Service Manual

435 Wheeled Loader

From M/C No. 523778

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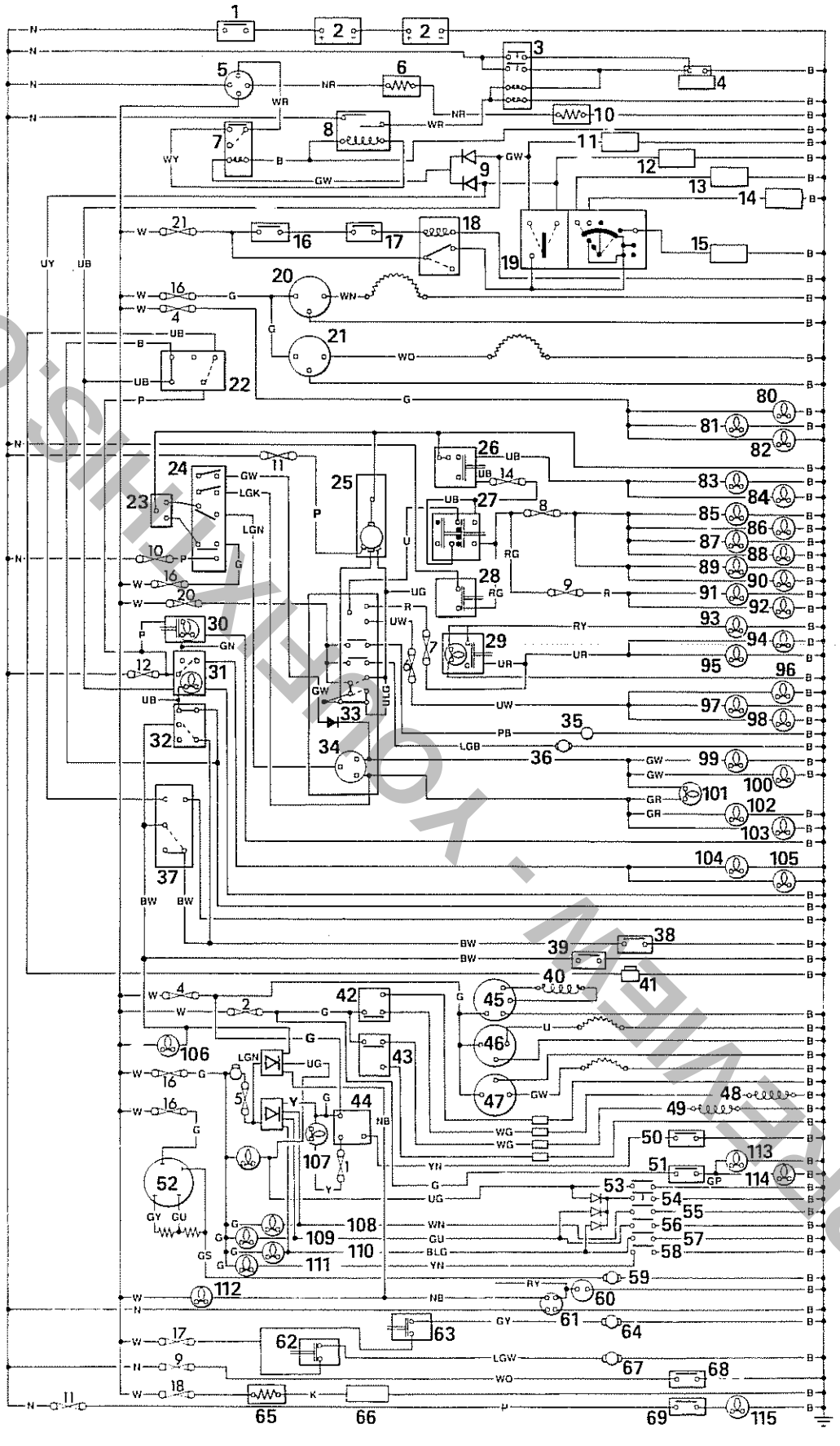
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Contents

General	1
Hydraulics	2
Attachments	3
Body and Framework	4
Engine	5
Transmission	6
Axles	7
Brakes	8
Hydraulic Steering	9
Electrics	10
Service Tools	11
Index	

