

Z22SE - Timing Chain

Problem:

Timing chain might break and that could cause engine damages.

Cause:

Production deviations at engine plant.

Remedy:

Install timing chain repair kit according to service literature. For Speedster please see attached rework instruction.

Vehicle Marking:

All vehicles, which have been reworked according to this information, have to be clearly marked by a green dot on the top of the timing chain cover.

Affected:

Astra G, Astra G Coupe, Astra G Convertible, Zafira A, Vectra B, Speedster
 MY 2001 - 2002 - Only vehicles with Z22SE engines are affected.

| No | Model | Plant | From | To |
|-------|------------------------------------|----------------|------------|------------|
| 4.004 | Astra G, Zafira A | Bochum | 1 2 091451 | 1 2 298557 |
| 1.459 | Astra G | Antwerp | 1 5 080989 | 1 5 274181 |
| 61 | Astra G | Ellesmere Port | 1 8 058837 | 1 8 151917 |
| 1.587 | Astra G Coupe, Astra G Convertible | Bertone | 1 B 000196 | 1 B 020685 |
| 1.554 | Zafira A | Rayong | 1 H 004026 | 2 H 025813 |
| 815 | Vectra B | Luton | 1 7 038996 | 1 7 070526 |
| 394 | Vectra B | Rüsselsheim | 1 1 061821 | 1 1 225193 |
| 293 | Speedster | Norwich | 1 N 000145 | 2 N 003417 |

Only vehicles listed in the vehicle information have to be reworked.

Parts:

Please send all removed parts back to the local warranty parts return center. In countries without warranty parts return center please take care about the scraping of NOK parts at dealers.

| Qty | Part Name | Part No. | Cat. No. |
|-----|---------------------------------------|------------|-----------|
| 1 | Timing Chain Repair Kit | 12 577 385 | 56 36 400 |
| 1 | Gasket, Cover, Oil Pump | 90 537 915 | 06 46 295 |
| 1 | Gasket, Cylinder Head Cover | 90 537 319 | 06 07 494 |
| 1 | Gasket, Oil Pump to Cylinder Block | 24 435 052 | 06 46 902 |
| 1 | Seal, Ring, Crankshaft Front | 90 571 925 | 06 38 199 |
| 1 | Screw, Hex. HD., Damper to Crankshaft | 90 537 363 | 06 14 927 |

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Warranty Claim Information:

Warranty claims will be accepted until 30/06/2005.

| Number | Labor Description | TC | Hours | AW |
|---------------|--|-----------|--------------|-----------|
| T 0846 00 | Install timing chain service kit Astra G, Astra G Coupe, Astra G Convertible | 92 | 3.0 | 36 |
| T 0846 10 | Install timing chain service kit Zafira A | 92 | 3.3 | 40 |
| T 0846 20 | Install timing chain service kit Vectra B (w/o A/C) | 92 | 3.7 | 44 |
| 001 | Additional work Vectra B with Air Condition | 92 | 1.1 | 13 |
| T 0846 30 | Install timing chain service kit Speedster | 92 | 4.3 | 52 |

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Rework Details:**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) Access to the front of the engine is best gained through the right hand rear wheel arch with the wheel arch liner removed.

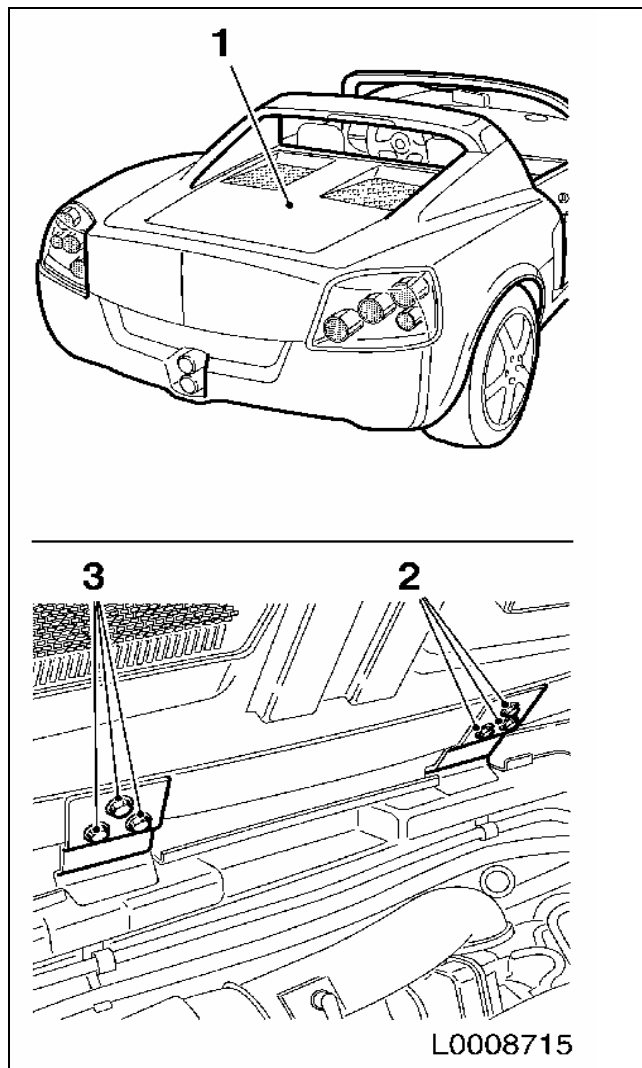
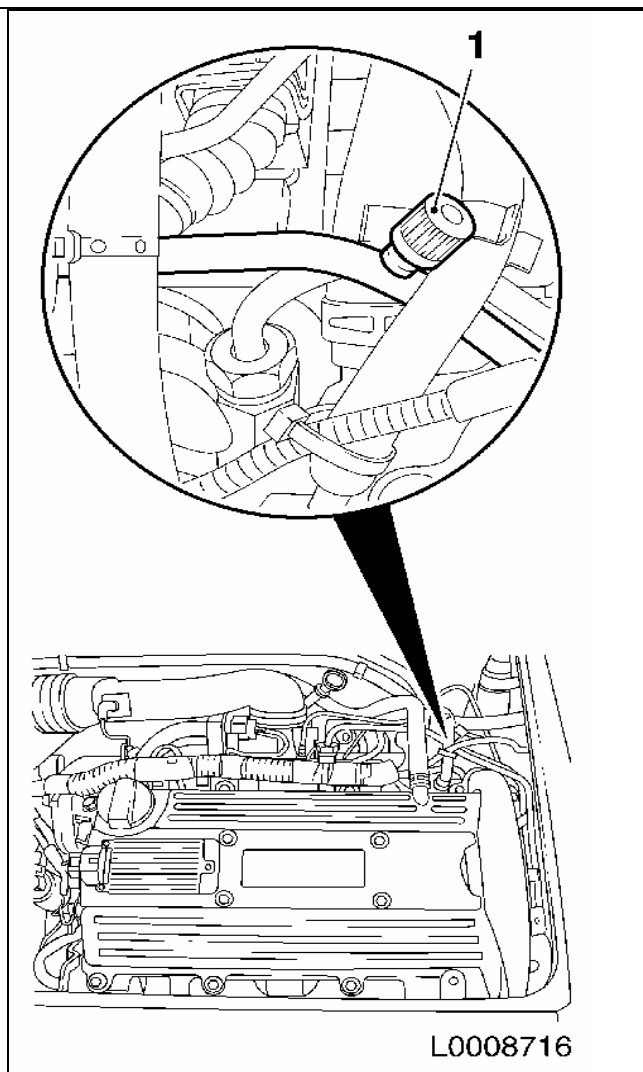


Figure 01

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5. Release the fuel pressure. 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 (1). – Collect any escaping fuel in a suitable container.

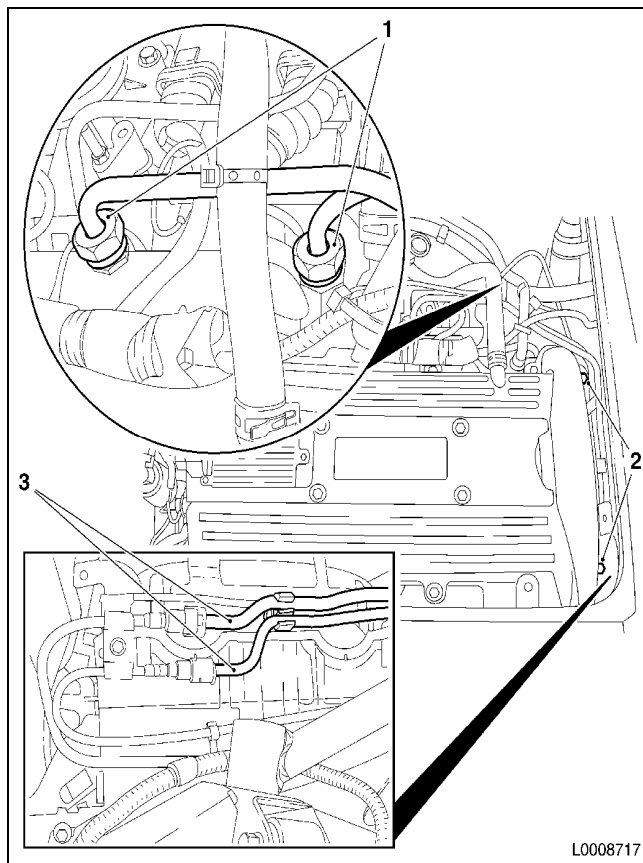


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Figure 02

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6. Disconnect the fuel lines.
 - 2 union nuts (1)
 - Fuel line bracket
 - 2 bolts (2)
- Reposition the fuel lines with the fuel line bracket to one side.



