

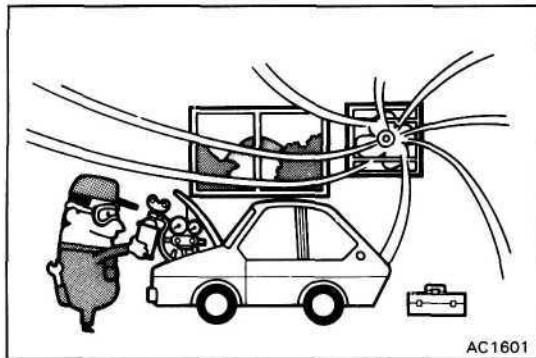
# AIR CONDITIONING SYSTEM

	Page
GENERAL INFORMATION.....	AC-2
DESCRIPTION.....	AC-4
TROUBLESHOOTING.....	AC-16
PREPARATION.....	AC-20
REFRIGERATION SYSTEM.....	AC-21
DRIVE BELT.....	AC-25
REFRIGERATION LINES.....	AC-26
COMPRESSOR.....	AC-28
RECEIVER.....	AC-42
CONDENSOR.....	AC-43
COOLING UNIT.....	AC-44
COOL/ICE BOX.....	AC-51
EVAPORATORS.....	AC-52
EXPANSION VALVES.....	AC-53
THERMISTORS.....	AC-54
A/C CONTROL ASSEMBLY.....	AC-56
REAR COOLER CONTROL PANEL.....	AC-66
REAR HEATER SWITCH.....	AC-67
REAR COOLER SWITCH.....	AC-67
TRIPLE PRESSURE SWITCH.....	AC-68
WATER TEMPERATURE SWITCH.....	AC-68
SERVOMOTORS.....	AC-69
BLOWER MOTORS.....	AC-70
CONDENSER FAN MOTOR.....	AC-71
BLOWER RESISTORS.....	AC-71
POWER TRANSISTOR.....	AC-72
LOCATION OF RELAYS AND AMPLIFIERS.....	AC-72
HEATER RELAY.....	AC-72
BLOWER SPEED CONTROL RELAY.....	AC-73
REAR HEATER RELAY.....	AC-73
BLOWER HIGH RELAY.....	AC-73
MAGNETIC CLUTCH RELAY.....	AC-73
WATER TEMPERATURE CUT RELAY.....	AC-74
REAR COOLER RELAY.....	AC-74
CONDENSER FAN RELAY.....	AC-74
MAGNETIC VALVES.....	AC-74
SENSORS.....	AC-75
VACUUM SWITCHING VALVE (VSV).....	AC-76
AMPLIFIERS.....	AC-77

## GENERAL INFORMATION

### ELECTRICAL PARTS

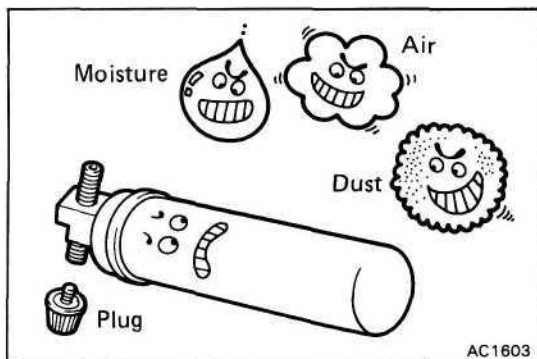
Before removing and inspecting the electrical parts, set the ignition switch to the LOCK position and disconnect the negative (—) terminal cable from the battery.



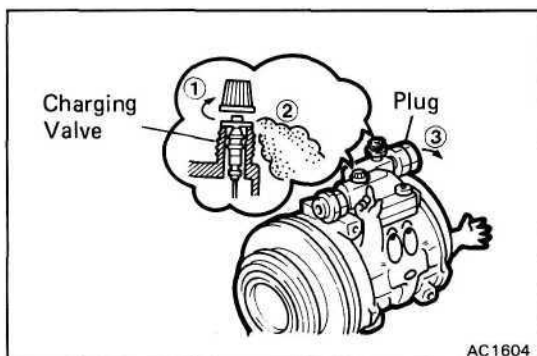
AC1601



AC1602



AC1603



AC1604

### REFRIGERATION SYSTEM

#### 1. WHEN HANDLING REFRIGERANT (R-12), FOLLOWING PRECAUTIONS MUST BE OBSERVED;

- (a) Do not handle refrigerant in an enclosed area or near an open flame.
- (b) Always wear eye protection.
- (c) 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;

- Do not rub.
- Wash the area with lots of cool water.
- Apply clean petroleum jelly to the skin.
- Go immediately to a physician or hospital for professional treatment.
- Do not attempt to treat yourself.

#### 2. WHEN REPLACING PARTS IN REFRIGERANT LINE;

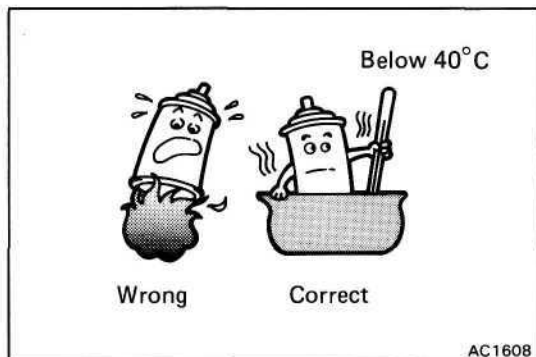
- (a) Discharge the refrigerant in the line slowly before replacement.
- (b) Insert a plug immediately in disconnected parts to prevent the entry of moisture and dust.
- (c) Do not leave a new condenser or receiver, etc., lying around with the plug removed.

- (d) Discharge the refrigerant from the charging valve before installing a new compressor.

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

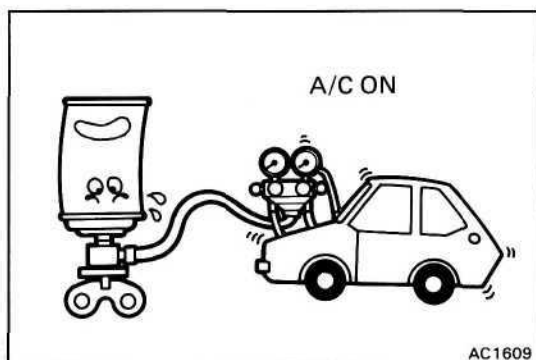
- (e) Do not use a torch for tube bending or lengthening operations.

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



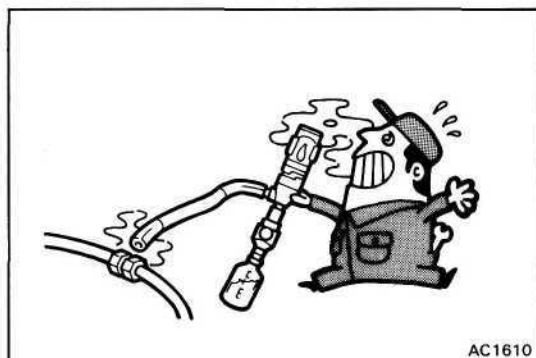
### 3. WHEN HANDLING REFRIGERANT CONTAINER (SERVICE CAN);

- (a) The container must never be heated.
- (b) Containers must be kept below 40°C (104°F)
- (c) If warming a service can with hot water, be careful that the valve on top of the service can is never immersed in the water, as the water may permeate the refrigerant cycle.
- (d) Empty service cans must never be re-used.



### 4. WHEN A/C IS ON AND REFRIGERANT GAS IS BEING REPLENISHED;

- (a) If there is not enough refrigerant gas in the refrigerant cycle, oil lubrication will be insufficient and compressor burnout may occur, so take care to avoid this.
- (b) If the valve on the high pressure side is opened, refrigerant flows in the reverse direction and could cause the service can to rupture, so open and close the valve on the low pressure side only.
- (c) If the service can is inverted and refrigerant is loaded in a liquid state, the liquid is compressed and causes the compressor to break down, so the refrigerant must be in a gaseous state.
- (d) Be careful not to load too much refrigerant gas, as this causes trouble such as inadequate cooling, poor fuel economy, engine overheating, etc.

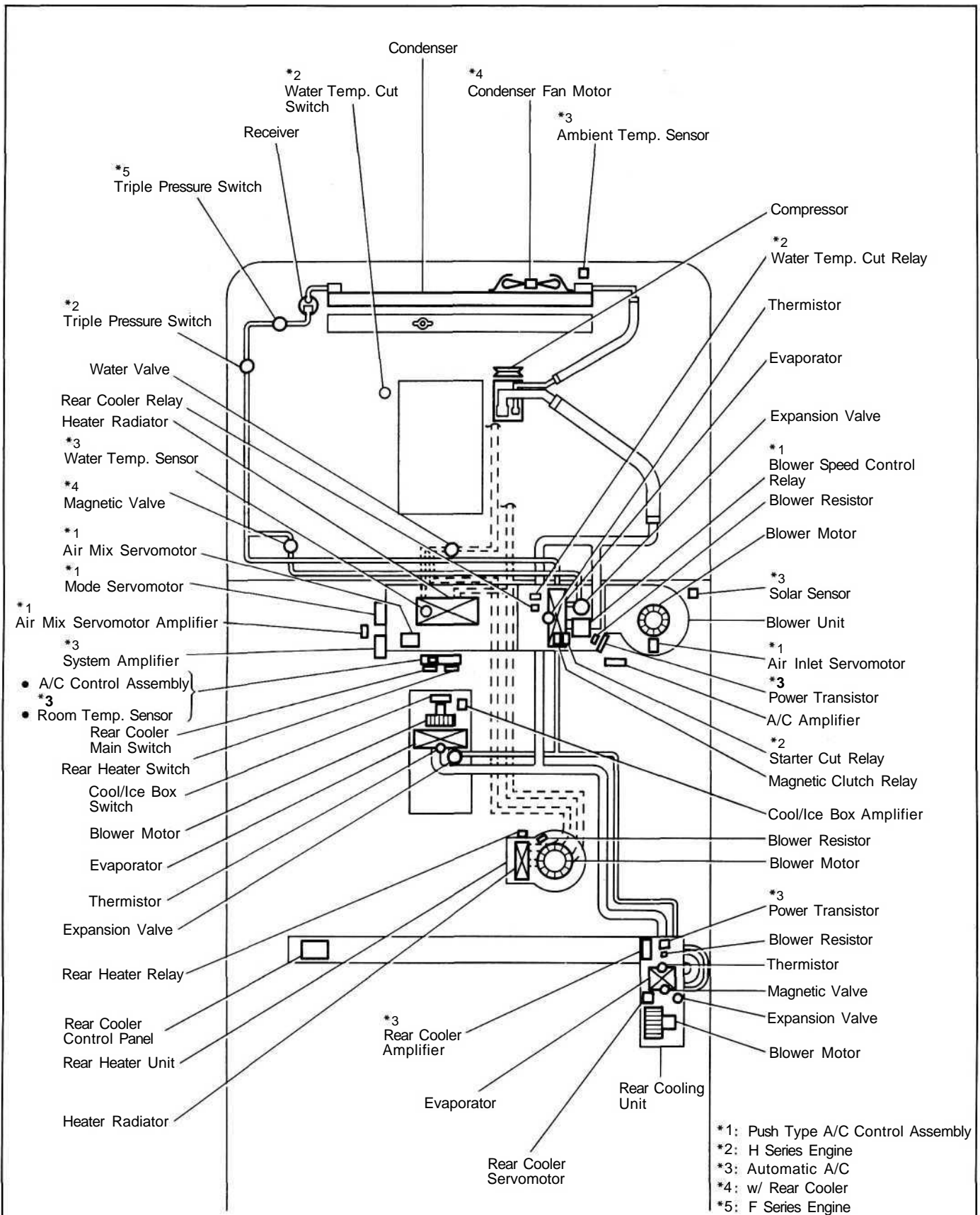


### 5. WHEN USING GAS-CYLINDER TYPE GAS LEAK TESTER;

- (a) As a naked flame is used, first make sure that there are no flammable substances nearby before using it.
- (b) Be careful, as a poisonous gas is produced when refrigerant gas comes in contact with heated parts.

## DESCRIPTION

## PARTS LOCATION



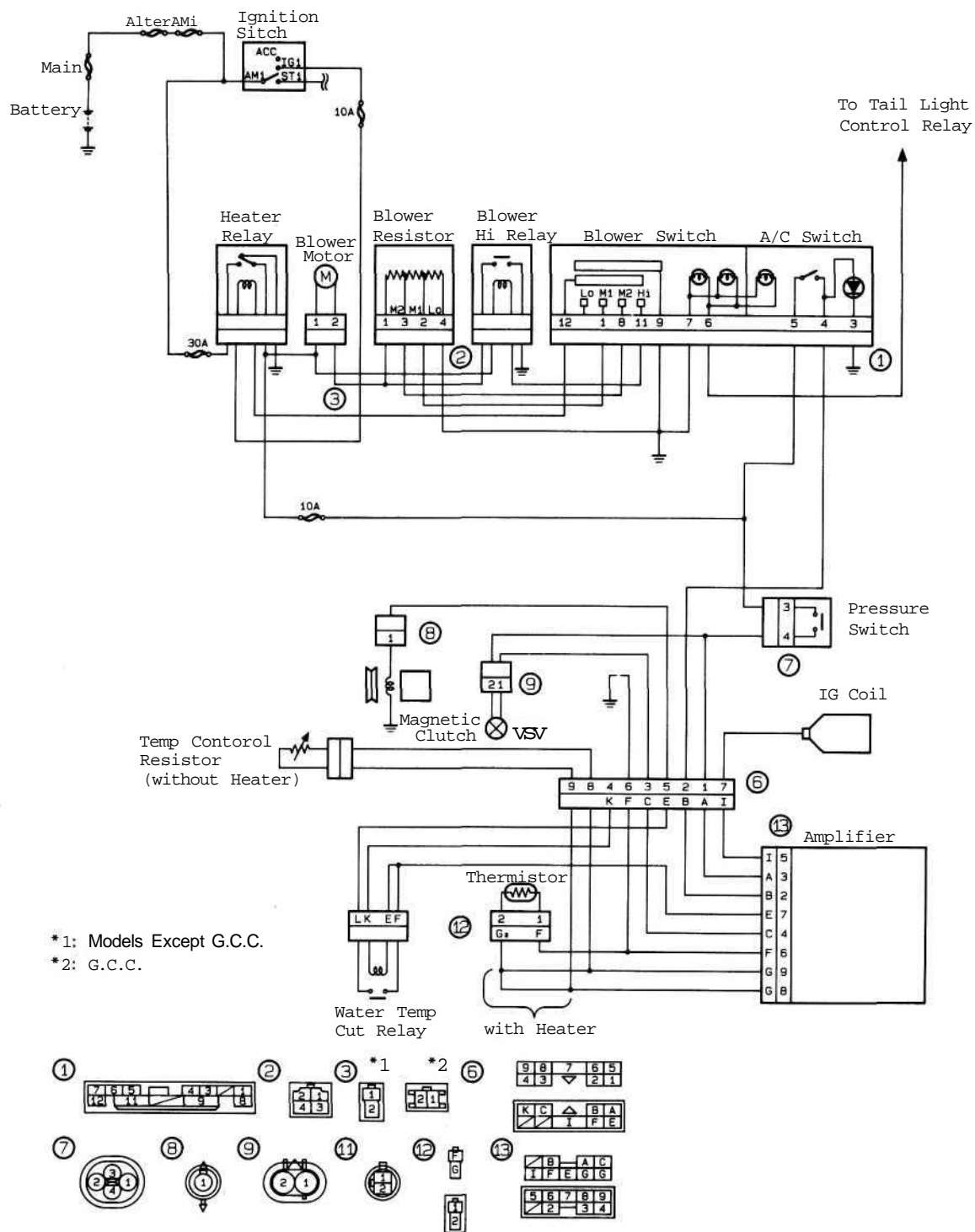


### SINGLE A/C (Lever Type A/C Control Assembly) 3F-E Engine



## SINGLE A/C (Lever Type A/C Control Assembly)

3F Engine



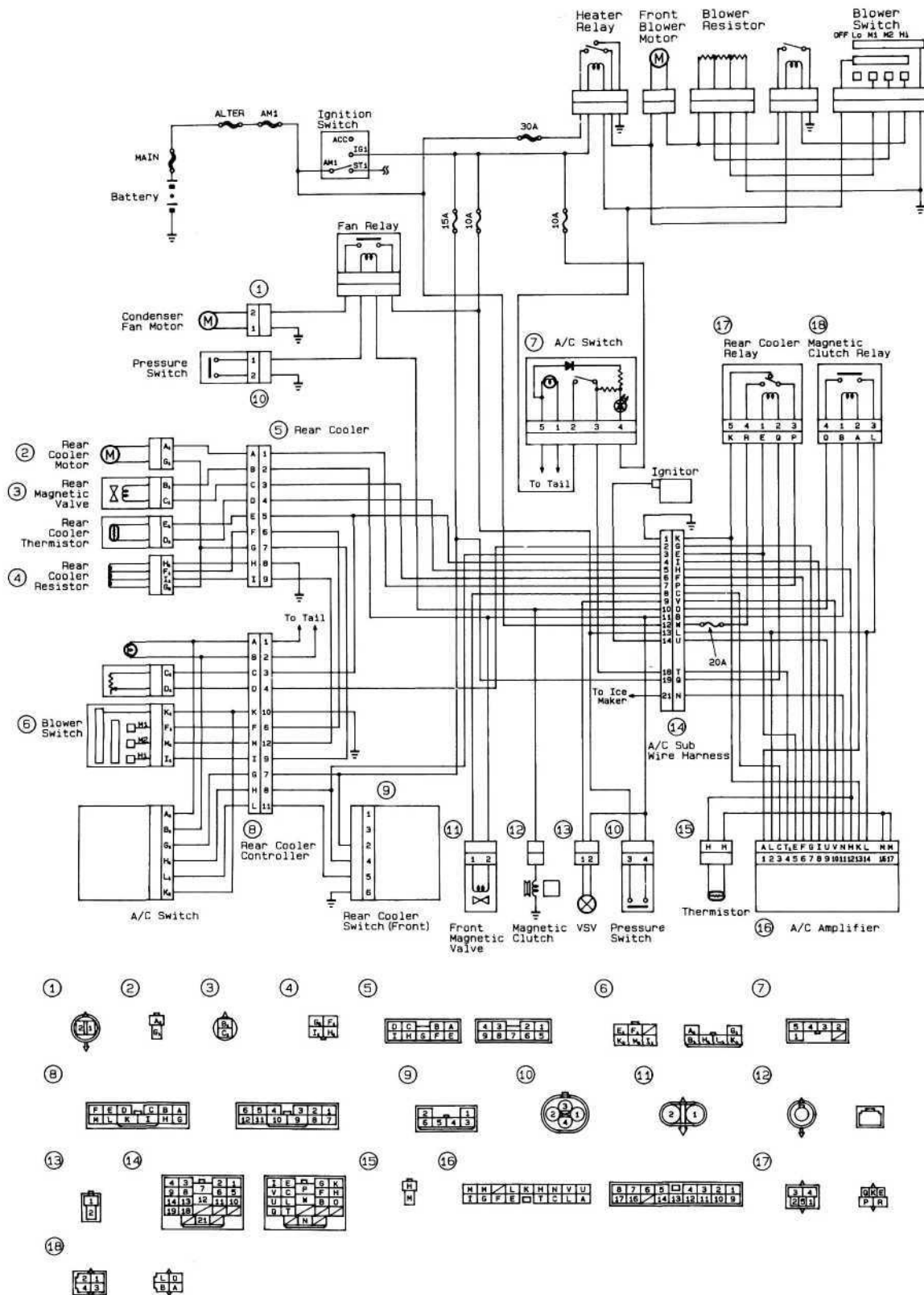
The diagram illustrates the electrical system for a vehicle, showing the following components and their connections:

- Power Sources:** Main Battery and Alter AM1 (Alternator).
- Ignition System:** Ignition Switch (ACC, AM1, ST1) connected to the battery and alternator.
- Heating System:** Heater Relay (30A) and Blower Motor (M) connected to the battery.
- Blower Control:** Blower Resistor (M2, M1, L2) and Blower Switch (LG, M1, M2, H1) connected to the blower motor.
- A/C System:** A/C Switch connected to the battery.
- Other Components:** Hi Relay, Variable Resistor (\*1), Pressure Switch, Water Temp Switch, Magnetic Clutch, VSV, Thermistor, Water Temp Relay, and Amplifier.

**Legend:**

- \*2: Models Except G.C.C.
- \*3: G.C.C.

# DUAL A/C (Lever Type A/C Control Assembly) 3F Engine



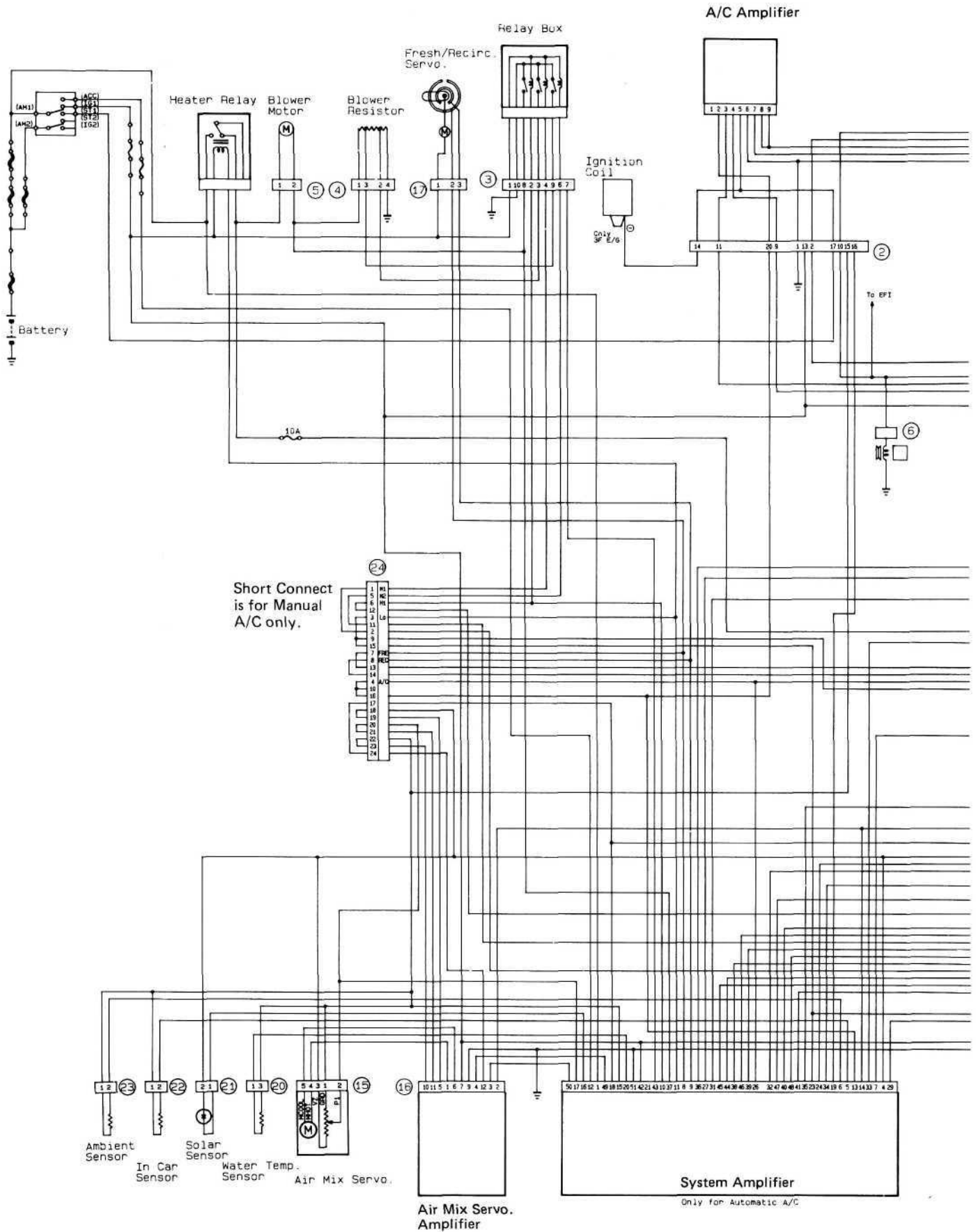
The diagram illustrates the electrical system for an air conditioning unit. Key components and their connections include:

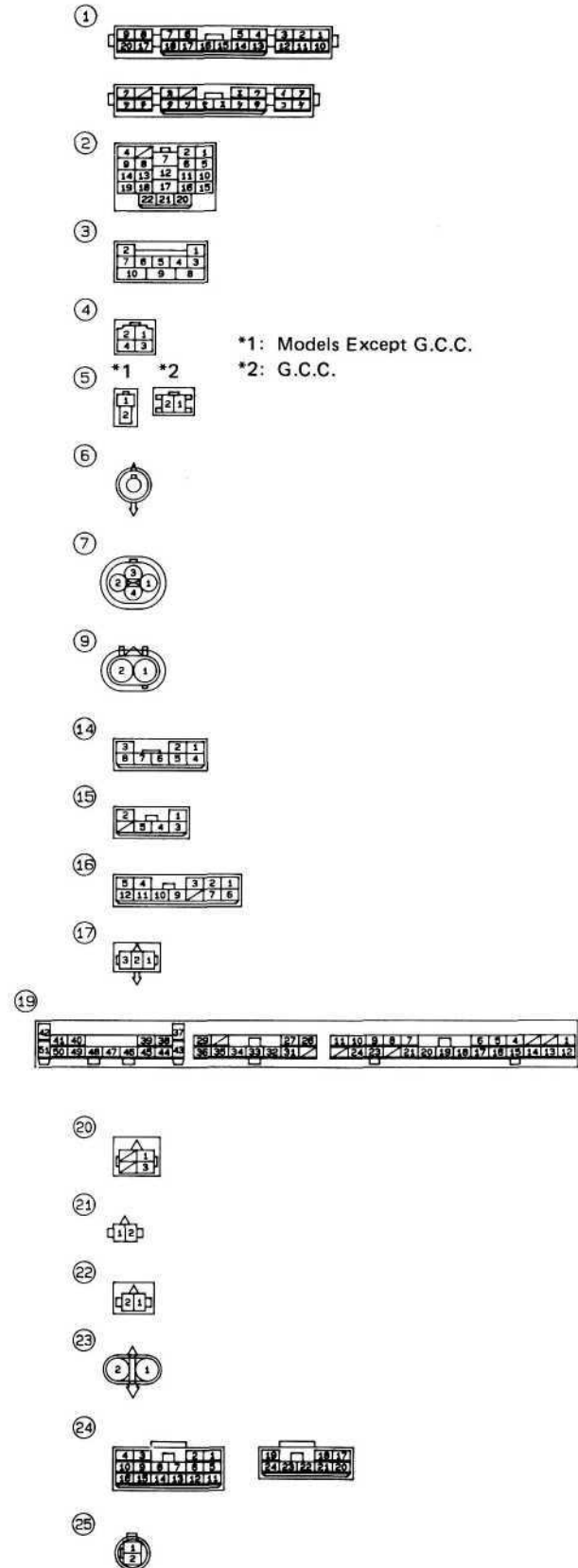
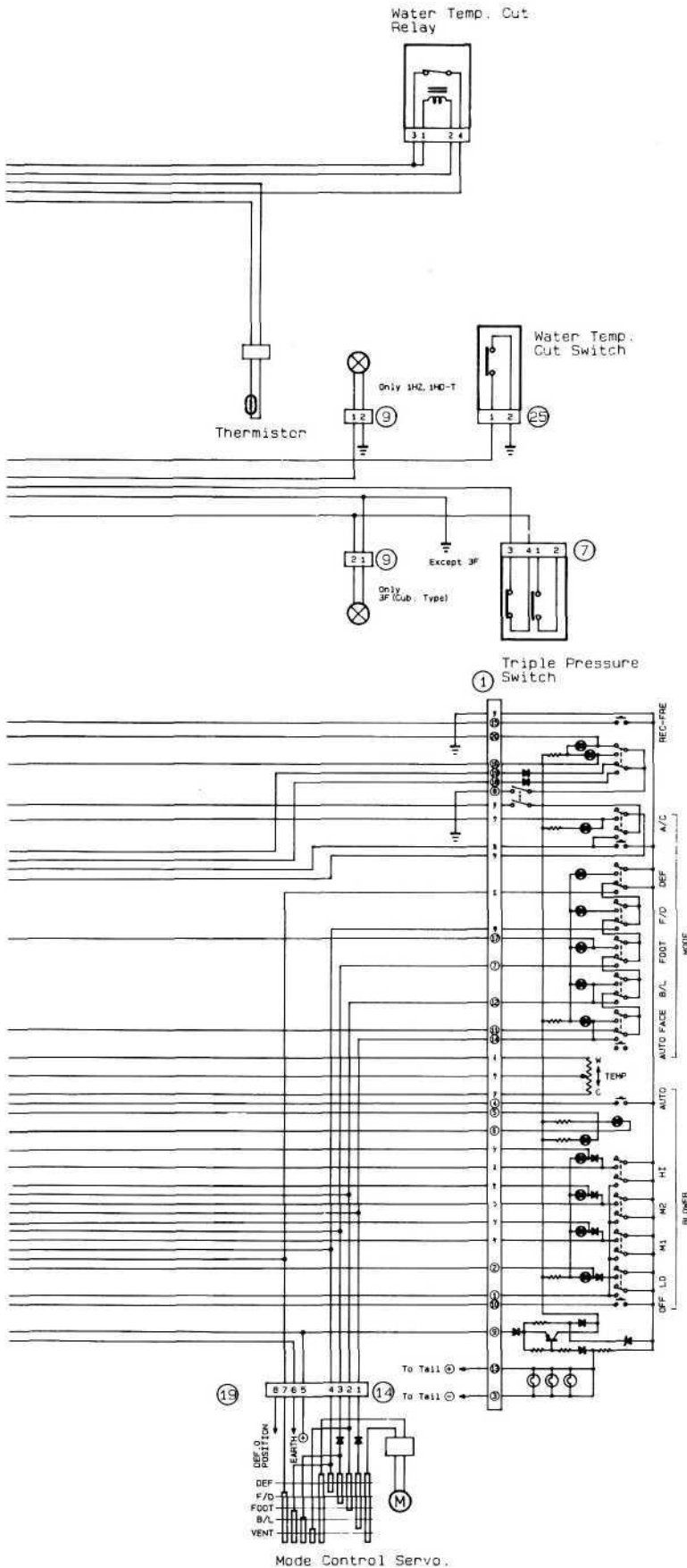
- Power Source:** BATTERY and MAIN, connected to the ALTERNATOR (ALTER) and AM1.
- Control Circuit:** Ignition Switch (ACC, AM1) controls the Fan Relay and the A/C Switch (7).
- Blower System:** Front Blower Motor (M) and Blower Resistor are controlled by the Blower Switch (6).
- Refrigerant System:** Rear Cooler Motor (M), Rear Magnetic Valve (3), Rear Cooler Thermostat (4), and Rear Cooler Resistor (4) are connected to the Rear Cooler Controller (8) and Rear Cooler Switch (Front) (9).
- Pressure and Temperature Sensing:** Pressure Switch (10), Water Temp. Switch (15), and Thermistor (16) provide feedback to the system.
- Relays and Switches:** Magnetic Clutch Relay (15), ST Cut Relay (19), Water Temp. Cut Relay (20), and A/C Sub Wire Harness (14) manage the high-voltage refrigerant circuit.
- Wiring Details:** The diagram shows specific wire colors and pin numbers for each component, such as 15A, 10A, and 30A for the main power lines.

