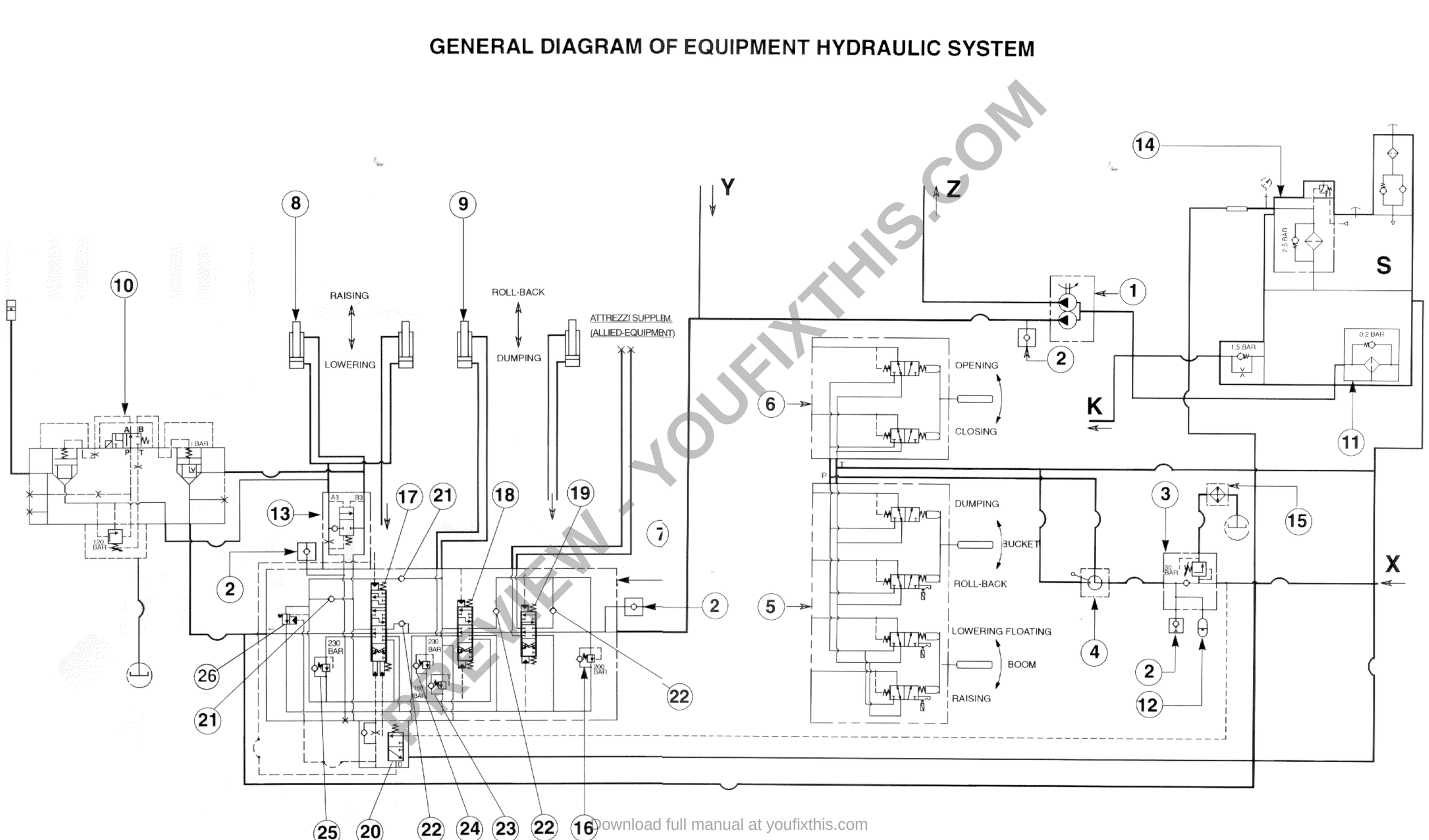
Wiring diagram

1. Batteries
2. Master switch
3. Starter motor
4. Starter relay switch contact
5. Fuel booster coil
6. 4-Amp fuse
7. Engine starting key switch
8. Starter relay solenoid
9. Starting inhibitor solenoid
10. Diode ref. 8
11. Cold starting electrovalve
12. Engine shutoff control solenoid
13. LINK 50-Amp fuse
14. Services relay
15. Instrument panel right lamp
16. Resistance
17. Right marker light
18. Front left parking light (TUV version)
19. Rear right parking light
20. 4-Amp fuse
21. Front left parking light
22. Front right parking light
23. 4-Amp fuse
24. Diode
25. Outer lighting switch
26. Rear left parking light
27. Front right parking light (TUV version)
28. License plate light
29. Left marker light
30. Instrument panel left lamp
31. Front left low beam headlamp
32. 7.5-Amp fuse
33. Front right low beam headlamp
34. Front left high beam headlamp
35. 7.5-Amp fuse
36. Front right high beam headlamp
37. High beams indicator
38. Outer lighting change-over switch
39. Front left turn signal light
40. Front left turn signal light (TUV version)
41. Rear left turn signal light
42. 7.5-Amp fuse
43. 7.5-Amp fuse
44. Hazard warning light switch, w/indicator
45. Front right turn signal light
46. Front right turn signal light (TUV version)
47. Rear right turn signal light
48. Turn signal lights indicator
49. Electronic flasher
50. Front wiper motor-reduction unit (2 speed)
51. 7.5-Amp fuse
52. Light switch (front wiper/washer section)
53. Front washer pump
54. 7.5-Amp fuse
55. Rear wiper/washer switch
56. Rear wiper motor-reduction unit
57. Rear washer pump
58. 7.5-Amp fuse
59. Cab mounted front lights on cab switch (with ncorporated indicator)
60. Engine coolant max. temperature switch
61. Cab front right work light
62. Cab front left work light
63. 7.5-Amp fuse
64. Cab mount rear lights switch (with incorporated indicator)
65. Cab mounted right rear lights
66. Cab mounted left rear lights
67. Engine oil pressure gauge sensor
68. 7.5-Amp fuse
69. Stop lights pressure switch
70. Solenoid switch
71. Left stop light
72. Right stop light
73. Magnetic breaker (8A)
74. Emergency steering timer
75. Pressure switch, transmission cut-off during braking
76. Transmission neutralizer relay contact
77. Backup alarm relay switch
78. Button, hydraulic oil high temperature indicator test
79. Starter inhibitor relay switch
80. Backup alarm relay switch
81. 7.5-Amp fuse
82. Backup alarm
83. Transmission neutralizer switch (during brake application)
84. Button, cold starting control
86. 7.5-Amp fuse
87. Transmission/parking brake disconnect relay
88. Parking brake indicator pressure switch
89. Parking brake indicator
90. Emergency steering indicator
91. Emergency steering pump low pressure switch
92. Main steering pump low pressure switch
93. Diode container (Ref. 10 and 24)
94. Horn pedal switch
95. Horn
96. 7.5-Amp fuse
97. Rotary beacon switch
98. Right rotary beacon
99. Left rotary beacon
100. Rotary beacons indicator (incorporated in 97)
101. 10-Amp fuse

