SECTION ATC
AUTOMATIC AIR CONDITIONER

CONTENTS

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

BJS000AI

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

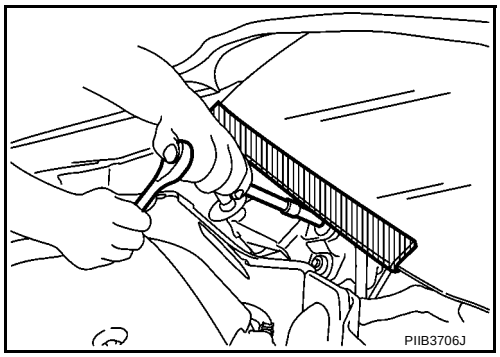
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Procedures without Cowl Top Cover

BJS000AJ

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Precautions for Working with HFC-134a (R-134a)

BJS000AK

WARNING:

- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**

- **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
- **When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
- **Do not allow lubricant (Nissan A/C System Oil Type R) to come in contact with styrofoam parts. Damage may result.**

General Refrigerant Precautions

BJS000AL

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**

- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C.**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Lubricant Precautions

BJS000AM

- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- Do not allow lubricant (Nissan A/C System Oil Type R) to come in contact with styrofoam parts. Damage may result.

Precautions for Refrigerant Connection

BJS000AN

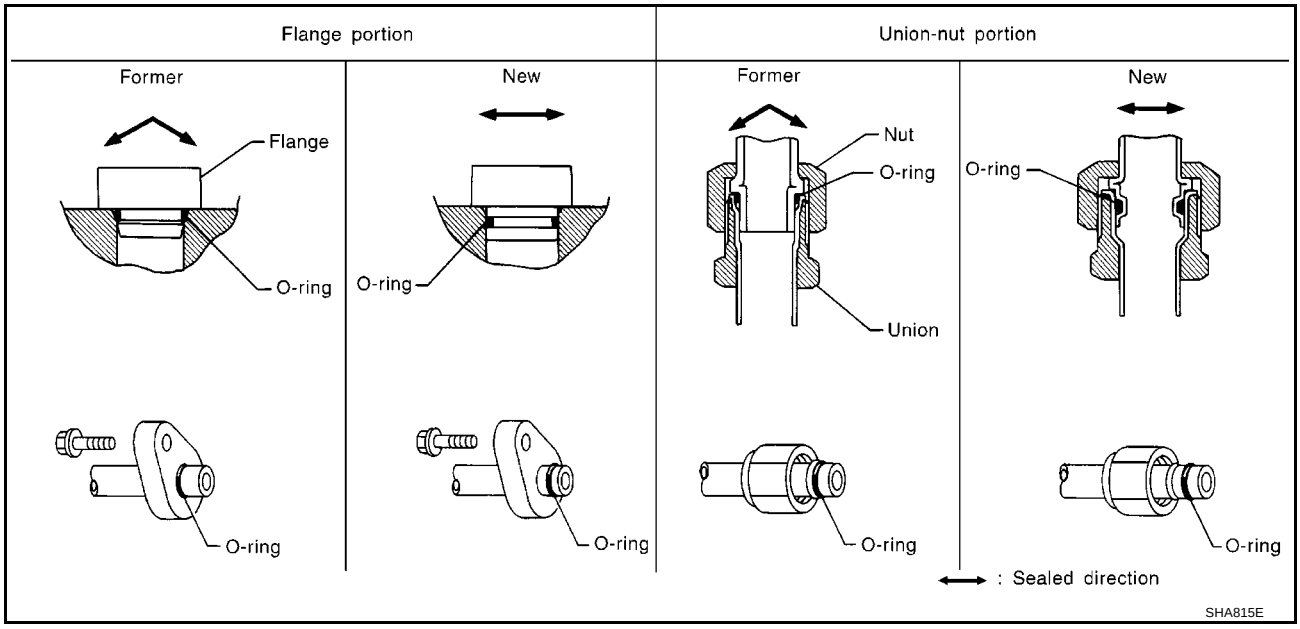
A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to evaporator
- Refrigerant pressure sensor to condenser

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.

- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



O-RING AND REFRIGERANT CONNECTION

CAUTION:

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.

O-Ring Part Numbers and Specifications (CR Engine Models)

Connection type	Piping connection point		Part number	Qty.	Remarks
New	Low-pressure flexible hose to heater & cooling unit		92473 BC700	1	
	High-pressure pipe to heater & cooling unit		92471 BC700	1	
	Condenser to high-pressure flexible hose		92472 BC700	1	
	Condenser to high-pressure pipe		92471 BC700	1	
	Compressor to low-pressure flexible hose		92474 BC700	1	
	Compressor to high-pressure flexible hose		92472 BC700	1	
	Liquid tank to condenser pipe		92471 N8210	1	
Former	Refrigerant pressure sensor		—	–	
	Expansion valve to evaporator	Inlet	92477 AX000	1	
		Outlet	92477 AX005	1	

O-Ring Part Numbers and Specifications (HR Engine Models)

Connection type	Piping connection point		Part number	Qty.	Remarks
New	Low-pressure flexible hose to heater & cooling unit		92473 N8210	1	
	High-pressure pipe to heater & cooling unit		92471 N8210	1	
	Condenser to high-pressure flexible hose		92472 N8210	1	
	Condenser to high-pressure pipe		92471 N8210	1	
	Compressor to low-pressure flexible hose		92474 N8210	1	
	Compressor to high-pressure flexible hose		92472 N8210	1	
	Liquid tank to condenser pipe		92471 N8210	1	
Former	Refrigerant pressure sensor		—	–	
	Expansion valve to evaporator	Inlet	92477 AX000	1	
		Outlet	92477 AX005	1	

O-Ring Part Numbers and Specifications (K9K Engine Models)

Connection type	Piping connection point		Part number	Qty.	Remarks
New	Low-pressure flexible hose to heater & cooling unit		92473 N8210	1	
	Low-pressure flexible hose to Low-pressure pipe		92473 N8210	1	
	High-pressure pipe to heater & cooling unit		92471 N8210	1	
	Condenser to high-pressure flexible hose		92472 N8210	1	
	Condenser to high-pressure pipe		92471 N8210	1	
	Compressor to low-pressure flexible hose		92474 N8210	1	
	Compressor to high-pressure flexible hose		92472 N8210	1	
	Liquid tank to condenser pipe		92471 N8210	1	
Former	Refrigerant pressure sensor		—	–	
	Expansion valve to evaporator	Inlet	92477 AX000	1	
		Outlet	92477 AX005	1	

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

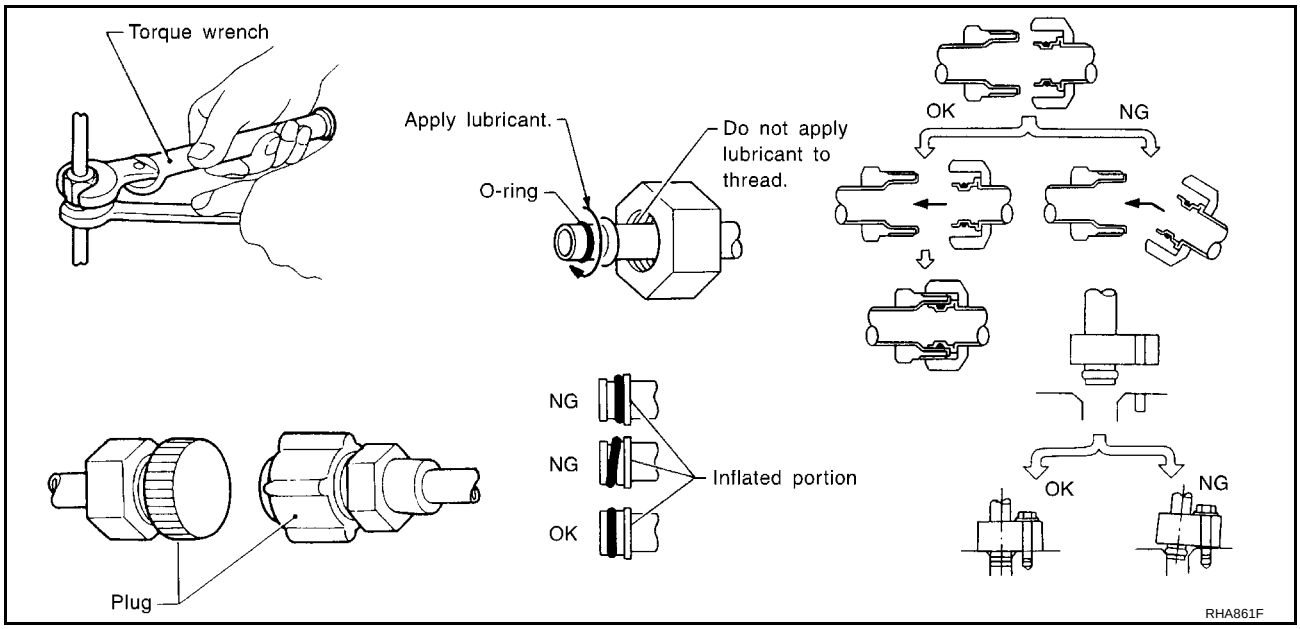
When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same position as it is when mounted on the car. Malfunction to do so will cause lubricant to enter the low-pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**

	Gasoline engine	K9K engine
Name	Nissan A/C System Oil Type R	Nissan A/C System Oil Type S
Parts number	KLH00 - PAGR0	KLH00 - PAGS0

- **O-ring must be closely attached to dented portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.**

- **After connecting line, perform leak test and make sure that there is no leakage from connections. When the refrigerant leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

BJS000AO

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-17, "Maintenance of Lubricant Quantity in Compressor" .**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for usual operation.**

Precautions for Service Equipment

BJS000AP

RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer’s instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

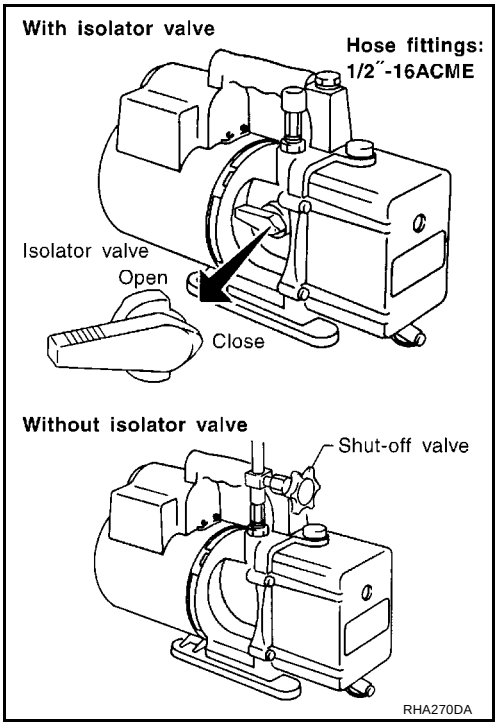
Be certain to follow the manufacturer’s instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

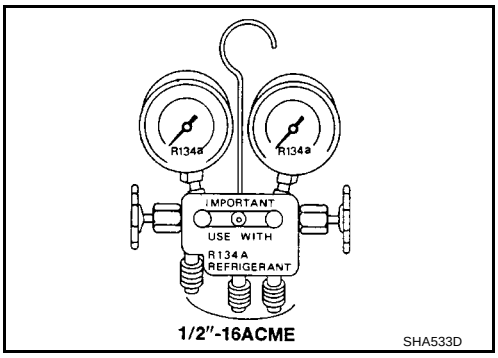
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut-off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



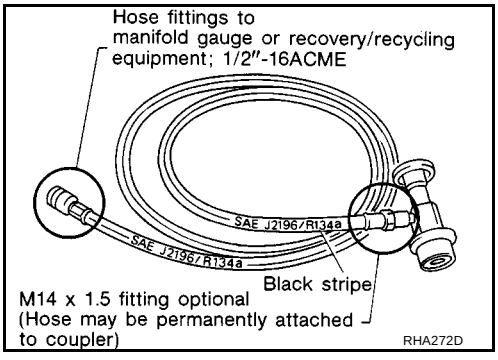
MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

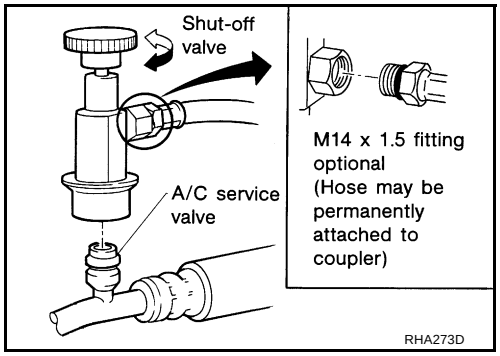
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

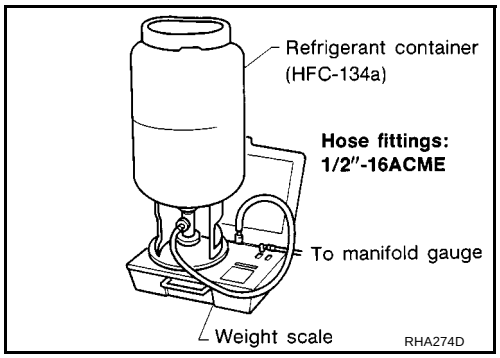
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2″-16 ACME.



CALIBRATING ACR4 WEIGHT SCALE

Calibrate the scale every three months.
To calibrate the weight scale on the ACR4:

1. Press **“Shift/Reset”** and **“Enter”** at the same time.
2. Press **“8787”** . **“A1”** will be displayed.
3. Remove all weight from the scale.
4. Press **“0”** , then press **“Enter”** . **“0.00”** will be displayed and change to **“A2”** .
5. Place a known weight (dumbbell or similar weight), between 4.5 and 8.6 kg (10 and 19 lb) on the center of the weight scale.
6. Enter the known weight using four digits. (Example 10 lb = 10.00, 10.5 lb = 10.50)
7. Press **“Enter”** — the display returns to the vacuum mode.
8. Press **“Shift/Reset”** and **“Enter”** at the same time.
9. Press **“6”** — the known weight on the scale is displayed.
10. Remove the known weight from the scale. **“0.00”** will be displayed.
11. Press **“Shift/Reset”** to return the ACR4 to the program mode.

CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder’s top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

Precautions for Leak Detection Dye

BJS000AQ

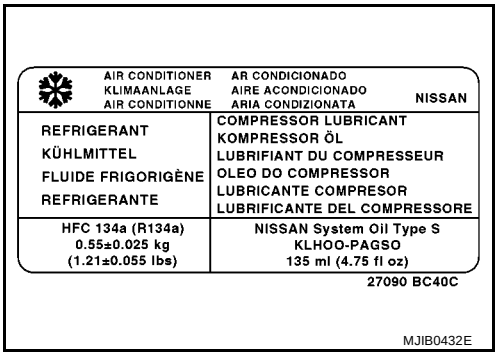
- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector to pinpoint refrigerant leaks.
- For your safety and your customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector.
- Always remove any remaining dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detector dye in HFC-134a (R-134a) A/C system or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:
Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have this identification label on the front side of hood.



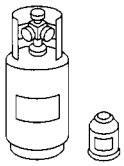
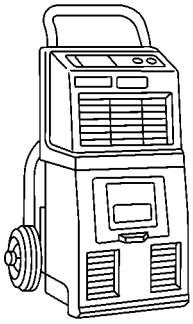
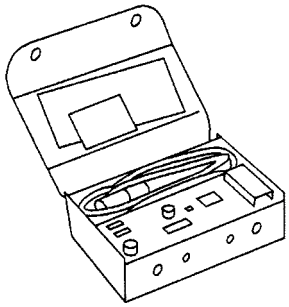
PREPARATION

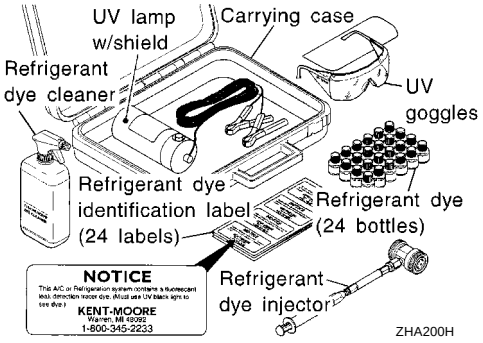
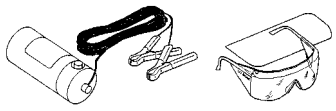
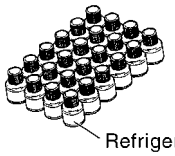
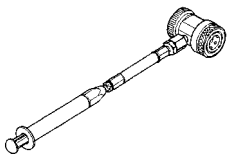
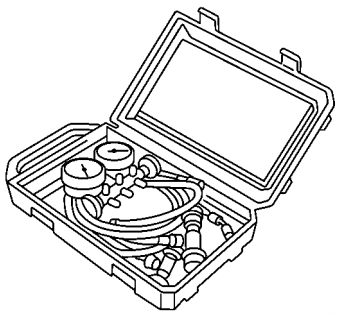
PFP:00002

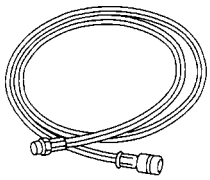
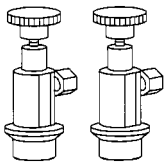
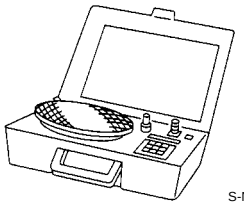
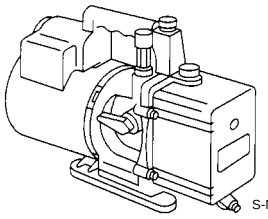
HFC-134a (R-134a) Service Tools and Equipment

BJS000AS

Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

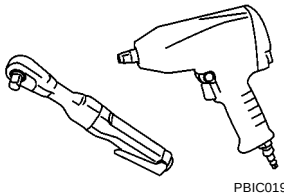
Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″ -16 ACME
KLH00-PAGR0 Nissan A/C System Oil Type R (DH-PR)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type R (DH-PR) Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: ● The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size ● 1/2″ -16 ACME

Tool number Tool name		Description
Service hoses ● High-pressure side hose ● Low-pressure side hose ● Utility hose	 S-NT201	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: ● 1/2″ -16 ACME
Service couplers ● High-pressure side coupler ● Low-pressure side coupler	 S-NT202	Hose fitting to service hose: ● M14 x 1.5 fitting is optional or permanently attached.
Refrigerant weight scale	 S-NT200	For measuring of refrigerant Fitting size: Thread size ● 1/2″ -16 ACME
Vacuum pump (Including the isolator valve)	 S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz.) Fitting size: Thread size ● 1/2″ -16 ACME

Commercial Service Tools

BJS000AT

Tool name		Description
Power tool	 PBIC0190E	For loosening bolts and nuts

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle

BJS000AU

REFRIGERANT FLOW

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

Under usual operating conditions, when the A/C is switched ON, the compressor runs continuously, and the evaporator pressure, and therefore, temperature is controlled by the compressor to prevent freeze up.

Refrigerant System Protection

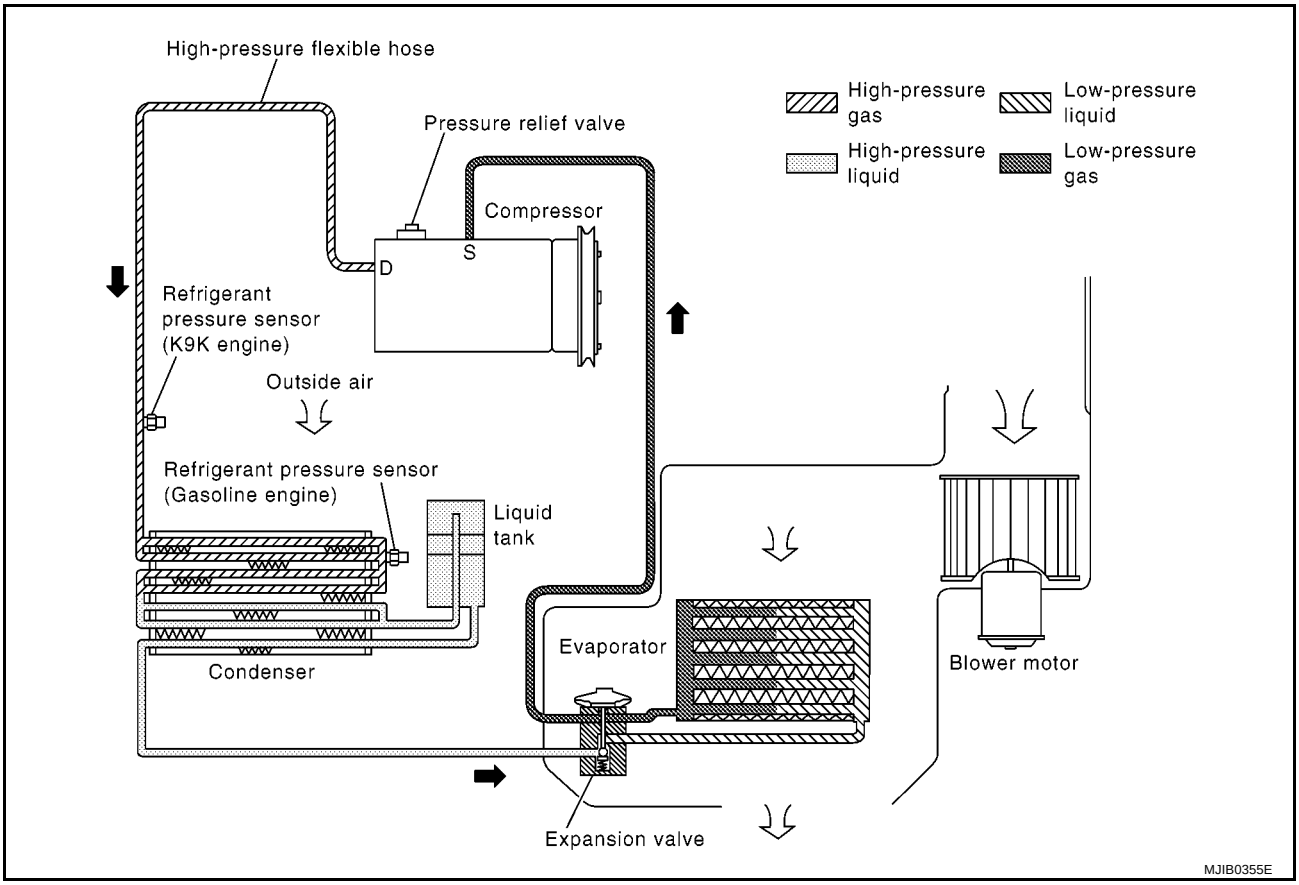
BJS000AV

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (27.46 bar, 28.0 kg/cm^2 , 398 psi), or below about 134 kPa (1.34 bar, 1.4 kg/cm^2 , 20 psi).

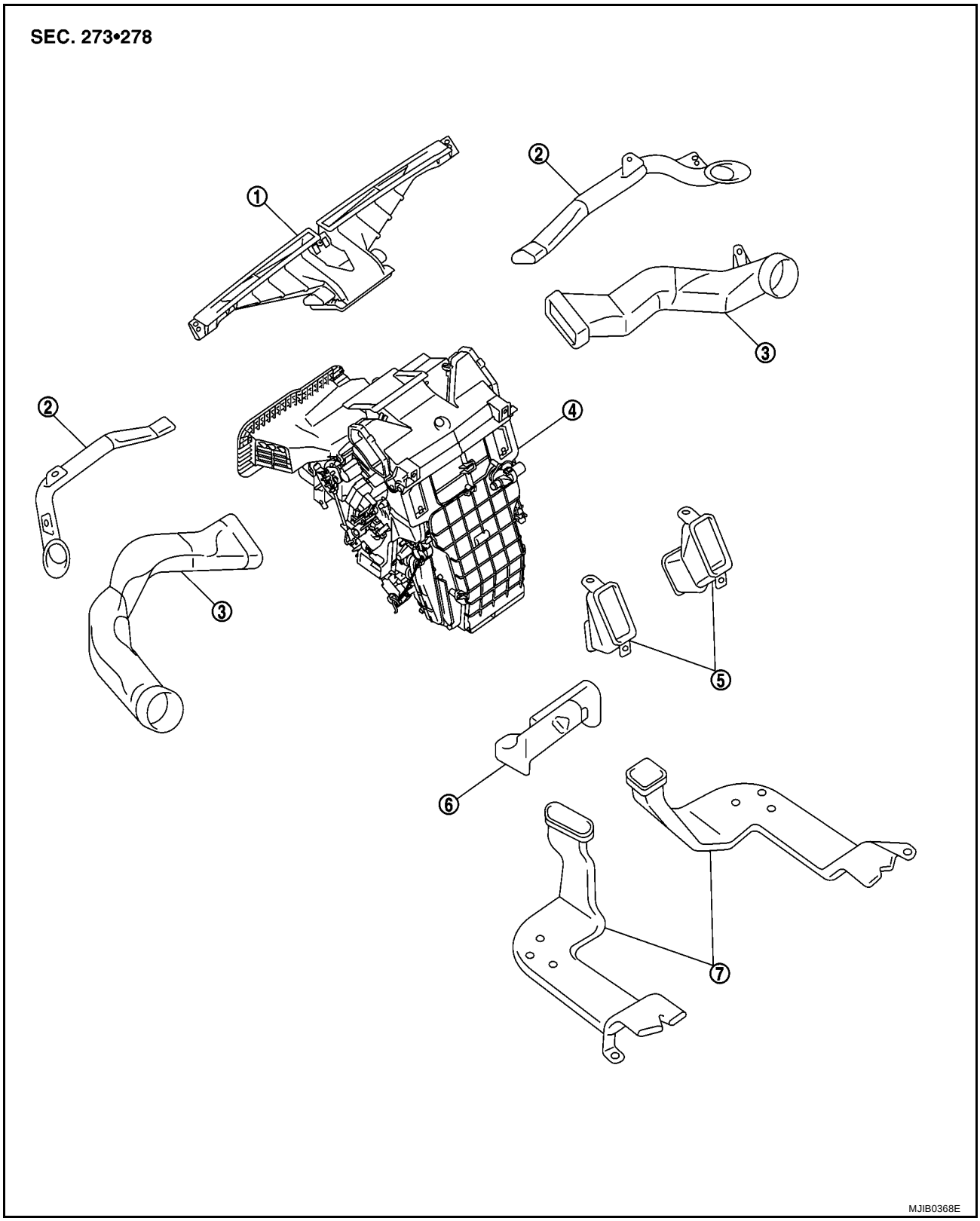
PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3.8MPa (38 bar, 38.76 kg/cm^2 , 551 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



Component Layout

BJS000AW



1. Defroster nozzle
2. Side defroster duct
3. Side ventilator duct
4. A/C unit
5. Center ventilator duct
6. Front floor duct
7. Rear floor duct

LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

BJS000AX

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

	Gasoline engine	K9K engine
Name	Nissan A/C System Oil Type R	Nissan A/C System Oil Type S
Parts number	KLH00 - PAGR0	KLH00 - PAGS0

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:
If excessive lubricant leakage is noted, do not perform the lubricant return operation.

OK or NG

OK >> GO TO 2.
NG >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start engine, and set the following conditions:
   - Engine speed: Idling to 1,200 rpm
   - A/C switch: ON
   - Blower speed: Max. position
   - Temp. control: Optional (Set so that intake air temperature is 25 to 30°C.)
   - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-18, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-18, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR" .

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.
Amount of lubricant to be added

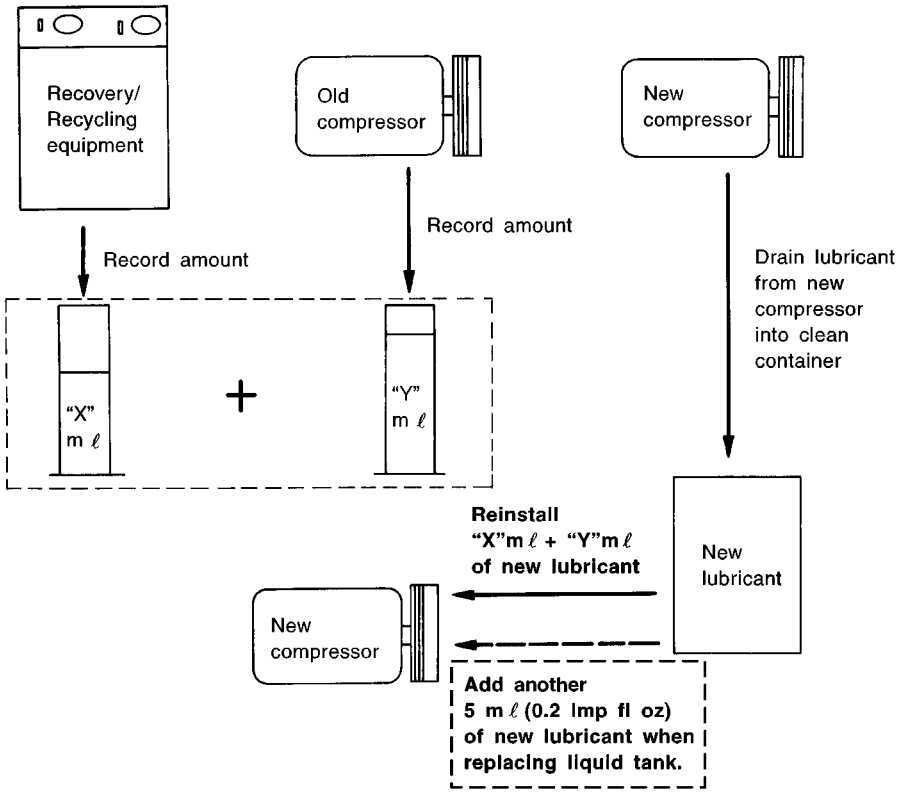
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (Imp fl oz.)	
Evaporator	35 (1.2)	-
Condenser	15 (0.5)	-
Liquid tank	5 (0.2)	-
In case of refrigerant leak	30 (1.1)	Large leak
	-	Small leak *1

*1: If refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
3. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
4. Drain the lubricant from the new compressor into a separate, clean container.
5. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
6. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
7. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 Imp fl oz.) of lubricant at this time. Do not add this 5 m ℓ (0.2 Imp fl oz.) of lubricant only when replaces the compressor.

Lubricant adjusting procedure for compressor replacement



SJIA0596E

AIR CONDITIONER CONTROL

PFP:27500

System Construction

BJS000AY

AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

FAN SPEED CONTROL

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With fan control dial set to AUTO switch is pressed, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

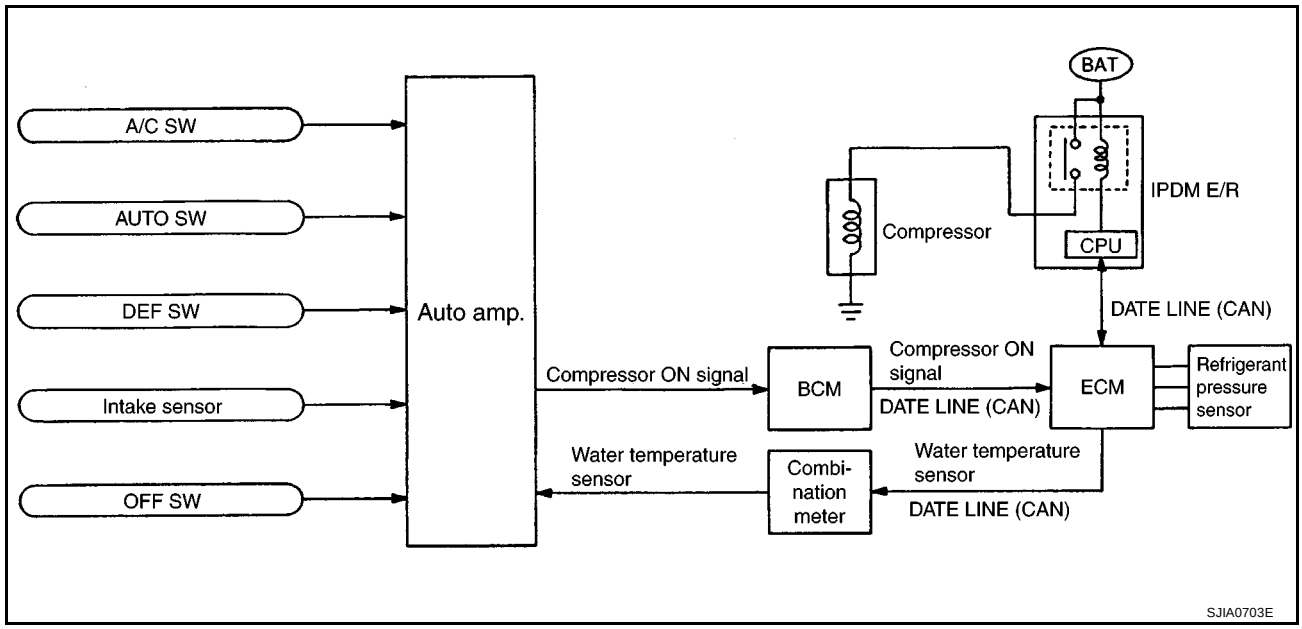
INTAKE DOOR CONTROL

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON-OFF operation of the compressor.

OUTLET DOOR CONTROL

The outlet door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

MAGNET CLUTCH CONTROL



When A/C switch, AUTO switch or DEF switch is pressed, auto amp. inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM, via CAN communication line.
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication line.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

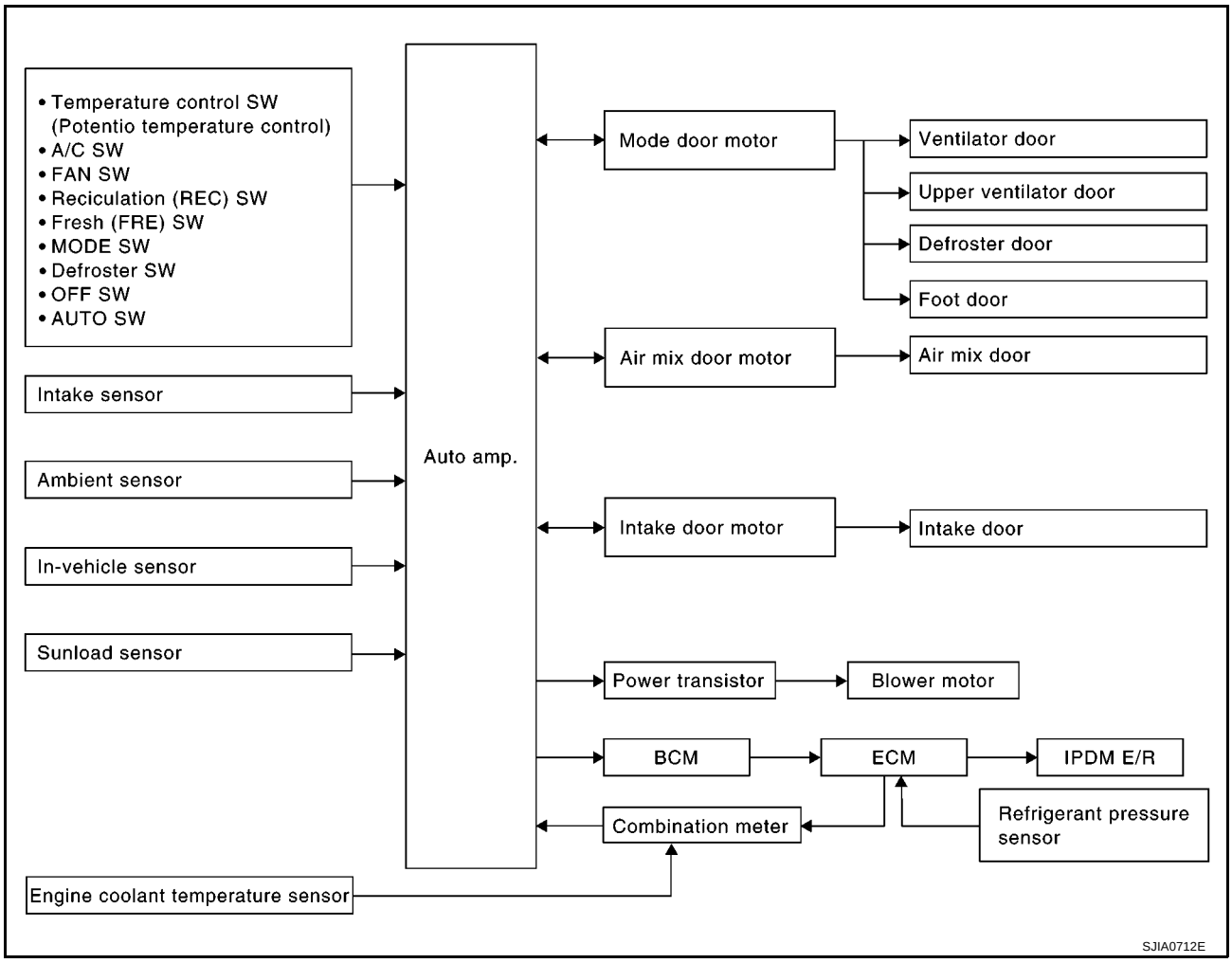
SELF-DIAGNOSTIC SYSTEM

The self-diagnostic system is built into the auto amp. to quickly locate the cause of symptoms.

Description of Control System

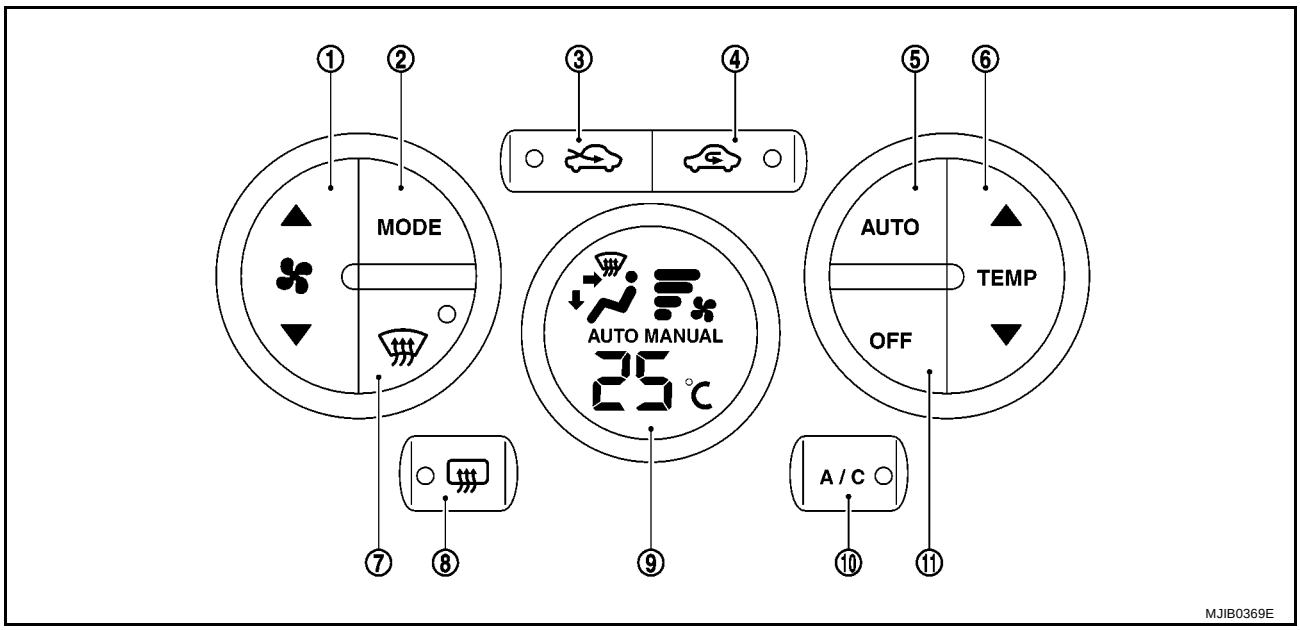
BJS000AZ

The control system consists of input sensors, switches, the auto amp. (microcomputer) and outputs. The relationship of these components is shown in the figure below:



Control Operation

BJS000B0



1. Fan SW
2. MODE SW
3. Fresh (FRE) SW
4. Reciculation (REC) SW
5. AUTO SW
6. Temperature control SW

7. Defroster (DEF) SW
8. Rear window defogger SW
9. Display screen
10. A/C SW
11. OFF SW

DISPLAY SCREEN

Displays the operational status of the system.

AUTO SWITCH

- The compressor, intake doors, air mix doors, outlet doors and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.
- When pressing AUTO switch, air inlet, air outlet, fan speed, and discharge air temperature are automatically controlled. (Inlet is automatically controlled only when FRE or REC switch is OFF.)

TEMPERATURE CONTROL SWITCH (POTENTIO TEMPERATURE CONTROL)

Increases or decreases the set temperature.

RECIRCULATION (REC) SWITCH

- When REC switch is ON, REC switch indicator turns ON, air inlet is fixed to REC, and compressor will turn ON.
- When FRE switch is turned ON, air outlet switches to D/F or DEF position, or when compressor is turned from ON to OFF, REC switch is automatically turned OFF (fixed to FRE mode).

FRESH (FRE) SWITCH

- When FRE switch is ON, FRE switch indicator turns ON, and air inlet is fixed to FRE.
- When REC switch is turned ON, FRE switch is automatically turned OFF (fixed to REC mode). FRE mode can be re-entered by pressing FRE switch again.

DEFROSTER (DEF) SWITCH

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position, and compressor will turn ON.

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

OFF SWITCH

The compressor and blower are OFF, the intake doors are set to the outside air position, and the air outlet doors are set to the foot position.

A/C SWITCH

The compressor is ON or OFF.
(Pressing the A/C switch when the A/C switch is ON will turn off the A/C switch and compressor.)

MODE SWITCH

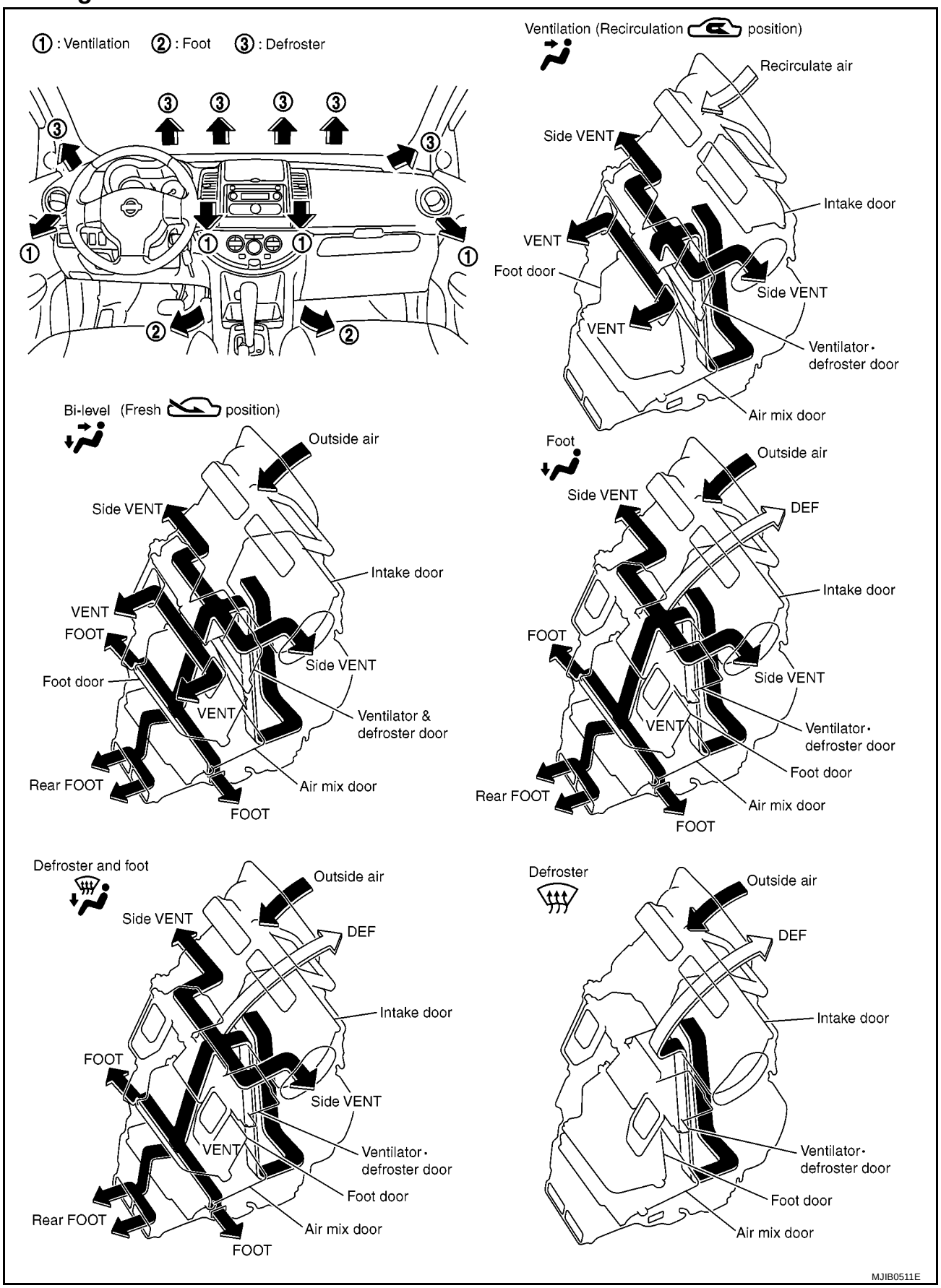
Controls the air discharge outlets.
When air outlet switches to D/F position, compressor will turn ON and fixed to REC mode.

FAN SWITCH

Manually control the blower speed. Four speeds are available for manual control (as shown on the display screen).

Discharge Air Flow

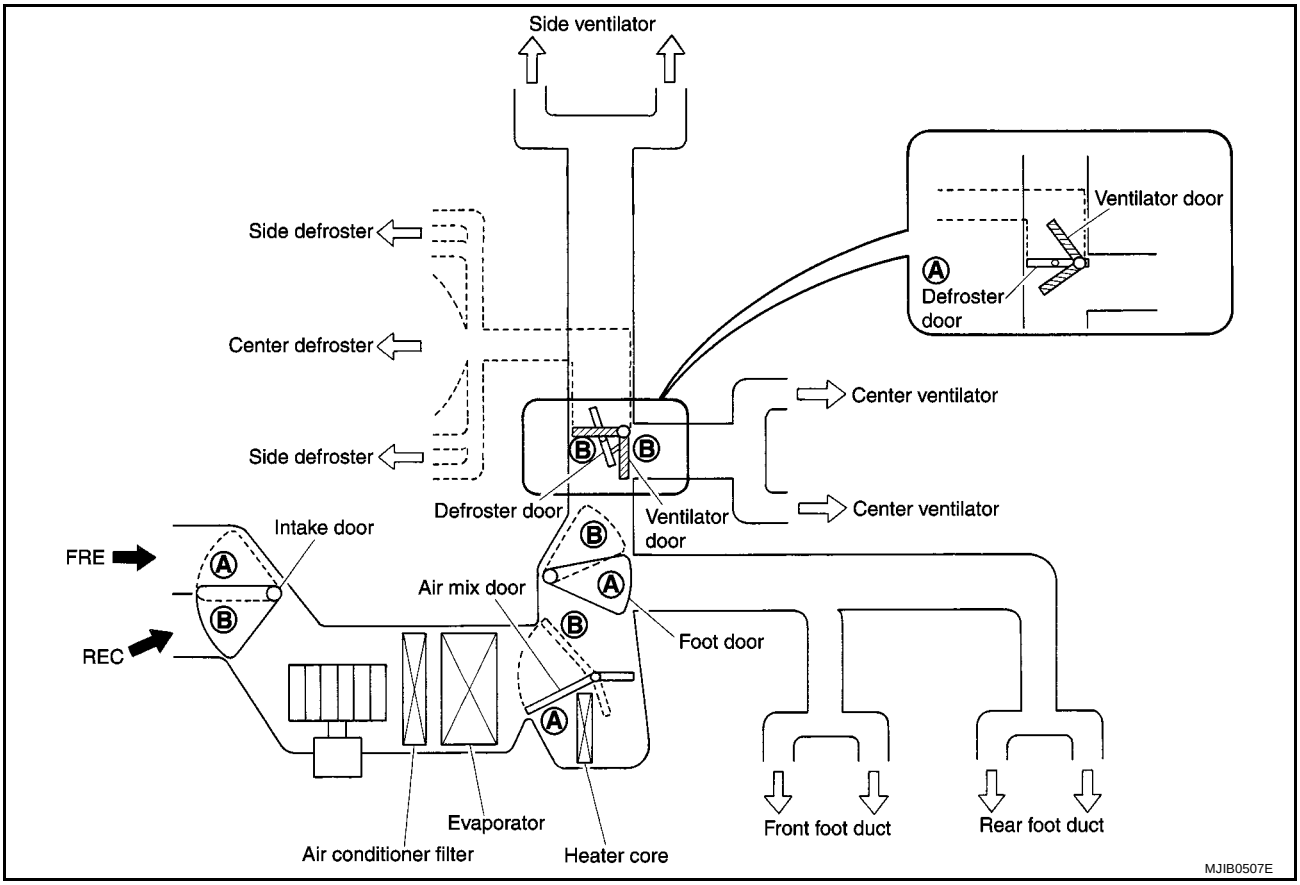
BJS000JB

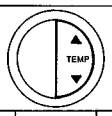


System Description

BJS000B4

SWITCHES AND THEIR CONTROL FUNCTION



Door \ Position or switch	MODE SW				DEF SW		AUTO SW	Intake SW		Temperature control SW			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF		FRE SW	REC SW				
							AUTO						OFF
						O			O	18℃	~	32℃	
Ventilator door	Ⓐ	Ⓐ	Ⓑ*1	Ⓑ*1	Ⓑ*1		AUTO	—		—			Ⓑ*1
Sub ventilator door	Ⓐ	Ⓐ	Ⓑ	Ⓑ	Ⓑ			—		—			Ⓑ
Defroster door	Ⓐ	Ⓐ	Ⓑ	Ⓑ	Ⓑ			—		—			Ⓑ
Foot door	Ⓐ	Ⓐ ~ Ⓑ	Ⓑ*1	Ⓐ ~ Ⓑ	Ⓐ			—		—			Ⓑ*1
Intake door	—				Ⓑ		—	Ⓑ	AUTO Ⓐ	—			Ⓑ
Air mix door	—				—		AUTO	—		Ⓐ	AUTO	Ⓑ	—

*1 When the Ⓑ position, ventilator door and foot door is not shuted perfectly.

