Service Manual

500 Series

From m/c No. 561001

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This Service Manual covers the following Machines:-

525-58 and 525-58 Farm Special - from machine Serial Number 561001
525-67 and 525-67 Farm Special - from machine Serial Number 561001
525-58 and 525-67 Farm Special Plus
525-58 and 525-67 Basic Servo Options
527-58 and 527-67 - from machine Serial Number 572775
530-95 - from machine Serial Number 564980
530-110 - from machine Serial Number 563359
530-110 and 530-120 - PlaceAce
530-110 and 530-120 Servo Options
530-120 - from machine Serial Number 562601
530-67 and 530-67 Farm Special - from machine Serial Number 571001
535-67 - from machine Serial Number 572775
* 537-120 and 537-130 from machine Serial Number 572900

Information covers two stage and three stage boom machines.

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The large bold numbers are main component identification numbers. The small plain numbers are cable identification numbers. When a cable identification number has a suffix number, for clarity, the suffix number is not shown. The complete electrical circuit is shown on page 10/10-12 and continued on page 10/10-13.

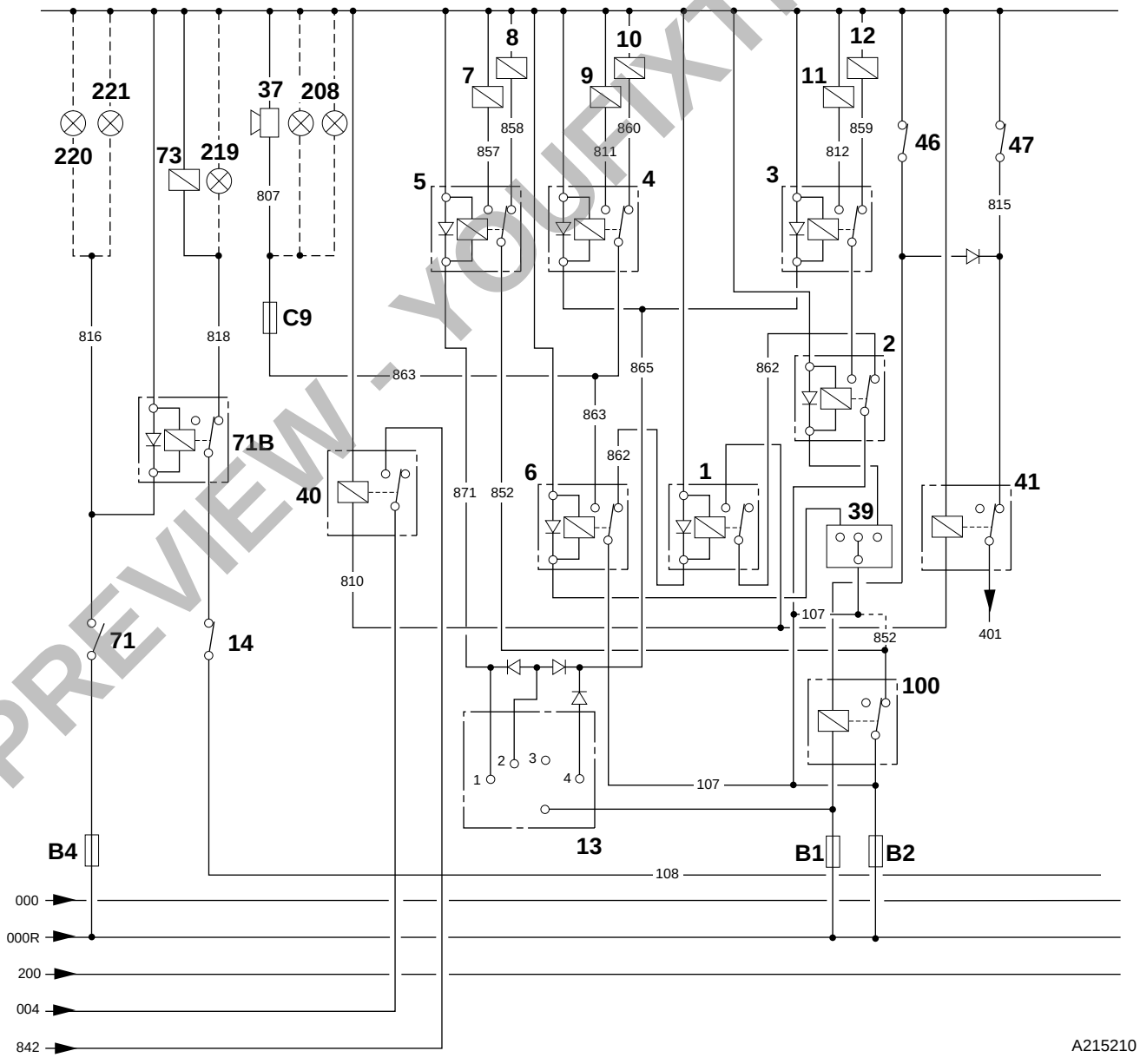
Main Components

1 Neutral Drive Relay
2 Forward Drive Relay
3 Forward High/Low Relay
4 Reverse High/Low Relay
5 Driveshaft Relay
6 Reverse Relay
7 Layshaft Solenoid
8 Mainshaft Solenoid
9 Reverse High Solenoid
10 Reverse Low Solenoid
11 Forward High Solenoid
12 Forward Low Solenoid
13 Column Gear Selector
14 2 Wheel Drive Switch
39 Forward/Reverse Selector Switch See note.
40 Neutral Start Relay
41 Parking Brake Warning Relay
46 Transmission Dump Switch
47 Parking Brake Switch
71 Brake Switch
71B Brake Switch Relay
73 2 Wheel Drive Solenoid
100 Transmission Dump Relay

Lamps

208 Reversing Lights
220 L.H. Brake Light
221 R.H. Brake Light
219 2 Wheel Drive Warning

* **Note**: On early machines the Forward/Reverse Selector Switch **39** is supplied by cable 852 and not 107.



