

**Engine Management and
Emission System****29L**

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TECHNICAL DATA (cont'd)

Ignition System

Coil

Primary resistance 0,72 to 0,88 ohms

Secondary resistance 4500 to 7000 ohms

Spark Plugs

Type AGPR901C

Electrode gap - all territories 0,75 mm (0,030 in)

Firing order 1 - 3 - 4 - 2

Distributor

Dwell angle It is totally controlled by the electronic module and cannot be adjusted

Idle advance initial 16° BTDC

HT Leads

Resistance 30,000 ohms maximum per lead

Heat sink compound 81SF-12103-AA

Tightening Torques

Nm

TDC sensor bracket to sump 8 to 10

TDC sensor to bracket 4 to 6 Loctite 270

Distributor clamp to cylinder block .. . 18,5 to 21,5

Clearance Settings

TDC sensor to pulley teeth 0,6 to 1,0 mm

Distributor cam to phase sensor 0,2 to 0,3 mm

FUEL (PETROLEUM SPIRIT) HANDLING SAFETY PRECAUTIONS

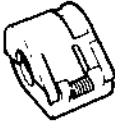
When carrying out repairs to vehicle fuel systems it is easy to become complacent about handling fuel, particularly in relation to draining fuel tanks. The risks involved should not be under-estimated. The information contained in Section 05 on the SIERRA Service Microfiche provides the basic precautions which must be taken if fuel is to be handled safely and also points out some other areas of risk that must not be overlooked.

WARNING:

- The fuel system remains pressurised when the engine has stopped. Adequate safety precautions must be taken when removing fuel lines to prevent fuel spillage.
- Loosen fuel pipes slowly to relieve system pressure.



SPECIAL SERVICE TOOLS

Tool	Tool Name
 23-021	Pressure Gauge
 23-023A	Fuel Hose Remover

GENERAL EQUIPMENT

- CO Meter
- Tamperproof Plug Remover, 150 mm long
- Cooling System Pressure Tester

SERVICE AND REPAIR OPERATIONS

22 214 0 DISTRIBUTOR - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable. Remove air hose from intercooler to throttle body.
2. Unclip distributor cap and position clear of distributor. Remove rotor arm and dust cover. Refit rotor arm.
3. Using a spanner on the crankshaft pulley bolt, rotate the engine clockwise until No.1 cylinder is at T.D.C. No.1. cylinder is at T.D.C. when the lug nearest the groove on the pully is inline with pointer and the rotor is pointing to the distributor body scribe mark.

NOTE: If rotor is 180° degrees out, continue rotating engine until both marks align.

4. Disconnect distributor multiplug. Remove distributor retaining bolt and plate, and remove distributor from engine.

To Install

Note: If refitting the old distributor, go to Sub-Operation No.6.

5. Remove cap, rotor and dust cover from new distributor and refit rotor. Transfer HT leads from old distributor cap to the new.
6. Check that 'O' ring on distributor body is in good condition, fit a new 'O' ring if necessary.
7. Turn distributor shaft until the rotor is aligned with the cap retaining clip, as shown in Fig.2.
8. Insert distributor into engine. Rotate distributor body until rotor aligns with scribe mark. Fit retaining plate and bolt, and tighten bolt.
9. Remove rotor and refit dust cover, rotor and distributor cap.
10. Reconnect distributor multiplug and refit air hose.
11. Reconnect battery and remove fender covers.

Note: Ignition timing is totally controlled by the module and does NOT require checking with a timing light.

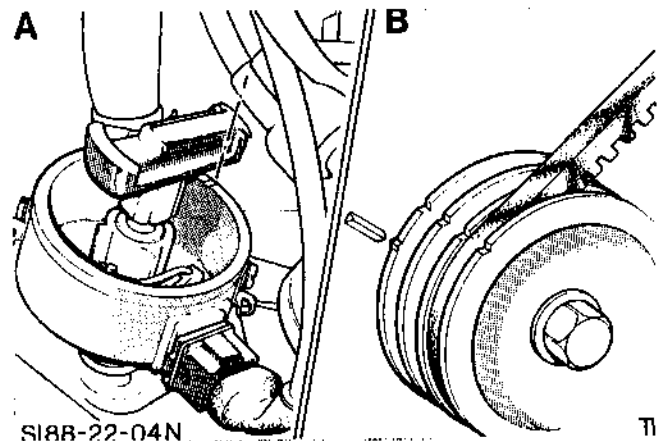


Fig.1. No.1. cylinder at T.D.C.

A - Distributor mark

B - Crank pulley lug inline with pointer

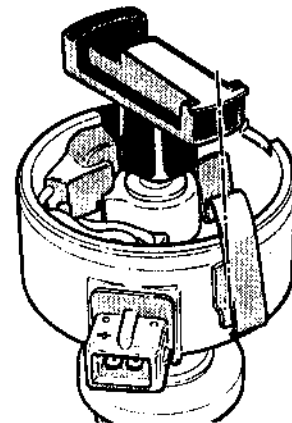


Fig.2. Before installing distributor, align rotor with distributor cap retaining clip.

22 215 5 PHASE SENSOR - DISTRIBUTOR - REMOVE AND
INSTALL
(Distributor removed)

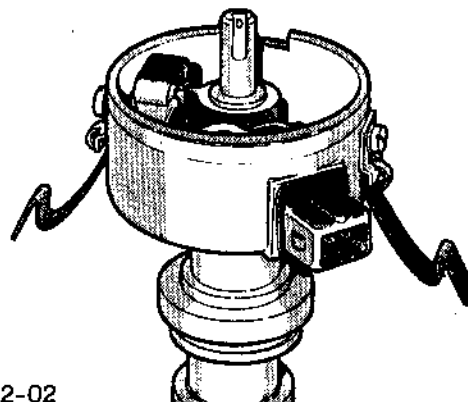
SPECIAL TOOLS REQUIRED: NONE

To Dismantle

1. Remove rotor arm, disconnect phase sensor plug and remove from base plate.
2. Remove base plate and phase sensor from distributor housing (2 bolts).

To Reassemble

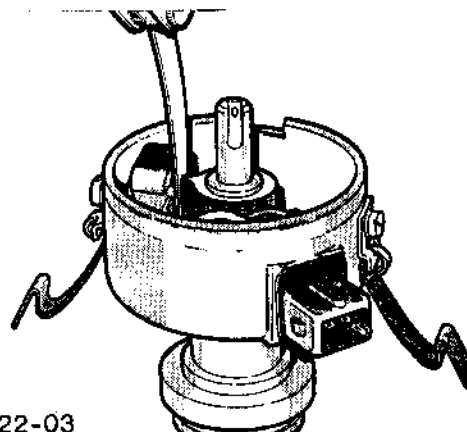
3. Fit base plate and phase sensor to distributor housing (2 bolts).
4. Fit phase sensor plug to base plate.
5. Adjust phase sensor (distributor)
Slacken the base plate, Fig.4. and adjust phase sensor to a distance of 0,2 to 0,3 mm from the distributor shaft cams. Tighten base plate. Refit rotor arm.



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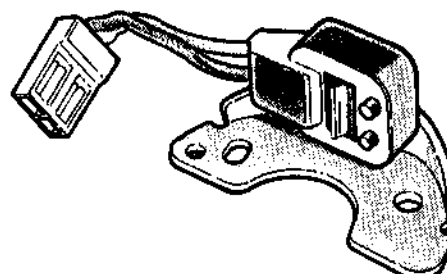
Fig.3. Distributor removed.



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Fig.4. Adjust distributor phase sensor to obtain the correct clearance.



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Fig.5. Phase sensor removed.

22 292 0 IGNITION AMPLIFIER MODULE - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Depress locking clip on multiplug and disconnect multiplug.
3. Remove two screws, lock washers and plain washers.

To Install

4. Coat rear face of ignition amplifier module with heat sink compound, refer Technical Data.
5. Position and secure module with two screws, lock washers and plain washers.
6. Reconnect module multiplug.
7. Reconnect battery and remove fender covers.

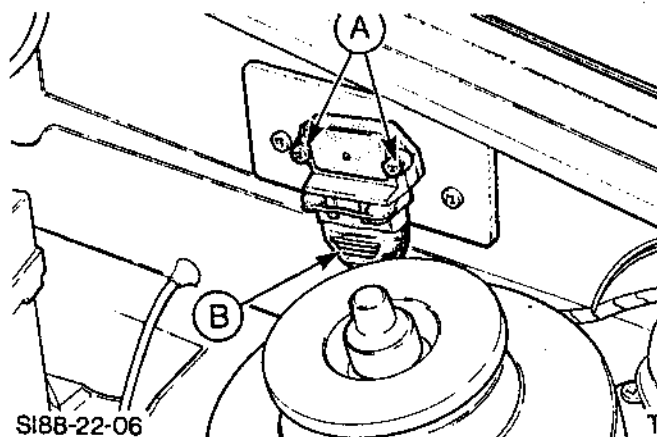


Fig.6. Ignition amplifier module.
A - Multiplug connection
B - Two securing screws

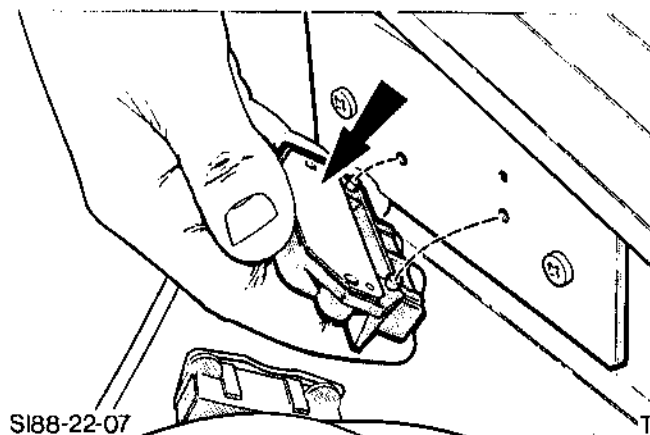


Fig.7. Coat rear face of module with heat sink compound.

22 414 0 IGNITION COIL - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Disconnect HT and LT connections at coil. Remove two screws and detach coil with strap assembly and suppression capacitor.

To Install

3. Position coil, strap assembly and suppression capacitor, secure with two screws. Reconnect HT and LT connections.
4. Reconnect battery earth cable. Start engine check coil operation. Remove fender covers.

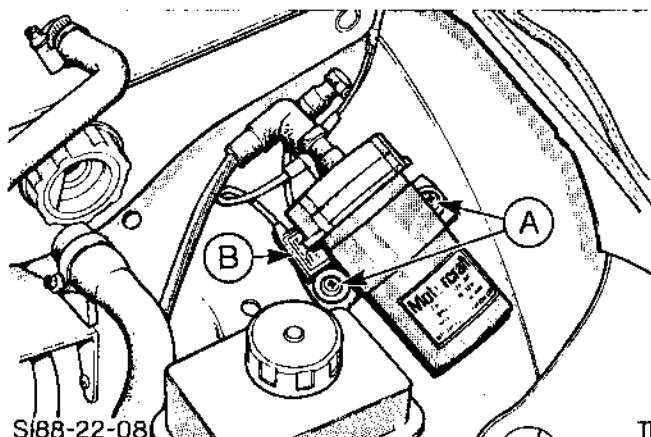


Fig.8. Ignition coil.
A - Mounting screws
B - Suppression capacitor

22 619 0 SPEED SENSOR - ENGINE - REMOVE AND INSTALL

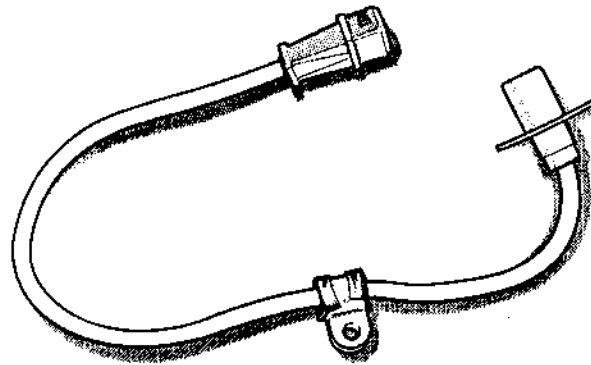
SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cable.
2. Raise vehicle.
3. Remove engine speed/TDC sensor from sump (2 bolts).
4. Disconnect multiplug plug, from wiring harness and remove cable from retainer. Remove cable clip from sump (1 bolt) and remove engine speed/TDC sensor.