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

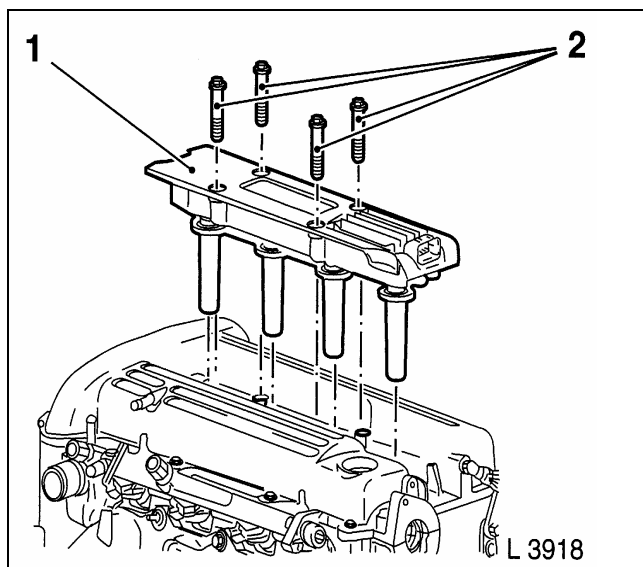
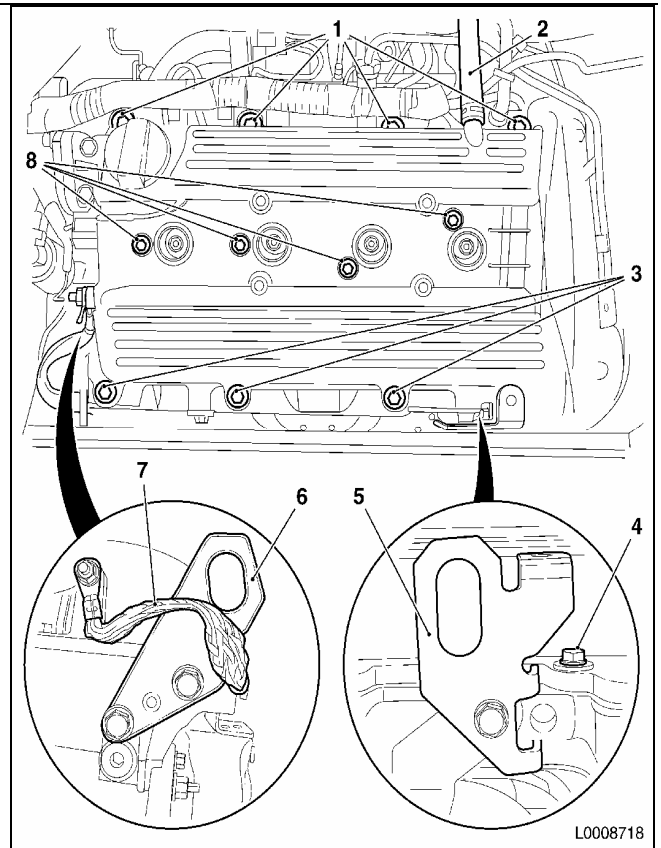


Figure 03

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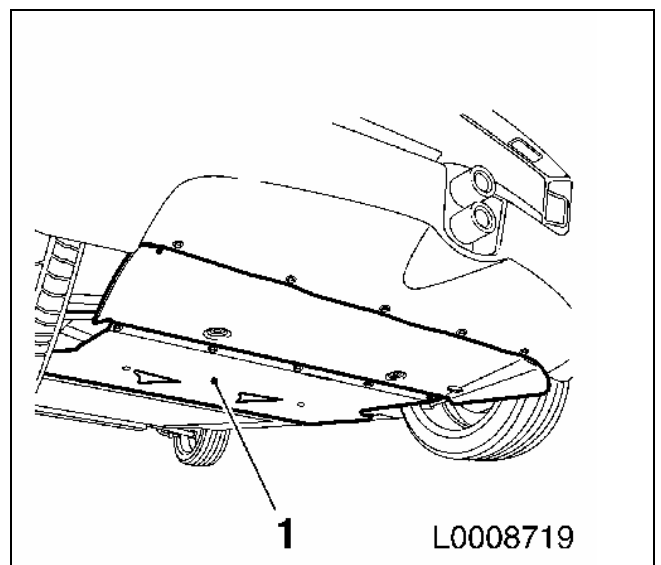
8. Remove the cylinder head cover.
 - Detach the engine breather hose (2).
 - Detach the engine lifting eyes (5) and (6).
 - 2 bolts, 1 nut
 - Detach the ground cable (7).
 - 1 bolt
 - 12 bolts (1), (3), (4) and (8)
9. Raise the lifting ramp.



L0008718

Figure 04

10. Remove the lower engine splash shield (1).
 - 13 bolts
11. Support vehicle
12. Remove right hand rear wheel
 - Remove 4 bolts, remove the locking bolt
 - Use special socket under the front bonnet
13. Remove wheel arch liner
 - Remove 6 screws

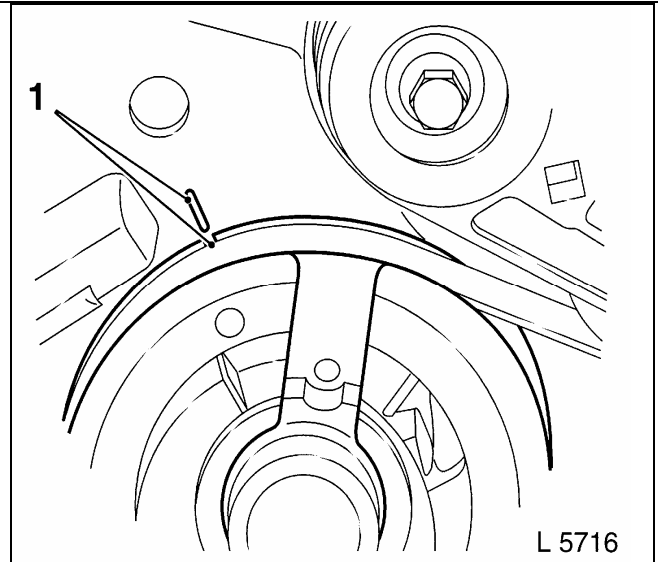


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Figure 05

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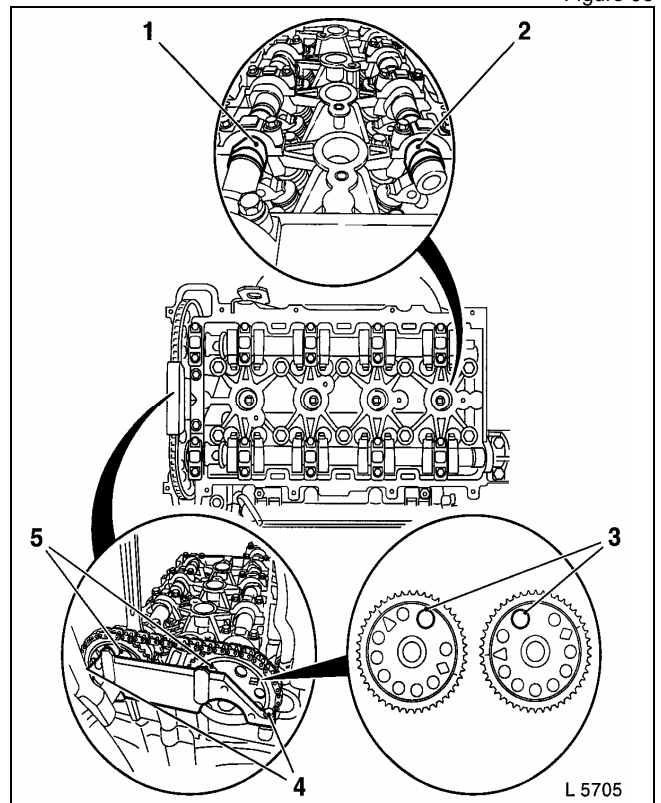
14. Align the crankshaft.
 - Rotate the crankshaft in the normal direction of rotation to TDC on cylinder no. 4 (marking 1).
15. Lower the lifting ramp.



L 5716

Figure 06

16. Attach KM-6148 . In this position the cams (1) and (2) of cylinder no. 4 point upwards.
 - Attach KM-6148 with the enclosed bolts (4).
 - Slide the positioning bolts (5) into the designated bores (3) on the camshaft sprockets.
17. Detach KM-6148 .



L 5705

Figure 07

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18. Remove the guide rail (1).
- 2 bolts (2)

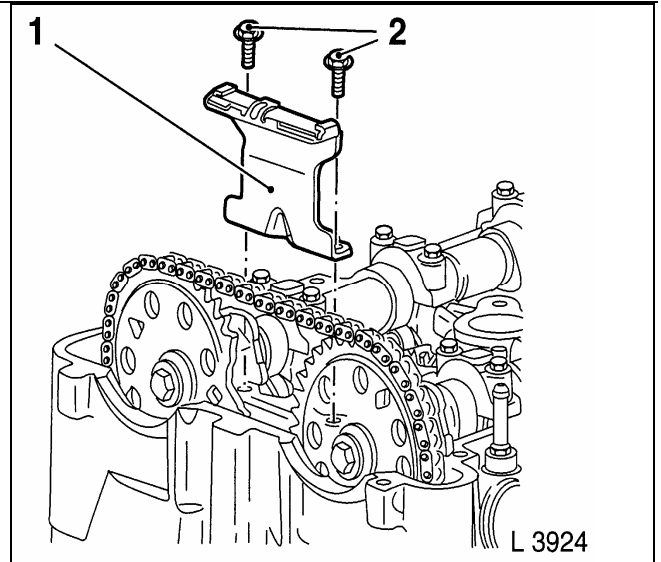


Figure 08

- 19.
- 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).

