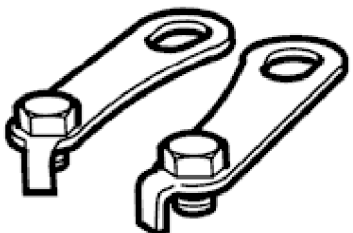


1998 XJ RANGE - Engine - 303-01

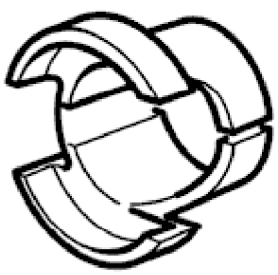
Engine - Removal 12.41.01

Special Service tools



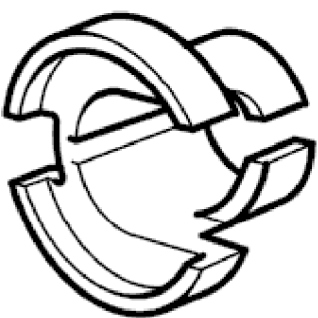
E36403

Engine Lifting Brackets
303-536



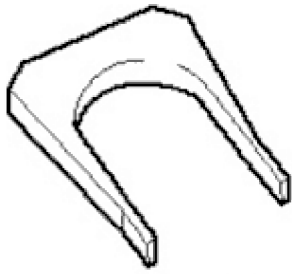
E36393

Quick Fit Connector Release Tool
310-044



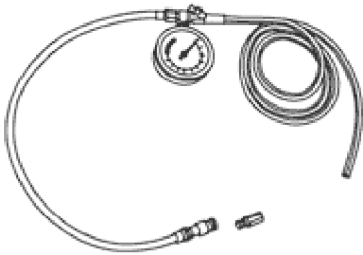
E36394

Quick Fit Connector Release Tool
310-054



E34592

Quick Fit Connector Release Tool
303-623



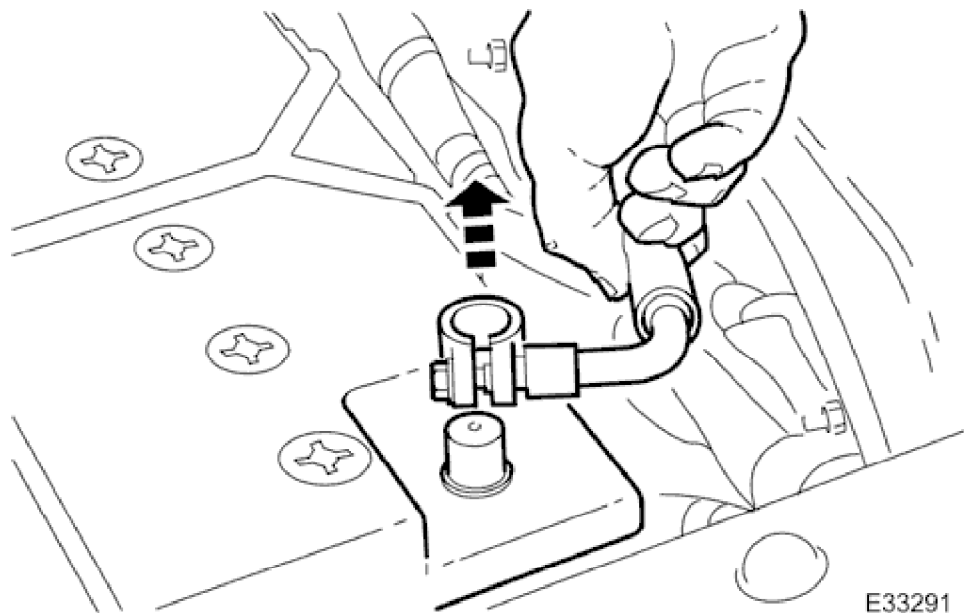
E36466

Fuel Injection Pressure Test Equipment
310-058

Removal

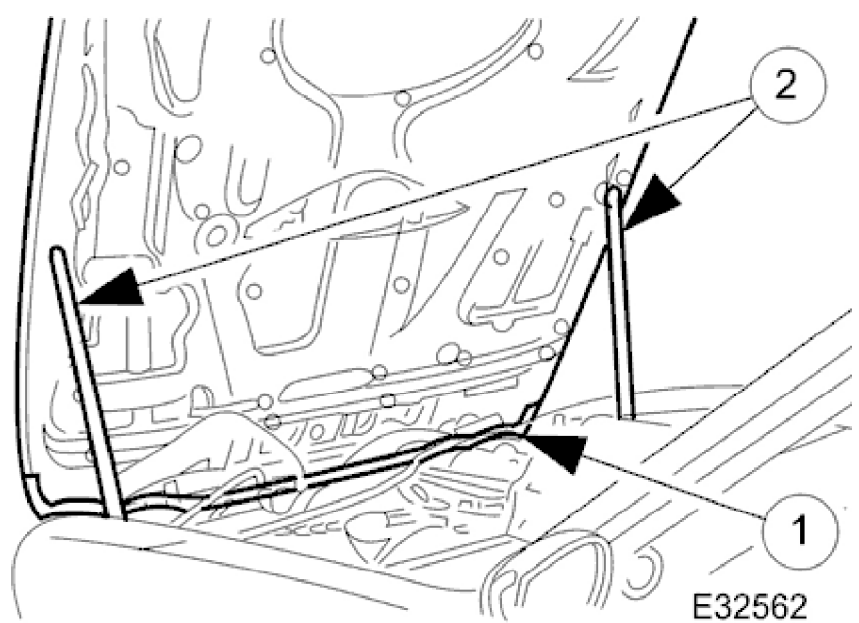
1. Park the vehicle on a four post ramp, over which, an overhead lifting crane is available, and set the gear selector to 'N'.
 - The crane should be rated at a minimum of 500 kg Safe Working Load and have sufficient fore and aft movement to traverse the engine assembly clear of the vehicle.
 - Do not apply the handbrake, but use wedges to chock one wheel to prevent movement of the vehicle.
2. Open the engine compartment and fit paintwork protection sheets.

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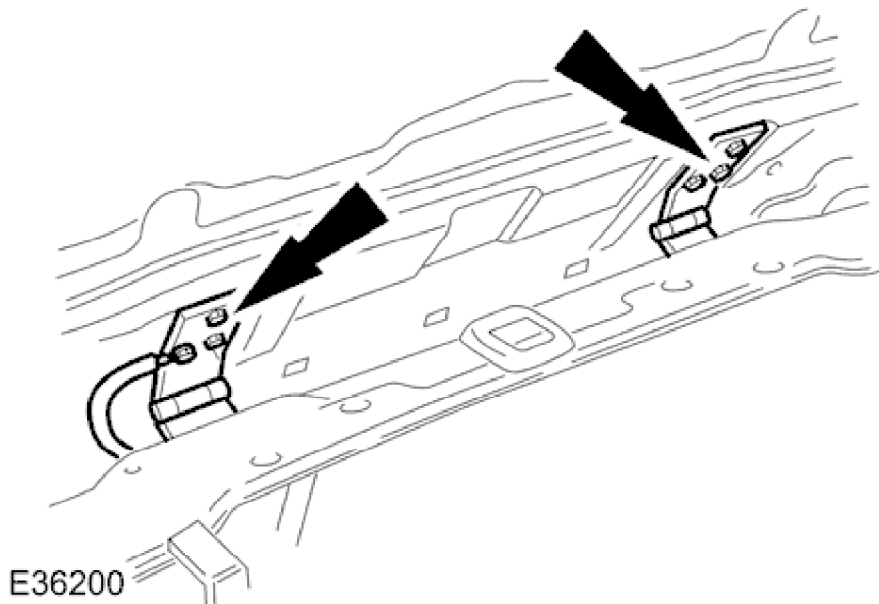
E33291

- 3. Disconnect the battery ground cable.
 - Remove the battery cover.

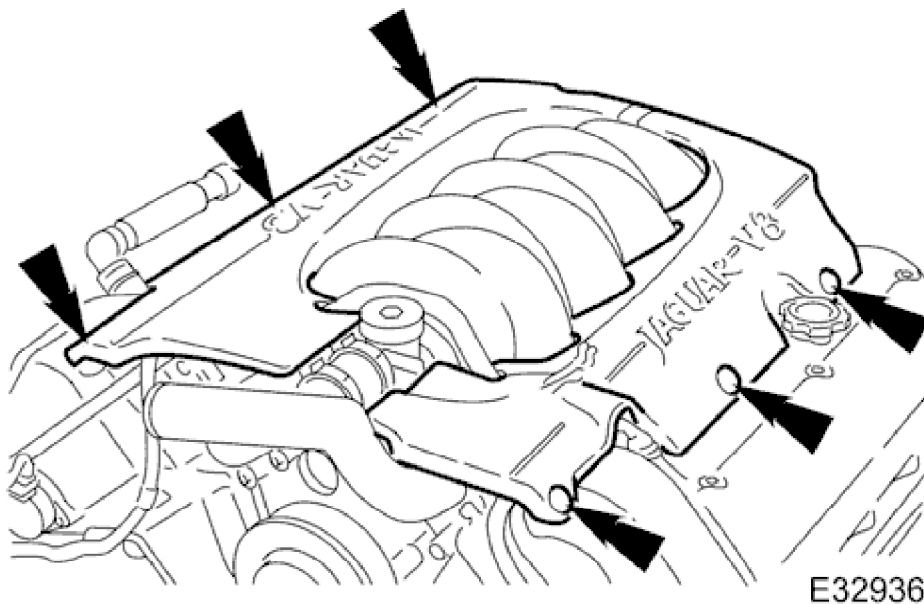


E32562

- 4. Remove the engine compartment cover (bonnet).
 - 1. Apply masking tape to the front edge of the engine compartment cover to protect the paintwork during removal and storage.
 - 2. With assistance, support the cover and release the gas struts.



5. With assistance, release the six bolts which retain the cover (bonnet) and lift the cover clear.
- Disconnect the ground cable from the left hand hinge.



6. Remove the engine covers

7. Drain the cooling system. Refer to Operation 26.10.01. Conserve as much of the coolant as possible to refill the system.

8. Depressurise the air conditioning system. Refer to Operation <<82.30.30>> and note all Warnings and Cautions.

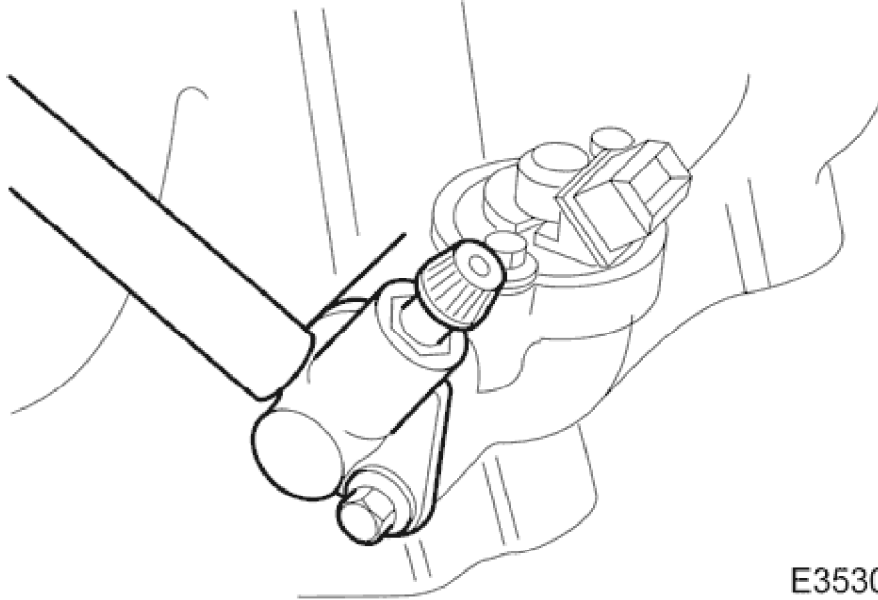


WARNING:

ENSURE THAT ALL FIRE PREVENTION PROCEDURES ARE ACTIVE.



WARNING:
BEFORE PROCEEDING, IT IS ESSENTIAL THAT THE WARNING NOTES GIVEN IN SECTION <<100-00>> (UNDER THE HEADING 'SAFETY PRECAUTIONS') ARE READ AND UNDERSTOOD.



E35302

9. Depressurise the fuel system.

- Ensure that the ignition is switched off and remove the valve cap from the fuel cross-over pipe. Place a cloth under the valve to collect any spillage.
- Place a closed container, suitable for collecting fuel, adjacent to the vehicle. Remove the lid.



