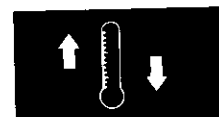


Air Conditioning

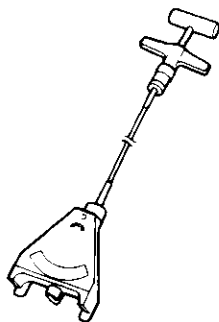
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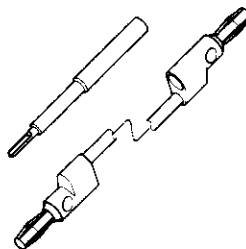
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	*07JGG – 001010A	Belt Tension Gauge	1	22-43
②	07SAZ – 001000A	Backprobe Set	2	22-14, 16
③	07947 – 6340300	Driver Attachment	1	22-34
④	07965 – 6920500	Hub Assembly Guide Attachment	1	22-35

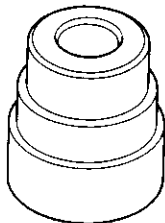
* Included in the Belt Tension Gauge Set, 07TGG-001000A.



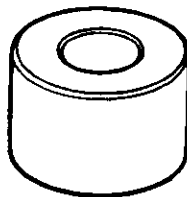
①



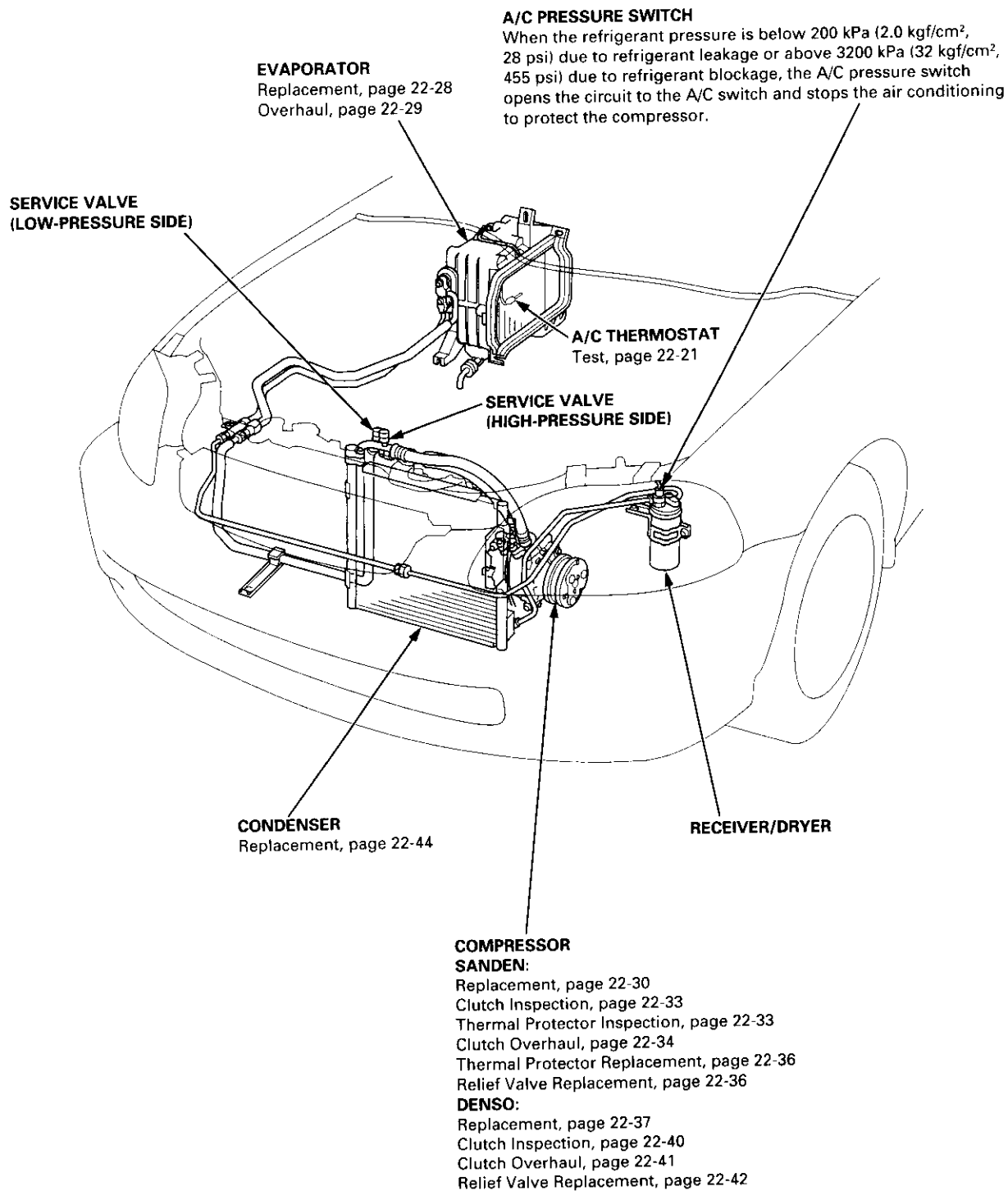
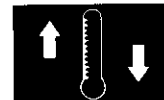
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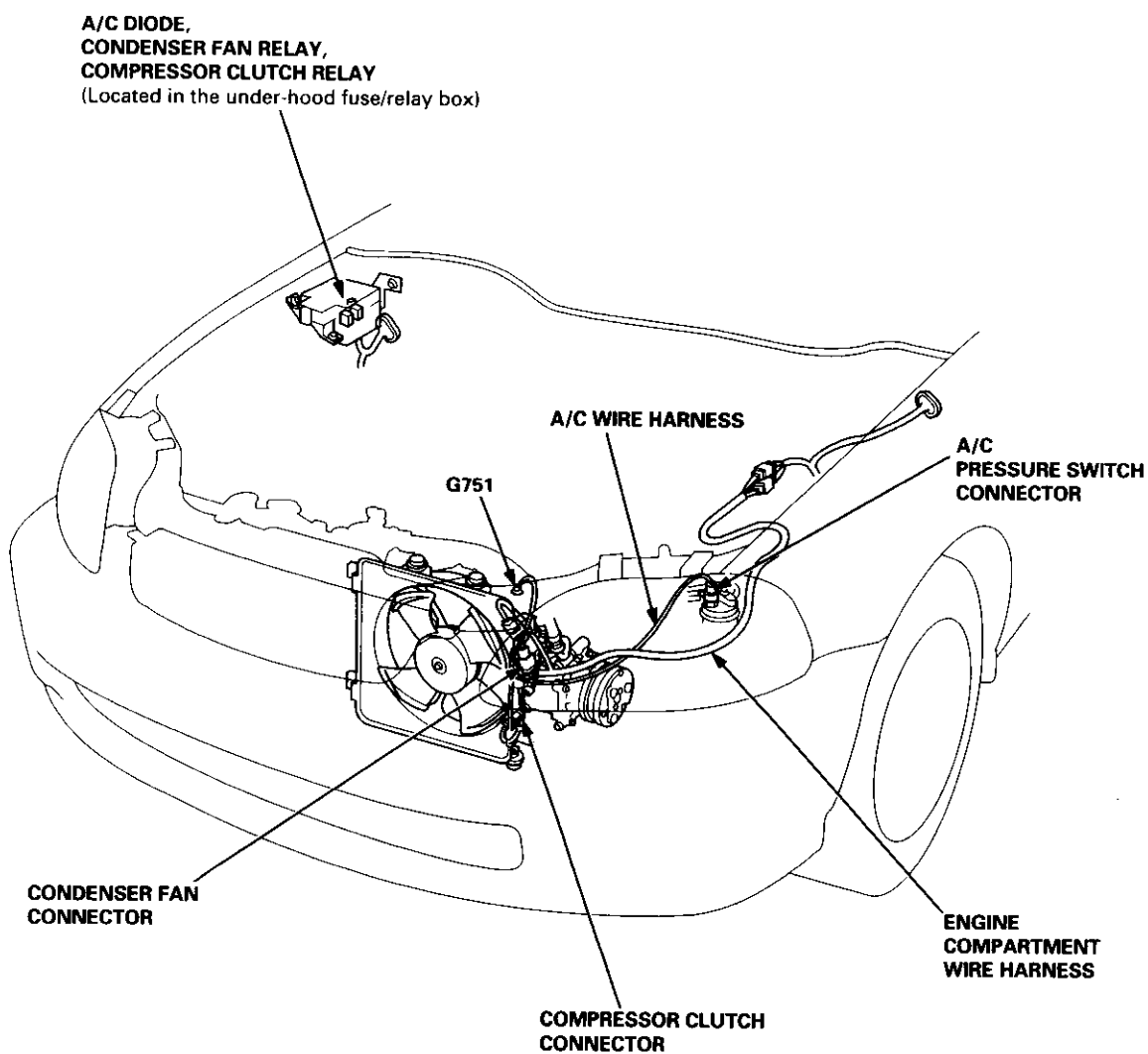
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④



Wiring/Connector Locations

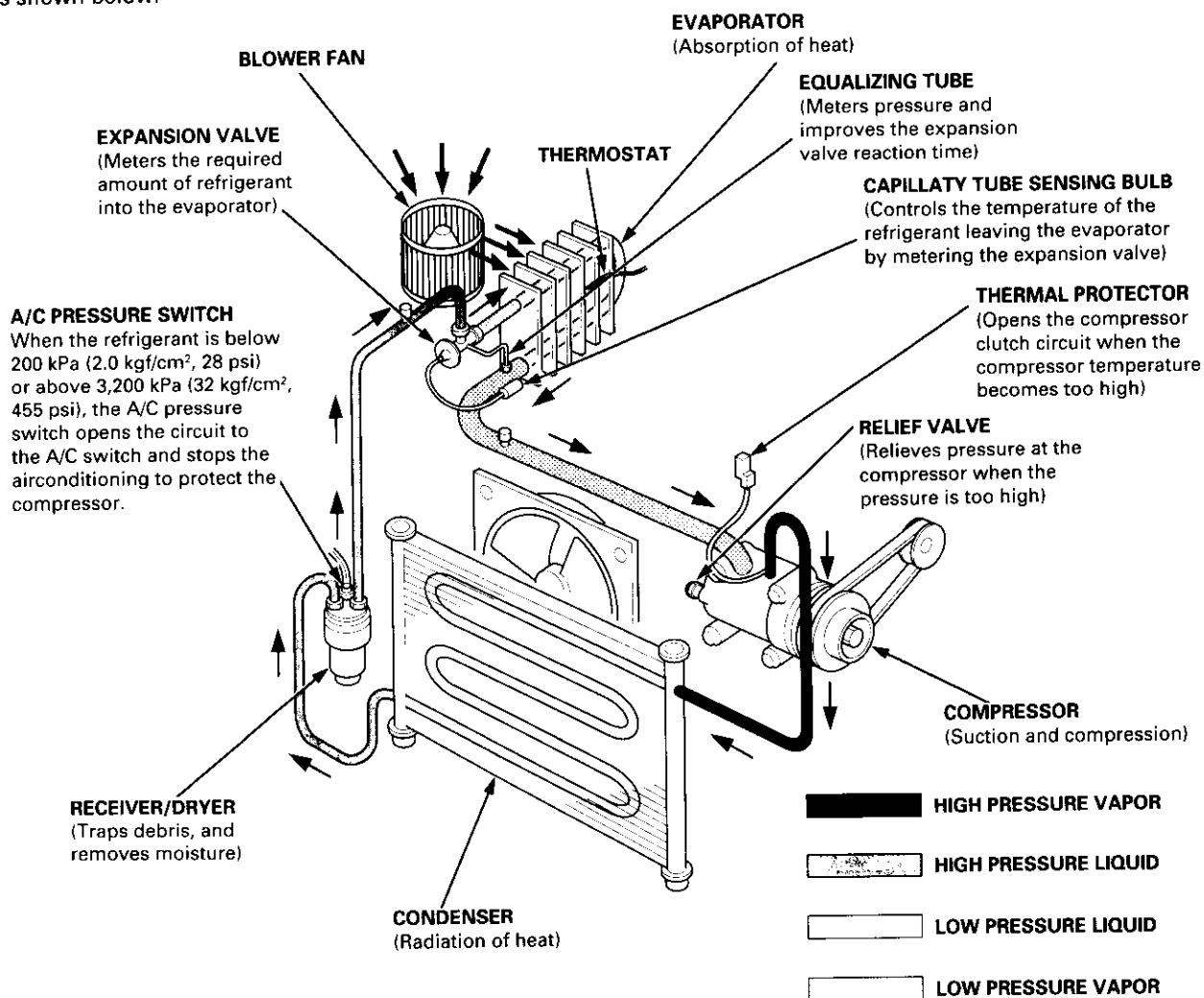


Description



Outline

The air conditioner system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.

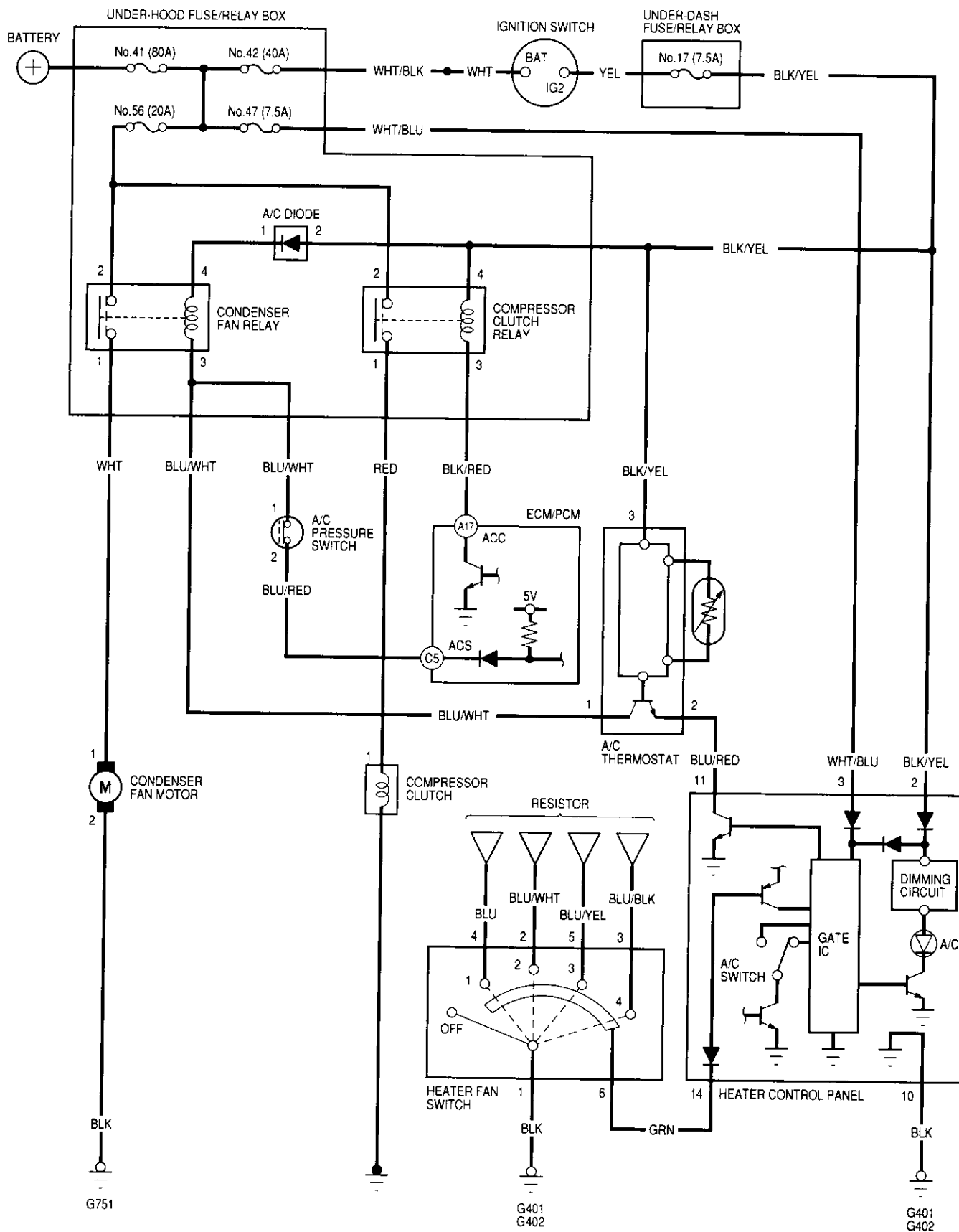


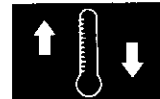
This car uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil designed for the R-134a compressor (SANDEN: SP-10; DENSO: ND-OIL8). Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a recovery/recycling/charging station that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning systems.
- Always recover the refrigerant R-134a with an approved recovery/recycling/charging station before disconnecting any A/C fitting.

