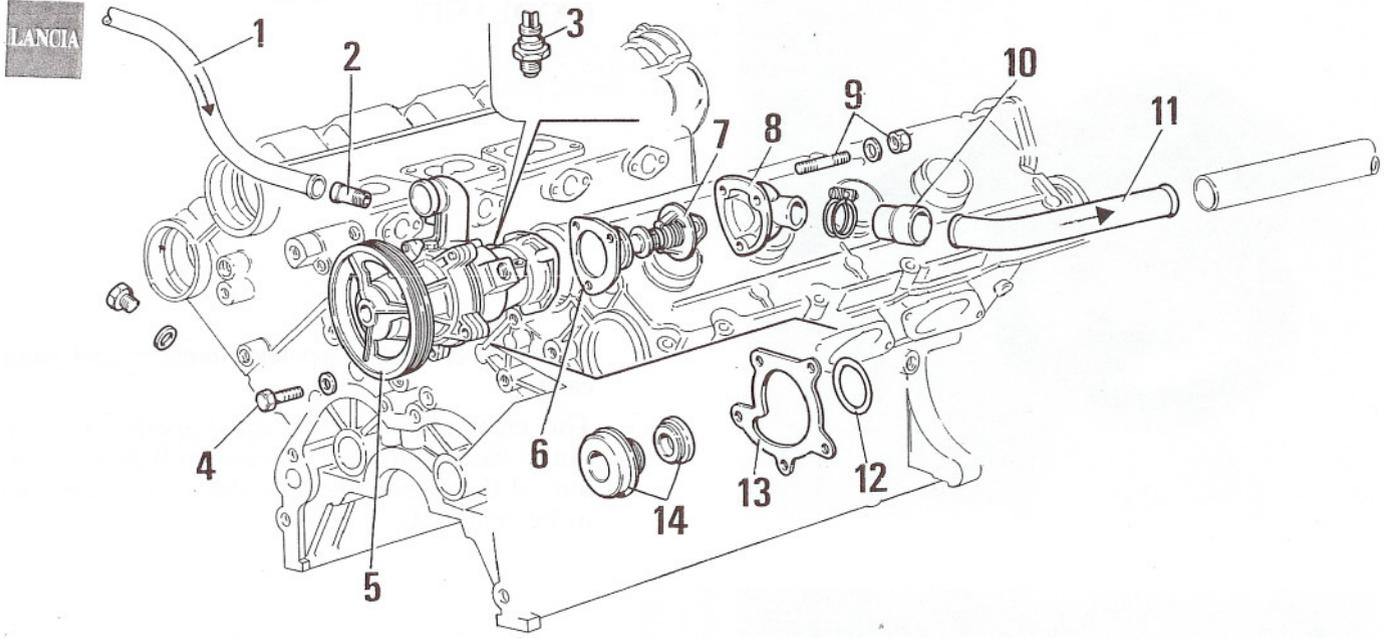
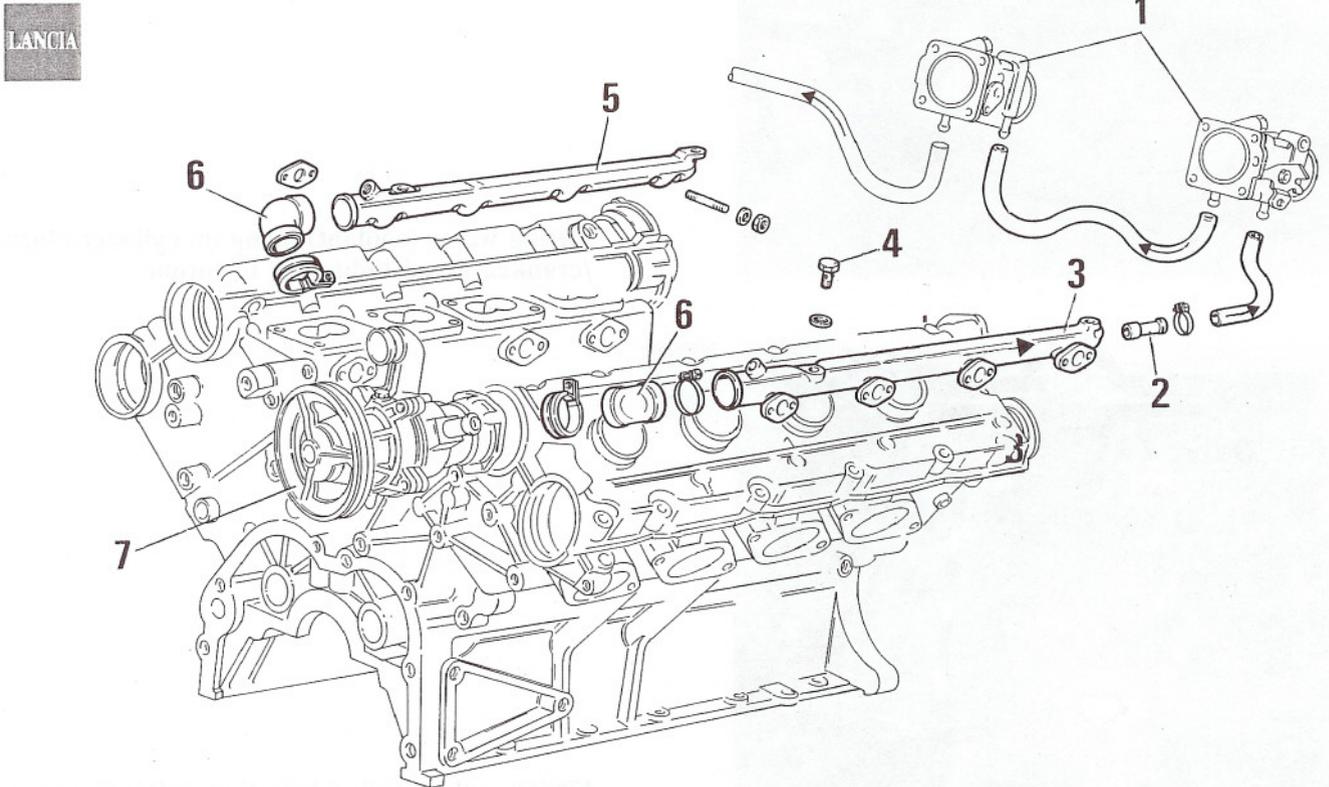


View of certain cooling system components available as spares

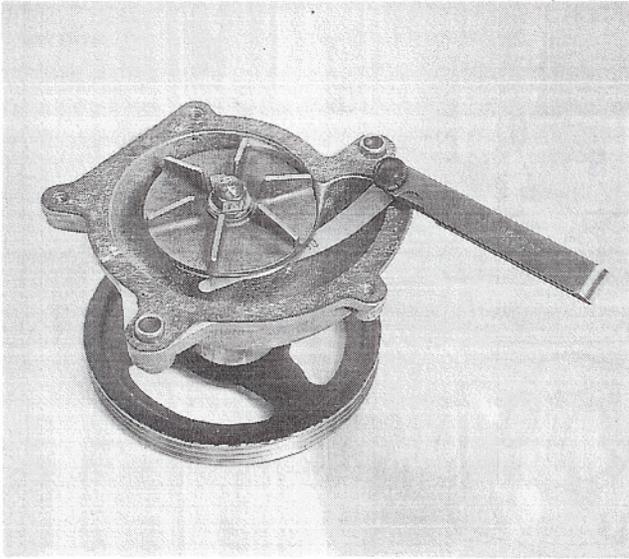


1. Coolant pipe between heater radiator and pump - 2. Union - 3. Coolant temperature sensor - 4. Bolts fixing coolant pump to cylinder block/crankcase - 5. Coolant pump - 6. Thermostat gasket - 7. Thermostat - 8. Coolant outlet union - 9. Stud and nut fixing thermostat to coolant pump - 10. Sleeve - 11. Coolant pipe between thermostat and radiator - 12. Seal - 13. Gasket - 14. Seal for coolant pump shaft.



1. Butterfly casings - 2. Union - 3. Coolant duct between left cylinder head and pump - 4. Bolts fixing ducts (3 and 5) to cylinder heads - 5. Coolant duct between right cylinder head and pump - 6. Sleeves - 7. Coolant pump.

10.



