

HEATING AND AIR CONDITIONING

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DESCRIPTION AND OPERATION

SERVICE WARNINGS AND PRECAUTIONS

WARNING:

- THE AIR CONDITIONING SYSTEM CONTAINS REFRIGERANT UNDER HIGH PRESSURE. SEVERE PERSONAL INJURY MAY RESULT FROM IMPROPER SERVICE PROCEDURES. REPAIRS SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.

- AVOID BREATHING THE REFRIGERANT AND REFRIGERANT OIL VAPOR OR MIST. EXPOSURE MAY IRRITATE THE EYES, NOSE, AND/OR THROAT. WEAR EYE PROTECTION WHEN SERVICING THE AIR CONDITIONING REFRIGERANT SYSTEM. SERIOUS EYE INJURY CAN RESULT FROM DIRECT CONTACT WITH THE REFRIGERANT. IF EYE CONTACT OCCURS, SEEK MEDICAL ATTENTION IMMEDIATELY.

- DO NOT EXPOSE THE REFRIGERANT TO OPEN FLAME. POISONOUS GAS IS CREATED WHEN REFRIGERANT IS BURNED. AN ELECTRONIC LEAK DETECTOR IS RECOMMENDED.

- IF ACCIDENTAL SYSTEM DISCHARGE OCCURS, VENTILATE THE WORK AREA BEFORE RESUMING SERVICE. LARGE AMOUNTS OF REFRIGERANT RELEASED IN A CLOSED WORK AREA WILL DISPLACE THE OXYGEN AND CAUSE SUFFOCATION.

- THE EVAPORATION RATE OF R-134a REFRIGERANT AT AVERAGE TEMPERATURE AND ALTITUDE IS EXTREMELY HIGH. AS A RESULT, ANYTHING THAT COMES IN CONTACT WITH THE REFRIGERANT WILL FREEZE. ALWAYS PROTECT THE SKIN OR DELICATE OBJECTS FROM DIRECT CONTACT WITH THE REFRIGERANT.

- THE R-134a SERVICE EQUIPMENT OR THE VEHICLE REFRIGERANT SYSTEM SHOULD NOT BE PRESSURE TESTED OR LEAK TESTED WITH COMPRESSED AIR. SOME MIXTURES OF AIR AND R-134a HAVE BEEN SHOWN TO BE COMBUSTIBLE AT ELEVATED PRESSURES. THESE MIXTURES ARE POTENTIALLY DANGEROUS, AND MAY RESULT IN FIRE OR EXPLOSION CAUSING INJURY OR PROPERTY DAMAGE.

DESCRIPTION AND OPERATION (Continued)

CAUTION:

- Liquid refrigerant is corrosive to metal surfaces. Follow the operating instructions supplied with the service equipment being used.
- Never add R-12 to a refrigerant system designed to use R-134a. Damage to the system will result.
- R-12 refrigerant oil must not be mixed with R-134a refrigerant oil. They are not compatible.
- Do not use R-12 equipment or parts on the R-134a system. Damage to the system will result.
- Do not overcharge the refrigerant system. This will cause excessive compressor head pressure and can cause noise and system failure.
- Recover the refrigerant before opening any fitting or connection. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.
- Do not remove the secondary retention clip from any spring-lock coupler connection while the refrigerant system is under pressure. Recover the refrigerant before removing the secondary retention clip. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.
- The refrigerant system must always be evacuated before charging.
- Do not open the refrigerant system or uncap a replacement component until you are ready to service the system. This will prevent contamination in the system.
- Before disconnecting a component, clean the outside of the fittings thoroughly to prevent contamination from entering the refrigerant system.
- Immediately after disconnecting a component from the refrigerant system, seal the open fittings with a cap or plug.
- Before connecting an open refrigerant fitting, always install a new seal or gasket. Coat the fitting and seal with clean refrigerant oil before connecting.
- Do not remove the sealing caps from a replacement component until it is to be installed.
- When installing a refrigerant line, avoid sharp bends that may restrict refrigerant flow. Position the refrigerant lines away from exhaust system components or any sharp edges, which may damage the line.
- Tighten refrigerant fittings only to the specified torque. The aluminum fittings used in the refrigerant system will not tolerate overtightening.
- When disconnecting a refrigerant fitting, use a wrench on both halves of the fitting. This will prevent twisting of the refrigerant lines or tubes.

- Refrigerant oil will absorb moisture from the atmosphere if left uncapped. Do not open a container of refrigerant oil until you are ready to use it. Replace the cap on the oil container immediately after using. Store refrigerant oil only in a clean, air-tight, and moisture-free container.

- Keep service tools and the work area clean. Contamination of the refrigerant system through careless work habits must be avoided.

COOLING SYSTEM REQUIREMENTS

To maintain the performance level of the heating-air conditioning system, the engine cooling system must be properly maintained. The use of a bug screen is not recommended. Any obstructions in front of the radiator or condenser will reduce the performance of the air conditioning and engine cooling systems.

The engine cooling system includes the heater core and the heater hoses. Refer to Group 7 - Cooling System for more information before the opening of, or attempting any service to the engine cooling system.

**REFRIGERANT HOSES/LINES/TUBES
PRECAUTIONS**

Kinks or sharp bends in the refrigerant plumbing will reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all refrigerant system connections are pressure tight.

A good rule for the flexible hose refrigerant lines is to keep the radius of all bends at least ten times the diameter of the hose. Sharp bends will reduce the flow of refrigerant. The flexible hose lines should be routed so they are at least 80 millimeters (3 inches) from the exhaust manifold. It is a good practice to inspect all flexible refrigerant system hose lines at least once a year to make sure they are in good condition and properly routed.

