

**TEST CHART - PART A**

**TEST 10 - CHECK IDLE ENRICHMENT CONTACTS IN THROTTLE SWITCH - THROTTLE CLOSED - SWITCH II AT 'THROTTLE 2'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
'0'	'∞'	Throttle switch incorrectly adjusted or open circuit in cable. Check adjustment. Remove plug and bridge terminals 17 and 12/47. If still at '∞', check for short circuit to ground in cable harness, otherwise replace throttle switch.

**TEST 11 - CHECK IDLE ENRICHMENT CONTACTS IN THROTTLE SWITCH - THROTTLE OPEN (5° APPROX.) - SWITCH II AT 'THROTTLE 2'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
Should fall to '0' when throttle released	'0'	Throttle switch incorrectly adjusted or open circuit in cable. Remove plug if meter still shows '0', check cable harness, otherwise adjust or replace throttle switch.

**TEST 12 - CHECK FULL LOAD ENRICHMENT DEVICE - FEDERAL CARS ONLY - THROTTLE FULLY OPEN - SWITCH II AT 'THROTTLE 3'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
'0'	'∞'	Throttle switch incorrectly adjusted or open circuit in cable. Remove plug and bridge terminals 12/47 and 2/14. If still at '∞', check for short circuit to ground in cable harness, otherwise replace throttle switch.

**TEST 13 - CHECK FULL LOAD ENRICHMENT DEVICE - FEDERAL CARS ONLY - THROTTLE 5° BEFORE FULLY OPEN - SWITCH II AT 'THROTTLE 3'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
'∞'	'0'	Throttle switch incorrectly adjusted or short circuit in cable. Remove plug; if meter still shows '0', check cable harness, otherwise adjust or replace throttle switch.

**TEST 14 CHECK RESISTANCE OF AIR TEMPERATURE SENSOR - SWITCH II AT 'TEMPERATURE 1'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
Affected by temp. See table below	'∞'	Open circuit; remove plug and bridge terminals. If meter shows '0' replace sensor, otherwise check and rectify fault in cables.

In case of doubt, remove temperature sensor and measure resistance with ohmmeter. The nominal values, which are dependent on temperature, are listed in the table below (tolerance ± 10%).

AIR TEMPERATURE SENSOR	METER READING
- 10° C corresponds to 960 ohms	9.6
0° C corresponds to 640 ohms	6.4
+ 10° C corresponds to 435 ohms	4.4
+ 20° C corresponds to 300 ohms	3.0
+ 30° C corresponds to 210 ohms	2.1
+ 40° C corresponds to 150 ohms	1.5
+ 50° C corresponds to 108 ohms	1.1
+ 60° C corresponds to 80 ohms	0.8

**TEST 15 - CHECK RESISTANCE OF COOLANT TEMPERATURE SENSOR - SWITCH II AT 'TEMPERATURE 2'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
Affected by temp. See table below	'∞'	Open circuit; remove plug and bridge terminals. If meter shows '0', replace sensor, otherwise check and rectify fault in cables.
	'0'	Short circuit; remove plug. If meter still shows '0', cables are faulty. If meter then shows '∞', replace sensor.

## TEST CHART - PART A

**TEST 15 (cont'd.)**  
 In case of doubt, remove temperature sensor and measure resistance with ohmmeter. The nominal values, which are dependent on temperature, are listed in the table below (tolerance  $\pm 10\%$ ).

COOLANT TEMPERATURE SENSOR	METER READING
-10° C corresponds to 9.2k ohms	9.2
0° C corresponds to 5.9k ohms	5.9
+10° C corresponds to 3.7k ohms	3.7
+20° C corresponds to 2.5k ohms	2.5
+30° C corresponds to 1.7k ohms	1.7
+40° C corresponds to 1.18k ohms	1.2
+50° C corresponds to 840 ohms	0.85
+60° C corresponds to 600 ohms	0.6
+70° C corresponds to 435 ohms	0.4
+80° C corresponds to 325 ohms	0.3
+90° C corresponds to 250 ohms	0.25
+100° C corresponds to 190 ohms	0.2

## TEST 16 - CHECK RESISTANCE OF EACH INPUT TO POWER AMPLIFIER - PRESS SWITCH 2' - SWITCH II AT 'AMPLIFIER'

METER READING	POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT
'0'	Short circuit in cable or amplifier. Separate in-line plug and socket adjacent to amplifier, and if meter then shows '∞', replace amplifier, otherwise replace cable harness.
6-12 (7.5 ohms approx)	Open circuit in cable harness or amplifier. Separate in-line plug and socket adjacent to amplifier and bridge harness socket: (i) Pins 11 to 9 - press 'Switch 2' (ii) Pins 12 to 9 - press 'Switch 3' If meter then shows '∞' cable harness is faulty, or if '0', amplifier is faulty.
Below '6' and over '12'	Separate in-line plug and socket adjacent to amplifier. If meter then shows '∞', replace amplifier, otherwise check cables.

