

A/C-HEATER SYSTEM - MANUAL

Article Text

1989 Volkswagen Golf
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Monday, August 23, 1999 11:36PM

ARTICLE BEGINNING

1989 MANUAL A/C- HEATER SYSTEMS
Volkswagen

Golf, Golf GT, GTI,

*** PLEASE READ THIS FIRST ***

CAUTION: When discharging air conditioning system, use only approved refrigerant recovery/recycling equipment. Make every attempt to avoid discharging refrigerant into the atmosphere.

A/C SYSTEM SPECIFICATIONS

A/C SYSTEM SPECIFICATIONS TABLE

Application		Speci fications
System Type	.....	Cycling Clutch
Compressor Type	.....	Sanden 5-Cylinder
R-12 Capacity	.....	38-40 oz.
Oil Capacity	.....	4.6 oz.
A/C Belt Deflection	.....	(1) 3/16" (4.8 mm)
Normal Operating Pressures		
Low Side	.....	26-40 psi (1-2 kg/cm ²)
High Side	.....	150-210 psi (10.5-19 kg/cm ²)

(1) - Deflection in center of belt between A/C compressor pulley and crankshaft pulley.

DESCRIPTION

The Volkswagen air conditioning system is a cycling clutch type. The compressor is cycled on and off by a thermostatic switch to maintain constant cooling rate. Other components include an evaporator, expansion valve, receiver-drier, control panel, condenser, high pressure switch and a low pressure switch.

The control panel includes a pair of levers and a fan control switch. The upper lever operates air distribution flap. The lower lever controls temperature selection. The rotary fan control switch controls fan speed selection.

SYSTEM CONTROLS OPERATION

AIR DISTRIBUTION LEVER

When in "A/C" position, cool air is routed to registers and side air vents. In "BI-LEV" position, cool air is routed to floor

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vents as well as registers and side air vents. In "HEAT" position, warm air is routed to windshield vents, side window nozzles, floor and center registers. In "DEFOG" position, warm air is routed to windshield vents, side window nozzles and side registers.

FAN CONTROL KNOB

The fan control knob controls airflow. As knob is turned clockwise, air intake opens and fan operates, increasing speed as knob is moved to extreme right position.

TEMPERATURE CONTROL LEVER

The temperature control lever controls heat and cooling. When moved to the left, lever turns compressor on. When moved to the right, a heater water valve is opened, supplying hot coolant to heater core.

HIGH PRESSURE SWITCH OPERATION

High pressure switch shuts compressor off if high pressure reaches 210 psi (14.8 kg/cm²). High pressure switch will reset when pressure reduces to 174 psi (12.2 kg/cm²).

LOW PRESSURE SWITCH OPERATION

Low pressure switch cuts off system operation when there is abnormally low pressure in system. This protects the compressor when there is not enough R-12 in system. Low pressure switch shuts compressor off at 26 psi (1.8 kg/cm²).

THERMOSWITCH OPERATION

Thermoswitch shuts compressor off if coolant temperature rises above 248°F (120°C).

MICROSWITCH ADJUSTMENT

Loosen microswitch mounting screw, and move microswitch so switch is on when lever is at "MAX A/C", "NORM", "BI-LEV" or extreme right positions, and off when lever is at "VENT" or "HEAT" positions. Tighten microswitch mounting screw. Recheck operation.

TEMPERATURE SWITCH ADJUSTMENT

Move temperature lever to full cool position. Loosen temperature switch mounting screw. Move temperature switch counterclockwise to full stop position. Tighten temperature switch mounting screw.

NO COOLING TEST

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1) Check that fan motor operates in all 4 speeds, air duct closes off outside air and heater water valve is closed. Adjust belt tension.

2) Inspect receiver-drier pressure seal. If seal is good, go to step 5). If seal is broken, evacuate and recharge system. If system cools properly, testing is complete. If system does not cool, connect pressure gauges.

3) Set engine speed at 2500 RPM. Insert thermometer in left register and close all others. Place controls on high blower and maximum cooling. With vehicle out of direct sunlight, close all windows. Radiator fan should come on with system pressure at 200 psi (14 kg/cm²).

