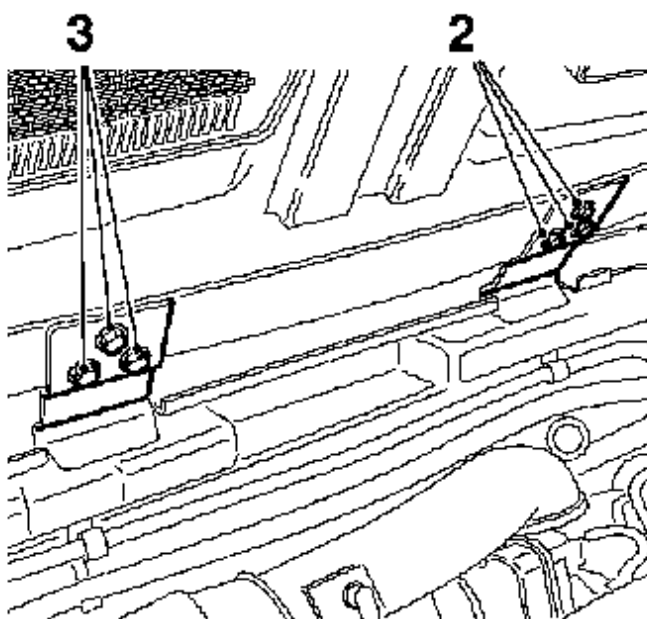
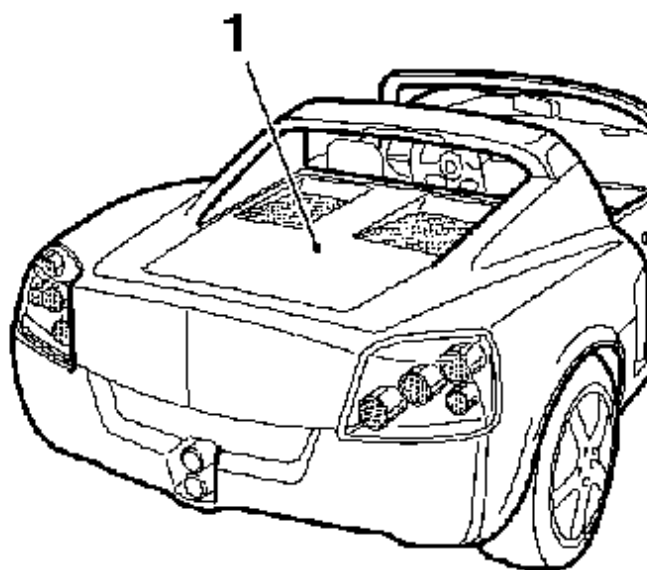


Camshaft Sprockets, Replace (Z 22 SE)



Remove

1. Open the bonnet.
2. Disconnect the battery.
3. Open the engine cover (1).
4. Detach the engine cover.
 - 6 bolts (2) and (3)

