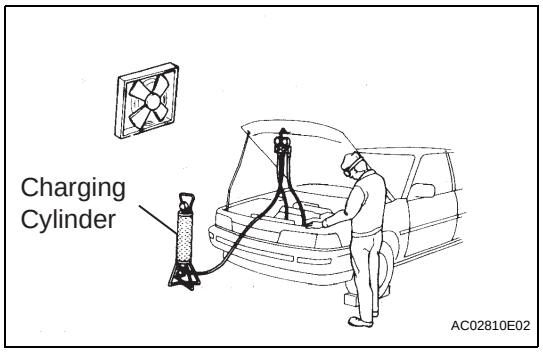
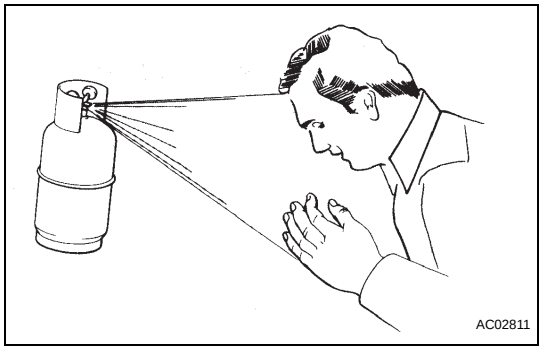
AIR CONDITIONING SYSTEM

PRECAUTION

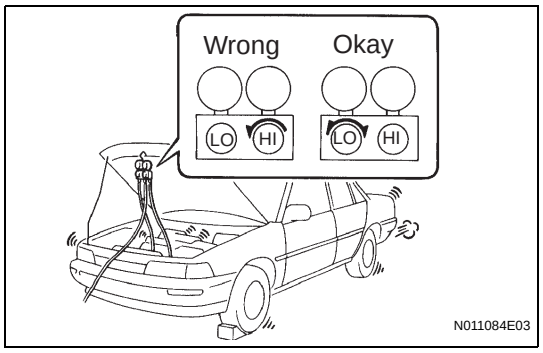
NOTICE:
Because the compressor operates at high voltages, wear electric insulated gloves and pull out the service plug to cut the high-voltage circuit before inspection.



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



3. **BE CAREFUL NOT TO GET LIQUID REFRIGERANT 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 cold water.
   CAUTION:
   Do not rub your eyes or skin.
   (b) Apply clean petroleum jelly to the skin.
   (c) Go immediately to a hospital or see a physician for professional treatment.
4. **NEVER HEAT CONTAINER OR EXPOSE IT TO OPEN FLAME**
5. **BE CAREFUL NOT TO DROP CONTAINER OR APPLY PHYSICAL SHOCKS TO IT**



6. **DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERANT SYSTEM**
   If there is not enough refrigerant in the A/C system, oil lubrication will be insufficient and the compressor may be damaged.
   Necessary care should be taken to avoid this.
7. **DO NOT OPEN HIGH PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATING**
   Open and close only the low pressure valve. If the high pressure values are opened, refrigerant flows in the reverse direction causing the charging cylinder to rupture.
   If the high pressure valve is opened, refrigerant flows in the reverse direction causing the charging cylinder to rupture.
8. **BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT**
   If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating, etc.

