

A/C COMPRESSOR OIL CHECKING

Article Text

1989 Volkswagen Golf

For Volkswagen Technical Site

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Monday, August 23, 1999 11:35PM

ARTICLE BEGINNING

1989 GENERAL SERVICING

Compressor Refrigerant Oil Checking

*** 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.

ISOLATING COMPRESSOR

NOTE: Only compressors with stem-type service valves can be isolated.

1) Connect service gauge set to the compressor service valves and open compressor valves slightly (turn in clockwise). Start engine and operate air conditioning. Slowly turn compressor suction valve clockwise toward closed (front-seated) position.

2) When suction pressure is reduced to zero or less, turn off engine and compressor and quickly turn suction valve stem in to full front-seated position. Suction pressure should be slightly above zero. Turn discharge valve into front-seated position.

3) To check oil level, slowly open compressor crankcase plug to relieve any remaining pressure. After oil level is corrected, cap service gauge ports on both valves. Back-seat suction service valve to allow refrigerant to enter compressor. Open discharge valve halfway.

4) Loosen discharge service valve cap, allowing refrigerant pressure to force air out of compressor. Back-seat service valve and tighten cap. Compressor is now ready for operation.

REFRIGERANT OIL

Only new, pure, moisture-free refrigerant oil should be used in the air conditioning system. This oil is highly refined and dehydrated to a point where moisture content is less than 10 parts per million. The oil container must be tightly closed at all times when not in use, or moisture will be absorbed into the refrigerant oil from the air.

DISCHARGING SYSTEM PRECAUTIONS

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

If compressor has stem-type service valves, it can be isolated and removed without discharging entire system. Otherwise, discharge system completely using approved refrigerant

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recovery/recycling equipment before loosening any fittings.

DISCONNECTING LINES & FITTINGS TEST

After system is discharged, carefully clean area around all fittings to be opened. Always use 2 wrenches when tightening or loosening fittings to avoid twisting or distorting lines. Cap or plug all openings as soon as lines are removed. Do not remove caps until immediately before connections are made. This will keep entry of air and moisture to a minimum.

CONNECTING LINES AND FITTINGS

A new gasket or "O" ring should be used in all instances when connecting lines or fittings. Dip "O" ring in new refrigerant oil and ensure it is not twisted during installation. Always use 2 wrenches to prevent damage to lines and fittings.

PLACING SYSTEM IN OPERATION

After component service or replacement has been completed and all connections have been made, evacuate system thoroughly with a vacuum pump. Charge system with proper amount of refrigerant and perform a leak test. See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities. Be sure to check all fittings that have been opened. After system has been leak tested, make a system performance check.

NOTE: Air conditioning systems will not normally need addition of refrigerant oil unless definite oil loss has occurred due to ruptured lines, leaking compressor seals, compressor overhaul or component replacement.

ATSUGI ROTARY VANE DRAIN & REFILL

1) Before checking and adjusting oil level, operate compressor at engine idling speed, with controls set for maximum cooling and high blower speed, for 20 to 30 minutes to return oil to compressor.

2) Stop engine, discharge refrigerant using approved refrigerant recovery/recycling equipment and remove compressor from vehicle. Drain compressor oil from compressor discharge port and measure the amount. Oil is sometimes hard to drain when compressor is cool. Remove oil while compressor is warm.

3) If the amount drained is less than 3 ounces, conduct leak tests at system connections, and if necessary, repair or replace faulty parts. Check purity of oil and adjust oil level as follows.

4) If amount drained was above 3 ounces, oil level is right. Pour in same amount as was drained. If amount drained was below 3 ounces, pour in 3 ounces of new refrigerant oil.

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BOSCH 6-CYL DRAIN & REFILL

1) Before checking and adjusting oil level, operate compressor at engine idling speed, with controls set for maximum cooling and high blower speed, for 20 to 30 minutes to return oil to compressor.