To Install

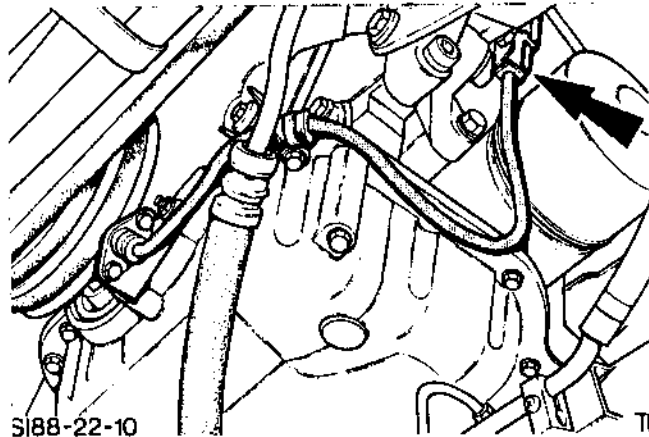
5. Clip engine speed/TDC sensor cable into retainer and connect multiplug.
6. Fit engine speed/TDC sensor to mounting. Align crankshaft pulley teeth with sensor and set sensor clearance, 0,6 to 1,0 mm.
7. Lower vehicle.
8. Re-connect battery earth cable.



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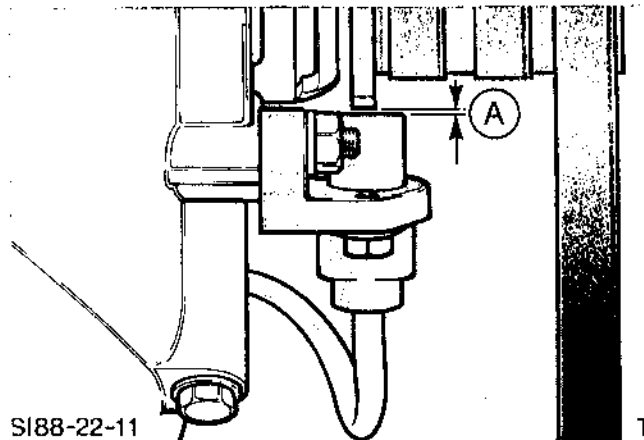
Fig.9. Engine speed/TDC sensor removed.



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Fig.10. Engine speed/TDC sensor cable plug.



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Fig.11. Engine speed/TDC sensor.
A - 0,6 to 1,0 mm

23 174 0 AIR CLEANER ASSEMBLY - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cables and fit fender covers.
2. Remove air hose engine ventilation, air hose solenoid control valve and air hose turbo-charger from air cleaner cover.
3. Release air cleaner cover, detach and remove air cleaner element.
4. Remove right hand inner fender protector. Remove air cleaner box retaining nuts and washers from beneath inner fender.
5. Withdraw air cleaner box from engine compartment.

To Install

6. Transfer metal reinforcements to new air cleaner box.
7. Locate air cleaner box and refit retaining nuts and washers from beneath inner fender.
8. Fit new air cleaner element and cover, secure with five clips.
9. Reconnect air hoses to cover. Refit inner fender protective shield.
10. Reconnect battery and remove fender covers.

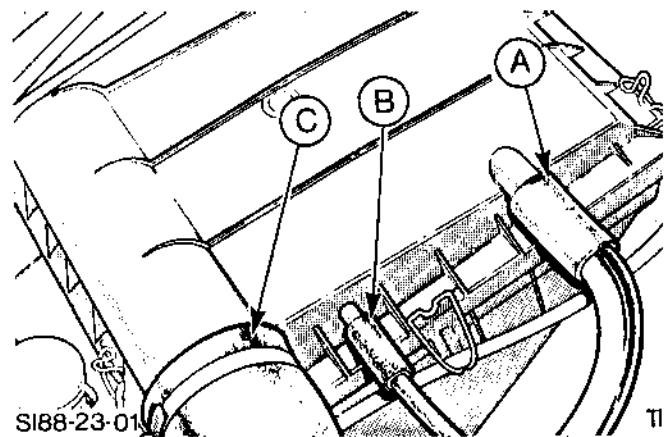


Fig.12. Air cleaner hose connections.
 A - Engine ventilation hose
 B - Solenoid control valve hose
 C - Turbocharger hose

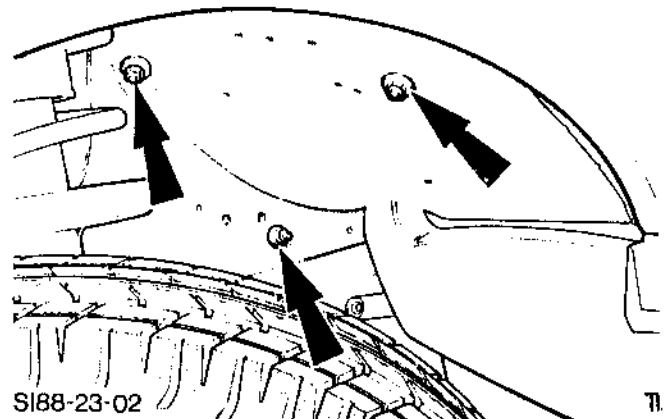


Fig.13. Air cleaner retaining nuts to inner wheel arch.

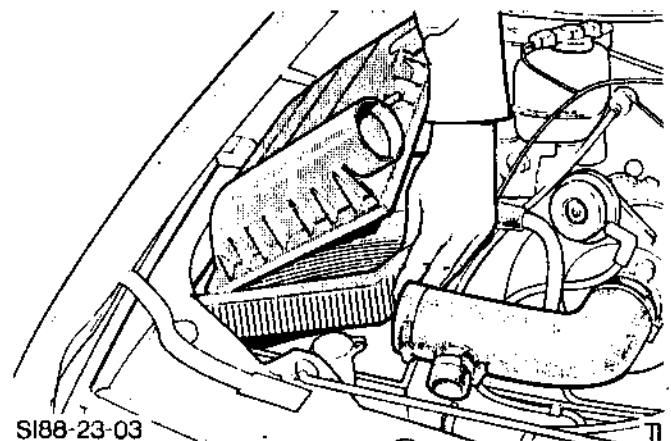


Fig.14. Air cleaner removal.

23 215 0 FUEL MIXTURE/CO - ADJUST

SPECIAL EQUIPMENT REQUIRED:

CO Meter
Tamperproof Plug Remover, 150 mm long

IMPORTANT NOTE: If CO reading is exceptionally high (above 2,5%) or below 0,3%, carry out checks contained in the Vehicle System Test Manual for high fuel consumption.

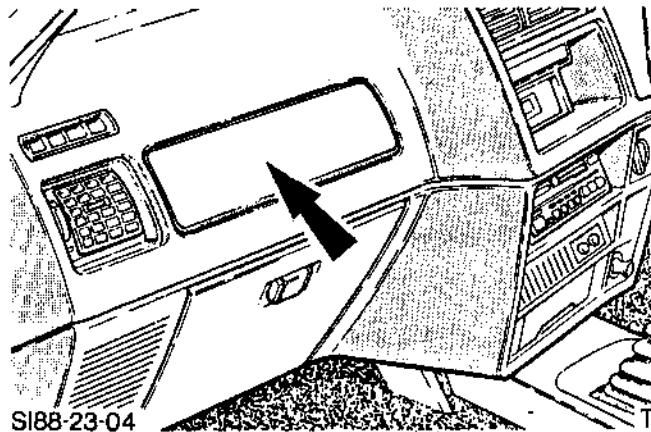
To Adjust

1. Remove module cover from above glove box.
2. Remove tamperproof plug with a suitable tool.

IMPORTANT NOTE: When performing this operation, note that the depth of the tamperproof plug remover should not exceed 4 mm as this will result in damage to the CO adjustment potentiometer.

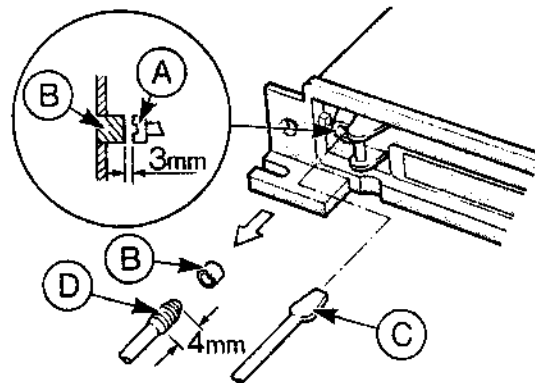
3. Warm engine to normal operating temperature.
4. Connect a CO meter to engine as per manufacturer's instructions.
5. Stabilise engine by running at 3000 rpm for approximately 15 seconds and allow engine to idle.
6. Wait for meter to stabilise and record %CO and idle speed.
7. Adjust CO screw with screwdriver to achieve correct %CO, Fig.16.
8. Remove idle speed control valve multiplug. Engine should idle at 850 rpm. If idle is incorrect, refer to the Vehicle System Test manual and carryout checks for incorrect idle speed.
9. Switch off engine and remove equipment. Fit new tamperproof plug.
10. Fit module cover.

IMPORTANT NOTE: Adjustment must be carried out within 10 to 30 seconds from time meters stabilise. If time taken is longer than 30 seconds, run engine again at 3000 rpm for 15 seconds and re-check.



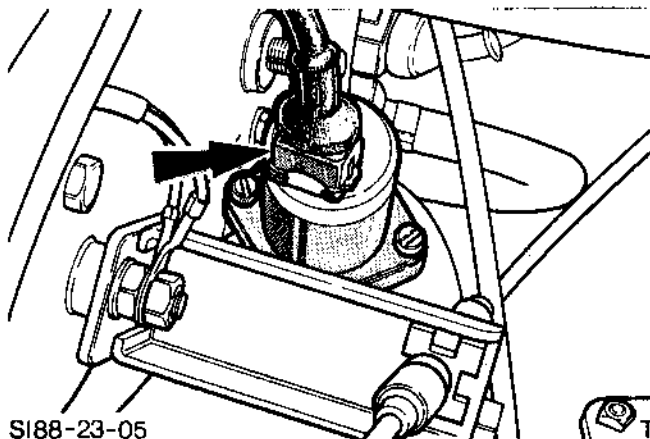
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Fig.15. Module cover.



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Fig.16. A - CO adjustment screw
B - Tamperproof plug
C - Screwdriver
D - Tamperproof plug remover



SI88-23-05

Fig.17. Idle speed control valve multiplug.

23 266 0 FUEL PRESSURE REGULATOR - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery and fit fender covers. Disconnect vacuum/air hose.
2. Disconnect fuel return pipe and slacken fuel feed pipe.

NOTE: If a crimped type hose clamp is fitted, it must be cut free using side cutters.

3. Remove regulator from its mounting bracket (2 bolts). Remove mounting bracket retaining nut and remove bracket.

To Install

4. Position and secure regulator to its bracket. Secure bracket to air intake.
5. Tighten fuel feed pipe and refit fuel return pipe.

NOTE: Ensure regulator inlet pipe is aligned with fuel rail, adjust bracket if necessary.

6. Reconnect vacuum/air hose. Reconnect battery and remove fender covers.

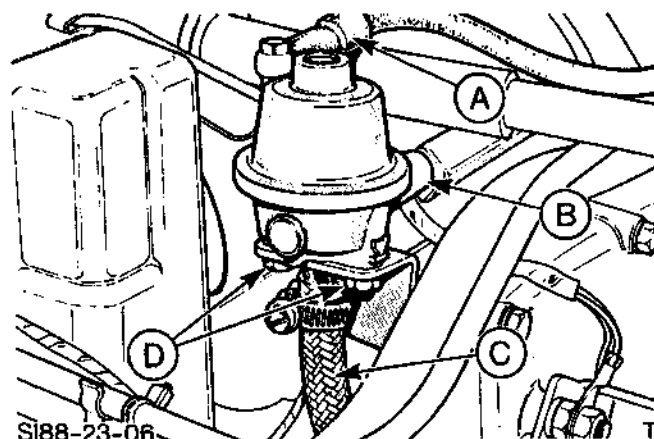


Fig.18. Fuel pressure regulator.
A - Vacuum/air hose C - Fuel return
B - Fuel feed D - Retaining bolts

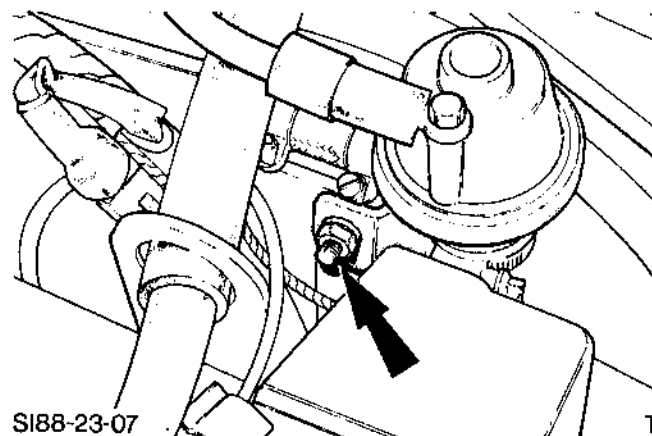


Fig.19. Fuel pressure regulator mounting bracket retaining nut.

