

High pressure pump leak flow: Check

K9K, and 764 or 772

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

- ☐ Follow the procedures described in the fault finding repair manual (see **MR 394 Fault finding, 13B, Diesel injection, Fault finding - Tests**) :

- TEST 2: Check internal fuel transfer pump (ITP)

IMPORTANT

Do not leave any object (tools or other) on the side of the engine housing during the entire operation.

Position the tools so that they do not fall during the « engine running » phase of the test.

High pressure pump: Removal - Refitting

K9K, and 764 or 772

Special tooling required

Mot. 855	Tool for locking the timing wheels.
Mot. 1768	Injection pump pulley extraction claws.
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Tightening torques

high pressure pump pulley	55 N.m
high pressure pump mounting bolts	21 N.m
high pressure pipe nuts	24 N.m
nut mounting the inter-cooler air inlet pipe on the alternator	8 N.m

WARNING

Before starting work on the vehicle, obtain:

- a new plug kit (**PART NO. 77 01 476 857**),
- cleaning cloths (**PART NO. 77 11 211 707**),
- cleaning product (**PART NO. 77 11 224 188**).

WARNING

Parts always to be replaced:

- the high pressure pipe between the injector rail and the high pressure pump.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- ☐ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).



IMPORTANT

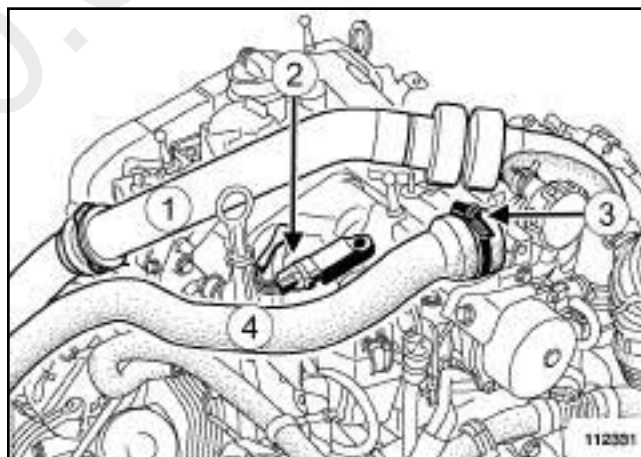
Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

- ☐ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ☐ Remove:
 - the engine protector,
 - the engine undertray,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-48) .



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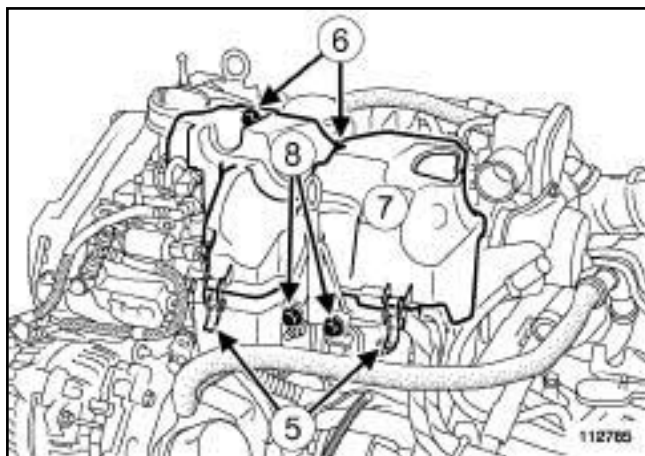
- ☐ Remove the upper part of the turbocharging duct (1) .
- ☐ Disconnect the inlet air pressure sensor (2)
- ☐ Loosen the clip (3) .
- ☐ Move the inlet duct to one side (4) .

DIESEL INJECTION

High pressure pump: Removal - Refitting

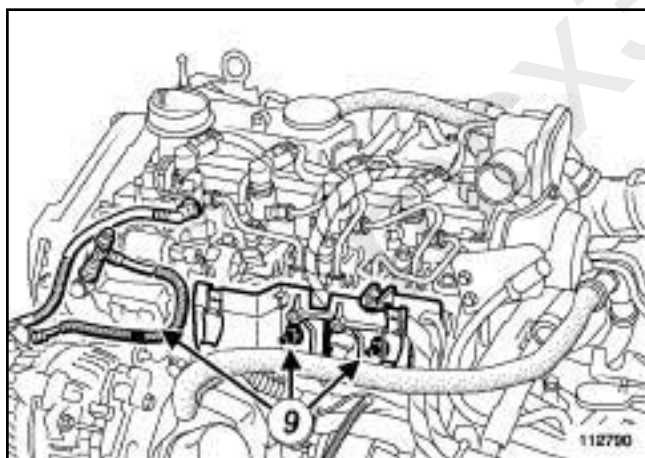
13B

K9K, and 764 or 772



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- ☐ Unclip the clips (5) from the injector rail protector cover.
- ☐ Remove:
 - the injector rail protector cover mounting bolts (6) ,
 - the injector rail protector cover (7) ,
 - the dipstick,
 - the dipstick tube mounting bolts (8) .
- ☐ Move the dipstick duct to one side.



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- ☐ Remove:
 - the injector rail protector mounting bolts (9) ,
 - the injector rail protector.
- ☐ Protect the alternator from fuel outflow.
- ☐ Pour cleaning product into a clean container.

IMPORTANT

Wear protective glasses when using cleaning product.

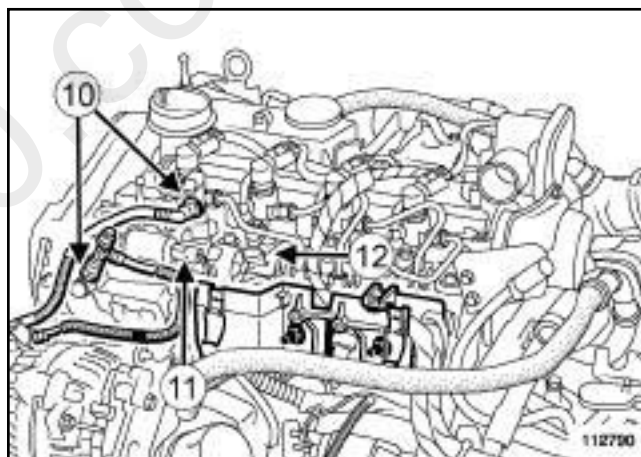
- ☐ Soak a brush with cleaning product, then clean the unions:
 - of the fuel supply pipe fuel on the high pressure pump,
 - on the high pressure pump fuel return pipe, taking care not to soak the diesel fuel temperature sensor,
 - on the high-pressure pipe and the injector rail.
- ☐ Blow compressed air into the cleaned areas, then wipe them with new wipes.

IMPORTANT

Wear protective glasses.

WARNING

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use wipes if necessary.



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- ☐ Disconnect the high pressure pump from:
 - the diesel fuel supply and return pipes (10) ,
 - the fuel pressure regulating valve connector (11) ,
 - the fuel flow regulating valve connector (12) .