SJIA0717E

CAN Communication System Description

BJS000B5

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-27, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-II Function (BCM)

BJS000B6

CONSULT-II can display diagnostic item using the diagnostic test modes shown following.

System part	Check item, diagnosis mode	Description
BCM	Data monitor	Displays BCM input data in real time.

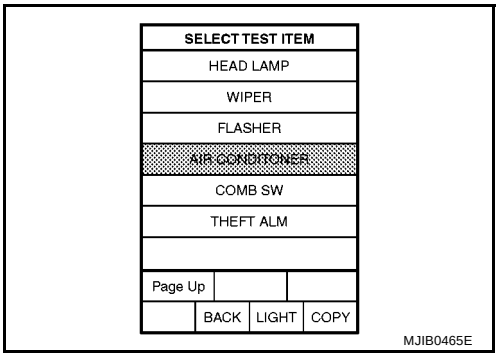
CONSULT-II BASIC OPERATION

Refer to GI-36, "CONSULT-II Start Procedure" .

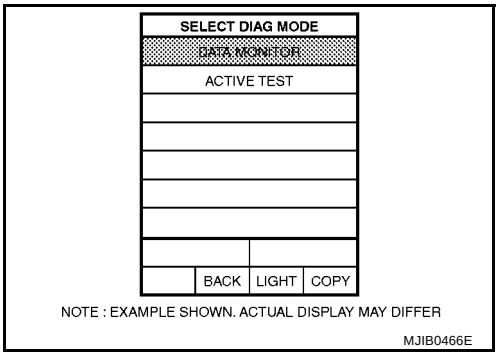
DATA MONITOR

Operation Procedure

1. Touch “AIR CONDITIONER” on “SELECT TEST ITEM” screen.



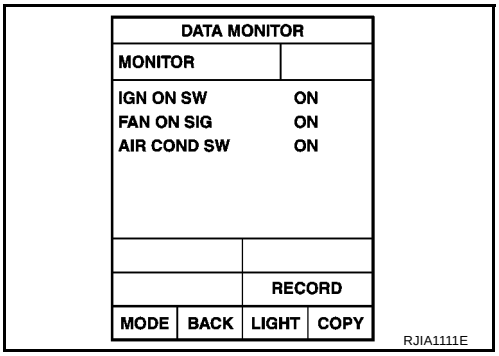
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.



3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR” screen.

All signals	Monitors all the items.
Selection from menu	Selects and monitors the individual item selected.

4. When “SELECTION FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all the items will be monitored.
5. Touch “START”.
6. Touch “RECORD” while monitoring, then the status of the monitored item can be recorded. To stop recording, touch “STOP”.



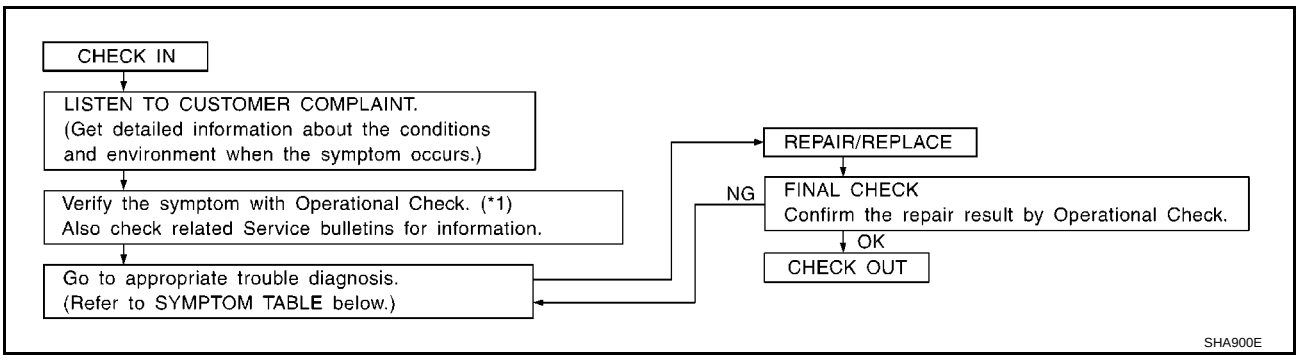
Display Item List

Monitor item name “operation or unit”		Contents
IGN ON SW	“ON/OFF”	Displays “IGN Position (ON)/OFF, ACC Position (OFF)” status as judged from ignition switch signal.
FAN ON SIG	“ON/OFF”	Displays “FAN (ON)/FAN (OFF)” status as judged from blower fan motor switch signal.
AIR COND SW	“ON/OFF”	Displays “COMP (ON)/COMP (OFF)” status as judged from air conditioner switch signal.

How to Perform Trouble Diagnosis for Quick and Accurate Repair

BJS000B7

WORK FLOW



*1 ATC-55, "Operational Check"

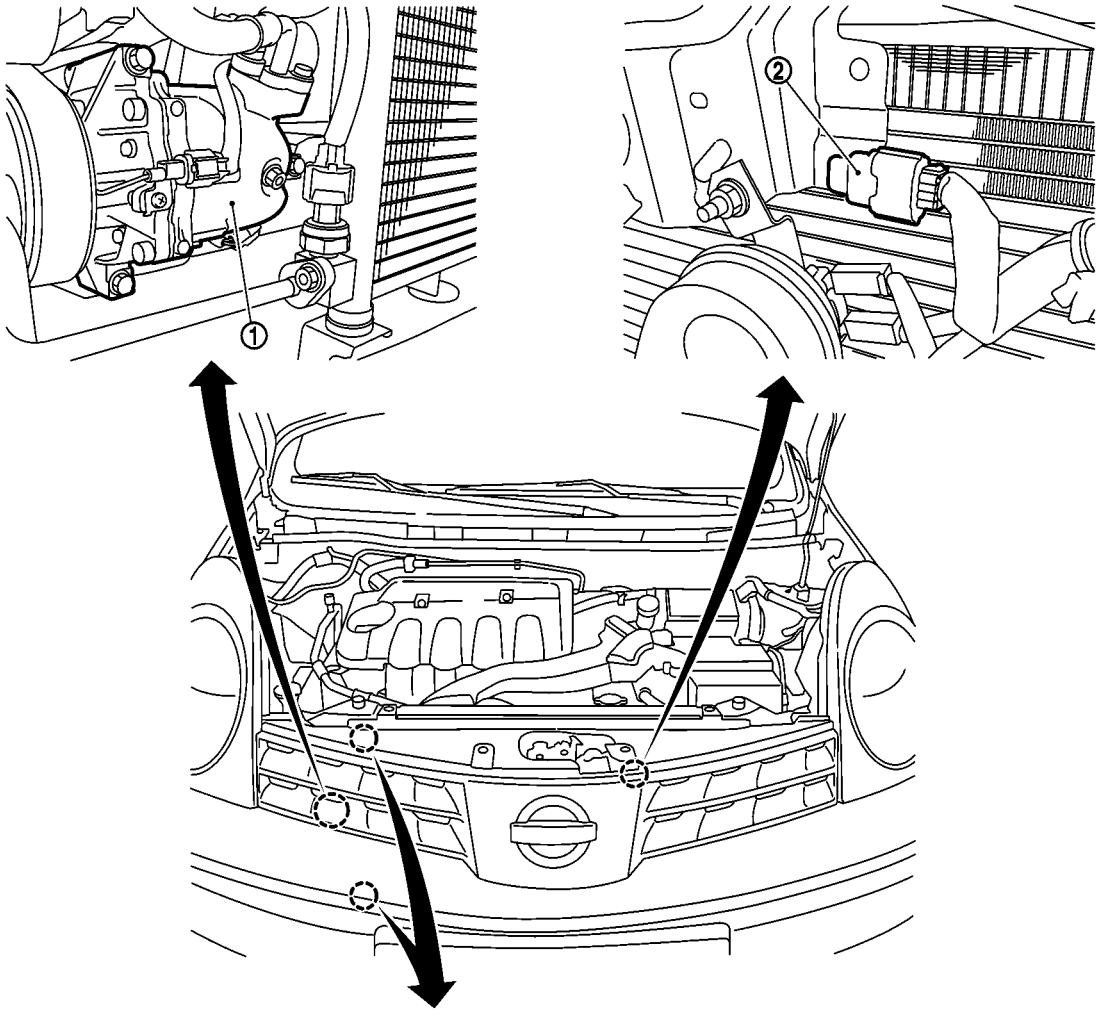
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	ATC-57, "Power Supply and Ground Circuit for Auto Amp."
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	ATC-60, "Mode Door Motor Circuit"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	ATC-64, "Air Mix Door Motor Circuit"
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	ATC-68, "Intake Door Motor Circuit"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-71, "Blower Motor Circuit"
Blower motor operation is malfunctioning under out of starting fan speed control.		
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-78, "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-86, "Insufficient Cooling"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-94, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-96, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-97, "Self-diagnosis"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	ATC-98, "Memory Function"

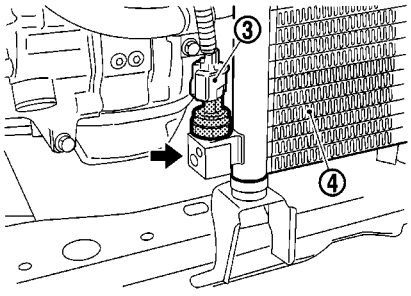
Component Parts and Harness Connector Location

BJS000B8

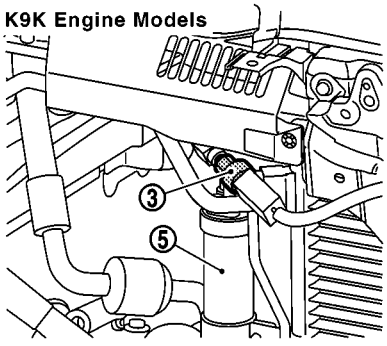
ENGINE COMPARTMENT



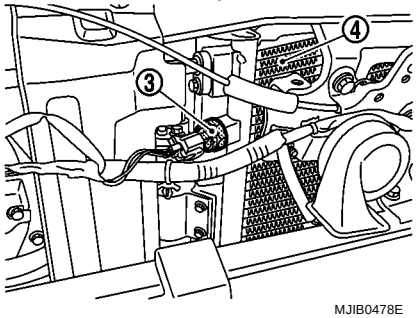
HR (A/T) Engine Models



K9K Engine Models



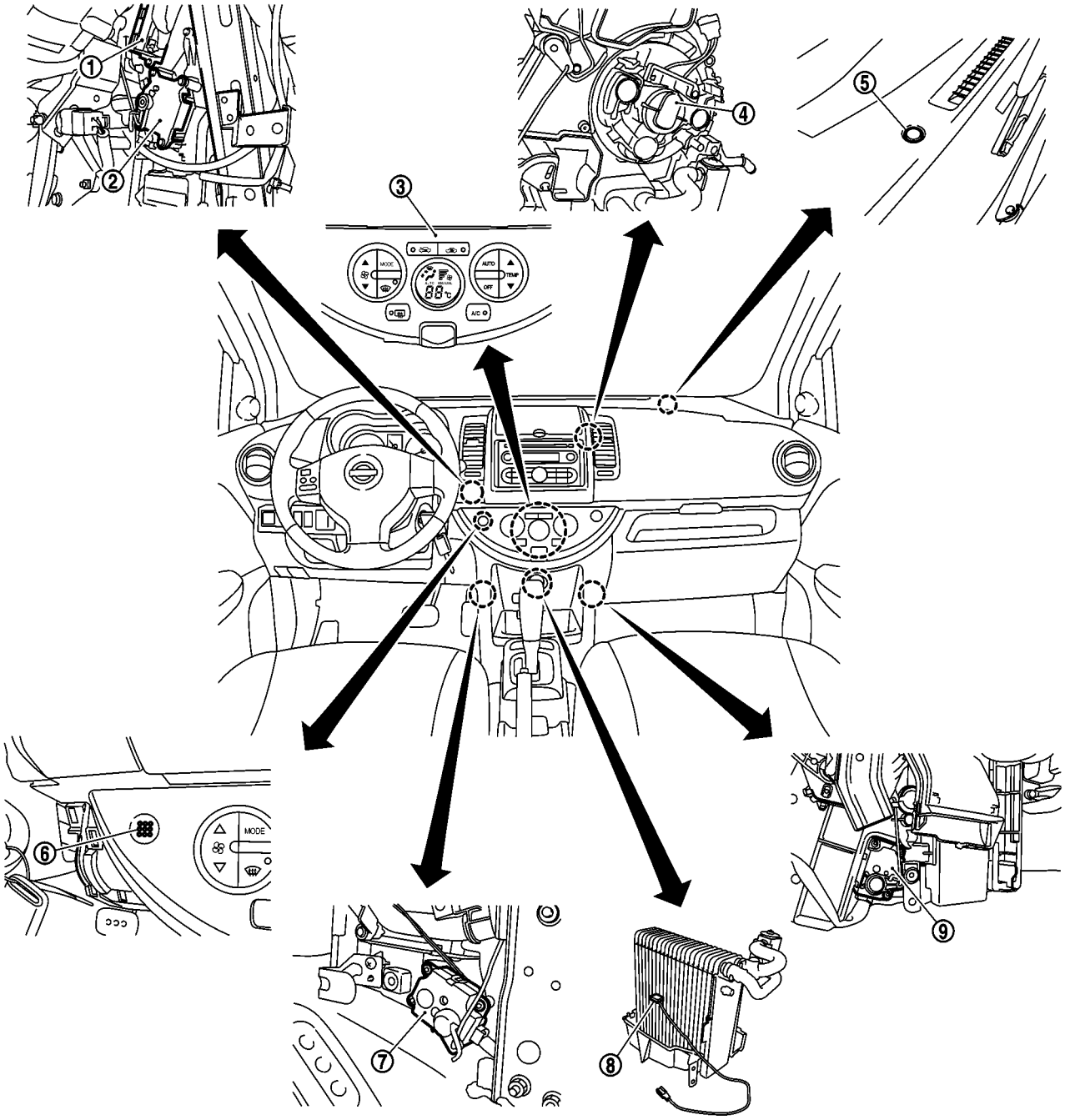
HR (M/T) and CR Engine Models



MJIB0478E

1. Compressor (CR & HR engine F28) (K9K engine F129)
2. Ambient sensor E17
3. Refrigerant pressure sensor (CR & HR engine E21) (K9K engine E65)
4. Condenser
5. Liquid tank

PASSENGER COMPARTMENT

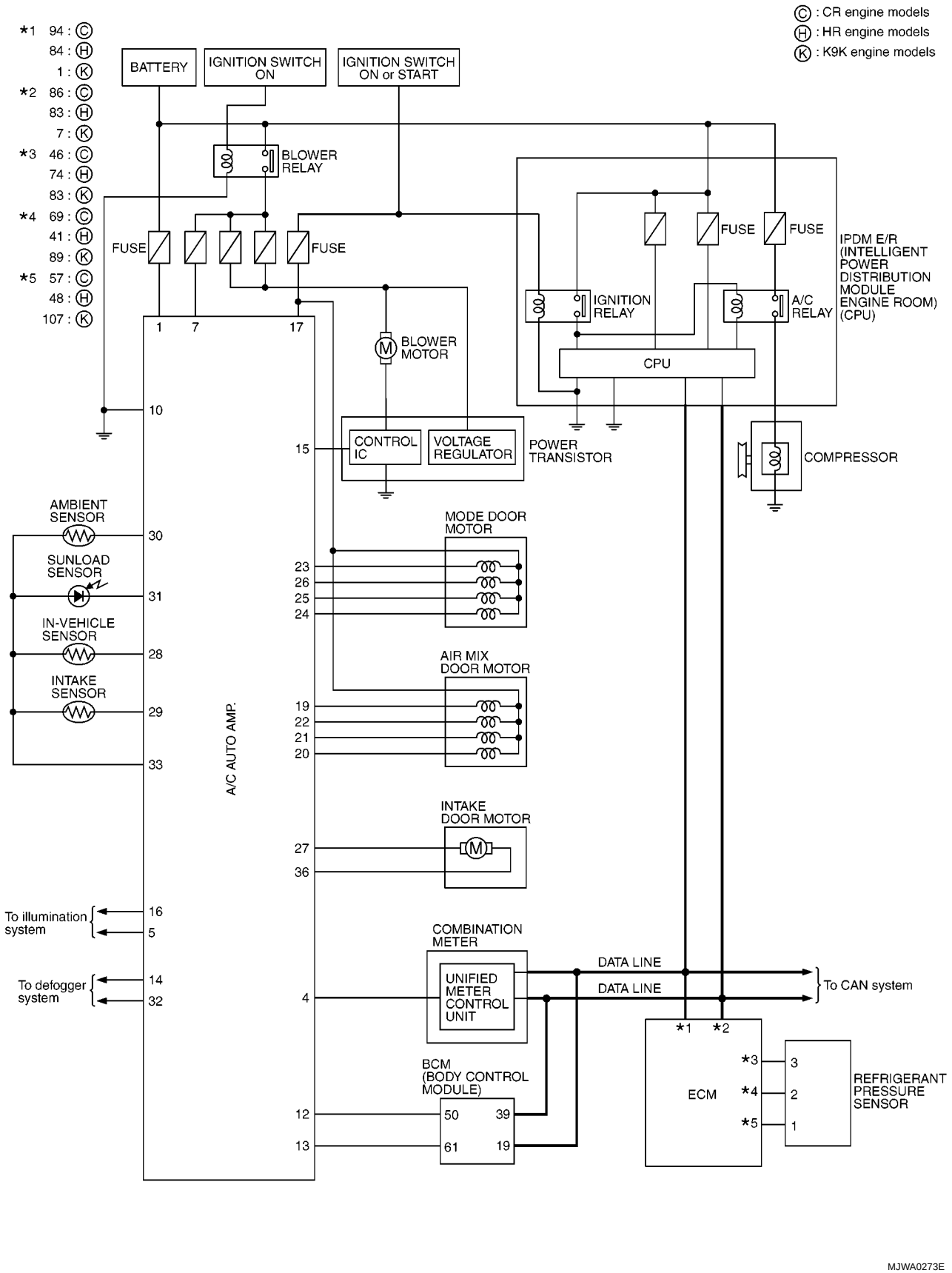


MJIB0479E

1. Power transistor M30, M31
2. Intake door motor M28
3. Controller (Auto amp.) M64, M65
4. Blower motor M56
5. Sunload sensor M43
6. In-vehicle sensor M43
7. Air mix door motor M51
8. Intake sensor M44
9. Mode door motor M50

Circuit Diagram

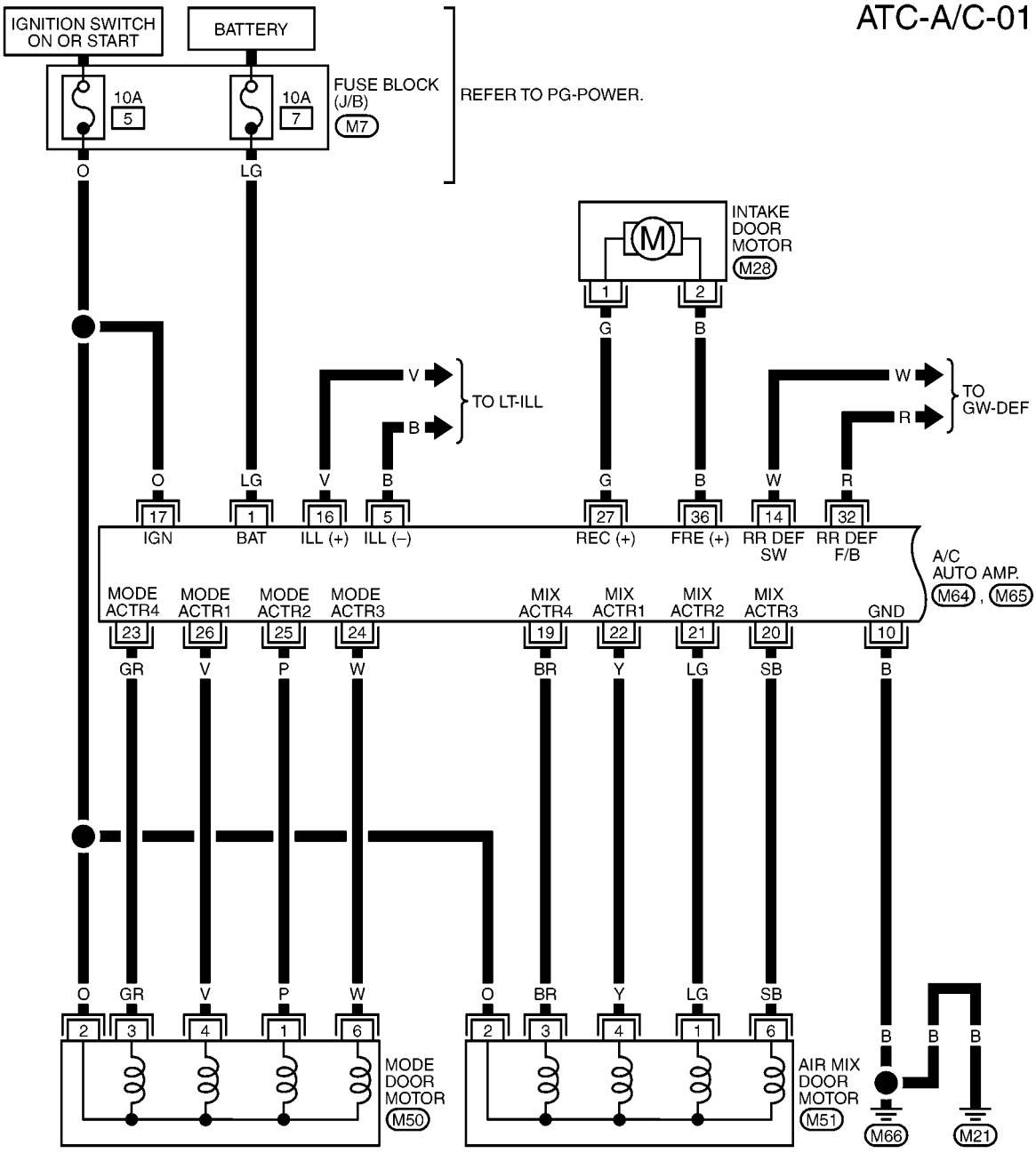
BJS000B9

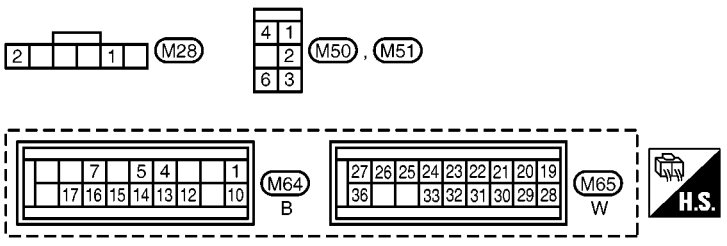


MJWA0273E

Wiring Diagram —A/C— CR Engine Models

BJS000BA

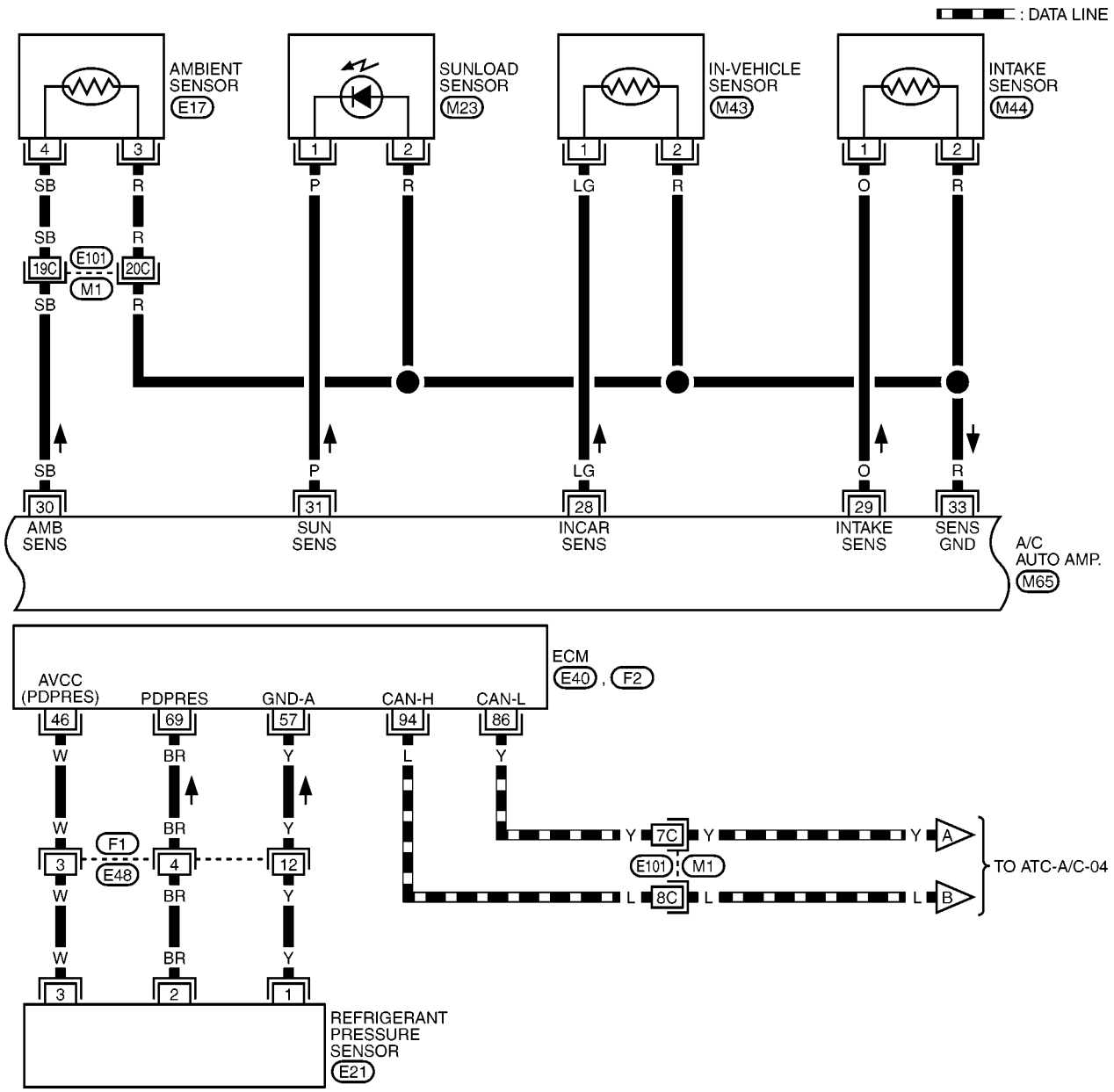


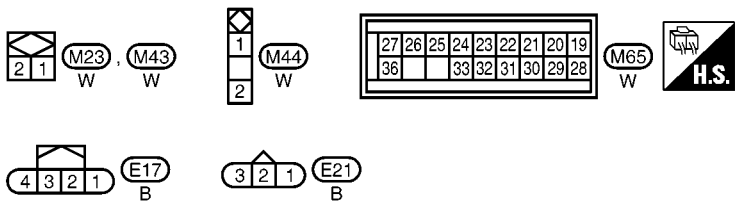


REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

MJWA0274E

ATC-A/C-02

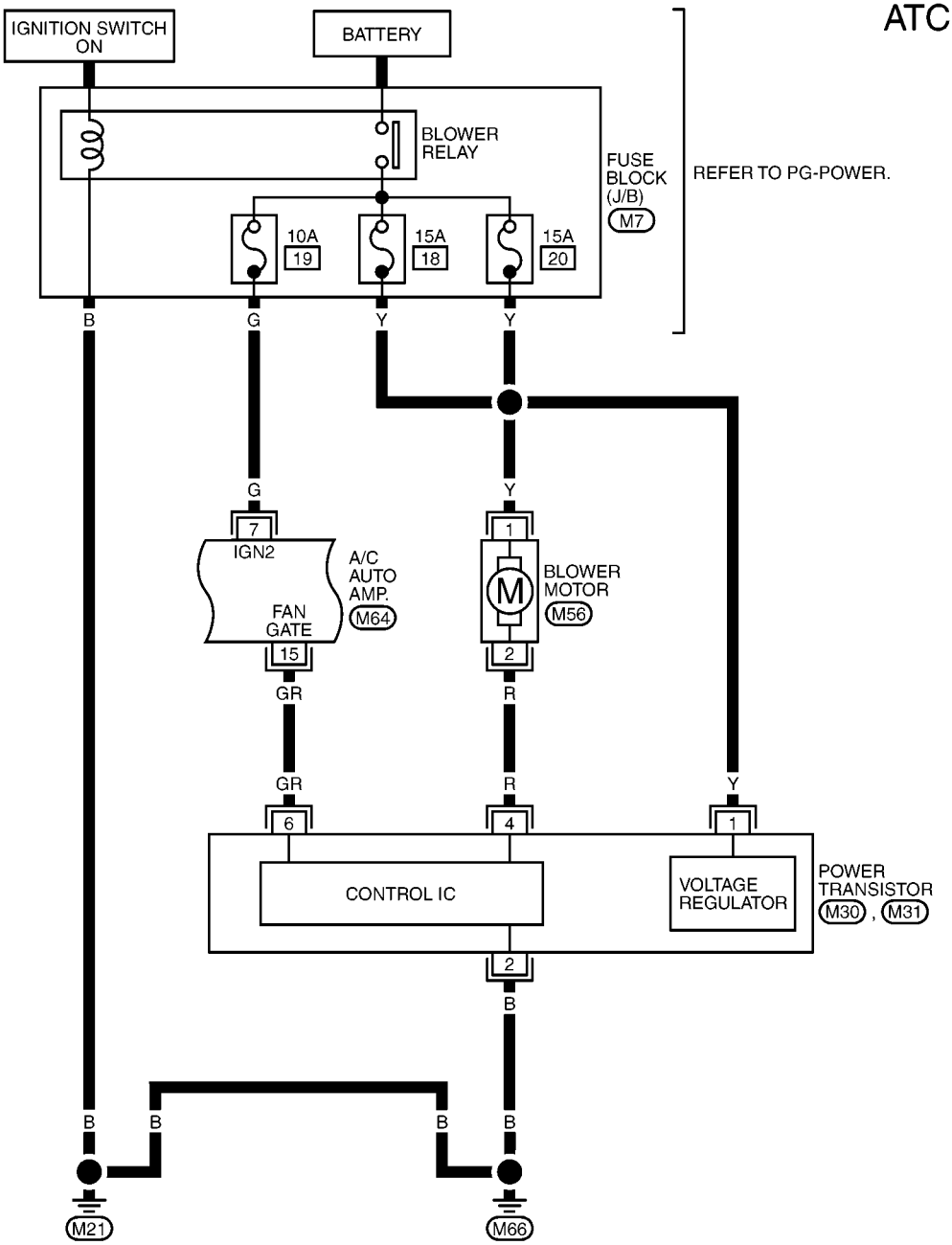


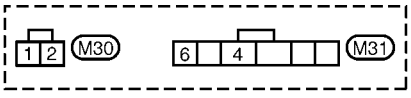


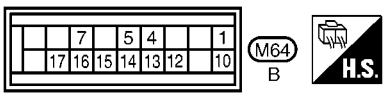
REFER TO THE FOLLOWING.
M1 , F1 - SUPER MULTIPLE JUNCTION (SMJ)
E40 , F2 - ELECTRICAL UNITS

MJWA0275E

ATC-A/C-03

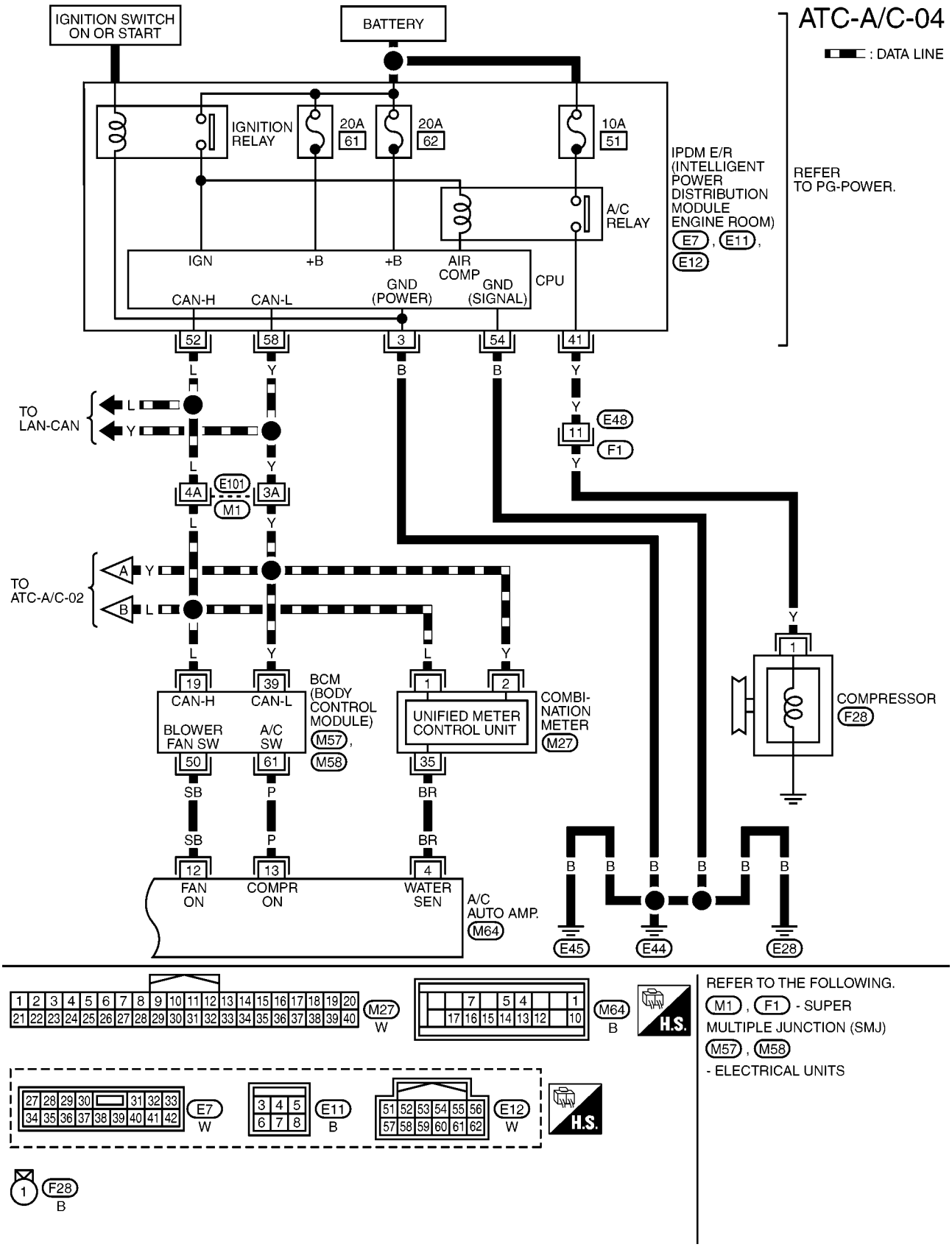






REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

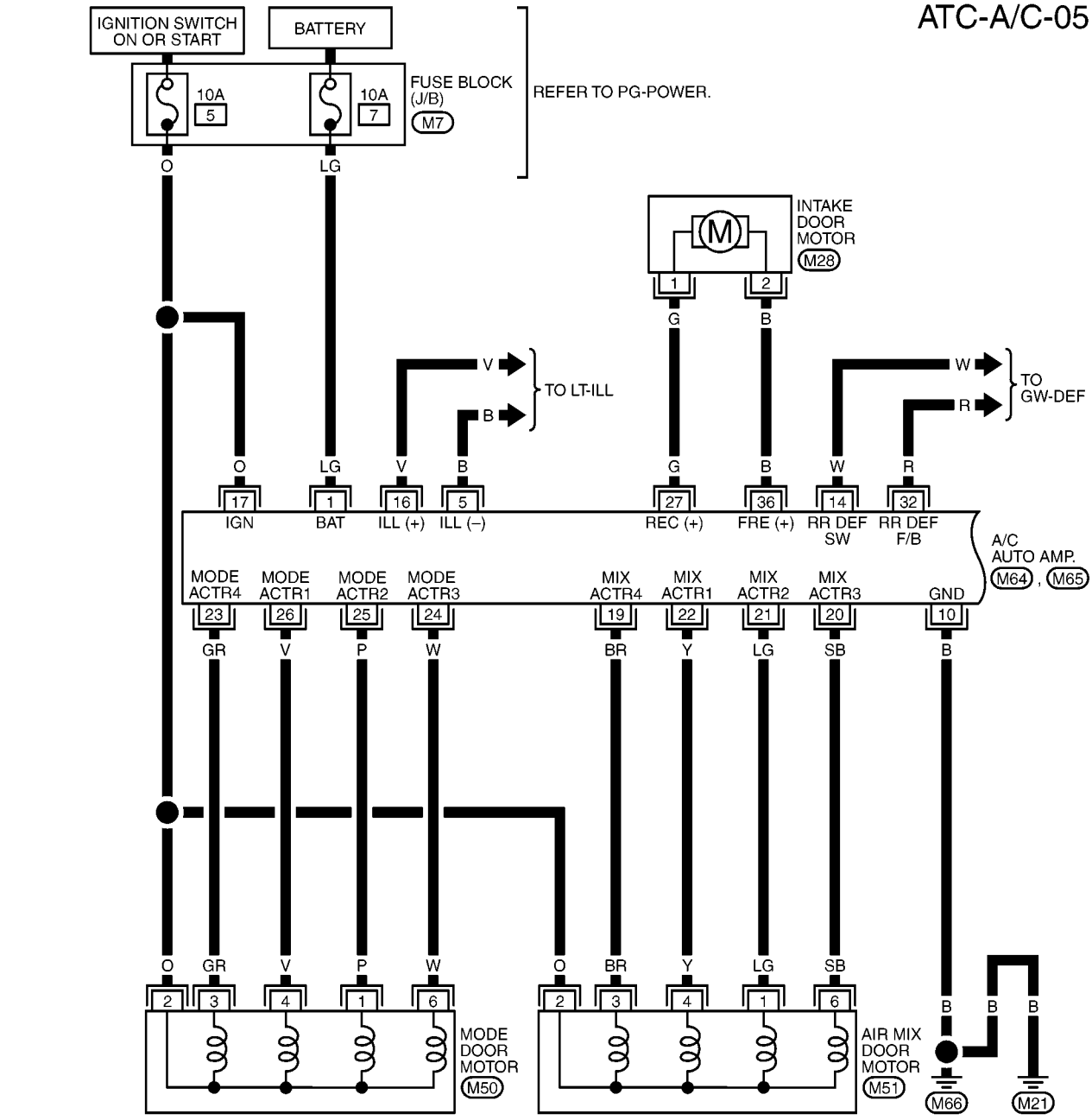
MJWA0276E

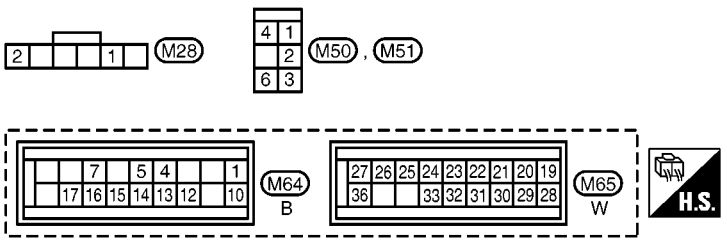

ATC-A/C-04
: DATA LINE
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
20A 61
20A 62
10A 51
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E7, E11, E12
REFER TO PG-POWER.
IGN
+B
+B
AIR COMP
GND (POWER)
GND (SIGNAL)
CPU
CAN-H
CAN-L
52
58
3
54
41
TO LAN-CAN
E48
11
F1
E101
M1
4A
3A
TO ATC-A/C-02
19
39
CAN-H
CAN-L
BLOWER FAN SW
A/C SW
BCM (BODY CONTROL MODULE) M57, M58
50
61
1
2
UNIFIED METER CONTROL UNIT
COMBI-NATION METER M27
35
COMPRESSOR F28
SB
P
BR
12
13
4
FAN ON
COMPR ON
WATER SEN
A/C AUTO AMP. M64
E45
E44
E28
M27 W
M64 B
H.S.
E7 W
E11 B
E12 W
F28 B
REFER TO THE FOLLOWING.
M1, F1 - SUPER MULTIPLE JUNCTION (SMJ)
M57, M58
- ELECTRICAL UNITS
MJWA0277E

Wiring Diagram —A/C—HR Engine Models

BJS000JD

ATC-A/C-05

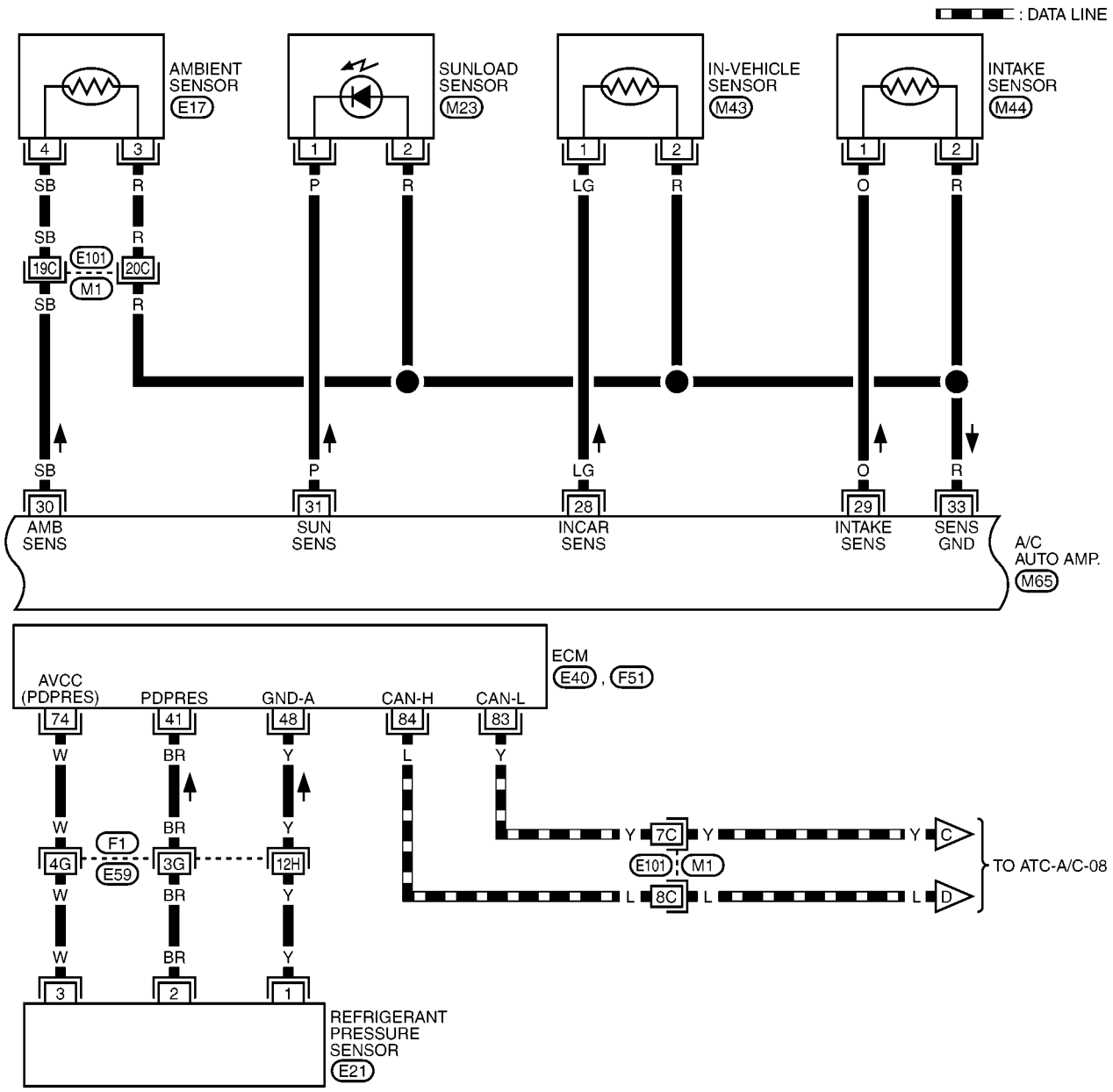


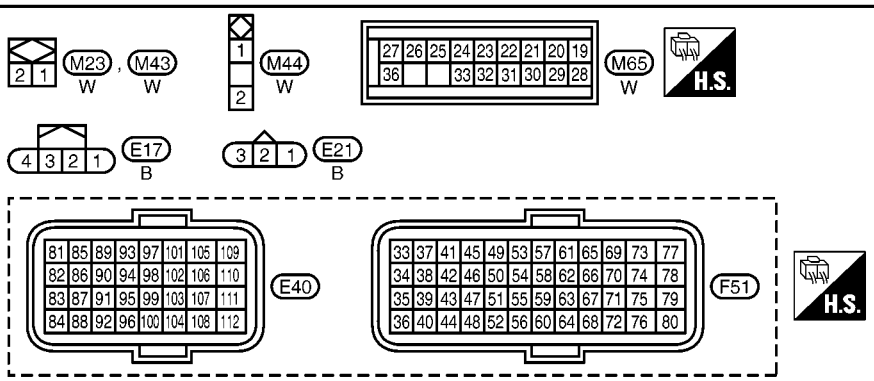


REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

MJWA0278E

ATC-A/C-06

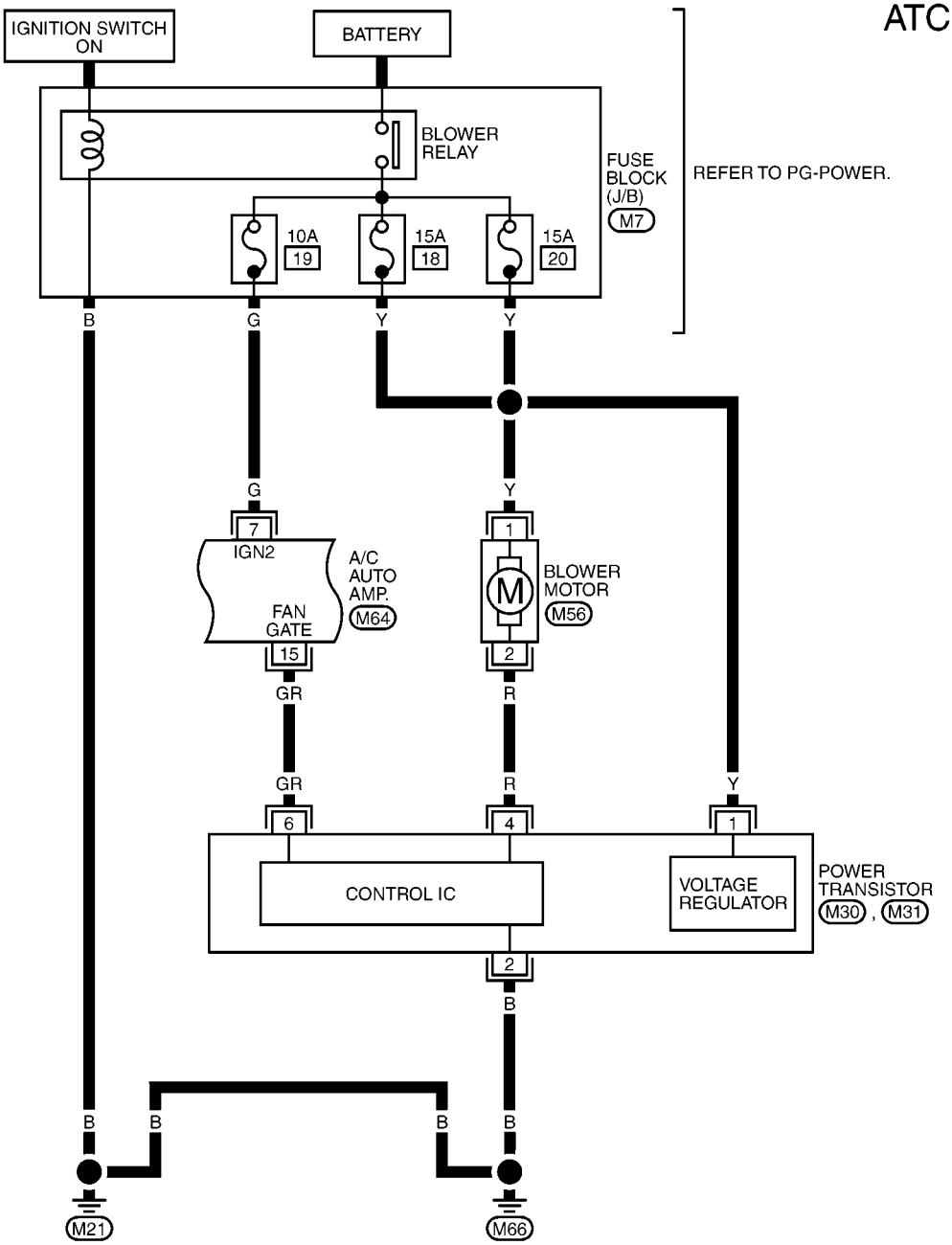


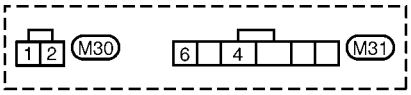


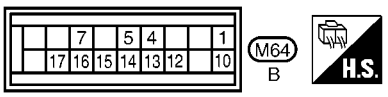
REFER TO THE FOLLOWING.
M1, F1 - SUPER MULTIPLE JUNCTION (SMJ)