**Legend:**

Number	Symbol	Pin Configuration
1	Pressure Switch	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
2	Rear Cooler Motor	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
3	Rear Magnetic Valve	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
4	Rear Cooler Thermostat	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
5	Rear Cooler Resistor	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
6	Blower Switch	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
7	A/C Switch	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
8	Rear Cooler Controller	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
9	Rear Cooler Switch (Front)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
10	Pressure Switch	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
11	Water Temp. Switch	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
12		

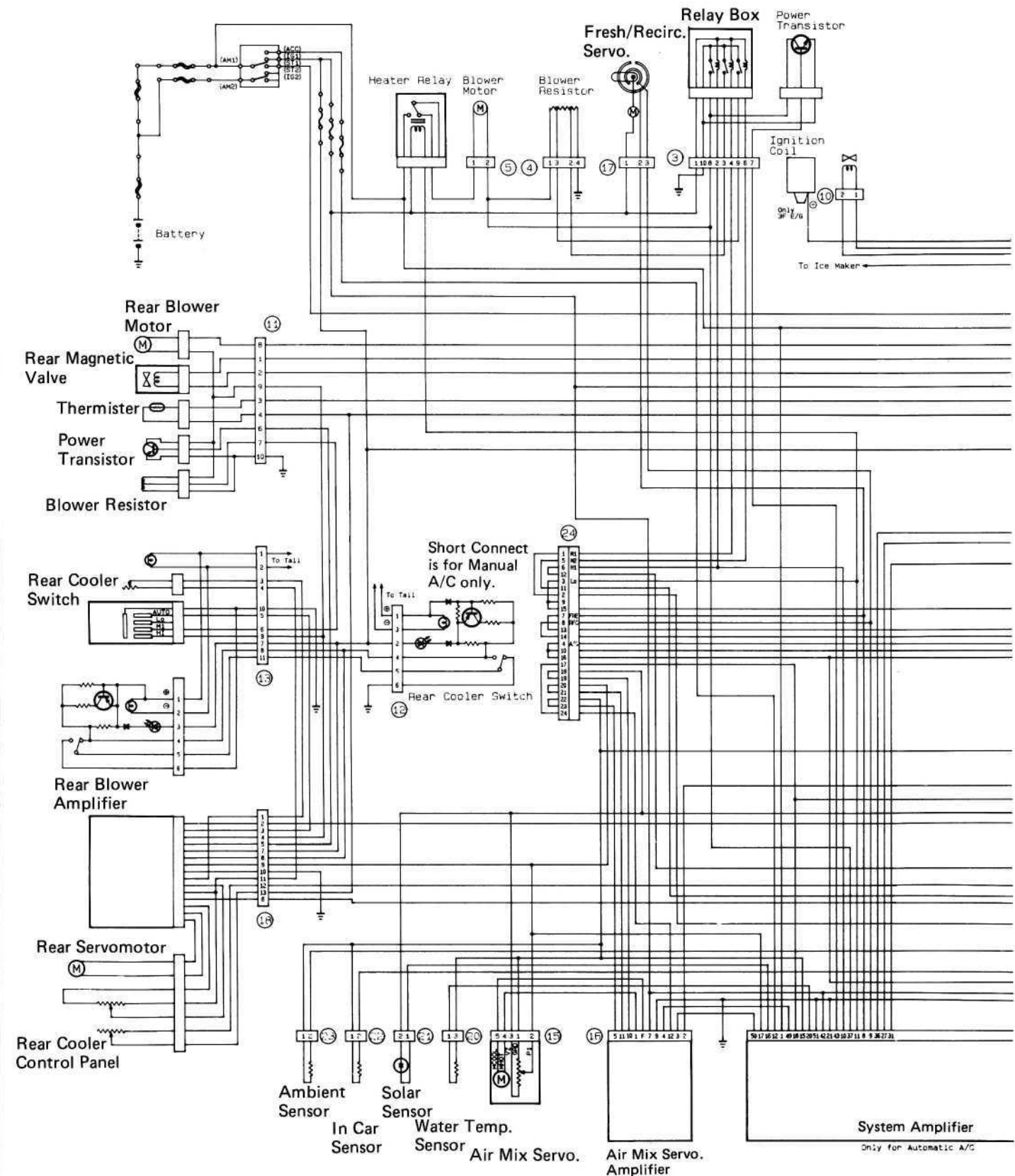
## SINGLE A/C (Push Type A/C Control Assembly)



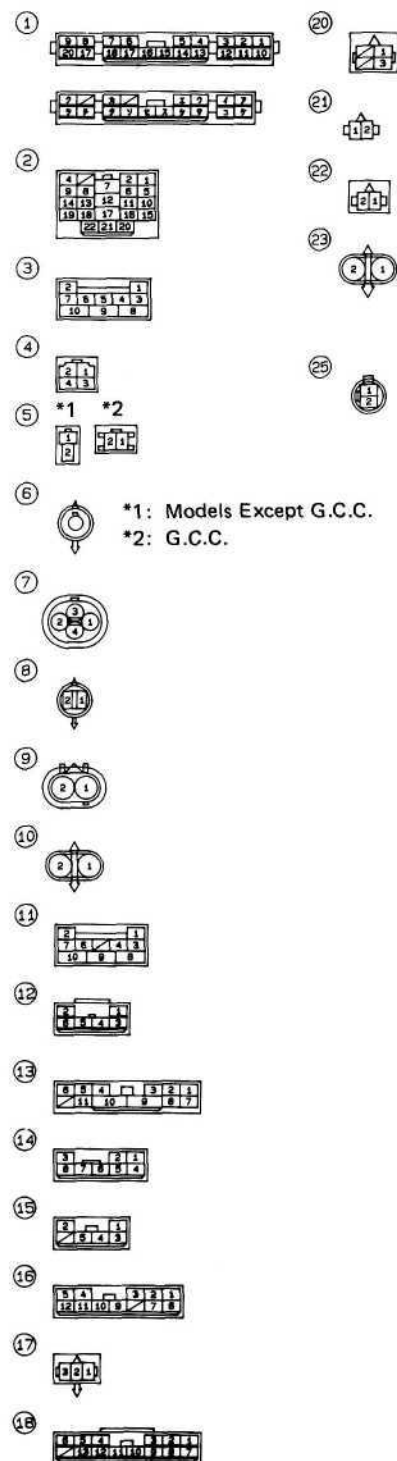
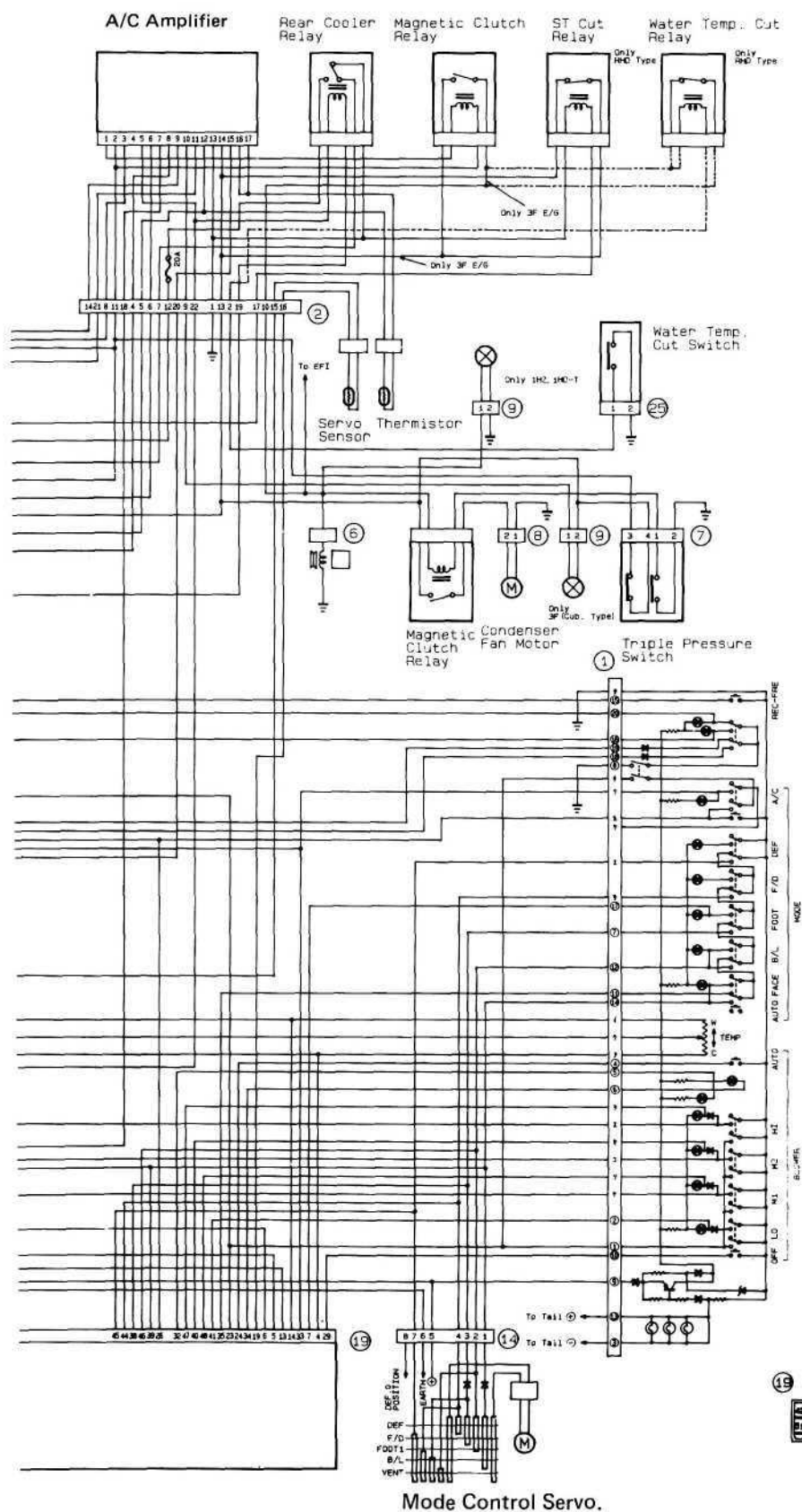


\*1: Models Except G.C.C.  
\*2: G.C.C.

## DUAL A/C (Push Type A/C Control Assembly)

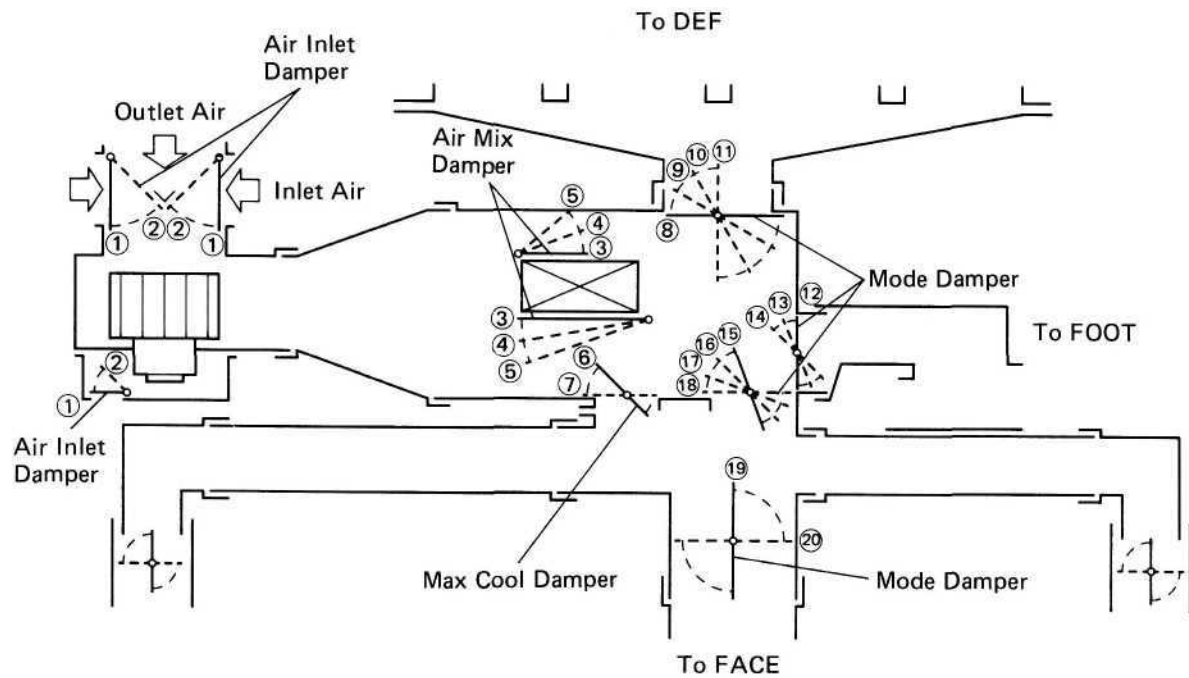














AC2660  
AC2661

## DAMPERS POSITION



A/C control lever	A/C control lever position	Dampers position	Air flow vents			
			FACE		FOOT	DEF
			Center	Side		
Air Inlet Control Lever	Fresh 	①	/	/	/	/
	Recirc 	②				
Temperature Control Lever	Warm 	③ ④ ⑦ ⑤ ⑥				
	Cool					
Mode Control Lever	Def. 	⑪ ⑫ ⑰ ⑳		○		○
	Foot/Def. 	⑩ ⑰ ⑳		○	○	○
	Foot 	⑨ ⑬ ⑰ ⑳		○	○	○
	Bi-Level 	⑧ ⑬ ⑯ ⑰	○	○	○	
	Face 	⑧ ⑭ ⑰	○	○		

The size of circle (○) indicates the proportion of the air flow volume.

## TROUBLESHOOTING

You will find the cause of 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 the part.

**(without Automatic A/C)**

See page	AC-23	AC-21	AC-25	AC-5 to 14	AC-5 to 14	AC-5 to 14	AC-68	AC-54	AC-68	AC-73	AC-72	AC-73	AC-74	AC-71
Parts Name	Inspect volume of refrigerant	Inspect refrigeration system with manifold gauge set	Inspect drive belt tension	Fusible link	Circuit breaker	Fuse	Triple pressure switch	Thermistor	Water temp. switch	Blower speed control relay	Heater relay	Magnetic clutch relay	CDS fan relay	Blower resistor
Trouble														
No blower operation				1	2					6	3			7
No blower control										2				3
No air flow mode control														
No air inlet control														
Insufficient flow of cool air											1			3
Insufficient flow of warm air											1			3
No cool air comes out	3	4	5			1	6	13				2		
Cool air comes out intermittently	1	2	3					5						
Cool air comes out only at high engine speed	2	3	1											
Insufficient cooling	1	2	3					14	7				6	
No warm air comes out														
Air temp. control not functioning														
*No engine idle up when A/C switch on														

\*: Models Expect 3F-E Engine

			2											Air inlet servomotor (Push type A/C control assembly)	AC-69
														Air mix servomotor (Push type A/C control assembly)	AC-69
												2		Mode servomotor (Push type A/C control assembly)	AC-70
				2									5	Blower motor	AC-70
														Conder fan motor (Dual A/C)	AC-71
													4	A/C control assembly	AC-56
														A/C amplifier	AC-77
														Compressor	AC-28
														Condenser	AC-43
														Evaporator	AC-52
														Expansion valve	AC-53
														Magnetic clutch	AC-28
														Receiver	AC-42
														Water valve	AC-58 or 65
														Heater radiator	—
														A/C Idle up VSV (Models except 3F-E engine)	AC-76
													7	Wiring or wiring connection	AC-5 to 14

## TROUBLESHOOTING (Cont'd)

You will find the cause of 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 the part.

**(with Automatic A/C)**

[illegible]

																	CDS fan relay	AC-74
																6	Blower resistor	AC-71
															2		Air inlet servomotor	AC-69
																	Air mix servomotor	AC-69
															2		Mode servomotor	AC-70
																5	Blower motor	AC-70
																	Condenser fan motor	AC-71
																4	A/C control assembly	AC-59
																	A/C amplifier	AC-77
																	System amplifier	AC-80
																	Compressor	AC-28
																	Condenser	AC-43
																	Evaporator	AC-52
																	Expansion valve	AC-53
																	Magnetic clutch	AC-28
																	Receiver	AC-42
																	Water valve	AC-65
																	Heater radiator	—
																	A/C Idle up VSV	AC-76
																	Wiring or wiring connector	AC-10 to 14

**PREPARATION****SPECIAL TOOLS AND EQUIPMENT**

<b>Tool</b>	<b>SST No.</b>	<b>Use</b>
Ohmmeter	—	To diagnosis electrical system
Voltage meter	—	To diagnosis electrical system
Air conditioner service tool set	07110-58011	To evacuate and charge system
Hexagon wrench set	07110-61050	To remove service valve and front housing
Magnetic clutch remover	07112-66040	To remove pressure plate
Magnetic clutch stopper	07112-76060	To remove pressure plate
Felt remover	07112-15020	To remove felt
Lip seal protector	07112-85010	To install shaft seal
Lip seal pressure	07112-85020	To install shaft seal
Seal plate remover	07112-85030	To remove shaft seal
Snap ring pliers	07114-84010	To remove shaft seal
Snap ring pliers	07114-84020	To remove magnetic clutch

**SSM (SPECIAL SERVICE MATERIALS)**

<b>Part Name</b>	<b>Part No.</b>	<b>Use etc.</b>
DENSO OIL 6, SUNISO No.5GS or equivalent	07117-68040 —	Compressor



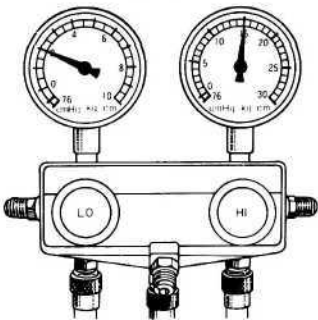
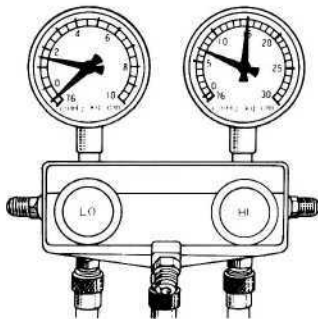
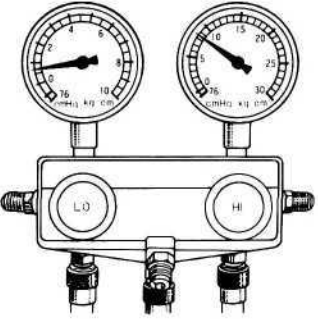
# REFRIGERATION SYSTEM

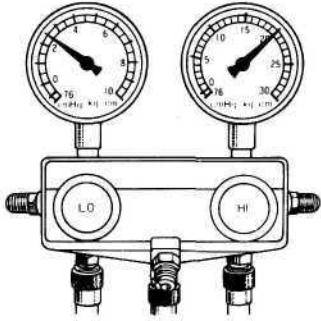
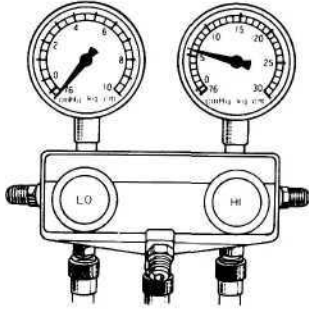
## INSPECTION OF REFRIGERATION SYSTEM WITH MANIFOLD GAUGE SET

This is a method in which the trouble is located by using a manifold gauge set. (See "Installation of Manifold Set" on page AC-24.) Read the manifold gauge pressure when the following conditions are established:

- Temperature at the air inlet with the switch set at RECIRC is 30 - 35°C (86 - 95°F)
- Engine running at 2,000 rpm
- Blower fan speed control switch set at high speed
- Temperature control switch set at max cool side

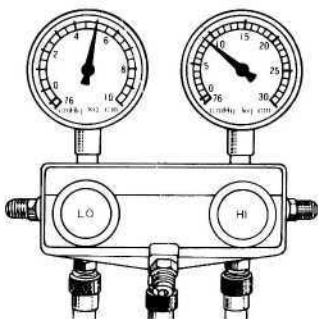
HINT: It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.

No.	Gauge reading kg/cm <sup>2</sup> (psi, kPa)	Condition	Probable cause	Remedy
1	LO: 1.5–2.0 (21–28, 147–196) HI: 14.5–15.0 (206–213, 1,422–1,471)  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 (3) Charge with refrigerant to proper amount
3	Pressure low at both low and high pressure sides  AC0069	<ul style="list-style-type: none"> <li>Insufficient cooling</li> <li>Bubbles seen in sight glass</li> </ul>	Insufficient refrigerant	(1) Using gas leak tester, check for leakage (2) Charge refrigerant to proper amount
		<ul style="list-style-type: none"> <li>Insufficient cooling</li> <li>Frost on tubes from receiver to unit</li> </ul>	Refrigerant flow obstructed by dirt in receiver	Replace receiver

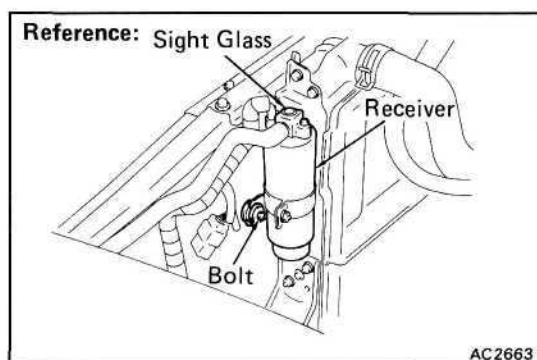
No.	Gauge reading kg/cm <sup>2</sup> (psi, kPa)	Condition	Probable cause	Remedy
4		Insufficient cooling	Insufficient cooling of condenser	(1) Clean condenser (2) Check fan motor operation
5			Refrigerant over charged	Check amount of refrigerant HINT: Vent out refrigerant through gauge manifold low pressure side by gradually opening valve
6			Air present in system	(1) Replace receiver (2) Check compressor oil to see if dirty or insufficient (3) Evacuate air and charge with new refrigerant
7		<ul style="list-style-type: none"> <li>• Insufficient cooling</li> <li>• Frost or large amount of dew on piping at low pressure side</li> </ul>	Expansion valve improperly mounted, heat sensing tube defective (Opens too wide)	(1) Check heat sensing tube installation condition (2) If (1) is normal, check expansion valve (3) Replace if defective
8	Vacuum indicated at low pressure side, very low pressure indicated at high pressure.  	<ul style="list-style-type: none"> <li>• Does not cool (Cools from time to time in some cases)</li> <li>• Frost or dew seen on piping before and after receiver or expansion valve</li> </ul>	Refrigerant does not circulate	Allow to stand for some time and then restart operation to determine if trouble is caused by moisture or dirt If caused by moisture refer to procedures step 2 on page AC-21 If caused by dirt, remove expansion valve and clean off dirt by blowing with air. If not able to remove dirt, replace valve Evacuate air and charge with new refrigerant to proper amount For gas leakage from heat sensing tube, replace expansion valve

## HINT at No.6

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

No.	Gauge reading kg/cm <sup>2</sup> (psi, kPa)	Condition	Probable cause	Remedy
9	Pressure too high at low pressure side, pressure too low at high pressure side 	Does not cool	Insufficient compression	Repair or replace compressor

AC0157



AC2663

## INSPECTION OF REFRIGERANT VOLUME

1. RUN ENGINE AT APPROX. 1,500 RPM
2. OPERATE A/C AT MAXIMUM COOLING FOR A FEW MINUTES
3. INSPECT AMOUNT OF REFRIGERANT  
Observe the sight glass on the liquid tube.

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	Check for gas leakage with gas leak tester
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	Evacuate and charge system. Then check for gas leakage with gas leak tester
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	Discharge excess refrigerant to specified amount
6	When air conditioner is turned off, refrigerant foams and then stays clear	Proper	

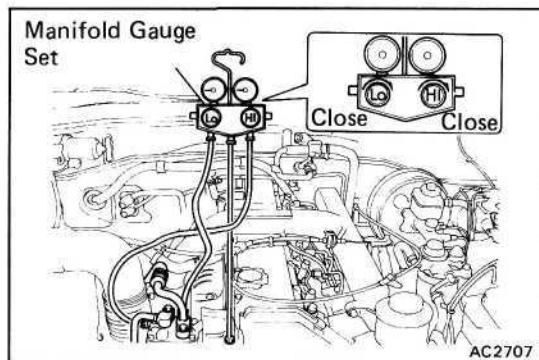
\*: Bubbles in the sight glass with ambient temperatures higher can be considered normal if cooling is sufficient.