9. NOTICE FOR INITIALIZATION:

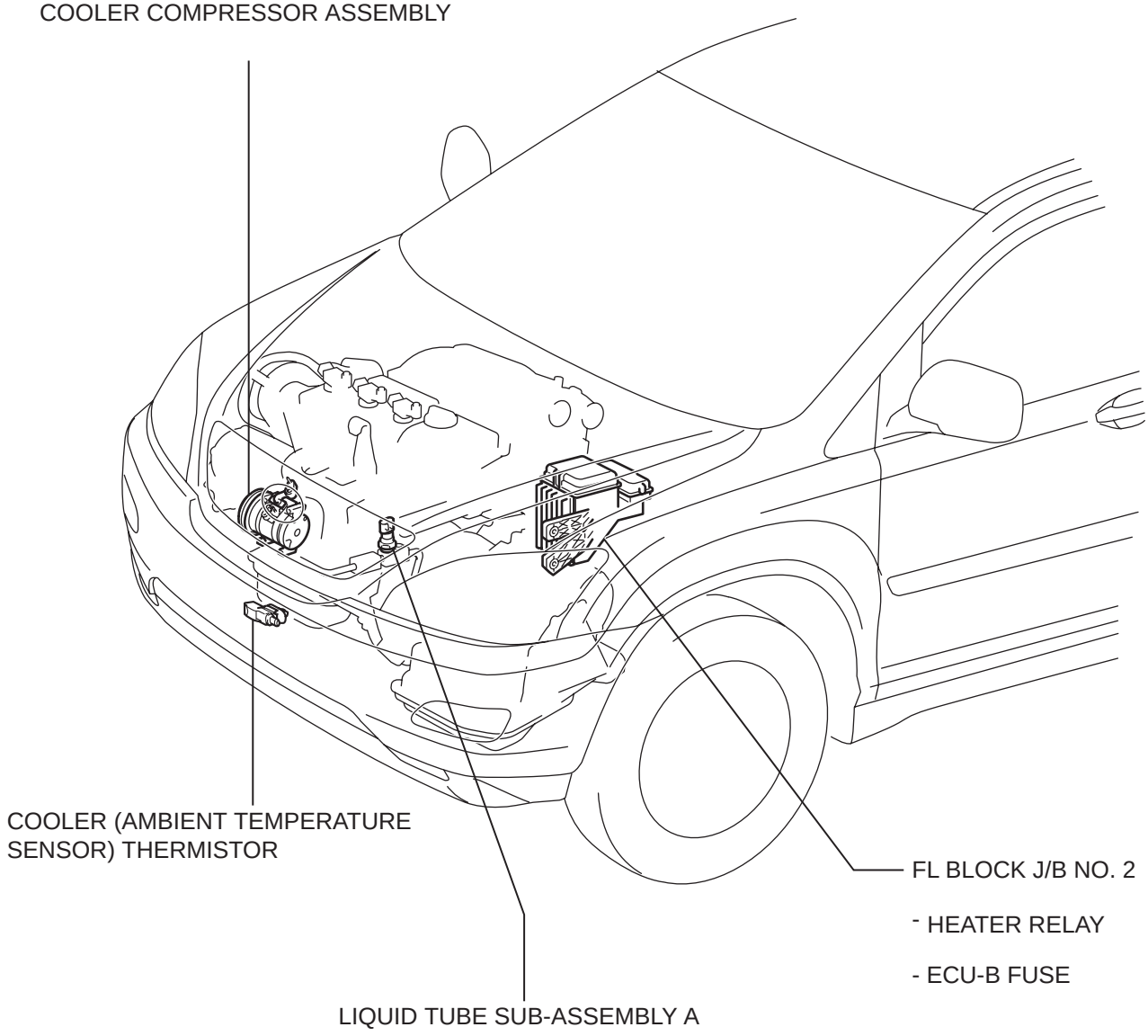
(a) When disconnecting the negative (-) battery terminal, initialize the following systems after the terminal is reconnected.

System Name	See procedure
Lighting System (Adaptive Front-Lighting System)	LI-17
Power Window Control System	WS-12
Power Back Door System	ED-33
Sliding Roof System	RF-22 and RF-4