There are two types of refrigerant fittings:

- All fittings with O-rings need to be coated with refrigerant oil before installation. Use only O-rings that are the correct size and approved for use with R-134a refrigerant. Failure to do so may result in a leak.

- Unified plumbing connections with gaskets cannot be serviced with O-rings. The gaskets are not reusable and new gaskets do not require lubrication before installing.

Using the proper tools when making a refrigerant plumbing connection is very important. Improper tools or improper use of the tools can damage the refrigerant fittings. Always use two wrenches when loosening or tightening tube fittings. Use one wrench

DESCRIPTION AND OPERATION (Continued)

to hold one side of the connection stationary, while loosening or tightening the other side of the connection with a second wrench.

The refrigerant must be recovered completely from the system before opening any fitting or connection. Open the fittings with caution, even after the refrigerant has been recovered. If any pressure is noticed as a fitting is loosened, tighten the fitting and recover the refrigerant from the system again.

Do not discharge refrigerant into the atmosphere. Use an R-134a refrigerant recovery/recycling device that meets SAE Standard J2210.

The refrigerant system will remain chemically stable as long as pure, moisture-free R-134a refrigerant and refrigerant oil is used. Dirt, moisture, or air can upset this chemical stability. Operational troubles or serious damage can occur if foreign material is present in the refrigerant system.

When it is necessary to open the refrigerant system, have everything needed to service the system ready. The refrigerant system should not be left open to the atmosphere any longer than necessary. Cap or plug all lines and fittings as soon as they are opened to prevent the entrance of dirt and moisture. All lines and components in parts stock should be capped or sealed until they are to be installed.

All tools, including the refrigerant recycling equipment, the manifold gauge set, and test hoses should be kept clean and dry. All tools and equipment must be designed for R-134a refrigerant.

COMPRESSOR - 2.5L VM DIESEL

DESCRIPTION

The 2.5L diesel engine uses a Denso 10PA17 seven cylinder, reciprocating wobble plate-type compressor. This compressor has a fixed displacement of 150 cubic centimeters (9.375 cubic inches), and has both the suction and discharge ports located on the compressor cylinder head. A label identifying the use of R-134a refrigerant is located on the compressor.

OPERATION

The compressor is driven by the engine through the power steering pump main shaft. The power steering pump is driven by the accessory drive belt.

The compressor is lubricated by refrigerant oil that is circulated throughout the refrigerant system with the refrigerant. The compressor draws in low-pressure refrigerant vapor from the evaporator through its suction port. It then compresses the refrigerant into a high-pressure, high-temperature refrigerant vapor, which is then pumped to the condenser through the compressor discharge port.

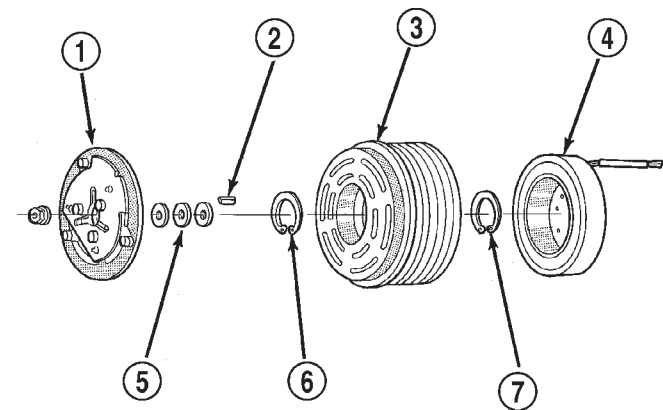
The compressor cannot be repaired. If faulty or damaged, the entire compressor assembly must be

replaced. The compressor clutch, pulley and clutch coil are available for service.

COMPRESSOR CLUTCH - 2.5L VM DIESEL

DESCRIPTION

The compressor clutch assembly used on the diesel engine is the same clutch used on most compressors however, due to the different drive arrangement it utilizes a drive cup that threads onto the clutch drive pulley. The basic compressor clutch assembly consists of a stationary electromagnetic coil, a hub bearing and pulley assembly, and a clutch plate (Fig. 1). The electromagnetic coil unit and the hub bearing and pulley assembly are each retained on the nose of the compressor front housing with snap rings. The clutch plate is keyed to the compressor shaft and secured with a nut. These components provide the means to engage and disengage the compressor from the engine serpentine accessory drive belt.



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Fig. 1 Compressor Clutch – Drive Cup Not Shown

- 1 – CLUTCH PLATE
- 2 – SHAFT KEY
- 3 – PULLEY
- 4 – COIL
- 5 – CLUTCH SHIMS
- 6 – SNAP RING
- 7 – SNAP RING

OPERATION

When the clutch coil is energized, it magnetically draws the clutch into contact with the pulley and drives the compressor shaft. When the coil is not energized, the pulley freewheels on the clutch hub bearing, which is part of the pulley. The compressor clutch and coil are the only serviced parts on the compressor.

The compressor clutch engagement is controlled by several components: the heater-A/C mode control switch, the low pressure cycling clutch switch, the dual function high pressure switch, the compressor

DESCRIPTION AND OPERATION (Continued)

clutch relay, and the Powertrain Control Module (PCM). The PCM may delay compressor clutch engagement for up to thirty seconds. Refer to Group 14 - Fuel System for more information on the PCM controls.

REMOVAL AND INSTALLATION

SUCTION AND DISCHARGE LINE

Any kinks or sharp bends in the refrigerant plumbing will reduce the capacity of the entire air conditioning system. Kinks and sharp bends reduce the flow of refrigerant in the system. A good rule for the flexible hose refrigerant lines is to keep the radius of all bends at least ten times the diameter of the hose. In addition, the flexible hose refrigerant lines should be routed so they are at least 80 millimeters (3 inches) from the exhaust manifold.