MJWA0279E

ATC-A/C-07

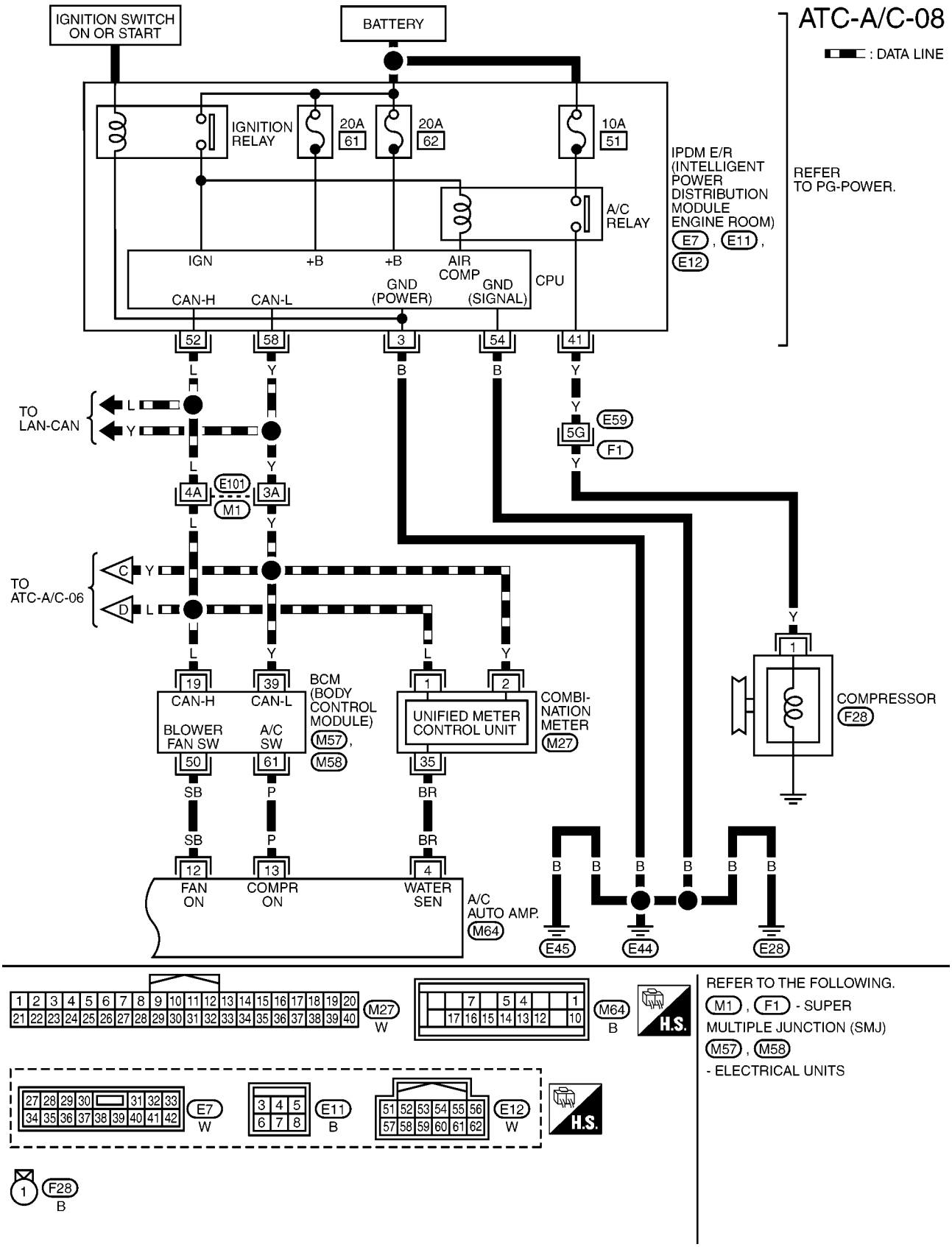






REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

MJWA0280E

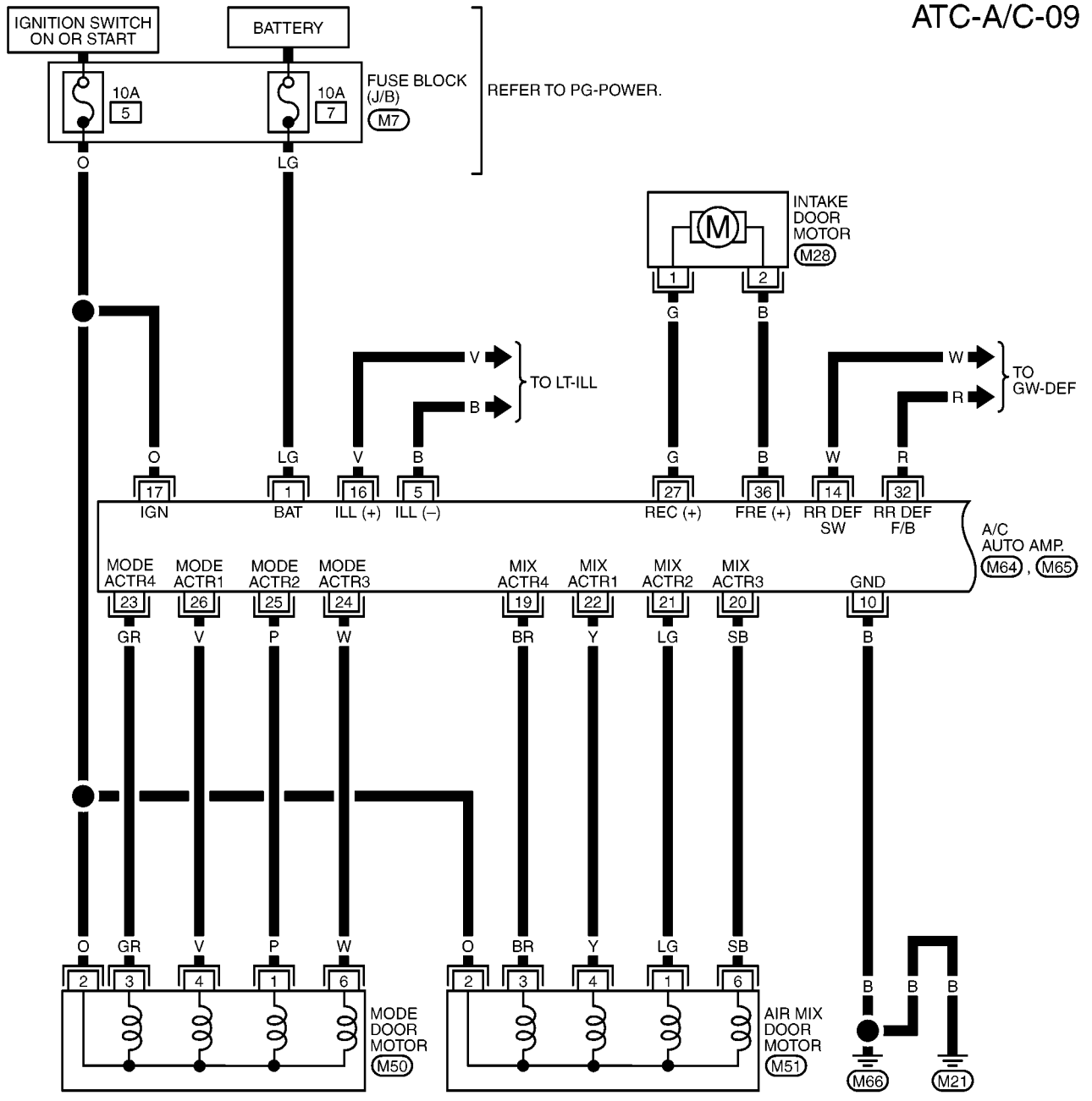

ATC-A/C-08
: DATA LINE
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
20A 61
20A 62
10A 51
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E7, E11, E12
REFER TO PG-POWER.
IGN
+B
+B
AIR COMP
GND (POWER)
GND (SIGNAL)
CPU
CAN-H
CAN-L
52
58
3
54
41
TO LAN-CAN
E59
5G
F1
E101
M1
4A
3A
TO ATC-A/C-06
19
39
BCM (BODY CONTROL MODULE) M57, M58
CAN-H
CAN-L
BLOWER FAN SW
A/C SW
50
61
1
2
UNIFIED METER CONTROL UNIT
COMBI-NATION METER M27
35
COMPRESSOR F28
SB
P
BR
12
13
4
FAN ON
COMPR ON
WATER SEN
A/C AUTO AMP. M64
E45
E44
E28
M27 W
M64 B
H.S.
E7 W
E11 B
E12 W
F28 B
REFER TO THE FOLLOWING.
M1, F1 - SUPER MULTIPLE JUNCTION (SMJ)
M57, M58
- ELECTRICAL UNITS

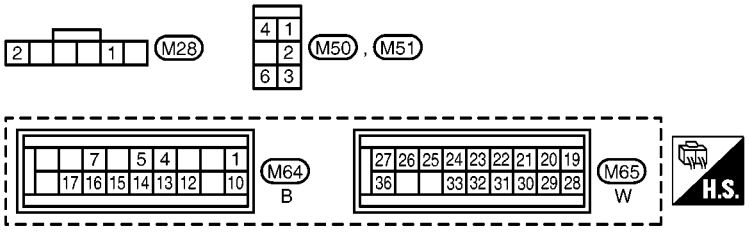
MJWA0281E

Wiring Diagram —A/C— K9K Engine Models

BJS000EZ

ATC-A/C-09

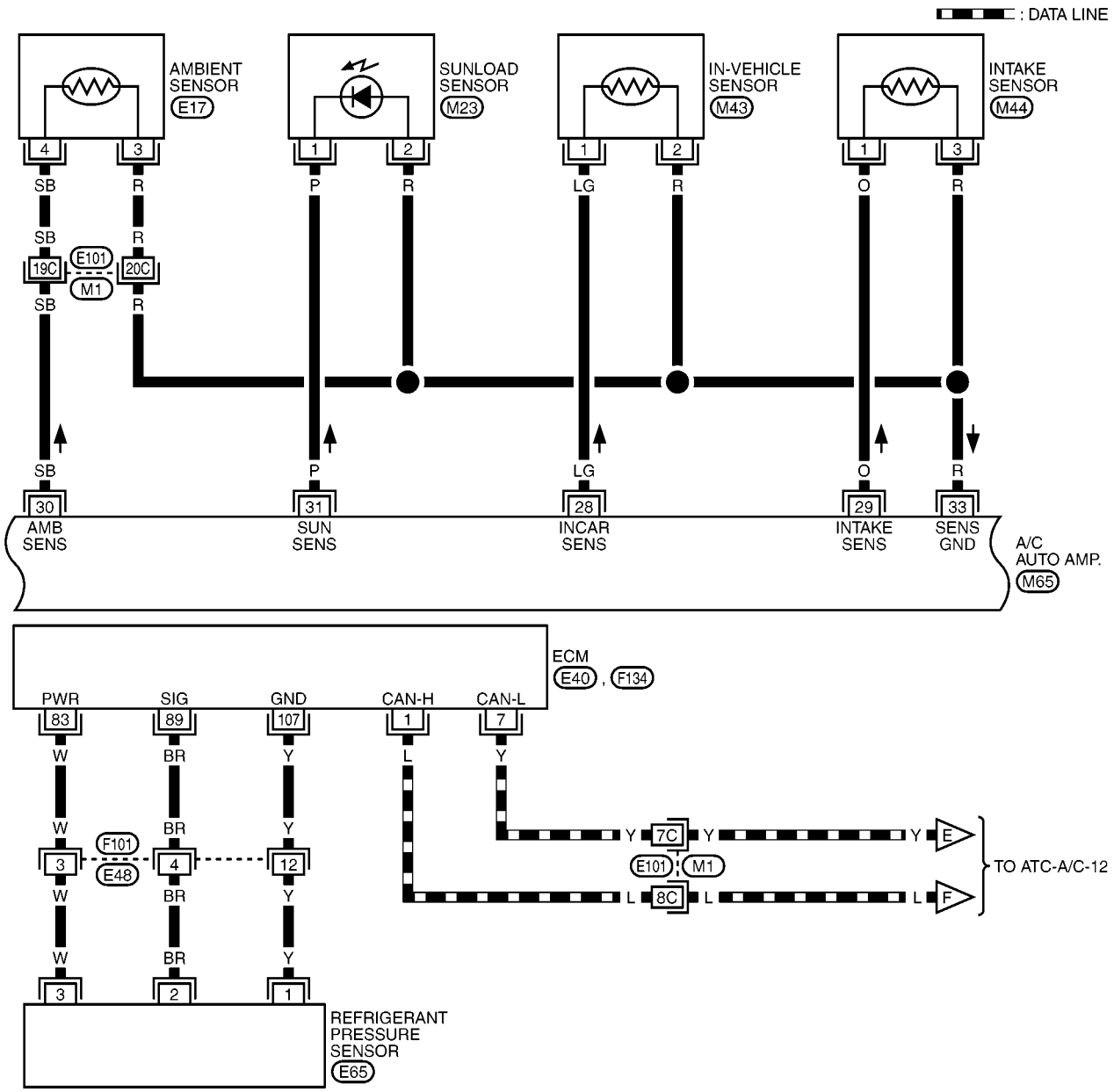




REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

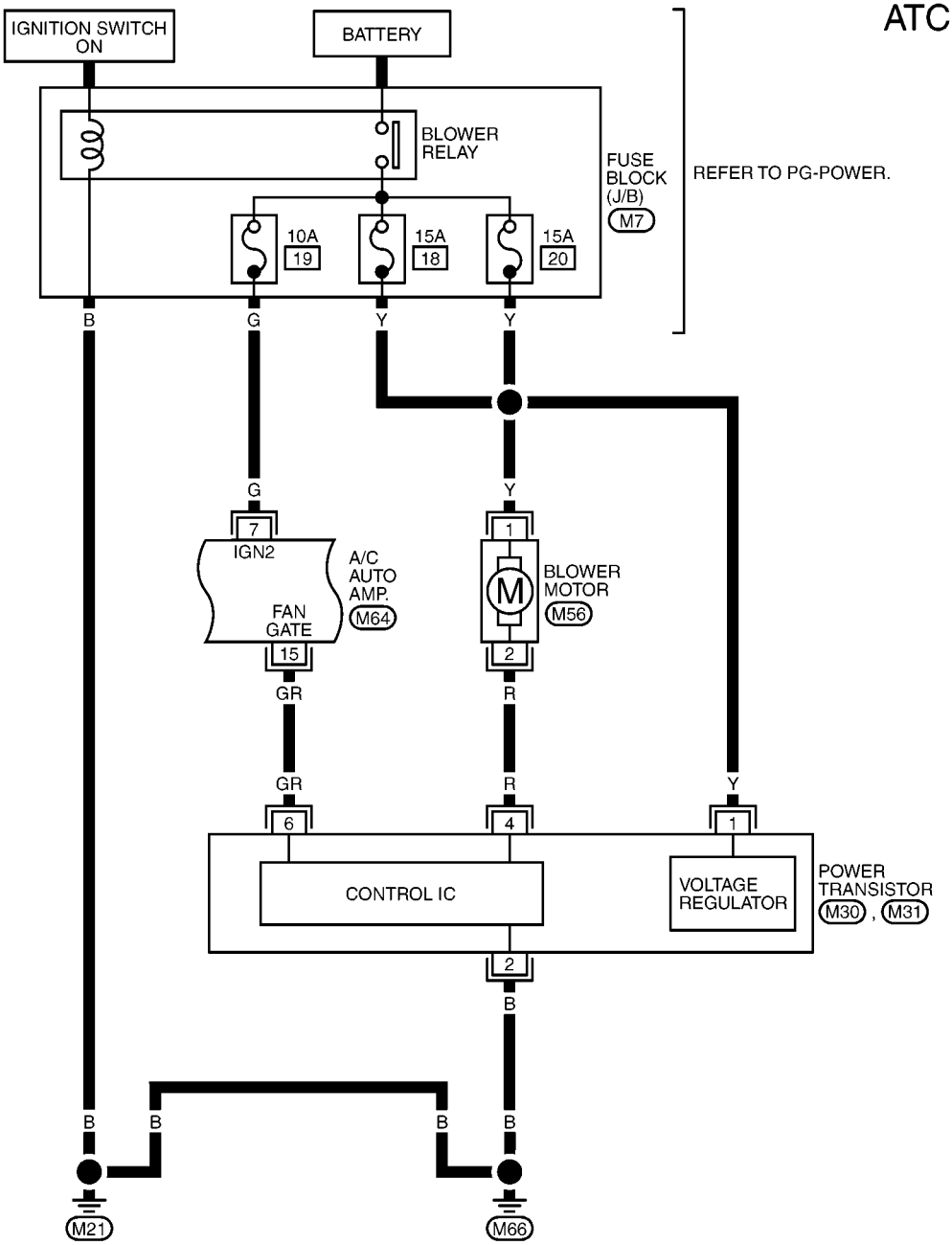
MJWA0282E

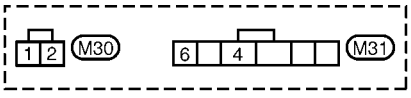
ATC-A/C-10

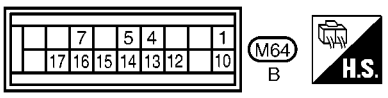


REFER TO THE FOLLOWING.
M1, F101 - SUPER MULTIPLE JUNCTION (SMJ)
E40, F134 - ELECTRICAL UNITS

MJWA0283E

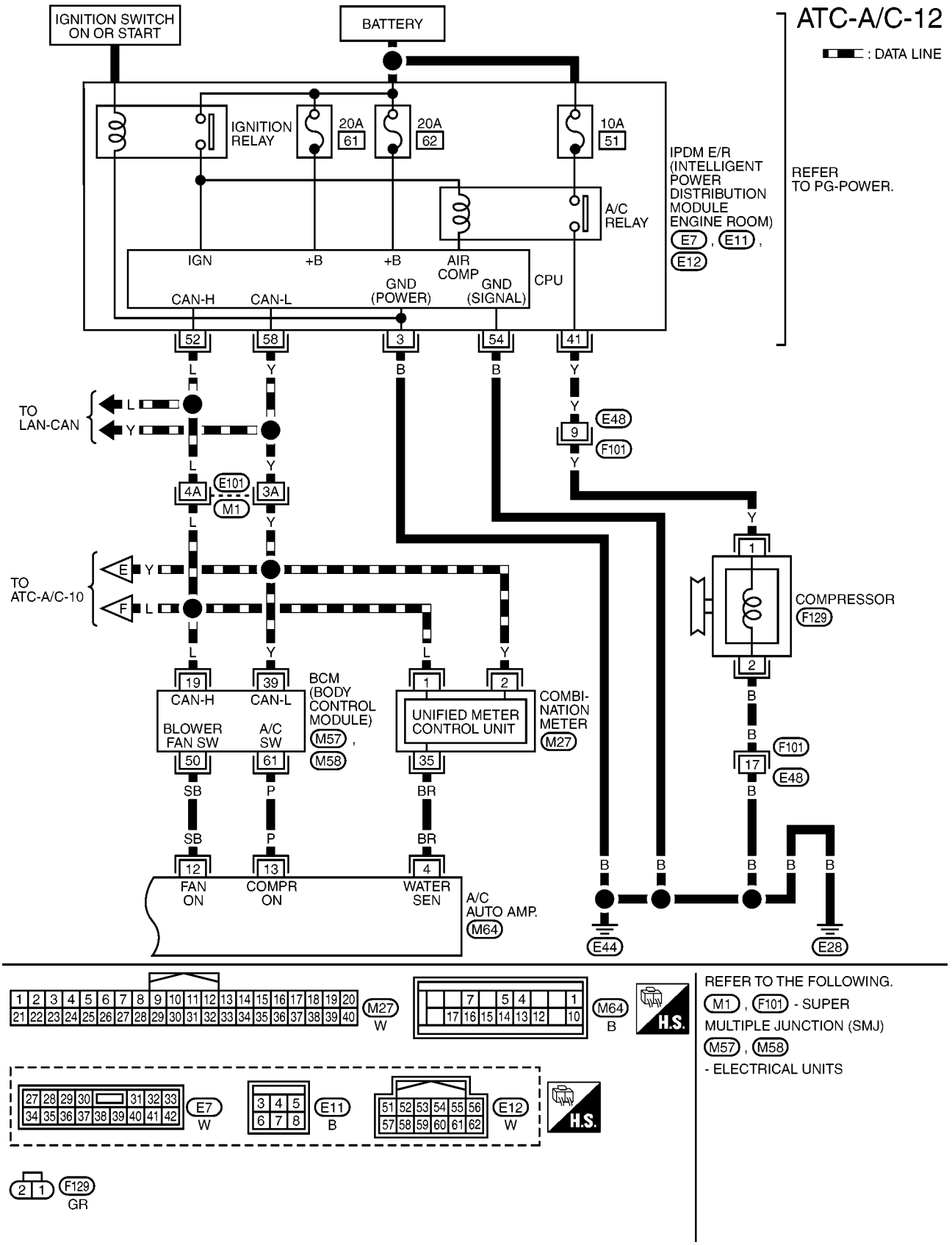






REFER TO THE FOLLOWING.
M7 - FUSE BLOCK - JUNCTION BOX (J/B)

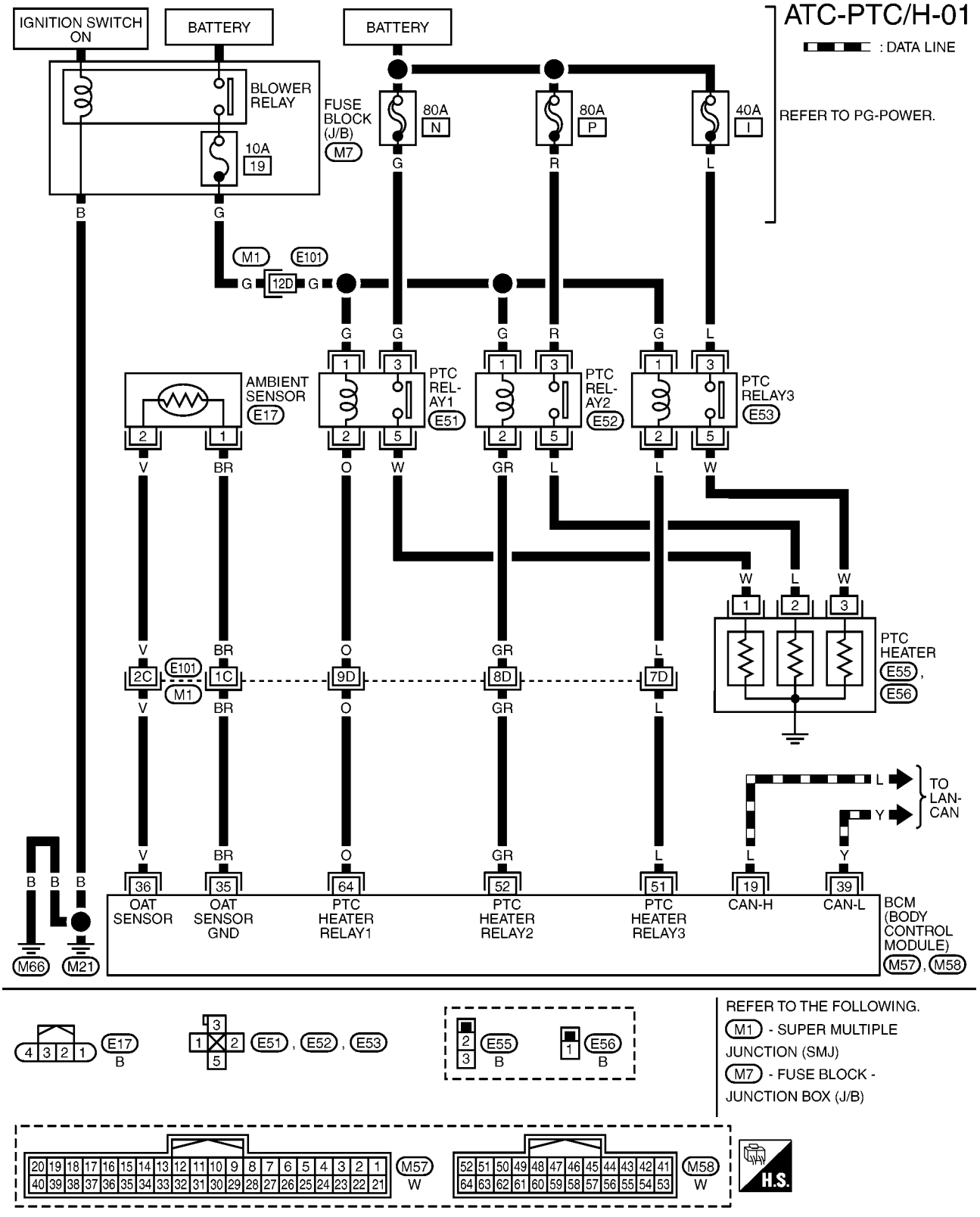
MJWA0284E


ATC-A/C-12
: DATA LINE
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
20A 61
20A 62
10A 51
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E7, E11, E12
REFER TO PG-POWER.
IGN
+B
+B
AIR COMP
GND (POWER)
GND (SIGNAL)
CPU
CAN-H
CAN-L
52
58
3
54
41
TO LAN-CAN
E48
9
F101
E101
M1
4A
3A
TO ATC-A/C-10
E
F
COMPRESSOR F129
19
39
1
2
BCM (BODY CONTROL MODULE) M57, M58
BLOWER FAN SW
A/C SW
UNIFIED METER CONTROL UNIT
COMBI-NATION METER M27
50
61
35
17
SB
P
BR
12
13
4
FAN ON
COMPR ON
WATER SEN
A/C AUTO AMP. M64
E44
E28
M27 W
M64 B
H.S.
E7 W
E11 B
E12 W
F129 GR
REFER TO THE FOLLOWING.
M1, F101 - SUPER MULTIPLE JUNCTION (SMJ)
M57, M58
- ELECTRICAL UNITS

MJWA0285E

Wiring Diagram —PTC/H— K9K Engine LHD Models

BJS000F0



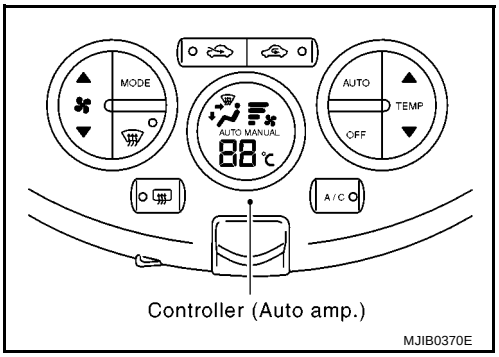
MJWA0286E

PTC heater function is intended to improve the heating performance with CTP electrical system for air heating system which is broken down into several stages controlled by relays.

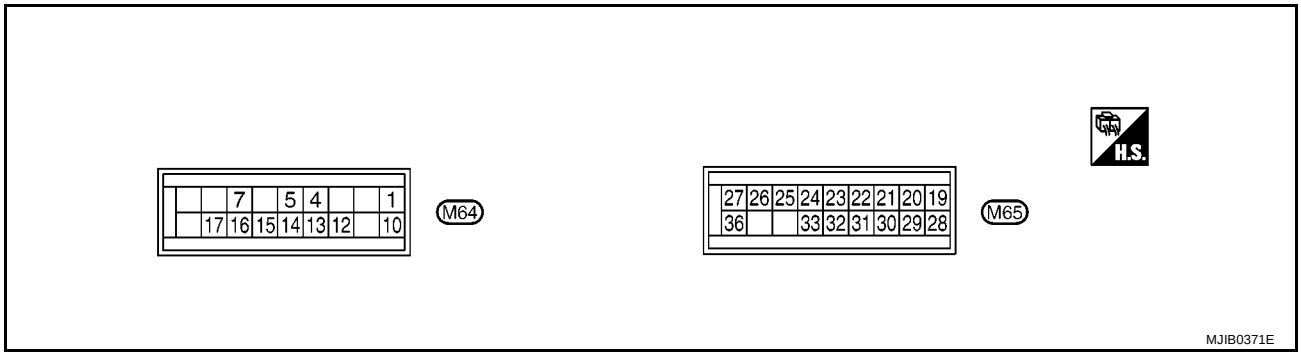
Auto Amp. Terminals and Reference Value

BJS000BB

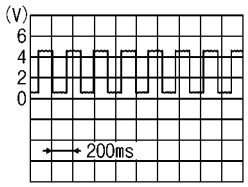
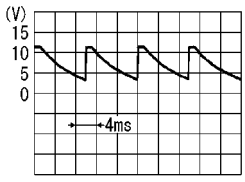
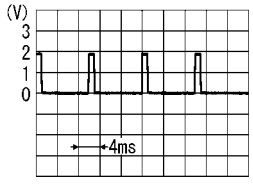
Measure voltage between each terminal and ground by following terminals and reference value for auto amp.

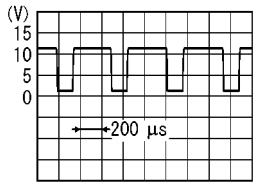
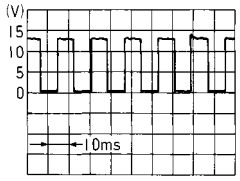
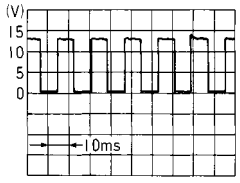


PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR AUTO AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	LG	Power supply for BAT	OFF	-	Battery voltage
4	BR	Engine coolant temperature sensor signal	ON	At idle (after warming up, approx. 80°C) **CAUTION:** **The wave forms vary depending on coolant temperature.**	 SKIB3651J
5	B	Illumination ground	ON	-	Approx. 0
7	G	Power supply for IGN 2	OFF	-	Battery voltage
10	B	Ground	ON	-	Approx. 0
12	SB	FAN ON signal	ON	FAN speed: 1st step (manual)	 ZJIA0583J
13	P	Compressor ON signal	ON	A/C switch: ON (Blower motor operates.)	 ZJIA0584J

Terminal No.	Wire color	Item	Ignition switch	Condition		Voltage (V)
14	W	Rear window defogger ON signal	ON	When rear window defogger switch is depressed.		Approx. 0
				When rear window defogger switch is released.		Approx. 5
15	GR	Blower PWM	ON	FAN speed: 1st step (manual)		 ZJIA0863J
16	V	Illumination signal	ON	Light switch: ON		Approx. 12
				Light switch: OFF		Approx. 0
17	O	Power supply for IGN 1	ON	-		Battery voltage
19	BR	Air mix door motor drive signal	ON	Immediately after temperature adjustment switch operation		 HAK0627D
20	SB					
21	LG					
22	Y					
23	GR	Mode door motor drive signal	ON	Immediately after mode switch operation		 HAK0627D
24	W					
25	P					
26	V					
27	G	Intake door motor drive signal	ON	REC or FRE switch	REC→FRE	Approx. 0
					FRE→REC	Approx. 12
28	LG	In-vehicle sensor	-	-		-
29	O	Intake sensor	-	-		-
30	SB	Ambient sensor	-	-		-
31	P	Sunload sensor	-	-		-
32	R	Rear window defogger feedback signal	ON	Rear window defogger: ON		Approx. 12
				Rear window defogger: OFF		Approx. 0
33	R	Sensor ground	ON	-		Approx. 0
36	B	Intake door motor drive signal	ON	REC or FRE switch	REC→FRE	Approx. 12
					FRE→REC	Approx. 0

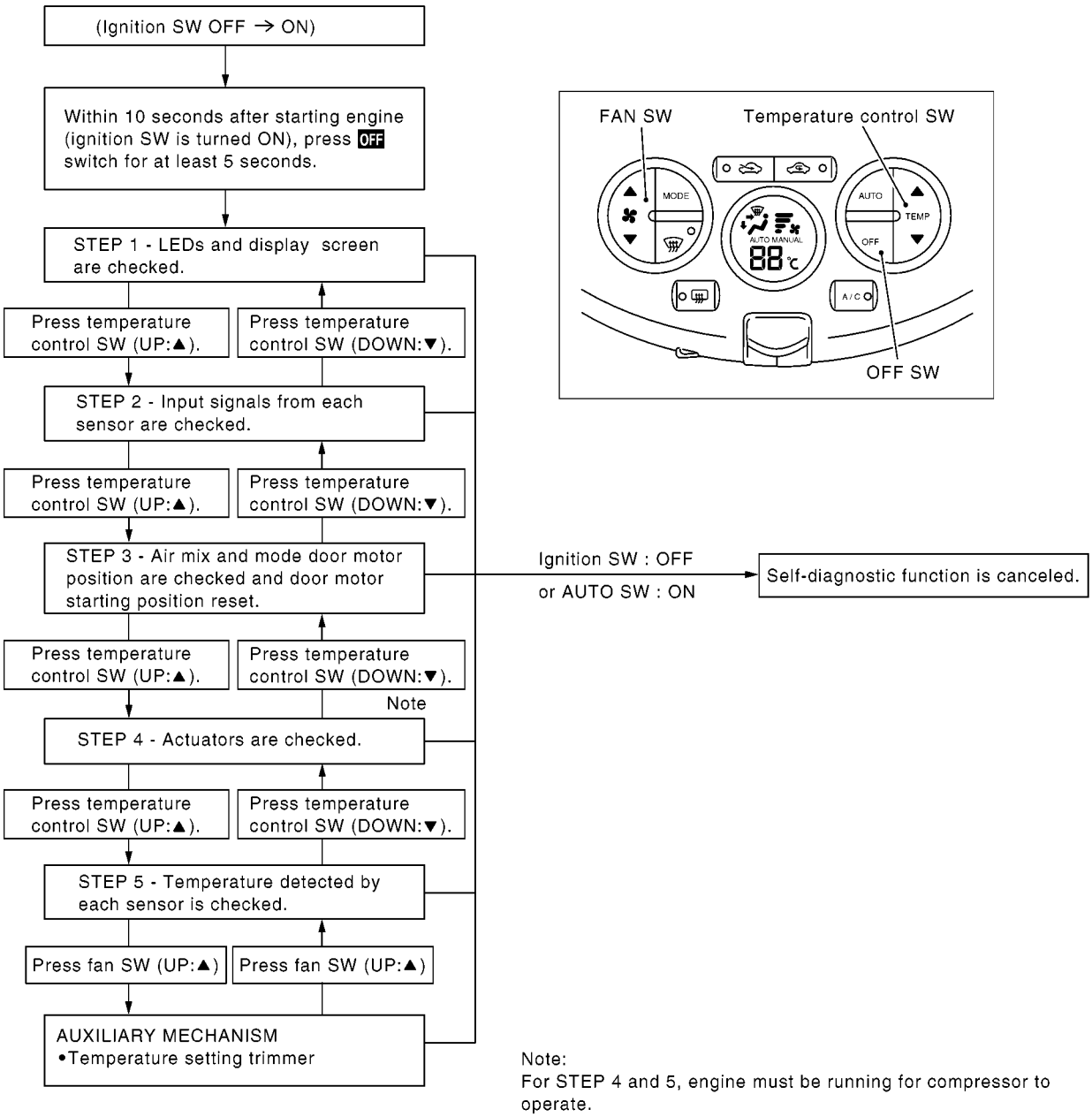
Self-diagnosis Function

BJS000BC

DESCRIPTION

The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from usual control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing AUTO switch or turning the ignition switch OFF. Shifting from one step to another is accomplished by means of pushing temperature control switch, as required.

Additionally shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pushing fan switch (UP:▲).



Note:
For STEP 4 and 5, engine must be running for compressor to operate.

MJIB0372E

FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSTIC MODE

1. Turn ignition switch ON.
2. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press OFF switch for at least 5 seconds.

CAUTION:
If battery voltage drops below 12V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is usual. To avoid this, start engine before performing this diagnosis.

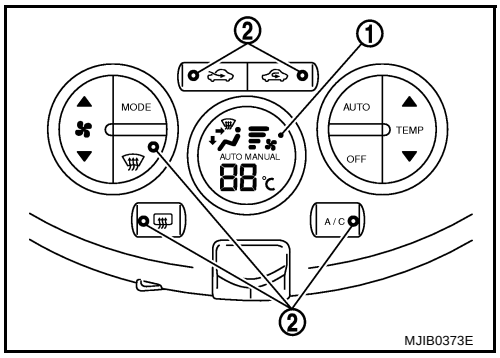
>> GO TO 2.

2. STEP-1: LED AND DISPLAY ARE CHECKED

Check display screen (1) and LED illumination (2).

OK or NG

OK >> GO TO 3.
NG >> Malfunction OFF switch or AUTO amp. Refer to ATC-97, "Self-diagnosis" .



3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

Press temperature control switch (UP: ▲).

Advance to self-diagnosis STEP-2?

YES >> GO TO 4.
NO >> Replace auto amp. (Temperature control switch is malfunctioning.)

4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Press temperature control switch (DOWN: ▼).

Return to self-diagnosis STEP-1?

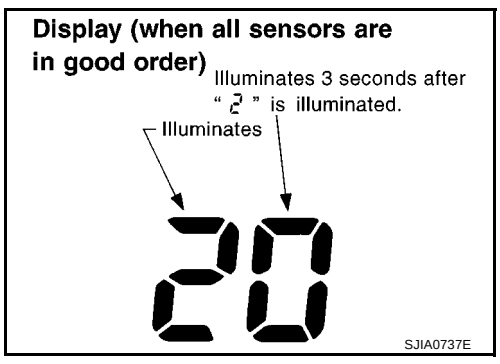
YES >> GO TO 5.
NO >> Replace auto amp. (Temperature control switch is malfunctioning.)

5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

Press temperature control switch (UP: ▲).

Does code No. 20 appear on the display?

YES >> GO TO 6.
NO >> GO TO 13.

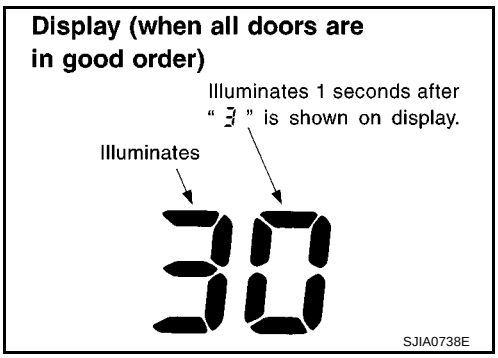


6. STEP-3: AIR MIX DOOR AND MODE DOOR POSITIONS ARE CHECKED

Press temperature control switch (UP: ▲).

Does code No. 30 appear on the display?

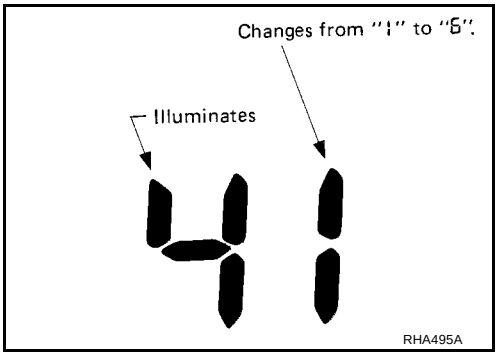
YES >> GO TO 7.
NO >> GO TO 14.



7. STEP-4: OPERATION OF EACH DOOR MOTOR IS CHECKED

1. Press temperature control switch (UP: ▲).
2. Press (DEF) switch. Code No. of each door motor test is indicated on the display.

>> GO TO 8.



8. CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage, compressor, ionizer and indicator (ION mode) operation.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	80%	5%	15%
	55%	30%	15%
	21%	60%	19%
	16%	35%	49%
	15%	5%	80%

MJIB0374E

Code No.	41	42	43	44	45	46
Mode door position	VENT	B/L 1	B/L 2	FOOT	D/F	DEF
Intake door position	REC	REC	FRE	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	50%	50%	FULL HOT	FULL HOT
Blower motor voltage	5V	10.5V	8.5V	8.5V	8.5V	Battery voltage
Compressor	ON	ON	ON	OFF	OFF	ON
Fan ON signal	12V	12V	12V	1V	1V	12V

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

OK or NG

OK >> GO TO 9.

NG >>
- Air outlet does not change.
  Go to Mode Door Motor Circuit. Refer to ATC-60, "Mode Door Motor Circuit" .
- Intake door does not change.
  Go to Intake Door Motor Circuit. Refer to ATC-68, "Intake Door Motor Circuit" .
- Blower motor operation is malfunctioning.
  Go to Blower Motor Circuit. Refer to ATC-71, "Blower Motor Circuit" .
- Magnet clutch does not engage.
  Go to Magnet Clutch Circuit. Refer to ATC-78, "Magnet Clutch Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-64, "Air Mix Door Motor Circuit" .

9. STEP-5: TEMPERATURE OF EACH SENSOR IS CHECKED

1. Press temperature control switch (UP: ▲).
2. Code No. 5 appears on the display.

>> GO TO 10.

10. CHECK AMBIENT SENSOR

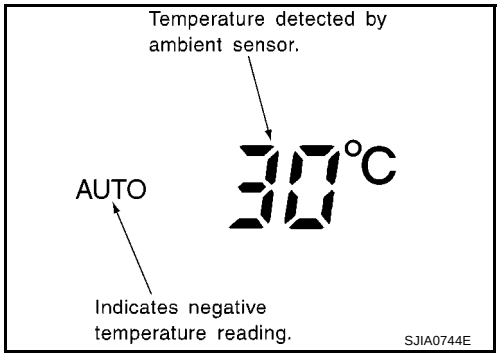
Press (DEF) switch one time. Temperature detected by ambient sensor is indicated on the display.

NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.

OK or NG

OK >> GO TO 11.

NG >> Go to Ambient Sensor Circuit. Refer to ATC-99, "Ambient Sensor Circuit" .



11. CHECK IN-VEHICLE SENSOR

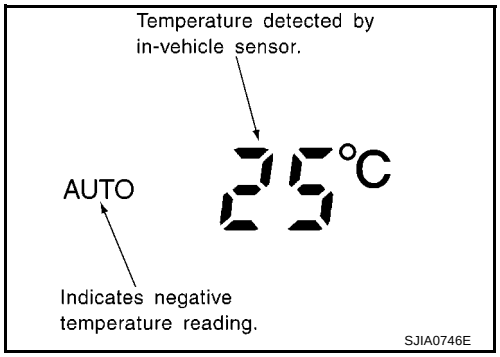
Press (DEF) switch second time. Temperature detected by in-vehicle sensor is indicated on the display.

NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.

OK or NG

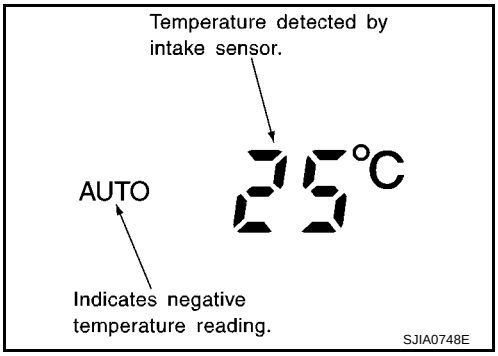
OK >> GO TO 12.

NG >> Go to In-vehicle Sensor Circuit. Refer to ATC-102, "In-vehicle Sensor Circuit" .



12. CHECK INTAKE SENSOR

Press (DEF) switch third time. Temperature detected by intake sensor is indicated on the display.



NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.

OK or NG

OK >> 1. Turn ignition switch OFF or AUTO switch ON.
2. INSPECTION END

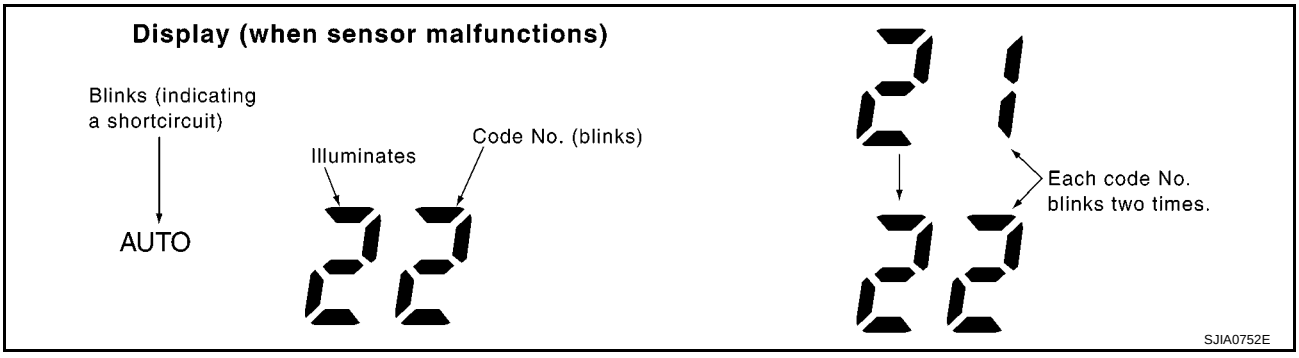
NG >> Go to Intake Sensor Circuit. Refer to ATC-108, "Intake Sensor Circuit" .

13. CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code No. blink respectively twice.)
*1: Perform self-diagnosis STEP-2 under sunshine.
When performing indoors, aim a light (more than 60W) at sunload sensor, otherwise code No.25 will indicate despite that sunload sensor is functioning properly.

Code No.	Malfunctioning sensor (Including circuits)	Reference page
21 / AUTO 21	Ambient sensor	*2
22 / AUTO 22	In-vehicle sensor	*3
24 / AUTO 24	Intake sensor	*4
25 / AUTO 25	Sunload sensor *1	*5
26 / AUTO 26	Intake door motor PBR	*6

*2: ATC-99, "DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-102, "DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-108, "DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR" .
*5: ATC-105, "DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR" .
*6: ATC-70, "DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR" .



>> INSPECTION END

14. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Air mix and/or mode door motor is/are malfunctioning.

Door motor corresponding to the DTC

Code No.*1 *2	31, 32, 33, 34	35, 36, 37, 38
Corresponding door motor	Air mix door	Mode door

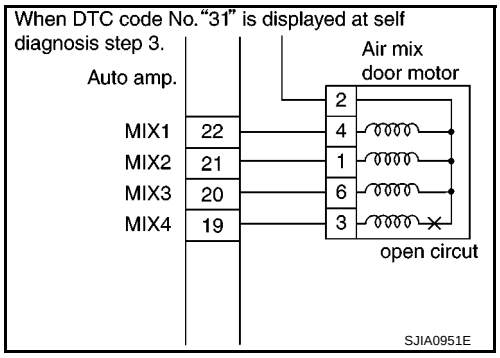
DTC for an inoperative harness

Corresponding door motor	Air mix door motor				Mode door motor			
Corresponding terminal (Door motor side)	3	4	1	6	3	4	1	6
Corresponding terminal (Auto amp. side)	19	22	21	20	23	26	25	24
Code number for short circuit	AUTO31	AUTO32	AUTO33	AUTO34	AUTO35	AUTO36	AUTO37	AUTO38
Code number for open circuit	31	32	33	34	35	36	37	38
Reference Page	*3				*4			

(If two or more air mix or mode doors are out of order, corresponding code numbers blink respectively twice.)
*1: If air mix door motor harness connector is disconnected, the following display pattern will appear.
31→32→33→34→Return to 31
*2: If mode door motor harness connector is disconnected, the following display pattern will appear.
35→36→37→38→Return to 35
*3: ATC-64, "Air Mix Door Motor Circuit" .
*4: ATC-60, "Mode Door Motor Circuit" .

