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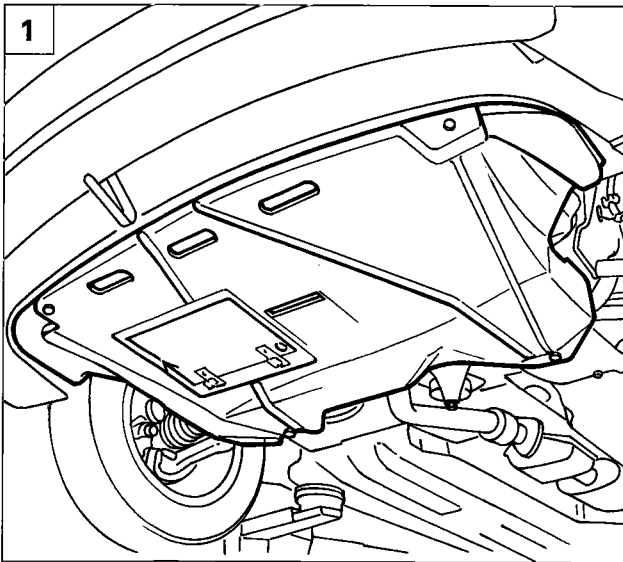
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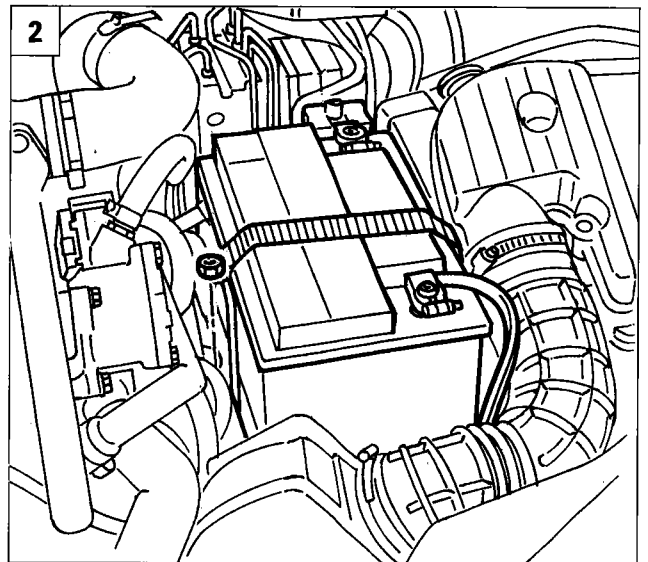
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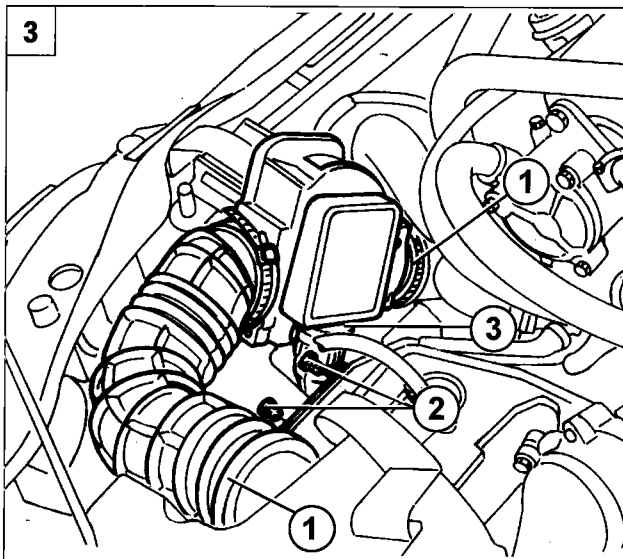
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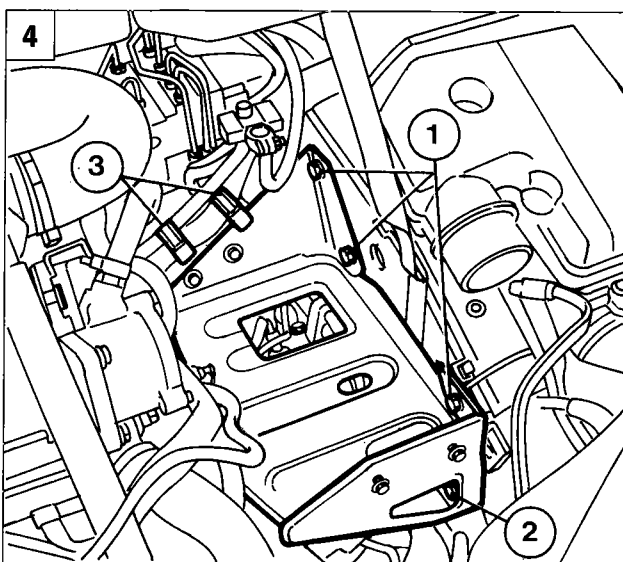


Before removing, make two mount brackets to be used with tool 1860860000 to support the engine during removal - refitting. Follow the instructions given on the first page of Section 21 - 27 "Removing - refitting gearbox" engine 2387 TD.

REMOVING - REFITTING POWER UNIT

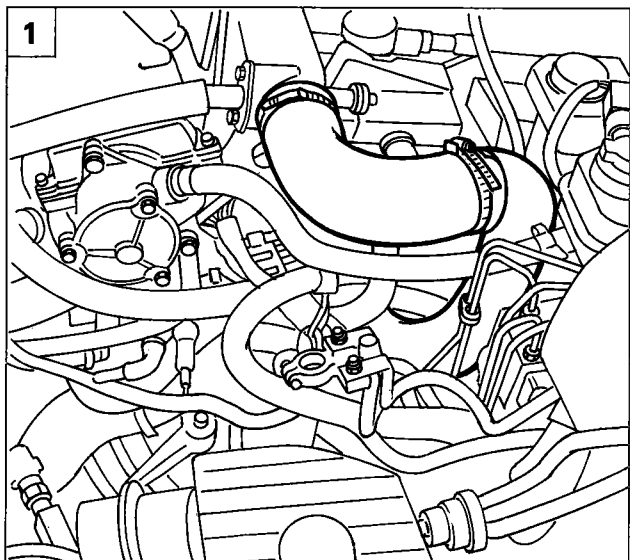
Position the vehicle on a lift, remove the front wheels and disconnect the battery negative terminal. Drain the engine air conditioning system as described in Sect.50 "Auxiliary components" in this manual, then proceed as follows:

1. Raise the lift and remove the lower power unit protection.
2. Disconnect the battery positive terminal, unscrew the nut retaining the battery to its cradle, then remove from the engine bay.
3. Loosen the two clips (1), unscrew retaining bolts (2), disconnect connection (3), then remove the air intake sleeve together with debimeter.
4. Unscrew bolts (1), loosen bolt (2), open clips (3) to release the engine wiring, then remove the battery cradle.

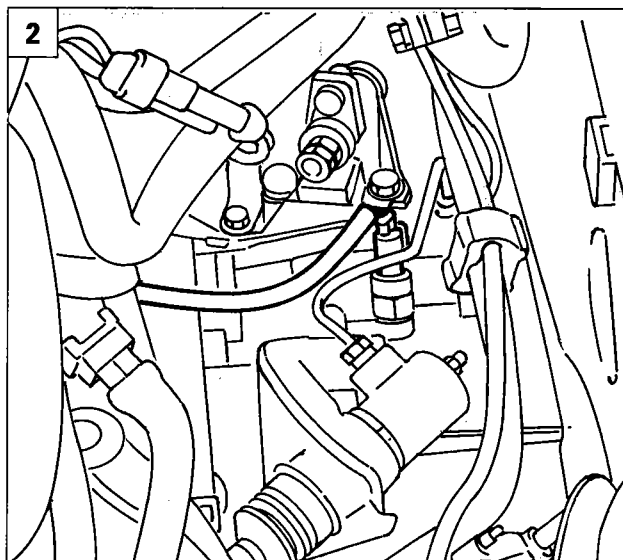


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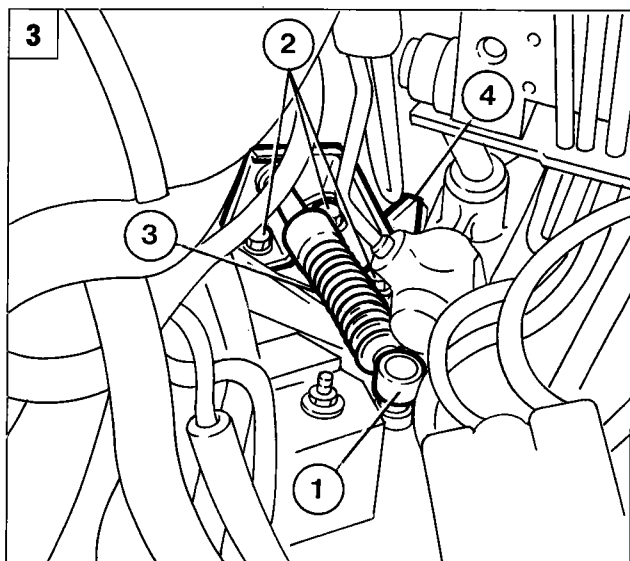
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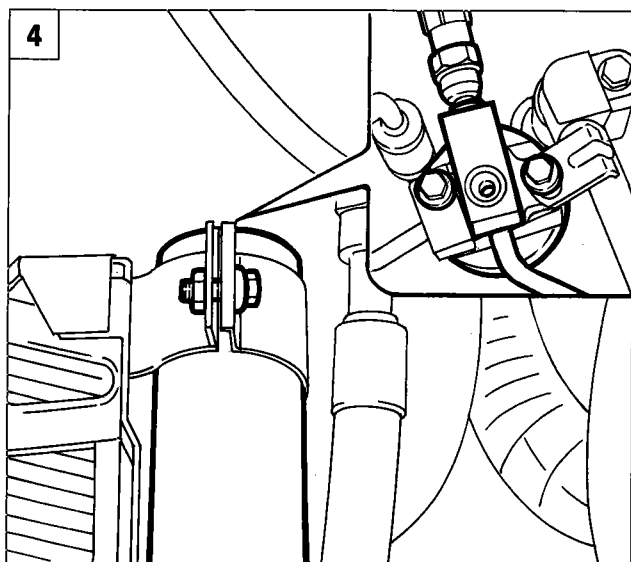
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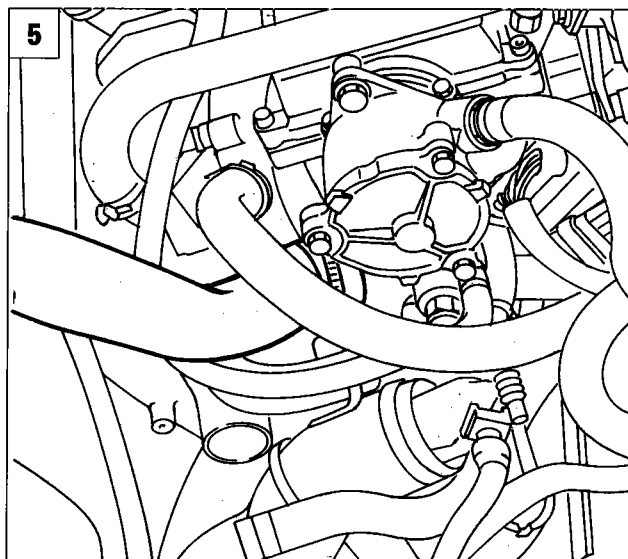
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1. Loosen clips and remove the sleeve as shown.
2. Disconnect the reversing light switch connection.
3. Prise head (1) off the ball joint, unscrew retaining retaining bolts (2), then prise gear selection cable (2) off the gearbox together with the mount bracket (4).
4. Remove the dehydrating filter by undoing the fastenings shown.
5. Position a suitable container to recover the coolant and remove the coolant intake sleeve from the point illustrated.

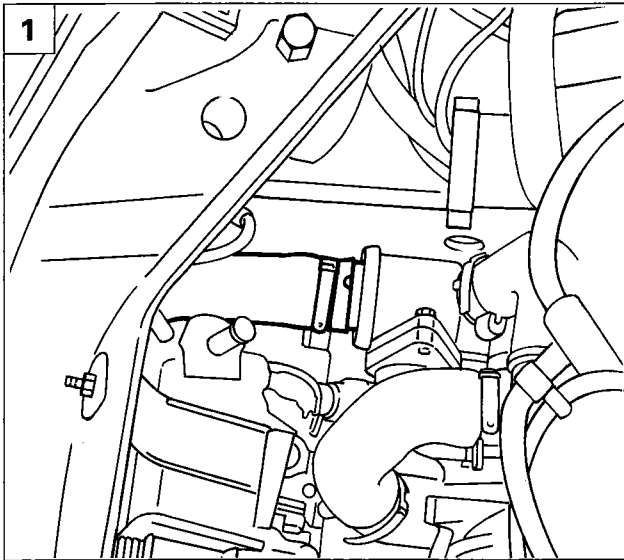


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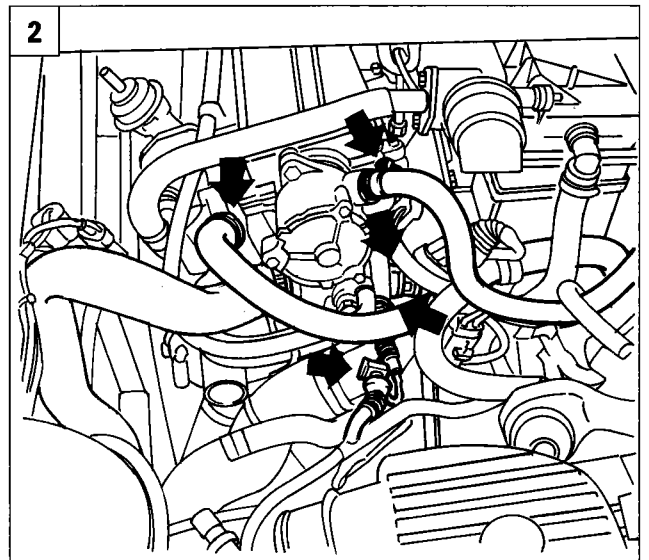


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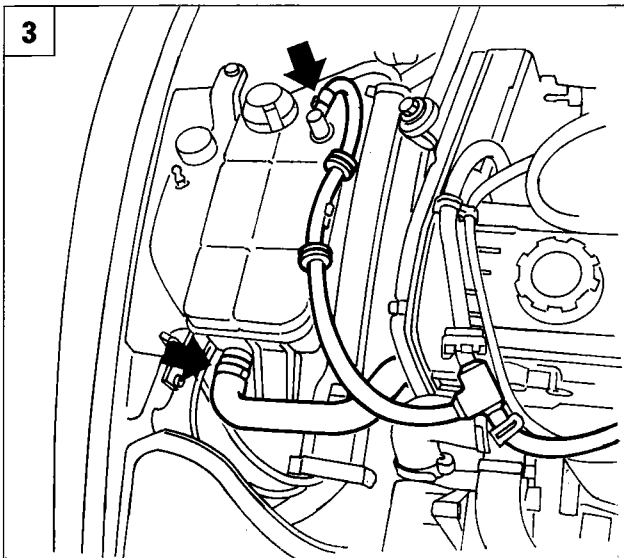
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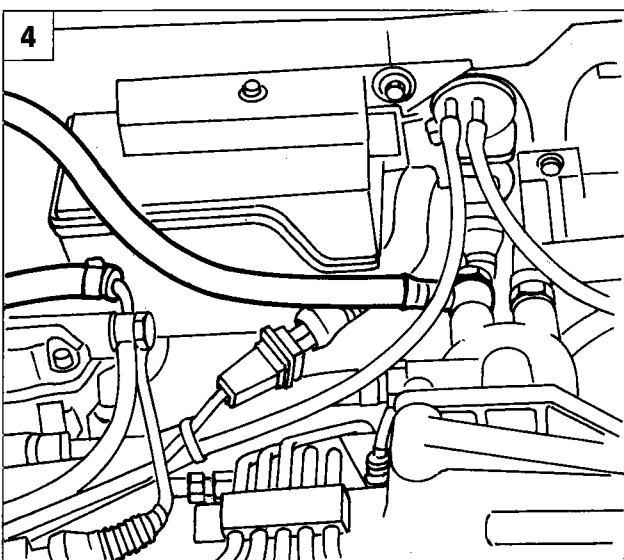
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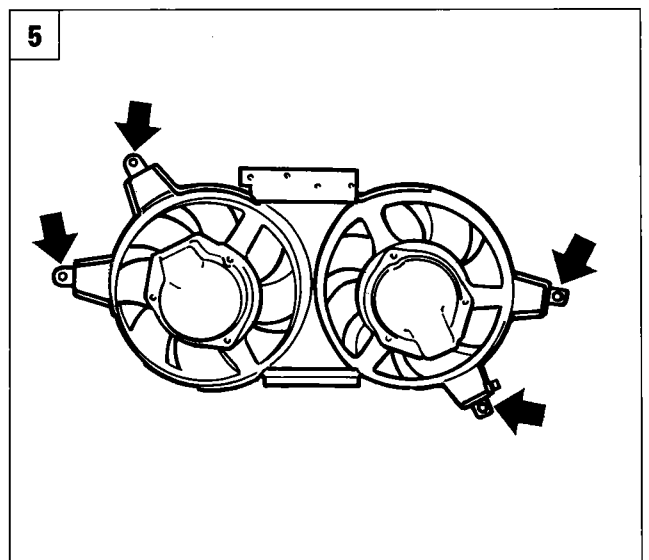
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1. Remove the engine coolant outlet sleeve from the point shown.
2. Remove lines leading from the heater unit and both coolant lines shown from the thermostat and disconnect both electrical connections shown.
3. Disconnect the lines shown from the expansion tank.
4. Disconnect the two fuel outlet and inlet lines.
5. Unscrew the fan retaining bolts.

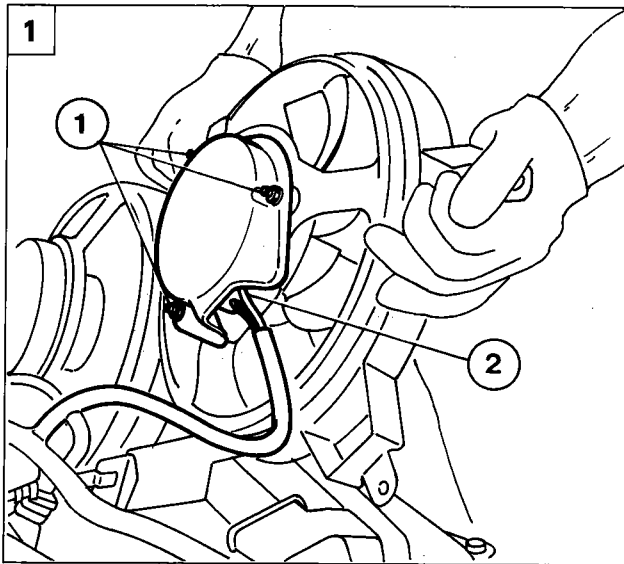


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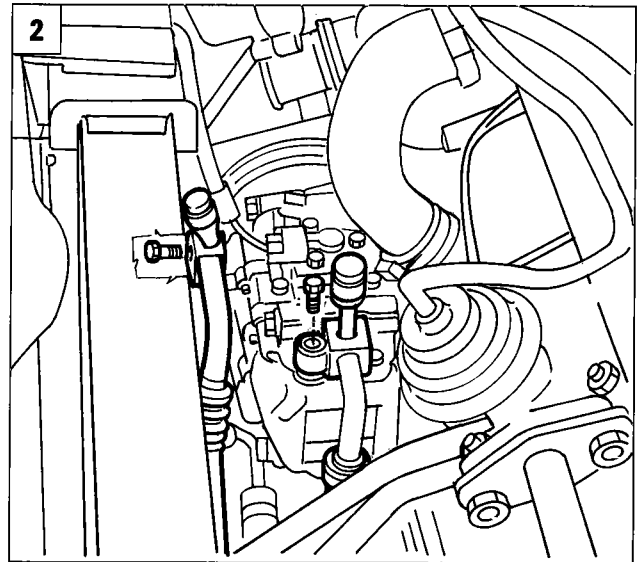


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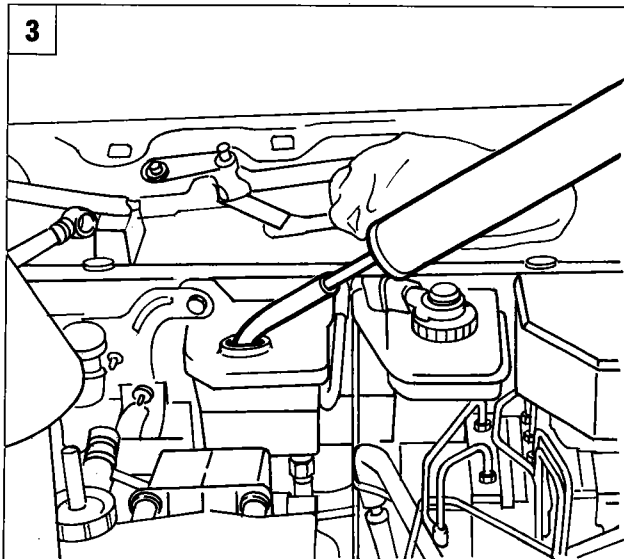
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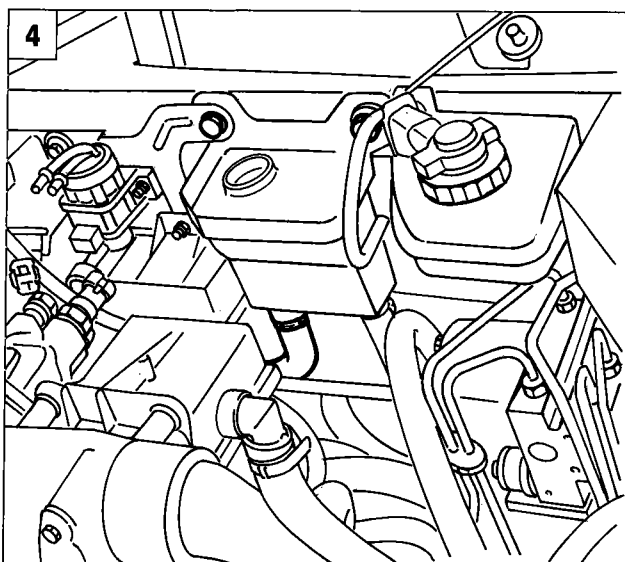
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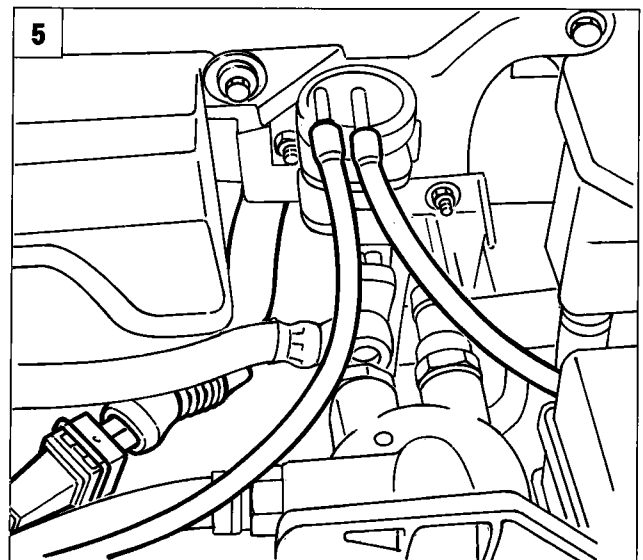
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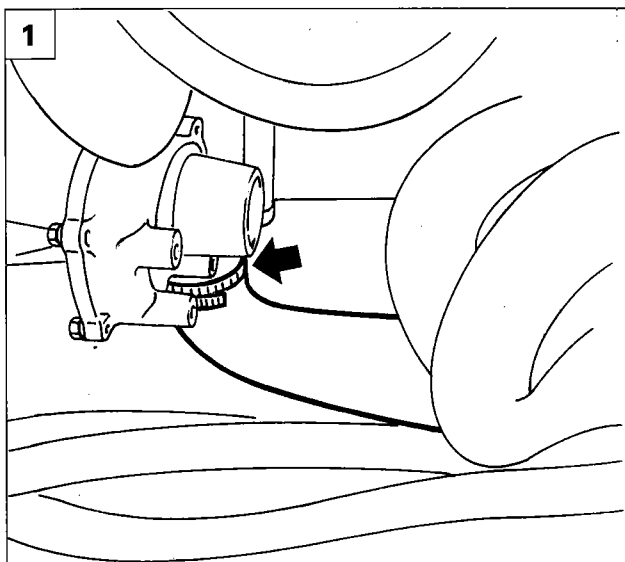
1. Loosen bolts (1) retaining the heat shield, lift shield, disconnect connection (2), repeat the operation on the other cover and then remove the fan.
2. Undo the fastenings shown to disconnect the lines from the air conditioner compressor.
3. Drain the fluid from the power steering pump using appropriate means to recover the oil.
4. *Unscrew the bolts fastening the reservoir to the bulkhead and disconnect the lines shown.*
5. Disconnect both pipes from the modulator solenoid and the associated electrical connection shown.