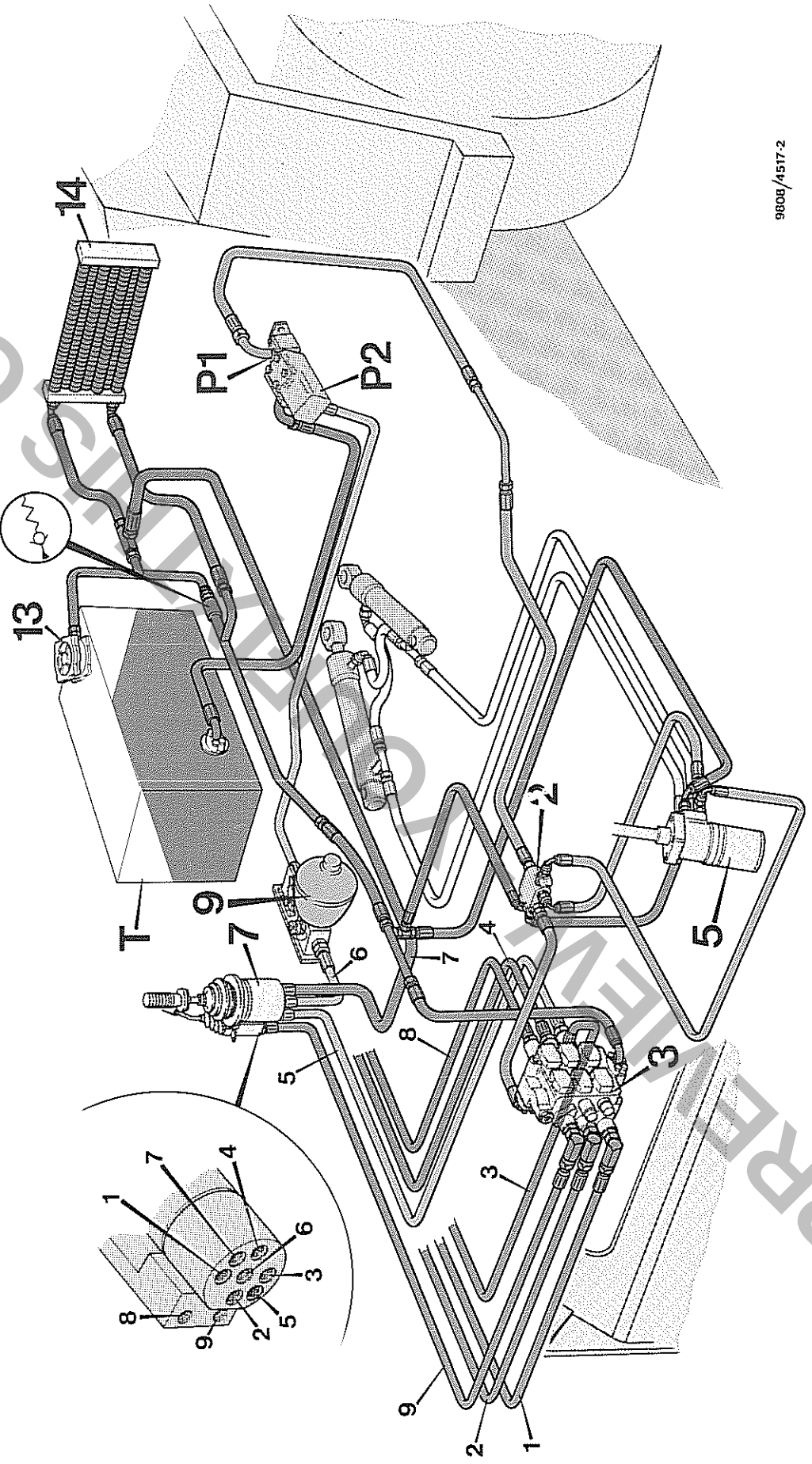
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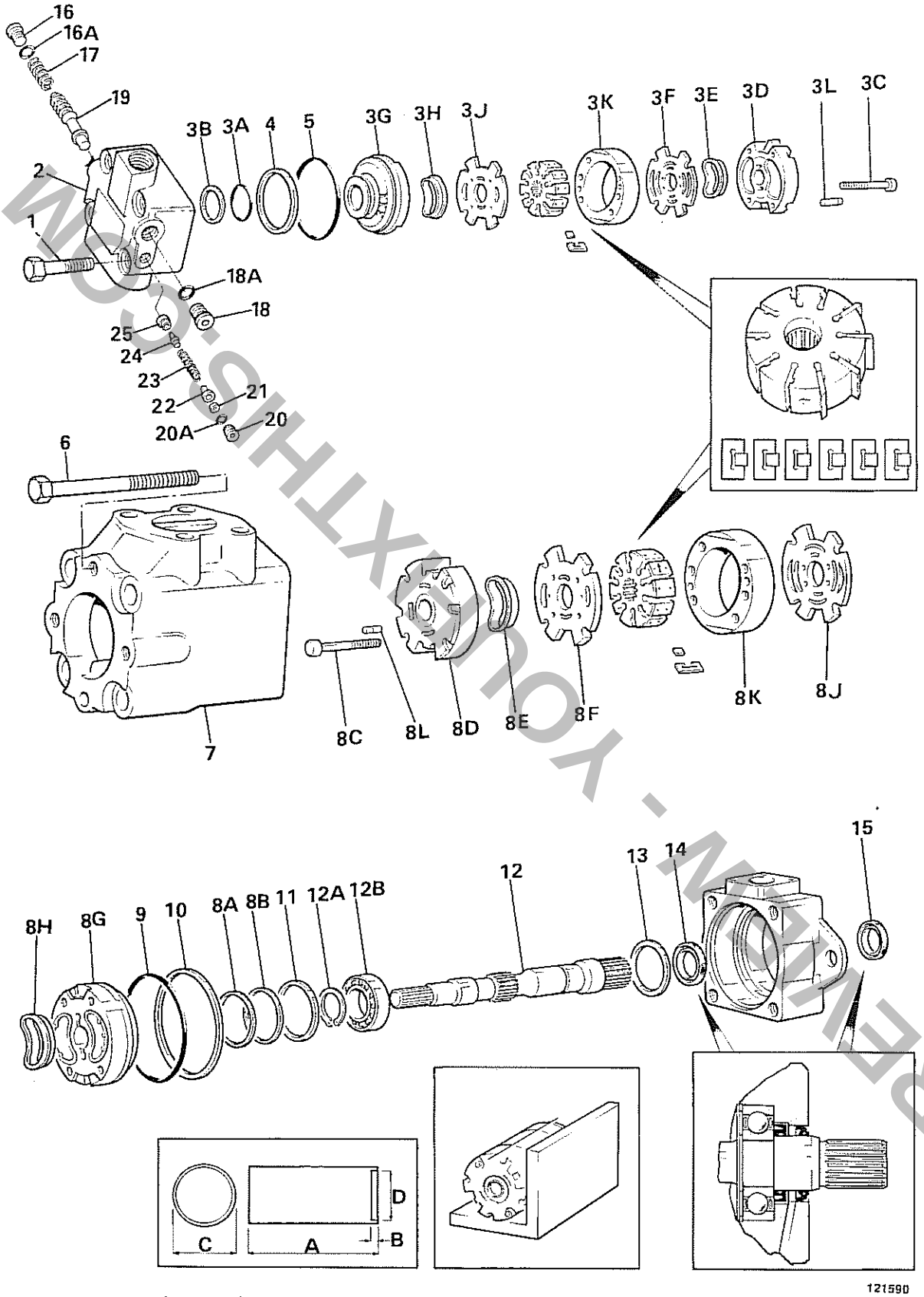


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A - 3.500 in. (88.9 mm)
B - 0.281 in. (7.14 mm)
C - 1.580 in. (40.13 mm)
D - 1.375 in. (34.93 mm)

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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 in	(mm)	Hexagon (A/F) in	Torque Settings 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	(mm)	Hexagon (A/F) mm	Torque Settings 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

ZF AXLES (USE ONLY ON ZF AXLES) - IN Nm

Metric Coarse Thread

Bolt Size	Grade 6.9	8.8	10.9	12.9
M 6	8.5	10	14	17
M 8	21	25	35	41
M 10	41	49	69	83
M 12	72	86	120	145
M 14	115	135	190	230
M 16	180	210	295	355
M 18	245	290	400	485
M 20	345	410	580	690
M 22	465	550	780	930
M 24	600	710	1000	1200
M 27	890	1050	1500	1800
M 30	1200	1450	2000	2400