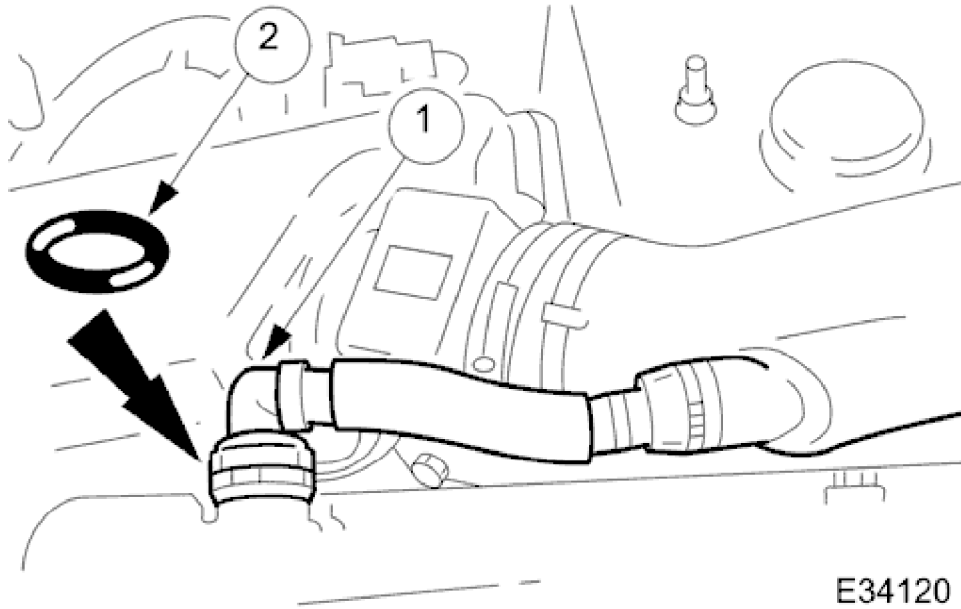
E32563

10. Connect the fuel injection pressure test equipment 310 - 058 (or other suitable type). Insert the drain / bleed tube into the fuel container. Follow the manufacturer's instructions and depressurise the fuel system.

11. Store the drained fuel safely and ensure that the lid is closed securely. Remove the equipment and discard

1998 XJ RANGE - Engine - 303-01

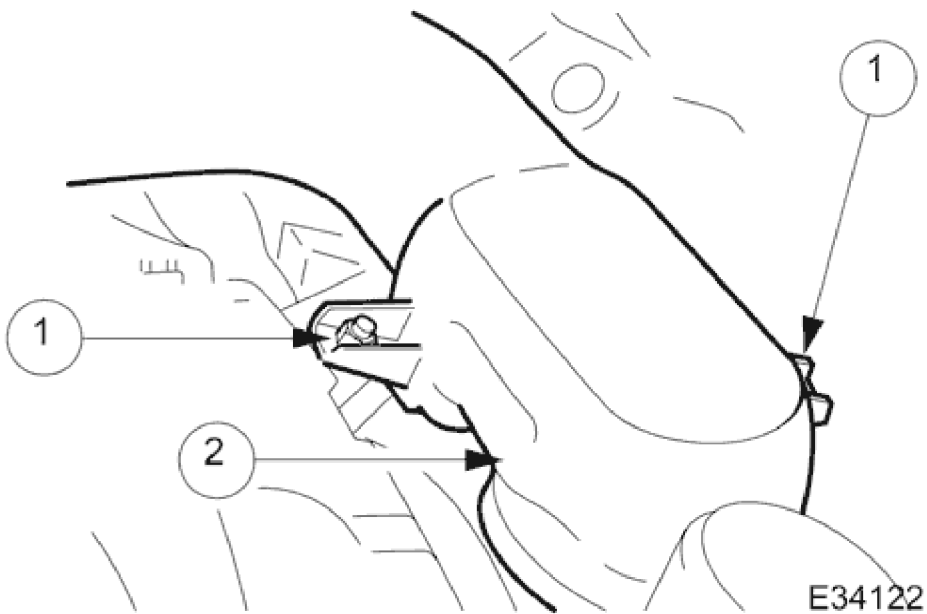
the cloth from beneath the valve. Refit the valve cap.



12. Disconnect the breather pipe from the A-Bank camshaft cover.
1. Disconnect the breather pipe from the stub pipe.
 2. Remove and discard the O-ring seal from the breather pipe.

13. Disconnect the air flow meter multi-plug.

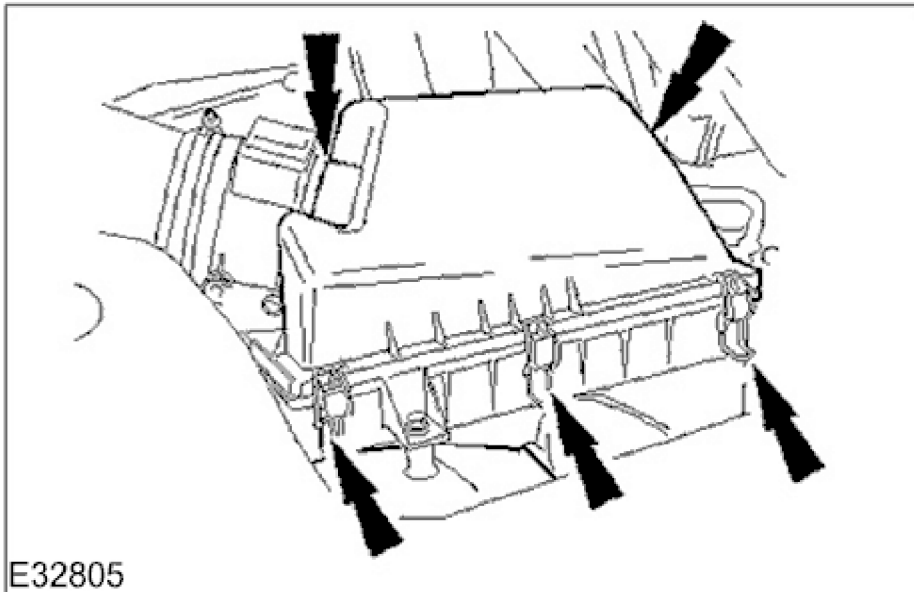
14. Cut and remove the strap which secures the vacuum pipe to the induction elbow.



15. Disconnect the intake tube from the throttle body.
1. Remove the two bolts which secure the intake tube to the throttle body.

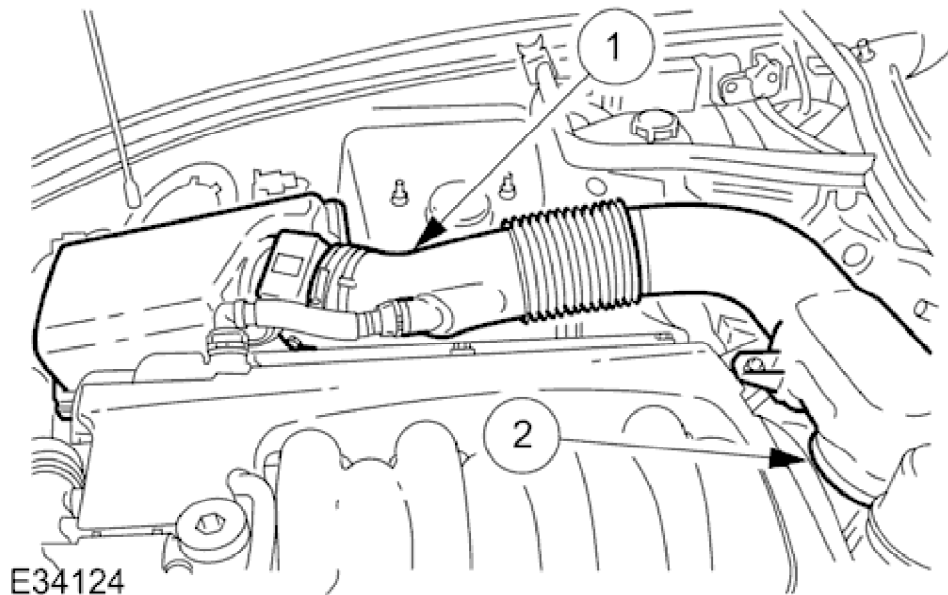
1998 XJ RANGE - Engine - 303-01

2. Disconnect the intake tube from the throttle body.



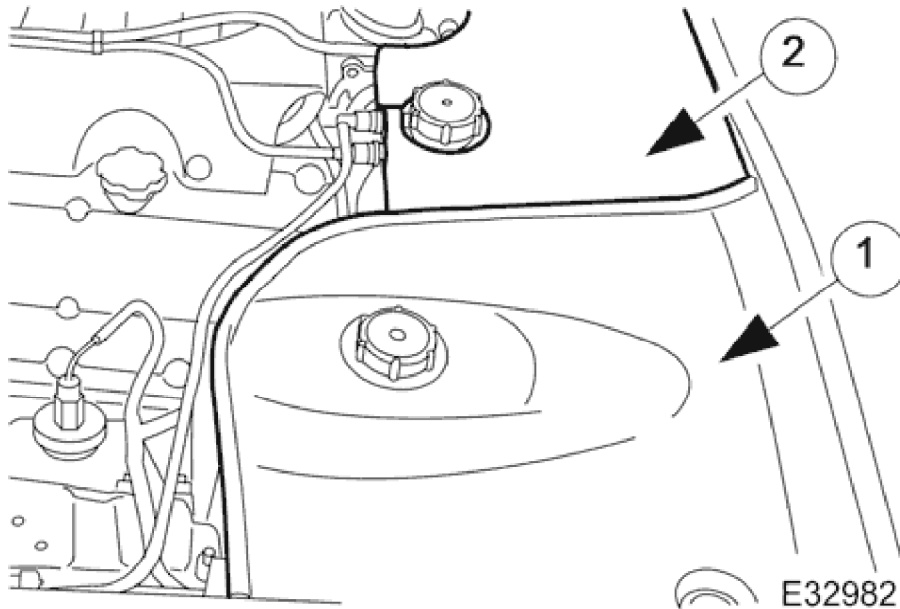
16. Disconnect the air cleaner cover.

- Remove the five clips which secure the air cleaner cover.

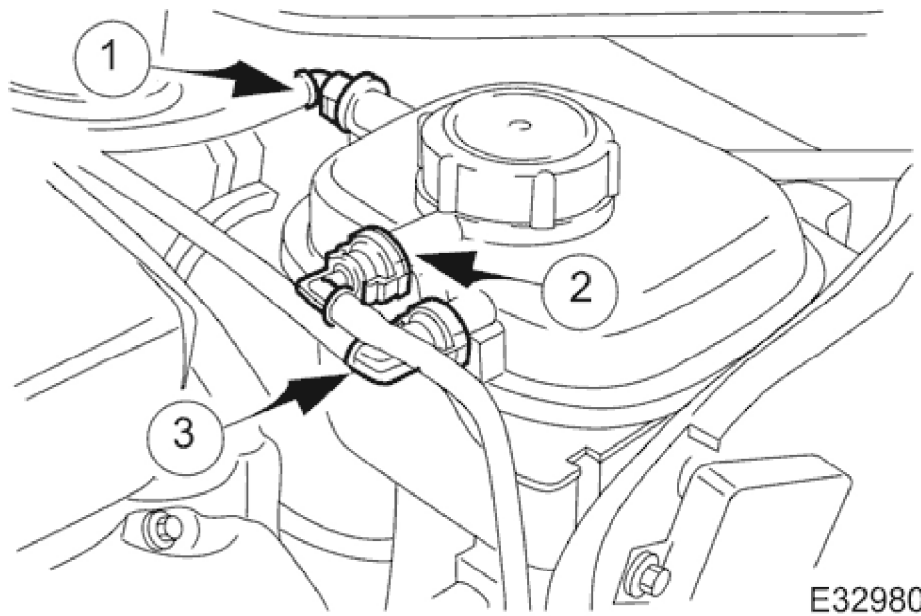


17. Remove the intake tube / air flow meter / air cleaner cover assembly.

1. Remove the intake tube / air flow meter / air cleaner cover assembly.
2. Remove and discard the rubber seal; air intake tube to throttle body.

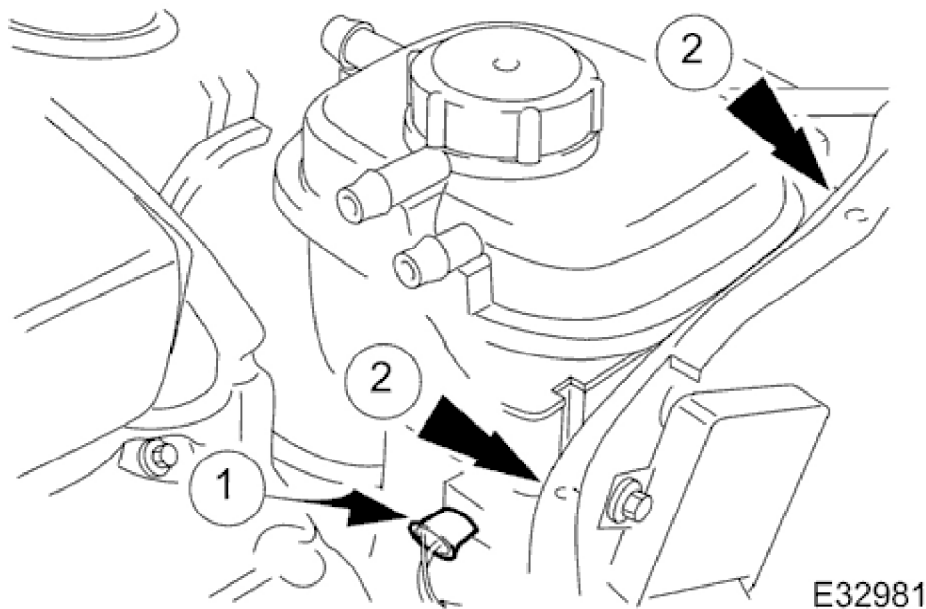


18. Remove the centre trim panel from the engine compartment.
1. Remove the left hand side enclosure panel.
 2. Remove the centre trim panel.

