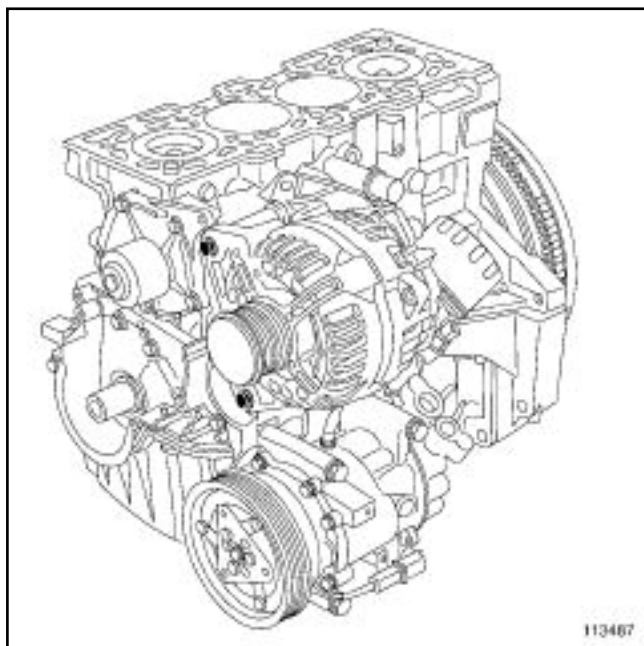


K9K, and 732 or 764

Tighten to torque the **air conditioning compressor mounting bolts** (21 ± 2.1 Nm) .



113487

Refit:

- the alternator,
- the alternator mounting bolts.

Tighten to torque **the alternator mounting bolts** (21 ± 2.1 Nm) .

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques 	
the cylinder head mounting bolts	25 ± 2.5 Nm
the cylinder head mounting bolts	255° ± 10°
the rocker cover bolts	12 ± 1.2 Nm
the turbocharger oil return pipe mounting bolts	12 ± 1.2 Nm
the turbocharger mounting nuts	26 ± 2.6 Nm
the catalytic converter stay mounting bolts on the engine	44 ± 4.4 Nm
the catalytic converter stay mounting bolts on the catalytic converter	26 ± 2.6 Nm
the mounting bolt of the turbocharger oil supply pipe (turbocharger end)	23 ± 2.3 Nm
the turbocharger oil supply pipe mounting nut (cylinder head end)	collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm
the inner timing cover mounting bolts	9 ± 0.9 Nm
the tensioning roller bolt	27 ± 2.7 Nm
the crankshaft accessories pulley M12 mounting bolt	60 ± 6 Nm + 100° ± 10°
the crankshaft accessories pulley M14 mounting bolt	120 ± 12 Nm + 95° ± 15°

Tightening torques 	
the tensioning roller bolt	27 ± 2.7 Nm
the TDC pin plug cap	20 ± 2 Nm
the cylinder head suspended mounting bolts	21 ± 2.1 Nm
the high-pressure pump position sensor bolt	8 ± 0.8 Nm

I - RECOMMENDATIONS FOR THE REPAIR OF THE CYLINDER HEAD

IMPORTANT

Wear protective gloves during every operation.

WARNING

When handling the cylinder head gasket, it is essential to hold the cylinder head gasket by the part between barrels.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not grease the new cylinder head mounting bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The gasket between the exhaust manifold and the turbocharger,
- The seals on the turbocharger oil return pipe,

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

- The catalytic converter seal,

Consumables

- Degreasing agent, part no. **77 11 224 559** .
- High-resistance bolt locking product, part no. **77 11 230 112** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Oil can,
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

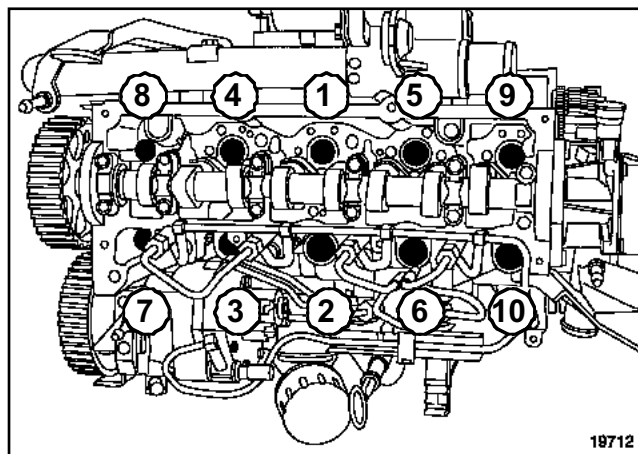
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP at the top) on the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



19712

19712

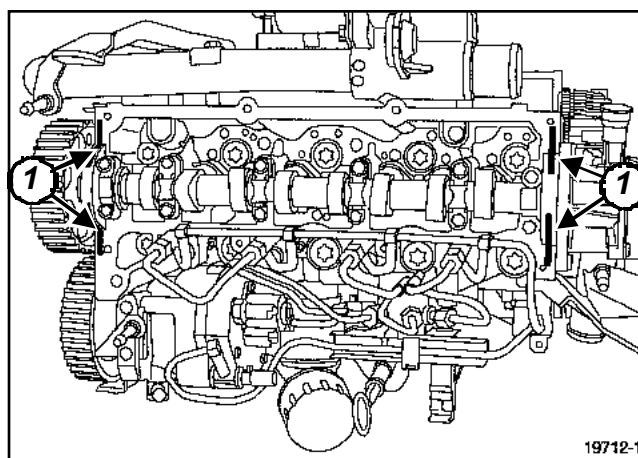
Torque tighten in order **the cylinder head mounting bolts (25 ± 2.5 Nm)** .

Check that all the **cylinder head mounting bolts** are correctly tightened to **(25 ± 2.5 Nm)** .

Tighten in order and to torque **the cylinder head mounting bolts ($255^\circ \pm 10^\circ$)** .

Using degreasing agent, degrease the surface of the rocker cover bearing on the cylinder head.

Fit a new seal on the rocker cover.



19712-1

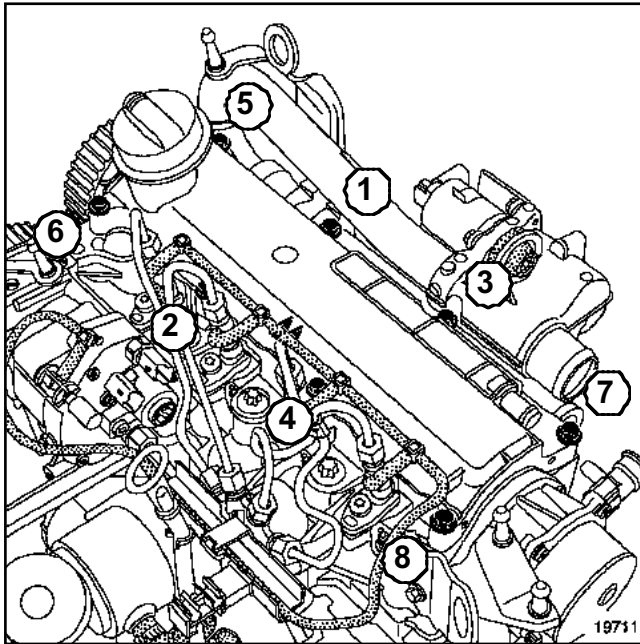
19712-1

Apply four beads (1) of **SILICONE SEALANT** with a diameter of **2 mm** .

Refit:

- the rocker cover,
- the rocker cover mounting bolts.

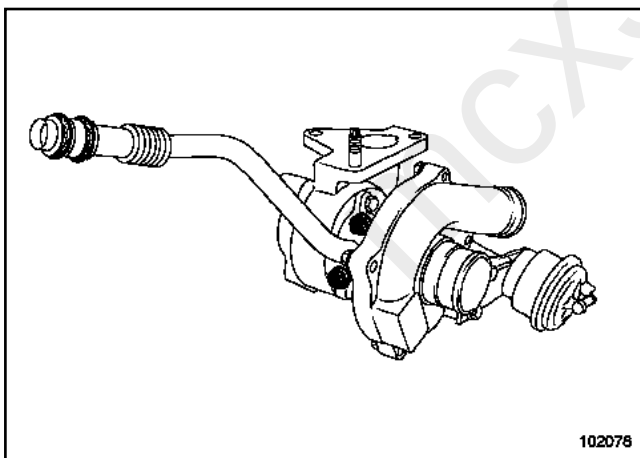
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



Tighten to torque and in order **the rocker cover bolts (12 ± 1.2 Nm)** .

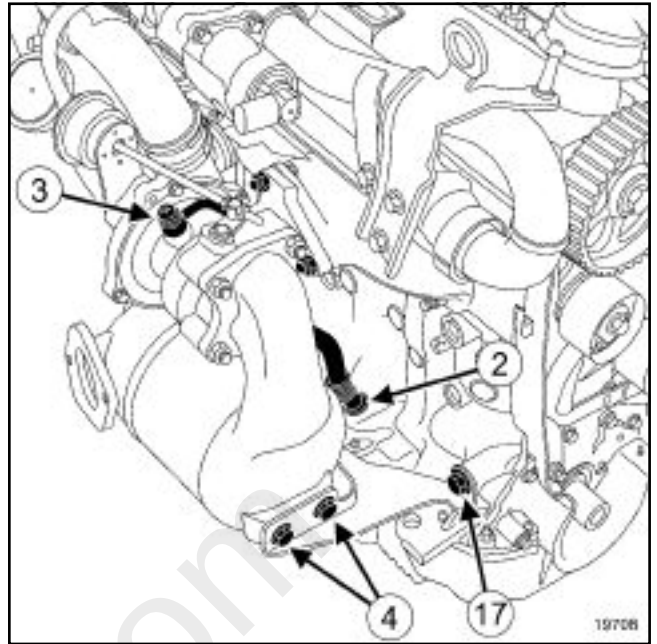
Fit the new seals on the turbocharger oil return pipe.

Lubricate the O-ring seals of the turbocharger oil return pipe with engine oil.



Tighten to torque **the turbocharger oil return pipe mounting bolts (12 ± 1.2 Nm)** .

Fit a new seal between the exhaust manifold and the turbocharger.



Refit the turbocharger-catalytic converter assembly.

Fully insert the turbocharger oil return pipes on to the cylinder block at (2) .

Refit:

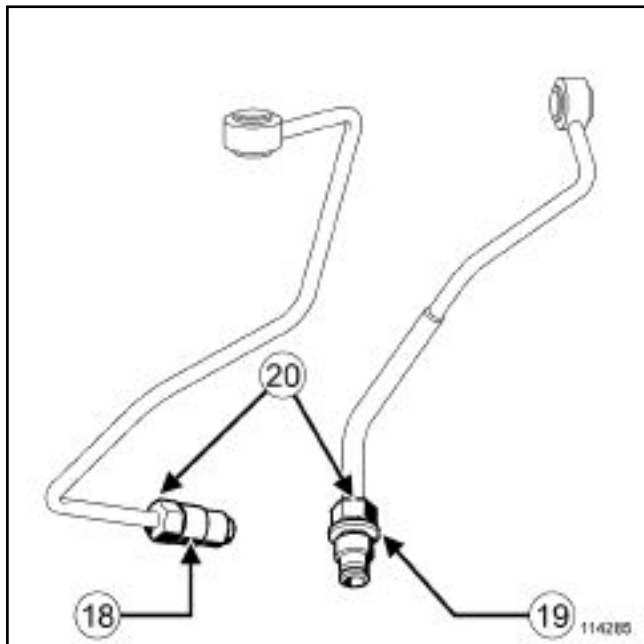
- the catalytic converter mounting stay,
- the catalytic converter stay mounting bolts.

Tighten to torque:

- **the turbocharger mounting nuts (26 ± 2.6 Nm)** ,
- **the catalytic converter stay mounting bolts on the engine (44 ± 4.4 Nm) (17) ,**
- **the catalytic converter stay mounting bolts on the catalytic converter (26 ± 2.6 Nm) (4) ,**

Put a little engine oil from an oil can in the oil circuit of the turbocharger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

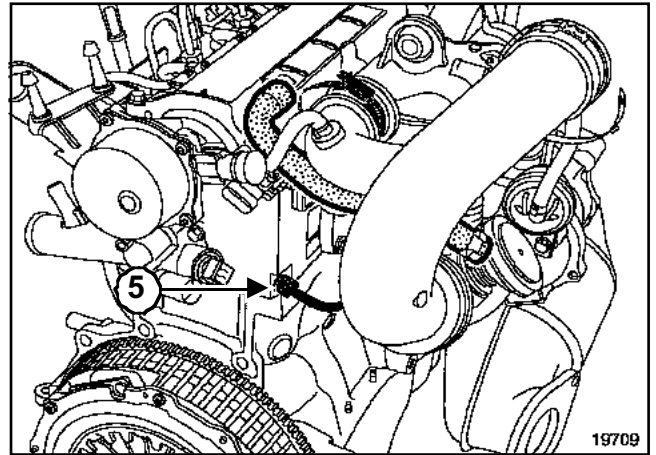


114285

Note:

These two turbocharger oil supply pipes may be used on the same engine. The tightening torque of the end pieces (20) on the cylinder head is different, depending on the following:

- if the end piece is **shouldered** (19), in this case there will be no need to place the high-resistance bolt locking product on the end piece thread,
- if the end piece is **not shouldered** (18), in this case it is essential to place the high-resistance bolt locking product on the end piece thread,



19709

Refit the turbocharger oil supply pipe.

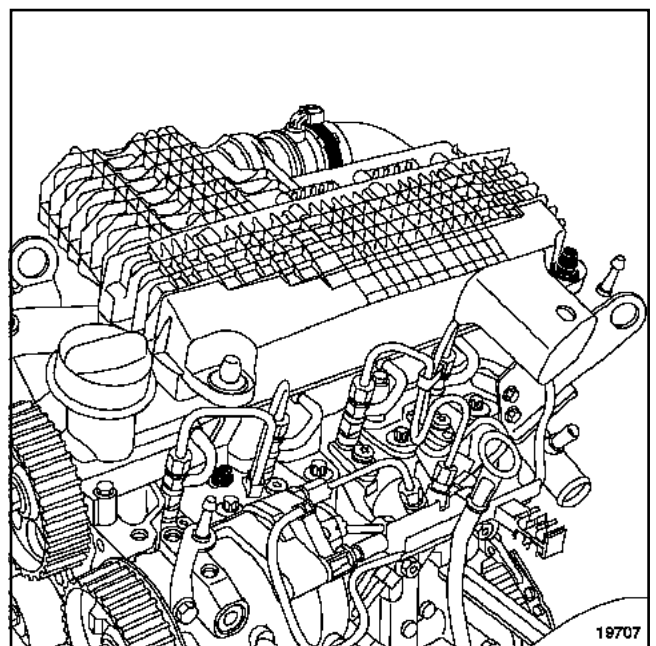
Screw in place each mounting of the turbocharger oil supply pipe.

Tighten to torque:

- the mounting bolt of the turbocharger oil supply pipe (turbocharger end) (23 ± 2.3 Nm) at (3)
- the turbocharger oil supply pipe mounting nut (cylinder head end) (collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm) at (5) .

Refit:

- the oil vapour rebreather pipe,
- the new turbocharger air ducts.

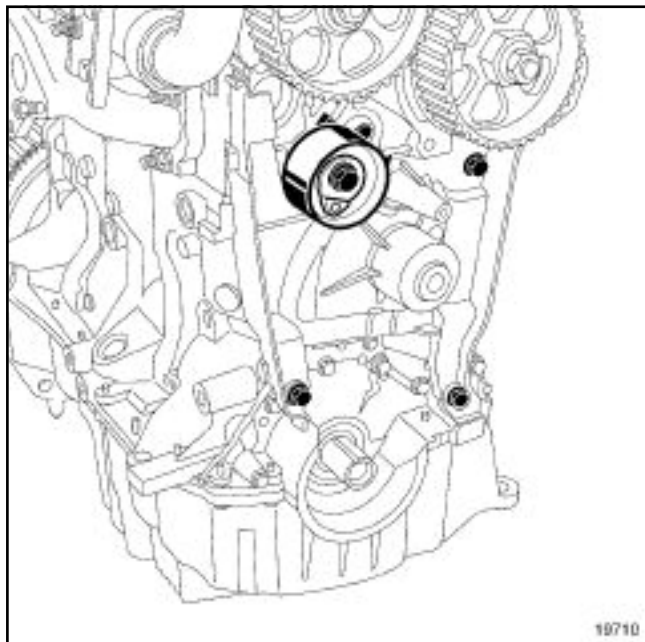


19707

Refit the air filter unit.

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19710

Refit:

- the inner timing cover (moving the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque **the inner timing cover mounting bolts** ($9 \pm 0.9 \text{ Nm}$).

V - RECOMMENDATIONS FOR THE REPAIR OF THE TIMING GEAR**IMPORTANT**

Wear protective gloves during every operation.

WARNING

The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

It is essential to remove the grease from the end of the crankshaft, the camshaft timing sprocket and the bearing face of the crankshaft accessories pulley. This is to avoid timing slippage.

VI - PARTS AND CONSUMABLES FOR THE REPAIR**Pièces à remplacer systématiquement pour la distribution**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

- Silicone adhesive sealant, part no. **77 11 227 484**
- Degreasing agent, part no. **77 11 224 559**.