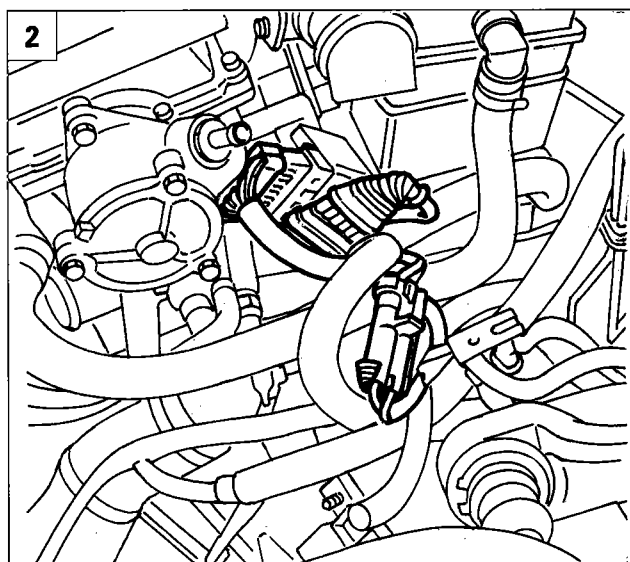
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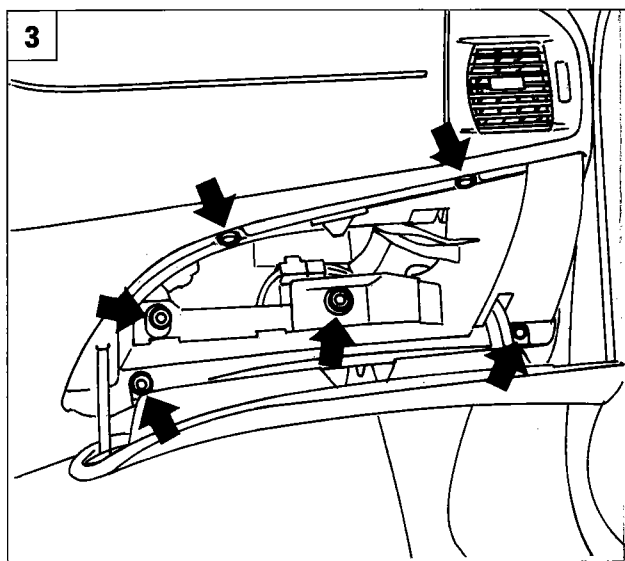
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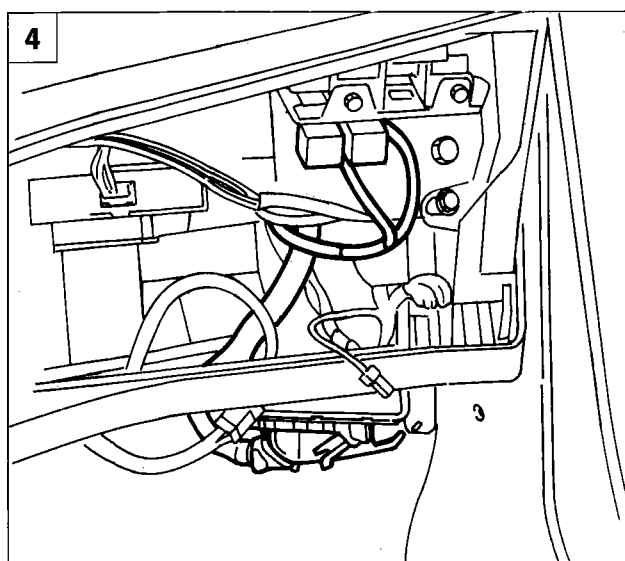
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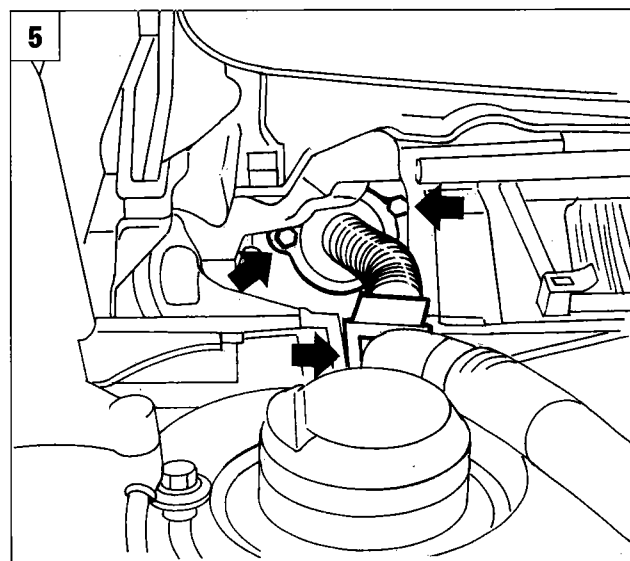
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1. Remove the line connecting the turbocharger to the heat exchanger.
2. Disconnect electrical connections shown.
3. Working from inside the car, remove the glove compartment by unscrewing the retaining screws shown.
4. Disconnect connector shown from the injection ECU and the two relays from their seats.
5. Remove the pollen filter protection after removing the wiper arms as described in Sect.70 Bodywork, unscrew both screws retaining the engine wiring to the bulk-head.

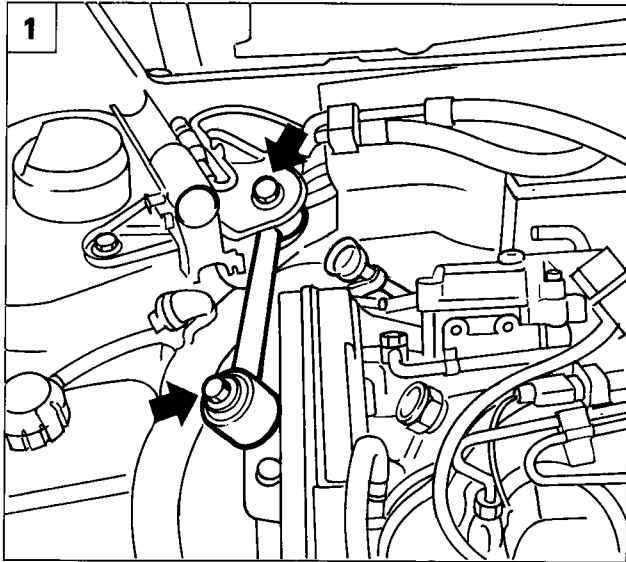


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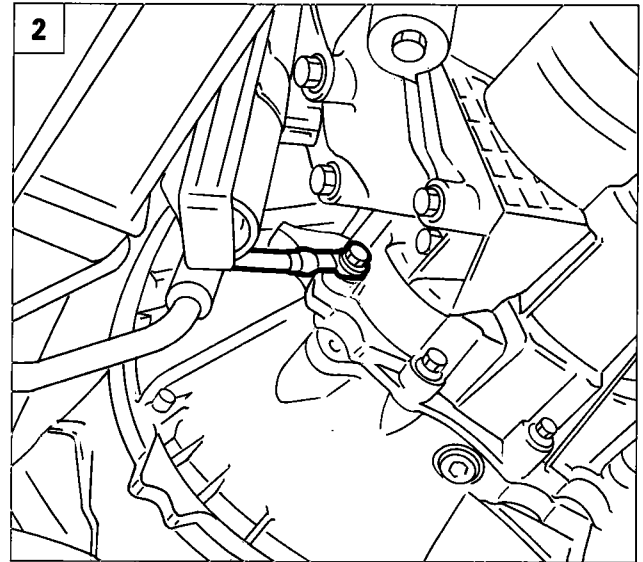


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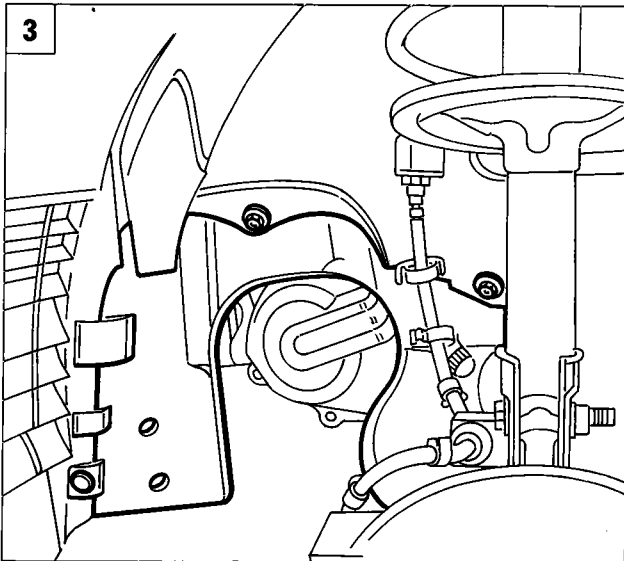
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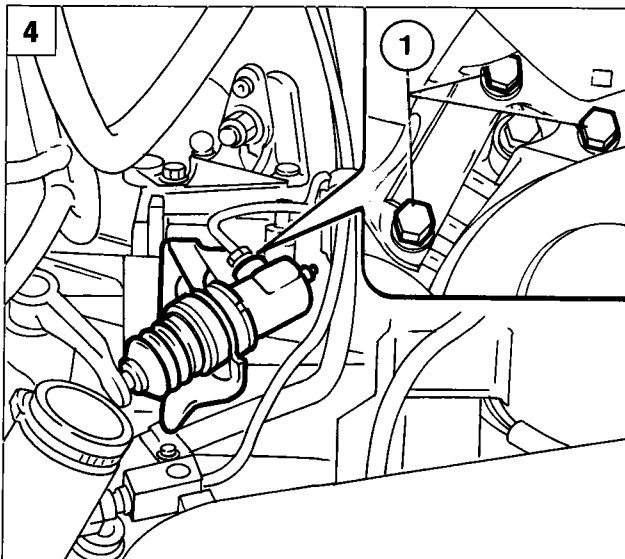
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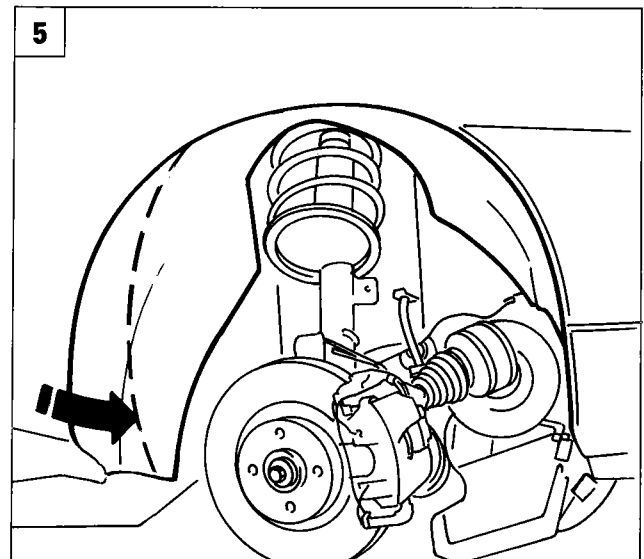
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1. Remove the reaction rod from the mount bracket by undoing the retaining bolts shown.
2. Disconnect the engine earth from the gearbox bell housing.
3. Use tool 1878077000 to undo the stud, unscrew the screws and release the dust guard from its seat.
4. Working from the wheel arch compartment, unscrew bolts (1) retaining the clutch cylinder mount bracket.
5. Prise off the right front wheel arch guard.

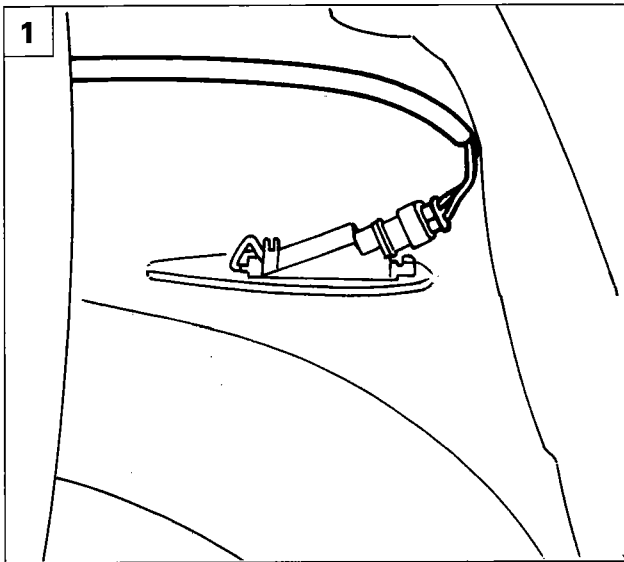


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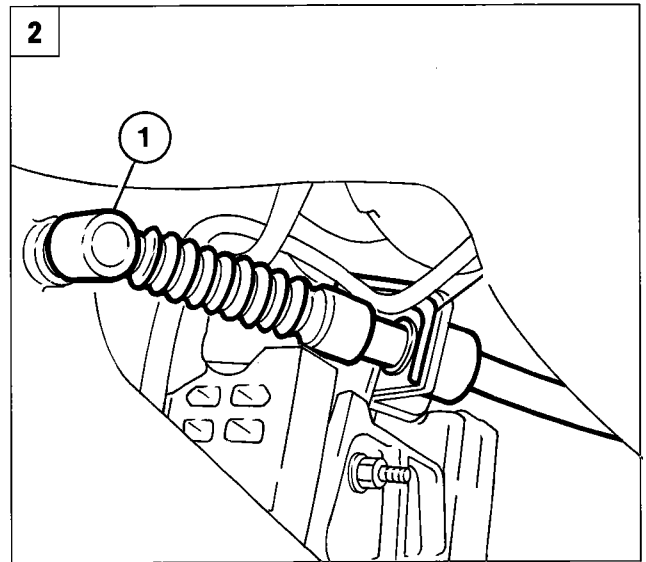


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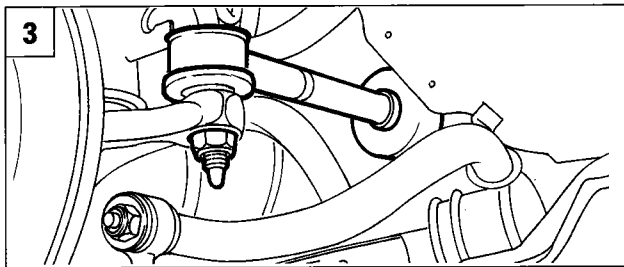
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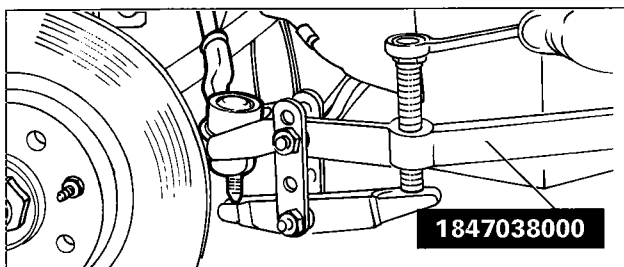
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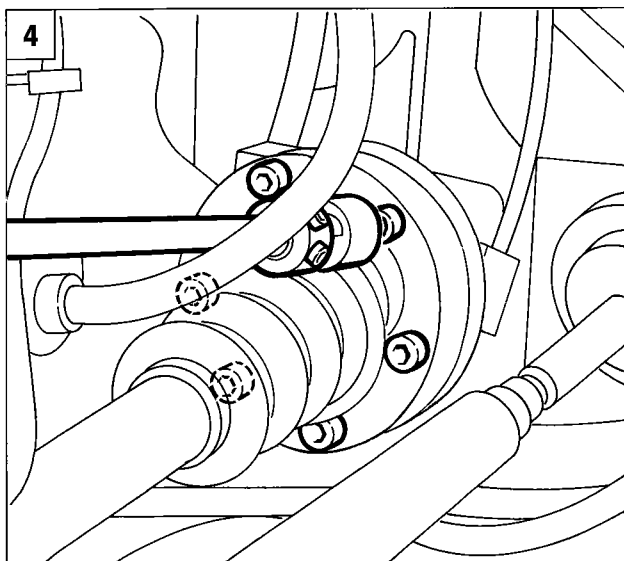
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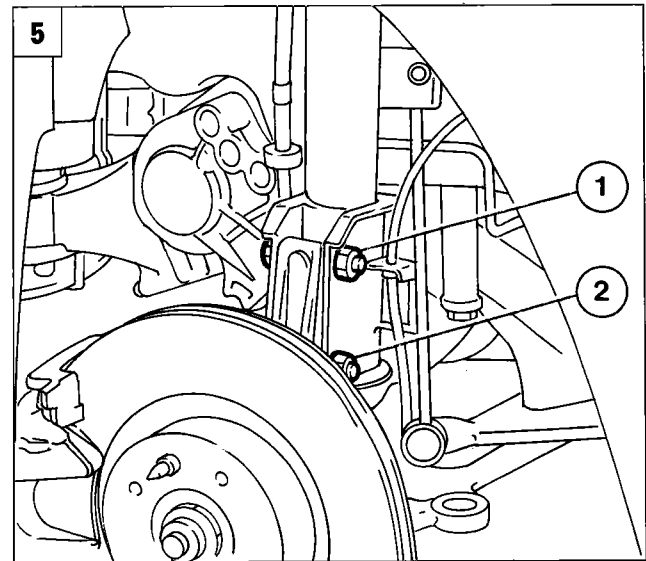
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1. Disconnect the right side turn signal connection and, working from the engine bay, withdraw the engine wiring and fasten to the engine.
2. Prise up head (1), then disconnect the gear engagement cable from the gearbox.
3. Unscrew nut retaining the steering link head, then use tool 1847038000 to disconnect from the pillar.
4. Disconnect the half-axes by undoing the bolts connecting the constant velocity joints to the gearbox flange.
5. Unscrew bolt (1) and loosen bolt (2) retaining the suspension strut, then turn the strut down to release the drive shaft from the differential.

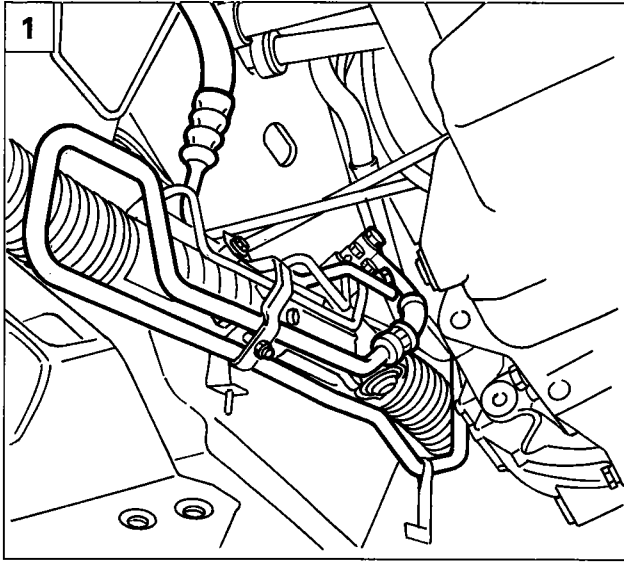


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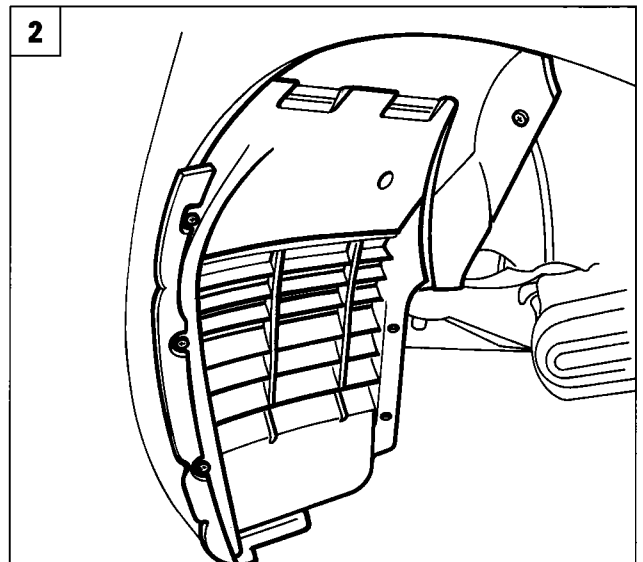


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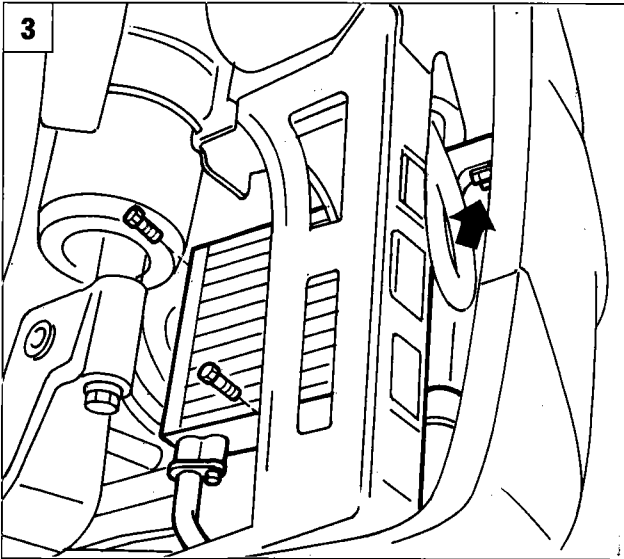
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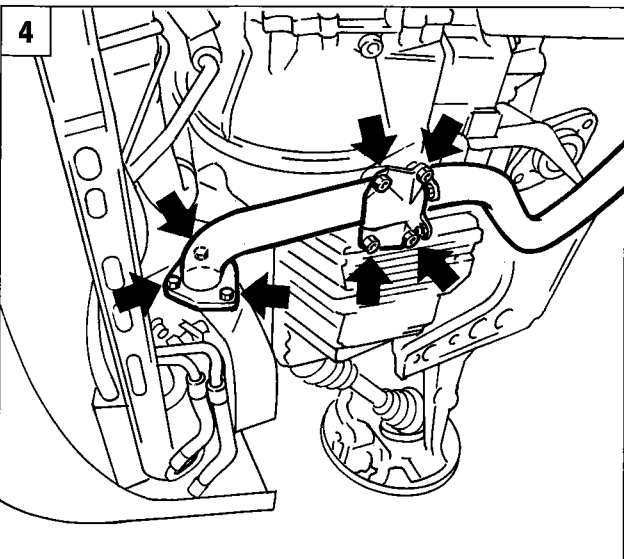
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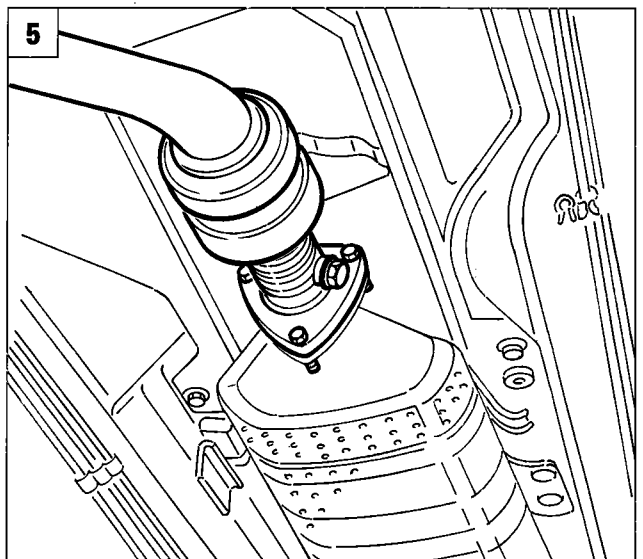
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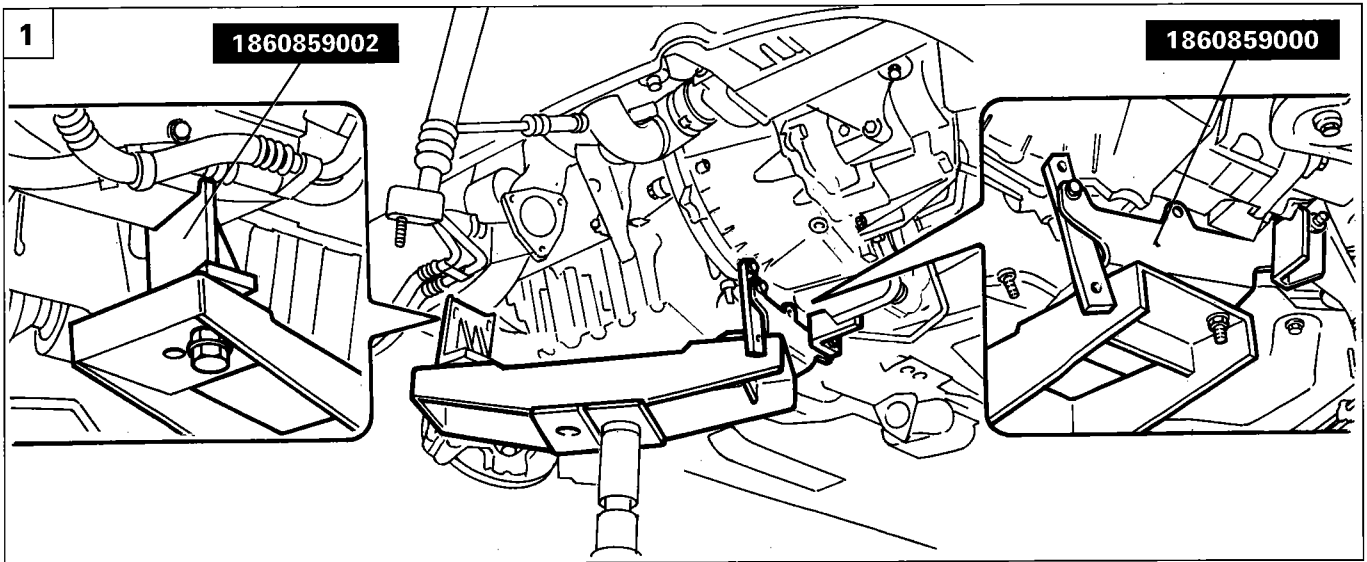
1. Disconnect both power steering fluid fittings from the steering box by releasing from the vibration-proof bracket.
2. Remove the dust shield as shown.
3. Remove the engine oil heat exchanger from the fastenings as shown, then secure to power unit.
4. Remove screws retaining the first section of the exhaust pipe to the manifold and the vibration-proof bracket retaining bolts.
5. Disconnect the first exhaust pipe section from the catalytic converter.



