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★ **NEW INFORMATION** since last filming

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## Cautions and warnings

### WARNING

- A/C system is filled with R12 refrigerant gas which is under pressure.
- always be careful that refrigerant does not come in contact with your skin
- always wear eye protection when working around the system
- if liquid refrigerant has come in contact with your skin or eyes:
  - do not rub skin or eyes
  - immediately flush with cool water
  - rush to a doctor or hospital
  - do not attempt to treat yourself
- keep refrigerant containers stored below 50°C (122°F) and never drop from high places
- keep refrigerant away from open flames because poisonous gas will be produced if it burns
- electric welding near refrigerant hoses causes refrigerant to decompose from ultraviolet light. Discharge system before electric welding, see A/C refrigerant system discharging procedure
- do not steam clean condensers or evaporators. Use only cold water or compressed air
- automotive refrigerant containing CFC's is hazardous to the earth's atmosphere. To protect our environment, use an Underwriter's Laboratory (UL) approved refrigerant recovery/recycling unit such as **Kent-Moore ACR<sup>3</sup>**, or equivalent, whenever discharging an A/C system

### CAUTION

Refrigerant system has no sight glass. System must not be topped up.

If low refrigerant charge is suspected, system must be completely discharged, evacuated and recharged with 1050 g + 20 g (37.0 oz + 0.7 oz) of R12 refrigerant.

## Refrigerant system components, repairing/replacing

### WARNING

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- discharge refrigerant system, see A/C refrigerant system discharging procedure
- remove defective component

### Note

Replacement A/C compressors, evaporators and condensers are filled with R12 refrigerant during manufacture. If no gas escapes when these parts are first opened, the component is possibly defective.

- add refrigerant oil to new component

Add the following amount of refrigerant oil when replacing these components:

|                  |               |
|------------------|---------------|
| evaporator       | 20cc (1.0 oz) |
| condenser        | 10cc (0.5 oz) |
| refrigerant line | 10cc (0.5 oz) |
| refrigerant hose | 10cc (0.5 oz) |

- replace A/C restrictor
- evacuate and recharge A/C refrigerant system

Use A/C refrigerant oil that meets the specifications of the following oils:

|              |                     |
|--------------|---------------------|
| Shell        | Clavus G100         |
| Sunil        | Suniso 5 GS         |
| Texaco (DEA) | Triton WF 100       |
| Idemitsu     | Nippondenso Oil 6 G |
| Fuchs        | Reniso Kes 100      |

Replacement A/C compressors supplied by the Parts Department are filled with 80cc (2.70 oz.) of A/C refrigerant oil.

## Refrigerant system, discharging

### Note

Follow safety precautions on page 87.2 when discharging or charging A/C refrigerant system.

### WARNING

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### WARNING

The A/C system should be serviced only by trained personnel familiar with:

- equipment use
- related safety procedures
- regulations governing the discharging/handling/disposal of automotive refrigerants.

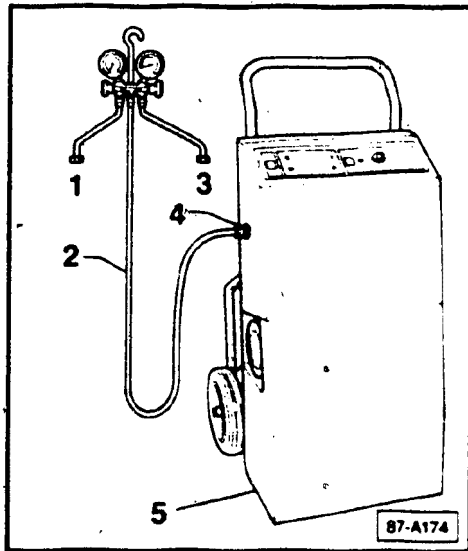
### WARNING

Always wear safety goggles when charging or discharging system. Be sure work area is well ventilated.

Avoid inhaling fumes when using flame type leak detector. Refrigerant-12 becomes poisonous gas after coming into contact with open flame.

## CAUTION

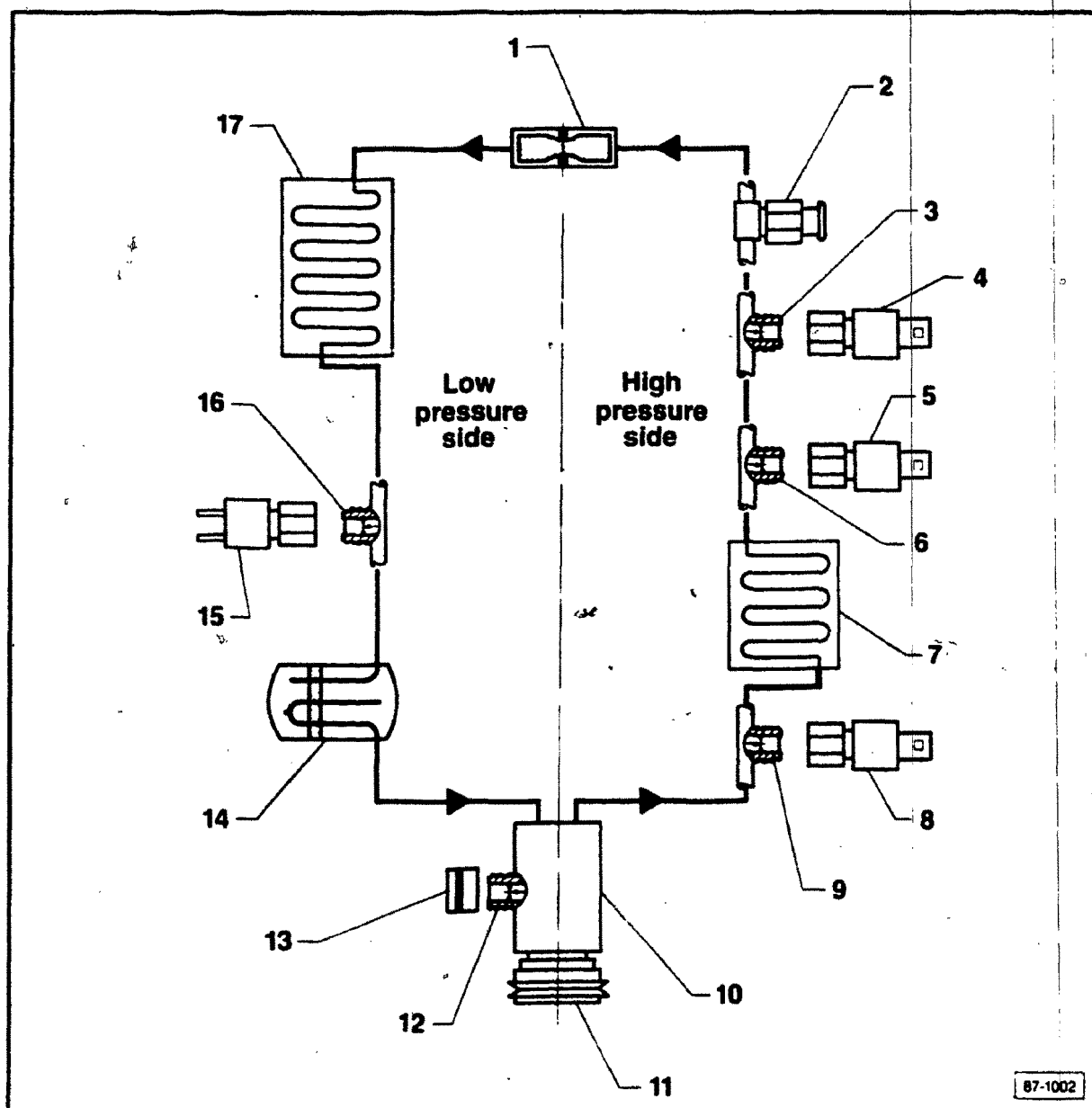
Always follow manufacturer's instructions when using a refrigerant recovery/recycling unit.



- close both valves on A/C manifold gauge set
- connect manifold gauge low pressure hose 1 to A/C low pressure service valve on vehicle
- remove A/C Refrigerant High Pressure Switch (identified by red housing) and connect hose 3 from high pressure gauge to high pressure service valve
- connect manifold gauge hose 2 to inlet connection 4 on refrigerant recovery/recycling unit 5
- following refrigerant recovery/recycling unit manufacturer's instructions, discharge A/C system into refrigerant recovery/recycling unit
- close manifold gauge valves when refrigerant is fully discharged

**THIS FRAME INTENTIONALLY LEFT**

**BLANK**



**1 — Restrictor**

- removing: Fig. 4
- O-ring: 9.3 mm inside diameter  
1.8 mm thickness

**2 — Safety valve**

- O-ring: 9.3 mm inside diameter  
1.8 mm thickness
- torque: 10.0 Nm (7.5 ft lb)

**3 — High pressure valve**

**4 — A/C refrigerant high pressure switch**

- housing color: yellow or green
- operating pressures:  
closes: 13.1-17.5 bar (189.9-253.7 psi)  
opens: 10.6-15.0 bar (153.7-217.5 psi)
- O-ring: 9.3 mm inside diameter  
1.8 mm thickness
- torque: 10.0 Nm (7.5 ft lb)

## 5 — A/C high pressure cut-out switch (5-cylinder motor)

- red housing
- opens: 28.2 bar-31.0 bar  
(408.9 psi-449.5 psi)
- closes: 10.3 bar-17.3 bar  
(149.3 psi-253.7 psi)
- O-ring: 9.3 mm inside diameter  
1.8 mm thickness
- torque: 10 Nm (7.5 ft lb)

## 6 — High pressure service valve (5-cylinder motor)

- for A/C refrigerant high pressure switch
- for charging and discharging A/C refrigerant system

## 7 — Condenser

- O-ring: inlet: 14.0 mm inside diameter  
1.8 mm thickness
- O-ring: outlet: 7.5 mm inside diameter  
1.8 mm thickness
- torque on inlet: 26.5 Nm (19.5 ft lb)
- torque on outlet: 16.5 Nm (12.0 ft lb)

### Note

When removing condensers on vehicles with 5-cylinder motors, first unbolt A/C refrigerant line from evaporator to condenser.

## 8 — A/C high pressure cut-out switch (4-cylinder motor)

## 9 — High pressure service valve (4-cylinder motor)

- for A/C refrigerant high pressure switch
- for charging and discharging A/C system

## 10 — A/C compressor

- O-ring seal on low pressure connection:  
17.2 mm inside diameter  
1.8 mm thickness
- O-ring seal on high pressure connection:  
14.0 mm inside diameter  
1.8 mm thickness
- torque on low pressure connection  
42 Nm (31.0 lb ft)
- torque on high pressure connection  
26.5 Nm (19.5 lb ft)

## 11 — A/C compressor clutch

## 12 — Low pressure service valve for charging and discharging A/C refrigerant system

## 13 — Cap

## 14 — Accumulator

- O-ring: inlet: 17.2 mm inside diameter  
1.8 mm thickness  
outlet: 17.2 mm inside diameter  
1.8 mm thickness
- torque: inlet: 42.0 Nm (31.8 ft lb)  
outlet: 42.0 Nm (31.8 ft lb)

## 15 — A/C refrigerant low pressure switch

- operating pressures:  
opens: 1.45-1.6 bar  
(21.0 psi-23.2 psi)  
closes: 2.9-3.2 bar  
(42.0 psi-46.4 psi)
- O-ring: 9.3 mm inside diameter  
1.8 mm thickness
- torque: 5.5 Nm (4.0 ft lb)

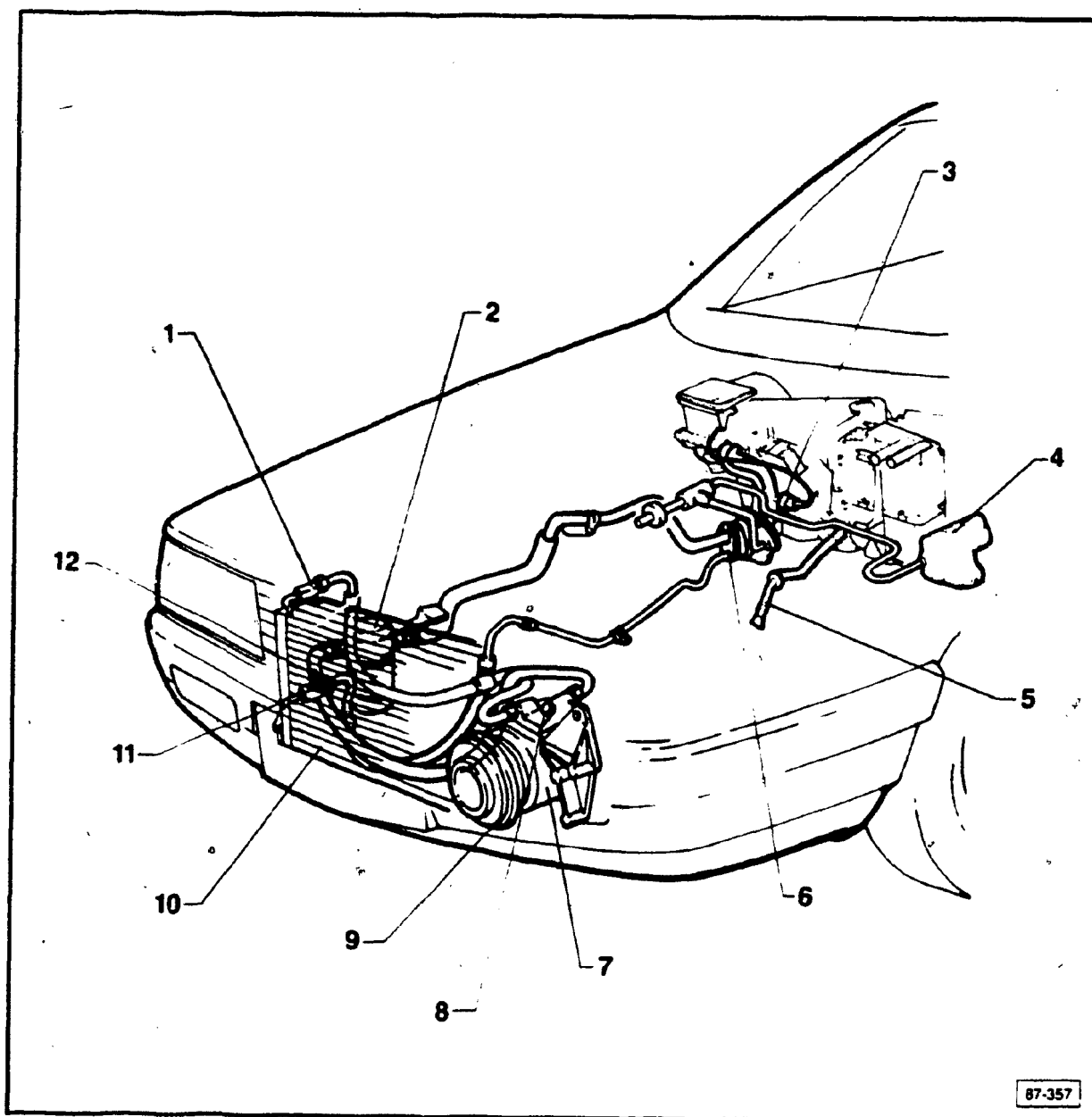
## 16 — Low pressure valve

## 17 — Evaporator

- refrigerant lines removing/installing, Fig. 3
- O-ring: inlet: 10.8 mm inside diameter  
1.8 mm thickness  
outlet: 17.2 mm inside diameter  
1.8 mm thickness
- torque: 16 Nm (11.8 ft lb)

