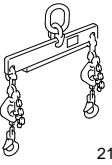
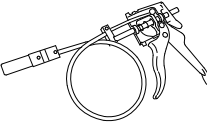


Engine – Remove and Install (21 134 0)

Special Tools

 <p>21-068 A</p>	<p>21-068A Engine lifting tackle</p>
 <p>24003</p>	<p>24-003 Coolant hose clamp removal and fitting tool</p>

Proprietary Tools

Four M12 x 180 bolts
3/8" wrench

Workshop Equipment

Transmission jack	
Trolley jack	
Workshop crane	

Materials

Coolant	ESD-M97B-49A
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Remove

1. General note.

Use removal and fitting tool 24-003 to remove coolant and breather hoses if necessary.

2. Preparatory measures.

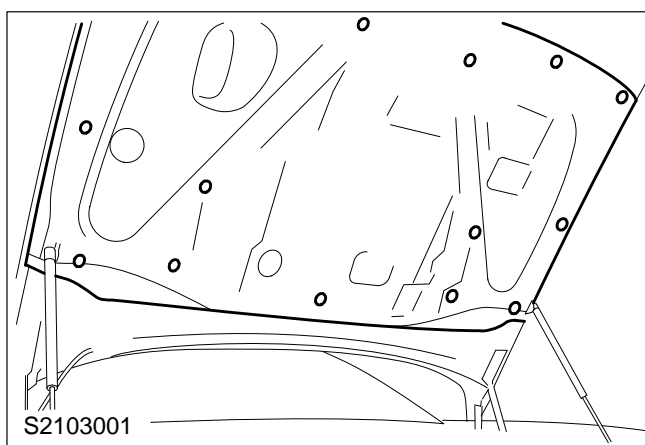
- Make a note of the radio keycode.
- Make a note of the preset radio stations.
- Remove the battery cover (one nut).

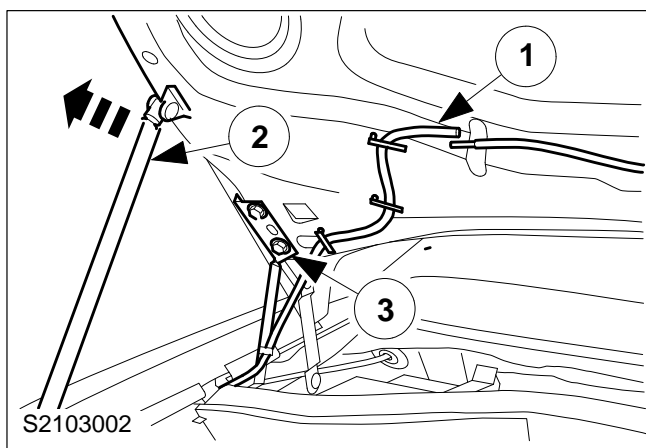
⚠ CAUTION: Disconnect the battery negative lead.

⚠ WARNING: Danger of scalding if the engine is warm.

Open the coolant expansion tank.

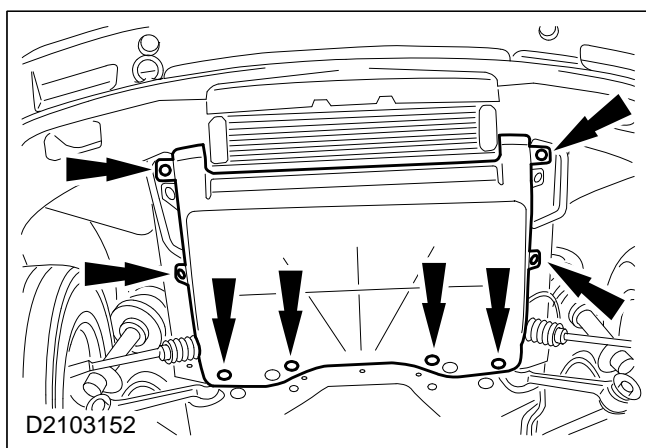
3. Remove the hood insulation (15 clips).





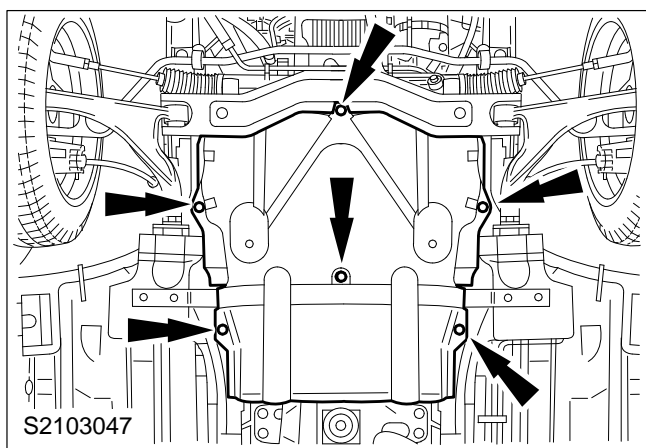
4. Remove the hood.

- 1 Separate the windscreen washer system hoses and take them out of their clips.
- 2 Unhook the hood dampers on both sides (right side shown).
- 3 Detach the hood hinges on both sides (two bolts each; right-hand side shown).

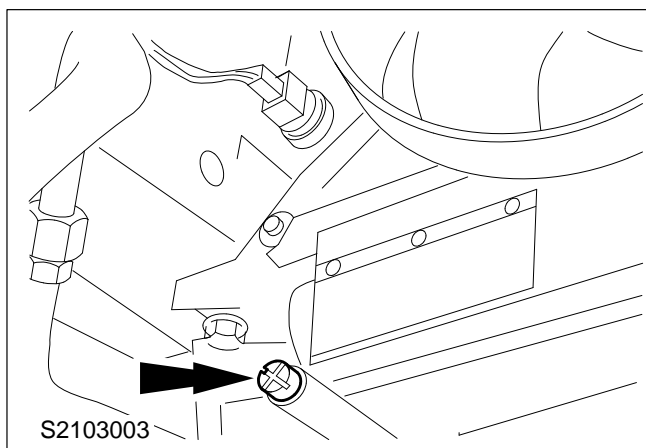


5. Raise the vehicle.

6. Remove the front engine undershield (eight clips).



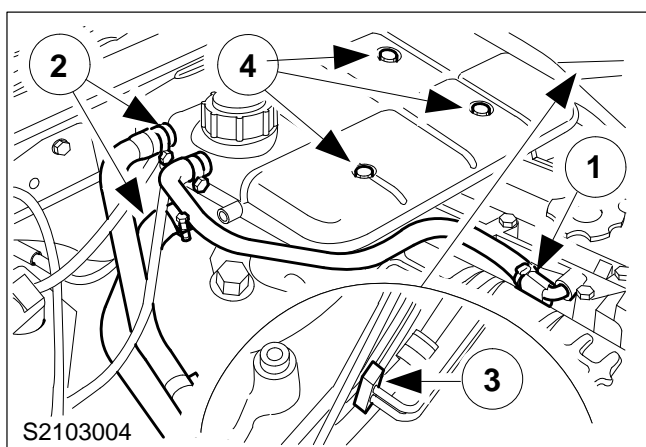
7. Remove the rear engine undershield (six clips).



⚠ WARNING: Danger of scalding if the engine is warm.

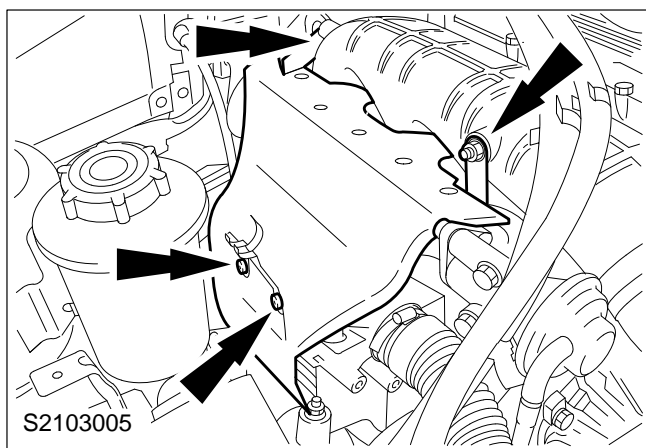
8. Drain off the coolant.

Screw the threaded plug in again after draining off the coolant.



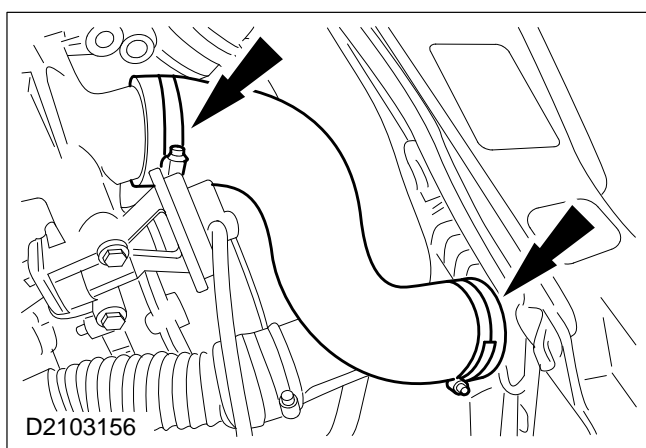
9. Remove the coolant expansion tank.

- 1 Detach the coolant hose.
- 2 Detach the two hoses.
- 3 Disconnect the engine coolant level sensor (ECL sensor).
- 4 Unscrew the bolts and remove the coolant expansion tank.

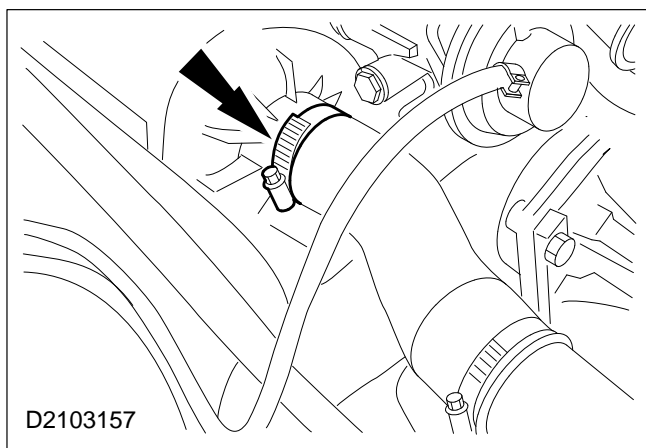


10. Remove the turbocharger heat shield.

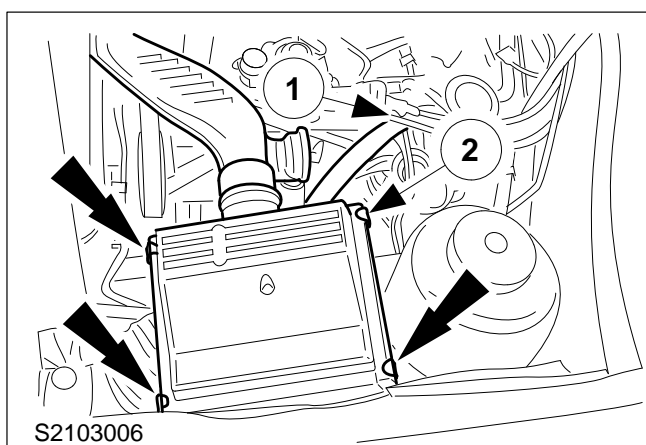
Unclip the hoses.



