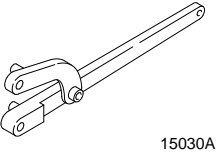
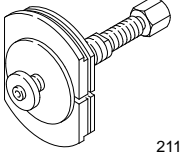
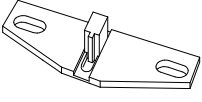
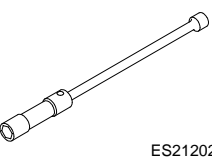
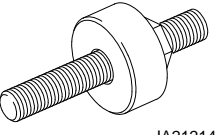


Timing Chain – Renew (21 314 0)

Special Tools

 15030A	15-030A Universal flange holding wrench
 21147	21-147 Vibration damper remover
 21168	21-168 Crankshaft locking tool
 ES21202	21-202 Socket, spark plugs
 IA21214	21-214 Installer, vibration damper

Proprietary Tools

Twist drill, 3,5 mm diameter
Brass drift

Materials

Engine oil	Refer to General Specifications
High-temperature grease	ESDM-M1C220-A
Cable ties	
Bolt	M6 X 60
Adhesive tape	

Remove

1. Standard preparatory measures:

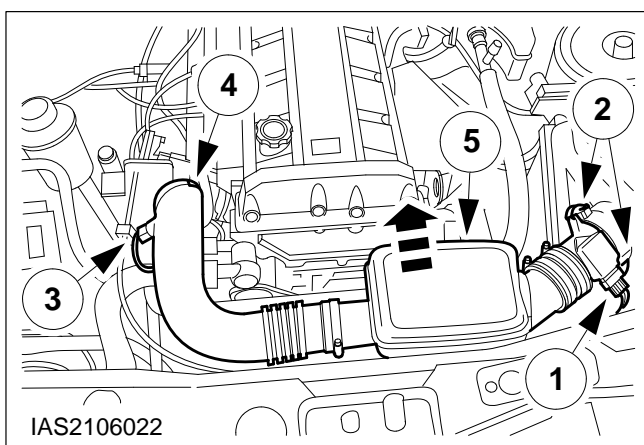
- Make a note of the radio keycode.
- Remove the battery cover.

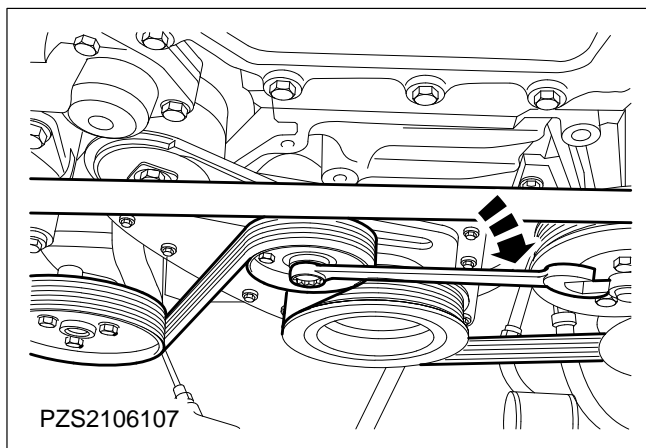
⚠ CAUTION: After making a note, disconnect the battery earth lead.

Make a note of the preset radio stations.

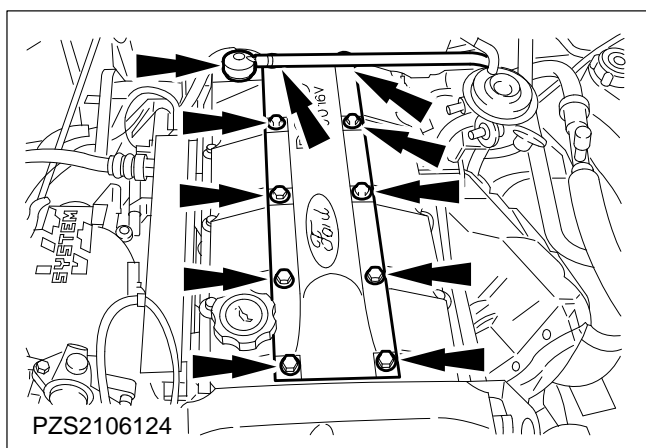
2. Remove the air intake pipe.

- 1 Disconnect the multiplug from the intake air temperature sensor (IAT sensor).
- 2 Detach the air intake pipe from the air cleaner housing (two clips).
- 3 Disconnect the mass air flow (MAF) sensor plug.
- 4 Detach the air intake pipe.
- 5 Lift the resonator (push-fit) and remove the air intake pipe complete.



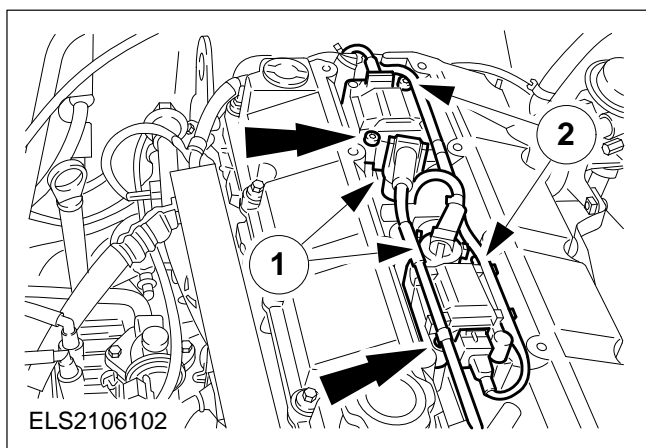


3. Slacken the drive belt and remove it.



4. Disconnect the valve with the crankcase breather hose and unclip it.

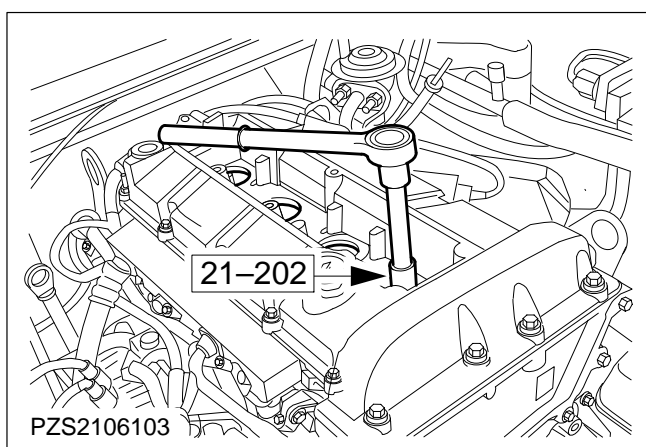
5. Remove the ignition coil cover.



