



Gasket - cylinder head

12.29.02

Remove

Note: The following procedures cover engines fitted with or without an EGR cooler. The EGR cooler is bolted to the front of the cylinder head.

1. Remove bonnet.

EXTERIOR FITTINGS, REPAIRS, Bonnet.

2. Release turnbuckles and remove battery cover.
3. Disconnect battery earth lead.
4. Drain cooling system.

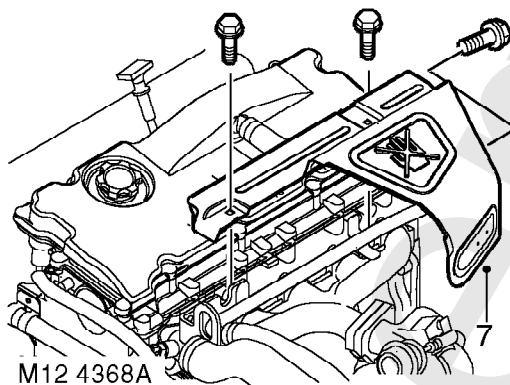
COOLING SYSTEM - Td5, ADJUSTMENTS, Drain and refill.

5. Remove camshaft cover gasket.

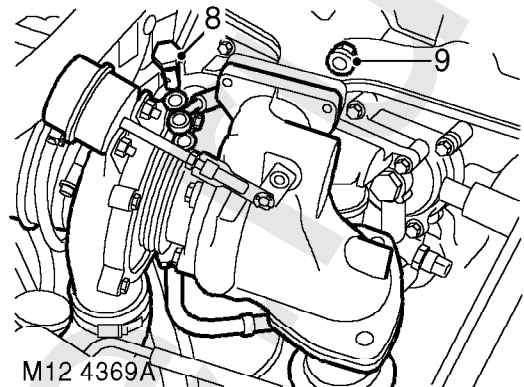
ENGINE - Td5, REPAIRS, Gasket - cover - camshaft.

6. Remove cooling fan coupling.

COOLING SYSTEM - Td5, REPAIRS, Fan - viscous.

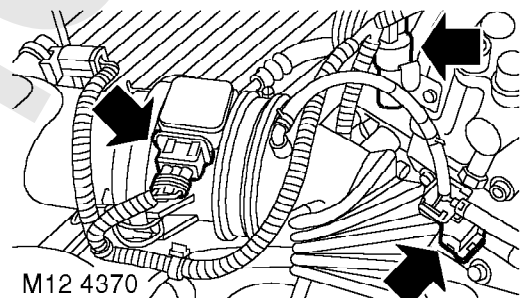


7. Remove 3 bolts and remove exhaust manifold heat shield.

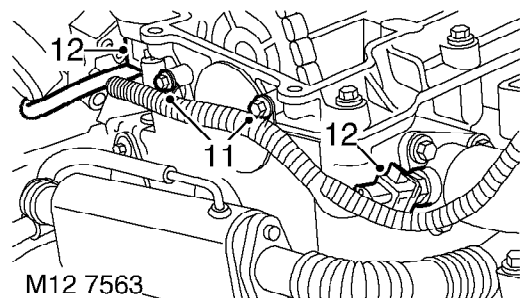


8. Remove turbocharger oil feed banjo bolt and discard sealing washers.

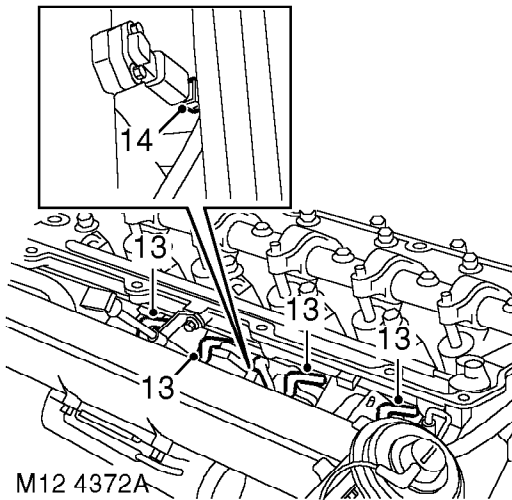
9. Remove 3 nuts, release turbocharger from exhaust manifold, discard gasket and tie turbocharger aside.