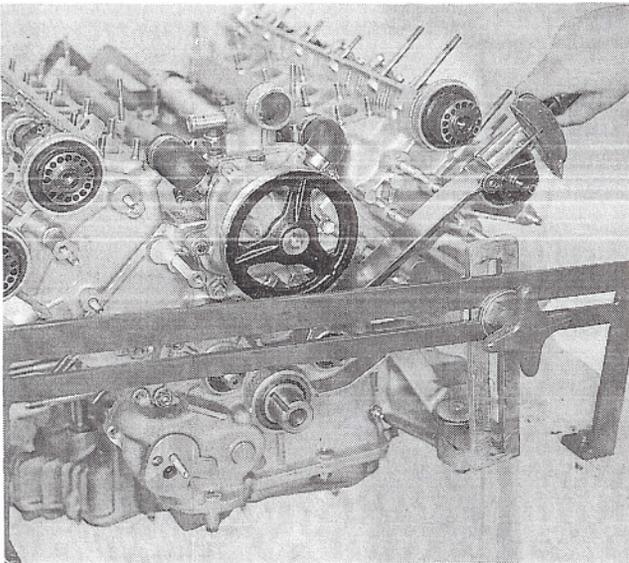
**WATER PUMP
(COOLANT)**



0,34 + 1,64

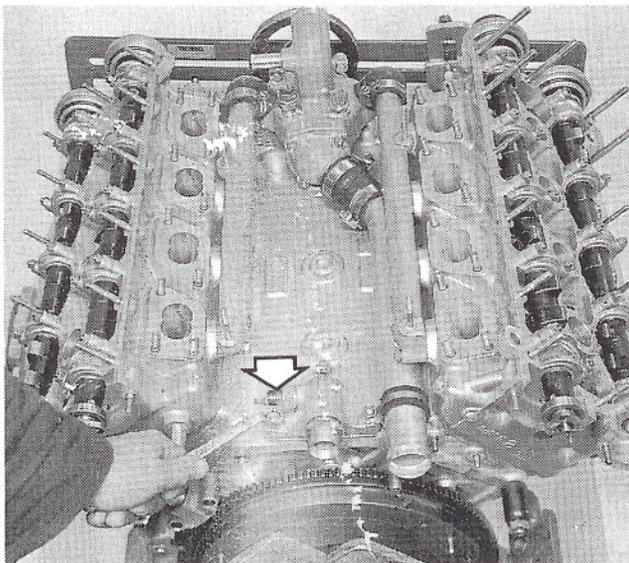
Checking clearance between impeller and pump casing

The clearance between the impeller and the pump casing should be between 0.34 and 1.64 mm; if this is not the case, the water pump has to be replaced.



2,5 daNm

**Fitting water (coolant) pump on cylinder block/
crankcase and tightening to torque**



**Fitting engine oil lubrication inlet flange on
cylinder block/crankcase**

The arrow shows the insufficient engine oil pressure switch

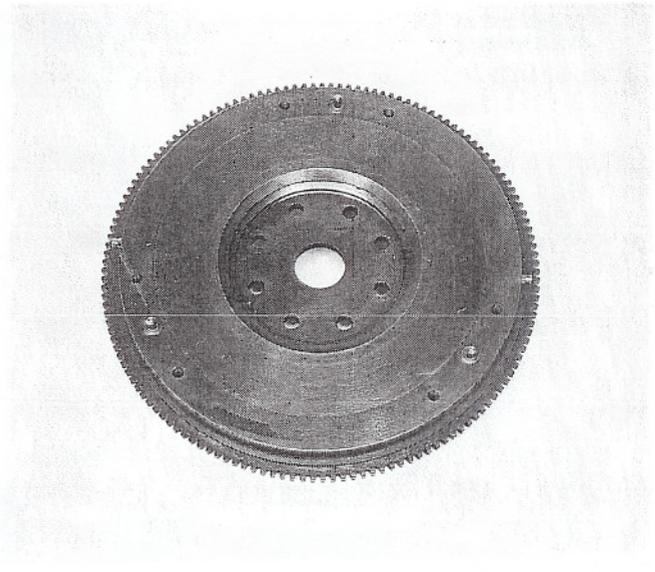
FLYWHEEL



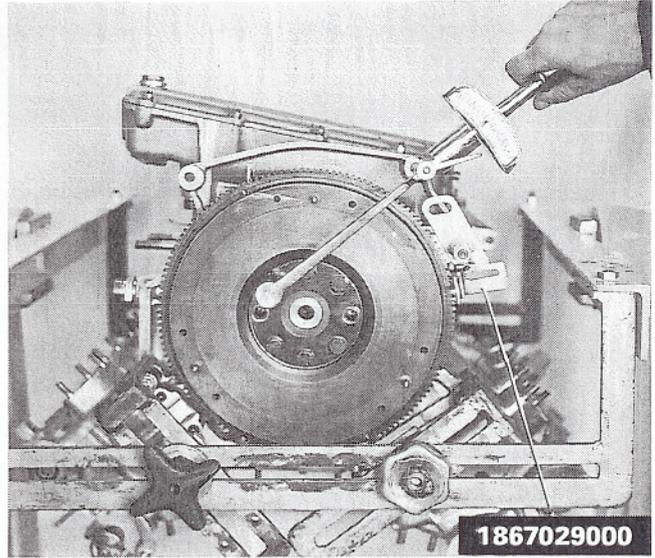
Checking clutch disc support surface

If there is any scoring on the surfaces, they must be skimmed.

NOTE *If the ring gear needs replacing, heat the new one in the oven to 80°C and fit it on the flywheel with the bevel on the internal diameter turned towards the actual flywheel. Use an ordinary steel drift when removing.*