## TEST 17 - CHECK RESISTANCE OF EACH INPUT TO POWER AMPLIFIER - PRESS SWITCH 3' - SWITCH II AT 'AMPLIFIER'

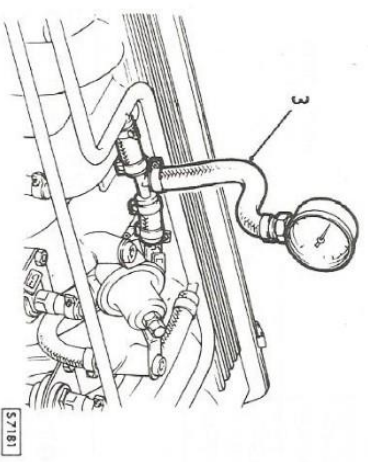
METER READING	POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT
As test 16	As test 16

## TEST CHART

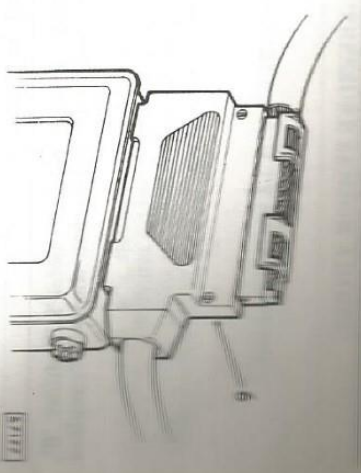
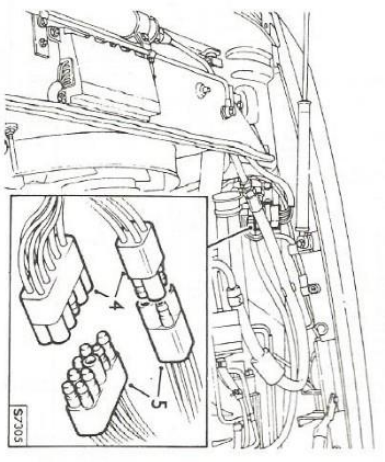
### PART B - SWITCH OFF IGNITION

The position of 'Switch II' is immaterial during these tests.

- 1 Select 'Volts 3' on switch I.
- 2 Crank engine to depressurise fuel system.
- 3 Contact pressure gauge to fuel rail.



- 4 Locate in-line connectors adjacent to power amplifier at right-hand valance in engine compartment.
- 5 Connect multi-plug of 'EPITEST' to in-line socket connector using adaptor supplied.



- 7 Switch on vehicle ignition and leave ON for all tests in Part B.
  - 8 Continue testing to end of Part B, moving to next position on switch I and using push switches as indicated in test chart.
  - 9 Rectify any faults found before continuing further tests.
  - 10 Switch I, position 'Fuel Check 2' should be ignored.
  - 11 Switch off vehicle ignition on completion of Part B.
- WARNING:**  
 1 Do not operate switches 'pump' and I, 2, 3 and 4 when switch is at 'Fuel Check' unless indicated on chart.  
 2 Start engine ONLY when switch I is in 'Run Engine' position.

- 6 Connect 'EPITEST' 25-way multi-plug adaptor (still connected to vehicle harness multi-plug) to ECU.

**TEST CHART - PART B**

**TEST 1 - CHECK VOLTAGE SUPPLY TO POWER AMPLIFIER - SWITCH 1 AT 'VOLTS 3'**

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
11-12.5V	No reading	(a) Open circuit or poor connections between pin 10 of power amplifier and terminal 87 of main relay. (b) Main relay not energised; check voltage at terminal 86 of main relay. If 0V, check feed from ignition switch, or if voltage is satisfactory, check relay (terminal 85) and its ground connections.
	Below 11V	Battery flat, or high resistance in either cables to power amplifier terminals 9 and 10, or across main relay terminals.