NOTE: If system doors allow air leaks, evaporator will freeze up and testing will not be possible.

4) If fan does not operate, replace pressure switch. Check that system is okay. If fan does come on, turn engine off and check for condenser obstructions and blocked airflow.

5) Turn air conditioner on and off with temperature control lever. Check that compressor clutch engages. Push lever to extreme right position and back again. A click should be heard from compressor clutch. If not, check for voltage at clutch coil wire with switch on. If voltage is present, replace clutch coil. If not, check wiring or replace thermostatic switch.

6) If compressor clutch operates, check gauge readings. If both are low, locate leak and recharge system. If both are high, replace expansion valve. If low side is too high and high side reads too low, replace or rebuild compressor.

INSUFFICIENT COOLING TEST

1) Check that fan motor operates at all 4 speeds, air duct closes off outside air intake and heater water valve is closed. Adjust compressor belt tension and clean condenser.

NOTE: If system doors allow air leaks, evaporator will freeze up and testing will not be possible.

2) Adjust engine speed to 2500 RPM. Position controls for maximum cooling and high blower. Insert thermometer in left register and close all other ducts. With vehicle out of sun, close all windows and doors. Connect pressure gauges and check readings.

3) If both gauges read too high, replace expansion valve. If both read too low, recharge system after locating leak. If both readings are normal, go to next step. If pressure side is too high and suction side is normal, go to step 5). If pressure side is too low and suction side is too high, go to step 6). If pressure side is normal and suction side is too low, go to step 7).

4) Turn compressor off and observe gauges. If readings equalize in 30 seconds, replace compressor. If readings take longer to

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equalize, check that capillary installation in evaporator is 7" (178 mm) long on all models.

5) If installation is correct, run system at maximum cooling for 15 minutes. If thermometer indicates temperature below 36°F (2°C) when compressor is turned off, or temperature is above 48°F (9°C) with compressor on, replace temperature switch.

6) Check condenser fins and clean or straighten. If operation is still not correct, discharge system using approved refrigerant recovery/recycling equipment, until bubbles show in sight glass. Recharge until bubbles disappear and recheck pressures. If still incorrect, locate leaks and tighten fittings. Discharge system using approved refrigerant recovery/recycling equipment, evacuate to remove all air and recharge system.

7) Check for bubbles at sight glass. If present, repair leaks and recharge system. If no bubbles, check condenser-to-expansion valve line for kinks and repair if necessary. Feel along line from condenser-to-expansion valve. If there are no cold spots, replace expansion valve.

8) If cold spot is felt, remove and flush out lines and condenser. Check for bubbles at sight glass. If there are no bubbles present, replace compressor. If bubbles are present, check for leaks. Repair and recharge system.

INTERMITTENT COOLING TEST

1) Check that fan motor operates in all 4 speeds, air duct closes off outside air and heater water valve is closed. Adjust belt tension and clean condenser.

NOTE: If system doors allow air leaks, evaporator will freeze up and no testing will be possible.

2) Adjust engine speed to 2500 RPM. Set controls for maximum cooling and high fan. Insert thermometer in left air duct and close all other ducts. With vehicle under shade, close windows and doors and connect pressure gauges. Operate system for 10 minutes.

3) Check for cool air from left duct. Low pressure gauge should read more than 16 psi (1.1 kg/cm²). If not, hold hands around expansion valve to warm valve. If pressure rises, moisture is present in system. Discharge, evacuate and recharge system using approved refrigerant recovery/recycling equipment. If pressure does not rise, go to next step.

4) Check temperature on thermometer when thermostatic switch turns compressor off. If temperature is 39°F (4°C), system is okay. If lower than 39°F (4°C), check that capillary tube installed length is 7" (178 mm). If installation is correct, replace thermostatic switch.

REMOVAL & INSTALLATION

NOTE: Removal and installation procedures are not available from manufacturer.