High pressures are produced in the refrigerant system when the air conditioning compressor is operating. Extreme care must be exercised to make sure that each of the refrigerant system connections is pressure-tight and leak free. It is a good practice to inspect all flexible hose refrigerant lines at least once a year to make sure they are in good condition and properly routed.

WARNING: REVIEW THE WARNINGS AND CAUTIONS IN THE FRONT OF THIS GROUP BEFORE PERFORMING THE FOLLOWING OPERATION.

LEFT-HAND DRIVE

REMOVAL

(1) Disconnect and isolate the battery negative cable.

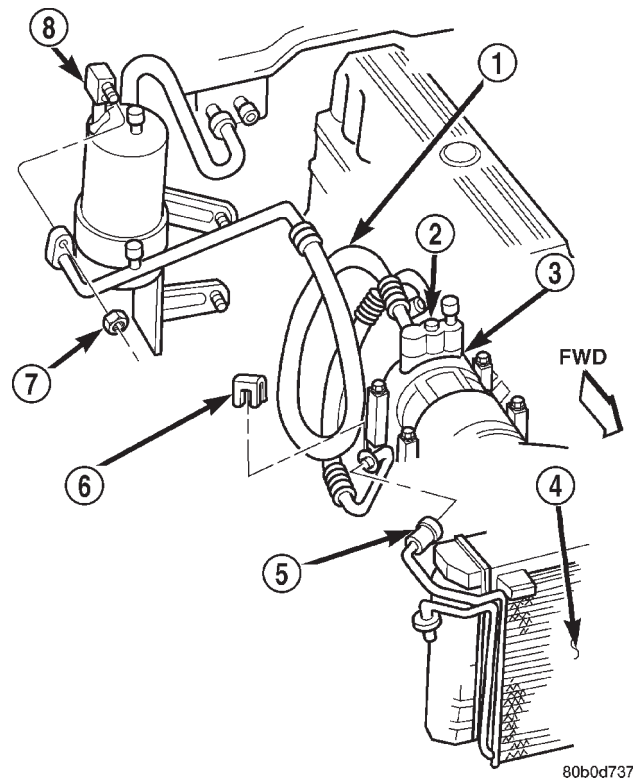
(2) Recover the refrigerant from the refrigerant system. See Refrigerant Recovery in this group for the procedures.

(3) Unplug the wire harness connector from the high pressure cut-off switch.

(4) Disconnect the discharge line refrigerant line fitting from the condenser inlet tube (Fig. 2). See Refrigerant Line Coupler in this group for the procedures. Install plugs in, or tape over all of the opened refrigerant line fittings.

(5) Remove the nut that secures the suction line block fitting to the accumulator outlet. Install plugs in, or tape over all of the opened refrigerant line fittings.

(6) Remove the screw that secures the suction and discharge line manifold to the compressor. Install plugs in, or tape over all of the opened refrigerant line fittings.



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Fig. 2 Suction and Discharge Line Remove/Install - Left-Hand Drive

- 1 - SUCTION AND DISCHARGE LINE
- 2 - SCREW
- 3 - COMPRESSOR
- 4 - CONDENSER
- 5 - INLET
- 6 - CLIP
- 7 - HEX NUT
- 8 - ACCUMULATOR

(7) Remove the suction and discharge line assembly from the vehicle.

INSTALLATION

(1) Remove the tape or plugs from the suction and discharge line manifold and the compressor. Install the suction and discharge line manifold to the compressor. Tighten the mounting screw to 28 N·m (250 in. lbs.).

(2) Remove the tape or plugs from the suction line and the accumulator outlet block fittings. Install the suction line to the accumulator outlet and tighten the mounting nut to 9 N·m (80 in. lbs.).

(3) Remove the tape or plugs from the refrigerant line fittings on the discharge line and the condenser inlet tube. Connect the discharge line refrigerant line coupler to the condenser inlet tube. See Refrigerant Line Coupler in this group for the procedures.

(4) Plug in the wire harness connector to the high pressure cut-off switch.

(5) Connect the battery negative cable.

REMOVAL AND INSTALLATION (Continued)

(6) Evacuate the refrigerant system. See Refrigerant System Evacuate in this group for the procedures.

(7) Charge the refrigerant system. See Refrigerant System Charge in this group for the procedures.

RIGHT-HAND DRIVE - 2.5L ENGINE

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Recover the refrigerant from the refrigerant system. See Refrigerant Recovery in this group for the procedures.

(3) Unplug the wire harness connector from the high pressure cut-off switch.

(4) Disconnect the discharge line refrigerant line fitting from the condenser inlet tube (Fig. 3). See Refrigerant Line Coupler in this group for the procedures. Install plugs in, or tape over all of the opened refrigerant line fittings.

(5) Remove the nut that secures the suction line block fitting to the accumulator outlet. Install plugs in, or tape over all of the opened refrigerant line fittings.

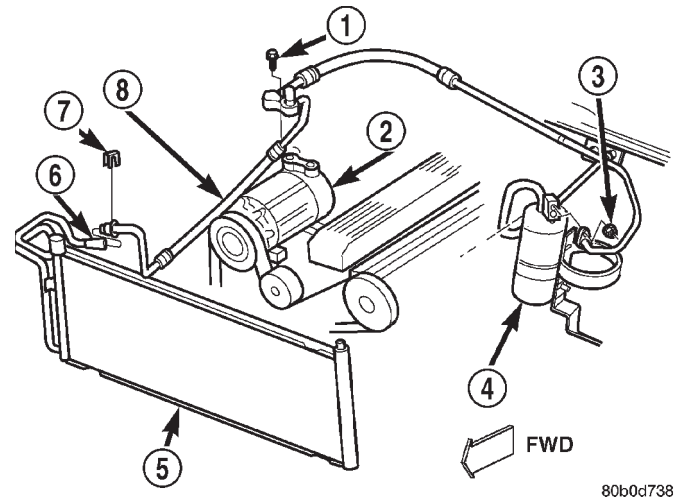
(6) Remove the screw that secures the suction and discharge line manifold to the compressor. Install plugs in, or tape over all of the opened refrigerant line fittings.