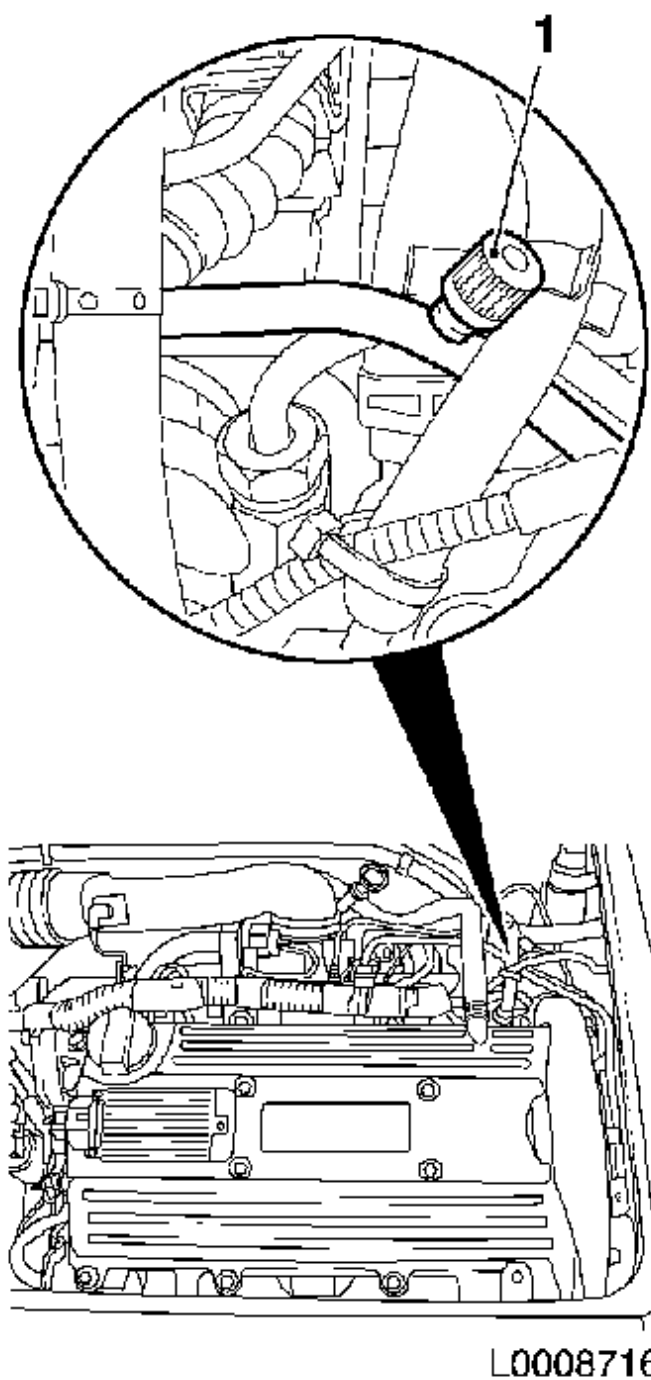


L0008715

5. Release the fuel pressure.

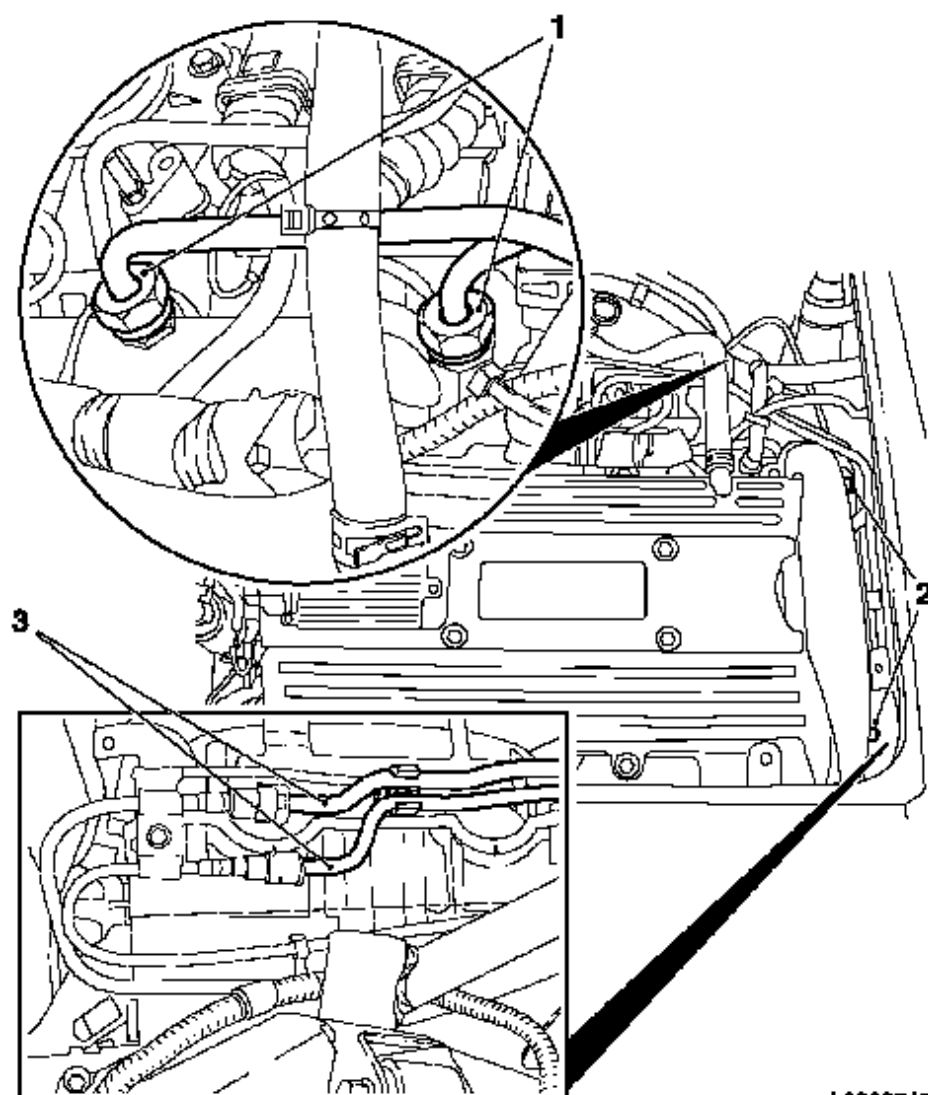
Note: Fuel may escape – observe the safety regulations and relevant national legislation.

 - Release the fuel pressure with the pressure tester **KM-J-34730-91** via test connection (2).
 - Collect any escaping fuel in a suitable container.



