housing **21** by pressing the shaft squarely into the housing (make sure the housing is securely supported).

Fit new 'O' rings **19** and **20** to piston **17**, locate the piston into housing **21**. Fit spring steel ring **18** ensuring that it seats firmly in its groove.

Place the disc spring **16** into the housing **21**.

Position the actuating sleeve **15** onto the disc spring **16**.

Install the clutch drum **14** in the housing. Fit support washer **13** and drum securing circlip **12**.

***Note**: If an earlier type clutch* drum ***14** (70.50 mm **X**) is replaced with a later type clutch drum (69 mm **X**) then the first counter plate (item **P**) must be removed, also note the following points:*

1 *Assembly of the clutch pack should be started by fitting a friction plate first and finishing with a shim plate/setting counter plate as required.*

2 *The setting tolerance, shown at **B**, remains unchanged.*

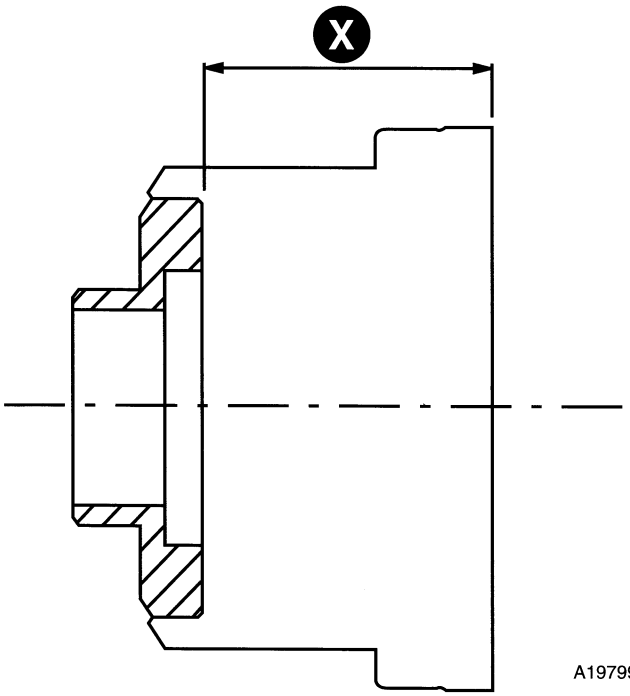
3 *Circlip **12** is a special heavy duty type and should not be opened more than necessary (i.e. open so that it just clears the shaft), otherwise over-stretching and failures could occur. It is strongly recommended that this circlip is replaced with a new one at each repair*

Build up the clutch pack **11**, installing friction plates and counter plates alternately, starting with a counter plate, *see **Note**: step **1** above*, and finishing with a friction plate.

Install shim(s) **10** and pressure plate **9**.

Use the output gear **5** to align the clutch plate spines. Ensure that all plates are engaged with the gear shaft splines. Rotate output gear back and forth to create maximum backlash then withdraw the gear taking care not to disturb the pack.

Place the first two disc springs **8B** with their convex sides uppermost, onto the clutch pack. (There are four identical disc springs.) Place the other two disc springs **8A**, with their convex sides down, onto the first two - refer to inset **A**.



A197990

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

TECHNICAL DATA (506-36, 506B)

FRONT AXLE

Type	JCB Spiral bevel with epicyclic hub reduction
Weight (approximate)	490 kg (1100 lb)
Overall Gear Ratio	18.16:1
Crownwheel & Pinion Ratio	3.36:1
Hub Reduction	5.4:1

REAR AXLE

Type	JCB Spiral bevel with epicyclic hub reduction
Weight (approximate)	352 kg (776 lb)
Overall Gear Ratio	23.625:1
Crownwheel and Pinion Ratio	4.38:1
Hub Reduction	5.4:1
Oscillation	± 10°
Castor Angle	0°
Camber Angle	1°
King-pin Inclination	Zero
Toe-in	Zero

* ***Note****: The maximum pressure embossed on the tyre may differ from the pressure stated below. Inflate to pressures below, these are agreed with the tyre manufacturer/s in accordance with the European Tyre and Rim Technical Organisation (ETRTO) standards to satisfy machine stability performance.*
If the tyres fitted to your machine are not listed, contact your JCB Distributor for advice, DO NOT guess tyre pressures.