11. Remove the air hose between the inlet manifold and the intercooler.

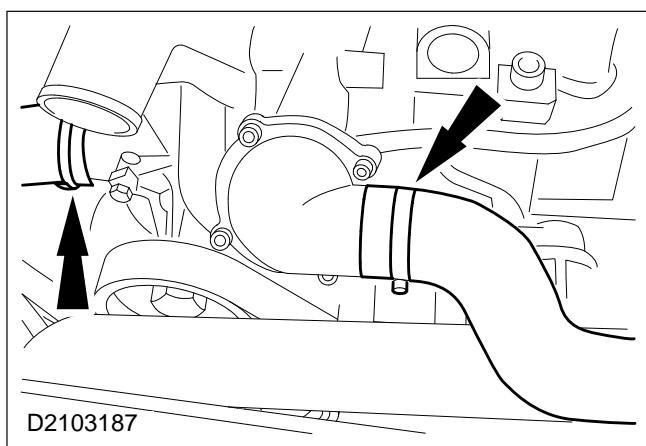


12. Detach the intake pipe from the turbocharger.

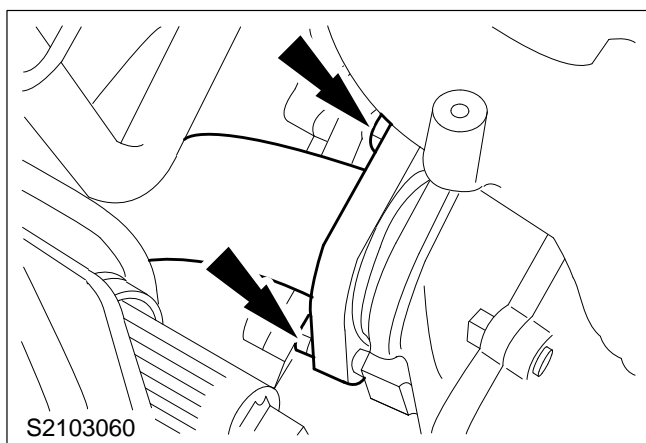


13. Remove the intake pipe.

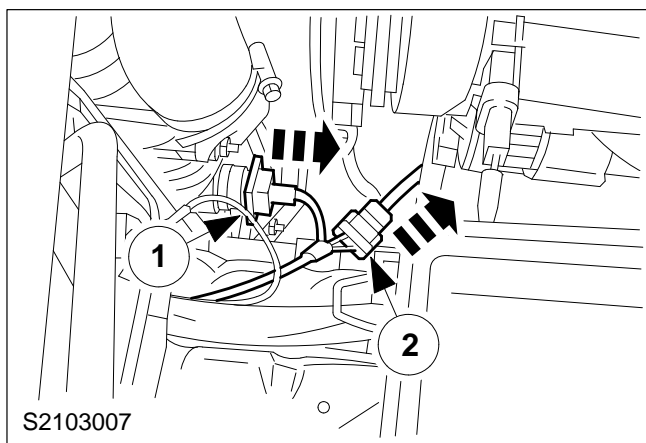
- 1 Detach the crankcase ventilation hose.
- 2 Detach the air cleaner housing cover and remove it with the intake pipe.



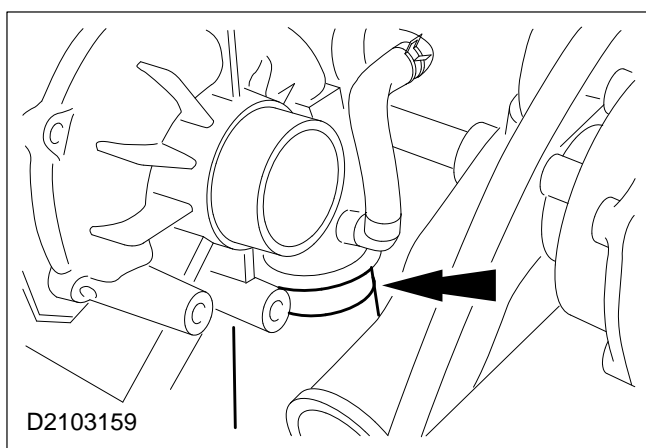
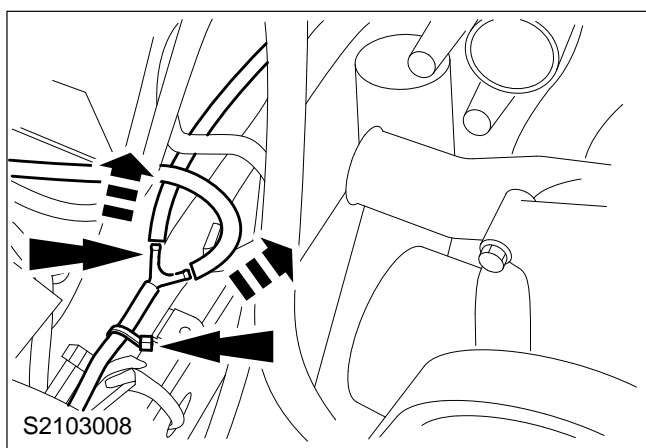
14. Detach the coolant hoses.



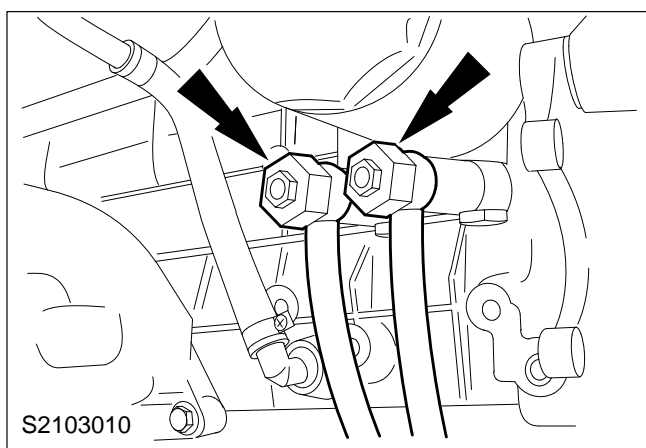
15. Detach the front exhaust pipe from the turbocharger.

**16. Disconnect the plugs.**

- 1 From the engine coolant temperature sensor (ECT sensor)
- 2 From both fan motors (left-hand side shown)

**17. Detach the intercooler air hose.****18. Detach the crankcase ventilation hose going to the EGR valve at the T-connector.**

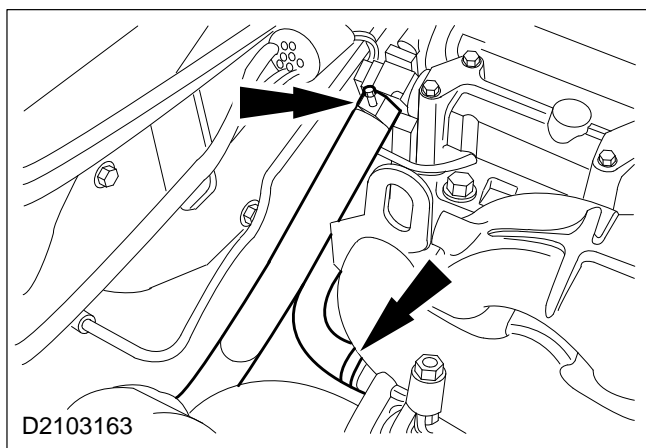
Undo the cable ties.



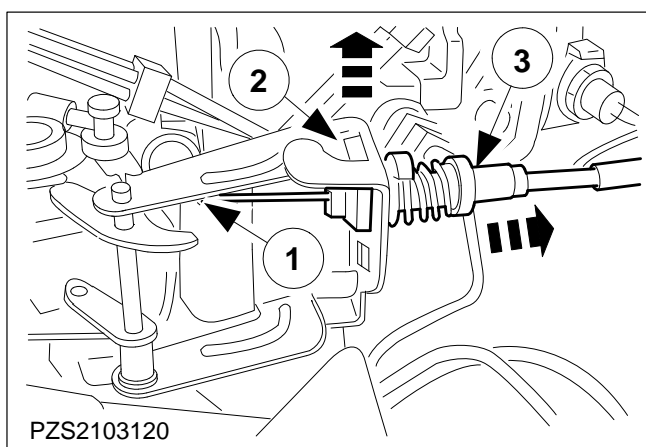
⚠ CAUTION: Escaping oil.

NOTE: Mark the pipe connections.

19. Disconnect the oil pipes from the oil filter intermediate housing extensions.

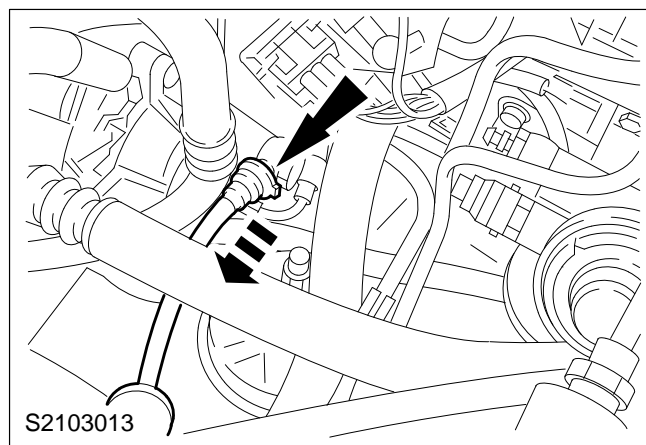


20. Detach the heater hoses.

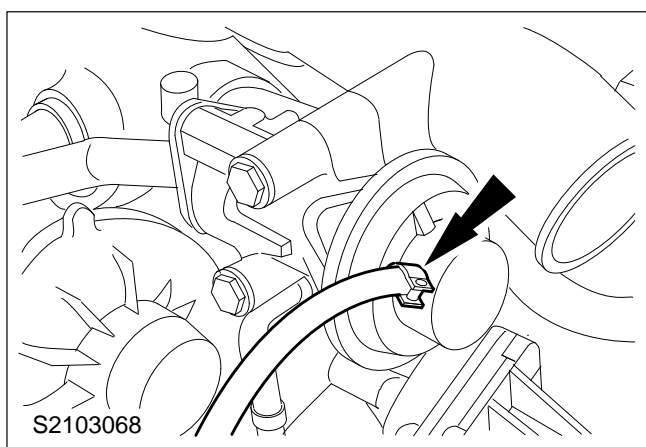


21. Detach the throttle cable.

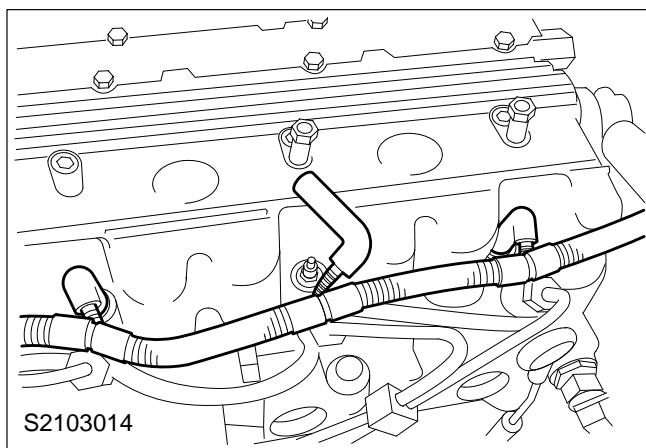
- 1 Unhook the throttle cable.
- 2 Remove the U-bolt.
- 3 Detach the throttle cable.