Metric Fine Thread

Bolt Size	Grade 6.9	8.8	10.9	12.9
M 8 x 1	23	27	38	45
M 10 x 1.25	44	52	73	88
M 12 x 1.25	80	95	135	160
M 12 x 1.5	76	90	125	150
M 14 x 1.5	125	150	210	250
M 16 x 1.5	190	225	315	380
M 18 x 1.5	275	325	460	550
M 20 x 1.5	385	460	640	770
M 22 x 1.5	520	610	860	1050
M 24 x 2	650	780	1100	1300
M 27 x 2	970	1150	1600	1950
M 30 x 2	1350	1600	2250	2700

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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FITTING THE ARTICULATION SAFETY LOCK

WARNING

Make sure the articulation safety lock is fitted before transporting the machine. The articulation safety lock must also be fitted if you are inspecting and/or doing any maintenance work in the articulation danger zone.

GEN-004

Installing

1 Position the machine straight ahead, or fully articulated, apply the parking brake, put the transmission in neutral and stop the engine.

2 Remove pins **A** and move the lock from the stowed position into one of the two lock positions, shown at **B**.

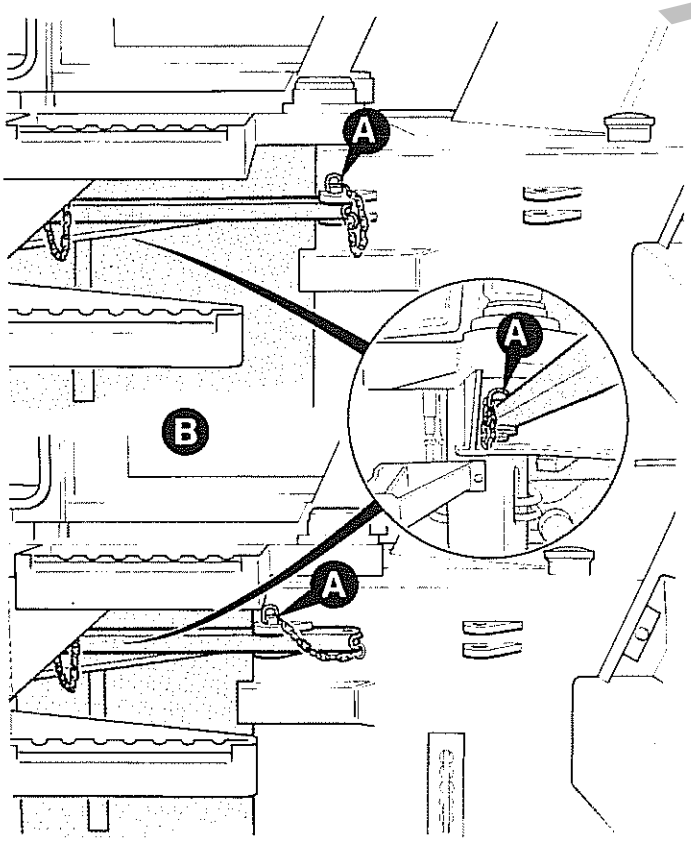
3 Fit pins **A** to lock the machine rigid.

Note: If the machine is slightly out of alignment it will not be possible to fit both pins. Under these circumstances continue as follows:

4 Fit one pin correctly in position and the other pin partly through.

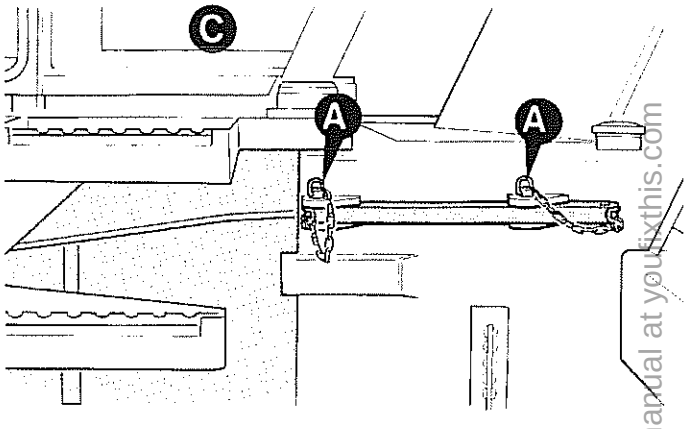
5 Restart the engine and turn the steering wheel slightly to allow the the partly fitted pin to drop into position.

6 Switch the engine off and check that the pin has located properly.



Removing

1 Remove pins **A** and return the lock to the stowed position as shown at **C**. Replace the pins to secure the lock.



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AIR CONDITIONING (cont'd)

Fault Finding

Before carrying out the tests listed, if possible, the machine should be operated to bring the system to its normal working temperature/pressure.

The compressor should be checked to ensure that there are no obvious oil leaks (see page 4/3 - 2)

If the compressor is noisy, start at check 1.

If there is lack of cooling, start at check 6.

CHECK		ACTION	
1	Is the noise with the compressor clutch engaged or disengaged?	ENGAGED: DISENGAGED:	Check 2 Check 5
2	Is the noise a squeal?	YES: NO:	Check drive belt. Check 3
3	Is the noise a rumble or grinding?	YES: NO:	Check pulley bearing. Check 4
4	Is the noise a clacking?	YES: NO:	Check valve plate. Check 5
5	Is the noise a chattering?	YES: NO:	Check clutch air gap. Check 6
6	Are the cab windows open?	YES: NO:	Check cab windows. Check 7
7	Is the compressor operating intermittently?	YES: NO:	Check for broken or disconnected leads. Check 8
8	Is the compressor clutch cycling intermittently?	YES: NO:	Check coil current: 3.6 to 4.2 amps at 12v; high or no reading - replace field coil. Check 9
9	Is the evaporator blower defective?	YES: NO:	Check blower motor/fuse. Check 10
10	Is there lack of cooling air to the condenser?	YES: NO:	Check engine fan belt. Check 11
11	Is the compressor shaft turning?	YES: NO:	Check for smoothness of operation. Renew compressor cylinder block
12	Is refrigerant leaking from the compressor/ cooling system	YES: NO:	Repair or replace defective item. Carry out system test.