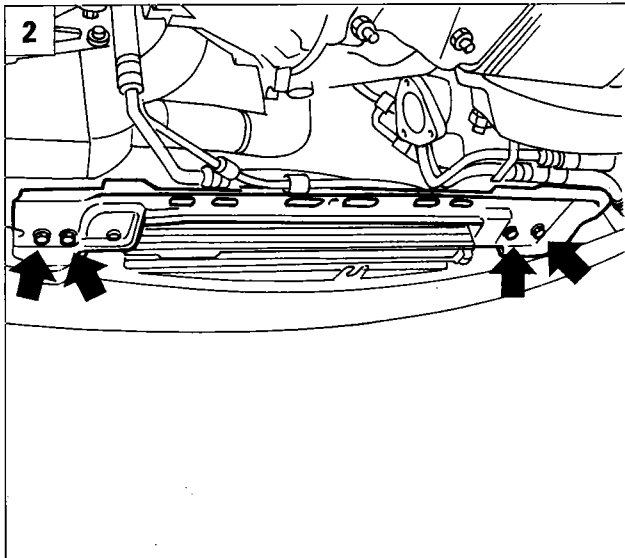
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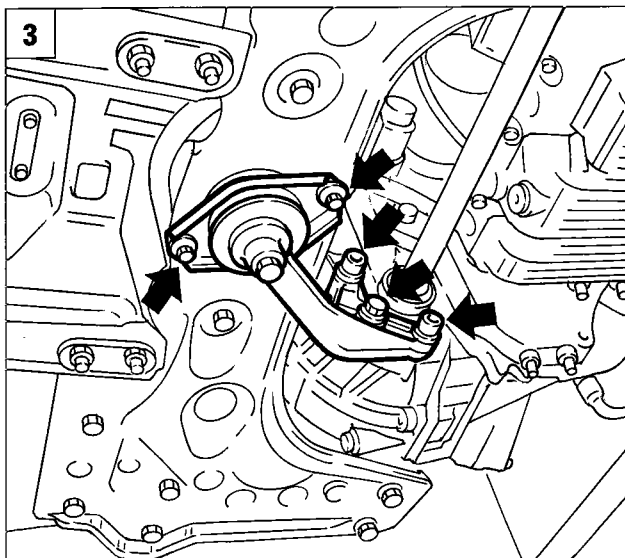


1. Position engine support tool 1860860000 with the two engine mount brackets made previously on the hydraulic jack and fasten to power unit using the tools shown.



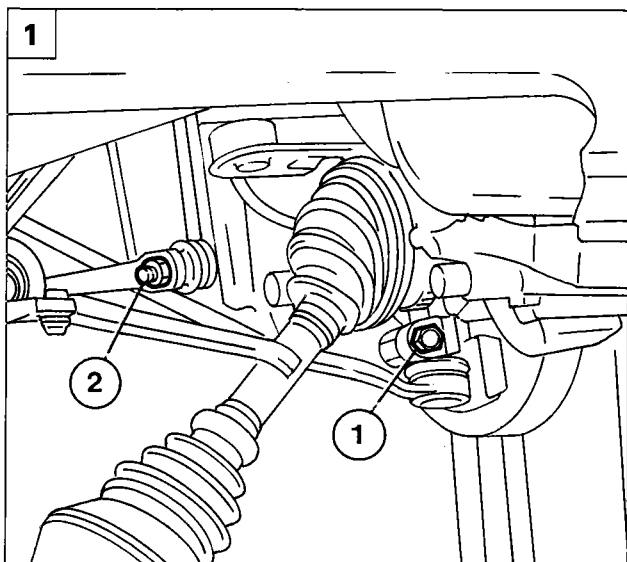
The hydraulic jack should be designed to carry at least 1000 kg and be high enough to allow the power unit to be removed from below. It is therefore necessary to consider maximum possible lift height and minimum possible hydraulic jack height.

2. Remove the lower beam by undoing the retaining bolts shown.
3. Remove the central power unit mount by unscrewing the retaining bolts shown.

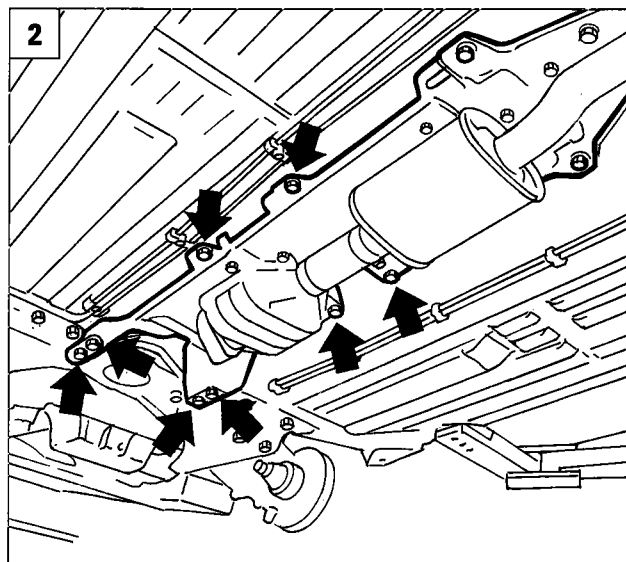


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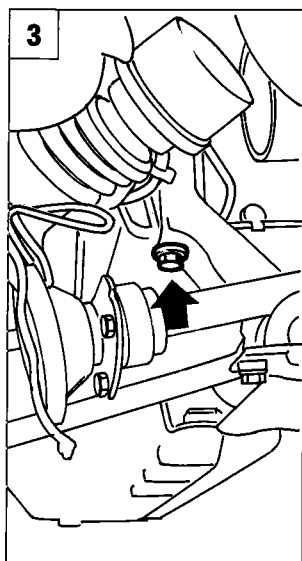
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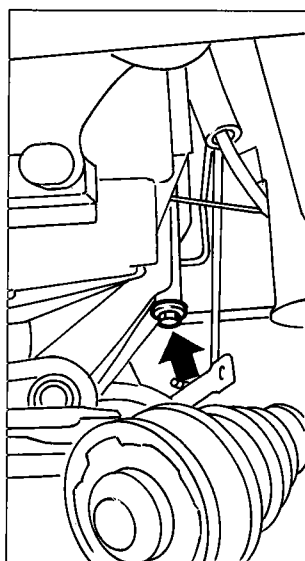
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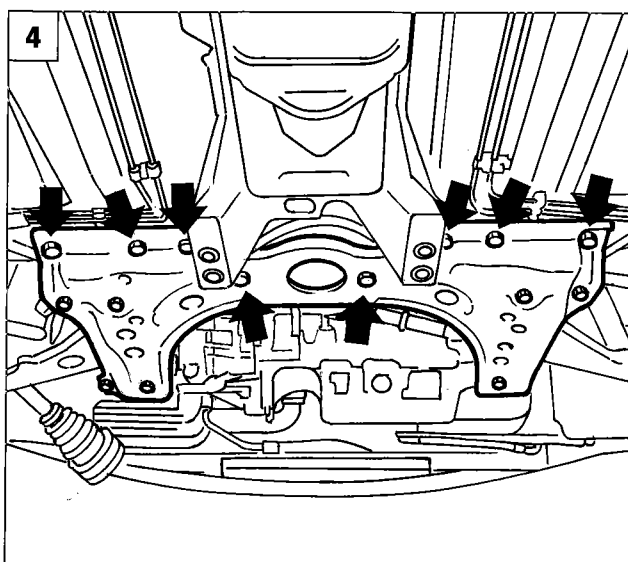
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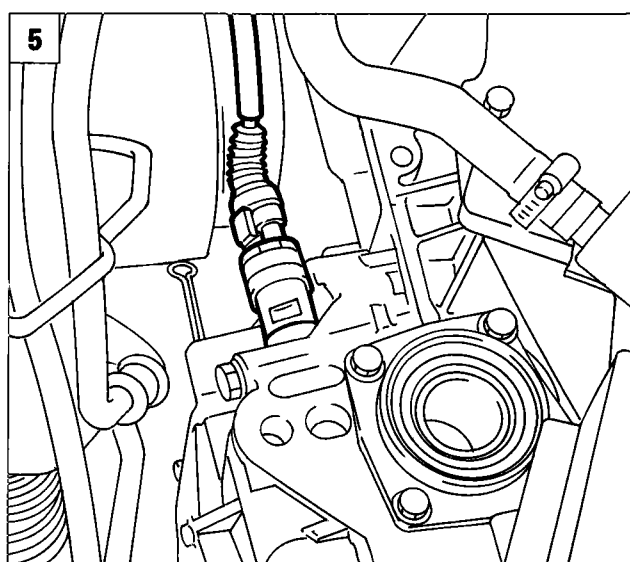
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1. Unscrew bolt (1) retaining the wishbone to the hub, and bolt (2) retaining the anti-roll bar to the suspension link.
2. Remove the heat shield fastenings shown in order to allow removal of the front beam.
3. Unscrew the side bolts retaining the front beam to the body.
4. Undo the rear bolts retaining the front beam to the body and the steering box, then remove the front beam with wishbones and anti-roll bar with the aid of a second operator.
5. Disconnect the mileometer speed sensor electrical connection.

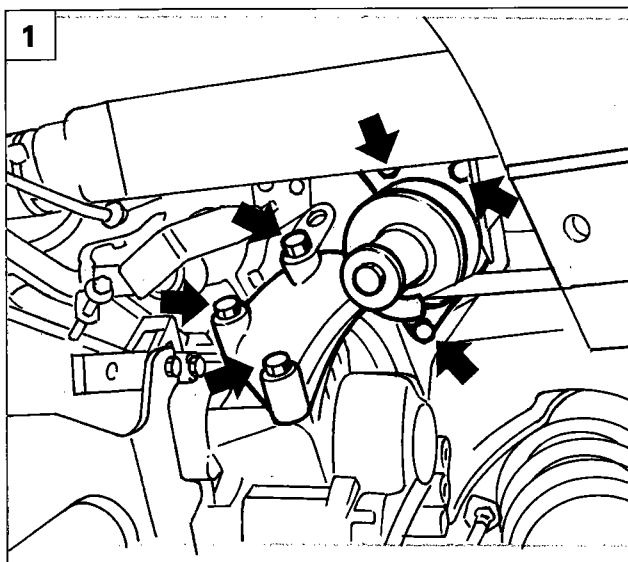


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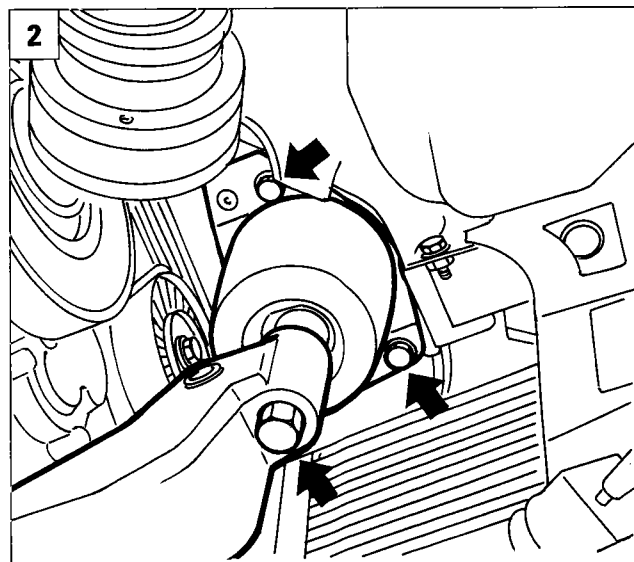


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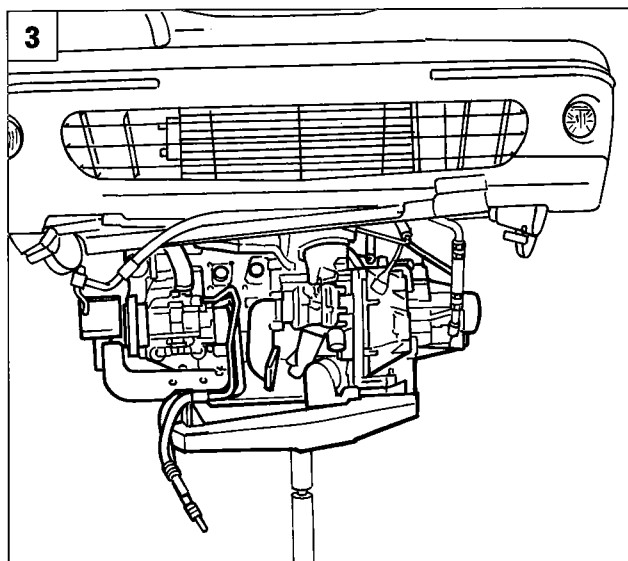
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P4F11FX02



P4F11FX03



1. Remove the gearbox end engine mount by undoing the retaining bolts shown.
2. Remove the timing end engine mount.
3. Lower the hydraulic jack and remove power unit from lower part of vehicle.



Lower hydraulic jack gradually and check power unit is properly positioned and balanced on the support tool.

4. Position power unit on a platform using a hydraulic lift.



Use a hydraulic lift to move the power unit after releasing it from the support tool.

NOTE *To refit the power unit, simply reverse order of removal instructions.*

- Prepare the engine bay to fit the power unit. Take care to connect all electrical leads, pipes etc. in order to avoid any possible hitches;
- Take great care not to damage individual components when the power unit is fitted
- When fitting the coolant lines, align groove on rubber hose with ridge on associated rigid sleeve. When filling the cooling system, refer to section on "Removing-refitting radiator".

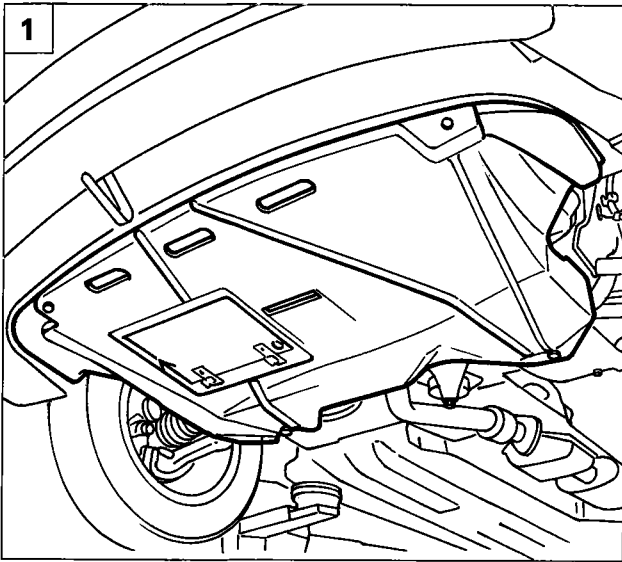


Ensure that the power unit mounting points are properly secured.

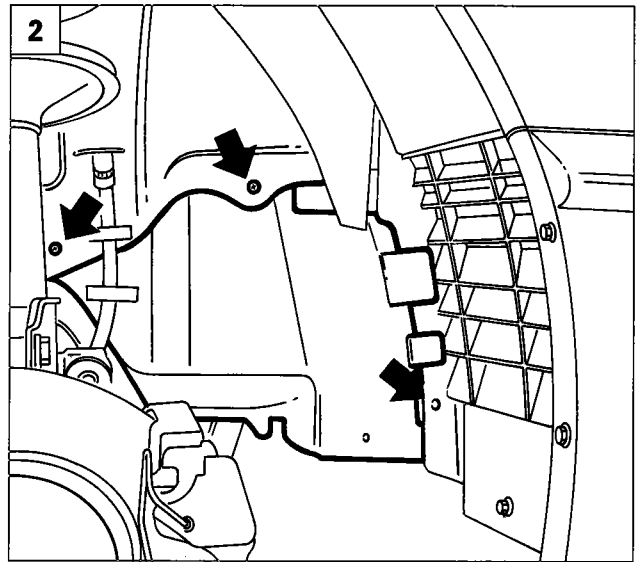


Clutch pedal height.

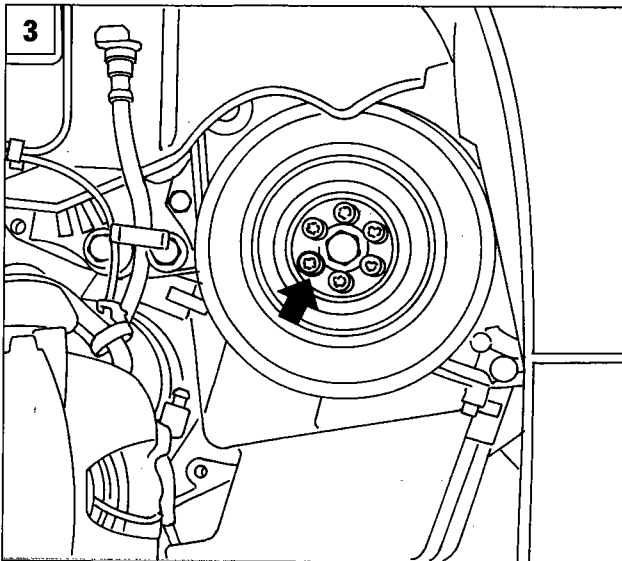
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P4F10CX02



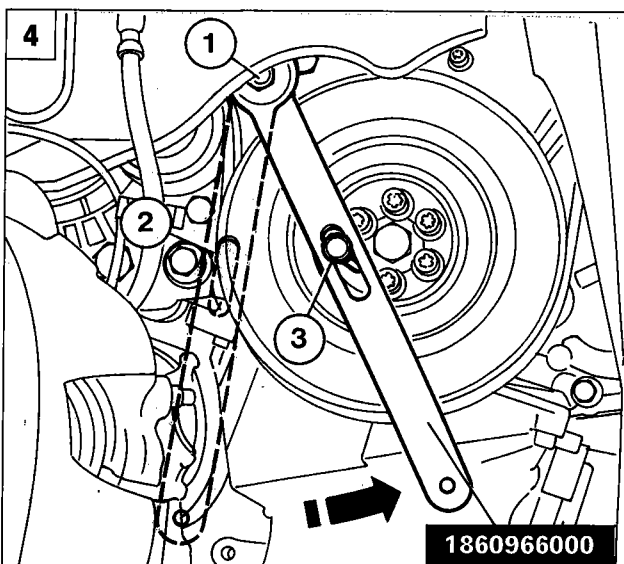
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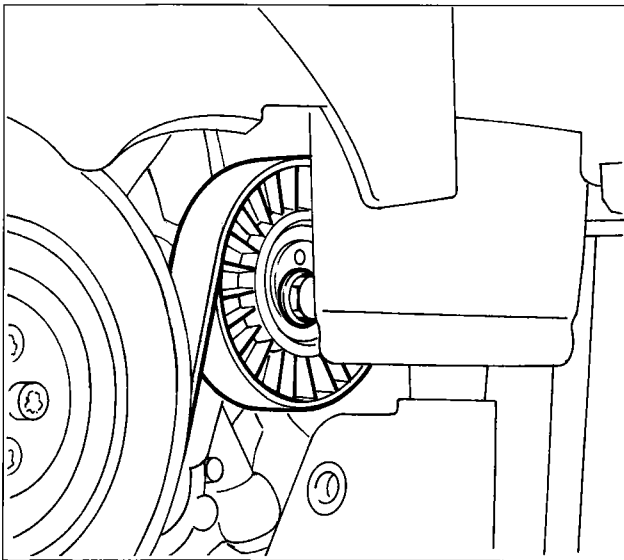
REMOVING AUXILIARY BELT

Place the vehicle on a lift, disconnect the battery negative terminal, remove the right front wheel, then proceed as follows.

1. Raise the lift and remove the lower power unit protection.
2. Use tool 1878077000 to undo the stud, unscrew bolts and release the dust shield from its seat.
3. Unscrew retaining bolt shown in order to position the belt tensioning tool.
4. Use wrench 1860966000 to loosen belt tension by turning automatic tension nut (1) anticlockwise until wrench slot (2) is aligned with hole (3) on the pulley, then lock the tool in position using a service bolt.

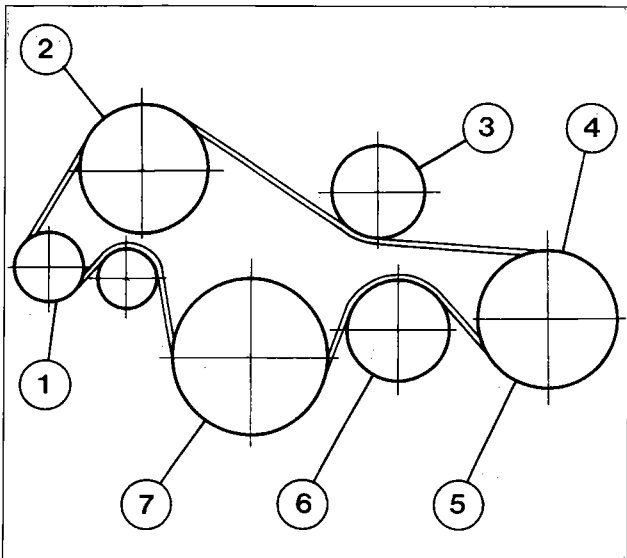


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1. Loosen tension in mobile pulley by undoing the retaining bolt. Then prise off the auxiliary drivebelt.