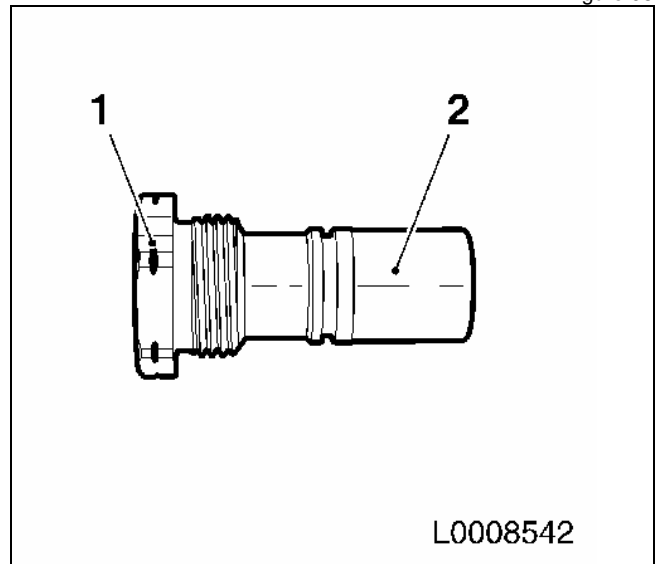


Figure 09

20. Remove the camshaft timing chain tensioner (1).

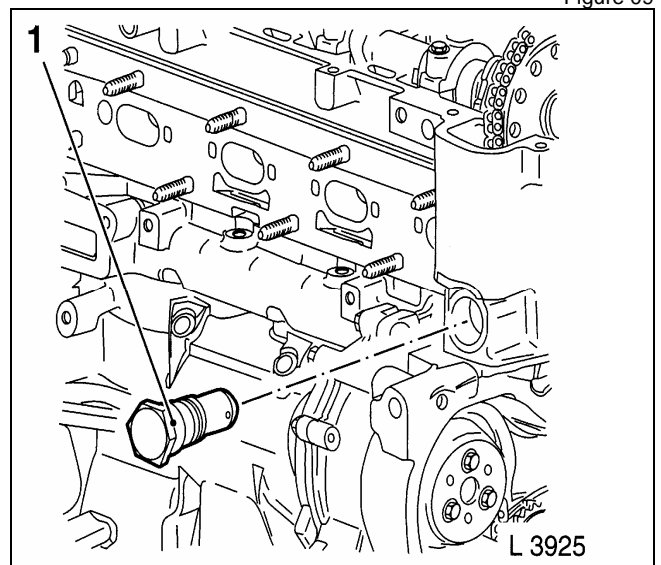


Figure 10

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21. Remove the exhaust camshaft sprocket (1).
- Hold the exhaust camshaft by the hexagon.

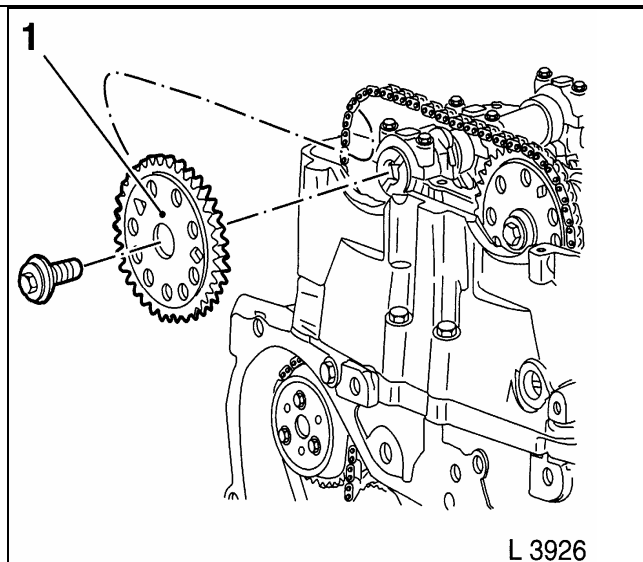


Figure 11

22. Remove the lower heat shield (1).
- 3 bolts

23. Raise the lifting ramp.

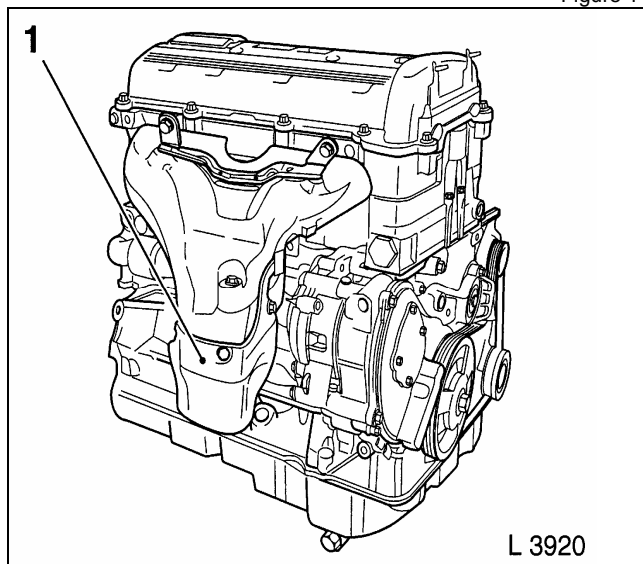


Figure 12

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24. Place a drip tray underneath.
25. Drain the engine oil.
 - Open the oil drain plug.
 - Install the oil drain plug using a new oil seal.
 - Tightening torque 25 Nm
26. Detach the front exhaust pipe.
 - 6 nuts (1) and (2), 3 bolts
 - Unhook the exhaust pipe from its mountings.
 - Remove the gaskets.

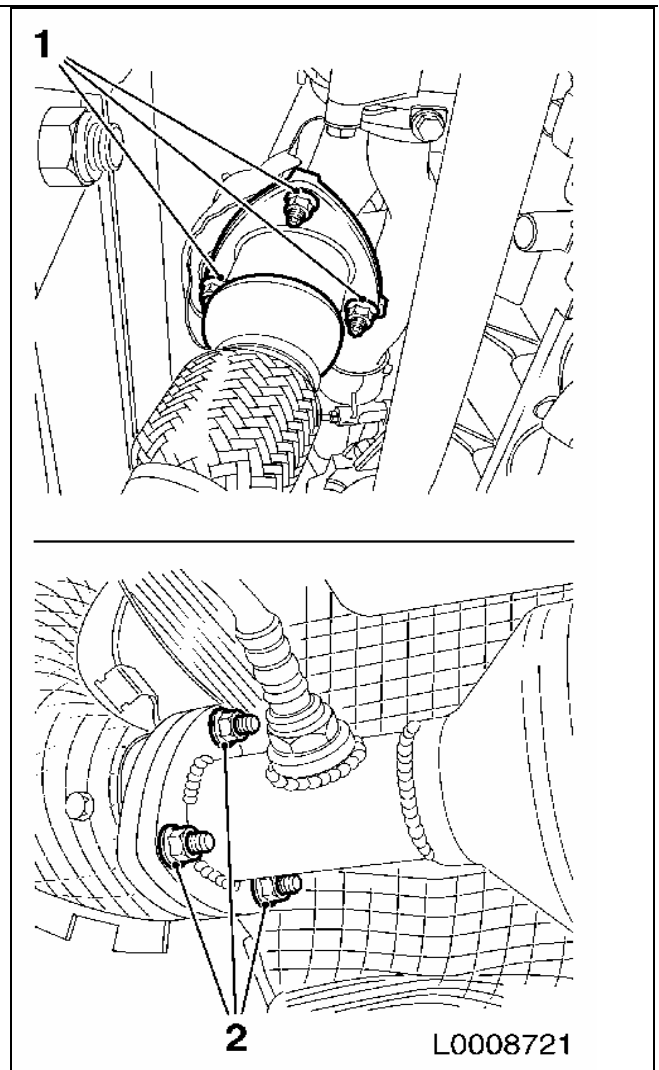


Figure 13

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27. Remove the ribbed V-belt.
- Mark the running direction of the ribbed V-belt.
 - Tension the ribbed V-belt tensioner in the direction of the arrow with KM-6151 .
 - Take out the ribbed V-belt.

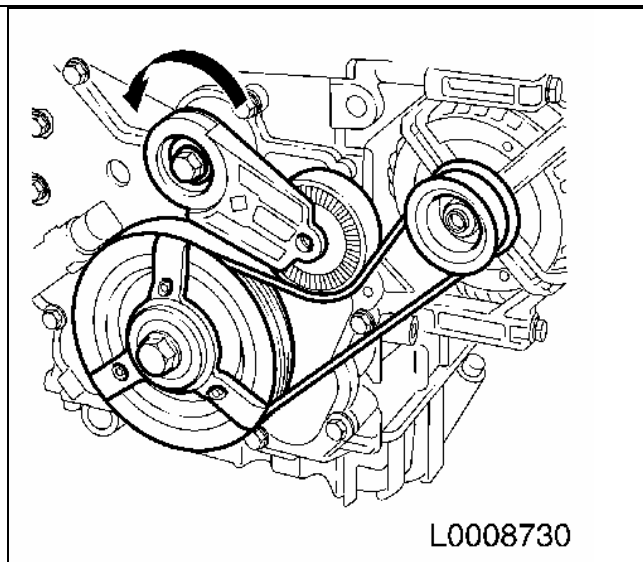


Figure 14

28. Detach the rotational vibration damper (2). • Use holding adapter KM-J-38122-A in conjunction with KM-956-1 (1) to hold.