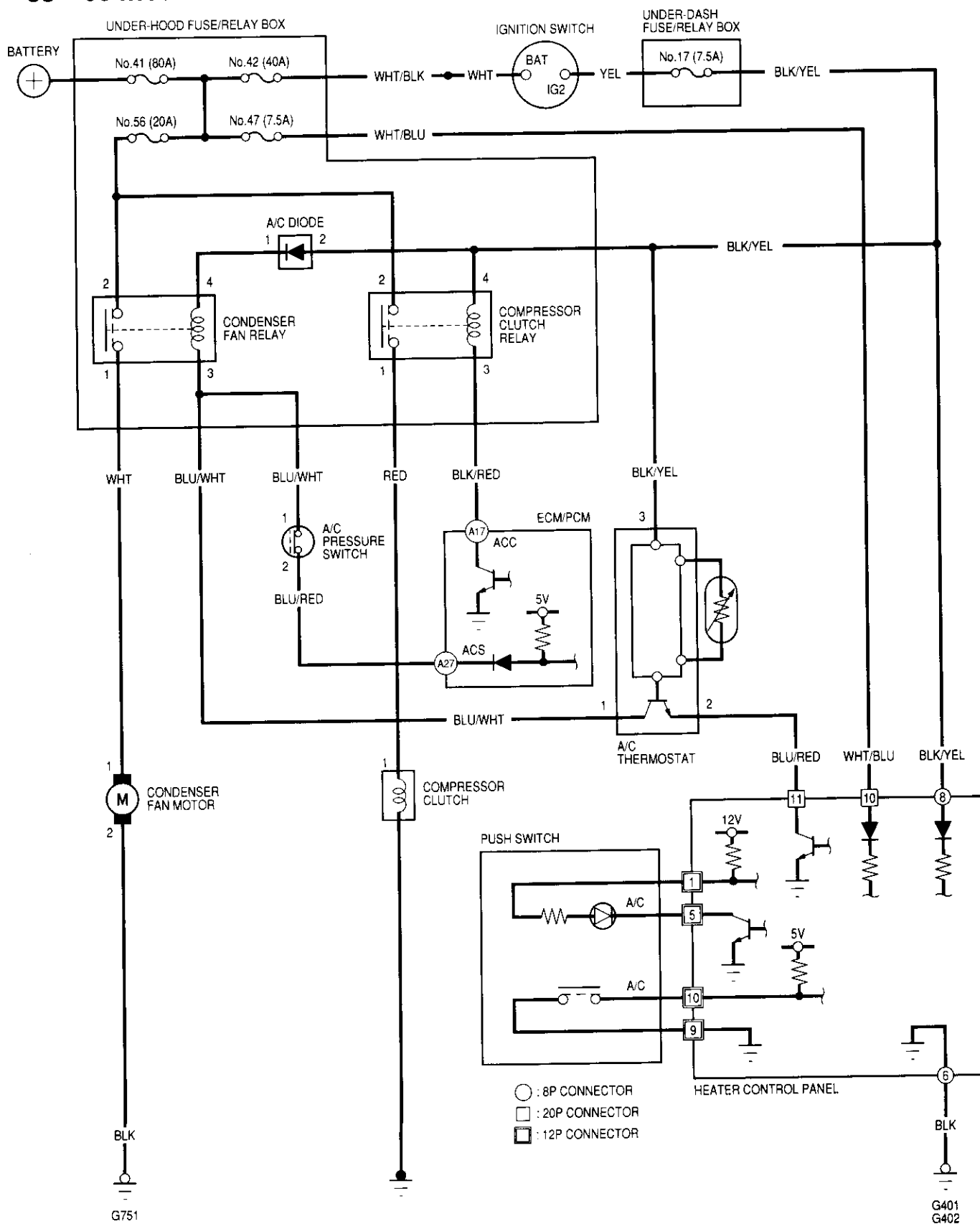
Circuit Diagram

'96 - 98 Models





'99 - 00 Models



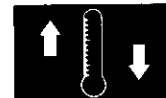
Troubleshooting

Symptom Chart

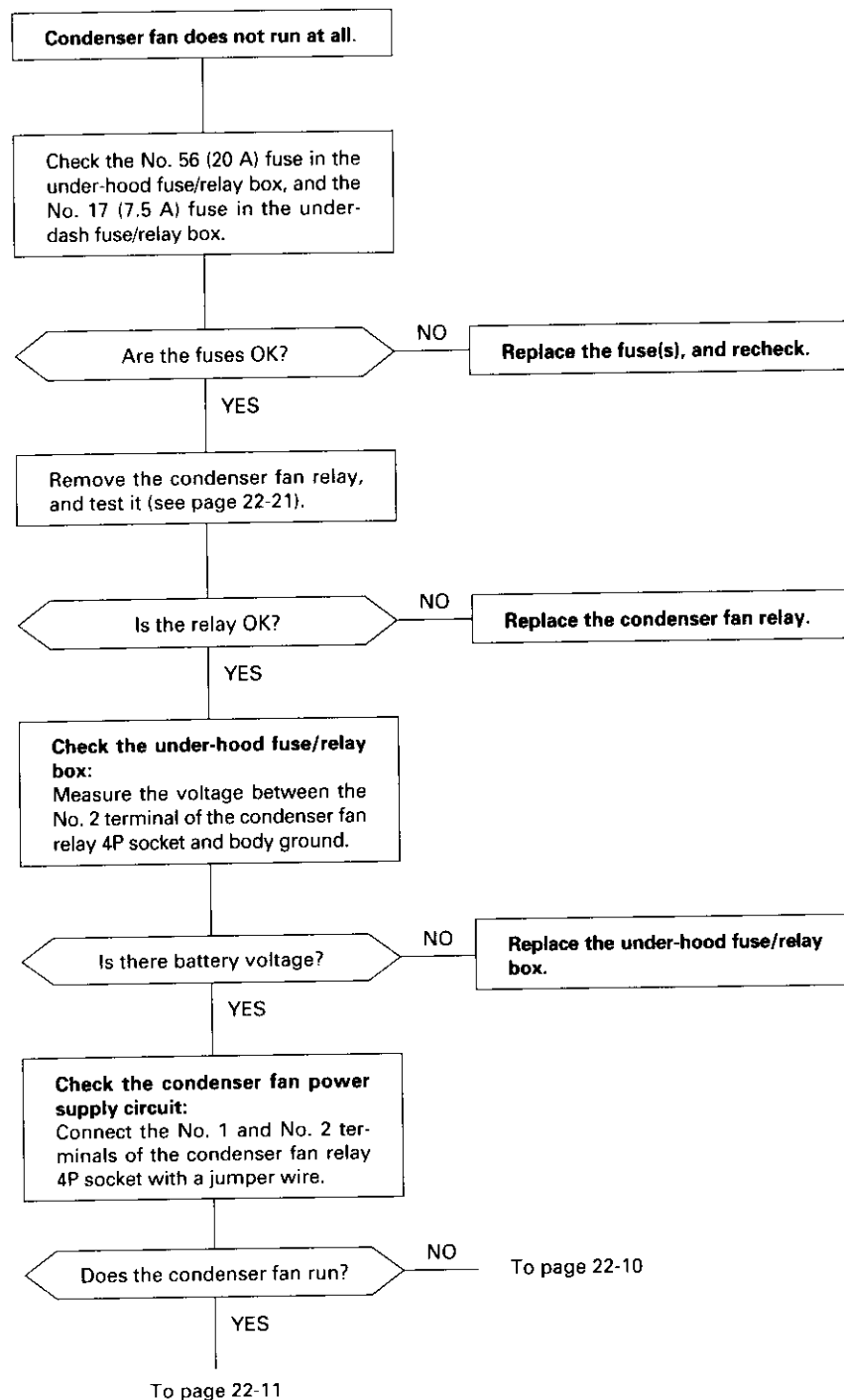
NOTE:

- Any abnormality must be corrected before continuing the test.
- Because of the precise measurements needed, use a multimeter when testing.
- Before performing any troubleshooting procedures check:
 - Fuses No. 47 (7.5 A), No. 56 (20 A) in the under-hood fuse/relay box, and No. 17 (7.5 A) in the under-dash fuse/relay box
 - Grounds No. G401, G402, G751
 - Cleanliness and tightness of all connectors

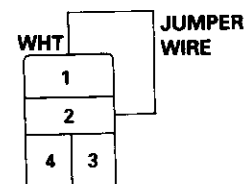
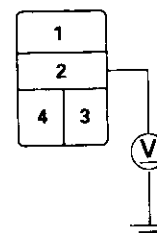
Symptom	Remedy
Condenser fan does not run at all.	Perform the procedures in the flowchart (see page 22-9).
Compressor clutch does not engage.	Perform the procedures in the flowchart (see page 22-12).
A/C system does not come on (compressor and fan).	Perform the procedures in the flowchart (see page 22-17).
Both heater and A/C do not work.	<ul style="list-style-type: none">• '96 – 98 models-Perform the procedures in the flowchart (see page 21-18).• '99 – 00 models-Perform the procedures in the flowchart (see page 21-35).



Condenser Fan



CONDENSER FAN RELAY 4P SOCKET

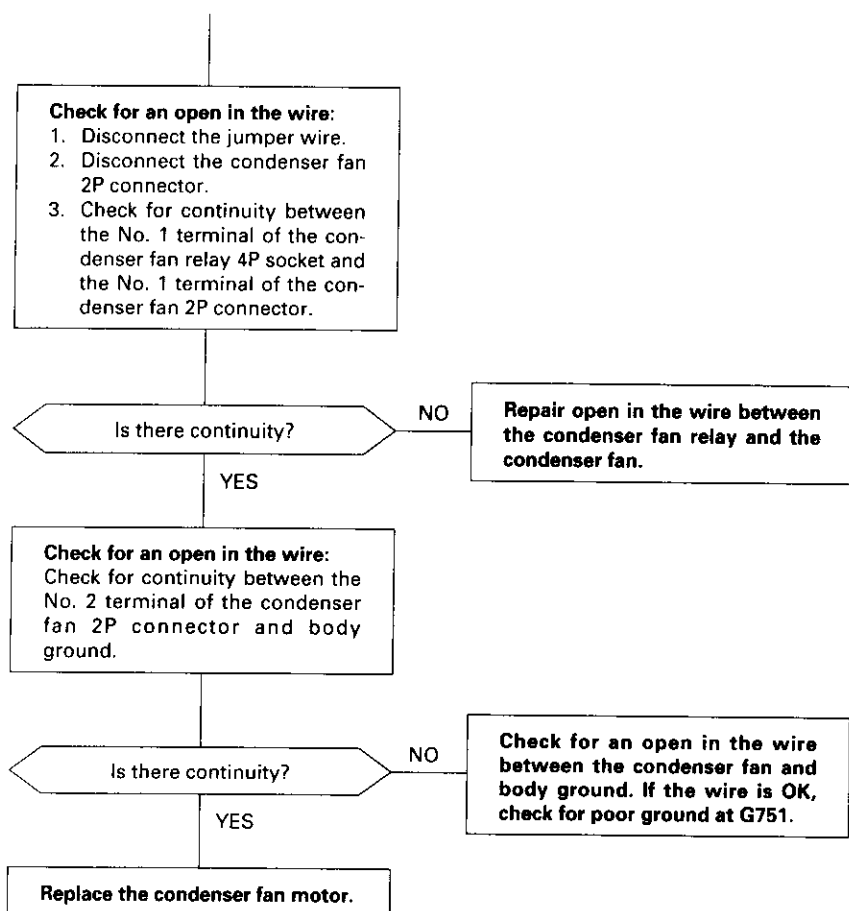


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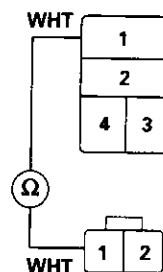
Troubleshooting

Condenser Fan (cont'd)

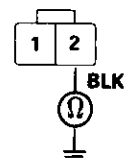
From page 22-9

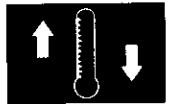


CONDENSER FAN RELAY 4P SOCKET



CONDENSER FAN 2P CONNECTOR
Wire side of female terminals





From page 22-9

Check the diode:

1. Disconnect the jumper wire.
2. Remove the A/C diode from the under-hood fuse/relay box.
3. Check for current flow in both directions between the A and B terminals.

Is there current flow in only one direction?

NO

Replace the diode.

YES

Check for an open in the wire:

1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 2 terminal of the A/C diode 2P socket and body ground.

Is there battery voltage?

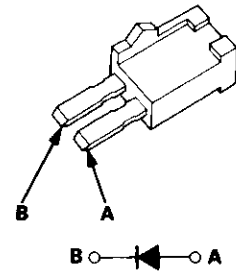
NO

Repair open in the wire between the No. 17 fuse and the A/C diode.

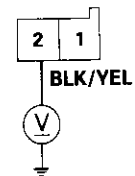
YES

Replace the under-hood fuse/relay box.

A/C DIODE

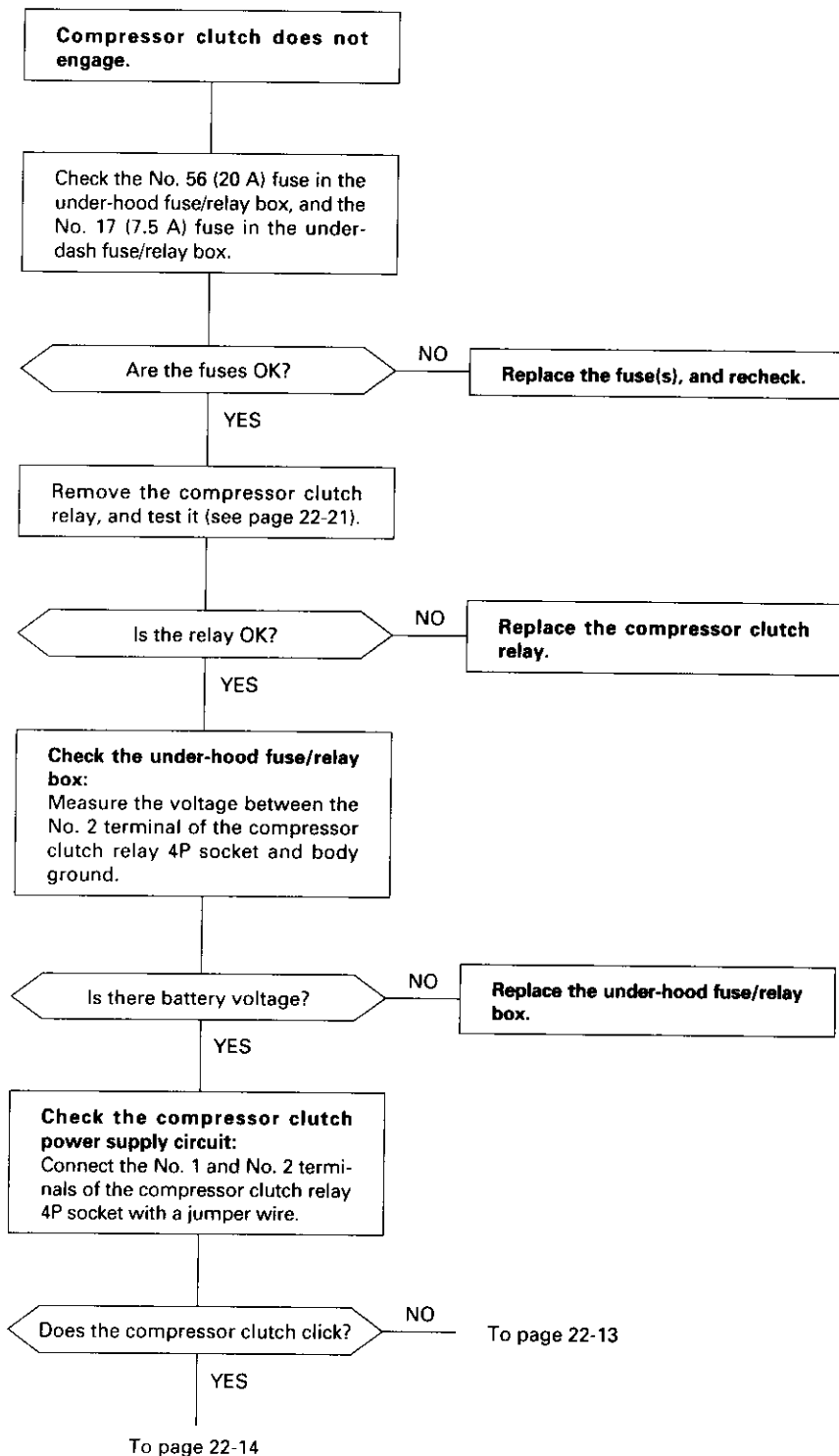


A/C DIODE 2P SOCKET

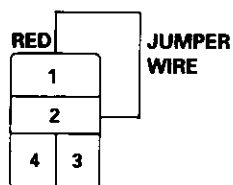
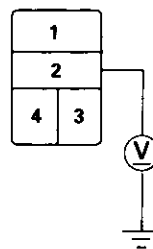


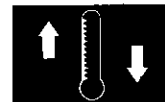
Troubleshooting

Compressor



**COMPRESSOR CLUTCH RELAY
4P SOCKET**





From page 22-12

Check for an open in the wire:

1. Disconnect the jumper wire.
2. Disconnect the compressor clutch 1P connector.
3. Check for continuity between the No. 1 terminal of the compressor clutch relay 4P socket and the terminal of the compressor clutch 1P connector.

