HEATERS AND AIR-CONDITIONING

CONTENTS

GENERAL SPECIFICATIONS

Heater assembly	
Heater unit	
Type	Selective recirculating, warm water type (air-mix type)
Performance	4,825 kW/h (4,150 kcal/h)
Heater control assembly	Control knob illuminated by optical fiber
Heater relay	
Exciting coil rated current	0.175 ± 0.04 A
Maximum contact current capacity	22 A
Automatic air-conditioning	
Air conditioner type	AC174LN
Capacity	
Cooling capacity	3,663 kW/h (3,150 kcal/h) *1
Heating capacity	4,651 kW/h (4,000 kcal/h) *2
Compressor	
Type	DR6148
Compression system	Inclined plate type
Displacement	148 cc (9.0 cu.in.)/rev.
Number of cylinders	6
Max. speed	6,000 rpm
Refrigerator oil	SUNISO 5GS, 170 cc (10.4 cu.in.)
Electromagnetic clutch	
Type	Dry, single plate magnet type, 150 dia. × A
Voltage and output	12 V DC, 40 W
Blower	
Type	Single suction sirroco fan (also serves as heater fan)
Capacity	350 m³/h (1,236 ft/h)
Voltage and output	12 V DC, 154 W
Cooling unit	
System	Forced draft
Type	Aluminum corrugated fin type
Condenser	
Type	Aluminum corrugated fin type
Receiver assembly	Integral type (receiver, dryer, strainer, sight glass, fusible plug) molecular sieves 30 g (1.1 oz)
Controls	
Air flow rate control	Manual 2 steps (OFF, L, H) and auto 10 steps
Temperature control	Automatic air mix by vacuum system
Compressor control	3 steps (off, economy and AUTO)
Cool air blow out prevention	In AUTO Mode, blower speed is set to L when water temperature is below 50°C (122°F).
Prevention of frosting	Fin thermostat
Various compensation	Thermo switch, photo sensor, inside air sensor, fin sensor, foot sensor

Protective devices (vehicles with an intercooler)		
Pressure switch (vehicles with an intercooler)	kPa (psi)	ON at 1,912 (277), OFF at 1,618 (235)
Dual pressure switch	kPa (psi)	Low pressure switch ON at 196 (28.4), OFF at 206 (29.9)
		High pressure switch ON at 2,648 (384), OFF at 2,059 (299)
Thermosensor No. 1 (vehicles with an intercooler)		OFF at 81°C (177.8°F), ON at 85°C (185°F)
Thermosensor No. 2 (vehicles with an intercooler)		OFF at 96°C (204.8°F), ON at 100°C (212°F)
Water temperature switch		OFF at 113°C (235°F), ON above 108°C (226.4°F)
Refrigerant and quantity to be charged		R12 730 g (25.8 oz)

*1. Condition:	Compressor speed	1,800 rpm
	Condensation temperature	55°C (131°F)
	Cooling unit air inlet	Dry bulb temperature 27°C (81°F), wet bulb temperature 19.5°C (67°F)
	Fan motor terminal voltage	13.5 V DC
*2. Condition:	Temperature difference between hot water inlet and air inlet	65°C (149°F)
	Hot water flow rate	6 lit./min. (6.3 qts./min.)
	Fan motor terminal voltage	12 V DC

SERVICE SPECIFICATIONS

Standard value	
Air-conditioning	
Drive belt deflection mm (in.)	17–20 (.7–.8)
Thermo switch °C (°F)	
OFF → ON	46–54 (115–129)
ON → OFF	43 (109) or more
Pressure plate to rotor clearance mm (in.)	0.4–0.7 (.02–.03)
Shaft rotating torque Nm (ft.lbs.)	5 (4) or less
Shaft starting torque Nm (ft.lbs.)	5 (4) or less

TORQUE SPECIFICATIONS

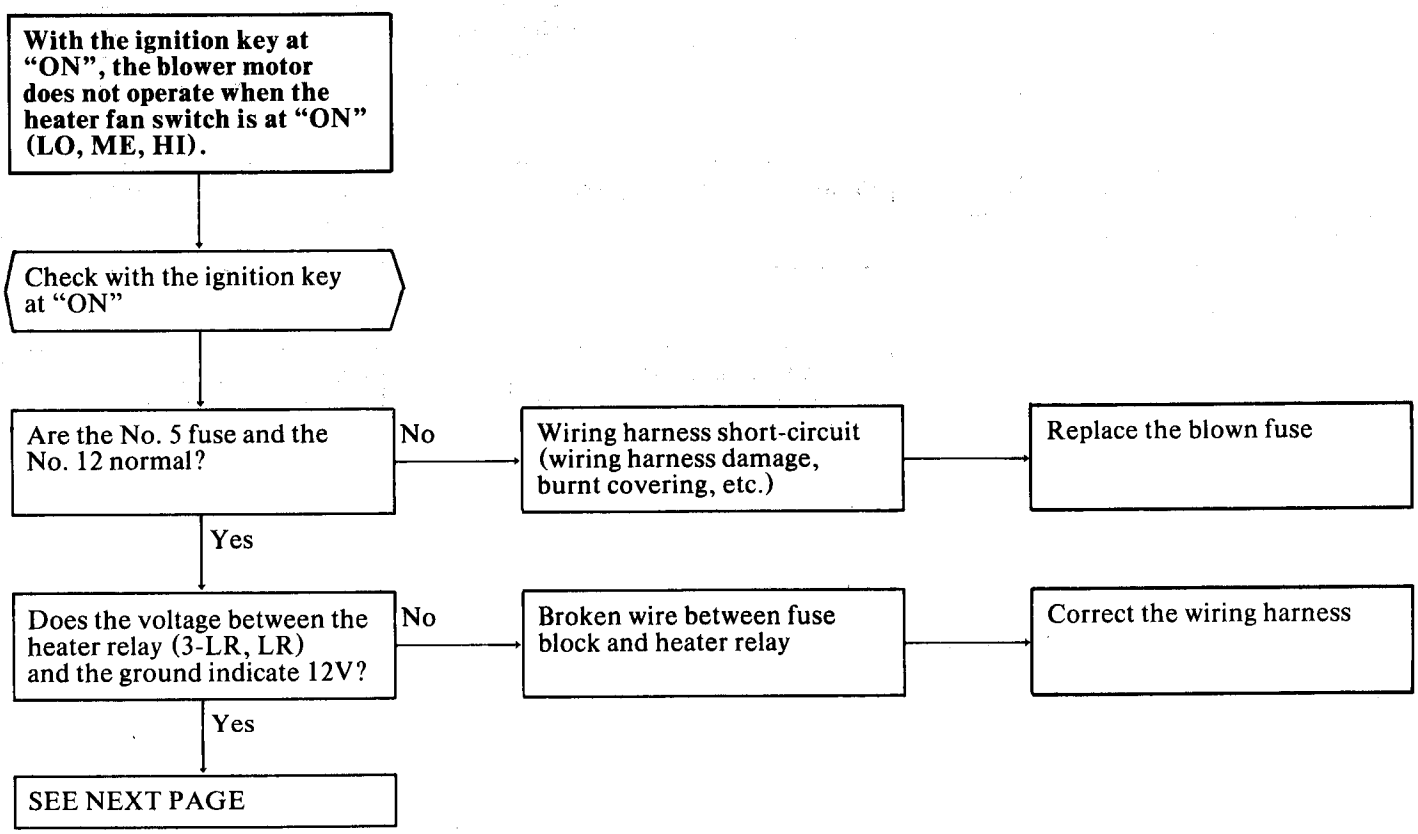
	Nm (ft.lbs.)
Air-conditioning	
Compressor to compressor brackets	20–29 (14–22)
Compressor bracket to engine block	40–50 (29–36) 10 × 50 bolt
	20–29 (14–22) 8 × 80 bolt
Center piece securing nut	15–17 (11–13)
Discharge and suction service valve mounting bolts	25–26 (18–20)
Front housing through bolt	2.5–2.6 (1.8–2.0)

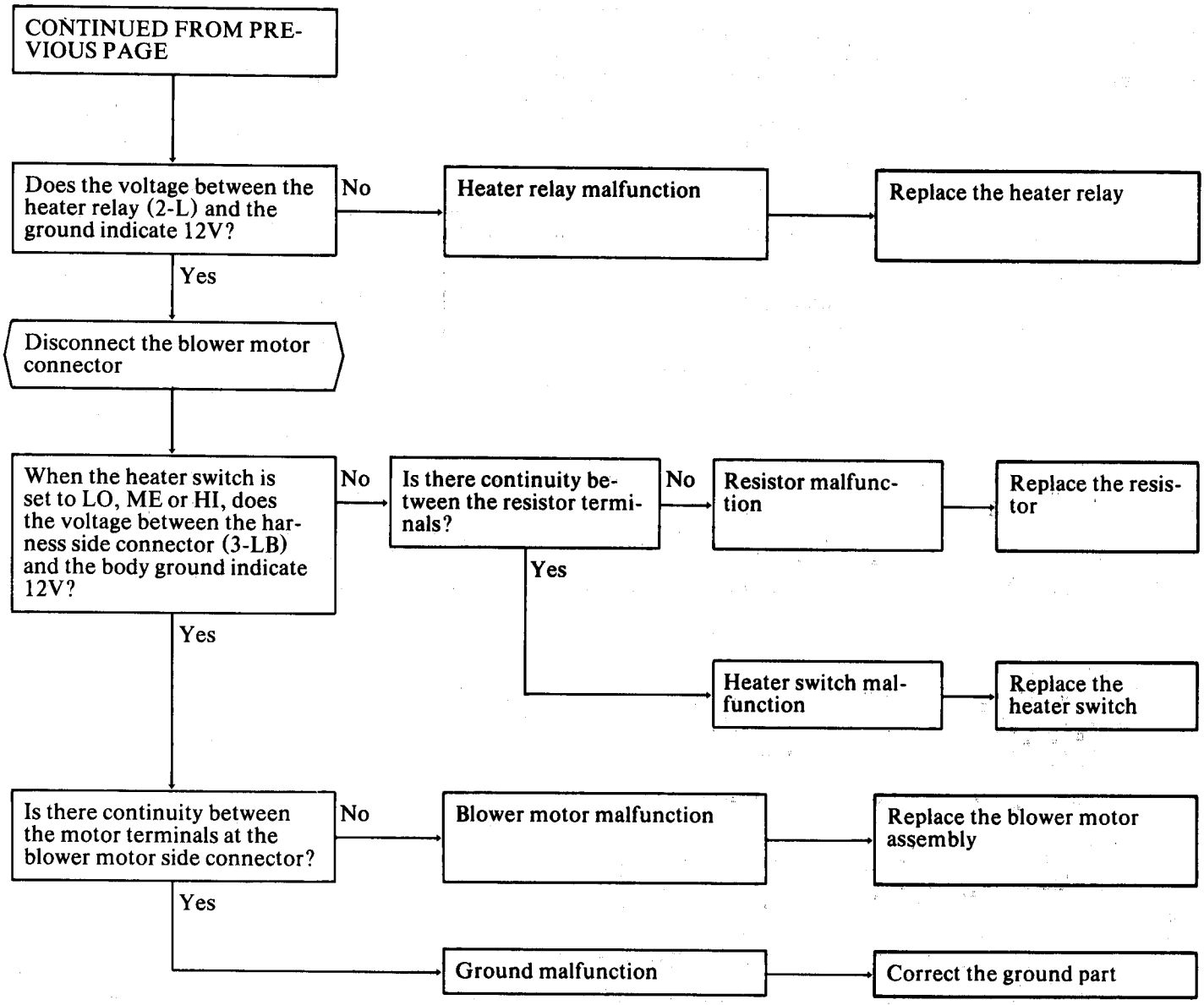
LUBRICANTS

	Specified lubricant	Quantity
Heater assembly		
Heater control lever	MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent	As required
Air-conditioning		
Compressor oil	SUNISO 5GS	Approx. 170 cc (10.4 cu.in.)

HEATER

Symptom	Probable cause	Remedy
The temperature cannot be regulated by operating the warm water flow control lever	Clogged or stuck water valve	Repair or replace the water valve
	Incorrect installation of warm water flow control cable	Adjust the warm water flow control cable
	Incorrect adjustment of water valve link	Adjust the water valve link
No ventilation even when air outlet changeover lever is operated	Incorrect adjustment of changeover dampers	Adjust the air outlet changeover cable
	Loose duct connection	Connect the duct securely
Abnormal sound from blower motor	Foreign matter inside blower	Remove foreign matter
	Incorrect balance of blower motor or fan	Replace the blower motor or fan
	Damaged blower	Replace
Dust enters passenger compartment	Ventilator duct connection malfunction	Connect the duct securely or replace the packing
	Incorrect adjustment of recirculation/ fresh air changeover damper	Adjust the recirculation/fresh air changeover cable





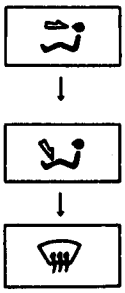
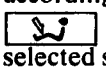
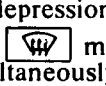
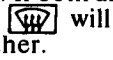
AUTOMATIC AIR-CONDITIONING

Operational Check and Causes of Troubles

Operate the switches in the sequence in the following table and check the indication of air flow indicator or the operation of each controller to verify correct operation of respective system components.

No.	Action	Normal Operation	Abnormal Operation/ Probable Cause
1	Start the engine. (Proceed to check after coolant is sufficiently warmed.)	• The AUTO switch lamp on control panel lights and "AUTO" is indicated on air flow indicator.	• AUTO switch lamp does not light and no beep sound is heard even if the switch is pressed. - Problem in switch
		• "88.0°F" is indicated on digital display. Two seconds later, the display changes to preset temperature indication.	• Some segments of "88.0" are missing or no indication. - Problem in digital display
		• Air flow is displayed on air flow indicator.	• No air flow display - Problem in indicator - Incorrect connection of harness connector
		• Air volume changes according to fan switch position.	• Fan motor does not operate even if the fan switch is set to ON. - Problem in fan controller
		• A/C lamp in air flow indicator lights and compressor comes into operation.	• Fan motor stays in operation even if the fan switch is set to OFF. - Problem in fan switch and/or harness
		• Compressor comes into operation.	• Compressor does not operate. - Problem in air conditioner
2	Change temperature setting to 90°F. (Set fan switch to AUTO position unless otherwise specified.)	• On depression of UP switch, beep sound is produced and the sound stops once 90°F is reached.	• No beep sound. Temperature setting remains unchanged. - Problem in switch - Problem in wiring harness
		• Beep sound is heard while temperature setting is being changed.	
		• When 90°F temperature is reached, the indication changes from "FACE" to "FACE/FOOT" and then to "FOOT", and also the air outlet accordingly.	• Air flow does not change to FOOT mode or air outlet does not correspond to mode indication. - Problem in air flow change vacuum solenoid or vacuum actuator
		• When outlet air reaches the warmest temperature, the indication color changes from green to orange.	• The warmest temperature cannot be attained or, conversely, temperature drops to the lowest. - Problem in air mixing damper servo motor
		• Outside air is introduced.	• Interior air recirculates. - Problem in outside/inside air damper vacuum solenoid or actuator
		• Compressor stops.	• Compressor comes into operation. - Problem in wiring harness - Problem in control box
		• Fan speed becomes MH.	• Fan speed remains unchanged. - Problem in fan controller - Problem in wiring harness - Problem in control box

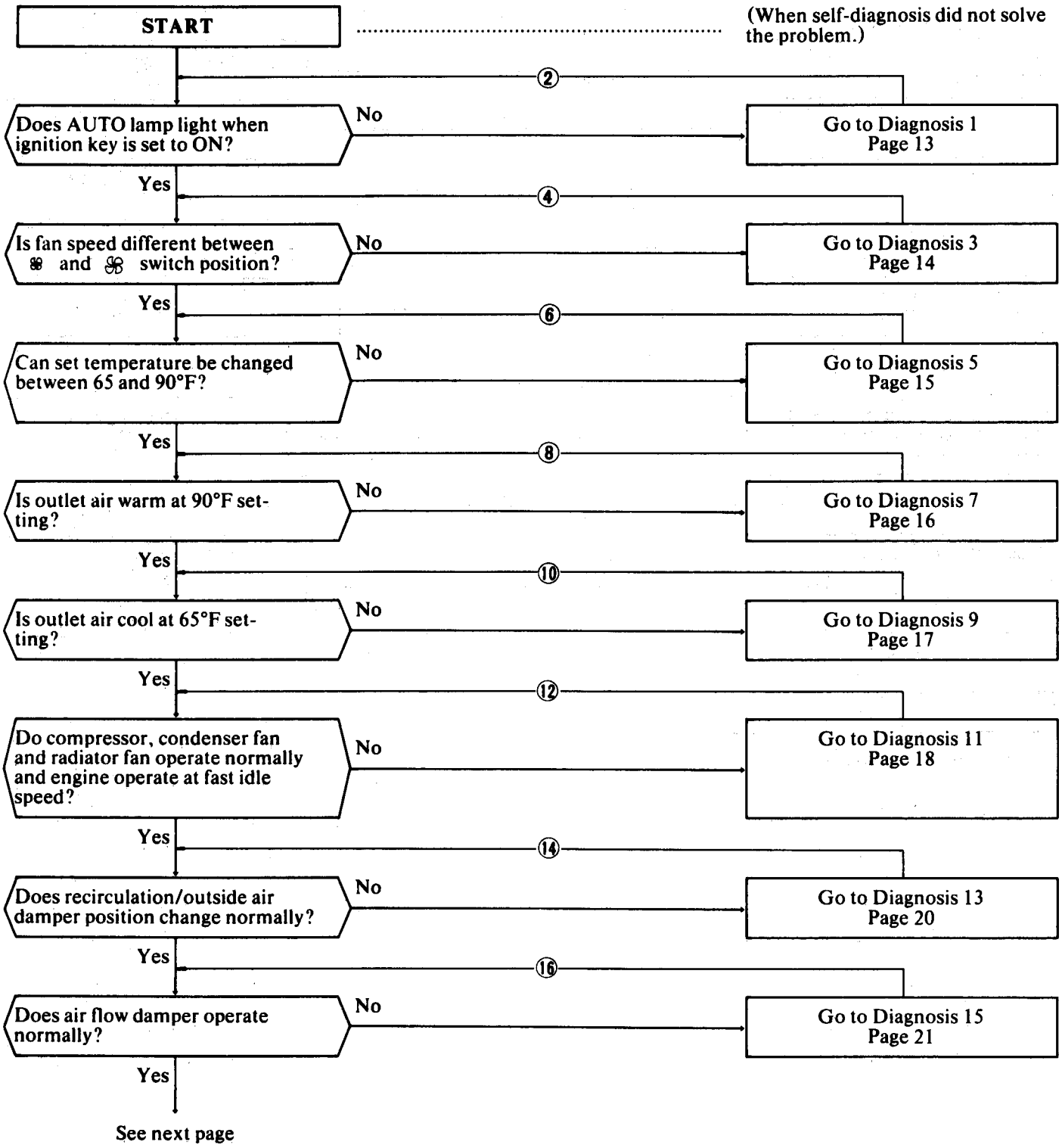
No.	Action	Normal Operation	Abnormal Operation/ Probable Cause
3	Change temperature setting from 90°F to 65°F	• Upon depression of DOWN switch, beep sound is produced and the sound stops once 65°F temperature is reached.	• No beep sound. Temperature setting remains unchanged. - Problem in switch - Problem in wiring harness
		• Beep sound is heard while temperature setting is being changed.	• Temperature indication remains unchanged. - Problem in indicator - Problem in wiring harness
		• When 65°F temperature is reached, the indication changes from "FOOT" to "FACE/FOOT" and then to "FACE", and also the air outlet accordingly. (Observe LED also.)	• Air flow does not change to FACE mode or air outlet does not correspond to the indicated mode. - Problem in air flow changeover vacuum solenoid or actuator
		• Outlet air temperature becomes the lowest (air mix damper is closed).	• Outlet air does not become cooler, much less the lowest temperature (air mix damper does not operate). - Problem in air mix damper servo motor
		• Temperature indication color changes to green.	• Temperature indication color becomes orange. - Problem in indicator and/or wiring harness
		• Compressor comes into operation.	• Compressor does not operate. - Problem in air conditioner
		• Air flow changes from introduction of outside air to recirculation of inside air.	• Outside air is introduced. - Problem in recirculation/outside air damper actuator
		• Fan speed becomes "H" (H relay closes).	• Fan speed remains unchanged and H relay is inoperative. - Problem in power transistor - Problem in relay
4	Press recirculation/ outside air changeover switch twice and then press AUTO switch. (Temperature setting is 77°F)	• Every depression of changeover switch causes beep sound and switch lamp is kept lit in that while. Once AUTO switch is pressed, the changeover switch lamp goes off.	• Beep sound is produced but lamp does not light. - Blown lamp bulb
			• Neither beep sound is produced nor lamp lights. - Problem in switch
		• On depression of changeover switch, the damper position changes from recirculation position to outside air position and vice-versa.	• Damper position does not change (but air flow indication changes). - Problem in recirculation/outside air damper actuator
		• Indication on air flow indicator changes or switch LED comes on or off in synchronization with the damper position change.	• Damper position changes but air flow indicator indication does not. - Problem in indicator - Problem in wiring harness
		• If AUTO switch is pressed, damper returns automatically to its original position and indication also returns to "AUTO".	

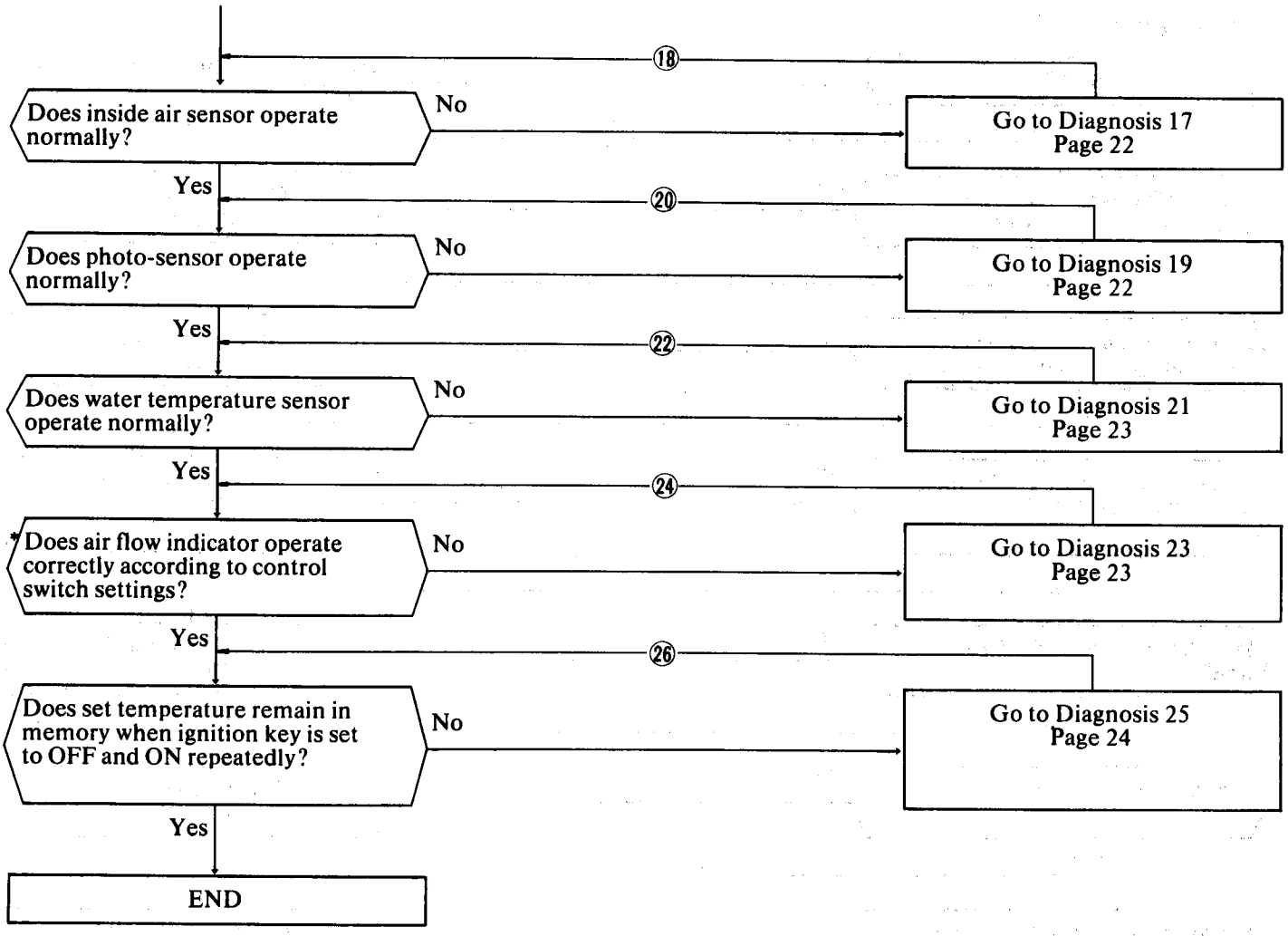
No.	Action	Normal Operation	Abnormal Operation/ Probable Cause
5	**Press ECONOMY switch three times and then press AUTO switch. (Temperature setting is 77°F)**	• Every depression of switch causes beep sound and switch lamp lights every other depression. • Second depression of switch causes compressor to stop and switch lamp and AUTO lamp to go off. • When compressor is caused to run, the A/C lamp of air flow indicator lights. • When AUTO switch is pressed, ECONOMY switch lamp goes off and air conditioner comes into operation continuously.	• No beep sound is produced (no response to switch action). - Problem in switch - Problem in wiring harness • Beep sound is produced but lamp does not light. - Blown lamp bulb (Switch does not operate.) • Lamp operates without any compressor operation - Too low gas charge in system - Problem in pressure switch - Problem in wiring harness and/or compressor clutch • Compressor operates but condenser fan does not. - Problem in condenser motor - Problem in condenser motor relay
6	Push air flow mode switches one after another 	• Beep sound is produced when respective switch is pushed; corresponding switch lamp and LED light. • AUTO lamp goes off when any of the switches is pushed. • Air comes out from the outlets corresponding to pushed switch. • Indication on air flow indicator changes according to depression of switch. *  and  modes cannot be selected simultaneously. If both are selected concurrently,  will have priority over the other.	• No beep sound is produced (no response to switch action). - Problem in switch - Problem in wiring harness • Beep sound is produced but lamp does not light. - Blown switch lamp bulb • Air flow direction does not change. - Problem in damper actuator
7	Change fan switch position OFF ↓  ↓ 	• Outlet air volume changes according to switch position. • If AUTO mode switch is activated, air volume changes automatically according to interior temperature. (For example, if the interior sensor is touched by hand when interior temperature is lower than bodily temperature, the air volume will increase.) • When engine is cold, if AUTO mode switch is activated, fan speed is fixed to low speed for some while after start of engine.	• No air volume change is caused by setting the switch to different positions (and). - Problem in switch - Problem in wiring harness • Fan motor does not operate in both and positions. - Problem in fan controller - Blown fuse - Broken harness • When AUTO mode switch is activated, fan turns at high speed even in cold season or stays turning at low speed even after the engine is warmed. - Problem in water temperature switch - Problem in water temperature switch wiring harness

No.	Action	Normal Operation	Abnormal Operation/ Probable Cause
8	Check for AUTO mode function (interior temperature sensor operation). (Set AUTO mode switch to ON; temperature setting is 77°F) * Touch interior temperature sensor heat sensing plate with hand to warm it to 30°C (86°F) or over. Then cool the plate down to 10°C (50°F) or below.	• When the interior temperature sensor is touched with hand, the air flow mode becomes to FACE, the air mix damper moves to the coolest position and fan speed changes to H level. The interior air recirculates under this condition. (If the system is in ECONOMY mode, the compressor comes into operation and A/C indicator lights.) • When the interior temperature sensor is cooled down, the outside air is introduced, the air mix damper moves to the warmest position and the air flow mode becomes to FOOT. Also, the fan speed becomes MH level. (If the system is in ECONOMY mode, the compressor stops and AC indicator goes off.)	• Neither touching the sensor with hand nor cooling it causes the results shown in the left. - Problem in interior temperature sensor - Problem in wiring harness - Problem in controller
9	Check photosensor for function. (With the system in AUTO mode, set the fan switch to AUTO position; temperature setting is 77°F.) Expose the photosensor to sunbeam for checking.	• When the sensor is exposed to sunbeam, the outlet air temperature lowers. (Fan speed increases in summer.) • When the sensor is coverd by hand, the outlet air temperature rises. (Fan speed decreases in summer.)	• No change results from action on sensor. - Problem in photosensor - Broken wiring harness - Problem in controller (Clean the photosensor.)
10	Check water temperature switch for operation. (With the system in AUTO mode, set the fan switch to AUTO position; temperature setting.) *Cool the interior temperature sensor heat sensing plate down to 20°C (68°F) or lower.	• When water temperature is lower than 50°C (122°F), the fan speed is in L level and the air flow mode becomes DEF. • When water temperature rises to 50°C (122°F) or higher, the fan speed increases and air flow mode becomes FOOT, FACE/FOOT or FACE.	• Blower motor speed is not fixed to L level even when water temperature is lower than 50°C (122°F). - Problem in controller - Problem in wiring harness • Air flow remains in mode. - Problem in water temperature switch - Broken wiring harness - Problem in controller

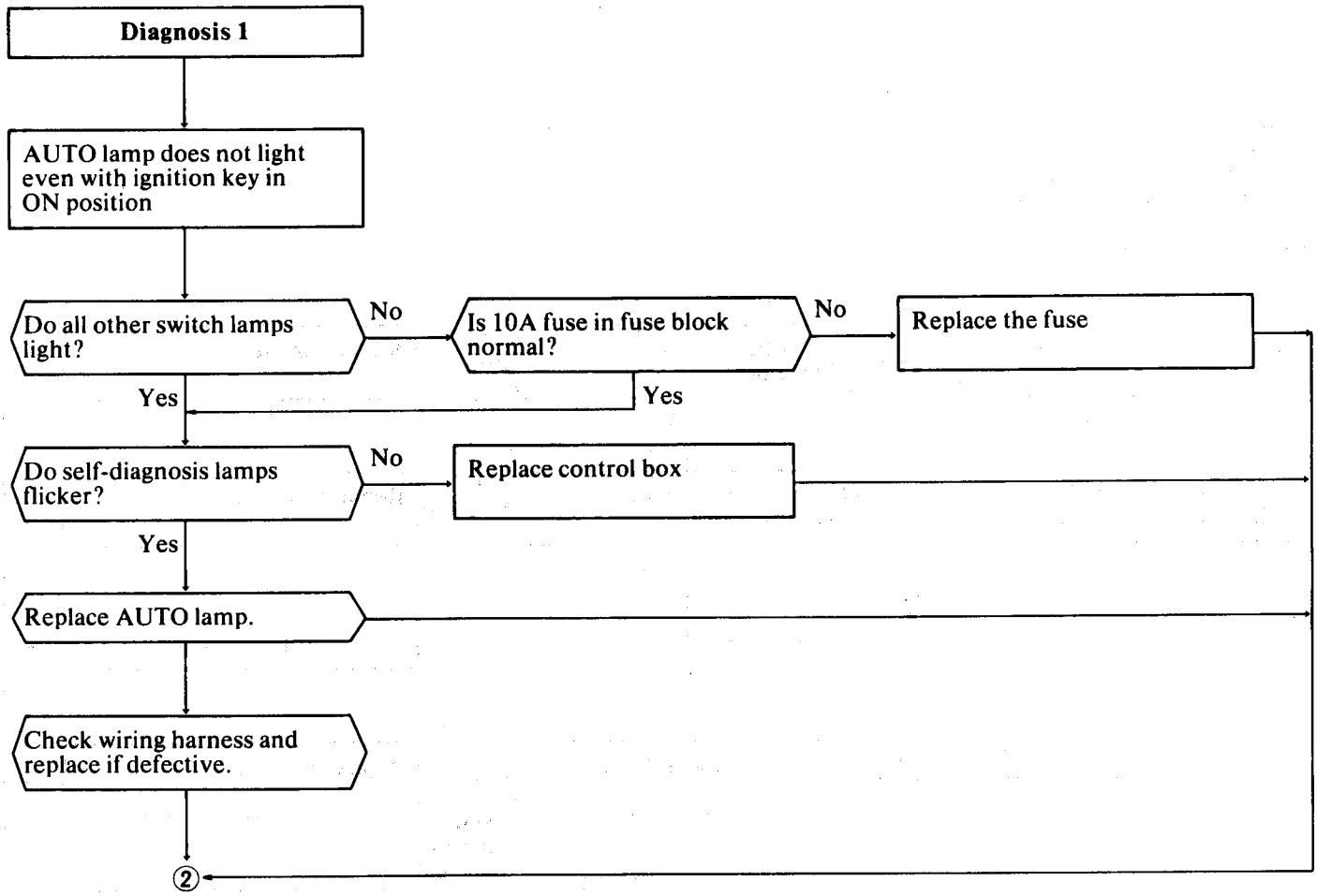
System Diagnostic Procedure

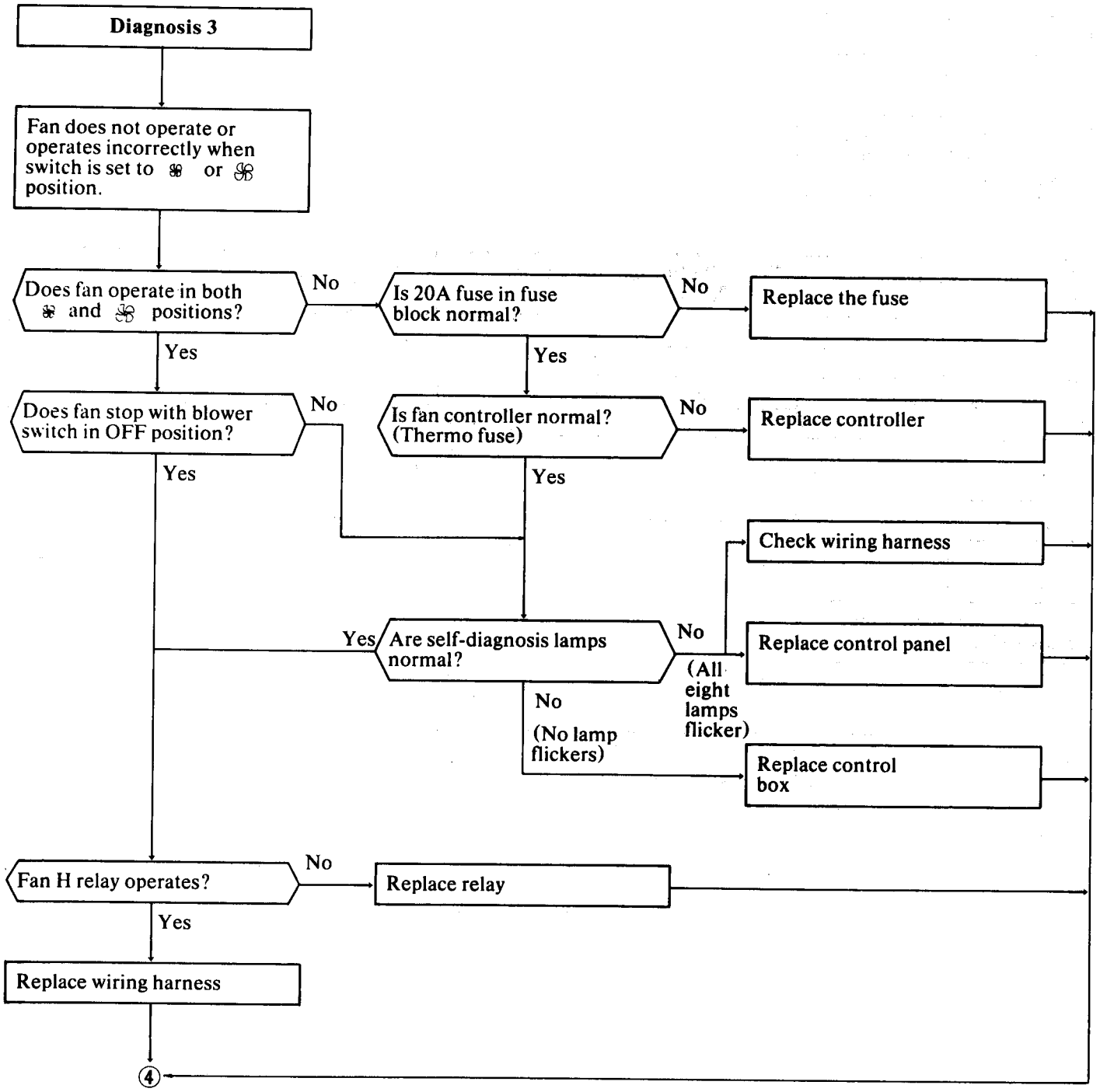
[Main diagnostic flow]