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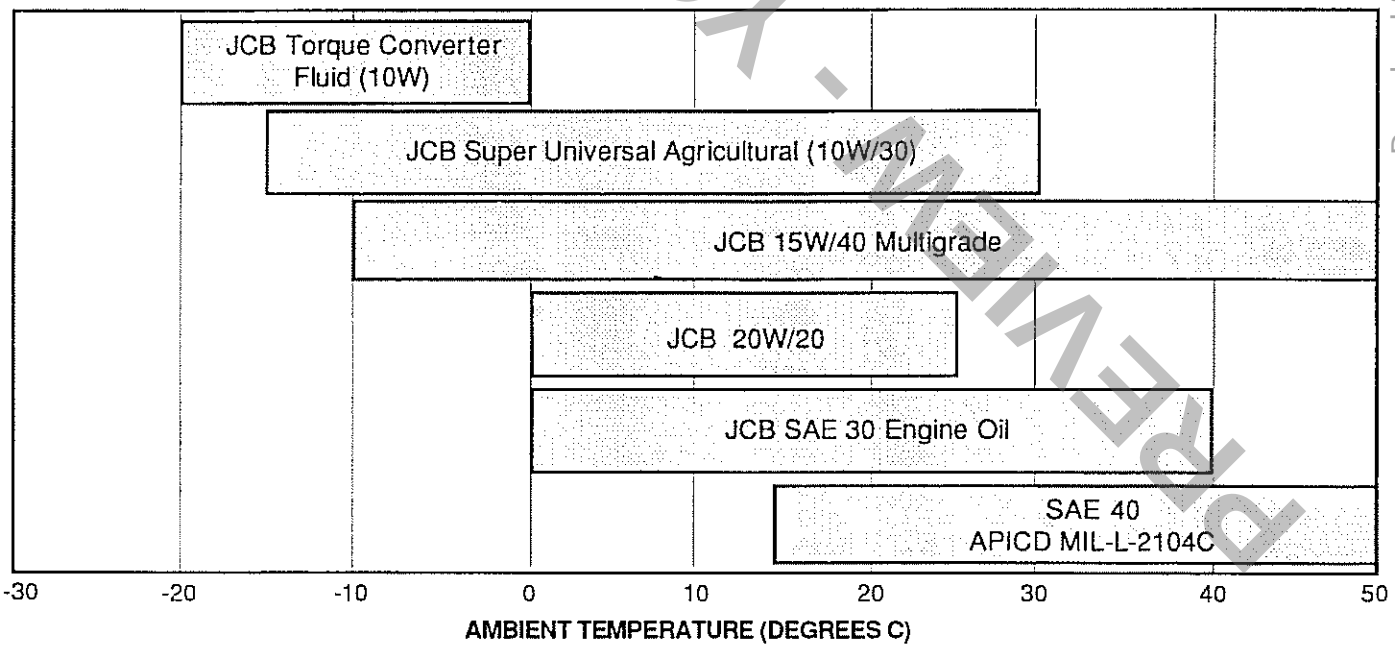
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ENGINE LUBRICANTS and CAPACITIES

Note: To promote thorough running-in, 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 recommended grade as shown in the engine lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted into the machine. Alternatively, where a new or reconditioned engine requires protection against corrosion during prolonged storage, Mobilarma 524 may be used during the storage period and for the first 100 hours operation. It is essential that both these oils are replaced by the recommended lubricant after the first 100 hours operation.

Item	Lubricant	Capacity	
Engine Oil	See chart below	14.5 litres	3.2 UK gals
Fuel		222.5 litres	49 UK gals
Transmission	†[1] JCB Torque Converter Fluid (SAE 10W)	24.5	5.4 UK gals
Hydraulic/Brake System	JCB Special Hydraulic Fluid	†[3] 177 litres	39 UK gals
Front Axle	* Mobil SAE 90LS Infilrex 33	25 litres	5.5 UK gals
Rear Axle	* Mobil SAE 90LS Infilrex 33	25 litres	5.5 UK gals
Grease Points	†[2] Mobilgrease Special		
Engine coolant	See page 5/5-1 for Anti-freeze recommendations	33 litres	7.5 UK gals

ENGINE LUBRICATION CHART - PERKINS 1000 SERIES - MODEL YB



†[1] This oil meets the following specifications: API CD, MIL-L-46152, MIL-L-2104D.

†[2] Denotes Lithium based No. 2 consistency grease.

†[3] The hydraulic system capacity is approximate and will vary depending on the type of attachments fitted. Fill with rams closed.

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SERVICE SCHEDULES

*** EVERY 10 OPERATING HOURS OR DAILY whichever occurs first**

CLEAN

1 Machine generally
2 Engine air filter pre-cleaner

CHECK (Engine Stopped)

3 Generally for damage
4 Engine coolant level and condition
5 Engine oil level and condition
6 Engine generally for leaks
7 Hydraulic fluid level
8 Hydraulic system for leaks
9 Tyre pressures and condition
10 Tightness of wheel nuts
11 ROPS/FOPS structure
12 Operation of warning lights and audible alarm
13 Windscreen washer level
14 Seat belt condition and security

CHECK (Engine Running)

15 Transmission oil level
16 Instrument readings, warning lights and audible alarm
17 Operation of all electrical equipment
18 Service brake operation
19 Steering operation
20 Operation of all hydraulic services
21 Optional Attachments (as needed)
22 Exhaust for excessive smoke
23 Parking brake operation

*** EVERY 50 OPERATING HOURS OR WEEKLY whichever occurs first**

Do the Daily jobs plus:

CHECK (Engine Stopped)

1 Hydraulic oil cooler connections
2 Transmission oil cooler connections
3 Radiator and hoses condition
4 Fan/Air cond. compressor belt tension and condition
5 Optional attachments (as needed)