P4F13FX01



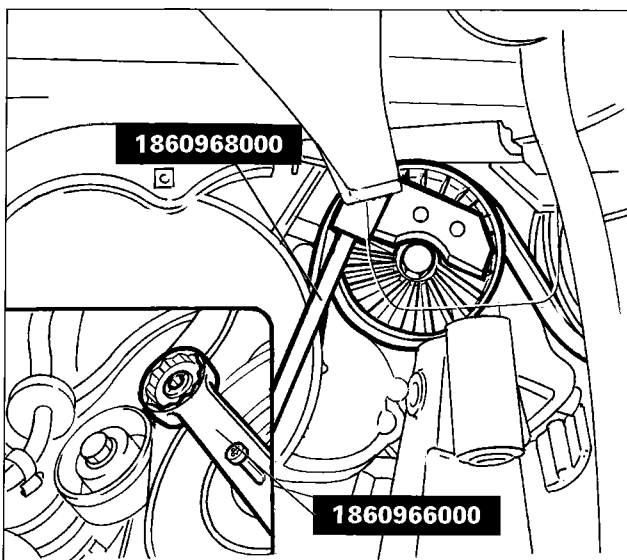
REFITTING AUXILIARY COMPONENT BELT

2. Fit the auxiliary component belt to obtain the configuration shown:

1. Alternator
2. Power steering pump
3. Fixed guide pulley
4. Air conditioner compressor pulley
5. Mobile guide pulley
6. Crankshaft pulley
7. Automatic tensioner



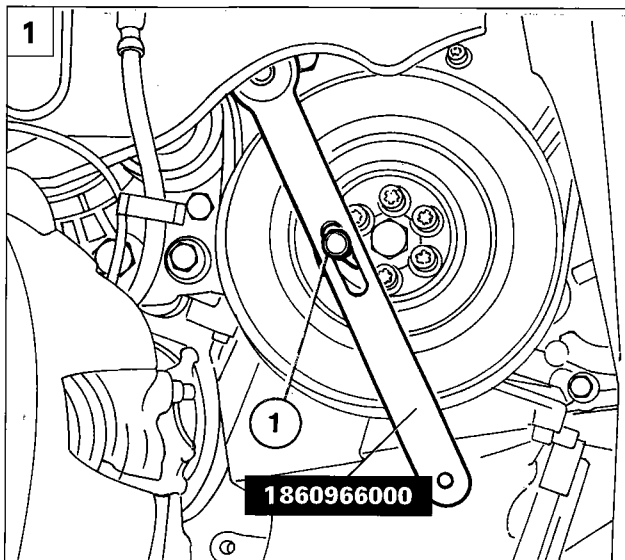
Check the condition and efficiency of the auxiliary component drive belt. In particular, check for cracks, tears, surface wear and dry or hard parts, which could lead to loss of grip.



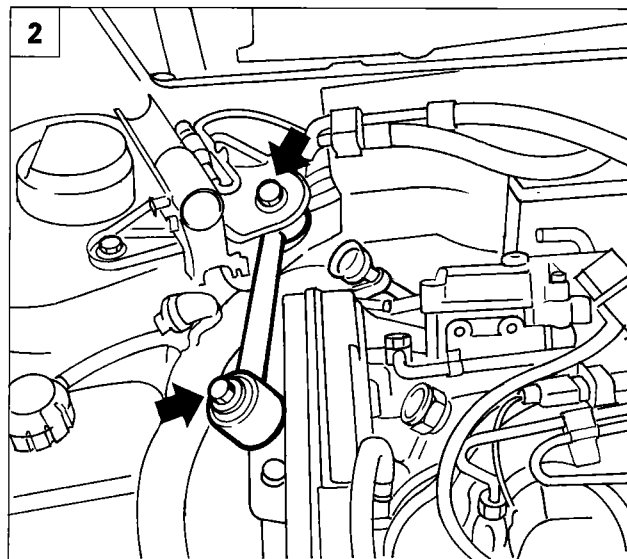
3. Position tool 1860968000 on the mobile pulley (left free to move) and align with the specific holes, turn the lever and adjust belt tension. Tighten the mobile pulley retaining bolt in this position.

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10.



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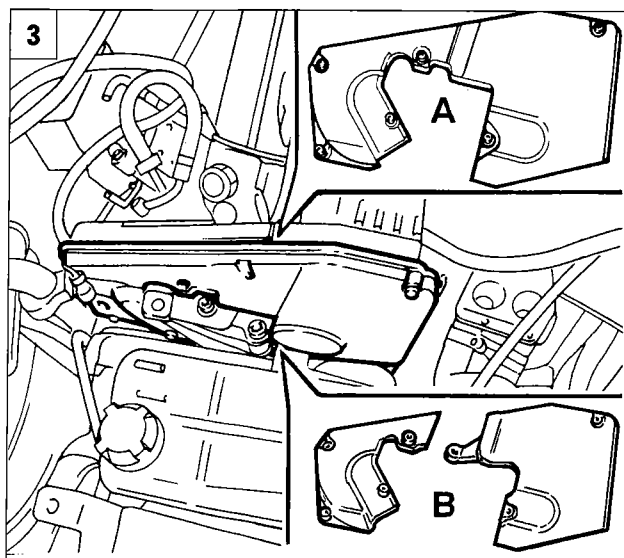
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1. Unscrew screw (1) and remove wrench 1860966000, then reposition the pulley retaining bolt and tighten to the specified torque. The preloaded automatic tensioner spring will ensure belt tension is correct.

REMOVING TIMING BELT

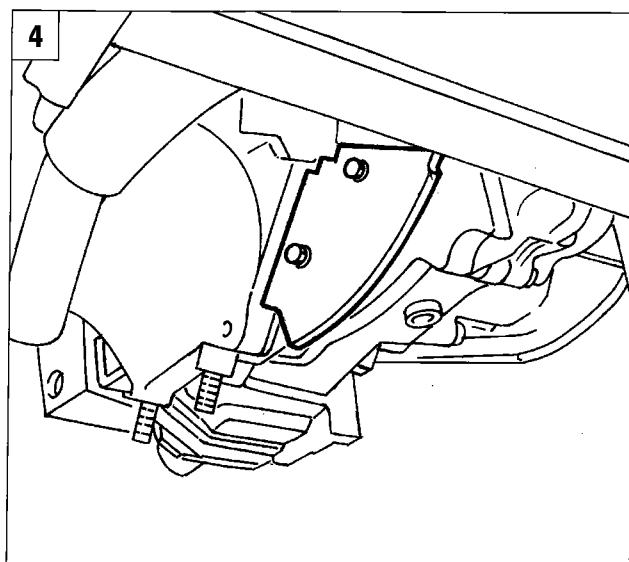


Before removing the timing belt, it is necessary to remove the auxiliary belt as described in the previous paragraph.

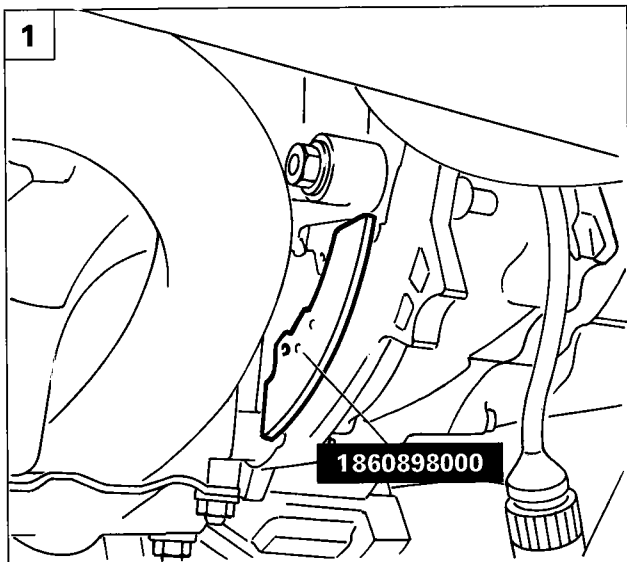
2. Remove the reaction rod from the mount bracket by undoing the retaining bolts shown.
3. Remove the upper timing belt guard (Fig. A)
From engine no. 0000424550 remove the two upper belt guards (Fig. B).
4. Unscrew bolts shown and remove the guard from the gearbox.



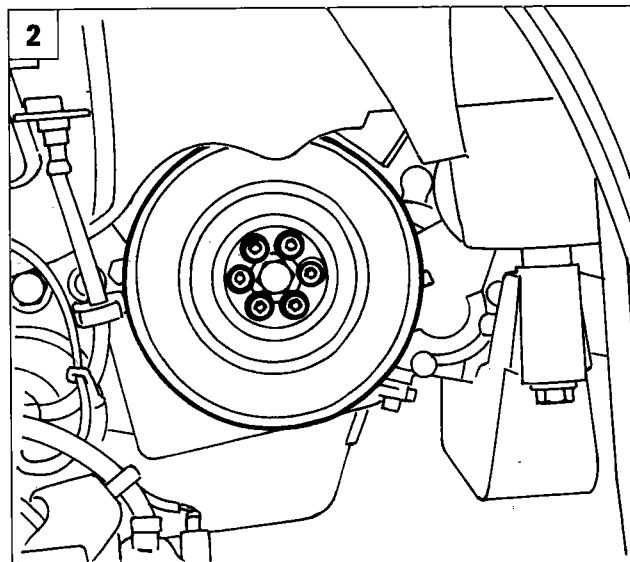
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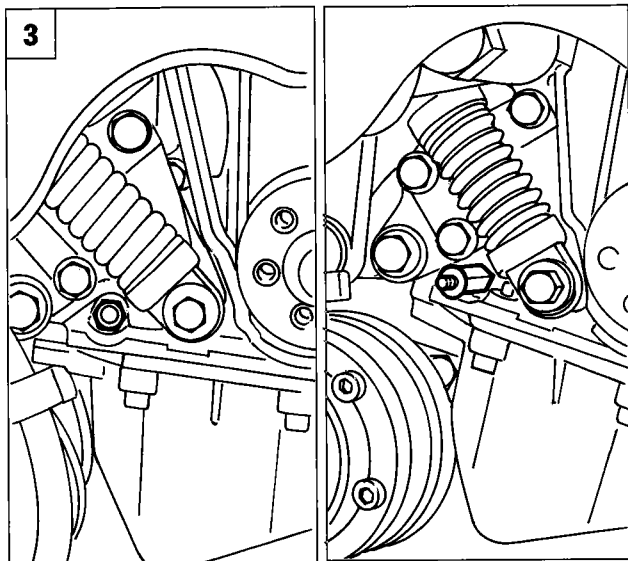
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P4F15FX01



P4F15FX02

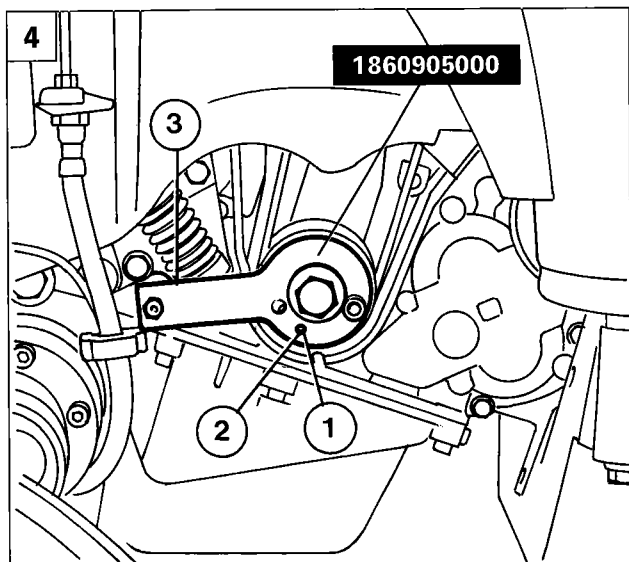


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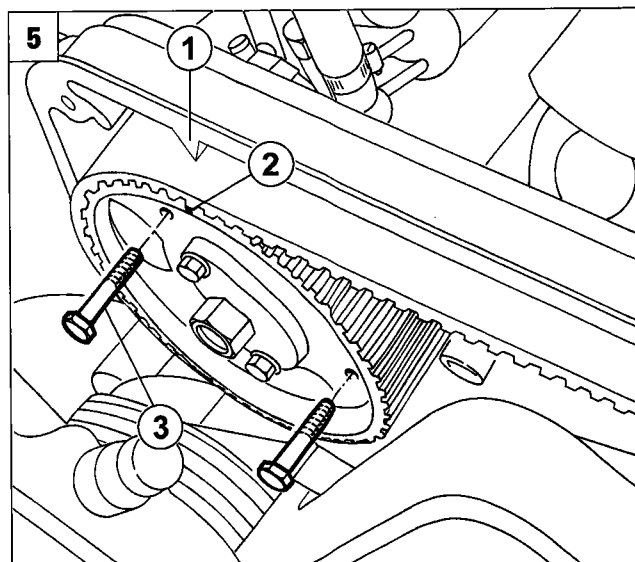
P4F15FX04



1. Position the flywheel retaining tool 1860898000.
2. Remove the auxiliary component pulley and the flywheel retainer 1860898000.
3. Remove the oil pump retaining bolt shown; position pin of tool 1860905000 in the place of the bolt.
4. Position tool 1860905000 on the crankshaft gear and pin (3); turn the crankshaft through small movements until locating dowel (2) slides into hole (1). In this position, the first cylinder is set to T.D.C.
5. Check that the injection pump timing is correct. Check hat references (1) and (2) shown are aligned and then lock the pulley in timing position by fitting screws (3) into the holes on the pulley.

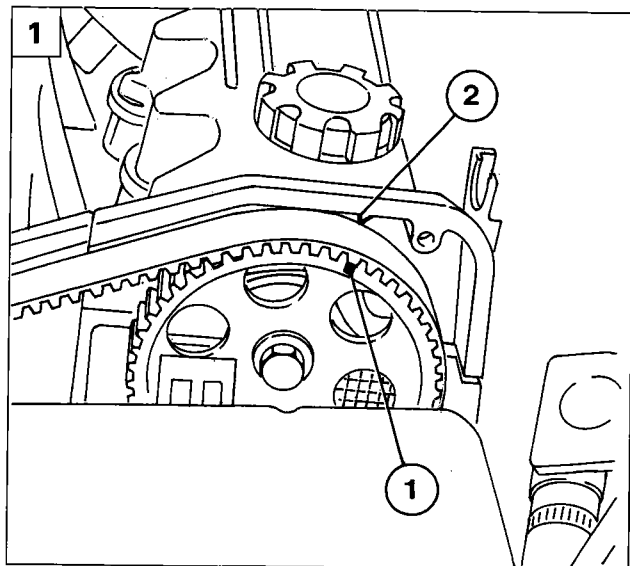


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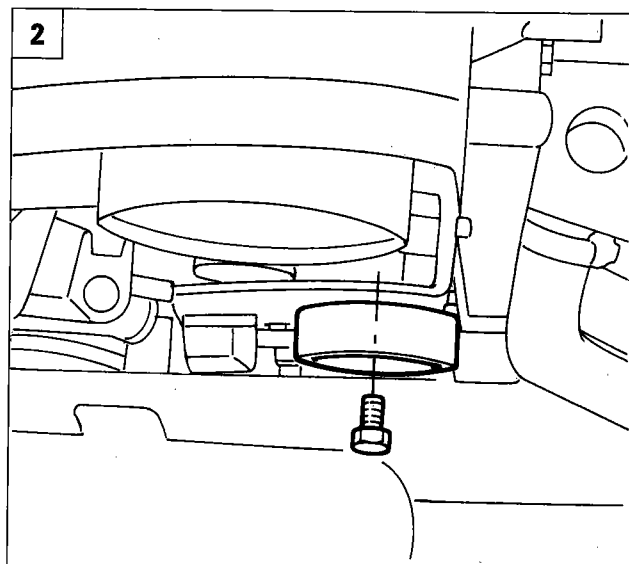


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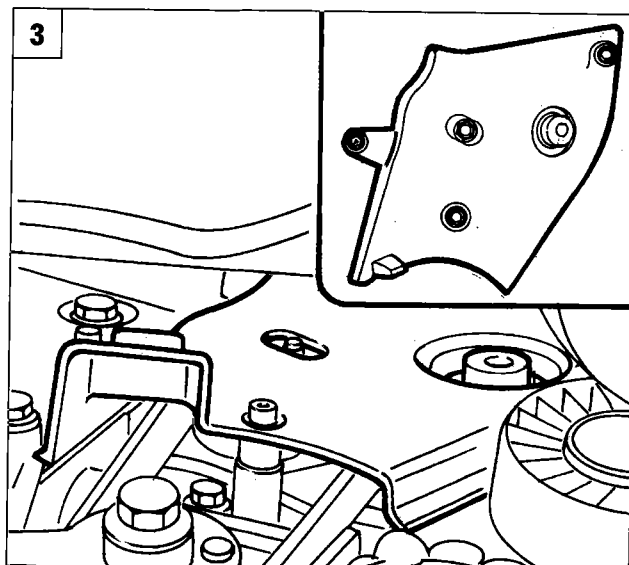
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P4F16FX01



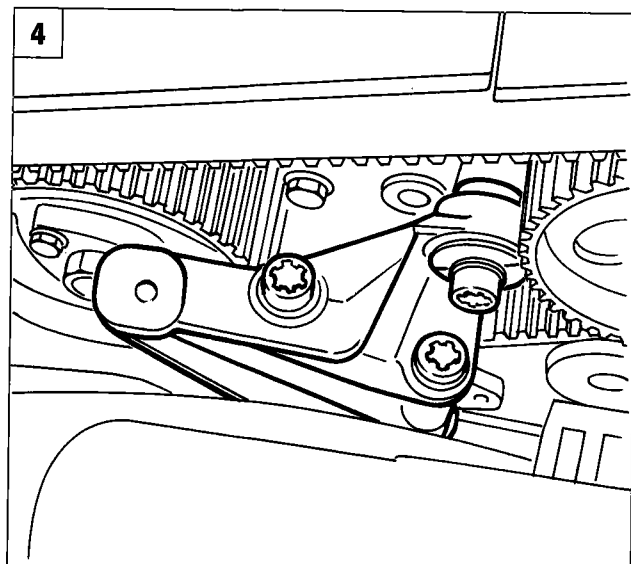
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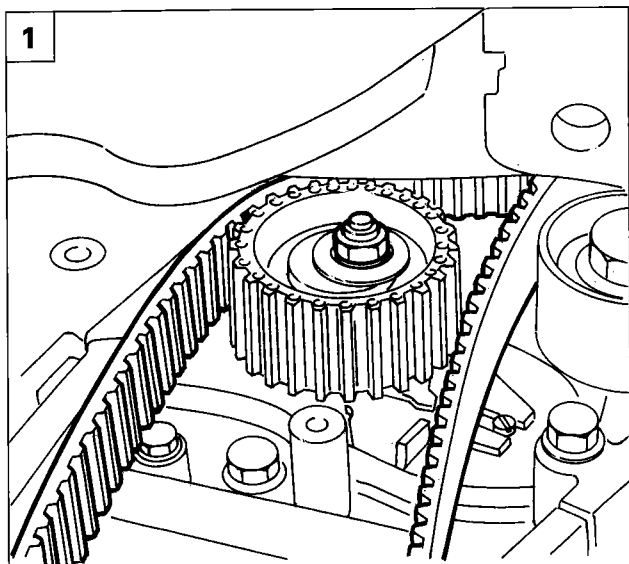
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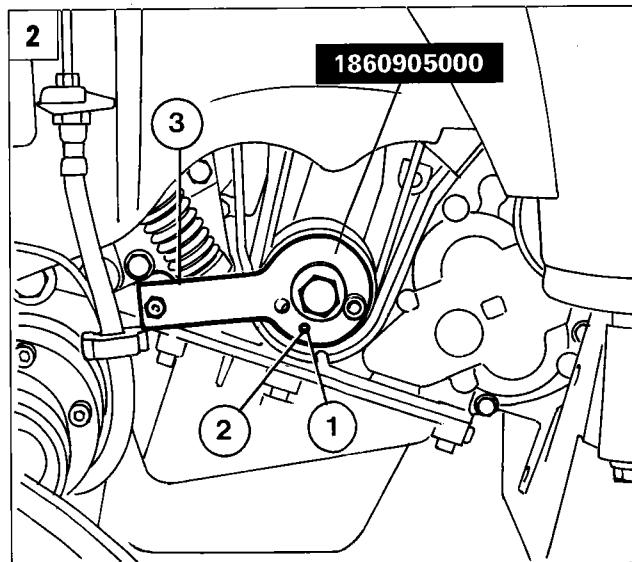
1. Check that reference (1) of the timing pulley is aligned with reference (2) located on the cam cover.
2. Use a wrench of appropriate size to remove the auxiliary component belt fixed pulley.
3. Remove the lower timing belt guard.
4. Unscrew the retaining bolts shown in the figure and remove the reaction rod mount.



P4F16FX04



P4F17FX01



P4F15FX05

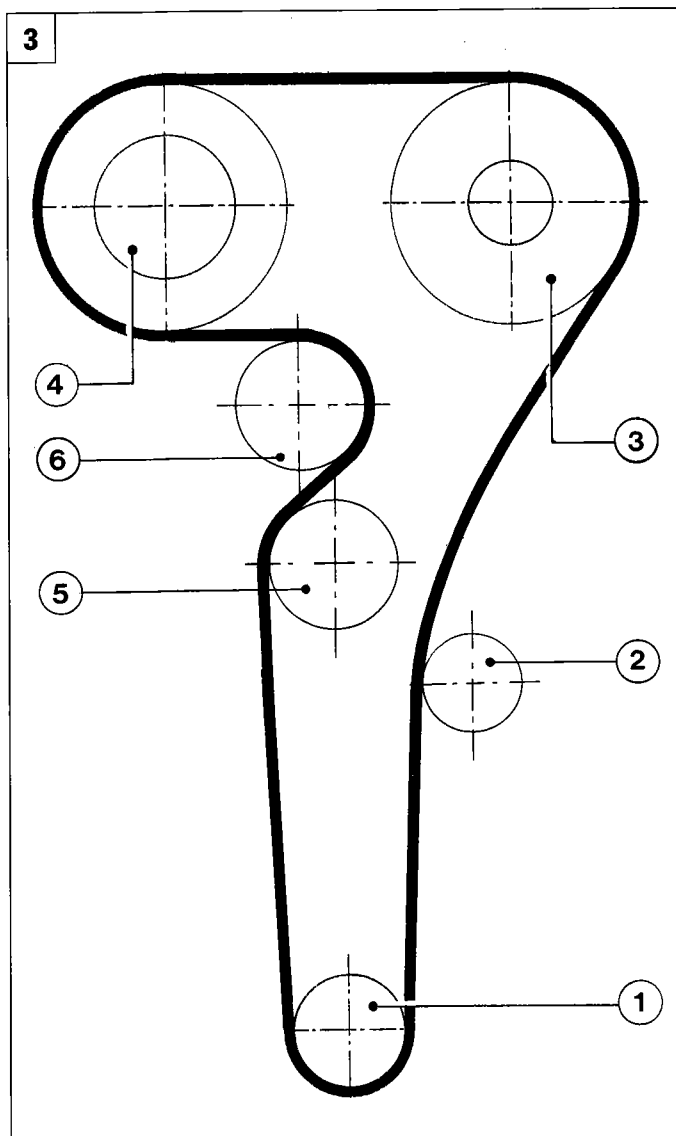
1. Loosen the belt tensioner nut, prise the belt off the injection pump and timing pulley, raise lift, position flywheel retainer 1860898000, remove tool 1860905000 preset to T.D.C. and then remove the timing belt.