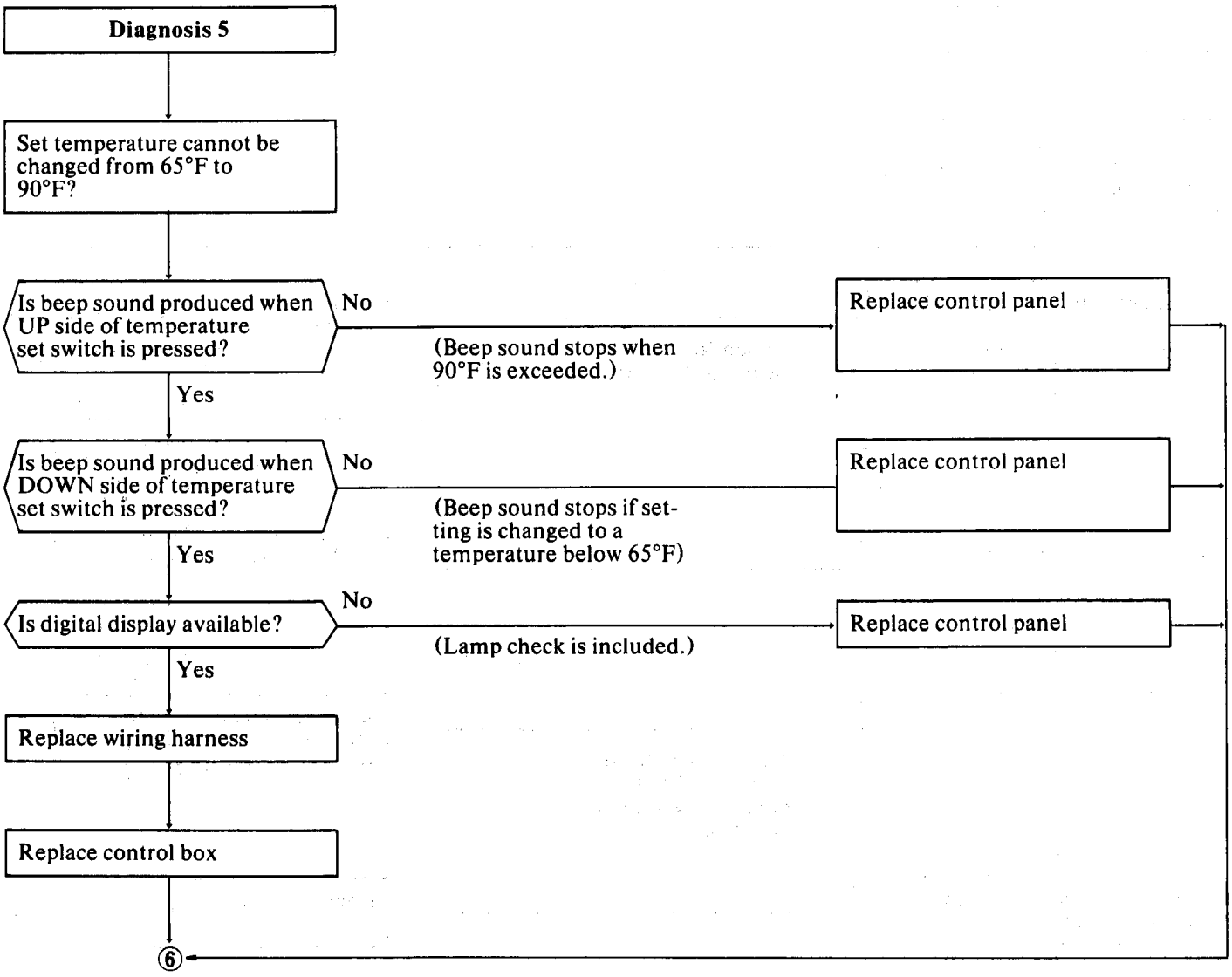


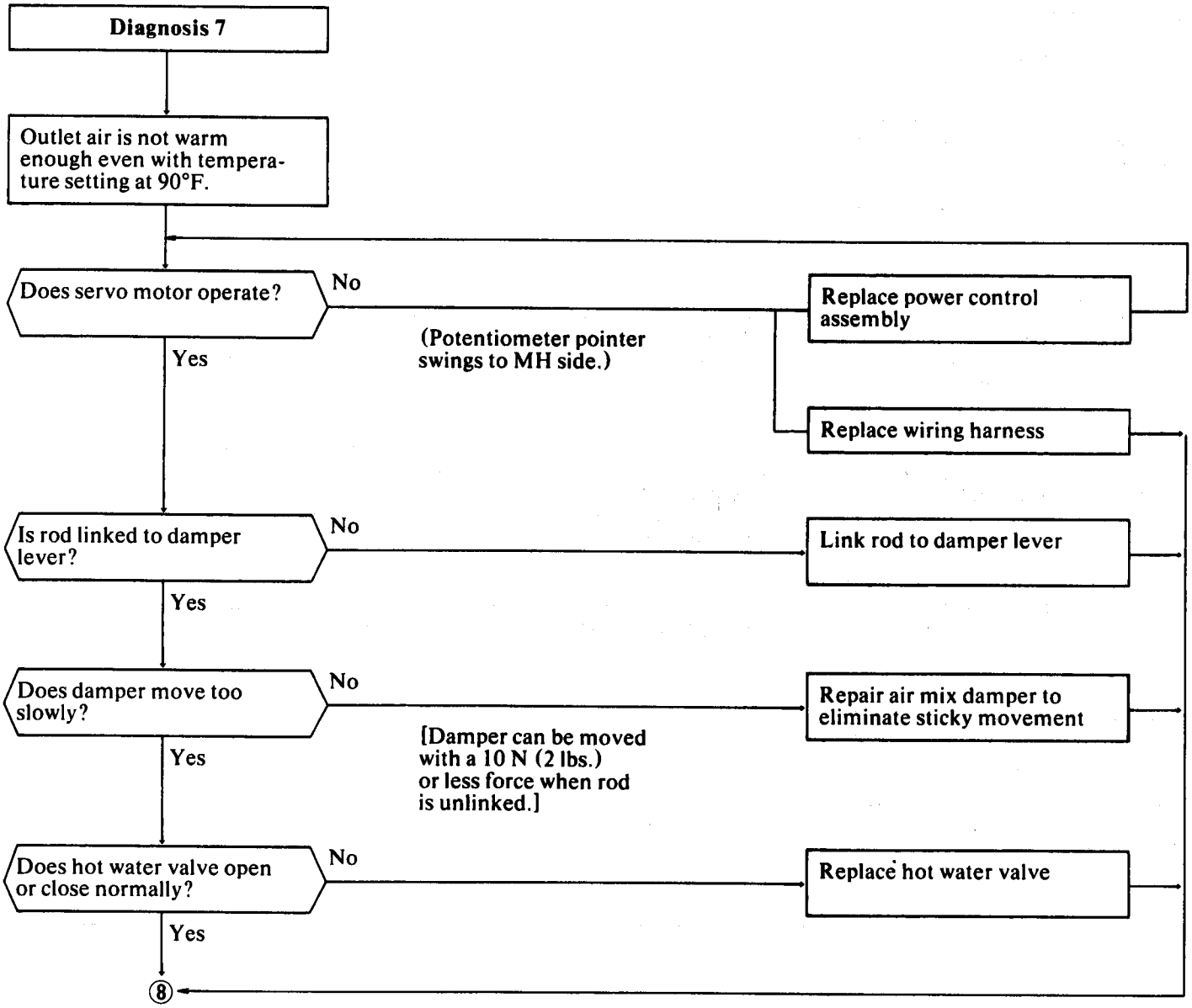


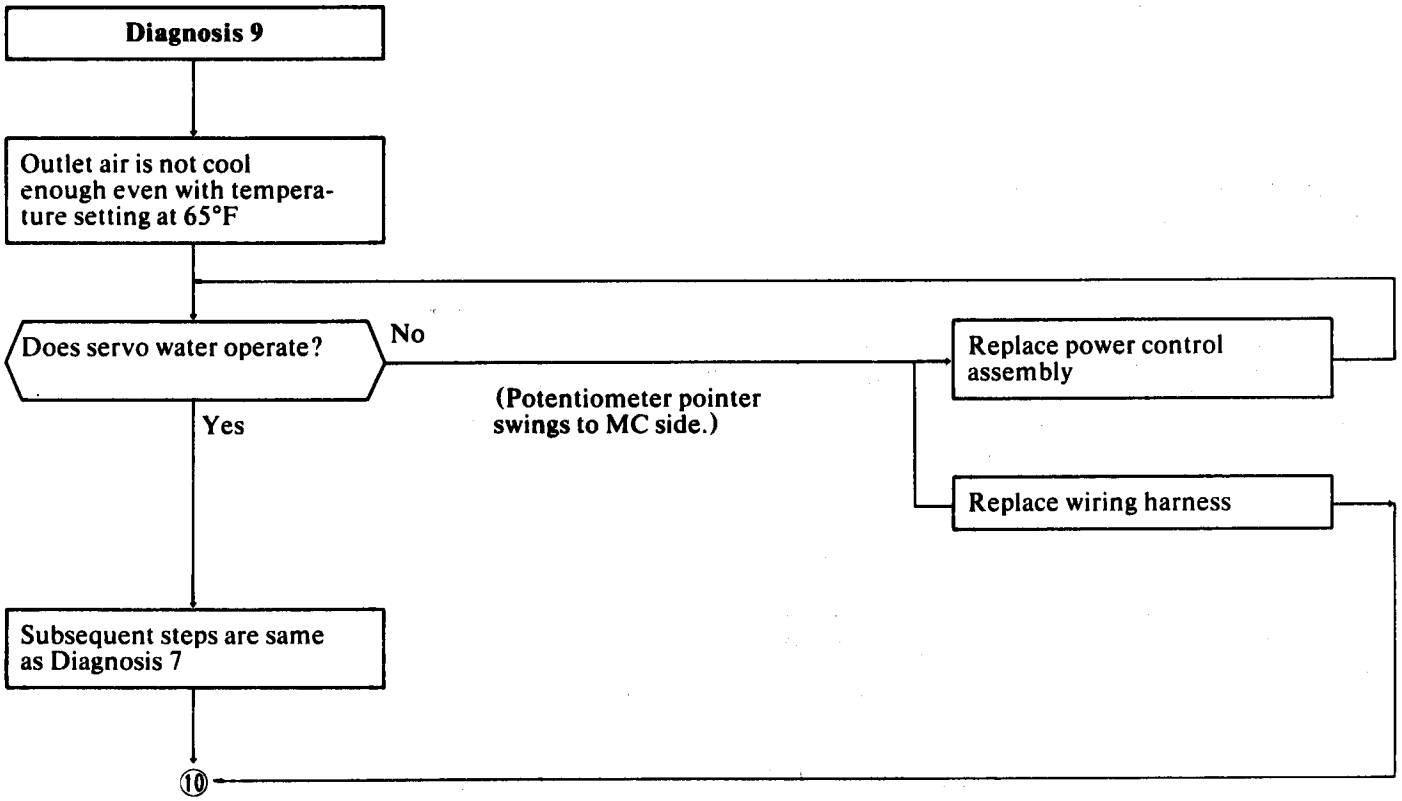
* Vehicles with air flow indicator

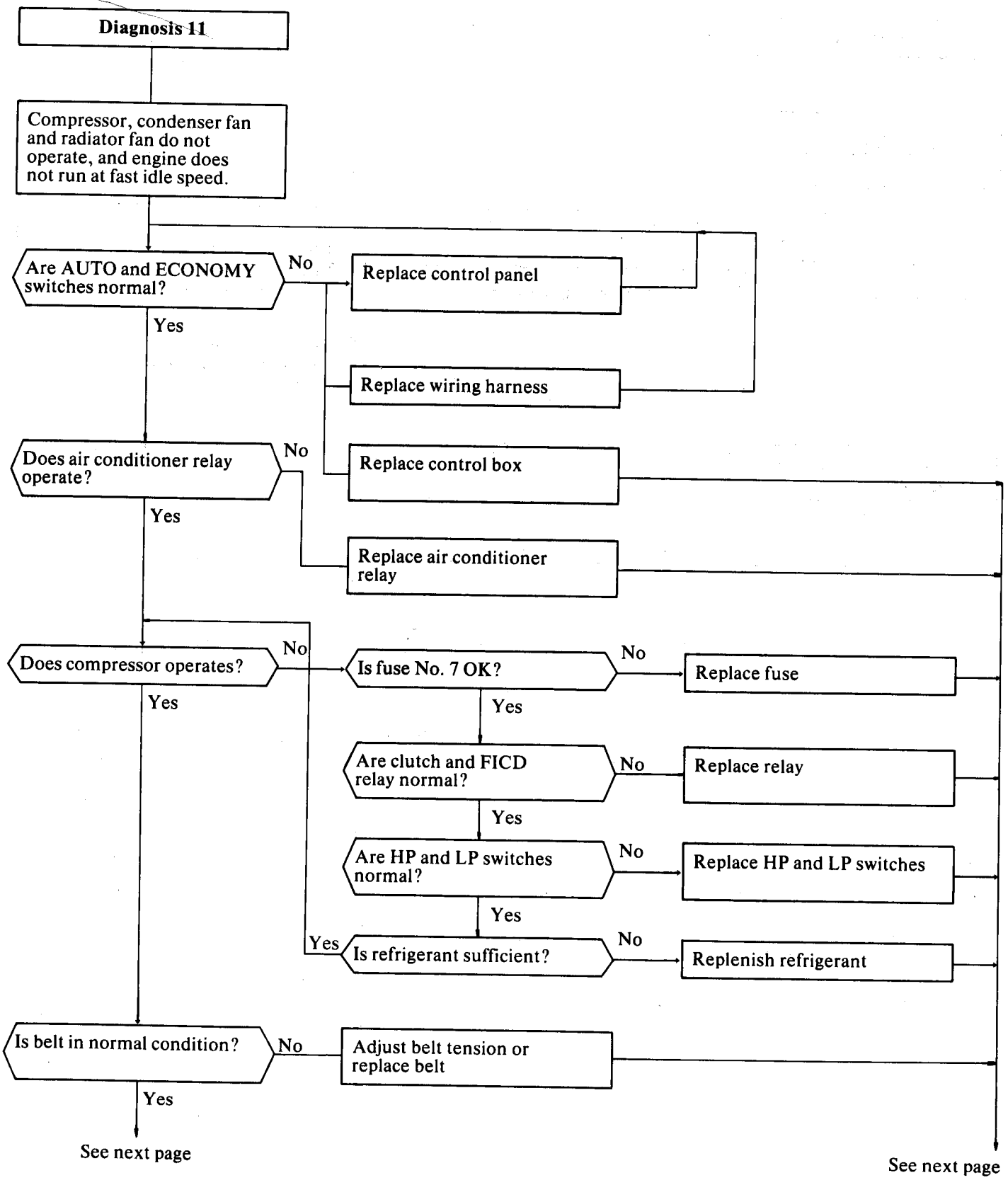


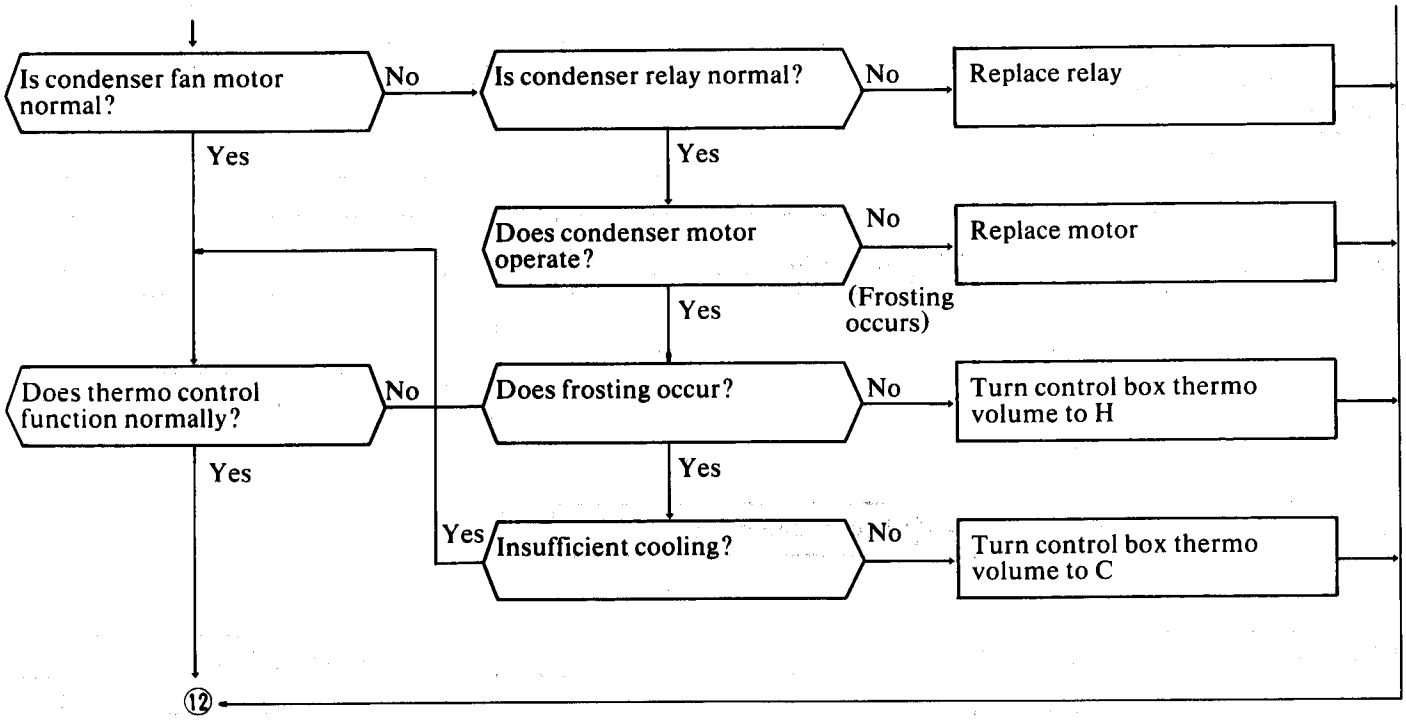


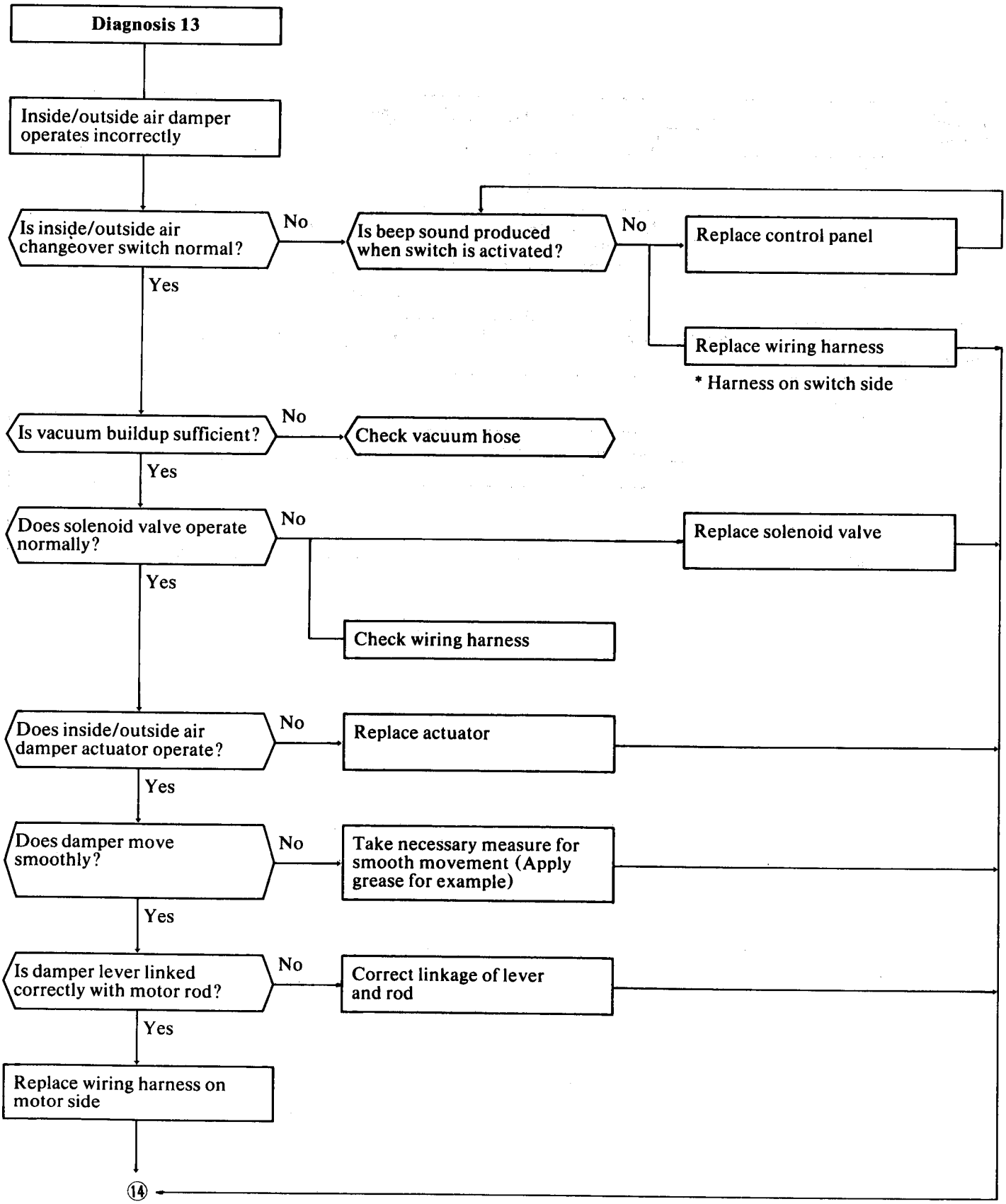


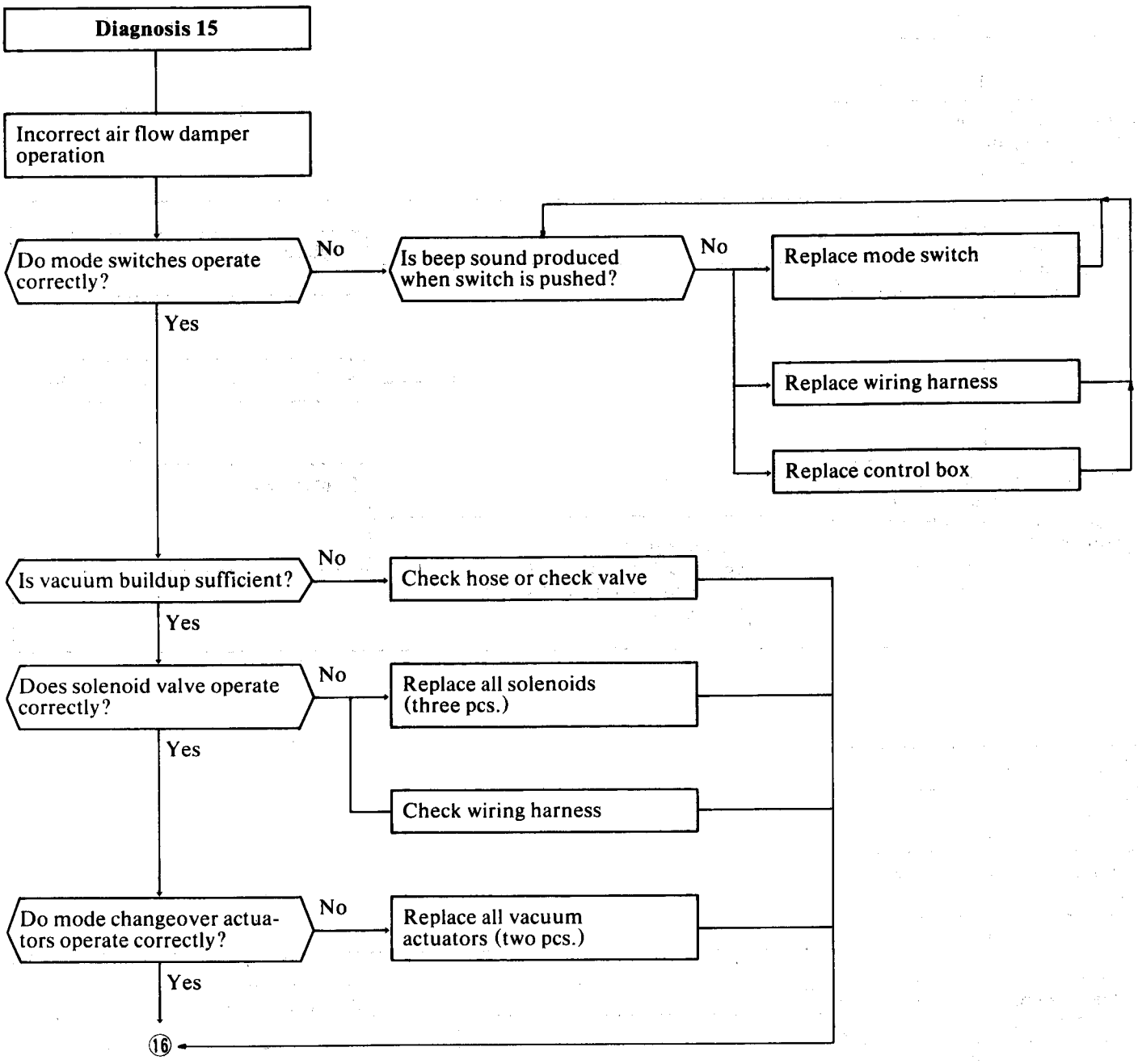


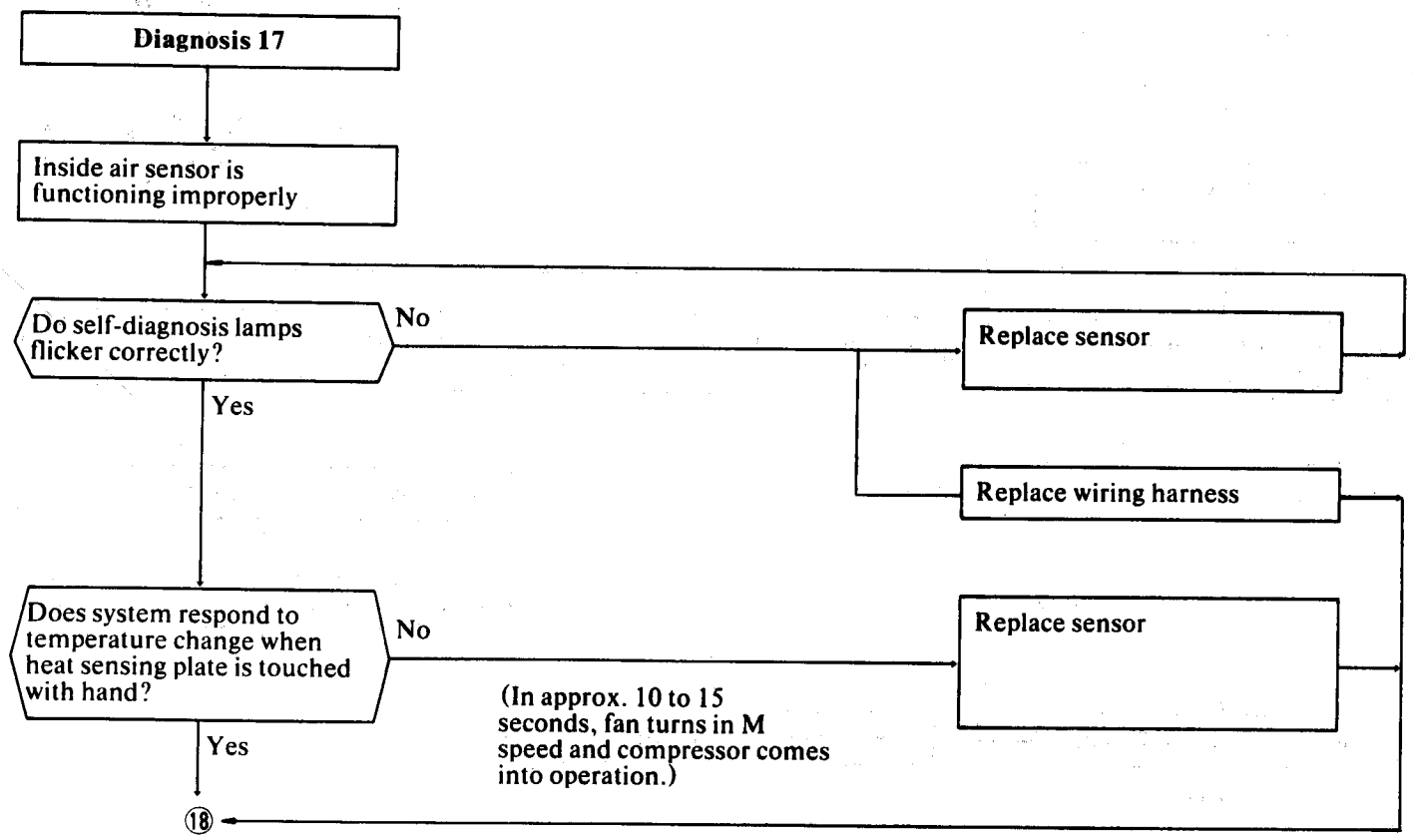


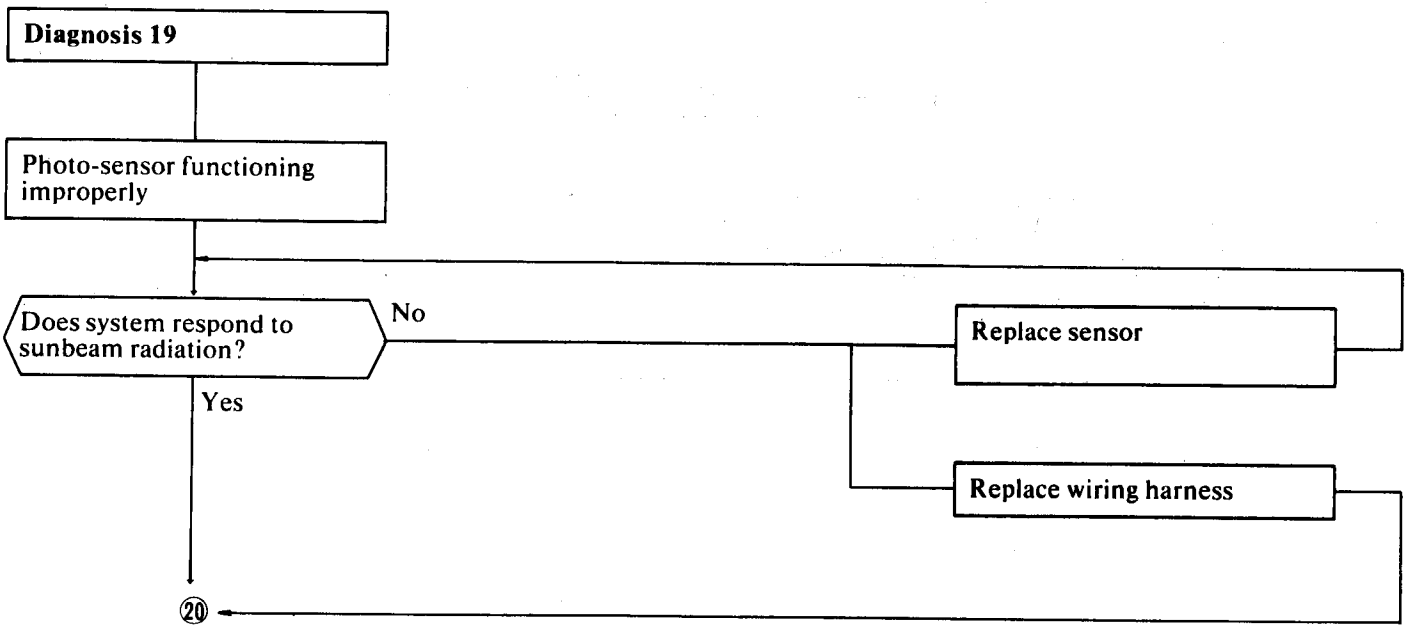


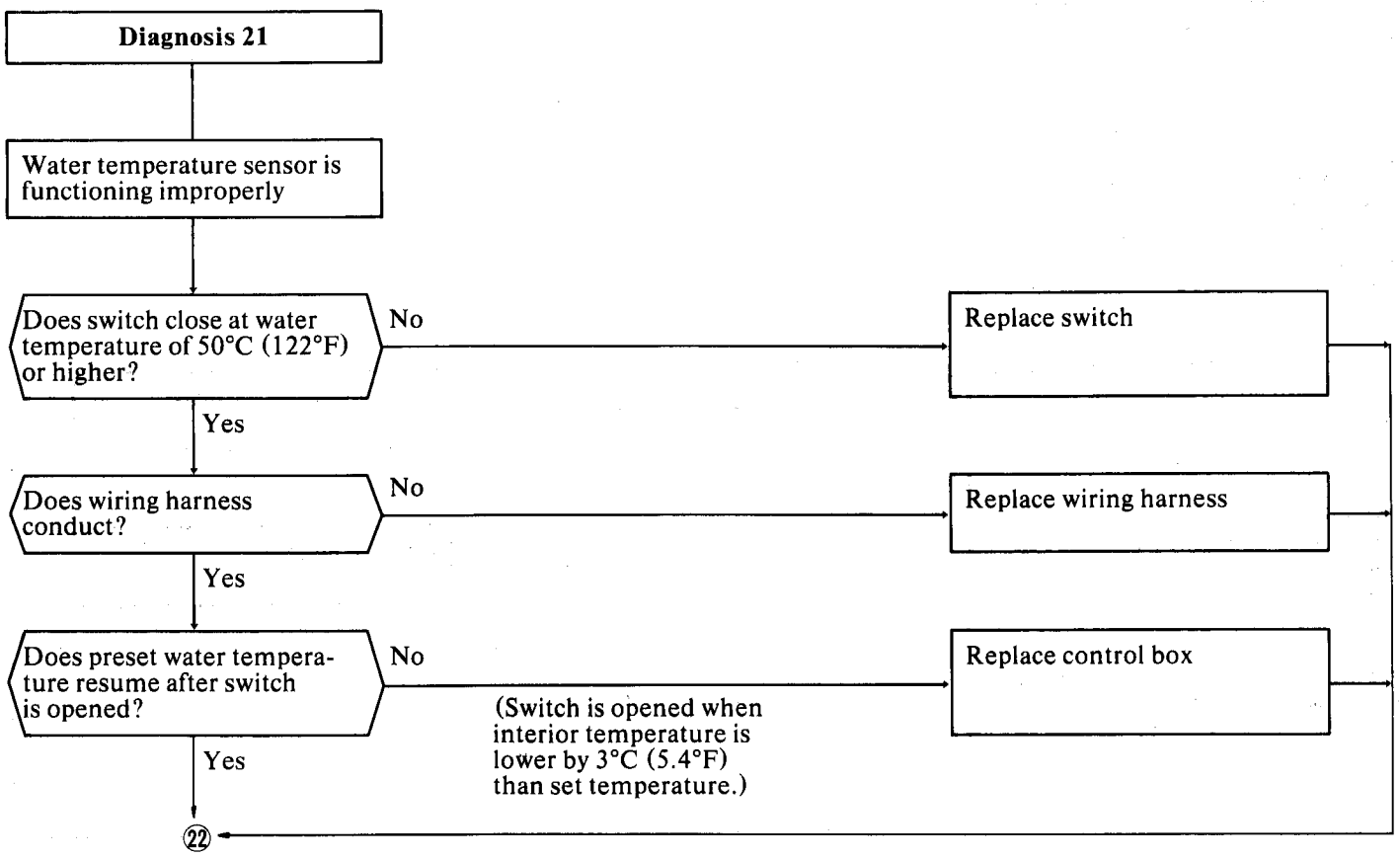


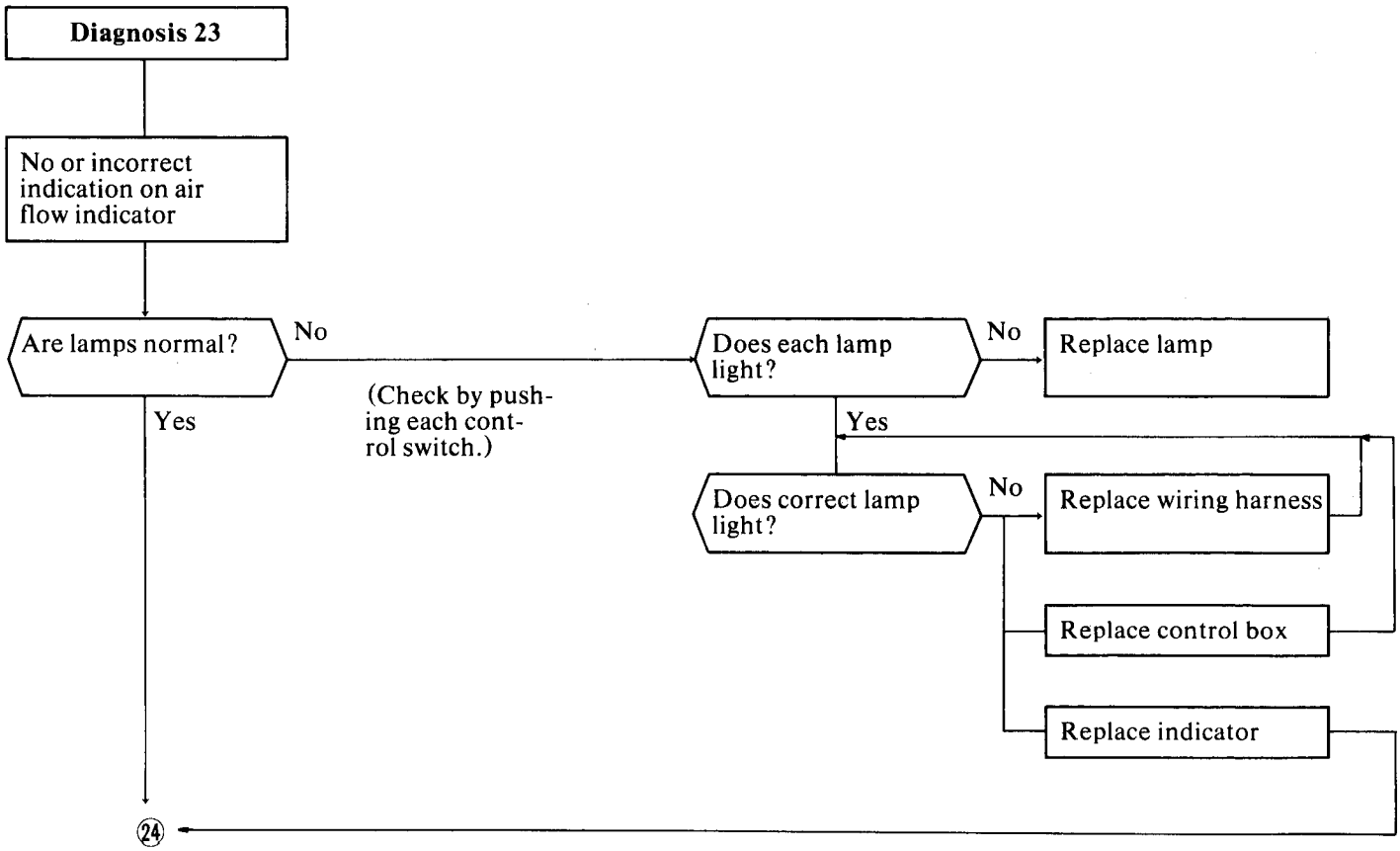


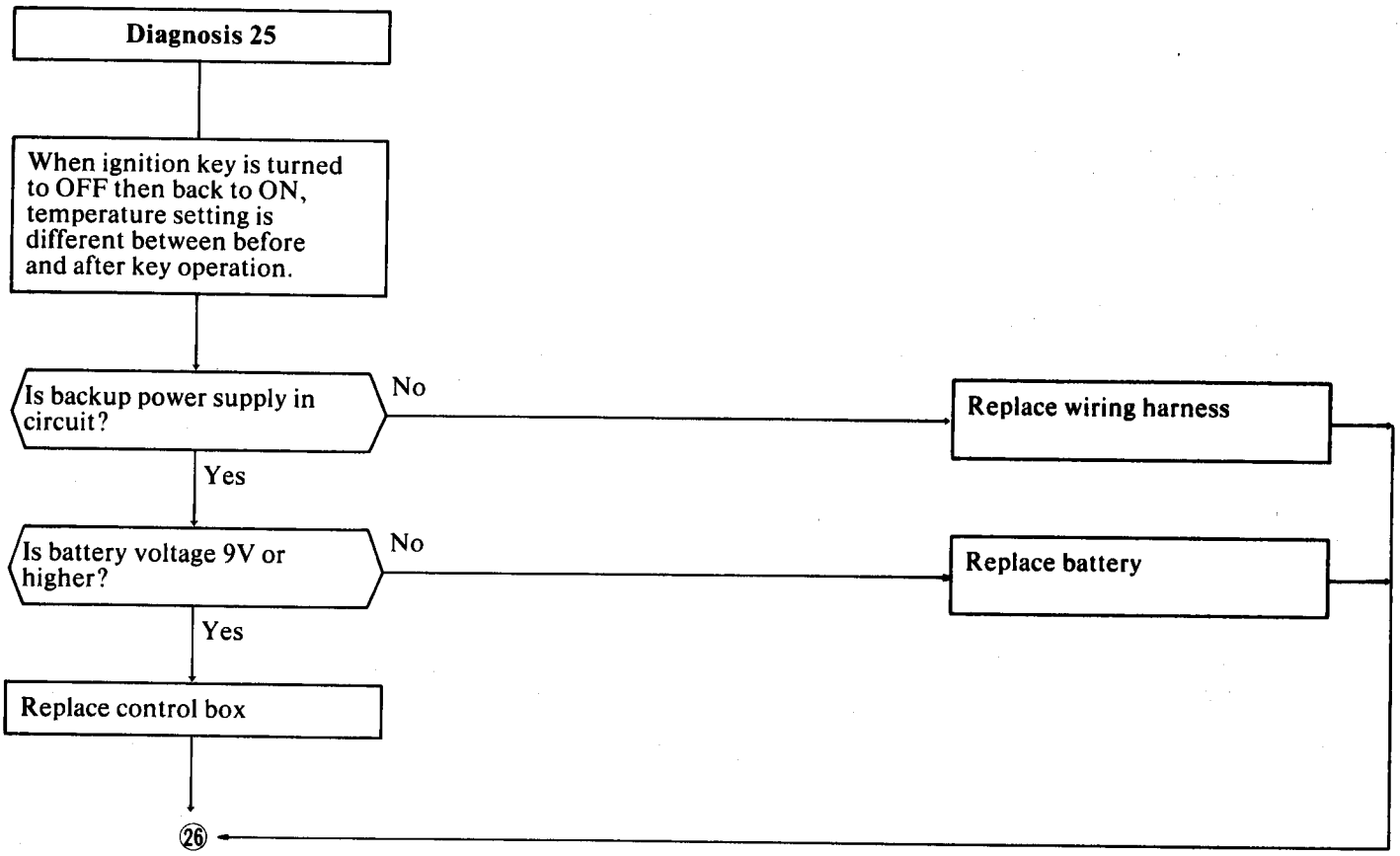












Troubleshooting Table

Check item \ Symptom		Fuse	Harness	Lamp bulb	Damper control motor & link	Water valve	Magnet clutch	Power relays	Sensor switches	Blower motor	Pusher fan motor	Control unit (diagnosis output)	A/C indicator	Vacuum system (VSV, hose, check valve)
1	"AUTO" lamp does not illuminate when ignition switch is turned to "ON" position	①	④	③								②		
2	Inside temperature does not rise (no hot air)		⑤		③	④			②			①		
3	Inside temperature does not drop (no cool air)		⑤		③	④	⑦	⑥	②			①		
4	Blower does not run	①	⑥					⑤	④	③		②		
5	Blower does not stop		④					③	②			①		
6	Air inlet switching damper does not operate		④						③			①		②
7	Air outlet switching damper does not operate		④						③			①		②
8	Pusher fan does not operate when air conditioner is operating		④					①	②		③			
9	A/C indicator fails to indicate properly		④	③								①	②	
10	Temperature setting changes when ignition switch is turned to "OFF" position and then back to "ON" position		②									①		

NOTE
1. O indicates items requiring check (number in circle indicates check order).
2. Use self-diagnosis and measure terminal voltage for control unit check.

Symptom	Probable cause	Remedy
1. "AUTO" lamp does not illuminate when ignition switch is turned to "ON" position	Open No. 12 fuse	Replace fuse
	Faulty control unit	Check diagnosis output
	Faulty full auto air conditioner panel assembly	Replace full auto air conditioner panel assembly
	Burnt-out "AUTO" indicator bulb	Replace "AUTO" lamp bulb
	Open harness between full auto air conditioner panel assembly and control unit	Correct harness
2. Inside temperature does not rise (no hot air)	Faulty control unit	Check diagnosis output
	Faulty upper in-car sensor input circuit	
	Faulty lower in-car sensor input circuit	
	Faulty fin sensor input circuit	
	Faulty air mix damper potentiometer input circuit	
	Faulty air mix damper control motor	Replace air mix damper control motor
	Inadequate connection between air mix damper control motor lever and air mix damper	Correct connection
	Seized air mix damper	Correct air mix damper
	Water valve failure	Replace water valve
	Open harness between air mix damper control motor and control unit	Correct harness
3. Inside temperature does not drop (no cool air)	Faulty control unit	Check diagnosis output
	Faulty upper in-car sensor input circuit	
	Faulty lower in-car sensor input circuit	
	Faulty fin sensor input circuit	
	Faulty air mix damper potentiometer input circuit	
	Faulty air mix damper control motor	Replace air mix damper control motor
	Inadequate connection between air mix damper control motor lever and air mix damper	Correct connection
	Seized air mix damper	Correct air mix damper
	Water valve failure	Replace water valve
	Open harness between air mix damper control motor and control unit	Correct harness

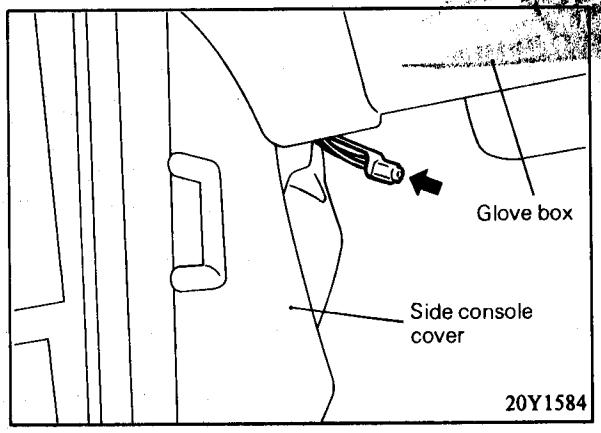
NOTE
When coolant temperature is below 50°C (122°F), blower speed is held at LOW.

Symptom	Probable cause	Remedy
3. Inside temperature does not drop (no cool air)	Faulty power relay (for compressor)	Replace power relay
	Faulty magnet clutch	Check or replace magnet clutch
	Refrigerant leaks	Replenish refrigerant
4. Blower does not run	Open fuse No. 5	Replace fuse
	Faulty control unit	Check diagnosis output
	Faulty blower motor	Replace blower motor
	Blown temperature fuse in power transistor or poor grounding	Replace temperature fuse or correct grounding
	Faulty power relay (for starter cut)	Replace power relay (for starter cut)
	Open harness between fuse and power relay (for starter cut)	Correct harness
	Open harness between power relay (for starter cut) and blower motor	
	Open harness between power transistor and control unit	
5. Blower does not stop	Faulty control unit	Check diagnosis output
	Faulty blower switch (OFF SW)	Replace full auto air conditioner panel assembly
	Faulty power relay (for high speed)	Replace power relay
	Shorted harness between blower switch and control unit	Correct harness
	Shorted harness between power relay (for high speed) and power transistor and control unit	
6. Air inlet switching damper does not operate	Faulty control unit	Check diagnosis output
	Defective vacuum solenoid valve	Replace vacuum solenoid valve
	Defective or disconnected vacuum hose	Check or replace vacuum hose
	Defective vacuum system including vacuum tank	Check or replace vacuum system
	Faulty full auto air conditioner switch (inside/outside air switching)	Replace full auto air conditioner panel assembly
	Faulty air inlet switching control vacuum actuator	Replace air inlet switching control vacuum actuator
	Air inlet switching damper failure	Correct air inlet switching damper
	Open harness between full auto air conditioner panel assembly and control unit	Correct harness

Symptom	Probable cause	Remedy
6. Air inlet switching damper does not operate	Open harness between air inlet switching vacuum solenoid valve and control unit	Correct harness
7. Air outlet switching damper does not operate	Faulty control unit	Check diagnosis output
	Defective vacuum solenoid valve	Replace vacuum solenoid valve
	Defective or disconnected vacuum hose	Check or replace vacuum hose
	Defective vacuum system including vacuum tank	Check or replace vacuum system
	Faulty full auto air conditioner switch (mode selection)	Replace full auto air conditioner panel assembly
	Faulty air outlet switching control vacuum actuator	Replace air outlet switching control vacuum actuator
	Inadequate engagement between cam and damper link or incorrect adjustment	Correct engagement or adjust
	FACE/DEF or FACE/FOOT damper failure	Correct FACE/DEF or FACE/FOOT damper
	Open harness between full auto air conditioner panel assembly and control unit	Correct harness
	Open harness between air outlet switching vacuum solenoid valve and control unit	
8. Pusher fan does not operate when air conditioner is operating	Faulty power relay (for pusher fan)	Replace power relay
	Faulty thermo sensor No. 2 (vehicles with an intercooler)	Check or replace thermo sensor
	Faulty pusher fan motor	Check or replace fan motor
	Faulty pressure switch (vehicles with an intercooler)	Check or replace pressure switch
9. A/C indicator fails to indicate properly	Faulty control unit	Check diagnosis output
	Faulty A/C indicator assembly	Replace A/C indicator assembly
	Blown bulb	Replace bulb
	Open harness between A/C indicator assembly and control unit	Correct harness
10. Temperature setting changes when ignition switch is turned to "OFF" position and back to "ON" position	Faulty control unit	Check diagnosis output
	Insufficient battery charge or faulty battery	Recharge, adjust specific gravity or replace battery
	Open harness between ignition switch and control unit	Correct harness

Self-Diagnosis

The self-diagnostic function provides indication of abnormal conditions with microcomputer, sensors and potentiometer wiring (broken wire, short circuit, etc.) and also an automatic control function by which a failure is compensated for by substitution of value to minimize the trouble resulting from the failure.



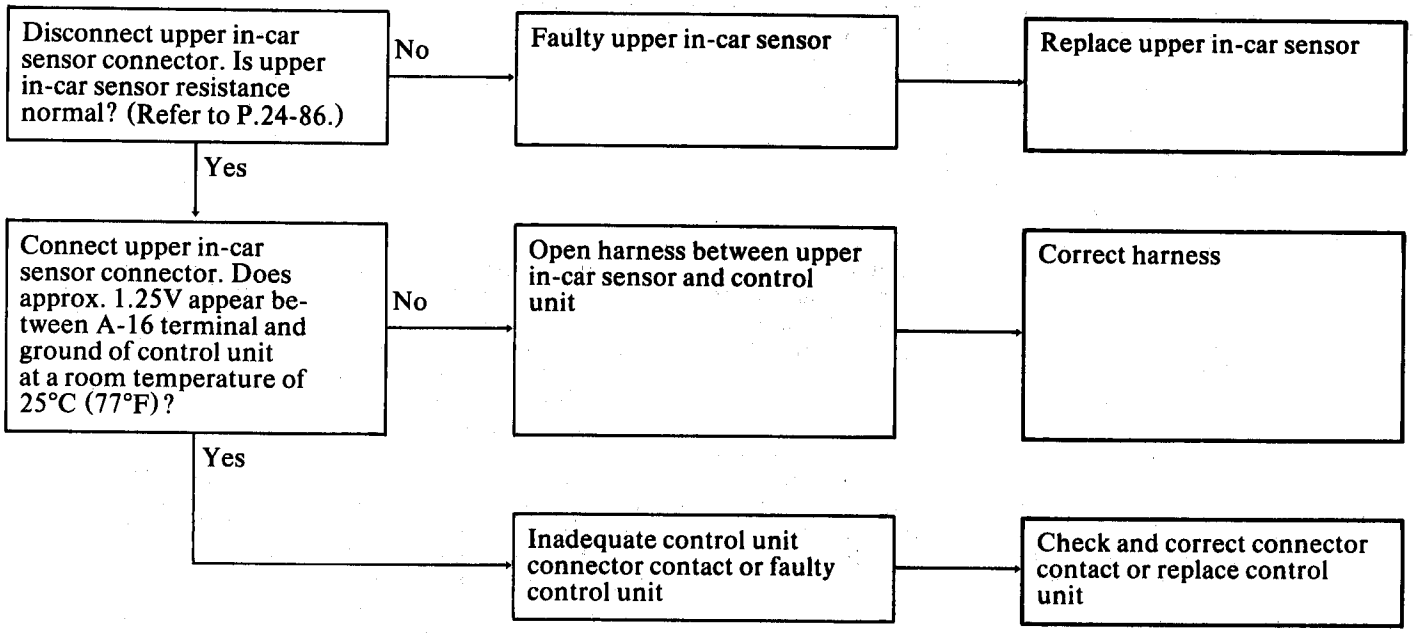
Self-diagnosis Indications

Code No.	Diagnosis display pattern	Malfunction (A/C condition)	Probable cause	Failsafe
1	12V 0V Continuous	Normal	—	—
2	12V 0V	Open or shorted upper in-car sensor circuit or faulty upper in-car sensor	• Disconnected upper in-car sensor connector • Open or shorted internal wiring of upper in-car sensor • Open or shorted harness in upper in-car sensor circuit or disconnected connector	Set upper in-car sensor input signal at 25°C (77°F)
3	12V 0V	Open or shorted lower in-car sensor circuit or faulty lower in-car sensor	• Disconnected lower in-car sensor connector • Open or shorted internal wiring of lower in-car sensor • Open or shorted harness in lower in-car sensor circuit or disconnected connector	Set lower in-car sensor input signal at 25°C (77°F)