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GENERAL DIAGRAM OF EQUIPMENT HYDRAULIC SYSTEM



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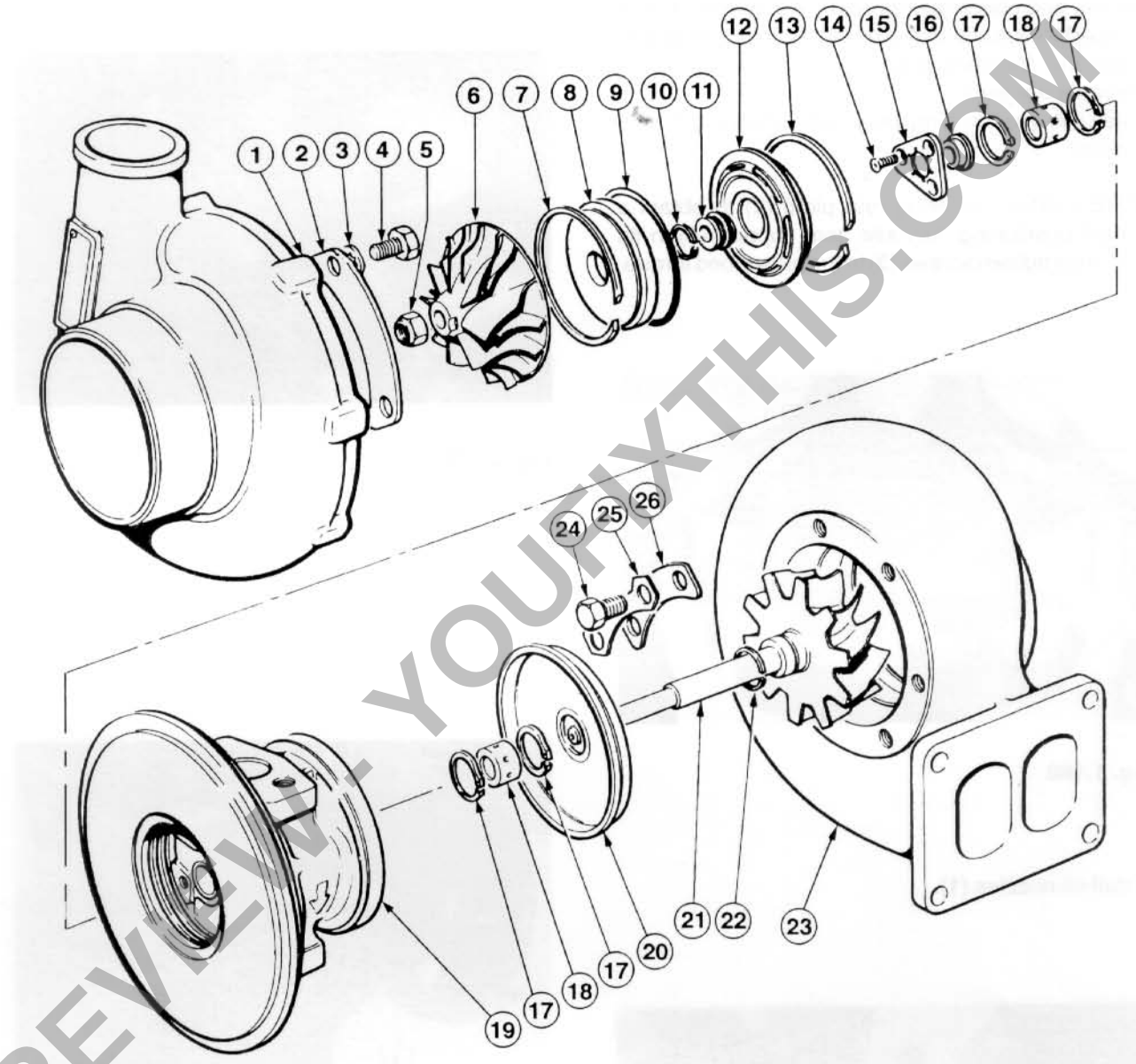


Fig. 1.167 - Components of the turbocharger

1. Compressor housing - **2.** Locking plate - **3.** Washer - **4.** Screw - **5.** Self-locking nut - **6.** Compressor wheel - **7.** Elastic ring - **8.** Oil sealing plate - **9.** Sealing ring - **10.** Elastic sealing ring - **11.** Ring holder sleeve - **12.** Oil baffle- **13.** Elastic ring - **14.** Screw - **15.** Thrust bearing - **16.** Thrust collar - **17.** Snap ring - **18.** Bushings - **19.** Central body - **20.** Heat shield - **21.** Wheel shaft - **22.** Sealing elastic ring - **23.** Turbine housing - **24.** Screw -**25.** Safety plate - **26.** Locking plate

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1.6 TIGHTENING TORQUES

ITEM	
Screw, securing cylinder head - 1st step: pre-tightening - 2nd step: pre-tightening - 3rd step: angle	 10 daNm 10 daNm 180° ± 5°
Screw, securing main journal cap Δ - pre-tightening - tightening to angle	 11,9 daNm 90° ± 5°
Screw, securing con-rod cap Δ - pre-tightening - tightening to angle	 4,6 daNm 90° ± 5°
Screw, securing flywheel - pre-tightening - angle	 10,2 daNm 60° ± 5°
Screw, flywheel housing	14,5 daNm
Screw, securing pulley on crankshaft Δ - pre-tightening - tightening to angle	 20,4 daNm 90° ± 5°
Screw, securing intake manifold	3,3 daNm
Screw, securing exhaust manifold	4,1 daNm
Nut, securing turbocharger to exhaust manifold	3,8 daNm
Nut, securing injection pump	10,7 daNm
Screw, securing drive gear	5,3 daNm
Screw, securing rocker arm shaft supports - pre-tightening - tightening to angle	 1,7 daNm 180° ± 5°

Δ Prior to tightening, lubricate the screw with UTDM oil

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Case	TROUBLE	PROBABLE CAUSE
M1	The starter motor does not work	• Battery cut-off main switch OPEN or FAULTY • Transmission speed selector NOT in NEUTRAL • Battery exhausted • LINK fuse burnt • Key switch faulty • Speed selector connection discontinued • Starter remote switch faulty • Starter motor faulty
M2	The starter motor turns, but the DIESEL engine does not start	• Fuel exhausted • Fuel filter clogged • Stop solenoid faulty • Injectors clogged • Injection pump faulty
M3	The engine smokes excessively and does not perform	• Injectors faulty • Injection pump out of calibration or faulty
M4	The engine does not stop, in spite of specific command	• Stop solenoid linkage out of alignment • Stop solenoid faulty

Study SAFETY RULES in the front of this manual thoroughly for the protection of machine and safety of personnel.

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10 Hour Services

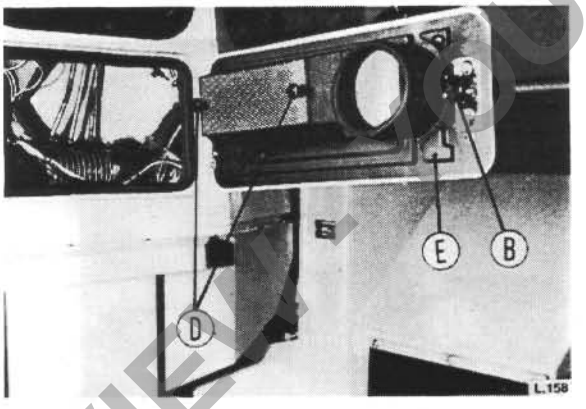
1. CAB AIR FILTER - Check

To gain access to this filter, open the door on cab right side. Unscrew knob **B** securing cover **E** and remove filter **C**. Check for good condition. If restricted, clean as follows:

- tap filter lightly on a flat surface;
- complete cleaning operation by blowing compressed air - dry and decontaminated - moving the jet up and down along element pleats, until dust is completely removed.

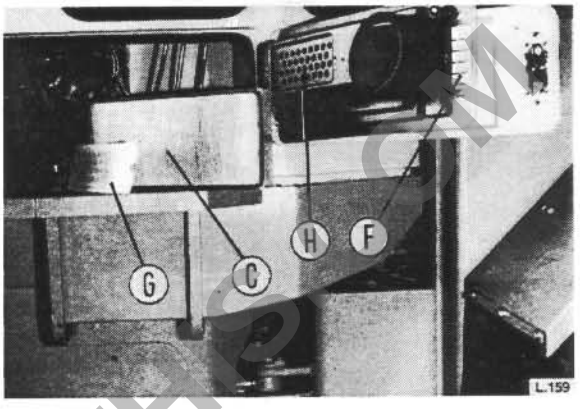
Important - Keep air jet at a safe distance from filter.

Loosen knobs **D** and remove retaining net and sponge filter **G**.
Should the filter be torn, replace it; if clogged, clean it with soapy water and dry with compressed air.
Before re-installing the filter, clean suction slots **F** and **H** in the panel and filter housing.



⚠ WARNING

Wear safety glasses with side shields or goggles when using compressed air for cleaning to reduce the danger of personal injury from flying particles. Limit the pressure to 2 bar (30 psi) according to local or national requirements.



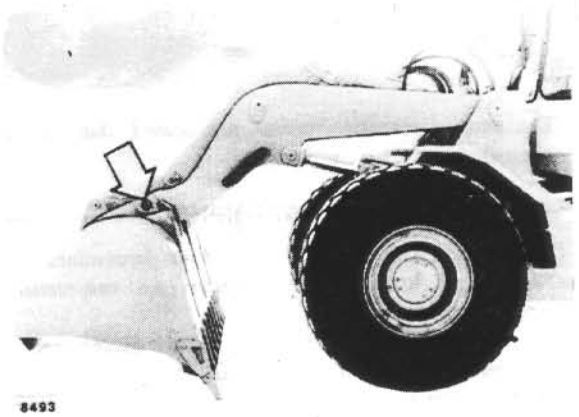
50 Hour Services

2. BUCKET LINKAGE AND FRAME ARTICULATIONS - Lubricate

⚠ WARNING

Observe all start up and shut down procedures and "Warnings" listed in the operation and maintenance instruction manual.
Always lower attachment to ground when making repairs, adjustments, or servicing machine.

Inject grease with an appropriate pump in the bucket lower articulation grease nipples and lower and upper frame articulation grease nipples (see page 54).



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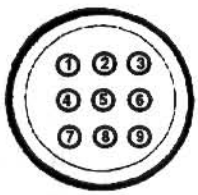
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The **E.D.M.** control module has on the rear side, two connections **A** and **B**.

CONNECTION A

Position	Wire	
1	**591**	To transmission oil low pressure sensor 161
2	**589**	To transmission oil low level sensor 109
4	**569**	To engine oil low level sensor 111
5	**520**	To engine coolant level sensor 112
6	**805**	To engine starting remote switch 4
7	**555**	To fuel level sensor 110
8	**557**	To fuel level sensor 110

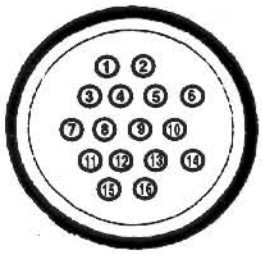
A



CONNECTION B

Position	Wire	
1	**855**	To fuse block
2	**000**	To cab ground
3	**104**	To buzzer 123
4	**559**	To transmission oil max. temperature switch 120
5		Not used
6	**105**	To buzzer 123
7	**528**	To engine coolant max. temperature switch 60
8	**637**	To alternartor 105
9	**503**	To engine oil low pressure sensor 114
10	**580**	To hydraulic oil filter clogging sensor 121
11	**871**	To fuse block
12	**663**	To air cleaner clogging sensor 118
13	**613**	To brakes accumulator low oil pressure switch 117
14		Not used
15		Not used
16		Not used

B

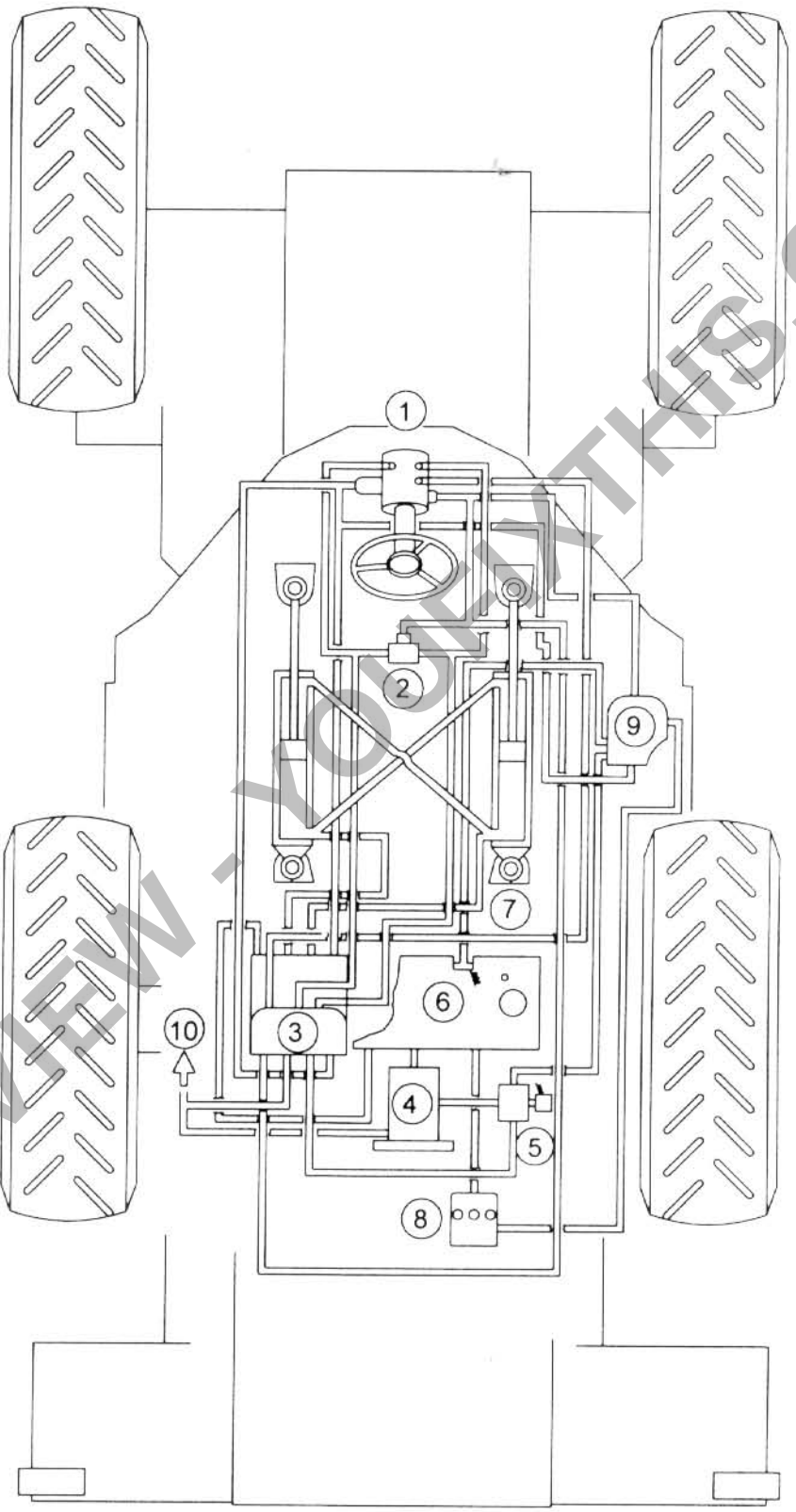




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STEERING HYDRAULIC SYSTEM DIAGRAM



Steering hydraulic system diagram (With emergency steering)

1. Power steering - **2**. Three-way valve - **3**. Flow amplifier - **4**. Hydraulic pump - **5**. Check valve - **6**. Oil reservoir - **7**. Steering cylinders - **8**. Emergency steering pump - **9**. Secondary priority valve - **10**. To hydraulic system control valve

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SPECIFICATIONS

ENGINE

Model: 8465.21.014
Diesel cycle, 4-stroke, direct-injection, with exhaust gas driven turbocharger.
Number of cylinders: 6
Cylinder bore ..... 120 mm
Piston stroke ..... 140 mm
Total displacement ..... 9500 cu cm
Compression ratio ..... 16 : 1
Max. rated power ..... 177 KW at 2200 RPM
Max. rated torque ..... 100,5 daNm at 1400 RPM
Engine low idle speed with no load .....
..... 925 ± 25 rpm (on bench)
Engine max. speed with no load .....
..... 2,450 ± 25 rpm

Lubrication System

Type: Force-feed by gear pump.
Strainer on pump intake, full-flow filter with replaceable cartridges on oil delivery.
Low oil pressure warning indicator in Electronic Data Monitor Panel.

Timing

Overhead Valve, Pushrod Operation.
- Intake:
  - Opens ..... 11° BTDC
  - Closes ..... 27° ABDC
- Exhaust:
  - Opens ..... 55° BBDC
  - Closes ..... 17° ATDC
- Valve clearance:
  - For normal operation:
  - Intake ..... 0.25 mm
  - Exhaust ..... 0.50 mm

Fuel system

Plunger feed pump, in-line injection pump, integral all-speed governor and automatic advance variator.
Throwaway cartridge fuel filters.
Pump timing to engine: 24° to 26° B.T.D.C. in cylinder No. 1 in compression stroke (start of delivery).
Firing order: 1-5-3-6-2-4
Fuel injectors release pressure: ..... 260 - 268 bar
Fuel filtration: replaceable cartridge filters.
Heated fuel pre-cleaner with priming pump and water separator.
Dry air cleaner with centrifugal separator and replaceable paper cartridges.
Air cleaner cartridge clogging indicator (light) on DATA MONITOR.

Cooling System

Water cooled, forced circulated by centrifugal pump.
Radiator: 5 tube row core.
Fan: 7 blade, pusher.
Circulation of coolant from engine to radiator, regulated by thermostat, beginning of opening 79°C ± 2°C.
Engine coolant low level/high temperature warning indicator in Electronic Data Monitor.

Starting

By electric motor.

DRIVE TRAIN

Transmission-to-Axles

Two drive shafts between transmission and front axle with central support. The first shaft, between transmission and transfer gear, is sliding with double U-joint. The second, between transfer gear and front axle, is rigid with single U-joint.
The drive shaft between transmission and rear axle consist of a shaft with sliding double U-joint.

Converter/Transmission

Hydraulic torque converter
Stall torque ratio 2.57 to 1.
Transmission: "automatic powershift", 4 speeds forward and 3 reverses electrically operated by a single lever on steering column.
Safety lever locking the transmission gearshift control in neutral.
Gear type converter/transmission pump.
Oil cooling through heat exchanger with coolant recirculated from radiator.
Oil filtration: Two full-flow filters with incorporated by-pass valve on control pump delivery line and metal strainer on suction intake.

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1.5.10.2 Injectors

The injectors include an injector holder and a nozzle; the function of the injectors is to send under pressure atomized fuel into the combustion chambers.

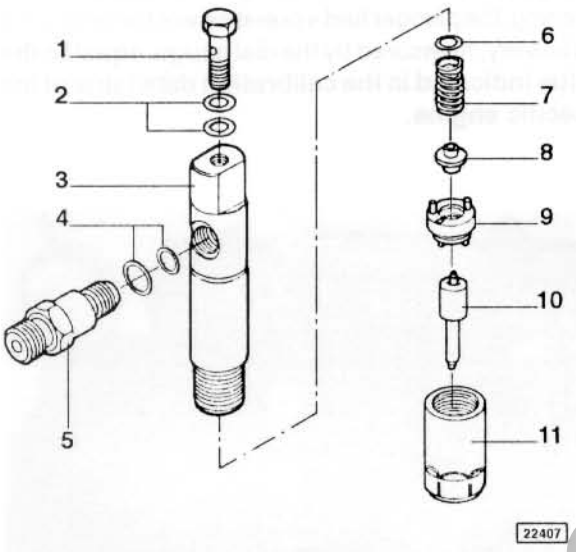


Fig. 1.131 - Components of the injector

1. Discharge connection - **2.** Washers - **3.** Body - **4.** Washers - **5.** Connection - **6.** Shim - **7.** Spring - **8.** Cap - **9.** Spacer - **10.** Nozzle - **11.** Retaining nut

1.5.10.3 Bench test and calibration

Calibrating an injector means to give its spring such a load that the prescribed injection pressure is required to lift the nozzle needle.
The exact calibration pressure is obtained by changing the thickness of the adjusting shim (**6**, fig. 1.131), so that the load of the spring (**7**) is changed accordingly.

Testing and calibration of the injectors (**1**):
- the calibration value is listed in the calibration table of the specific engine.

Perform the calibration and check the tightness of the nozzle, actuate the pump until the pressure gauge shows 120 bar and follow the pressure drop that must occur between 120 and 70 bar in a time between 4 and 20 sec.s.

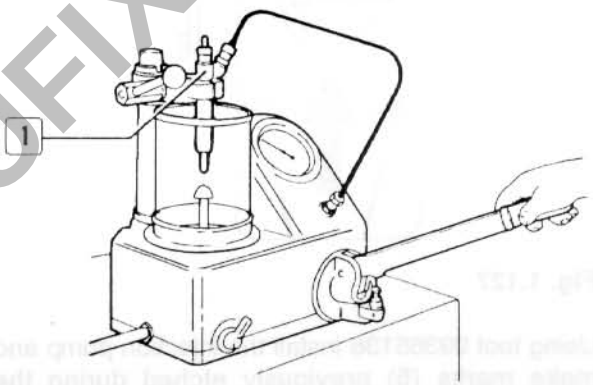


Fig. 1.132

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2.4 DIAGNOSTIC AND THE TESTS

2.4.1 MEASURE OF PRESSURES ON TRANSMISSION CONTROL VALVE

Before measuring the pressures listed, operate the transmission so as to bring the oil temperature to 70° ÷ 80°C (160 ÷ 175°F).
Do not perform measures with cold oil.
Connect a pressure gauge set to the points indicated in fig. 2.6.

2.4.2 MEASURE OF TRANSMISSION OIL TEMPERATURE

Connect a pressure gauge to the port (fig. 2.7) for the heat exchanger (**4**) intake piping.
Remove plug (**2**) from block (**5**) and measure the temperature. The normal operation temperature is 80° ÷ 90°C (175° ÷ 195°F).

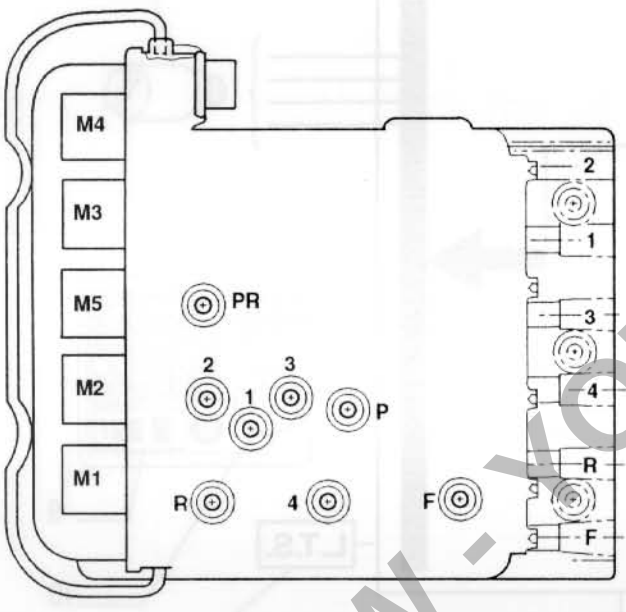


Fig. 2.6 - Pressure pick-up point on control valve

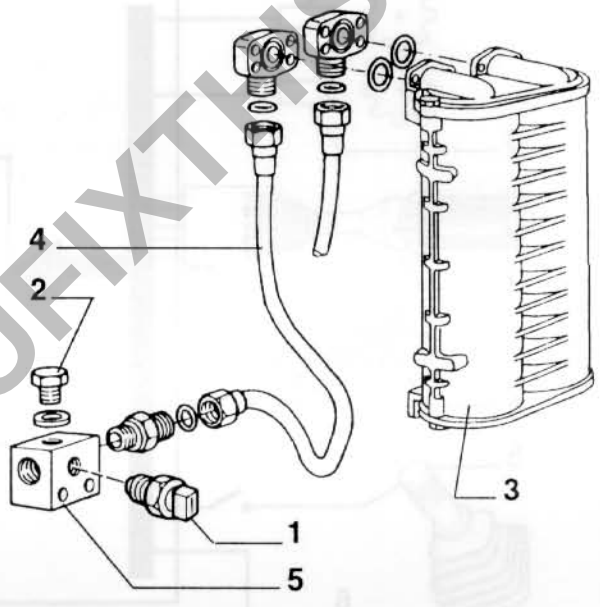


Fig. 2.7 - Measure of transmission oil temperature

Reference	Description	Pressure
1.	First speed	16 ÷ 18 bar
2.	Second speed	16 ÷ 18 bar
3.	Third speed	16 ÷ 18 bar
4.	Fourth speed	16 ÷ 18 bar
F.	Forward	16 ÷ 18 bar
R.	Reverse	16 ÷ 18 bar
P.	Main	16 ÷ 18 bar
PR.	Reduction valve	10 bar

1. Transmission high temperature sensor (setting: 116° ÷ 120 °C - 240° ÷ 248 °F)
2. Plug
3. Oil heat exchanger
4. Heat exchanger inlet piping
5. Block

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1.3 SPECIFICATIONS AND DATA

DESCRIPTION	mm
CYLINDER GROUP / CONRODS Bore of cylinder sleeves	119.990 ÷ 120.015
Diameter of bore for cylinder liners on cylinder block: upper lower	 137.010 ÷ 137.025 134.000 ÷ 134.025
Guide diameter of cylinder liners: upper lower	 136.975 ÷ 137.000 133.972 ÷ 133.990
Fitting between cylinder liners and their seat on cylinder block: upper lower	 0.000 ÷ 0.050 0.010 ÷ 0.053
Protrusion of cylinder liner from surface of cylinder block	0.045 ÷ 0.065
Thickness of rings for setting of cylinder sleeve protrusion	0.08 - 0.10 - 0.12 - 0.14
Diameter of camshaft bush seats	63.000 ÷ 63.030
Diameter of crankshaft journal bearing seat	96.000 ÷ 96.022
Diameter of standard tappet seats	18.000 ÷ 18.027
Diameter of con-rod journal bearing seat	86.213 ÷ 86.235
Diameter of con-rod small end bush seat	52.000 ÷ 52.025
Thickness of standard half-bearing	2.079 ÷ 2.089
Range of undersized con-rod half-bearings	0.254 - 0.508 - 0.762 - 1.016
Inside diameter of con-rod bushes (to be obtained after press-fitting)	48.023 ÷ 48.033
Fitting piston pin / con-rod small end bush (clearance)	0.030 ÷ 0.048
Fitting bushes / con-rod small end	Interference must always be present
Fitting of con-rod half-bearings / crankshaft journals	0.035 ÷ 0.097
Tolerance of parallelism between the two center lines of con-rod (measured at 125 mm from center lines)	0.07

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LUBRIFICATION AND SERVICE GUIDE

10 hour services	1. CAB AIR FILTER - Check
50 hour services	2. BUCKET AND FRAME ARTICULATIONS - Lubricate 3. CAB AIR FILTER - Clean
100 hour services	4. BOOM AND BUCKET ARTICULATIONS - Lubricate 5. GREASE FITTINGS - Lubricate 6. IMPLEMENT HYDRAULIC CONTROL SYSTEM - Check oil level 7. AXLES - Check oil level
250 hour services	8. ENGINE OIL - Change (*) 9. FUEL TANK - Drain condensation 10. ALTERNATOR / FAN DRIVE BELTS - Check 11. VARIOUS VENTS - Clean vents on hydraulic oil tank, axles and transmission 12. TYRES - Check pressure 13. L.T.S. ACCUMULATOR (Optional) - Check charge
500 hour services	14. ENGINE OIL FILTERS - Change 15. FUEL FILTERS - Change 16. ENGINE COOLING SYSTEM FILTER - Change 17. HYDRAULIC SYSTEM - Clean breather and change oil filter on return 18. PILOT CONTROL SYSTEM FILTER - Change 19. DRIVE SHAFT - Lubricate 20. CAB AIR FILTER - Change 21. L.T.S. ACCUMULATOR (Optional) - Check charge
1000 hour services	22. ENGINE - Check injector setting 23. ENGINE - Check valve clearance 24. TRANSMISSION - Change oil and filter 25. BATTERIES - Check electrolyte level 26. S.M.T. AXLES - Change oil
2000 hour services	27. SEDIMENTATION PRE-FILTER - Change filter 28. AIR CLEANER - Change cartridges 29. ENGINE COOLANT- Change 30. HYDRAULIC SYSTEM - Change oil
As required	31. TRANSMISSION / DRIVE HOUSING- Top-up oil level 32. ENGINE - Top-up oil level 33. RADIATOR - Add coolant 34. HYDRAULIC SYSTEM - Change oil return filter and vent 35. AIR CLEANER - Clean/change cartridges 36. TIRES - Check inflation pressure 37. BRAKE AND PILOT SYSTEM - Check efficiency
Occasional	38. FUEL SYSTEM BLEEDING 39. BRAKE SYSTEM BLEEDING

(*) The oil can be changed at 500 hours with oil corresponding to CCMC D5 specifications.

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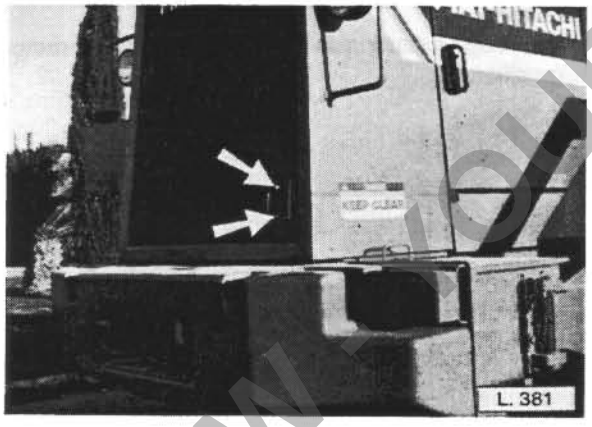
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OPERATION

GENERAL INFORMATION

Before starting engine and/or placing loader in motion, be certain it has been properly prepared for use and has been properly serviced since last operating period. Refer to Preliminary Instructions and Break-in Period for detailed information.
If repairs have been made since last operating period, be sure all nuts and bolts affected by repairs have been tightened and all necessary adjustments made.

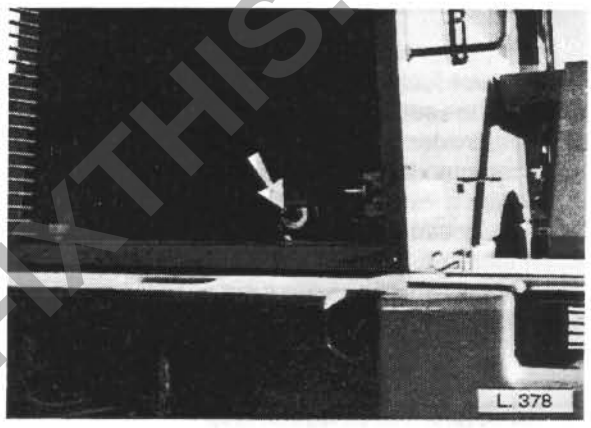
For access to ELECTRICAL SYSTEM MASTER SWITCH and FUEL TANK FILLER CAP open the grill shown after unlocking with the key provided.

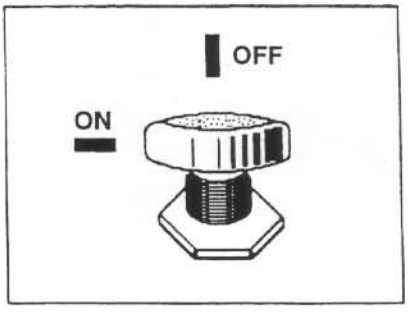


Note - The terms LEFT and RIGHT as referred to in this Manual, are determined by sitting on the Operator's seat and facing the front (bucket) end of the loader.

ELECTRICAL SYSTEM MASTER SWITCH

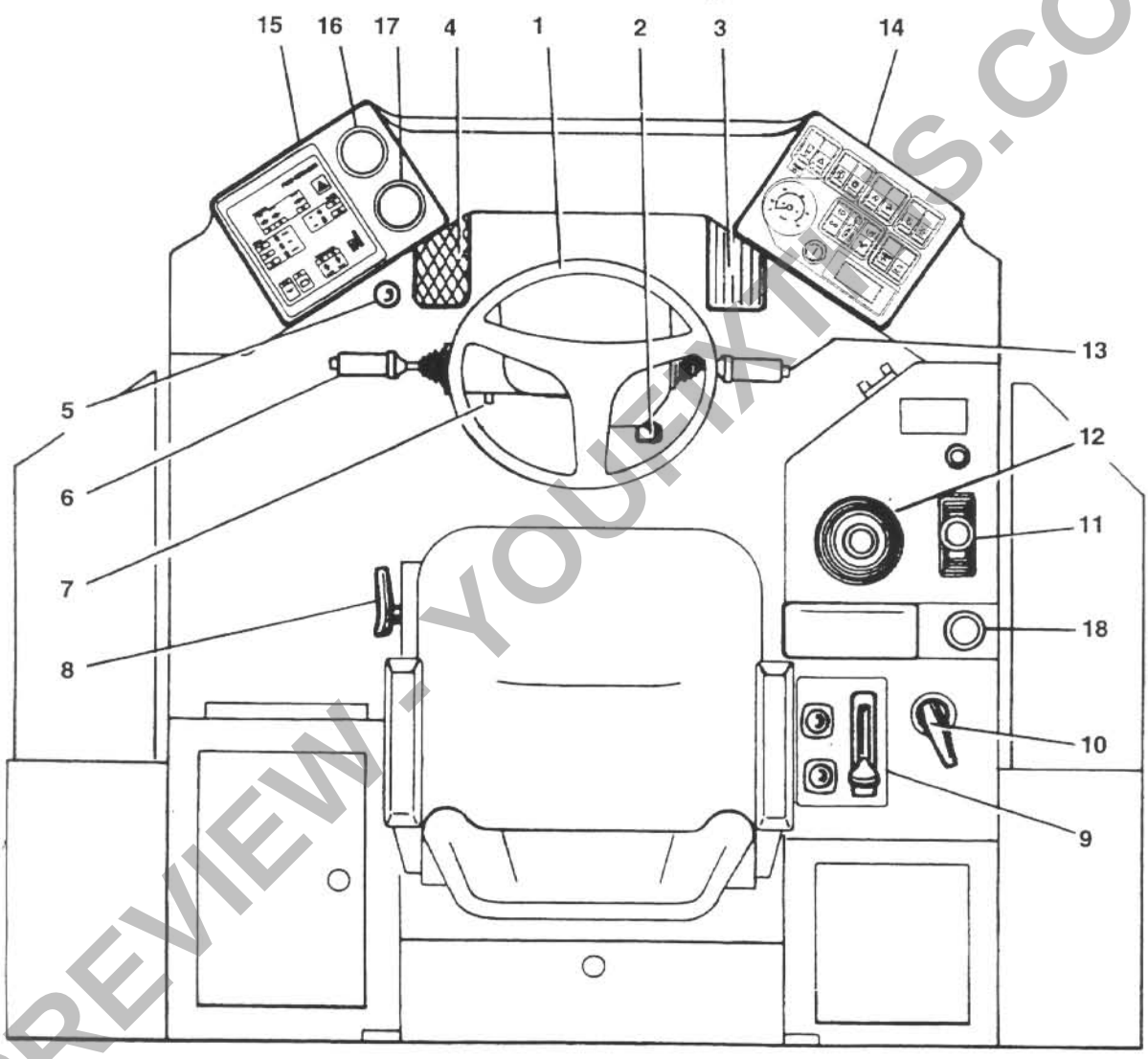
When electrical system operation is needed the key of this switch must be set **ON** as shown.
Turn key to **OFF** when the machine must be parked after work, then remove from switch. This practice will prevent machine abuse and misuse by unauthorized persons.





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CONTROLS AND INSTRUMENTS



L. 245

Note - The terms LEFT and RIGHT as referred to in this Manual, are determined by sitting on the Operator's seat and facing the front (bucket) end of the loader.

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7.1 REPAIR

7.1.1 REMOVAL AND INSTALLATION OF BUCKET

WARNING

Always turn the master switch to the "OFF" position before cleaning, repairing, servicing, or parking the unit to prevent injuries.

Lower the bucket flat to the ground.

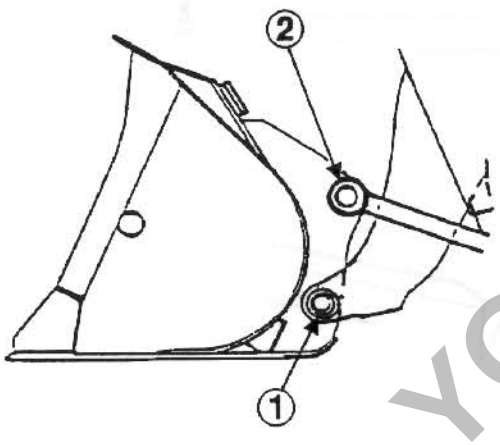


Fig. 7.1

1. Bucket boom pivot pin - **2.** Link-bucket pivot pin

Place a few wooden blocks under the boom so that it stays in the same position, to facilitate there-installation

Remove the screws securing bucket strut and boom pins (**1** and **2**), pull out the pins ensuring that the grease nipples are not damaged, and salvage the shims eventually installed.

Sling the bucket with a hoist, using the two eyes , than move it to a place where it is possible to inspect it.

For the installation, reverse the removal procedure.

7.1.2 INSPECTION OF BUCKET AND TEETH

Clean the bucket and check that it does not show cracked weldings , twisting or damages to the cutting edges.

Should these defects be found, repairs to the bucket must be made.

If the bucket has been damaged by particularly hard working conditions, it could be recommended to reinforce the damaged areas with weldings.

Before welding, check the shape of the bucket, reshaping it as required. Cracked or worn areas along the cutting edges must be repaired immediately.

If the bucket is so equipped, remove the screws securing the teeth to the bucket.

Place a guide ruler (**4,** fig. 7.2) along the existing central cutting edge, and using a cutting torch, remove the cutting edge (**3**). Turn the bucket and remove the side rib edges (**5**).

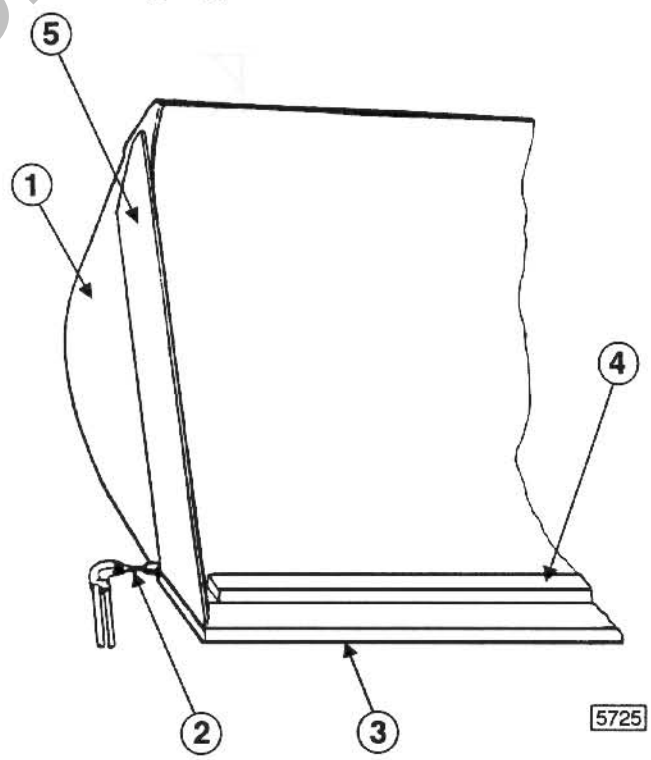


Fig. 7.2 - Removal of cutting edge

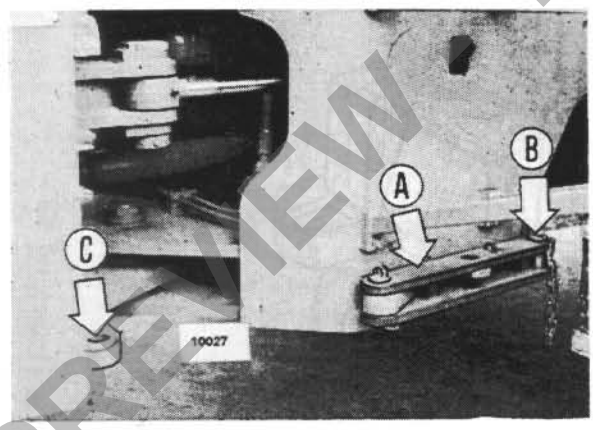
1. Bucket - **2.** Cutting torch - **3.** Central cutting edge- **4.** Guide ruler - **5.** Side rib edge.

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TRANSPORTING

Use suitable vehicle of appropriate capacity.
Load and unload on a level area that gives full support under the wheels of the transporting vehicle. Use ramps of adequate strength, low angle and proper height. Use chock blocks on transport vehicle wheels, so it cannot move.
Keep bed of transporting vehicle clean of clay, oil and all materials that become slippery.
Use a signal person stationed in a place thal provides full view of ramp, vehicle bed, machine and operator.
Raise implements just high enough for clearance.
Keep engine speed low so machine will creep up the ramps and onto transporting vehicle load bed.
Make the least possible use of accelerator and steering conlrols. When loaded, lower all implements. Set parking brake. Heed all shutdown procedures.
Tie machine securely to bed of transporting vehicle and block wheels as required by the carrier.
Verify that the cab door, compartment doors or other mobile components are securely locked.
Install the signals prescribed by Road Regulations, should the dimensions of the machine exceed the approved limits.
Lock the steering frame modules with the appropriate safety lock bar **A** and pin **B**, as illustrated.



ROADING

⚠ WARNING

Avoid transporting the machine on the road with a loaded bucket. Make sure that the bucket controls are in neutral position and lock them with the appropriate device. This is to avoid that unwanted or accidental movements of the bucket controls cause dangerous situations.

Check all fluid levels and tire pressure. Position implements within wheel width, raised high enough for clearance. Bucket must be empty. Make sure all lights work properly. Check with tire manufacturer for advice. Some tires and tread designs are not suitable for highway travel.

Know your stopping distance at any given speed. Regulale travel speed accordingly.

Obey all traffic regulations. If traffic backs up, pull to the side of the road and allow traffic to pass. Stop for 30 minutes after two hours of travel to allow tires to cool. Tire pressure will rise during operation; this is normal and must not be reduced.

Monitor system indicators frequently to insure that all systems are functioning properly. Travel with a signal vehicle equipped with flashing lights and signs to adequately warn oncoming traffic. If a rhythmic bounce develops, slow down to stop it, then continue at a slower speed.
During transfers on roads open to normal traffic obey all highway code regulations.

Caution: When travelling on roads open to traffic, obey all laws and regulations. Keep all lights in good working conditions. Replace immediately any bulb out of order.

Note: The rules quoted in this manual are subject to slight changes if so dictated by local traffic regulations in different Countries.

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TABLE OF CONTENTS

TOPIC	PAGE
Safety Rules	I - VII
Foreword	VIII
Identification Data	2
Specifications	4
Stability	7
Quantitative facets of comfort	8
List and location of safety plates	9
Preliminary Instructions and Break-in period	14
Operating warnings	15
Controls and Instruments	16
Operation	25
General Information	25
Electrical System Master Switch	25
Fuel Tank	26
Engine Starting	26
Engine idling	27
Starting at low temperature	28
Placing Loader in Motion	29
Stopping the Loader	29
Stopping the engine	29
Lowering attachment to ground without engine power	30
Moving the machine with external aids	30
Transporting	32
Roading	32
Automatic bucket leveler	34
Automatic boom kick-out adjustment	34
Cold Climate Precaution	35
Preparation for storage	35
Cab	36
Operator's seat adjustments	38
Steering wheel rake adjustment	38
Heating and ventilation	39
Fire protection	42
Operating warning	44
Maintenance	47
Walk around inspection	48
Maintenance operations	49
List of on-board tools	51
Lubrication and Service Guide	52
10 Hour Services	53
50 Hour Services	53
100 Hour Services	54
250 Hour Services	57
500 Hour Services	61
1000 Hour Services	65
2000 Hour Services	69
As required Services	72
Occasional Services	74
Electrical System	75
Wiring diagram	78
Fluid capacities	80
Trouble-shooting	81
List of residual dangers	87

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SAFETY RULES

GENERALITIES

Study this Manual before starting, operating, maintaining, fuelling or servicing the machine.

Read and heed all safety rules before any intervention.

Do not allow unauthorised personnel to operate service or maintain this machine.

Do not wear rings, wrist watches, jewellery, loose or hanging apparels, such as ties, torn clothing, scarves, unbuttoned or unzipped jackets that can catch on moving parts. Wear proper safety equipment as recommended for the job. Examples: hard hat, heavy gloves, ear protection, safety glasses or goggles, reflector vests, respirator. Consult your employer for specific safety equipment requirements.

Keep operator's compartment, stepping points, grab-rails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimize the danger of slipping or stumbling. Clean mud or grease from shoes before attempting to mount or operate the machine.

Do not jump on or off the machine. Keep two hands and one foot, or two feet and one hand in contact with step grab rails and handles at all times.

Do not use controls or hoses as hand holds when climbing on or off machine. Hoses and controls are movable and do not provide a solid support. Controls also may be inadvertently moved causing accidental machine or equipment movement.

Never attempt to operate the machine or its tools from any position other than seated in the operator's seat.

Keep head, body, limbs, hands and feet inside operator's compartment at all times to reduce exposure to hazards outside the operator's compartment.

Be careful of slippery conditions on stepping points, hand rails, and on the ground. Wear safety boots or shoes that have a high slip resistant sole material.

Do not leave the machine until it is completely stopped.

Check the seat safety belt at least twice a year. If there are signs of wear or fraying or other signs of weakness that could lead to failure, replace it.

STARTING

NEVER START OR OPERATE AN UNSAFE MACHINE. Before operating a machine, always ensure that any unsafe condition has been satisfactorily remedied.

Check brakes, steering and attachment controls before moving. Advise the proper maintenance authority of any malfunctioning part or system.

Be sure all protective guards or panels are in place, and all safety devices provided are in place and in good operating conditions.

Be sure exposed personnel in the area of operation are clear of the machine before moving it or its attachments. WALK COMPLETELY AROUND the machine before mounting. Sound horn. Obey flag man, safety signals and signs.

Before starting machine, check, adjust and lock the operator's seat for maximum comfort and control of the machine.

Fasten your seat belt (when provided).

Obey all flag signals and signs.

Due to the presence on the machine of flammable fluids, never check or fill fuel reservoirs or batteries near open flames, smoking materials or sparks.

REMEMBER THAT STARTING FLUID IS FLAMMABLE. Follow recommendations printed on containers and in the Operation and Maintenance Manual.

DO NOT PUNCTURE OR BURN CONTAINERS.

Containers must be stored in fresh, well ventilated places, out of reach of unauthorised persons. Follow strictly the instructions provided by the Manufacturer.

Never use these preducts near open flames, smoking materials or sparks.

OPERATING

Check the fasteners of wheels and rims before starting a working shift. If necessary, retighten to the prescribed torque.

Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

Roll Over Protective Structures are required on loaders, dozers, graders, excavators. NEVER OPERATE machines without ROPS.

Make sure the Operator's compartment is free of foreign objects, especially if not firmly secured. Never use the machine to transport objects, unless proper securing points are provided.

DO NOT CARRY RIDERS ON MACHINE

Study and familiarize with escape routes alternate to normal exit routes.

Seat belts are required to be provided with Roll Over Protection Structures or cabs. Keep safety belts fastened around you during operation.

For your personal protection, do not climb on or off machine while machine in motion.

Make sure that exposed persons in the area of operation are clear of the machine, before starting the engine and operating the equipment. Obey all indications provided by flags and signals.

NEVER COAST the machine down grades and slopes with

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FLUID CAPACITIES

ITEM	QUANTITY Liter	PRODUCT	TYPE OF SUPPLY (International classification)
Cooling system	60	PARAFLU 11	50% water/anti-freeze mixture. Oxidation, corrosion, rust and foam inhibiting, anti-freeze protection to - 35°C (- 30°F).
Fuel reservoir	350	–	Fuel ASTM N.2-D type TT of good quality and brand.
Engine	21	AMBRA SUPER	Engine oil to "CCMC D-4" or "MIL - L - 2104 E Level" or "API CF-4"
Transmission	17,5	AMBRA SUPER	Engine oil to "CCMC D-4" or "MIL - L - 2104 E Level" or "API CF-4"
		GI/M (1)	ATF Type A SUFFIX A
Hydraulic system and brakes	200	IDRAULICAR AP 31, 51	Hydraulic oil to DIN 51524/51525 or ISO VG 32, 68
Grease fittings	–	TUTELA G9	Lithium-calcium base grease N.L.G.I. 2 consistency.
Axles - "Super Max Trac"			
front	63	FINA PONTONIC N	API GL- 4
rear	53	SAE 85W/90	MIL - L - 2105

(1) To be used with temperatures below - 20°C (- 4°F).

The quantities of oil indicated are those required for periodic changes as detailed in the drainage and refill instructions for each item.

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With an appropriate Allen wrench (2) loosen almost completely the damper hub (1) retaining screw; this warning helps the operator from eventual sudden seizing of the hub during the extraction.

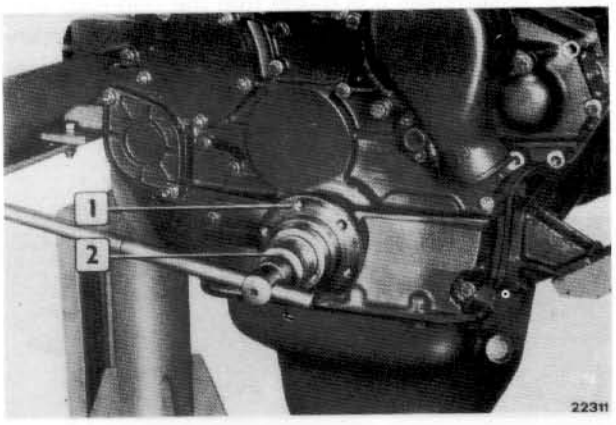


Fig. 1.17

Mount a puller (3) complete with hydraulic unit (2) and clamp (4) on hub (5); using hydraulic pump (1) pull-out the damper.

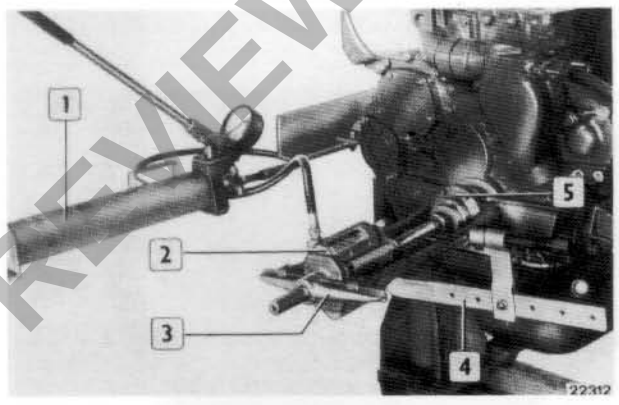


Fig. 1.18

Loosen the screws and remove water pump (2) remove also intake connection (1).

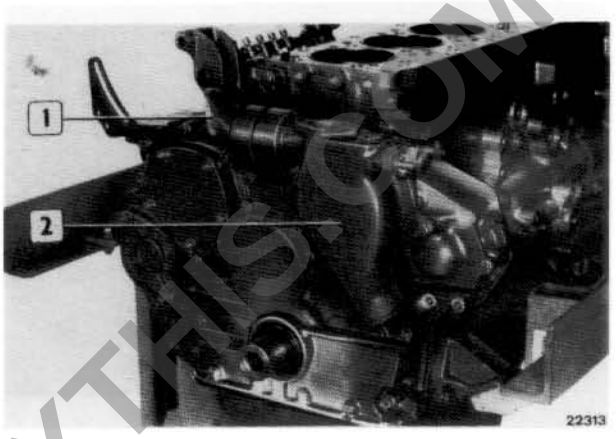


Fig. 1.19

Using tool (1) remove injection pump (2) after identifying with two marks (3) the mounting position of the injection pump.

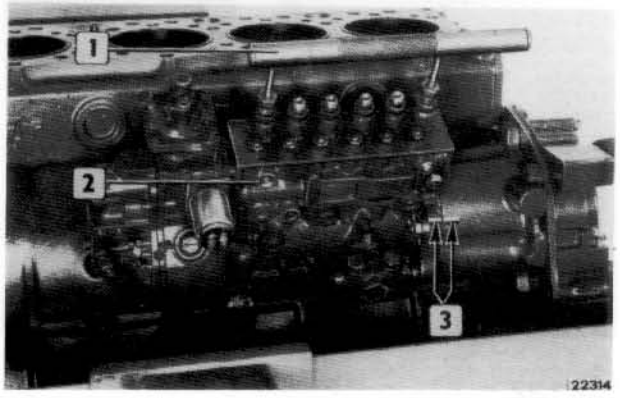


Fig. 1.20

Rotate the engine 180°, loosen the screws and remove the oil sump recovering the gasket.

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3.1 DESCRIPTION

Rigid full-floating type front axle.
Swinging, full-floating type rear axle with two supports rigidly mounted on the machine frame.
The axles are constantly engaged and are driven by the shafts connected to the transmission output.

Each axles includes, essentially:
- bevel gear unit, differential, planetary final drives and in-built brakes.

The final drives include the brake discs (q.ty 5) in the front axle and 4 in the rear one.

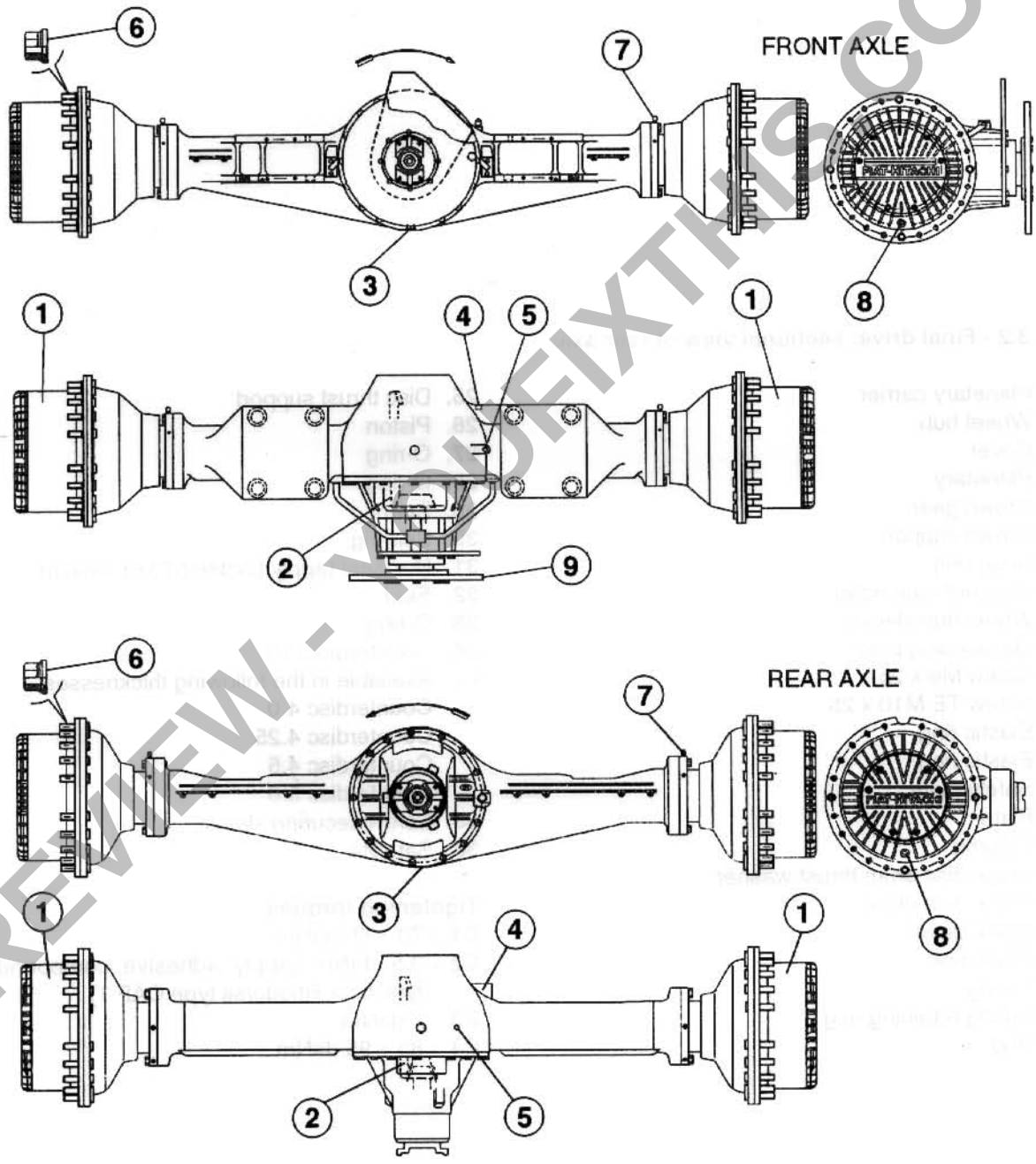


Fig. 3.1 - Diagram of axles

1. Final drives - **2.** Differential - **3.** Oil draining plug - **4.** Differential oil filler and level plug - **5.** Breather - **6.** Nut, securing front and real wheels - **7.** Oil bleeding - **8.** Final drive oil filler and level plug. - **9.** Parking brake disc.

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6.3.4 PILOT VALVE

(ref. 5 General diagram)

Removal - Installation

Prior to beginning the removal operations, actuate, with engine inoperative, the pilot valve lever to discharge the accumulator pressure.
Tag and disconnect the oil piping. Disconnect the electrical wirings. Loosen the securing screws and remove the pilot valve.
Reinstall the pilot valve reversing the removal operations.

Disassembly - Assembly

Loosen screw (**6**, fig. 6.31) and remove the two shells of the hand-grip (pay attention to the switch for Kick-down and Shift-down of the automatic transmission, inside the hand-grip).
Remove the protection hood.
Turn the pilot valve upside-down, loosen screws (**C3**) and separate the lower body (**5**) from the upper one (**3**).

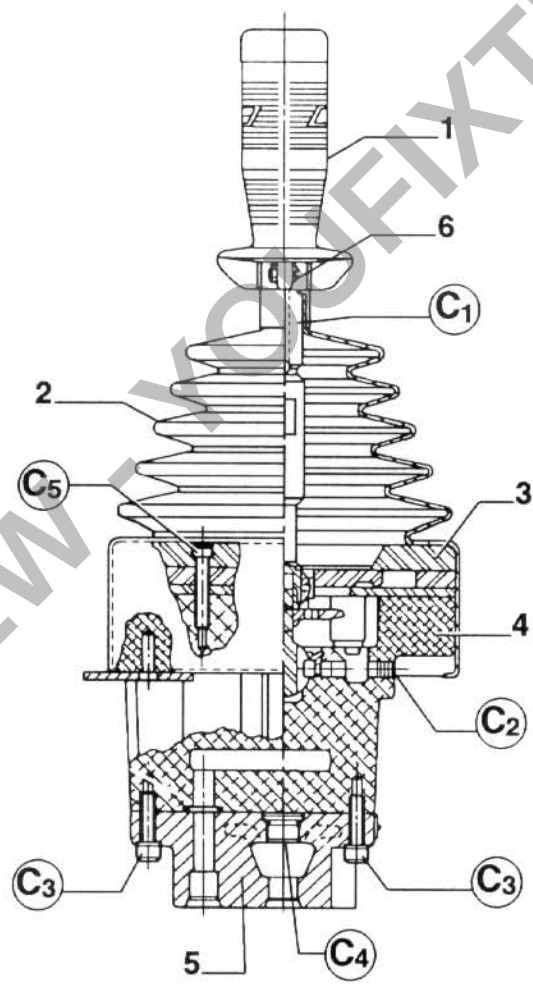


Fig. 6.31 - Disassembly of pilot valve

1. Hand-grip - **2**. Hood - **3**. Upper plate - **4**. Pilot valve body - **5**.Lower body - **6**. Screw

Tightening torque: C1. Lever securing screw = 3.4 daNm - **C2**.Lever securing screw = 0.8 daNm - **C3**. Lower body securing screw = 0.5 daNm - **C4**. Plug = 1.5 daNm - **C5**. Lower plate securing screw = 0.5 daNm

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