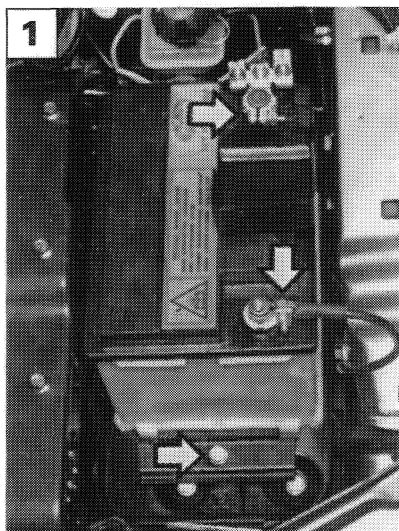


PUNTO eMANUAL

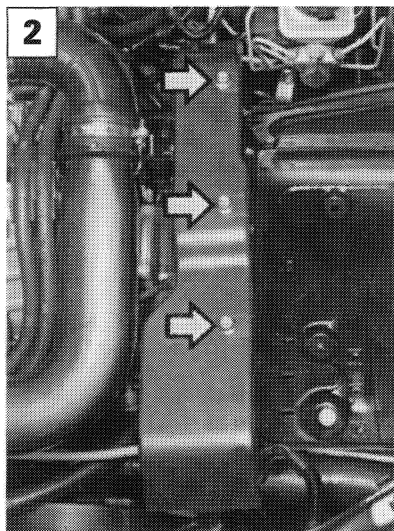
Engines

Title	Page
Removal/refitting power unit	1 ➡
Separating gearbox from power unit	12 ➡
Drawings	15 ➡
Removal/refitting timing belt	17 ➡
Removal/refitting cylinder head	25 ➡

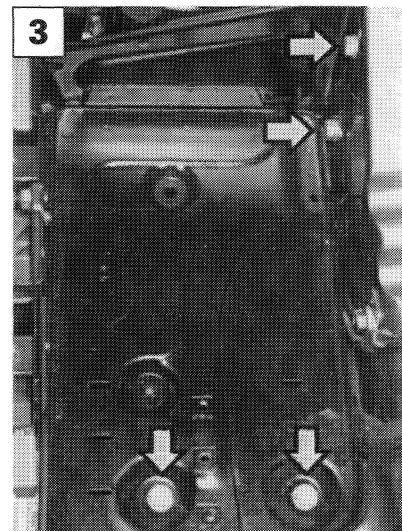
REMOVING-REFITTING POWER UNIT



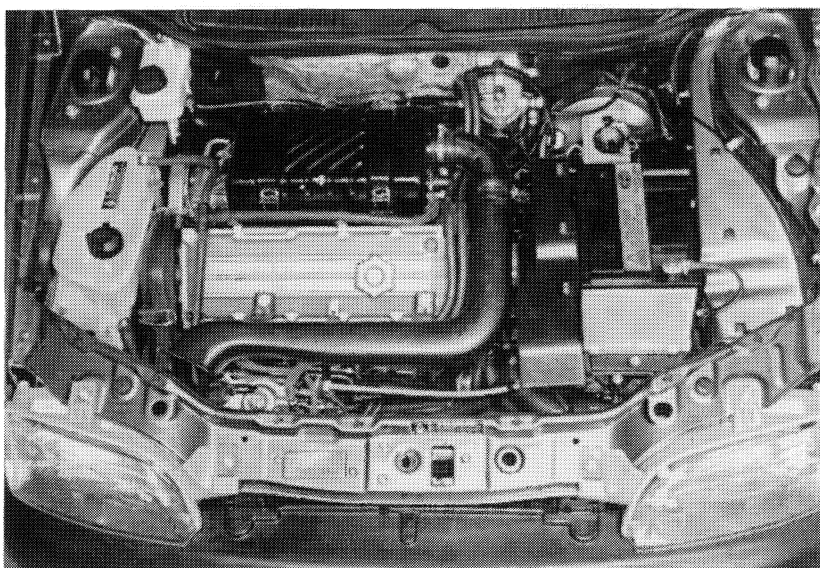
P3M001X01



P3M001X02



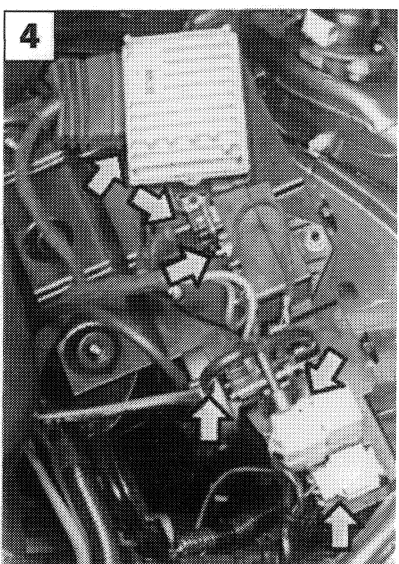
P3M001X03



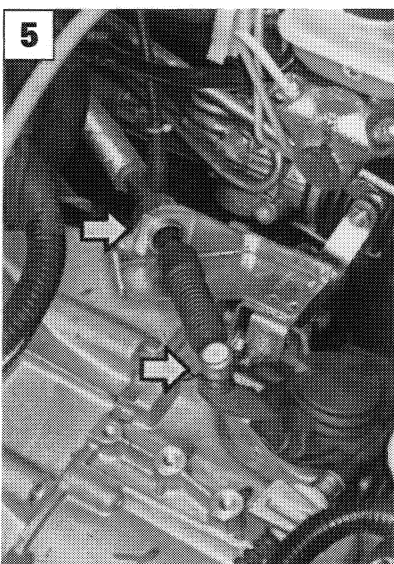
P3M001X04

Remove the bonnet lid, position vehicle on lift, drain coolant and engine oil, then proceed as follows.

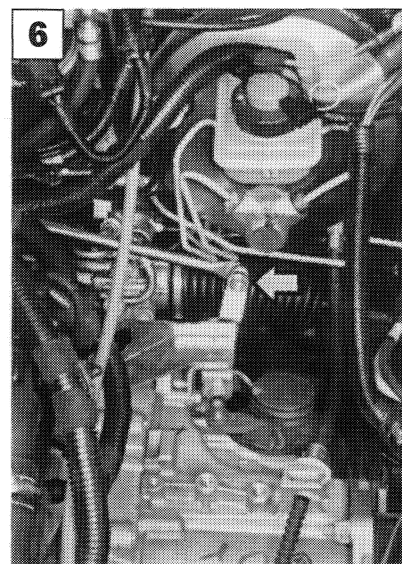
1. Disconnect leads, unscrew retaining screw and remove battery.
2. Unscrew bolts and remove relay guard.
3. Unscrew bolts and turn battery cradle.
4. Disconnect connectors shown and remove battery cradle.
5. Disconnect gear lever, remove retaining plate and extract gear engagement cable.
6. Unscrew nut and remove gear selection idler lever.



P3M001X05

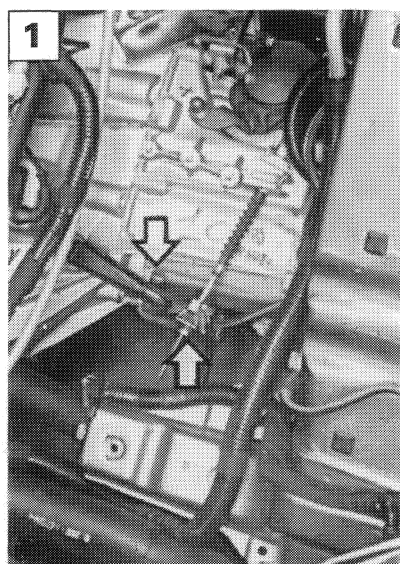


P3M001X06

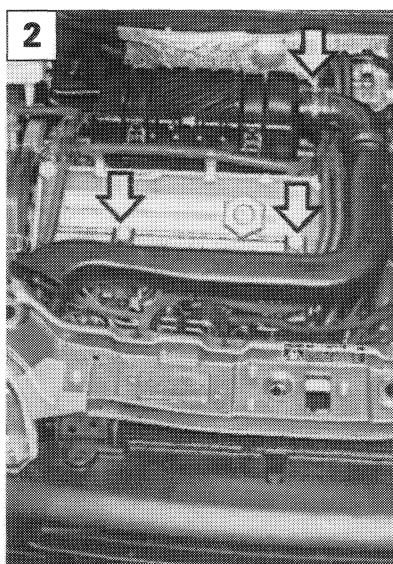


P3M001X07

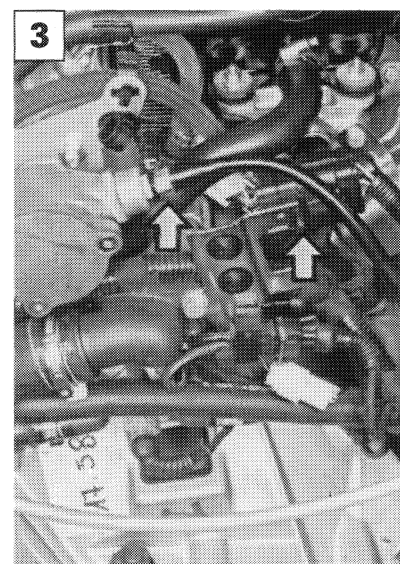
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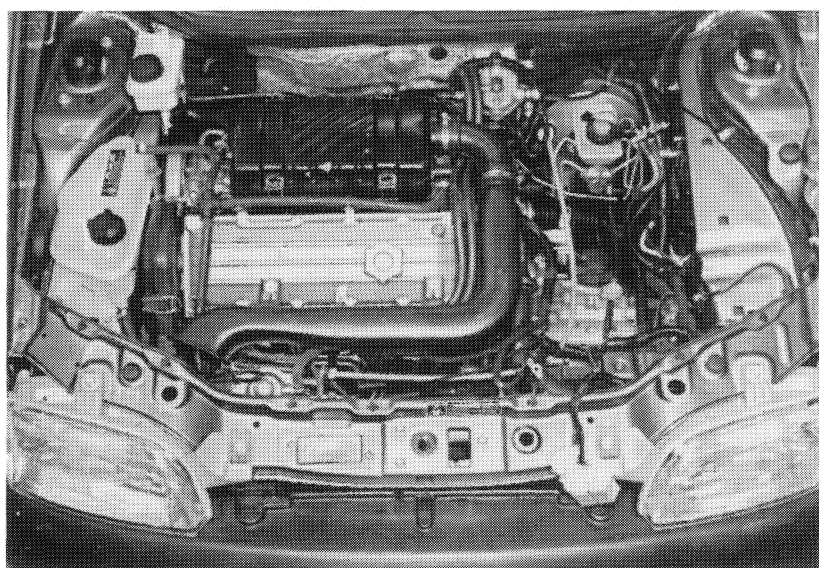
P3M002X01



P3M002X02

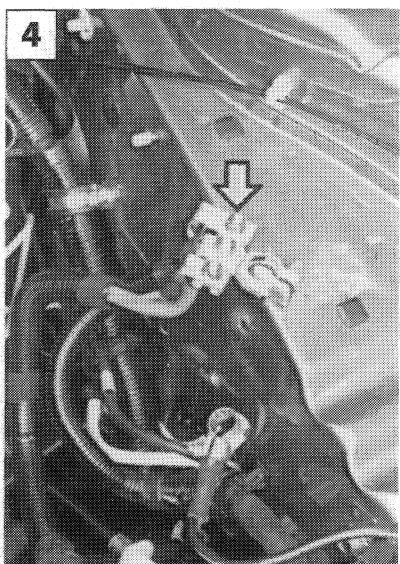


P3M002X03

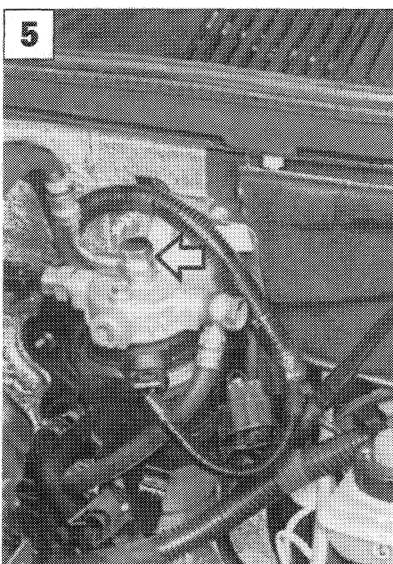


P3M002X04

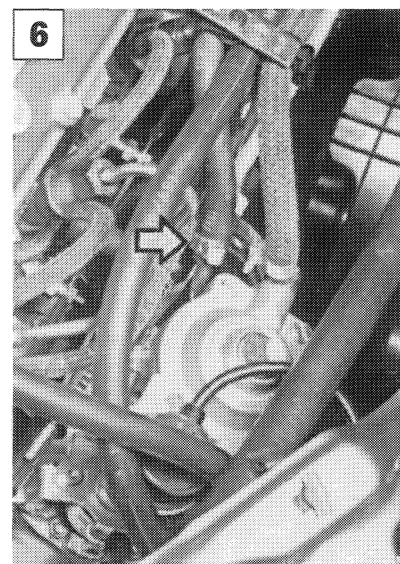
1. Disconnect the clutch cable and disconnect the earth lead.
2. Unscrew clip and screws indicated, then remove air intake pipe to cleaner.
3. Loosen clip, then disconnect vacuum pipe and connector shown in figure.
4. Separate lead indicated from battery terminal.
5. Unscrew screw and disconnect fuel delivery pipe to pump.
6. Remove clip and disconnect fuel return pipe from pump.



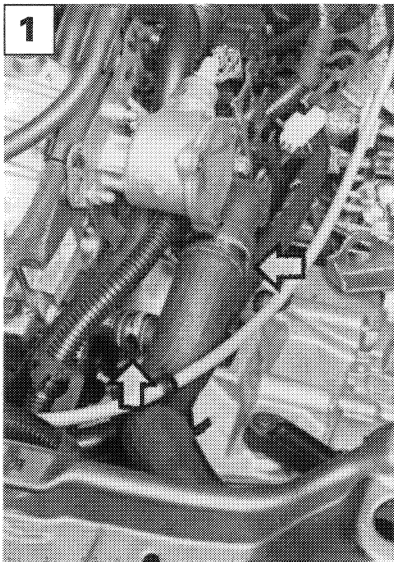
P3M002X05



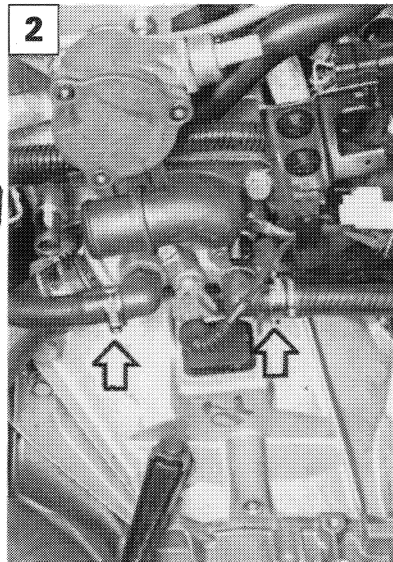
P3M002X06



P3M002X07



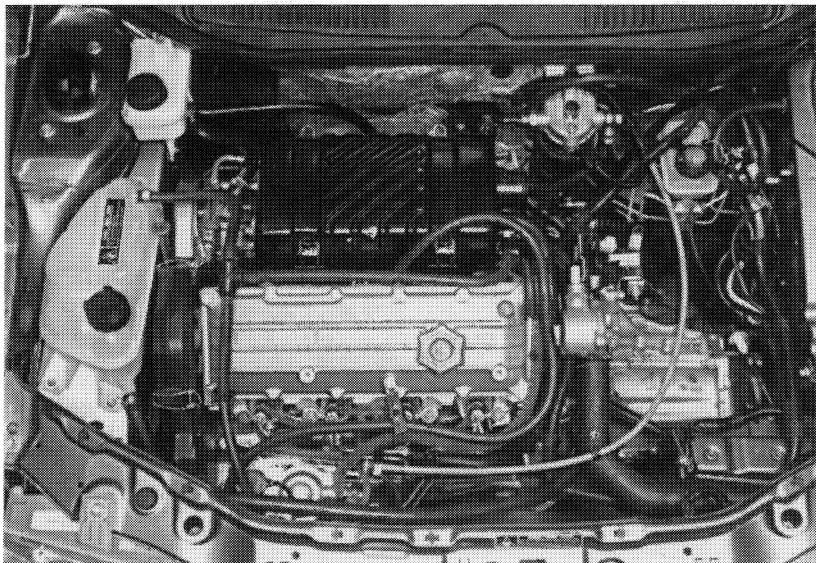
P3M003X01



P3M003X02

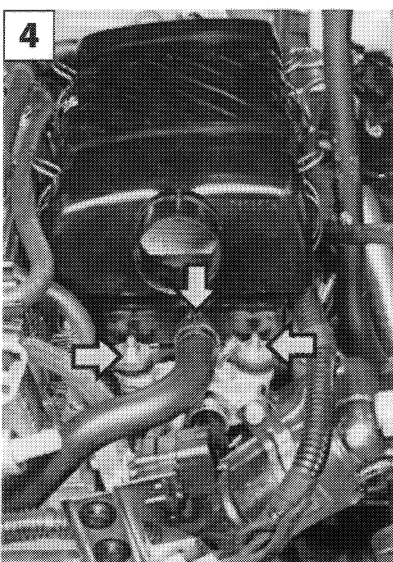


P3M003X03

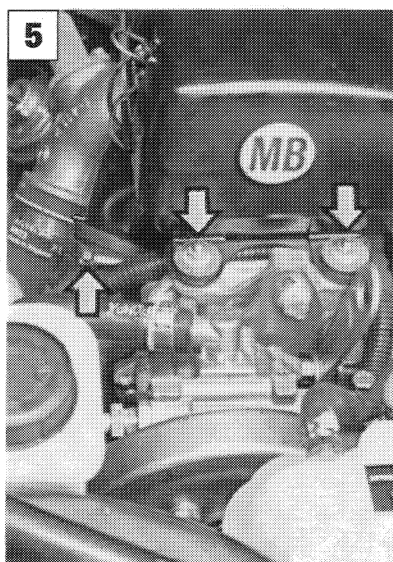


P3M003X04

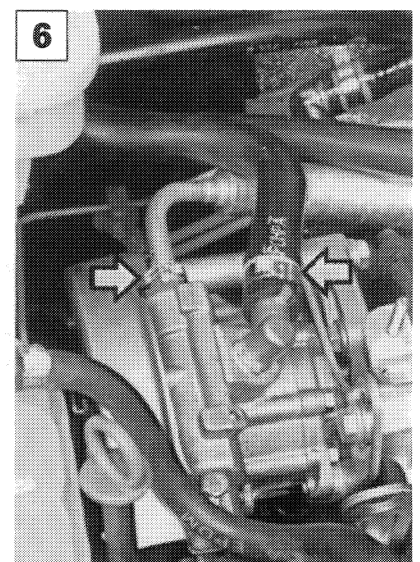
1. Loosen clips and disconnect pipes from thermostat to radiator and pump to vehicle interior heater.
2. Loosen clips and disconnect coolant return lines from interior heater, from the radiator and from the expansion tank.
3. Disconnect mileometer point and speedometer from gearbox.
4. Unscrew retaining nuts, loosen clip and disconnect sleeve.
5. Unscrew retaining nuts, disconnect sleeve by loosening clip and then remove the air cleaner.
6. Drain fluid from power steering system. Then disconnect pipes from power steering pump.