4	12V 0V	Open or shorted wiring of fin sensor circuit or faulty fin sensor	• Disconnected fin sensor connector • Open or shorted internal wiring of fin sensor • Open or shorted harness in fin sensor circuit or disconnected connector	Set fin sensor input signal at 1°C (33.8°F) and turn off compressor
5	12V 0V	Open or shorted air mix damper potentiometer circuit or faulty air mix damper potentiometer	• Disconnected air mix damper potentiometer connector • Open or shorted internal wiring of air mix damper potentiometer • Open or shorted harness in air mix damper potentiometer circuit or disconnected connector	Set air mix damper at MAX-HOT position

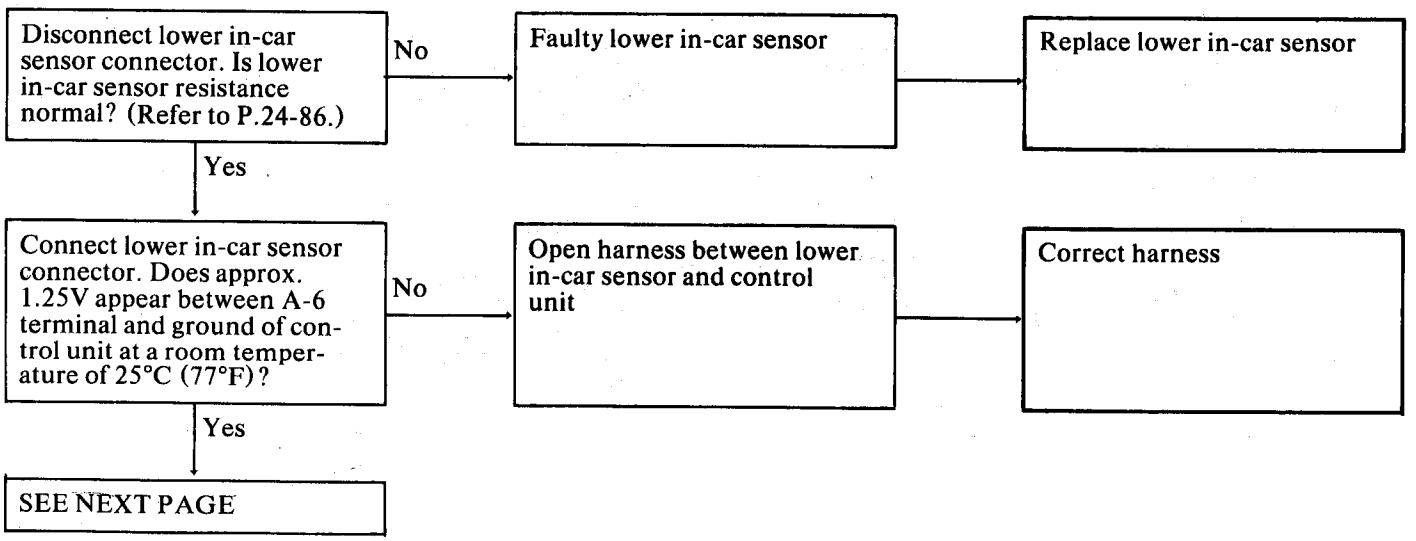
Code No.	Diagnosis display pattern	Malfunction (A/C condition)	Probable cause	Failsafe
—	12V / 0V — Constantly 12V; 12V / 0V — Constantly 0V	Internal failure of control unit	• Replace control unit	—

NOTE
1. If two or more troubles are caused at the same time, one with the largest code No. is displayed.
2. The contents of troubles are stored until the ignition switch is turned off.

Diagnosis Display Pattern 2



Diagnosis Display Pattern 3



CONTINUED FROM PREVIOUS PAGE

→ Inadequate control unit connector contact or faulty control unit → Check and correct connector contact or replace control unit

Diagnosis Display Pattern 4

Disconnect fin sensor connector. Is fin sensor resistance normal? (Refer to P.24-84.)
- No → Faulty fin sensor → Replace fin sensor
- Yes ↓

Connect fin sensor connector. Does approx. 1.25V appear between A-19 terminal and ground of control unit at a room temperature of 25°C (77°F)?
- No → Open harness between fin sensor and control unit → Correct harness
- Yes ↓

→ Inadequate control unit connector contact or faulty control unit → Check and correct connector contact or replace control unit

Diagnosis Display Pattern 5

Disconnect air mix potentiometer connector. Is resistance of potentiometer normal? (Refer to P.24-79.)
- No → Faulty air mix damper potentiometer → Replace air mix damper potentiometer
- Yes ↓

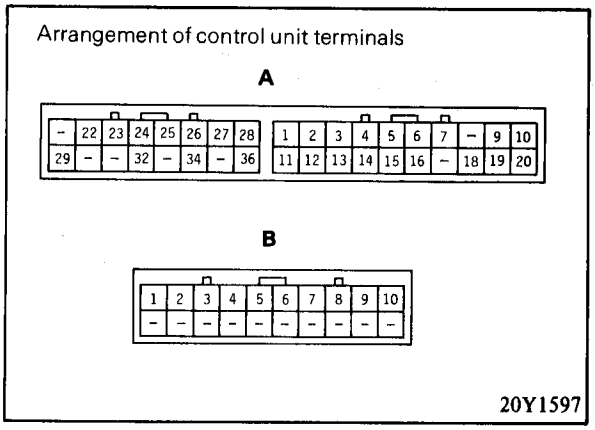
Connect air mix damper potentiometer connector. Does approx. 2.5V appear between A-15 terminal and ground of control unit when potentiometer is set to MAX. COOL position?
- No → Open or shorted harness between air mix damper potentiometer and control unit → Correct harness
- Yes ↓

→ Inadequate control unit connector contact or faulty control unit → Check and correct connector contact or replace control unit

Control Unit Terminal Voltage Table

PRECAUTIONS ON TERMINAL VOLTAGE CHECKING

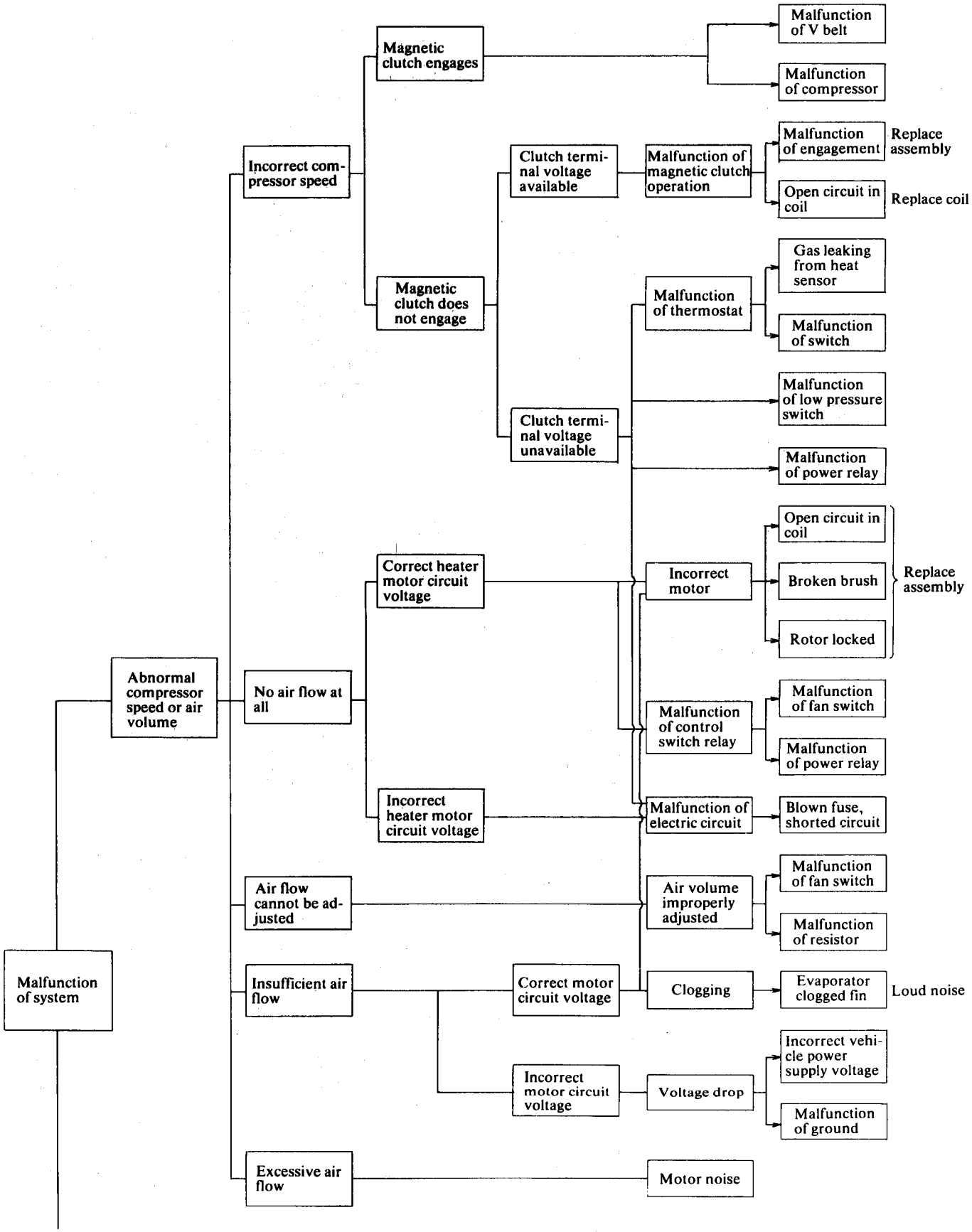
1. Before disconnecting or reconnecting the control unit connector, be sure to disconnect the battery terminals.
2. Measure the terminal voltage between each terminal and ground (body) or B terminal with the control unit connector connected.
   When measuring the terminal voltage, be sure to observe the following.
   (1) Make sure that the tester is set in the voltage (V) range.
   (2) Do not accidentally short the terminal to be measured with other terminals.
   Use of a tester in resistance (ohm) range or shorting between terminals could cause damage to electronic parts in the control unit.
3. Make sure that the connectors are connected securely. Pay particular attention to the controller assembly (including the panel) connector connections.

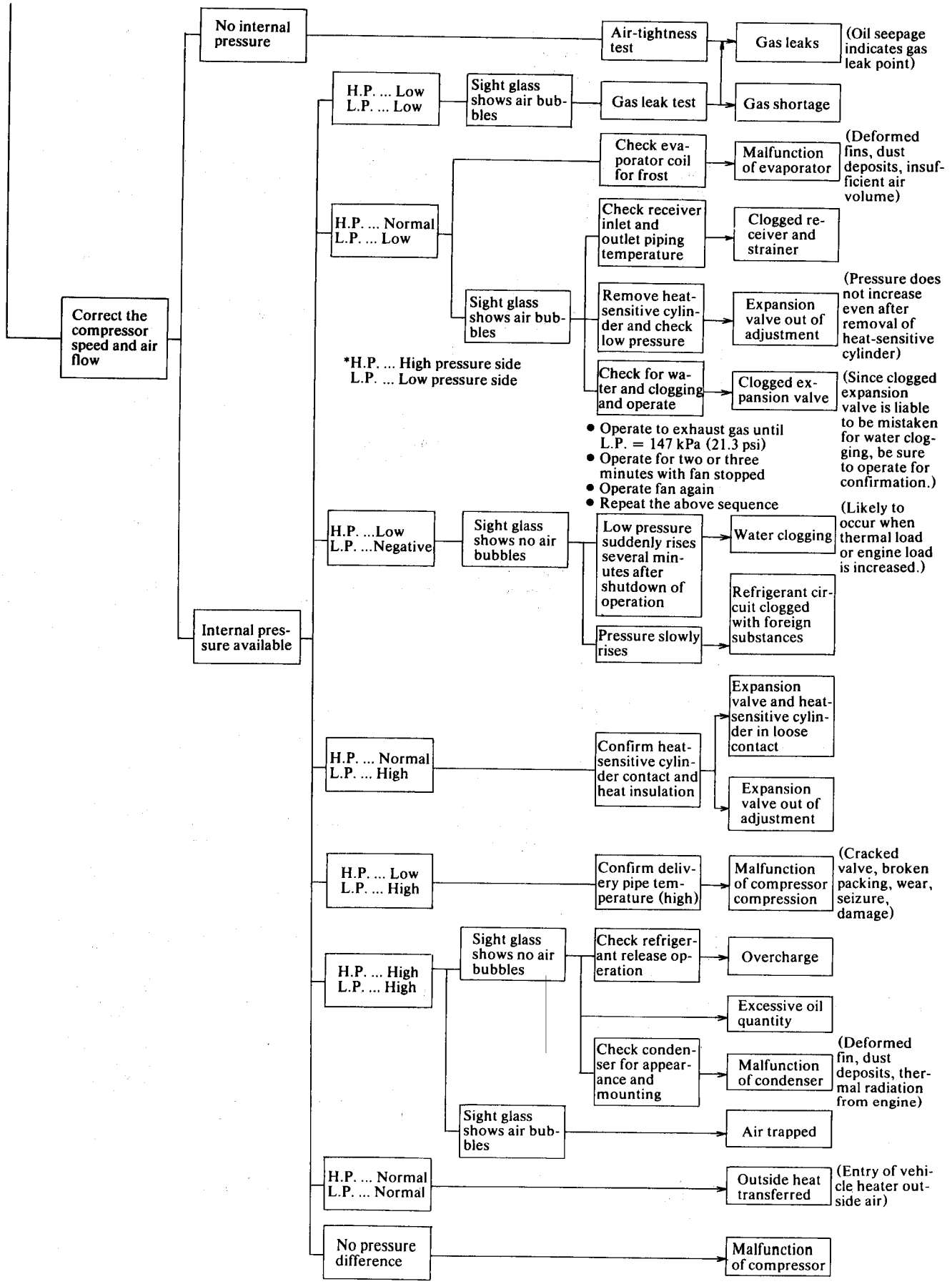


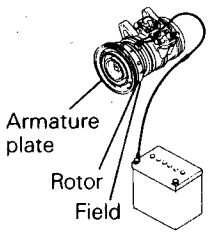
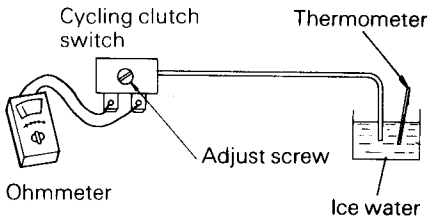
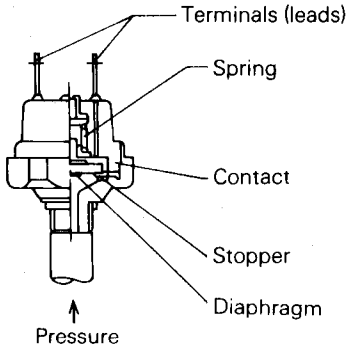
Connector symbol	Pin No.	Signal name	Condition	Nominal value
A	1	IG2 power supply	When ignition key is at ON position	Approx. 12V
			When ignition key is at other position than ON	0V
	2	Ground	–	0V
	3	Battery power	When battery is connected	Approx. 12V
			When battery is not connected	0V
	4	Photo-sensor (input)	When illumination is 5,000 lux	(Approx. –0.1V)
			When illumination is 10,000 lux	(Approx. –0.25V)
			When harness is open	(0V)
	5	Photo-sensor (ground)	–	0V
	6	Lower in-car sensor	When room temperature is 25°C (77°F)	Approx. 1.25V
			When harness is open	0V
	7	Air mix damper control potentiometer	At MAX. COOL	Approx. 0.2V
			At MAX. HOT	Approx. 2.3V
	9	Air mix damper control potentiometer	–	0V
	10	Control panel display power (from light controller)	When lighting switch is OFF	Approx. 12V
			When lighting switch is ON	Voltage changes with dimmer control setting

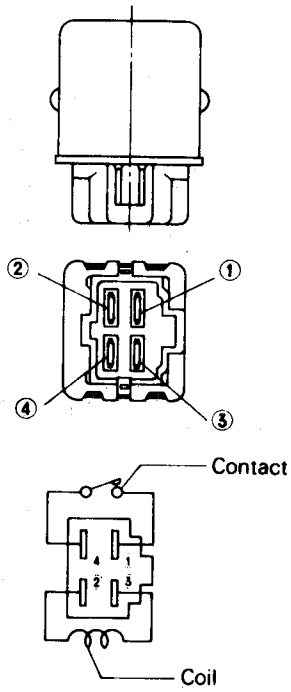
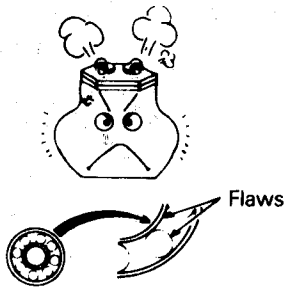
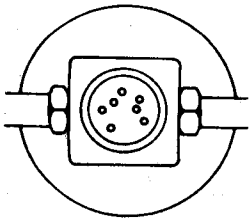
Connector symbol	Pin No.	Signal name	Condition	Nominal value
A	11	IG_2 power supply	When ignition key is at ON position	Approx. 12V
			When ignition key is at other position than ON	0V
	12	Ground	–	0V
	13	Actuator power (power relay for high speed, vacuum solenoid valve)	–	Approx. 12V
	14	Control panel display power (from light controller)	When lighting switch is OFF	Approx. 12V
			When lighting switch is ON	Voltage changes with dimmer control setting
	15	Sensor power	–	Approx. 2.5V
	16	Upper in-car sensor	When room temperature is 25°C (77°F)	Approx. 1.25V
			When harness is open	0V
	18	Diagnosis output	–	–
	19	Fin sensor	When room temperature is 25°C (77°F)	Approx. 1.25V
			When harness is open	0V
	20	Power transistor (base)	When blower is rotating	0 to 5V
	22	Blower motor	When switch HI is ON	Approx. 12V
			When switch LO is ON	Approx. 6V
			When switch is OFF	0V
	23	Water temperature switch	When water temperature switch is ON	Approx. 0.2 to 0.8V
			When water temperature switch is OFF	Approx. 12V
	24	Air mix damper control motor	When motor (reverse) is ON	Approx. 12V
			When motor is OFF	0V
	25	Inside/outside air switching vacuum solenoid valve	When ON (inside air)	Approx. 0.2 to 0.8V
			When OFF (outside air)	Approx. 12V
	26	Air outlet mode selection vacuum solenoid valve	When ON (in FACE mode)	Approx. 0.2 to 0.8V
			When OFF (other than above)	Approx. 12V
	27	Air outlet mode selection vacuum solenoid valve	When ON (in FOOT or DEF mode)	Approx. 0.2 to 0.8V
			When OFF (other than above)	Approx. 12V
	28	Air outlet mode selection vacuum solenoid valve	When ON (in DEF or DEF/FACE mode)	Approx. 0.2 to 0.8V
			When OFF (other than above)	Approx. 12V

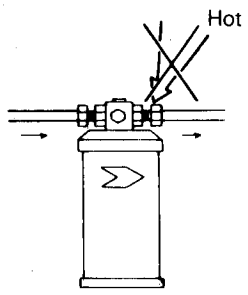
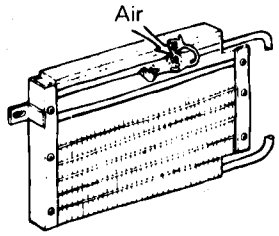
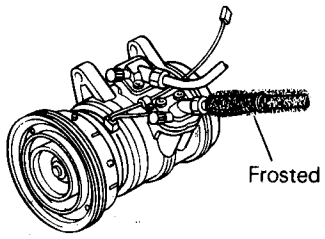
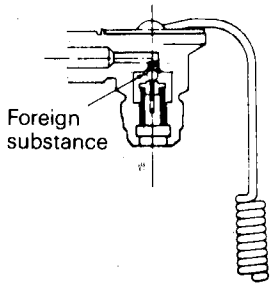
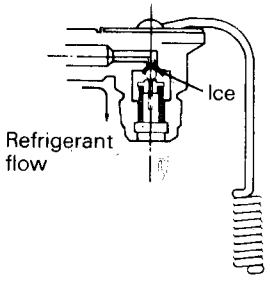
Connector symbol	Pin No.	Signal name	Condition	Nominal value
A	29	Ground	–	0V
	32	Air mix damper control motor	When motor (forward) is ON	Approx. 12V
			When motor is OFF	0V
	34	Power relay (for high speed)	When fan speed is HI	Approx. 0.2 to 0.8V
			When fan speed is other than HI	Approx. 12V
	36	A/C output	When A/C is ON	Approx. 12V
B	1	DEF mode (warm air) display of A/C pictorial indicator	When DEF indicator lamp (orange) is ON	Approx. 0.5 to 1V
			When DEF indicator lamp (orange) is OFF	Voltage changes with dimmer control setting
	2	DEF mode (cool air) display of A/C pictorial indicator	When DEF indicator lamp (green) is ON	Approx. 0.5 to 1V
			When DEF indicator lamp (green) is OFF	Voltage changes with dimmer control setting
	4	A/C display of A/C pictorial indicator	When A/C indicator lamp (green) is ON	Approx. 0.5 to 1V
			When A/C indicator lamp (green) is OFF	Voltage changes with dimmer control setting
	5	RECIRC mode display of A/C pictorial indicator	When RECIRC indicator lamp (green) is ON	Approx. 0.5 to 1V
			When RECIRC indicator lamp (green) is OFF	Voltage changes with dimmer control setting
	6	FACE mode (cool air) display of A/C pictorial indicator	When FACE indicator lamp (green) is ON	Approx. 0.5 to 1V
			When FACE indicator lamp (green) is OFF	Voltage changes with dimmer control setting
	7	FACE mode (warm air) display of A/C pictorial indicator	When FACE indicator lamp (orange) is ON	Approx. 0.5 to 1V
			When FACE indicator lamp (orange) is OFF	Voltage changes with dimmer control setting
	8	FOOT mode (cool air) display of A/C pictorial indicator	When FOOT indicator lamp (green) is ON	Approx. 0.5 to 1V
			When FOOT indicator lamp (green) is OFF	Voltage changes with dimmer control setting
	9	FOOT mode (warm air) display of A/C pictorial indicator	When FOOT indicator lamp (orange) is ON	Approx. 0.5 to 1V
			When FOOT indicator lamp (orange) is OFF	Voltage changes with dimmer control setting
	10	FRESH mode display of A/C pictorial indicator	When FRESH indicator lamp (green) is ON	Approx. 0.5 to 1V
			When FRESH indicator lamp (green) is OFF	Voltage changes with dimmer control setting