## DISCHARGING OF REFRIGERANT IN REFRIGERATION SYSTEM

(See Air Conditioning Fundamentals and Repairs Pub. No. 36950E)

## EVACUATING OF AIR IN REFRIGERATION SYSTEM AND CHARGING WITH REFRIGERANT

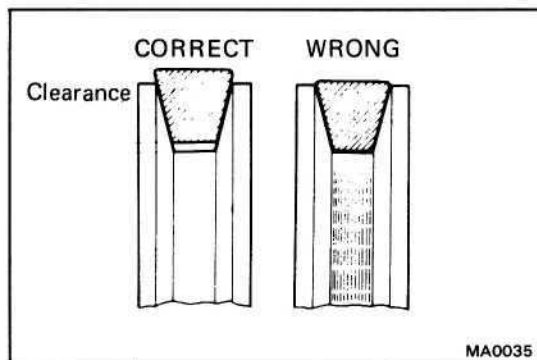
(See Air Conditioning Fundamentals and Repairs Pub. No. 36950E)



### INSTALLATION OF MANIFOLD GAUGE SET

1. CLOSE BOTH HIGH AND LOW HAND VALVES
2. CONNECT CHARGING HOSES TO CHARGING VALVES
  - (a) Connect the low pressure hose to the low pressure charging valve and the high pressure hose to the high pressure charging valve.
  - (b) Tighten the hose nuts by hand.

**NOTICE:** Do not apply compressor oil to the seats of the connection.



## DRIVE BELT

### ON-VEHICLE INSPECTION

#### 1. MAKE SURE THAT DRIVE BELT IS INSTALLED CORRECTLY

Visually check the belt for cracks, oiliness or wear. Check that the belt does not touch the bottom of the pulley groove.

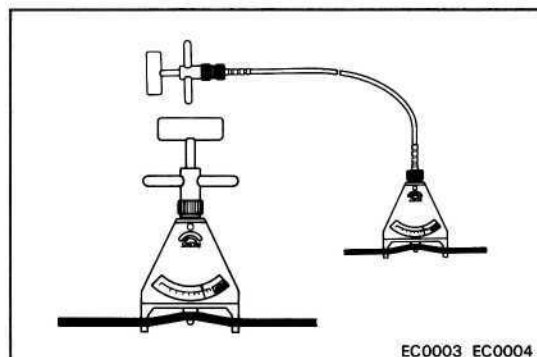
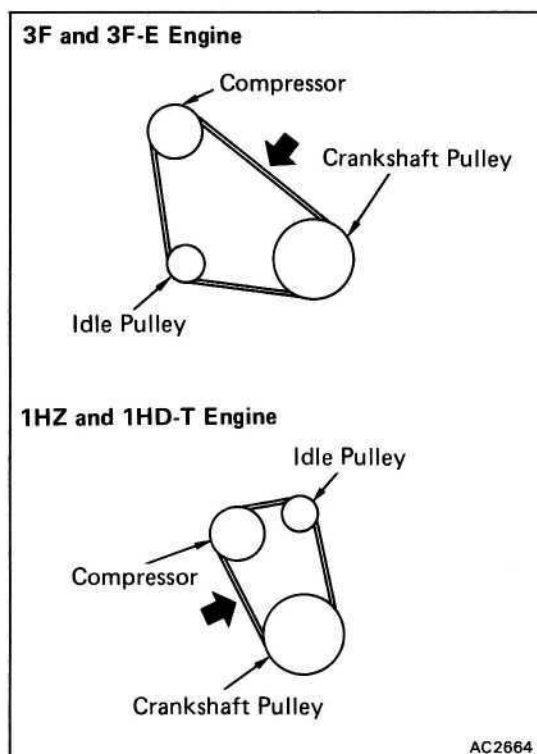
#### 2. INSPECT DRIVE BELT TENSION

Drive belt tension at 10 kg (22.0 lb, 98N):

New belt	HZ and HD Series Engine	12 - 16 mm (0.47 - 0.63 in.)
		F Series Engine
Used belt	HZ and HD Series Engine	11 - 15 mm (0.43 - 0.59 in.)
		F Series Engine
		15 - 21 mm (0.59 - 0.83 in.)

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



#### (Reference)

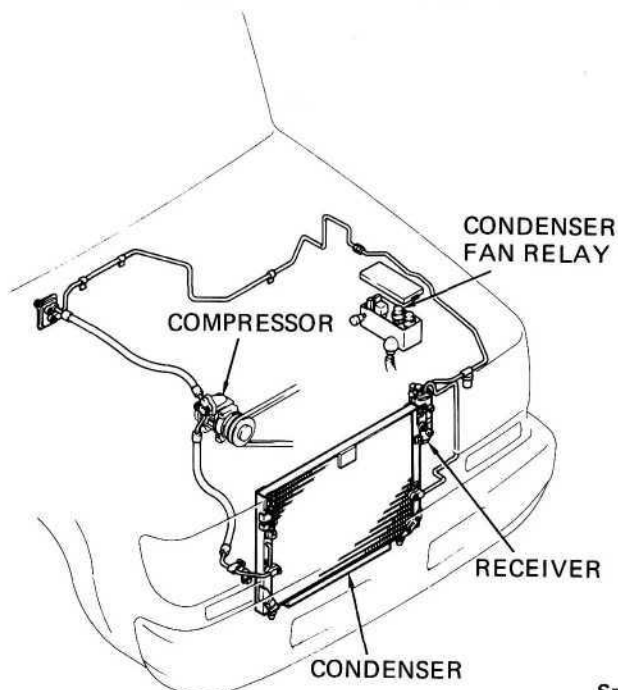
Using SST, check the drive belt tension.

SST 09216-00020 and 09216-00030

New belt	40 - 60 kg
Used belt	20 - 40 kg

## REFRIGERATION LINES TIGHTENING

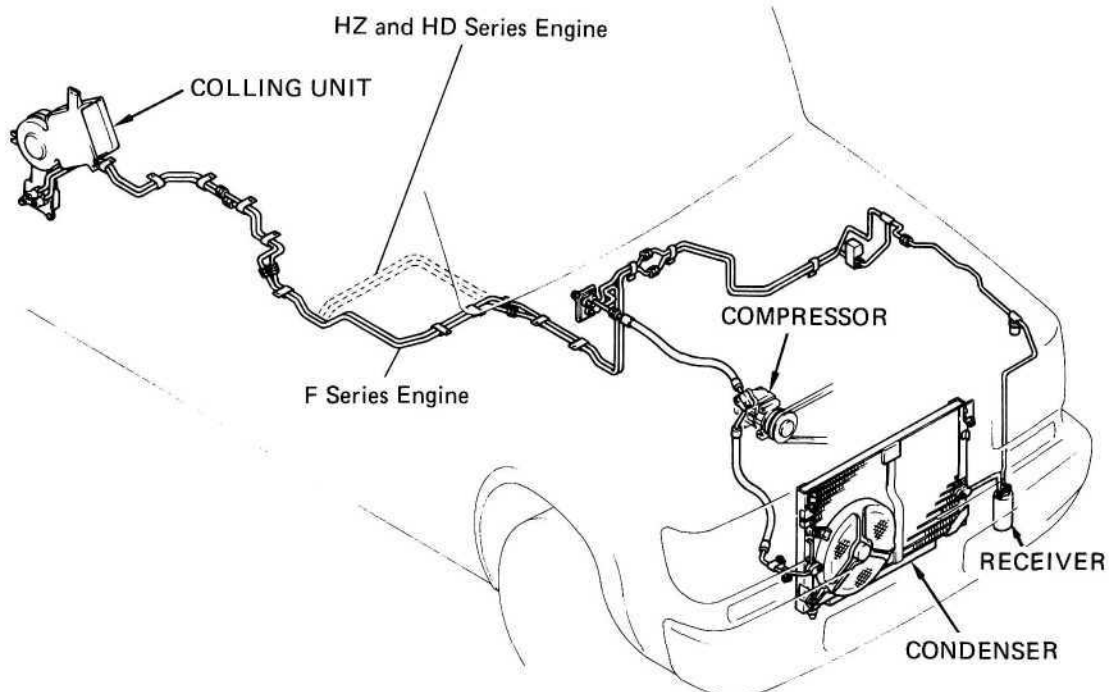
### SINGLE A/C

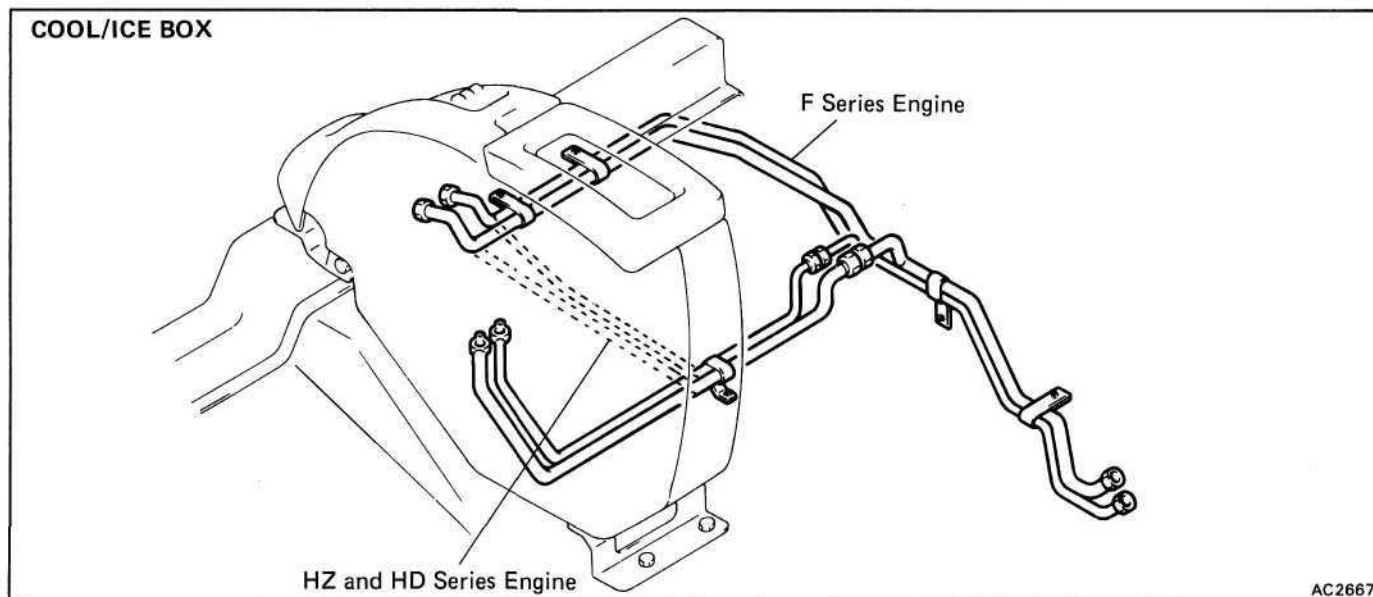


Specified Torque: kg-cm (ft-lb, N-m)

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

### DUAL A/C





### On-Vehicle Inspection

1. **INSPECT HOSE AND TUBE CONNECTIONS FOR LOOSENESS**
2. **INSPECT HOSES AND TUBES FOR LEAKAGE**  
Using a gas leak tester, check for leakage of refrigerant.

### Replacement of Refrigerant Lines

1. **DISCHARGE REFRIGERANT IN REFRIGERATION SYSTEM**  
See page AC-24.
2. **REPLACE FAULTY TUBE OR HOSE**  
HINT: Cap the open fittings immediately to keep moisture or dirt out of the system.
3. **TORQUE CONNECTIONS TO SPECIFIED TORQUE**  
**NOTICE:** Connections should not be torqued tighter than the specified torque.
4. **EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT**

#### Specified amount:

Single A/C	900 ± 50 g (31.74 ± 1.76 oz)
Dual A/C [G.C.C.]	1,500 ± 50 g (52.91 ± 1.76 oz)
	[Models Except G.C.C.]
	1,350 ± 50 g (47.61 ± 1.76 oz)
Dual A/C + Cool/Ice Box [G.C.C.]	1,600 ± 50 g (56.43 ± 1.76 oz)
	[Models Except G.C.C.]
	1,500 ± 50 g (52.91 ± 1.76 oz)

5. **INSPECT FOR LEAKAGE OF REFRIGERANT**  
Using a gas leak tester, check for leakage of refrigerant.
6. **INSPECT AIR CONDITIONER OPERATION**

## COMPRESSOR

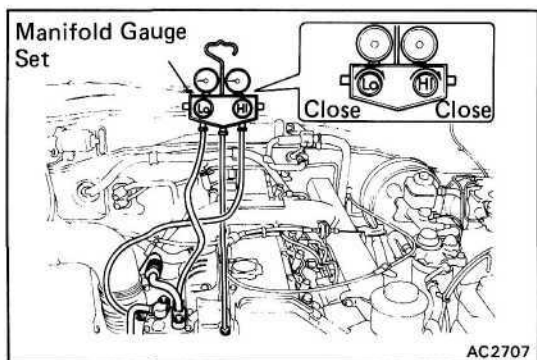
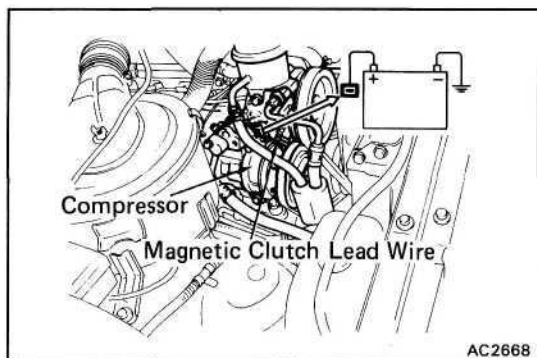
### ON-VEHICLE INSPECTION

#### (Magnetic Clutch)

##### INSPECT MAGNETIC CLUTCH FOR FOLLOWING

- (a) Inspect the pressure plate and the rotor for signs of oil.
- (b) Check the clutch bearings for noise and grease leakage.
- (c) Connect the positive (+) lead from the battery to the terminal on the magnetic clutch connector and the negative (—) lead to the body ground.
- (d) Check that the magnetic clutch is energized.

If the magnetic clutch is not energized, replace the magnetic clutch.



#### (Compressor)

##### 1. INSTALL MANIFOLD GAUGE SET

See page AC-24

##### 2. RUN ENGINE AT APPROX. 2,000 RPM

##### 3. INSPECT COMPRESSOR FOR FOLLOWING

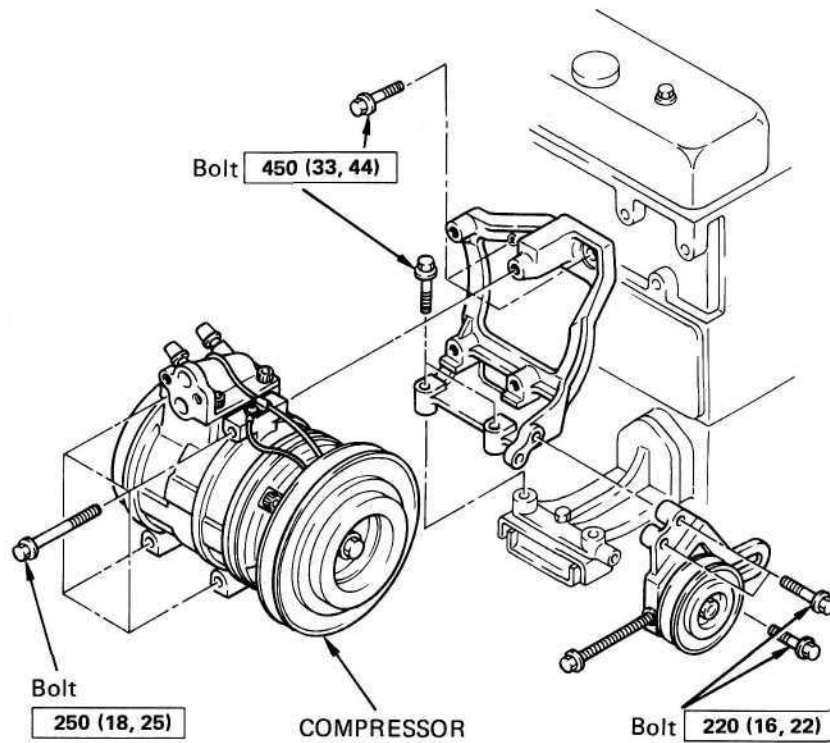
- (a) High pressure gauge reading is not lower and low pressure gauge reading is not higher than normal.
- (b) Check that the metallic sound.
- (c) Check that the leakage from shaft seal.

If defects are found, replace the compressor.

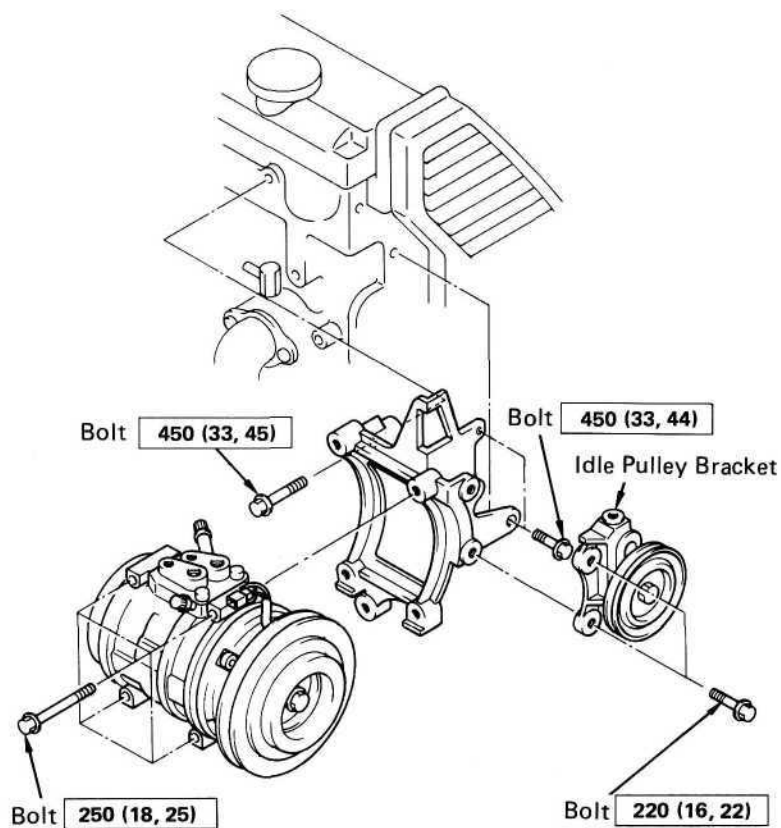


## REMOVAL OF COMPRESSOR

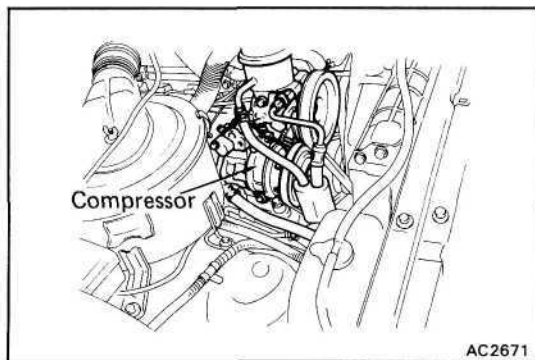
## 3F and 3F-E ENGINE



## 1HZ and 1HD-T ENGINE



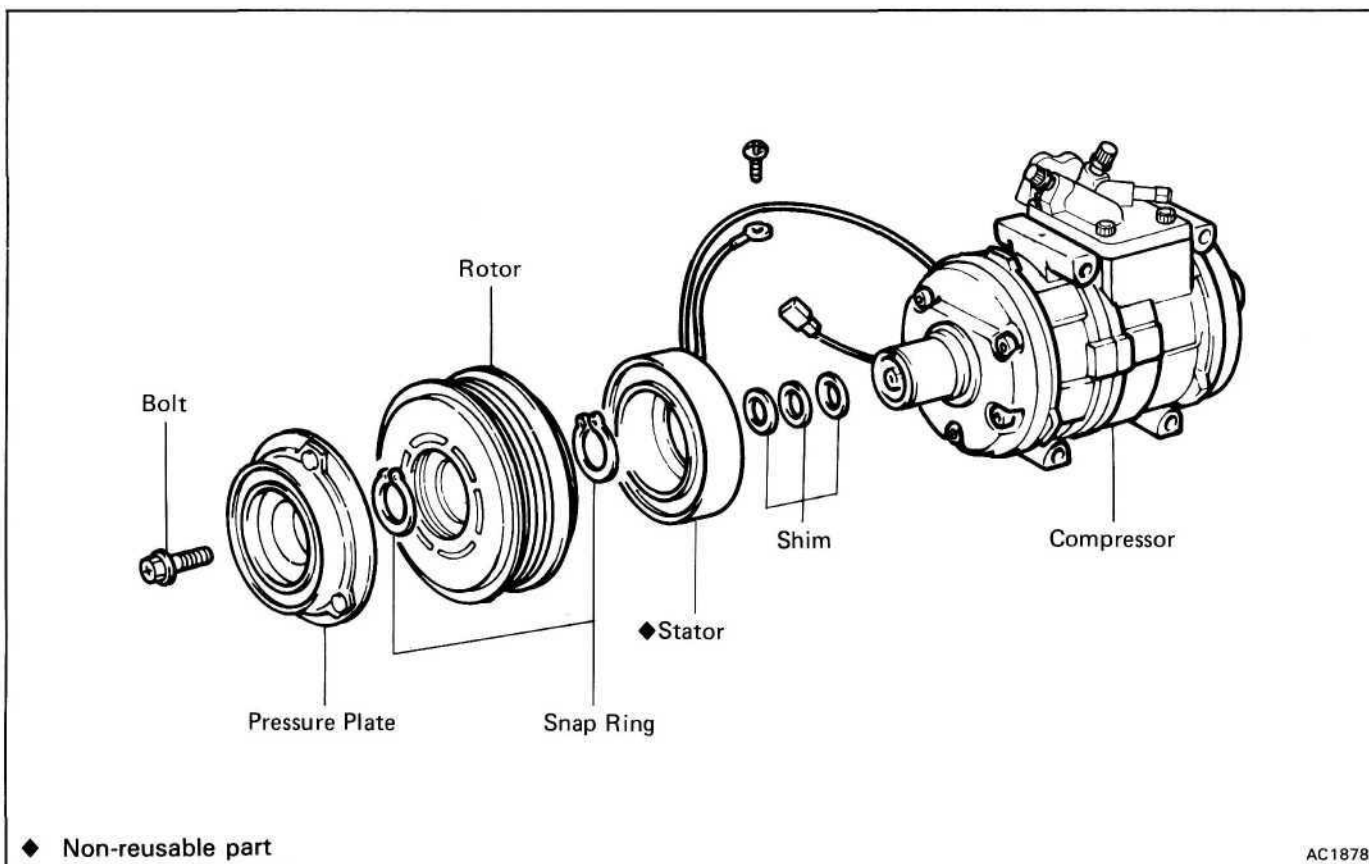
kg-cm (ft-lb, N·m) : Specified torque



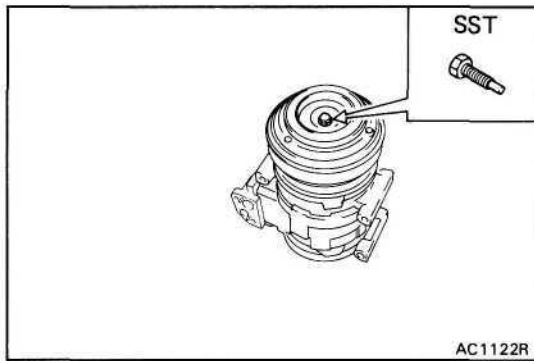
1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR TEN MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE CABLE FROM BATTERY
4. REMOVE UNDER COVER
5. DISCONNECT CONNECTOR FROM MAGNETIC CLUTCH
6. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
7. DISCONNECT TWO HOSES FROM COMPRESSOR SERVICE VALVES

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

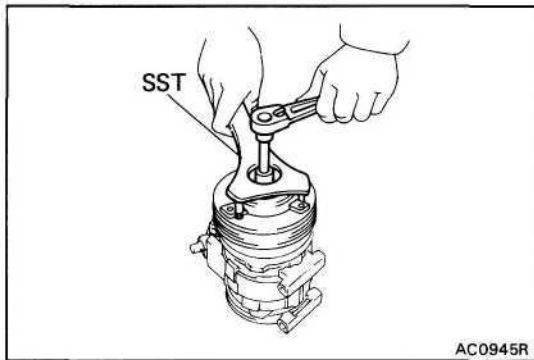
### DISASSEMBLY OF MAGNETIC CLUTCH



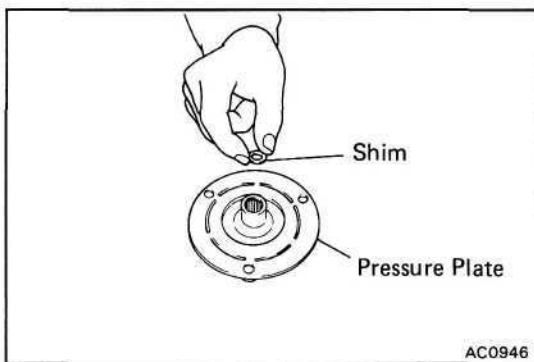
1. REMOVE PRESSURE PLATE
  - (a) Using SST and a socket, remove the shaft bolt.  
SST 07112-76060



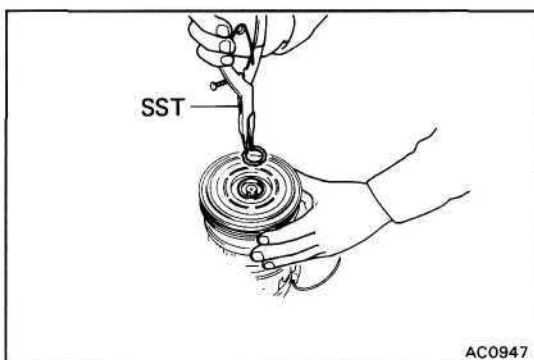
- (b) Install SST to the pressure plate.  
SST 07112-66040



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

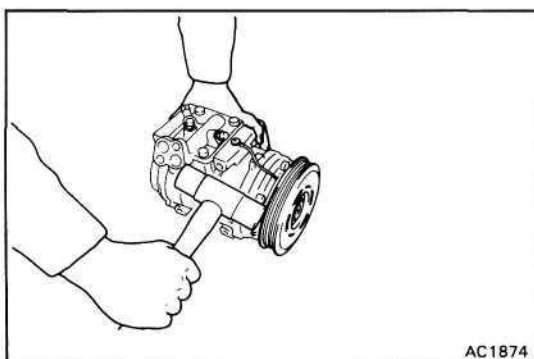


- (d) Remove the shims from the pressure plate.

