
TN60A, TN70A, TN75A, TN85A, TN95A REPAIR MANUAL COMPLETE CONTENTS

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The following pages are the collation of the contents pages from each section and chapter of the TNA Series Repair manual. Complete Repair part # 87393899.

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the TNA Series Tractors.

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⚠ WARNING ⚠

All maintenance and repair work described in this manual must be performed exclusively by NEW HOLLAND service technicians in strict accordance with the instructions given and using any specific tools necessary.

⚠ WARNING ⚠

Anyone who performs the operations described herein without strictly following the instructions is personally responsible for resulting injury or damage to property.

⚠ WARNING ⚠

The Manufacturer and all organizations belonging to the Manufacturer's distribution network, including but not restricted to national, regional or local distributors, will accept no responsibility for personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer, including those used for maintenance and/or repair of the product manufactured or marketed by the Manufacturer. In any case, the product manufactured or marketed by the Manufacturer is covered by no guarantee of any kind against personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer.

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GENERAL INSTRUCTIONS

IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by the authorized workshops. All instructions detailed should be carefully observed and special equipment indicated should be used if necessary.

Everyone who carries out service operations described without carefully observing these prescriptions will be directly responsible of deriving damages.

SHIMMING

At each adjustment, select adjusting shims, measure them individually using a micrometer and then sum up recorded values. Do not rely on measuring the whole shimming set, which may be incorrect, or on the rated value indicated for each shim.

ROTATING SHAFT SEALS

To correctly install rotating shaft seals, observe the following instructions:

- Let the seal soak into the same oil as it will seal for at least half an hour before mounting;
- Thoroughly clean the shaft and ensure that the shaft working surface is not damaged;
- Place the sealing lip towards the fluid. In case of a hydrodynamic lip, consider the shaft rotation direction and orient grooves in order that they deviate the fluid towards the inner side of the seal;
- Coat the sealing lip with a thin layer of lubricant (oil rather than grease) and fill the gap between the sealing lip and the dust lip of double lip seals with grease;
- Insert the seal into its seat and press it down using a flat punch. Do not tap the seal with a hammer or a drift;

- Take care to insert the seal perpendicularly to its seat while you are pressing it. Once the seal is settled, ensure that it contacts the thrust element, if required;
- To prevent damaging the sealing lip against the shaft, place a suitable protection during installation.

O RINGS

Lubricate the O rings before inserting them into their seats. This will prevent the O rings from roll over and twisting during mounting, which will jeopardize sealing.

SEALERS

Apply silicone/gasket eliminator over the mating surfaces marked with an X in the figures. Before applying the sealer, prepare the surface as follows:

- remove possible scales using a metal brush;
- thoroughly degrease the surfaces using one of the following cleaning agents: trichlorethylene, diesel fuel or a water and soda solution.

BEARINGS

It is advisable to heat the bearings to 80° to 90°C (176° to 194°F) before mounting them on their shafts and cool them down before inserting them into their seats with external tapping.

SPRING PINS

When mounting split socket spring pins, ensure that the pin notch is oriented in the direction of the effort to stress the pin.

Spiral spring pins should not be oriented during installation.

GENERAL INSTRUCTIONS

PRECAUTIONARY NOTICE

Only authorized workshops should carry out maintenance and repair operations on the tractor, or tractor components. Carefully observe all instructions, safety precautions, and the use of equipment such as special tools, as detailed in this manual. Damage to the tractor, or injury to personnel is the direct responsibility of anyone who fails to observe these precautions.

EQUIPMENT NOTICE

The equipment proposed in this manual is:

- Designed and studied expressly for use on New Holland tractors
- Necessary for adequate and reliable repair of the tractor
- Strictly tested for the efficient and long lasting life cycle of the tractor

SPARE PARTS NOTICE

Genuine NEW HOLLAND spare parts guarantee the same quality, safety and life cycle as original components. These parts bear the logo:



GENERAL NOTICES

In this manual, the description 'FRONT', 'REAR', 'RIGHT-HAND' and 'LEFT-HAND' refer to the view seen by the operator while in the operator's seat, looking in the direction in which the tractor normally moves.

Wear limits detailed in this manual, although advised, are not binding.

SECTION 10 - ENGINE

Chapter 1 - Engine (Three-Cylinder)

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SPECIFICATIONS

Engine, technical type:	
- Models TN60A (Naturally Aspirated)	8035.05C.920
- Models TN70A (Turbocharged)	8035.25R.920
- Models TN75A (Turbocharged)	8035.25.920
Cycle	diesel, 4-stroke
Fuel injection	direct
Number of cylinders in line	3
Piston diameter	
- Models TN60A	104 mm (4.0944 in.)
- Models TN70A	104 mm (4.0944 in.)
- Models TN75A	104 mm (4.0944 in.)
Piston stroke	115 mm (4.5275 in.)
Total displacement:	
- Models TN60A	2931 cm ³ (178.8496 in ³)
- Models TN70A	2931 cm ³ (178.8496 in ³)
- Models TN75A	2931 cm ³ (178.8496 in ³)
Compression ratio Model TN60A	17:1 naturally aspirated
Compression ratio for Models TN70A and TN75A	16.5:1 turbocharged
Maximum power:	
- Models TN60A	gross 57 hp (net 55 hp)
- Models TN70A	gross 70 hp (net 67 hp)
- Models TN75A	gross 75 hp (net 72 hp)
Rated speed	2300 rpm
Low idle speed	625 to 675 rpm
High idle speed	2450-2500 rpm
Maximum torque speed for Models TN60A	1400 rpm
Maximum torque speed for Models TN70A	1400 rpm
Maximum torque speed for Models TN75A	1400 rpm
Number of main bearings	4
Sump pan	structural, cast iron