GREASE

6 Bucket pivot pins

OIL

7 All linkage points
8 All cables
9 All hinges

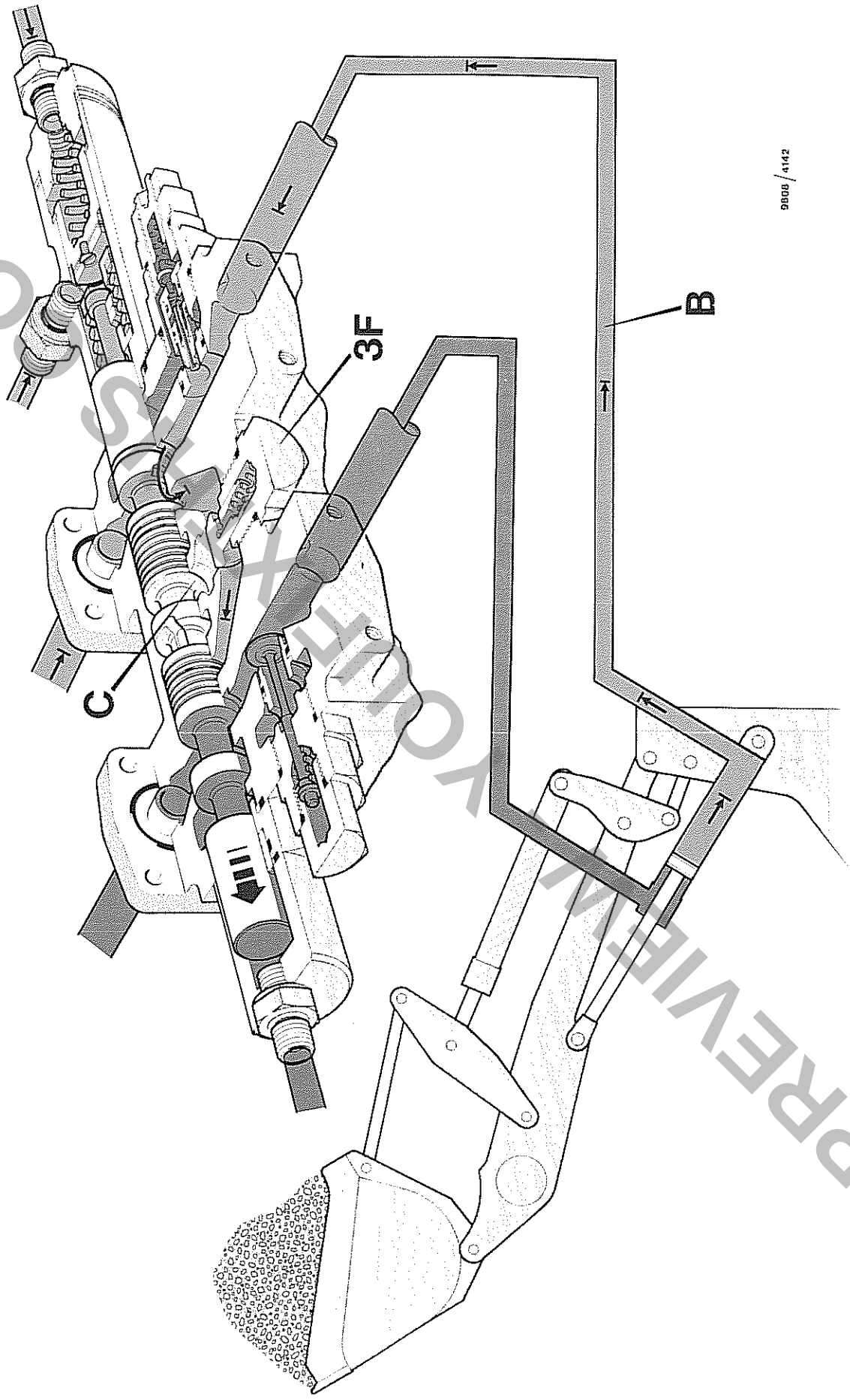
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Page No.	Issue
Section 7	
1 - 1	2
2 - 1	1
3 - 1	2
3 - 2	1
3 - 3	1
4 - 1	1
4 - 2	1
4 - 3	1
4 - 4	1
4 - 5	1
4 - 6	1
4 - 7	1
4 - 8	2*
4 - 9	2*
4 - 10	1
4 - 11	1
4 - 12	1
4 - 13	1
4 - 14	1
4 - 15	1
4 - 16	1
4 - 17	1
4 - 18	1
4 - 19	1
4 - 20	1
4 - 21	1
4 - 22	1
4 - 23	1
4 - 24	2*
4 - 25	1
4 - 26	1
4 - 27	1
4 - 28	1
4 - 29	1
Section 8	
1 - 1	1
2 - 1	3
2 - 2	4*
3 - 1	1
3 - 2	1
3 - 3	1
3 - 4	1
3 - 5	1
3 - 6	2*
7 - 1	1
7 - 2	1
8 - 1	1
8 - 2	1
9 - 1	2
9 - 2	3
10 - 1	3
11 - 1	2
11 - 2	2
12 - 1	1
Section 9	
1 - 1	1
2 - 1	2
2 - 2	2
2 - 3	2
2 - 4	1
2 - 5	1
2 - 6	1
3 - 1	1
4 - 1	2
5 - 1	1
5 - 2	1
5 - 3	1
5 - 4	1
6 - 1	1
6 - 2	1
7 - 1	2
7 - 2	2
7 - 3	1
7 - 4	1
7 - 5	1
7 - 6	1
8 - 1	2
8 - 2	1
9 - 1	1
9 - 2	1
9 - 3	1
9 - 4	1
10 - 1	1
10 - 2	1
Section 10	
1 - 1	1
1 - 2	2
2 - 1	1
3 - 1	1
3 - 2	1
3 - 3	1
4 - 1	1
5 - 1	1
5 - 2	1
6 - 1	1
7 - 1	1
7 - 2	1
7 - 3	1
8 - 1	4*
8 - 2	4*
8 - 3	1
8 - 4	2*
8 - 5	2
8 - 6	3*
8 - 7	2
8 - 8	3*
8 - 9	1*
8 - 10	1*
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8 - 12	1*
8 - 13	1*
8 - 14	1*
8 - 15	1*
8 - 16	1*
8 - 17	1*
8 - 18	1*
9 - 1	1
9 - 2	1
Section 11	
1 - 1	4*
2 - 1	1
2 - 2	2
2 - 3	1
2 - 4	2
2 - 5	4*
2 - 6	3*
2 - 7	3*
2 - 8	1
3 - 1	1
Index	
i	4*
ii	4*
iii	4*
iv	4*
v	4*