Is there continuity?

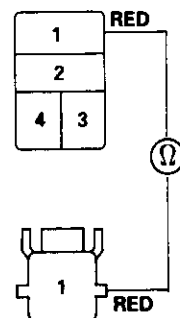
NO

Repair open in the wire between the compressor clutch relay and the compressor clutch.

YES

Inspect the compressor clutch clearance, the thermal protector (SANDEN), and the compressor clutch field coil (SANDEN: See page 22-33; DENSO: See page 22-40).

**COMPRESSOR CLUTCH RELAY
4P SOCKET**



COMPRESSOR CLUTCH 1P CONNECTOR
Wire side of female terminals

(cont'd)

Troubleshooting

Compressor (cont'd)

From page 22-12

Check for an open in the wire:

1. Disconnect the jumper wire.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 4 terminal of the compressor clutch relay 4P socket and body ground.

Is there battery voltage?

NO

Repair open in the wire between the No. 17 fuse and the compressor clutch relay.

YES

Check for an open in the wire:

1. Turn the ignition switch OFF, then reinstall the compressor clutch relay.
2. Make sure the A/C switch is OFF, then turn the ignition switch ON (II).
3. Using a *Backprobe Set (T/N 07SAZ - 001000A), measure the voltage between the No. 17 terminal of the ECM/PCM connector A (32P) and body ground with the ECM/PCM connectors connected.

Is there battery voltage?

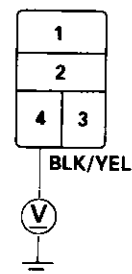
NO

Repair open in the wire between the compressor clutch relay and the ECM/PCM.

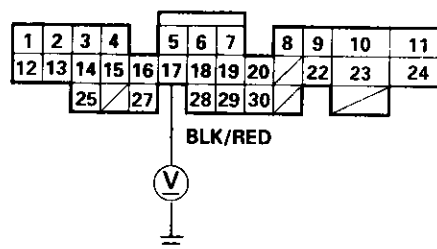
YES

To page 22-15

COMPRESSOR CLUTCH RELAY
4P SOCKET



ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

*How to use the backprobe sets

Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire (see section 11).



From page 22-14

Check for an open in the wire:

1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal of the A/C pressure switch 2P connector and body ground.

Is there battery voltage?

NO

Repair open in the wire between the condenser fan relay and the A/C pressure switch.

YES

Check the A/C pressure switch:

1. Turn the ignition switch OFF.
2. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

Is there continuity?

YES

To page 22-16

NO

Check for A/C system pressure.

Is the pressure within specifications?

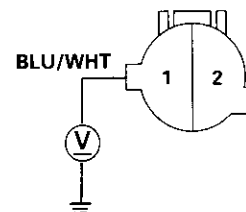
NO

Repair the A/C pressure problem.

YES

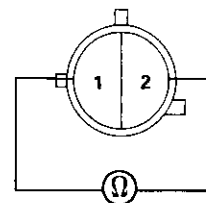
Replace the A/C pressure switch.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

A/C PRESSURE SWITCH



(cont'd)

Troubleshooting

Compressor (cont'd)

From page 22-15

Check for an open in the wire:

1. Reconnect the A/C pressure switch 2P connector.
2. Make sure the A/C switch is OFF, then turn the ignition switch ON (II).
3. Using a *Backprobe Set (T/N 07SAZ - 001000A), measure the voltage between the No. 5 terminal of the ECM/PCM connector C (31P) and body ground with the ECM/PCM connectors connected ('96 - 98 models), or between the No. 27 terminal of the ECM/PCM connector A (32P) and body ground with the ECM/PCM connectors connected ('99 - 00 models).

Is there battery voltage?

NO

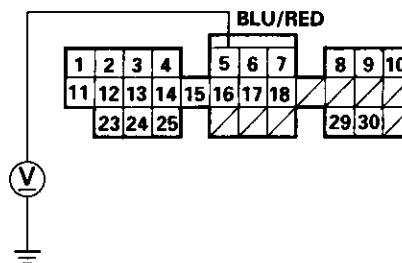
Repair open in the wire between the A/C pressure switch and the ECM/PCM.

YES

Check for loose wires or poor connections at the ECM/PCM connectors A (32P) and at the A/C pressure switch 2P connector. If the connections are good, substitute a known-good ECM/PCM, and recheck. If the symptom/indication goes away, replace the original ECM/PCM.

'96 - 98 models:

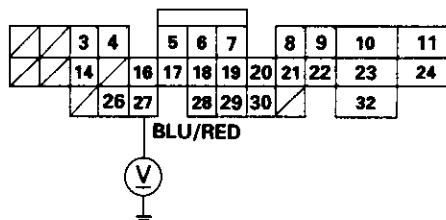
ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

'99 - 00 models:

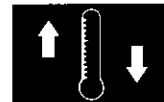
ECM/PCM CONNECTOR A (32P)



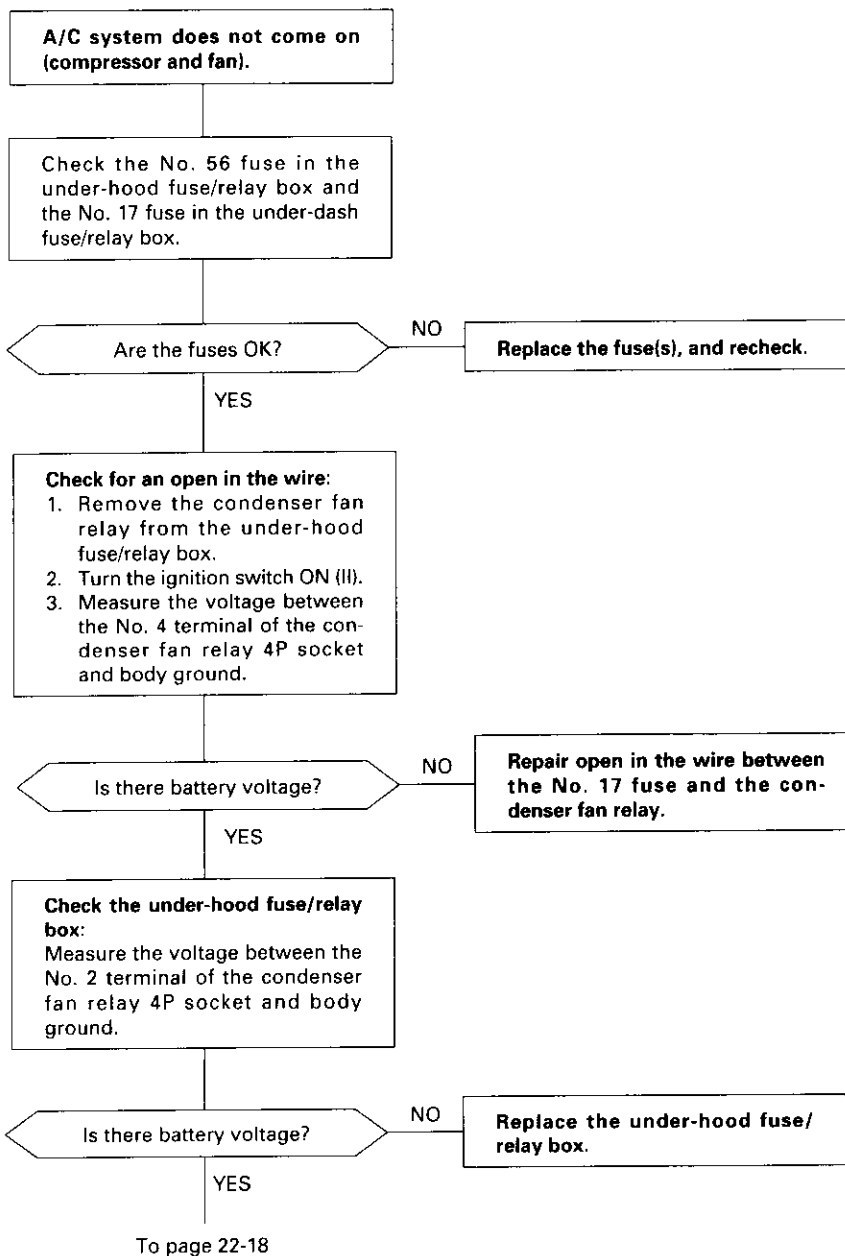
Wire side of female terminals

*How to use the backprobe sets

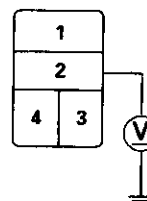
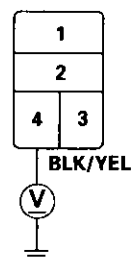
Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire (see section 11).



A/C System



CONDENSER FAN RELAY 4P SOCKET

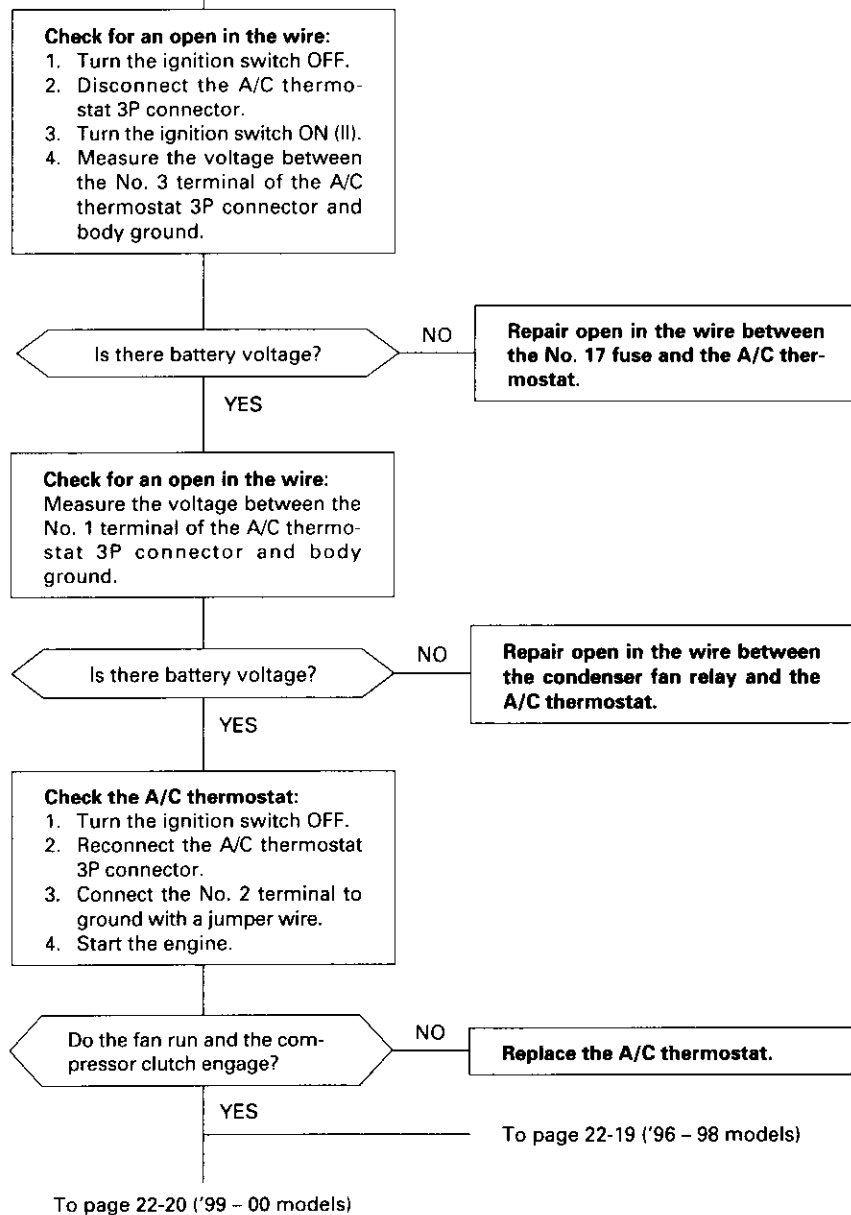


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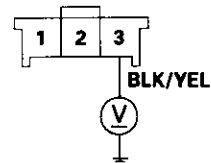
Troubleshooting

A/C System (cont'd)

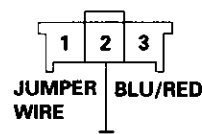
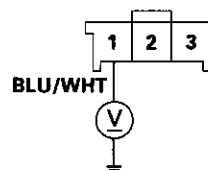
From page 22-17

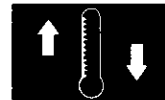


A/C THERMOSTAT 3P CONNECTOR



Wire side of female terminals





('96 - 98 models)

From page 22-18

Check for an open in the wire:

1. Turn the ignition switch OFF, then disconnect the jumper wire.
2. Remove the center dashboard lower cover (see section 20), and disconnect the heater control panel 14P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 11 terminal and body ground.

Is there battery voltage?

NO

Repair open in the wire between the A/C thermostat and the heater control panel.

YES

Check for an open in the wire:

1. Turn the ignition switch OFF.
2. Disconnect the heater fan switch 6P connector.
3. Check for continuity between the No. 14 terminal of the heater control panel 14P connector and the No. 6 terminal of the heater fan switch 6P connector.

Is there continuity?

NO

Repair open in the wire between the heater control panel and the heater fan switch.

YES

Check for an open in the wire:

Check for continuity between the No. 1 terminal of the heater fan switch 6P connector and body ground.

Is there continuity?

NO

Check for an open in the wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G401 and G402.

YES

Test the heater fan switch (see page 21-49).

Is the heater fan switch OK?

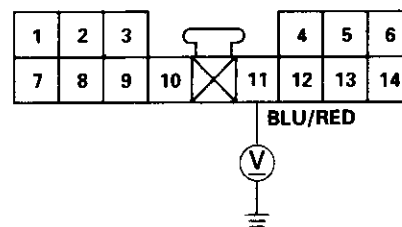
NO

Replace the heater fan switch.

YES

Check for loose wires or poor connections at the heater control panel 14P connector and heater fan switch 6P connector and at the A/C thermostat 3P connector. If the connections are good, replace the heater control panel.

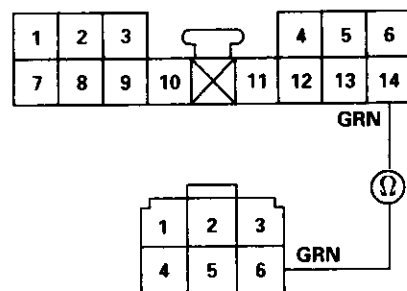
HEATER CONTROL PANEL 14P CONNECTOR



Wire side of female terminals

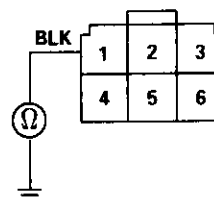
HEATER CONTROL PANEL 14P CONNECTOR

Wire side of female terminals



HEATER FAN SWITCH 6P CONNECTOR

Wire side of female terminals



(cont'd)

Troubleshooting

A/C System (cont'd)

('99 - 00 models)

From page 22-18

Check for an open in the wire:

1. Turn the ignition switch OFF, then disconnect the jumper wire.
2. Disconnect the heater control panel 20P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 11 terminal of the heater control panel 20P connector and body ground.

Is there battery voltage?

NO

Repair open in the wire between the A/C thermostat and the heater control panel.

YES

Check the push switch:

1. Turn the ignition switch OFF.
2. Disconnect the push switch 12P connector.
3. Check for continuity between the No. 9 and No. 10 terminals of the push switch 12P connector with the A/C switch ON.

Is there continuity?

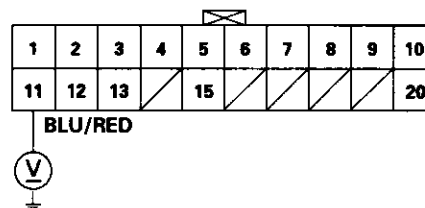
NO

Replace the push switch.

YES

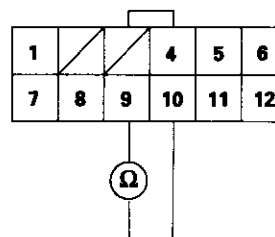
Check for loose wires or poor connections at the heater control panel 20P connector and push switch 12P connector and at the A/C thermostat 3P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.

HEATER CONTROL PANEL 20P CONNECTOR

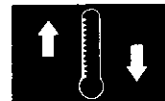


Wire side of female terminals

PUSH SWITCH 12P CONNECTOR



Wire side of female terminals



Test

1. Remove the A/C thermostat (see page 22-29).
2. Connect battery power to the No. 3 terminal, ground the No. 2 terminal, and connect a test light between the No. 1 and No. 3 terminals.

NOTE: Use a 12 V, 3 W – 18 W test light.