(continued)

OVERHAUL

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ENGINE

Removal

————  **DANGER**  ————

Lift and handle all heavy parts using suitable lifting equipment.

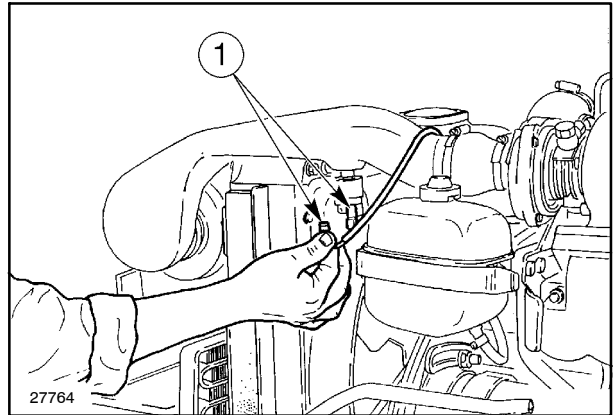
Make sure that assemblies or parts are supported by means of suitable slings and hooks. Make sure that no-one is standing in the vicinity of the load to be lifted.

————  **WARNING**  ————

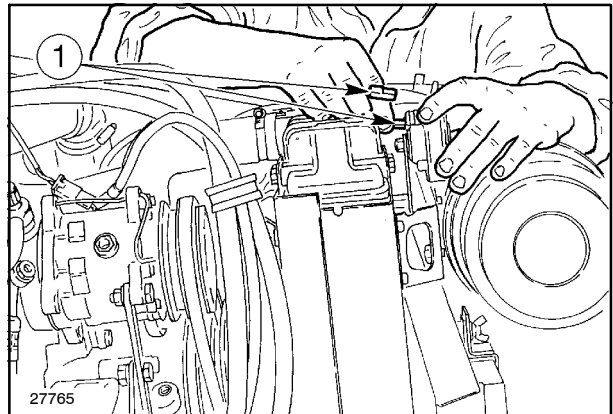
Always use appropriate tools to align fixing holes. NEVER USE YOUR FINGERS OR HANDS.

Proceed as follows.

1. Carry out operation **18 110 10** Clutch Removal (see sect. 18).
2. Remove the clogged air filter sensor connection (1).
3. Disconnect the horn connection (1).

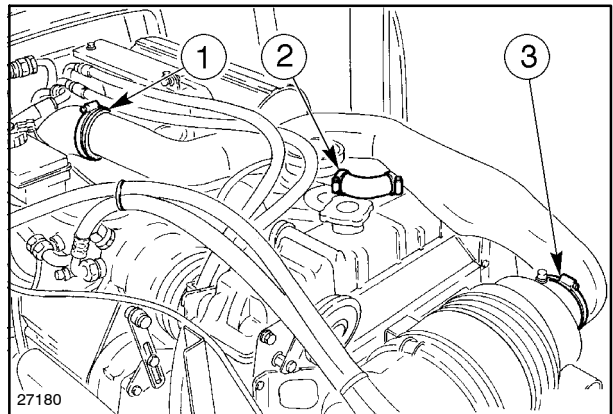


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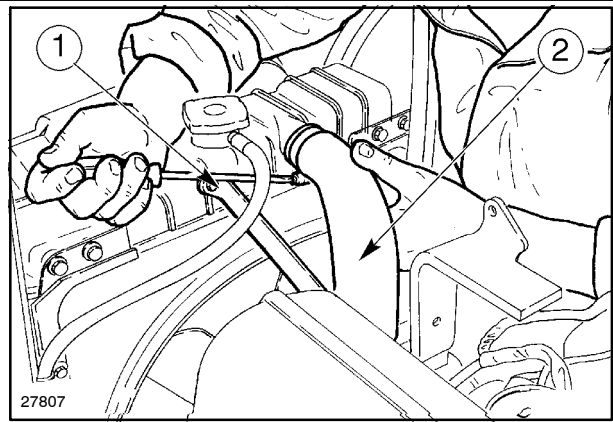
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4. Loosen the clamps (1, 2 and 3) and remove the inlet manifold.

