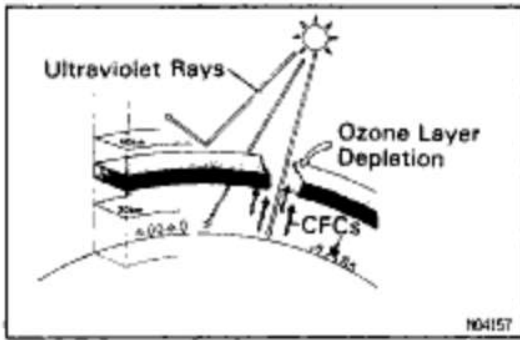


AIR CONDITIONING SYSTEM

AC-2

AIR CONDITIONING SYSTEM – GENERAL DESCRIPTION

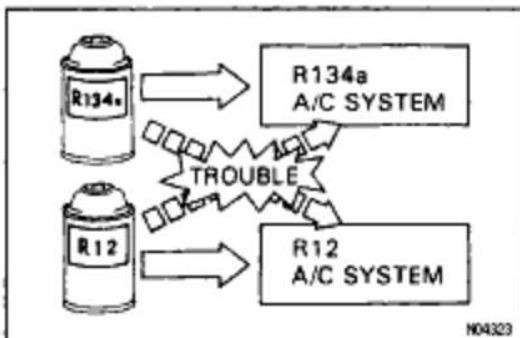


GENERAL DESCRIPTION

NEW AIR CONDITIONING SYSTEM WITH R134a

Refrigerant R12 (CFC12), previously used in automobiles air conditioning systems is believed to contribute towards the depletion the earth's ozone layer. The ozone layer help to protect us against the harmful ultraviolet rays of the sun.

A newly developed refrigerant, R134 a (HFC 134 a), does not the destroy the ozone layer.



PRECAUTIONS FOR SERVICING R134a AIR CONDITIONERS

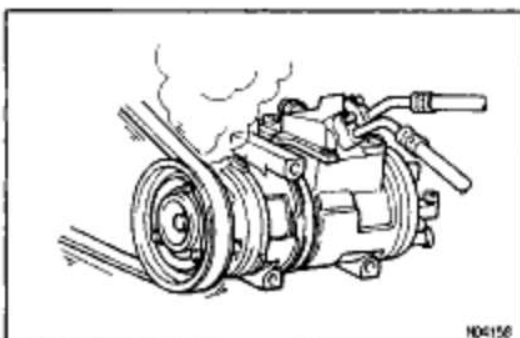
1. USE OF NEW REFRIGERANT R134a

The very different characteristics of refrigerants R134a and R12 have determined the design of their respective air conditioning systems. Under no circumstances allow R12 to enter an R134a system, or vice versa, because serious damage could occur.

2. USE OF PROPER COMPRESSOR OIL

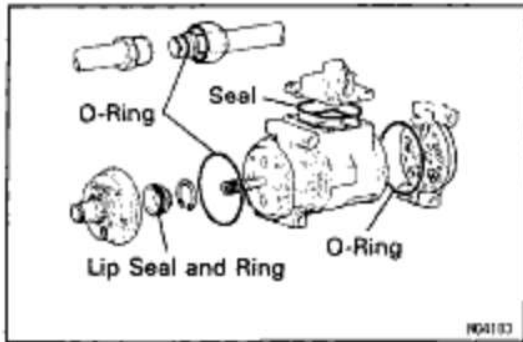
Compressor oil used in conventional R12 air conditioning systems cannot be used in R 134a air conditioning systems.

Always use genuine Toyota R1 34a air conditioning oil N D – OIL 8, made expressly for use with R 1 34a.



If even a small amount of the wrong oil is changed, it will result in clouding of the refrigerant. A large amount will cause the compressor to seize up.

AIR CONDITIONING SYSTEM – GENERAL DESCRIPTION

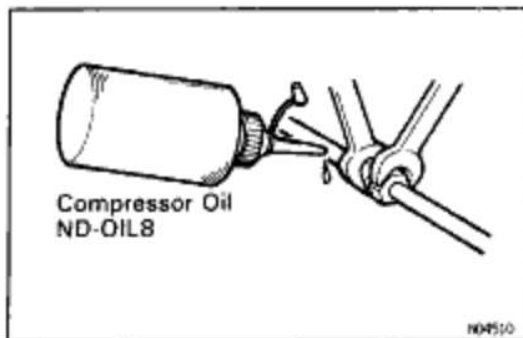
**3. USE OF PROPER O – RINGS AND SEALS**

O-rings and seals used for conventional R12 air conditioning systems cannot be used for R134a air conditioning systems.

Always use genuine Toyota R 134a system O-rings and seals for R 1 34a air conditioning systems.



If O-rings and/or seals for R12 air conditioning systems are used by mistake in the connections of an R134a air conditioning system, the O-ring and seals will foam and swell resulting in leakage of refrigerant.

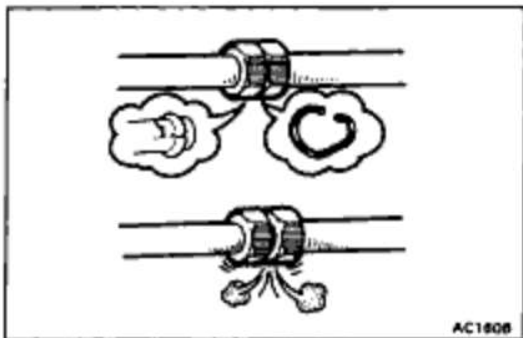
**4. TIGHTEN CONNECTING PARTS SECURELY**

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

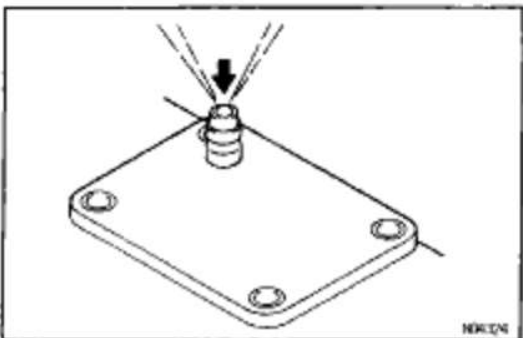
Apply a few drops of compressor oil to O-ring fittings for easy tightening and to prevent leaking of refrigerant gas.

CAUTION: Apply only ND-OIL 8 compressor oil. Tighten the nuts using 2 wrenches to avoid twisting the tube.

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

**5. INSERT PLUG IMMEDIATELY IN DISCONNECTED PARTS**

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

6. DO NOT REMOVE PLUG FROM NEW PARTS UNTIL IMMEDIATELY BEFORE INSTALLATION**7. DISCHARGE GAS IN NEW COMPRESSOR FROM CHARGING VALVE BEFORE INSTALLING IT**

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

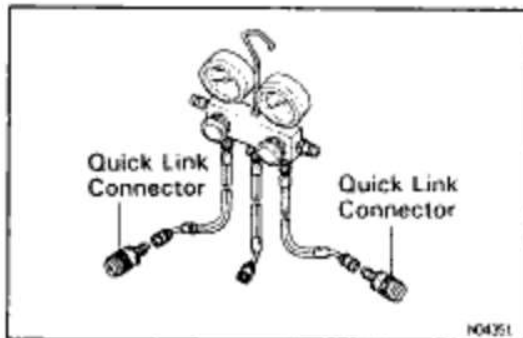
AC-4

AIR CONDITIONING SYSTEM – GENERAL DESCRIPTION

SERVICE TOOLS FOR R134a AIR CONDITIONER

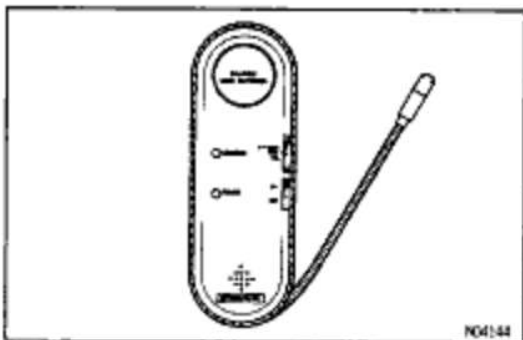
AC095-04

When servicing R134a air conditioning systems always use the R134a dedicated manifold gauges, gas leak detector and vacuum pump adaptor.



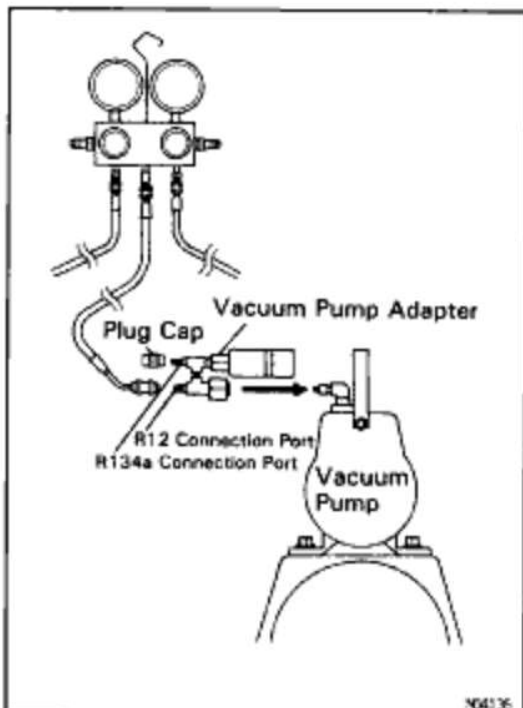
1. USE MANIFOLD GAUGES FOR R134a AIR CONDITIONER

Always use R134a dedicated manifold gauges to prevent R12 and R134a compressor oil contaminating the R134a system.



2. USE R134a GAS LEAK DETECTOR

Similarly, always use an R134a dedicated leak detector. The R12 leak detector is not sufficiently sensitive.



3. USE VACUUM PUMP ADAPTER

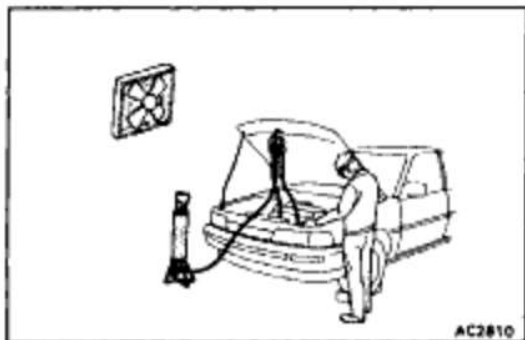
By connecting a vacuum pump adapter, the vacuum pump can be used for both R134a and R12 air conditioning systems.

The vacuum pump adaptor has an internal magnetic valve.

When evacuation is completed and the vacuum pump switch is turned off, the magnetic valve opens allowing the introduction of atmospheric air into the manifold gauges to prevent the back flow of oil from the vacuum pump into the gauge hose.

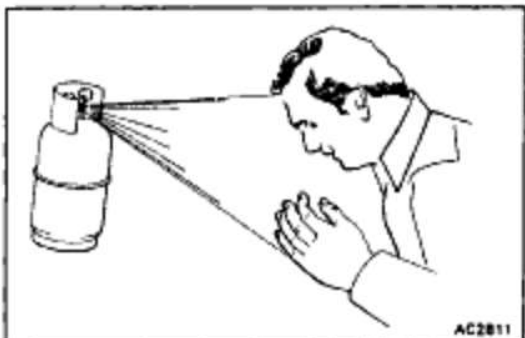
CAUTION:

Be sure to turn off the manifold gauge valve immediately after evacuating the system. Then you may switch off the vacuum pump. If this order is reversed, the line will be temporarily open to atmosphere.



HANDLING PRECAUTIONS FOR REFRIGERANT

1. DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR NEAR AN OPEN FLAME
2. ALWAYS WEAR EYE PROTECTION



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

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

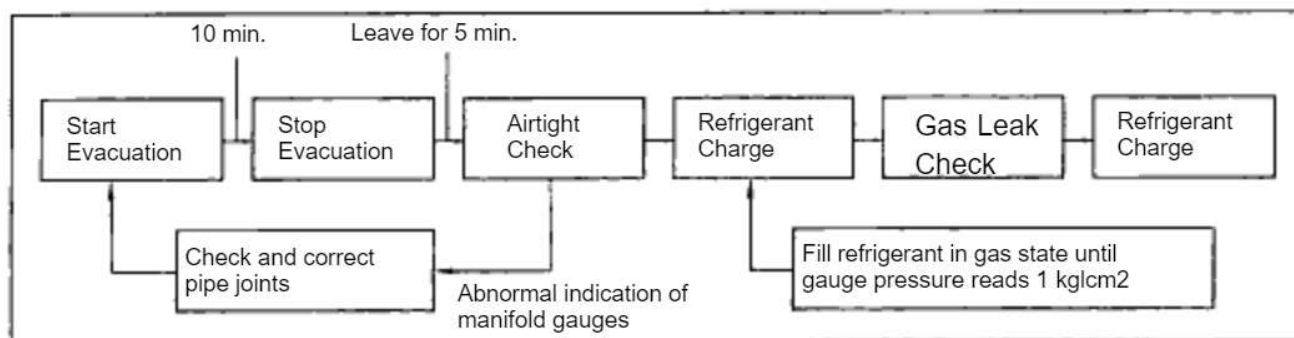
- (a) Wash the area with lots of cool water.
CAUTION: Do not rub your eyes or skin.
- (b) Apply clean petroleum jelly to the skin.
- (c) GO immediately to a physician or hospital for professional treatment.

HANDLING PRECAUTIONS FOR REFRIGERANT CONTAINER

1. NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME
2. BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT

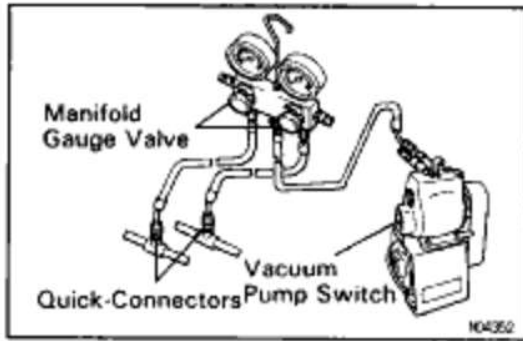
CHARGING AND LEAK-CHECK METHODS

Evacuate the refrigeration system according to the following procedures.



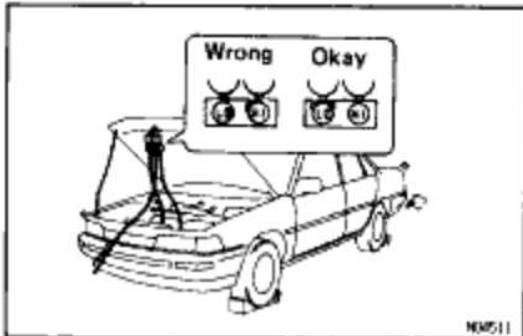
AC-6

AIR CONDITIONING SYSTEM – GENERAL DESCRIPTION

**CAUTION:**

- Be sure to connect both the high and low pressure quick-connectors onto the A/C system when evacuating. If only one side is connected, the system would be open to atmosphere through the other connector, making it impossible to maintain vacuum.
- Be sure to turn off the manifold gauge valve immediately after evacuating the system. Then you may switch off the vacuum pump.

AC606-06



PRECAUTIONS WHEN CHARGING REFRIGERANT

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

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

2. DO NOT OPEN HIGH PRESSURE MANIFOLD VALVE WHILST COMPRESSOR IS OPERATING

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

3. BE CAREFUL NOT TO OVERCHARGE WITH REFRIGERANT IN SYSTEM

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

AC607-06

ELECTRICAL PARTS

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

CAUTION: Work must be started after 90 seconds from the time the Ignition switch is turned to the “LOCK” position and the negative (–) terminal cable is disconnected from the battery.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) REPAIR - 02