P3M003X05

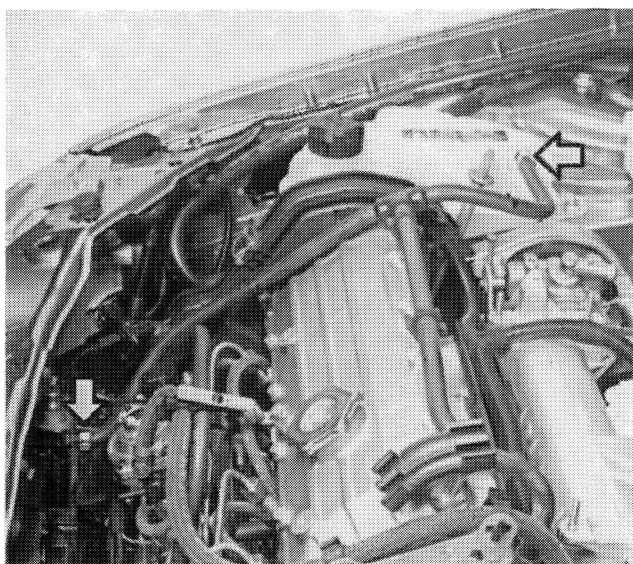


P3M003X06



P3M003X07

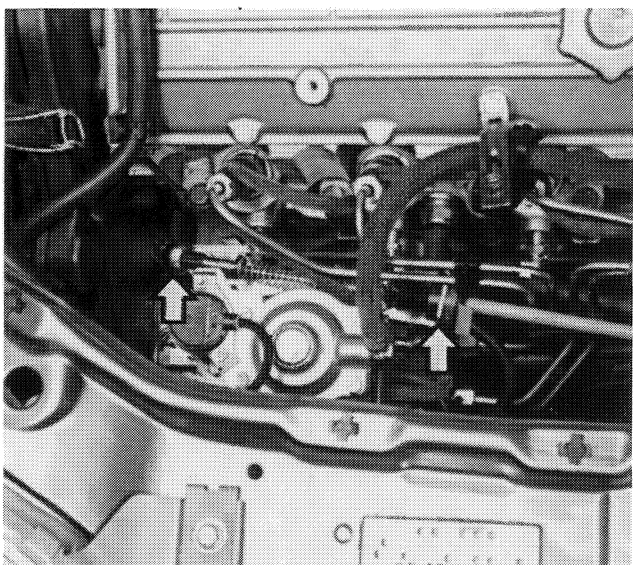
10.



P3M004X01



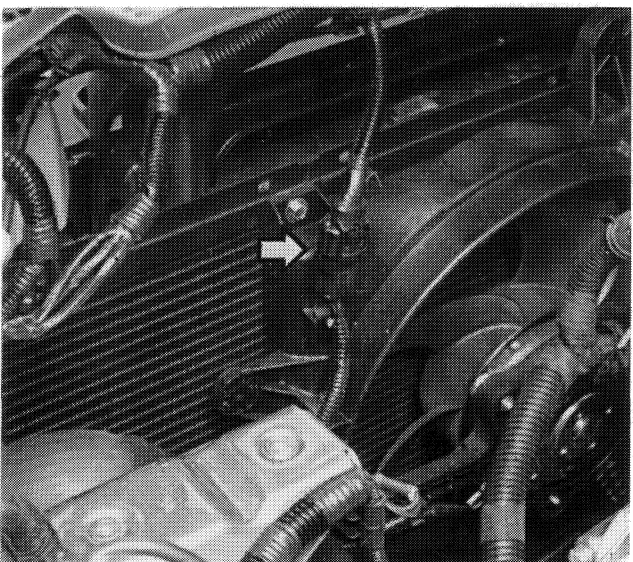
- Loosen clips and disconnect pipes from radiator and expansion tank;



P3M004X02



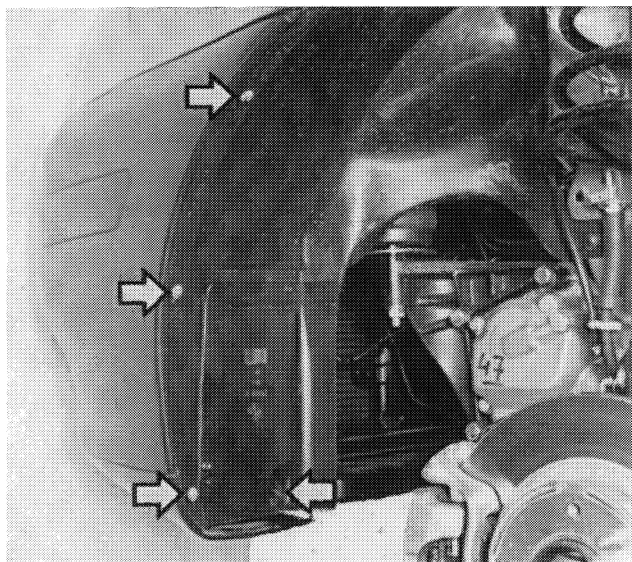
- disconnect accelerator cable after releasing pin and retaining plate;



P3M004X03



- disconnect connector of coolant temperature sensor for activating/deactivating fan;



P3M005X01



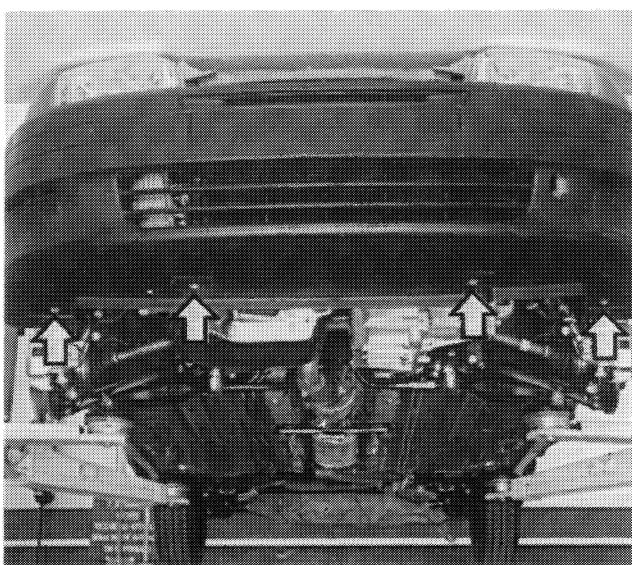
- unscrew screws retaining wheel arch protection to bumpers to gain access to fastening points beneath;



P3M005X02



- prise off wheel arch protection;
- unscrew screw retaining bumper to wing;

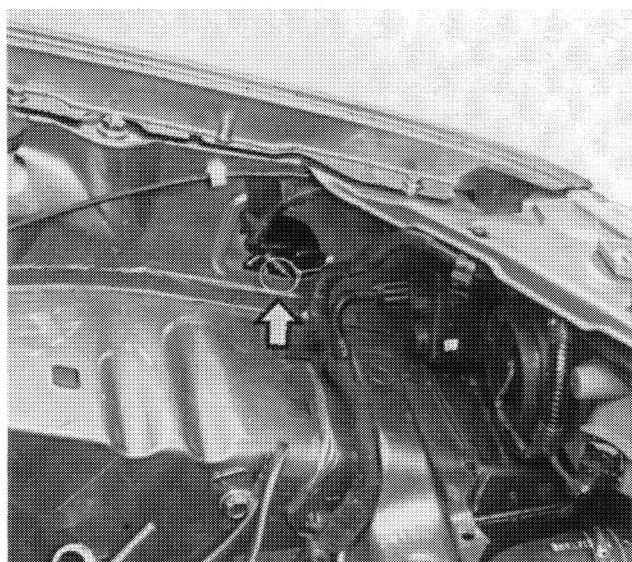


P3M005X03

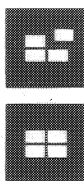


- unscrew front bumper lower retaining screws;

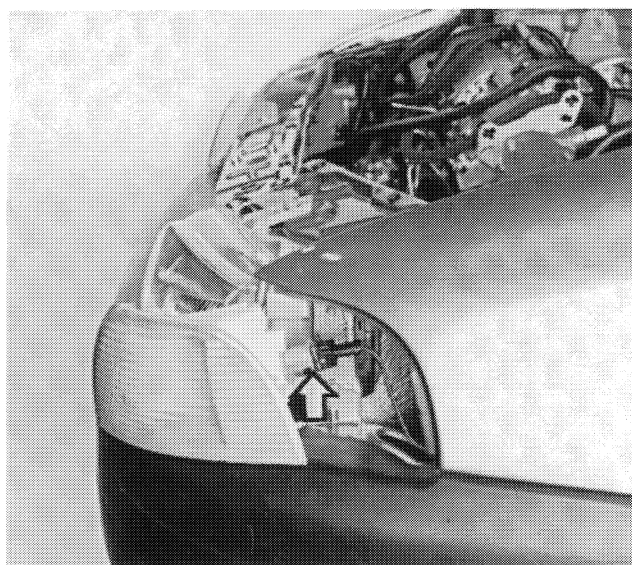
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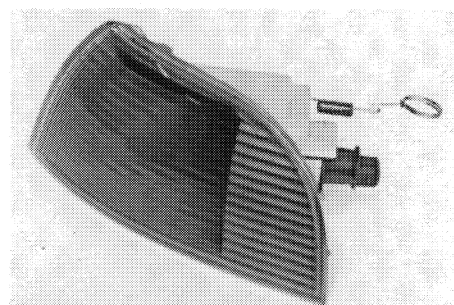
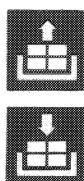
P3M006X01



- working from engine bay, release front turn signal retaining clip;

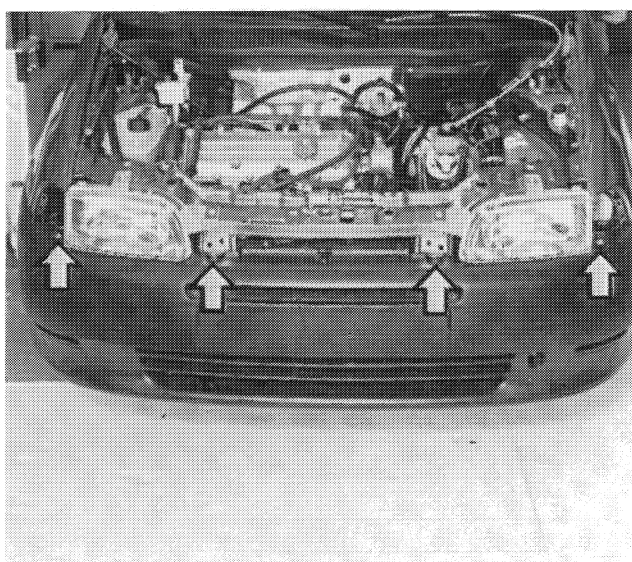


P3M006X02

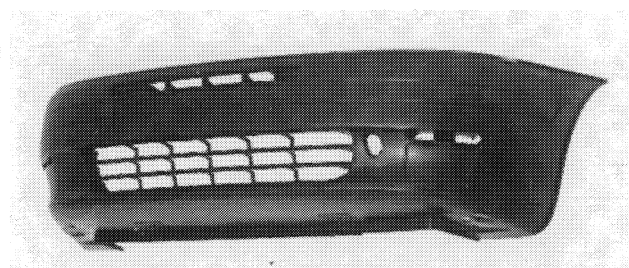
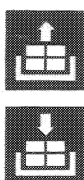


P3M006X03

- disconnect connector shown and remove front turn signal;

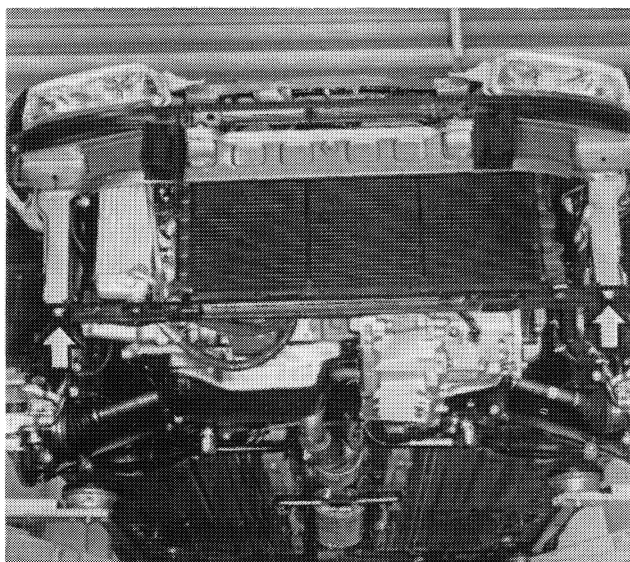


P3M006X04

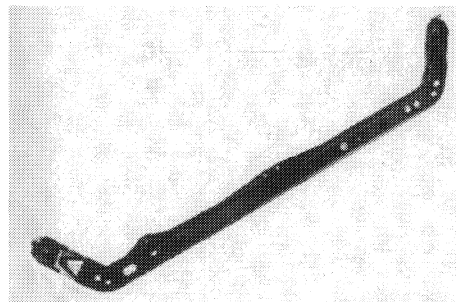


P3M006X05

- unscrew top retaining bolts, then disconnect the front bumper from the body;

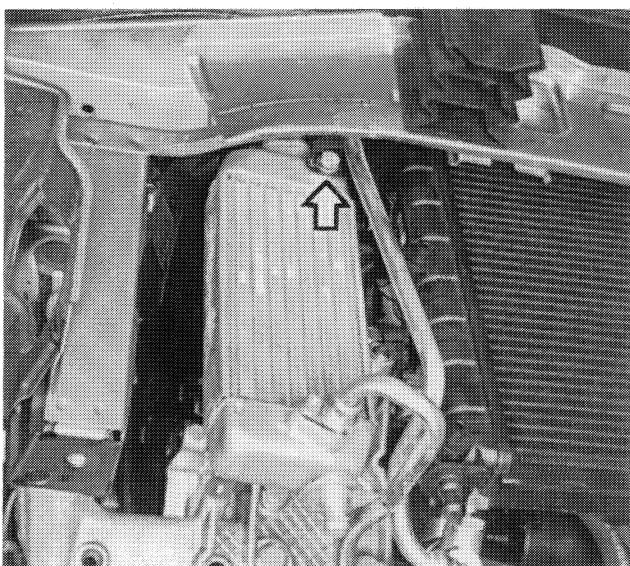


P3M007X01



P3M007X02

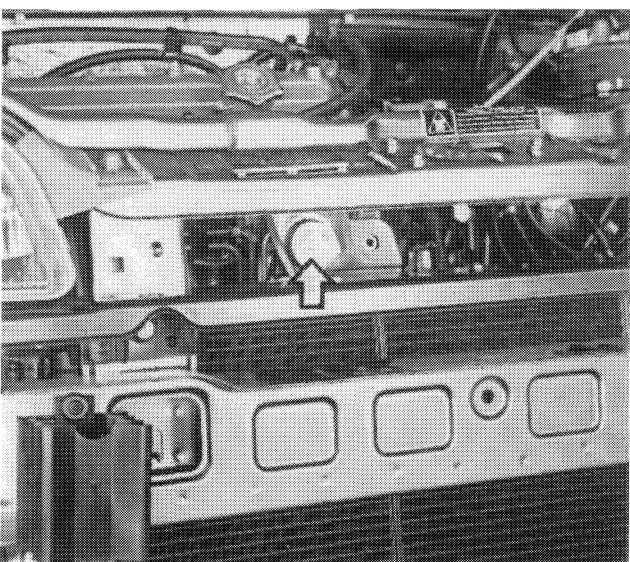
- unscrew screws indicated and remove radiator - fan support beam;



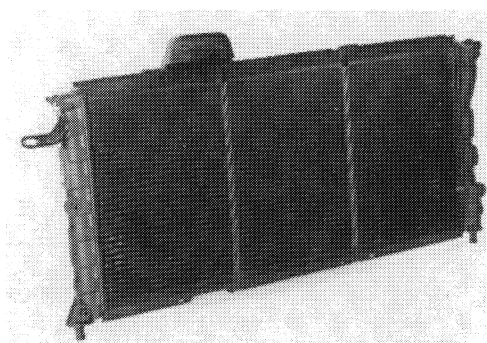
P3M007X03



- separate engine oil cooling radiator from radiator - fan unit by unscrewing the retaining screw shown in the figure;



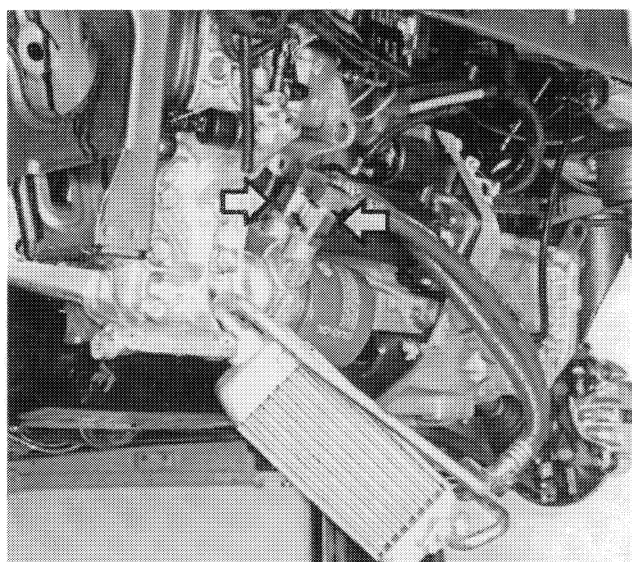
P3M007X04



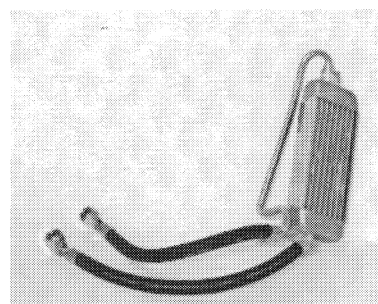
P3M007X05

- unscrew the retaining screw shown and remove radiator - fan unit from vehicle;

10.