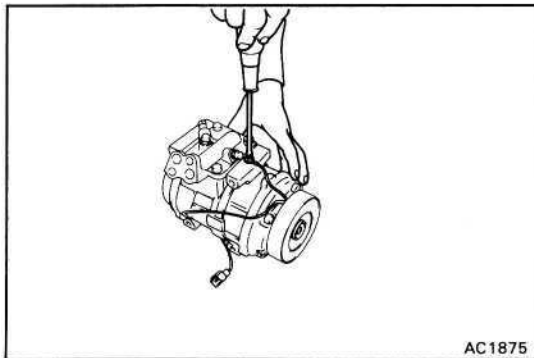


## 2. REMOVE ROTOR

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

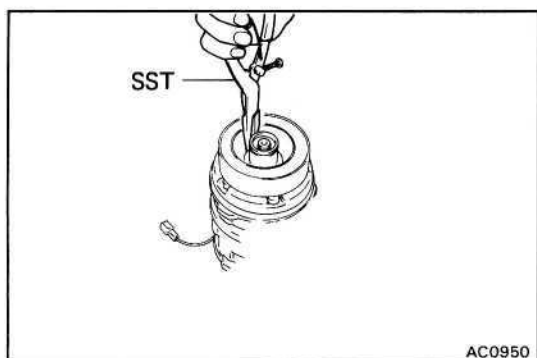


- (b) Using a plastic hammer, tap the rotor off the shaft.  
**NOTICE:** Be careful not to damage the pulley when tapping on the rotor.

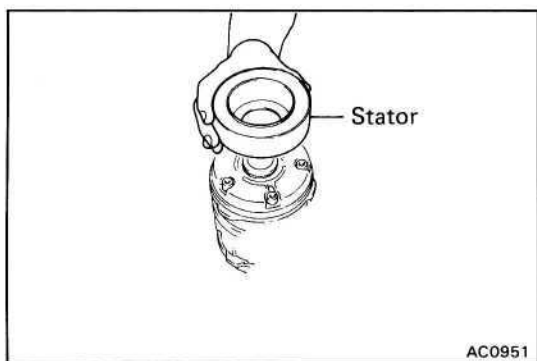


### 3. REMOVE STATOR

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

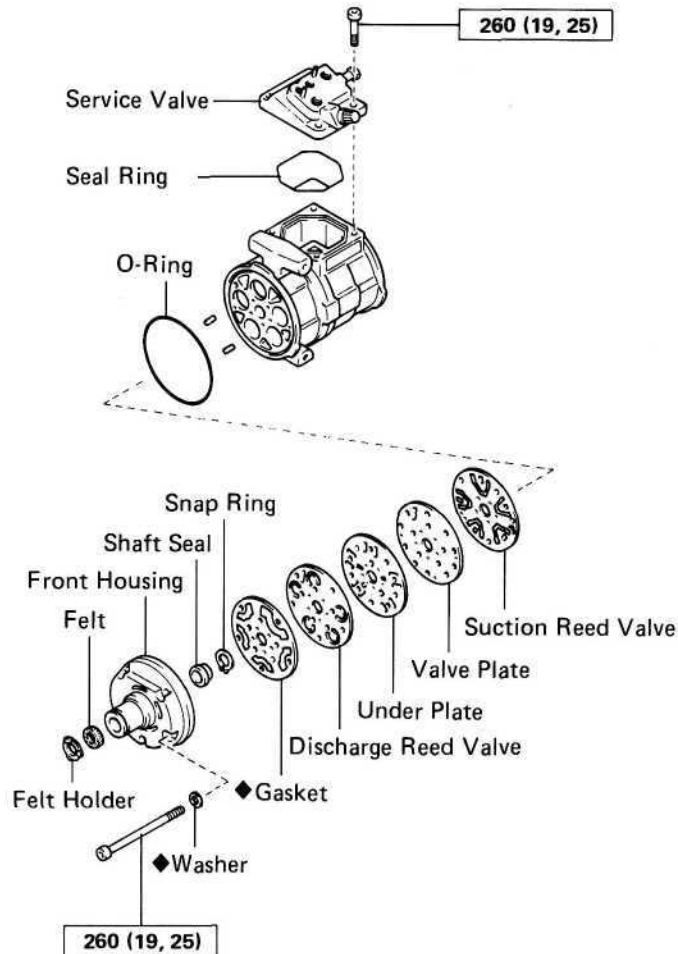


- (b) Using SST, remove the snap ring.  
SST 07114-84020

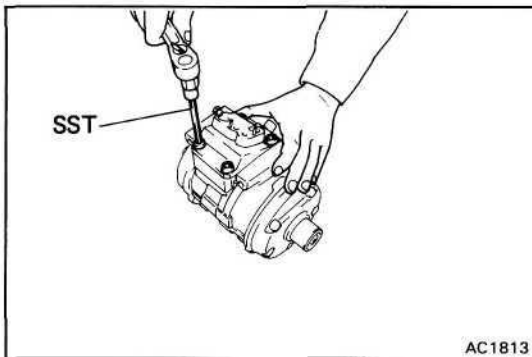


- (c) Remove the stator.

## REPLACEMENT OF SHAFT SEAL



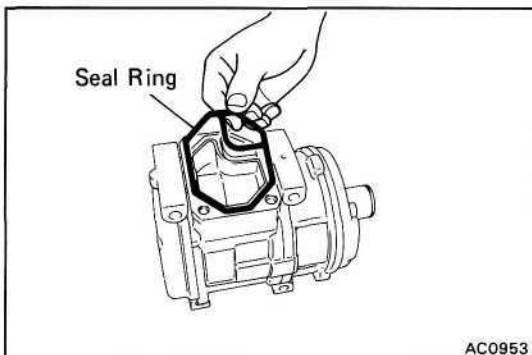
AC2768



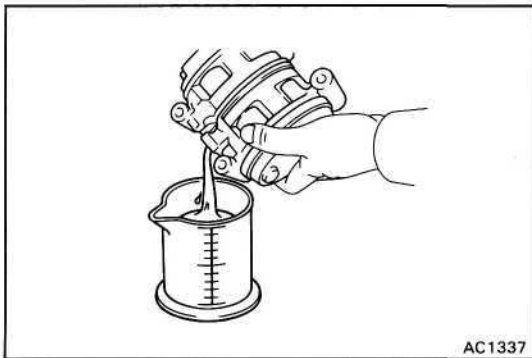
## 1. REMOVE SERVICE VALVE

- (a) Using SST, remove four bolts holding the service valve.

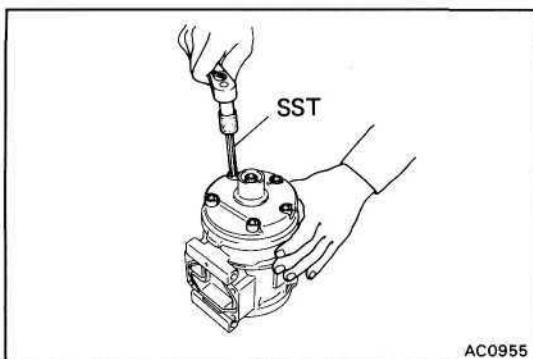
SST 07110-61050



- (b) Remove the seal ring from the cylinder block.  
Discard the seal ring.

**2. DRAIN COMPRESSOR OIL INTO MEASURING FLASK**

Measure the quantity of drained oil because the same amount should be replaced later.

**3. REMOVE FRONT HOUSING**

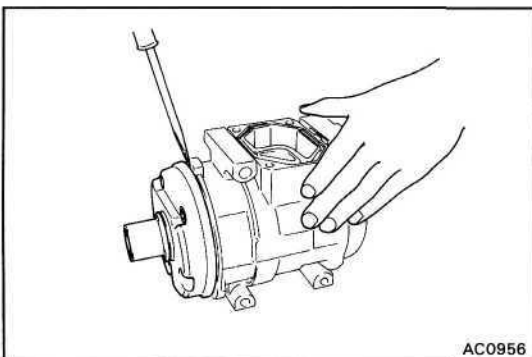
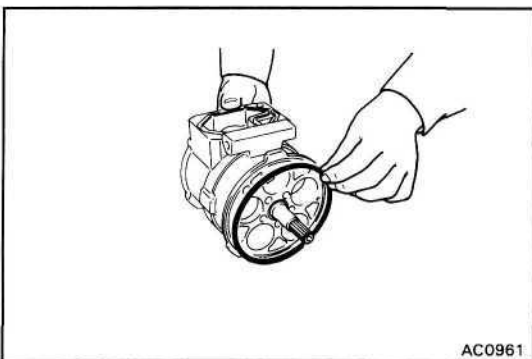
(a) Using SST, remove five through bolts.

HINT: Do not reuse five washers.

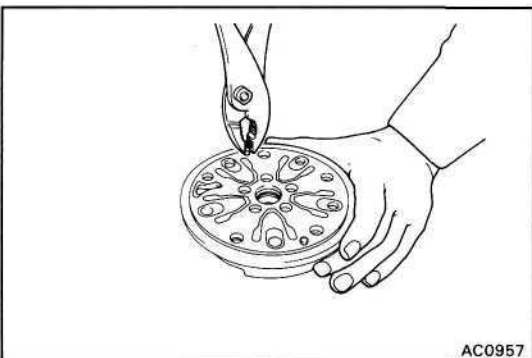
SST 07110-61050

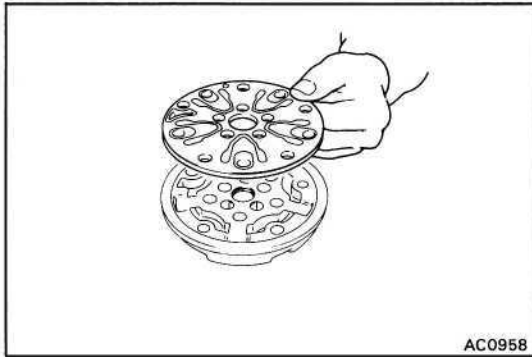
(b) Using a screwdriver, remove the front housing.

**NOTICE:** Be careful not to scratch the sealing surface of the front housing.

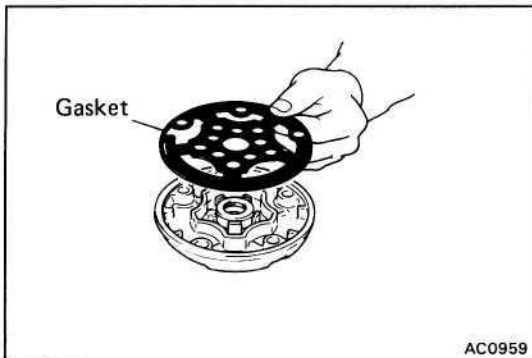
**4. REMOVE O-RING****5. REMOVE FRONT VALVE PLATE**

(a) Remove two pins from the front housing. Discard the pins.

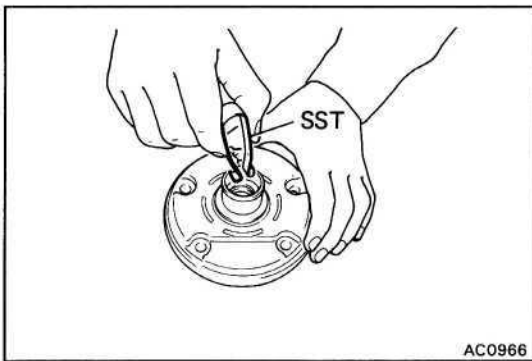




(b) Remove the front valve plate with reed valves.

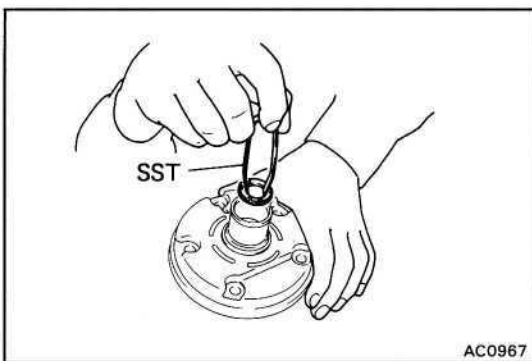


## 6. REMOVE GASKET

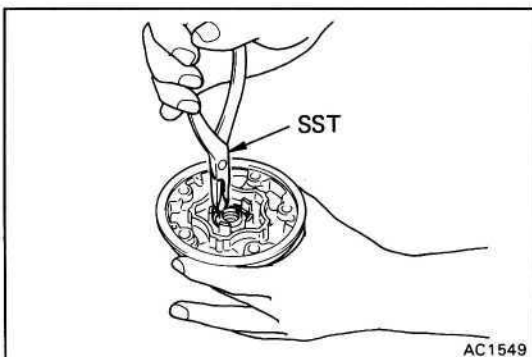


## 7. REMOVE FELT

(a) Set SST on the felt.  
SST 07112-15020

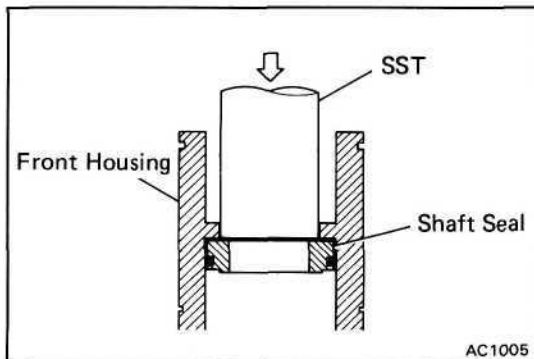


(b) Pull the felt with felt holder out of front housing.  
SST 07112-1 5020



## 8. REMOVE SHAFT SEAL

(a) Using SST, remove the snap ring from the front housing.  
SST 07114-84010



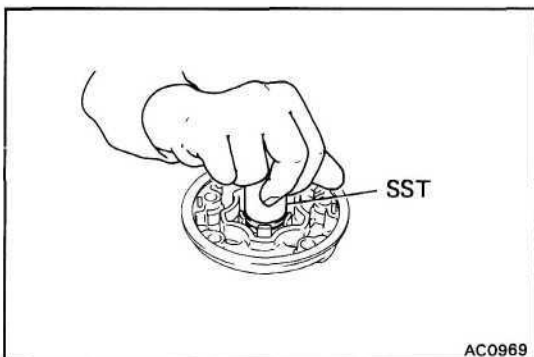
(b) Set SST on the shaft seal.

SST 07112-85030



(c) Using SST, put the shaft seal out of the front housing.

SST 07112-85030

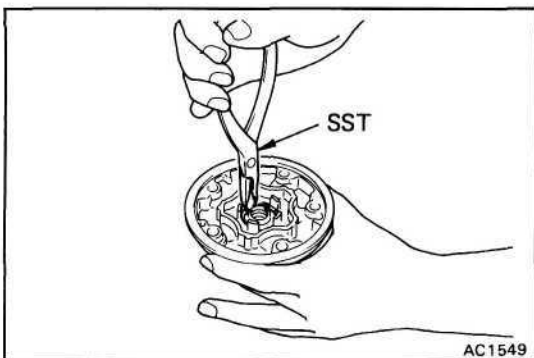


## 9. INSTALL SHAFT SEAL

(a) Fit shaft seal on SST, and install the shaft seal into the front housing.

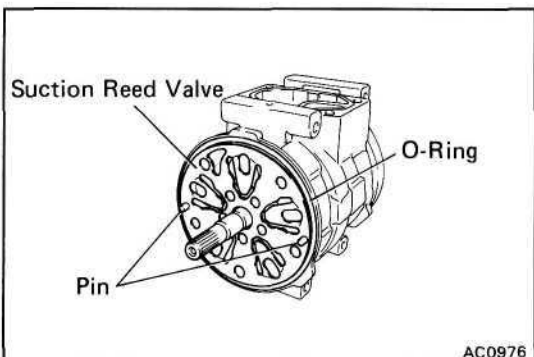
SST 07112-85020

HINT: Clean up the surface of the shaft seal with compressor oil.



(b) Using SST, install the snap ring into the front housing.

SST 07114-84010



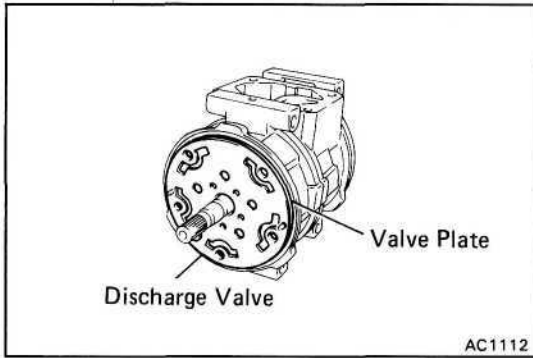
## 10. INSTALL FRONT VALVE PLATE ON FRONT CYLINDER

(a) Install two pins in the front cylinder.

(b) Lubricate a new O-ring with compressor oil and install it in the front housing.

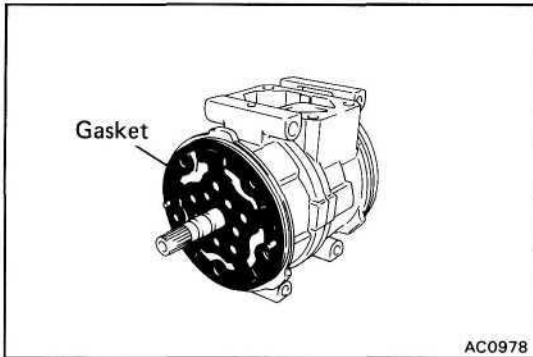
(c) Install the front suction reed valve over the pins on the front cylinder.



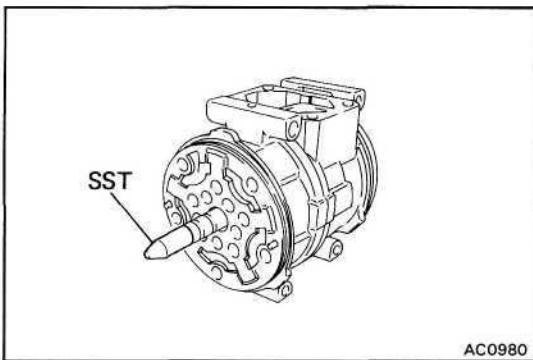


- (d) Install the front valve plate with the discharge reed valve over the pins on the front cylinder.

HINT: The front valve plate is marked with an "F".



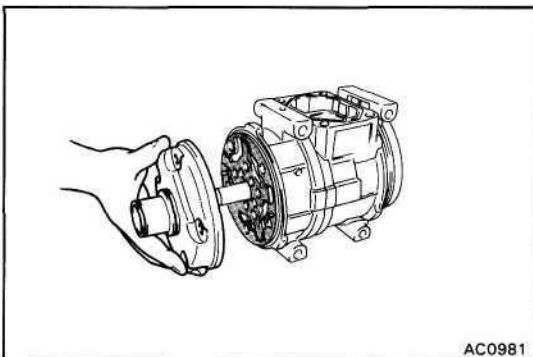
- (e) Lubricate a new gasket with compressor oil and install the gasket on the valve plate.



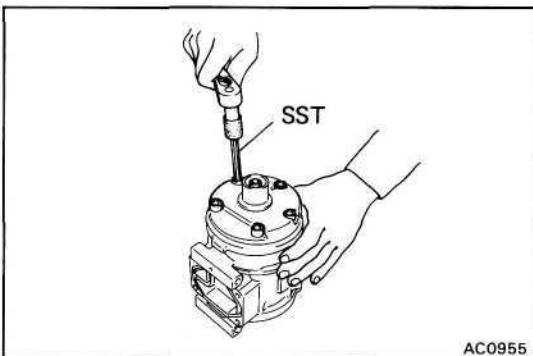
## 11. INSTALL FRONT HOUSING ON FRONT CYLINDER

- (a) Set SST on the shaft to protect the lip seal.

SST 07112-85010



- (b) Install the front housing on the front cylinder.

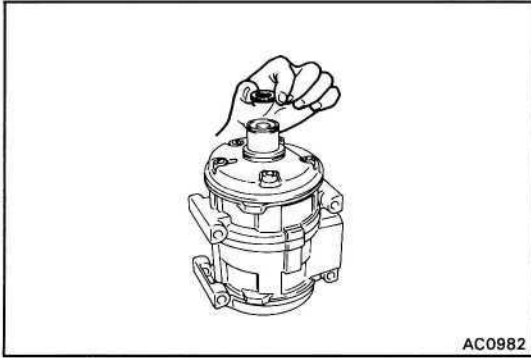


## 12. TIGHTEN FIVE THROUGH BOLTS

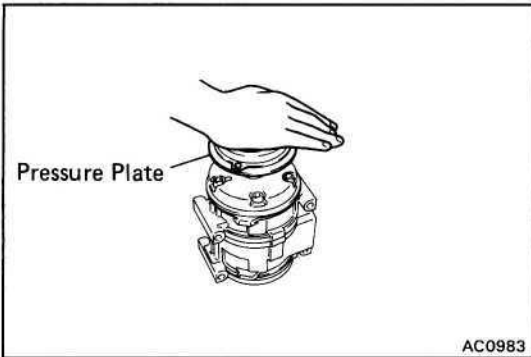
Using SST and torque wrench, gradually tighten the five through bolts in two or three passes.

SST 07110-61050

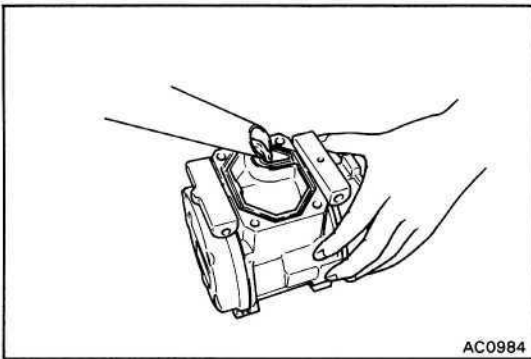
**Torque: 260 kg-cm (19 ft-lb, 25 Nm)**

**13. INSTALL FELT**

- (a) Set the felt with felt holder to the front housing.

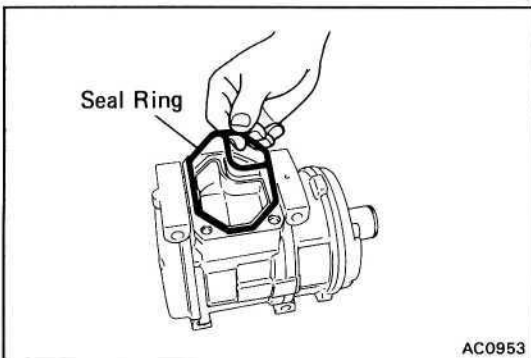


- (b) Using pressure plate of magnetic clutch, install the felt.

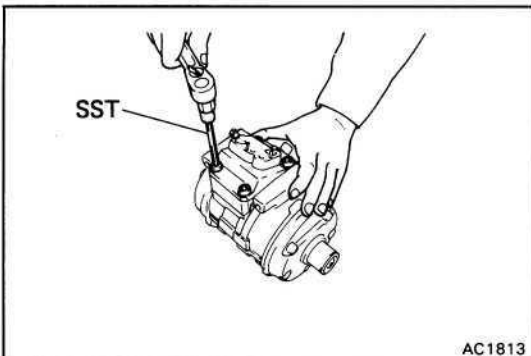
**14. POUR COMPRESSOR OIL INTO COMPRESSOR**

Add the same quantity of oil as was removed, plus 20 cc (0.7 fl.oz), into the compressor.

**Compressor oil: DENSO OIL 6,  
SUNISO No.5GS or equivalent**

**15. INSTALL SERVICE VALVE**

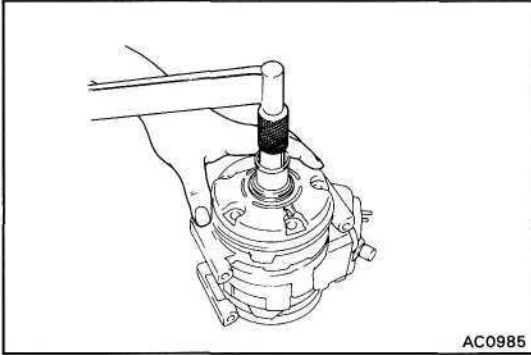
- (a) Lubricate new seal ring with compressor oil.  
Install the seal ring in the service valve.



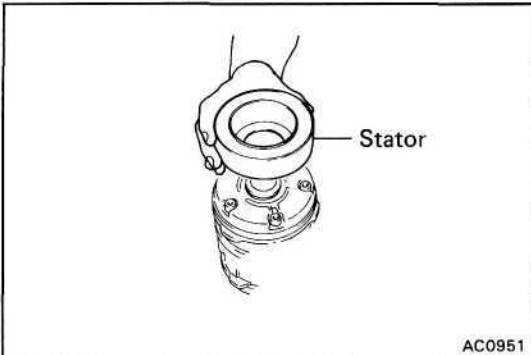
- (b) Install the service valve on the compressor.  
Using SST and torque wrench, tighten the bolts.

SST 07110-61050

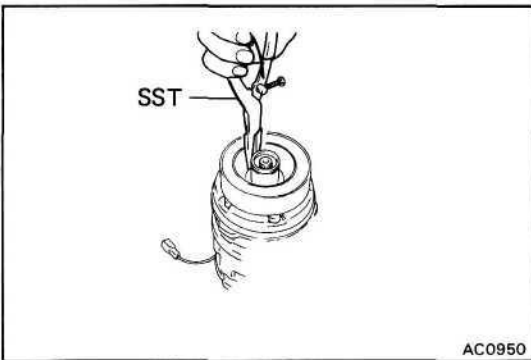
**Torque: 260 kg-cm (19 ft-lb, 25 Nm)**

**16. CHECK SHAFT STARTING TORQUE**

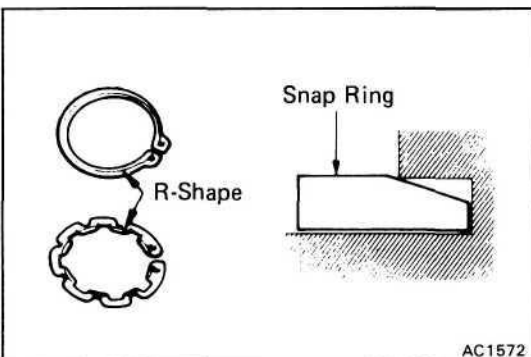
Torque: 30 kg-cm (26 in.-lb, 2.9 N-m) or less

**ASSEMBLY OF MAGNETIC CLUTCH****1. INSTALL STATOR**

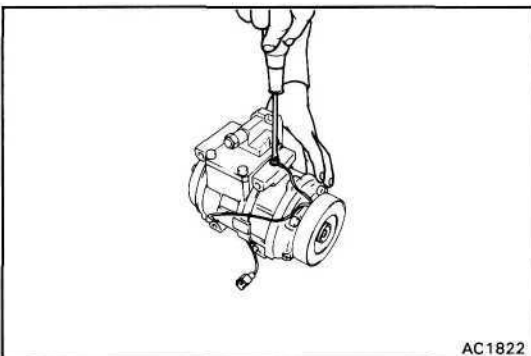
(a) Install the stator on the compressor.



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



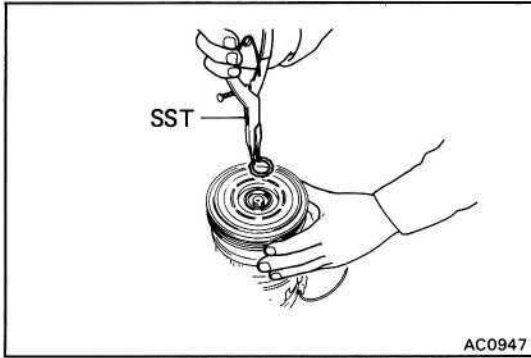
**NOTICE:** The snap ring should be installed so that its beveled side faces up.



(c) Using a SST and torque wrench, fasten the magnetic clutch lead wire to the cylinder block.

Torque: 35 kg-cm (30 in.-lb, 3.4 N-m)

SST 07110-61050

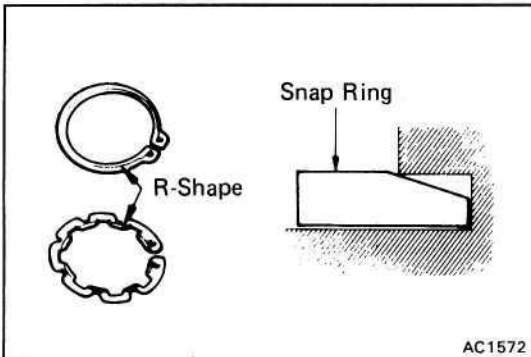


AC0947

## 2. INSTALL ROTOR

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

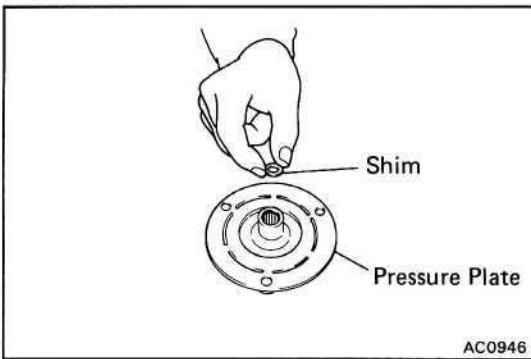
**NOTICE:** The snap ring should be installed so that its beveled side faces up.