10. GENERAL PRECAUTION

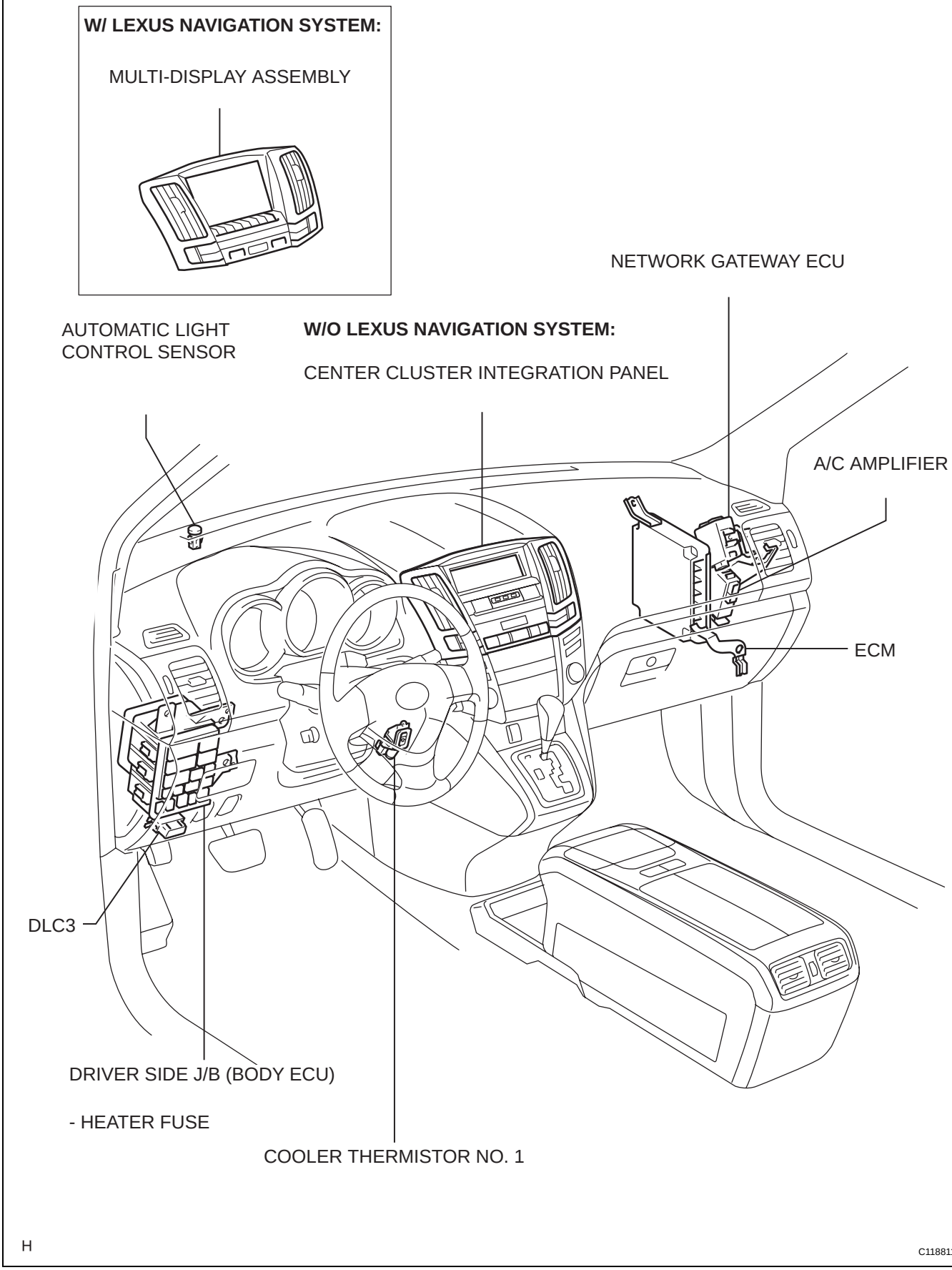
(a) While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