A215210

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SCHEMATIC HYDRAULIC CIRCUIT

(525-58,67 and 530-95 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

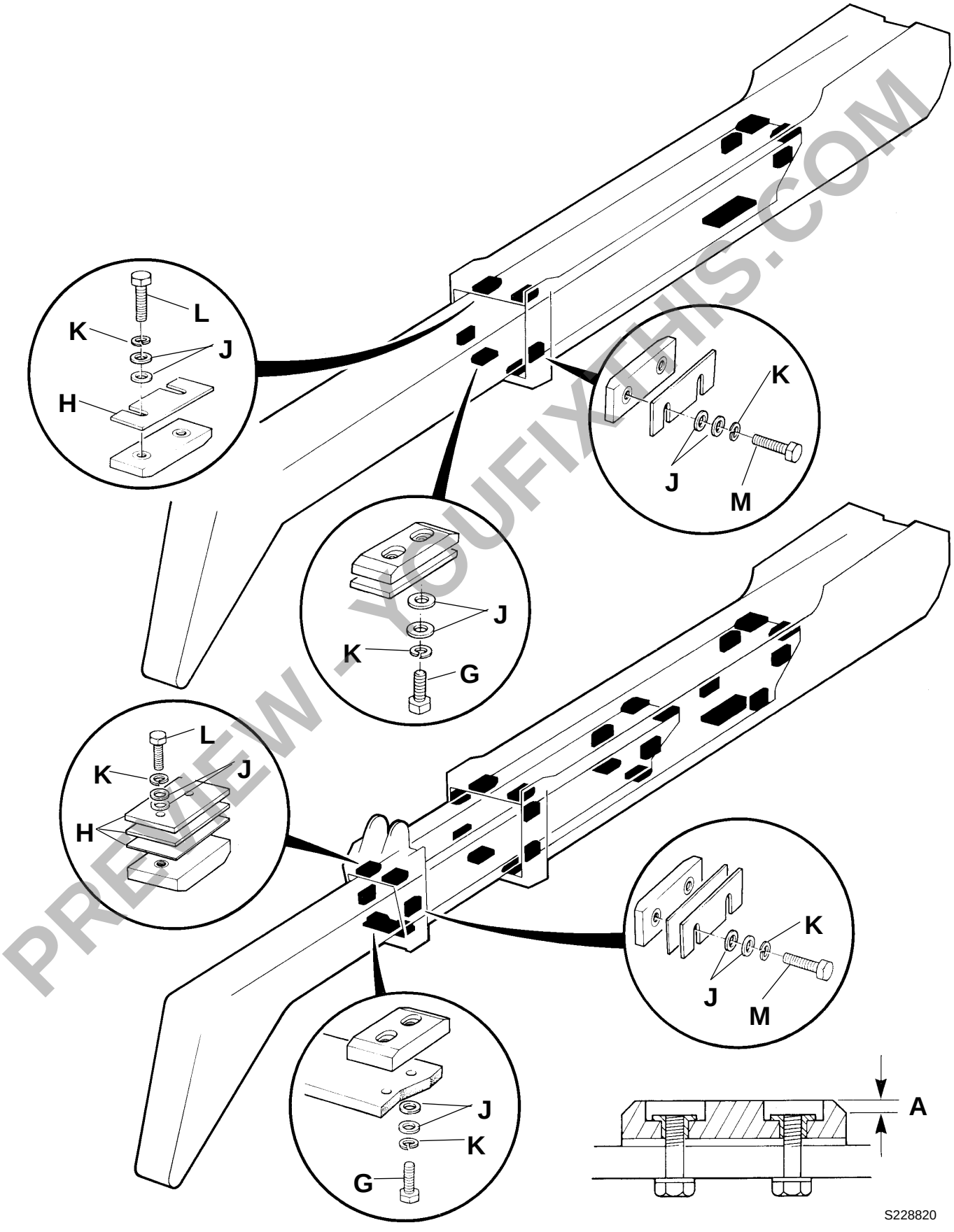
F Filter
P1 Main pump
P2 Steering pump
P3 Cooling fan pump
S1 Main pump suction line
S2 Steering pump suction line
S3 Cooling fan pump suction line
T Tank
1A Neutral circuit feed line
1B Neutral circuit return line
2 Valve block
2A Main relief valve (M.R.V.)
2B Lift spool
2C Extension spool
2D Auxiliary spool
2E Tilt spool
2F Auxiliary spool
2G Sway spool
2H
2J
2K
2L
2M Auxiliary relief valves (A.R.V's)
2N
2P
2Q
2Y (530-95 Only)
2R
2S
2T Load hold check valves (L.H.C.V's)
2U
2V
2W
2X Pressure test point see note
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 (525-58 Only)
15 Sway ram (530-95)
15A Sway ram check valve — Optional on 525-58,67
15B Sway isolation valve
29 Steering Anti-cavitation valve
30 Steering flow control valve
31 Steering pressure relief valve
32 Steering pressure test point
33 Steering unit
34A 2 Wheel steer solenoid
34B 4 Wheel and crab steer solenoid
34C 4 Wheel steer solenoid
34D Cab steer solenoid
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
43 Displacement ram isolation valve (530-95 Only)

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 **2X** may be at the valve block or the hydraulic pump.

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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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Display Unit lights and the alarm sounds momentarily, then the ERROR and CALIBRATE lights remain 'On'.

Perform the following procedure

1 Perform the full system calibration procedure see page 4/5-5
Was the calibration successful?

Yes: Check 2
NO: Check the sensor that would not calibrate.

2 Do the ERROR and CALIBRATE lights remain on after start up?

Yes: Replace M.P.C.U

NO: Resume normal operations

Lights flash and alarm sounds momentarily, then the ERROR light only remains 'On'

Perform the following procedure

1 Check joystick internal wiring and switches (See page 4/6-8).
Where the joystick checks successful?

Perform the following procedure

1 Make sure that the power and earth connections to the M.P.C.U are clean and secure and Fuse C5 is intact

2 Check display unit harness continuity (See page 4/6-18).
Was it successful?

3 Check display unit internal switches (See page 4/6-18).
Was it successful?

4 Check display unit supply voltage (See page 4/6-18).
Was it successful?

5 Check alarm voltage supply and continuity (See page 4/6-18).
Was it successful?

Alarm and lights except ERROR operate and stay on but system seems dead

Perform the following procedure

1 Replace M.P.C.U
Does this cure the fault?

2 Replace display unit
Does this cure the fault?

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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	•	•		•	•	•	•
Coolant Level and Condition	Check	•	•	•		•	•	•
* Fuel System For Leaks and Contamination	Check			•				
Oil Level and Condition	Check	•	•	•	•	•	•	•
Fuel Filter	Drain		•		•	•	•	•
Fuel Sedimenter	Drain and Clean		•	•	•	•	•	•
Air Cleaner Dust Valve	Clean			•	•	•	•	•
* Oil and Filter	Change			•		•	•	•
Fuel Lift Pump	Clean			•		•	•	•
Engine Mounting Bolts	Check			•		•	•	•
Fuel Filter	Change			•		•	•	•
Air Cleaner Outer Element	Change					•	•	•
Valve Clearance	Check							•
Air Cleaner Inner Element	Change							•
Fan Belt Tension/Condition	Check			•		•	•	•
* Engine Exhaust for Security	Check			•		•	•	•
* Air Inlet for Security	Check			•		•	•	•
Radiator	Clean					•	•	•
All hoses	Condition			•	•	•	•	•
TRANSMISSION AND AXLES								
Transmission Oil Level	Check	•	•	•	•	•	•	•
Tyre Pressures and Condition (see Handbook)	Check	•	•	•	•	•	•	•
Tightness of Wheel Nuts	Check	•	•	•	•	•	•	•
Axle(s) Oil Level	Check			•	•	•	•	•
Axle(s) Oil	Change					•	•	•
Hub Oil Levels	Check			•	•	•	•	•
Hub Oil	Change					•	•	•
Drive Shafts and Universal Joints	Grease		•	•	•	•	•	•
Steer Axle Pivots and Linkages	Grease		•	•	•	•	•	•
Wheel Alignment (see Handbook)	Check	•	•	•	•	•	•	•
Wheel Bearings	Check and Adjust					•	•	•
King Pin and Bushes	Check and Adjust					•	•	•
Transmission Oil Filter	Change			•		•	•	•
Transmission Oil	Change						•	•
Transmission Strainer	Clean						•	•
Axle Breathers	Check Clear			•				
Axle Security	Check			•				
Transmission Mount Security	Check			•				
Steering Stops (if fitted)				•				
HYDRAULICS								
Hydraulic Fluid Level	Check	•	•	•	•	•	•	•
System for Leaks	Check	•	•	•	•	•	•	
Oil Filter	Change			•	•	•	•	•
Oil (and clean suction strainers)	Sample/Change						•	