(7) Remove the suction and discharge line assembly from the vehicle.

INSTALLATION

(1) Remove the tape or plugs from the suction and discharge line manifold and the compressor. Install the suction and discharge line manifold to the compressor. Tighten the mounting screw to 28 N·m (250 in. lbs.).

(2) Remove the tape or plugs from the suction line and the accumulator outlet block fittings. Install the suction line to the accumulator outlet and tighten the mounting nut to 9 N·m (80 in. lbs.).



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Fig. 3 Suction and Discharge Line Remove/Install - Right-Hand Drive 2.5L Engine

- 1 - SCREW
- 2 - COMPRESSOR
- 3 - HEX NUT
- 4 - ACCUMULATOR
- 5 - CONDENSER
- 6 - INLET
- 7 - CLIP
- 8 - SUCTION AND DISCHARGE LINE

(3) Remove the tape or plugs from the refrigerant line fittings on the discharge line and the condenser inlet tube. Connect the discharge line refrigerant line coupler to the condenser inlet tube. See Refrigerant Line Coupler in this group for the procedures.

(4) Plug in the wire harness connector to the high pressure cut-off switch.

(5) Connect the battery negative cable.

(6) Evacuate the refrigerant system. See Refrigerant System Evacuate in this group for the procedures.

(7) Charge the refrigerant system. See Refrigerant System Charge in this group for the procedures.

REMOVAL AND INSTALLATION (Continued)

RIGHT-HAND DRIVE - 4.0L ENGINE

The suction and discharge lines for this model are individual components and are secured to a manifold block on the compressor with block fittings (Fig. 4). There is also a jumper line installed between the discharge line and the condenser inlet that is secured with refrigerant line couplers at each end. Each of these components is available as a separate service part.

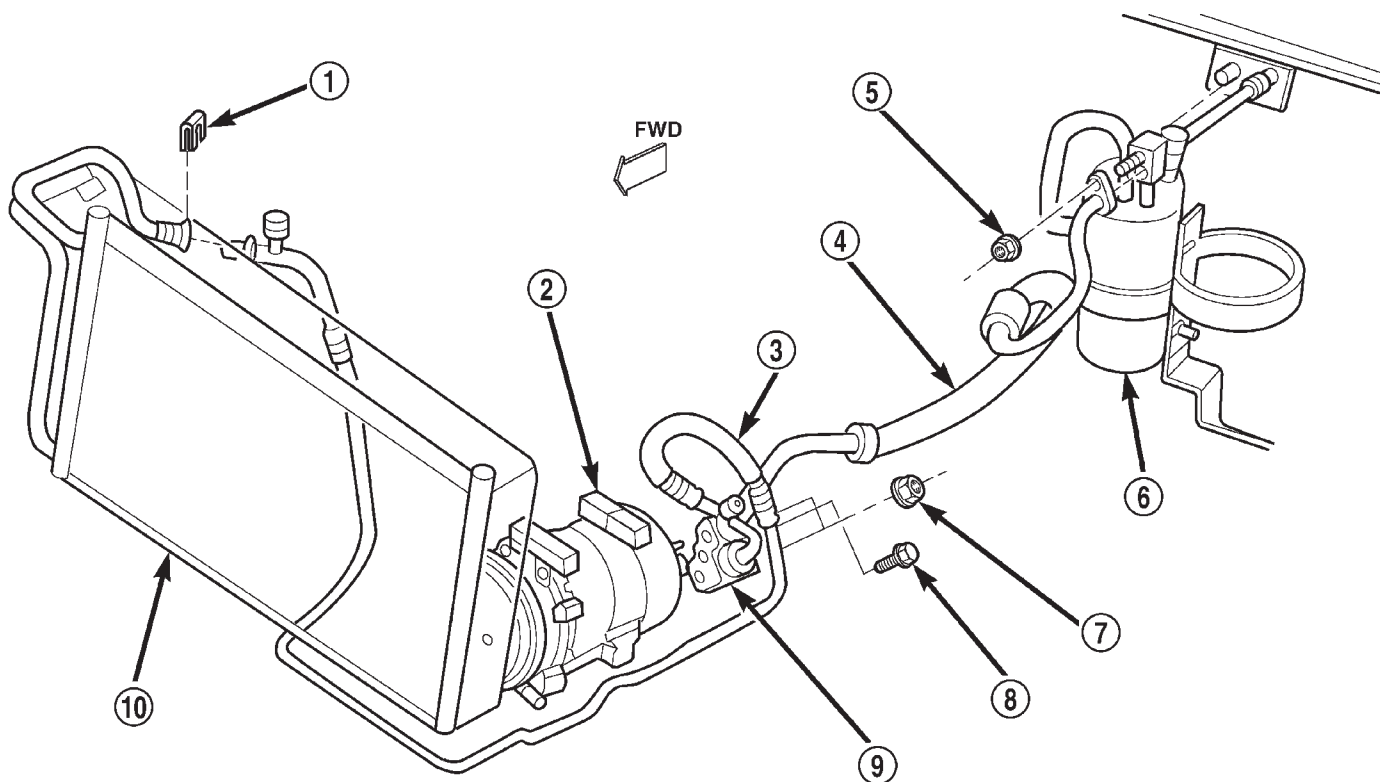
The suction and discharge line components can be removed from or installed on the vehicle individually, or as a unit. Otherwise, the service procedures are the same as those for the other applications. Tighten the additional mounting hardware as follows:

- Suction line to manifold block nut - 9 N-m (80 in. lbs.)
- Discharge line to manifold block nut - 9 N-m (80 in. lbs.)

