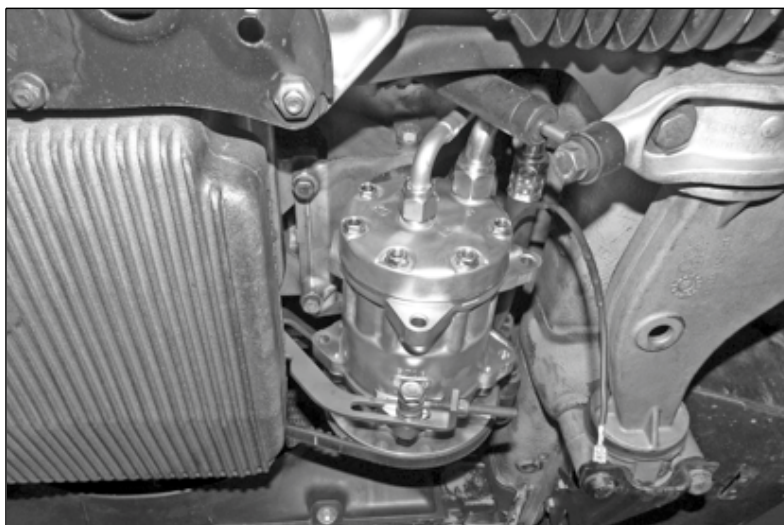


Air-Conditioning Compressor

Vehicle Type: **928/S Coupe/928 S4 Coupe/928 GT Coupe/928 GTS Coupe**

Model Year: **As of 1980 up to 1989**

Concern: **Replacing air-conditioning compressor during repairs.**



Notes: If a faulty air-conditioning compressor needs to be replaced, an air-conditioning compressor of similar design is available.

The fastening points are **not** the same as on the standard air-conditioning compressor. The high-pressure and low-pressure lines must be changed!

Parts Info: **928.126.010.71** 1 x ⇒ Air-conditioning compressor, complete, set

Also order the following, depending on model year:

928.573.089.10 Intake pipe (low-pressure hose) - 1980 to 1986

928.573.089.11 Intake pipe (low-pressure hose) - 1987 to 1989

Parts list:

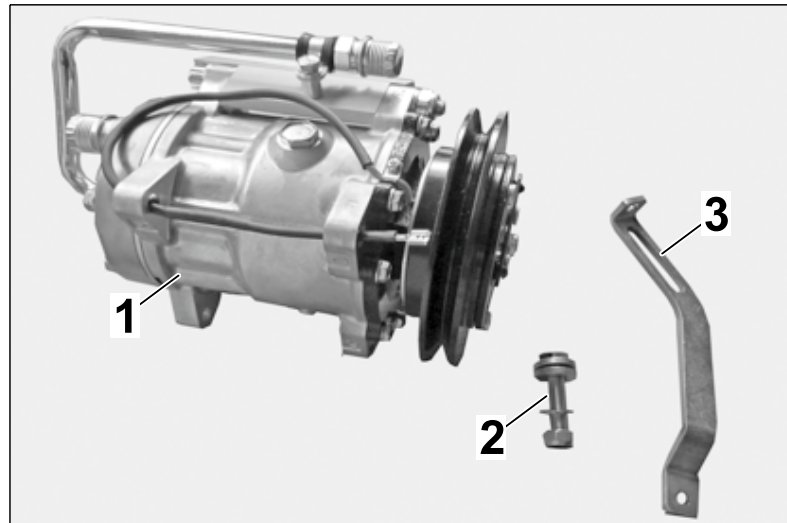


Figure 2

----	1 x	Air-conditioning compressor assembly (ASSY) ⇒ Figure 2-1-
----	1 x	Fastening material for compressor, comprising ⇒ Figure 2-2-: 1 x hexagon-head bolt, M10 X 50 DIN 933 1 x M10 hexagon nut, self-locking DIN 985 1 x M10 washer DIN 125 2 x M10 washer (25x4) DIN 7349
----	1 x	Strut ⇒ Figure 2-3-

Materials:	000.043.305.79	1 x	Refrigerant oil (as required)
	----	1 x	Refrigerant R134a, approx. 850 +/- 25 g

Tools:

- Locally available R12 Recovery Machine, or if converted to R134
- Locally available R134 Recovery Machine
- Rubber gloves (commercially available)
- Protective goggles (commercially available)
- Thermometer

WARNING

Refrigerant

- **Danger of freezing**
- ⇒ **Avoid contact with refrigerant.**
- ⇒ **Wear personal protective gear.**

- ⇒ Observe the safety regulations for working on air-conditioned vehicles and dealing with refrigerant.
- ⇒ Observe the safety regulations for extraction and filling systems.
- ⇒ Observe the instructions for repairing air conditioning systems and storing spare parts.