Note:

Make preparations for fuel outflow. Clean with new cloths.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

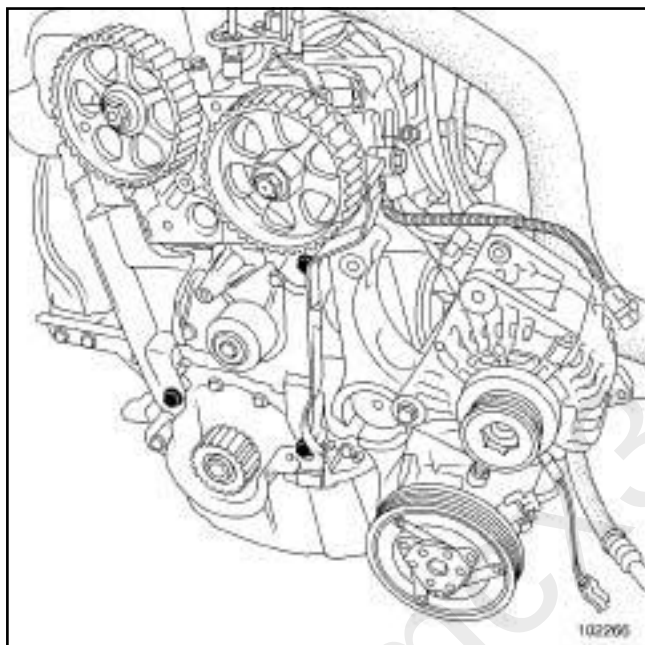
K9K, and 764 or 772

- ❑ Remove the high-pressure pipe between the high-pressure pump and the injector rail and discard it.

Note:

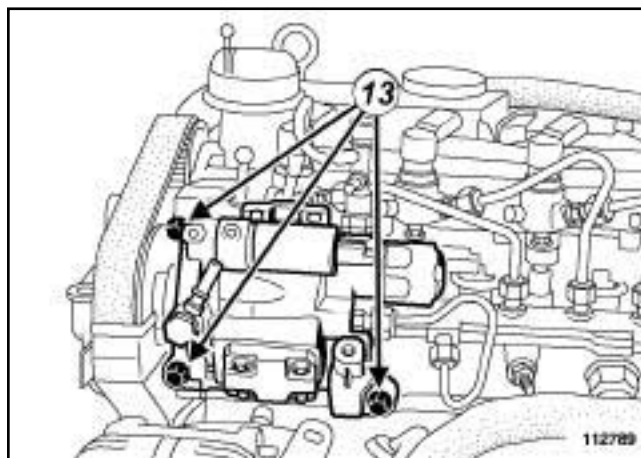
Hold the intermediate nut between the pump-rail pipe and the high pressure pump using a lock wrench.

- ❑ Insert the blanking plugs.
- ❑ Remove the lower mounting bolt from the alternator.
- ❑ Undo the alternator's upper mounting bolt.
- ❑ Tip the alternator towards the front of the vehicle.



- ❑ Remove:
 - the inner timing cover mounting bolts,
 - the inner timing cover.

II - REMOVAL OF PART CONCERNED



- ❑ Remove:
 - the high-pressure pump mounting bolts (13) ,
 - the high pressure pump.

WARNING

If the high-pressure pump is to be reused, keep it in a sealed plastic bag all the time it is disconnected.

Remove the high pressure pump pulley

❑

WARNING

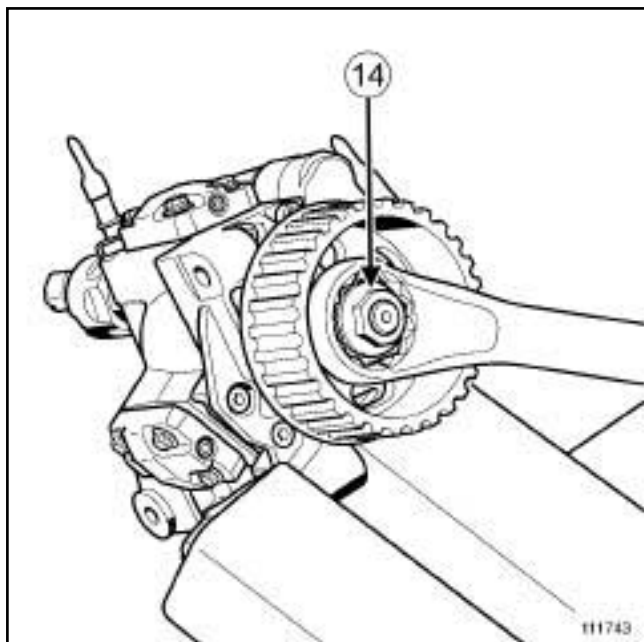
If the high-pressure pump is being replaced, take the high-pressure pump pulley and refit it to the new pump.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 764 or 772



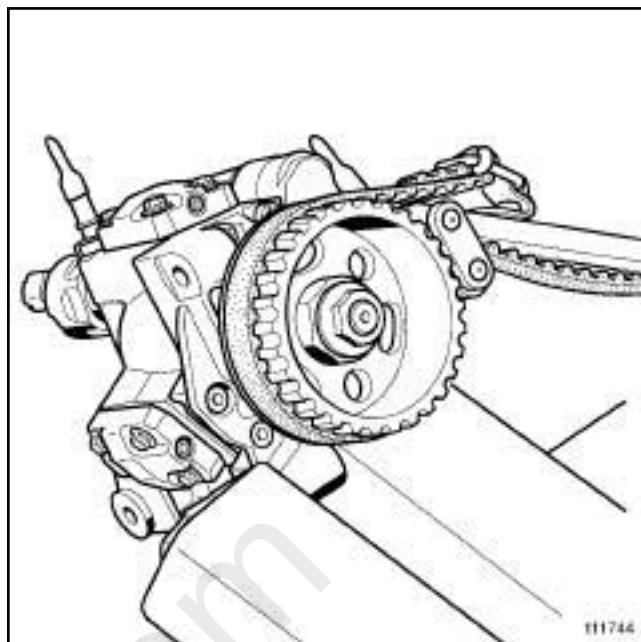
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- ❑ Hold the high pressure pump in a vice, using the lower securing point on the pulley side.

WARNING

Fix jaw covers onto the vice to protect the high-pressure pump.

- ❑ Hold the high pressure pump pulley with a **32 mm offset wrench** then remove the mounting nut (14) from the pulley.



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- ❑

Note:

The high pressure pump pulley can also be held with a (**Mot. 855**).

- ❑ Fit the tool (**Mot. 1768**), as well as the tool **Mot. 1525** without the spacer at the end of threaded rod, on the high pressure pump pulley, then extract the pulley.

WARNING

Take care not to mark the high-pressure pump when removing it.

A damaged high pressure pump pulley must always be replaced.