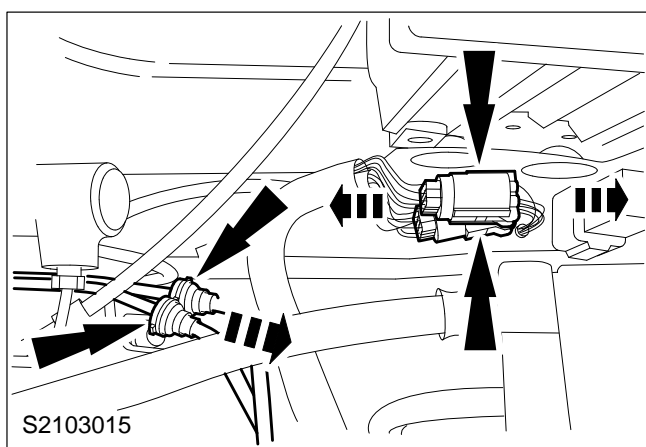
22. Disconnect the vacuum pipe from the vacuum pump brake servo.



23. Detach the hose from the EGR valve.

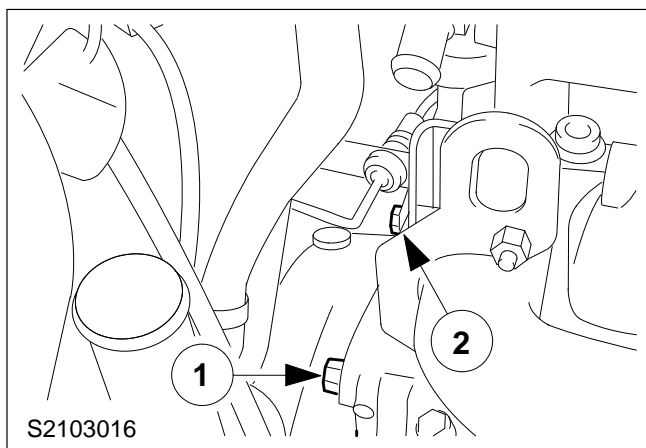


24. Pull off the glow plug connectors.



25. Separate both main wiring loom connectors.

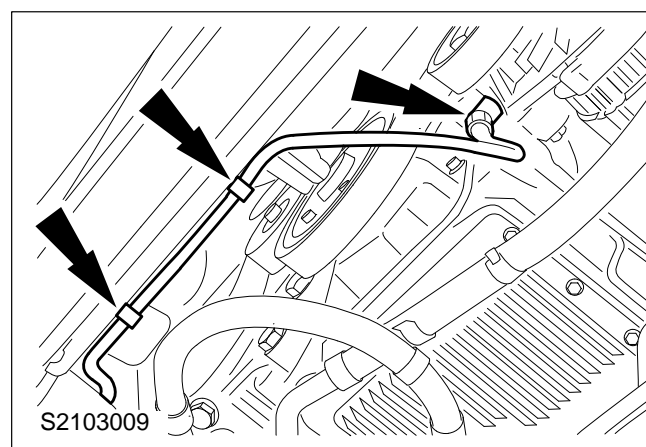
26. Disconnect the fuel pipe quick-release couplings.



27. Detach the top of the transmission housing from the transmission intermediate flange.

1 Bolt.

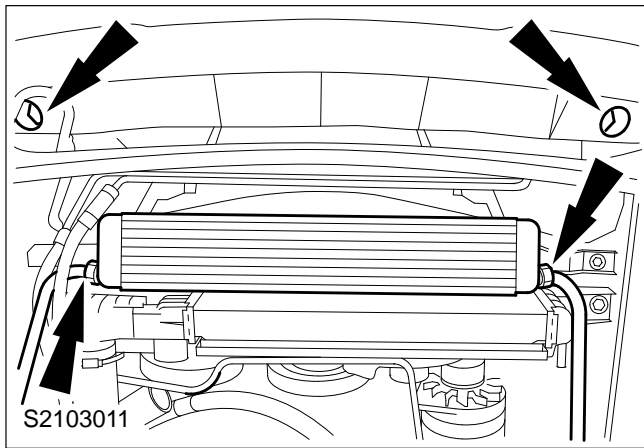
2 Bolt with hydraulic clutch operator bracket.



28. Raise the vehicle.

29. Pull the crankcase ventilation hose going to the EGR valve off the engine block.

Detach the hose from the radiator.

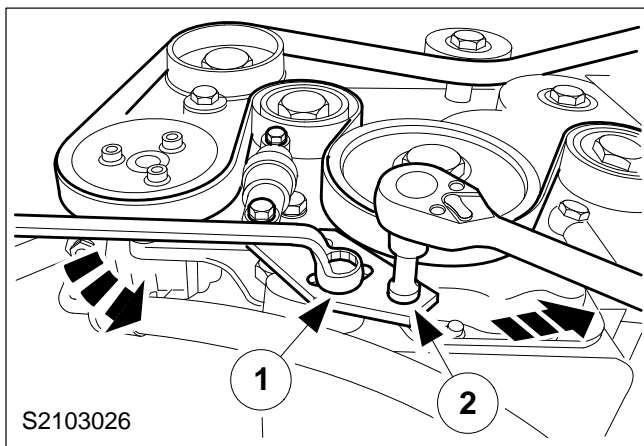


30. Detach the oil pipes from the oil cooler.

31. Remove the radiator with the intercooler.

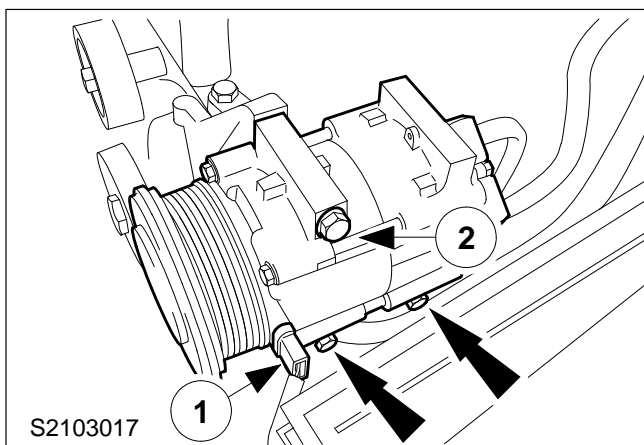
NOTE: The radiator is a push fit at the top.

- One bolt on each side.
- Remove the radiator downwards.



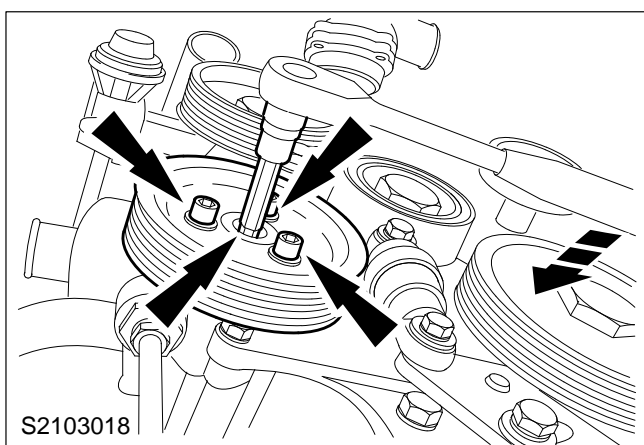
32. Remove the drive belt.

- 1 Slacken the bolt.
- 2 Slacken the drive belt and remove it.



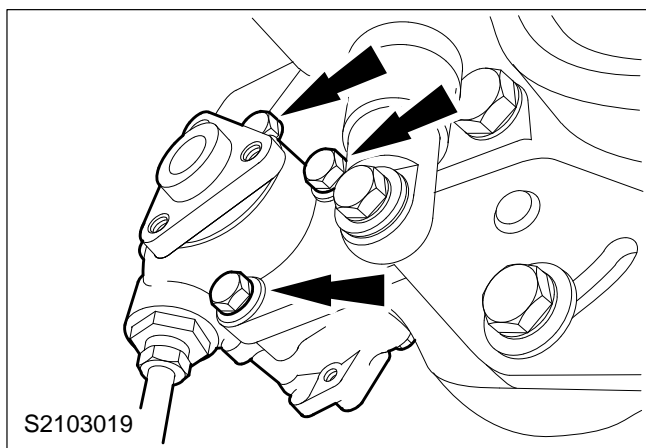
33. Remove the air conditioning compressor.

- 1 Disconnect the plugs.
 - 2 Remove the bolts.
- Place the compressor to one side and secure it.