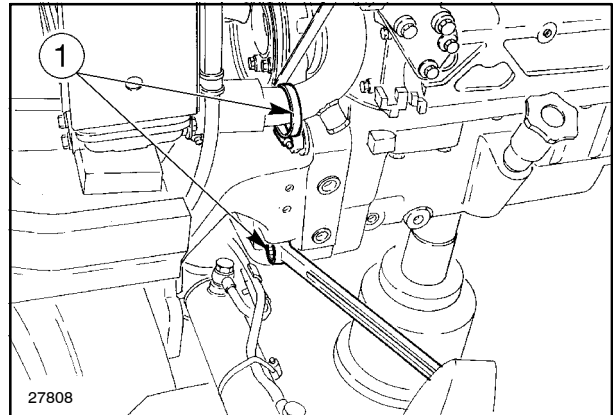


6

5. Unscrew the band clamps and detach the upper (2) and lower radiator hoses, detach the radiator bracket (1).



6. Position two fixed stands under the front axle support and under the engine. Attach the chains so that the engine is balanced during hoisting and position two wood blocks between the support and the front axle, to prevent oscillation.
7. Loosen the front axle support retaining bolts (1).
8. Remove the engine from the axle-support unit.



Installation



WARNING



Always use appropriate tools to align fixing holes. NEVER USE YOUR FINGERS OR HANDS.

Apply the prescribed tightening torques - see the "Contents".

1. Install the front axle-support unit on the engine.
2. Connect and secure the upper and lower radiator hoses and the connecting bracket.
3. Install the inlet manifold.
4. Connect the horn and clogged air filter connections.
5. Carry out operation **18 110 10** Clutch Installation (see Section 18).

Op. 10 001 30**Compression Test**

In case of poor engine performance, in addition to checking the fuel injection system (injection nozzles and injection pump), also test the compression on each cylinder.

 **DANGER** 

Do not use matches, lighters, blow torches or any form of naked flame as a source of light when inspecting the engine due to the presence of inflammable fluids and vapor.

Compression Ratio

The compression ratio is a measure of the quantity of air drawn into the cylinder, and provides an indication of the efficiency of the sealing elements in the cylinder (piston rings and valves).

Uniform compression in all the cylinders ensures that they all perform an equal amount of work, provided that each cylinder is injected with the same quantity of fuel at the right time.

Low compression not only reduces engine performance, it also causes incomplete fuel combustion due to the lack of available combustion air.

The engine therefore gives poor performance with excessive fuel consumption and, consequently, exhaust smoke and restriction of the exhaust passages.

As the compression ratio also varies with the temperature of the engine (cold engines produce lower compression values than hot engines), the compression should only be tested when the engine is at normal operating temperature.

Compression should be tested using the compression test kit **380000303**, as follows:

- 1) Run the engine until it reaches normal operating temperature.
- 2) Switch off the engine.
- 3) Disconnect the lead from the engine stop electromagnet on the injection pump in order to close the valve and block the flow of fuel to the injectors.
- 4) Remove the injector from the cylinder to be tested.
- 5) Turn the engine over a few times with the starter motor in order to expel any carbon residue.

6) Fit the dummy injector tool **380000617** in place of the injector removed previously, interposing the copper sealing washer.

7) Connect the compression test instrument **380000303** and take readings while turning the engine over with the starter motor.

On engines in perfect working order, with the sump oil at approx. 40 °C (104 °F) at sea level (760 mm - 29.92 in. - of mercury) and at an engine speed of 200 to rpm, the compression should be 25 to 27 bar (369 to 398 psi).

8) Test the compression on the other cylinders, repeating steps 4-5-6-7, bearing in mind that:

The minimum permissible compression on a used engine is 21.6 bar (313 psi).

The maximum permissible compression difference between cylinders is 3 bar (43 psi).

Every 100 meters (109.36 yards) above sea level corresponds to a reduction in compression by approx. 1%.

Uniform Compression

Although high compression is important, it is more important for smooth engine running that compression is uniform in all cylinders.

Low compression readings

If extremely low pressure readings are obtained on one cylinder it is advisable to repeat the test.

Before testing this time, pour approx. one spoonful of engine oil into the cylinder through the injector bore.

Turn over the engine a few times to distribute the oil evenly over the cylinder walls, and then repeat the test.

If the second test readings are significantly higher, the problem may be worn piston rings, out-of-round or damaged pistons or cylinders.

If the second test readings are not higher, the problem will be the valves.

On the other hand, if the second test reading shows only a slight improvement, the problem will be due to both the valves and the rings.