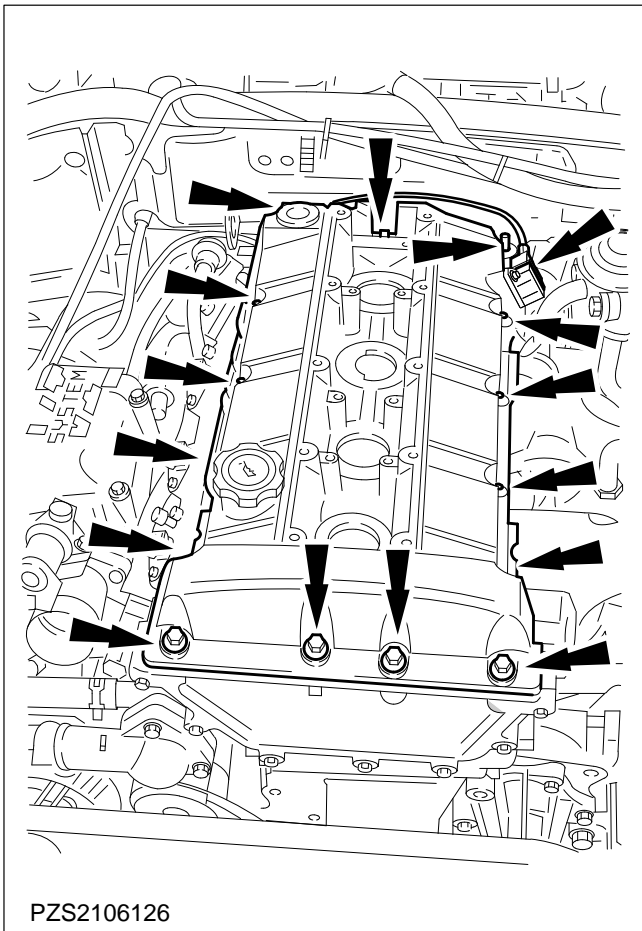
6. Disconnect the spark plug connectors and remove the ignition coils.

1 Spark plug connectors

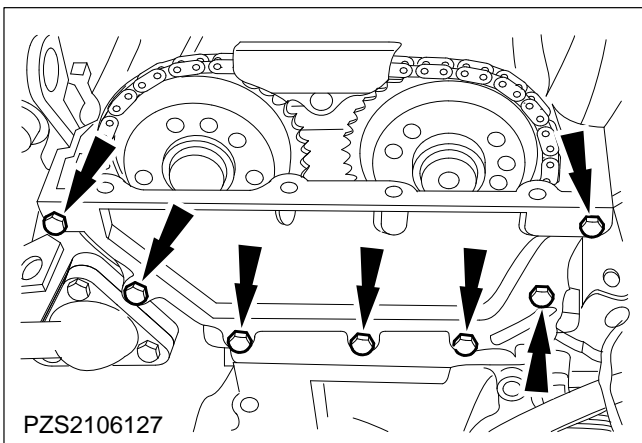
2 Ignition coils.



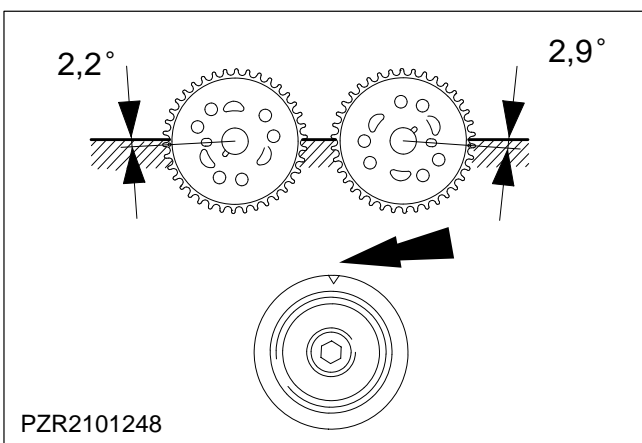
7. Remove the spark plugs.



8. Disconnect the camshaft position sensor (CMP sensor) plug.
9. Remove the cylinder head cover (eleven bolts, four nuts).
Remove the gasket.

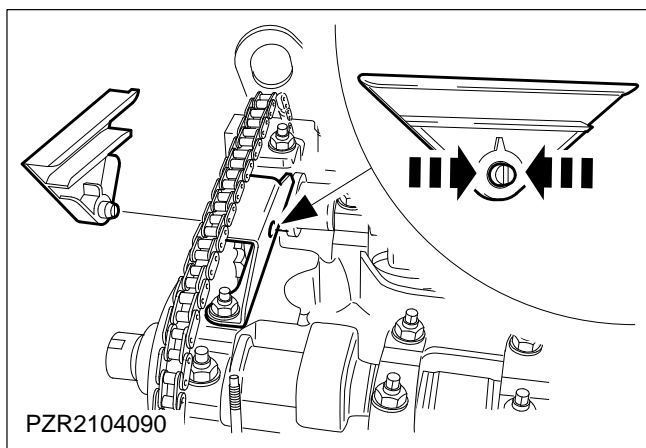


10. Remove the upper timing chain cover.

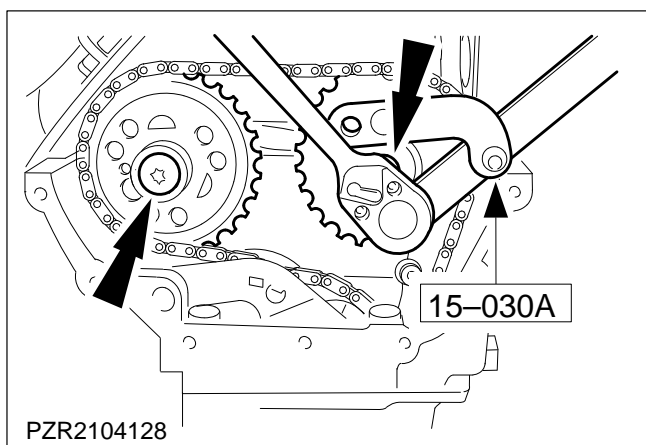


11. Set the crankshaft to the TDC position of cylinder no. 1.

The marking on the crankshaft pulley/vibration damper should lie vertically uppermost.

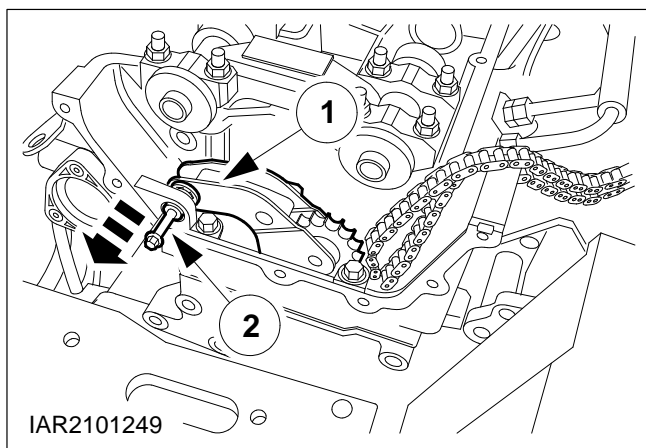


12. Remove the chain guide at the top.



NOTE: Counter hold them to stop them from turning.

13. Remove the camshaft sprockets.

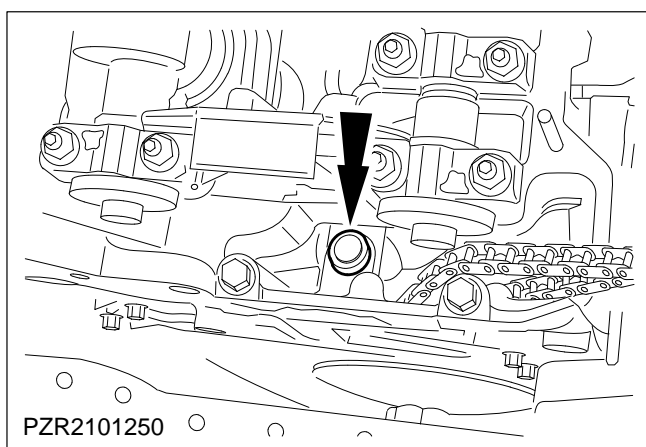


CAUTION: Secure the lock washer to prevent it from dropping down.

