



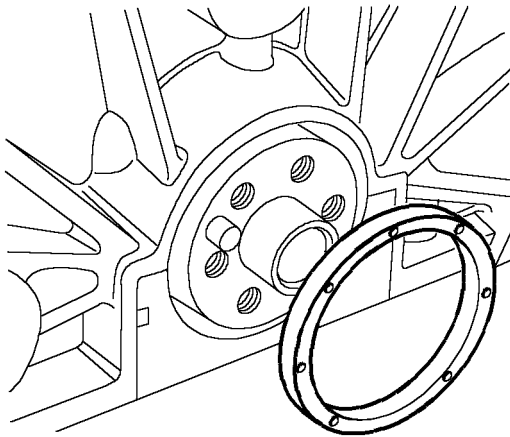


## Seal - crankshaft - rear

➔ 12.21.20

### Remove

1. **Automatic gearbox models:** Remove converter drive plate.  
 **ENGINE - V8, REPAIRS, Plate - drive - automatic.**
2. **Manual gearbox models:** Remove flywheel.  
 **ENGINE - V8, REPAIRS, Flywheel.**

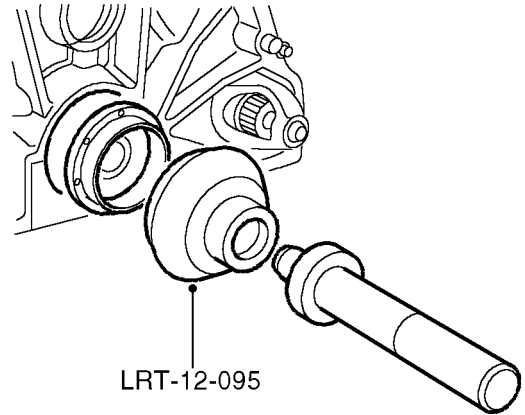


M12 4665



3. Carefully remove oil seal from cylinder block to avoid damage to seal location or running surface on crankshaft. Discard seal.

### Refit

1. Ensure both seal location and running surface on crankshaft are clean.



M12 4666

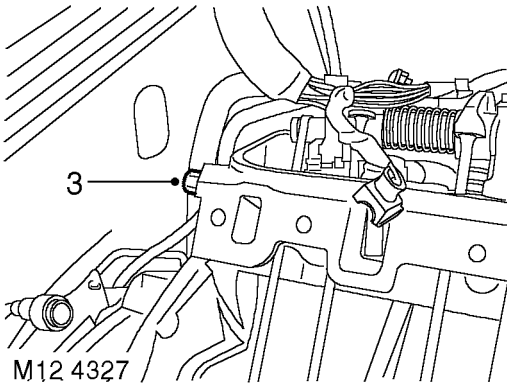
2. Lubricate seal guide **LRT-12-095** with clean engine oil and fit guide to crankshaft.
3. Lubricate oil seal lip with clean engine oil.
4. Fit seal squarely onto crankshaft and remove guide.
5. Fit seal into location using **LRT-12-091**.
6. **Automatic gearbox models:** Fit converter drive plate.  
 **ENGINE - V8, REPAIRS, Plate - drive - automatic.**
7. **Manual gearbox models:** Fit flywheel.  
 **ENGINE - V8, REPAIRS, Flywheel.**

## Gasket - cylinder head - LH

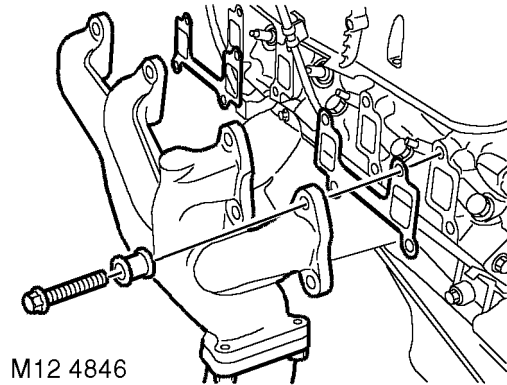
12.29.02

### Remove

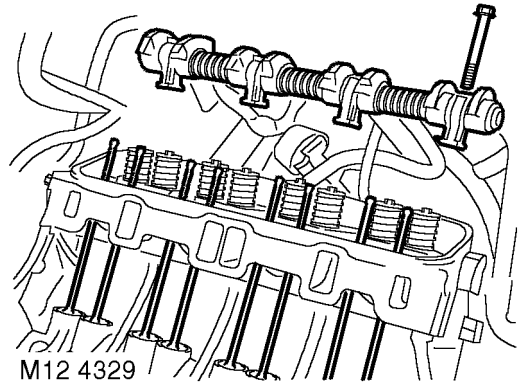
1. Remove inlet manifold gasket.  
**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - lower.**
2. Noting their fitted order, disconnect ht leads from spark plugs.



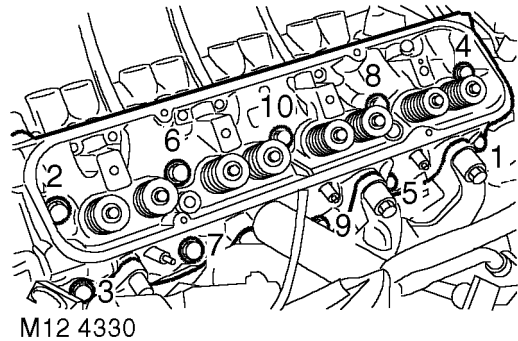
3. Remove bolt securing engine harness to rear of cylinder head.



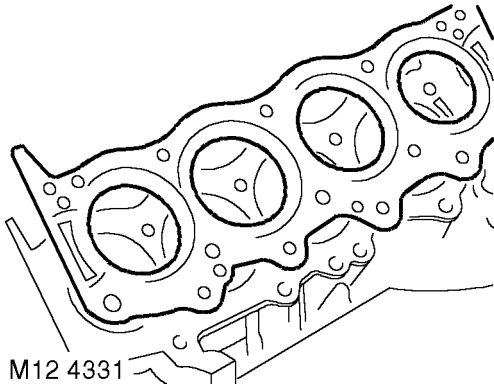
4. Remove 8 bolts securing exhaust manifold to cylinder head, release manifold and collect 2 gaskets.



5. Progressively remove 4 bolts securing the rocker shaft and remove rocker shaft.
6. Remove push rods. **Store push rods in their fitted order.**



7. In the sequence shown, remove 10 bolts securing the cylinder head to block. Discard the bolts.
8. Remove cylinder head.  
**CAUTION: Support both ends of cylinder head on blocks of wood.**



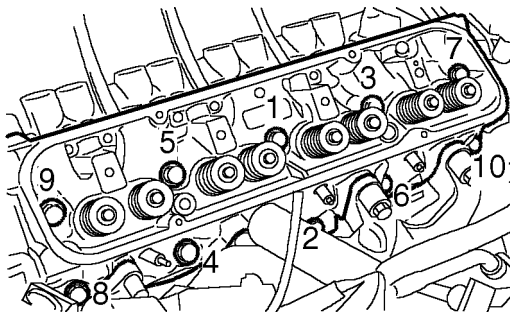
- Remove cylinder head gasket.

#### Refit

- Clean mating faces of cylinder block and head using suitable gasket removal spray and a plastic scraper, ensure that bolt holes in block are clean and dry. Clean mating faces of cylinder head and exhaust manifold.

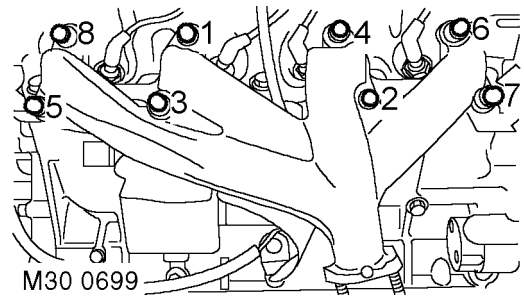
**CAUTION: Do not use a metal scraper or machined surfaces may be damaged.**

- Check head and block faces for warping and pitting. If out of specification, renew head.
  - Fit cylinder head gasket with the word 'TOP' uppermost.
- CAUTION: Gaskets must be fitted dry.**
- Carefully fit cylinder head and locate on dowels.
  - Lightly lubricate new cylinder head bolt threads with clean engine oil.



- Noting that bolts 1, 3 and 5 are longer than the remainder, fit cylinder head bolts and tighten in the sequence shown to 20 Nm (15 lbf.ft) then 90° , and finally a further 90° .
- Clean push rods.

- Lubricate ends of push rods with clean engine oil.
- Fit push rods in their removed order.
- Clean bases of rocker pillars and mating faces on cylinder head.
- Clean contact surfaces on rockers, valves and push rods.
- Lubricate contact surfaces and rocker shaft with clean engine oil.
- Fit rocker shaft assembly and engage push rods.
- Fit rocker shaft bolts and progressively tighten to 40 Nm (30 lbf.ft).



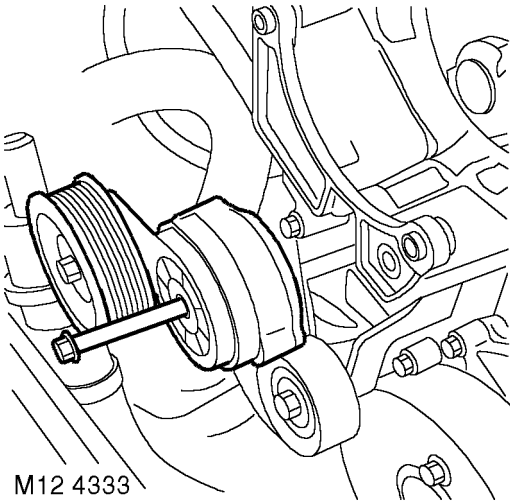
- Using new gaskets, position exhaust manifold to cylinder head, fit bolts and tighten to 55 Nm (40 lbf.ft).
  - Fit engine harness bolt and tighten to 22 Nm (16 lbf.ft).
  - Connect ht leads to spark plugs in their correct fitted order.
  - Fit inlet manifold gasket.
- MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - lower.**

## Gasket - cylinder head - RH

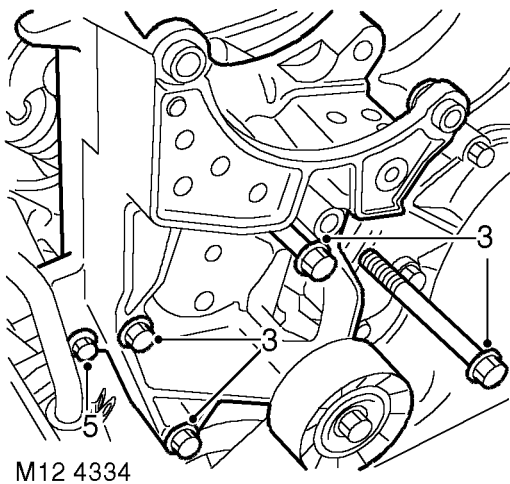
12.29.03

### Remove

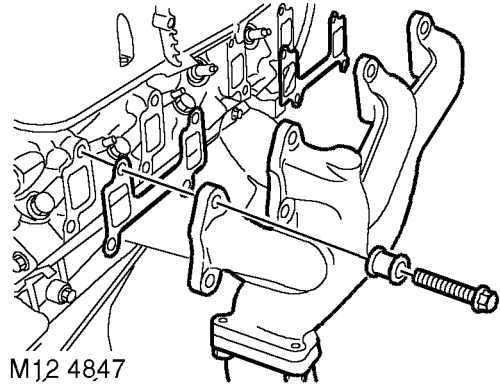
1. Remove inlet manifold gasket.  
**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - lower.**



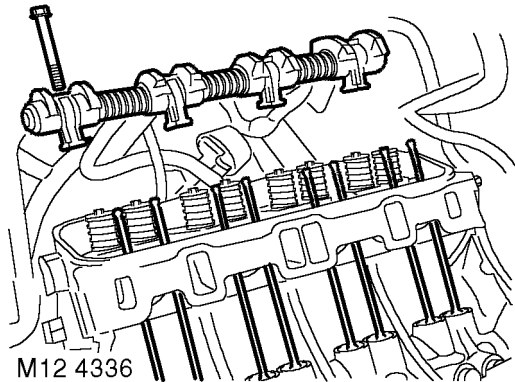
2. Remove bolt securing auxiliary drive belt tensioner and remove tensioner.