3. Dip the A/C thermostat into a cup filled with ice water, and check the test light.

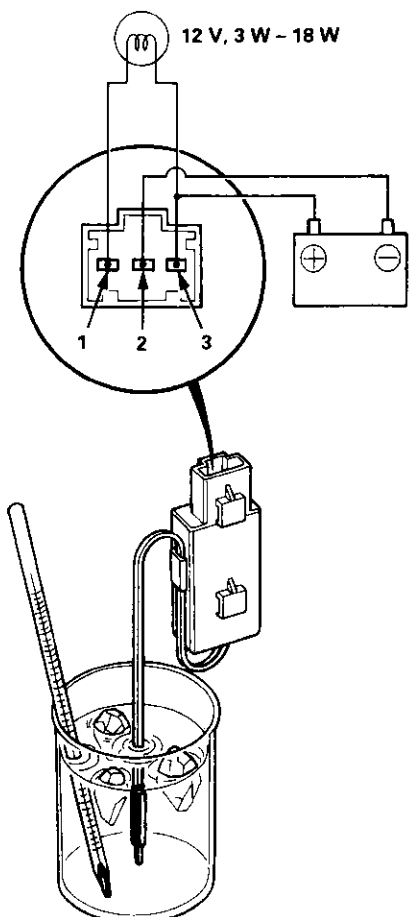
Serpentine-type evaporator

The light should go off at 36 – 39°F (2 – 4°C) or less, and should come on at 39 – 41°F (4 – 5°C) or more.

Laminate-type evaporator

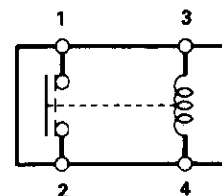
The light should go off at 39 – 43°F (4 – 6°C) or less, and should come on at 43 – 45°F (6 – 7°C) or more.

If the light doesn't come on and go off as specified, replace the A/C thermostat.

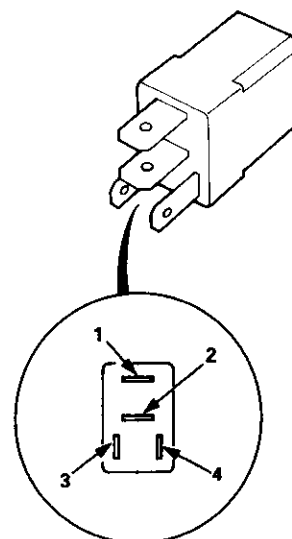


Test

There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals, and there should be no continuity when power is disconnected.



- Condenser fan relay
- Compressor clutch relay



A/C Service Tips and Precautions

The air conditioner system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil*, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioner system or your servicing equipment will result.

*Sanden SP-10:

- P/N 38897 – P13 – A01AH: 120 ml (4 fl-oz, 4.2 Imp-oz)
- P/N 38899 – P13 – A01: 40 ml (1 1/3 fl-oz, 1.4 Imp-oz)

*DENSO ND-OIL 8:

- P/N 38897 – PR7 – A01AH: 120 ml (4 fl-oz)
- P/N 38899 – PR7 – A01: 40 ml (1 1/3 fl-oz)

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, use a R-134a refrigerant recovery/recycling/charging station; don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts:

NOTE:

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

Condenser 20 ml (2/3 fl-oz, 0.7 Imp-oz)

Evaporator 45 ml (1 2/3 fl-oz, 1.6 Imp-oz)

Line or hose 10 ml (1/3 fl-oz, 0.4 Imp-oz)

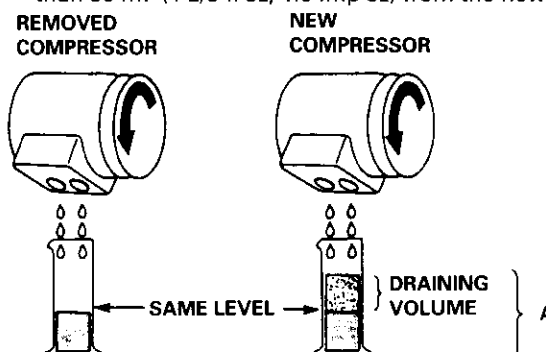
Receiver/Dryer 10 ml (1/3 fl-oz, 0.4 Imp-oz)

Leakage repair 25 ml (5/6 fl-oz, 0.9 Imp-oz)

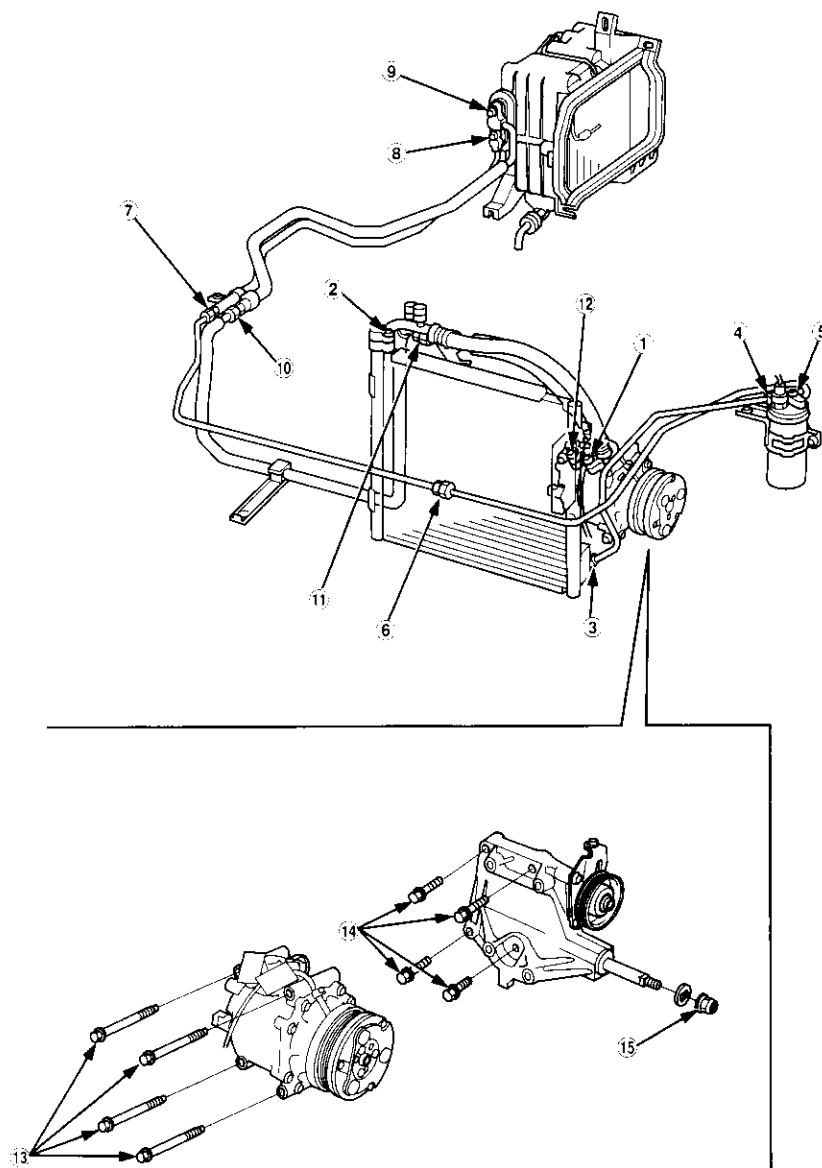
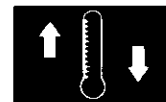
Compressor For compressor replacement, subtract the volume of oil drained from the removed compressor from A, and drain the calculated volume of oil from the new compressor: $A - \text{Volume of removed compressor} = \text{Volume to drain from new compressor}$.

A: SANDEN 130 ml (4 1/3 fl-oz, 4.6 Imp-oz); DENSO 140 ml (4 2/3 fl-oz, 4.9 Imp-oz),

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 ml (1 2/3 fl-oz, 1.8 Imp-oz) from the new compressor.



A/C System Torque Specifications



① Discharge hose to the compressor (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the condenser (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Condenser pipe to the condenser (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Condenser pipe to the receiver/dryer (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑤ Receiver pipe A to the receiver/dryer (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑥ Receiver pipe B to the receiver pipe A	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑦ Receiver pipe C to the receiver pipe B	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑧ Receiver pipe C to the evaporator (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑨ Suction pipe B to the evaporator (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑩ Suction pipe A to the suction pipe B	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑪ Suction hose to the suction pipe A	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑫ Suction hose to the compressor (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑬ Compressor to the compressor bracket (8 x 1.25 mm)	24 N·m (2.4 kgf·m, 17 lbf·ft)
⑭ Compressor bracket to the cylinder block (10 x 1.25 mm)	44 N·m (4.5 kgf·m, 33 lbf·ft)
⑮ Compressor bracket to the left front engine mount (12 x 1.25 mm)	59 N·m (6.0 kgf·m, 43 lbf·ft)

A/C System Service

Performance Test

The performance test will help determine if the air conditioner system is operating within specifications.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

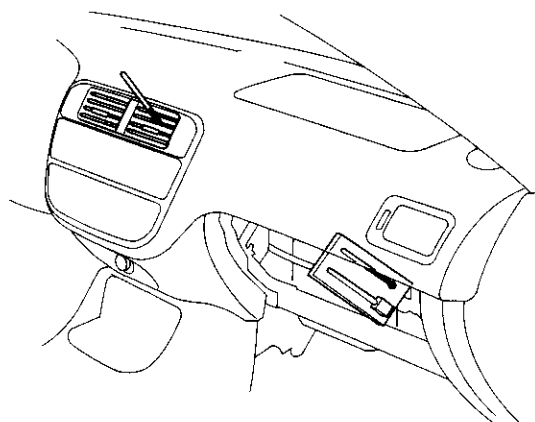
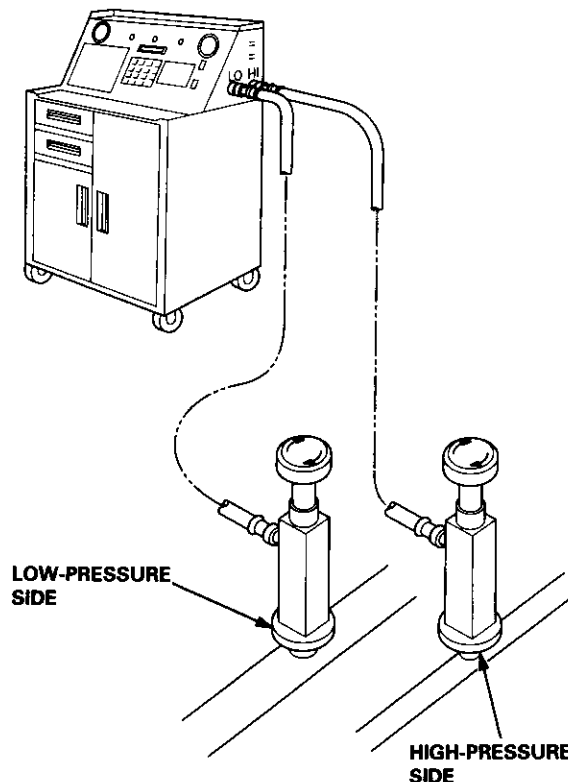
R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

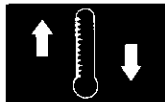
WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recover/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.
2. Insert a thermometer in the center vent outlet. Determine the relative humidity and air temperature.
3. Test conditions:
 - Avoid direct sunlight.
 - Open hood.
 - Open front doors.
 - Set the temperature control lever or dial to MAX. COOL, the mode control switch or dial on VENT and the recirculation control switch on RECIRCULATE.
 - Turn the A/C switch on, and the heater fan switch on MAX.
 - Run the engine at 1,500 rpm.
 - No driver or passengers in vehicle
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent and the high and low system pressure from the A/C gauges.

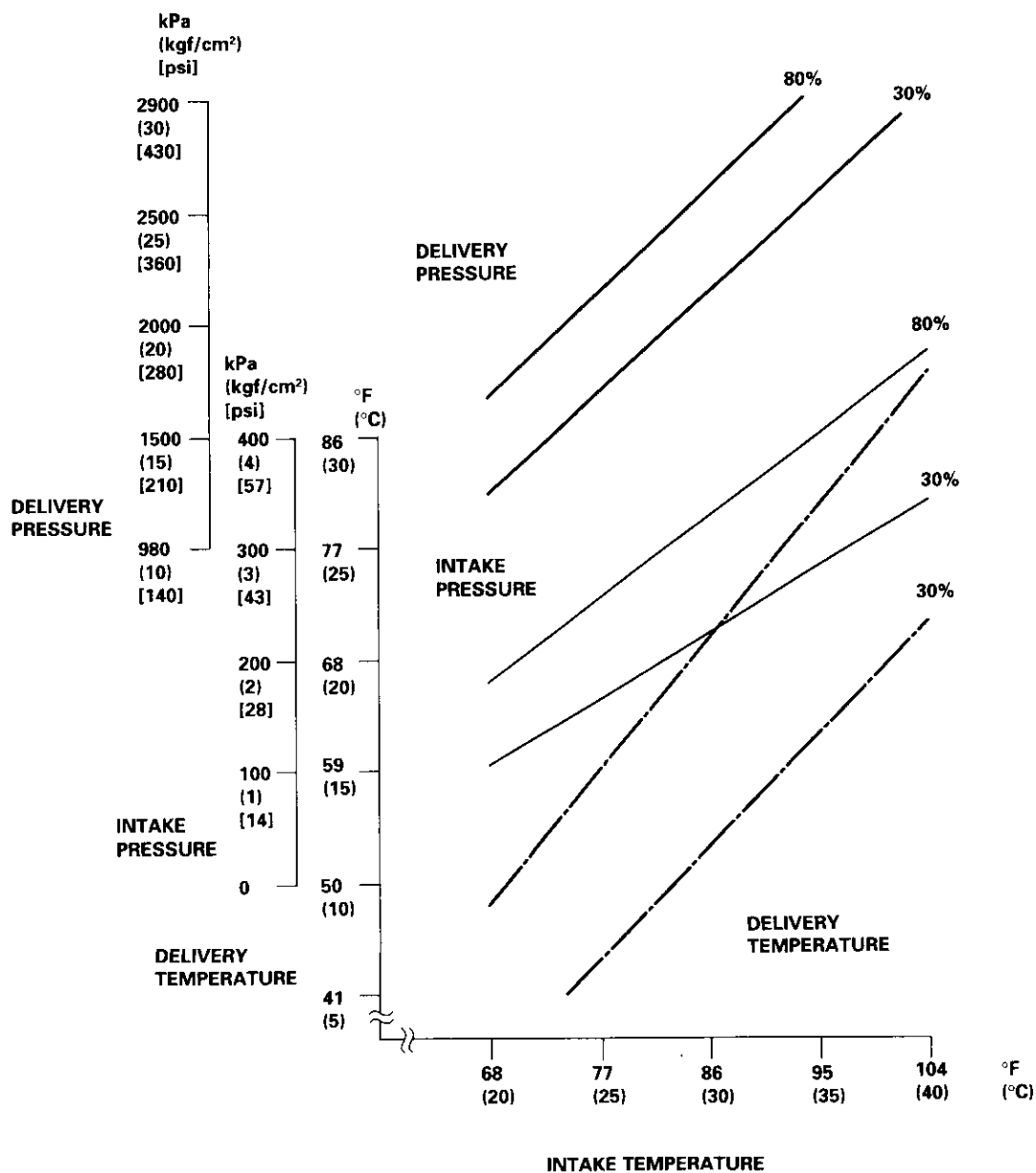
Recovery/Recycling/Charging Station





5. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point 10% above and 10% below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low side pressure test and high side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.

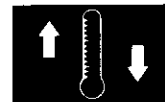


A/C System Service

Pressure Test Chart

NOTE: Performance Test is on page 22-24.

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 200 kPa (2.0 kgf/cm ² , 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate, and recharge with specified amount. Evacuation: see page 22-45 Charging: see page 22-46
	Reduced or no air flow through condenser	<ul style="list-style-type: none"> • Clogged condenser fins • Condenser fan not working properly 	<ul style="list-style-type: none"> • Clean. • Check voltage and fan rpm. • Check fan direction.
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	High and low pressures are balanced soon after stopping compressor. Low side is higher than normal.	<ul style="list-style-type: none"> • Faulty compressor discharge valve • Faulty compressor seal 	Replace the compressor.
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> • Faulty expansion valve • Moisture in system 	<ul style="list-style-type: none"> • Replace. • Recover, evacuate, and recharge with specified amount.
Suction (low) pressure abnormally low	Expansion valve is not frosted, and low pressure line is not cold. Low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> • Frozen expansion valve • Faulty expansion valve 	Replace the expansion valve.
	Discharge temperature is low, and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check A/C thermostat.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
	Receiver/dryer outlet is cool, and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace.
Suction pressure abnormally high	Low pressure hose and check joint are cooler than the temperature around evaporator.	<ul style="list-style-type: none"> • Expansion valve open too long • Loose expansion capillary tube 	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate, and recharge with specified amount.
	High and low pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	<ul style="list-style-type: none"> • Faulty gasket • Faulty high pressure valve • Foreign particle stuck in high pressure valve 	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	<ul style="list-style-type: none"> • Clogged condenser fins • Condenser fan not working properly 	<ul style="list-style-type: none"> • Clean condenser. • Check voltage and fan rpm. • Check fan direction.
Suction and discharge pressure abnormally low	Low pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high pressure line	Repair or replace.
Refrigerant leaks	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.