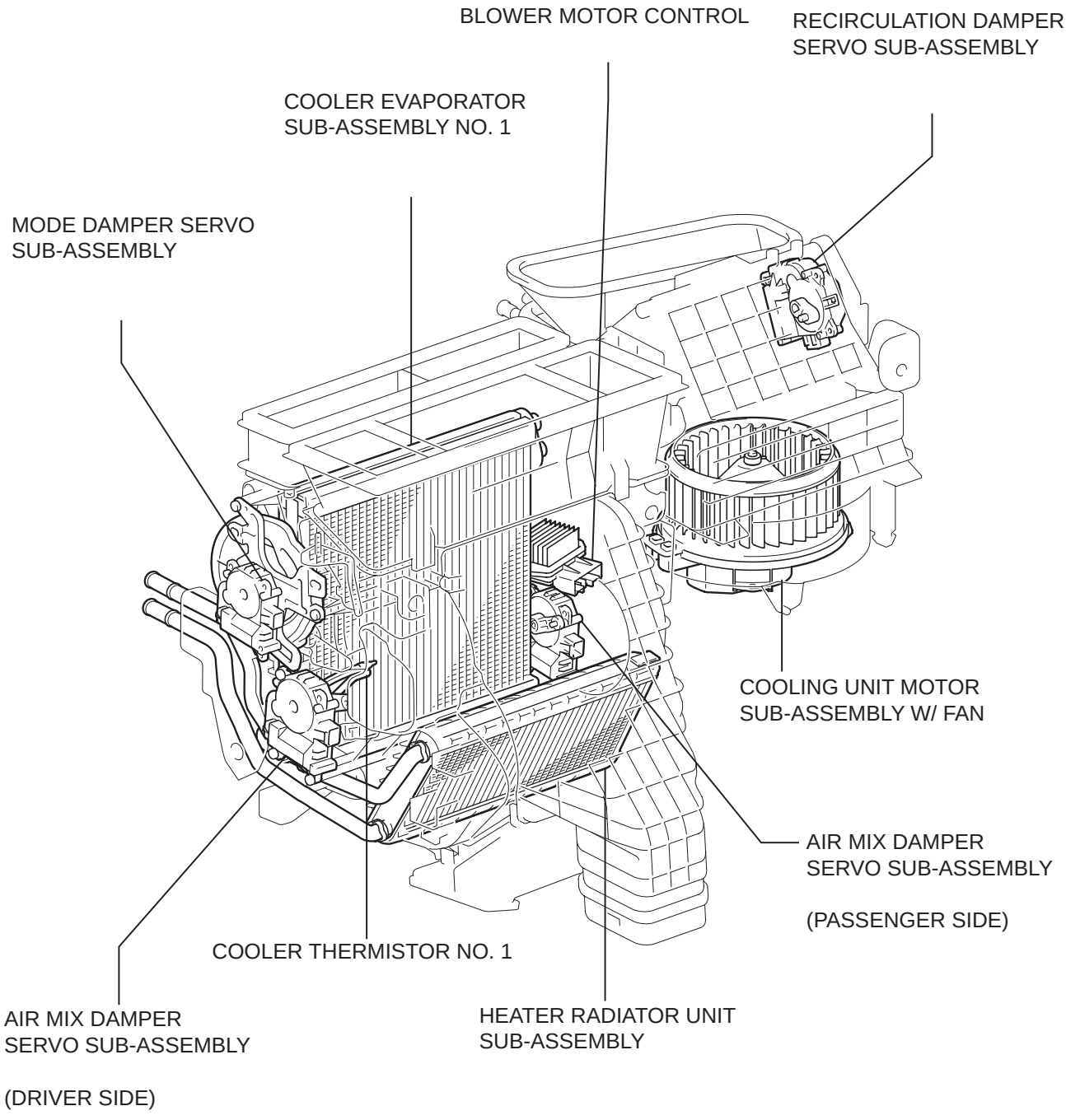
PARTS LOCATION



AC

AC


W/ LEXUS NAVIGATION SYSTEM:
MULTI-DISPLAY ASSEMBLY
NETWORK GATEWAY ECU
AUTOMATIC LIGHT CONTROL SENSOR
W/O LEXUS NAVIGATION SYSTEM:
CENTER CLUSTER INTEGRATION PANEL
A/C AMPLIFIER
ECM
DLC3
DRIVER SIDE J/B (BODY ECU)
- HEATER FUSE
COOLER THERMISTOR NO. 1
H
C118811E01



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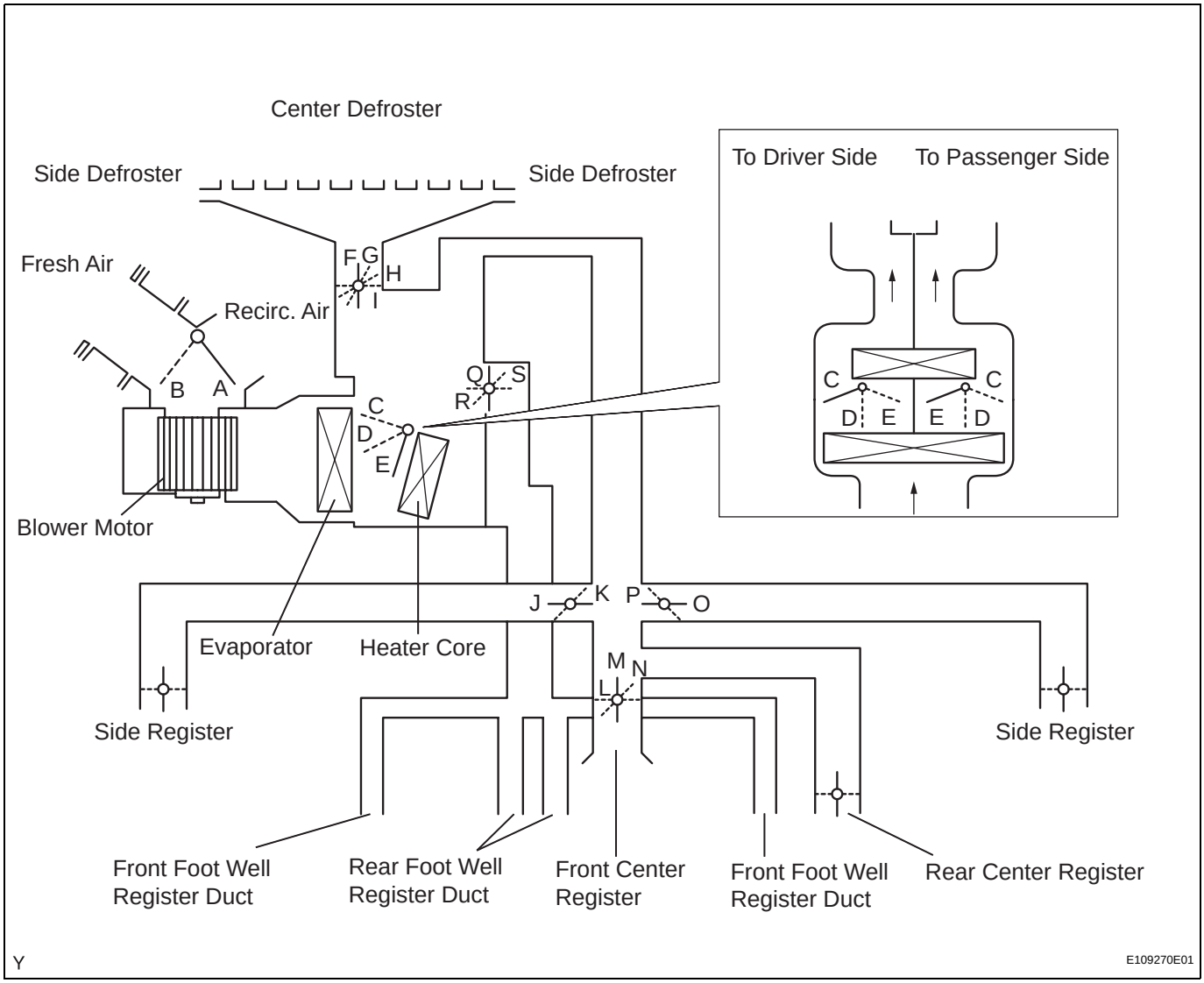
SYSTEM DESCRIPTION