NOTE: Secure the timing chain.

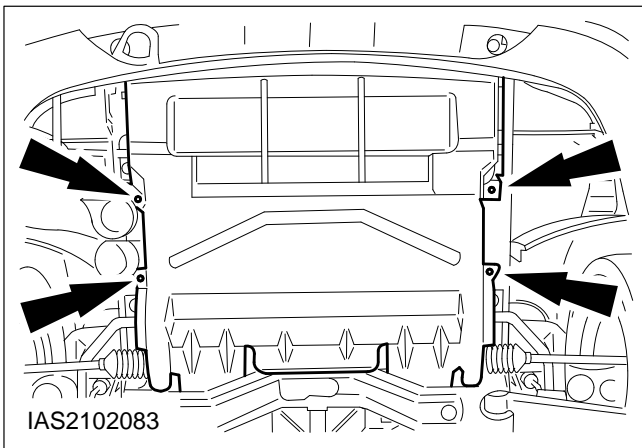
14. Remove the timing chain tensioner.

- 1 Remove the lock washer.
- 2 Extract the chain tensioner pivot bolt using an M6 x 60 bolt.



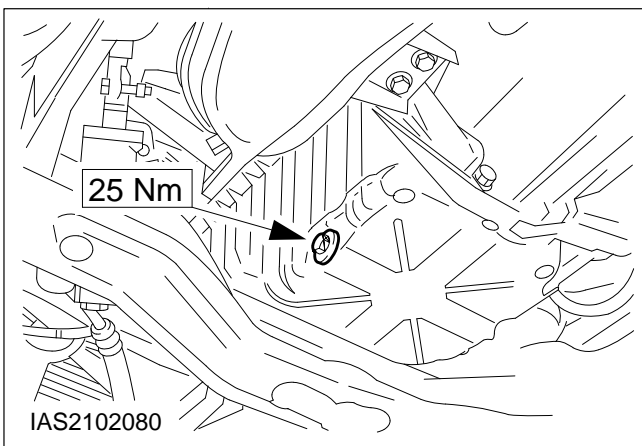
CAUTION: Do not re-use the chain tensioner plunger.

15. Remove the chain tensioner plunger.



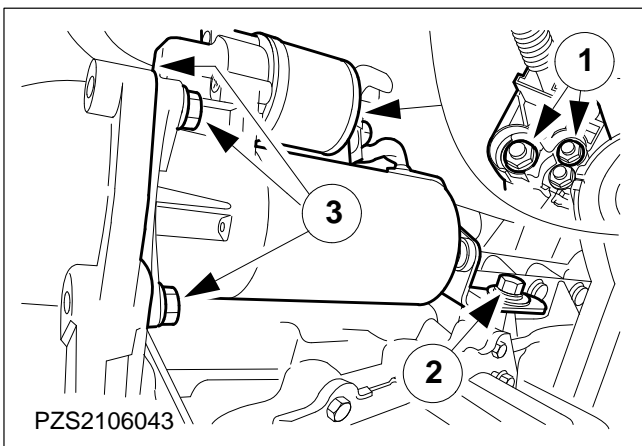
16. Raise the vehicle.

17. Remove the engine undershield.



18. Drain off the engine oil.

Tighten the oil drain plug using a new seal.

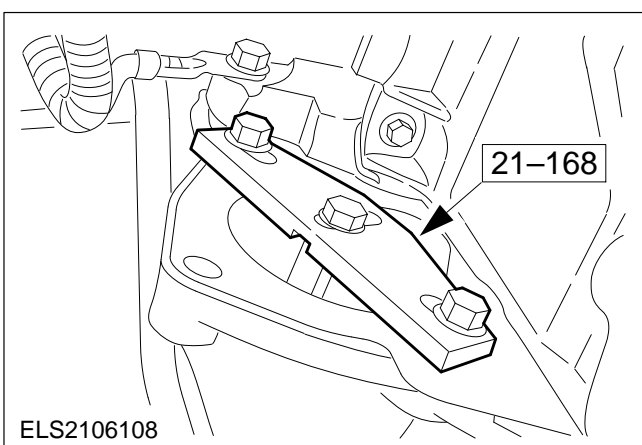


19. Remove the starter motor.

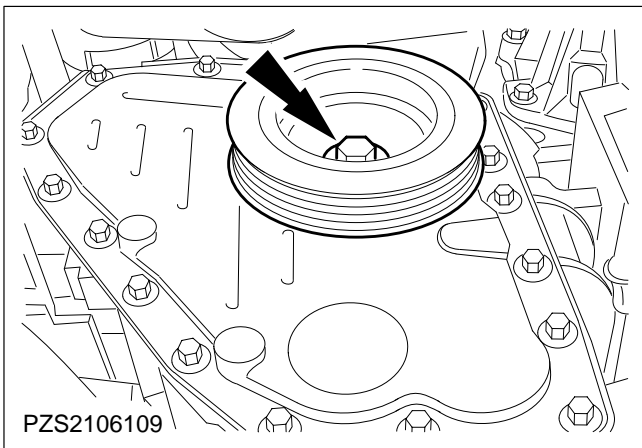
1 Disconnect the lead.

