

HEATING AND AIR CONDITIONING

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DESCRIPTION AND OPERATION

ATC IN-CAR TEMPERATURE SENSOR

DESCRIPTION

The Automatic Temperature Control (ATC) In-Car Temperature Sensor returns electrical signals to the Body Control Module (BCM). The In-Car Temperature Sensor is used on ATC equipped vehicles only. The In-Car Temperature Sensor is made up of two

parts. One part is the in-car sensor motor fan assembly and the second part is a temperature thermistor. The in-car sensor motor fan assembly attaches to the back of the ATC Control head (Fig. 1). This assembly has a small fan and a motor which draws air through the intake on the front of the ATC control. The in-car sensor thermistor is located inside of the ATC Control Head. Air drawn from the passenger compartment by the in-car sensor motor-fan assembly, flows over the thermistor. The in-car sensor thermistor

DESCRIPTION AND OPERATION (Continued)

changes resistance with air temperature. The BCM measures this resistance and calculates the temperature of the air drawn into the ATC Control. The ATC system then makes adjustments to maintain the optimum passenger compartment comfort. Refer to the ATC Sensor Motor-Fan Operation table for when the ATC Sensor is operating.

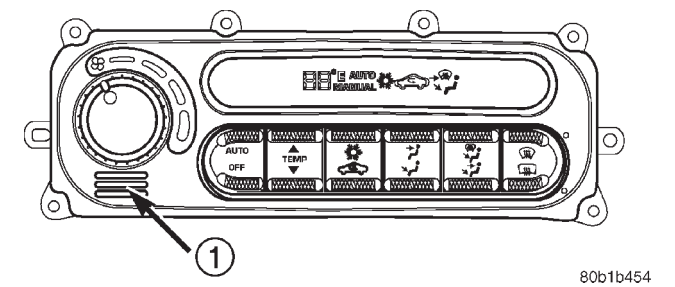


Fig. 1 ATC In-Car Temperature Sensor
1 – ATC IN-CAR TEMPERATURE SENSOR

OPERATION

CONDITION	ATC SENSOR MOTOR OPERATION
IGNITION SWITCH IS ON.	MOTOR ALWAYS OPERATES, EVEN WHEN ATC CONTROL HEAD "OFF" BUTTON IS PUSHED.
VEHICLE IS DRIVEN, THEN THE IGNITION SWITCH IS TURNED OFF.	MOTOR TURNS OFF WHEN THE IGNITION SWITCH IS TURNED OFF.
VEHICLE DOOR IS OPENED WITHOUT TURNING ON THE IGNITION SWITCH AND LEFT OPEN.	MOTOR TURNS OFF IN APPROXIMATELY 2 MINUTES AFTER DOOR IS OPENED.
VEHICLE DOOR IS OPENED AND THEN CLOSED WITHOUT TURNING ON THE IGNITION SWITCH.	MOTOR TURNS OFF IN APPROXIMATELY 2 MINUTES AFTER DOOR IS SHUT.

The in-car sensor motor is an integral part of the Control Head and not a separate serviceable part. The ATC Control Head must be replaced if there is a fault relating to the motor. See Diagnosis and Testing in this section for proper check of airflow. The In-Car Sensor Thermistor is part of the ATC Control Head and not a separate serviceable part. One must replace the ATC Control Head if the ATC self-diagnostics indicates a fault code. See Self-Diagnostics in

this section for information on diagnosing wiring and thermistor.

BLOWER MOTOR RESISTOR

DESCRIPTION

Vehicles with manual air conditioning (non-ATC) systems will have a blower motor resistor. The resistor is mounted to the lower right side of the heater-A/C housing in the passenger compartment, where it can be accessed for service. See Blower Motor Resistor in the Removal and Installation section of this group for more information.

The blower motor resistor has multiple resistor wires, each of which will change the resistance in the blower motor ground path to change the blower motor speed. The blower motor switch directs the ground path through the correct resistor wire to obtain the selected blower motor speed.

The blower motor resistor cannot be repaired and, if faulty or damaged, it must be replaced.

OPERATION

With the blower motor switch in the lowest speed position the ground path for the motor is applied through all of the resistor wires. Each higher speed selected with the blower motor switch applies the blower motor ground path through fewer of the resistor wires, increasing the blower motor speed. When the blower motor switch is in the highest speed position, the blower motor resistor is bypassed and the blower motor receives a direct path to ground.

BLOWER MOTOR POWER MODULE

DESCRIPTION

The blower motor power module is only used in vehicles equipped with Automatic Temperature Control (ATC). It is located on the lower right side of the HVAC unit housing, and is controlled by the Body Control Module (BCM).

OPERATION

The power module receives pulse width modulated (PWM) signals from the BCM. The power module varies voltage to the blower motor for different blower speeds based on the ATC software. There are 14 selectable speeds, while the Auto mode provides 256 variations.

COMPRESSOR

DESCRIPTION

The air conditioning system uses a Nippondenso 10PA17 ten cylinder, double-acting swash plate-type compressor on all models. This compressor has a

DESCRIPTION AND OPERATION (Continued)

fixed displacement of 170 cubic centimeters (10.374 cubic inches), and has both the suction and discharge ports located on the 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 an electric clutch, drive pulley and belt arrangement. 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.

ENGINE COOLING SYSTEM REQUIREMENTS**DESCRIPTION**

To maintain the performance level of the heating/air-conditioning system, the engine cooling system must be prepared as shown in this manual.

The use of a bug screen is not recommended. Any obstructions in front of the radiator or condenser can reduce the performance of the A/C and/or engine cooling system.

WARNING: DO NOT OPEN COOLING SYSTEM WHEN HOT AS PERSONAL INJURY OR DAMAGE TO VEHICLE MAY RESULT.

OPERATION

The engine cooling system is designed to develop internal pressure of 97 to 123 kPa (14 to 18 psi). Wait 15 minutes (after the engine is shut off), or until safe temperature and pressure is attained, before opening cooling system. Refer to Group 7, Cooling System. Coolant temperature can be checked using the scan tool (DRBIII®).

When additional coolant is needed, it should be added to the coolant pressure bottle. Use only 50/50 mix of Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (orange in color), or the equivalent and distilled water. This coolant must not be mixed with other (green in color) coolants. If this occurs, a reduction in the extended service interval will result. Refer to LUBRICATION AND MAINTENANCE for service schedules.

CAUTION: Do not add additional inhibitors, anti-rust products, or soluble oil (sold as "water pump lubricants"). These products may not be compatible with the engine coolant.

Refer to Group 7, Cooling System for cooling system procedures.

EVAPORATOR TEMPERATURE SENSOR**DESCRIPTION**

The evaporator temperature sensor is a temperature sensing element located at the coldest point on the face of the evaporator. The evaporator temperature sensor prevents condensate water on the evaporator coil from freezing which can block airflow. The probe is a thermistor inside a metal tube which is wedged between the evaporator fins. The metal tube is tightly held by the evaporator fins so that the thermistor in the tube will detect the temperature of the evaporator. The thermistor will change resistance as the temperature changes.

OPERATION

The Body Control Module (BCM) will send a Programmable Communications Interface (PCI) bus message to the Powertrain Control Module (PCM), which will check engine, coolant temperature, and refrigerant pressure temperature before turning ON the A/C Compressor Clutch. Turning ON the A/C Compressor Clutch will allow the system to cool the evaporator. The BCM will send a message to the PCM when the evaporator temperature becomes too cold. The PCM will then turn OFF the A/C Compressor Clutch, before evaporator freeze up occurs. The DRBIII® scan tool can be used to monitor this operation. The temperature setpoint at which the clutch is turned OFF varies with the outside ambient temperature. The temperature at which the clutch is turned ON is preset to 2° F above the OFF setpoint mentioned above. Refer to Evaporator Temperature Sensor Setpoint table and (Fig. 2) for the correct setpoint.

EXPANSION VALVE**DESCRIPTION**

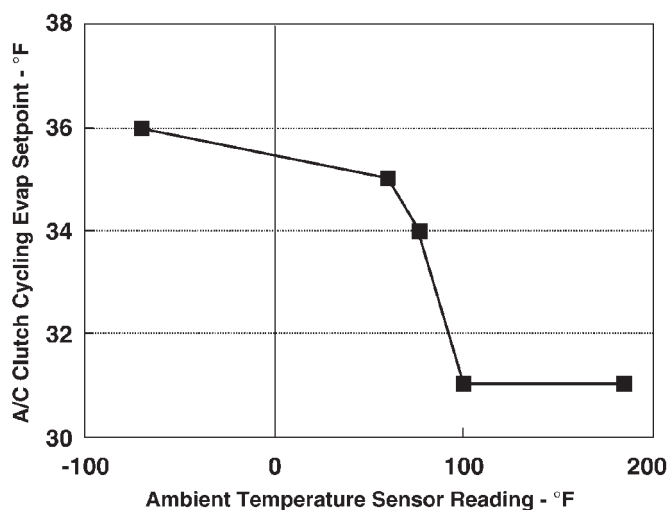
The "H valve" type thermal expansion valve (TXV) is located at the point where the refrigerant lines join the evaporator coil on the engine compartment side of the dash panel.

The expansion valve is a factory calibrated unit and cannot be adjusted or repaired. If faulty or damaged, the expansion valve must be replaced.

DESCRIPTION AND OPERATION (Continued)

EVAPORATOR TEMPERATURE SENSOR
SETPOINT

AMBIENT TEMPERATURE SENSOR READING ° F (° C)	A/C CLUTCH OFF EVAPORATOR TEMPERATURE SETPOINT ° F (° C)
185 (85)	31 (-.5)
100 (37.7)	31 (-.5)
77 (25)	34 (1.1)
60 (15.5)	35 (1.6)
-70 (-56.6)	36 (2.2)



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Fig. 2 Evaporator Temperature Sensor Setpoint**OPERATION**

High-pressure, high temperature liquid refrigerant from the liquid line passes through the expansion valve orifice, converting it into a low-pressure, low-temperature mixture of liquid and gas before it enters the evaporator coil. A temperature sensor in the expansion valve control head monitors the temperature of the refrigerant leaving the evaporator coil through the suction line, and adjusts the orifice size at the liquid line to let the proper amount of refrigerant into the evaporator coil to meet the vehicle cooling requirements. Controlling the refrigerant flow through the evaporator ensures that none of the refrigerant leaving the evaporator is still in a liquid state, which could damage the compressor.

FILTER-DRIER**DESCRIPTION**

The filter-drier is located in the engine compartment near the dash panel on the passenger side of the vehicle. The filter-drier incorporates a sight glass for visual diagnosis of the refrigerant system.

OPERATION

High-pressure liquid refrigerant from the condenser flows into the filter-drier. A drying agent, called a desiccant, is used to remove any traces of moisture from the refrigerant system. The filter-drier also performs a filtering action to prevent foreign material in the refrigerant from contaminating the expansion valve. In addition, during periods of high demand air conditioner operation, the filter-drier acts as a reservoir to store surplus refrigerant.

The A/C refrigerant must be removed from the system before removing the filter/drier using a refrigerant recovery machine. Replace the filter/drier if an A/C system is left open for an extended period of time.

The filter-drier cannot be repaired and, if faulty, must be replaced.

HANDLING TUBING AND FITTINGS**DESCRIPTION**

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system.

DESCRIPTION AND OPERATION (Continued)

CAUTION: The system must be completely empty before opening any fitting or connection in the refrigeration system. Open fittings with caution even after the system has been emptied. If any pressure is noticed as a fitting is loosened, retighten fitting and evacuate the system again.

A good rule for the flexible hose lines is to keep the radius of all bends at least 10 times the diameter of the hose. Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so they are at least 3 inches (80 mm) from the exhaust manifold. Inspect all flexible hose lines to make sure they are in good condition and properly routed.

The use of correct wrenches when making connections is very important. Improper wrenches or improper use of wrenches can damage the fittings.

The internal parts of the A/C system will remain stable as long as moisture-free refrigerant and refrigerant oil is used. Abnormal amounts of dirt, moisture or air can upset the chemical stability. This may cause operational troubles or even serious damage if present in more than very small quantities.

When opening a refrigeration system, have everything you will need to repair the system ready. This will minimize the amount of time the system must be opened. Cap or plug all lines and fittings as soon as they are opened. This will help prevent the entrance of dirt and moisture. All new lines and components should be capped or sealed until they are ready to be used.

All tools, including the refrigerant dispensing manifold, the manifold gauge set, and test hoses should be kept clean and dry.

OPERATION

High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The refrigerant oil will absorb moisture readily out of the air. This moisture will convert into acids within a closed system.

HVAC FORCED RECIRCULATION

DESCRIPTION

The HVAC system (both Manual A/C and ATC) may force itself into recirculated airflow when extremely hot outside ambient conditions exist. This action can occur at a range of approximately 95°F to 120°F.

OPERATION

The Body Control Module (BCM) receives a Programmable Communications Interface (PCI) bus message from the Powertrain Control Module (PCM) with the feedback from the A/C Pressure Transducer. The BCM will force the system into the Recirculation mode, reducing the A/C refrigerant pressure under these extreme conditions. The reduced operating pressure offers improved A/C system performance and reduced wear on A/C components.

REFRIGERANT LINES

DESCRIPTION

The air conditioning lines used on this vehicle are made from reinforced rubber with a nylon liner on the inner walls. The ends of the A/C lines are made with light weight aluminum fittings.

CAUTION: Never attempt to disconnect an A/C line without reclaiming all refrigerant from the air conditioning system. The system must be empty.

OPERATION

The O-rings are made from a special type of rubber that is not affected by R-134a refrigerant. O-ring replacement is required whenever lines are removed and installed. Use only O-rings specified for this vehicle. Failure to use the correct type of O-ring will cause the connection to leak within a short period of time.

When it is necessary to open the refrigeration system, have everything needed to service the system ready. The system should not be left open any longer than necessary. Cap or plug all lines and fittings as soon as they are opened. This will prevent the entrance of dirt and moisture into the system. All new lines and components should be capped or sealed until they are ready to be used.

WARNING: AVOID BREATHING A/C REFRIGERANT AND LUBRICANT VAPOR OR MIST. EXPOSURE MAY IRRITATE EYES, NOSE AND THROAT. USE ONLY APPROVED SERVICE EQUIPMENT MEETING SAE REQUIREMENTS TO DISCHARGE R-134a SYSTEM. IF ACCIDENTAL SYSTEM DISCHARGE OCCURS, VENTILATE WORK AREA BEFORE RESUMING SERVICE.

R-134a SERVICE EQUIPMENT OR VEHICLE A/C SYSTEM SHOULD NOT BE PRESSURE TESTED OR LEAK TESTED WITH COMPRESSED AIR. SOME MIXTURES OF AIR/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)

SIDE WINDOW DEMISTERS**DESCRIPTION**

The side window demisters direct air from the heater assembly through the outlets located on the top corners of the instrument panel, to the side windows.

OPERATION

Side window demisting is performed when the mode selector is on FLOOR, DEFROST, MIX OR BI-LEVEL setting.