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FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS (525-58, 67, 527-58, 67, 530-95)

***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 Litres (Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel Tank	90 (20)	Diesel Oil (See **Types of Fuel**)	ASTM D975-66T Nos. 1D, 2D
Engine (Oil)	10 (2.2)	**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)	17 (3.7)	**JCB Universal Antifreeze/water** (See **Coolant Mixtures**)	ASTM D3306-74
Gearbox **Syncro Shuttle** **Powershift**	 18.25 (4.0) †15.0 (3.3)	 **JCB Special Transmission Fluid** **JCB Special Transmission Fluid**	 ESP-M2C 33G ESP-M2C 33G
Front Axle **Housing** **Hubs (x2)**	 18 (3.9) 2.0 (0.4)	 **JCB Special Gear Oil** **JCB Special Gear Oil**	 ESEN-M2C 86A/B ESEN-M2C 86A/B
Rear Axle * **Housing** * **Hubs (x2)**	 13 (2.8) 2.0 (0.4)	 **JCB Special Gear Oil** **JCB Special Gear Oil**	 ESEN-M2C 86A/B ESEN-M2C 86A/B
Brake System		**JCB Light Hydraulic Fluid** DO NOT USE ORDINARY BRAKE FLUID	ISO VG15
Hydraulic Tank	*152 (33.5)	**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	9.35 litres (2.04 gal)	-36° C (-33 °F)

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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.

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Introduction

This publication is designed for the benefit of JCB Distributor Service Engineers who are receiving, or have received, training by JCB Technical Training Department.

It is assumed that these personnel have a sound knowledge of workshop practice, safety procedures, and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment. Therefore these basic subjects generally are omitted from this manual, the intention being to convey only more specialised information concerning particular aspects of a machine or component.

For example, renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course, and therefore information of this nature is included only in the context of specialised procedures or where a range of wear tolerances is required. Similarly, it is expected that components will be cleaned and lubricated where appropriate, also that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt.

For convenience this manual is compiled in sections, e.g. "Hydraulics", "Electrics", etc. but, to find details of a specific component, reference should be made to the alphabetical index at the back of the book.

Illustrations which show a dismantled component are numbered as a guide to the dismantling sequence, which generally can be reversed for assembly.

Torque settings are given as a 'mean' figure which may be varied by plus or minus 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third. Where no figure is quoted in the text, refer to page 1/1 - 3.

'Left Hand' and 'Right Hand' are as viewed from the rear of the machine looking forward.

⚠ WARNING

Asbestos

Asbestos dust can damage your lungs. Some engine joints and gaskets may contain asbestos. Take the following precautions when working on them.

1 Wear a face mask and gloves.

2 Work in a well ventilated area and do not smoke.

3 Do not use a rotary wire brush, use a hand scraper.

4 Make sure the material to be removed is wet with oil or water to contain loose particles.

5 Place all material into plastic bags and dispose in accordance with local regulations.

GEN-1-8

⚠ WARNING

Fluoroelastomeric Materials

Certain seals and gaskets (e.g. crankshaft oil seal) on JCB machines contain fluoroelastomeric materials such as Viton, Fluorel and Technoflon. Fluoroelastomeric materials subjected to high temperatures can produce highly corrosive hydrofluoric acid. THIS ACID CAN SEVERELY BURN.

New fluoroelastomeric components at ambient temperature require no special safety precautions.

Used fluoroelastomeric components whose temperatures have not exceeded 300°C require no special safety precautions. If evidence of decomposition (e.g. charring) is found, refer to the next paragraph for safety instructions DO NOT TOUCH COMPONENT OR SURROUNDING AREA.

Used fluoroelastomeric components subjected to temperatures greater than 300°C (e.g. engine fire) must be treated using the following safety procedure. Make sure that heavy duty gloves and special safety glasses are worn:

1 Ensure that components have cooled then remove and place material into plastic bags.

2 Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.

3 Thoroughly wash contaminated area with detergent and water.

4 Contain all removed material, gloves etc. used in this operation in sealed plastic bags and dispose of in accordance with Local Authority Regulations.

DO NOT BURN FLUOROELASTOMERIC MATERIALS.

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Get medical attention immediately.

INT-3-3-5/1

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* HYDRAULIC PUMP

530-120 with Service Bulletin 5/055 carried out and from Machine Serial No. 569294. All 537-120 and 537-130 Machines

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 **7**, remove pump from machine.

Replacement

Replacement is a reversal of the removal procedure.

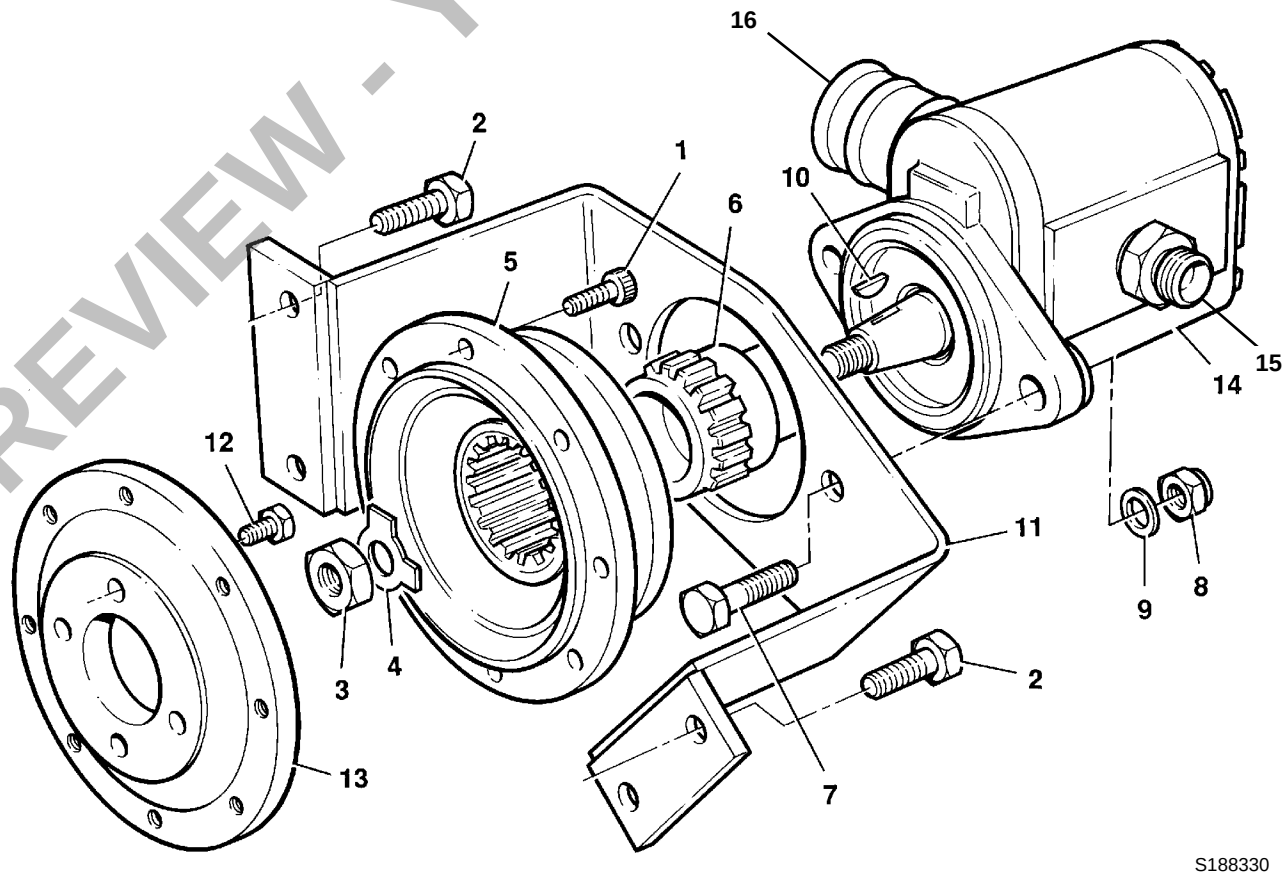
Ensure that tab washer **4** is located in the keyway, and bend up tabs after torque tightening nut **3**.