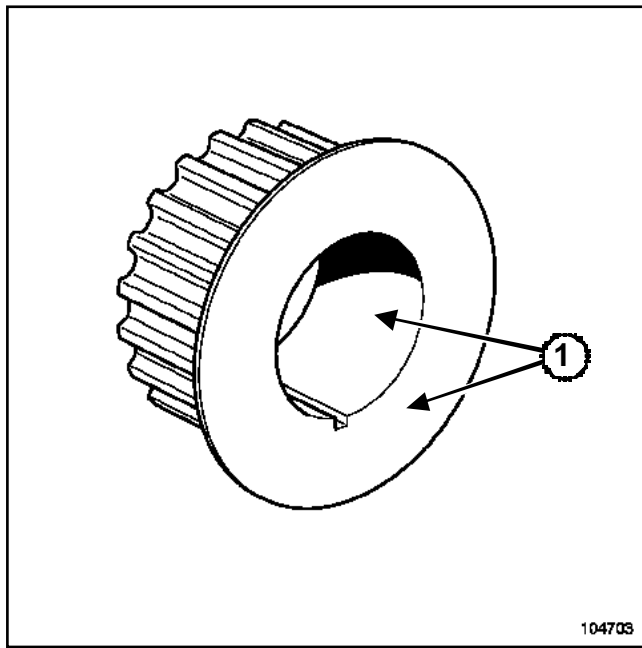
VII - EQUIPMENT REQUIRED FOR THE TIMING GEAR

- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset spanner (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

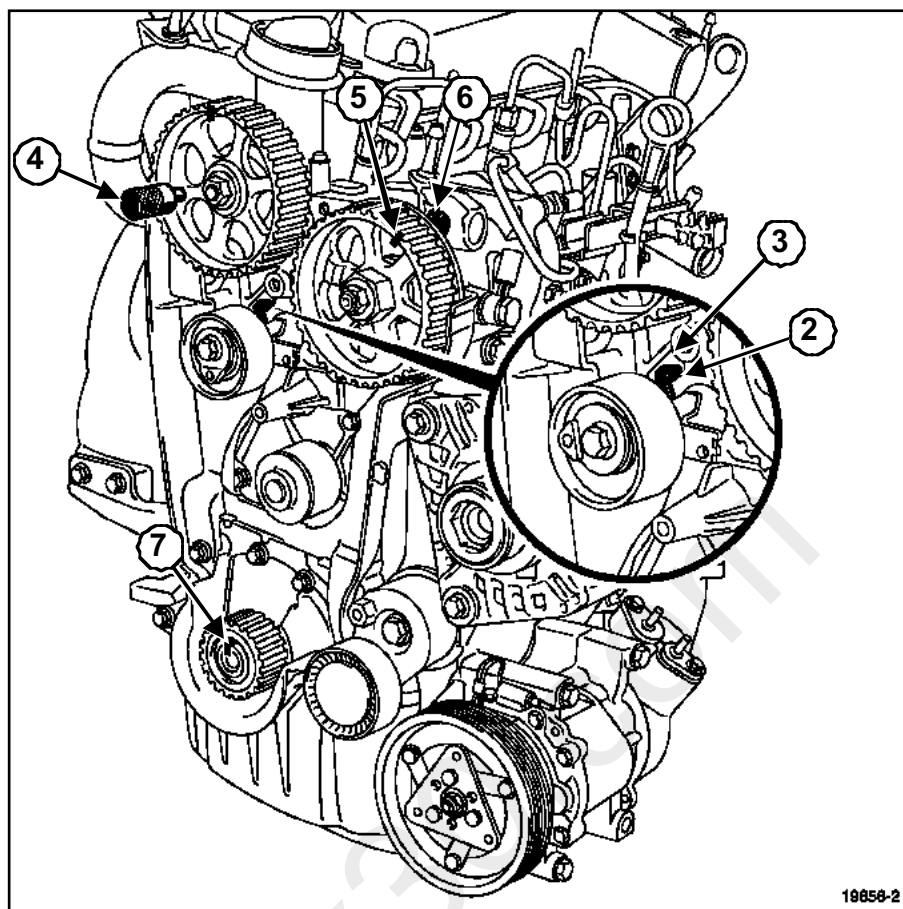
VIII - REFITTING THE TIMING BELT



Apply degreaser to:

- the end of the crankshaft (timing end),
- the timing sprocket bearing faces and bore at (1) ,
- the contact surfaces of the crankshaft accessories pulley.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19656-2

19656-2

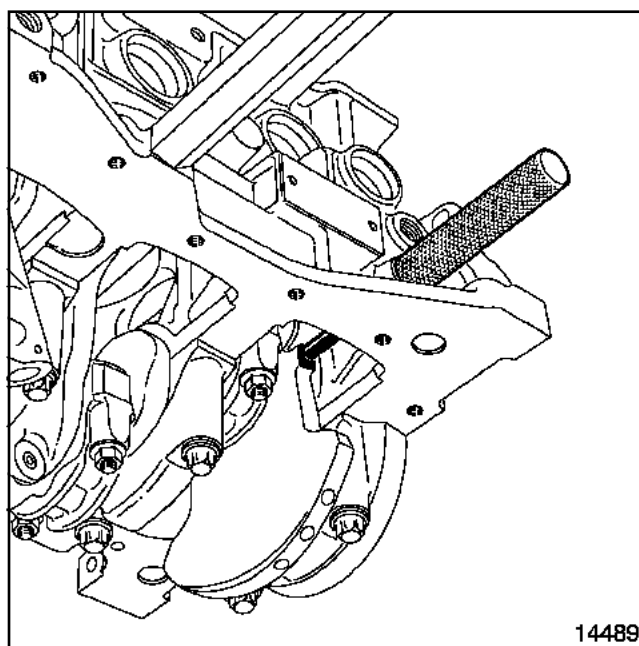
Refit:

- the crankshaft timing sprocket,
- the timing tensioning roller.

Position the spigot (2) of the tensioning roller in the groove (3) of the cylinder head.

Insert pin (Mot. 1430) in the cylinder head and camshaft pulley holes at (4). Turning the camshaft using an 18 mm offset spanner, if necessary.

Check that high-pressure pump pulley marking (5) is opposite the bolt head (6).

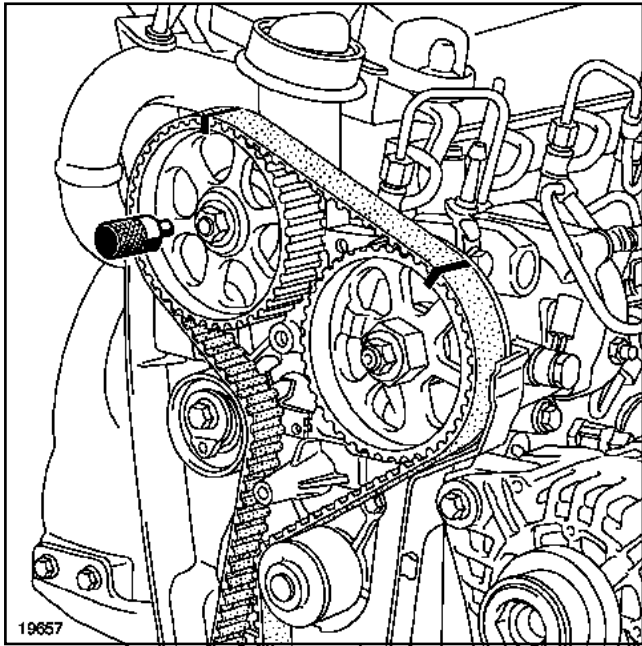


14489

14489

Position the crankshaft so that it presses against the TDC setting pin (Mot. 1489) (crankshaft groove (7) must be at the top).

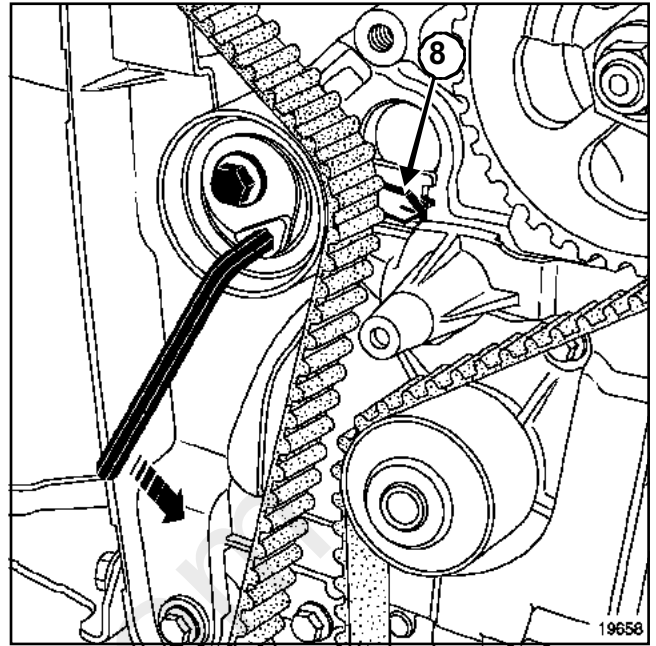
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



Fit the timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the camshaft and high-pressure pump pulleys.

Note:

There must be 19 belt grooves between the marks of the high-pressure pump and camshaft pulleys.



Position the tensioning roller adjustable index marker (8) opposite the spigot, turning the eccentric cam anti-clockwise using a 6 mm Allen key.

Torque tighten the tensioning roller bolt (27 ± 2.7 Nm) .

Refit the accessories crankshaft pulley with a new bolt.

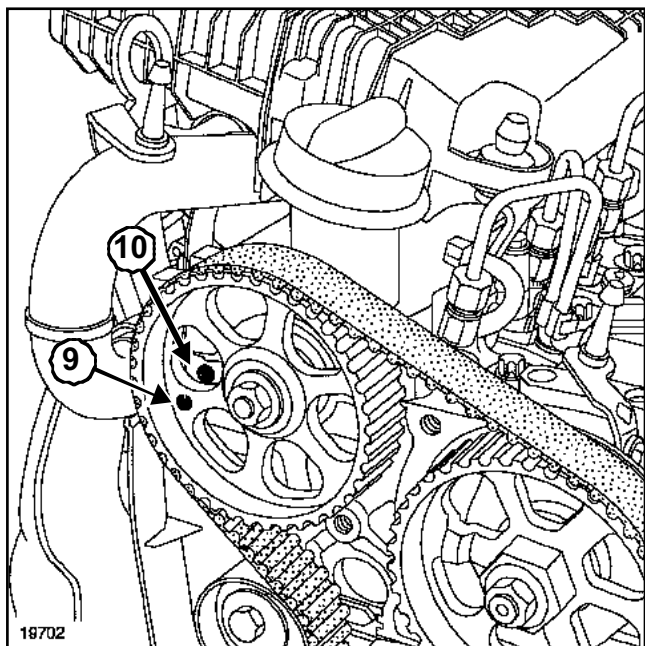
Torque and angle tighten (crankshaft pressed against the TDC setting pin):

- the crankshaft accessories pulley M12 mounting bolt (60 ± 6 Nm + $100^\circ \pm 10^\circ$) ,
- the crankshaft accessories pulley M14 mounting bolt (120 ± 12 Nm + $95^\circ \pm 15^\circ$) ,

Remove the following tools:

- the camshaft pulley timing pin (Mot. 1430) ,
- the TDC setting pin (Mot. 1489) ,

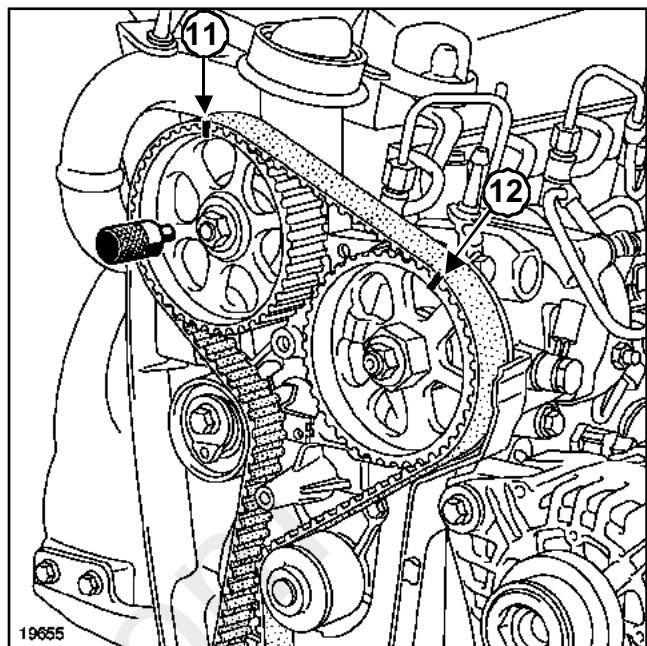
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



Rotate the crankshaft twice in a clockwise direction (timing end) before the camshaft pulley hole (9) is opposite the cylinder head hole (10) .

Screw the TDC setting pin (Mot. 1489) into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



Set the camshaft pulley using the (Mot. 1430) .

Note:

There must be **19 belt grooves** between the marks of the camshaft pulley (11) and the high-pressure pump pulley (12) .

Remove:

- the TDC setting pin (Mot. 1489) ,
- the Set of 5 timing pins for the camshaft and crankshaft pulleys (Mot. 1430) .

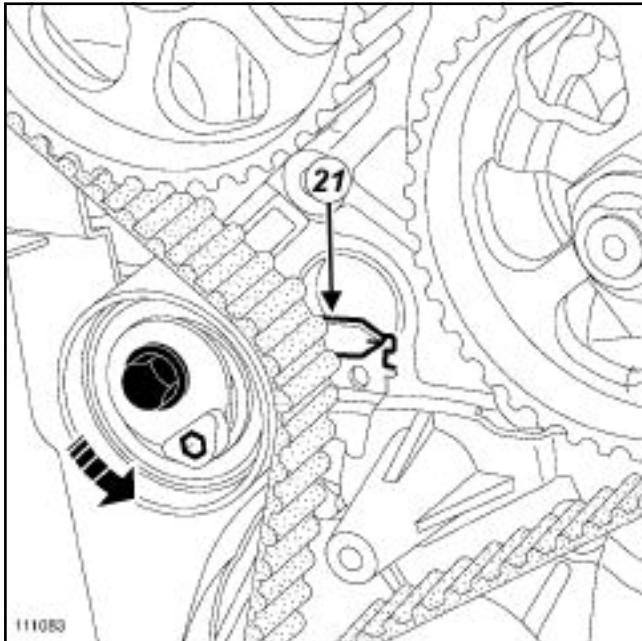
Note:

After two turns, the tensioning roller index markers may be in two different positions.

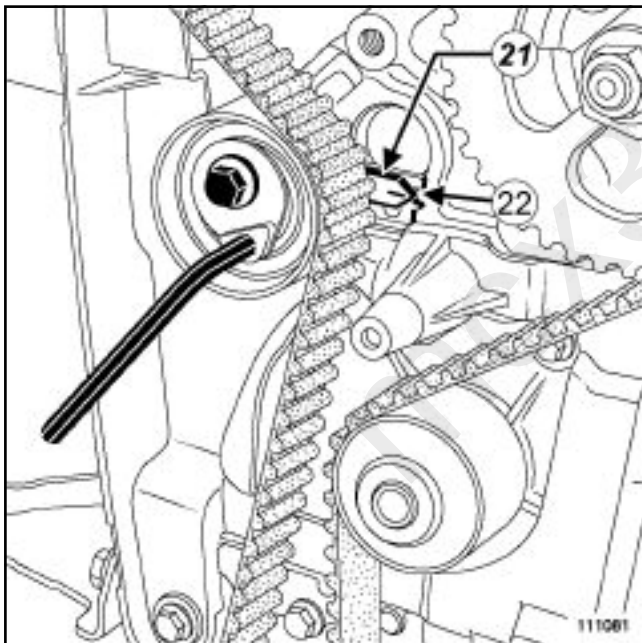
The rotation of the tensioning roller eccentric depends on the position.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

First position



111083

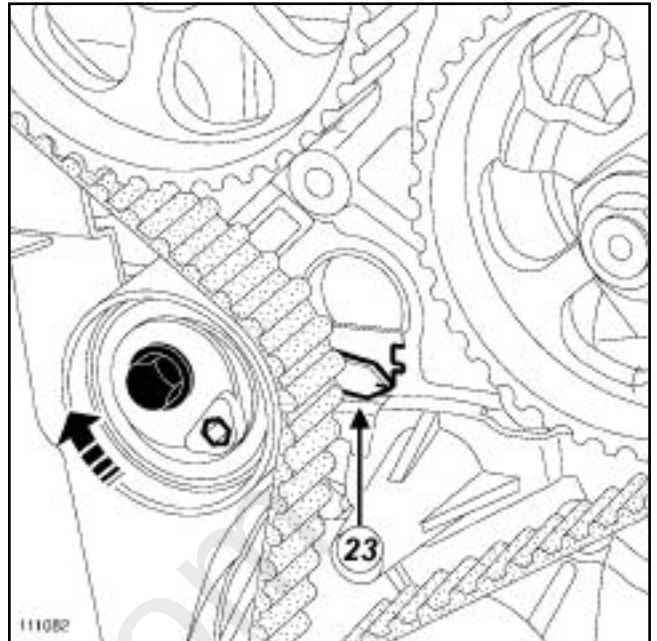


111081

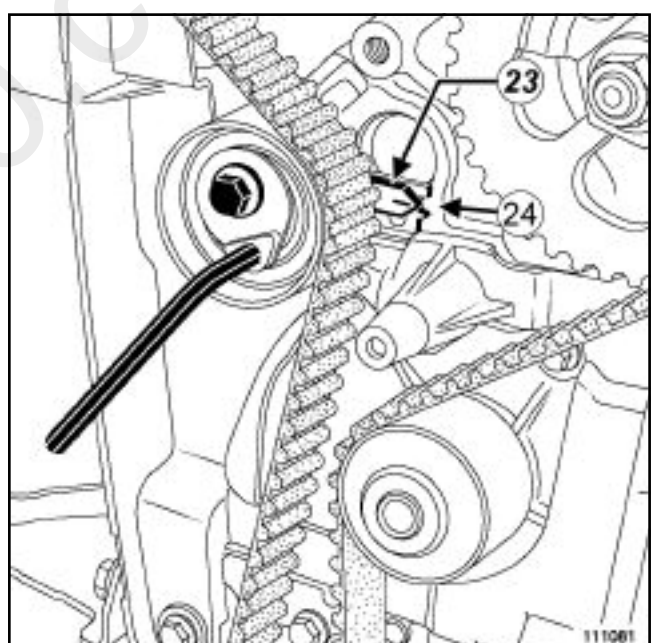
Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index marker (21) to the middle of the timing window, (22) turning the key anti-clockwise.

Second position



111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index marker (23) to the middle of the timing window, (24) turning the key clockwise.

Torque tighten the tensioning roller bolt (27 ± 2.7 Nm).

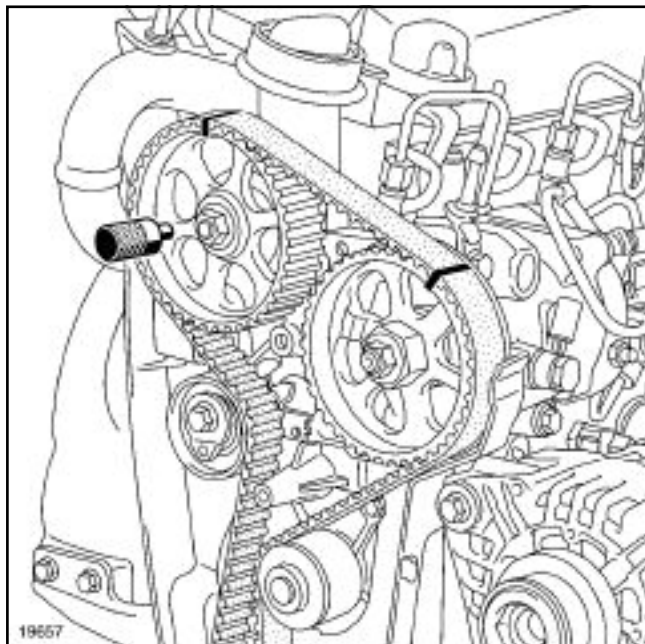
Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Screw the TDC setting pin (**Mot. 1489**) into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



19657

Set the camshaft pulley using the (**Mot. 1430**) .

If this is not possible, repeat the timing belt refitting operation.

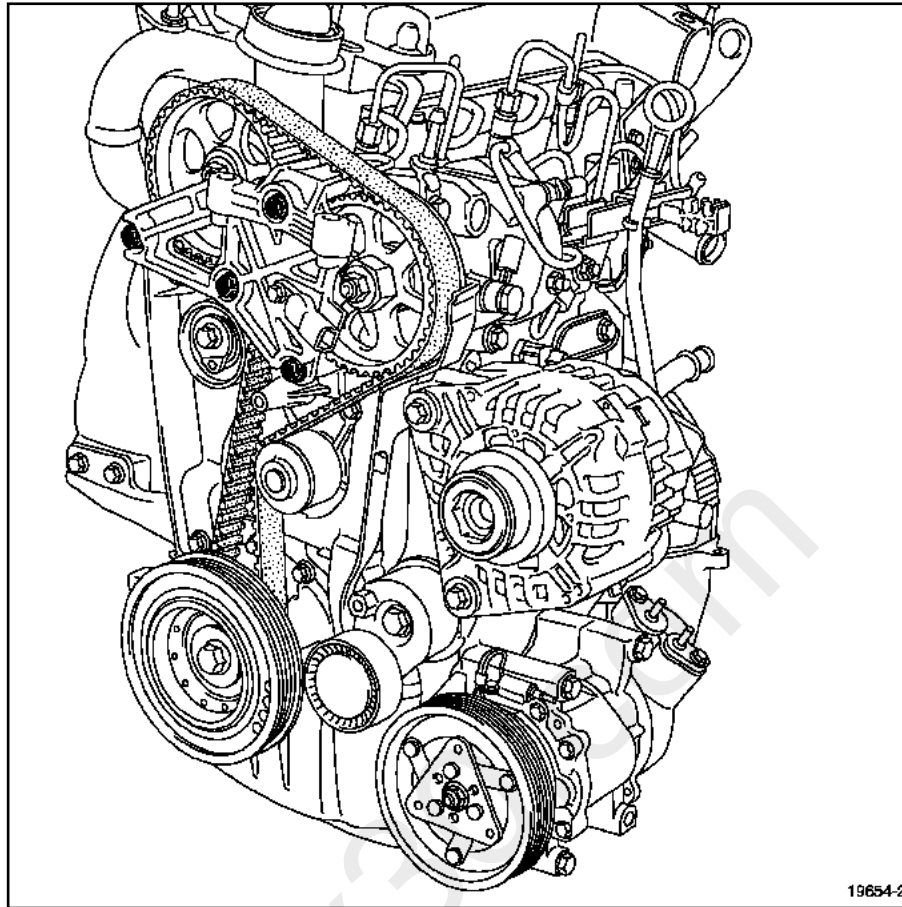
Remove the following tools:

- TDC setting pin (**Mot. 1489**) ,
- set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**) .