23 323 0 IDLE SPEED CONTROL VALVE - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cable and fit fender covers.
2. Remove multiplug from idle speed control valve.
3. Remove two retaining bolts and withdraw idle speed control valve.

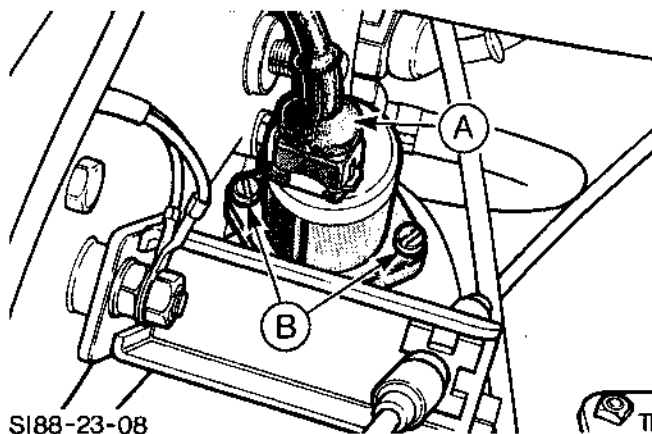


Fig.20. Idle speed control valve.
A - Multiplug
B - Retaining bolts

To Install

4. Fit new O-rings. Position idle speed control valve to detent pin and secure valve.
5. Refit multiplug.
6. Reconnect battery and remove fender covers.

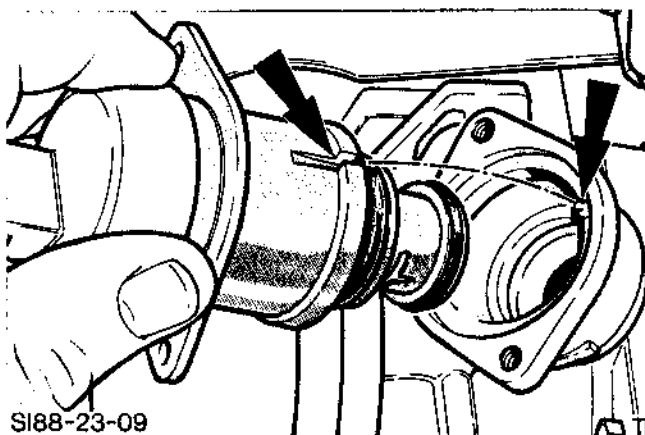


Fig.21. Locate valve on detent pin.

23 325 0 THROTTLE POSITION SENSOR -
REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cable and fender covers.
2. Remove throttle cable from throttle butterfly (1 clip).

NOTE: Do not remove throttle cable bracket from air chamber as Loctite used at initial build may fall inside air chamber.

3. Remove air hose from throttle body intake connection.
4. Disconnect throttle position sensor plug and idle speed control plug.
5. Remove throttle butterfly housing from air chamber connection (4 bolts).
6. Remove sensor from throttle butterfly housing (2 bolts).

To Install

7. Locate sensor on throttle butterfly shaft and turn anti-clockwise until spring pressure is felt. Tighten retaining bolts ensuring spring pressure is not being applied.
8. Clean gasket faces and using a new gasket, fit throttle butterfly housing to air chamber connection.
9. Connect plugs to throttle position sensor and idle speed control valve.
10. Fit air hose to throttle plate intake connection.
11. Fit throttle cable to throttle butterfly. Adjust throttle cable.
12. Re-connect battery earth cable and remove fender covers.

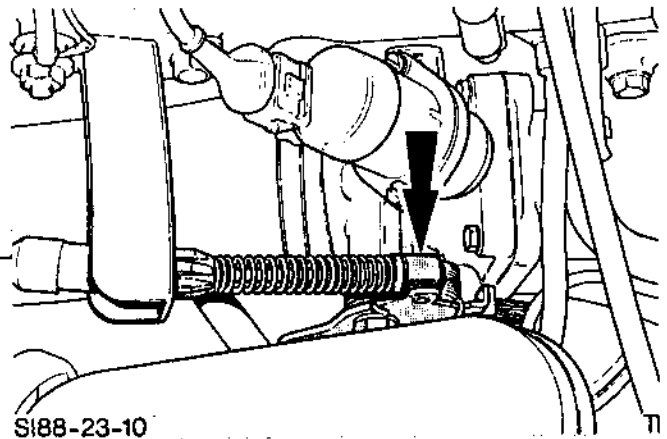


Fig.22. Remove throttle cable from throttle butterfly.

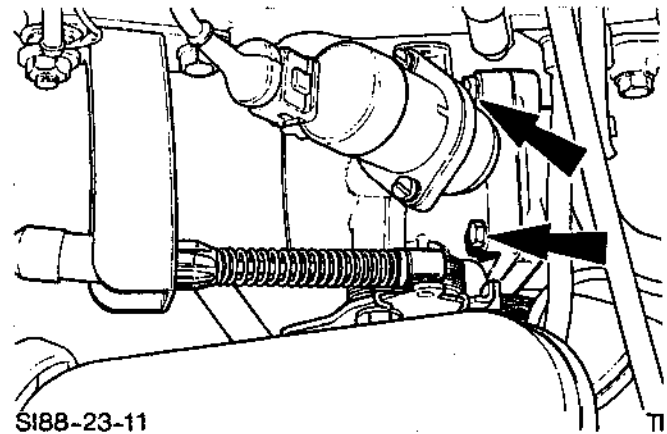


Fig.23. Remove throttle housing retaining bolts (4) - 2 bolts arrowed.

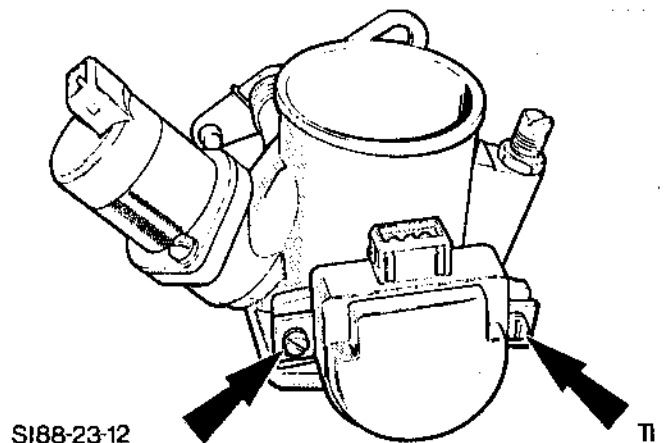


Fig.24. Throttle position sensor securing screws.

23 455 0 FUEL INJECTORS - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED:

Fuel Hose Remover 23-023A

IMPORTANT NOTE: WHEN REMOVING FUEL LINES, IT MUST BE REMEMBERED THAT THE SYSTEM REMAINS PRESSURISED. TAKE ADEQUATE SAFETY PRECAUTIONS TO PREVENT FUEL SPILLAGE.

To Remove

1. Disconnect battery earth cable and fit fender covers.
2. Remove vacuum line from fuel pressure regulator. Remove degas hose and crankcase vent pipe.
3. Disconnect multiplugs from injectors, idle speed control valve and air charge temperature sensor.
4. Remove fuel line from fuel pressure regulator, remove regulator mounting bolts and remove regulator.

NOTE: If a crimped type hose clamp is fitted, it must be cut free using side cutters.

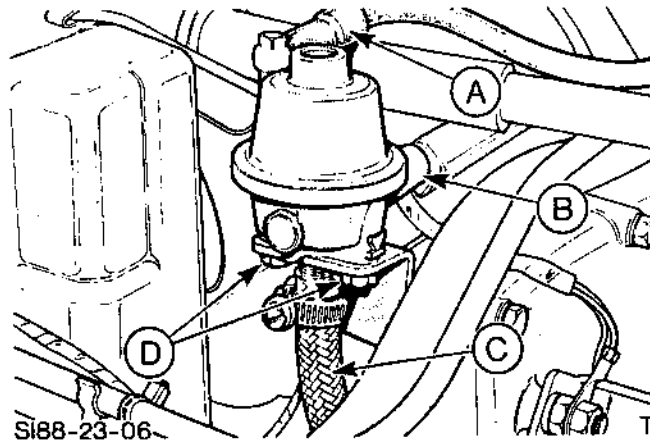


Fig.25. Fuel pressure regulator.

A - Air hose C - Fuel return
B - Fuel feed D - Retaining bolts

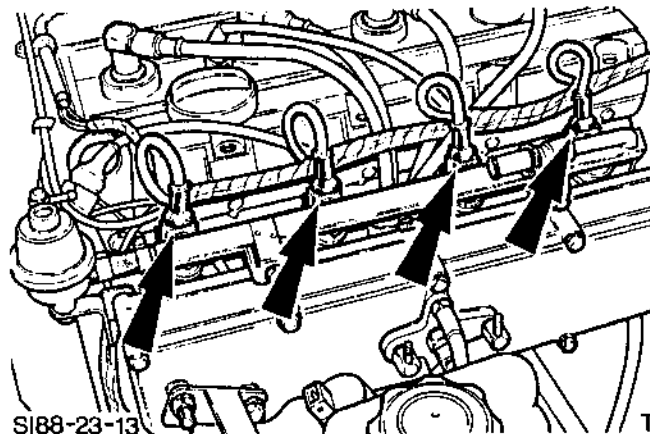


Fig.26. Injector plugs.

5. Disconnect earth cables from air intake, cut cable ties and position cables clear of fuel rail.
6. Remove safety clip from fuel feed hose. Using Special Tool 23-023A, disconnect fuel feed pipe.
7. Remove fuel rail retaining bolts from air chamber (2 bolts). Remove fuel rail complete with injectors, from intake manifold.
8. Remove injectors from fuel rail (4 clips).

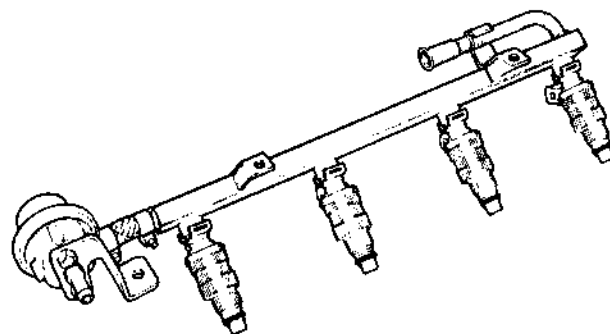


Fig.27. Fuel rail with injectors.

23 455 0

To Install

9. Fit injectors to fuel rail and secure with clips.

NOTE: Always use new 'O' rings and clips when refitting injectors.

10. Locate injectors complete with fuel rail into intake manifold and fit to air chamber (2 bolts).

NOTE: When installing the injectors, ensure there is a gap between intake manifold and injector body.

11. Fit fuel pressure regulator retaining bolts to air chamber.

12. Fit fuel line and vacuum line to fuel pressure regulator.

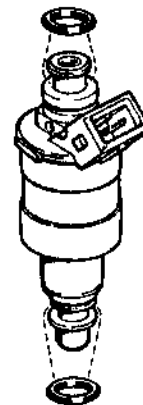
NOTE: If crimped clamps were removed they must be replaced with screw and nut type clamps.

13. Connect multiplugs to injectors, idle speed control valve and charge temperature sensor. Route cables and secure with new ties.