REFITTING AND ADJUSTING TIMING BELT TENSION

2. Fit the toothed belt on the crankshaft gear, remove the flywheel retainer positioned previously and fit tool 1860905000 to record T.D.C.

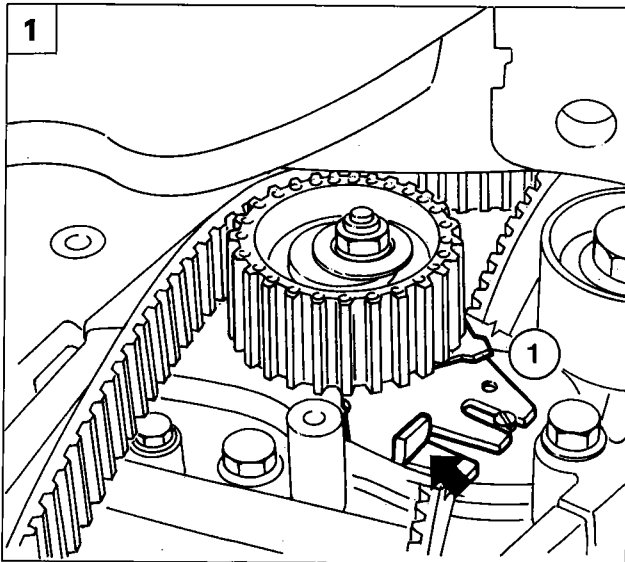
3. Finish fitting the toothed belt by following these instructions in order:

1. Crankshaft gear
2. Fixed guide pulley
3. Timing pulley
4. Injection pump pulley
5. Automatic tensioner
6. Coolant pump



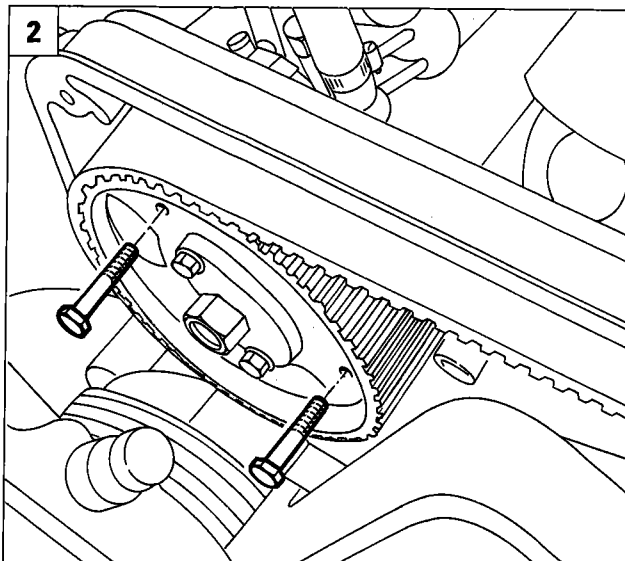
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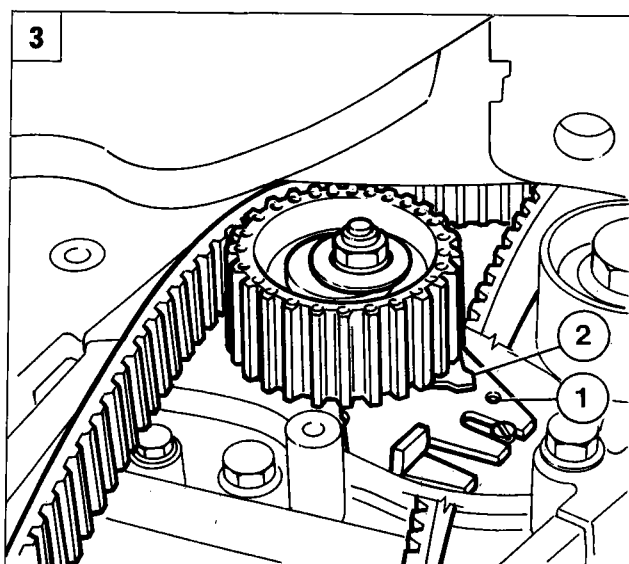
P4F18FX01

1. Apply a force at the point indicated on the automatic tensioner to put the tensioner mobile indicator (1) in a position of maximum tension.



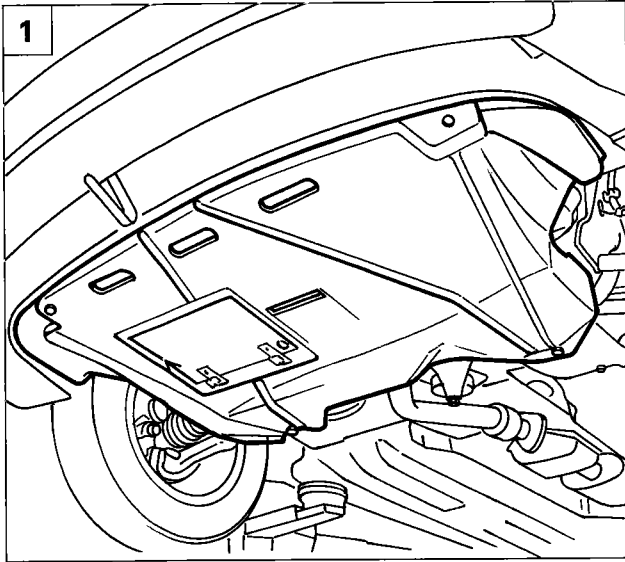
P4F18FX02

2. Release the injection pump drive pulley by undoing the two screws positioned previously.

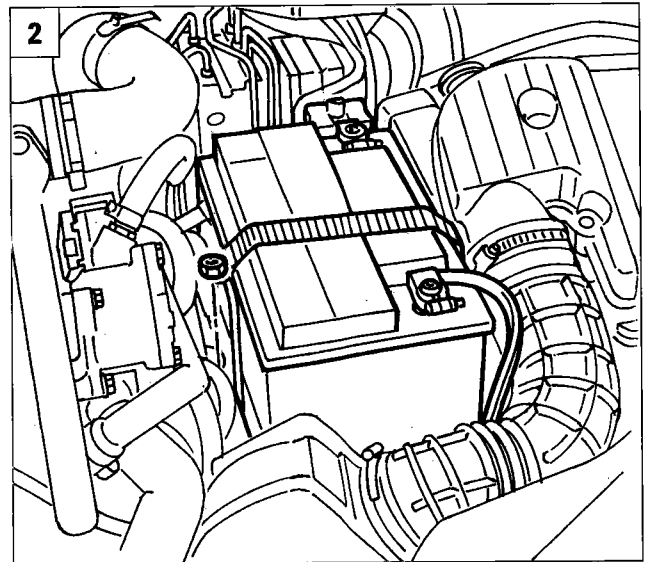


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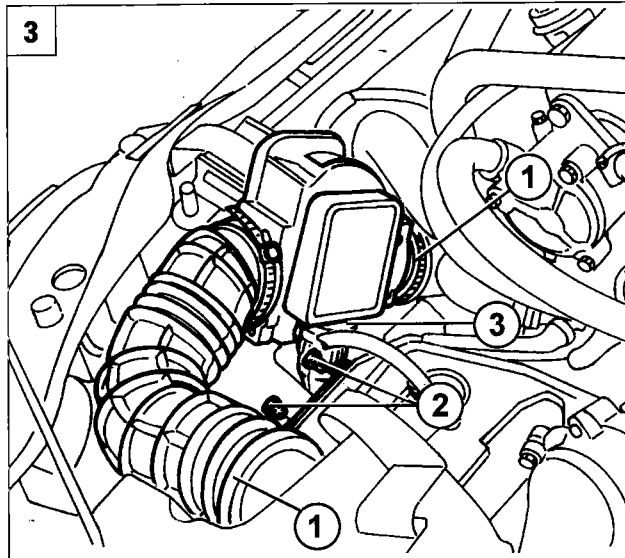
3. Turn the crankshaft through two turns in its normal direction of rotation, undo the tensioner retaining nut and align the fixed index (1) on the tensioner mount with belt tensioner mobile indicator (2). Screw in the tensioner nut and then tighten to torque. Refit the parts taken off previously in order to remove the belt.



P4F003B01



P4F060B01



P4F060B02

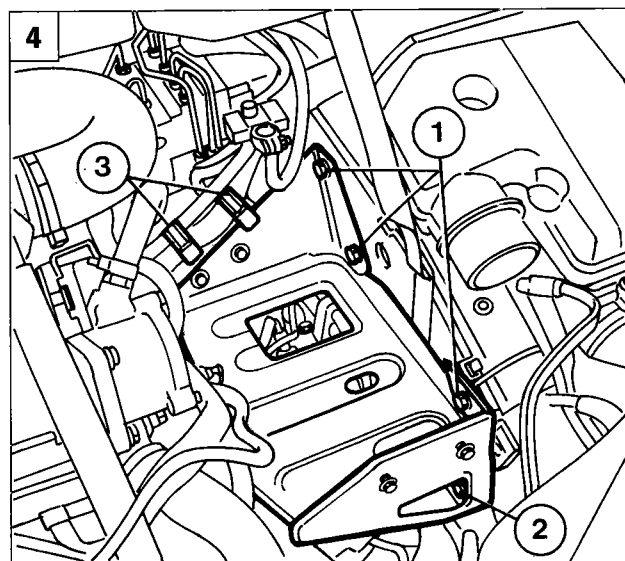


REMOVING CYLINDER HEAD

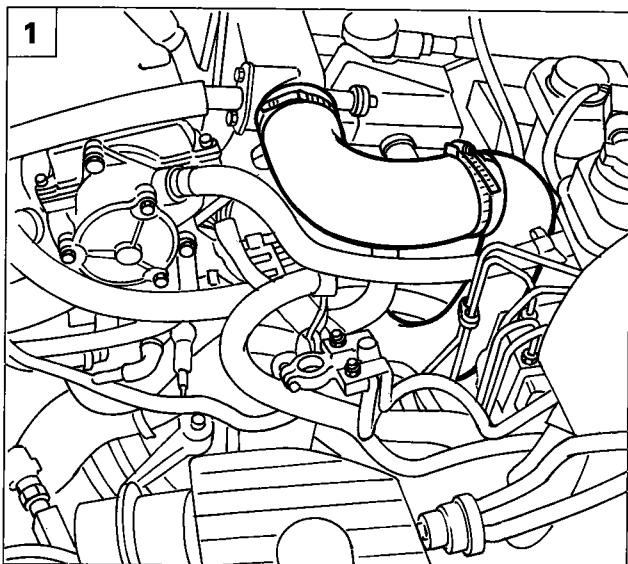
Place the vehicle on a lift, remove the front wheels, disconnect the battery negative terminal and then proceed as follows.



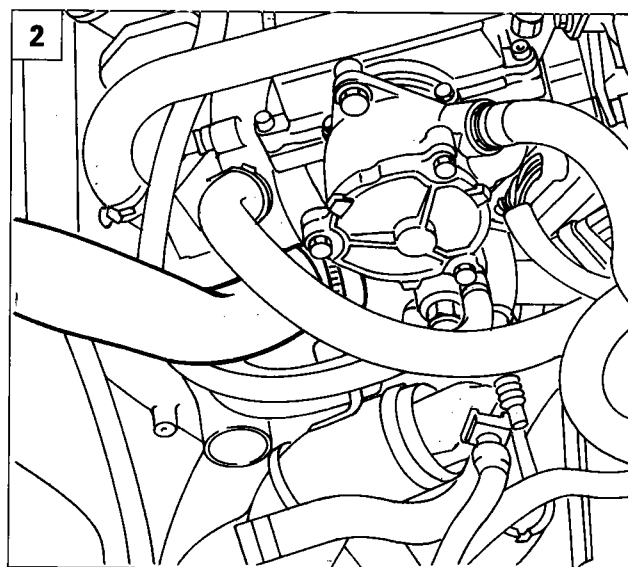
1. Raise the lift and remove the lower power unit protection.
2. Disconnect the battery negative terminal, unscrew the bolt retaining the battery to the cradle and then remove from the engine bay.
3. Loosen the two clips (1), unscrew retaining bolts (2), disconnect connection (3), then remove the air intake sleeve together with debimeter.
4. Unscrew bolts (1), loosen bolt (2), open clips (3) to release the engine wiring, then remove the battery cradle.



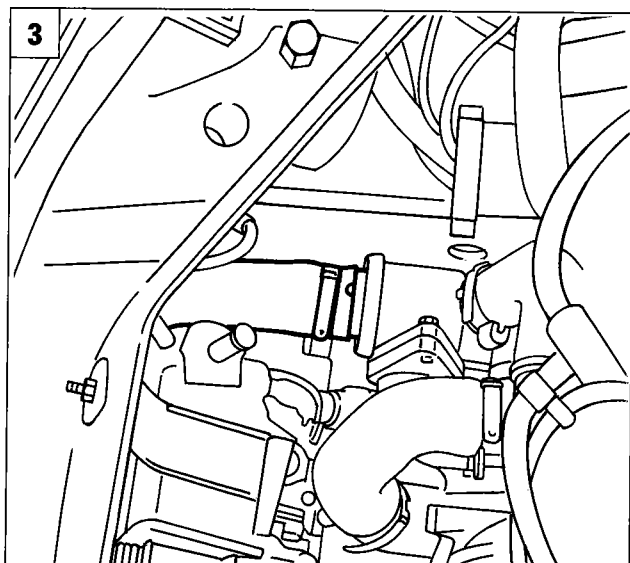
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P4F060B04



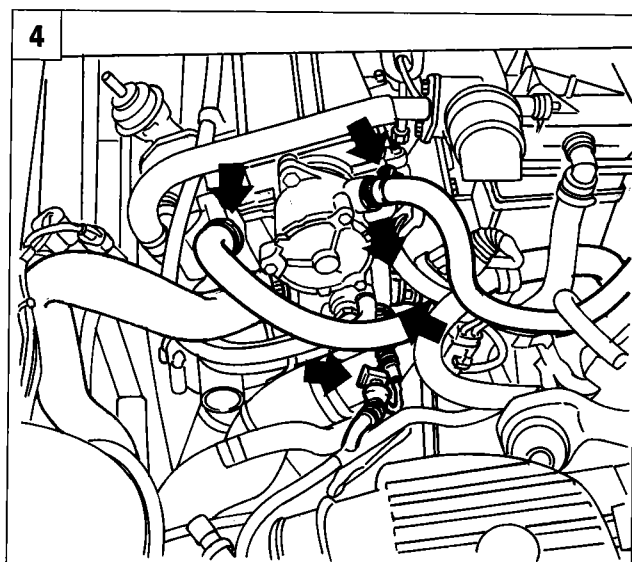
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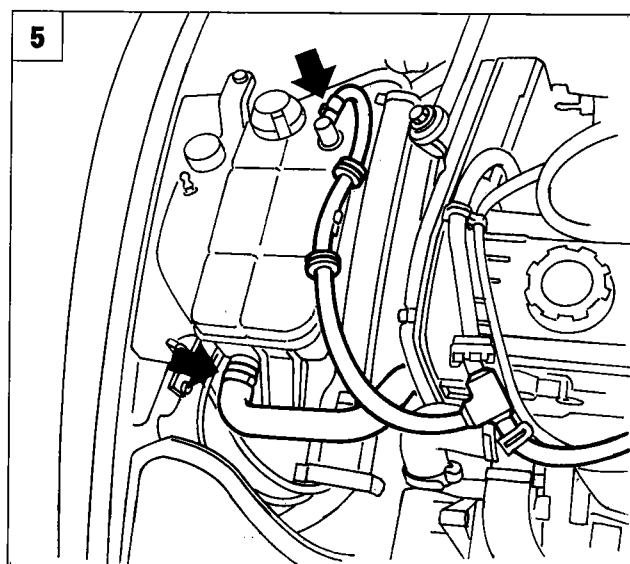
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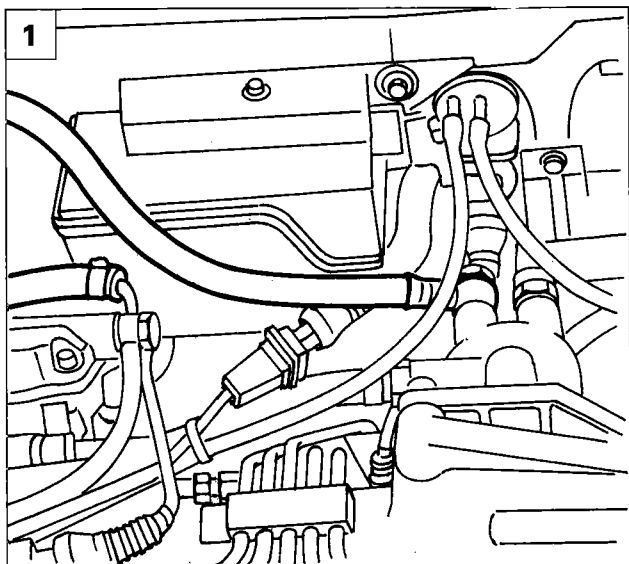
1. Loosen clips and remove the sleeve shown.
2. Position a suitable container to recover the engine coolant and then remove the coolant intake sleeve from the points shown.
3. Remove the coolant outlet sleeve from the point shown.
4. Remove lines leading from the heater unit and both coolant lines shown from the thermostat and disconnect both electrical connections shown.
5. Disconnect the lines shown from the expansion tank.



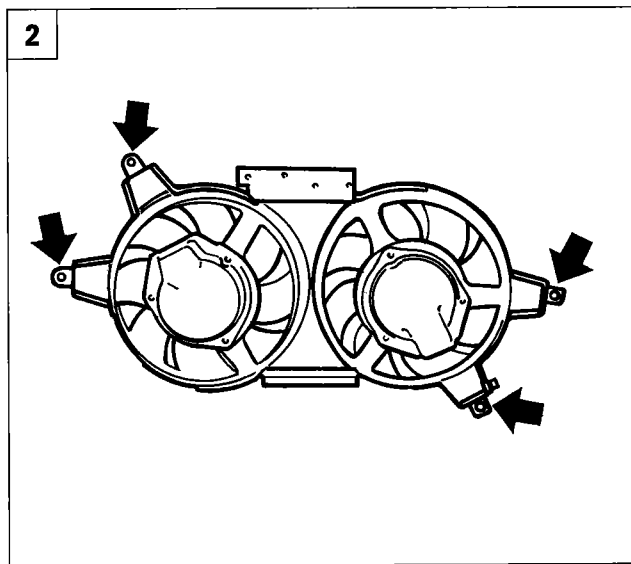
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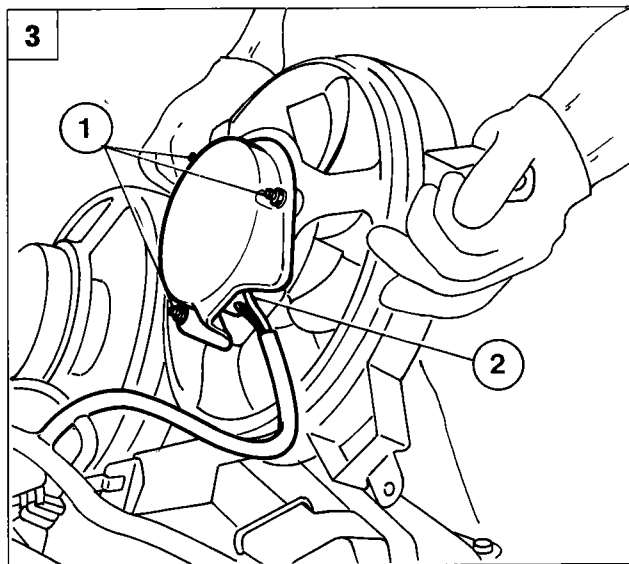
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P4F03FX04



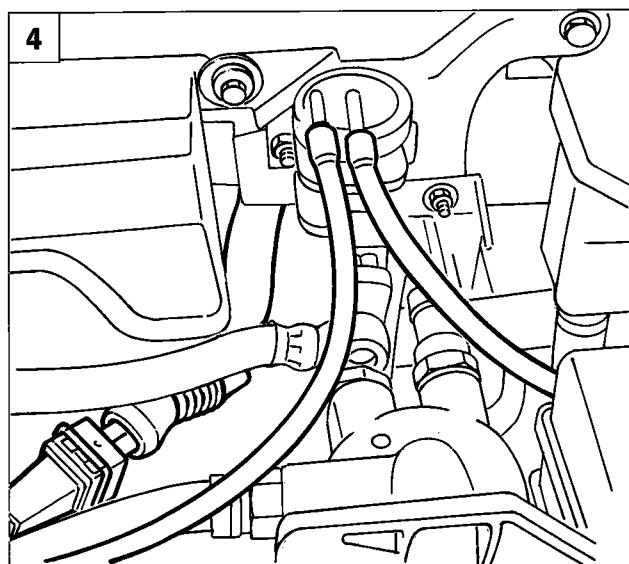
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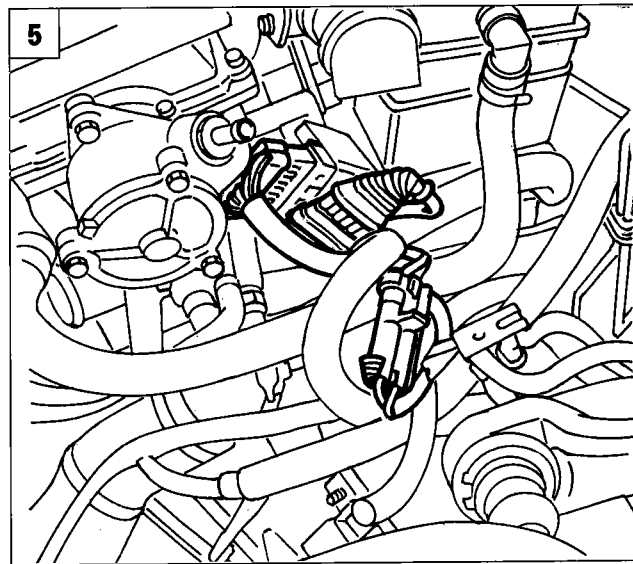
P4F04FX01



1. Disconnect the two fuel inlet and outlet lines.
2. Unscrew the bolts fastening the fan.
3. Loosen bolts (1) retaining both heat shields, raise, disconnect connections (2), repeat the operation on the other cover, then remove the fan.
4. Disconnect both pipes from the modulator solenoid and the electrical connection.
5. Disconnect electrical connections shown.