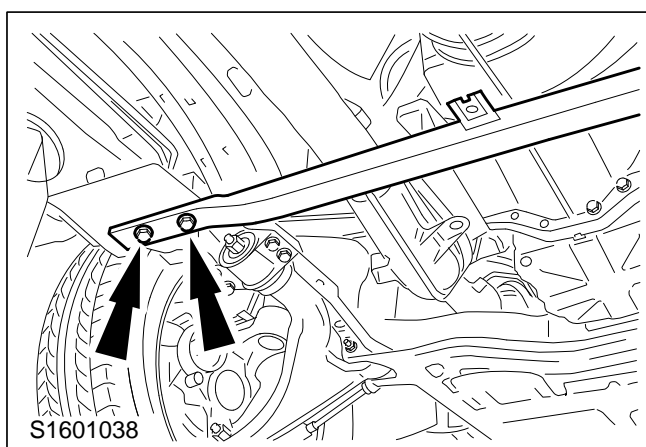
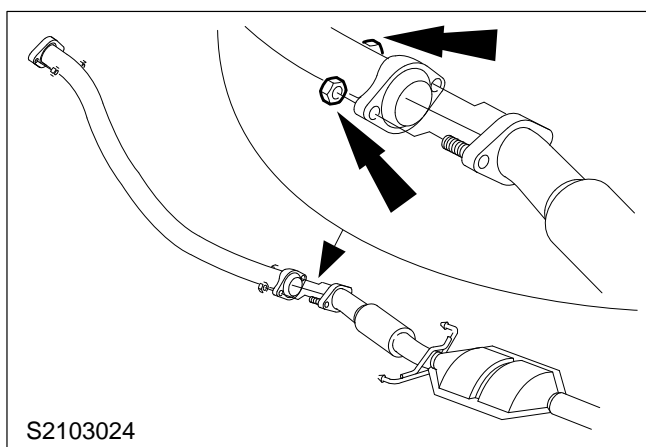
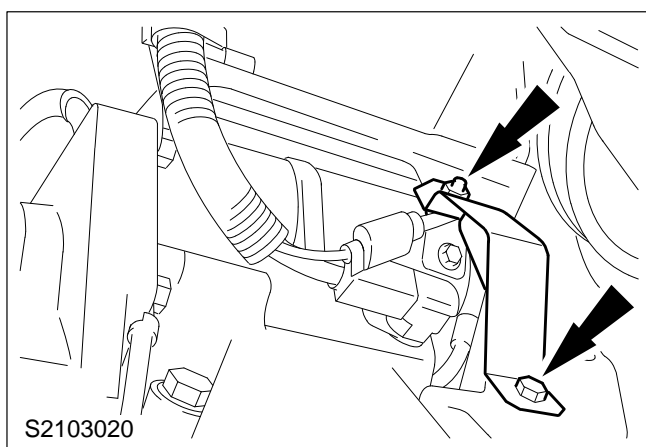


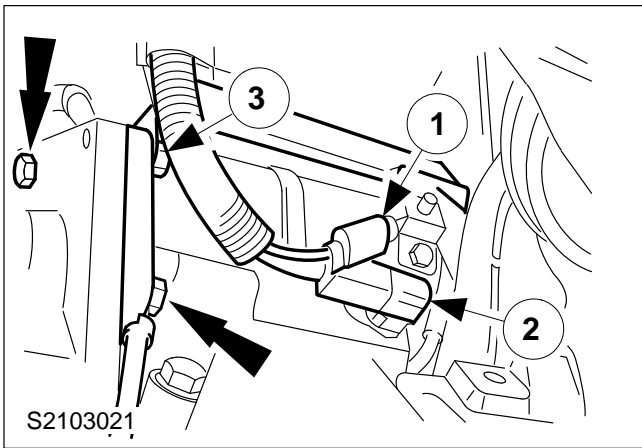
34. Remove the power steering pump pulley.

Stop it from turning using a 3/8" Allen key.

**35. Detach the power steering pump.**

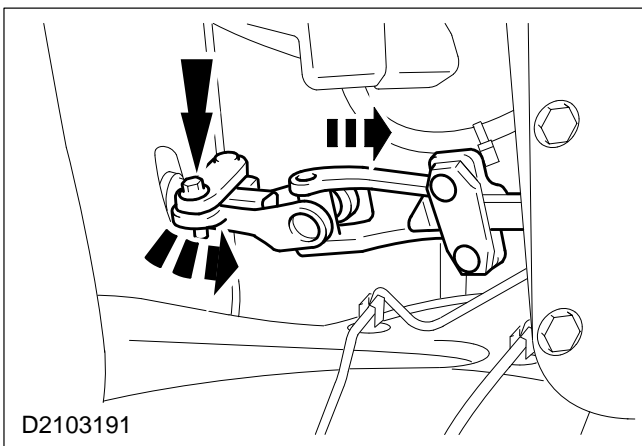
Tie the power steering pump to one side.

**36. Detach the front axle transverse brace from the side member (two bolts on each side; left-hand side shown).****37. Detach the front exhaust pipe from the catalytic converter.****38. Detach the heat shield bracket from the starter motor.**



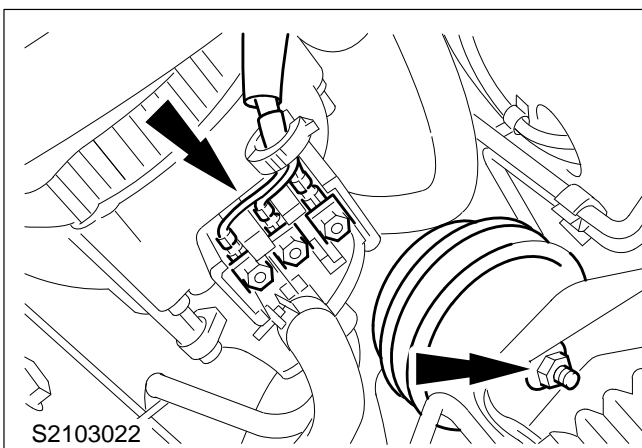
39. Detach the starter motor from the transmission intermediate flange.

- 1 Disconnect the plug.
- 2 Open the cover and disconnect the battery positive lead.
- 3 Detach the starter motor and heat shield.



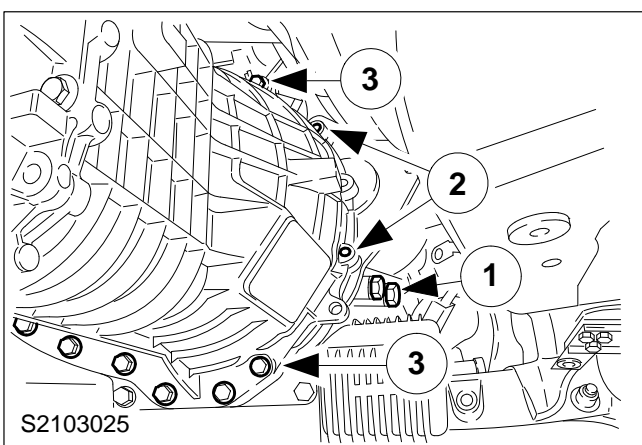
40. Disconnect the steering intermediate shaft from the steering shaft.

- Unscrew the bolt and swivel the clamp plate to the side.
- Pull the steering intermediate shaft away from the steering shaft.



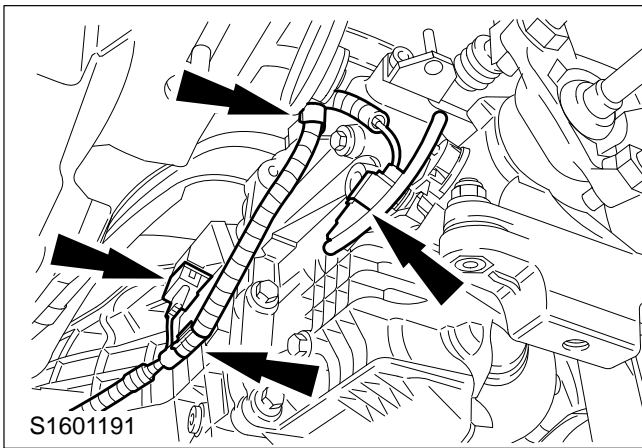
41. Disconnect the cables from the alternator.

42. Detach the engine mountings on both sides (left-hand engine mounting nut shown).



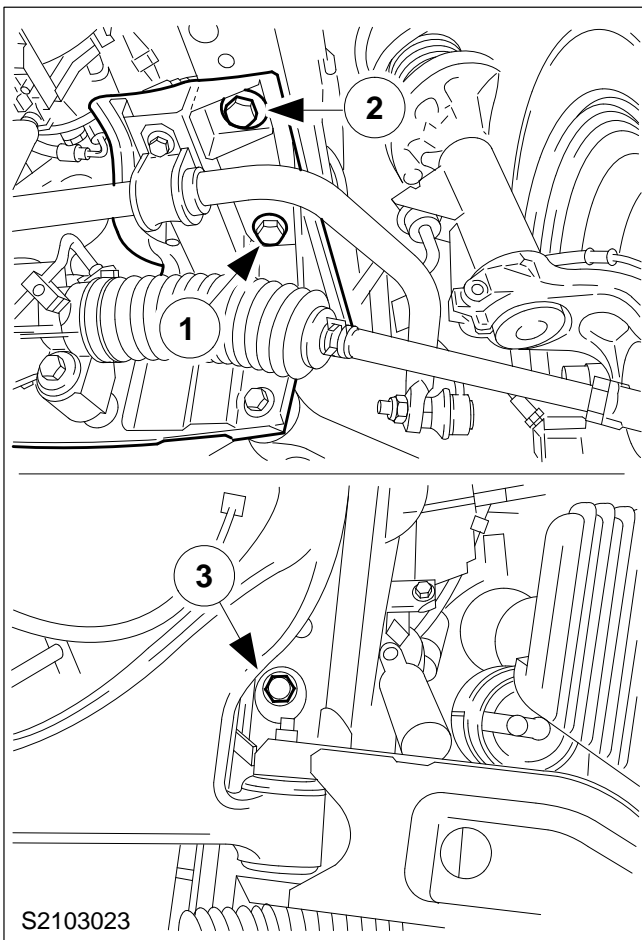
43. Detach the engine from the transmission intermediate flange (ten bolts).

- 1 Slacken the transmission bracket bolts.
- 2 Unscrew the bolts on the engine side.
- 3 Unscrew the bolts on the transmission side.



44. Detach the wiring loom from the transmission.

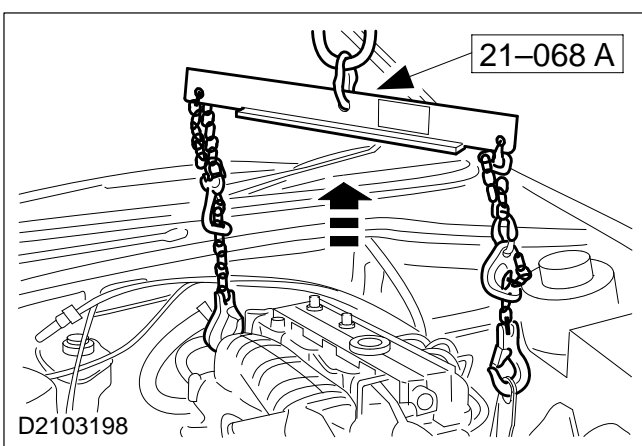
- Disconnect the two plugs.
- Release the wiring loom from the two clips and tie it to the engine.



⚠ WARNING: Support the front axle/engine support bar on a transmission jack.

45. Lower the front axle/engine support bar.

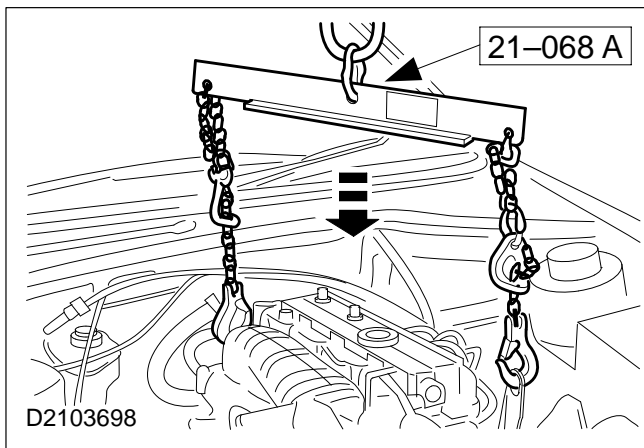
- 1 Take out the centre bolt and screw in a M12 x 180 bolt instead (left-hand side shown).
Renew the centre bolt on the other side as well.
- 2 Unscrew the bolt at the back and screw in a M12 x 180 bolt.
Renew the bolt at the back on the other side as well.
- 3 Unscrew the bolt on the left and right-hand sides.
 - Lower the front axle/engine support bar using the transmission jack.
 - Remove the transmission jack.