Work Procedure: 1 Preparatory work:

1.1 Remove air intake hose ⇒ *Figure 3-1*.

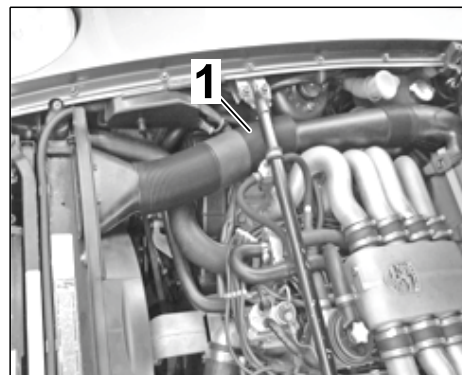


Figure 3

WARNING

Toxic substances

- Danger of poisoning or suffocation
- ⇒ Ventilate the work area well.
- ⇒ Never ingest or inhale.
- ⇒ Read specific information on the MSDS Sheet.
- ⇒ Wear personal protective gear.



Information

- On air-conditioning service equipment with a transparent oil separator, read and take note of the oil level before removing refrigerant.
 - Do not carry out this step on empty air-conditioning systems (pressure gauge approx. 0 psi/bar) because if you do, air will get into the refrigerant bottle.
 - If the vehicle is cold, it may be necessary to repeat the suction procedure until all refrigerant has been removed from the air-conditioning system. This step is carried out automatically with some units.
- 1.2 Remove refrigerant by suction. ⇒ see 8701 87 01 Connecting service equipment to the air-conditioning system.

2 Remove air-conditioning compressor.

- 2.1 Disconnect plug connection for solenoid switch ⇒ *Figure 4-1-*.

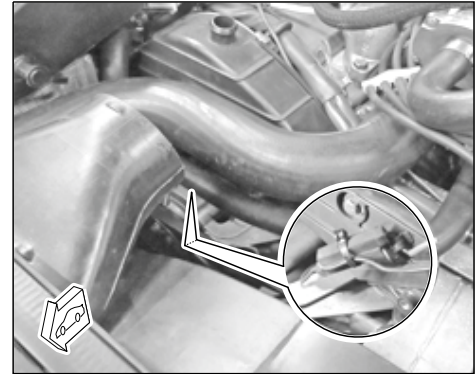


Figure 4

- 2.2 Unscrew union nut ⇒ *Figure 5-1-* from low-pressure hose.
Counter at the lock nut ⇒ *Figure 5-2-*.
- 2.3 Remove underbody panelling.

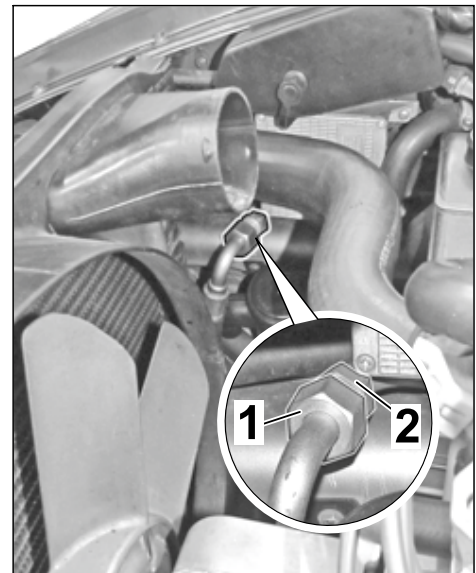


Figure 5

- 2.4 Remove strut (for air-conditioning compressor) ⇒ *Figure 6-1-*.
- 2.4.1 Slacken the air-conditioning compressor V-belt.
Unscrew M8 hexagon nut ⇒ *Figure 6-2-* and unscrew hexagon-head bolt (M10 x 33) ⇒ *Figure 6-3-*.
- 2.4.2 Unscrew hexagon-head bolt (M8 x 28) ⇒ *Figure 6-4-*.