AC1572

## 3. INSTALL PRESSURE PLATE

- (a) Put the shims on the pressure plate.

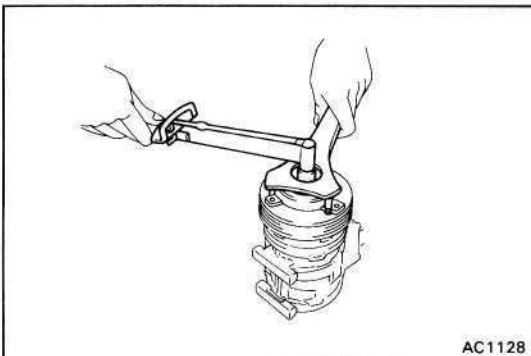


AC0946

- (b) Using a SST and torque wrench, install the shaft bolt.

SST 07112-76060

**Torque:** 135 kg-cm (9.8 ft-lb, 13 Nm)



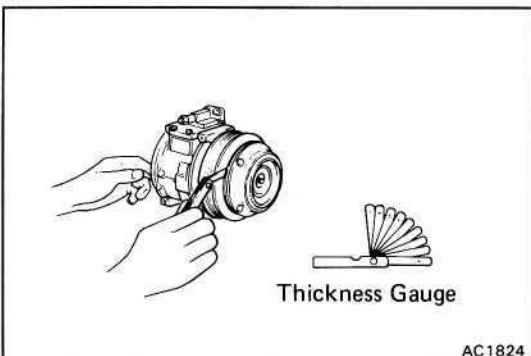
AC1128

## 4. CHECK CLEARANCE OF MAGNETIC CLUTCH

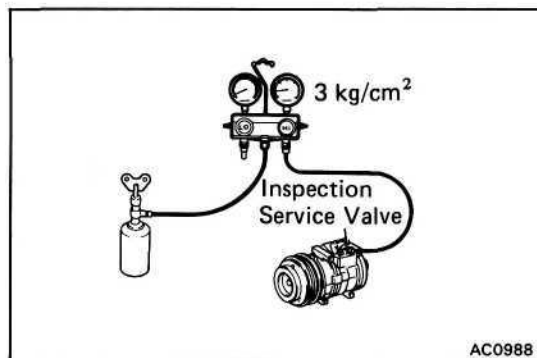
Check the clearance between the pressure plate and rotor using thickness gauge.

**Standard clearance:**  $0.5 \pm 0.15$  mm  
( $0.020 \pm 0.0059$  in.)

If the clearance is not within tolerance, change the number of shims to obtain the standard clearance.



AC1824



## PERFORMANCE TEST OF COMPRESSOR

### 1. PERFORM GAS LEAKAGE TEST

- Install the inspection service valve on the service valve.

HINT: Use only a TOYOTA supplied inspection service valve to perform the gas leakage test.

Part No. Suction side 88376-17020

Discharge side 88376-22020

- Charge the compressor with refrigerant through the charge valve until the pressure is 3 kg/cm<sup>2</sup> (43 psi, 294 kPa).
- Using a gas leak tester, check the compressor for leaks.

If leaks are found, check and replace the compressor.

### 2. EVACUATE COMPRESSOR AND CHARGE WITH REFRIGERANT

Make sure the caps are tight and the compressor is free from moisture and contamination.

HINT: When storing a compressor for an extended period, charge the compressor with refrigerant or dry nitrogen gas to prevent corrosion.

## INSTALLATION OF COMPRESSOR

(See page AC-29)

### 1. INSTALL COMPRESSOR WITH THREE MOUNTING BOLTS

Torque: 280 kg-cm (20 ft-lb, 27 Nm)

### 2. INSTALL DRIVE BELT

(See page AC-25)

### 3. CONNECT TWO HOSES TO COMPRESSOR SERVICE VALVES

Torque: Discharge line 250 kg-cm (18 ft-lb, 25 Nm)  
Suction line 250 kg-cm (18 ft-lb, 25 Nm)

### 4. CONNECT CLUTCH LEAD WIRE TO WIRING HARNESS

### 5. CONNECT NEGATIVE CABLE TO BATTERY

### 6. EVACUATE AIR FROM AIR CONDITIONING SYSTEM

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

Specified amount:

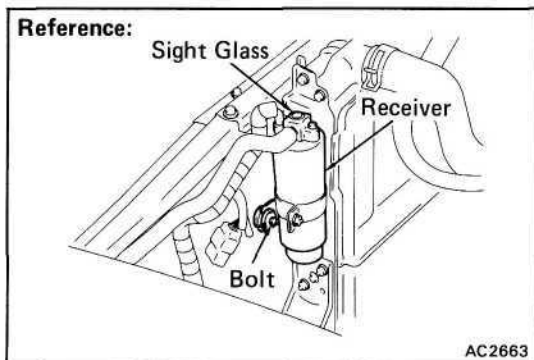
Single A/C 900 ± 50 g (31.74 ± 1.76 oz)  
Dual A/C [G.C.C.]

1,500 ± 50 g (52.91 ± 1.76 oz)  
[Models Except G.C.C.]

1,350 ± 50 g (47.61 ± 1.76 oz)  
Dual A/C + Cool/Ice Box [G.C.C.]

1,600 ± 50 g (56.43 ± 1.76 oz)  
[Models Except G.C.C.]

1,500 ± 50 g (52.91 ± 1.76 oz)



## RECEIVER

### ON-VEHICLE INSPECTION

#### INSPECT SIGHT GLASS, FUSIBLE PLUG AND FITTINGS FOR LEAKAGE

Use a gas leak tester. Repair as necessary.

### REMOVAL OF RECEIVER

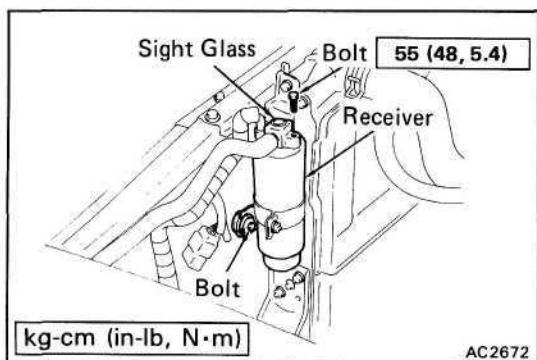
1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
2. REMOVE BATTERY
3. DISCONNECT TWO LIQUID TUBES FROM RECEIVER  
HINT: Cap the open fittings immediately to keep moisture out of the system
4. REMOVE RECEIVER FROM RECEIVER HOLDER

### 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: 55 kg-cm (48 in.-lb, 5.4 N-m)
3. INSTALL BATTERY
4. IF RECEIVER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR  
Add 20 cc (0.7 fl.oz.)  
Compressor oil: DENSO OIL 6,  
SUNISO NO.5GS or equivalent
5. EVACUATE AIR FROM REFRIGERATION SYSTEM
6. CHARGE SYSTEM WITH REFRIGERANT AND INSPECT FOR LEAKAGE OF REFRIGERANT

#### Specified amount:

Single A/C	900 ± 50 g (31.74 ± 1.76 oz)
Dual A/C [G.C.C]	
	1,500 ± 50 g (52.91 ± 1.76 oz)
[Models Except G.C.C]	
	1,350 ± 50 g (47.61 ± 1.76 oz)
Dual A/C + Cool/Ice Box [G.C.C]	
	1,600 ± 50 g (56.43 ± 1.76 oz)
[Models Except G.C.C]	
	1,500 ± 50 g (52.91 ± 1.76 oz)



## CONDENSER

### ON-VEHICLE INSPECTION

#### 1. INSPECT 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.

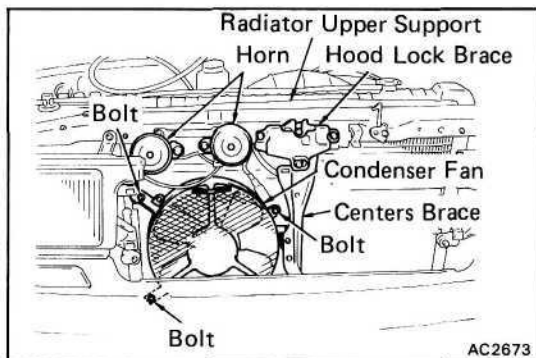
#### 2. INSPECT CONDENSER FITTINGS FOR LEAKAGE

Repair as necessary.

### REMOVAL OF CONDENSER

#### 1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

#### 2. DISCONNECT NEGATIVE CABLE FROM BATTERY



#### 3. REMOVE FOLLOWING COMPONENTS

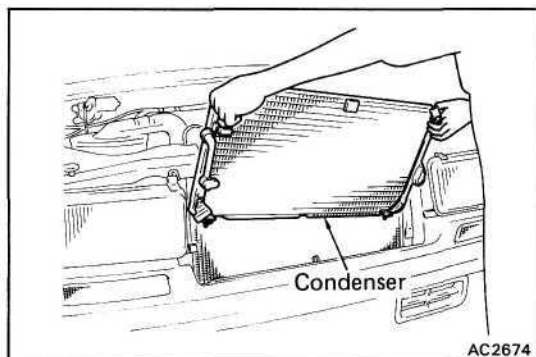
- (a) Hood lock brace
- (b) Center brace
- (c) Horns
- (d) Condenser fan (Dual A/C)
- (e) Radiator Upper Support (4 Lamp Headlight)

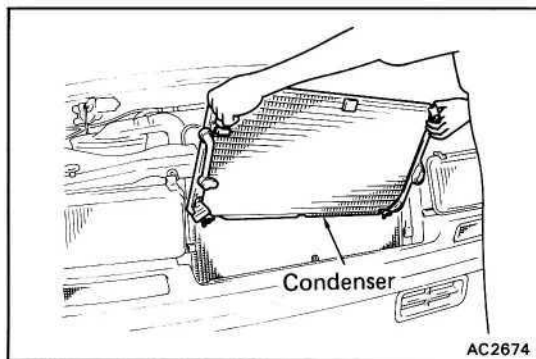
#### 4. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE

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

#### 5. REMOVE CONDENSER

- (a) Remove two bolts.
- (b) Pull out the condenser between the radiator and the body.





## INSTALLATION OF CONDENSER

### 1. INSTALL CONDENSER

Put in the condenser between the radiator and the body. Then, tighten two bolts.

### 2. CONNECT DISCHARGE HOSE AND LIQUID TUBE

Torque: 185 kg-cm (13 ft-lb, 18 N-m)

### 3. INSTALL FOLLOWING COMPONENTS

- (a) Radiator Upper Support (4 Lamp Headlight)
- (b) Condenser fan (Dual A/C)
- (c) Horns
- (d) Center brace
- (e) Hood lock brace

### 4. IF CONDENSER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR

Add 40 - 50 cc (1.4 - 1.7 fl.oz.)

Compressor oil: DENSOIL 6,  
SUNISO NO.5GS or equivalent

### 5. EVACUATE AIR FROM AIR CONDITIONING SYSTEM

### 6. CHARGE SYSTEM WITH REFRIGERANT AND INSPECT FOR LEAKAGE OF REFRIGERANT

Specified amount:

Single A/C 900  $\pm$  50 g (31.74  $\pm$  1.76 oz)

Dual A/C [G.C.C.]

1,500  $\pm$  50 g (52.91  $\pm$  1.76 oz)

[Models Except G.C.C.]

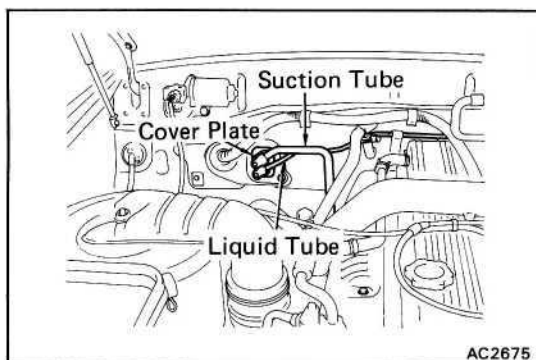
1,350  $\pm$  50 g (47.61  $\pm$  1.76 oz)

Dual A/C + Cool/Ice Box [G.C.C.]

1,600  $\pm$  50 g (56.43  $\pm$  1.76 oz)

[Models Except G.C.C.]

1,500  $\pm$  50 g (52.91  $\pm$  1.76 oz)



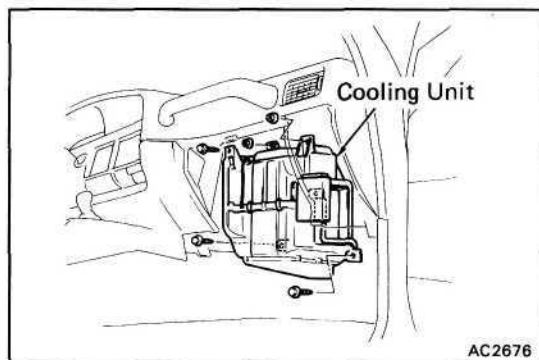
## COOLING UNIT

### Front Cooling Unit

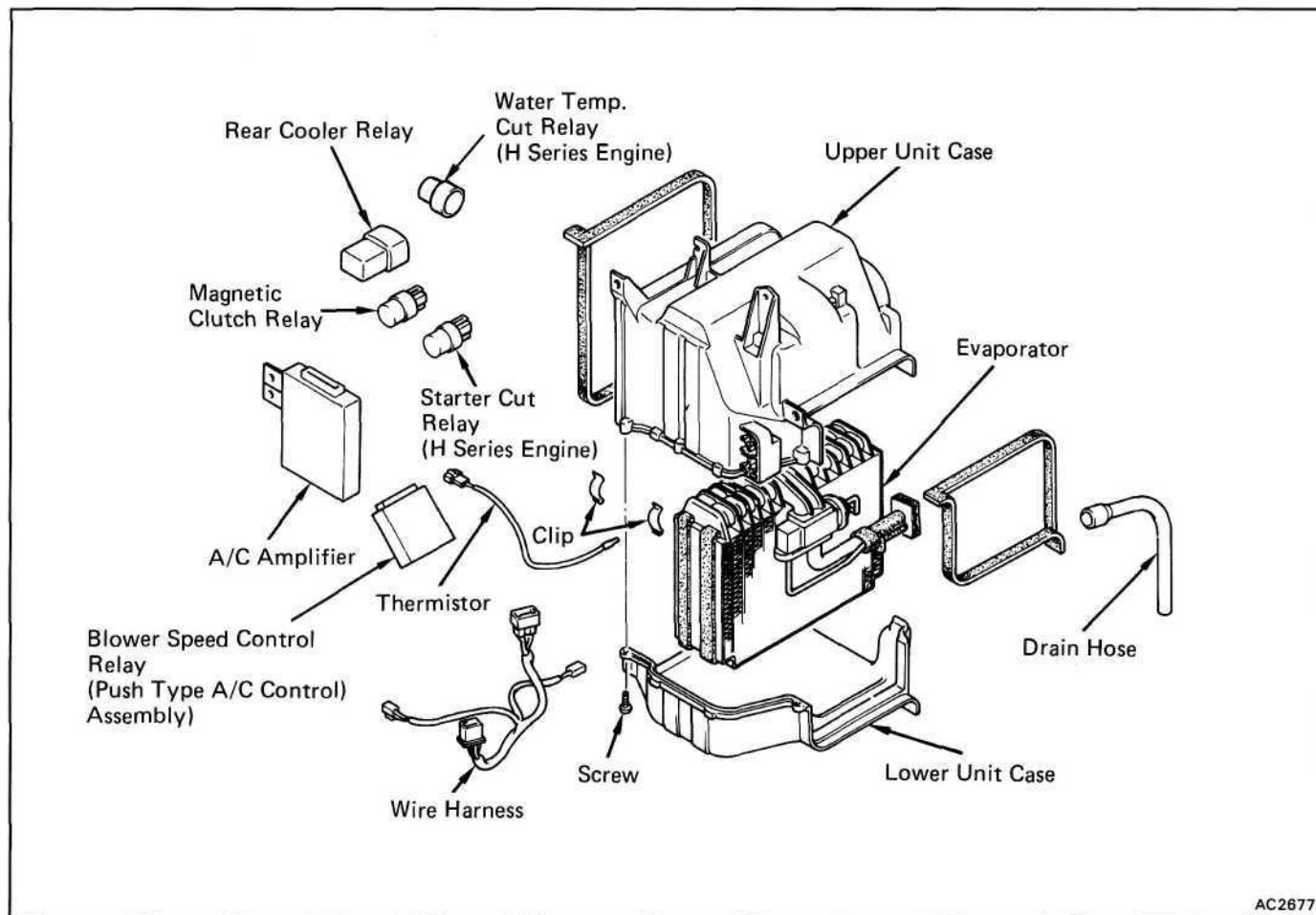
#### Removal of Cooling Unit

1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. DISCHARGE 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 COVER PLATE FROM INLET AND OUTLET FITTINGS
6. REMOVE GLOVE BOX
7. DISCONNECT CONNECTORS

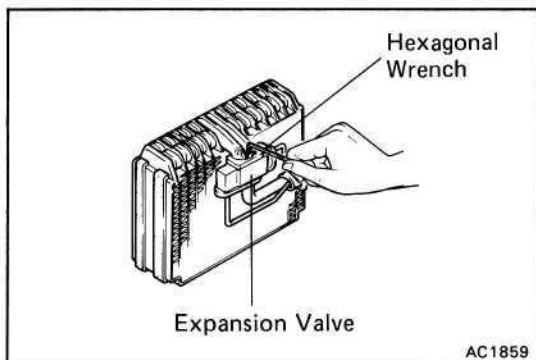


**8. REMOVE COOLING UNIT**

Remove the two nuts and three screws.

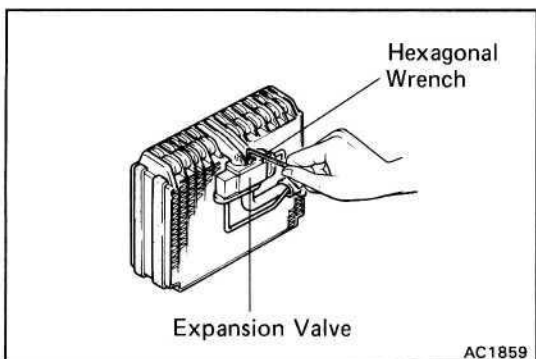
**DISASSEMBLY OF COOLING UNIT****1. REMOVE MAGNETIC CLUTCH RELAY****2. REMOVE REAR COOLER RELAY****3. REMOVE A/C AMPLIFIER****4. REMOVE LOWER AND UPPER CASE**

- (a) Remove connector of thermistor from unit case.
- (b) Remove three clips.
- (c) Remove four screws.
- (d) Remove upper unit case.
- (e) Remove thermistor with thermistor holder.
- (f) Remove lower unit case.



## 5. REMOVE EXPANSION VALVE

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



## ASSEMBLY OF COOLING UNIT

### INSTALL COMPONENTS ON EVAPORATOR

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

**Torque:** 55 kg-cm (48 in.-lb, 5.4 N-m)

**HINT:** Be sure that the O-rings are positioned on the tube fitting.

- (b) Install the holder to the suction and liquid tubes with heat sensing tube.
- (c) Install the lower unit case to the evaporator.
- (d) Install the thermistor to the evaporator.
- (e) Install the upper unit case.
- (f) Install the four screws.
- (g) Install three clips.
- (h) Install the connector of thermistor.

## INSTALLATION OF COOLING UNIT

### 1. INSTALL COOLING UNIT

Install the cooling unit with three screws and two nuts.

### 2. CONNECT CONNECTOR OF THERMISTOR

### 3. INSTALL EFI AND A.B.S. COMPUTER

### 4. INSTALL GLOVE BOX COVER AND REINFORCEMENT

### 5. INSTALL GLOVE BOX AND UNDER COVER

### 6. INSTALL GROMMETS ON INLET AND OUTLET FITTINGS

### 7. CONNECT LIQUID TUBE TO COOLING UNIT INLET FITTING

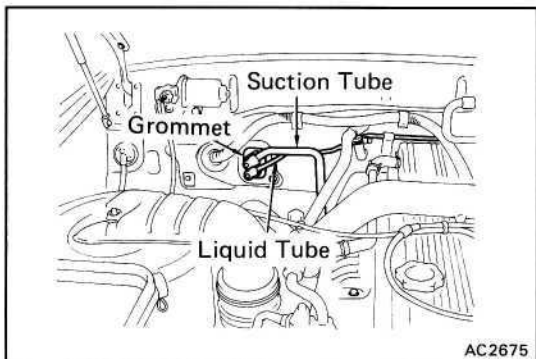
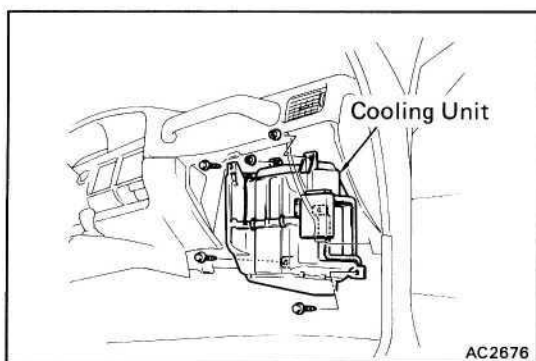
Torque the bolt.

**Torque:** 50 kg-cm (43 in.-lb, 4.9 N-m)

### 8. CONNECT SUCTION TUBE TO COOLING UNIT OUTLET FITTING

Torque the nut.

**Torque:** 50 kg-cm (43 in.-lb, 4.9 N-m)



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

Add 40 - 50 cc (1.4 - 1.7fl.oz.)

Compressor oil: DENSOIL 6,

SUNISO No.5GS or equivalent

10. INSTALL CHARCOAL CANISTER WITH BRACKET
11. CONNECT NEGATIVE CABLE TO BATTERY
12. EVACUATE AIR FROM AIR CONDITIONING SYSTEM
13. CHARGE AIR CONDITIONING SYSTEM WITH REFRIGERANT AND CHECK FOR GAS LEAKAGE

Specified amount:

Single A/C 900  $\pm$  50 g (31.74  $\pm$  1.76 oz)

Dual A/C [G.C.C.]

1,500  $\pm$  50 g (52.91  $\pm$  1.76 oz)

[Models Except G.C.C.]

1,350  $\pm$  50 g (47.61  $\pm$  1.76 oz)

Dual A/C + Cool/Ice Box [G.C.C.]

1,600  $\pm$  50 g (56.43  $\pm$  1.76 oz)

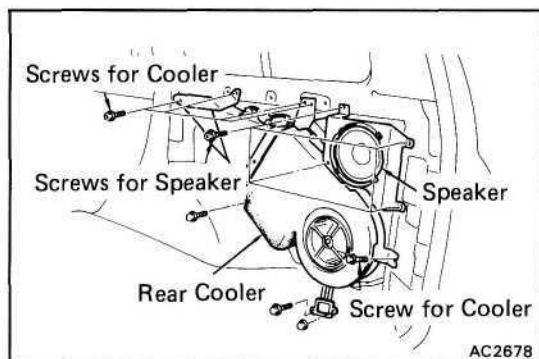
[Models Except G.C.C.]

1,500  $\pm$  50 g (52.91  $\pm$  1.76 oz)

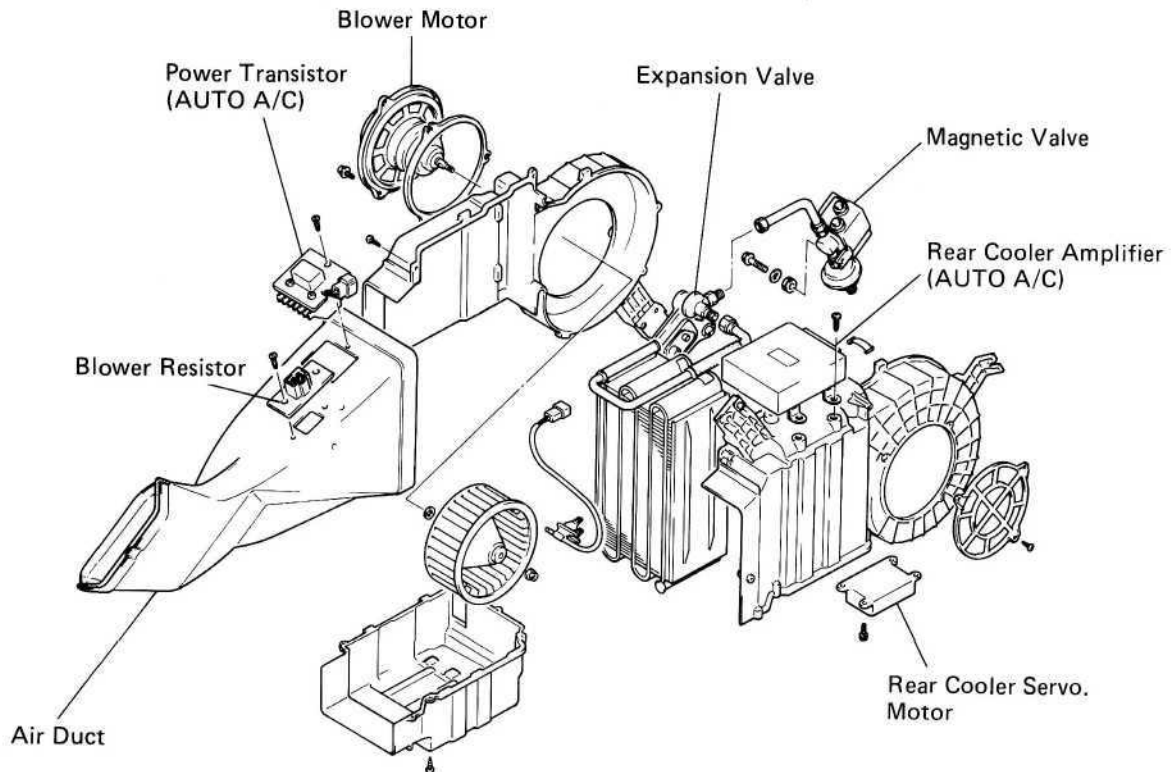
## Rear Cooling Unit

### REMOVAL OF COOLING UNIT

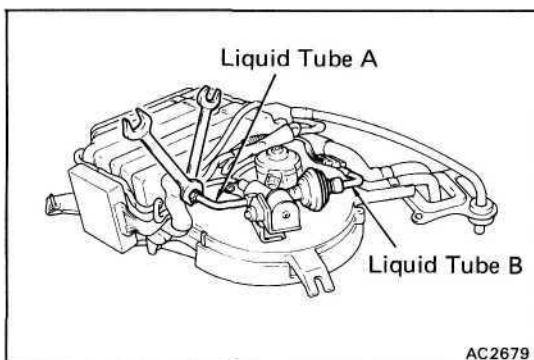
1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. DISCHARGE REFRIGERATION SYSTEM
3. DISCONNECT CONNECTORS
4. DISCONNECT LIQUID TUBES
5. DISCONNECT SUCTION TUBE
6. REMOVE SPEAKER  
Remove three bolts, one screw and the speaker.
7. REMOVE COOLING UNIT  
Remove seven bolts, one nut and the cooling unit.