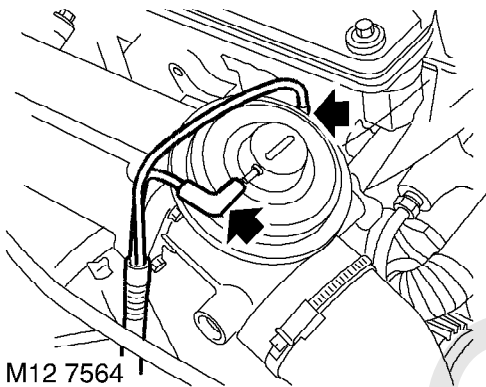
10. Disconnect multiplugs from compressor, MAF sensor, turbocharger wastegate modulator, and AAP & IAT sensor.



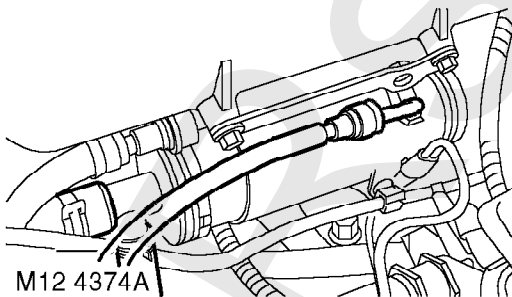
11. Remove 2 bolts securing engine harness to camshaft carrier.
12. Disconnect multiplug from EUI's and coolant temperature sensor.



13. Disconnect 4 glow plug connectors.
14. Disconnect MAP sensor multiplug from inlet manifold.



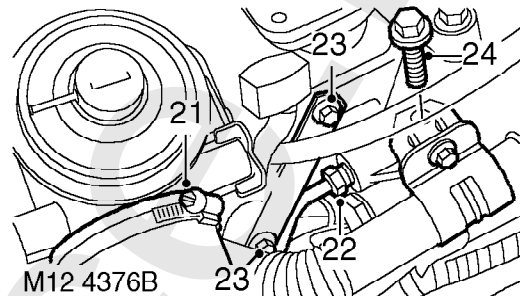
15. Position engine harness clear of inlet manifold.
16. Disconnect vacuum hose from EGR valve.



17. Release 3 clips and disconnect coolant hoses from fuel cooler.
18. Disconnect fuel hoses, tank to fuel cooler and connector block on cylinder head.

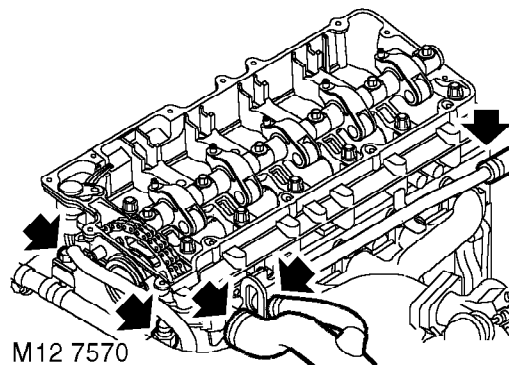
CAUTION: Always fit plugs to open connections to prevent contamination.

19. Disconnect fuel hose from connector block on cylinder head.
20. Disconnect fuel hose from fuel cooler and secure to connector block on cylinder head.
This is to prevent contamination of the fuel injection system.