REFITTING

I - REMOVAL PREPARATION OPERATION

- ❑

WARNING

- Remove the blanking plugs only before reconnecting the fuel circuit pipes.
- The plugs are single-use. Do not reuse them and throw away the complete kit after opening.

High pressure pump: Removal - Refitting

K9K, and 764 or 772

Refitting the high pressure pump pulley

- ☐ Remove the injector rail from its plastic bag.

WARNING

If a high pressure pump is being replaced, only remove the new one from its original packaging when it is about to be fitted.

- ☐ Finger tighten the high-pressure pump pulley mounting nut as far as possible.
- ☐ Hold the high-pressure pump pulley with the previously used tool.
- ☐ Torque tighten the **high pressure pump pulley (55 N.m)**.

II - REFITTING PART CONCERNED

- ☐ Remove the injector rail from its plastic bag.

WARNING

If a high pressure pump is being replaced, only remove the new one from its original packaging when it is about to be fitted.

- ☐ Position the high-pressure pump on the cylinder head.
- ☐ Finger tighten the high-pressure pump mounting bolts as far as possible.
- ☐ Torque tighten the **high pressure pump mounting bolts (21 N.m)**.

III - FINAL OPERATION

- ☐ Fit the new high pressure pipe between the injector rail and the high pressure pump.

Note:

If the new pipe kit does not contain an applicator, lubrication of the high-pressure nut threads will be unnecessary (as they are self-lubricating pipes).

- ☐ Hand-tighten the nut on the high-pressure pipe on the pump end, then the one on the rail end.
- ☐ Tighten to torque the **high pressure pipe nuts (24 N.m)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting with the high pressure pump end.
- ☐ Disconnect the high pressure pump from:
 - the fuel supply and return pipes,
 - the fuel pressure regulating valve connector,

- the fuel flow regulating valve connector,

☐ Refit:

- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**),
- loosen the nut mounting the intercooler air inlet pipe to the alternator.
- fit the air duct between the turbocharger and the intercooler air inlet pipe,
- lock the air duct onto the turbocharger and the intercooler air inlet pipe.
- tighten the air duct bolt on the rocker cover,
- torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 N.m)**,
- the engine undertray.

- ☐ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

High pressure pump: Removal - Refitting

K9K, and 750 or 752 or 760 or 762 or 766 or 768

Special tooling required

Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1606	High pressure pump pulley support tool.
Mot. 1525-02	Adapter claws for Mot. 1525.
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Equipment required

Diagnostic tool

Tightening torques

high pressure pump bolts on the cylinder head	23 N.m
high pressure pump pulley nut	55 N.m
suspended mounting bolts on the cylinder head	25 N.m
camshaft position sensor bolt	8 N.m
right-hand suspended engine mounting bolts	62 N.m
engine tie-bar bolts	105 N.m
high pressure pipe unions between the pump and the yellow rail	24 N.m
high pressure pipe unions between the pump and the silver rail	28 N.m
high pressure pump protection bolts	21 N.m
dipstick guide tube nuts	10 N.m
exchanger inlet air pipe nut on the alternator	8 N.m

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1**).

REMOVAL

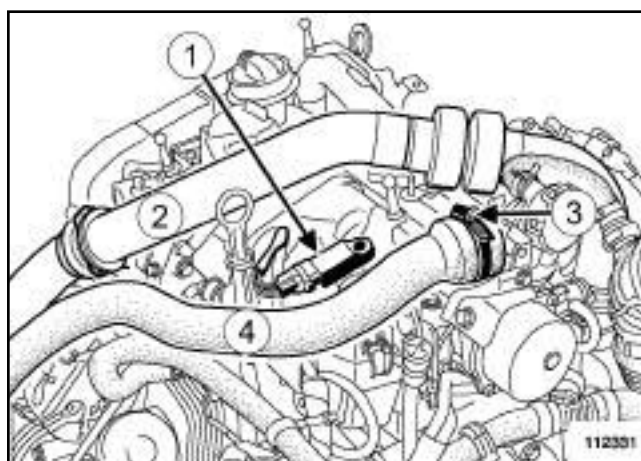
I - PARTS AND CONSUMABLES FOR THE REPAIR

- ☐ Consumables: (see **13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1**)

- Cleaning cloths,
- Set of K9K blanking plugs (injection **DELPHI**).

II - REMOVAL PREPARATION OPERATION

- ☐ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- ☐ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



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- ☐ Disconnect the inlet air pressure sensor (1)

K9K, and 750 or 766 or 768

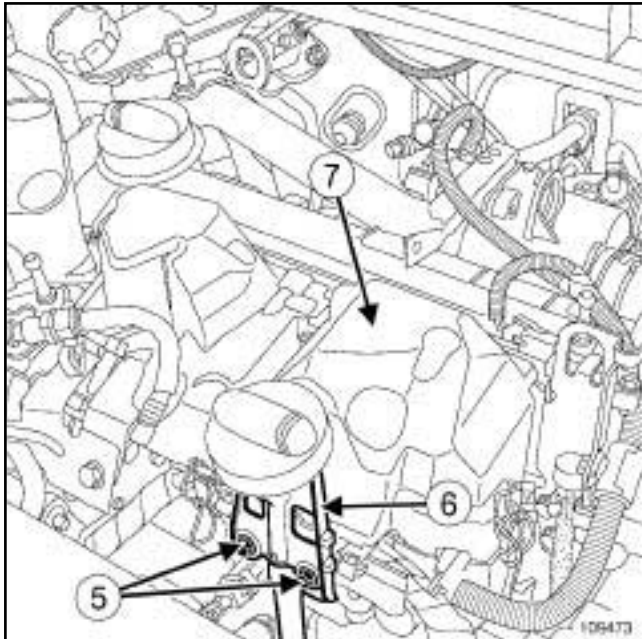
- ☐ Remove the turbocharger outlet air pipe (2).
- ☐ Loosen the clip (3) on the intercooler outlet air pipe.
- ☐ Move the intercooler outlet air pipe to one side (4).

