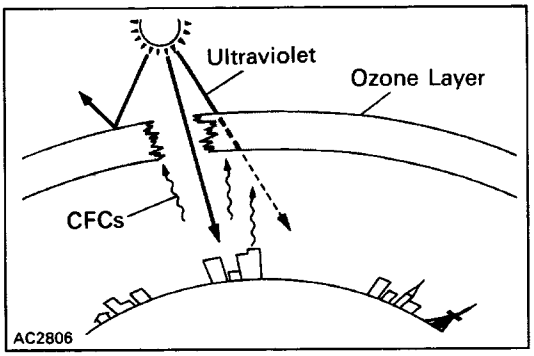
AIR CONDITIONING SYSTEM



GENERAL INFORMATION

REFRIGERATION SYSTEM

Prevention of Refrigerant Release and Excessive quantities Refrigerant (CFCs) for automobile air conditioners is believed to cause harm by depleting the ozone layer which helps to protect us from the ultraviolet rays of the sun. Therefore, it is necessary to prevent release of refrigerant to the atmosphere and to use the minimum amount when servicing the air conditioner.

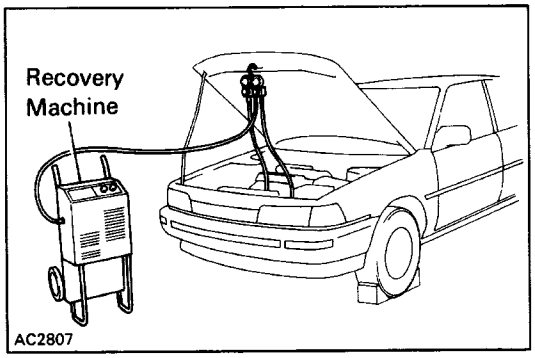
1. USE RECOVERY MACHINE TO RECOVER REFRIGERANT

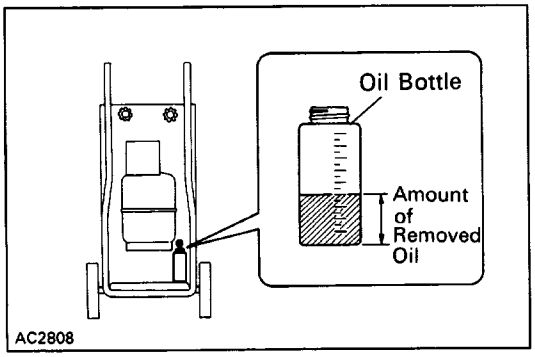
When discharging refrigerant from the system as follows, use a recovery machine to recover the refrigerant.

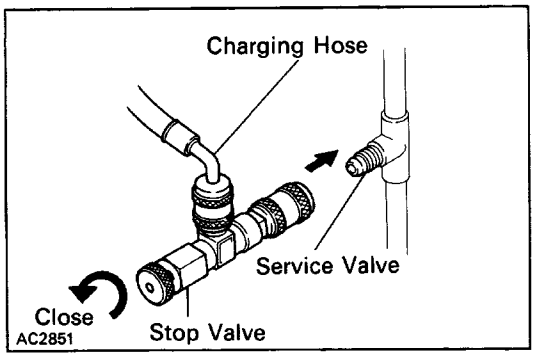
- Before replacing parts on the refrigerant line.
- When moisture or air gets in the refrigerant line.
- When excess refrigerant is charged.

NOTICE:

- **When handling the recovery machine, always follow the directions given in the instruction manual.**
- **After recovery, the amount of compressor oil removed must be measured and the same amount added to the system.**







2. USE CHARGING HOSES WITH STOP VALVE WHEN INSTALLING MANIFOLD GAUGE SET

To prevent release of refrigerant, using charging hoses with a stop valve when installing the manifold gauge set to the service valves on the refrigerant line.

3. TIGHTEN CONNECTING PARTS SECURELY

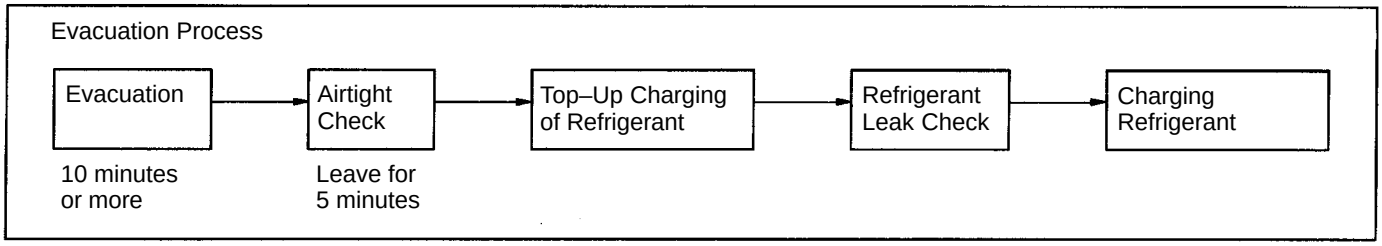
Follow the notices about tightening connecting parts in step 6 on page AC–4.

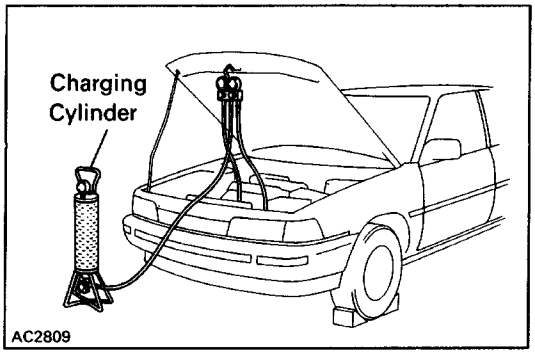
4. PROPERLY EVACUATE AIR FROM REFRIGERANT SYSTEM

To prevent release and wasteful use of refrigerant, evacuate air with care from refrigeration system as follows;

- Do not evacuate before recovering refrigerant in system.

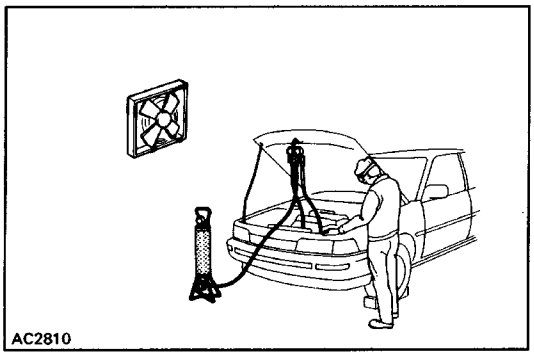
- Do not perform repeat evacuation of system.





6. USE CHARGING CYLINDER TO CHARGE PROPER AMOUNT OF REFRIGERANT

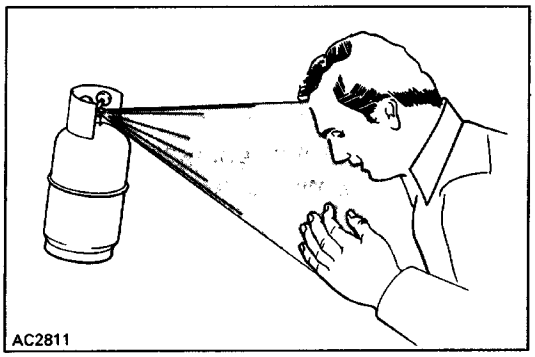
To prevent excessive use of refrigerant due to overcharging, use a charging cylinder to charge the proper amount of refrigerant.



Handling Precautions for Refrigerant

1. DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR NEAR AN OPEN FLAME

2. ALWAYS WEAR EYE PROTECTION



3. BE CAREFUL THAT LIQUID REFRIGERANT DOES NOT GET IN YOUR EYES OR ON YOUR SKIN

If liquid refrigerant gets in your eyes or on your skin;

(a) Wash the area with lots of cool water.

CAUTION: Do not rub your eyes or skin.

(b) Apply clean petroleum jelly to the skin.

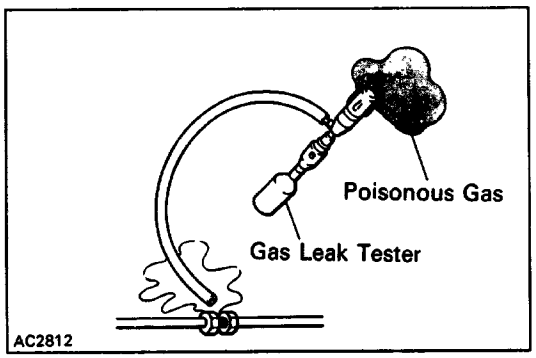
(c) Go immediately to a physician or hospital for professional treatment.

CAUTION: Do not attempt to treat yourself.

Handling Precautions for Refrigerant Container

1. NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME

2. BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT

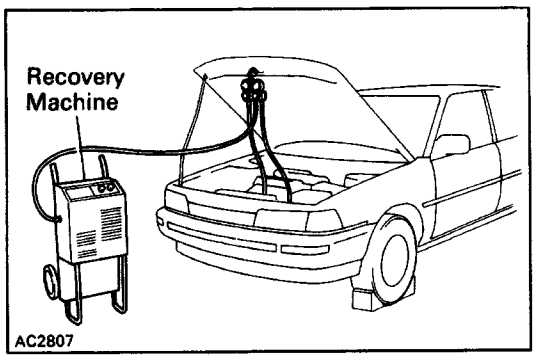


Handling Precautions for Gas–Cylinder Type Gas Leak Tester

1. BEFORE USING TESTER MAKE SURE THAT THERE ARE NO FLAMMABLE SUBSTANCES NEARBY

2. BE CAREFUL NOT TO INHALE POISONOUS GAS

If refrigerant gas comes in contact with flame, a poisonous gas is produced. During leak tests, do not inhale any gas.

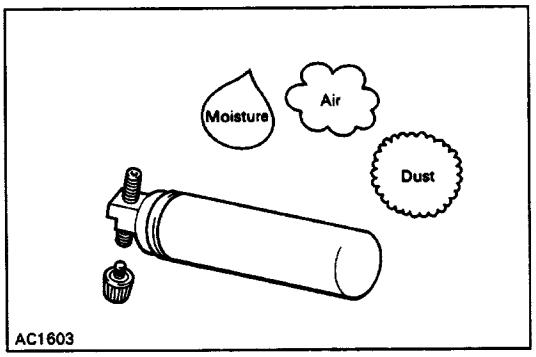


Precautions When Replacing Parts in Refrigerant line

1. RECOVER REFRIGERANT IN SYSTEM BEFORE REMOVING PARTS

Using a recovery machine, recover refrigerant in system before removing the parts.

NOTICE: Do not release refrigerant to atmosphere.



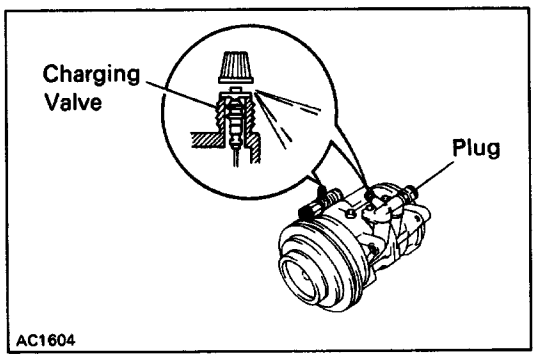
2. INSERT PLUG IMMEDIATELY IN DISCONNECTED PARTS

Insert a plug immediately in the disconnected parts to prevent the entry of moisture and dust.

3. DO NOT REMOVE PLUG FROM NEW PARTS UNTIL IMMEDIATELY BEFORE INSTALLATION

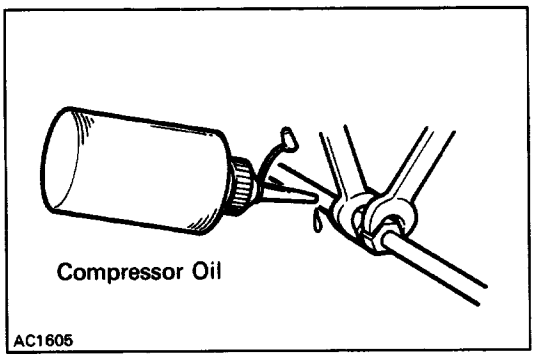
4. DO NOT USE BURNER FOR BENDING OR LENGTHENING OPERATIONS ON TUBE

If the tubes are heated with a burner, a layer of oxidation forms inside the tube, causing the same kind of trouble as an accumulation of dust.



5. DISCHARGE GAS IN NEW COMPRESSOR FROM CHARGING VALVE BEFORE INSTALLING IT

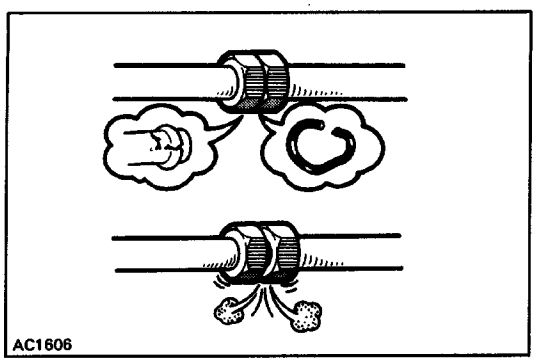
If the gas in new compressor is, not discharged first, compressor oil will spray out with gas when the plug is removed.



6. TIGHTEN CONNECTING PARTS SECURELY

Securely tighten the connecting parts to prevent leaking of refrigerant gas.

- Apply a few drops of compressor oil to O–ring fitting for easy tightening and to prevent leaking of refrigerant gas.
- Tighten the nuts using two wrenches to avoid twisting the tube.

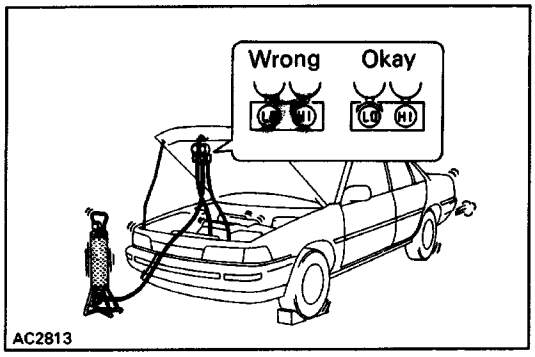

AC1606

- Tighten the O–ring fittings or the bolted type fittings to the specified torque.

Precautions When Charging Refrigerant

1. DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERANT CYCLE

If there is not enough refrigerant in the refrigerant cycle, oil lubrication will be insufficient and compressor burnout may occur, so take care to avoid this.



AC2813

2. DO NOT OPEN HIGH PRESSURE VALVE OF MANIFOLD GAUGE WITH COMPRESSOR OPERATING

If the high pressure valve is opened, refrigerant flows in the reverse direction and could cause the charging cylinder to rupture, so open and close the low pressure valve only.

3. BE CAREFUL NOT TO OVERCHARGE WITH REFRIGERANT IN SYSTEM

If refrigerant is overcharged, it causes trouble such as insufficient cooling, poor fuel economy, engine overheating etc.

ELECTRICAL PARTS

Before removing and inspecting the electrical parts, set the ignition switch to the LOCK position and disconnect the negative (–) terminal cable from the battery.

CAUTION: Work must not be started until after at least 20 seconds or longer from the time the negative (–) terminal cable is disconnected.

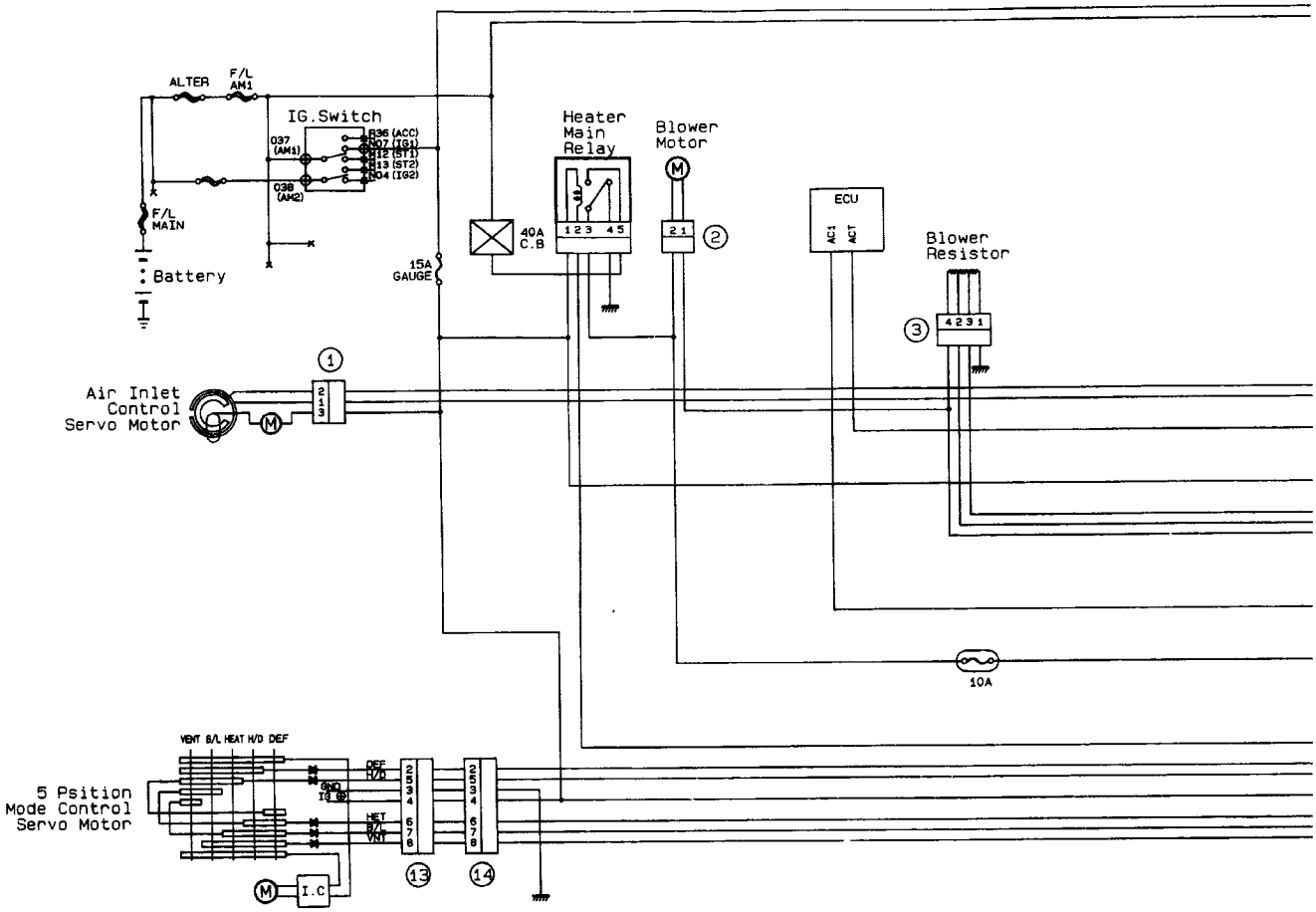
SRS AIRBAG SYSTEM

Failure to carry out service operations in the correct sequence could cause the airbag system to deploy, possibly leading to a serious accident.

When removal or installation of the parts and the yellow wire harness and connector for the airbag is necessary, refer to the precautionary notices in the AB section before performing the operation.