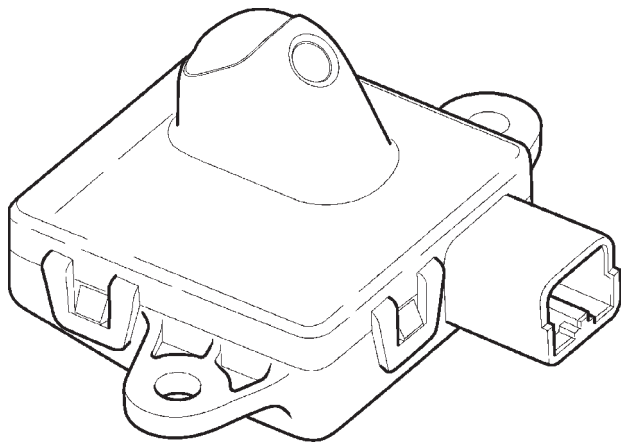
SUN SENSOR**DESCRIPTION**

The sun sensor is only used on vehicles equipped with Automatic Temperature Control (ATC). The sensor is mounted on the top of the instrument panel below the instrument panel top cover (Fig. 3).

OPERATION

The sun sensor is not a thermistor type sensor but rather a photo diode. For this reason the sun sensor responds to sun light intensity rather than temperature. It is used to aid in determining proper mode door position, temperature door position and blower speed. The sun sensor is also used to sense day/night conditions for automatic headlight control if so equipped, and has an LED indicator for the vehicle security system.

The sun sensor is not serviceable and must be replaced if found to be defective.



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Fig. 3 Sun Sensor

SYSTEM AIRFLOW**DESCRIPTION**

The system draws outside air through the cowl opening at the base of the windshield. Then it goes

into the plenum chamber above the Heater A/C unit housing and passes through the evaporator. At this point airflow can be directed either through or around the heater core.

OPERATION

Airflow can be adjusted by the blend-air door with the TEMP control on the control head. After the air passes the blend air door, the air flow is then directed from the PANEL, BI-LEVEL (panel and floor), and FLOOR-DEFROST outlets. Air flow velocity can be adjusted with the blower speed selector switch on the control head.

Ambient air intake can be shut off by closing the recirculating air door. This will recirculate the air that is already inside the vehicle. See owners manual for recirculation operation.

DIAGNOSIS AND TESTING**A/C PERFORMANCE TEST**

The air conditioning system is designed to remove heat and humidity from the air entering the passenger compartment. The evaporator, located in the heater A/C unit, is cooled to temperatures near the freezing point. As warm damp air passes over the fins in the evaporator, moisture in the air condenses to water, dehumidifying the air. High humidity reduces the evaporator's ability to cool the air. During periods of high heat and humidity, an air conditioning system will be less effective. With the control module set to RECIRC, only air from the passenger compartment passes through the evaporator. As the passenger compartment air dehumidifies, A/C performance levels rise.

PERFORMANCE TEST PROCEDURE

Review Safety Precautions and Warnings in this group before proceeding with this procedure. Air temperature in test room and in vehicle must be 21° C (70°F) minimum for this test.

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

- (1) Connect a tachometer and manifold gauge set.
- (2) Set controls:

MANUAL A/C

- A/C ON
- Panel Recirculation
- Temperature to full cold
- High blower

DIAGNOSIS AND TESTING (Continued)

ATC (Automatic Temperature Control) System:

- Rotate blower knob to high position (full clockwise)
- Set temperature to the LO position
- Push panel mode button
- Push RECIRC (Recirculation) button (A/C and RECIRC symbols should be lit)

NOTE: The word **MANUAL** should appear in the ATC display, confirming that the system is set manually.

(3) Start engine and hold at 1000 rpm with A/C clutch engaged.

(4) Engine should be warmed up with doors and windows closed.

(5) Insert a thermometer in the left center A/C outlet and operate the engine for five minutes. The A/C clutch may cycle depending on ambient conditions.

(6) **With the A/C clutch engaged**, compare the discharge air temperature to the A/C Performance Temperature table.

A/C PERFORMANCE TEMPERATURE AND PRESSURE

AMBIENT TEMPERATURE	21°C (70°F)	26.5°C (80°F)	32.5°C (90°F)	37°C (100°F)	43°C (110°F)
MAXIMUM ALLOWABLE AIR TEMPERATURE AT CENTER LEFT PANEL OUTLET	6°C (42°F)	7°C (45°F)	10°C (50°F)	12°C (54°F)	15°C (59°F)
COMPRESSOR DISCHARGE PRESSURE	1379–1585 kPa (200–230 psi)	1448–1723 kPa (210–250 psi)	1654–1930 kPa (240–280 psi)	1930–2206 kPa (280–320 psi)	2206–2516 kPa (320–365 psi)
COMPRESSOR SUCTION PRESSURE	103–172 kPa (15–25 psi)	139–208 kPa (20–30 psi)	172–241 kPa (25–35 psi)	208–276 kPa (30–40 psi)	241–310 kPa (35–45 psi)

ATC IN-CAR TEMPERATURE SENSOR

(1) Perform air flow test to check motor/fan assembly.

(a) Turn ignition to the ON position and push the OFF button to stop the ATC system airflow. This will make it easier to observe paper in the step Step b.

(b) Place a small piece of newspaper in front of the sensor/motor opening on the ATC control. If the paper sticks to the opening, the In-Car sensor/motor is operating properly. The piece of paper should be only large enough to cover the grille opening.

(2) Check if the electrical connection and connector are OK.

COMPRESSOR

The compressor used on this vehicle is a Nippon-denso 10PA17 R134a. This compressor uses an aluminum swash plate, teflon coated pistons and aluminum cylinder walls. One-way check valves are used to regulate refrigerant flow through the compressor.

CAUTION: A 10PA17 R-12 compressor looks identical to a 10PA17 R134a and will bolt up to this vehicle.

It is extremely important that a R-134a compressor is identified prior to using compressor in question. Check tag located on compressor for model number.

Excessive noise that occurs when the air-conditioning is being used may be caused by:

- Loose Bolts
- Mounting Brackets
- Loose Compressor Clutch
- Excessive High Refrigerant Operating Pressure

Verify the following before compressor repair is performed:

- (1) Compressor drive belt condition
- (2) Proper refrigerant charge
- (3) Thermal expansion valve (TXV) operating correctly
- (4) Head pressure is normal

EXPANSION VALVE

The expansion valve is located on the engine side of the dash panel, near the right shock tower.

The expansion valve can fail in three different positions (open, closed or restricted). **Note, that in each case, it is defective and requires replacement.**

DIAGNOSIS AND TESTING (Continued)

In an Open Position: this will result in a noisy compressor or no cooling. The cause can be a broken spring, broken ball or excessive moisture in the A/C system. If the spring or ball are found to be defective, replace the expansion valve. If excessive moisture is found in the A/C system, recycle the refrigerant.

In a Closed Position: There will be low suction pressure and no cooling. This may be caused by a failed power dome or excessive moisture in the A/C system. If the power dome on the expansion valve is found to be defective replace the expansion valve. If excessive moisture is found recycle the refrigerant.

A Restricted Orifice: There will be low suction pressure and no cooling. This may be caused by debris in the refrigerant system. If debris is believed to be the cause, recycle the refrigerant and replace the expansion valve and filter/drier.

SELF DIAGNOSTICS

DIAGNOSTIC TROUBLE CODES (DTC's)

Both the ATC and the Manual A/C system are controlled by the Body Control Module (BCM). Both systems can be diagnosed by the DRBIII® scan tool or the vehicles own control head display. Refer to the DRBIII® menu for checking Diagnostic Trouble Codes (DTC's) Note that there are three DTC tables. The ATC and Manual A/C DTC table contain faults that are common to both the ATC and the Manual A/C system. The same diagnosis can be used for both systems. The DTC's cover operation of the climate control unit actuators, doors, evaporator temperature sensor, ambient temperature sensor and the A/C refrigerant system. The Manual A/C DTC table covers Fault Codes that are for the manual A/C Control Head and wiring and are not used on an ATC system. The ATC DTC table has DTC's for ATC Head Communications, In-Car Temperature Sensor and Sun Sensor which are not in a Manual A/C system.

TROUBLE CODES FROM THE ATC CONTROL

The trouble codes can be checked with the ATC control if a DRBIII® scan tool is not available. The control head can only be placed into the diagnostic mode while the engine is running and the vehicle is not moving. Set the control to a 75° F setting (so there is no confusion with the 23-51 Diagnostic Trouble Codes (DTC's).

To place the system into it's diagnostic mode, press and hold the Floor, Mix and Defrost buttons (at the same time). The ATC head display will begin to blink. Release the Floor, Mix and Defrost buttons. Once the control head enters the diagnostic mode, the display on the control head will continue to blink. This occurs until it completes its tests and climate control unit door/actuator calibrations. Then it will

ATC AND MANUAL A/C DTC'S

CODE	DESCRIPTION
23	BLEND DOOR ACTUATOR FEEDBACK FAILURE
24	MODE DOOR ACTUATOR FEEDBACK FAILURE
25	AMBIENT SENSOR
31	RECIRCULATION DOOR ACTUATOR STALL FAILURE
32	BLEND DOOR ACTUATOR STALL FAILURE
33	MODE DOOR ACTUATOR STALL FAILURE
35	EVAPORATOR SENSOR FAILURE
37	BLEND DOOR ACTUATOR OUTPUT SHORTED TO BATTERY
38	BLEND DOOR ACTUATOR OUTPUT SHORTED TO GROUND
39	MODE DOOR ACTUATOR OUTPUT SHORTED TO BATTERY
40	MODE DOOR ACTUATOR OUTPUT SHORTED TO GROUND
41	RECIRC DOOR ACTUATOR OUTPUT SHORTED TO BATTERY
42	RECIRC DOOR ACTUATOR OUTPUT SHORTED TO GROUND
43	COMMON DOOR OUTPUT SHORTED TO BATTERY
44	COMMON DOOR OUTPUT SHORTED TO GROUND
51	SYSTEM VOLTAGE TOO LOW FOR DOOR CALIBRATION

MANUAL A/C DTC'S

CODE	DESCRIPTION
45	A/C CONTROL BLEND DOOR INPUT OPEN OR SHORTED TO GROUND
46	A/C CONTROL BLEND DOOR SHORTED TO BATTERY
47	A/C CONTROL - A/C SWITCH FAILURE
48	A/C CONTROL MODE DOOR INPUT SHORTED TO GROUND
49	A/C CONTROL MODE DOOR INPUT SHORTED TO BATTERY
50	A/C CONTROL ELECTRIC BACKLITE (EBL) SWITCH FAILURE

DIAGNOSIS AND TESTING (Continued)

ATC DTC'S

CODE	DESCRIPTION
26	ATC IN-CAR TEMPERATURE THERMISTER FAILURE
27	ATC IN-CAR SENSOR FAILURE
34	ENGINE TEMPERATURE MESSAGE NOT RECEIVED
36	ATC CONTROL COMMUNICATION FAILURE

display any diagnostic trouble codes that are present in the BCM. If there are no diagnostic trouble codes, the system will return to its normal operation as indicated by the temperature symbol (a C or a F). Diagnostic trouble codes related to the ATC and climate control unit will appear on the display in numerical form. The diagnostic trouble codes are stored in the BCM and can range between 23 and 51. The ATC control can only show one diagnostic trouble code at a time. Under certain circumstances, more than one diagnostic trouble code could be in the memory. To scroll through any additional diagnostic trouble codes, press the Panel Mode button on the ATC control. **It is important that no other knob or button is pushed until all codes are read. Pushing any button except Panel Mode or turning a knob will end the diagnostic test without showing the rest of the trouble codes. There also may be other trouble codes stored in the BCM not related to the Climate Control System. These codes can only be found using the DRBIII® scan tool.**

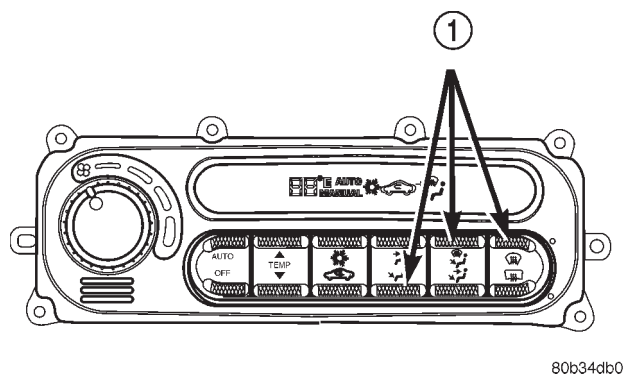


Fig. 4 Entering Self-Diagnostic Mode

1 - PRESS BUTTONS SIMULTANEOUS

TROUBLE CODES FROM THE MANUAL A/C CONTROL

The trouble codes can be checked with the Manual A/C control and the Odometer Display of the Mechanical Instrument Cluster if a DRBIII® scan tool is not available. The Manual A/C Control Head

can only be placed into the diagnostic mode while the engine is running and the vehicle is not moving. To place the system into it's diagnostic mode, adjust the Manual A/C Control to the following settings:

(1) The engine must be running with vehicle not moving.

(2) The Fan Speed set to any speed except OFF.

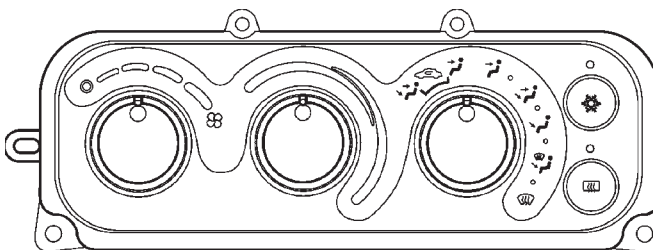
(3) The Temperature Knob in full cold (full counterclockwise position).

(4) The mode knob must be placed in defrost position (full clockwise position).

(5) The A/C button can be ON or OFF.

(6) Press and hold the EBL button until the Mechanical Instrument Cluster Odometer display indicates an "AC00". The body control module (BCM) will chime once and the Manual A/C control A/C button LED will begin blinking.

(7) Release the EBL button and wait until the Manual A/C Control A/C button LED stops blinking. This means that the error check and climate control unit door calibration is complete.



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Fig. 5 Manual A/C Control Head

Diagnostic trouble codes related to the Manual A/C Control and the climate control unit will appear on the odometer display in numerical form after the letters "AC". The diagnostic trouble codes are stored in the BCM and can range between 23 and 51. The odometer display will return to normal operation if no trouble codes are found. If a problem is found, then the odometer will display the letters "A/C" followed by the trouble code number. The odometer display can only show one diagnostic trouble code at a time. Under certain circumstances, more than one diagnostic trouble code could be in the memory. To scroll through any additional diagnostic trouble codes, press the A/C button on the Manual-A/C control. The BCM will beep each time the A/C button is pushed. Continue pushing the A/C button and recording the trouble code numbers until the odometer returns to normal operation (note the letters AC will disappear). **It is important that no other knob or button is pushed until all codes are read. Push-**

DIAGNOSIS AND TESTING (Continued)

ing any button except the A/C button or turning a knob will end the diagnostic test without showing the rest of the trouble codes. There also may be other trouble codes stored in the BCM not related to the Climate Control System. These codes can only be found using the DRBIII® scan tool.

ERASING DIAGNOSTIC TROUBLE CODES (DTC's)

Diagnostic trouble codes can be cleared from the memory two ways:

- The DRBIII® scan tool
- Power to the BCM can be disconnected for ten minutes by disconnecting the battery negative remote cable.

If the scan tool is to be used, refer to the proper LH Body Diagnostic Procedures Manual.