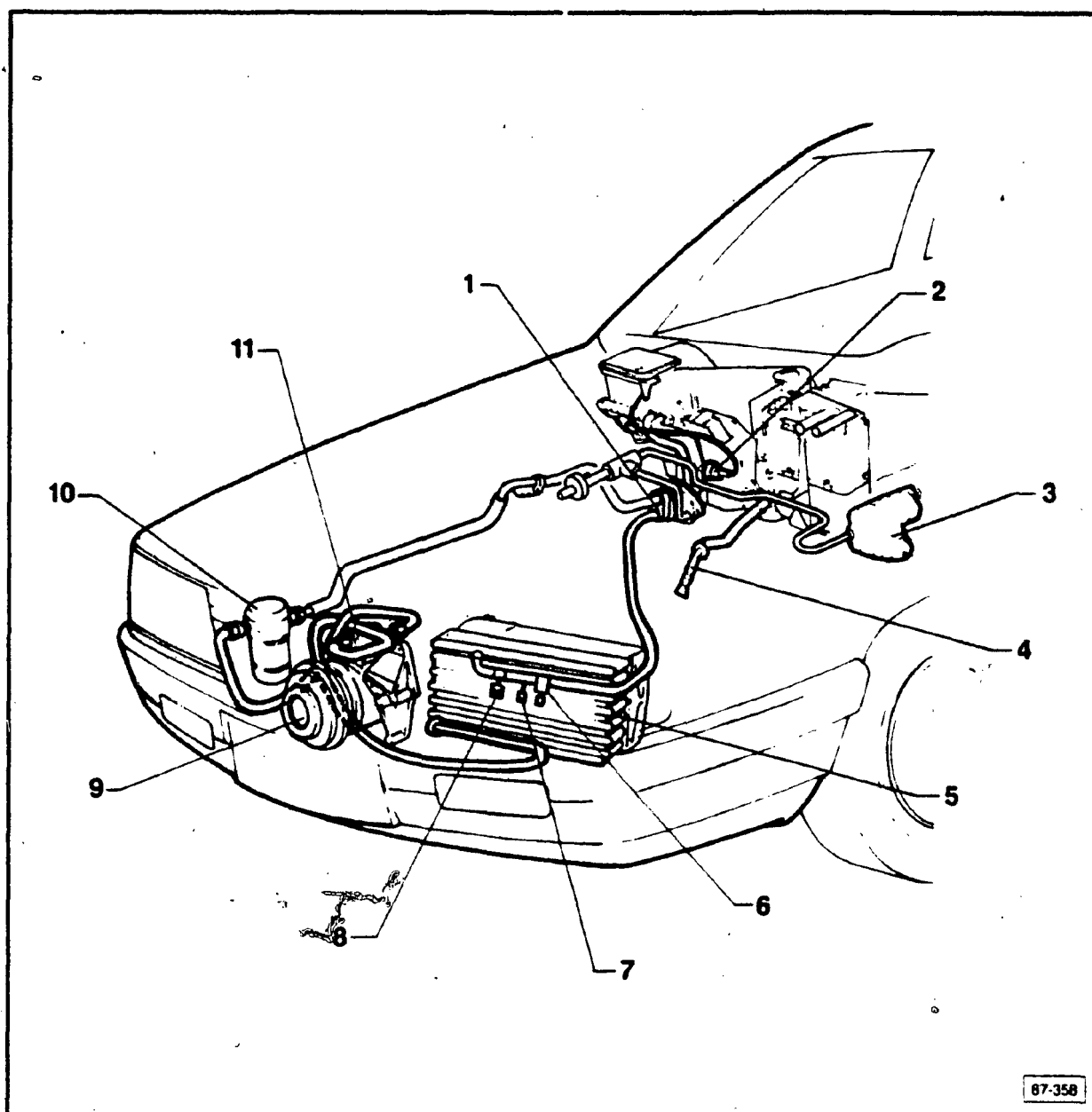
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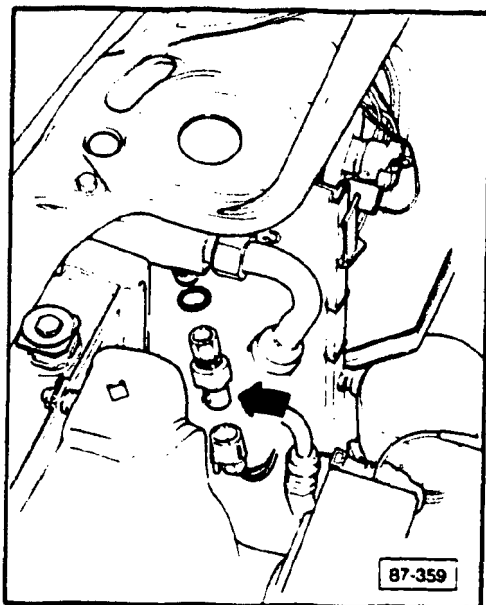
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- |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 — A/C high pressure cut-out switch<br/>removing-installing. Fig 1</p> <p>2 — Accumulator</p> <p>3 — A/C refrigerant low pressure switch<br/>removing installing. Fig 5</p> <p>4 — Vacuum reservoir<br/>vacuum system layout. see Index<br/>vacuum system. checking. see Index</p> <p>5 — Water drain hose<br/>checking. Fig. 6<br/>removing installing. see Index</p> <p>6 — Restrictor<br/>Fig. 13</p> | <p>7 — A/C compressor<br/>high pressure relief valve Fig 15<br/>V-belt tension Fig 8<br/>removing-installing. see Index</p> <p>8 — Low pressure service valve</p> <p>9 — A/C compressor clutch<br/>repairing. see Index</p> <p>10 — Condenser</p> <p>11 — A/C refrigerant high pressure switch<br/>removing installing. Fig 3</p> <p>12 — A/C refrigerant safety switch<br/>see Fig. 15</p> |
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- |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 — Restrictor<br/>Fig. 13</p> <p>2 — A/C refrigerant low pressure switch<br/>removing/installing, Fig. 5</p> <p>3 — Vacuum reservoir<br/>vacuum hose layout, see Index<br/>vacuum system checking, see Index</p> <p>4 — Water drain hose<br/>removing/installing, Fig. 7</p> <p>5 — Condenser</p> <p>6 — A/C refrigerant safety switch</p> | <p>7 — A/C refrigerant high pressure switch<br/>removing/installing, Fig. 4</p> <p>8 — A/C high pressure cut-out switch<br/>removing/installing, Fig. 2</p> <p>9 — A/C compressor and clutch<br/>V-belt tension, Fig. 9<br/>removing/installing, see Index<br/>repairing, see Index</p> <p>10 — Accumulator</p> <p>11 — Low pressure service valve</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



► **Fig. 1 A/C high pressure cut-out switch (4-cylinder engine)**

Switch is identified by red housing (arrow).

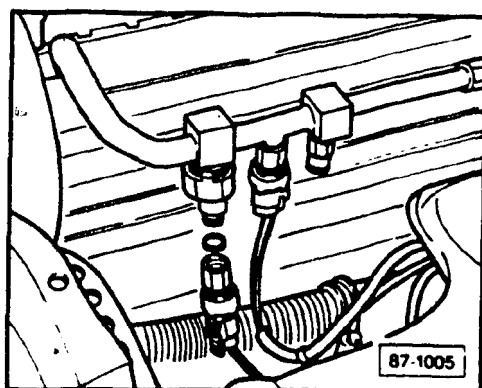
Switches A/C compressor clutch **OFF** when refrigerant pressure goes too high.

**Note**

This switch can be removed without discharging the A/C refrigerant system.

Tightening torque:

- 10 N·m (7.5 ft lb)



► **Fig. 2 A/C high pressure cut-out switch (5-cylinder engine)**

Switch is identified by red housing.

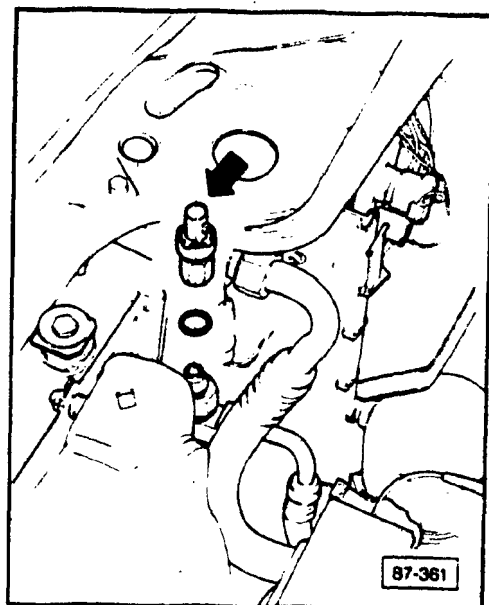
Switches A/C compressor clutch **OFF** when refrigerant pressure goes too high.

**Note**

This switch can be removed without discharging the A/C refrigerant system.

Tightening torque:

- 10 Nm (7.5 ft lb)



► **Fig. 3 A/C refrigerant high pressure switch (4-cylinder engine)**

Switch has yellow housing or green housing with welded connections (arrow).

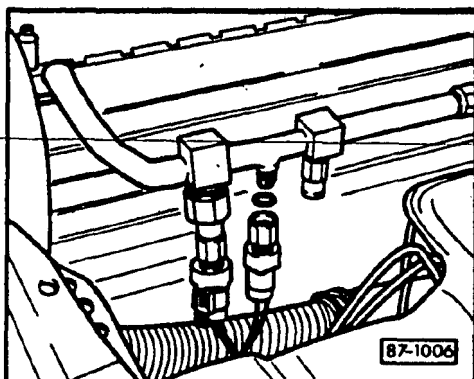
Switches radiator cooling fan to 2nd stage when refrigerant pressure reaches specified level.

**Note**

This switch can be removed without discharging the A/C refrigerant system.

Tightening torque:

- 10 Nm (7.5 ft lb)



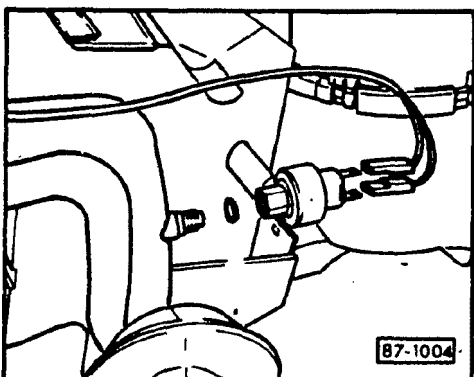
► **Fig. 4 A/C refrigerant high pressure switch (5-cylinder engine)**

Switch has yellow housing or green housing with welded connections.

Switches radiator cooling fan to 2nd stage when refrigerant pressure reaches specified level.

### Note

This switch can be removed without discharging the A/C refrigerant system.



► **Fig. 5 A/C refrigerant low pressure switch**

Switch controls evaporator temperature by cycling A/C compressor clutch **ON** and **OFF**.

Switch also turns A/C compressor clutch **OFF** when refrigerant pressure is too low.

### Installation location

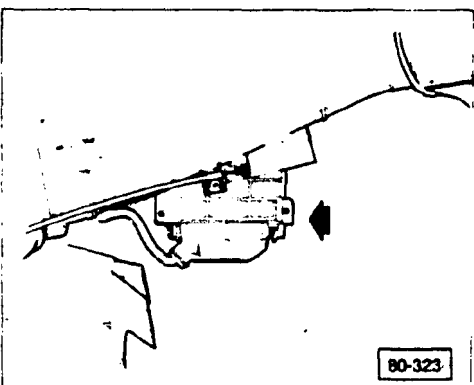
On passenger side of vehicle between evaporator housing and firewall.

### Note

This switch can be removed without discharging the A/C refrigerant system.

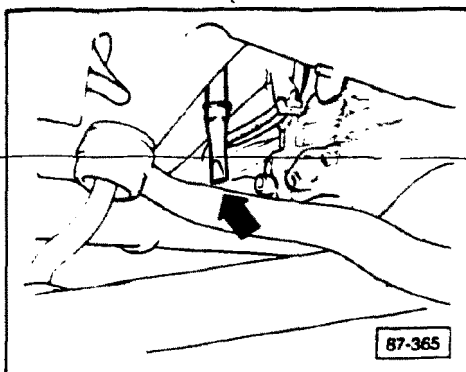
### Removing

- remove close-out panel under glove compartment
- remove fuel injection control unit (arrow)
- remove A/C refrigerant low pressure switch



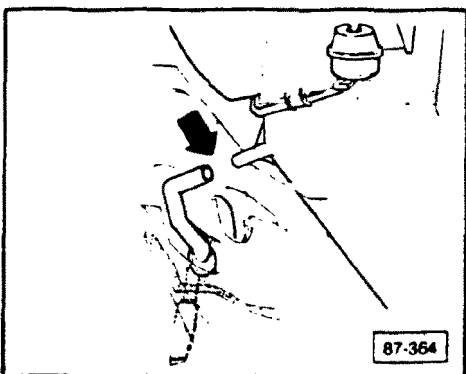
### CAUTION

Wear protective glasses and gloves when removing the A/C refrigerant low pressure switch.



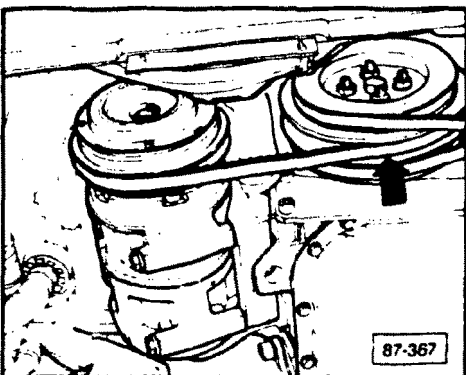
► Fig. 6 Water drain valve

Located in right hand side of engine compartment next to transmission housing (arrow).



► Fig. 7 Water drain valve, installing

- lubricate hose connection lightly with Vaseline
- push water drain hose on connection to stop (arrow)



► Fig. 8 A/C compressor V-belt (4-cylinder engine)

V-belt is properly tensioned when it can be pushed in approximately 5mm (5/16 in.) at center.

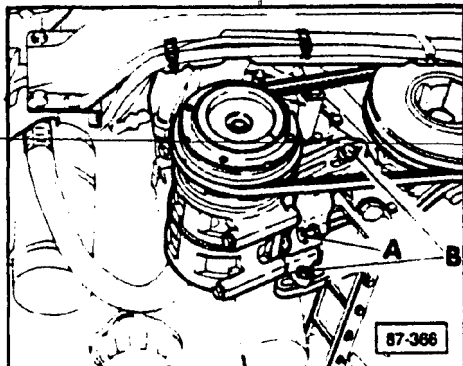
The V-belt tension is adjusted by adding or subtracting shims between the crankshaft pulley halves (arrow).

Store unused shims on front half of crankshaft pulley between pulley and tightening bolts.

## Note

When adjusting V-belt, tighten crankshaft pulley bolts alternately while turning crankshaft.

Tightening torque: 22 Nm (16.2 ft lb)



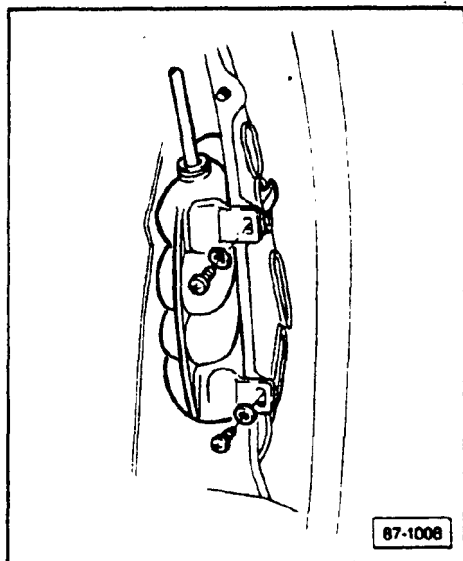
► **Fig. 9 A/C compressor V-belt (5-cylinder engine)**

V-belt is properly tensioned when it can be pushed in approximately 5mm (5.16 in.) at center.

- loosen bolts **B**
- tension belt by turning bolt **A**
- tighten bolts **B**
  - 22 Nm (16.2 ft lb)
- back bolt **A** out until there is at least a 5mm gap between engine block and bolt
- lock adjusting bolt **A** in place with nut

## CAUTION

Bolt **A** is used for adjustment only. Do not leave this bolt tensioned against the engine block.



► **Fig. 10 Vacuum reservoir**

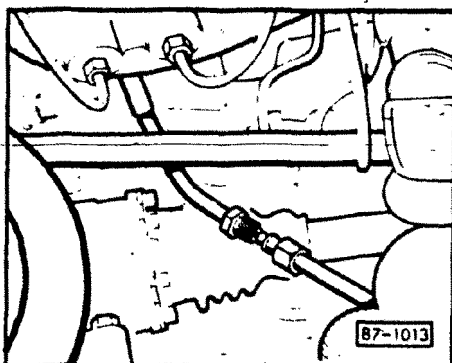
The vacuum reservoir is located in the rear of the left front wheelhouse behind the wheelhousing liner.

## Vacuum system, checking

- remove left front wheelhousing liner
- remove vacuum hose from vacuum reservoir
- connect vacuum pump to vacuum hose
- apply 300mbar (8.8 Hg) vacuum to system
  - reading should not drop more than 10% in two minutes

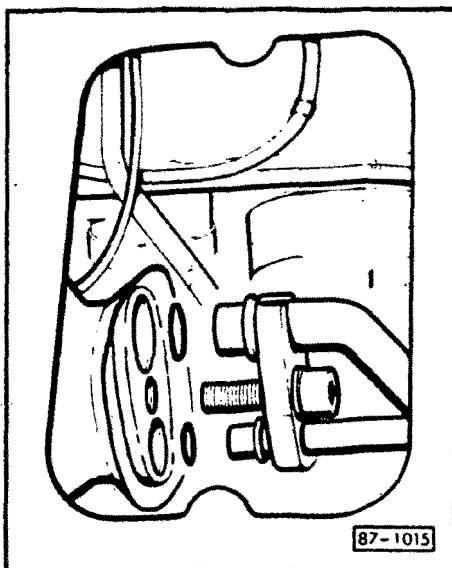
If system will not maintain vacuum,

- check vacuum hoses and components for leaks
- repair as necessary



► **Fig. 11 Connection in refrigerant high pressure line (5-cylinder engine only)**

- remove this connection before removing condenser in vehicles with 5-cylinder engines
- torque: 16.5 Nm (12.1 ft lb)

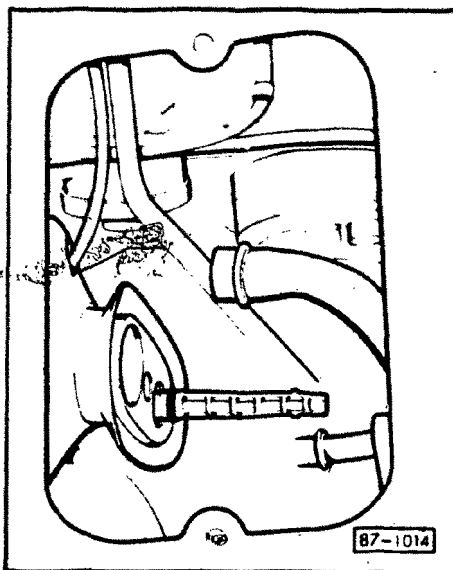


► **Fig. 12 A/C refrigerant line connection to evaporator**

**Note**

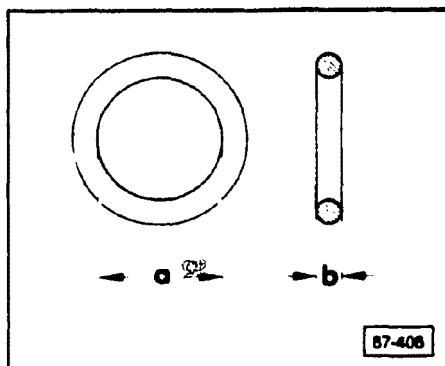
Be sure there is no tension on refrigerant lines before tightening.