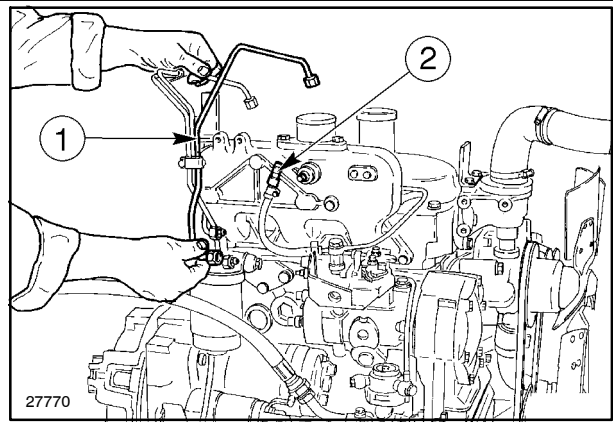
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Disassembly

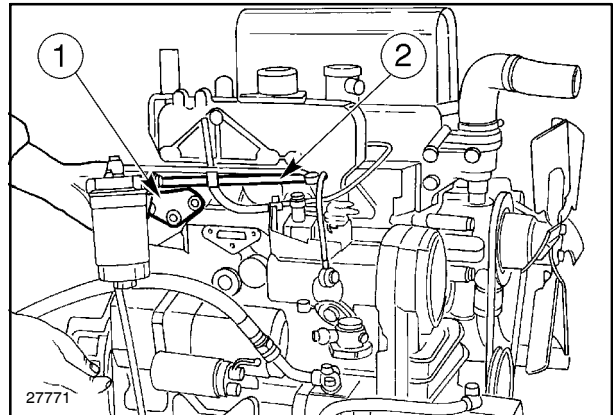
**WARNING**

Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing - safety goggles, gloves and shoes.

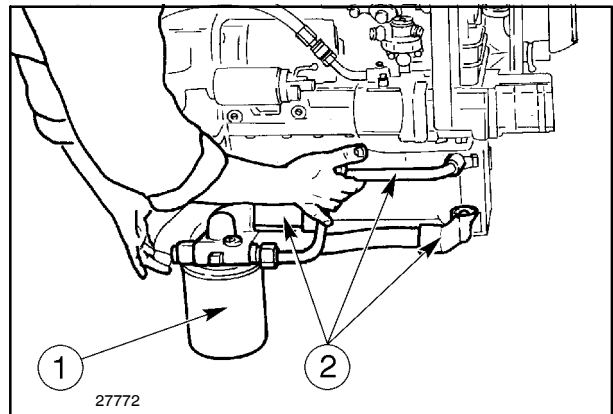
1. Disconnect the thermostarter union (2), the inlet line unions from the injection pump, the injectors, and the piping (1).
2. Disconnect the fuel filter lines (2) to the injection pump and the support retaining bolts (1). Remove the fuel filter.
3. Disconnect the hydraulic piping (2), the oil filter (1) retaining bolts complete with the support and remove the engine.
4. Remove the lift (2) and steering (1) hydraulic pumps and remove the piping (3).



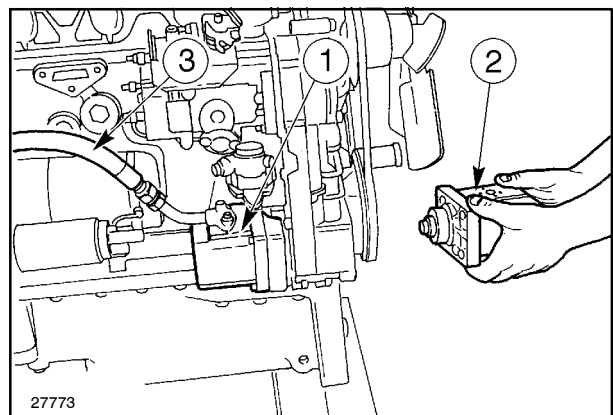
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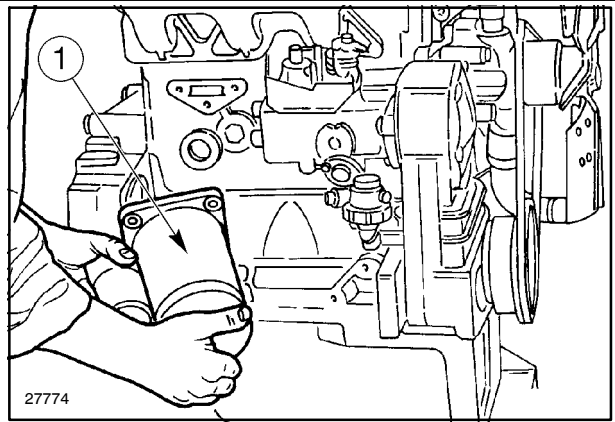


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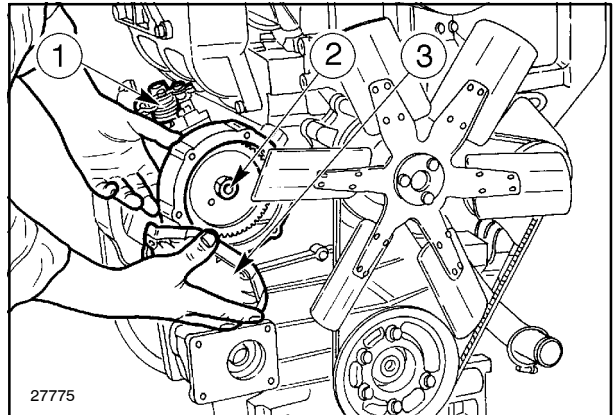
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5. Unscrew the retaining bolts and remove the starter motor (1).