Recovery

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

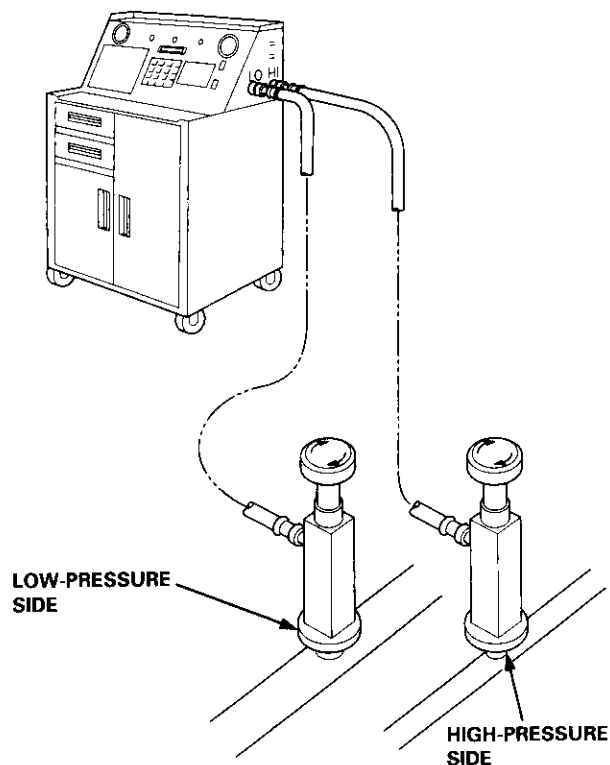
⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.
2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed.

NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

Recovery/Recycling/Charging Station

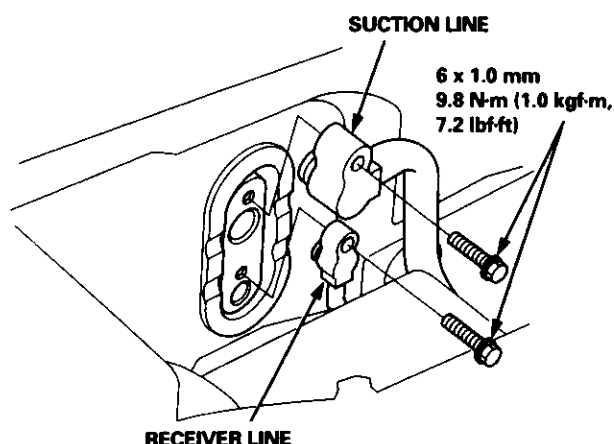


Evaporator

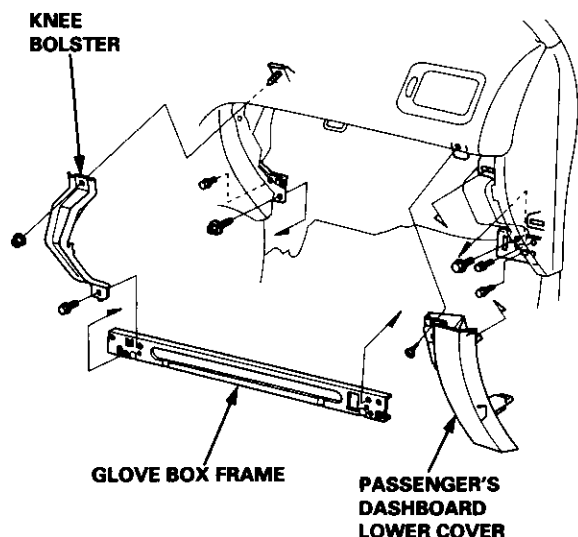
Replacement

1. Move the temperature control to "HOT."
'96-98: Slide the temperature control lever.
'99-00: Turn the ignition switch ON (II), then turn the temperature control knob. Turn the ignition switch off.
2. Remove the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the bolts, then disconnect the suction and receiver lines from the evaporator.

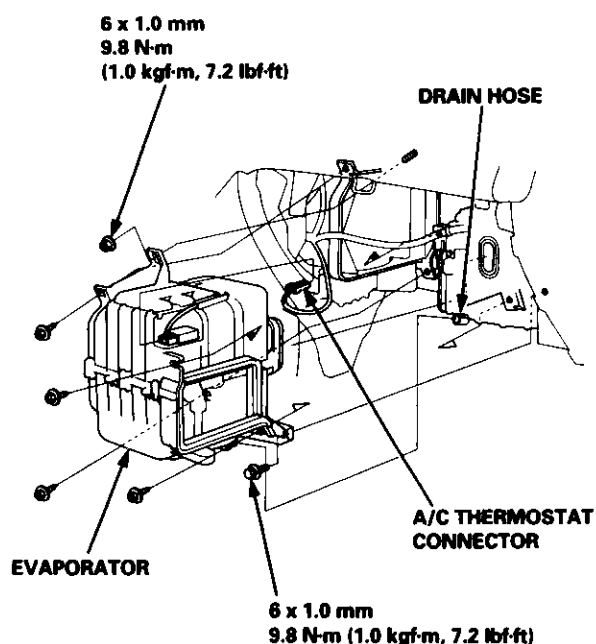
NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



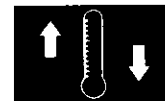
5. Remove the glove box (see section 20).
6. Remove the self-tapping screw and the passenger's dashboard lower cover. Remove the bolt, the nut and the knee bolster, then remove the five bolts and the glove box frame.



7. Disconnect the connector from the A/C thermostat, and remove the wire harness from the evaporator. Remove the four self-tapping screws, the mounting bolt and the mounting nut. Disconnect the drain hose, then remove the evaporator.



8. Install in the reverse order of removal. Make note of the following items.
 - If you're installing a new evaporator, add refrigerant oil (SANDEN, SP-10 or DENSO, ND-OIL 8) (see page 22-22).
 - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - Apply sealant to the grommets.
 - Make sure that there is no air leakage.
 - Charge the system (see page 22-46), and test its performance (see page 22-24).



Overhaul

1. Pull out the A/C thermostat sensor from the evaporator fins.
2. Remove the self-tapping screws and clamps from the housings.
3. Carefully separate the housings, then remove the evaporator.
4. If necessary, remove the expansion valve.

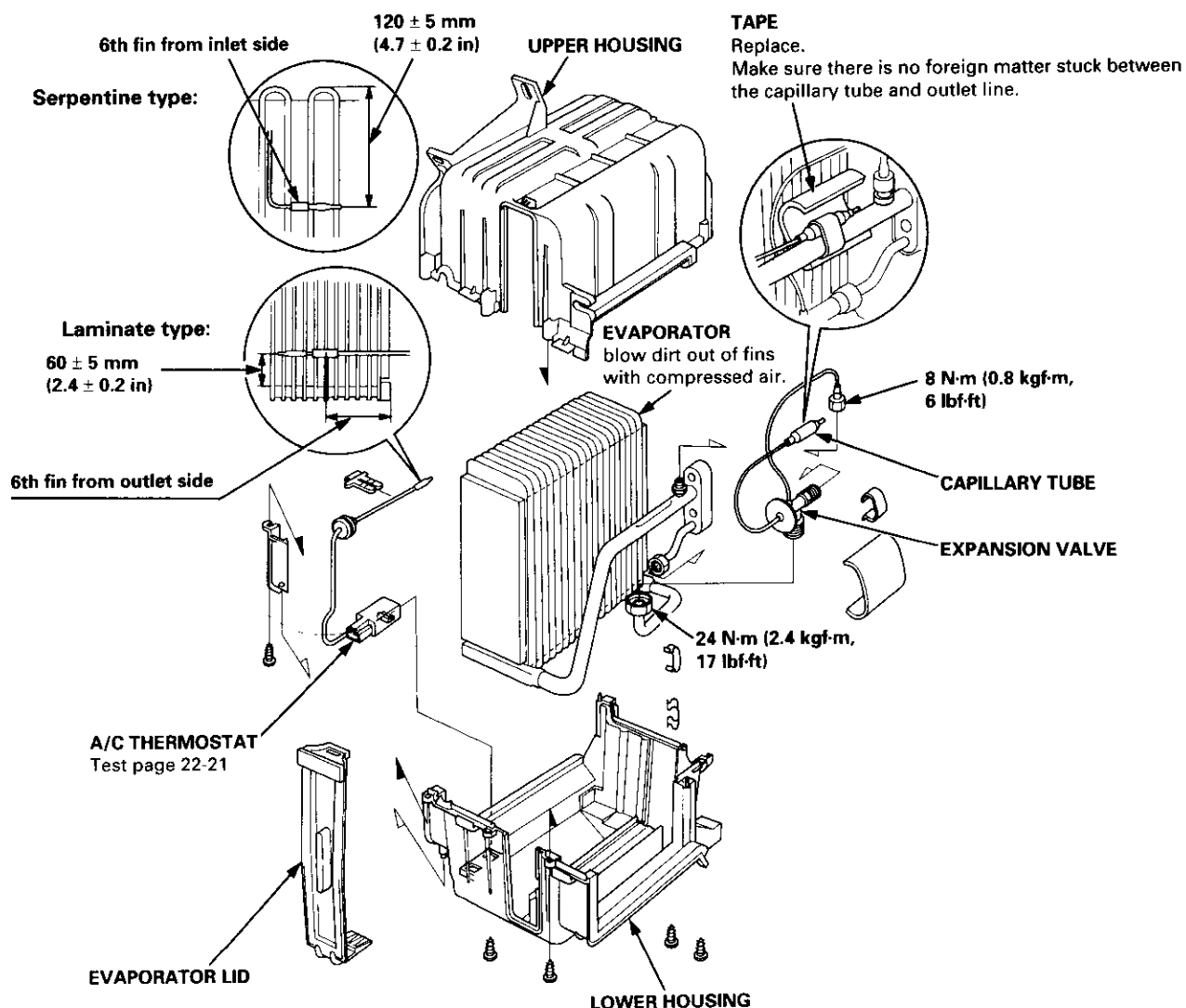
NOTE: When loosening the expansion valve nuts, use a second wrench to hold the expansion valve or the evaporator pipe. Otherwise, they can be damaged.

5. Assemble in the reverse order of disassembly. Make note of following items.

- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.

NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.

- Install the expansion valve capillary tube so that it is in direct contact with the suction line. Then wrap with tape.
- Reinstall the A/C thermostat sensor to its original location.

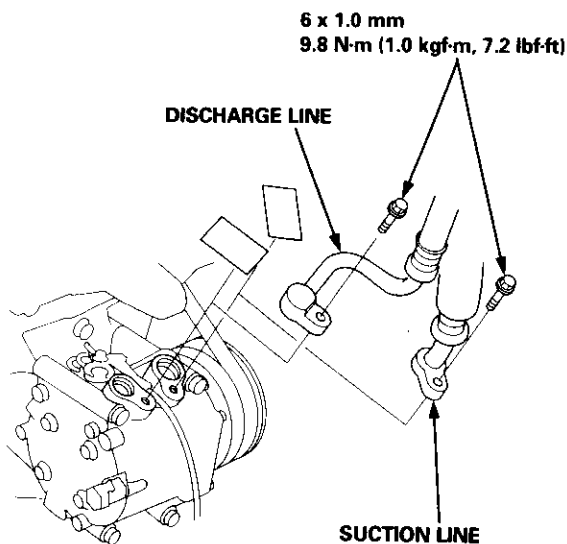


Compressor (SANDEN)

Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioner work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the bolts, then disconnect the suction and discharge lines from the compressor.

NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

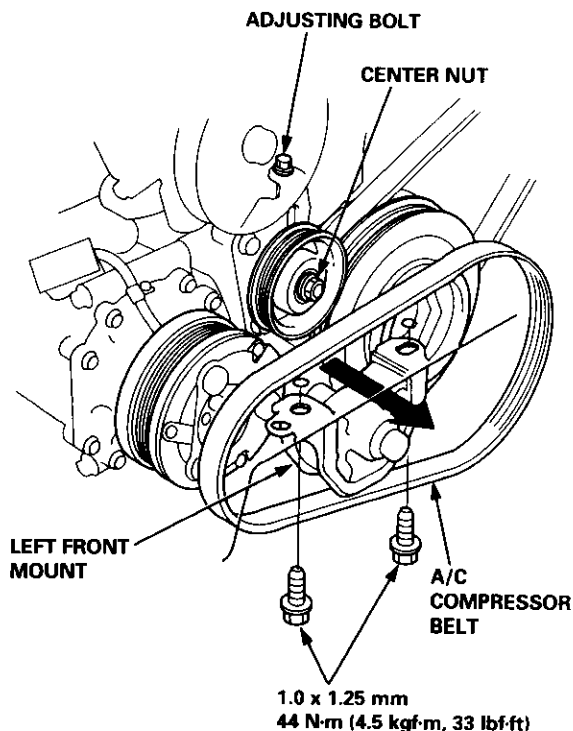


5. Remove the condenser (see page 22-44).

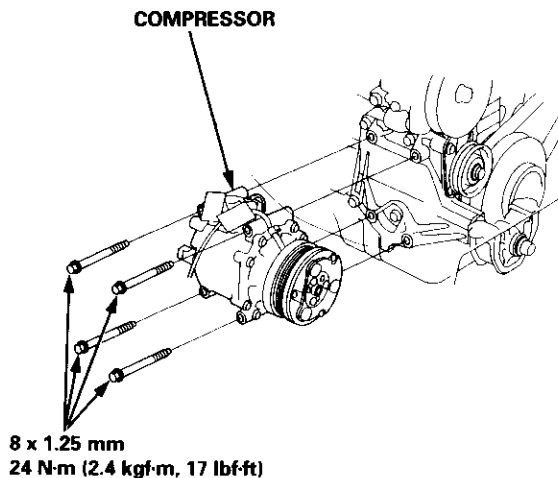
NOTE: Do not disconnect the discharge hose from the condenser.

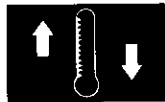
6. Remove the power steering pump belt (see section 17).

7. Loosen the center nut of the idler pulley and the adjusting bolt, then remove the A/C compressor belt from the pulleys. Remove the two mounting bolts from the left front mount, then remove the A/C compressor belt by passing it through the gap between the body and the left front mount.



8. Remove the four mounting bolts and the compressor.



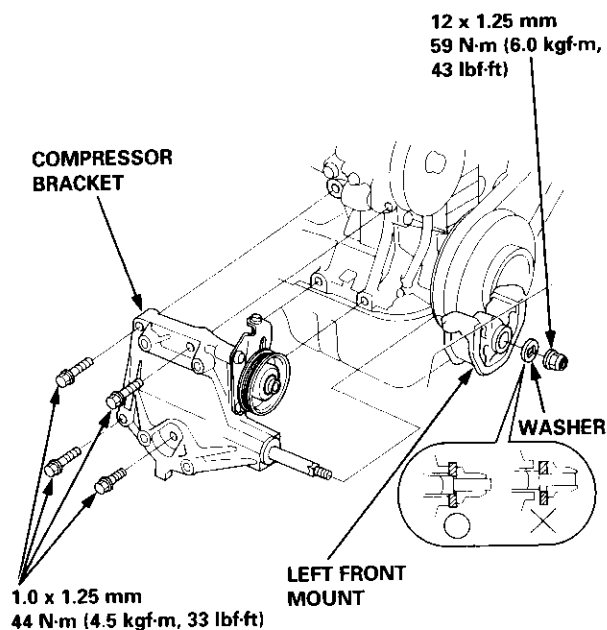


9. If necessary, remove the compressor bracket as follows.

- Remove the nut and the washer.

NOTE: When tightening the nut of the left front mount, make sure the washer is set properly on the left front engine mount as shown.

- Remove the four mounting bolts and the compressor bracket.



10. Install in the reverse order of removal. Make note of the following items.

- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 130ml (4 1/3 fl-oz, 4.6 Imp-oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).