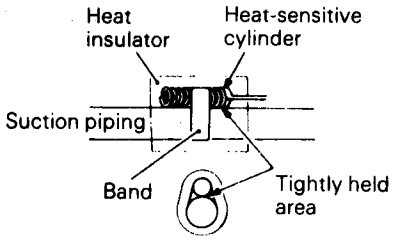




Probable cause	Diagnosis and correction	Remarks
Malfunction of magnetic clutch	[Diagnostic procedure] 1. Connect clutch lead to the (+) terminal of the battery to see if the clutch engages with a click. 2. Check for continuity between the lead and ground. (Check for open circuit in the coil.) 3. Check for noise during operation. (Check for malfunction of bearing and for slipping.) [Correction] 1. If there is an open circuit in the coil, replace the clutch. 2. If the bearing produces noise, replace the bearing. 3. If slipping is evident, replace the clutch.	 20Y901
Malfunction of fin cycling clutch switch	[Diagnostic procedure] 1. Immerse the capillary of the cycling clutch switch in ice water as shown. Check to ensure that when the temperature is lowered to 1.6°C (35°F), there is no continuity (OFF). If the thermostat is not OFF, it has a problem. 2. Gradually add normal temperature water into the water tank until the thermometer registers 4.6°C (40.28°F), and check to ensure that there is continuity (ON). If the thermostat is not ON, it has a problem. [Correction] 1. If the switch is out of calibration, slightly turn the adjust screw (clockwise for lower temperature setting) and check by performing the above steps 1. and 2. 2. If this does not correct the problem, replace.	 20Y902
Malfunction of low pressure switch	[Diagnostic procedure] 1. When the air conditioner is shut off, connect the gauge manifold to the service valve of the compressor. Use adapter for the discharge side. If there is a pressure of over 2.1 kg/cm²G (30 lb/in²G) in the system, connect an ohmmeter tester between terminals (leads) to verify that there is continuity (ON). OFF means a problem. 2. If the pressure in the system's is lower than 2.1 kg/cm²G (30 lb/in²G), check to ensure that there is no continuity between terminals (leads) (OFF). ON means a problem. 3. If there is no continuity (OFF) in the above step (2), add refrigerant through the gauge manifold and check to ensure that when the pressure of the high pressure side rises to 2.35 kg/cm²G (33.5 lb/in²G), the switch is driven to ON. If it is not driven to ON, it means a problem. [Correction] If there is a problem, replace.	 20Y903

Probable cause	Diagnosis and correction	Remarks
Malfunction of power relay	[Diagnostic procedure] If there is continuity (ON) between the terminals (1) and (2) when a voltage is applied across the terminals (3) and (4), and if there is no continuity (OFF) when no voltage is applied across the terminals (3) and (4), the power relay is good. Otherwise the power relay is defective. [Correction] Replace if defective.	 20Y904
Malfunction of cooling performance	If the refrigerant level is low, the compressor oil can also be assumed to be low. Remove the compressor from the vehicle, check the amount of oil in the compressor, and then replenish the oil so that there is approximately 110 c.c. (6.7 cu.in.)	Check the refrigerant level visually in the sight glass at least once every three months.
Malfunction of compressor	[Diagnostic procedure] 1. Check to see if the pulley can be turned by hand. (Check for seizure.) 2. Operation causes low pressure to increase and main body temperature to rise. (Broken packing, cracked valve) [Correction] Correct malfunctions by replacing parts.	 C20524
Refrigerant leaks	[Diagnostic procedure] If the sight glass shows air bubbles, the refrigerant is leaking or insufficient. [Correction] Check to discover leaking points. Correct or recharge.	 C20525

Probable cause	Diagnosis and correction	Remarks
Clogged strainer (receiver)	[Diagnostic procedure] If the temperature difference between the strainer inlet and outlet pipings is more than 5°C (41°F), there is a malfunction of the strainer in the receiver. [Correction] Replace.	 C20526
Air in refrigerant circuit	[Diagnostic procedure] High pressure increases more than 98 kPa (14.2 psi) over saturation pressure about 1,600 kPa (230 psi) which corresponds to the temperature of the refrigerant outlet piping of the condenser. [Correction] Evacuate the circuit and recharge refrigerant.	 C20527
Refrigerant overcharged	[Diagnostic procedure] 1. Both high and low pressures are high. 2. Compressor suction piping is frosted. [Correction] Remove refrigerant from the check valve. As a guide, make certain that the suction piping superheating temperature just before appearance of air bubbles in the sight glass is 10 to 20°C (50 to 68°F).	 20Y905
Clogging with foreign substance	[Diagnostic procedure] 1. High pressure increases and low pressure falls, and there is no cooling. 2. Separation into high and low temperature areas is caused by clogging. 3. Clogging is not automatically corrected during shutdown. 4. Clogging usually occurs in the expansion valve. [Correction] Remove clogged parts and replace them.	 C20529
Moisture in receiver drier	[Diagnostic procedure] 1. Symptoms similar to clogging with a foreign substance appear. 2. The trouble is corrected after more than 30 minutes of shutdown, but it occurs again after resumption of operation. [Correction] After sufficient evacuation, replace with a new receiver drier.	 C20530

Probable cause	Diagnosis and correction	Remarks
Expansion valve heat-sensitive cylinder	[Diagnostic procedure] 1. Low pressure is high, although the interior is cool. 2. The suction piping is frosted. [Correction] Check and correct.	 C20531
Expansion valve out of adjustment	[Diagnostic procedure] Removal of the heat-sensitive cylinder does not cause low pressure to increase. [Correction] Replace.	

HEATER CONTROL SYSTEM ADJUSTMENT

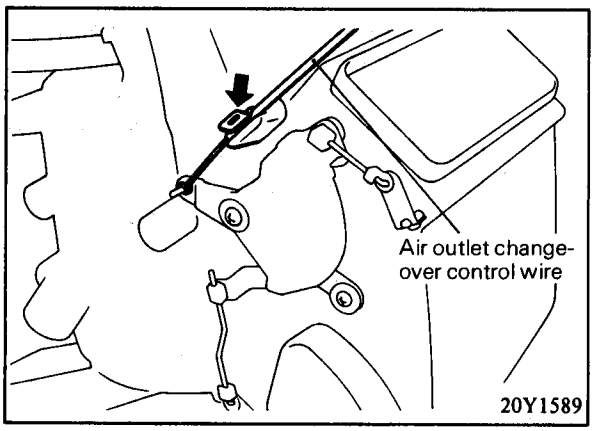
Air Outlet Changeover Lever

1. Check blower operation and air flow at every air outlet changeover lever position.
2. If air flow is improper at any air outlet changeover lever position, adjust the air outlet changeover control wire. If this adjustment failed to obtain good result, adjust the damper.

ADJUSTMENT OF THE AIR OUTLET CHANGEOVER CONTROL WIRE

1. Disconnect the defroster duct at the driver's seat side from the heater unit and the defroster nozzle.
2. Disconnect the air outlet changeover control wire from the heater unit's clip.

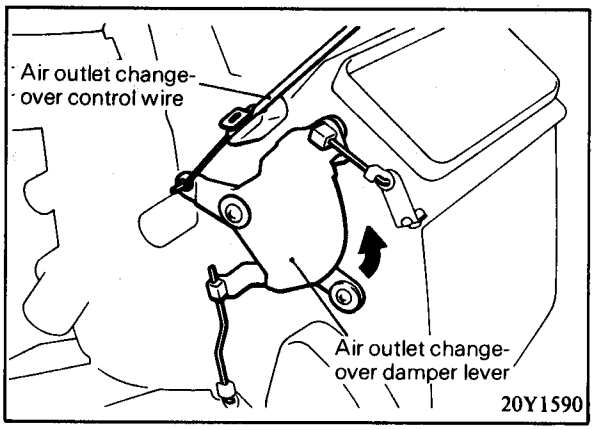
NOTE
Place the air outlet changeover lever of heat control to " " position for easier disconnection of air outlet changeover control wire.



3. Set the air outlet changeover lever of heater control to the " " position.
4. Turn the air outlet changeover damper lever completely to the left.
5. Connect the air outlet changeover control wire to the clip part of the heater unit.

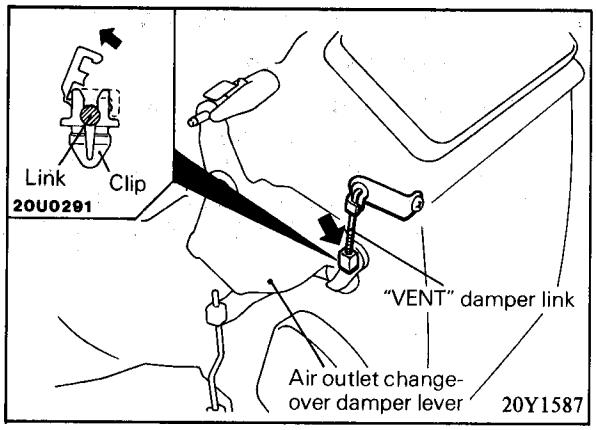
Caution
Be careful that the lever does not move when clipping.

6. Move the heater control air outlet changeover lever to all positions one after another to check that the lever moves smoothly with distinctive engagement feel at every position and the air flow changes accordingly.
7. If air flow is improper at any air outlet changeover lever position, adjust the air outlet changeover control wire. If this adjustment failed to obtain good result, adjust both "VENT" and "FOOT/DEF" dampers.
8. Connect the driver's side defroster duct to the heater unit and defroster nozzle.

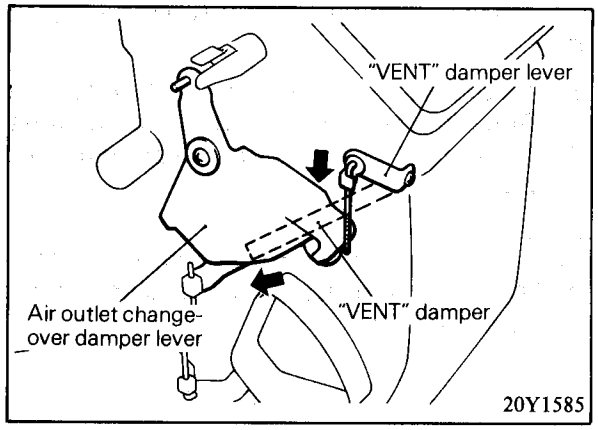


ADJUSTMENT OF THE DAMPER

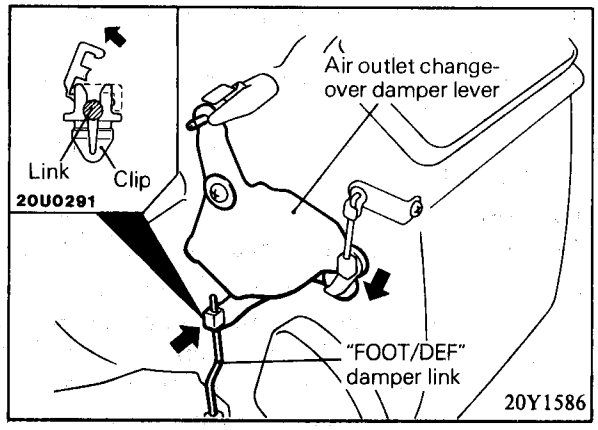
1. Disconnect the air outlet changeover control wire from the air outlet changeover damper lever and the heater unit's clip.
2. Adjust the "VENT" damper as follows:
   (1) After unlocking the air outlet changeover damper lever clip, disconnect the link for the "VENT" damper from the air outlet changeover damper lever.



   (2) Turn the air outlet changeover damper lever completely to the right.
   (3) Pull the "VENT" damper lever completely downward, and move the damper to the position (not visible) shown in the figure.
   (4) Attach the end of the link for the "VENT" damper to the air outlet changeover damper lever.

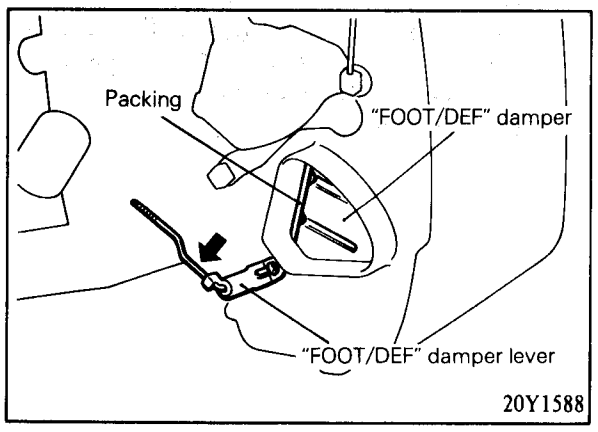


3. Adjust the "FOOT/DEF" damper as follows:
   (1) After unlocking the air outlet changeover damper lever clip, disconnect the link for the "FOOT/DEF" damper from the air outlet changeover damper lever.
   (2) Turn the air outlet changeover damper lever completely to the right.



   (3) Pull the "FOOT/DEF" damper lever completely downward, and move the damper to the position shown in the figure (the packing should be in contact with the case).

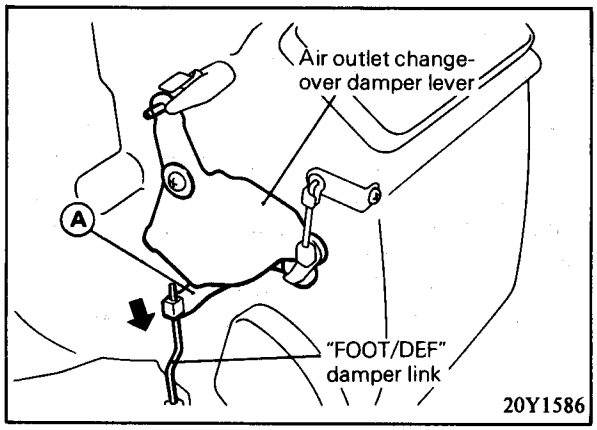
NOTE
Confirmation can be made that the "FOOT/DEF" damper is raised upward through the defroster blower outlet of the heater unit (with defroster duct disconnected).



(4) Attach the end of the link for the "FOOT/DEF" damper to the air outlet changeover damper lever.

NOTE
When attaching it, pull the lever end (A in the figure) in the direction of the arrow.

4. Connect the air outlet changeover control wire to the air outlet changeover damper lever according to the procedure shown in "ADJUSTMENT OF THE AIR OUTLET CHANGEOVER CONTROL WIRE".

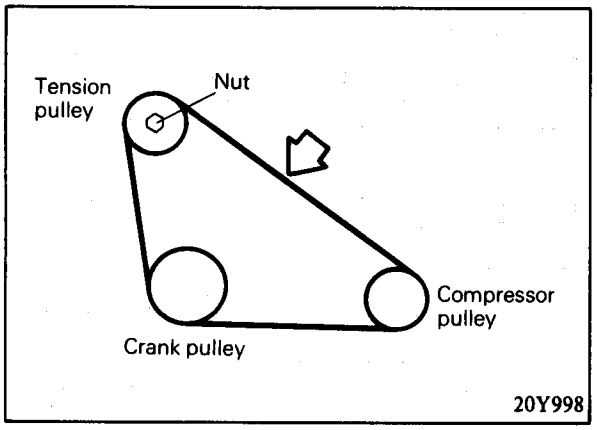


CHECK AND ADJUSTMENT

After compressor reinstallation or belt replacement, check the following points and confirm that everything is in order. Then charge with refrigerant, adjust the idle, and make the belt adjustment, performance test and the operation test.

1. Check for any abnormal vehicle performance, etc.
2. Check the magnetic clutch for operation (without turning the compressor).
3. Check the belt for improper tension. (20Y998)

Drive belt tension	17—20 mm (.7—.8 in.)

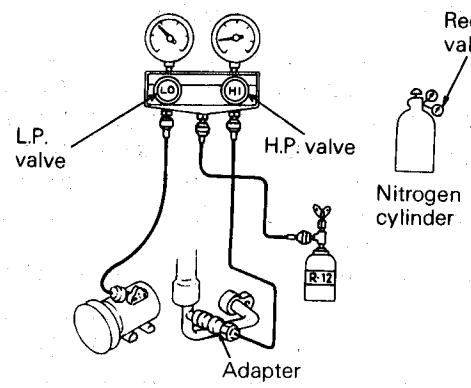


AIR TIGHTNESS TEST

After all piping work has been completed, conduct an air tightness test by the following procedure to check for leaks through the flare connections, etc., and then evacuate the system. If this air tightness test is omitted and evacuation is immediately started, there is no way of detecting possible leaks. If there are leaks, the specified vacuum cannot be attained unless the test is made at the beginning.
In order to eliminate wasted time, therefore, be sure to conduct the air tightness test before evacuation.

Air Tightness Test Procedure

- Mount gauge manifold to compressor check valve. (Do not confuse high and low pressures.)
- H.P. valve (closed) / L.P. valve (closed)
- Attach service can to charge hose.
- H.P. valve (open) / L.P. valve (open)
- Charge refrigerant [196 kPa (28.4 psi) of gaseous refrigerant from the service can held in vertical position].
- H.P. valve (close) / L.P. valve (close)
- Replace service can by nitrogen cylinder.
- Charge nitrogen gas [883 kPa (127.8 psi)].
  - Gauge manifold L.P. valve (open)
  - Reducing valve (open)
  - Set nitrogen gas to 883 kPa (127.8 psi) by the reducing valve.
- H.P. valve (open) / L.P. valve (open)
- Leave alone. (Check to ensure that the gauge reading does not change.)
- Air tightness test
- Discharge gas inside the equipment (slowly, from low pressure side).



NOTE
Since the high pressure valve and the low pressure valve differ in size, connect the adapter to the high pressure line of the manifold gauger set as illustrated before installing the manifold gauge set to ethe compressor service port.

Thread dimension
High pressure: 3/8 – 24 UNF
Low pressure: 7/16 – 20 UNF

20K678

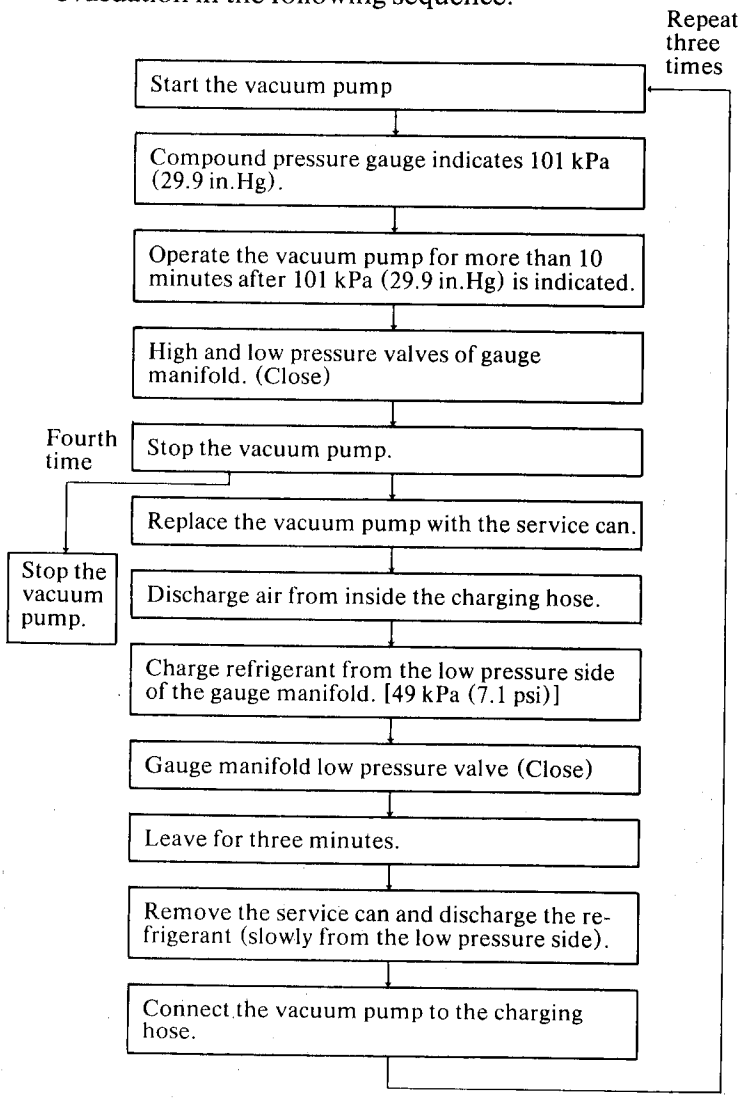
EVACUATION

After the air tightness test, evacuate the equipment as a preliminary step before charging the refrigerant in the equipment.

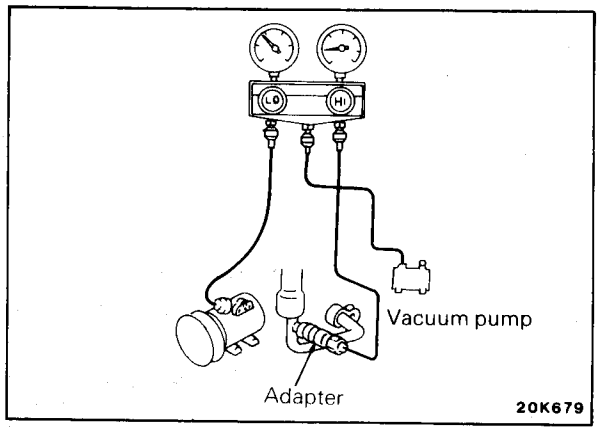
When the air conditioner is handled, the most important point to note is existence of non-condensing gas and water in the equipment. Since the refrigerant R12 is very insoluble in water, even a small amount of moisture left in the equipment will freeze, causing what is called "water clogging".

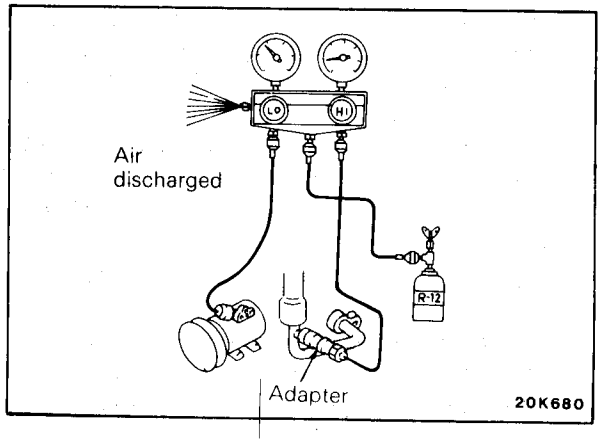
Evacuation Procedure

1. Check to ensure that there is no internal pressure in the equipment. If there is an internal pressure, it should be relieved through the check valve.
2. Connect the charging hoses of the gauge manifold to the inlet and outlet check valves of the compressor.
3. Connect a vacuum pump to the charging hose. Repeat evacuation in the following sequence.



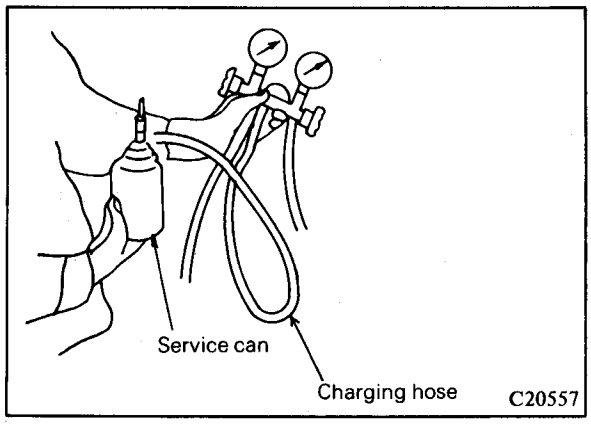
Notes 1. Do not use the refrigerant pressure to expel air.
2. Do not use the compressor for evacuation.
3. Do not operate the compressor in the vacuum condition; shaft seal leaks could occur.





REFRIGERANT CHARGE

Charge with refrigerant immediately after evacuation.



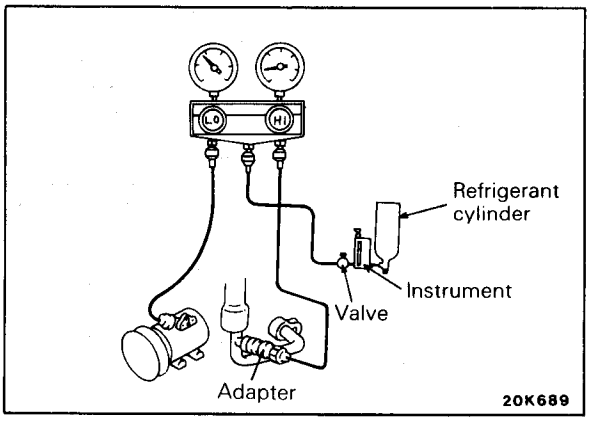
Charging from a Service Can

1. Connect the service can to the charging hose. (C20557)
2. Slightly loosen the flare nut at the gauge manifold to expel air (from inside the charging hose) with the refrigerant, and tighten the flare nut immediately after the expelling air.
3. Hold the service can upright, and slowly loosen the low-pressure valve of the gauge manifold so that the gaseous refrigerant will be drawn into the equipment.
4. When the gaseous refrigerant is no longer drawn into the equipment, start the engine and keep it running at approx. 1,100 rpm in order to charge the refrigerant into the equipment.
5. Touch the bottom of the service can. If it is no longer cool, it is empty. Replace it with a new one.
6. When the service can is replaced, close the low-pressure valve of the gauge manifold.
7. After a new service can has been installed, repeat Items 1 through 5 until the specified amount of refrigerant is charged.
8. After the specified amount of refrigerant has been charged, close the low pressure valve of the gauge manifold and check the condition while observing the pressure gauge.
9. If only part of the service can is to be used, place it on a scale and measure its weight before and after charging.
10. Close the service can valve and remove the gauge manifold.

Caution
The service cans should always be kept below 40°C (104°F).

Charging from a Refrigerant Cylinder

1. Connect the refrigerant cylinder and measuring instrument as shown. (20K689)
2. Let the specified amount of refrigerant flow into the measuring instrument, and check the indication.
3. Connect the measuring instrument to the charging hose.
4. Slightly loosen the flare nut at the gauge manifold to expel air (from inside the charging hose) with the gaseous refrigerant, and tighten the flare nut immediately after expelling the air.
   Loosen the valve of the measuring instrument and charge the gaseous refrigerant by the procedure described in Item 3 and subsequent items of paragraph 1.



Cautions
1. **If the high pressure gauge registers more than 1,471 kPa (213 psi), such as on a hot summer day, stop charging for a while, and allow the pressure to fall by spraying water on the compressor before charging is resumed.**
2. **Never overcharge the cylinder as it is dangerous.**

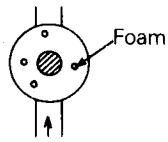
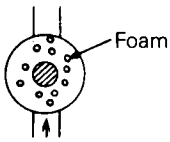
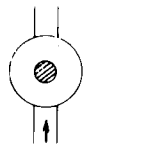
Checking the Refrigerant Level

When charging the refrigerant, use a measuring instrument of scale for measuring. Use of a sight glass for checking and judging the proper refrigerant level requires considerable experience and proficiency. The charging procedure is as follows:

1. Operate the engine at approx. 1,100 rpm.
2. Adjust the high pressure to 1,177 to 1,373 kPa (170 to 200 psi)
3. Adjust the cooler inlet temperature to 25°C (77°F) or higher.
4. Adjust for maximum cooling unit air volume (HI).
5. Check the sight glass by the following procedure:

Cautions

1. **For checking by sight glass, start and stop the engine a few times.**
2. **When charging refrigerant at a low atmospheric temperature, such as in the off-season, foam may disappear before the specified level is reached. If so, cover the front of the condenser to increase the pressure to the specified level. The temperature of the cabin should also be increased.**
3. **When charging at a very high atmospheric temperature or under the hot sun, place the vehicle in a cool, well-ventilated area, and keep doors of the vehicle open. (This is because under such circumstances the system tends to be overcharged with refrigerant because of slower foam disappearance.)**

Sight glass condition		Remarks
Proper refrigerant level	 C20559	1. Foam occasionally appears. 2. Foam disappears if speed is slightly increased.
Insufficient refrigerant	 C20559	Considerable foam appears. If the system is extremely short of refrigerant, the sight glass appears white.
Excessive refrigerant	 C20559	1. No foam appears. 2. Slight foam appears if speed is decreased.

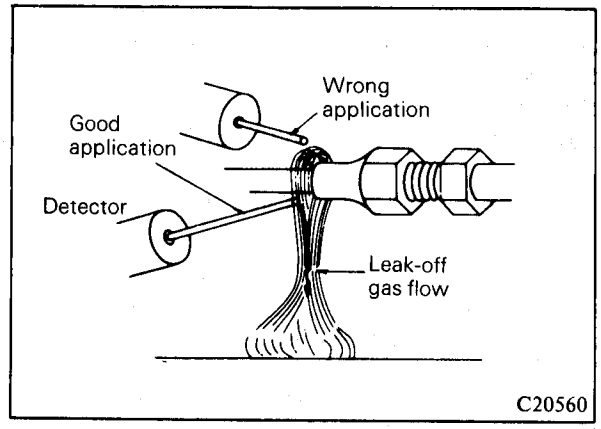
LEAK TEST

Test Points

1. All O-rings of connected piping.
2. Shaft seal and service valve of compressor.
3. Check the soldered piping joints.

Test Procedure

1. For gas leak test, the use of an electric gas leak detector is recommended.
2. Perform the test in a windless area in a building, or the like.
3. The refrigerant is heavier than air. Leaks will be concentrated at the bottom. Make certain that the tester tube is applied from below the test point.
4. The test should be performed patiently. Make certain that the testing tube is moved slowly [approx. 10 mm/sec. (.4 in./sec.)].
5. The high pressure side refrigerant circuit should be tested for gas leaks during operation. Those areas which are dangerous or hard to test during operation (including areas around the compressor and condenser) should be tested immediately after shutdown.
6. The low pressure side refrigerant circuit should be tested during shutdown after the gas pressure has balanced.



C20560

7. The test should be performed on the basis of the following standards:

Gas Leak Test Standards

Test point / Instrument	Compressor shaft seal	Part other than described at left
Electric gas leak detector	Pointer shall not swing more than 0.1 mA at low sensitivity	Pointer must not swing more than 0.1 mA at high sensitivity
Halide torchgas leak detector	Flame color (moss green) shall not change	

Cautions

1. **Smoking should be prohibited if a gas leak is detected.**
2. **If the refrigerant contacts flame, toxic phosgene gas will be produced. Do not keep the detector in contact with a leaky point for a long time.**

PERFORMANCE TEST

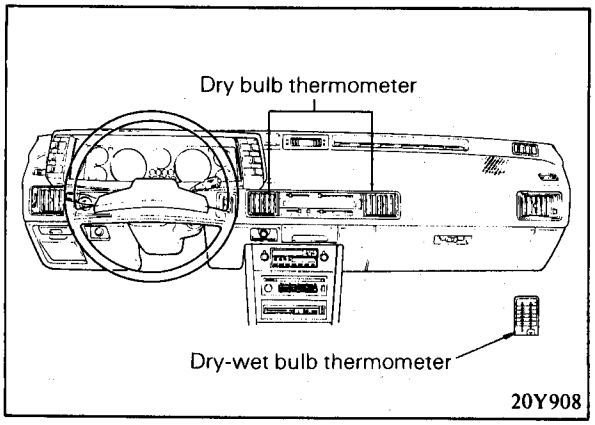
With the air conditioner properly installed and filled with refrigerant, measure the wet-bulb temperature of air conditioner intake air and the dry-bulb temperature of air conditioner outlet air by the following conditions when the outlet air temperature is saturated (10 to 15 minutes after starting of air conditioner) and make sure that the measured temperatures are below the criterion line in the performance chart.

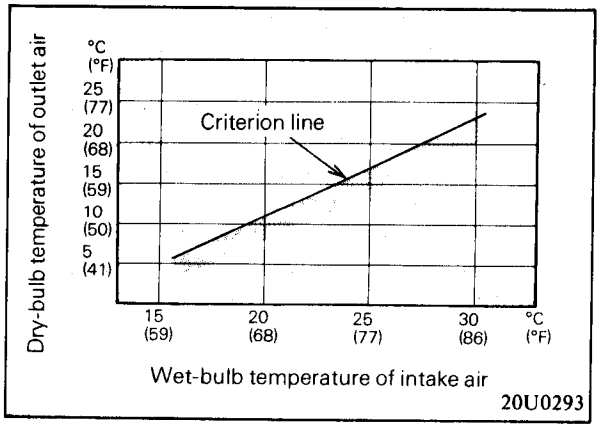
NOTE

1. Measure the dry-bulb temperature of outlet air at the center of each outlet air flow and take an average of the measured temperatures.
2. The velocity of air passing the temperature sensing portion of wet-bulb thermometer must be not less than 0.5 m/sec. (1.6 ft./sec.).

Air Conditioner Operating Conditions

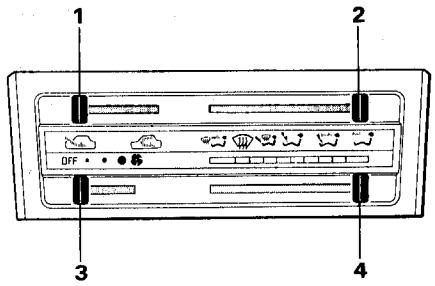
1. Place the vehicle in the shade with all doors full-open to keep inside air temperature at the same level as outside air temperature [wet-bulb temperature of not lower than 16°C (61°F)].
2. Set the engine speed to approx. 1,500 rpm.
3. Place the blower switch in the maximum (HI) position.
4. Place the warm water control lever to the coldest position.
5. Set the recirculation/fresh air changeover lever to the recirculation position.
6. Set the high pressure at 1,422 to 1,520 kPa (206 to 220 psi). (Put a shield in front of the condenser or send air by a fan to regulate air velocity in front of the condenser.)