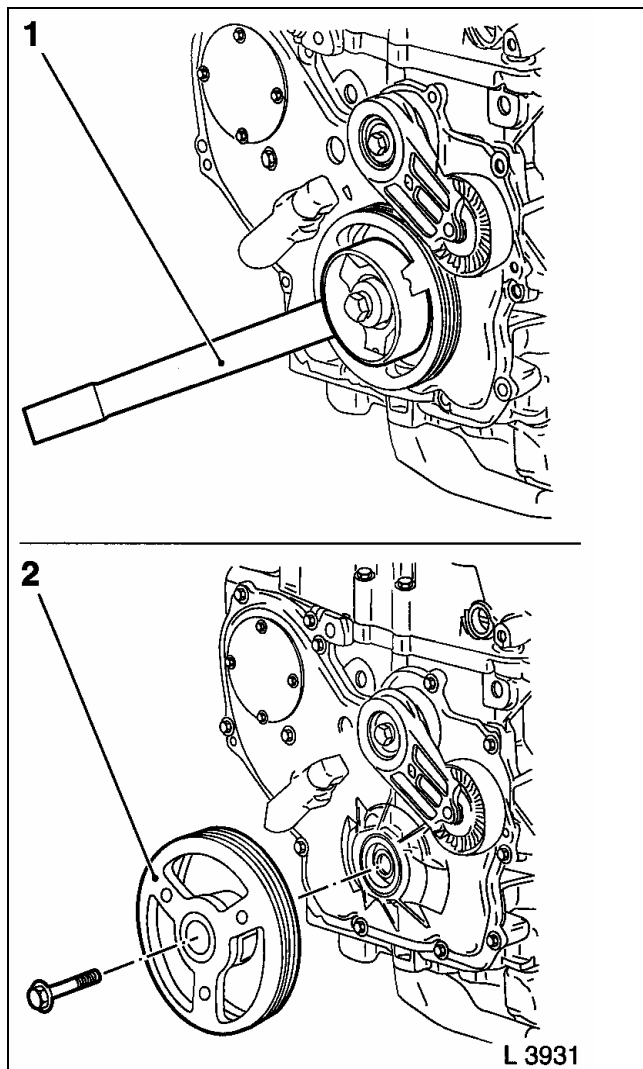


Figure 15

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29. Detach the ribbed V-belt tensioner.

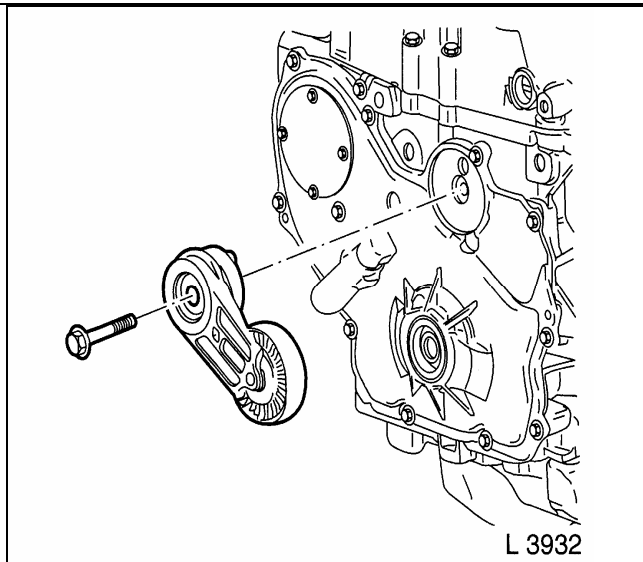


Figure 16

30. Detach the bracket for the gearshift cables.
- From the transmission
 - 1 bolt (arrow)

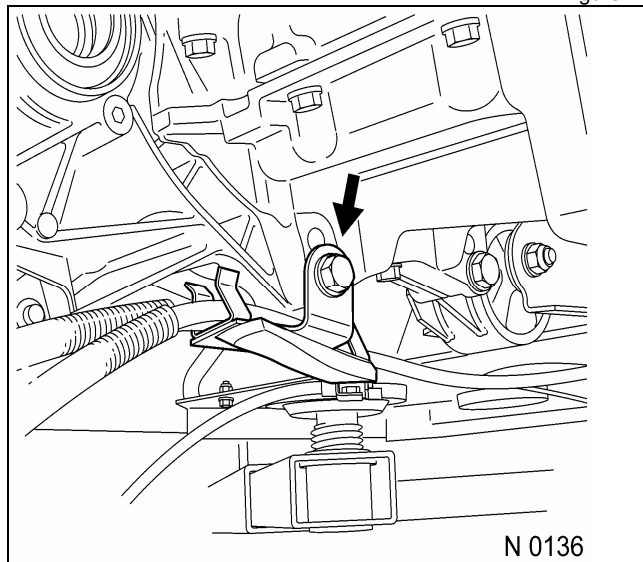


Figure 17

31. Support the engine from underneath with KM-904 together with KM-6054 .
32. Release the rear engine damping block (2).
- 1 bolt (1), 1 nut

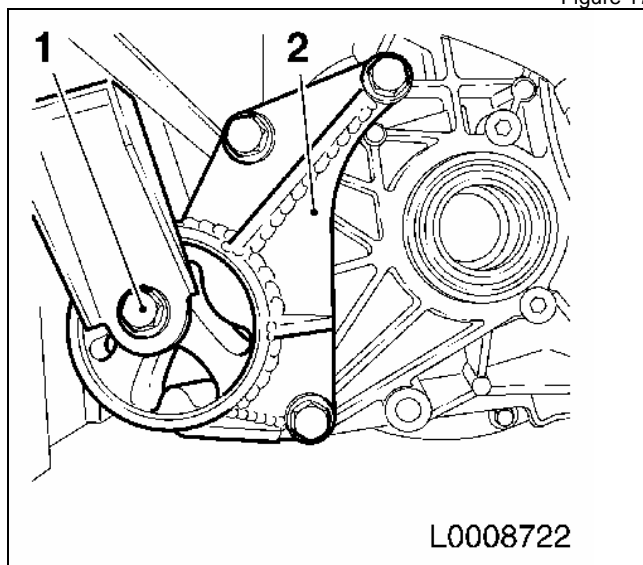


Figure 18

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33. Undo the bolts on the right-hand engine damping block bracket.
 - 3 bolts (1)
34. Undo the bolts on the right-hand engine damping block.
 - 1 nut (arrow)
35. Take out the engine damping block bracket together with the right-hand engine damping block.

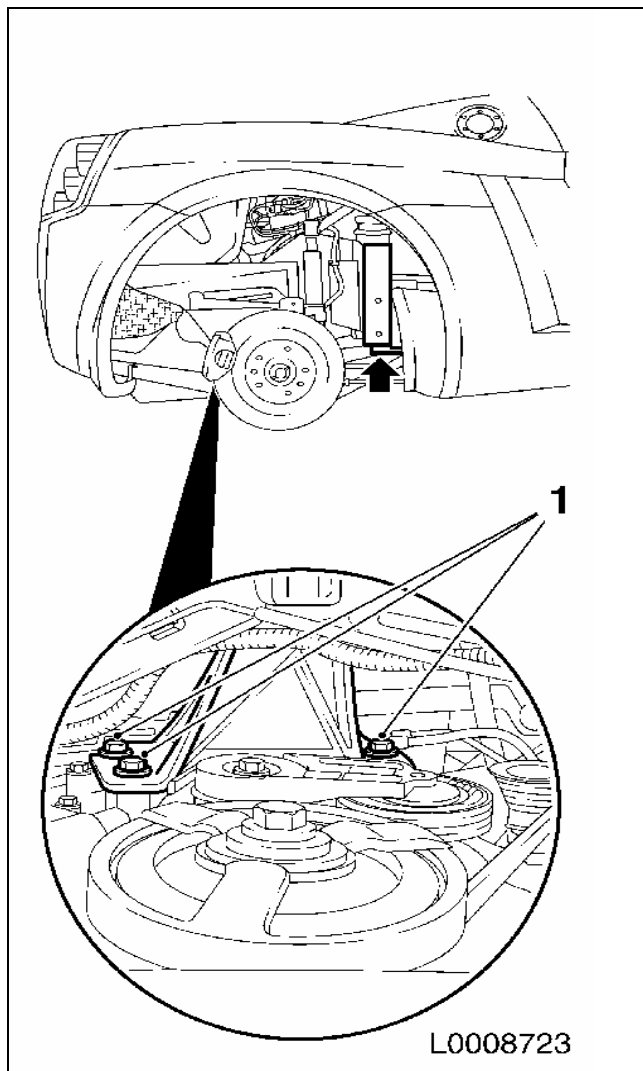


Figure 19

36. Undo the bolts on the timing case (5).
 - 11 bolts (1), (2) and (6)
37. Lower the engine. It must be possible to guide the long bolt (2) of the timing case past the longitudinal member.
38. Remove the timing case.
 - Remove the gasket (3). Cover the opening (4) in the timing case with a cloth.
 - Use a suitable tool to remove the oil seal. Do not damage the sealing surfaces.
 - Clean the sealing surfaces.