- torque: 16.0 Nm (12.1 ft lb)



► **Fig. 13 Restrictor, removing/installing**

- remove refrigerant lines from evaporator
- pull restrictor from evaporator with needle nose pliers
- install restrictor with new O-ring
- install refrigerant lines
- 16.0 Nm (12.1 ft lb)



► Fig. 14 O-ring gaskets

## Note

Do not re-use O-ring gaskets.

Lubricate O-ring seals with A/C refrigerant oil before installing.

| O-ring Specifications                                                                                                                                    | a (mm) | b (mm) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| <ul style="list-style-type: none"> <li>• Compressor (low pressure side)</li> <li>• Evaporator outlet</li> <li>• Accumulator</li> </ul>                   | 17.2   | 1.8    |
| <ul style="list-style-type: none"> <li>• Compressor (high pressure side)</li> <li>• Condenser inlet</li> </ul>                                           | 14.0   | 1.8    |
| <ul style="list-style-type: none"> <li>• Evaporator inlet</li> </ul>                                                                                     | 10.8   | 1.8    |
| <ul style="list-style-type: none"> <li>• Refrigerant high pressure switch</li> <li>• Refrigerant low pressure switch</li> <li>• Safety switch</li> </ul> | 9.3    | 1.8    |
| <ul style="list-style-type: none"> <li>• Condenser outlet</li> <li>• Connection in high pressure refrigerant line (5-cylinder only)</li> </ul>           | 7.5    | 1.8    |
| <ul style="list-style-type: none"> <li>• Restrictor</li> </ul>                                                                                           | 7.5    | 1.5    |

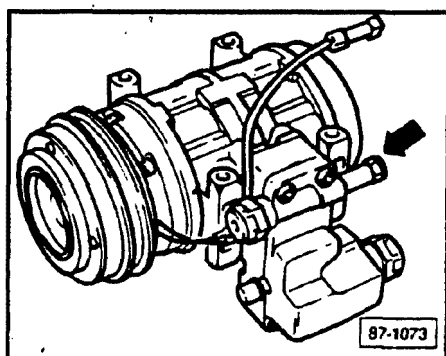


Fig. 15 A/C compressor with high pressure relief valve

Since November 1987, A/C compressors with a high pressure relief valve are being installed on Audi 80/90 vehicles with 4 cylinder motors.

With the installation of these compressors, the high pressure relief valve on the condenser has been eliminated.

## CAUTION

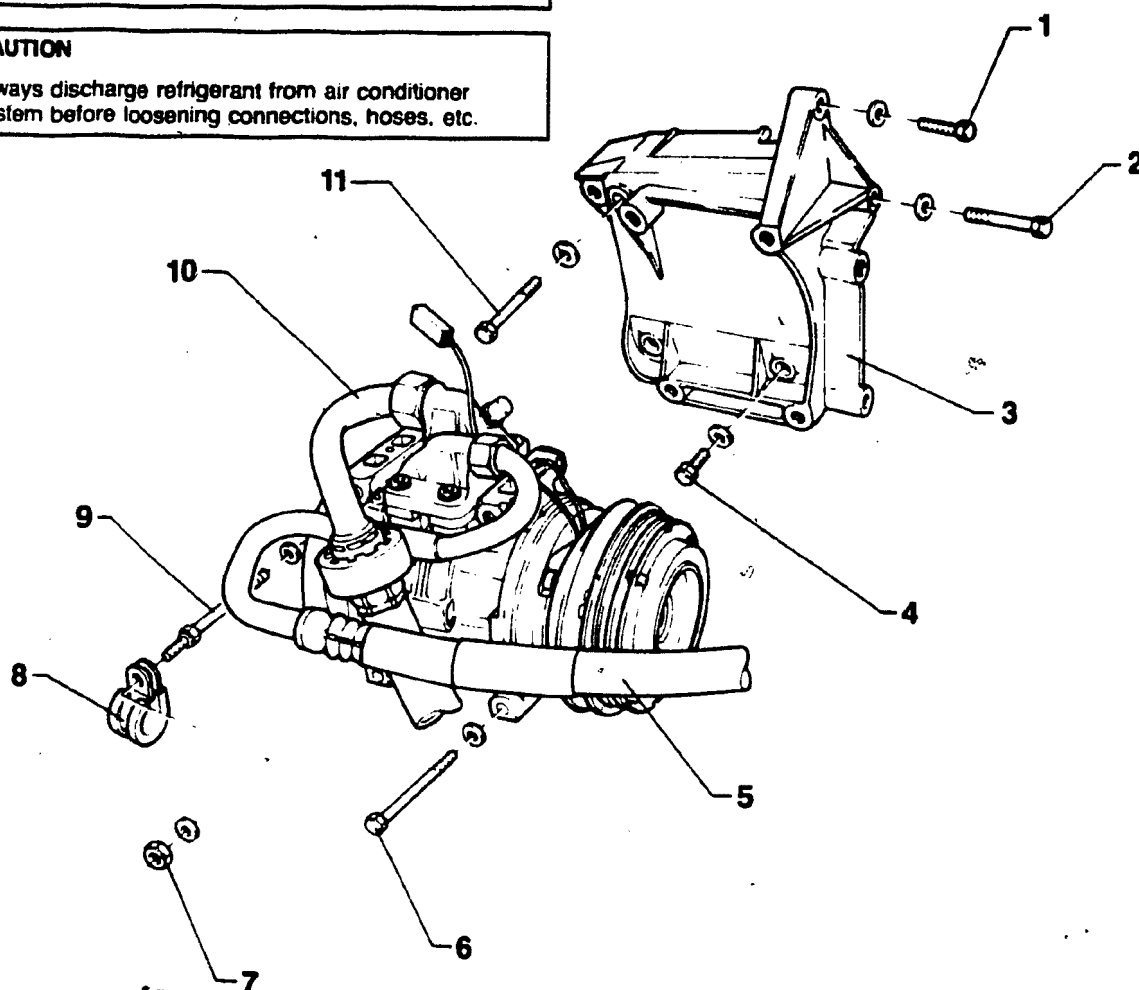
If an A/C compressor or condenser is replaced during repairs, check that at least one pressure relief valve remains in the refrigerant system.

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## CAUTION

Always discharge refrigerant from air conditioner system before loosening connections, hoses, etc.



87-1011

1 — 32 Nm (23.6 ft lb)

2 — 32 Nm (23.6 ft lb)

3 — A/C compressor bracket

4 — 32 Nm (23.6 ft lb)

5 — A/C refrigerant high pressure hose

6 — 32 Nm (23.6 ft lb)

7 — 32 Nm (23.6 ft lb)

8 — Clamp

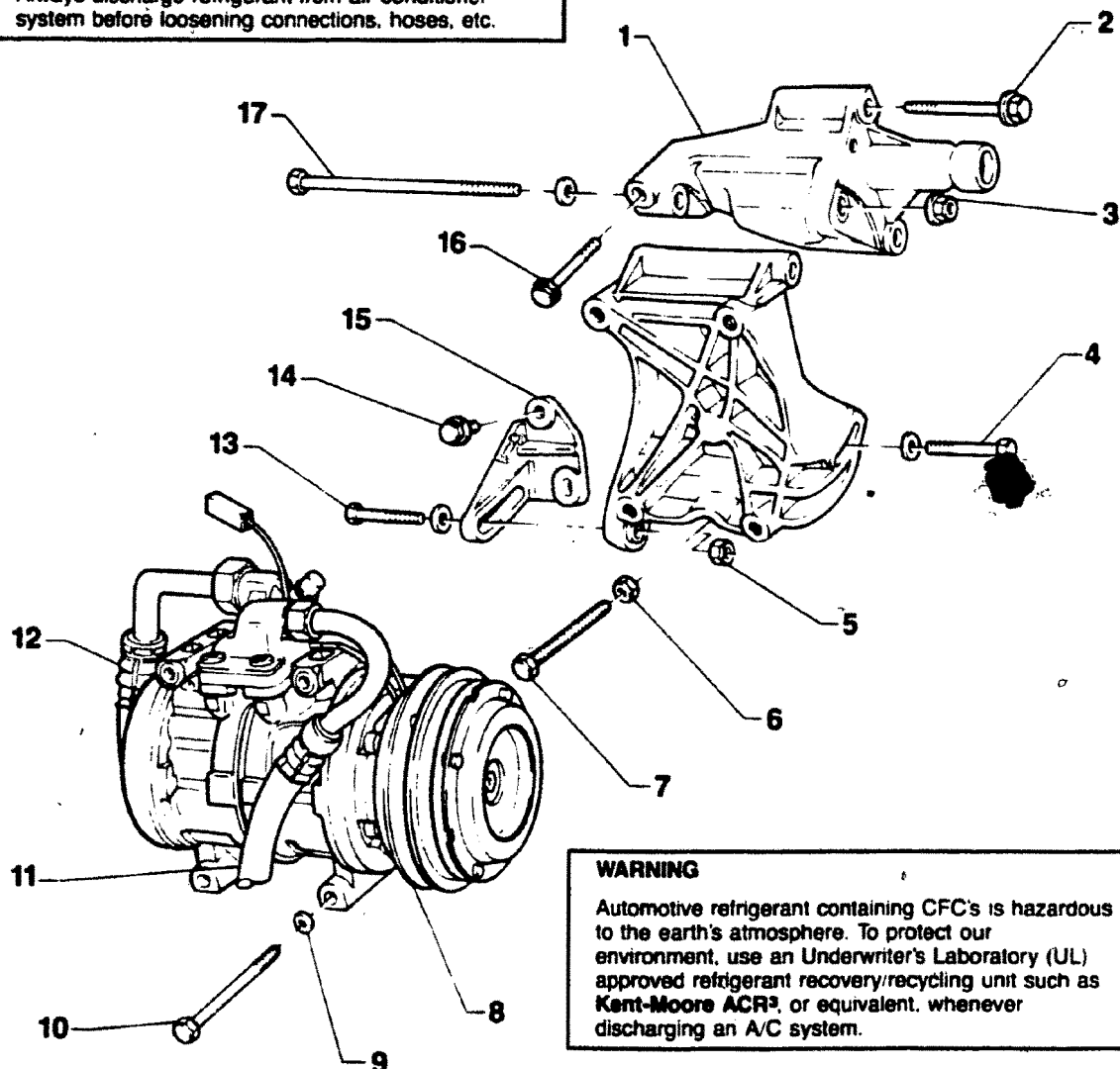
9 — 32 Nm (23.6 ft lb)

10 — A/C refrigerant low pressure hose

11 — 32 Nm (23.6 ft lb)

## CAUTION

Always discharge refrigerant from air conditioner system before loosening connections, hoses, etc.

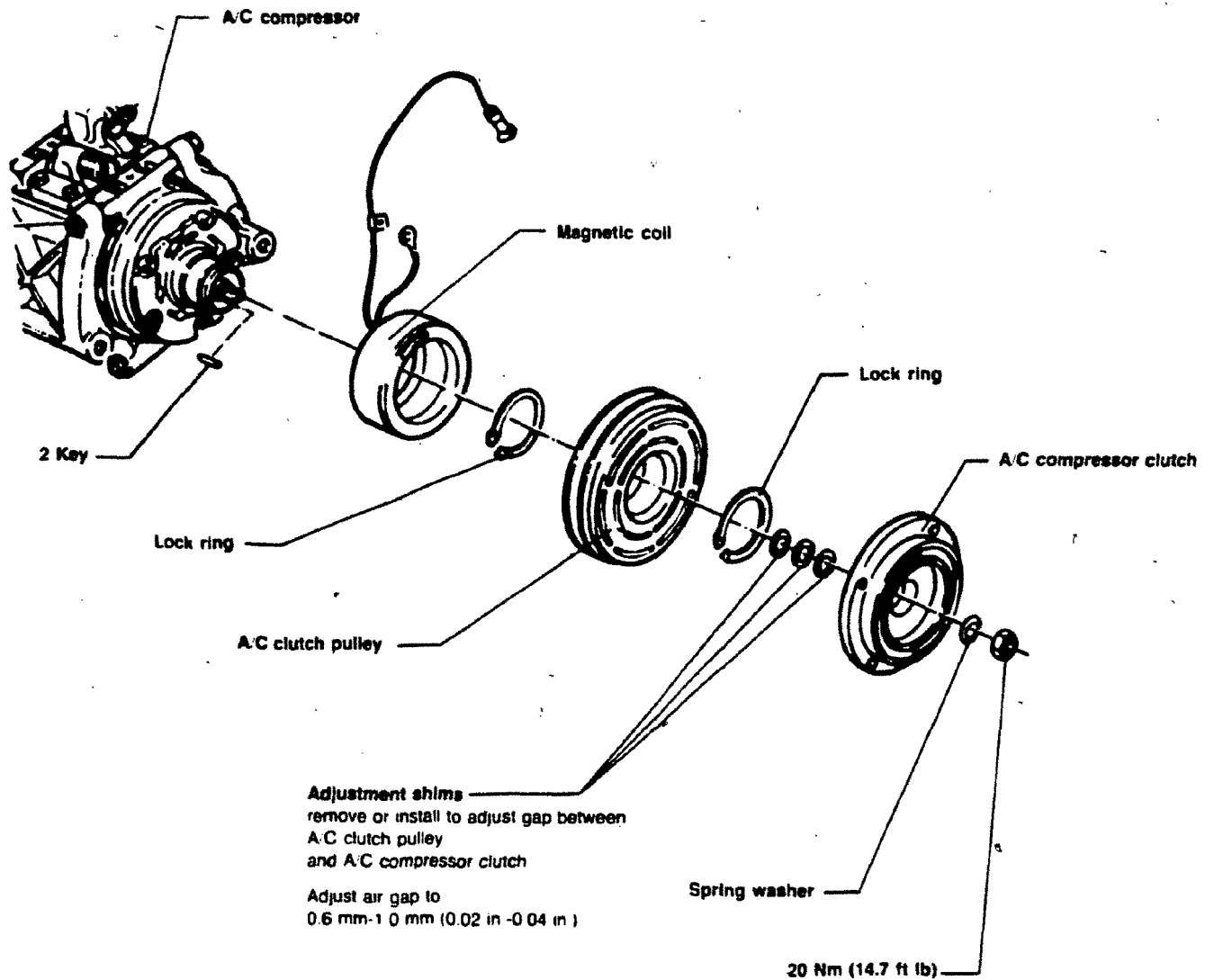


## WARNING

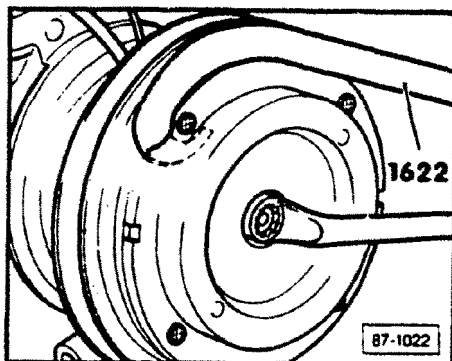
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87-1010

- |                                                              |                                         |                                                 |
|--------------------------------------------------------------|-----------------------------------------|-------------------------------------------------|
| 1 — Bracket                                                  | 7 — Bolt<br>for adjusting belt tension  | 15 — Angle bracket                              |
| 2 — Bolt/washer assembly<br>45 Nm (33.1 ft lb)               | 8 — A/C compressor and clutch           | 16 — Bolt/washer assembly<br>22 Nm (16.2 ft lb) |
| 3 — Self locking nut<br>45 Nm (33.1 ft lb)<br>always replace | 9 — Washer                              | 17 — Bolt                                       |
| 4 — 22 Nm (16.2 ft lb)                                       | 10 — 22 Nm (16.2 ft lb)                 |                                                 |
| 5 — Self locking nut<br>22 Nm (16.2 ft lb)<br>always replace | 11 — A/C refrigerant high pressure hose |                                                 |
| 6 — Nut                                                      | 12 — A/C refrigerant low pressure hose  |                                                 |
|                                                              | 13 — Bolt                               |                                                 |
|                                                              | 14 — Bolt/washer assembly               |                                                 |

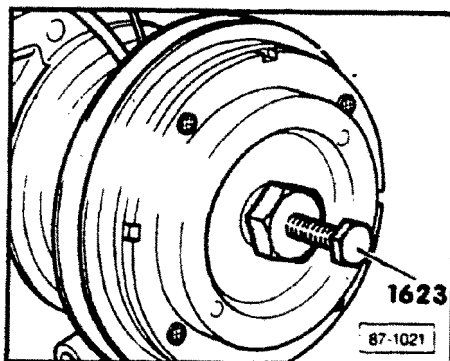


87-381

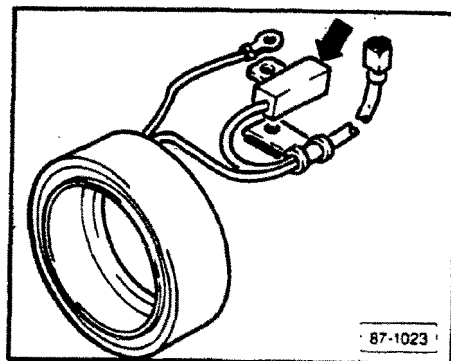


## A/C compressor clutch, removing/ installing

- hold A/C compressor clutch with tool and loosen and remove nut
  - 20 Nm (14.7 ft lb)