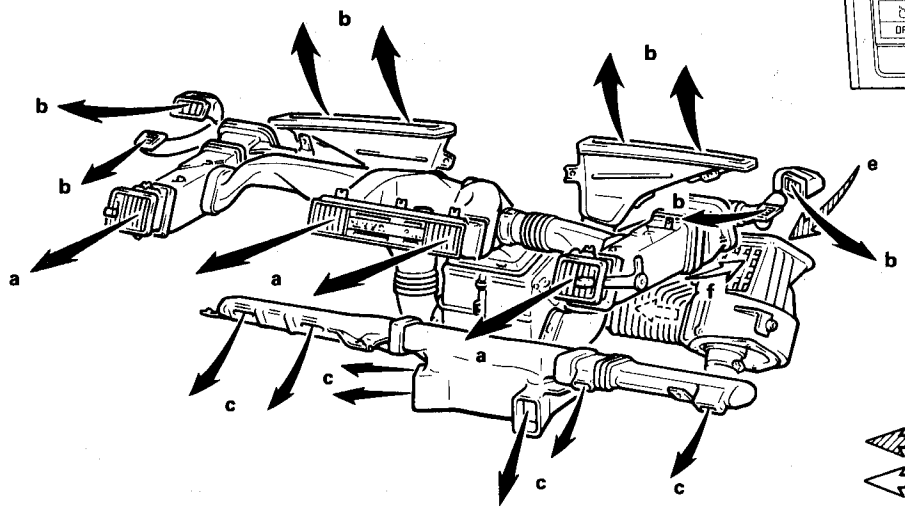




OPERATION

1. Inside/outside air changeover lever
2. Air outlet changeover lever
3. Blower switch
4. Warm water flow control lever

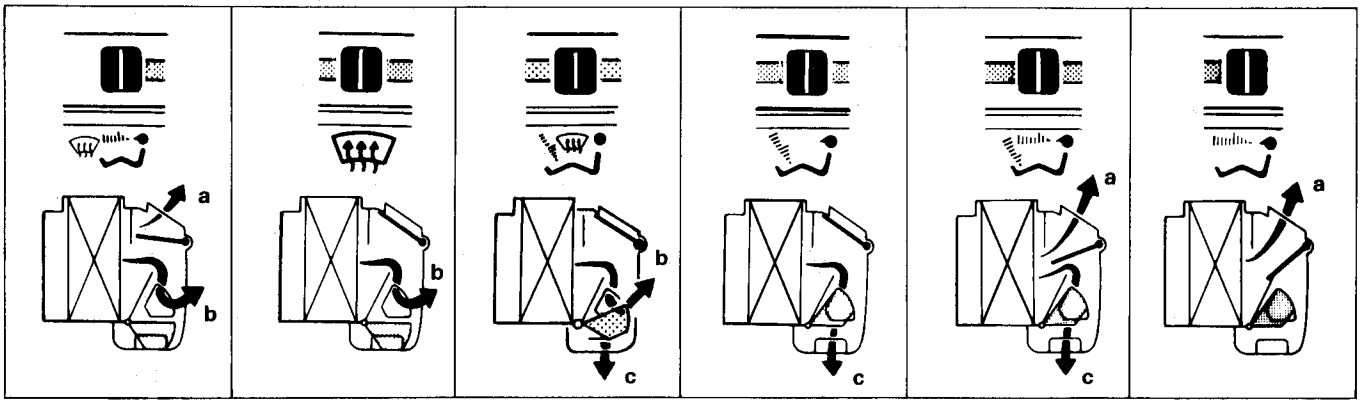




Fresh air
Recirculating air

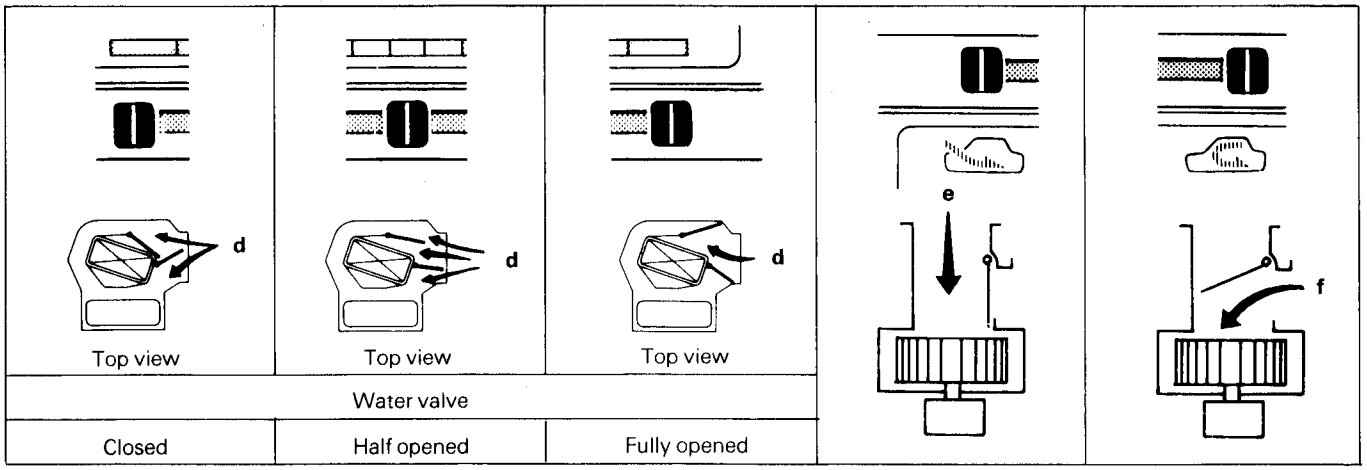
70Y517
20Y826

Air outlet changeover



Warm water flow control (linked to damper)

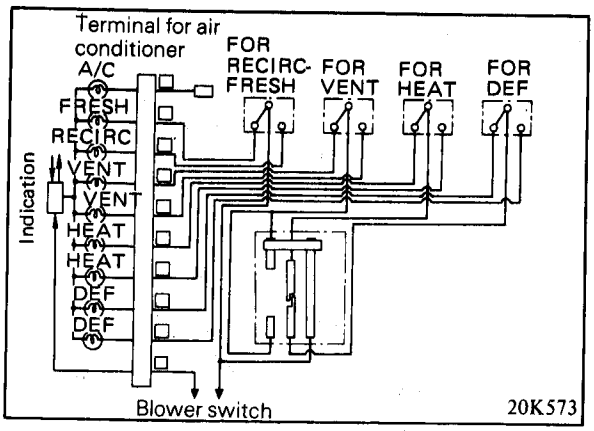
Recirculation/fresh air changeover



20Y1583

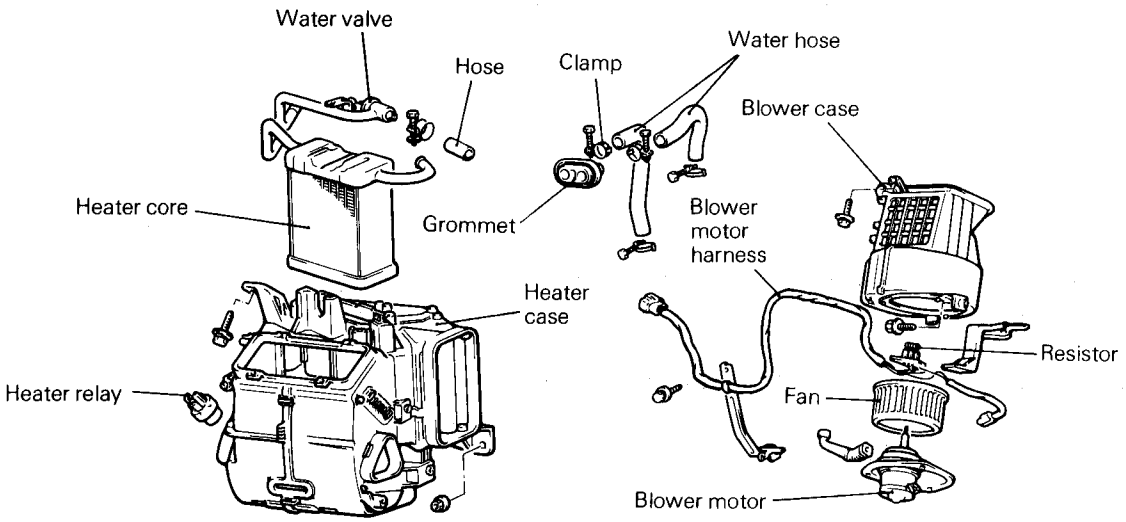
Air Control Indication System

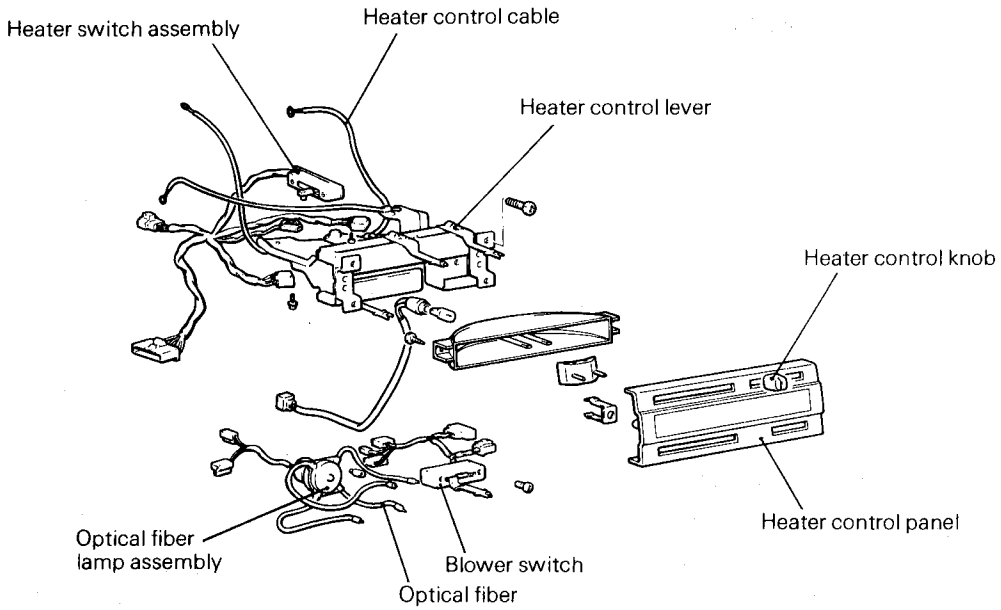
This system consists of indication lamps built into the combination meter and four switches connected to the various control levers. An indication lamp illuminates when the heater blower switch is turned on, and the air selection (inside/outside) and the outlets from which the air is directed air indicated. In addition, the temperature of the air directed from the outlets will be indicated by the color of the indication for each air outlet. The color will be green (cool air) or orange (warm air), in accordance with the position of the temperature control lever.



Mode selector lever		Air selector lever	
Lever position	Indication	Lever position	Indication
			
			
		Temperature control lever	
		Lever position	Indication
		Extreme Left	 Green
		Extreme Right	 Orange
			66C003

COMPONENTS

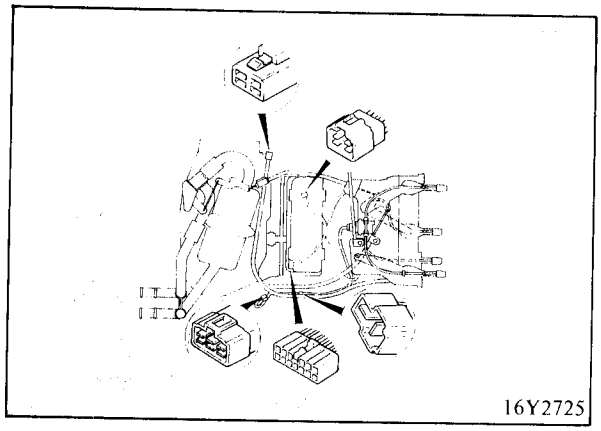




20Y814
20Y1532

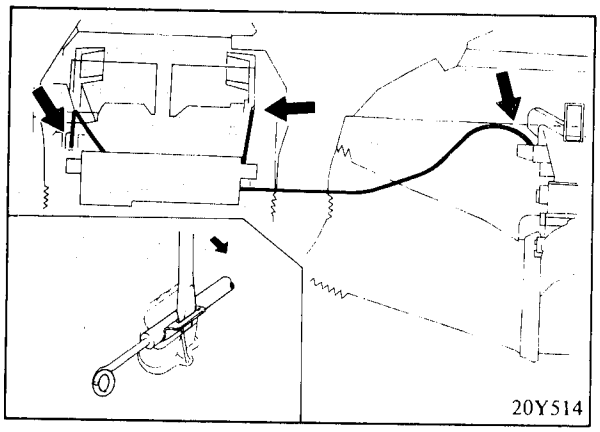
REMOVAL

1. Remove the instrument panel and floor console. (Refer to GROUP 23).
2. Remove the left side defroster nozzle.
3. Disconnect the heater blower switch harness connectors and optical fiber light harness connector if so equipped. (16Y2725)

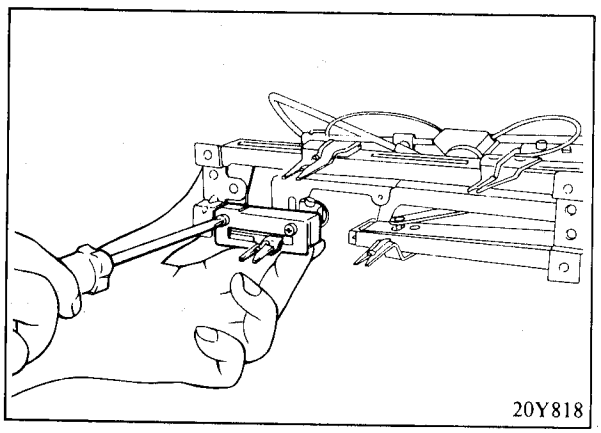

16Y2725

4. Disconnect the heater control cables from the heater unit and blower assembly.

NOTE
Detach the control cables with a screwdriver as shown in the illustration.


20Y514

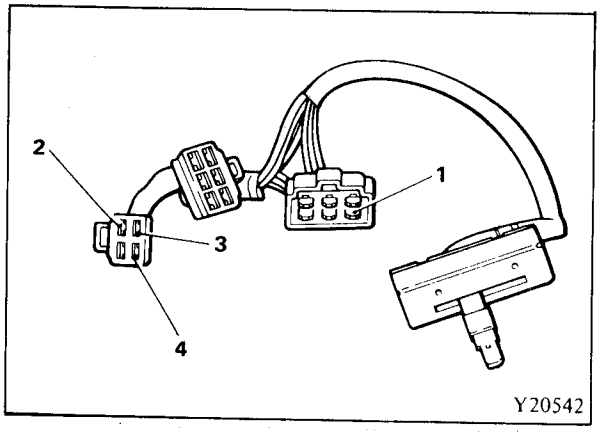
5. Remove the optical fiber from the heater blower switch.
6. Remove the heater blower switch.


20Y818

INSPECTION

Operate the switch to check for continuity.

Switch position \ Terminal	1	2	3	4
OFF				
• (Low)	○	○		
• (Medium)	○		○	
● (High)	○			○



Y20542

INSTALLATION

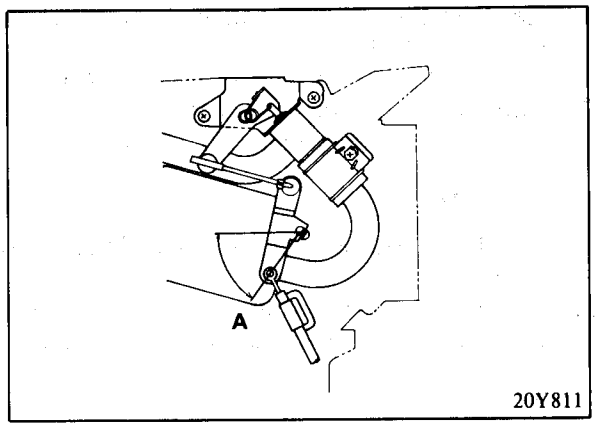
Connect each control cable and damper lever by the following procedures.

Air Outlet Changeover System

Refer to SERVICE ADJUSTMENT PROCEDURE (P.24-41).

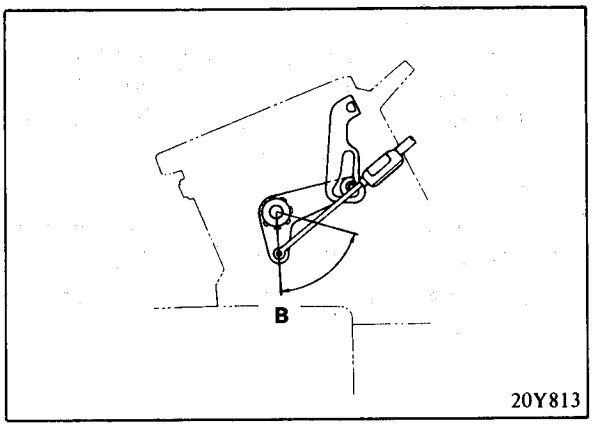
Warm Water Flow Control System

1. Place the warm water flow control lever at the off position.
2. With the heater side water valve control lever in position A, connect the inner cable to the lever and secure the cable casing with clips.



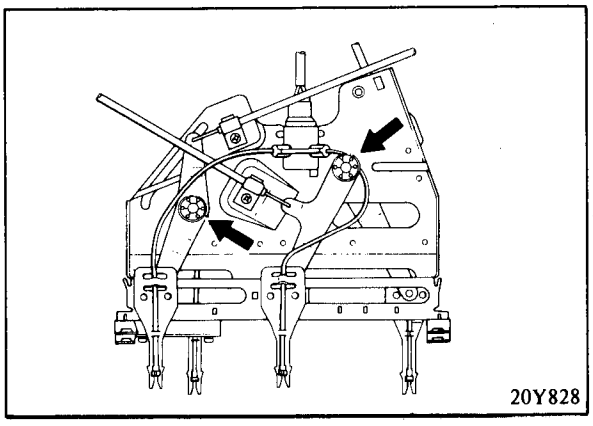
Recirculation/Fresh Air Changeover System

1. Place the recirculation/fresh air changeover lever at the "fresh air" position.
2. With the heater side recirculation/fresh air changeover damper lever in position B, connect the inner cable to the lever and secure the cable casing with clips.



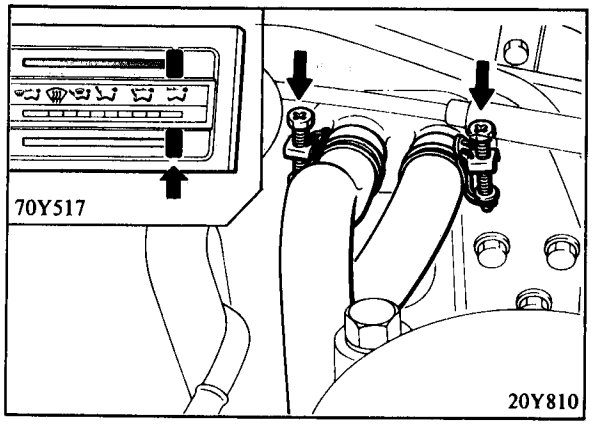
3. Check to make sure that each control lever moves smoothly.
   If there is any noise or stiff movement, apply the specified multipurpose grease to all moving parts.

Specified grease	MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent

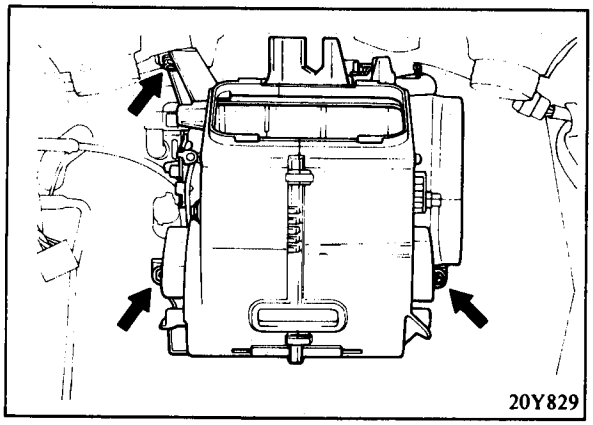


REMOVAL

1. Move the warm water flow control lever to the "warm" position. (70Y517)
2. Loosen the radiator drain plug, and drain the coolant.
3. Disconnect the water hoses from the heater unit. (20Y810)
4. Remove the instrument panel and floor console. (Refer to GROUP 23.)



5. Remove the center ventilator duct, defroster duct, and lap heater duct.
6. Remove the center reinforcement. (Refer to GROUP 23.)
7. Remove the heater control assembly.
8. Remove the heater unit. (20Y829)



INSPECTION

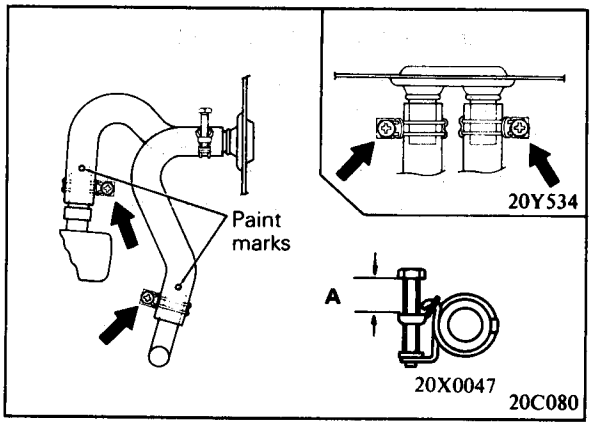
1. Check the heater core for leaks, clogging and bent heater core fin.
2. Check operation of water valve.
3. Check all hoses for cracks and deterioration.

INSTALLATION

1. Install the water hoses, and tighten the clamps in the positions shown in the illustration. (20Y534)
2. The hose with the painted mark should be connected to the engine side. (20C080)

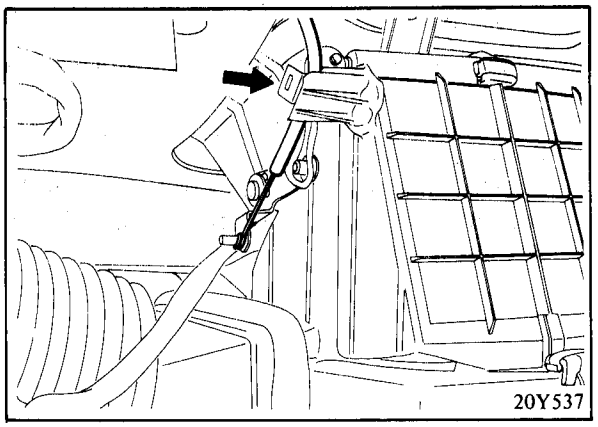
NOTE
Tighten each clamp screw until dimension A shown in the illustration is 4—9 mm (.16—.35 in.).

3. After installing engine coolant, recheck cooling system for leaks.

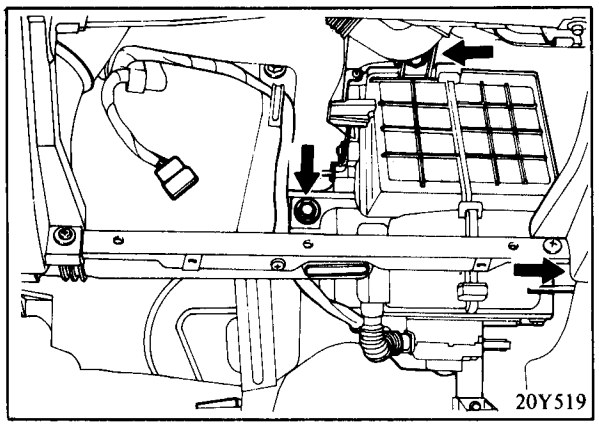


REMOVAL

1. Remove the under cover and glove box. (Refer to GROUP 23.)
2. Disconnect the recirculation/fresh air changeover cable from the blower assembly. (20Y537)
3. Remove the duct from the blower assembly.

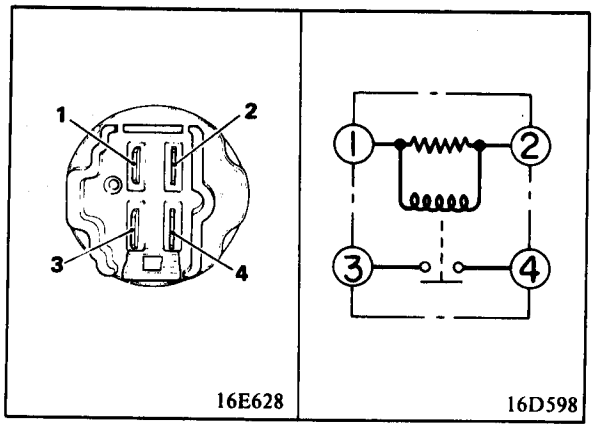


4. Disconnect the heater blower switch connector.
5. Remove the blower assembly.

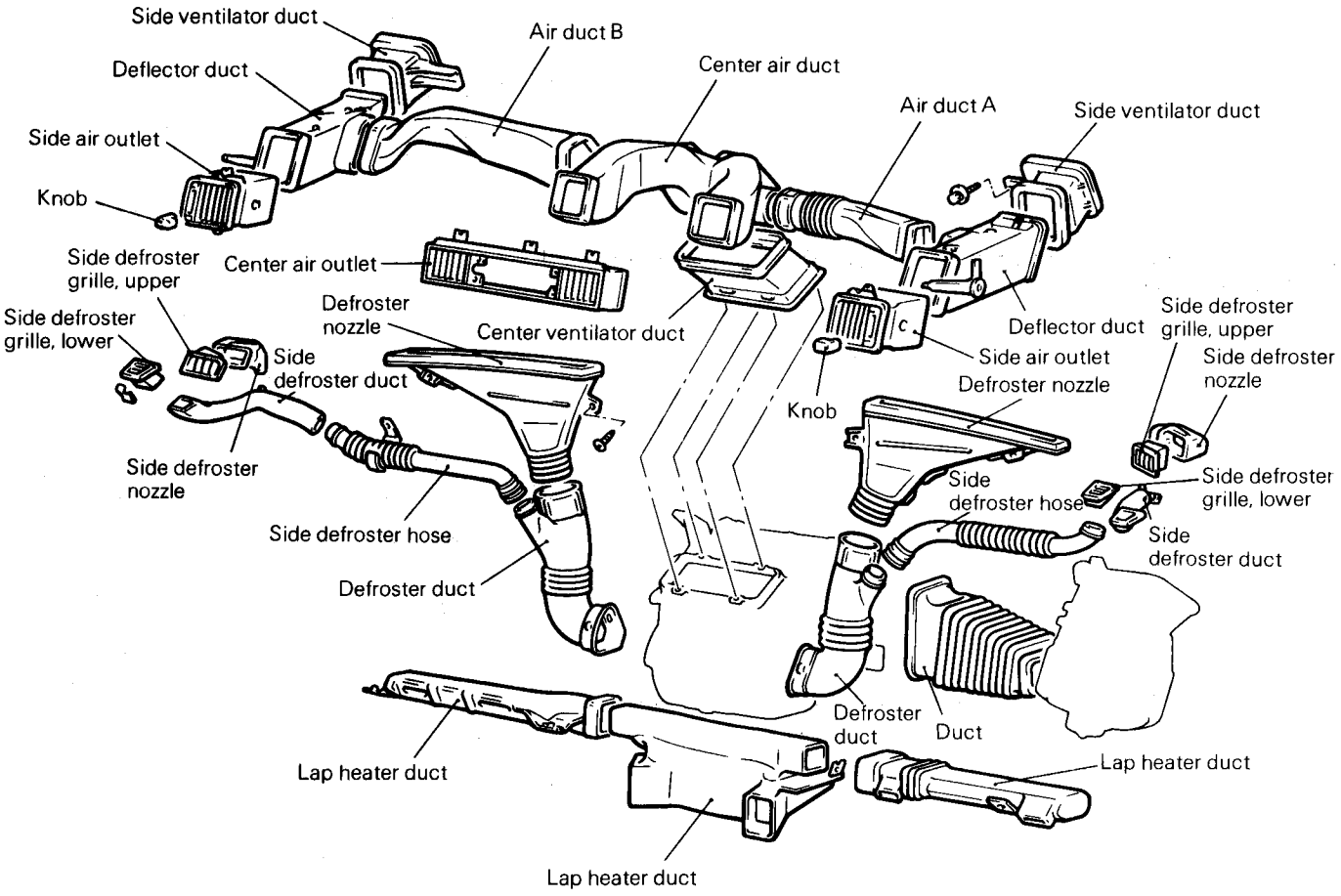


INSPECTION

1. Check continuity between terminals 1 and 2. There should be continuity.
2. Check continuity between terminals 3 and 4. There should not be continuity.
3. Check continuity between terminals 3 and 4 while applying battery voltage to terminals 1 and 2. There should be continuity.



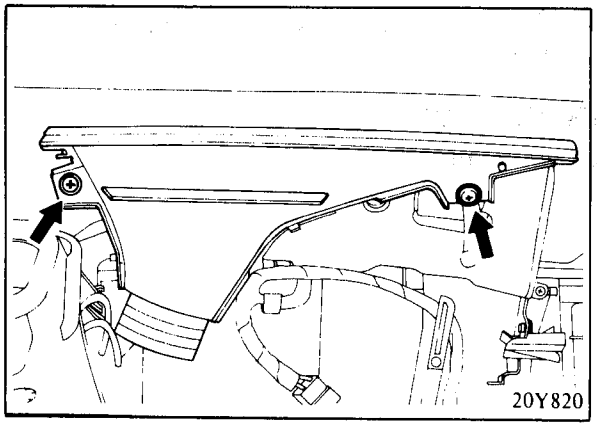
COMPONENTS



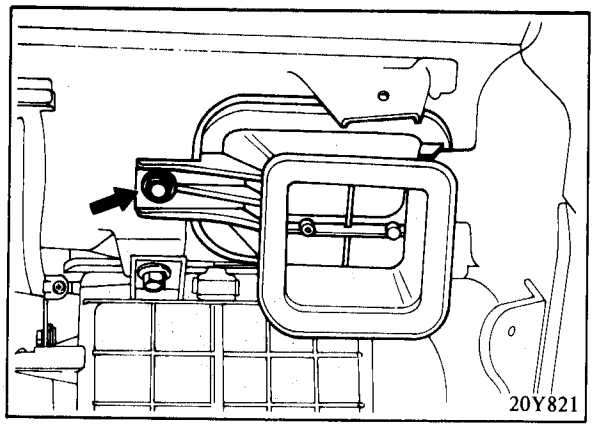
20Y816

REMOVAL

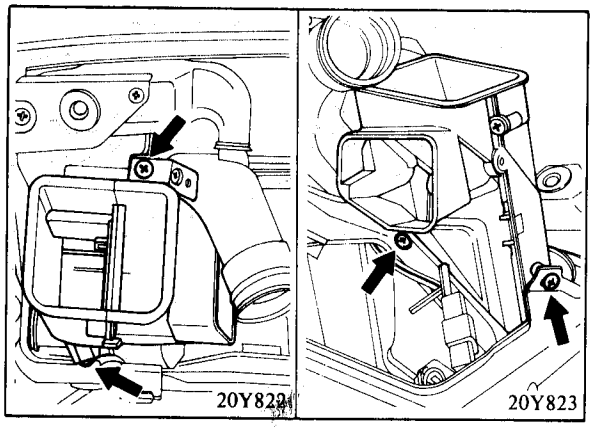
1. Remove the defroster duct, and then remove the defroster nozzle. (20Y820)
2. Remove the instrument pad. (Refer to GROUP 23.)



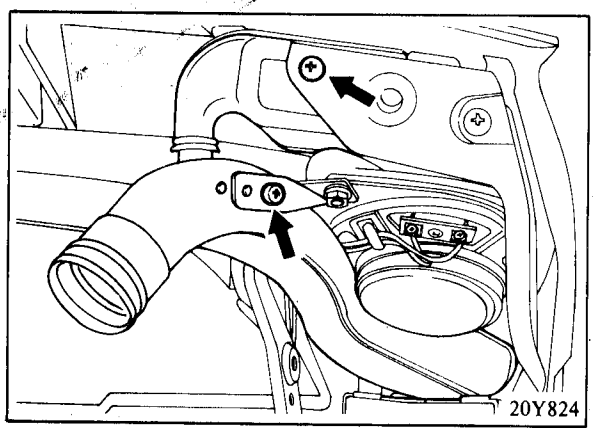
3. Remove the side ventilator duct from the body.



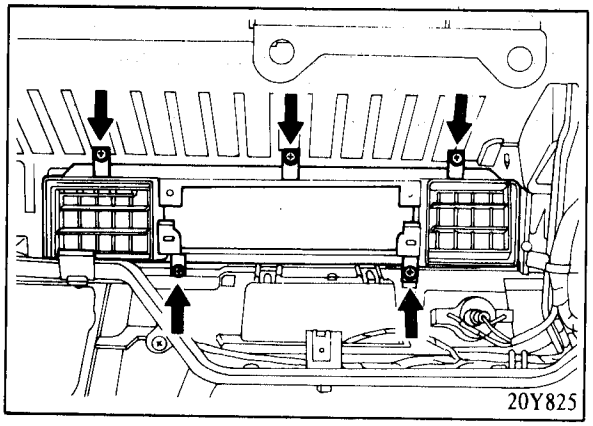
4. Remove the air duct and knob, and then remove the deflector duct.



5. Remove the side defroster duct and the defroster nozzle.



6. Remove the center air duct, and then remove the center air outlet.

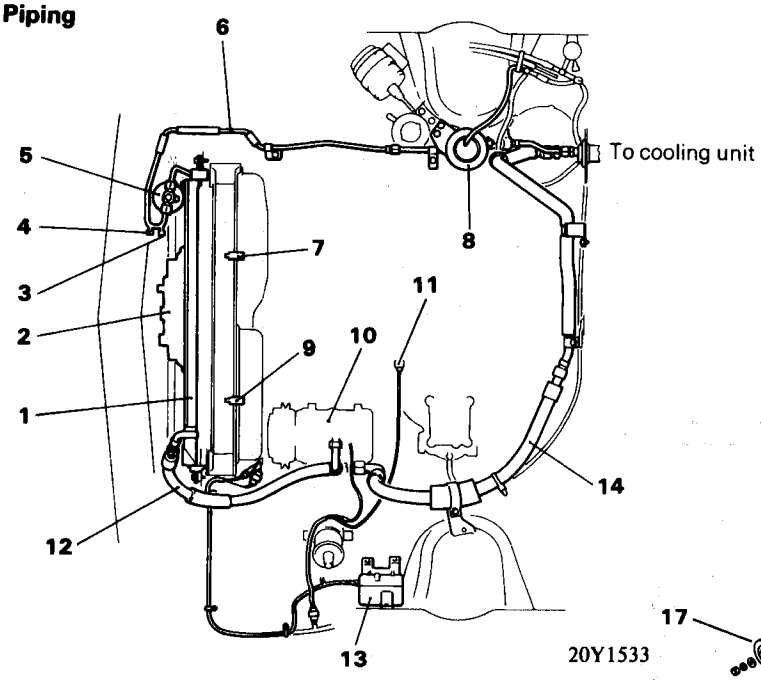


INSPECTION

Check all ducts for cracks.

COMPONENTS

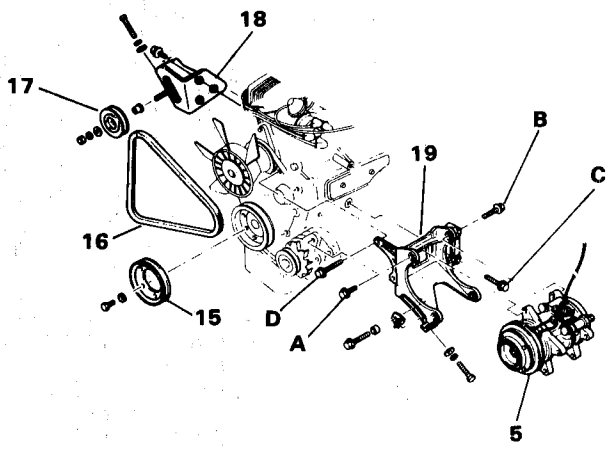
Piping



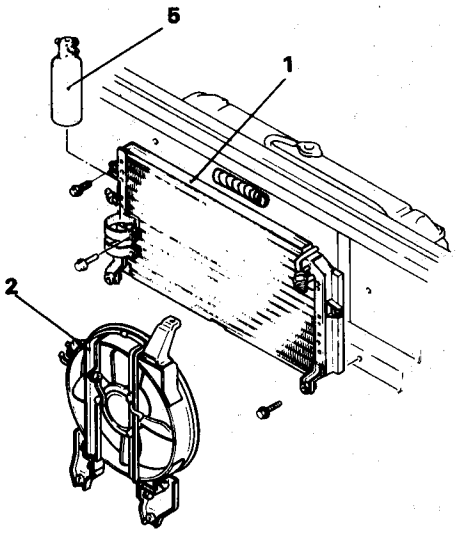
20Y1533

	Nm	ft.lbs.	O.D. x length mm (in.)
A	20 – 29	14 – 22	10 x 30 (1.2)
B	20 – 29	14 – 22	10 x 35 (1.4)
C	40 – 50	29 – 36	10 x 50 (2.0)
D	20 – 29	14 – 22	8 x 80 (3.1)

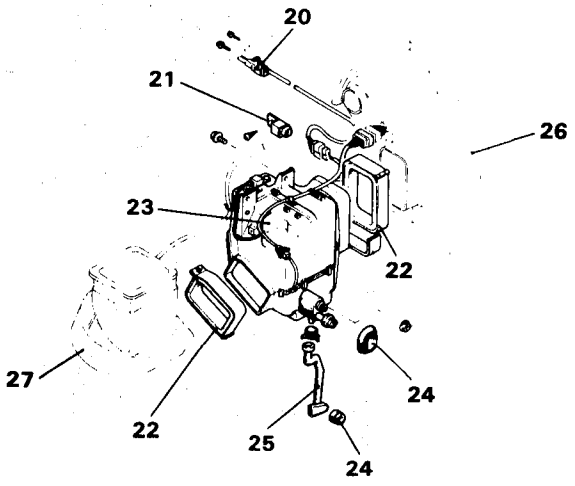
Engine compartment



20Y999



Passenger compartment

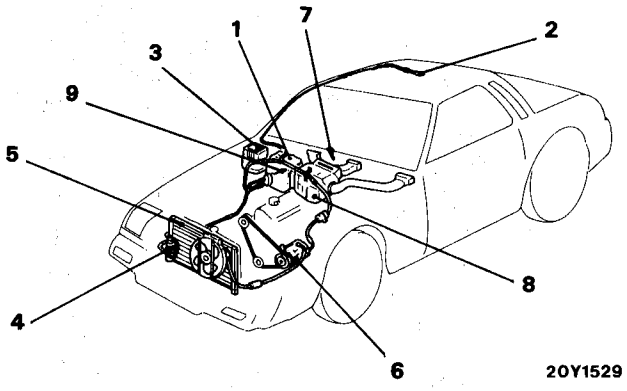


20Y1504

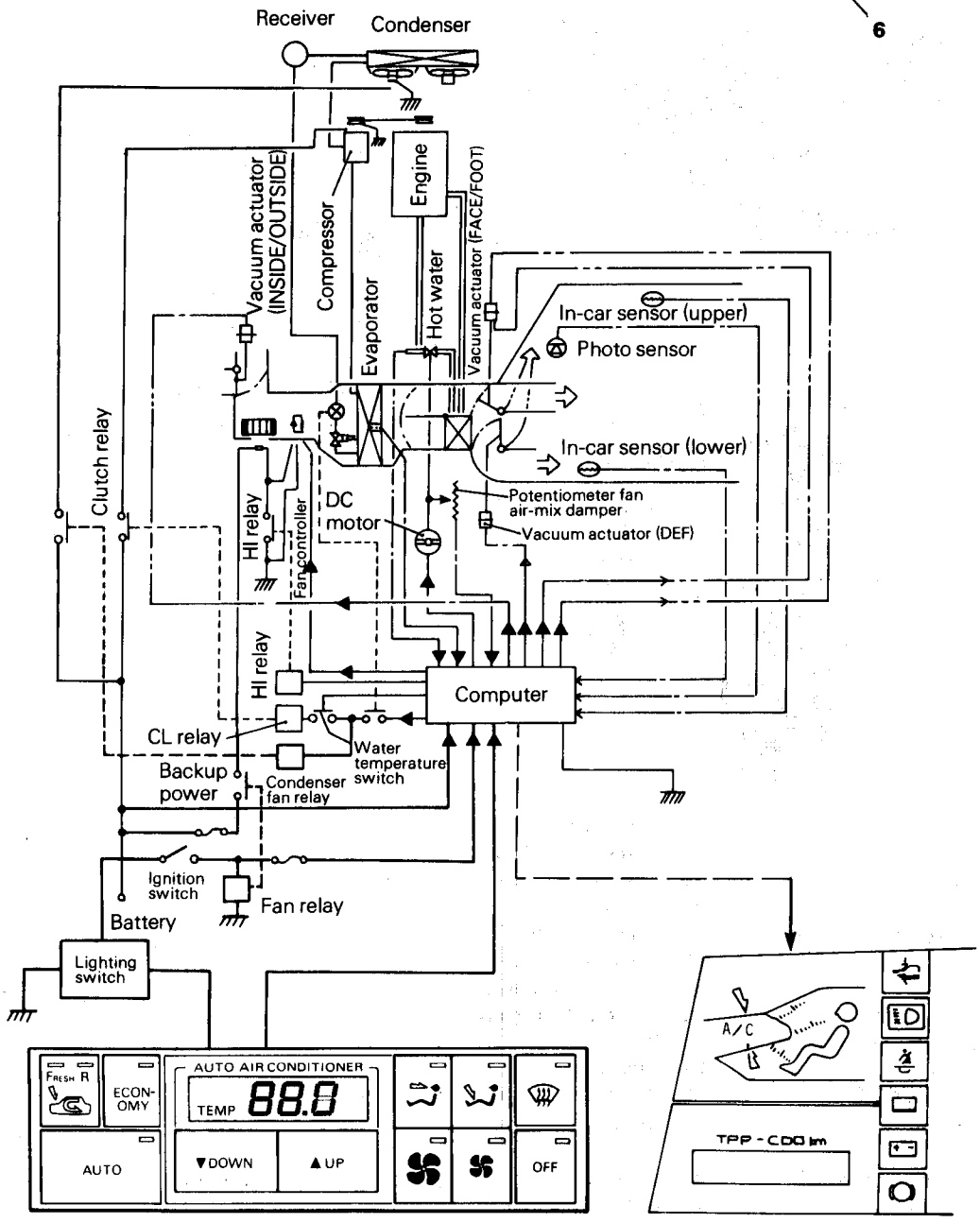
1. Condenser
2. Pusher fan
3. Dual pressure switch
4. Pressure switch (vehicles with an intercooler)
5. Receiver
6. Liquid line
7. Thermosensor No. 1 (vehicles with an intercooler)
8. Vacuum tank
9. Thermosensor No. 2 (vehicles with an intercooler)
10. Compressor
11. Water temperature switch
12. High pressure hose
13. Relay assembly
14. Low pressure hose
15. Crankshaft pulley
16. V-belt
17. Tension pulley
18. Tension pulley bracket
19. Compressor bracket
20. Air-conditioning switch
21. Power relay
22. Duct joint
23. Air-conditioning unit
24. Grommet
25. Drain hose
26. Heater unit
27. Blower assembly