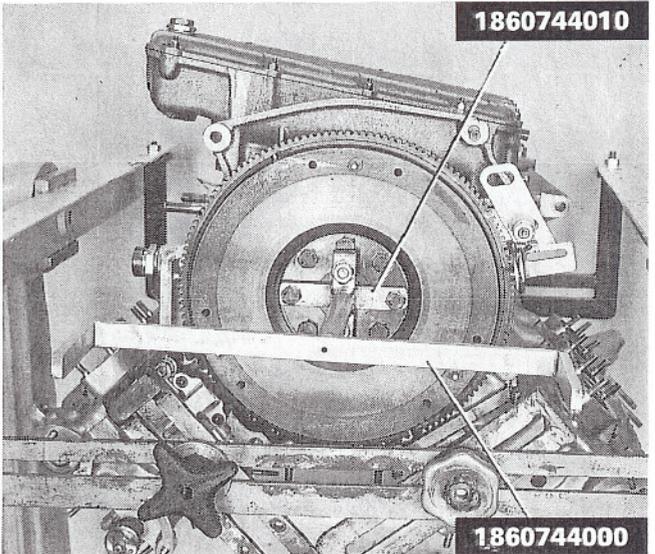


8,3 daNm



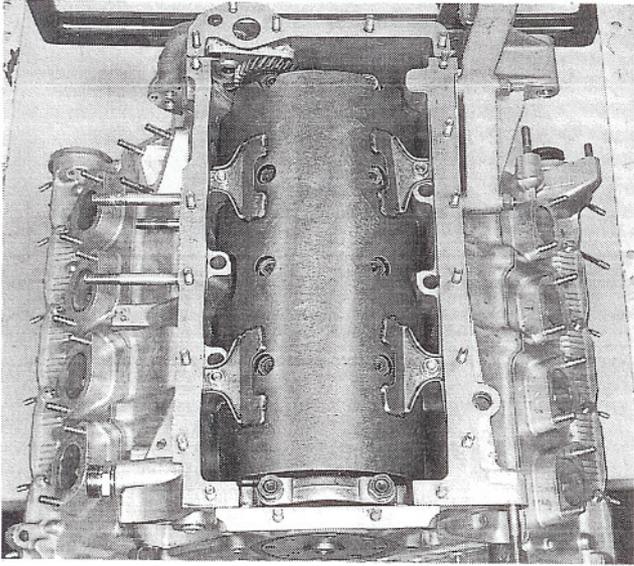
Fitting flywheel

NOTE *Use tool 1867029000 (flywheel lock) when fitting the flywheel.*

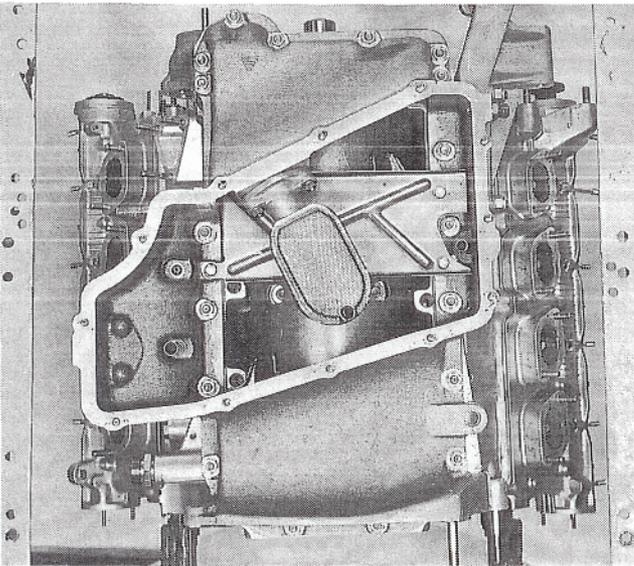


Fitting crank for rotating crankshaft

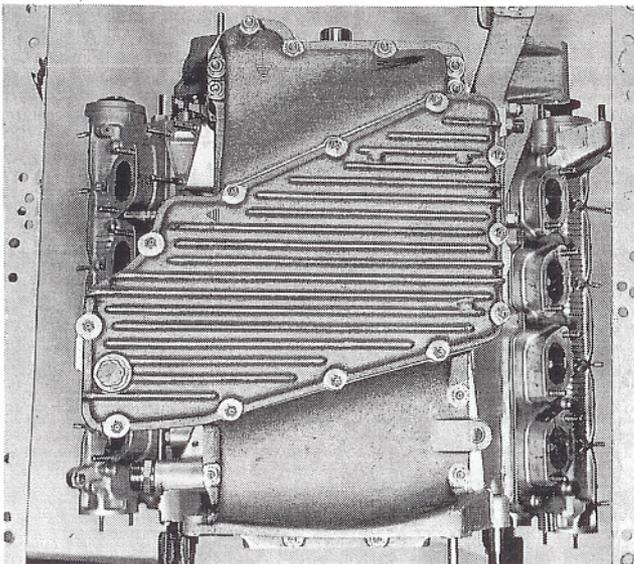
10.



Fitting partition wall to prevent oil shaking in sump

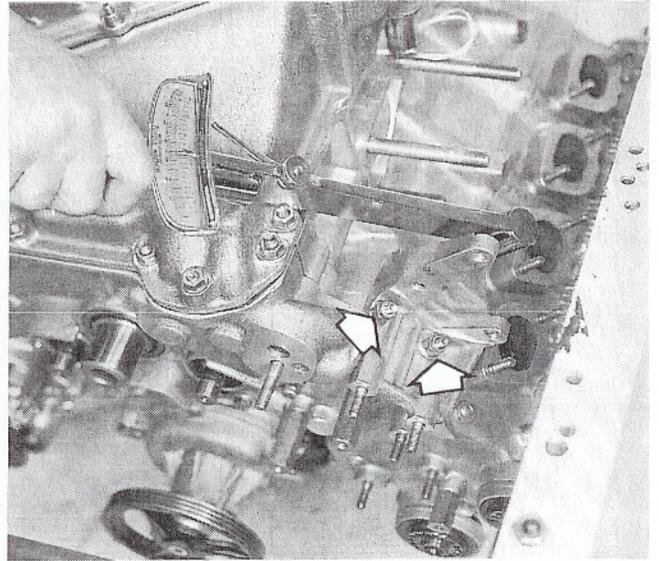


Fitting engine oil sump



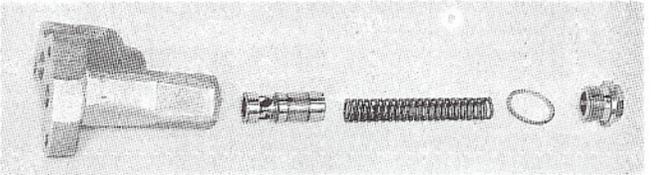
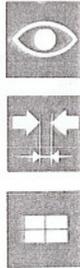
Fitting oil sump lower cover

2,5 daNm



Fitting power assisted steering mounting and tightening nuts fixing it to the crankcase to torque

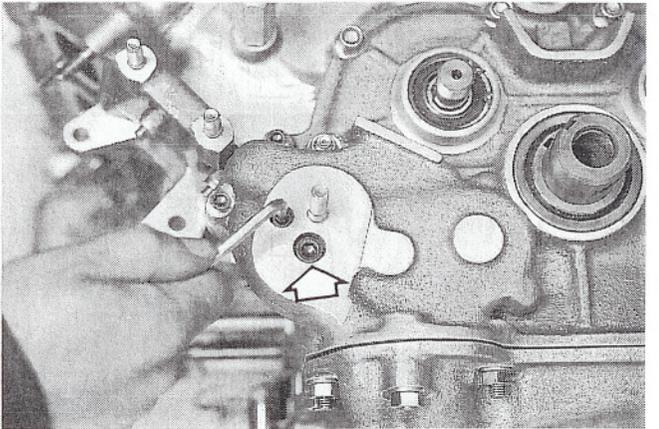
ENGINE OIL PRESSURE RELIEF VALVE



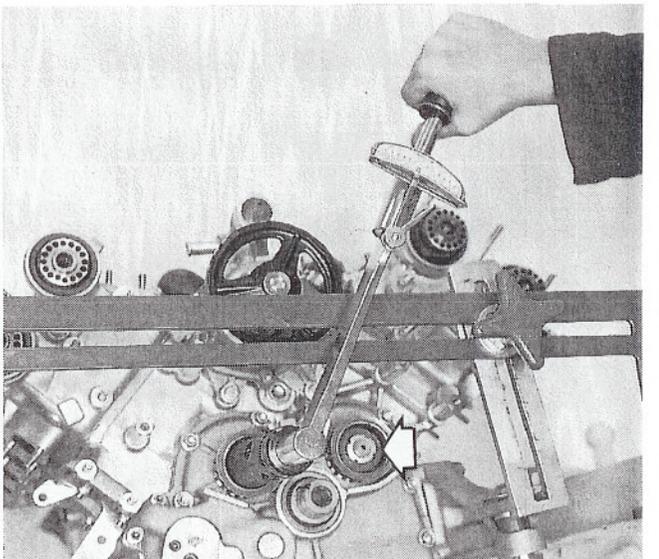
Fitting oil pressure relief valve on crankshaft front cover



Check that there is no scoring on the valve piston or else it has to be replaced. The valve spring should have a height of 74 mm under a load of 11.3 - 12.3 daN and a height of 66 mm under a load of 13.4 - 14.6 daN or else the spring must be replaced.



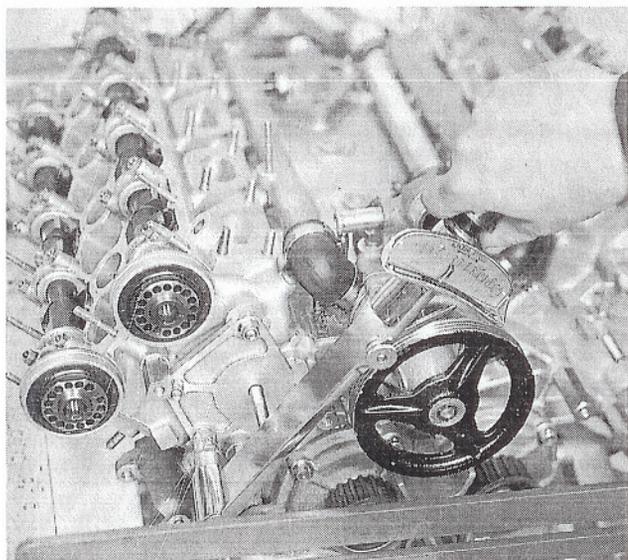
9,8 daNm



Fitting timing drive gears and tightening ring nuts to torque

The arrow shows the ring nut

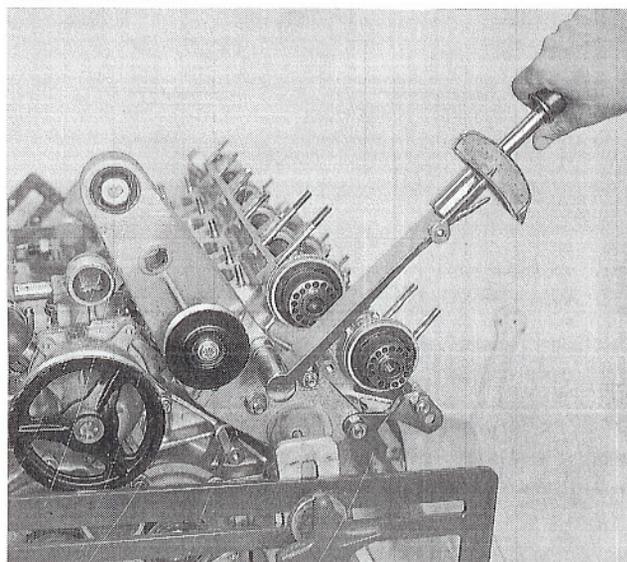
10.