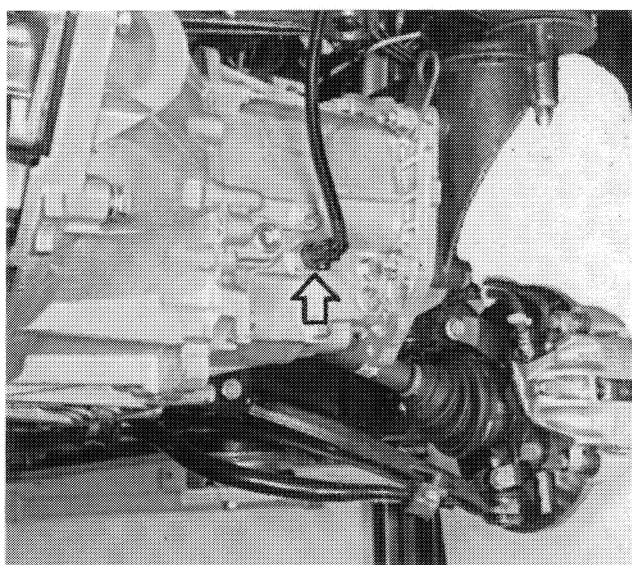


P3M008X01



P3M008X02

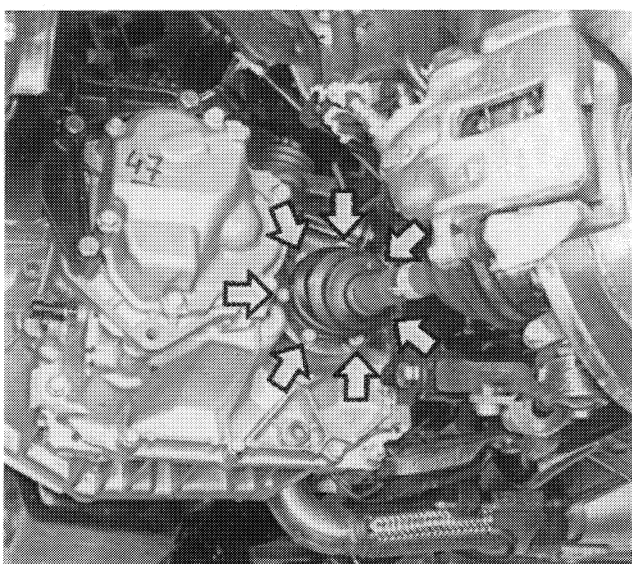
- disconnect oil delivery and return lines from engine oil filter;
- extract engine oil cooling radiator from engine bay;



P3M008X03



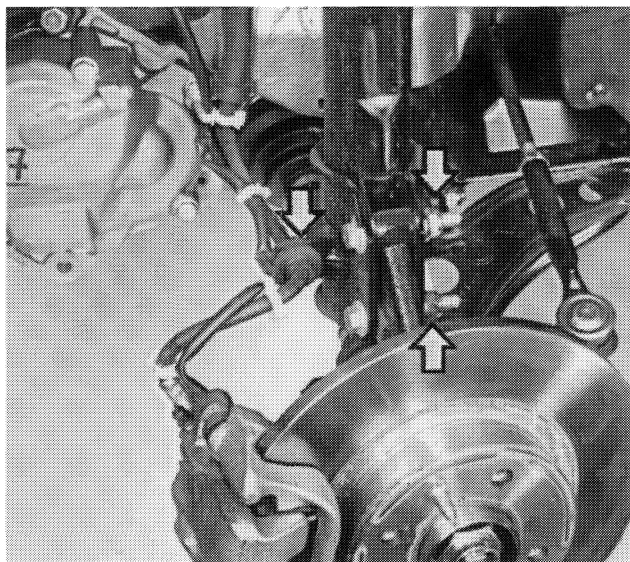
- disconnect the reversing light sensor connector from the gearbox;



P3M008X04

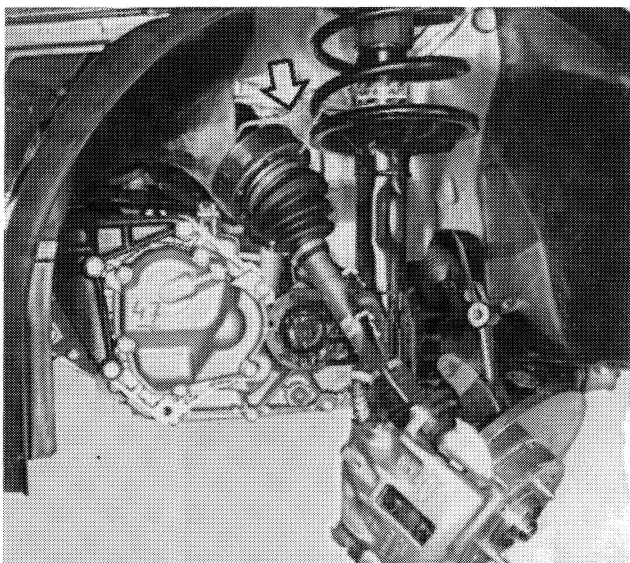


- unscrew screws retaining half-axle flanges to constant velocity joints;



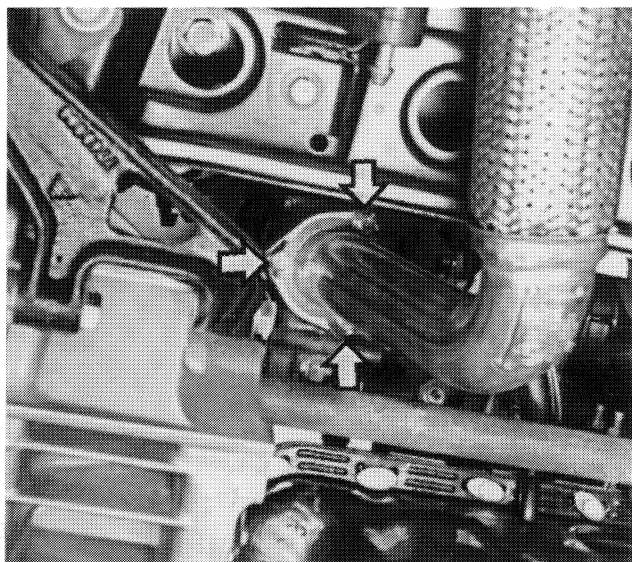
P3M009X01

- separate wheel hub assembly from damper by unscrewing the bolts and releasing the brake system lines shown in the figure;



P3M009X02

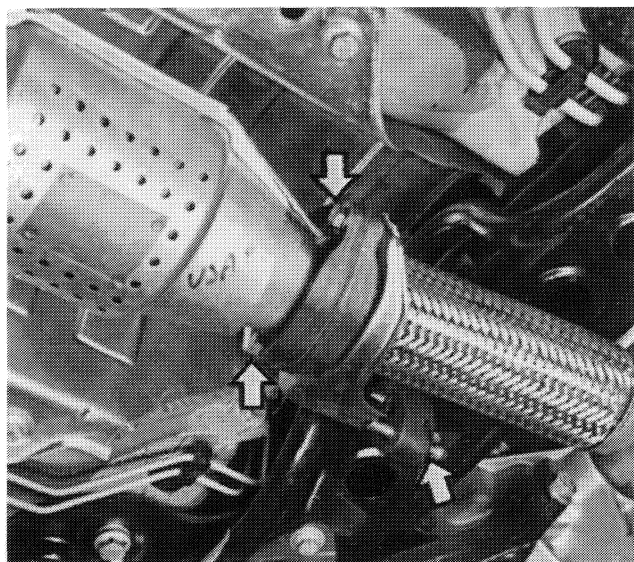
- prise out the half-axles and secure to damper;



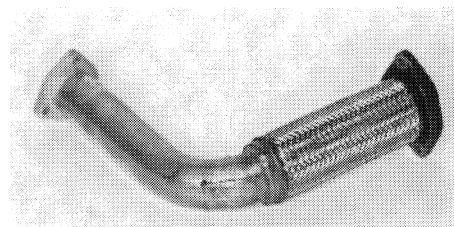
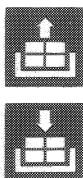
P3M009X03

- raise the retaining plates and unscrew the bolts retaining the front exhaust pipe section to the manifold;

10.



P3M010X01



P3M010X02

- unscrew the bolts shown in the figure. Then remove the exhaust pipe and seal;

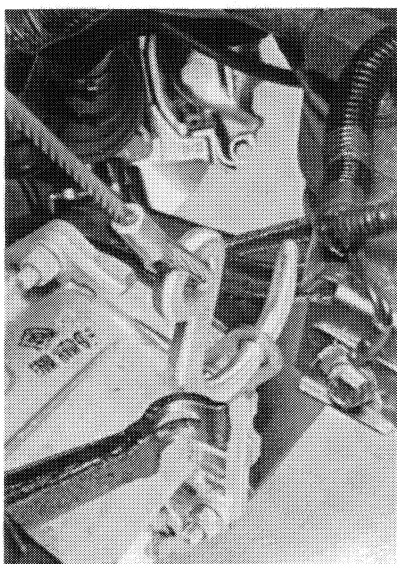


P3M010X03

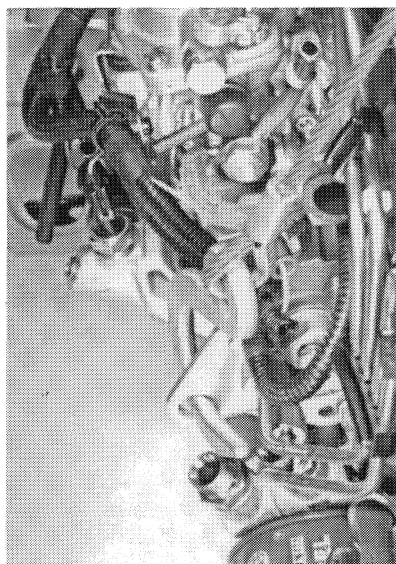


- lower vehicle to the ground;
- position universal hook 1860592000 in the power unit support brackets and apply a hoist;
- use hoist to take up slack in power unit support cables;

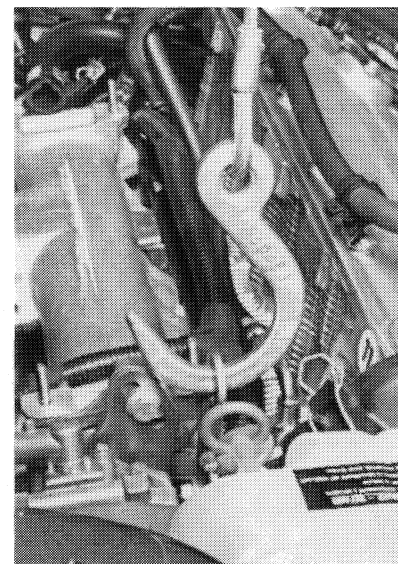
NOTE The figure below shows the position of the hooks in the power unit support brackets.



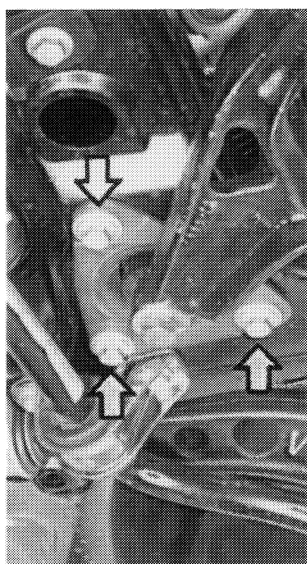
P3M010X04



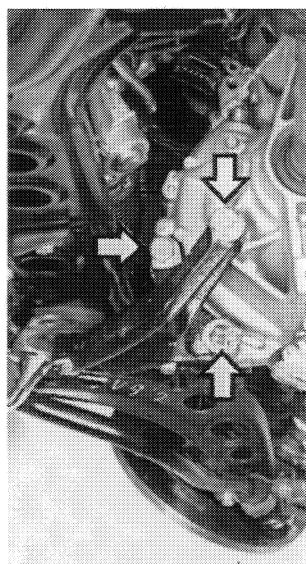
P3M010X05



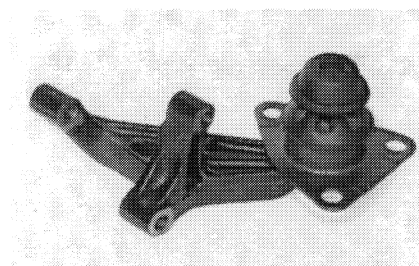
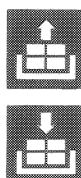
P3M010X06



P3M011X01

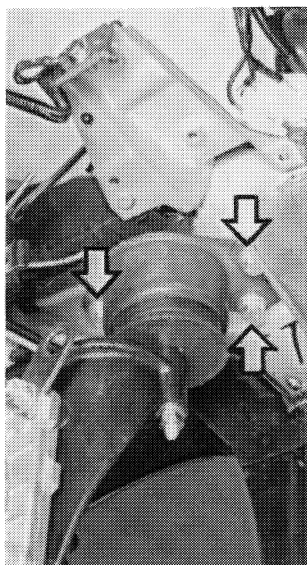


P3M011X02

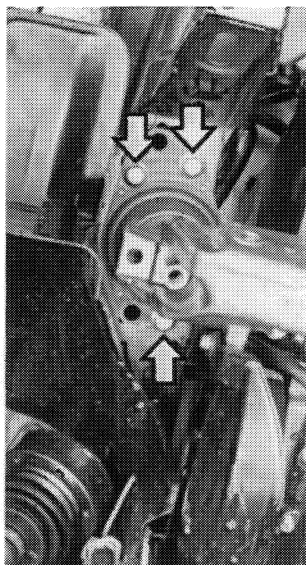


P3M011X03

- unscrew central mount bolts from body (left hand box);
- position a hydraulic jack temporarily in order to support power unit;
- remove central mount from gearbox after unscrewing bolts (right hand box);



P3M011X04



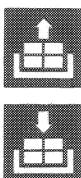
P3M011X05



- unscrew screws retaining power unit front left mount (left hand box);
- unscrew screws retaining power unit front right mount (right hand box);



P3M011X06

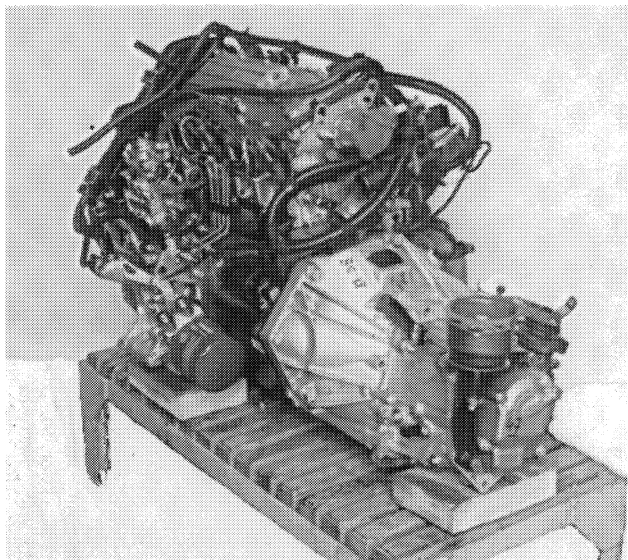


- remove power unit from engine bay by means of hoist and place on board below;



Seek the aid of a second operator.

10.



P3M012X01



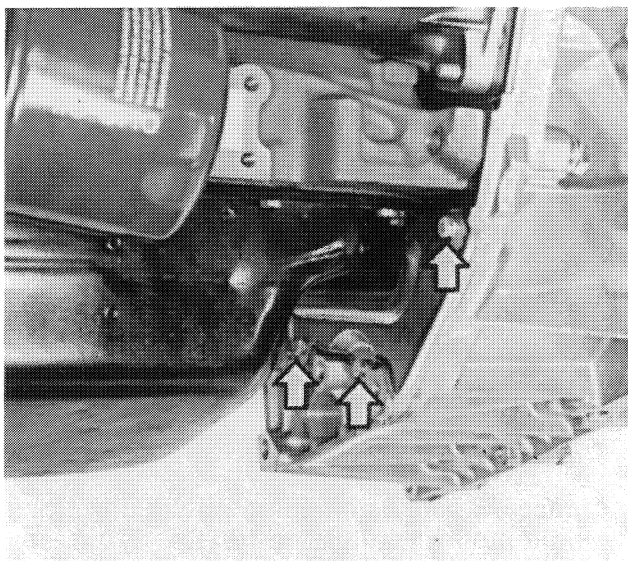
SEPARATING ENGINE - GEARBOX FROM POWER UNIT

Operation sequence

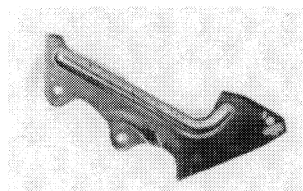
- Rest the power unit on a platform, making sure it is in a stable position;



Drain the gear oil

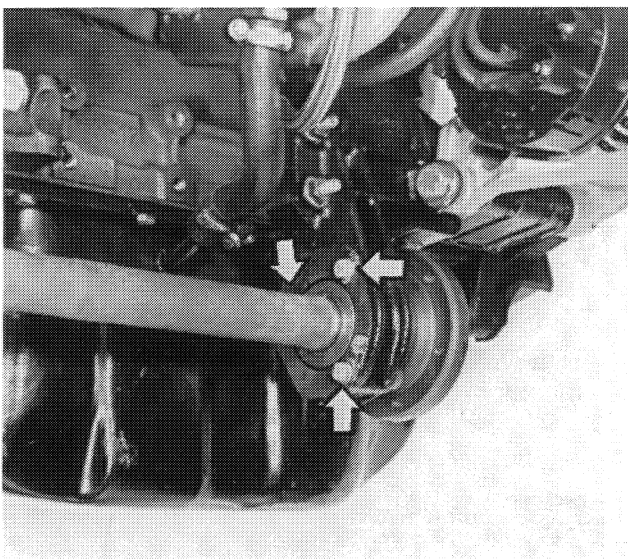


P3M012X02



P3M012X03

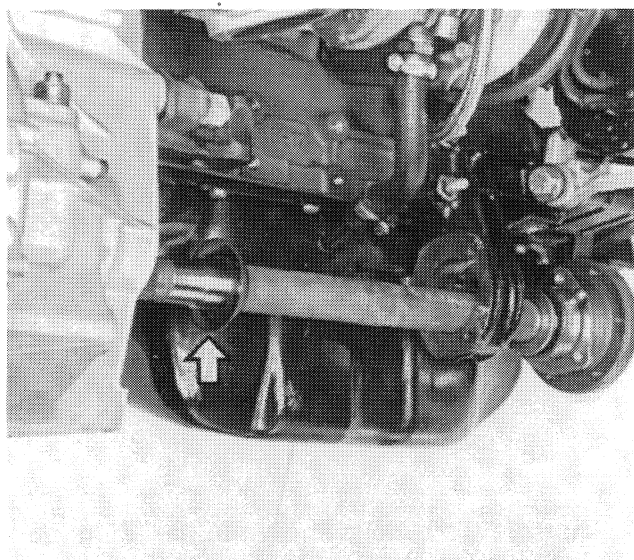
- unscrew bolts indicated in figure, then remove the flywheel protection;



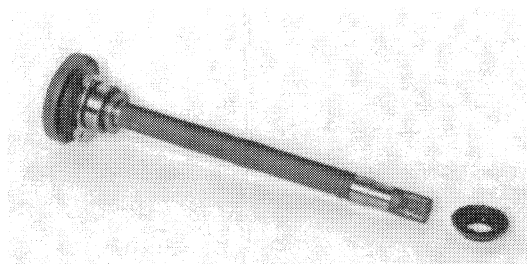
P3M012X04



- unscrew the support retaining screws and withdraw the intermediate shaft;

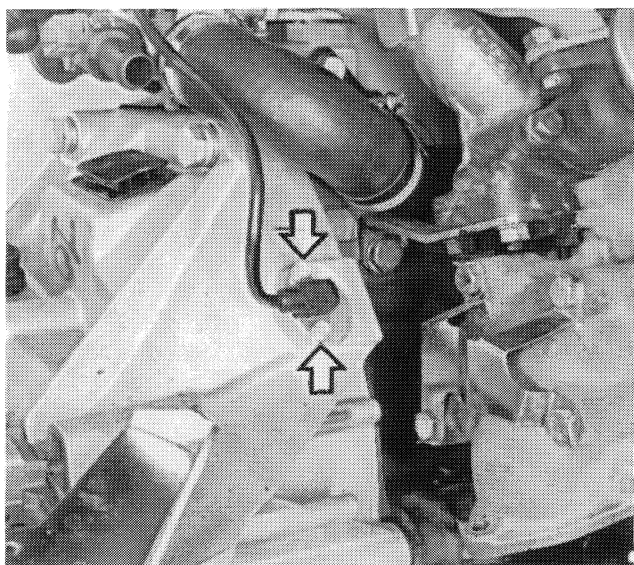


P3M013X01



P3M013X02

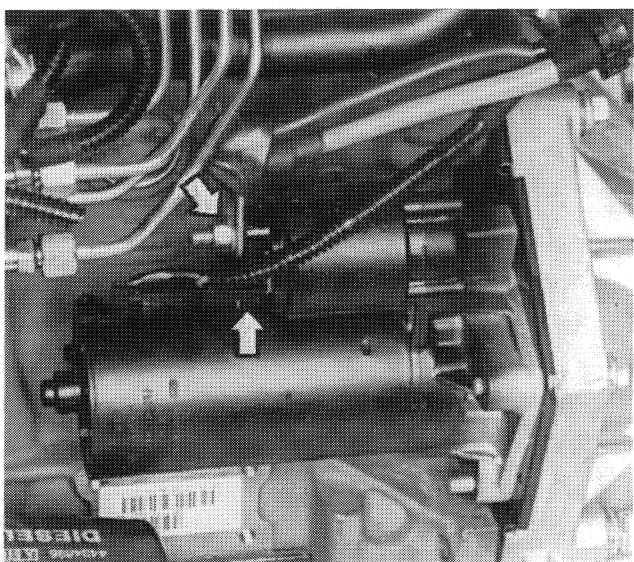
- remove the intermediate shaft after taking out the dust boot;



P3M013X03



- unscrew bolts disconnect rpm sensor from gearbox;



P3M013X04

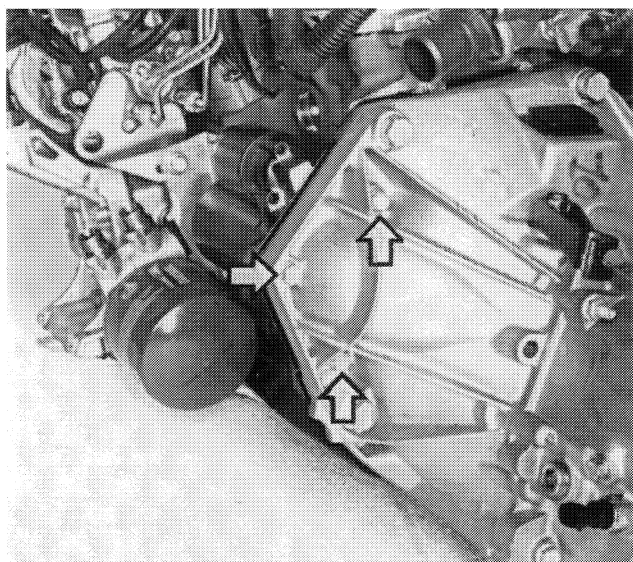


- raise the protection, unscrew the nut indicated and disconnect the leads from the starter motor;

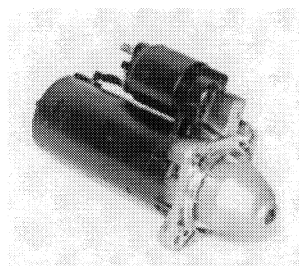
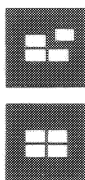
Engine

Removing-refitting

10.