46. Lower the vehicle.

47. Lift the engine out of the vehicle.

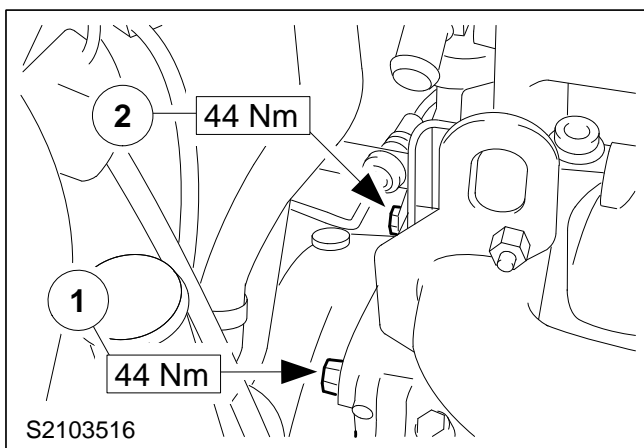
- Fit the engine lifting tackle.
- Support the transmission on a trolley jack.
- Separate the engine from the transmission and lift it out of the vehicle.



Install

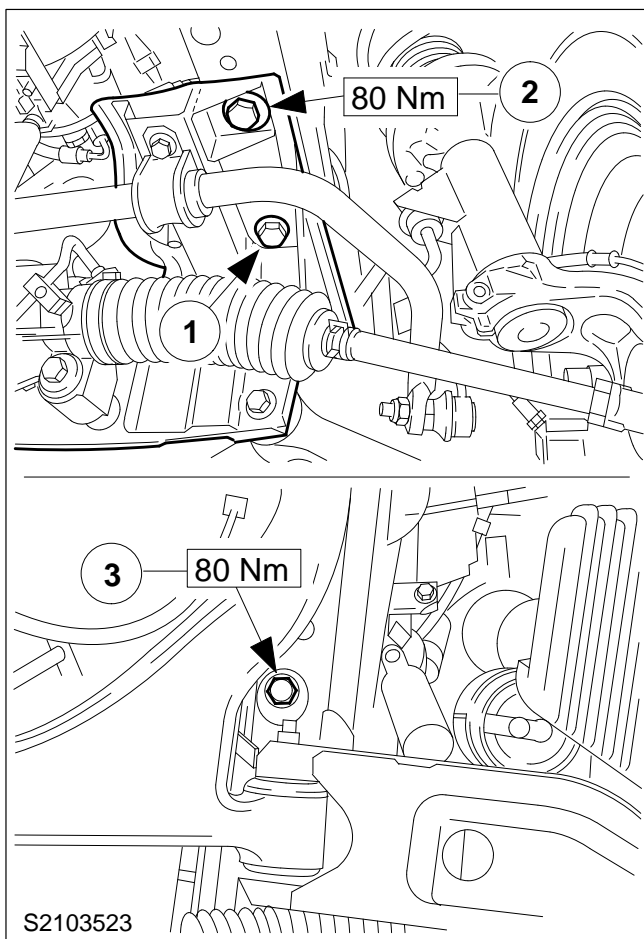
NOTE: Guide the engine mounting in the bores of the engine support bar.

48. Fit the engine in the vehicle and connect it to the transmission.



49. Attach the transmission housing to the transmission intermediate flange at the top.

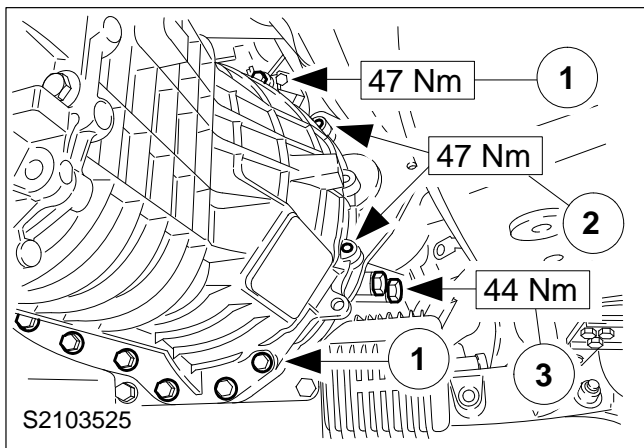
- 1 Bolt.
 - 2 Bolt with hydraulic clutch operator bracket.
- Remove the engine lifting tackle.



50. Raise the vehicle.

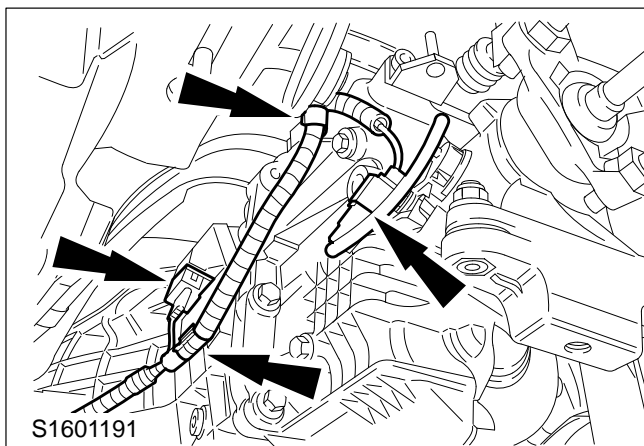
51. Attach the front axle/engine support bar on both sides (left-hand side shown).

- 1 Remove the centre bolt (M12 x 180) and screw in the original bolt.
Renew the centre bolt on the other side as well.
- 2 Remove the bolt (M12 x 180) at the back and screw in the original bolt.
Renew the bolt at the back on the other side as well.
- 3 Put in the bolts on both sides (left-hand side shown).
Tighten all the bolts.



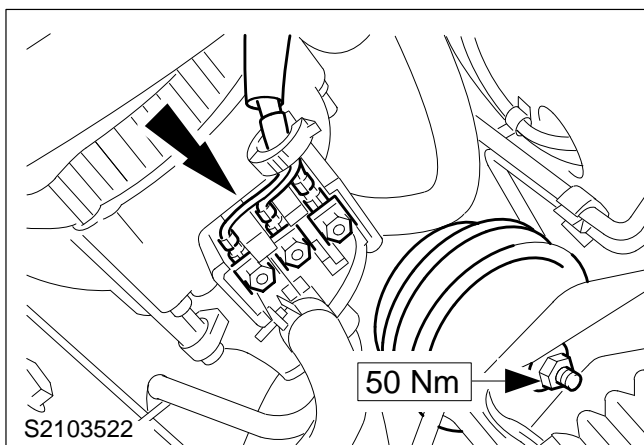
52. Attach the engine to the transmission intermediate flange (nine bolts).

- 1 Bolts on transmission side.
- 2 Bolts on engine side.
- 3 Transmission bracket bolts.



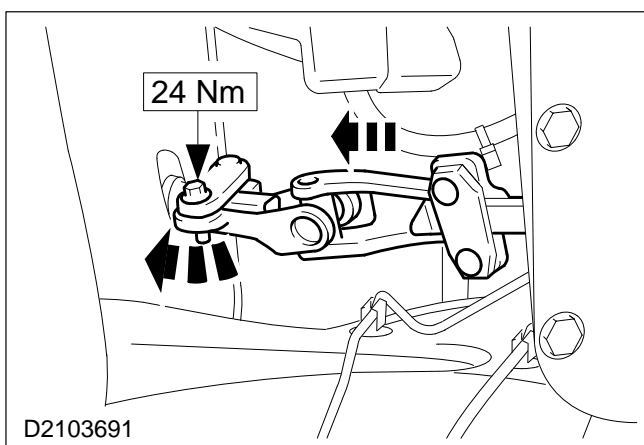
53. Attach the wiring loom to the transmission.

- Push on the two electrical connectors.
- Press the wiring loom into the clips.



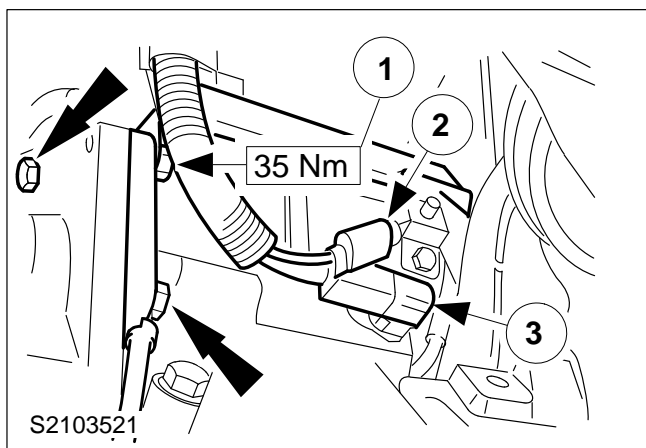
54. Attach the engine mounting to the front axle/engine mounting on both sides (left-hand engine mounting nut shown).

55. Connect the cables at the alternator.



56. Attach the steering intermediate shaft.

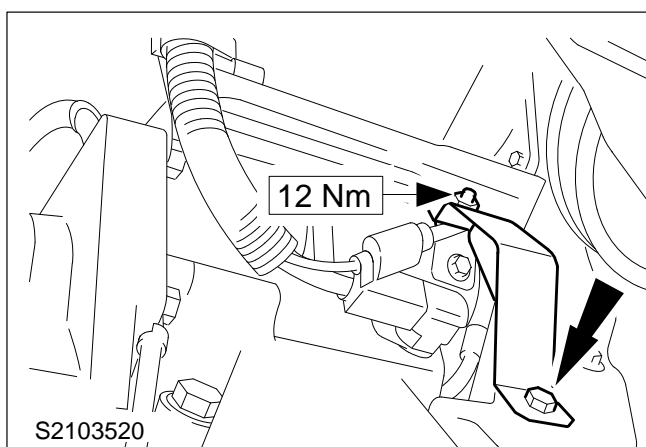
- Push the steering intermediate shaft onto the steering shaft.
- Insert the bolt in the clamp plate and tighten it.



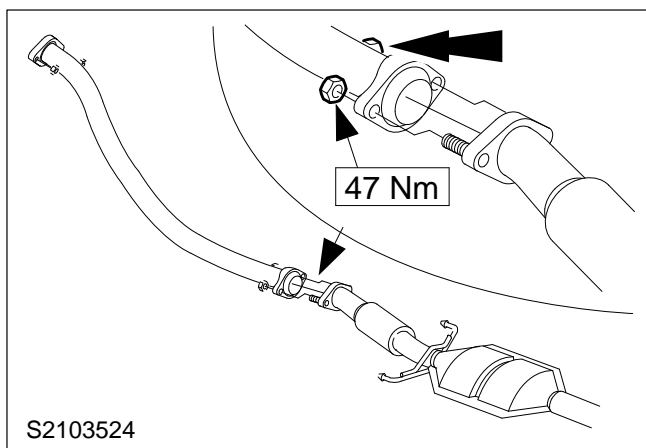
57. Attach the starter motor to the transmission intermediate flange.