506-36		**Front**		**Rear**		
Size	Ply	Bar	lbf/in²	Bar	lbf/in²	Manufacturer/Type
15.5-25	12	4.0	58	4.0	58	Industrial Traction

506B		**Front**		**Rear**		
Size	Ply	Bar	lbf/in²	Bar	lbf/in²	Manufacturer/Type
15.5-25	12	4.0	58	4.0	58	Industrial Traction

GENERAL DESCRIPTION

The front axle consists of a centre casing (drivehead) and two axle arms. The drivehead houses the differential gearing and two oil-immersed disc brake units. The axle arms house the halfshafts. Specially shaped spider gears in the differential provide 'torque proportioning'. This means that drive power will be kept on one wheel if the other is slipping.

The wheel hubs are connected to the halfshafts through universal joints which drive sun-and-planet gears inside the hubs.

The rear axle works on the same principle as the front axle, but has a single-piece casing which houses the differential and halfshafts. There are no brakes in the rear axle.

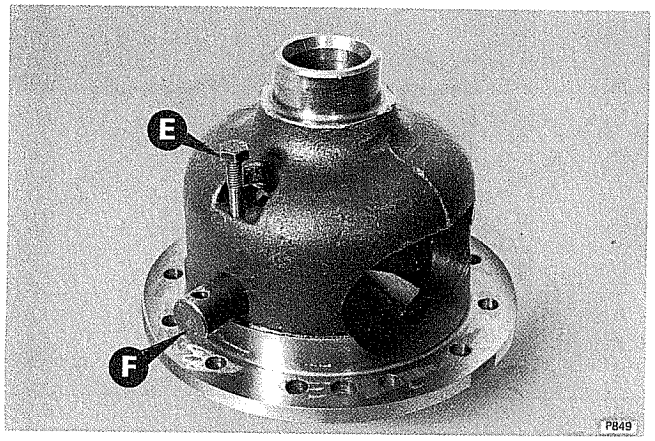
The rear axle is mounted to the machine through a horizontal trunnion. This allows the wheels to ride up and down over uneven ground, helping to keep the machine, and its load, level.

* For machines fitted with water ballasted tires see page 7/1-3, this details the procedure for filling the tire. For checking the tire pressure ensure valves are at the uppermost position.

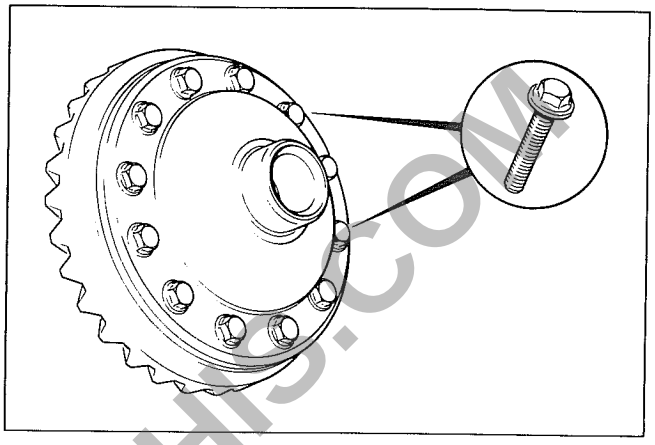
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