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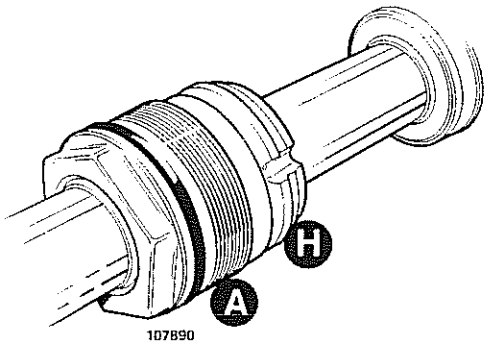


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TYPICAL RAM

When Assembling (cont'd)

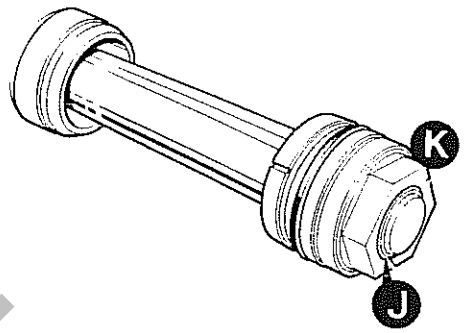
Slide gland bearing **H** into engagement with the end cap **A**. Install piston rod assembly into cylinder whilst ensuring that seals and bearing rings are not displaced from the piston head.



Taking care to retain the end cap at the further end of the piston rod from the cylinder, coat thread of cylinder with Loctite Activator N. Next apply Loctite 932 to thread of end cap. Wait 15 minutes before bringing the two together and then torque tighten the end cap into the cylinder.

Note: If hydraulic oil contacts uncured Loctite, a weakening of the bond will result. Cure times vary according to the ambient temperature and the type of Activator used. The following approximate cure times apply at 20°C and are the minimum periods between assembly and filling the ram with oil.

Loctite 262 or 932 with Activator N - 1 hour
Loctite 262 or 932 with Activator T - 1 hours



Torque Settings

Item	Nm	kgf m	lbf ft
K	405	41	300
A	678	69	500

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FAN BELT

Check Tension - *for Interval see Service Schedule*

Adjustment

1 Remove fan guard.

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

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

Caution: If any leverage is necessary, use a length of wood at the drive end 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.

Note: Fan belts should be renewed in pairs on 6 cylinder engines.

EXHAUSTER / COMPRESSOR BELT

Check Tension -*for interval see service schedule*

Adjustment

1 Loosen locknut **E**.

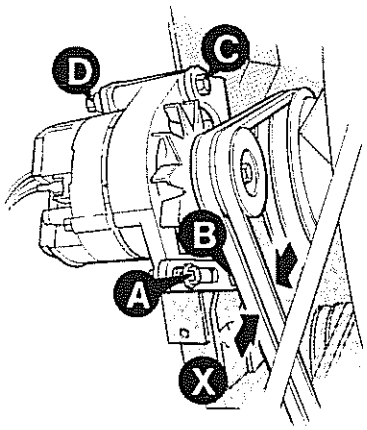
2 Position the compressor with rod **B** to give 5mm (3/16in) slack at point **Y**.

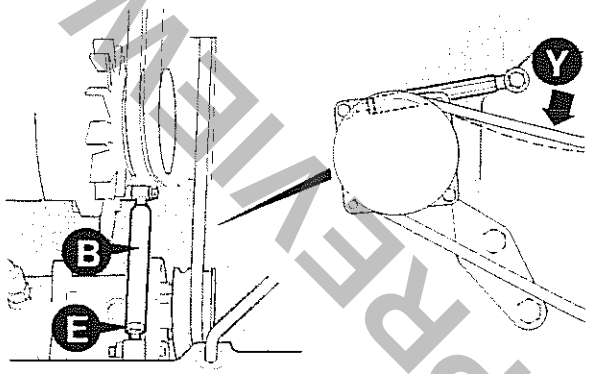
AIR CONDITIONING

WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant which can be dangerous if released. Refer to *Air Conditioning* before attempting to disconnect any part of the system.

BF 001

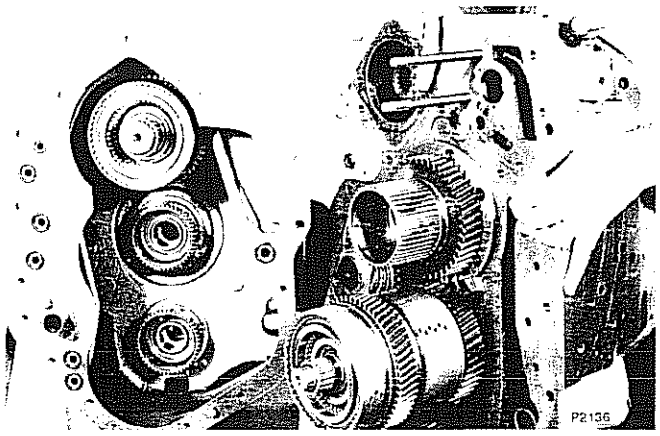




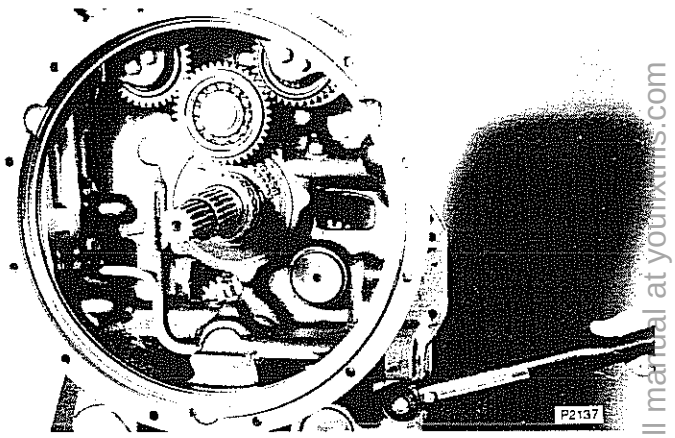
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4 SPEED TRANSMISSION - ASSEMBLY (cont'd)

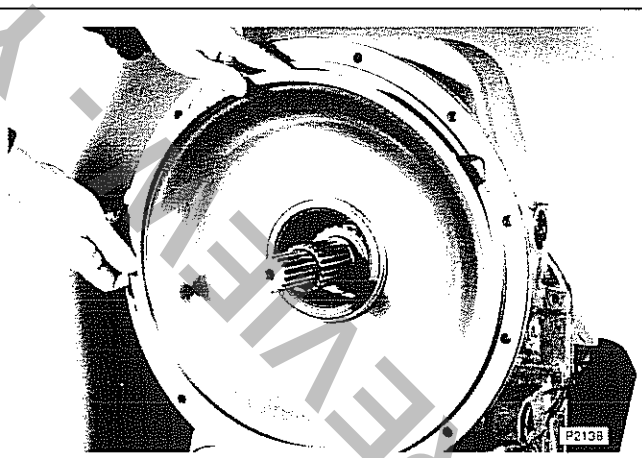
41 Fit the converter housing to transmission casing taking care to align the clutch pilots into the clutch disc hubs. Turn the turbine shaft back and forth to align the clutch discs with the hubs. DO NO FORCE THIS OPERATION. When all clutches are properly aligned the converter housing will be tight against the transmission housing.