- Manifold block to compressor screw - 28 N-m (250 in. lbs.).

COMPRESSOR - 2.5L VM DIESEL**REMOVAL**

- (1) Disconnect the negative battery cable.
- (2) Recover the refrigerant. See Refrigerant Recovery in this group for the procedure.
- (3) Disconnect the A/C compressor clutch electrical connector (Fig. 5).
- (4) Remove the suction and discharge refrigerant line retaining bolts from the compressor and plug the openings.
- (5) Raise the vehicle on a hoist.
- (6) Loosen all (4) H-block retaining bolts. Do not remove at this time.



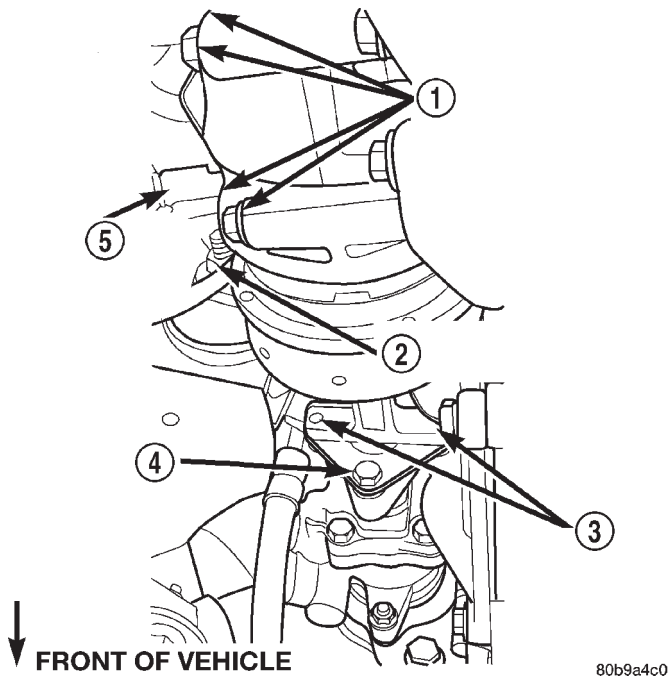
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Fig. 4 Suction and Discharge Line Remove/Install - Right-Hand Drive 4.0L Engine

- 1 - CLIP
- 2 - COMPRESSOR
- 3 - DISCHARGE LINE
- 4 - SUCTION LINE
- 5 - NUT

- 6 - ACCUMULATOR
- 7 - NUT
- 8 - SCREW
- 9 - MANIFOLD BLOCK
- 10 - CONDENSER

REMOVAL AND INSTALLATION (Continued)

**Fig. 5 A/C Compressor Position & Orientation**

- 1 - A/C COMPRESSOR MOUNTING BOLTS
- 2 - LEFT ENGINE MOUNT THROUGH BOLT NUT
- 3 - H BLOCK BOLTS
- 4 - COUPLER PINCH BOLT
- 5 - COMPRESSOR ELECTRICAL CONNECTOR

NOTE: Mark the H-Block position in relation to the power steering pump so it may be reinstalled in the same position.

(7) Remove the (2) H-block bolts from the power steering pump side of the block (Fig. 5).

(8) Remove the serpentine drive belt. Refer to Group 7, Cooling System for the procedure.

(9) Loosen, but do not remove, the coupler pinch bolt and slide the coupler towards the pump (Fig. 5).

NOTE: There are 4 spacers located between the engine block and the A/C compressor. The doweled spacers are located in the front, undoweled in the rear.

(10) Remove the (4) A/C compressor retaining bolts (Fig. 5).

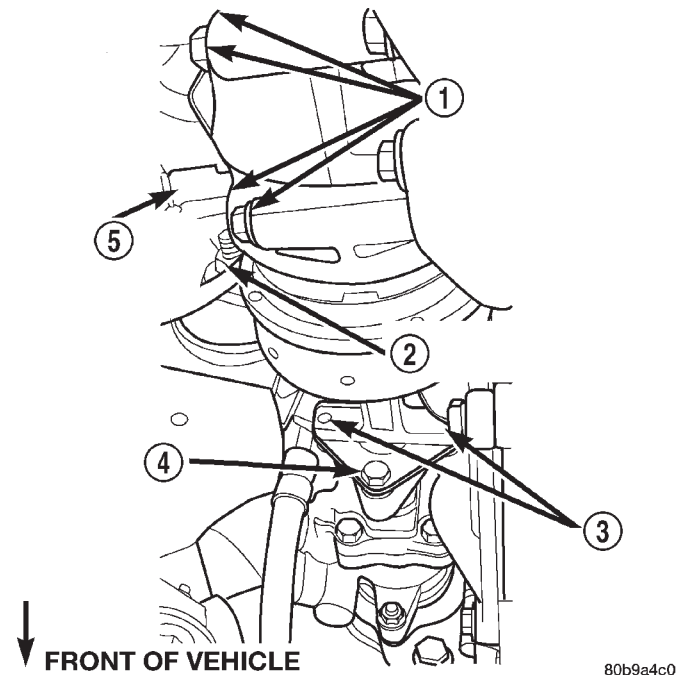
(11) Remove the compressor assembly from the vehicle with H-Block attached.

CAUTION: Check the refrigerant oil level in the new compressor prior to installation. See compressor oil level in this group for a detailed procedure.

INSTALLATION

(1) Transfer the H-Block to the new compressor and leave the bolts loose at this time.

(2) Lift the A/C compressor in position and install the (4) spacers and retaining bolts (Fig. 6). Torque the bolts to 33 N·m (25 ft. lbs.).