NOTE: Fit the ground cable using the lower bolt.

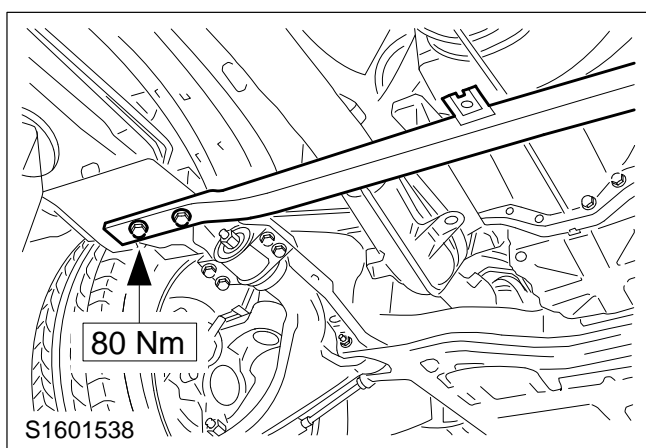
- 1 Fit the starter motor with the heat shield.
- 2 Connect the plugs.
- 3 Connect the positive lead and press the cover on.



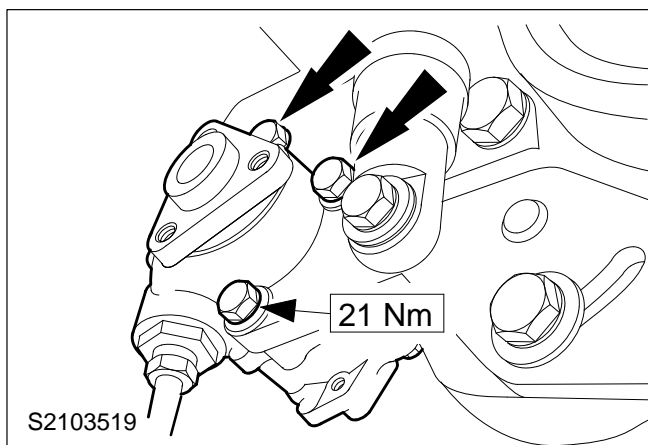
58. Fit the heat shield bracket to the starter motor.



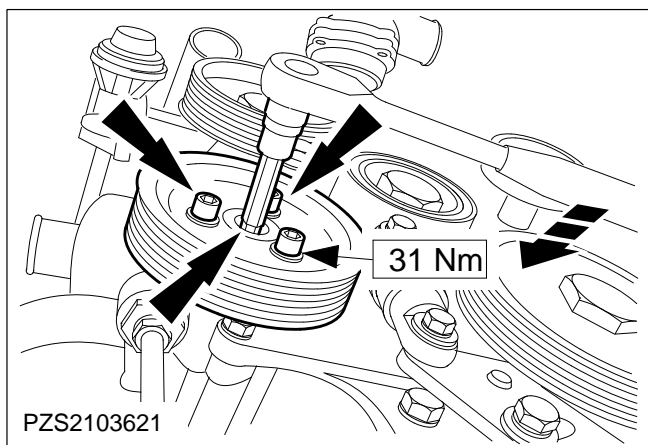
59. Connect the front exhaust pipe to the catalytic converter.



60. Attach the front axle transverse brace to the side member (two bolts on each side; left-hand side shown).

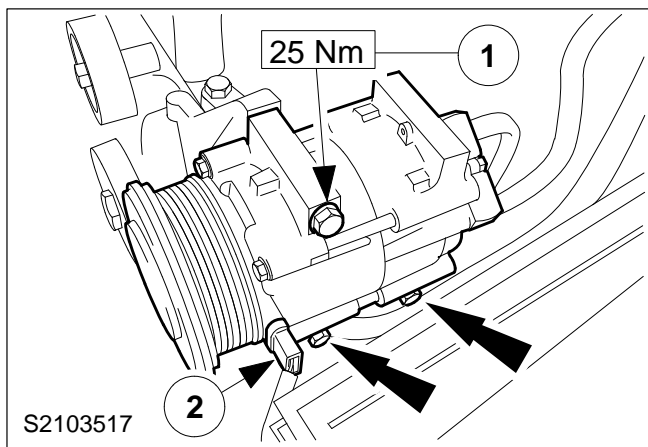


61. Install the power steering pump.



62. Fit the pulley on the power steering pump.

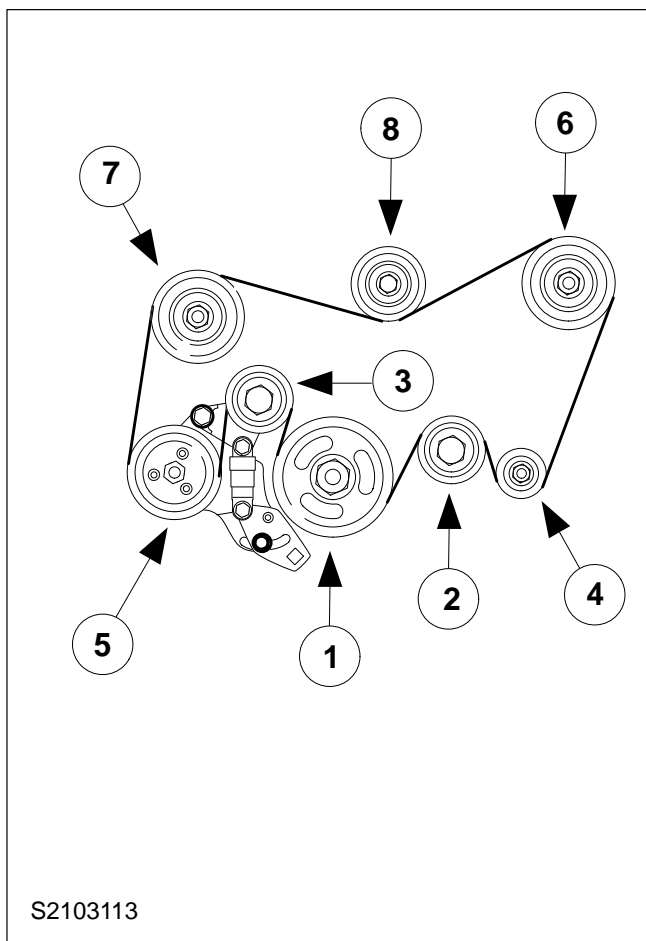
Stop it from turning using a 3/8" Allen key.



63. Lower the vehicle.

64. Fit the air conditioning compressor.

Connect the plugs.

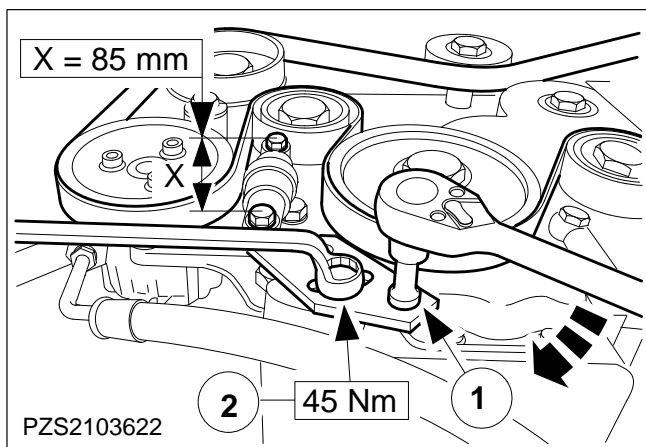


NOTE: Correct seating.

65. Route the drive belt as shown.

NOTE: When the belt is fitted, the lettering on the belt must be legible from the front.

- 1 Crankshaft pulley/vibration damper
- 2 Idler pulley
- 3 Automatic belt tensioner pulley
- 4 Alternator pulley
- 5 Power steering pump pulley
- 6 Air conditioning compressor pulley
- 7 Coolant pump pulley
- 8 Idler pulley

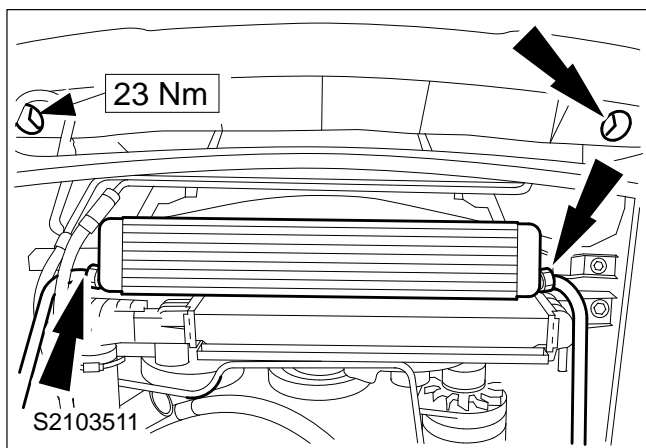


66. Raise the vehicle.

NOTE: Check the setting after a five-minute road test.

67. Tension the drive belt.

- 1 Tension the belt and hold it taught as soon as the automatic belt tensioner has reached the specified measurement "X".
- 2 Tighten the clamp bolt on the automatic belt tensioner.

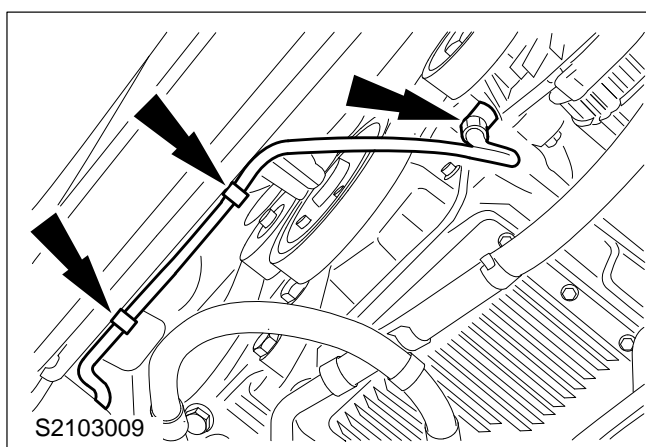


68. Install the radiator and intercooler.

NOTE: The radiator is a push fit at the top.