DIESEL INJECTION

High pressure pump: Removal - Refitting

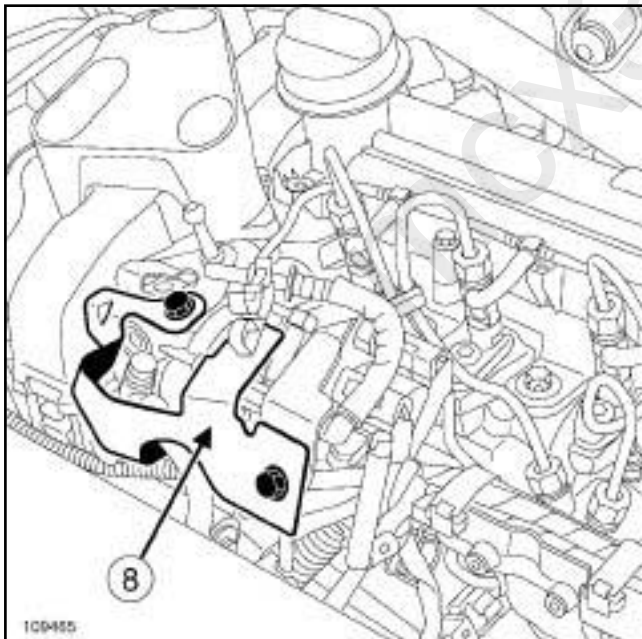
13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768



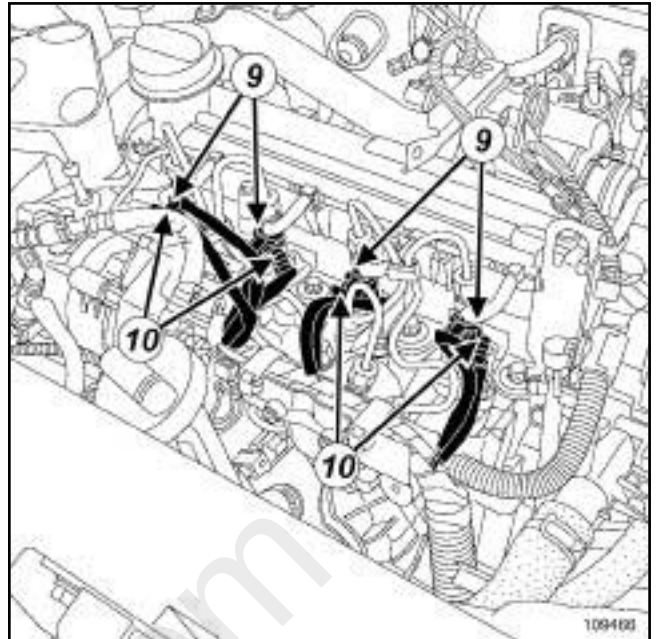
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- ☐ Remove the dipstick.
- ☐ Remove the engine oil dipstick guide bolts (5) .
- ☐ Put the engine oil dipstick guide (6) to one side.
- ☐ Remove the diesel fuel splash plate (7) .



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- ☐ Remove the high pressure pump protector (8) .



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- ☐ Disconnect:
 - the heater plugs (9) ,
 - the injectors (10) .



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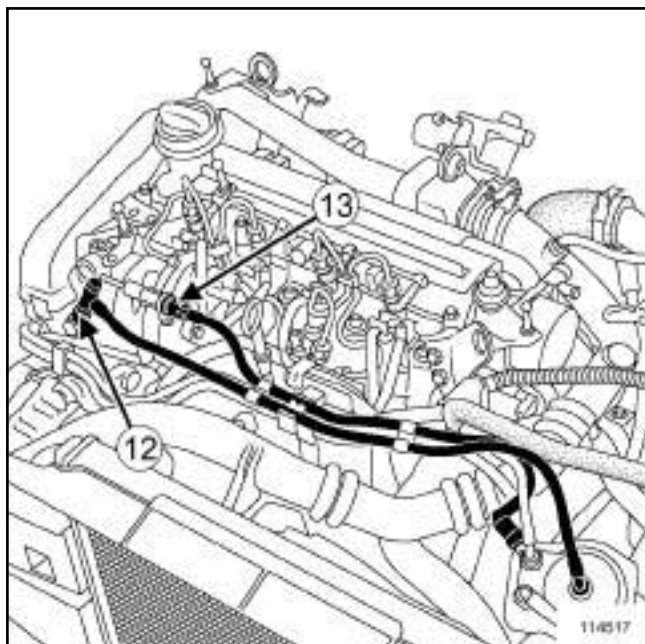
- ☐ Disconnect the connectors on the high pressure pump (11) .
- ☐ Protect the alternator from fuel outflow.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768



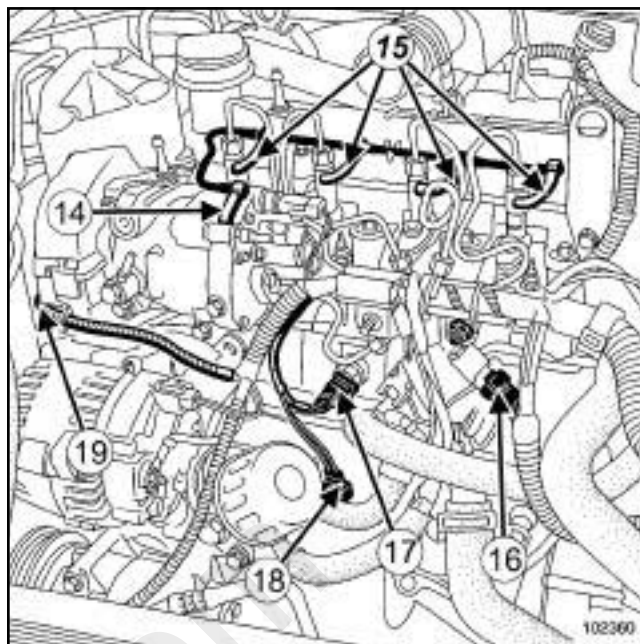
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- ☐ Clean the union (12) on the diesel supply pipe high pressure pump (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1).
- ☐ Disconnect the high pressure pump from:
 - the diesel supply pipe,
 - the diesel return pipe (13) to the fuel filter.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ☐ Fit the appropriate blanking plugs on the high pressure pump and on the pipes.
- ☐ Disconnect the diesel supply and return pipes from the injection rail filler neck then move them away from the high pressure pump.



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- ☐ Disconnect:
 - the diesel return pipe (14) on the venturi tube fitted to the high pressure pump,
 - the diesel return pipes (15) on the diesel injectors,
 - the rail pressure sensor connector (16),
 - the accelerometer connector (17),
 - the oil level sensor connector (18),
 - the cylinder reference sensor (19) connector on the timing cover.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

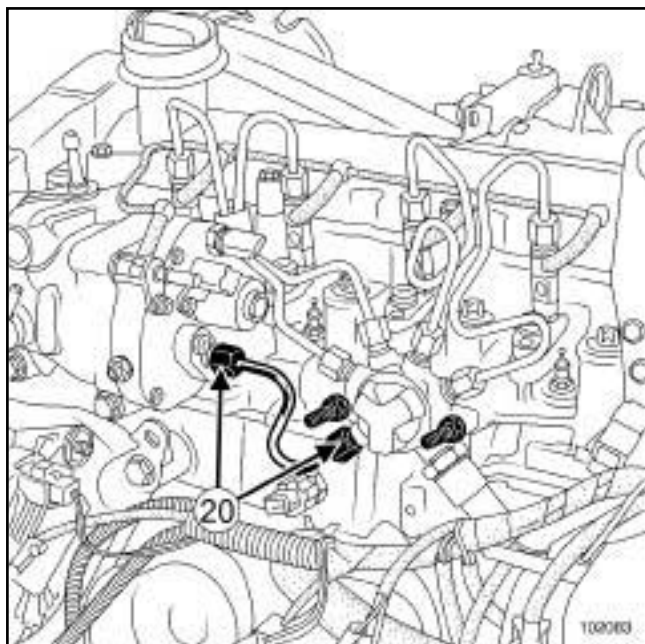
- ☐ Fit suitable blanking plugs on:
 - the Venturi,
 - the diesel injectors.
- ☐ Unclip and move aside the electric wiring on the injection rail filler neck.
- ☐ Remove the filler neck on the injector rail.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768