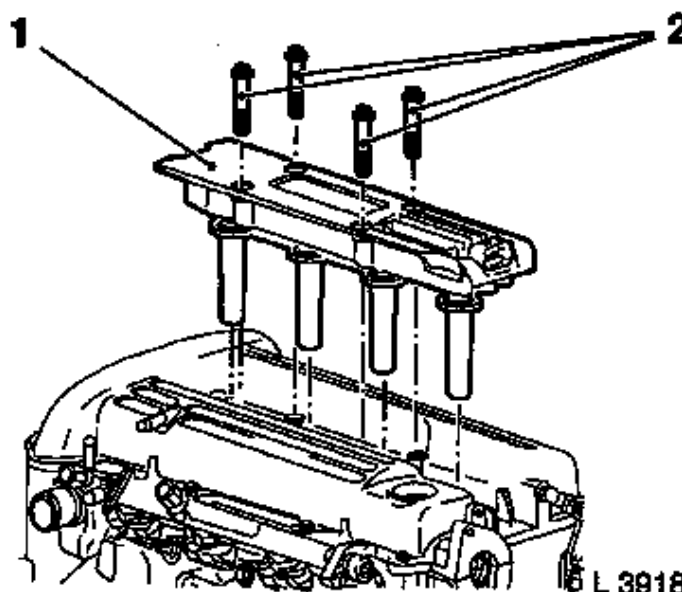
L0008716

6. Disconnect the fuel lines.
- 2 union nuts (1)
 - 2 bolts (2)
 - Reposition the fuel lines (3) to one side.



L0008717

7. Detach the ignition module (1).
- Release and detach the wiring harness connector.
 - 4 bolts (2)

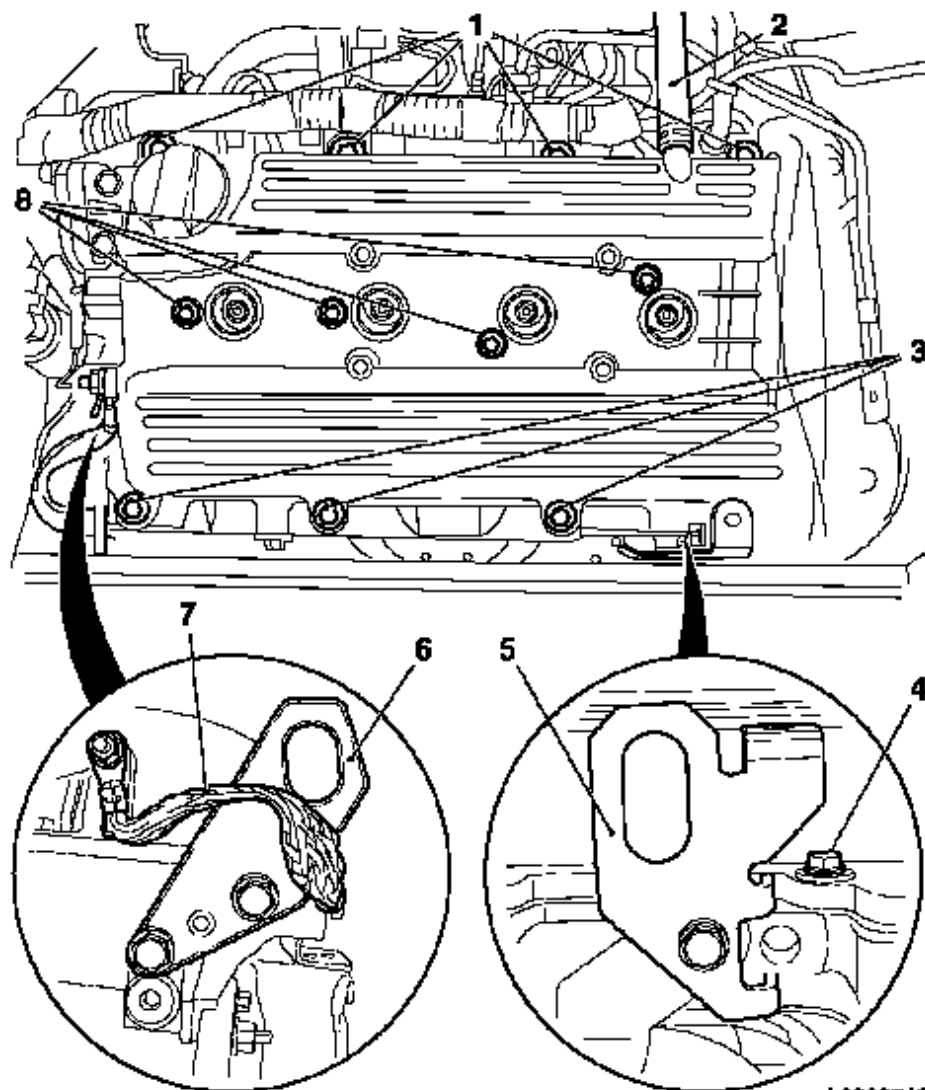


L 3918

8. Remove the cylinder head cover.

- Detach the engine breather hose (2).
- Detach the engine lifting eyes (5) and (6).
 - 2 bolts, 1 nut
- Detach the ground cable (7).
 - 1 bolt
- 12 bolts (1), (3), (4) and (8)