CAUTION: Fault code 26 can be created if the in-car sensor thermistor is disconnected while the BCM is operating. This can happen by disconnecting connectors from the BCM or the ATC Control Head when the battery is connected (even if the ignition switch is OFF). To correct, clear the fault code 26 from the BCM.

HEATER PERFORMANCE TEST

PRE-DIAGNOSTIC PREPARATIONS

Review Safety Precautions and Warnings in this group before performing the following procedures.

Check the coolant level, drive belt tension, vacuum line connections, radiator air flow and fan operation. Start engine and allow to warm up to normal temperature.

WARNING: DO NOT REMOVE RADIATOR CAP WHEN ENGINE IS HOT, SEVERE PERSONAL INJURY CAN RESULT.

If vehicle has been run recently, wait until engine is cool before removing cap. Squeeze the radiator hose to check temperature, and for pressure in the system. If the hose is very firm, allow time to cool down. Place a rag over the cap and turn it to the first safety stop. Allow pressure to escape through the overflow tube. When the system stabilizes, remove the cap completely.

MAXIMUM HEATER OUTPUT: TEST AND ACTION

Engine coolant is provided to the heater system by two 19 mm (3/4 inch inside diameter) heater hoses. With engine idling at normal running temperature, set the control to maximum heat, floor, and high blower setting. Using a test thermometer, check the

air temperature coming from the floor outlets. Refer to Temperature Reference Table.

TEMPERATURE REFERENCE TABLE

Ambient Temp.		Minimum Floor	Outlet Temp.
Celsius	Fahrenheit	Celsius	Fahrenheit
15.5°	60°	62.2°	144°
21.1°	70°	63.8°	147°
26.6°	80°	65.5°	150°
32.2°	90°	67.2°	153°

If the floor outlet air temperature is insufficient, refer to Group 7, Cooling Systems for specifications. Both heater hoses should be HOT to the touch (coolant return hose should be slightly cooler than the supply hose). If coolant return hose is much cooler than the supply hose, locate and repair engine coolant flow obstruction in heater system.

POSSIBLE LOCATIONS OR CAUSE OF OBSTRUCTED COOLANT FLOW

- (1) Pinched or kinked heater hoses.
- (2) Improper heater hose routing.
- (3) Plugged heater hoses or supply and return ports at cooling system connections, refer to Group 7, Cooling System.
- (4) Plugged heater core.
- (5) Air locked heater core.
- (6) If coolant flow is verified and outlet temperature is insufficient, a mechanical problem may exist.

POSSIBLE LOCATION OR CAUSE OF INSUFFICIENT HEAT

- (1) Obstructed cowl air intake.
- (2) Obstructed heater system outlets.
- (3) Blend-air door not functioning properly.

TEMPERATURE CONTROL

If temperature cannot be adjusted with the TEMP knob/button on the control panel, the following could require service:

- (1) Blend-air door binding.
- (2) Faulty blend-air door motor.
- (3) Improper engine coolant temperature.
- (4) Faulty Instrument Panel Control.
- (4) Refer to the appropriate LH Body Diagnostic Procedures Manual.

SUN SENSOR

The sun sensor is located so the sun hits the sensor in the same way that it hits the driver and the passenger. It is important that the area in front of

DIAGNOSIS AND TESTING (Continued)

the sensor be unobstructed. Check that the following items are not in the way of the sun sensor.

- Windshield wipers that are adjusted too high.
- Stickers on the windshield that are directly in front of the sensor.
- Top cover which is not properly installed. The sun sensor should be 1/4 inch. above the top cover.
- Caps or papers which might cover the sensor.

Refer to the proper LH Body Diagnostic Procedures Manual for electrical test.

SYSTEM OIL LEVEL

It is important to have the correct amount of lubricant in the A/C system to ensure proper lubrication of the compressor. Too little lubricant will result in damage to the compressor. Too much lubricant will reduce the cooling capacity of the system and consequently result in higher discharge air temperatures.

The lubricant used in the compressor is polyalkylene glycol PAG lubricant. Only the refrigerant lubricant approved for use with this vehicle (ND8 PAG oil) should be used to service the system. Do not use any other lubricant. The lubricant container should be kept tightly capped until it is ready for use. Refrigerant lubricant will quickly absorb any moisture it comes in contact with.

It is not necessary to check or add lubricant unless it has been lost. Lubricant loss at the leak point will be evident by the presence of a wet, shiny surface around the leak.

REFRIGERANT OIL LEVEL CHECK

When an air conditioning system is first assembled, all components (except the compressor) are refrigerant oil free. After the system has been charged with (R-134a) refrigerant and operated, the oil in the compressor is dispersed through the lines and components. The evaporator, condenser, and receiver/drier will retain a significant amount of oil. Refer to the A/C Component Refrigerant Oil Capacities table. When a component is replaced, the specified amount of refrigerant oil must be added. When the compressor is replaced, the amount of oil that is retained in the rest of the system must be drained from the replacement compressor. The oil capacity of the system, minus the amount of oil still in the remaining components (refer to the oil capacity chart below) can be measured and poured into the suction port of the compressor. When a line or component has ruptured and oil has escaped, the receiver/drier must be replaced along with the ruptured part.

Example: On an A/C system the evaporator retains 60 ml. (2 oz.). The condenser retains 30 ml. (1 oz.) of oil, and system capacity may be 150 ml. (5.00 oz.) of oil.

150 ml. minus 90 ml. equals 60 ml. (2.00 oz.).

A/C COMPONENT REFRIGERANT OIL CAPACITIES

COMPONENT NAME	ml.	oz.
Total Air Conditioning System	150 ml.	5.00 oz.
Condenser	30 ml.	1.00 oz.
Evaporator	59 ml.	2.00 oz.
Filter/Drier	30 ml.	1.00 oz.
Line Blown	44 ml.	1.50 oz.

CAUTION: The refrigerant oil used in a R-134a A/C system is unique. Use only oils which were designed to work with R-134a refrigerant. The oil designated for this vehicle is ND 8 PAG (polyalkylene glycol).

VERIFY REFRIGERANT ND8 LUBRICANT LEVEL

(1) Discharge refrigerant system using a recycling/reclaiming equipment if a charge is present.

(2) Disconnect refrigerant lines from A/C compressor. Cap the open lines to prevent moisture from entering system.

(3) Remove compressor from vehicle.

(4) From suction and discharge ports on top of compressor, drain lubricant from compressor.

(5) Add system capacity minus the capacity of components that have not been replaced. Refer to the A/C Component Refrigerant Oil Capacities chart above. Add lubricant through the suction and discharge ports on compressor. This is not to exceed 150 ml. (5.00 oz.) in total.

(6) Install compressor and connect refrigerant lines. Then evacuate and charge refrigerant system.

(7) Most reclaim/recycling equipment will measure the lubricant being removed. This amount of lubricant should be added back to the system. If a new compressor is being installed, drain lubricant from old compressor, measure the amount drained and discard old lubricant. Drain the lubricant from the new compressor into a clean container. Return the amount of lubricant measured from the old compressor, plus the amount reclaimed from the system back into the new compressor.

SERVICE PROCEDURES

EVACUATING REFRIGERANT SYSTEM

NOTE: Special effort must be used to prevent moisture from entering the A/C system oil. Moisture in the oil is very difficult to remove and will cause a reliability problem with the compressor.

SERVICE PROCEDURES (Continued)

If a compressor designed to use R-134a refrigerant is left open to the atmosphere for an extended period of time. It is recommended that the refrigerant oil be drained and replaced with new oil or a new compressor be used. This will eliminate the possibility of contaminating the refrigerant system.

If the refrigerant system has been open to the atmosphere, it must be evacuated before the system can be filled. Moisture and air mixed with the refrigerant will raise the compressor head pressure above acceptable operating levels. This will reduce the performance of the air conditioner and damage the compressor. Moisture will boil at near room temperature when exposed to vacuum. To evacuate the refrigerant system:

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

(1) Connect a suitable charging station, refrigerant recovery machine, and a manifold gauge set with vacuum pump (Fig. 6).

(2) Open suction and discharge valves and start vacuum pump. The vacuum pump should run a minimum of 45 minutes prior to charge, to eliminate all moisture in system. When suction gauge reads -88 kPa (-26 in. Hg) vacuum or greater for 45 minutes, close all valves and turn off vacuum pump. **If the system fails to reach specified vacuum, the refrigerant system likely has a leak that must be corrected.** If the refrigerant system maintains specified vacuum for at least 30 minutes, start the vacuum pump, open the suction and discharge valves. Then allow the system to evacuate an additional 10 minutes.

(3) Close all valves. Turn off and disconnect the vacuum pump.

(4) The refrigerant system is prepared to be charged with refrigerant.

R-134a REFRIGERANT

This vehicle uses a refrigerant called R-134a. It is a non-toxic, non-flammable, clear colorless liquefied gas.

R-134a refrigerant is not compatible with R-12 refrigerant in an air conditioning system. Even a small amount of R-12 in a R-134a system could cause compressor failure, refrigerant oil sludging or poor performance. **Never add R-12 to a system designed to use R-134a. System failure will occur.**

The service ports for the 3.2 / 3.5L applications are located on the compressor (Fig. 7). The service ports for the 2.7L application are located on the A/C liquid (high pressure) and suction (low pressure) lines.

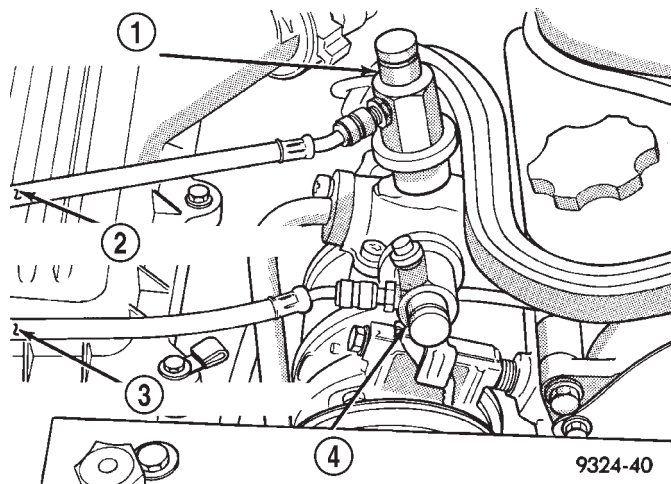


Fig. 6 Gauge Set or Refrigerant Recovery Machine Hookup (3.2 / 3.5L)

- 1 - HIGH SIDE CONNECTOR
- 2 - TO MANIFOLD GAUGE SET
- 3 - TO MANIFOLD GAUGE SET
- 4 - LOW SIDE CONNECTOR

R-134a service ports have been used to ensure that the system is not accidentally filled with the wrong refrigerant.

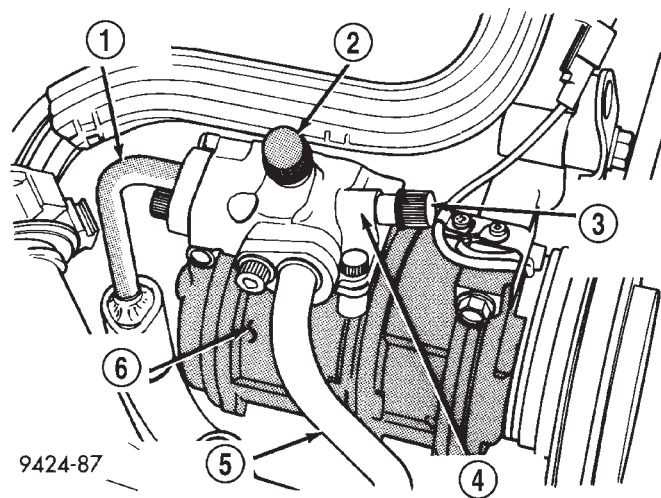


Fig. 7 A/C Service Ports (3.2 / 3.5L)

- 1 - DISCHARGE LINE
- 2 - HIGH SIDE SERVICE PORT
- 3 - LOW SIDE SERVICE PORT
- 4 - MANIFOLD
- 5 - SUCTION LINE
- 6 - A/C COMPRESSOR

When servicing a system, it is required that an air conditioning charging recovery/recycling machine be used (Fig. 8). Contact an automotive service equipment supplier for proper equipment. Refer to the operating instructions provided with the equipment for proper operation.

SERVICE PROCEDURES (Continued)

A manifold gauge set (Fig. 9) must also be used in conjunction with the charging and/or recovery/recycling device. Only use gauges that have not been used for R-12. The service hoses on the gauge set should have manual (turn wheel) or automatic back flow valves at the service port connector ends. This will prevent refrigerant R-134a from being released into the atmosphere.

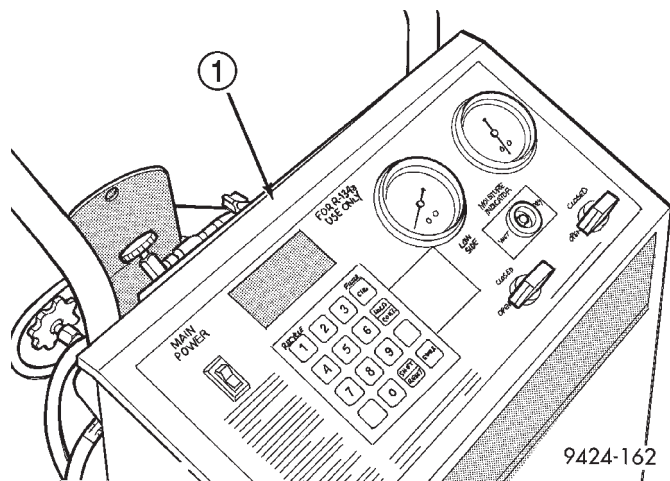


Fig. 8 Refrigerant Recovery/Recycling Station - Typical

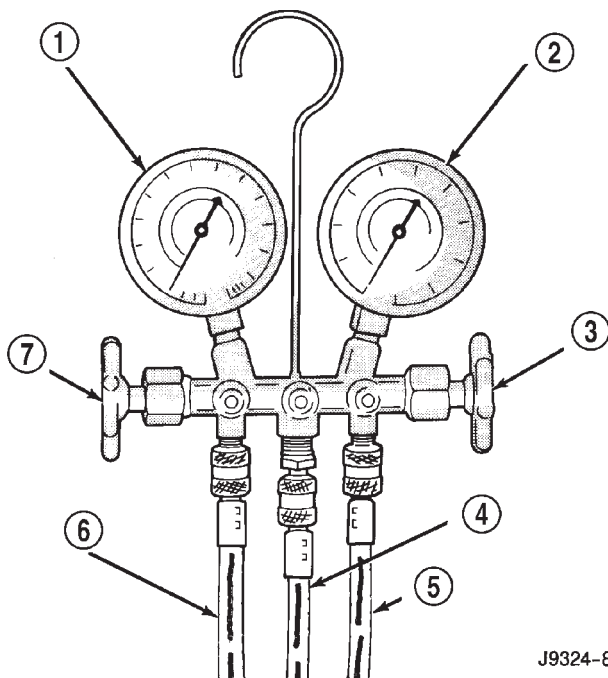
1 - R-134a REFRIGERANT RECOVERY MACHINE

R-134a refrigerant requires a special type of compressor oil. When adding oil, make sure that it is designed to be used in a R-134a system. Refer to the label under the hood for proper oil and refrigerant charge levels

WARNING: AVOID BREATHING A/C REFRIGERANT AND LUBRICANT VAPOR OR MIST. EXPOSURE MAY IRRITATE EYES, NOSE AND THROAT. USE ONLY APPROVED SERVICE EQUIPMENT MEETING SAE REQUIREMENTS TO RECLAIM R-134a SYSTEMS. IF ACCIDENTAL SYSTEM DISCHARGE OCCURS, VENTILATE WORK AREA BEFORE RESUMING SERVICE.