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

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

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

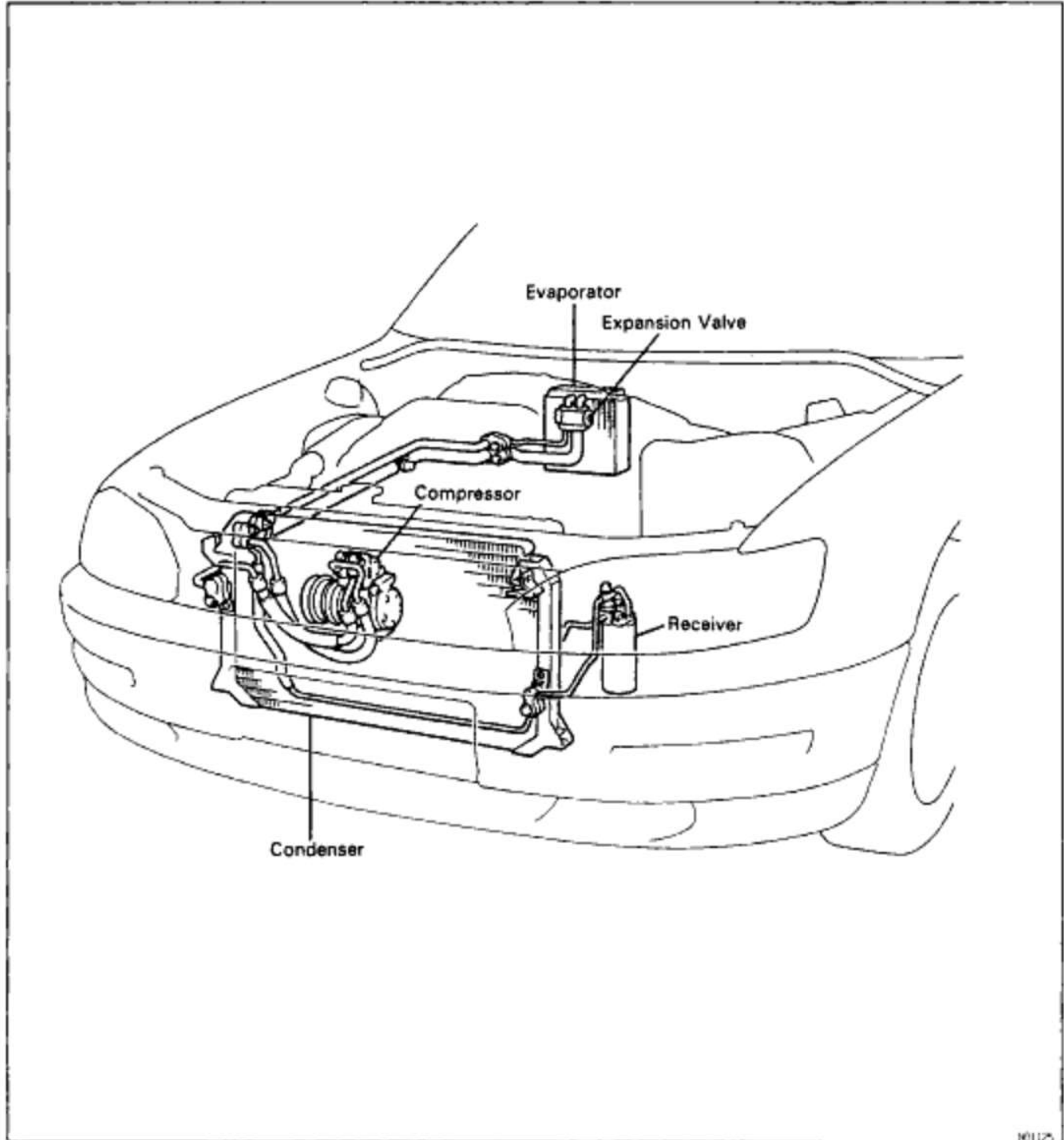
AC-8

AIR CONDITIONING SYSTEM - DESCRIPTION

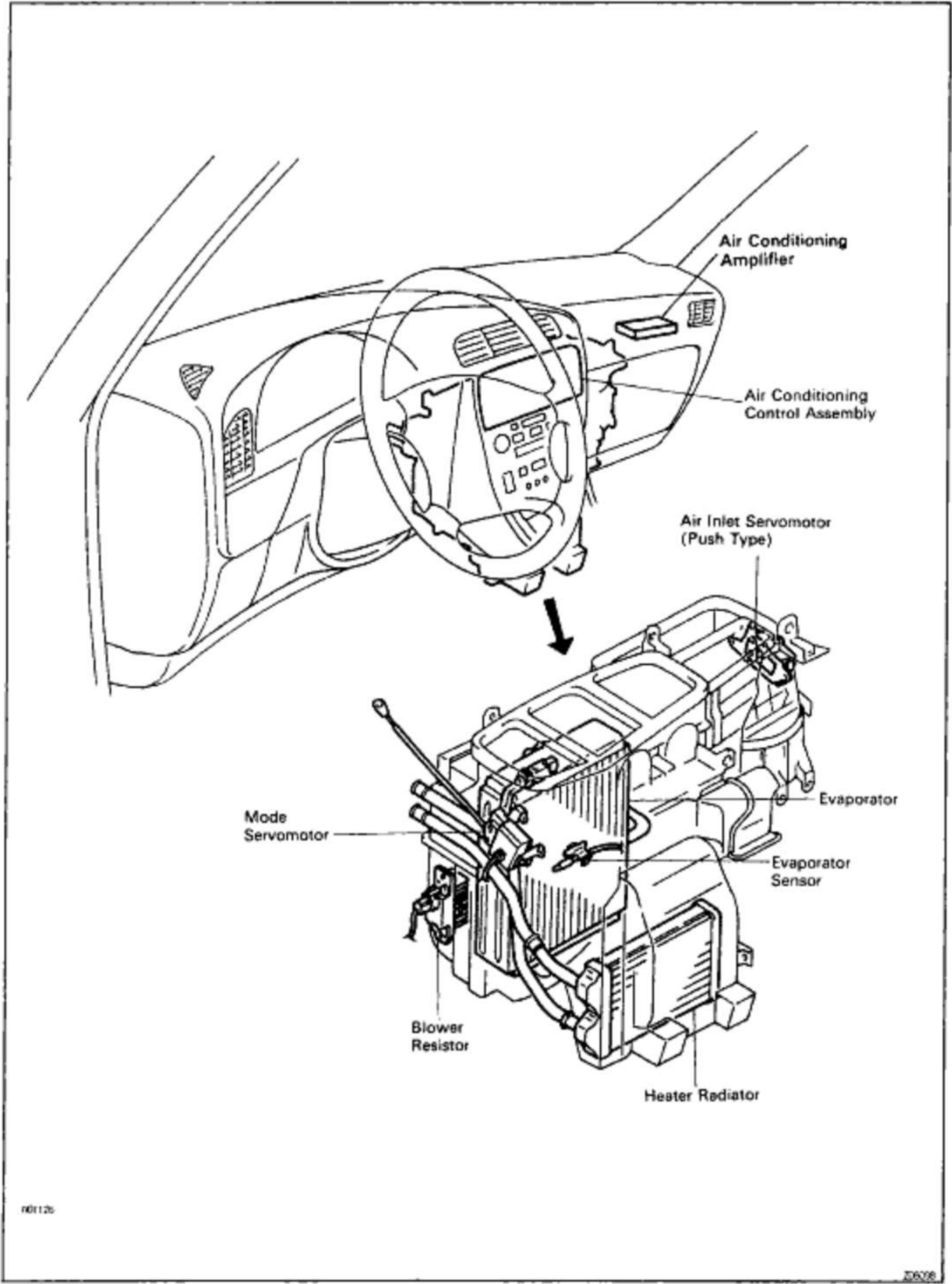
DESCRIPTION

PARTS LOCATION

AC804-102



AIR CONDITIONING SYSTEM - DESCRIPTION

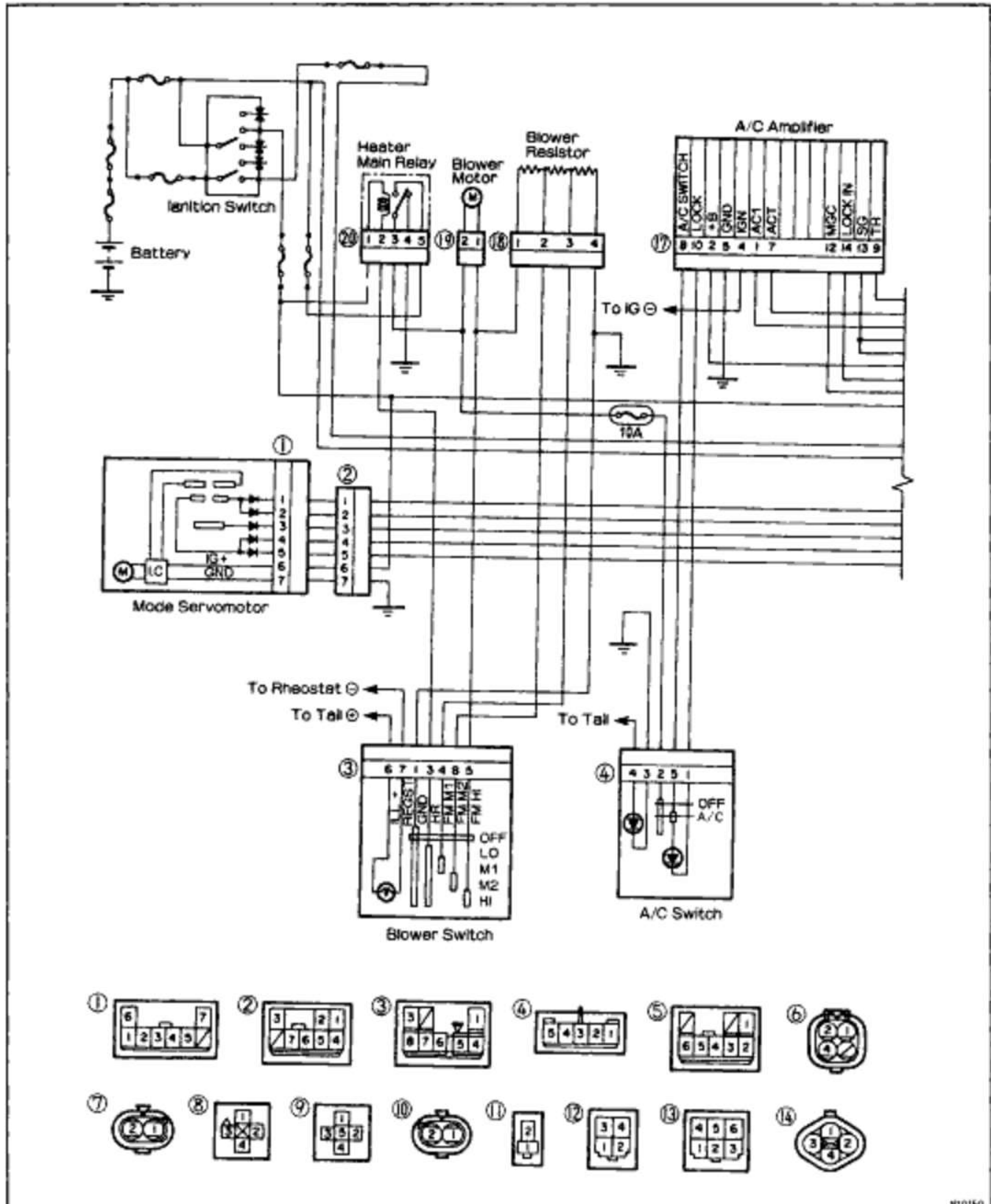


AC-10

AIR CONDITIONING SYSTEM - DESCRIPTION

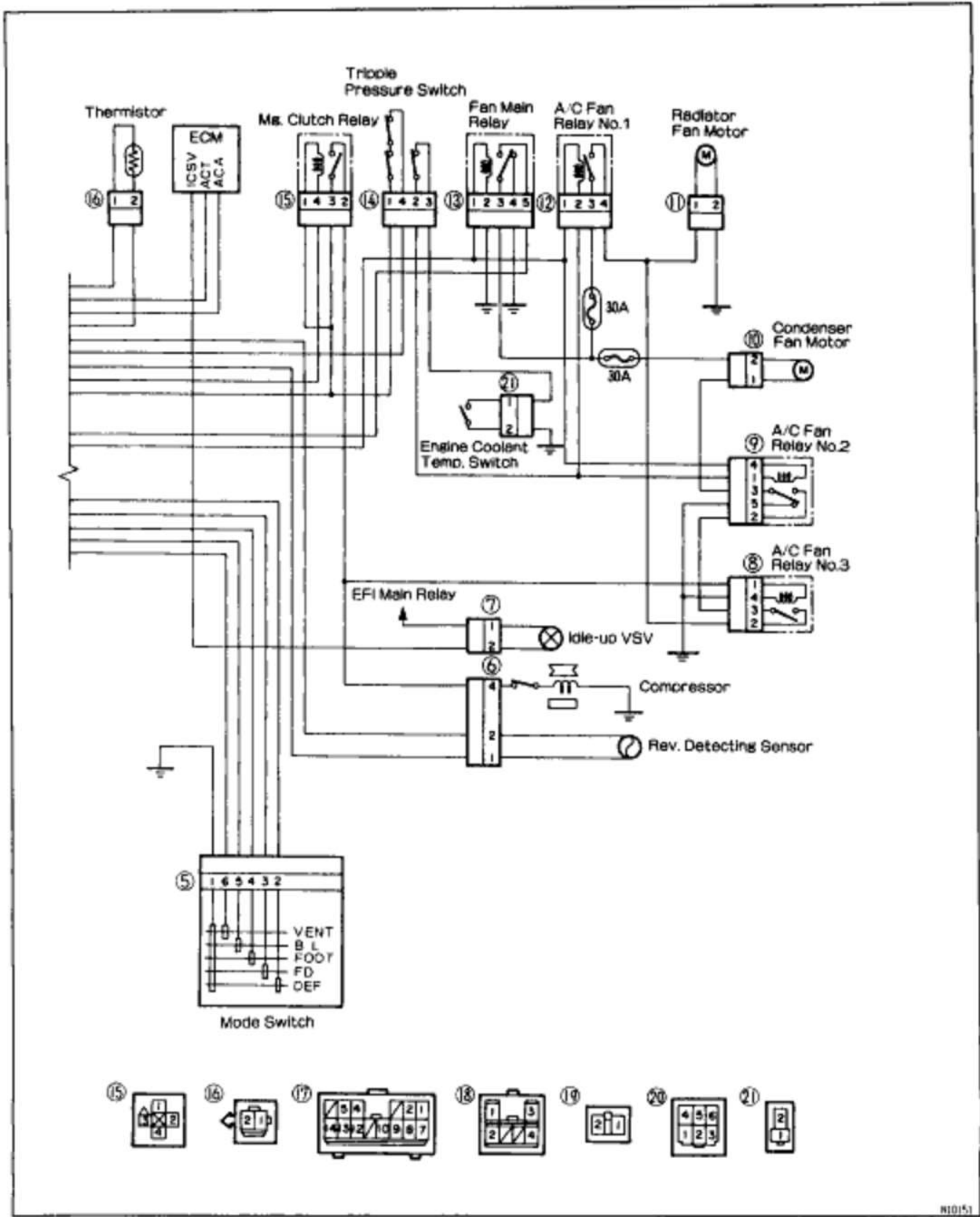
AC898-68

ELECTRICAL WIRING DIAGRAM (Lever Type On 5S-FE Engine Model)



N10150

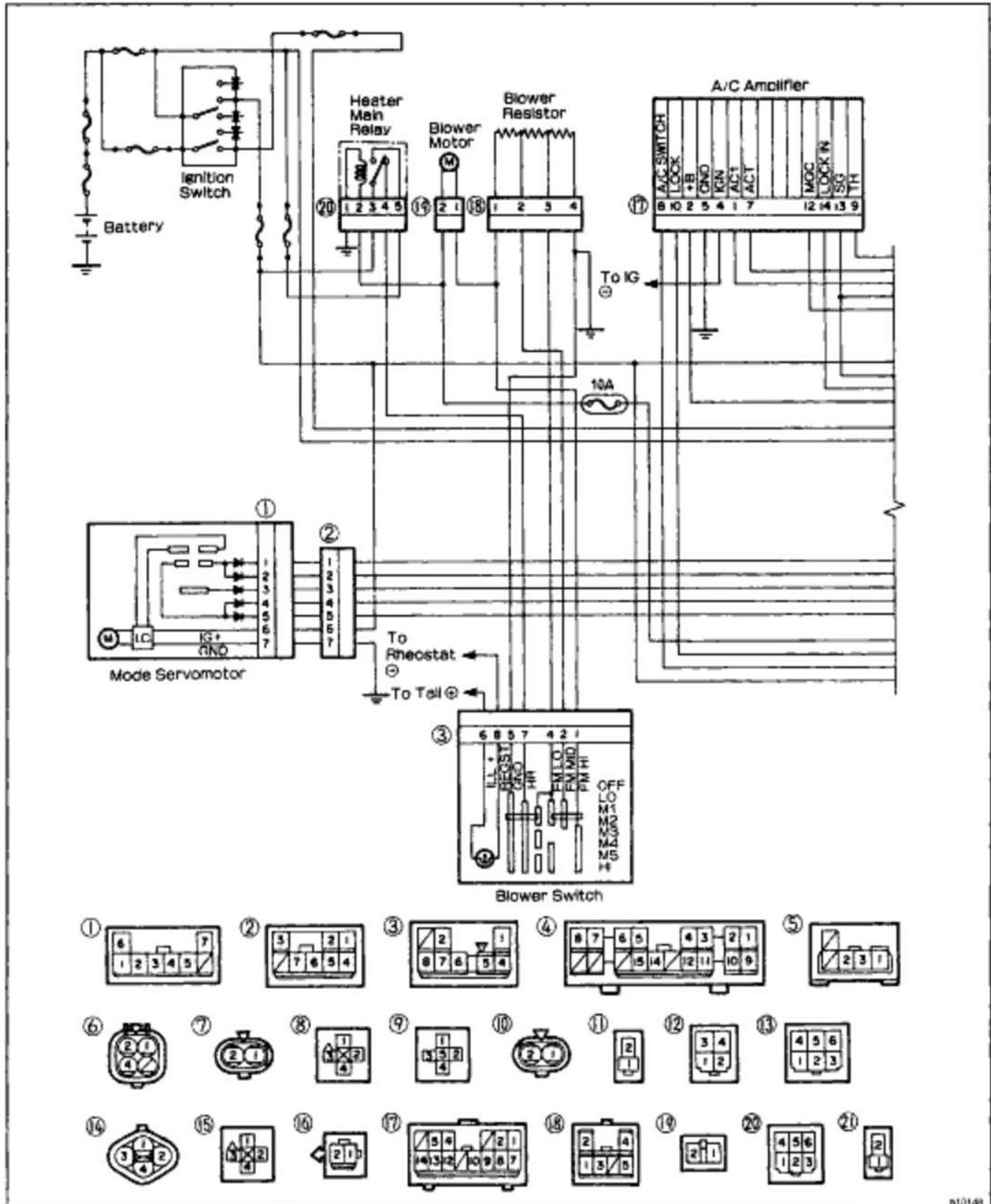
AIR CONDITIONING SYSTEM – DESCRIPTION



AC-12

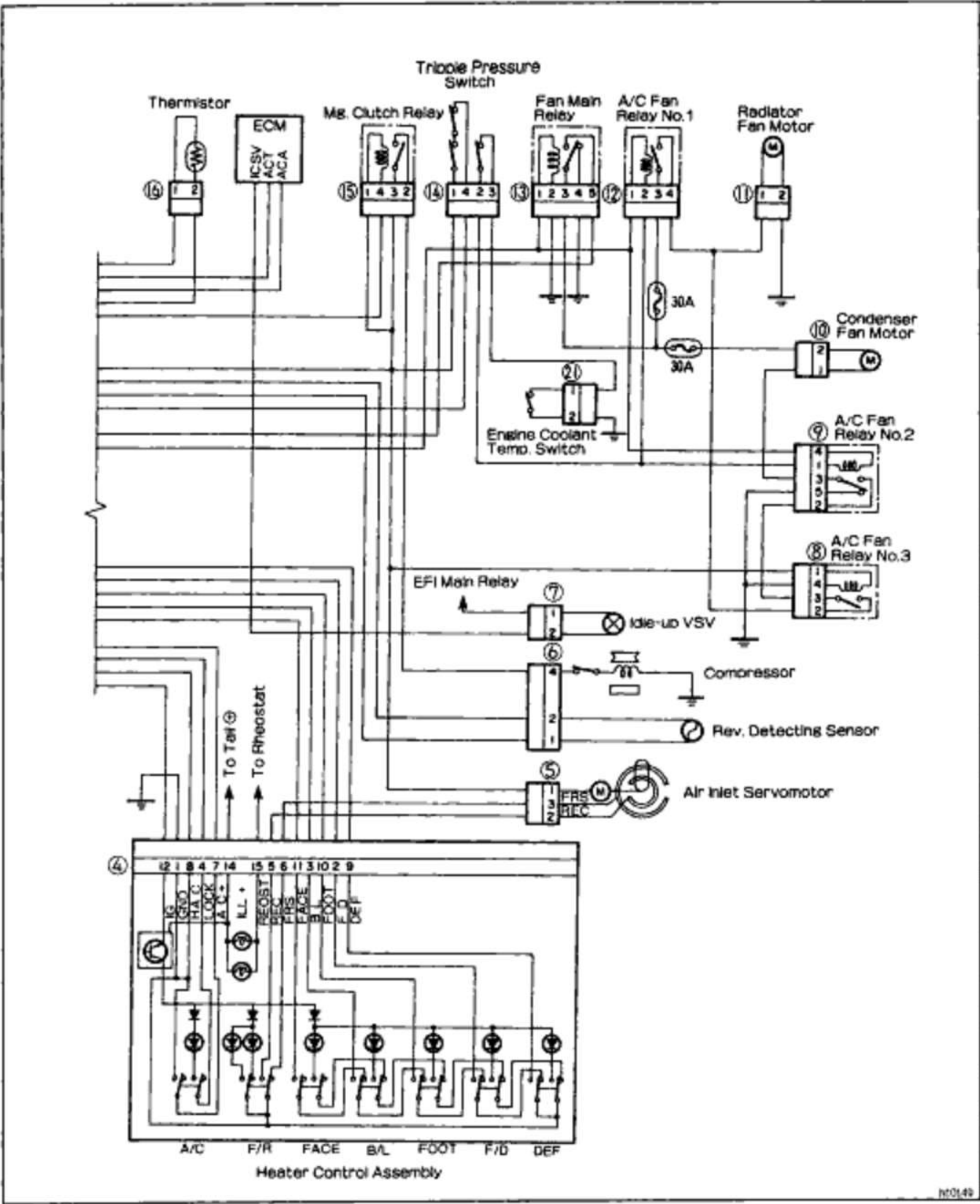
AIR CONDITIONING SYSTEM — DESCRIPTION

(Push Button Type On 5S-FE Engine Model)



N10148

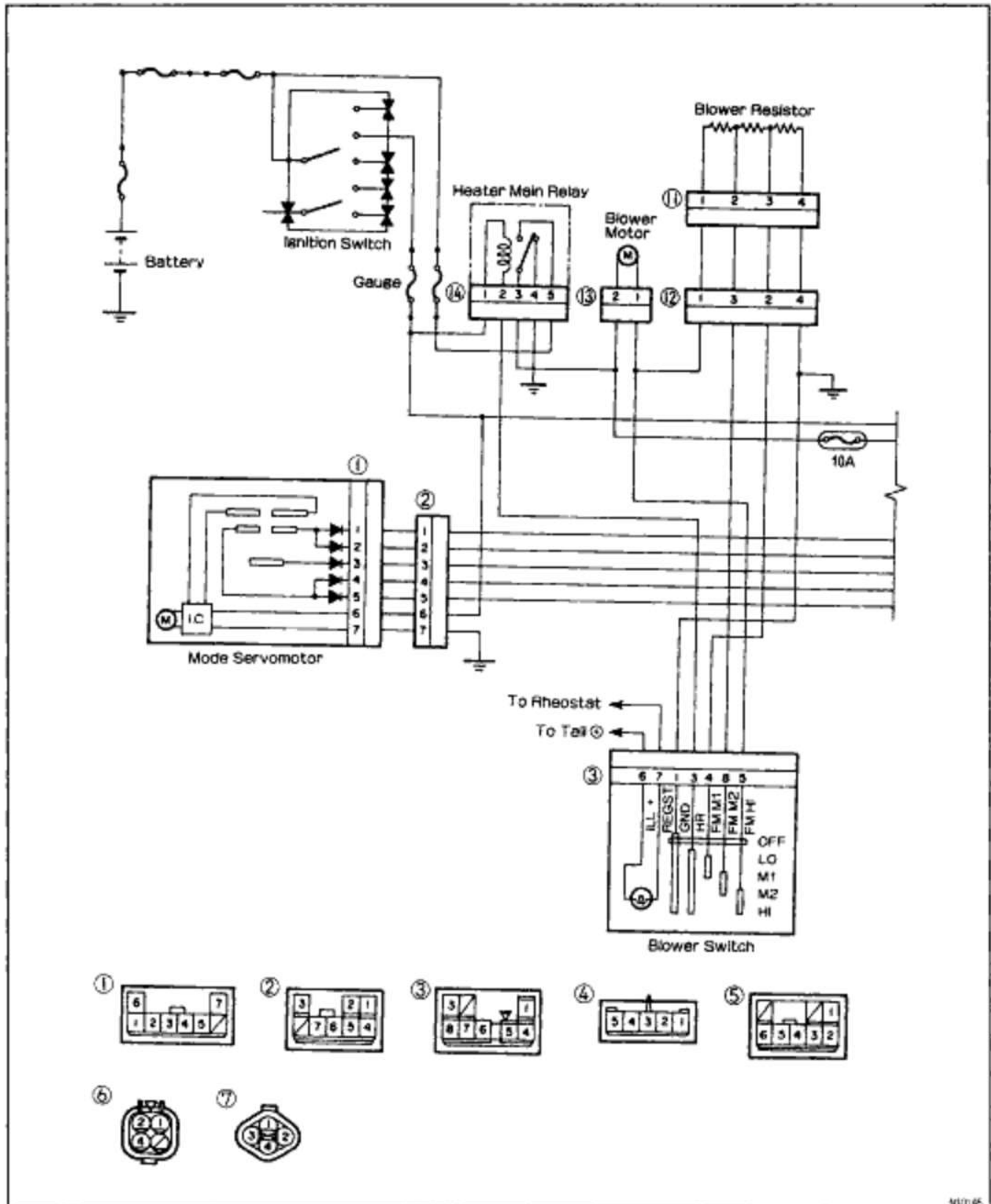
AIR CONDITIONING SYSTEM – DESCRIPTION



AC-14

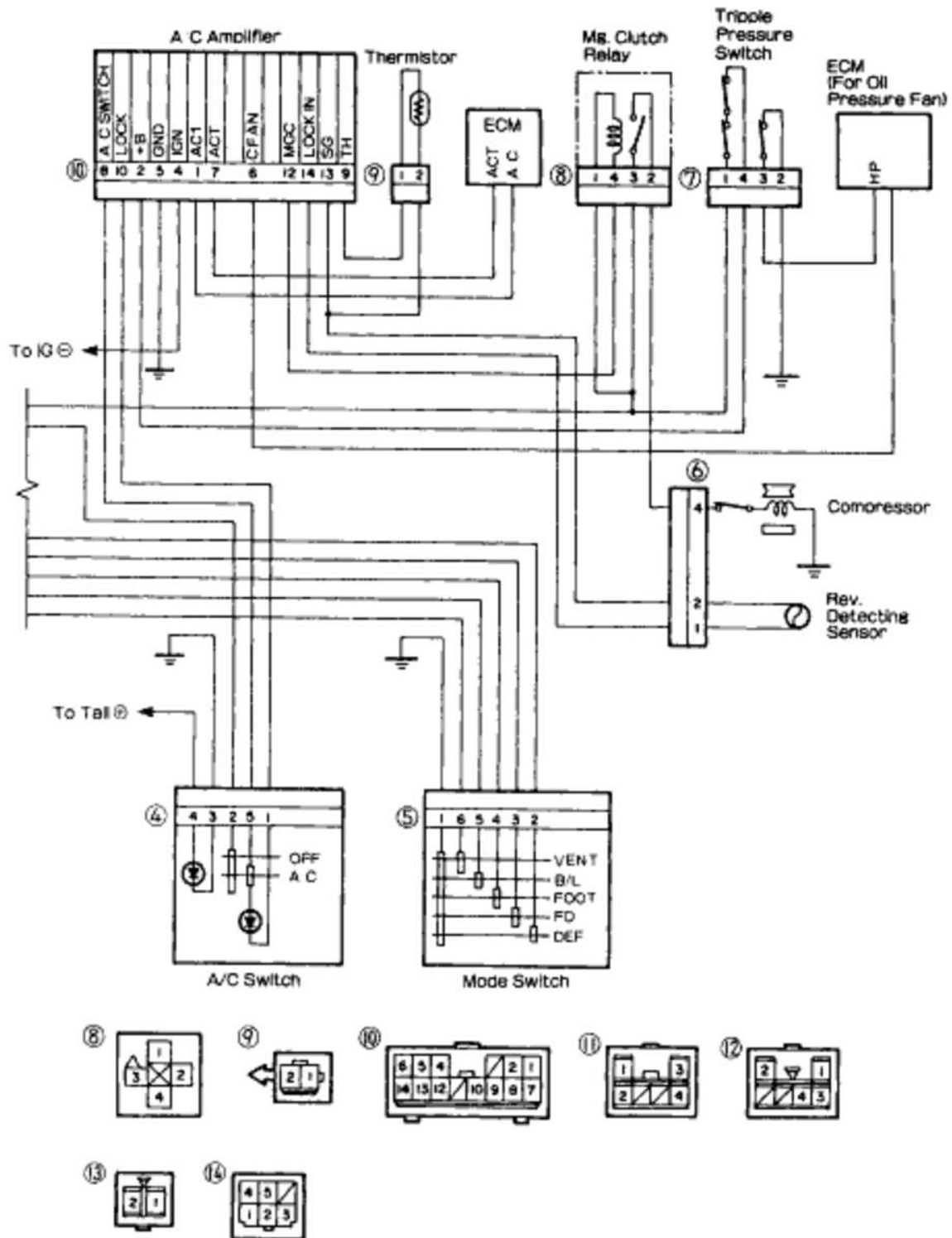
AIR CONDITIONING SYSTEM - DESCRIPTION

(Lever Type On 1 MZ-FE Engine Model)