- remove A/C compressor clutch

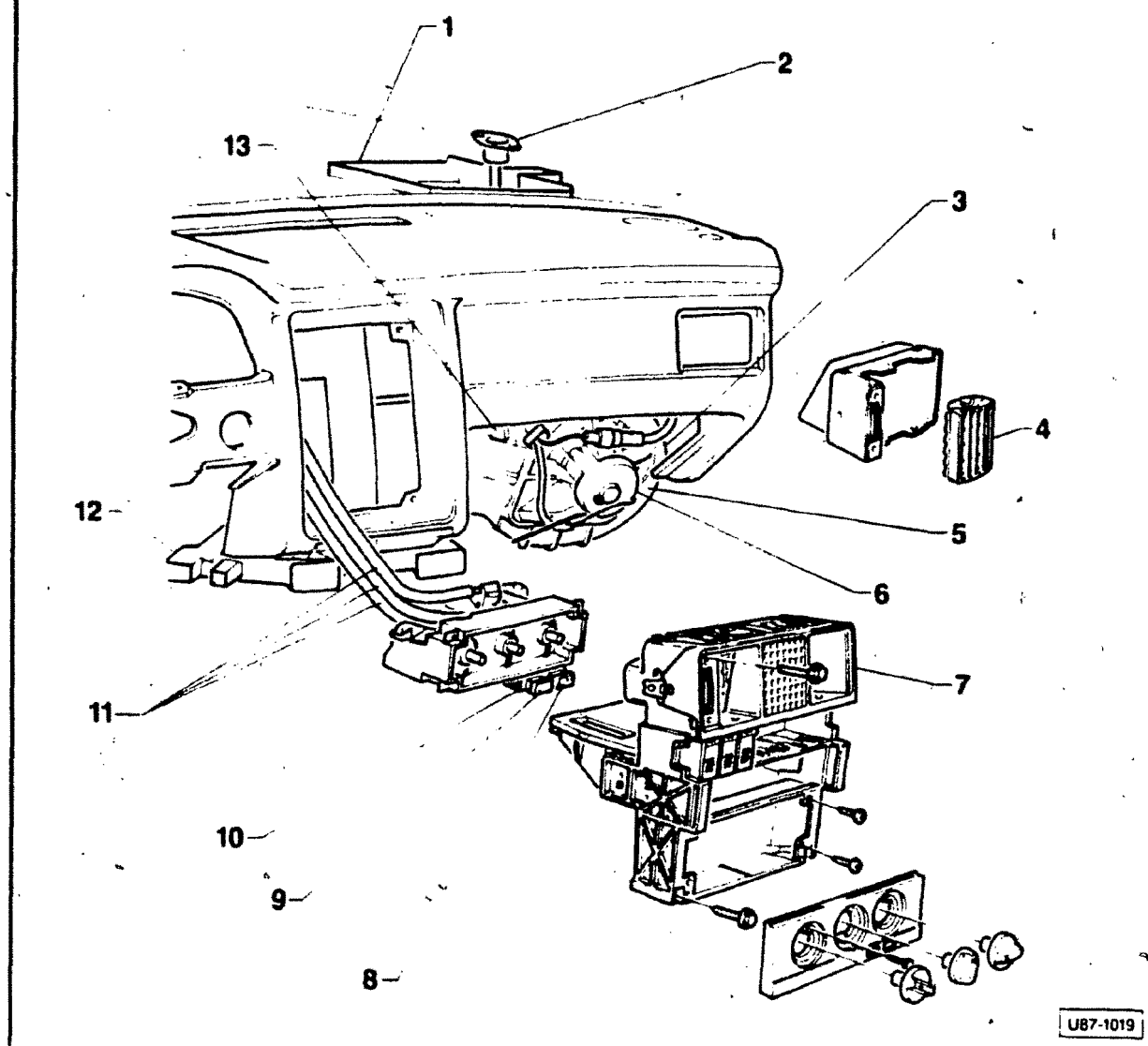


### CAUTION

Only install magnetic coil with protective diode (arrow).

## Note

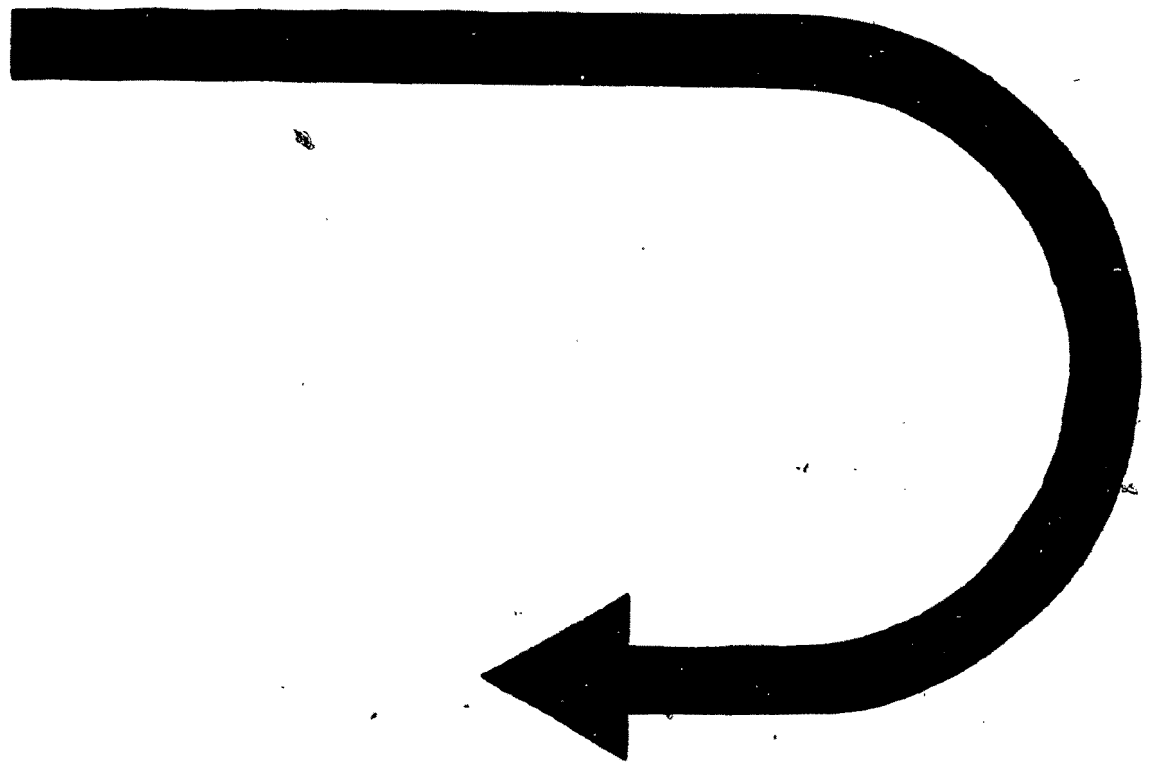
Repairs can be made to these components without discharging the A/C refrigerant system.

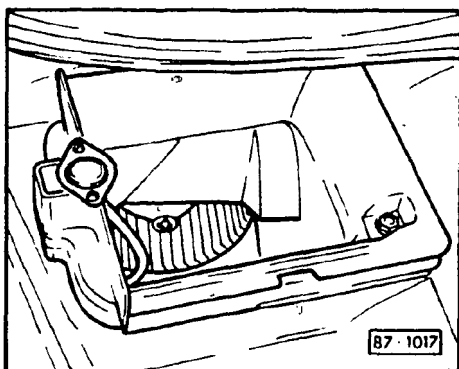


- |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 — Fresh air/recirculation door<br/>checking, Fig. 1</p> <p>2 — Outside temperature sensor<br/>removing/installing, Fig. 2</p> <p>3 — Vacuum servo<br/>• for fresh air/recirculation door<br/>• checking, Fig. 5<br/>• vacuum system layout, see Index<br/>• checking, see Index</p> <p>4 — Instrument panel air vent<br/>removing/installing, Fig. 4</p> <p>5 — Two way valve<br/>for fresh air/recirculation door</p> | <p>6 — Fresh air blower<br/>• removing/installing, Fig. 6<br/>• checking, Fig. 8</p> <p>7 — Center vent/control panel<br/>removing/installing, Fig. 4</p> <p>8 — Fresh air/recirculation door switch</p> <p>9 — A/C switch</p> <p>10 — A/C control head</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- 11 — Bowden cable
  - connections at A/C control head,  
Fig. 9-10
  - connections at flap doors,  
Fig. 11-12
- 12 — Footwell air outlets  
removing/installing,  
Fig. 13
- 13 — Fresh air blower series resistance  
removing/installing, Fig. 3

**CONTINUED IN THE  
BEGINNING OF NEXT ROW**





► Fig. 1 Fresh air/recirculation door, checking

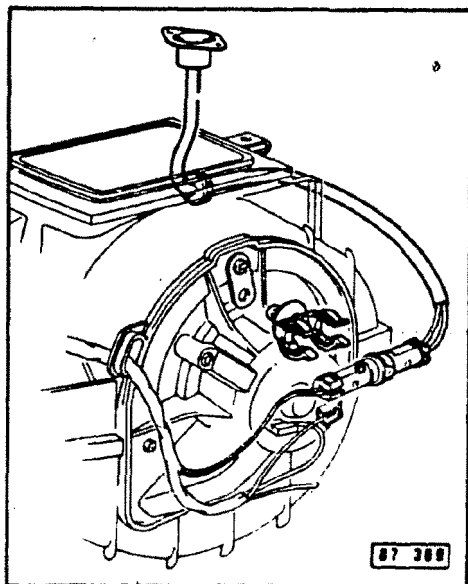
- remove air plenum cover on right side
- start engine and run at idle
- push A/C switch button
- push recirculation button
  - warning light lights
  - fresh air/recirculation door closes

If warning light does not light and fresh air/recirculation door does not close,

- check voltage supply for two way valve per wiring diagram
- repair as necessary
- check vacuum system
- repair as necessary

## Note

If the vacuum system fails, the fresh air/recirculation door will open and all air will be drawn into the vehicle from the outside.



► **Fig. 2 Outside temperature sensor, removing/checking**

Sensor switches A/C compressor clutch **OFF** when temperature drops below specified temperature.

Sensor switches clutch **OFF**:  $-1^{\circ}\text{C}$  ( $30^{\circ}\text{F}$ )

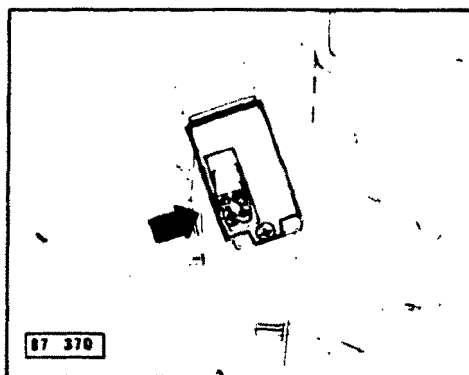
Allows clutch to be switched **ON**:  $+7^{\circ}\text{C}$  ( $45^{\circ}\text{F}$ )

## Removing

- remove air plenum cover
- remove glove compartment
- disconnect wires to temperature sensor
- remove sensor and pull wiring and grommet out through fresh air blower intake

## Checking

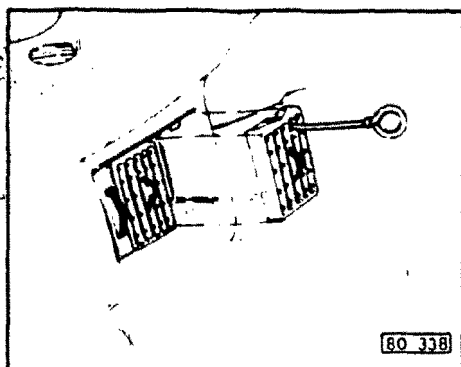
- disconnect wires to sensor
- connect **VW 1119** and set to ohm scale
- place thermometer near outside temperature sensor
- spray cold water on sensor and thermometer
- measure temperature and check **VW 1119** to see when switch opens and closes



► **Fig. 3 Fresh air blower series resistance**

## Removing/Installing

- remove glove compartment
- remove series resistance (arrow)



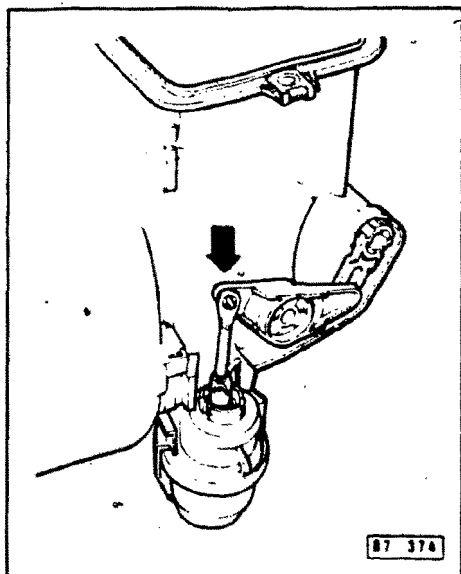
► Fig. 4 Instrument panel air outlet, removing/ installing

## Removing

- remove air direction vanes with self-made hook
- remove air outlet

## Installing

- install air outlet
  - air outlet must snap in
- install air direction vanes with larger tab on top



► Fig. 5 Vacuum servo (for fresh air/recirculation door)

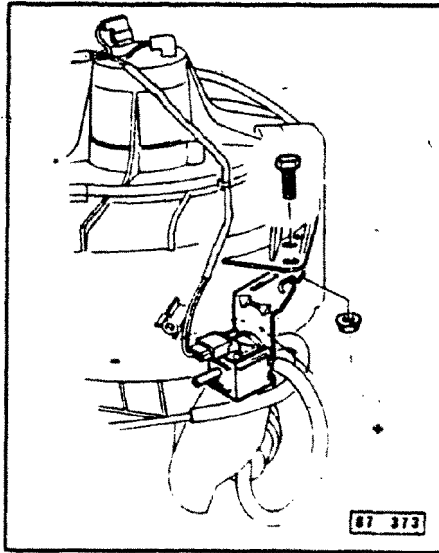
Vacuum servo is located on passenger side of vehicle on right side of heater housing.

## Checking

- remove cover under glove compartment
- connect vacuum pump to vacuum servo
- apply vacuum to vacuum servo
  - fresh air recirculation door must close

## Note

Vacuum servo can only be replaced when the heater box is removed.



► Fig. 6 Two way valve (for fresh air/recirculation door), removing

Valve allows vacuum to be applied to vacuum servo for fresh air/recirculation door.

Located on passenger side of vehicle on right side of heater housing.

### Removing

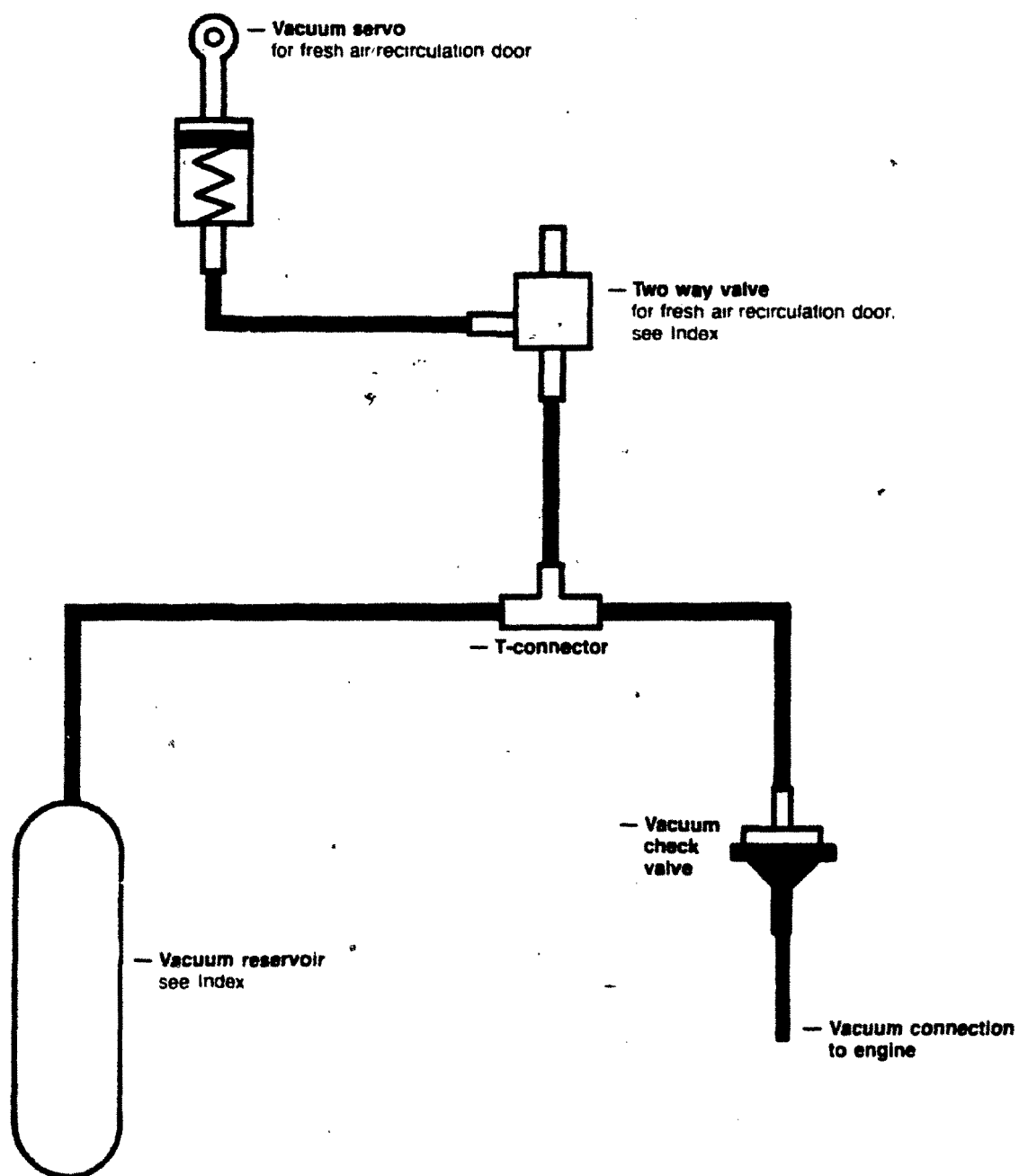
- remove cover under glove compartment
- start engine and run at idle
- push A/C switch button
- push recirculation button
  - warning light lights
  - fresh air/recirculation door closes

If warning light lights and fresh air/recirculation door does not close.