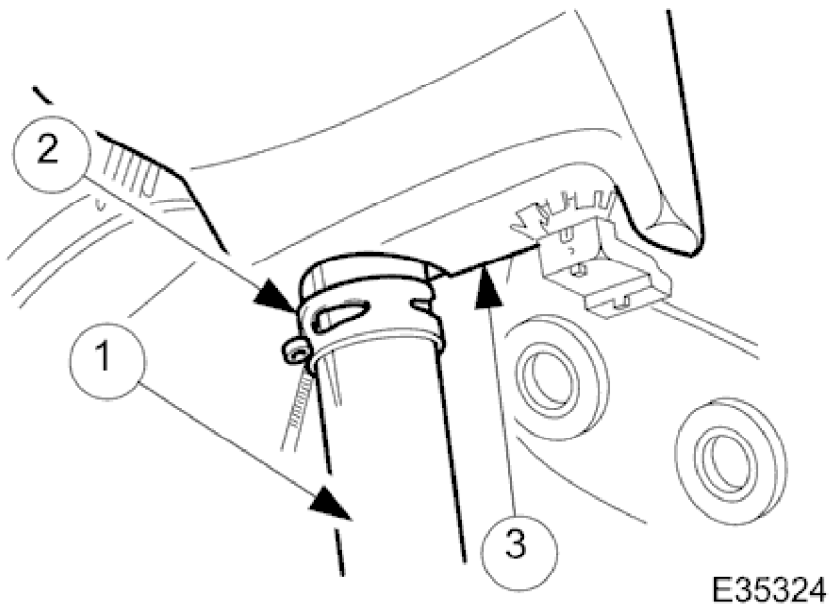


19. Release the hoses (Quick Fit connections) from the expansion tank, using 303 - 623.
1. Release the hose, expansion tank to thermostat housing (coolant outlet pipe on supercharged engines).
 2. Release the hose, expansion tank to recovery tank.
 3. Release the hose, expansion tank to radiator.

20. Fit blanking plugs to the pipes and the tank.



21. Remove the expansion tank from the mounting.
1. Disconnect the coolant level sensor connector.
2. Remove the nuts which secure the tank.

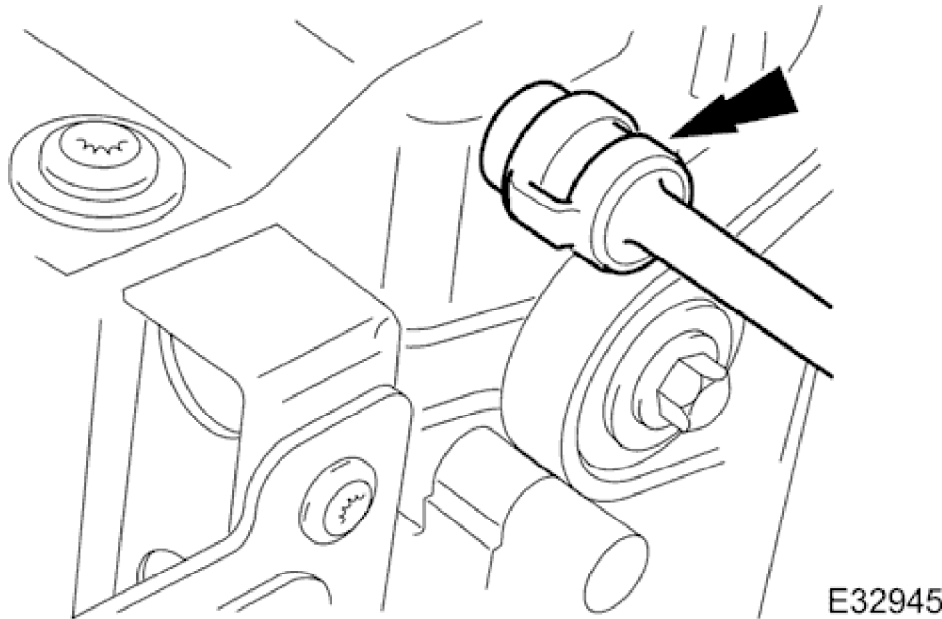


22. Remove the expansion tank from the vehicle.
1. It may be necessary to use a pipe clamp to clamp the bottom hose branch.
2. Release the pipe clip and move it along the pipe.
3. Disconnect the tank from the bottom hose and remove it from the vehicle.

23. Empty any remaining coolant from the expansion tank into a drain tray.

24. Remove the cloth from the engine and clean any spillage from the engine bay.

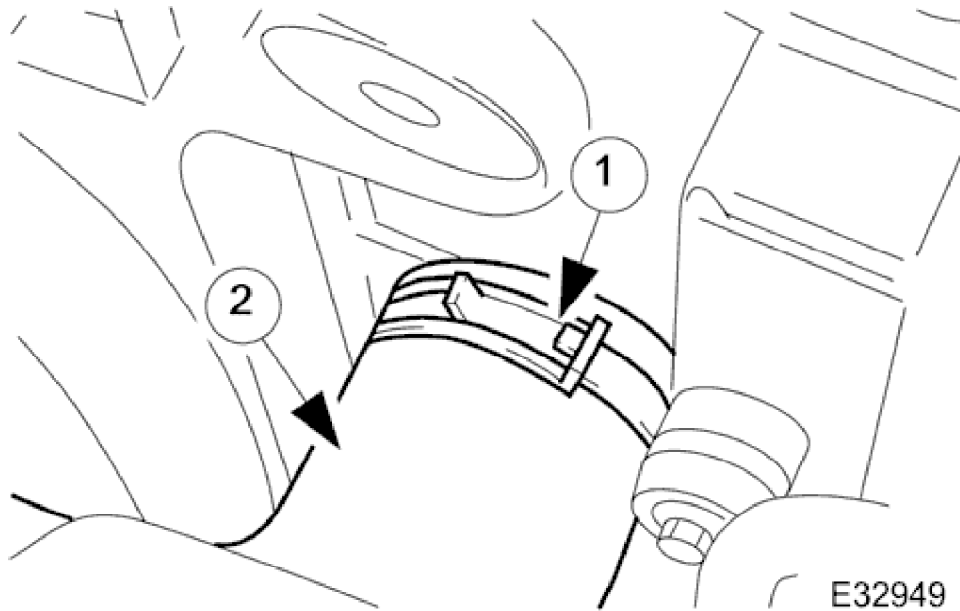
1998 XJ RANGE - Engine - 303-01



25. Disconnect the radiator breather hose.

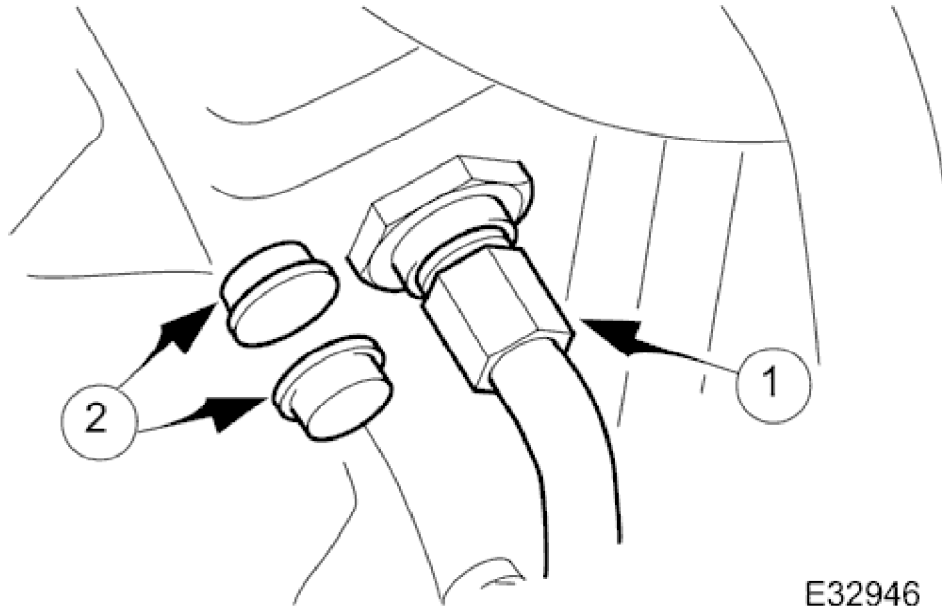
- Release the Quick-Fit hose (radiator to expansion tank) using 303 - 623, and disconnect the hose from the radiator.

26. Remove the twin fan and motor assembly. Refer to Operation 26.25.12.



27. Disconnect the radiator top hose.

1. Slacken the hose retaining clip and reposition the clip along the hose.
2. Disconnect the hose from the radiator.



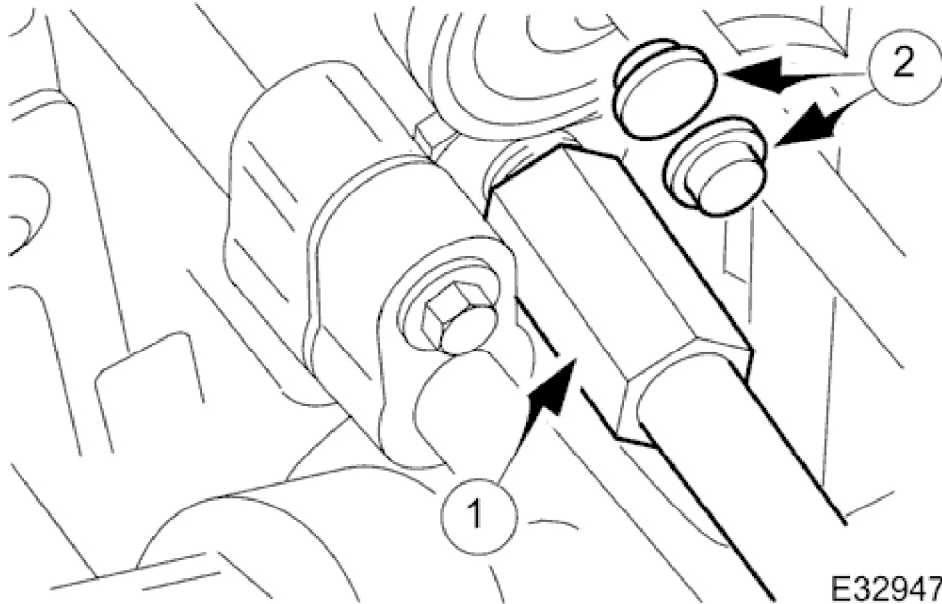
E32946

28. Disconnect the transmission oil cooler lower pipe.

- Position a drain tray for the transmission fluid.

1. Disconnect and reposition the union nut, lower cooler pipe to radiator. Disconnect the pipe.

2. Remove and discard the O-ring seal from the pipe and fit blanking plugs to the pipe and to the union on the radiator.



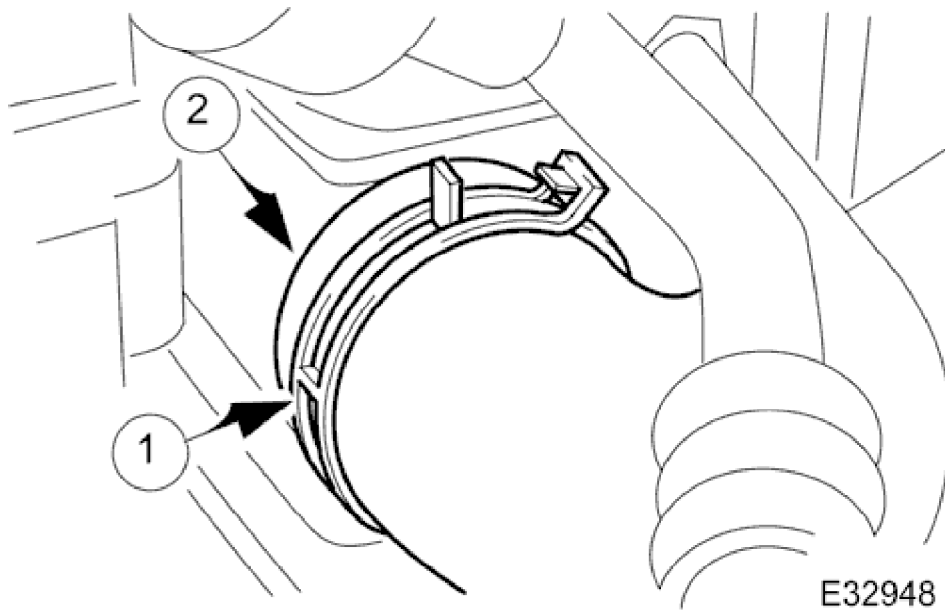
E32947

29. Disconnect the transmission oil cooler upper pipe.

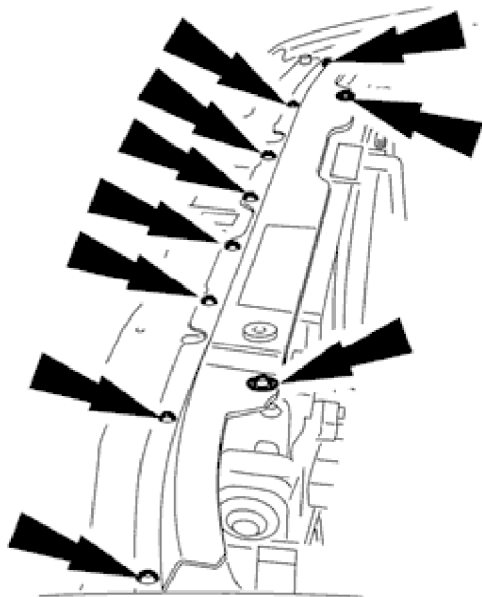
1. Disconnect and reposition the union nut, upper cooler pipe to radiator. Disconnect the pipe.