M10145

AIR CONDITIONING SYSTEM - DESCRIPTION

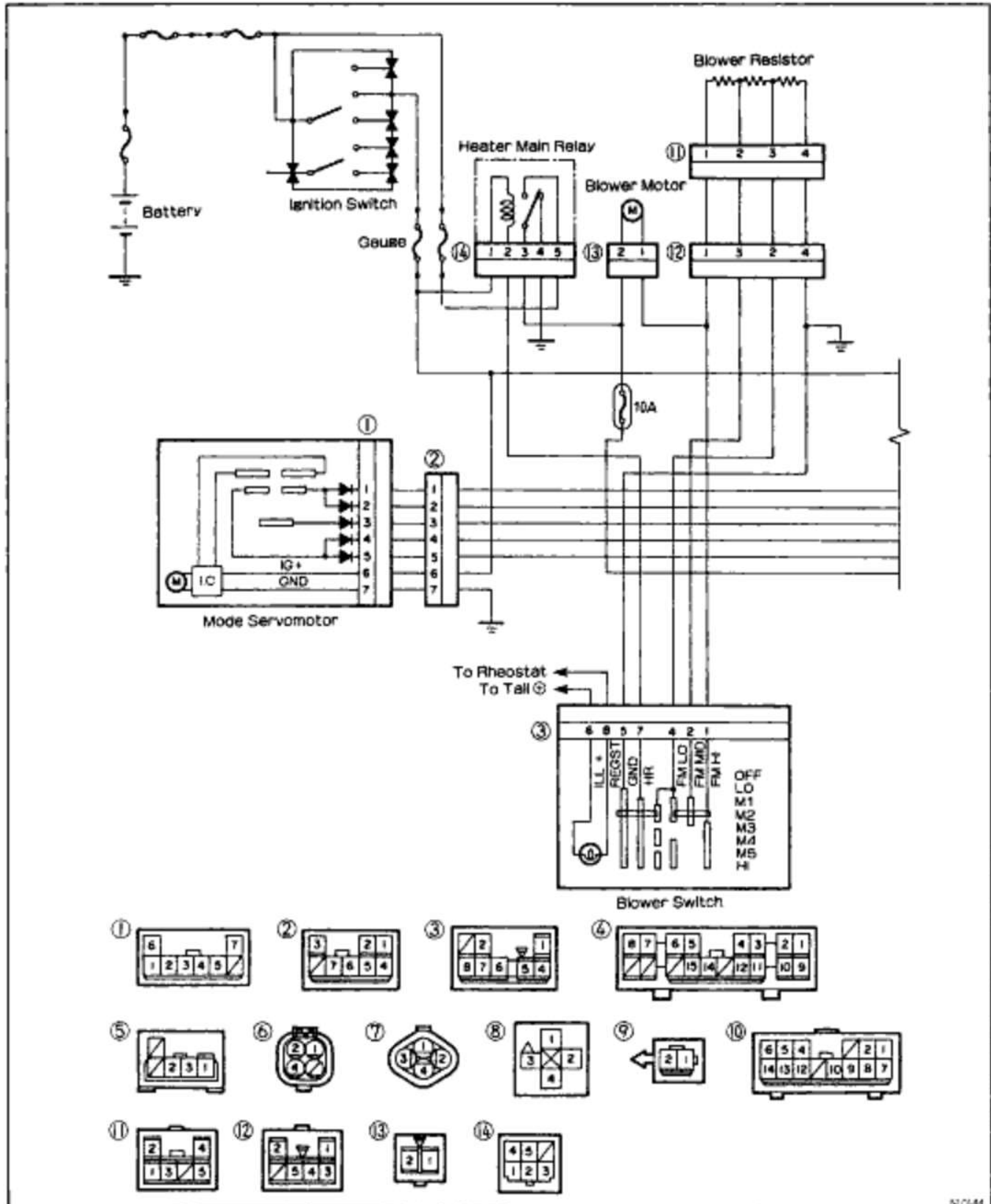


M1016P

AC-16

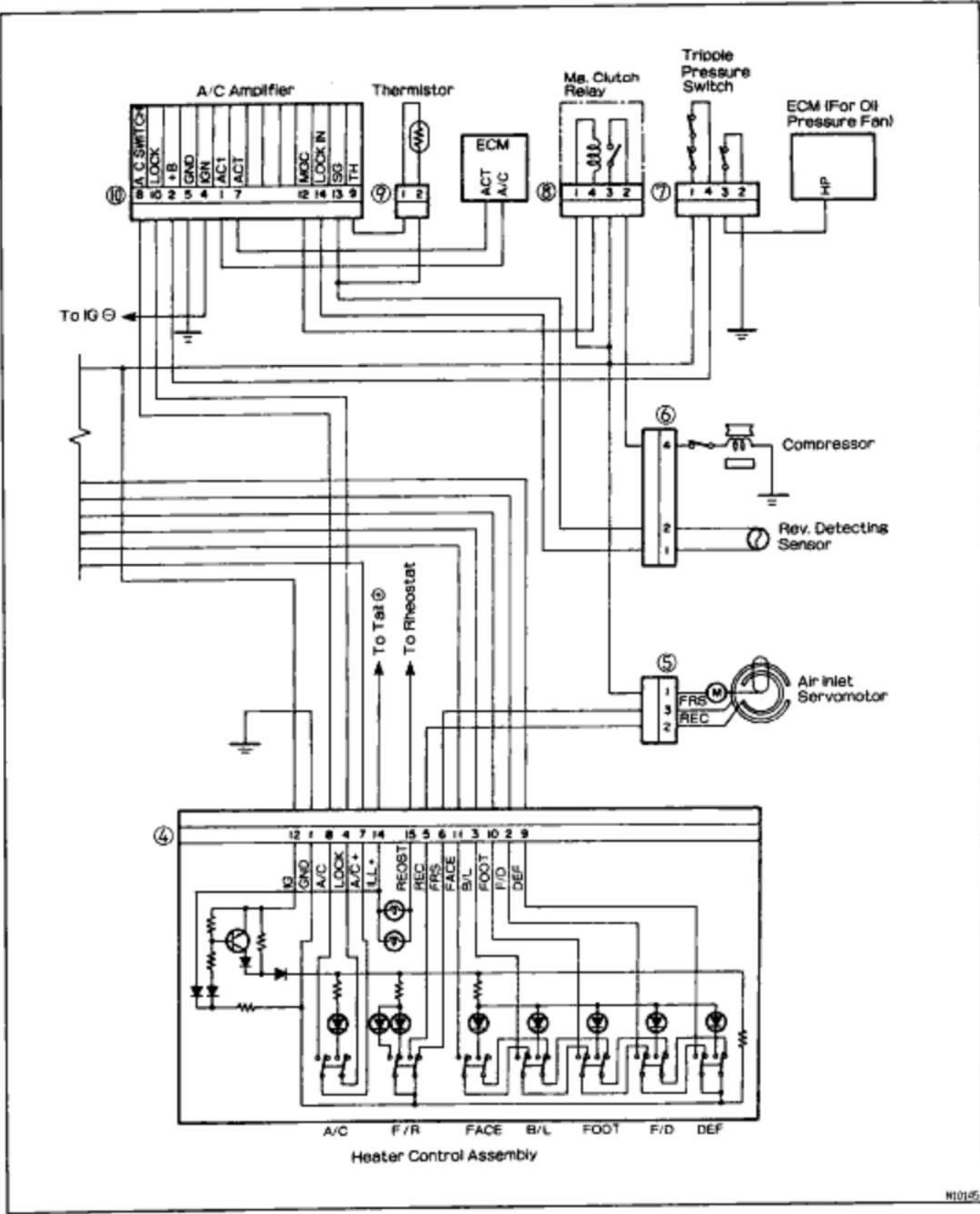
AIR CONDITIONING SYSTEM - DESCRIPTION

(Push Button Type On 1 MZ-FE Engine Model)



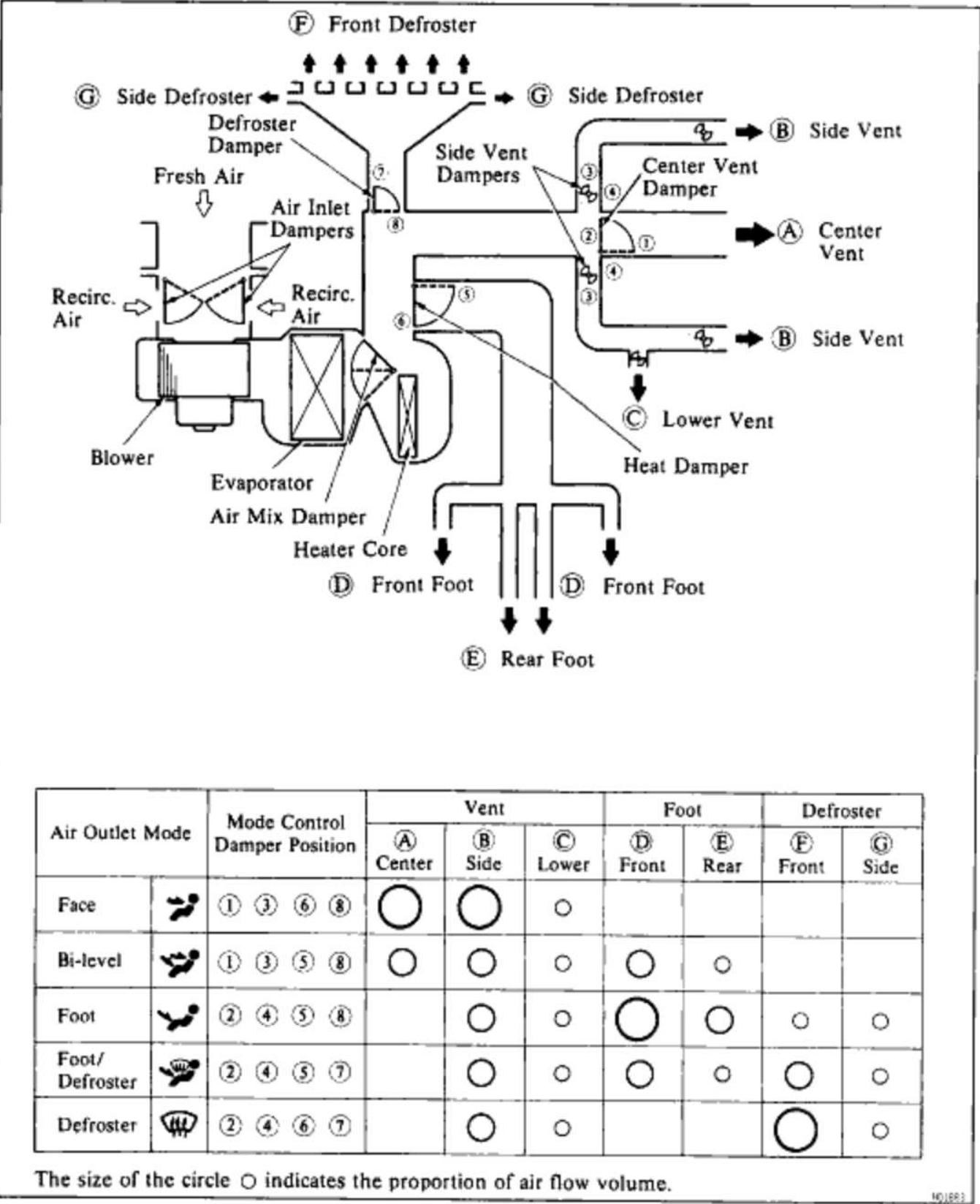
NOL44

AIR CONDITIONING SYSTEM – DESCRIPTION



DAMPERS POSITION

AC001-01

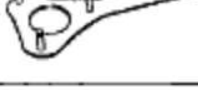


10/08/01

PREPARATION

SST (SPECIAL SERVICE TOOLS)

AC2004-52

	07110-58060 Air Conditioner Service Tool Set	
	(07117-58060) Refrigerant Drain Service Valve	
	(07117-58070) T-Joint	
	(07117-58080) Quick Coupler	Discharge (diam. 16 mm)
	(07117-58090) Quick Coupler	Suction (diam. 13 mm)
	(07117-78050) Refrigerant Charging Gauge	
	(07117-88060) Refrigerant Charging Hose	Discharge (Red)
	(07117-88070) Refrigerant Charging Hose	Suction (Blue)
	(07117-88080) Refrigerant Charging Hose	Utility (Green)
	07112-66040 Magnetic Clutch Remover	
	07112-76060 Magnetic Clutch Stopper	
	07114-84020 Snap Ring Pliers	
	07116-38360 Gas Leak Detector Assembly	

AC-20

AIR CONDITIONING SYSTEM – PREPARATION

ACB7-18

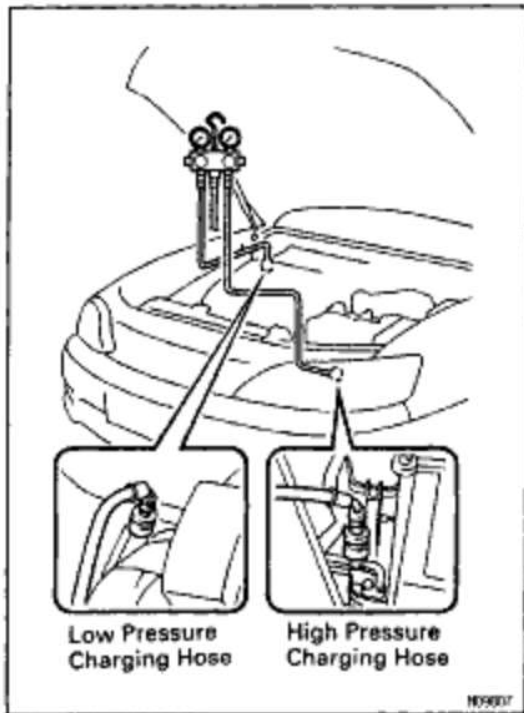
RECOMMENDED TOOL

	09082-00050 TOYOTA Electrical Tester Set	
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ADW15-00

LUBRICANT

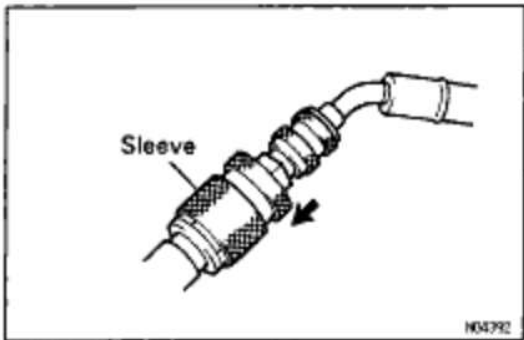
Item	Capacity	Classification
Compressor oil	—	ND-OIL 8 or equivalent
When replacing receiver	10 cc (0.34 fl.oz.)	
When replacing condenser	40 cc (1.4 fl.oz.)	
When replacing evaporator	40 cc (1.4 fl.oz.)	
When replacing compressor	140 cc (4.9 fl.oz.)	



USE OF MANIFOLD GAUGE SET

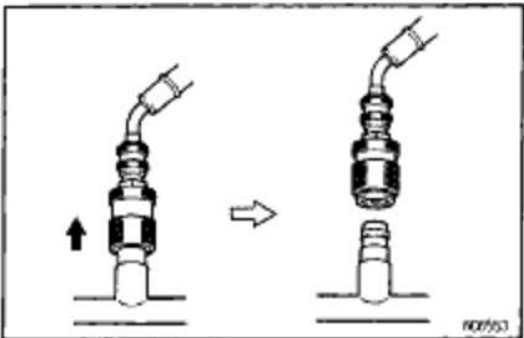
MANIFOLD GAUGE SET INSTALLATION

1. **CONNECT CHARGING HOSES TO MANIFOLD GAUGE SET**
Tighten the nuts by hand.
CAUTION: Do not connect the wrong hoses.
2. **CONNECT QUICK CONNECTORS TO CHARGING HOSES**
Tighten the nuts by hand.
3. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
4. **REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINE**



5. **CONNECT QUICK CONNECTORS TO SERVICE VALVES**

HINT: Push the quick connector onto the service valve, then slide the sleeve of the quick connector downward to lock it.



MANIFOLD GAUGE SET REMOVAL

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK CONNECTORS FROM SERVICE VALVES ON REFRIGERANT LINE**
HINT: Slide the sleeve of the quick connector upward to unlock the connector and remove it from the service valve.
3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

AC-22

AIR CONDITIONING SYSTEM – TROUBLESHOOTING

TROUBLESHOOTING

Use the table below to help you find the cause of problem. The numbers indicate the priority of the likely cause of the problem. Check each rt in order. If necessary, replace these parts.

See page	AC-29	AC-24	AC-30	-	-	AC-60	AC-62	AC-63	AC-63	AC-64
Parts Name	Inspect Volume of Refrigerant	Inspect Refrigeration System with Manifold Gauge Set	Inspect Drive Belt Tension	Fusible Link	Fuse (A/C)	Pressure Switch	Evaporator Temp. Sensor	Revolution Detecting Sensor	Magnet Clutch Relay	A/C Fan Relays
Trouble										
No blower operation				1						
No blower control										
No air flow mode control										
No air inlet control										
Insufficient flow of cool air										
Insufficient flow of warm air										
No cool air comes out	3	4	5		1	6	13	9	2	
Cool air comes out intermittently	1	2	3				6	4		
Cool air comes out only at high engine speed	2	3	1							
Insufficient cooling	1	2	3			7	12			6
No warm air comes out										
Air temp. control not functioning										
No engine idle up when A/C switch on										

100705

AIR CONDITIONING SYSTEM - TROUBLESHOOTING

AC-59	AC-57	AC-58	AC-55	AC-56	AC-67	AC-66	AC-36	AC-47	AC-49	AC-36	AC-45	AC-53	-
Blower Resistor	Air Inlet Servomotor	Air out let Servomotor	Blower Motor	Condenser Fan Motor	A/C Control Assembly	A/C Amplifier	Compressor	Condenser	Evaporator	Magnet Clutch	Receiver	Expansion Valve (Replace)	Wiring or Wiring Connection
4			3		2								5
					1								2
		2			1								3
	2				1								3
2			1						3				4
2			1										3
					10	12	8			7			14
						5						7	8
							5	4					
				8		11	10	4	13	9	5	14	
					1								2
					1								2
						1							2

W02701

AC-24

AIR CONDITIONING SYSTEM – TROUBLESHOOTING

REFRIGERANT SYSTEM INSPECTION WITH MANIFOLD GAUGE SET AC/RE-01

This is a method in which the trouble is located by using a manifold gauge set.

(See "USE OF MANIFOLD GAUGE SET" on page [AC-21](#))

Read the manifold gauge pressure when the following conditions are established:

- (a) Temperature at the air inlet with the switch set at RECIRC is 30 – 35 °C (86 – 95 °F)
- (b) Engine running at 1,500 rpm
- (c) Blower speed control switch set at high
- (d) Temperature control set at max. cool

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

AC/RE-01

1. NORMALLY FUNCTIONING REFRIGERATION SYSTEM

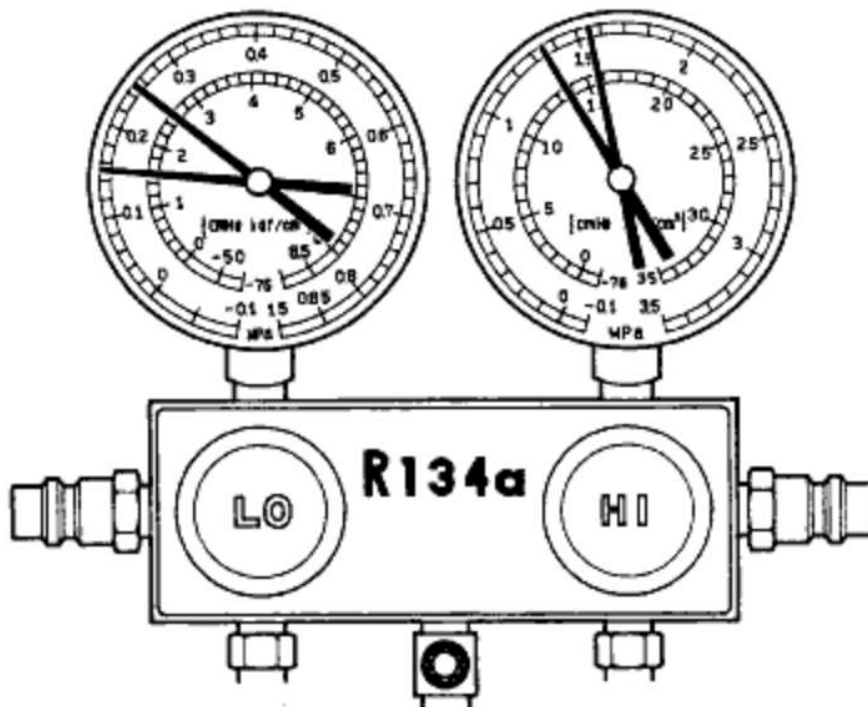
Gauge reading:

Low pressure side:

0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm²)

High pressure side:

1.37 – 1.57 MPa (14 – 16 kgf/cm²)

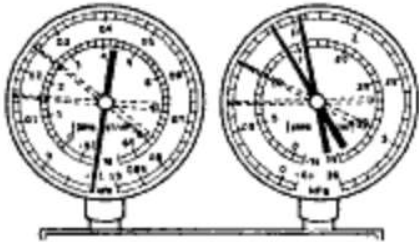


ND0147

AIR CONDITIONING SYSTEM – TROUBLESHOOTING

2. MOISTURE PRESENT IN REFRIGERATION SYSTEM

Condition: Periodically cools and then fails to cool



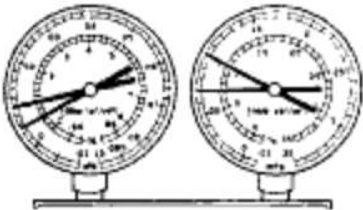
ND4143

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes becomes a vacuum and sometimes normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	- Drier in oversaturated state - Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace receiver/drier (2) Remove moisture in cycle through repeatedly evacuating air (3) Charge new refrigerant to proper amount

W01004

3. INSUFFICIENT REFRIGERANT

Condition: Insufficient cooling



ND4143

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
- Pressure low on both low and high pressure sides - Bubbles seen in sight glass continuously - Insufficient cooling performance	Gas leakage at some place in refrigeration system	- Insufficient refrigerant in system - Refrigerant leaking	(1) Check for gas leakage with leak detector and repair if necessary (2) Charge refrigerant to proper amount (3) If pressure indicated value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak

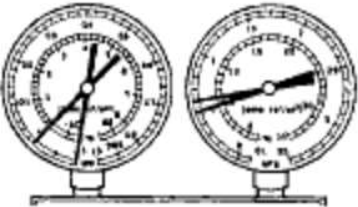
W01005

AC-26

AIR CONDITIONING SYSTEM – TROUBLESHOOTING

4. POOR CIRCULATION OF REFRIGERANT

Condition: Insufficient cooling



Symptom seen in refrigeration system

- Pressure low on both low and high pressure sides
- Frost on tubes from receiver to unit

Probable cause

- Refrigerant flow obstructed by dirt in receiver

Diagnosis

- Receiver clogged

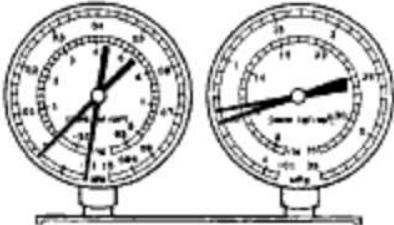
Remedy

- Replace receiver

V00330

5. REFRIGERANT DOES NOT CIRCULATE

Condition: Does not cool (Cools from time to time in some cases)



Symptom seen in refrigeration system

- Vacuum indicated on low pressure side, very low pressure indicated on high pressure side
- Frost or dew seen on piping before and after receiver/drier or expansion valve

Probable cause

- Refrigerant flow obstructed by moisture or dirt in refrigeration system
- Refrigerant flow obstructed by gas leakage from expansion valve heat sensing tube

Diagnosis

- Refrigerant does not circulate

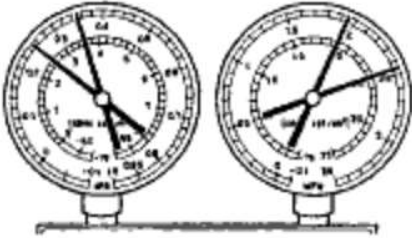
Remedy

- (1) Check heat sensing tube, expansion valve and EPR
- (2) Clean out dirt in expansion valve by blowing with air
If not able to remove dirt, replace expansion valve
- (3) Replace receiver
- (4) Evacuate air and charge new refrigerant to proper amount.
For gas leakage from heat sensing tube, replace expansion valve.