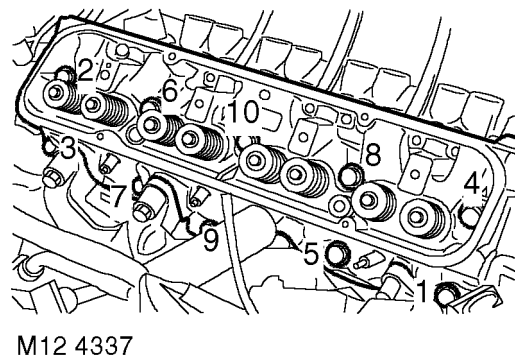
3. Remove 4 bolts securing alternator mounting bracket and remove bracket.
4. Noting their fitted order, disconnect ht leads from spark plugs.
5. Remove bolt securing engine earth lead.



6. Remove 8 bolts securing exhaust manifold to cylinder head, release manifold and collect 2 gaskets.

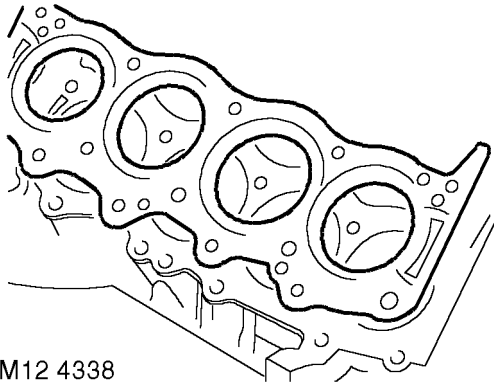


7. Progressively remove 4 bolts securing the rocker shaft and remove rocker shaft.
8. Remove push rods. **Store push rods in their fitted order.**

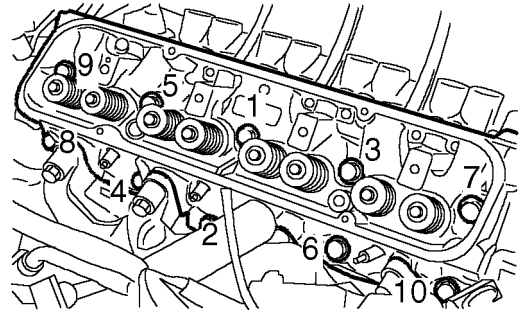


9. In the sequence shown, remove 10 bolts securing the cylinder head to block.
10. Remove cylinder head.

**CAUTION: Support both ends of cylinder head on blocks of wood.**



M12 4338



M12 4361

11. Remove cylinder head gasket.

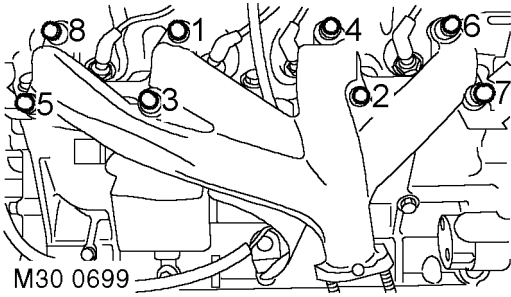
#### Refit

1. Clean mating faces of cylinder block and head using suitable gasket removal spray and a plastic scraper, ensure that bolt holes in block are clean and dry. Clean mating faces of cylinder head and exhaust manifold.

**CAUTION: Do not use a metal scraper or machined surfaces may be damaged.**

2. Check head and block faces for warping and pitting. If out of specification, renew head.
3. Check head and block faces for warping and pitting.
4. Fit cylinder head gasket with the word 'TOP' uppermost.  
**CAUTION: Gaskets must be fitted dry.**
5. Carefully fit cylinder head and locate on dowels.
6. Lightly lubricate new cylinder head bolt threads with clean engine oil.

7. Noting that bolts 1, 3 and 5 are longer than the remainder, fit bolts and tighten in the sequence shown to 20 Nm (15 lbf.ft) then 90°, and finally a further 90°.
8. Clean push rods.
9. Lubricate ends of push rods with clean engine oil.
10. Fit push rods in their removed order.
11. Clean bases of rocker pillars and mating faces on cylinder head.
12. Clean contact surfaces on rockers, valves and push rods.
13. Lubricate contact surfaces and rocker shaft with clean engine oil.
14. Fit rocker shaft assembly and engage push rods.
15. Fit rocker shaft bolts and progressively tighten to 40 Nm (30 lbf.ft).
16. Position alternator mounting bracket, fit bolts and tighten to 40 Nm (30 lbf.ft).
17. Position auxiliary drive belt tensioner, fit bolt and tighten to 45 Nm (33 lbf.ft).
18. Connect ht leads to spark plugs in their fitted order.



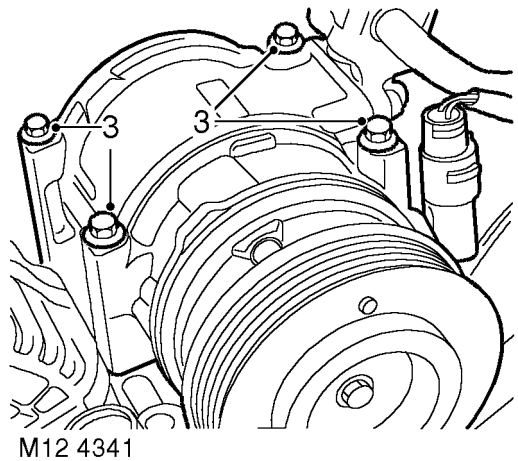
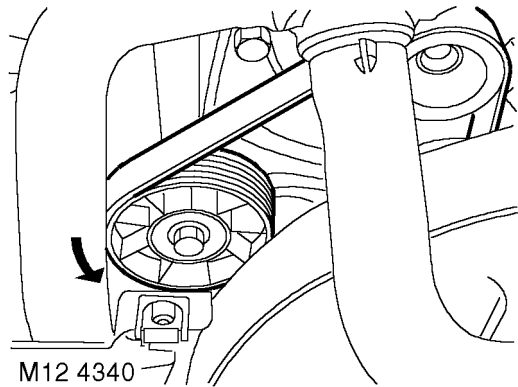
19. Using a new gaskets, fit exhaust manifold to cylinder head. Fit bolts and tighten to 55 Nm (40 lbf.ft).
20. Position engine earth lead, fit bolt and tighten to 22 Nm (16 lbf.ft).
21. Fit inlet manifold gasket.  
**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - lower.**

## Gasket - rocker cover - LH

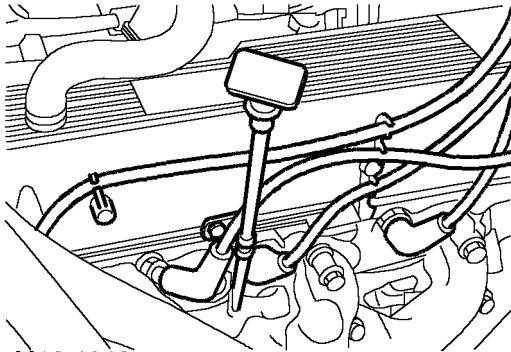
12.29.40

### Remove

1. Remove upper inlet manifold gasket.  
**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - upper.**
2. **Models with air conditioning:** Release 4 clips and remove fan cowl.

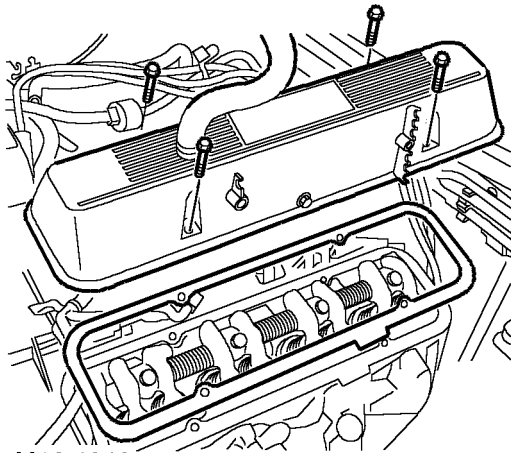


3. **Models with air conditioning:** Release tension on auxiliary drive belt and remove belt from air conditioning compressor. Disconnect compressor multiplug. Remove 4 bolts securing compressor and position compressor aside.



M12 4342

4. Release ht leads from rocker cover clips.
5. Remove screw securing dip stick tube.



M12 4343

6. Remove 4 bolts securing rocker cover.
7. Remove rocker cover and collect gasket.

#### Refit

1. Clean mating faces of rocker cover and cylinder head.
2. Using a new gasket, position rocker cover ensuring gasket is correctly located.
3. Fit rocker cover bolts and, working in diagonal sequence, tighten to 8 Nm (6 lbf.ft).
4. Fit and tighten screw securing dip stick tube.
5. Secure ht leads in rocker cover clips.
6. **Models with air conditioning:** Clean compressor dowels and dowel holes. Position compressor, fit bolts and tighten to 22 Nm (16 lbf.ft). Release auxiliary drive belt tensioner and fit belt to compressor.
7. **Models with air conditioning:** Position fan cowl and secure clips.
8. Fit upper inlet manifold.