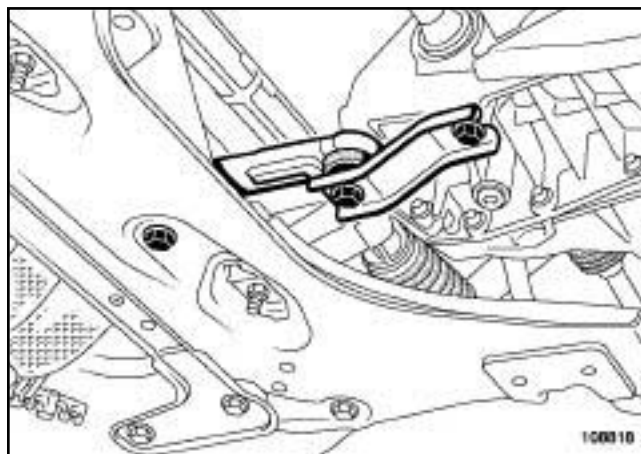


- ☐ Clean the high pressure pipe unions (20) between the pump and the rail (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).
- ☐ Remove the high pressure pipe between the pump and the rail and discard it.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

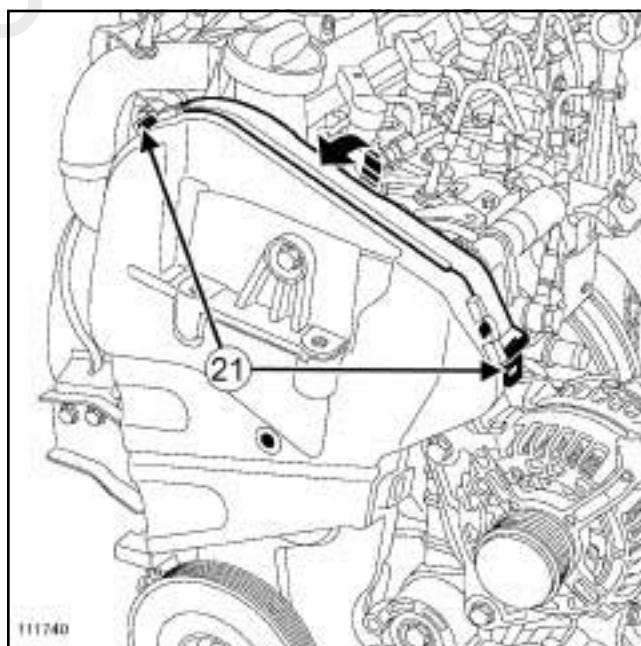
- ☐ Fit suitable blanking plugs on:
 - the high pressure pump,
 - the injector rail.
- ☐ Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) (19D, Engine mounting).
- ☐ Raise the vehicle.
- ☐ Remove the engine undertray.



- ☐ Remove the engine tie-bar.
- ☐ Lower the vehicle.
- ☐ Lift the engine a few centimetres using the (**Mot. 1453**).

Note:

Do not disconnect the right-hand driveshaft when raising the engine.



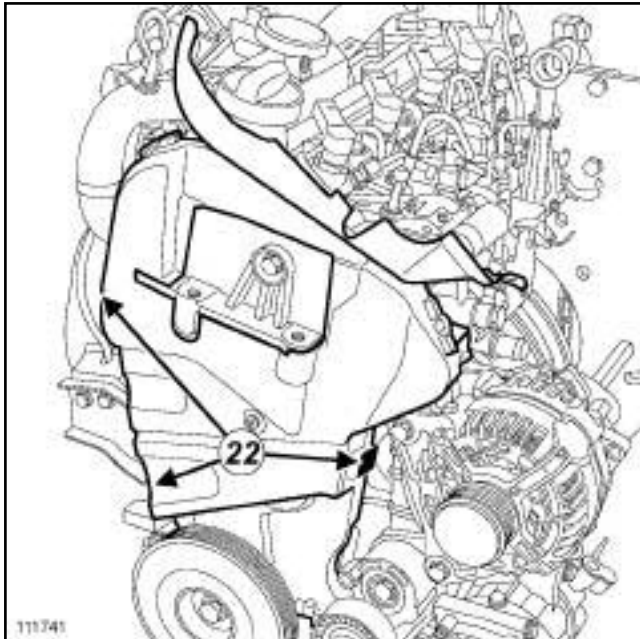
- ☐ Unclip the upper timing cover tabs (21).
- ☐ Swivel the timing cover in the direction of the arrow.
- ☐ Remove the plastic bolt.

DIESEL INJECTION

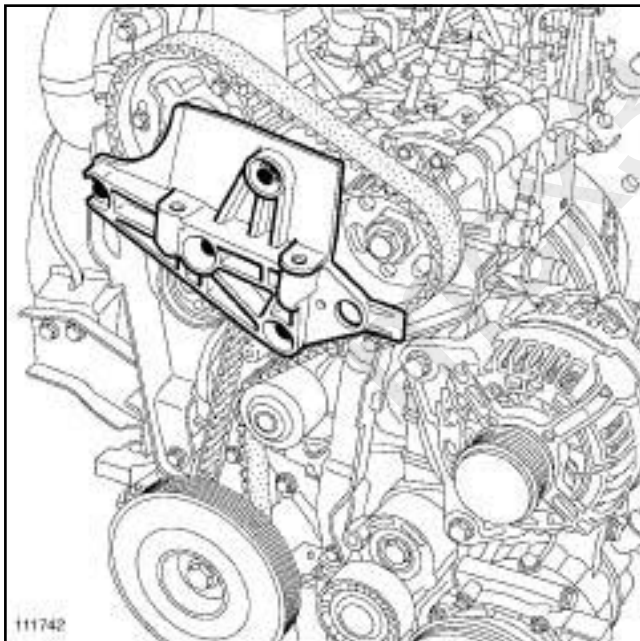
High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768



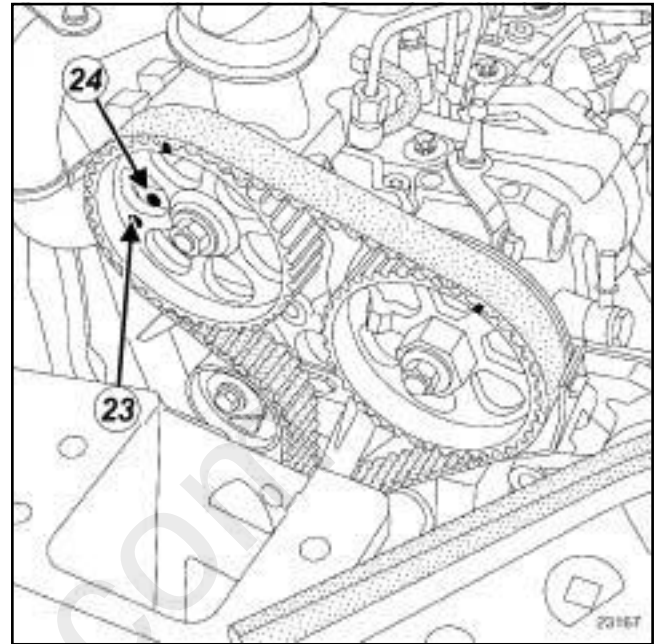
- ❑ Unclip the three tabs (22) .
- ❑ Remove the timing cover.