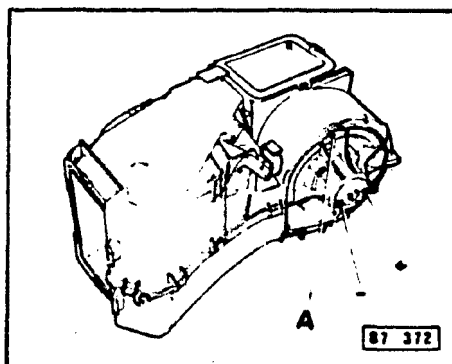
- check voltage supply for two way valve per wiring diagram
- repair as necessary
- check vacuum system, see Index
- repair as necessary

### Note

If the vacuum system fails, the fresh air/recirculation door will open and all air will be drawn into the vehicle from the outside.



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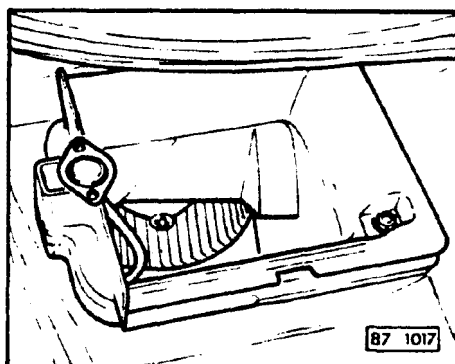


► Fig. 7 Fresh air blower, removing/installing

- remove cover under glove compartment
- remove glove compartment
- remove 6 bolts (A)
- remove fresh air blower with anchor plate from heater housing
- separate fresh air fan and anchor plate
- remove motor

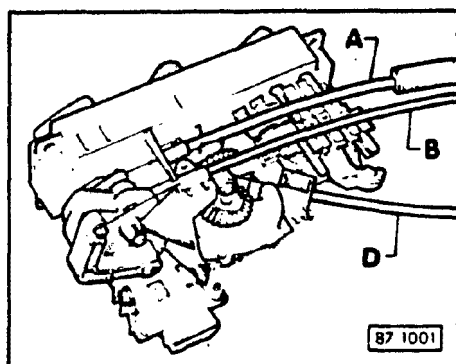
## Note

Coat fitting surfaces of fresh air motor and anchor plate with silicone gasket sealer before assembling.



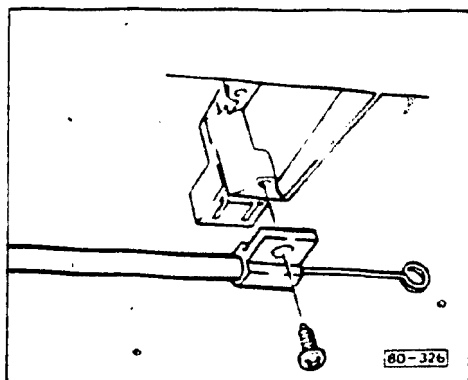
► Fig. 8 Fresh air blower impeller, checking

- remove cover over air plenum on right side of vehicle
- check that impeller moves easily
- check for objects in wheel



► Fig. 9 Bowden cable identification on A/C control head

- A = from air distribution control to flap door for floor defrost outlet  
color: white
- B = from air distribution control to main air distribution flap  
color: black
- D = from temperature control lever to temperature regulation flap  
color: red



► **Fig. 10 Bowden cable connections on A/C control head**

Bowden cables are not adjustable.

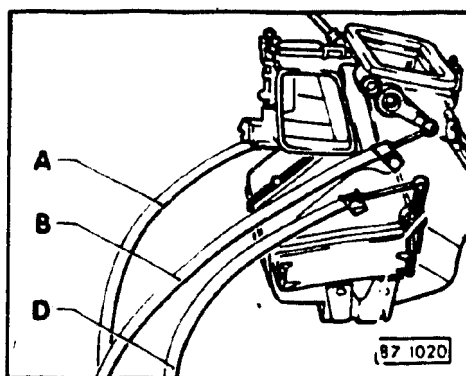
**Note**

If cable retainer (A) breaks,

- turn cable 90° and attach with screw (arrow).

**Note**

Always replace bent or binding cables.



► **Fig. 11 Bowden cable connections on heater/evaporator box**

A = from footwell defrost flap door to air distribution control

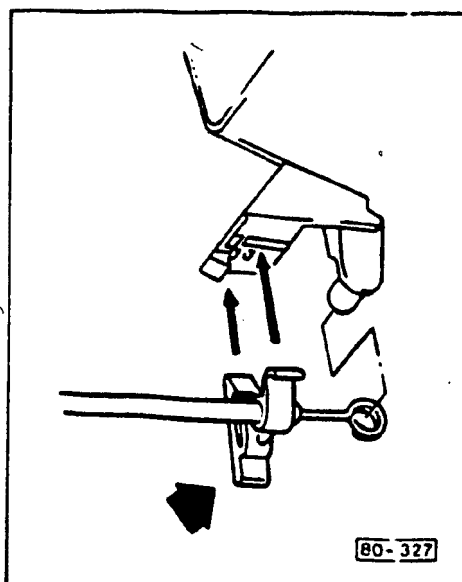
color: white

B = from central air distribution flap door to air distribution control

color: black

D = from temperature regulation flap to temperature regulation control

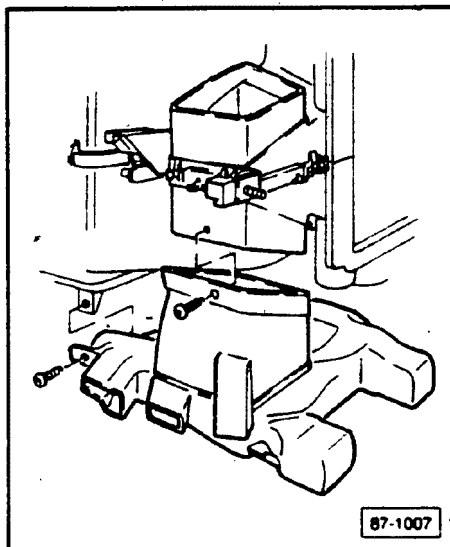
color: red



► **Fig. 12 Bowden cable connections on heater/evaporator box**

**Note**

Always replace bent or binding cables.



► Fig. 13 Footwell air outlet, removing/installing

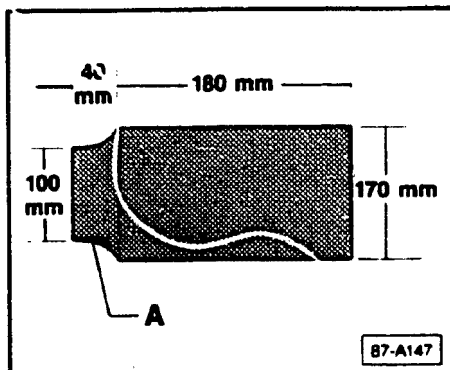
- remove storage shelf on driver's side
- remove cover under glove compartment
- remove center vent/control panel
- remove ashtray
- remove instrument panel support at center tunnel
- loosen mounting bolts
- remove heater floor outlets channels, rear
- remove footwell air outlet

## Fresh air intake duct mesh, installing

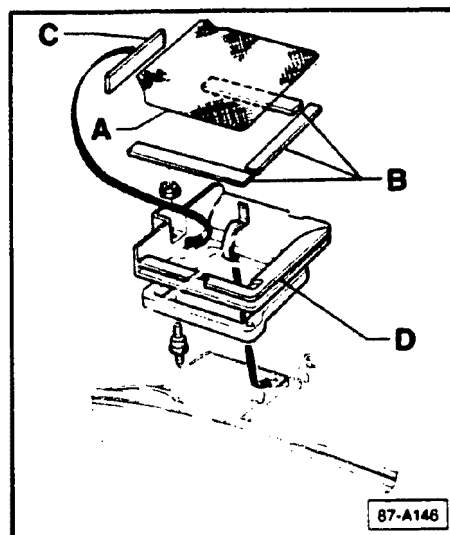
Debris can enter the passenger compartment through the fresh air intake duct if the intake duct mesh is missing.

### Note

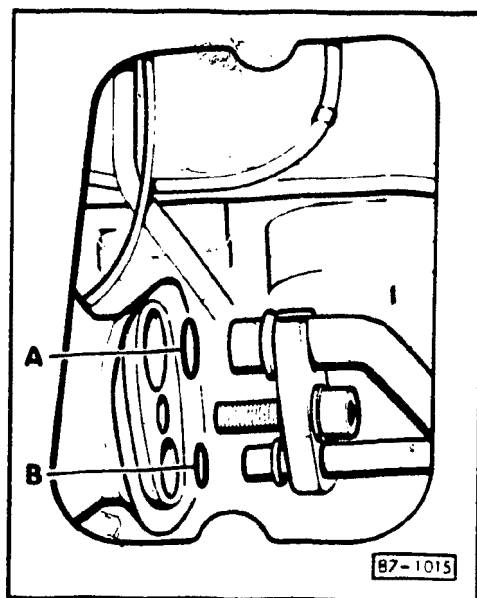
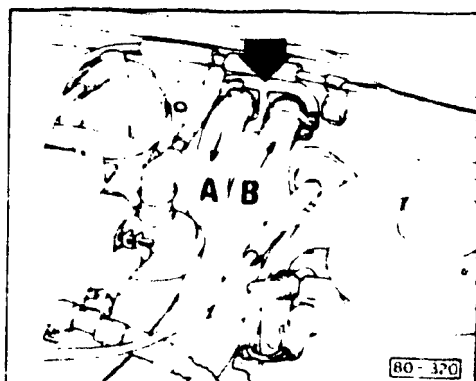
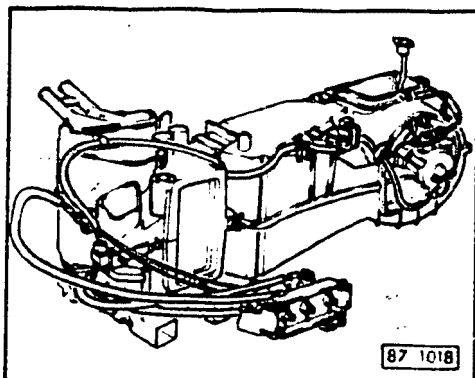
Clean debris from air intake before installing intake duct mesh.



- cut intake duct mesh, P/N: 893 819 408 according to illustration
- bend section A up 90°



- cut sealing cord P/N: AKD 497 010 04 R10 to fit bottom of mesh (B and C)
- apply sealing cord to intake housing (D)
- press edge A of intake mesh onto sealing cord first
- press intake mesh onto remaining sealing cord



## Heater/evaporator housing, removing/installing

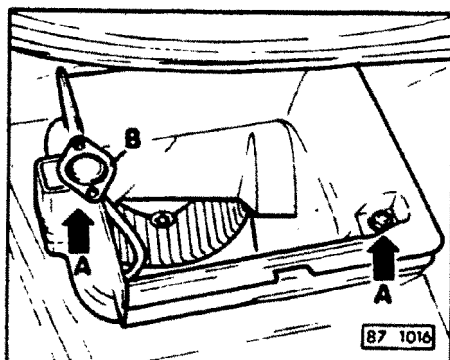
### WARNING

Automotive refrigerant containing CFC's is hazardous to the earth's atmosphere. To protect our environment, use an Underwriter's Laboratory (UL) approved refrigerant recovery/recycling unit such as **Kent-Moore ACR<sup>3</sup>**, or equivalent, whenever discharging an A/C system.

- disconnect battery cables and remove battery
  - discharge refrigerant system, see A/C refrigerant system discharge procedure
  - remove center vent/control panel
  - remove instrument panel (see Group 70)
  - clamp heater hoses **A** and **B** to prevent excess engine coolant loss
- A** = return to water pump  
**B** = feed to cylinder head
- loosen clamps and remove hoses
  - cap hoses
  - remove A/C refrigerant lines from evaporator
    - 16 Nm (11.8 ft lb)

### Note

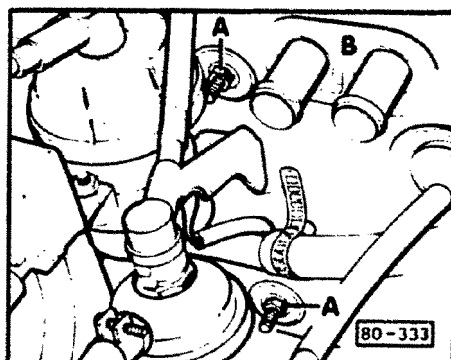
Be sure there is no tension on refrigerant lines during installation.



- remove right side air plenum cover
- remove outside temperature sensor B
- remove mounting bolts A
- remove air intake

## Note

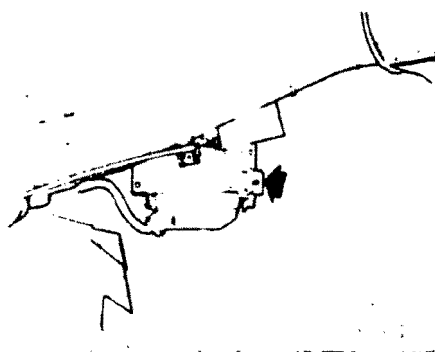
Be sure gasket around air intake seals correctly during installation.



- remove nuts A on fire wall

## Note

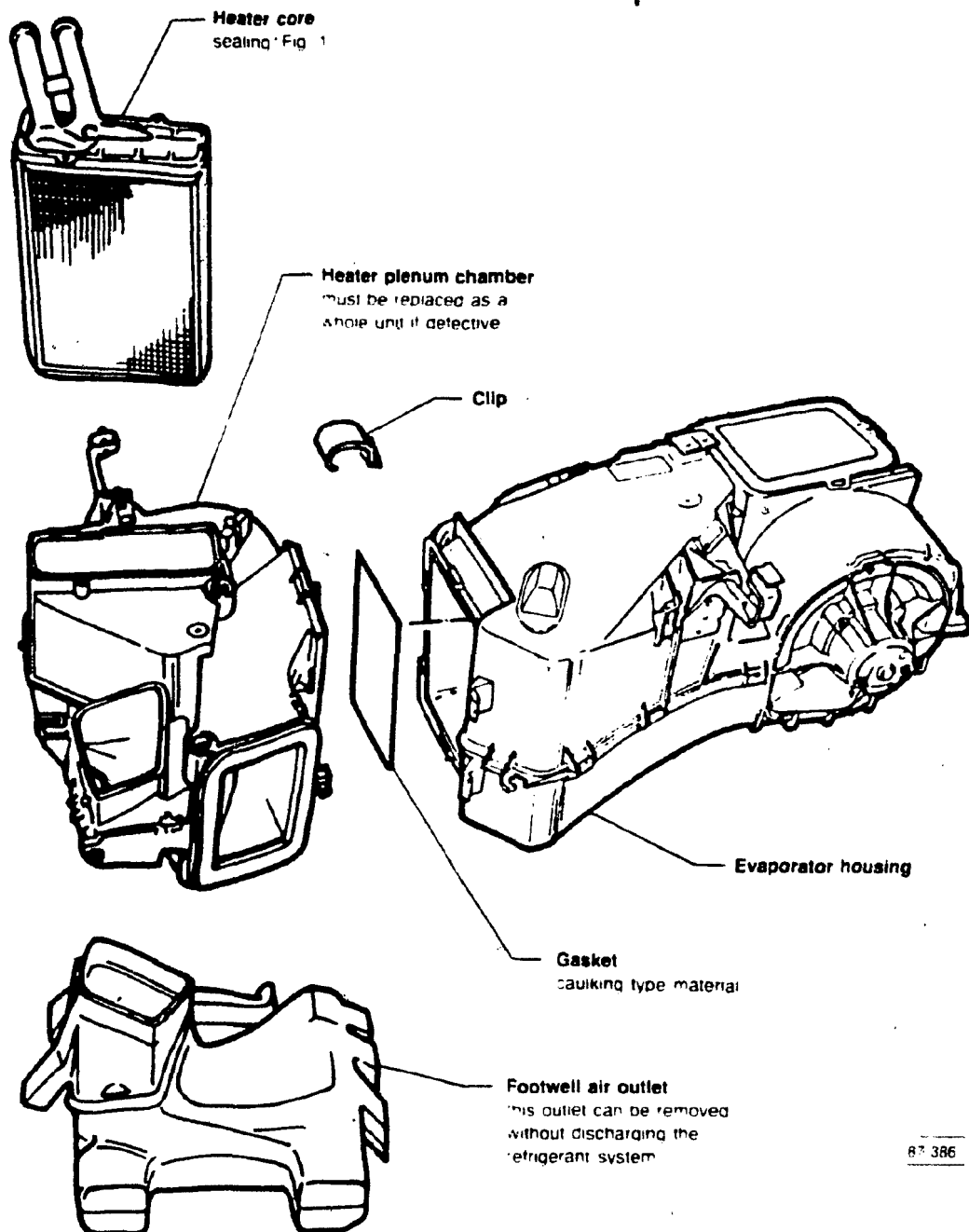
Be sure rubber grommet B seals properly during installation.