2 Detach the bracket from the cylinder block.

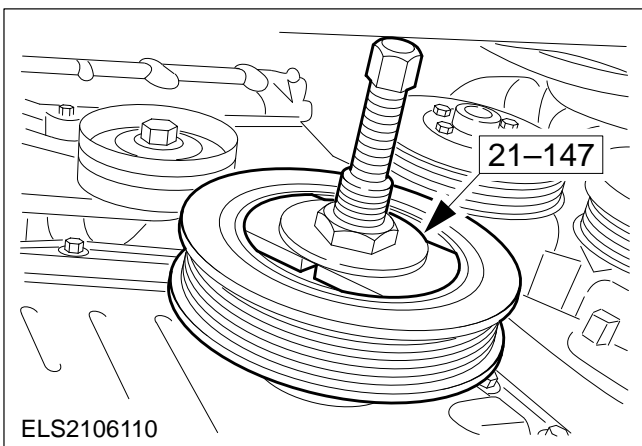
3 Bolts



20. Fit the special tool.

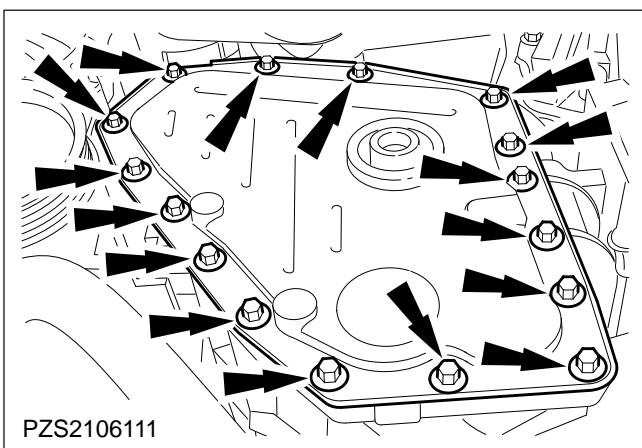


21. Unscrew the crankshaft pulley/vibration damper bolt.

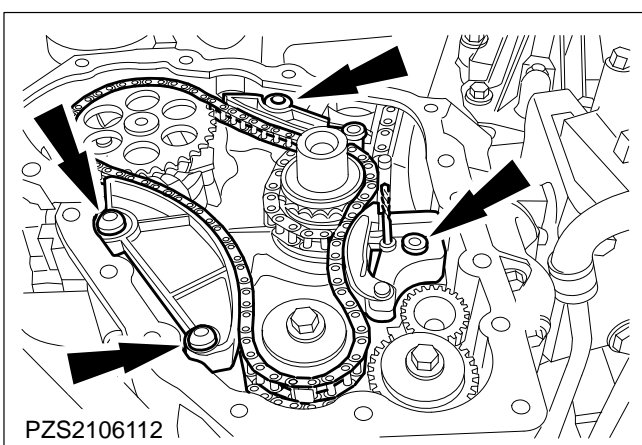


22. Remove the crankshaft pulley/vibration damper.

23. Remove Special Tool 21-168.



24. Remove the lower timing chain cover (16 bolts).

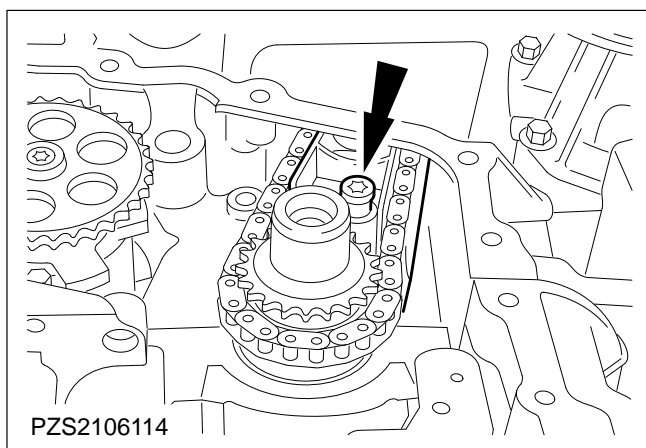


25. Remove the chain guides and the oil pump drive chain tensioner.

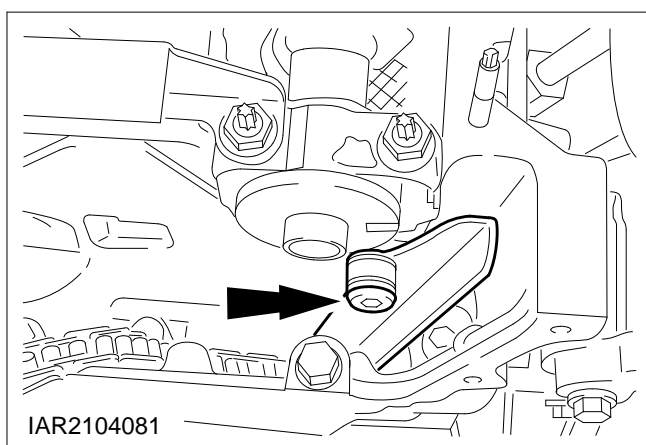
⚠ WARNING: Wrap adhesive tape around the twist drill flutes.

Compress the chain tensioner, secure it with the 3,5 mm twist drill and remove it.

26. Remove the oil pump drive chain.



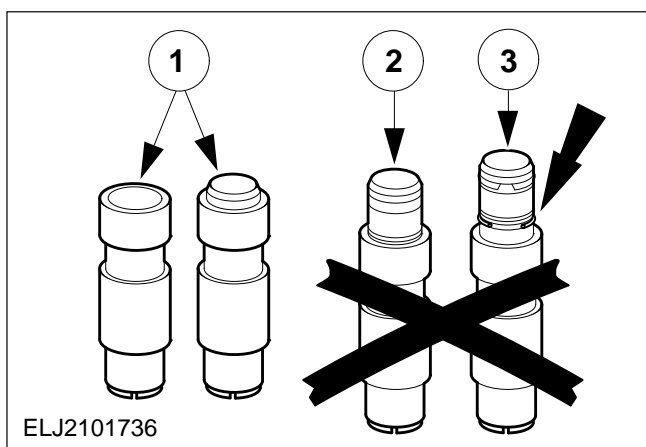
27. Unscrew the bottom bolt of the timing chain guide.



28. Lower the vehicle.

29. Unscrew the top bolt of the timing chain guide.

30. Remove the timing chain with the timing chain guide.

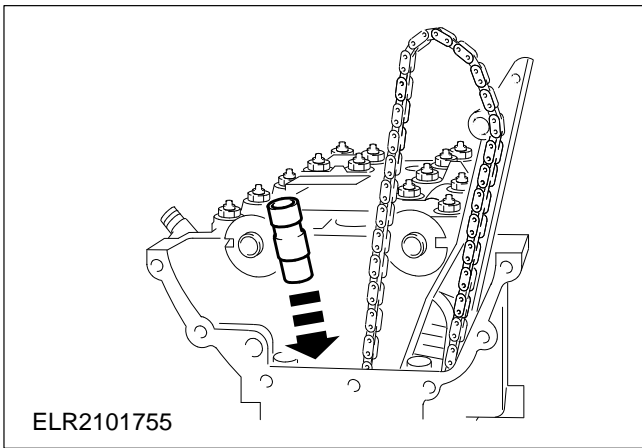


Install

⚠ CAUTION: A fully or partially released chain tensioner plunger (whether new or used) must not be fitted.

31. Check the new chain tensioner plunger.

- 1 Plunger latched.
- 2 Plunger partly released.
- 3 Plunger fully released (the detent ring is visible).



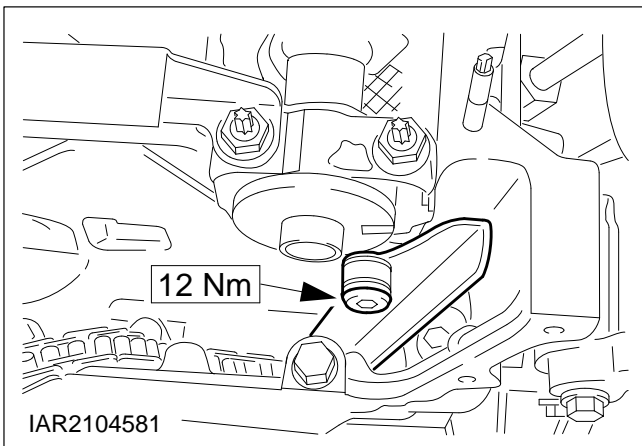
⚠ CAUTION: Only use a new and latched chain tensioner plunger.