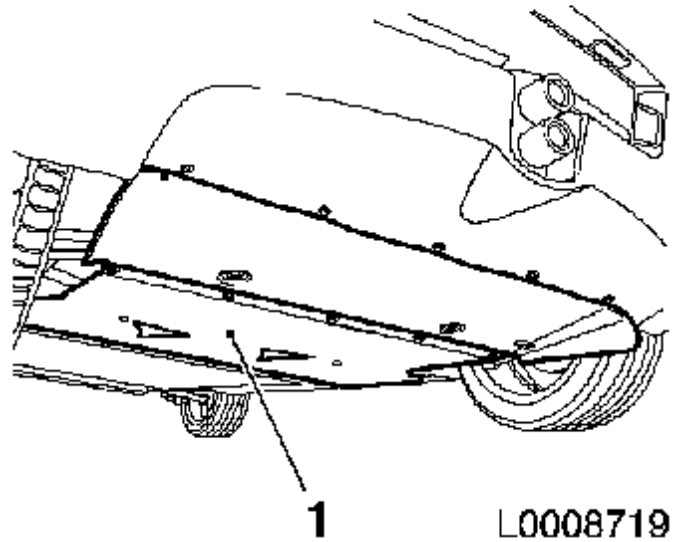
9. Raise the lifting ramp.



L0008718

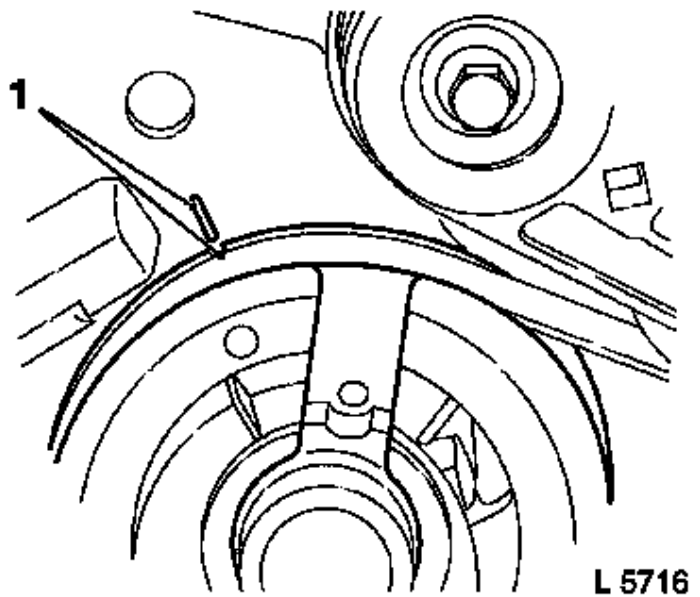
10. Remove the lower engine splash shield (1).

- 13 bolts



11. Align the crankshaft.

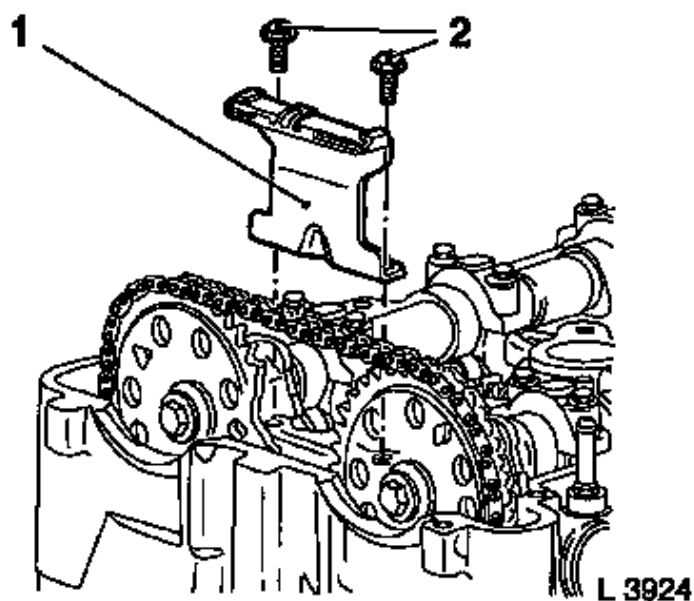
- Rotate the crankshaft in the normal direction of rotation to TDC on cylinder no. 4 (marking 1).



12. Lower the lifting ramp.

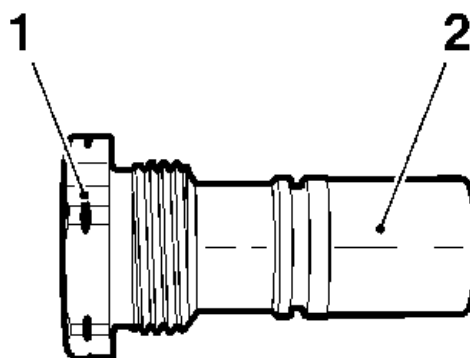
13. Remove the guide rail (1).