1. General

The air conditioning system has the following features:

- A compact, lightweight, and highly efficient electrical water pump is used in order to ensure the proper heater performance while the engine is stopped.
- A left / right independent temperature control and neural network control have been adopted to make air conditioner control available to suit the perception of the persons in the driver seat and in the passenger seat. Automatic air conditioner is standard in all models.
- A left/right independent temperature control and neural network control have been adopted to make air conditioner control available to suit the perception of the persons in the driver seat and in the passenger seat. Automatic air conditioner is standard in all models.
- A semi-center location air conditioner unit, in which the evaporator and heater core are placed in the vehicle's longitudinal direction, is used.
- A compact, lightweight, and highly efficient straight flow (full-path flow) aluminum heater core is used.
- A revolutionary slim structure evaporator is used.
- A humidity sensor function has been added to the room temperature sensor in order to optimize the amount of dehumidification effort during the operation of the air conditioning system.
- A deodorizing function that eliminates the exhaust gas smell that enters the cabin from the outside has been added to the conventional clean air filter.
- The air conditioning ECU is equipped with a self-diagnosis function. If there is a malfunction in the system, it stores the DTCs (Diagnostic Trouble Codes) in its memory.

2. Mode Position and Damper Operation



Function of Main Damper

Control Damper	Control Position	Damper Position	Operation
Air Inlet Control Damper	FRESH	A	Brings in fresh air.
	RECIRCULATION	B	Recirculates internal air.
Air Mix Control Damper (Left / Right Independent Control)	MAX COLD - MAX HOT TEMP. SETTING (18°C (65°F) - 32°C (85°F))	C - D - E	Varies the mixture ratio of the cool air and the warm air in order to regulate the temperature continuously from HOT to COLD.