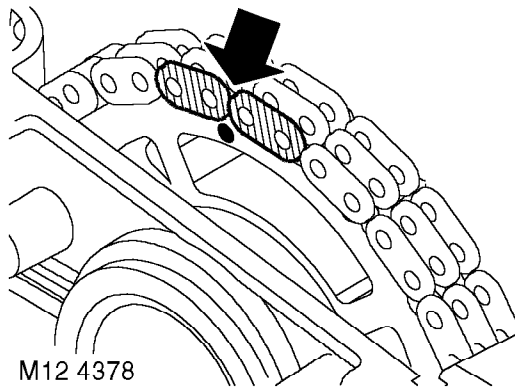
Pre EU3 model shown

21. Loosen clip screw and disconnect air intake hose from EGR valve.
22. Loosen vacuum pump oil feed pipe union from cylinder head and discard 'O' ring.
23. Loosen 2 bolts and release alternator support bracket from cylinder head.
24. **Pre EU3 model:** Remove bolt securing EGR valve pipe clamp to cylinder head.
25. **EU3 model:** Release the clips and disconnect the coolant hoses from the EGR cooler.

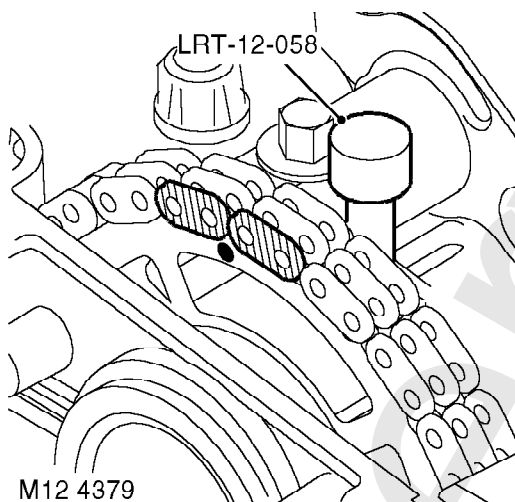


26. Remove nut and bolt securing cylinder head to timing chain cover.
27. Release clips and disconnect top hose, heater hose and heater feed hose.
28. Raise front of vehicle.

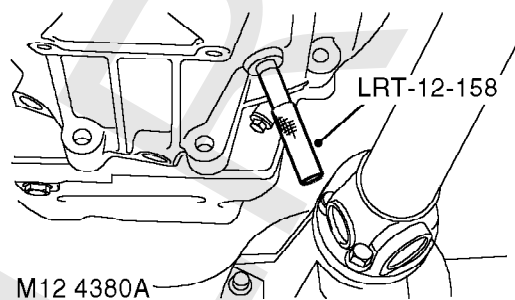
WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.



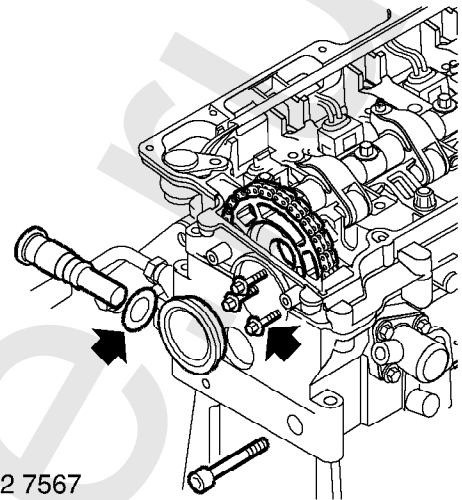
29. Rotate engine clockwise to align mark on camshaft sprocket between coloured links on timing chain.



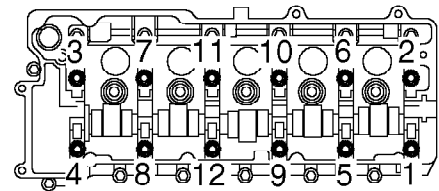
30. Position tool **LRT-12-058** through camshaft carrier to lock camshaft.