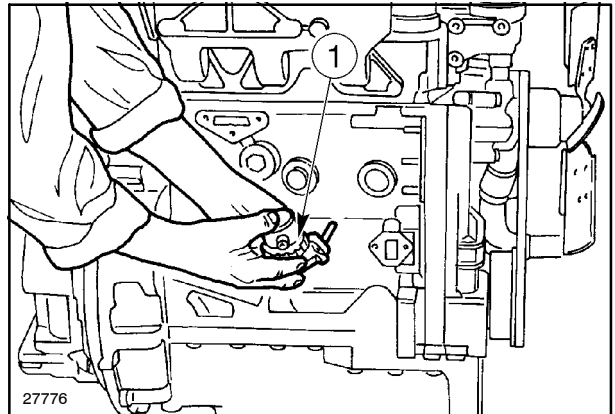
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6. Unscrew the retaining bolts and remove the cover (3), loosen the retaining nut (2) on the injection pump (1) and remove from the opposite side.



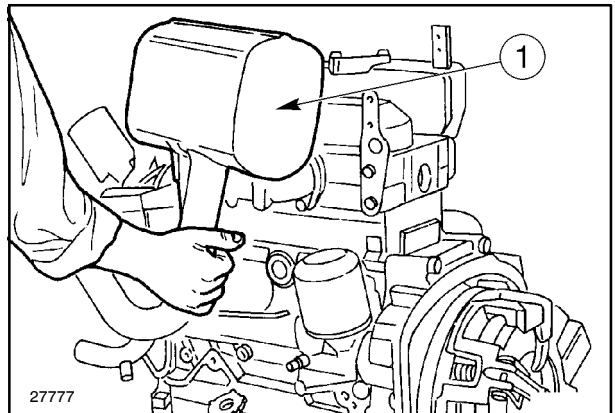
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7. Unscrew the retaining nuts and remove the fuel pump (1).



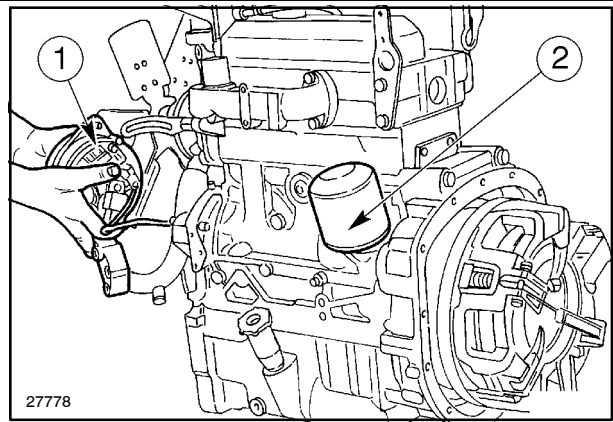
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8. Unscrew the retaining bolts and remove the exhaust silencer (1) complete with the vertical pipe. On models with horizontal exhaust pipes, remove when disassembling the engine.

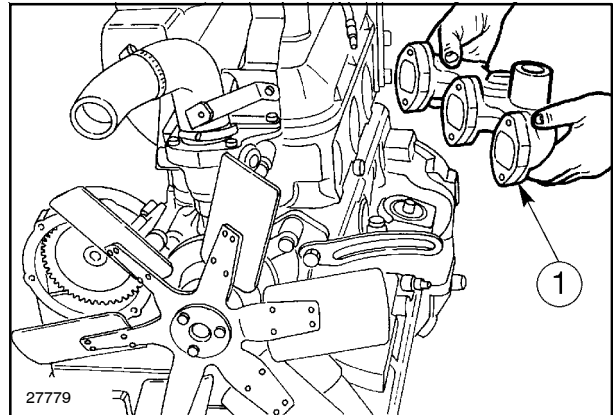


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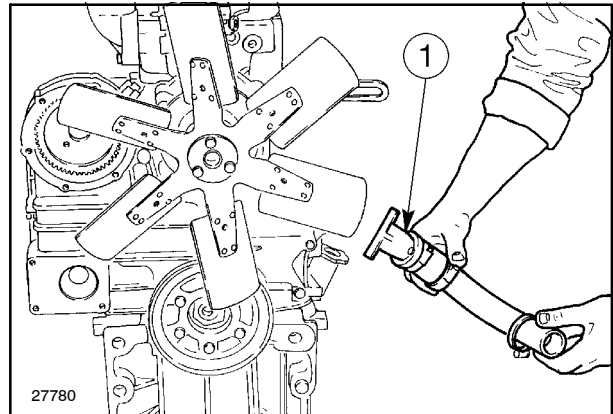
9. Unscrew the retaining bolts, remove the alternator (1) and recover the drive belt.
10. Remove the engine oil filter (2).