**TEST 2 - CHECK RESISTANCE OF INJECTOR WINDINGS AND CONNECTIONS - SET METER TO '00' - SWITCH 1 AT 'INJECTOR'**

- Injector switch 1 energises injectors, A1, A3 and A5. Check each injector by disconnecting the plugs from the other two and pressing 'Injector Switch 1'.
- Injector switch 2 energises injectors, B2, B4 and B6. Check each injector by disconnecting the plugs from the other two and pressing 'Injector Switch 2'.
- Injector switch 3 energises injectors, A2, A4 and A6. Check each injector by disconnecting the plugs from the other two and pressing 'Injector Switch 3'.
- Injector switch 4 energises injectors, B1, B3 and B5. Check each injector by disconnecting the plugs from the other two, and pressing 'Injector Switch 4'.

METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
2-3 (2.4 ohms at 20°C) for each injector	'0'	Short circuit in cable or injector, disconnect injector, if meter shows '∞' (with appropriate switch pressed), replace injector, otherwise check and rectify cable faults.
	'∞'	Open circuit injector or cables: Bridge contacts of injector harness plug, if meter shows '∞' (with appropriate switch pressed), cable is faulty. If meter shows '0', replace injector.
	'3'	High resistance connections between terminal 9 of power amplifier and engine (ground).

**TEST 3 - CHECK FUEL LINE PRESSURE - PRESS 'PUMP' SWITCH - SWITCH 1 AT 'FUEL CHECK 1', DISCONNECT L.T. LEAD AT IGNITION COIL.**

PRESSURE GAUGE/METER READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
28.5-30.8 lbf/in <sup>2</sup> 2.0-2.2 kgf/cm <sup>2</sup>	No pressure (pump does not run)	Disconnect cables from pump, press 'Pump' switch and measure voltage at cable ends. Ensure changeover valve selecting correct pump. Pump defective - replace.
	12V	Disconnect feed to changeover switch. Check voltage, if satisfactory, check for open circuit switch. Check, by listening, that pump relay energises. If yes: Open circuit in cable between plug relay terminal 87 to changeover switch, or the positive pump connection, or from the negative pump connection to ground. Ensure fuel switch connections and contacts satisfactory. If connecting cable and plug connections are satisfactory, pump relay is defective - replace. If no: Break in cable from main relay terminal 85 to pump relay terminal 86, or from pump relay terminal 85 to pin 19 of ECU. If satisfactory, replace pump relay.
	'0'	Pressure regulator(s) incorrectly adjusted, re-adjust, if adjustment not possible, pressure regulator(s) defective - replace.

**TEST 4 - CHECK FOR LEAKS IN FUEL LINE - BRIEFLY PRESS 'PUMP' SWITCH (AS REQUIRED) - SWITCH 1 AT 'FUEL CHECK 1'**

PRESSURE GAUGE READING		POSSIBLE FAULTS AND REMEDIES
CORRECT	INCORRECT	
17 lbf/in <sup>2</sup> min. (1.2 kgf/cm <sup>2</sup> )	See next column	If pressure drops quickly below 17 lbf/in <sup>2</sup> (1.2 kgf/cm <sup>2</sup> ) as soon as 'pump' switch is released, there is a leak in the fuel line (from pump to pressure regulator). Clamp fuel hose from pump, after fuel filter. If no pressure drop occurs, the leak is at the pump (faulty non-return valve) or in the line between the pump, and temporary clamp. If pressure continues to drop, check all pipe connections to fuel rails, injectors, cold start injectors, pressure regulators, and pressure gauge. Pinch off the fuel line before each pressure regulator. If pressure continues to drop, check injectors and cold start injectors for leaks. If pressure remains constant, release clamps at each regulator in turn to establish which is faulty. In order to ascertain in which injector group a known leak is to be found, the injectors must be removed (see Test 5). Operate fuel changeover switch and repeat test.

## TEST CHART - PART B

### TEST 5 - VISUAL CHECK OF INJECTOR SPRAY - REMOVE INJECTORS - SWITCH 1 AT 'FUEL CHECK 1'

NOTE: Carry out this test only if injectors are suspect. To remove injectors see operation 19,60,01/03.

WARNING: THIS TEST RESULTS IN FUEL VAPOUR BEING PRESENT IN THE ENGINE COMPARTMENT. IT IS THEREFORE IMPERATIVE THAT ALL DUE PRECAUTIONS ARE TAKEN AGAINST FIRE AND EXPLOSION.