If bolt **1** is removed apply Loctite and torque tighten.

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	14	1.4	10.3
2	98	10.0	72.25
3	95 - 100	9.7 - 10.2	70 - 74
7	118	12.0	87
12	77	7.8	56.75
15/16	95 - 100	9.7 - 10.2	70 - 74



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CONTROL VALVE

* The procedure given is for the 525-58 but the same procedure is used for all machines.

⚠ WARNING

Make the machine safe before getting beneath it. Park the machine on level ground. Make sure the engine is stopped, the parking brake engaged and the transmission is in neutral. Disconnect the battery. Chock both sides of all four wheels.

5-3-2-1

Removal

1 Operate control levers to vent residual pressure.

2 Remove control lever gaiters **A**.

3 Slacken locknuts and unscrew control levers **B**.

4 Remove control valve cover situated under L.H. rear wheelarch.

5 Disconnect and plug hydraulic hoses **C** labelling each to ensure correct position on replacement.

6 Disconnect control rods **D** from spools.

7 Undo and remove nuts **E** and lift out control valve.

For dismantling the control valve see page 2/5 - 3.

Replacement

Replace the control valve by reversing the removal procedure.

After replacement, check M.R.V. and A.R.V. pressures (see page 2/6 - 1).

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Assembling

Wash all components. Apply hydraulic oil immediately afterwards to prevent moisture collecting.

Renew all seals and 'O' rings using JCB Special Hydraulic fluid as a lubricant.

Fit shaft seal **22** into the mounting flange **10** with gaiter spring facing the motor. Fit circlip **21** and coat seal lips with JCB HP Grease.

Fit bushes **18** and **19** in their original positions. Place end cover **6** temporarily against main body **20** and stand assembly upright with dowels uppermost.

Fit drive shaft **14** and idler gear **17**. Fit bushes **15** and **16** in their original positions. Fit 'O' ring **13**, bush seals **12a** and **12b** and back-up seal **11**. Make sure that the flat face of back-up seal is uppermost.

Fit protective sleeve **33** over drive shaft. Locate flange **10** to main body with a square fit on the dowels. Turn the assembly over and support on the flange, not on the drive shaft. Remove end cover.

Fit 'O' ring **9**, bush seals **8a** and **8b** and back-up seal **7**. Make sure that the flat face of back-up seal is uppermost. Fit end cover **6** with relief valve tapping on the same side as the outlet port. Secure with spring washers **5** and bolts **4**. Torque tighten to 49Nm (36 lbf ft.).

Put a small amount of clean hydraulic oil in the inlet port and check that the drive shaft can be turned by hand without undue force.

Fit relief valve **31** into valve seat **32**. Fit 'O' ring **28** onto spring plug **27** and insert into spring retainer **24** along with spring **30**. Fit 'O' ring **29** on spring retainer.

Screw spring retainer assembly into end cover **6** over relief valve. Torque tighten to 28Nm (20 lbf ft.). Fit set screw **26** and locknut **25**.

Note: For relief valve setting instructions, *see page 2/9 - 2.*

Torque Settings

Item	Nm	kgf m	lbf ft
4	49	5.0	36
24	28	2.8	20

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FUEL TANK

(See Section Contents for machine models)

⚠ WARNING

Make the machine safe before getting beneath it. Park the machine on level ground. Make sure the engine is stopped, the parking brake engaged and the transmission is in neutral. Disconnect the battery. Chock both sides of all four wheels.
5-3-2-1

Removal

1 Disconnect the battery, to prevent the engine being started.

2 Unscrew bolts **A** and remove steps to gain access to fuel tank.

3 Remove drain plug and drain fuel tank.

4 Disconnect fuel sender **B**.

5 Remove nuts **C** and nuts **D** to remove restraining brackets **E**.

6 Remove fuel tank from machine.

Replacement

Replace the tank by reversing the removal procedure. Refill with clean fuel and check for leaks.

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PRESSURE TESTING

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the boom. Apply the parking brake, put the transmission in neutral and stop the engine. Chock both sides of all four wheels.
HYD 4-2

Operate the machine to normal operating temperature before checking the following.

Stop engine, select starter switch to 'On' position and operate the joystick to vent residual pressure, return the starter switch to the 'Off' position.

Connect a 0 - 400 bar (0 - 6000 lbf/in²) pressure gauge to test point **Z**.

Auxiliary Relief Valves

Note: The positions of A.R.V's in the valve block may vary from machine to machine. To establish the correct service, get an assistant to operate the relevant control lever and check which hose moves under increased pressure.

The A.R.V's can be tested in situ. All A.R.V's except the tilt ram rod side are set below the M.R.V. pressure and can therefore be tested simply by operating the relevant service. As the tilt ram rod side A.R.V. is set above the M.R.V. pressure, a different procedure is required.

To test all A.R.V's except the tilt ram rod side, proceed as follows:

With the pressure gauge connected to test point **Z** (see above), run engine at idle rev/min and operate the relevant service to full travel. Hold while checking the maximum gauge reading which should equal the A.R.V. operating pressure specified in Technical Data.

Note: The engine must not be run at maximum speed as a significant increase in pressure will be recorded.

If the A.R.V. pressure is incorrect, adjust as follows.

Stop engine, select starter switch to 'On' position and operate the joystick to vent residual pressure, return the starter switch to the 'Off' position.