**MANIFOLDS AND EXHAUST SYSTEMS**  
**- V8, REPAIRS, Gasket - inlet manifold - upper.**

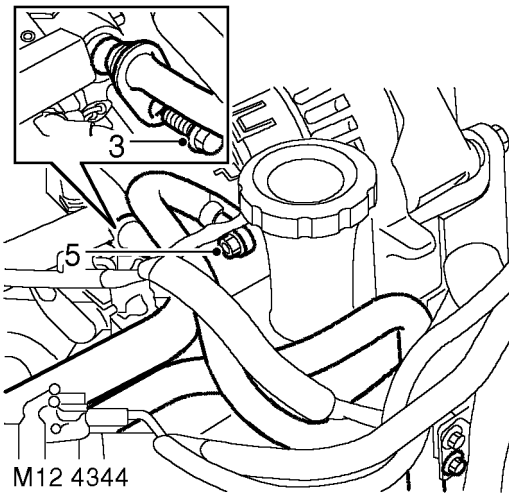
## ENGINE - V8

### Gasket - rocker cover - RH

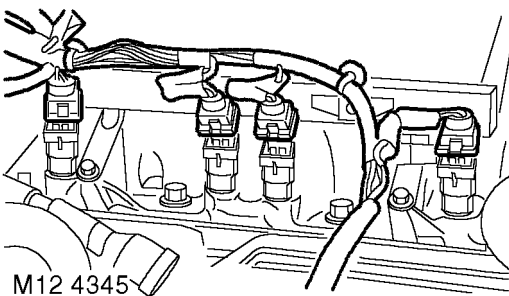
🔑 12.29.41

#### Remove

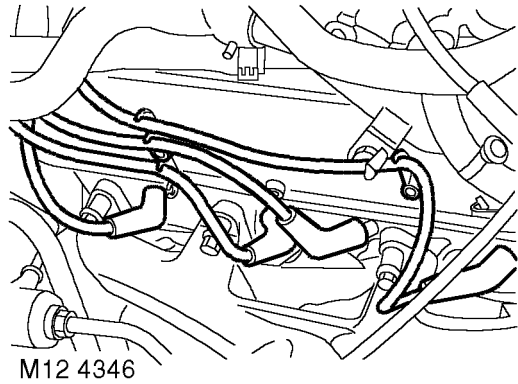
1. Drain cooling system.  
👉 **COOLING SYSTEM - V8, ADJUSTMENTS, Drain and refill.**
2. Remove upper inlet manifold gasket.  
👉 **MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - upper.**



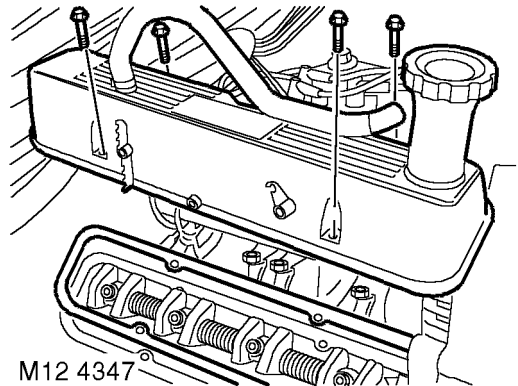
3. Remove 2 bolts securing coolant rails to inlet manifold and cylinder block.
4. Release coolant rail from inlet manifold and discard 'O' ring.
5. Remove nuts securing alternator cables and release cables from alternator.



6. Disconnect multiplugs from RH bank of injectors and release harness from fuel rail.





7. Release ht leads from clips on rocker cover.




8. Remove 4 bolts securing rocker cover.
9. Remove rocker cover and collect gasket.



### Refit

1. Clean mating faces of rocker cover and cylinder head.
2. Using a new gasket, position rocker cover ensuring gasket is correctly located.
3. Fit rocker cover bolts and, working in diagonal sequence, tighten to 8 Nm (6 lbf.ft).
4. Secure ht leads in rocker cover clips.
5. Secure injector harness to fuel rail and connect multiplugs to injectors.
6. Position alternator cables, and tighten terminal B+ nut to 18 Nm (13 lbf.ft) and terminal D+ nut to 5 Nm (3 lbf.ft).
7. Clean coolant rail 'O' ring recess.
8. Lubricate and fit new 'O' ring to coolant rail, position coolant rails, fit bolts and tighten to 22 Nm (16 lbf.ft).
9. Fit upper inlet manifold.  
 **MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - upper.**
10. Refill cooling system.  
 **COOLING SYSTEM - V8, ADJUSTMENTS, Drain and refill.**


### Mounting - front - LH

 12.45.01

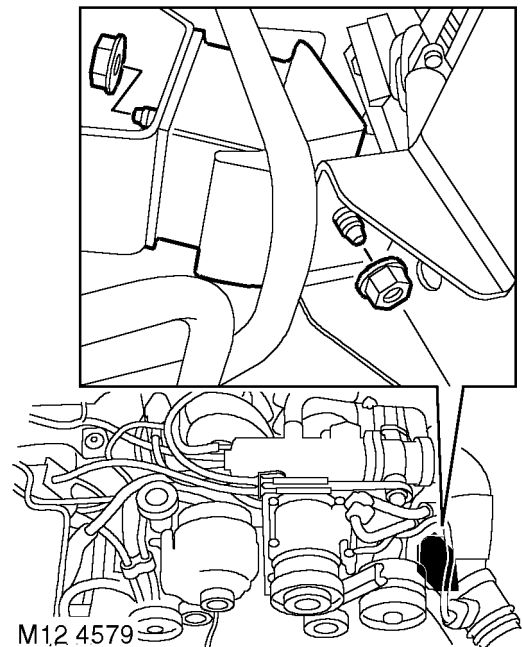
#### Remove

1. Release turnbuckles and remove battery cover.
2. Disconnect battery earth lead.
3. 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.**

4. Remove underbelly panel.  
 **EXTERIOR FITTINGS, REPAIRS, Panel - underbelly.**
5. Position a jack beneath the sump, and support the engine on the jack.

**CAUTION: To prevent damage to components, cushion the jack pad with a block of wood or hard rubber.**




6. Remove 2 nuts securing engine mountings to chassis.
7. Remove nut securing LH mounting to cylinder block.
8. Raise engine sufficiently to allow engine mounting to be removed, take care not to trap any cables, pipes or harness.
9. Remove engine mounting.

## ENGINE - V8

---


### Refit

1. Fit engine mounting ensuring dowel is located.
2. Lower the jack and engage engine mounting studs in chassis.
3. Fit nuts securing LH engine mounting and tighten to 85 Nm (63 lbf.ft).
4. Fit underbelly panel.  
 **EXTERIOR FITTINGS, REPAIRS, Panel - underbelly.**
5. Remove stand(s) and lower vehicle.
6. Connect battery earth lead.
7. Fit battery cover and secure turnbuckles.

---

### Mounting - front - RH


---

 12.45.03

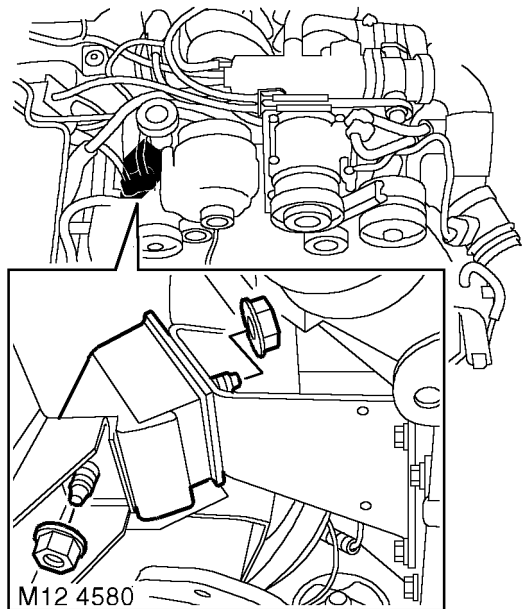
### Remove

1. Release turnbuckles and remove battery cover.
2. Disconnect battery earth lead.
3. 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.**

4. Remove underbelly panel.  
 **EXTERIOR FITTINGS, REPAIRS, Panel - underbelly.**
5. Position a jack beneath the sump, and support the engine on the jack.


**CAUTION: To prevent damage to components, cushion the jack pad with a block of wood or hard rubber.**




6. Remove 2 nuts securing engine mountings to chassis.
7. Remove nut securing RH mounting to cylinder block.
8. Raise engine sufficiently to allow engine mounting to be removed. Take care not to trap any cables, pipes or harness.
9. Remove engine mounting.
10. Collect heat shield.



### Refit

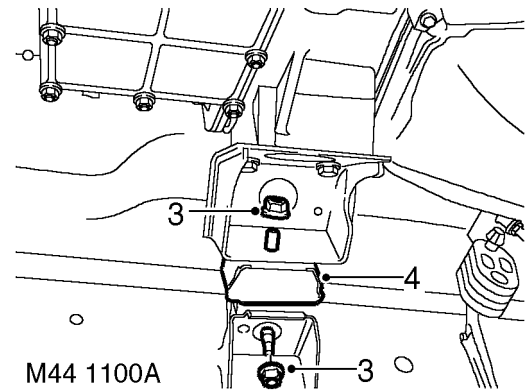
1. Position heat shield.
2. Fit engine mounting ensuring dowel is located.
3. Lower the jack and engage engine mounting studs in chassis.
4. Fit engine mounting nuts and tighten to 85 Nm (63 lbf.ft).
5. Fit underbelly panel.
  -  **EXTERIOR FITTINGS, REPAIRS, Panel - underbelly.**
6. Remove stand(s) and lower vehicle.
7. Connect battery earth lead.
8. Fit battery cover and secure turnbuckles.

### Mounting - engine - rear - LH

 12.45.07

### Remove

1. Raise vehicle on ramp.
2. Position jack to support gearbox.



3. Remove 2 nuts and remove mounting.
4. Remove heat shield from mounting.

### Refit

1. Clean mounting and mating faces.
2. Position heat shield to mounting.
3. Position engine mounting and tighten nuts to 85 Nm (63 lbf.ft).
4. Lower support jack.
5. Lower vehicle.

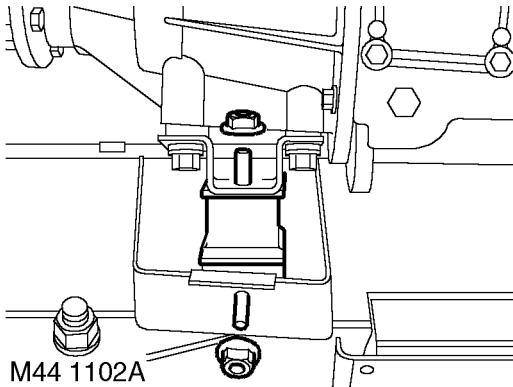
## ENGINE - V8

### Mounting - engine - rear - RH

🔑 12.45.09

#### Remove

1. Raise vehicle on ramp.
2. Position jack to support gearbox.



3. Remove 2 nuts and remove mounting.

#### Refit

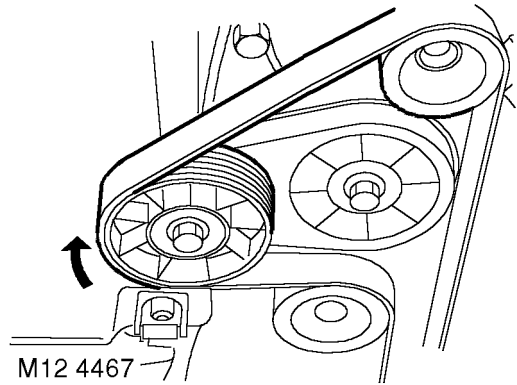
1. Clean mounting and mating faces.
2. Position engine mounting and tighten nuts to 85 Nm (63 lbf.ft).
3. Lower support jack.
4. Lower vehicle.