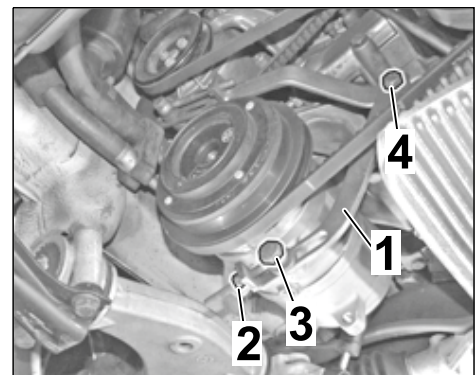


Figure 6

- 2.5 Unscrew hexagon nut ⇒ *Figure 7-1-* and remove strut (for secondary air injection pump) ⇒ *Figure 7-2-*.
- 2.6 Remove compressor.

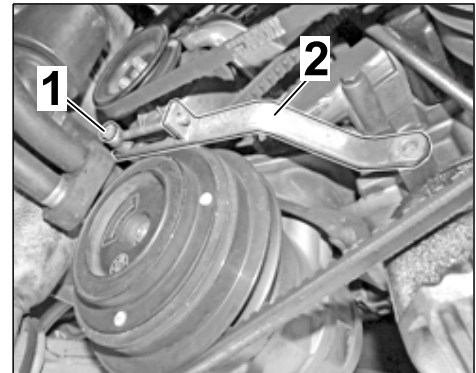


Figure 7

- 2.6.1 Unscrew hexagon-head bolts ⇒ *Figure 8-1-*.
- 2.6.2 Remove V-belt and lower the compressor.

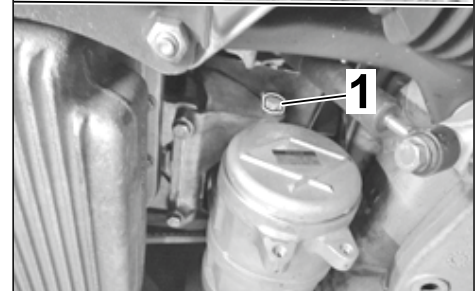
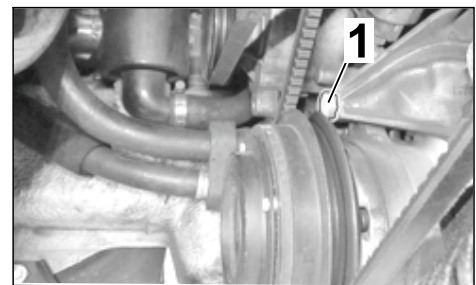


Figure 8

- 2.6.3 Unscrew union nut from high-pressure hose ⇒ *Figure 9-1-* and remove air-conditioning compressor with low-pressure hose.

- 3 Work steps for blocked/seized up air-conditioning compressor
 - 3.1 Remove desiccator.

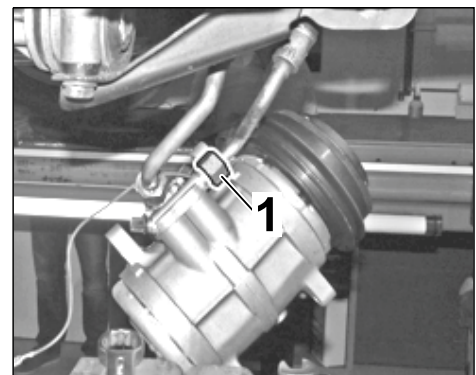


Figure 9

 **WARNING****Toxic substances**

- **Danger of poisoning or suffocation**
- ⇒ **Ventilate the work area well.**
- ⇒ **Never ingest or inhale.**
- ⇒ **Read specific information on the MSDS Sheet.**
- ⇒ **Wear personal protective gear.**

**Information**

- If there are chips in the system, the air conditioning must be flushed.
 - When using air conditioning service equipment with a flushing function, follow the procedure described in the operating instructions provided by the relevant manufacturer.
 - If you only have access to air conditioning service equipment without a flushing function, it is still possible to flush the air conditioning system in the conventional way. See description below.
- 3.2 Check connections on the condenser, on the desiccator and at the refrigerant lines for the desiccator for signs of wear/chips.
- Is there wear/chips?
- **YES:** Continue with 3.2.1
 - **NO:** Continue with 3.3

3.2.1 Remove refrigerant line between compressor and condenser.

 **WARNING****Toxic substances**

- **Danger of poisoning or suffocation**
- ⇒ **Ventilate the work area well.**
- ⇒ **Never ingest or inhale.**
- ⇒ **Read specific information on the MSDS Sheet.**
- ⇒ **Wear personal protective gear.**

3.2.2 Flush refrigerant line between the compressor and condenser using a suction and pressure adapter and commercially available acetone. The acetone dissolves the refrigerant oil in the air-conditioning line.