32. Install the chain tensioner plunger.

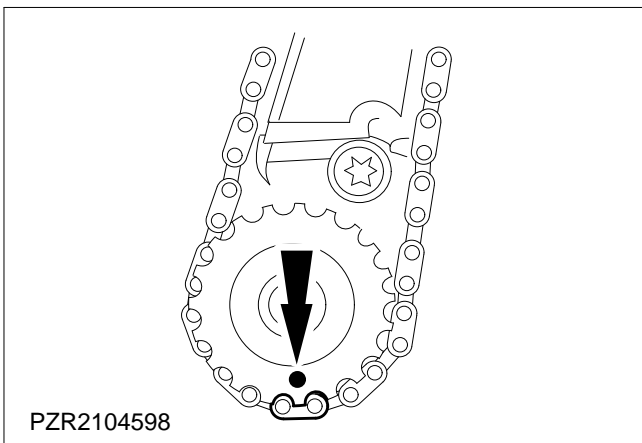
NOTE: The only copper chain link must be at the bottom end of the chain guide.

33. Install the timing chain with the timing chain guide.

Secure the chain with wire to prevent it from slipping into the timing case cover.



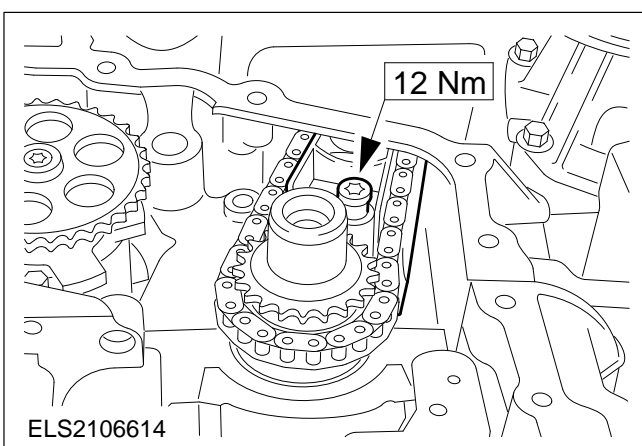
34. Tighten the top bolt of the timing chain guide.



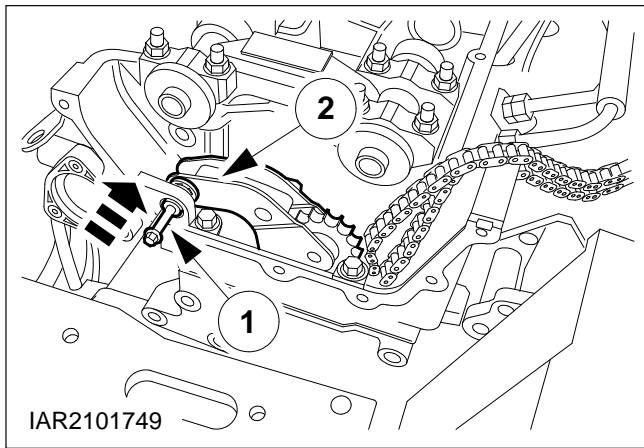
35. Raise the vehicle.

NOTE: The copper chain link must be across the single mark on the rear sprocket.

36. Fit the timing chain at the bottom.



37. Tighten the bottom bolt of the timing chain guide.



38. Lower the vehicle.

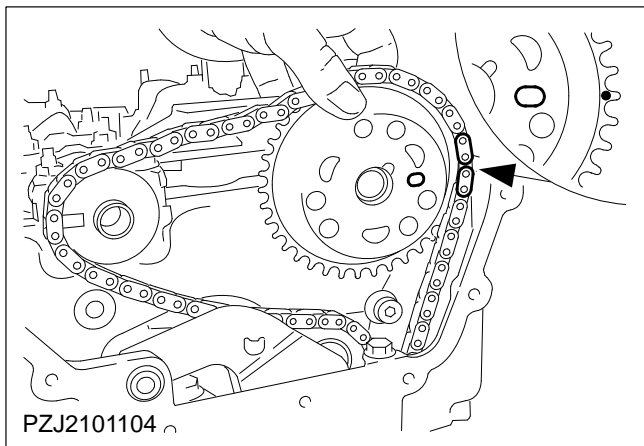
⚠ CAUTION: Secure the lock washer to prevent it from dropping down.

39. Install the timing chain tensioner.

1 Insert the pivot bolt using the M6 x 60 bolt.

2 Fit the lock washer.

Unscrew the M6 x 60 bolt.



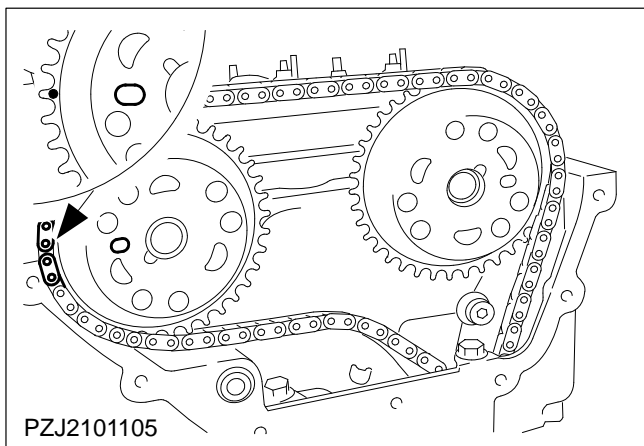
NOTE: The timing chain must be taut on the long side.

NOTE: The copper chain links must line up with the marking on the sprocket.

⚠ CAUTION: The camshaft sprockets must engage in the camshaft groove.

40. Fit the camshaft sprocket with the timing chain (in the TDC position).

If necessary, turn the camshaft slightly.

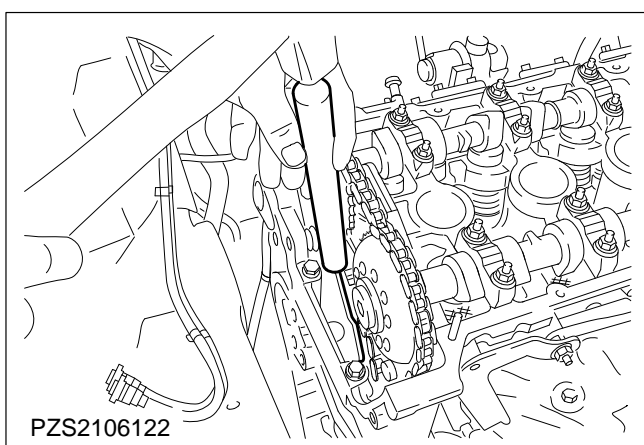


NOTE: The timing chain may sag slightly between the camshaft sprockets.

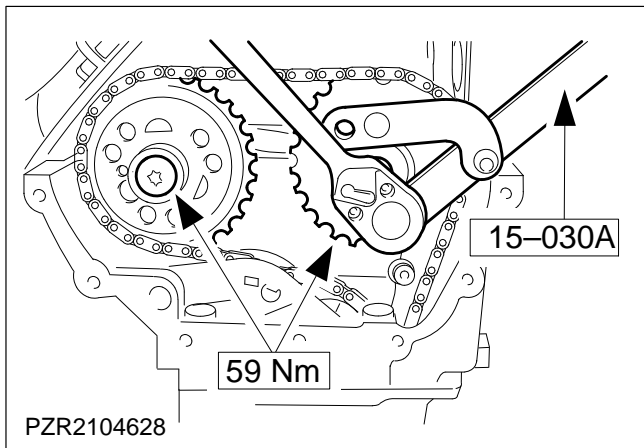
NOTE: The copper chain links must line up with the marking on the sprocket.