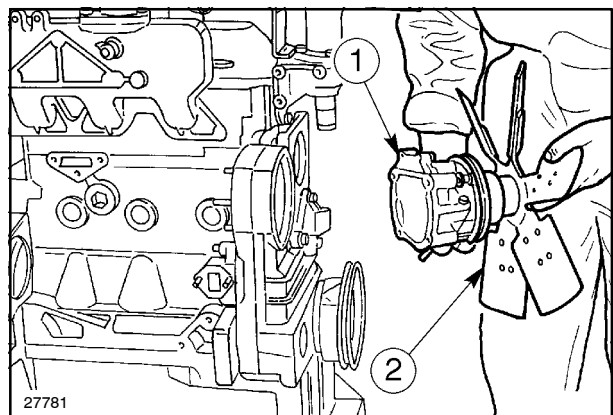
11. Unscrew the retaining bolts and remove the exhaust manifold (1).



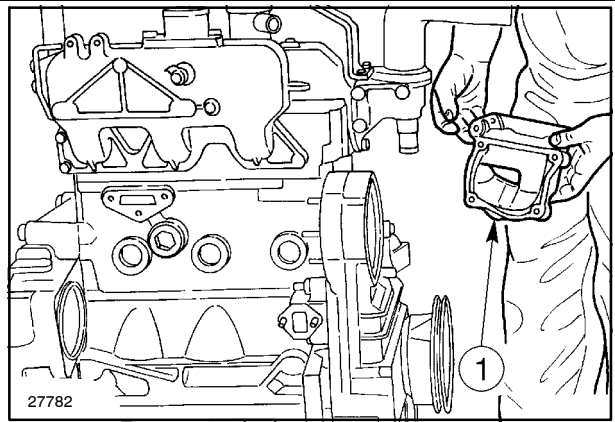
12. Unscrew the retaining bolts and detach the coolant pump hose(1).



13. Unscrew the retaining bolts and detach the coolant pump (1) complete with fan (2).

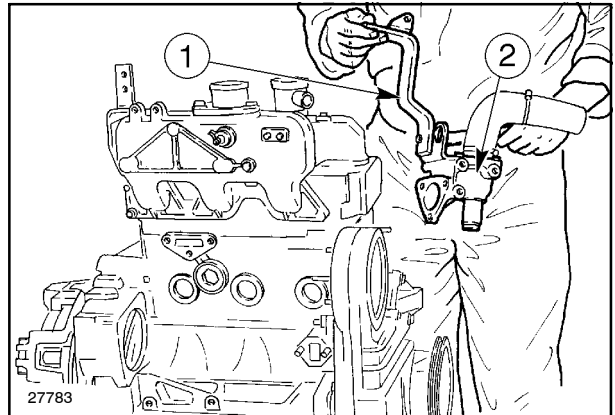


14. Unscrew the retaining bolts and detach the coolant pump support (1).



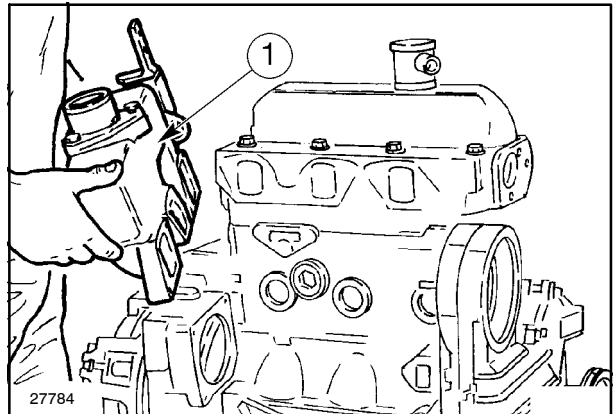
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15. Unscrew the retaining bolts and disconnect the thermostatic valve unit (2) complete with bracket (1).



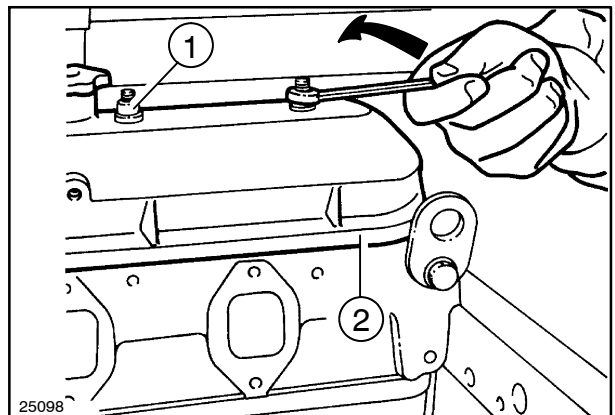
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16. Unscrew the retaining bolts and remove the inlet manifold (1).



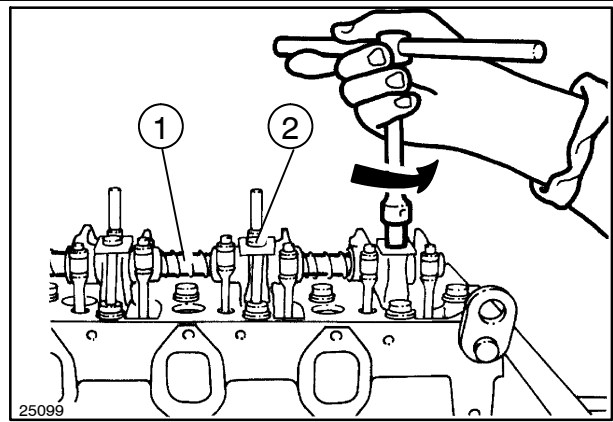
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17. Remove the injector mounting nuts, the underlying spherical washers, then the supports and the injectors themselves.
18. Remove the rocker cover bolts (1), washers and seals, and then the rocker cover (2) and the gasket.