Disconnect plugs from two injectors in each bank. Press 'Pump' switch, then switches 1, 2, 3 and 4 in sequence, visually checking one injector in each bank. Repeat for other injectors, collect sprayed fuel.

The injector orifice may become wet, but not more than two drops should form per minute on the nozzle. If no leaks have been determined, change the pressure regulator. Press 'Pump' switch and check visually for leaks.

### TEST 6 - CHECK COLD START INJECTOR AND THERMOTIME SWITCH - COOLANT TEMPERATURE ABOVE RATED VALUE OF SENSOR

PROCEDURE	CORRECT FUNCTION	POSSIBLE FAULTS AND REMEDIES
Press and hold 'Pump' switch, operate starter for one second with switch 1 at 'Fuel Check 1'	Very small or no pressure drop.	Pressure continues to fall: Thermotime switch faulty - replace.
Join connection 'W' of thermotime switch cable to ground. Operate starter for one second with switch 1 at 'Fuel Check 1'	Injector valve injects, pressure drops after engine has stopped.	Pressure does not drop: Check cables from starter relay (terminal C4) to terminal 86 (cold start relay), from thermotime switch (G or W) to terminal 85 (cold start relay), from terminal 87 (pump relay) to terminal 30 of cold start relay. Also check cables from terminal 87 (pump relay) to cold start injectors and from injectors to ground. If cables and connections satisfactory, check cold start injectors. Resistance value of winding in cold start coils is 4.2 ohms at 20°C.

### TEST 7 - CHECK COLD START INJECTOR AND THERMOTIME SWITCH - COOLANT TEMPERATURE BELOW RATED VALUE OF SENSOR

#### PROCEDURE

Press 'Pump' switch, operate starter for one second with Switch 1 at 'Fuel Check 1'

#### CORRECT FUNCTION

Pressure drops slowly

#### POSSIBLE FAULTS AND REMEDIES

Pressure does not drop: Replace thermotime switch or test cold start injector as described in test 6.

### TEST 8 - CREATE VACUUM IN PRESSURE SENSOR - SWITCH 1 AT 'RUN ENGINE' - RECONNECT L.T. LEAD AT IGNITION COIL

- 1 Reconnect vehicle in-line connector to power amplifier.
- 2 Switch off ignition and connect 25-way multi-plug from 'EPITEST' (harness plug attached) to ECU.
- 3 Connect vacuum gauge (no longer required to check fuel pressure).
- \*4 Start and run engine at 3,000 to 4,000 rev/min.
- \*5 Release throttle, and very quickly, before engine revs. drop, clamp pipe from pressure sensor between sensor and 'T' piece of balance pipes.

#### VACUUM GAUGE READING

##### CORRECT

##### INCORRECT

16 in Hg (400 mm Hg) with pipes clamped

Below 16 in Hg (400 mm Hg)

High, but cannot be maintained when pipe clamped.

#### POSSIBLE FAULTS AND REMEDIES

Repeat operations 1 to 5. If still unsatisfactory, check that gauge will read high vacuum without clamping when throttle quickly released from high revs. If still not possible to obtain high reading, check engine valve clearances, air leaks, etc.

Pressure sensor suspect or clamping operation not satisfactory (too late or leaking). If in doubt, test sensor with pump\* to pull sufficient vacuum.

\*If vacuum pump available, disconnect sensor feed pipe at sensor. Connect pump to sensor and pull approximately 16 in Hg (400 mm Hg).

### TEST 9 - CHECK MECHANICAL OPERATION OF PRESSURE SENSOR - SWITCH 1 AT 'PRESSURE SIGNAL' - ENGINE WILL STOP

#### METER READING

##### CORRECT

##### INCORRECT

Swings between 2-4 and 12-14 on volts scale

Irregular swing  
Final reading below 14

#### POSSIBLE FAULTS AND REMEDIES

Pressure sensor faulty - replace.