SUMMARY

1. Cooling unit
2. Upper in-car sensor
3. Blower motor
4. Receiver assembly
5. Condenser
6. Compressor
7. Photo sensor
8. Heater unit
9. Lower in-car sensor (Foot area)



20Y1529

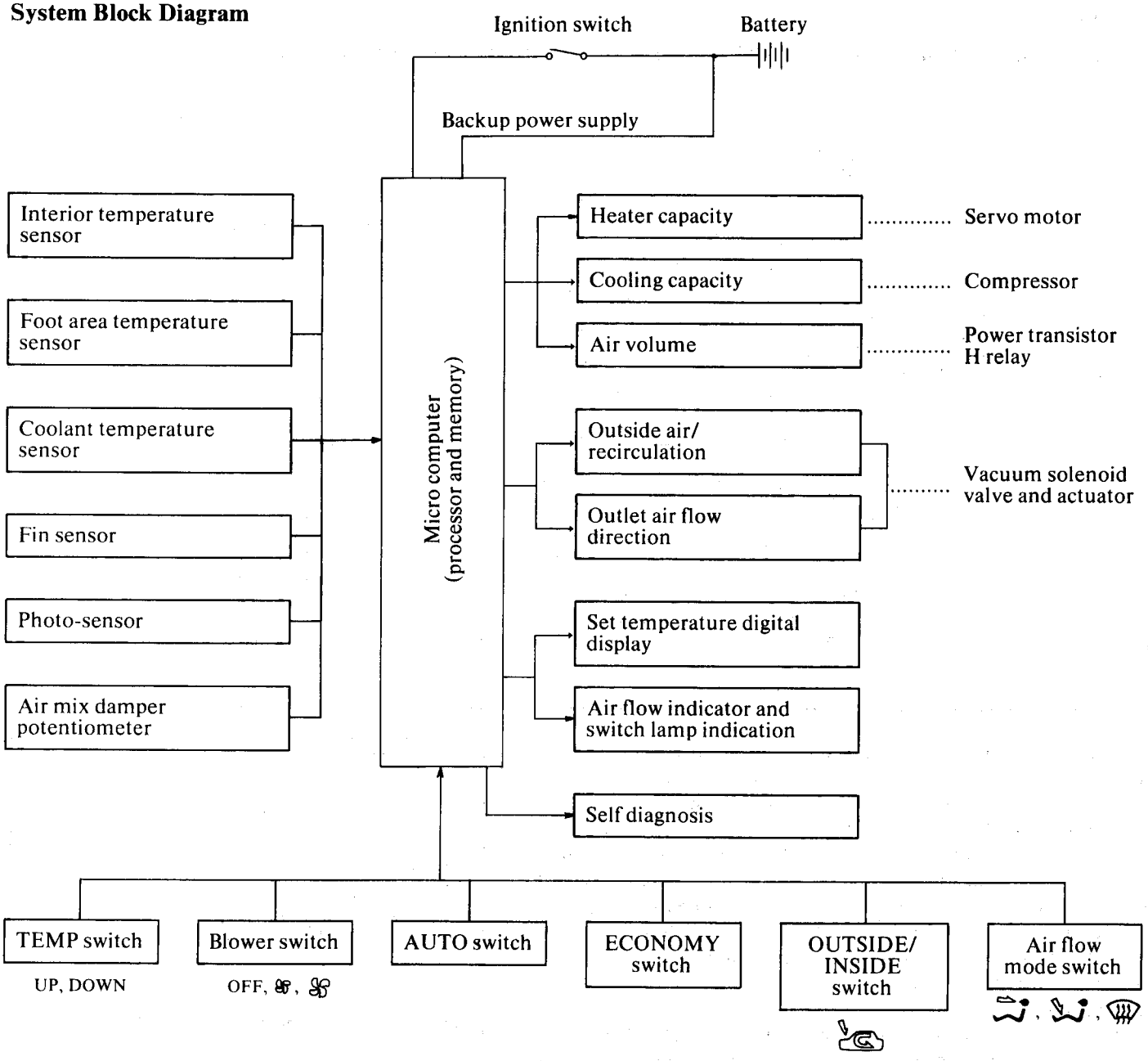


Control panel

Air-conditioning graphic display

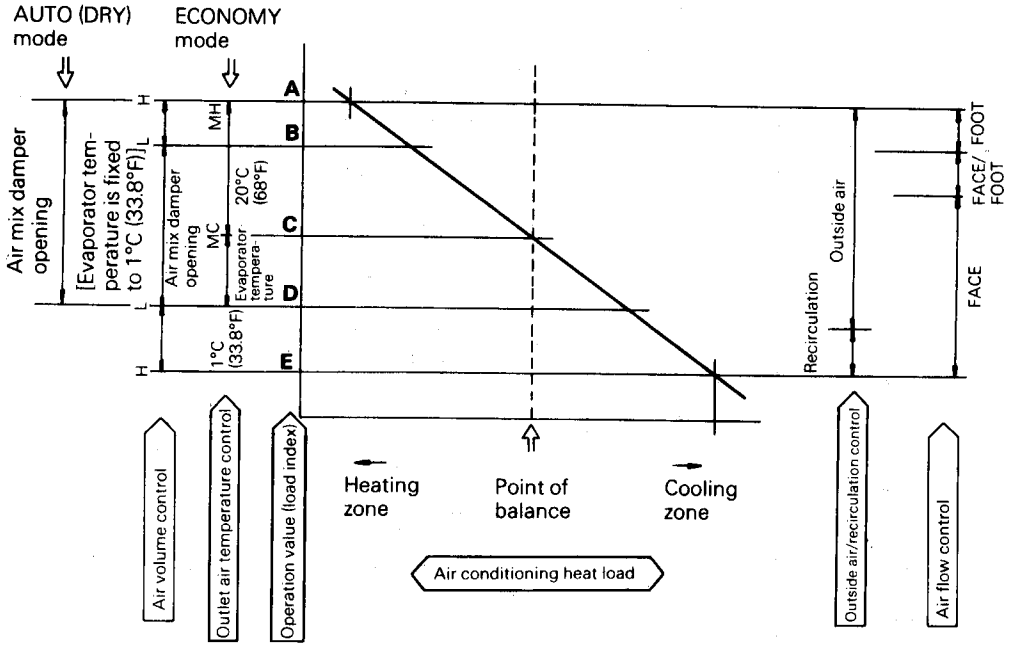
20Y1578

System Block Diagram



Temperature Control Diagram

(Air mix damper opening in AUTO (DRY) mode is different from that in ECONOMY mode)

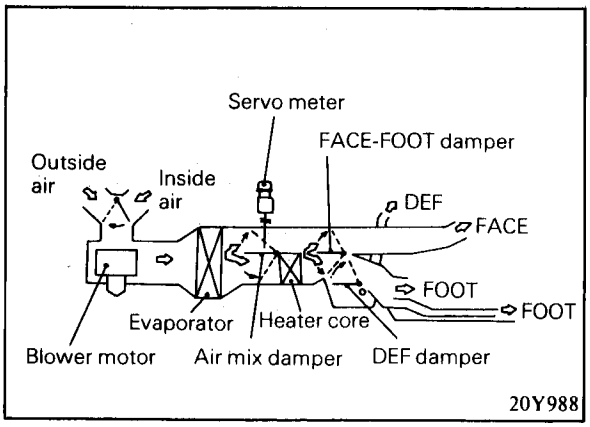


20Y1576

For car interior temperature control, a "feedback control system" is employed, in which the difference between set temperature and inside temperature is compared by a microcomputer and the system mechanisms are so operated as to eliminate the difference. In the microcomputer, the input data from various sensors (upper and lower inside air sensor, photo-sensor, fin sensor, hot water thermo-sensor), potentiometers and control switches are processed and its outputs control the selection of inside air recirculation or introduction of outside air, direction of air flow, outlet air temperature and air volume.

Further, as a backup circuit is provided to store set temperature and temperature conditions in memory even when the ignition switch is turned OFF (with battery terminals in connected condition), if the ignition switch is turned ON again, the system resumes automatic control operation in the same condition as before turning off of ignition switch provided the switch is in AUTO position.

By changeover of the switch, manual operation is also possible. In this case, the functions other than those selected for manual control are accomplished in automatic control mode.



20Y988

Outlet Air Temperature Control

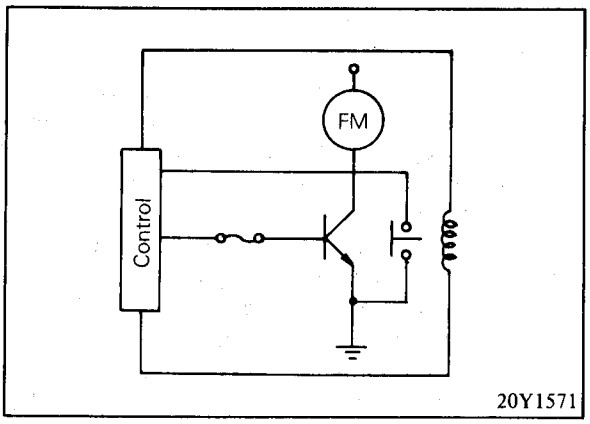
1. Air Mix Damper Operating Range
   On activating the AUTO switch, inside temperature and set temperature are compared and, on the basis of preset control conditions before starting (hereinafter called "temperature control value", the temperature control value is changed according to detected temperature difference to the HOT side if inside temperature is lower and to the COOL side if it is higher. The servo motor is driven and air mix damper opening is controlled according to the change in temperature control operation value so that in the case of change to the HOT side, air mix damper will open to raise outlet air temperature and in the case of change to the COOL side, air mix damper will close to lower outlet air temperature.
   In the AUTO mode, the air mix damper operating range is from the point "a" to the point "d" in the control diagram, and the temperature control operation value changes from value "A" to "D" according to damper position. In the ECONOMY mode, the damper operating range and the corresponding temperature control value range are from the point "a" to "c" and from the value "A" to "C", respectively.
2. Evaporator Temperature Variable Range (Evaporator temperature variable range is set if the ECONOMY mode is selected.)
   If inside temperature becomes higher when the air mix damper is closed and the system is in the cooling range, a command is given to lower evaporator temperature with air mix damper closed, which causes the compressor operating rate to increase. If inside temperature becomes lower, a command is given to raise evaporator temperature with air mix damper in closed position, and a lower compressor operating rate results. Through the course of above operation, the outlet air temperature is controlled to an optimum level. The evaporator temperature control range to change compressor operating rate is between the points, "c" and "d" in the control diagram. In the AUTO mode, however, this control range (between points "c" and "d") is cleared. If compressor operating rate reaches 100% and further cooling is required, air volume is increased in the range between "d" and "e" in the control diagram.
   On the contrary, if air mix damper opening reaches MAX HOT and further heating is required, air volume is increased in the range between points B and A in the diagram.
3. Selection of ECONOMY Mode
   If the ECONOMY switch is pressed, the control range mentioned in the above paragraph 2 is established and if the switch is pressed again, the compressor stops and only air is supplied through outlets.

Air Volume Control

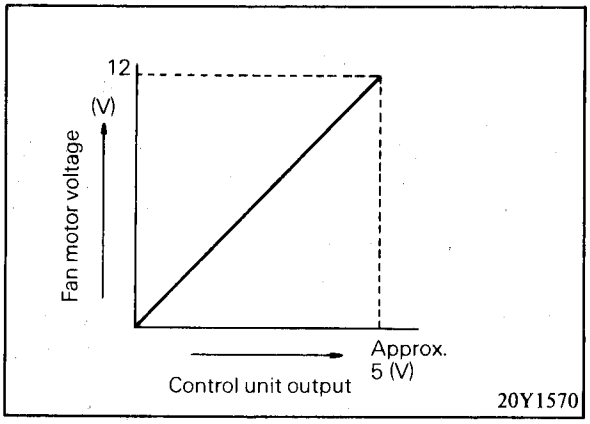
Outlet air volume is controlled automatically in either cooling range or heating range if the system is in AUTO mode. In the MANUAL mode, the system operates according to the button settings.
Fan speed is controlled according to the temperature control value obtained by comparing inside temperature and set temperature.
Outlet voltage from the computer controls power transistor to change fan motor voltage. For the maximum speed operation, the relay is energized to directly apply the maximum supply voltage to the fan motor.

Cooling range	Heating range	Manual control
10 steps	8 steps	2 steps

In the temperature control diagram, the outlet air volume control range is between points "d" and "e" for cooling and between points "a" and "b" for heating.

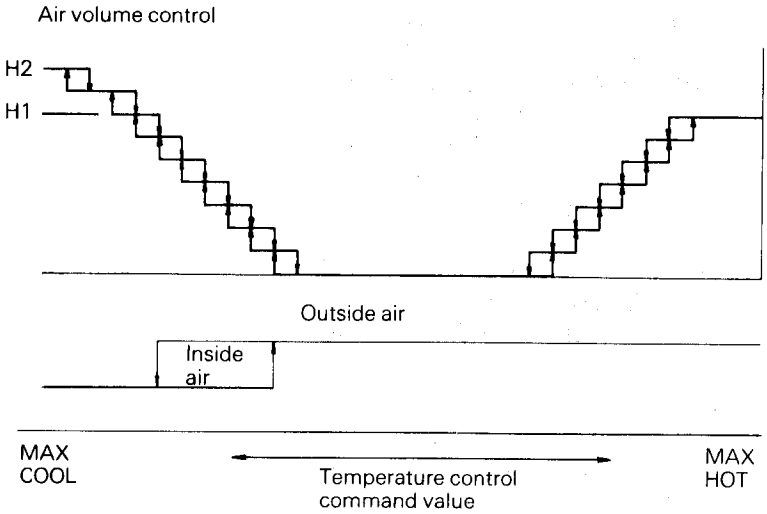


20Y1571



20Y1570

Inside/Outside Air Control



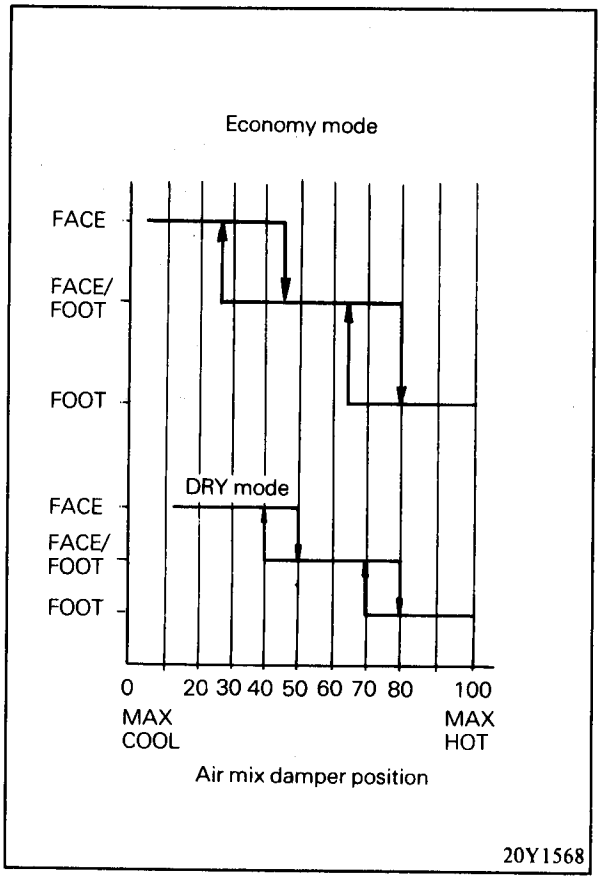
20Y1545

In the AUTO mode, the inside/outside air damper operation for selecting fan air suction port is controlled automatically according to the temperature control value obtained through comparison of inside temperature and set temperature. In the cooling range, the inside air circulation is selected if inside temperature is high and the outside air introduction is selected if inside temperature is low.
Even in AUTO mode, the selection is possible as desired by pressing the MANUAL button. However, this method of control has the following limitations:
(1) After start, outside air is introduced for two minutes.
(2) Outside air is introduced in DEF mode.
(3) Inside air recirculates when set temperature is 65°F.
(4) Outside air is introduced when set temperature is 90°F.

Air Flow Control

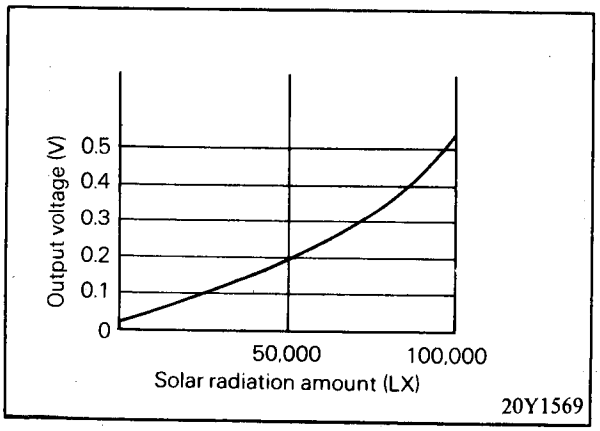
Air blown by the blower is cooled or heated with the evaporator or heater to an optimum temperature and then supplied to the car interior through various outlets. For the air flow directions, any of the three modes FACE, FACE/FOOT and FOOT is determined depending on temperature setting conditions and selected automatically through operation of air mix damper. Between DRY and ECONOMY modes, the air flow mode change points are different as illustrated.
However, the air flow selecting operation has the following limitations:
(1) Set temperature 65°F Fixed to FACE mode
Set temperature 90°F Fixed to FOOT mode
(2) Water temperature compensation in heating
When inside temperature is lower than set temperature by more than 3°C (5.4°F), the air outlet and blower speed are fixed as follows depending on engine coolant temperature to improve heating at system start time.

Coolant temperature	Air flow mode	Blower speed	Compressor
Below 50°C (122°F)	Defroster	LO	OFF
50°C (122°F) or higher	AUTO mode		



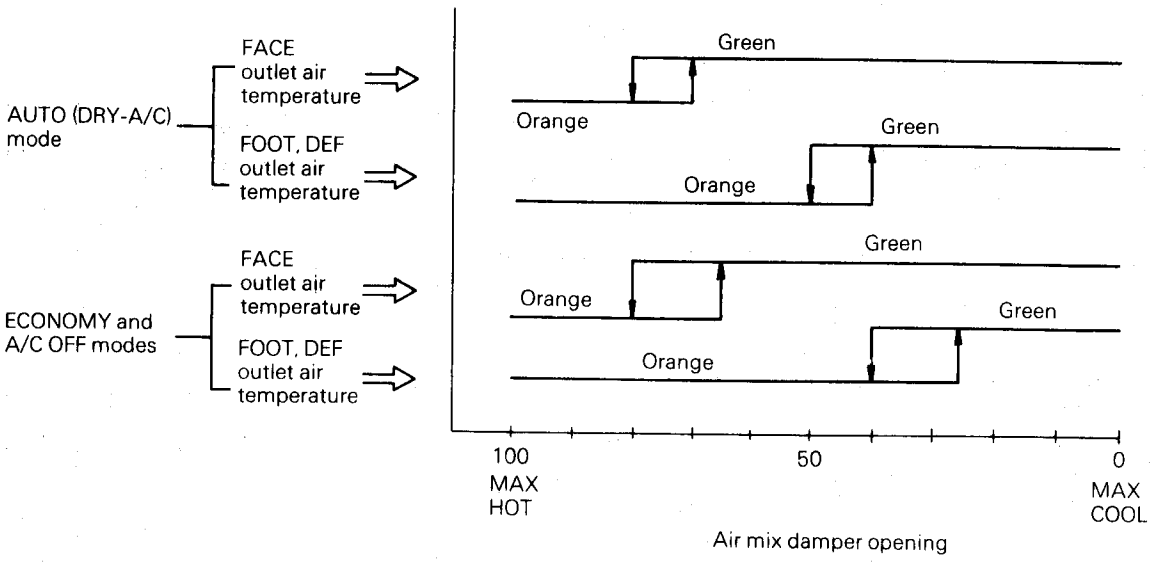
Compensation of Solar Radiation

The photo-sensor (photodiode) senses the solar radiation amount. The data from this sensor is used for correcting the temperature control value. According to the corrected value, the air mix damper position or blower speed is controlled for an optimum interior temperature.

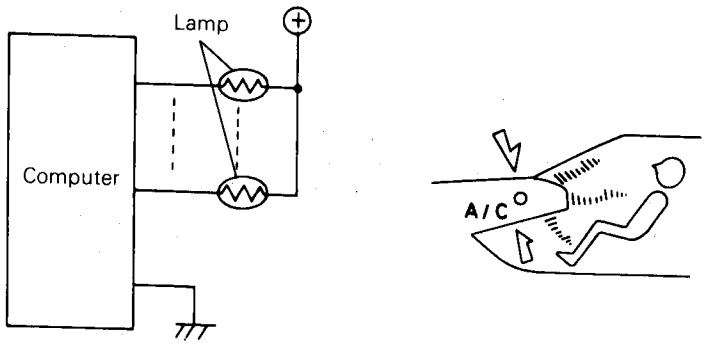


Air Conditioning Graphic Display Control (available on vehicle with electronic meter)

With output from the computer, various air flow indicator lamps are lit to display conditions of air conditioning. (LED's within the control panel also indicate operating conditions).
In addition to display of inside air recirculation or outside air introductions, air flow outlets and air conditioner (compressor) operating condition, the air outlets are displayed in green (cool air) or orange (hot air) to indicate outlet air temperature condition.
The display colors of cool air and hot air change depending on air mix damper position as follows:

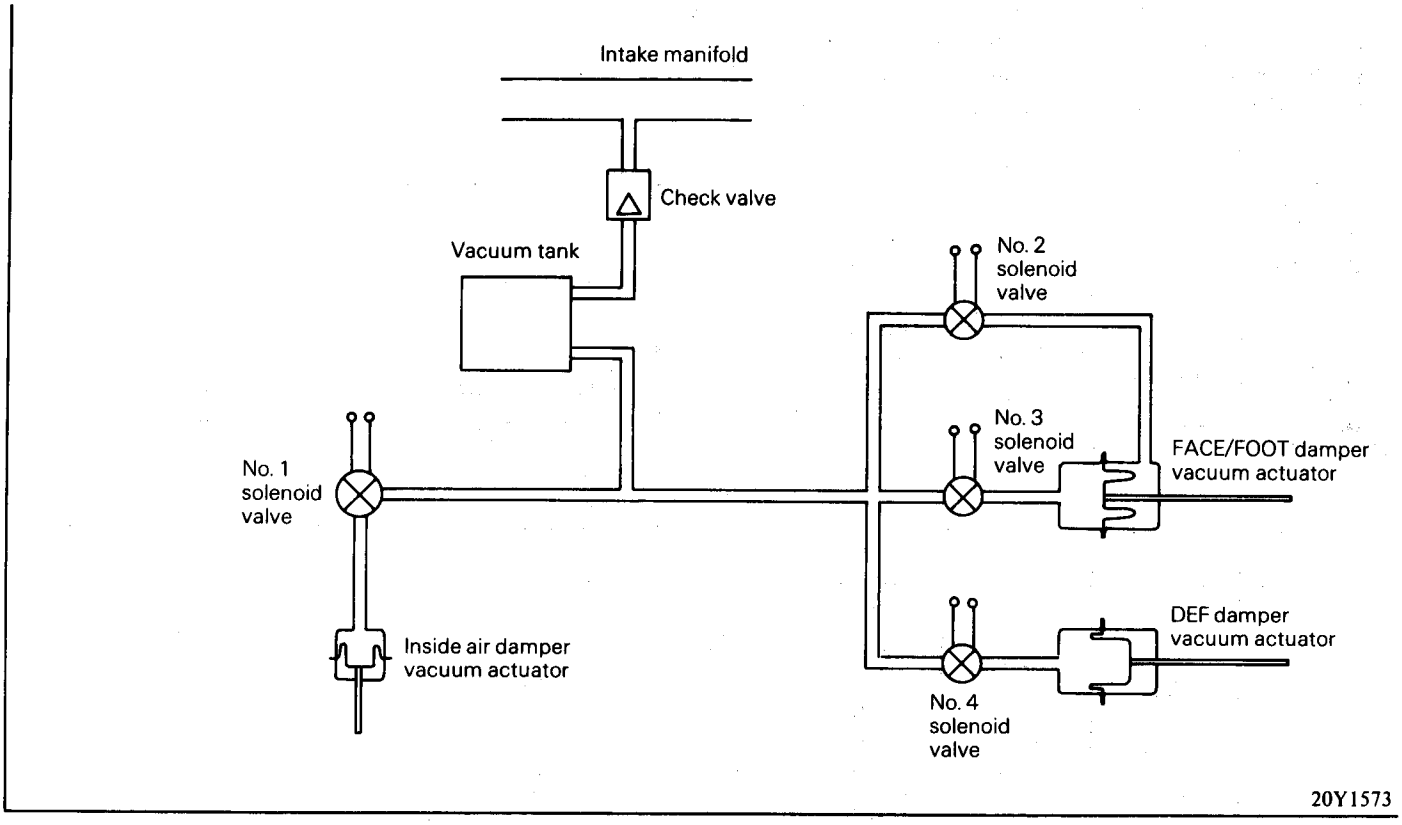


20Y1574



20Y1575

Vacuum System



The vacuum system consisting of vacuum tank, check valve, vacuum hoses, vacuum solenoid valves and vacuum actuators, energizes or de-energizes the solenoid valves in response to signals from computer and operates the vacuum actuators to open or close the dampers for switching air flow. The relationship between modes and solenoids are as shown below.

Mode \ Solenoid	No. 1	No. 2	No. 3	No. 4
Inside air recirculation	ON	–	–	–
Outside air introduction	OFF	–	–	–
FACE	–	ON	OFF	OFF
FACE/FOOT	–	OFF	OFF	OFF
FOOT	–	OFF	ON	OFF
DEF	–	OFF	ON	ON
DEF/FACE	–	OFF	OFF	ON

Fan Control System (Vehicles with an intercooler)

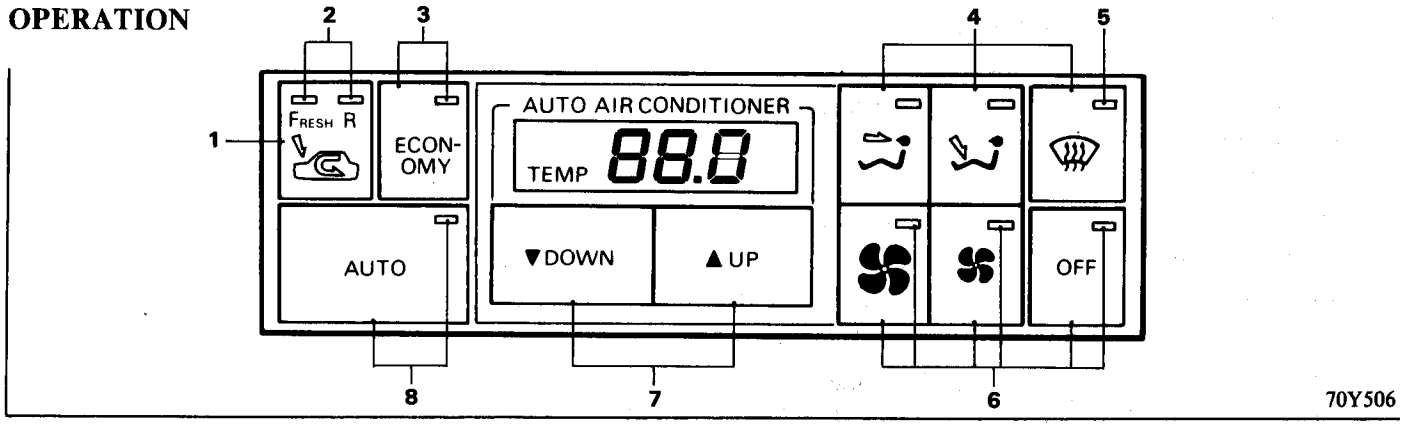
This system detects the air conditioner operating state and coolant temperature through the information from the air conditioner switch, pressure switch and thermosensor, and controls the operation of radiator fan and pusher fan.

Fan Control Modes

Status of switches and sensors / Fan operation					Radiator fan motor No. 1		Radiator fan motor No. 2		Pusher fan motor	
Air conditioner switch	Pressure switch	Water temperature switch	Thermosensor No. 1	Thermosensor No. 2	ON	OFF	ON	OFF	ON	OFF
OFF	—	—	OFF	OFF		○		○		○
			ON	OFF	○			○		○
			ON	ON	○		○		○	
ON	OFF	ON	OFF	OFF	○		○			○
		ON	ON	OFF	○		○			○
		ON	ON	ON	○		○		○	
		OFF	ON	ON	○		○		○	
	OFF	ON	OFF	OFF	○		○		○	
		ON	ON	OFF	○		○		○	
		ON	ON	ON	○		○		○	
		OFF	ON	ON	○		○		○	

Remarks:
Contact operating pressure and temperature
Pressure switch: 1,912 kPa (277 psi) → ON
Water temperature switch: 113°C (235°F) → OFF
Thermosensor No. 1: 85°C (185°F) → ON
Thermosensor No. 2: 100°C (212°F) → ON

OPERATION



Control Panel

1. Inside/outside Air Changeover Switch

   Ignition switch at ON and control in AUTO mode:

   Inside air recirculation or outside air introduction mode as selected in AUTO mode is established, with the lamp lit dim.

   Manual setting:

   By every depression of the switch, the selected mode is reversed and the status is held, with corresponding lamp lit.

2. Outside Air Introduction Mode Display LED (green) and Inside air circulation mode display LED (Orange)

   Ignition switch at ON and control in AUTO mode:

   The LED lights to indicate inside air recirculation or outside air introduction mode as selected in AUTO mode.

   Manual setting:

   The LED indicates inside air recirculation or outside air introduction mode.

3. ECON Operation Display LED (Orange) and ECON Switch

   The LED operation and ECON switch operation are synchronized.

   Ignition switch ON and control in AUTO mode:

   Switch lamp is lit dim and LED is off.

   Manual setting:

   If ECONO key is pressed, ECONO mode is set and ECONO switch and LED are lit.
   If the key is pressed again, compressor OFF mode is set and ECONO switch is lit dim, with LED being off (fan in operation).
   The ECONO and OFF modes are established alternatively at every depression of ECONO key.

4. Air Flow Mode Selection Switch

   Ignition switch at ON and control in AUTO mode:

   (1) Air flow mode is determined in AUTO mode.
   (2) All lamps are lit dim.

   Manual setting:

   (1) Air flow mode is established as selected.
   (2) Lamps for set keys only are lit.

5. Air Flow Mode Operation Display LED (Orange)

   Ignition switch at ON and control in AUTO mode:

   LED for mode selected in AUTO mode is lit. [LED for FACE, FACE/FOOT, FOOT or DEF mode is lit (when coolant temperature is compensated).]

   Manual setting:

   LED for set air flow mode (FACE, FACE/FOOT, FOOT, DEF or FACE/DEF) is lit. Simultaneous selection of DEF and FOOT is impossible. (DEF is selected if they are selected simultaneously.)

   * The LED's for two modes selected within a second are lit. In case of concurrent selection of DEF and FOOT, however, the mode selected later becomes effective.

6. For Operation Display LED (Orange) and Fan Switch

   The LED operation is synchronized with switch operation.

   Ignition at ON and control in AUTO mode:

   (1) Fan speed level is determined by deviation of interior temperature from set temperature.
   (2) Switch lamps are all lit dim.

   Manual setting:

   (1) Fan speed level is set as selected (OFF*, Lo or Hi).
   (2) Switch lamps and LED's are lit for set keys only.
      * If OFF key is pressed, ECONO operation display LED, ECONO switch lamp and AUTO switch lamp are lit dim (with compressor OFF).

7. Set Temperature Change Switch

   (1) After ignition switch is set to ON, lamp is always lit dim.
   (2) Beep sound is produced once at every set temperature change. (Setting changes at 1°F increments from 65 to 90°F.)
   (3) If pressed simultaneously, no change occurs in set temperature. No beep sound.
   (4) No effect on other switches.
   (5) If the switch is kept pressed, set temperature continues to change down to 65°F or up to 90°F. (Below 65°F or above 90°F, neither set temperature change nor beep sound is caused even if the switch is pressed).

8. AUTO Operation Display LED (Orange) and AUTO Switch

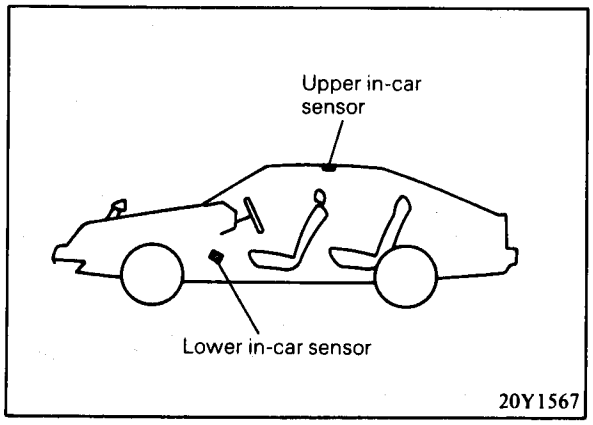
   The LED operation and AUTO switch operation are synchronized.

   (1) Ignition switch ON:
   AUTO switch lamp and LED only are lit. (Other switch lamps are lit dim.) Operation display LED's are as described in the respective displays.
   Manual setting:
   When the fan speed level and air flow mode are selected and compressor is in OFF mode, AUTO switch lamp is lit dim and AUTO LED indicator is off. In case of inside/outside mode and ECONOMY mode selection, however, AUTO switch lamp and LED will be lit.

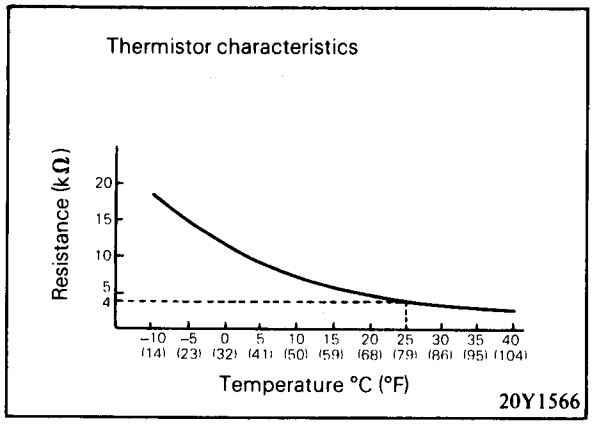
   (2) If AUTO key is pressed again, AUTO mode is set and AUTO switch lamp and LED will be lit except when temperature is same as set temperature.

In-Car Sensors (upper and lower)

Changes in interior temperatures, cause thermister resistance in those sensors to change and apply such resistance change data as input to the microcomputer.



The temperatures detected by upper and lower sensors are averaged and obtained value is used as an interior temperature data.

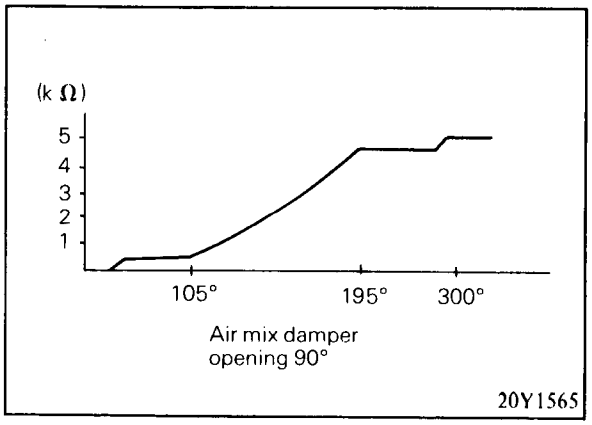


Fin Sensor

This sensor senses evaporator temperature and inputs the signal to the microcomputer for compressor ON-OFF control. Further, it detects the frost point to prevent frosting of evaporator. Its characteristics are same as those of the in-car sensor.