## DISASSEMBLY OF COOLING UNIT



AC2766

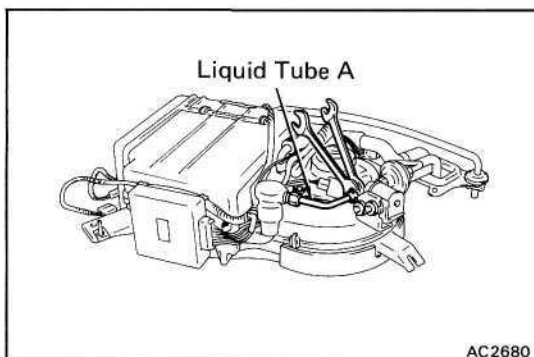


AC2679

## 1. REMOVE REAR COOLING UNIT AIR DUCT

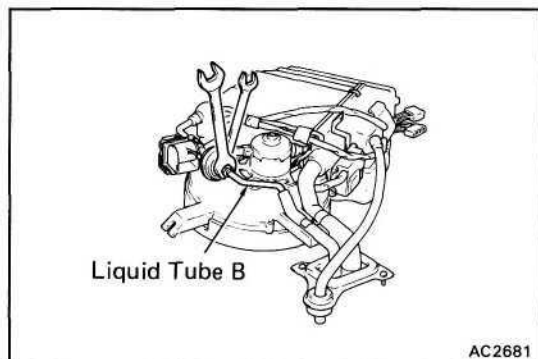
## 2. REMOVE LIQUID TUBE A AND B

- (a) Remove the liquid tube A from the expansion valve, using two wrenches.

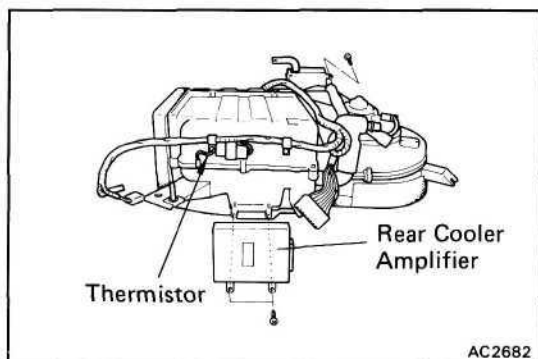


AC2680

- (b) Remove the liquid tube A from the magnetic valve, using two wrenches.



- (c) Remove the liquid tube B from the magnetic valve, using two wrenches.



**3. (AUTO A/C)  
REMOVE REAR COOLER AMPLIFIER AND  
SERVOMOTOR**

- (a) Disconnect the connector from amplifier and servomotor.
- (b) Remove two screws and the amplifier and servomotor.

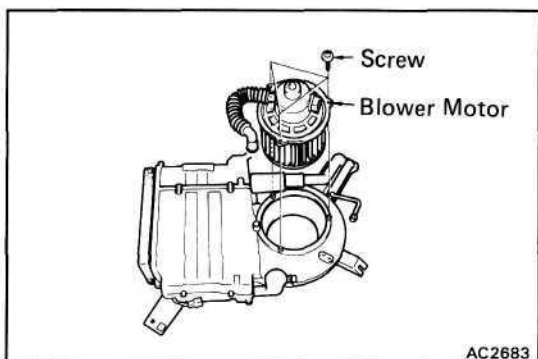
**4. REMOVE THERMISTOR**

**5. REMOVE WIRE HARNESS**

- (a) Disconnect the connectors of the cooler wire harness from the blower motor and the magnetic valve.
- (b) Remove the wire harness from the cooling unit case.

**6. REMOVE MAGNETIC VALVE**

Remove two screws and the magnetic valve.

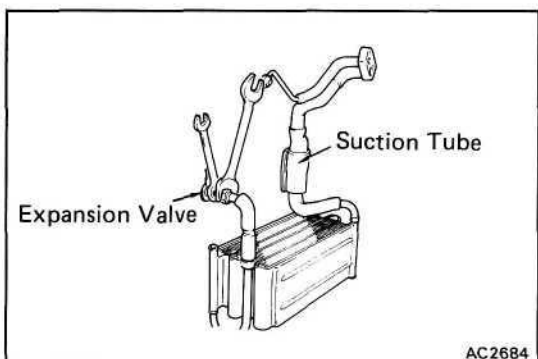


**7. REMOVE BLOWER FAN AND MOTOR**

Remove three screws and the blower fan and motor.

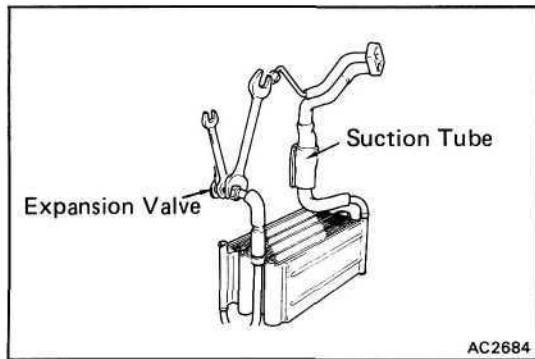
**8. SEPARATE COOLING UNIT CASE**

- (a) Remove screws and clamps.
- (b) Separate the upper case and lower case.



**9. REMOVE EXPANSION VALVE AND SUCTION TUBE**

Remove the expansion valve and the suction tube from the evaporator, using two wrenches.



## ASSEMBLY OF COOLING UNIT

### 1. INSTALL EXPANSION VALVE TO EVAPORATOR

Connect the expansion valve to the inlet fitting of the evaporator. Then, torque the nut.

**Torque:** 225 kg-cm (16 ft-lb, 22 Nm)

**HINT:** Be sure that the O-rings are positioned, on the tube fitting.

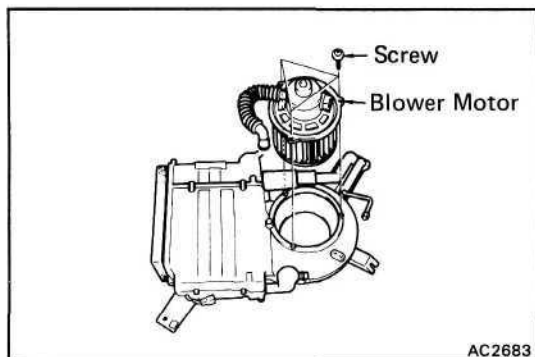
### 2. INSTALL SUCTION TUBE TO EVAPORATOR

Connect the suction tube to the outlet fitting of the evaporator. Then, torque the nut.

**Torque:** 330 kg-cm (24 ft-lb, 32 Nm)

**HINT:** Be sure that the O-rings are positioned, on the tube fitting.

### 3. INSTALL COOLING UNIT CASE



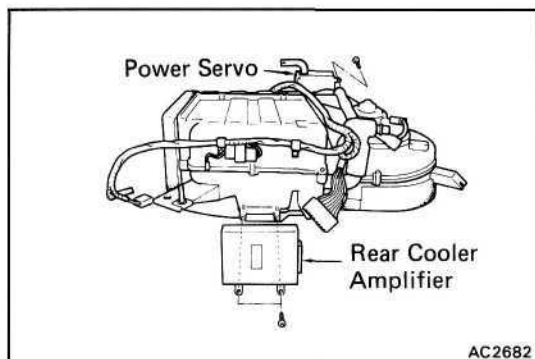
### 4. INSTALL BLOWER FAN AND MOTOR

### 5. INSTALL MAGNETIC VALVE

### 6. INSTALL WIRE HARNESS

Connect connectors and install the wire harness.

### 7. INSTALL THERMISTOR

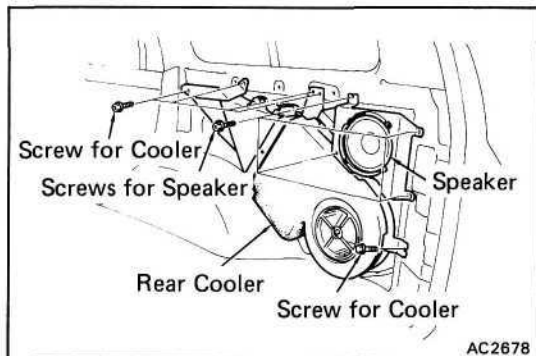


### 8. INSTALL REAR COOLER AMPLIFIER AND SERVOMOTOR

### 9. INSTALL LIQUID TUBE A AND B

**Torque:** 140 kg-cm (10 ft-lb, 14 Nm)

### 10. INSTALL REAR COOLING UNIT AIR DUCT



## INSTALLATION OF COOLING UNIT

1. INSTALL COOLING UNIT
2. INSTALL SPEAKER
3. CONNECT SUCTION TUBE AND LIQUID TUBE  
Torque: 50 kg-cm (43 in.-lb, 4.9 N-m)
4. CONNECT CONNECTORS
5. CONNECT NEGATIVE CABLE TO BATTERY
6. IF EVAPORATOR WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR  
Add 40 - 50 cc (1.4 - 1.7 ft.oz.)  
Compressor oil: DENSOLIL 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:

without Cool/Ice Box

[G.C.C.]

1,500 ± 50 g (52.91 ± 1.76 oz)

[Models Except G.C.C.]

1,350 ± 50 g (47.61 ± 1.76 oz)

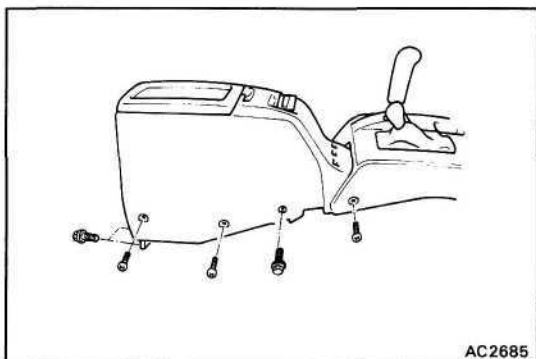
with Cool/Ice Box

[G.C.C.]

1,600 ± 50 g (56.43 ± 1.76 oz)

[Models Except G.C.C.]

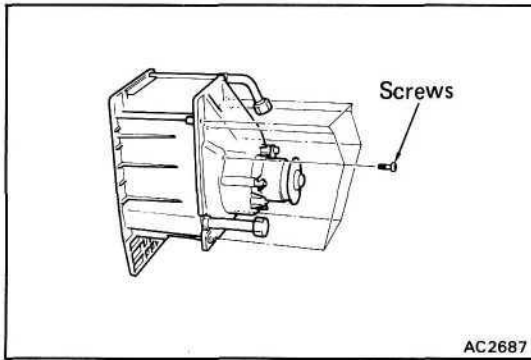
1,500 ± 50 g (52.91 ± 1.76 oz)



## COOL/ICE BOX

### REMOVAL OF COOL/ICE BOX

1. DISCONNECT LIQUID AND SUCTION TUBE
2. REMOVE COOL/ICE BOX  
Remove four bolts and the cool/ice box.
3. REMOVE COOL/ICE BOX COVER  
Remove six screws and the box cover.
4. REMOVE SWITCH  
Disconnect the connector from the switch and remove it.
5. REMOVE CONNECTORS
6. REMOVE AMPLIFIER



## 7. REMOVE BLOWER MOTOR

## INSTALLATION OF COOL/ICE BOX

Install by following the removal procedure in reverse order.

## EVAPORATORS

### Front A/C Evaporator

#### REMOVAL OF EVAPORATOR

See Disassembly of Front Cooling Unit on page AC-45.

#### INSPECTION OF EVAPORATOR

##### 1. INSPECT EVAPORATOR FINS FOR BLOCKAGE

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

**NOTICE:** Never use water to clean the evaporator.

##### 2. INSPECT FITTINGS FOR CRACKS OR SCRATCHES

Repair as necessary.

#### INSTALLATION OF EVAPORATOR

See Assembly of Front Cooling Unit on page AC-46.

### Rear Cooler Evaporator

#### REMOVAL OF EVAPORATOR

See Disassembly of Rear Cooling Unit on page AC-48.

#### INSPECTION OF EVAPORATOR

Check the rear cooler evaporator the same way as for the front A/C evaporator on page AC-52.

#### INSTALLATION OF EVAPORATOR

See Assembly of Rear Cooling Unit on page AC-50.



## **Cool/Ice Box Evaporator**

### **REMOVAL OF EVAPORATOR**

See Removal of Cool/Ice Box on page AC-51.

### **INSPECTION OF EVAPORATOR**

Check the cool/ice evaporator the same way as for the front A/C evaporator on page AC-52.

### **INSTALLATION OF EVAPORATOR**

See Assembly of Cool/Ice Box on page AC-52.

## **EXPANSION VALVES**

### **Front A/C Expansion Valve**

#### **ON-VEHICLE INSPECTION**

**1. INSPECT REFRIGERANT VOLUME**

See page AC-23.

**2. INSTALL MANIFOLD GAUGE SET**

See page AC-24.

**3. TURN FRONT A/C SWITCH ON AND BLOWER SWITCH TO HI POSITION**

**4. RUN ENGINE AT APPROX. 2,000 RPM FOR AT LEAST FIVE MINUTES**

**5. INSPECT EXPANSION VALVE**

If the expansion valve is clogged, the low pressure reading will drop to 0 kg-cm<sup>2</sup> (0 psi, 0 kPa), otherwise it is OK.

**HINT:** If the low pressure reading is normal and only the front A/C is not cooling, check for the malfunction of the expansion valve.

#### **REMOVAL OF EXPANSION VALVE**

See Disassembly of Front Cooling Unit on page AC-45.

#### **INSTALLATION OF EXPANSION VALVE**

See Assembly of Front Cooling Unit on page AC-46.

## Rear Cooler Expansion Valve

### ON-VEHICLE INSPECTION

Turn the rear cooler switch ON and rear blower switch to HI position, then perform the same inspection as for the front A/C expansion valve.

HINT: If the low pressure reading is normal and cool air is only failing to come out of the rear cooler, check for a malfunction of the expansion valve.

### REMOVAL OF EXPANSION VALVE

See Disassembly of Rear Cooling Unit on page AC-48.

### INSTALLATION OF EXPANSION VALVE

See Assembly of Rear Cooling Unit on page AC-50.

## Cool/Ice Box Expansion Valve

### ON-VEHICLE INSPECTION

With the cool/ice box switch at COOL or ICE position, perform the same inspection as for the front A/C expansion valve.

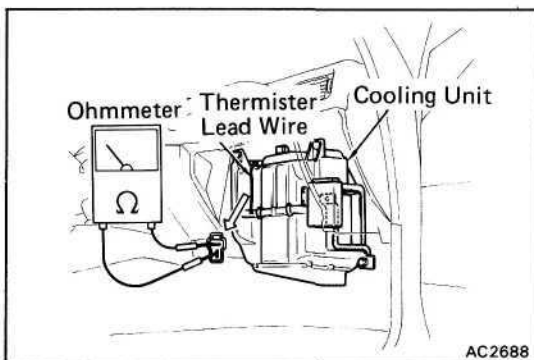
HINT: First, turn the front A/C switch and rear cooler switch OFF.

### REMOVAL OF EXPANSION VALVE

See Removal of Cool/Ice Box on page AC-51.

### INSTALLATION OF EXPANSION VALVE

See Installation of Cool/Ice Box on page AC-52.



## THERMISTORS

### Front A/C Thermistor

#### ON-VEHICLE INSPECTION

1. DISCONNECT NEGATIVE BATTERY CABLE
2. REMOVE GLOVE BOX
3. CHECK RESISTANCE OF THERMISTOR

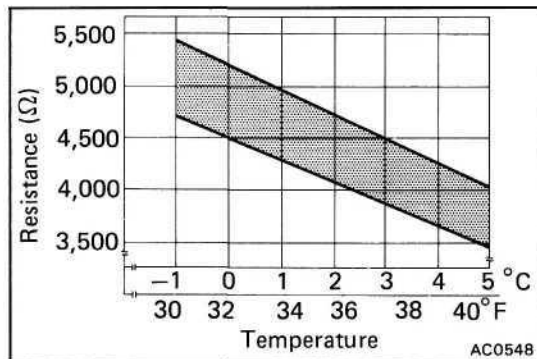
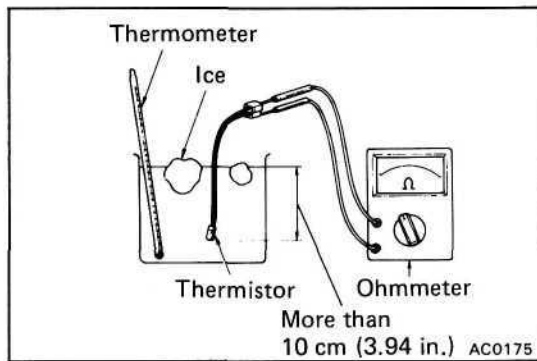
Measure the resistance between terminals.

**Standard resistance: 1,500  $\Omega$  at 25°C (77°F)**

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

#### REMOVAL OF THERMISTOR

See Disassembly of Front Cooling Unit on page AC-45.



## INSPECTION OF THERMISTOR

### INSPECT THERMISTOR OPERATION

- 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.

- Compare the two readings on the chart.

If the intersection is not between the two lines, replace the thermistor.

## INSTALLATION OF THERMISTOR

See Assembly of Front Cooling Unit on page AC-46.

## Rear Cooler Thermistor

### REMOVAL OF THERMISTOR

See Disassembly of Rear Cooling Unit on page AC-48.

## INSPECTION OF THERMISTOR

Check the thermistor the same way as for the front A/C thermistor on page AC-55.

## INSTALLATION OF THERMISTOR

See Assembly of Rear Cooling Unit on page AC-50.

## Cool/Ice Box Thermistor

### REMOVAL OF THERMISTOR

See Removal of Cool/Ice Box on page AC-51.

## INSPECTION OF THERMISTOR

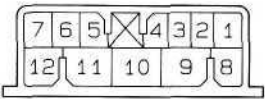
Check the thermistor the same way as for the front A/C thermistor on page AC-55.

## INSTALLATION OF THERMISTOR

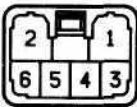
See Installation of Cool/Ice Box on page AC-52.

# A/C CONTROL ASSEMBLY (Lever Type)

Blower Switch



A/C Switch



Temperature Control Resistor

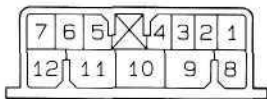


AC2716  
S-6-2  
AC2752 GA-2-2-6

## Blower Switch

### INSPECTION OF SWITCH

#### INSPECT SWITCH CONTINUITY



AC2716

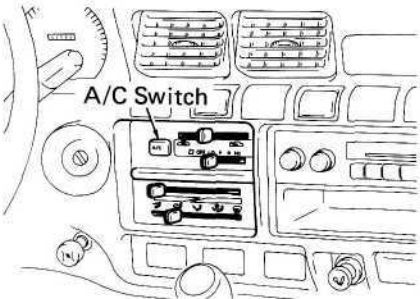
Terminal Switch position	1	8	9	11	12	Illustration	
						6	7
OFF							
LO							
▪ (M1)							
▪ (M2)							
HI							

If continuity is not as specified, replace the switch.

## A/C Switch

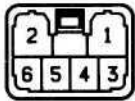

### REMOVAL OF SWITCH

1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. REMOVE A/C SWITCH



AC2689

**INSPECTION OF SWITCH****INSPECT SWITCH CONTINUITY**

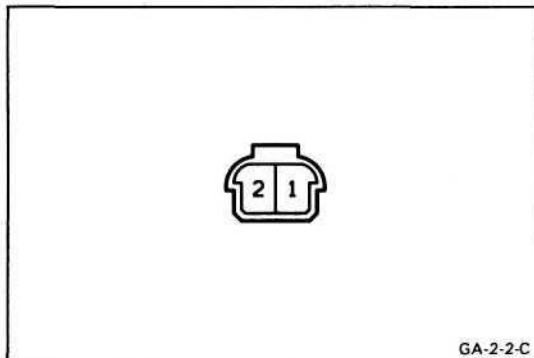
	Terminal	2	3
	Switch position		
	OFF		
ON			

S-6-2

If continuity is not as specified, replace the switch.

**INSTALLATION OF SWITCH**

1. INSTALL A/C SWITCH
2. CONNECT NEGATIVE CABLE TO BATTERY

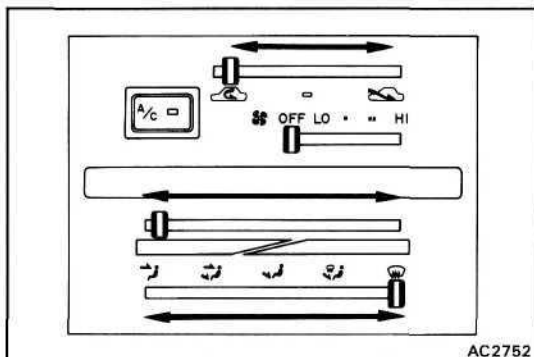


GA-2-2-C

**Temperature Control Resistor****INSPECTION OF RESISTOR****INSPECT RESISTOR RESISTANCE**

- (a) Check that there is no continuity between terminals with the arm OFF position.
- (b) Check that the resistance between terminals decreases from approx. 3 kΩ to 0 Ω, when the arm is moved from OFF to COOL position.

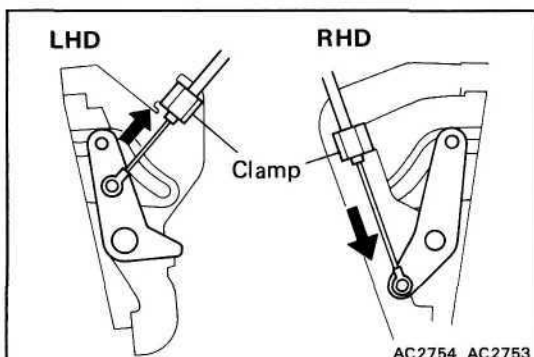
If resistance valve is not as specified, replace the resistor.



AC2752

**A/C Control Levers****INSPECTION OF A/C CONTROL LEVERS****INSPECT A/C CONTROL LEVERS OPERATION**

Move the control levers left and right, and check for stiffness and binding through the full range of the levers.

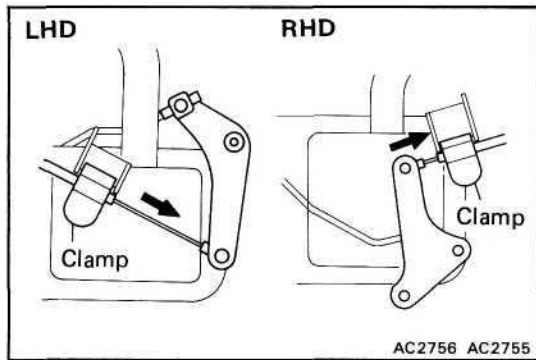


AC2754 AC2753

**ADJUSTMENT OF A/C CONTROL CABLES**

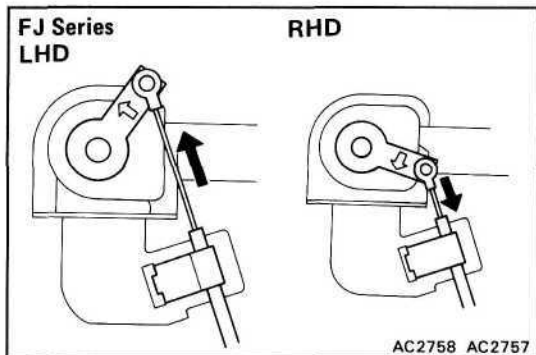
1. ADJUST AIR INLET DAMPER CONTROL CABLE

Set the air inlet damper and the control lever to "FRESH" position, install the control cable and lock the clamp.



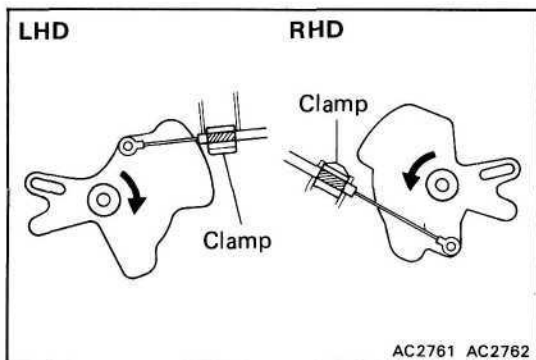
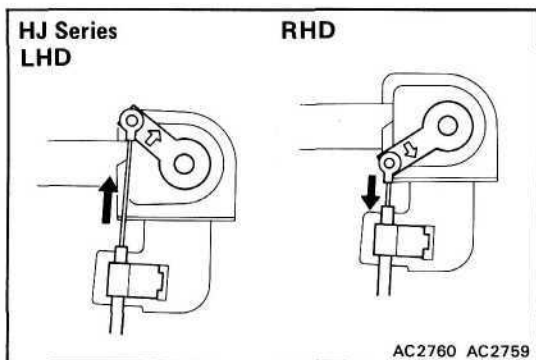
## 2. ADJUST AIR MIX DAMPER CONTROL CABLE

Set the air mix damper and the control lever to "COOL" position, install the control cable and lock the clamp.



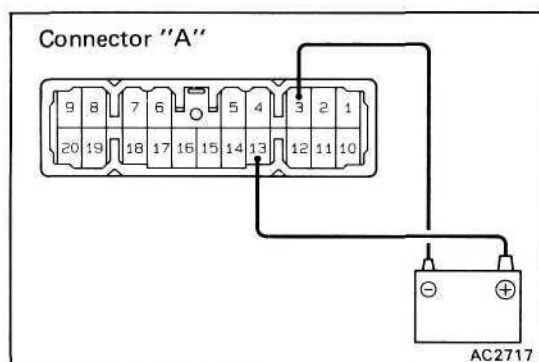
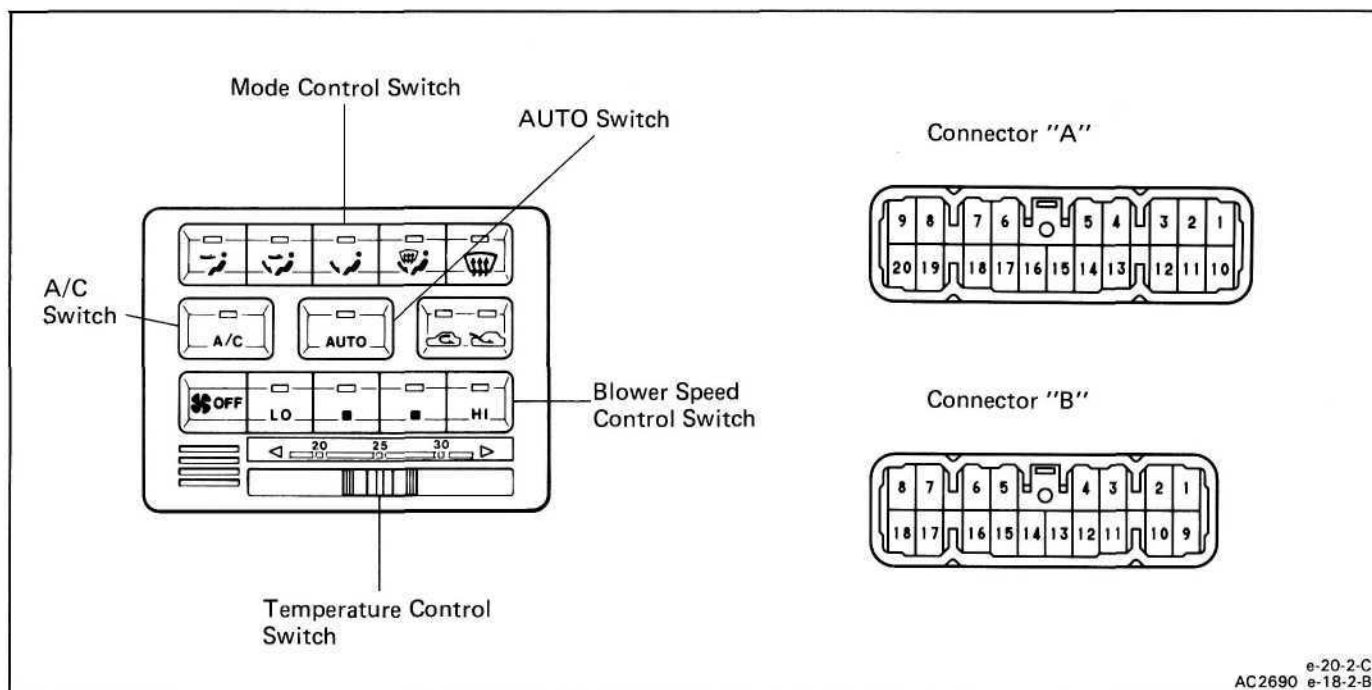
## 3. ADJUST WATER VALVE CONTROL CABLE

Set the water and the control lever to "COOL" position, install the control cable and lock the clamp.