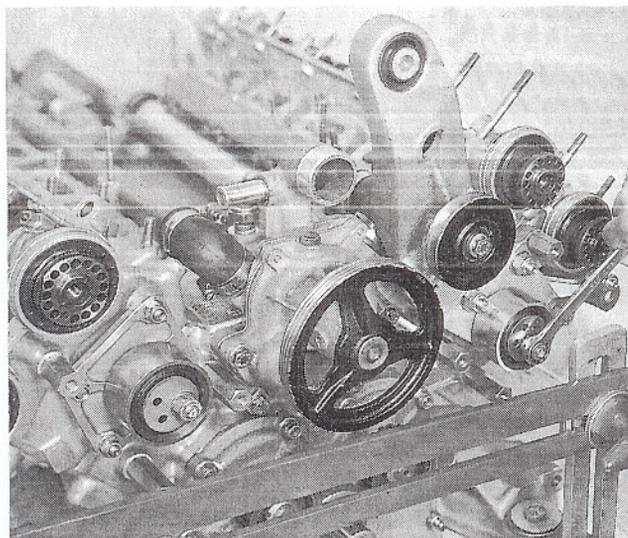
Fitting right belt tensioner mounting and tightening fixing nuts to torque



2,5 daNm

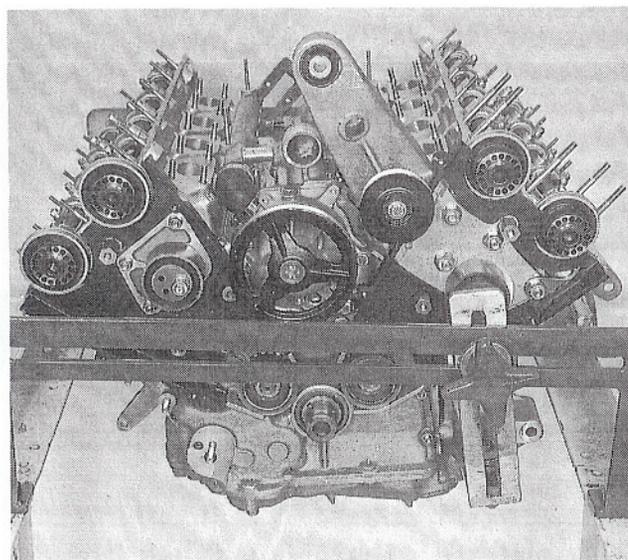


Fitting engine mounting (timing side), fixed belt tensioner mounting (for compressor drive belt), left moveable belt tensioner mounting and tightening fixing nuts to torque



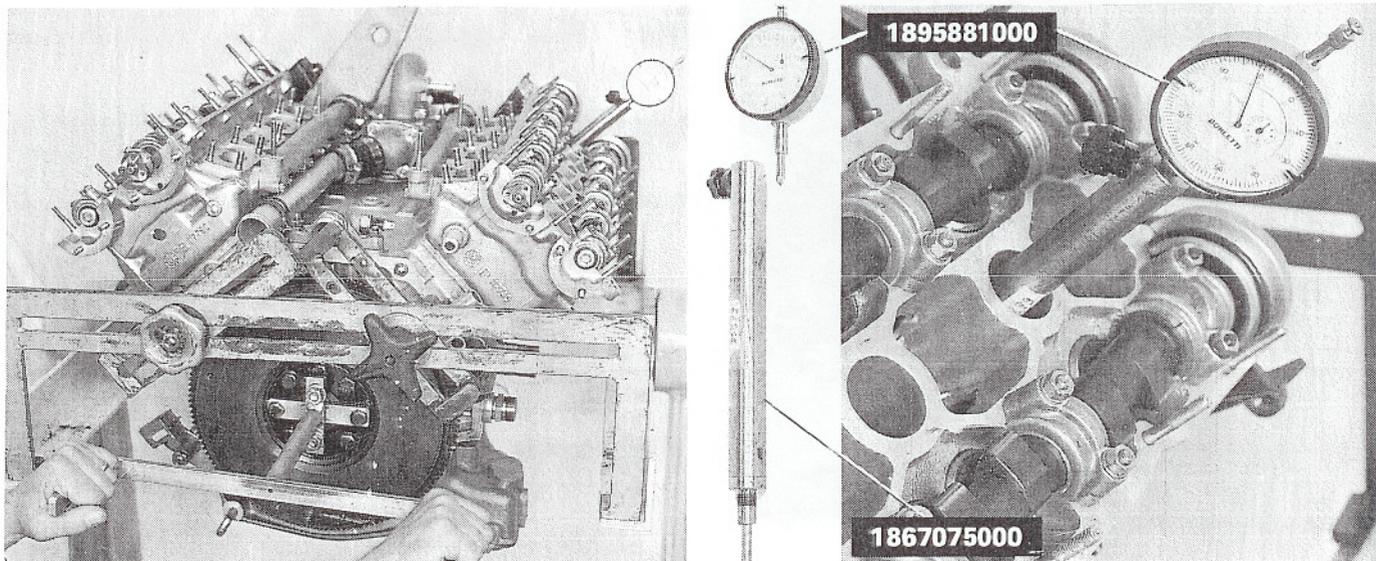
Fitting and positioning belt tensioner

To facilitate the fitting of the belts, position the belt tensioner as shown in the diagram, then temporarily lock the belt tensioner fixing nuts in this position.



Fitting lower rear shields for timing belts

TIMING SYSTEM

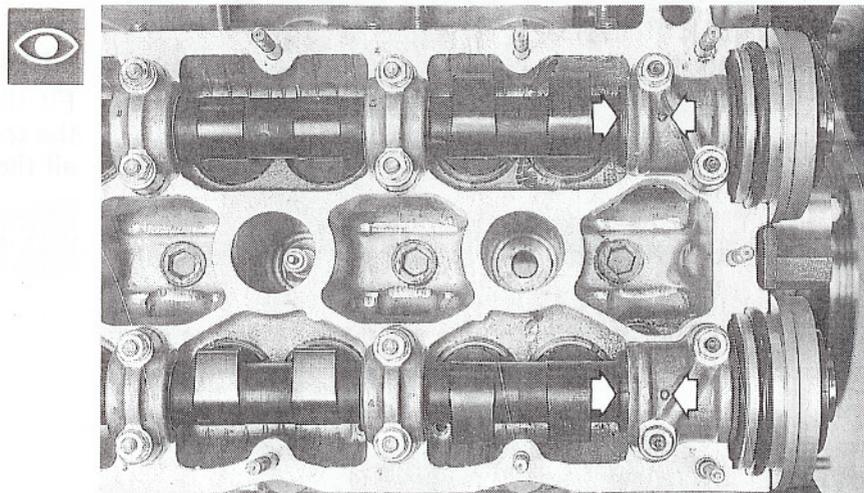


Positioning piston no. 1 (right main bearing) at TDC (explosion stroke)

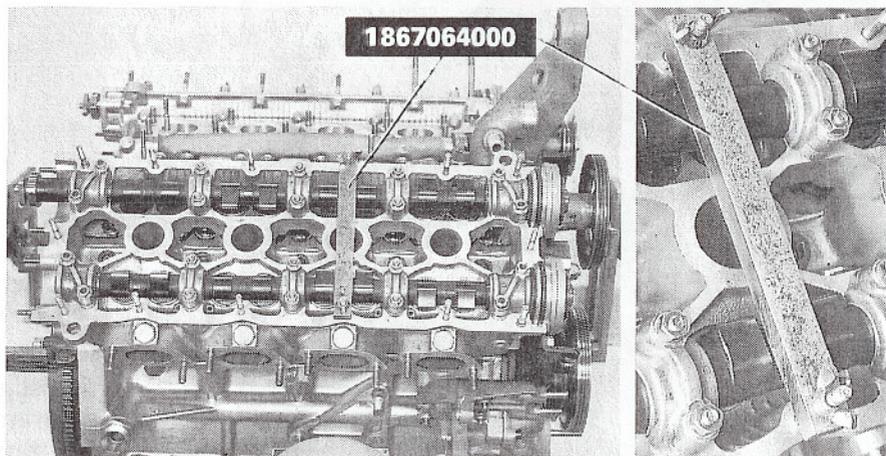
In order to carry out this operation it is necessary to use tool 1867075000 and dial gauge 1895881000 as illustrated in the diagrams above. Tool 1867075000 is threaded and is bolted in place of the spark plug for piston no. 1