**Fig. 6 A/C Compressor Position & Orientation**

- 1 - A/C COMPRESSOR MOUNTING BOLTS
- 2 - LEFT ENGINE MOUNT THROUGH BOLT NUT
- 3 - H BLOCK BOLTS
- 4 - COUPLER PINCH BOLT
- 5 - COMPRESSOR ELECTRICAL CONNECTOR

(3) Slide the drive coupler into its original position and start the remaining (2) H-Block bolts (Fig. 6).

(4) Install the serpentine drive belt. See Group 7, Cooling System for the procedure.

(5) Torque all H-Block retaining bolts to 33 N·m (25 ft. lbs.).

(6) Lower the vehicle from the hoist.

(7) Install the suction and discharge refrigerant lines on the compressor, making sure the o-rings are well lubricated with refrigerant oil and free of tears.

(8) Connect the A/C compressor electrical connector (Fig. 6).

(9) Connect the negative battery cable.

(10) Charge the refrigerant system. See Refrigerant System Charge in this group for procedure.

REMOVAL AND INSTALLATION (Continued)

COMPRESSOR CLUTCH - 2.5L VM DIESEL

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the compressor from the vehicle. Refer to the procedure in this group.

(3) Unscrew the compressor drive cup from the clutch pulley.

(4) Insert the two pins of the spanner wrench (Special Tool C-4489) into the holes of the clutch plate. Hold the clutch plate stationary and remove the hex nut (Fig. 7).

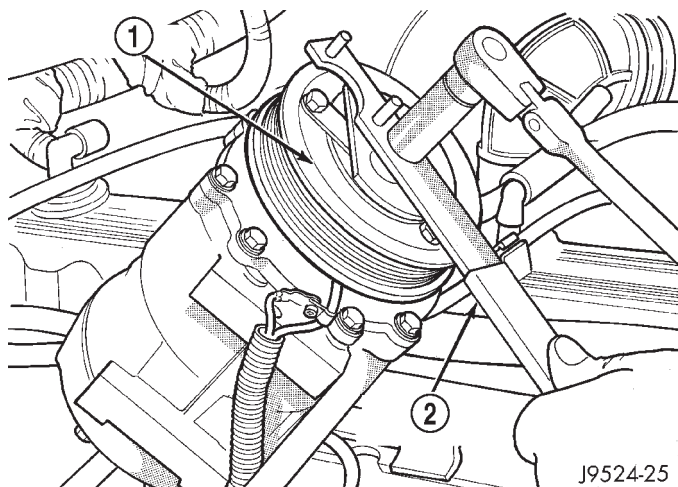


Fig. 7 Clutch Nut Remove

- 1 - CLUTCH PLATE
- 2 - SPANNER

(5) Remove the clutch plate with a puller (Special Tool C-6461) (Fig. 8).

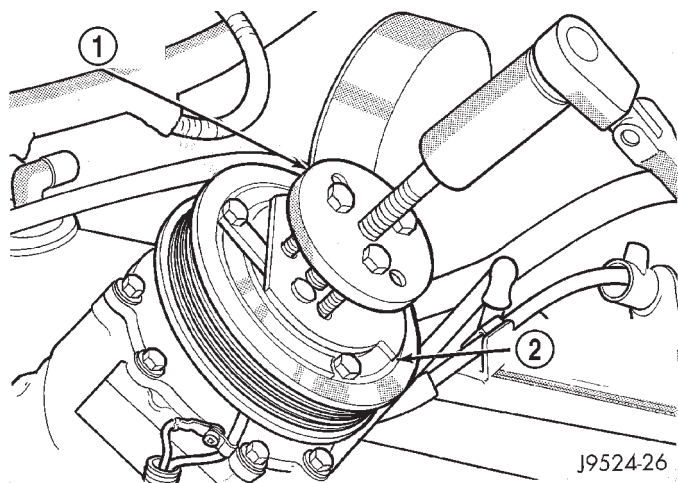


Fig. 8 Clutch Plate Remove

- 1 - CLUTCH PLATE PULLER
- 2 - CLUTCH PLATE

(6) Remove the compressor shaft key and the clutch shims.

(7) Remove the external front housing snap ring with snap ring pliers (Fig. 9).

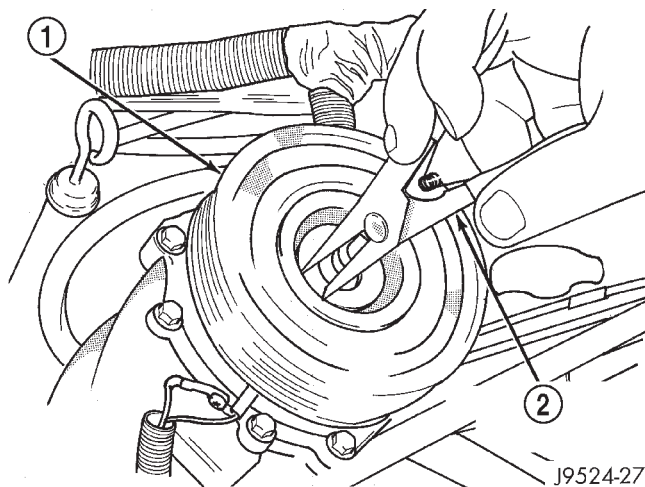


Fig. 9 External Snap Ring Remove

- 1 - PULLEY
- 2 - SNAP RING PLIERS

(8) Install the lip of the rotor puller (Special Tool C-6141-1) into the snap ring groove exposed in the previous step, and install the shaft protector (Special Tool C-6141-2) (Fig. 10).