2. Remove and discard the O-ring seal from the pipe and fit blanking plugs to the pipe and to the union on the radiator.

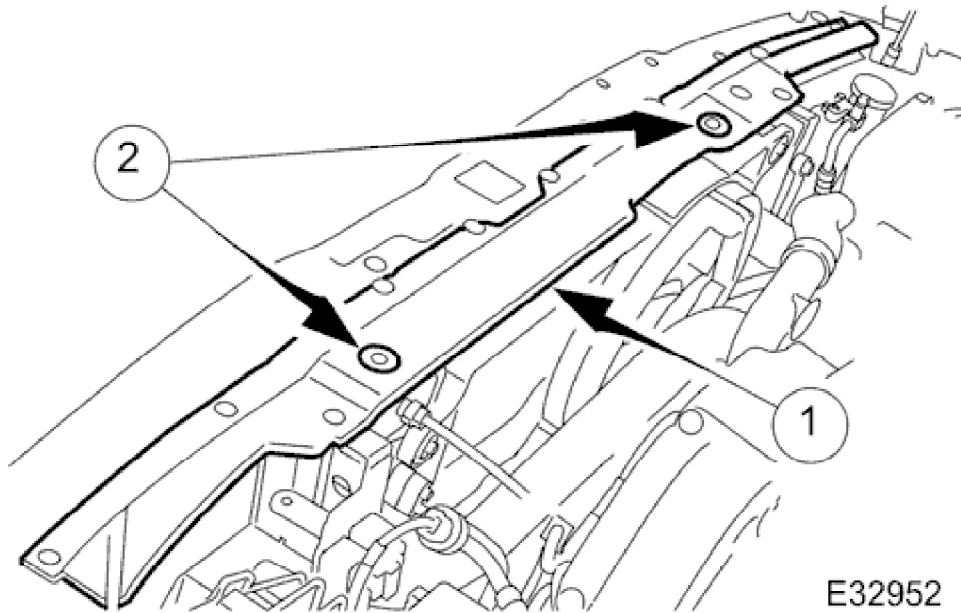
1998 XJ RANGE - Engine - 303-01



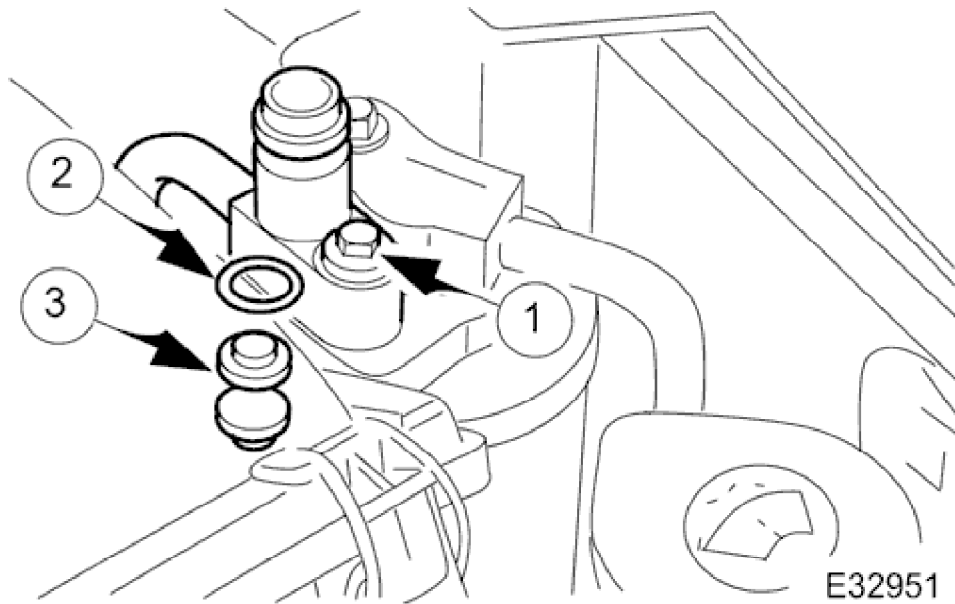
30. Disconnect the radiator bottom hose.
- 1. Slacken the hose retaining clip and reposition the clip along the hose.
 - 2. Disconnect the hose from the radiator.



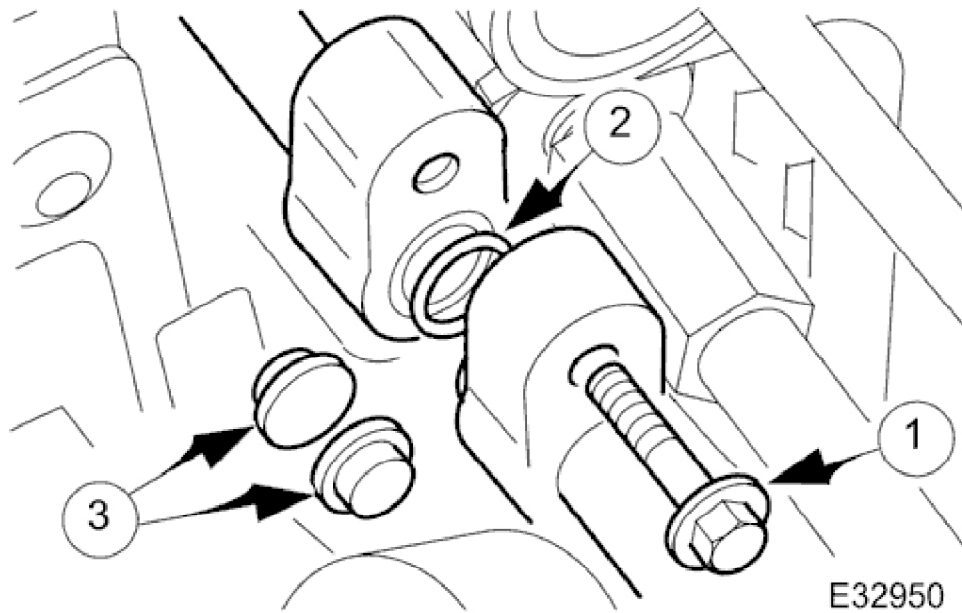
31. Release the radiator top retaining panel.
- Remove the ten bolts which secure the panel.



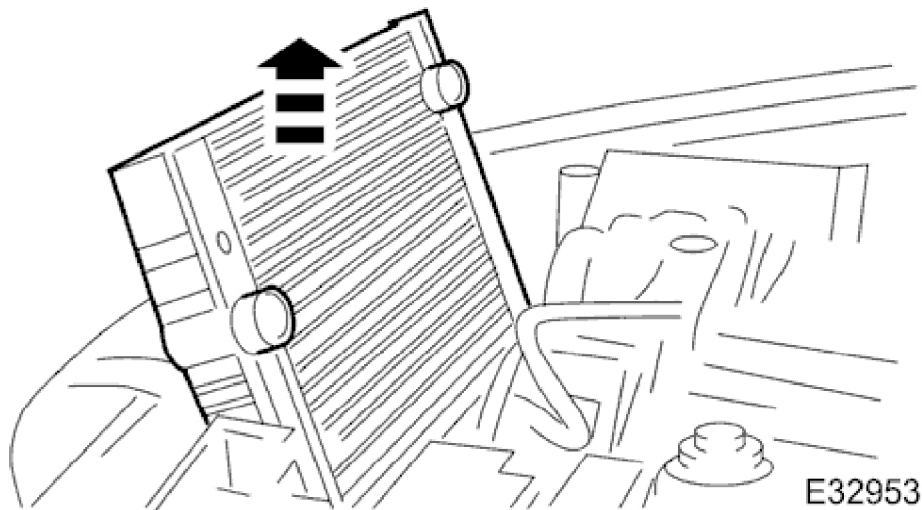
32. Remove the radiator top retaining panel.
1. Remove the panel.
 2. Remove the radiator top mounting bushes.



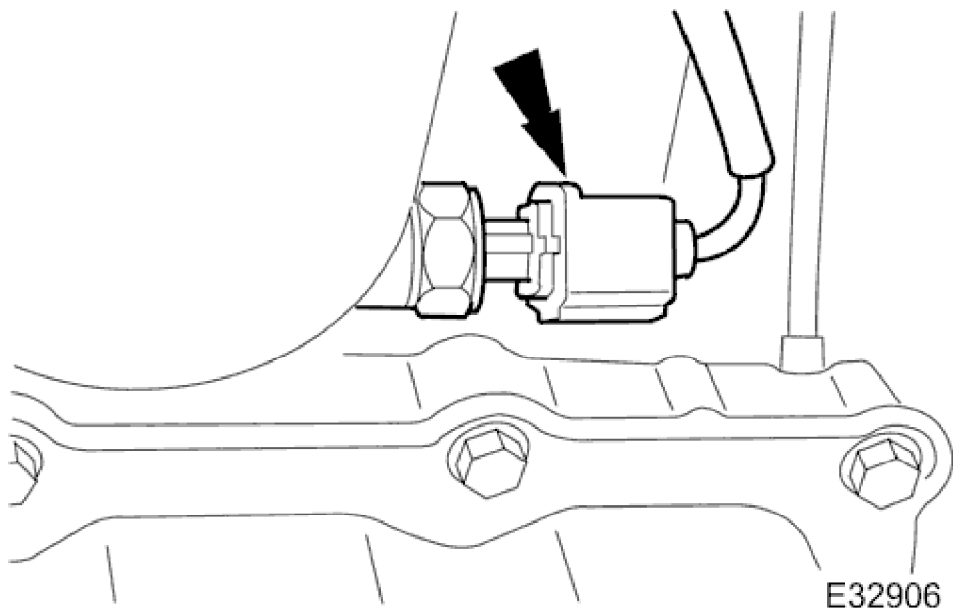
33. Disconnect the condenser jump hose from the receiver / drier.
1. Remove the bolt which secures the condenser jump hose and disconnect the hose.
 2. Remove and discard the O-ring seal from the hose.
 3. Fit blanking plugs to the hose and to the receiver / drier.



34. Disconnect the discharge hose from the condenser.
- 1. Remove the bolt which secures the condenser discharge hose and disconnect the hose.
 - 2. Remove and discard the O-ring seal from the hose.
 - 3. Fit blanking plugs to the hose and to the condenser.

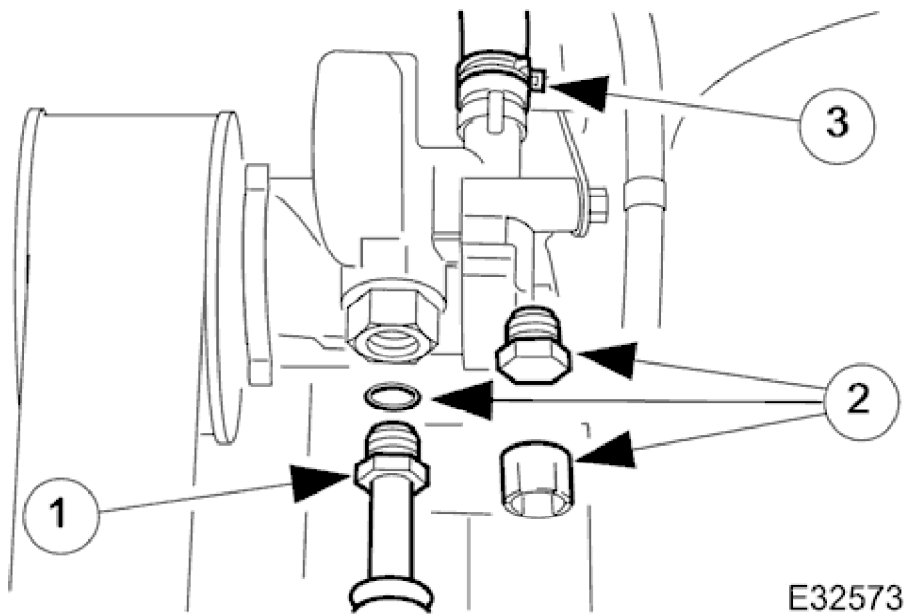


35. Remove the radiator.
- Remove the radiator assembly.
 - Clean coolant spillage from the radiator.



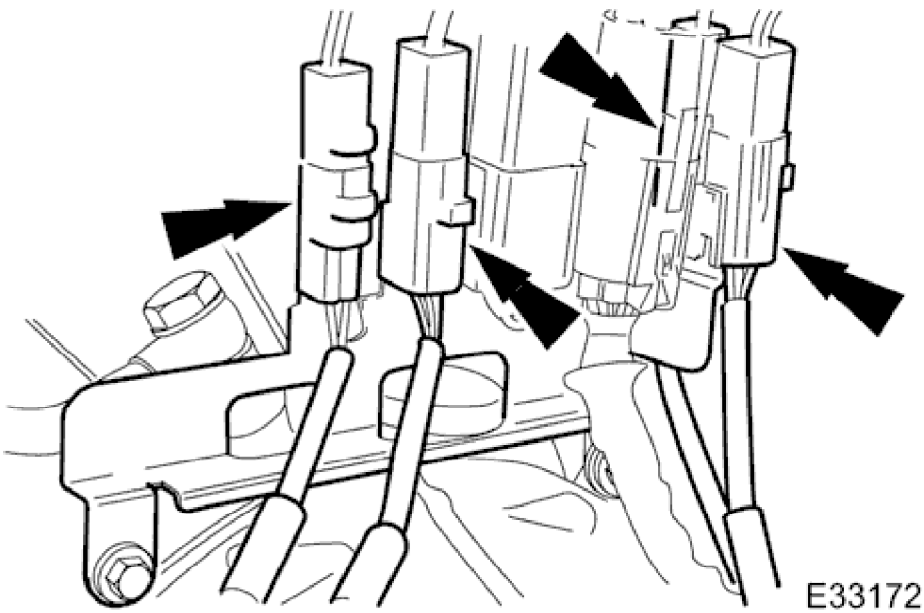
36. Disconnect the engine oil pressure transmitter.