41. Fit the camshaft sprocket with the timing chain (in the TDC position) (continued).

42. Tighten the bolts of the camshaft sprockets finger tight.

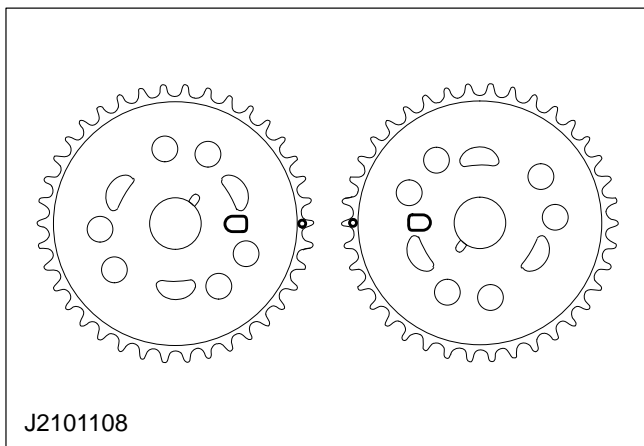


43. Release the chain tensioner plunger with a light tap on the chain tensioner with the brass drift.



NOTE: Hold them in position.

44. Tighten the camshaft sprocket bolts.

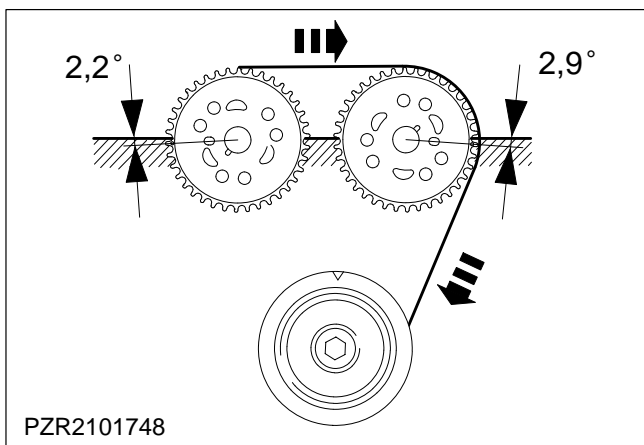


45. Set the crankshaft to TDC position of cylinder no. 2.

NOTE: If it is necessary to correct the valve timings, i.e. release the timing chain, a new chain tensioner plunger must be fitted as described in sub-operations 31., 32. and 43.

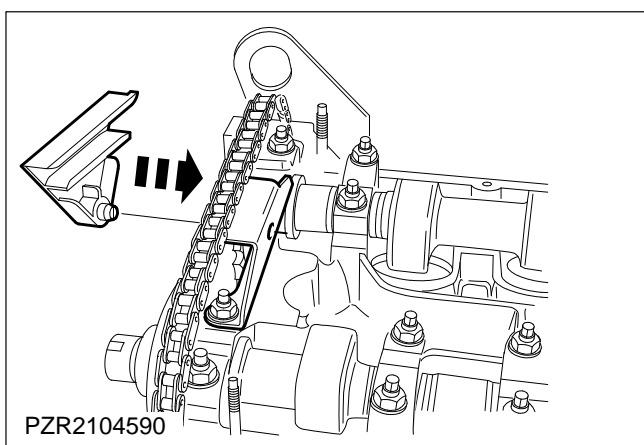
46. Check the valve timing.

The markings on the camshaft sprockets must be opposite each other on the level of the top edge of the cylinder head.

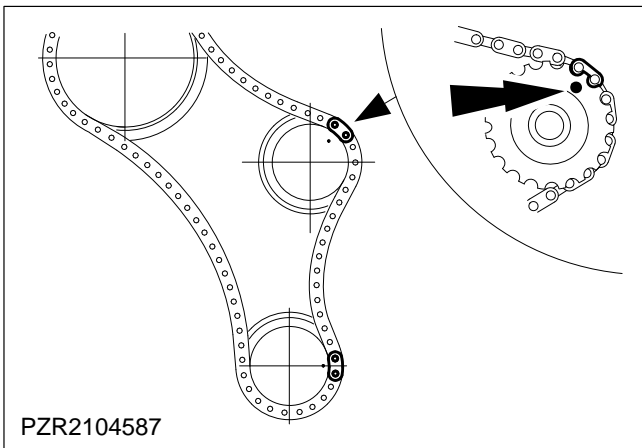


47. Check the valve timing (continued).

Turn the crankshaft one more revolution in the normal running direction and set it to the mark.



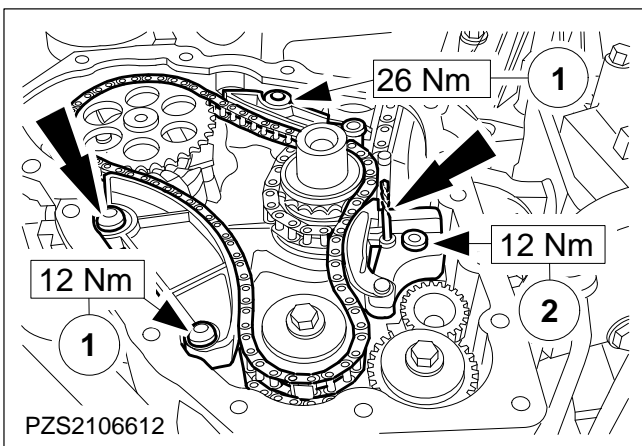
48. Install a new chain guide at the top.



NOTE: The crankshaft must be at the TDC position of cylinder no. 2.

NOTE: The copper chain links of the timing chain must be across the markings on the crankshaft sprocket and the balancer shaft sprocket.

49. Fit the oil pump drive chain.



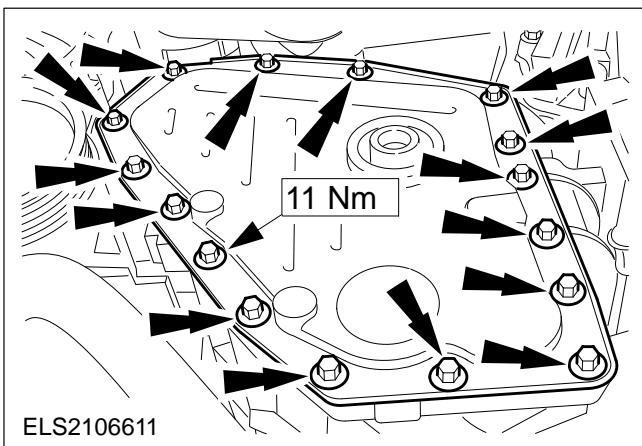
50. Install the oil pump drive chain guides and chain tensioner.

1 Install the chain guides.

⚠ WARNING: Wrap adhesive tape around the twist drill flutes.