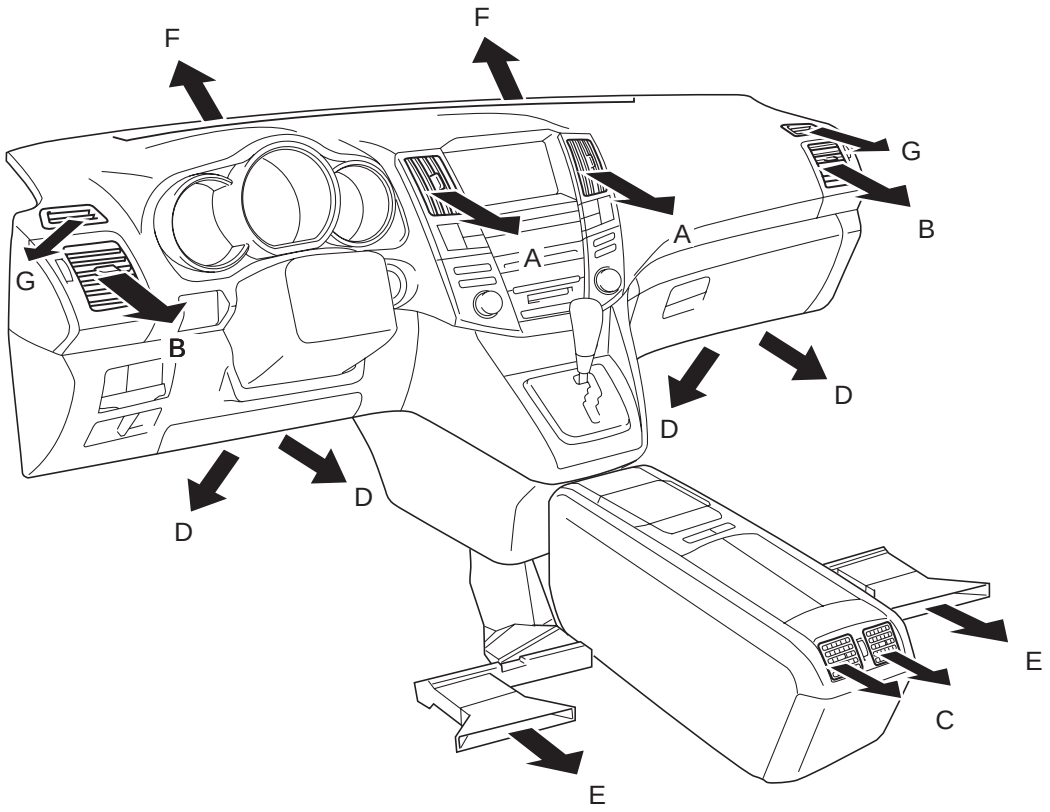
AC

Mode Control Damper	DEF	F, K, L, P, S	Defrosts the windshield through the center defroster, side defroster, side registers and rear center register.
	FOOT/DEF	G, K, L, P, Q	Defrosts the windshield through the center defroster, side defrosters, side registers and rear center register, while air is also blown out from the front and rear foot well register ducts.
	FOOT	H*1, *2, K, L, P, Q	Air blows out of the front and rear foot well register ducts, side registers, and rear center register. Furthermore, when the damper is set to FOOT in the AUTO mode, a slight amount of air also flows from the register.
	BI-LEVEL	I, K, N, P, R	Air blows out of the front and rear center registers, side registers, and front and rear foot well register ducts.
	FACE	I, J, M, O, S	Air blows out of the front and rear center registers, and side registers.

AC

*1: Auto FOOT Mode
*2: Manual FOOT Mode

3. Air Outlets and Air Volume Rations



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Air Outlet Position Symbol	A	B	C	D	E	F	G

Air Outlet Mode	Air Mix, Position	Center Face	Side Face	Rear Face	Front Foot	Rear Foot	Center Defroster	Side Defroster
FACE 	Max. Cool	◯	◯	◯	—	—	—	—
BI-LEVEL 	Center	○	○	○	○	○	—	—
FOOT 	Max. Hot	—	○	○	◯	○	○	○
FOOT/DEF 	Max. Hot	—	○	○	○	○	◯	○
DEF 	Max. Hot	—	○	○	—	—	◯	○

The size of the circle ○ indicates the proportion of airflow volume.

HOW TO PROCEED WITH TROUBLESHOOTING

The intelligent tester can be used in steps 2, 5, 6, 7 and 10.

1	VEHICLE BROUGHT TO WORKSHOP

NEXT

AC

2	CHECK AND CLEAR DTCS

NEXT

3	PROBLEM SYMPTOM CONFIRMATION

- SYMPTOM DOES NOT OCCUR (GO TO STEP 4)
- SYMPTOM OCCURS (GO TO STEP 5)

4	SYMPTOM SIMULATION

NEXT

5	CHECK BODY MULTIPLEX COMMUNICATION SYSTEM

(a) Check for DTC outputs.

- MULTIPLEX DTC OUTPUT (PROCEED TO "BODY MULTIPLEX COMMUNICATION SYSTEM")
- NO MULTIPLEX DTC (GO TO STEP 6)

6	CHECK CAN COMMUNICATION SYSTEM

- CAN DTC OUTPUTS (PROCEED TO "CAN COMMUNICATION SYSTEM")
- NO CAN DTC (GO TO STEP 7)

7	DTC CHECK (OTHER THAN MULTIPLEX DTC)

- TROUBLE CODE (GO TO STEP 8)

NORMAL SYSTEM CODE (GO TO STEP 9)