37. Remove the filler cap from the power steering reservoir.

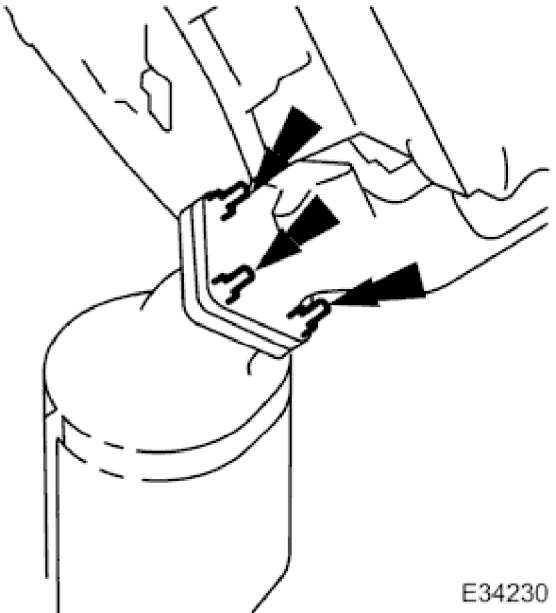


38. Disconnect the hoses from the power steering pump.

- Position a drain tray under the pump.
 1. Release the high pressure hose union nut and drain the fluid.
 2. Discard the O-ring seal and fit blanking plugs to the pipe and union.
 3. Release the feed hose from the pump and fit blanking plugs to the pipe and union.
- Discard the fluid.

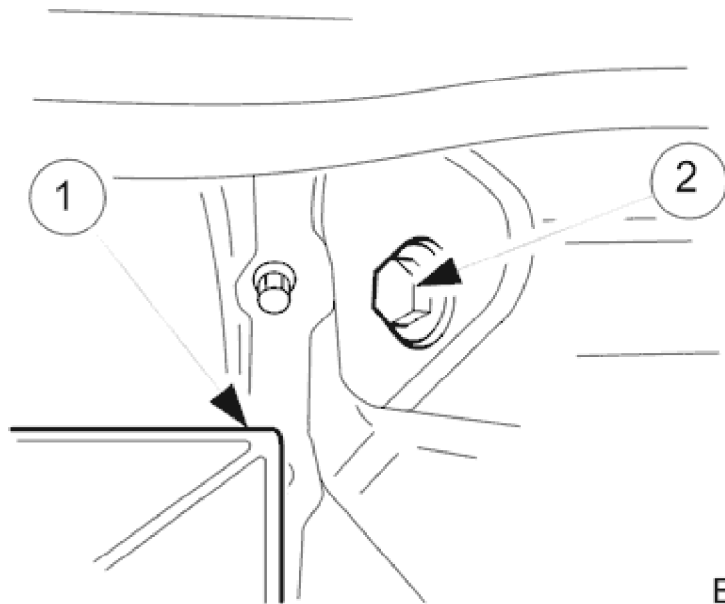


39. Release the Oxygen sensor multi-plugs from the mounting bracket and disconnect the plugs.



40. Remove the four nuts, each side, which secure the downpipe catalytic converters to the exhaust manifold.

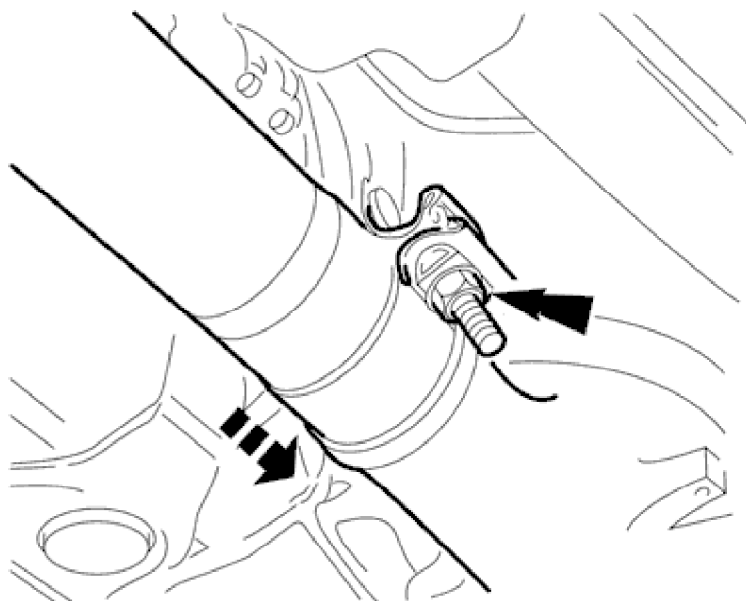
41. Raise the vehicle on the ramp.



E35325

42. Drain the engine oil.

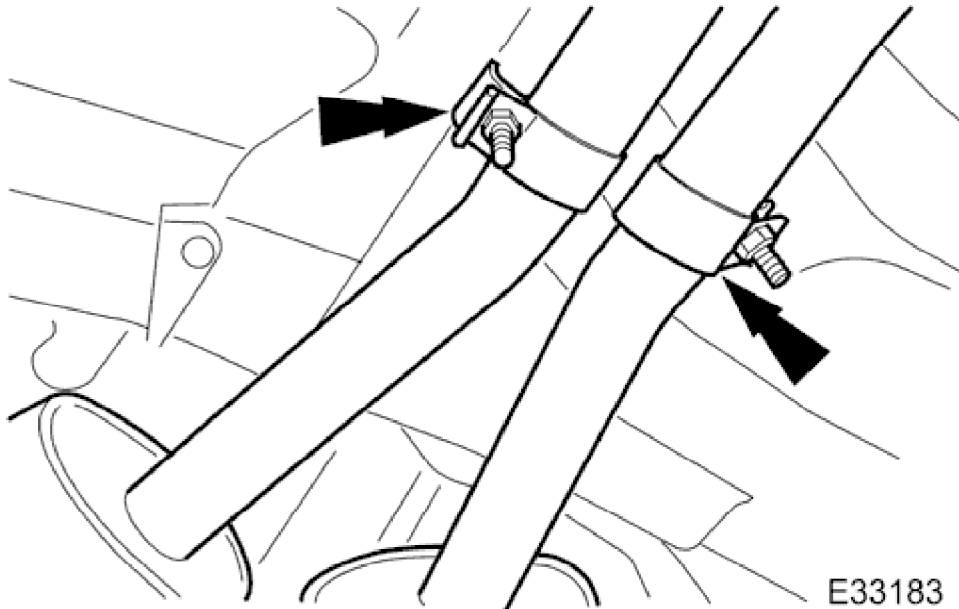
1. Position the waste oil bowser.
 2. Remove the sump drain plug and drain the engine oil.
- Wipe the drain plug and refit it to the sump to prevent oil dripping.
 - Move the oil bowser away from the vehicle.



E35369

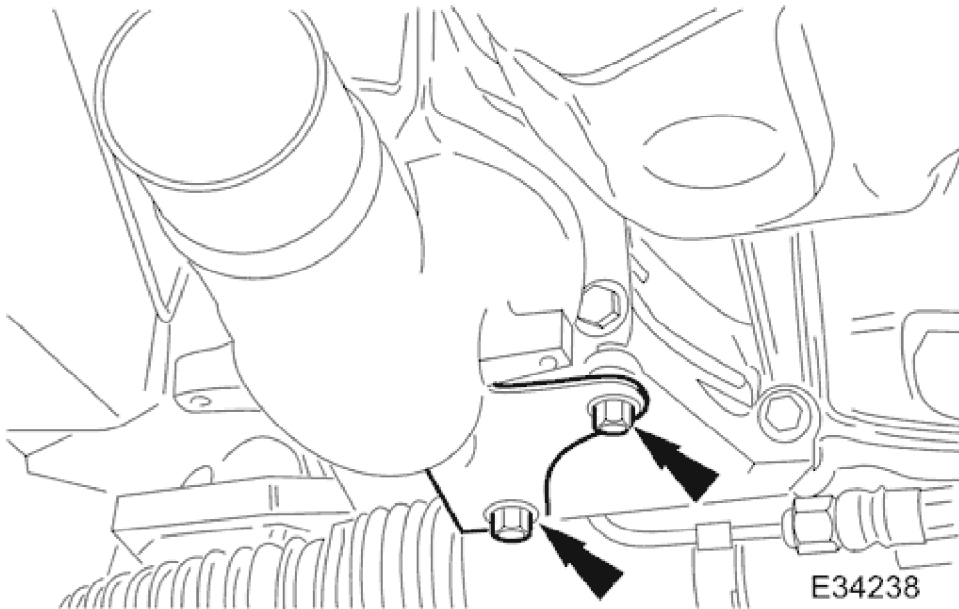
43. Move the front muffler forward to allow the intermediate mufflers to be displaced.

- Slacken the clamps (left-hand and right-hand sides), catalytic converter to front muffler.



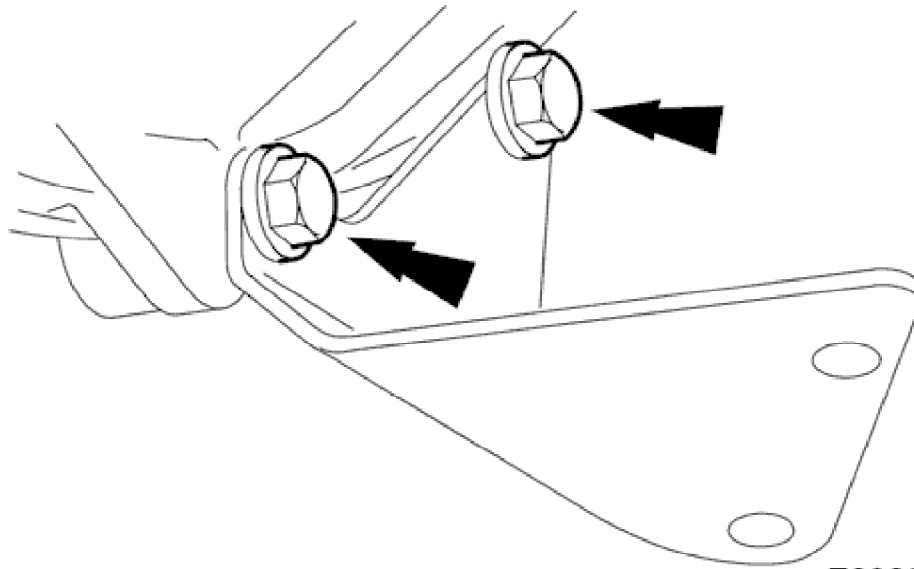
E33183

44. Slacken the clamps (left-hand and right-hand sides), intermediate mufflers to front muffler.
45. Remove the front muffler.
 - Disconnect the front muffler from the intermediate mufflers and then from the downpipe catalytic converters.



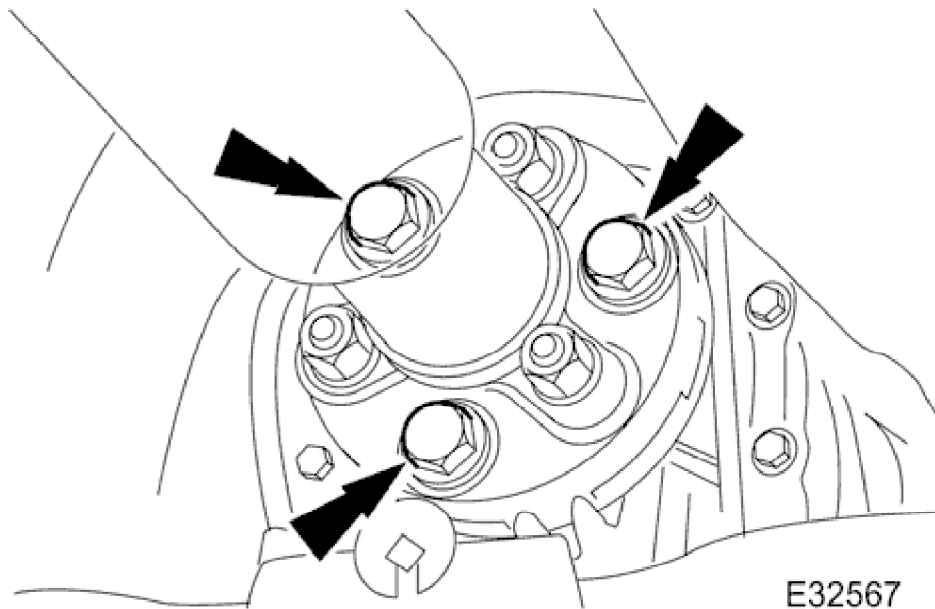
E34238

46. Remove the downpipe catalytic converters.
 - Remove the bolts which secure the downpipe to the lower mounting bracket.
 - Remove the downpipe assembly.
 - Repeat the above operations for the other downpipe catalytic converter.