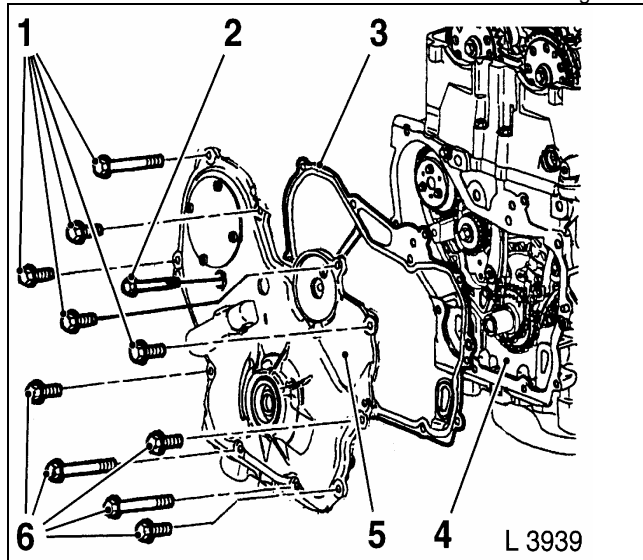


Figure 20

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39. Remove the camshaft timing chain guide rail (1).
- Remove the screw plug (1).
 - 1 bolt (2)

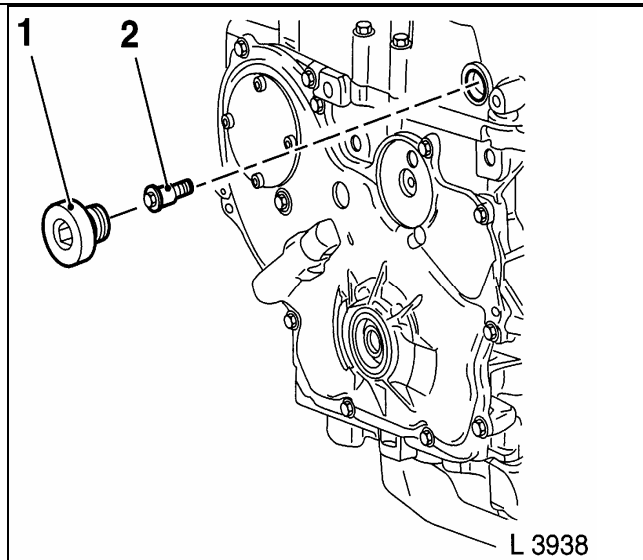


Figure 21

40. Remove the camshaft timing chain guide rail (1).
- 1 bolt (2)

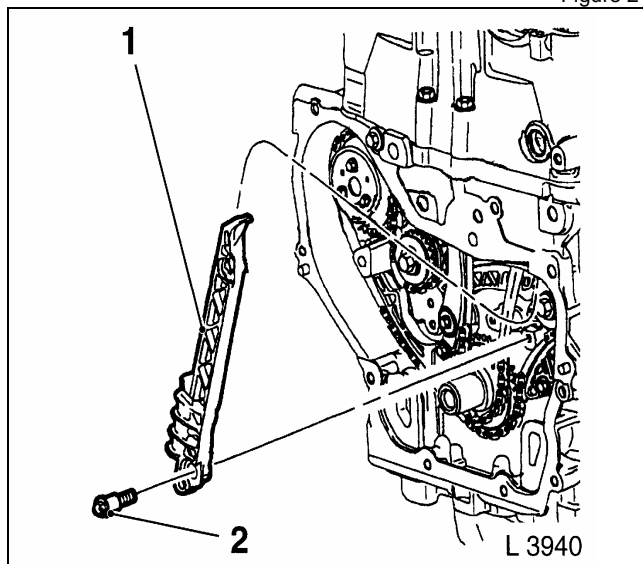


Figure 22

41. Remove the camshaft timing chain tensioner rail (1).
42. Raise the engine.
43. Secure the engine
- to the rear engine damping block.
 - Retaining bolt
44. Lower the engine.
- Take out KM-904 with KM-6054 .
45. Lower the lifting ramp.

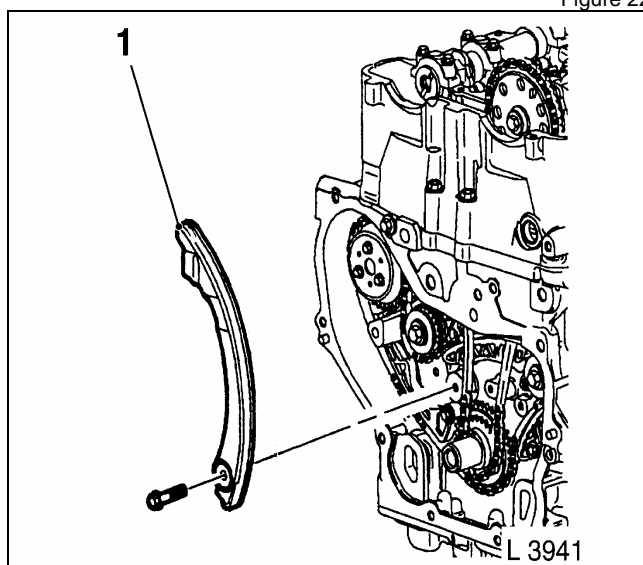


Figure 23

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46. Remove the intake camshaft sprocket (1).
 - Hold the intake camshaft by the hexagon.
47. Take out the camshaft timing chain (2).
 - Guide the chain past the crankshaft and lift it out to the top.

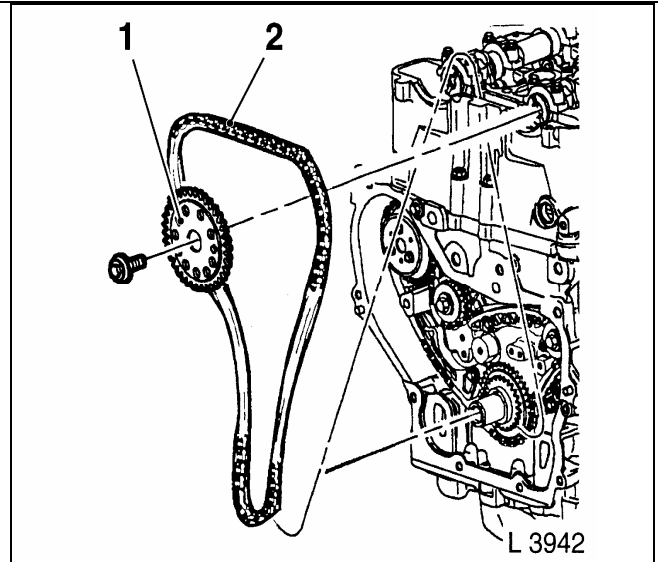


Figure 24

48. Insert the camshaft timing chain. Working from the top left and right, insert the timing chain past the central web (1).
49. Install the intake camshaft sprocket.
 - Lay the camshaft timing chain onto the camshaft sprocket.
 - Use a new bolt.
 - Hold the intake camshaft by the hexagon.
 - Tightening torque 85 Nm + 30° + 15°

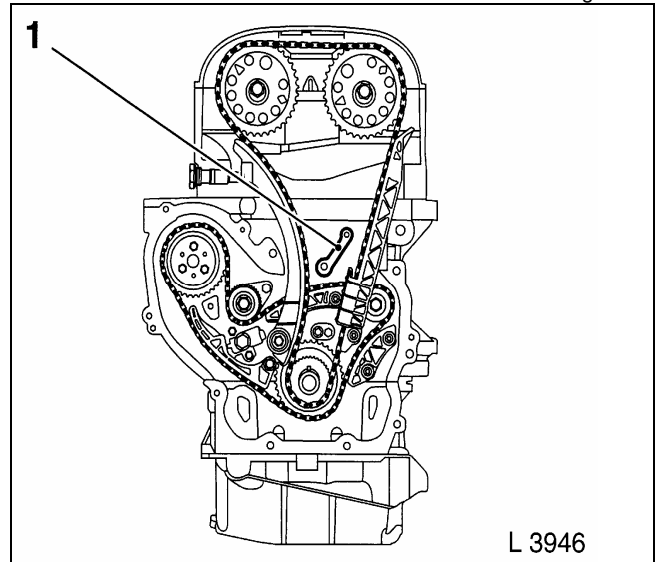


Figure 25

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50. Fit the camshaft timing chain. The TDC reference points on the timing chain are indicated by coloured links in the chain. These must line up with the markings on the timing sprockets.
- Chain link (copper colour) (1) to INT marking (2) on the intake camshaft sprocket
51. Raise the lifting ramp.
52. Install the camshaft timing chain tensioner rail (part number 24 449 448)
- Tightening torque 10 Nm