V00341

6. REFRIGERANT OVERCHARGE OR INSUFFICIENT COOLING OF CONDENSER

Condition: Does not cool sufficiently



Symptom seen in refrigeration system

- Pressure too high on both low and high pressure sides
- No air bubbles seen through the sight glass even when the engine rpm is lowered.

Probable cause

- Unable to develop sufficient performance due to excessive refrigerant in system
- Insufficient cooling of condenser

Diagnosis

- Excessive refrigerant in cycle – refrigerant overcharged:
- Condenser cooling insufficient – condenser fins clogged or fan motor faulty

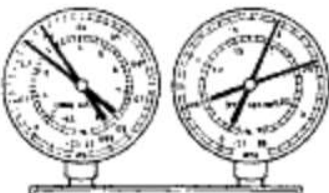
Remedy

- (1) Clean condenser
- (2) Check fan motor operation
- (3) If (1) and (2) are in normal state, check amount of refrigerant

Charge proper amount of refrigerant

7. AIR PRESENT IN REFRIGERATION SYSTEM

Condition: Does not cool down sufficiently



Symptom seen in refrigeration system

- Pressure too high on both low and high pressure sides
- The low pressure piping is hot to the touch
- Bubbles seen in sight glass

Probable cause

- Air entered in refrigeration system

Diagnosis

- Air present in refrigeration system
- Insufficient vacuum purging

Remedy

- (1) Check compressor oil to see if dirty or insufficient
- (2) Evacuate air and charge new refrigerant

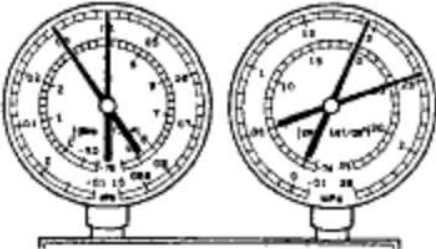
NOTE: These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging.

AC-28

AIR CONDITIONING SYSTEM – TROUBLESHOOTING

8. EXPANSION VALVE IMPROPERLY MOUNTED/HEAT SENSING TUBE DEFECTIVE (OPENS TOO WIDE)

Condition: Insufficient cooling



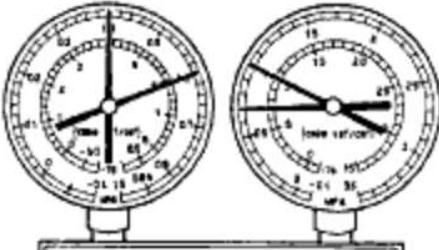
N04152

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
- Pressure too high on both low and high pressure sides - Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve or heat sensing tube not installed correctly	- Excessive refrigerant in low pressure piping - Expansion valve opened too wide	(1) Check heat sensing tube installed condition (2) If (1) is normal, check expansion valve - Replace if defective

W01021

9. DEFECTIVE COMPRESSION COMPRESSOR

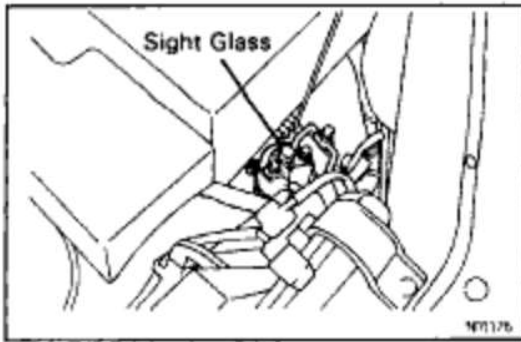
Condition: Does not cool



N04148

Symptom seen in ref rigeration system	Probable cause	Diagnosis	Remedy
- Pressure too high on low pressure side - Pressure too low on high pressure side	Internal leak in compres-sor	- Compression defective - Valve leaking or broken, sliding parts	Repair or replace com-pressor

W01021



REFRIGERANT VOLUME

AC2903-02

REFRIGERANT VOLUME INSPECTION

1. RUN ENGINE AT IDLE SPEED
2. OPERATE A/C AT MAXIMUM COOLING FOR A FEW MINUTES
3. INSPECT AMOUNT OF REFRIGERANT
OBSERVE THE SIGHT GLASS ON THE LIQUID TUBE.

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

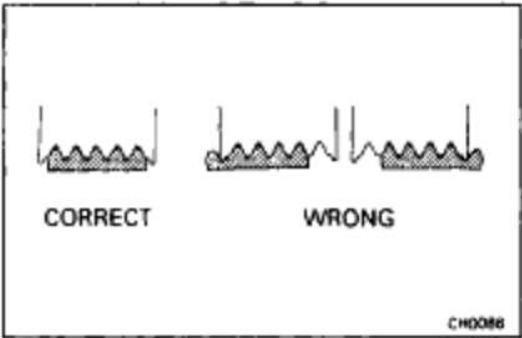
*: Bubbles in the sight glass with ambient temperatures higher can be considered normal if cooling is sufficient.

REFRIGERANT CHARGE VOLUME

AC2904-06

Specified amount:

850 ± 50 g (29.98 ± 1.76 oz)

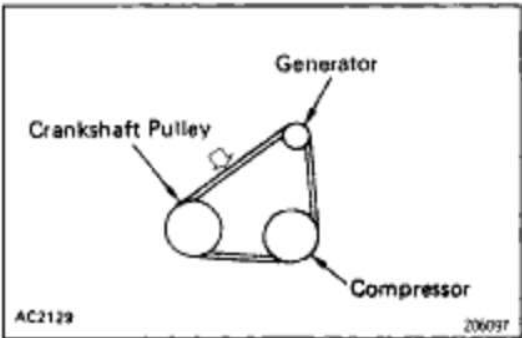


DRIVE BELT TENSION

DRIVE BELT TENSION INSPECTION

1. INSPECT DRIVE BELT’S INSTALLATION CONDI-TION

Check that the drive belt fits properly in the ribbed grooves.



2. INSPECT DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt ten-sion.

Belt tension gauge:
Nippondenso BTG-20 (95506-00020) or
Borroughs No. BT-33-73F

Drive belt tension:

5S- FE:

New belt 165 ± 26 lbf

Used belt 110 ± 11 lbf

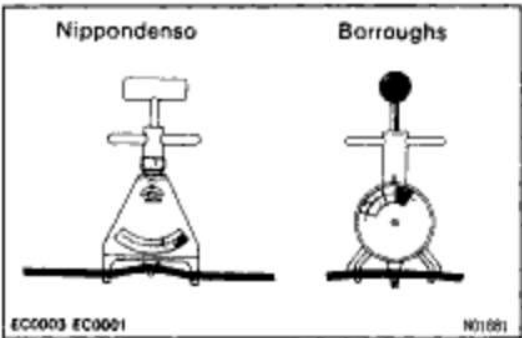
1 MZ-FE:

New belt 165 ± 26 lbf

Used belt 88 ± 22 lbf

HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing the drive belt, check that it fits properly in the ribbed grooves.



IDLE-UP SPEED

IDLE UP SPEED INSPECTION

1. WARM UP ENGINE

2. INSPECT IDLE SPEED

5S- FE:

Magnet clutch condition	Standard idle speed (rpm)
No engaged	Approx. 750
Engaged	Approx. 850

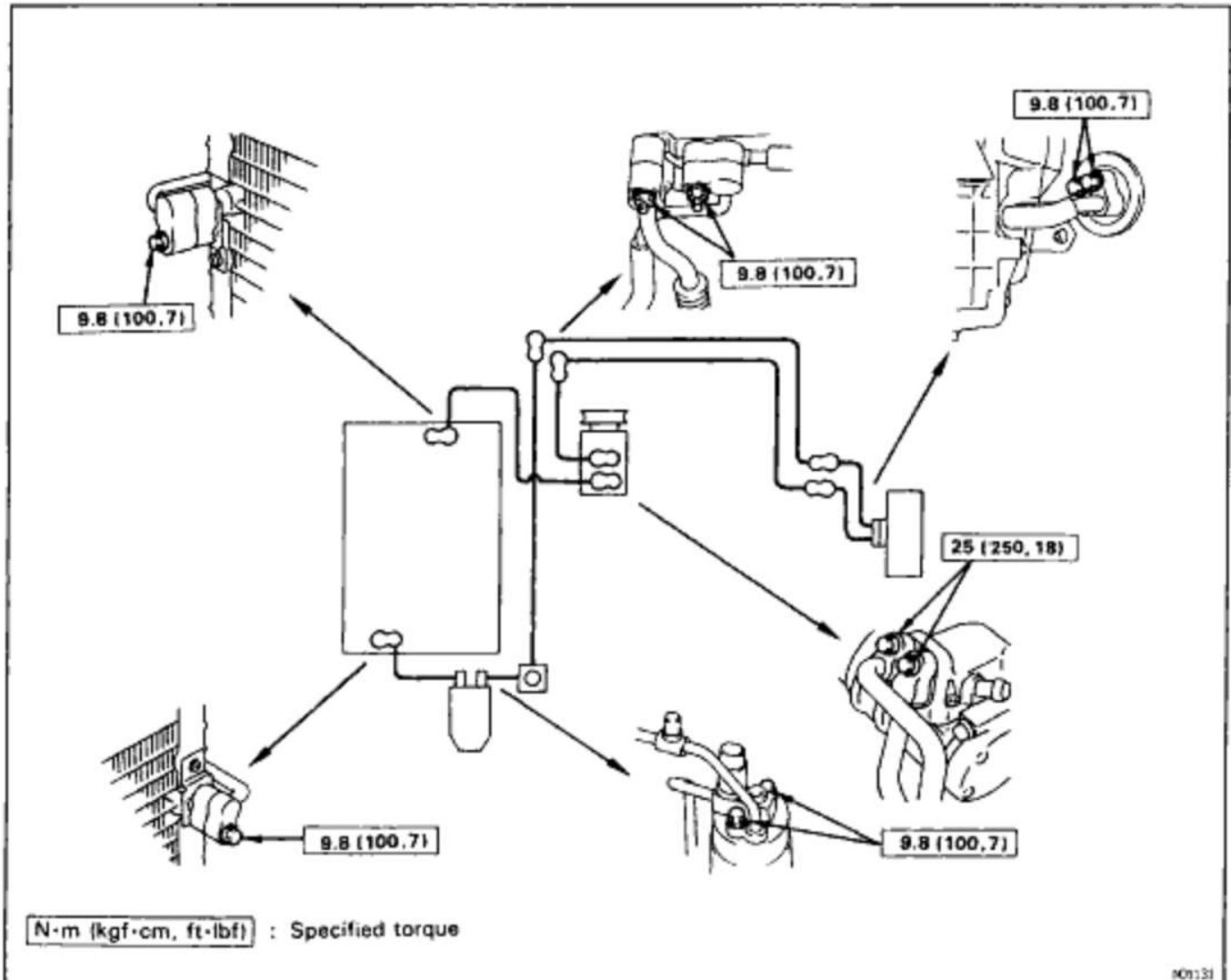
1 MZ - FE:

Magnet clutch condition	Standard idle speed (rpm)
No engaged	Approx. 700
Engaged	Approx. 700

REFRIGERANT LINES

TIGHTENING TORQUE OF REFRIGERATION LINES

A200L-91



AC30M-06

ON-VEHICLE INSPECTION

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

REFRIGERANT LINES REPLACEMENT

1. **DISCHARGE REFRIGERANT IN REFRIGERATION SYSTEM**
(See page [AC-21](#))
2. **REPLACE FAULTY TUBE OR HOSE**
HINT: Cap the open fittings immediately to keep moisture or dirt out of the system.
3. **TORQUE CONNECTIONS TO SPECIFIED TORQUE**
NOTICE: Connections should not be torque tighter than the specified torque.
4. **EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT**
Specified amount:
 $850 \pm 50\text{g}$ (29.98 ± 1.76 oz)
5. **INSPECT FOR LEAKAGE OF REFRIGERANT**
Using a gas leak tester, check for leakage of refrigerant.
6. **INSPECT AIR CONDITIONING OPERATION**

AIR CONDITIONING UNIT

ACR0P-94

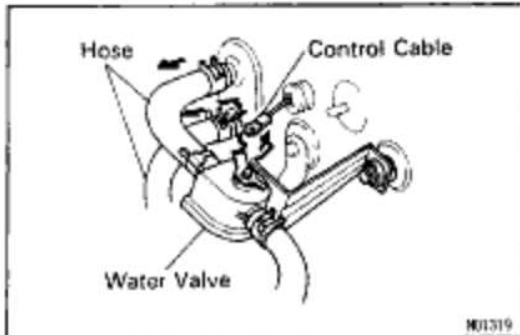
A/C UNIT REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(See page [AC-21](#))

2. DRAIN ENGINE COOLANT FROM RADIATOR

HINT: It is not necessary to drain out all the coolant.

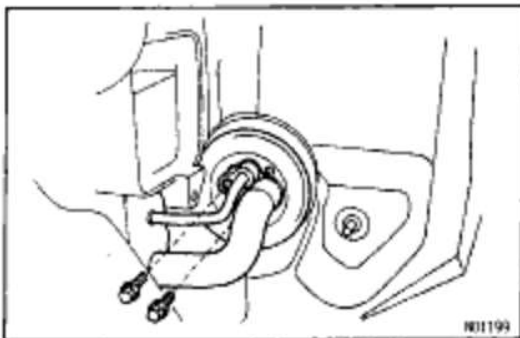


3. DISCONNECT WATER VALVE CONTROL CABLE FROM WATER VALVE
4. DISCONNECT WATER HOSES FROM HEATER RADIATOR PIPES
5. REMOVE INSTRUMENT PANEL AND REINFORCEMENT

(See page [BO-108](#))

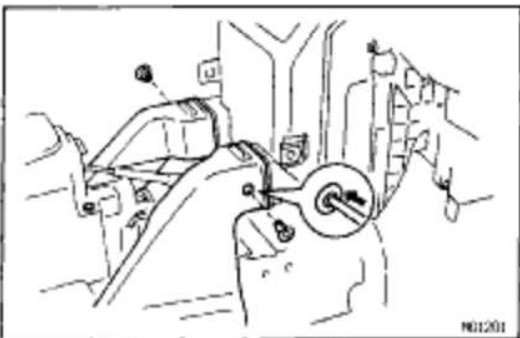
6. REMOVE BLOWER UNIT

(See page [AC-35](#))



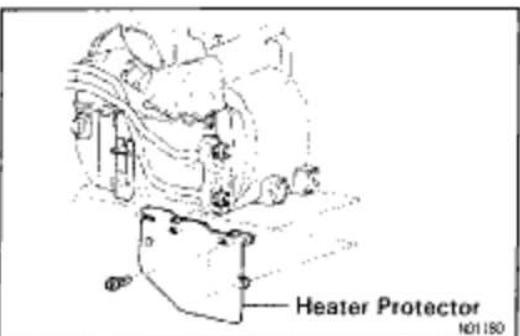
7. DISCONNECT LIQUID AND SUCTION TUBE FROM BLOCK JOINT

Remove 2 bolts and both tubes.



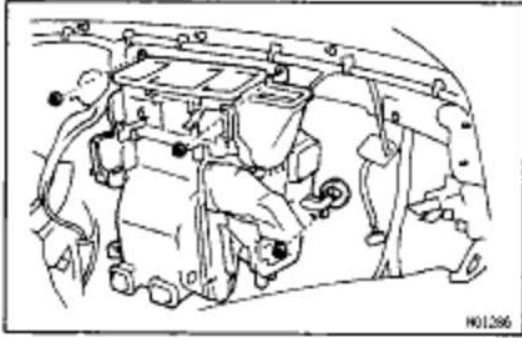
8. REMOVE REAR AIR DUCTS

Remove the clip and the air duct.



9. REMOVE HEATER PROTECTOR

Remove the 2 clips and the heater protector.

AC-34**AIR CONDITIONING SYSTEM – AIR CONDITIONING UNIT****10. REMOVE A/C UNIT**

- (a) Disconnect connectors from the unit.
- (b) Remove the 3 nuts and the A/C unit.

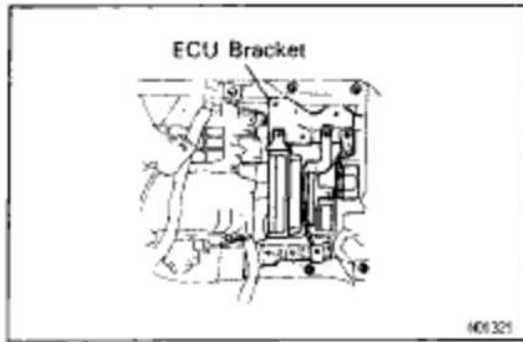
A/C UNIT INSTALLATION

AC18P-61

1. INSTALL A/C UNIT

- (a) Install the A/C unit with the 3 nuts.
- (b) Connect connectors.

2. INSTALL HEATER PROTECTOR**3. INSTALL REAR AIR DUSTS****4. CONNECT LIQUID AND SUCTION TUBE TO BLOCK JOINT****5. INSTALL BLOWER UNIT****6. INSTALL INSTRUMENT PANEL AND REINFORCEMENT****7. CONNECT WATER HOSES TO HEATER RADIATOR PIPES****8. CONNECT WATER VALVE CONTROL CABLE TO WATER VALVE**(See step 3 on page [AC-33](#))**9. REFILL WITH ENGINE COOLANT****10. EVACUATE AIR FROM REFRIGERATION SYSTEM****11. CHARGE SYSTEM WITH REFRIGERANT AND INSPECT FOR LEAKAGE OF REFRIGERANT****Specified amount:****850 ±50 g (29.98 ±1.76 oz)**

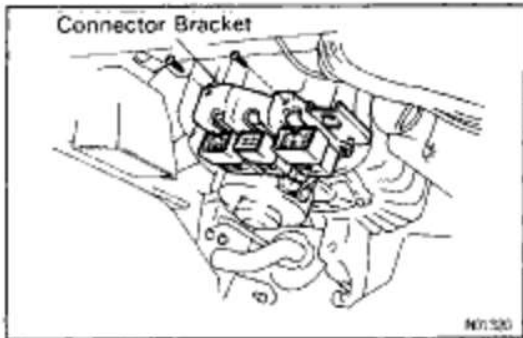


BLOWER UNIT

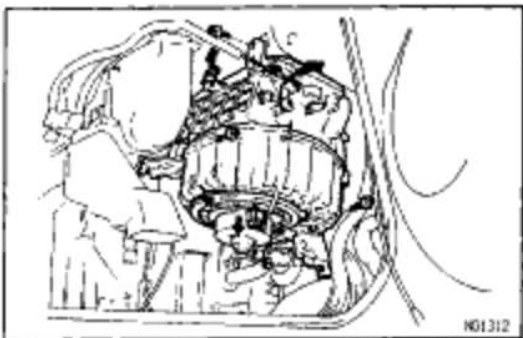
AG140-02

BLOWER UNIT REMOVAL

1. REMOVE GLOVE COMPARTMENT
(See page [BO-108](#))
2. REMOVE ECU AND ECU BRACKET



3. REMOVE CONNECTOR BRACKET
 - (a) Disconnect the connector from the connector bracket.
 - (b) Remove the 2 screws and the bracket.



4. REMOVE BLOWER UNIT
 - (a) Disconnect the connector from the blower unit.
 - (b) Disconnect the air inlet damper control cable.
 - (c) Remove the 3 screws, nut and the blower unit.

BLOWER UNIT INSTALLATION

AG140-01

1. INSTALL BLOWER UNIT
 - (a) Install the blower unit with the 3 screws and the nut.
 - (b) Connect the air inlet damper control cable to the blower unit.
 - (c) Connect the connector.
2. INSTALL CONNECTOR BRACKET
3. INSTALL ECU BRACKET AND ECU
4. INSTALL GLOVE COMPARTMENT

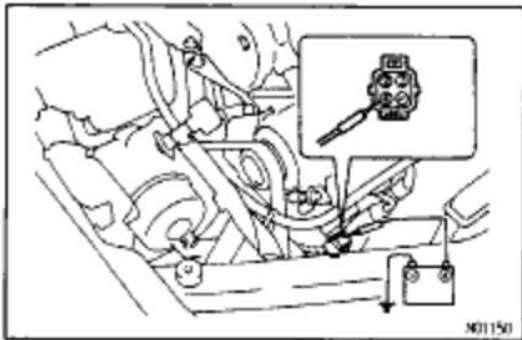
COMPRESSOR

ON-VEHICLE INSPECTION

Magnet Clutch:

AC008-36

1. **MAKE THE FOLLOWING VISUAL CHECKS:**
 Leakage of grease from the clutch bearing.
 Signs of oil on the pressure plate or rotor.
 Repair or replace, as necessary.
2. **INSPECT MAGNET CLUTCH BEARING FOR NOISE**
 - (a) Start engine.
 - (b) Check for abnormal noise from near the compressor when the A/C switch is OFF.
 If abnormal noise is being emitted, replace the magnetic clutch.

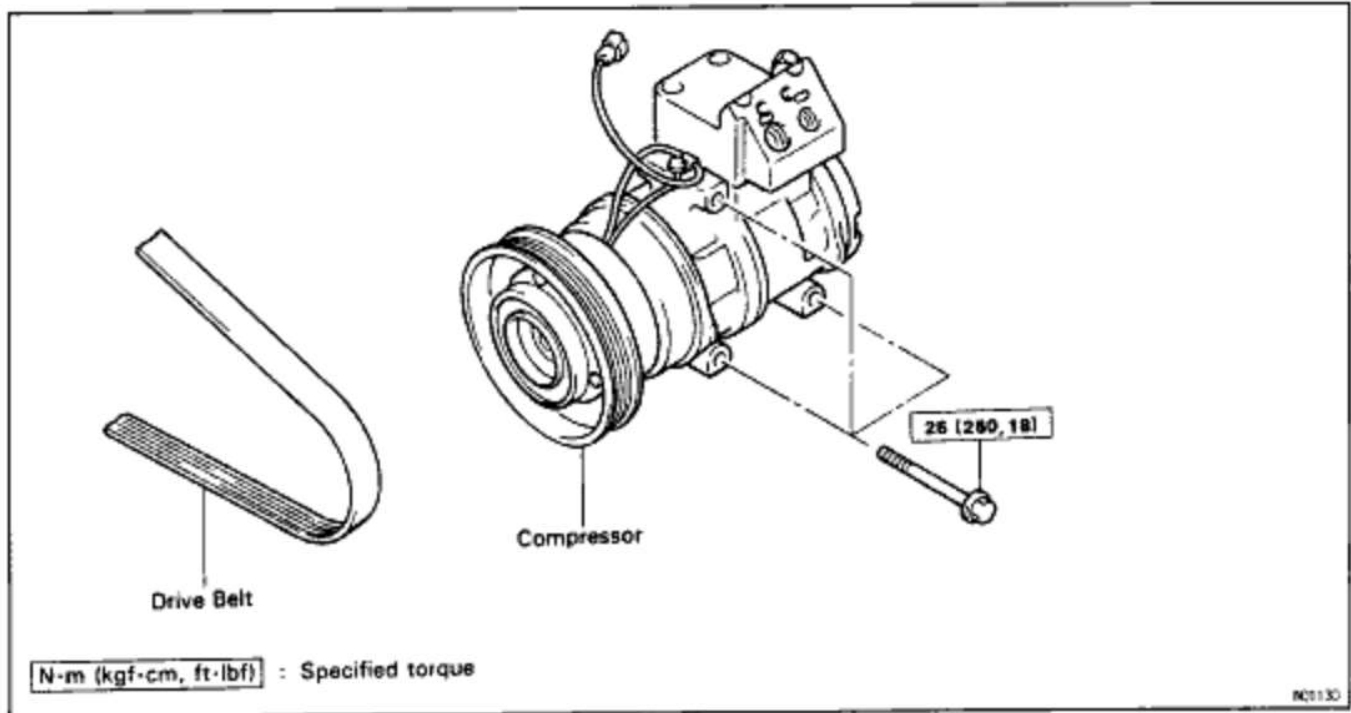


3. **INSPECT MAGNET CLUTCH**
 - (a) Disconnect the connector from the magnet clutch.
 - (b) Connect the positive (+) lead from the battery to the terminal on the magnetic clutch connector and the negative (-) lead to the body ground.
 - (c) Check that the magnet clutch is energized.
 If operation is not as specified, replace the magnet clutch.