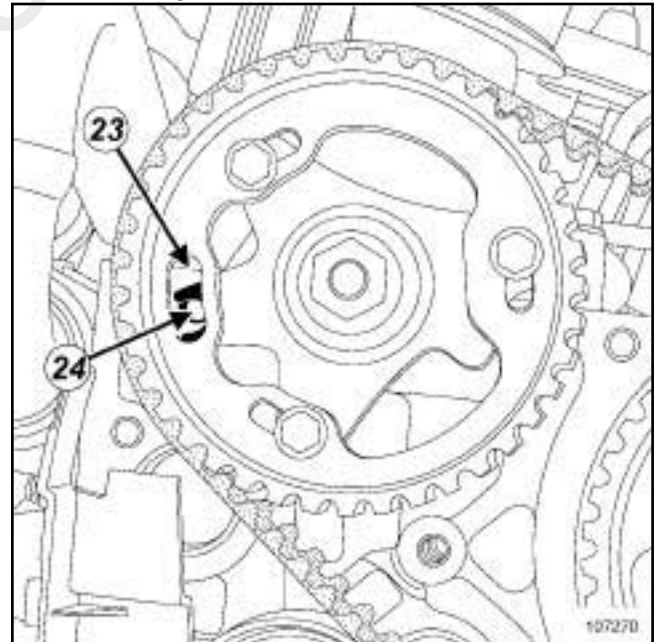
- ❑ Remove the suspended mounting from the cylinder head.

III - OPERATION FOR REMOVAL OF PART CONCERNED

First fitting



Second fitting



- ❑ Position the engine at Top Dead Centre. The camshaft pulley hole (23) should be opposite the cylinder head hole (24) .

Note:

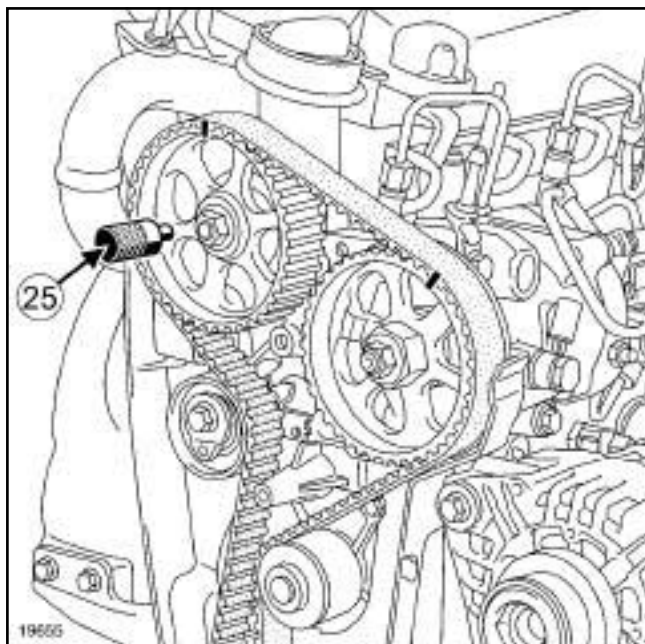
Never turn the engine against its operating direction.

DIESEL INJECTION

High pressure pump: Removal - Refitting

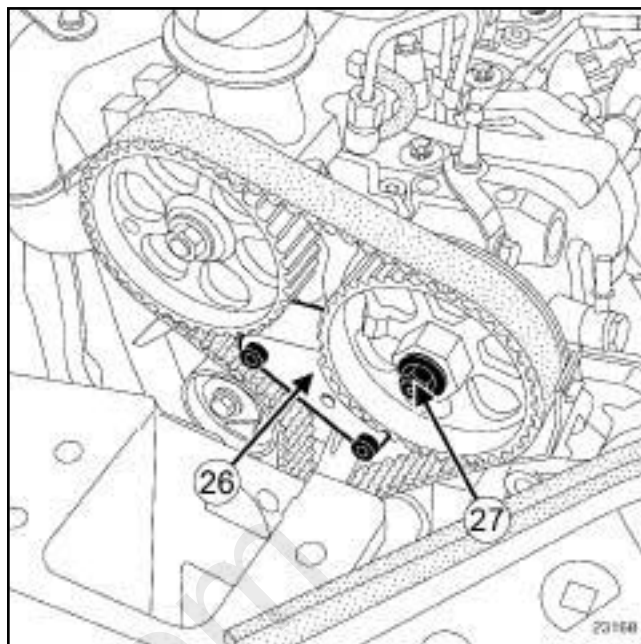
13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768



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- ☐ Insert the **(Mot. 1430)** (25) in the camshaft pulley hole and in the cylinder head hole to check that the engine operates correctly at top dead centre.
- ☐ Remove the **(Mot. 1430)** once the engine is in position.



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- ☐ Fit the **(Mot. 1606)** (26) on the cylinder head.

Note:

If necessary, turn the engine slowly to adjust the position of the **(Mot. 1606)** on the high pressure pump pulley teeth.

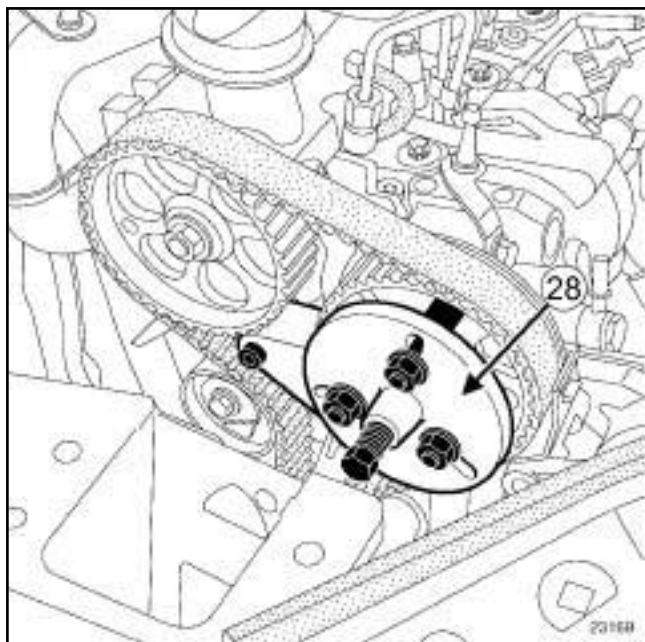
- ☐ Immobilise the high pressure pump pulley with a **32 mm spanner** then remove the nut (27) from the pulley.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768



- ❑ Fit the (28) with the (Mot. 1525-02) on the high pressure pump pulley.