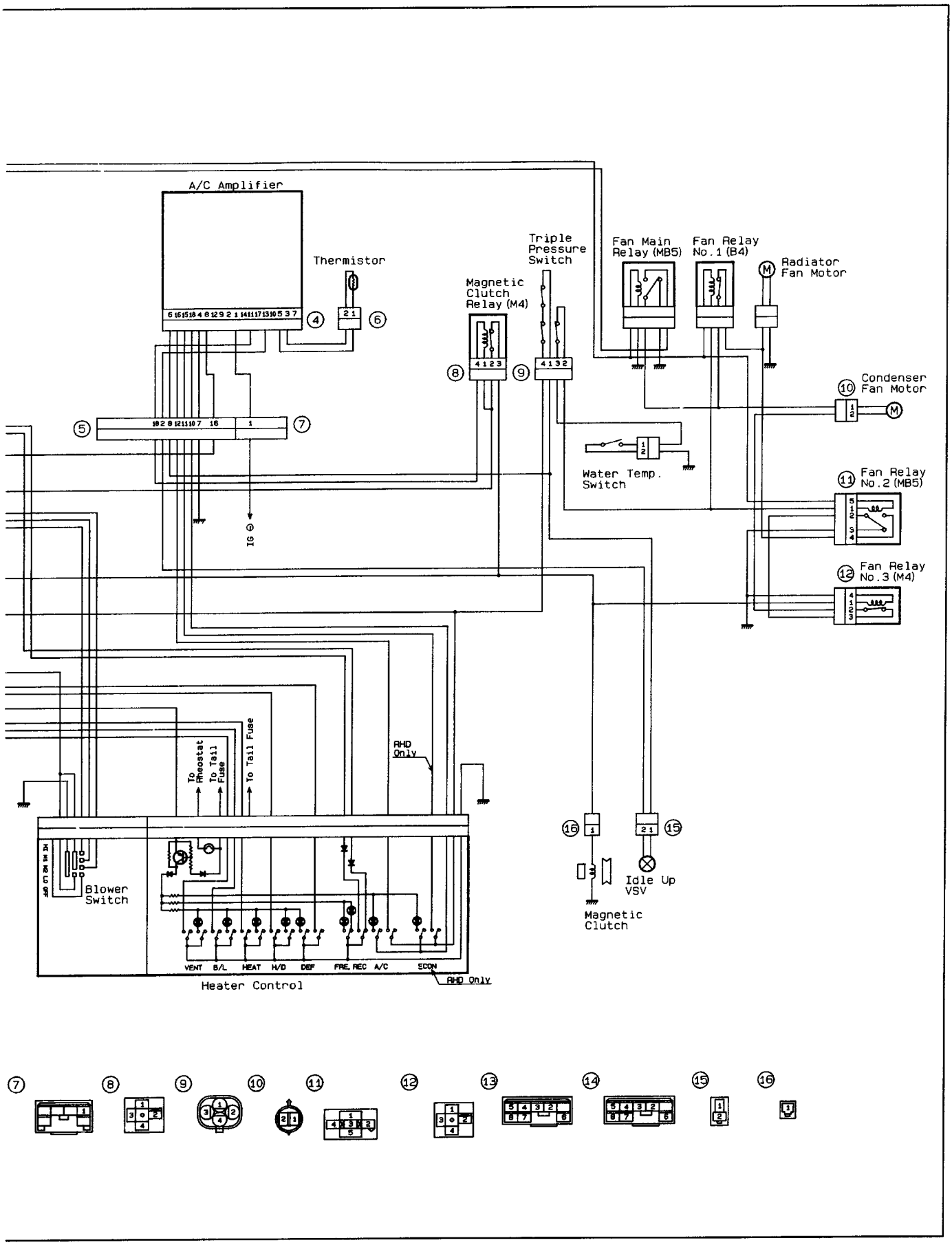
WIRING DIAGRAM

Dial Type Blower Speed Control Switch (without AUTO A/C)



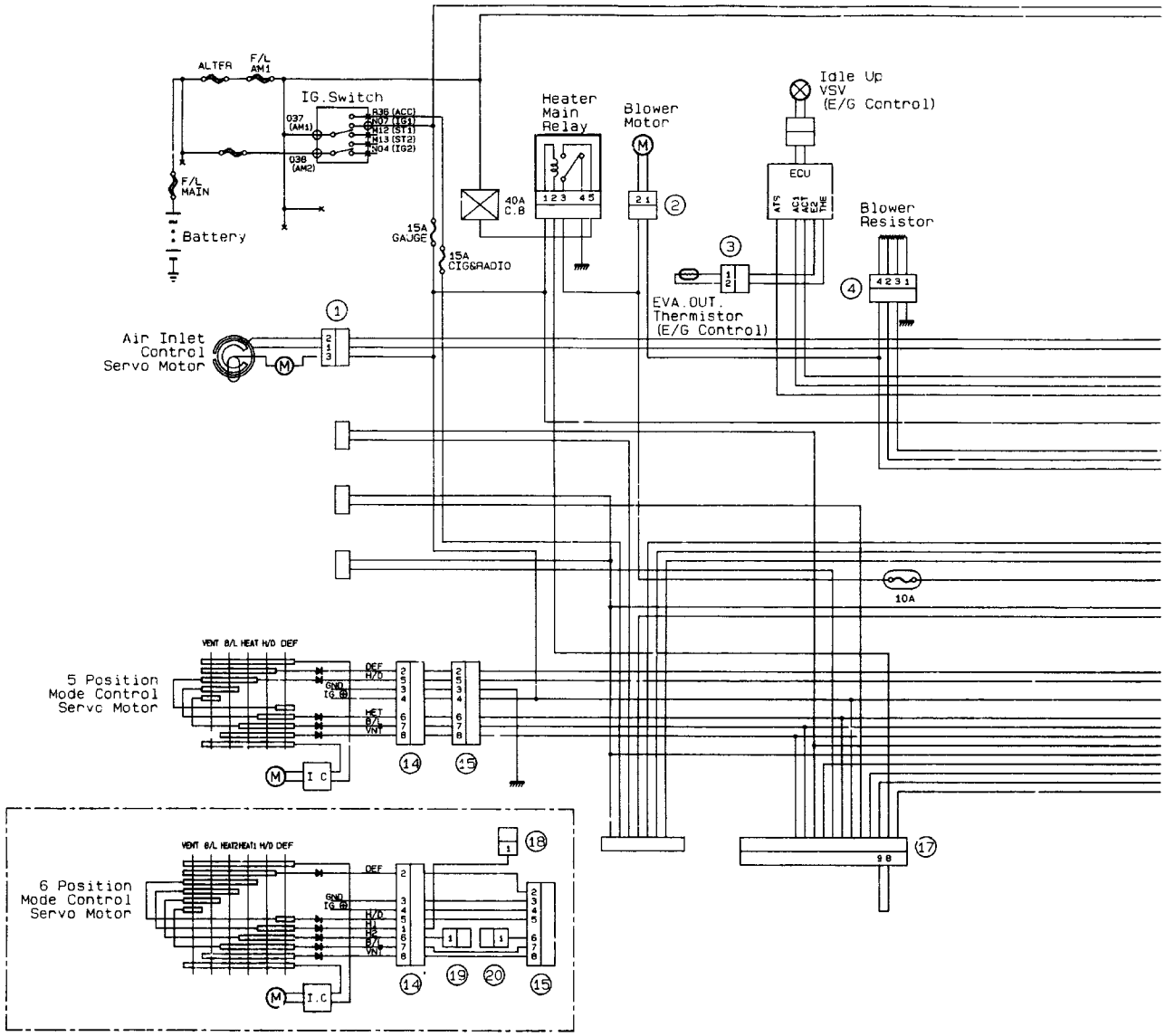


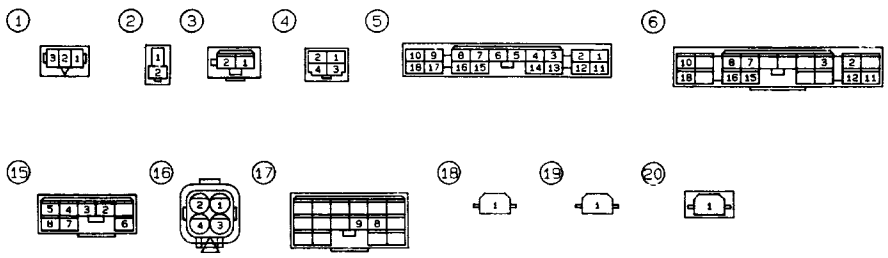
AC2220


A/C Amplifier
Thermistor
Triple Pressure Switch
Magnetic Clutch Relay (M4)
Fan Main Relay (MB5)
Fan Relay No.1 (B4)
Radiator Fan Motor
Condenser Fan Motor
Water Temp. Switch
Fan Relay No.2 (MB5)
Fan Relay No.3 (M4)
IG
To Rheostat
To Tail
To Tail Fuse
RHD Only
Blower Switch
Idle Up VSV
Magnetic Clutch
VENT B/L HEAT H/D DEF FRE REC A/C ECON
RHD Only
Heater Control

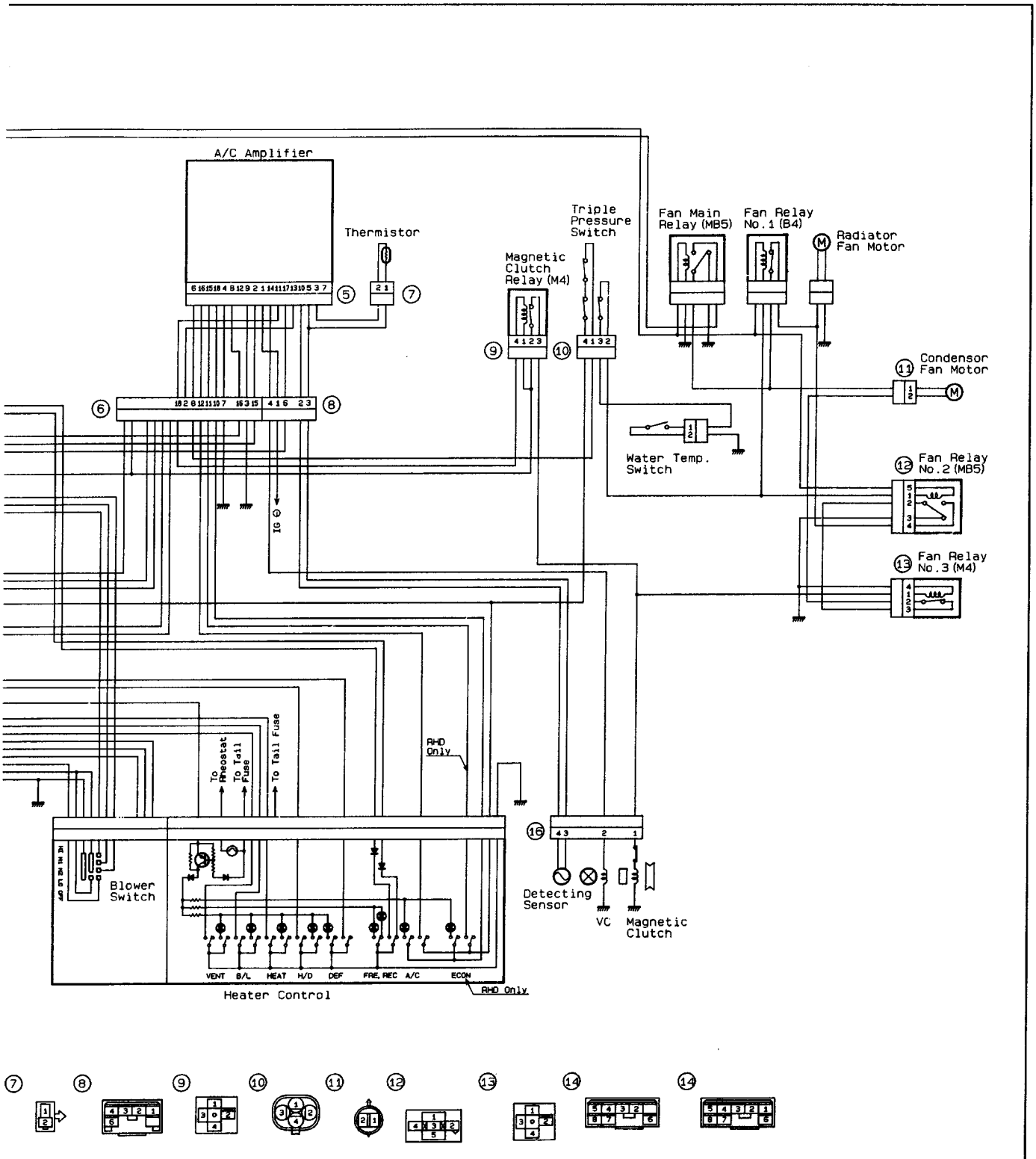
WIRING DIAGRAM (Cont'd)

Dial Type Blower Speed Control Switch (with AUTO A/C)

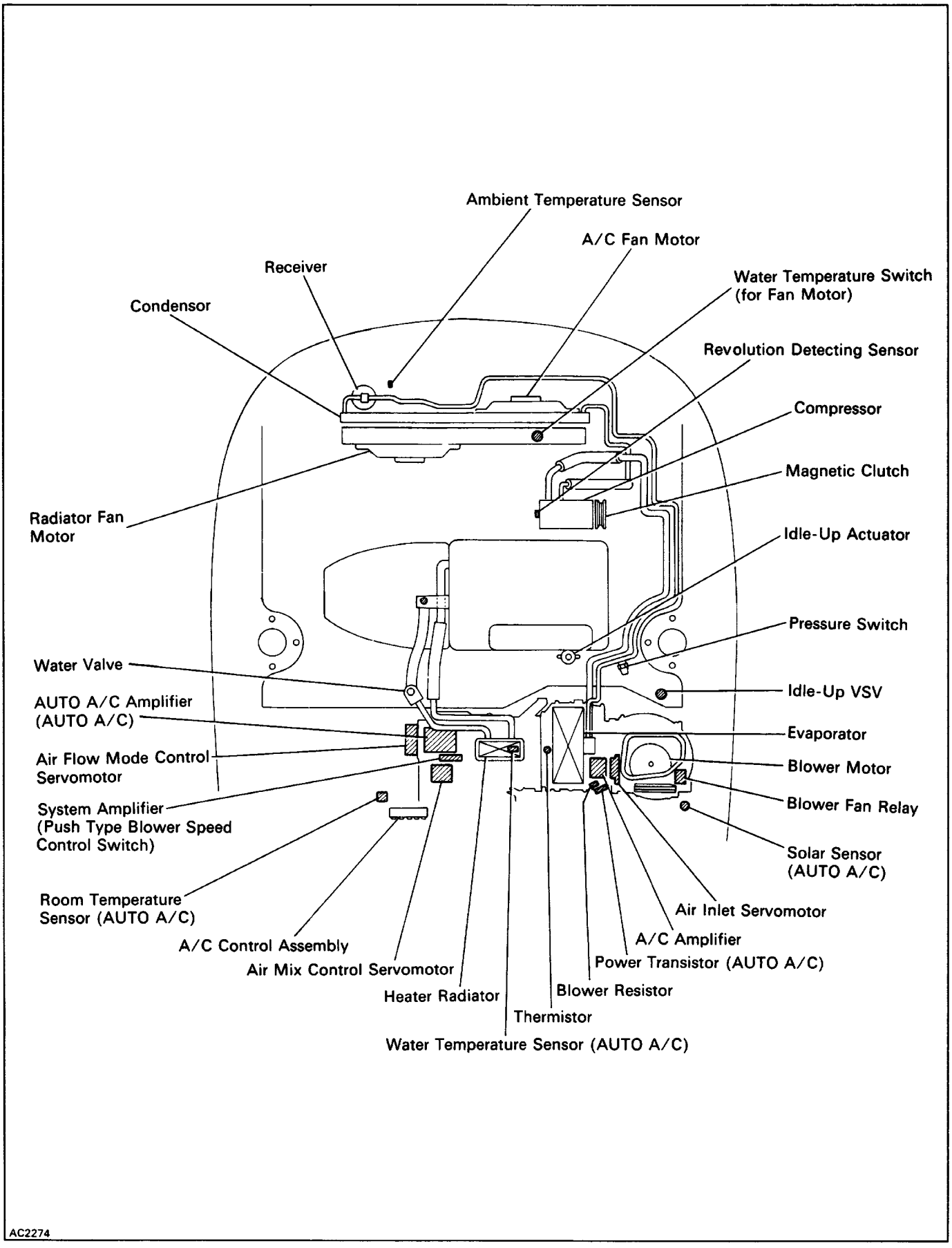


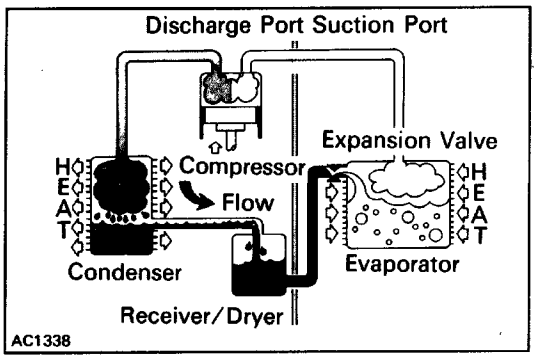


AC2221


A/C Amplifier
Thermistor
Triple Pressure Switch
Fan Main Relay (MB5)
Fan Relay No.1 (B4)
Radiator Fan Motor
Magnetic Clutch Relay (M4)
Condensor Fan Motor
Water Temp. Switch
Fan Relay No.2 (MB5)
Fan Relay No.3 (M4)
IG
To Rheostat
To Tail Fuse
To Tail Fuse
RHD Only
Blower Switch
Detecting Sensor
VC
Magnetic Clutch
VENT
B/L
HEAT
H/D
DEF
FRE, REC
A/C
ECON
RHD Only
Heater Control