3.2.3 Allow the acetone to dry off in the refrigerant line.

3.2.4 Wrap bright fabric around the refrigerant line connection between the compressor and condenser and secure it on the line with a tie-wrap.

 **WARNING**

Working with compressed air

- Risk of eye injuries
 - Risk of damaging and dirtying components
- ⇒ Wear protective goggles with side eye protection.
- ⇒ Protect the point at which the compressed air emerges with suitable material.
- ⇒ Place the point at which the compressed air emerges on suitable surfaces.

3.2.5 Blow out refrigerant line between the compressor and condenser using pure compressed air (with **NO** oil or water mixed in).

3.2.6 Replace condenser and desiccator.

3.2.7 Install refrigerant line between the compressor and condenser.

3.3 Replace desiccator.

NOTICE

Too much or too little refrigerant oil in air conditioning circuit

- Reduced cooling output
 - Lack of lubrication and failure of the air conditioning compressor
- ⇒ If a new air conditioning compressor or a component in the circuit is replaced, the oil quantity must be checked and adjusted.

4 Check and measure the refrigerant oil level in the air-conditioning compressor/cooling system.

4.1 **ONLY** for air-conditioning compressor **WITHOUT** oil drain plug:
Measure refrigerant oil quantity of "old" air-conditioning compressor.

4.1.1 Open the oil filler screw on the air-conditioning compressor.

4.1.2 Fill refrigerant oil from the air-conditioning compressor into a measuring cylinder.
Turn the pressure plate on the air-conditioning compressor (not the pulley) when emptying refrigerant oil.

4.1.3 Take note of the measured refrigerant oil quantity (V_{old}).

4.2 Check the refrigerant oil quantity of the total system ($V_{total} = 170 \text{ cm}^3$) and add refrigerant oil if necessary.

- 4.2.1 Calculate the refrigerant oil quantity of the total system (air conditioning) = V_{total} using the following formula:

$$V_{\text{total}} = V_{\text{compressor new}} + (V_{\text{removed}} + V_{\text{old}}) + V_{\text{safety}}$$

- $V_{\text{total}} = \text{Filling capacity } 170 \text{ cm}^3$
- $V_{\text{safety}} = \text{Filling capacity } 20 \text{ cm}^3$

Sample calculation:

$$V_{\text{total}} (170 \text{ cm}^3) = V_{\text{compressor new}} (135 \text{ cm}^3) + V_{\text{removed}}(X1) + V_{\text{old}}(X2) + V_{\text{safety}}(20 \text{ cm}^3)$$

- 4.3 Fill the air-conditioning compressor.

- 5 Install new air-conditioning compressor.

- 5.1 Disconnect rigid line \Rightarrow *Figure 10-3-* at the compressor.

- 5.1.1 Unscrew hexagon-head bolt \Rightarrow *Figure 10-1-*.

- 5.1.2 Unscrew union nut \Rightarrow *Figure 10-2-*.

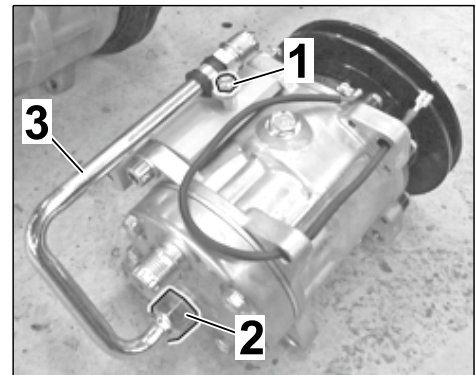


Figure 10

- 5.2 Insert air-conditioning compressor and fit using standard screws \Rightarrow *Figure 11-2-* at the front \Rightarrow *Figure 11-1-* and rear \Rightarrow *Figure 11-2-*.