2 Compress the chain tensioner, secure it with the 3,5 mm twist drill and install it.

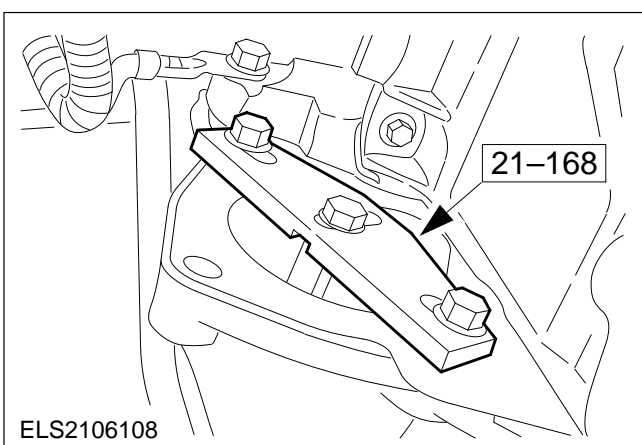
Remove the twist drill.



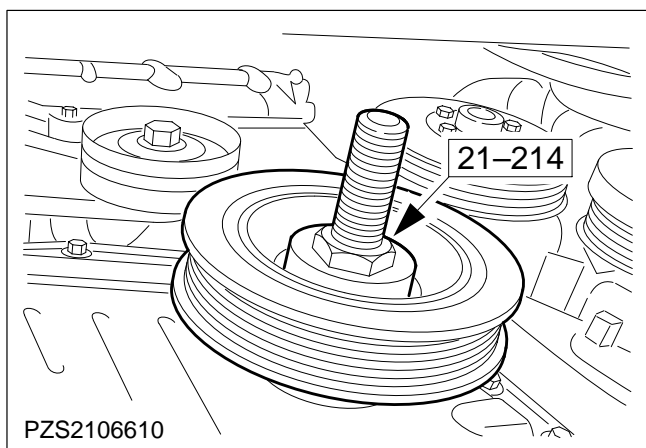
NOTE: Use a new cover with an integral gasket and radial oil seal.

51. Install a new lower timing chain cover with a centring cap (16 bolts).

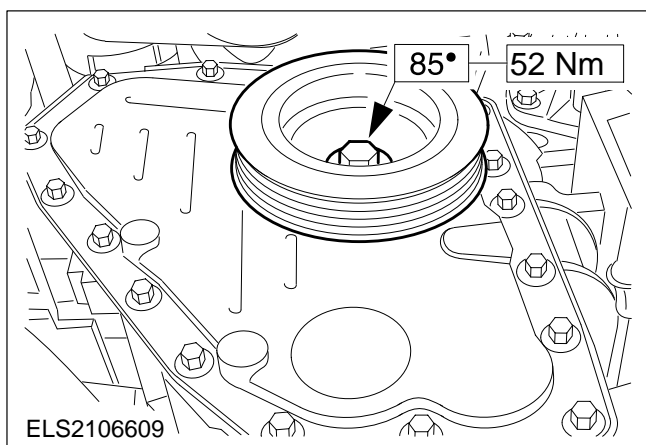
Remove the centring cap.



52. Fit the special tool.

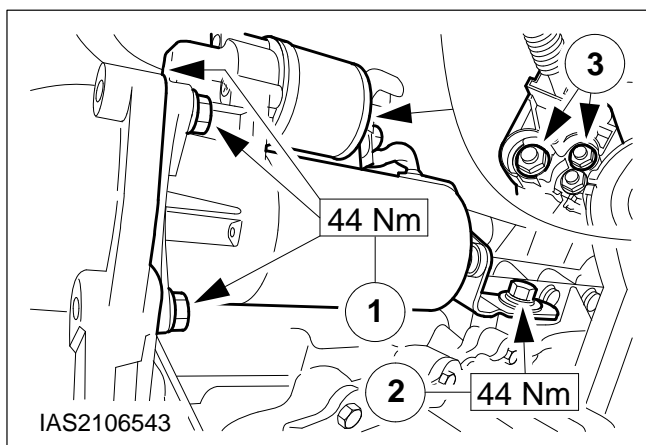


53. Install the crankshaft pulley/vibration damper.



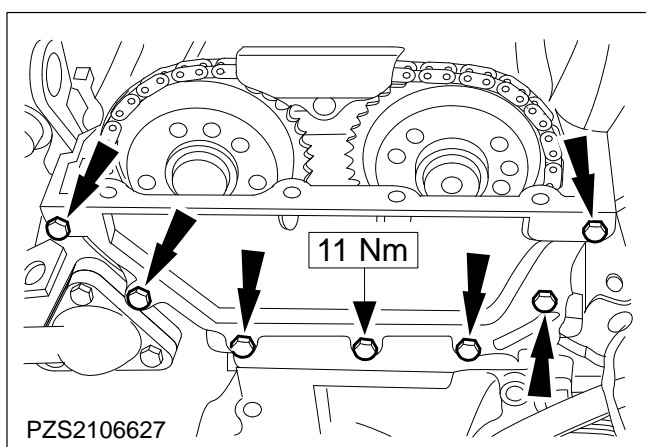
54. Tighten the crankshaft pulley/vibration damper bolt.

55. Remove Special Tool 21-168.



56. Fit the starter motor.

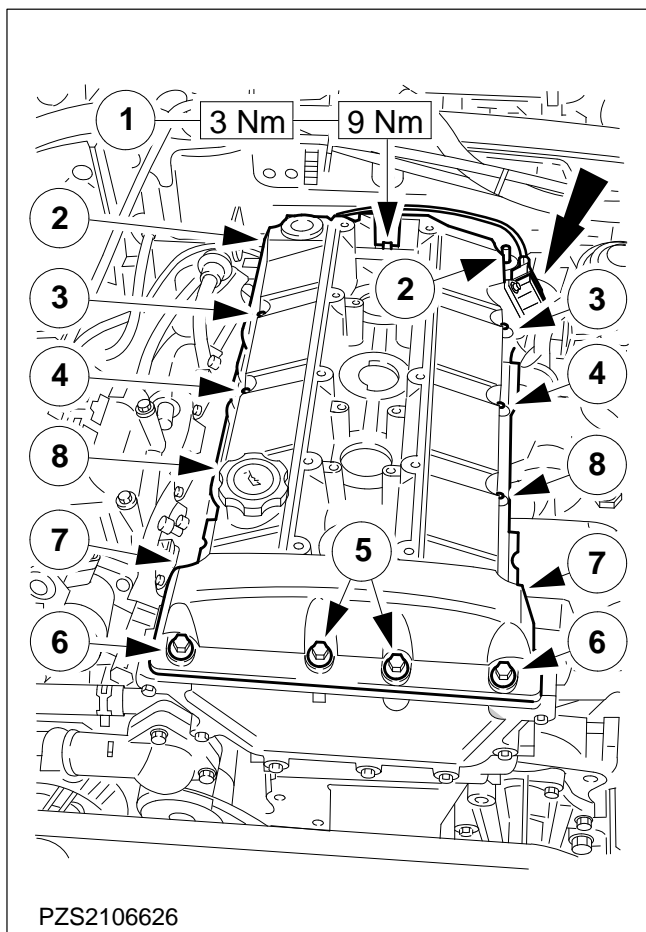
- 1 Bolts.
- 2 Attach the bracket to the cylinder block.
- 3 Connect the lead.