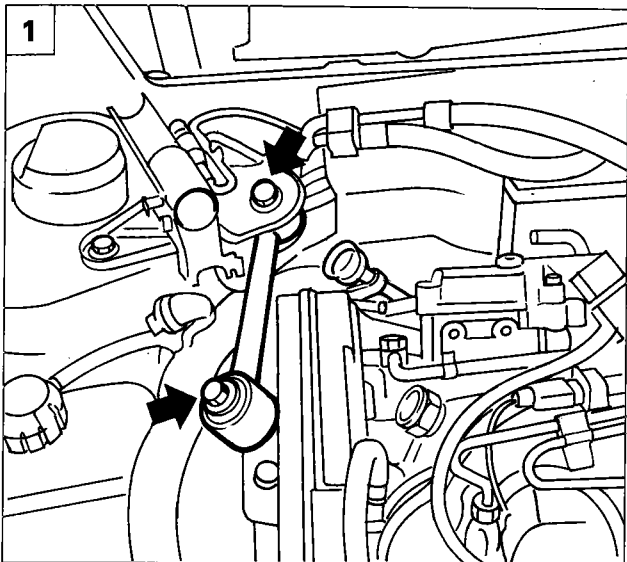


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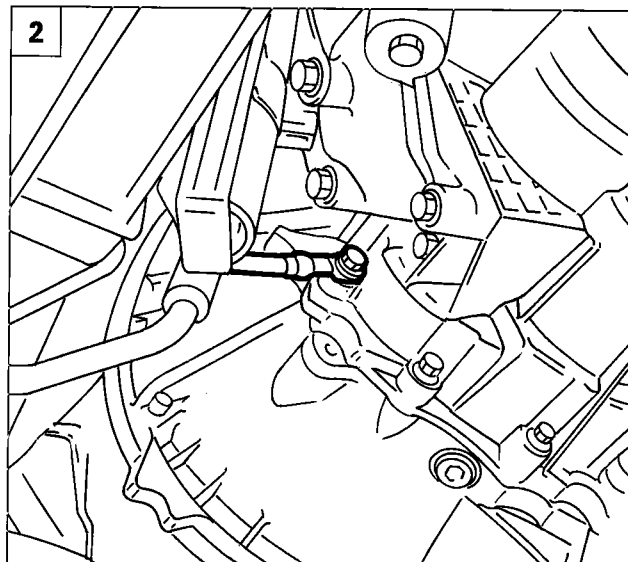


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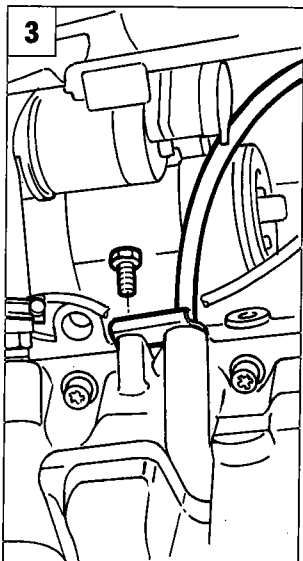
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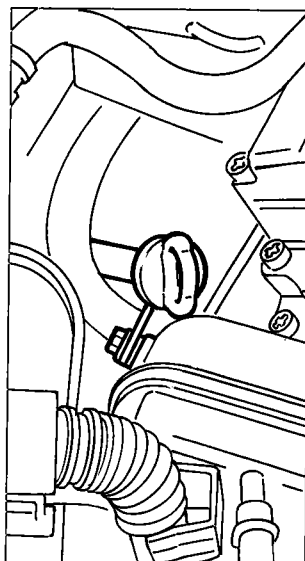
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P4F063B01



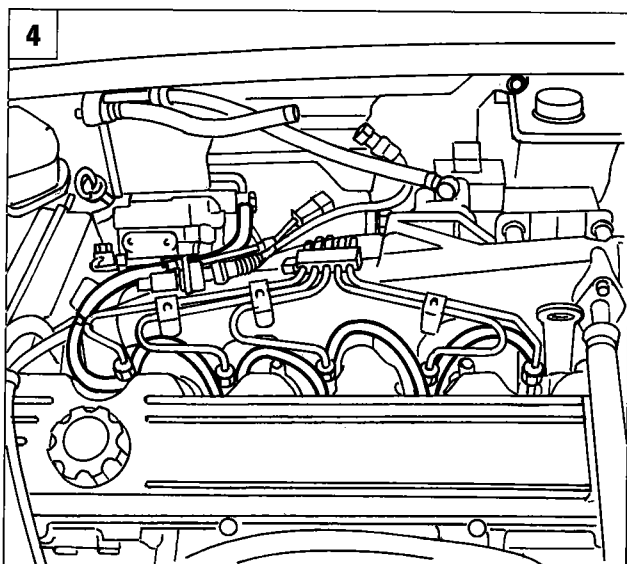
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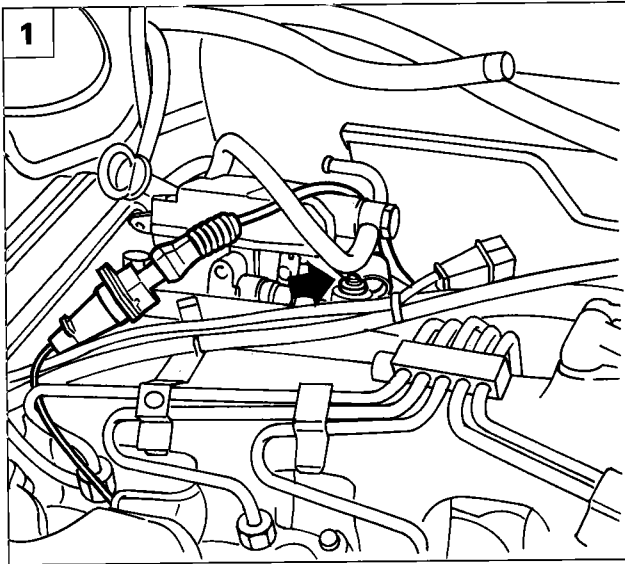
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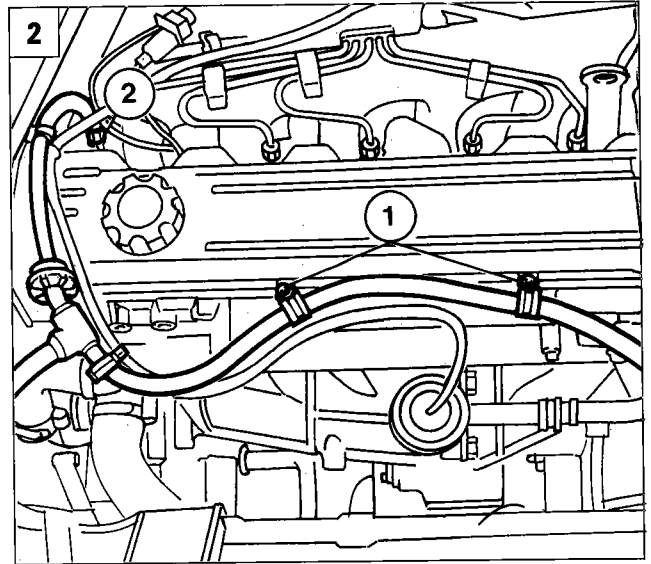
1. Remove the reaction rod from the support bracket by undoing the retaining screws shown.
2. Disconnect the engine earth shown from the gearbox bell housing.
3. Undo the lower bolt and upper bolt retaining the oil dipstick and remove.
4. Disconnect the diesel return lines shown from the injectors and injection pump.



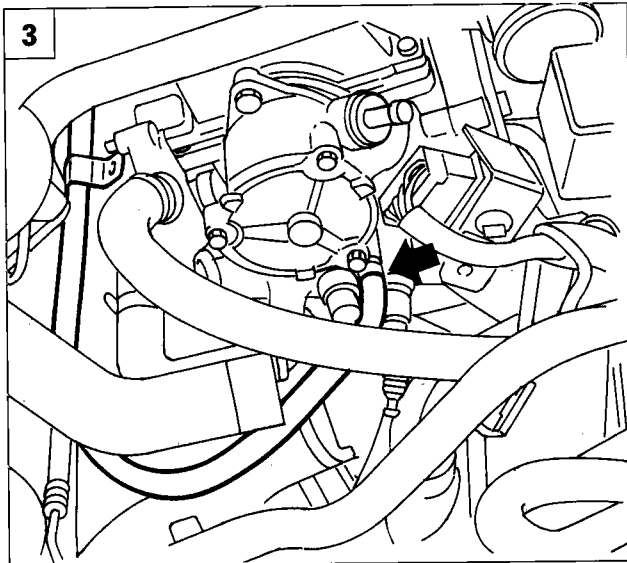
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P4F23FX01



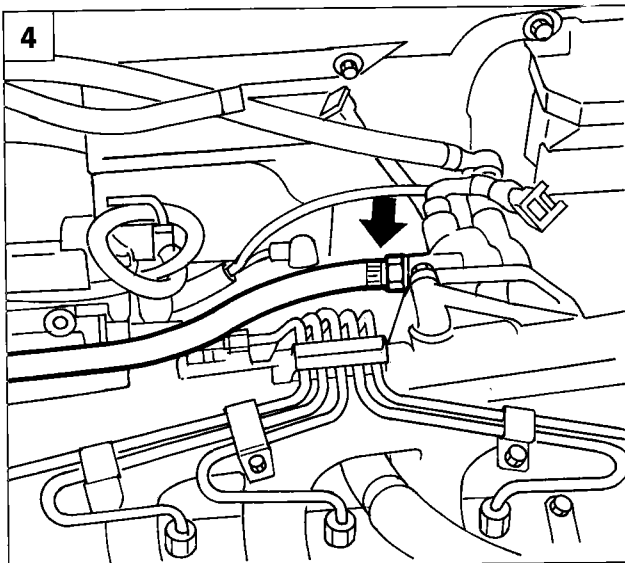
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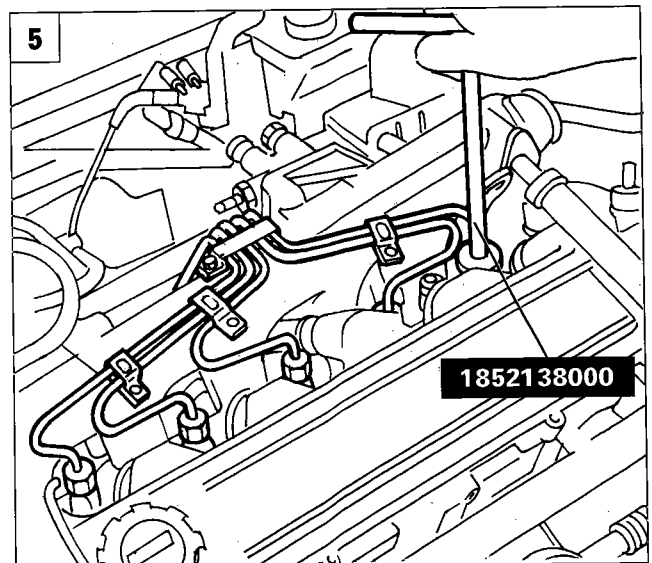
P4F23FX03



1. Disconnect electrical connection of the injector with controls, and disconnect the earth lead from the injection pump by undoing the nut shown.
2. Disconnect the pipe shown from the cylinder head, remove bolts (1) and loosen clip (2).
3. Disconnect the clip shown and put the side pipe to one side in the engine bay.
4. Disconnect the fuel delivery line to the injection pump from the fuel filter.
5. Use wrench 1852138000 to unscrew the fittings of the diesel lines on the injectors.



P4F23FX04

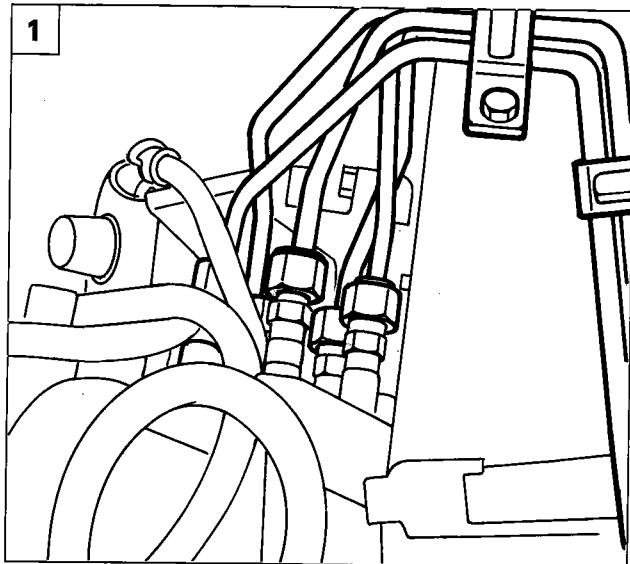


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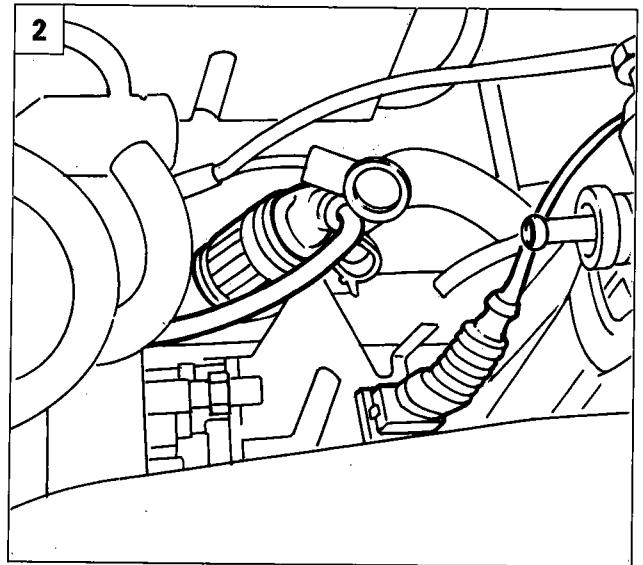
Engine

Removing - refitting cylinder head

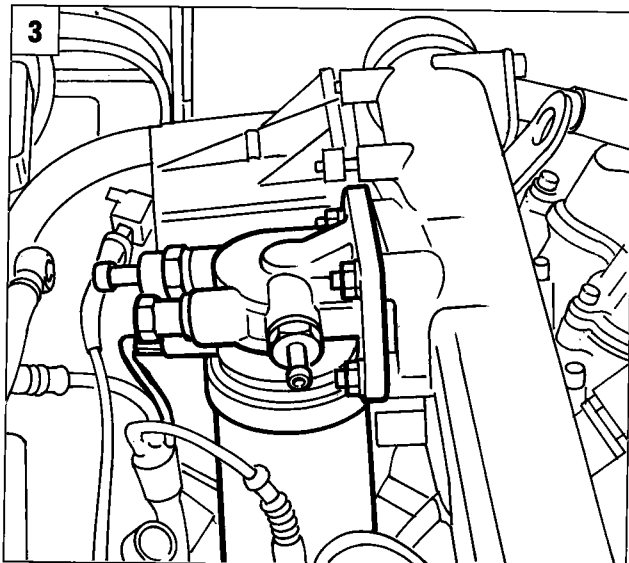
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P4F24FX01

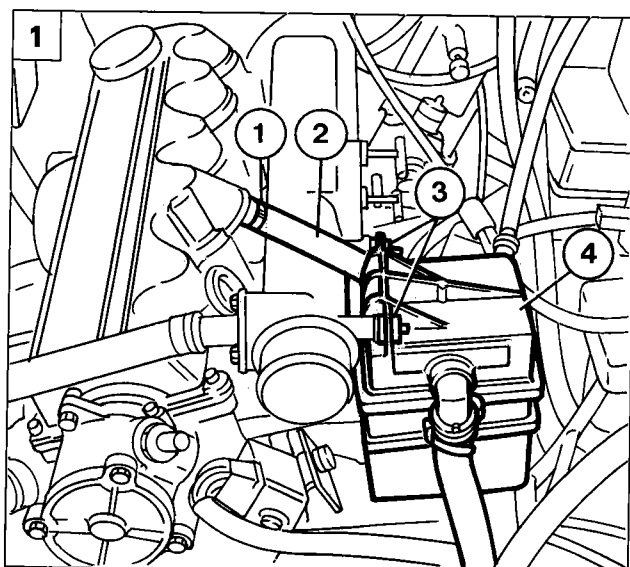


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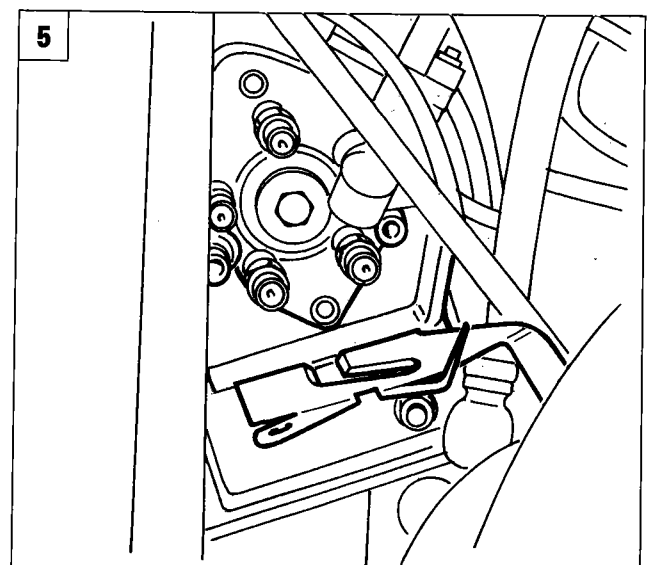


P4F24FX03

1. Unscrew the fittings of the diesel supply lines from the pump, then remove the lines.
2. Disconnect both electrical connections shown.
3. Disconnect electrical connection from filter, undo nuts retaining the diesel filter to the intake manifold and then remove the filter.
4. Loosen clip (1), disconnect pipe (2), unscrew nuts (3), then place the oil vapour separator (4) to one side.
5. Remove the bracket from the injection pump by unscrewing the bolts shown. These bolts also secure the injection pump to the mount.



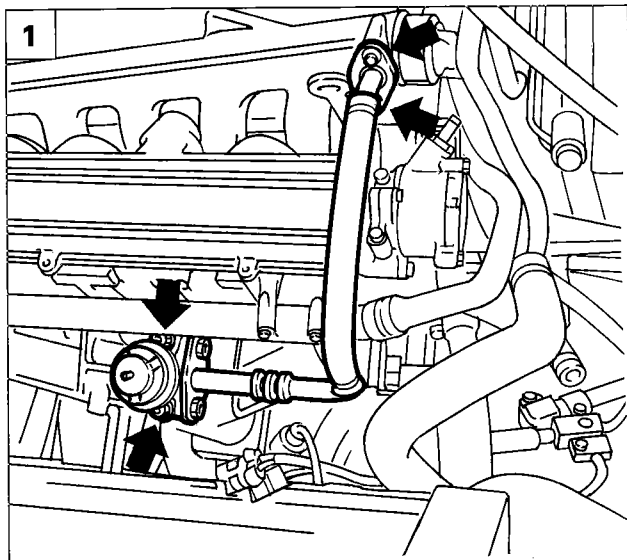
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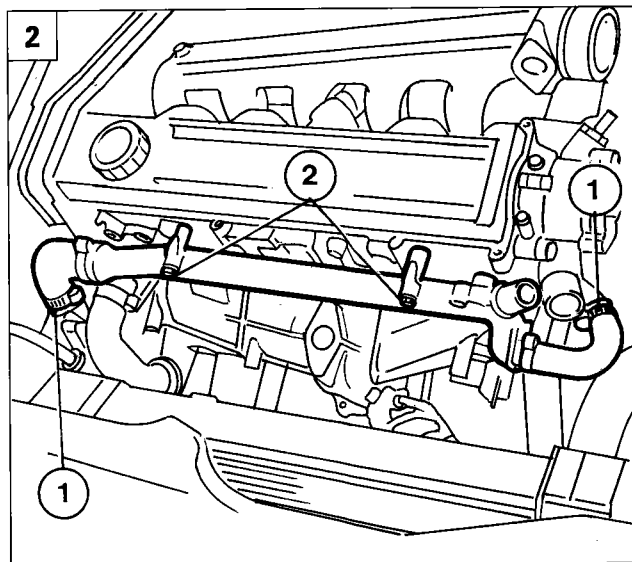
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Engine Removing - refitting cylinder head

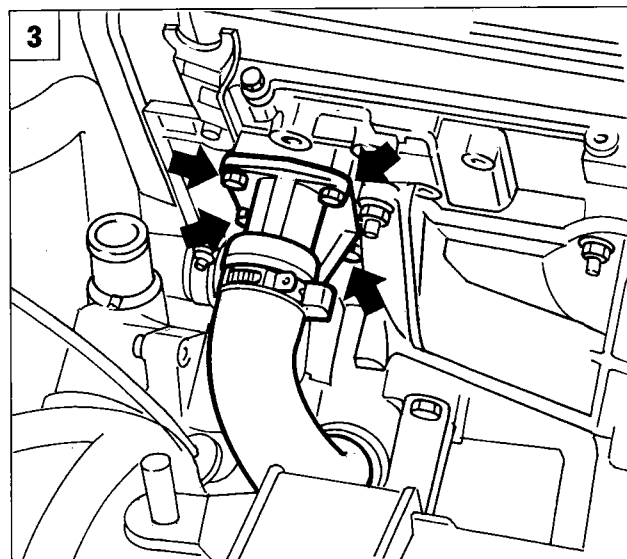
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P4F25FX01



P4F25FX02



P4F25FX03

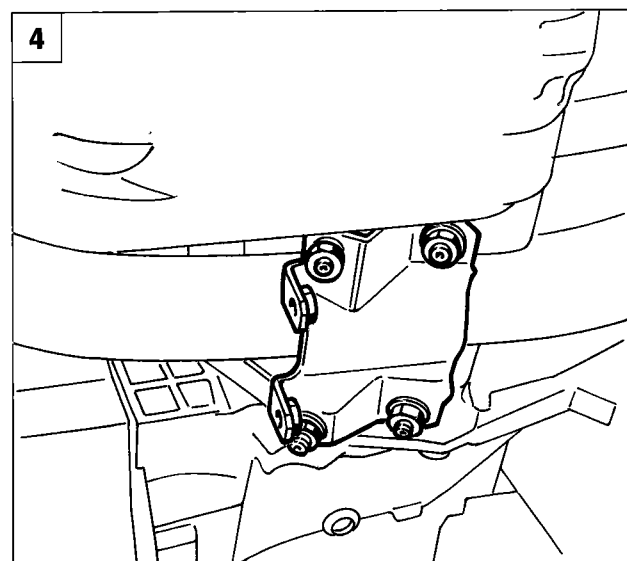


1. Remove the E.G.R. valve, complete with lines.
2. Loosen clips (1), unscrew bolts (2), then remove rigid engine coolant pipe from the cylinder head.
3. Unscrew the bolts fastening the coolant flexible sleeve and set to one side.

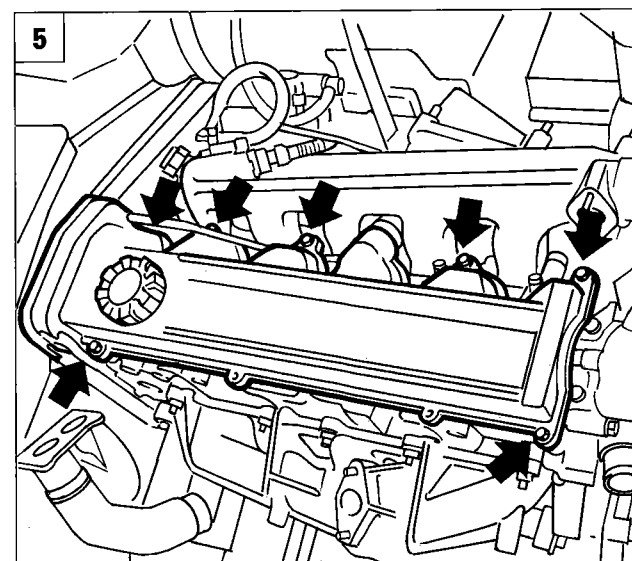


Remove the auxiliary component and timing belt as described in previous paragraphs.