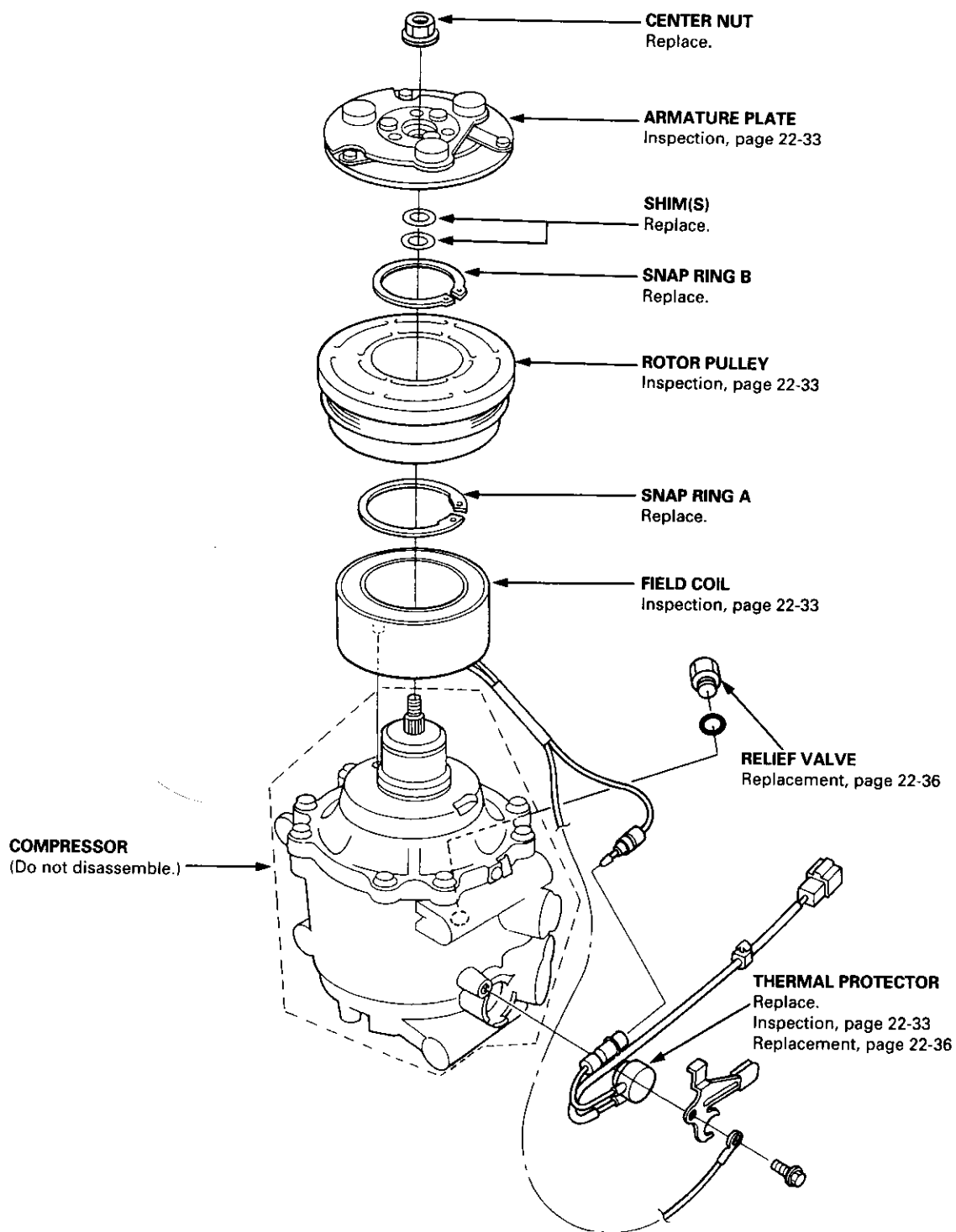
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.

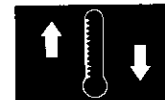
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.

- Use refrigerant oil (SP-10) for R-134a Sanden and Hadsys spiral type compressors only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Adjust the A/C compressor belt (see page 22-43) and the power steering pump belt (see section 17).
- Charge the system (see page 22-46), and test its performance (see page 22-24).

Compressor (SANDEN)

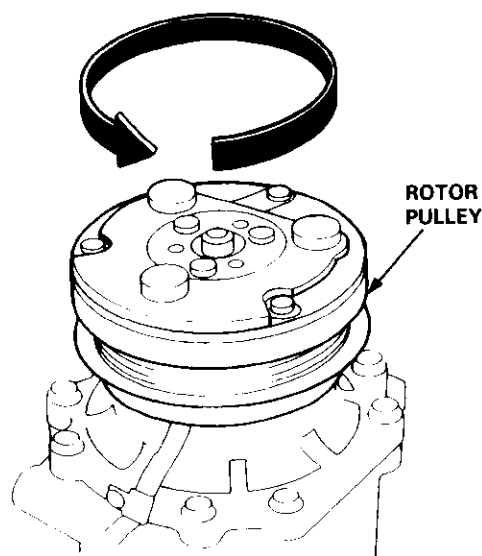
Illustrated Index





Clutch Inspection

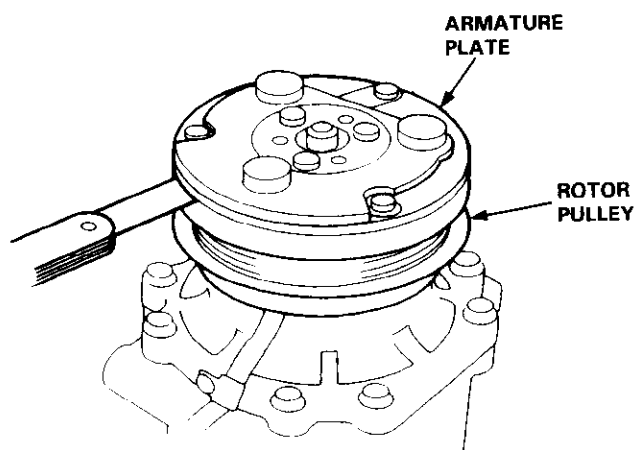
- Check the plated parts of the armature plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



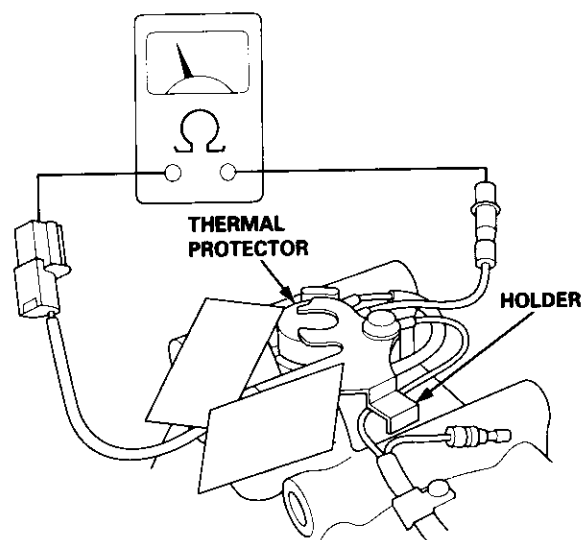
- Measure the clearance between the rotor pulley and the armature plate all the way around. If the clearance is not within specified limits, the armature plate must be removed and shims added or removed as required, following the procedure on page 22-34.

Clearance: 0.5 ± 0.15 mm (0.020 ± 0.006 in)

NOTE: The shims are available in four thicknesses: 0.1 mm, 0.2 mm, 0.4 mm and 0.5 mm



- Release the field coil connector from the holder, then disconnect it. Check the thermal protector for continuity. If there is no continuity, replace the thermal protector.

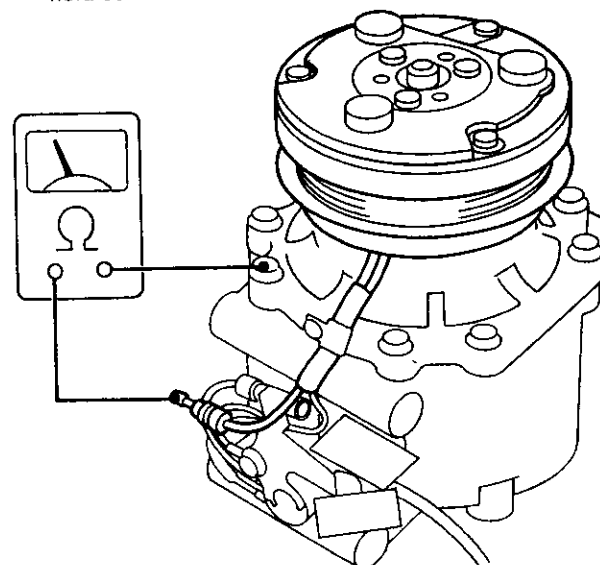


NOTE: The thermal protector will have no continuity above 251.6 to 262.4°F (122 to 128°C). When the temperature drops below 240.8 to 219.8°F (116 to 104°C), the thermal protector will have continuity.

- Check resistance of the field coil.

Field Coil Resistance: 3.05 to 3.35 Ω at 68°F (20°C)

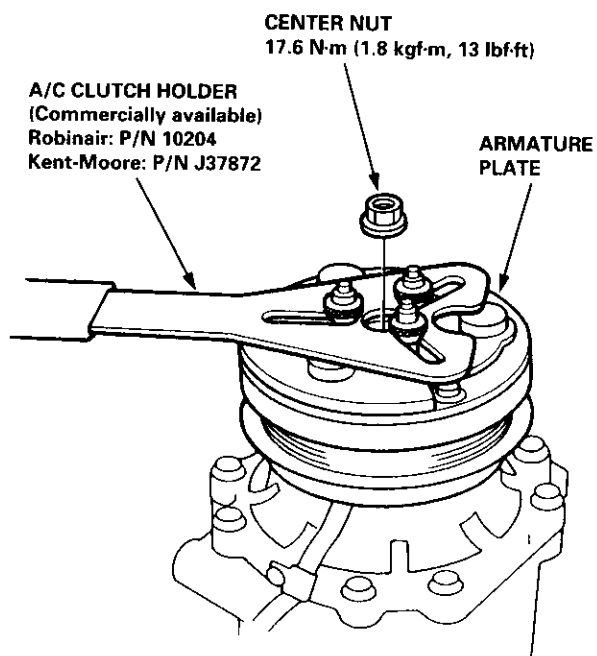
If resistance is not within specifications, replace the field coil.



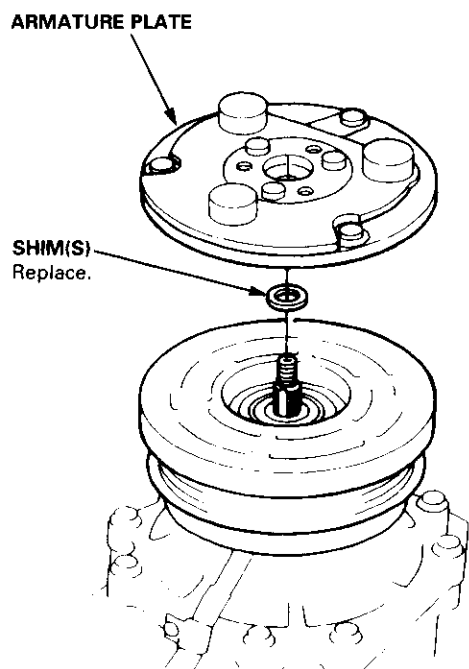
Compressor (SANDEN)

Clutch Overhaul

1. Remove the center nut while holding the armature plate with the tool.



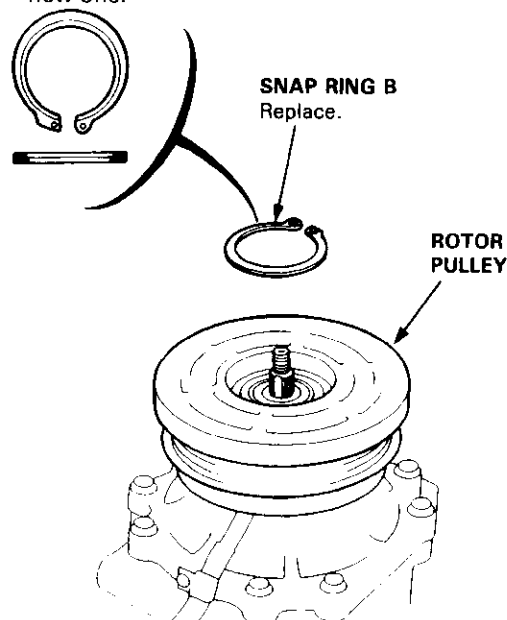
2. Remove the armature plate by pulling it up by hand.



3. Remove snap ring B with snap ring pliers.

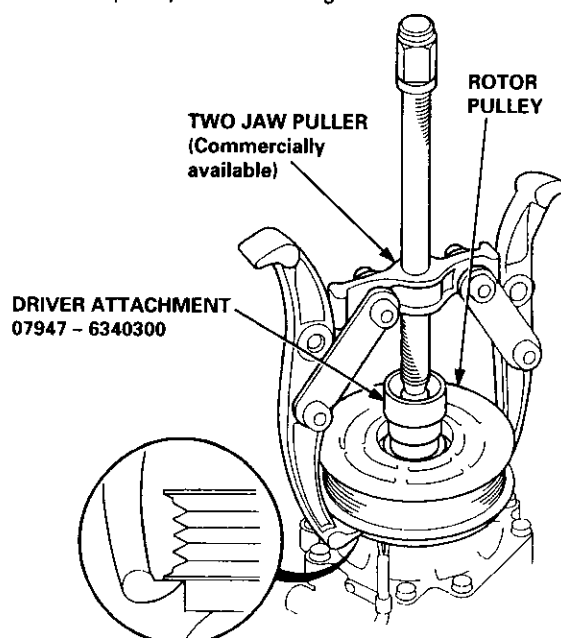
NOTE:

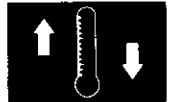
- Be careful not to damage the rotor pulley and compressor during removal/installation.
- Once snap ring B is removed, replace it with a new one.



4. Remove the rotor pulley from the shaft with a puller and the special tool.

NOTE: Place the claws of the puller on the back of the rotor pulley, not on the belt area; otherwise the rotor pulley can be damaged.

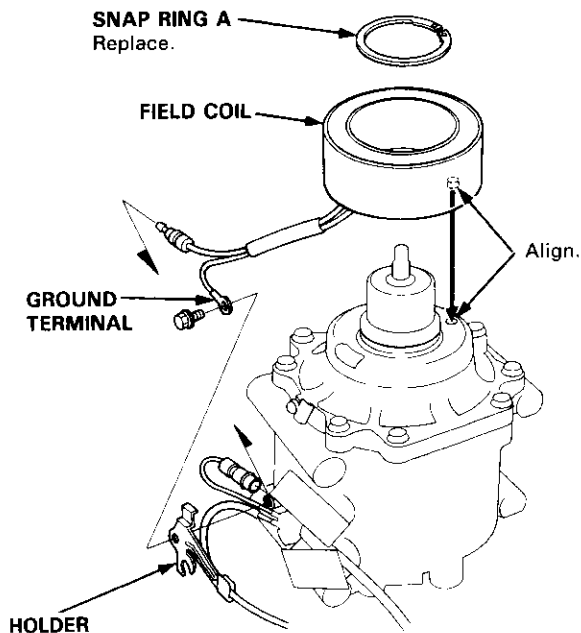




5. Remove the screw from the field coil ground terminal, then disconnect the field coil connector. Remove snap ring A with snap ring pliers, then remove the field coil.

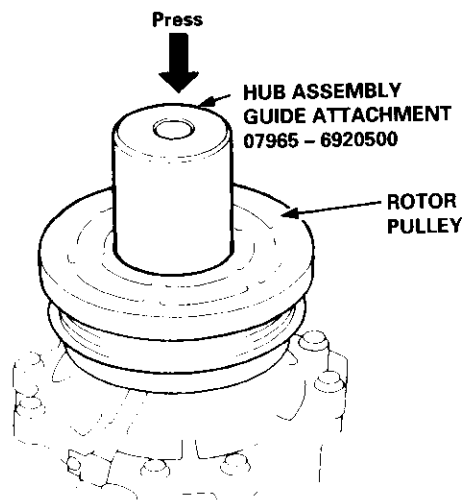
NOTE:

- Be careful not to damage the field coil and compressor during remove/installation.
- Once snap ring A is removed, replace it with a new one.
- When installing the field coil, align the boss on the field coil with the hole in the compressor.



6. Position the rotor pulley squarely over the field coil. Press the rotor pulley onto the compressor boss with the special tool. If the rotor pulley does not press on straight, remove it, and check the rotor pulley and compressor boss for burrs or damage.

CAUTION: Maximum press load: 39,200 kPa (400 kgf/cm², 5,690 psi)



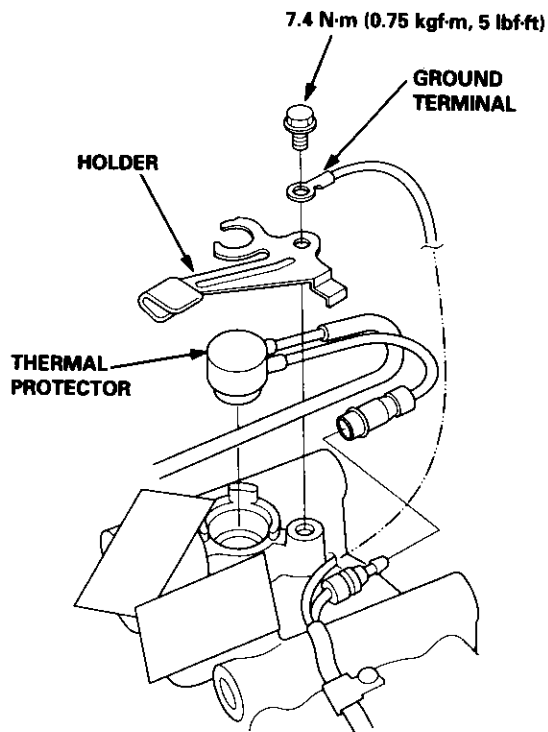
7. Assemble in the reverse order of disassembly. Make note of the following items.