NOTE: Use a new gasket.

NOTE: Align the top edge of the upper cover with the cylinder head mating face (maximum downward misalignment 0,13 mm).

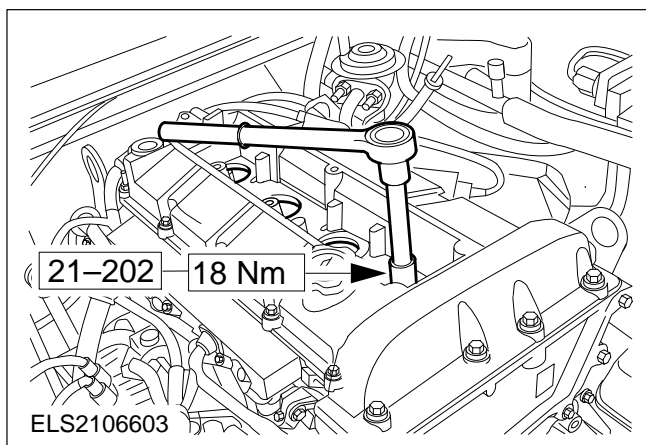
57. Install the upper timing chain cover.



NOTE: Bolt-tightening sequence.

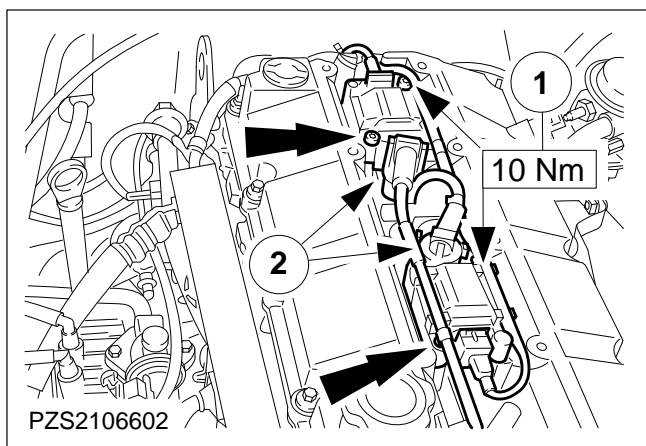
58. Install the cylinder head cover using a new gasket (eleven bolts, four nuts).

59. Connect the CMP sensor plug.



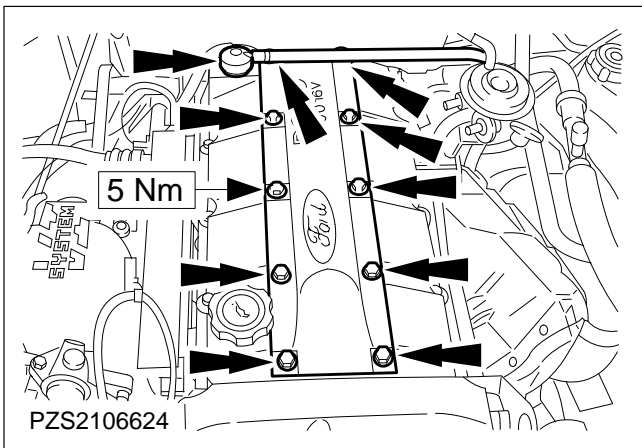
NOTE: Apply lubricant (ESE-M1244-A) to the spark plug threads.

60. Fit the spark plugs.



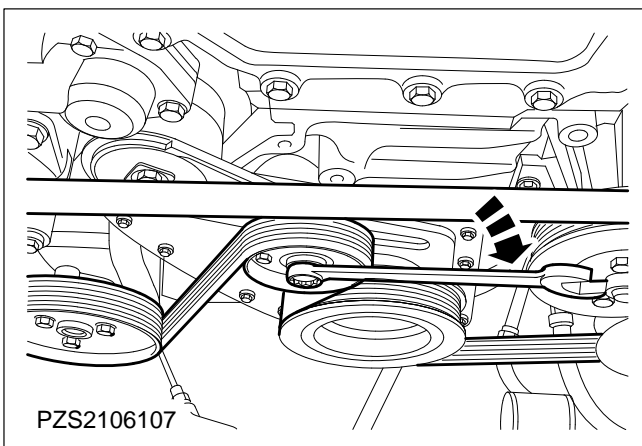
61. Install the ignition coils and connect the spark plug connectors.

- 1 DIS ignition coils
- 2 Spark plug connectors

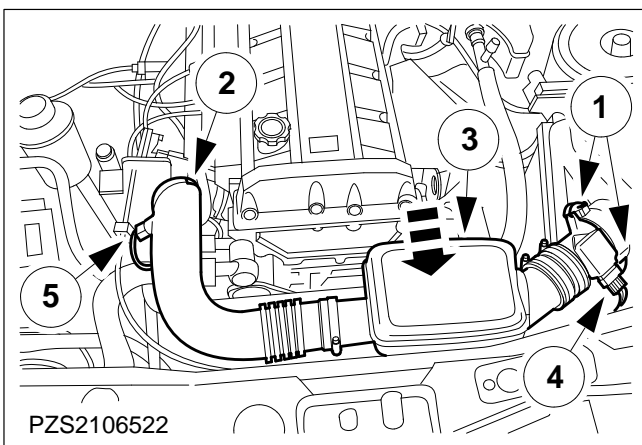


62. Install the ignition coil cover.

63. Connect the valve with the crankcase breather hose and clip it into place.



64. Preload the belt tensioner and fit the drive belt.

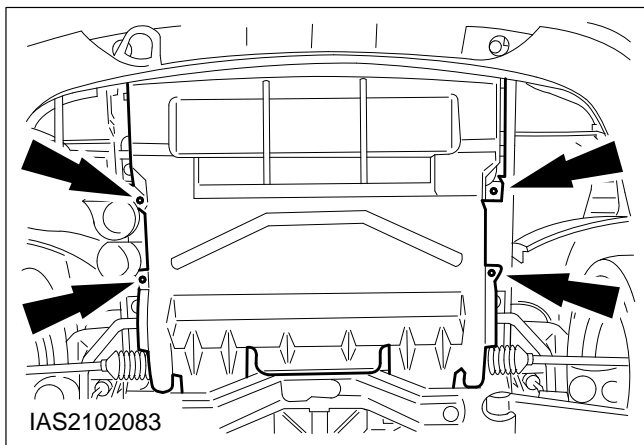


65. Install the air intake pipe.

- 1 Attach the air intake pipe to the air cleaner housing (two clips).
- 2 Fit the air intake pipe.
- 3 Move the resonator into the installation position (push-fit).
- 4 Connect the IAT sensor plug.
- 5 Connect the MAF sensor plug.

66. Standard finishing operations.

- Top up with engine oil.
- Fix the wiring and hoses in place with cable ties.
- Connect the battery earth lead.
- Bring the engine to operating temperature and check it for leaks (visual check).
- Check the fluid levels and rectify as necessary.
- Enter the radio keycode.
- Reprogramme the preset radio stations.
- Reset the clock.

**67. Raise the vehicle.****68. Fit the engine undershield.****69. Lower the vehicle.****70. Carry out a road test to enable the PC module (EEC V) to collect data.**