Compressor:

1. **INSTALL MANIFOLD GAUGE SET**
 (See page [AC-21](#))
2. **START ENGINE**
3. **INSPECT COMPRESSOR FOR METALLIC SOUND**
 Check that there is a metallic sound from the compressor when the A/C switch is turn on.
 If metallic sound is heard, replace the compressor assembly.
4. **INSPECT PRESSURE OF REFRIGERATION SYSTEM**
 See "Refrigerant System Inspection with Manifold Gauge Set" on page [AC-24](#).
5. **STOP ENGINE**
6. **INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT FROM SAFETY SEAL**
 If there is any leakage, replace the compressor assembly.

COMPRESSOR REMOVAL 5S-FE Engine Model:



1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX 10 MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE (-) CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

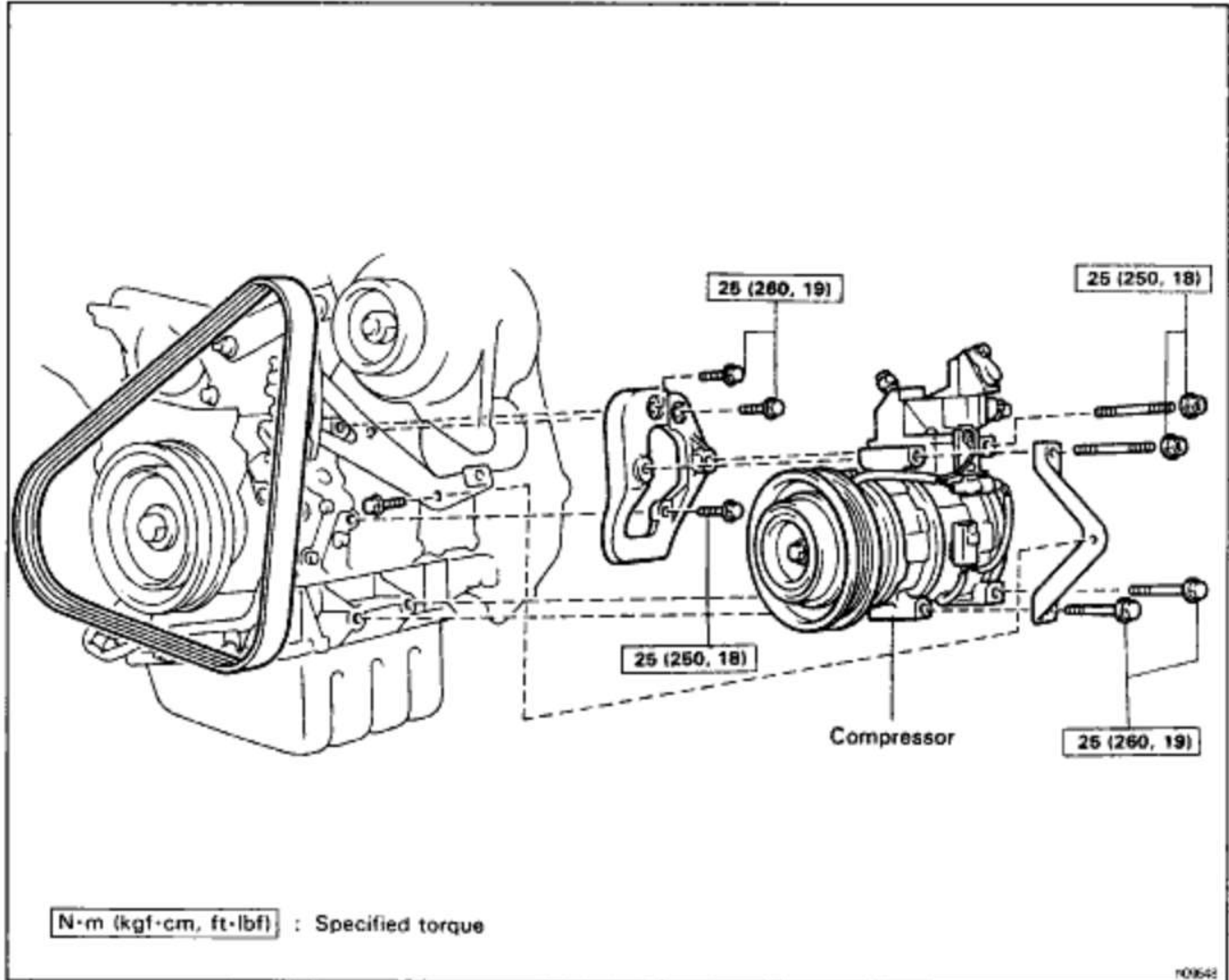
4. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
(See page [AC-21](#))
6. DISCONNECT DISCHARGE HOSE AND SUCTION HOSE FROM COMPRESSOR
7. DISCONNECT CONNECTOR FROM MAGNET CLUTCH
8. REMOVE COMPRESSOR
 - (a) Loosen the drive belt.
 - (b) Remove 3 bolts and compressor.

AC-38

AIR CONDITIONING SYSTEM - COMPRESSOR

COMPRESSOR REMOVAL

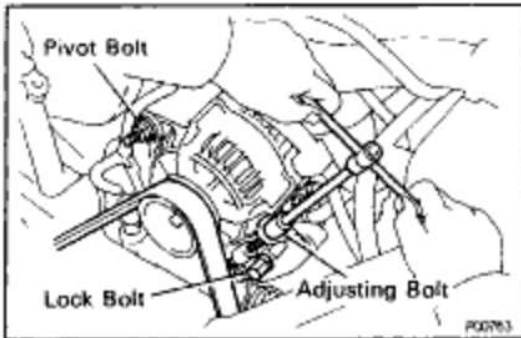
1 MZ-FE Engine Model:



1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX 10 MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE (-) CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

4. **DISCHARGE REFRIGERANT FROM REFRIGERA-
TION SYSTEM**
(See page [AC-21](#))
5. **DISCONNECT DISCHARGE HOSE AND SUCTION
HOSE FROM COMPRESSOR**
6. **DISCONNECT CONNECTOR FROM MAGNET
CLUTCH**



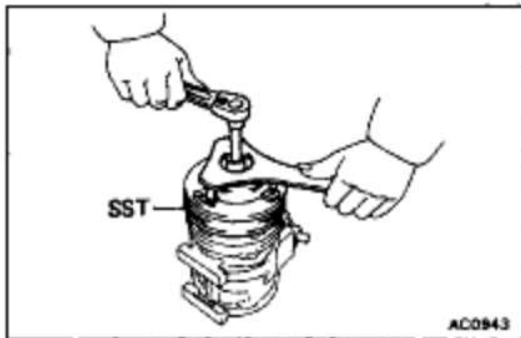
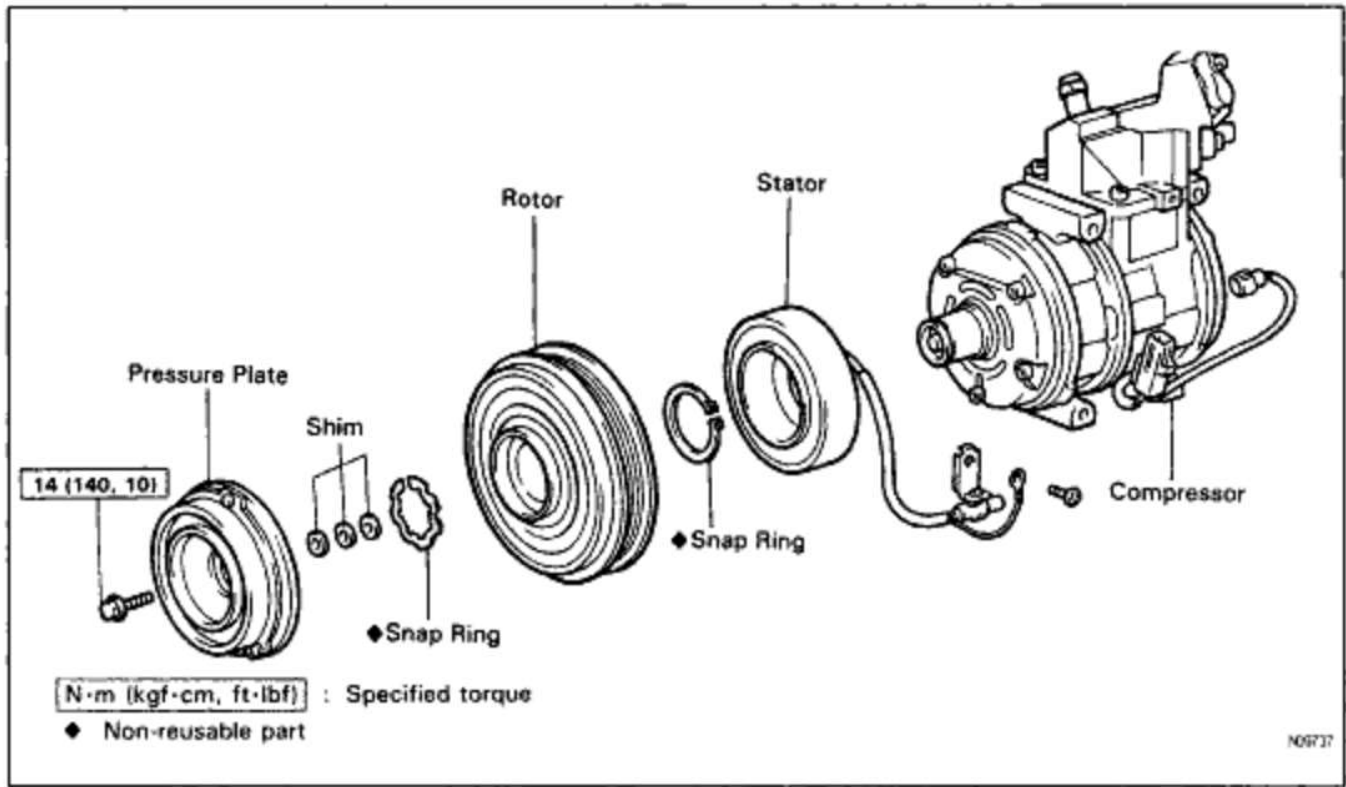
7. **REMOVE DRIVE BELT**
Loosen the pivot bolt and adjusting lock bolt and remove the drive belt.
8. **REMOVE COMPRESSOR**
 - (a) Remove 2 nuts and 2 bolts.
 - (b) Remove the compressor.

AC-40

AIR CONDITIONING SYSTEM – COMPRESSOR

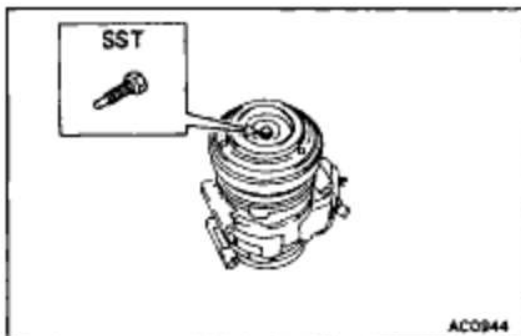
MAGNET CLUTCH DISASSEMBLY

A0801-90



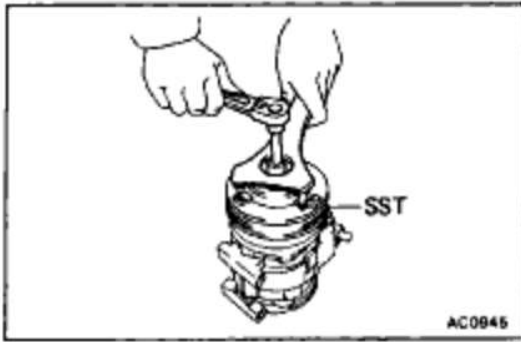
1. REMOVE PRESSURE PLATE

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

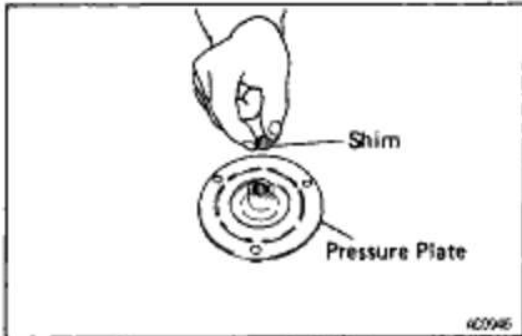


- (b) Install a SST on the pressure plate.
SST 07112–66040

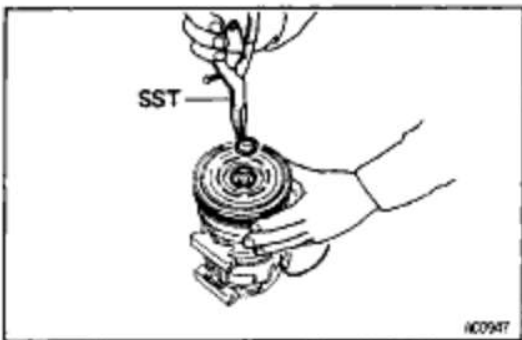
AIR CONDITIONING SYSTEM – COMPRESSOR



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

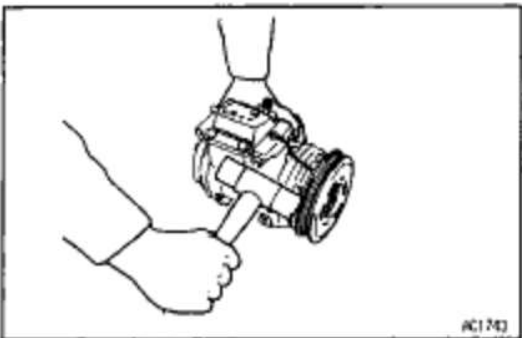


- (d) Remove the shims from the pressure plate.

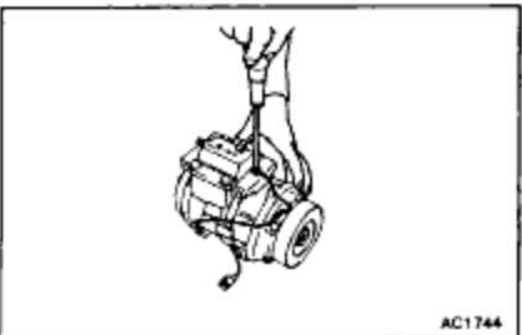


2. REMOVE ROTOR

- (a) Using SST, remove the snap ring.
SST 07114-84020
CAUTION: Do not spread the point of SST widely.
Max width:
23.1 mm



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

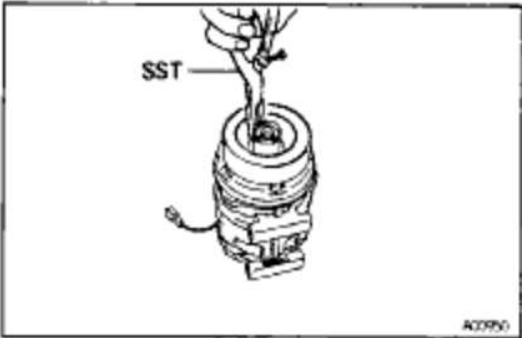


3. REMOVE STARTER

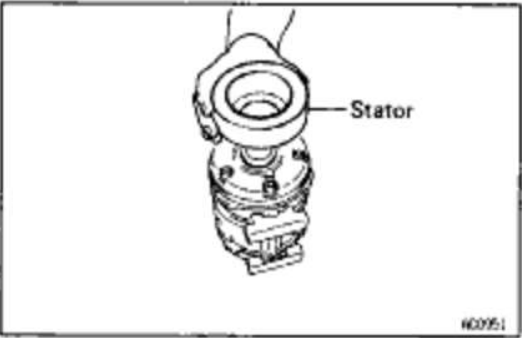
- (a) Disconnect the stator lead wire from the compressor housing.

AC-42

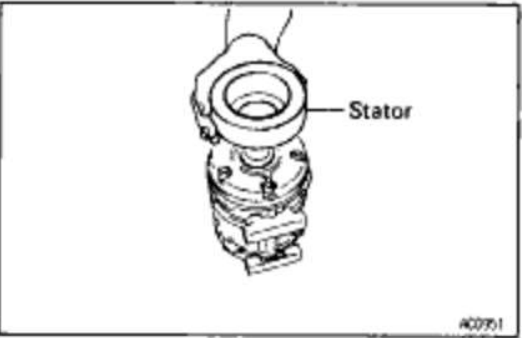
AIR CONDITIONING SYSTEM – COMPRESSOR



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



- (c) Remove the stator.

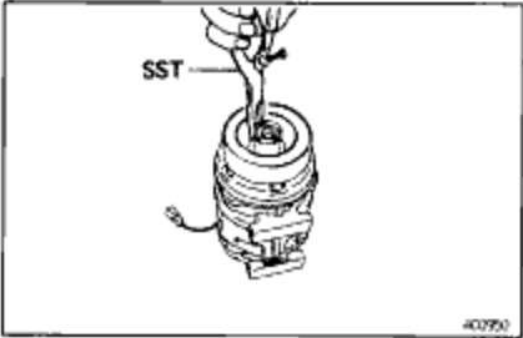


MAGNET CLUTCH ASSEMBLY

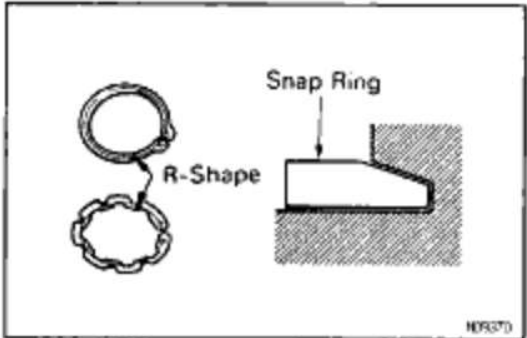
AC801-0A

1. INSTALL STATOR

- (a) Install the stator on the compressor.

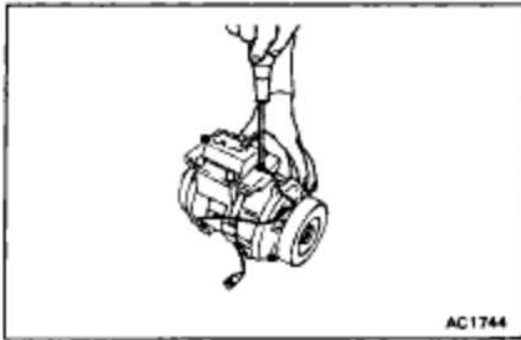


- (b) Using SST, install the new snap ring.
SST 07114 -84020



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

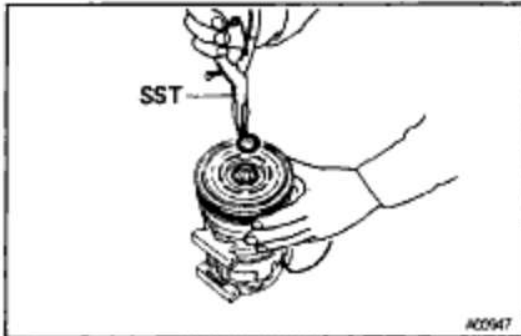
AIR CONDITIONING SYSTEM – COMPRESSOR



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

Torque: 3.4 N-m (35 kgf.cm, 30 in.-lbf)

SST 07110-61050



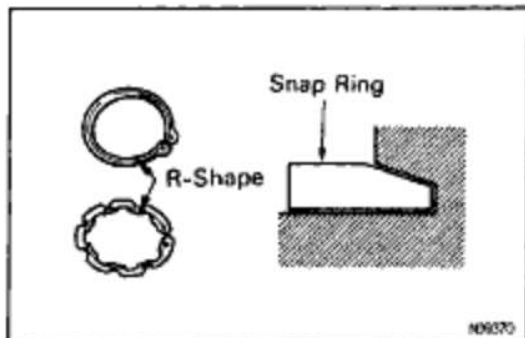
2. INSTALL ROTOR

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

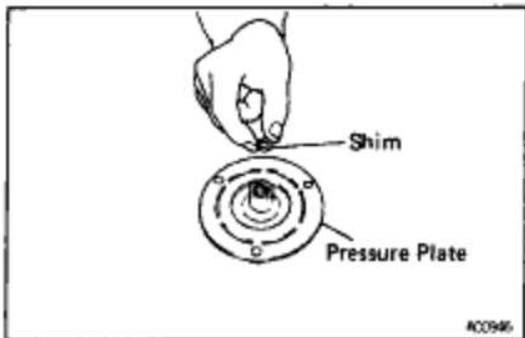
SST 07114-84020

CAUTION: Do not spread the point of SST widely.

Max width:
23.1 mm

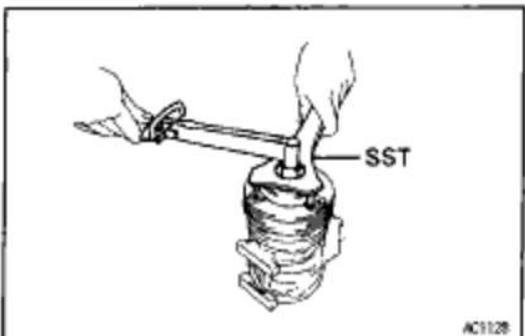


NOTICE: The snap ring should be installed so that its beveled side faces up.



3. INSTALL PRESSURE PLATE

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



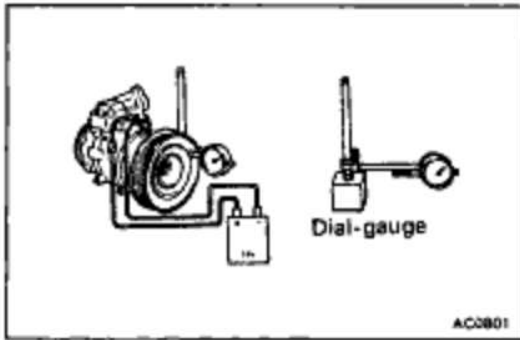
- (b) Using SST and torque wrench, install the shaft bolt.

SST 07112-76060

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

AC-44

AIR CONDITIONING SYSTEM – COMPRESSOR

**4. CHECK CLEARANCE OF MAGNET CLUTCH**

- (a) Set the dial – gauge to the pressure plate of the magnet clutch.
- (b) Connect the magnet clutch lead wire to the positive (+) terminal of the battery.
- (c) Check the clearance between the pressure plate and rotor, when connect the negative (–) terminal of the battery.