- 5.3 Set position of high-pressure hose and screw on securely.

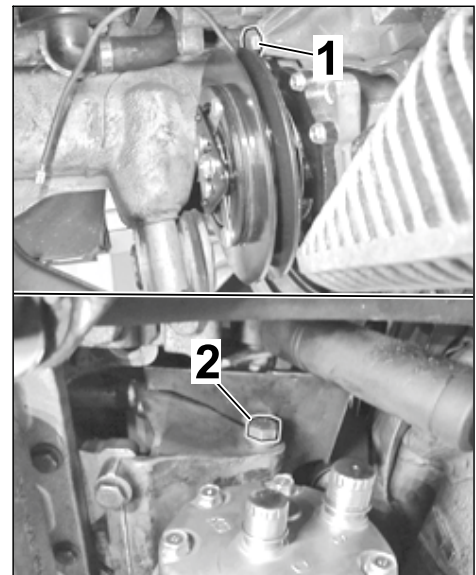


Figure 11

- 5.3.1 Screw union nuts ⇒ *Figure 12-3-* from high-pressure hose ⇒ *Figure 12-2-* on the rigid line ⇒ *Figure 12-1-*.

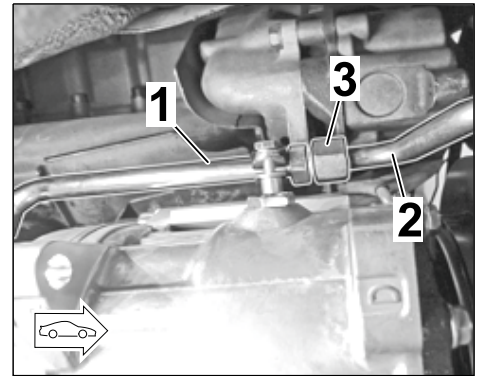


Figure 12

- 5.3.2 Set distance **X** between collar on high-pressure hose ⇒ *Figure 13-1-* and center of pulley ⇒ *Figure 13-2-*.

X – = 87 mm

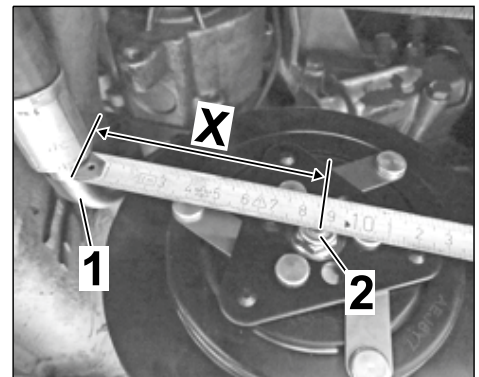


Figure 13

- 5.3.3 Mark position of the lines ⇒ *Figure 14-1-*.

- 5.3.4 Remove rigid line from the compressor.

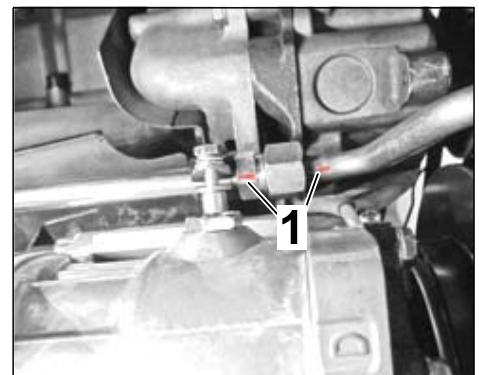


Figure 14

- 5.3.5 Position rigid line \Rightarrow *Figure 15-2-* and high-pressure hose \Rightarrow *Figure 12-1-* with respect to each other in accordance with the markings.

Tighten union nut.

**Tightening torque 36 Nm
(27 ftlb.) +/-3 Nm (+/-2 ftlb.)**

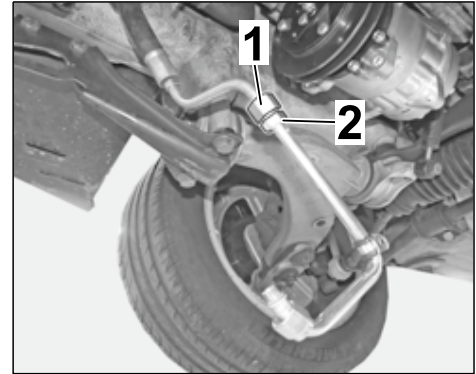


Figure 15

- 5.3.6 Screw rigid line securely on the compressor.