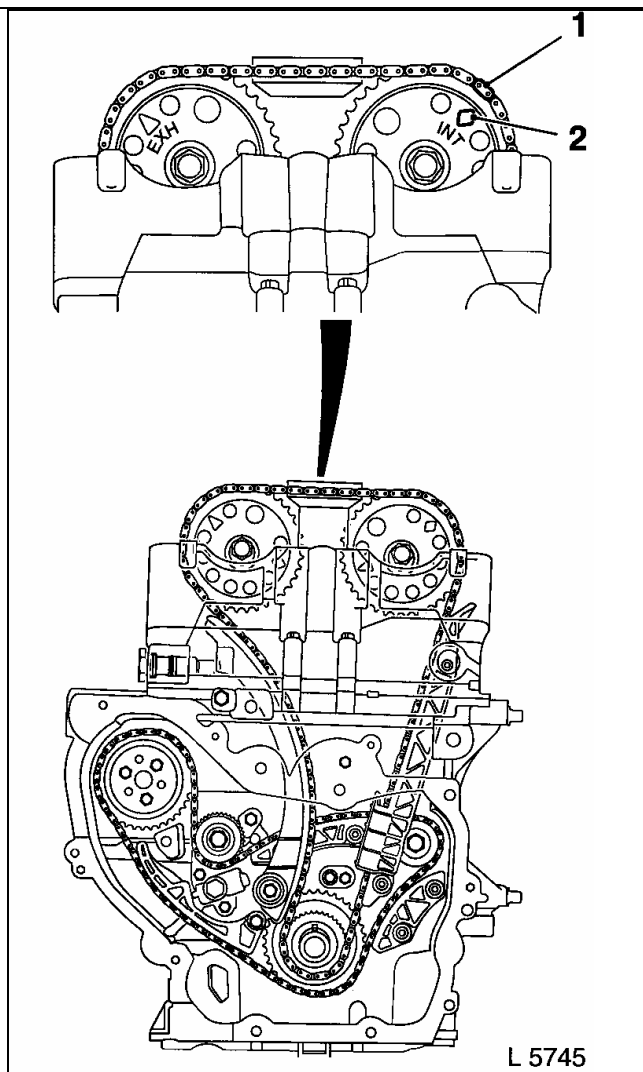


Figure 26

53. Install the camshaft timing chain guide rail (1).
- 1 bolt (2)
 - Tightening torque 10 Nm

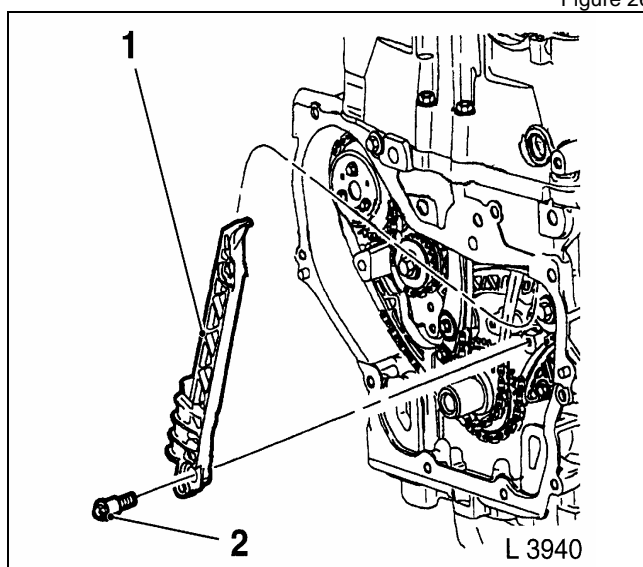


Figure 27

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- 54. Secure the camshaft timing chain.
 - Important: Check that the TDC reference points line up. Secure the chain link (1) with a plastic wedge at the marking on the camshaft timing chain sprocket
- 55. Lower the lifting ramp.

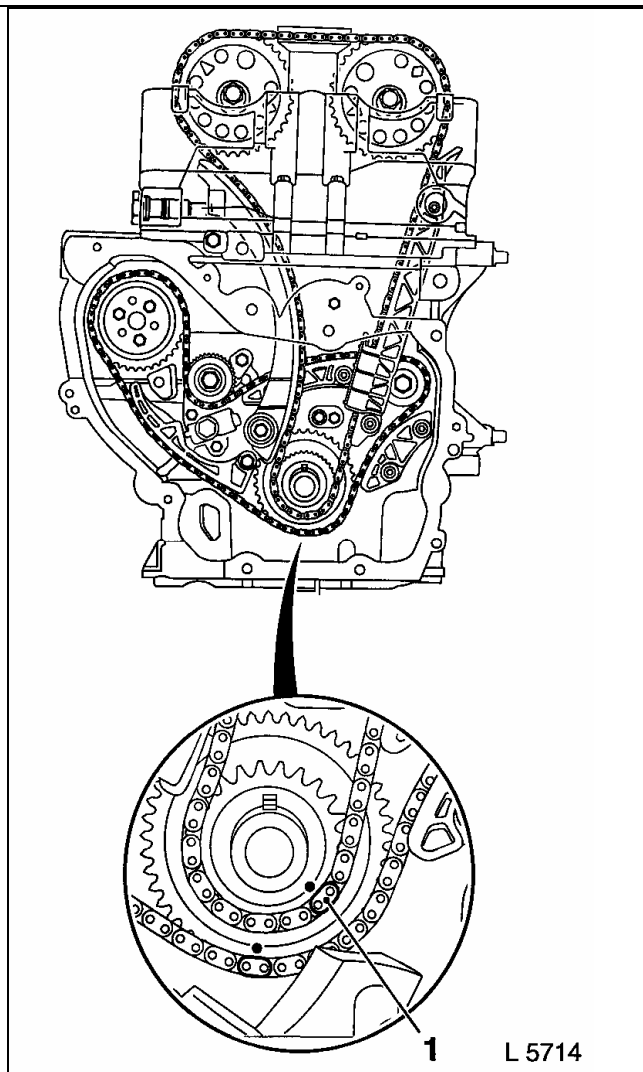


Figure 28

- 56. Install the camshaft timing chain guide rail. • 1 bolt (2)
 - Tightening torque 10 Nm
- Install the screw plug (1).
 - Tightening torque 65 Nm

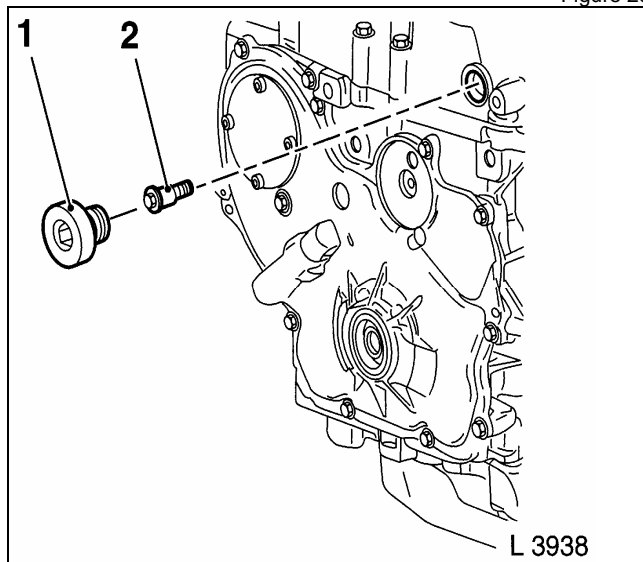


Figure 29

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57. Install the exhaust camshaft sprocket.
- Important: Check that the TDC reference points line up. Chain link (1) to EXH marking (2) on the exhaust camshaft sprocket
 - Rotate the exhaust camshaft by the hexagon until the exhaust camshaft sprocket is seated in the guide.
 - Use a new bolt.
 - Hold the camshaft by the hexagon.
 - Tightening torque 85 Nm + 30° + 15°
58. Recut the thread.
- 2 off
59. Install the guide rail.
- Coat the bolts with thread locking compound (red) and insert them.
 - Tightening torque 8 Nm

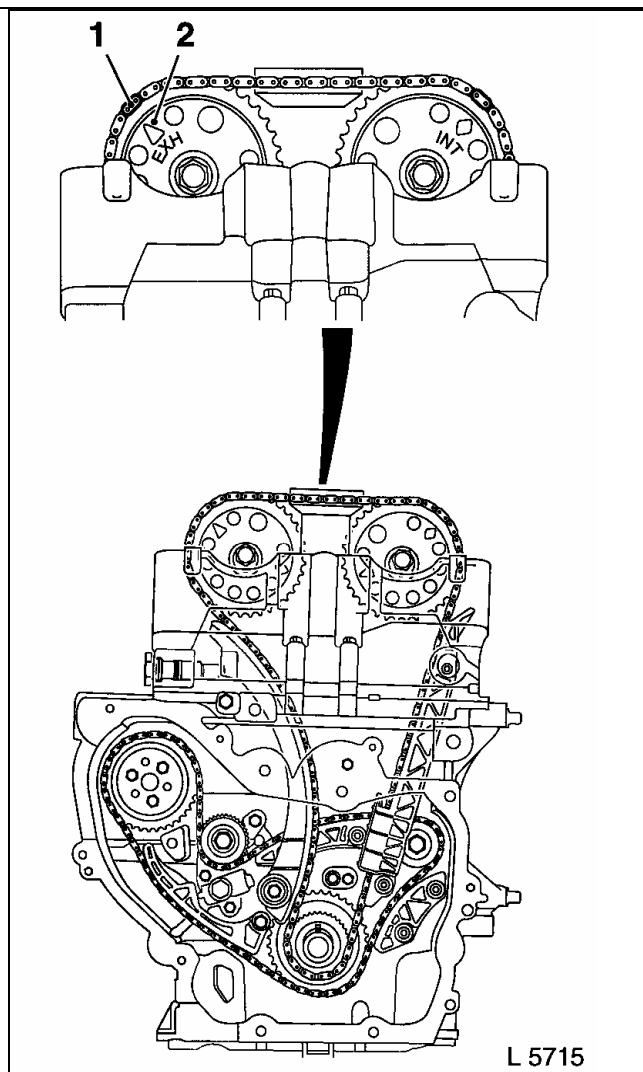


Figure 30

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60. 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