- 2 bolts (2)



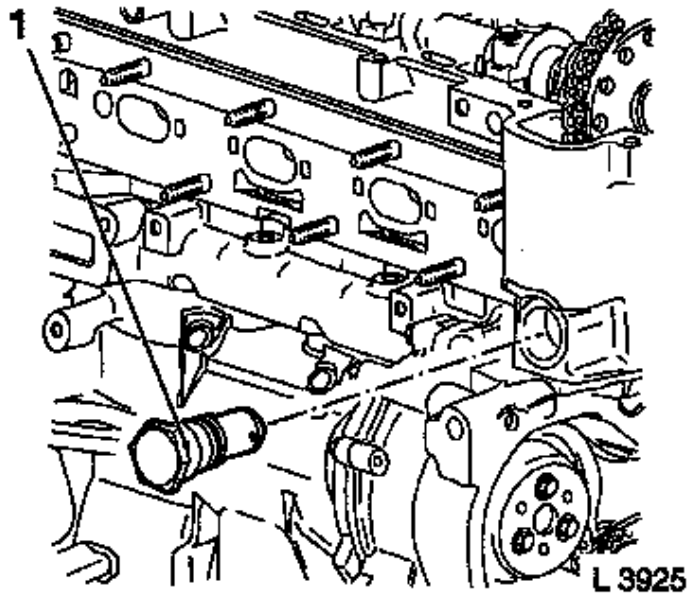
14. Note:

If there is no marking (1) on the camshaft timing chain tensioner (2), then it should be replaced with a new camshaft timing chain tensioner (part number 24 448 509) including a new camshaft timing chain tensioner rail (part number 24 449 448).

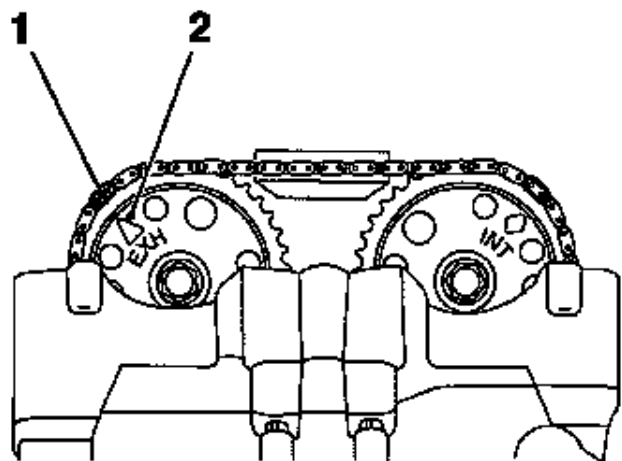


L0008542

- 15.** Remove the camshaft timing chain tensioner (1).



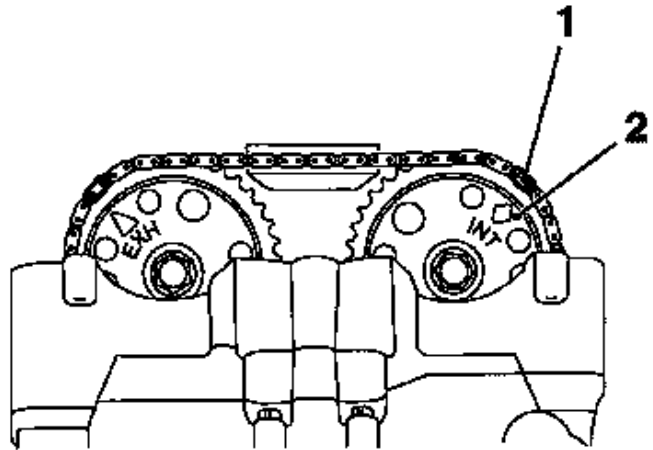
- 16.** Remove the exhaust camshaft sprocket.
- Mark the chain link (1) next to the EXH marking (2) on the exhaust camshaft sprocket.
 - Remove 1 bolt.
 - Hold the exhaust camshaft by the hexagon.
 - Take out the exhaust camshaft sprocket.



L 5994

- 17.** Remove the intake camshaft sprocket.
- Mark the chain link (1) next to the INT marking (2) on the intake camshaft sprocket.
 - Remove 1 bolt.
 - Hold the intake camshaft by the hexagon.
 - Pull back the positioning bolt.
 - Take out the intake camshaft sprocket.
 - Slide in the positioning bolt.
 - Hang the camshaft timing chain over

the positioning bolt.