### Engine assembly

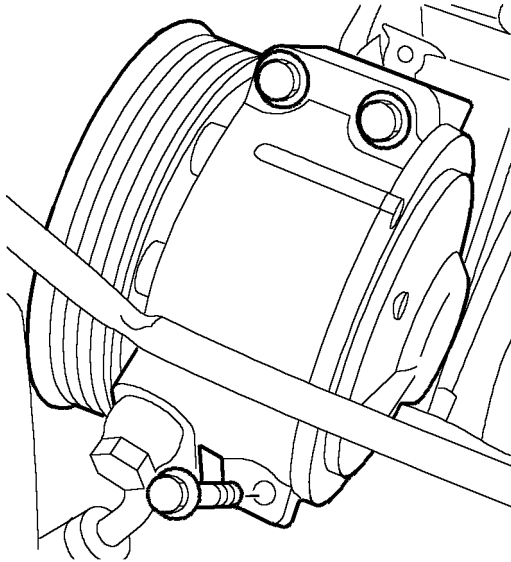
🔑 12.41.01.99

#### Remove

1. Drain engine oil and remove oil filter.
2. Remove radiator.  
👉 **COOLING SYSTEM - V8, REPAIRS, Radiator.**
3. Remove upper inlet manifold.  
👉 **MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - upper.**
4. Remove ignition coil assemblies.
5. Position absorbent material to catch spillage and disconnect fuel pipe from fuel rail.  
**CAUTION: Always fit plugs to open connections to prevent contamination.**
6. Release 2 hose clips and remove top hose.

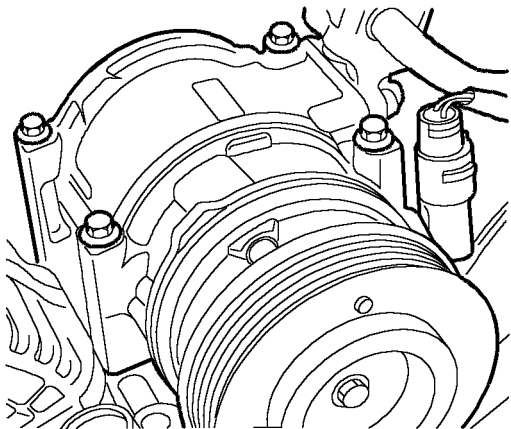


7. Using a 15 mm spanner, release auxiliary drive belt tension and remove drive belt.



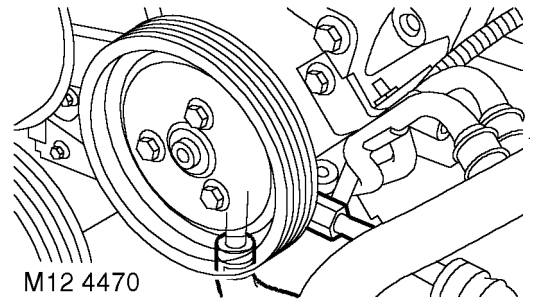
M12 4468

8. Remove 3 bolts securing ACE pump, release pump and tie aside.



M12 4469

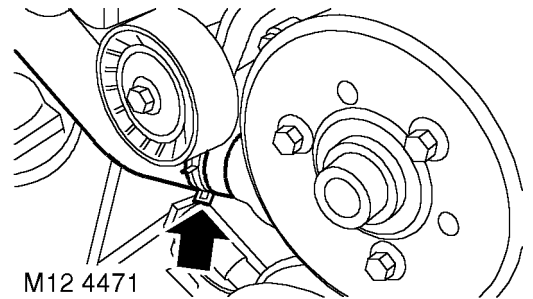
9. Disconnect multiplug from A/C compressor.  
10. Remove 4 bolts securing A/C compressor, release compressor and tie aside.



M12 4470

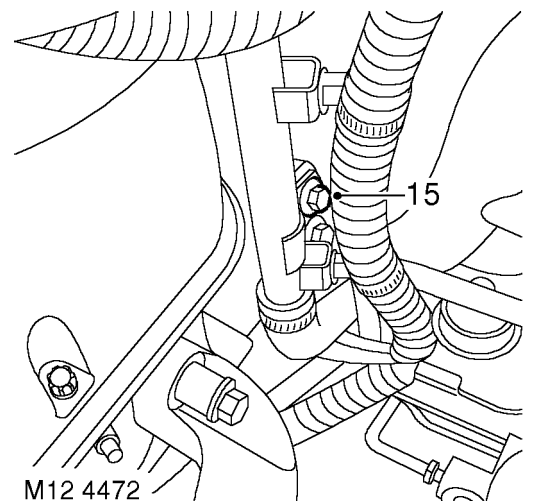
11. Remove bolt securing oil cooling pipes to PAS pump housing and remove saddle clamp.  
12. Release PAS pump high and low pressure pipes and position aside.

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



M12 4471

13. Release clips securing hose to coolant pump and coolant rail, release hose and position aside.



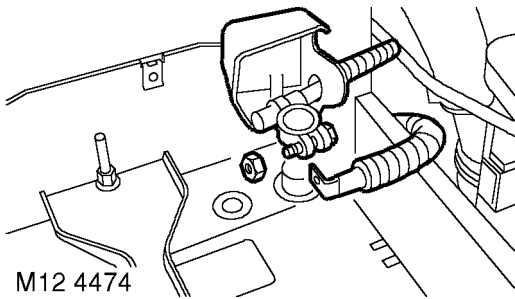
M12 4472

14. Release 2 harness clips from coolant rail.  
15. Remove bolt securing coolant rail and position rail aside.

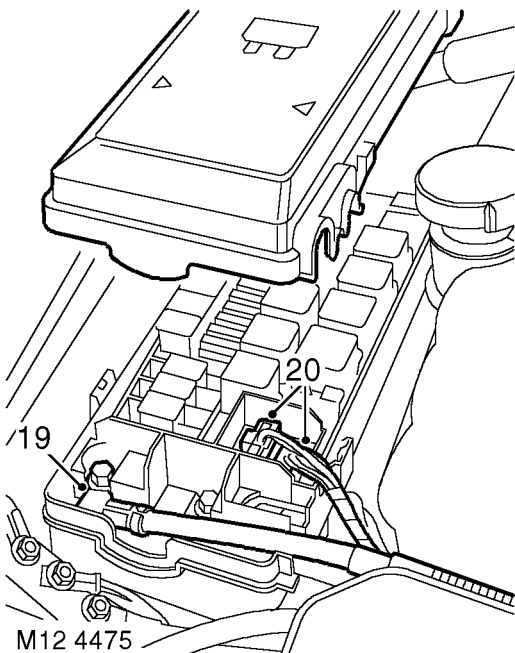
## ENGINE - V8

---

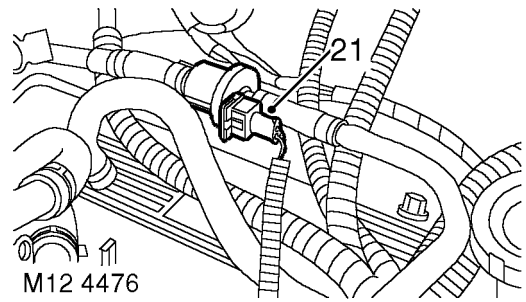
16. Remove bolt securing engine earth lead and position earth lead aside.



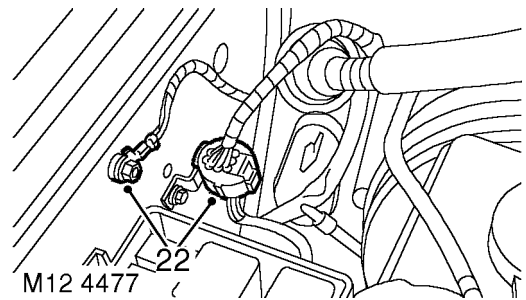
17. Remove nut securing engine harness positive lead to battery, release lead and position aside.



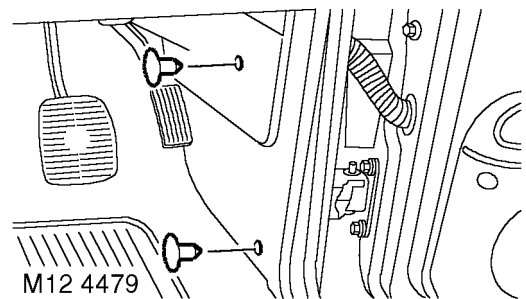
18. Release clips and remove fuse box cover.  
19. Remove bolt securing starter lead to fuse box, release lead and position aside.  
20. Disconnect 2 engine harness multiplugs from fuse box.



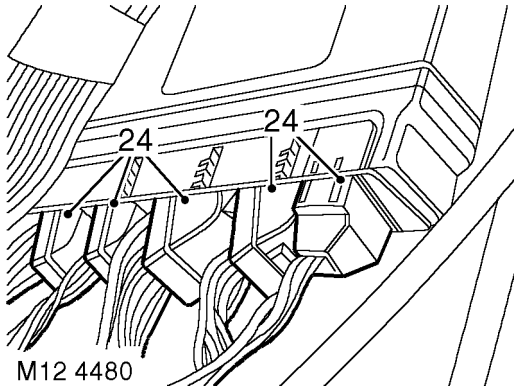
21. Disconnect multiplug from EVAP purge valve.



22. Remove nut securing engine harness earth to body and disconnect engine harness to main harness multiplug.

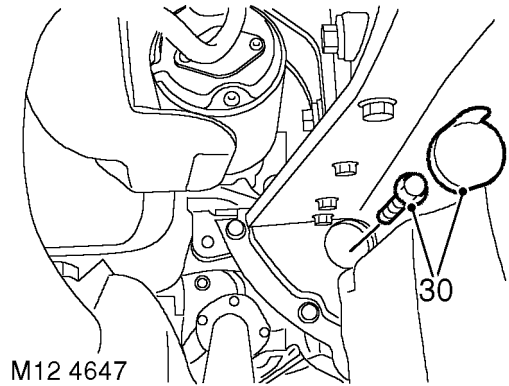


23. Remove trim fixings securing toe board and remove toe board.



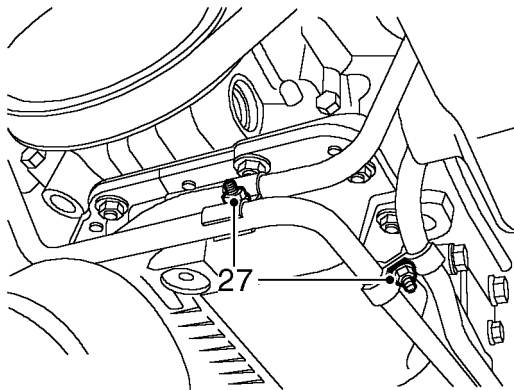
M12 4480

24. Disconnect 5 multiplugs connecting engine harness to ECM.
25. Release engine harness, pull into engine bay and coil on top of engine.
26. Raise vehicle on ramp.



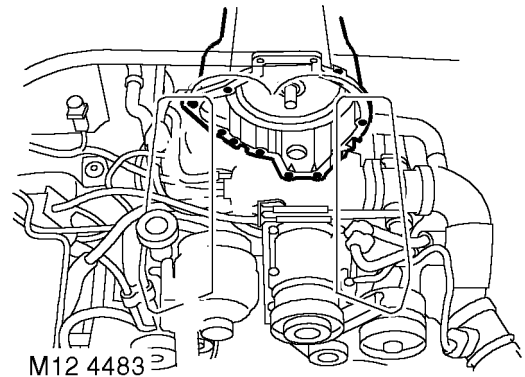
M12 4647

30. **Models with automatic gearbox:** Remove access plug and remove 4 bolts securing torque converter to drive plate.
31. Rotate engine to access bolts.