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WIRING DIAGRAMS

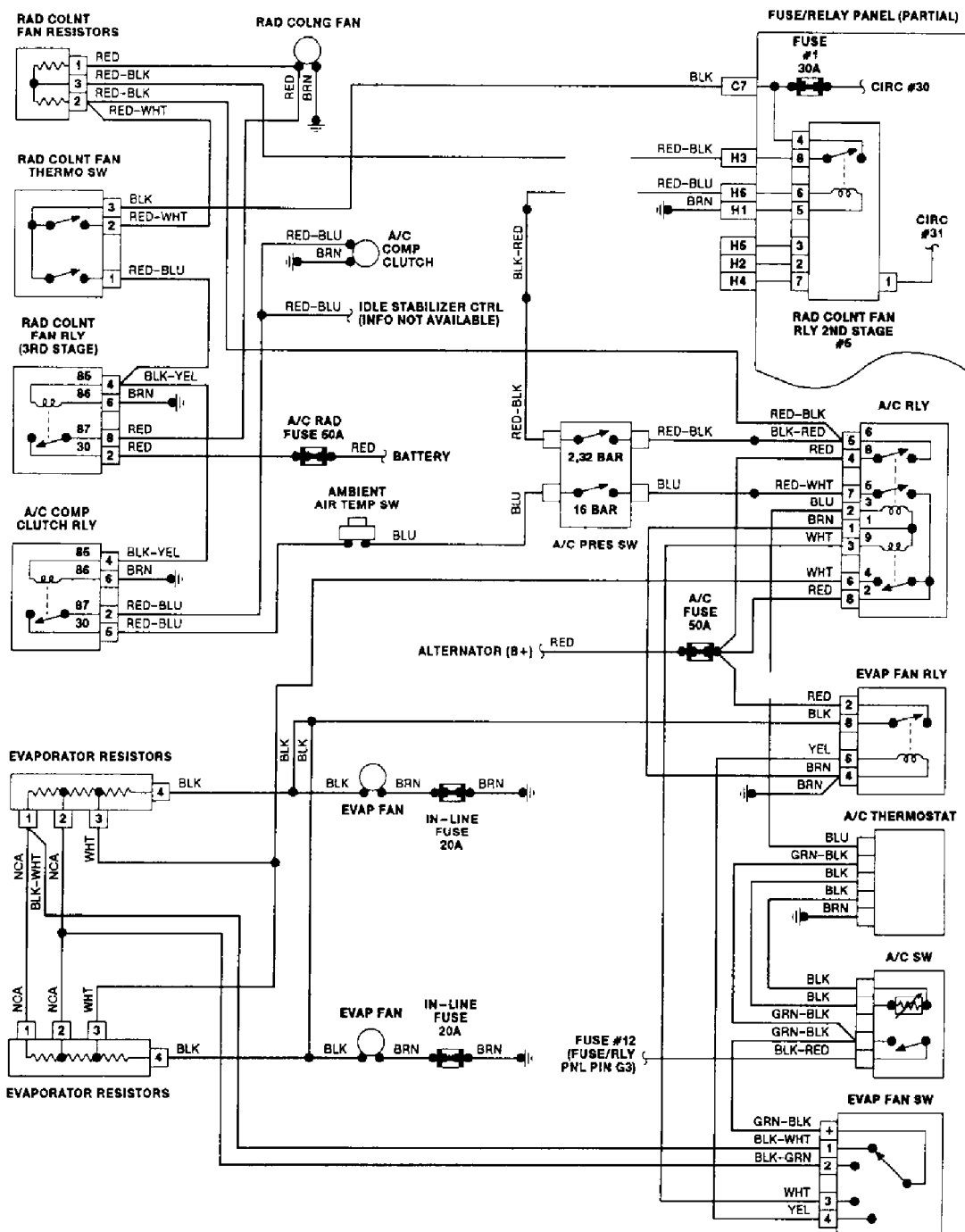


Fig. 1: Golf & GTI Manual A/C-Heater System Wiring Diagram
Courtesy of Volkswagen United States, Inc.

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