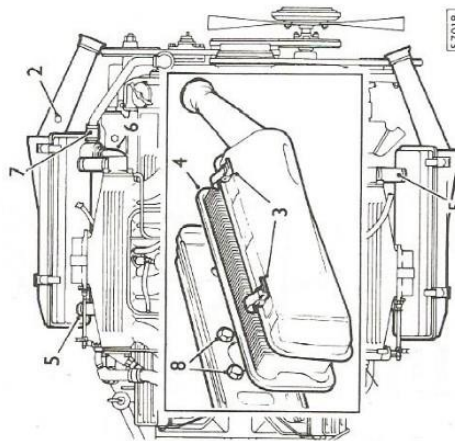
Check battery voltage (see 'EPITEST' diagnostic test Part A, Switch II position 'Volts 1' and 'Volts 2').

## AIR CLEANER

### Remove and refit—Left-hand 19.10.01

#### Removing

- 1 Disconnect battery, see 86.15.20.
- 2 Pull electrical connector from air temperature sensor.
- 3 Release two toggle clips securing air cleaner cover and pull cover from backplate.
- 4 Remove air cleaner element.
- 5 Release hose clip and remove auxiliary air valve hose from backplate.
- 6 Disconnect P.C.V. to auxiliary air valve feed pipe hose at P.C.V. valve.
- 7 Release hose clip and disconnect crankcase breather hose at P.C.V. valve.



- 8 Remove four setscrews and washers securing air cleaner backplate to throttle housing.
- 9 Remove air cleaner backplate complete with overrun valve hose from throttle housing.
- 10 Remove and discard gasket and overrun valve hose from rear of backplate.

#### Refitting

**NOTE:** If necessary transfer components to replacement air cleaner cover and backplate.

- 11 Fit new overrun valve hose to rear of backplate and secure using new hose clip.

12 Locate new gasket to throttle housing using suitable sealing compound.

13 Fit air cleaner backplate to throttle housing locating overrun valve hose to valve and auxiliary air valve hose to backplate. Secure using new hose clip.