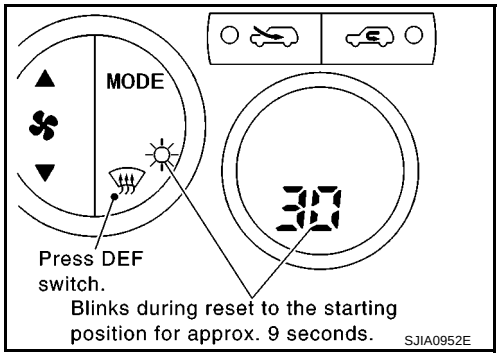
NOTE:

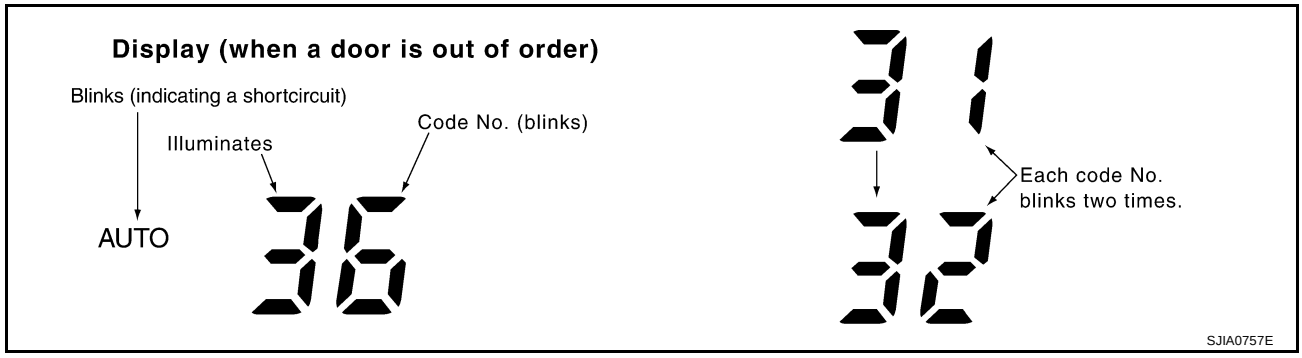
- If all four terminals of each door motor show an open circuit, there is probably a disconnected connector or an open circuit in actuator drive power supply harness.
- If a short circuit occurs in the harness between terminal for each door motor and drive signal, although it cannot be detected by self-diagnosis, the door motor will vibrate when it operate.



Door Motor Starting Position Reset

- Pressing the DEF switch during STEP-3 will send a reset signal to air mix door and mode door motor to reset them to the starting position.
  During reset: The 30 and DEF switch LED will blinks. (For approx. 9 seconds)



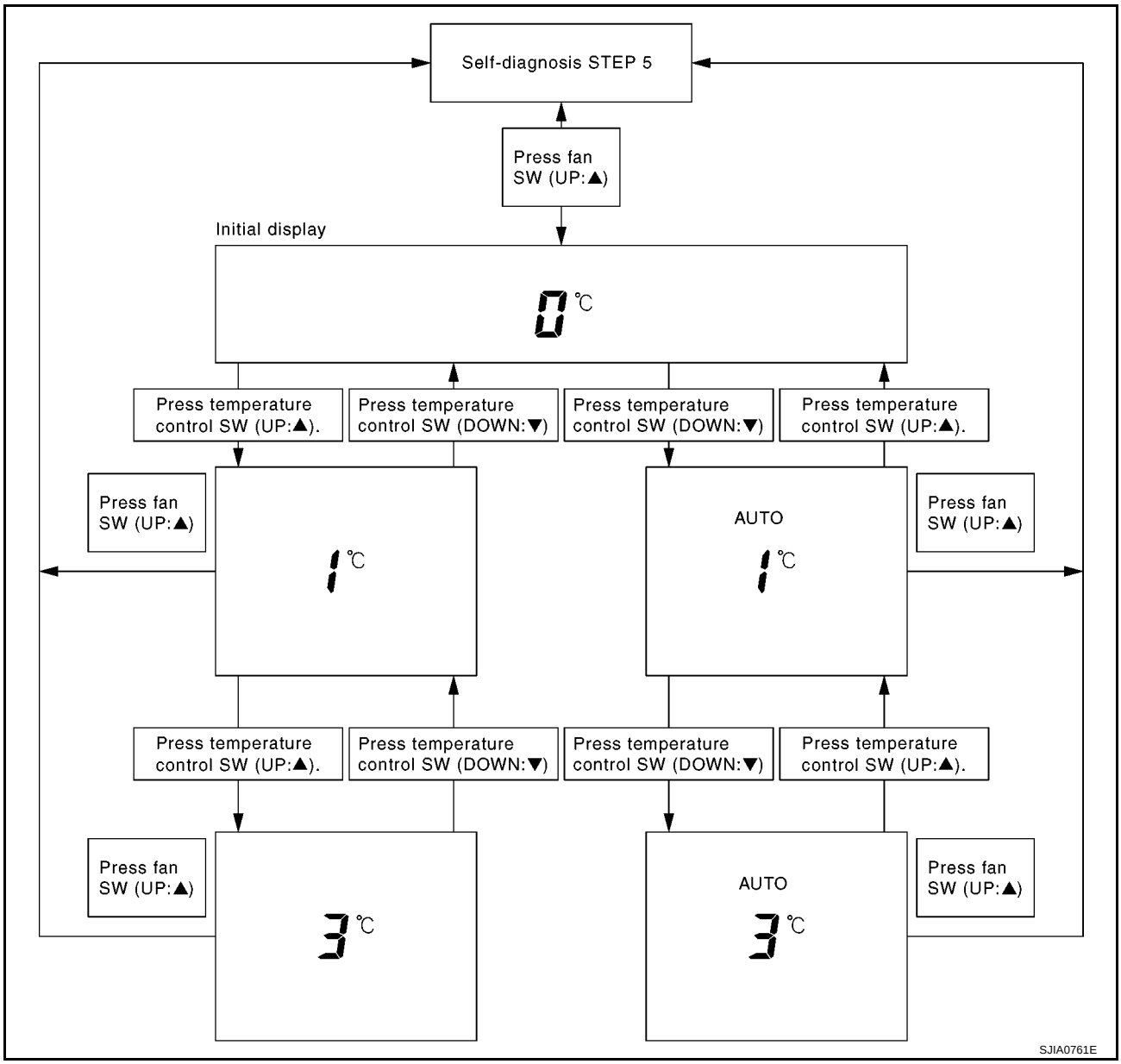


>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C between temperature setting (displayed digitally) and temperature felt by driver.
Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to ATC-46, "Self-diagnosis Function" .
2. Press fan switch (UP:▲) to set system in auxiliary mode.
3. Display shows 0°C in auxiliary mechanism.
4. Press temperature control switch as desired. Temperature will change at a rate of 1°C each time a switch is pressed.



When battery cable is disconnected or battery voltage is 9.0V or less, trimmer operation is canceled. Set temperature returns to the initial condition, i.e. 0°C.

Operational Check

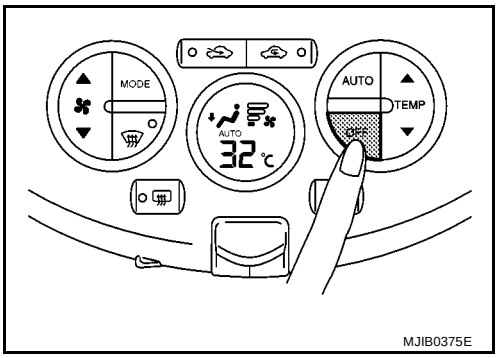
BJS000BD

The purpose of the operational check is to confirm that the system operates properly.

Conditions : Engine running at usual operating temperature

CHECKING MEMORY FUNCTION

1. Press temperature control switch (UP:▲) until 32°C is displayed.
2. Press OFF switch.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

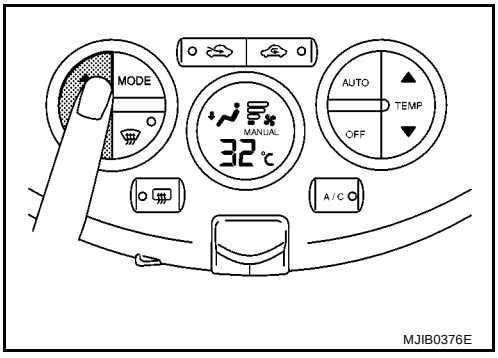


MJIB0375E

If NG, go to trouble diagnosis procedure for ATC-98, "Memory Function" .
If OK, continue the check.

CHECKING BLOWER

1. Press fan switch (UP:▲). Blower should operate on low speed. The fan symbol should have one blade lit.
2. Press fan switch (UP:▲), and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on max. speed.

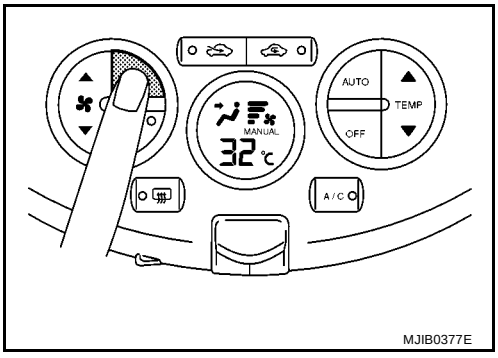


MJIB0376E

If NG, go to trouble diagnosis procedure for ATC-71, "Blower Motor Circuit" .
If OK, continue the check.

CHECKING DISCHARGE AIR

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.



MJIB0377E

3. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-24, "Discharge Air Flow" .

Intake door position is checked in the next step.
If NG, go to trouble diagnosis procedure for ATC-60, "Mode Door Motor Circuit" .
If OK, continue the check.

NOTE:
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when the DEF is selected.

Discharge air flow

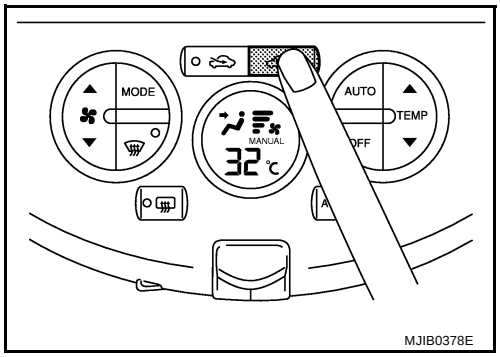
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	80%	5%	15%
	55%	30%	15%
	21%	60%	19%
	16%	35%	49%
	15%	5%	80%

MJIB0374E

CHECKING RECIRCULATION

1. Press recirculation (REC) switch one time. Recirculation LED should illuminate.
2. Press fresh (FRE) switch one time. Fresh LED should illuminate.
3. Listen for intake door position change (you should hear blower sound change slightly).

If NG, go to trouble diagnosis procedure for ATC-68, "Intake Door Motor Circuit" .
If OK, continue the check.

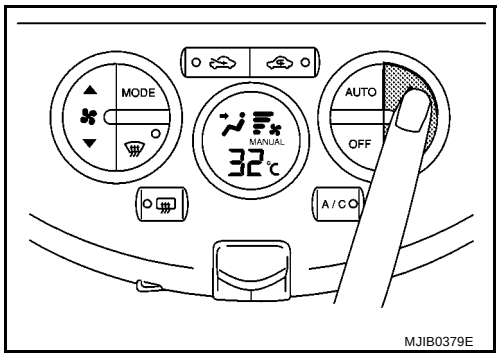


MJIB0378E

CHECKING TEMPERATURE INCREASE

1. Press temperature control switch (UP:▲) until 32°C is displayed.
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-94, "Insufficient Heating" .
If OK, continue the check.

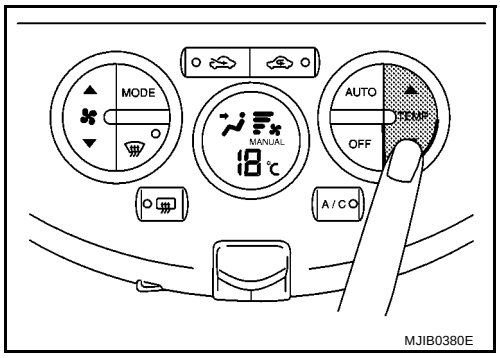


MJIB0379E

CHECKING TEMPERATURE DECREASE

1. Press temperature control switch (DOWN:▼) until 18°C is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-86, "Insufficient Cooling" .
If OK, continue the check.

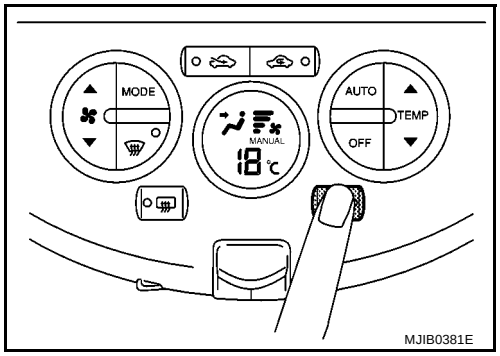


MJIB0380E

CHECK A/C SWITCH

1. Press AUTO and A/C switches.
2. A/C switch LED will turn ON.
   - Confirm that the compressor clutch engages (sound or visual inspection).

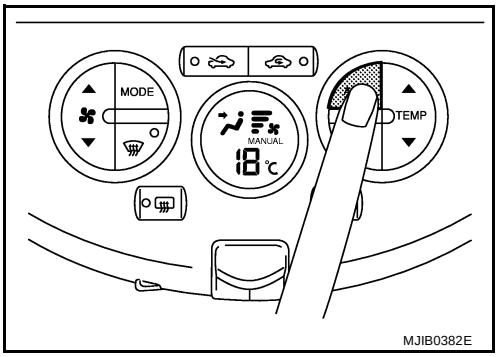
If NG, go to trouble diagnosis procedure for ATC-78, "Magnet Clutch Circuit" .
If OK, continue the check.



MJIB0381E

CHECKING AUTO MODE

1. Press AUTO switch.
2. Display should indicate AUTO.
   - Confirm that discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.



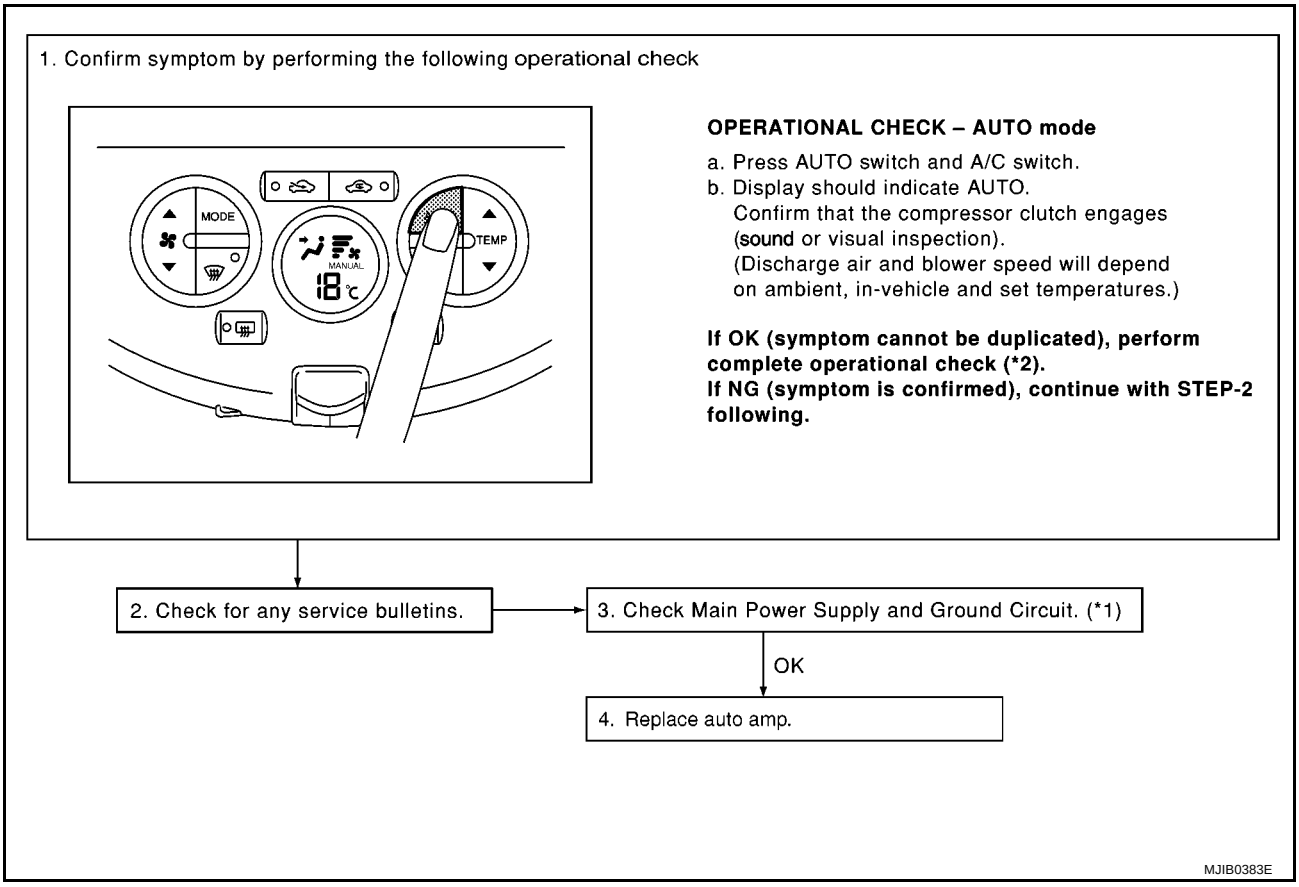
- If NG, go to trouble diagnosis procedure for ATC-57, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-78, "Magnet Clutch Circuit" .
- If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment.
- If symptom appears, refer to ATC-27, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.

Power Supply and Ground Circuit for Auto Amp.

BJS000BE

SYMPTOM: A/C system does not come on.

INSPECTION FLOW



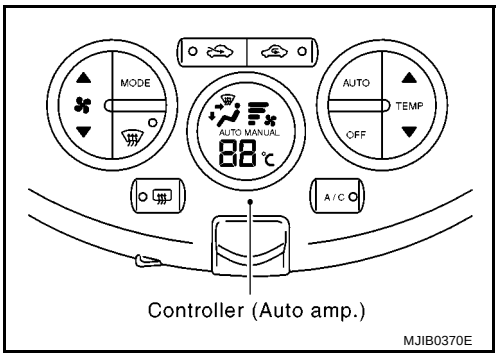
*1 ATC-58, "DIAGNOSTIC PROCEDURE FOR A/C SYSTEM"

*2 ATC-55, "Operational Check"

COMPONENT DESCRIPTION

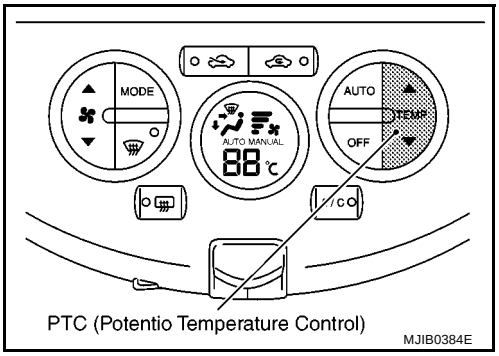
Auto Amp. (Automatic Amplifier)

The auto amp. has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.
The auto amp. is unitized with control mechanisms. Signal from various switches and Potentio Temperature Control (PTC) are directly entered into auto amp.
Self-diagnostic functions are also built into auto amp. to provide quick check of malfunctions in the auto air conditioner system.



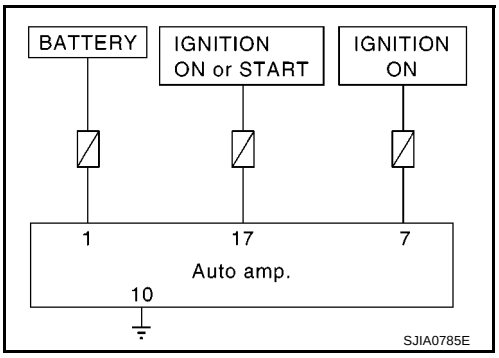
Potentio Temperature Control (PTC)

The PTC is built into the auto amp. It can be set at an interval of 1°C in the 18°C to 32°C temperature range by pressing temperature control switch. The set temperature is displayed.



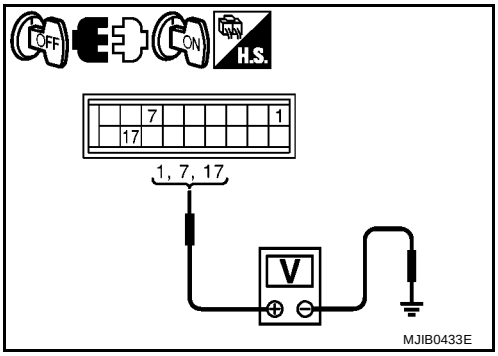
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUIT FOR AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check voltage between auto amp. harness connector and ground.



Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Connector	Terminal				
Auto amp.: M64	1	Ground	Battery voltage	Battery voltage	Battery voltage
	7		Approx. 0V	Approx. 0V	Battery voltage
	17		Approx. 0V	Approx. 0V	Battery voltage

OK or NG

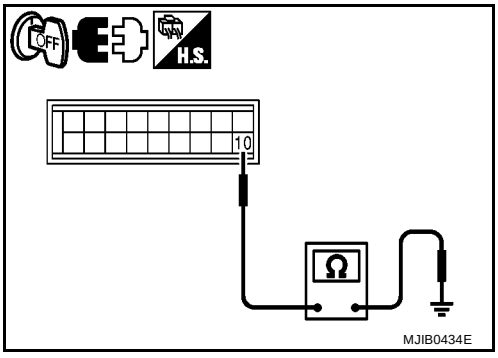
OK >> GO TO 2.

NG >> Check 10A fuses (Nos. 5, 7 and 19, located in the fuse block). Refer to PG-95, "FUSE BLOCK" .

- If fuses are OK, check harness for open circuit. Repair or replace if necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace if necessary.

2. CHECK GROUND CIRCUIT FOR AUTO AMP.

1. Turn ignition switch OFF.
2. Check continuity between auto amp. harness connector and ground.



Connector	Terminal	Ground	Continuity
Auto amp.: M64	10		Yes

OK or NG

OK >> Replace auto amp.

NG >> Repair or replace harness.

Mode Door Motor Circuit

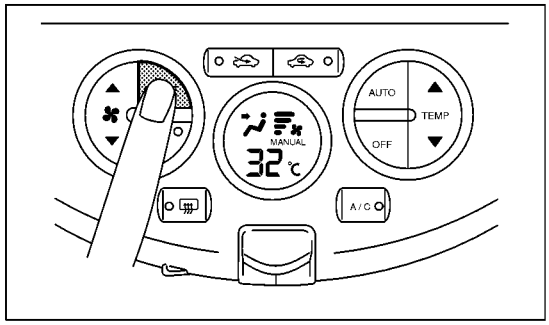
BJS000BF

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

a. Press MODE switch and DEF switch.
b. Each position indicator should change shape.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	80%	5%	15%
	55%	30%	15%
	21%	60%	19%
	16%	35%	49%
	15%	5%	80%

c. Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air Flow” (*1).

If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when DEF is selected.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*3)
4. Perform self-diagnosis STEP-2. (*4)
   - OK → OK
   - NG → Go to appropriate malfunctioning sensor circuit. (*9)
5. Perform self-diagnosis STEP-3. (*4)
   - NG → Check malfunctioning door motor position switch (*10)
6. Perform self-diagnosis STEP-4. (*4)
   - NG → Check mode door control linkage. (*11)
     - NG → Replace mode door motor.
   - OK **[Cause cannot be confirmed by self-diagnosis.]**
7. Check ambient sensor circuit. (*5) — OK
8. Check in-vehicle sensor circuit. (*6) — OK
9. Check sunload sensor circuit. (*7) — OK
10. Check intake sensor circuit. (*13) — OK
11. Check air mix door motor circuit. (*8) — OK

If the symptom still exists, perform a complete operational check (*2) and check for other symptoms.
[Refer to symptom table, (*12).]
Does another symptom exist?

- YES → Go to Trouble Diagnosis for related symptoms. **[Another symptom exists.]**
- NO → Replace auto amp. → INSPECTION END

MJIB0385E

*1 ATC-24, "Discharge Air Flow"
*2 ATC-55, "Operational Check"
*3 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-99, "Ambient Sensor Circuit"
*6 ATC-102, "In-vehicle Sensor Circuit"
*7 ATC-105, "Sunload Sensor Circuit"
*8 ATC-125, "AIR MIX DOOR MOTOR"
*9 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.

*10 ATC-48, "FUNCTION CONFIRMATION PROCEDURE" see No. 14. *11 ATC-126, "MODE DOOR MOTOR" *12 ATC-27, "SYMPTOM TABLE"

*13 ATC-108, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

- Auto amp.
- Mode door motor
- In-vehicle sensor
- Ambient sensor
- Sunload sensor

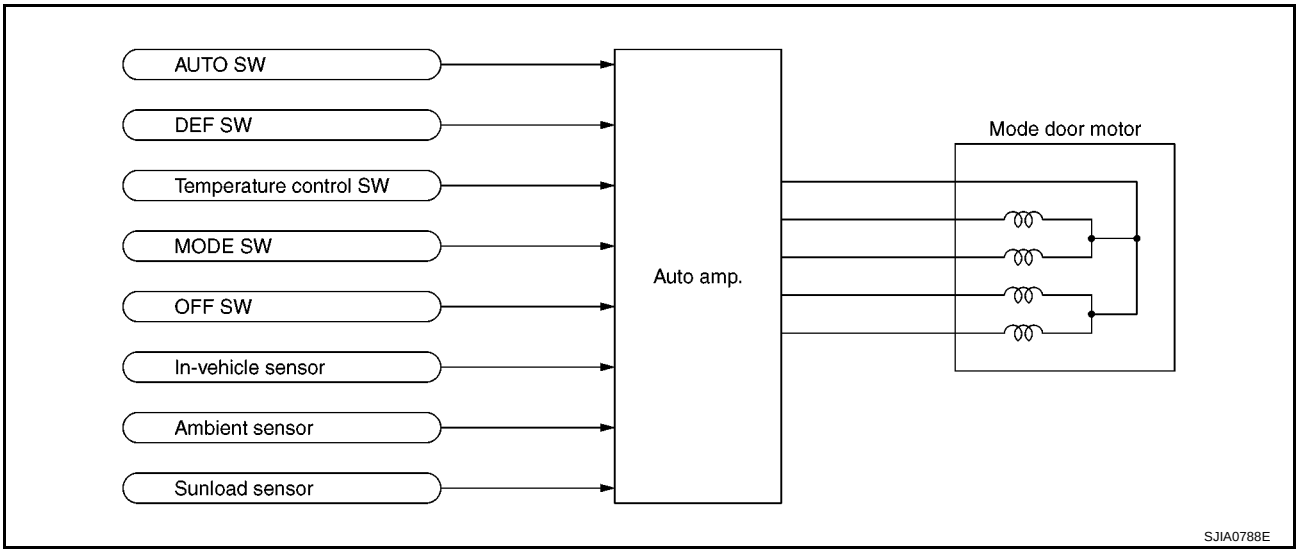
System Operation

The auto amp. receives data from each of the sensors. When a drive signal is input from auto amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the position of target door.

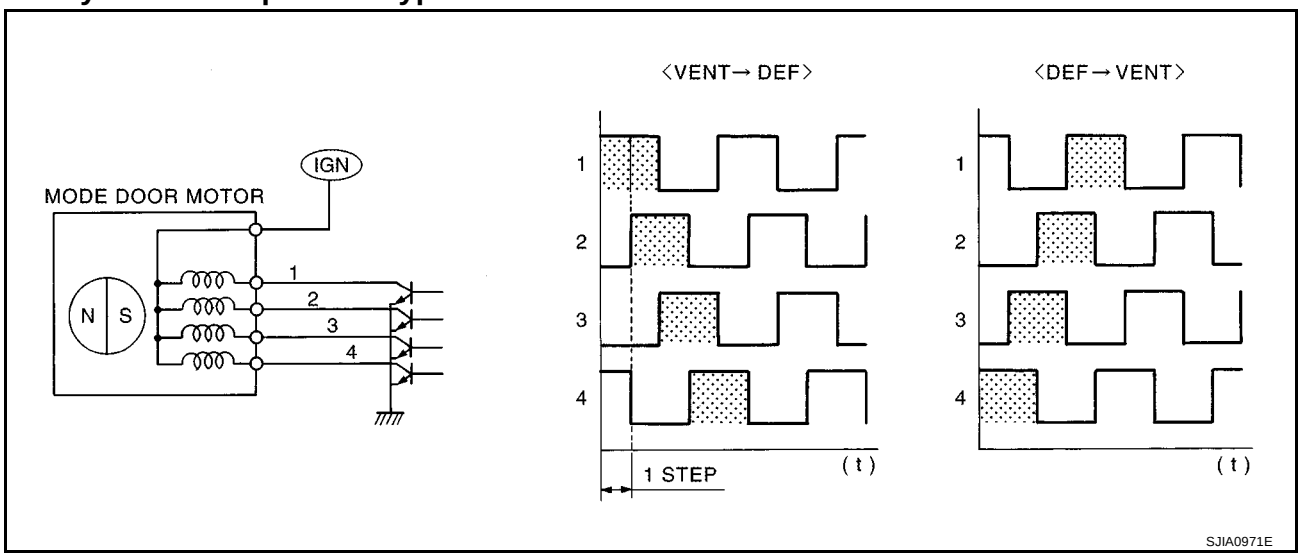
Mode door changes to manual select mode by pressing MODE/DEF switch of the controller. That allows mode door to be fixed.

Pressing AUTO switch allows automatic control by auto amp., and mode door is fixed in the FOOT position by pressing OFF switch.

During automatic operation of mode door, mode door position (VENT, B/L, FOOT) is selected according to the temperature of discharge air calculated by auto amp. based on the target opening angle of air mix door and the amount of sunload. And only when ambient temperature is extremely low with the mode door in the FOOT position, D/F is selected and prevents windshield fogging.

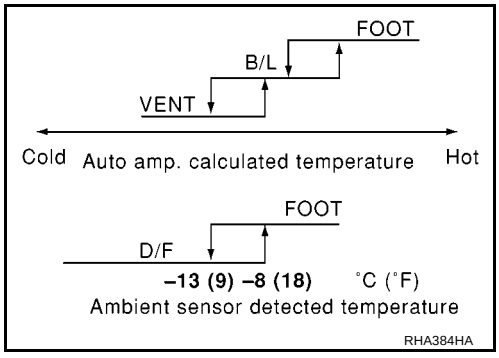


Drive System of Step Motor Type Door Motor



- Motor is actuated in sequence by energizing four drive coils.
- Rotation direction can be changed by changing pattern of excitation.

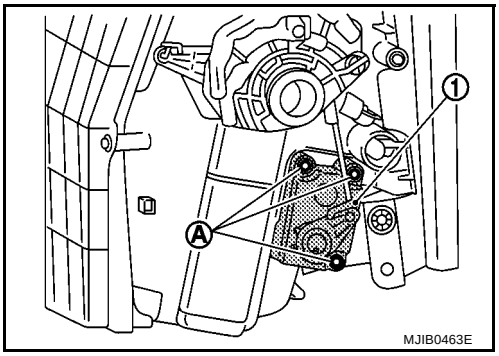
Mode Door Control Specification



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the A/C unit assembly. It rotates so that air is discharged from the outlet set by the auto amp. Motor rotation is conveyed to a link which activates the mode door.

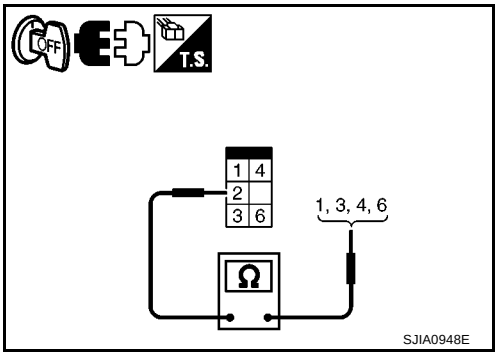


DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR

1. CHECK MODE DOOR MOTOR

1. Turn ignition switch OFF.
2. Disconnect mode door motor connector.
3. Check continuity between mode door motor connector terminal.

Connector	Terminals		Continuity
Mode door motor: M50	2	1	Yes
		3	
		4	
		6	



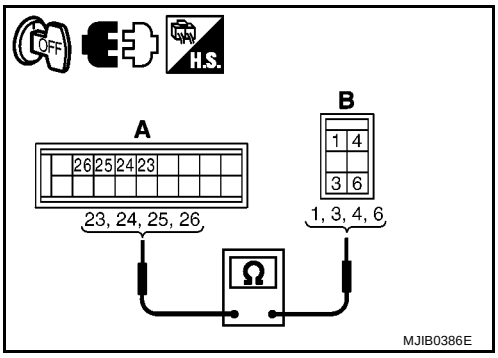
OK or NG

OK >> GO TO 2.
NG >> Replace mode door motor.

2. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND MODE DOOR MOTOR

1. Disconnect auto amp. connector.
2. Check continuity between auto amp. harness connector (A) and mode door motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M65	23	Mode door motor: M50	3	Yes
	24		6	
	25		1	
	26		4	



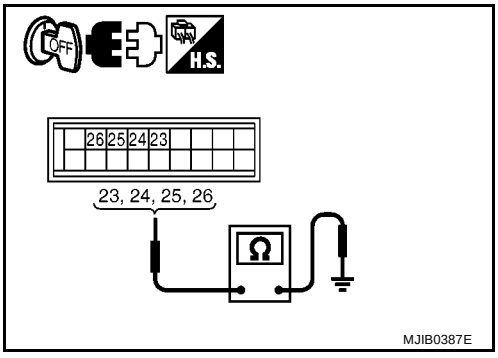
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND GROUND

Check continuity between auto amp. harness connector and ground.

Connector	Terminal		Continuity
Auto amp.: M65	23	Ground	No
	24		
	25		
	26		



OK or NG

OK >> Replace auto amp.
NG >> Repair harness or connector.

Air Mix Door Motor Circuit

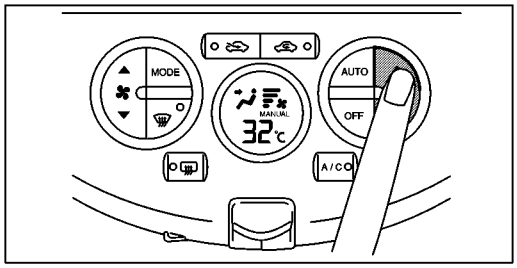
BJS000BG

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

INSPECTION FLOW

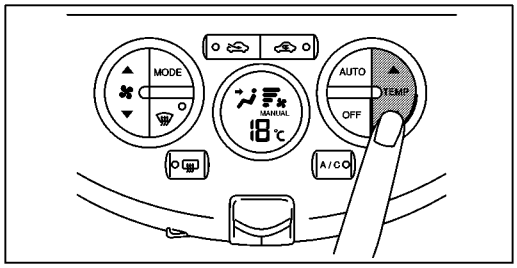
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK

Temperature increase

a. Press temperature control switch (UP :▲) until 32˚C is displayed.
b. Check for hot air at discharge air outlets.



Temperature decrease

a. Press temperature control switch (DOWN :▼) until 18˚C is displayed.
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*12)
NG → Go to appropriate malfunctioning sensor circuit. (*6)
OK
5. Performself-diagnosis STEP-3. (*12)
NG → Check malfunctioning door motor position switch. (*7)
OK
6. Perform self-diagnosis STEP-4. (*12)
OK **[Cause cannot be confirmed by self-diagnosis.]**
NG → Check air mix door motor. (*8)
NG → Replace air mix door motor.
7. Check ambient sensor circuit. (*2)
OK
8. Check in-vehicle sensor circuit. (*3)
OK
9. Check sunload sensor circuit. (*4)
OK
10. Check intake sensor circuit. (*11)
OK
11. Check air mix door motor circuit. (*5)
OK
If the symptom still exists, perform a complete operational check (*9) and check for other symptoms. [Refer to symptom table, (*10).] Does another symptom exist?
YES → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
NO
Replace auto amp. → INSPECTION END

MJIB0388E

*1 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-99, "Ambient Sensor Circuit"
*3 ATC-102, "In-vehicle Sensor Circuit"
*4 ATC-105, "Sunload Sensor Circuit"
*5 ATC-64, "Air Mix Door Motor Circuit"
*6 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.
*7 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*8 ATC-64, "Air Mix Door Motor Circuit"
*9 ATC-55, "Operational Check"
*10 ATC-27, "SYMPTOM TABLE"
*11 ATC-108, "Intake Sensor Circuit"
*12 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

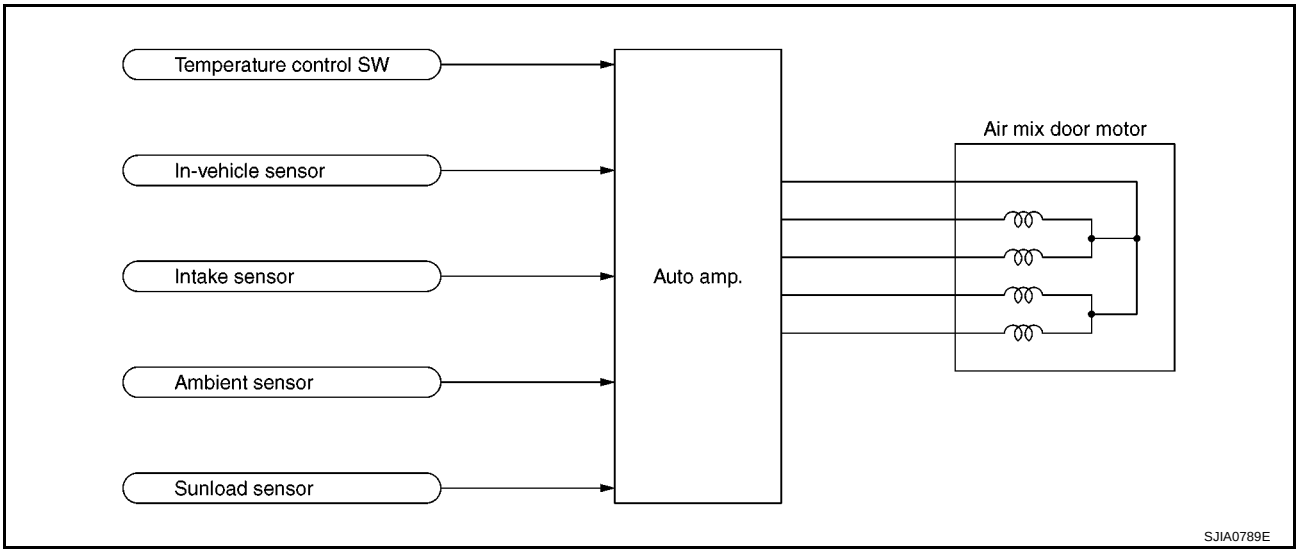
Component Parts

Air mix door control system components are:

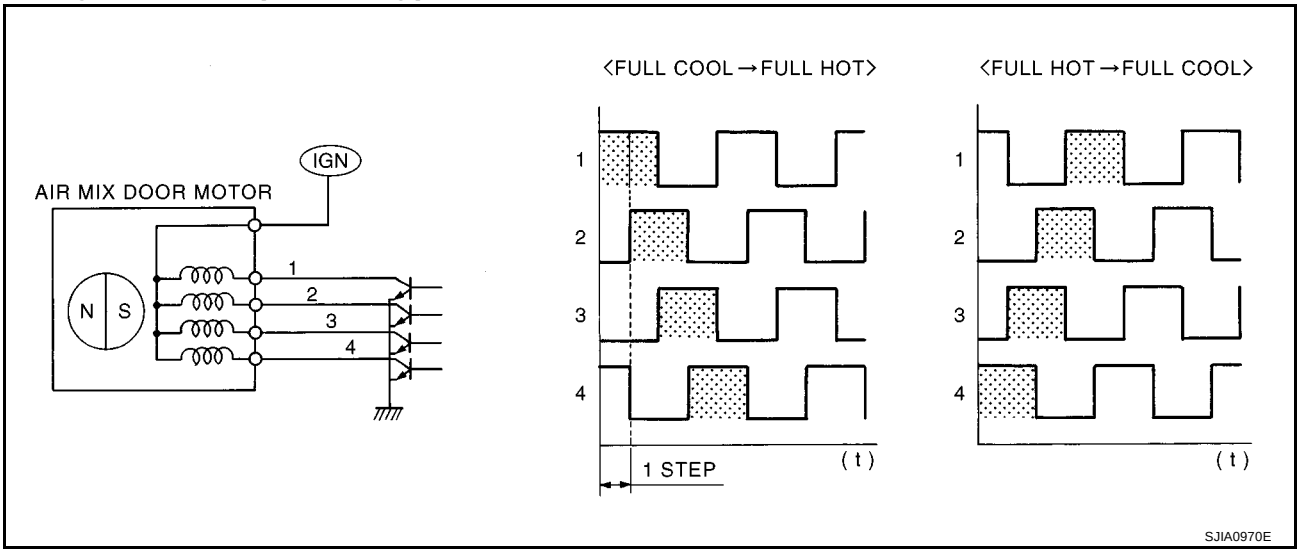
- Auto amp.
- Air mix door motor
- In-vehicle sensor
- Intake sensor
- Ambient sensor
- Sunload sensor

System Operation

The auto amp. receives data from each of the sensors. When setting a target temperature by using temperature button, auto amp. corrects preset temperature, performs an arithmetical operation based on signals from sensors and determines opening angle of target air mix door.
Air mix door is constantly controlled so as to keep optimum opening angle of air mix door based on target and present opening angles of air mix door. Air mix door is fixed in the full cold position when preset temperature is set to 18°C, and full hot position when set to 32°C.

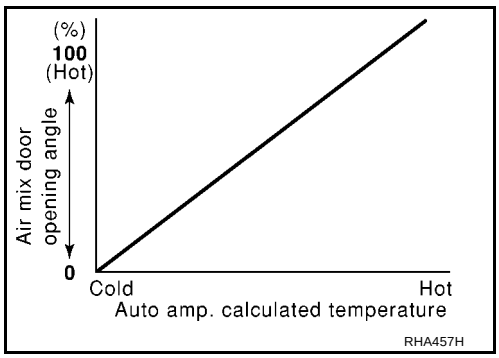


Drive System of Step Motor Type Door Motor



- Motor is actuated in sequence by energizing four drive coils.
- Rotation direction can be changed by changing pattern of excitation.

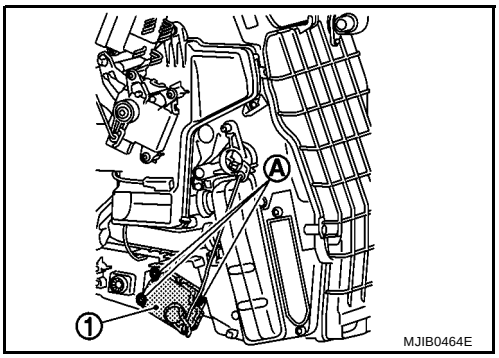
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor is attached to the A/C unit assembly. It rotates so that the air mix door is opened or closed to a position set by the auto amp. Motor rotation is conveyed through a shaft and the air mix door position is then feedback to the auto amp. by PBR built-in air mix door motor.

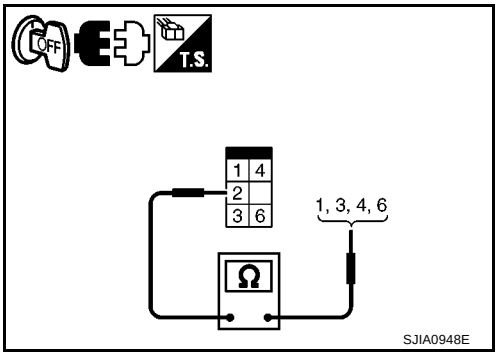


DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR

1. CHECK AIR MIX DOOR MOTOR

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector.
3. Check continuity between air mix door motor connector terminals.

Connector	Terminals		Continuity
Air mix motor: M51	2	1	Yes
		3	
		4	
		6	



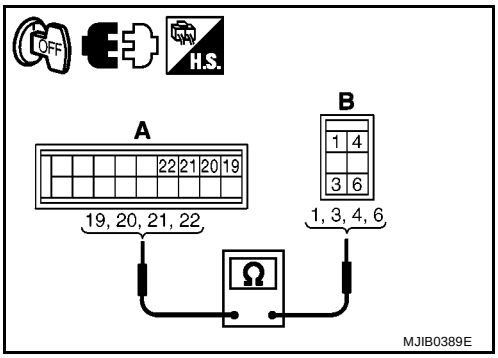
OK or NG

OK >> GO TO 2.
NG >> Replace air mix door motor.

2. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND AIR MIX DOOR MOTOR

1. Disconnect auto amp. connector.
2. Check continuity between auto amp. harness connector (A) and air mix door motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M65	19	Air mix door motor: M51	3	Yes
	20		6	
	21		1	
	22		4	



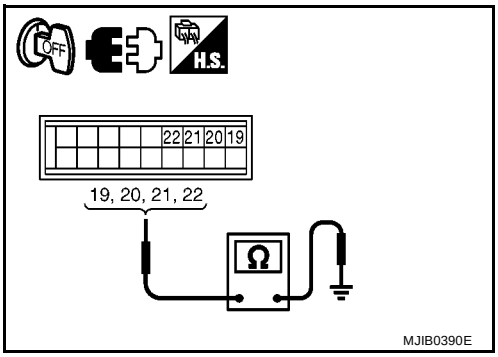
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND GROUND

Check continuity between auto amp. harness connector and ground.

Connector	Terminal		Continuity
Auto amp.: M65	19	Ground	No
	20		
	21		
	22		



OK or NG

OK >> Replace auto amp.
NG >> Repair harness or connector.

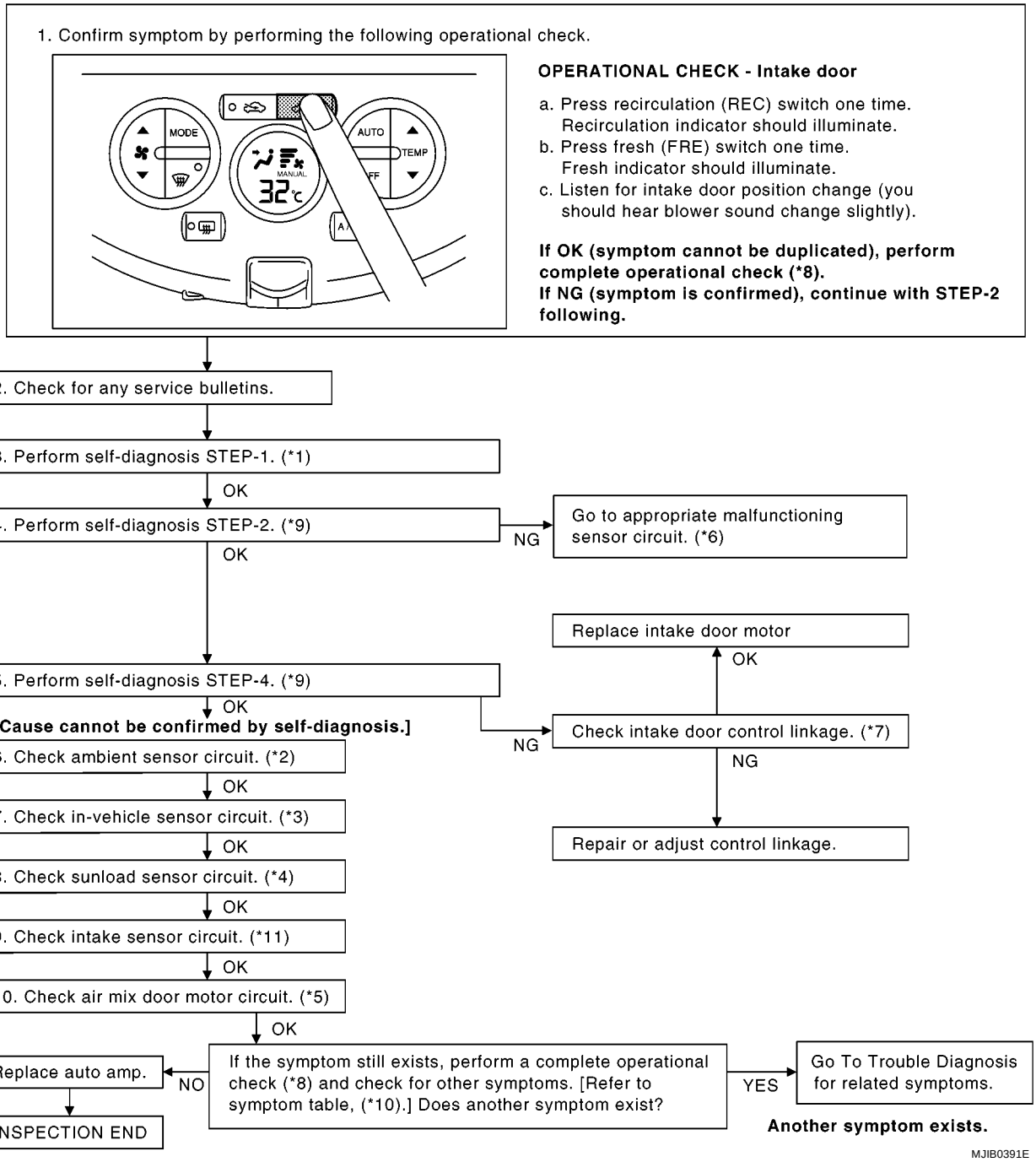
Intake Door Motor Circuit

BJS000BH

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW



MJIB0391E

*1 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-99, "Ambient Sensor Circuit"
*3 ATC-102, "In-vehicle Sensor Circuit"
*4 ATC-105, "Sunload Sensor Circuit"
*5 ATC-64, "Air Mix Door Motor Circuit"
*6 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.
*7 ATC-124, "INTAKE DOOR MOTOR"
*8 ATC-55, "Operational Check"
*9 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*10 ATC-27, "SYMPTOM TABLE"
*11 ATC-108, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

Component Parts

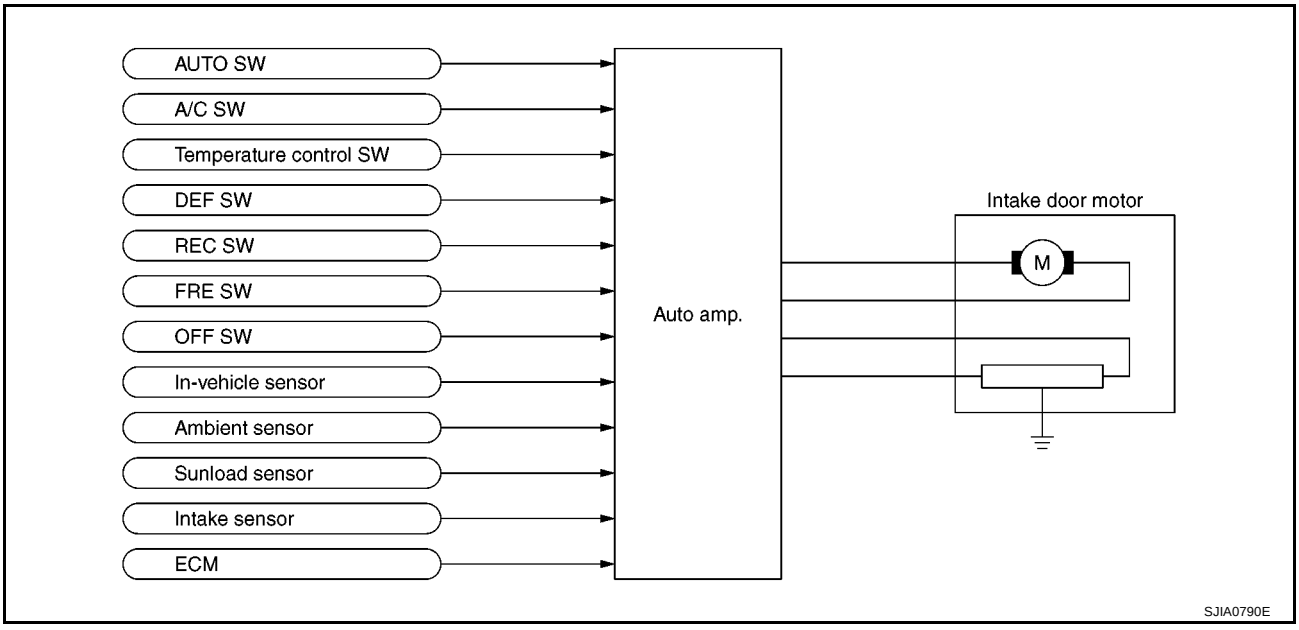
Intake door control system components are:

- Auto amp.
- Intake door motor
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor
- ECM

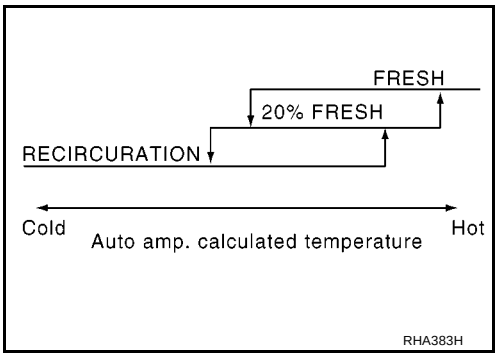
System Operation

Suction opening is basically fixed in the position FRESH when DEF switch, FRE switch, or OFF switch (only at the time of REC switch OFF) is pressed or when A/C switch is OFF. It is fixed in the position RECIRCULATION when REC switch is pressed. It is automatically controlled at all other times.