NOTE After this operation cylinder no. 7 (left main bearing) should also be perfectly positioned at TDC (balance stroke)

Checking perfect alignment of reference marks on camshafts and caps, timing side

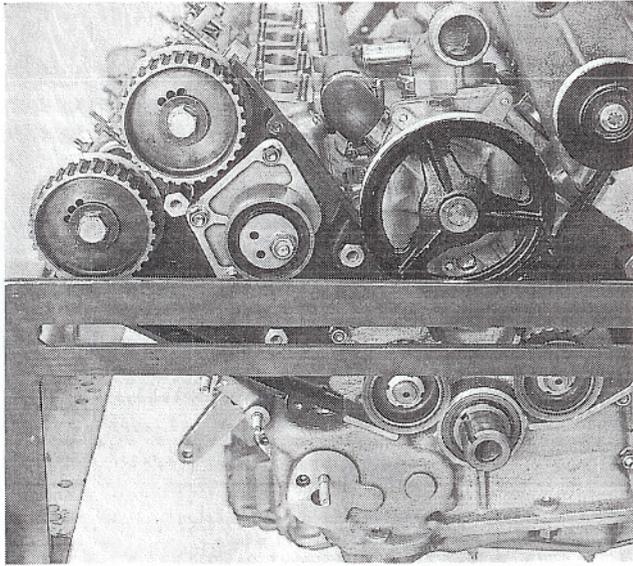


The spark plug for piston no. 1 has to be removed for the next stage.



Fitting tool 1867064000 for retaining camshafts in reference position

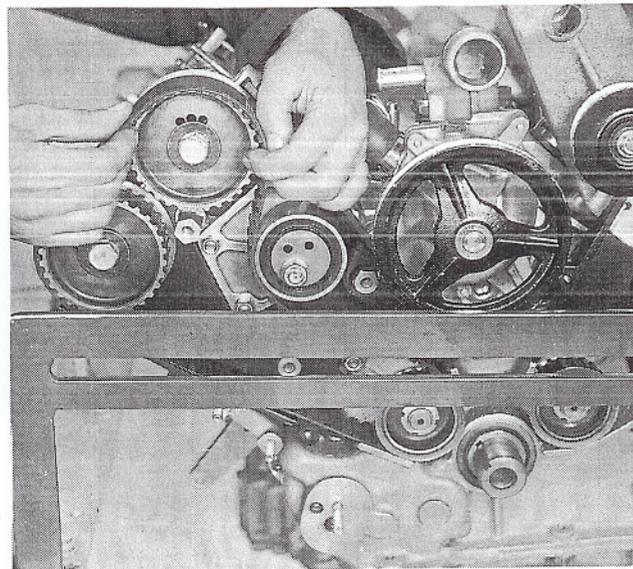
10.



Temporarily fit the camshaft drive pulleys with the appropriate dowels.



Under these circumstances the pulleys can rotate freely as they are not fixed to the camshafts.

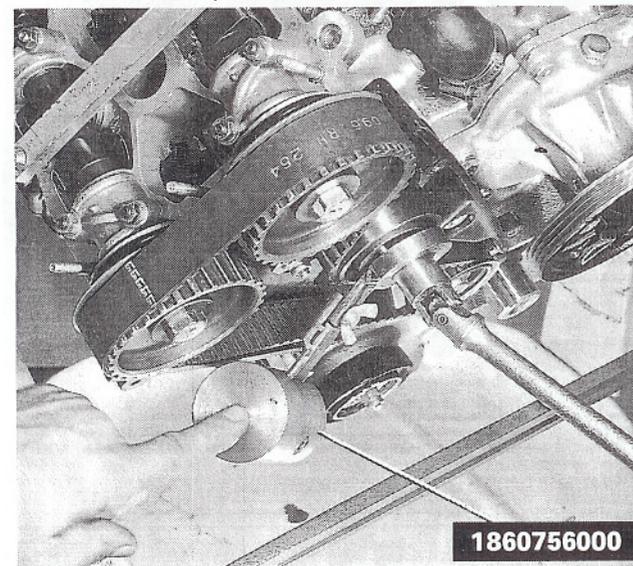


Fitting timing belts

Fit the timing belts taking care to check that the teeth are properly mated with the ones on all the pulleys.



Whilst fitting the timing belts do not under any circumstances bend them at a sharp angle or get them covered with oil or petrol as this would damage them.

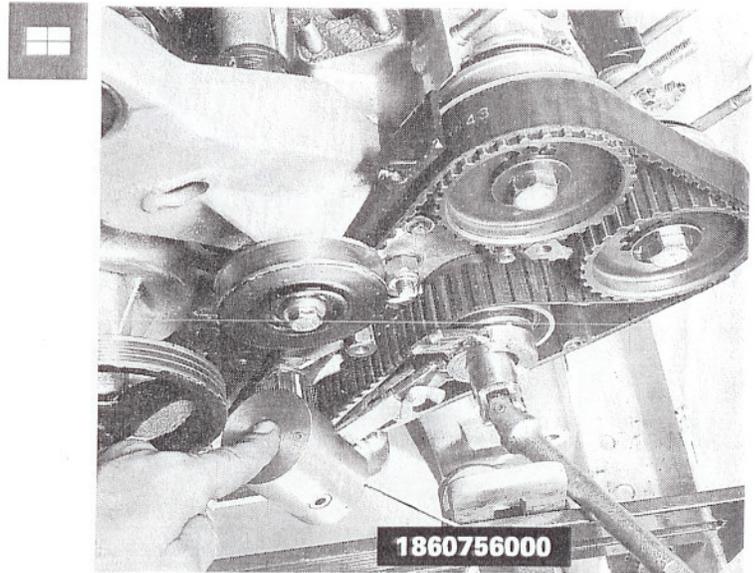


Fitting tool 1860756000 for tensioning (right cylinder head) camshaft drive belt on moveable belt tensioner

Further pre-tighten the camshaft belt by exerting slight pressure on the tool (as shown in the diagram at the side) and temporarily tighten the moveable belt tensioner fixing nut.

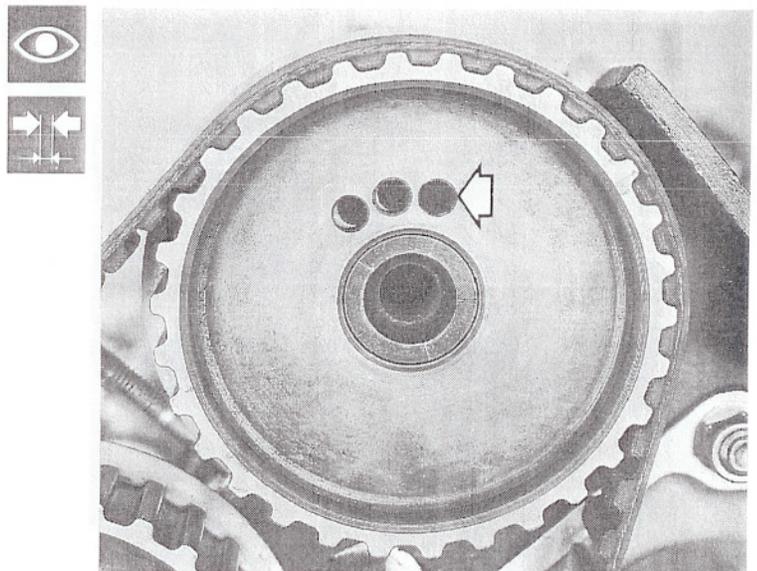
Fitting tool 1860756000 for tensioning (left cylinder head) camshaft belt on moveable belt tensioner

Further pre-tighten the camshaft belt by exerting slight pressure on the tool (as shown in the diagram at the side) and temporarily tighten the moveable belt tensioner fixing nut.