14. Refit degas tank hose and crankcase vent pipe. Reconnect battery earth cable.

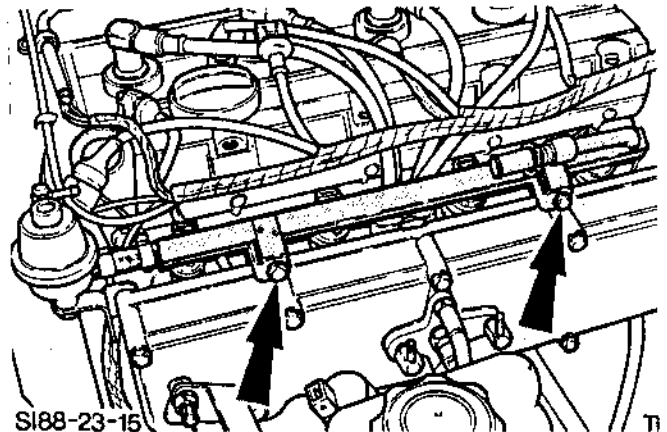
15. Start engine and check for any fuel leaks.

16. Remove fender covers.



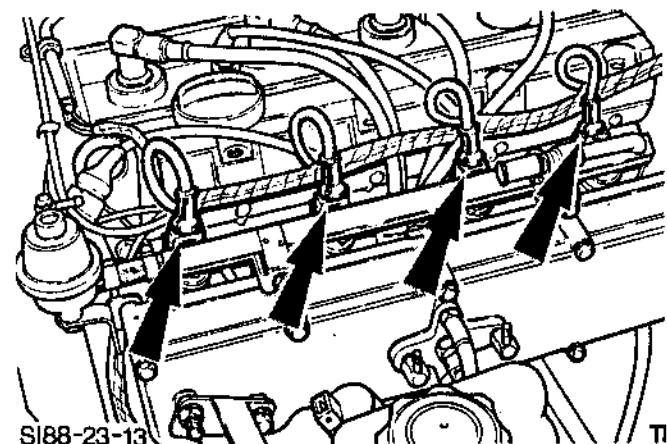
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Fig.28. Use new 'O' rings when refitting injectors.



SI88-23-15

Fig.29. Refit fuel rail retaining bolts.



SI88-23-13

Fig.30. Connect plugs to injectors.

23 534 0 FUEL PUMP - REMOVE AND INSTALL

SPECIAL SERVICE EQUIPMENT REQUIRED: NONE

IMPORTANT NOTE: WHEN REMOVING FUEL LINES, IT MUST BE REMEMBERED THAT THE SYSTEM REMAINS PRESSURISED. TAKE ADEQUATE SAFETY PRECAUTIONS TO PREVENT FUEL SPILLAGE

To Remove

1. Disconnect battery.
2. Raise vehicle on a ramp. Clamp fuel pump inlet hose with a suitable clamp to prevent fuel draining from tank when hose is disconnected. Take care not to damage hose.
3. Hold a suitable container beneath fuel pump inlet connection, loosen clamp and remove hose. Plug end of hose to prevent fuel seepage.
4. Loosen fuel outlet hose gently as fuel system will still be pressurised. Remove hose and collect any fuel in a suitable container.
5. Disconnect wiring loom connectors. Loosen pump securing bolt and slide pump from bracket. Remove damper from outlet port.

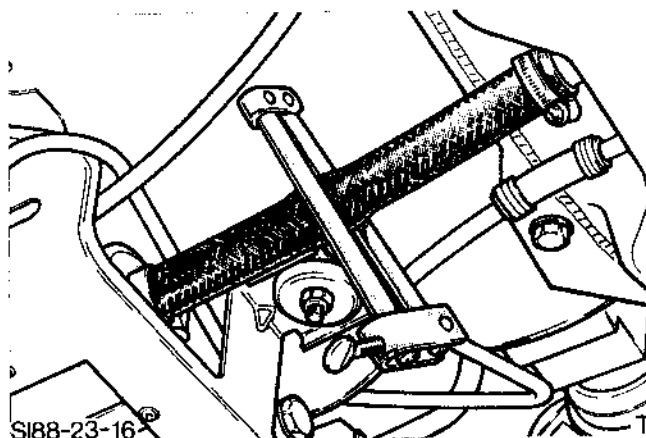


Fig.31. Pump inlet hose suitably clamped.

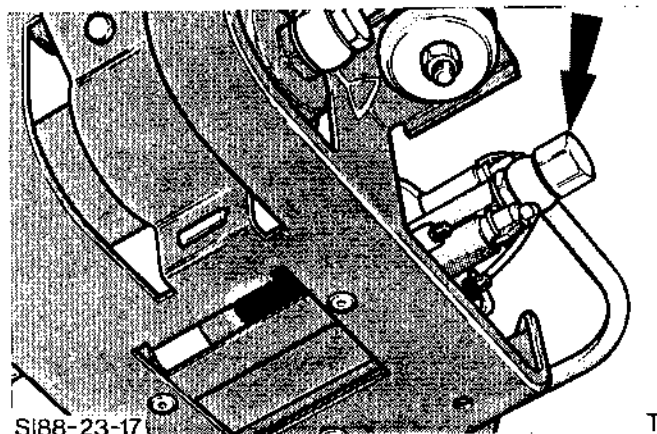


Fig.32. Slacken outlet hose, taking appropriate precautions to collect spilt fuel.

To Install

6. Clean fuel and wiring connections.
7. Slide pump into bracket and secure.
8. Reconnect fuel lines and wiring. Remove clamp from hose.
9. Reconnect battery, start engine and check for leaks.
10. Lower vehicle to the ground.

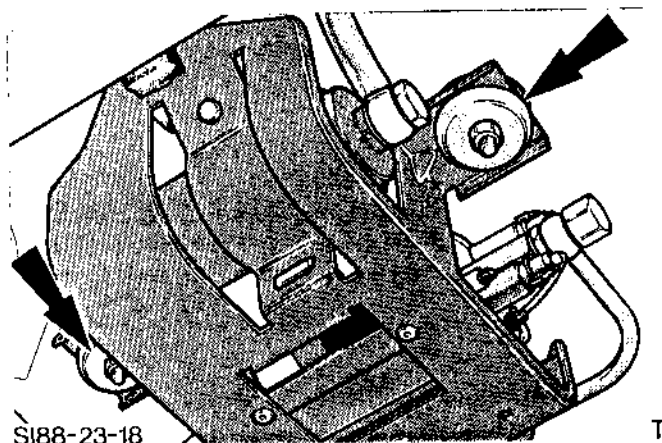


Fig.33. Fuel pump retaining nuts.

23 545 0 FUEL FILTER - REMOVE AND INSTALL

SPECIAL SERVICE EQUIPMENT REQUIRED: NONE

IMPORTANT NOTE: WHEN REMOVING FUEL LINES, IT MUST BE REMEMBERED THAT THE SYSTEM REMAINS PRESSURISED. TAKE ADEQUATE SAFETY PRECAUTIONS TO PREVENT FUEL SPILLAGE.

To Remove

1. Disconnect battery, raise vehicle on a ramp, clamp fuel feed hose at tank.
2. Position a suitable container beneath fuel filter. Slacken fuel inlet pipe, allow pressure in fuel line to reduce. Remove fuel inlet and outlet pipe.
3. Loosen filter retaining bolts and withdraw filter assembly.

NOTE: Take care when removing filter, as it contains fuel.

To Install

4. Fit new filter assembly and secure, ensuring that filter is round the correct way (note direction of flow arrows).
5. Refit fuel filter inlet and outlet pipes. Remove clamp.
6. Reconnect battery. Switch ignition 'on' and 'off' five times and check filter and fuel pipes for leakage.
7. Lower vehicle.

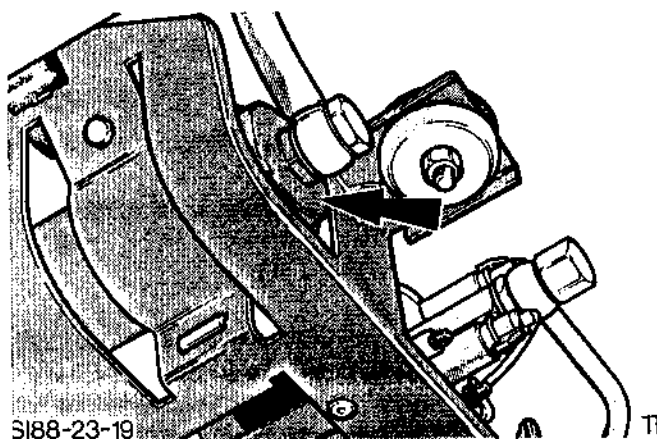


Fig.34. Fuel filter location.

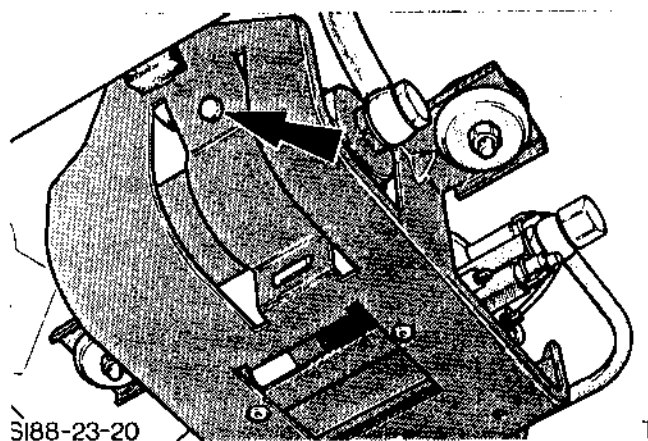


Fig.35. Fuel filter assembly.

23 601 0 BOOST PRESSURE - ADJUST

SPECIAL TOOLS REQUIRED:

Pressure Gauge and Hose 23-021
Cooling System Pressure Tester

NOTE: After fitment or replacement parts to the Turbocharger, the boost pressure will require resetting.

This operation is divided into two sections:
initial 'static' adjustment and final adjustment during/after road test.

IMPORTANT NOTE: Roller testing is not recommended as the temperatures generated by the engine and brakes and the inadequate cooling available on a roller test.

Initial Static Adjustment

1. With the actuator rod disconnected from the waste gate operating lever, connect the cooling system pressure tester to the waste gate actuator and apply a pressure of 0,45 bar (max. 0,48 bar).
2. Move the operating lever to fully close the waste gate valve.
3. With 0,45 bar (max. 0,48 bar) pressure still applied to the actuator, adjust the rod length so that it just slips onto the waste gate lever.
4. Fit a new circlip to retain the rod and tighten the locknut ensuring that the rod eye is not twisted and allows the waste gate to move freely when the pressure is released.

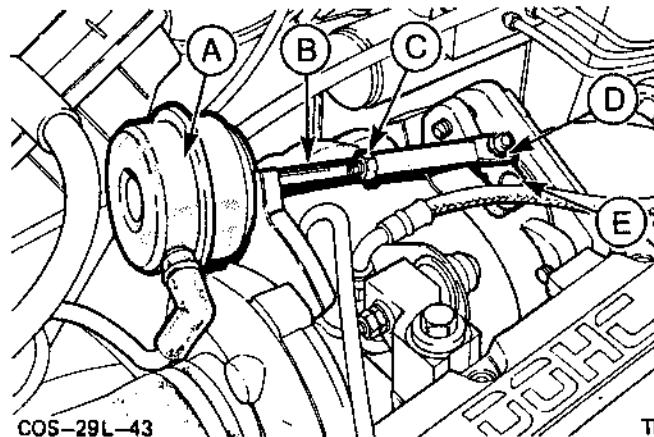


Fig.36. Actuator rod and waste gate.
A - Waste gate actuator D - Circlip
B - Actuator rod E - Operating lever
C - Locknut

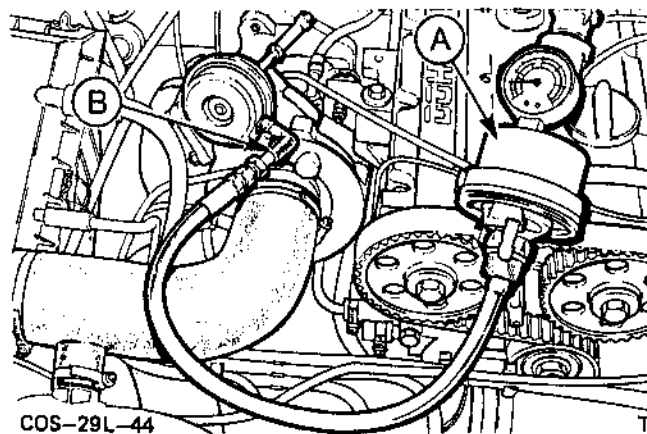


Fig.37. A - Cooling system pressure tester
B - Waste gate actuator hose

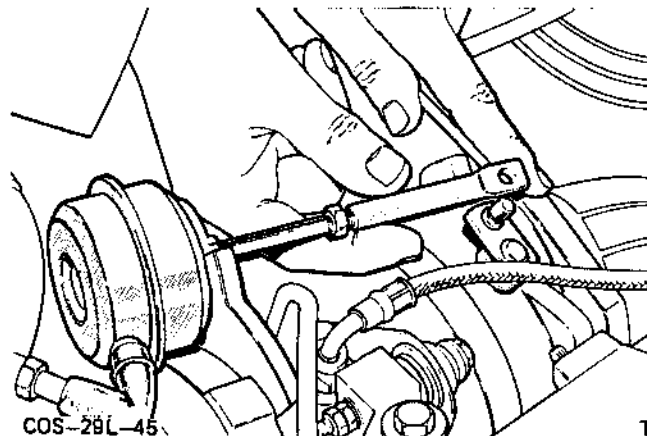


Fig.38. Adjust the rod length so that it just slips onto the waste gate lever.