Air Mix Damper Potentiometer

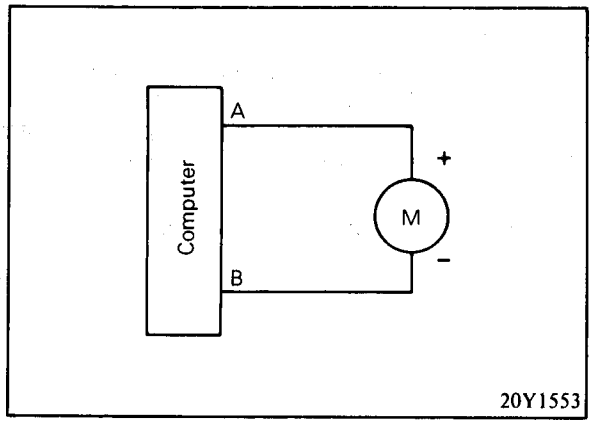
This potentiometer detects air mix damper position.



Servo Motor

The air mix damper is driven by a high accuracy stepping motor.
The damper position is detected with an interconnected potentiometer and the servo motor operates so that a damper position as commanded by the computer will be realized.

Rated voltage	12 V
Rated load torque	40 Ncm (3 in-lbs.)
Rated load speed	20 rpm



In case of COOL side operation (clockwise turn as seen from motor output shaft):

A terminal	12V
B terminal	Ground

In case of HOT side operation (counterclockwise turn as seen from motor output shaft):

A terminal	Ground
B terminal	–12V

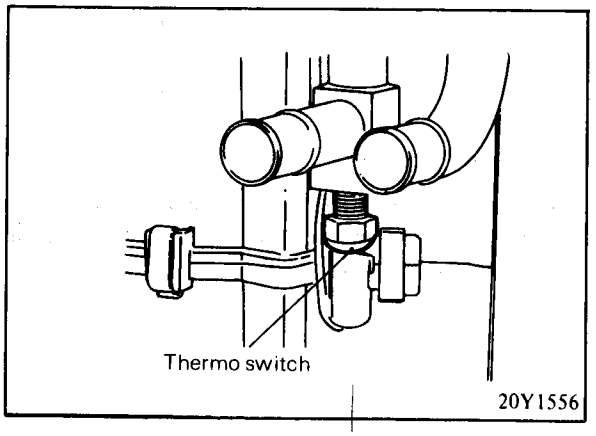
At time of stop, the level at both A and B terminals will be 0V.

Air Mix Damper Adjustment

Remove the rod from the air mix damper. Move the air mix damper operating lever fully towards COOL side (pull in the direction of rod) and turn the motor lever fully clockwise (in the direction of pulling up lever rod).
This condition represents the coolest (Max. cool) damper position at which motor lever rod is connected with air mix damper lever grip.

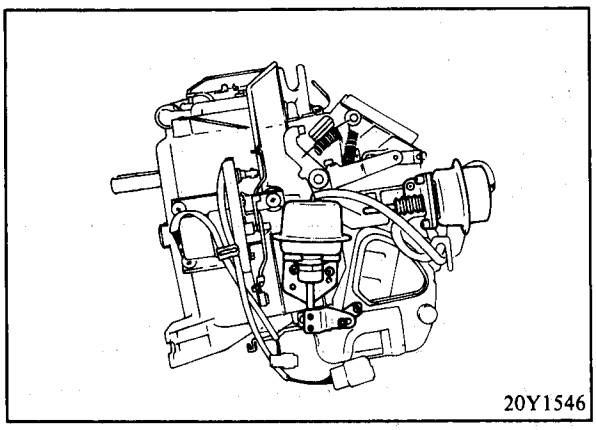
Thermo Switch

The thermo switch is turned on to send signal to the controller when engine coolant temperature is below 46°C–54°C (115°F–129°F) and the thermo switch is turned off when it is above 43°C (109°F).
This causes the mode switch and fan speed to be fixed at "L" level and a hot water compensation to be accomplished in AUTO range.



Actuator

1. Inside/Outside Air Changeover Actuator
   Via vacuum solenoid valves, this vacuum actuator operate to switch the air suction port (inside or outside) with link.
2. Actuator for Air Flow Mode Damper
   Via vacuum solenoid valves, this vacuum actuator switches air flow mode with link.



Actuator for Air Mix Damper

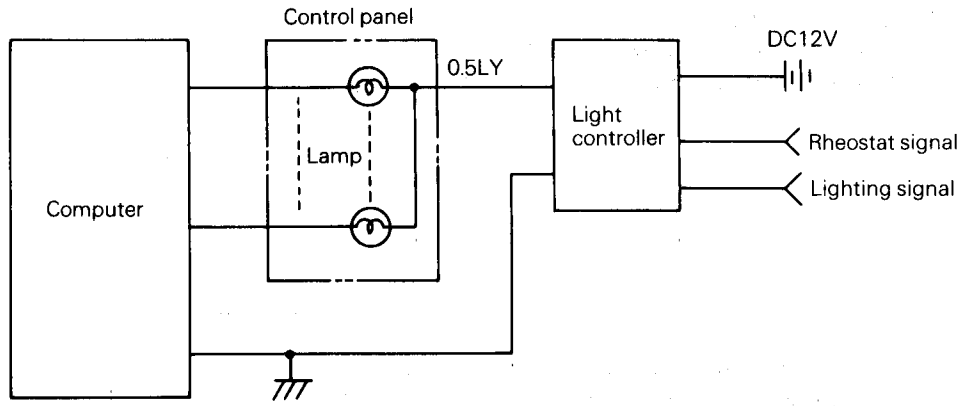
This actuator switches air mix damper position with DC motor and temperature control potentiometer.

Low Pressure Switch

This switch opens when refrigerant pressure falls below the set point to stop the compressor.

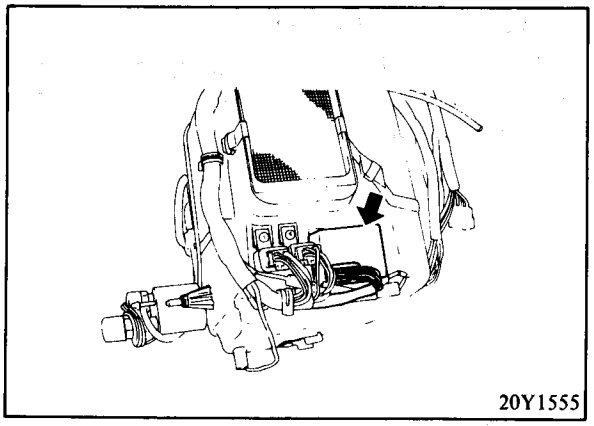
ON	206 kPa (29.9 psi)
DIFF	25 kPa (3.6 psi)

Control Panel Lighting Controller



This controller provides intensity control of various lamps on the panel according to the brightness of the instrument panel for improved panel visibility.

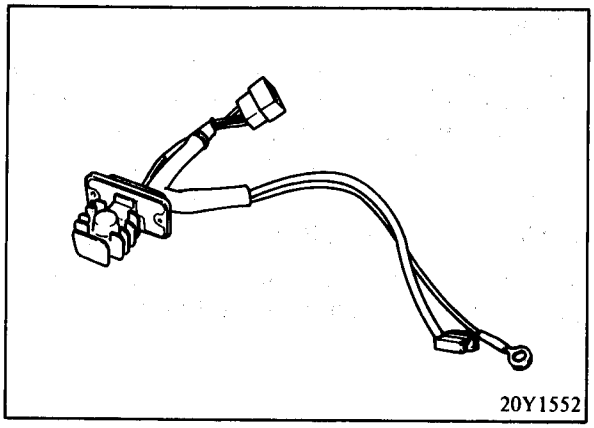
The lighting controller is installed in the cooling unit.



Fan Controller (Power Transistor)

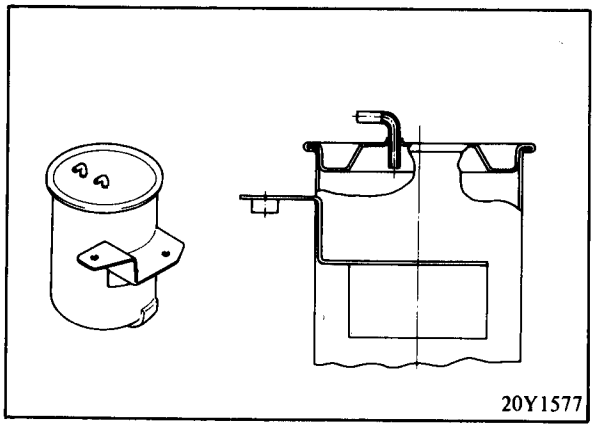
The fan controller controls fan speed and air volume by changing fan motor voltage. It is mounted on the blower unit air outlet.

Rated voltage	12V (24V) DC
Rated current	20A (10A)
Thermo fuse	109°C (228°F)



Vacuum Tank

(1) Operation
This tank serves for reducing vacuum fluctuation in engine manifold to a certain extent.
(2) This tank is installed on the left fender in engine compartment.

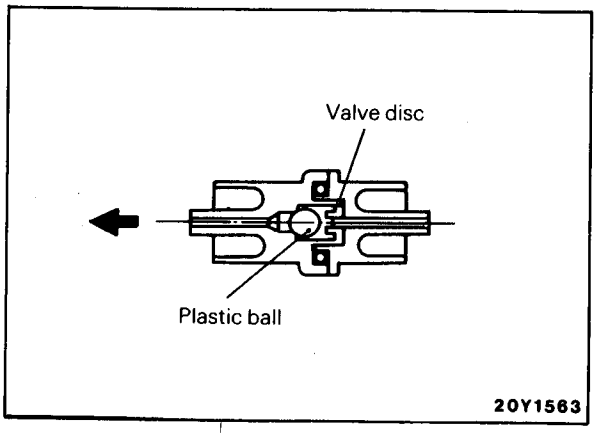


Check Valve

This valve maintains constant the vacuum in vacuum tank in the event of a loss of engine manifold vacuum to stabilize the operation of vacuum actuators.

INSTALLED POSITION

The check valves are installed at negative pressure port of vacuum tank and double vacuum valve (DVV).



Vacuum Solenoid Valve

This electric solenoid valve supplies to the vaccum actuator, vacuum (when the solenoid is ON) or atmospheric pressure (when the solenoid is OFF).

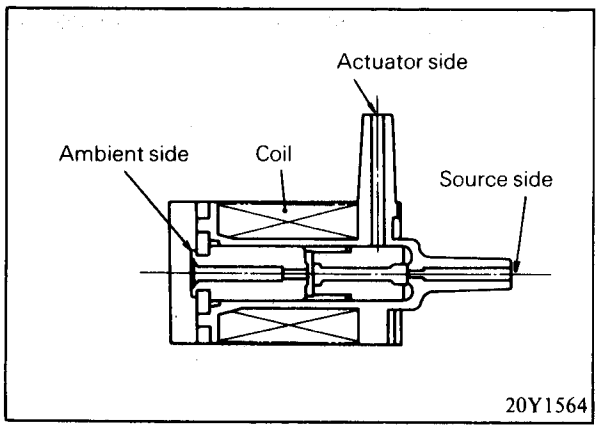
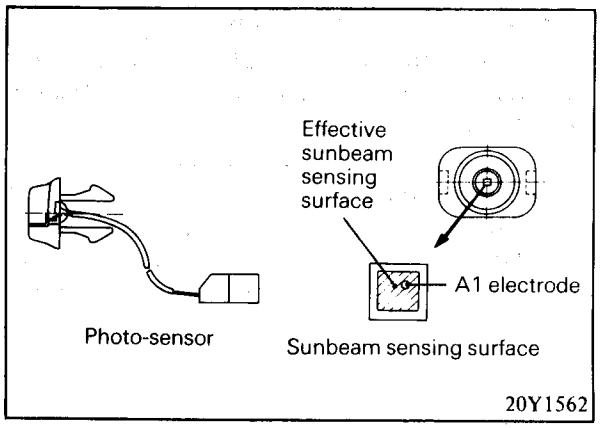


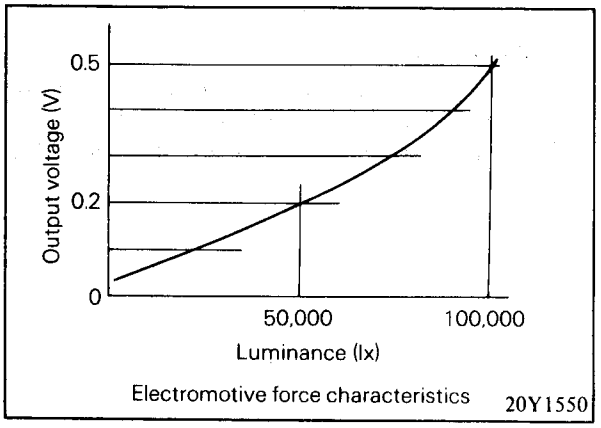
Photo-sensor

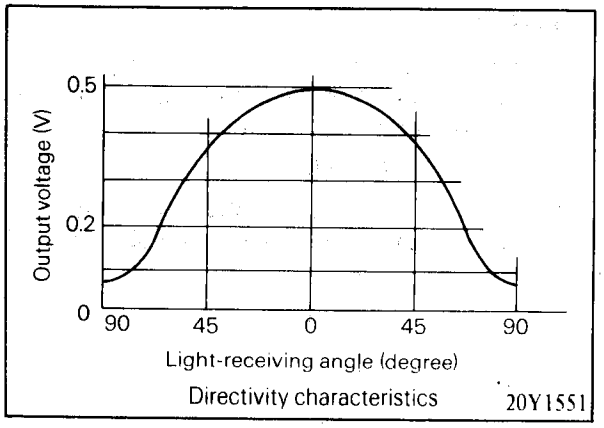
This sensor receives solar radiation on its sensing surface, generates electromotive force corresponding to the amount of sunbeam received, and sends it to the Automatic Temperature Controller for sunbeam compensation in temperature control.

INSTALLED POSITION

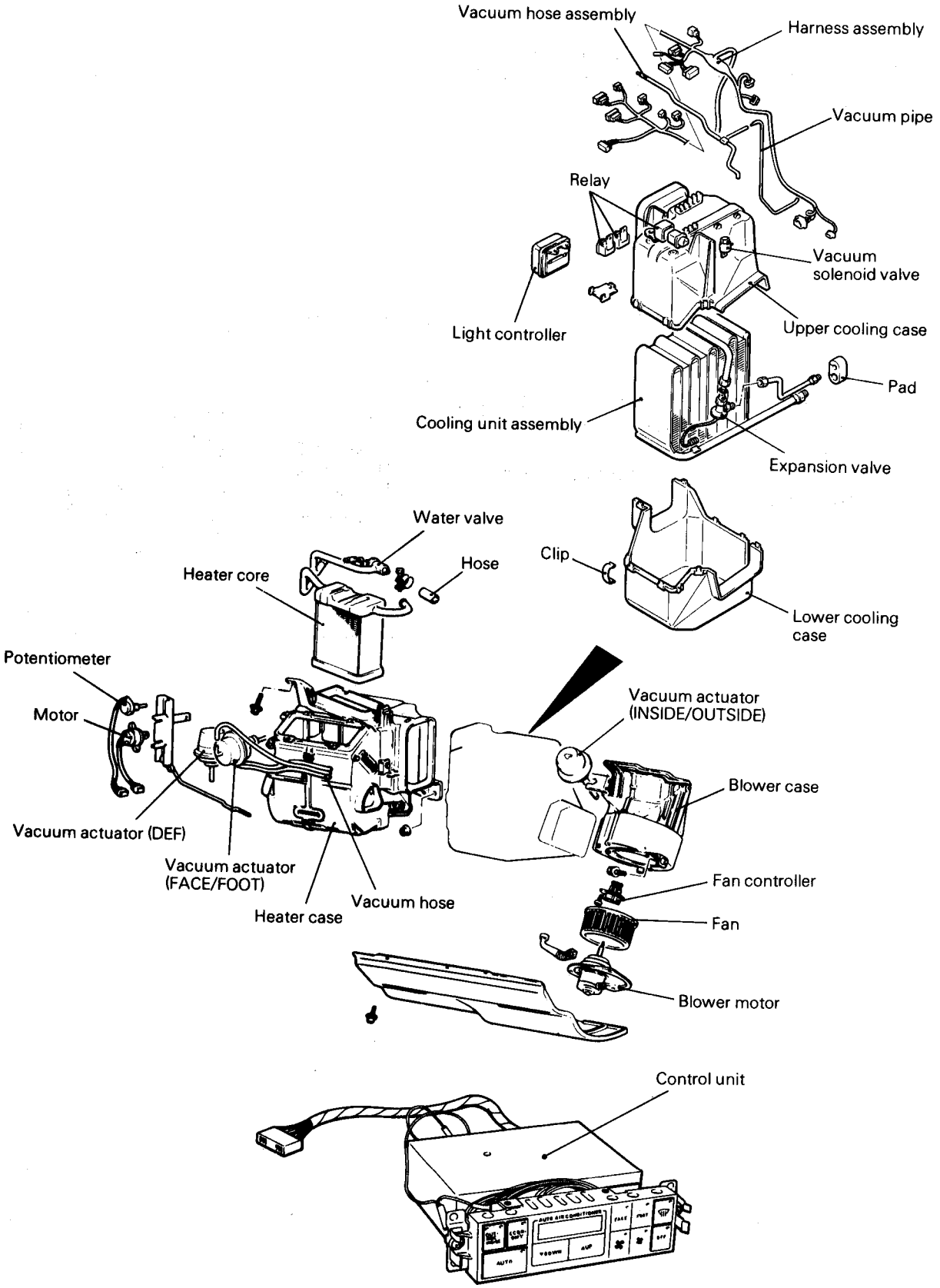
The sensor is installed on the upper right of the instrument panel at a point exposed to sunbeam.







COMPONENTS



20Y1599
20Y1598
20Y1531

CONTROL ASSEMBLY

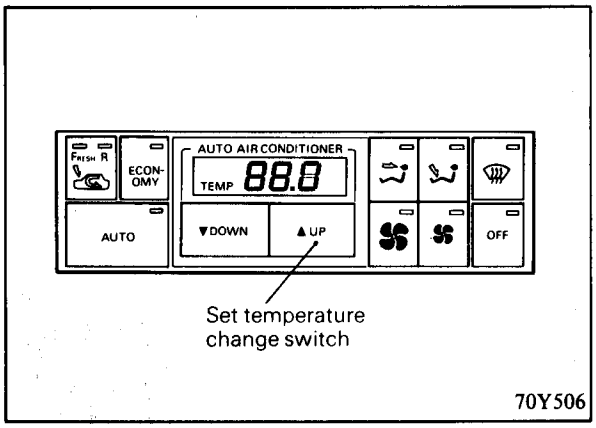
REMOVAL

1. Remove the instrument panel. (Refer to GROUP 23.)
2. Disconnect the vacuum hoses and harness connector, and remove the control assembly.

HEATER UNIT

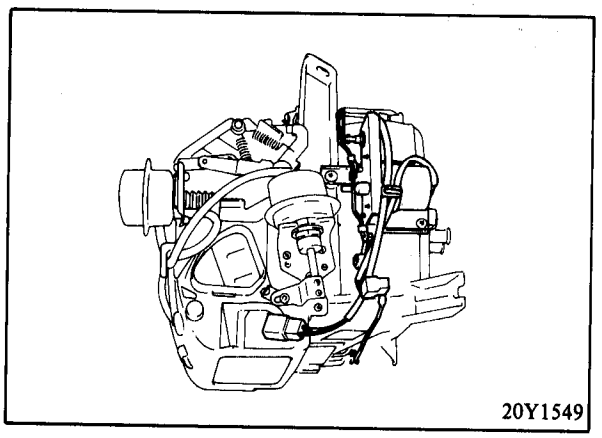
REMOVAL

1. Start the engine and operate the set temperature change switch to adjust the temperature setting to MAX HOT. Then, stop the engine.
2. For the working procedures of steps 2 and up, inspection and installation, see P.24-54.

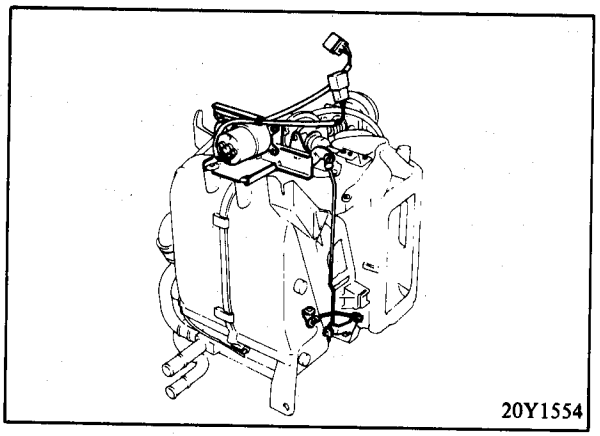


REMOVAL

1. Remove the heater unit.
2. Using a screwdriver, uncouple the air mix damper and the servo motor rod.


20Y1549

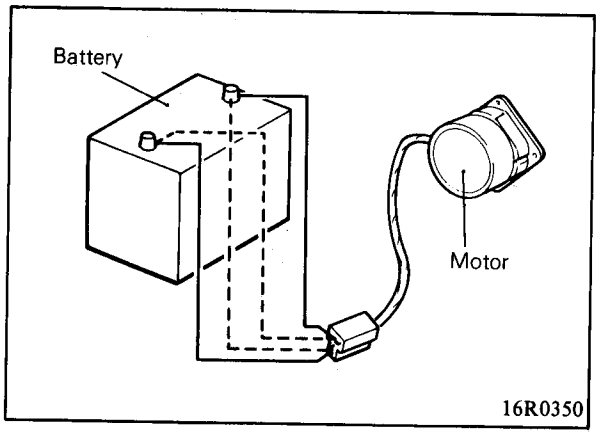
3. Remove screws securing the servo motor and remove the servo motor from the heater unit.


20Y1554

INSPECTION

Motor

Check that the motor runs when battery voltage is applied to the motor connector. Also check that the motor runs in the opposite direction when the polarity is reversed.

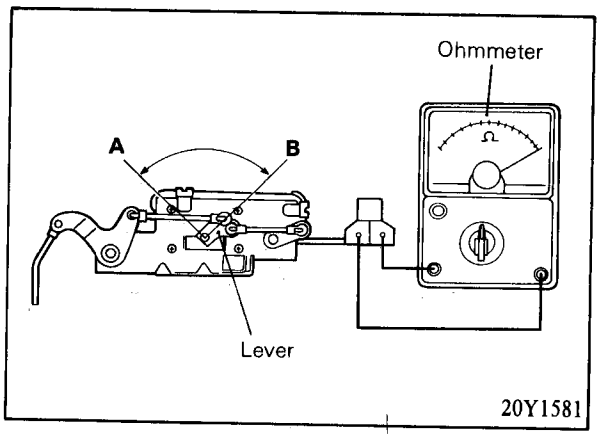


16R0350

Potentiometer

Connect an ohmmeter to the potentiometer connector terminals (BR and RG) and check resistance reading when the lever is moved to positions A and B.

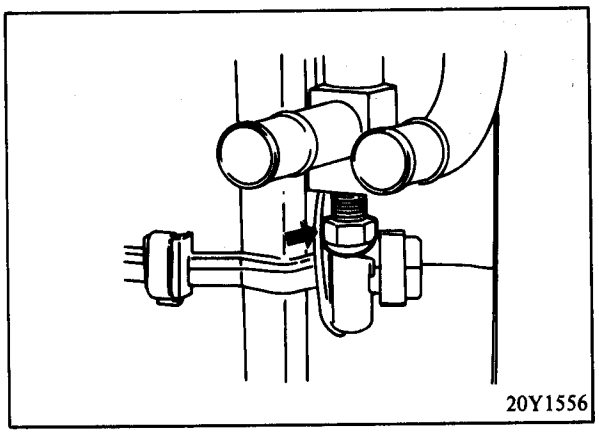
Air mix damper potentiometer resistance [Standard value]
MAX HOT A ..... 180 Ω
MAX COOL B ..... 4,640 Ω



20Y1581

REMOVAL

1. Remove the heater unit.
2. Disconnect the thermo switch connector and remove the thermo switch.

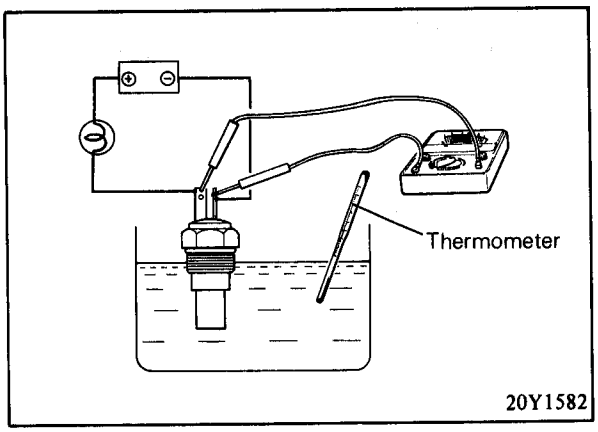


INSPECTION

Check thermo switch for continuity.

1. With the thermo switch in hot water, connect in series the battery and a 12V, 3.4W bulb to the thermo switch terminals.
2. Cause current to flow between the thermo switch terminals and measure voltage.
3. Check that the voltage changes from 12V to approximately 0V (or the bulb lights up) when the water temperature reaches the standard value.

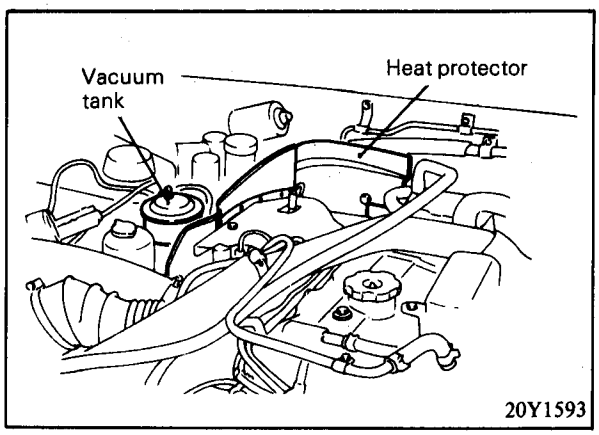
Thermo switch continuity [Standard value]
OFF → ON ..... 46°C – 54°C (115°F – 129°F)
ON → OFF ..... Over 43°C (109°F)



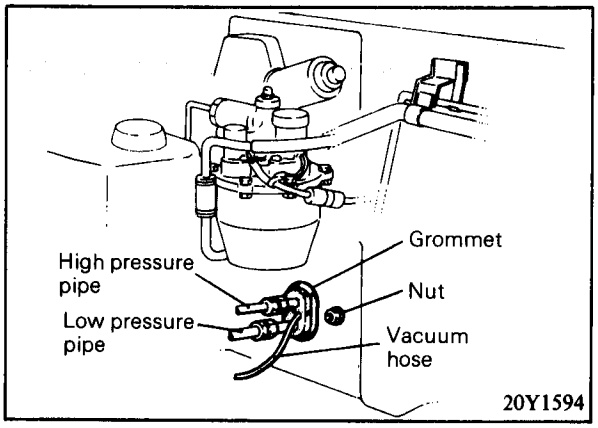
REMOVAL

In the Engine Compartment

1. Release all refrigerant through the compressor service outlet.
2. Remove the heat protector. (20Y1593)
3. Remove the vacuum tank, if equipped; and set it to one side.

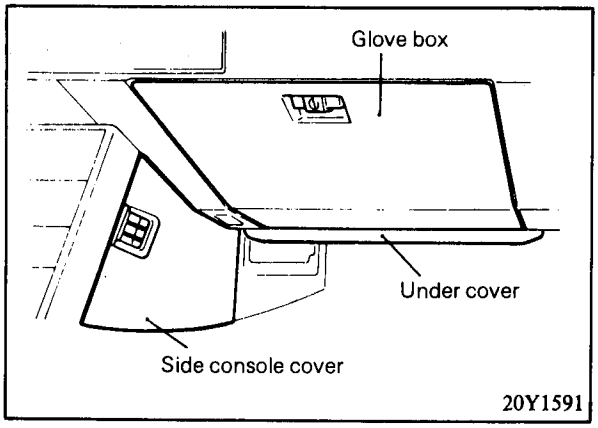


4. Disconnect the vacuum hose and high and low pressure pipes to the evaporator at the bulkhead. (20Y1594)
5. Remove the nut securing the evaporator to the dash panel. (20Y1594)
6. Remove the grommet.

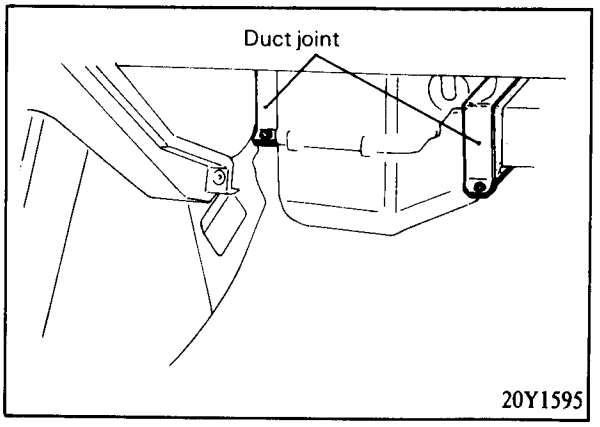


Inside the Passenger Compartment

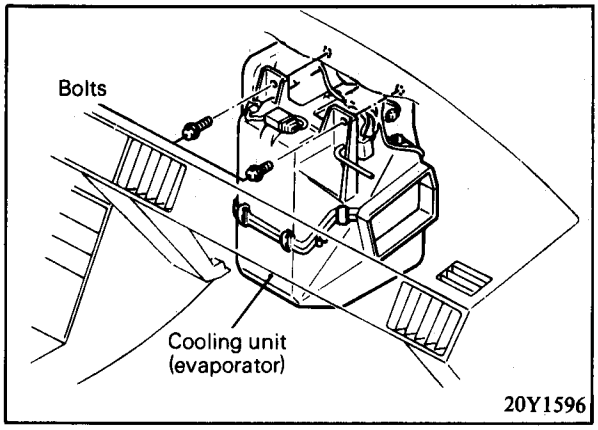
1. Remove the glove box. (20Y1591)
2. Remove the under cover.
3. Remove the lap heater duct.
4. Remove the side console cover on the passenger side.
5. Remove the glove box lower frame.



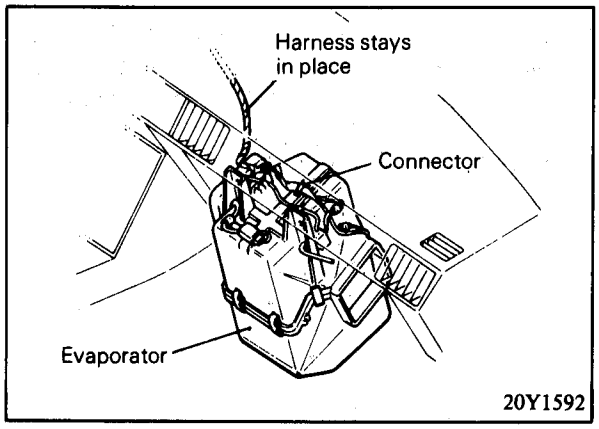
6. Remove the defroster duct.
7. Loosen and remove the duct joints from the evaporator housing. (20Y1595)



8. Remove the two upper bolts attaching the upper part of the evaporator unit to the bulkhead. (20Y1596)
9. Pull the evaporator out from the dash and tilt it about 45 degrees.

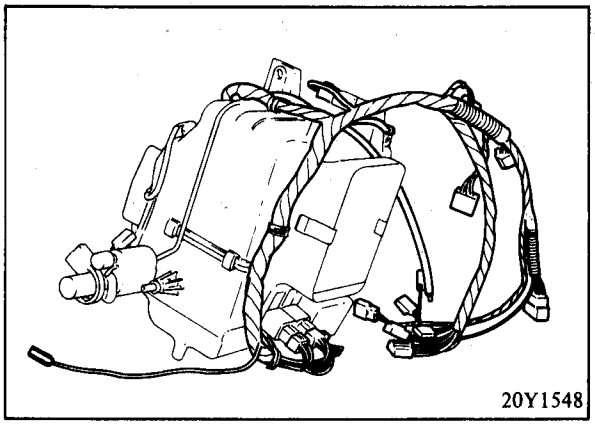


10. Disconnect the wiring harness connector from the evaporator. (20Y1592)
11. Disconnect the vacuum hose from the servo.
12. Remove the evaporator.

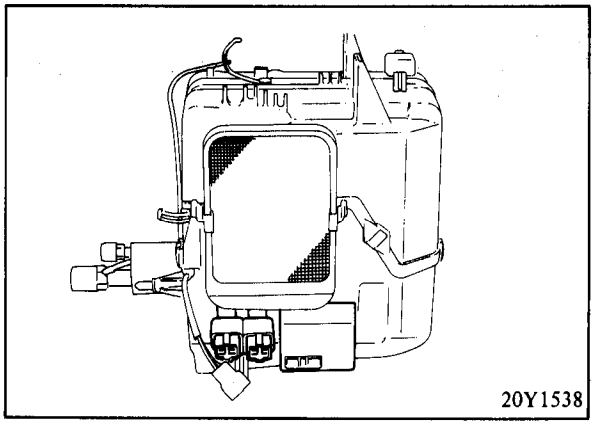


DISASSEMBLY

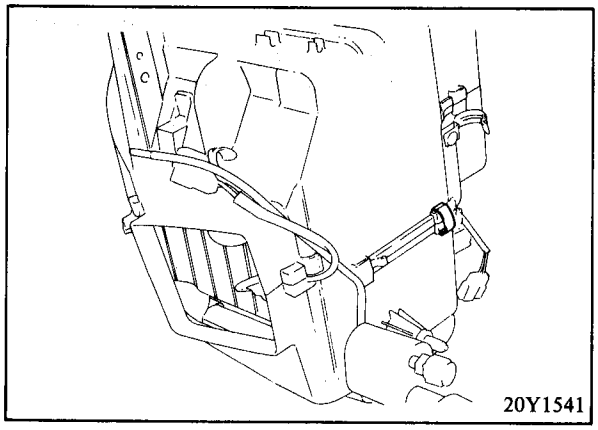
1. Disconnect the relay, light controller, harness connectors.
2. Remove the vacuum hose.



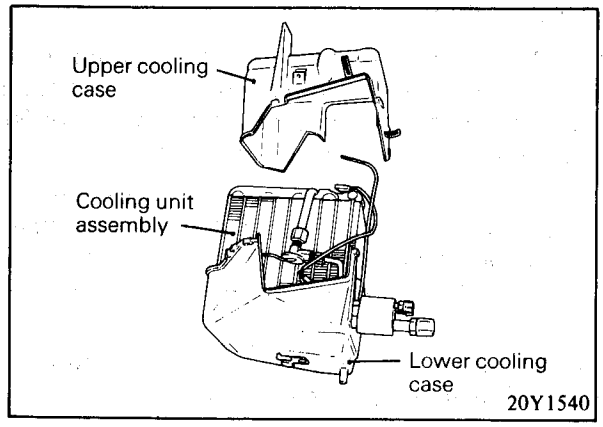
3. Remove the relay, light controller.



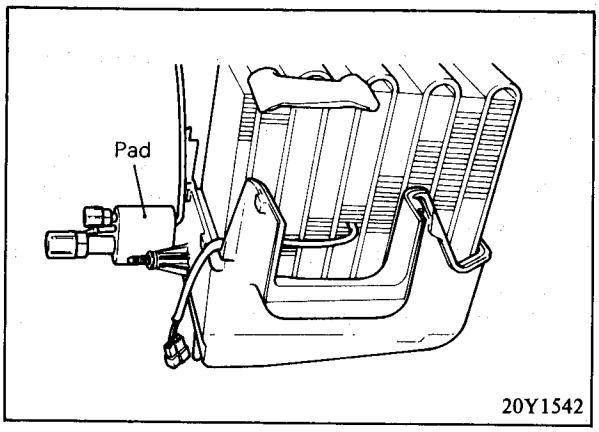
4. Using a slot screwdriver, remove the clips securing the upper cooling case and the lower cooling case.



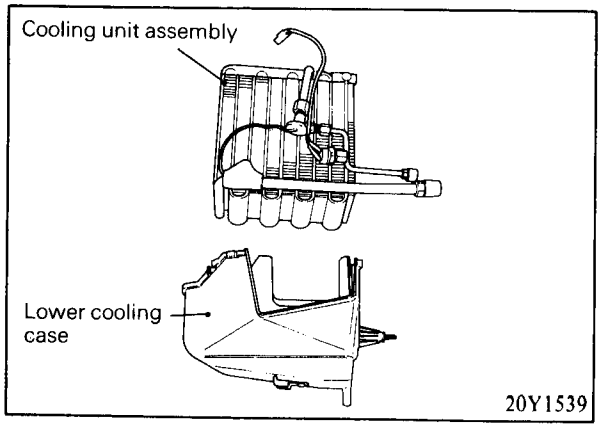
5. Separate the upper cooling case from the lower cooling case.