PARTS LOCATION

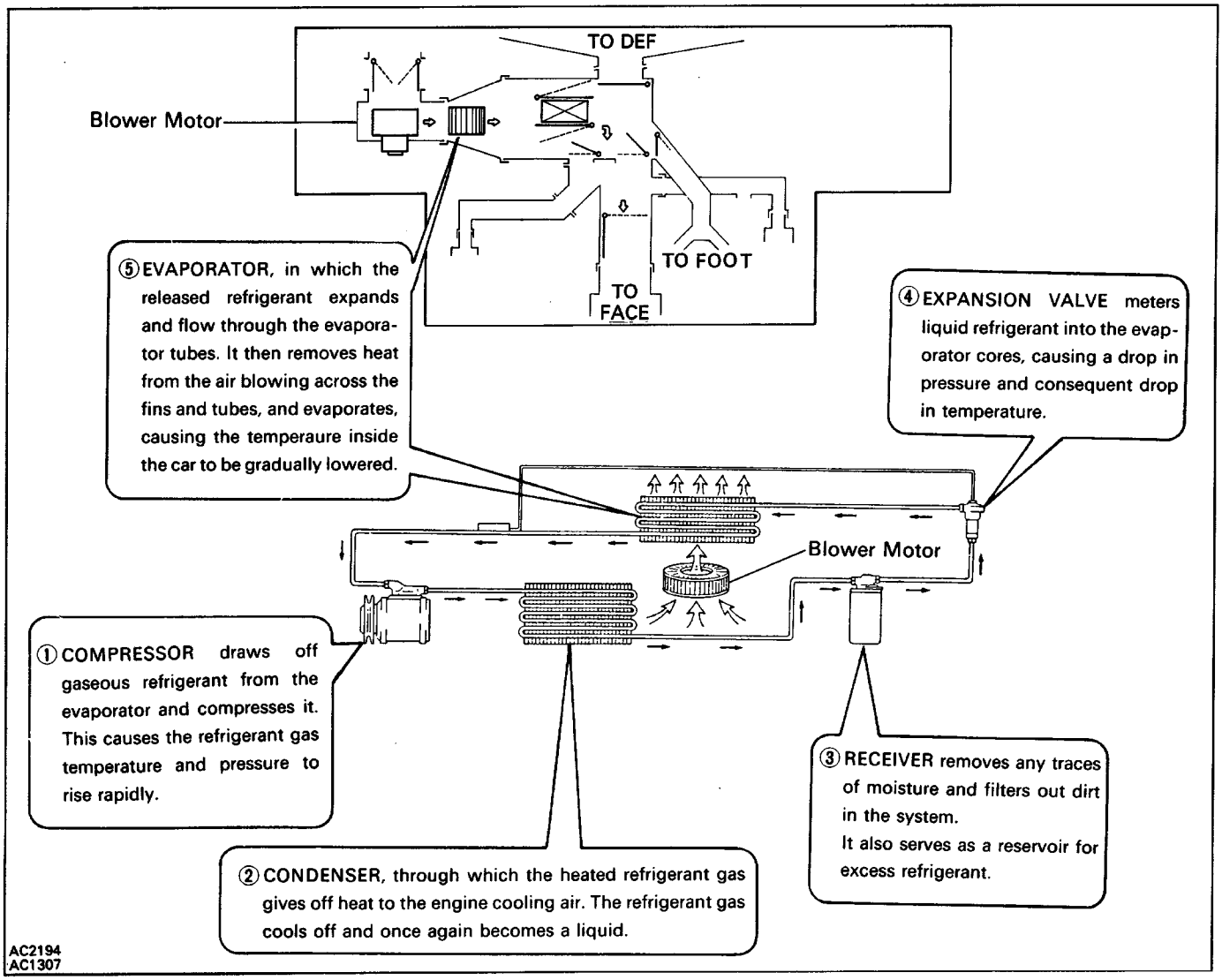




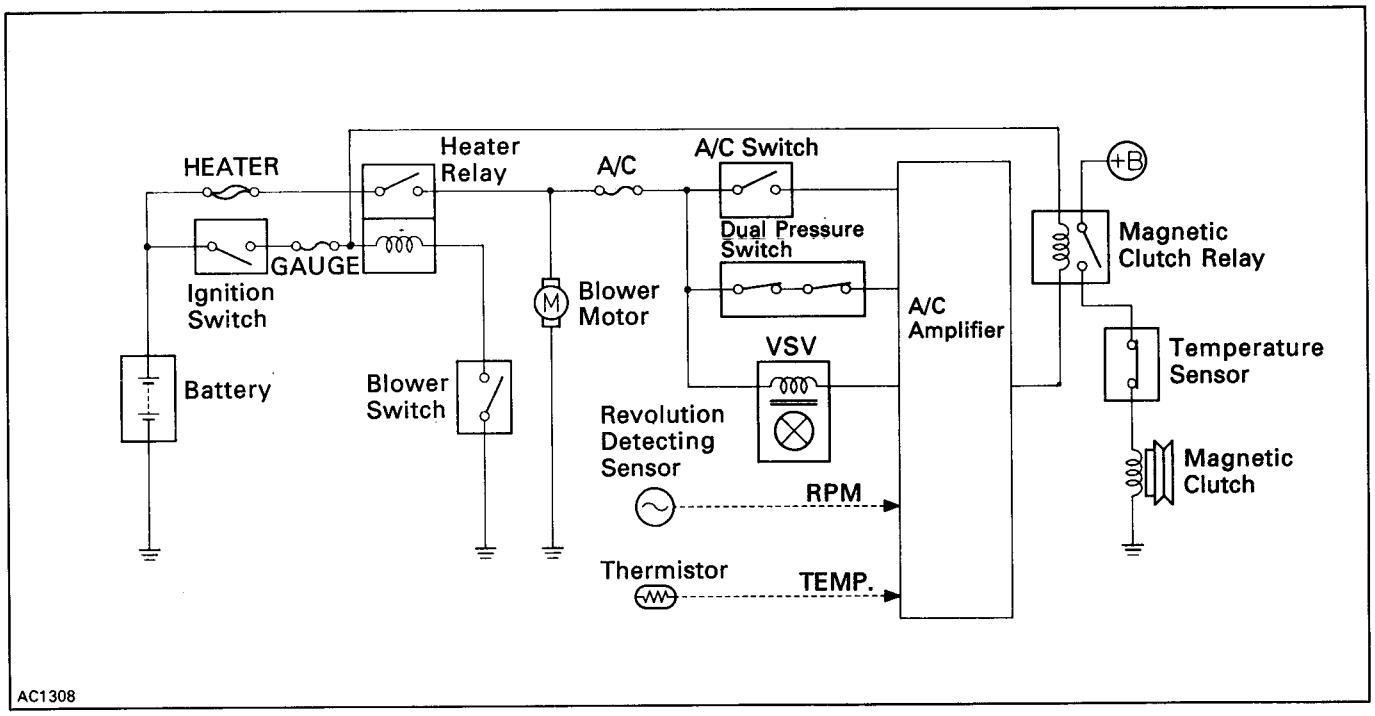
GENERAL DESCRIPTION

REFRIGERATION CYCLE

1. The compressor discharges high temperature and high pressure refrigerant containing the heat absorbed from the evaporator plus heat created by the compressor in a discharge stroke.
2. This gaseous refrigerant flows into the condenser. In the condenser, the gaseous refrigerant condenses into liquid refrigerant.
3. This liquid refrigerant flows into the receiver which stores and filters the liquid refrigerant till the evaporator requires the refrigerant.
4. The liquid refrigerant is changed by the expansion valve into a low temperature, low pressure liquid and gaseous mixture.
5. This cold and foggy refrigerant flows to the evaporator. Vaporizing the liquid in the evaporator, the heat from the warm air stream passing through the evaporator core is transferred to the refrigerant. All the liquid is changed into the gaseous refrigerant in the evaporator and only heat–laden gaseous refrigerant is drawn into the compressor. Then the process is repeated again.



PRINCIPLE OF A/C ELECTRICAL CIRCUIT



HOW IS MAGNETIC CLUTCH ENERGIZED?

The general process until the magnetic clutch is energized is shown below.

① Ignition Switch "ON"

② Blower Switch "ON" ——→ Heater Relay "ON" (Blower Motor "RUN")

③ A/C Switch "ON" ——→ A/C Amplifier "ON" (A/C Amp. Main Power Supply)

④ Dual Pressure Switch "ON":
Refrigerant Condition (206 kPa (2.1 kgf/cm^2, 30 psi) less than 2,648 kPa (27 kgf/cm^2, 384 psi)).

⑤ Thermistor supplies temperature signal of evaporator to A/C amplifier.

⑥ VSV "ON" ——→ E/G Idle UP

⑦ Magnetic Clutch Relay "ON"

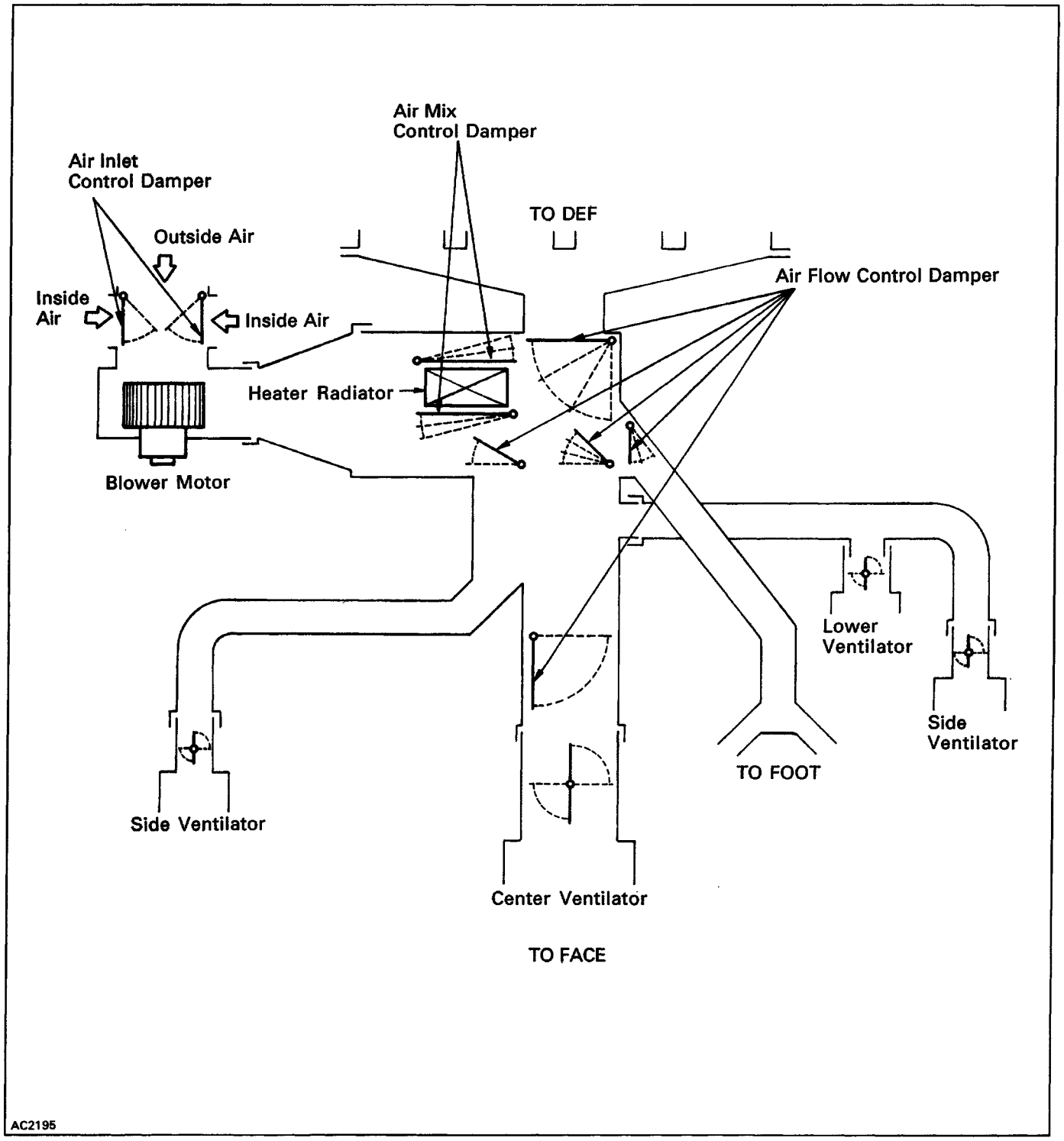
⑧ Temperature Sensor "ON".
Temperature of Themperature Sensor is less than 180°C (356°F).

⑨ Magnetic Clutch "ON"

⑩ Revolution Detecting Sensor supplies RPM signal of compressor to A/C amplifier.

If compressor is not locked, magnetic clutch is continuously energized.

DAMPERS POSITIONS

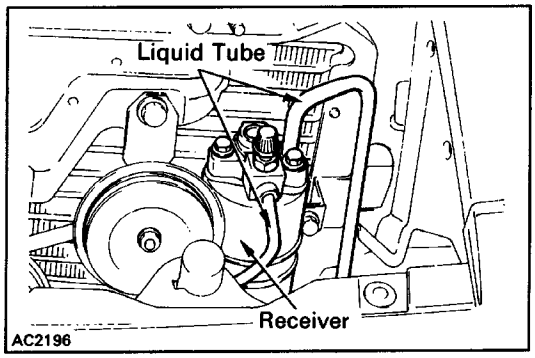


TROUBLESHOOTING

You will find the source of the trouble more easily by properly using the table shown below. In this table, the numbers indicate the order of priority of the causes of trouble. Check each part in the order shown. If necessary, replace these parts.

Trouble / Parts name	No blower operation	No Cool air come out	No warm a came out	Cool air comes out intermittently	Cool air comes out only at high speed	Insufficient velocity of cool air	Insufficient cooling	No blower control	See page
Fuses	1	1							AC–6 to 9
Inspect Refrigerant Volume		2		1	1		1		AC–15
Inspect Refrigeration System		2		1	1		1		AC–18
Refrigerant Leakage		3			2		2		AC–34
Belt Tension		4		2	3		3		AC–17
A/C Control Cable Adjustment			1				4		AC–43
Compressor		6			4		6		AC–21
Magnetic Clutch		5		3					AC–21
Receiver		8							AC–28
Condenser		8			5		5		AC–29
Expansion Valve		8		4			8		AC–30
Evaporator		8				2			AC–32
Blower Motor	3								AC–35
Air Inlet Control Servomotor									AC–36
Mode Control Servomotor									AC–36
Air Mix Control Servomotor			3				10		AC–36
Radiator and Condenser Fan Motor					6		7		AC–37
Power Transistor*1	4							1	AC–38
Blower Resistor	4							1	AC–38
Heater Relay	2							1	AC–39
Blower Fan Relay *2	4							1	AC–39
Magnetic Clutch Relay		5							AC–39
Fan Relay No. 1					6		7		AC–39
A/C Fan Relay No. 2					6		7		AC–40
A/C Fan Relay No. 3					6		7		AC–40
Engine Main Relay					6		7		AC–40
Pressure Switch		5							AC–40
A/C Water Temp. Switch		5							AC–40
Water Temp. Switch (for Radiator Fan)					6		7		CO Section
Thermistor		9							AC–42
Room Temp. Sensor*1		9							AC–41
Ambient Temp. Sensor *1		9							AC–41
Solar Sensor *1		9							AC–41
Water Temp. Sensor	6								AC–42
A/C Control Assembly	5	7					9	2	AC–43
A/C Amplifier		10							AC–47
System Amplifier *2			4				11		AC–48
AUTO A/C Amplifier *1		10	4				11		AC–49
Water Valve			2						
Wiring or Wiring Connection	7	11	5				12	3	AC–6 to 9
Air Leakage From Cooling Unit or Duct						1			
Air Inlet Block						1			

* 1: with AUTO A/C
*2 : with Push Type Blower Speed Control Switch A/C Control Assembly



REFRIGERATION SYSTEM

INSPECTION OF REFRIGERANT VOLUME

1. RUN ENGINE AT APPROX. 2000 RPM

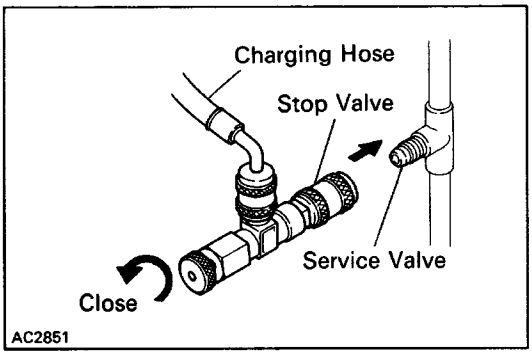
2. OPERATE AIR CONDITIONER AT MAXIMUM COOLING FOR A FEW MINUTES

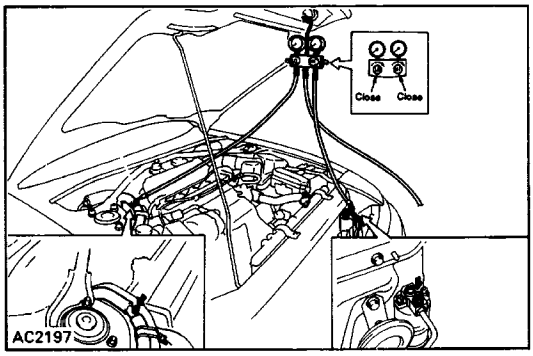
3. CHECK AMOUNT OF REFRIGERANT

Observe the sight glass on the receiver.

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	(1) Check for gas leakage with gas leak tester and repair if necessary (2) Add refrigerant until bubbles disappear
2	No bubbles present in sight glass	None, sufficient or too much	Refer to items 3 and 4.
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	(1) Check for gas leakage with gas leak tester and repair if necessary (2) Add refrigerant until bubbles disappear
4	Temperature between compressor inlet and outlet is noticeably different	Proper or too much	Refer to items 5 and 6
5	Immediately after air conditioner is turned off, refrigerant in sight glass stays clear	Too much	(1) Recover refrigerant (2) Evacuate air and charge proper amount of purified refrigerant
6	When air conditioner is turned off, refrigerant foams and then stay clear	Proper	—

*: Bubbles in the sight glass with ambient temperatures higher can be considered normal if cooling is sufficient





INSTALLATION OF MANIFOLD GAUGE SET

HINT: To prevent releasing refrigerant, use charging hoses with a stop valve when installing the manifold gauge set to service valves on the refrigerant line.

1. CONNECT CHARGING HOSES WITH A STOP VALVE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

- **Do not connect the wrong hoses to the high pressure and the low pressure sides.**
- **To prevent loosening the nuts, do not apply compressor oil to seat of the connection.**

2. CLOSE HAND VALVES OF BOTH STOP VALVES

3. CLOSE BOTH HAND VALVES OF GAUGE SET

4. REMOVE PLUGS FROM SERVICE VALVES ON REFRIGERANT LINE

5. CONNECT STOP VALVES TO SERVICE VALVES

Tighten the nuts by hand.

CAUTION:

- **Do not connect the wrong valves to the high pressure and the low pressure sides.**
- **To prevent loosening the nuts, do not apply compressor oil to seat of the connection.**

6. OPEN HAND VALVES OF BOTH STOP VALVES

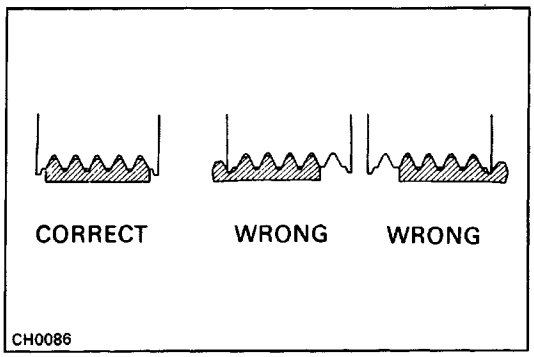
REMOVAL OF MANIFOLD GAUGE SET

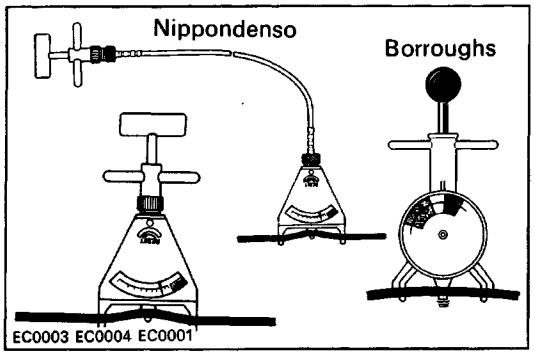
1. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

2. CLOSE HAND VALVES OF BOTH STOP VALVES

3. DISCONNECT STOP VALVES FROM SERVICE VALVES ON REFRIGERANT LINE

4. INSTALL PLUGS TO SERVICE VALVES





ON–VEHICLE INSPECTION

1. CHECK CONDENSER FINS FOR BLOCKAGE OR DAMAGE

If the fins are clogged, clean them with pressurized water.

NOTICE: Be careful not to damage the fins.

2. MAKE SURE THAT DRIVE BELT IS INSTALLED CORRECTLY

After installing the drive belt, check that it fits properly in the ribbed grooves.

3. CHECK DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt tension.

Belt tension gauge:

Nippondenso BTG–20 (95506–00020) or
Borroughs No.BT–33–73F

Drive belt tension:

Engine	New belt (lbf)	Used belt (lbf)
4A-FE	160 ± 25	100 ± 20
5S-FE	165 ± 10	110 ± 10
3S-GTE	165 ± 10	84 ± 15

HINT:

- ”New belt” refers to a belt which has been used less than 5 minutes on a running engine.
- ”Used belt” refers to a belt which has been used on a running engine for 5 minutes or more.

4. START ENGINE

5. TURN ON A/C SWITCH

Check that the A/C operates at each position of the blower switch.

6. CHECK MAGNETIC CLUTCH OPERATION

If magnetic clutch does not engage, check the A/C fuse.

7. CHECK THAT IDLE INCREASES

When the magnetic clutch engages, engine revolution should increase.

Standard idle–up rpm: 900 –1,000 rpm

8. CHECK CONDENSER FAN MOTOR ROTATES

9. CHECK AMOUNT OF REFRIGERANT

If you can see bubbles in the sight glass, additional refrigerant is needed. (See page AC–15)

10. IF NO COOLING OR IT IS INSUFFICIENT, INSPECT FOR LEAKAGE

Using a gas leak tester, inspect each component of the refrigeration system.

INSPECTION OF REFRIGERATION SYSTEM WITH MANIFOLD GAUGE SET

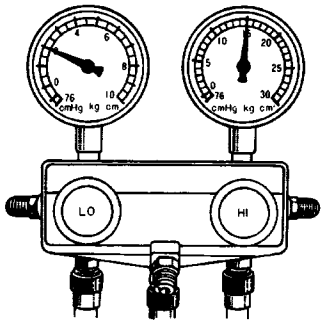
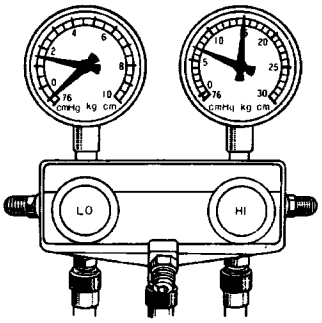
This is a method in which the trouble is located by using a manifold gauge set. (See "Installation of Manifold Gauge Set" on page AC–16) Read the manifold gauge pressure when the following conditions are established:

(a) Temperature at the air inlet with the switch set at RECIRC is 30 – 35˚C (86 – 95˚F)
(b) Engine running at 2,000 rpm
(c) Blower fan speed control switch set at high speed
(d) Temperature control switch set at max. cool side

HINT: It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.