E33093

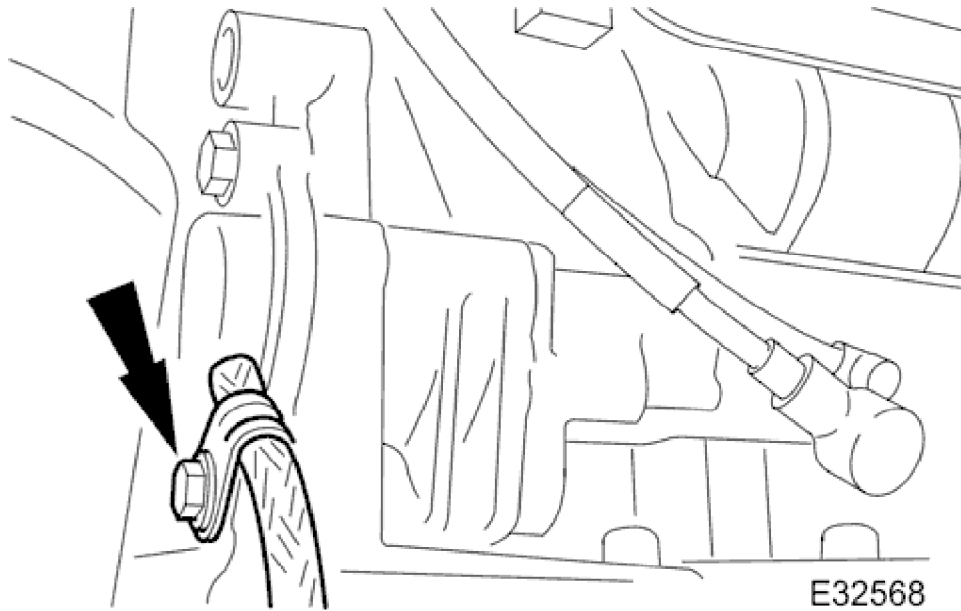
47. Remove the two bolts which secure each mounting bracket to the bell housing and remove the brackets.



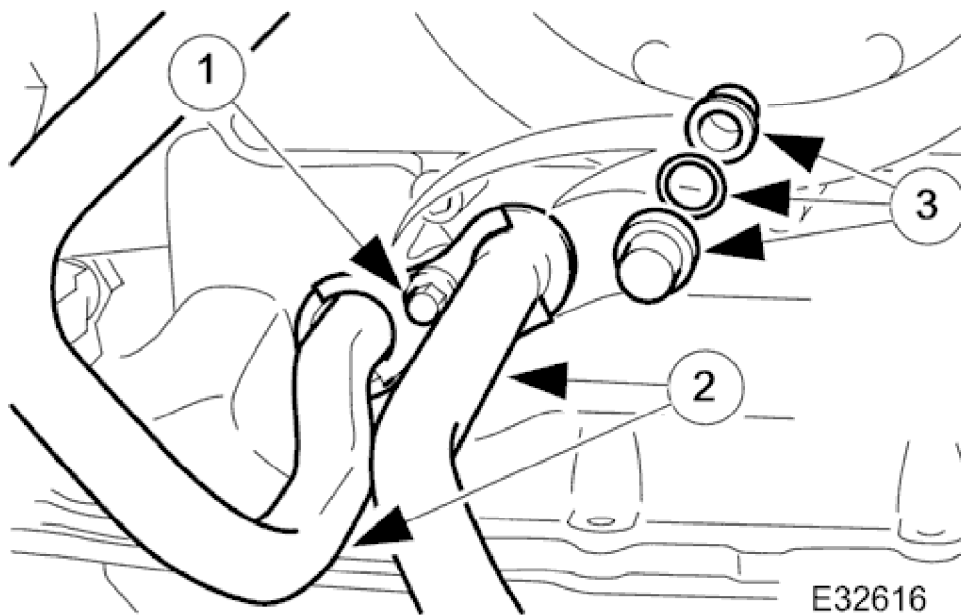
E32567

48. Disconnect the driveshaft (propshaft) flange from the transmission output flange.

- Remove the three bolts which secure the flange. Rotate the shaft for access to each bolt.
- Disconnect the shaft and reposition it to the side.



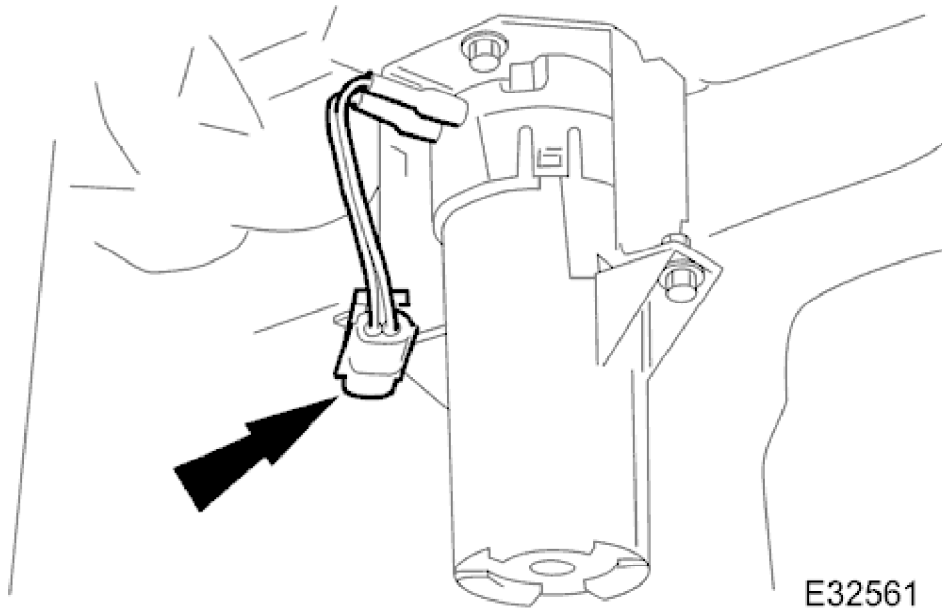
49. Remove the securing bolt and disconnect the ground lead from the transmission casing.



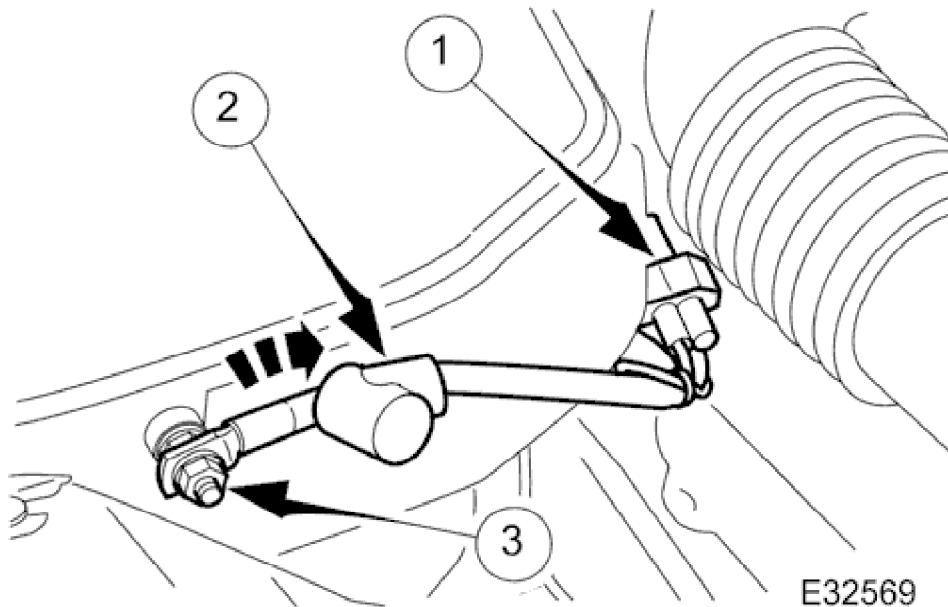
50. Disconnect the oil cooler pipes (where fitted) from the engine.
1. Remove the bolt which secures the pipe clamping plate. Remove the clamping plate.
2. Place a drain tray beneath the pipes and disconnect the pipes. Allow the oil to drain.
3. Remove the O-ring seals and fit blanking plugs to the pipes and to the mating unions on the engine.

51. Lower the ramp.

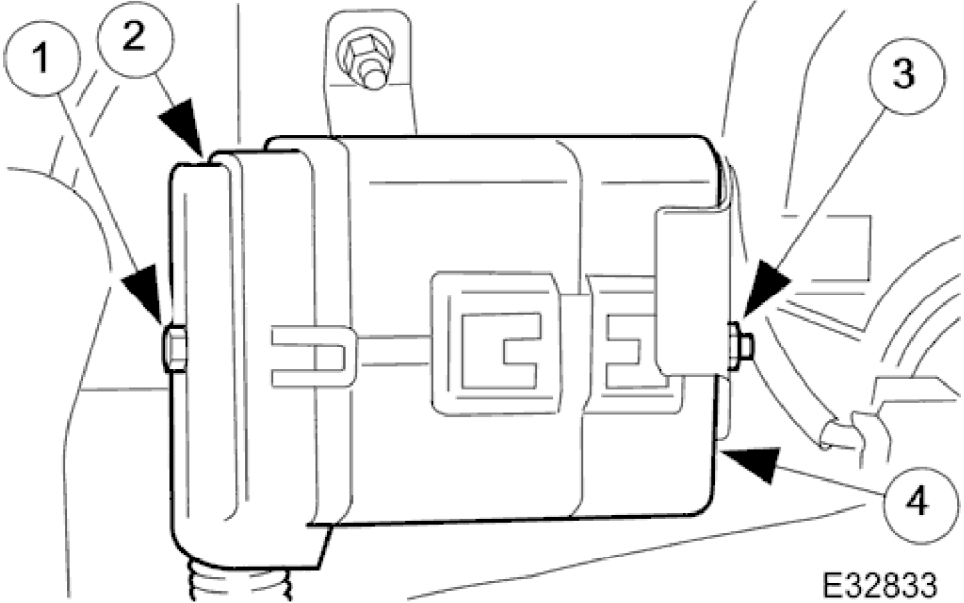
1998 XJ RANGE - Engine - 303-01



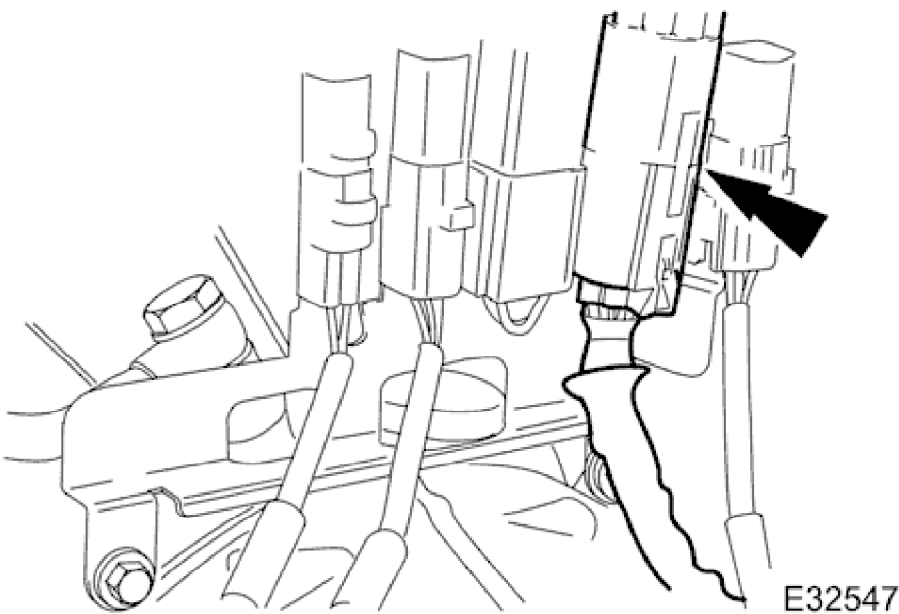
52. Disconnect the generator suppression module (where fitted) harness.
- Disconnect the harness multi-plug and reposition the harness from under the suppression module.