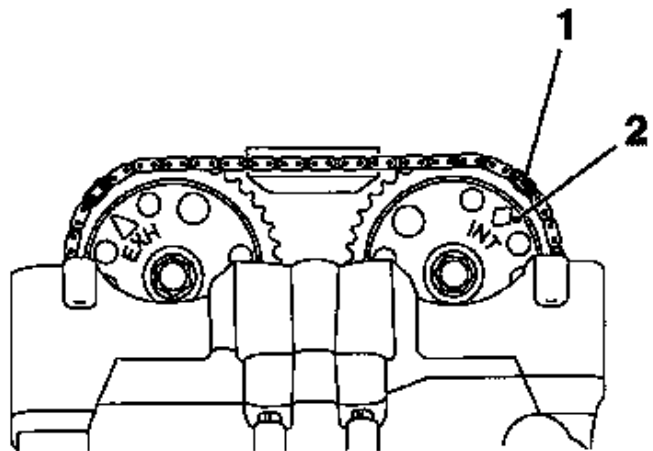


L 5995



Install

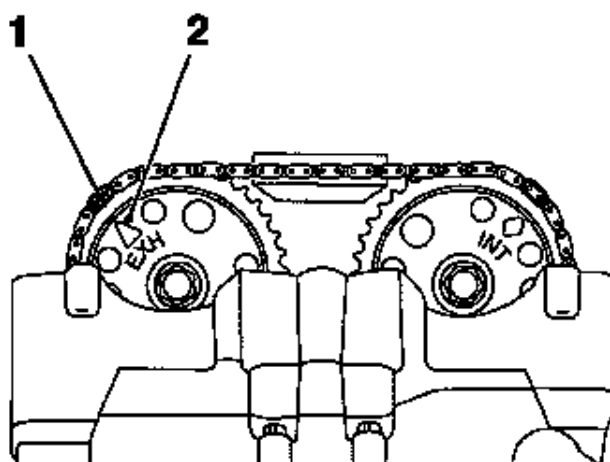
18. Install the intake camshaft sprocket.
 - Insert the intake camshaft sprocket.
 - Pull back the positioning bolt.
 - Marked chain link (1) to INT marking (2) on the intake camshaft sprocket
 - Slide the positioning bolts into the designated bores in the intake camshaft sprocket.
 - Use a new bolt.
 - Hold the intake camshaft by the hexagon.
 - Tightening torque **85 Nm + 30° + 15°**



L 5995

19. Install the exhaust camshaft sprocket.
 - Insert the exhaust camshaft sprocket.
 - Pull back the positioning bolt.
 - Marked chain link (1) to EXH marking (2) on the exhaust camshaft sprocket
 - Slide the positioning bolt into the designated bore in the exhaust camshaft sprocket.

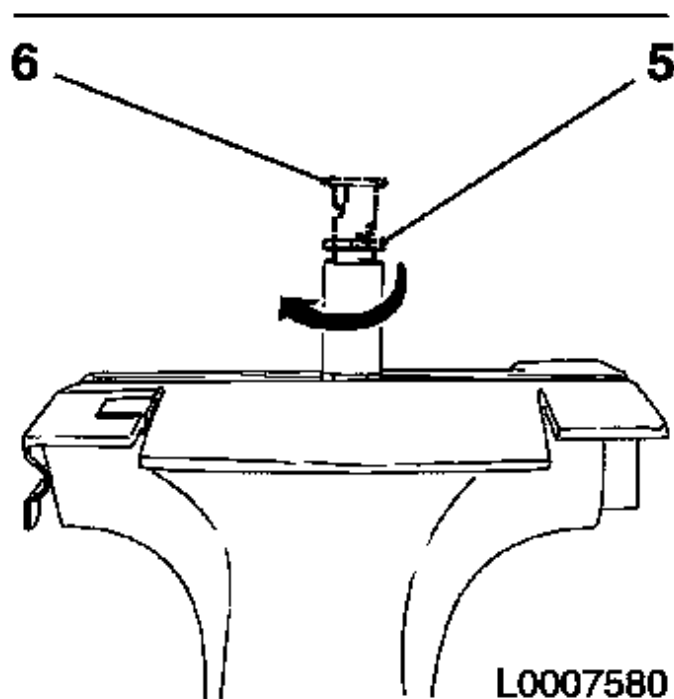
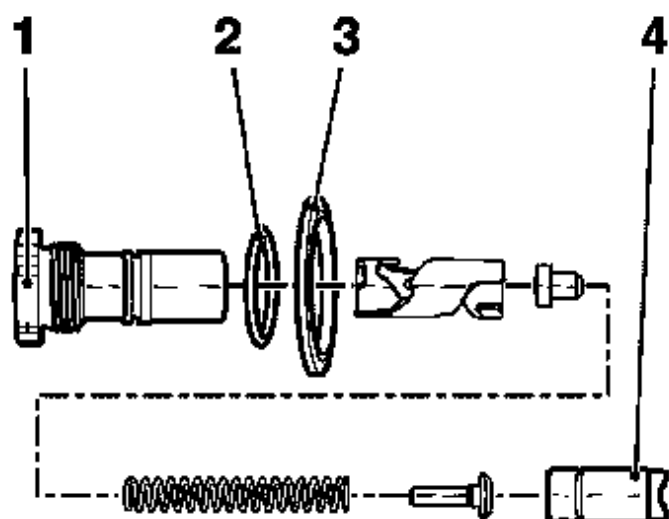
- Use a new bolt.
 - Hold the exhaust camshaft by the hexagon.
 - Tightening torque **85 Nm + 30° + 15°**



L 5994

20. Install the camshaft timing chain tensioner.

- Pull out the piston (4) from the housing (1).
 - Clamp the piston at the square into a vice.
 - Turn clockwise to lock the internal piston (6) in the last latch position (5).
 - Insert the piston into the housing.
- Use new oil seals (2) and (3).
- Tightening torque **75 Nm**