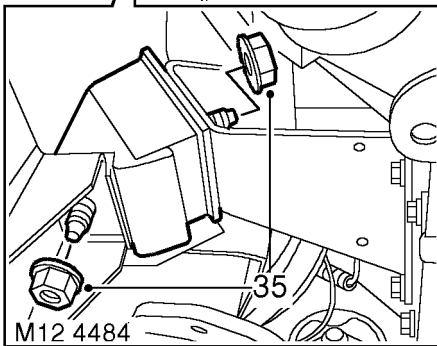
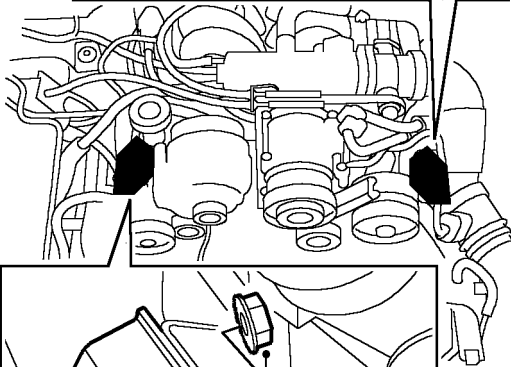
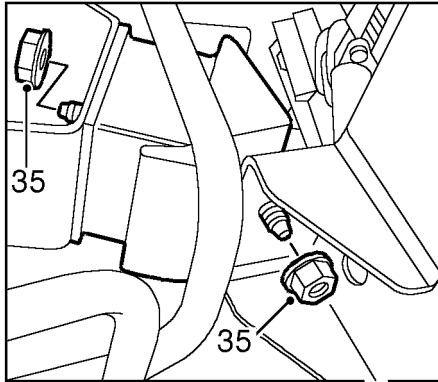
M12 4481

27. Remove 3 bolts securing oil cooling pipes to sump and remove saddle clamps.
  28. Tie oil cooling pipes aside.
  29. Remove exhaust front pipe.
- MANIFOLDS AND EXHAUST SYSTEMS**  
- V8, REPAIRS, Front pipe.

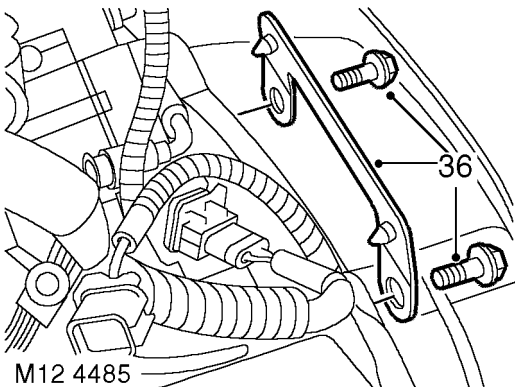


M12 4483

32. Remove 12 bolts securing engine to gearbox. **DO NOT remove the top 2 bolts at this stage.**
33. Collect support brackets from bell housing bolts.
34. Attach suitable lifting equipment to engine.



35. Remove 4 nuts securing engine mountings, raise engine and remove engine mountings.



36. Lower engine, remove top bolts securing engine to gearbox and collect bracket.  
 37. Support gearbox on a jack.  
 38. Release engine from gearbox dowels.  
 39. With assistance remove engine from engine bay.

**Refit**

1. Clean mating faces of engine and gearbox, dowel and dowel holes.
2. Lubricate splines and bearing surface on first motion shaft with grease.
3. With assistance position engine in engine bay, align to gearbox and locate on dowels.
4. Position support brackets, fit bell housing bolts and tighten to 50 Nm (37 lbf.ft).
5. Position engine mountings, fit nuts and tighten to 85 Nm (63 lbf.ft).
6. Lower lifting equipment and remove from engine.
7. **Models with automatic gearbox:** Align torque converter to drive plate, fit bolts and tighten to 50 Nm (37 lbf.ft). Fit access plug.
8. Fit exhaust front pipe.

**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Front pipe.**

9. Position oil cooling pipe saddle clamps and tighten bolts.
10. Position engine harness into foot well.
11. Connect 5 multiplugs to ECM.
12. Fit toe board and secure with trim fixings.
13. Connect engine harness earth to body and secure with nut.
14. Connect engine harness to main harness multiplug.
15. Connect multiplug to EVAP purge valve.
16. Connect engine harness multiplugs to fuse box.
17. Connect starter lead to fuse box and secure with nut.
18. Connect engine harness positive lead to battery and tighten nut.
19. Fit fuse box cover.
20. Position engine earth lead and secure with bolt.
21. Position coolant rail and secure with bolt.
22. Connect harness clips to coolant rail.
23. Connect hose to coolant rail and coolant pump and secure with clips.
24. Connect PAS pump high and low pressure pipes and secure with clips.
25. Position oil cooling pipe saddle clamp to PAS pump housing and secure with bolt.
26. Clean A/C compressor and housing mating faces, dowels and dowel holes.
27. Position A/C compressor, fit bolts and tighten to 22 Nm (16 lbf.ft).
28. Connect multiplug to A/C compressor.
29. Clean ACE pump and housing mating faces, dowels and dowel holes.
30. Position ACE pump, fit bolts and tighten to 22 Nm (16 lbf.ft).
31. Clean all pulley 'V's, fit auxiliary drive belt, using a 15mm spanner, release belt tensioner secure belt and re-tension drive belt.



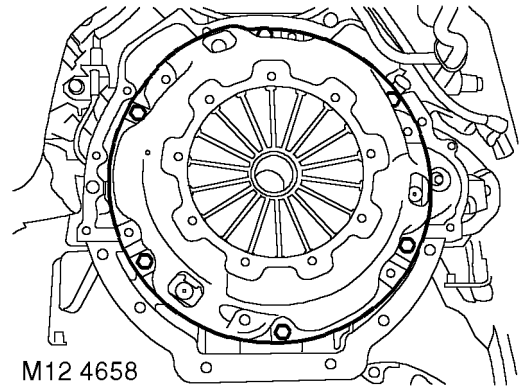
32. Ensure auxiliary drive belt is correctly located on all pulleys.
33. Fit radiator.  
**COOLING SYSTEM - V8, REPAIRS, Radiator.**
34. Fit top hose and secure with clips.
35. Connect fuel pipe to fuel rail.
36. Position ignition coils and connect ht leads.
37. Fit upper inlet manifold.  
**MANIFOLDS AND EXHAUST SYSTEMS - V8, REPAIRS, Gasket - inlet manifold - upper.**
38. Fit new oil filter and refill engine with oil.  
**ENGINE - V8, REPAIRS, Filter - oil.**  
**MAINTENANCE, PROCEDURES, Engine oil - V8 engine.**
39. Top up gearbox oil.  
**MAINTENANCE, PROCEDURES, Automatic gearbox.**

## Flywheel

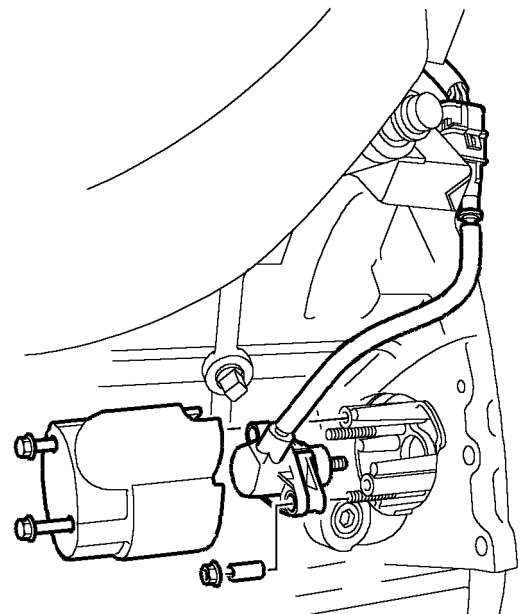
12.53.07

### Remove

1. Remove gearbox  
**MANUAL GEARBOX - R380, REPAIRS, Gearbox - V8.**
2. Restrain flywheel.



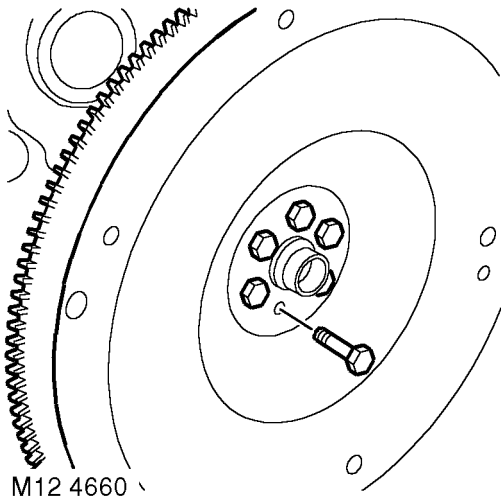
3. Working in sequence, progressively slacken 6 bolts securing clutch cover to flywheel. Remove bolts.
4. Remove clutch cover.
5. Remove clutch plate.



6. Release crankshaft sensor multiplug from bracket.
7. Remove 2 bolts securing crankshaft sensor cover.

## ENGINE - V8

8. Remove crankshaft sensor cover.
9. Remove 2 nuts securing crankshaft sensor.
10. Remove crankshaft sensor.



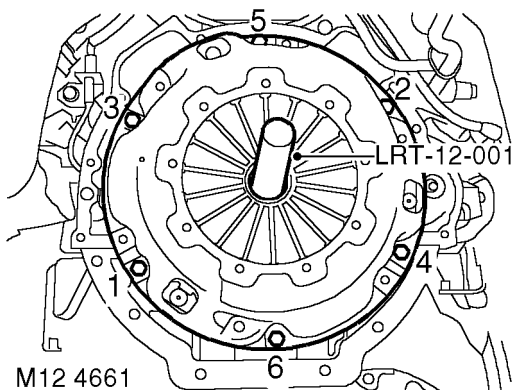
10. Fit drive plate onto tool **LRT-12-001** ensure side marked 'flywheel side' is towards flywheel.
11. Fit clutch cover and locate on dowels.
12. Fit clutch cover bolts and tighten in diagonal sequence to 40 Nm (30 lbf.ft).
13. Fit gearbox assembly.

**MANUAL GEARBOX - R380, REPAIRS, Gearbox - V8.**

11. Remove 6 bolts securing flywheel.
12. Remove flywheel.

### Refit

1. Clean mating faces of flywheel and crankshaft, dowel and dowel hole.
2. Fit flywheel to crankshaft and tighten bolts to 78 Nm (58 lbf.ft).
3. Clean crankshaft sensor and mating face.
4. Fit crankshaft sensor and tighten nuts to 6 Nm (4.4 lbf.ft).
5. Fit crankshaft sensor cover and tighten bolts to 6 Nm (4.4 lbf.ft).
6. Fit crankshaft sensor multiplug to bracket.
7. Clean clutch cover, drive plate and spigot bush in end of crankshaft. Renew worn components as necessary.
8. If refitting existing drive plate, apply 'Molycote FB 180' to splines.