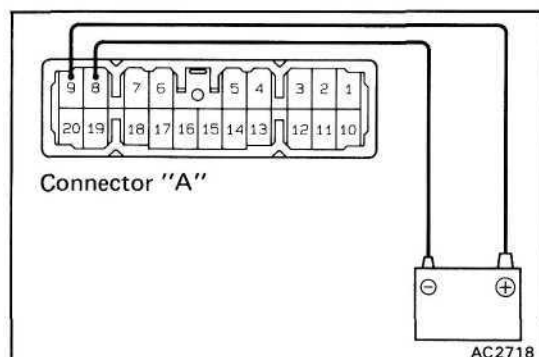
## 4. ADJUST MODE DAMPER CONTROL CABLE

- Set the mode damper and the control lever to "FACE" position.
- Clamp the white section of the control cable and install the cable to damper control lever.

**(Push Type)****Illumination****INSPECTION OF ILLUMINATIONS****INSPECT ILLUMINATIONS**

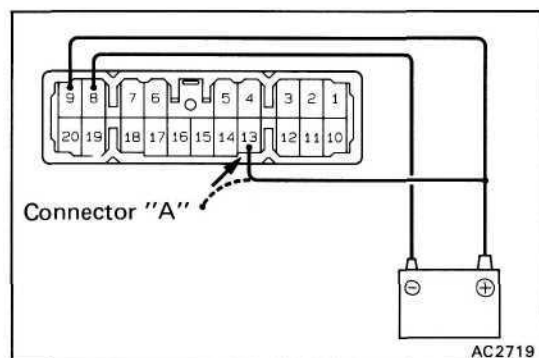
Connect the positive (+) lead from the battery to terminal A-13 and the negative (-) lead to terminal A-3, then check that the illuminations light up.

If illuminations do not light up, test the bulb.

**Air Inlet Control Switch****INSPECTION OF SWITCH  
(without Auto A/C)****1. INSPECT INDICATORS**

- Connect the positive (+) lead from the battery to terminal A-9 and the negative (-) lead to terminal A-8.
- Check that the FRESH and RECIRC indicators light up alternately each time the air inlet control switch button is pressed.
- Then, connect the positive (+) lead from the battery to terminal A-13 and check that the indicator dims.

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



2. INSPECT SWITCH CONTINUITY

Connector "A"

Terminal	A-8	A-18	A-19
Switch position			
FRESH			
RECIRC			

e-20-2-C

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

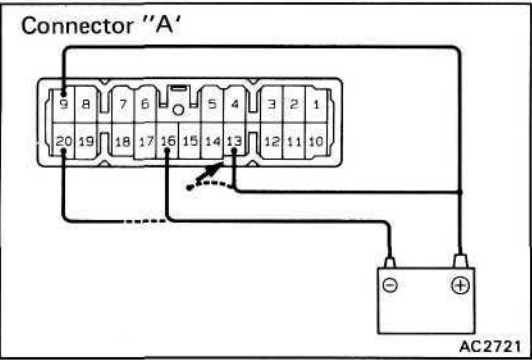
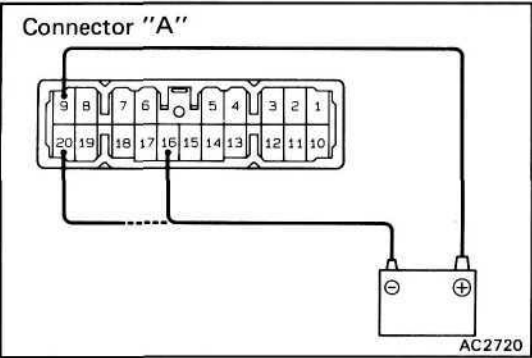
(With Auto A/C)

1. INSPECT INDICATORS

- (a) Connect the positive (+) lead from the battery to terminal A-9 and the negative (—) lead to each terminal, then check that the each indicator lights up.

Connected terminal	Indicator
A-16	RECIRC
A-20	FRESH

- (b) Then, connect the positive (+) lead from the battery to terminal A-13 and check that the indicator dims. If indicator operation is not as specified, replace the A/C control assembly.



2. INSPECT SWITCH CONTINUITY

Connector "A"

Connector "B"

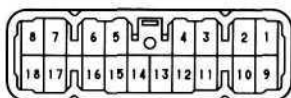
Terminal	A-15	B-16
Switch position		
Free		
Pushed in		

e-20-2-C  
e-18-2-B

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



Connector "B"



e-18-2-B

## Temperature Control Switch

### INSPECTION OF SWITCH

#### INSPECT SWITCH RESISTANCE

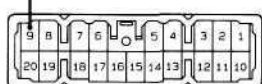
- (a) Measure the resistance between terminals B-1 and B-2.

**Resistance: Approx. 3 kfi**

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

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

Connector "A"



Connector "B"



AC2722

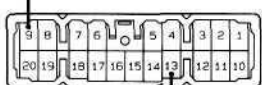
## Mode Control Switch

### INSPECTION OF SWITCH

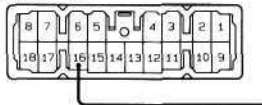
#### 1. INSPECT INDICATOR

- (a) Connect the position (+) lead from the battery to terminal A-9 and the negative (—) lead to terminal B-16.
- (b) Push each of the mode control switch buttons in and check that their indicators light up.
- (c) Then, connect the positive (+) lead from the battery to terminal A-13 and check that indicator dims.

Connector "A"

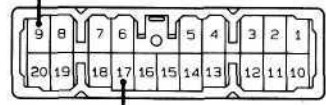


Connector "B"



AC2723

Connector "A"



AC2724

- (d) (with Auto A/C)  
Disconnect the positive (+) lead from terminal A-13 and the negative (—) lead from terminal B-16, then connect the negative (—) lead from the battery to terminal A-17 and check that the "FOOT" indicator lights up.

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

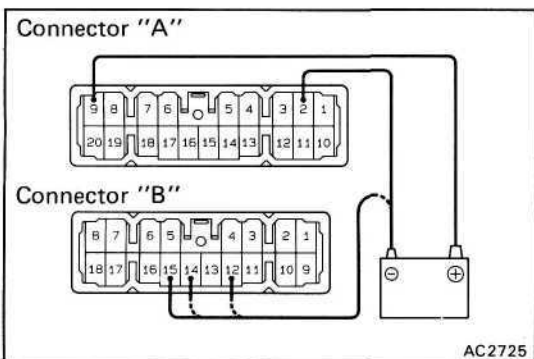
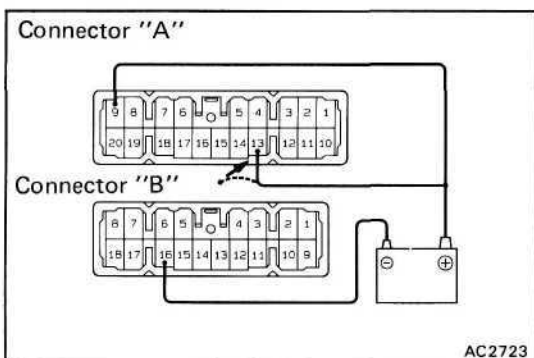
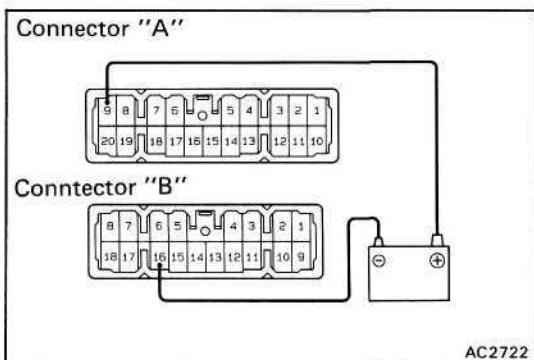
## 2. INSPECT SWITCH CONTINUITY

Terminal Switch position	A-7	A-11	A-12	A-14	B-4	B-11	B-16
FACE				○	—	—	○
BI-LEVEL			○	—	—	—	○
FOOL	○	—					○
FOOT-DEF						○	○
DEF					○	—	○
*AUTO		○	—	—	—	—	○

e-20-2-C  
e-18-2-B

\*: with Auto A/C

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



## Blower Speed Control Switch

## INSPECTION OF SWITCH

## 1. INSPECT INDICATOR

- Connect the positive (+) lead from the battery to terminal A-9 and the negative (—) lead to terminal B-16.
- Push each of the blower speed control switch buttons in and check that their indicators light up.
- Then, connect the positive (+) lead from the battery to terminal A-13 and check that indicator dims.
- (with Auto A/C)  
Disconnect the positive (+) lead from terminal A-13 and the negative (—) lead from terminal B-16, and connect the negative (—) lead from the battery to each terminal, then check that the each indicator lights up.

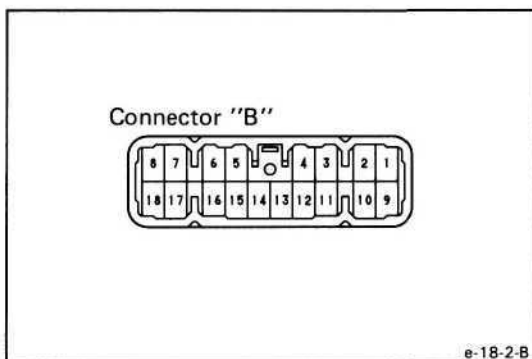
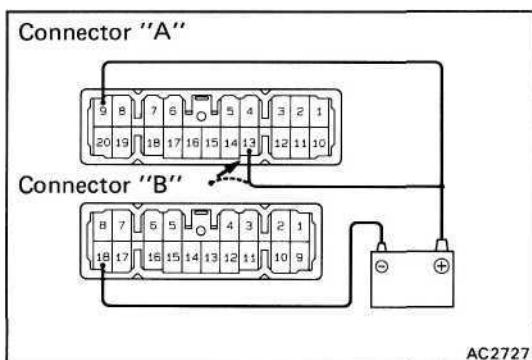
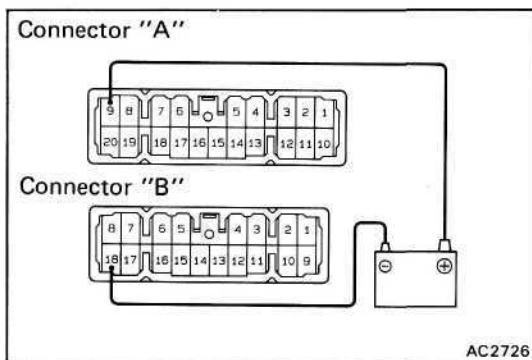
Connected terminal	Indicator
A-2	LO
B-12	HI
B-14	■(M2)
B-15	■(M1)

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

## 2. INSPECT SWITCH CONTINUITY

Terminal		A-1	A-10	B-9	B-10	B-13	B-16
Switch position							
OFF			○				○
LO		○					○
▪ (M1)				○			○
▪ (M2)					○		○
HI						○	○

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



## A/C Switch

### INSPECTION OF SWITCH (without Auto A/C)

#### 1. INSPECT INDICATOR

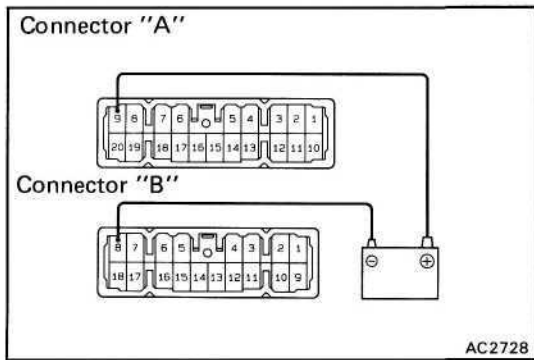
- Connect the positive (+) lead from the battery to terminal A-9 and the negative (—) lead to terminal B-18.
- Check that the A/C indicator lights up intermittently each time the A/C switch button is pressed.
- Then, connect the positive (+) lead from the battery to terminal A-13 and check that the indicator dims.

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

#### 2. INSPECT SWITCH CONTINUITY

Check that there is continuity between terminals B-6 and B-17 intermittently each time the A/C switch button is pressed.

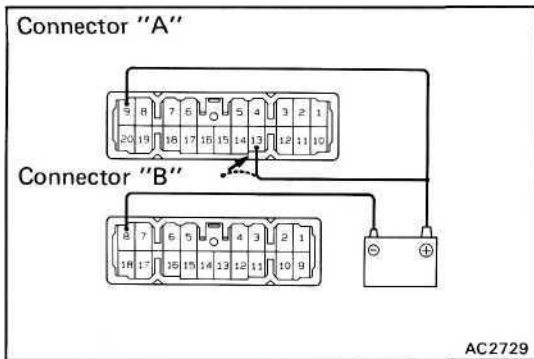
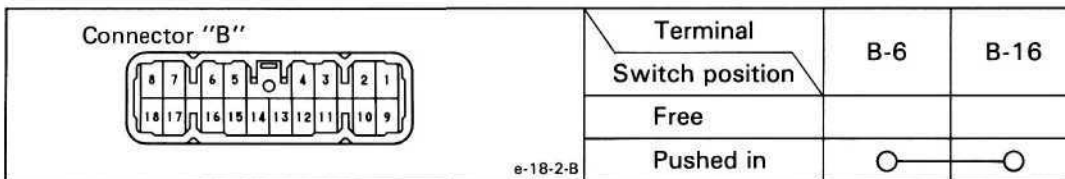
If continuity is not as specified, replace the A/C control assembly.

**(with Auto A/C)****1. INSPECT INDICATOR**

- (a) Connect the positive (+) lead from the battery to terminal A-9 and the negative (—) lead to terminal B-8, and check that the A/C indicator lights up.

- (b) Then, connect the positive (+) lead from the battery to terminal A-13 and check that the indicator dims.

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

**2. INSPECT SWITCH CONTINUITY**

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

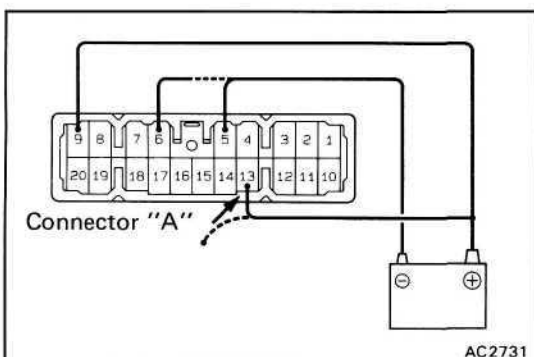
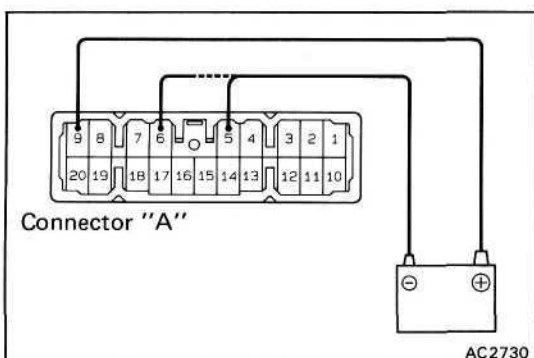
**Auto Switch****INSPECTION OF SWITCH****1. INSPECT INDICATOR**

- (a) Connect the positive (+) lead from the battery to terminal A-9 and the negative (—) lead to each terminal, then check that the each color indicator lights up.

Connected terminal	Color of indicator
A-5	Green
A-6	Yellow

- (b) Then, connect the positive (+) lead from the battery to terminal A-13 and check that the indicator dims.

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

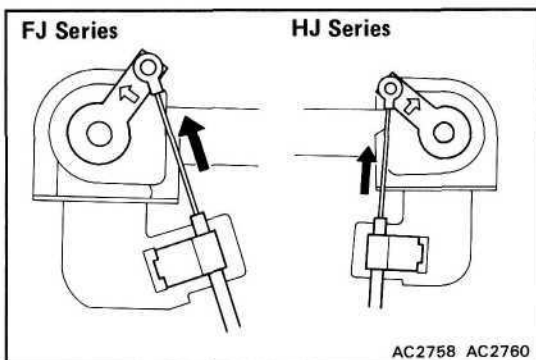


**2. INSPECT SWITCH CONTINUITY**

Connector "A"		Terminal	A-4	B-16
		Switch position		
Connector "B"		Free		
		Pushed in		

e-20-2-C  
e-18-2-B

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



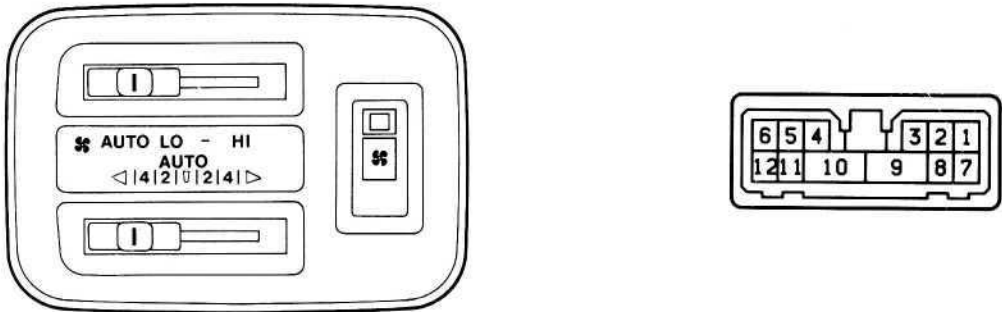
AC2758 AC2760

**Water Valve Control Cable****ADJUSTMENT OF CONTROL CABLE****ADJUST CONTROL CABLE**

- (a) Set the vehicle in following condition.
  - Ignition switch on.
  - Blower speed control switch on.
  - Temperature control switch to "COOL" position.
- (b) Set the water valve to "COOL" position, install the control cable and lock the clamp.

REAR COOLER CONTROL PANEL

Reference:

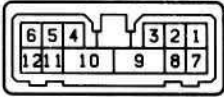


AC2763 SH-12-2

A/C Switch

INSPECTION OF SWITCH

INSPECT SWITCH CONTINUITY

	Terminal Switch position	2	8	11
	OFF	○	○	
	ON		○	○

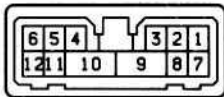
SH-12-2

If continuity is not as specified, replace the control panel.

Blower Switch

INSPECTION OF SWITCH

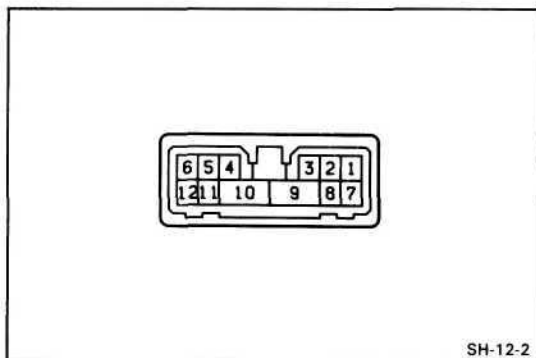
INSPECT SWITCH CONTINUITY

	Terminal		6	9	10	12	
	Switch position						
	Manual A/C	AUTO A/C					
	LO	AUTO					
	▪	LO	○		○		
	▪	▪				○	○
	HI	HI			○	○	

SH-12-2

SH-12-2

If continuity is not as specified, replace the control



SH-12-2

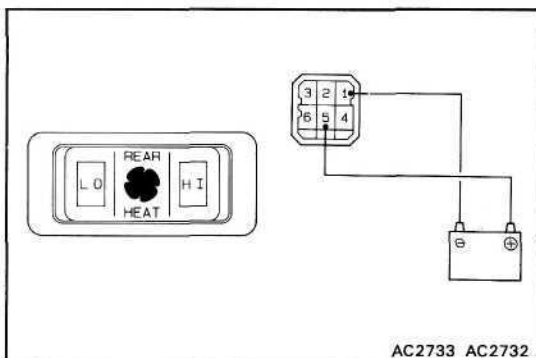
## Temperature Control Resistor

### INSPECTION OF RESISTOR

#### INSPECT RESISTOR RESISTANCE

- (a) (Manual A/C)  
Check that there is no continuity between terminals 3 and 4 with the arm OFF position.
- (b) Check that the resistance between terminals 3 and 4 decreases from approx. 3 k $\Omega$  to 0  $\Omega$ , when the arm is moved from HOT to COOL position.

If resistance value is not as specified, replace the control panel.



AC2733 AC2732

## REAR HEATER SWITCH

### INSPECTION OF SWITCH

#### 1. INSPECT INDICATOR

- (a) Connect the positive (+) lead from the battery to terminal 5 and the negative (—) lead to terminal 1.
- (b) Push each of the rear heater switch knob in and check that their indicators light up.

If indicator operation is not as specified, replace the switch.

#### 2. INSPECT SWITCH CONTINUITY

Terminal Switch position	1	2	4	5	Illumination	
					3	6
HI	○	—	○			
OFF						
LO	○	○				

AC2733 S-6-2-B

If continuity is not as specified, replace the switch.

## REAR COOLER SWITCH

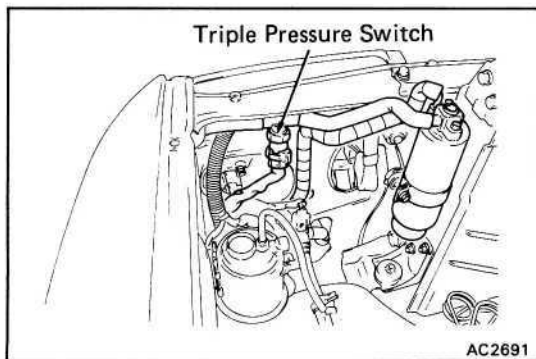
### INSPECTION OF SWITCH

#### INSPECT SWITCH CONTINUITY

Terminal Switch position	4	5	6
OFF		○	○
ON	○	○	

AC2764 S-6-2

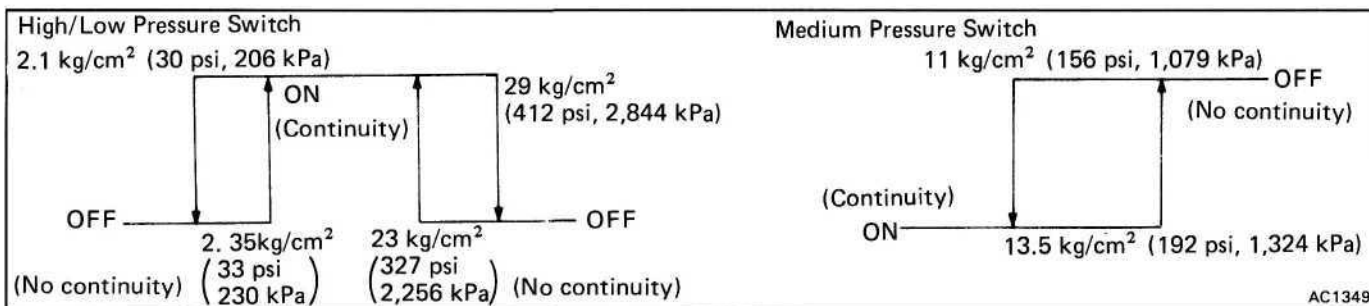
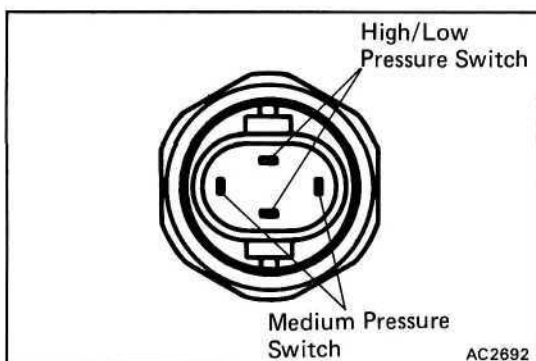
If continuity is not as specified, replace the switch.



## TRIPLE PRESSURE SWITCH

### ON-VEHICLE INSPECTION

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 the two terminals of the pressure switch shown in the below.



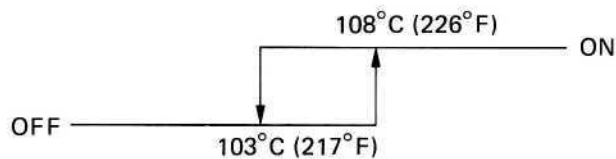
If defective, replace the pressure switch.

## WATER TEMPERATURE CUT SWITCH

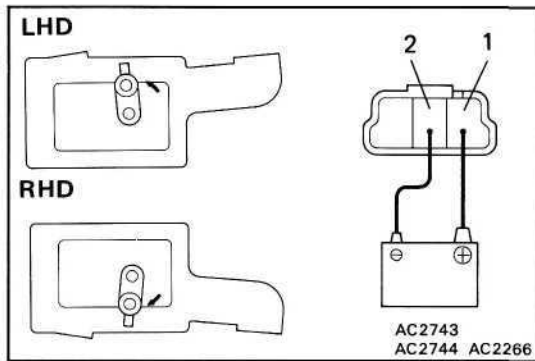
### INSPECTION OF SWITCH

#### INSPECT SWITCH CONTINUITY

Check the continuity between terminals of the switch shown in the below.







## SERVOMOTORS

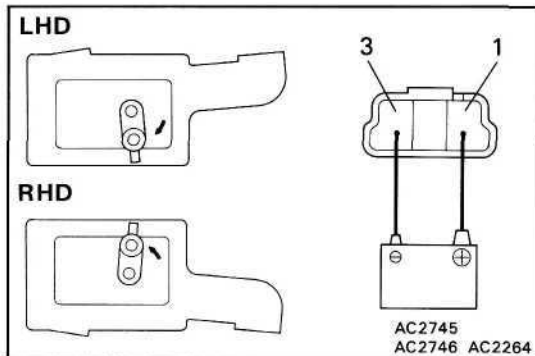
### Air Inlet Servomotor

#### INSPECTION OF SERVOMOTOR

##### INSPECT SERVOMOTOR OPERATION

- Connect the positive (+) lead from the battery to terminal 1 and the negative (—) lead to terminal 2, then check that the arm rotates to the "FRESH" position.
- Connect the positive (+) lead from the battery to terminal 1 and the negative (—) lead to terminal 3, then check that the arm rotates to the "RECIRC" position.

If operation is not as specified, replace the servomotor.



### Air Mix Servomotor

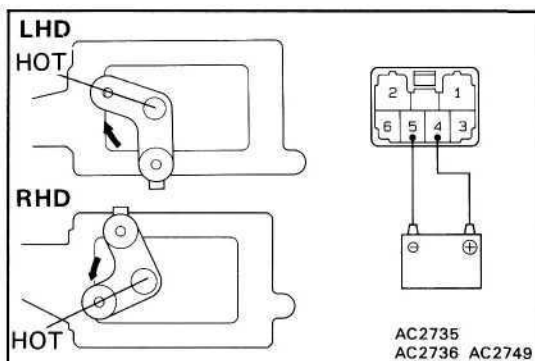
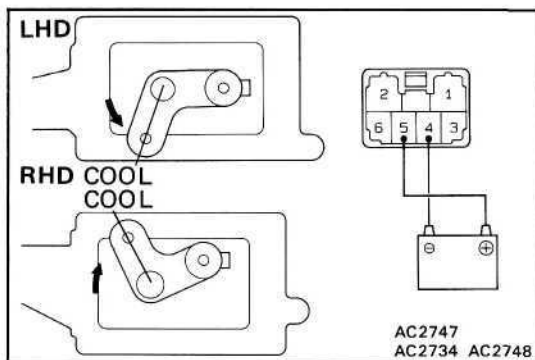
#### INSPECTION OF SERVOMOTOR

##### 1. INSPECT SERVOMOTOR OPERATION

- Connect the positive (+) lead from the battery to terminal 5 and the negative (—) lead to terminal 1, then check that the arm rotates to the "COOL" position.