- 1 - Union nut
2 - Screw, M6

Union nut \Rightarrow *Figure 16-1-*:

**Tightening torque 36 Nm
(27 ftlb.) +/-3 Nm (+/-2 ftlb.)**

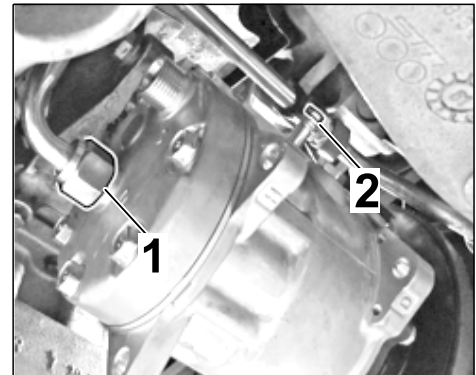


Figure 16

- 5.4 Install new low-pressure hose \Rightarrow *Figure 17-1-*.

- 5.4.1 Route low-pressure hose upwards. Screw in union nut \Rightarrow *Figure 17-2-* on connecting line (on vehicle side) loosely by hand.

- 5.4.2 Route low-pressure hose above the high-pressure hose to the rear to the compressor \Rightarrow *Figure 17-3-*.

Tighten union nut on the compressor.

**Tightening torque 33 Nm
(24 ftlb.) +/-3 Nm (+/-2 ftlb.)**

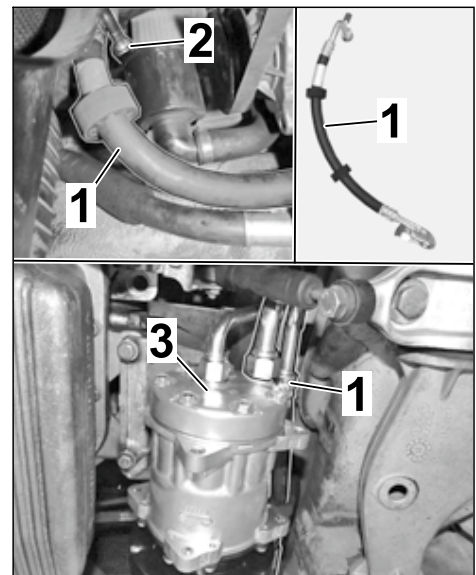


Figure 17

- 5.5 Insert strut (for secondary air injection pump) ⇒ *Figure 18-3-*.
- 5.5.1 Fit V-belt for compressor ⇒ *Figure 18-1-*.
- 5.5.2 Loosen hexagon nut ⇒ *Figure 18-2-*.
- 5.5.3 Position strut and screw in hexagon-head bolt ⇒ *Figure 18-4-*.

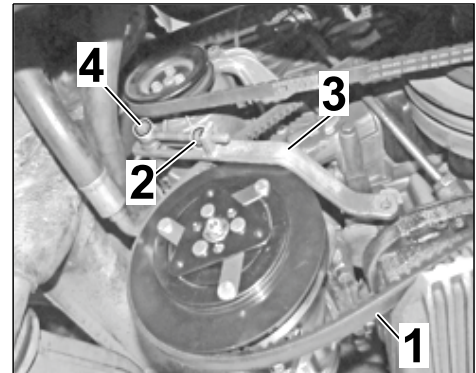


Figure 18

- 5.6 Install new strut (for air-conditioning compressor) ⇒ *Figure 19-2-*. Screw in hexagon-head bolt ⇒ *Figure 19-1-* loosely by hand.
- 5.7 Tension the air-conditioning compressor V-belt.

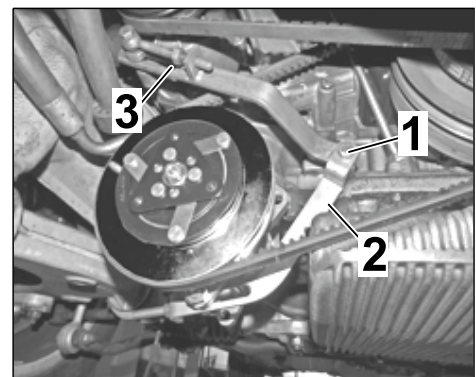


Figure 19



Information

Re-use eye bolt ⇒ *Figure 20-5-* and hexagon nut ⇒ *Figure 20-6-* from the standard tensioning device.