14 Reconnect P.C.V. to auxiliary air valve feed pipe hose at P.C.V. valve.

15 Secure air cleaner backplate to throttle housing using four setscrews, and spring washers.

16 Reconnect crankcase breather hose at P.C.V. valve. Secure using new hose clip.

17 Ensure air cleaner element seal in good condition and locate air cleaner element.

**NOTE:** Ensure element correctly orientated with metal plate opposite throttle housing.

18 Locate air cleaner cover and secure two toggle clips.

19 Fit electrical connector to air temperature sensor.

20 Reconnect battery.

## AIR CLEANER

### Remove and refit — Right-hand 19.10.02

#### Removing

1 Release two toggle clips securing air cleaner cover and pull cover from backplate.

2 Remove air cleaner element.

3 Remove four setscrews and washers securing air cleaner backplate to throttle housing.

4 Remove air cleaner backplate complete with overrun valve hose from throttle housing.

5 Remove and discard gasket and overrun valve hose from rear of backplate.

#### Refitting

6 Fit new overrun valve hose to rear of backplate and secure using new hose clip.

7 Locate new gasket to throttle housing using suitable sealing compound.

8 Fit air cleaner backplate to throttle housing locating overrun valve hose to valve.

9 Secure air cleaner backplate to throttle housing using four setscrews and spring washers.

10 Ensure air cleaner element seal in good condition and locate air cleaner element.

**NOTE:** Ensure element correctly orientated with metal plate opposite throttle housing.

11 Locate air cleaner cover and secure two toggle clips.

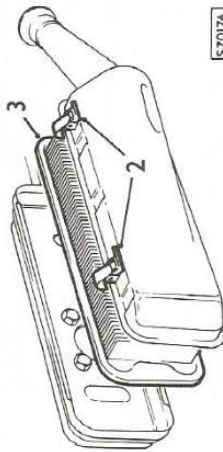
## AIR CLEANERS

### Renew element 19.10.08

1 Disconnect battery, see 86.15.20.

2 Pull electrical connector from air temperature sensor — left-hand air cleaner only.

3 Release two toggle clips securing air cleaner cover and pull cover from backplate.



4 Remove and discard air cleaner element.

5 Ensure seal on new air cleaner element in good condition and locate air cleaner element.

**NOTE:** Ensure element correctly orientated with metal plate opposite throttle housing.

6 Locate air cleaner cover and secure two toggle clips.

7 Fit electrical connector to air temperature sensor — left-hand air cleaner only.

8 Reconnect battery.

## THROTTLE PEDAL

### Remove and refit — Left-hand drive 19.20.01

#### Removing

1 Remove and discard split pin securing throttle cable to throttle pedal.

2 Pull off sleeve and disconnect throttle cable.

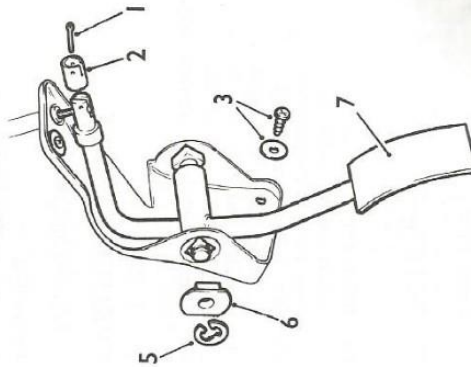
3 Remove two screws securing throttle pedal assembly to bulkhead.

4 Remove throttle pedal assembly.

5 Remove two circlips securing nylon bushes to throttle pedal bracket.

6 Turn nylon bushes through 45° and remove from throttle pedal bracket.

7 Remove pedal from bracket.



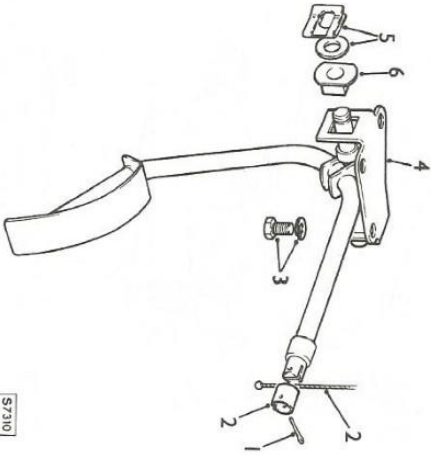
#### Refitting

Reverse operations 1 to 7.

## THROTTLE PEDAL

Remove and refit — Right-hand drive 19.20.01

- Removing**
- 1 Remove and discard split pin securing throttle cable to throttle pedal.
  - 2 Disconnect throttle cable from throttle pedal.
  - 3 Remove three bolts and spring washers securing throttle pedal assembly to bulkhead.
  - 4 Remove throttle pedal assembly.
  - 5 Remove spring clip and plain washer securing nylon bush to throttle pedal bracket.
  - 6 Turn nylon bushes through 45° and remove from throttle pedal bracket.
  - 7 Remove pedal from bracket.



- 4 Rotate throttle pulley and release throttle cable nipple.
- 5 Disconnect multi-pin connector from throttle switch.
- 6 Remove four nuts and spring washers securing platform to pedestal, remove platform from pedestal.
- 7 Remove two taprite screws securing switch operating rod to throttle pulley, remove rod.
- 8 Remove circlip and spring washer securing throttle pulley to platform, remove pulley.
- 9 Remove two bushes from throttle pulley bore.
- 10 Remove and discard return spring.
- 11 Remove ball pins.
- 12 Clean all parts in clean petrol and inspect for wear.

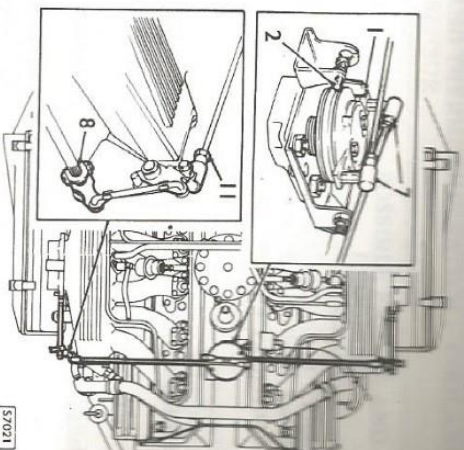
## THROTTLE LINKAGE

Check and adjust 19.20.05

- Check**
- 1 Ensure throttle return springs correctly secured and that throttle pulley moves freely, resting against closed stop when released.
  - 2 Ensure that throttle butterfly closed stop screw has not been moved. If signs of tampering are present, check, and if necessary, adjust.
  - 3 Ensure that throttle pulley can be rotated to touch fully open stop and that throttle butterfly valve stop arm is touching throttle housing.
  - 4 If conditions of operations 1, 2 and 3 are not satisfied, proceed with operation 5 — Adjust.