R-134a SERVICE EQUIPMENT OR VEHICLE A/C 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.

The use of R-134a will have a positive environmental impact due to it's zero ozone depletion and low global warming impact.



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Fig. 9 Manifold Gauge Set - Typical

- 1 - LOW PRESSURE GAUGE
- 2 - HIGH PRESSURE GAUGE
- 3 - VALVE
- 4 - VACUUM/REFRIGERANT HOSE (YELLOW W/BLACK STRIP)
- 5 - HIGH PRESSURE HOSE (RED W/BLACK STRIP)
- 6 - LOW PRESSURE HOSE (BLUE W/BLACK STRIP)
- 7 - VALVE

THERMOCOUPLE PROBE

To diagnose the LH A/C system, a temperature probe is required to measure liquid line temperature. The clamp-on type K probe shown in this manual is available through the Chrysler Professional Service Equipment (PSE) program. This probe is compatible with temperature-measuring instruments that accept Type K Thermocouples and have a miniature connector input. Other temperature probes are available through aftermarket sources. All references in this manual will reflect the use of the probe made available through the Professional Service Equipment program.

In order to use the temperature probe, a digital thermometer will be required. If a digital thermometer is not available, an adapter is available through the Professional Service Equipment program. It can convert any standard digital multimeter into a thermometer. This adapter is designed to accept any standard K-type thermocouple.

If a digital multimeter is not available, it can be ordered through Professional Service Equipment program.

SERVICE PROCEDURES (Continued)

SYSTEM CHARGE LEVEL

TO CHECK OR FILL SYSTEM

The procedure below should be used to check and/or fill the refrigerant charge in the air conditioning system.

NOTE: The air conditioning system in this vehicle holds 0.71 Kg. (25 oz. or 1.56 lbs.) of R-134a refrigerant.

This procedure can be performed two different ways:

- With a scan tool (DRBIII®) and a thermocouple (Fig. 10).
- Using a manifold gauge set (Fig. 11), a thermocouple and the Charge Determination Graph (Fig. 12). It is recommended to use the gauges or reclaim/recycle equipment.

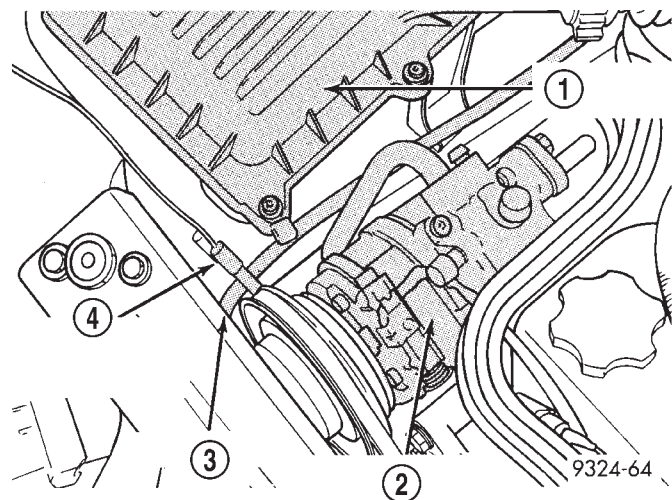


Fig. 10 Thermocouple Attachment Point (3.2 / 3.5L)

- 1 - AIR CLEANER HOUSING
- 2 - A/C COMPRESSOR
- 3 - LIQUID LINE
- 4 - CLAMP-ON THERMOCOUPLE PROBE

WARNING: AVOID BREATHING A/C REFRIGERANT AND LUBRICANT VAPOR OR MIST. EXPOSURE MAY IRRITATE EYES, NOSE AND THROAT. USE ONLY APPROVED SERVICE EQUIPMENT MEETING SAE REQUIREMENTS TO DISCHARGE R-134a SYSTEM. IF ACCIDENTAL SYSTEM DISCHARGE OCCURS, VENTILATE WORK AREA BEFORE RESUMING SERVICE.

R-134a SERVICE EQUIPMENT OR VEHICLE A/C 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 DANGER-

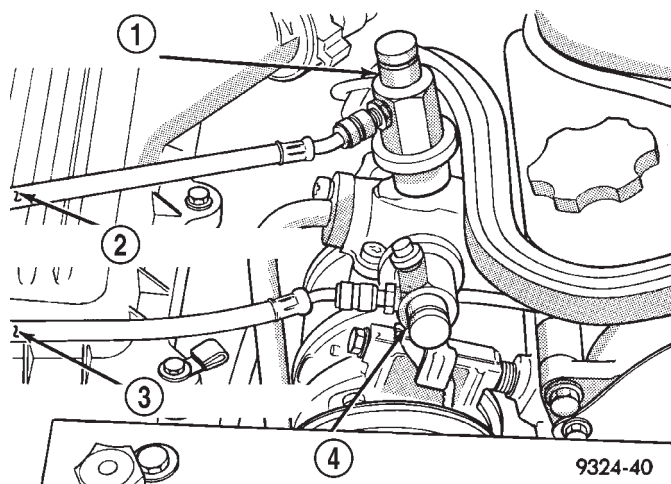


Fig. 11 Manifold Gauge Hook-up (3.2 / 3.5L)

- 1 - HIGH SIDE CONNECTOR
- 2 - TO MANIFOLD GAUGE SET
- 3 - TO MANIFOLD GAUGE SET
- 4 - LOW SIDE CONNECTOR

CAUTION: A/C REFRIGERANT IS FLAMMABLE AND MAY RESULT IN FIRE OR EXPLOSION CAUSING INJURY OR PROPERTY DAMAGE.

(1) Establish your preferred method of measuring compressor discharge pressure. Use a manifold gauge set or a scan tool.

(2) Attach a clamp-on thermocouple (P. S. E. 66-324-0014 or 80PK-1A) or equivalent to the liquid line (Fig. 10). It must be placed as close to the condenser outlet as possible to observe liquid line tubing temperature. Refer to "Thermocouple Probe" in this section for more information on probe.

(3) The vehicle must be in the following modes:

- Transaxle in Park
- Engine Idling
- A/C Controls Set to Outside Air
- Panel Mode
- Full Cool
- High Blower
- A/C Button in the ON position
- Vehicle Windows Open.
- Recirc button turned OFF on ATC equipped vehicles

(4) Operate system for a couple of minutes to allow the system to stabilize.

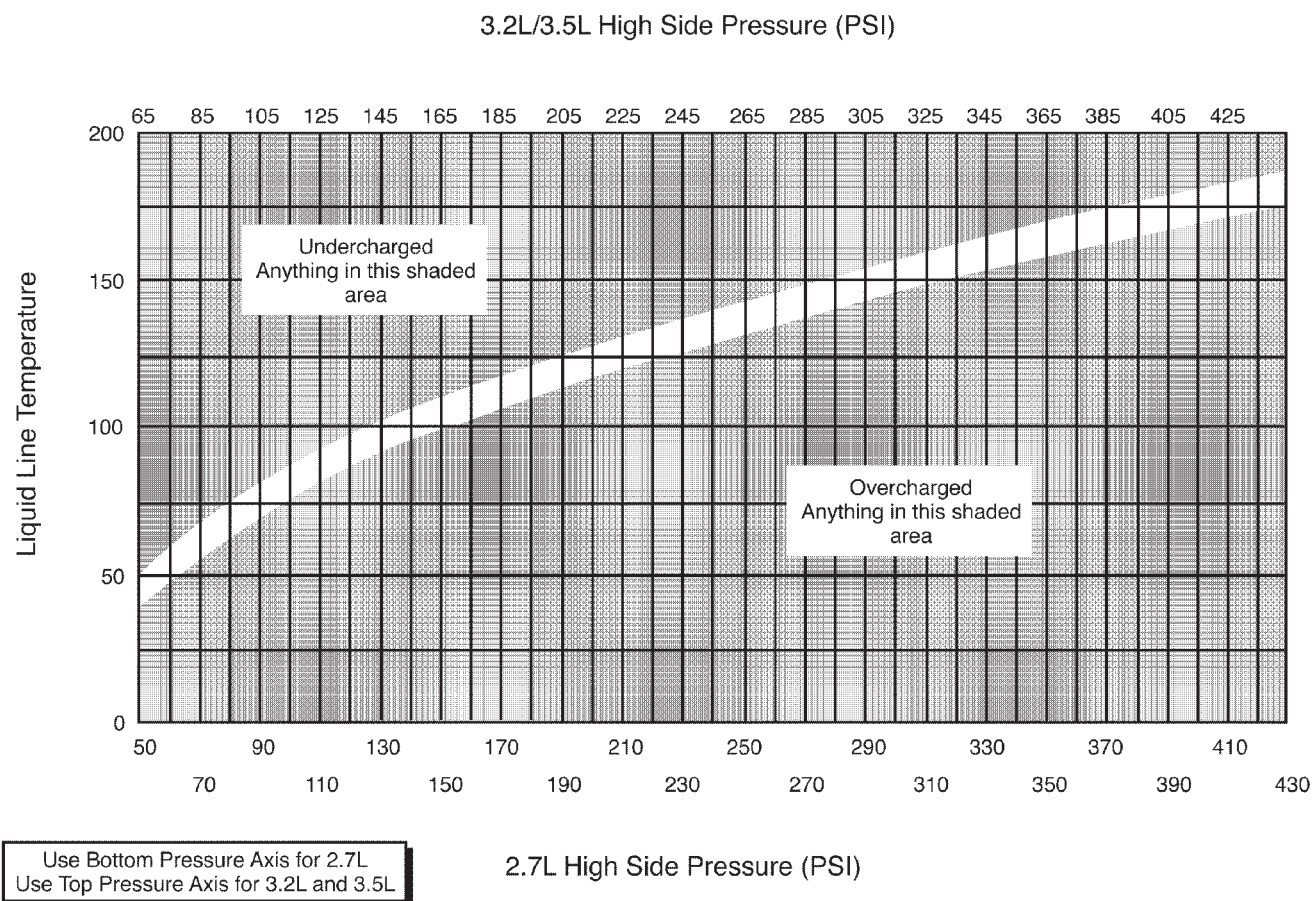
(5) Set system pressure to about 1793 kPa (260 psi) by blocking off the airflow to the front grill area. This will maintain a constant pressure and stop the cooling fans from alternating between high and low speeds.

(6) Observe Discharge pressure and Liquid line temperature. Using the Charge Determination Graph determine where the system is currently operating (Fig. 12). If the system is in the undercharged region,

SERVICE PROCEDURES (Continued)

ADD 0.057 Kg. (2 oz.) to the system and recheck readings. If the system is in the overcharged region, RECLAIM 0.057 Kg. (2 oz.) from the system and recheck readings. Continue this process until the system readings are in the proper charge area on the Charge Determination Chart (Fig. 12).

If the A/C system is not cooling properly, determine if the refrigerant system is fully charged with R-134a. This is accomplished by performing a system Charge Level-Check or Fill. If while performing this test A/C liquid line pressure is less than 207 kPa (30 psi) proceed to Empty Refrigerant System Leak Test.



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Fig. 12 Charge Determination Graph

SYSTEM LEAK CHECKING

WARNING: R-134a SERVICE EQUIPMENT OR VEHICLE A/C SYSTEM SHOULD NOT BE PRESSURE TESTED OR LEAK TESTED WITH COMPRESSED AIR. MIXTURE OF AIR and R-134a CAN BE COMBUSTIBLE AT ELEVATED PRESSURES. THESE MIXTURES ARE POTENTIALLY DANGEROUS AND MAY RESULT IN FIRE OR EXPLOSION CAUSING INJURY OR PROPERTY DAMAGE.

AVOID BREATHING A/C REFRIGERANT AND LUBRICANT VAPOR OR MIST. EXPOSURE MAY IRRITATE EYES, NOSE AND THROAT. USE ONLY APPROVED SERVICE EQUIPMENT MEETING SAE REQUIREMENTS TO DISCHARGE R-134a SYSTEM. IF ACCIDENTAL SYSTEM DISCHARGE OCCURS, VENTILATE WORK AREA BEFORE RESUMING SERVICE.

If liquid line pressure is greater than 207 kPa (30 psi) proceed to low refrigerant level leak test. If the refrigerant system is empty or low in refrigerant charge, a leak at any line fitting or component seal is likely. A review of the fittings, lines and components for oily residue is an indication of the leak location. To detect a leak in the refrigerant system, perform one of the following procedures as indicated by the symptoms.

EMPTY REFRIGERANT SYSTEM LEAK TEST

(1) Evacuate the refrigerant system (minimum evacuation time of 15 min.) to the lowest degree of vacuum possible (approx. 28 in Hg.). Determine if the system holds a vacuum for at least 15 minutes after pump is off. If vacuum is held, a leak is probably not present. If system will not maintain vacuum level, proceed with this procedure.

SERVICE PROCEDURES (Continued)

(2) Prepare a.284 Kg. (10 oz.) refrigerant charge to be injected into the system.

(3) Connect and dispense.284 Kg. (10 oz.) of refrigerant into the evacuated refrigerant system.

(4) Proceed to Step 2 of Low Refrigerant Level Leak Test.

LOW REFRIGERANT LEVEL LEAK TEST

(1) Determine if there is any (R-134a) refrigerant in the system. Use the scan tool (DRBIII®) partial charge test or pressure gauge liquid line temperature partial charge check. See system charge level check or fill for procedure.

(2) Position the vehicle in a wind free work area. This will aid in detecting small leaks.

(3) Bring the refrigerant system up to operating temperature and pressure. This is done by allowing the engine to run for five minutes with the system set to the following:

- Transaxle in Park
- Engine Idling
- A/C Controls Set in 100 percent outside air
- Blower switch in the high A/C position
- A/C in the ON position
- Open all windows

CAUTION: A leak detector designed for R-12 refrigerant may not detect leaks in a R-134a refrigerant system. Check specifications on leak detector.

(4) Shut off the vehicle and wait 2 to 7 minutes. Then use an Electronic Leak Detector that is designed to detect R-134a type refrigerant and search for leaks. Fittings, lines, or components that appear to be oily usually indicates a refrigerant leak. To inspect the evaporator core for leaks, insert the leak detector probe into the drain tube opening or a heat duct.

If a thorough leak check has been completed without indication of a leak, proceed to System Charge Level.

NOTE: If leak is not detected but known to exist, further diagnosis may be necessary using a refrigerant dye and the recovery machine. Refer to recovery machine instructions for proper dye injection procedures.

REMOVAL AND INSTALLATION**SAFETY PRECAUTIONS AND WARNINGS**

WARNING: WEAR EYE PROTECTION WHEN SERVICING THE AIR CONDITIONING REFRIGERANT SYSTEM. SERIOUS EYE INJURY CAN RESULT

FROM EYE CONTACT WITH REFRIGERANT. IF EYE CONTACT IS MADE, SEEK MEDICAL ATTENTION IMMEDIATELY.