9. Fit alignment tool **LRT-12-001** to spigot bearing in crankshaft.

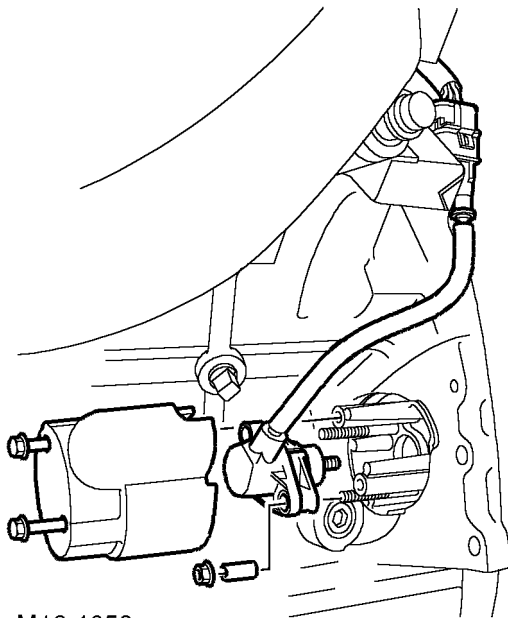


## Plate - drive - automatic

➔ 12.53.13

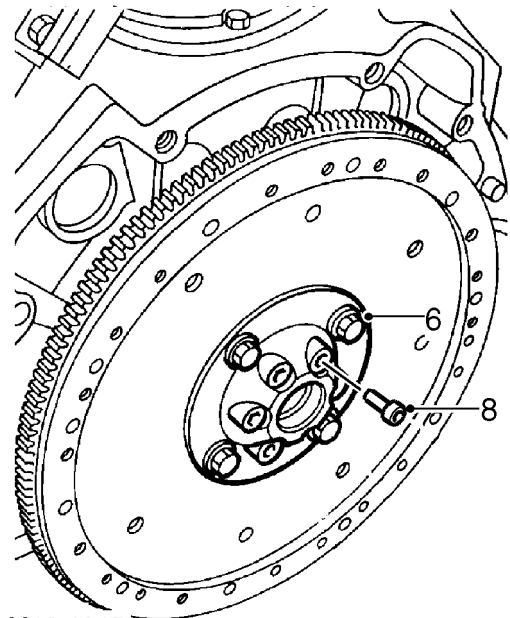
### Remove

1. Remove automatic gearbox.  
**👉 AUTOMATIC GEARBOX - ZF4HP22 - 24, REPAIRS, Gearbox - convertor and transfer gearbox - V8.**



M12 4659

2. Remove 2 bolts securing CKP sensor cover.
3. Remove CKP sensor cover.
4. Remove 2 nuts securing CKP sensor.
5. Remove CKP sensor.



M12 4845

6. Remove 4 bolts securing drive plate clamp ring and remove ring.
7. Remove drive plate from hub.
8. Remove 6 screws securing hub, remove hub and collect spacer.

### Refit

1. Clean hub and mating face, spacer and clamp ring.
2. Clean drive plate and ensure free from cracks and distortion.
3. Fit spacer and hub to crankshaft, tighten screws to 85 Nm (62 lbf.ft).
4. Fit drive plate and clamp ring, tighten bolts to 45 Nm (33 lbf.ft).
5. Clean CKP sensor and mating face.
6. Fit crankshaft sensor and tighten nuts to 6 Nm (5 lbf.ft).
7. Fit CKP sensor cover and tighten bolts to 6 Nm (4.4 lbf.ft).
8. Fit CKP sensor multiplug to bracket.
9. Fit automatic gearbox.  
**👉 AUTOMATIC GEARBOX - ZF4HP22 - 24, REPAIRS, Gearbox - convertor and transfer gearbox - V8.**

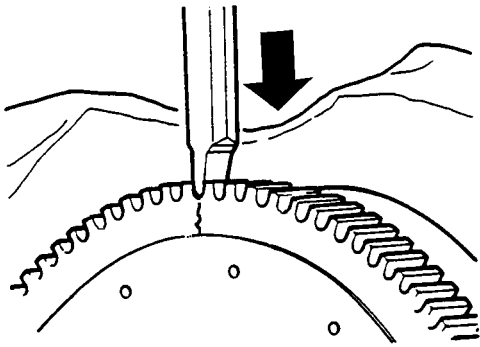
## ENGINE - V8

### Ring gear - starter

🔧 12.53.19

#### Remove

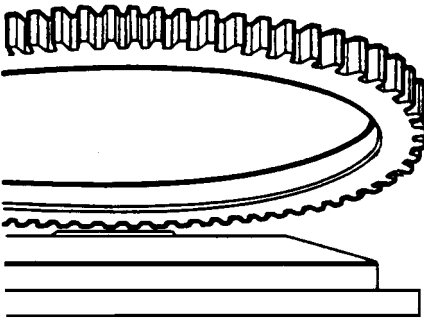
1. Remove flywheel.  
🔧 ENGINE - V8, REPAIRS, Flywheel.



M124585

2. Apply a cold chisel in root of one of ring gear teeth, strike chisel with hammer to break ring gear.
3. Remove starter ring gear.

#### Refit



M124586

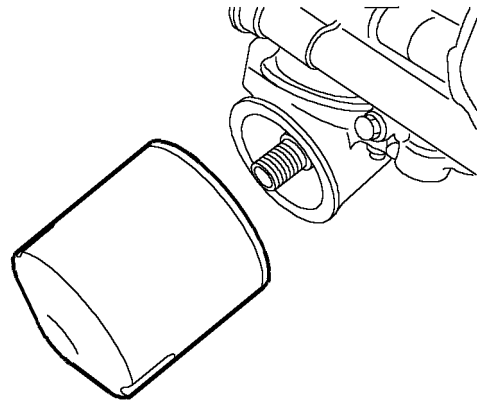
1. Clean flywheel and starter ring gear.
2. Heat new starter ring gear evenly to 350°C (660°F), indicated when the ring is a light blue colour.
3. Locate ring gear on flywheel and press ring gear hard against flange on flywheel.
4. Ensure ring gear is correctly seated around the complete circumference of flywheel and allow to cool.
5. Fit flywheel.  
🔧 ENGINE - V8, REPAIRS, Flywheel.

### Filter - oil

🔧 12.60.04

#### Remove

1. Release fixings and remove underbelly panel.
2. Clean area around filter head and place a container beneath engine.



M12 4446

3. Using a strap wrench, unscrew and discard filter.

#### Refit

1. Clean mating face of filter head.
2. Lubricate sealing ring of new filter with clean engine oil.
3. Fit filter and tighten by hand until it seats then tighten a further half turn.
4. Start and run engine to check for leaks.
5. Stop engine, wait a few minutes, then check oil level.
6. Top up engine oil.
7. Fit underbelly panel and secure with fixings.

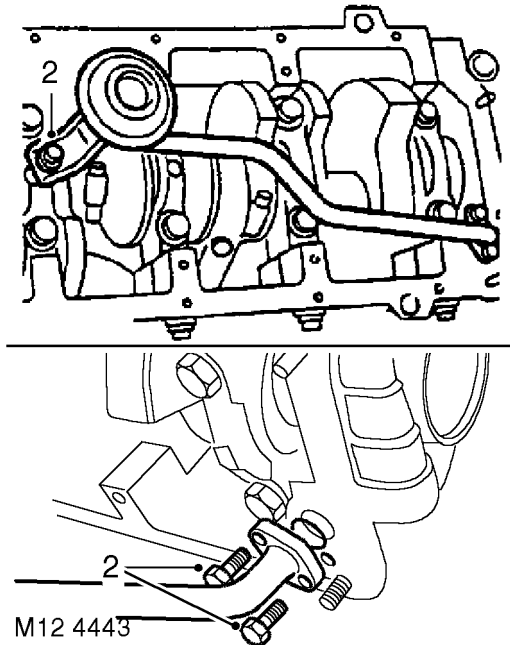


## Strainer - oil pick-up

➤ 12.60.20


### Remove

1. Remove sump gasket.  
 ENGINE - V8, REPAIRS, Gasket - sump.



2. Remove 2 bolts and one nut securing oil pick-up strainer.
3. Remove oil pick-up strainer.
4. Collect spacer from stud.
5. Remove and discard 'O'ring.


### Refit

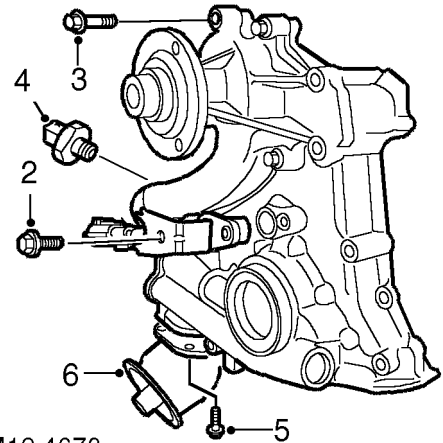
1. Clean oil pick up strainer and 'O' ring recess.
2. Lubricate and fit new 'O' ring.
3. Locate spacer on stud.
4. Position oil pick-up strainer, fit bolts and tighten to 10 Nm (8 lbf.ft). Fit nut and tighten to 22 Nm (16 lbf.ft).
5. Fit new sump gasket.  
 ENGINE - V8, REPAIRS, Gasket - sump.

## Pump - oil

➤ 12.60.26

### Remove

1. Remove timing gear cover gasket.  
 ENGINE - V8, REPAIRS, Gasket - timing gear cover.



M12 4673

2. Remove bolt securing CMP sensor, remove clamp and sensor.
3. Remove 6 bolts securing coolant pump, remove pump and discard gasket.
4. Remove oil pressure switch and discard 'O' ring.
5. Remove 4 bolts securing oil filter head, remove filter head and discard 2 'O' rings.
6. Remove filter head adaptor.


## ENGINE - V8

### Refit


1. Ensure filter head adaptor is clean and apply Loctite 577 sealant to thread.
2. Fit filter head adaptor and tighten bolts to 13 Nm (9 lbf.ft).
3. Clean filter head and mating face.
4. Fit new 'O' rings to filter head and filter head adaptor.
5. Fit filter head and tighten bolts to 8 Nm (6 lbf.ft).
6. Ensure oil pressure switch and mating face is clean.
7. Fit new 'O' ring and tighten switch to 15 Nm (11 lbf.ft).
8. Clean coolant pump and mating face.
9. Use a new gasket and fit coolant pump. Tighten bolts securing coolant pump to 25 Nm (19 lbf.ft).
10. Ensure CMP sensor is clean and fit sensor to cover.
11. Fit clamp to CMP sensor and tighten bolt to 8 Nm (6 lbf.ft).
12. Fit timing gear cover gasket.

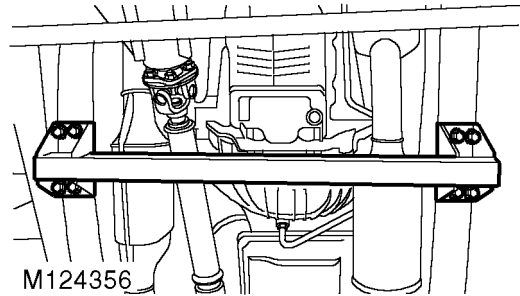
 **ENGINE - V8, REPAIRS, Gasket - timing gear cover.**

### Gasket - sump

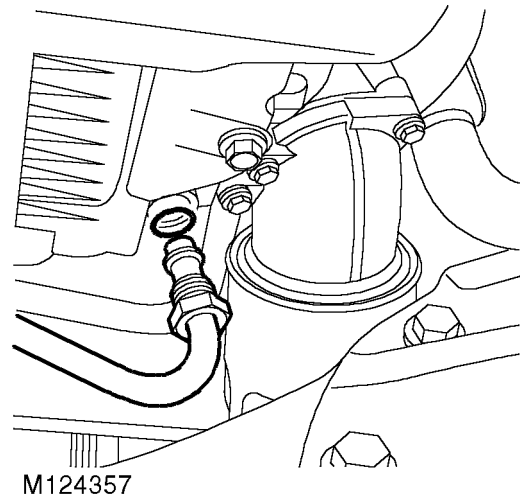
 **12.60.38**

### Remove

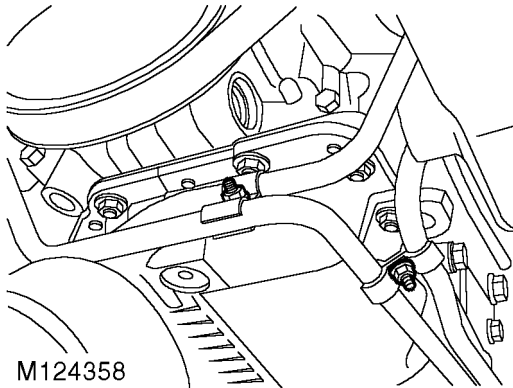
1. Release fixings and remove battery cover.
2. Disconnect battery earth lead.
3. Remove dipstick.
4. Raise the vehicle on a ramp.
5. Drain engine oil.  
 **MAINTENANCE, PROCEDURES, Engine oil - V8 engine.**



6. Remove 8 bolts securing cross member and remove cross member.
7. Raise front of vehicle under body to increase clearance between engine and front axle.