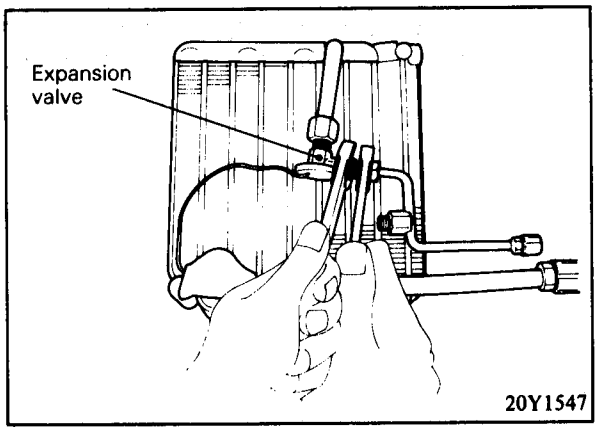
6. Remove the pad from the piping.



7. Separate the cooling unit assembly from the lower cooling case.



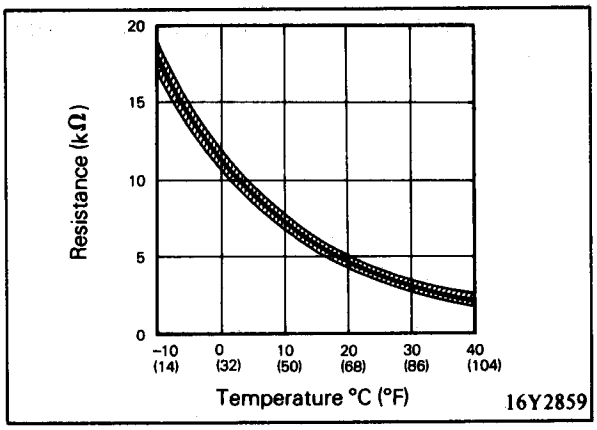
8. Remove the expansion valve temperature sensing tube from the suction piping.
9. Remove the expansion valve proper.



INSPECTION

Check resistance between the fin sensor terminals.
When the sensor terminal resistance is measured at two or more different temperature locations, the resistance must be as indicated in the characteristic curve.

Resistance of fin sensor by temperature characteristics
[Standard value] ..... to be as indicated



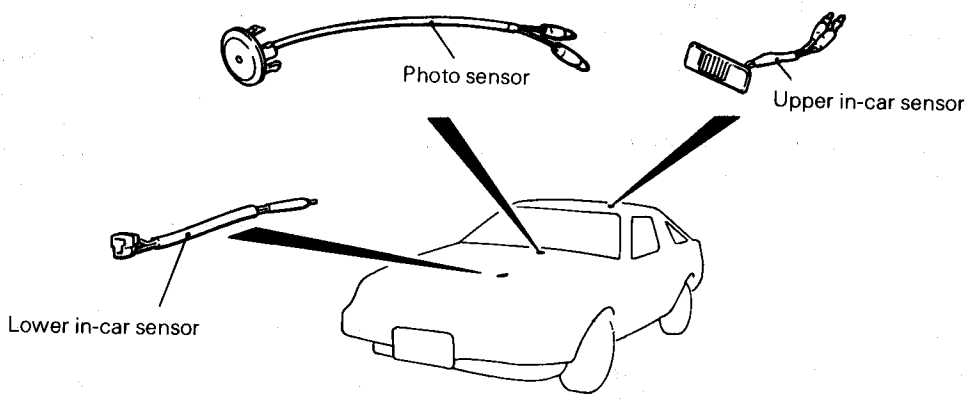
NOTE
Temperature conditions during check must be within the range shown in the characteristic curve.

INSTALLATION

Install components in reverse order of removal.

NOTE
Take care to do the following:
1. Connect the harness connector securely.
2. Before installing the evaporator, connect the ducts loosely.
3. Install the grommet to the bulkhead before connecting the pipes.
4. Be sure to recharge the system as described below.

COMPONENTS

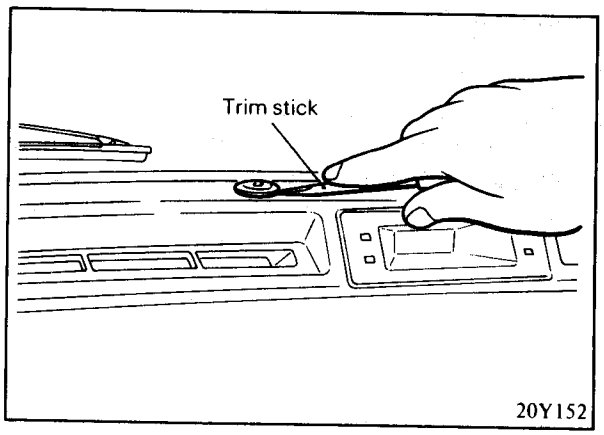


20Y1528

REMOVAL

Photo Sensor

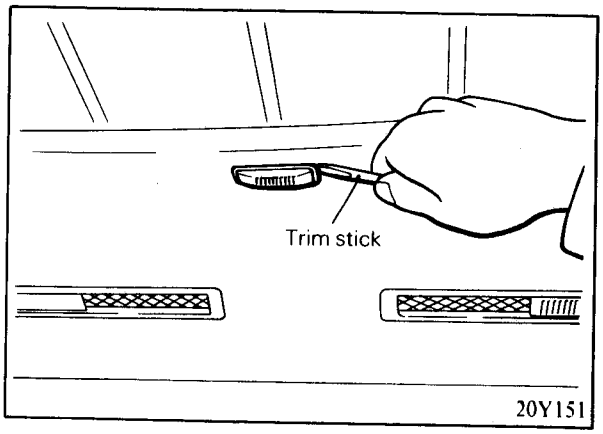
1. Remove the photo sensor from the instrument panel.



20Y152

Upper In-Car Sensor

Remove the room temperature sensor from the roll bar trim.



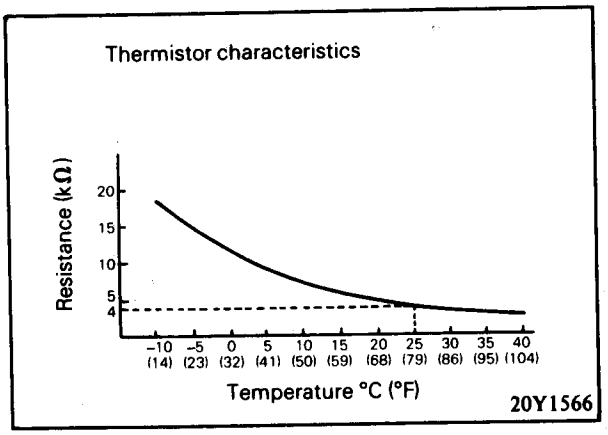
20Y151

INSPECTION

Check resistance between the in-car sensor terminals.
When the in-car sensor terminal resistance is measured at two or more different temperature locations, the resistance must be as indicated in the characteristic curve.

Resistance of in-car sensor by temperature characteristics [Standard value] ..... to be as indicated

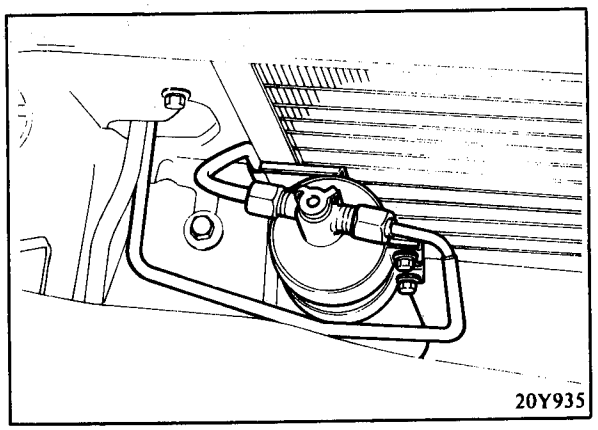
NOTE
Temperature conditions during check must be within the range shown in the characteristic curve.



RECEIVER

REMOVAL

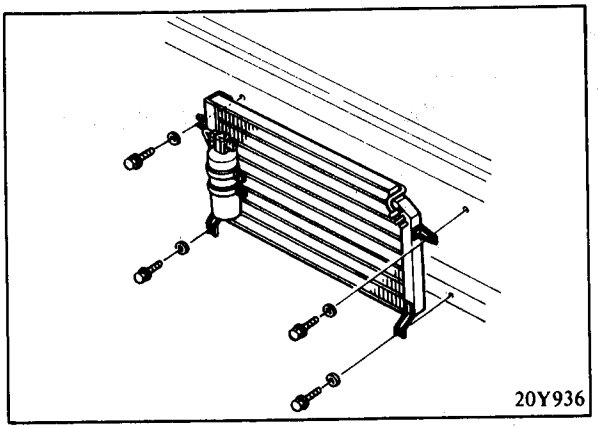
1. Remove the center instrument stay.
2. Disconnect the receiver outlet and inlet pipes.
3. Remove the receiver attaching bolts. (20Y935)
4. Remove the receiver upward.



CONDENSER

REMOVAL

1. Remove the center instrument stay.
2. Disconnect the receiver outlet and inlet pipes.
3. Remove the condenser top and bottom attaching bolts.
4. Take out the condenser from the vehicle side.



PUSHER FAN

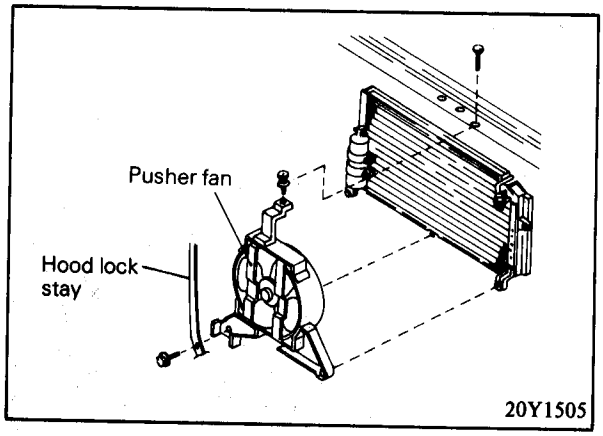
REMOVAL

Vehicles without an Intercooler

1. Remove the pusher fan harness at the connector.
2. Remove three bolts securing the pusher fan.

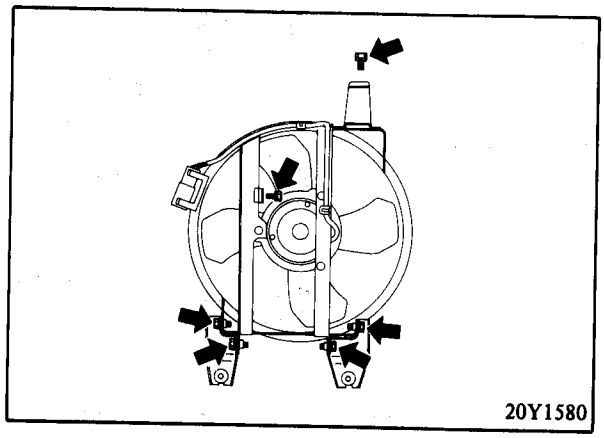
NOTE
The top and bottom left ones secure the fan and the hood lock stay and the bottom right one secures the fan and the condenser bracket.

3. Lift out the pusher fan from between the header panel and the headlight support panel.



Vehicles with an Intercooler

1. Remove the pusher fan harness at the connector.
2. Remove six bolts securing the pusher fan.
3. Lift out the pusher fan from between the header panel and the headlight support panel.

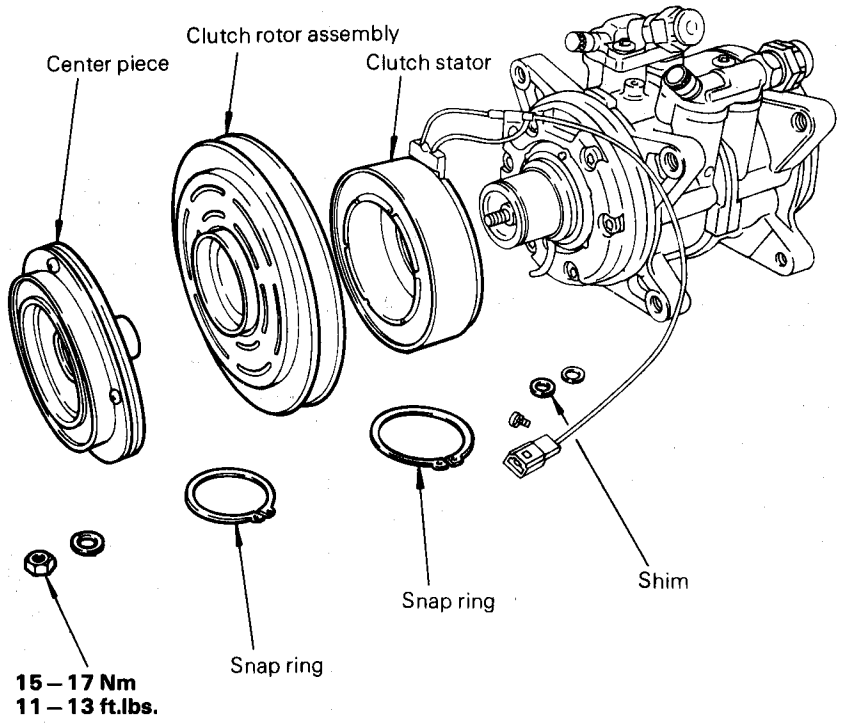


COMPRESSOR

REMOVAL

1. Loosen the idler pulley and remove the V-belt.
2. Disconnect the primary cord of the ignition coil.
3. Disconnect the magnet clutch harness.
4. Disconnect and plug the HP and LP hoses slowly to release the refrigerant.
5. Remove the front and rear set bolts.
6. Remove the compressor.

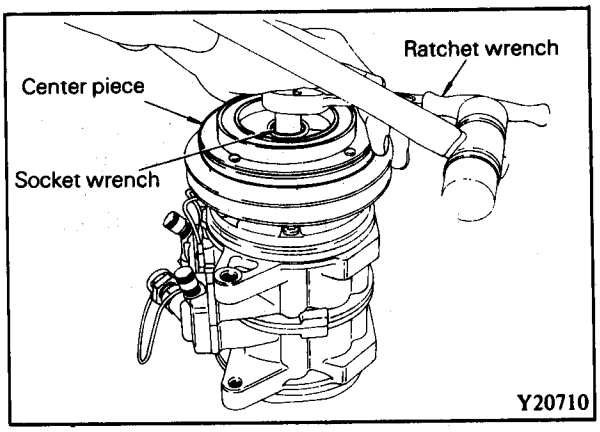
COMPONENTS



Y20709

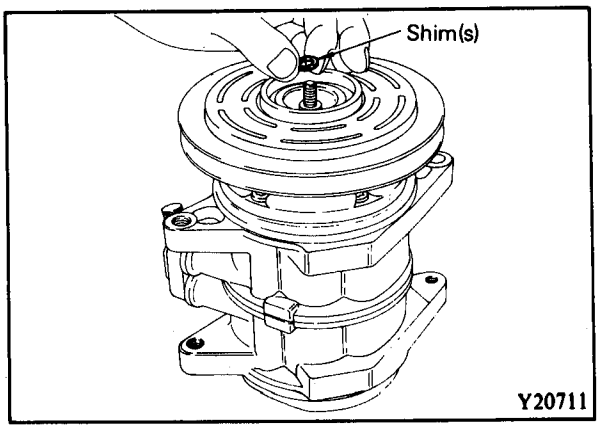
DISASSEMBLY

1. Hold the center piece and loosen the nut. (Y20710)
2. Remove the center piece.



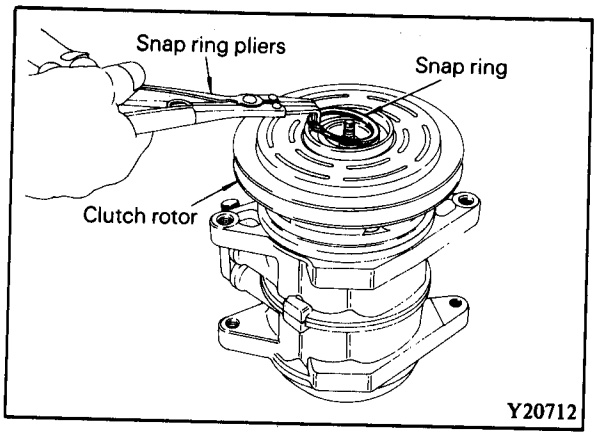
Y20710

3. Remove the clearance adjusting shim(s) located on the end of the compressor shaft.



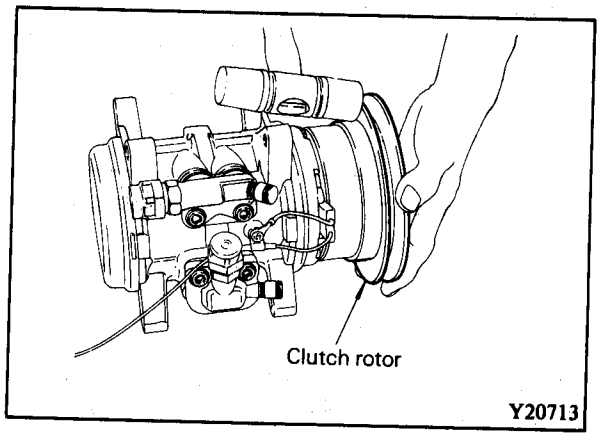
Y20711

4. Remove the snap ring which secures the clutch rotor.



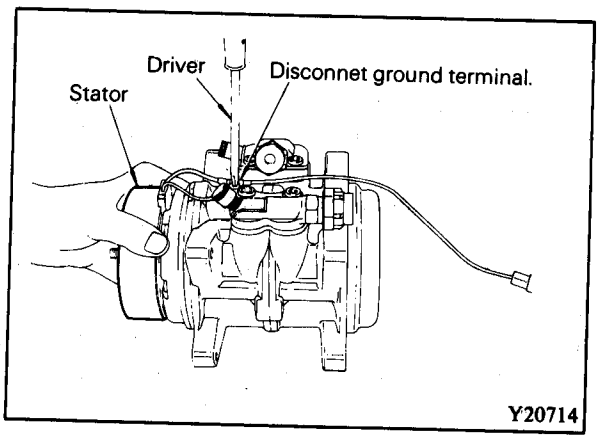
5. Pull the clutch rotor off of the compressor.

NOTE
It may be necessary to lightly tap the rotor with a plastic hammer.

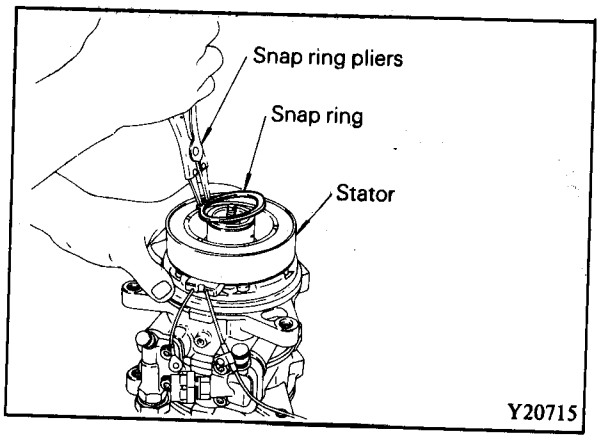


6. Disconnect the ground terminal for the stator coil.

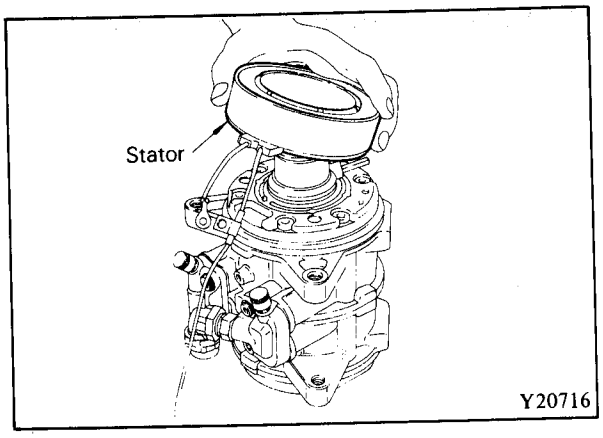
NOTE
Use an impact driver to remove the attaching screw.



7. Remove the snap ring which secures the stator.



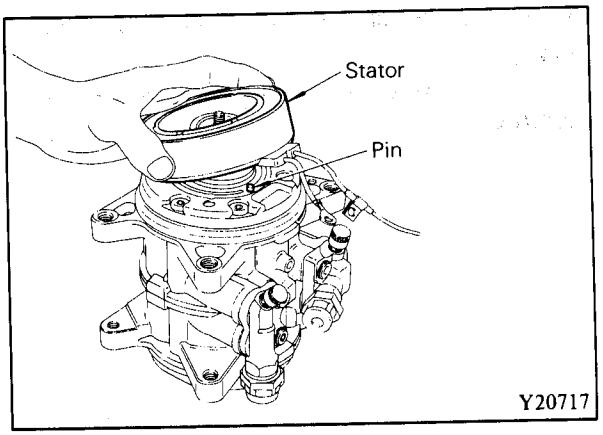
8. Pull the stator off of the compressor housing.



INSPECTION

1. Check the surface of the center piece for scoring or bluing.
2. Check the surface of the rotor for scoring or bluing.
3. Measure the resistance of the stator coil. Resistance should be equal to the standard value.

Coil resistance [at ambient temperature 20°C (68°F)]	2.9 ± 0.2 Ω



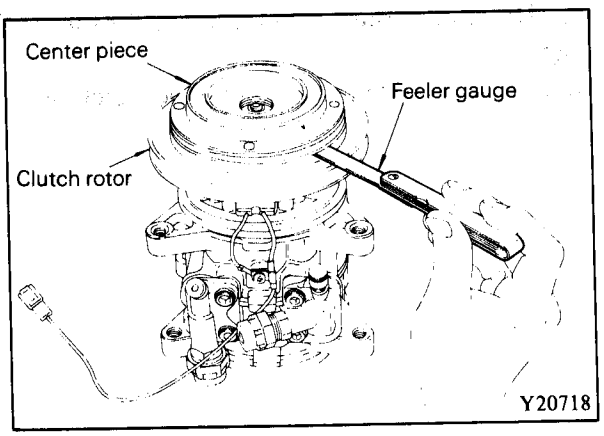
INSTALLATION

The stator must be aligned with the pin in the compression housing and center piece to stator clearance must be checked after in- stallation.

MAGNETIC CLUTCH CLEARANCE INSPECTION

1. Tighten the clutch nut.
2. Check the clutch clearance as illustrated. (Y20718)

Pressure plate to rotor clearance	0.4—0.7 mm (.02—.03 in.)



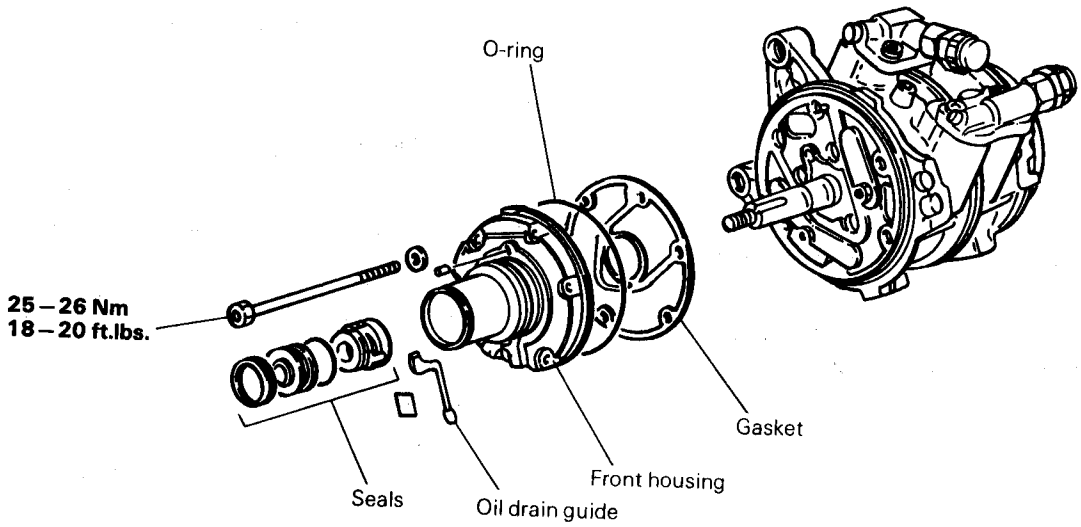
NOTE
Remove clearance adjusting shims to decrease clutch clearance. Add shims selected from the following table to increase clutch clearance.

Clearance Adjustment Shims

Part No.	Thickness
CSA935F100	0.1 mm (.004 in.)
CSA935F100A	0.2 mm (.008 in.)
CSA935F100B	0.5 mm (.020 in.)

3. Turn the rotor by hand to confirm that it rotates freely.

COMPONENTS

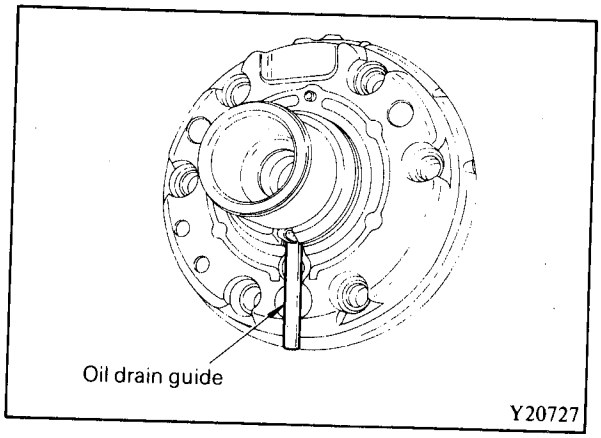


20Y947

REMOVAL

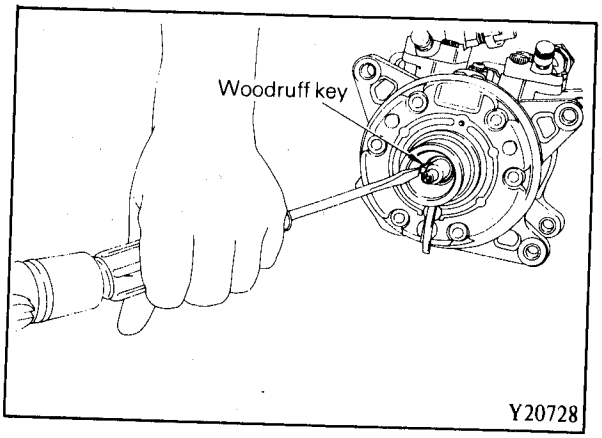
NOTE
Magnetic clutch must be removed. (Refer to P. 24-88.)

1. Pull the oil drain guide out of the front housing.



Y20727

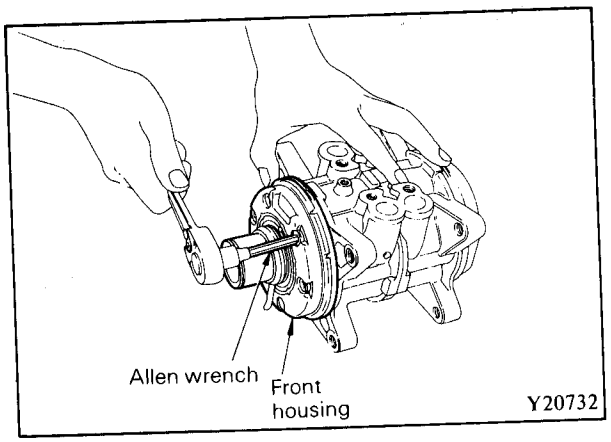
2. Remove the woodruff key.



Y20728

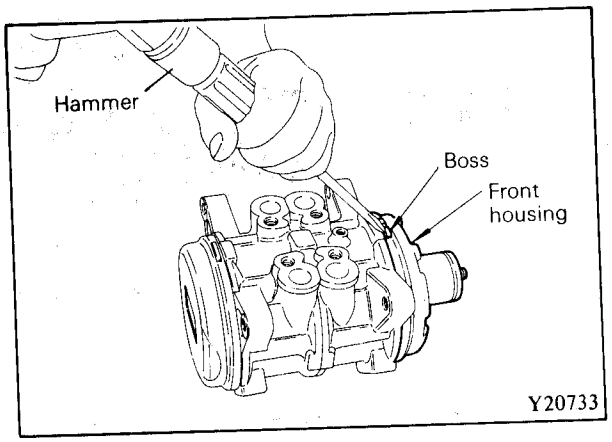
3. Remove the six compressor through bolts as illustrated.

NOTE
Set compressor on end to prevent oil loss during front housing removal.

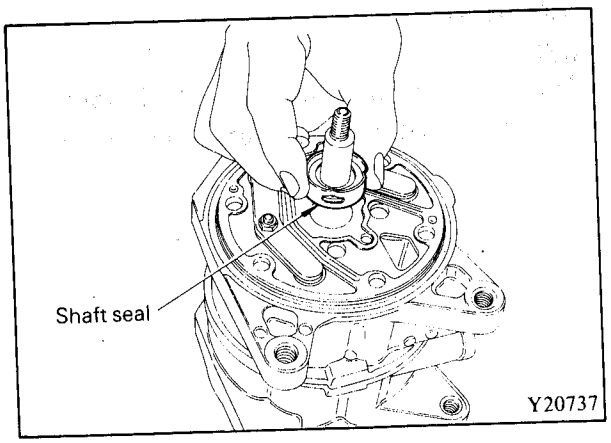


4. Remove the front housing from the compressor.

NOTE
It may be necessary to lightly tap the housing at the boss as illustrated. Do not damage the front housing.



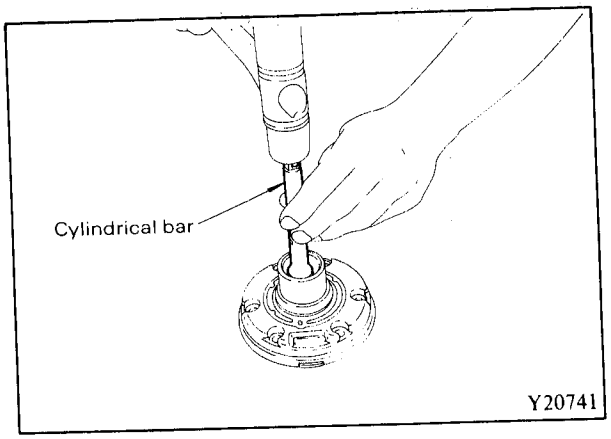
5. Remove the shaft seal.



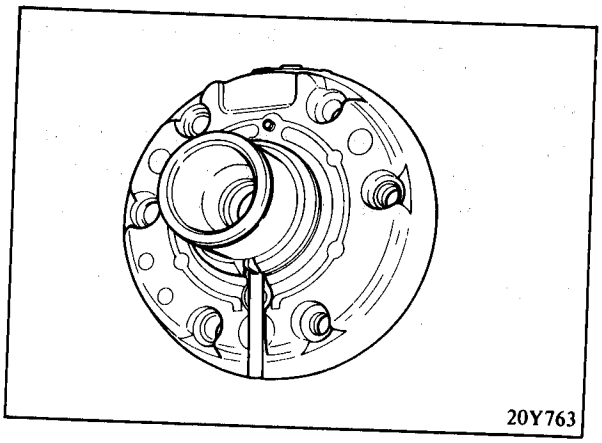
6. Remove the seal plate in the front housing with a 13 mm deep well socket.

NOTE
Do not damage the inside surface of the front housing when removing and installing the seal plate.

7. Carefully drain the oil from the compressor into a container.



8. Check the sealing surfaces for cracks, scratches and deformation.


20Y763

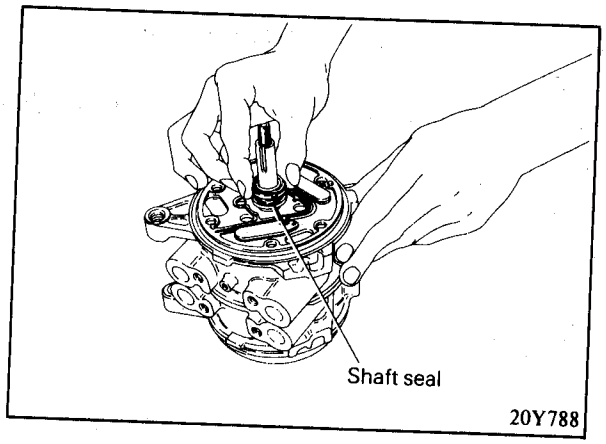
INSPECTION

1. Check the front housing for cracks or scoring on the sealing surfaces.
2. Check the compressor shaft for scoring.

INSTALLATION

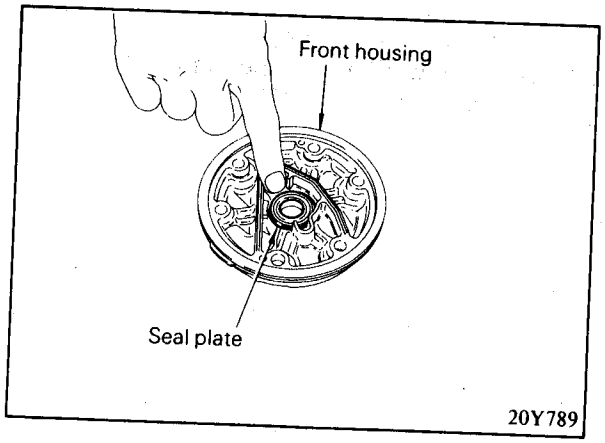
1. Lubricate the shaft seal with compressor oil. Install the shaft seal on the shaft.

NOTE
Rotate the shaft seal lightly by hand to check that it is fitted into the notch on the compressor shaft.



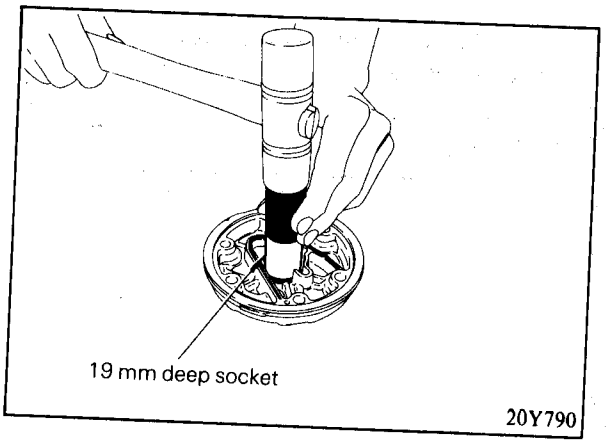
20Y788

2. Lubricate the seal plate and a new O-ring with compressor oil. Push the seal plate and O-ring into the front housing.



20Y789

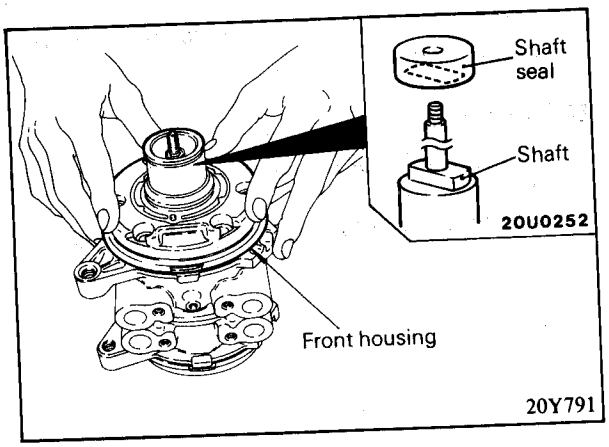
3. Install the seal plate into the front housing with a 19 mm deep well socket. (20Y790)
4. Lubricate the new front housing O-ring with compressor oil and install it into the compressor housing.



20Y790

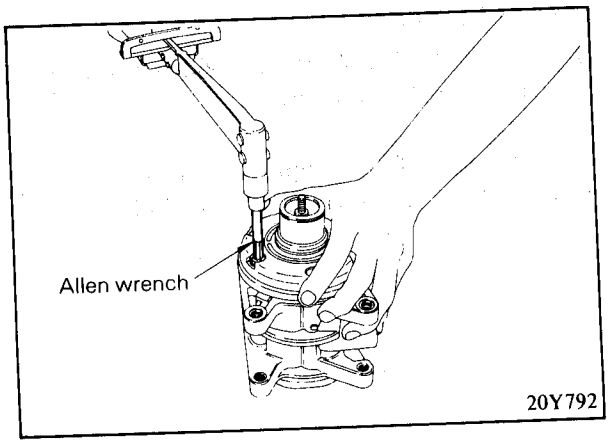
5. Install the front housing over the locating pins in the compressor.

NOTE
When the front housing is installed to the compressor, be sure to align the notch of the shaft seal in the front housing with that of the compressor shaft.

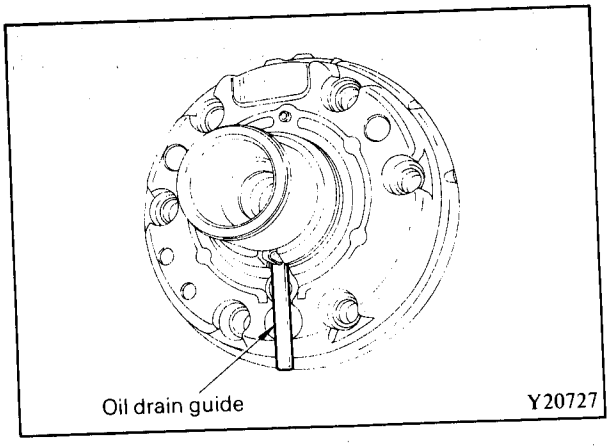


6. Install the six compressor through bolts.

NOTE
New washers should be used on the six through bolts.



7. Install the woodruff key.
8. Insert a new oil drain guide in front of the seal plate on the front housing. (Y20727)



9. Pour the specified quantity of new compressor oil into the service valves.

Compressor oil	170 cc (10.4 cu.in.)