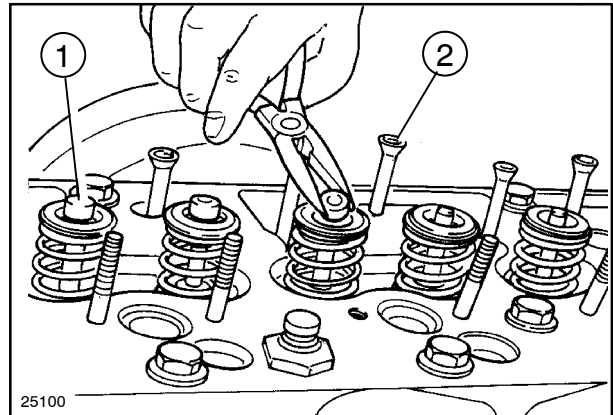
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19. Remove the rocker shaft retaining bolts (2), then remove the entire rocker shaft assembly (1).



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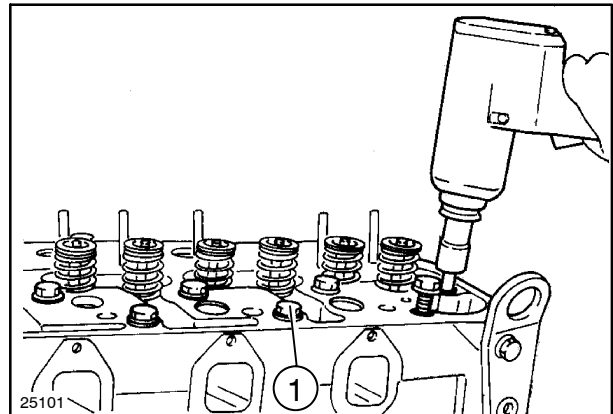
20. Remove the valve collets (1) and extract the pushrods (2).



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21. Unscrew the cylinder head bolts (1) and remove the head using a hoist and lifting hook **380000216**.

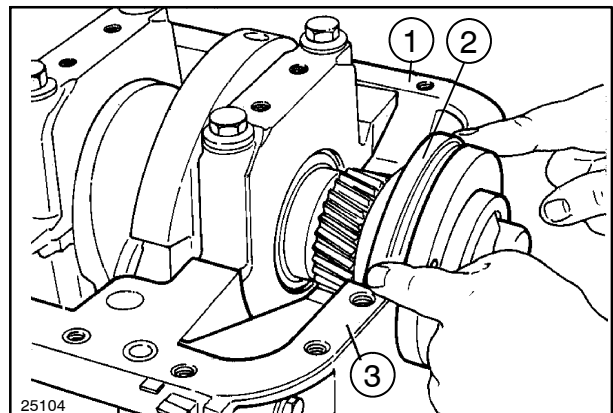
22. Remove the cylinder head gasket.



27

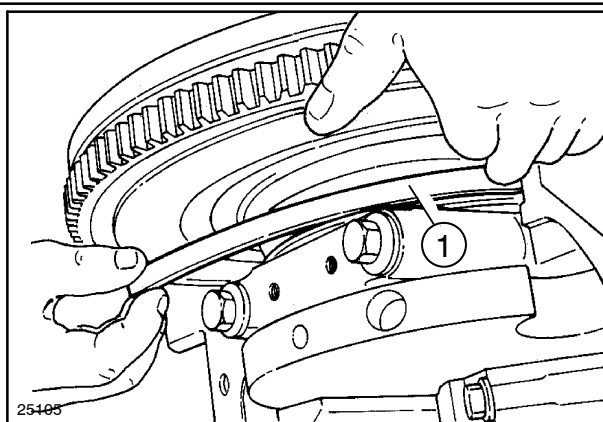
23. Unscrew the sump pan retaining bolts and remove the sump pan using a hoist, lifting hook **380000216** and lifting chain with eyeholes.

24. Remove the half-gaskets (1) and (3) between the crankcase and sump pan and the gasket (2) between the timing gear carrier and sump pan.



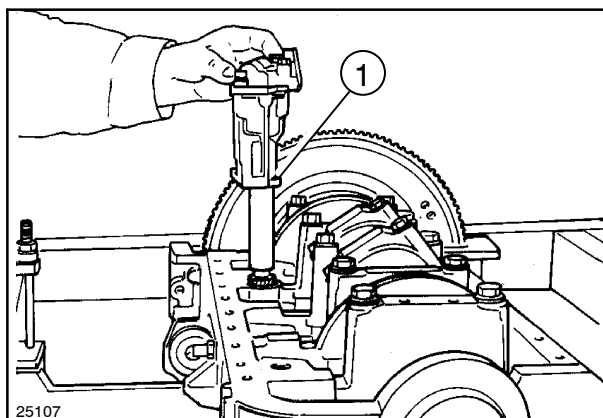
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25. Remove the gasket (1) between the flywheel carrier and the sump pan.