- Reverse the polarity, check that the arm rotates to the "HOT" position.

If operation is not as specified, replace the servomotor.



##### 2. INSPECT POSITION SENSOR RESISTANCE

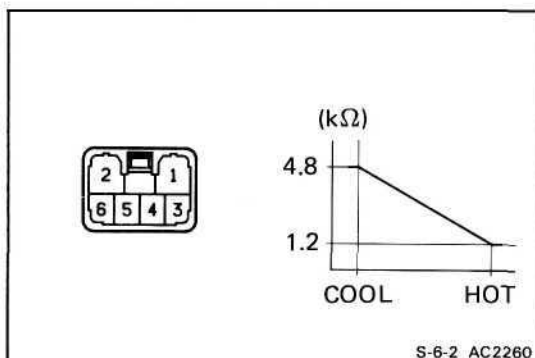
- Measure the resistance between terminals 1 and 3.

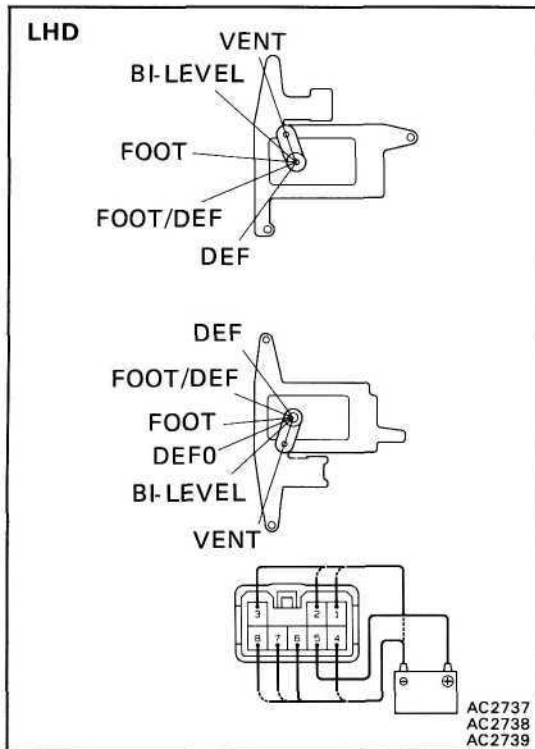
**Resistance: Approx. 6 k $\Omega$**

- Set the arm to COOL position.

- Check that the resistance between terminals 2 and 3 decreases from approx. 4.8 k $\Omega$  to 1.2 k $\Omega$ , when the arm is rotated from COOL to HOT position.

If operation is not as specified, replace the motor.





## Mode Servomotor

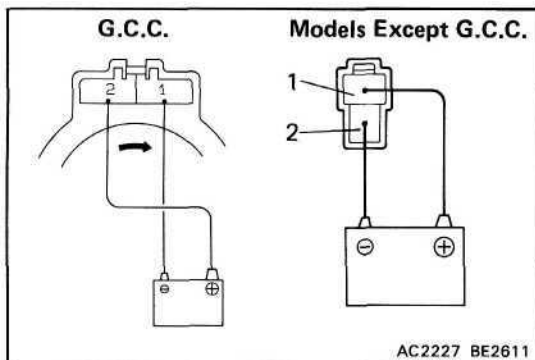
### INSPECTION OF SERVOMOTOR

#### INSPECT SERVOMOTOR OPERATION

- Connect the positive (+) lead from the battery to terminal 5 and the negative (—) lead to terminal 6.
- Connect the negative (—) lead from the battery to each terminal and check that the arm rotates to each position as shown.

Connected terminal	Position
1	VENT
2	BI-LEVEL
3	FOOT
4	FOOT/DEF
7	DEF
8 (RHD)	DEF 0

If operation is not as specified, replace the servomotor.



## BLOWER MOTORS

### Front A/C Blower Motor

#### INSPECTION OF BLOWER MOTOR

##### INSPECT BLOWER MOTOR OPERATION

##### (G.C.C.)

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.

##### (Models Except G.C.C.)

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.

### Rear Heater Blower Motor

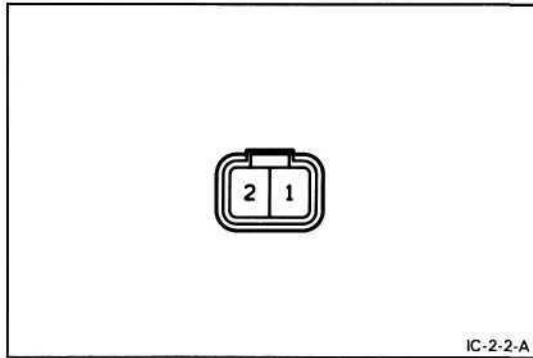
#### INSPECTION OF BLOWER MOTOR

Check the motor the same way as for the front A/C blower motor (RHD).

### Rear Cooler Blower Motor

#### INSPECTION OF BLOWER MOTOR

Check the motor the same way as for the front A/C blower motor (RHD).



## CONDENSER FAN MOTOR

### INSPECTION OF CONDENSER FAN MOTOR

#### INSPECT FAN MOTOR OPERATION

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

If operation is not as specified, replace the motor.

## BLOWER RESISTORS

### Front A/C Blower Resistor

#### INSPECTION OF BLOWER RESISTOR

##### INSPECT BLOWER RESISTOR CONTINUITY

<p>H-4-2</p>	Terminal Condition	1	3	2	4
	Constant				

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

### Rear Heater Blower Resistor

#### INSPECTION OF BLOWER RESISTOR

##### INSPECT BLOWER RESISTOR CONTINUITY

Connector "A"	Connector "B"	Terminal Condition	A-1	A-2	A-3	B-1	B-2
	<p>H-3-2 H-2-2</p>						

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

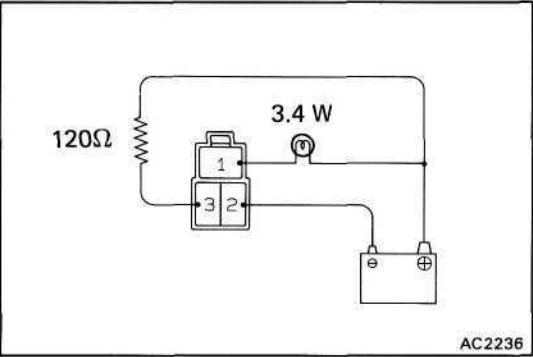
### Rear Cooler Blower Resistor

#### INSPECTION OF BLOWER RESISTOR

##### INSPECT BLOWER RESISTOR CONTINUITY

<p>G-9-2</p>	Terminal Condition	8	6	9	7
	Constant				

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



POWER TRANSISTOR

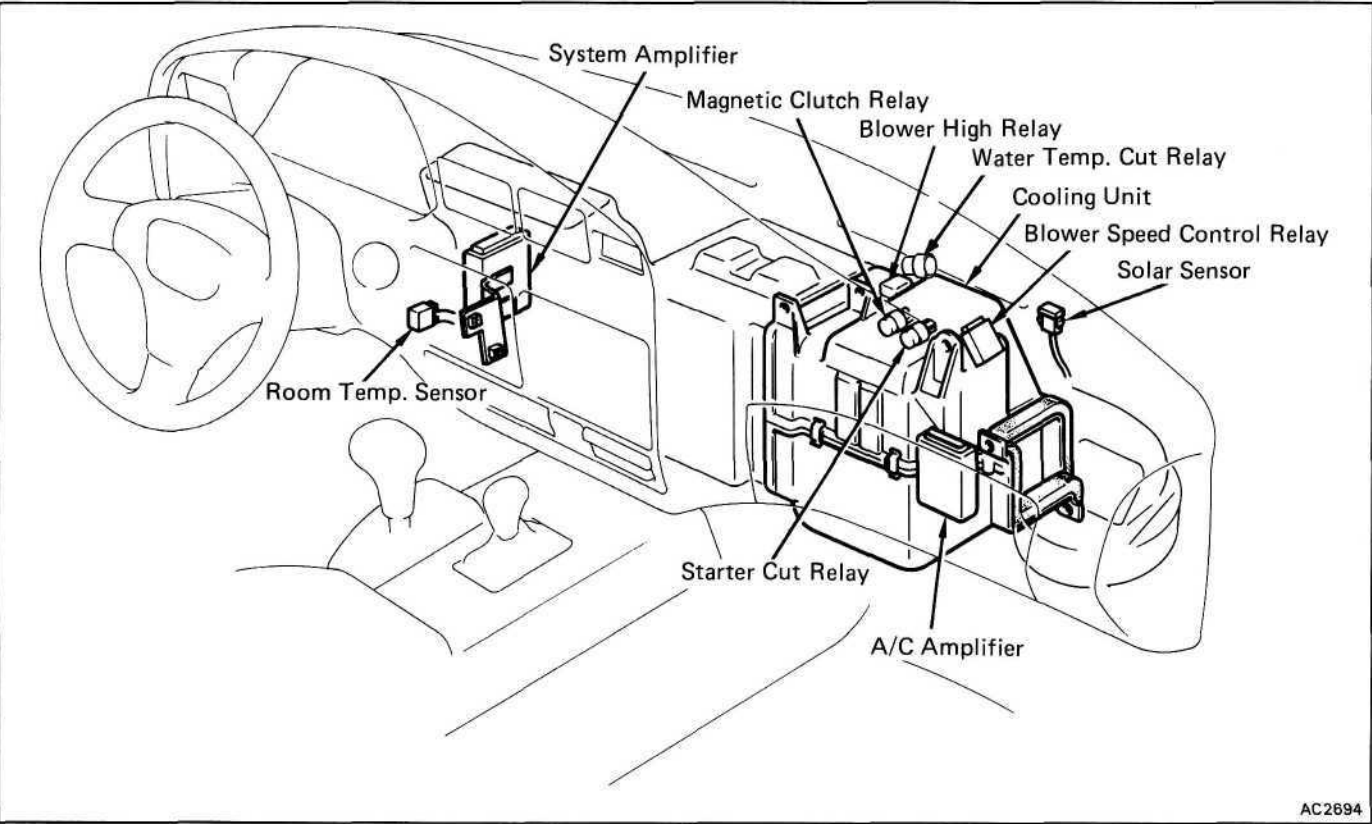
INSPECTION OF POWER TRANSISTOR

INSPECT POWER TRANSISTOR

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

LOCATION OF RELAYS AND AMPLIFIERS



HEATER RELAY

INSPECTION OF RELAY

INSPECT RELAY CONTINUITY

BE1850 BE1844

Terminal	1	2	3	4	5
Condition					
Costant	○	○	○	○	
Apply battery voltage to terminals 1 and 3.				○	○

If continuity is not as specified, replace the relay.

## BLOWER SPEED CONTROL RELAY

### INSPECTION OF RELAY BOX

#### INSPECT RELAY BOX CONTINUITY

<p>H-8-2 AC2145</p>	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.

## REAR HEATER RELAY

### INSPECTION OF RELAY

#### INSPECT RELAY CONTINUITY

<p>H-6-2 BE1844</p>	Terminal Condition	1	2	3	4	6
	Constant					
	Apply battery voltage to terminals 2 and 6.					

If continuity is not as specified, replace the relay.

## BLOWER HIGH RELAY

### INSPECTION OF RELAY

#### INSPECT RELAY CONTINUITY

<p>BE1647 BE1841</p>	Terminal Condition	1	2	3	4
	Constant				
	Apply battery voltage to terminals 1 and 3.				

If continuity is not as specified, replace the relay.

## MAGNETIC CLUTCH RELAY

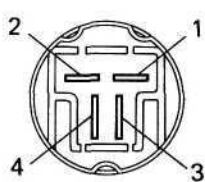
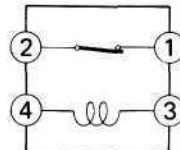
### INSPECTION OF RELAY

Check the relay the same way as for the blower high relay on page AC-73.

## WATER TEMPERATURE CUT RELAY

### INSPECTION OF RELAY

#### INSPECT RELAY CONTINUITY

					
BE0006 BE4229					
Apply battery voltage to terminals 3 and 4.					
Terminal Condition		1	2	3	4
Constant		○	○	○	○

If continuity is not as specified, replace the relay.

## REAR COOLER RELAY

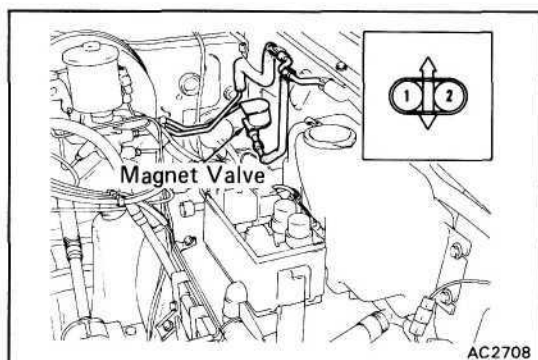
### INSPECTION OF RELAY

Check the relay the same way as for the heater relay on page AC-72.

## CONDENSER FAN RELAY

### INSPECTION OF RELAY

Check the relay the same way as for the blower high relay on page AC-73



## MAGNETIC VALVES

### Front Magnetic Valve

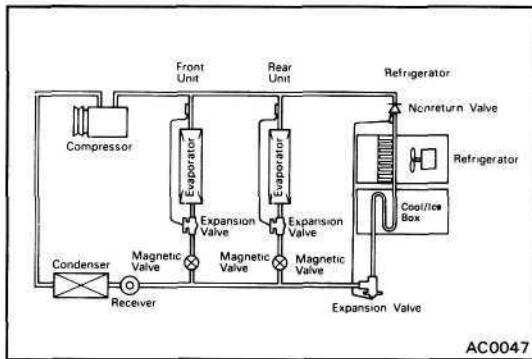
#### INSPECTION OF MAGNETIC VALVE

##### 1. MEASURE MAGNETIC VALVE RESISTANCE

Measure the resistance between terminals 1 and 2.

**Resistance:** 12.5 - 17.0Ω/20°C

If resistance value is not correct, replace the magnetic valve.

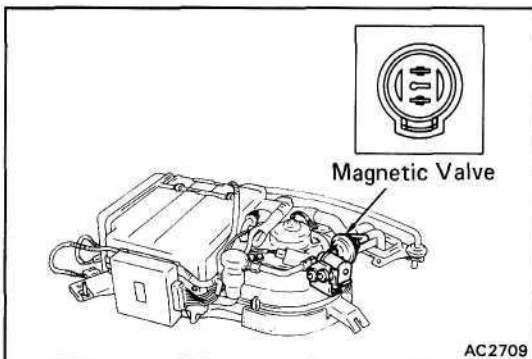


## 2. INSPECT MAGNETIC VALVE OPERATION

A/C ON-OFF, Refrigerator OFF

Condition		1	2	3	4
Device					
A/C Switch	Front	ON	ON	OFF	OFF
	Rear	ON	OFF	ON	OFF
Magnetic Valve					
	Front	Open (ON)	Open (ON)	Shut (OFF)	Shut (OFF)
	Rear	Open (ON)	Shut (OFF)	Open (ON)	Shut (OFF)
Compressor Magnetic Clutch		ON	ON	ON	OFF

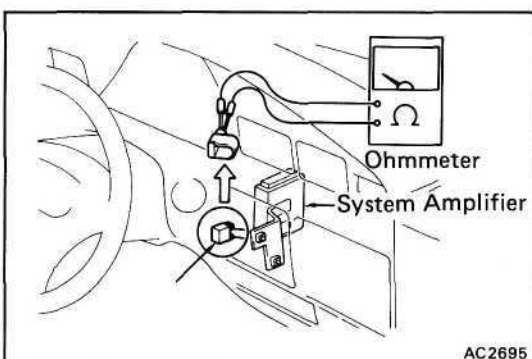
If operation is not as specified, replace the magnetic valve.



## Rear Cooler Magnetic Valve

### INSPECTION OF MAGNETIC VALVE

Check the magnetic valve the same way as for the front A/C magnetic valve on page AC-74.



## SENSORS

### Room Temperature Sensor

#### INSPECTION OF SENSOR

##### MEASURE SENSOR RESISTANCE

Check the sensor resistance.

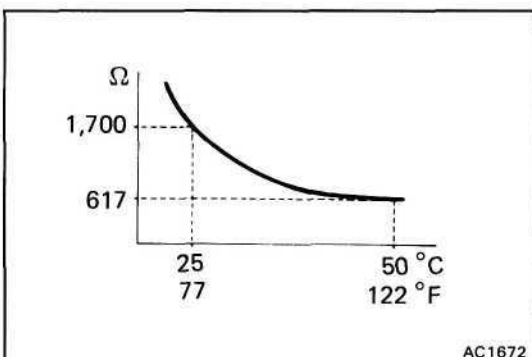
**1.6 - 1.8k $\Omega$  at 25°C (77°F)**

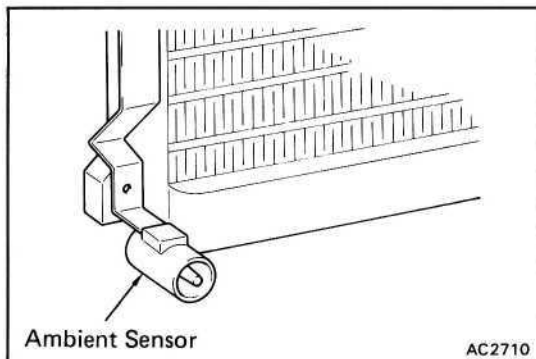
If resistance value is not as specified, replace the sensor.

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.

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





## Ambient Temperature Sensor

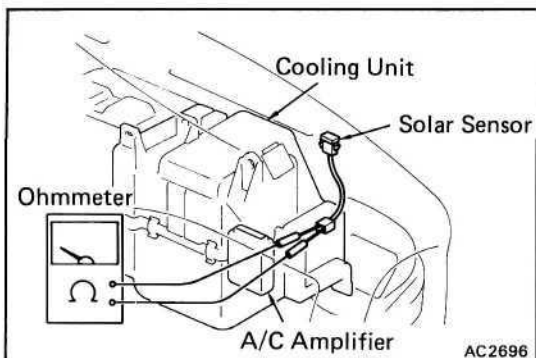
### INSPECTION OF SENSOR

#### MEASURE SENSOR RESISTANCE

Check the sensor resistance.

1.6 - 1.8 k $\Omega$  at 25°C (77°F)

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



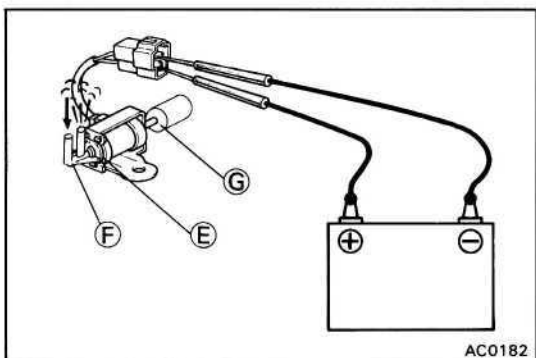
## Solar Sensor

### INSPECTION OF SENSOR

#### INSPECT SENSOR CONTINUITY

Check that there is continuity between terminals.

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



## VACUUM SWITCHING VALVE (VSV)

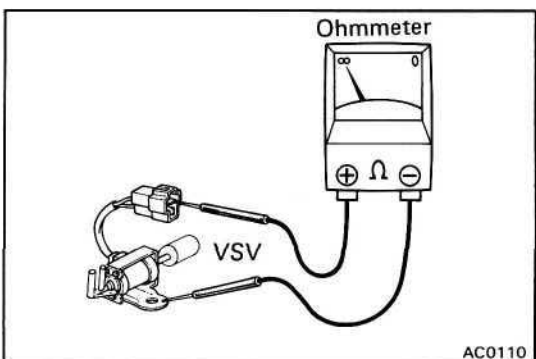
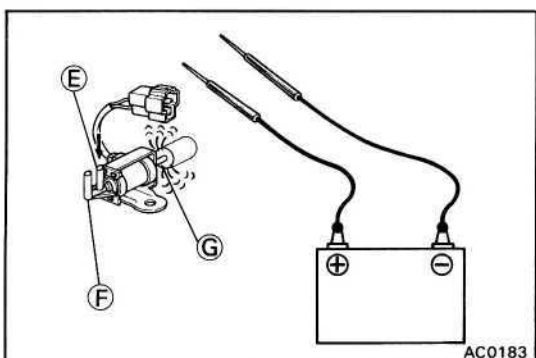
(1HZ, 1HD-T and 3F Engine)

### INSPECTION OF VSV

#### 1. CHECK VACUUM CIRCUIT CONTINUITY IN VSV BY BLOWING AIR INTO PIPES

- Connect the VSV terminals to the battery terminals as illustrated.
- Blow into pipe "F" and check that air comes out of pipe "E" but does not come out of filter "G".
- Disconnect the battery.
- Blow into pipe "E" and check that air comes out of filter "G" but does not come out of pipe "F".

If a problem is found, repair or replace the VSV.

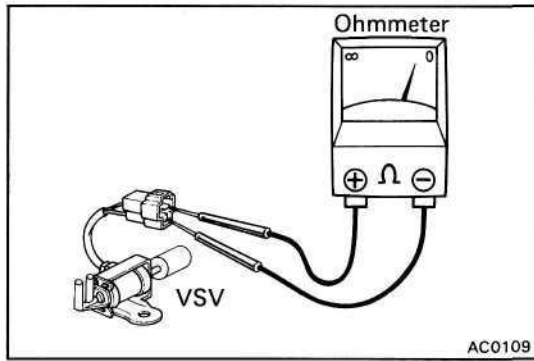


#### 2. CHECK FOR SHORT CIRCUIT

Using an ohmmeter, check that there is no continuity between each terminal and the VSV body.

If there is continuity, replace the VSV.





### 3. CHECK FOR OPEN CIRCUIT

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

Resistance: 38 - 44  $\Omega$  at 20°C (68°F)

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

## AMPLIFIERS

### A/C Amplifier

#### INSPECTION OF AMPLIFIER

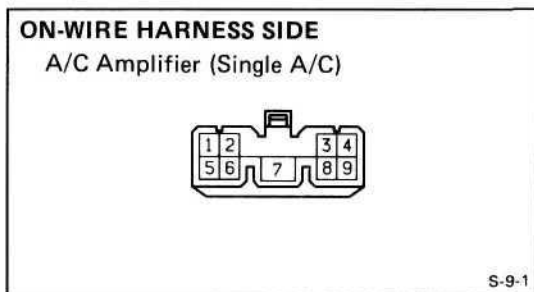
##### (Single A/C)

#### 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	6 — Ground	Constant	Continuity
	8 — 9	Constant	Continuity
Voltage	2 — 6	Turn A/C switch on.	Battery voltage
		Turn A/C switch off.	No voltage
	3 — 6	Turn A/C switch on.	Battery voltage
		Turn A/C switch off.	No voltage
	5 — 6	Start the engine.	Approx. 10 to 14 V
		Stop the engine.	No voltage
Resistance	9 — 6	Constant	Approx. 1.5 k $\Omega$ at 25°C (77°F)
	7 — 6	Constant	Approx. 38 — 44 $\Omega$ at 20°C (68°F)

If circuit is as specified, replace the amplifier.

**WIRE HARNESS**

A/C Amplifier (Dual A/C)



K-17-1

**(Dual A/C : 3F Engine)****INSPECT AMPLIFIER CIRCUIT**

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

Test conditions:

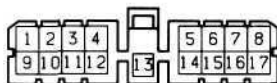
- (1) Ignition switch: ON
- (2) Temperature control lever: MAX COOL
- (3) Blower switch: HI

Check for	Tester connection	Condition	Specified value
Continuity	5 – 13	Turn rear A/C switch on.	Continuity
		Turn rear A/C switch off.	No continuity
	13 – Ground	Constant	Continuity
	16 – 17	Constant	Continuity
Voltage	1 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	2 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	3 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	4 – 13	Turn A/C switch on.	Battery voltage
		Turn A/C switch off.	No voltage
	5 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	6 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	9 – 13	Start the engine.	Approx. 10 to 14 V
		Stop the engine.	No voltage
	10 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
Resistance	7 – 8	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	16 – 12	Constant (thermistor)	Approx. 100 – 4,000 Ω

If circuit is as specified, replace the amplifier.

**WIRE HARNESS**

A/C Amplifier (Dual A/C)



K-17-1

**(Dual A/C : 3F-E, 1HZ and 1HD-T Engine)****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	5 – 13	Turn rear A/C switch on.	Continuity
		Turn rear A/C switch off.	No continuity
	13 – Ground	Constant	Continuity
	16 – 17	Constant	Continuity
Voltage	1 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	2 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	3 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	4 – 13	Turn A/C switch on.	Battery voltage
		Turn A/C switch off.	No voltage
	5 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	6 – 13	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
Resistance	7 – 8	Turn ignition switch on.	Battery voltage
		Turn ignition switch off.	No voltage
	14 – 13	Turn ignition switch on.	Battery voltage
Resistance	7 – 8	Variable	Approx. 0 to 3 k $\Omega$
	8 – 12	Constant (thermistor)	Approx. 100 – 4,000 $\Omega$
	16 – 12	Constant (thermistor)	Approx. 100 – 4,000 $\Omega$

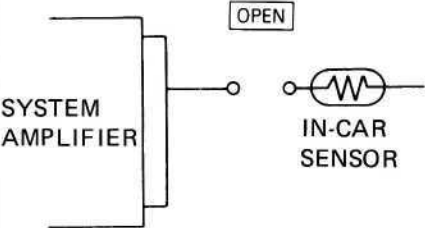
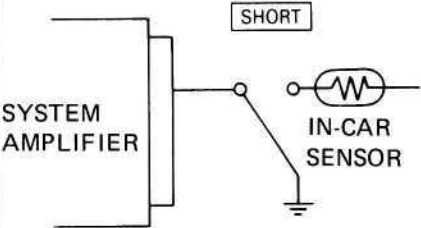
If circuit is as specified, replace the amplifier.

## System Amplifier

(Automatic A/C)

### INSPECTION OF SYSTEM AMPLIFIER

#### 1. False Signal Input to System Amplifier

False Signal	A	B
Condition	<p>Interior room temperature is very low.</p>  <p style="text-align: right;">AC1370</p>	<p>Interior room temperature is very high.</p>  <p style="text-align: right;">AC1371</p>
Your Work	Remove in-car sensor connector.	Remove in-car sensor, and ground the number 1 pin of in-car 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 Servo Motor	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 Servo Motor		Air Flow Mode Damper			
		VENT	BI-LEVEL	HEAT	DEF
	A	Close	Close	Open	Close
	B	Open	Close	Close	Close

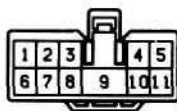
#### System Operation When Input False Signal (Cont'd)

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

If necessary, replace the system amplifier.

**WIRE HARNESS SIDE**

Cool/Ice Box Amplifier



SH-11-1

**Cool/Ice Box Amplifier****INSPECTION OF 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	4 — Ground	Constant	Continuity
	9 — Ground	Constant	Continuity
	8 — 5	Constant	Continuity
Voltage	1 — 4	Turn COOL switch on.	Battery voltage
		Turn COOL switch off.	No voltage
	3 — 4	Turn ICE switch on.	Battery voltage
		Turn ICE switch off.	No voltage
	6 — 4	Turn ignition switch on.	Battery voltage
	8 — 4	Turn ignition switch off.	No voltage
Resistance	7 — 11	Constant	Approx. 1.5 kΩ

If circuit is correct, replace the amplifier.