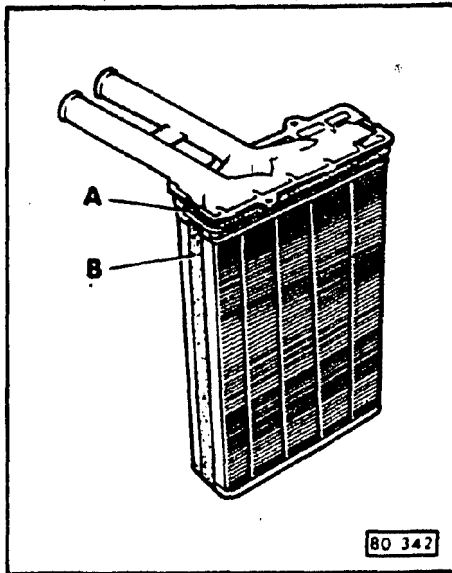
- remove vacuum hose from two way valve
- remove water drain hose from heater/evaporator housing
- remove fuel injection control unit (arrow)
- remove heater/evaporator housing

## Note

Check Bowden cables for kinks and ease of movement before reinstalling heater/evaporator housing. Replace cables if necessary.



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► Fig. 1 Heater core

## Sealing

Gaskets **A** and **B** must seal heater core completely without gaps.

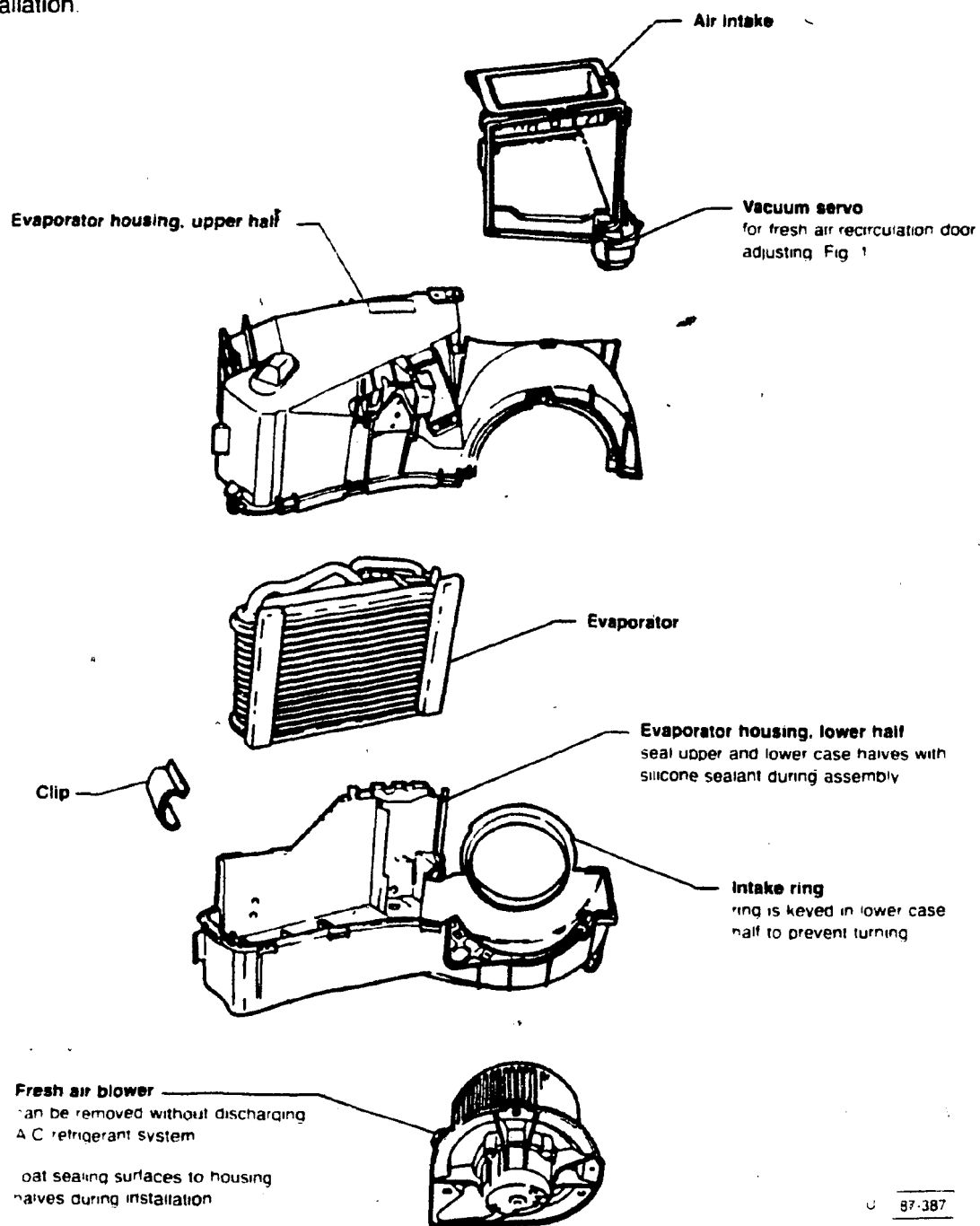
## Note

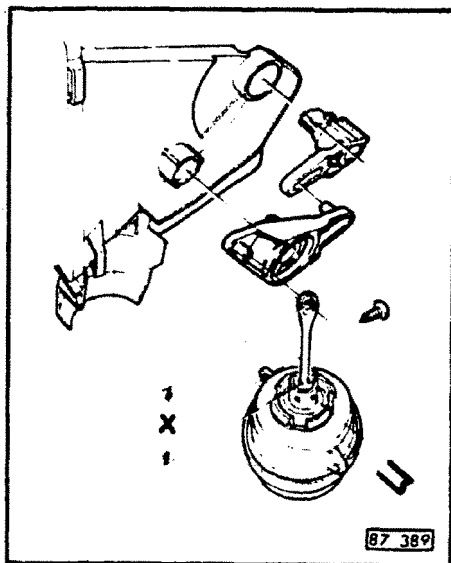
If the heater core does not lock firmly in place during installation,

- secure with self-tapping screws

## Note

Be sure evaporator case halves seal properly during installation.





► Fig. 1 Vacuum servo, removing/installing

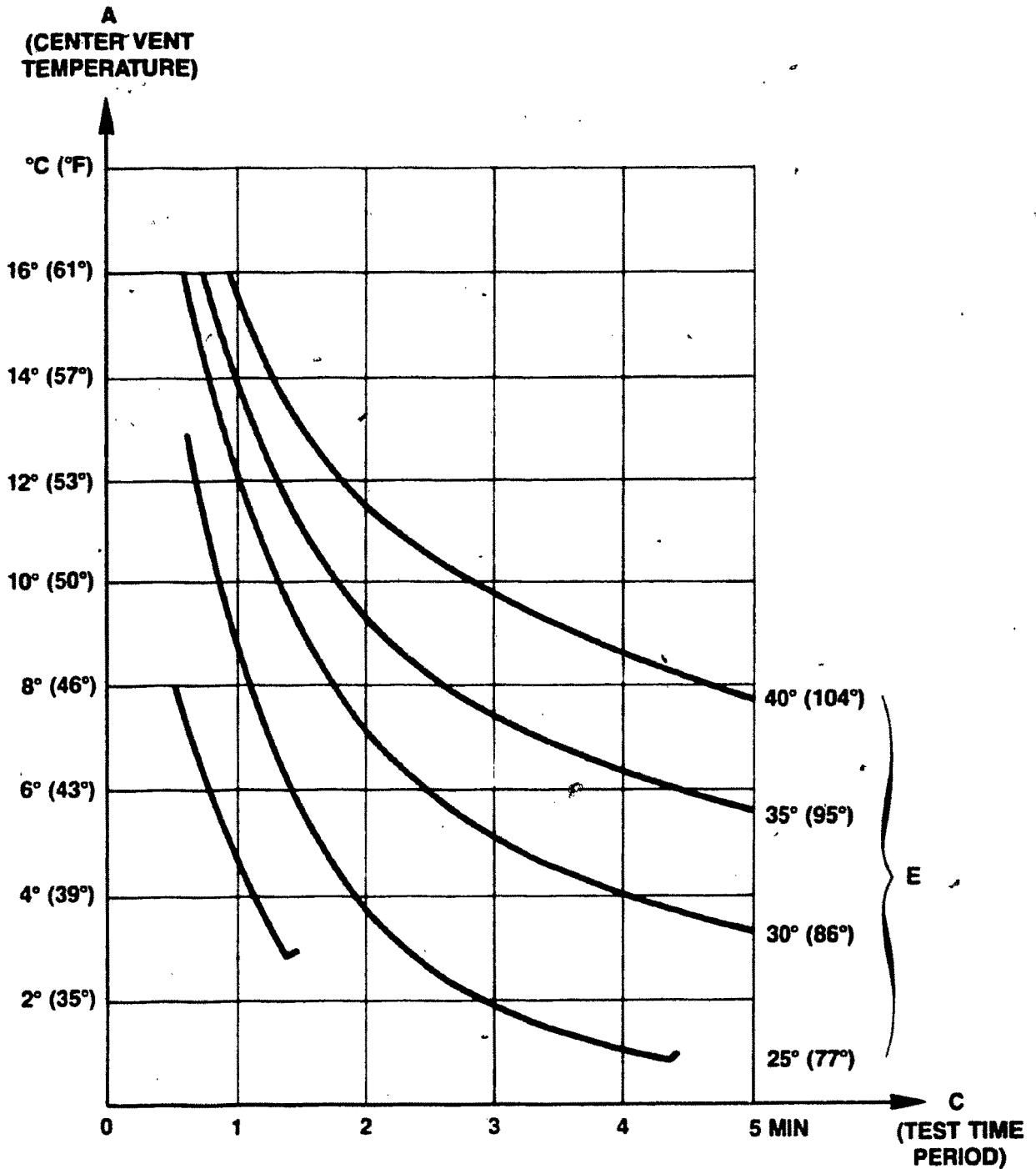
- remove screw
- remove vacuum servo

#### Note

Length of vacuum servo arm A is adjustable.

#### Adjusting

- remove clip B
- adjust arm height
  - X = 50mm (approximately 2 in.)
- install clip



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## A/C system, checking

### Troubleshooting preparations

Observe the following:

- do not park car in sunlight
- V-belt properly adjusted
- condenser and radiator free of obstructions
- air ducts for condenser and radiator properly installed
- close valves on pressure test gauges
- remove A/C refrigeration high pressure switch
- connect line from high pressure test gauge to valve
- connect line from low pressure test gauge to low pressure service valve on A/C compressor
- run engine until warm
- push A/C switch button and fresh air recirculation door button
  - fresh air/recirculation door light lights
  - A/C compressor runs
  - radiator cooling fan runs in stage one
  - fresh air/recirculation door is closed
- switch ignition **OFF**

### Test preparation

- switch ignition **ON**
- open doors
- run fresh air blower for approximately 5 minutes on speed 4 to stabilize evaporator temperature
- close sunroof, doors and windows
- switch A/C switch **ON**
- push fresh air/recirculation button
  - fresh air/recirculation door closes
  - indicator light **ON**
- set temperature to full cold position
- set fresh air blower speed to 4
- open all instrument panel vents
- adjust air distribution so all air comes only from instrument panel vents
- place thermometer at air intake for heater evaporator housing (under glove compartment)
- measure temperature and match to closest temperature curve at **E** on graph

### This is your base measurement

#### Test

- insert thermometer in center vent
- start engine

After approximately 30 seconds,

- raise idle speed to 2000 RPM

### THIS STARTS THE TEST TIME PERIOD

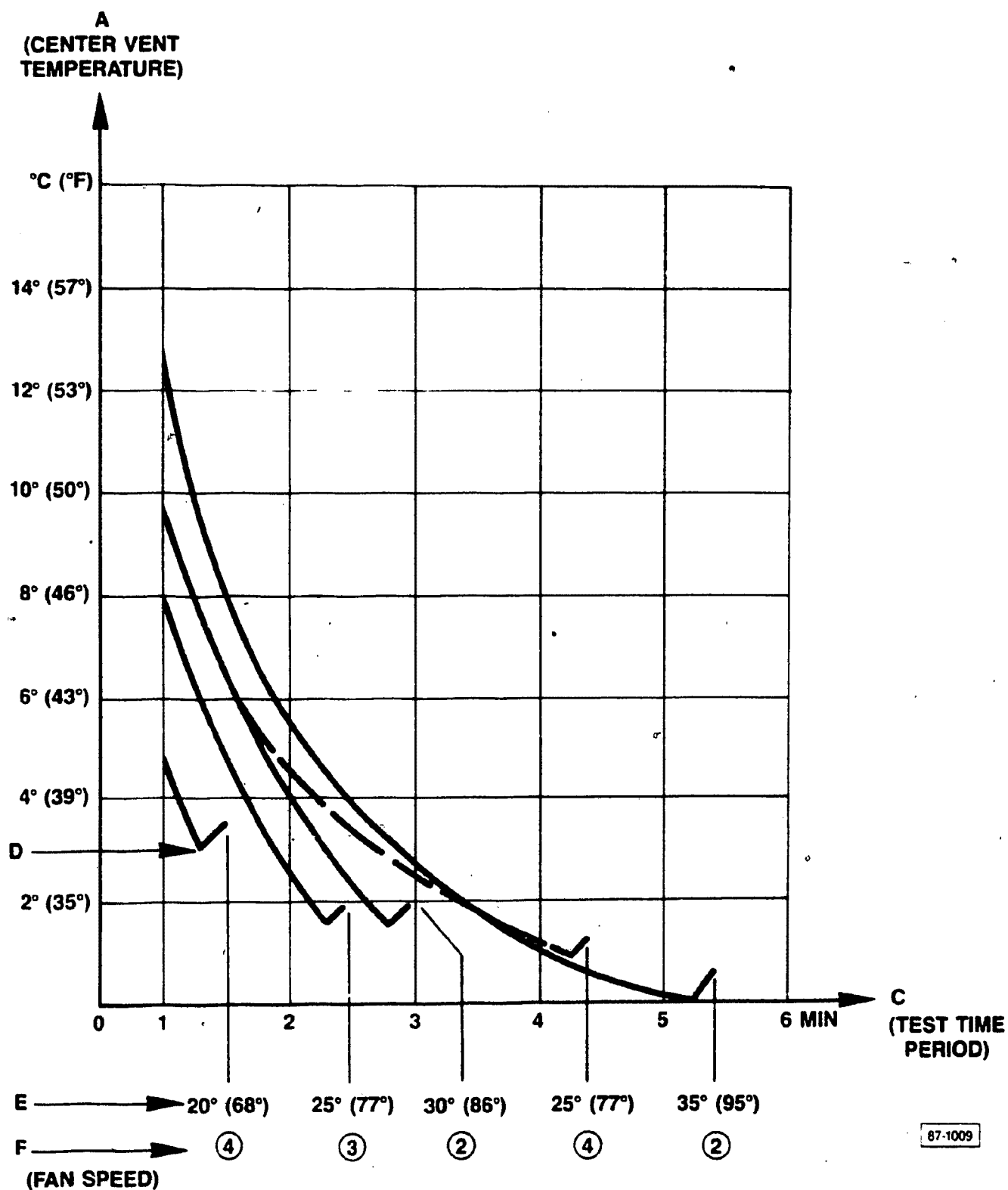
- measure temperature at center vent
- compare temperature at center vent with temperature from selected curve at **E** (your base measurement) in relation to time period **C**

#### Note

Temperature must not vary from graph by more than  $+5^{\circ}\text{C}$  ( $9^{\circ}\text{F}$ ).

If specified values are not obtained,

- check that radiator cooling fan is operating on 2nd stage (high speed)
- check position of temperature flap arm on evaporator/heater housing



## A/C refrigerant low pressure switch, checking

### Note

This switch will cycle the A/C compressor **ON** and **OFF** depending on the pressure in the refrigerant system.

A/C refrigerant low pressure switch is used to regulate interior temperature and prevent evaporator icing.