During automatic control of suction opening, any of FRESH, 20% FRESH and RECIRCULATION is selected according to the target opening angle of air mix door calculated by auto amp. based on the in-vehicle temperature, ambient temperature and the amount of solar radiation.



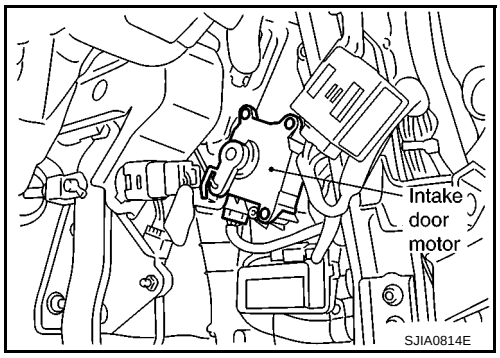
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake Door Motor

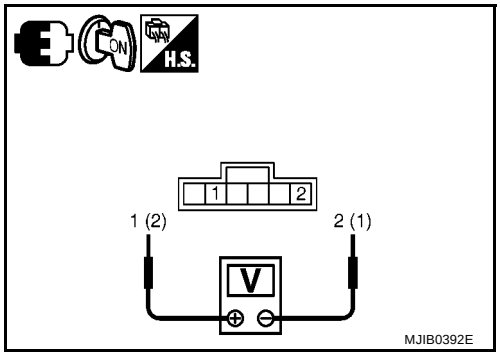
The intake door motor is attached to the A/C unit assembly. It rotates so that air is drawn from inlets set by the auto amp. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

1. Turn ignition switch ON.
2. Check voltage between intake door motor harness connector.



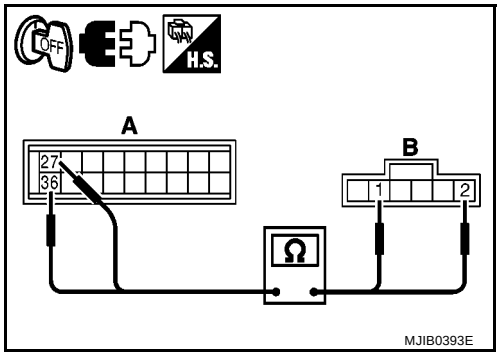
Terminals			Condition	Voltage (Approx.)
Connector	Terminal			
	(+)	(–)		
Intake door motor: M28	1	2	FRE → REC	12 V
	2	1	REC → FRE	

OK or NG

OK >> Replace intake door motor.
NG >> GO TO 2.

2. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND INTAKE DOOR MOTOR

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Disconnect intake door motor connector.
4. Check continuity between auto amp. harness connector (A) and intake door motor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M65	27	Intake door motor: M28	1	Yes
	36		2	

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND GROUND

OK or NG

OK >> Replace auto amp.
NG >> Repair harness or connector.

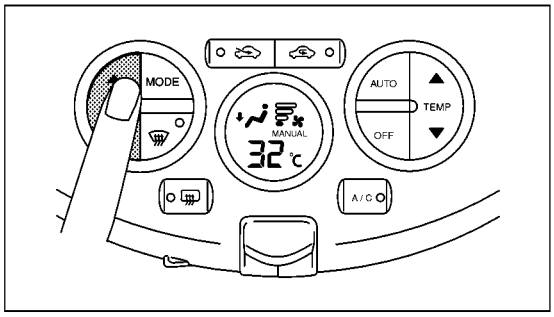
Blower Motor Circuit

BJS000BI

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK - Blower
a. Press fan switch (up :▲).
Blower should operate on low speed.
The fan symbol should have one blade lit.
b. Press fan switch (up :▲), and continue checking blower speed and fan symbol until all speeds are checked.

If OK (symptom cannot be duplicated), perform complete operational check (*1).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*2)
OK
4. Perform self-diagnosis STEP-2. (*3)
Code No. 20 should be displayed after approx. 3 seconds.
NG → Go to appropriate malfunctioning sensor circuit. (*5)
OK
5. Perform self-diagnosis STEP-4. (*4)
Does blower motor speed change according to each code No.?
NO → Go to Blower Motor Circuit. (*6)

Code No.	41	42	43	44	45	46
Blower motor voltage	5.0V	10.5V	8.5V			Battery voltage

YES
6. Is engine coolant temperature below 56˚C ?
NO → Blower motor operation is usual.
YES
7. Is blower motor operating under starting blower speed control?
NO → Go to Blower Motor Circuit. (*6)
YES **[Cause cannot be confirmed by self-diagnosis.]**
OK → Check engine coolant temperature sensor circuit. (*12)
8. Check ambient sensor circuit. (*8)
OK
9. Check in-vehicle sensor circuit. (*9)
OK
10. Check sunload sensor circuit. (*10)
OK
11. Check intake sensor circuit. (*11)
OK
If the symptom still exists, perform a complete operational check (*1) and check for other symptoms. [Refer to symptom table, (*7).] Does another symptom exist?
YES → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
NO
Replace auto amp. → INSPECTION END

MJIB0394E

*1 ATC-55, "Operational Check"
*2 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.
*4 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 7.
*5 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.
*6 ATC-73, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR"

*7	ATC-27, "SYMPTOM TABLE"	*8	ATC-99, "Ambient Sensor Circuit"	*9	ATC-102, "In-vehicle Sensor Circuit"
*10	ATC-105, "Sunload Sensor Circuit"	*11	ATC-108, "Intake Sensor Circuit"	*12	CR(WITH EURO–OBD): EC-166 CR(WITHOUT EURO–OBD): EC-565 HR(WITH EURO–OBD): EC-947 HR(WITHOUT EURO–OBD): EC-1361 K9K: EC-1727

*For further information refer to EC-21, "APPLICATION NOTICE" .

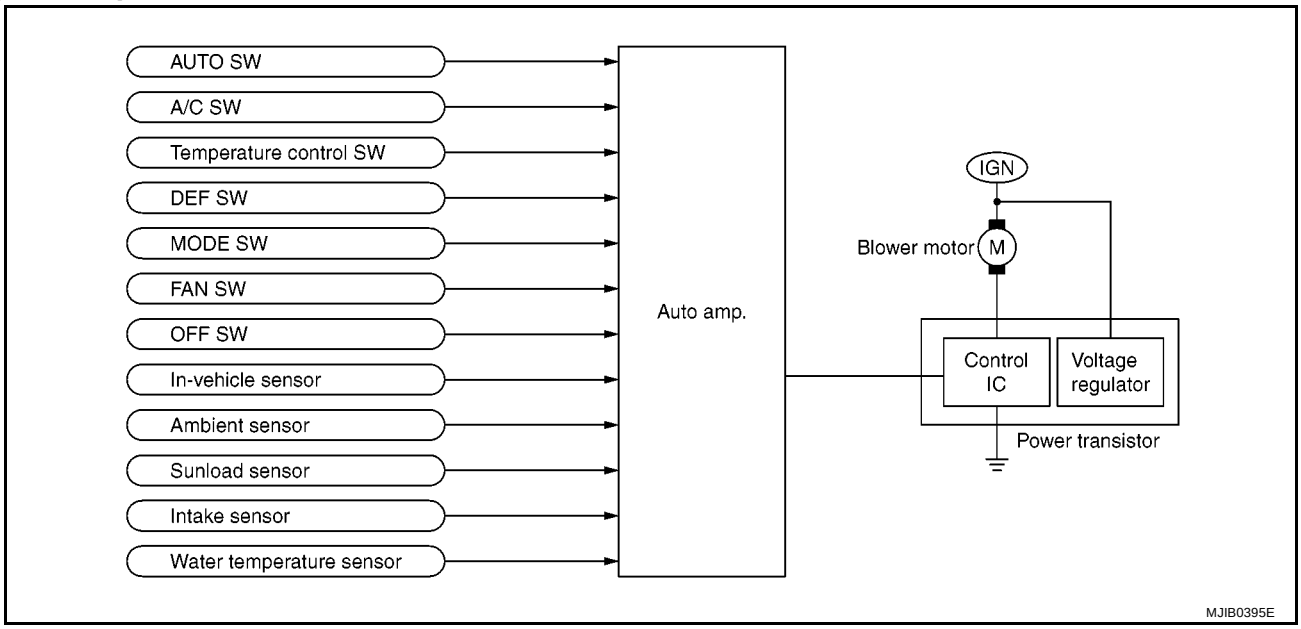
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

- Auto amp.
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the auto amp. based on input from in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.
The blower motor is applied voltage ranges from approximately 3.0 volts (lowest speed) to 12 volts (highest speed).
The control blower speed (in the range of 3.0 to 12V), auto amp. supplies a gate voltage to the power transistor. Based on this voltage, auto amp. controls voltage supplied to the blower motor.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C, the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C, at which time the blower speed will increase to the objective speed.

Start up from usual or HOT SOAK Condition (Automatic mode)

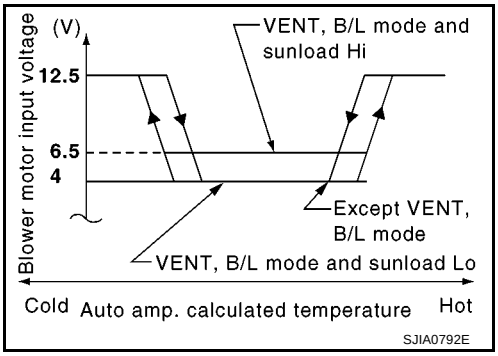
The blower will begin operation momentarily after the A/C switch is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

Sunload

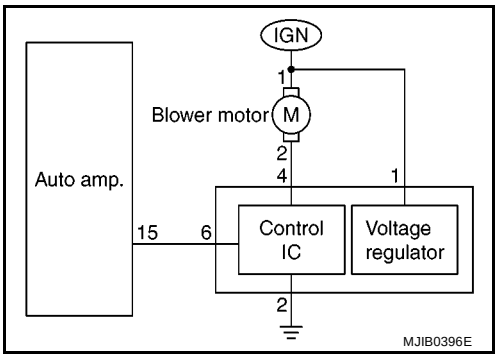
When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower low speed is usual low speed (approx. 4.0V). During high sunload conditions, auto amp. causes the blower speed to increase (approx. 6.5V).

Fan Speed Control Specification



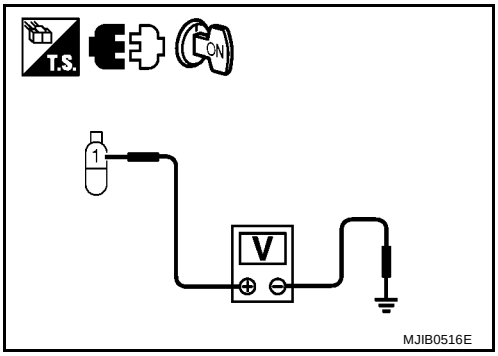
DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

SYMPTOM: Blower motor operation is malfunctioning.



1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
Connector	Terminal	Ground	
Blower motor: M56	1		Battery voltage

OK or NG

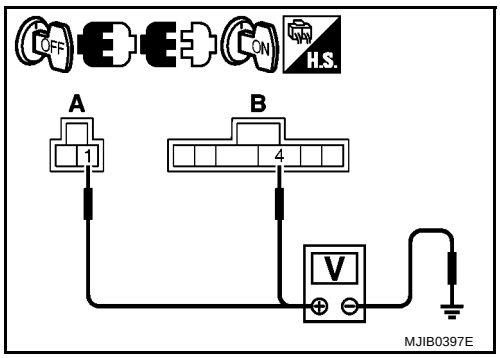
OK >> GO TO 2.

NG >> Check power supply circuit and 15A fuses (Nos. 18 and 20, located in the fuse block). Refer to PG-95, "FUSE BLOCK" .

- If fuses are OK, check harness for open circuit. Repair or replace if necessary.
- If fuses are OK, check blower relay. Replace if necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace if necessary.

2. CHECK CIRCUIT POWER SUPPLY FOR POWER TRANSISTOR

1. Turn ignition switch OFF.
2. Connect blower motor connector.
3. Disconnect power transistor connector.
4. Turn ignition switch ON.
5. Check voltage between power transistor harness connector (A), (B) and ground.



Terminals				Voltage (Approx.)
(+)			(–)	
Connector		Terminal		
A	Power transistor: M30	1	Ground	Battery voltage
B	Power transistor: M31	4		

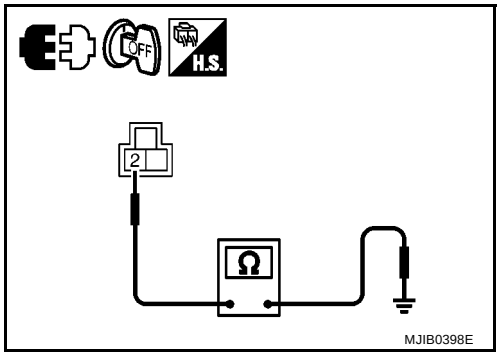
OK or NG

OK >> GO TO 3.

NG >>
- Terminal 1 - Ground: Repair harness or connector.
- Terminal 4 - Ground: GO TO 5.

3. CHECK GROUND CIRCUIT FOR POWER TRANSISTOR

1. Turn ignition switch OFF.
2. Check continuity between power transistor harness connector and ground.



Connector	Terminal	Ground	Continuity
Power transistor: M30	2		Yes

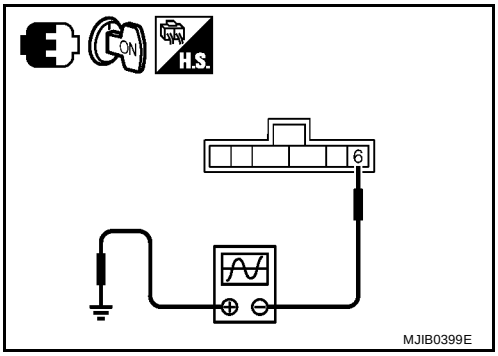
OK or NG

OK >> GO TO 4.

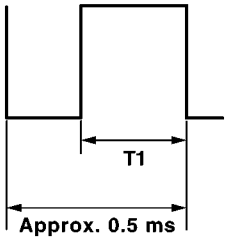
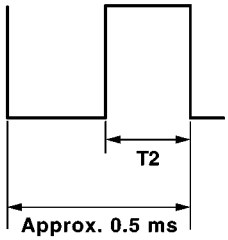
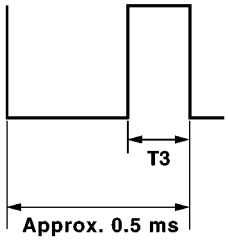
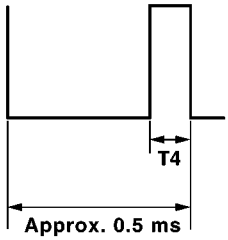
NG >> Repair harness or connector.

4. CHECK FOR AUTO AMP. OUTPUT

1. Reconnect power transistor connector.
2. Turn ignition switch ON.



3. Change the fan speed from Lo to Hi, and confirm the duty ratios between power transistor harness connector and ground using an oscilloscope. Usual terminal 6 drive signal duty ratios are shown in the table below.

Fan speed	1st	2nd	3rd	4th
Power transistor connector M88 Terminal 8 (Oscilloscope)				
	T1: Approx. 0.37 ms Duty ratio: Approx. 26%	**T2: Approx. 0.29 ms** Duty ratio: Approx. 42%	**T3: Approx. 0.19 ms** Duty ratio: Approx. 62%	**T4: Approx. 0.04 ms** Duty ratio: Approx. 92%

NOTE: Duty ratio = $\frac{\text{Approx. 0.5 ms} - Tx}{\text{Approx. 0.5 ms}}$ x 100 (%)

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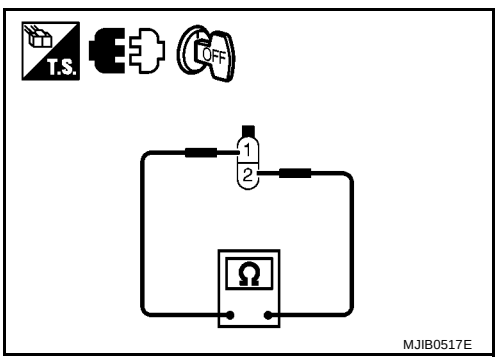
OK or NG

OK >> GO TO 5.
NG >>
- Fan speed is stuck at speed 4: GO TO 7.
- Fan speed is stuck at speed 1: GO TO 8.

5. CHECK BLOWER MOTOR

1. Turn ignition switch OFF.
2. Remove blower motor connector.
3. Check continuity between blower motor connector terminals.

Connector	Terminal		Continuity
Blower motor: M56	1	2	Yes



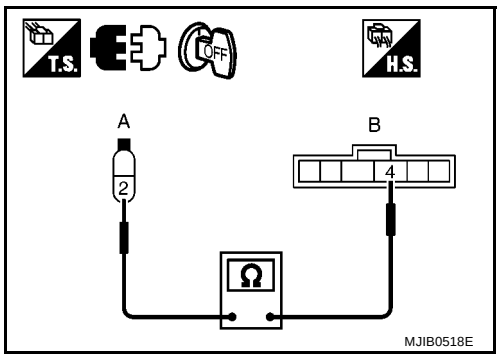
OK or NG

OK >> GO TO 6.
NG >> Replace blower motor.

6. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND POWER TRANSISTOR

Check continuity between blower motor harness connector (A) and power transistor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
Blower motor: M56	2	Power transistor: M31	4	Yes



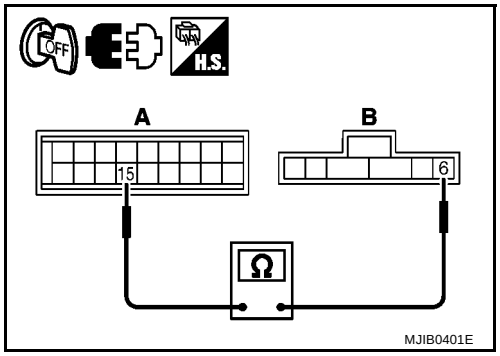
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND POWER TRANSISTOR

1. Turn ignition switch OFF.
2. Disconnect power transistor connector.
3. Disconnect auto amp. connector.
4. Check continuity between auto amp. harness connector (A) and power transistor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M64	15	Power transistor: M31	6	Yes

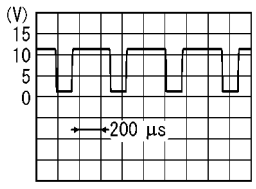


OK or NG

OK >> Replace power transistor.
NG >> Repair harness or connector.

8. CHECK FOR AUTO AMP. OUT PUT 2

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Turn ignition switch ON.
4. Check output signal between auto amp. harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Connector	Terminal			
Auto amp.: M64	15	Ground	Fan speed: 1st	

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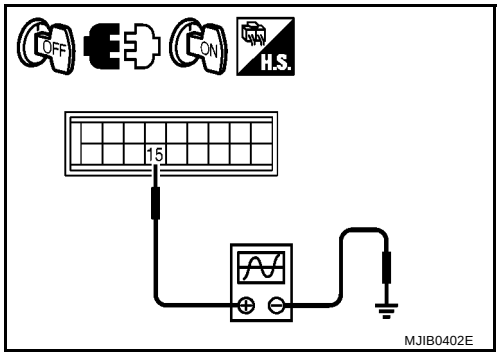


OK or NG

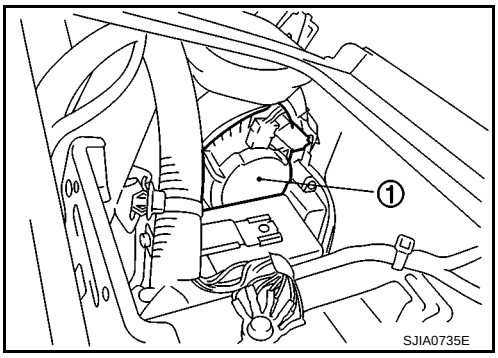
OK >> Replace auto amp.
NG >> Replace power transistor.

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor (1).

- Ensure that there are no foreign particles inside the A/C unit assembly.

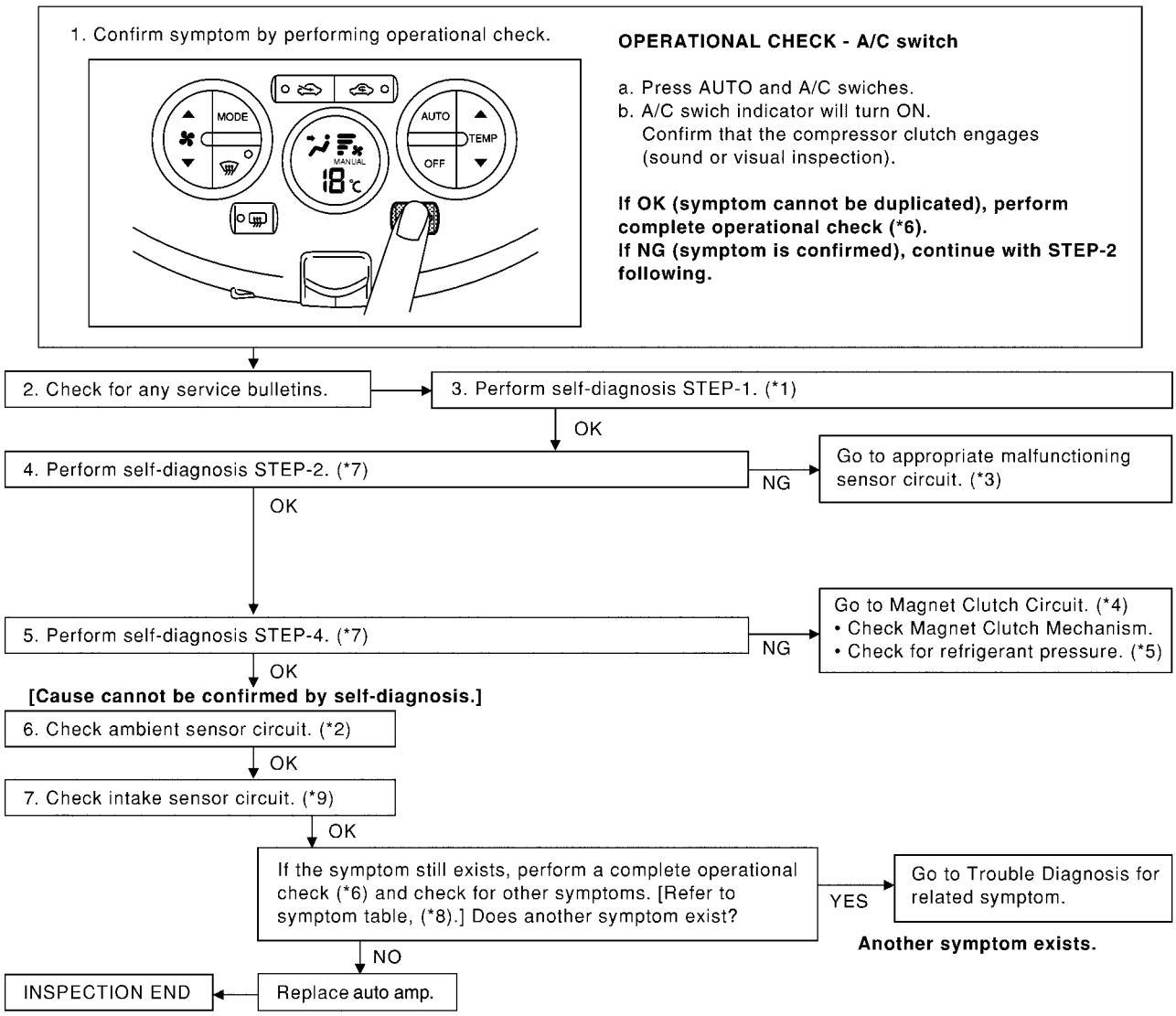


Magnet Clutch Circuit

BJS000BJ

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



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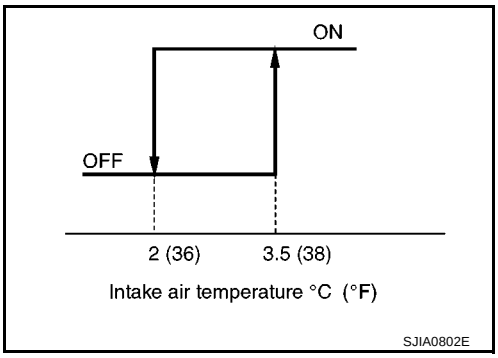
*1 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-99, "Ambient Sensor Circuit"
*3 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.
*4 ATC-79, "DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH"
*5 ATC-91, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"
*6 ATC-55, "Operational Check"
*7 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*8 ATC-27, "SYMPTOM TABLE"
*9 ATC-108, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

Auto amp. controls compressor operation by intake air temperature and signal from ECM.

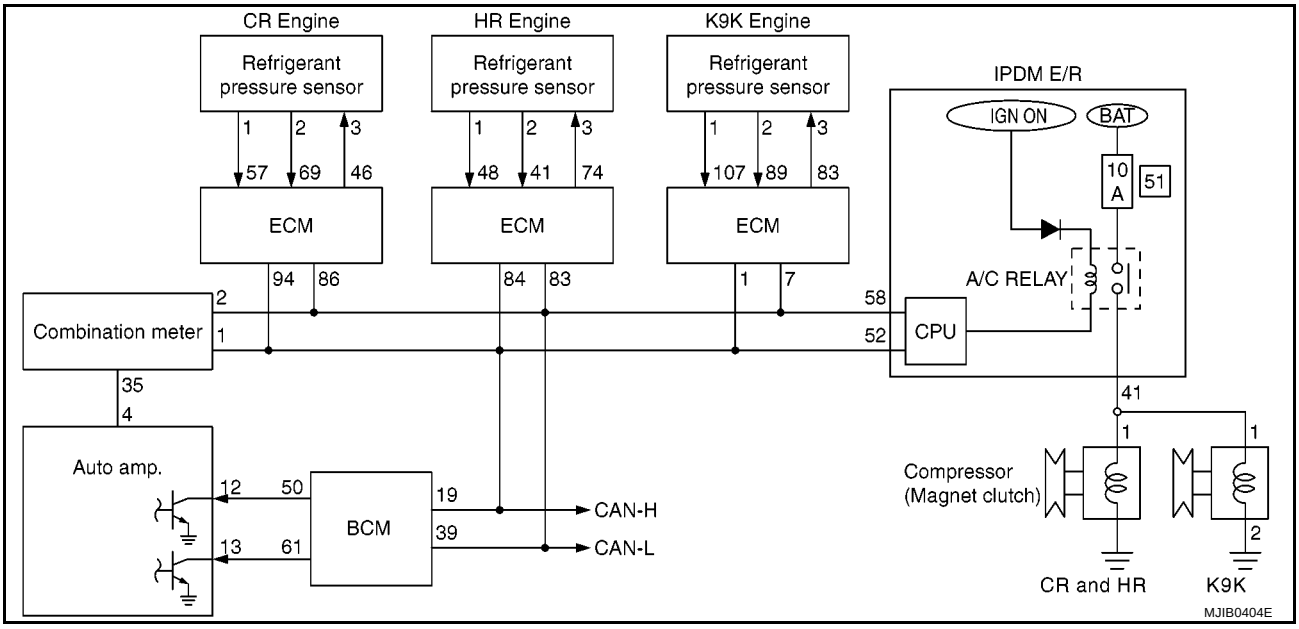
Low Temperature Protection Control

Auto amp. will turn compressor ON or OFF as determined by a signal detected by intake sensor. When intake air temperatures are higher than 3.5°C (38°F), the compressor turns ON. The compressor turns OFF when intake air temperatures are lower than 2°C (36°F).



DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK INTAKE SENSOR CIRCUIT

Check intake sensor. Refer to ATC-48, "FUNCTION CONFIRMATION PROCEDURE" , see No. 12.

OK or NG

OK >> GO TO 2.
NG >> Malfunctioning intake sensor: Refer to ATC-108, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-22, "Auto Active Test" .

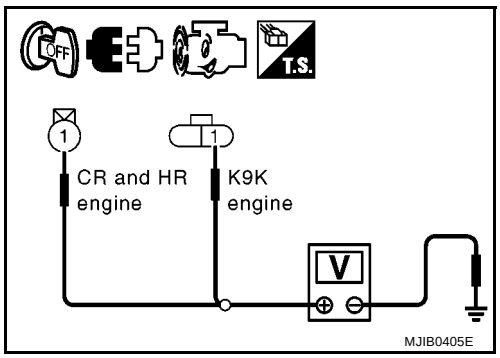
Does the magnet clutch operate?

YES >> ● WITH CONSULT-II
GO TO 6.
● WITHOUT CONSULT-II
GO TO 7.

NO >> GO TO 3.

3. CHECK POWER SUPPLY COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect compressor connector.
3. Start the engine.
4. Press AUTO switch and A/C switch ON.
5. Check voltage between compressor harness connector and ground.



Terminals				Voltage (Approx.)
(+)			(–)	
Engine	Connector	Terminal	Ground	
CR and HR	Compressor: F28	1		12V
K9K	Compressor: F129			

OK or NG

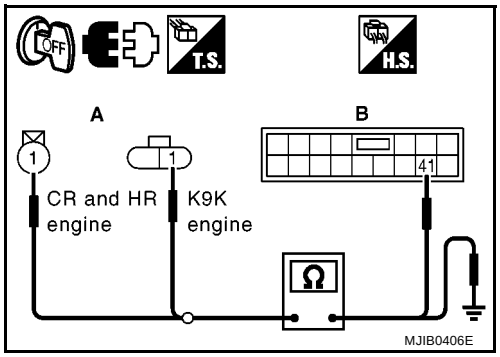
OK >> GO TO 5.

NG >> Check power supply circuit and 10A fuse (No. 51, located in the fuse block), and GO TO 4. Refer to PG-32, "IPDM E/R Terminal Arrangement" .

- If fuse is OK, GO TO 4.
- If fuse is NG, replace fuse and GO TO 4.

4. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between compressor harness connector (A) and IPDM E/R harness connector (B).

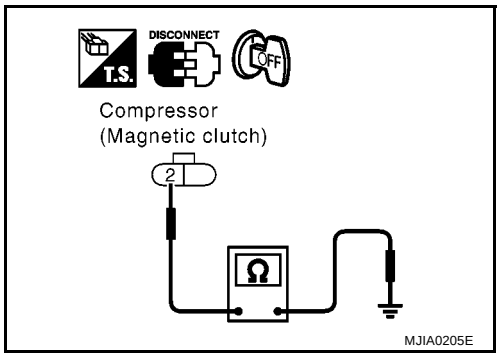


	A		B		Continuity
Engine	Connector	Terminal	Connector	Terminal	
CR and HR	Compressor: F28	1	IPDM E/R: E7	41	Yes
K9K	Compressor: F129				

4. Check continuity between compressor harness connection (A) and ground.

Engine	Connector	Terminal		Continuity
CR and HR	Compressor: F28	1	Ground	No
K9K	Compressor: F129			

5. Check continuity between compressor harness connector and ground.



Engine	Connector	Terminal	Ground	Continuity
K9K	Compressor: F129	2		Yes

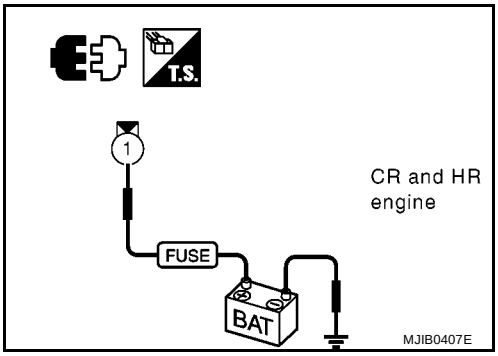
OK or NG

OK >> GO TO 5.

NG >> Repair harness or connector.

5. CHECK MAGNET CLUTCH

Check for operation sound when applying battery voltage direct current to terminal.



OK or NG

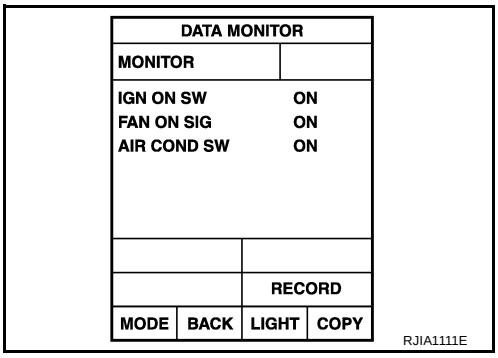
OK >> 1. Replace IPDM E/R.
2. Go to self-diagnosis procedure ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-4. Confirm that magnet clutch operation usual.

NG >> 1. Replace compressor.
2. Go to self-diagnosis procedure ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-4. Confirm that magnet clutch operation usual.

6. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-26, "CONSULT-II Function (BCM)" .

A/C SW ON : AIR COND SW ON
A/C SW OFF : AIR COND SW OFF

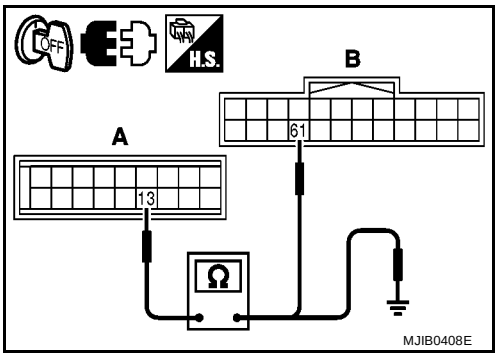


OK or NG

OK >> GO TO 9.
NG >> GO TO 7.

7. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND BCM.

1. Turn ignition switch OFF.
2. Disconnect auto amp. harness connector.
3. Check continuity between auto amp. harness connector (A) and BCM harness connector.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M64	13	BCM: M58	61	Yes

4. Check continuity between auto amp.harness connector (A) and ground.

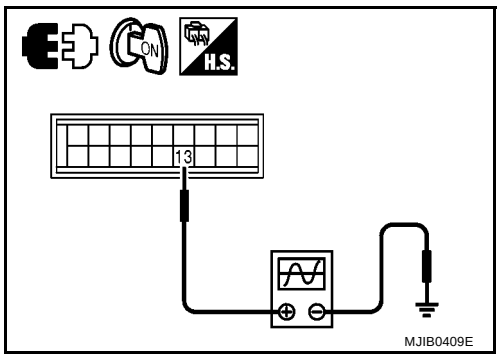
A		Ground	Continuity
Connector	Terminal		
Auto amp.: M64	13		No

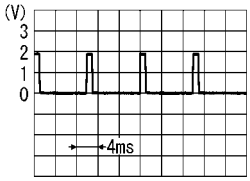
OK or NG

OK >> GO TO 8.
NG >> Repair harness or connector.

8. CHECK VOLTAGE FOR AUTO AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect auto amp. harness connector and BCM harness connector.
2. Turn ignition switch ON.
3. Confirm compressor ON signal between auto amp. harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(-)		
Connector	Terminal			
Auto amp.: M64	13	Ground	A/C switch: ON (Blower motor operates.)	

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OK or NG

OK >> GO TO 9.
NG >> Replace auto amp.

9. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

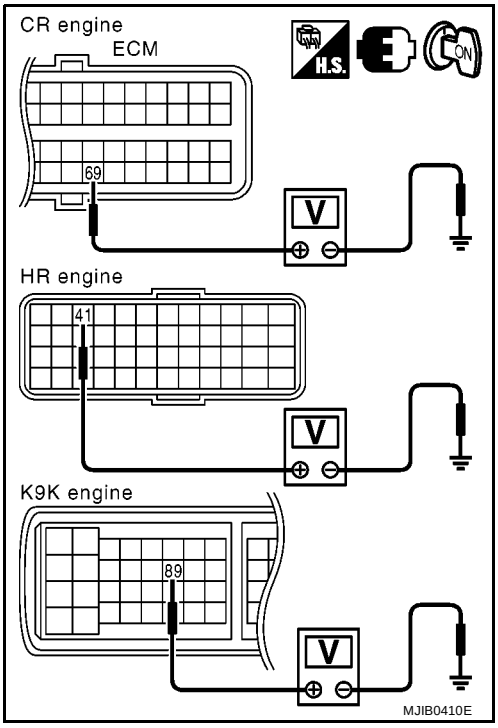
1. Start the engine.
2. Check the voltage of refrigerant pressure sensor.
   CR(WITH EURO–OBD): Refer to EC-112, "CONSULT-II Reference Value in Data Monitor Mode" .
   CR(WITHOUT EURO–OBD): Refer to EC-527, "CONSULT-II Reference Value in Data Monitor Mode" .
   HR(WITH EURO–OBD): Refer to EC-902, "CONSULT-II Reference Value in Data Monitor" .
   HR(WITHOUT EURO–OBD): Refer to EC-1321, "CONSULT-II Reference Value in Data Monitor" .
   K9K: Refer to EC-1694, "CONSULT-II Reference Value in Data Monitor Mode" .

*For further information refer to EC-21, "APPLICATION NOTICE" .

WITHOUT CONSULT-II

1. Start the engine.
2. Check voltage between ECM harness connector and ground.

Engine	Terminals			Condition	Voltage (Approx.)
	(+)		(-)		
	Connector	Terminal			
CR	ECM: F2	69	Ground	A/C switch: ON (Blower motor operates.)	1-4V
HR	ECM: F51	41			
K9K	ECM: F134	89			



OK or NG

OK >>
- WITH CONSULT-II
  GO TO 10.
- WITHOUT CONSULT-II
  GO TO 11.

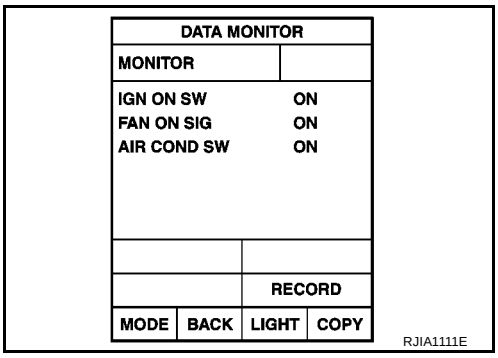
NG >>
- CR (WITH EURO–OBD): Refer to EC-443 .
- CR (WITHOUT EURO–OBD): Refer to EC-794 .
- HR (WITH EURO–OBD): Refer to EC-1231 .
- HR (WITHOUT EURO–OBD): Refer to EC-1590 .
- K9K: Refer to EC-1811 .

10. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-26, "CONSULT-II Function (BCM)" .

FAN SW ON : **FAN ON SIG ON**

FAN SW OFF : **FAN ON SIG OFF**

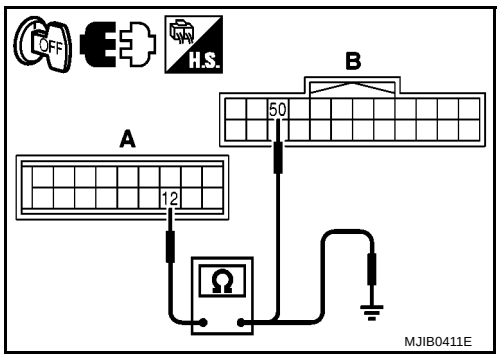


OK or NG

OK >> GO TO 13.
NG >> GO TO 11.

11. CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND BCM

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector and BCM connector.
3. Check continuity between auto amp. harness connector (A) and BCM harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M64	12	BCM: M58	50	Yes

4. Check continuity between auto amp.harness connector (A) and ground.

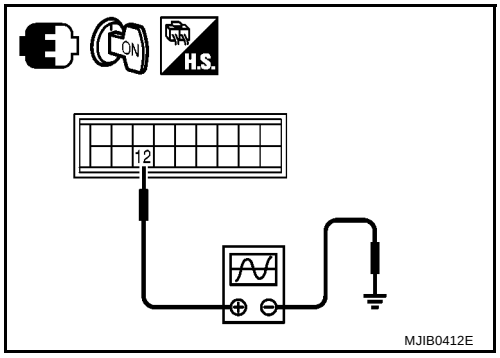
A		Ground	Continuity
Connector	Terminal		
Auto amp.: M64	12		No

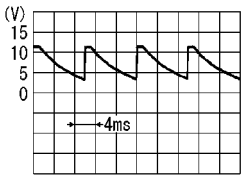
OK or NG

OK >> GO TO 12.
NG >> Repair harness or connector.

12. CHECK VOLTAGE FOR AUTO AMP. (FAN ON SIGNAL)

1. Reconnect auto amp. connector and BCM connector.
2. Turn ignition switch ON.
3. Confirm fan ON signal between auto amp. harness connector and ground using oscilloscope.



Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Connec-tor	Terminal			
Auto amp.: M64	12	Ground	Fan speed: 1st	

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OK or NG

OK >> Replace auto amp.
NG >> Replace BCM.

13. CHECK CAN COMMUNICATION

Check CAN communication. Refer to BCS-17, "CAN Communication Inspection With CONSULT-II (Self-Diagnosis)" .

- BCM – ECM
- ECM – IPDM E/R

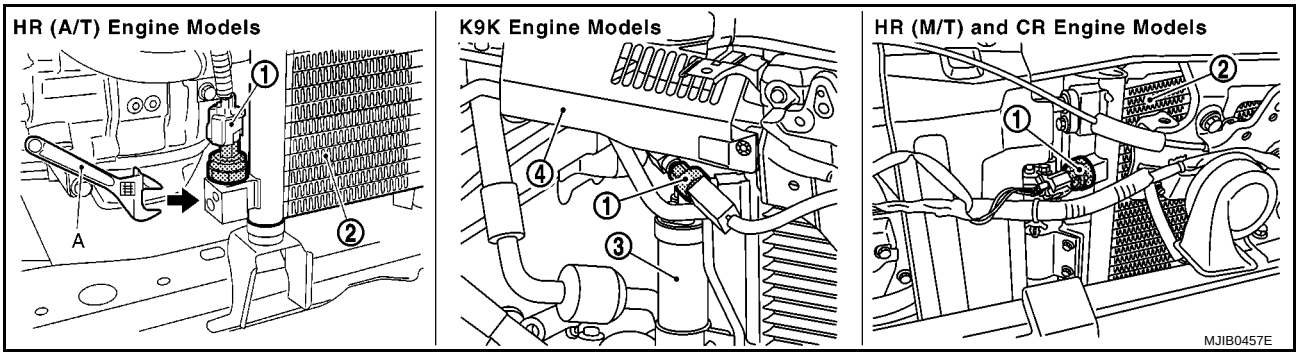
OK or NG

OK >> INSPECTION END
NG >> Repair or replace malfunction part(s).

COMPONENT INSPECTION

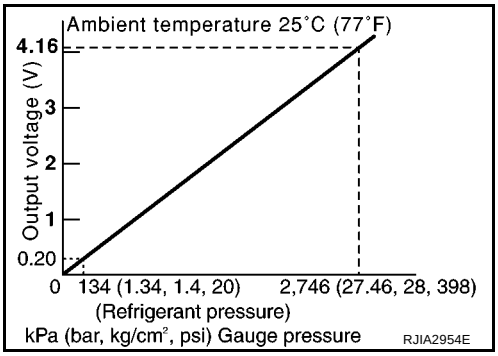
Refrigerant Pressure Sensor

The refrigerant pressure sensor (1) is attached to the condenser.



Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure.

CR(WITH EURO–OBD): Refer to EC-443 .
CR(WITHOUT EURO–OBD): Refer to EC-794 .
HR(WITH EURO–OBD): Refer to EC-1231 .
HR(WITHOUT EURO–OBD): Refer to EC-1590 .
K9K: Refer to EC-1811 .
*For further information refer to EC-21, "APPLICATION NOTICE" .

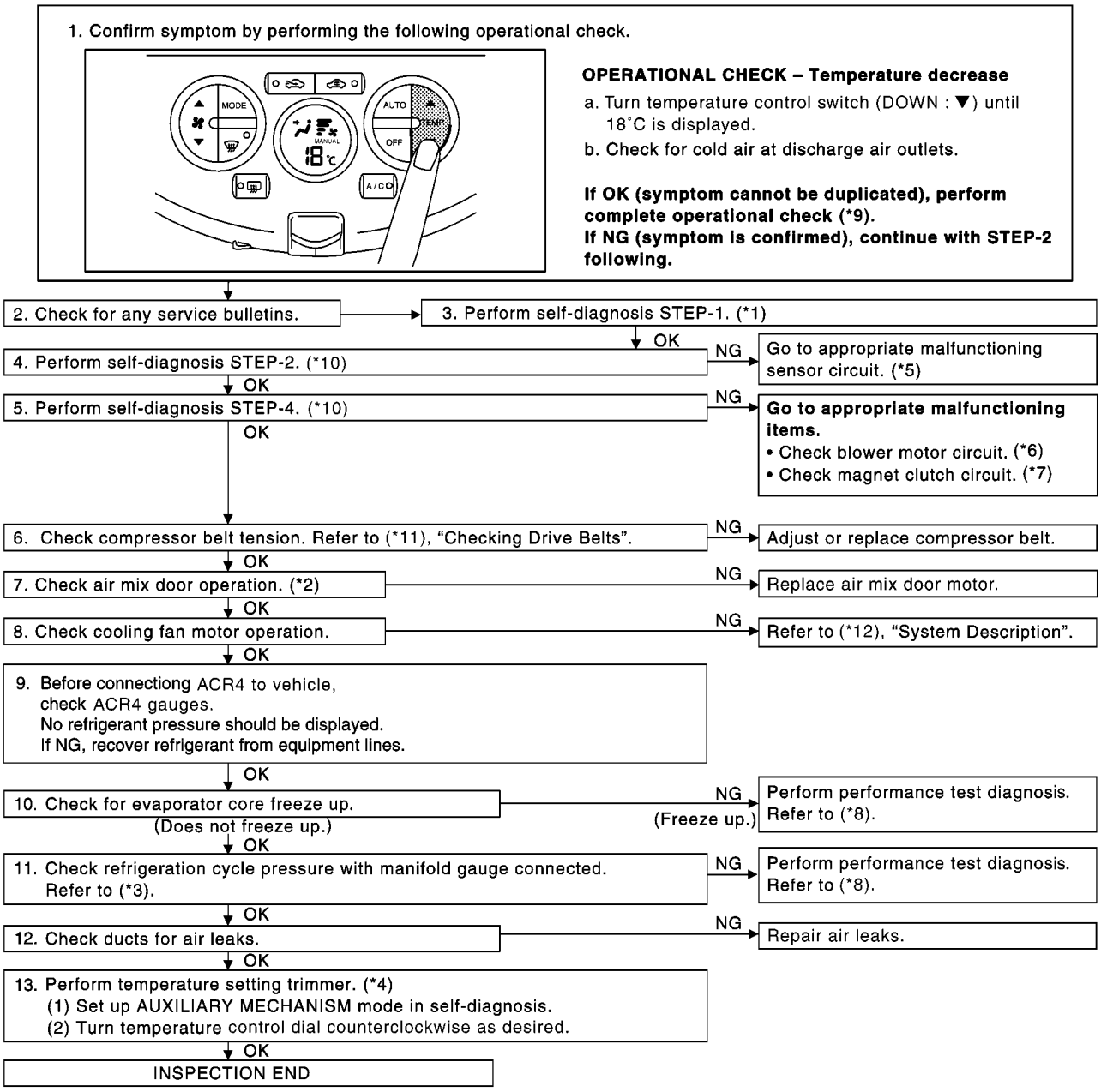


Insufficient Cooling

BJS000BK

SYMPTOM: Insufficient cooling

INSPECTION FLOW



MJIB0413E

*1 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.