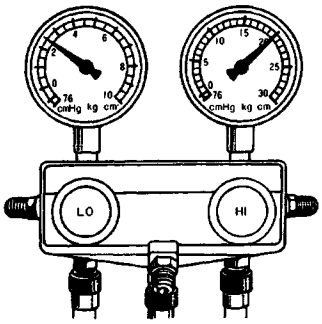
NOTICE:

- **Always recover refrigerant before removing the parts in the refrigerant line and evacuating air.**
- **Evacuate air and charge proper amount of purified refrigerant after installing the pants in the refrigerant line.**

No	Gauge reading kPa (kgf/cm², psi)	Condition	Probable cause	Remedy
1	LO: 147 – 196 (1.5 – 2.0, 21 – 28) HI: 1,422 – 1,471 (14.5 – 15,0, 206 – 213)  AC0067	Normal cooling	Normally functioning system	
2	During operation, pressure at low pressure side sometimes becomes a vacuum and sometimes normal  AC0068	Periodically cools and then fails to cool	Moisture present in refrigeration system	(1) Replace receiver (2) Remove moisture in system through repeatedly evacuating air

NOTICE:

- **Always recover refrigerant before removing the parts in the refrigerant line and evacuating air,**
- **Evacuate air and charge proper amount of purified refrigerant after installing the parts in the refrigerant line.**

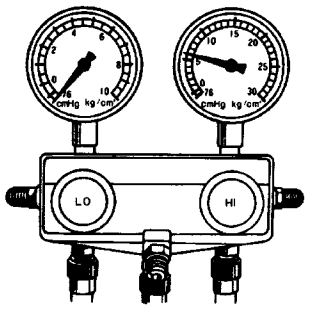
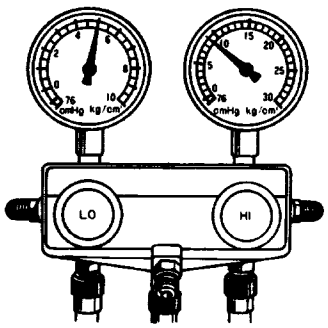
No	Gauge reading kPa (kgf/cm², psi)	Condition	Probable cause	Remedy
3	Pressure low at both low and high pressure sides	• Insufficient cooling • Bubbles seen in sight glass	Insufficient refrigerant	(1) Check for gas leakage with gas leak tester and repair if necessary (2) Add refrigerant until bubbles disappear
	AC0069	• Insufficient cooling • Frost on tubes from receiver to unit	Refrigerant flow obstructed by dirt in receiver	Replace receiver
4	Pressure too high at both low and high pressure sides	Insufficient cooling	Insufficient cooling of condenser	(1) Clean condenser (2) Check fan motor operation
5			Refrigerant overcharged	(1) Check amount of refrigerant If refrigerant is overcharged (2) Recover refrigerant (3) Evacuate air and charge proper amount of purified refrigerant
6	 AC0070		Air present in system	(1) Replace receiver (2) Check compressor oil to see if dirty (3) Remove air in system through repeatedly evacuating air
7		• Insufficient cooling • Frost or Large amount of dew on piping at low pressure side	Expansion valve improperly mounted, heat sensing tube defective (Opens too wide)	(1) Check heat sensing tube installation condition If (1) is normal (2) Check expansion valve and replace if defective

HINT at 6:

These gauge indications are for when the refrigeration system has been opened and the refrigerant charged without evacuating air.

NOTICE:

- **Always recover refrigerant before removing the parts in the refrigerant line and evacuating air.**
- **Evacuate air and charge proper amount of purified refrigerant after installing the parts in the refrigerant, line.**

No	Gauge reading kPa (kgf/cm², psi)	Condition	Probable cause	Remedy
2	Vacuum indicated at low pressure side, very low pressure indicated at high pressure  AC0156	• Does not cool (Cools from time to time in some cases) • Frost or dew seen on piping before and after receiver or expansion valve	Refrigerant does not circulate	(1) Check heat sensing tube for gas leakage and replace expansion valve if defective If (1) is normal (2) Clean out dirt in expansion valve by blowing with air If not able to remove dirt, replace expansion valve (3) Replace receiver
9	Pressure too high at low pressure side, pressure too low at high pressure side  AC0157	Does not cool	Insufficient compression	Repair or replace compressor

SPECIAL TOOLS AND EQUIPMENT

Tool	SST No.	Use
Ohmmeter	–	To perform electrical diagnosis
Voltage meter	–	To perform electrical diagnosis
Ammeter	–	To perform electrical diagnosis
Air conditioner service tool set	07110–58011	To evacuate and charge system
Charging hose kit with stop valve	07110–58040	If you require a stop valve, please order this kit
Magnetic clutch remover	07112–66040	To remove pressure plate
Magnetic clutch stopper	07112–76060	To remove and install pressure plate
Snap ring pliers (External type)	07114–84020	To remove and install rotor and stator

SSM (SPECIAL SERVICE MATERIALS)

Part Name	Part No.	Use etc.
ND OIL 6, SUNISO No.5GS or equivalent	07117–68040 –	Compressor

COMPRESSOR

ON–VEHICLE INSPECTION

1. INSTALL MANIFOLD GAUGE SET

(See page AC–16**)**

2. RUN ENGINE AT FAST IDLE

3. CHECK COMPRESSOR FOR FOLLOWING:

(a) High pressure gauge reading is not lower and low pressure gauge reading is not higher than normal.

(b) Metallic sound

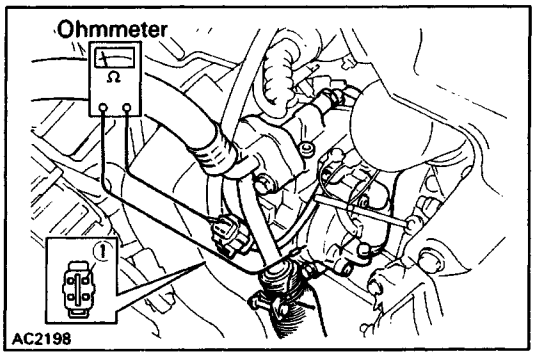
(c) Leakage from shaft seal

If defects are found, repair the compressor.

4. CHECK MAGNETIC CLUTCH

(a) Inspect the pressure plate and the rotor for signs of oil.

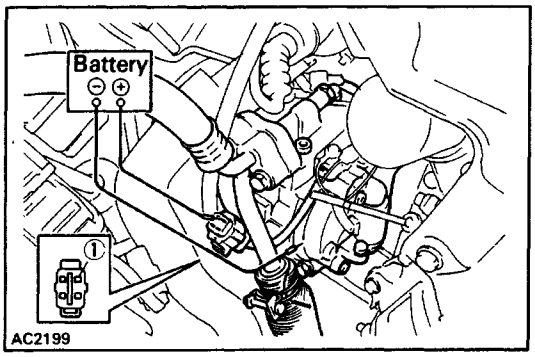
(b) Check the clutch bearings for noise and grease leakage.



(c) Using an ohmmeter, measure the resistance of the stator coil between terminal 1 and ground.

Standard resistance: 3.4 – 3.8 at 20˚C (68˚F)

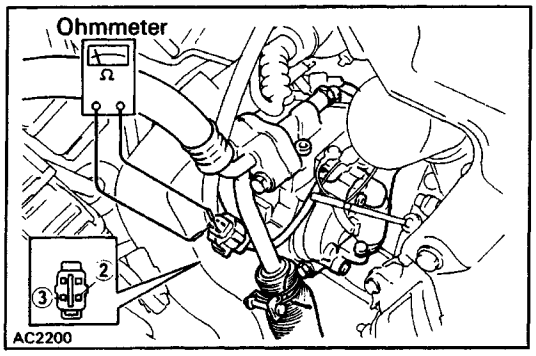
If resistance is not as specified, replace the coil.



(d) Connect the positive (+) lead from the battery to terminal 1, check that the magnetic clutch is energized.

If magnetic clutch is not energized, replace the coil.

NOTICE: Do not short the positive (+) lead wire on the vehicle, applying battery voltage.



REVOLUTION DETECTING SENSOR

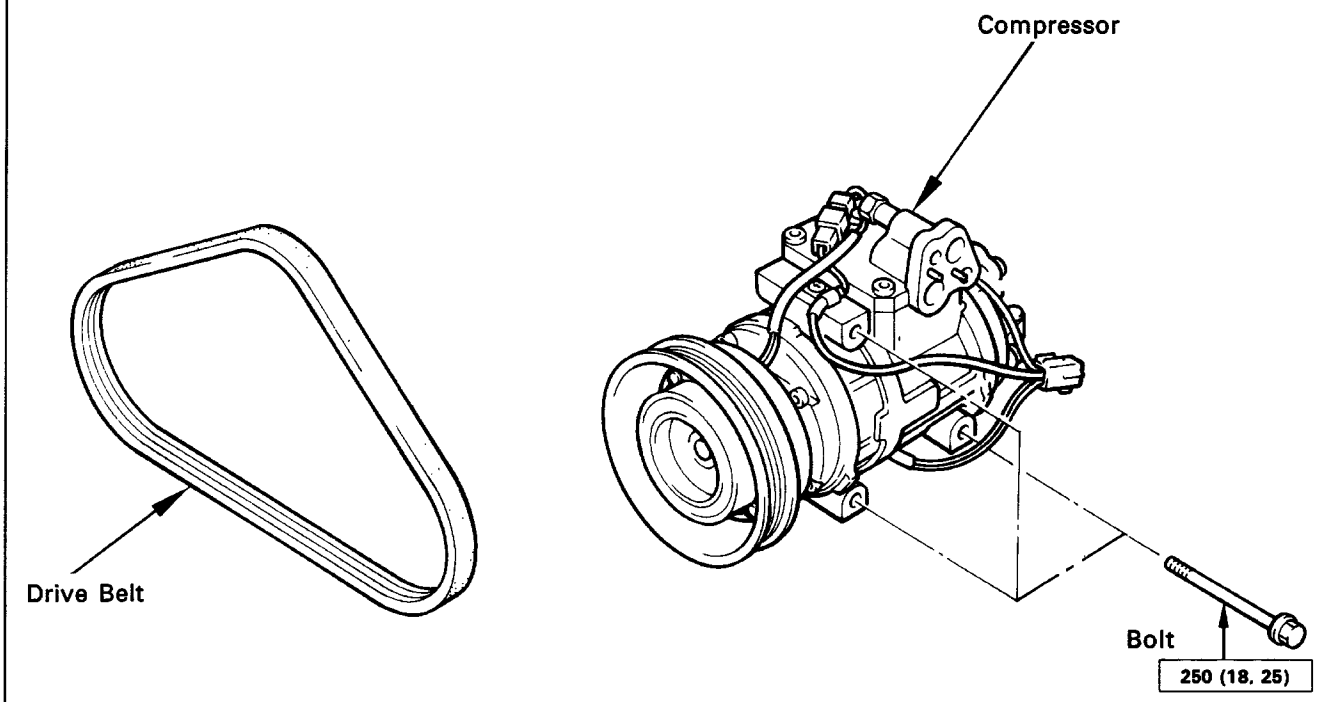
Using an ohmmeter, measure the resistance between two terminals 2 and 3 of the sensor.

Standard resistance: 100 – 130 at 20˚C (68˚F)

If resistance is not as specified, replace the revolution detecting sensor.

REMOVAL OF COMPRESSOR

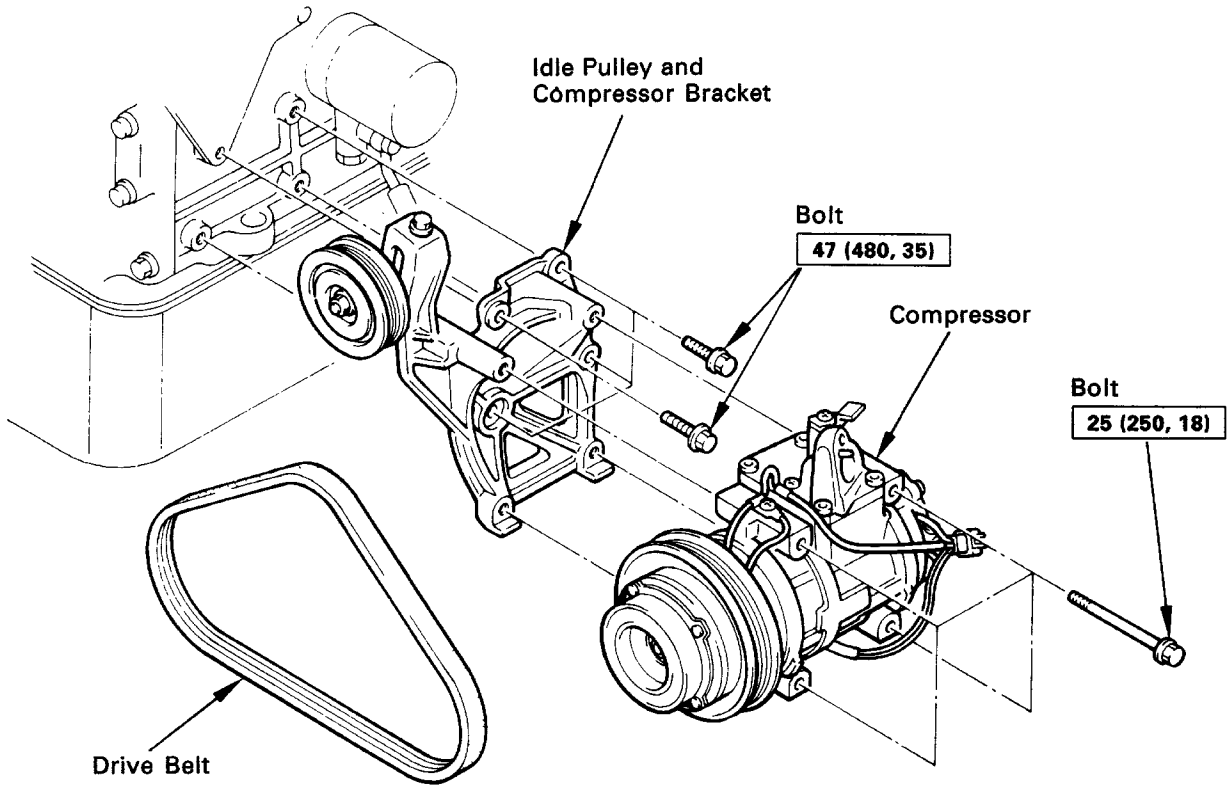
S Series Engine



AC2201

N·m (kgf·cm, ft·lbf)

A Series Engine



AC2202

N·m (kgf·cm, ft·lbf)

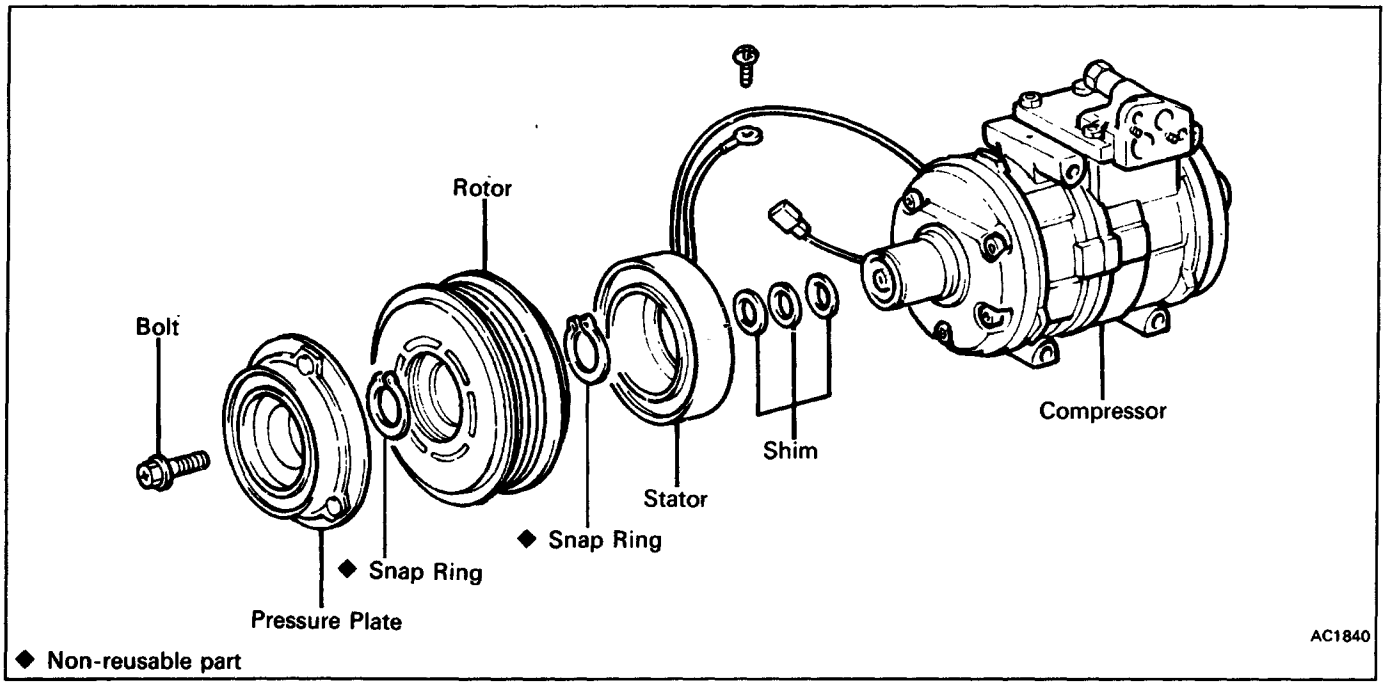
1. RUN ENGINE AT IDLE SPEED WITH AIR CONDITIONING ON FOR 10 MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE CABLE FROM BATTERY
4. REMOVE BATTERY
5. DISCONNECT CLUTCH LEAD WIRE FROM WIRING HARNESS
6. RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM
7. DISCONNECT TWO HOSES FROM COMPRESSOR SERVICE VALVES

Cap the open fitting immediately to keep moisture out of the system.

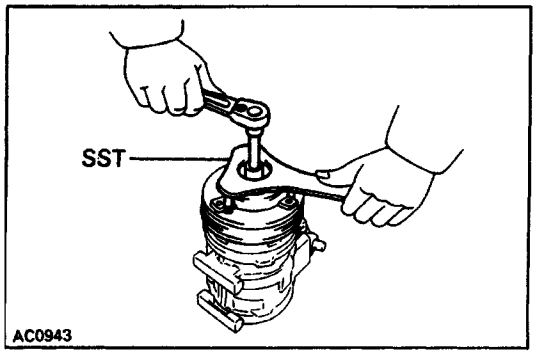
8. REMOVE COMPRESSOR

(a) Loosen the drive belt.
(b) Remove the compressor mounting bolts and the compressor.

DISASSEMBLY OF MAGNETIC CLUTCH

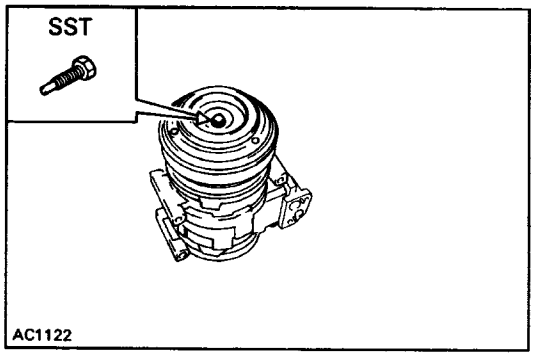


◆ Non-reusable part

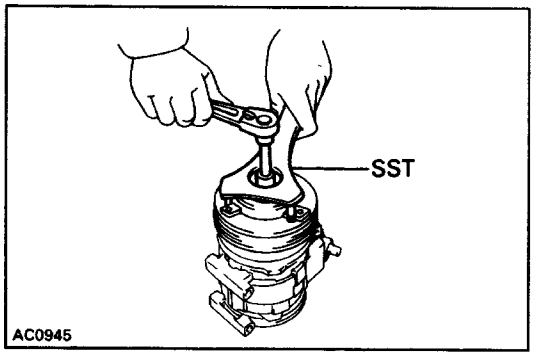


1. REMOVE PRESSURE PLATE

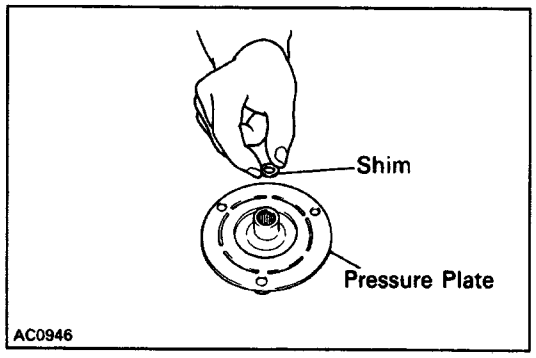
(a) Using SST and a socket, remove the shaft bolt.
SST 07112–76060



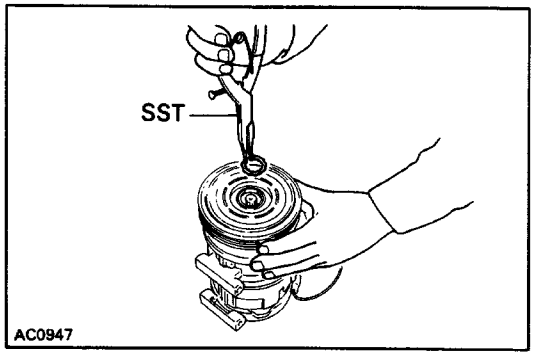
(b) Install SST to the pressure plate.
SST 07112–66040



(c) Using SST and the socket, remove the pressure plate.
SST 07112–76060

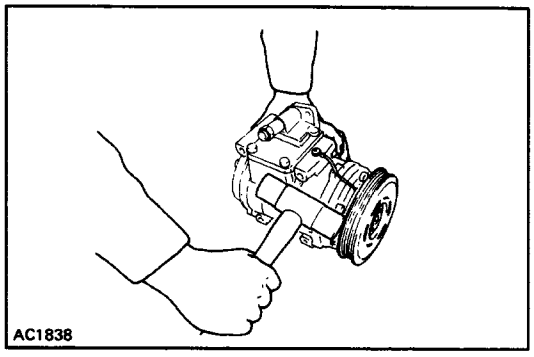


(d) Remove the shims from the pressure plate.