Standard clearance:

$$0.5 \pm 0.15 \text{ mm } (0.020 \pm 0.059 \text{ in.})$$

If the clearance is not within standard clearance, adjust the clearance using shims to obtain the standard clearance.

COMPRESSOR INSTALLATION**1. INSTALL COMPRESSOR**

- (a) Install compressor with 4 bolts.
Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)
- (b) Install drive belt.
- (c) Inspect drive belt tension.

2. CONNECT CONNECTOR TO MAGNET CLUTCH**3. CONNECT DISCHARGE HOSE AND SUCTION HOSE TO COMPRESSOR**

NOTICE: Hoses should be connected immediately after the caps have been removed.

Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)

4. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT**Specified amount:**

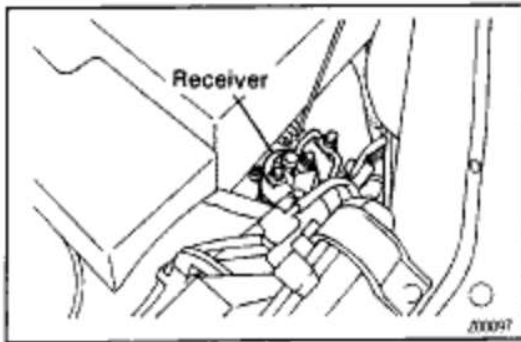
$$850 \pm 50 \text{ g } (29.98 \pm 1.76 \text{ oz})$$

5. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak tester, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

6. CONNECT NEGATIVE (–) CABLE TO BATTERY**7. INSPECT A/C OPERATION**



RECEIVER

AC809-02

ON-VEHICLE INSPECTION

INSPECT FITTINGS FOR LEAKAGE

Using a gas leak tester, check for leakage.

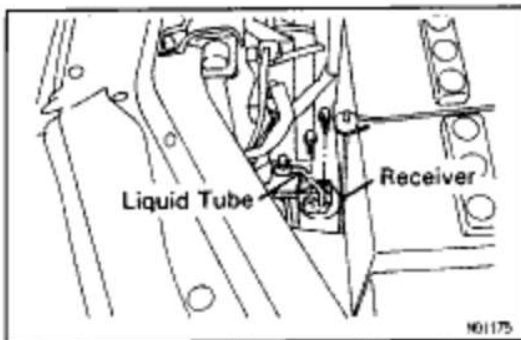
If there is leakage, check the tightening torque at the joints.

RECEIVER REMOVAL

AC809-03

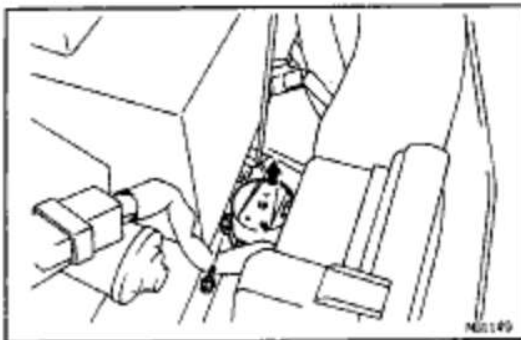
1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(See page [AC-21](#))



2. REMOVE 2 LIQUID TUBES FROM RECEIVER

Remove the 2 bolts and the both tubes from the receiver.



3. REMOVE RECEIVER FROM RECEIVER HOLDER

Remove the bolt, then remove the receiver from receiver holder.

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

RECEIVER INSTALLATION

1. **INSTALL RECEIVER INTO RECEIVER HOLDER**
Install the receiver into the receiver, holder with the bolt.

2. **INSTALL 2 LIQUID TUBES TO RECEIVER**
Install 2 liquid tubes to the receiver with 2 bolts.
Torque: 5.5 N-m (55 kgf-cm, 48 in.-lbf)

NOTICE: Do not remove the caps until the tubes are connected.

3. **REPLENISH COMPRESSOR OIL IF RECEIVER HAS BEEN REPLACED**

Add 15 cc (0.5 fl.oz.)

Compressor oil:

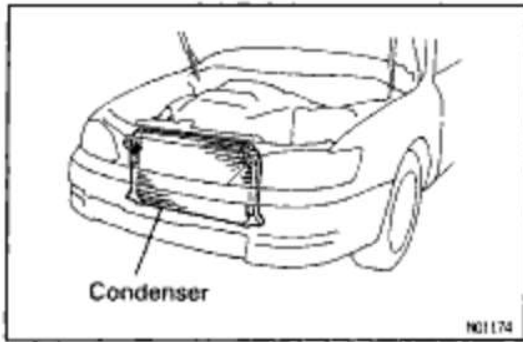
ND OIL 8 or equivalent

4. **EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT**

Specified amount:

850 ±50 g (29.98 ±1.76 oz)

5. **INSPECT FOR LEAKAGE OF REFRIGERANT**
6. **INSPECT A/C OPERATION**



CONDENSER

AC1047-01

ON-VEHICLE INSPECTION

1. INSPECT CONDENSER FINS FOR BLOCKAGE OR DAMAGE

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

NOTICE: Be careful not to damage the fins.

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

2. INSPECT CONDENSER AND FITTINGS FOR LEAKAGE

Using a gas leak tester, check for leakage.

If there is leakage, check the tightening torque at the joints.

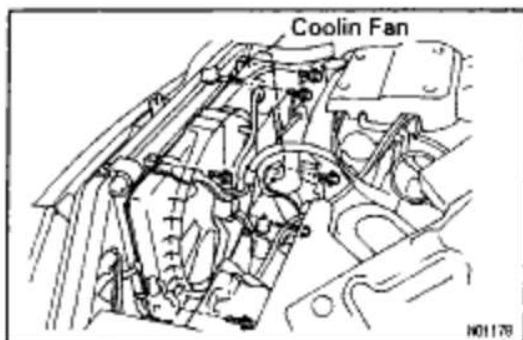
CONDENSER REMOVAL

AC1047-01

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(See page [AC-21](#))

2. REMOVE UPPER COVER

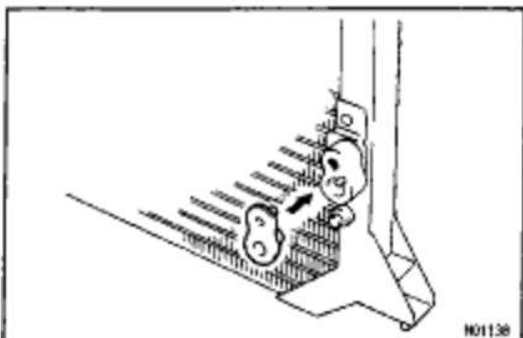


3. REMOVE COOLING FAN

(See page [EG-351](#))

4. REMOVE UPPER SUPPORT

Remove the 2 bolts and 2 upper supports.



5. REMOVE LIQUID TUBES

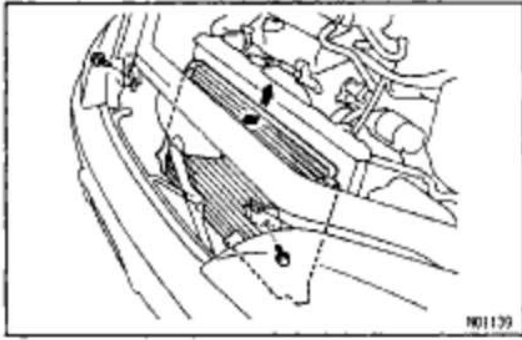
Remove the 2 bolts and 2 tubes.

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

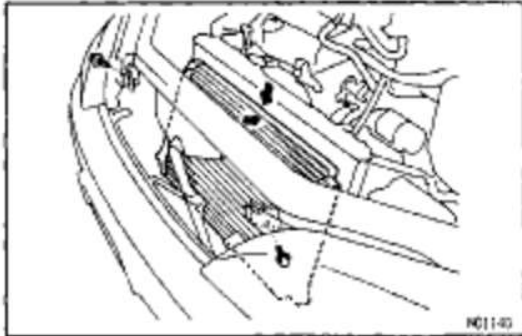
6. REMOVE HEADLIGHTS ON THE BOTH SIDES

AC-48

AIR CONDITIONING SYSTEM – CONDENSER

**7. REMOVE CONDENSER**

Remove the 2 bolts and lean the radiator backward, then remove the condenser.

**CONDENSER INSTALLATION****1. INSTALL CONDENSER**

Install the condenser with the 2 bolt.

2. INSTALL LIQUID TUBES

Install both tubes with the 2 bolts.

Specified torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)

NOTICE: Do not remove caps until the tube is installed.

3. INSTALL COOLING FAN**4. REPLENISH COMPRESSOR OIL IF CONDENSER HAS BEEN REPLACED**

Add 40 cc (1.4 fl.oz.)

Compressor Oil:

ND OIL 8 or equivalent

5. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT

Specified amount:

850 ±50g (33.51 ±1.76 oz)

6. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak tester, check for leakage of refrigerant.

7. INSTALL REMOVAL PARTS

Install the removal parts in reverse order of removal procedure.

EVAPORATOR

AC913-88

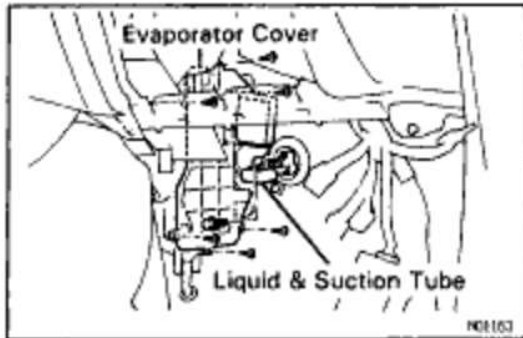
EVAPORATOR REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(See page [AC-21](#))

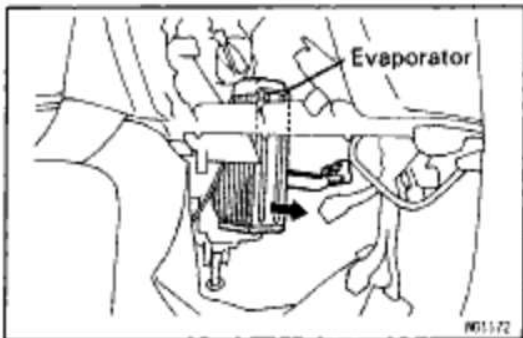
2. REMOVE BLOWER UNIT

(See page [AC-35](#))



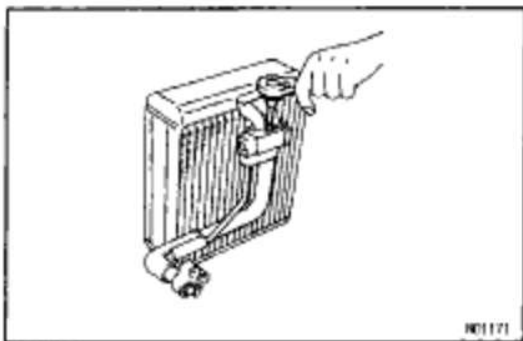
3. REMOVE EVAPORATOR COVER

- Remove 2 bolts for the liquid and suction tube.
- Remove 8 screws and evaporator cover.



4. REMOVE EVAPORATOR

- Pull and remove the evaporator.



- Remove 2 bolts using a hexagon wrench and separate the evaporator and expansion valve.

EVAPORATOR INSPECTION

AC918-94

1. INSPECT FINS FOR BLOCKAGE

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

NOTICE: Never use water to clean the evaporator.

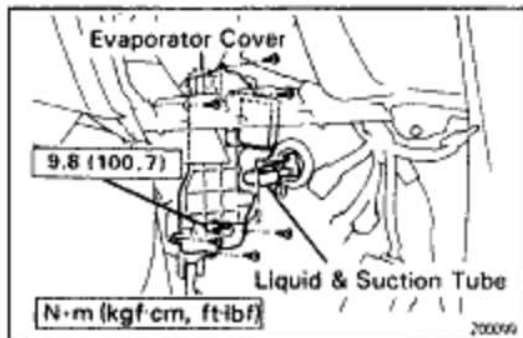
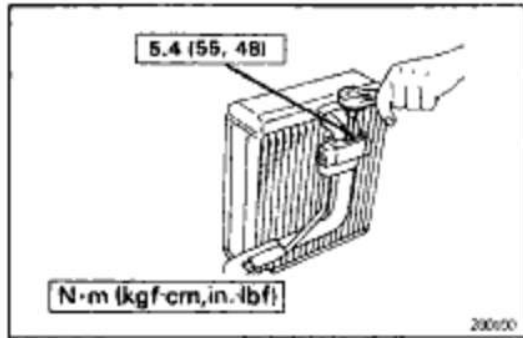
2. INSPECT FITTINGS FOR CRACKS OR SCRATCHES

Repair as necessary.

AC-50

AIR CONDITIONING SYSTEM – EVAPORATOR

A5014-32



EVAPORATOR INSTALLATION

1. INSTALL REMOVAL PARTS

Install the removal parts in reverse order of removal procedure.

HINT:

The tightening torque for the bolt used to install the expansion valve on the evaporator is shown below.

Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)

The tightening torque for the bolts used to install the liquid and suction tube is shown below.

Torque: 9.8 N·m (100 kgf·cm, 7 ft-lbf)

2. REPLENISH COMPRESSOR OIL IF EVAPORATOR HAS BEEN REPLACED

Add 40 cc (1.4 fl.oz)

Compressor oil:

ND OIL 8 or equivalent

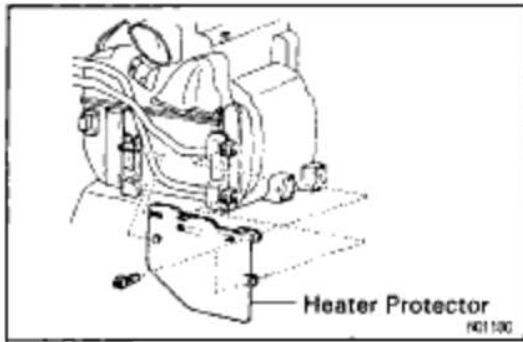
3. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT

Specified amount:

$850 \pm 50\text{g}$ ($29.98 \pm 1.76\text{ oz}$)

4. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak tester, check for leakage of refrigerant.

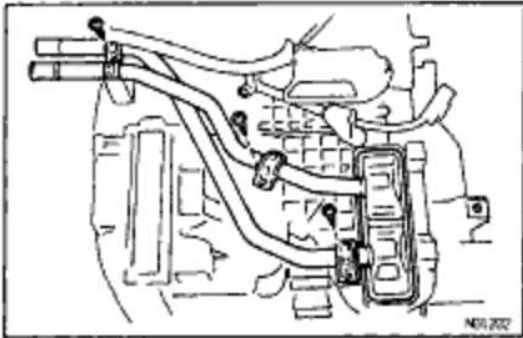


HEATER RADIATOR

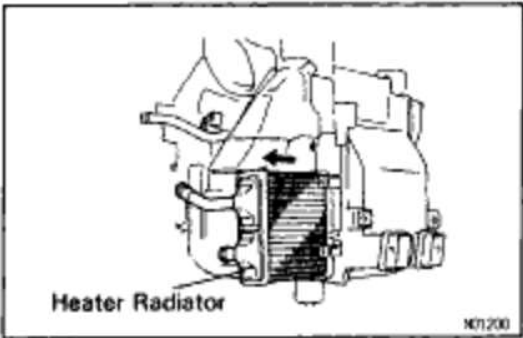
HEATER RADIATOR REMOVAL

AC51B-04

1. **REMOVE HEATER PROTECTOR**
Remove the 2 clips and the heater protector.



2. **REMOVE HEATER RADIATOR**
(a) Remove the 3 screws and the 3 clamps.



- (b) Disconnect the heater pipes.
- (c) Pull the heater radiator out.

HEATER RADIATOR INSPECTION

AC1400-06

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

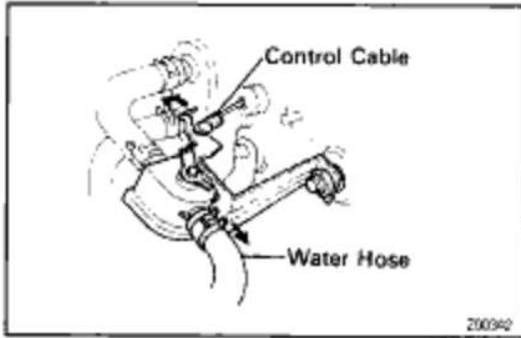
HEATER RADIATOR INSTALLATION

AC51B-01

1. **INSTALL HEATER RADIATOR TO A/C UNIT**
 - (a) Put the radiator in the A/C unit.
 - (b) Connect the heater pipes.
 - (c) Install the 3 clamps with 3 screws.
2. **INSTALL HEATER PROTECTOR**

AC-52

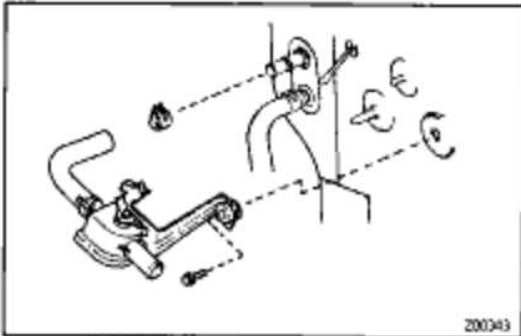
AIR CONDITIONING SYSTEM – WATER VALVE

**WATER VALVE**

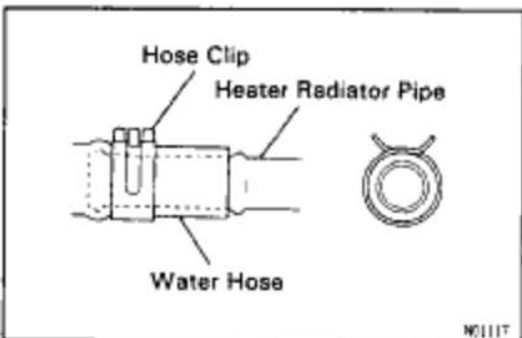
AC018-02

WATER VALVE REMOVAL

1. **DRAIN ENGINE COOLANT FROM RADIATOR**
HINT: It is not necessary to drain out all the coolant.
2. **DISCONNECT WATER VALVE CONTROL CABLE FROM WATER VALVE**
3. **DISCONNECT WATER HOSE FROM WATER VALVE**

**4. REMOVE WATER VALVE**

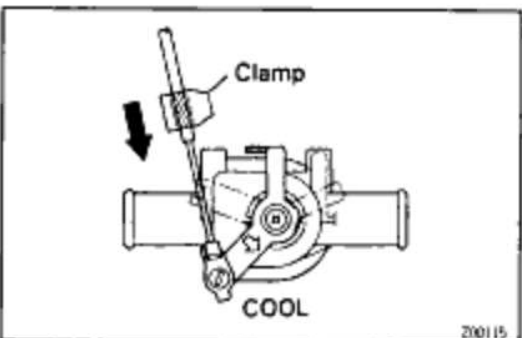
- (a) Disconnect the water hose from the heater radiator pipe.
- (b) Remove the bolt and the water valve

**WATER VALVE INSTALLATION**

AC017-02

1. INSTALL WATER VALVE

- (a) Push the water hose onto the heater radiator pipe as far as it goes on the pipe and install the hose clip.
- (b) Install water valve with the bolt.

2. CONNECT HEATER HOSE TO WATER VALVE**3. CONNECT WATER VALVE CONTROL CABLE TO WATER VALVE**

- (a) Set the temperature control switch to "COOL".
- (b) Set the water valve lever to "COOL", install the control cable and lock the clamp.

HINT: Lock the clamp while lightly pushing the outer cable in the direction shown by the arrow.

EXPANSION VALVE ON-VEHICLE INSPECTION

AG019-08

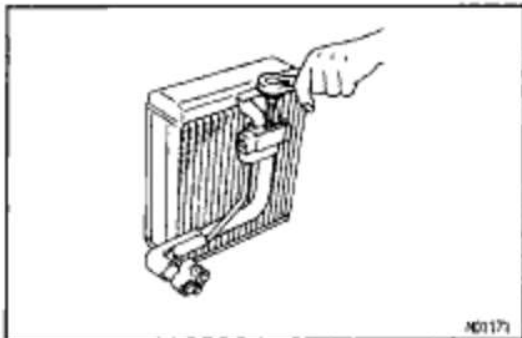
1. CHECK QUANTITY OF GAS DURING REFRIGERATION CYCLE
2. INSTALL MANIFOLD GAUGE SET
3. RUN ENGINE

Run the engine at 1,500 rpm for at least 5 minutes. Then check that the high pressure reading is 1.37 – 1.53 MPa (14 – 16 kgf/cm², 199 – 228 psi).

4. CHECK EXPANSION VALVE

If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm², 0 psi).

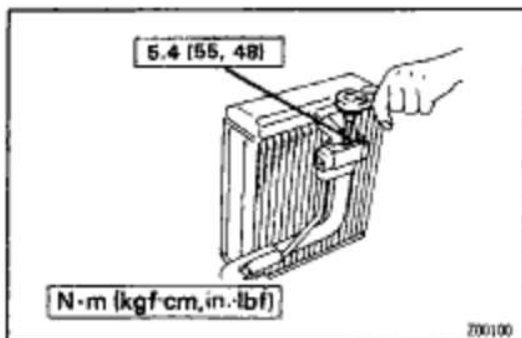
HINT: When the low pressure drops to 0 kPa (0 kgf/cm², 0 psi), feel the receiver's IN and OUT sides for no temperature difference.



EXPANSION VALVE REMOVAL

AG187-01

1. REMOVE EVAPORATOR
(See page [AC-50](#))
2. REMOVE EXPANSION VALVE
(See page [AC-51](#))



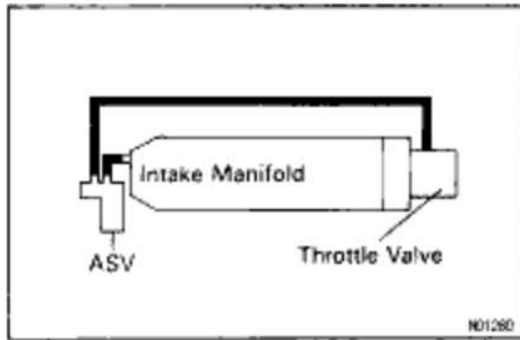
EXPANSION VALVE INSTALLATION

AG142-01

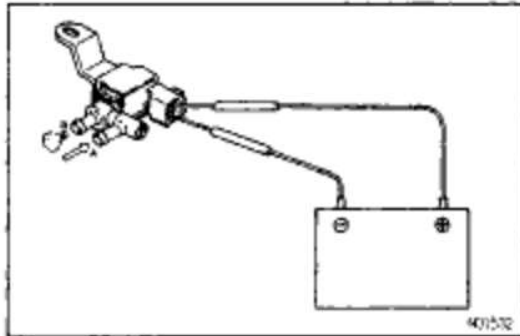
1. INSTALL EXPANSION VALVE
(See page [AC-51](#))
2. INSTALL EVAPORATOR
(See page [AC-51](#))

AC-54

AIR CONDITIONING SYSTEM – AIR SWITCHING VALVE (ASV)



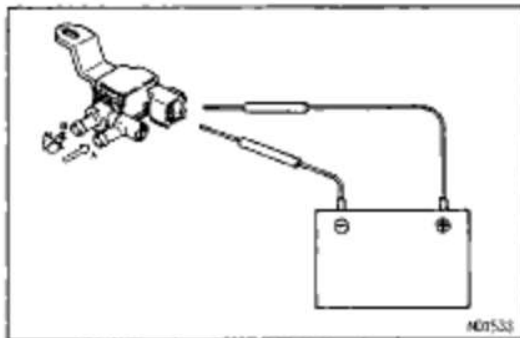
AIR SWITCHING VALVE (ASV) VACUUM HOSE CIRCUIT (5S-FE ENGINE MODEL)



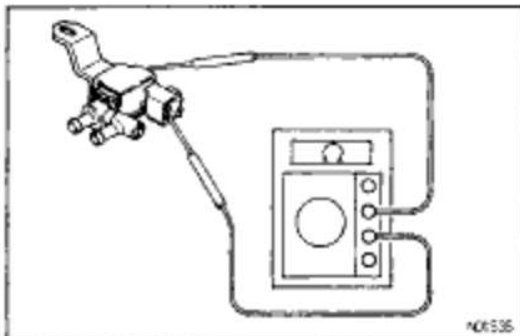
ASV INSPECTION (5S-FE ENGINE MODEL)

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

- Connect the ASV terminals to the battery terminals as illustrated.
- Blow into pipe "A" and check that air comes out of pipe "B".