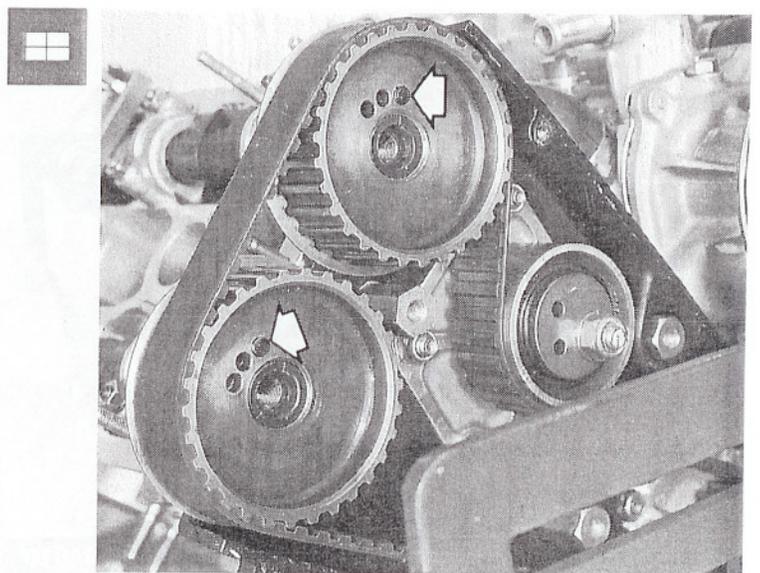


Checking alignment of openings in the pulleys and the camshafts

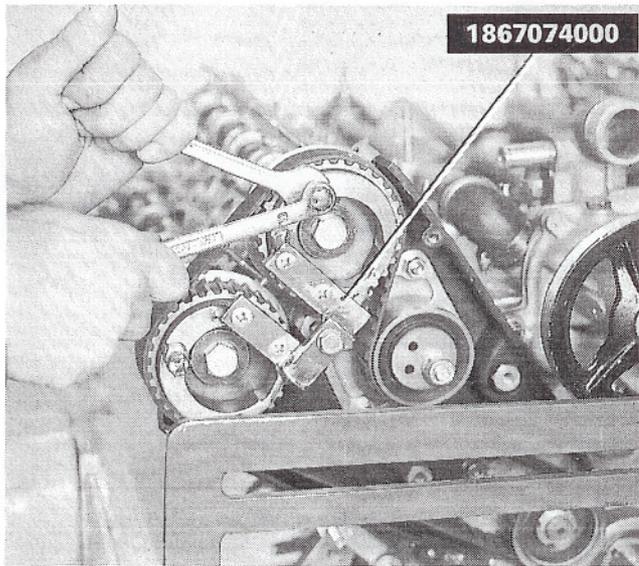
Look for an opening in the pulley which is in line with an opening in the camshaft and then insert the dowel. If this is not possible, the pulley has to be removed and moved one tooth further round the belt (without releasing the tensioner). In this way, on account of the different angular division of the belt teeth and the openings in the pulley, it is always possible to find two openings which are aligned.



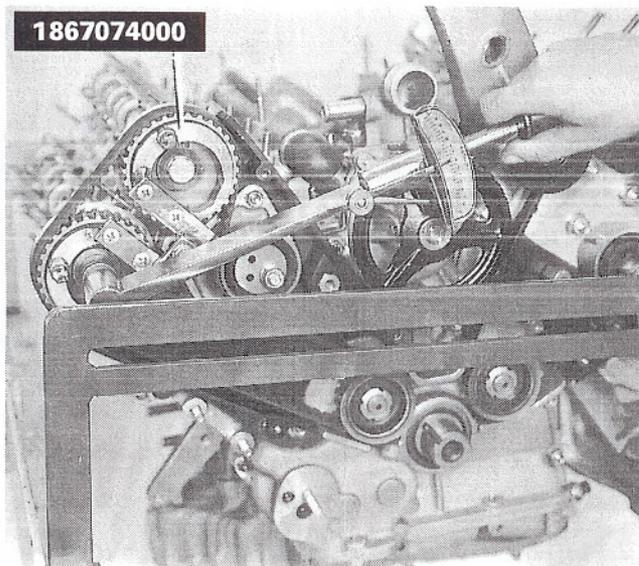
Fitting camshaft drive pulley dowels



10.

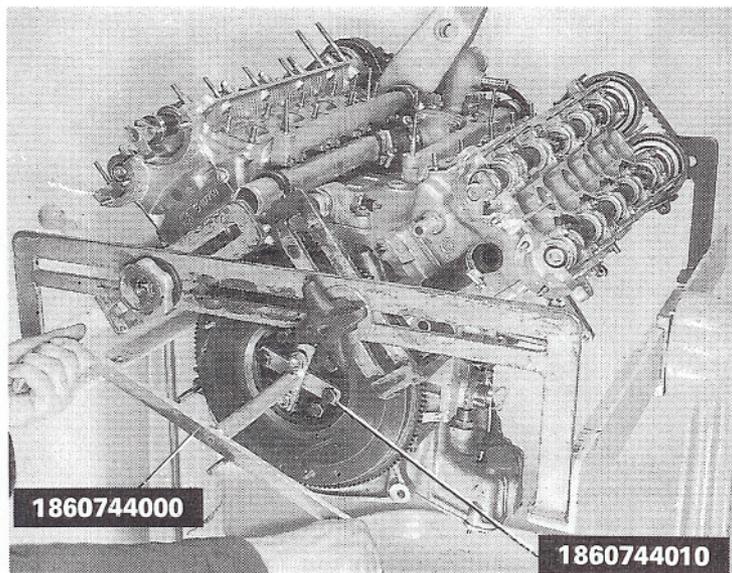


Fitting tool 1867074000 for retaining timing pulleys whilst tightening bolts fixing them to the relevant shafts



9,8 daNm

Tightening bolts fixing timing pulleys to relevant shafts to torque



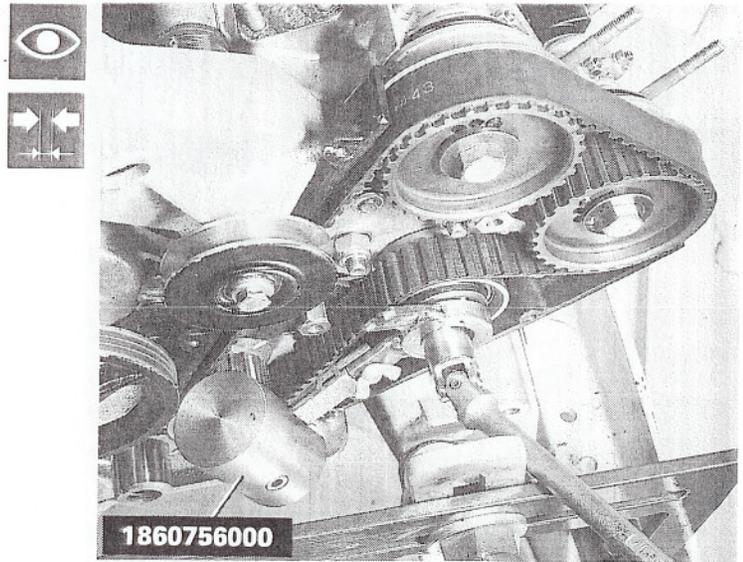
ADJUSTING TIMING BELT TENSION



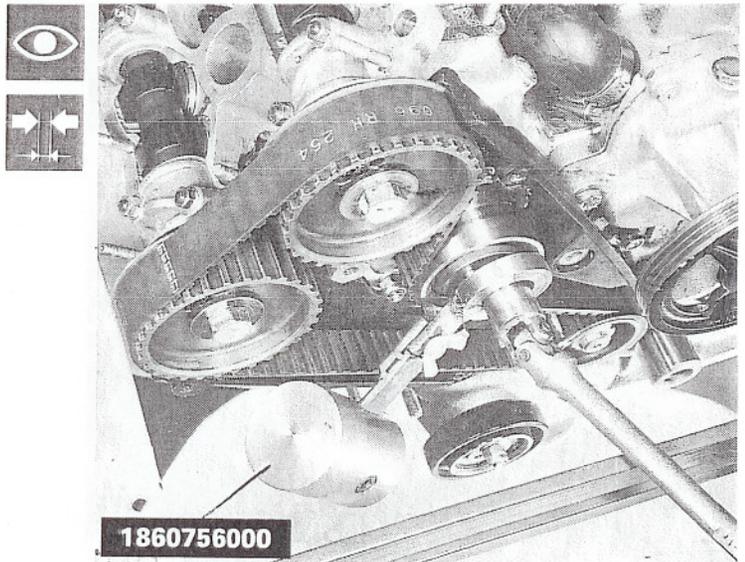
Set the timing belts by making the crankshaft complete two revolutions in the direction of rotation. Check that the reference marks on the camshafts and the caps, timing side, coincide. At this stage both piston no. 1 (right main bearing) and piston no. 7 (left main bearing) should be at TDC with piston no. 7 in the balance stroke.