8	DTC CHART

GO TO STEP 10

9	PROBLEM SYMPTOMS TABLE

NEXT

10	ACTUATOR CHECK

NEXT

11	CIRCUIT INSPECTION

NEXT

12	TERMINALS OF ECU

NEXT

13	IDENTIFICATION OF PROBLEM

NEXT

14	REPAIR OR REPLACE

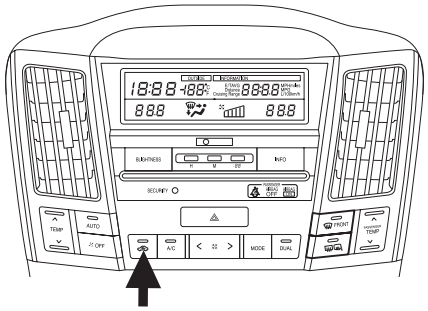
NEXT

15	CONFIRMATION TEST

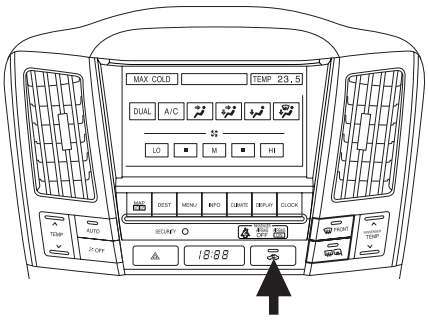
NEXT

END

w/o LEXUS Navigation System:



w/ LEXUS Navigation System:



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ACTUATOR CHECK

1. ACTUATOR CHECK

(a) After entering the DTC check mode (Sensor Check Mode), press the "R/F" switch.

(b) At each damper, the motor and relay automatically operate the actuator check at 1 second intervals from step No. 1 to No. 10 continuously, check the temperature and air flow visually and by hand.
If the slower display is desired, press the "UPDr" switch and change it to step operation. Each time the "UPDr" switch is pressed, the display changes by 1 step.
HINT:

- Codes are displayed from the smaller to the larger numbers in order.
- To cancel the check mode, press the "OFF" switch.

Step No.	Display code	Conditions				
		Blower level	Air flow vent	Air inlet damper	Air mix damper	A/C compressor revolution speed (rpm)
1	0	0	FACE (0%)	FRESH (109%)	"COOL" side (-5%)	0
2	1	1	FACE (0%)	FRESH (109%)	"COOL" side (-5%)	0
3	2	17	FACE (0%)	R/F (50%)	"COOL" side (-5%)	8,600
4	3	17	FACE (0%)	RECIRCULATION (-9%)	"COOL" side (-5%)	8,600
5	4	17	B/L (33.5%)	FRESH (109%)	"COOL"/"HOT" (50.0% opened)	8,600
6	5	17	FOOT (AUTO) (53.5%)	FRESH (109%)	"COOL"/"HOT" (50.0% opened)	5,000
7	6	17	FOOT (MANUAL) (53.5%)	FRESH (109%)	"COOL"/"HOT" (50.0% opened)	5,000
8	7	17	FOOT (MANUAL) (53.5%)	FRESH (109%)	"HOT" side (105%)	5,000
9	8	17	F/D (73.5%)	FRESH (109%)	"HOT" side (105%)	5,000
10	9	31	DEF (100%)	FRESH (109%)	"HOT" side (105%)	5,000

CUSTOMIZE PARAMETERS

HINT:
The followings are the possible items to be customized.
NOTICE:

- **After confirming whether the items of the customer's request is applicable or not for the customized items, perform the customize operation.**
- **Be sure to record the current value before customizing.**
- **In case of performing the troubleshooting, pay attention as there is a possibility that the function is OFF by customizing. (Example: In case of the symptom in which "The wireless operation does not function", check that the wireless operation is not OFF by customizing, then perform the troubleshooting.)**

AIR CONDITIONER:

DISPLAY (ITEM)	DEFAULT	CONTENTS	SETTING
SET TEMP SHIFT (Set Temperature Shift)	NORMAL	To control with the shifted temperature against the display temperature.	+2C / +1C / NORMAL / -1C / -2C
AMBINT TMP SFT (Ambient Temperature Shift)	NORMAL	To control with the shifted ambient temperature against the display ambient temperature.	+3C / +2C / +1C / NORMAL / -1C / -2C / -3C
AIR INLET MODE (Air Inlet Mode)	AUTO	In case of turning the A/C ON when you desire to make the compartment cool down quickly, this is the function to change the mode automatically to RECIRCULATED mode.	AUTO / MANUAL
COMPRESSOR MODE (Compressor Mode)	AUTO	Function to turn the A/C ON automatically by pressing the AUTO button when the blower is ON and the A/C is OFF.	AUTO / MANUAL
COMPRS/DEF OPER (Compressor/Air inlet DEF operation)	LINK	Function to turn the A/C ON automatically linking with the FRONT DEF button when the A/C OFF.	LINK / NORMAL
MOTOR INITIALIZ (Step Motor Initializing (IG/off))	OFF	Function to initialize the step motor after the ignition switch is OFF.	ON / OFF
FOOT/DEF MODE (Foot/DEF auto mode)	ON	Function to turn the air flow from FOOT/DEF ON automatically when AUTO MODE is ON.	ON / OFF