23 601 0

Road Testing

NOTE: When performing this operation, the duration of the actual boost test itself should be no more than 3 - 5 seconds.

The boost pressure is measured via a gauge and connecting pipe work as detailed below:

5. Pull off the hose of the turbocharger boost pressure gauge. Connect the pressure gauge, using a 2,0 metre length of 6 mm diameter neoprene tubing.

NOTE: It is essential for correct readings that the pressure gauge is securely fixed to the driver's side vent nozzle in an upright position.

6. Drive the vehicle until normal operating temperature is reached.

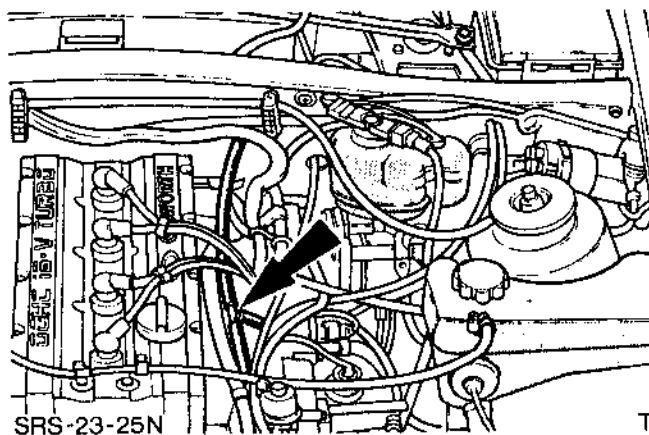


Fig.39. 'T' piece location (only on vehicles fitted with a boost gauge).

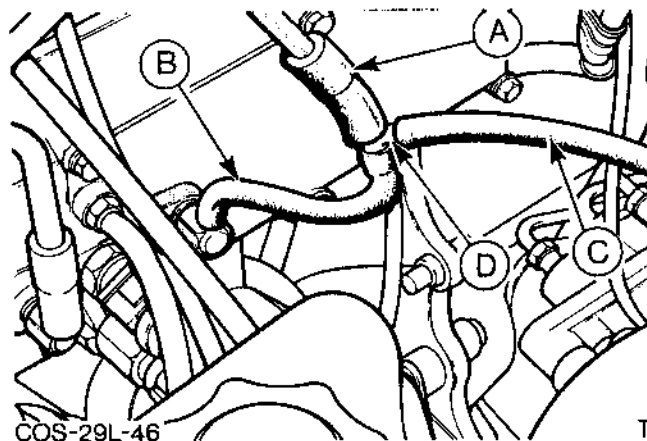


Fig.40. 'T' piece and hose installation.
A - Hose to bypass valve C - Hose to gauge
B - Hose to air chamber D - 'T' piece

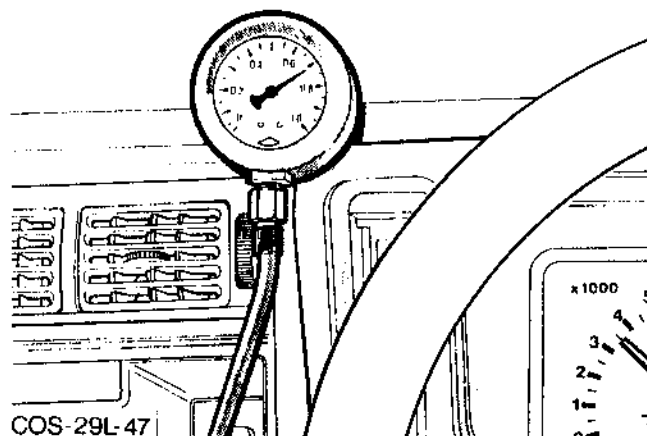


Fig.41. Gauge installation hose routing.

23 601 0

7. With a clear, straight road ahead and behind (preferably without junctions). Select 4th gear and drive along at an engine speed of approximately 1500 rpm.

8. Fully depress the throttle pedal.

9. Keeping the throttle pedal fully depressed, fully apply the brakes when the engine reaches 3500 rpm - **DO NOT EXCEED THE TEST DURATION (MAX 5 SECS).**

With both throttle and brake fully depressed read the boost pressure from the gauge.

Specification: 0,7 bar (max. 0,9)

NOTE: After taking reading, drive the car for at least 1 mile to allow the brakes to cool.

10. If the reading obtained is within specification, apply a small amount of paint to the actuator rod threads and locknut to lock into position.

11. If the reading obtained was outside the specification, the actuator rod should be adjusted as follows:

12. Loosen locknut nut at rod eye, remove the circlip and detach the rod from the waste gate operating lever.

● Boost Pressure Low

Shorten rod one half turn for every 0,02 bar of pressure below that specified.

● Boost Pressure High

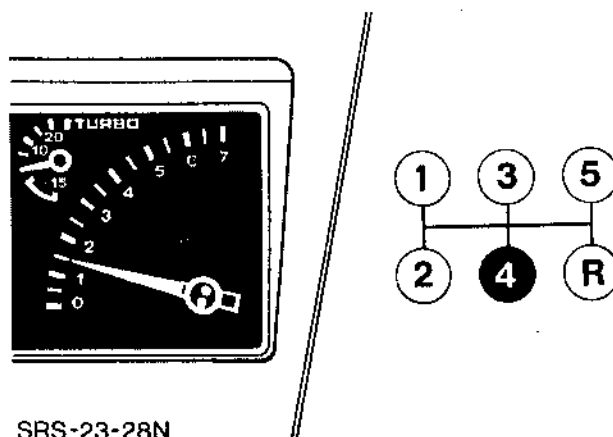
Lengthen rod one half turn for every 0,02 bar of pressure above that specified.

13. After adjustment, refit rod and circlip and tighten locknut ensuring the rod eye does not bind on the waste gate lever.

14. Repeat test.

15. If boost pressure is now within specification, apply paint to the actuator rod threads and locknut to lock in position.

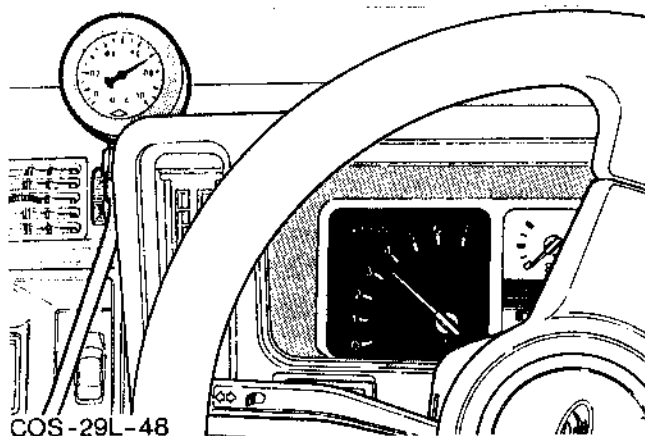
16. Remove the test equipment and reconnect turbo-charger boost pressure gauge hose to the 'T' piece.



SRS-23-28N

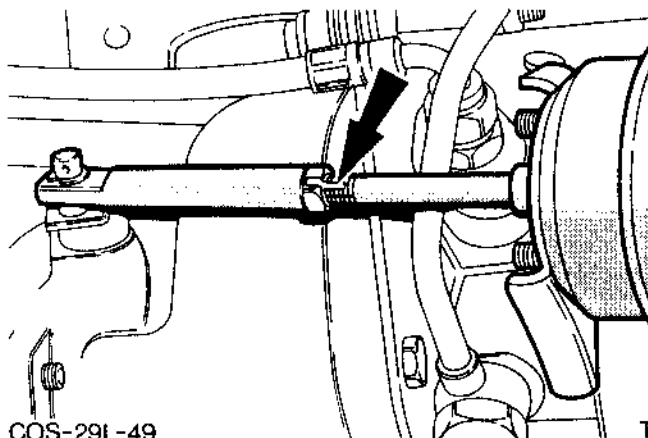
TI

Fig.42. 4th gear engaged and engine speed at 1500 rpm.



COS-29L-48

Fig.43. Readings with full load induced.



COS-29L-49

TI

Fig.44. Paint mark over threads and locknut of waste gate actuator rod.

23 612 0 TURBOCHARGER - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Remove air hoses from air cleaner, bypass valve and turbocharger (3 hose clamps).
3. Remove heat shield.
4. Remove both solenoid control valve hoses from turbocharger and actuator.
5. Remove bottom air hose from turbocharger.
6. Remove oil pressure hose from turbocharger.
7. Remove turbocharger coolant return pipe from turbocharger. Detach retainer from cylinder head cover.
8. Remove turbocharger cooling feed pipe from thermostat housing.
9. Remove exhaust pipe from turbocharger (3 bolts).
10. Remove secondary exhaust manifold from main exhaust manifold (two bolts top and two bolts bottom).

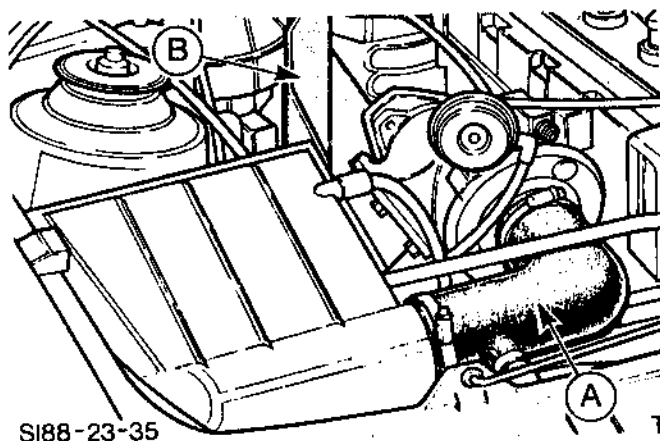


Fig.45. A - Top air hose
B - Heat shield

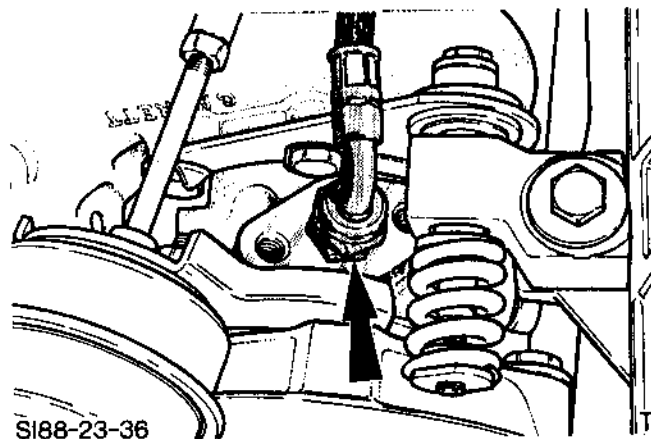


Fig.46. Oil pressure hose connection.

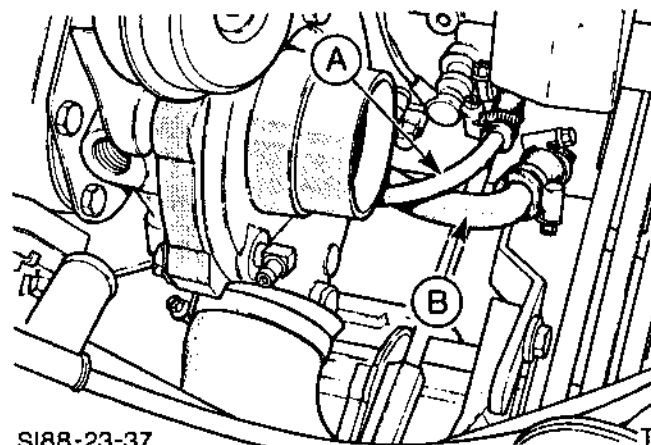


Fig.47. Turbocharger coolant.
A - Coolant feed pipe
B - Coolant return pipe

23 612 0

11. Remove turbocharger vibration damper assembly (1 bolt) and withdraw turbocharger.

12. Replace Turbocharger (turbocharger removed)

- Remove secondary exhaust manifold from turbocharger (4 bolts, locked).
- Remove oil return pipe (2 bolts).
- Remove coolant pipe from turbocharger.
- Remove waste gate actuator with rod and retainer (2 bolts, 1 clip).
- Transfer oil pressure/boost pressure connection fittings.
- Refit all parts in reverse order.
- Use new friction washers if necessary.