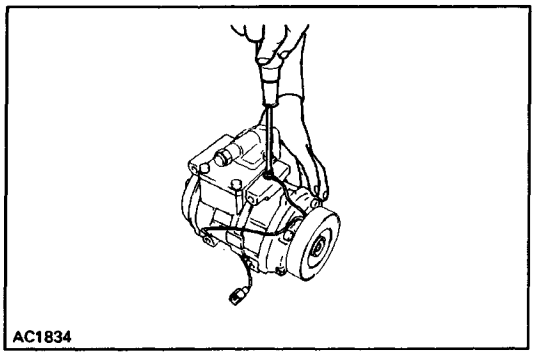


2. REMOVE ROTOR

(a) Using SST, remove the snap ring.
SST 07114–84020

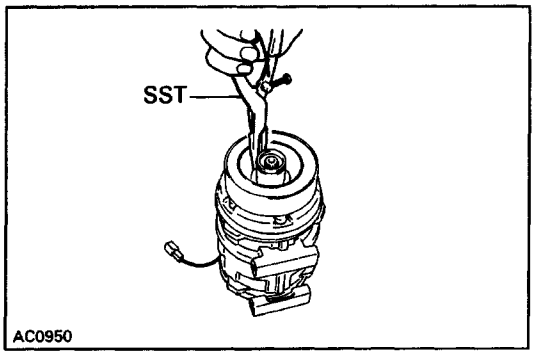


(b) Using a plastic hammer, tap the rotor off the shaft.
NOTICE: Be careful not to damage the pulley when tapping on the rotor.


AC1834

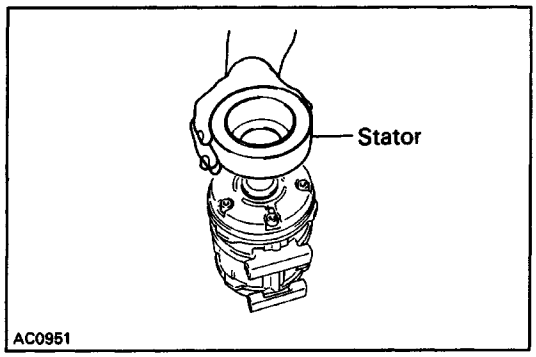
3. REMOVE STATOR

(a) Disconnect the stator lead wire from the compressor housing.



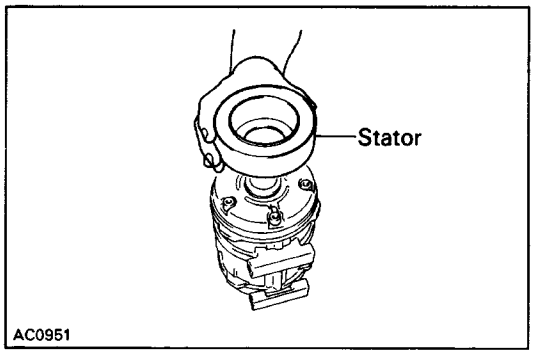
AC0950

(b) Using SST, remove the snap ring.
SST 07114–84020



AC0951

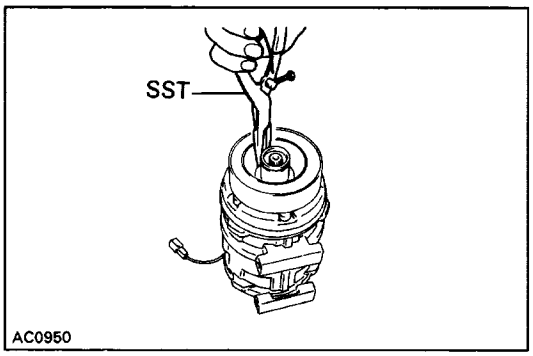
(c) Remove the stator.



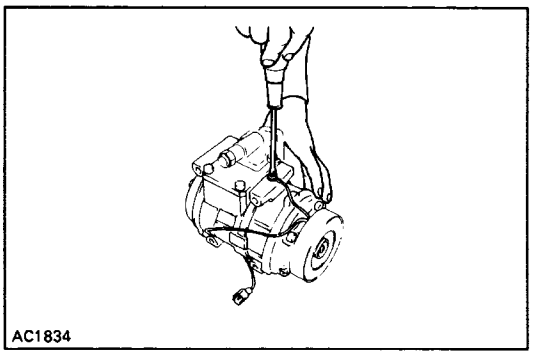
ASSEMBLY OF MAGNETIC CLUTCH

1. INSTALL STATOR

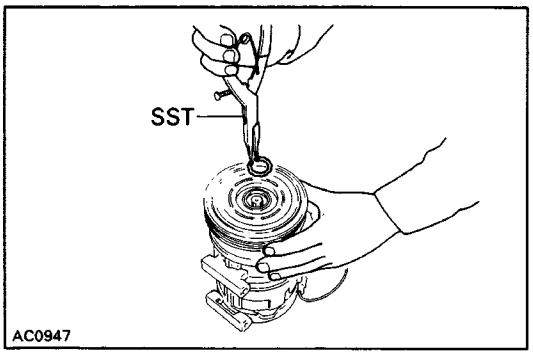
(a) Install the stator on the compressor.



(b) Using SST, install the new snap ring.
SST 07114–84020

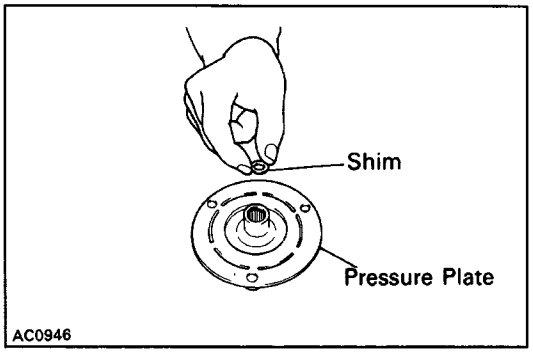


(c) Connect the stator lead wires to the compressor housing.



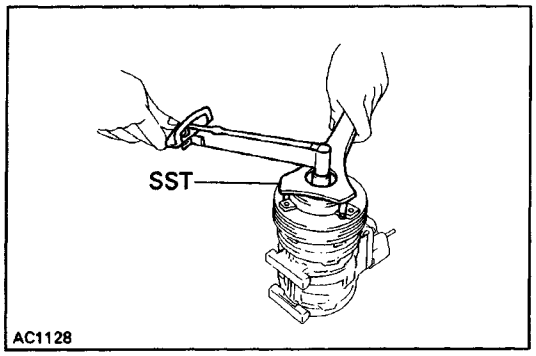
2. INSTALL ROTOR

(a) Install the rotor on the compressor shaft.
(b) Using SST, install the new snap ring.
SST 07114–84020

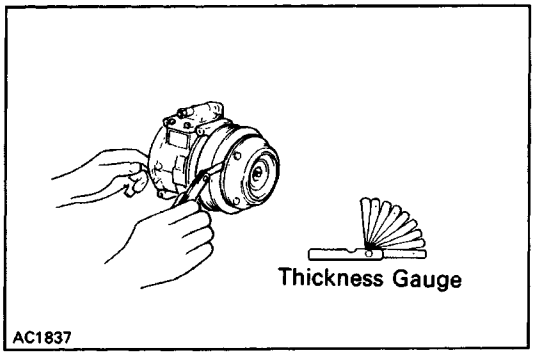


3. INSTALL PRESSURE PLATE

(a) Install the shims to the pressure plate.



(b) Using SST and torque wrench, install the shaft bolt.
SST 07112–76060
Torque: 14 N–m (140 kgf–cm, 10 ft–lbf)



4. CHECK CLEARANCE OF MAGNETIC CLUTCH
Check the clearance between the pressure plate and rotor using thickness gauge.
Standard clearance: 0.5 ± 0.15 mm
(0.0020 ± 0.0059 in.)
If the clearance is not within tolerance, change the number of shims to obtain the standard clearance.

INSTALLATION OF COMPRESSOR

(See page AC–26)
1. INSTALL COMPRESSOR WITH THREE MOUNTING BOLTS
Torque: 27 N–m (280 kgf–cm, 20 ft–lbf)
2. INSTALL DRIVE BELT
(See steps 2 and 3 on page AC–21)
3. CONNECT TWO HOSES TO COMPRESSOR SERVICE VALVES
Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)
4. CONNECT CLUTCH LEAD WIRE TO WIRING HARNESS
5. PLACE BATTERY
6. CONNECT NEGATIVE CABLE TO BATTERY
7. EVACUATE AIR FROM AIR CONDITIONING SYSTEM
8. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK GAS LEAKAGE
Specified amount: 720 ± 50 g (25.4 ± 1.8 oz)

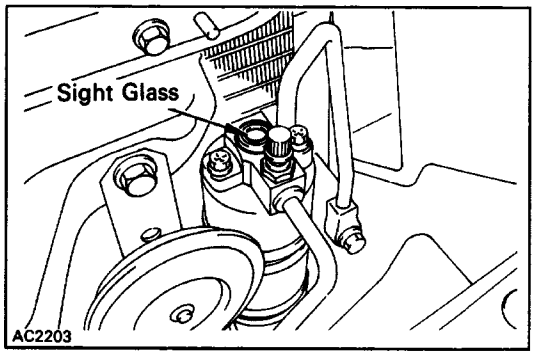
RECEIVER

(See page AC–10)

ON–VEHICLE INSPECTION

CHECK SIGHT GLASS, FUSIBLE PLUG AND FITTINGS FOR LEAKAGE

Use a gas leak detector. Repair as necessary.



REMOVAL OF RECEIVER

1. RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM

2. DISCONNECT TWO LIQUID TUBES FROM RECEIVER

HINT: Cap the open fittings immediately to keep moisture out of the system.

3. REMOVE RECEIVER FROM RECEIVER HOLDER

INSTALLATION OF RECEIVER

1. INSTALL RECEIVER IN RECEIVER HOLDER

HINT: Do not remove the blind plugs until ready for connection.

2. CONNECT TWO LIQUID TUBES TO RECEIVER

Torque: 13 N–m (135 kgf–cm, 10 ft–lbf)

3. IF RECEIVER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR

Add 20 cc (0.7 fl.oz.)
ND OIL 6,
SUNISO No. 5GS or equivalent.

4. EVACUATE AIR FROM AIR CONDITIONING SYSTEM

5. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK FOR GAS LEAKAGE

Specified amount: 720 ±50 g (25.4 ±1.8 oz)

CONDENSER

(See page AC–10)

ON–VEHICLE INSPECTION

1. CHECK CONDENSER FINS FOR BLOCKAGE OR DAMAGE

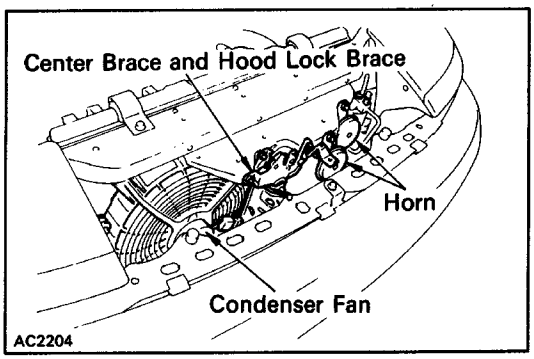
If the fins are clogged, wash them with water and dry with compressed air.

NOTICE: Be careful not to damage the fins.

If the fins are bent, straighten them with a screwdriver or pliers.

2. CHECK CONDENSER FITTINGS FOR LEAKAGE

Repair as necessary.



REMOVAL OF CONDENSER

1. RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM

2. REMOVE FRONT GRILLE AND FRONT UNDER COVER

3. REMOVE CENTER BRACE AND HORNS

4. REMOVE CONDENSER FAN

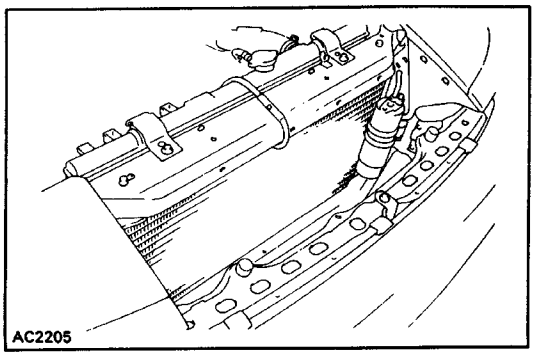
5. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE CLAMP FROM CONDENSER INLET FITTING

6. DISCONNECT LIQUID TUBE AND LIQUID TUBE CLAMP FROM CONDENSER OUTLET FITTING

HINT: Cap the open fittings immediately to keep moisture out of the system.

7. REMOVE CONDENSER

Remove the four nuts and condenser.



INSTALLATION OF CONDENSER

1. INSTALL CONDENSER

install the four condenser nuts, making sure the rubber cushions fit on the mounting flanges correctly.

2. CONNECT LIQUID TUBE, DISCHARGE HOSE TO CONDENSER

Torque:

Liquid tube 14 N–m (140 kgf–cm, 10 ft–lbf)

Discharge hose 23 N–m (230 kgf–cm, 17 ft–lbf)

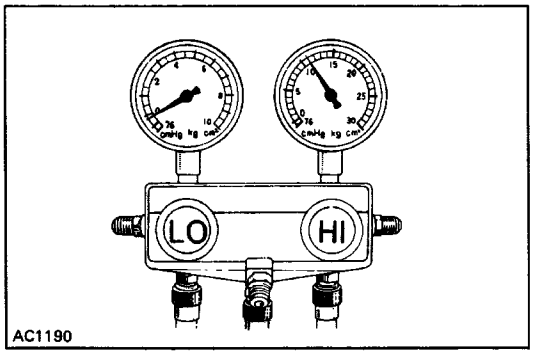
3. INSTALL CONDENSER FAN
4. INSTALL CENTER BRACE AND HORNS
5. INSTALL FRONT GRILLE AND UNDER COVER
6. IF CONDENSER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR
Add 40 – 50 cc (1.4 – 1.7 fl.oz.)
ND OIL 6,
SUNISO No. 5GS or equivalent.
7. EVACUATE AIR FROM AIR CONDITIONING SYSTEM
8. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK FOR GAS LEAKAGE
Specified amount 720 ± 50 g (25.4 ± 1.8 oz)

COOLING UNIT

(See page AC–10)

ON–VEHICLE INSPECTION OF EXPANSION VALVE

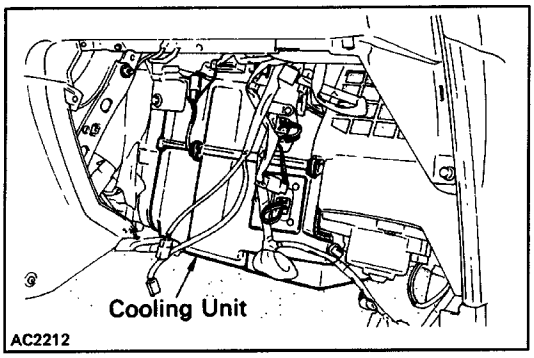
1. CHECK QUANTITY OF REFRIGERANT GAS DURING REFRIGERATION CYCLE



2. INSTALL MANIFOLD GAUGE SET
(See page AC–16)
3. RUN ENGINE
Run the engine at 2,000 rpm at least 5 minutes.
4. CHECK EXPANSION VALVE
If the expansion valve is clogged, the low pressure reading will drop to 0 kPa (0 kgf/cm^2, 0 psi), otherwise iis OK.

REMOVAL OF COOLING UNIT

1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM
3. DISCONNECT SUCTION TUBE FROM COOLING UNIT OUTLET FITTING
4. DISCONNECT LIQUID TUBE FROM COOLING UNIT INLET FITTING

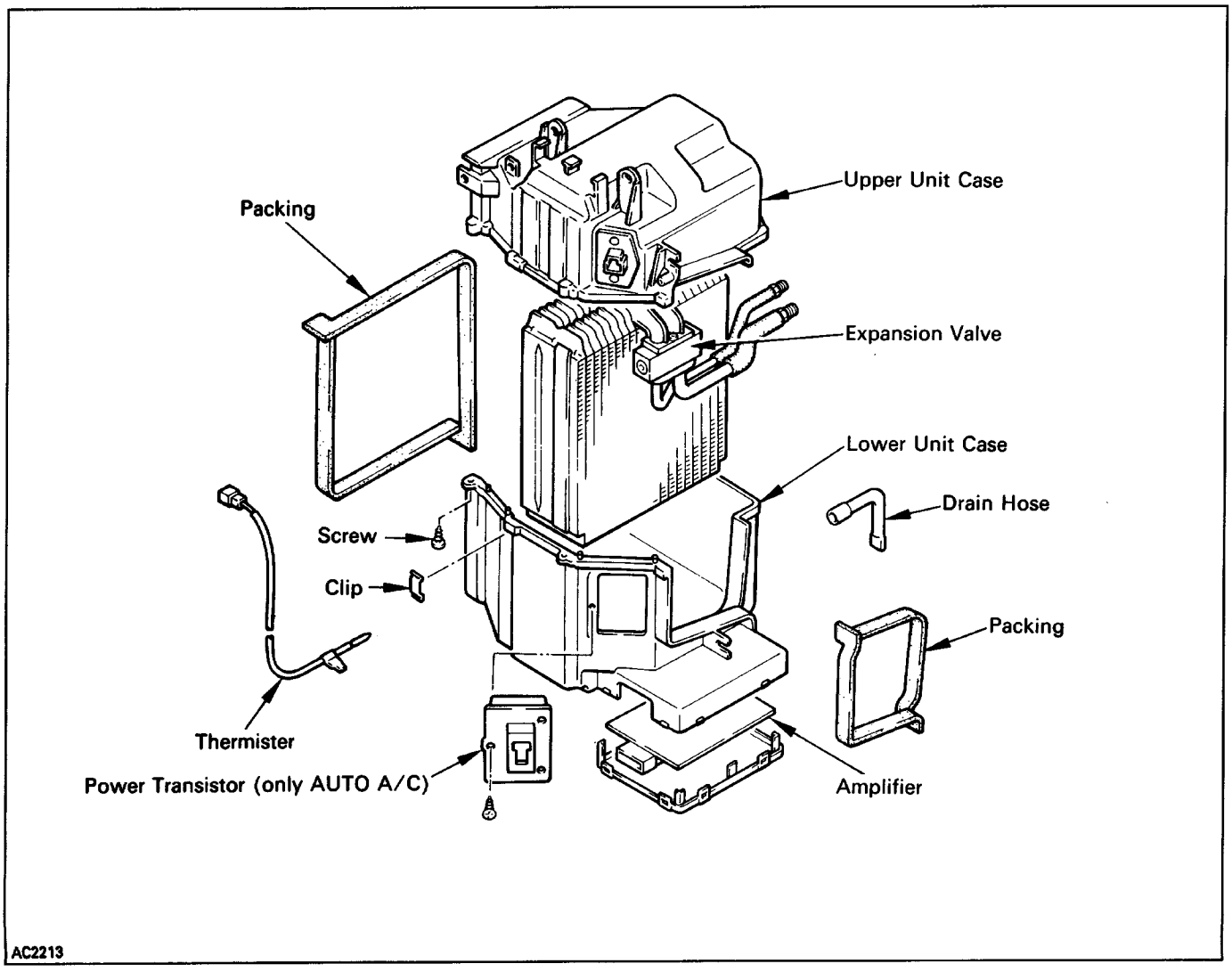


HINT: Cap the open fittings immediately to keep moisture out of the system.

5. REMOVE GROMMETS FROM INLET AND OUTLET FITTINGS
6. REMOVE GLOVE BOX AND REINFORCEMENT
7. DISCONNECT CONNECTORS
8. REMOVE COOLING UNIT

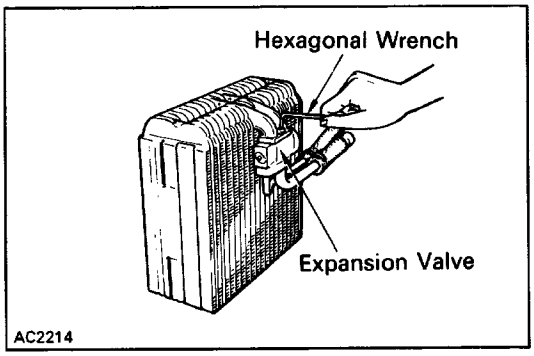
Remove three nuts and four bolts.

DISASSEMBLY OF COOLING UNIT



1. REMOVE LOWER AND UPPER UNIT CASES

(a) Disconnect connectors.
(b) Remove four clips.
(c) Remove four screws.
(d) Remove upper unit case.
(e) Remove thermistor with thermistor holder.
(f) Remove lower unit case.



2. REMOVE EXPANSION VALVE

(a) Remove the packing and heat sensing tube from suction and liquid tubes.
(b) Remove the expansion valve from the evaporator.