Place a drop of **ADHESIVE SILICONE SEALANT** on the threading of the TDC pin plug.

Tighten to torque the TDC pin plug cap (20 ± 2 Nm) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654-2

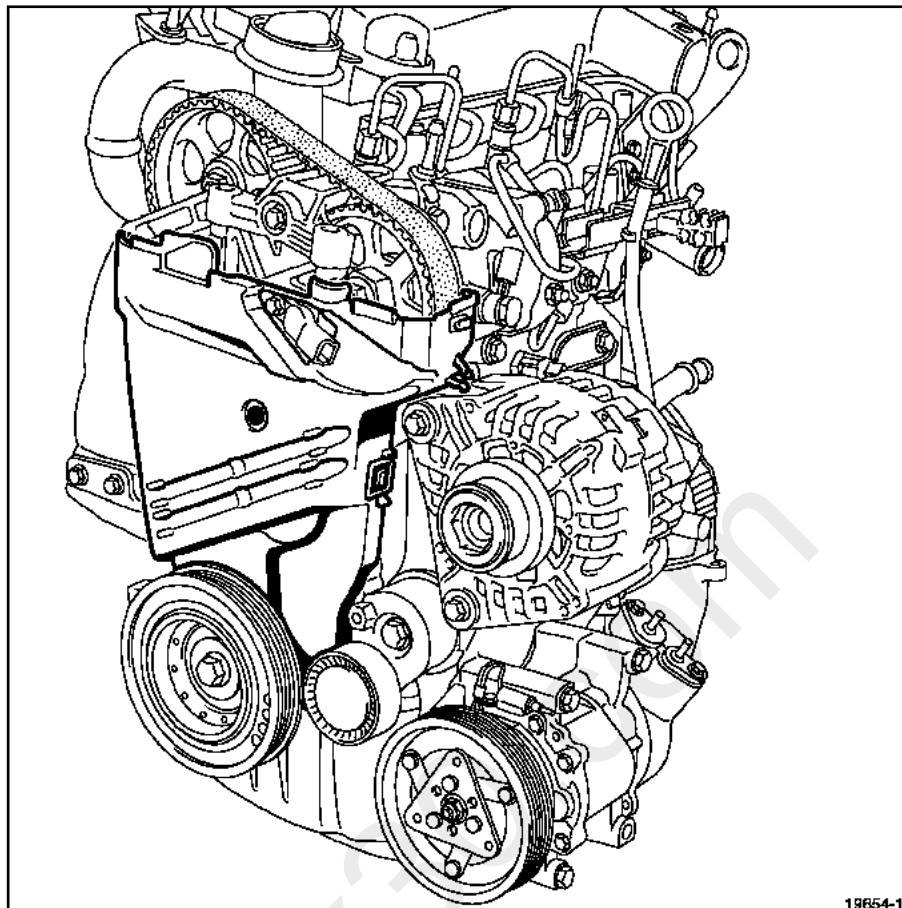
19654-2

Refit the cylinder head suspended mounting.

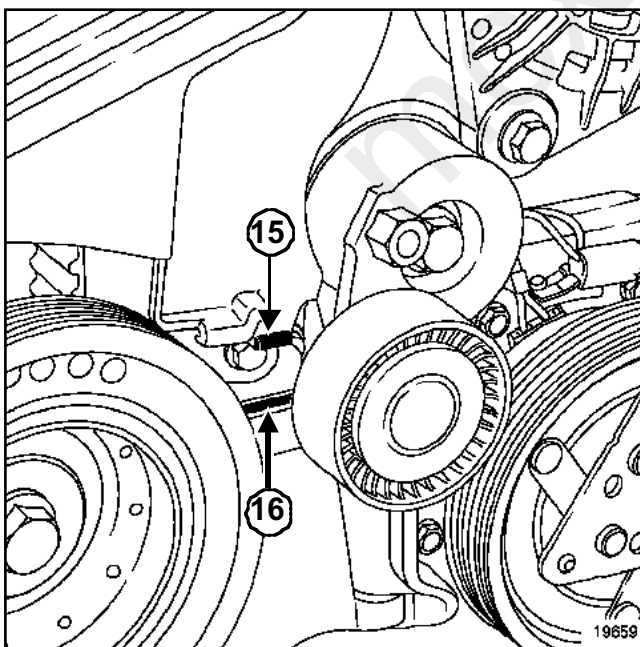
Tighten to torque **the cylinder head suspended mounting bolts** (21 ± 2.1 Nm).

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654-1
19654-1

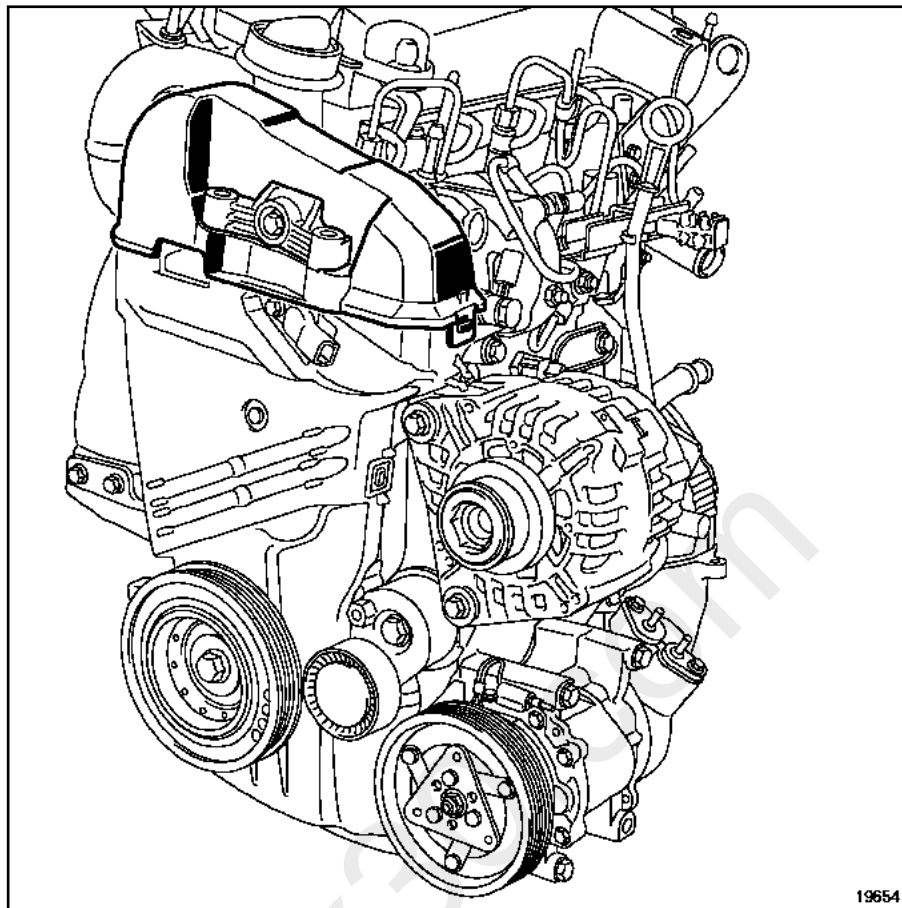


19659
19659

Refit the timing cover, positioning tab (15) in lower timing cover opening. (16) .

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654

19654

Refit the high-pressure pump position sensor.

Tighten to torque **the high-pressure pump position sensor bolt** (8 ± 0.8 Nm).

Refit the upper timing cover.

K9K, and 732 or 764

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques 	
cylinder head mounting bolts	25 ± 2.5 Nm
cylinder head mounting bolts	255° ± 10°
rocker cover mounting bolts	12 ± 1.2 Nm
dipstick guide mounting nuts	10 ± 1 Nm
damper valve mounting nuts	12 ± 1.2 Nm
turbocharger oil return pipe mounting bolts	12 ± 1.2 Nm
the nuts mounting the catalytic converter on the turbocharger	26 ± 2.6 Nm
the bolts mounting the catalytic converter stay on the engine	44 ± 4.4 Nm
the bolts mounting the catalytic converter stay on the catalytic converter	26 ± 2.6 Nm
inner timing cover mounting bolts	9 ± 0.9 Nm
tensioning roller bolt	27 ± 2.7 Nm
the camshaft pulley wheel bolts	14 ± 1.4 Nm
the tensioning roller bolt	27 ± 2.7 Nm
the camshaft pulley wheel bolts	14 ± 1.4 Nm
the crankshaft accessories pulley M14 bolt	120 ± 12 Nm + 95° ± 15°

Tightening torques 	
TDC pin plug	20 ± 2 Nm
cylinder head suspended mounting bolts	21 ± 2.1 Nm
cylinder head suspended mounting bolts	21 ± 2.1 Nm

I - RECOMMENDATIONS FOR REPAIRING THE CYLINDER HEAD

IMPORTANT

Wear protective gloves during every operation.

WARNING

When handling the cylinder head gasket, use the cylinder barrel to hold it.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not lubricate the new cylinder head bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The damper valve seal,
- The seals on the turbocharger oil return pipe,
- The catalytic converter seal.

Consumables

- Degreaser, part no. **77 11 224 559** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

K9K, and 732 or 764

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING OF THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to the:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

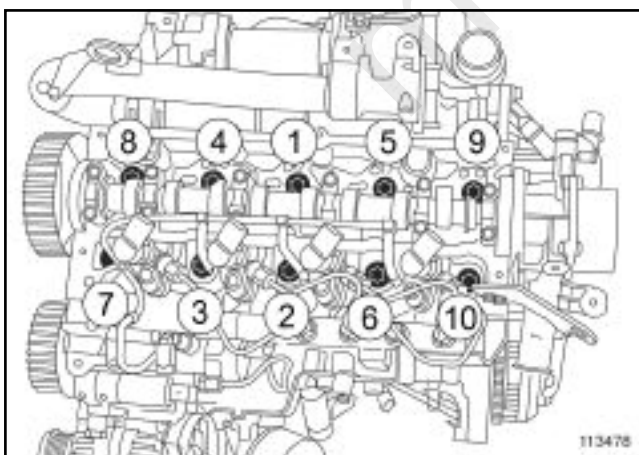
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP facing upwards) onto the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



113478

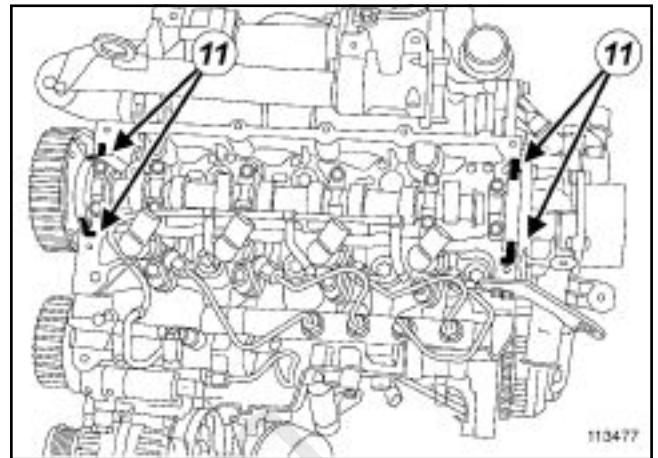
Tighten to torque and in order the **cylinder head mounting bolts** (25 ± 2.5 Nm).

Check that all the **cylinder head mounting bolts** are tightened to (25 ± 2.5 Nm).

Angle tighten in order the **cylinder head mounting bolts** ($255^\circ \pm 10^\circ$).

Degrease the rocker cover sealing surface on the cylinder head.

Fit a new seal onto the rocker cover.

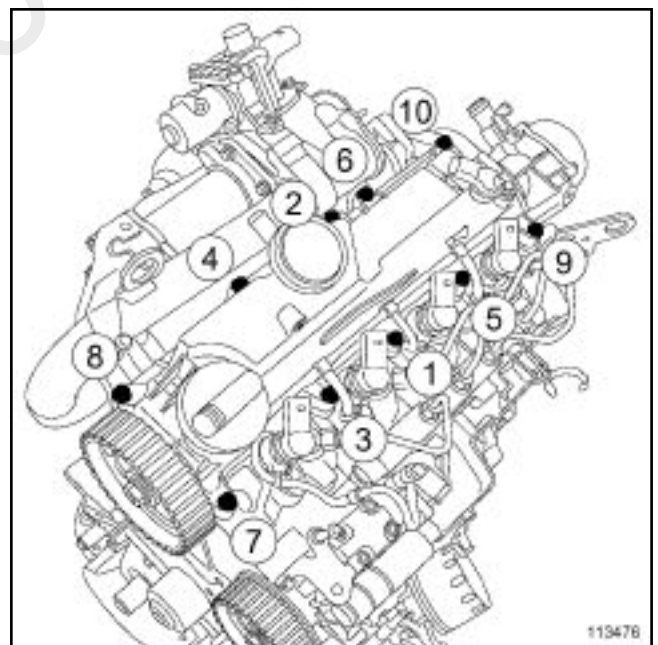


113477

Apply four beads (**11**) of **SILICONE ADHESIVE SEALANT** (2 mm in diameter).

Refit:

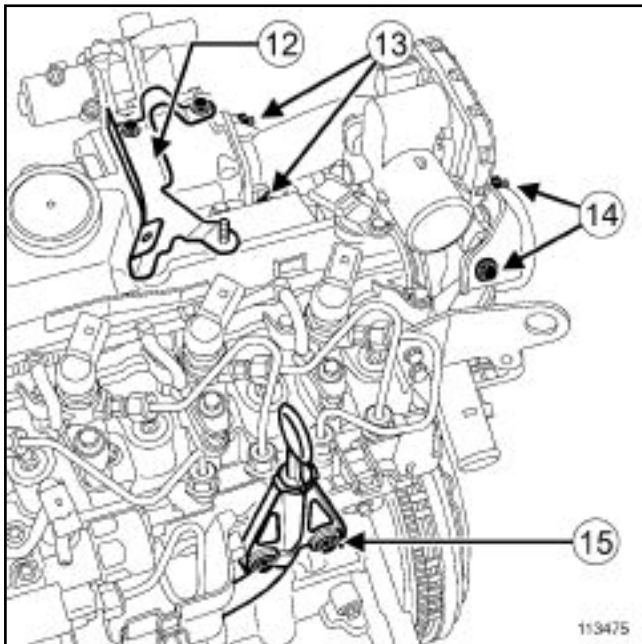
- the rocker cover,
- the rocker cover mounting bolts.



113476

Tighten to torque and in order the **rocker cover mounting bolts** (12 ± 1.2 Nm).

K9K, and 732 or 764



113475

Refit:

- the dipstick guide,
- the dipstick guide mounting nuts (15) .

Tighten to torque the **dipstick guide mounting nuts** (10 ± 1 Nm) .

Refit a new seal to the damper valve.

Refit:

- the damper valve,
- the damper valve mounting nuts (13) .

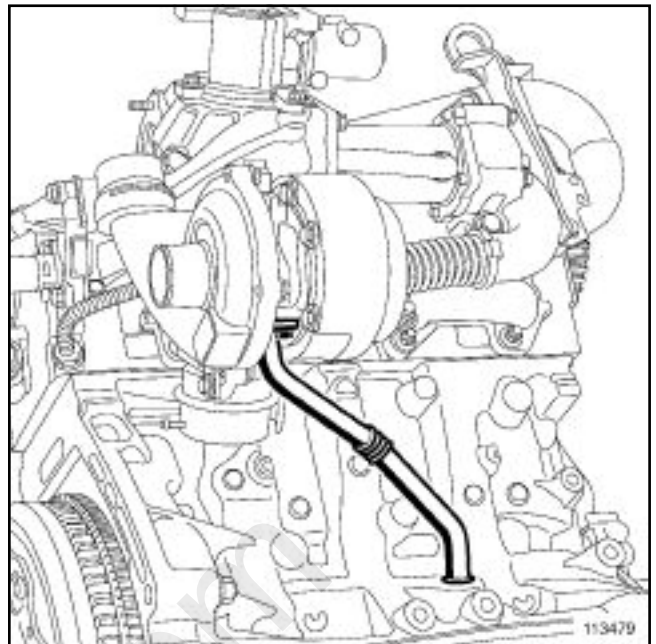
Tighten to torque the **damper valve mounting nuts** (12 ± 1.2 Nm) .

Refit:

- the damper valve mounting bracket,
- the mounting bolts securing the damper valve mounting bracket,
- the exhaust gas recirculation valve retaining bracket,
- the exhaust gas recirculation valve retaining bracket mounting bolts.

Fit the new seals onto the turbocharger oil return pipe.

Use engine oil to lubricate the turbocharger oil return pipe O-ring seals.



113479

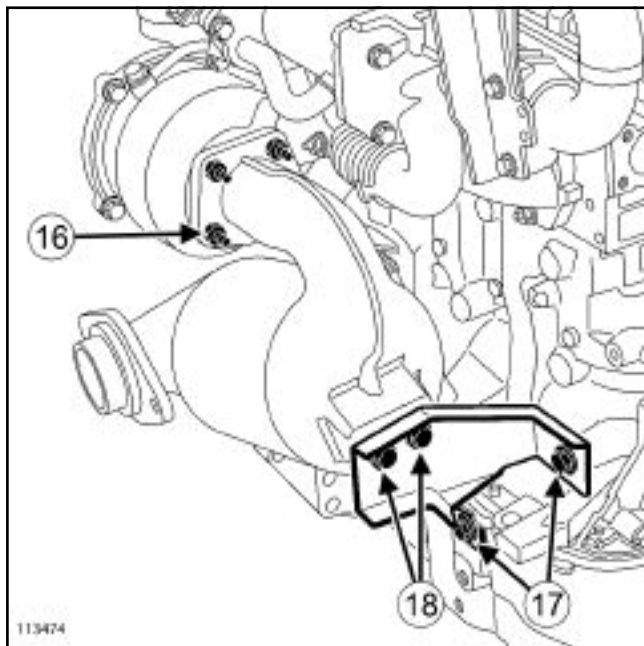
Refit:

- the turbocharger oil return pipe,
- the turbocharger oil return pipe mounting bolts.

Tighten to torque the **turbocharger oil return pipe mounting bolts** (12 ± 1.2 Nm) .

Fit a new seal between the turbocharger and the catalytic converter.