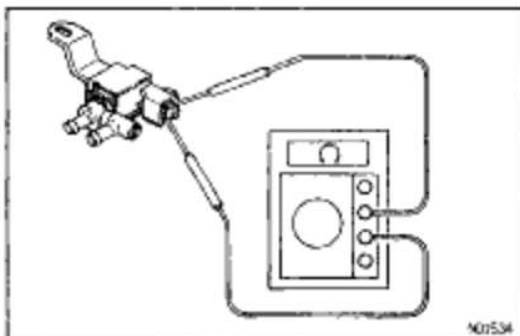


- Disconnect the battery.
 - Blow into pipe "A" and check that air does not come out of pipe "B".
- If a problem is found, replace the ASV.



2. CHECK FOR SHORT CIRCUIT

Using an ohmmeter, check that there is no continuity between each terminal and the ASV. If there is continuity, replace the ASV.



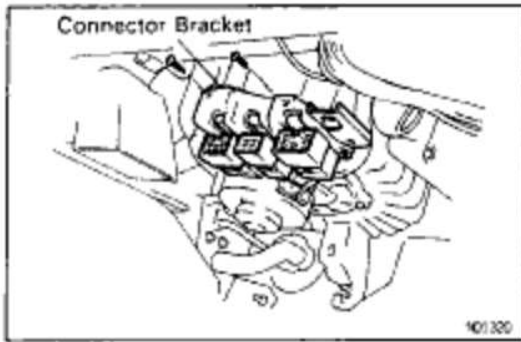
3. CHECK FOR OPEN CIRCUIT

Using an ohmmeter, measure the resistance between the 2 terminals.

Resistance:

30 – 34 Ω at 20° C (68° F)

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



BLOWER MOTOR

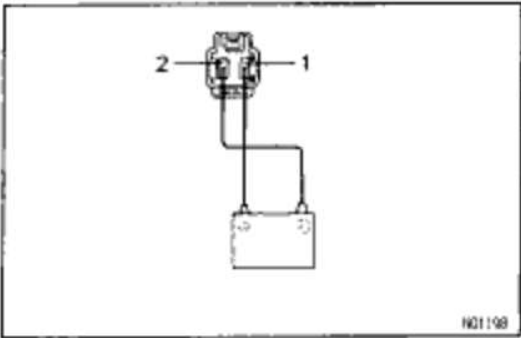
AG61E-08

BLOWER MOTOR REMOVAL

1. **REMOVE INSTRUMENT LOWER PANEL AND UNDER COVER NO. 2**
(See page [BO-108](#))
2. **REMOVE CONNECTOR BRACKET**
Remove the 2 screws and the bracket



3. **REMOVE MOTOR**
 - (a) Disconnect the connector.
 - (b) Remove the 3 screws and the motor.



AG61E-08

BLOWER MOTOR INSPECTION

INSPECT BLOWER MOTOR OPERATION

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

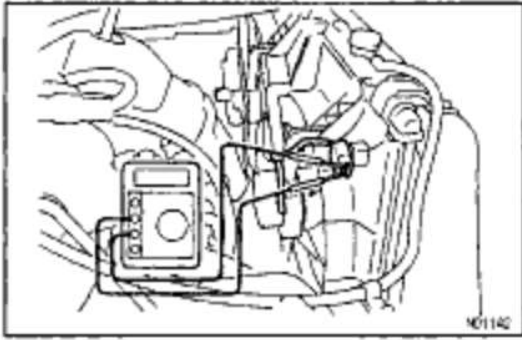
BLOWER MOTOR INSTALLATION

AG61E-08

1. **INSTALL MOTOR**
 - (a) Install the motor with the 3 screws.
 - (b) Connect the connector.
2. **INSTALL CONNECTOR BRACKET**
3. **INSTALL INSTRUMENT LOWER PANEL AND UNDER COVER NO. 2**

AC-56

AIR CONDITIONING SYSTEM – CONDENSER FAN MOTOR



CONDENSER FAN MOTOR

CONDENSER FAN MOTOR INSPECTION

5S-FE ENGINE MODEL:

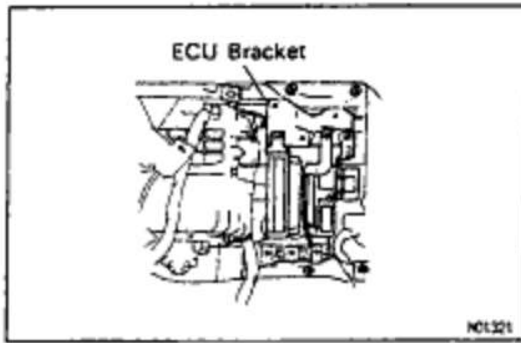
1. DISCONNECT CONNECTOR
2. INSPECT CONDENSER FAN MOTOR

Connect positive (+) lead from battery and negative (–) lead to terminals, then check that the condenser fan motor operates smoothly.

Standard current:

6.7±1 (A)

If current value is not as specified, replace the condenser fan motor.

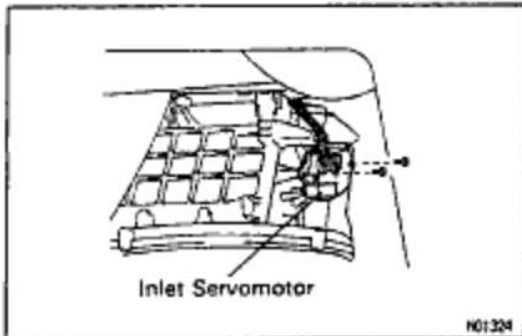


AIR INLET SERVOMOTOR

A0016-08

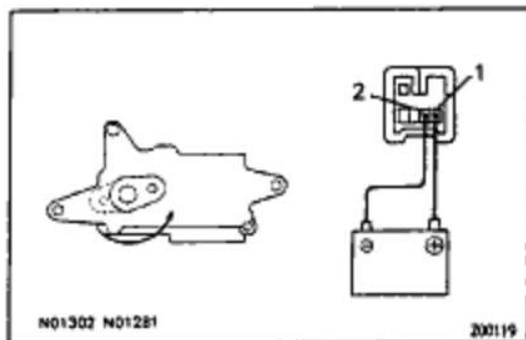
AIR INLET SERVOMOTOR REMOVAL

1. REMOVE GLOVE COMPARTMENT
(See page [BO-108](#))
2. REMOVE ECU AND ECU BRACKET



3. REMOVE SERVOMOTOR

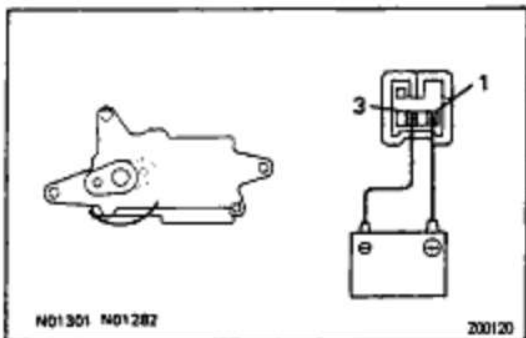
- (a) Disconnect the connector.
- (b) Remove the 2 screws and the servomotor.



AIR INLET SERVOMOTOR INSPECTION

INSPECT SERVOMOTOR OPERATION

- (a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the arm rotates to the "FRESH" side smoothly.



- (b) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 3, check that the arm rotates to the "RECI RC" side smoothly.

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

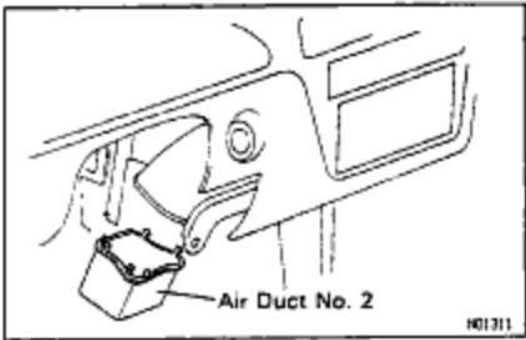
AIR INLET SERVOMOTOR INSTALLATION

1. INSTALL SERVOMOTOR

- (a) Install the servomotor with the 2 screws.
- (b) Connect the connector.

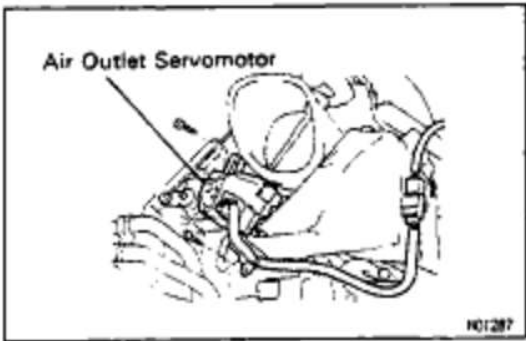
2. INSTALL ECU AND ECU BRACKET

3. INSTALL GLOVE COMPARTMENT

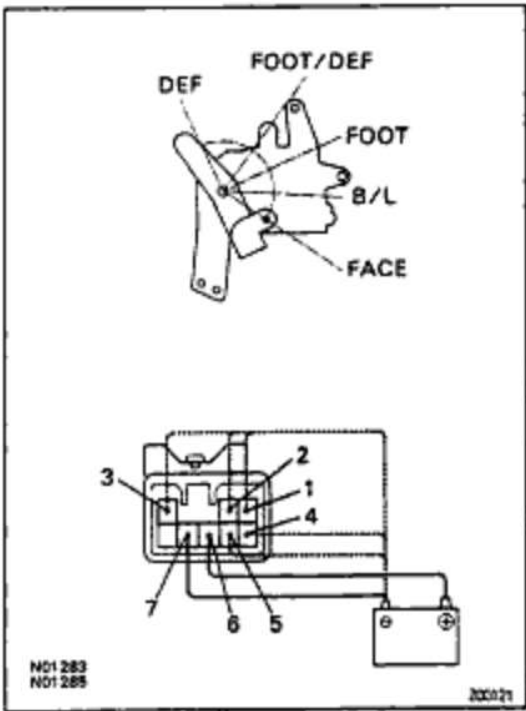


AIR OUTLET SERVOMOTOR
AIR OUTLET SERVOMOTOR REMOVAL

- 1. REMOVE INSTRUMENT LOWER FINISH PANEL AND AIR DUCT
(See page [BO-108](#))
- 2. REMOVE AIR DUCT NO. 2



- 3. REMOVE SERVOMOTOR
 - (a) Disconnect the connector.
 - (b) Remove the 2 screws and the servomotor.



AIR OUTLET SERVOMOTOR INSPECTION
INSPECT SERVOMOTOR OPERATION

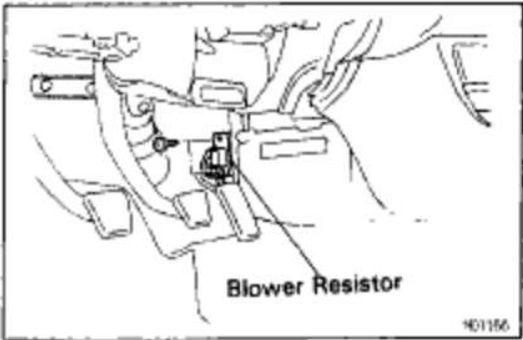
- (a) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 7.
- (b) Connect the negative (-) lead from the battery to each terminal and check that the arm rotates to each position as shown below.

Connected terminal	Position
1	D EF
2	FOOT/DEF
3	FOOT
4	B/L
5	FACE

If operation is not as specified, replace the servomotor.

AIR OUTLET SERVOMOTOR
INSTALLATION

- 1. INSTALL SERVOMOTOR
 - (a) Install the servomotor with 2 screws.
 - (b) Connect the connector
- 2. INSTALL HEATER DUCT
- 3. INSTALL LOWER FINISH PANEL



BLOWER RESISTOR

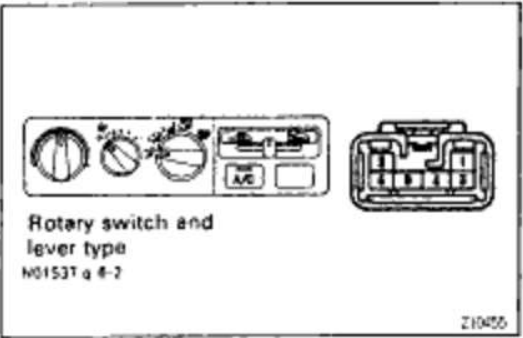
BLOWER RESISTOR REMOVAL

A0918-52

1. REMOVE INSTRUMENT LOWER FINISH PANEL
(See page [BO-108](#))
2. REMOVE BLOWER RESISTOR
 - (a) Disconnect the connector from the resistor.
 - (b) Remove the 2 screws and the resistor.

BLOWER RESISTOR INSPECTION

AC630-93

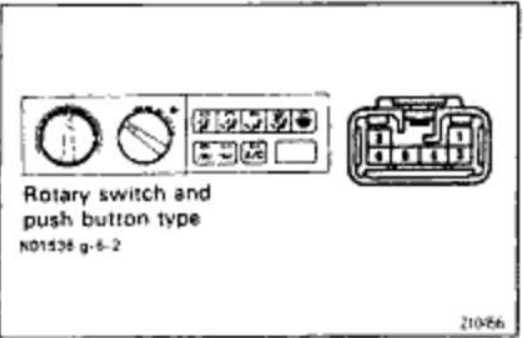


INSPECT BLOWER RESISTOR CONTINUITY

Continuity

Condition	Tester connectoin to terminal number	Specified value
Constant	1-2-3-6	Continuity

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



Condition	Tester connectoin to terminal number	Specified value
Constant	t-2-3-5-6	Continuity

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

BLOWER RESISTOR INSTALLATION

A0619-81

1. INSTALL BLOWER RESISTOR
 - (a) Install the resistor with the 2 screws.
 - (b) Connect the connector to the resistor.
2. INSTALL INSTRUMENT LOWER FINISH PANEL

AC-60

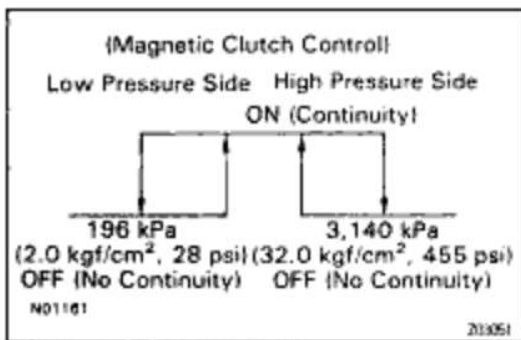
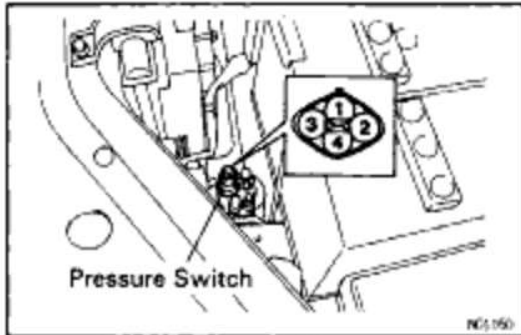
AIR CONDITIONING SYSTEM – PRESSURE SWITCH

PRESSURE SWITCH

ON-VEHICLE INSPECTION

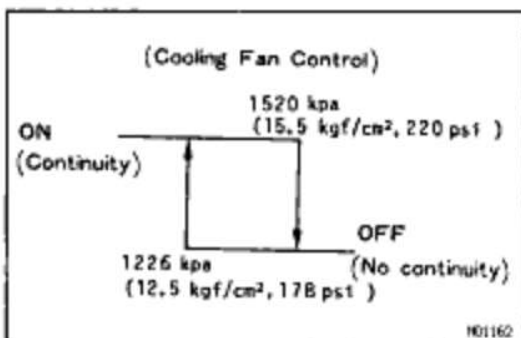
AC-60

1. INSTALL MANIFOLD GAUGE SET
(See page AC-21)
2. DISCONNECT CONNECTOR FROM PRESSURE SWITCH
3. RUN ENGINE AT APPROX. 2000 RPM
4. INSPECT PRESSURE SWITCH OPERATION



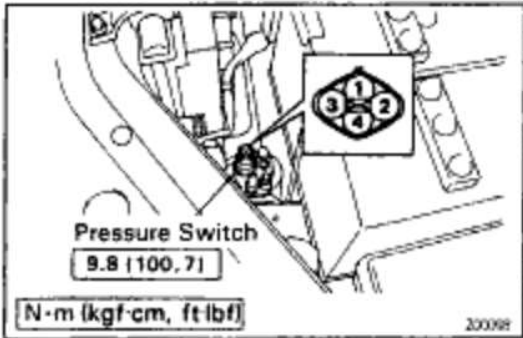
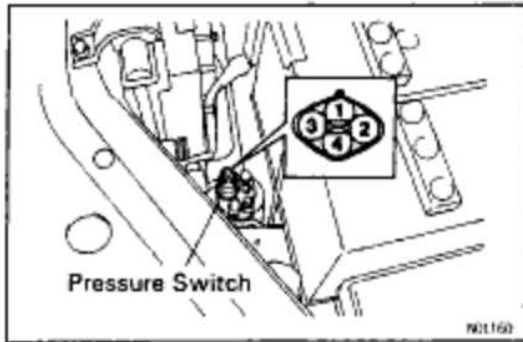
Magnet Clutch Control:

- (a) Connect the positive (+) lead from the ohmmeter to terminal 4 and negative (–) lead to terminal 1.
- (b) Check continuity between terminals when refrigerant pressure is changed, as shown.
If operation is not as specified, replace the pressure switch.



Cooling Fan Control:

- (a) Connect the positive (+) lead from the ohmmeter to terminal 2 and negative (–) lead to terminal 3.
 - (b) Check continuity between terminals when refrigerant pressure is changed, as shown.
If operation is not as specified, replace the pressure switch.
5. STOP ENGINE AND REMOVE MANIFOLD GAUGE SET
 6. CONNECT CONNECTOR TO PRESSURE SWITCH



PRESSURE SWITCH REMOVAL

1. DISCHARGE REFRIGERANT IN REFRIGERATION SYSTEM

2. REMOVE PRESSURE SWITCH

- Disconnect the connector.
- Remove the pressure switch from the liquid tube.
HINT: Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.

PRESSURE SWITCH INSTALLATION

1. INSTALL PRESSURE SWITCH

- Install the pressure switch to the liquid tube.
Torque: 9.8 N-m (100 kgf-cm, 7 ft-lbf)
HINT: Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and install the switch.
- Connect the connector.

2. EVACUATE AIR IN REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT

Specified amount:

850 ±50 g (29.98 ±1.76 oz)

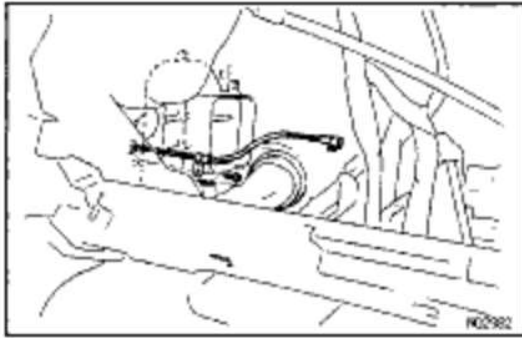
3. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak tester, check for leakage of refrigerant from the pressure switch mount.

4. INSPECT A/C OPERATION

AC-62

AIR CONDITIONING SYSTEM – EVAPORATOR TEMPERATURE SENSOR

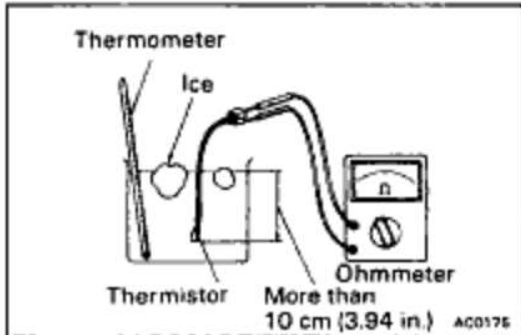


EVAPORATOR TEMPERATURE SENSOR

EVAPORATOR TEMPERATURE SENSOR REMOVAL

REMOVE EVAPORATOR TEMPERATURE SENSOR

Remove the screw and the evaporator temperature sensor (thermistor).



EVAPORATOR TEMPERATURE SENSOR INSPECTION

Check resistance between terminals of evaporator temperature sensor (thermistor) connector at each temperature.

Resistance:

at 0°C (32°F): 4.6 – 5.1 kΩ

at 15°C (59°F): 2.1 – 2.6 kΩ

In addition as temperature increases, the resistance decreases gradually.

EVAPORATOR TEMPERATURE SENSOR INSTALLATION

INSTALL EVAPORATOR TEMPERATURE SENSOR

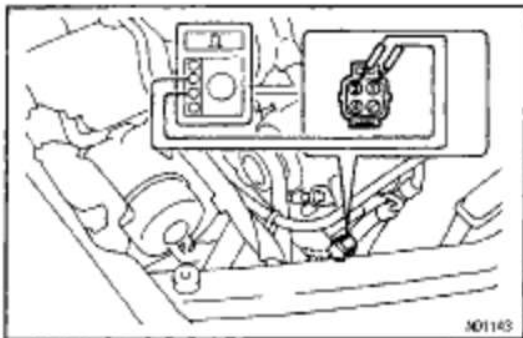
Install evaporator temperature sensor in reverse order of removal procedure.

REVOLUTION DETECTING SENSOR ON-VEHICLE INSPECTION

1. DISCONNECT NEGATIVE (–) CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned "LOCK" position and the negative (–) terminal cable is disconnected from the battery.

2. DISCONNECT CONNECTOR OF REVOLUTION DETECTING SENSOR



3. INSPECT REVOLUTION DETECTING SENSOR

Check the resistance between terminals 1 and 2 of the sensor.