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

LARGE AMOUNTS OF REFRIGERANT RELEASED IN A CLOSED WORK AREA WILL DISPLACE THE OXYGEN AND CAUSE SUFFOCATION.

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

ANTIFREEZE IS AN ETHYLENE GLYCOL BASE COOLANT AND IS HARMFUL IF SWALLOWED OR INHALED. SEEK MEDICAL ATTENTION IMMEDIATELY IF SWALLOWED OR INHALED. DO NOT STORE IN OPEN OR UNMARKED CONTAINERS. WASH SKIN AND CLOTHING THOROUGHLY AFTER COMING IN CONTACT WITH ETHYLENE GLYCOL. KEEP OUT OF REACH OF CHILDREN AND PETS.

DO NOT OPEN A COOLING SYSTEM WHEN THE ENGINE IS AT RUNNING TEMPERATURE. PERSONAL INJURY CAN RESULT.

CAUTION: The engine cooling system is designed to develop internal pressure of 97 to 123 kPa (14 to 18 psi). Allow the vehicle to cool a minimum of 15 minutes before opening the cooling system. Refer to Group 7, Cooling System.

A/C PRESSURE TRANSDUCER

CAUTION: A/C pressure transducer switch connector terminal contacts can be damaged by probing tools during system diagnosis and repair. Failure to use their respective mating terminals or pin gauge to check for tightness will cause contact beam spreads. This will result in loss of continuity.

REMOVAL AND INSTALLATION (Continued)

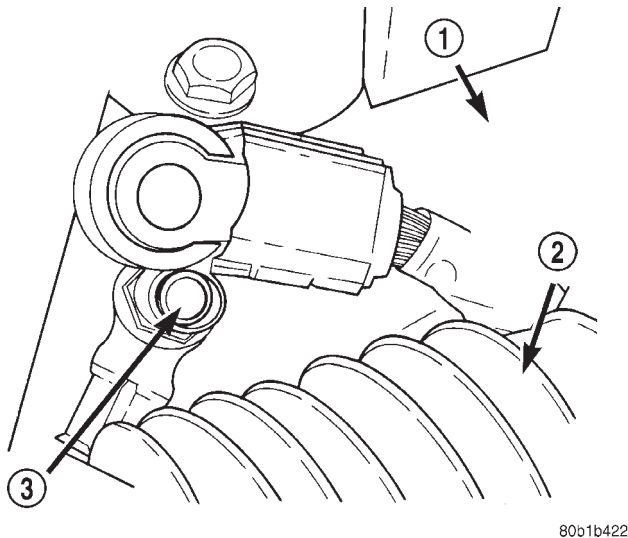
O-ring replacement is required whenever the pressure transducer is serviced. Be sure to use the O-ring specified for this vehicle.

The A/C pressure transducer is screwed on to a valve on the discharge line. The transducer can be removed or installed without evacuating the refrigerant from the A/C system.

NOTE: For 3.2/3.5L applications, the passenger side headlamp must be rotated out of the way to access the A/C pressure transducer.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).



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Fig. 13 Negative Battery Cable Remote Terminal

- 1 - RIGHT STRUT TOWER
- 2 - AIR CLEANER INLET TUBE
- 3 - REMOTE TERMINAL

(2) Disconnect the wire harness connector from the A/C pressure transducer.

CAUTION: A slight release of pressure trapped in the fitting may be experienced. It is not necessary to discharge the refrigerant system.

(3) Remove the transducer with a counterclockwise rotation using a 14 mm open-end wrench.

INSTALLATION

For installation, reverse the above procedures. Tighten pressure transducer to 6 N·m (50 in. lbs.).

AMBIENT TEMPERATURE SENSOR

The ambient air temperature sensor is located on the inside of the right front bumper beam (Fig. 14).

This sensor will inform the ATC system of the ambient temperature outside the vehicle. This sensor is used by the ATC system to adjust blower speed, temperature offsets, evaporator temperatures and mode control.

The ambient sensor is not serviceable and must be replaced if found to be defective.

The ambient temperature sensor is used on all LH vehicles with or without ATC systems.

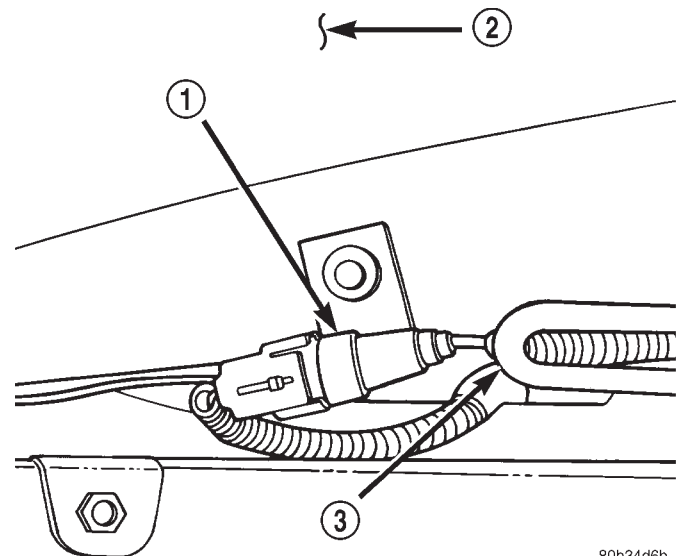
To test Ambient Temperature Sensor, refer to proper LH Body Diagnostic Manual.

REMOVAL

- (1) Remove sensor mounting screw.
- (2) Disconnect sensor wiring connector.

INSTALLATION

For installation, reverse the above procedures.



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Fig. 14 Ambient Temperature Sensor Location

- 1 - AMBIENT TEMPERATURE SENSOR
- 2 - FRONT FASCIA
- 3 - POWER STEERING COOLER

ATC IN-CAR TEMPERATURE SENSOR

The ATC In-Car Temperature Sensor is located in the Control Head. The Control Head must be removed for service to the sensor.

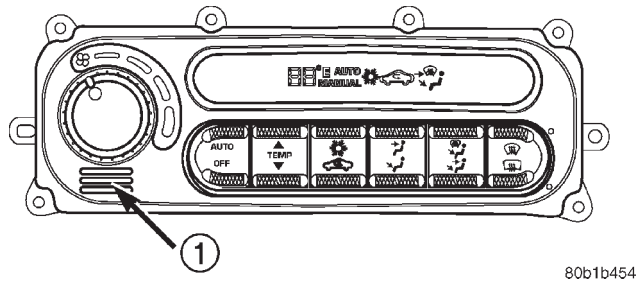
REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove snap-on center bezel which holds the ATC Control.

(3) Disconnect the ATC Control from the vehicle wiring harness.

REMOVAL AND INSTALLATION (Continued)

**Fig. 15 ATC In-Car Temperature Sensor**

1 - ATC IN-CAR TEMPERATURE SENSOR

(4) If the ATC in-car temperature sensor (fault 26) is verified to be bad, then the ATC control section of the assembly must be replaced. If the ATC in-car sensor does not pass the paper test, then the problem may only be with the ATC In-Car Sensor Fan-Motor assembly.

(5) Remove the fan-motor assembly from the ATC control with two screws located on the back of the ATC control.

(6) Replace only the fan-motor assembly if control does not pass the paper test, but passes with no fault code 26 (bad thermistor).

NOTE: Retest control. If ATC control still fails the paper test, then replace the ATC control and the fan-motor assembly. The ATC Control must be replaced if the part fails fault code 26 (after confirming proper wiring connections).

INSTALLATION

For installation, reverse the above procedures.

BLOWER MOTOR AND WHEEL ASSEMBLY

The blower motor is located on the right side of the heater housing. The blower motor and the blower motor wheel must be replaced as an assembly.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove lower right under panel duct.

(3) Remove blower motor connector from resistor block/power module.

(4) Squeeze blower motor wiring grommet and push grommet through blower motor housing cover.

(5) Remove blower motor housing cover.

(6) Remove blower motor retaining screws.

(7) Lower blower motor from housing.

INSTALLATION

For installation, reverse the above procedures.

BLOWER MOTOR POWER MODULE**REMOVAL**

The Blower Motor Power Module is used on ATC systems only.

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove lower right underpanel silencer/duct.

(3) Disconnect wiring connectors on blower motor resistor.

(4) Remove blower motor resistor retaining screws.

(5) Pull blower motor resistor out of heater housing.

INSTALLATION

For installation, reverse the above procedures.

BLOWER MOTOR RESISTOR**REMOVAL**

The Blower Motor Resistor is used on manual Heater-A/C systems only.

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove lower right underpanel silencer/duct.

(3) Disconnect wiring connectors on blower motor resistor.

(4) Remove blower motor resistor retaining screws.

(5) Pull blower motor resistor out of heater housing.

INSTALLATION

For installation, reverse the above procedures.

BLOWER MOTOR WHEEL

The blower motor wheel is only serviced with the blower motor. The wheel and the motor are balanced as an assembly. If the blower motor wheel requires replacement, the blower motor must also be replaced. Refer to blower motor for replacement procedure.

COMPRESSOR

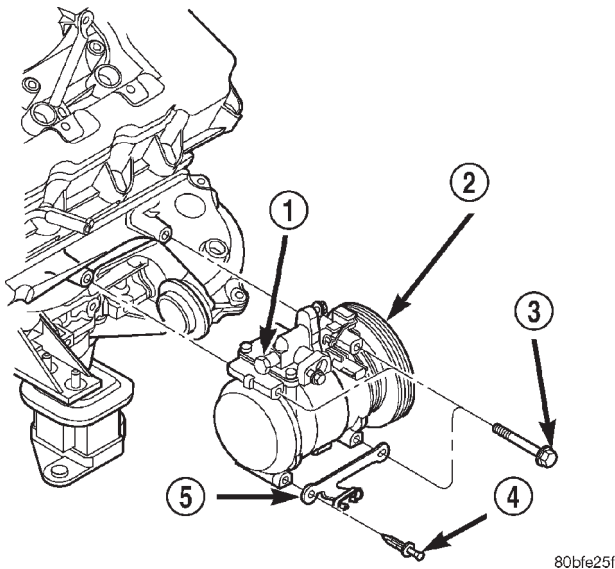
The A/C compressor may be unbolted and repositioned without discharging the refrigerant system. Discharging is not necessary if removing the compressor clutch/coil assembly, engine, cylinder head, or alternator.

WARNING: REFRIGERANT PRESSURES REMAIN HIGH EVEN THOUGH THE ENGINE MAY BE TURNED OFF. DO NOT TWIST OR KINK THE REFRIGERANT LINES WHEN REMOVING A FULLY CHARGED COMPRESSOR. SAFETY GLASSES MUST BE WORN.

REMOVAL AND INSTALLATION (Continued)

REMOVAL

- (1) Disconnect Negative battery cable.
- (2) Loosen and remove drive belts (refer to Group 7, Engine Cooling) and disconnect compressor clutch wire lead.
- (3) Remove refrigerant from the A/C system (with a refrigerant recovery machine) if the compressor is being replaced.
- (4) Remove refrigerant lines from compressor and disconnect electrical connector.
- (5) If system is left open place plug/cap over open lines.
- (6) Remove compressor attaching bolts (Fig. 16) and (Fig. 17).

**Fig. 16 Compressor Mounting 2.7L**

- 1 - HIGH PRESSURE RELIEF VALVE
- 2 - A/C COMPRESSOR
- 3 - MOUNTING BOLTS
- 4 - PUSH PIN
- 5 - ENGINE OIL COOLER BRACKET

- (7) Remove compressor. If refrigerant lines were not removed, lift compressor/clutch assembly and tie it to a suitable component.

INSTALLATION

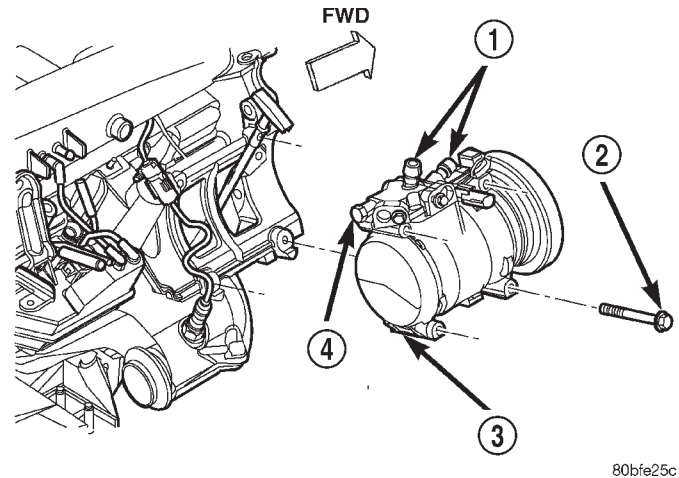
For installation, reverse the above procedures. Torque Compressor bolts to 28 N·m (21 ft. lbs.)

COMPRESSOR HIGH-PRESSURE RELIEF VALVE

The high pressure relief valve is located on the A/C compressor manifold (Fig. 16) and (Fig. 17).

REMOVAL

- (1) Remove refrigerant from A/C system using a refrigerant recovery machine.



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Fig. 17 Compressor Mounting 3.2L/3.5L

- 1 - SERVICE PORTS
- 2 - MOUNTING BOLTS
- 3 - A/C COMPRESSOR
- 4 - HIGH PRESSURE RELIEF VALVE

- (2) Rotate the high pressure relief valve counter-clockwise and separate relief valve from the vehicle.

INSTALLATION

For installation, reverse the above procedures using a new O-ring seal. Evacuate and charge the refrigerant system. Torque 5/8" Hex to 13.5 N·m (10 ft. lbs.).

COMPRESSOR CLUTCH/COIL ASSEMBLY

REMOVAL

Compressor assembly must be removed from mounting. Although, refrigerant discharge is not necessary.

- (1) Remove the compressor shaft bolt (Fig. 18). A band type oil filter removal tool can be placed around the clutch plate to aid in bolt removal.

- (2) Tap the clutch plate with a plastic hammer and remove clutch plate and shim(s) (Fig. 19).

CAUTION: Do not use screwdrivers between the clutch plate assembly and pulley to remove front plate as this may damage the front plate assembly.

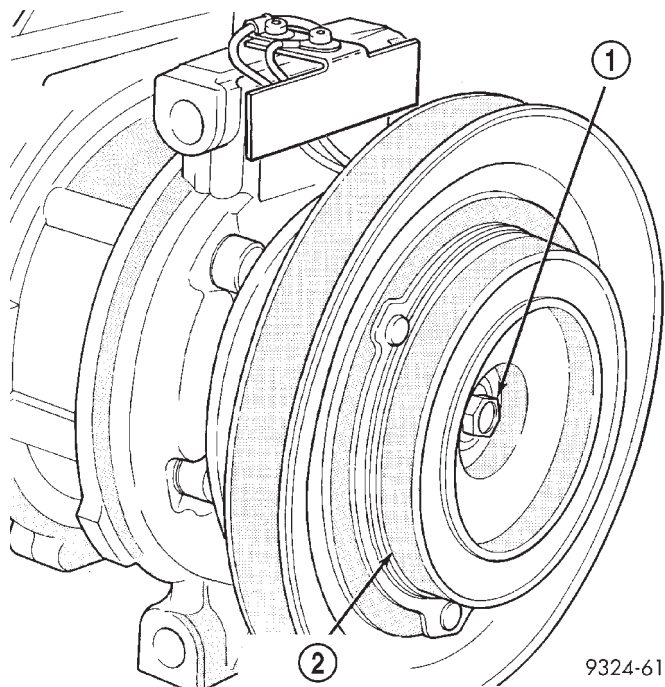
- (3) Remove pulley retaining snap ring with Snap Ring Pliers (C-4574), and slide pulley assembly off of compressor (Fig. 20).