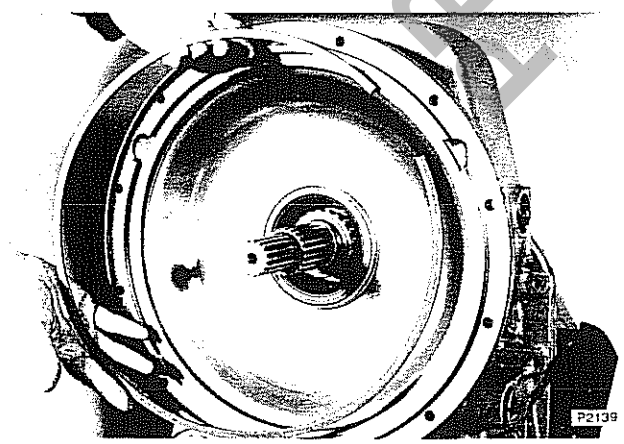
42 Install bolts and washers and tighten to 50 - 55 Nm (37 - 41 lbf ft).



43 Apply a light coat of JCB Multi-gasket to the outer diameter of the oil baffle inner oil seal and press the seal into the baffle with the lip facing towards impeller hub bearing. Position new outer sealing ring on to the baffle and fit to the housing.



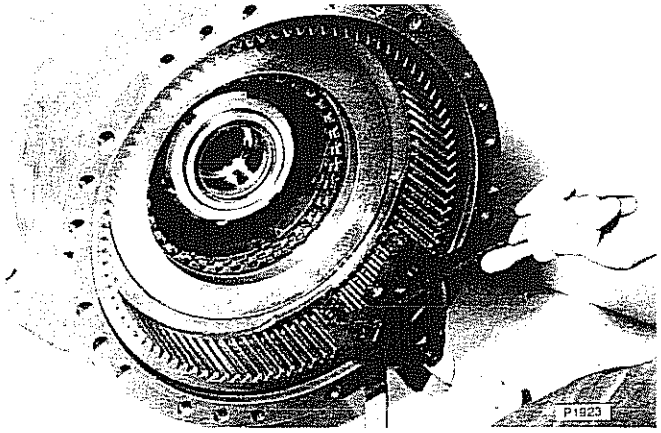
44 Fit the oil baffle retaining ring making sure it is fully in position.



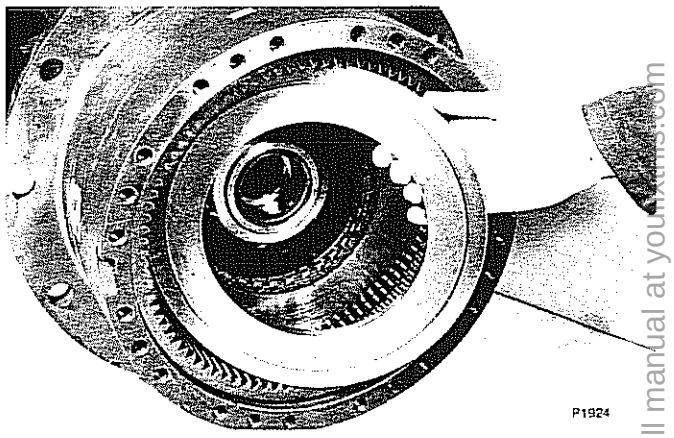
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AXLE - DISMANTLING
WHEEL HUB

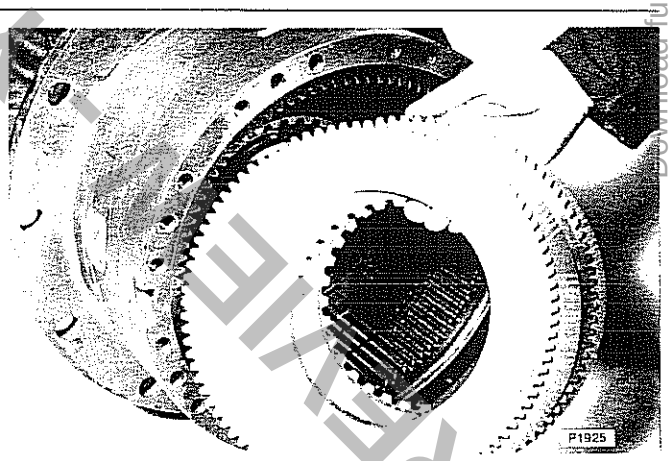
9 Remove the circlip.



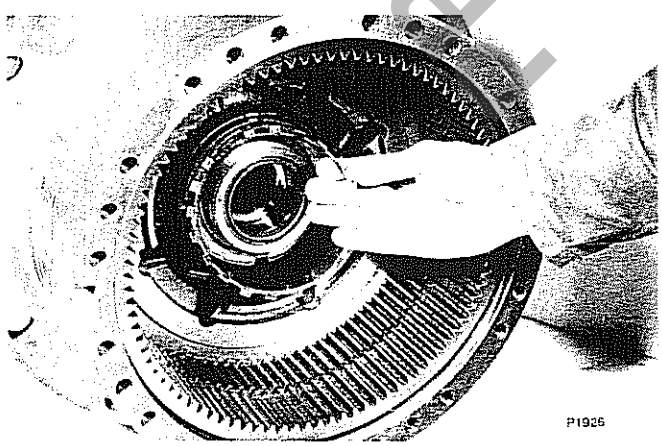
10 Remove the backing plate.