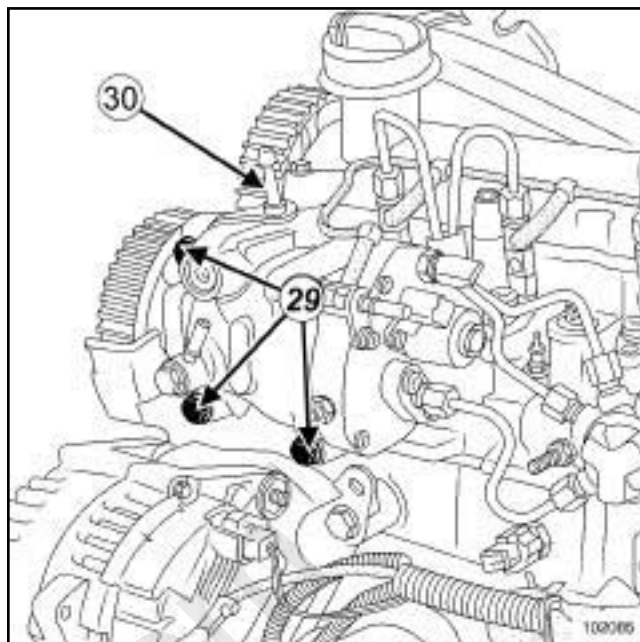
Note:

If necessary, remove the spacer at the end pushrod of the to improve the positioning.

- ❑ Screw the pushrod until it makes contact with the high pressure pump shaft.

Note:

Check that the pushrod is correctly orientated and is pressing against the high pressure pump shaft. adjust the tool if necessary.



- ❑ Remove:
 - the bolts (29) from the high pressure pump on the cylinder head,
 - the air filter unit bracket (30) .
- ❑ Gradually screw the pushrod of the until the high pressure pump becomes detached.

Note:

Guide and support the high pressure pump with one hand as it is being removed using the

- ❑ Remove the high pressure pump from the engine compartment.

Note:

If the high pressure pump is being reused, keep it in a sealed bag during the removal operation.

- ❑ Remove the and (Mot. 1525-02) from the high pressure pump pulley.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768

REFITTING

I - PRECAUTIONS FOR REPAIR



WARNING

Only remove the blanking plugs from the protected components at the last possible moment.

Also, do not remove the components from their packaging until just before fitting them to the vehicle.

II - PARTS AND CONSUMABLES FOR THE REPAIR

- ❑ parts always to be replaced: High pressure pipe between the pump and rail (11,05,03,02)

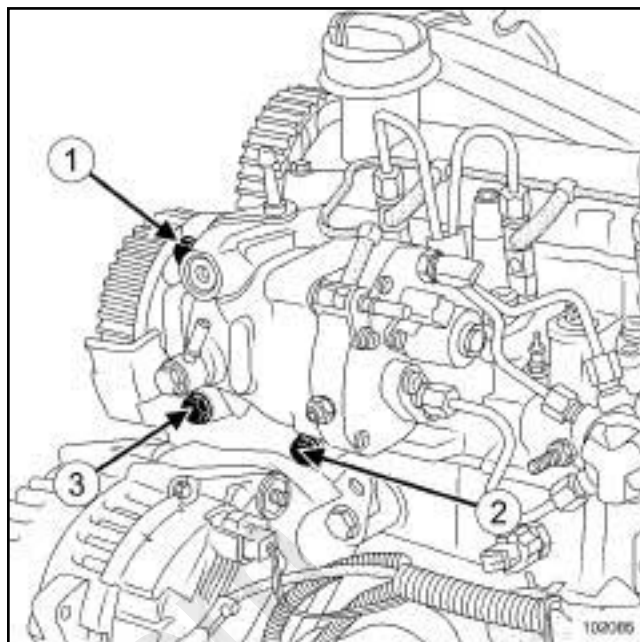
III - REFITTING OPERATION FOR PART CONCERNED

- ❑ Check that there is an indexing pin on the high pressure pump shaft.
- ❑ Position the high pressure pump on the cylinder head whilst inserting it in its pulley.

Note:

Check that the high pressure pump shaft is correctly orientated in relation to the pulley.

- ❑ Fit the air filter unit bracket.
- ❑ Tighten the high pressure pump bolts until they make contact with the cylinder head.



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- ❑ Tighten to torque and in order the **high pressure pump bolts on the cylinder head (23 N.m)**.
- ❑ Fit the nut on the high pressure pump pulley.
- ❑ Torque tighten the **high pressure pump pulley nut (55 N.m)** holding the high pressure pump pulley with a **32 mm** spanner.

Note:

Check that the timing belt is operating correctly and in good condition.

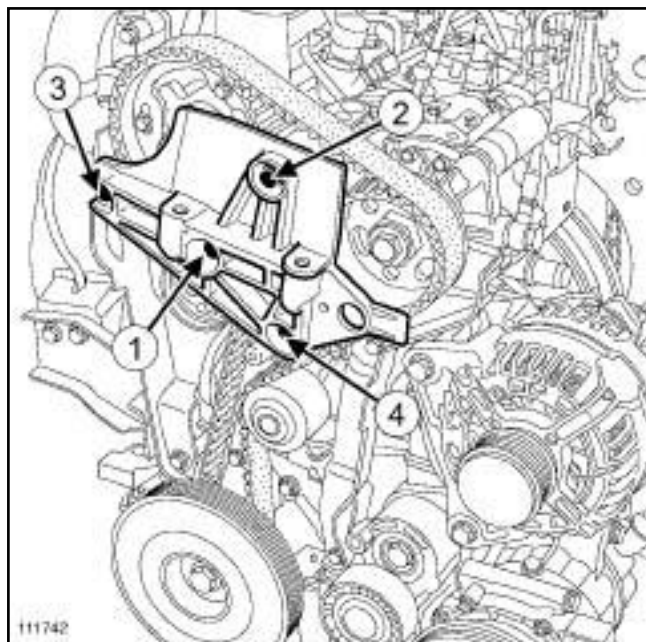
- ❑ Remove the **(Mot. 1606)** from the cylinder head.

IV - FINAL OPERATION.

- ❑ Position the suspended mounting on the cylinder head.
- ❑ Tighten the suspended mounting bolts onto the cylinder head until they make contact.