13. Position turbocharger assembly and locate oil return pipe.

14. Fit secondary exhaust manifold to main exhaust manifold, tighten bolts finger tight only.

NOTE: Use new bolts.

Install Turbocharger Vibration Damper (Damper without spring, for damper incorporating spring go to sub-operation 23).

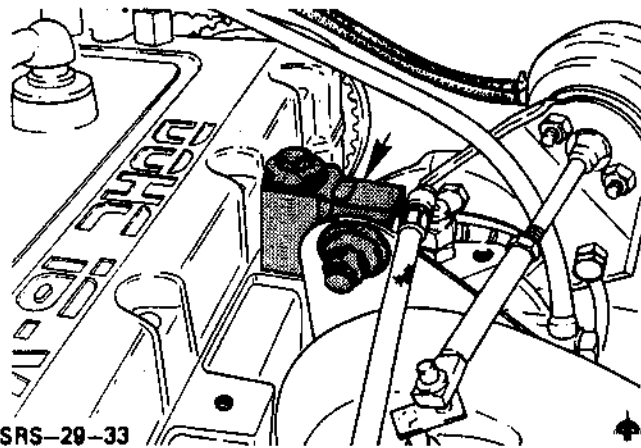
NOTE: Special care should be taken during the assembly and adjustment of the turbocharger vibration damper.

Fig.49. Turbocharger vibration damper cross section.

- A - Bolt
- B - Washer
- C - Locknut
- D - Washer
- E - Damper support
- F - Bearing bush
- G - Guide pin
- H - Turbocharger support
- J - Taper sleeve
- K - Washer
- L - Bolt
- M - Disc spring
- N - Friction washer

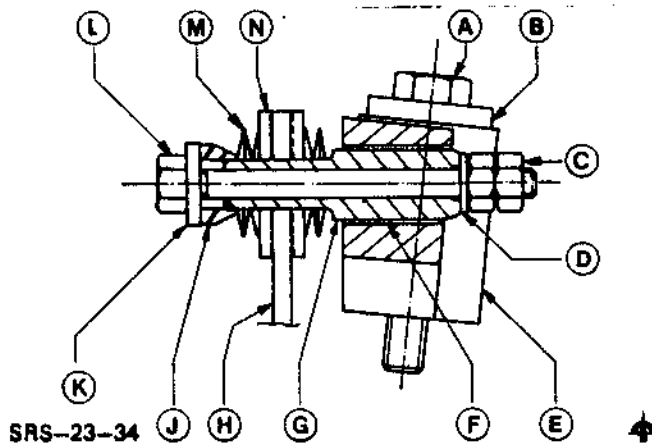
15. Assemble the turbocharger vibration damper parts finger tight as shown in Fig.49.

16. Adjust the guide pin so that its shoulder protrudes 4 mm from the damper support. Check distance with a rule, Fig.50.



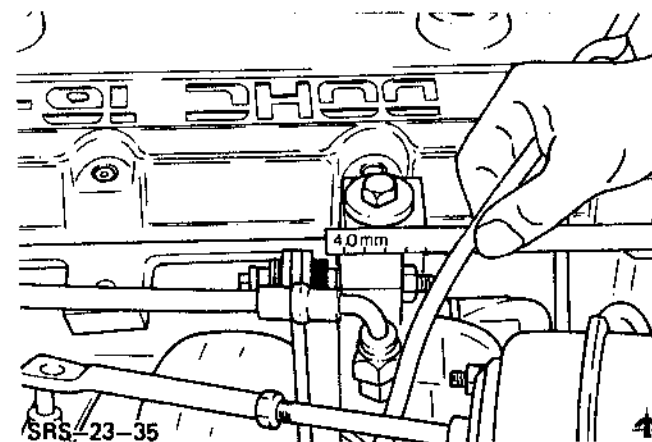
SRS-29-33

Fig.48. Turbocharger vibration damper.



SRS-23-34

Fig.49. Turbocharger vibration damper cross section.

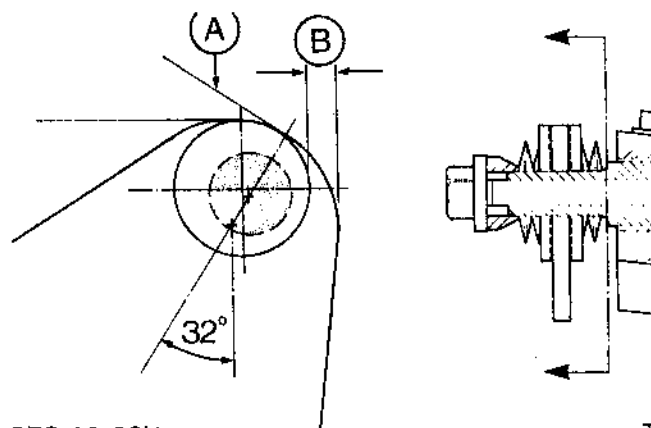


SRS-23-35

Fig.50. Setting - guide pin shoulder to damper support - 4 mm.

23 612 0

17. Adjust the vibration damper so that the friction washers are flush with the turbocharger holder at the top and also are 5,4 mm from the side.



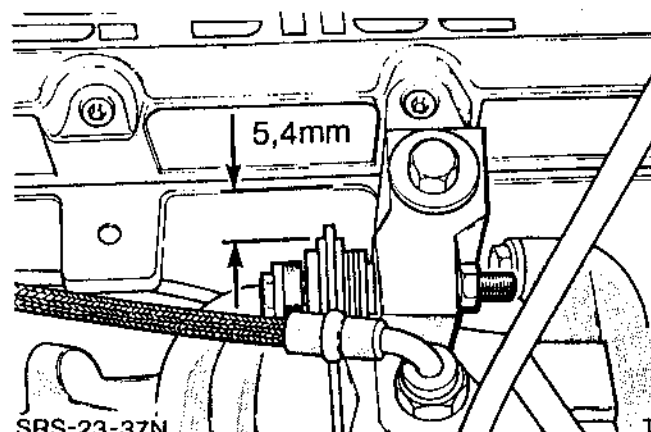
SRS-23-36N

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Fig.51. Turbocharger vibration damper assembly.

- A - Holder and friction washers flush
B - Holder to friction washers 5,4 mm

18. Measure the distance between the friction washers and the turbocharger holder with vernier calipers.

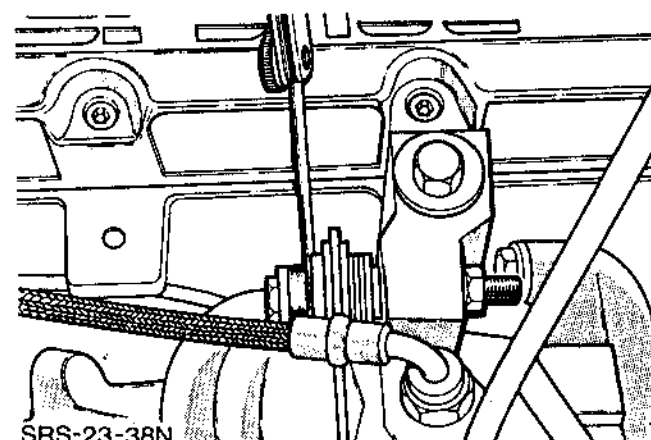


SRS-23-37N

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Fig.52. Holder to friction washer setting 5,4 mm.

19. Insert a 0,04 mm feeler gauge between two disc springs and tighten the nut until the feeler can just be withdrawn.



SRS-23-38N

TI

Fig.53. Feeler gauge (0,04 mm) between two disc springs.



23 612 0

20. Hold the bolt, then tighten the nut $1\frac{1}{2}$ to 2 turns. Use a marking pen on the nut to assure correct adjustment.

NOTE: Do not exceed 2 turns.

21. Fit locknut and tighten to specified torque (see Technical Data).

NOTE: After tightening the locknut to the specified torque, recheck the 4,0 mm gap.

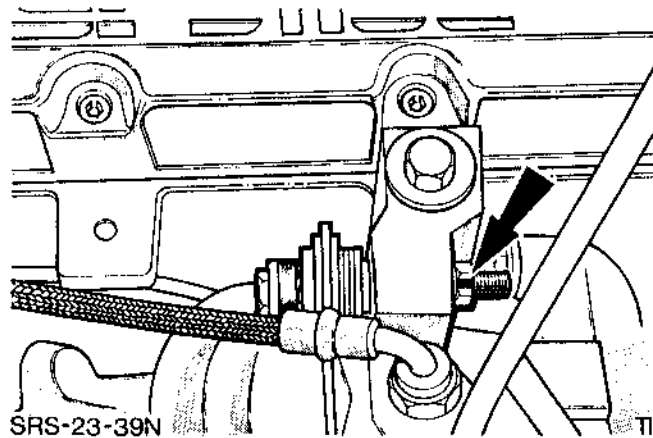


Fig.54. Mark nut.

22. Tighten retaining screw, vibration damper to cylinder head, to the specified torque (see Technical Data).

Tighten the turbocharger manifold to exhaust manifold bolts (4) to the specified torque (See Technical Data), go to sub-operation 29.

Install turbocharger damper assembly (spring type)

23. Mount damper block to cylinder head, do not fully tighten bolt.

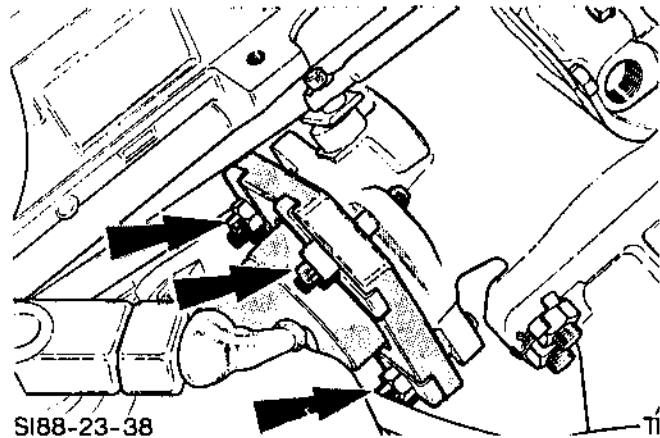


Fig.55. Exhaust pipe to turbocharger.

24. Assemble damper components as shown in Fig.56.

Fig.56. Spring type damper assembly components.

- A - Bolt
- B - Washer
- C - Taper sleeve
- D - Friction washers
- E - Guide sleeve
- F - Collar
- G - Spring
- H - Threaded collar
- J - Lock nut

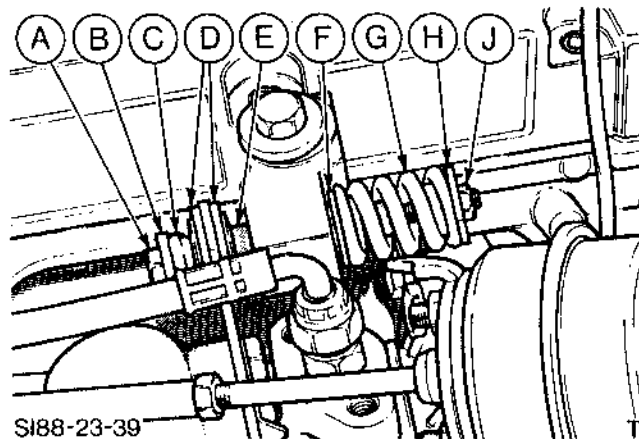
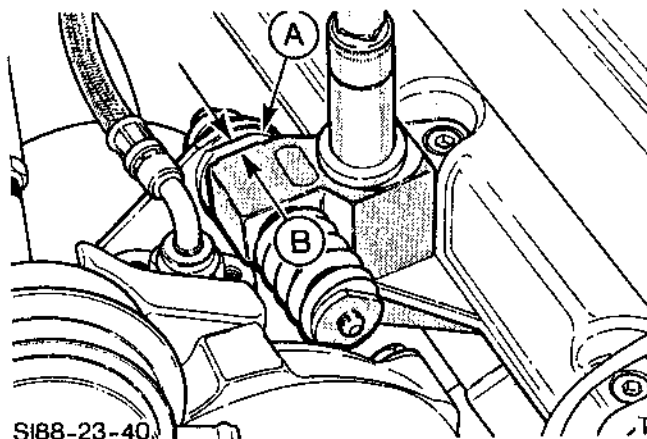


Fig.56. Spring type damper assembly components.