11 Pull the plate pack assembly out of the gear ring.



12 Unlock the locking plate and remove.



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PARKING BRAKE

WARNING

The adjustment and removal of the pads requires the parking brake to be disengaged. Make sure the machine is on level ground and chock all four wheels
BRAK 1-3

Adjusting the pads

Make sure that the brake system is pressurised with the parking brake lever set to **OFF.**

Remove pin **A** and screw in the threaded rod **D** to bring fixed pad **F** towards disc.

Set gap between fixed pad **F** and disc to 2.5 mm (0.098 in), replace pin **A.**

Slacken locknut **B** and adjust the striker-bar **C** until it just touches axle case (DO NOT OVER TIGHTEN). Recheck gap between fixed pad **F** and disc to 2.5 mm (0.098 in).

Tighten locknut **B.**

Checking the pad wear

With the system pressurised and the parking brake applied, check dimension **Z.** If dimension is less than 8 mm (0.31 in), fit a new set of brake pads.

Note: Dimension **Z** is measured between the disc and the brake unit.

Renewing the pads

Make sure that the brake system is pressurised with the parking brake lever set to **OFF.**

Remove pin **A** and screw out threaded rod **D.**

WARNING

Asbestos dust can damage your lungs. The brake pads contain asbestos. Wear a face mask and gloves when working on or near the brake pads. Dispose of brake dust and used brake pads in accordance with local regulations.
2-1-1-7

Push the brake unit towards the rear of the machine. Remove brake pad **E** using a screwdriver. (The pads are held in position by a magnet).

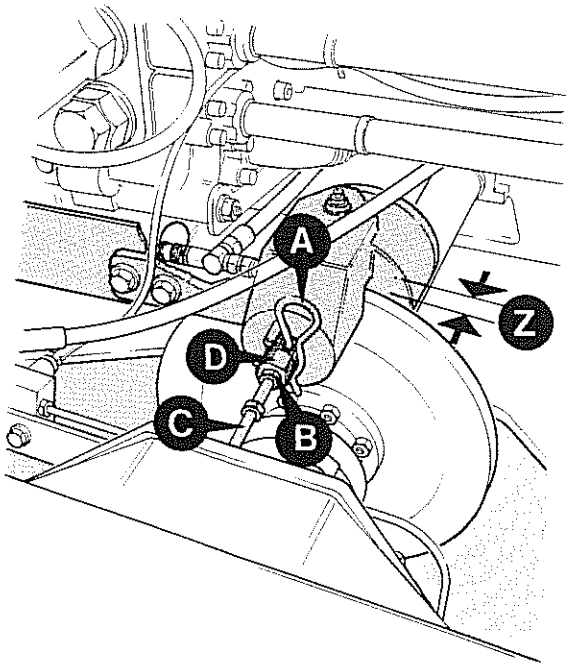
Fit new pad **E**; make sure that it is held in the correct position by the magnet.

Slacken locknut **B** on the striker-bar **C** and screw in striker-bar, to allow the brake unit to be pulled forward to remove brake pad **F.**

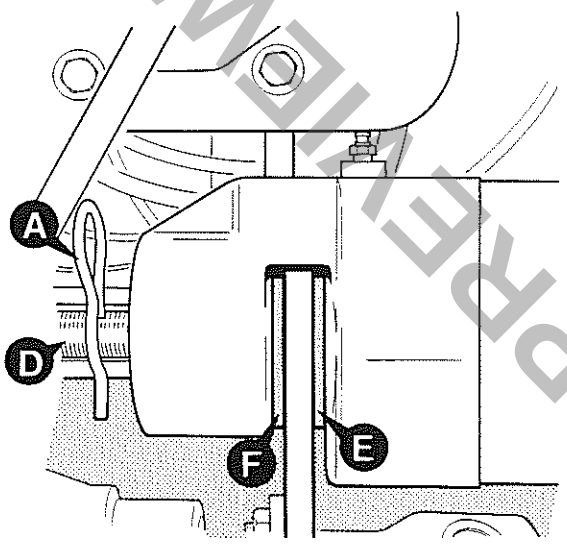
Remove brake pad **F** and fit the new item; make sure that it is held in the correct position by the magnet.

Adjust the pads as described previously.

Note: The system is pressurised when the engine is running. The system will remain pressurised, after the engine is switched off, for approximately 10 applications of the parking brake.



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ALTERNATOR

Testing

Before testing the alternator, carry out charging circuit checks **1** and **2**.

Failure of the alternator to charge the battery may be caused by one of the following conditions. These are listed in approximate order of probability.

a Defective regulator

b Dirty slip rings or worn slip ring brushes.

c Defective rectifier.

d Defective surge protection diode.

e Open or short circuited field (rotor) winding.

f Open or short circuited power (stator) windings.

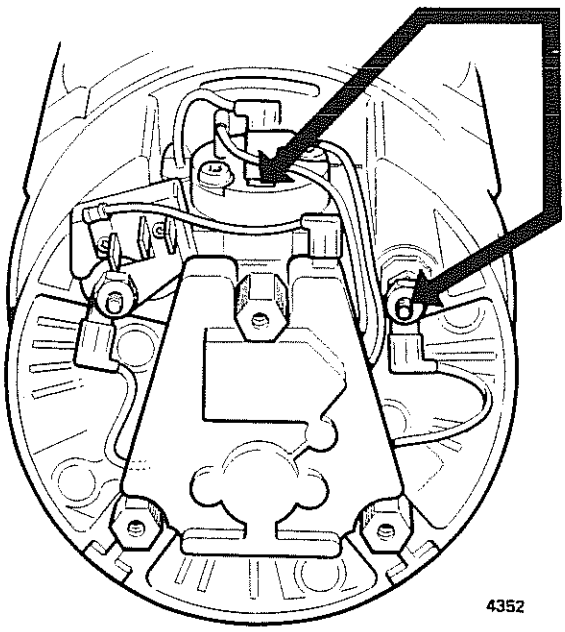
Regulator Check

Connect **'F'** terminal on brush box to negative (-) terminal.

Connect test meter *(see Service Tools Section II)* in circuit, using a dummy alternator connector as shown in Charging Circuit **Check 2.**

Run the engine at 2000 rev/min. switch on all lights and auxiliaries and check the ammeter reading.

If the ammeter now indicates the maximum rate of charge, the alternator is in good order but the regulator is defective. If the ammeter continues to show a low reading, remove the alternator for further testing.



4352

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