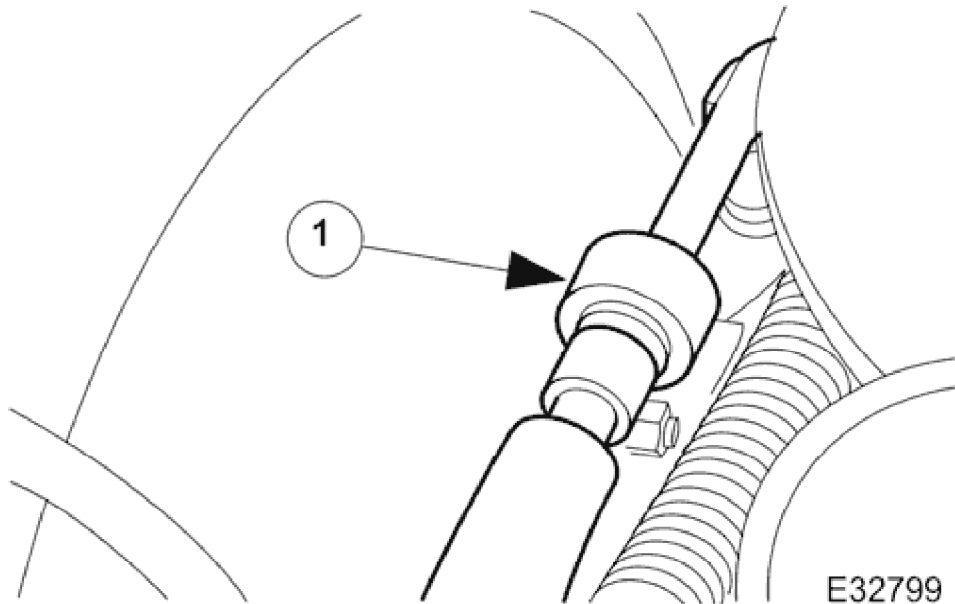
53. Disconnect the starter motor power cable, at the right hand side engine compartment enclosure.
1. Disconnect the multi-plug, engine management harness to starter motor.
 2. Reposition the protective boot from the starter motor power stud.
 3. Remove the nut and disconnect the power cable.
- Cut the tie strap which secures the power cable to the enclosure and route the cable into the engine bay.



54. Disconnect the P.I. harness from the engine management harness.
- 1. Release the bolt which secures the P.I. harness multi-plug to the engine management harness.
 - 2. Disconnect the multi-plug.
 - 3. Remove the nut which secures the engine management harness multi-plug to the mounting bracket.
 - 4. Reposition the multi-plug from the bracket.

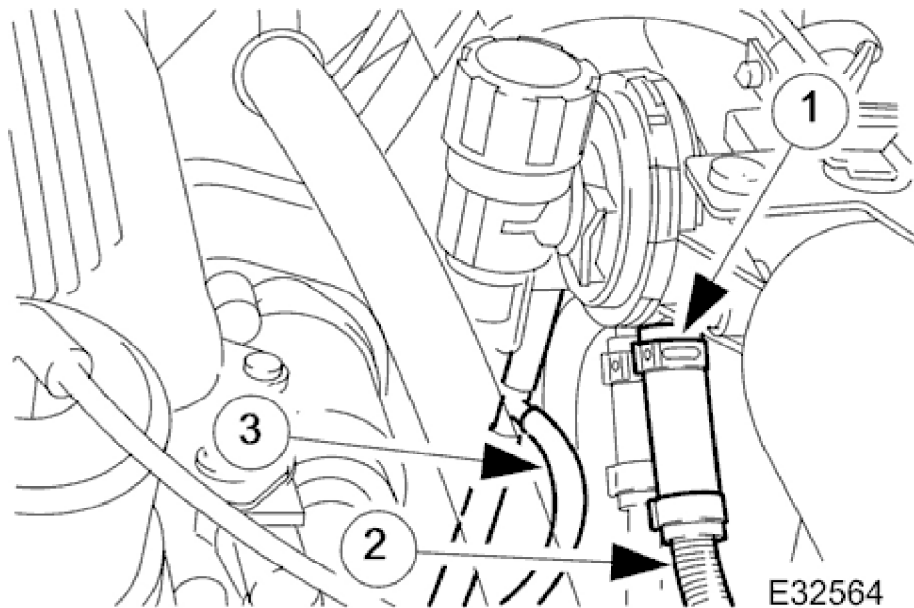


55. Disconnect the transmission rotary switch harness connector.
- Reposition and disconnect the harness multi-plug.



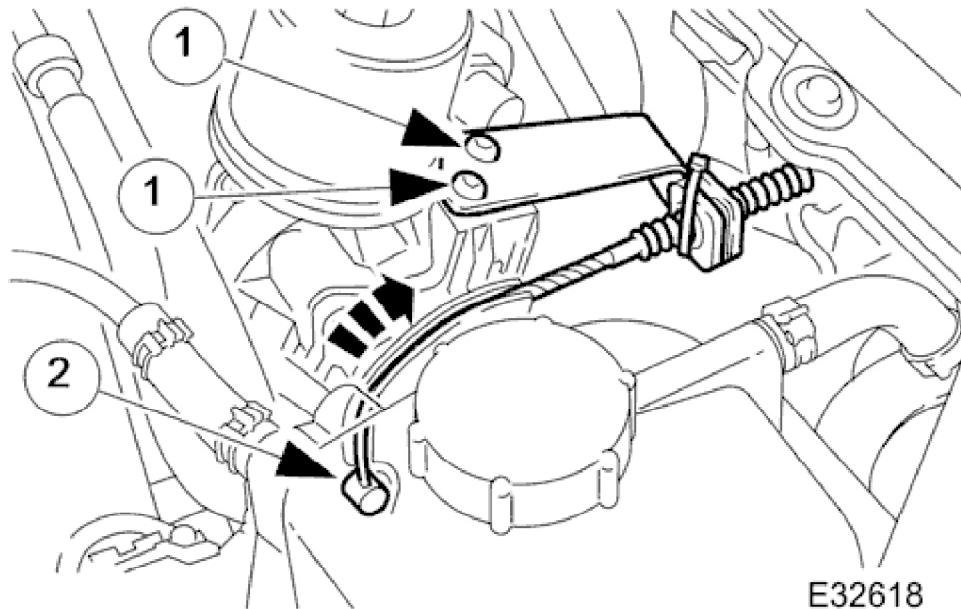
56. Disconnect the fuel feed and return hoses.

1. Disconnect the fuel hoses at the Quick Fit connectors, using special tool 310 - 044 for the feed hose and 310 - 54 for the return hose.
- Disconnect the return hose from the feed hose clip.
 - Fit blanking plugs to the pipes.



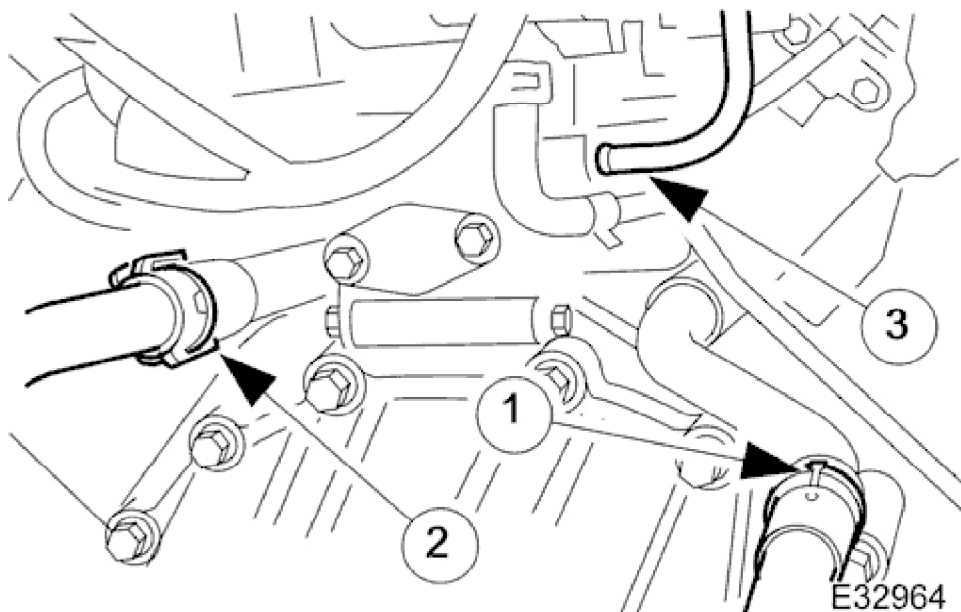
57. Disconnect the pipes from the purge valve.

1. Remove the clip which secures the part load breather hose to the purge valve.
2. Disconnect the part load breather hose.
3. Disconnect the vacuum hose from the purge valve and reposition the hose.



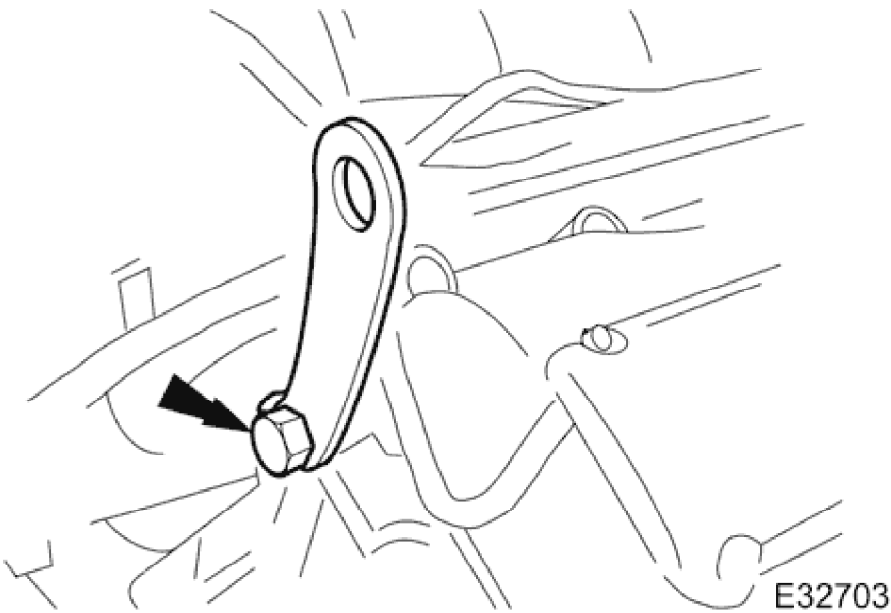
58. Disconnect the throttle cable.

1. Secure the cable abutment to the bracket with tape or a ratchet strap, if necessary (to save subsequent adjustment procedure). Remove the bolts which secure the abutment bracket to the throttle body.
2. Rotate the butterfly actuator cam and disconnect the cable. Reposition the cable.



59. Disconnect the heater and brake servo hoses.

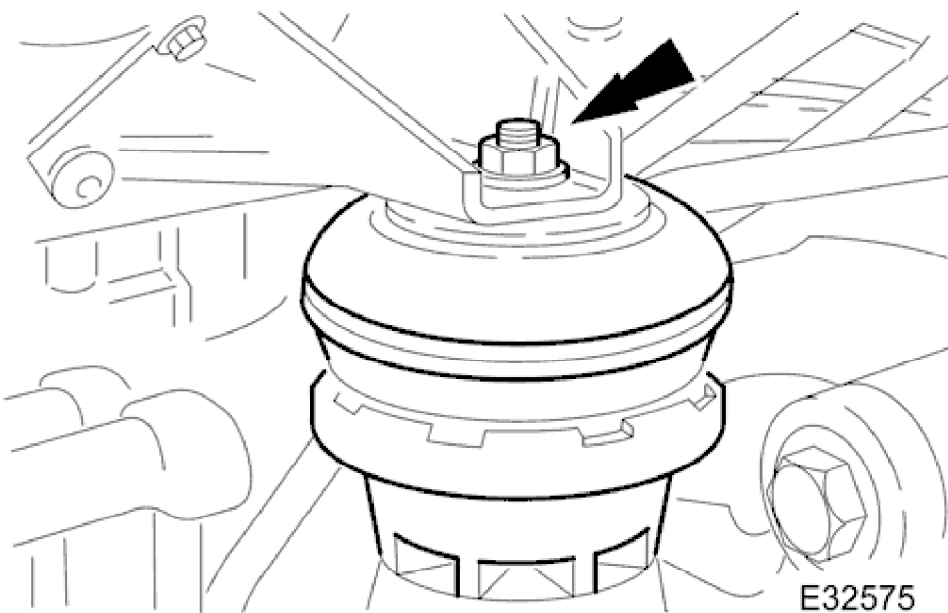
1. Disconnect the heater return hose.
2. Release the heater feed hose locking lever and disconnect the hose.
3. Disconnect the brake servo hose.