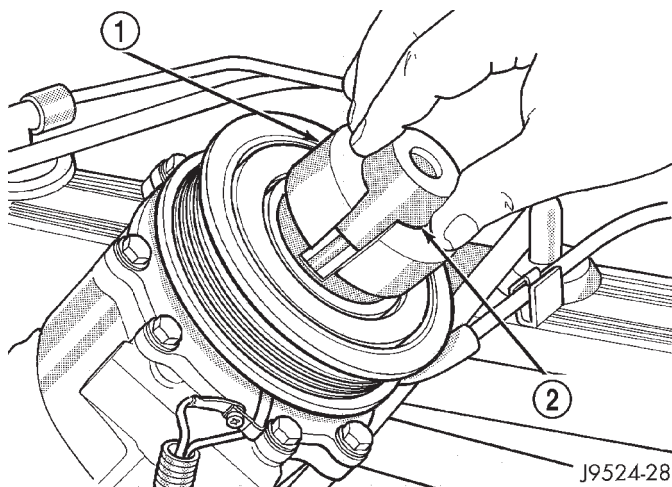


Fig. 10 Shaft Protector and Puller

- 1 - PULLER JAW
- 2 - SHAFT PROTECTOR

REMOVAL AND INSTALLATION (Continued)

(9) Install the puller through-bolts (Special Tool C-6461) through the puller flange and into the jaws of the rotor puller and tighten (Fig. 11). Turn the puller center bolt clockwise until the rotor pulley is free.

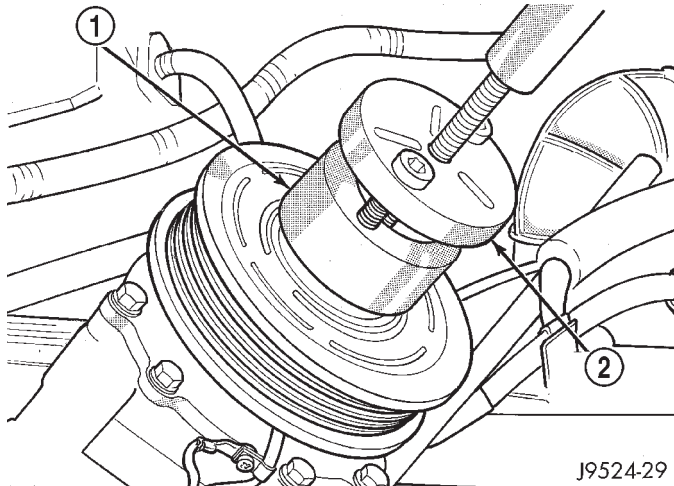


Fig. 11 Install Puller Plate

- 1 - PULLER JAW
- 2 - PULLER

(10) Remove the screw and retainer from the clutch coil lead wire harness on the compressor front housing (Fig. 12).

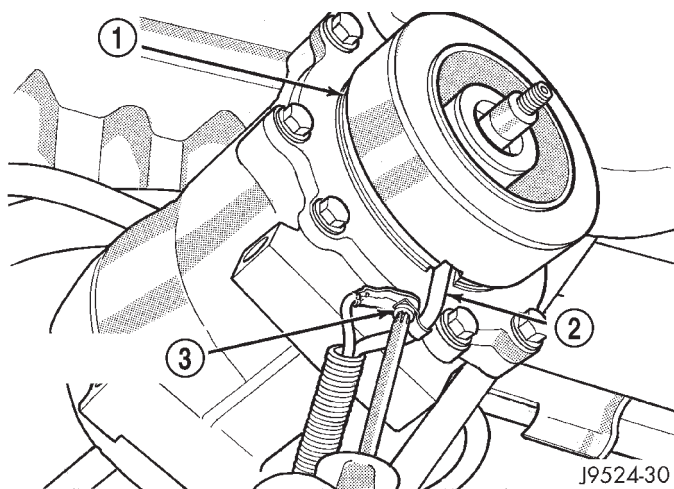


Fig. 12 Clutch Coil Lead Wire Harness

- 1 - COIL
- 2 - COIL WIRE
- 3 - RETAINER SCREW

(11) Remove the snap ring from the compressor hub and remove the clutch field coil (Fig. 13). Slide the clutch field coil off of the compressor hub.

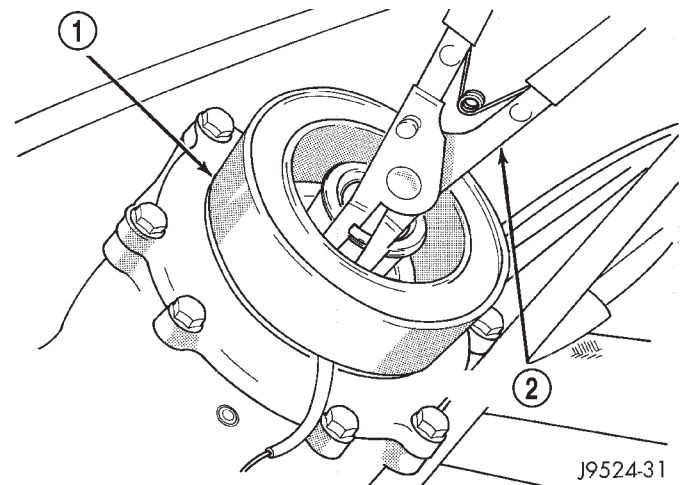


Fig. 13 Clutch Field Coil Snap Ring Remove

- 1 - COIL
- 2 - SNAP RING PLIERS

INSPECTION

Examine the friction surfaces of the clutch pulley and the front plate for wear. The pulley and front plate should be replaced if there is excessive wear or scoring.