Checking left cylinder head timing belt tension

With piston no. 7 at TDC during the balance stroke and with tool 1860756000 fitted on the belt tensioner, loosen the bolt fixing the belt tensioner. Then, tighten the belt tensioner fixing bolts to torque.

**Checking right cylinder head timing belt tension**

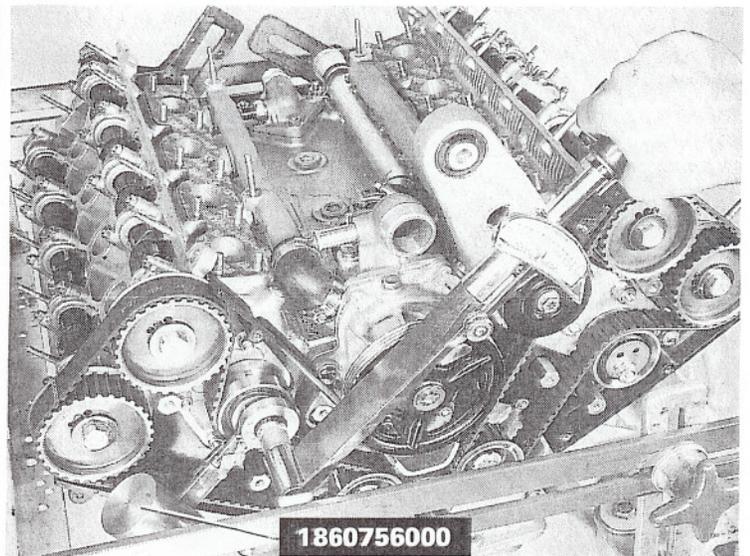
Rotate the crankshaft, in its direction of rotation, through one further revolution so that piston no. 1 (right main bearing) is at TDC during the balance stroke. Fit tool 1860756000 on the belt tensioner and then loosen the belt tensioner fixing bolt.

**Tightening right cylinder head belt tensioner fixing bolt to torque****Timing belts****2,5 daNm**

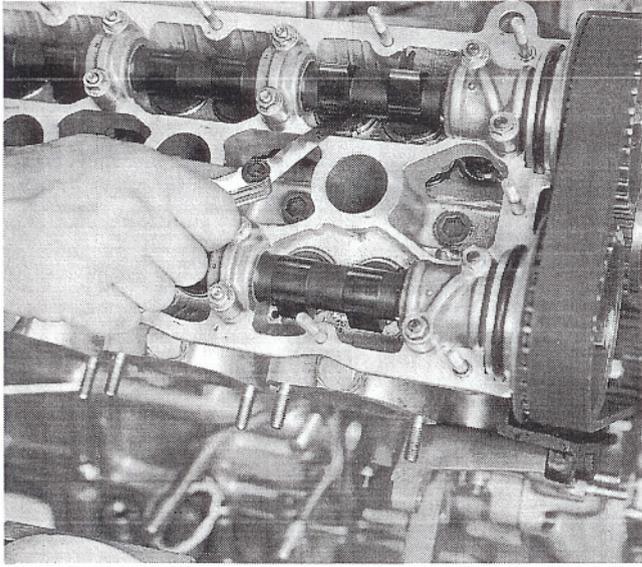
Check the condition and tension of the timing belts every 10,000 km and replace them if:

- they are soaked in oil or coolant;
- they show traces of cracks or broken teeth;
- they are slack or the teeth are worn.

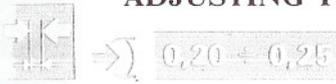
The timing belts must be replaced during service operations which necessitate their removal and **at least every 40,000 km.**



10.

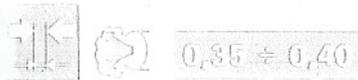
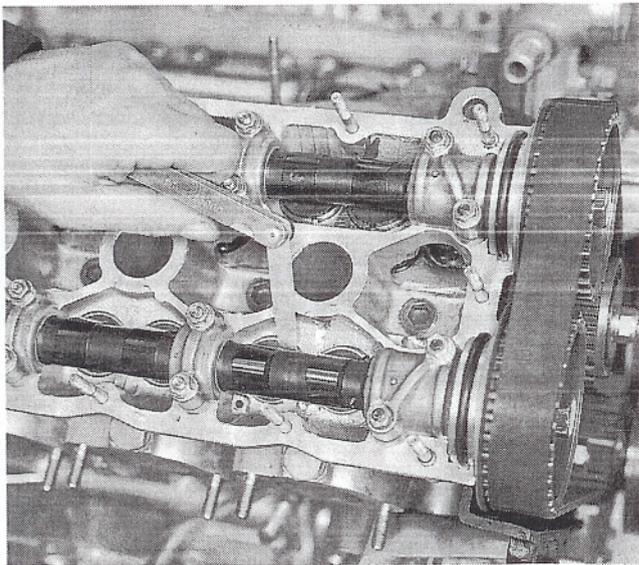


ADJUSTING TAPPET CLEARANCE



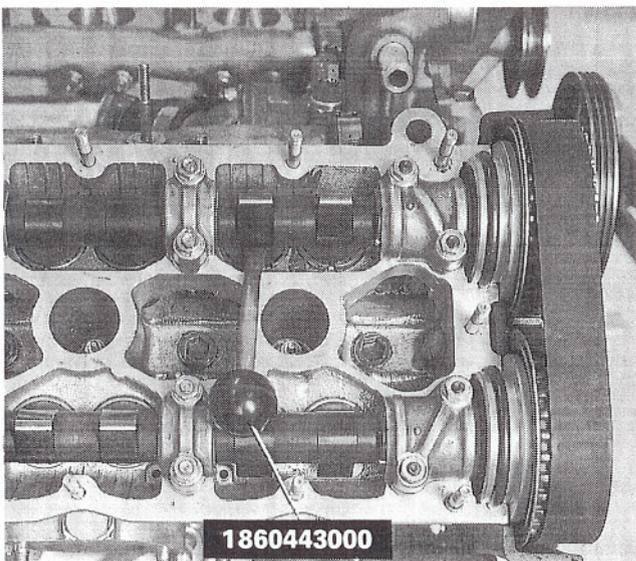
Checking inlet valve clearance

Rotate the camshaft until the cams are perpendicular (upwards) in relation to the tappet shims to be checked; then carry out the measurement (see diagram at the side)



Checking exhaust valve clearance

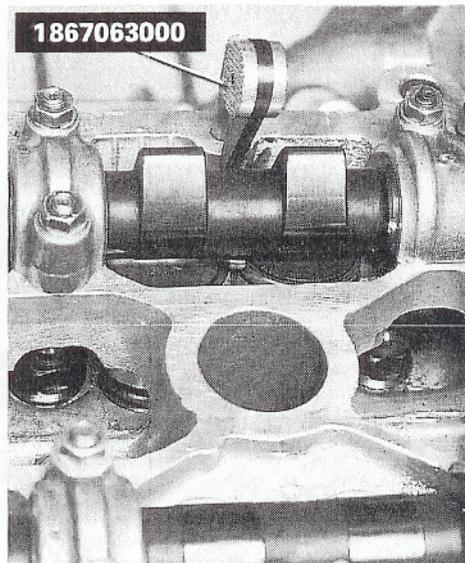
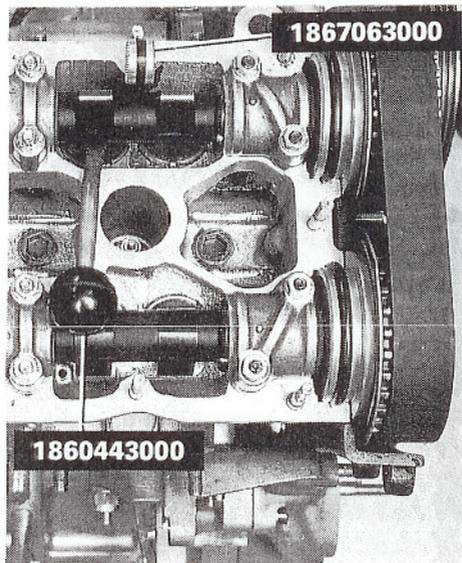
Rotate the camshaft until the cams are perpendicular (upwards) in relation to the tappet shims to be checked; then carry out the measurement (see diagram at the side).