For access to sway head side ARV, tilt rod side ARV and auxiliary ARV remove access cover **A** in the cab.

Release lock nut **B** and adjust **C** using a 4 mm AF Allen key, in increases the pressure, out decreases the pressure.

To test the tilt ram rod side A.R.V. proceed as follows:

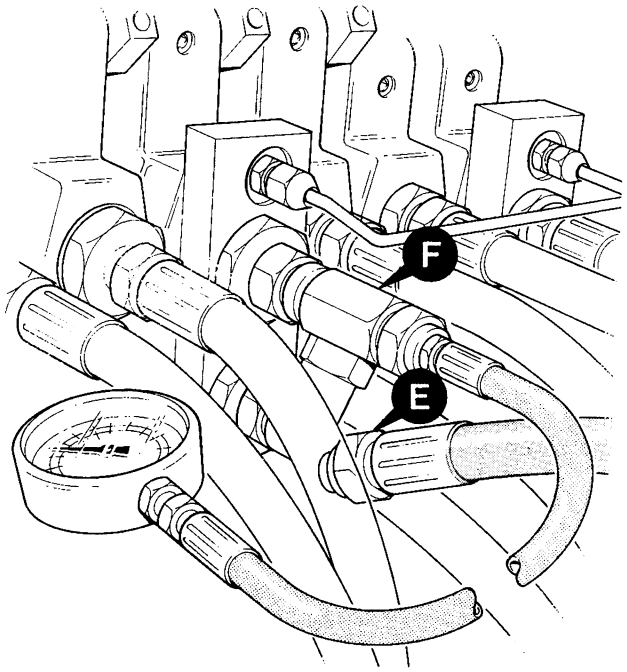
With the boom fully lowered, stop engine. Select starter switch to 'On' position and operate the joystick to vent residual pressure, return the starter switch to the 'Off' position.

Disconnect and plug tilt ram feed hose **E** and connect the pressure gauge into tee piece **F** as shown.

Start engine and slowly raise the boom to approximately 45° angle then operate the boom lower service. As the boom descends the pressure gauge will show the A.R.V. pressure which should be as shown in Technical Data.

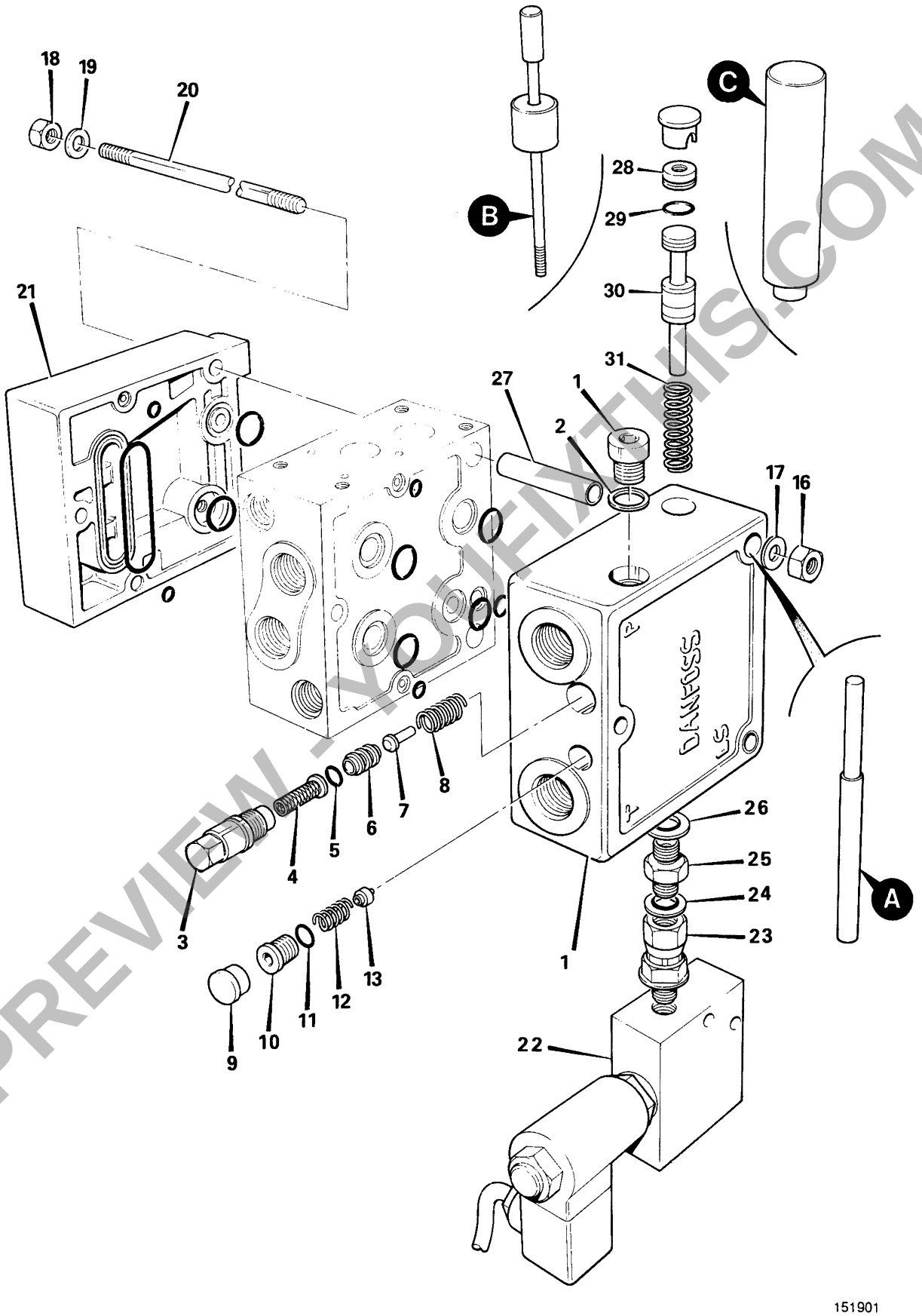
If the pressure is incorrect, adjust the A.R.V.

After completing the test, fully lower the boom, stop engine and vent pressures. Disconnect gauge and re-connect tilt ram feed hose **E**. Refit control valve cover **A**.



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ALTERNATOR DRIVE BELT

Check Tension - *for Interval see Service Schedule*

Adjustment

1 Remove fan guard.

2 Loosen bolts **A**, **B**, **C**, and **D** holding then alternator.

3 Reposition the alternator until belt deflection at point **X** is approximately 10mm ($^{3}/_{8}$ in).

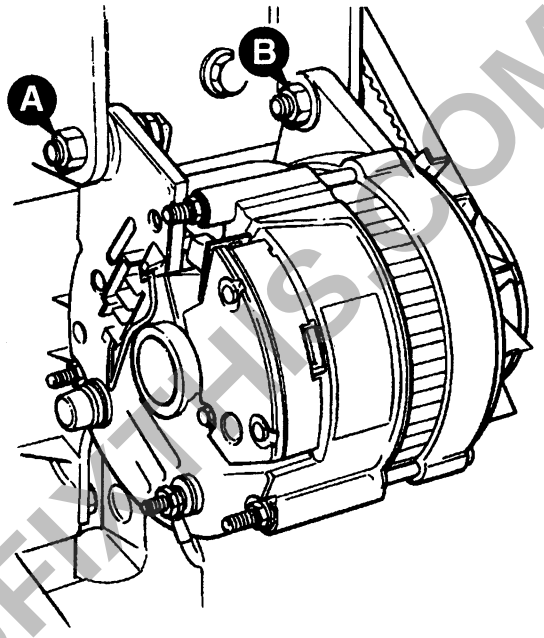
Note: If leverage is necessary, use a length of wood at the drive and bracket only; otherwise damage to the alternator may be caused.