- (4) Remove coil wire bracket/ground clip screw and wire harness.

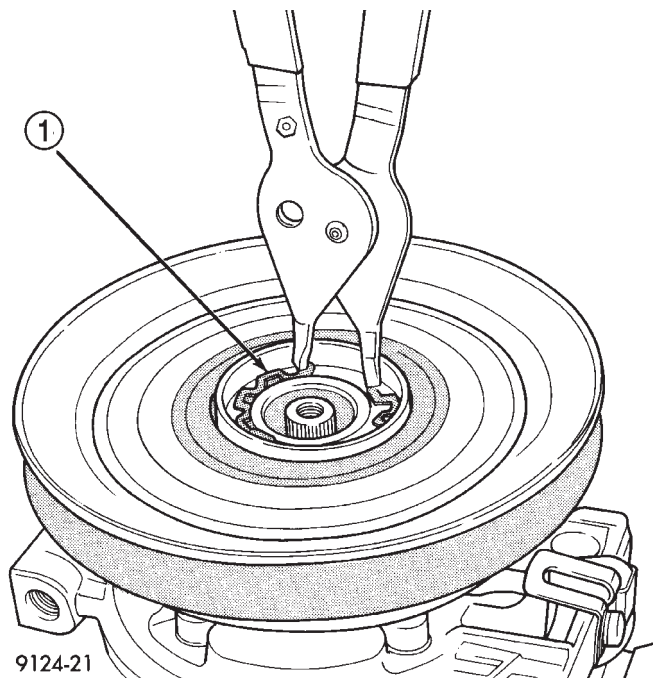
- (5) Remove snap ring retaining field coil onto compressor housing (Fig. 21). Slide field coil off of compressor housing.

- (6) Examine frictional faces of the clutch pulley and front plate for wear. The pulley and front plate

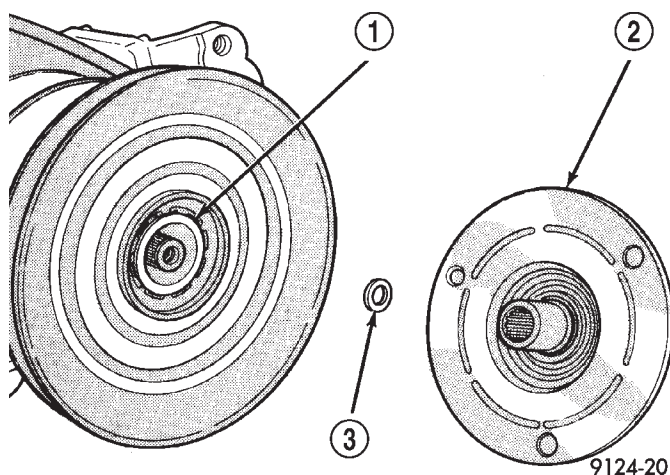
REMOVAL AND INSTALLATION (Continued)

**Fig. 18 Compressor Shaft Bolt and Clutch Plate**

- 1 - COMPRESSOR SHAFT BOLT
2 - COMPRESSOR CLUTCH PLATE

**Fig. 20 Removing Pulley Snap Ring**

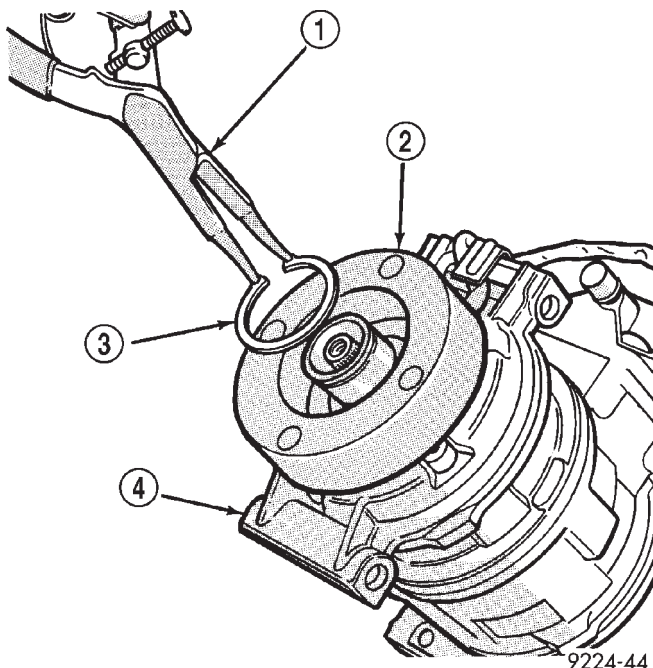
- 1 - SNAP RING

**Fig. 19 Clutch Plate and Shim(s)**

- 1 - COMPRESSOR SHAFT
2 - CLUTCH PLATE
3 - CLUTCH PLATE SHIM

should be replaced if there is excessive wear or scoring. If the friction surfaces are oily, inspect the shaft nose area of the compressor for oil and remove the felt from the front cover. If the compressor felt is saturated with oil, the shaft seal is leaking and will have to be replaced.

(7) Check bearing for roughness or excessive leakage of grease. Replace bearing as required.

**Fig. 21 Clutch Coil Snap Ring**

- 1 - SNAP RING PLIERS
2 - CLUTCH COIL
3 - SNAP RING
4 - COMPRESSOR

INSTALLATION

(1) Align pin in back of field coil with hole in compressor end housing, and position field coil into place.

REMOVAL AND INSTALLATION (Continued)

Make sure that lead wires are properly routed, and fasten the diode and coil wire bracket with retaining screw.

(2) Install field coil retaining snap ring with Snap Ring Pliers (C- 4574). Press snap ring to make sure it is properly seated in the groove.

NOTE: The bevel side of the snap ring must be outward. Also both eyelets must be to the right or left of the pin on the compressor.

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

Do not mar the pulley frictional surface.

(3) Install pulley assembly to compressor. If necessary, tap gently with a block of wood on the friction surface (Fig. 22).

(4) Install pulley assembly retaining snap ring (bevel side outward) with Snap Ring Pliers (C-4574). Press the snap ring to make sure it is properly seated in the groove.

NOTE: The bevel side of the snap ring must be facing outward.

(5) If the original front plate assembly and pulley assembly are to be reused, the old shim(s) can be used. If not, place a trial stack of shims, 2.54 mm (0.10 in.) thick, on the shaft against the shoulder.

(6) Install front plate assembly onto shaft.

(7) If installing a new front plate and/or pulley assembly, the gap between front plate and pulley face must be checked. Use the following procedure:

(a) Attach a dial indicator to front plate so that movement of the plate can be measured.

(b) With the dial indicator zeroed on the front plate, energize the clutch and record the amount of movement.

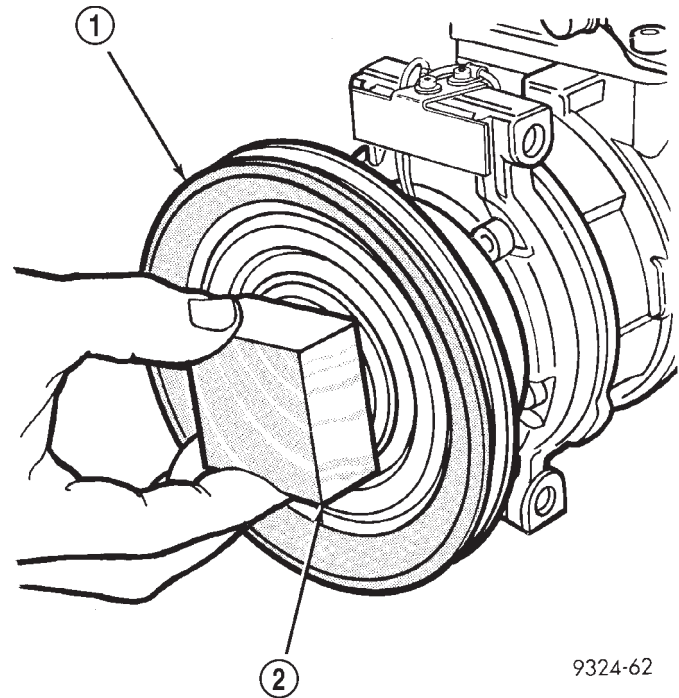
(c) The readings should be 0.35 to 0.65 mm (0.014 to 0.026 in.). If proper reading is not obtained, add or subtract shims until desired reading is obtained.

(8) Install compressor shaft bolt. Tighten to 17.5 \pm 2 N·m (155 \pm 20 in. lbs.).

NOTE: Shims may compress after tightening shaft nut. Check air gap in four or more places to verify if air gap is still correct. Spin pulley for final check.

CLUTCH BREAK-IN

After new clutch installation, cycle the A/C clutch 20 times (5 seconds ON and 5 seconds OFF). During this procedure, set the system to the A/C mode, engine rpm at 1500-2000, and high blower speed.



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Fig. 22 Installing Pulley Assembly

- 1 - PULLEY ASSEMBLY
2 - WOOD BLOCK

This procedure (burnishing) will seat the opposing friction surfaces and provide a higher clutch torque capability.

NOTE: Excessive clutch gap will result in clutch slippage or non-engagement.

CONDENSER

The condenser is located between the radiator and the front bumper. The condenser can be serviced without having to drain the cooling system or remove the radiator.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Using a refrigerant recovery machine, remove refrigerant from the A/C system.

(3) Remove five push pin fasteners retaining the center front fascia.

(4) Remove two right wheel well push pin fasteners retaining front fascia.

(5) Remove right headlamp housing. Refer to Group 8L, Lamps for Removal and Installation procedure.

(6) Remove two push pin fasteners to air flow deflectors.

REMOVAL AND INSTALLATION (Continued)

(7) Remove upper radiator core support. Refer to Group 23, Body for Removal and Installation procedures.

NOTE: If equipped with 3.2/3.5L engine, remove two cooler lines to engine oil cooler and the hose retainer.

(8) Remove upper hose to auxiliary transmission cooler (Fig. 23).

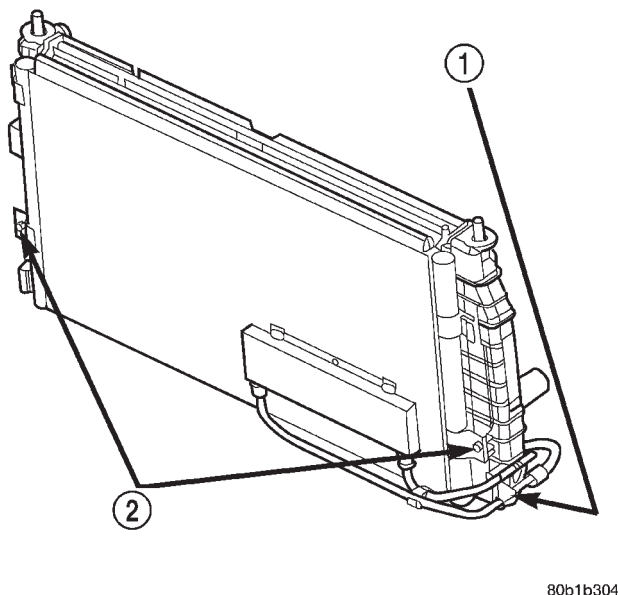


Fig. 23 A/C Condenser and Auxiliary Transmission Oil Cooler

- 1 - TRANSMISSION OIL COOLER LINE MOUNTING BRACKET
2 - A/C CONDENSER TO RADIATOR MOUNTING SCREWS

(9) Remove the upper A/C discharge line fastener at condenser.

(10) Remove the lower A/C liquid line fastener at condenser. On the 300M, the lower fastener may be more easily accessed by removing the passenger side fog lamp. Refer to Section 8L Lamps, for procedures.

(11) Remove both auxiliary transmission cooler lines.

(12) Cut auxiliary transmission cooler zip strips.

(13) Remove two bolts retaining condenser to radiator.

(14) Separate condenser from radiator.

(15) Transfer auxiliary transmission cooler to new condenser.

NOTE: The new condenser will include new zip ties for the auxiliary transmission cooler attachment to new condenser assembly.

CAUTION: Avoid bending or breaking condenser inlet tube when lifting radiator/condenser assembly from the vehicle.

INSTALLATION

For installation, reverse the above procedures.

CONTROL HEAD

The Heater A/C Control Head is located in the instrument panel center bezel. Refer to Group 8E, Instrument Panel and System for Removal and Installation procedures.

DISCHARGE LINE

REMOVAL

(1) Remove refrigerant from the A/C system using a refrigerant recovery machine.

(2) Disconnect A/C pressure transducer wire harness (Fig. 24) and (Fig. 25).

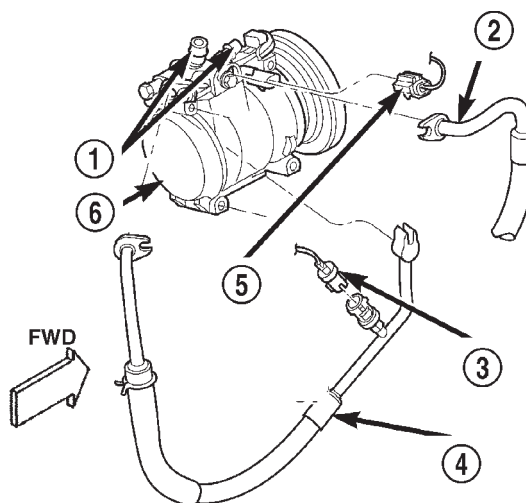


Fig. 24 A/C Pressure Transducer and Discharge Line 3.2L/3.5L

- 1 - SERVICE PORTS
2 - SUCTION LINE
3 - A/C PRESSURE TRANSDUCER AND CONNECTOR
4 - DISCHARGE LINE
5 - A/C COMPRESSOR CLUTCH ELECTRICAL CONNECTOR
6 - A/C COMPRESSOR

(3) Disconnect discharge line at compressor using a M13 Hex wrench for 2.7L, 6 mm allen wrench for 3.2/3.5L.

CAUTION: Cap all lines that are not being replaced and cap the expansion valve tubes.

(4) Disconnect line at A/C condenser using a M13 Hex wrench.

REMOVAL AND INSTALLATION (Continued)

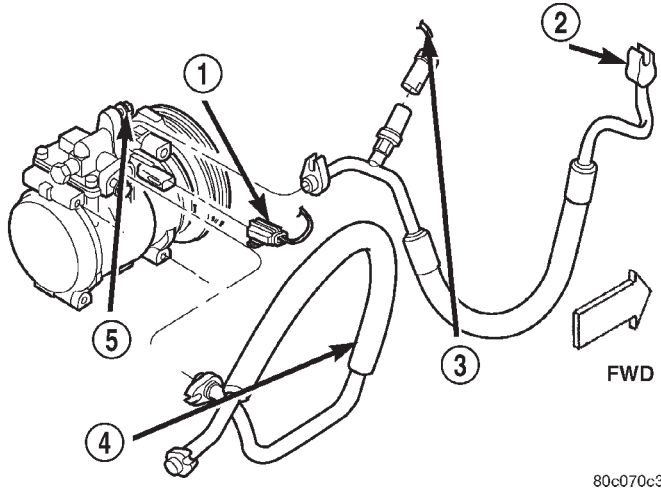


Fig. 25 A/C Pressure Transducer and Discharge Line 2.7L

- 1 - A/C COMPRESSOR CLUTCH ELECTRICAL CONNECTOR
- 2 - DISCHARGE LINE
- 3 - A/C PRESSURE TRANSDUCER AND CONNECTOR
- 4 - SUCTION LINE
- 5 - A/C COMPRESSOR

INSTALLATION

For installation, reverse the above procedures. Then, tighten bolts to 23 N·m (17 ft. lbs.) at condenser and compressor.