K9K, and 732 or 764



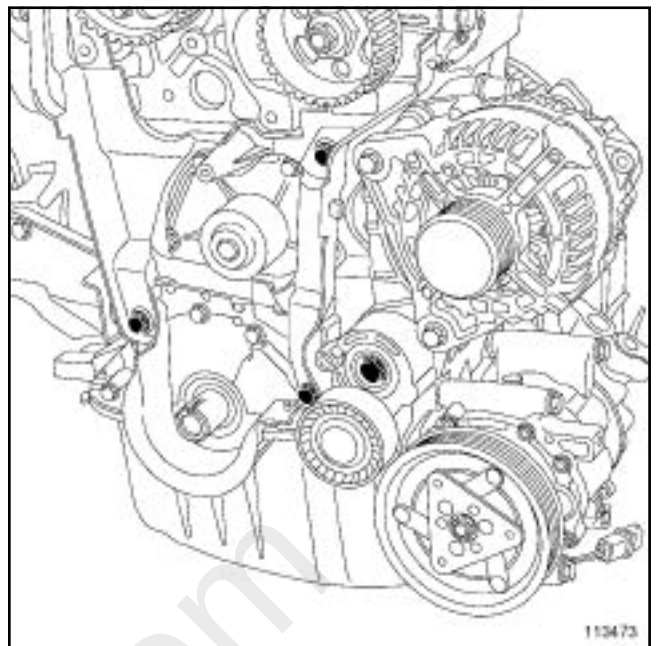
113474

Refit:

- the catalytic converter,
- the nuts mounting the catalytic converter on the turbocharger,
- the catalytic converter mounting stay,
- the catalytic converter stay mounting bolts.

Tighten to torque:

- the nuts mounting the catalytic converter on the turbocharger (26 ± 2.6 Nm) (16) ,
- the bolts mounting the catalytic converter stay on the engine (44 ± 4.4 Nm) (17) ,
- the bolts mounting the catalytic converter stay on the catalytic converter (26 ± 2.6 Nm) (18) .



113473

Refit:

- the inner timing cover (tilting the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque the **inner timing cover mounting bolts** (9 ± 0.9 Nm) .

V - RECOMMENDATIONS FOR REPAIRING THE TIMING

IMPORTANT

Wear protective gloves during every operation.

WARNING

The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

VI - PARTS AND CONSUMABLES

Parts always to be replaced for the timing

- Timing belt,

K9K, and 732 or 764

- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Consumables

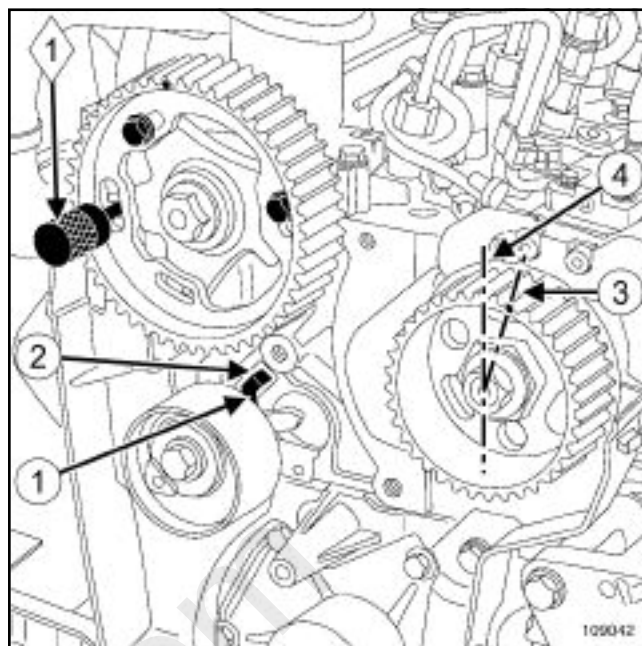
- Silicone adhesive sealant, part no. **77 11 227 484**

VII - EQUIPMENT REQUIRED FOR THE TIMING BELT

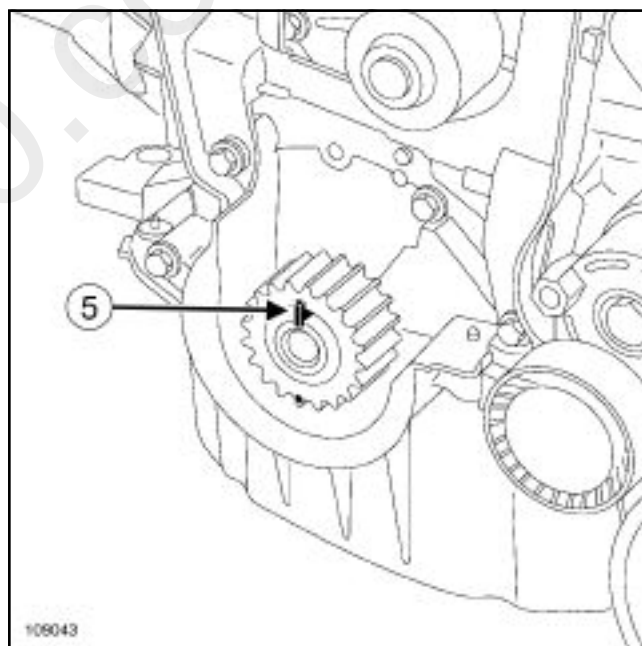
- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

VIII - REFITTING THE TIMING BELT

Refit the crankshaft timing sprocket.



109042



109043

Refit the timing tensioning roller.

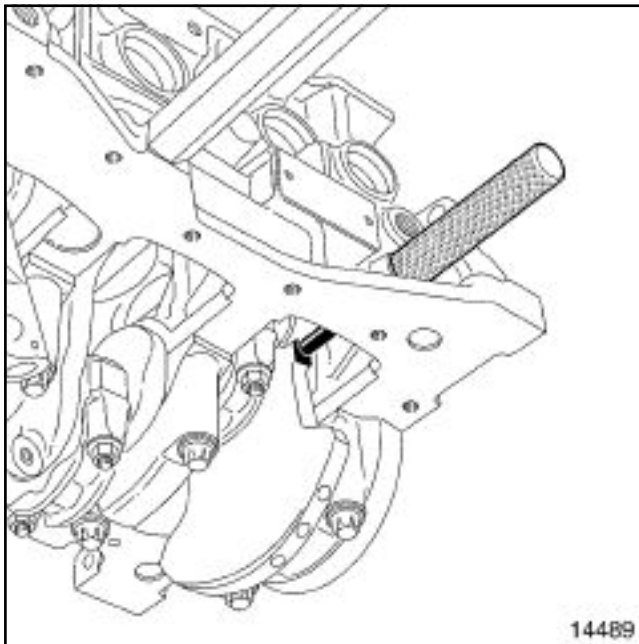
Put the tensioning roller spigot (1) in the cylinder head groove (2) .

Engage the pin (1) (**Mot. 1430**) in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

Check that the high-pressure pump mark (3) has shifted one tooth to the right of the vertical axle (4) .

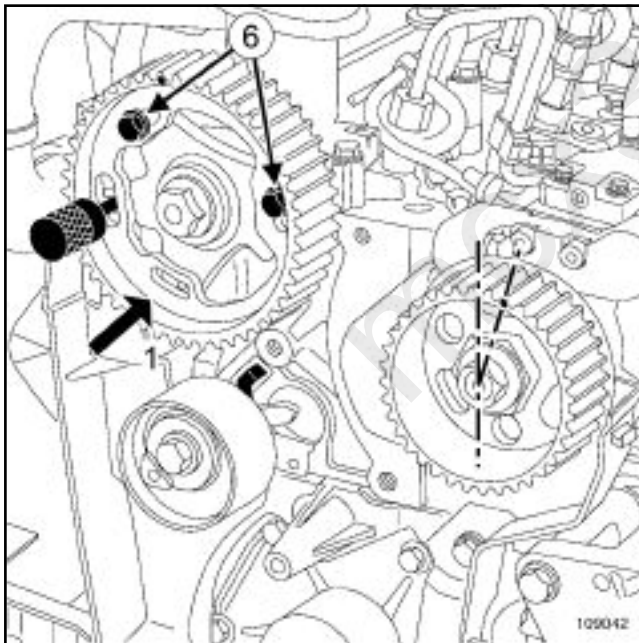
Timing - cylinder head: Refitting

K9K, and 732 or 764



14489

Position the crankshaft so that it presses on the TDC setting pin (**Mot. 1489**) (the crankshaft timing sprocket cotter (**5**) must face upwards)



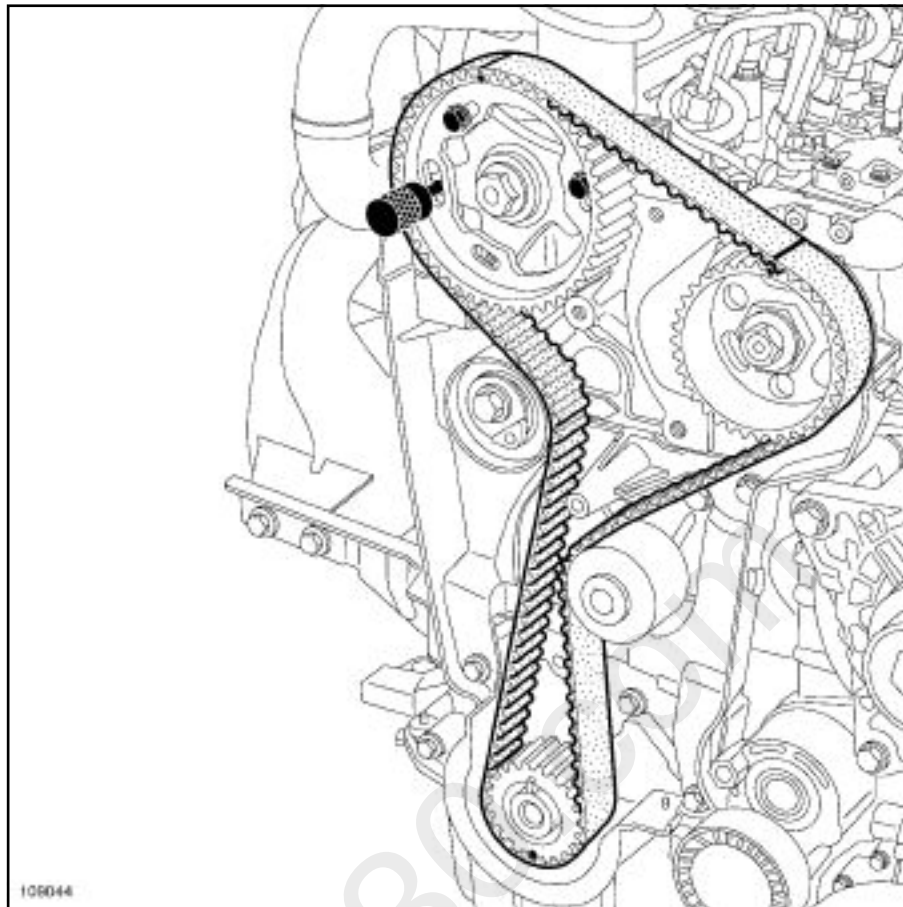
109042

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts (**6**) by one turn.

Timing - cylinder head: Refitting

K9K, and 732 or 764



109044

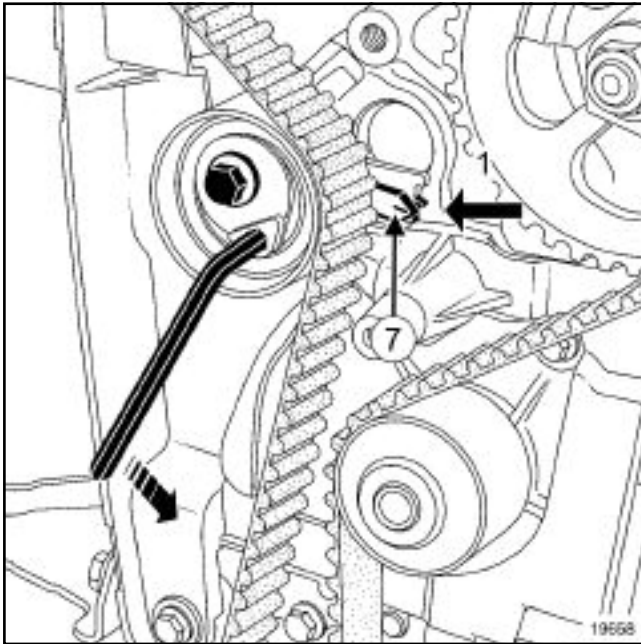
Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

note:

There should be 19 tooth belt grooves on the belt between the camshaft sprocket marks and the high-pressure pump, and 51 tooth belt grooves between the crankshaft sprockets and the high-pressure pump.

Timing - cylinder head: Refitting

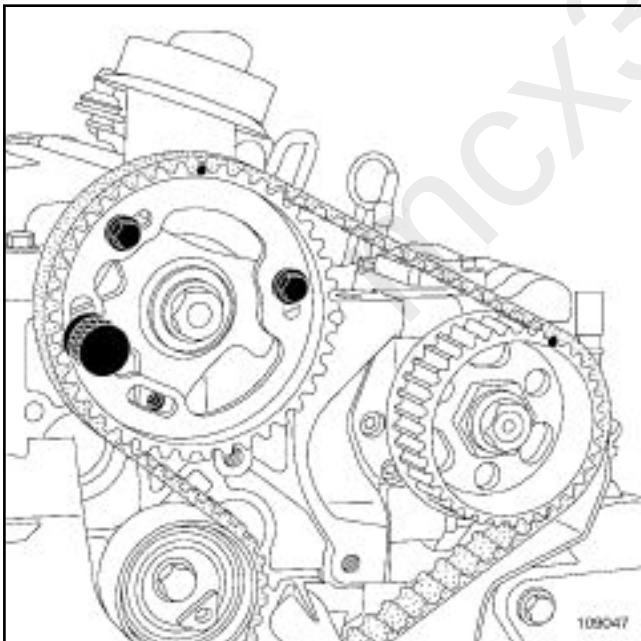
K9K, and 732 or 764



19658

Position the tensioning roller adjustable index (7) opposite the spigot, turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

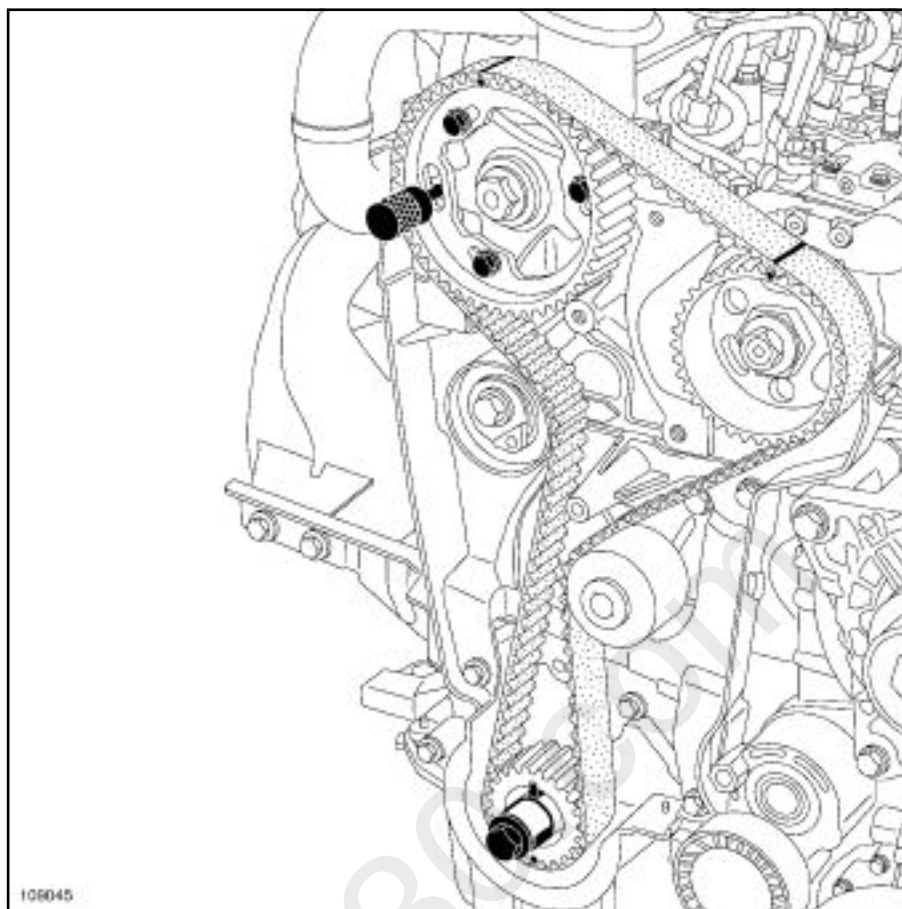
Tighten to torque the **tensioning roller bolt** ($27 \pm 2.7 \text{ Nm}$).



109047

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 732 or 764



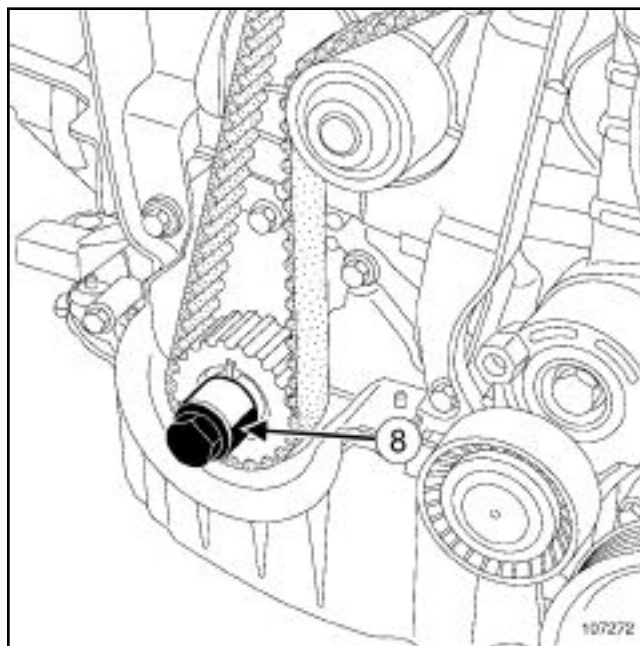
109045

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts** ($14 \pm 1.4 \text{ Nm}$).

Remove:

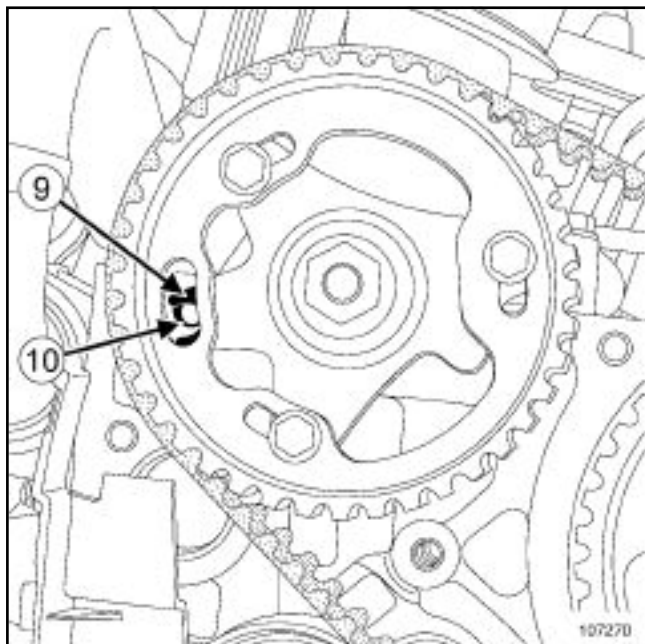
- the TDC setting pin (**Mot. 1489**),
- the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**).