- Install the field coil with the wire side facing down.
- Clean the rotor pulley and compressor sliding surfaces with non-petroleum solvent.
- Make sure the snap rings are fully seated in the groove.
- Make sure that the rotor pulley turns smoothly after it's reassembled.
- Route and clamp the wires properly or they can be damaged by the rotor pulley.

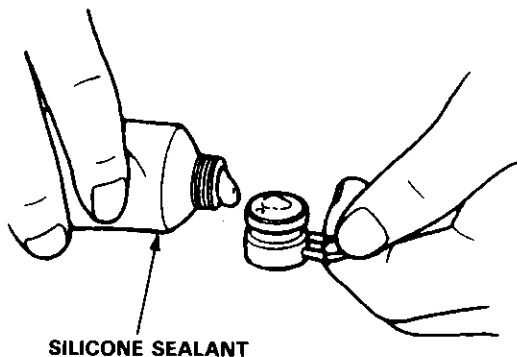
Compressor (SANDEN)

Thermal Protector Replacement

1. Remove the bolt, the ground terminal and the holder. Disconnect the field coil connector, then remove the thermal protector.



2. Replace the thermal protector with a new one, and apply silicone sealant to the top of the thermal protector.



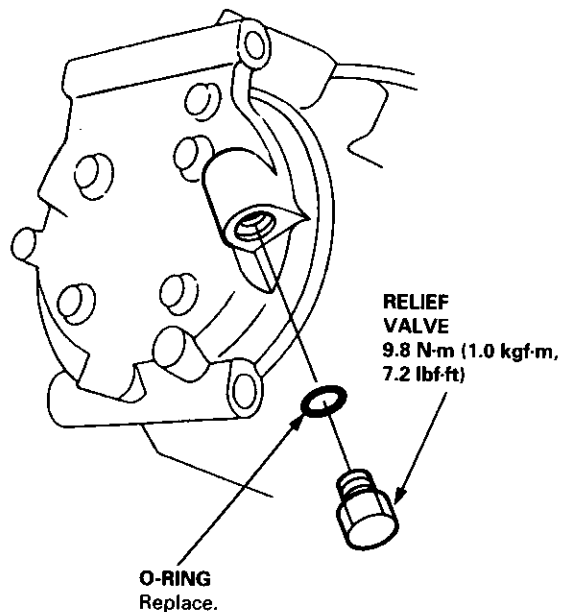
3. Install in the reverse order of removal.

Relief Valve Replacement

1. Remove the relief valve and the O-ring.

NOTE:

- Do not let the compressor oil run out.
- Make sure that no foreign matter enters the system.



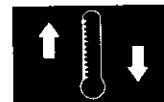
2. Clean the mating surfaces.
3. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.

NOTE:

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

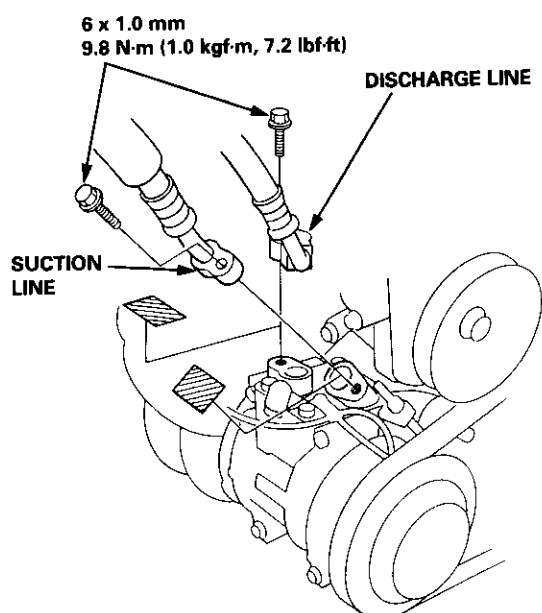
4. Install and tighten the relief valve.
5. Charge the system (see page 22-46), and test its performance (see page 22-24).

Compressor (DENSO)



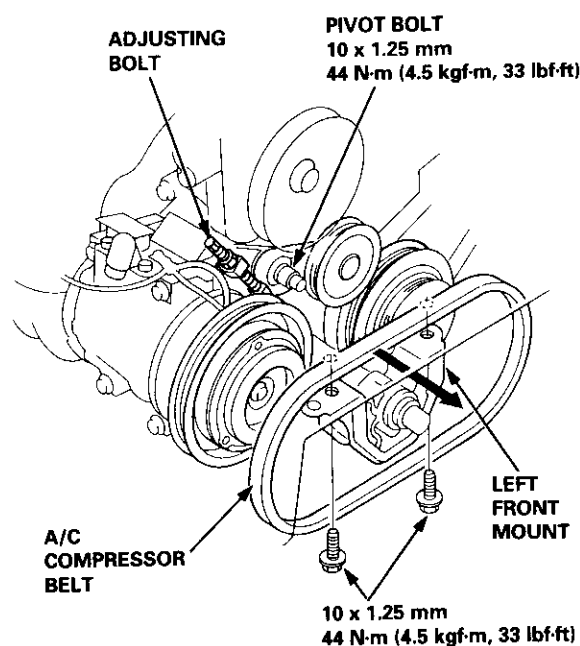
Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the each bolt, then disconnect the suction and discharge lines from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

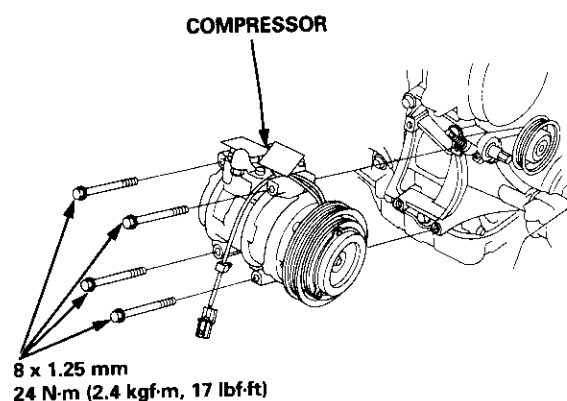


5. Remove the condenser, but do not disconnect the discharge hose from the condenser (see page 22-44).
6. Remove the power steering pump belt (see section 17).

7. Loosen the pivot bolt of the idler pulley bracket and the adjusting bolt, then remove the A/C compressor belt from the pulleys. If necessary, remove the mounting bolts from the left front mount, then remove the A/C compressor belt through the gap between the body and the left front mount.



8. Disconnect the compressor clutch connector, then remove the mounting bolts and the compressor.

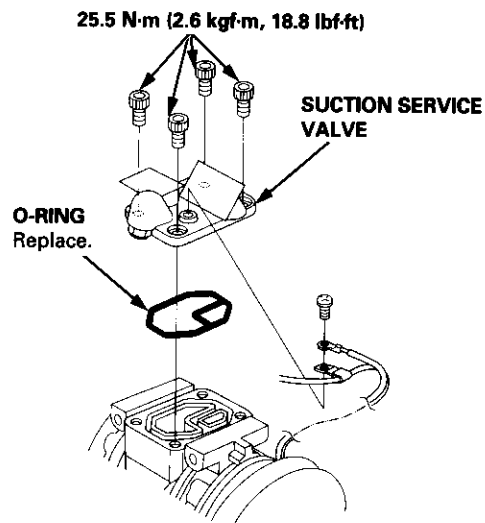


(cont'd)

Compressor (DENSO)

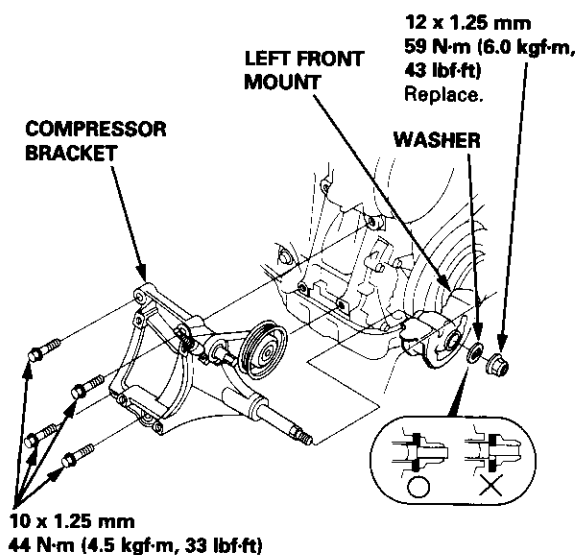
Replacement (cont'd)

9. Remove the bolts, the suction service valve and the O-ring from the compressor.



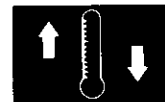
10. If necessary, remove the compressor bracket as follows.

- Remove the nut and the washer from the left front mount. When tightening the nut to the left front mount, make sure the washer is set properly on the left front mount as shown.
- Remove the mounting bolts and the compressor bracket.

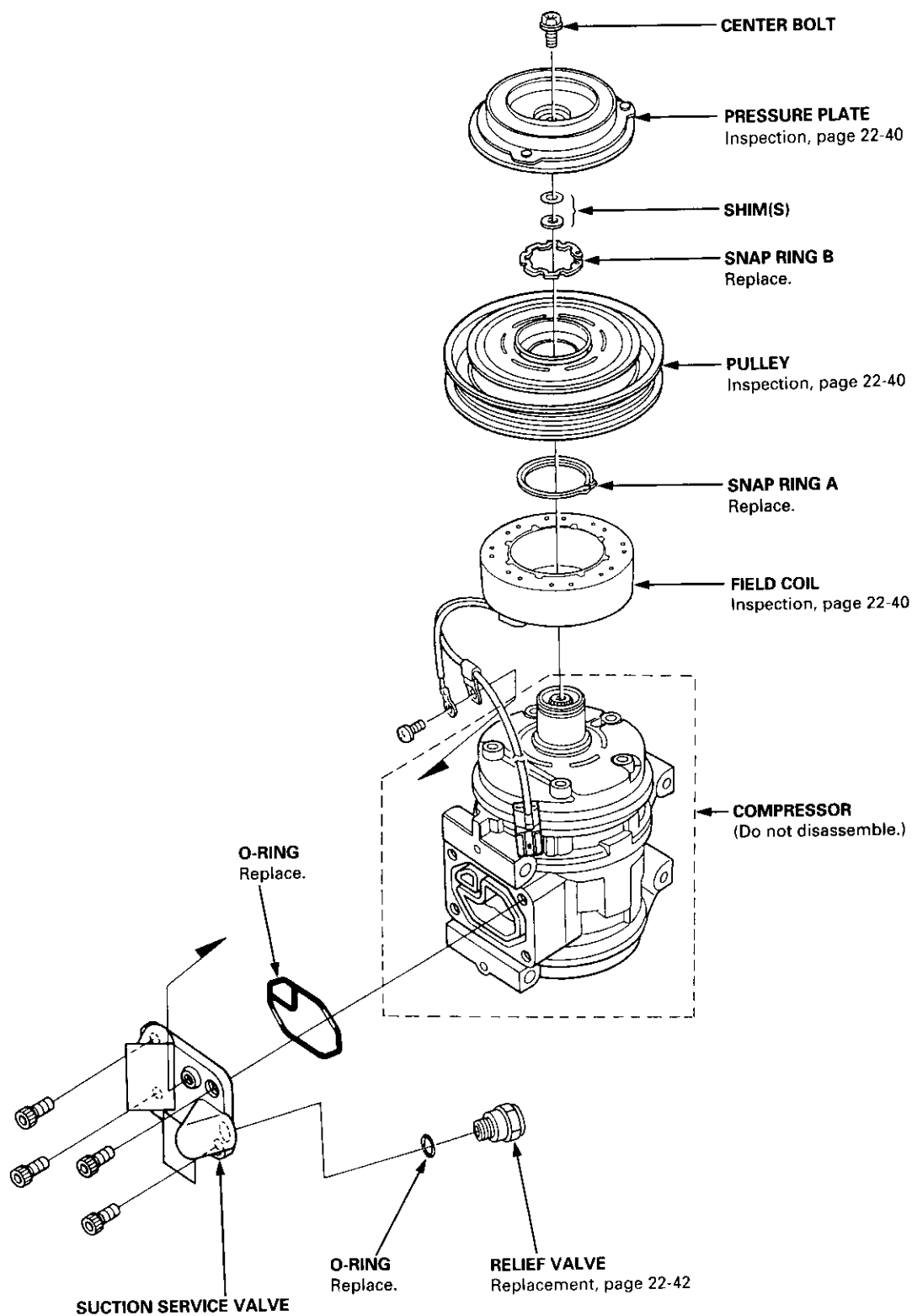


11. Install in the reverse order of removal, and note these items:

- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 140 ml (4 2/3 fl-oz, 4.9 Imp-oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (DENSO, ND-OIL8) for HFC-134a DENSO piston type compressors only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Adjust the A/C compressor belt (see page 22-43) and the power steering pump belt (see section 17).
- Charge the system (see page 22-46), and test its performance (see page 22-24).



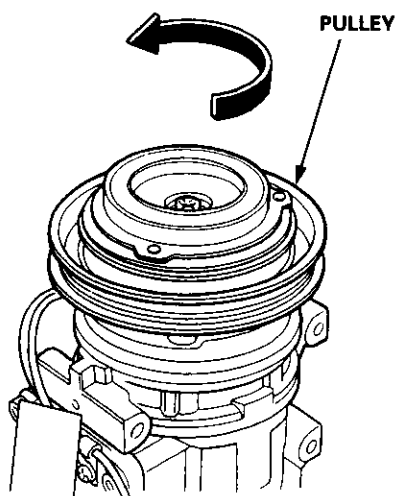
Illustrated Index



Compressor (DENSO)

Clutch Inspection

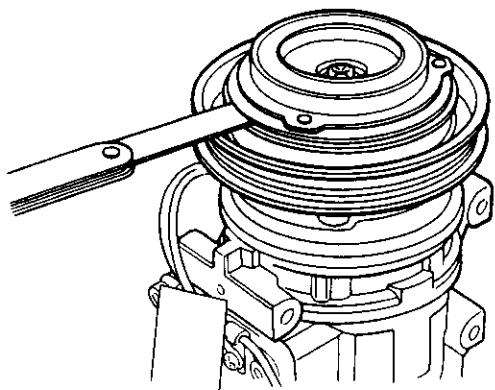
- Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



- Measure the clearance between the pulley and the pressure plate all the way around. If the clearance is not within specified limits, the pressure plate must be removed and shim(s) added or removed as required, following the procedure on page 22-41.

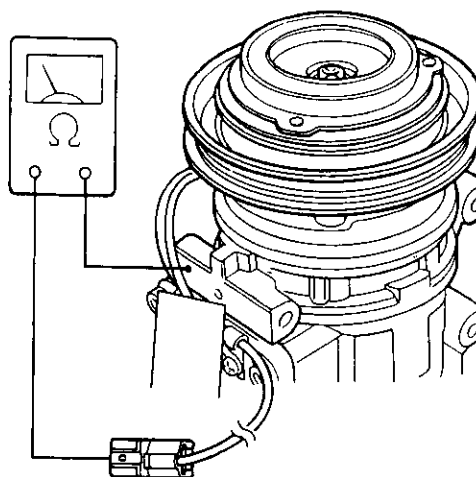
Clearance: 0.5 ± 0.15 mm (0.020 ± 0.006 in)

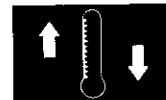
NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



- Check resistance of the field coil. If resistance is not within specifications, replace the field coil.