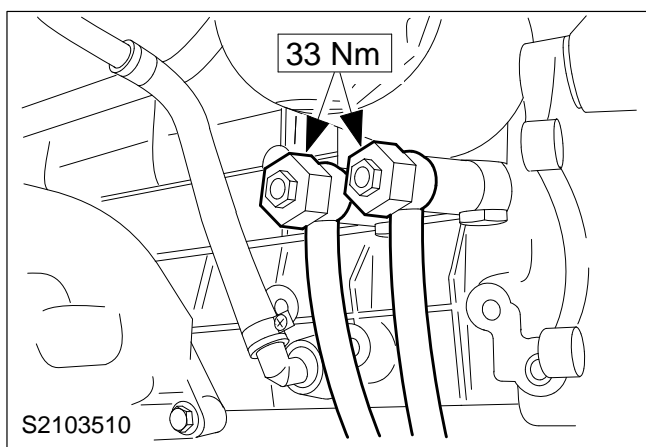
Install the radiator from below and secure it (two bolts).

69. Connect the oil pipes to the oil cooler.



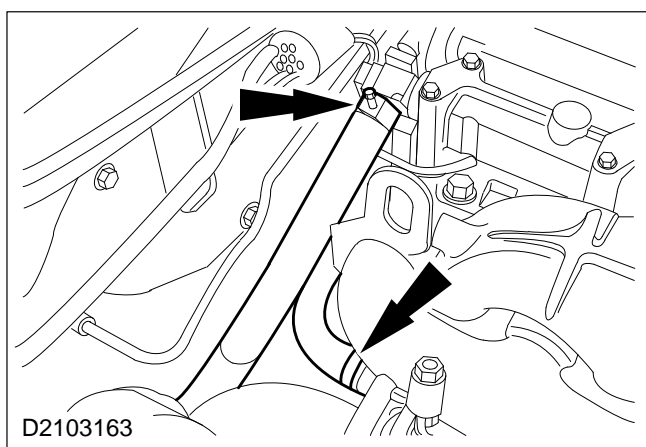
70. Clip the crankcase ventilation hose going to the EGR valve in place.

Clip the hose to the radiator.

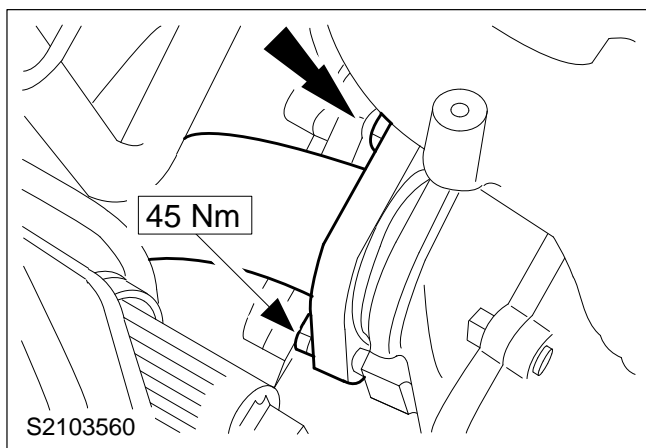


71. Lower the vehicle.

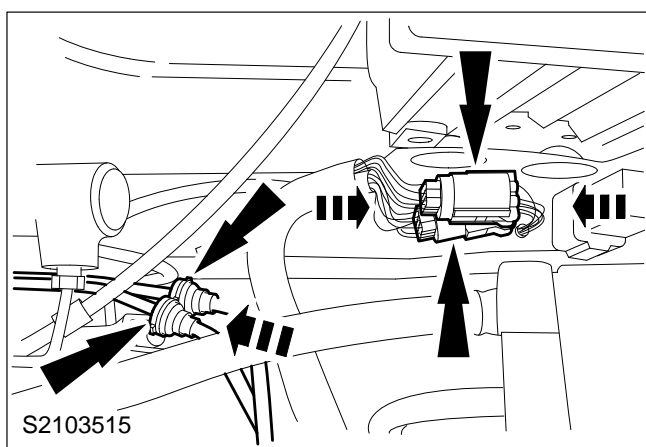
72. Connect the oil pipes to the oil filter intermediate housing extensions.



73. Fit the heater hoses.



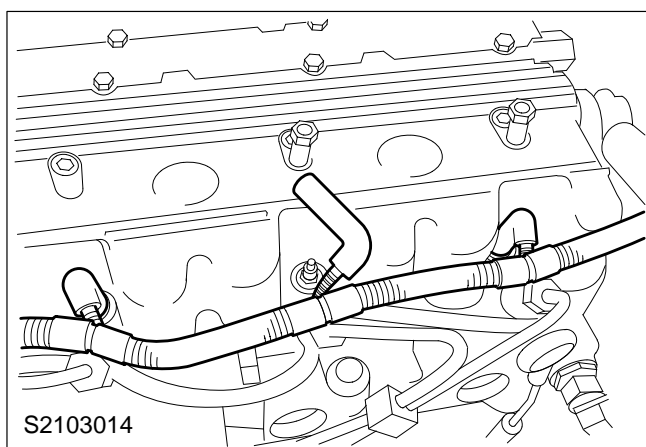
74. Attach the front exhaust pipe to the turbocharger.



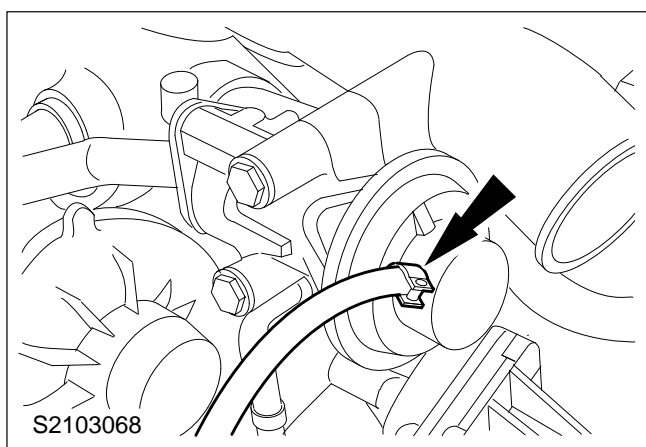
NOTE: Coloured markings.

75. Connect the fuel pipe quick-release couplings.

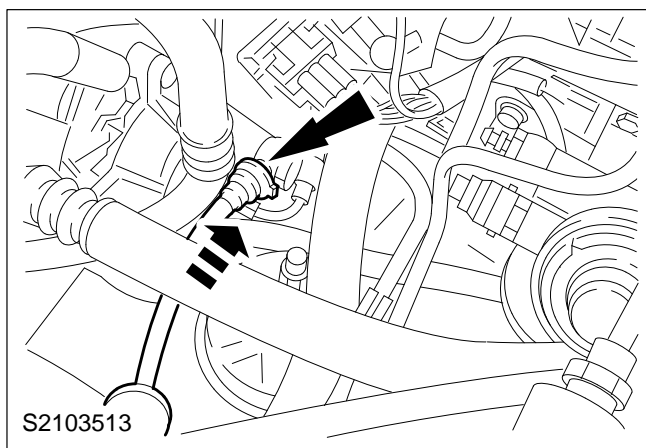
76. Connect the two main engine wiring loom connectors.



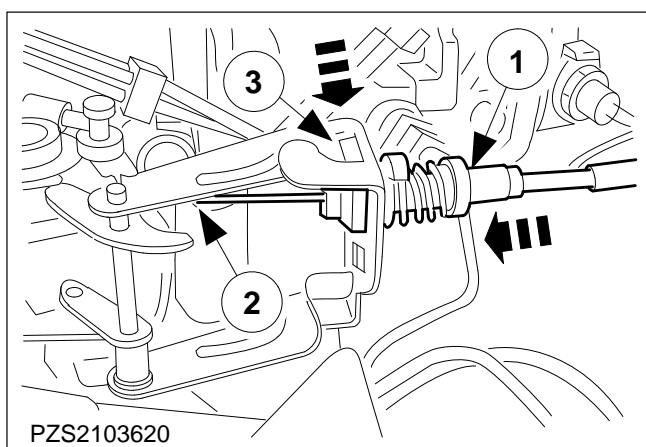
77. Connect the glow plug connectors.



78. Fit the EGR valve hose.

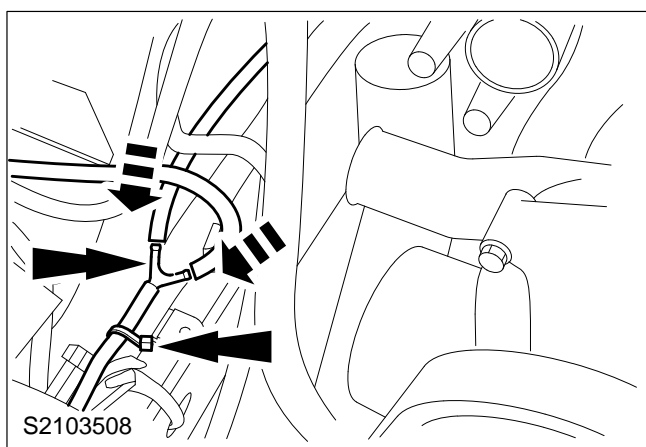


79. Push the vacuum line onto the brake servo vacuum pump.



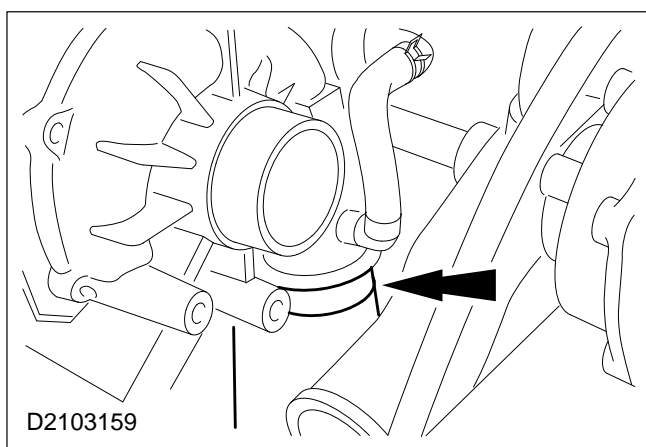
80. Attach the throttle cable.

- 1 Insert the throttle cable.
- 2 Attach the throttle cable.
- 3 Insert the U-bolt.

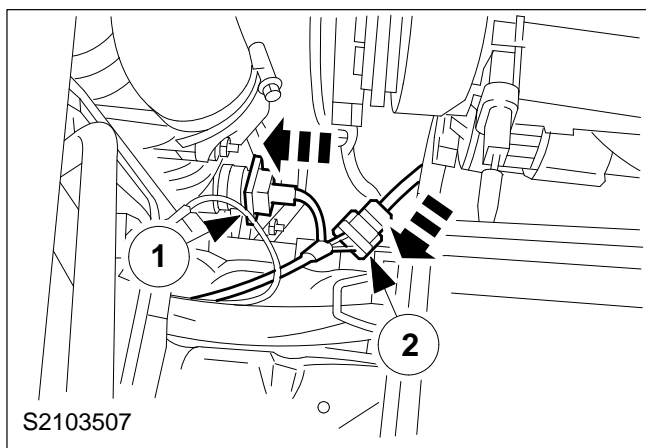


81. Slide the crankcase ventilation hose going to the EGR valve onto the T-connector.

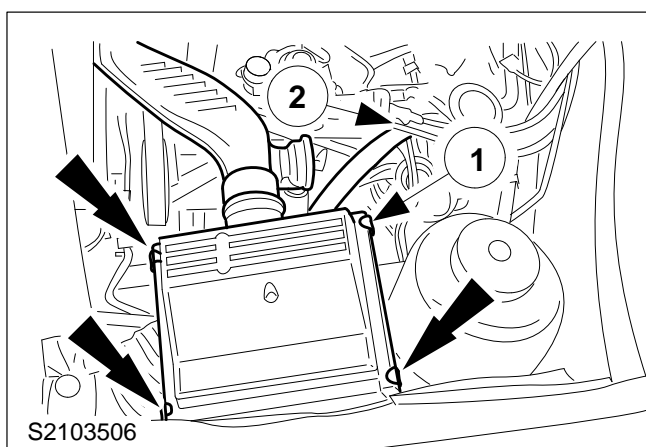
Fit the cable tie.