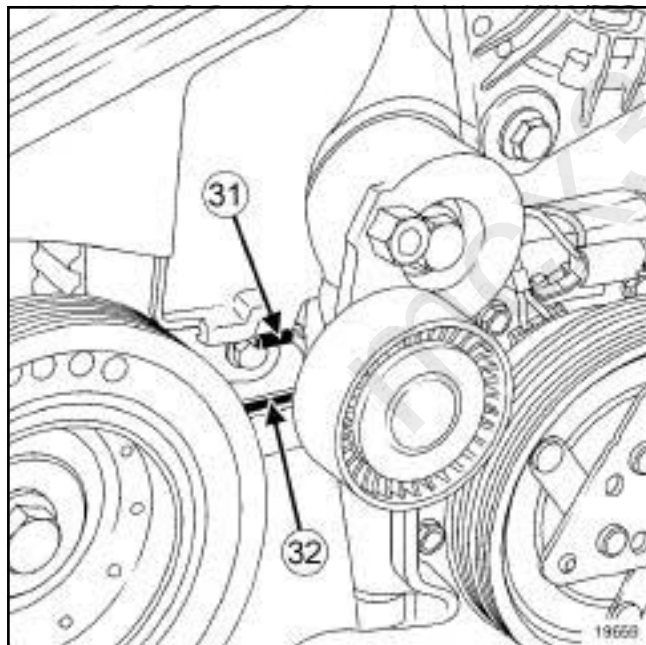
High pressure pump: Removal - Refitting

K9K, and 750 or 752 or 760 or 762 or 766 or 768



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- ☐ Tighten to torque and in order the **suspended mounting bolts on the cylinder head (25 N.m)**.



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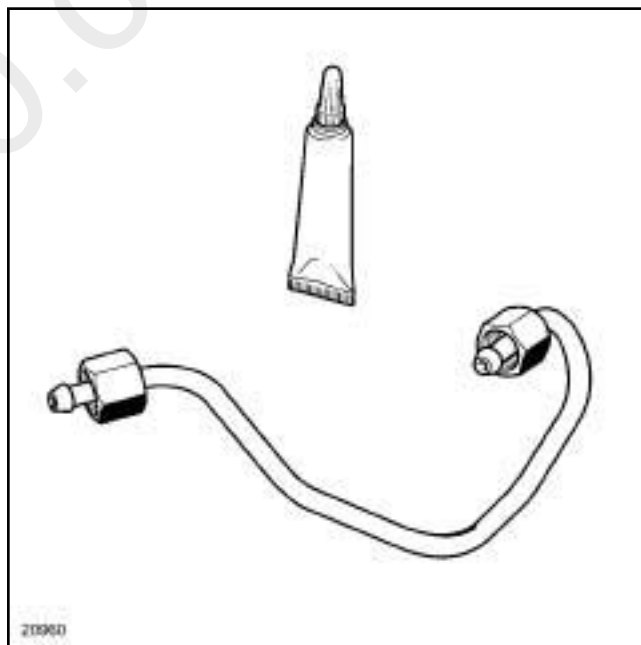
- ☐ Refit and clip on the lower timing cover.

Note:

Make sure that the tab (31) is positioned opposite the mark (32) .

- ☐ Refit:
 - the plastic bolt on the lower timing cover,
 - the cylinder position sensor,

- ☐ Torque tighten the **camshaft position sensor bolt (8 N.m)**.
- ☐ Refit and clip on the upper timing cover.
- ☐ Lower the engine using the **(Mot. 1453)**.
- ☐ Fit the right-hand suspended engine mounting with its bolts.
- ☐ Tighten the bolts on the straight suspended engine mounting until they make contact.
- ☐ Torque tighten the **right-hand suspended engine mounting bolts (62 N.m)**.
- ☐ Raise the vehicle.
- ☐ Refit the engine tie-bar.
- ☐ Torque tighten the **engine tie-bar bolts (105 N.m)**.
- ☐ Refit then tighten the protector under the engine.
- ☐ Remove tool **(Mot. 1453)** from the vehicle.
- ☐ Lower the vehicle.



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- ☐

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator, as these high-pressure pipes are self-lubricating.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K, and 750 or 752 or 760 or 762 or 766 or 768

- ☐ Remove and discard the blanking plugs on:
 - the high pressure pump,
 - the injector rail.
- ☐ Fit a new high pressure pipe between the pump and the rail.
- ☐ Tighten the high pressure pipe unions between the pump and the rail until contact is made.
- ☐ Using the **(Mot. 1746)**, tighten to torque:
 - the **high pressure pipe unions between the pump and the yellow rail (24 N.m)**,
 - the **high pressure pipe unions between the pump and the silver rail (28 N.m)**,
- ☐ Refit the neck on the injector rail.
- ☐ Clip the wiring to the filler neck on the injector rail.
- ☐ Remove and discard the blanking plugs on:
 - the Venturi,
 - the diesel injectors.
- ☐ Connect:
 - the cylinder position sensor connector on the timing cover,
 - the oil level sensor connector,
 - the accelerometer connector,
 - the rail pressure sensor connector,
 - the diesel return pipes on the fuel injectors,
 - the diesel return pipe to the Venturi attached to the high pressure pump.
- ☐ Clip the high pressure pump diesel supply and return pipes to the filler neck.
- ☐ Remove the blanking plugs from the high pressure pump and the pipes and discard them.
- ☐ Connect to the high pressure pump:
 - the diesel return pipe to the fuel filter,
 - the diesel fuel supply pipe.
- ☐ Remove the protection on the alternator to prevent fuel flowing out.
- ☐ Connect the electrical connectors to:
 - the diesel temperature sensor,
 - the flow actuator,
 - the injectors,
 - of the heater plugs.
- ☐ Remove the protection on the inlet opening of the oil level dipstick guide.

- ☐ Refit the high pressure pump protection.
- ☐ Torque tighten the **high pressure pump protection bolts (21 N.m)**.
- ☐ Refit:
 - the diesel splash plate cover,
 - dipstick guide ,
 - the oil dipstick guide nuts,
 - the dipstick.
- ☐ Torque tighten the **dipstick guide tube nuts (10 N.m)**.
- ☐ Refit the inlet duct.
- ☐ Connect the inlet air sensor connector.

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- ☐ Loosen the intercooler inlet air pipe nut on the alternator.
 - ☐ Fit the air pipe on the turbocharger outlet and the air pipe on the intercooler inlet.
 - ☐ Click the turbocharger outlet air pipe on the turbocharger and on the exchanger inlet air pipe.
 - ☐ Tighten the turbocharger outlet air pipe bolt on the rocker cover.
 - ☐ Torque tighten the **exchanger inlet air pipe nut on the alternator (8 N.m)**.
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- ☐ Prime the fuel circuit with the manual priming pump until the disconnected pipes are filled with fuel (automatic degassing).
 - ☐ Check that there are no fuel leaks.
 - ☐ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
 - ☐ Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page 13B-99).
 - ☐ Refit the engine cover.
 - ☐ Using the diagnostic tool, check for stored faults; deal with these and clear them as necessary.