2) Stop engine and discharge refrigerant using approved refrigerant recovery/recycling equipment. Remove refrigerant oil level inspection plug on side of compressor. Oil should be at lower lip of threaded hole. Add necessary new refrigerant oil (if low). Replace inspection plug and tighten to 10-12 ft. lbs. (14-16 N.m).

DIESEL KIKI ROTARY VANE DRAIN & REFILL

1) Before checking and adjusting oil level, operate compressor at engine idling speed, with controls set for maximum cooling and high blower speed, for 20 to 30 minutes to return oil to compressor.

2) Stop engine, discharge refrigerant using approved refrigerant recovery/recycling equipment and remove compressor from vehicle. Drain compressor oil from compressor discharge port and measure the amount. Oil is sometimes hard to drain when compressor is cool. Remove oil while compressor is warm.

3) If the amount is less than 2.4 ounces, conduct leak tests at system connections, and if necessary, repair or replace faulty parts. Check purity of oil and adjust oil level as follows.

4) If amount drained was above 2.4 ounces, oil level is right. Pour in same amount as was drained. If amount drained was below 2.4 ounces, pour in 2.4 ounces of new refrigerant oil.

DIESEL KIKI 6-CYL DRAIN & REFILL

1) Before checking and adjusting oil level, operate compressor at engine idling speed, with controls set for maximum cooling and high blower speed, for 20 to 30 minutes to return oil to compressor.

2) Stop engine, discharge refrigerant using approved refrigerant recovery/recycling equipment and remove compressor from vehicle. Remove oil drain plug and drain oil. Measure amount of oil drained. Install drain plug with new "O" ring.

3) If amount drained was more than 2 ounces, refill with same amount of new oil. If amount drained was less than 2 ounces, refill with 2 ounces. Install filler plug and recharge system.

HARRISON 4-CYL DRAIN & REFILL

NOTE: The Harrison compressor does NOT have an oil sump. It's crucial that the compressor remains well oiled. It takes very little time to destroy this compressor if it runs dry.

The Harrison 4-cyl compressor is charged (new) with 6 ounces

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of refrigerant oil. Because compressor does not have an oil sump, it should not have to be removed for oil measurement (it retains very little oil). Note the following situations for checking and adding oil to this compressor.

NO OIL LEAK; REPLACING COMPONENTS

If only the compressor is to be replaced, remove, drain oil, measure and reinstall an equal amount of new oil. If evaporator is being replaced, add 3 ounces of new oil. If condenser is being replaced, add one ounce.

LOSS OF REFRIGERANT OVER EXTENDED PERIOD

When a loss of refrigerant has occurred over an extended period of time and a component is being replaced to correct the leak, add an appropriate amount of refrigerant oil to the component.

SIGNS OF EXCESSIVE OIL LEAKAGE

If system has lost excessive oil, remove accumulator. Drain and measure oil. If more than 3 ounces is measured, replace the same amount of new oil as was drained. If less than 3 ounces is measured, add 3 ounces of new oil. Add and additional 2 ounces of new oil to compensate for that lost by replacing the accumulator (held in desiccant).

HARRISON 6-CYL DRAIN & REFILL

1) If system is operable, run for several minutes to stabilize system before performing repairs. Turn off engine, discharge system using approved refrigerant recovery/recycling equipment and remove compressor. Remove drain plug. Drain and measure oil.

2) If amount drained was 7 ounces or more, add the same amount of new refrigerant oil. If less than 7 ounces was drained, add 7 ounces of new refrigerant oil to compressor.

3) If air conditioner components are replaced, refrigerant oil will need to be added to system. Add 3 ounces if condenser or evaporator is replaced. Add one ounce if drier is replaced.

NOTE: If oil drained contains metal chips or other debris, replace receiver-drier. Flush out system before evacuating and recharging.

HITACHI 6-CYL DRAIN & REFILL

1) Before checking and adjusting oil level, operate compressor at engine idling speed, with controls set for maximum cooling and high blower speed, for 10 minutes to return oil to compressor.