4. Remove the antivibration bracket from the first exhaust pipe section.
5. Remove the cover from the cylinder head.



P4F25FX04

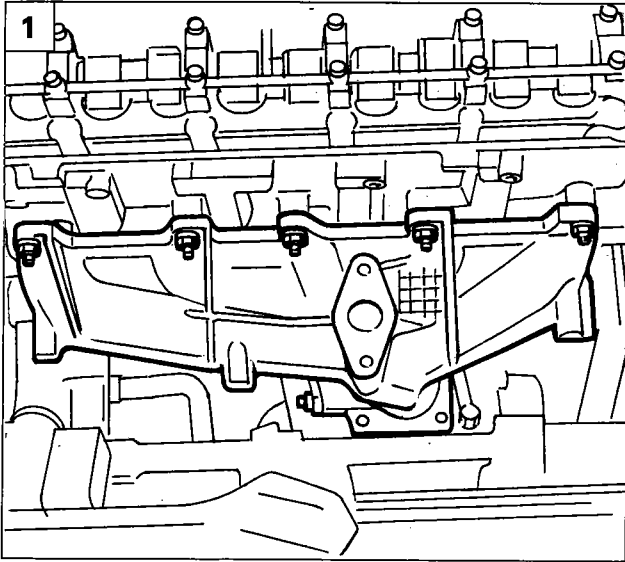


P4F25FX05

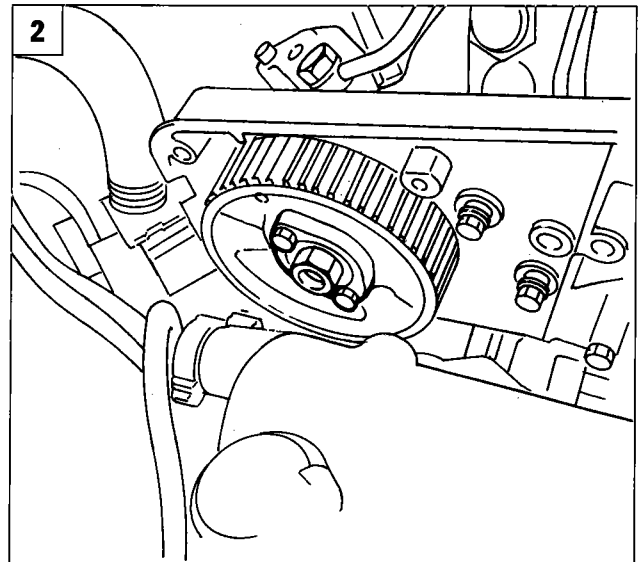
Engine

Removing - refitting cylinder head

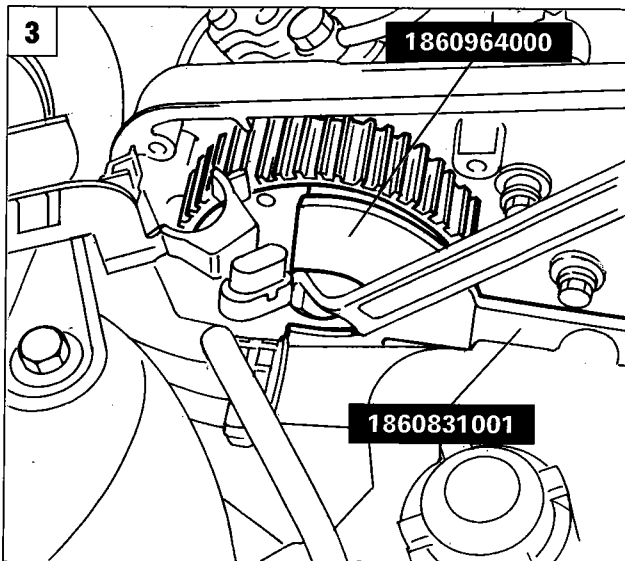
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P4F26FX01



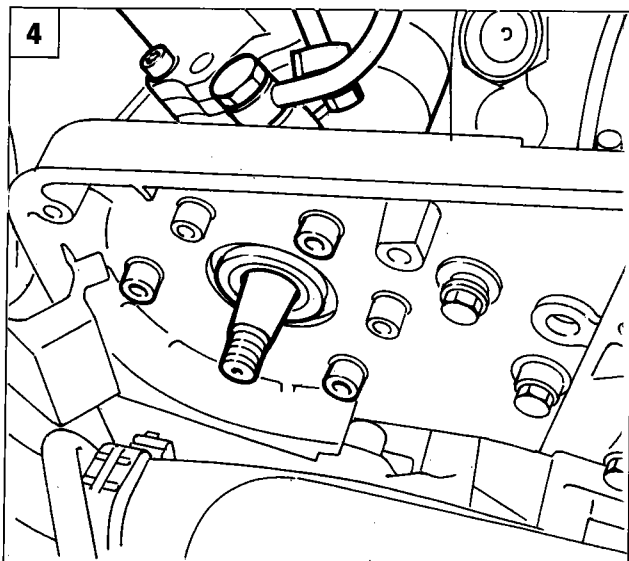
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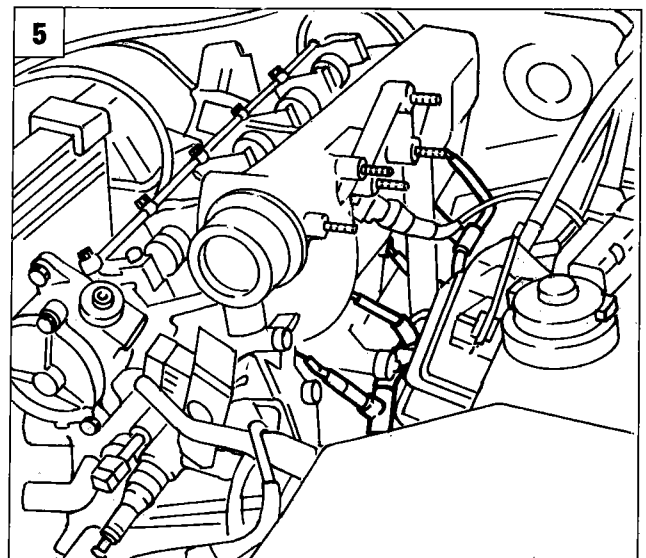
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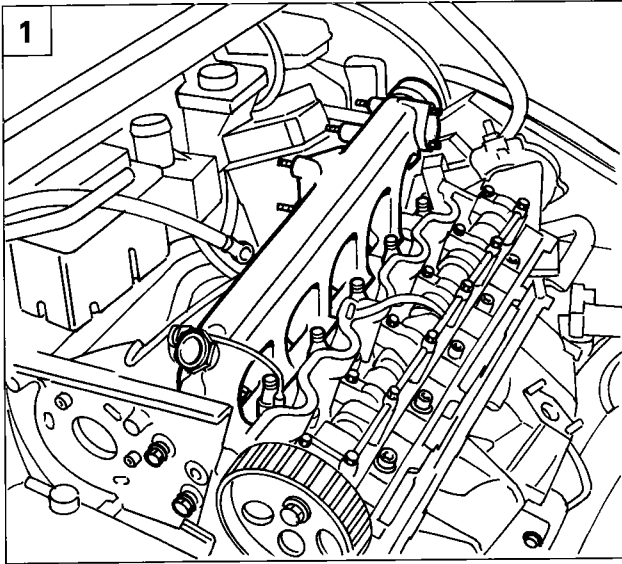
1. Undo nuts retaining the exhaust manifold to cylinder head and release the manifold from its studs.
2. Loosen nuts retaining the flange to the injection pump pulley.
3. Use tool 1860831001 and 1860964000 to release the injection pump pulley retaining nut and then remove from its seat.
4. Unscrew the bolts fastening the injection pump to the mount, then remove.
5. Disconnect glow plug supply leads.



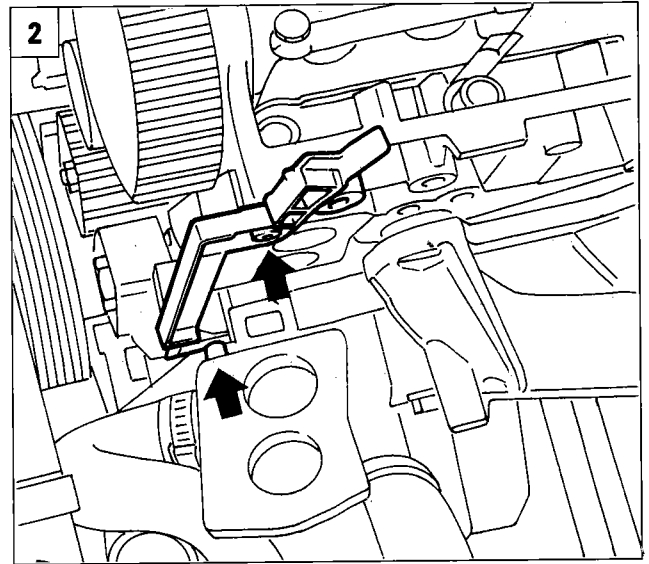
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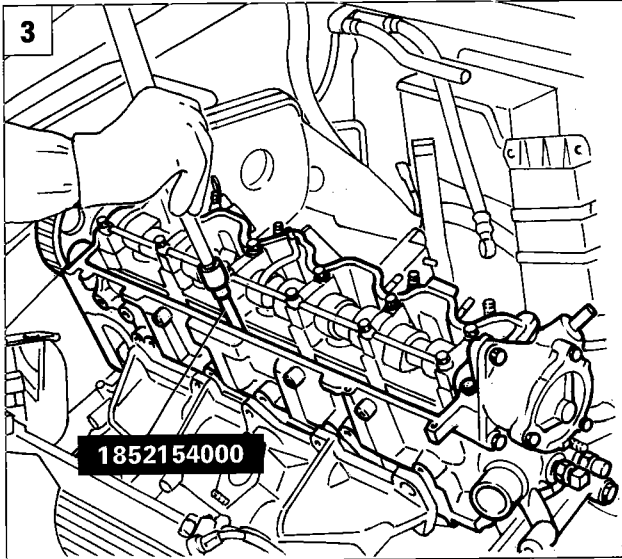
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P4F27FX01



P4F27FX02



P4F27FX03



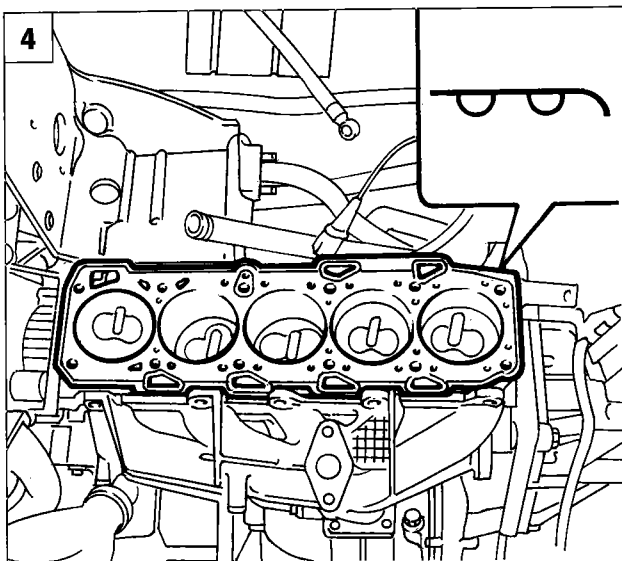
1. Remove the inlet manifold from the cylinder head.
2. Remove the plastic guard shown.
3. Use wrench 1852154000, to unscrew the bolts retaining the cylinder head to the crankcase, then remove.

REFITTING CYLINDER HEAD

Fitting gasket to cylinder head

4. After checking piston position in relation to top crankcase surface, in order to maintain compression ratio within specified limits, fit a cylinder head gasket of the thickness shown in the table.

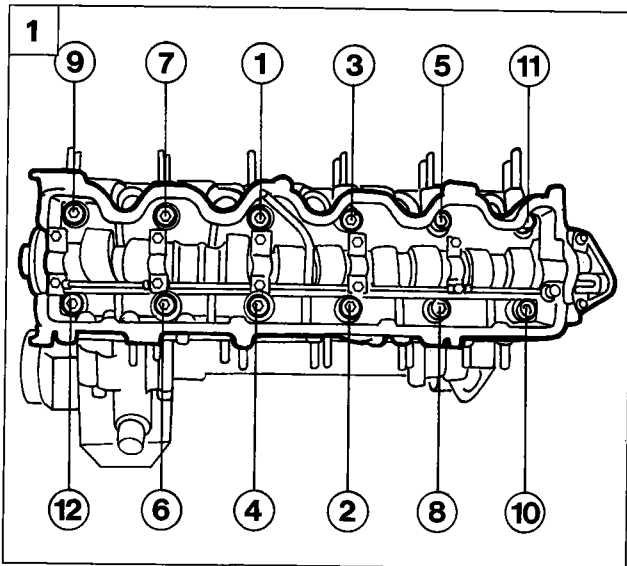
Position the cylinder head gasket with the wording **ALTO** facing the operator. Ensure that the gasket has been kept in its plastic bag before fitting. Do not lubricate or contaminate with oil and ensure that the crankcase surfaces are thoroughly clean before fitting.



P4F27FX04

Average piston protrusion	Head gasket thickness	No. of notches
up to 0.85 mm	1.6 mm	-
from 0.85 at 0.95 mm	1.7 mm	1
more than 0.95 mm	1.8 mm	2

10.

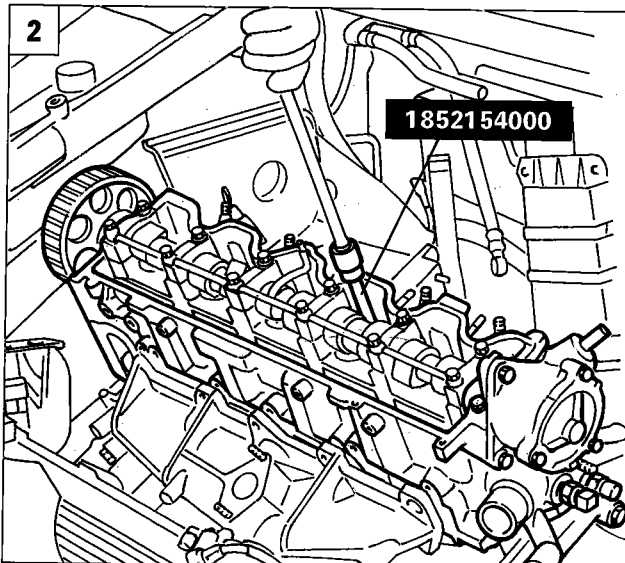


P4F28FX01



Cylinder head tightening

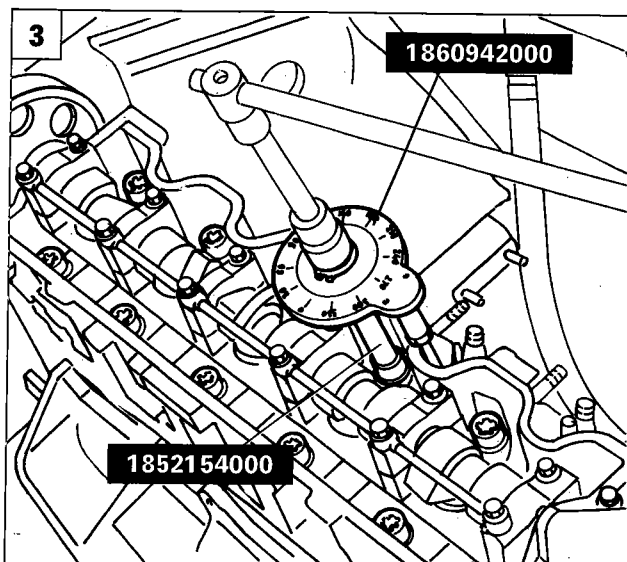
1. Position the cylinder head on the crankcase, then tighten the retaining bolts to torque noting that tightening order is as shown in the figure for each specified tightening stage.



P4F28FX03



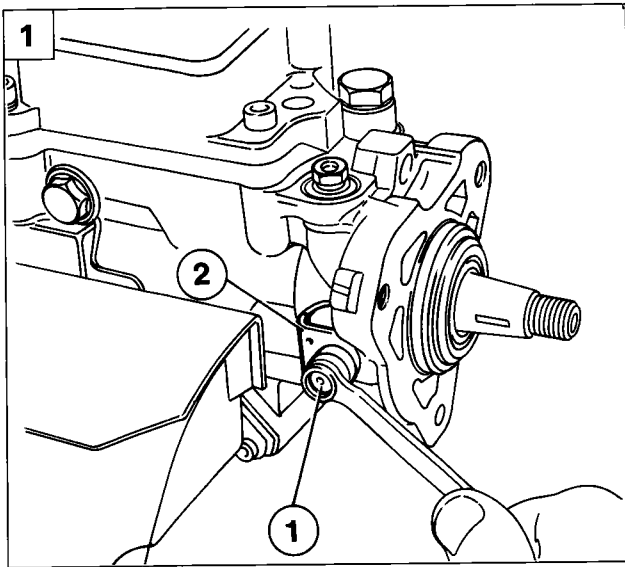
2. Oil screws and washers and leave to drain for at least 30 minutes; screw the bolts in to a torque of 2 daNm, then carry out final tightening to a torque of 6.5 daNm using wrench 1852154000.



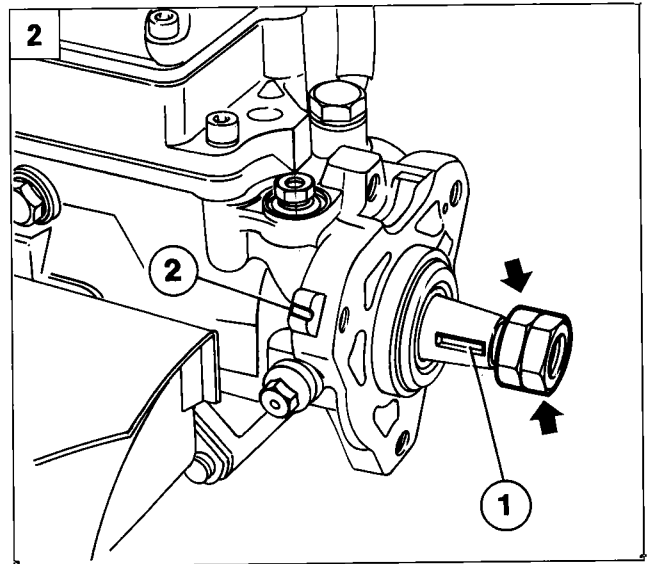
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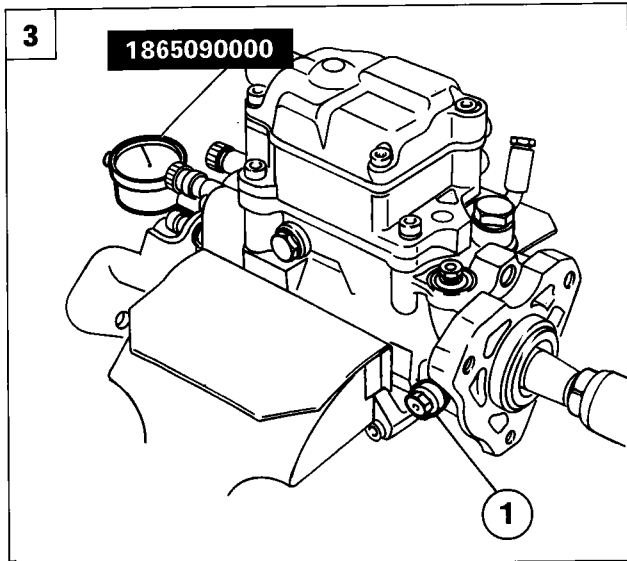
3. Tighten the bolts through an angle of 270° in three separate stages (90°+90°+90°) using wrench 1852154000 applied to tool 1860942000.



P4F29FX01



P4F29FX02

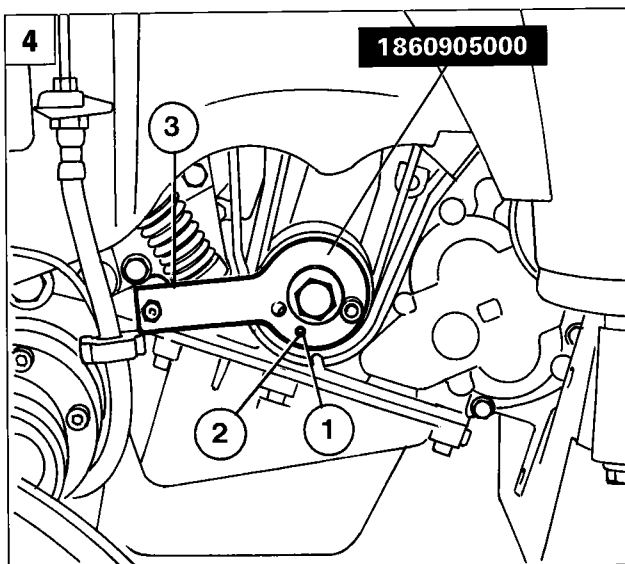


P4F29FX03



Refitting injection pump and adjusting timing

1. Secure the injection pump in a vice, then loosen the retaining bolt(1) and remove spacer (2).
2. Use a nut and lock-nut located at the threaded end of the pump shaft to align the key seat on pump (1) with the notch on pump case (2).
3. Remove the cap on the pump cover and tighten probe 1865090000 together with gauge into contact with the distributor piston crown. Turn the pump shaft anti-clockwise to the distributor piston BDC, as indicated by the gauge.

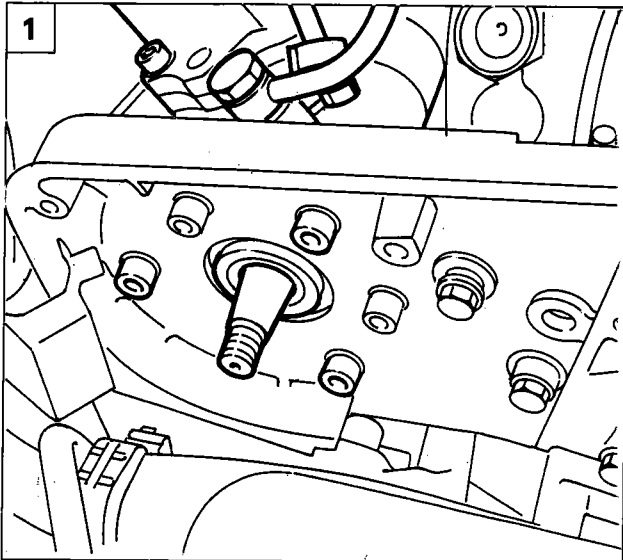


P4F15FX05

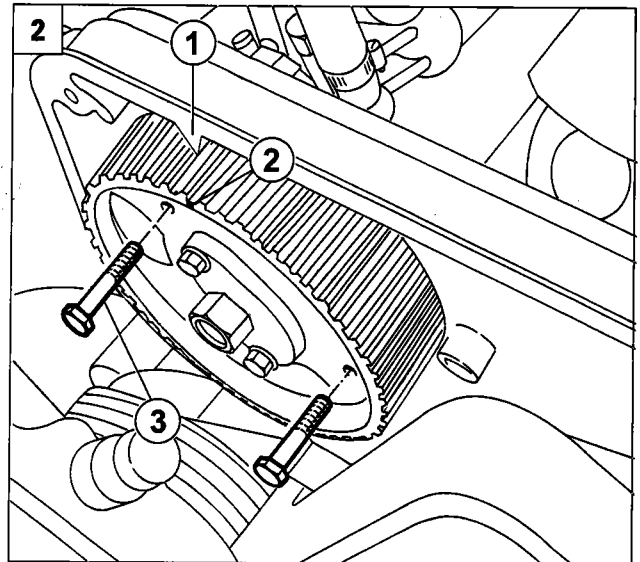
Reset the gauge to zero and turn the shaft clockwise until piston stroke is 0.75 mm. Prevent the shaft from turning by means of retaining bolt (1).

4. Fit the belt and position tool 1860905000 on the crankshaft gear and pin (3); turn the crankshaft by small amounts until centring dowl (2) fits into hole (1). In this position, the first cylinder is set to TDC.

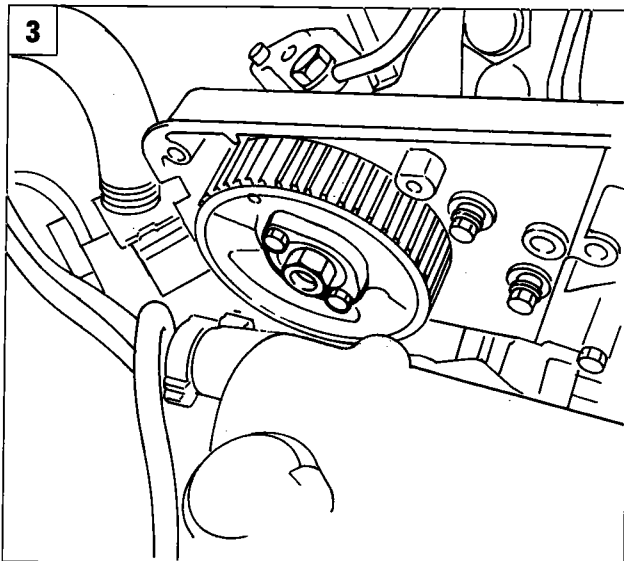
10.