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 732 or 764

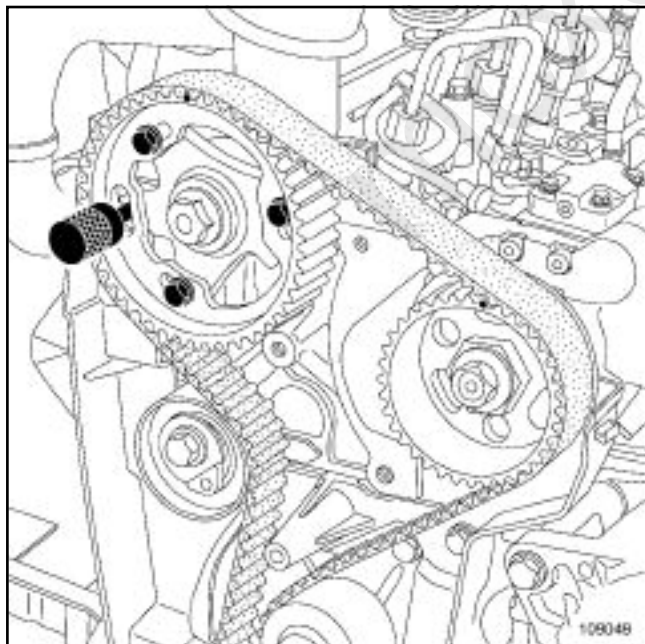


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (9) is opposite the cylinder head hole (10) .

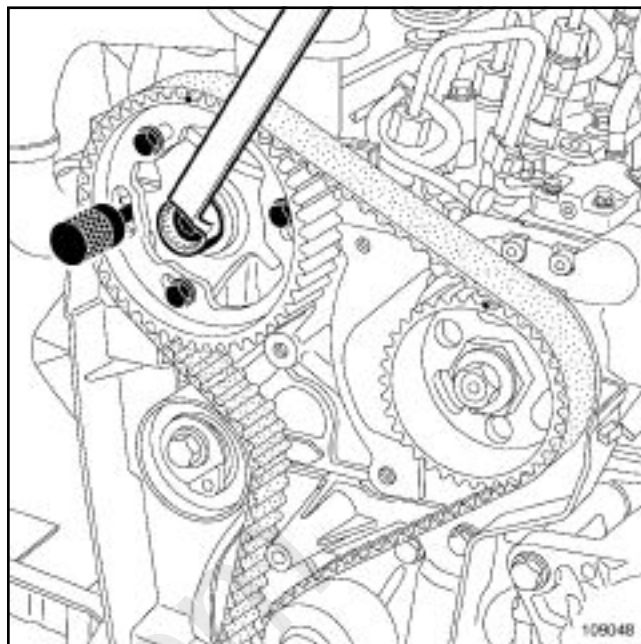
Screw the TDC setting pin (**Mot. 1489**) into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the (**Mot. 1430**) .



109048

If the pin (**Mot. 1430**) does not engage:

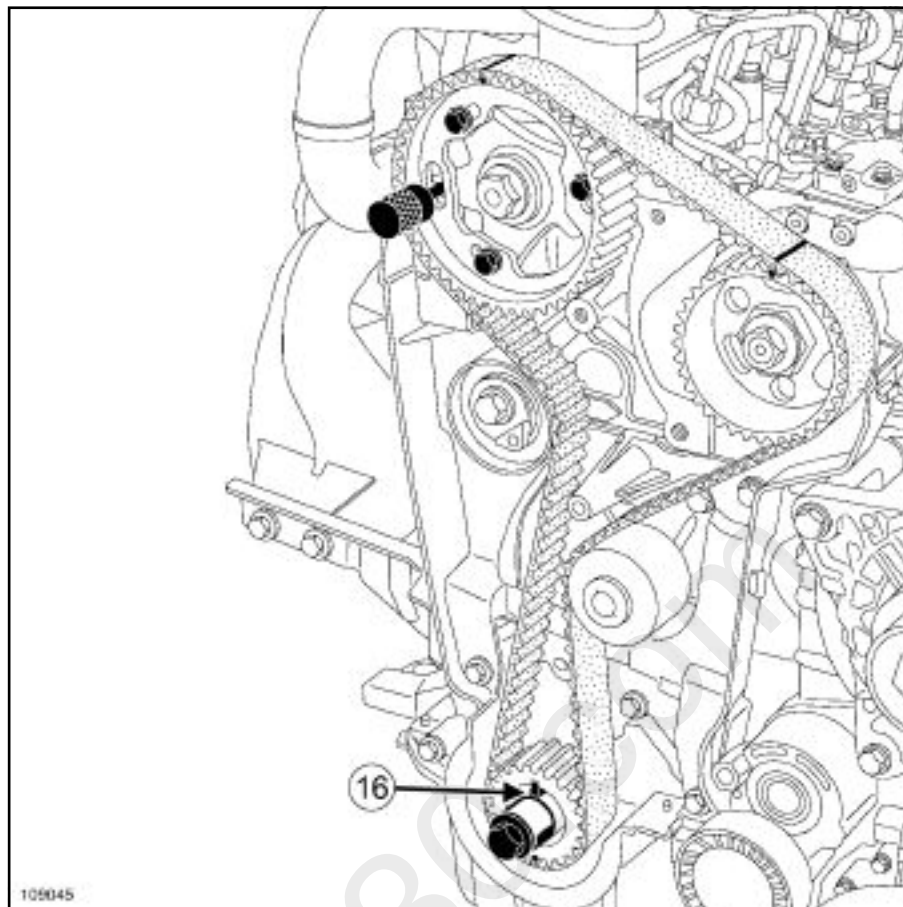
loosen the camshaft pulley wheel bolts by one turn,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

Timing - cylinder head: Refitting

K9K, and 732 or 764



109045

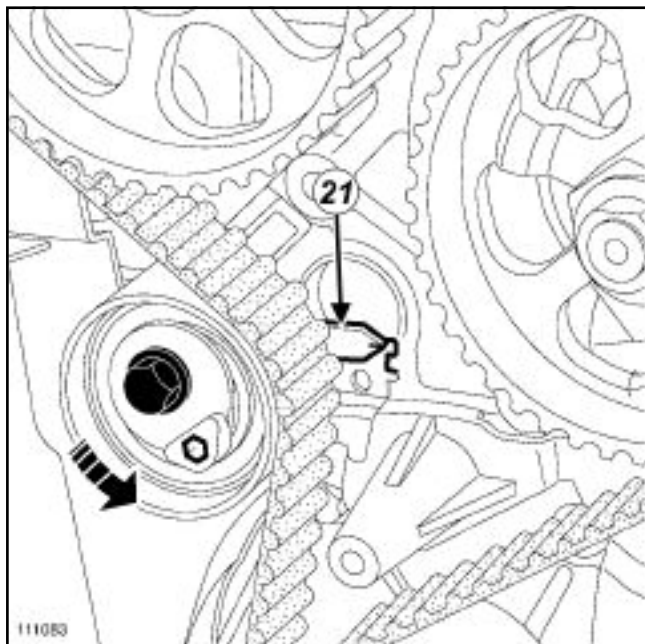
Check that the crankshaft timing sprocket cotter (**16**) is positioned vertically at the top.

note:

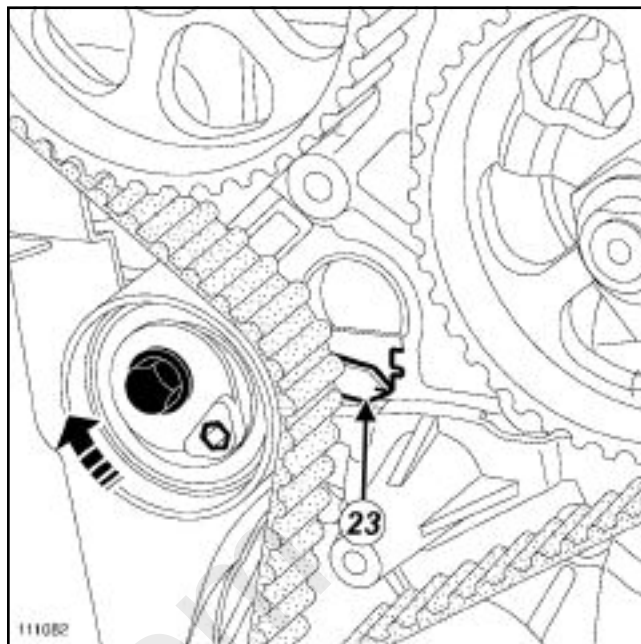
After two turns, the tensioning roller index markers may be in two different positions.

The rotation of the tensioning roller eccentric depends on the position.

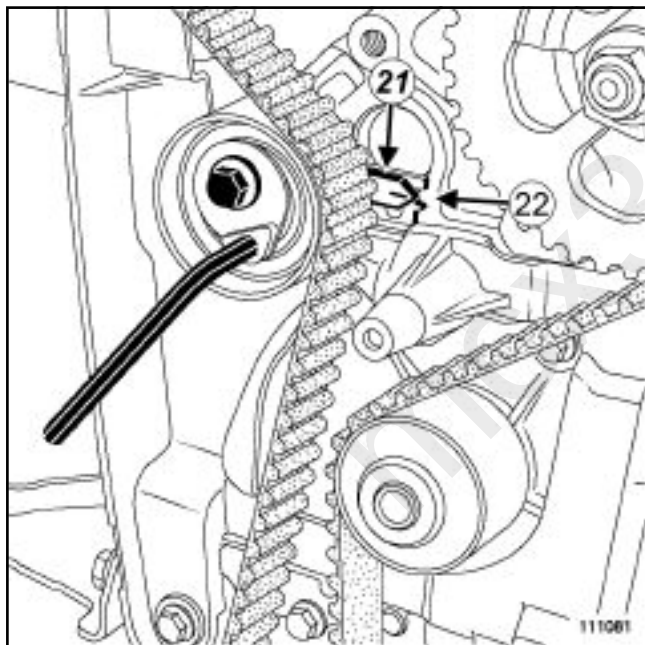
K9K, and 732 or 764



111083



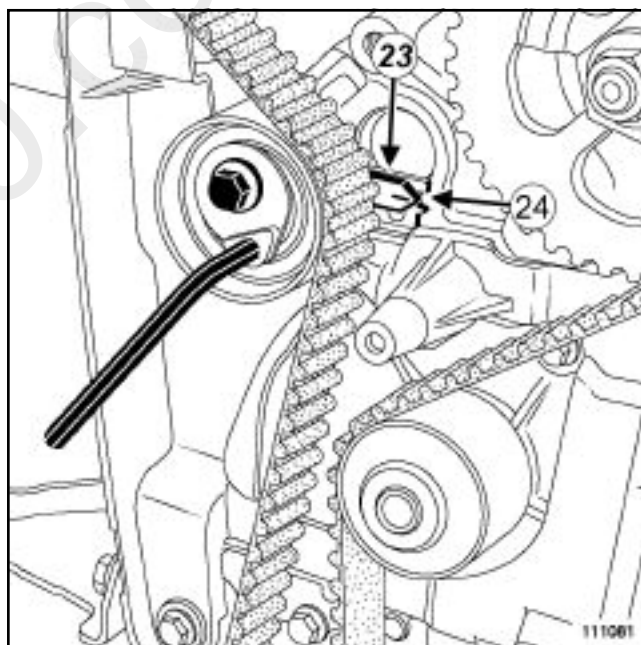
111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**), turning the key anti-clockwise.



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**), turning the key clockwise.

Tighten to torque:

- the tensioning roller bolt (27 ± 2.7 Nm) ,
- the camshaft pulley wheel bolts (14 ± 1.4 Nm) .

Remove the following tools:

- TDC setting pin (**Mot. 1489**) ,

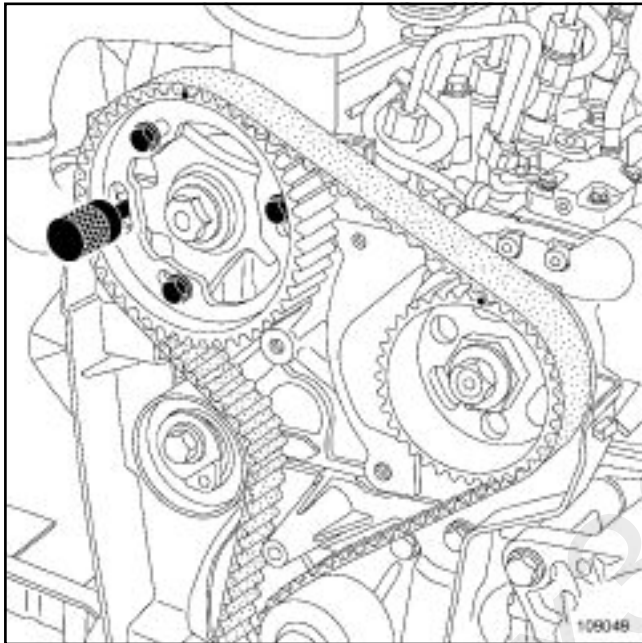
K9K, and 732 or 764

-the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**) .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin (**Mot. 1489**) into the cylinder block.

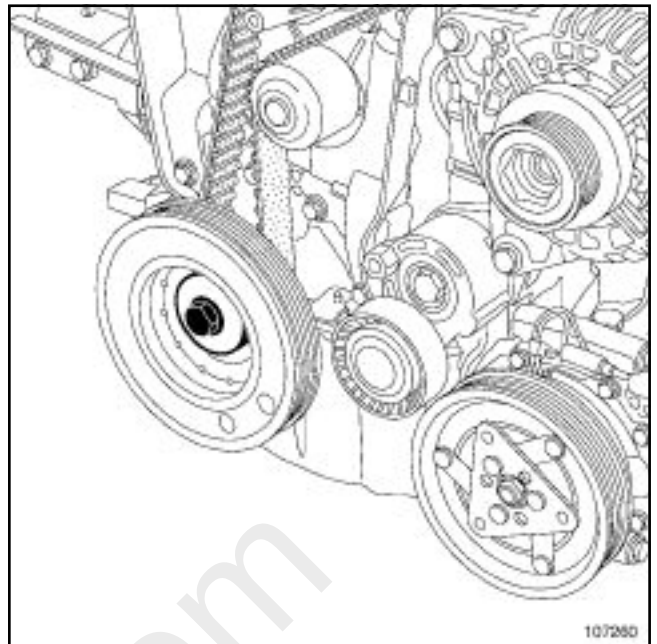
Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the (**Mot. 1430**) .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt** ($120 \pm 12 \text{ Nm} + 95^\circ \pm 15^\circ$) .

Remove the following tools:

- TDC setting pin (**Mot. 1489**) ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**) .

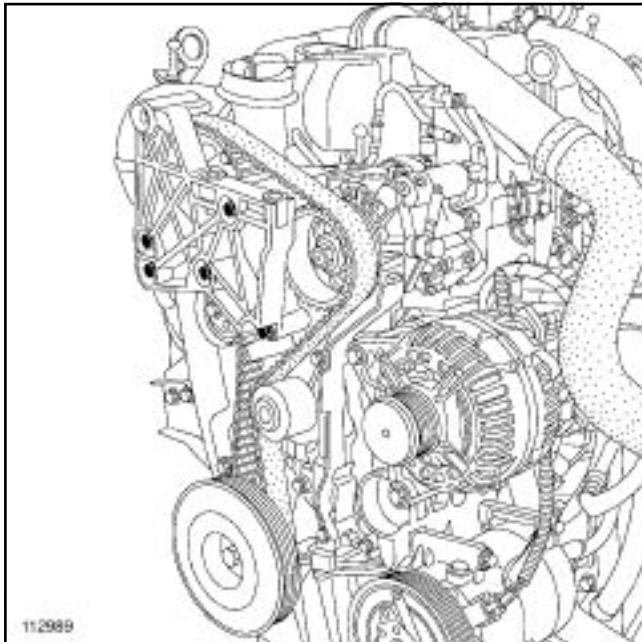
Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug** ($20 \pm 2 \text{ Nm}$) .

Timing - cylinder head: Refitting

K9K, and 732 or 764

K9K, and 732

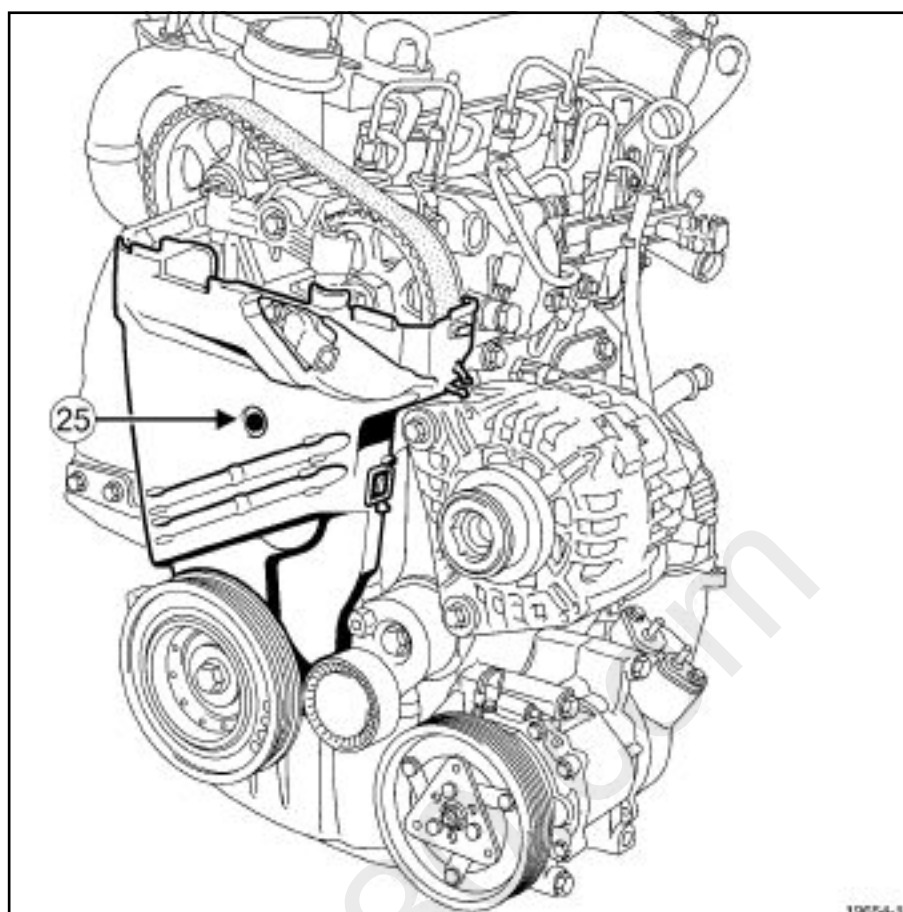
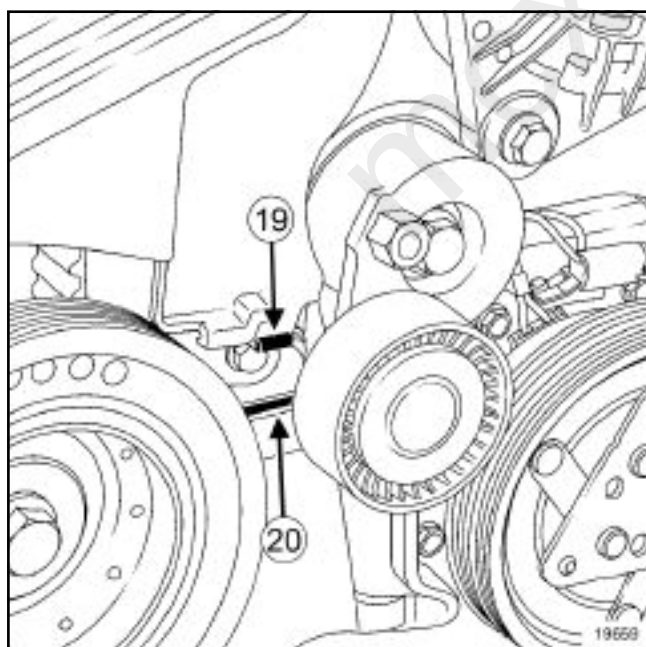


112989

Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts** (21 ± 2.1 Nm).