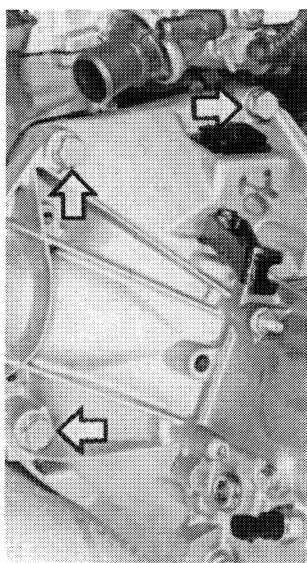


P3M014X01



P3M014X02

- unscrew the bolts shown in the figure and remove the starter motor;



P3M014X03



P3M014X04



- unscrew the bolts retaining the gearbox to the engine (left hand box);
- unscrew the nut joining the gearbox and the engine (right hand box);
- separate gearbox from engine.

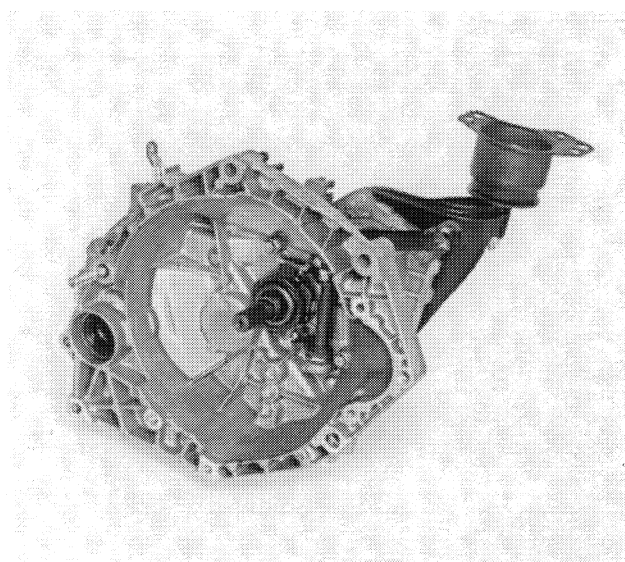


To refill the cooling system, follow the instructions given at the end of Section 10. Engine

NOTE *To refit the power unit reverse removal instructions.*

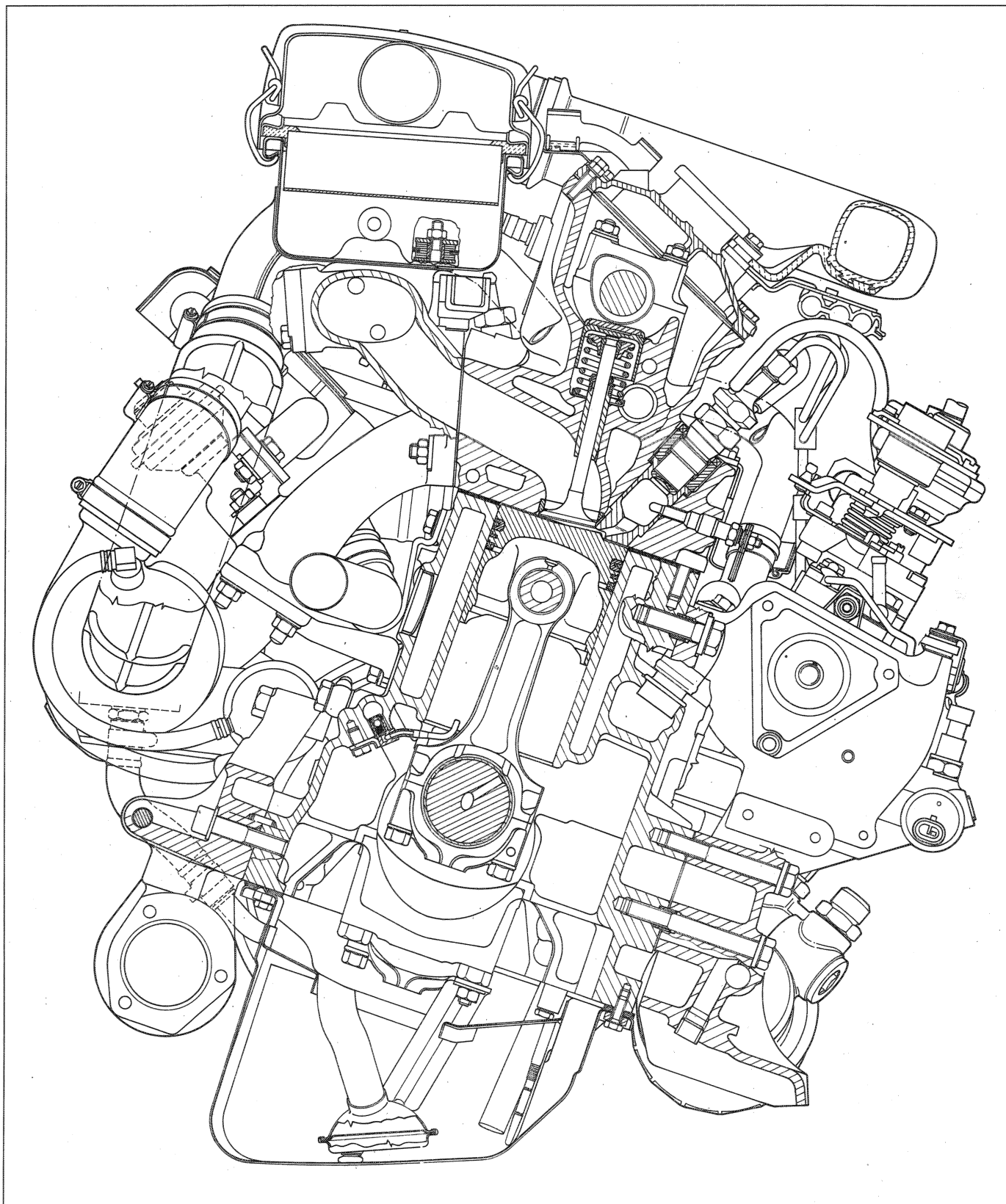


P3M014X05



P3M014X06

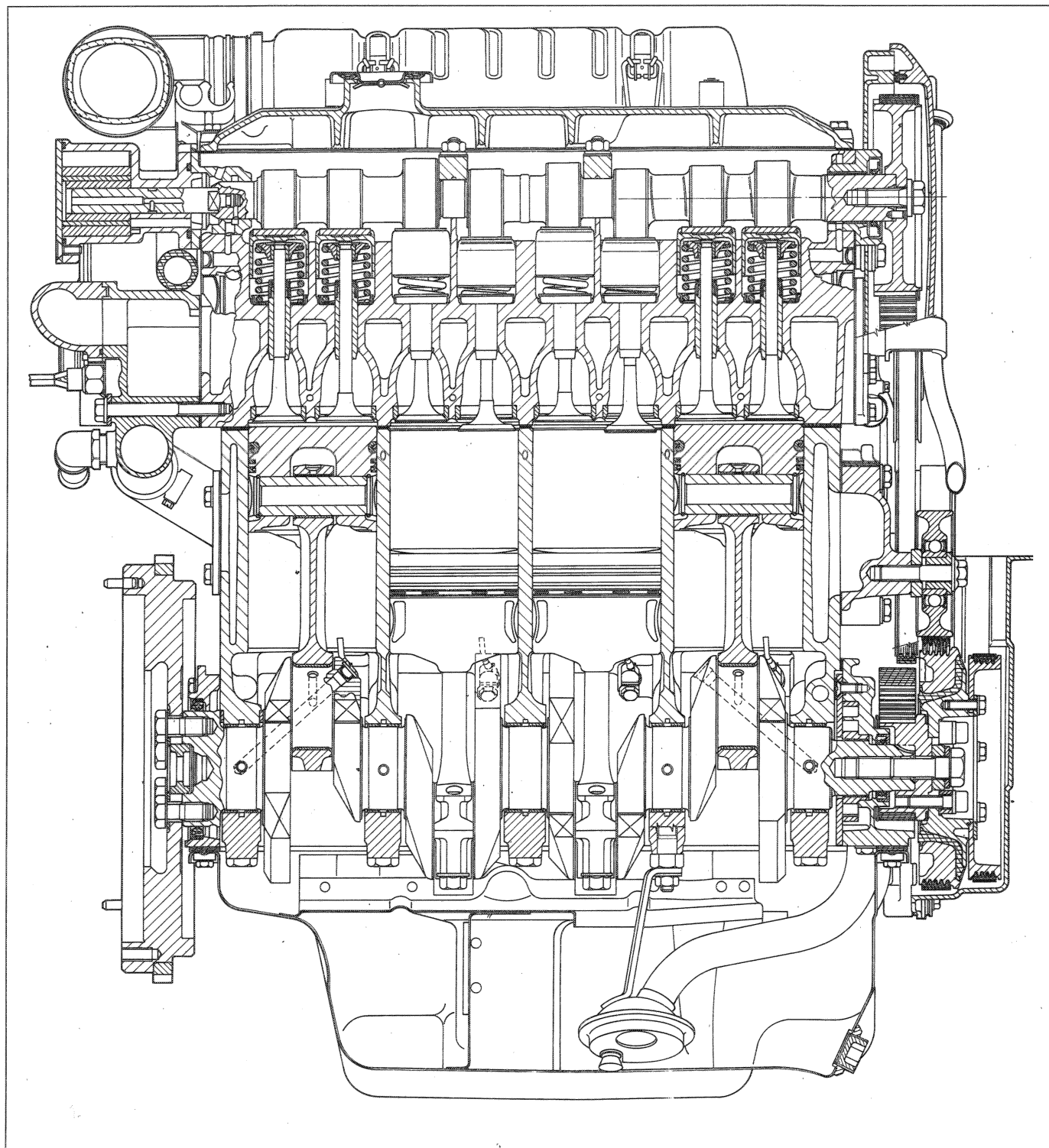
CROSS SECTION THROUGH ENGINE



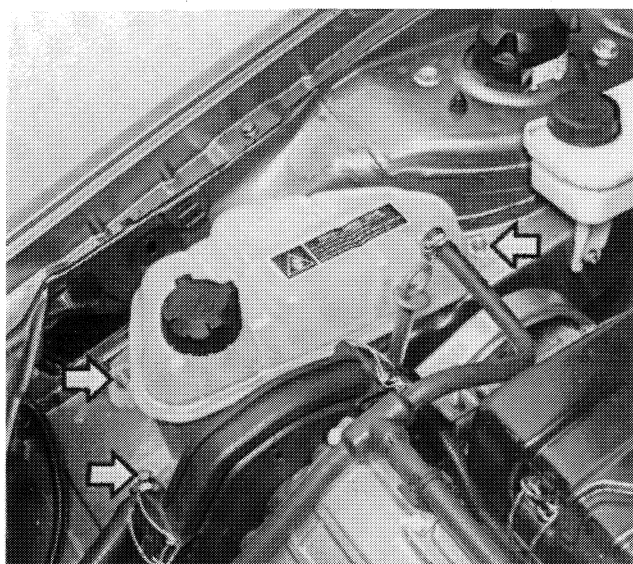
P3M015X01

10.

LONGITUDINAL SECTION THROUGH ENGINE



P3M016X01



P3M017X01



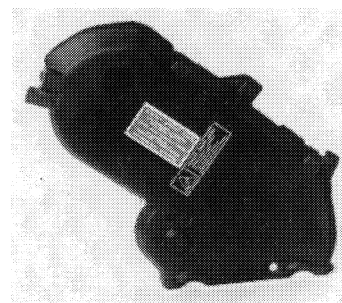
REMOVING-REFITTING TIMING BELT

Operation sequence

- Remove the right hand wheel;
- unscrew the screws shown in the figure and move the expansion tank to one side by releasing hose clips on the cam cover;



P3M017X02

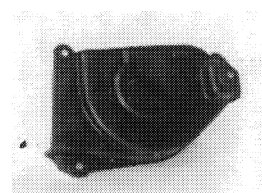


P3M017X03

- remove the retaining clips and remove the top timing cover;



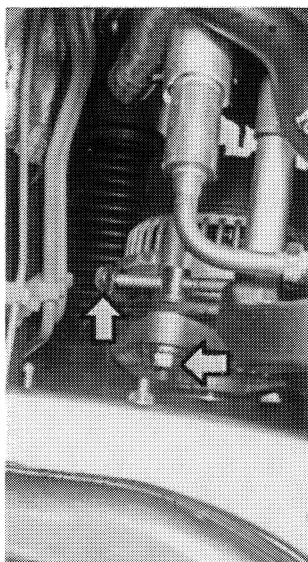
P3M017X04



P3M017X05

- unscrew bolts indicated in figure and remove the lower timing cover;

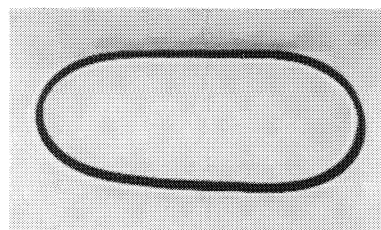
10.



P3M018X01

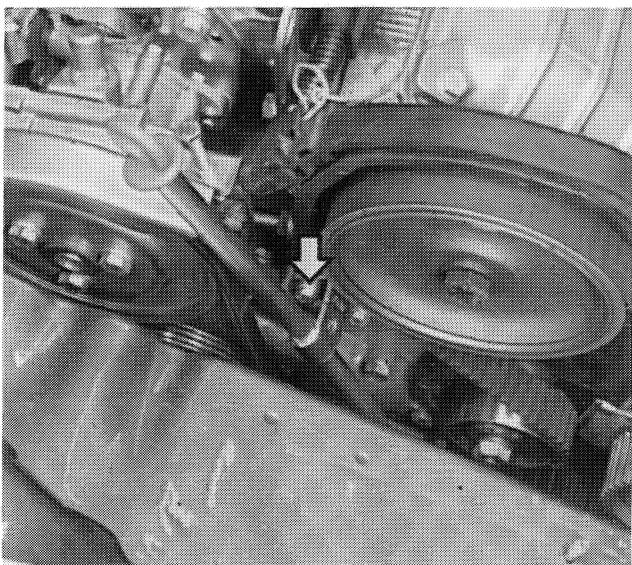


P3M018X02

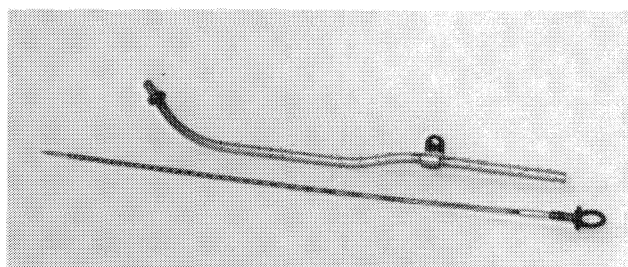


P3M018X03

- loosen screws shown in figure and remove alternator belt;



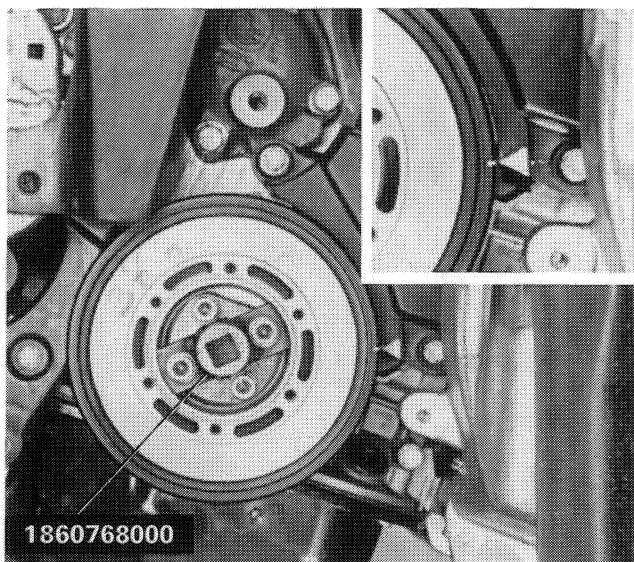
P3M018X04



P3M018X05

- unscrew the screw shown in the figure and remove the engine oil dipstick;