5.7.1 Fit tensioning device for V-belt ⇒ *Figure 20-6-* for air-conditioning compressor.

- 1 – M10 hexagon nut, self-locking DIN 985
- 2 – M10 washer DIN 125
- 3 – M10 washers (25x4) DIN 7349
- 4 – Hexagon-head bolt, M10 X 50 DIN 933
- 5 – Eye bolt
- 6 – Hexagon nut, M8

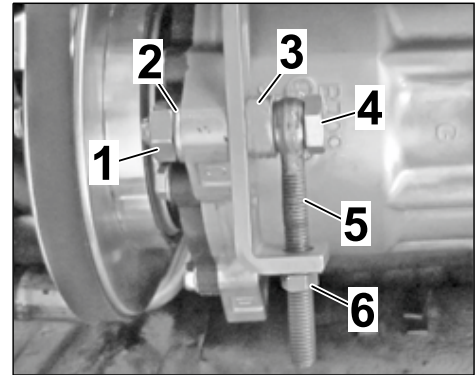


Figure 20

5.7.2 Check the tension by pressing your thumb in the centre of the V-belt. The belt should press in by approx. 10 mm.

5.7.3 Secure the air-conditioning compressor.

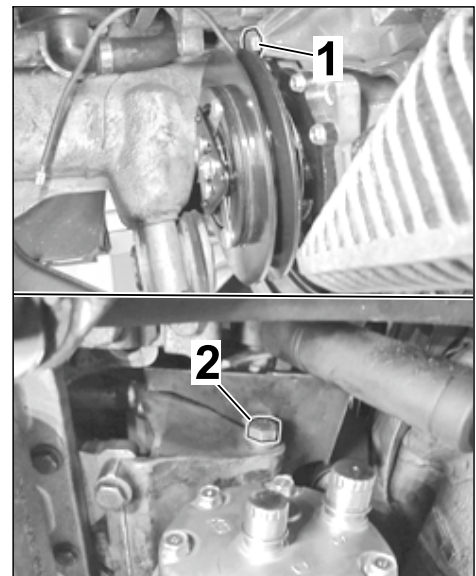


Figure 21

- 5.7.4 Tighten hexagon-head bolt ⇒ *Figure 22-1-*.
- 5.8 Tension V-belt for secondary air injection pump.
- 5.9 Connect plug connection for solenoid switch.

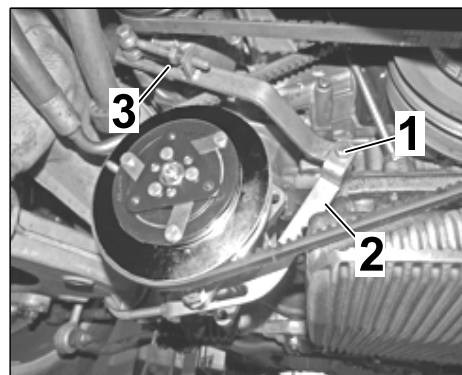


Figure 22

- 6 Screw on and tighten union nut ⇒ *Figure 23-1-* on low-pressure hose. Counter at the lock nut ⇒ *Figure 23-2-*.

- 7 Fill the air-conditioning system and perform function test.

- 7.1 Connect high-pressure line and low-pressure line from the air-conditioning service station to the respective valve.

- 7.2 Add refrigerant oil.

- 7.2.1 **ONLY** for equipment **WITH** integrated oil filling system:

- Enter the measured refrigerant oil quantity.
- Allow the equipment to take in the refrigerant oil.