P4F26FX04



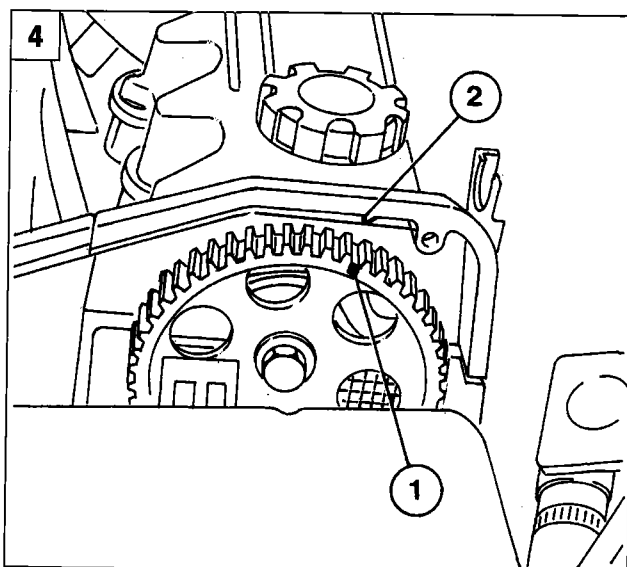
P4F30FX02



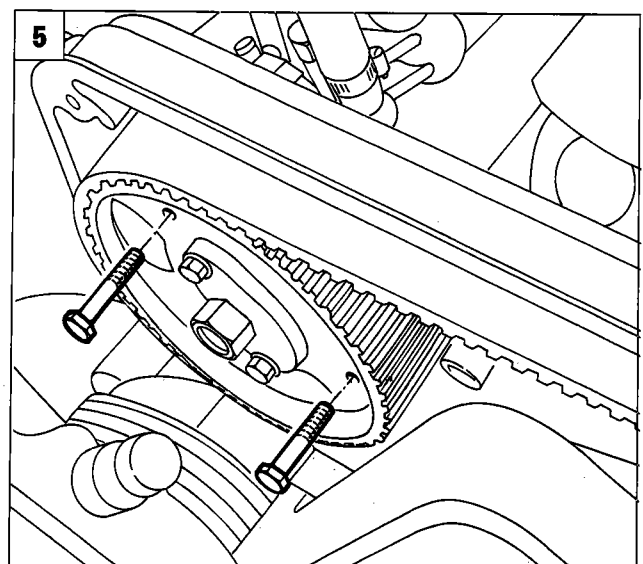
P4F26FX02



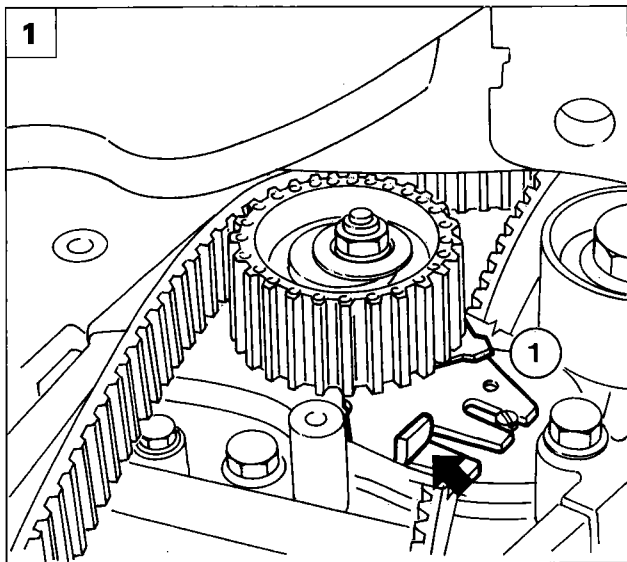
1. Fit the injection pump on the mount and tighten the retaining bolts shown.
2. Position the injection pump pulley and check that references (1) and (2) are aligned. Then tighten by means of the two bolts (3) located in the holes shown.
3. Screw in the flange retaining bolts.
4. Position the cam cover and check that pulley reference (1) is aligned with reference (2) on the cam cover.
5. Finish fitting the timing belt as described in the paragraph "Removing - refitting timing belt", and remove both bolts retaining the injection pump to the mount.



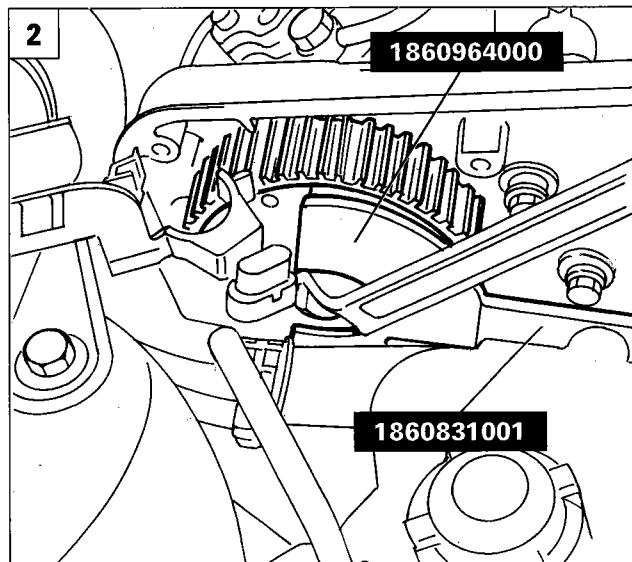
P4F30FX01



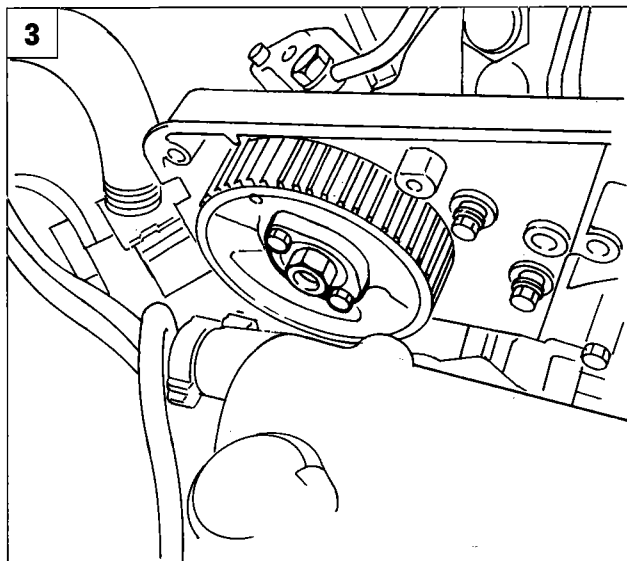
P4F30FX03



P4F18FX01



P4F26FX03



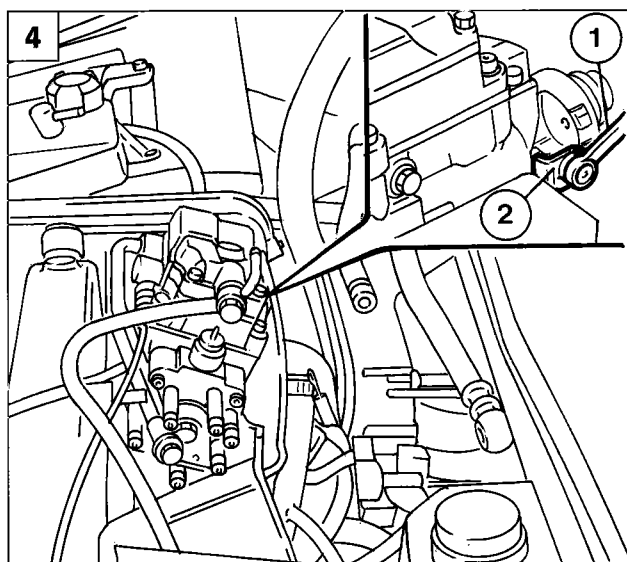
P4F26FX02



1. Apply a force at the point indicated on the automatic tensioner to move the mobile tensioner indicator (1) to the position of maximum tension.
2. Use tools 1860831001 and 1860964000 to secure and tighten the injection pump pulley retaining nut to the specified torque.
3. Tighten both bolts retaining the flange to the pulley.



If the reading on the gauge changes during tightening of the injection pump pulley, the correct original value must be reset by alternating the position of the slots on the pump mount. Release the three bolts and move the pump until the gauge shows a reading of 0.75 mm.



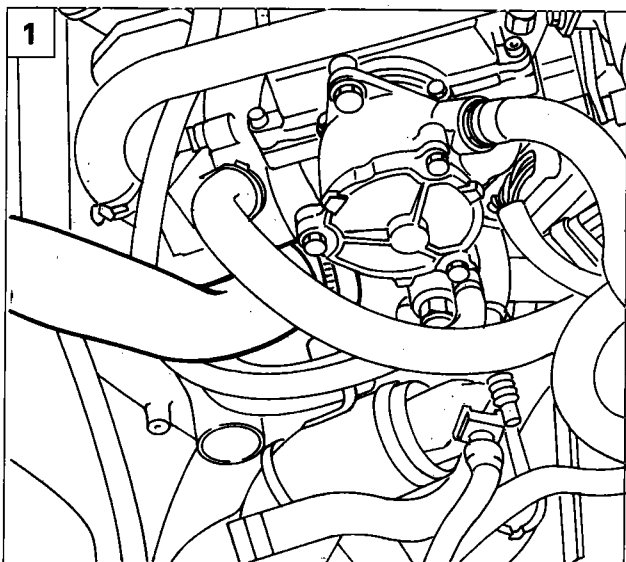
P4F31FX04

4. Loosen retaining bolt (1) and reposition spacer (2).

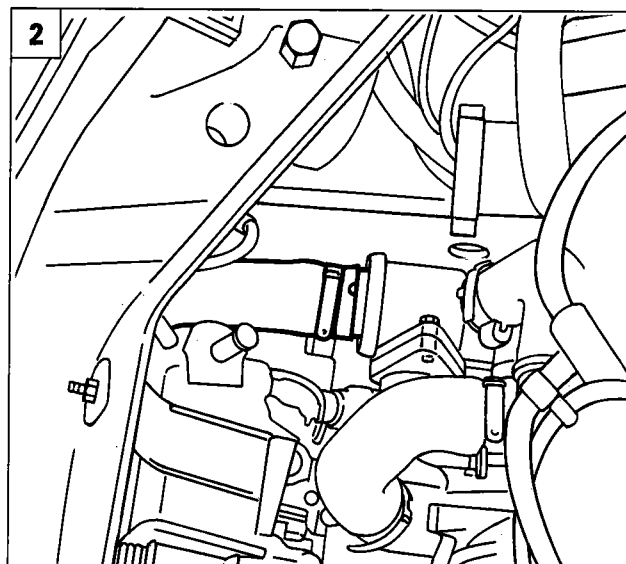


Remove tool 1860905000 then adjust the timing belt to rated tension as described in the previous paragraph. Refit the remaining components removed previously by reversing the removal instructions.

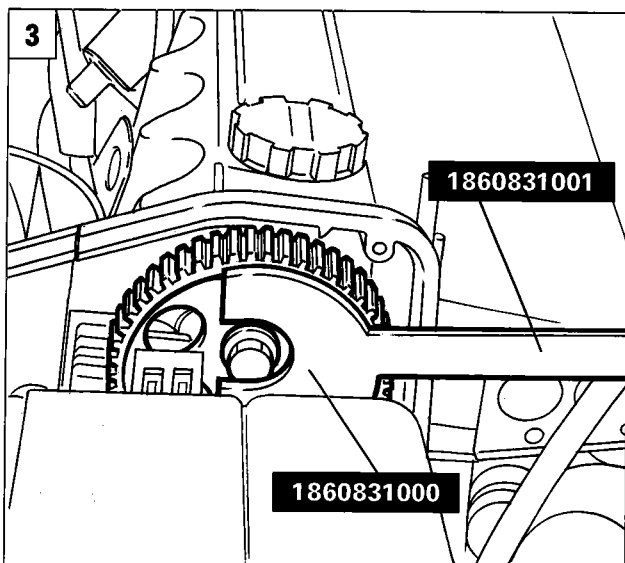
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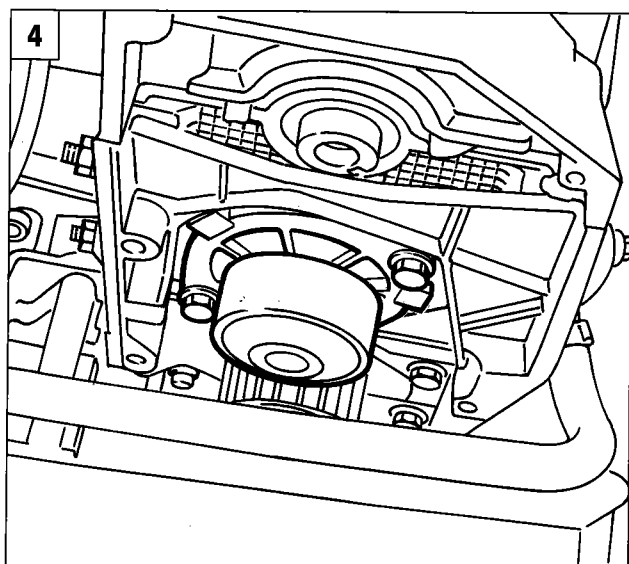
P4F02FX05



P4F03FX01



P4F32FX03



P4F32FX04

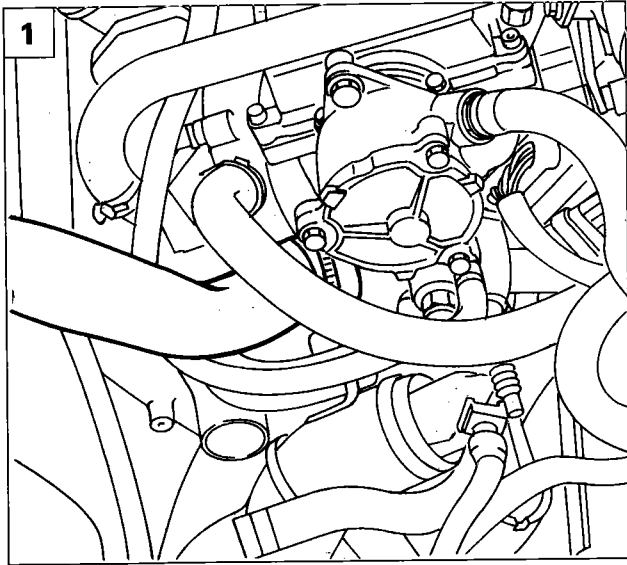


REPLACING COOLANT PUMP

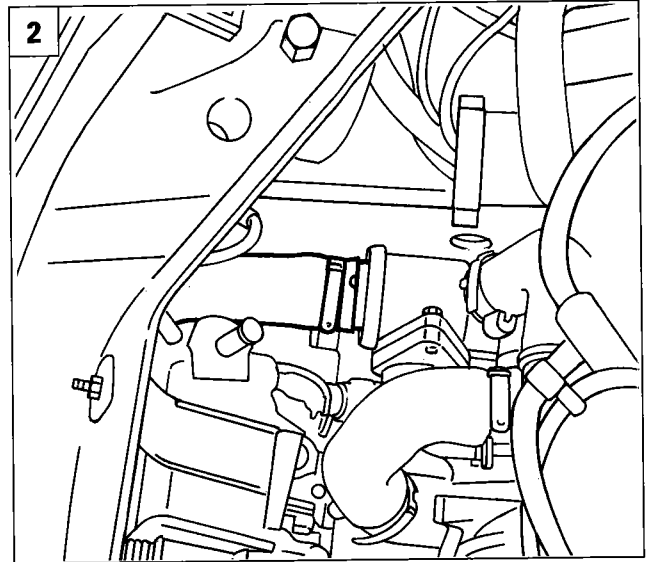


Before removing the coolant pump, remove the auxiliary component belt and the timing belt as described previously.

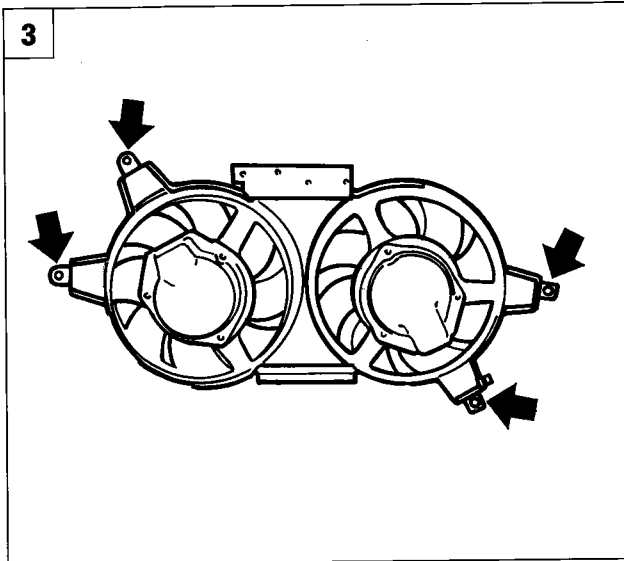
1. Position a suitable container to collect the coolant and remove the coolant intake sleeve from the points shown.
2. Remove the coolant outlet sleeve from the points shown.
3. Use tools 1860831001 and 1860831000 to unscrew the camshaft pulley retaining nut.
4. Remove the coolant pump from the cylinder head.



P4F02FX05



P4F03FX01

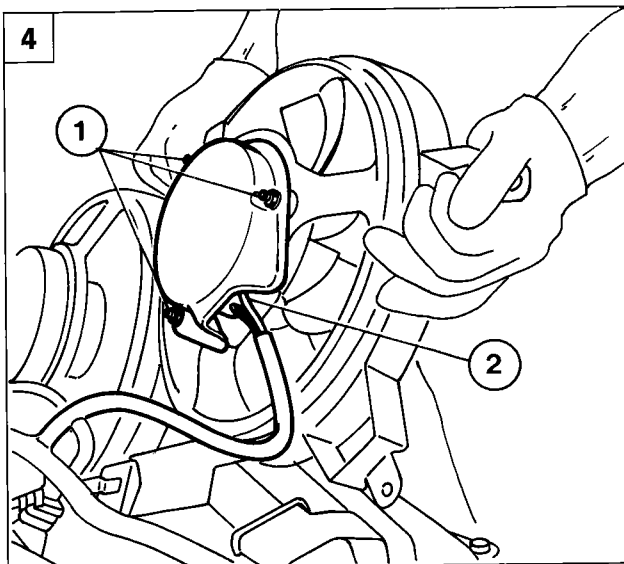


P4F03FX05

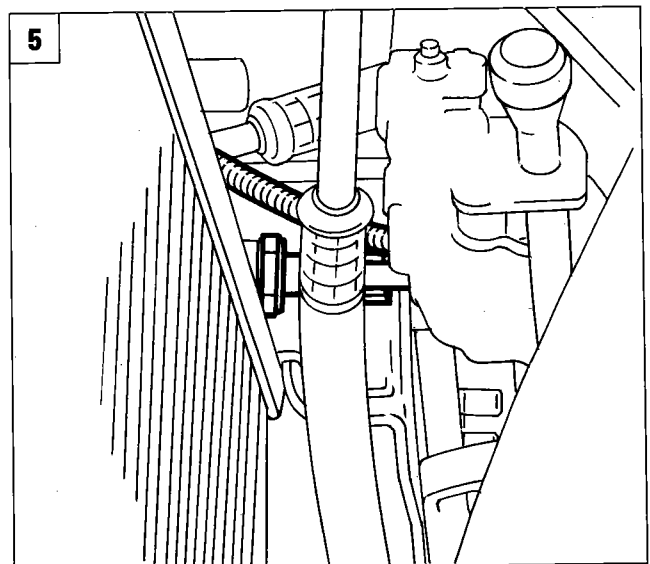


REMOVING - REFITTING RADIATOR

1. Position a suitable container to recover the engine coolant and remove the coolant intake sleeve from the points indicated.
2. Remove the coolant outlet sleeve from the point shown.
3. Undo the fan retaining bolts.
4. Loosen bolts (1) retaining the two heat shields, raise, disconnect connections (2), repeat the operations on the other cover and then remove the fan.
5. Disconnect the bulb shown from the radiator.

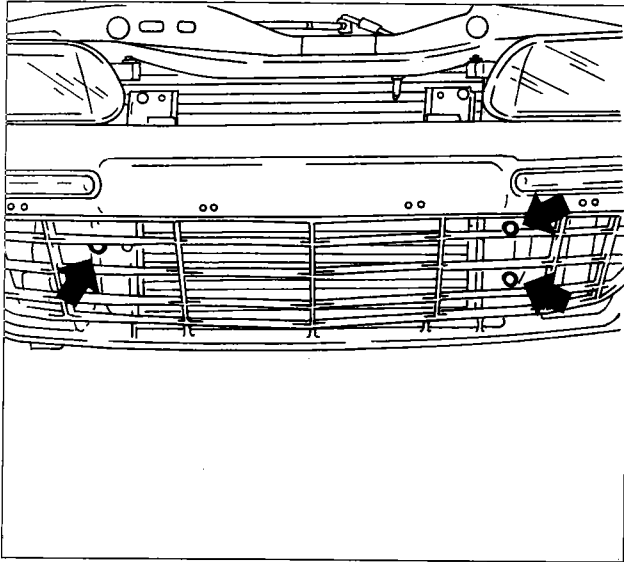


P4F04FX01



P4F33FX05

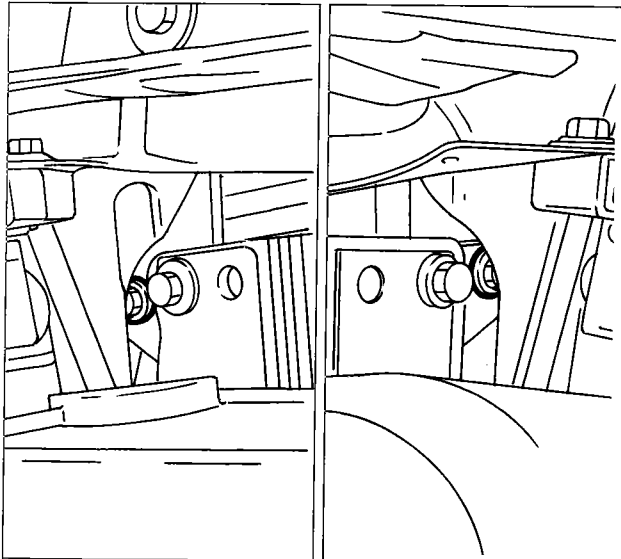
10.



P4F34FX01



1. Unscrew screws fastening the air shroud to the radiator.

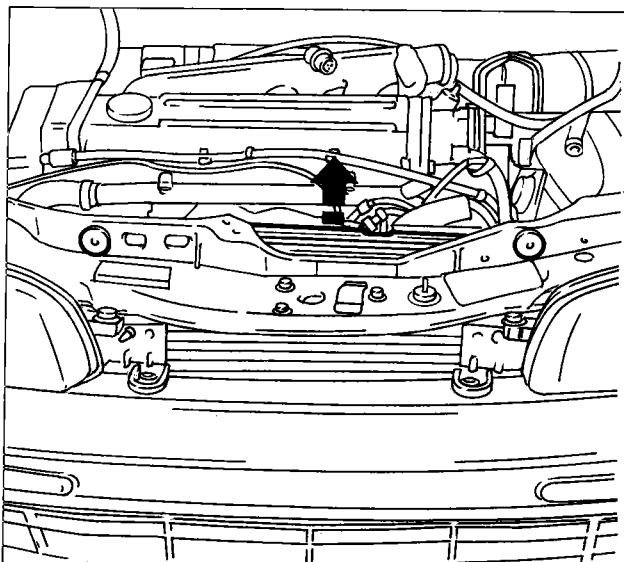


P4F34FX02

P4F34FX03



2. Separate the radiator from the condenser by unscrewing the retaining screws shown.



P4F34FX04



3. Unscrew both bolts retaining the radiator to the body, release from the lower retaining pins and remove the radiator from the upper part of the car.

COOLING SYSTEM FILLING PROCEDURE (HEATED VERSION)

Procedure not available at the time of going to press. Will be published during a future update.

COOLING SYSTEM FILLING PROCEDURE (VERSION WITH A/C)

Procedure not available at the time of going to press. Will be published during a future update.