### Adjust

- 5 If throttle butterfly closed stop has been moved, adjust stop.
- 6 Check for worn pivots, damaged rods or linkage and trace of any stiffness. Renew items as necessary.
- 7 Release throttle cross-rods from throttle pulley.
- 8 Slacken clamps securing levers to rear of throttle shafts.
- 9 With butterfly valve against closed stop, bellcrank against stop, and play in coupling taken up in opening direction, tighten clamp to lock lever to throttle shaft.
- 10 Repeat for other side of engine.
- 11 Offer cross-rods to ball connectors on pulley; rods must locate without moving pulley or linkage. If adjustment is necessary, continue with operations 11 and 12. If adjustment is not necessary, continue with operation 13.
- 12 Slacken locknuts on cross-rods and adjust length of rods to locate pulley ball connector while bellcrank against closed stop.
- 13 Tighten locknuts and ensure ball joints remain free.
- 14 Slacken locknut on throttle pulley, fully open stop and wind back adjustment screw.



- 14 Hold throttle pulley fully open and ensure that both throttle butterfly stop arms are against throttle housing.
- 15 Set fully open stop to just touch throttle pulley and tighten locknut.
- 16 Check operation of throttle switch, see 19.22.37.
- 17 Check kickdown switch adjustment, see 44.30.12.

## THROTTLE CABLE

Remove and refit 19.20.06

- Removing**
- 1 Disconnect battery, see 86.15.20.
  - 2 Remove and discard split pin securing throttle cable to throttle pedal, pull off sleeve and release cable from pedal.
  - 3 Slacken locknut and disconnect throttle cable from pulley.
  - 4 Disconnect cable assembly from bulkhead tube. Pull cable through to engine compartment.
- NOTE:** On right-hand drive cars the cable is secured to the bulkhead by a nut above the driver's footwell.
- 5 Disconnect electrical connectors from kickdown switch.
  - 6 Release cable from pedestal.
  - 7 Slacken throttle cable locknut at pedestal bracket, remove throttle cable assembly.

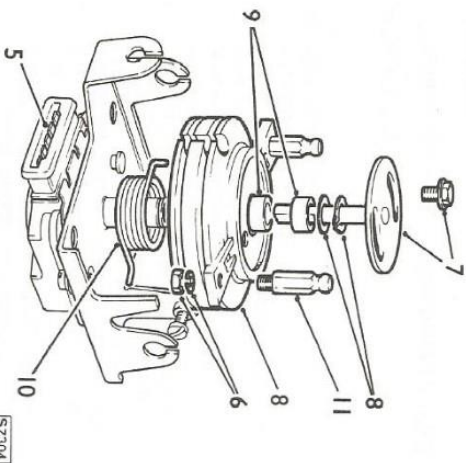
### Refitting

Reverse operations 1 to 7.

## THROTTLE PEDESTAL

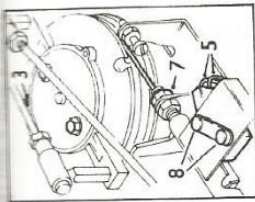
Overhaul 19.20.03

- Dismantling**
- 1 Disconnect battery, see 86.15.20.
  - 2 Disconnect throttle push rods from throttle pulley.
  - 3 Remove nut securing throttle cable to pedestal bracket.



### Refitting

- 13 Reverse operations 2 to 11.
- 14 Check throttle linkage adjustment, see 19.20.05.
- 15 Check throttle switch, see 19.22.35.
- 16 Connect battery.

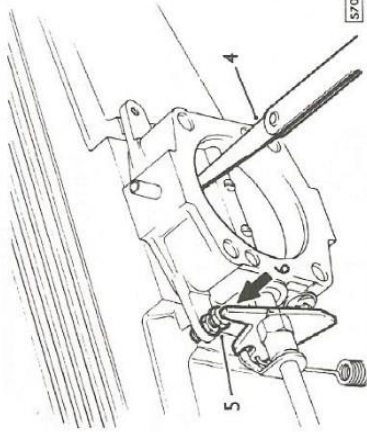


- Remove two screws securing kickdown switch to mounting plate, remove clamping plates and switch.

#### Refitting

- Examine bulkhead grommet for damage, renew as necessary. Fit grommet to cable.
- Reverse operations 2 to 8, apply suitable sealing compound around cable and grommet at bulkhead (right-hand drive cars).
- Check throttle linkage adjustment, see 19.20.05.
- Check kickdown switch adjustment, see 44.30.12.
- Re-connect battery.

- Adjust stop screw to just touch stop arm and tighten locknut with feeler in position.
- Press stop arm against stop screw and withdraw feeler.