EVAPORATOR

The Heater A/C housing must be removed from the vehicle when replacing the evaporator.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

CAUTION: The refrigerant must be removed from the system before removing Heater-A/C housing. Use a refrigerant recovery machine. A/C lines at Thermostatic Expansion Valve must be removed and the exposed fittings must be capped off to prevent moisture from entering the system.

(2) Remove heater housing from vehicle. Refer to Heater-A/C Housing Removal and Installation in this section for procedure.

- (3) Remove recirculation door actuator.
- (4) Remove recirculation door and housing.
- (5) Remove upper housing retaining screws.
- (6) Remove upper half of heater housing.
- (7) Lift evaporator out of lower housing.
- (8) Transfer evaporator probe. Place the evaporator probe in the same location as on the previous evaporator.

INSTALLATION

For installation, reverse the above procedures.

EVAPORATOR TEMPERATURE SENSOR

The Evaporator Temperature Sensor is located on the lower right side of the heater housing.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove right under panel silencer.

(3) Disconnect wiring connector for evaporator probe.

(4) At center of heater housing, locate evaporator probe access plate. Using a flat blade pry tool, pull back on the locking tab. Twist the access plate counter clockwise one-quarter turn and remove plate.

(5) Pull probe out of evaporator core. This plate must be pushed inside the A/C unit and orientated in such a way that the plate can be removed.

INSTALLATION

For installation, reverse the above procedures. **The new probe must not go into the same hole (in the evaporator coil) that the old probe was removed.** The evaporator is manufactured with three holes for probe insertion. Insert the probe in the uppermost hole (Fig. 26).

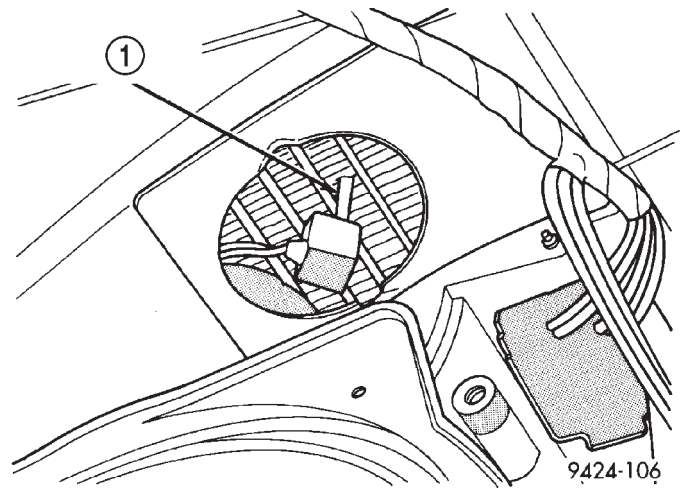


Fig. 26 Evaporator Probe Needle

- 1 - EVAPORATOR PROBE

EXPANSION VALVE

REMOVAL

(1) Remove refrigerant from the A/C system using a refrigerant recovery machine.

REMOVAL AND INSTALLATION (Continued)

(2) Remove engine air inlet tube and the air distribution duct on vehicles equipped with 3.2/3.5 liter engine.

(3) Remove one nut to A/C lines at expansion valve.

(4) Loosen bolt at Filter/Drier to pivot lines away from expansion valve.

(5) Place plug/cap over open end of refrigerant lines.

(6) Gently pull A/C line out of expansion valve.

(7) Remove two #30 torx bolts retaining expansion valve to evaporator coil.

(8) Remove expansion valve from vehicle.

CAUTION: Always install new O-rings when replacing expansion valve.

INSTALLATION

For installation, reverse the above procedures.

FILTER/DRIER

CAUTION: When installing new filter/drier do not leave open to atmosphere for a long period of time. The filter/drier contains moisture absorbing materials which will absorb moisture in the atmosphere.

REMOVAL

(1) Remove refrigerant from A/C system using a refrigerant recovery machine.

(2) Remove engine air inlet tube and the air distribution duct on vehicles equipped with 3.2/3.5 liter engine.

(3) Remove one 8mm hex bolt to filter/drier bracket.

(4) Remove one nut retaining A/C lines to expansion valve.

(5) Gently pry filter/drier bracket out of strut tower.

(6) Remove one A/C line at filter/drier (tubing to condenser).

(7) Remove filter/drier from vehicle.

(8) Transfer small line from filter/drier to expansion valve to new filter/drier.

NOTE: Always install new O-rings when replacing filter/drier.

(9) Plug or cap liquid line fittings while system is open to prevent moisture intrusion.

INSTALLATION

For installation, reverse the above procedures.

NOTE: Upon installation, loosely fit all parts and lines together before individually tightening them to prevent damage. Torque filter/drier plumbing fasteners to 10 ft-lbs.

HEATER CORE

The HVAC unit housing must be removed from the vehicle to service the heater core.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove the HVAC unit housing from vehicle. Refer to Unit Housing Removal and Installation procedures in this section.

(3) With the HVAC unit housing out of the vehicle, remove (2) screws retaining the heater core. Then pull the heater core out of the heater housing.

INSTALLATION

For installation, reverse the above procedures.

(1) Push new heater core into the unit housing.

(2) Fasten heater core to HVAC unit housing with (2) screws.

LIQUID LINES

REMOVAL

(1) Remove refrigerant from the A/C system using a refrigerant recovery machine.

(2) Remove engine air inlet tube and the air distribution duct on vehicles equipped with 3.2/3.5 liter engine.

(3) Remove A/C plumbing to expansion valve fastener using a M13 Hex wrench. Remove suction line block from expansion valve, cap and swing out of the way.

CAUTION: Cap off all lines that are not being replaced. Cap/plug the expansion valve and condenser fittings.

(4) Disconnect liquid line fastener at filter-drier (short filter-drier to evaporator line may be removed at this step).

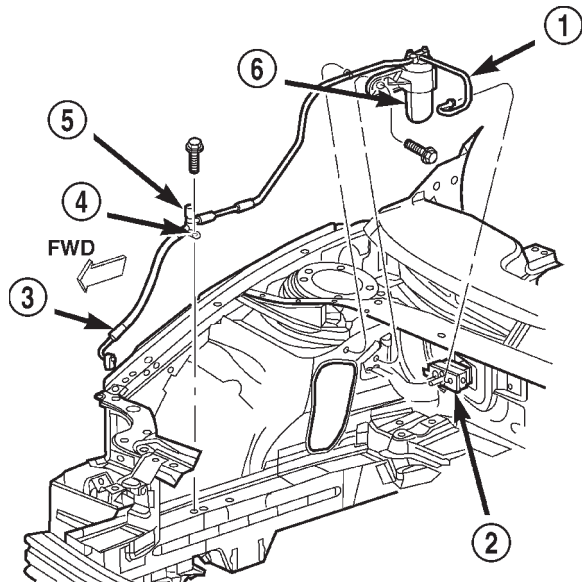
(5) Disconnect filter/drier bracket fastener and separate bracket from strut panel (there are two hidden plastic fasteners to pry out).

(6) Disconnect liquid line fastener at condenser (M13 Hex).

NOTE: Radiator upper crossmember must be removed to access the liquid line fastener. Refer to Group 23, Body for Removal and Installation procedures.

REMOVAL AND INSTALLATION (Continued)

(7) Remove liquid line mounting clamp fastener located near service port (Fig. 27).



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Fig. 27 Liquid Lines

- 1 - LIQUID LINE
- 2 - EXPANSION VALVE
- 3 - LIQUID LINE
- 4 - MOUNTING CLAMP
- 5 - SERVICE PORT
- 6 - FILTER-DRIER AND BRACKET

(8) Disconnect liquid line fastener at filter-drier. Remove liquid line from vehicle. Cap off all fittings if reusing to prevent moisture from entering system.

INSTALLATION

For installation, reverse the above procedures. Torque liquid line fasteners as follows: TXV and condenser: 20.3 N·m (15 ft. lbs.). Filter-drier line fasteners 13.6 N·m (10 ft. lbs.). Plastic bracket and screws: 6.8 N·m (5 ft. lbs.).

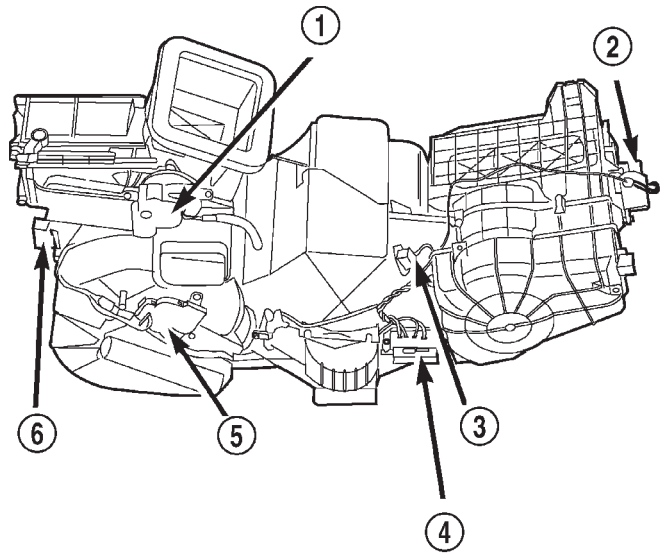
MODE DOOR ACTUATOR

The mode door actuator is an electric motor. It mechanically positions the A/C unit panel/bi-level door and the floor/defrost door. This actuator contains a feedback strip which allows the computer control to know the exact position of the mode door at all times. The mode door actuator is not serviceable and must be replaced if found to be defective.

The mode door actuator is located on the lower left side of the HVAC unit housing (Fig. 28).

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).



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Fig. 28 Mode Door Actuator Location

- 1 - MODE DOOR ACTUATOR
- 2 - RECIRCULATION DOOR ACTUATOR
- 3 - EVAPORATOR TEMPERATURE SENSOR
- 4 - POWER MODULE OR BLOWER RESISTOR
- 5 - BLEND DOOR ACTUATOR
- 6 - HVAC PLENUM CONNECTOR

- (2) Remove left and right underpanel ducts.
- (3) Remove floor console.
- (4) Remove center floor heat adaptor duct.
- (5) Remove rear seat heat forward adaptor duct.
- (6) Loosen center support bracket and pry rearward to gain access to the actuator.
- (7) Remove actuator retaining screws. Then pull actuator straight down. Upon removal, note the shaft position of the actuator, because the shaft on this motor is keyed. When installing new actuator, its shaft must be positioned in the same location.
- (8) Remove electrical connection on actuator.

INSTALLATION

For installation, reverse the above procedures.

RECIRCULATION DOOR ACTUATOR

The recirculation door actuator is located on the right side of the heater housing (Fig. 28).

The recirculation door actuator is an electric motor. It mechanically positions the recirculation door in either the open or closed position. The recirculation door actuator does not have a feedback signal. The outside Air/Recirc door actuator is not serviceable and must be replaced if found to be defective.

REMOVAL AND INSTALLATION (Continued)

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove instrument panel. Refer to Group 8E, Instrument Panel and Systems for Removal and Installation procedures.

(3) Remove actuator retaining screws. Pull actuator straight off recirculation door shaft. Upon removal, note the shaft position of the actuator, because the shaft on this motor is keyed. When installing new actuator, its shaft must be positioned in the same location.

(4) Disconnect electrical connection.

(5) Remove recirculation door motor from vehicle.

INSTALLATION

For installation, reverse the above procedures.

SERVICE PORT VALVE CORES

The 3.2 / 3.5L service port valve cores are located on the top of the manifold (High Side) and front side of the manifold (Low Side) (Fig. 29). The 2.7L service port valve ports are located on the A/C liquid line (high side) (Fig. 27) and suction line (low side) (Fig. 31).

REMOVAL

(1) Remove the valve caps. Remove refrigerant from A/C system using a refrigerant recovery machine.

(2) Using a standard valve core tool, remove the valve core. **Be careful to prevent any dirt/debris from entering the valve core opening or getting on the replacement valve core.**

CAUTION: A valve that is not fully seated can lead to damage to the valve during evacuation and charge. This can result in system refrigerant discharge while uncoupling the charge adapters.

INSTALLATION

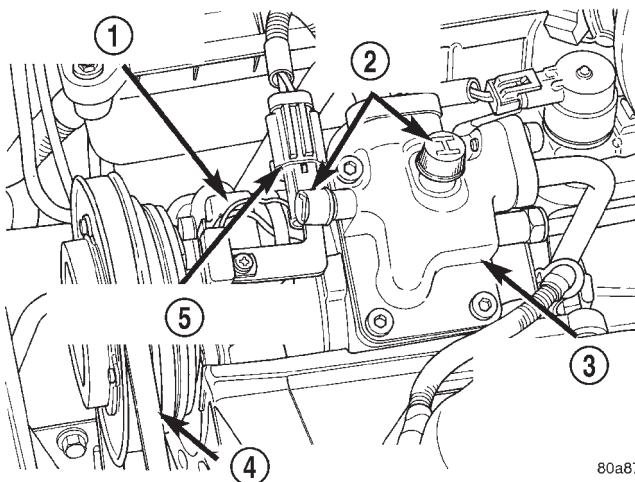
For installation, reverse the above procedures. Evacuate and charge the A/C system.

NOTE: When assembling the new valve core into the manifold, the core should be oiled with clean ND8 PAG compressor oil.

SUCTION LINE

REMOVAL

(1) Remove refrigerant from the A/C system using a refrigerant recovery machine.

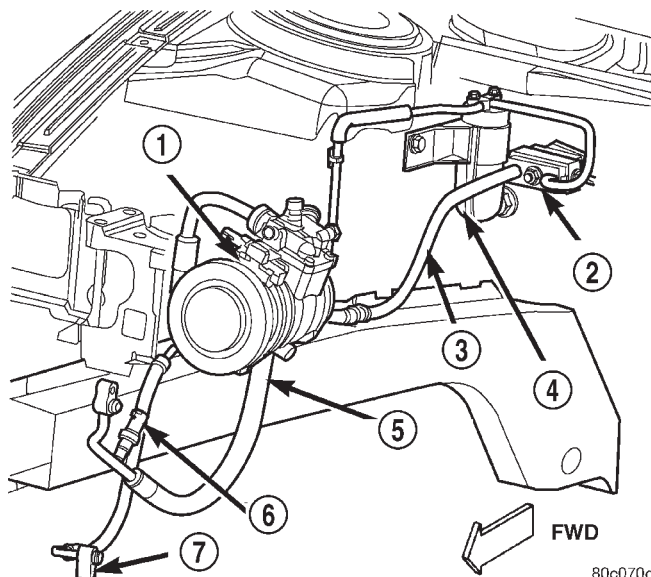


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Fig. 29 A/C Compressor Service Ports 3.2L/3.5L

- 1 - A/C COMPRESSOR
- 2 - A/C SERVICE PORTS
- 3 - COMPRESSOR MANIFOLD
- 4 - A/C DRIVE BELT
- 5 - COMPRESSOR WIRE CONNECTOR

(2) Remove one M13 nut holding suction line at expansion valve (Fig. 30) and (Fig. 31).