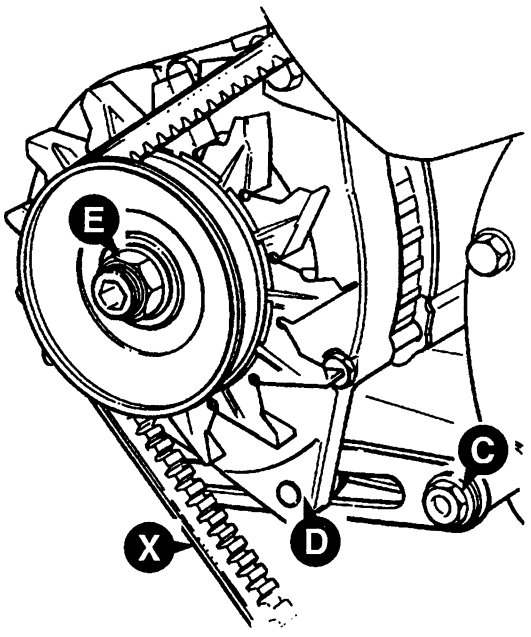
4 Tighten bolts **A**, **B**, **C** and **D**, ensuring that bolt at the rear of the alternator is the last to be tightened.

5 Refit fan guard.

*** Torque Settings**

Item	Nm	Kgf m	lbf ft
E	60	6.0	44





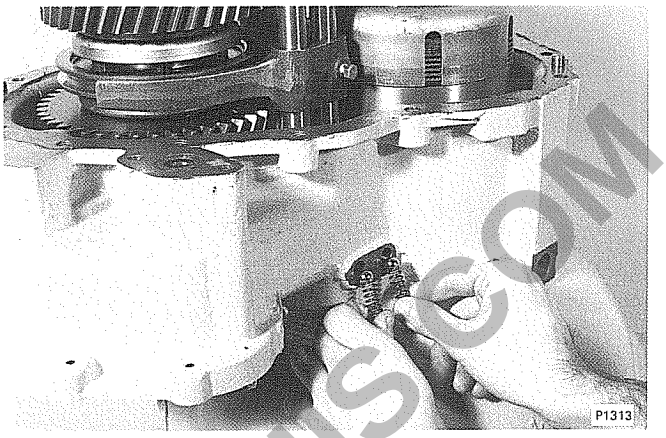
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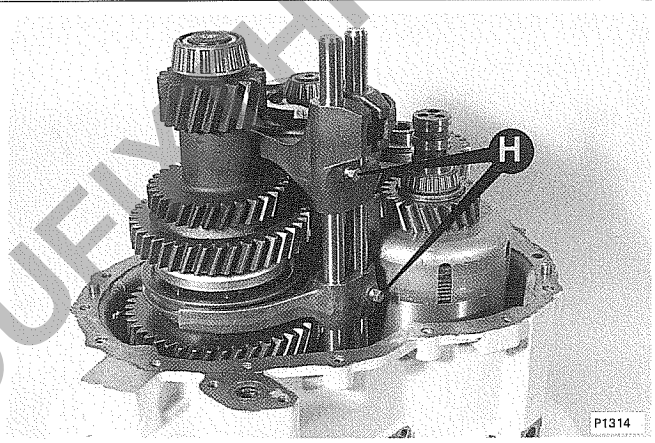
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SYNCRO SHUTTLE - DISMANTLING (cont'd)

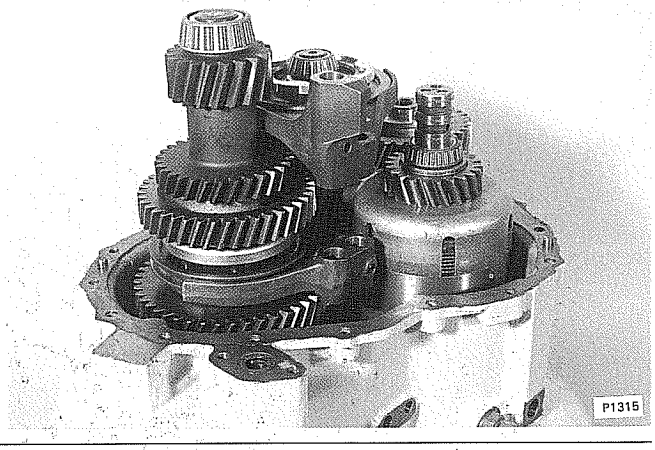
20 Remove selector detent balls and springs.



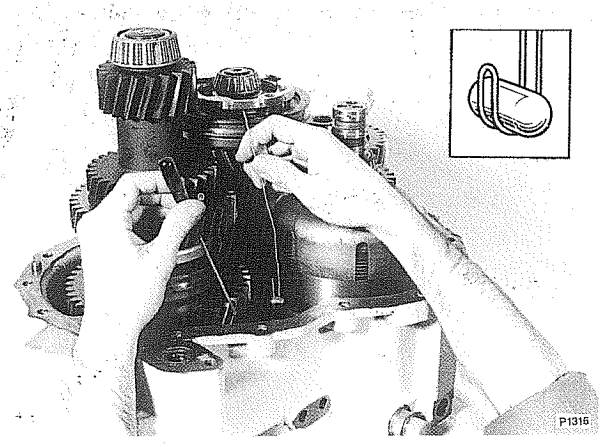
21 Unscrew selector fork retaining screws **H** and lift out selector rods.



22 Remove selector forks.



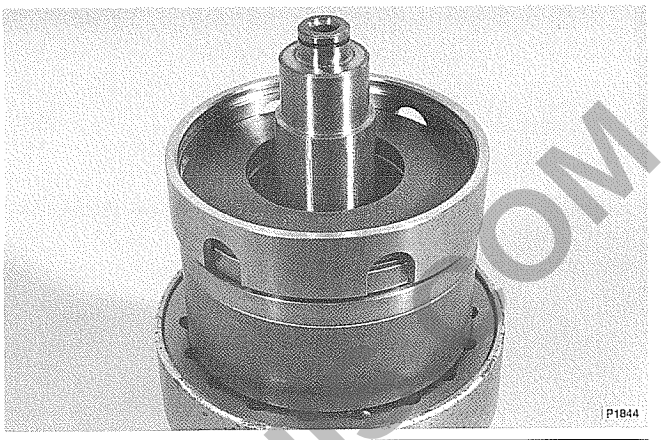
23 Using a suitable wire support as shown, remove interlock plunger situated between selector rod bores.