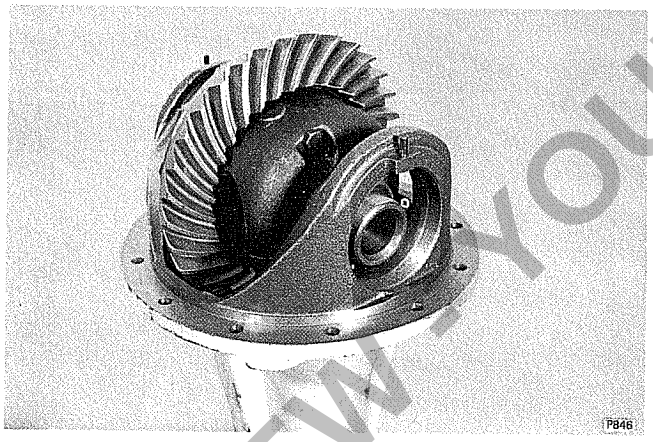
REAR DRIVE HEAD - ASSEMBLY



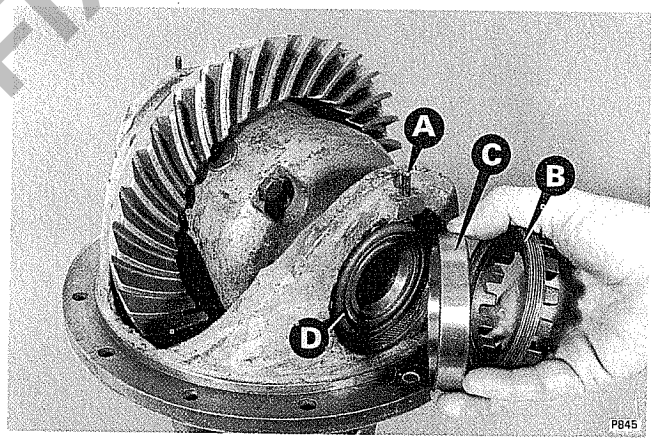
6 Drive in trunnion pin **F** until bolt **E** can be located. Apply JCB Lock and Seal to threads of bolt then fit and tighten to 28 Nm (20 lbf ft).



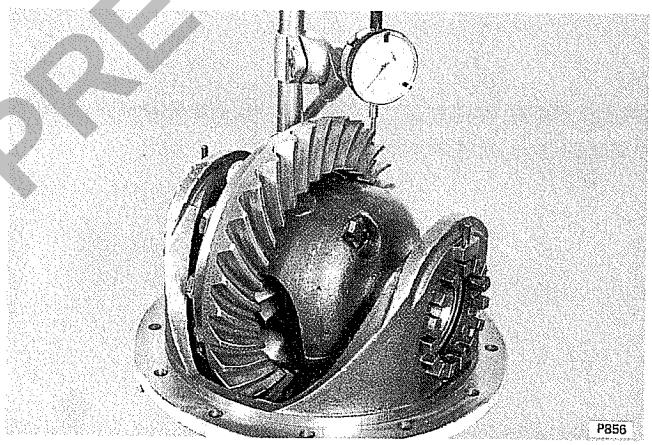
7 Fit crownwheel using new Durlok bolts tightened to 94 Nm (70 lbf ft).



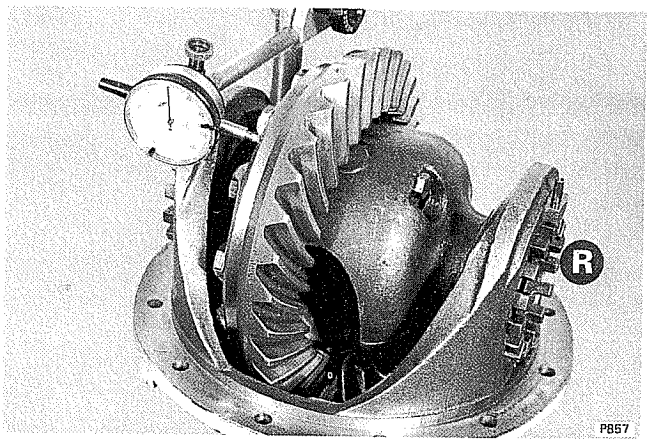
8 Locate crownwheel assembly (without bearings) into housing.



9 Drive bearing cones **D** onto spigots, lightly oil the bearings then fit bearing cups **C** and castellated nuts **B**. Do not fit the roll pins **A** at this stage.