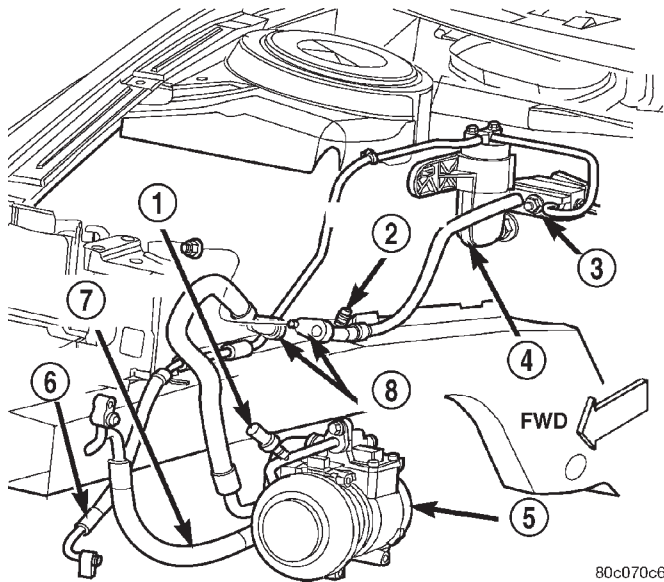
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Fig. 30 A/C Refrigerant Lines and Expansion Valve 3.2L/3.5L

- 1 - A/C COMPRESSOR
- 2 - EXPANSION VALVE
- 3 - SUCTION LINE
- 4 - FILTER-DRIER
- 5 - DISCHARGE LINE
- 6 - A/C PRESSURE TRANSDUCER
- 7 - LIQUID LINE

CAUTION: Cap all lines that are not being replaced and cap the expansion valve tubes.

REMOVAL AND INSTALLATION (Continued)



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Fig. 31 A/C Refrigerant Lines and Expansion Valve 2.7L

- 1 - A/C PRESSURE TRANSDUCER
- 2 - SERVICE PORT
- 3 - EXPANSION VALVE
- 4 - FILTER-DRIER
- 5 - A/C COMPRESSOR
- 6 - LIQUID LINE
- 7 - DISCHARGE LINE
- 8 - SUCTION LINES

(3) Remove engine air inlet tube and air distribution duct for access to compressor lines.

(4) Remove bolt holding line at compressor using a 6mm allen wrench (3.2/3.5L), or M10 Hex (2.7L) (Fig. 32) and (Fig. 33).

(5) Remove line by pulling rear end of line up out of vehicle with compressor end following through the tie-rod area.

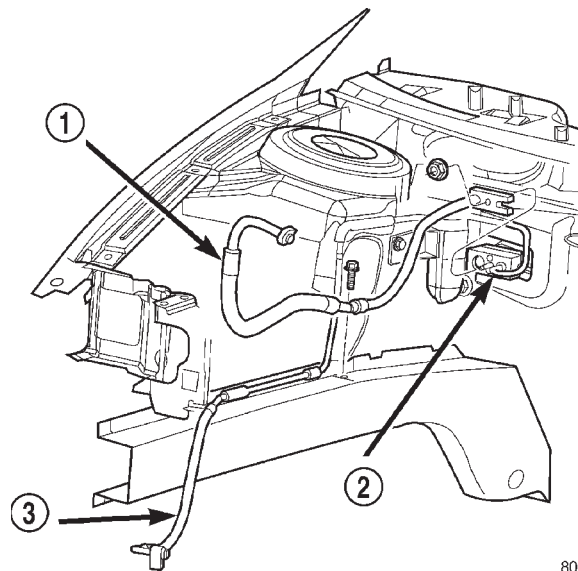
INSTALLATION

For installation, reverse the above procedures. Tighten TXV and compressor fasteners to 23 N·m (17 ft. lbs.). 2.7L: Rail screw and mid-line nut to 7 N·m (5ft. lbs.).

SUN SENSOR

REMOVAL

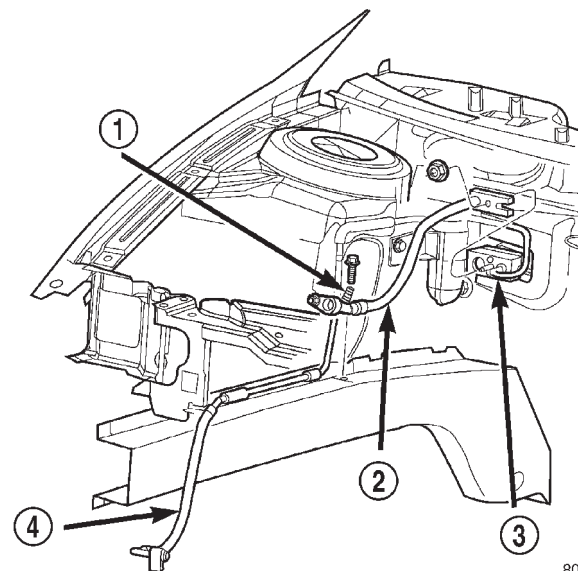
- (1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).
- (2) Remove instrument panel top cover.
- (3) Remove two Sun Sensor mounting screws.
- (4) Lift sensor out of instrument panel and disconnect wiring.
- (5) Remove sensor from vehicle.



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Fig. 32 Suction Line 3.2L/3.5L

- 1 - SUCTION LINE
- 2 - EXPANSION VALVE
- 3 - LIQUID LINE



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Fig. 33 Suction Line 2.7L

- 1 - SERVICE PORT
- 2 - SUCTION LINE
- 3 - EXPANSION VALVE
- 4 - LIQUID LINE

INSTALLATION

CAUTION: The sun sensor must protrude approximately 1/4 inch above the instrument panel top cover. This will ensure proper operation.

For installation, reverse the above procedures.

REMOVAL AND INSTALLATION (Continued)

Some ATC equipped vehicles may exhibit a lack of passenger comfort in sunny weather. This will not occur in night operation. This most likely occur in the early afternoon. Verify that the ATC system is functioning properly. Inspect the location of the sun sensor. The sun sensor must protrude approximately 1/4 inch above the instrument panel top cover to insure proper operation. If the sensor does not protrude 1/4 inch, perform the following procedure:

- Confirm that the top cover is properly installed
- Remove the top cover
- Remove fasteners from sun sensor
- Install one 1/4-20 nut per fastener under the sun sensor so that it is shimmed higher
- Reinstall the sun sensor. Do not overtighten screw. If a longer screw is required, use 8-15x1 inch.

TEMPERATURE DOOR ACTUATOR

The blend-air (temperature) door actuator is an electric motor which mechanically positions the temperature door. A feedback strip in the actuator allows the computer control to know the exact position of the temperature door at all times. The blend-air door actuator is not serviceable and must be replaced if found to be defective.

The temperature door actuator is located at the bottom of the heater housing at the center tunnel (Fig. 28).

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13).

(2) Remove left and right underpanel silencer/ducts.

(3) Remove two screws from actuator which are accessible from the right side of center stack.

(4) Remove one screw from actuator on left side.

(5) Pull actuator straight down from shaft and disconnect electrical connection. Upon removal, note the shaft position of the actuator, because the shaft on this motor is keyed. When installing new actuator, its shaft must be positioned in the same location.

INSTALLATION

For installation, reverse the above procedures.

HVAC UNIT HOUSING**REMOVAL**

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 13). This must be done to prevent accidental air bag deployment.

(2) Remove instrument panel from vehicle. Refer to Group 8E, Instrument Panel and Systems for Removal and Installation procedures.

(3) Using an A/C recovery unit, remove all R-134a refrigerant from the A/C system.

(4) Drain the engine cooling system.

(5) Remove air cleaner hose and air distribution duct from the engine.

(6) Remove spring type fasteners to heater hoses at the dash panel and remove hoses from heater core. Plug the heater core inlet and outlet tubes to prevent anti-freeze from spilling on the vehicle interior during removal. If an appropriate plug cannot be found pull back carpet and use caution when removing unit. Keep the heater tubes elevated to prevent spillage of coolant.

(7) Remove one nut at expansion valve retaining both A/C lines to expansion valve. After removing lines cap the expansion valve openings and the A/C hose openings. This will prevent any dirt or moisture from entering the refrigerant system during servicing.

CAUTION: The lubricant used in this air conditioning system absorbs moisture readily (similar to brake fluid). Do not leave any portion of the system open for extended periods of time.

(8) Remove the three retaining nuts from the studs. These studs project through the dash panel into the engine compartment.

(9) Remove two screws to defrost duct and remove.

(10) Remove two nuts, two screws attaching hvac housing to dash panel.

(11) Remove four nuts retaining rear seat heat duct and remove.

(12) Remove rear seat heat duct elbow push pin fastener.

(13) Disconnect HVAC harness connector.

(14) Gently pull hvac unit housing rearward from dash panel, being careful not to spill any coolant into passenger compartment.

INSTALLATION

For installation, reverse the above procedures.

DISASSEMBLY AND ASSEMBLY

HVAC UNIT HOUSING RECONDITION

Heater-A/C unit housing must be removed from vehicle before performing this operation. Refer to Unit Housing Removal and Installation.

The heater a/c unit housing need not be disassembled to remove the heater core. Refer to Heater Core Removal and Installation.

DISASSEMBLE

- (1) Place heater-A/C unit assembly on workbench.
- (2) Remove core retaining screws. Pull back on retaining tabs and remove heater core from housing.
- (3) Remove recirculation door actuator wiring. Remove actuator from recirculation housing.
- (4) Remove lower distribution housing. Remove mode door actuator.
- (5) Remove blend air door actuator.
- (6) Remove recirculation housing screws and clip.
- (7) Remove blower motor wiring at resistor.
- (8) Squeeze blower motor wiring grommet and push grommet through blower motor cover.
- (9) Remove blower motor cover.
- (10) Remove screws at blower motor mounts. Remove motor.
- (11) Remove blower motor resistor.
- (12) Remove wiring at evaporator temperature probe.
- (13) Using a screwdriver, pry up on tab at evaporator probe. Twist probe counterclockwise and push tab into the housing.
- (14) Pull the evaporator probe needle out of the evaporator fins. Remove the evaporator probe through the opening at the blower motor housing.
- (15) Remove vent door seal from housing.
- (16) Remove evaporator seal from housing.
- (17) Remove upper housing screws and clips.
- (18) Separate upper housing from lower housing.
- (19) Remove evaporator assembly from lower housing.
- (20) Remove blend air door from lower housing.
- (21) Using a flat blade screwdriver, pinch in the retaining tab at the base of the vent door. Pull up on door and remove from housing.
- (22) Remove mode door actuating cam.
- (23) Remove screw at defrost door actuating arm. Remove defrost door link from arm.

- (24) Remove defrost door arm from lower housing.
- (25) Remove link and defrost door from housing.
- (26) Remove vent door actuating arm from lower housing.

ASSEMBLE

- (1) Install vent door actuating arm to lower housing.
- (2) Install defrost door link to defrost door.
- (3) Install door and link into A/C housing.
- (4) Install defrost door actuating arm and retaining screw at housing.
- (5) Install defrost door link to actuating arm.
- (6) Line up the slots to the pegs on the mode door cam. Install the mode door cam.
- (7) Turn housing over and snap in the vent door to the vent door arm.
- (8) Install blend-air door in the housing.
- (9) Install evaporator into the lower housing.
- (10) Install upper housing onto lower housing.
- (11) Install screws to retain the upper housing to the lower housing.
- (12) Install evaporator and vent door seals onto the A/C housing.
- (13) Install evaporator probe assembly into the housing. Insert probe needle into evaporator.
- (14) Position the evaporator probe assembly at the housing face. Twist assembly clockwise to lock tab into slot on housing face.
- (15) Install wiring at evaporator temperature probe.
- (16) Install blower motor resistor.
- (17) Install blower motor into housing. Install blower motor mounting screws.
- (18) Thread the blower motor wiring through the blower motor cover. Install the blower motor cover.
- (19) Seat blower motor wiring grommet at blower motor cover.
- (20) Install blower motor wiring to the blower motor resistor.
- (21) Position recirculation housing to A/C housing. Install retaining screws and clip.
- (22) Install blend-air door actuator.
- (23) Install mode door actuator.
- (24) Install lower distribution housing.
- (25) Install recirculation door actuator and wiring.
- (26) Install heater core into A/C housing. Retain core with screws.

SPECIFICATIONS

A/C APPLICATION TABLE-ATC

Item	Description	Notes
Vehicle	LH - Intrepid, Concorde, 300M, LHS	Automatic Temperature Control (ATC)
System	R134a w/expansion valve	
Compressor	Nippondenso 10PA17	ND-8 PAG oil
Freeze-up Control	2-wire evaporator temp probe	BCM controlled, clutch OFF < 33° F, resets > 37° F
Low psi Control	pressure transducer line mounted	opens < 29.4 psi PCM input
High psi Control		opens > 431.0 psi PCM input
Forced Recirc Mode	System forced into Recirc at high pressures	BCM steps HVAC into recirc at 375 psi, steps out at 325 psi
Control head	automatic ATC type	Programmable Communication Interface (PCI)
Mode Door	electric actuator	BCM controlled actuators use a common ground
Blend Air Door	electric actuator	
Fresh/Recirc door	electric actuator	
Blower Motor	controlled via power module	Pulse Width Modulation (PWM)
Cooling Fans	2 fans, low speed and high speed	PCM controlled fan module via 2 relays
Clutch		
Control	relay	PCM
Draw	2.2 amps @ 12 V \pm 0.5V	
Gap	0.014" - 0.026"	
DRB III®		
Reads	TPS, RPM, A/C switch test	
Actuators	mode doors, clutch and fan relays	

A/C APPLICATION TABLE-MANUAL

Item	Description	Notes
Vehicle	LH - Intrepid, Concorde, 300M, LHS	manual A/C control
System	R134a w/expansion valve	
Compressor	Nippondenso 10PA17	ND-8 PAG oil
Freeze-up Control	2-wire evaporator temp probe	BCM controlled, clutch OFF < 33° F, resets > 37° F
Low psi Control	pressure transducer line mounted	opens < 29.4 psi PCM input
High psi Control		opens > 431.0 psi PCM input
Forced Recirc Mode	System forced into Recirc at high pressures	BCM steps HVAC into recirc at 375 psi, steps out at 325 psi
Control Head	manual type	BCM diagnostics
Mode Door	electric actuator	BCM controlled actuators use a common ground
Blend-Air Door	electric actuator	
Fresh/Recirc door	electric actuator	
Blower Motor	hardwired to control head	resistor block
Cooling Fans	2 fans, low speed and high speed	PCM controlled via 2 relays
Clutch		
Control	relay	PCM
Draw	2.2 amps @ 12 V \pm 0.5V	
Gap	0.014" - 0.026"	
DRB III®		
Reads	TPS, RPM, A/C switch test	
Actuators	mode doors, clutch and fan relays	