2) Stop engine, discharge refrigerant using approved

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refrigerant recovery/recycling equipment and remove compressor from vehicle. Drain oil from compressor suction port. Measure amount of oil drained. If amount drained was more than 2.4 ounces, refill with same amount of new oil. If amount drained was less than 2.4 ounces, refill with 2.4 ounces. Install compressor and recharge.

MATSUSHITA ROTARY VANE DRAIN & REFILL

Discharge system using approved refrigerant recovery/recycling equipment. Remove compressor from vehicle. Drain oil from compressor through inlet and outlet holes. Refill compressor with 3.4-4.7 ounces of oil through suction port. When replacing evaporator, add 2 ounces. When replacing other A/C components, add 1.4 ounces per component replaced.

NIPPONDENSO 6 & 10-CYL DRAIN & REFILL

When inspecting system for oil loss, look for signs of leaking (shiny, wet spots on components or underside of hood). If oil leak is noted or component replacement is required, use the following procedure as indicated:

NO OIL LEAK

Discharge system using approved refrigerant recovery/recycling equipment and change components as necessary. Add refrigerant oil to components as necessary.

OIL LEAK

1) Slowly discharge system using approved refrigerant recovery/recycling equipment. Repair or replace faulty components. If equipped with a drain plug, remove plug, drain and discard oil. If not equipped with a drain plug, remove compressor from vehicle and pour oil out suction and discharge ports.

2) Replace drain plug (if equipped). Add 1.5 ounces of new refrigerant oil through suction port. Use new gaskets or "O" rings when replacing suction and discharge lines.

COMPRESSOR FAILURE OR SYSTEM CONTAMINATED

If either situation exists, discharge system using approved refrigerant recovery/recycling equipment and remove compressor, receiver-drier and expansion valve. Clean expansion valve screen. Flush entire system. Install new compressor and receiver-drier. New compressors contain correct amount of oil. If installing overhauled compressor, add 1.5 ounces of new refrigerant oil through suction port.

SANDEN SCROLL DRAIN & REFILL

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Discharge system using approved refrigerant recovery/recycling equipment. Remove compressor from vehicle. Drain oil from compressor through inlet and outlet holes. Refill compressor with 2.8 ounces of oil through suction port. When replacing condenser, add .5 ounce. When replacing evaporator, add 1.7 ounces. When replacing other A/C components, add .5 ounce per component replaced.

SANDEN 5-CYL DRAIN & REFILL

1) Discharge system using approved refrigerant recovery/recycling equipment. Remove compressor belt and loosen mounting bolts. Rotate compressor in brackets until filler plug is at top. Clean area around filler plug and remove plug slowly. Rotate front hub plate so notch in lobe is 110 degrees from the bottom. This rotates ball end of top piston to align with oil fill port and allows clearance for dipstick. See Fig. 1.

2) Insert compressor dipstick diagonally from right to left until stop on dipstick contacts filler plug surface. Remove dipstick and note oil fill level. Each increment on dipstick represents one ounce of oil. Add oil if necessary to reach 3-4 ounce level.

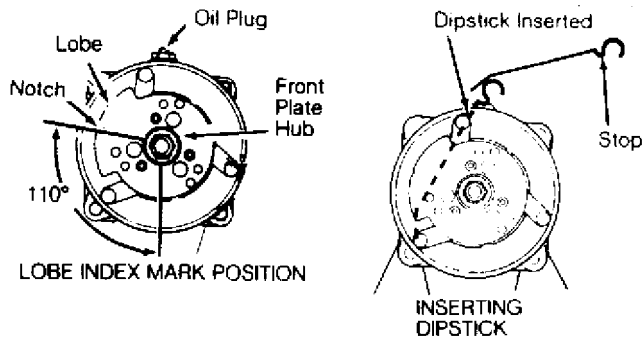


Fig. 1: Sanden 5-Cylinder Oil Level Checking
Courtesy of Sanden International U.S.A, Inc.

END OF ARTICLE