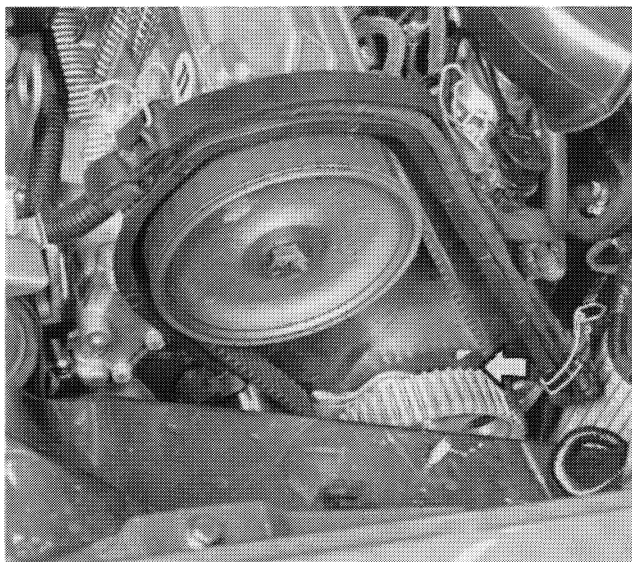
P3M018X07



1860768000

P3M018X06

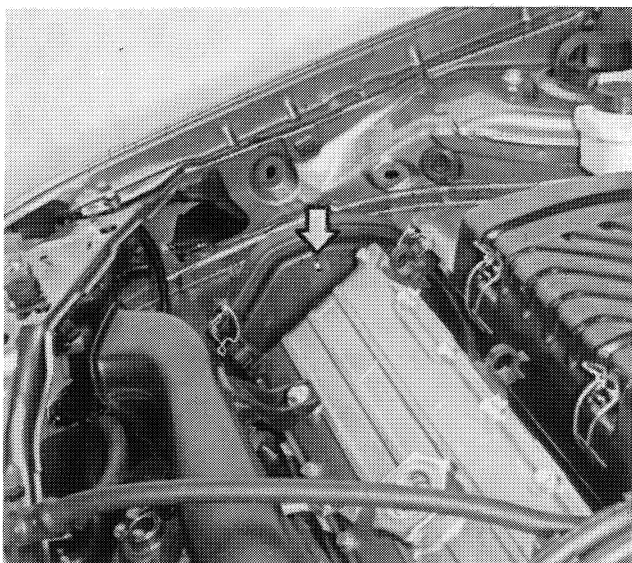
- fit tool 1860768000 to turn the crankshaft and check that the reference notch on the pulley aligns with the notch on the timing belt cover;



P3M019X01



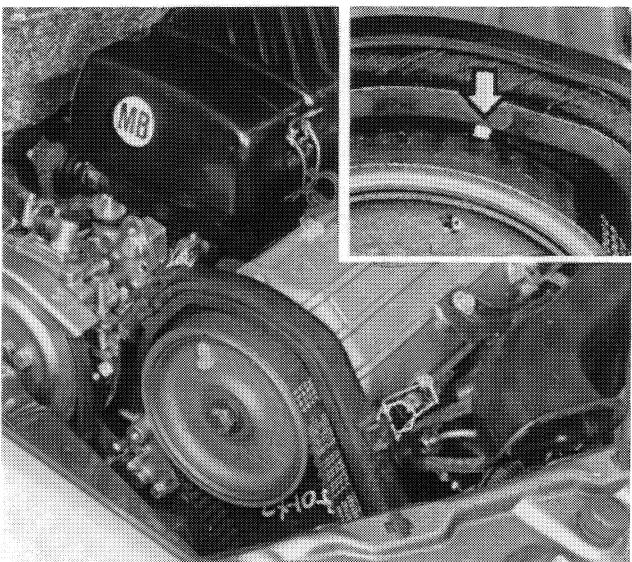
- check that the reference notch on the injection pump pulley coincides with the reference mark on the timing belt cover;



P3M019X02



- check that the rear reference notch on the camshaft drive gear is aligned with the hole located on the timing belt cover;

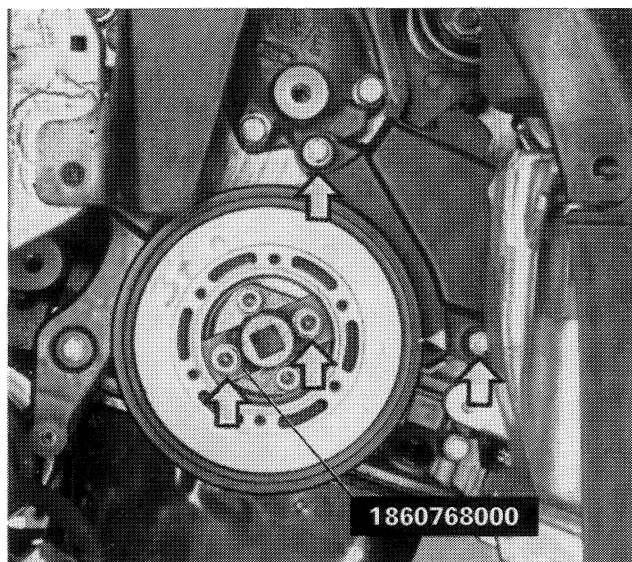


P3M019X03



- check that the front reference notch on the camshaft driven gear is aligned with the hole on the timing belt cover (see box);

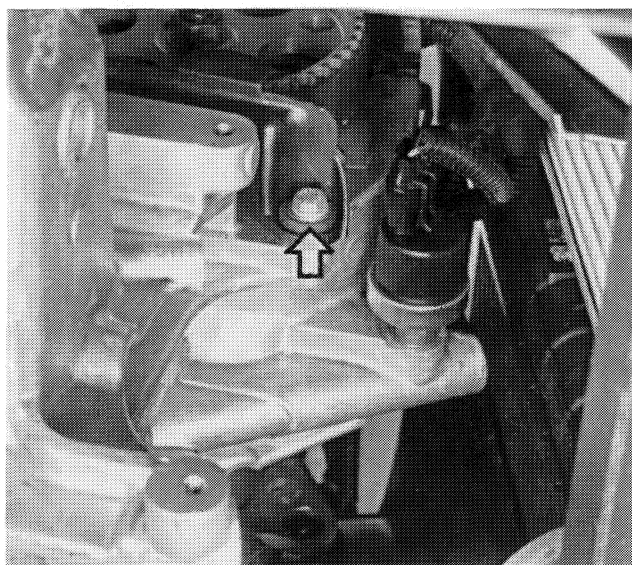
10.



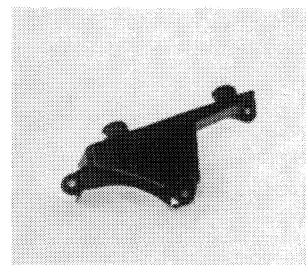
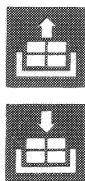
P3M020X01



- remove tool 1860768000 and unscrew bolts retaining lower timing belt cover;

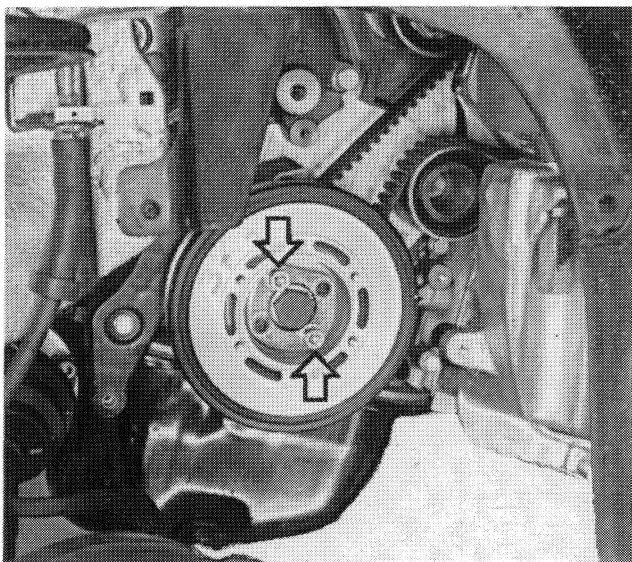


P3M020X02

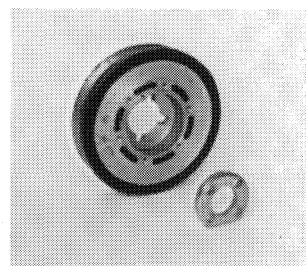
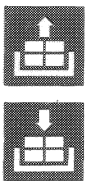


P3M020X03

- unscrew the screw indicated in the figure and remove the lower timing belt cover;

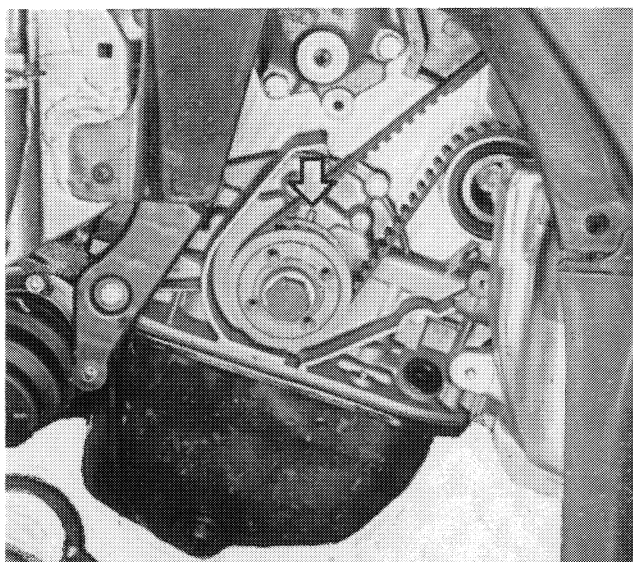


P3M020X04



P3M020X05

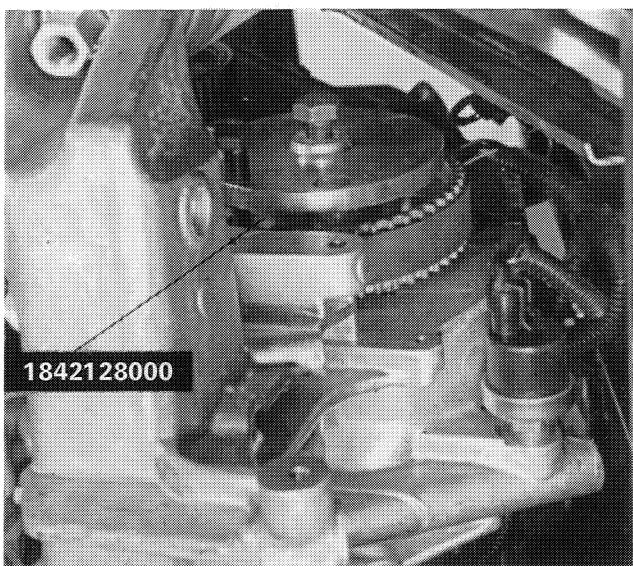
- unscrew the hexagonal-headed socket screws and remove the crankshaft pulley;



P3M021X01



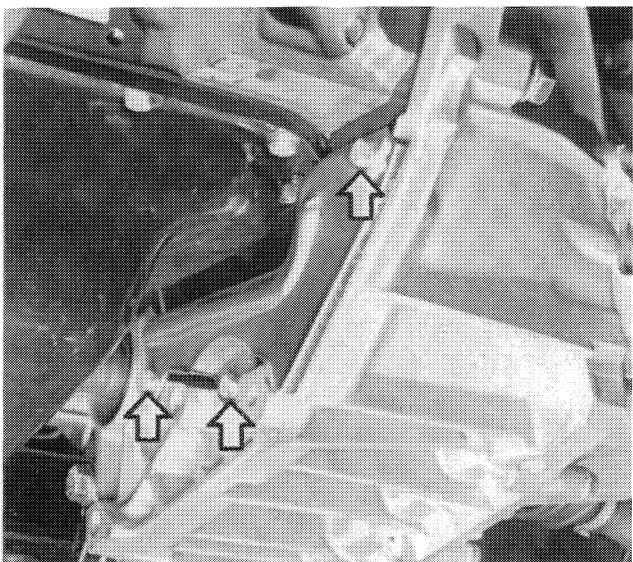
- check that the notch on the crankshaft drive gear coincides with the notch on the crankcase;



P3M021X02



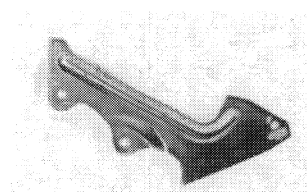
- fit tool 1842128000 to the injection pump drive;
- prevent the pulley turning using screw shown in figure;



P3M021X03

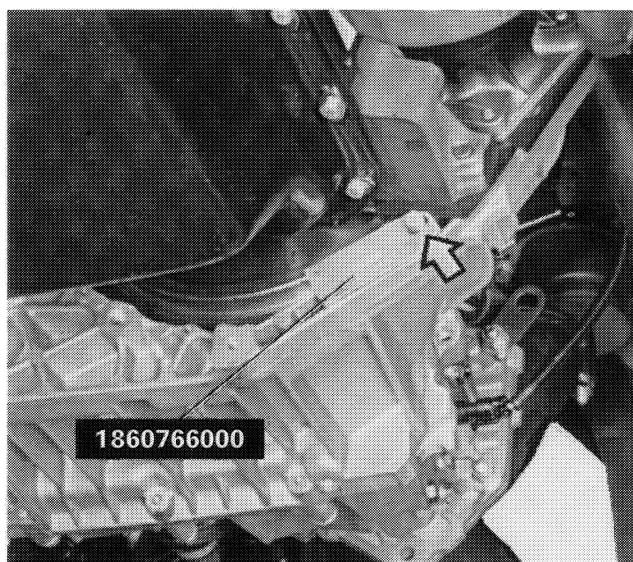


- unscrew bolts indicated in figure and remove flywheel cover;



P3M012X03

10.



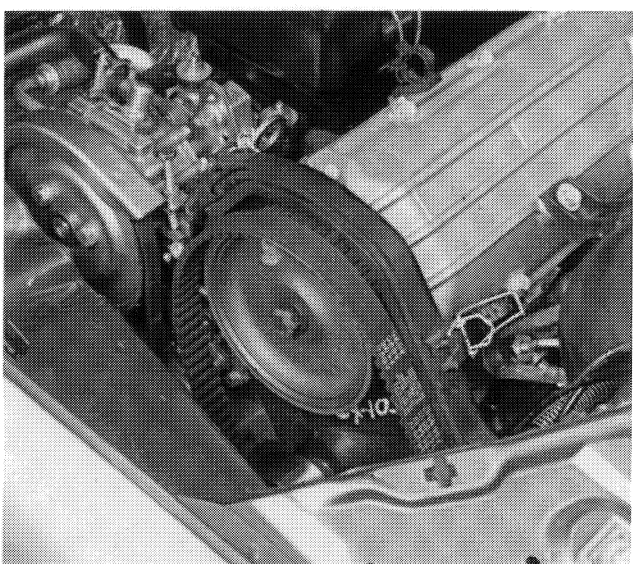
P3M022X01

- apply flywheel retaining tool 1860766000 to prevent the crankshaft from turning;

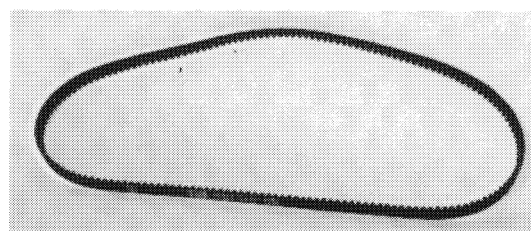


P3M022X02

- loosen the nut retaining the belt tensioner to the crankcase;



P3M022X03



P3M022X04

- remove the timing belt.



P3M023X01



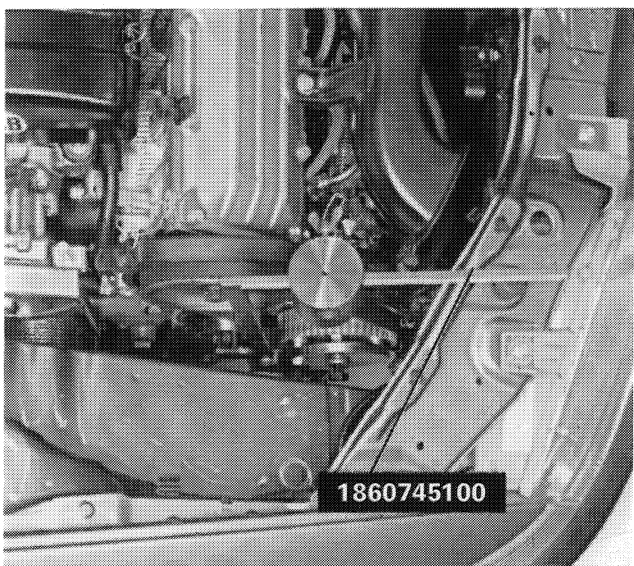
Fitting toothed timing belt

Visually inspect toothed belt condition every 40,000 km and replace when:

- it is soaked in oil or coolant;
- it shows signs of cracking or broken teeth;
- it is frayed or the tooth profiles are worn.



Replace the toothed belt every 100,000 km or during service operations that involve belt removal with mileages in excess of 30,000 km.



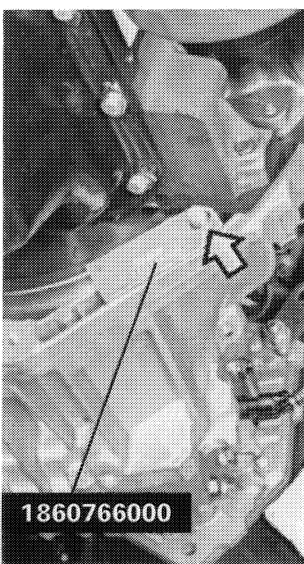
P3M023X02



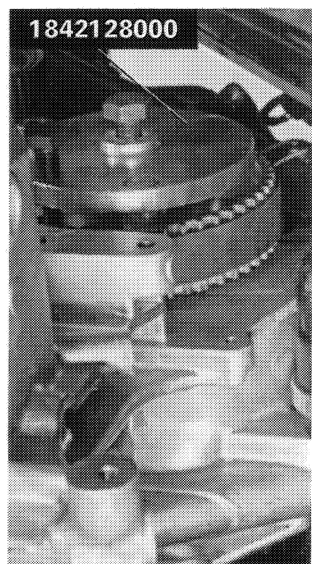
P3M023X03

Adjusting toothed timing belt tension

- Fit part 1860745200 to tool 1860745100 and position weight at a distance of 60 mm along calibrated rod and secure;
- apply the resulting tool to the mobile belt tensioner;
- adjust joint and position the calibrated rod so that it is horizontal. Then tighten joint retaining screw.



P3M023X04

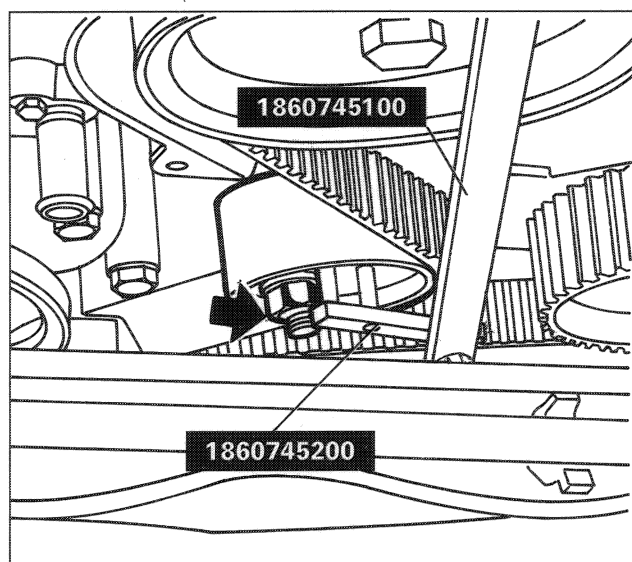


P3M023X05



- remove flywheel retaining tool 1860766000 from gearbox;
- remove tool 1842128000 from injection pump pulley;

10.



P3M024X01



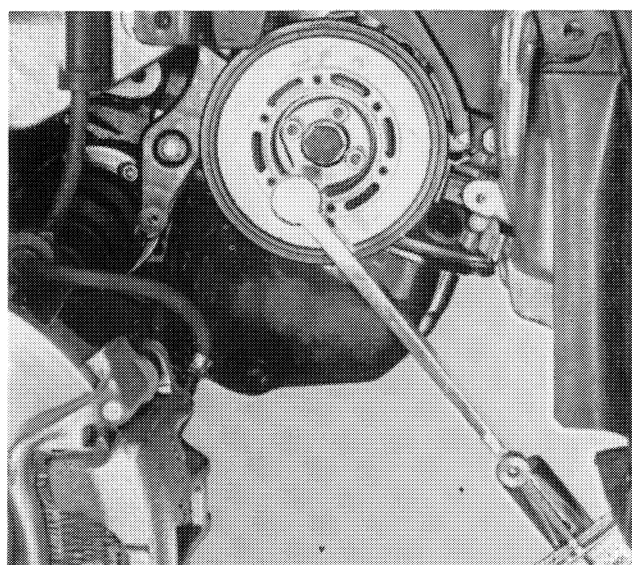
4,4 daNm

Tightening belt tensioner retaining nut to torque



Use flywheel retaining tool 186076600.