Evaporator

INSPECTION OF EVAPORATOR

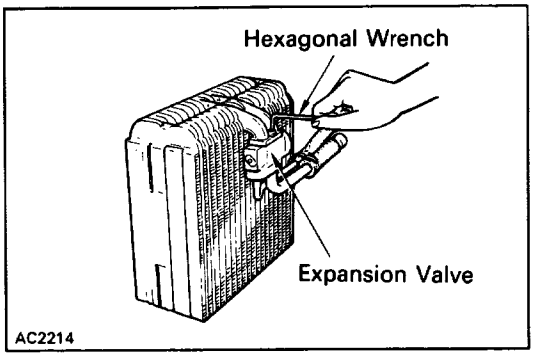
1. CHECK EVAPORATOR FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressed air.

NOTICE: Never use water to clean the evaporator.

2. CHECK FITTINGS FOR CRACKS OR SCRATCHES

Repair as necessary.



ASSEMBLY OF COOLING UNIT

INSTALL COMPONENTS ON EVAPORATOR

(a) Connect the expansion valve, suction and liquid tubes to the evaporator. Torque the bolt.

Torque: 5.4 N–m (55 kgf–cm, 47.7 in.–lbf)

HINT: Be sure that the 0–rings are positioned on the tube fitting.

(b) Install lower unit case to the evaporator.
(c) Install thermistor to the evaporator.
(d) Install upper unit case.
(e) Install four screws.
(f) Install four clips.
(g) Connect connectors.

INSTALLATION OF COOLING UNIT

1. INSTALL COOLING UNIT

Install the cooling unit with three nuts and four bolts.

2. CONNECT CONNECTORS

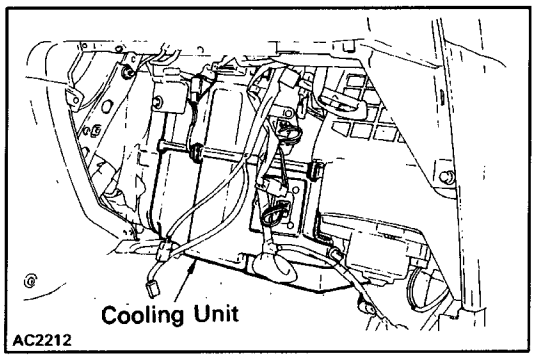
3. INSTALL GLOVE BOX AND REINFORCEMENT

4. INSTALL GROMMETS ON INLET AND OUTLET FITTINGS

5. CONNECT LIQUID TUBE TO COOLING UNIT INLET FITTING

Torque the nut.

Torque: 13 N–m (135 kgf–cm, 10 ft–lbf)



6. CONNECT SUCTION TUBE TO COOLING UNIT OUTLET FITTING

Torque the nut.

Torque: 32 N–m (325 kgf–cm, 24 ft–lbf)

7. IF EVAPORATOR WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR

Add 40 – 50 cc (1.4 –1.7 fl.oz.)

ND OIL 6,

SUNISO No. 5GS or equivalent.

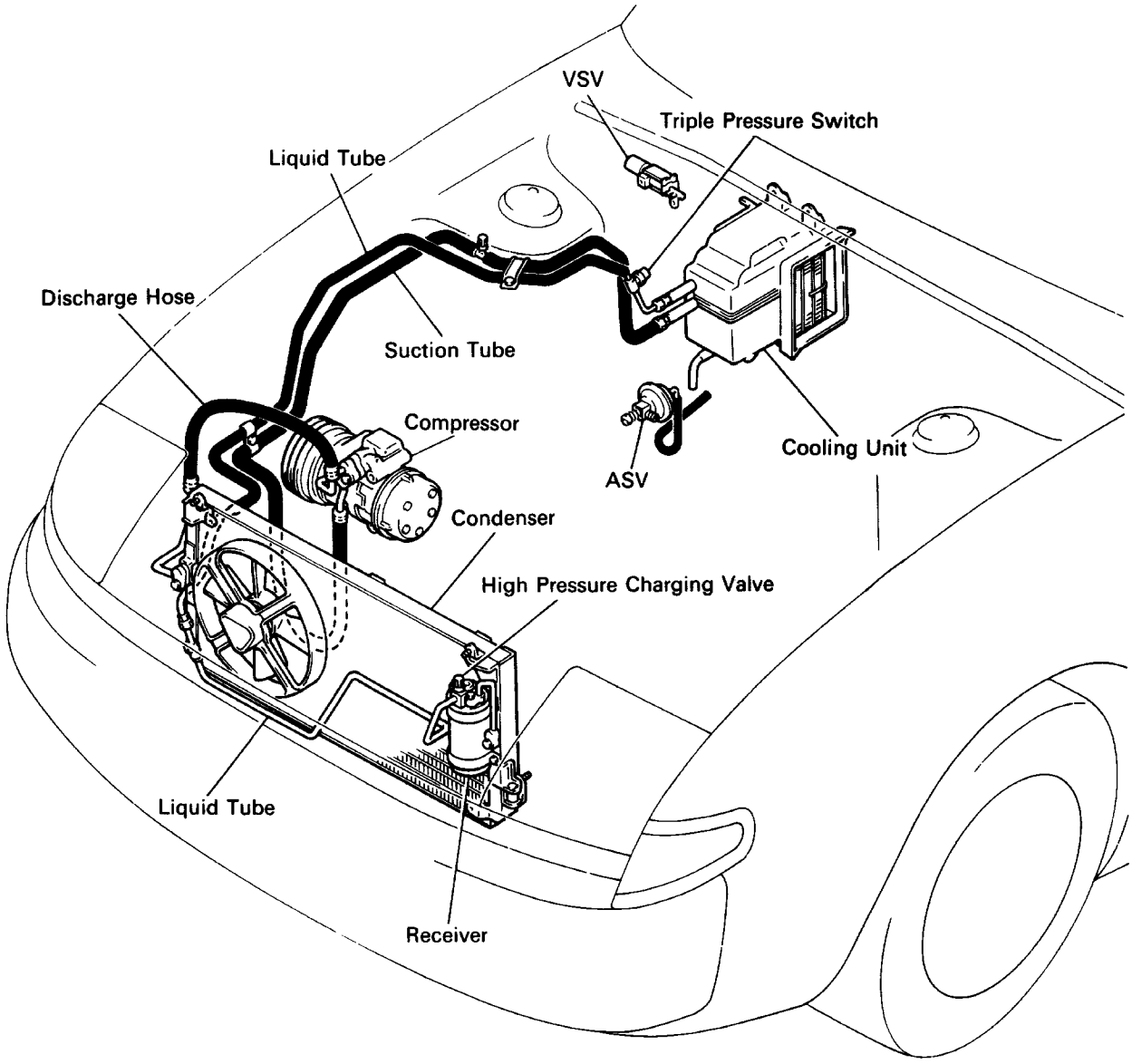
8. CONNECT NEGATIVE CABLE TO BATTERY

9. EVACUATE AIR FROM AIR CONDITIONING SYSTEM

10. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK ON GAS LEAKAGE

Specified amount: 720 ±50 g (25.4 ±1.8 oz)

REFRIGERANT LINES



Specified Torque: N·m (kgf·cm, ft·lbf)

0.31 in. Tube		14 (140, 10)
0.50 in. Tube		23 (230, 17)
0.62 in. Tube		32 (330, 24)
Bolted Type	For Compressor	25 (250, 18)
	For Condenser	13 (130, 9)
	For Receiver	5 (55, 4)

AC2193

ON–VEHICLE INSPECTION

1. INSPECT HOSES AND TUBES FOR LEAKAGE

Use a gas leak detector. Replace, if necessary.

2. CHECK THAT HOSE AND TUBE CLAMPS ARE NOT LOOSE

Tighten or replace as necessary.

REPLACEMENT OF REFRIGERANT LINES

1. RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

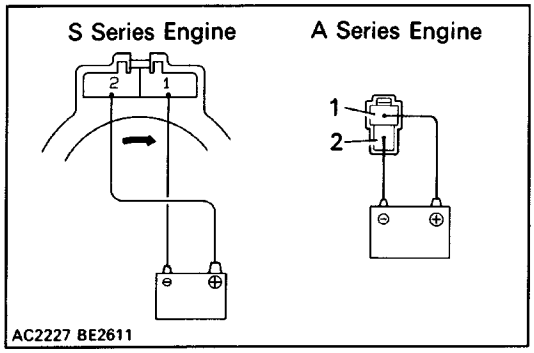
HINT: Cap the open fitting immediately to keep moisture out of the system.

3. TIGHTENING TORQUE FOR O–RING FITTINGS AND BOLTED TYPE FITTINGS

4. EVACUATE AIR FROM AIR CONDITIONING SYSTEM

5. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK ON GAS LEAKAGE

Specified amount: 720 ± 50 g (25.4 + 1.8 oz)



MOTORS

INSPECTION OF BLOWER MOTOR

INSPECT BLOWER MOTOR

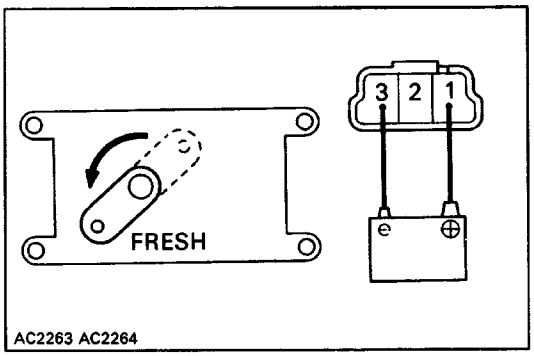
(S Series Engine)

Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, then check that the motor operation is smooth.

(A Series Engine)

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, then check that the motor operation is smooth.

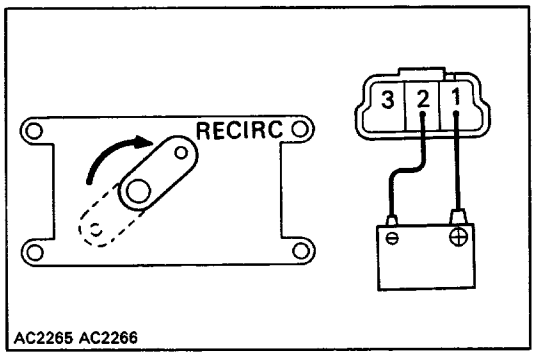
If operation is not as specified, replace the blower motor.



INSPECTION OF SERVOMOTORS

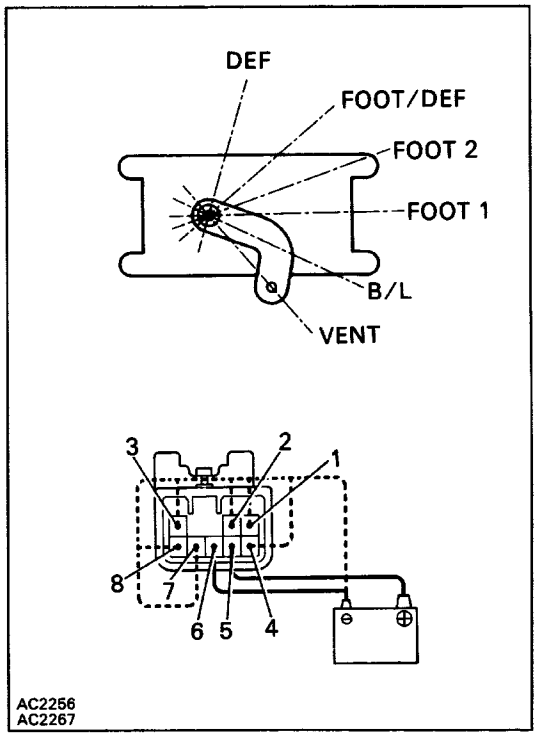
1. INSPECT AIR INLET CONTROL SERVOMOTOR

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 3, check that the arm rotates to the ”FRESH” side smoothly.



(b) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, check that the arm rotates to the ”RECIRC” side smoothly.

If operation is not as specified, replace the servo motor.



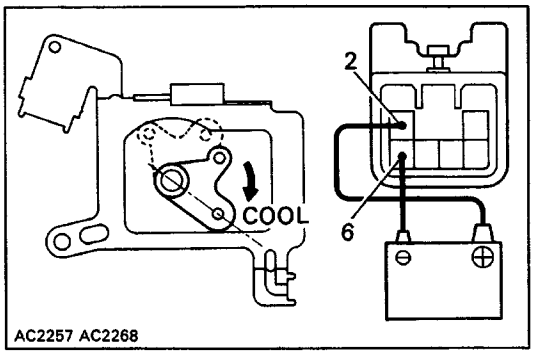
2. INSPECT MODE CONTROL SERVOMOTOR

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 6.

(b) Connect the negative (–) lead from the battery to each terminal and check that the arm rotates to each position as shown below.

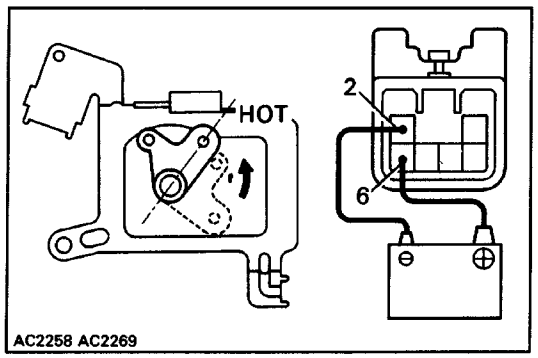
Connected terminal	Position
1	VENT
2	B/L
3	FOOT 2
4	FOOT/DEF
7	DEF
8	FOOT 1

If operation is not as specified, replace the servomotor.



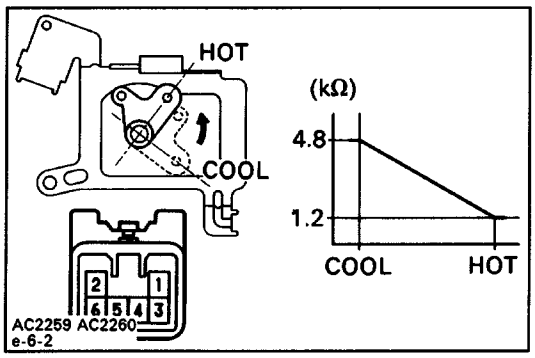
3. INSPECT AIR MIX CONTROL SERVOMOTOR (Motor Operation)

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 6, check that the lever moves smoothly from HOT to COOL.



(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (–) lead to terminal 2, check that the lever moves smoothly from COOL to HOT.

If operation is not as specified, replace the motor.



(Position Sensor Operation)

(a) Measure the resistance between terminals 1 and 3.

Resistance: Approx. 6 k

(b) Set the arm to COOL position.

(c) Check that the resistance between terminals 1 and 4 decreases from approx. 4.8 kΩ to 1.2 kΩ, when the arm is rotated from COOL to HOT position.

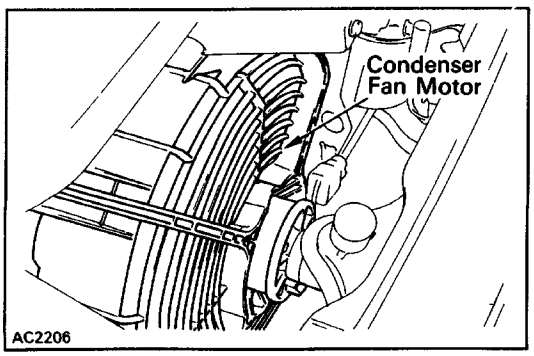
If operation is not as specified, replace the motor.

INSPECTION OF RADIATOR FAN MOTOR AND CONDENSER FAN MOTOR

1. INSPECT RADIATOR FAN AND CONDENSER FAN SYSTEM OPERATION

HINT: The fan motor operate at two speeds depending on the water temperature and the A/C switch.

A/C Switch	Magnetic Clutch	Water Temperature	Fan Motor Speed
OFF or ON	OFF	90°C (194°F) or below	Off
		90°C (194°F) or above	High
ON	ON	90°C (194°F) or below	Low
		90°C (194°F) or above or the refrigerant pressure is approx. 15.5 kg/cm² (220 psi, 1,520 kPa) or greater	High



2. INSPECT FAN MOTORS

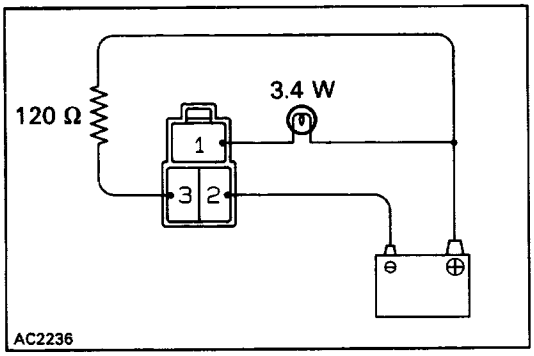
(a) Disconnect 2 pins connector of the fan motor.

(b) Using the wire harness, apply battery voltage to the connector.

(c) Confirm smooth rotation of the motor within the specified current flow.

Standard current: 6.7 ± 0.7 A

If current is not as specified, replace the motor.



POWER TRANSISTOR (with AUTO AC)

INSPECTION OF POWER TRANSISTOR

INSPECT POWER TRANSISTOR

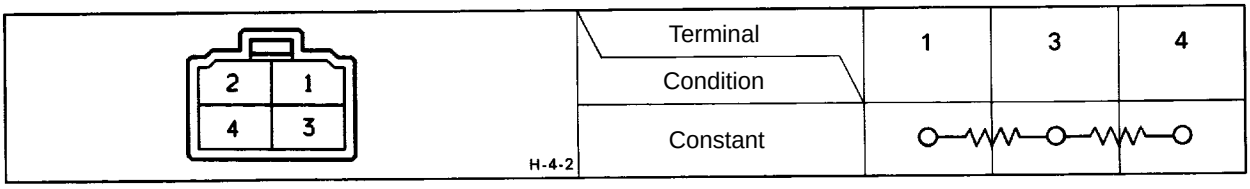
(a) Connect the positive (+) leads from the battery to terminal 1 through a 3.4 W test bulb and terminal 3 of a 120Ωresistor.

(b) Connect the negative (–) lead from the battery to terminal 2, then check that the test bulb lights up. If operation is not as specified, replace the power transistor.

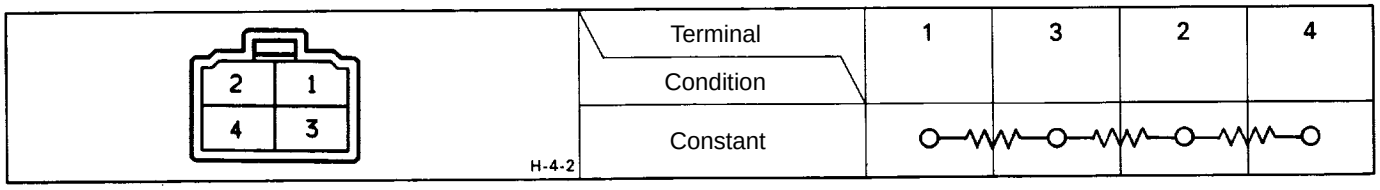
BLOWER RESISTOR

INSPECTION OF BLOWER RESISTOR

INSPECT BLOWER RESISTOR CONTINUITY
(with AUTO A/C: Dial Type Blower Speed Control Switch)



(without AUTO A/C)

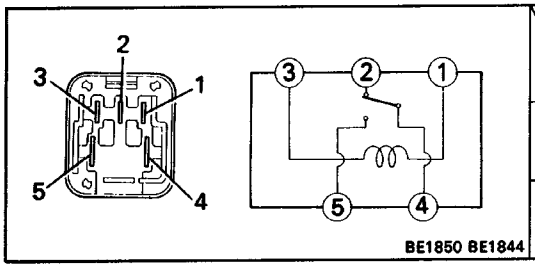


If continuity is not as specified, replace the blower resistor.

RELAYS

INSPECTION OF RELAYS FOR BLOWER FAN

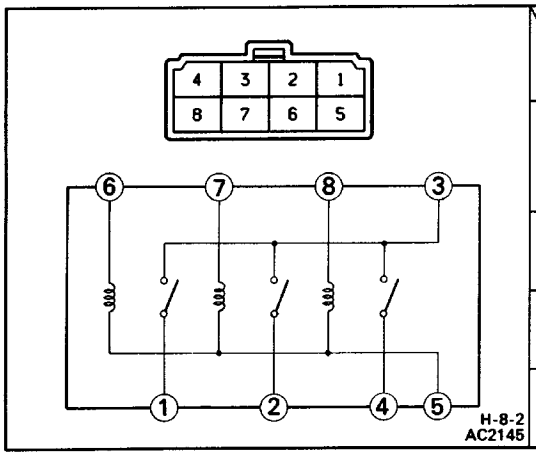
1. INSPECT HEATER MAIN RELAY CONTINUITY



Terminal / Condition	1	2	3	4	5
Constant	○—∿∿∿—○		○—∿∿∿—○	○——	
Apply battery voltage to terminals 1 and 3.				○—○	

If continuity is not as specified, replace the relay.