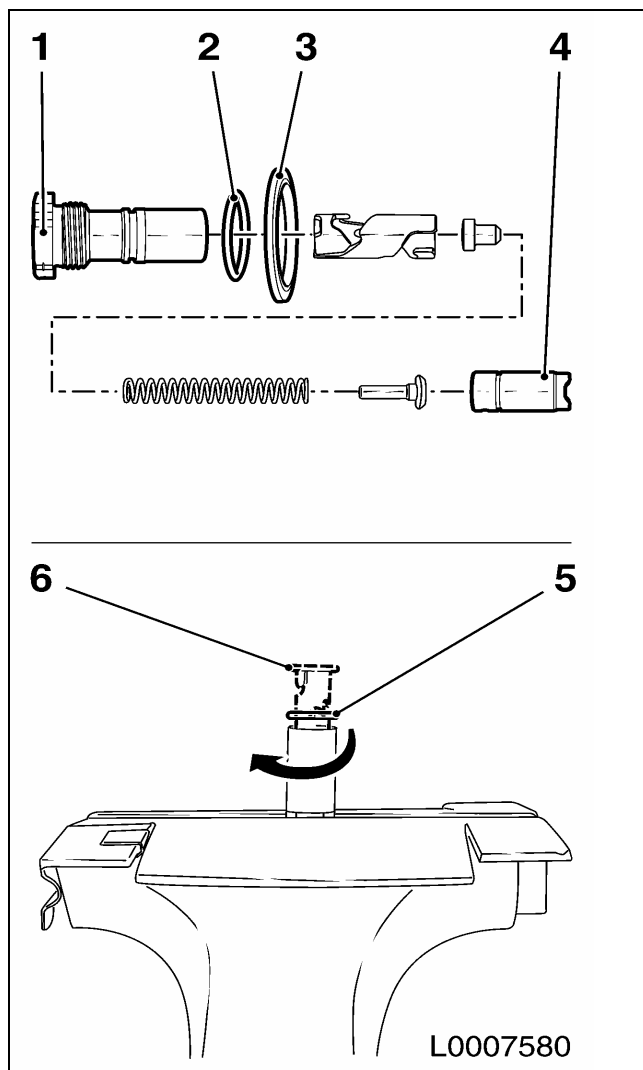


Figure 31

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

61. 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). If the TDC markings no longer line up with the coloured chain links, refit the camshaft timing chain. Once the crankshaft has been rotated once again they will no longer line up.

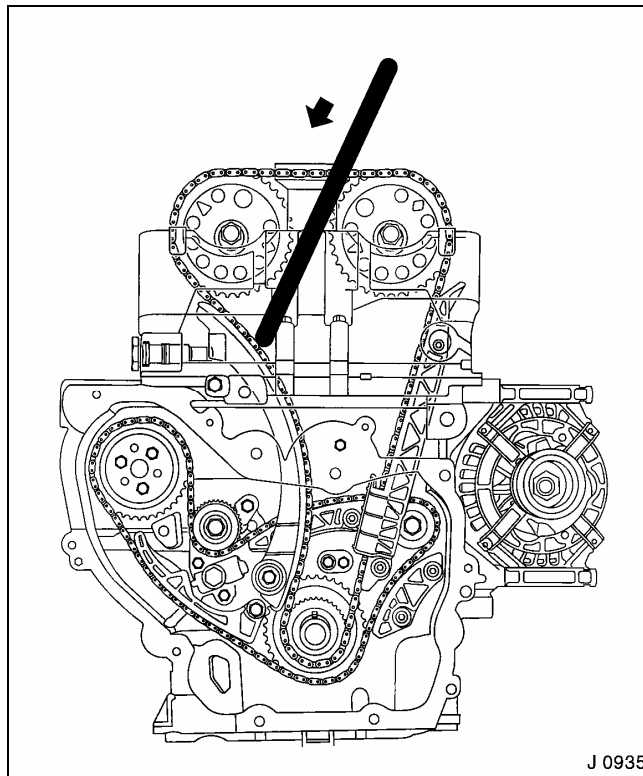
62. Raise the lifting ramp.

63. Support the engine from underneath with KM-904 together with KM-6054.

64. Remove the retaining bolt from the engine damping block.

- 1 retaining bolt

65. Lower the engine.

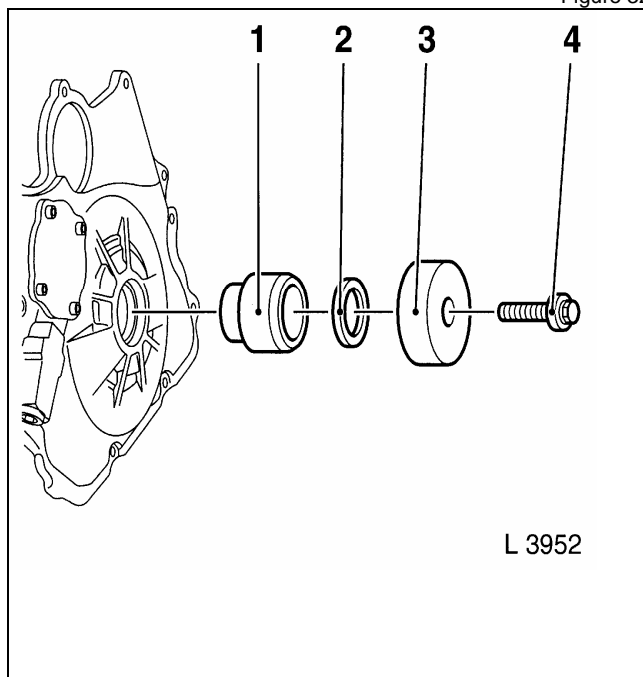


J 0935

Figure 32

66. Install the timing case. Remove the cloth from the opening in the timing case.

- Use a new gasket.
- Tightening torque 21 Nm
- Install a new crankshaft front oil seal (2).
- Slide protective sleeve (1) from KM-6105 (3) onto the connecting rod journal.
- Coat the sealing lips with silicone grease (white).
- Slide the oil seals over the protective sleeve onto the connecting rod journal.
- Use KM-6105 to press the oil seal into the timing case.
- Use bolt (4) of the rotational vibration damper.
- Take out KM-6105.



L 3952

Figure 33

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67. Raise the engine.
68. Insert the right-hand engine damping block together with the engine damping block bracket.
69. Attach the right-hand engine damping block.
 - 1 nut
 - Tightening torque 45 Nm
70. Attach the right-hand engine damping block bracket.
 - 3 bolts
 - Tightening torque 85 Nm
71. Attach the rear engine damping block.
 - 1 bolt, 1 nut
 - Tightening torque 49 Nm
72. Lower the engine.
 - Remove the lifting device KM-904 with KM-6054.
73. Attach the bracket for the gearshift cables. •
To the transmission
 - 1 bolt
 - Tightening torque 22 Nm

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74. Attach the rotational vibration damper (2). •
 Use holding adapter KM-J-38122-A in conjunction with KM-956-1 (1) to hold.
- Use a new bolt.
 - Tightening torque 100 Nm + 75° + 15°

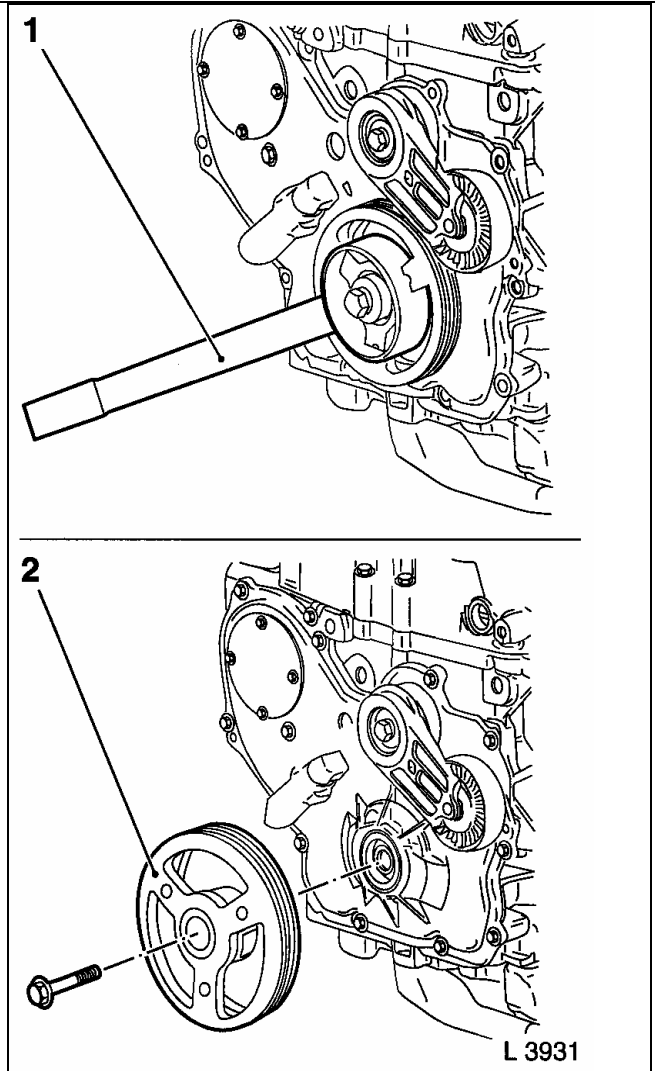


Figure 34

75. Attach the ribbed V–belt tensioner. The lug (1) of the ribbed V–belt tensioner engages into the bore in the timing case (2).
- Tightening torque 43 Nm