*2 ATC-64, "Air Mix Door Motor Circuit"

*3 ATC-90, "Test Reading"

*4 ATC-54, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"

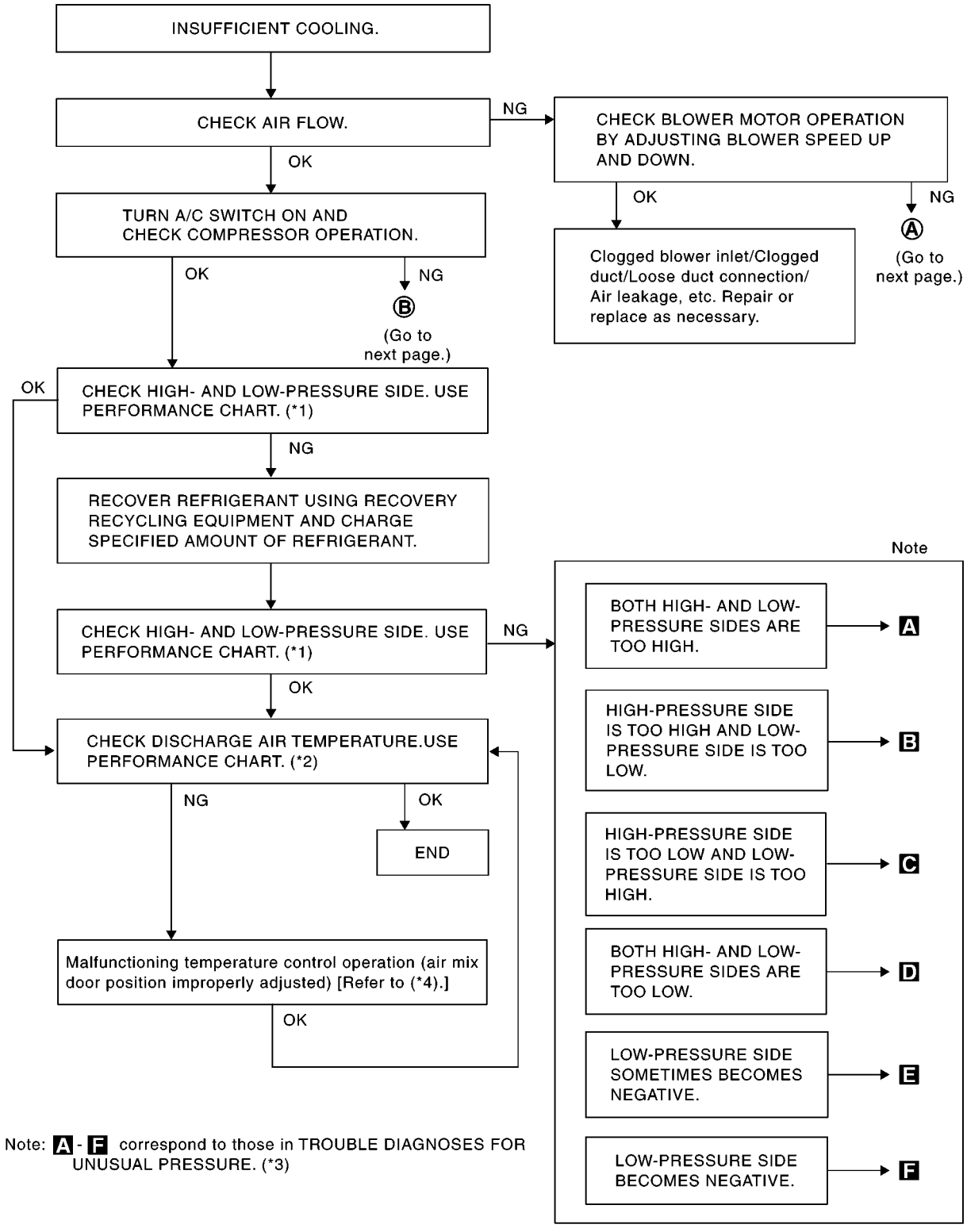
*5 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.

*6 ATC-71, "Blower Motor Circuit"

*7	ATC-78, "Magnet Clutch Circuit"	*8	ATC-88, "PERFORMANCE TEST DIAGNOSIS"	*9	ATC-55, "Operational Check"
*10	ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*11	CR: EM-14, "Checking drive Belts" HR: EM-114, "Checking Drive Belts" K9K: EM-242, "Checking Drive Belts"	*12	CR(WITH EURO–OBD): EC-345 CR(WITHOUT EURO–OBD): EC-662 HR(WITH EURO–OBD): EC-1130 HR(WITHOUT EURO–OBD): EC-1451 K9K: EC-1864

*For further information refer to EC-21, "APPLICATION NOTICE" .

PERFORMANCE TEST DIAGNOSIS



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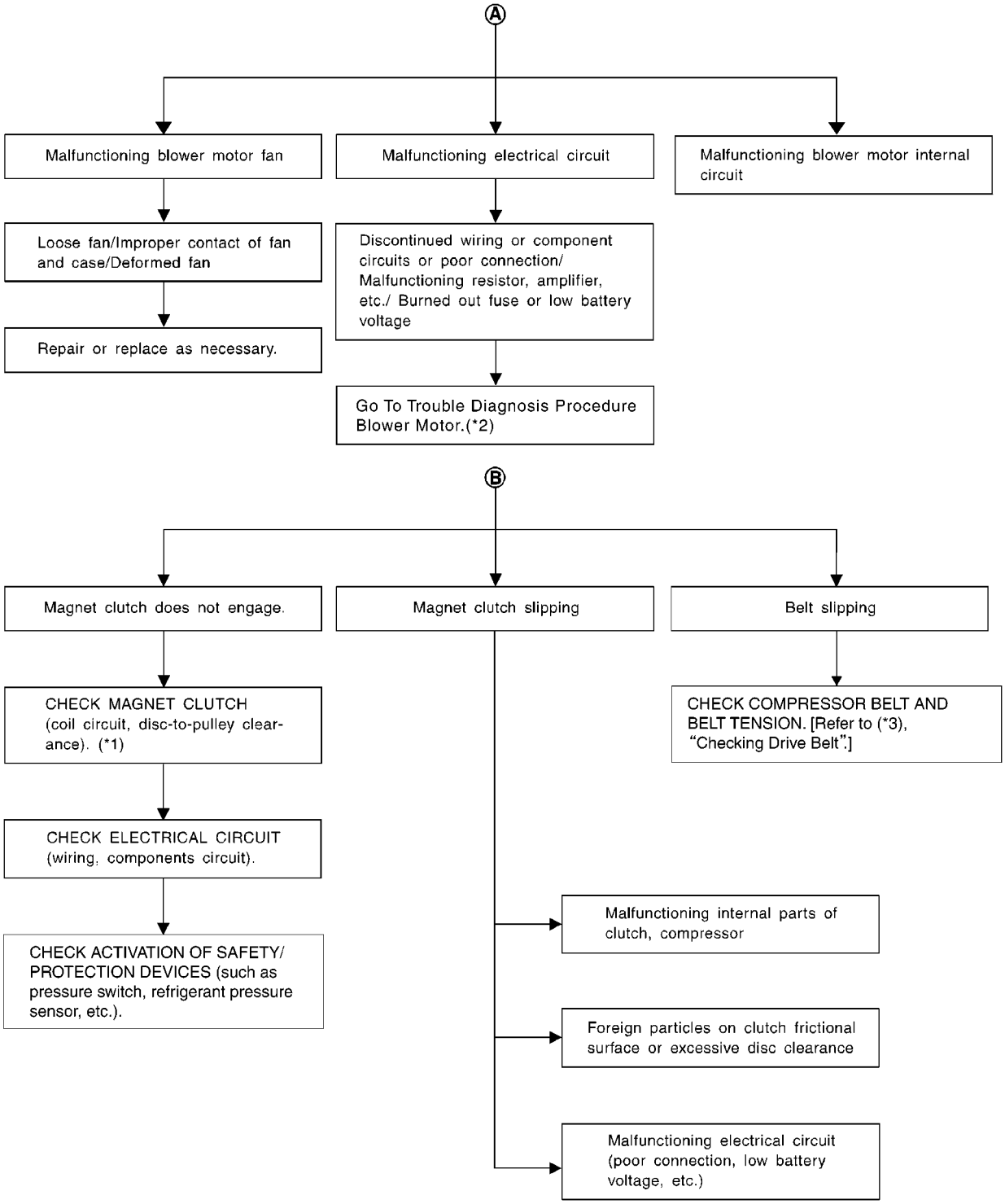
*1 ATC-90, "PERFORMANCE CHART" *2 ATC-90, "PERFORMANCE CHART" *3 ATC-91, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"

*4 ATC-64, "Air Mix Door Motor Circuit"



RJIA3107E

*1 ATC-141, "CHECK DISC TO PULLEY CLEARANCE"

*2 ATC-71, "Blower Motor Circuit"

*3 CR: EM-14, "Checking drive Belts"
HR: EM-114, "Checking Drive Belts"
K9K: EM-242, "Checking Drive Belts"

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Recirculation (REC) switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.2 - 9.1 (45 - 48)
	25 (77)	11.4 - 13.8 (53 - 57)
	30 (86)	15.5 - 18.4 (60 - 65)
	35 (95)	20.3 - 23.7 (69 - 75)
60 - 70	20 (68)	9.1 - 10.9 (48 - 52)
	25 (77)	13.8 - 16.2 (57 - 61)
	30 (86)	18.4 - 21.3 (65 - 70)
	35 (95)	23.7 - 27.1 (75 - 81)

Ambient Air Temperature-to-operating Pressure Table

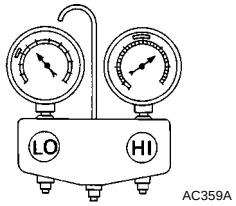
Ambient air		High-pressure (Discharge side) kPa (bar, kg/cm^2 , psi)	Low-pressure (Suction side) kPa (bar, kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	843 - 1,036 *1 (11.08 - 13.63, 8.6 - 10.6, 122 - 150)	159.0 - 194.0 (1.59 - 1.94, 1.62 - 1.98, 23.1 - 28.1)
	25 (77)	1,094 - 1,338 *1 (10.94 - 13.38, 11.2 - 13.6, 159 - 194)	196.3 - 240.0 (1.96 - 2.40, 2.00 - 2.45, 28.5 - 34.8)
	30 (86)	1,298 - 1,590 *1 (12.98 - 15.90, 13.2 - 16.2, 188 - 231)	248.0 - 302.7 (2.48 - 3.03, 2.53 - 3.09, 36.0 - 43.9)
	35 (95)	1,383 - 1,688 *2 (13.83 - 16.88, 14.1 - 17.2, 201 - 245)	308.8 - 377.4 (3.09 - 3.77, 3.15 - 3.85, 44.8 - 54.7)
	40 (104)	1,628 - 1,988 *2 (16.28 - 19.88, 16.6 - 20.3, 236 - 288)	377.4 - 461.2 (3.77 - 4.61, 3.85 - 4.70, 54.7 - 66.8)

*1: In the motor fan low-speed control
*2: In the motor fan high-speed control

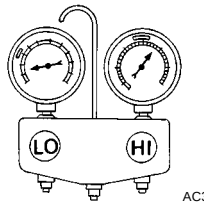
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

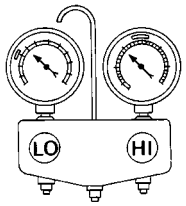
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	● Clean condenser. ● Check and repair cooling fan if necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (1.96 bar, 2 kg/cm^2 , 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Plates are sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

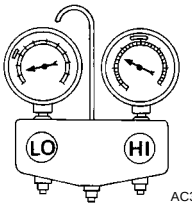
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

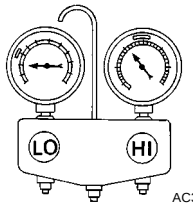
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

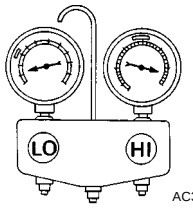
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	● There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. ● Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	● Replace liquid tank. ● Check lubricant for contamination.
	● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet may be frosted. ● Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components	Check refrigerant for leaks. Refer to ATC-147, "Checking for Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	● Remove foreign particles by using compressed air. ● Replace expansion valve. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	● Check intake sensor circuit. Refer to ATC-108, "Intake Sensor Circuit" . ● Replace compressor. ● Repair evaporator fins. ● Replace evaporator. ● Refer to ATC-71, "Blower Motor Circuit" .

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	● Air conditioning system does not function and does not cyclically cool the compartment air. ● The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

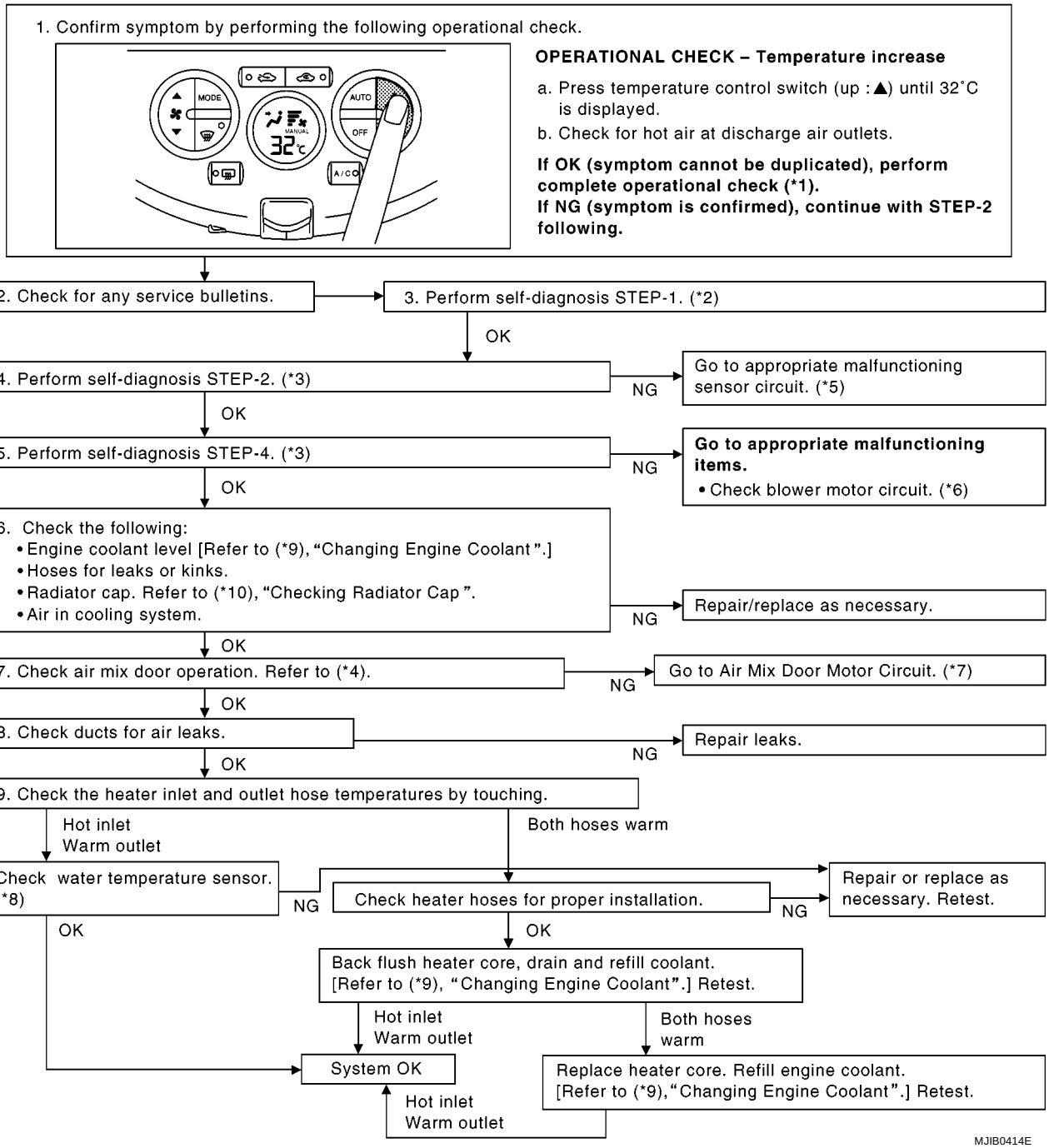
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. ● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). ● If either of the above methods cannot correct the malfunction, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

Insufficient Heating

BJS000BL

SYMPTOM: Insufficient heating

INSPECTION FLOW



*1 ATC-55, "Operational Check"

*2 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.

*3 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

*4 ATC-64, "Air Mix Door Motor Circuit"

*5 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 13.

*6 ATC-71, "Blower Motor Circuit"

*7	ATC-64, "Air Mix Door Motor Circuit"	*8	CR(WITH EURO–OBD): EC-166 CR'WITHOUT EURO–OBD): EC-565 HR(WITH EURO–OBD): EC-947 HR(WITHOUT EURO–OBD): EC-1361 K9K: EC-1727	*9	CR: CO-9 HR: CO-28 K9K: CO-49
*10	CR: CO-15 or CO-16 HR: CO-34 or CO-35 K9K: CO-53				

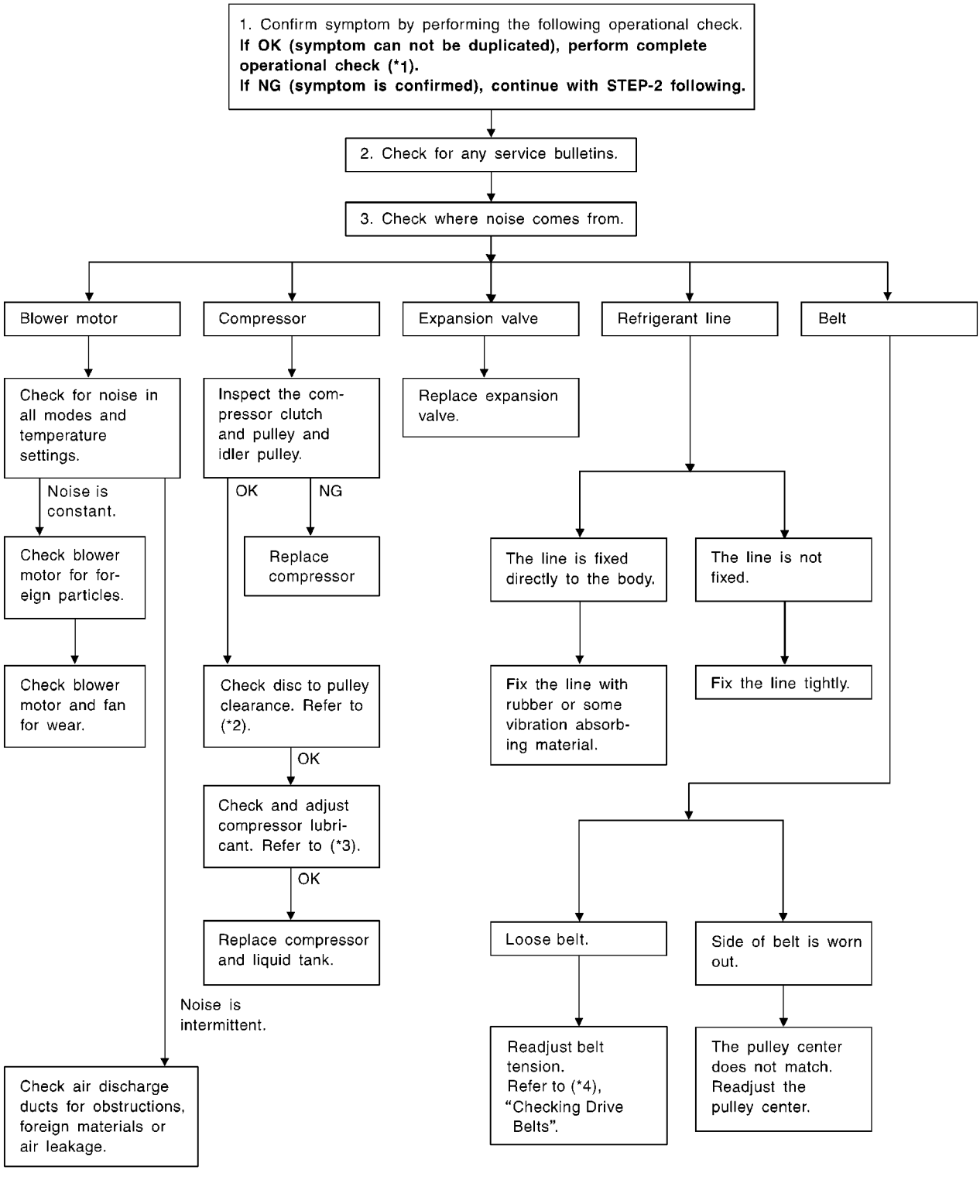
*For further information refer to EC-21, "APPLICATION NOTICE" .

Noise

BJS000BM

SYMPTOM: Noise

INSPECTION FLOW



SJIA0843E

*1 ATC-55, "Operational Check" *2 ATC-141, "CHECK DISC TO PULLEY CLEARANCE" *3 ATC-17, "Maintenance of Lubricant Quantity in Compressor"

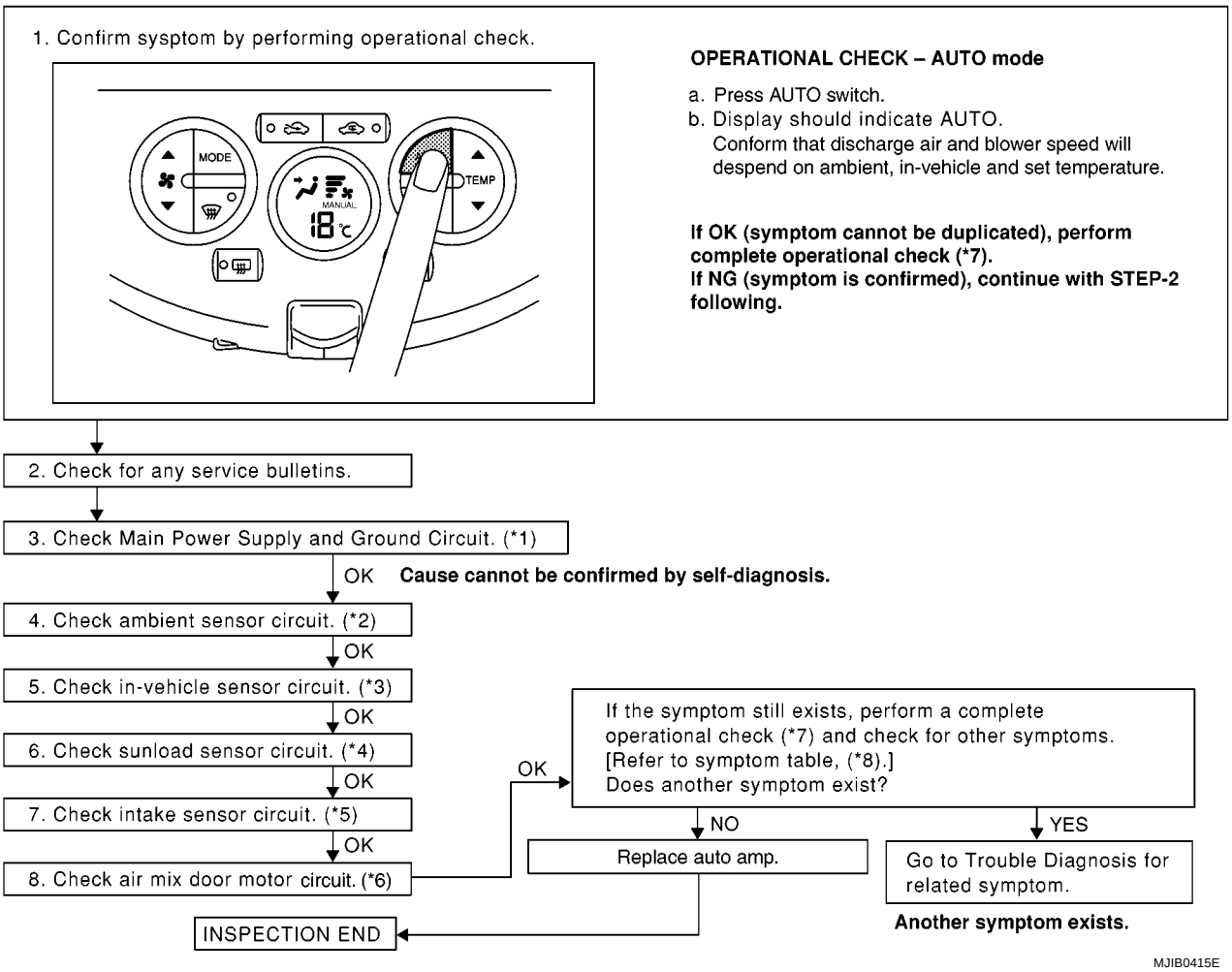
*4 CR: EM-14, "Checking drive Belts"
HR: EM-114, "Checking Drive Belts"
K9K: EM-242, "Checking Drive Belts"

Self-diagnosis

BJS000BN

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-57, "Power Supply and Ground Circuit for Auto Amp." *2 ATC-99, "Ambient Sensor Circuit" *3 ATC-102, "In-vehicle Sensor Circuit"

*4 ATC-105, "Sunload Sensor Circuit" *5 ATC-108, "Intake Sensor Circuit" *6 ATC-64, "Air Mix Door Motor Circuit"

*7 ATC-55, "Operational Check" *8 ATC-27, "SYMPTOM TABLE"

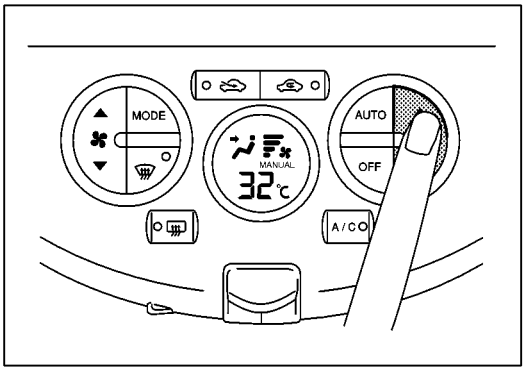
Memory Function

BJS000BO

SYMPTOM: Memory function does not operate.

INSPECTION FLOW

1. Comfirm symptom by performing the following operational check.



OPERATIONAL CHECK -Memory function

a. Press temperature control switch (UP : ▲) until 32℃ is displayed.
a. Press OFF switch.
c. Turn ignition OFF.
d. Turn ignition ON.
e. Press AUTO ON switch.
f. Comfirm that the set temperature remains at previous temperature.
g. Press OFF switch.
If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK

4. Replace auto amp.

5. FINAL CHECK
Go to self-diagnosis function confirmation procedure (*3) and perform self-diagnosis STEP-2.
Confirm that code No. 20 is displayed.

MJIB0416E

*1 ATC-57, "Power Supply and Ground Circuit for Auto Amp."
*2 ATC-55, "Operational Check"
*3 ATC-48, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.

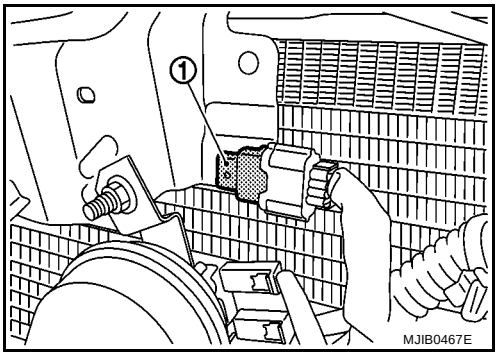
Ambient Sensor Circuit

BJS000BP

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor (1) is attached on the radiator core support upper. It detects ambient temperature and converts it into a resistance value which is then input into the auto amp.



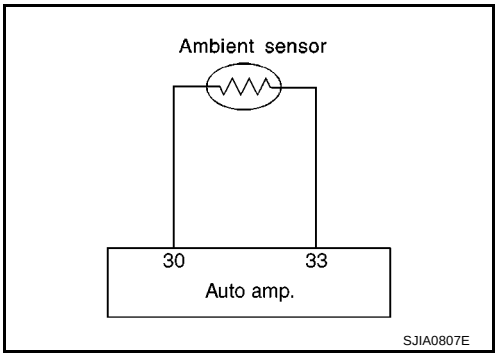
AMBIENT TEMPERATURE INPUT PROCESS

The auto amp. includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the auto amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.
As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

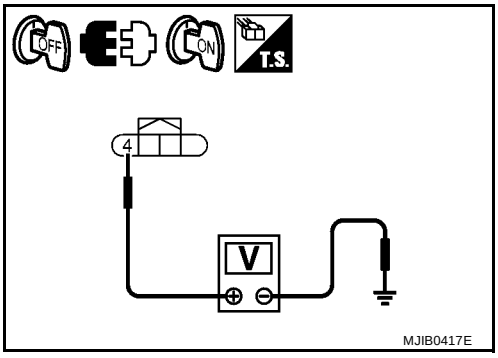
SYMPTOM: Ambient sensor circuit is open or shorted. (21 or 21 is indicated on auto amp. As a result of performing self-diagnosis STEP-2.)

AUTO



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector.
3. Turn ignition switch ON.
4. Check voltage between ambient sensor harness connector and ground.



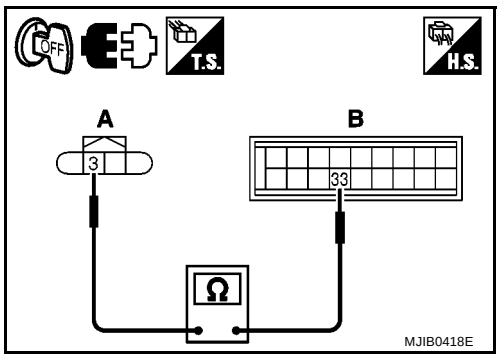
Terminals			Voltage (Approx.)
(+)		(–)	
Connector	Terminal	Ground	
Ambient sensor: E17	4		5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between ambient sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Ambient sensor: E17	3	Auto amp.: M65	33	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Refer to ATC-114, "AMBIENT SENSOR" .

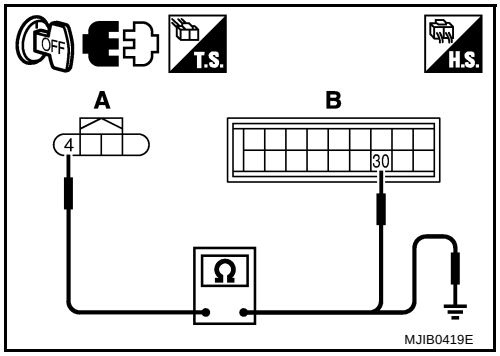
OK or NG

OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between ambient sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Ambient sensor: E17	4	Auto amp.: M65	30	Yes

4. Check continuity between ambient sensor harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
Ambient sensor: E17	4		No

OK or NG

OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

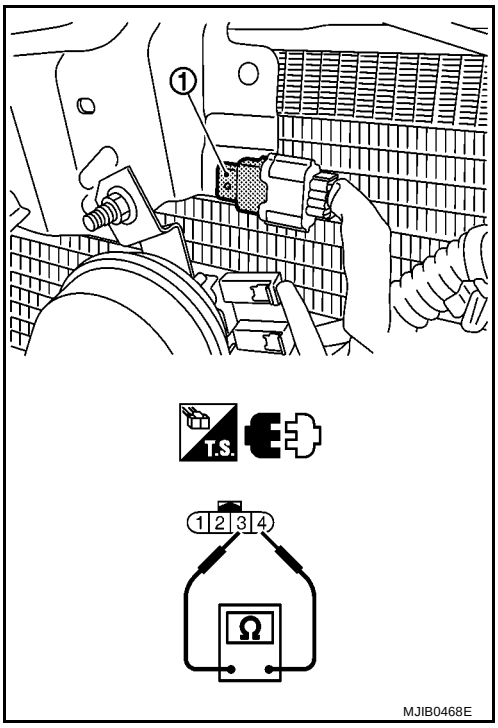
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E32, measure resistance between terminals 1 and 2 at sensor side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



If NG, replace ambient sensor.

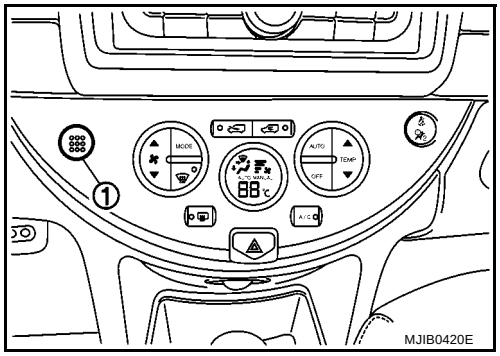
In-vehicle Sensor Circuit

BJS000BQ

COMPONENT DESCRIPTION

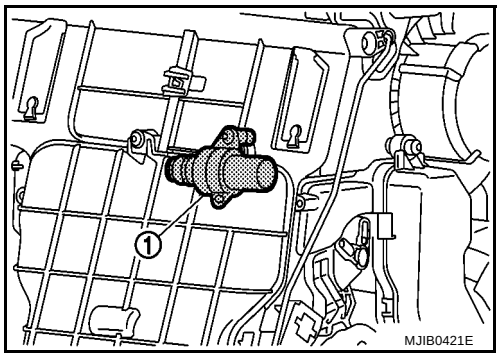
In-vehicle Sensor

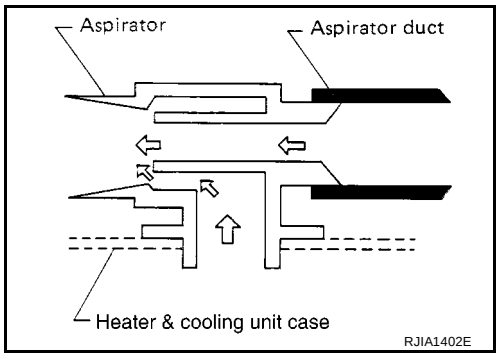
The in-vehicle sensor (1) is located on instrument lower finisher. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the auto amp.



Aspirator

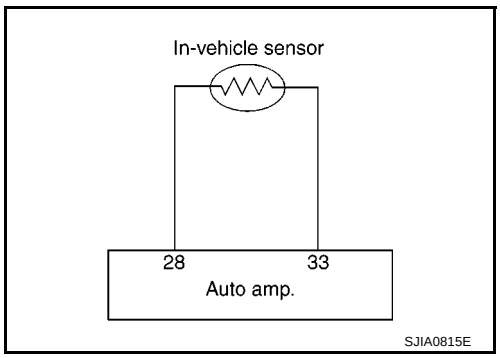
The aspirator (1) is located on passenger's side of A/C unit assembly. It produces vacuum pressure due to air discharged from the A/C unit, continuously taking compartment air in the aspirator.





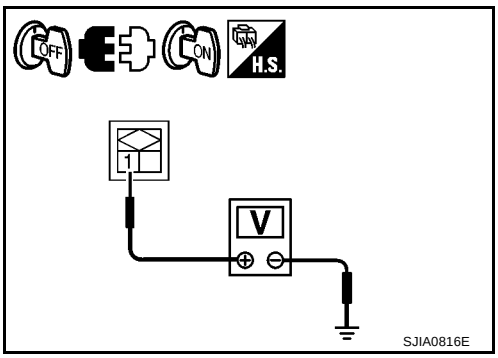
DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. (22 or ^{AUTO} 22 is indicated on auto amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector.
3. Turn ignition switch ON.
4. Check voltage between in-vehicle sensor harness connector and ground.



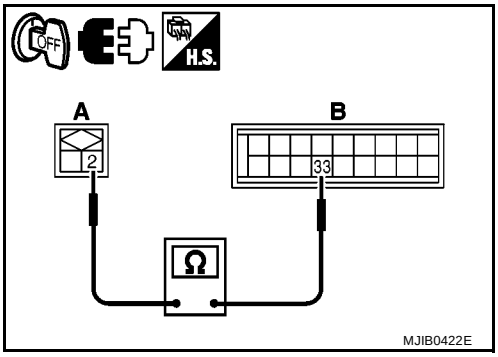
Terminals			Voltage (Approx.)
(+)		(–)	
Connector	Terminal	Ground	
In-vehicle sensor: M43	1		5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
In-vehicle sensor: M43	2	Auto amp.: M65	33	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IN-VEHICLE SENSOR

Refer to ATC-115, "IN-VEHICLE SENSOR" .

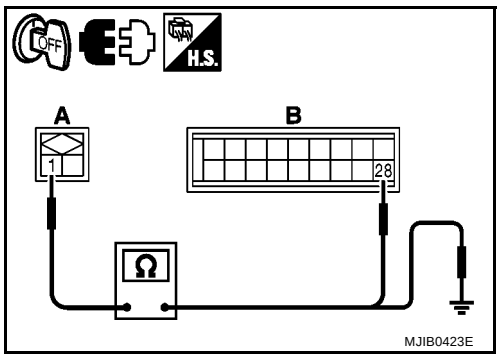
OK or NG

OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
In-vehicle sensor: M43	1	Auto amp.: M65	28	Yes

4. Check continuity between in-vehicle sensor harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
In-vehicle sensor: M43	1		No

OK or NG

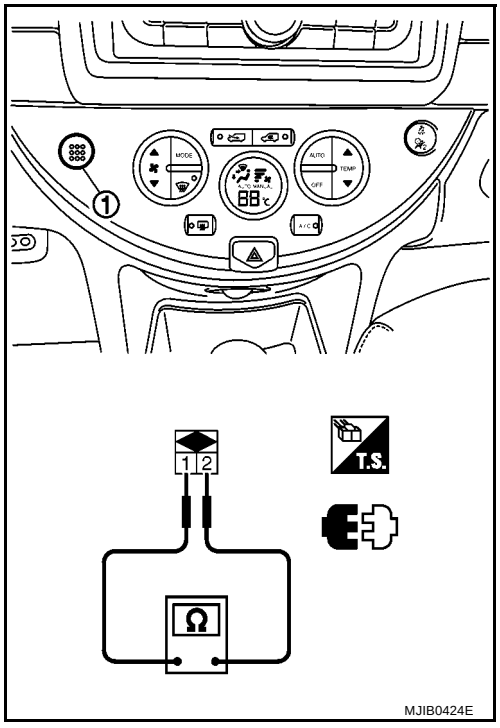
OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M41, measure resistance between terminals 1 and 2 at sensor side, using the table below.



Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace in-vehicle sensor.

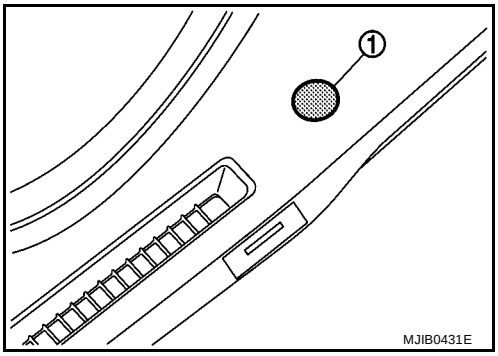
Sunload Sensor Circuit

BJS000BR

COMPONENT DESCRIPTION

Sunload Sensor

The sunload sensor (1) is located on the instrument upper mask. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the auto amp.



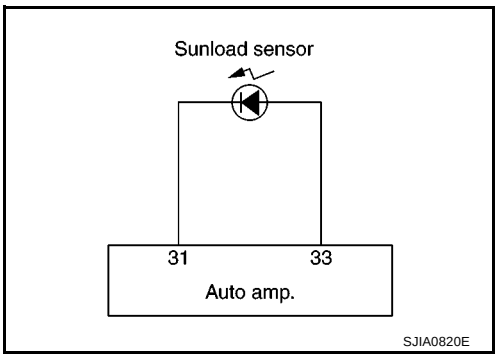
SUNLOAD INPUT PROCESS

The auto amp. also includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

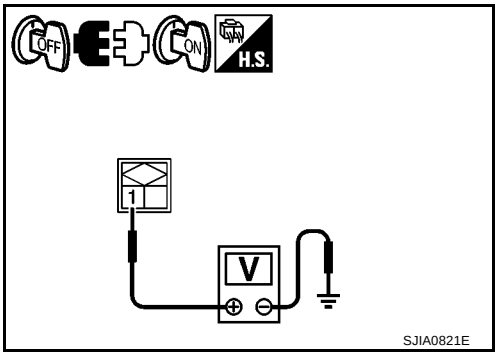
DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR

SYMPTOM: Sunload sensor circuit is open or shorted. (25 or AUTO 25 is indicated on auto amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Turn ignition switch OFF.
2. Disconnect sunload sensor connector.
3. Turn ignition switch ON.
4. Check voltage between sunload sensor harness connector and ground.



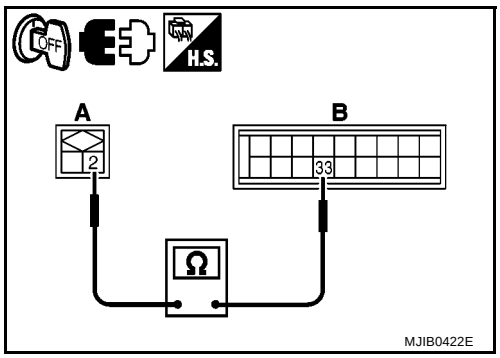
Terminals			Voltage (Approx.)
(+)		(–)	
Connector	Terminal	Ground	
Sunload sensor: M23	1		5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between sunload sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Sunload sensor: M23	2	Auto amp.: M65	33	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

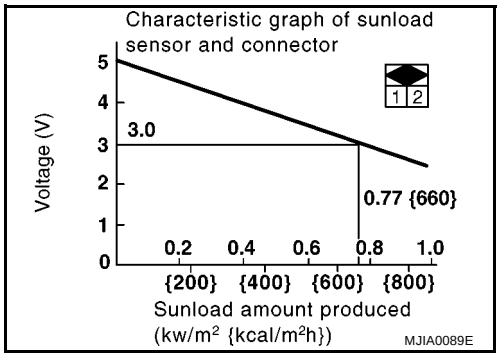
3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and auto amp. connector.
2. Refer to ATC-116, "SUNLOAD SENSOR" .

OK or NG

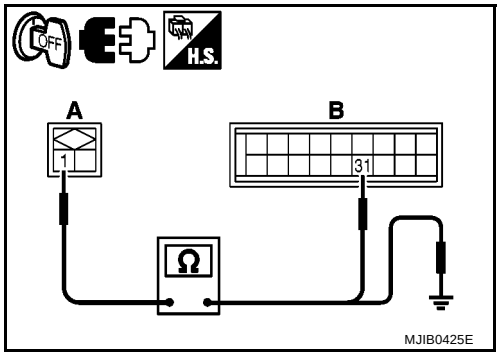
OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.



4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between sunload sensor harness connector (B) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Sunload sensor: M23	1	Auto amp.: M65	31	Yes

4. Check continuity between sunload sensor harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
Sunload sensor: M23	1		No

OK or NG

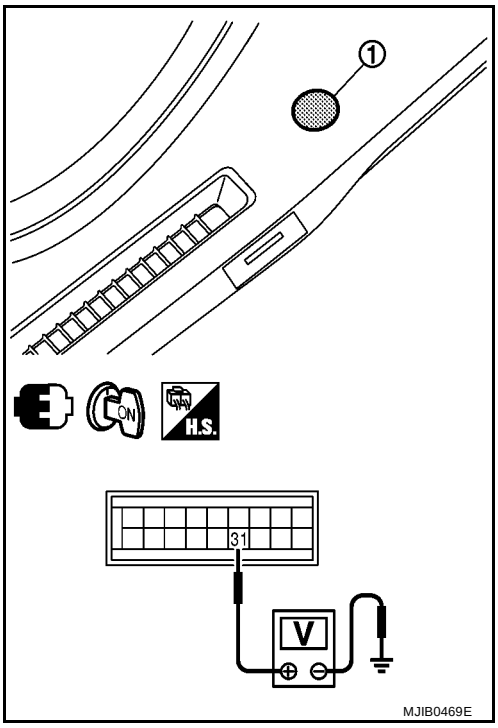
OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

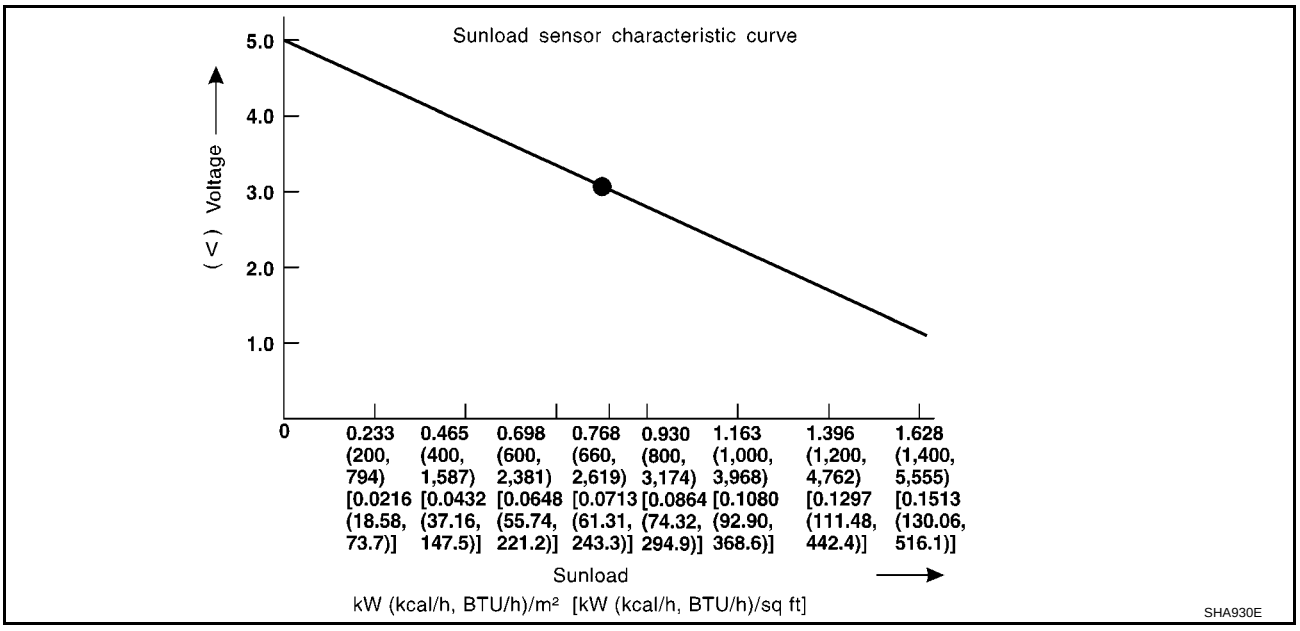
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between auto amp. harness connector M65 terminal 31 and ground.
If NG, replace sunload sensor (1).



- When checking sunload sensor, select a place where sun shines directly on it.



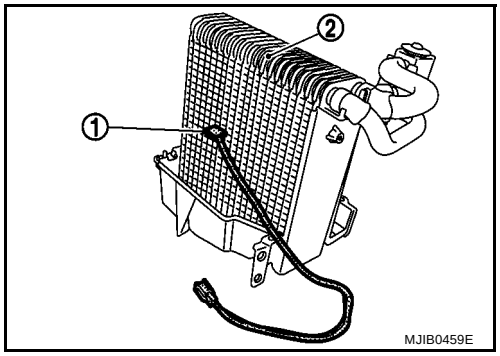
Intake Sensor Circuit

BJS000BS

COMPONENT DESCRIPTION

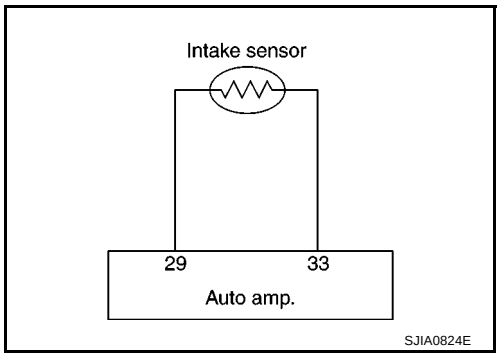
Intake Sensor

The intake sensor (1) is located on the A/C unit. It converts temperature of air that through the evaporator (2) into a resistance value which is then input to the auto amp.



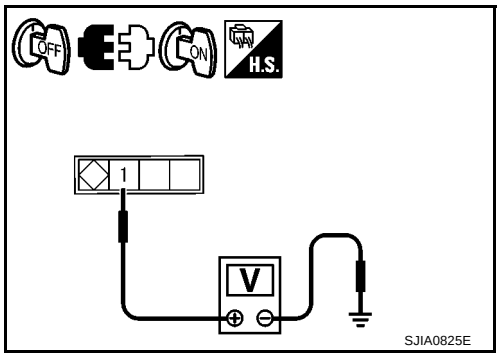
DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (24 or ^{AUTO} 24 is indicated on auto amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Turn ignition switch OFF.
2. Disconnect intake sensor connector.
3. Turn ignition switch ON.
4. Check voltage between intake sensor harness connector and ground.