### Test preparation

- switch ignition **ON**
- open doors
- run fresh air blower for approximately 5 minutes on speed 4 to stabilize evaporator temperature
- close sunroof, doors and windows
- switch A/C switch **ON**
- push fresh air/recirculation button
  - fresh air/recirculation door closes
  - indicator light lights
- set temperature to full cold position
- set fresh air blower speed to 4
- open all instrument panel vents
- adjust air distribution so all air comes only from instrument panel vents
- place thermometer at air intake for heater/evaporator housing (under glove compartment)
- measure temperature and match to closest temperature curve at **E** on graph

### This is your base measurement

- adjust fresh air blower speed (**F** on graph) according to selected temperature curve at **E**

### Test

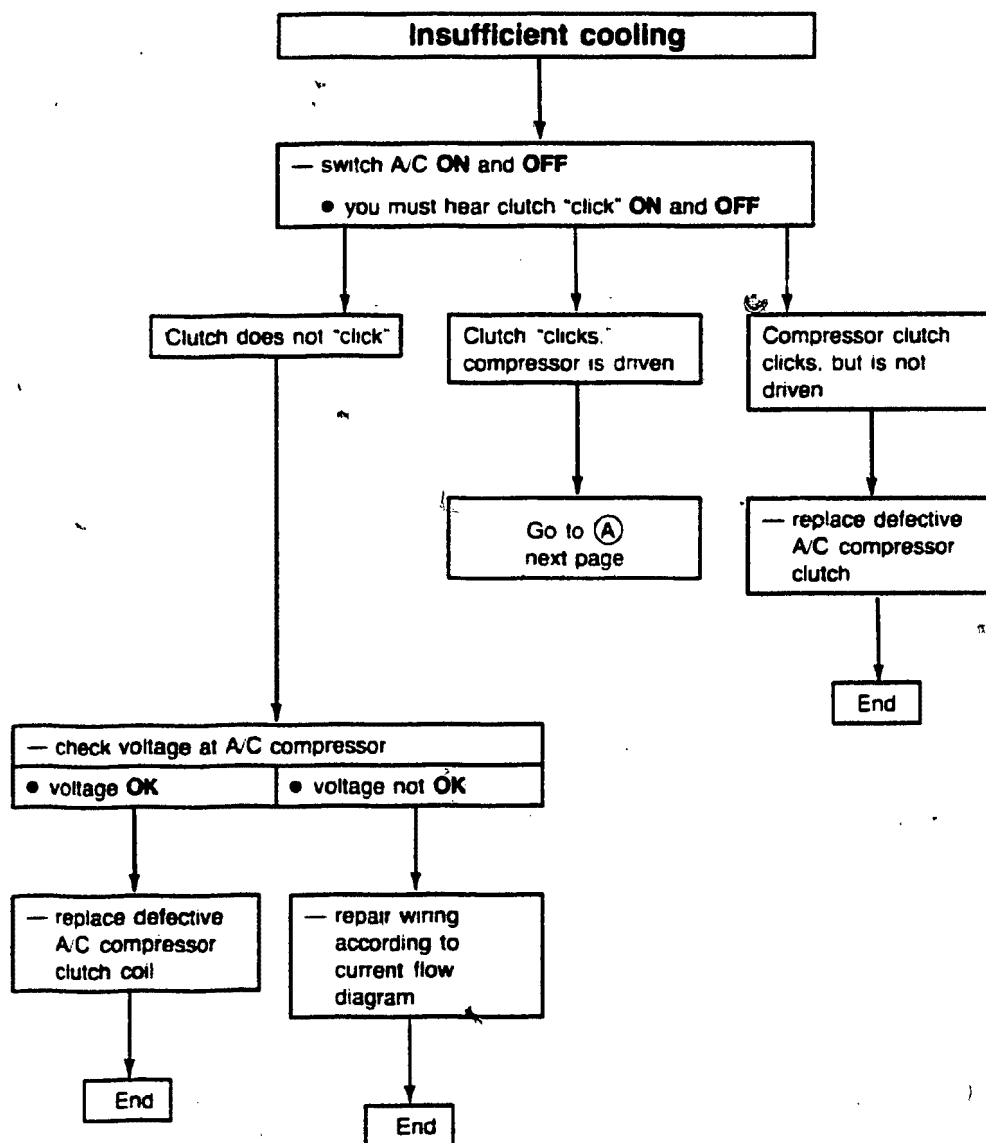
- insert thermometer in center vent
- start engine

After approximately 30 seconds,

- raise idle speed to 2000 RPM

### THIS STARTS THE TEST TIME PERIOD

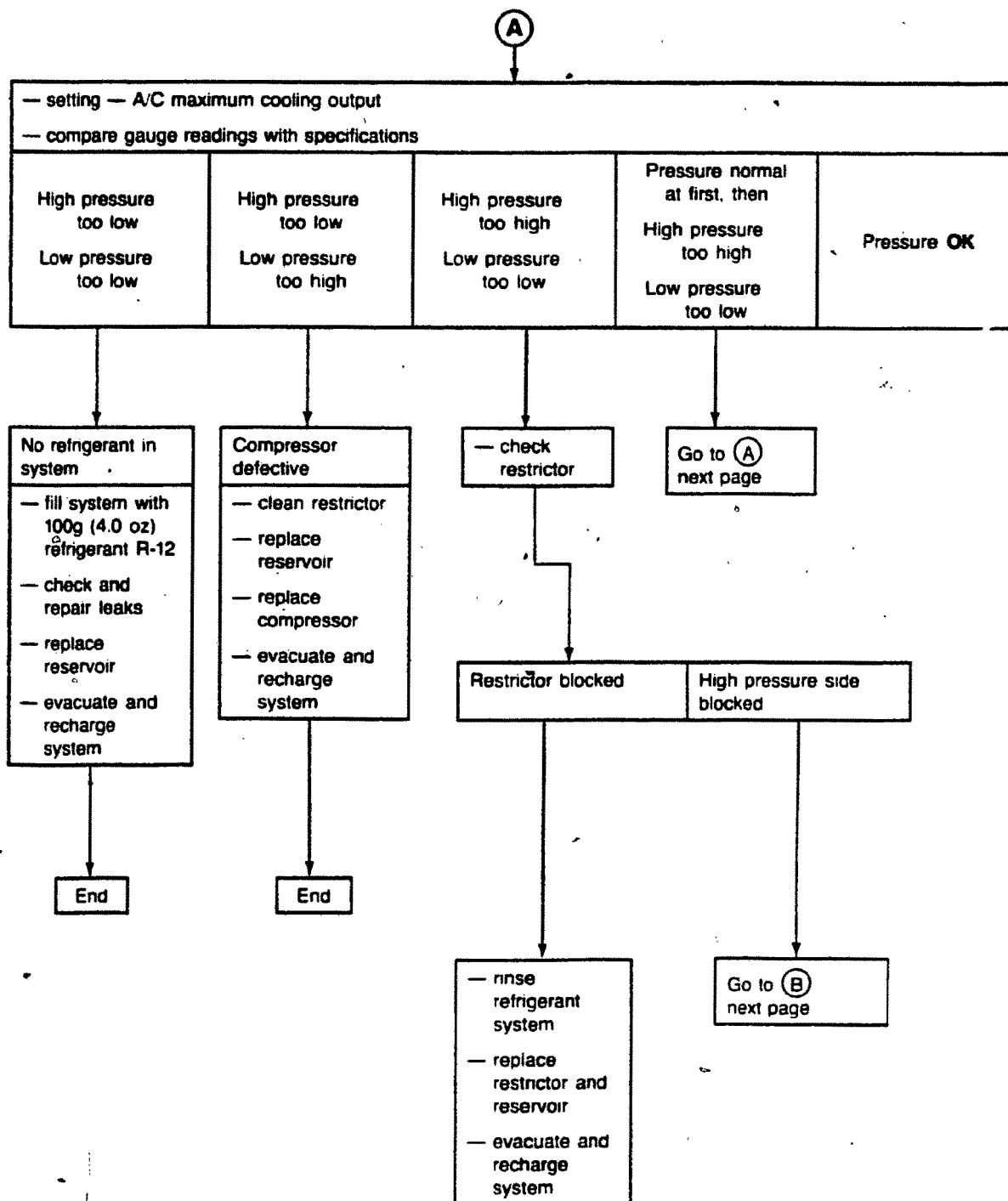
- measure temperature at center vent
- compare temperature at center vent with temperature from selected curve **B** (your base measurement) in relation to time period **C**
- read temperature from center when A/C compressor clutch disengages (**D** on graph)
- compare temperature with temperature curve you have chosen on graph
  - A/C compressor clutch must disengage at point indicated on graph for the temperature curve you have selected (your base measurement) + 5°C (9°F) tolerance

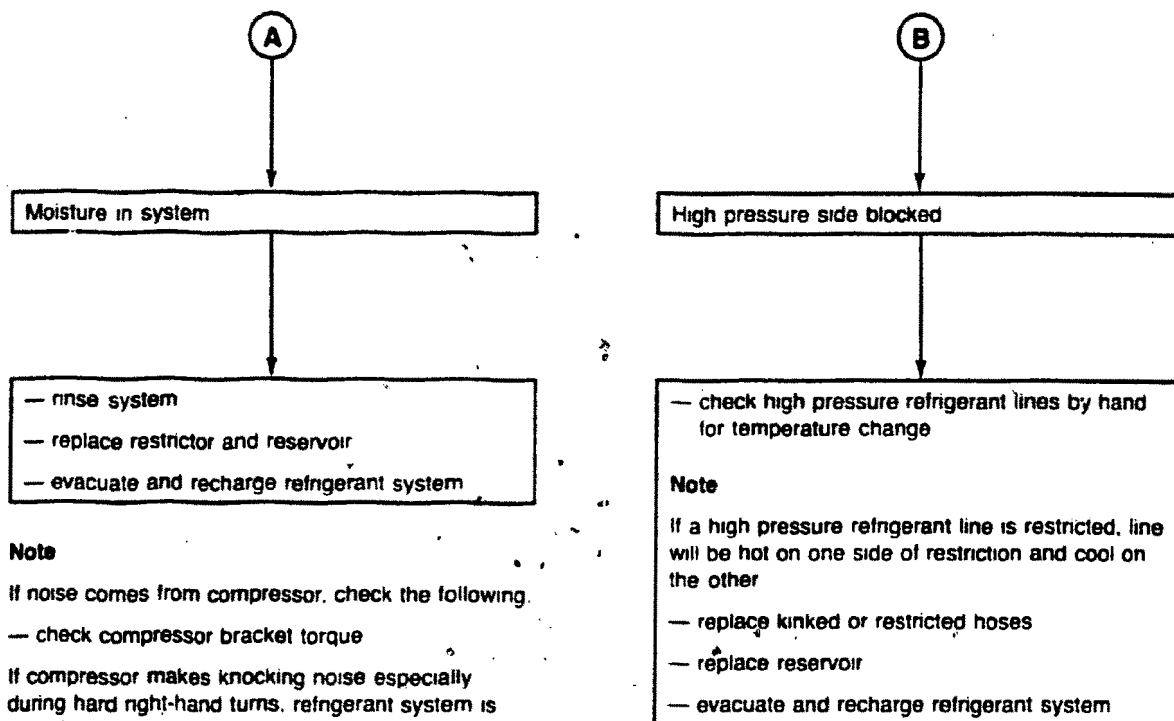


## Pressure specifications

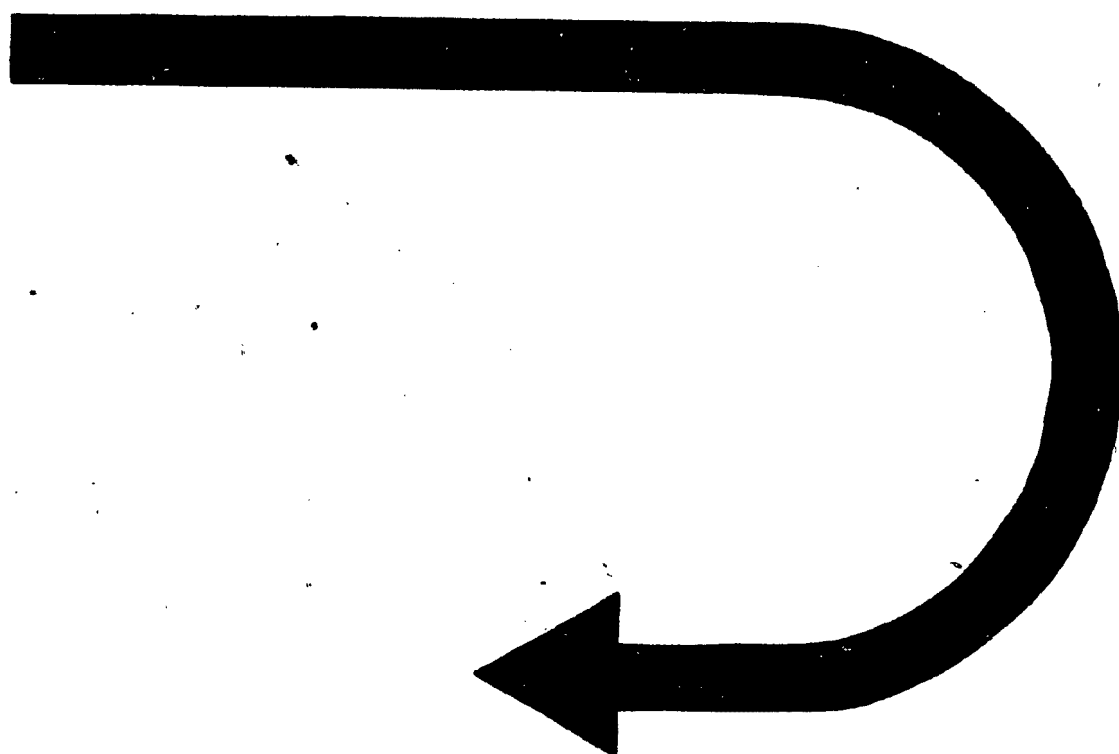
— test with gauge

- low pressure = 1.3 bar-3.2 bar ( 19 - 46 psi )  
at idle
- high pressure = 10.6 bar-17.6 bar  
( 154 - 255 psi ) at idle



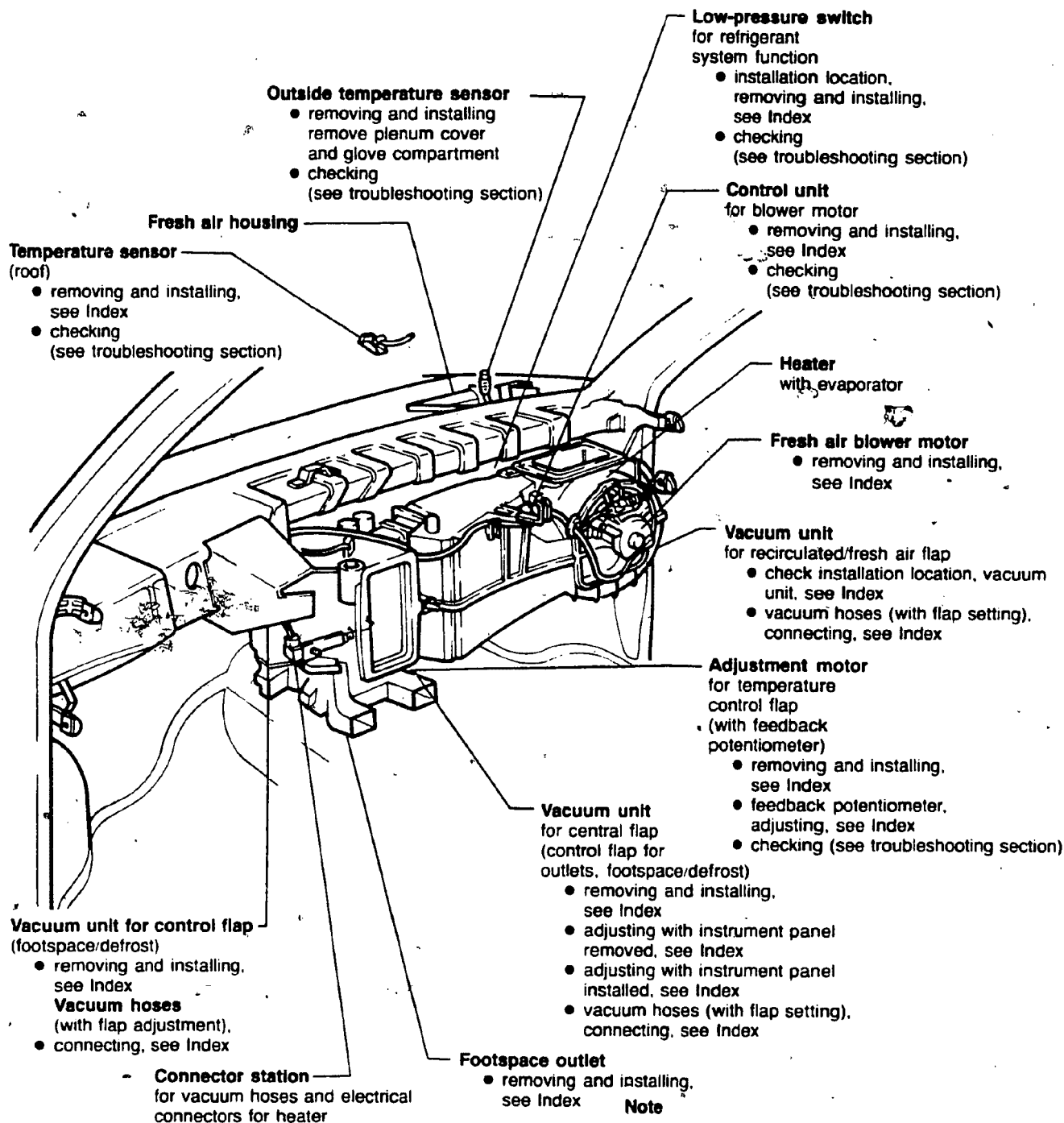


**CONTINUED IN THE  
BEGINNING OF NEXT ROW**



## Note

The components listed on this page are in the engine compartment in addition to the components shown on page 87.8 (4-cylinder engine) and page 87.9 (5-cylinder engine).



## Note

A defective vacuum unit can only be replaced if the heater is removed.

## CAUTION

Heater cannot be removed until refrigerant system is discharged.