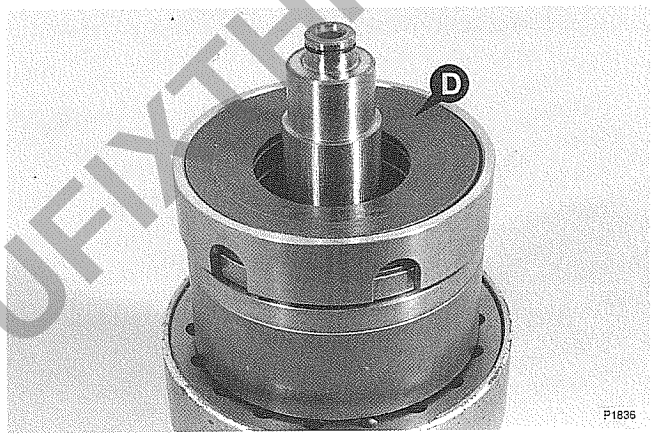
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HYDRAULIC 4 WHEEL DRIVE UNIT (OPTIONAL)
ASSEMBLY (cont'd)

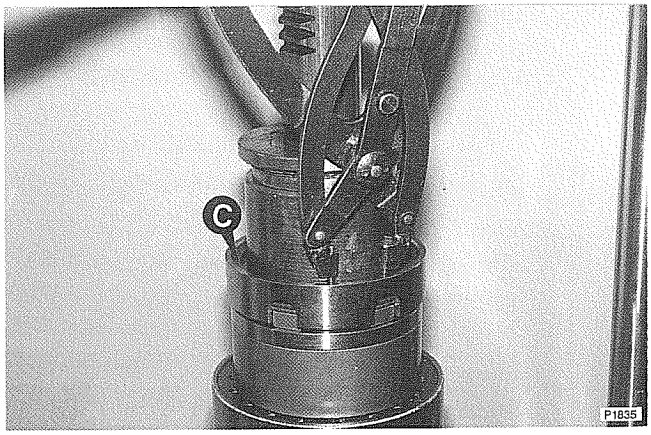
9 Place the first two disc springs with their convex sides uppermost, onto the clutch pack. (There are four disc springs, which are identical.)



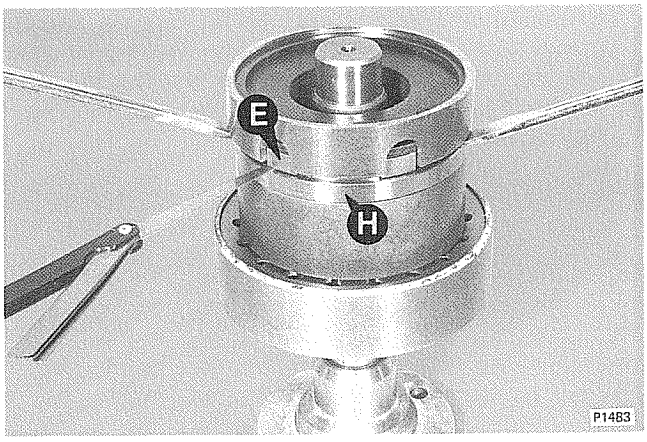
10 Place the other two disc springs **D**, with their convex sides down, onto the first two.



11 Compress the disc springs and fit the circlip **C**.



12 Measure gap between pressure plate **E** and spacer **H**. The gap should be 0.8 - 1.2 mm (0.031 - 0.047 in). Fit a new spacer if necessary to achieve the correct gap. (A selective spacer kit is available.) Check that the clutch pack splines are still aligned (see Step 8).



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TECHNICAL DATA (530-120, 537-120/130)

FRONT AXLE

Type	JCB Spiral bevel with epicyclic hub reduction
Weight (approximate)	490 kg (1100 lb)
Overall Gear Ratio	18.16:1 (Germany 13.7:1)
Crownwheel & Pinion Ratio	3.36:1 (Germany 2.54:1)
Hub Reduction	5.4:1

REAR AXLE

Type	JCB Spiral bevel with epicyclic hub reduction
Overall Gear Ratio	24.97:1 (Germany 18.16:1)
Crownwheel and Pinion Ratio	4.62:1 (Germany 3.36:1)
Hub Reduction	5.4:1
Oscillation	± 10°
Castor Angle	Zero
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.

TYRE PRESSURES

530-120

		Front		Rear		
Size	Ply	Bar	lbf/in²	Bar	lbf/in²	Manufacturer/Type
15.5-25	12	4.0	58	4.0	58	Industrial Traction
15.5/80 - 24	12	4.0	58	4.0	58	Sure Grip/Traction

537-120

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

537-130

		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 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.

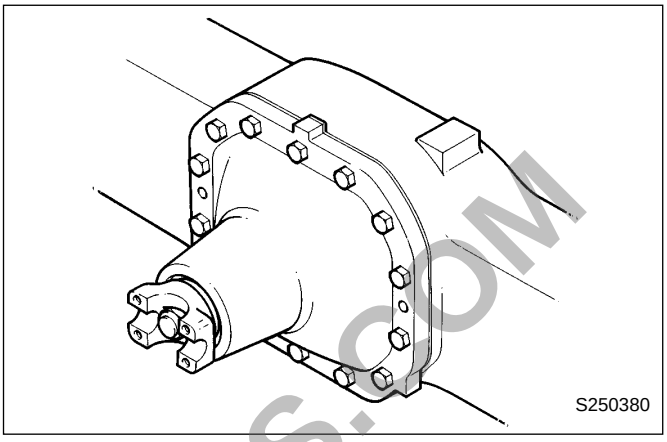
The front axle is rigidly mounted to the chassis.

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REAR DRIVE HEAD - ASSEMBLY

12 Using a new gasket, fit differential to axle casing with crownwheel towards long driveshaft. Coat threads of securing bolts with JCB High Strength Gasketing and torque tighten. Note that the bolts which secure the steering sensor bracket are slightly longer. Assemble the track rod with the steering sensor pin uppermost and with the R.H. and L.H. sides correctly positioned.