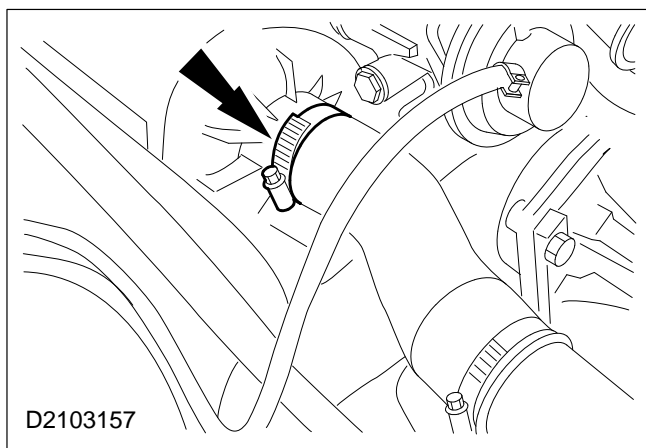
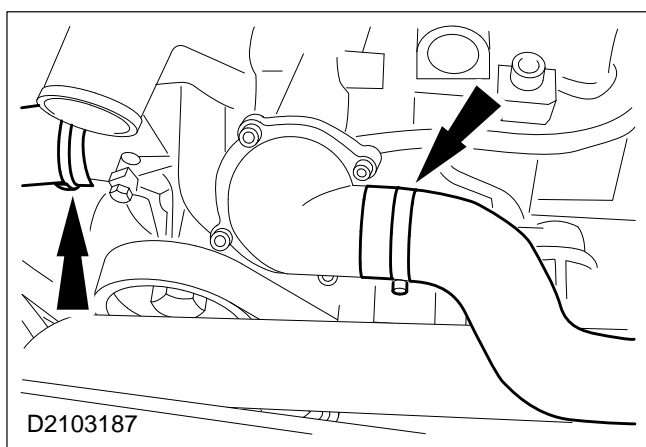
82. Fit the intercooler air hose.

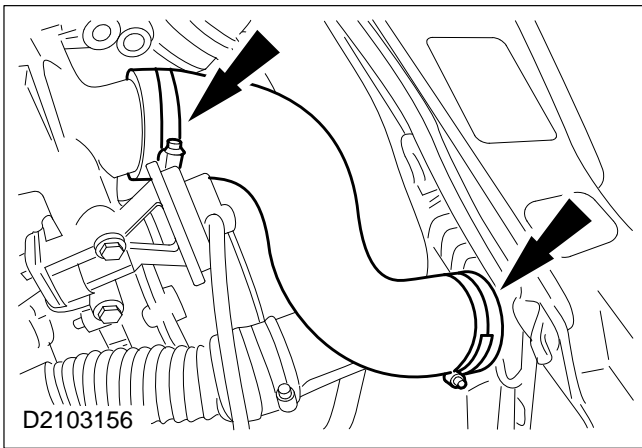
**83. Connect the plugs.**

- 1 To the ECT sensor
- 2 To both fan motors (left-hand side shown)

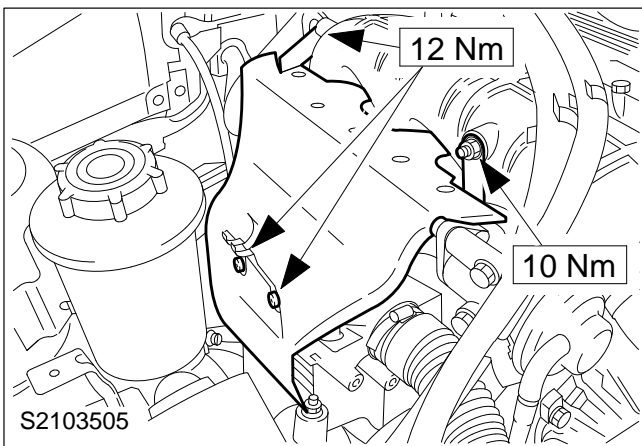
**84. Install the intake pipe.**

- 1 Fit the air cleaner housing cover.
- 2 Attach the crankcase breather hose.

**85. Fit the intake pipe at the turbocharger.****86. Attach the coolant hoses.**

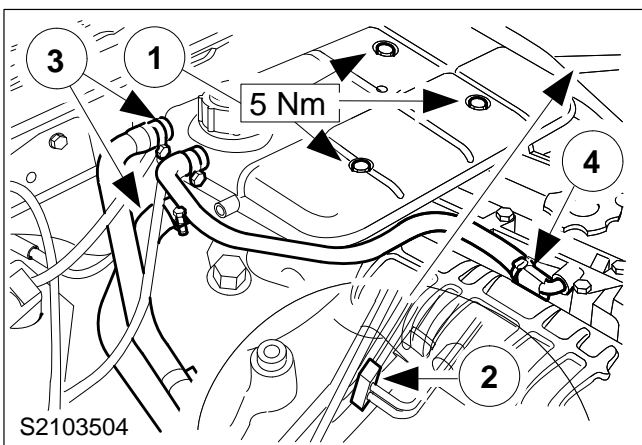


87. Fit the air hose between the intake manifold and the intercooler.



88. Attach the turbocharger heat shield.

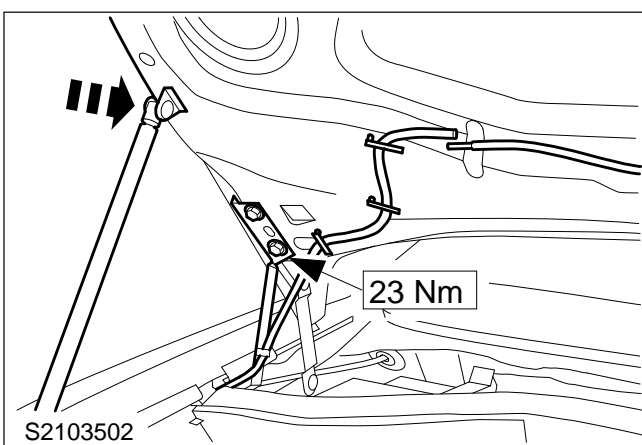
Clip the hoses in place.



89. Fit the coolant expansion tank.

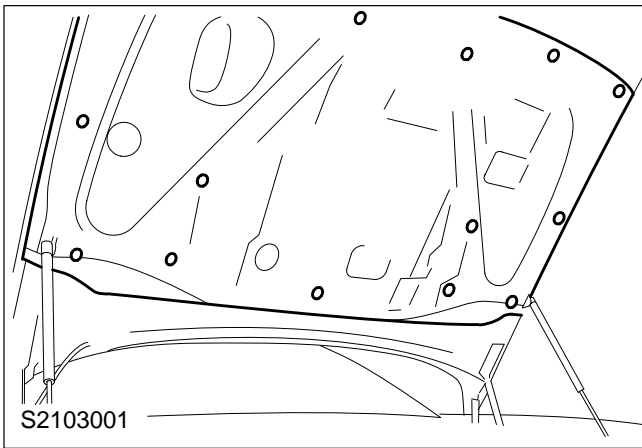
- 1 Tighten the bolts.
- 2 Connect the plug for the ECL sensor.
- 3 Fit the two hoses.
- 4 Fit the coolant collection pipe.

90. Top up the coolant.



91. Fit the hood.

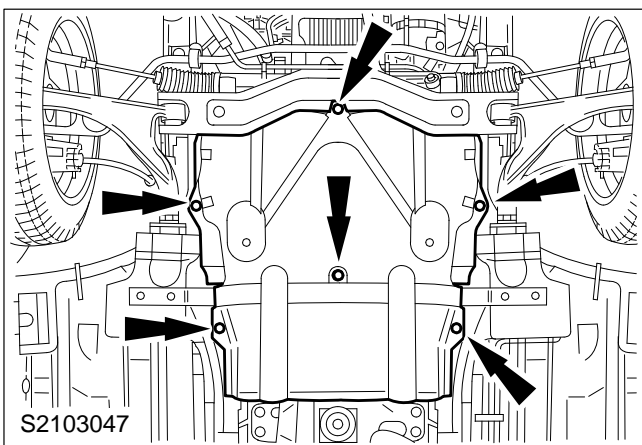
- Position the hood ready for installation.
- Fit the hood hinges on both sides (right-hand side shown).
- Attach the hood damper on each side (right-hand side shown).
- Connect the windscreen washer hoses and secure them using the clips.



92. Fit the hood insulation panel (15 clips).

93. Finishing operations:

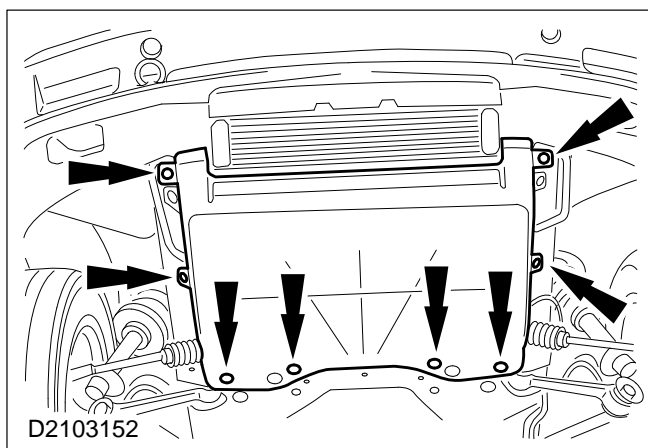
- Check the engine oil level and correct if necessary.
- Connect the battery negative lead.
- Attach the battery cover (one nut).
- Check the routing of the vacuum hoses and the wiring and secure them using cable ties as required.
- Remove the air from the cooling system.
- Check the fluid levels and rectify as necessary.
- Check the engine and cooling system for leaks (visual check).
- Enter the radio keycode.
- Reprogramme the preset radio stations.
- Reset the clock.



94. Raise the vehicle.

95. Fit the rear engine undershield (six clips).

96. Lower the vehicle.



97. Carry out a road test to enable the PCM to gather data.

NOTE: Check the measurement at the drive belt adjuster after a five minute road test.

98. Fit the front engine undershield (eight clips).