10 Adjust castellated nut on crownwheel side until backlash is 0.12—0.20 mm (0.005—0.008 in).

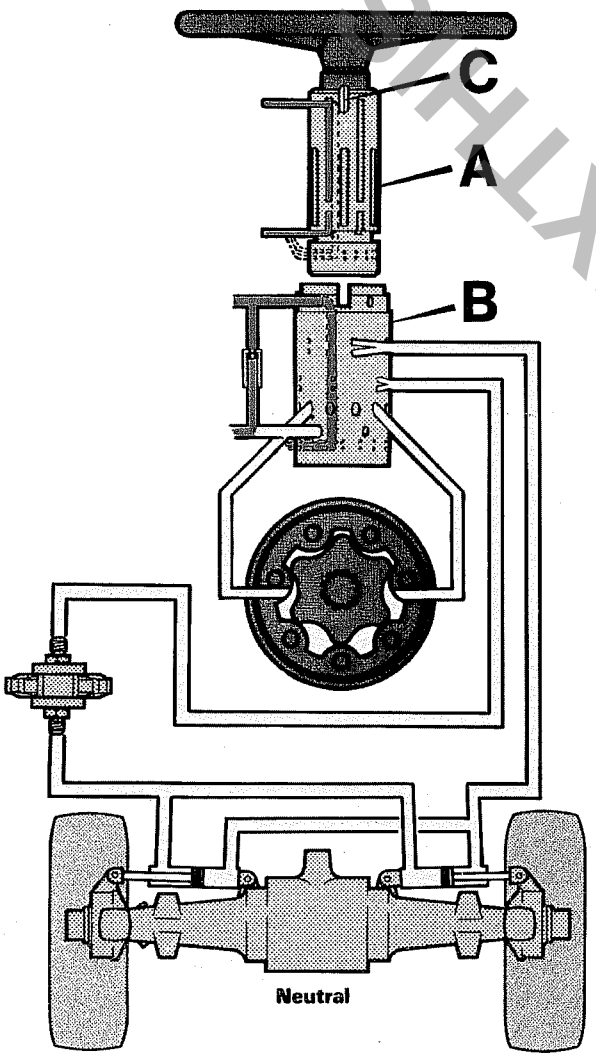


11 Adjust castellated nut **R** until there is no end-float and no pre-load, ensuring that bearings are bedded in by rotating in each direction. Tighten nut **R** by a further 4 castellations to set pre-load, ensuring that correct backlash is maintained. Fit roll pins.

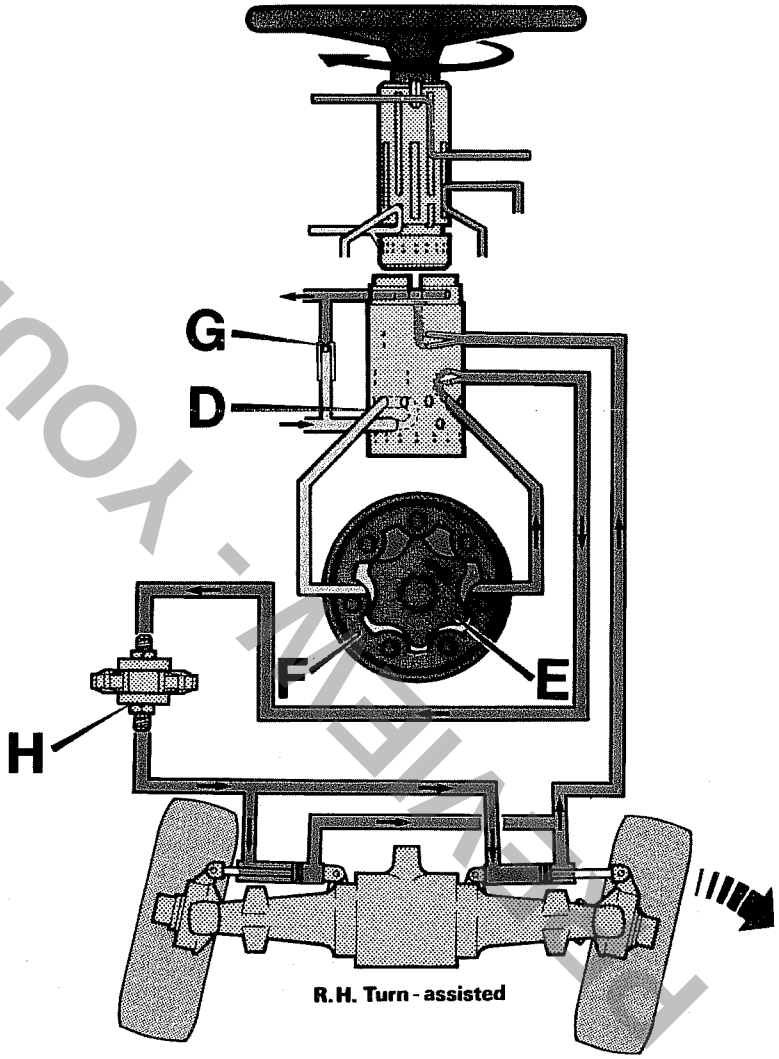
Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM

STEERING UNIT OPERATION 1

In neutral (L.H. fig.) the steering wheel is stationary, the inner and outer spools (**A** and **B**) are held in neutral position by their centring springs. Oil from the pump is returned to tank via galleries, preventing flow to and from the steering rams. The R.H. fig shows flow through the unit in a R.H. turn condition. Turning the steering wheel rotates the inner spool a few degrees relative to the outer spool and directs pressure oil through 6 of the 12 ports **D** in the bottom of the outer spool. The metering unit is linked to the spool by a cross pin and as the steering wheel is turned, the oil is diverted by the inner spool into the stator **F** and the rotating lobes **E** pump the oil out to the rams via the steering mode valve **H**. Non return valve **G** is held closed by pump pressure.



Neutral



R.H. Turn - assisted

9808/6435

WWW.YOUFIXTHIS.COM
Download full manual at youfixthis.com

STARTER MOTOR - LUCAS M127

Removal and Replacement

Disconnect cables and remove battery. Remove cables from main starter terminal and solenoid terminal. Unscrew three securing nuts and remove starter.

Replace by reversing the removal sequence.

Dismantling

Note: Dismantle only to item **34** unless the field windings are to be renewed Test the windings electrically before removing then from the motor yoke **15**.

Using a slotted steel tube, displace ring **23** to permit withdrawal of ring **22**.

Allow brake shoes **28** to remain in the end plate **11** unless requiring renewal.

Servicing and Renewal

Renew brushes **14** and **14A** if their length is less than 8mm (0.3in).

Clean the commutator **A**. If individual copper bars are burned or eroded the armature has broken windings and must be renewed. Otherwise polish with fine grade glass paper (not emery). Renew armature if commutator diameter is 38mm (1.5in) or less.

Check the field windings for open circuits by connecting an ohmmeter (0 to 100 ohms) between the stud terminal **B** and each positive brush **14A** in turn. A high or infinity reading indicates an open circuit. Similarly, connect the meter between brushes **14A** in turn. A high or infinity reading indicates a short circuit between the coils and the yoke. Renew the coils as necessary, removing screws **36** with a pole shoe screwdriver C50 (obtainable from Lucas dealers).

Check bronze bushes **32** and **34** for wear.

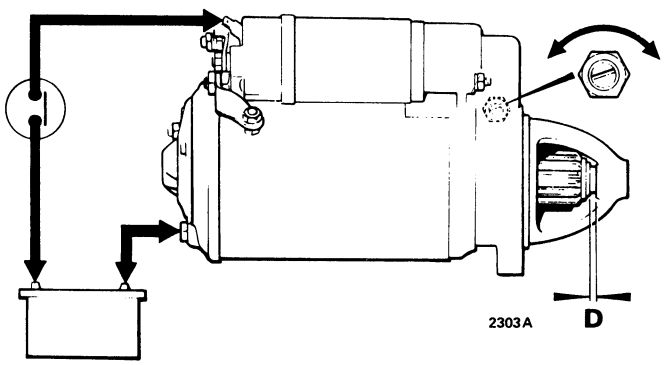
Assembly

Soak new bushes **32** and **34** in clean warm engine oil for 24 hours before fitting.

Align crosspin **C** with the notches in the brake shoes **28** before assembling brush carrier and back plate to motor yoke. Ensure that brushes **14A** are correctly located in the insulated brush boxes.

Smear drive shaft splines and operating collar bearing surface with JCB MPL Grease before assembly. Assemble operating fork **19** with curved face toward the armature.

Set the movement of drive pinion **24** by connecting a 6V battery and switch as shown. Operate switch and check dimension **D**. Adjust to 0.13-1.14 mm (0.005-0.045in.) by slackening locknut **17** and rotating eccentric pin **18** as necessary. Retighten locknut.



PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 25 of 701 pages

The full manual includes:

- All 701 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Jcb 505-19, 505-22, 508-40, 506-36, 510-40, 506B Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual