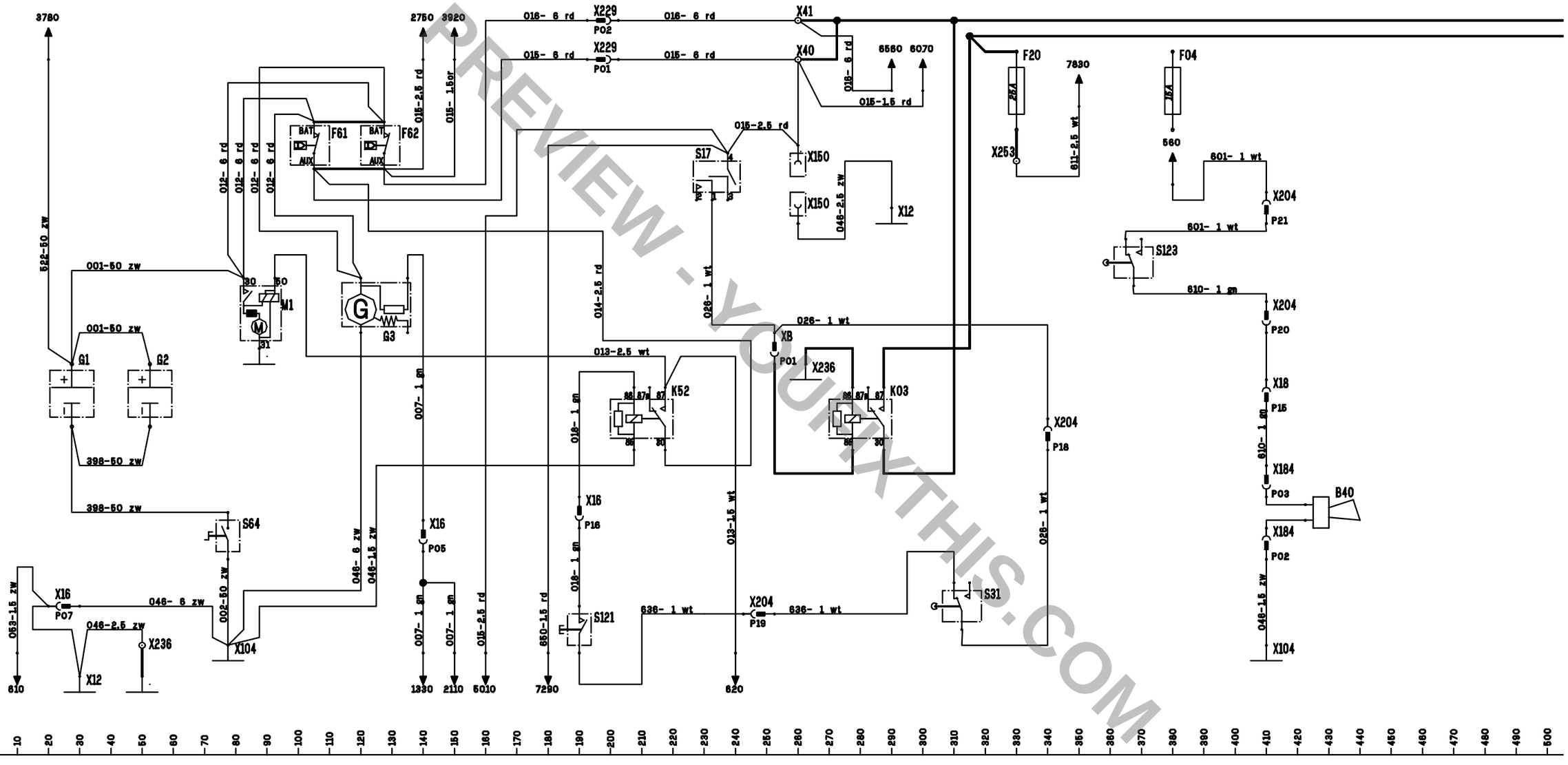
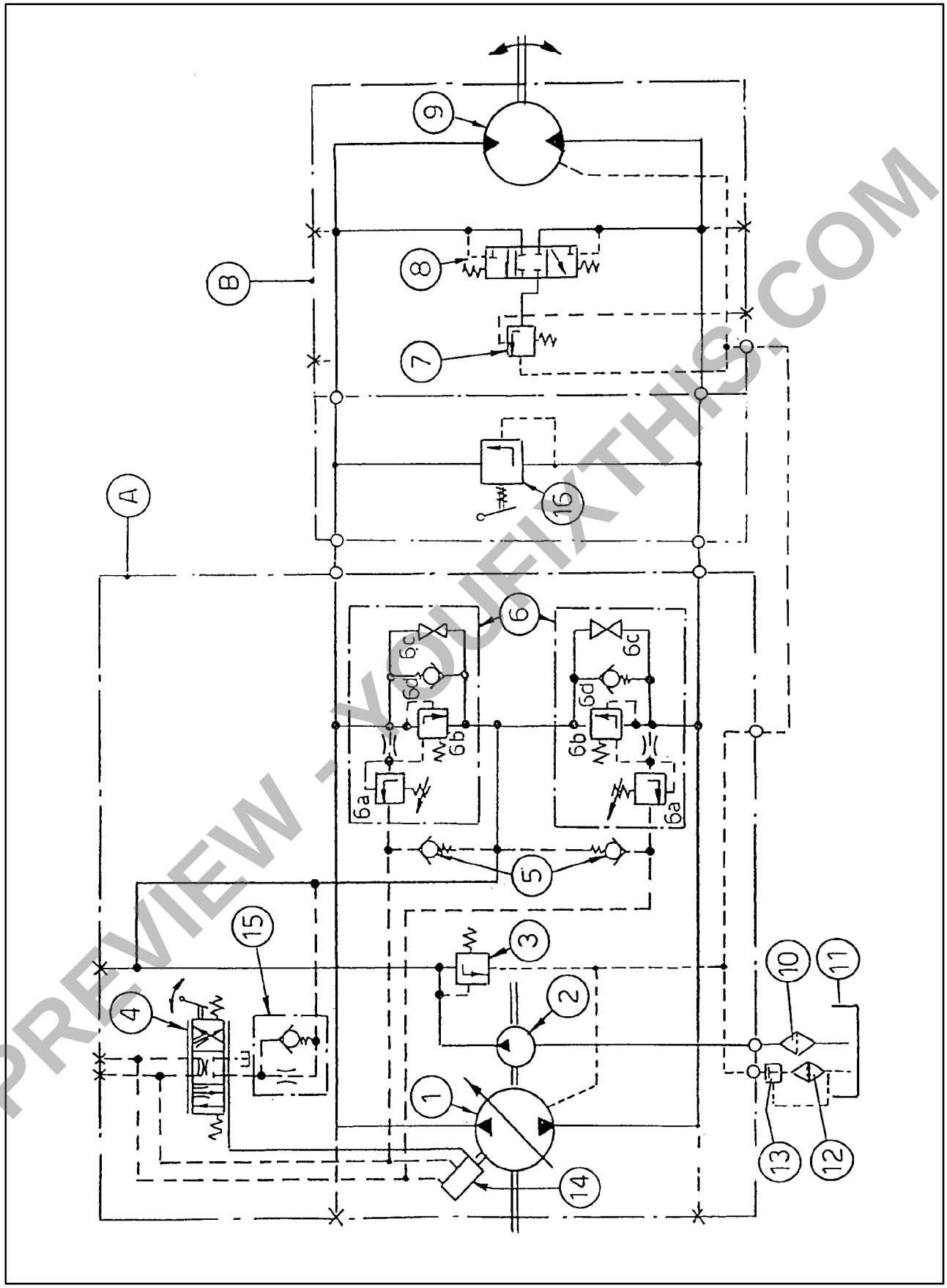
STARTER CIRCUIT (AL)
AL59 9262 > .....



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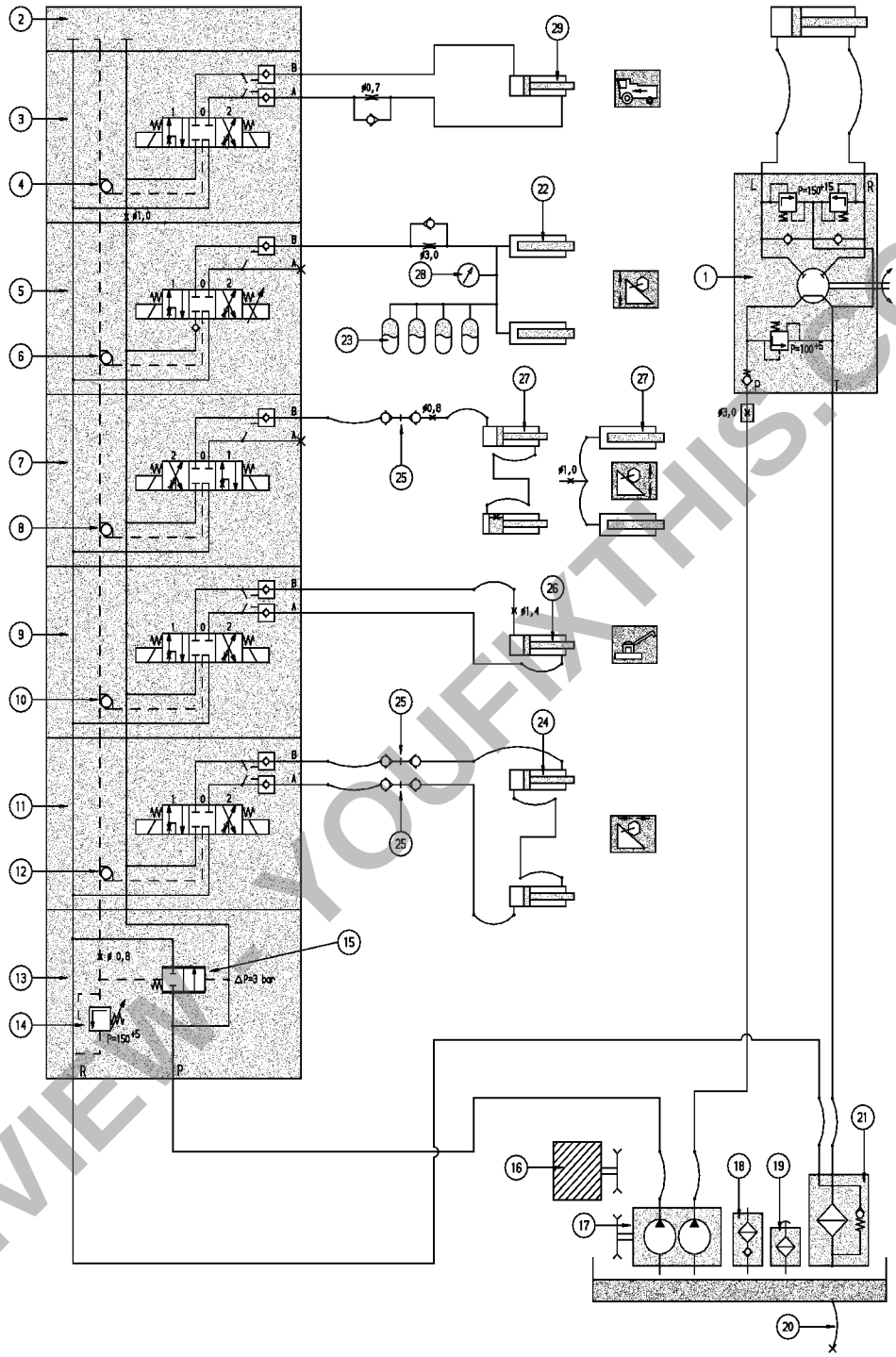
HYDROSTATIC SYSTEM DIAGRAM



1

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1

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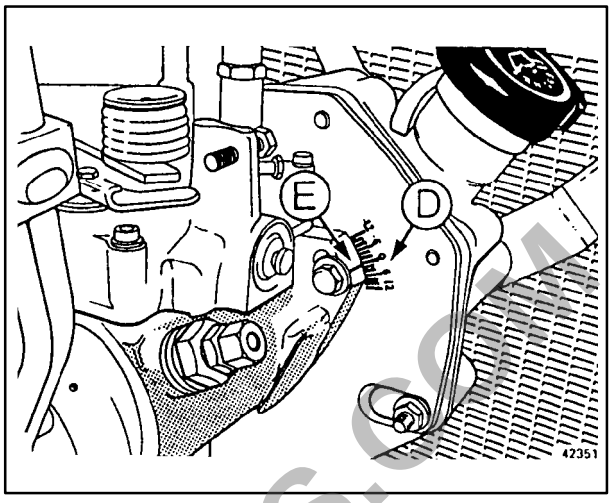
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TIGHTENING TORQUES	Nm
Main bearing bolts	81 + 90°
Connecting rod bolts	149
Cylinder head bolts (with engine cold)	55-95+90°
Cylinder head through rocker shaft bolts	As above +45°
Intake manifold-to-cylinder head	35
Exhaust manifold-to-cylinder head	61
Exhaust pipe-to-flange	31
Flywheel to crankshaft	197
Oil pan drain plug	41
Valve rocker cover bolts	24
Crankshaft pulley to crankshaft	224
Self-locking screw - valve rocker arm	24
Injector fastening bolts	23
Cover bolts (oil drilling protection)	31
Oil pump to block	23
Water pump to cylinder block	35
Water pump cover-to-pump	27
Oil pan to cylinder block	44
Injection line nuts	27
Unload tube pivoting bushing connection bolts	6
Injection pump-to-front cover	24
Camshaft idler drive gear-to-block	237
Front cover-to-cylinder block	24
Thermostat housing bolts	24
Camshaft gear bolt	69
Camshaft rear gear plate bolts	47
Oil filter adaptor bolts	42
Oil filter mounting bolt insert	34
Starting motor-to-rear adaptor plate	31
Injection pump-to-gear nut	92
Oil pressure switch assembly	31
Turbocharger-to-exhaust manifold nut	44
Fan blade to viscous unit	27
Viscous unit to pulley	54
Crankshaft rear oil seal retainer	20
Belt tensioner pulley bolt	54
Temperature sender	20
Tensioner to water pump bolt	54
Tensioner pulley blt	54
Pump connector to block	27

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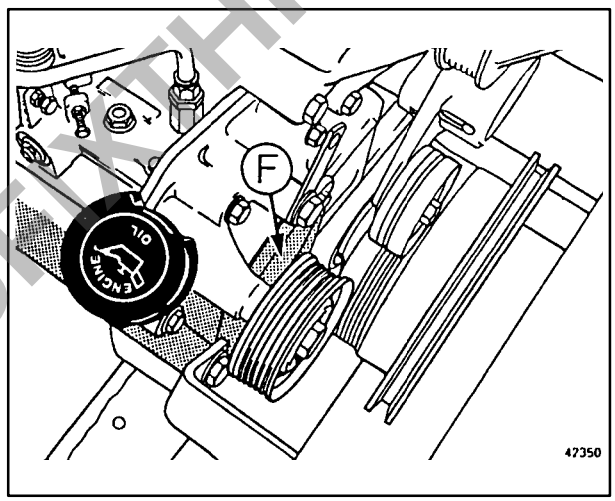
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4. If the pump needs no inner setting, before disassembly note down the pump setting with respect to the notch corresponding to 0 degrees at the end of the engine front plate (D) (fig. 3). Mark the plate with a centering punch, so that it can be directed with the line (E) etched on the pump flange.



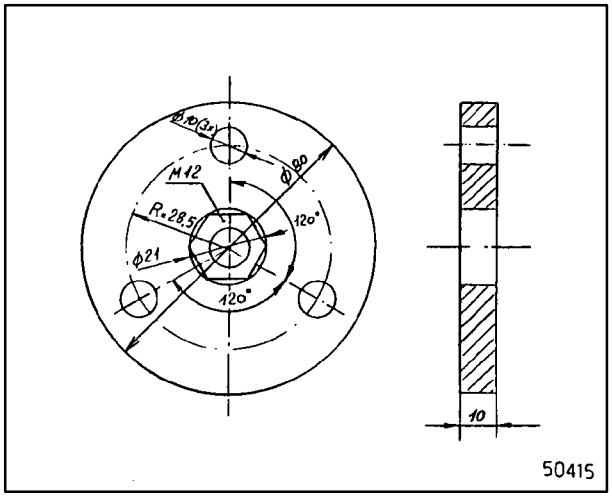
3

5. Remove the engine adjustment guard (F) (fig. 4). Take out the injection pump drive shaft drive gear locking nut.
6. Check that the V-groove of the gear spline is in the upper position.



4

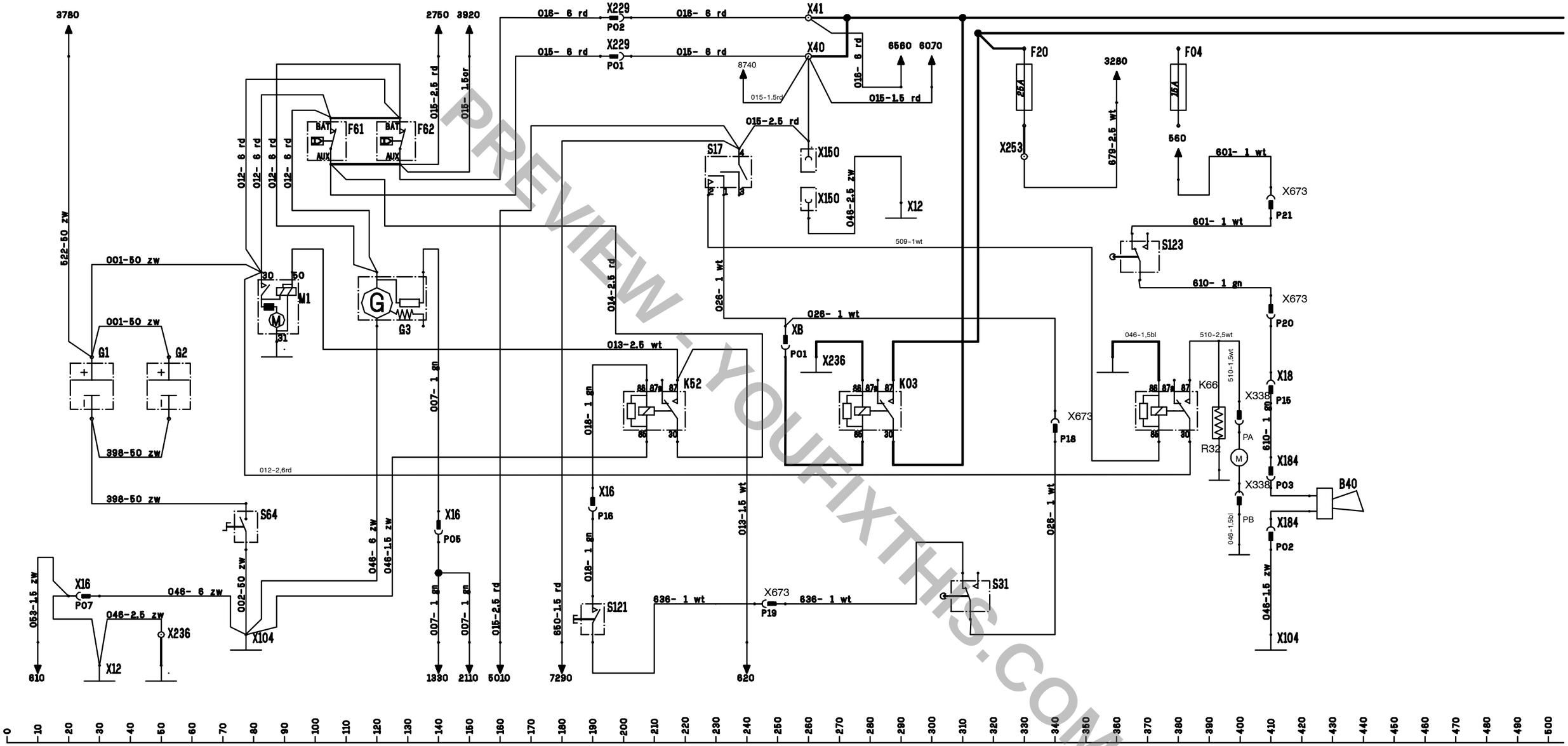
7. Make a puller referring to figure 5. Fasten the puller to the drive train with three screws 5/16" - UNFx2" and an intermediate screw M12x50, then remove the gear from the shaft.
8. Remove the gear from the engine only after removing the engine front guard.



5

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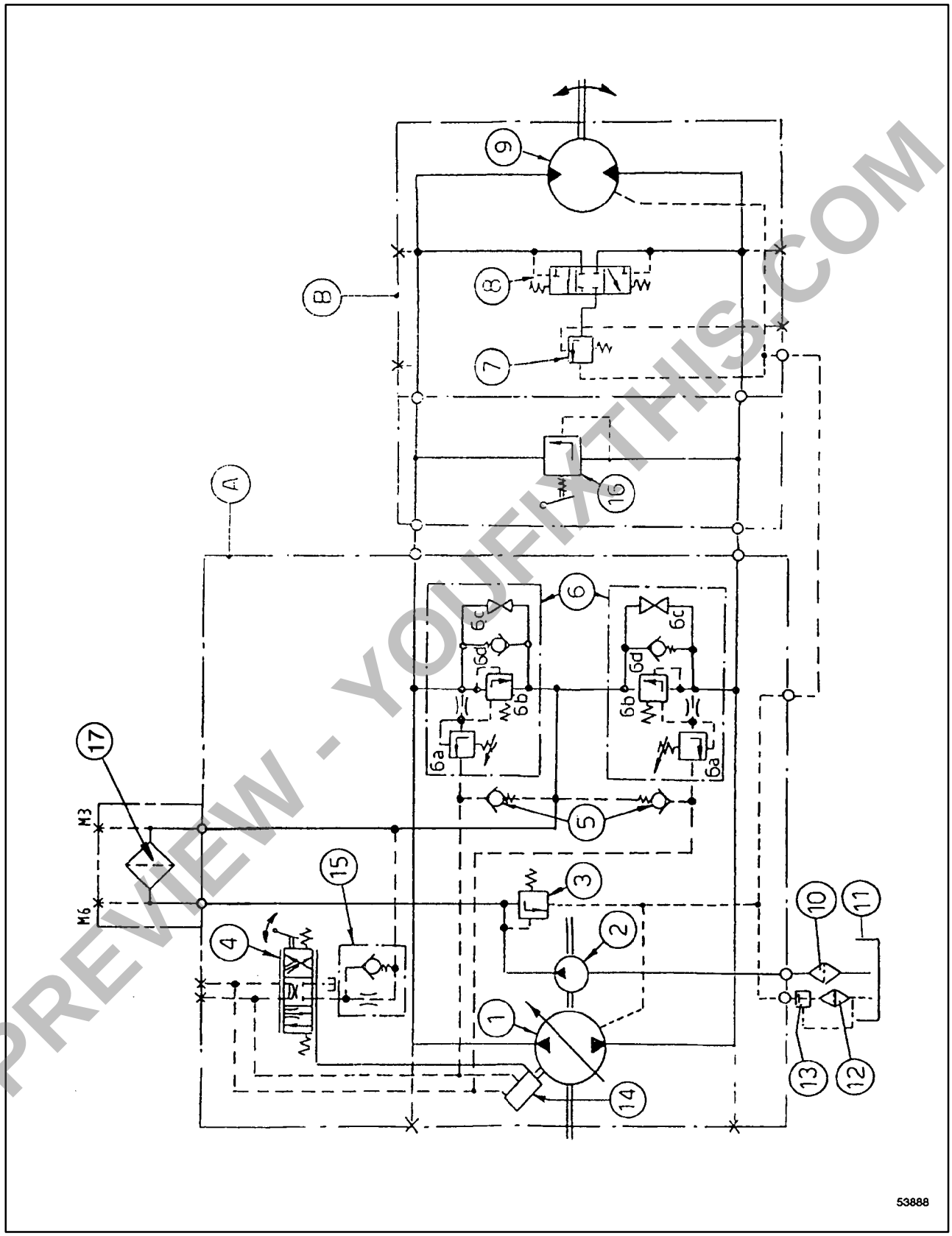
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TC56 9262 > .....



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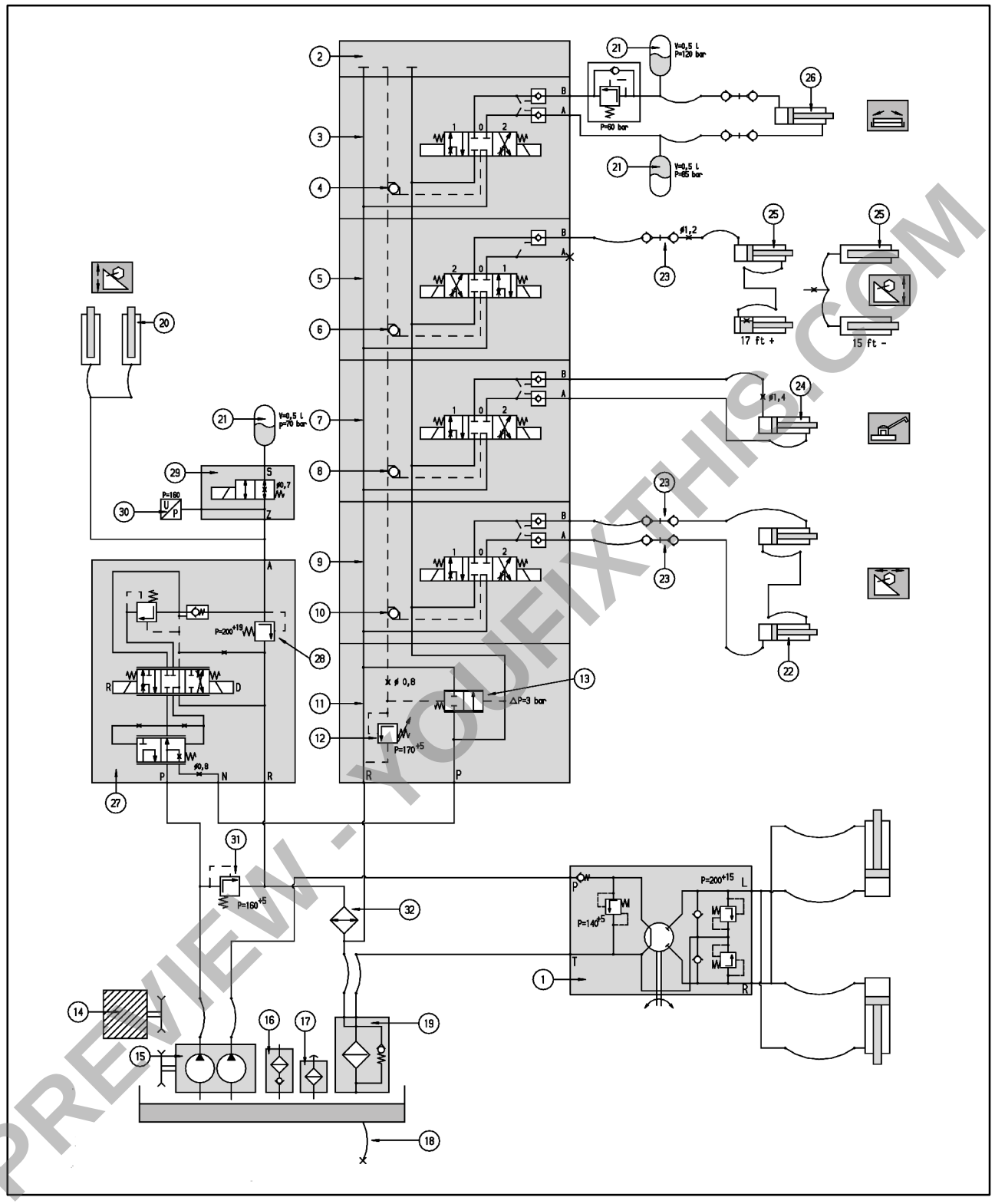
HYDROSTATIC SYSTEM DIAGRAM



1

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2

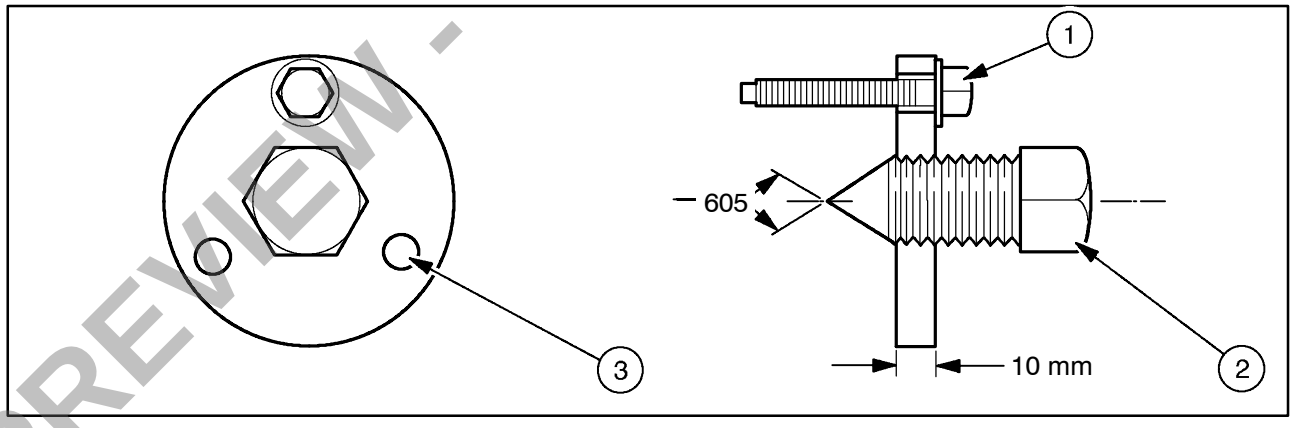
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The following general nut and bolt installation torque requirements (lubricated) apply to any operation not previously listed.

INCH SERIES	Nm
1/4 - 20	11
1/4 - 28	11
5/16 -18	19
5/16 -24	23
3/4 - 16	31
3/4 - 24	45
7/16 -14	65
7/16 -20	75
1/2 - 13	88
1/2 - 20	102
9/16 -18	122
5/6 -18	187
CYLINDER BLOCK PLUGS	
1/4 - 27 NPT	11
1/4 - 18 NPT	29.8
3/4 - 18 NPT	38
3/4 - 14 NPT	27

SPECIAL TOOLS



11

Fuel Injection Pump Drive Gear Puller
(Local manufacture or Special Tool No. 38 0000 323)

1. Bolt 5/16-UNFx51 mm with integral washer (3 bolts required)
2. Bolt 3/4x16-UNCx251 mm
3. Three holes 9.5-mm dia. on 56.87 mm-dia. equally spaced material of 10 mm plate HRLC P&O Steel

(Prior Tool Numbers, where applicable, shown in brackets)

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9. Take out the fixing screws (G) of the pump (fig. 2). Take out the pump from the engine cover plate. Close all the openings with covers, to prevent any dirt inlet.

Installation

1. Assembly a new pump on the O-ring of the engine front plate, next to the pump fastening flange.
2. Fit the three screws (G) (fig. 2), fastening the injection pump to the engine front plate.
3. If the pump is adjusted inside, looking at the pump from the back, rotate the pump to the right by half a notch with respect to the notch corresponding to zero degrees, at the engine front plate rear end.
4. If the pump is not adjusted inside, align the cut line on the flange of the pump (E) (fig. 3) with the centering punch previously fitted in the engine front plate rear end. Tighten the fastening screws to 27 Nm.
5. Assemble the pump drive gear aligning it with the Woodruff key on the pump drive shaft.
6. Fit the safety washer and the fastening screw of the pump drive shaft and tighten to 79 Nm.
7. Fit a new control guard seal and fasten the control guard (F) (fig. 4) to the engine front plate; tighten the fastening screws to 25 Nm.
8. Fasten the fuel lines to the injection pump and tighten to the torque of 27 Nm.
9. Assemble the fuel line (B) and the stop cock (C) on the injection pump (fig. 2).

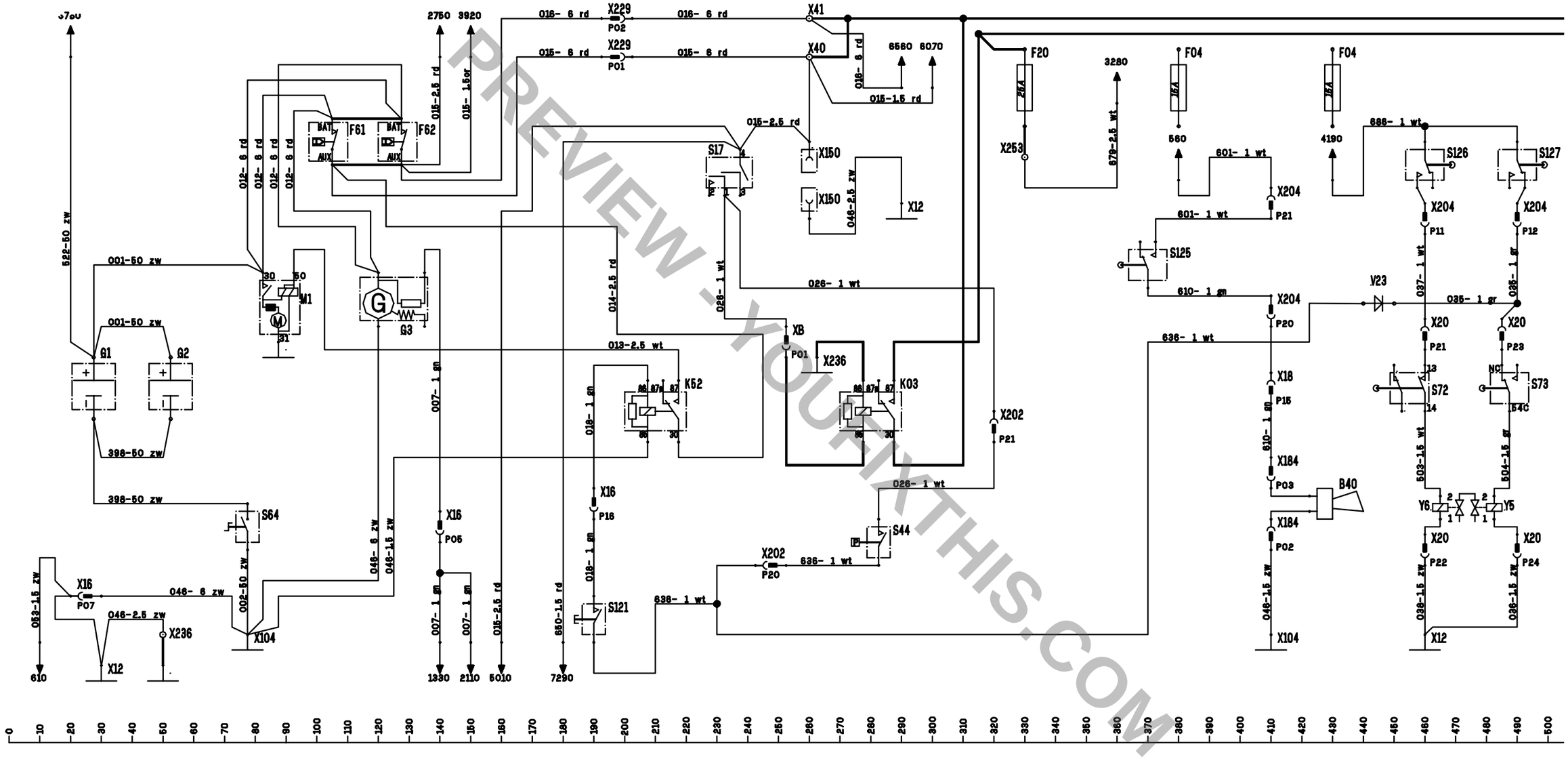
Venting the system

1. Turn the ignition key to ON and press the reset push button.
2. The electric pump supplies fuel to the filter and the main pump.
3. Open a breather next to the filter.
4. After bleeding air, tighten the breather.

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STARTER CIRCUIT (MECHANICAL DRIVE)
TC54 9262 > .....TC56 9262 > .....



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Filter change

OIL FILTER – replace at each oil change.

Proceed as follows:

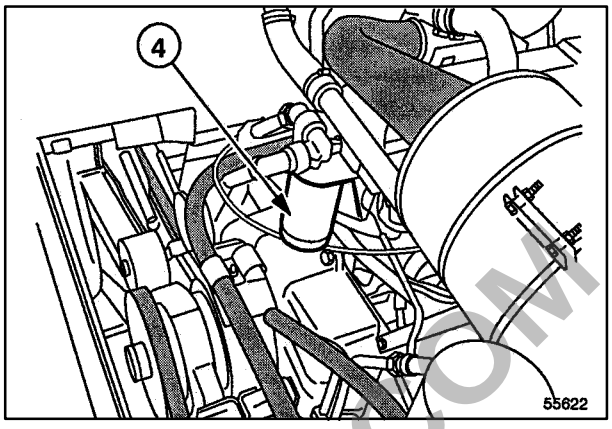
1. disassemble the threaded filter (4) on the machine left side.
2. Full up the new filter with oil and apply a film of oil to the seal ring.
3. Screw on the new filter by hand. DO NOT USE TOOLS for tightening!
4. Refill with clean engine oil. See paragraph "Oil change".
5. Start the engine and search for possible leaks.

FILTER MAINTENANCE – Air bleed system from the engine housing

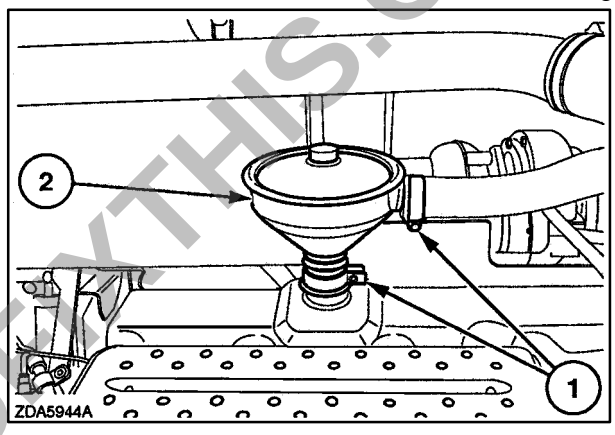
PRE–FILTER
(TC56H)

Clean this filter every 600 operating hours. Clean following the instructions below:

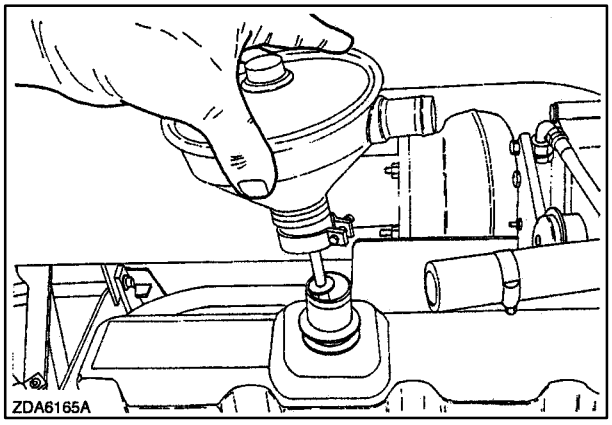
1. loosen the clamps 1 of the hose and remove the filter 2.
2. Wash out the filter with kerosene and dry with compressed air. Make sure there are no residues of the washing fluid inside the filter.
3. Install the filter and tighten the hose clamps.



6



7



8

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TABLE OF CONTENTS

GENERAL INFORMATION

Introduction 2
Important information 2
General instruction 3
Shimming 3
Rotating shaft seals 3
O-ring seals 3
Sealing compounds 3
Cotter pins 3
Protecting the electronic/electrical systems during charging or welding . 4
Spare parts 5
Tools 5
Safety regulations 6
Accident prevention 6
Safety rules 6
General guidelines 6
Start-up 8
Hydraulic systems 8
Wheels and Tyres 8
Removal and Re-fitting 8
Units of measure - conversion chart 9
Minimum hardware tightening torques 11
Explanation of machine serial numbers 12
Speed 13

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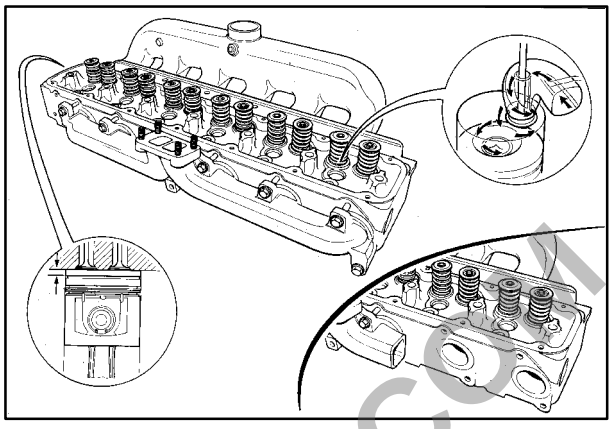
CYLINDER HEAD ASSEMBLY

The cylinder head incorporates an inlet and exhaust valve per cylinder with the valve rocker arm shaft assembly bolted to the cylinder block through the cylinder head. Cylinder head retaining bolts are evenly spaced with a six-point pattern around each cylinder, this ensures an even clamping load across the cylinder head area.

The intake and exhaust manifolds are bolted to the head, the intake manifold is mounted on the right hand side of the engine, with the diesel injectors mounted outside the rocker cover. The exhaust manifold is mounted on the left hand side of the engine. Water outlet connections and thermostats are attached to the front of the cylinder block.

Valve guides are integral in the cylinder head, and valves with oversized stems are available in service. Special replaceable sintered iron valve seats are pressed into each valve port during manufacture and oversized valve seats are also available in service.

All valves are fitted with positive valve rotators and valve stem oil seals. Valve clearance is maintained by adjustment of the self-locking adjusting screw, mounted in each of the rocker arms.



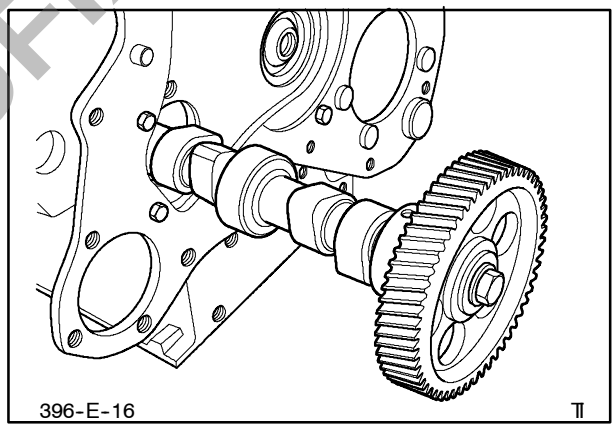
13

CAMSHAFT ASSEMBLY

The camshaft runs in 5 replaceable bearings. The camshaft drive gear is in mesh with and driven by the camshaft idler gear, which is driven by the crankshaft timing gear.

Camshaft end thrust is controlled by a thrust plate bolted to the block, and located between the camshaft gear and the front camshaft journal.

A helical gear is mounted on the rear of the camshaft and drives the engine oil lubrication pump mounted in front of the flywheel.



14

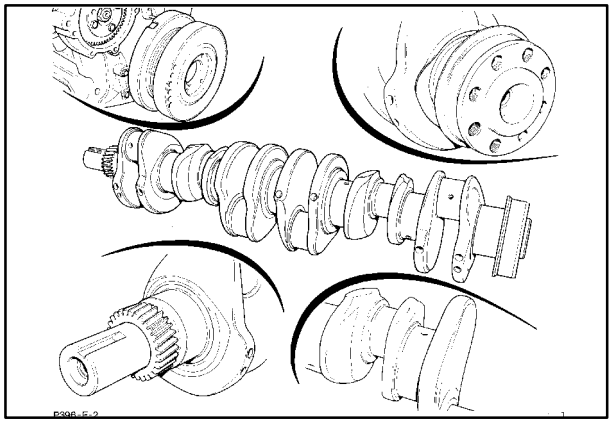
CRANKSHAFT ASSEMBLY

The crankshaft is supported in the cylinder block by 7 main bearings.

The crankshaft is manufactured from steel with machine-finished crank webs.

End thrust is controlled by a thrust bearing incorporated in the centre main bearing of the crankshaft.

An external damper is fitted to the crankshaft pulley to ensure smooth running operation. Front and rear crankshaft oil sealing is effected by cassette type seals that are designed for long and durable service life.



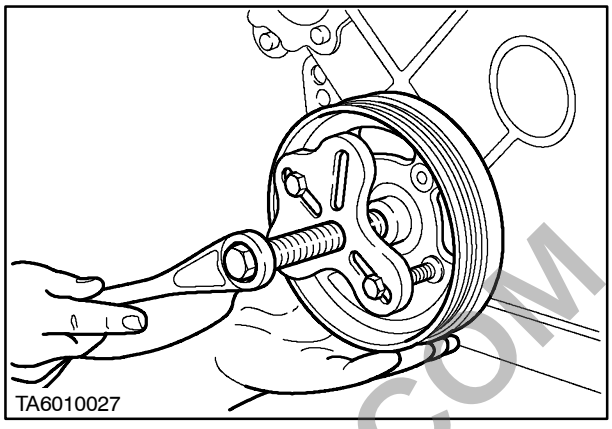
15

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FRONT CRANKSHAFT CASSETTE OIL SEAL REPLACEMENT

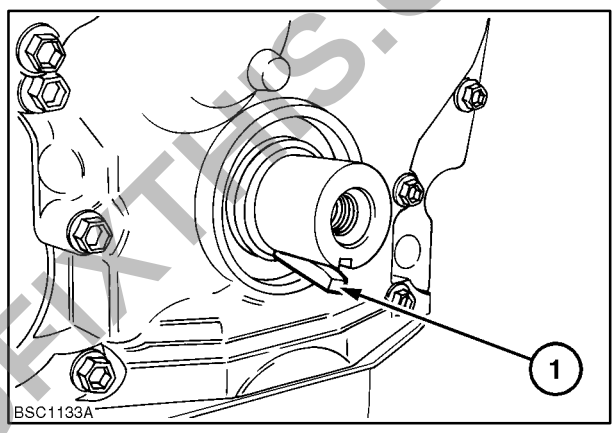
Removal

1. Remove crankshaft pulley using tool no. 38 0000 329 or equivalent equipment.



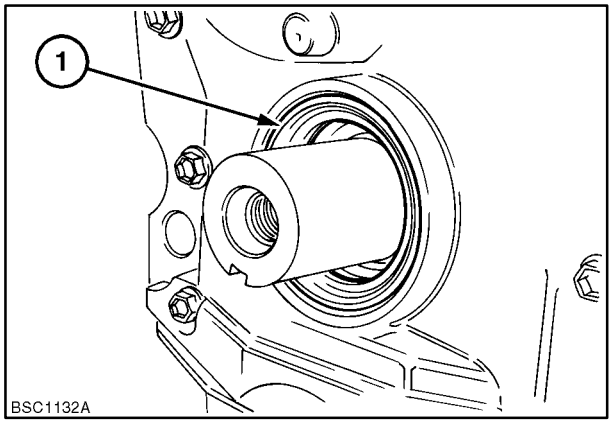
158

2. Remove the fitting key (1).



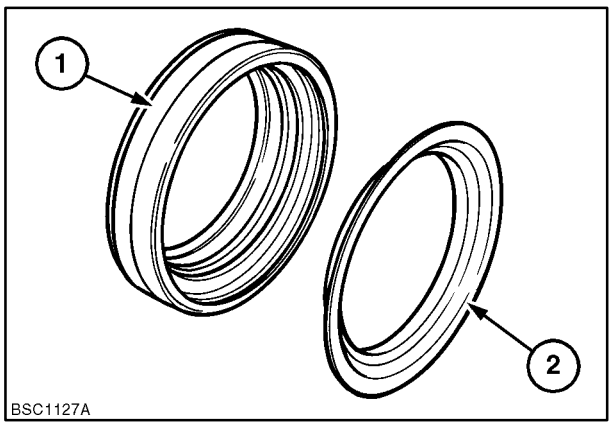
159

3. Remove the shield (1) from the front of the seal to expose the lip of the seal outer casing.



160

The seal (1) must be removed from the guard (2).



161

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REMOVAL

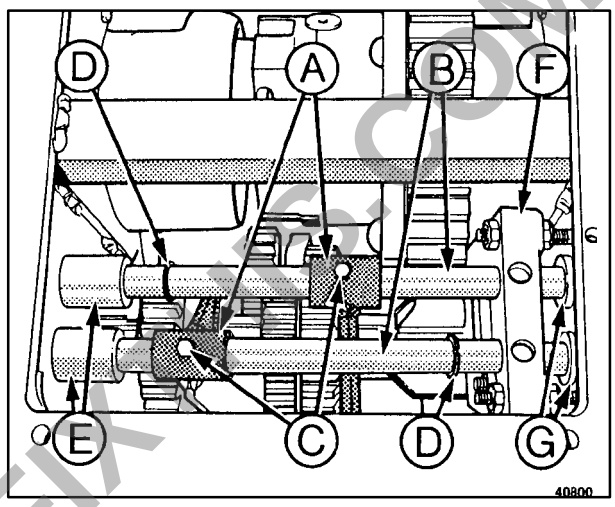
General remarks

1. Remove the clutch and the clutch housing from the gearbox housing.
2. Remove the guard from the gearbox housing.

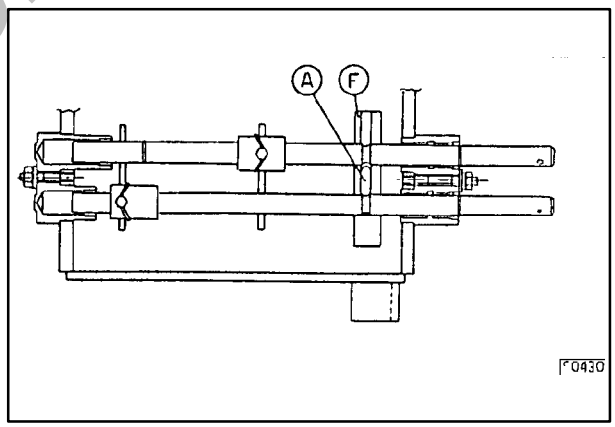
Gearshifting fork (A) and shaft (B) removal

1. Remove the metal wire locking the screws (C) and take the screws out.
2. Press the slip ring (D) to the left.
3. Remove the sleeves (E) on the left side and press the gearshifting shafts (B) to the right, one after the other.

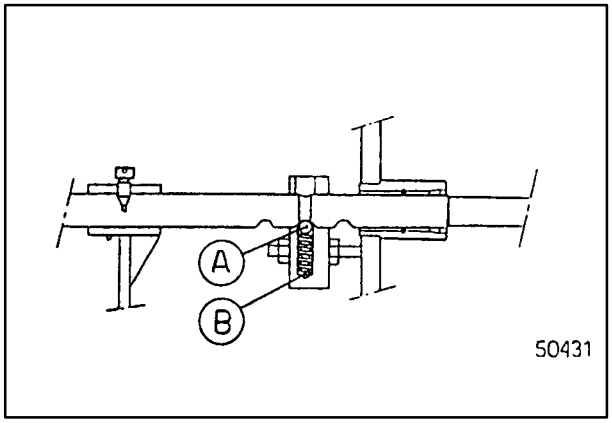
   Pay attention not to lose the balls (A) (fig. 80), the springs (B) and the sliding pin (A) (fig. 79) in the pawl (F).
4. Remove the sleeves (G) on the right side.



78



79

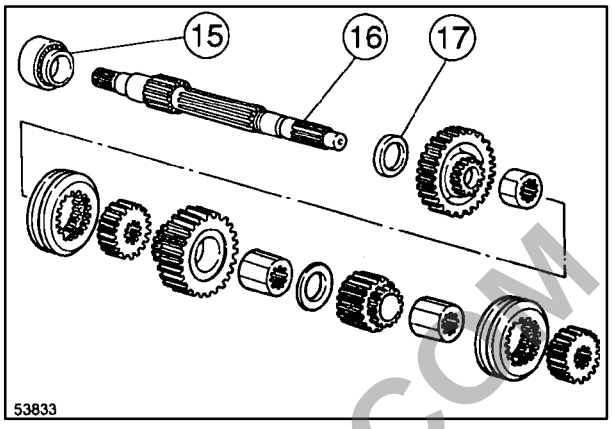


80

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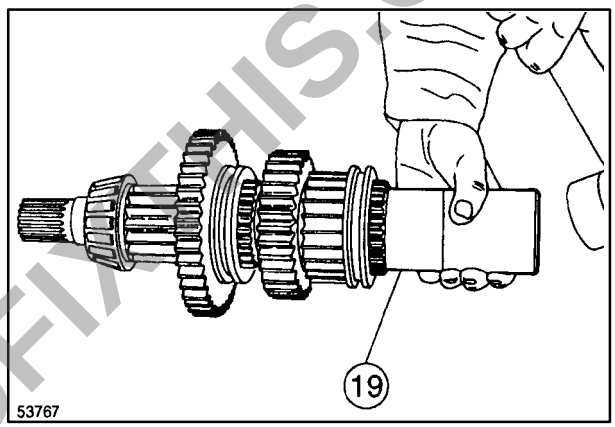
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4. Assemble the sleeve (15) on the shaft (16).
5. Assemble the remaining parts on the intermediate shaft (16), in the sequence shown.
6. A standard shim (17) is supplied, with dimensions 4.4 mm.



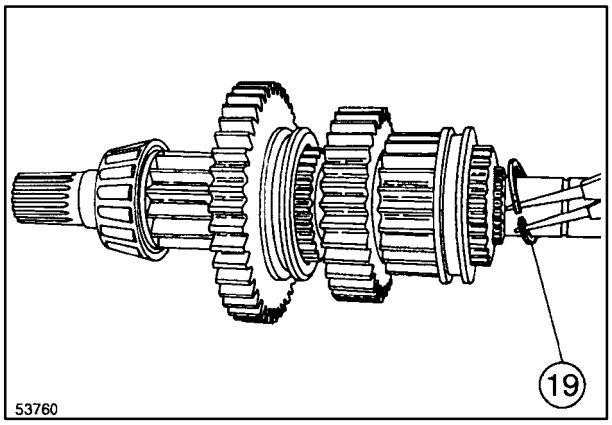
66

7. Balance the clearance with a punch (18).



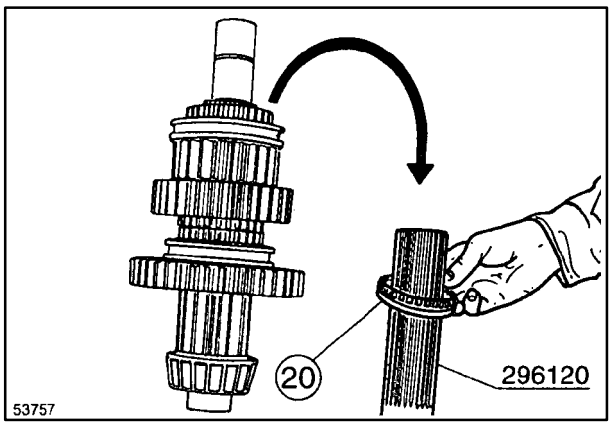
67

8. Fit the snap ring (19) and possibly remove the clearance between snap ring and gears. Otherwise, replace the standard shim (17) with a more suitable one (for the available shims, see page 8).



68

9. Fit the gear on the driving shaft no. 296120.
10. Remove the snap ring (19), rotate the assembly and transfer the gear block from the main shaft to the drive tool, as shown.



69

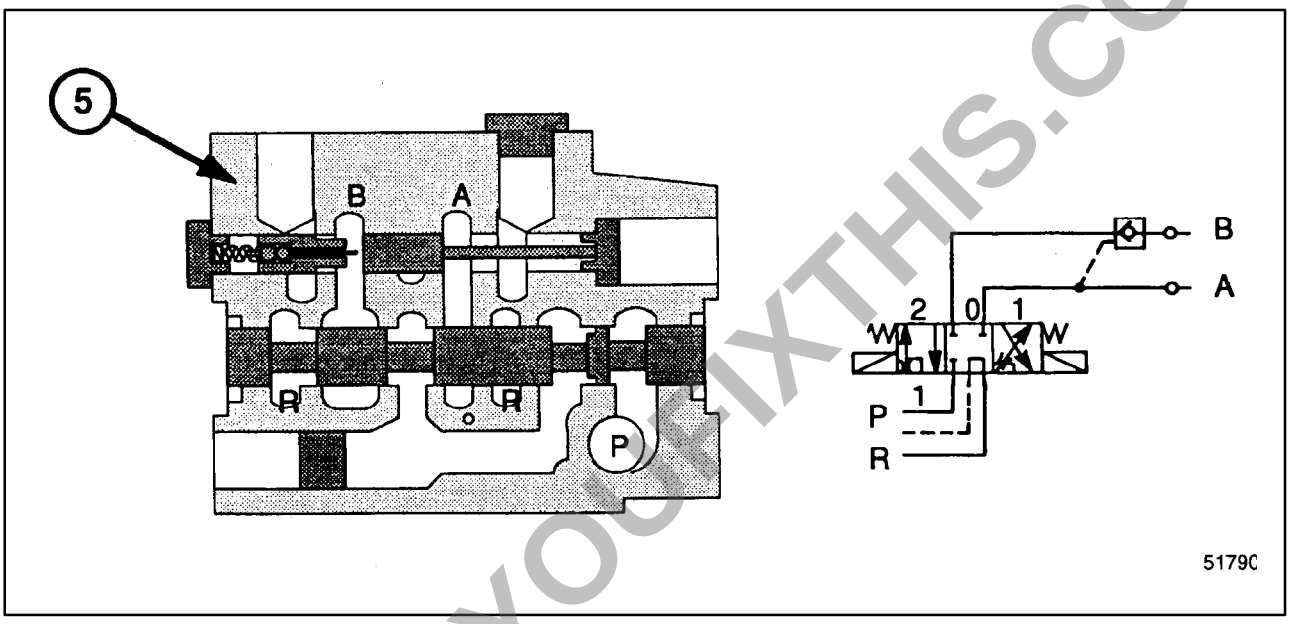
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When all valves are in "0" position:

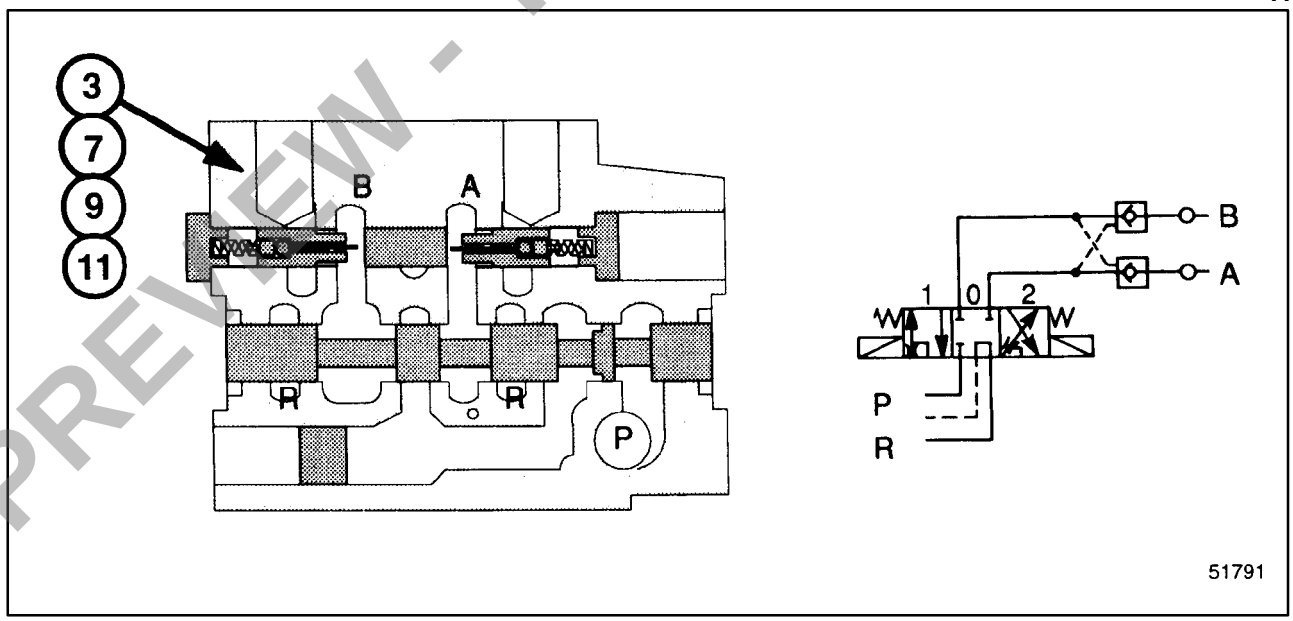
- The valves (3, 5, 7, 9, 11) are closed, that is oil cannot pass through these valves.
- The pilot line (14) operates the adjustment valve (13) connecting the pressure line to the return line, with a pressure difference of 3 bar.

Operation of the valves (3, 5, 7, 9)

- When one (or more than one) pilot spools are enabled, the hydraulic cylinder pressure (pump pressure measured depending on the spool restriction) is over the charge measurement spool in point (14).
- This pressure moves the charge measuring spool (12) with the spring in position "0".
- Pressurized oil does not pass through the opening (R) and flows through the enabled adjustment valve, to the hydraulic cylinders.



41

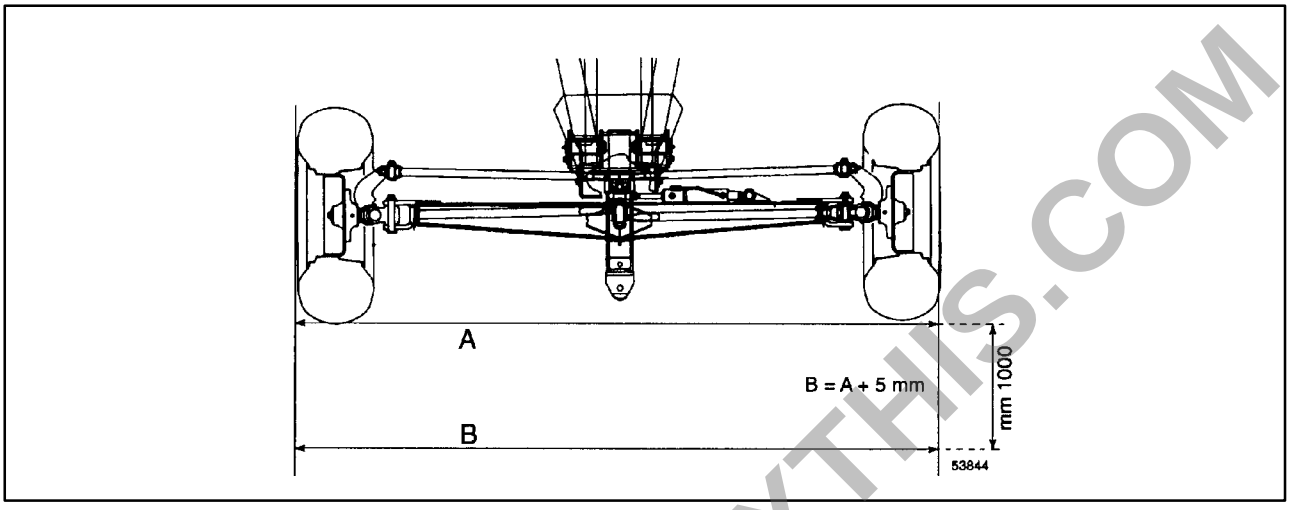


42

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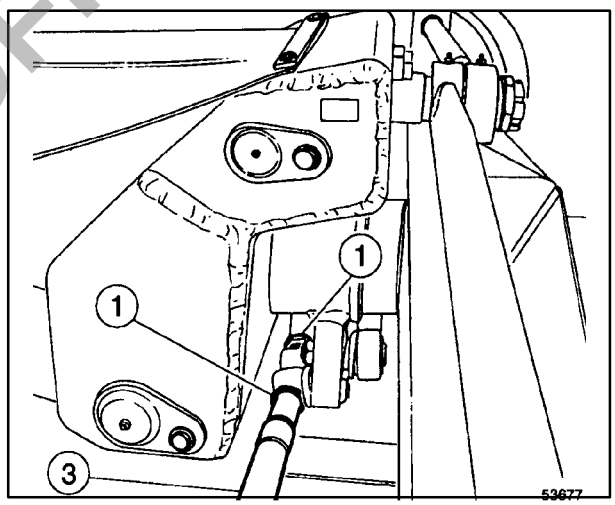
STEERING WHEEL TOE-IN



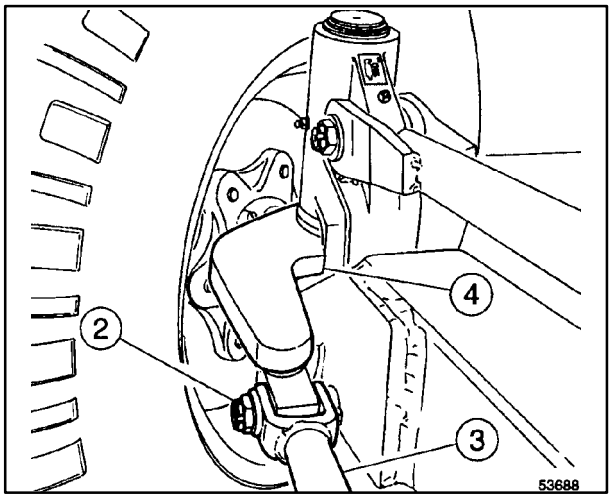
13

Steering wheels should have the right toe-in to avoid tyre early wear and combine swerving while driving. The distance between the front parts of steering wheels must be lower than that between the rear parts.
Toe-in is factory-measured, as shown.
When a high tyre wear is detected, toe-in must be adjusted as follows:

1. Position steering wheels so that they are parallel.
2. Support both swinging links on the sides, next to the wheels, in the middle and parallel to the ground.
3. Loosen the jam nuts (1).
4. Remove the pins (2) so that the swinging links (3) can be tightened or loosened, if required.
5. During fine adjustment, check that the steering angle on the right and left side ends at the corresponding stroke (4).
6. Otherwise, adjust again.
7. Tighten the nuts (1) to the torque of 600 Nm.
8. Tighten the nuts (2) to the torque of 70 Nm.
9. To adjust toe-in correctly, it is always advisable to adjust both swinging links (3) at the same length.



14



15

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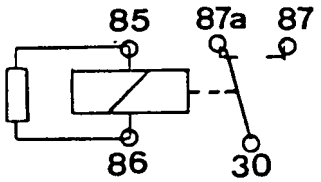
RELAYS

The plug-in relays which MUST be used are the ones fitted with a suppressor built inside the relay, parallel with the coil.

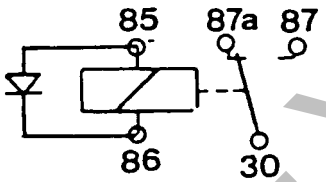
REMARK:
NEVER use relays with a diode parallel with the coil or without a suppressor.

The relays can be recognized by the drawing on the relay housing.

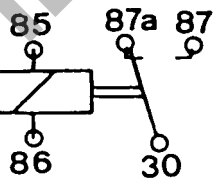
USE



DO NOT USE



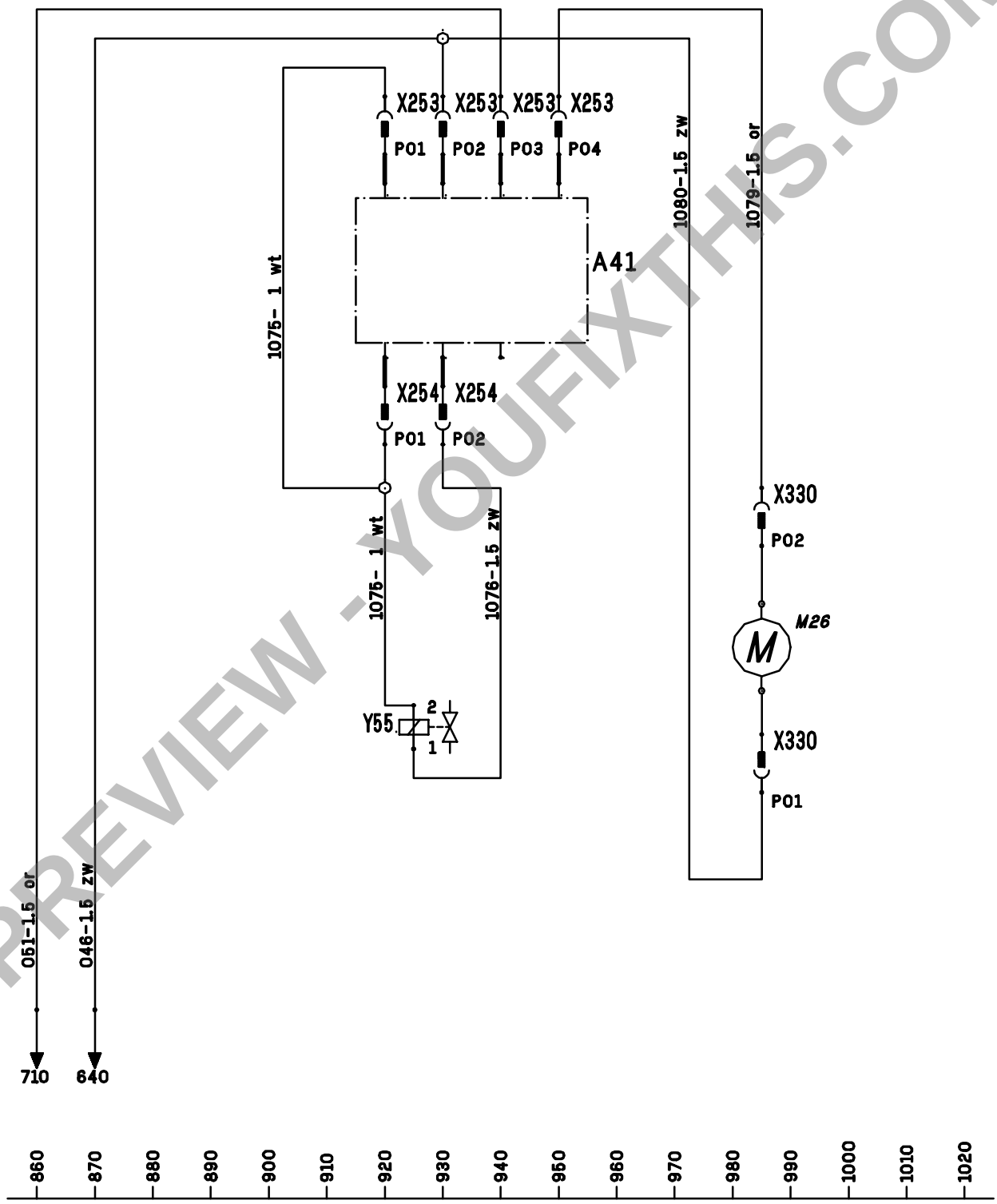
DO NOT USE



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BLOW-OFF SYSTEM
TC56 9262 > ..... AL59 9262 > .....



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23 MACHINE LEVELLING SYSTEM
AL59 9262 > .....

Code	Description	Line
A41.	Printed circuit - Machine levelling system	8240
S105.	Machine transverse levelling override	8380
S106.	End of stroke, right-hand side up (machine levelling)	8400
S107.	End of stroke, left-hand side up (machine levelling)	8370
S108.	End of stroke, rear down (machine levelling)	8370
S109.	End of stroke, rear up (machine levelling)	8400
Y51.	Self-levelling system, rear down	8430
Y52.	Self-levelling system, rear up	8460
Y53.	Self-levelling system, right up	8430
Y54.	Self-levelling system, left up	8460

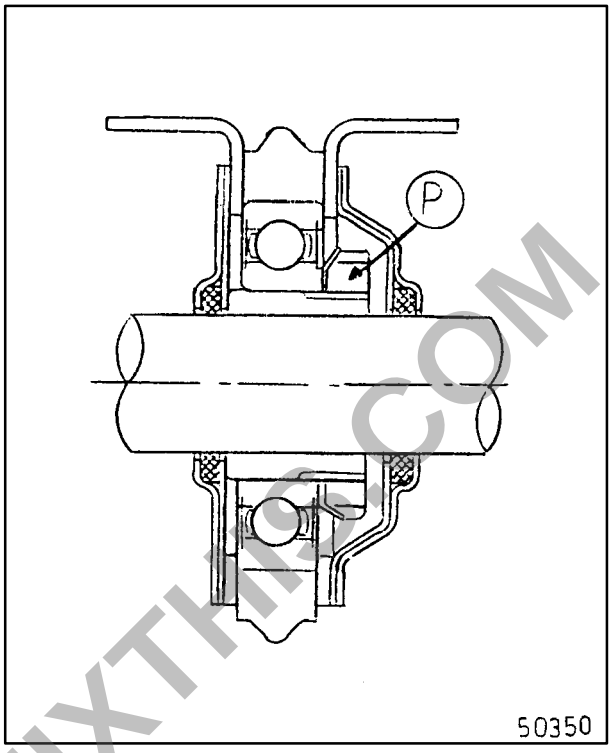
Line: 8160 - 8490

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Straw walker bearings

When one bearing must be replaced, all the felt gaskets must be make water-tight with engine oil.

Tighten the nut (P) (fig. 9) to the torque of 105 Nm.



9

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