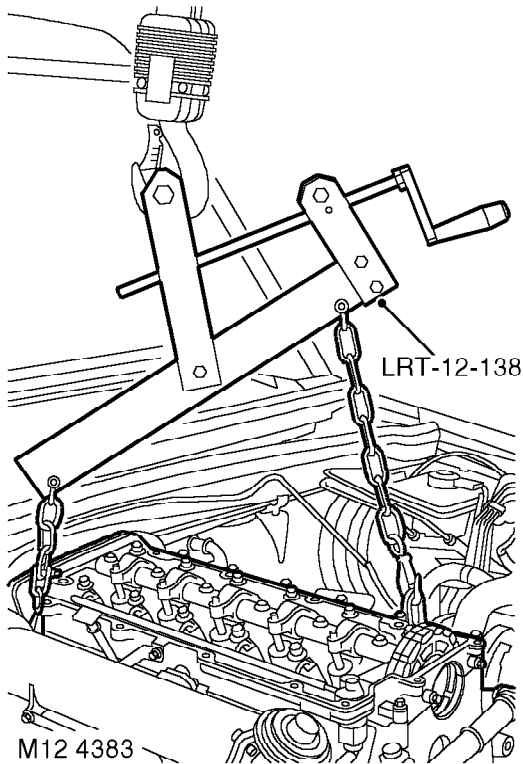
31. Position tool **LRT-12-158** through gearbox bell housing to lock crankshaft.



32. Remove timing chain tensioner and discard sealing washer.
33. Remove timing chain fixed guide Allen screw from front of cylinder head.
34. Lever out camshaft sprocket blanking plug and 'O'-ring seal from front of cylinder head and discard.
35. Remove 3 bolts and release timing sprocket from camshaft. Discard bolts.



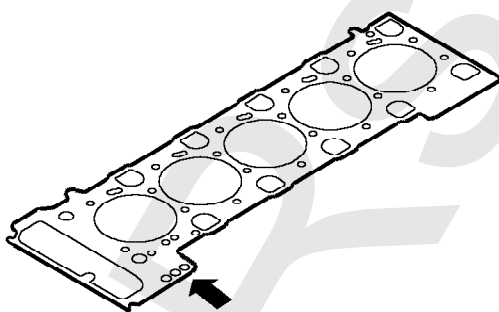
36. Using sequence shown, progressively loosen then remove and discard 12 cylinder head bolts together with their captive washers.



37. Using suitable lifting chains and tool **LRT-12-138** carefully remove cylinder head and place on wooden blocks or stands.

CAUTION: Support both ends of cylinder head on blocks of wood. With the camshaft carrier bolted down, the injector nozzles and some of the valves will protrude from the face of the cylinder head.

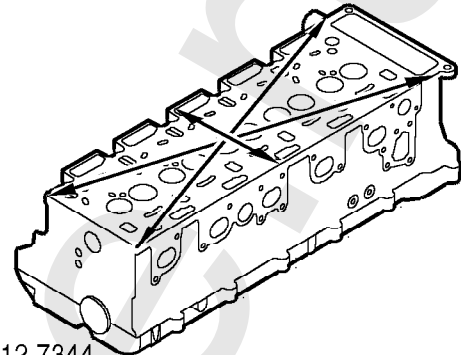
38. Remove cylinder head gasket.



39. Note the gasket thickness indicator and ensure the same thickness gasket is used on refitment of cylinder head.
40. Remove and discard plastic dowels from cylinder block.

Refit

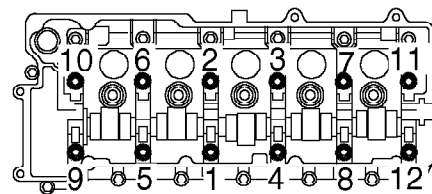
1. Clean mating faces of cylinder head and cylinder block.



2. Check cylinder head for warping, across centre and from corner to corner: – Maximum warp = 0.10 mm (0.0004 in)

CAUTION: Cylinder heads may not be refaced, replace cylinder head if warping exceeds figure given.