- Repeat on other side of engine.
- Seal threads of adjusting screws and locknuts using a blob of paint.
- Refit air-cleaners.
- Check throttle linkage adjustment, see 19.20.25.
- Check operation of throttle switch, see 19.22.37.
- Check kickdown switch adjustment, see 44.30.12.

### AUXILIARY AIR VALVE

Remove and refit

19.20.16

#### Removing

**CAUTION:** This procedure MUST ONLY be carried out on a cold or cool engine.

- Carefully remove pressure cap from remote header tank to release any cooling system residual pressure. Replace cap tightly.
- Slacken hose clip securing air balance pipe to auxiliary air valve and crankcase breather pipe.
- Slacken hose clip securing manifold bleed pipe to auxiliary air valve.
- Release air balance pipe from auxiliary air valve, manifold bleed pipe and crankcase breather pipe.

### THROTTLE BUTTERFLY VALVE

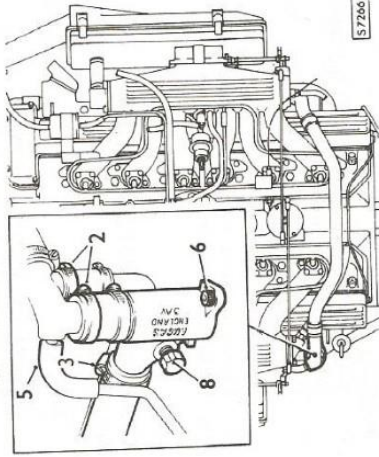
Adjust - Both

19.20.11

**CAUTION:** Any adjustment must be carried out on both butterfly valves. It is NOT permitted to adjust one valve only.

- Remove both air cleaners, see 19.10.01/02.
- Slacken locknut on throttle butterfly stop screw. Wind back screw.
- Ensure throttle butterfly valve closes fully.
- Insert a 0.002 in (0.05 mm) feeler gauge between top of valve and housing to hold valve open.

- Slacken hose clip securing air cleaner pipe to auxiliary air valve, disconnect pipe.
- Remove two screws and washers securing auxiliary air valve to coolant pipe, lift valve clear.
- Clean all traces of gasket from coolant pipe, taking care not to damage seating area.
- Scribe a line on idle speed adjusting screws and note number of turns required to screw fully in.



#### Refitting

- Set idle speed adjustment screw of replacement valve to the number 8. Turns open as noted in operation 8.
- Locate valve, orientated correctly, secure using two screws and washers.
- Reverse operations 2 to 5.
- Check coolant level at remote header tank, if necessary top up.
- Check, if necessary adjust idle speed, see 19.20.18.

### AUXILIARY AIR VALVE

Test

19.20.17

- Remove left-hand air cleaner element, see 19.10.01.
- Fully close idle speed adjustment screw.
- With engine at normal running temperature, blocking auxiliary air valve inlet should NOT affect idling speed. If idle speed affected, continue with operations 5 to 11. If idle speed is not affected continue with operation 4.

- Reset idle speed, replace air cleaner element.
- Remove auxiliary air valve, see 19.20.16.
- Fully close idle speed adjustment screw.
- Immerse auxiliary air valve bulb in a container of boiling water and observe valve head through side port. Valve should move smoothly to closed position.
- Quickly blow through side port; no air should pass.
- Allow valve bulb to cool. Valve head should move smoothly back to open main air passage.
- If valve performance is satisfactory reset idle speed adjustment screw and refit valve.
- If valve performance is not satisfactory, fit replacement component.

### IDLE SPEED

Adjust

19.20.18

- Ensure engine is at normal operating temperature.
  - Check throttle linkage for correct operation, check that return springs are secure and effective.
  - Start engine, run for two to three minutes.
  - Set idle speed adjustment screw to achieve 750 rev/min.
- NOTE:** If it proves impossible to reduce idle speed to specified level proceed as detailed in operations 5 to 9.

- Check ALL pipes and hoses to inlet manifolds for security and condition.
- Check security of injectors and cold start injectors.
- Ensure that all joints are tight and that inlet manifold to cylinder head fastenings are tight.
- Ensure that both throttle butterfly closed stops show no signs of tampering; if they do, adjust throttle butterfly valves, see 19.20.11.
- Check operation of overrun valve, see 19.20.21.
- If operations 5 to 9 do not reduce idle speed, check operation of auxiliary air valve, see 19.20.17.