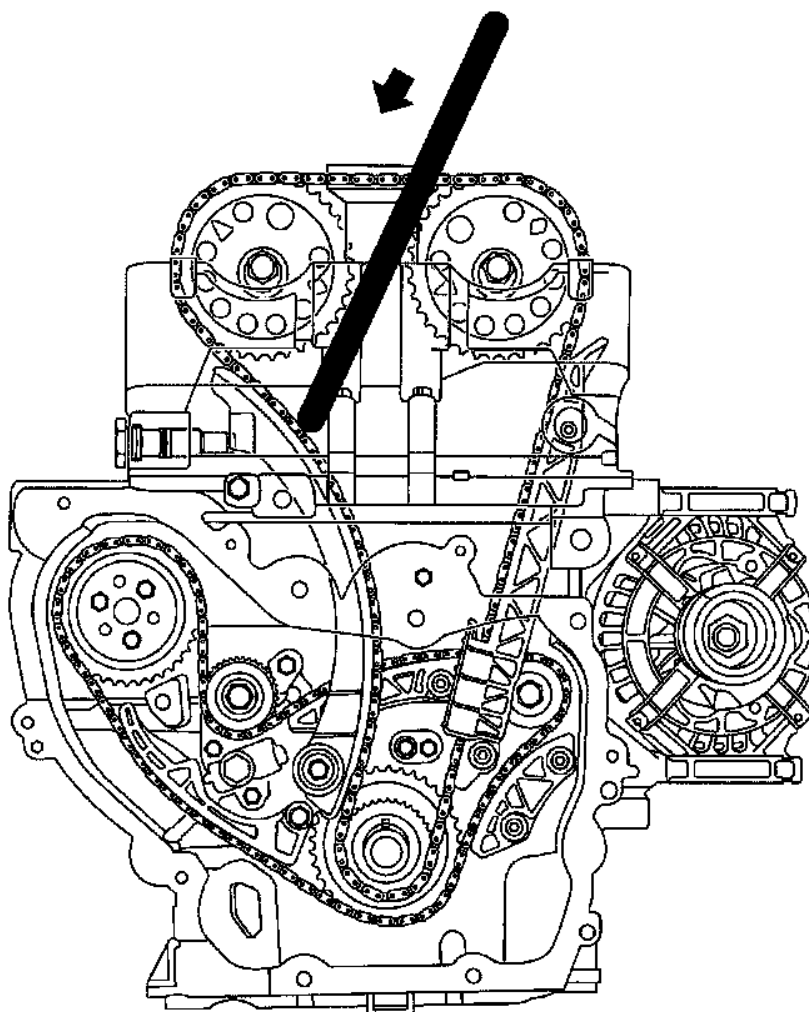


Important: Failure to follow this instruction could cause the camshaft timing chain to jump.

21. Release the camshaft timing chain tensioner by pressing on the tensioner rail or the camshaft timing chain (using a blunt tool – e.g. a rounded assembly lever).
22. Recut the thread.
 - 2 off

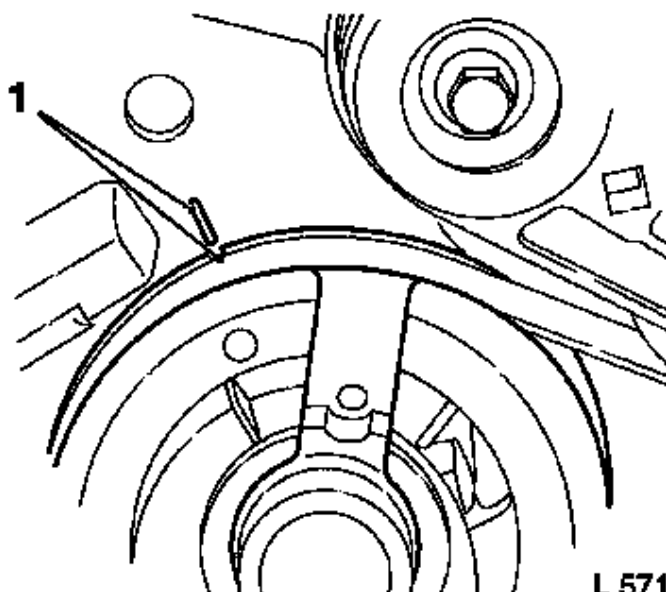
23. Install the guide rail.
- Coat the bolts with thread locking compound (red) and insert them.
 - Tightening torque **8 Nm**