23 612 0

25. Tighten the threaded collar until the friction washers abutt the bracket and can still be rotated by hand. Adjust the damper so that the friction washers are flush with the turbocharger holder at the top and are also 5,4 mm from the side.

26. Position 4,0 mm gauge between turbocharger holder and mounting block. Adjust the mounting block to obtain the 4,0 mm setting and tighten the retaining bolt to the specified torque (refer to Technical Data)



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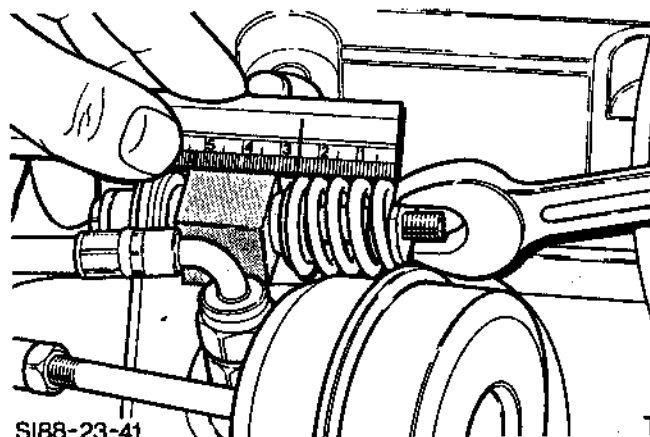
Fig.57. Turbocharger vibration damper assembly.

A - Insert 4 mm gauge.

B - Ensure 4 mm clearance is obtained between damper and mounting block

27. Hold through bolt and tighten threaded collar until spring is compressed to a length of 25 mm. Fit locknut, hold threaded collar and tighten locknut to 8 to 10 Nm.

28. Tighten the turbocharger manifold to exhaust manifold bolts (4) to the specified torque (See Technical Data).



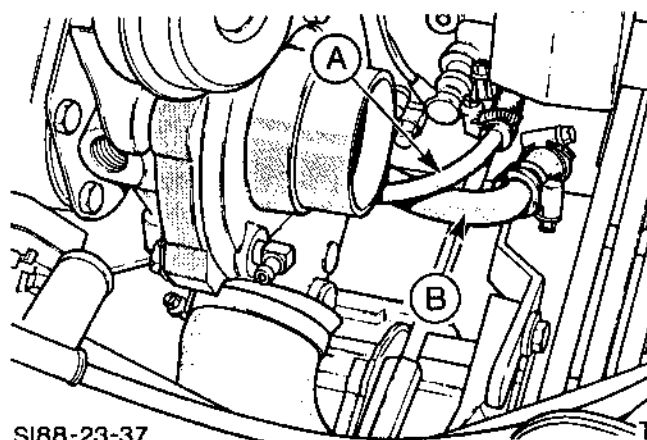
SI88-23-41

Fig.58. Tighten spring to compress to 25 mm.

29. Fit exhaust pipe to turbocharger, tighten to specified torque (refer to Technical Data).

30. Fit turbocharger coolant feed to thermostat housing.

31. Fit turbocharger coolant system return to turbocharger and mount retainer on cylinder head cover.



SI88-23-37

Fig.59. Turbocharger coolant.

A - Feed pipe

B - Return pipe

23 612 0

32. Fit oil feed hose to turbocharger.

33. Fit bottom air hose to turbocharger.

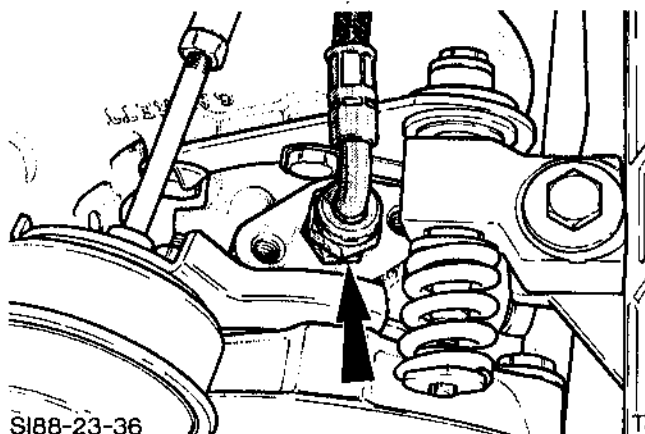
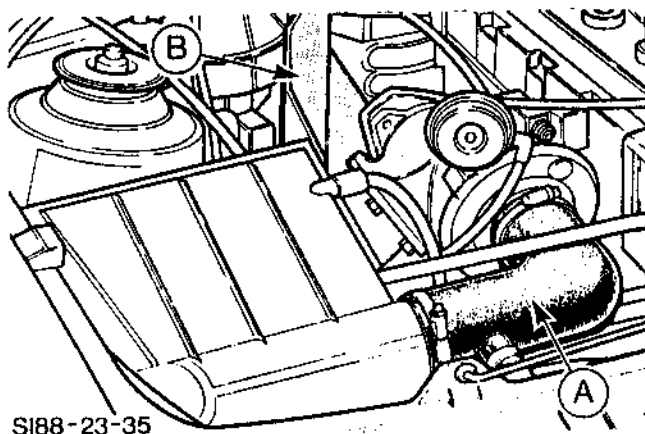


Fig.60. Oil pressure hose connection.

34. Fit both hoses connecting solenoid control valve to turbocharger and actuator.

35. Fit heat shield assembly.



36. Fit top air hose to air cleaner, bypass valve and turbocharger.

Fig.61. A - Top air hose
B - Heat shield

37. Reconnect battery earth cable and remove fender covers.

38. Check waste gate valve setting and adjust rod if necessary (see Repair Operation 23 601 0).

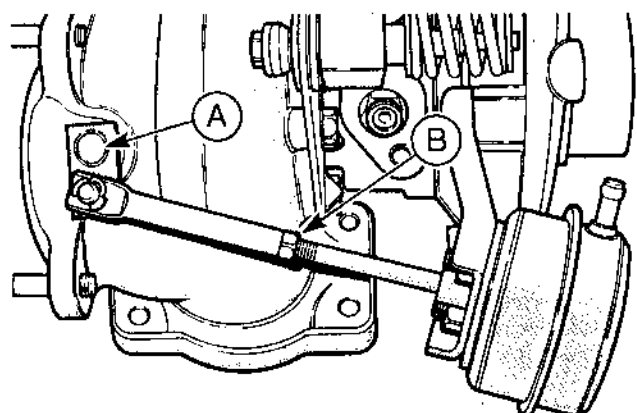


Fig.62. A - Waste gate valve
B - Adjust rod

23 616 0 SOLENOID CONTROL VALVE - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Remove multiplug.
3. Remove the three hoses from the solenoid control valve.
4. Remove securing screws and detach the solenoid control valve.

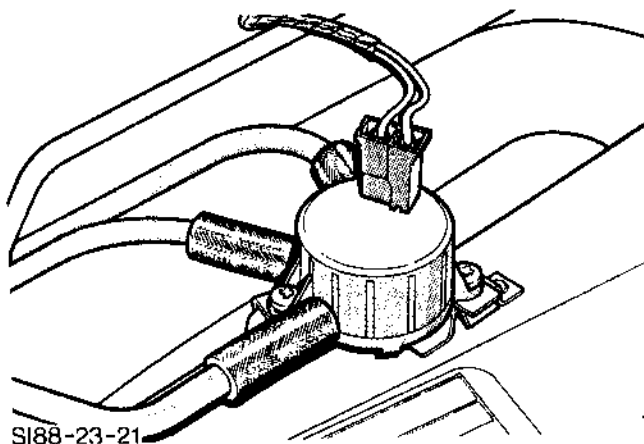


Fig.63. Solenoid control valve.

To Install

5. Refit solenoid control valve and fully tighten the securing screws.

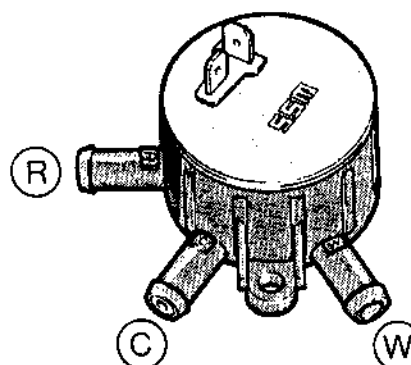


Fig.64. Solenoid control valve removed.

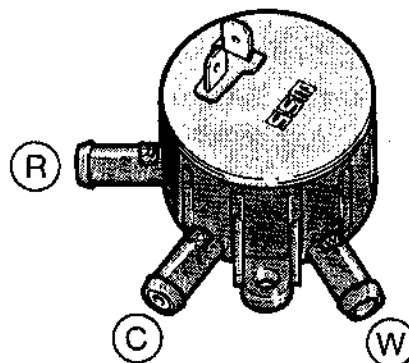
6. Reconnect the three air hoses:
 - air hose of turbocharger waste gate actuator to connection W (W - waste gate)
 - air hose of turbocharger compressor housing to connection C (C - compressor)
 - air hose of air cleaner to connection R (R - return)
7. Reconnect multiplug.
8. Reconnect battery and remove fender covers.

23 620 0 INTERCOOLER - REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Remove solenoid control valve from intercooler (2 bolts). Disconnect multiplug.

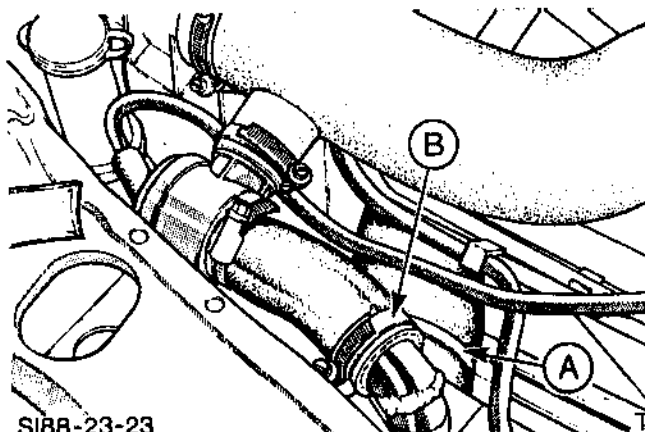


SI88-23-22

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Fig.65. Solenoid control valve.

3. Remove bypass hose from intercooler and rotate to give adequate clearance when removing intercooler.
4. Remove air hoses (left and right) from intercooler.



SI88-23-23

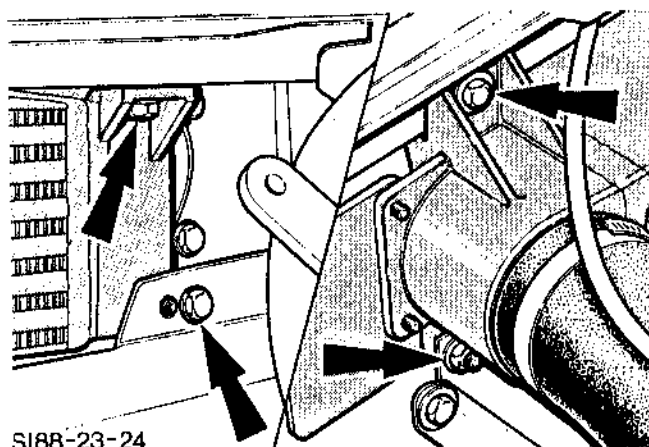
Fig.66. A - Air cleaner intake
B - Bypass hose

5. Remove air cleaner intake, (1 plastic expansion rivet) from intercooler. Remove air cleaner cover.

6. Pre '88 Model Year only.
Remove radiator grille.

7. Remove air duct plate from intercooler (2 bolts).

8. Remove intercooler from upper front body crossmember (2 bolts).



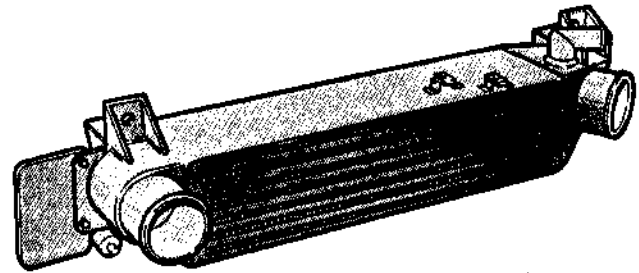
SI88-23-24

Fig.67. Intercooler retaining bolts
(1 side shown).