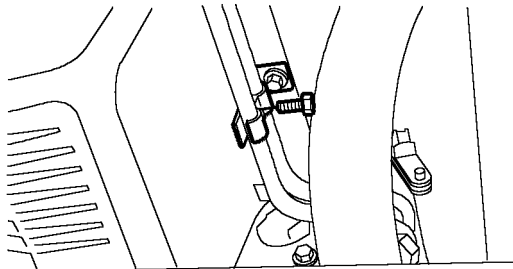


8. Disconnect and release gearbox oil cooler pipe and discard 'O' ring.



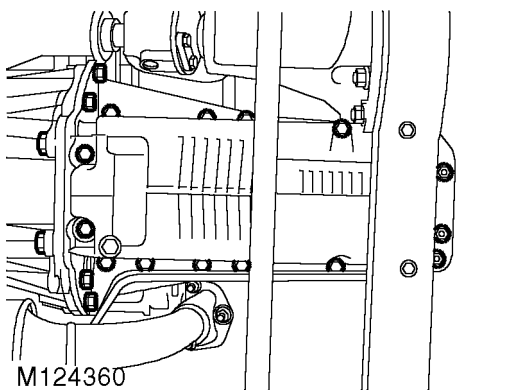
M124358

9. Remove 2 clips securing oil cooler pipes at front of sump.



M124359

10. Remove clip securing oil cooler pipes to side of sump.  
11. Remove clip bracket.



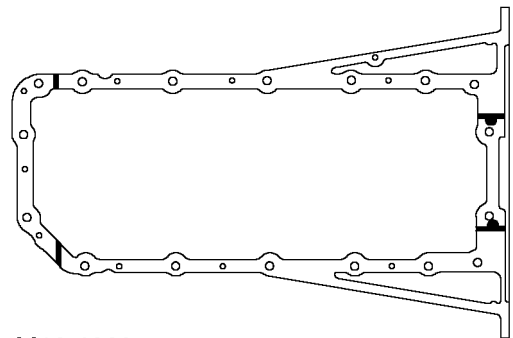
M124360

12. Remove 2 forward facing bolts securing sump to bell housing.  
13. Remove 4 rear facing bolts securing sump to bell housing.  
14. Remove 2 bolts in sump recess.  
15. Remove 3 nuts securing front of sump.

16. Remove 12 bolts securing sump flange to engine.  
17. Manoeuvre sump over front axle and remove sump.  
18. Discard sump gasket.

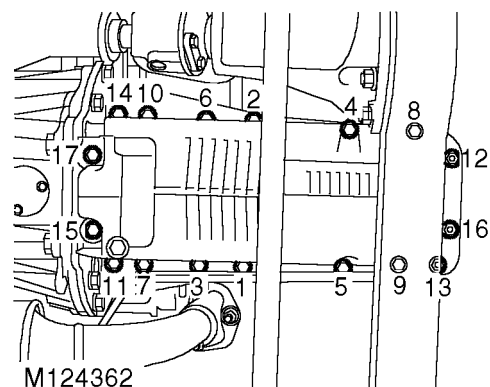
#### Refit

1. Clean all traces of RTV from the sump and sump mating faces using a wide, flat-bladed implement or solvent.



M12 4669

2. Apply a bead of RTV sealant 5 mm wide across the cylinder block to front cover joint and across the cylinder block to rear main bearing joint. Apply a globule of RTV to cover the end of the cruciform seal, (see illustration).  
3. Fit new gasket to sump, ensuring that locating tags are correctly positioned.  
4. Manoeuvre sump into position and fit 2 bolts to retain sump in place, then fit remainder of bolts.



M124362

5. Working in the sequence illustrated, tighten the sump bolts to 22 Nm (16 lbf.ft).  
6. Position side clip bracket, fit and tighten bolt.  
7. Position oil cooler pipe clips, fit and tighten nuts.  
8. Clean oil cooler pipe 'O' ring recess and mating face.  
9. Lubricate and fit new 'O' ring to oil cooler pipe.

## ENGINE - V8

---

10. Position pipe and tighten nut.
11. Lower front of vehicle.
12. Position cross member to chassis, fit bolts and tighten to 25 Nm (18 lbf.ft).
13. Refill engine oil and fit dipstick.
14. Connect battery earth lead.
15. Fit battery cover and retain with fixings.

---

### Switch - oil pressure

---

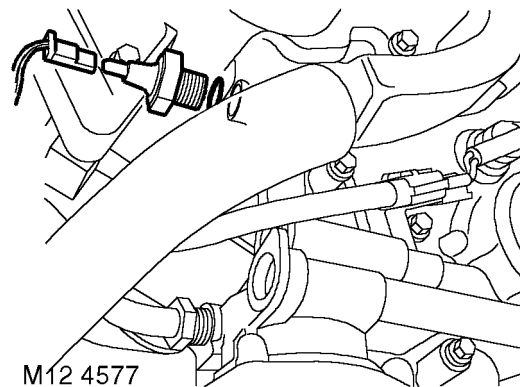
➤ 12.60.50

#### Remove

1. Release fixings and remove battery cover.
2. Disconnect battery earth lead.
3. 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.**

4. Remove fixings and remove underbelly panel.



5. Disconnect Lucar from oil pressure switch.
6. Position container below switch to catch oil spillage.
7. Remove oil pressure switch and discard sealing washer.

#### Refit

1. Clean oil pressure switch threads.
2. Fit new sealing washer to switch.
3. Fit oil pressure switch and tighten to 15 Nm (11 lbf.ft) .
4. Connect Lucar to oil pressure switch.
5. Fit underbelly panel and secure with fixings.
6. Remove stand(s) and lower vehicle.
7. Connect battery earth lead.
8. Fit battery cover and retain with fixings.
9. Top up engine oil.

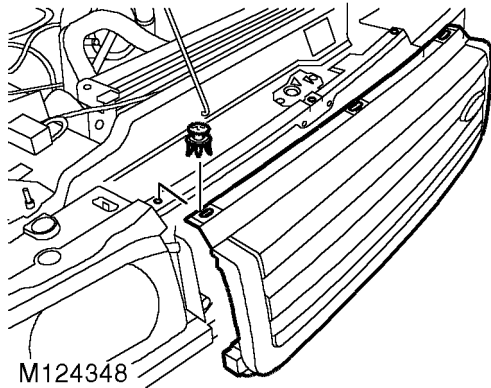


## Cooler - engine oil

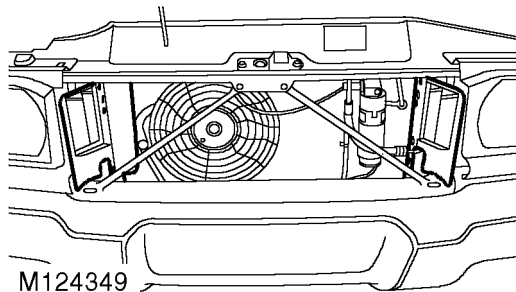
12.60.68

### Remove

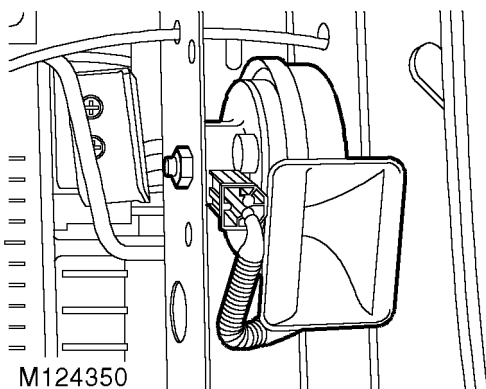
1. Release fixings and remove battery cover.
2. Release fixings and remove cooling fan cowl.



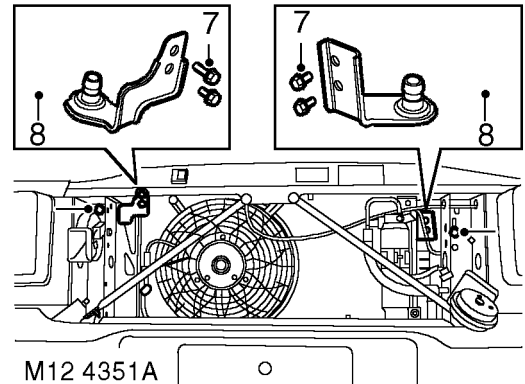
3. Remove 3 screws and remove front grille.



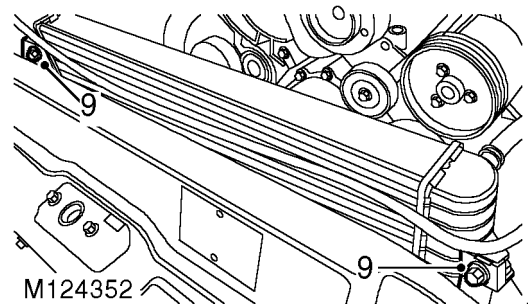
4. Remove 6 screws and remove LH and RH air deflectors from front panel.



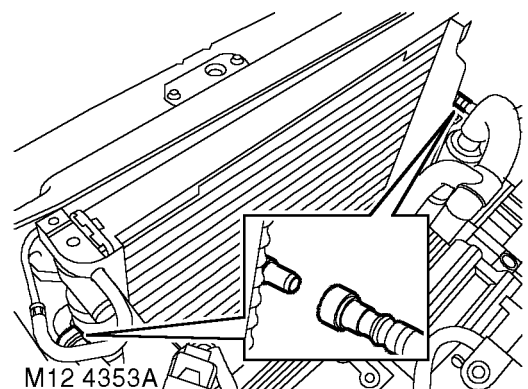
5. Remove nut and move LH horn aside.



6. Remove 2 bolts securing radiator LH and RH upper mounting brackets to body panel and remove brackets.
7. Remove 4 screws securing air conditioning condenser LH and RH upper mounting brackets to condenser.
8. Remove condenser upper mounting brackets with rubber mounts from radiator extension brackets.