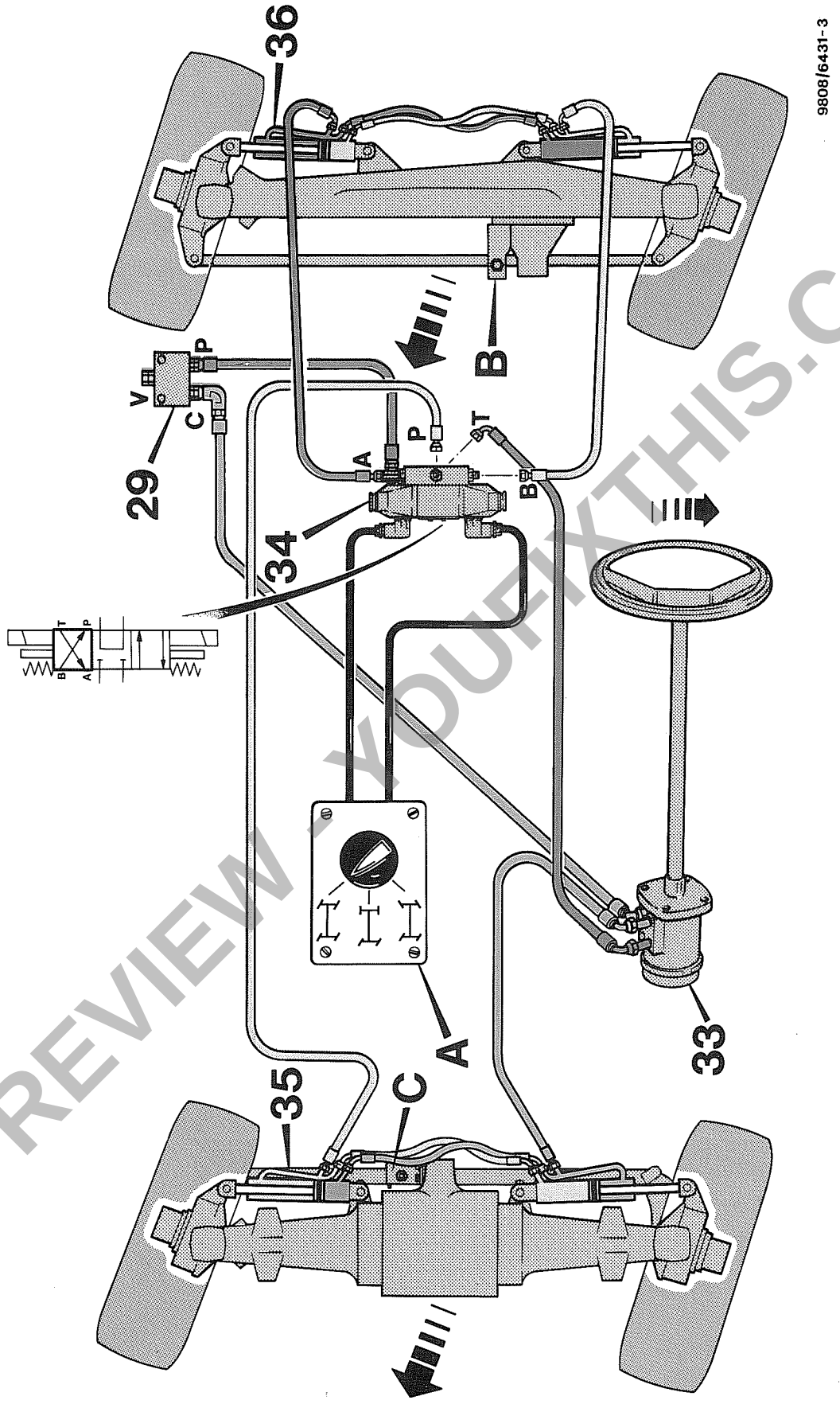


* **Note**: Torque tightening depends on bolt type. The grade is stamped on the head. If standard grade 8.8 bolt, torque tighten to 56 Nm (40 lbf ft). For Verbus Rip 12.9 grade bolts torque tighten to 94 Nm (70 lbf ft). Use heavy duty socket 892/00819.

Reassemble both driveshafts and hub assemblies, re-fill hubs and differential with the correct grade of oil.

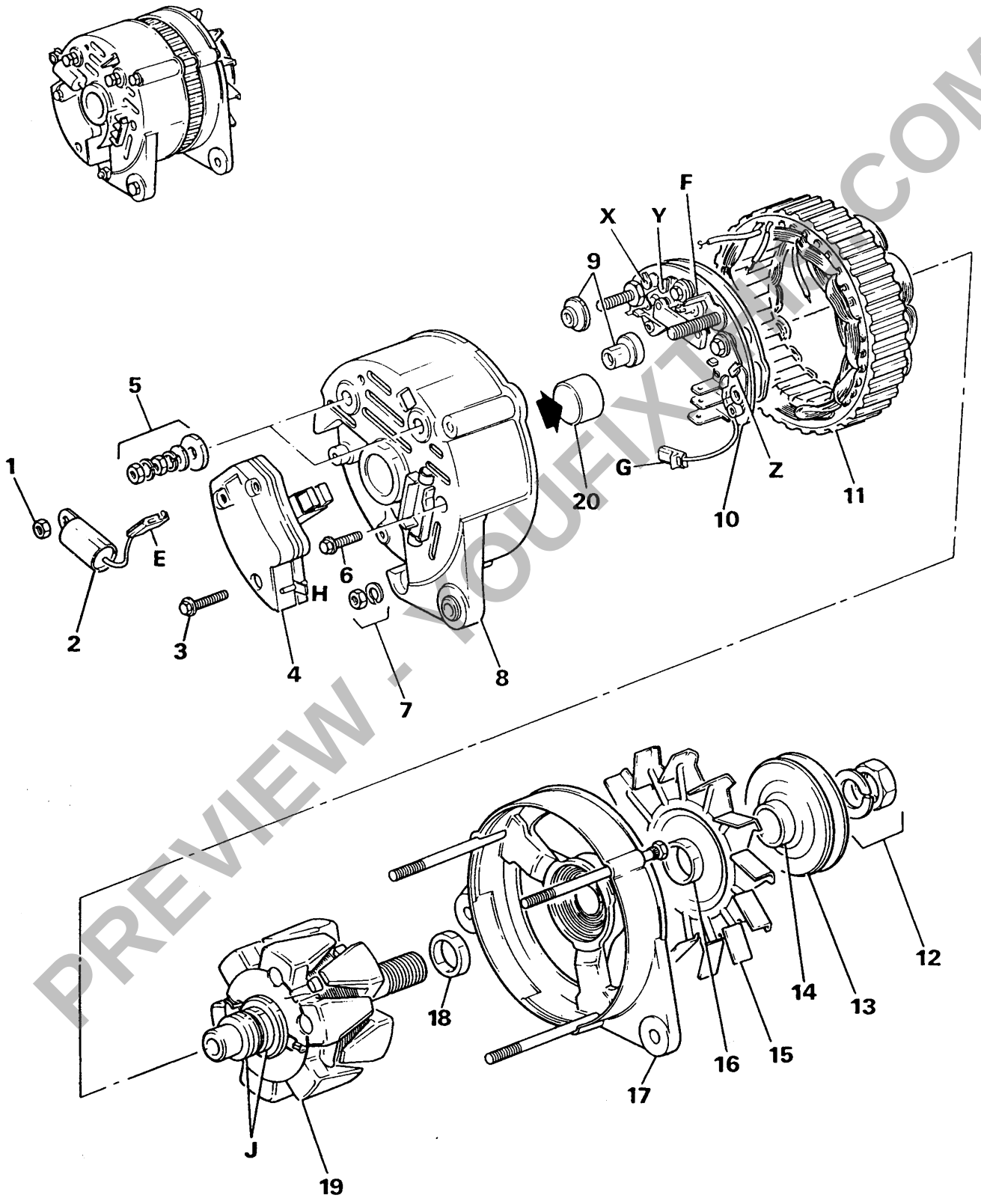
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