Tighten belt tensioner to specified torque.



P3M024X02



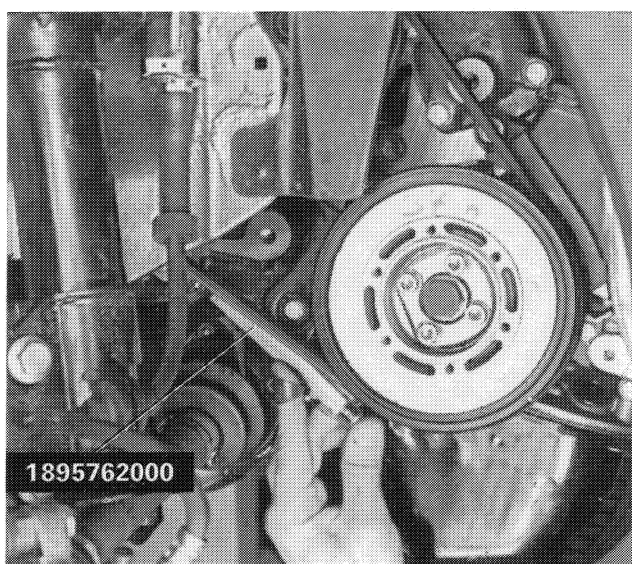
2,8 daNm

Tighten crankshaft pulley retaining screws to torque



Use flywheel retaining tool 186076600.

- Tighten crankshaft pulley retaining screws to the specified torque;
- remove flywheel retaining tool 1860766000 when the operation is complete.

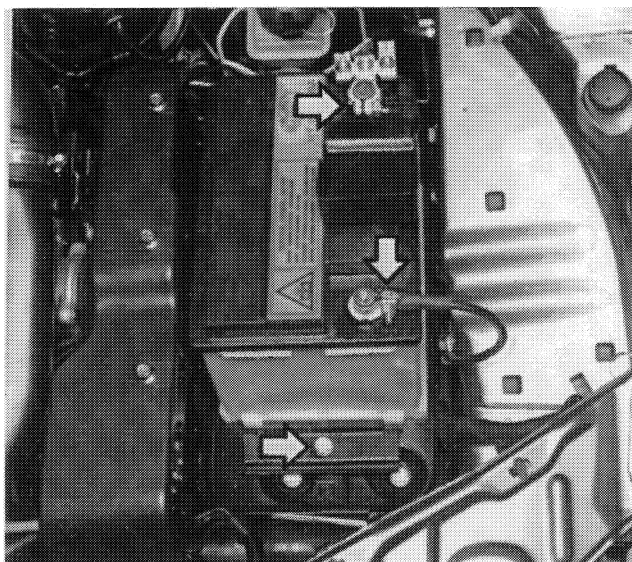


P3M024X03



Checking alternator poli-V belt tension

- Check that new belt tension is 50 - 60 daN, measured using tool 1895762000;
- run engine for 15 minutes and leave the engine to cool for 15 minutes. Check that tension is 40 - 50 daN;
- if not, adjust tension to 50 - 60 daN;
- If the load is less than 25 daN upon the periodic check carried out every 20,000 km, adjust tension to 35 - 45 daN.



P3M025X01



REMOVING-REFITTING HEAD

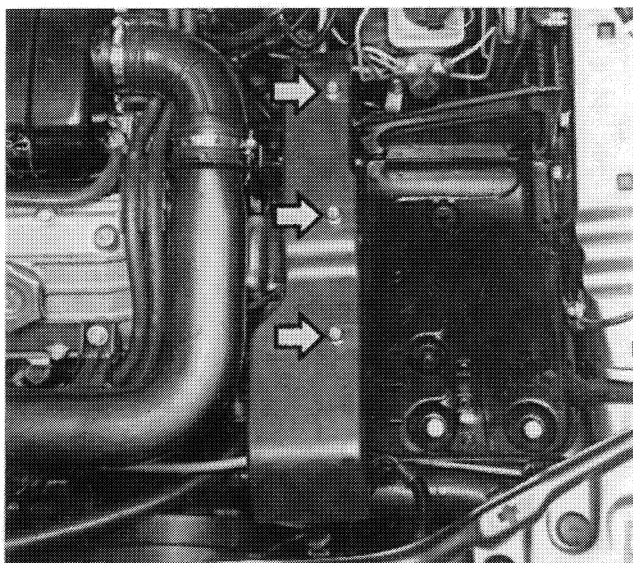
CYLINDER



Before removing the cylinder head, drain the engine oil and coolant.

Operation sequence

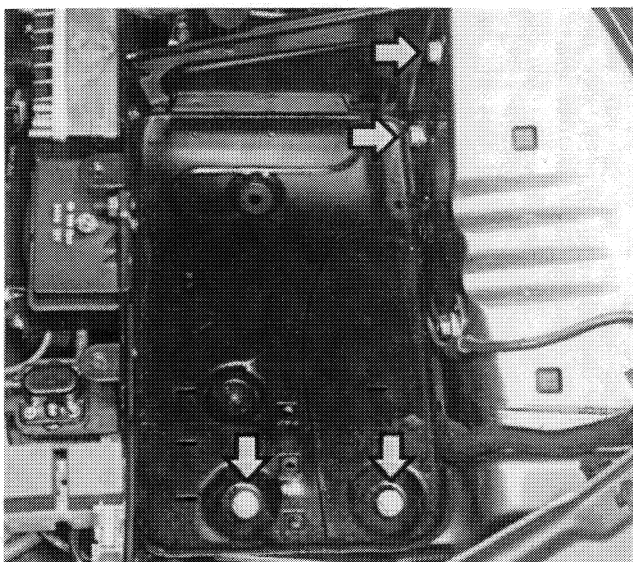
- Remove the timing belt (see procedure on page 17);
- disconnect the leads, unscrew the retaining screw and remove the battery,



P3M025X02



- unscrew the bolts and remove the guard;

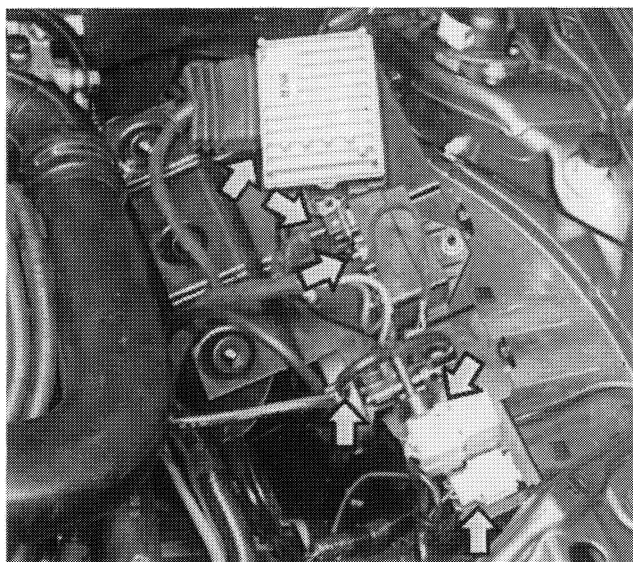


P3M025X03

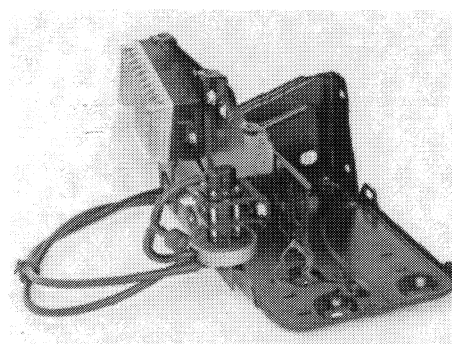
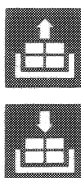


- unscrew the bolts and turn the battery mount;

10.

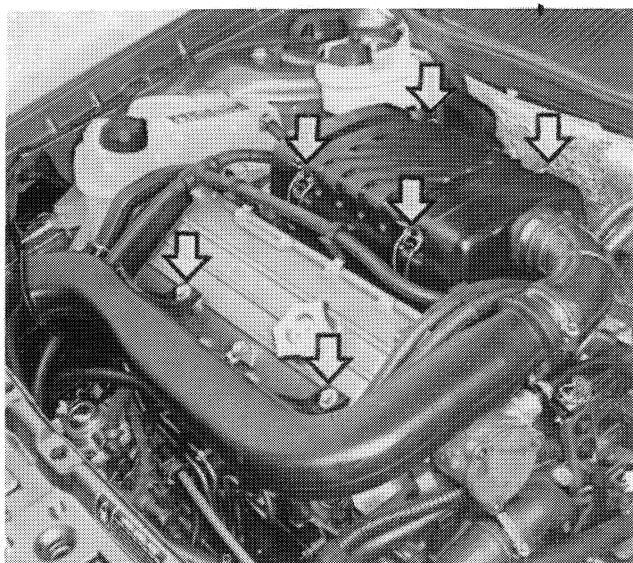


P3M026X01

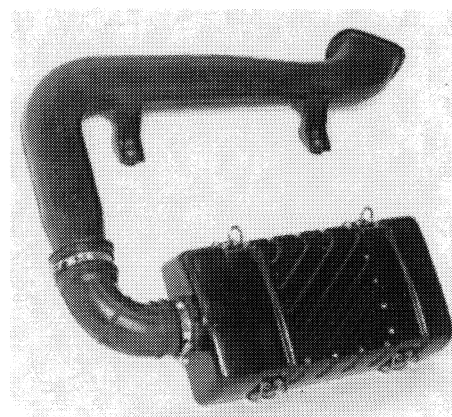
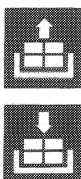


P3M026X02

- disconnect the connectors, lines from modulator valve and relays - then remove the battery mount;

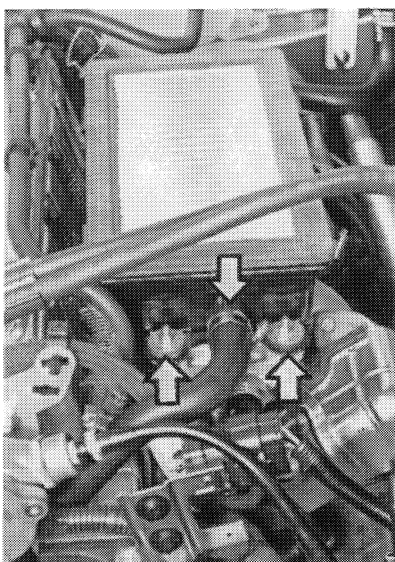


P3M026X03

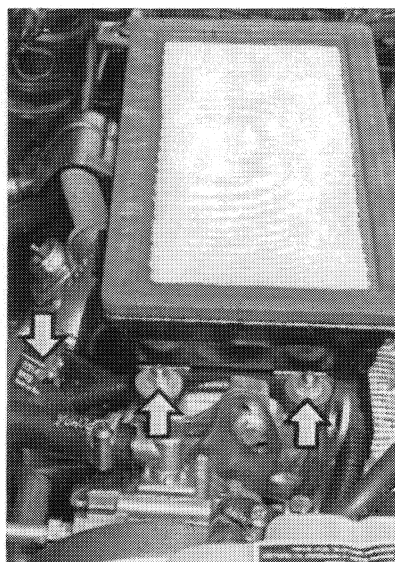


P3M026X04

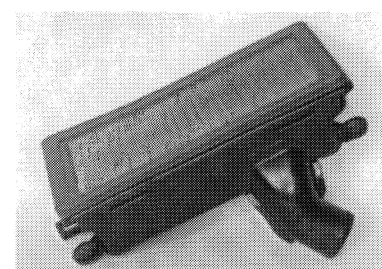
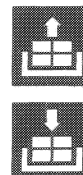
- unscrew the bolts and release the clips. Then remove the air cleaner cover and pipe;



P3M026X05

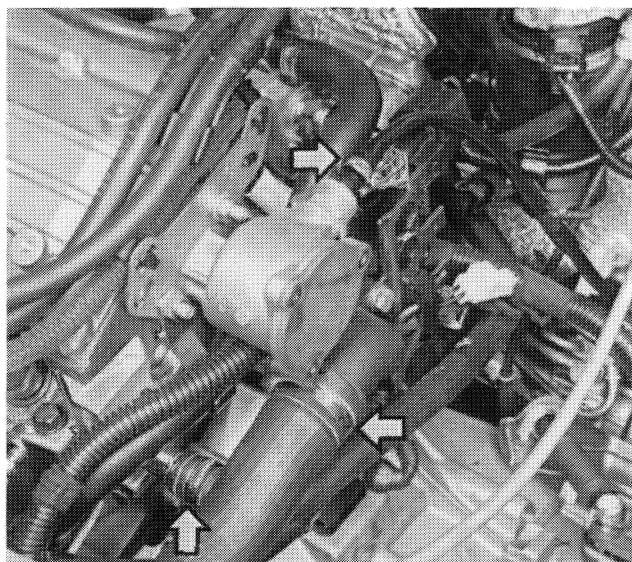


P3M026X06



P3M026X07

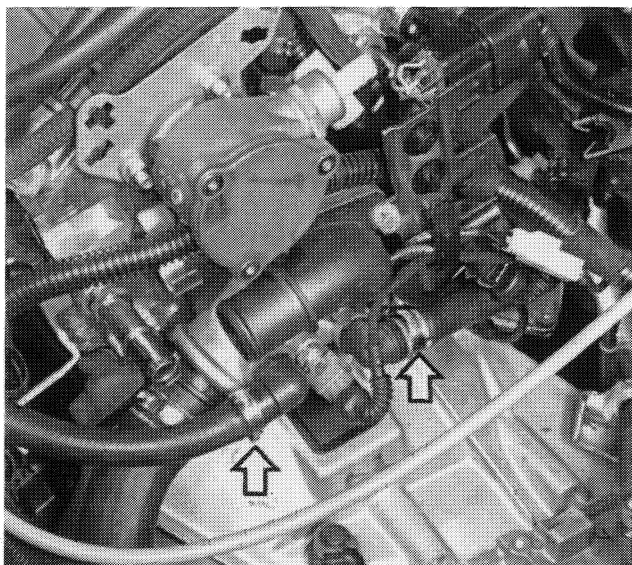
- disconnect the clip and unscrew the bolts indicated in the figure. Then remove the air cleaner mount;



P3M027X01



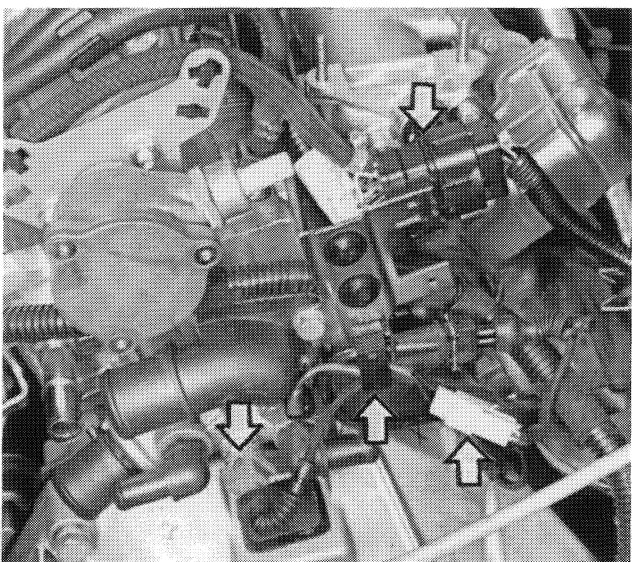
- disconnect the brake servo pipe from the vane vacuum pump;
- release the retaining clips and disconnect the coolant delivery lines to the radiator and lines from thermostat to interior heater;



P3M027X02



- remove the retaining clips and disconnect the lines from the expansion tank and the heater;

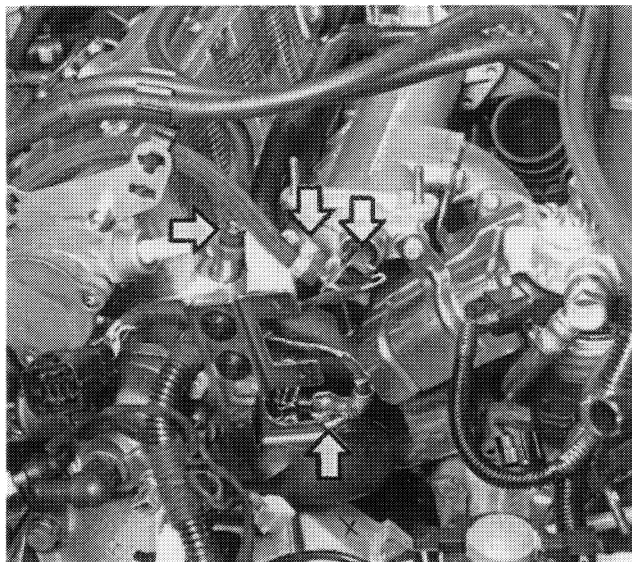


P3M027X03



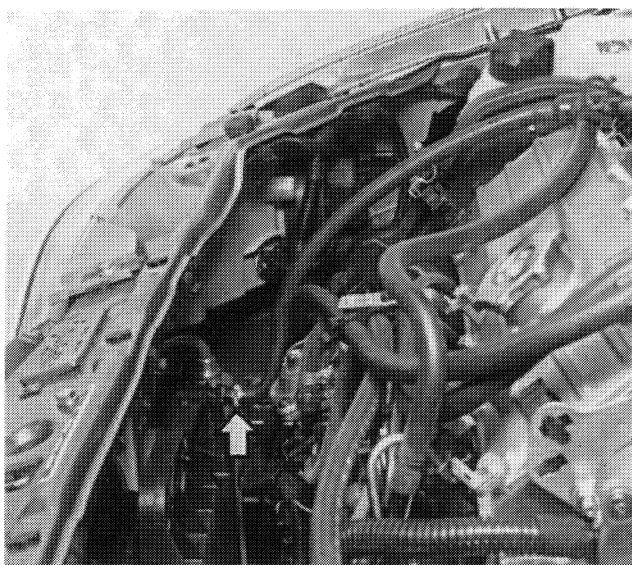
- disconnect the connectors and release the lead retaining clip shown in the figure;

10.