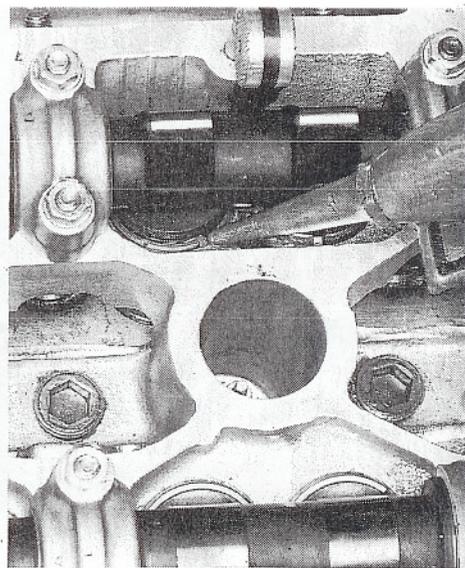
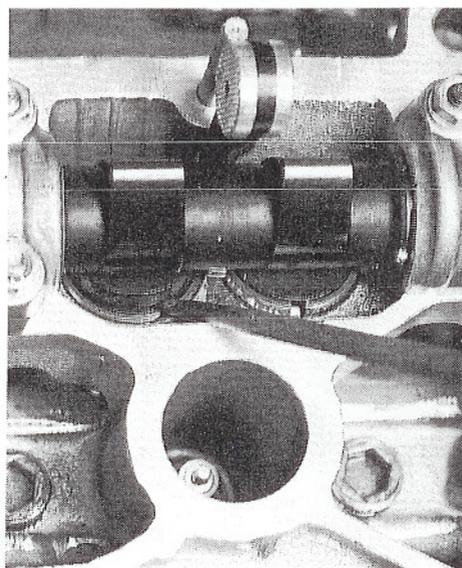
Fitting pressure lever 1860443000

Inserting tool 1867063000 for keeping tappets in lower position

Before fitting tool 1867063000, rotate the camshaft until the tappet concerned is in the completely open position.

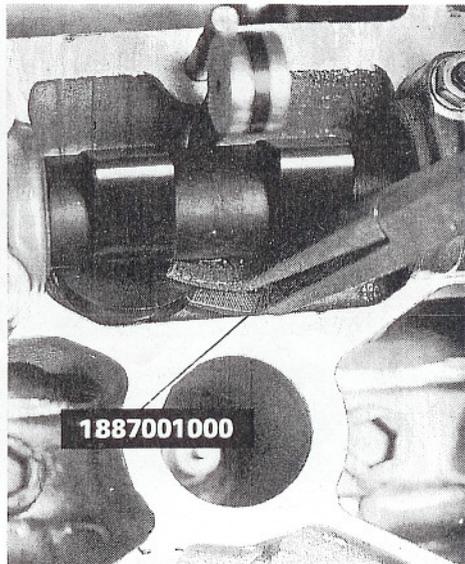
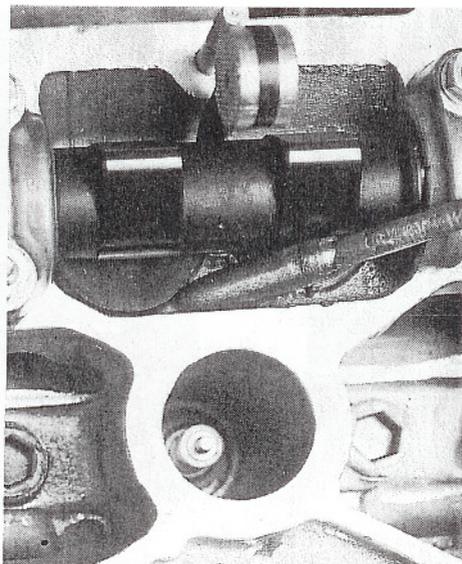


Fit the tappet adjustment shim using a scriber or compressed air

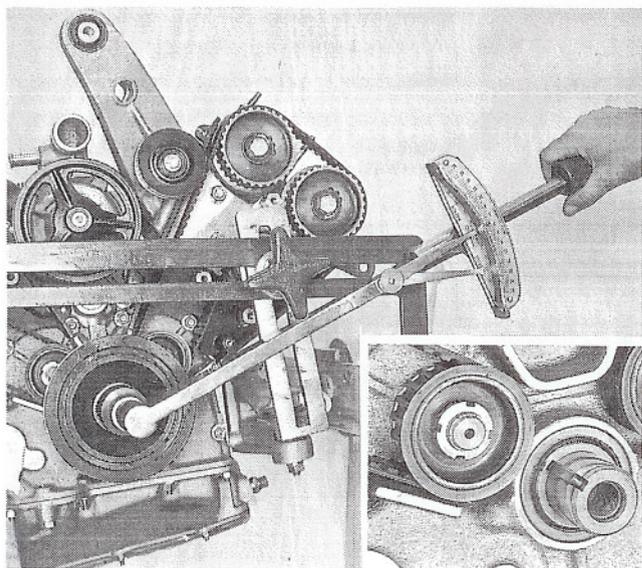


Removing and replacing tappet adjustment shim using a magnet or pliers 1887001000

Replace the shim which has been removed with another of the same size to renew the correct valve clearance.



10.

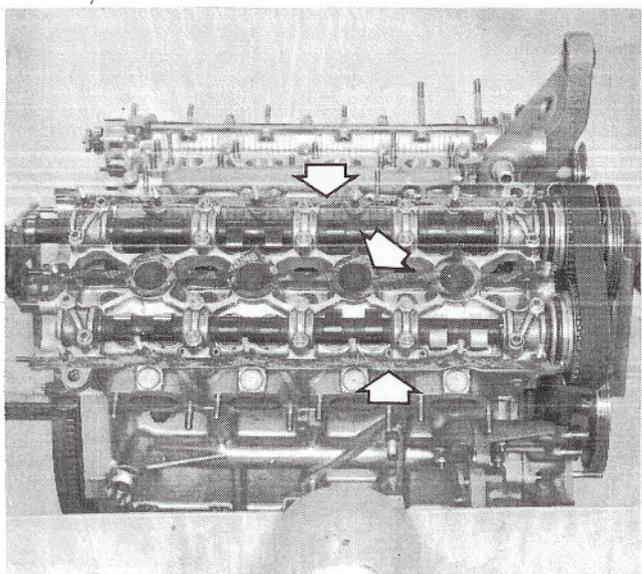


19,6 daNm

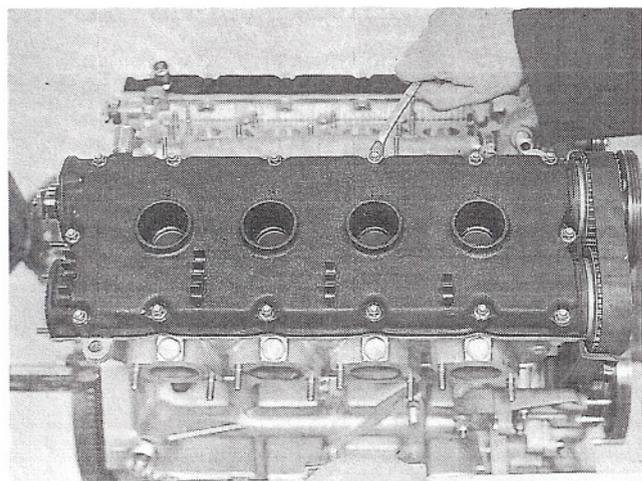
Fitting damper pulley and tightening fixing bolt to torque

When fitting, insert the key in the crankshaft and make sure it coincides with the opening in the damper pulley

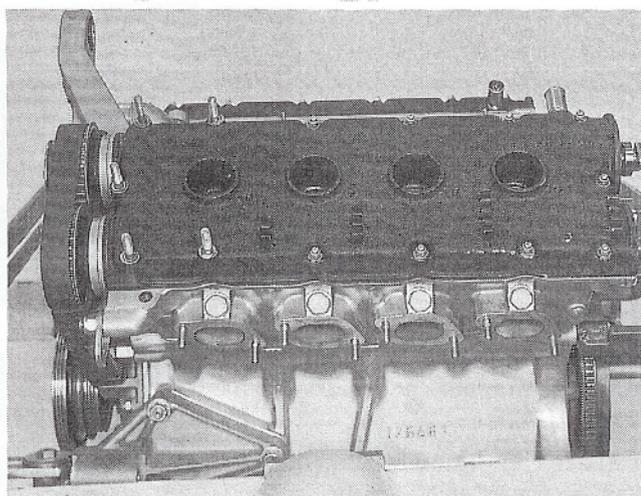
NOTE Use tool 1867029000 (flywheel lock) when tightening the bolt fixing the timing gear to the crankshaft to torque



Fitting cylinder head cover gaskets



Fitting right cylinder head cover



Fitting left cylinder head cover