60. Fit engine rear lifting eyes (303 - 536).

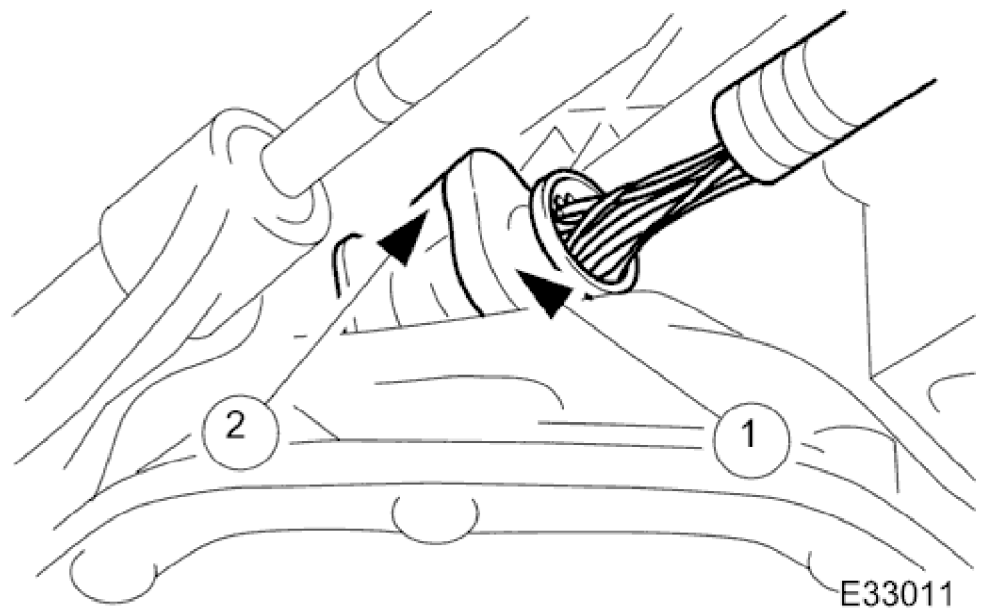
61. Traverse the hoist to the engine compartment and lower it to working height.

62. Fit lifting chains to the hoist and connect to each engine lifting eye. Use longer chains to the rear lifting eyes to allow the engine to tilt rearwards when removing from the vehicle.

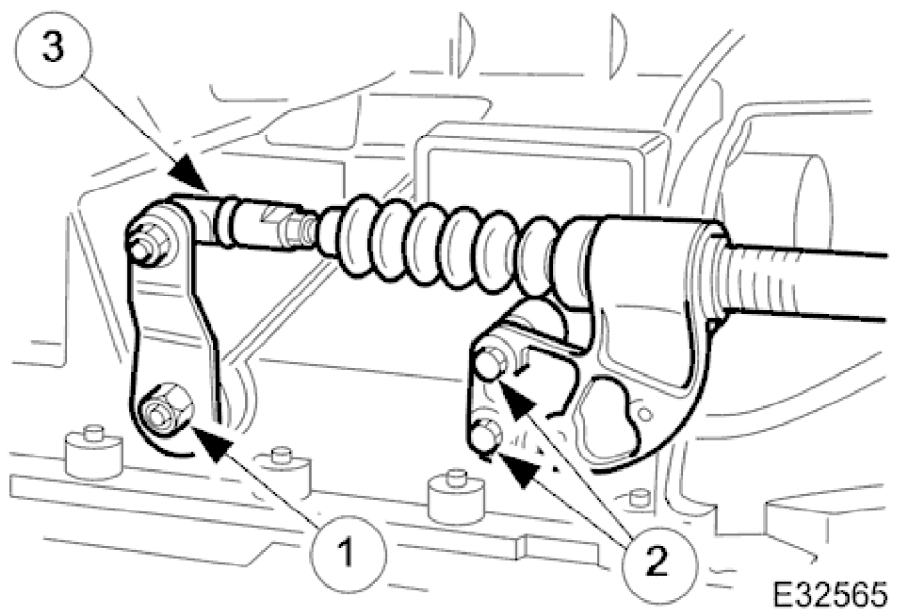


63. Remove the engine front mounting nuts.

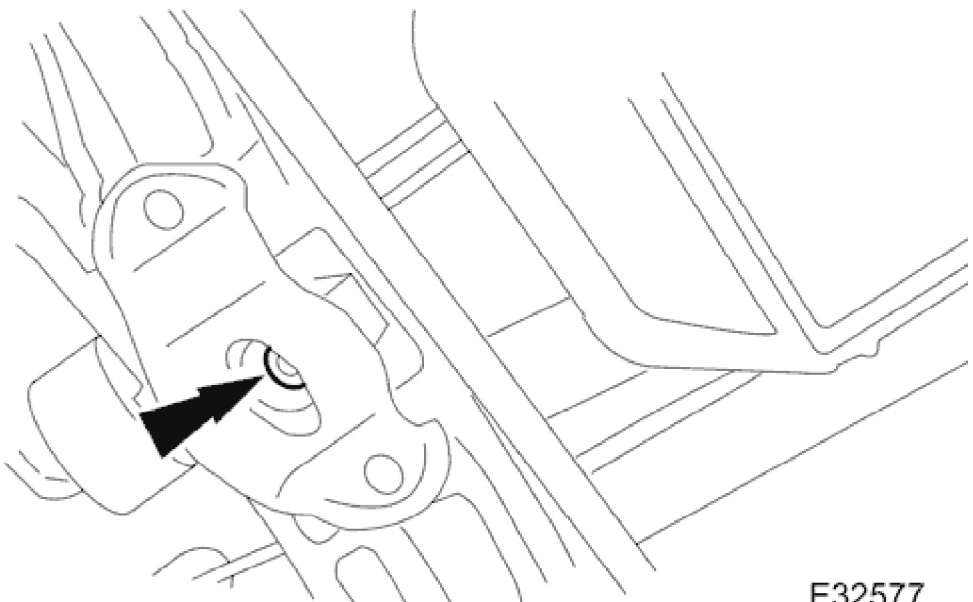
64. Raise the ramp.



65. Disconnect the transmission connector.
- 1. Release the lever lock on the transmission harness multi-plug.
 - 2. Disconnect the connector.

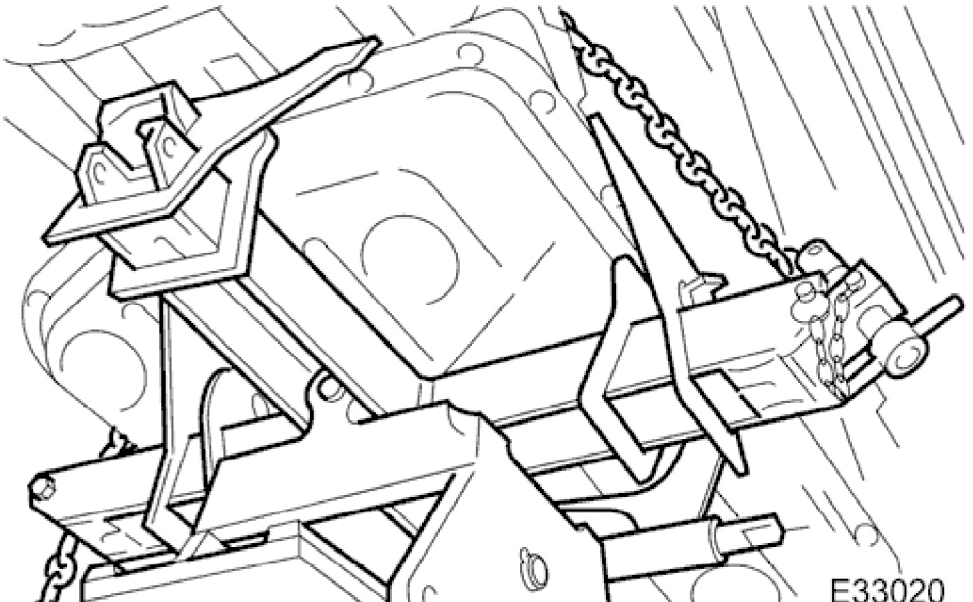


66. Disconnect the transmission selector cable.
- 1. Remove the nut which secures the selector lever to the transmission cross shaft.
 - 2. Remove the selector cable abutment bolts.
 - 3. Disconnect the selector arm from the cross shaft.



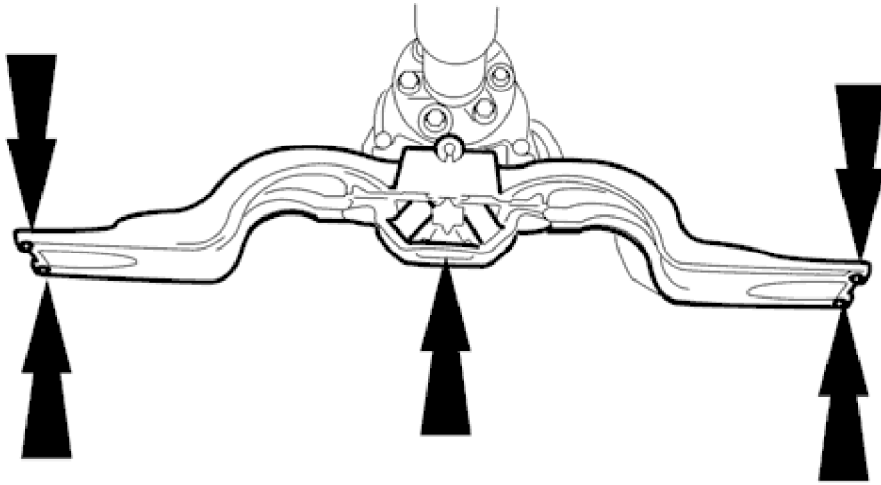
E32577

67. Loosen the bolt which secures the engine rear mounting rubber to the transmission.



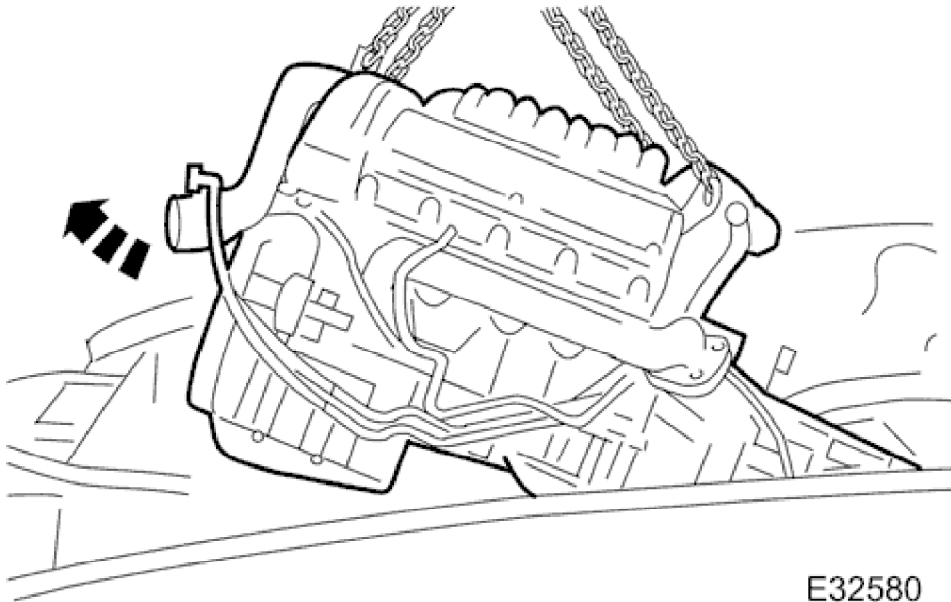
E33020

68. Position a transmission jack e.g. Epcos V100 and raise the support bed of the jack to take the weight of the transmission. Fit and adjust the chains to secure the transmission to the jack.



E33923

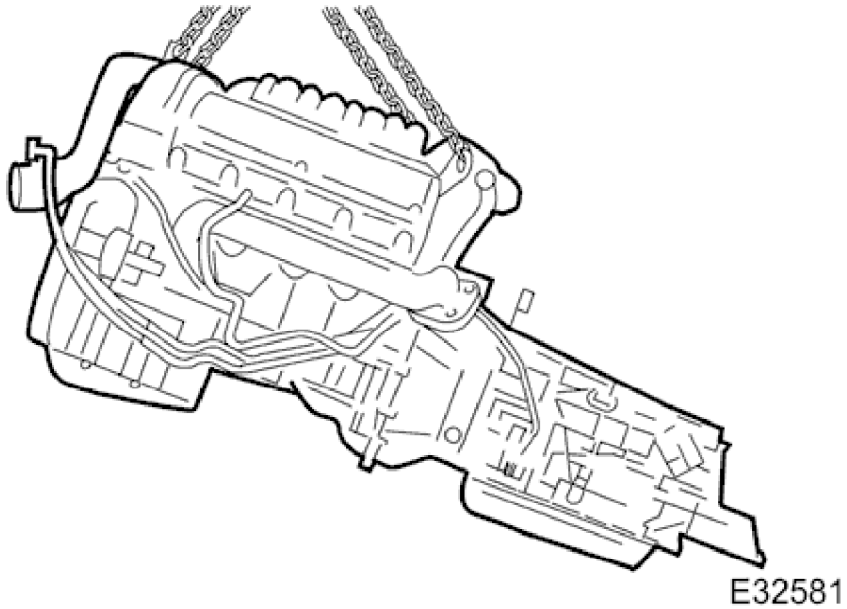
69. Remove the engine rear mounting assembly.
- Remove the mounting centre bolt.
 - Remove the four bolts which secure the crossmember to the body.
 - Remove the crossmember and mounting assembly.



E32580

70. Release the engine and transmission assembly from the engine compartment.
- Take the weight of the engine / transmission with the hoist and move it towards the front of the vehicle.
 - Lower the transmission jack slightly to release the securing chains. Remove the jack from below the vehicle.
 - Remove the engine and transmission assembly, upwards and forwards, from the vehicle.

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71. Remove the engine and transmission assembly from the vehicle.
- Operate the crane controls and the ramp simultaneously (with assistance) to lower the vehicle to a convenient working height.
 - Traverse the crane clear until the assembly can be lowered.