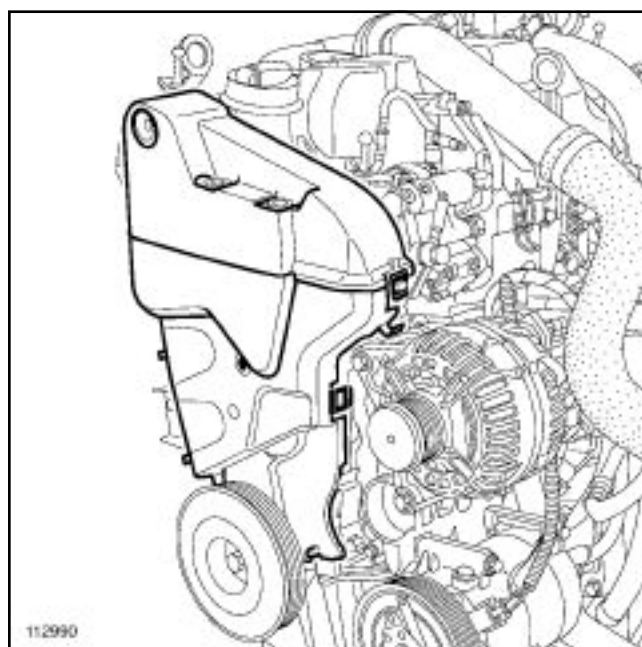
K9K, and 732 or 764

19654-1
19654-1

19659

Refit:

- the lower timing cover, positioning the tab (19) in the inner timing cover hole (20) ,
- the timing cover plastic bolt (25) .



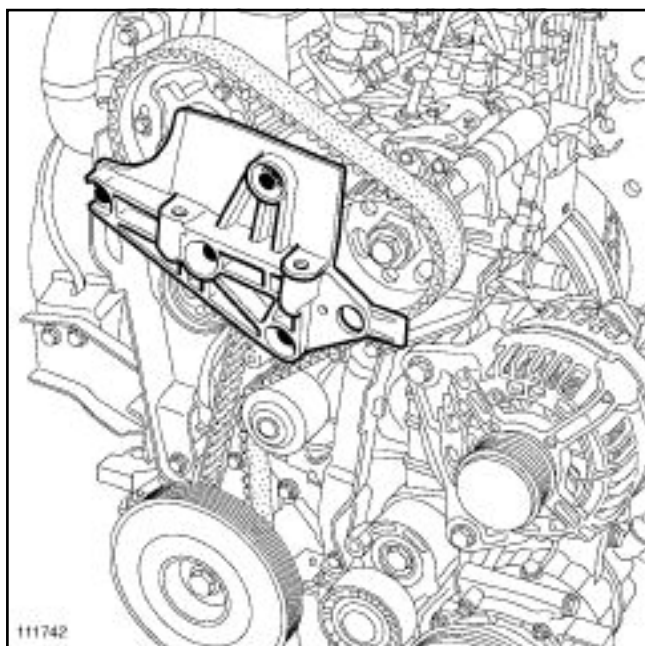
112990

112990

Refit the upper timing cover.

K9K, and 732 or 764

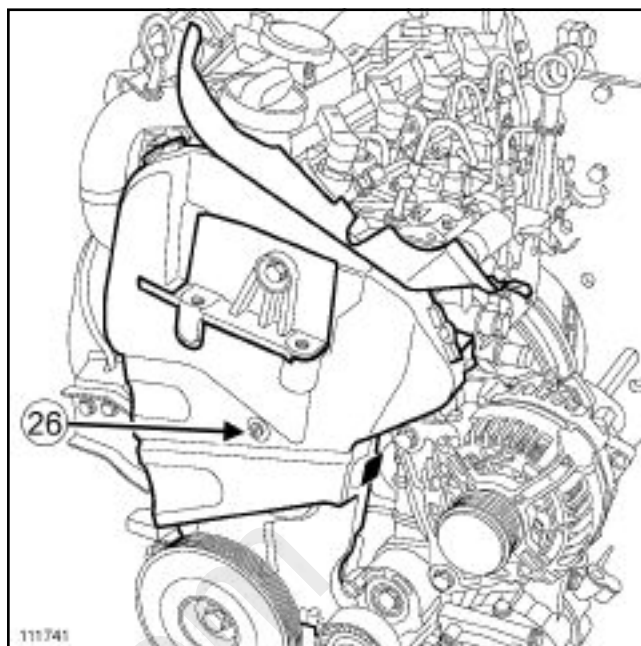
K9K, and 764



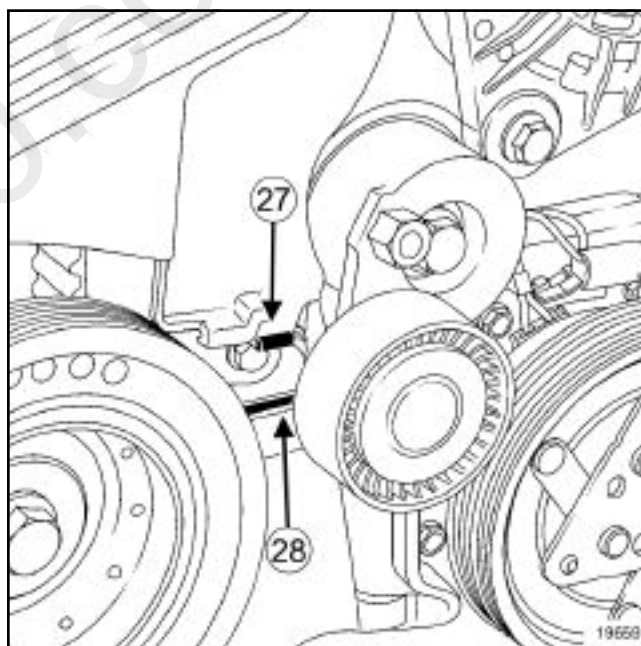
111742

Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts** (21 ± 2.1 Nm).



111741



19659

Refit:

- the timing cover, positioning the tab (27) in the inner timing cover hole (28) ,
- the timing cover plastic bolt (26) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques 	
cylinder head mounting bolts	25 ± 2.5 Nm
cylinder head mounting bolts	255° ± 10°
rocker cover mounting bolts	12 ± 1.2 Nm
turbocharger oil return pipe mounting bolts	12 ± 1.2 Nm
the nuts mounting the catalytic converter on the turbocharger	26 ± 2.6 Nm
the bolts mounting the catalytic converter stay on the engine	44 ± 4.4 Nm
the bolts mounting the catalytic converter stay on the catalytic converter	26 ± 2.6 Nm
oil vapour recirculation valve mounting nuts	12 ± 1.2 Nm
inner timing cover mounting bolts	9 ± 0.9 Nm
tensioning roller bolt	27 ± 2.7 N.m
the camshaft pulley wheel bolts	14 ± 1.4 Nm
the tensioning roller bolt	27 ± 2.7 Nm
the camshaft pulley wheel bolts	14 ± 1.4 Nm
the crankshaft accessories pulley M14 bolt	120 ± 12 Nm + 95° ± 15°
TDC pin plug	20 ± 2 Nm

Tightening torques 	
cylinder head suspended mounting bolts	21 ± 2.1 Nm
high-pressure pump position sensor bolt	8 Nm

I - RECOMMENDATIONS FOR REPAIRING THE CYLINDER HEAD

IMPORTANT

Wear protective gloves during every operation.

WARNING

When handling the cylinder head gasket, use the cylinder barrel to hold it.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not lubricate the new cylinder head bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The oil vapour recirculation valve seal,
- The seals on the turbocharger oil return pipe,
- The catalytic converter seal.

Consumables

- Degreaser, part no. **77 11 224 559** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING OF THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

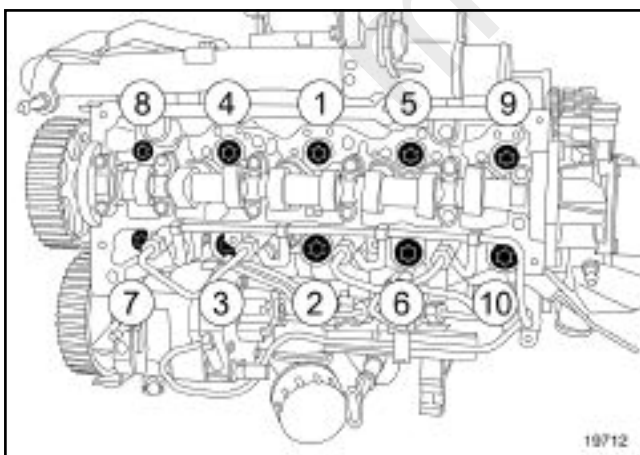
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP facing upwards) onto the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



19712

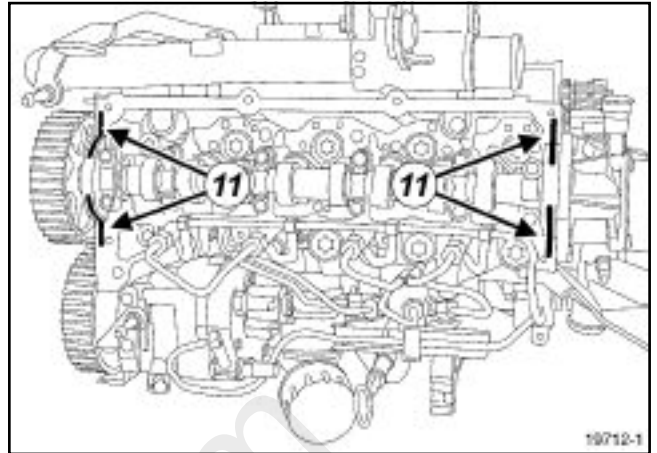
Tighten to torque and in order the **cylinder head mounting bolts** (25 ± 2.5 Nm).

Check that all the **cylinder head mounting bolts** are tightened to (25 ± 2.5 Nm).

Angle tighten in order the **cylinder head mounting bolts** ($255^\circ \pm 10^\circ$).

Degrease the rocker cover sealing surface on the cylinder head.

Refit a new seal onto the rocker cover.

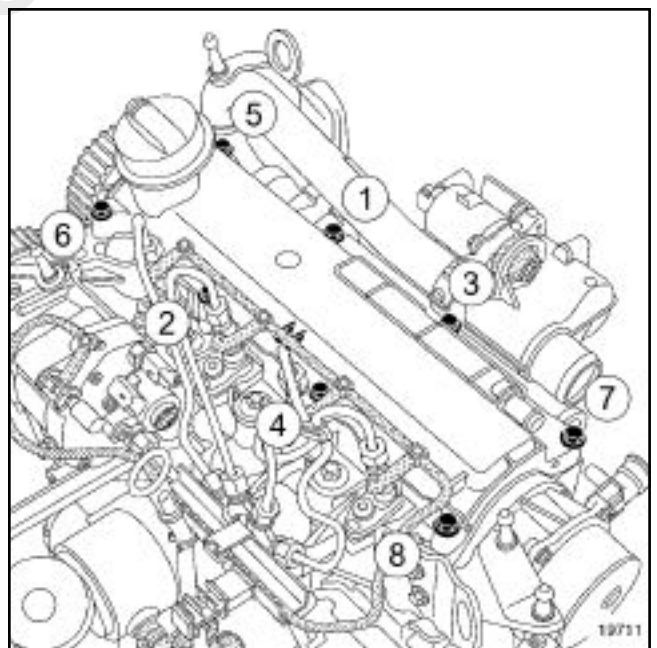


19712-1

Apply four beads (11) of **SILICONE ADHESIVE SEALANT** (2 mms in diameter).

Refit:

- the rocker cover,
- the rocker cover mounting bolts.



19711

Tighten to torque and in order the **rocker cover mounting bolts** (12 ± 1.2 Nm).

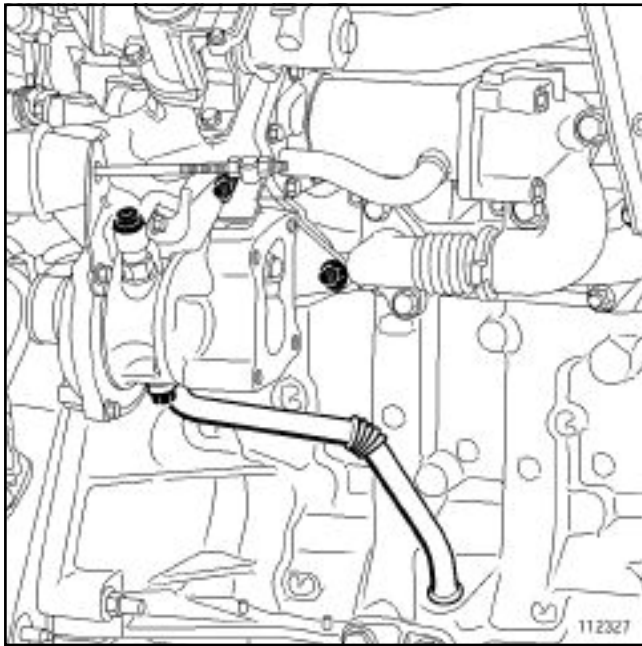
Refit the dipstick guide tube.

Clip the fuel return pipe onto the rocker cover.

Fit the new seals onto the turbocharger oil return pipe.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Use engine oil to lubricate the turbocharger oil return pipe O-ring seals.

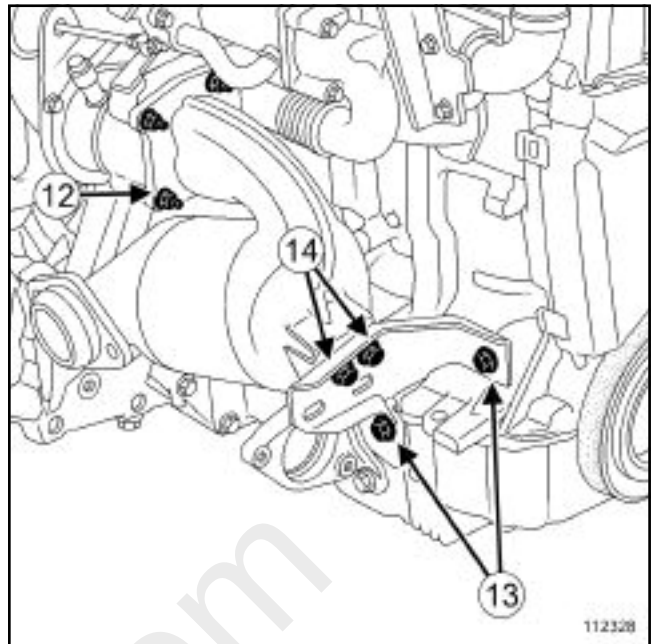


Refit:

- the turbocharger oil return pipe,
- the turbocharger oil return pipe mounting bolts.

Tighten to torque the **turbocharger oil return pipe mounting bolts (12 ± 1.2 Nm)** .

Fit a new seal between the turbocharger and the catalytic converter.



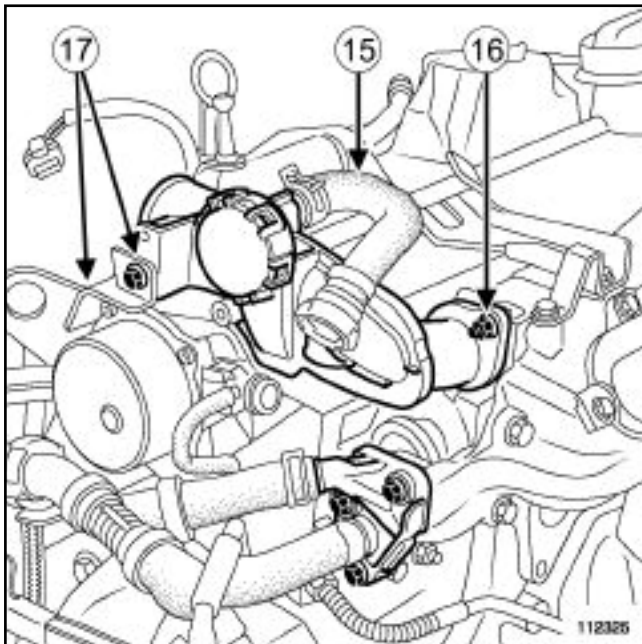
Refit:

- the catalytic converter,
- the nuts mounting the catalytic converter on the turbocharger,
- the catalytic converter mounting stay,
- the catalytic converter stay mounting bolts.

Tighten to torque:

- **the nuts mounting the catalytic converter on the turbocharger (26 ± 2.6 Nm) (12) ,**
- **the bolts mounting the catalytic converter stay on the engine (44 ± 4.4 Nm) (13) ,**
- **the bolts mounting the catalytic converter stay on the catalytic converter (26 ± 2.6 Nm) (14) .**

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



112325

Fit a new seal onto the oil vapour recirculation valve.

Refit:

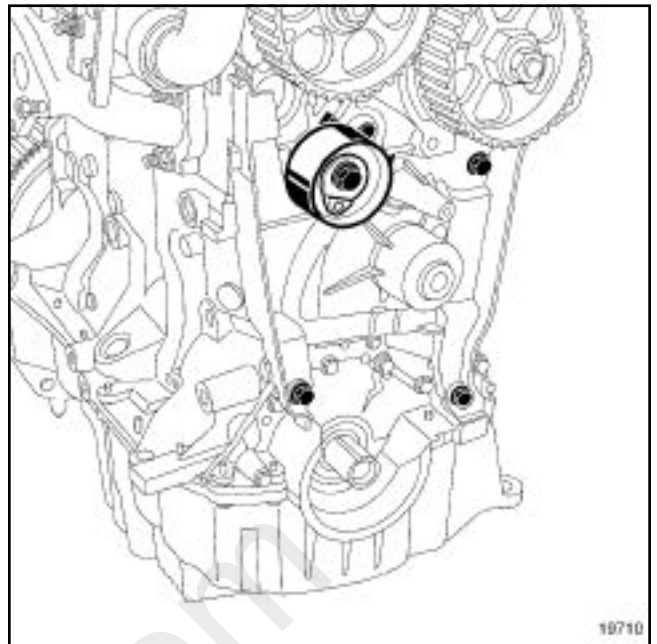
- the oil vapour recirculation valve,
- the oil vapour recirculation valve mounting nuts (16) .

Tighten to torque the **oil vapour recirculation valve mounting nuts** (12 ± 1.2 Nm) .

Connect the oil vapour recirculation pipe (15) .

Refit:

- the oil vapour recirculation valve retaining bracket,
- the mounting bolts of the oil vapour recirculation valve retaining bracket.



19710

Refit:

- the inner timing cover (tilting the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque the **inner timing cover mounting bolts** (9 ± 0.9 Nm) .

V - RECOMMENDATIONS FOR REPAIRING THE TIMING BELT

IMPORTANT

Wear protective gloves during every operation.