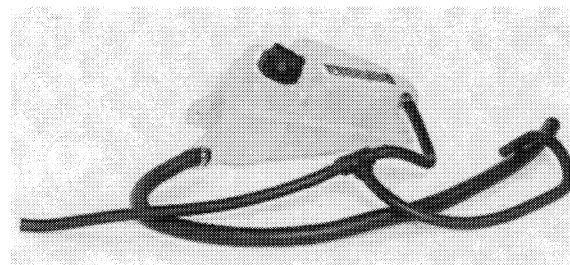
P3M028X01

- disconnect the connectors and lines shown in the figure;

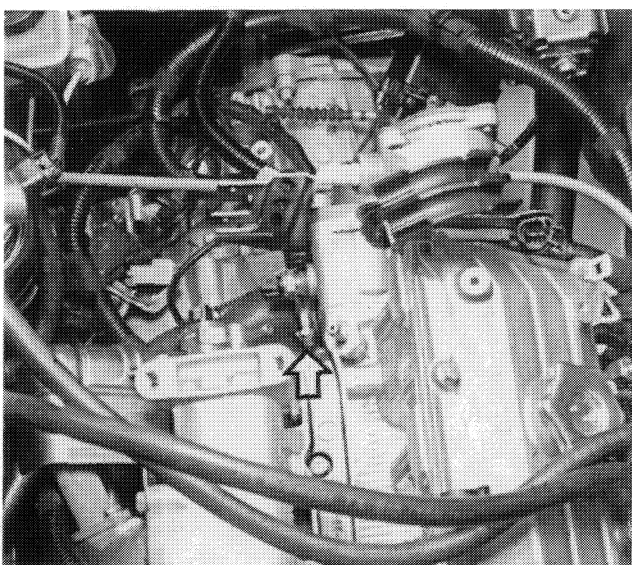


P3M028X02

- release the retaining clips and disconnect the coolant delivery line from the expansion tank;
- remove the expansion tank;

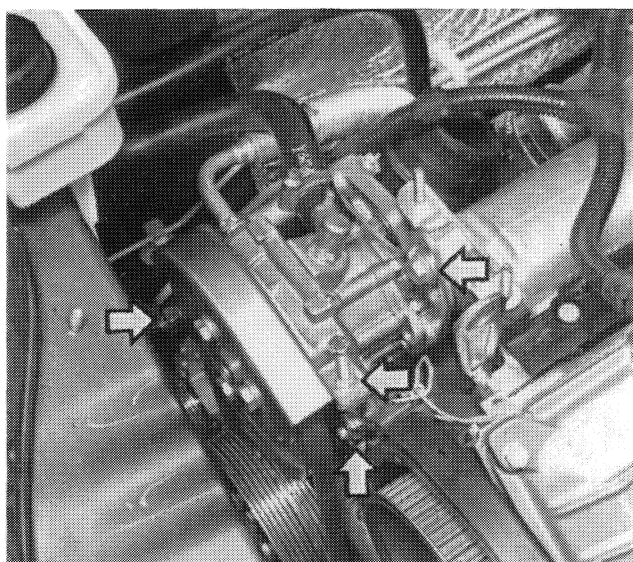


P3M028X03

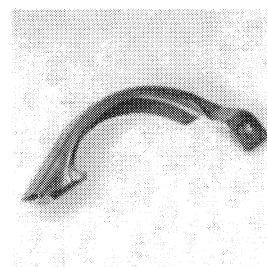
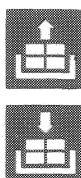


P3M028X04

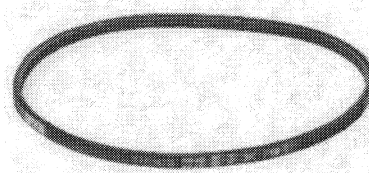
- release the retaining clip and disconnect the sleeve from the crankcase;



P3M029X01

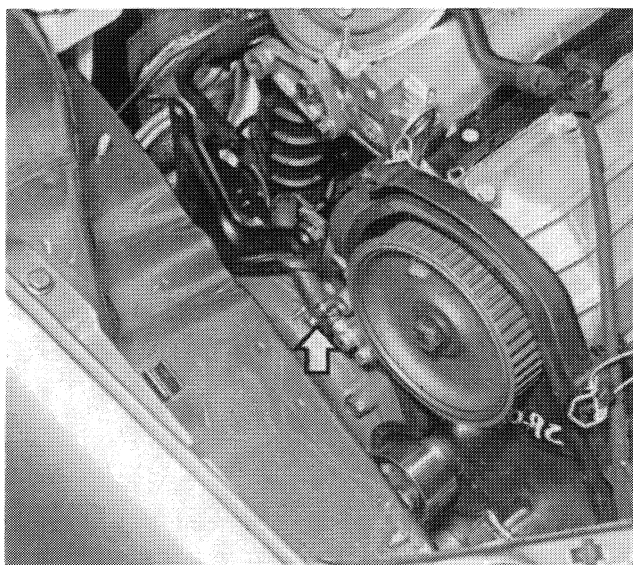


P3M029X02

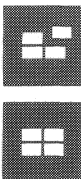


P3M029X03

- unscrew the bolts shown in the figure and remove the power steering pump belt protection;
- move power steering pump to one side without draining the system and remove the drive belt;



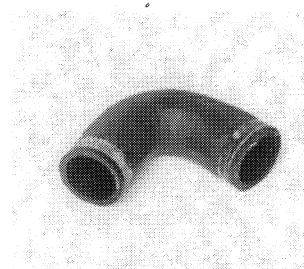
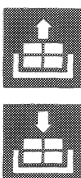
P3M029X04



- release the retaining clip and disconnect the coolant hose from cylinder head to pump;



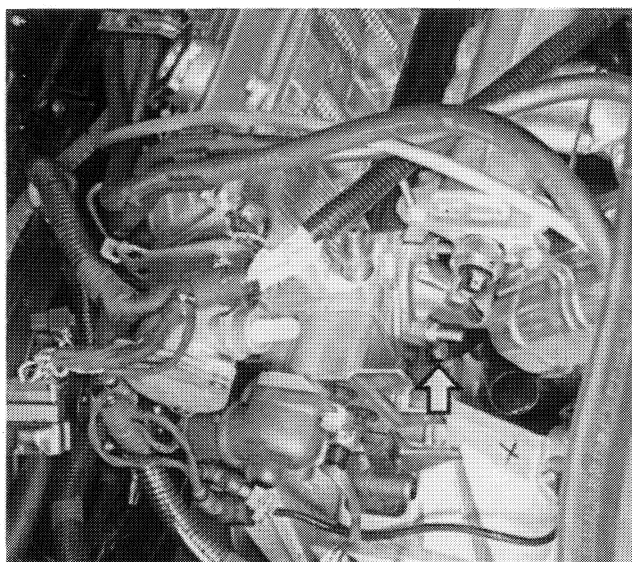
P3M029X05



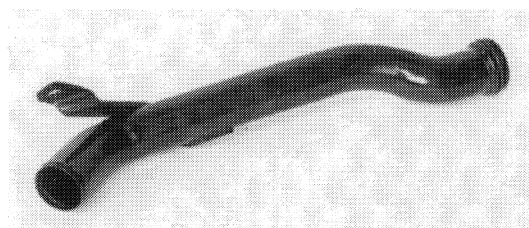
P3M029X06

- unscrew bolt and disconnect oil delivery pipe from crankcase to turbocharger;
- disconnect the sleeve from the return pipe to the coolant pump;

10.



P3M030X01



P3M030X02

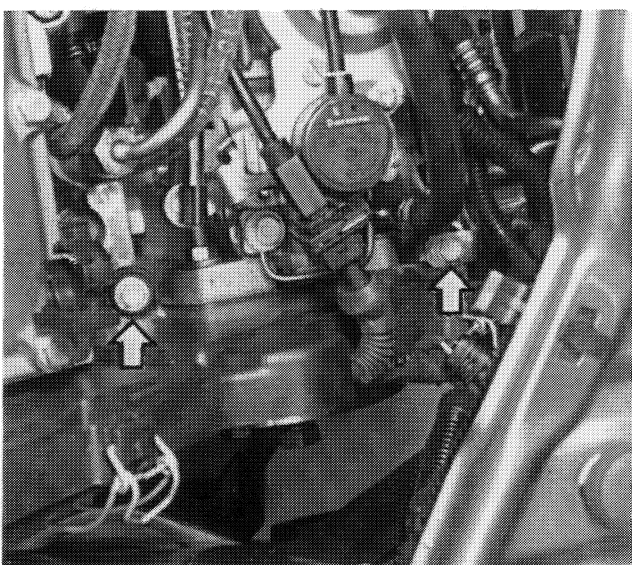
- unscrew the screw shown in the figure and remove the coolant pump return pipe;



P3M030X03



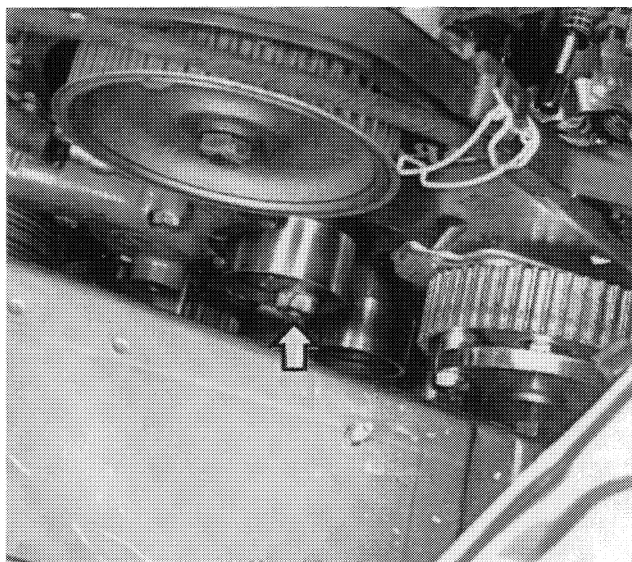
- unscrew bolts retaining bracket to crankcase and loosen the bolts retaining it to the turbocharger;



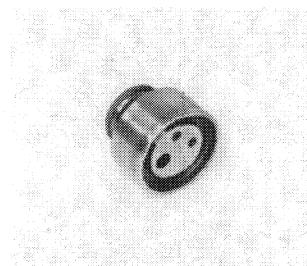
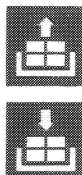
P3M030X04



- unscrew the timing belt protection retaining bolts;

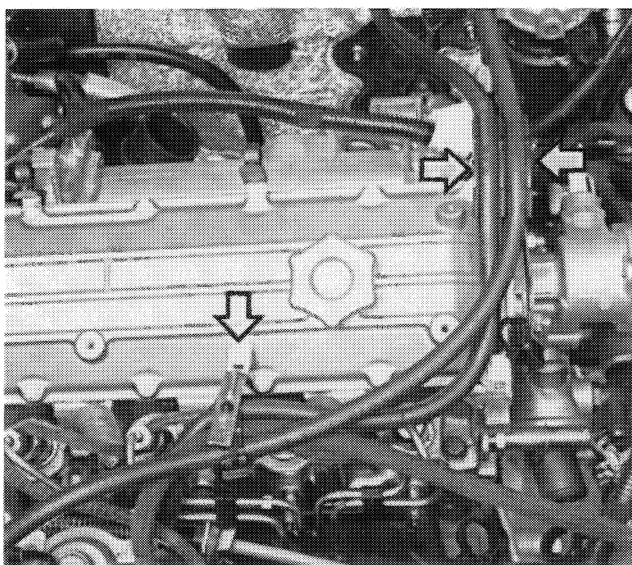


P3M031X01

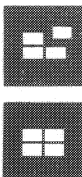


P3M031X02

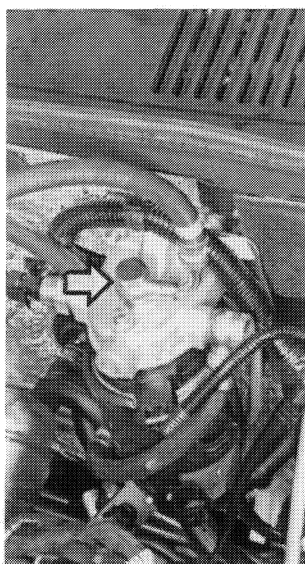
- unscrew the nut shown in the figure and remove the belt tensioner;



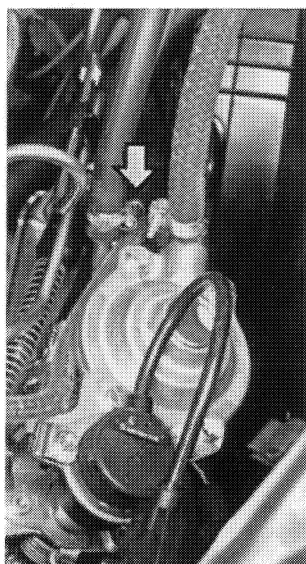
P3M031X03



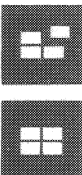
- release fuel delivery and return lines from hose clips and retaining bracket shown in figure;



P3M031X04

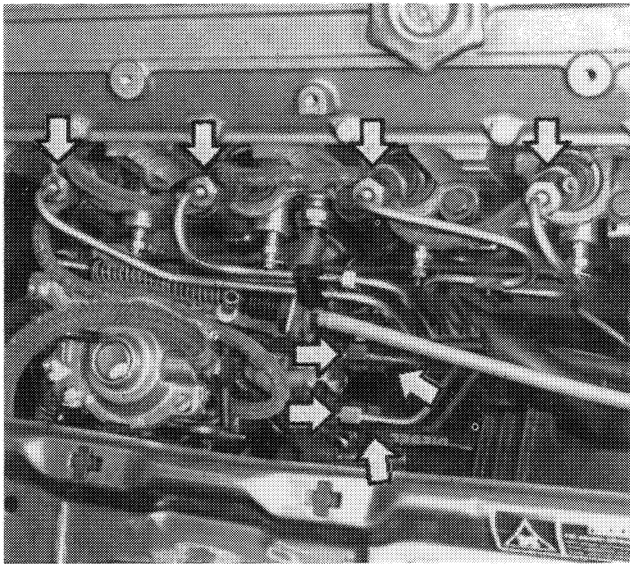


P3M031X05

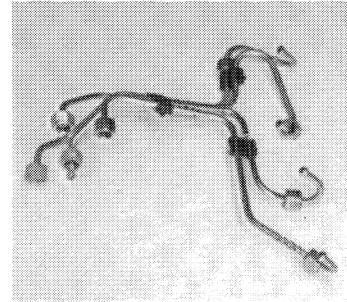
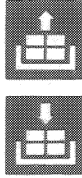


- disconnect fuel delivery and return pipes from filter (left hand box) and injection pump (right hand box);

10.

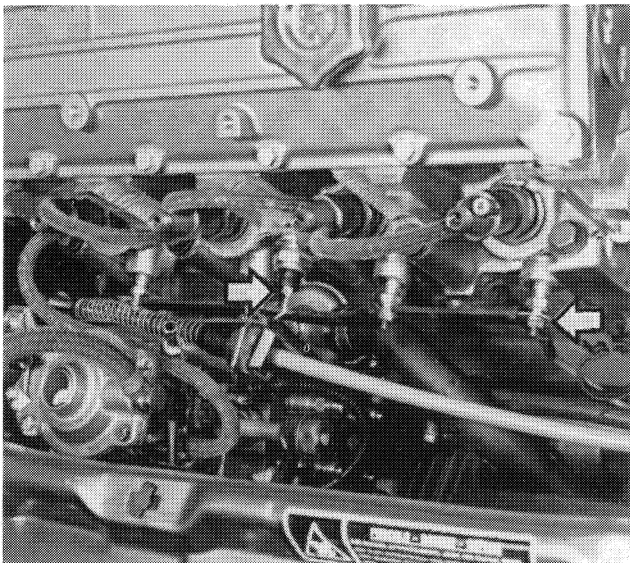


P3M032X01

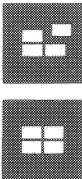


P3M032X02

- disconnect fuel delivery lines from injectors and injection pump;



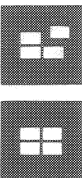
P3M032X03



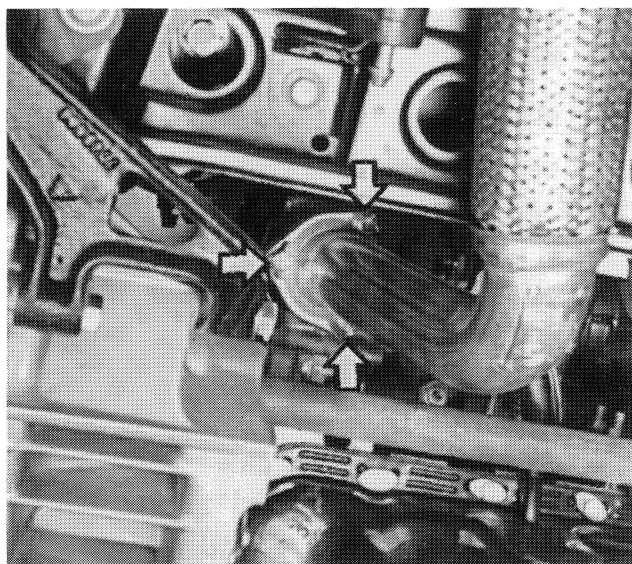
- unscrew the nut and disconnect the spark plug supply lead;
- disconnect the maximum coolant temperature connector;



P3M032X04



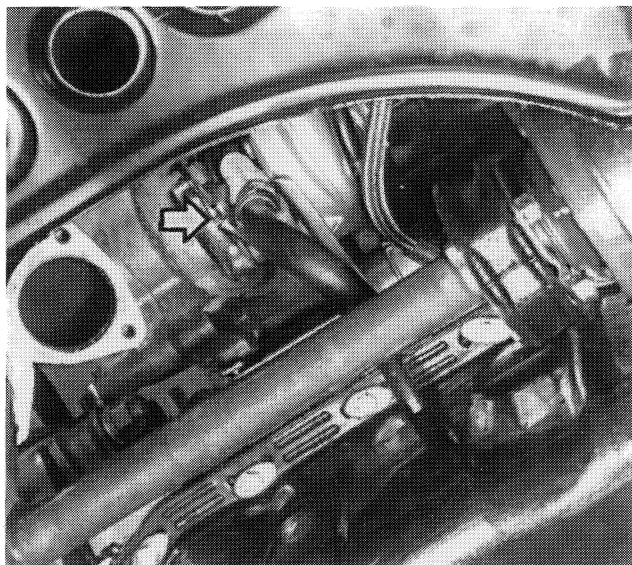
- disconnect the connector and fuel return line from injectors, shown in figure;



P3M009X03



- raise the retaining plates and unscrew the bolts retaining the front section of the exhaust pipe to the manifold;



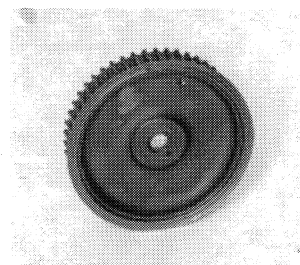
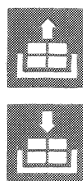
P3M033X01



- remove the retaining clip and disconnect the oil return hose from the turbocharger to the oil sump;



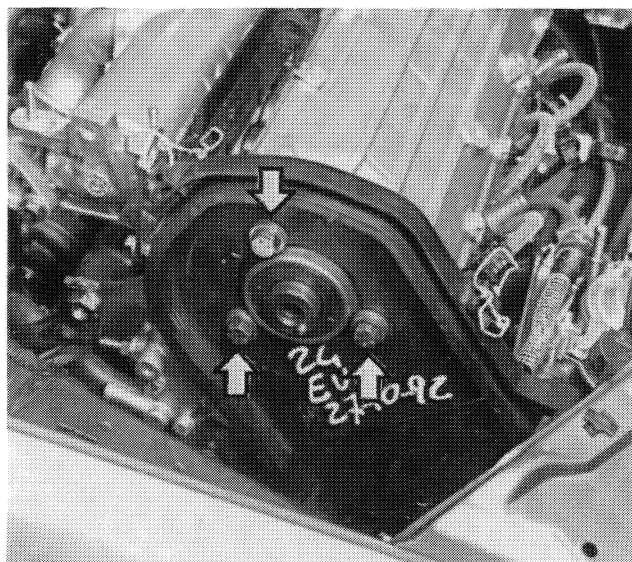
P3M033X02



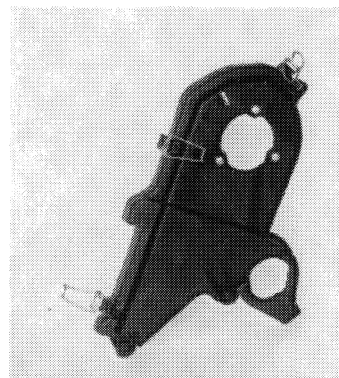
P3M033X03

- remove the camshaft pulley;

10.