9. Remove 2 bolts securing LH and RH extension brackets to radiator and remove brackets.

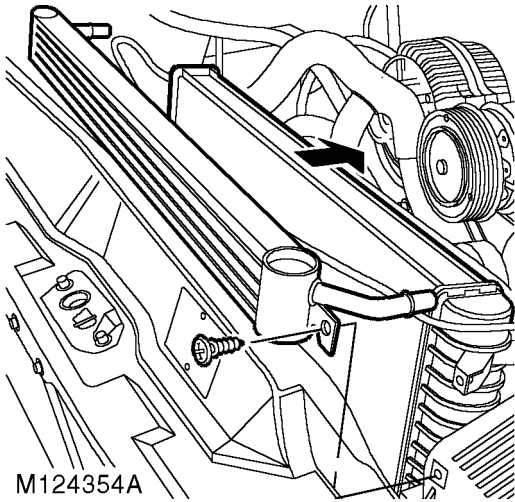


10. Position absorbent cloth under each oil cooler hose connection to collect oil spillage.

## ENGINE - V8

11. Push against coupling release rings and disconnect both hoses from oil cooler.

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



12. Remove screw securing oil cooler to radiator.
13. Release cooler from its location on radiator.
14. Release radiator lower mountings from location in chassis and carefully move radiator towards engine sufficiently only to release engine oil cooler from radiator.
15. Remove engine oil cooler.

### Refit

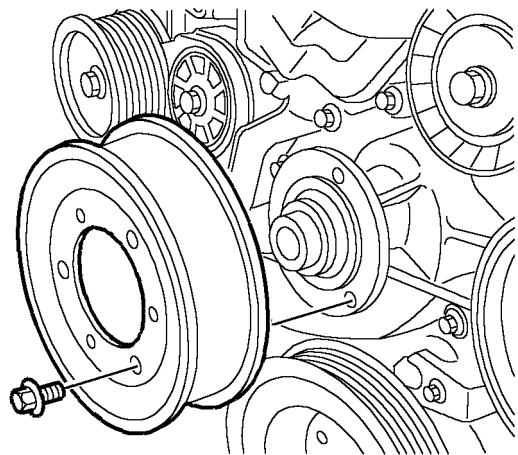
1. Fit engine oil cooler to radiator, engage in location and secure with screw.
2. Fit radiator to location in chassis.
3. Ensure connections are clean, then secure hoses to oil cooler.
4. Fit extension brackets to radiator and secure with bolts.
5. Fit brackets with rubber mounts to extension brackets and secure to air conditioning condenser with screws.
6. Fit radiator upper mounting brackets and secure to body with bolts.
7. Fit LH horn and secure with nut.
8. Fit LH and RH air deflectors to front panel and secure with scrivenets.
9. Fit grille and secure with screws.
10. Fit cooling fan cowl and secure with fixings.
11. Fit battery cover and secure with fixings.
12. Top up engine oil.

## Gasket - timing gear cover

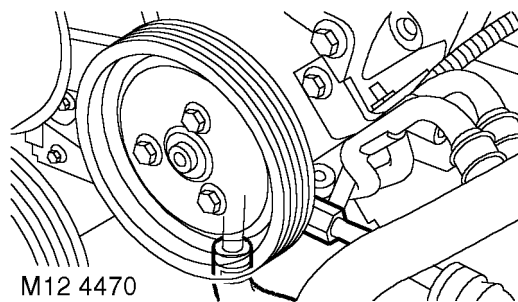
12.65.04

### Remove

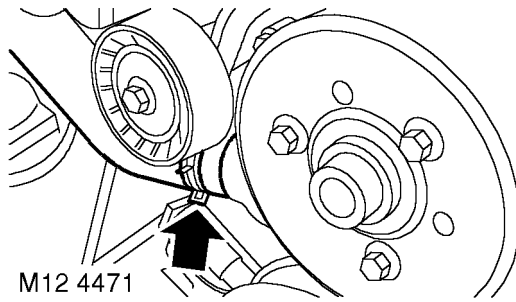
1. Remove oil pick-up strainer.  
**ENGINE - V8, REPAIRS, Strainer - oil pick-up.**
2. Remove timing gear cover oil seal.  
**ENGINE - V8, REPAIRS, Seal - cover - timing gears.**
3. Remove engine oil filter.  
**ENGINE - V8, REPAIRS, Filter - oil.**



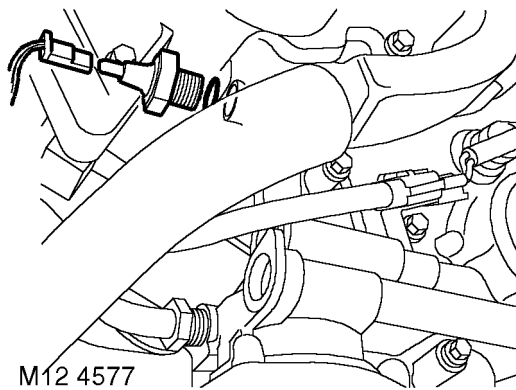
4. Remove 3 bolts securing coolant pump pulley and remove pulley.



5. Remove 3 bolts securing PAS pump pulley and remove pulley.
6. Drain cooling system.  
**COOLING SYSTEM - V8, ADJUSTMENTS, Drain and refill.**

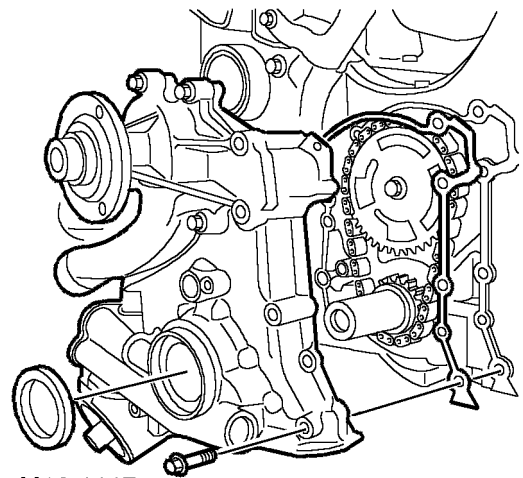


7. Release clip and disconnect coolant hose from coolant pump.



8. Disconnect Lucar from oil pressure switch.  
 9. Disconnect multiplug from CMP sensor.  
 10. Loosen union and disconnect oil cooler pipe from timing gear cover. Remove and discard 'O' ring.

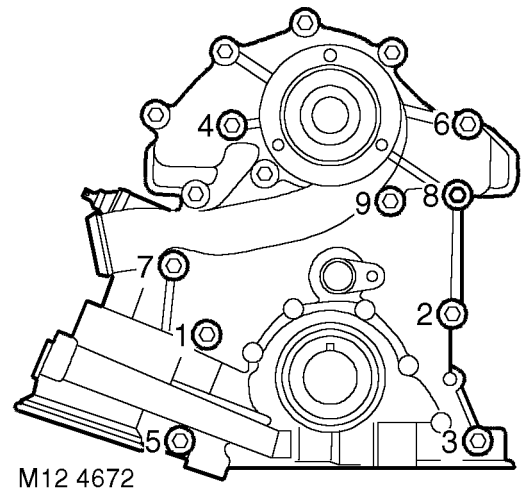
**CAUTION:** Always fit plugs to open connections to prevent contamination.



11. Remove 9 bolts securing timing gear cover and remove cover. Remove and discard gasket.

#### Refit

1. Clean mating faces of timing gear cover and cylinder block. Clean dowels and dowel holes.
2. Fit new gasket to dowels in cylinder block.



3. Fit timing gear cover to cylinder block and, working the sequence illustrated, tighten bolts to 22 Nm (17 lbf.ft) . Ensure CMP sensor multiplug bracket is secured by bolt.
4. Fit new 'O' ring to oil cooler pipe, connect pipe to timing gear cover and tighten union to 15 Nm (11 lbf.ft).
5. Connect Lucar to oil pressure switch.
6. Connect multiplug to CMP sensor.
7. Connect coolant hose to coolant pump and secure with clip.

## ENGINE - V8

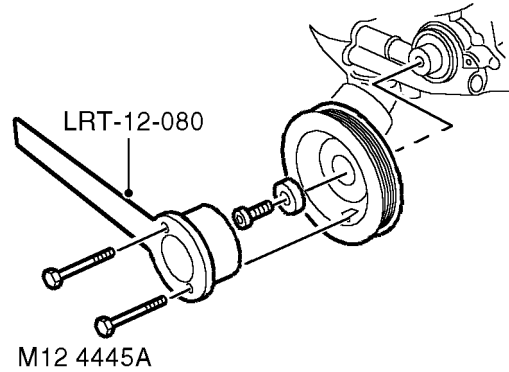
8. Ensure mating faces of PAS pump pulley and drive flange are clean, fit pulley and tighten bolts to 22 Nm (16 lbf.ft).
9. Ensure mating faces of coolant pump pulley and drive flange are clean, fit pulley and tighten bolts to 22 Nm (16 lbf.ft).
10. Ensure mating faces of oil filter and adaptor are clean, smear clean engine oil onto seal and fit filter.
11. Fit timing gear cover oil seal.  
**🔧 ENGINE - V8, REPAIRS, Seal - cover - timing gears.**
12. Fit oil pick-up strainer.  
**🔧 ENGINE - V8, REPAIRS, Strainer - oil pick-up.**
13. Refill cooling system.  
**🔧 COOLING SYSTEM - V8, ADJUSTMENTS, Drain and refill.**

### Seal - cover - timing gears

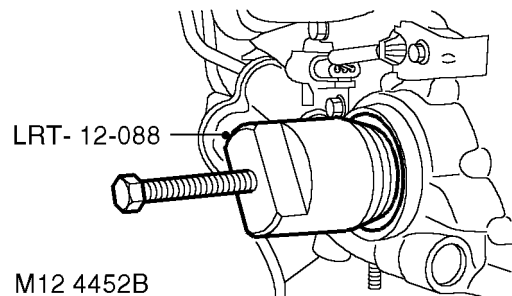
🔑 12.65.05

#### Remove

1. Remove auxiliary drive belt.  
**🔧 CHARGING AND STARTING, REPAIRS, Belt - auxiliary drive.**



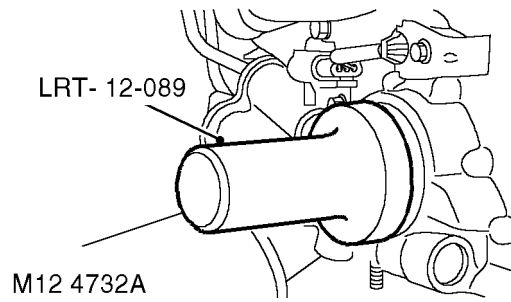
2. Secure tool **LRT-12-080** to crankshaft pulley with 2 bolts.
3. Remove crankshaft pulley bolt.
4. Remove crankshaft pulley.



5. Use tool **LRT-12-088**, to remove oil seal from timing gear cover.

#### Refit

1. Clean seal register in timing gear cover and crankshaft pulley.



2. Lubricate outer face of seal and fit new seal to timing gear cover using tool **LRT-12-089** .
  3. Lubricate oil seal lip and fit crankshaft pulley.
  4. Fit crankshaft pulley bolt and tighten to 270 Nm (200 lbf.ft).
  5. Remove tool **LRT-12-080** from crankshaft pulley.
  6. Fit auxiliary drive belt.
- 🔧 CHARGING AND STARTING, REPAIRS, Belt - auxiliary drive.**