WARNING

The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

VI - PARTS AND CONSUMABLES FOR THE REPAIR**Pièces à remplacer systématiquement pour la distribution**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

- Silicone adhesive sealant, part no. **77 11 227 484**

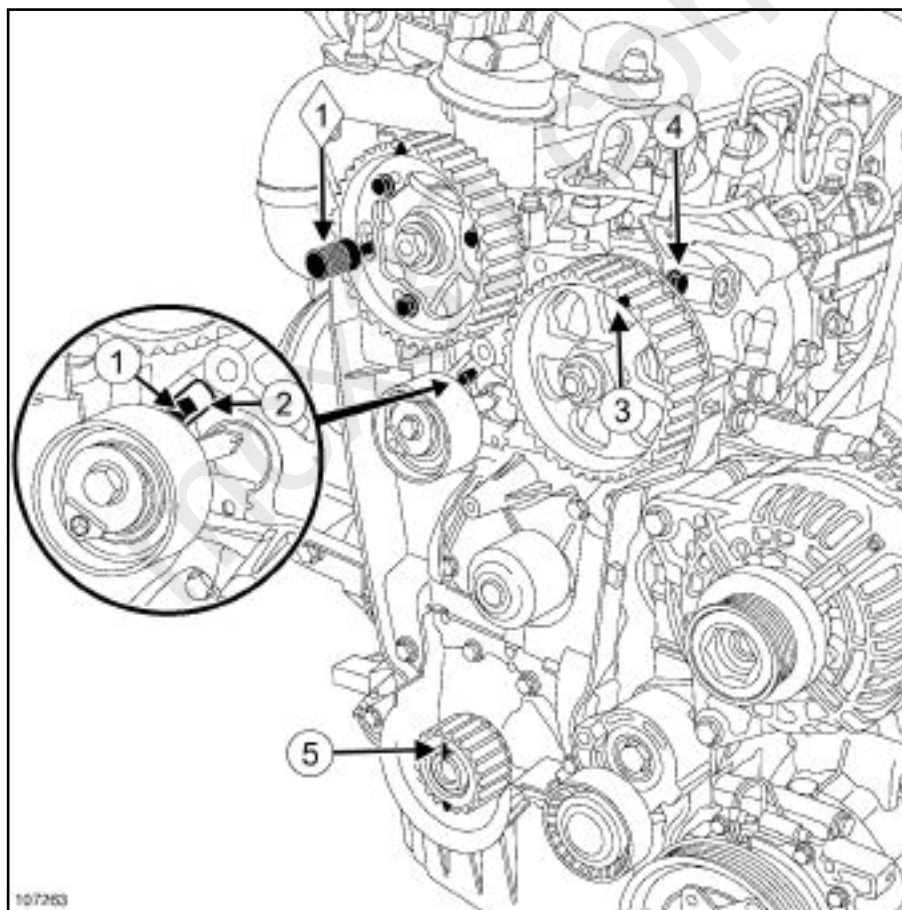
VII - EQUIPMENT REQUIRED FOR THE TIMING BELT

- Protective gloves,

- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

VIII - REFITTING THE TIMING

Refit the crankshaft timing sprocket.



107263

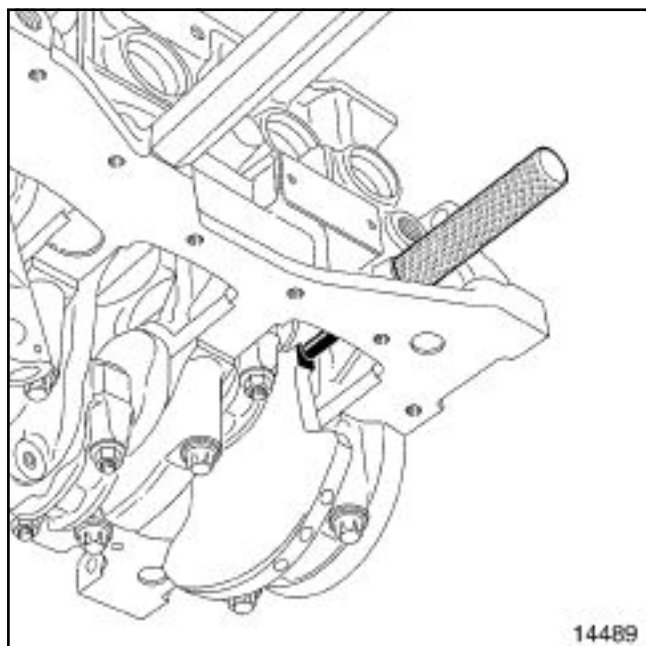
Refit the timing tensioning roller.

Put the tensioning roller spigot (1) in the cylinder head groove (2) .

Engage the pin (1) (**Mot. 1430**) in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

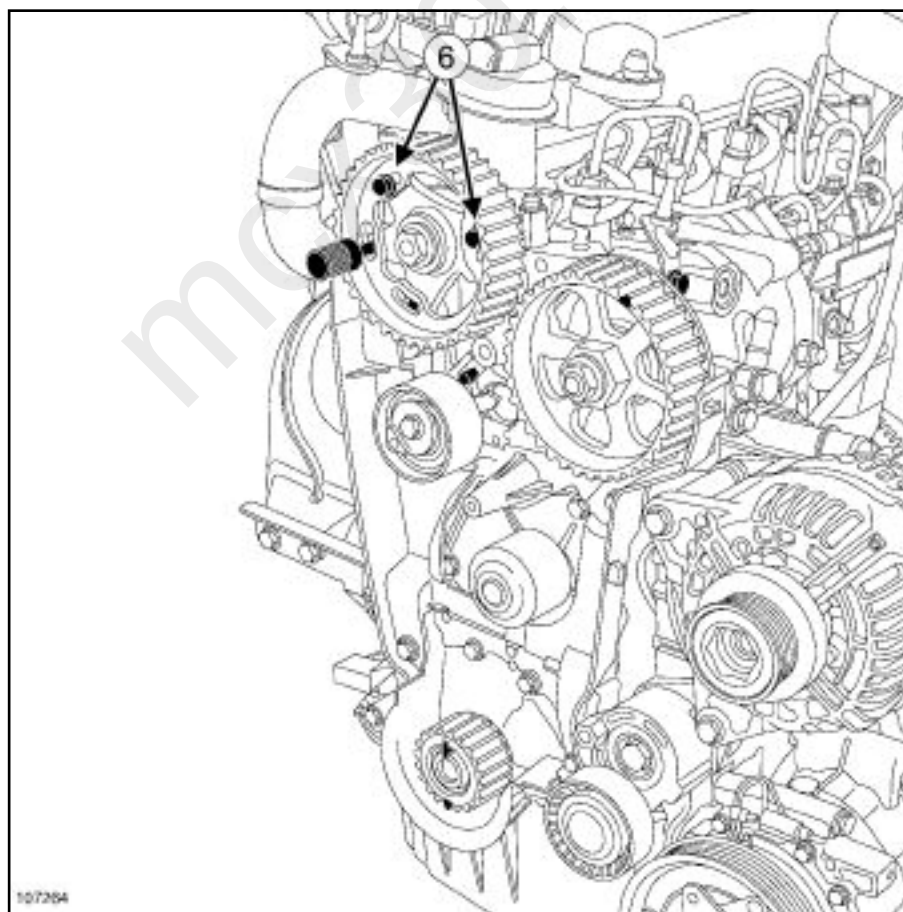
Check that the mark on the high-pressure pump (3) is opposite the bolt head (4) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



14489

Position the crankshaft so that it presses against the TDC setting pin (**Mot. 1489**) (the crankshaft sprocket cotter **(5)** must face upwards).



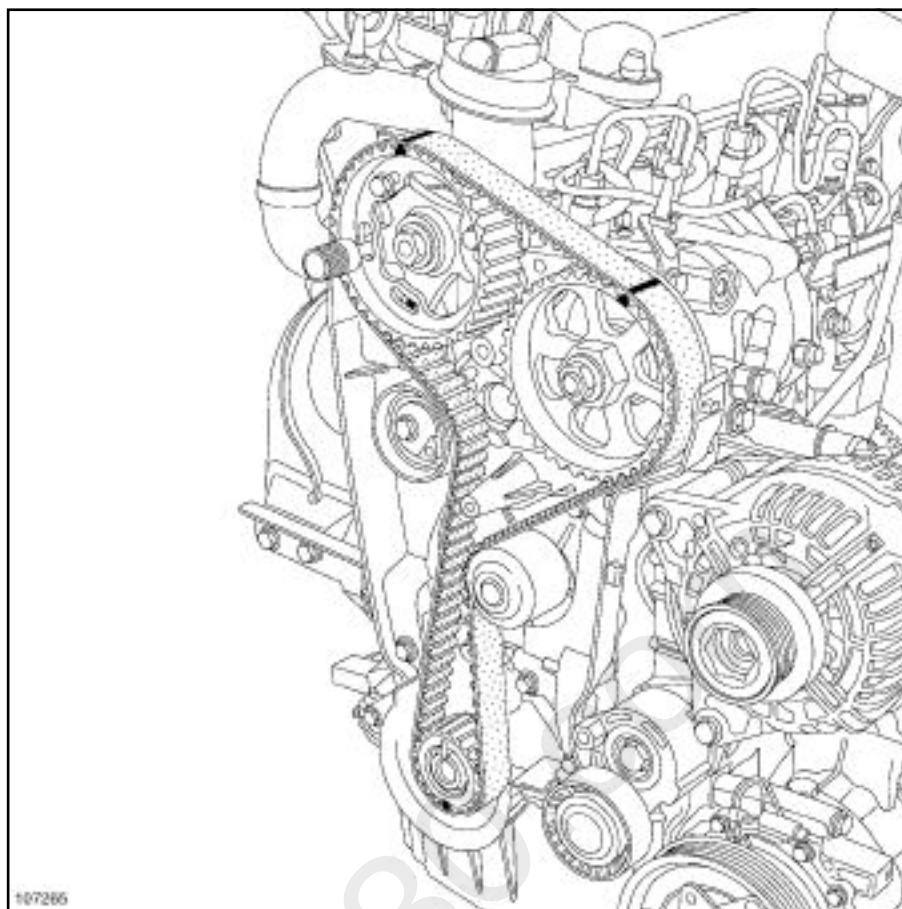
107264

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts **(6)** by one turn.

Timing - cylinder head: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



107265

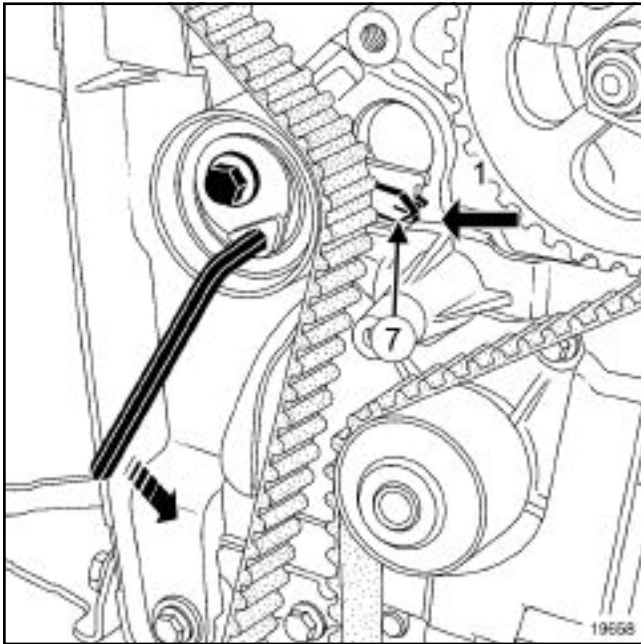
Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

note:

There should be 19 tooth belt grooves between the camshaft sprocket marks and the high-pressure pump, and 51 tooth valleys between the crankshaft sprockets and the high-pressure pump.

Timing - cylinder head: Refitting

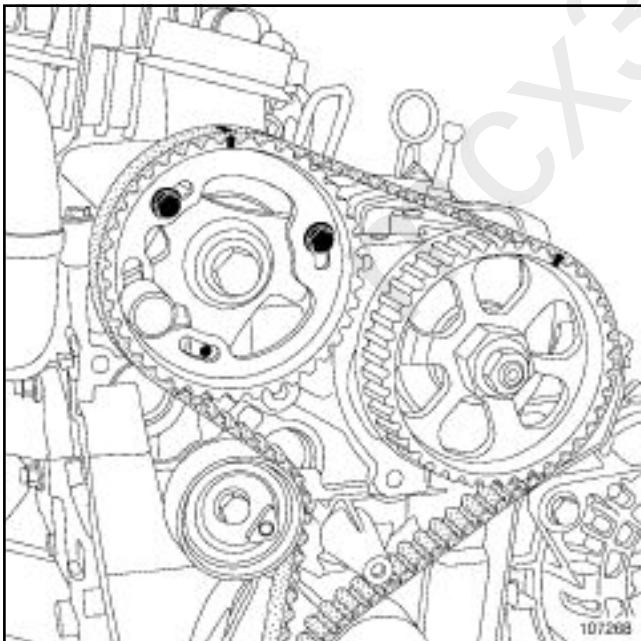
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19658

Position the tensioning roller adjustable index (7) opposite the spigot, turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

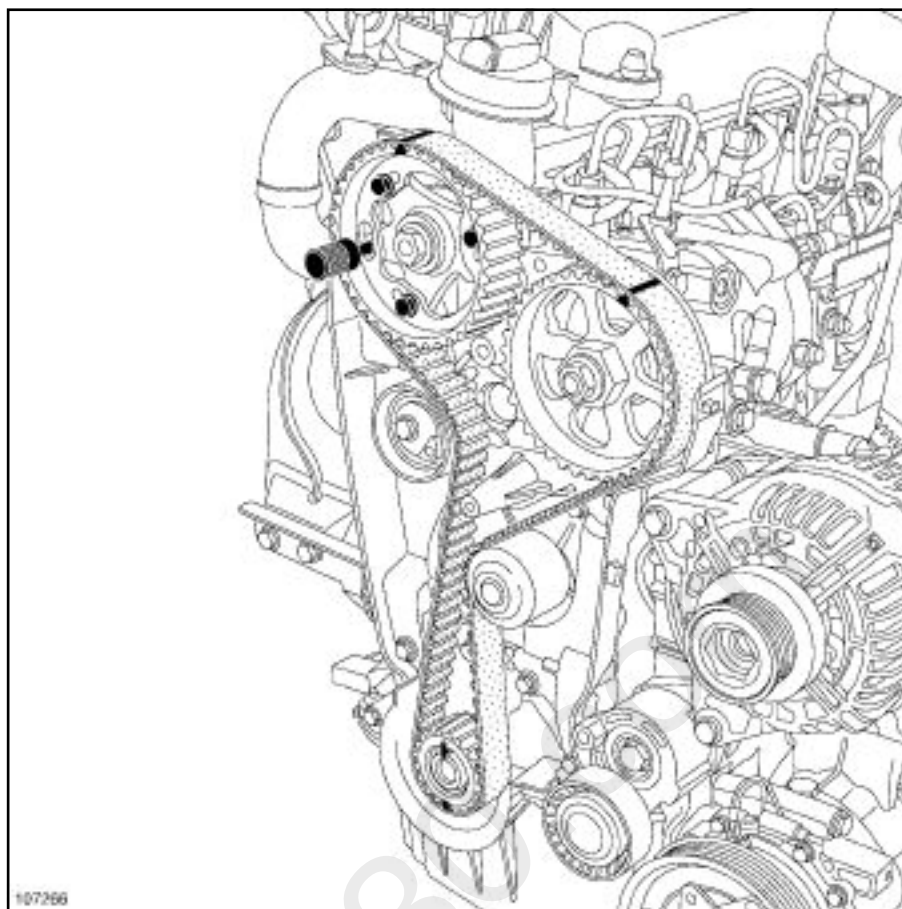
Tighten to torque the **tensioning roller bolt** ($27 \pm 2.7 \text{ N.m}$).



107268

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



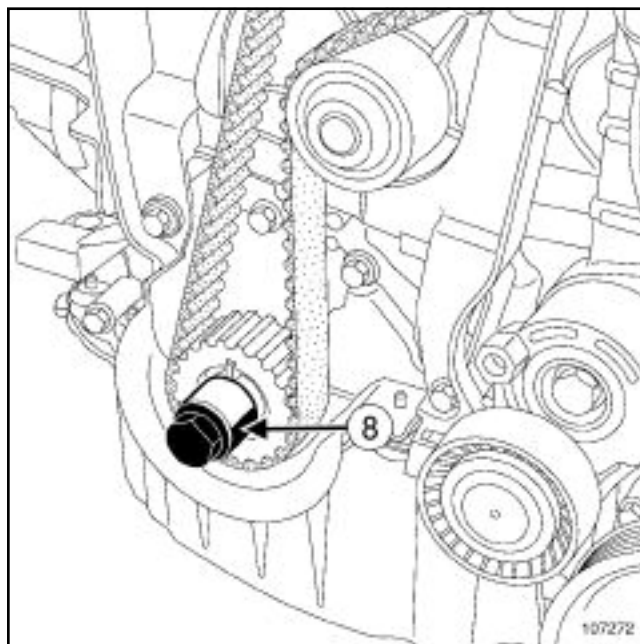
107266

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts** ($14 \pm 1.4 \text{ Nm}$).

Remove:

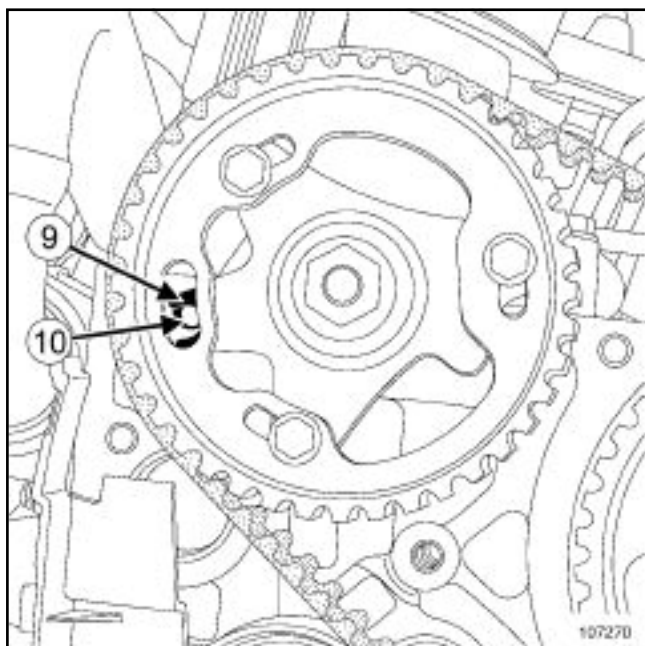
- the TDC setting pin (**Mot. 1489**),
- the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**).



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

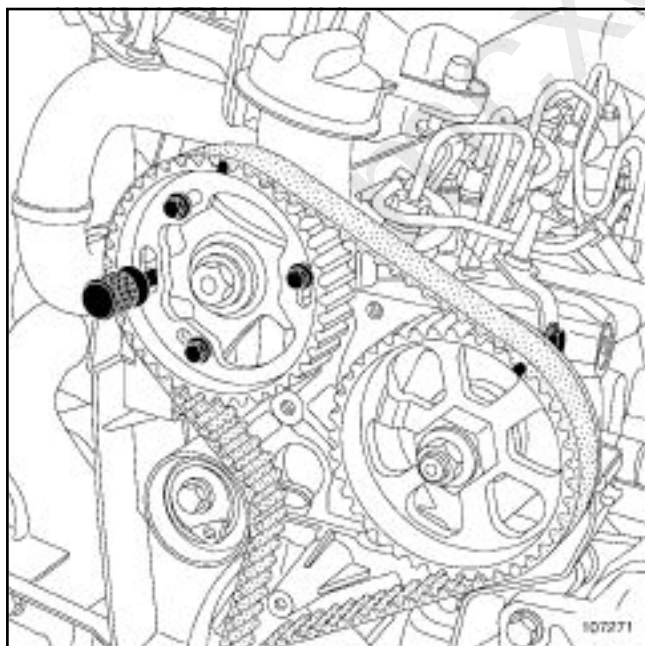


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (9) is opposite the cylinder head hole (10) .