Specified resistance:

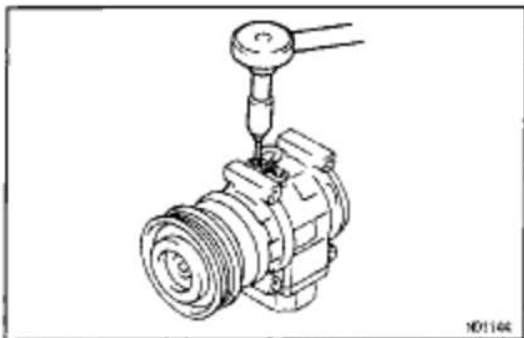
5S-FE:

165 – 205Ω at 20 °C (68 °F)

1 MZ-FE:

65 – 125Ω at 20 °C (68 °F)

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



REVOLUTION DETECTING SENSOR REMOVAL

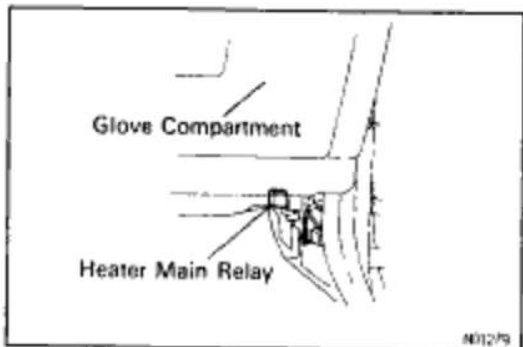
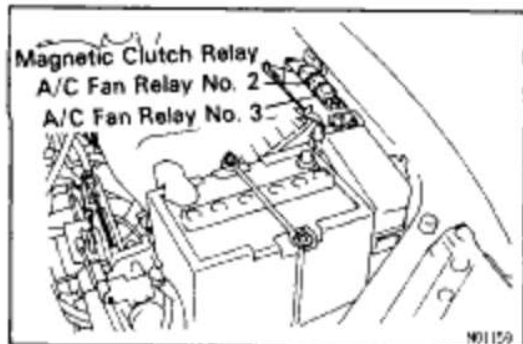
1. REMOVE COMPRESSOR
(See page [AC-37](#))
2. REMOVE REVOLUTION DETECTING SENSOR
 - (a) Remove 2 bolts.
 - (b) Remove the revolution detecting sensor.

REVOLUTION DETECTING SENSOR INSTALLATION

1. INSTALL REVOLUTION DETECTING SENSOR
Using a torque wrench, tighten the bolts.
Torque: 6 N·m (60 kgf·cm, 4 ft·lbf)
2. INSTALL COMPRESSOR
(See page [AC-46](#))

AC-64

AIR CONDITIONING SYSTEM - RELAY



RELAY

RELAYS REMOVAL

1. DISCONNECT NEGATIVE (-) CABLE FROM BATTERY

CAUTION: Work must be started after 90 seconds from the time the ignition switch is turned to the 'LOCK' position and the negative (-) terminal cable is disconnected from the battery.

2. REMOVE RELAYS

RELAYS INSPECTION

1. INSPECT MAGNET CLUTCH RELAY CONTINUITY

Condition	Tester connection to terminal number	Specified value
Constant	1 - 4	Continuity
Apply B + between terminals 1 and 4.	2 - 3	Continuity

If continuity is not as specified, replace the relay.

2. INSPECT A/C FAN RELAY NO. 2 CONTINUITY
5S-FE Engine Model:

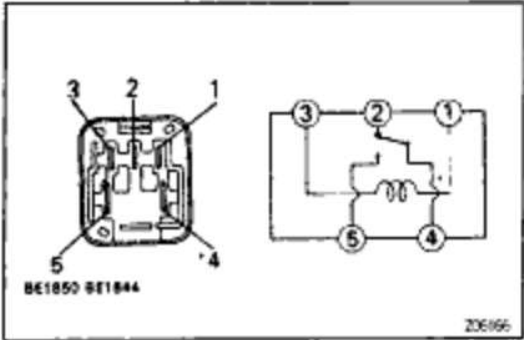
Condition	Tester connection to terminal number	Specified value
Constant	1 - 4 3 - 5	Continuity
Apply B + between terminals 1 and 4.	2 - 3	Continuity

If continuity is not as specified, replace the relay.

3. INSPECT A/C FAN RELAY NO. 3 CONTINUITY
5S-FE Engine Model:

Condition	Tester connection to terminal number	Specified value
Constant	1 - 4	Continuity
Apply B + between terminals 1 and 4.	2 - 3	Continuity

If continuity is not as specified, replace the relay.



4. INSPECT HEATER MAIN RELAY CONTINUITY

Condition	Tester connection to terminal number	Specified value
Constant	1-3 2-4	Continuity
Apply B + between terminals 1 and 3.	4-5	Continuity

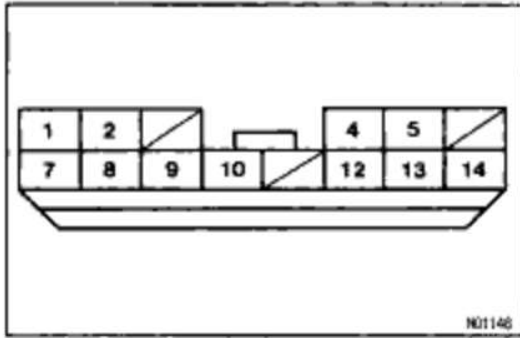
If continuity is not as specified, replace the relay.

RELAYS INSTALLATION

1. INSTALL RELAYS
2. CONNECT NEGATIVE (-) CABLE TO BATTERY

AC-66

AIR CONDITIONING SYSTEM – AIR CONDITIONING AMPLIFIER



AIR CONDITIONING AMPLIFIER

A/C AMPLIFIER INSPECTION

AC 120-66

INSPECT AMPLIFIER CIRCUIT

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

Test conditions

- Ignition switch : ON
- Temperature control dial : MAX COOL
- Blower dial: HI

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
9–13	Constant	1.5 k Ω at 20 °C (68 °F)
14–13	Constant	Approx. 115 Ω at 20 °C (68 °F)
12 – Ground	Turn A/C switch ON	Battery voltage
12– Ground	Turn A/C switch OFF	No voltage
2 – Ground	Refrigerant pressure: 196 – 3140 kPa	Battery voltage
2 – Ground	Refrigerant pressure: less than 196 kPa or more than 3140 kPa	No voltage
10 – Ground	Turn A/C switch ON	Battery voltage
10 – Ground	Turn A/C switch OFF	No voltage
8 – Ground	Turn A/C switch ON	Battery voltage
8 – Ground	Turn A/C switch OFF	No voltage

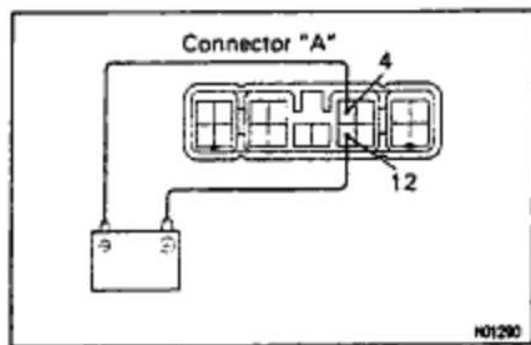
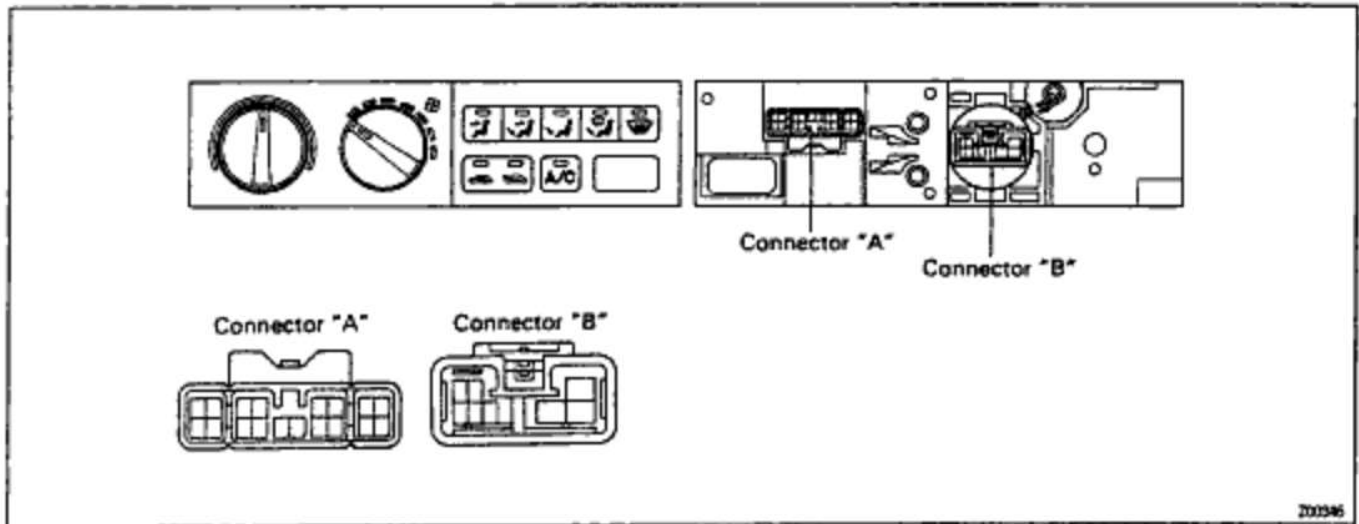
If circuit is not as specified, replace the amplifier.

AIR CONDITIONING CONTROL ASSEMBLY

A/C CONTROL ASSEMBLY REMOVAL

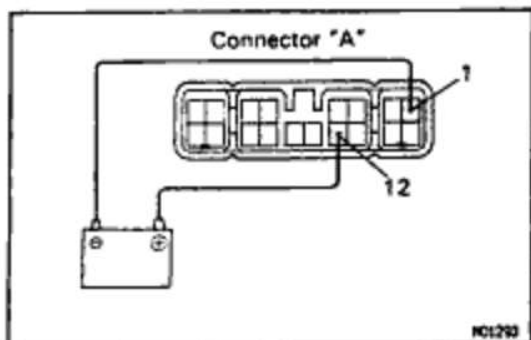
(See page [BO-108](#))

A/C CONTROL ASSEMBLY INSPECTION (ROTARY SWITCH AND PUSH BUTTON TYPE)



1. INSPECT A/C INDICATOR

- Connect the positive (+) lead from the battery to terminal A-12 and the negative (-) lead to terminal A-4.
- Push the A/C button in and check that the indicator light up.
If operation is not as specified, replace the A/C control assembly.

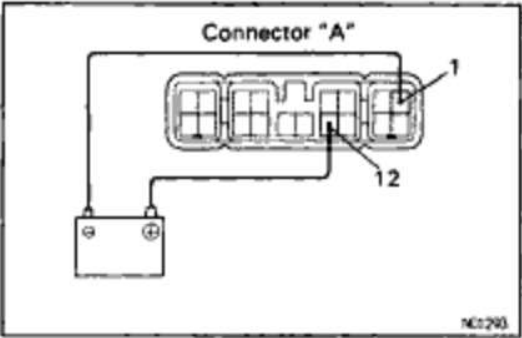


2. INSPECT MODE INDICATOR

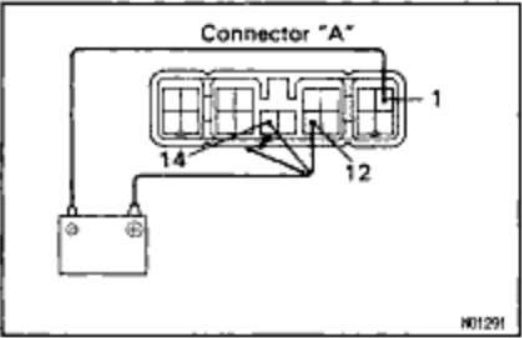
- Connect the positive (+) lead from the battery to terminal A-12 and the negative (-) lead to terminal A-1.
- Push each of the mode buttons in and check that their indicators light up.
If operation is not as specified, replace the A/C control assembly.

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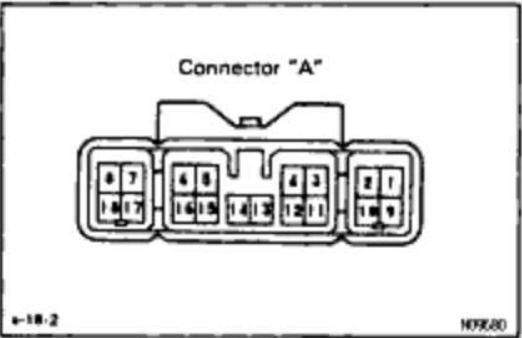
AIR CONDITIONING SYSTEM – AIR CONDITIONING CONTROL ASSEMBLY



- 3. INSPECT AIR INLET INDICATOR**
- (a) Connect the positive (+) lead from the battery to terminal A- 12 and the negative (-) lead to terminal A-1.
 - (b) Check that the FRESH and RECIRC indicators light up alternately each time the air inlet control switch button is pressed.
- If operation is not as specified, replace the A/C control assembly.



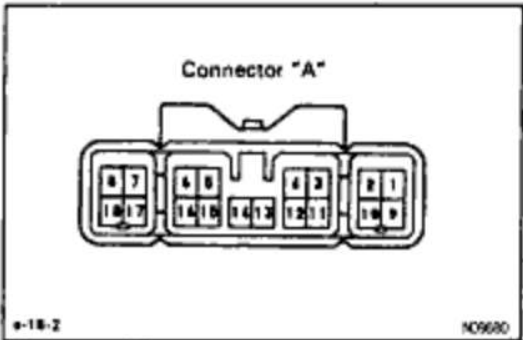
- 4. INSPECT INDICATOR DIMMING OPERATION**
- (a) Connect the positive (+) lead from the battery to terminal A- 12 and the negative (-) lead to terminal A -1.
 - (b) Connect the positive (+) lead from the battery to terminal A-14 and check that the mode indicator dims.
- If operation is not as specified, replace the A/C control assembly.



5. INSPECT A/C SWITCH CONTINUITY

Switch position	Tester connection to terminal number	Specified value
OFF	—	No continuity
ON	A7 – A8	Continuity

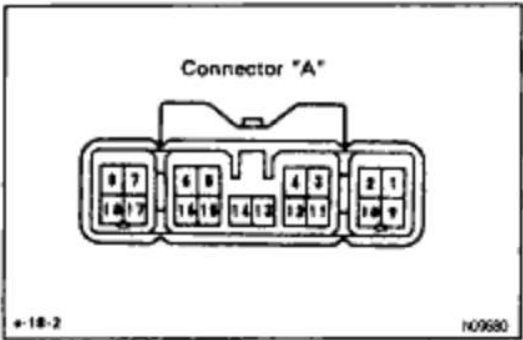
If continuity is not as specified, replace the A/C control assembly.



6. INSPECT MODE CONTROL SWITCH CONTINUITY

Switch position	Tester connection to terminal number	Specified value
FACE	A11 – A1	Continuity
B/L	A3 – A 1	Continuity
FOOT	A10 – A1	Continuity
FOOT/ oeF	A2 – A 1	Continuity
D EF	A9 – A 1	Continuity

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



7. INSPECT AIR INLET CONTROL SWITCH CONTINUITY

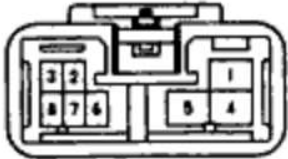
Switch position	Tester connectoin to terminal number	Specified value
RECIRC	A5 – A 1	Continuity
FRESH	A6–A1	Continuity

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

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AIR CONDITIONING SYSTEM – AIR CONDITIONING CONTROL ASSEMBLY

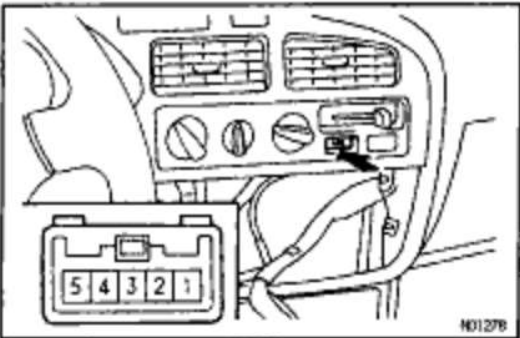
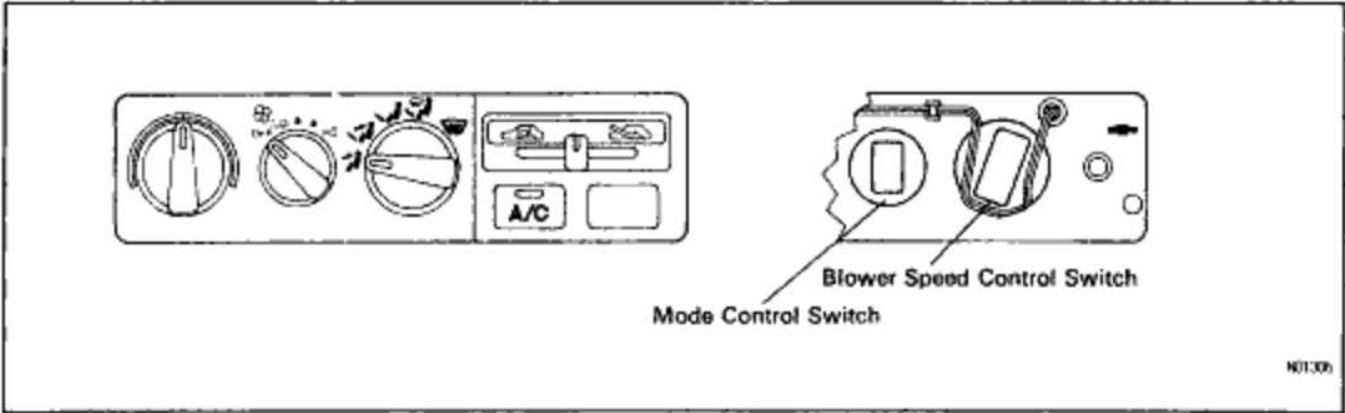
8. INSPECT BLOWER SPEED CONTROL SWITCH CONTINUITY

Connector "B" 	Terminal Switch position	B-1	E-2	B-4	B-5	B-7	6-8	B-6
	OFF							
	LO				○	○		
	□		○	○	○	○		
	□		○	○	○	○	○	○
	□	○	○		○	○		
	□	○	○	○	○	○		
	□	○		○	○	○		
	HI	○		○	○	○		

W0013

If continuity is not as specified, replace the switch.

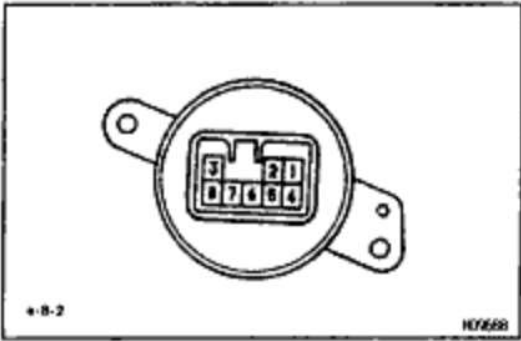
ROTARY SWITCH AND LEVER TYPE:



1. INSPECT A/C SWITCH CONTINUITY

Switch position	Tester connection to terminal number	Specified value
OFF.	—	No continuity
ON	2 – 5	Continuity

If continuity is not as specified, replace the switch.



2. INSPECT MODE CONTROL SWITCH CONTINUITY

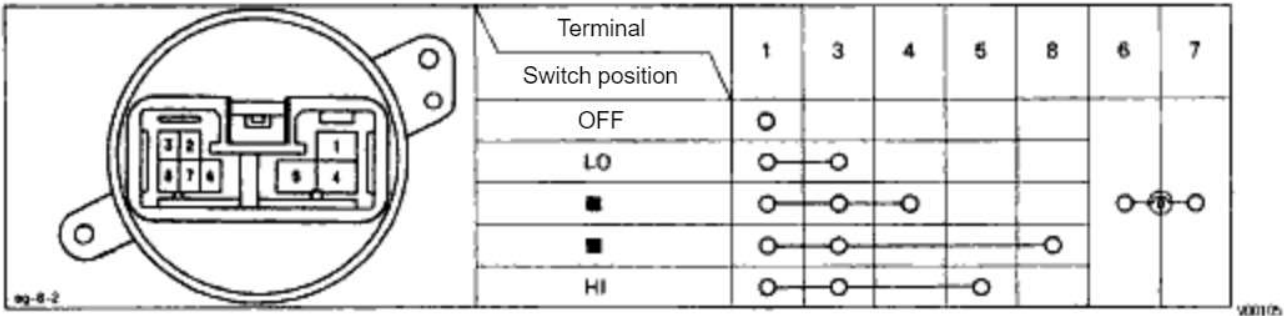
Switch position	Tester connection to terminal number	Specified value
FACE	1–8	Continuity
B/ L	1 – 7	Continuity
FOOT	1 –6	Continuity
FOOT/ DEF	1–5	Continuity
DEF	1–4	Continuity

If continuity is not as specified, replace the switch.

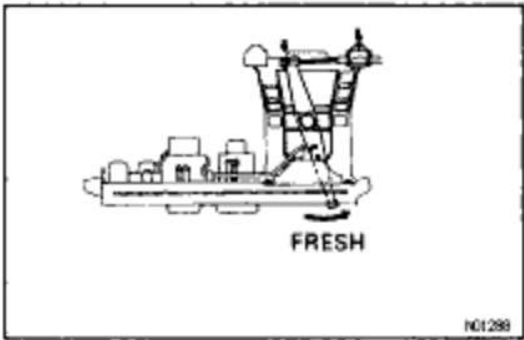
3. INSPECT BLOWER SPEED CONTROL SWITCH CONTINUITY

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AIR CONDITIONING SYSTEM – AIR CONDITIONING CONTROL ASSEMBLY

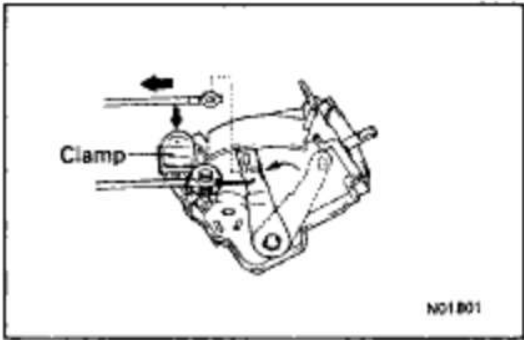


If continuity is not as specified, replace the switch.



A/C CONTROL CABLES ADJUSTMENT

- 1. **ADJUST AIR INLET DAMPER CONTROL CABLE**
Set the air inlet damper and the control lever to "FRESH" position, install the control cable and lock the clamp.



- 2. **ADJUST AIR MIX DAMPER CONTROL CABLE**
Set the air mix damper and control switch to "COOL" position, install the control cable and lock the clamp while lightly pushing the outer cable in the direction shown by the arrow.

A/C CONTROL ASSEMBLY
INSTALLATION

(See page [BO-108](#))

SERVICE SPECIFICATIONS

AC028-08

SERVICE DATA

Refrigerant charge volume		850 ± 50 g (29.98 ± 1.78 oz)
Drive belt tension		
5S-FE:	New belt	185 ± 28 lb
Used belt		110 ± 11 lb
1 MZ- FE:	New belt	185 ± 28 lb
Used belt		88 ± 22 lb
Idle speed		
5S-FE:	Magnetic clutch no engaged	Approx. 750 rpm
	Magnetic clutch engaged	Approx. 850 rpm
1 MZ- FE:	Magnetic clutch noT engaged	Approx. 700 rpm
	Magnetic clutch engaged	Approx. 700 rpm
Magnetic clutch clearance		0.5 ± 0.15 mm (0.020 ± 0.006 in.)

AC028-08

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Suction hose x Compressor	9.8	100	7
Discharge hose x Compressor	9.8	100	7
Compressor x Engine	25	250	18
Liquid x Receiver	5.4	55	48 in.·lbf
Liquid x Condensor	9.8	100	7
Expansion valve x Evaporator	5.4	55	48 in.·lbf
Suction tube x A/C unit	9.8	100	7
Liquid tube x A/C unit	9.8	100	7
Pressure switch x Liquefied tube	9.8	100	7