3. Ensure coolant and oil passages are clean.
4. Clean dowel holes and fit new plastic dowels.
5. Lightly lubricate threads and beneath heads of cylinder head bolts with clean engine oil.
6. Fit new cylinder head gasket of the correct thickness with the word 'TOP' uppermost.
7. Using assistance, fit cylinder head and locate onto dowels.
8. Carefully enter cylinder head bolts, **DO NOT DROP**. Lightly tighten bolts.



M12 4384

9. Using the sequence shown, progressively tighten cylinder head bolts to 30 Nm (22 lbf.ft), then to 65 Nm (48 lbf.ft), then a further 90°, then a further 180° and finally a further 45°.

CAUTION: Ensure correct sequence is followed for all 5 tightening stages. Do not tighten bolts 315 degrees in one operation.

10. Fit nut and bolt securing cylinder head to timing chain cover and tighten to 25 Nm (18 lbf.ft).



11. Clean camshaft sprocket and mating face on camshaft.
12. Ensure engine is set to TDC No. 1 cylinder and mark on camshaft sprocket is positioned between the 2 coloured links.
13. Position camshaft sprocket to camshaft; fit and lightly tighten new bolts, then loosen bolts half a turn.
14. Clean timing chain fixed guide retaining pin and apply Loctite 242 to threads.
15. Fit timing chain fixed guide retaining pin and tighten to 25 Nm (18 lbf.ft) .
16. Clean timing chain tensioner and fit new sealing washer.
17. Fit timing chain tensioner and tighten to 45 Nm (22 lbf.ft).
18. Tighten bolts securing camshaft sprocket to camshaft to 37 Nm (27 lbf.ft).
19. Remove tool **LRT-12-058** from camshaft.
20. Remove tool **LRT-12-158** from gearbox bell housing.
21. Fit new camshaft bore blanking plug and 'O'-ring seal in recess in cylinder head.
22. Clean vacuum pump union.
23. Tighten union securing vacuum pump oil feed pipe to cylinder head to 10 Nm (7 lbf.ft) .
24. Fit bolts securing alternator support bracket to cylinder head and tighten to 25 Nm (18 lbf.ft) .
25. Connect top hose and heater hoses and secure with clips.
26. **Pre EU3 model:** Fit bolt securing EGR pipe clamp to cylinder head bolt and tighten to 10 Nm (7 lbf.ft) .
27. **EU3 model:** Connect coolant hoses to EGR cooler and secure with the clips.
28. Position air intake hose to EGR valve and tighten clip screw.
29. Disconnect fuel hose from connector block and connect to fuel cooler.
30. Connect fuel hoses to fuel cooler and connector block on cylinder head.
31. Connect coolant hoses to fuel cooler and secure clips.
32. Connect vacuum hose to EGR valve.
33. Position engine harness and connect multi plugs and glow plug connectors.
34. Fit and tighten bolts, engine harness to camshaft carrier.
35. Clean exhaust manifold and turbocharger interface.
36. Fit new gasket to exhaust manifold, position turbocharger and tighten – nuts securing turbocharger to manifold to 30 Nm (22 lbf.ft).
37. Clean turbocharger oil feed hose bolt.
38. Position turbocharger oil feed hose using new sealing washers. Fit banjo bolt securing turbocharger oil feed hose and tighten to 25 Nm (18 lbf.ft) .
39. Position exhaust manifold heatshield and tighten M6 bolts to 9 Nm (7 lbf.ft) and M8 bolt to 25 Nm (18 lbf.ft).
40. Fit cooling fan coupling.
 **COOLING SYSTEM - Td5, REPAIRS, Fan - viscous.**
41. Fit camshaft cover with new seal.
 **ENGINE - Td5, REPAIRS, Gasket - cover - camshaft.**
42. Refill cooling system.
 **COOLING SYSTEM - Td5, ADJUSTMENTS, Drain and refill.**
43. Connect battery earth lead.
44. Fit battery cover and secure fixings.
45. Fit bonnet.
 **EXTERIOR FITTINGS, REPAIRS, Bonnet.**