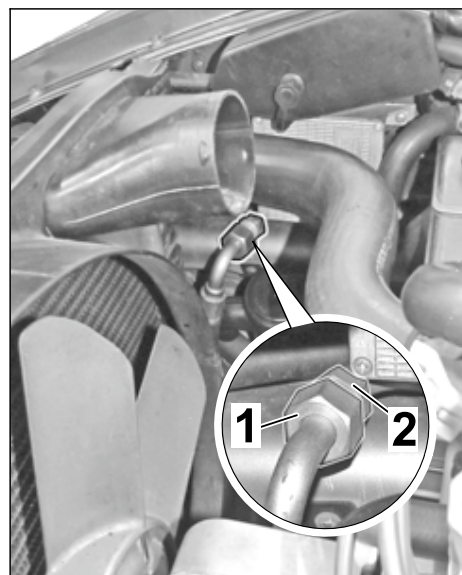


Figure 23

- 7.2.2 **ONLY** for equipment **WITHOUT** integrated oil filling system:

- Start the vacuum pump.
- At the start of the vacuum phase, add the measured quantity of refrigerant oil using an oil injector or a hose disconnected from the servicing equipment.
- Re-connect the hose to the servicing equipment immediately after adding the oil.

- 7.3 Evacuate the air-conditioning system.

- 7.3.1 Evacuate the air-conditioning system for at least 20 minutes.

- 7.3.2 If the air-conditioning system was open for a long time, evacuate the system for up to 120 minutes.

NOTICE**Excessively high pressure in refrigerant circuit**

- **Risk of damage to air-conditioning compressor**

⇒ **Do not allow the low-pressure gauge to exceed Nominal value 43.5psi bar (3) at any time.**

7.4 Fill the air-conditioning system.

7.4.1 Using the servicing equipment, add the refrigerant quantity stated in the manual into the air-conditioning lines.

Refrigerant quantity: **Filling capacity 850 g +/-25 g**

7.4.2 Start the engine and carry out a leak test.

7.4.3 Check the performance of the new air-conditioning compressor.

- 1 – Low-pressure display
- 2 – High-pressure display

- Low pressure at an engine speed of approx. 950 – 2,000 rpm = approx. 14.5 – 29 psi (1.0 – 2.0 bar)
- High pressure at an engine speed of approx. 950 – 2,000 rpm = approx. 174 – 290 psi (12.0 – 20.0 bar)

To reach the high pressure values, switch off/disconnect the condenser blower if necessary.

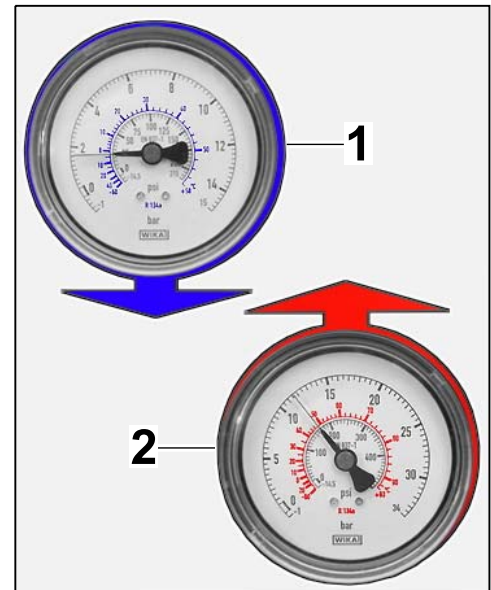


Figure 24

- 7.4.4 Temperature measurement on dashboard.
 - Temperature difference in the centre vent area (dashboard) after approx. 20 minutes = approx. 41° F (15°)C.

8 Concluding work

- 8.1 Disconnect high-pressure line and low-pressure line from the air-conditioning service station.
- 8.2 Screw protection caps onto the respective valve.



Figure 25

- 8.3 Install air intake hose ⇒ Figure 26 -1-.
- 8.4 Install underbody panelling.

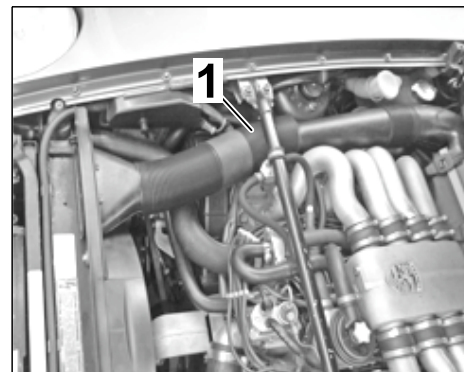


Figure 26

87031700: Refrigerant drained and filled
 Without:
 Includes: Checking leak-tightness using leak tester
 Checking cooling output of air-conditioning system.

Labor time: **130 TU**

87345500: Compressor replaced
 Includes: Replacing intake pipe (low-pressure hose).
 Without: Draining and filling refrigerant.

Labor time: **133 TU**

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