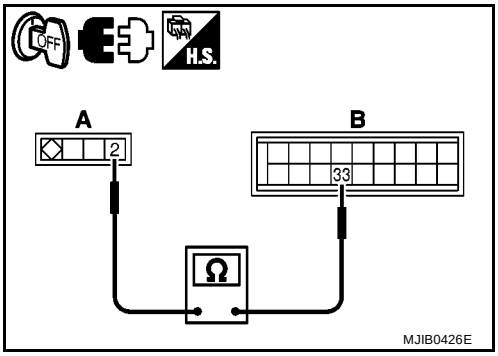
Terminals			Voltage (Approx.)
(+)		(–)	
Connector	Terminal	Ground	
Intake sensor: M44	1		5V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between intake sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Intake sensor: M44	2	Auto amp.: M65	33	Yes

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK INTAKE SENSOR

Refer to ATC-117, "INTAKE SENSOR" .

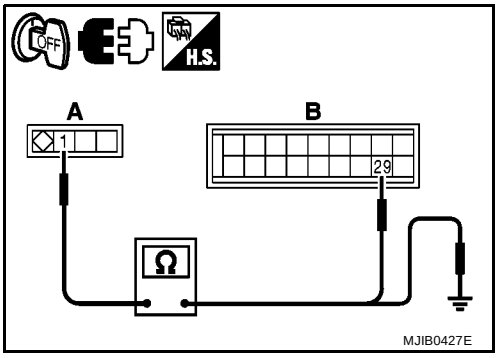
OK or NG

OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between intake sensor harness connector (A) and auto amp. harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Intake sensor: M44	1	Auto amp.: M65	29	Yes

4. Check continuity between intake sensor harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
Intake sensor: M44	1		No

OK or NG

OK >> 1. Replace auto amp.
2. Go to self-diagnosis ATC-48, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

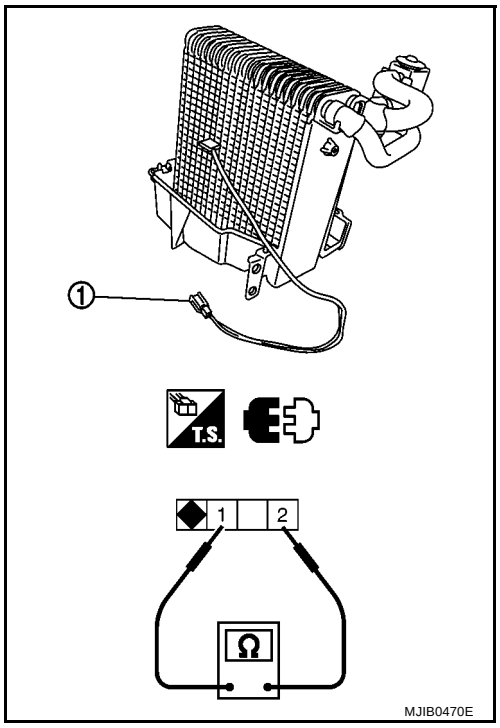
NG >> Repair harness or connector.

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector (1) M44, measure resistance between terminals 1 and 2 at sensor side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.34
–10 (14)	9.62
–5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04



If NG, replace intake sensor.

Engine Coolant Temperature Circuit

BJS000BT

Symptom: Low engine coolant temperature startup airflow control cannot be cancelled, or the mode cannot be switched to low engine coolant temperature startup airflow control.

Inspection Procedure

1. COMBINATION METER FUNCTION INSPECTION

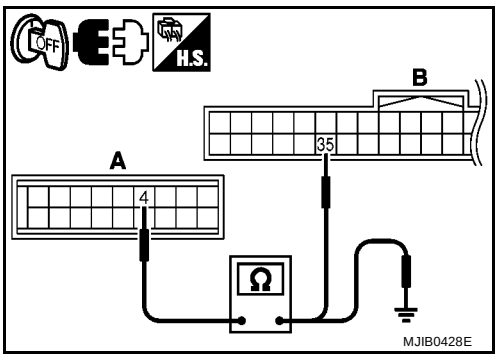
Is engine coolant temperature gauge operating normally?

OK or NG

OK >> GO TO 2.
NG >> GO TO DI-19, "Check Water Temperature Warning/indicator Lamp" of Combination Meter.

2. HARNESS INSPECTION

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector and combination meter connector.
3. Check continuity between auto amp. harness connector (A) and combination meter harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Auto amp.: M64	4	Combination meter: M27	35	Yes

4. Check continuity between auto amp. harness connector (A) and ground.

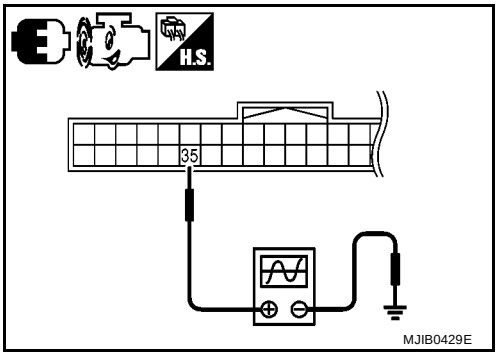
A		Ground	Continuity
Connector	Terminal		
Auto amp.: M64	4		No

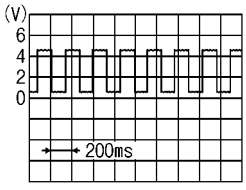
OK or NG

OK >> GO TO 3.
NG >> Repair harness and connector.

3. ENGINE COOLANT TEMPERATURE SIGNAL INSPECTION

After warming up engine, check voltage waveform between combination meter harness connector and ground.



Terminals			Condition	Voltage (approx.)
(+)		(–)		
Connector	Terminal			
Combination meter: M27	35	Ground	After warming up, approx. 80°C.	

SKIB3651J

OK or NG

OK >> Replace auto amp.
NG >> Replace combination meter.

CONTROLLER

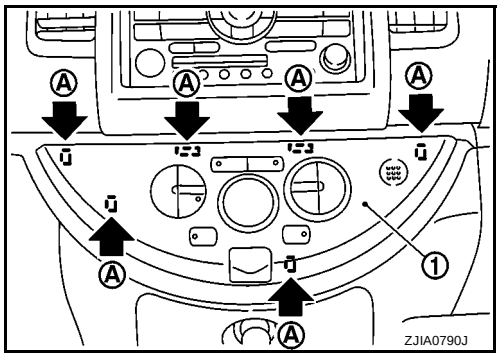
PFP:28074

Removal and Installation of Controller

BJS000BU

REMOVAL

1. Remove controller mounting clips (A) using remover tool.
2. Disconnect controller harness connector and front passenger air bag OFF indicator harness connector.
3. Remove controller (1).

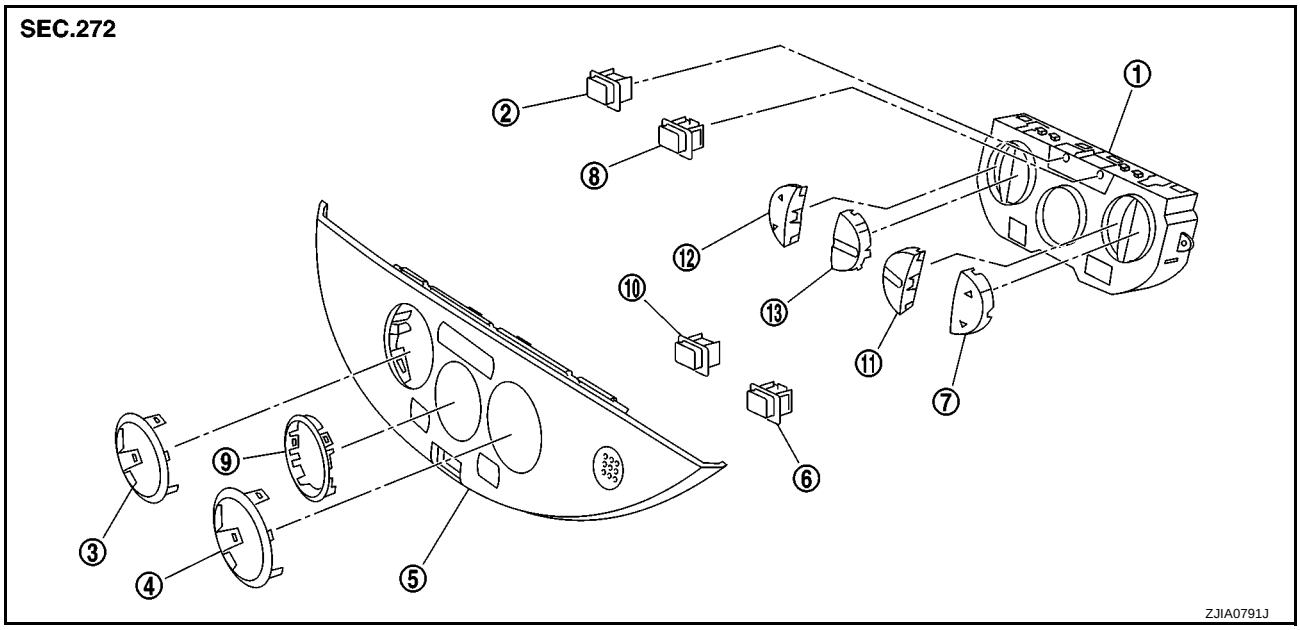


INSTALLATION

Installation is basically the reverse order of removal.

Disassembly and Assembly of Controller

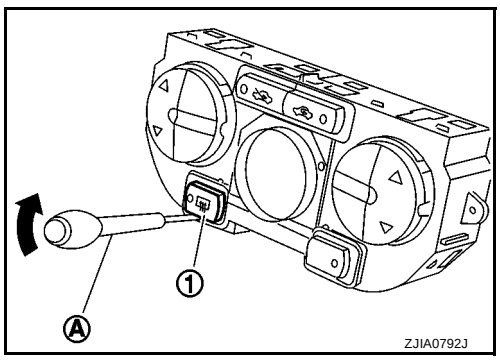
BJS000BV



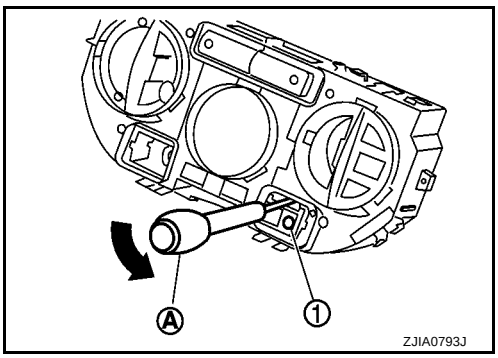
1. Controller assembly
2. FRE button
3. MODE ring
4. TEMP ring
5. A/C finisher
6. A/C button
7. TEMP button
8. REC button
9. LCD ring
10. Rear DEF button
11. AUTO button
12. FAN button
13. MODE button

DISASSEMBLY

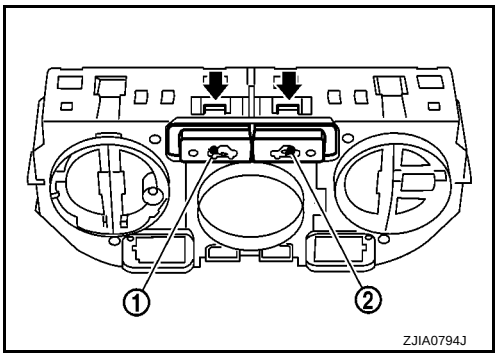
1. Remove rear DEF button (1) using screwdriver (A).



2. Remove A/C button (1) using screwdriver (A).



3. Remove FRE button (1) and REC button (2) using screwdriver.



ASSEMBLY

Assembly is basically the reverse order of disassembly.

AMBIENT SENSOR

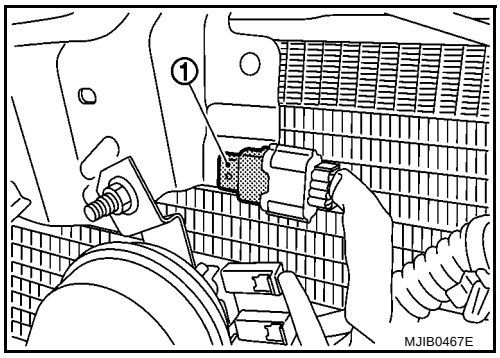
PFP:27722

Removal and Installation

BJS000BY

REMOVAL

1. Remove front grille (left side). Refer to EI-10, "Removal and Installation" .
2. Disconnect ambient sensor connector, and then remove ambient sensor (1).



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

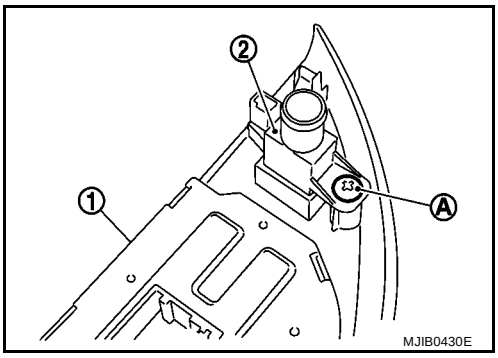
PFP:27720

Removal and Installation

BJS000BZ

REMOVAL

1. Remove instrument lower finisher. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screw (A), and then remove in-vehicle sensor (1) from instrument lower finisher (2).



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

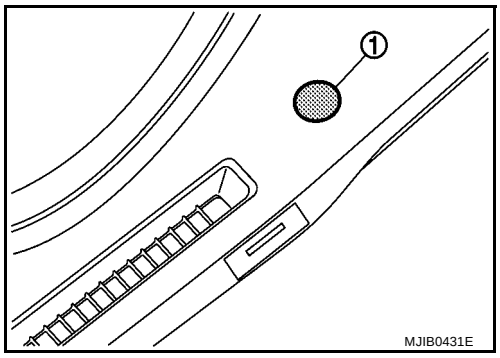
PFP:27721

Removal and Installation

BJS000C0

REMOVAL

1. Remove instrument upper mask. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect sunload sensor connector, and then remove sunload sensor (1).



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE SENSOR

PFP:27723

Removal and Installation

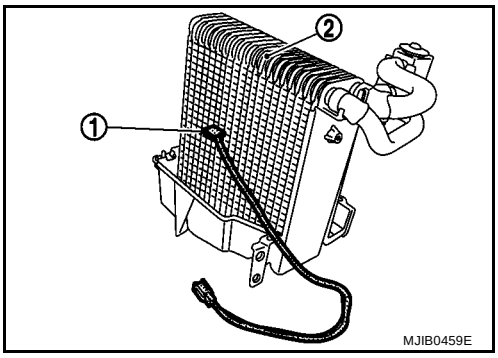
BJS000C1

REMOVAL

1. Remove evaporator. Refer to ATC-145, "Removal and Installation for Evaporator" .

   CAUTION:
   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

2. Remove intake sensor (1) from evaporator (2).



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, and then apply compressor oil to it when installing it.**
- **Mark the mounting position of intake sensor.**
- **When recharging refrigerant, check for leaks.**

A/C UNIT ASSEMBLY

PFP:27110

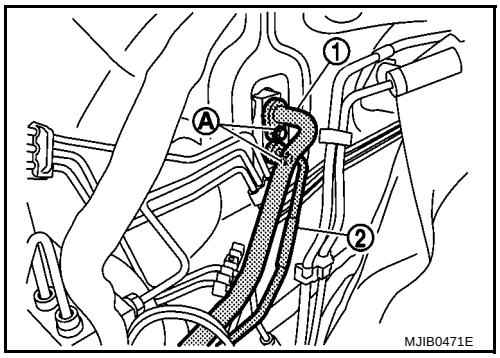
Removal and Installation

BJS000C2

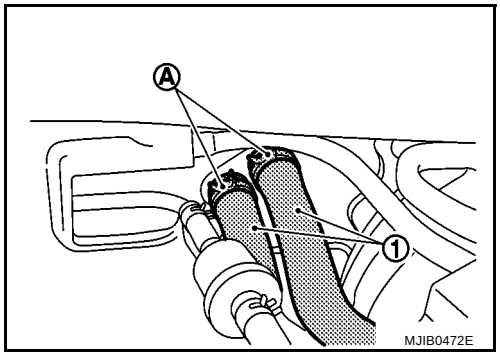
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge refrigerant.
2. Drain coolant from cooling system.
   CR: Refer to CO-28, "Changing Engine coolant" .
   HR: Refer to CO-28, "Changing Engine coolant" .
   K9K: Refer to CO-49, "Changing Engine Coolant" .
3. Remove cowl top cover. Refer to EI-12, "Removal and Installation" .
4. Remove lower dash insulator.
5. Remove mounting bolt (A), and then disconnect low-pressure flexible hose (1) and high-pressure pipe (2) from evaporator.

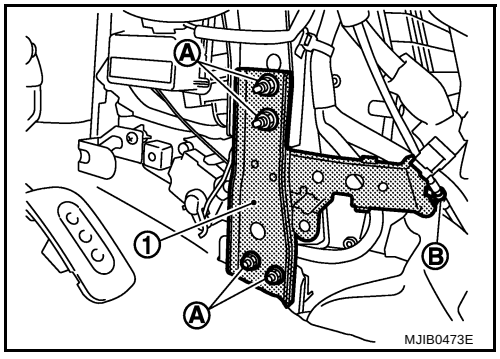
   CAUTION:
   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



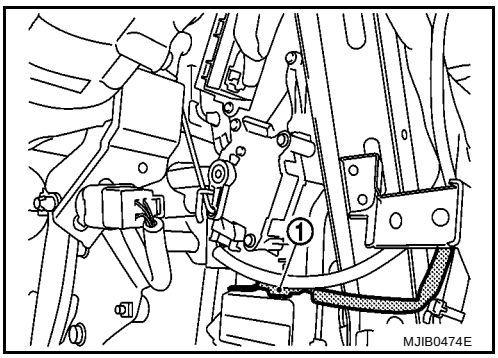
6. Remove clamps (A), and then disconnect heater hoses (1) from heater core.



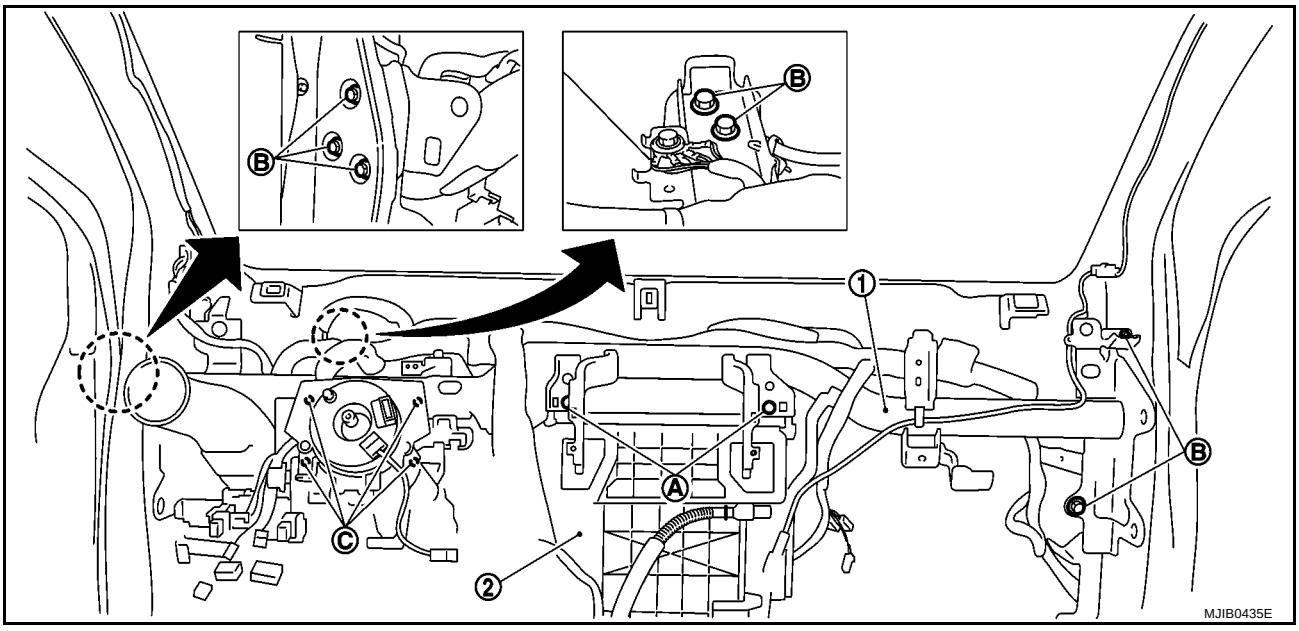
7. Remove console box assembly. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
8. Remove mounting nuts (A) and harness clamps (B), and then remove instrument stay (1).



9. Disconnect intake sensor connector (1).



10. Remove instrument panel & pad. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
11. Remove side ventilator ducts. Refer to ATC-132, "Removal of Side Ventilator Ducts" .
12. Remove center ventilator ducts. Refer to ATC-132, "Removal of Center Ventilator Ducts" .
13. Remove A/C unit assembly mounting bolts (A), steering member mounting bolts (B), steering column mounting nuts (C) and harness clips.



14. Remove steering member, and then remove A/C unit assembly.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

NOTE:

- When filling radiator with coolant.
  CR: Refer to CO-9, "Changing Engine coolant" .
  HR: Refer to CO-28, "Changing Engine coolant" .
  K9K: Refer to CO-49, "Changing Engine Coolant" .
- Recharge the refrigerant.

A/C unit assembly mounting bolt

Tightening torque : 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member mounting bolt

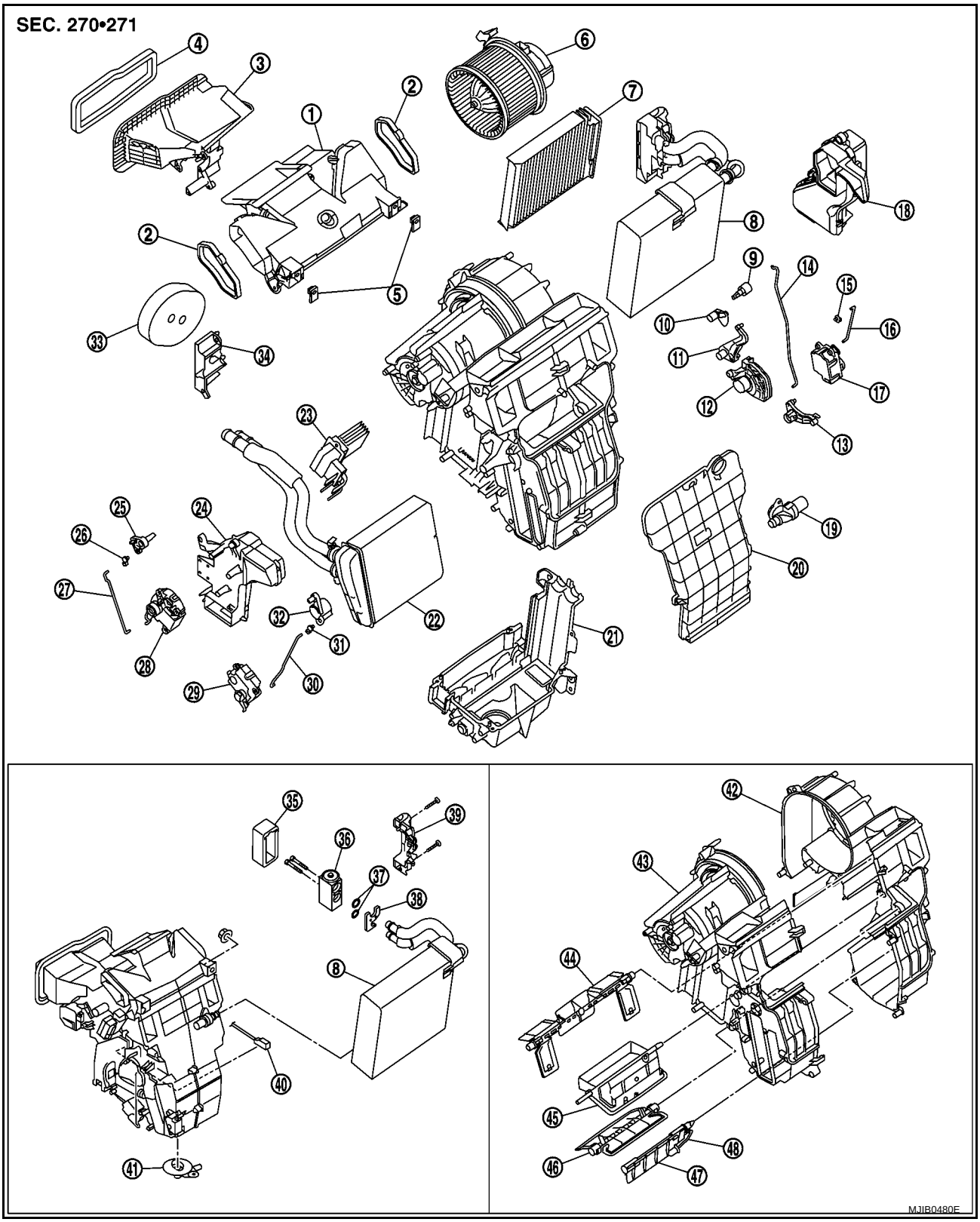
Tightening torque : 12 N·m (1.25 kg-m, 9 ft-lb)

Steering column mounting nut

Tightening torque : 12 N·m (1.25 kg-m, 9 ft-lb)

Disassembly and Assembly

BJS000C3



1. Center defroster duct
2. Seal
3. Intake case
4. Insulator
5. Nut
6. Blower motor
7. Air conditioner filter
8. Evaporator assembly
9. Ventilator-defroster door lever
10. Foot door lever
11. Air mix door link
12. Main link
13. Foot door link
14. Rod
15. Rod holder
16. Rod
17. Mode door motor
18. Foot duct assembly (RH)

19. Aspirator
20. Heater cover
21. Lower blower case
22. Heater core assembly
23. Power transistor
24. Foot duct assembly (LH)
25. Intake door lever
26. Rod holder
27. Rod
28. Intake door motor
29. Air mix door motor
30. Rod
31. Rod holder
32. Air mix door lever
33. Heater pipe packing
34. Heater hose cover
35. Cover
36. Expansion valve assembly
37. O-ring
38. Evaporator valve block
39. Expansion valve cover
40. Intake sensor
41. Drain hose
42. Blower case (RH)
43. Blower case (LH)
44. Ventilator-defroster door
45. Air mix door 1
46. Air mix door 2
47. Foot door
48. Foot door link

BLOWER MOTOR

PFP:27226

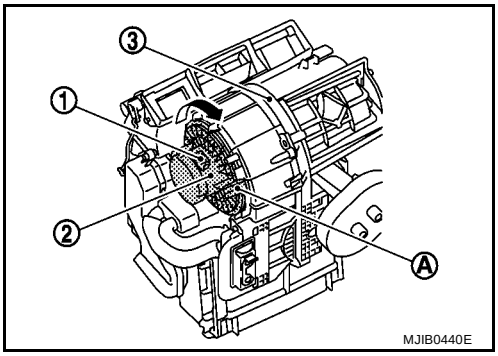
Removal and Installation

BJS000C4

REMOVAL

1. Remove instrument panel & pad. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove side ventilator duct (right). Refer to ATC-132, "Removal of Side Ventilator Ducts" .
3. Disconnect blower motor connector (1).
4. Push flange holding hook (A), and then remove blower motor (2) from A/C unit assembly (3).

CAUTION:
When blower fan and blower motor are assembled, the balance is adjusted, so do not replace the individual parts.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:
Correctly install blower motor flange holding hook in A/C unit assembly.

INTAKE DOOR MOTOR

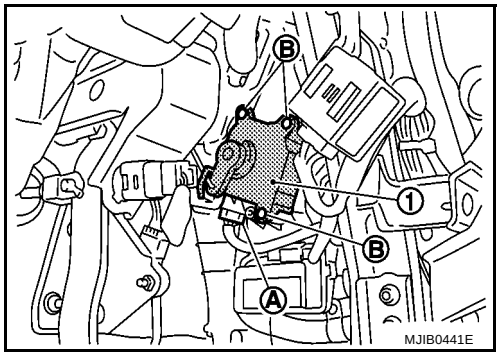
PFP:27730

Removal and Installation

BJS000C5

REMOVAL

1. Remove instrument lower finisher and instrument lower cover (LH). Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect connector (A).
3. Remove mounting screws (B), and then remove intake door motor (1).



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

After installing door motor, perform door motor starting position reset by following self-diagnosis STEP-3. Refer to ATC-46, "Self-diagnosis Function" .

AIR MIX DOOR MOTOR

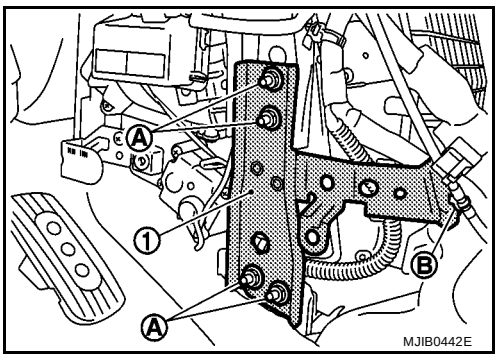
PFP:27732

Removal and Installation

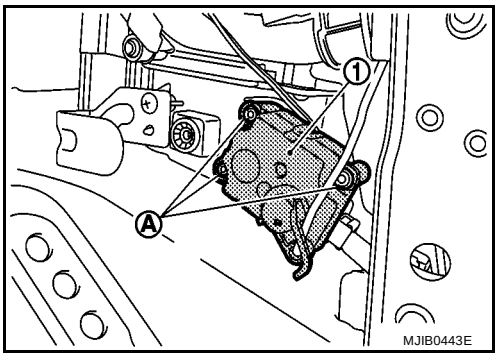
BJS000C6

REMOVAL

1. Remove instrument lower finisher. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove console box assembly. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
3. Remove mounting nuts (A) and harness clamps (B), and then remove instrument stay (1).



4. Remove mounting screws (A), and then remove air mix door motor (1).
5. Disconnect air mix door motor connector.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

After installing door motor, perform door motor starting position reset by following self-diagnosis STEP-3. Refer to ATC-46, "Self-diagnosis Function" .

MODE DOOR MOTOR

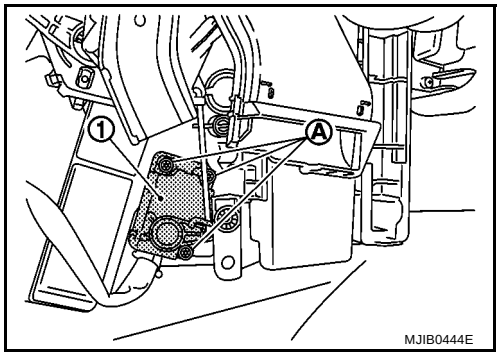
PFP:27731

Removal and Installation

BJS000C7

REMOVAL

1. Remove glove box assembly and instrument lower cover (RH). Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A), and then remove mode door motor (1).
3. Disconnect mode door motor connector.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

After installing door motor, perform door motor starting position reset by following self-diagnosis STEP-3. Refer to ATC-46, "Self-diagnosis Function" .

POWER TRANSISTOR

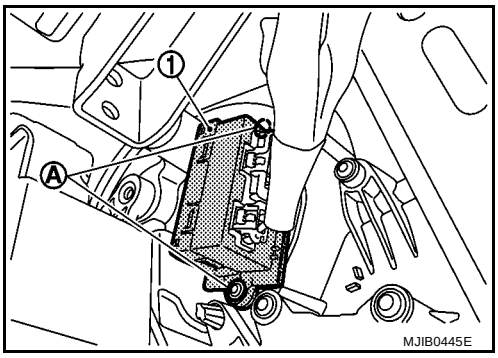
PFP:27761

Removal and Installation

BJS000C8

REMOVAL

1. Remove A/C unit assembly. Refer to ATC-118, "A/C UNIT ASSEMBLY" .
2. Remove mounting screws (A), and then remove power transistor (1).



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

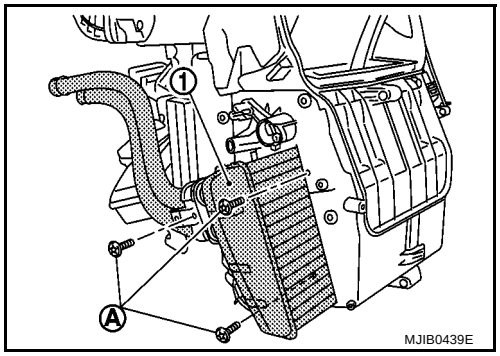
PFP:27140

Removal and Installation

BJS000C9

REMOVAL

1. Remove A/C unit assembly. Refer to ATC-118, "A/C UNIT ASSEMBLY" .
2. Remove foot duct (left). Refer to ATC-132, "Removal of Foot Ducts" .
3. Remove mounting screws (A).
4. Slide heater core (1) to leftward.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

After installing door motor, perform door motor starting position reset by following self-diagnosis STEP-3. Refer to ATC-46, "Self-diagnosis Function" .

AIR CONDITIONER FILTER

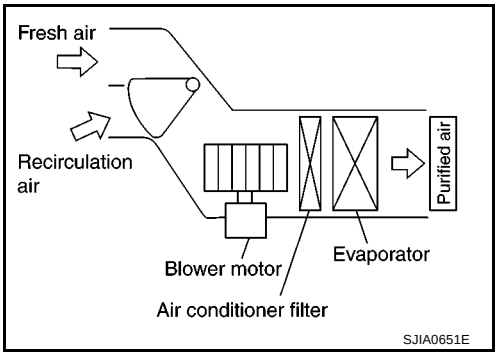
PFP:27277

Removal and Installation

BJS000CA

FUNCTION

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing air conditioner filter into A/C unit assembly.

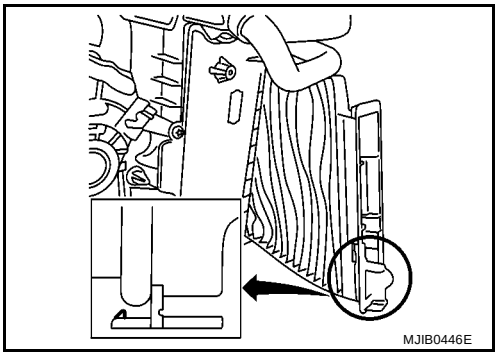


REPLACEMENT TIMING

Replace air conditioner filter.
Refer to MA-55, "CHASSIS AND BODY MAINTENANCE" .
Caution label is fixed inside glove box.

REPLACEMENT PROCEDURES

1. Remove glove box assembly. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Compress air conditioner filter downward while sliding it to the right side of the vehicle.
3. Turn the bottom of air conditioner filter upward, and then remove it.
4. Replace with new one and reinstall on A/C unit assembly.
5. Reinstall glove box assembly.



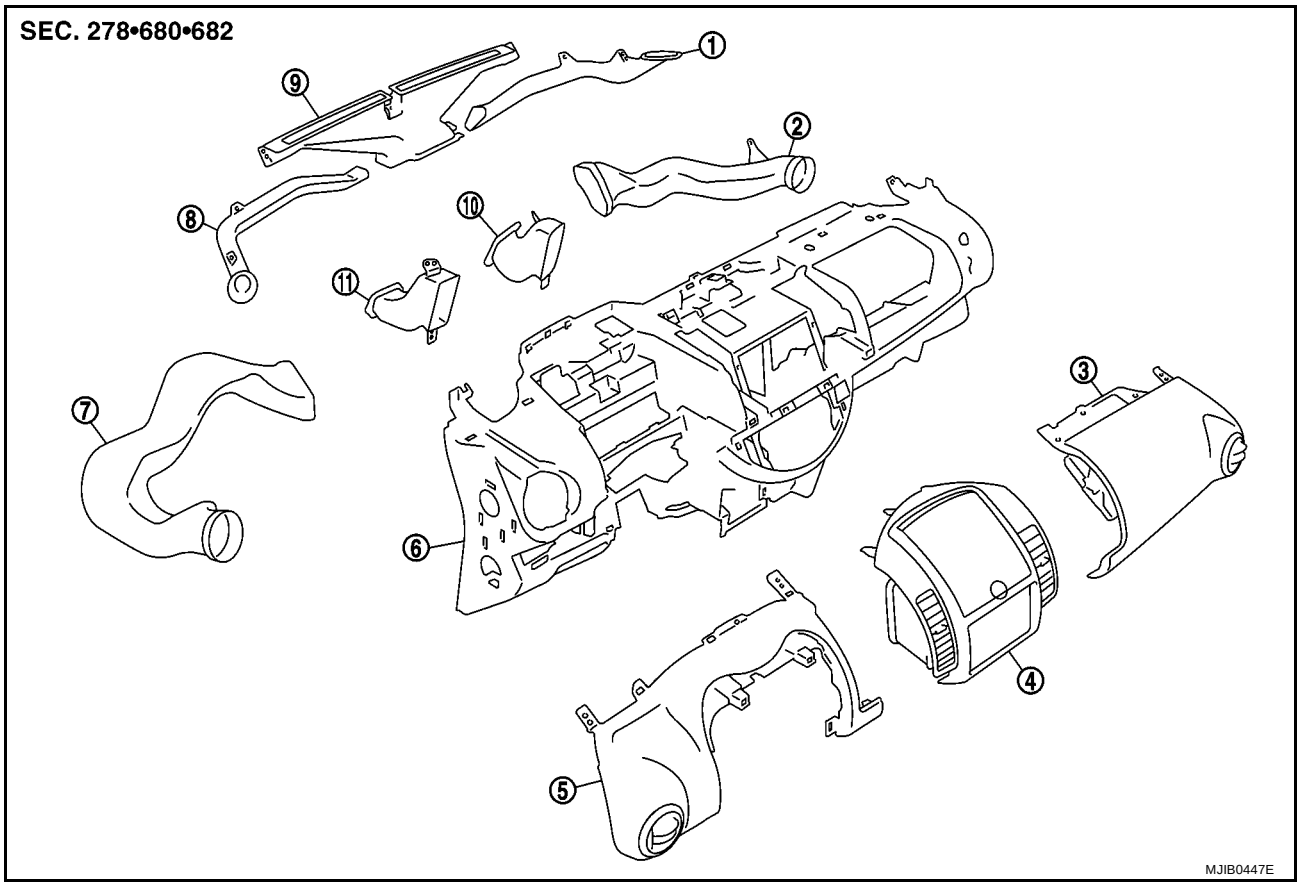
DUCTS AND GRILLES

PFP:27860

Removal and Installation

BJS000CB

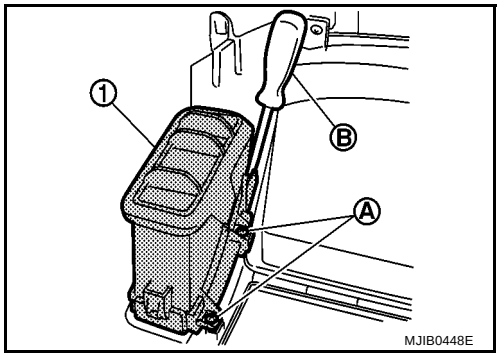
REMOVAL



1. Side defroster duct (right)
2. Defroster nozzle
3. Side defroster duct (left)
4. Side defroster grille (left)
5. Instrument side panel (left)
6. Instrument panel & pad
7. Side ventilator assembly (left)
8. Cluster lid C
9. Side ventilator assembly (right)
10. Instrument finisher E
11. Instrument side panel (right)

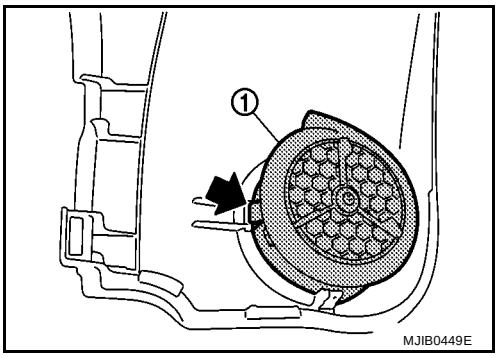
Removal of Center Ventilator Grilles

1. Remove cluster lid C. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove center ventilator grilles (1) mounting screws (A) using a screwdriver (B), and then remove center ventilator grilles (1).

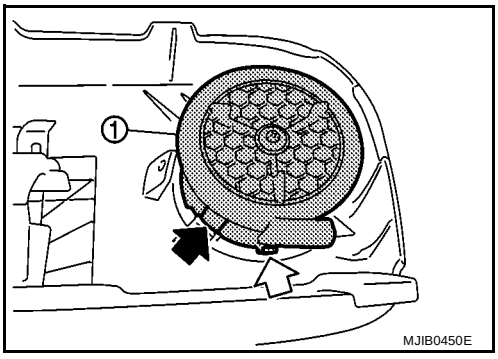


Removal of Side Ventilator Grilles

1. Remove instrument pad assembly (left). Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Side ventilator grille (left) (1) mounting pawl (⬅) is pushed, and side ventilator grille (left)(1) is pulled out.

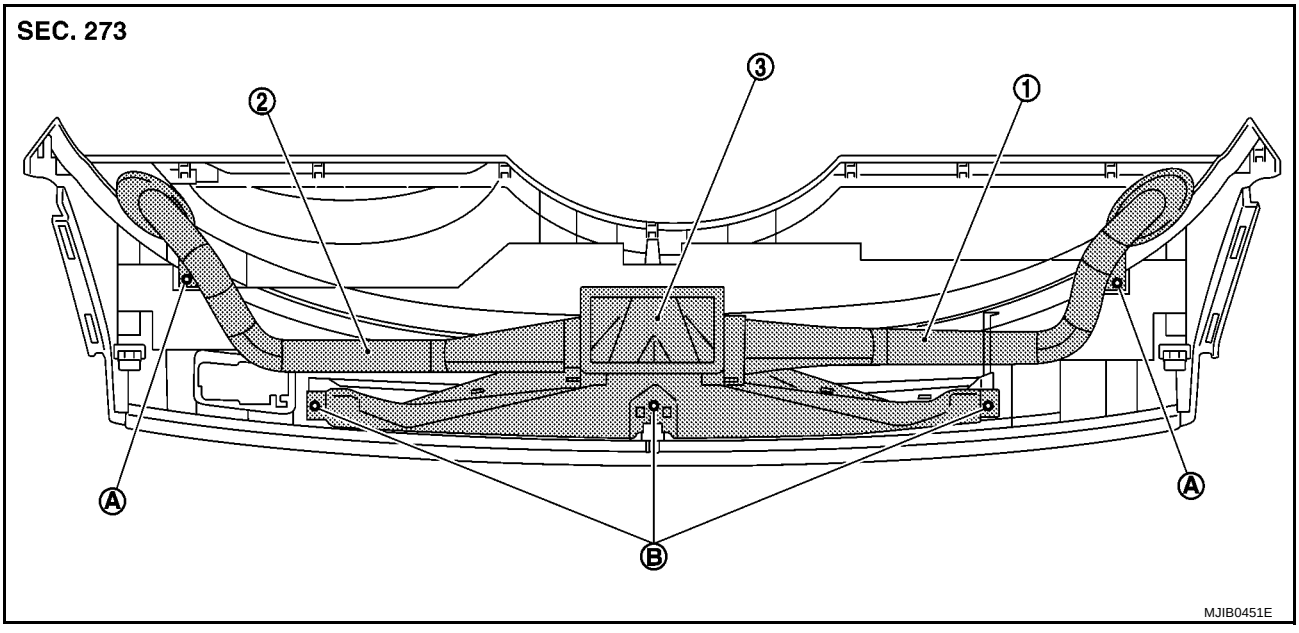


3. Remove instrument pad assembly (right). Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
4. Side ventilator grille (right) (1) mounting pawl (⬅) is pushed, and side ventilator grille (right)(1) is pulled out.



Removal of Defroster Nozzle and Ducts

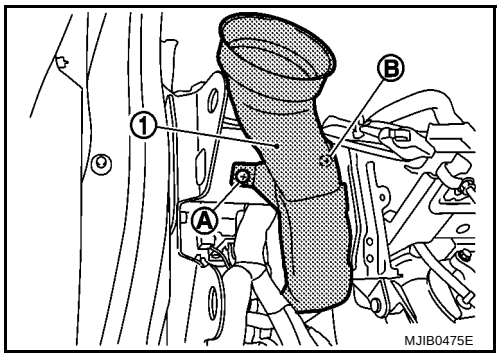
1. Remove instrument upper finisher. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A) and then remove side defroster duct (right) (1) and side defroster duct (left) (2).



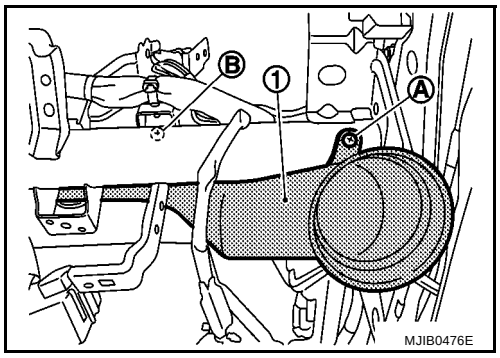
3. Remove mounting screws (B), and then remove defroster nozzle (3).

Removal of Side Ventilator Ducts

1. Remove instrument panel & pad. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A) and clip (B), and then remove side ventilator duct (left) (1).

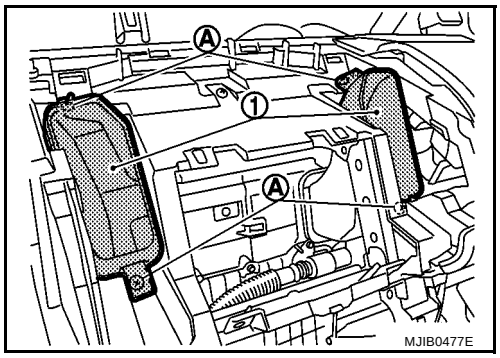


3. Remove mounting screw (A) and clip (B), and then remove side ventilator duct (right) (1).



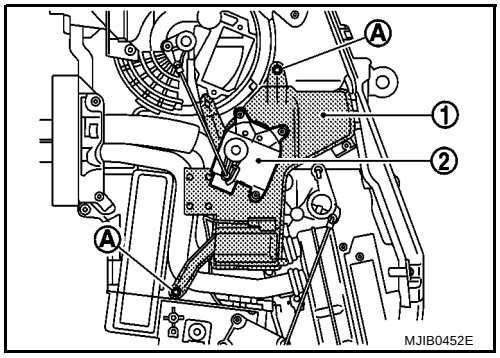
Removal of Center Ventilator Ducts

1. Remove instrument panel & pad. Refer to IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws (A), and then remove center ventilator ducts (1).

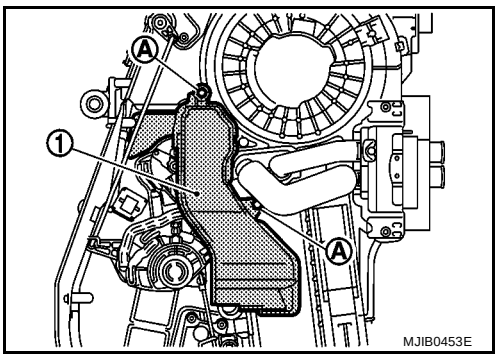


Removal of Foot Ducts

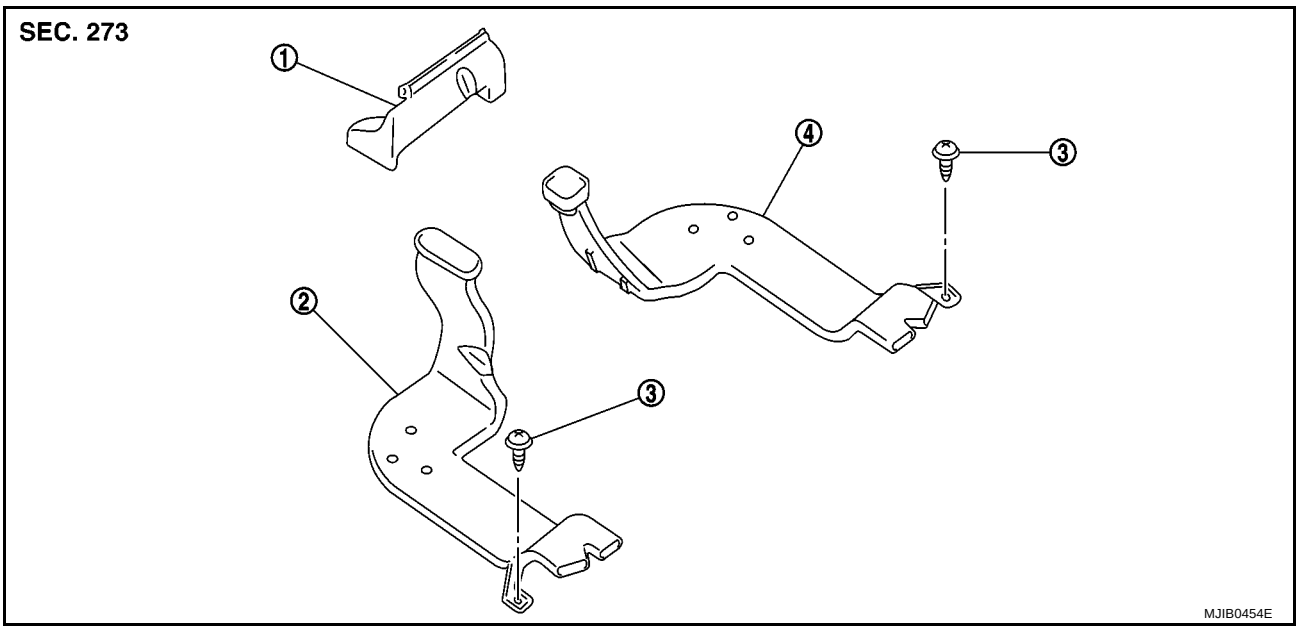
1. Remove A/C unit assembly. Refer to ATC-118, "A/C UNIT ASSEMBLY" .
2. Remove intake door motor (2). Refer to ATC-124, "INTAKE DOOR MOTOR" .
3. Remove mounting screws (A), and then remove foot duct (left) (1).