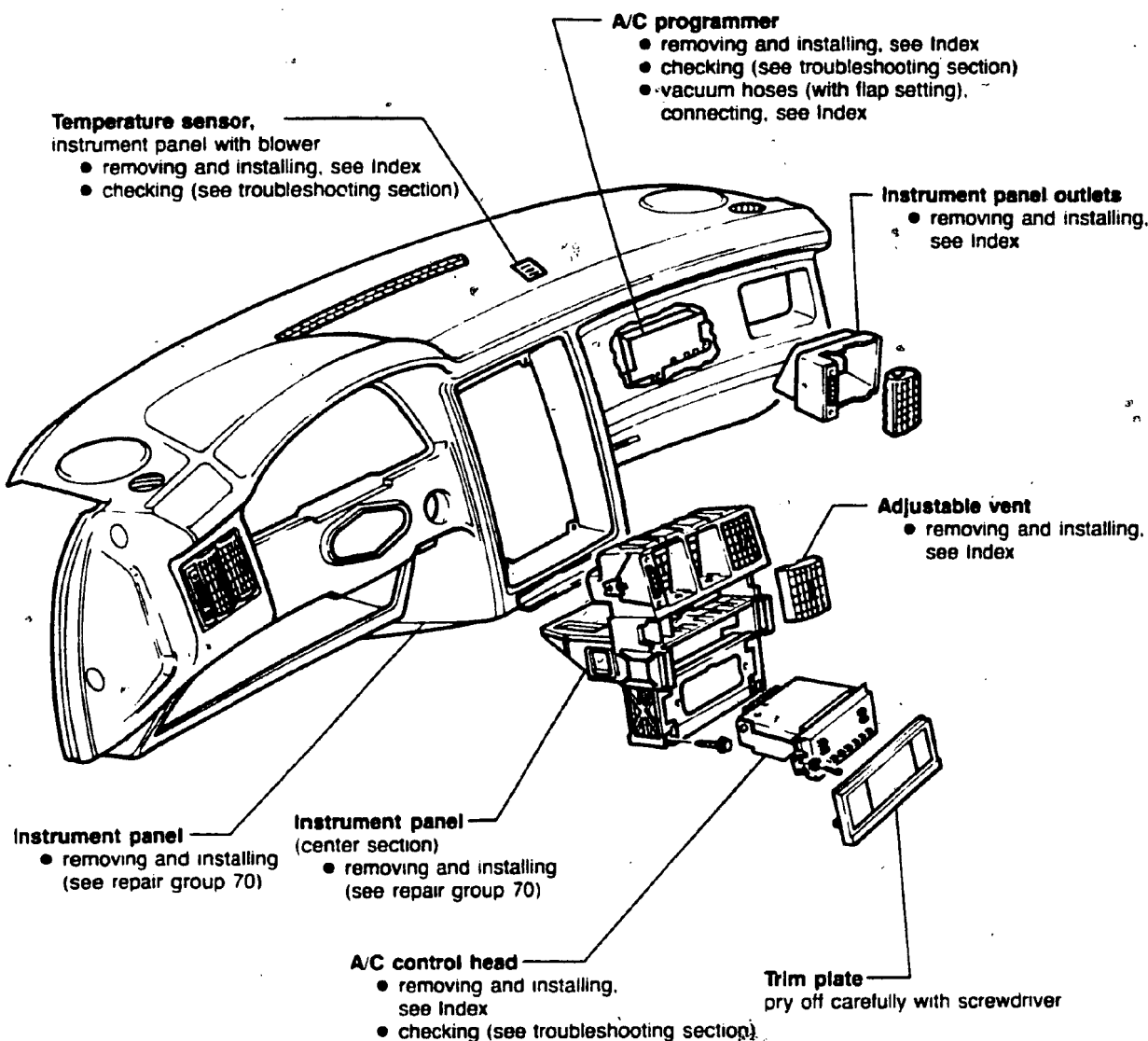
- remove and install evaporator housing with heater as a complete unit

## WARNING

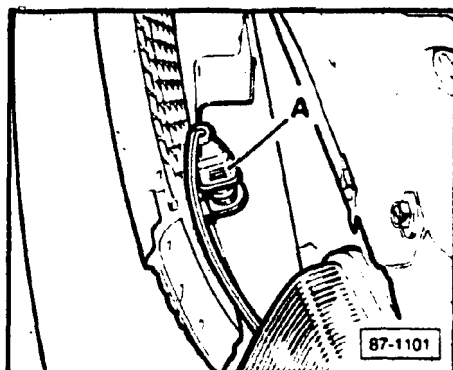
Automotive refrigerant containing CFC's is hazardous to the earth's atmosphere. To protect our environment, use an Underwriter's Laboratory (UL) approved refrigerant recovery/recycling unit such as Kent-Moore ACR<sup>3</sup>, or equivalent, whenever discharging an A/C system.

## Note

When installing fresh air housing, make sure it seats properly on plenum gasket.



87-1103



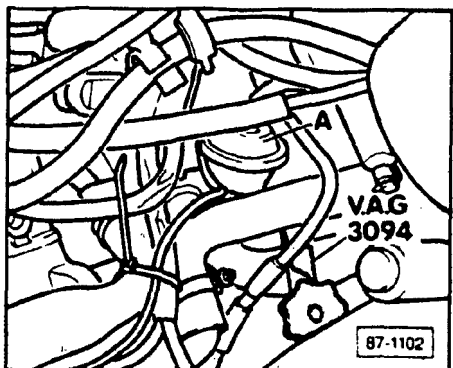
## Climate control (with fault memory), repairing

### Note

The following repair information describes procedures that do **NOT** affect the refrigerant system.

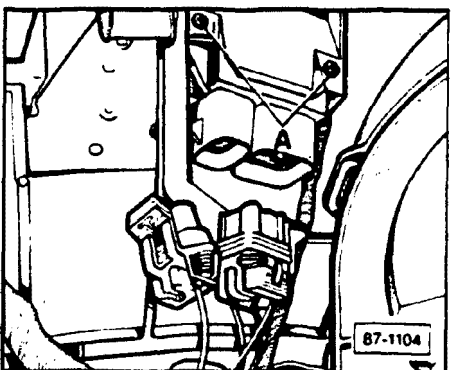
### Outside temperature sensor

Checking (see troubleshooting section)



### Vacuum unit and coolant check valve (for heater with coolant temperature sensor), removing and installing

- open cap on overflow reservoir
- disconnect coolant hoses
- after installing, ventilate coolant circuit according to directions (see repair group 19)
  - vacuum hoses (with flap adjustment), connecting, see Index

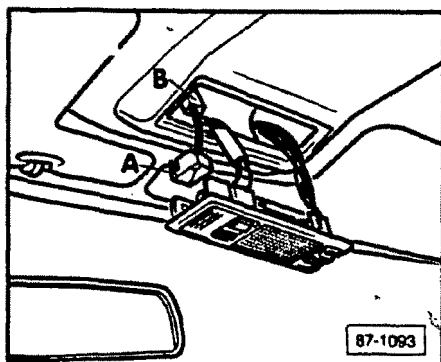


### Fig. 1 Blower motor control unit, removing and installing

- remove glove compartment (see repair group 70)
- remove screws A (2)

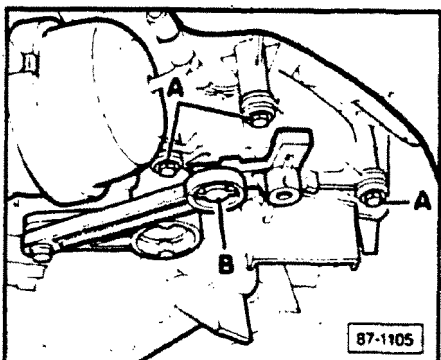
### Note

Clean old heat-conducting paste off of heat sink and control unit each time unit is removed, then apply new paste to contact surfaces.



► Fig. 2 Temperature sensor (roof), removing and installing

- remove interior light
- remove connector B
- press back clip A

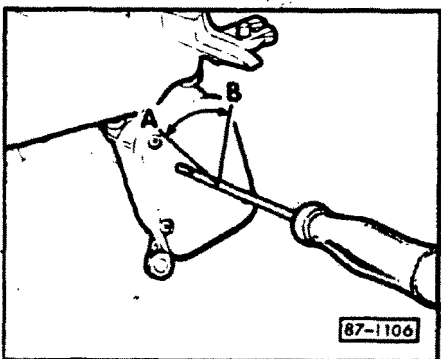


► Fig. 3 Adjustment motor for temperature control flap (with feedback potentiometer), removing and installing

- remove center section of instrument panel (see repair group 70)
- remove footspace outlets, see Index
- remove screws A (3)
- disconnect linkage B
- disconnect adjustment motor harness connector at the 5-pin connector (left, on the heater)
- pull out wiring (over the heater)

When installing:

Route wiring (5-pin connector) for the new adjustment motor using the harness clip in front of the heater, making sure there is sufficient clearance for the heater lever.



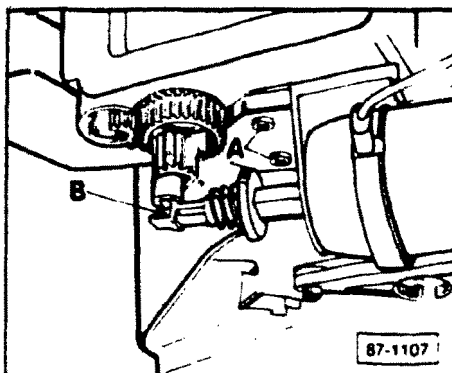
► Fig. 4 Feedback potentiometer, adjusting

- remove temperature control flap adjustment motor but do not separate harness connectors
- set control head temperature to "High"
- start diagnosis on channel 8 (see troubleshooting)
  - checking: 9-14
  - adjusting: 12

Turning in direction:

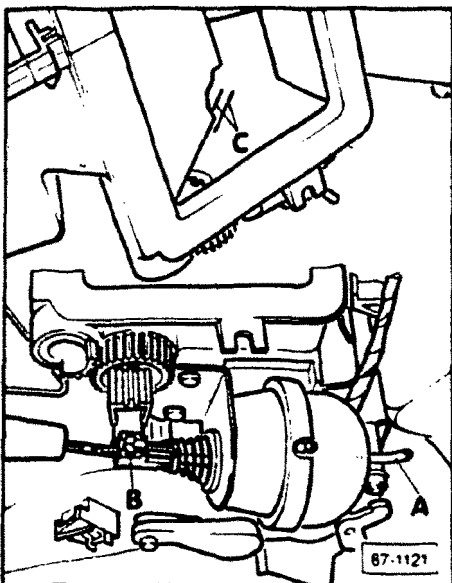
A — feedback value increases

B — feedback value decreases



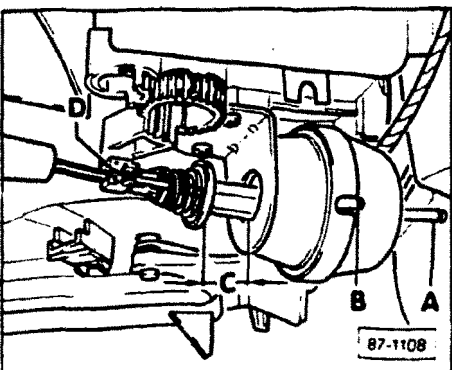
► **Fig. 5 Vacuum unit for central flap (control flap for footspace and defrost outlets), removing and installing**

- remove footspace outlet, see Index
- remove screws A (2)
- remove screw B



► **Fig. 6 Vacuum unit for central flap, adjusting (Instrument panel removed)**

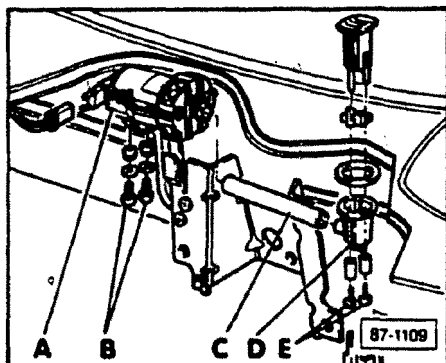
- apply vacuum at connection A
- adjust central flap setting by turning screw B until it is between marking C of the heater/fresh air housing



► **Fig. 7 Vacuum unit for central flap, adjusting (Instrument panel installed)**

- remove footspace outlet, see Index
- remove vacuum hoses from connectors A and B
- adjust by turning screw D
  - adjustment dimension C = 19 mm (0.75 in.)

Vacuum hoses (with flap adjustment), connecting, see Index



► **Fig. 8 Instrument panel temperature sensor (with blower), blower (A) removing and installing**

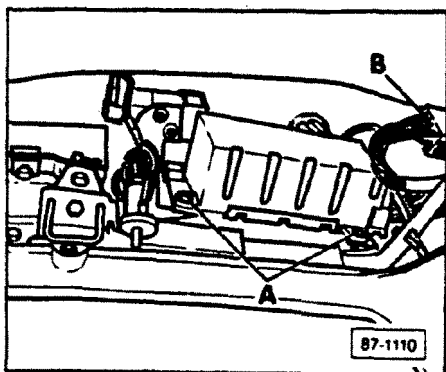
- remove glove compartment (see repair group 70)
- remove screws B (2)
- remove hose C

**Temperature sensor (D) instrument panel, removing and installing**

- remove glove compartment
- remove A/C programmer (see Fig. 9)
- remove screws E (2)
- remove hose C

**CAUTION.**

Hose C **MUST** fit properly.

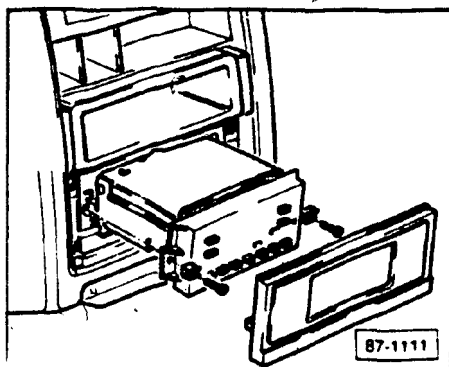


► **Fig. 9 A/C programmer, removing and installing**

- remove glove compartment (see repair group 70)
- remove center section of instrument panel
- remove driver's side storage compartment
- remove screws A (2)
- separate connector B
- separate connector for vacuum hoses (on heater, left)

**Note**

Visually inspect the connectors before making connections.

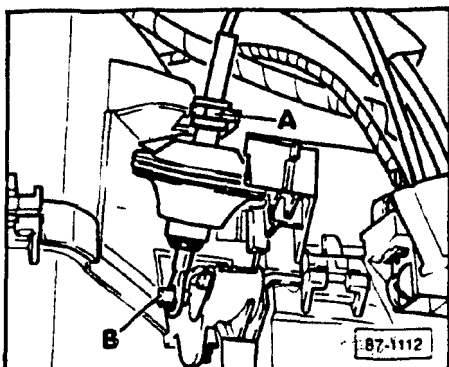


► Fig. 10 A/C control head, removing and installing

- carefully pry off trim plate with a screwdriver
- remove 2 screws

**Note**

Visually inspect the terminals before inserting the connector.



► Fig. 11 Vacuum unit for control flap (foot space/defrost), removing and installing

- remove driver's side storage compartment
- remove vacuum unit A
- disconnect vacuum unit at lever B

**THIS FRAME INTENTIONALLY LEFT**

**BLANK**

# Vacuum hoses (with flap adjustment), connecting

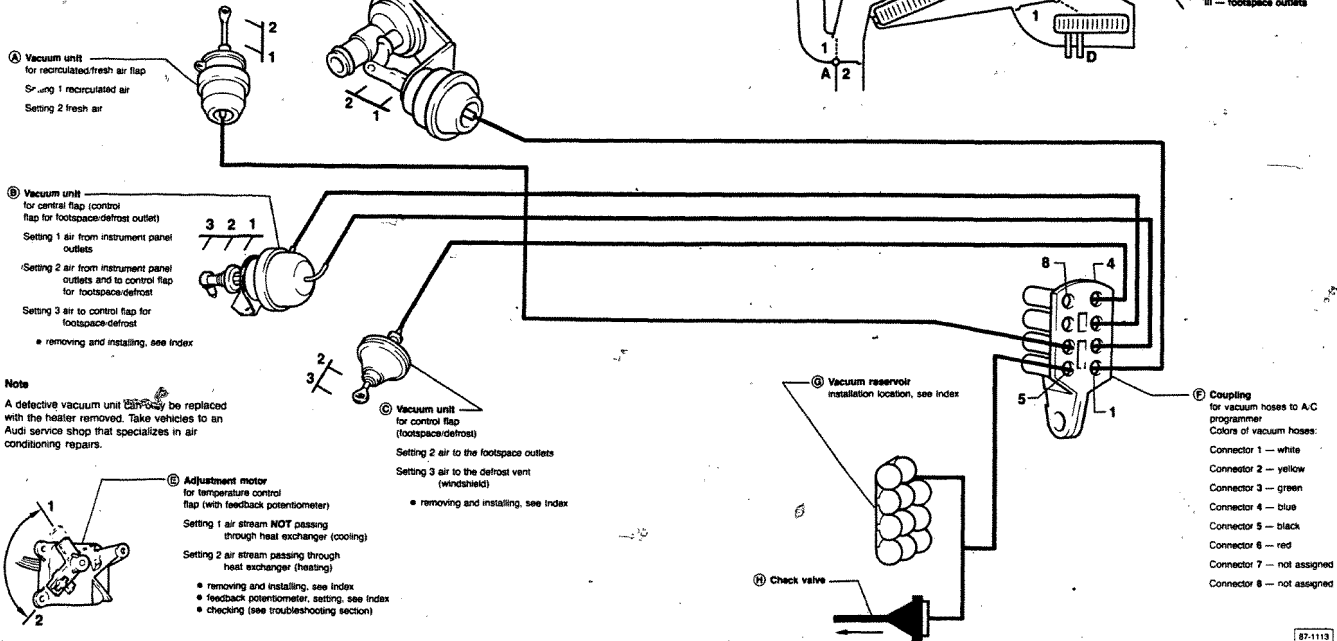
## Note

The temperature control flap adjustment motor and the vacuum unit settings are program dependent.

Air leakage is permissible for all flap settings.

## Checking — see troubleshooting section

- ① Vacuum unit with coolant check valve for heater
  - Setting 1 check valve closed
  - Setting 2 check valve open
  - removing and installing, see index



G-10

87.50

Vacuum hoses, connecting

G-11

Vacuum hoses, connecting

87.51