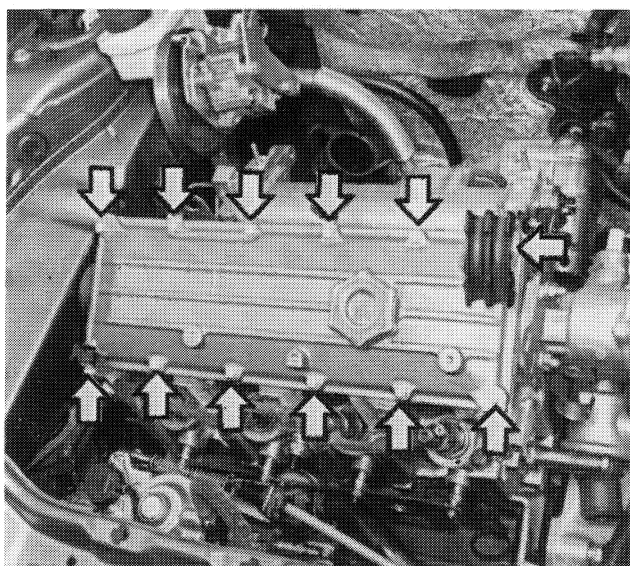


P3M034X01

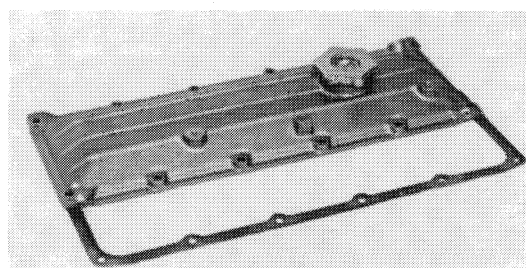


P3M034X02

- unscrew bolts indicated in figure and remove the rear timing belt guard;

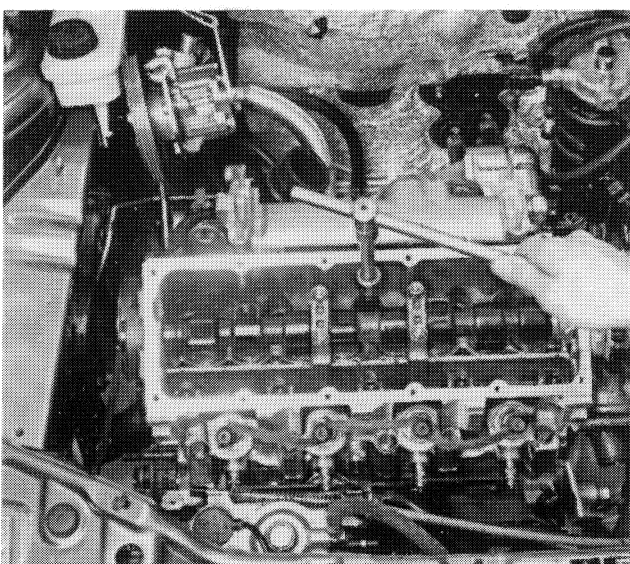


P3M034X03



P3M034X04

- remove the screws indicated in the figure and take off the cam cover;

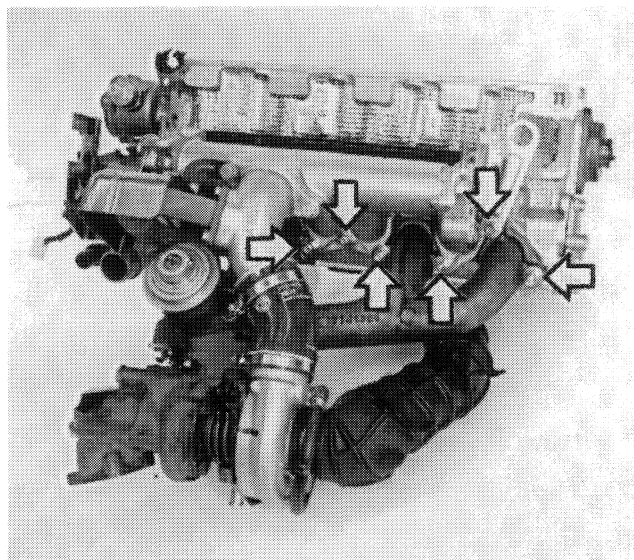


P3M034X05



The assistance of a second operator is required in order to remove the cylinder head.

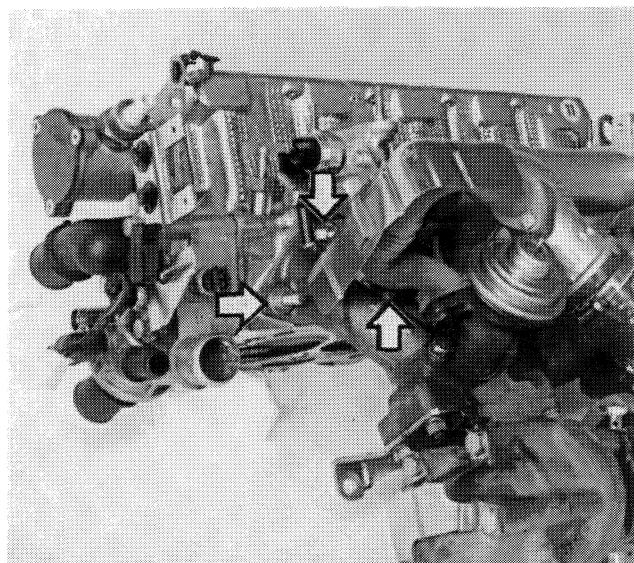
- unscrew the bolts and remove the cylinder head from its seat.



P3M035X01

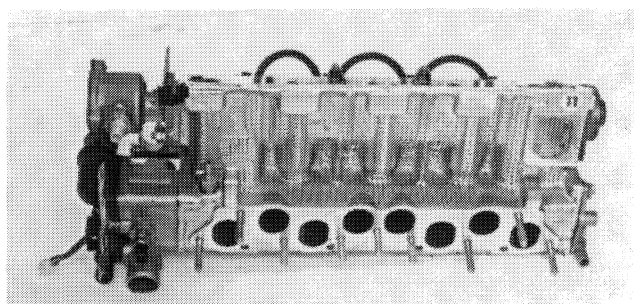
Separate cylinder head from inlet and exhaust manifolds

- Unscrew nuts retaining inlet and exhaust manifolds to cylinder head;

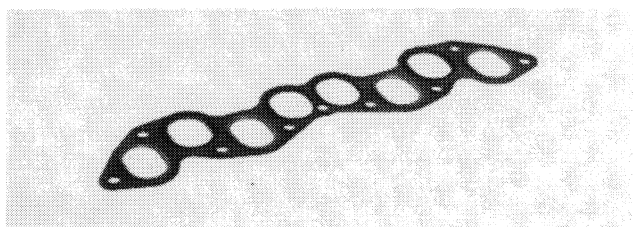


P3M035X02

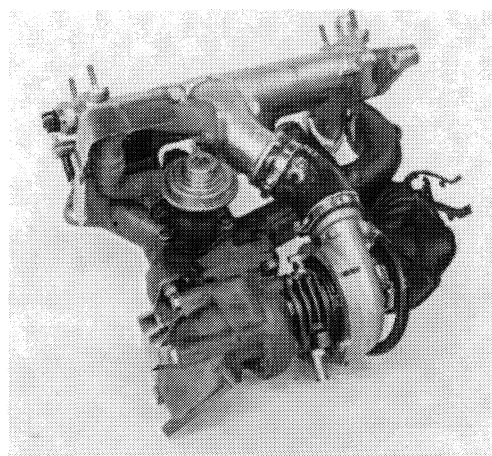
- unscrew the remaining nuts retaining inlet and exhaust manifolds to the cylinder head;



P3M035X03



P3M035X04



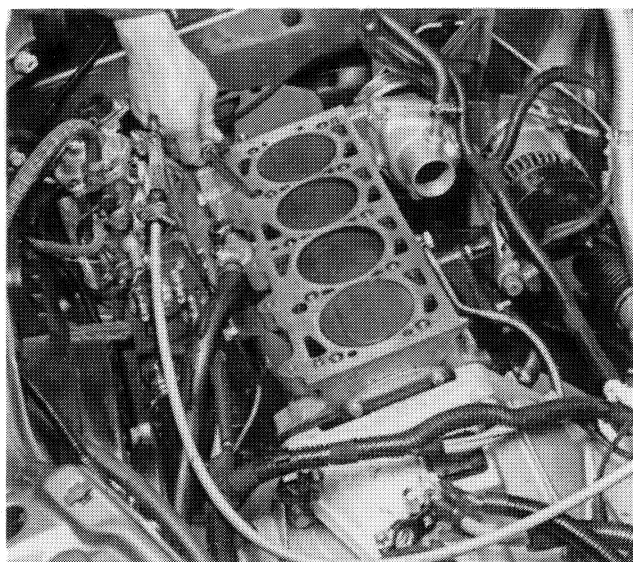
P3M035X05

- separate inlet and exhaust manifolds complete with turbocharger from the cylinder head.

Engine

Replacement operations on vehicle

10.

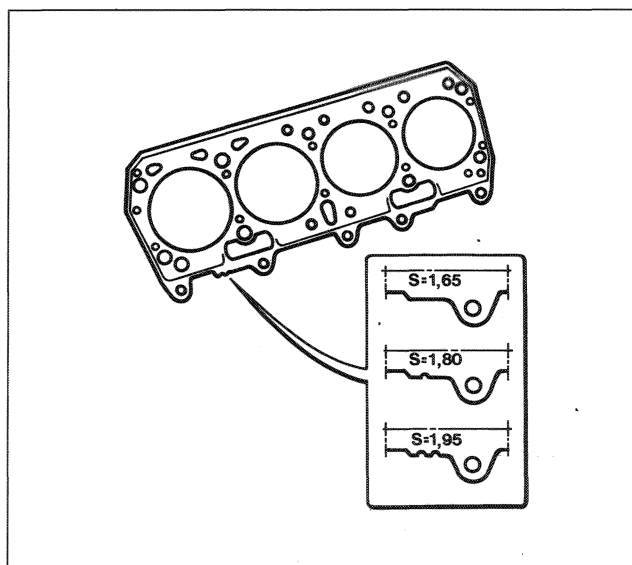


P3M036X01



Fitting cylinder head gasket

- Thoroughly clean gasket support surfaces on the crankcase and cylinder head.

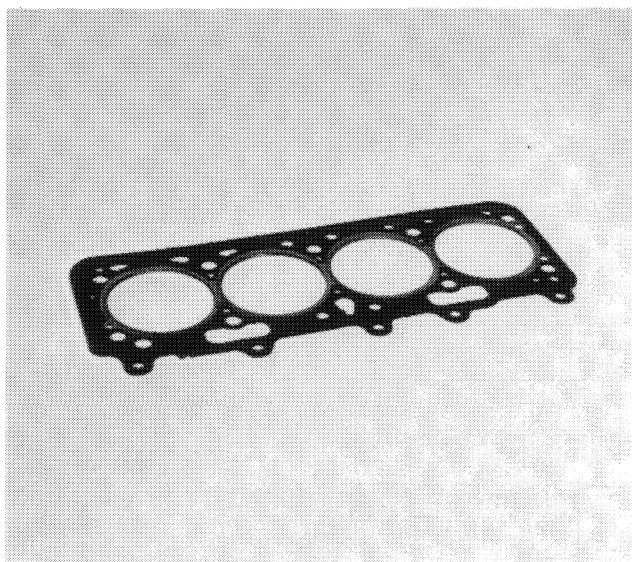


P3M036X02



After checking piston recess or protrusion in relation to top crankcase surface, in order to maintain compression ratio within specified tolerances, fit a cylinder head gasket of the thickness specified in the following table:

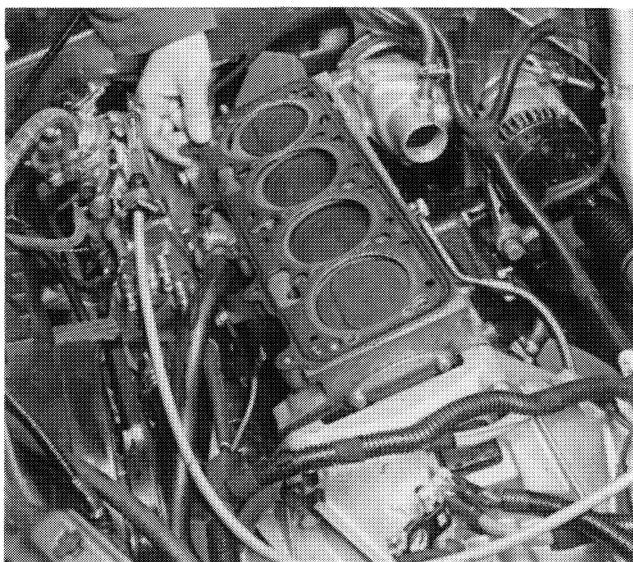
Mean piston protrusion	Cylinder head gasket thickness	Number of notches
Up to -0.03 - 0.1 mm	1.65 mm	-
From 0.1 to 0.3 mm	1.80 mm	1
More than 0.3 - 0.43 mm	1.95 mm	2



P3M036X03



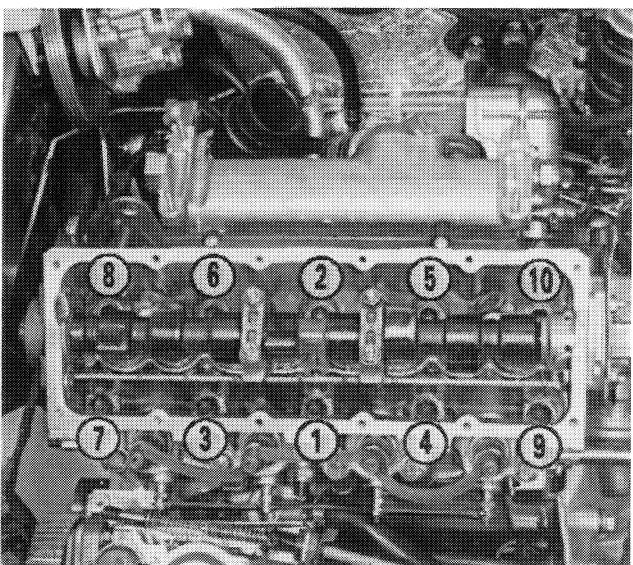
NOTE The cylinder head gasket is AS-TADUR type. This gasket is made of special material that undergoes a process of polymerization while the engine is running and thus hardens considerably during service. In order for cylinder head polymerization to take place, keep the gasket sealed in its plastic bag and take out only shortly before use.



P3M037X01



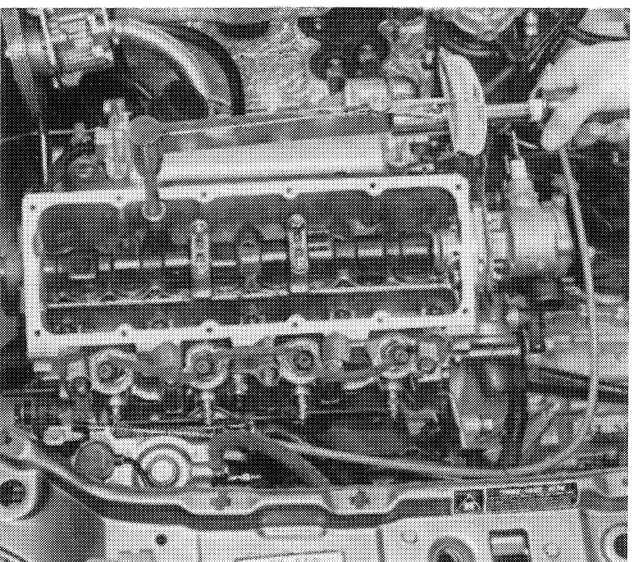
- Position cylinder head gasket on crankcase with word "ALTO" facing operator.
- do not lubricate gasket or contaminate with oil. Ensure that cylinder head and crankcase surfaces are thoroughly clean.



P3M037X02



Tightening order of bolts retaining cylinder head to crankcase



P3M037X03



5 + 5 daNm

Cylinder head tightening

- Proceed as follows to tighten cylinder head retaining bolts properly, noting that tightening order is as shown in the previous diagram:
- lubricate screws and washers and leave to drain for at least 20 minutes;

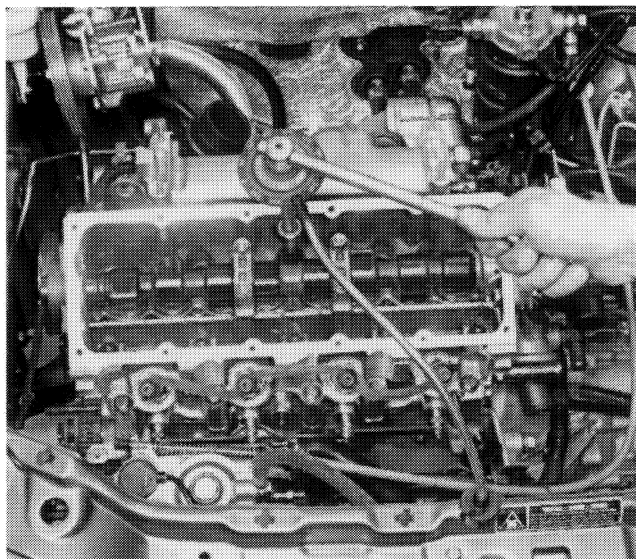
stage 1: tighten cylinder head bolts to a torque of 5 daNm;

stage 2: repeat cylinder head tightening to a torque of 10 daNm.

Engine

Replacement operations on vehicle

10.



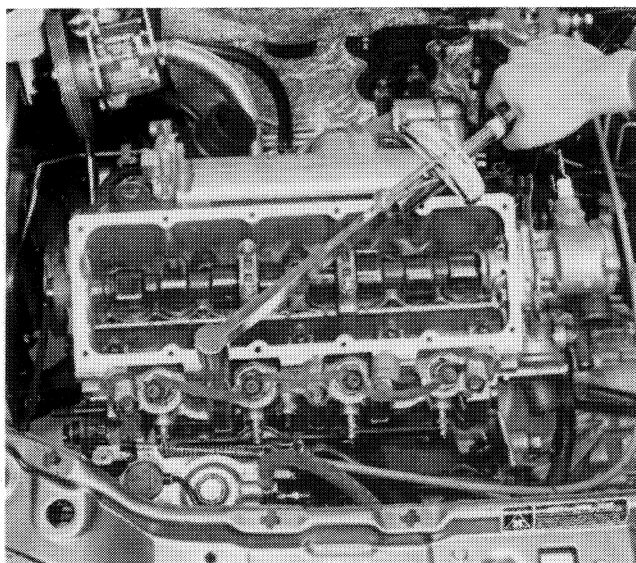
P3M038X01



90° + 90°

stage 3: use a lever wrench to tighten all the bolts through 90°.

stage 2: using the lever wrench, tighten bolts further through 90°, following the same pattern as before.



P3M038X02



3 daNm

- to complete cylinder head tightening, tighten side retaining screws to the specified torque;



To fill the cooling system, follow the instructions given at the end of Section 10, Engine.



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P3M038X03



12 daNm

- tighten camshaft pulley retaining screw to the specified torque.

NOTE *To finish fitting the cylinder head, reverse removal instructions.*