4. Remove mounting screws (A), and then remove foot duct (right) (1).

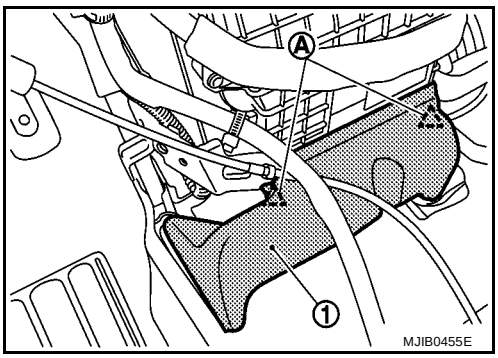


Removal of Floor Ducts



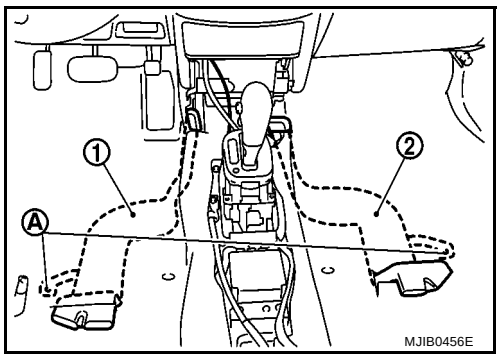
1. Front floor duct
2. Rear floor duct (left)
3. Clip
4. Rear floor duct (right)

1. Remove front seats and center console assembly. Refer to SE-8, "Removal and Installation" and IP-4, "INSTRUMENT PANEL ASSEMBLY" .
2. Disengage claws (A), and then remove front floor duct (1).



3. Peel back floor trim to a point where floor duct is visible.

4. Remove mounting clips (A), and then remove rear floor duct (left) (1) and rear floor duct (right) (2).



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

HFC-134a (R-134a) Service Procedure

BJS000CC

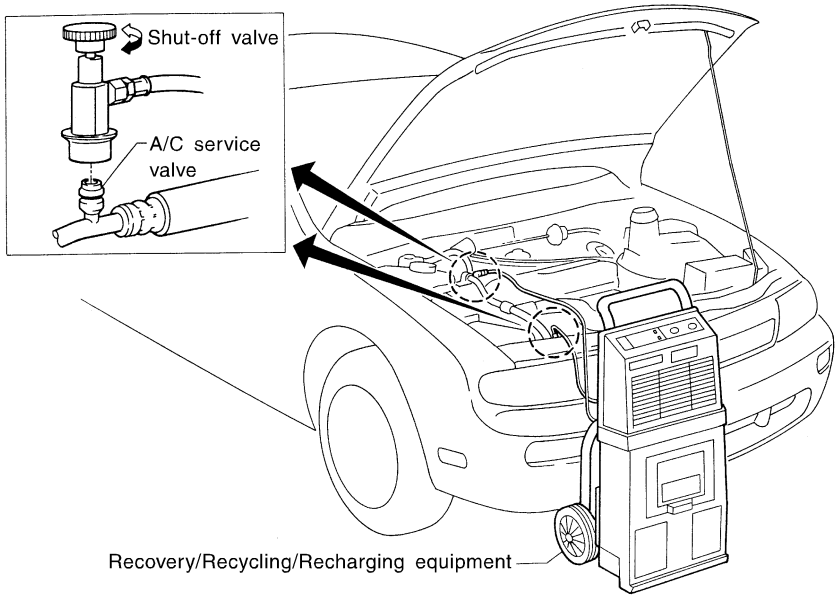
SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

WARNING:

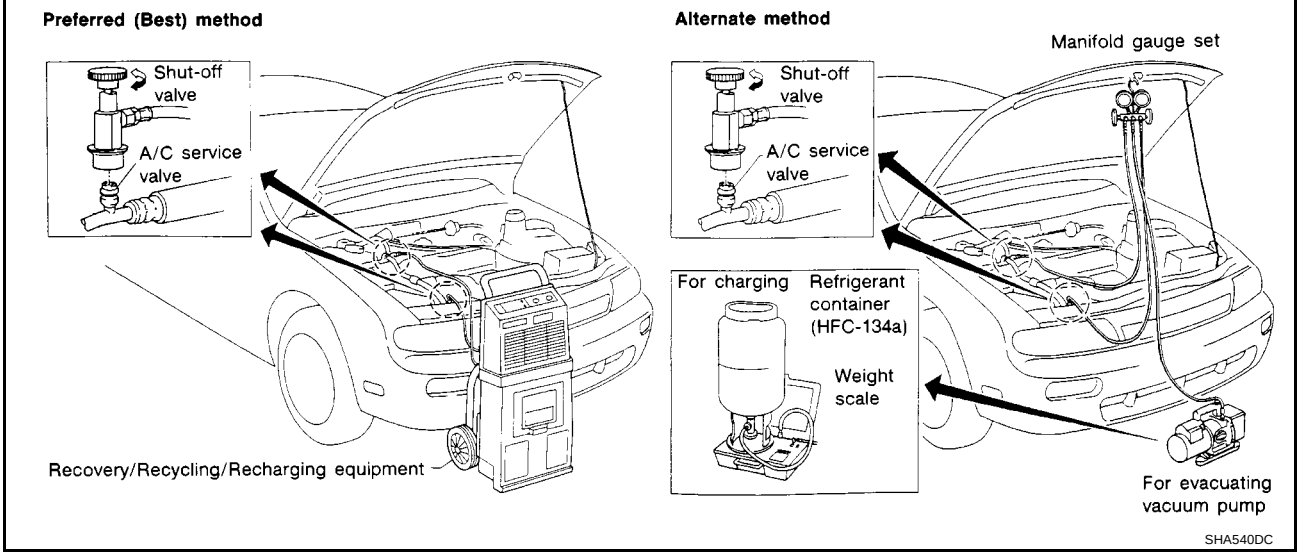
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

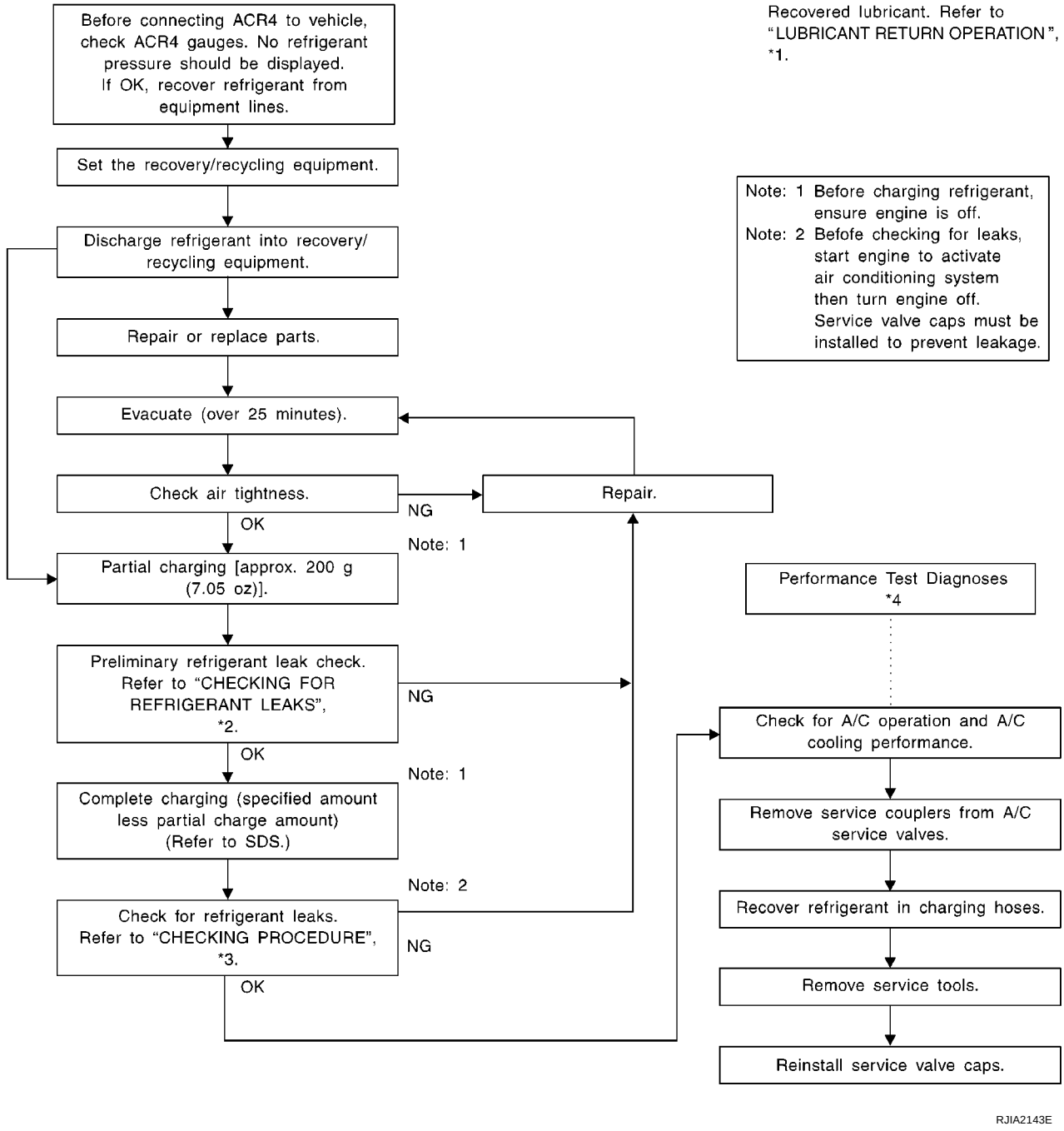
Example



Evacuating System and Charging Refrigerant

Example





RJIA2143E

*1 ATC-17, "LUBRICANT RETURN OPERATION"

*2 ATC-147, "Checking for Refrigerant Leaks"

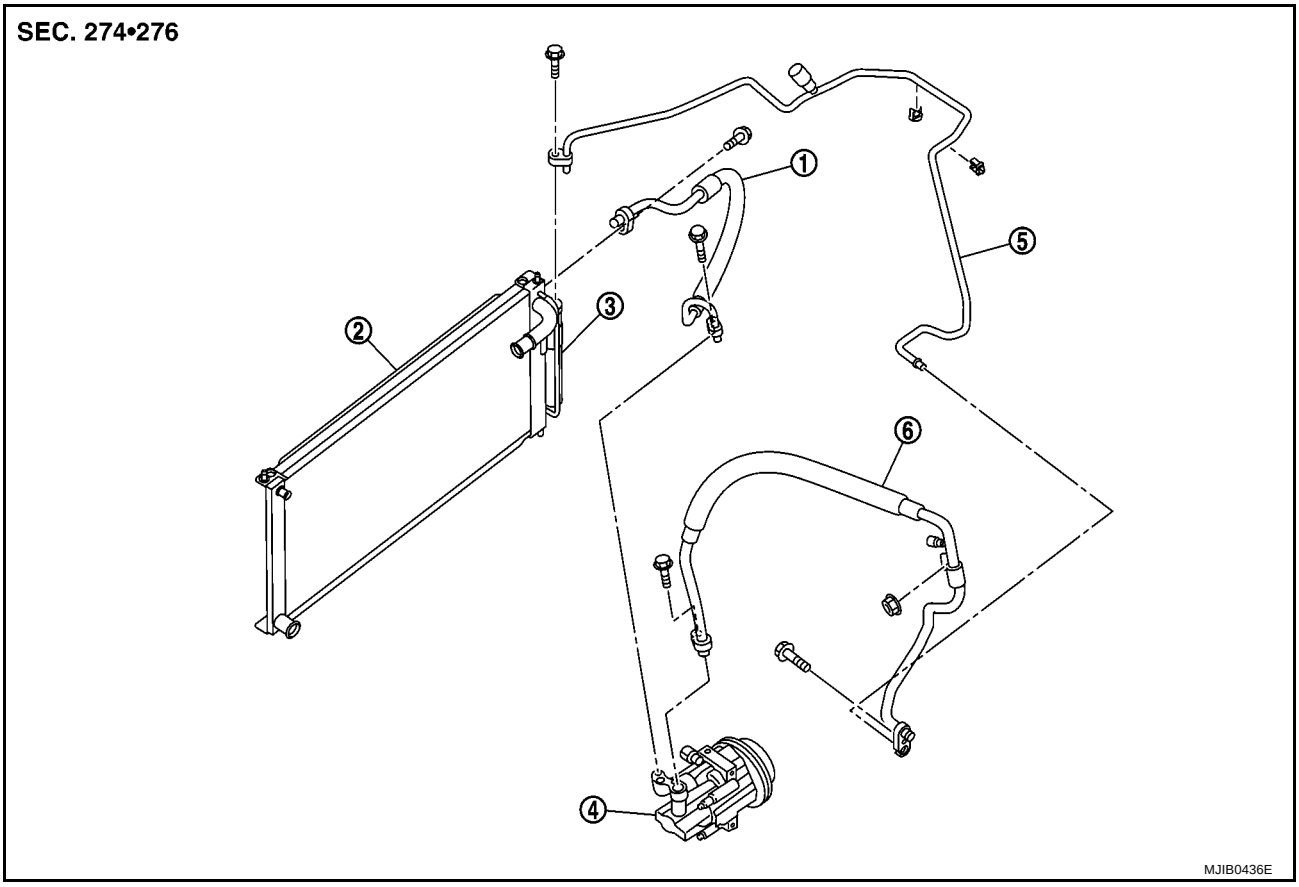
*3 ATC-149, "CHECKING PROCEDURE"

*4 ATC-88, "PERFORMANCE TEST DIAGNOSIS"

Components

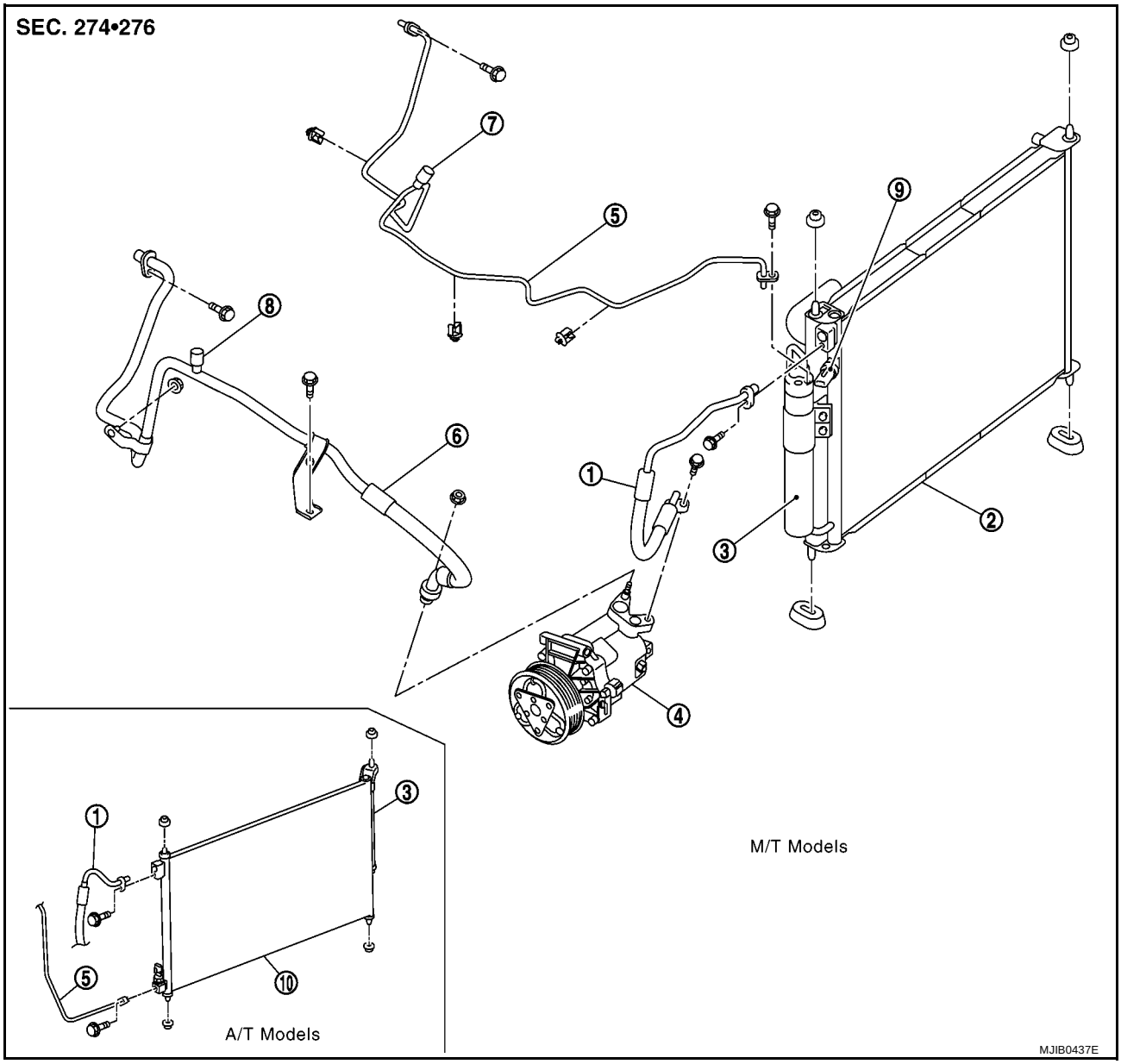
BJS000CD

CR ENGINE MODELS



1. High-pressure flexible hose
2. Radiator (Condenser)
3. Liquid tank
4. Compressor
5. High-pressure pipe
6. Low-pressure flexible hose

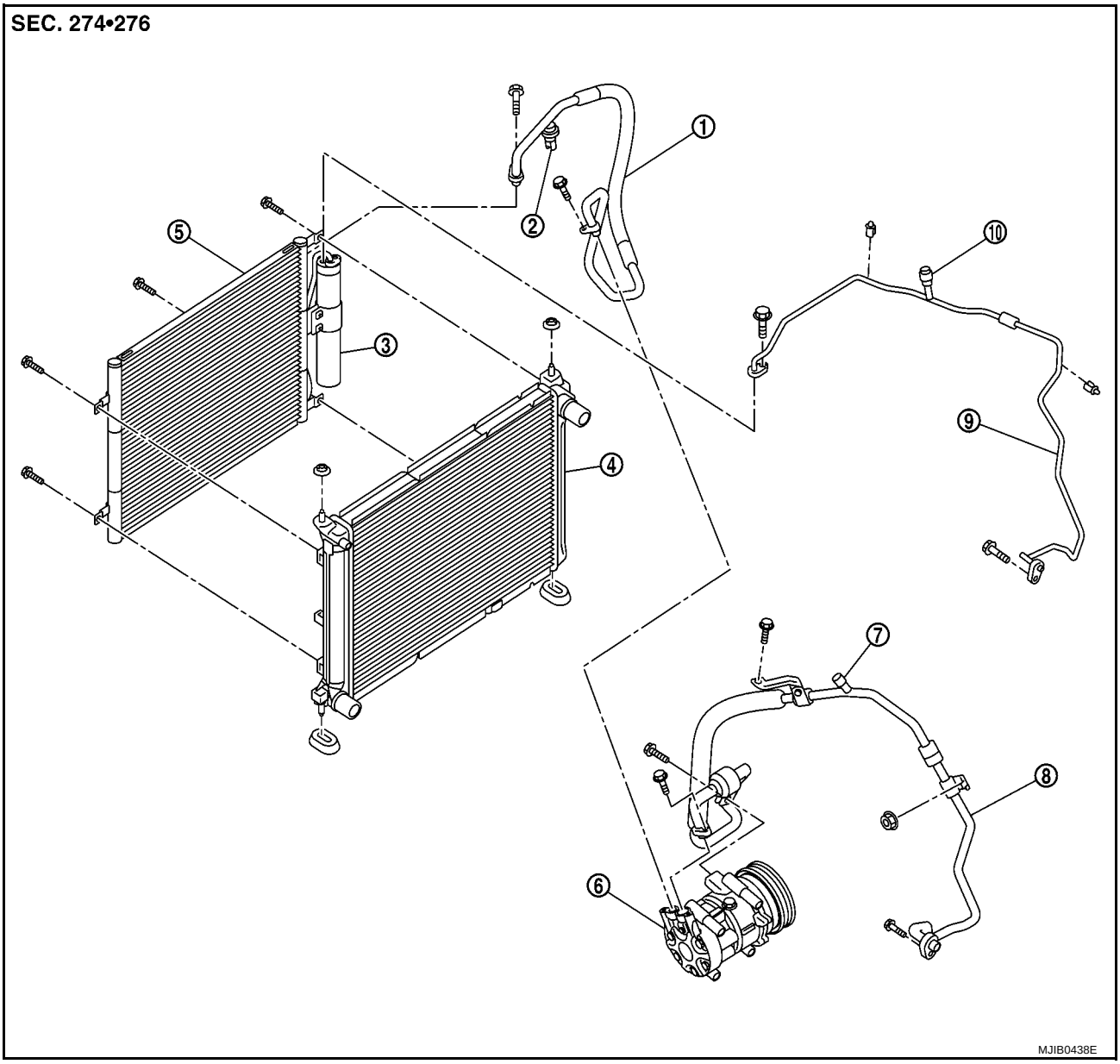
HR ENGINE MODELS



1. High-pressure flexible hose
2. Radiator (Condenser)
3. Liquid tank
4. Compressor
5. High-pressure pipe
6. Low-pressure flexible hose
7. Service valve (High pressure)
8. Service valve (Low pressure)
9. Refrigerant pressure sensor
10. Condenser

K9K ENGINE MODELS

SEC. 274•276



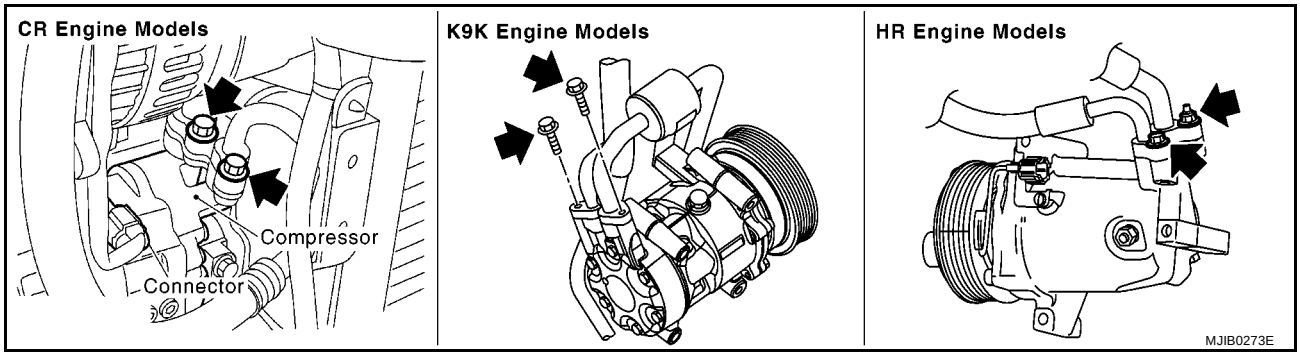
1. High-pressure flexible hose
2. Refrigerant pressure sensor
3. Liquid tank
4. Radiator (Condenser)
5. Condenser
6. Compressor
7. Service valve (Low pressure)
8. Low-pressure flexible hose
9. High-pressure pipe
10. Service valve (High pressure)

Removal and Installation of Compressor

BJS000CE

REMOVAL

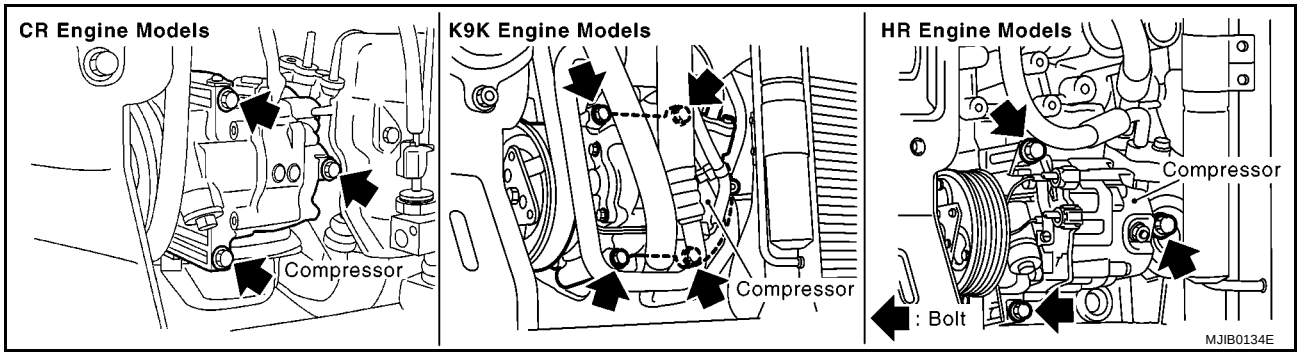
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine undercover, using power tools.
3. Remove low-pressure flexible hose mounting nut and high-pressure flexible hose mounting bolt from compressor.



CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

4. Remove A/C compressor belt.
   CR: Refer to EM-14, "DRIVE BELTS" .
   HR: Refer to EM-114, "DRIVE BELTS" .
   K9K: Refer to EM-242, "DRIVE BELTS" .
5. Disconnect compressor connector.
6. Remove mounting bolts from compressor, using power tools.



7. Remove compressor downward of the vehicle.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with a new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

Compressor mounting bolt

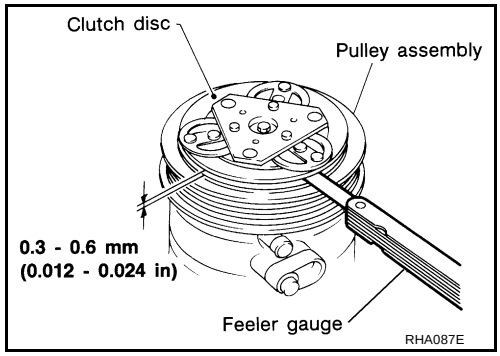
Tightening torque : 20.0 N·m (2.05 kg-m, 14.8 ft-lb)

CHECK DISC TO PULLEY CLEARANCE

Check clearance around entire periphery of clutch disc.

Disc to pulley clearance : 0.3 - 0.6 mm (0.012 - 0.024 in)

If specified clearance is not obtained, replace compressor.



Removal and Installation for Pipe and Hose

BJS000I9

REMOVAL

1. Use recovery/recycling recharging equipment [for HFC-134a (R-134a)] to discharge refrigerant.
2. Remove the low-pressure flexible hose bracket mounting bolt and nut.
3. Remove the high-pressure pipe and low-pressure flexible hose mounting bolts (air conditioner unit side).

   CAUTION:
   Seal the connecting points of the pipe and hose with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.
4. Remove the low-pressure flexible hose mounting bolt or nut (compressor side) and then remove the low-pressure flexible hose.

   CAUTION:
   Seal the connecting points of the hose with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.
5. Remove the front bumper and air guide (RH). Refer to EI-4, "Removal and Installation" and BL-13, "Removal and Installation" .
6. Remove the high-pressure pipe mounting bolt (liquid tank side) and then remove the high-pressure pipe.

   CAUTION:
   Seal the connecting points of the pipe with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.
7. Remove the high-pressure flexible hose mounting bolts and then remove the high-pressure flexible hose.

   CAUTION:
   Seal the connecting points of the hoses with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

INSTALLATION

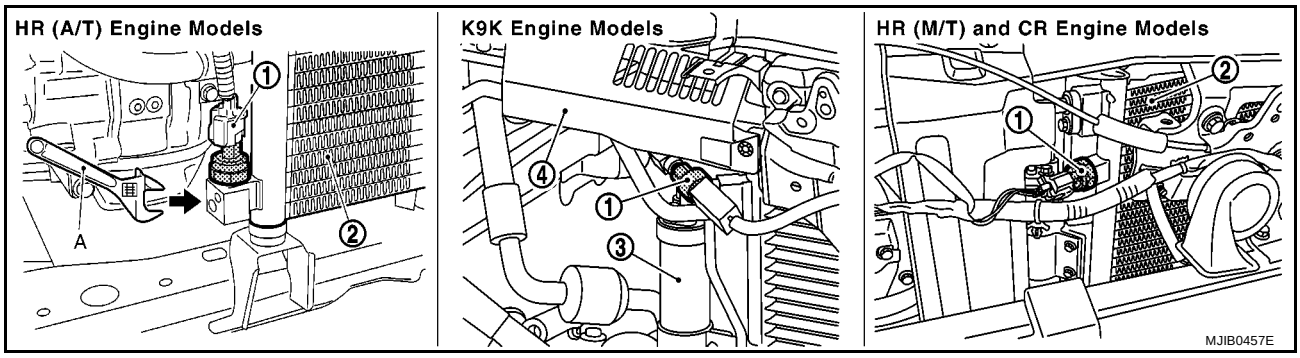
CAUTION:

- **Replace the O-rings on the high-pressure pipe, low-pressure flexible hose, and high-pressure flexible hose with new ones, and apply compressor lubricant to O-rings before installing.**
- **When charging refrigerant, check for refrigerant leaks.**

High-pressure pipe mounting bolt
Tightening torque : 4.4 N·m (0.45 kg-m, 39.0 in-lb)
Low-pressure flexible hose and high-pressure pipe mounting bolts (evaporator side)
Tightening torque : 4.4 N·m (0.45 kg-m, 39.0 in-lb)
Low-pressure flexible hose mounting bolt (compressor side)
Tightening torque : 13.7 N·m (1.4 kg-m, 10.1 ft-lb)
Low-pressure flexible hose bracket mounting bolt/nut
Tightening torque : 4.2 N·m (0.43 kg-m, 37.2 in-lb)
High-pressure flexible hose mounting bolt
Tightening torque : 13.7 N·m (1.4 kg-m, 10.1 ft-lb)

Removal and Installation for Refrigerant Pressure Sensor

BJS000IA



1. Refrigerant pressure sensor
2. Condenser
3. Liquid tank
4. Air guide

REMOVAL AND INSTALLATION

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the front bumper and air guide (RH) (4). Refer to EI-4, "Removal and Installation" and BL-13, "Removal and Installation" .
3. Use a adjustable wrench A or other tool to hold the refrigerant pressure sensor mounting block, and then remove the refrigerant pressure sensor from the condenser (CR and HR engine models) or the high-pressure flexible hose (K9K engine models).

   CAUTION:
   - **Be careful when working so as not to damage the condenser core.**
   - **When installing refrigerant pressure sensor, apply compressor lubricant to the O-rings.**

   Refrigerant pressure sensor

   Tightening torque : 10.8 N·m (1.1 kg-m, 8.0 ft-lb)

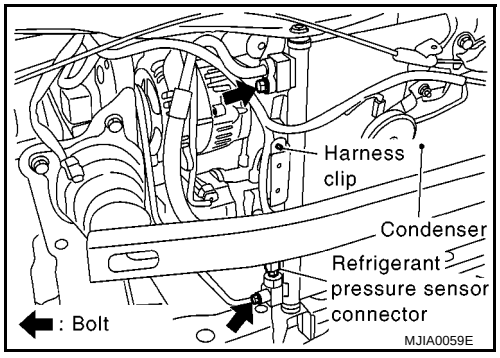
Removal and Installation for Condenser (Models without Integrated Condenser)

BJS000IB

REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the front bumper and air guide (RH). Refer to EI-4, "Removal and Installation" and BL-13, "Removal and Installation" .
3. Disconnect the high-pressure flexible hose and high-pressure pipe from the condenser.

   CAUTION:
   Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.
4. Disconnect the refrigerant pressure sensor connector, and then remove the harness clip (CR engine models).

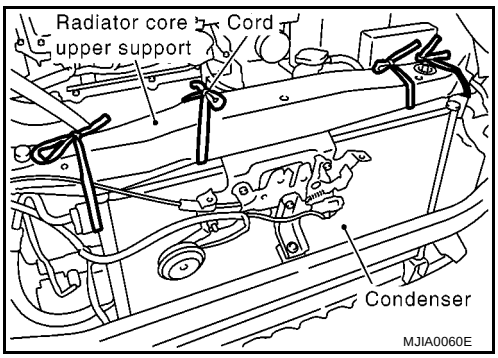


5. Use cord, etc., to hold the condenser and radiator to each radiator core support upper.

   NOTE:
   To prevent the condenser and radiator from being dropped when the radiator core lower support is removed.

6. Remove the mounting bolts, and then remove the radiator core lower support.
7. Remove the condenser from underneath the vehicle.

   CAUTION:
   Do not damage the condenser core.



INSTALLATION

CAUTION:

- **Replace O-rings on the high-pressure pipe and high-pressure flexible hose with new ones. Apply compressor lubricant to O-rings when installing them.**
- **When charging refrigerant, check for refrigerant leaks.**

High-pressure flexible hose bolt
Tightening torque : 13.7 N·m (1.4 kg-m, 10.1 ft-lb)
High-pressure pipe mounting bolt
Tightening torque : 4.4 N·m (0.45 kg-m, 39.0 in-lb)
Radiator core lower support mounting bolts.
Tightening torque : 51.1 N·m (5.3 kg-m, 37.7 ft-lb)

Removal and Installation for Condenser (Models with Integrated Condenser)

BJS000IC

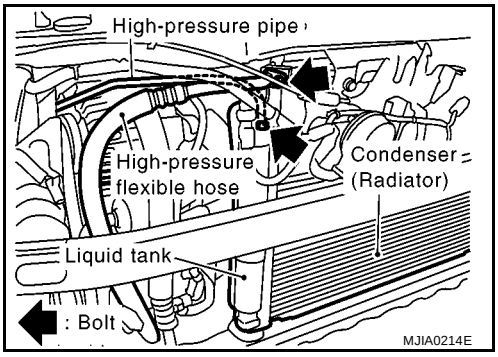
REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the front bumper and air guide (RH). Refer to EI-4, "Removal and Installation" and BL-13, "Removal and Installation" .
3. Disconnect the high-pressure flexible hose from the condenser. Disconnect the high-pressure pipe from the liquid tank.

   CAUTION:
   Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

4. Remove the radiator assembly.
   CR: Refer to CO-12, "Removal and Installation" .
   HR: Refer to CO-31, "Removal and Installation" .

   CAUTION:
   Do not damage the radiator and condenser core.



INSTALLATION

CAUTION:

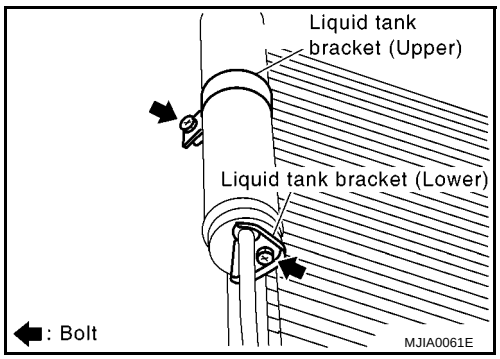
- **Replace O-rings on the high-pressure pipe and high-pressure flexible hose with new ones. Apply compressor lubricant to O-rings when installing them.**
- **When charging refrigerant, check for refrigerant leaks.**

Removal and Installation for Liquid Tank (HR Engine with A/T Models)

BJS000ID

REMOVAL

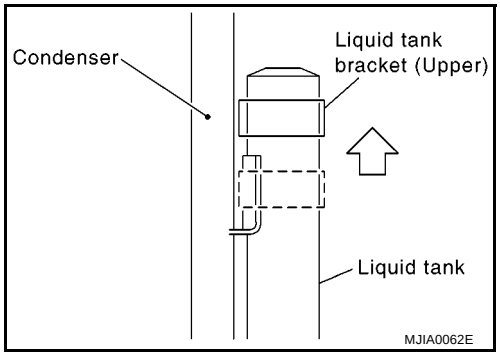
1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove condenser. Refer to ATC-142, "Removal and Installation for Condenser (Models without Integrated Condenser)" .
3. Clean around the liquid tank to remove foreign material and corrosion.
4. Remove the liquid tank bracket (upper/lower) mounting bolts.



5. Lift up the liquid tank bracket, and remove it from the condenser protruding area.
6. Lift up the liquid tank and remove it.

CAUTION:

Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

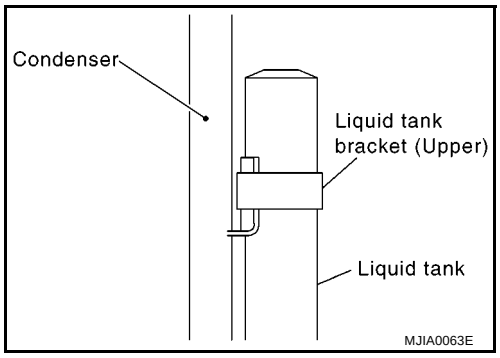


INSTALLATION

Install the liquid tank, and then install liquid tank bracket to the condenser.

CAUTION:

- **Make sure the liquid tank bracket is correctly inserted into the condenser's protruding area (the liquid tank bracket does not move below the center of the liquid tank).**
- **Replace the condenser pipe O-rings with new ones. Apply a coat of compressor lubricant to the O-rings prior to installation.**



Liquid tank bracket (upper) mounting bolt

Tightening torque : 3.38 N·m (0.35 kg-m, 30.0 in-lb)

Liquid tank bracket (lower) mounting bolt

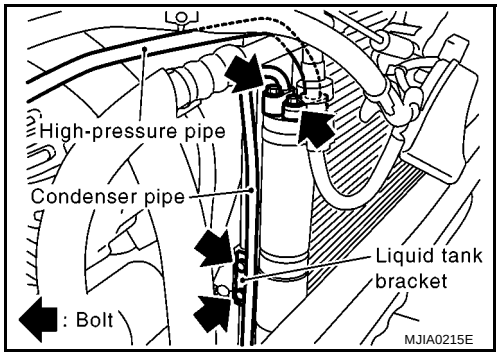
Tightening torque : 5.74 N·m (0.58 kg-m, 50.8 in-lb)

Removal and Installation for Liquid Tank (Except HR Engine with A/T Models)

BJS000IE

REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Clean around the liquid tank to remove foreign material and corrosion.
3. Remove the high-pressure pipe from the liquid tank.
4. Remove the condenser pipe mounting bolt from the liquid tank, and remove pipe from the condenser protruding area.
5. Remove the liquid tank bracket bolts and then remove the liquid tank.



CAUTION:
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

INSTALLATION

Install the liquid tank, and then install liquid tank bracket to the condenser.

CAUTION:
Replace the condenser pipe O-rings with new ones. Apply a coat of compressor lubricant to the O-rings prior to installation.

Removal and Installation for Evaporator

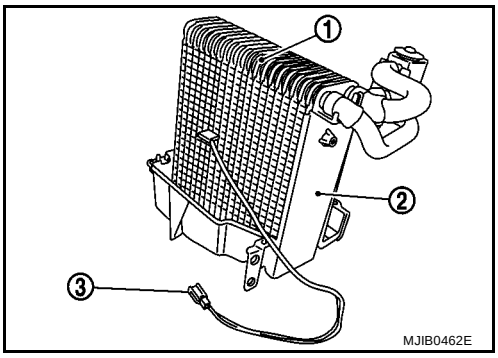
BJS000IF

REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the A/C unit. Refer to ATC-118, "A/C UNIT ASSEMBLY" .

CAUTION:
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

3. Remove the air conditioner filter, mode door motor, and foot duct (RH). Refer to ATC-129, "AIR CONDITIONER FILTER" , ATC-126, "MODE DOOR MOTOR" and ATC-132, "Removal of Foot Ducts" .
4. Remove the lower blower case and expansion valve cover.
5. Slide the evaporator (1) and lower blower case (2) downward, and remove the intake sensor (3).
6. Remove the evaporator from the lower blower case.



INSTALLATION

CAUTION:
- **Replace low-pressure flexible hose and high-pressure pipe O-rings with new ones. Apply a coat of compressor lubricant prior to installation.**
- **When installing a new evaporator, install the thermistor of intake air temperature in the same position as the removed intake sensor.**
- **When removing and installing the intake sensor, do not rotate the thermistor insertion part.**

Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.

Tightening torque : 4.4 N·m (0.45 kg-m, 39.0 in-lb)

Removal and Installation for Expansion Valve

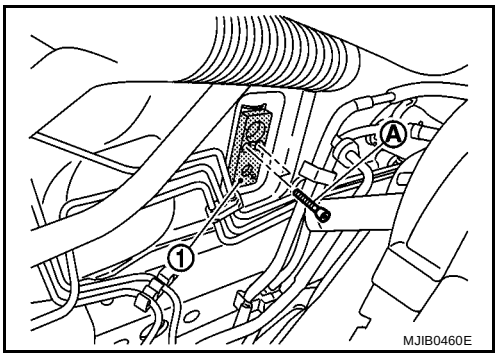
BJS000IG

REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Disconnect the low-pressure flexible hose and high-pressure pipe from the evaporator.

CAUTION:
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

3. Remove the two bolts from the expansion valve, and then remove the expansion valve.



INSTALLATION

CAUTION:

Replace the removed O-rings with new ones. Apply a coat of compressor lubricant to the O-rings prior to installation.

Expansion valve mounting bolts

Tightening torque : 4.0 N·m (0.41 kg-m, 35.4 in-lb)

Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.

Tightening torque : 4.4 N·m (0.45 kg-m, 39.0 in-lb)

Checking for Refrigerant Leaks

BJS000CN

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector or fluorescent dye leak detector.
If dye is observed, confirm the leak with an electronic refrigerant leak detector. It is possible a prior leak was repaired and not properly cleaned.
When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
When searching for refrigerant leaks using an electronic leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:
Moving the electronic leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

Checking System for Leaks Using the Fluorescent Leak Detector

BJS000CO

1. Check A/C system for leaks using the UV lamp and safety goggles [SST: J-42220] in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner [SST: J-43872] to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electronic refrigerant leak detector.

NOTE:
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.
Clean with a dry cloth or blow off with shop air.
Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

BJS000CP

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.45 bar, 3.52 kg/cm^2 , 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool [SST: J-41459].
3. Connect the injector tool to the A/C low-pressure side service fitting.
4. Start engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool J-41459 (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service fitting.

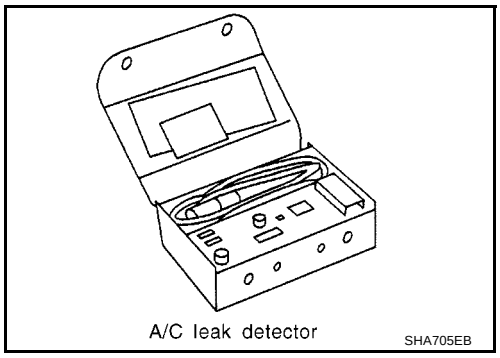
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.

Electronic Refrigerant Leak Detector

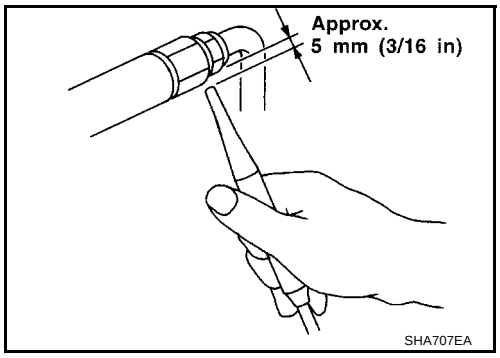
BJS000CQ

PRECAUTIONS FOR HANDLING LEAK DETECTOR

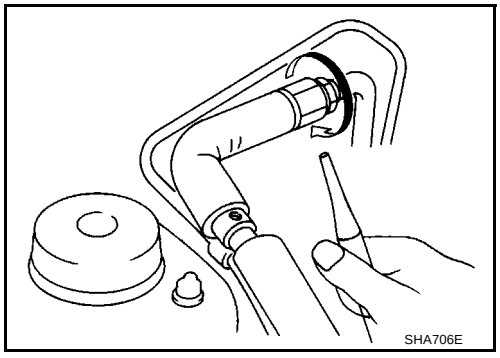
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



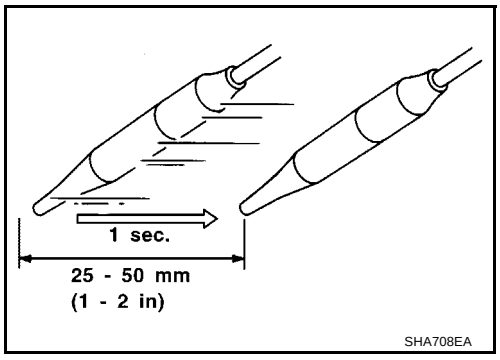
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Turn engine OFF.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.45 bar, 3.52 kg/cm^2 , 50 psi) above 16°C. If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

   NOTE:
   At temperatures below 16°C, leaks may not be detected since the system may not reach 345 kPa (3.45 bar, 3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet f) to the low-pressure side (evaporator drain hose g to shaft seal k). Refer to ATC-137, "Components" . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

   Compressor
   Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

   Condenser
   Check the fitting of high-pressure flexible hose and pipe, refrigerant pressure sensor.

   Liquid tank
   Check the refrigerant connection.

   Service valves
   Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

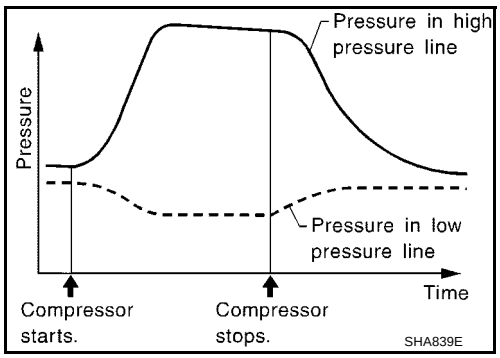
   NOTE:
   After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

   Cooling unit (Evaporator)
   With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
   Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7-10.
7. Start engine.
8. Set the heater A/C control as follows;

a. A/C switch: ON
b. MODE door position: VENT (Ventilation)
c. Intake door position: Recirculation
d. Temperature control dial: Max. cold
e. Fan speed: High

9. Run engine at 1,500 rpm for at least 2 minutes.

10. Turn engine off and perform leak check again following steps 4 through 6 above.
    Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.
11. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines.
12. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.



13. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
14. Perform A/C performance test to ensure system works properly.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

COMPRESSOR

BJS000IH

Model		CR engine models	HR engine models	K9K engine models
		ZEXEL VALEO CLIMATE CONTROL make KC59G	CR-10	SANDEN make SD6V12
Type		Vane rotary		Variable volume piston
Displacement cm^3 (cu in)/rev	Max.	80 (4.88) Theoretical displacement	96 (5.86) Theoretical displacement	125.1 (7.63) 6.2 (0.38)
	Min.			
Cylinder bore × stroke mm (in)		5 vanes, $\phi 51.0 \times 7.28$	5 vanes, $\phi 50.2 \times 8.5$	—
Direction of rotation		Clockwise (viewed from drive end)		
Drive belt		Poly V (4grooves)	V-Ribbed (7 grooves)	Poly V (6 grooves)

LUBRICANT

BJS000J9

Model		CR engine models	HR engine models	K9K engine models
		ZEXEL VALEO CLIMATE CONTROL make KC59G	CR-10	SANDEN make SD6V12
Name		Nissan A/C System Oil Type R		Nissan A/C System Oil Type S
Part number		KLH00-PAGR0		KLH00-PAGS0
Capacity m ℓ (Imp fl oz)	Total in system	—	—	135 (4.75)
	Compressor (Service part) charging amount	—	—	135 (4.75)

REFRIGERANT

BJS000JA

Model	CR engine models	HR engine models	K9K engine models
	ZEXEL VALEO CLIMATE CONTROL make KC59G	CR-10	SANDEN make SD6V12
Type	HFC-134a (R-134a)		
Capacity kg (lb)	0.475 ± 0.025 (1.04 ± 0.055)	0.475 ± 0.025 (1.04 ± 0.055)	0.55 ± 0.05 (1.21 ± 0.11)

ENGINE IDLING SPEED

BJS000IK

Refer to EC-449, "SERVICE DATA AND SPECIFICATIONS (SDS)" . CR (with EURO–OBD).
Refer to EC-801, "SERVICE DATA AND SPECIFICATIONS (SDS)" . CR (without EURO–OBD).
Refer to EC-1237, "SERVICE DATA AND SPECIFICATIONS (SDS)" . HR (with EURO–OBD).
Refer to EC-1597, "SERVICE DATA AND SPECIFICATIONS (SDS)" . HR (without EURO–OBD).
Refer to EC-1870, "SERVICE DATA AND SPECIFICATIONS (SDS)" .K9K.

BELT TENSION

BJS000IL

Refer to EM-14, "Tension Adjustment" . (CR engine models).
Refer to EM-114, "Tension Adjustment" . (HR engine models).
Refer to EM-242, "Tension Adjustment" . (K9K engine models).