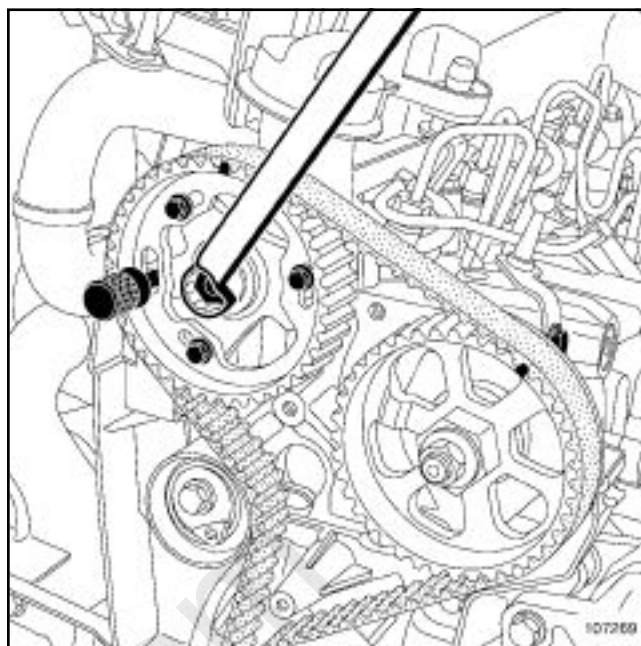
Screw the TDC setting pin (**Mot. 1489**) into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

Set the camshaft pulley using the (**Mot. 1430**) .



107269

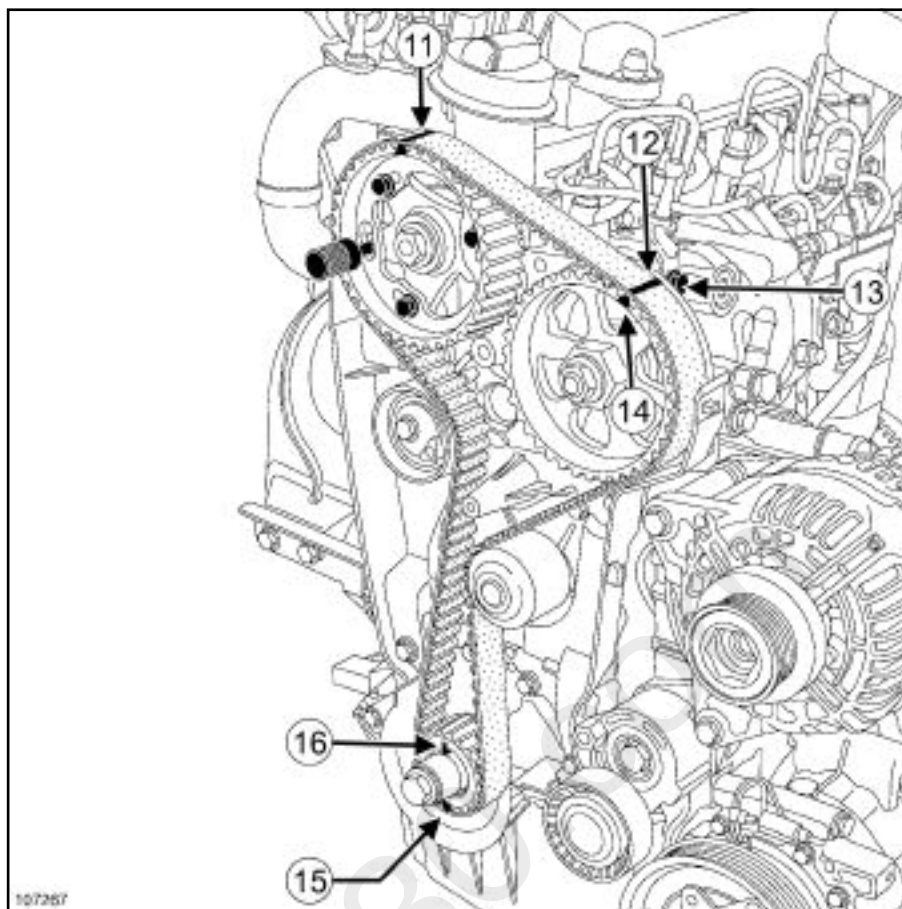
If the pin (**Mot. 1430**) does not engage:

loosen the camshaft pulley wheel bolts by one turn at most,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



107267

Check:

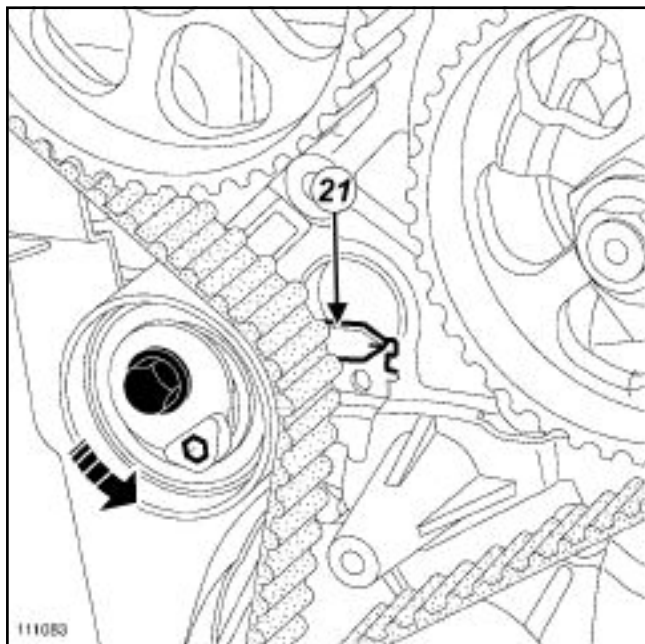
- that the high-pressure pump sprocket mark (14) is opposite the bolt head (13) ,
- that the crankshaft timing sprocket cotter (16) is positioned vertically at the top,
- that there are 19 tooth belt grooves between the camshaft sprocket marks (11) and the high-pressure pump sprocket (12) ,
- that there are 51 tooth belt grooves between the crankshaft sprocket marks (15) and the high-pressure pump sprocket (12) .

note:

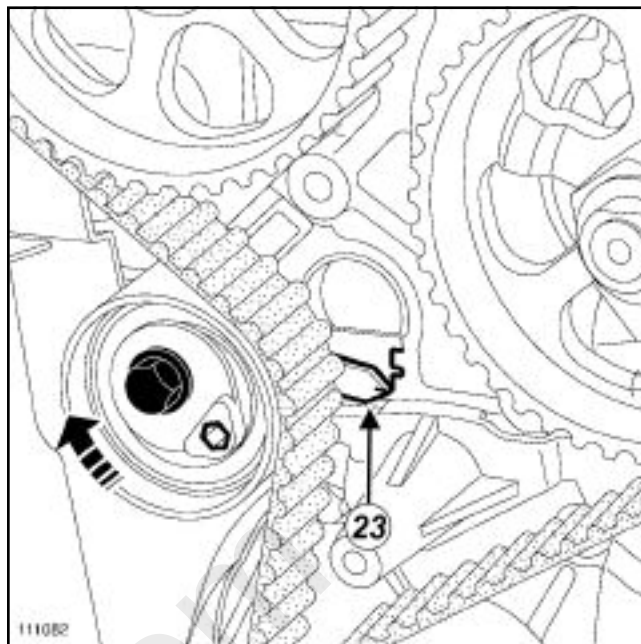
After two turns, the tensioning roller index markers may be in two different positions.

The rotation of the tensioning roller eccentric cam depends on the position.

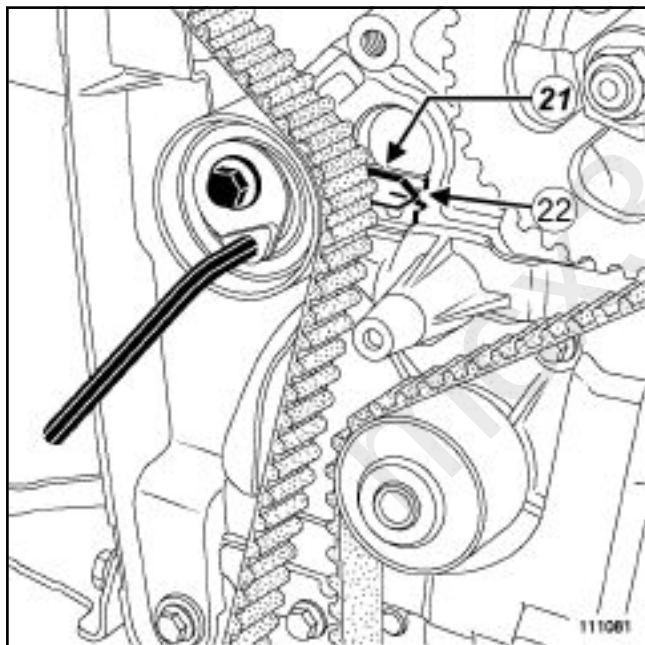
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



111083



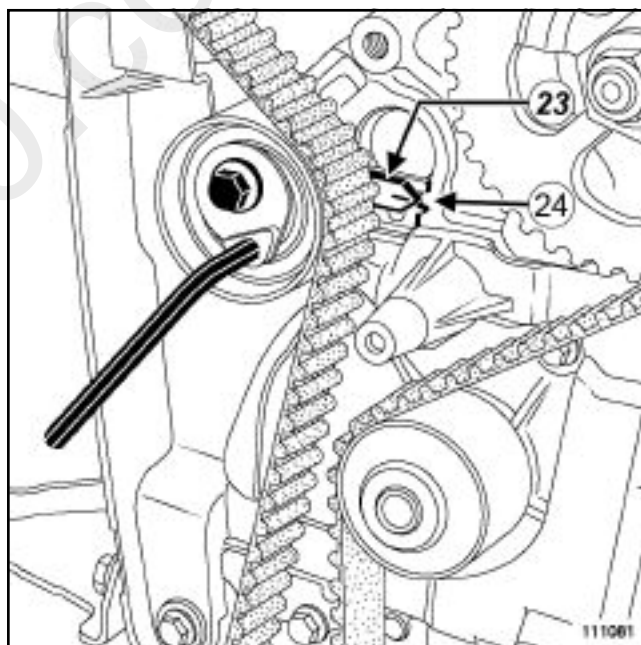
111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**), turning the key anti-clockwise.



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**), turning the key clockwise.

Tighten to torque:

- the tensioning roller bolt (27 ± 2.7 Nm) ,
- the camshaft pulley wheel bolts (14 ± 1.4 Nm) .

Remove the following tools:

- TDC setting pin, (**Mot. 1489**)

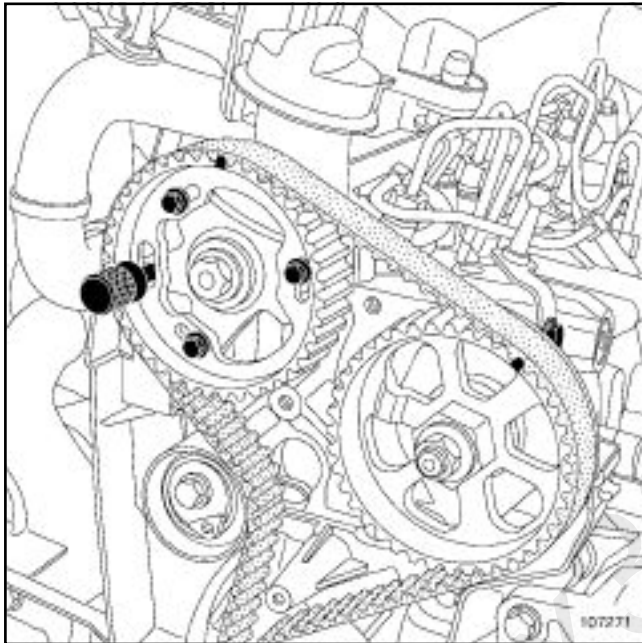
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

-the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**) .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin (**Mot. 1489**) into the cylinder block.

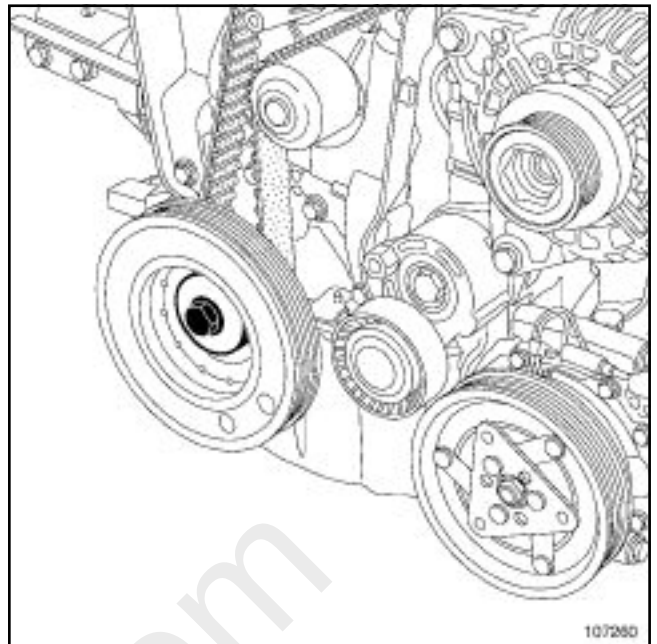
Bring the crankshaft slowly and smoothly into contact with the TDC setting pin.



107271

Set the camshaft pulley using the (**Mot. 1430**) .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt** ($120 \pm 12 \text{ Nm} + 95^\circ \pm 15^\circ$) .

Remove the following tools:

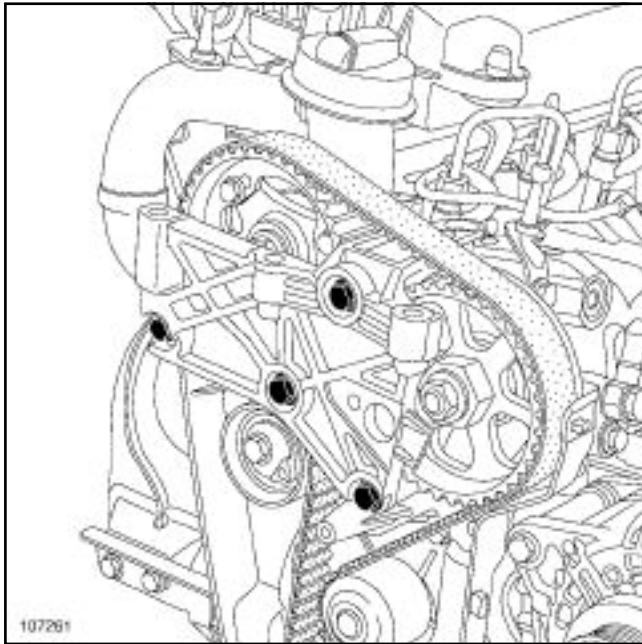
- TDC setting pin, (**Mot. 1489**)
- the set of 5 timing pins for the camshaft and crankshaft pulleys (**Mot. 1430**) .

Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug** ($20 \pm 2 \text{ Nm}$) .

Timing - cylinder head: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



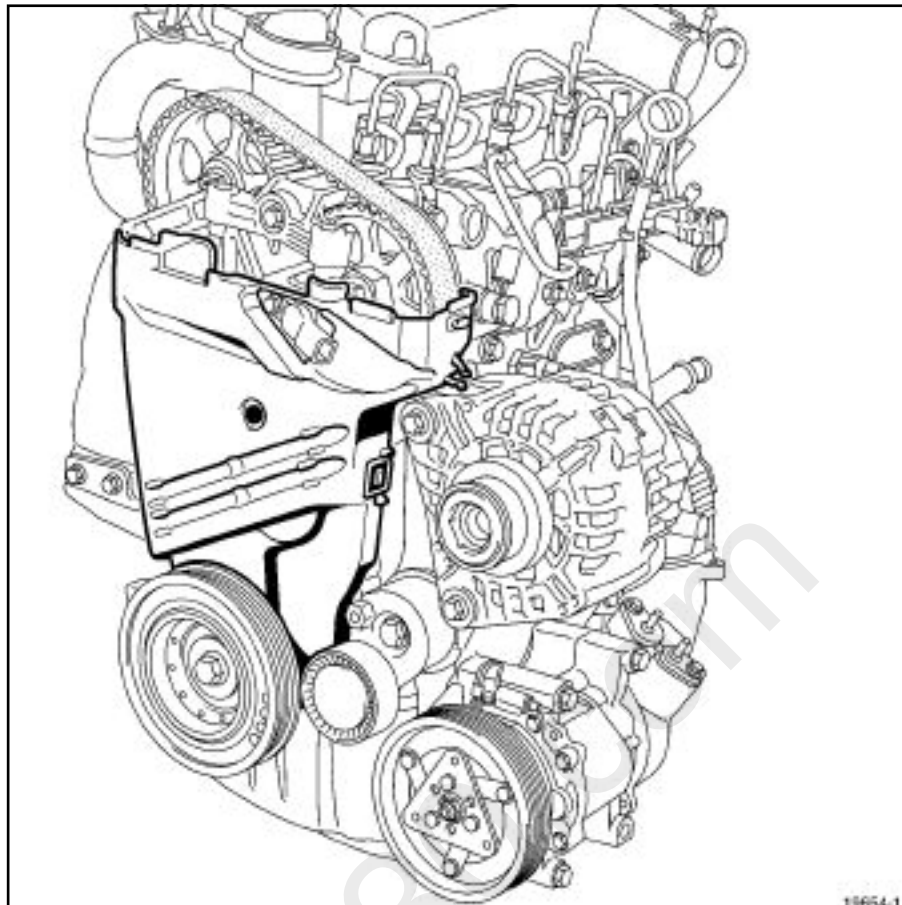
107261

Refit the cylinder head suspended mounting.

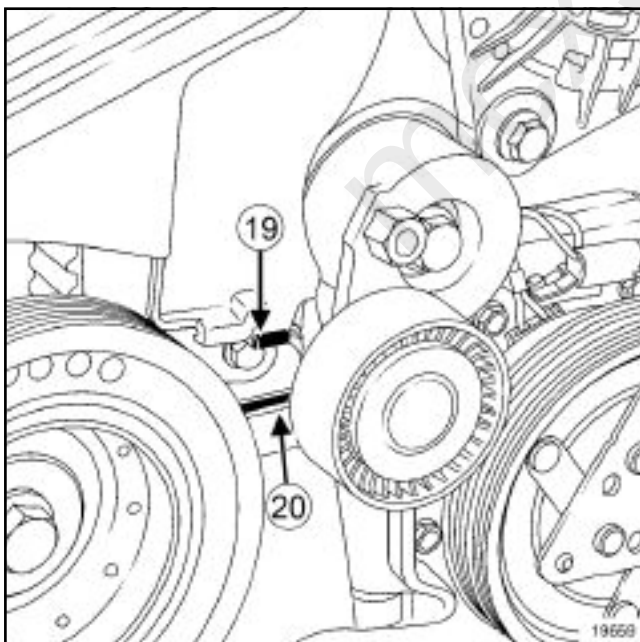
Tighten to torque the **cylinder head suspended mounting bolts** (21 ± 2.1 Nm).

Timing - cylinder head: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19654-1



19659

Refit:

- the lower timing cover, positioning the tab (19) in the inner timing cover hole (20) ,
- the timing cover plastic mounting bolt.