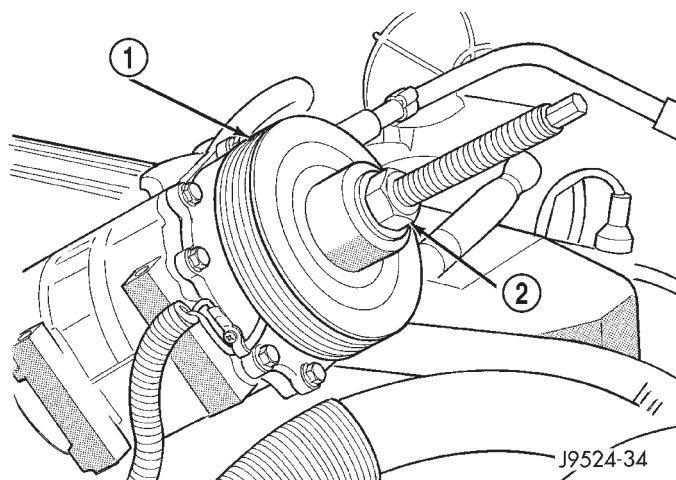
If the friction surfaces are oily, inspect the shaft and nose area of the compressor for oil. Remove the felt from the front cover. If the felt is saturated with oil, the shaft seal is leaking and the compressor must be replaced.

Check the clutch pulley bearing for roughness or excessive leakage of grease. Replace the bearing, if required.

INSTALLATION

- (1) Install the clutch field coil and snap ring.
- (2) Install the clutch coil lead wire harness retaining clip on the compressor front housing and tighten the retaining screw.
- (3) Align the rotor assembly squarely on the front compressor housing hub.
- (4) Install the pulley bearing assembly with the installer (Special Tool C-6871) (Fig. 14). Thread the installer on the shaft, then turn the nut until the pulley assembly is seated.
- (5) Install the external front snap ring with snap ring pliers. The bevel side of the snap ring must be facing outward. Press the snap ring to make sure it is properly seated in the groove.

REMOVAL AND INSTALLATION (Continued)

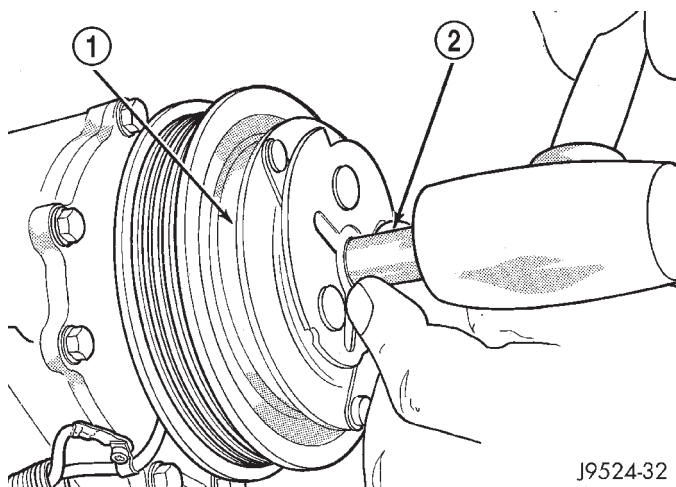
**Fig. 14 Clutch Pulley Install**

- 1 - PULLEY BEARING ASSEMBLY
2 - INSTALLER

CAUTION: If the snap ring is not fully seated in the groove it will vibrate out, resulting in a clutch failure and severe damage to the front housing of the compressor.

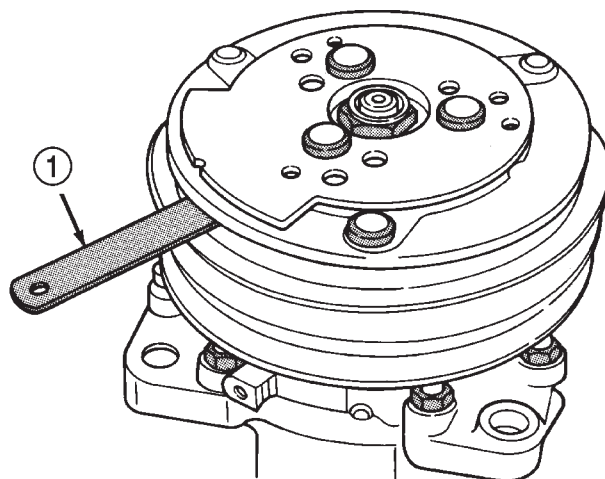
(6) Install the compressor shaft key and the original clutch shims on the compressor shaft.

(7) Install the clutch plate with the driver (Special Tool C-6463) (Fig. 15). Install the shaft hex nut and tighten to 14.4 N·m (10.5 ft. lbs.).

**Fig. 15 Clutch Plate Driver**

- 1 - CLUTCH PLATE
2 - DRIVER

(8) Check the clutch air gap with a feeler gauge (Fig. 16). If the air gap does not meet the specification, add or subtract shims as required. The air gap specification is 0.41 to 0.79 millimeter (0.016 to 0.031 inch). If the air gap is not consistent around the circumference of the clutch, lightly pry up at the minimum variations. Lightly tap down at the points of maximum variation.



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Fig. 16 Check Clutch Air Gap

- 1 - FEELER GAUGE

NOTE: The air gap is determined by the spacer shims. When installing an original, or a new clutch assembly, try the original shims first. When installing a new clutch onto a compressor that previously did not have a clutch, use 1.0, 0.50, and 0.13 millimeter (0.040, 0.020, and 0.005 inch) shims from the clutch hardware package that is provided with the new clutch.

(9) Reverse the remaining removal procedures to complete the installation.

CLUTCH BREAK-IN

After a new compressor clutch has been installed, cycle the compressor clutch approximately twenty times (five seconds on, then five seconds off). During this procedure, set the heater-A/C control to the Recirculation Mode, the blower motor switch in the highest speed position, and the engine speed at 1500 to 2000 rpm. This procedure (burnishing) will seat the opposing friction surfaces and provide a higher compressor clutch torque capability.