2. INSPECT BLOWER FAN RELAY

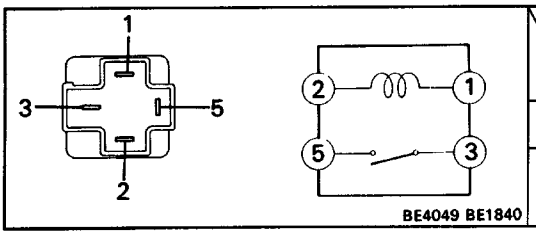


Terminal / Condition	1	2	3	4	5	6	7	8
Constant					○—∿∿∿—○	○—∿∿∿—○		○—∿∿∿—○
Apply battery voltage to terminals 5 and 6	○——	——○						
Apply battery voltage to terminals 5 and 7			○——	——○				
Apply battery voltage to terminals 5 and 8		○——	——○					

If the continuity is not as specified, replace the relay.

INSPECTION OF MAGNETIC CLUTCH RELAY

INSPECT MAGNETIC CLUTCH RELAY CONTINUITY

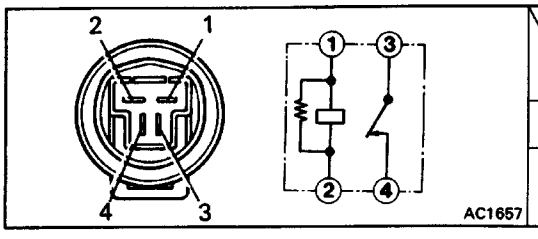


Terminal / Condition	1	2	3	5
Constant	○—∿∿∿—○			
Apply battery voltage to terminals/and 2.			○—○	

If continuity is not as specified, replace the relay.

INSPECTION OF RELAYS FOR RADIATOR FAN AND CONDENSER FAN

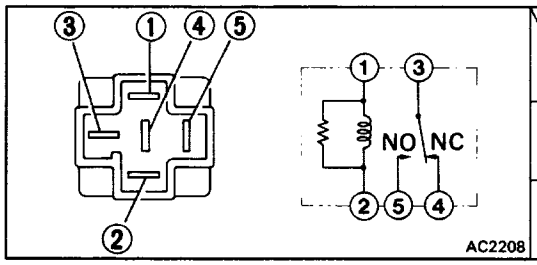
1. INSPECT FAN RELAY NO. 1 CONTINUITY



Terminal / Condition	1	2	3	4
Constant	○—∿∿∿—○		○——	——○
Apply battery voltage to terminals 1 and 2.			No continuity	

If continuity is not as specified, replace the relay.

2. INSPECT A/C FAN RELAY NO. 2 CONTINUITY



Terminal / Condition	1	2	3	4	5
Constant	○—≈—○		○—○		
Apply battery voltage to terminal 1 and 2			○—○		○

If continuity is not as specified, replace the relay.

3. INSPECT A/C FAN RELAY NO. 3 CONTINUITY

See Magnetic Clutch Relay on page AC–43.

4. INSPECT ENGINE MAIN RELAY

See Heater Main Relay on page AC–43.

SWITCHES

INSPECTION OF PRESSURE SWITCH

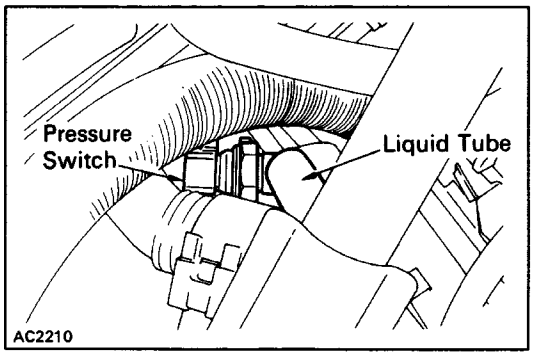
1. DISCONNECT CONNECTOR OF PRESSURE SWITCH

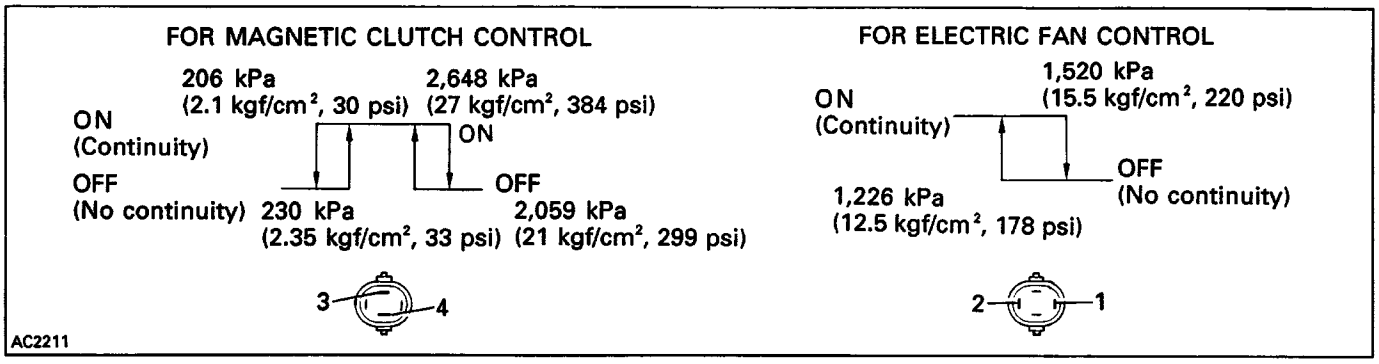
2. INSPECT PRESSURE SWITCH

(a) Install the manifold gauge set.

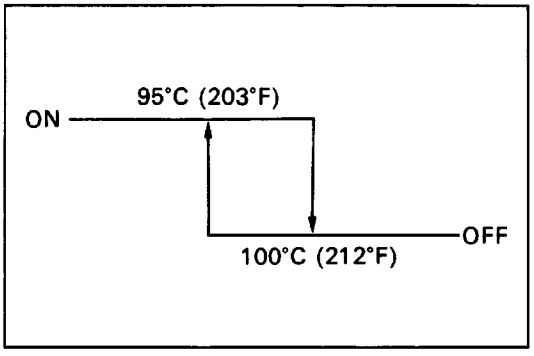
(b) Observe the gauge reading.

(c) Check the continuity between two terminals of pressure switch shown in the below.





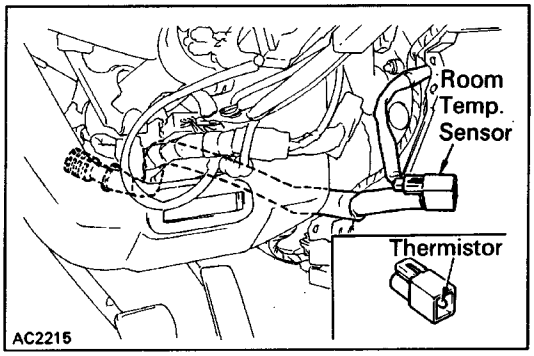
INSPECTION OF A/C WATER TEMPERATURE SWITCH



1. DISCONNECT CONNECTOR OF A/C WATER TEMPERATURE SWITCH

2. INSPECT A/C WATER TEMPERATURE SWITCH

Check the continuity between terminal of the temperature switch and ground.



SENSORS

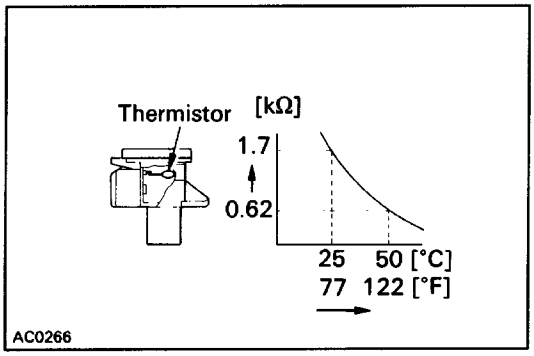
INSPECTION OF ROOM TEMPERATURE SENSOR

INSPECT ROOM TEMPERATURE SENSOR

Check the sensor resistance.

HINT: If there is an open circuit in the sensor, the system will operate at maximum heating.

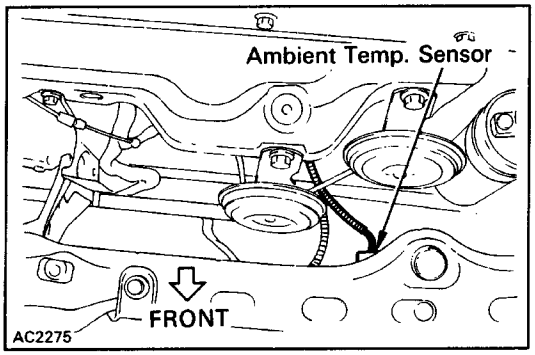
Conversely, if there is a short in the system, it will operate at maximum cooling.

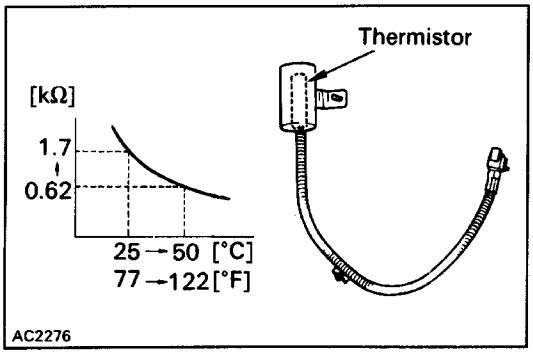


INSPECTION OF AMBIENT TEMPERATURE SENSOR

INSPECT AMBIENT TEMPERATURE SENSOR

Check the sensor resistance.



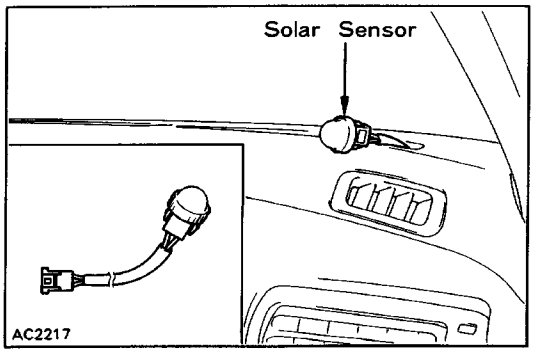


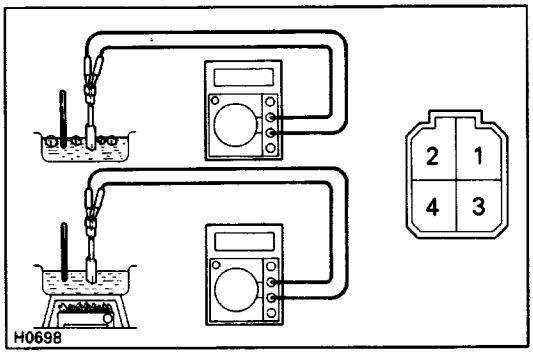
INSPECTION OF SOLAR SENSOR

INSPECT SOLAR SENSOR

Using an ohmmeter, check the continuity.

HINT: There is the solar sensor on the safety pad of the assistant side.





INSPECTION OF WATER TEMPERATURE SENSOR

INSPECT WATER TEMPERATURE SENSOR

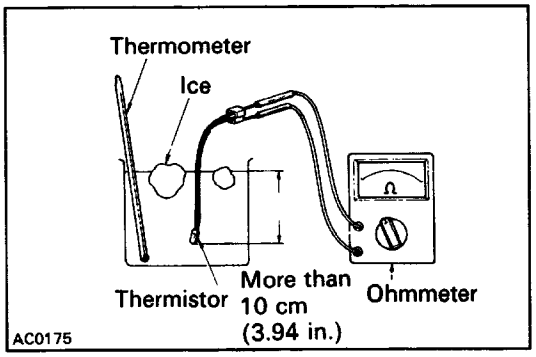
Using an ohmmeter, check the resistance.

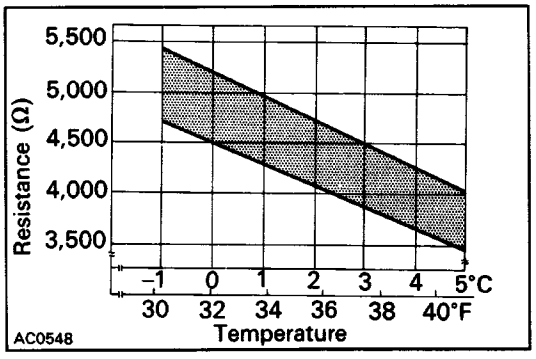
Temperature	Resistance
0°C (34°F)	15 – 19 kΩ
40°C (104°F)	2.5 – 2.7 kΩ
70°C (158°F)	0.8 – 1.0 kΩ

If resistance value is not as specified, replace the sensor.

THERMISTOR

REMOVAL AND INSPECTION OF THERMISTOR





1. DISCONNECT NEGATIVE CABLE FROM BATTERY

2. REMOVE GLOVE BOX AND UNDER COVER

3. CHECK THERMISTOR INSTALLED OPERATION

Using an ohmmeter, measure the resistance at the connector.

Resistance: 1,500 at 25˚C (77˚F)

If resistance value is not as specified, replace the thermistor.

4. REMOVE THERMISTOR

(a) Disconnect the connector.

(b) Remove the screw and thermistor from the cooling unit.

5. CHECK THERMISTOR OPERATION

(a) Place the thermistor in cold water. While varying the temperature of the water, measure the resistance at the connector and, at the same time, measure the temperature of the water with a thermometer.

(b) Compare the two readings on the chart.
If the intersection is not between the two lines, replace
the thermistor.

INSTALLATION OF THERMISTOR

1. INSTALL THERMISTOR

(a) Install the thermistor with the screw.

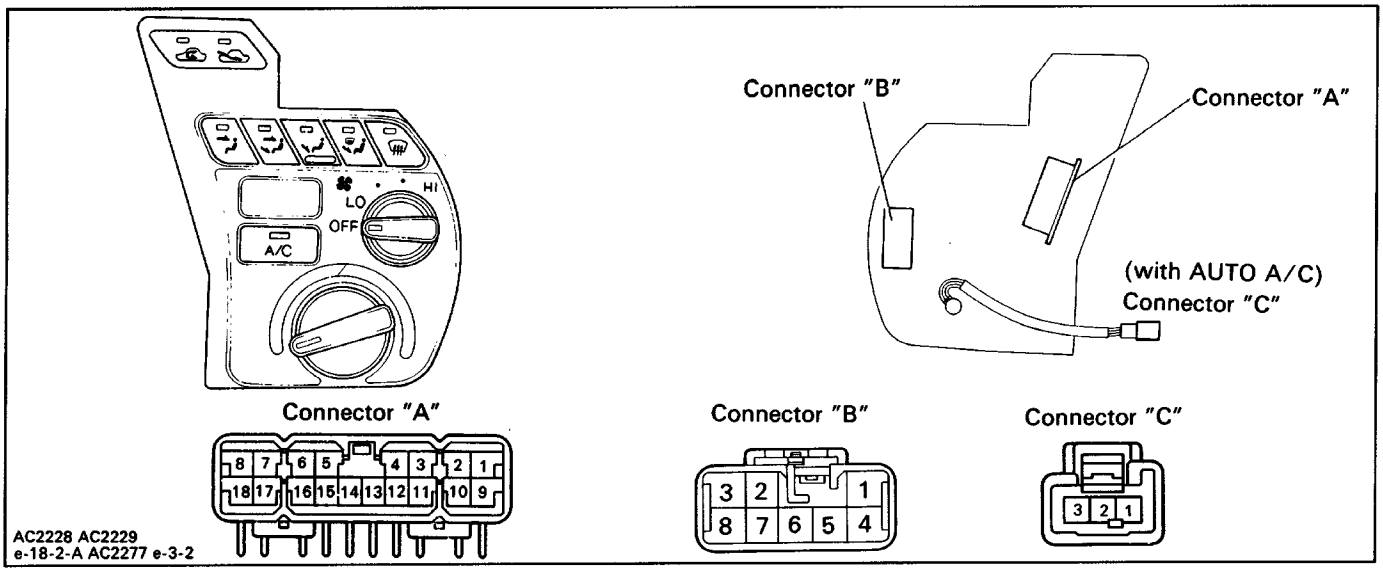
(b) Connect the connector.

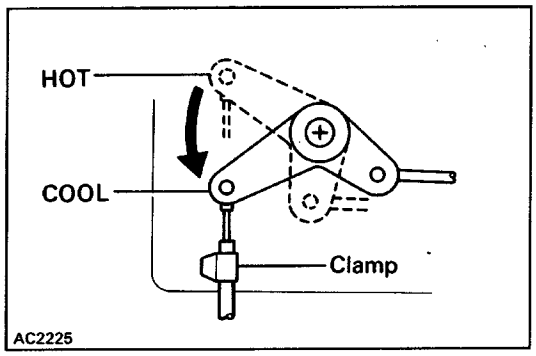
2. INSTALL GLOVE BOX AND UNDER COVER

3. CONNECT NEGATIVE CABLE TO BATTERY

AC CONTROL ASSEMBLY

with Dial Type Blower Speed Control Switch

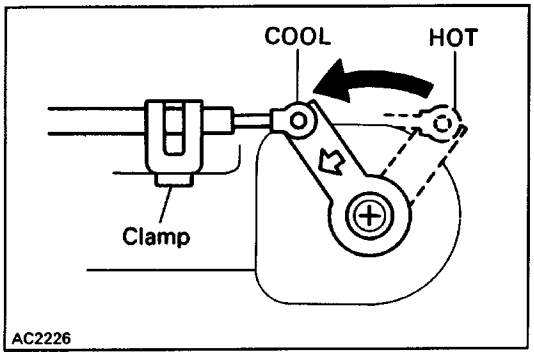




ADJUSTMENT OF AIR MIX DAMPER CONTROL CABLE

ADJUST AIR MIX DAMPER CONTROL CABLE

Set the air mix damper and the temperature control switch to "COOL", then install the control cable and lock the clamp.

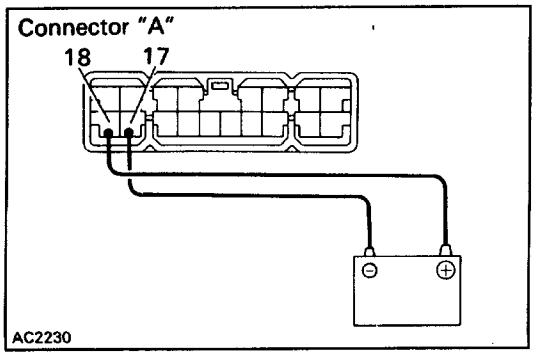


ADJUSTMENT OF AIR MIX CONTROL CABLE

ADJUST WATER VALVE CONTROL CABLE

Set the water valve and the temperature control switch to "COOL", then install the control cable and lock the clamp.

HINT: For the servomotor type temperature control switch, set the switch to "COOL" when the ignition switch is turned ON and the blower motor is operating.



INSPECTION OF A/C CONTROL ASSEMBLY

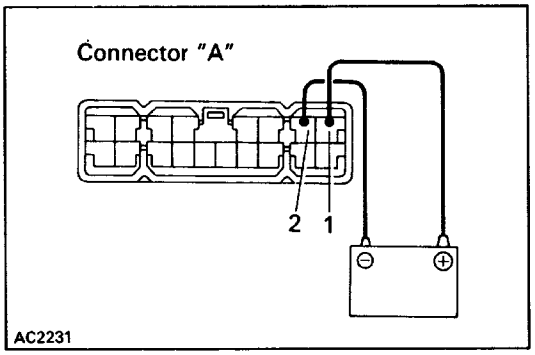
Illumination

INSPECT ILLUMINATION

(a) Connect the positive (+) lead from the battery to terminal A–18 and the negative (–) lead to terminal A–17.

(b) Check that the illumination lights up.

If the illumination does not light up, test the bulb.



Indicators

1. INSPECT AIR INLET INDICATOR

(a) Connect the positive (+) lead from the battery to terminal A–1 and the negative (–) lead to terminal A–2.

(b) Check that the FRESH and RECIRC indicators light up alternately each time the air inlet control switch button is pressed.

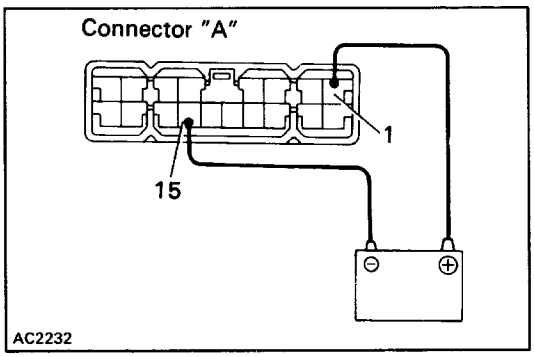
If operation is not as specified, replace the A/C control assembly.