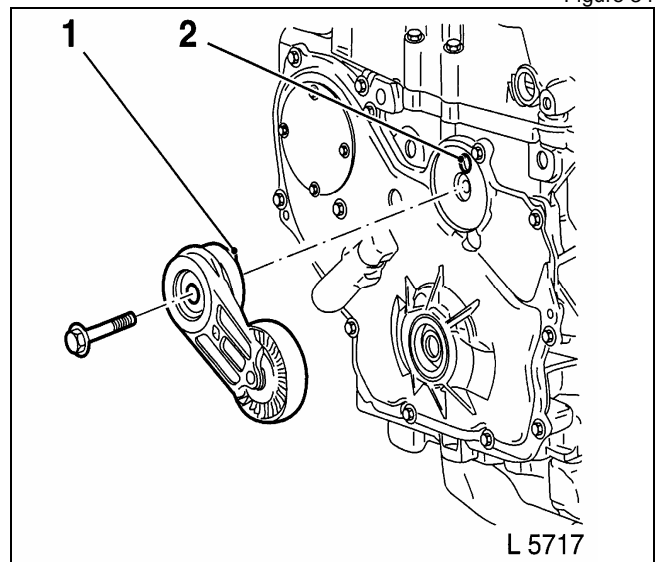


Figure 35

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76. Install the ribbed V-belt.
- Lay the ribbed V-belt in place. Note the running direction and installation position of the ribbed V-belt.
 - Tension the ribbed V-belt tensioner in the direction of the arrow with KM-6151.

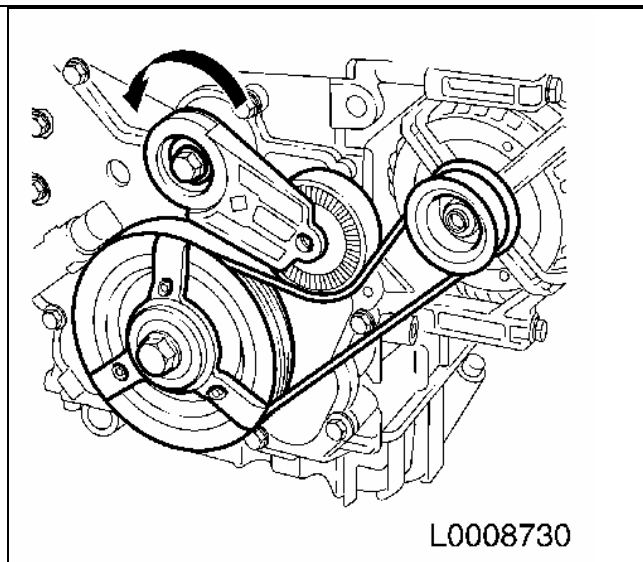


Figure 36

77. Rotate the crankshaft 720°.
- Rotate the crankshaft in the normal direction of rotation to TDC on cylinder no. 4 (marking 1). In this position the cams (1) and (2) of cylinder no. 4 point upwards.

78. Install the front exhaust pipe.
- Use new gaskets.
 - 6 nuts, 3 bolts
 - Tightening torque 16 Nm
 - Hook into the mountings.

79. Install wheel arch liner
- Install 6 screws

80. Install rear wheel
- Install 4 bolts, install locking bolt 90 Nm

81. Remove support

82. Install the lower engine splash shield
- 13 bolts

83. Lower the lifting ramp.

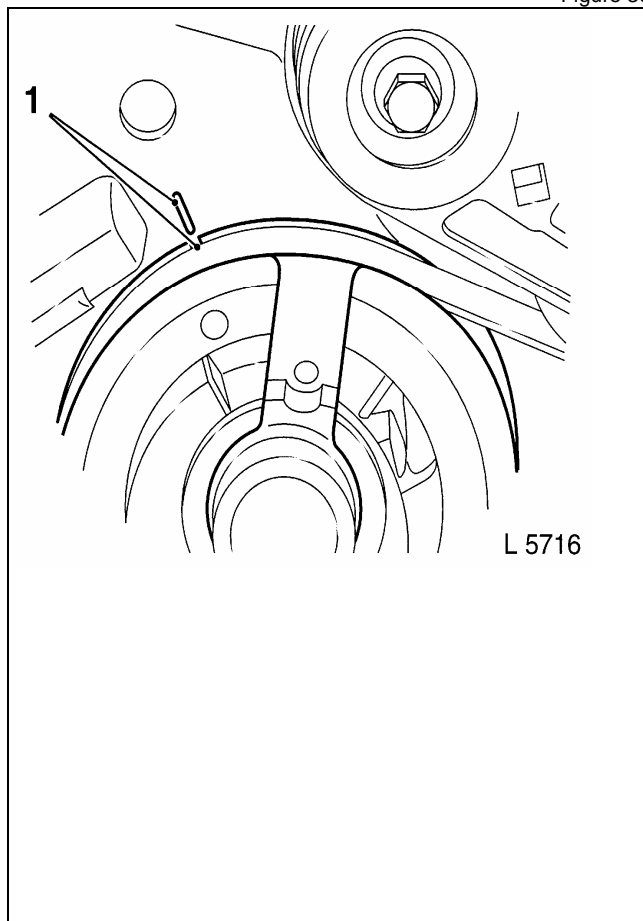


Figure 37

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84. Attach KM-6148 . In this position the cams (1) and (2) of cylinder no. 4 point upwards.
- Attach KM-6148 with the enclosed bolts (4).
 - Slide the positioning bolts (5) into the designated bores (3) on the camshaft sprockets.
85. Detach KM-6148.

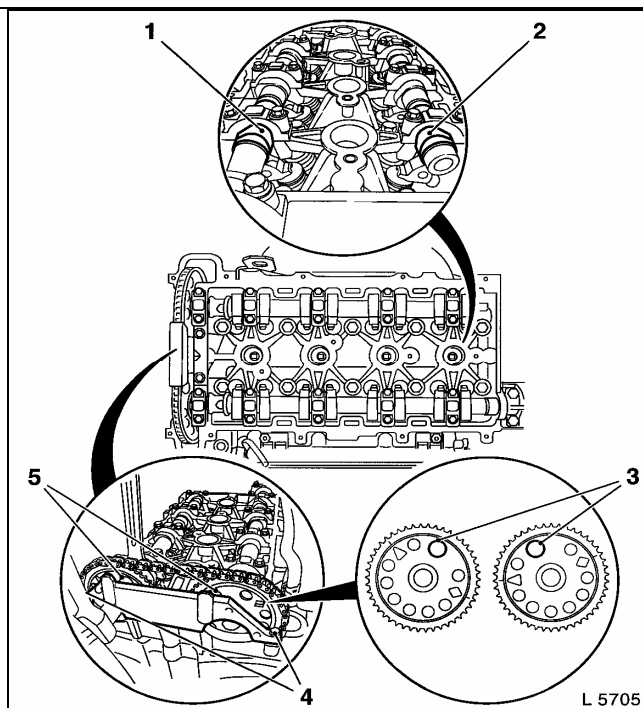


Figure 38

86. Attach the cylinder head cover
- Clean the sealing surfaces.
 - Use new gaskets. 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.
 - 2 bolts, tightening torque 9 Nm

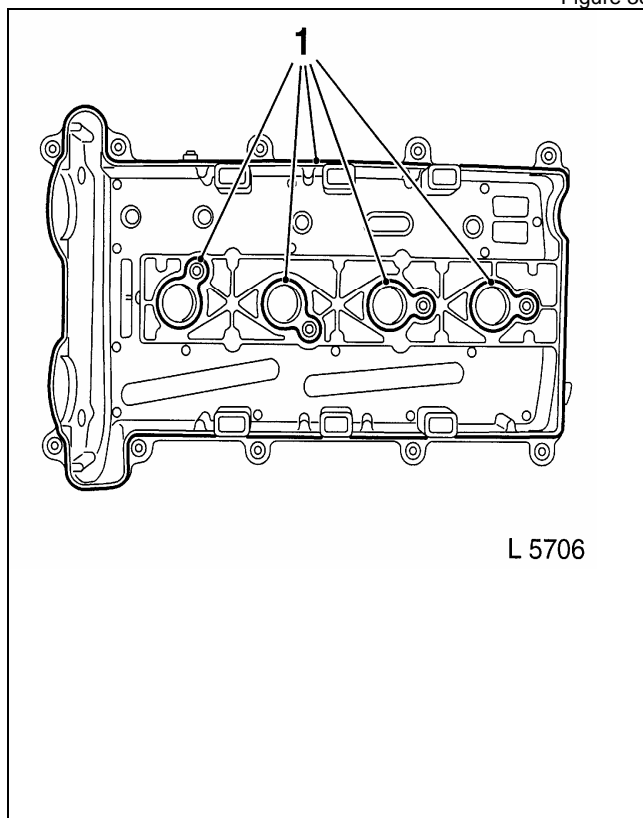


Figure 39

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

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88. Connect the fuel lines.
 - 2 union nuts
 - Tightening torque 10 Nm

89. Install the engine cover.
 - Check the alignment.
 - 6 bolts, tightening torque 14 Nm

90. Close the engine cover.
91. Connect the battery.
92. Close the bonnet.
93. Reprogram the volatile memories.

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