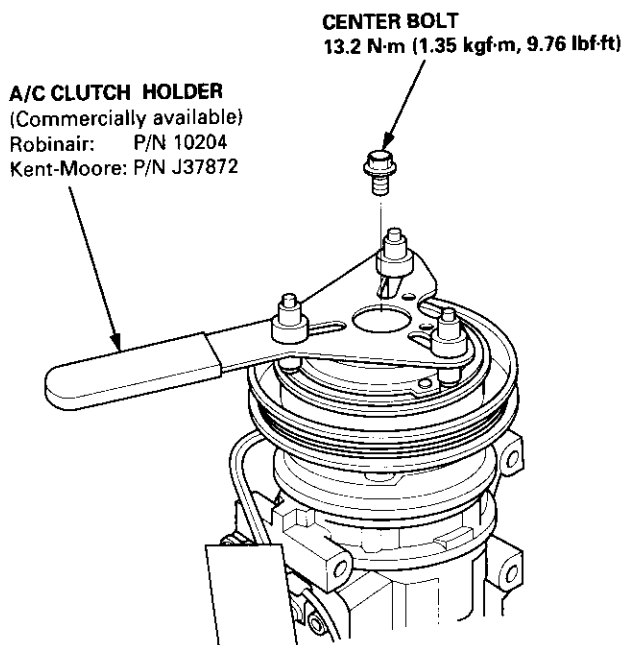
Field Coil Resistance: 3.4 to 3.8 Ω at 20°C (68°F)



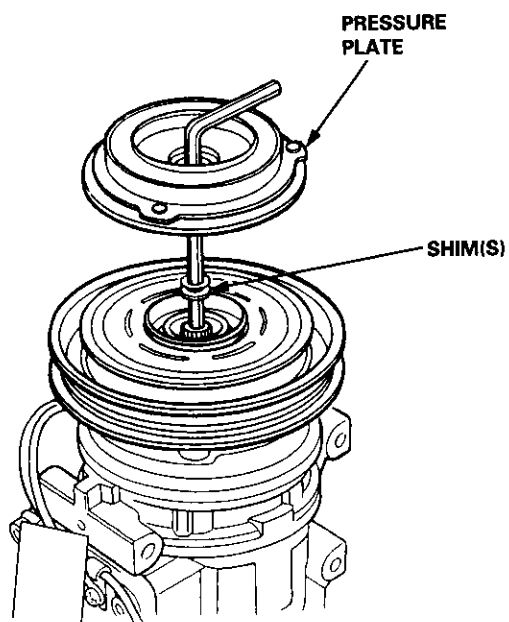


Clutch Overhaul

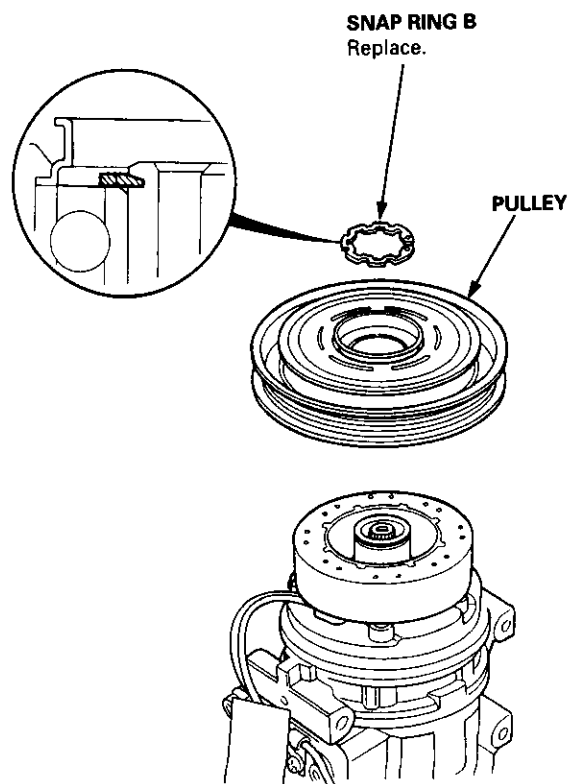
1. Remove the center bolt while holding the pressure plate with the special tool.



2. Remove the pressure plate and shim(s), taking care not to lose the shim(s).



3. Remove the snap ring B with snap ring pliers, then remove the pulley. Be careful not to damage the pulley and compressor.

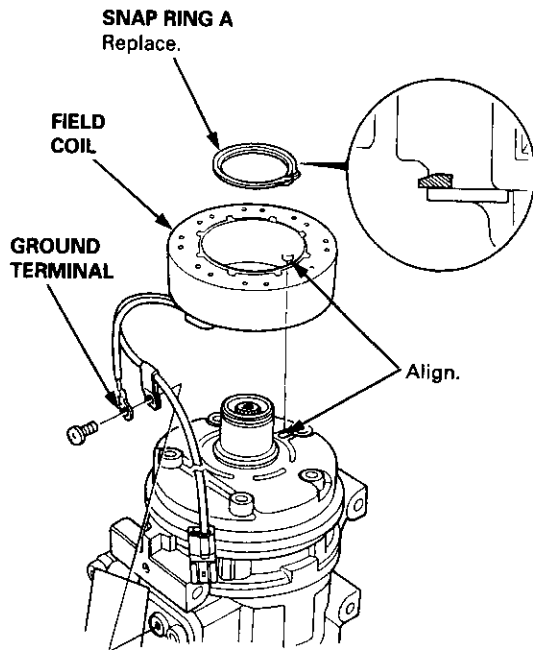


(cont'd)

Compressor (DENSO)

Clutch Overhaul (cont'd)

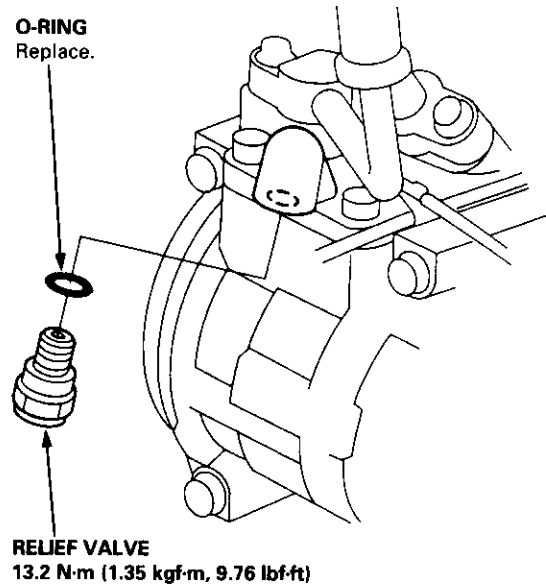
4. Remove the screw from the field coil ground terminal. Remove the snap ring A with snap ring pliers, then remove the field coil. Be careful not to damage the field coil and compressor.



5. Reassemble the compressor clutch in the reverse order of disassembly, and note these items:
 - Install the field coil with the wire side facing down.
 - Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
 - Install new snap rings, and make sure they are fully seated in the groove.
 - Make sure that the pulley turns smoothly after it's reassembled.
 - Route and clamp the wires properly or they can be damaged by pulley.

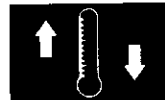
Relief Valve Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
2. Remove the relief valve and the O-ring. Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.



3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (see page 22-46), and test its performance (see page 22-24).

A/C Compressor Belt



Adjustment

Deflection Method

1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection between the A/C compressor and the crankshaft pulley.

A/C Compressor Belt

Used Belt: B16A2 engine

6.0 – 9.5 mm (0.24 – 0.37 in)

Except B16A2 engine

7.5 – 9.5 mm (0.30 – 0.37 in)

New Belt: B16A2 engine

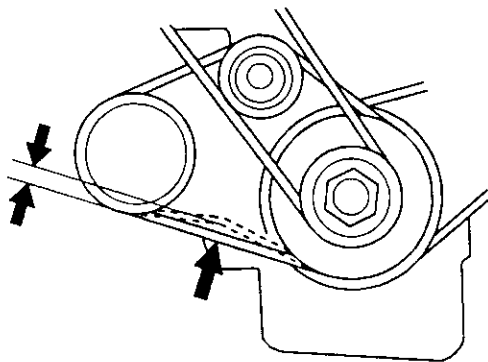
4.5 – 6.5 mm (0.18 – 0.26 in)

Except B16A2 engine

5.0 – 6.5 mm (0.20 – 0.26 in)

Note these items when adjusting belt tension:

- If there are cracks or any damage evident on the belt, replace it with a new one.
 - "Used belt" means a belt which has been used for five minutes or more.
 - "New belt" means a belt which has been used for less than five minutes.
2. Loosen the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
 3. Turn the adjusting bolt to get proper belt tension.
 4. Retighten the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
 5. Recheck the deflection of the A/C compressor belt.



Tension Gauge Method

1. Attach the special tool to the A/C compressor belt as shown below, and measure the tension of the belt.

A/C Compressor Belt

Used Belt: B16A2 engine

390 – 540 N (40 – 55 kgf, 88 – 120 lbf)

Except B16A2 engine

340 – 490 N (35 – 50 kgf, 77 – 110 lbf)

New Belt: B16A2 engine

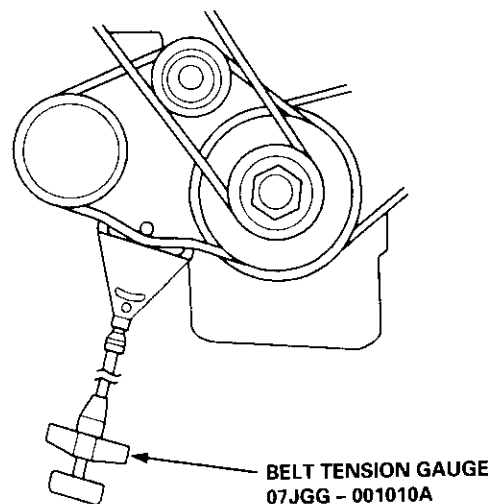
740 – 880 N (75 – 90 kgf, 170 – 200 lbf)

Except B16A2 engine

690 – 830 N (70 – 85 kgf, 150 – 190 lbf)

Note these items when adjusting belt tension:

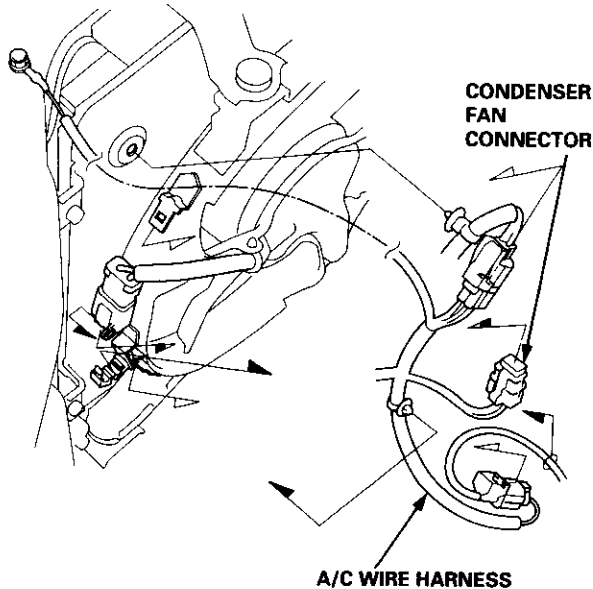
- Follow the manufacturer's instructions for the belt tension gauge.
 - If there are cracks or any damage evident on the belt, replace it with a new one.
 - "Used belt" means a belt which has been used for five minutes or more.
 - "New belt" means a belt which has been used for less than five minutes.
2. Loosen the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
 3. Turn the adjusting bolt to get proper belt tension.
 4. Retighten the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
 5. Recheck the tension of the A/C compressor belt.



Condenser

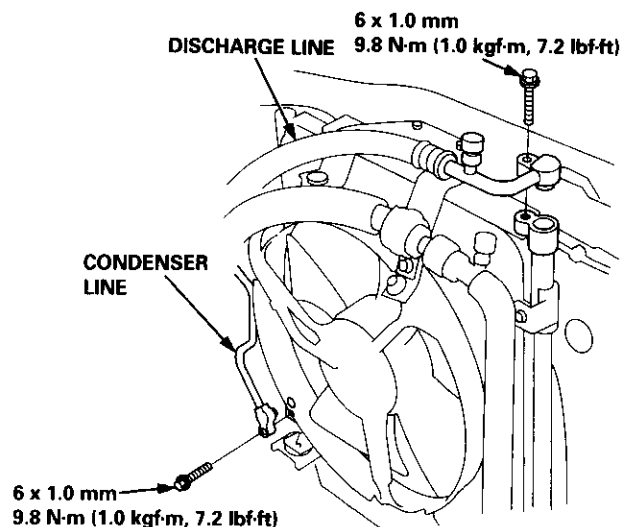
Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
2. Disconnect the condenser fan connector from the A/C wire harness, then remove the A/C wire harness from the condenser fan shroud.



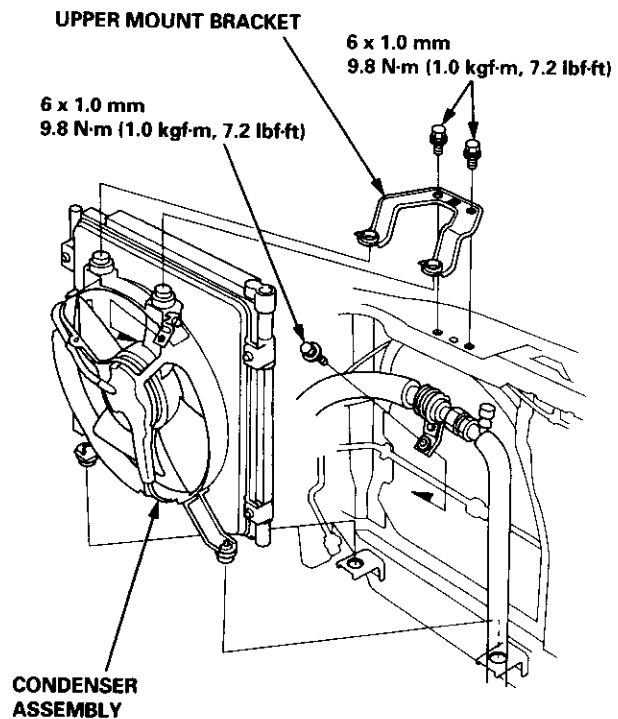
3. Remove the bolts, then disconnect the discharge and condenser lines from the condenser.

NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



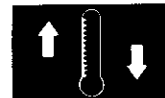
4. Remove the bolt from the suction hose bracket, and remove the two bolts and the upper mount bracket. Remove the condenser assembly by lifting it up.

NOTE: Be careful not to damage the condenser fins when removing the condenser assembly.



5. Install in the reverse order of removal. Make note of the following items.

- If you're installing a new condenser, add refrigerant oil (SANDEN, SP-10 or DENSO, ND-OIL 8) (see page 22-22).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Be careful not to damage the condenser fins when installing the condenser assembly.
- Charge the system (see page 22-46), and test its performance (see page 22-24).



Evacuation

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

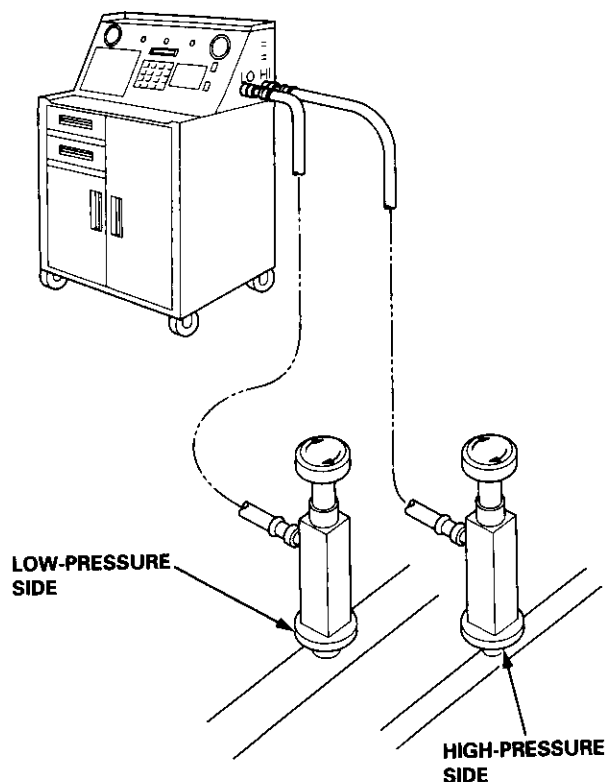
⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recovery/recycling/charging station. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.

NOTE: If low pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see Leak Test).

Recovery/Recycling/Charging Station



A/C System Service

Charging

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

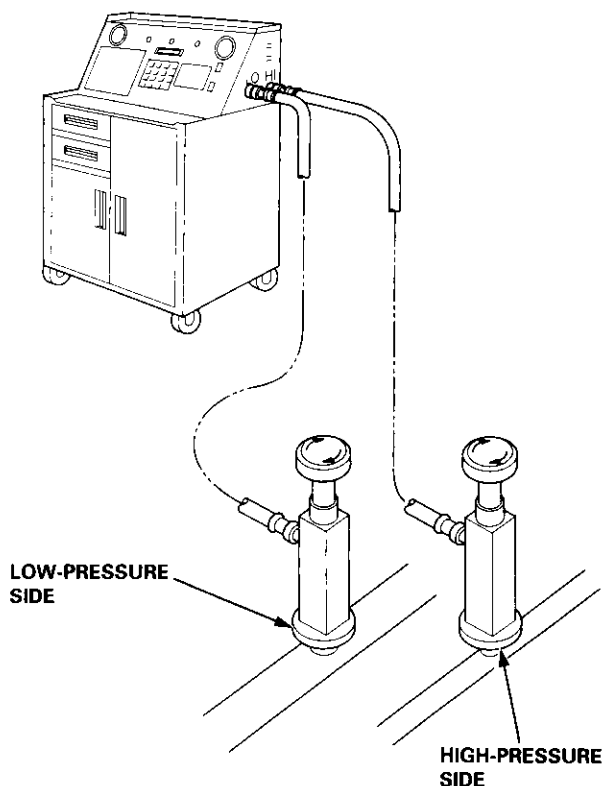
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Refrigerant capacity: 600 – 650 g (21.1 – 22.9 oz)

CAUTION: Do not overcharge the system; the compressor will be damaged.

Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.

Recovery/Recycling/Charging Station



Leak Test

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown in the previous column, following the equipment manufacturer's instructions.

NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

2. Open the high-pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

Refrigerant capacity: 600 – 650 g (21.1 – 22.9 oz)

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.
4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system according to the Recovery Procedure on page 22-27.
5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-45).