2. INSPECT MODE INDICATOR

(a) Connect the positive (+) lead from the battery to terminal A–1 and the negative (–) lead to terminal A–2.

(b) Push each of the mode buttons in and check that their indicators light up.

If operation is not as specified, replace the A/C control assembly.



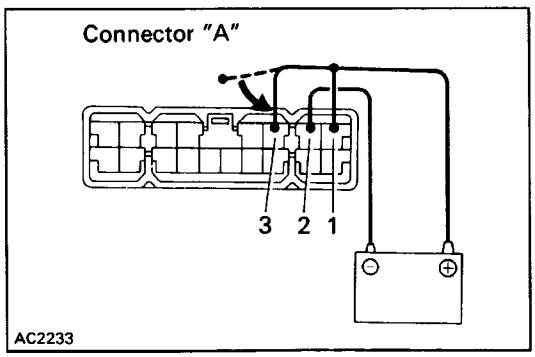
3. (with A/C)

INSPECT A/C INDICATOR

(a) Connect the positive (+) lead from the battery to terminal A–1 and the negative (–) lead to terminal A–15.

(b) Push the A/C switch button in and check that the indicator lights up.

If operation is not as specified, replace the A/C control assembly.



4. INSPECT INDICATOR LIGHT DIMMING OPERATION

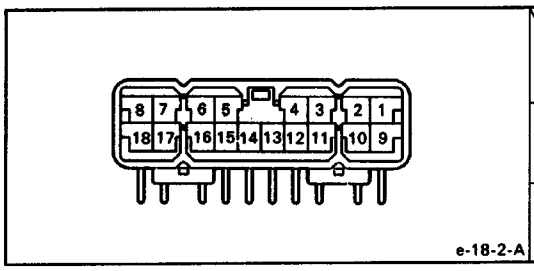
(a) Connect the positive (+) lead from the battery to terminal A–1 and the negative (–) lead to terminal A–2.

(b) Connect the positive (+) lead from the battery to terminal A–3 and check that the indicators dim.

If operation is not as specified, replace the A/C control assembly.

Switches

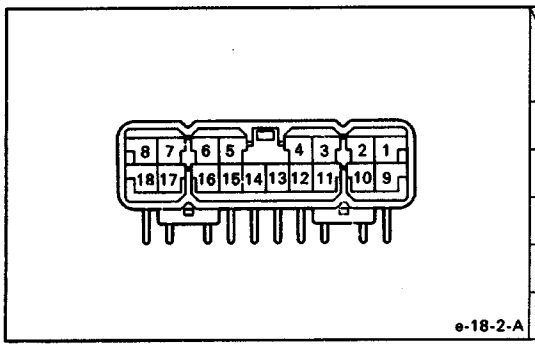
1. INSPECT AIR INLET CONTROL SWITCH CONTINUITY



Terminal / Switch position	A-2	A-7	A-8
RECIRC	○	○	
FRESH	○		○

If continuity is not as specified, replace the A/C control assembly.

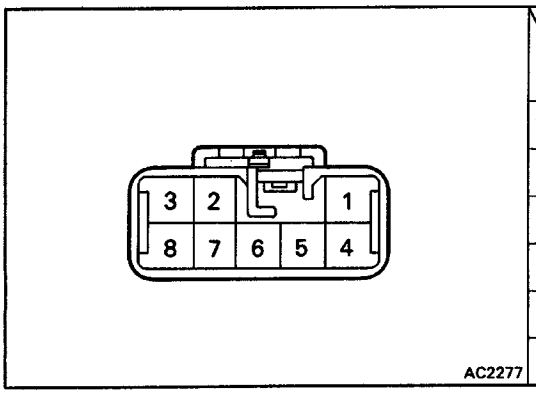
2. INSPECT MODE CONTROL SWITCH CONTINUITY



Terminal / Switch position	A-2	A-9	A-10	A-11	A-12	A-13
FACE	○	○				
B/L	○		○			
FOOT	○			○		
F/ D	○				○	
DEF	○					○

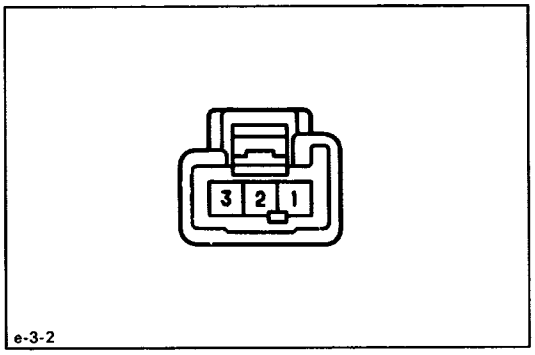
If continuity is not as specified, replace the A/C control assembly.

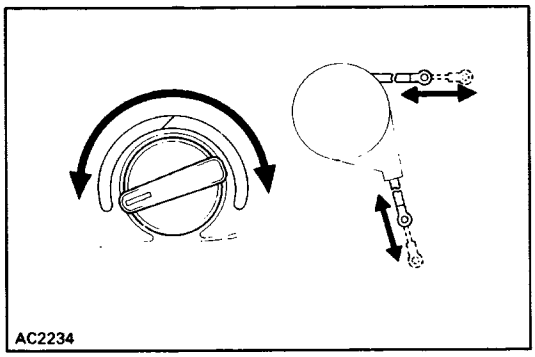
3. INSPECT BLOWER SPEED CONTROL SWITCH CONTINUITY



Terminal / Switch position		B-1	B-2	B-3	B-4	B-5	B-6	B-7
w/AUTO A/C	w/o AUTO A/C							
OFF	OFF							
AUTO	LO	○		○				○
LO	■		○	○			○	
■	■		○	○	○			
HI	HI		○	○		○		

If continuity is not as specified, replace the A/C control assembly.





4. INSPECT TEMPERATURE CONTROL SWITCH
(with AUTO A/C)

(a) Measure the resistance between terminals C–2 and C–3.

Resistance: Approx. 3k

(b) Check that the resistance between terminals C–1 and C–3 increases from 0 to approx. 3 kΩ when the switch knob is turned from COOL to HOT.

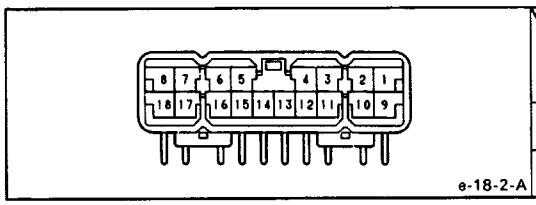
If operation is not as specified, replace the A/C control assembly.

(without AUTO A/C)

Check that the switch knob turns smoothly and that the control cables contract and expands as the switch knob is turned.

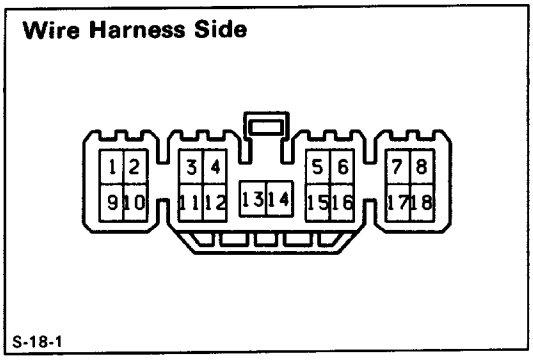
If operation is not as specified, replace the temperature control switch.

5. (with A/C)
INSPECT A/C SWITCH CONTINUITY



Terminal / Switch position	A-14	A-16
OFF		
ON	O——	——O

If continuity is not as specified, replace the A/C control assembly.



AMPLIFIERS

INSPECTION OF A/C AMPLIFIER

INSPECT AMPLIFIER CIRCUIT

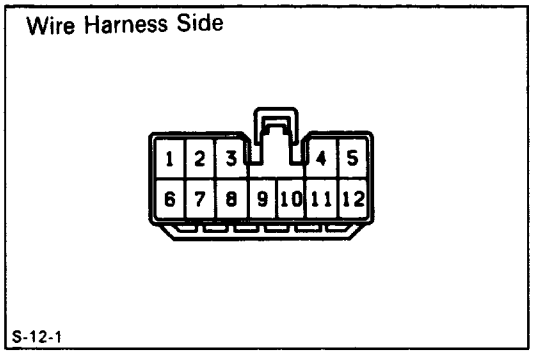
Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

Test conditions:

(1) Ignition switch: ON
(2) Temperature control lever: MAX COOL
(3) Blower switch: HI

Check for	Tester connection	Condition		Specified value
Continuity	*1 2 – ground	Engine coolant less than 95°C (203°F)		Continuity
		Engine coolant more than 100°C (212°F)		No continuity
	15 – ground	Constant		Continuity
Continuity	10 – ground	3S–GTE	Constant	No continuity
		5S–FE	Constant	Continuity
Resistance	*1 5 – ground	Constant		Approx. 12Ω
	9 – 14	Constant		Approx. 115Ω
	16 – 14	Constant		Approx. 15 kΩ at 25°C (77°F)
Voltage	1 – ground	Turn A/C switch on.		No voltage
		Turn A/C switch off.		No voltage
	3 – ground	Turn A/C switch on.		Battery voltage
		Turn A/C switch off.		No voltage
	6 – ground	Turn A/C switch on.		No voltage
		Turn A/C switch off.		Battery voltage
	8 – ground	Turn A/C switch on.		No voltage
		Turn A/C switch off.		Battery voltage
	13 – ground	Turn A/C switch on.		Battery voltage
		Turn A/C switch off.		No voltage
	18 – ground	Start the engine.		Approx. 10 to 14 V
		Stop the engine.		No voltage

*1: with Variable Volume Control Mechanism Compressor



INSPECTION OF SYSTEM AMPLIFIER

INSPECT AMPLIFIER CIRCUIT

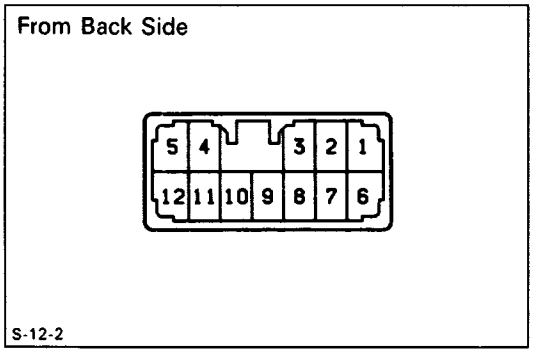
(a) Disconnect the amplifier and inspect connector on the wire harness side as shown in the chart below.

Test conditions:

(1) Ignition switch: ON

(2) Temperature control switch: MAX COOL

Check for	Tester connection	Condition	Specified value
Continuity	1 – 6	Constant	Continuity
	9 – ground	Constant	Continuity
Resistance*1	5 – 2	Constant	Approx. 3 kΩ
	5 – 10	Constant	Approx. 6 kΩ
	11 – 10	Constant	1.2 – 4.8 kΩ
	12 – 2	Temperature control switch turned to MAX COOL	Approx. 3 kΩ
Voltage	7 – ground	Constant	Battery voltage
*1: without AUTO A/C models			



HINT: Perform the following check only for vehicles with AUTO A/C.

(b) Connect the connector to the amplifier and inspect connector from back side as shown in the chart below.

Test conditions:

(1) Engine running

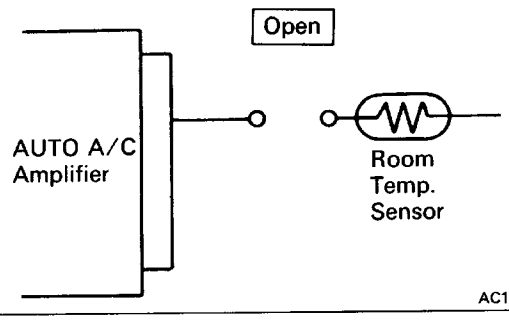
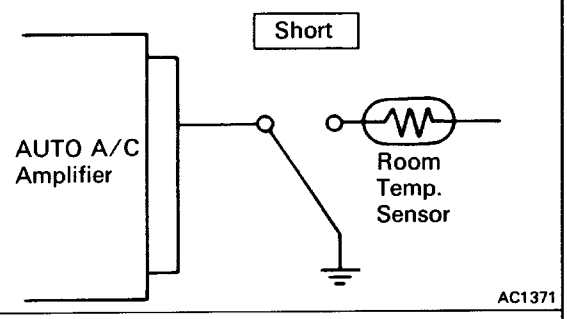
(2) A/C switch: ON

(3) Blower switch: HI

Check for	Tester connection	Condition	Specified value
Voltage	3 – ground	Temp. control switch turned to MAX HOT	Approx. 0 V*1
		Temp. control switch turned to MAX COOL	Approx. 5 V
	4 – ground	Temp. control switch turned to MAX HOT	Approx. 5 V
		Temp. control switch turned to MAX COOL	Approx. 0 V*1
*1: Voltage becomes 0 V when switch is turned, then soon returns to 5 V.			

INSPECTION OF AUTO A/C AMPLIFIER

1. False Signal Input to Auto A/C Amplifier

False Signal	A	B
Condition	Interior room temperature is very low. 	Interior room temperature is very high. 
Your Work	Remove in–car sensor connector.	Remove room temp. sensor, and ground the number 2 pin of room temp. sensor female connector.

2. System Operation when Input False Signal

Condition: Setting Temperature is at 25˚C (77˚F)

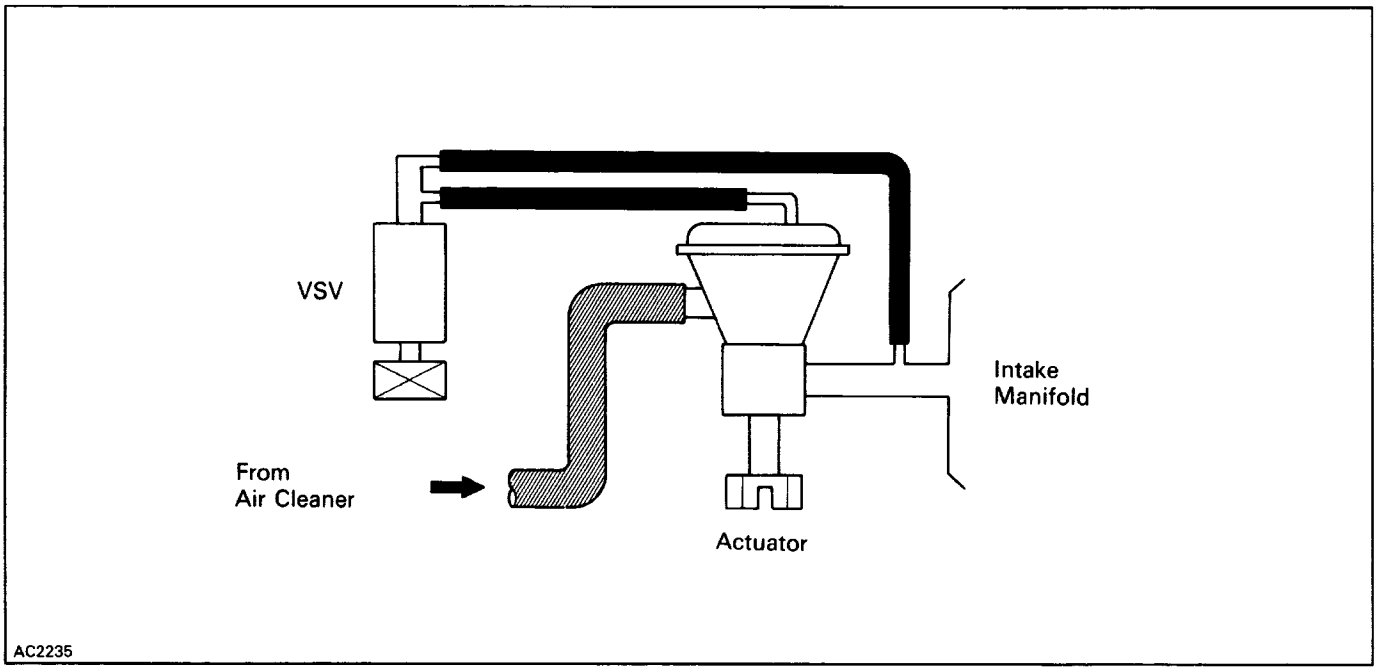
System Main Parts	False Signal	Motion			
Air Mix Control Servomotor	A	Air mix control servo motor shaft moves towards max–hot side.			
	B	Air mix control servo motor shaft moves towards max–cool side.			
Air Flow Mode Control Servomotor		Air Vent Mode Damper			
		VENT	BI–LEVEL	H EAT	DEF
	A	Close	Close	Open	Close
	B	Open	Close	Close	Close

3. System Operation when Input False Signal (Cont'd)

System Main Parts	False Signal	Motion
Blower Motor	A	Blower motor rotates at high speed.
	B	
Water Valve	A	OPEN
	B	CLOSE
FRE/REC Control Servomotor	FRE Switch ON	Fresh air is ventilated.
	REC Switch ON	Recirculation air is ventilated.

If necessary, replace the system amplifier.

VACUUM HOSE CIRCUIT

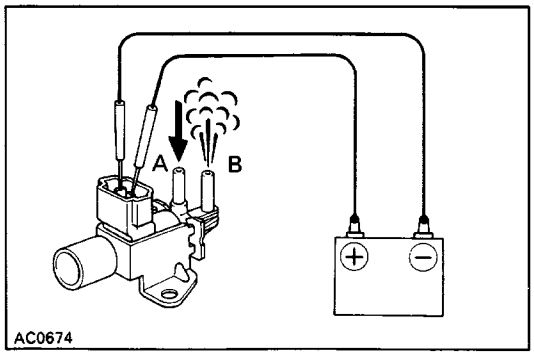


VACUUM SWITCHING VALVE (VSV)

(See page AC–10)

INSPECTION OF VSV

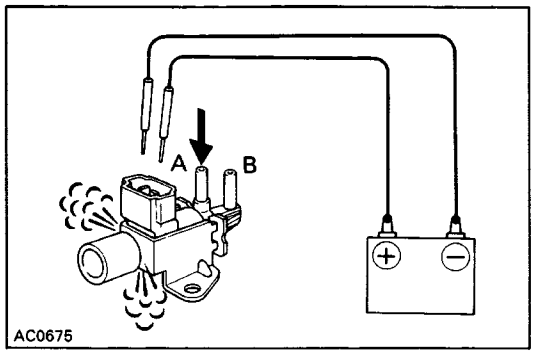
1. REMOVE VSV



2. CHECK VACUUM CIRCUIT CONTINUITY IN VSV BY BLOWING AIR INTO PIPE

(a) Connect the VSV terminals to the battery terminals as shown.

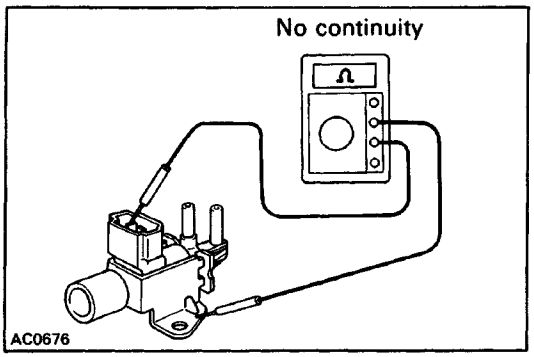
(b) Blow into pipe ”A”, and check that air comes out of pipe ”B” but does not come out of filter ”C”.



(c) Disconnect the battery.

(d) Blow into pipe ”A” and check that air comes out of filter ”C” but does not come out of pipe ”B”.

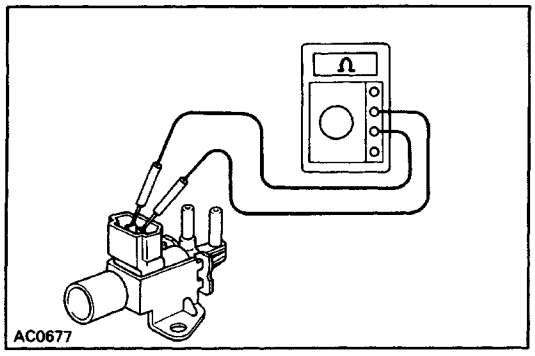
If a problem is found, replace the VSV.



3. CHECK FOR SHORT CIRCUIT

Using and ohmmeter, check that there is continuity between each terminal and the VSV body.

If a short circuit is found, repair or replace the VSV.



4. CHECK FOR OPEN CIRCUIT

Using an ohmmeter, measure the resistance between the two terminals of the VSV.

Specified resistance: 38 – 43 at 20˚C (68˚F)

If resistance value is not as specified, replace the VSV.