23 620 0

9. Remove intercooler from above radiator (2 nuts).

10. Raise vehicle on a ramp.



11. Loosen six clips retaining air shroud and two bottom radiator mounting bolts to release radiator and remove intercooler.

SI88-23-25

71

Fig.68. Intercooler assembly.

To Install

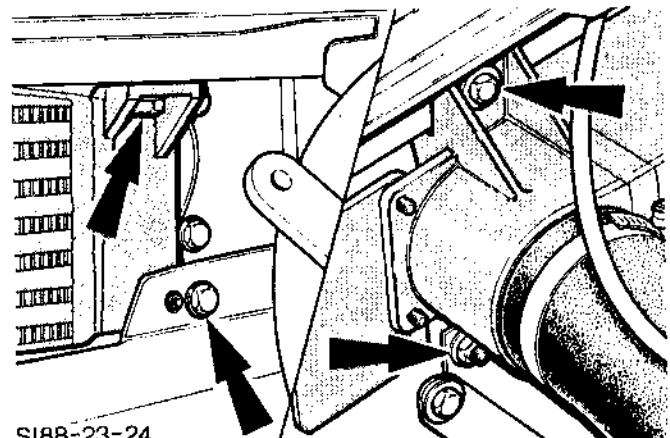
12. Position intercooler, tighten bottom radiator bolts and fasten air shroud with 6 clips.

13. Lower vehicle to the ground.

14. Fit top of intercooler to radiator (2 nuts).

15. Fit intercooler to upper front body cross-member (4 bolts).

16. Fit air shroud to intercooler (2 bolts).



SI88-23-24

17. If removed, fit radiator grille (4 bolts).

Fig.69. Intercooler mounting bolts (1 side shown).

23 620 0

18. Fit air cleaner intake to intercooler (1 plastic expansion rivet).

NOTE: Use new plastic expansion rivet to fit air cleaner intake connection.

19. Fit left and right-hand air hoses to intercooler.

20. Fit air cleaner cover complete with hoses.

21. Refit bypass valve hose to intercooler.

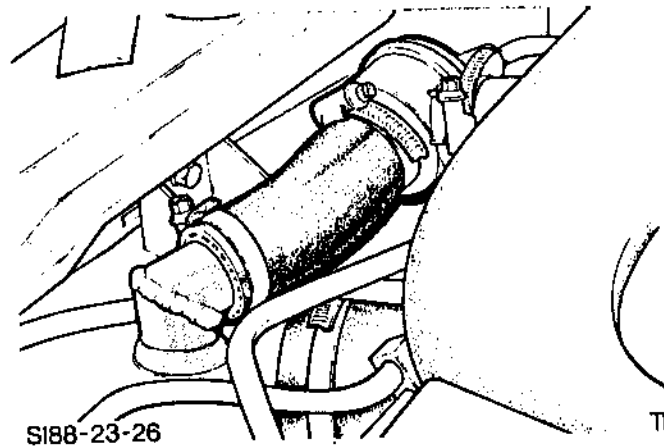


Fig.70. Top air hose and bypass valve hose.

22. Fit solenoid control valve to intercooler and connect plug.

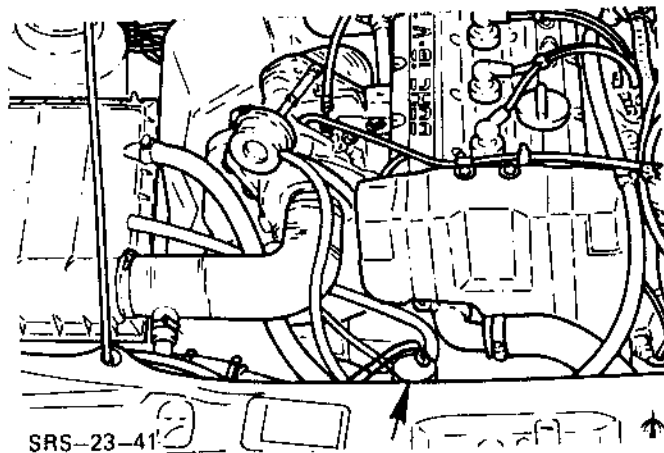


Fig.71. Solenoid control valve.

23. Reconnect battery earth cable and remove fender covers.

29 622 0 AIR CHARGE TEMPERATURE SENSOR -
REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Fit fender covers and disconnect battery earth cable.
2. Remove multiplug.
3. Using a suitable spanner, remove the sensor from air chamber.

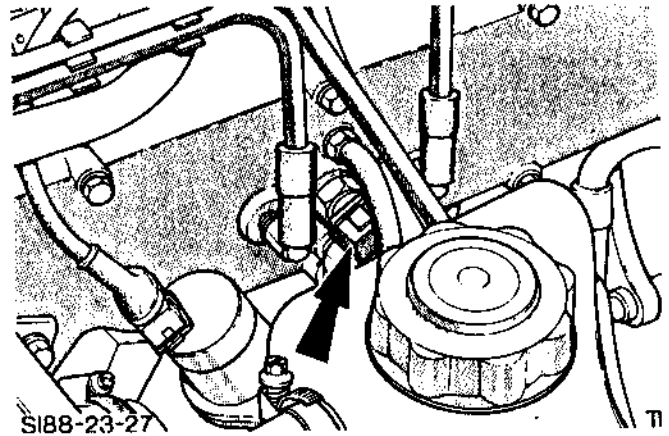
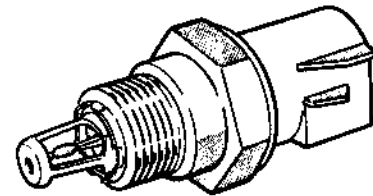


Fig.72. Air charge temperature sensor.



To Install

4. Apply sealant to sensor (see Technical Data) and refit sensor to air chamber.
5. Tighten sensor to specified torque (refer to Technical Data).
6. Reconnect multiplug and battery and remove fender covers.

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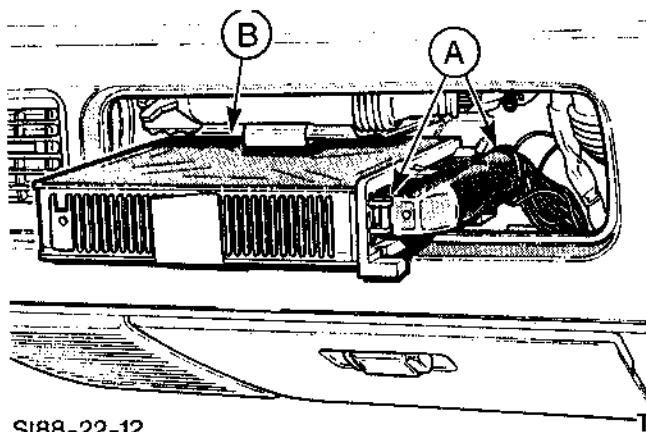
Fig.73. Air charge temperature sensor removed.

29 200 0 CONTROL MODULE - ENGINE MANAGEMENT REMOVE AND INSTALL

SPECIAL TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cable.
2. Unclip trim above glove compartment.
3. Remove module and remove multiplug from module.
 - Push back plug retainer,
 - Lift up multiplug and remove from retainer.

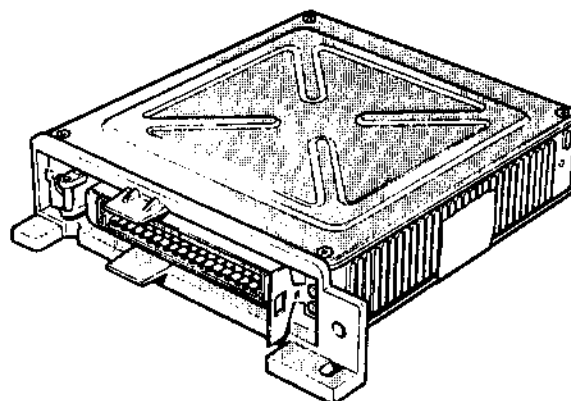


SI88-22-12

Fig.74. Engine management module.
A - Multiplug retainer
B - Retainer

To Install

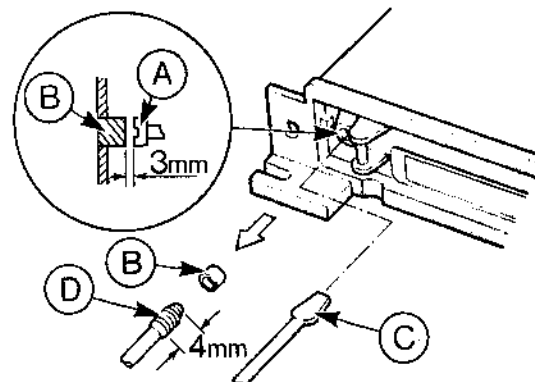
4. Connect multiplug to module:
 - Refit retainer and
 - Push in multiplug so that clip engages.
5. Insert module into holder, connect battery earth cable.
6. Check CO content and adjust if necessary:
 - Connect CO meter and check CO content at normal operating temperature.
 - If required, remove CO adjustment tamper-proof plug, on module and turn adjusting screw to correct CO content. Fit new tamperproof plug to adjusting screw.



SI88-22-13

Fig.75. Engine management module.

IMPORTANT NOTE: When performing this operation, note that the depth of the tamper-proof plug remover should not exceed 4 mm as this will result in damage to the CO - adjustment potentiometer.



SI88-22-14

Fig.76. A - CO adjustment screw
B - Tamperproof plug
C - Screwdriver
D - Extractor tamperproof plug

7. Fit trim above glove compartment.

29 224 0 SENSOR - MANIFOLD ABSOLUTE PRESSURE - REMOVE AND INSTALL

SPECIAL SERVICE TOOLS REQUIRED: NONE

To Remove

1. Disconnect battery earth cable and fit fender covers.
2. Remove three retaining bolts securing sensor to bracket, from underside of bracket.
3. Disconnect multiplug. Cut hose clip and remove vacuum pipe from sensor.

To Install

4. Refit vacuum pipe, using a new hose clip. Reconnect multiplug.
5. Locate sensor on bracket and secure with three bolts.
6. Reconnect battery and remove fender covers.

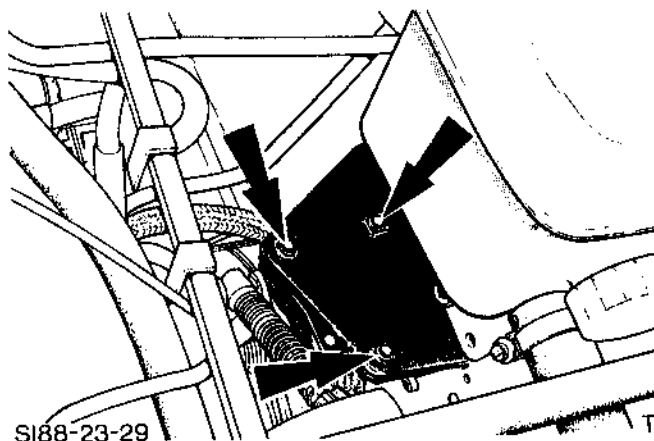


Fig.77. Sensor securing bolts.
(Remove from underside of bracket).

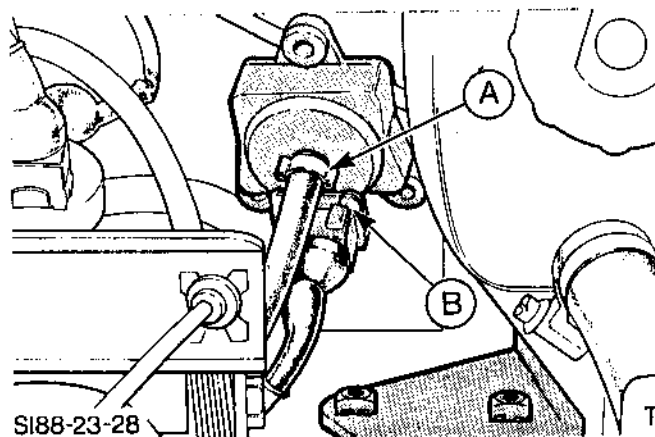


Fig.78. A - Vacuum pipe connection
B - Sensor multiplug