24. Raise the lifting ramp.



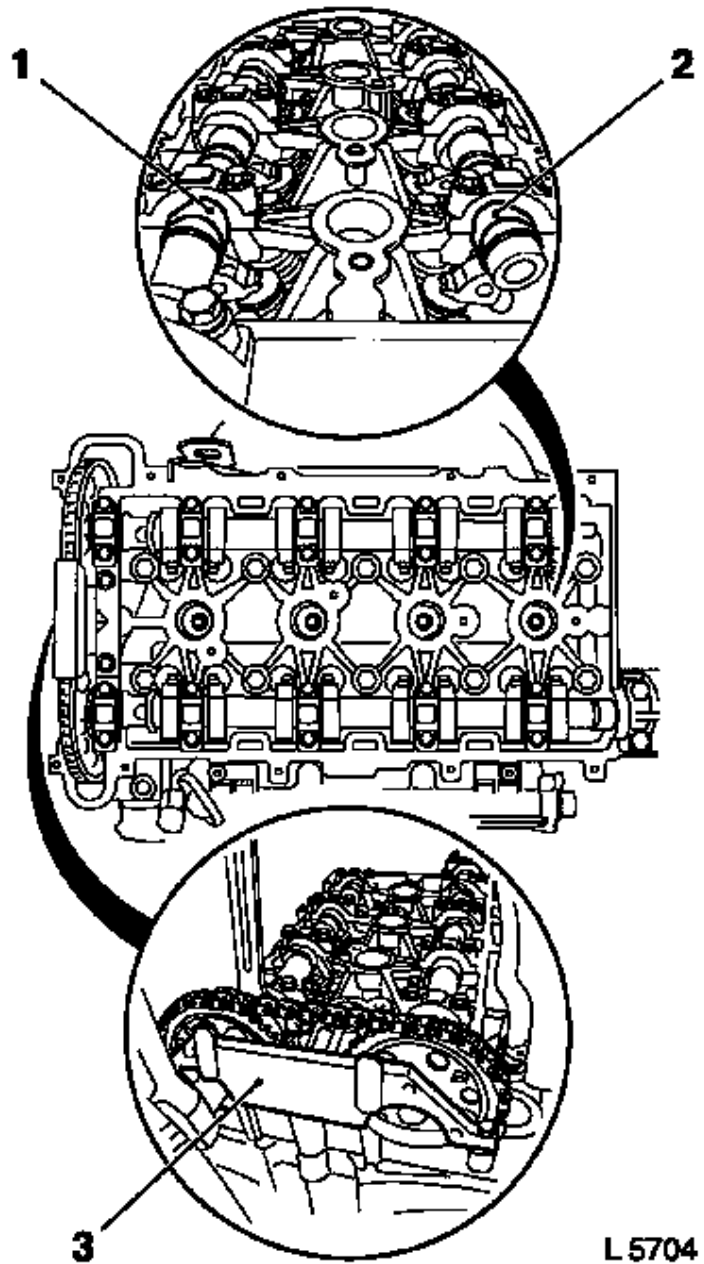
J 0935

25. Rotate the crankshaft **720°**.
- Rotate the crankshaft in the normal direction of rotation to TDC on cylinder no. 4 (marking 1).
26. Attach the lower engine splash shield.
- 13 bolts



L 5716

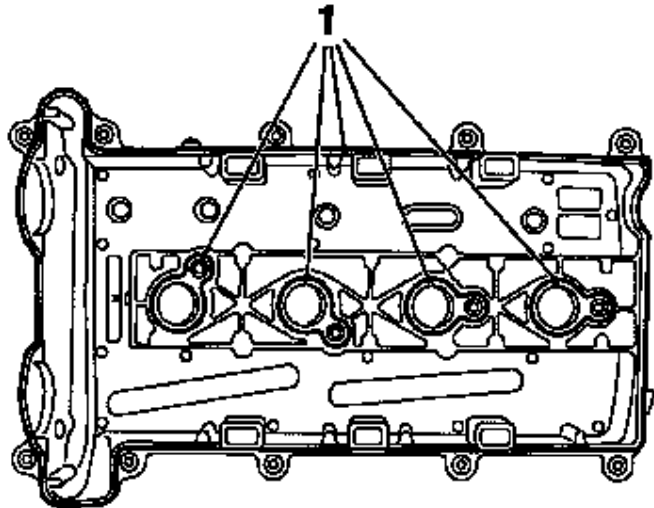
27. Note:
In this position the cams (1) and (2) of cylinder no. 4 point upwards, and it must be possible to insert blocking tool **KM-6148** (3).
28. Lower the lifting ramp.
29. Detach **KM-6148**.



30. Attach the cylinder head cover
- Clean the sealing surfaces.
 - Use new gaskets.
- Note:** The sealing lips of the seals (1) must be inserted into the groove on the cylinder head cover.
- Tightening torque **9 Nm**
 - Attach the ground cable
 - Tightening torque **9 Nm**
 - Attach the engine lifting eyes.
 - 2 bolts, 1 nut
 - Attach the engine breather hose.

- Attach the fuel line bracket.
 - Tightening torque **8 Nm**

- 31.** Attach the ignition module.
- Tightening torque **9 Nm**
 - Attach and secure the wiring harness connector.



L 5706

- 32.** Connect the fuel lines.
- 2 union nuts
 - Tightening torque **10 Nm**
 - 2 bolts
 - Tightening torque **9 Nm**
- 33.** Install the rear engine cover.
- Check the alignment.
 - 6 bolts, tightening torque **14 Nm**
- 34.** Close the rear engine cover.
- 35.** Connect the battery.
- 36.** Close the bonnet.
- 37.** Reprogram the volatile memories.