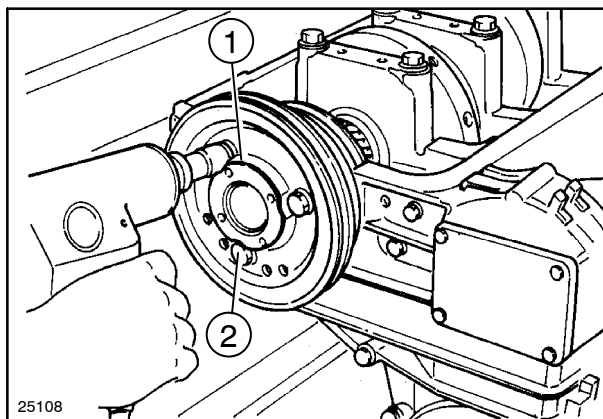
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26. Unscrew retaining bolts (1) and remove the complete oil pump (non-turbo version shown).



30

27. Unscrew the retaining bolts (2) and remove the crankshaft pulley (1).



31



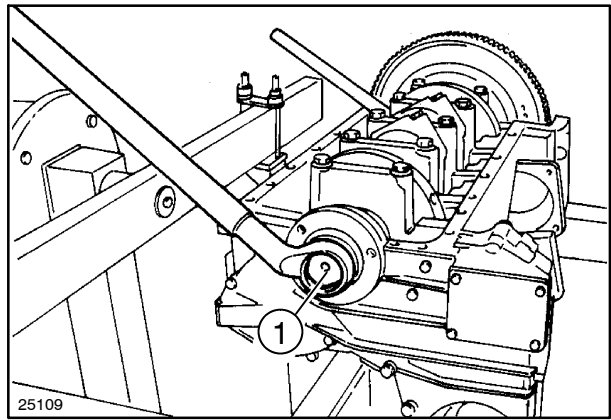
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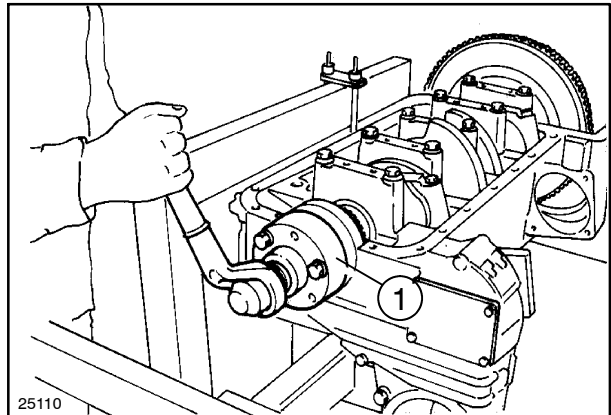
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28. Straighten the lock tab, securing the crankshaft against rotation and unscrew nut (1).



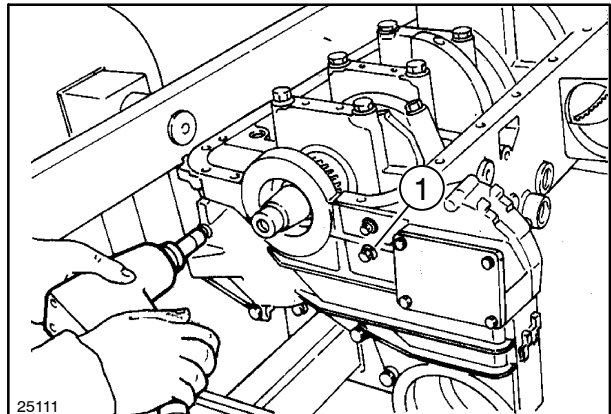
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29. Pull the pulley hub off the crankshaft using tool **380000226** (1) and recover the woodruff key.



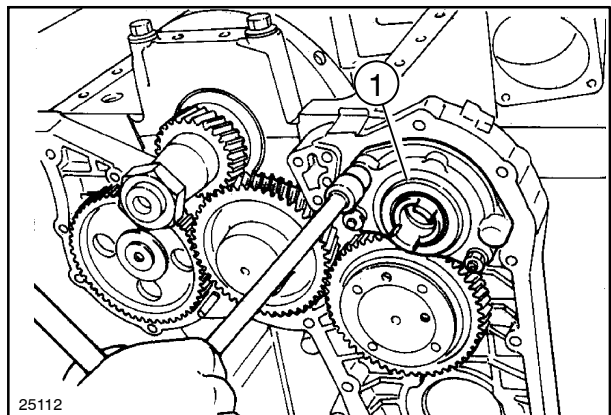
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30. Unscrew the retaining bolt (1) and remove the timing cover and gasket.



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31. Unscrew the retaining bolts and remove the lift pump drive gear carrier (1).



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