PROBLEM SYMPTOMS TABLE

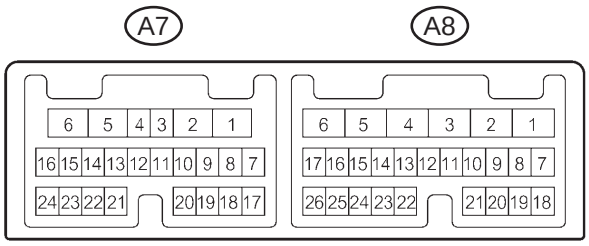
AIR CONDITIONING SYSTEM

Symptom	Suspected area	See page
Entire A/C system does not operate	1. IG power source circuit	AC-118
	2. A/C amplifier assembly	AC-193
Air Flow Control: No blower operation	1. Blower motor circuit	AC-101
	2. Heater relay circuit	AC-115
	3. A/C amplifier assembly	AC-193
Air Flow Control: No blower control	1. Blower motor circuit	AC-101
	2. Heater relay circuit	AC-115
	3. A/C amplifier assembly	AC-193
Air Flow Control: Insufficient air output	1. Blower motor circuit	AC-101
	2. A/C amplifier assembly	AC-193
Temperature Control: No cool air comes out	1. Volume of refrigerant	AC-128
	2. Drive belt tension	AC-168
	3. Refrigerant pressure	AC-124
	4. Compressor circuit	AC-108
	5. Compressor lock sensor circuit	AC-48
	6. Pressure switch circuit	AC-51
	7. Air mix damper control servomotor circuit (Driver side)	AC-95
	8. Air mix damper control servomotor circuit (Passenger side)	AC-80
	9. Air mix damper position sensor circuit (Driver side)	AC-75
	10. Air mix damper position sensor circuit (Passenger side)	AC-60
	11. Room temperature sensor circuit	AC-30
	12. Ambient temperature sensor circuit	AC-34
	13. A/C amplifier assembly	AC-193
	14. Multiplex communication circuit	-
Temperature Control: No warm air comes out	1. Air mix damper control servomotor circuit (Driver side)	AC-95
	2. Air mix damper control servomotor circuit (Passenger side)	AC-80
	3. Air mix damper position sensor circuit (Driver side)	AC-75
	4. Air mix damper position sensor circuit (Passenger side)	AC-60
	5. Ambient temperature sensor circuit	AC-34
	6. Room temperature sensor circuit	AC-30
	7. Evaporator temperature sensor circuit	AC-39
	8. A/C amplifier assembly	AC-193
	9. Multiplex communication circuit	-
	10. Heater radiator	AC-140
Temperature Control: Output air is warmer or cooler than set temperature or response is slow	1. Room temperature sensor circuit	AC-30
	2. Ambient temperature sensor circuit	AC-34
	3. Solar sensor circuit (Driver side)	AC-43
	4. Solar sensor circuit (Passenger side)	AC-55
	5. Air mix damper control servomotor circuit (Driver side)	AC-95
	6. Air mix damper control servomotor circuit (Passenger side)	AC-80
	7. Air mix damper position sensor circuit (Driver side)	AC-75
	8. Air mix damper position sensor circuit (Passenger side)	AC-60
	9. A/C amplifier assembly	AC-193
	10. Multiplex communication circuit	-

Symptom	Suspected area	See page
Temperature Control: No temperature control (only Max. cool or Max. warm)	1. Air mix damper control servomotor circuit (Driver side)	AC-95
	2. Air mix damper control servomotor circuit (Passenger side)	AC-80
	3. Air mix damper position sensor circuit (Driver side)	AC-75
	4. Air mix damper position sensor circuit (Passenger side)	AC-60
	5. A/C amplifier assembly	AC-193
No air inlet control	1. Air inlet damper control servomotor circuit	AC-85
	2. Air inlet damper position sensor circuit	AC-65
	3. A/C amplifier assembly	AC-193
No air outlet control	1. Air outlet damper control servomotor circuit	AC-90
	2. Air outlet damper position sensor circuit	AC-70
	3. A/C amplifier assembly	AC-193
Engine idle up does not occur, or is continuous	1. Compressor circuit	AC-108
	2. Compressor lock sensor circuit	AC-48
	3. A/C amplifier assembly	AC-193
	4. Multiplex communication circuit	-
Displayed set temperature value does not match up with operation of temperature control switch	A/C amplifier assembly	AC-193
Brightness does not change when rheostat volume or light control switch is adjusted	1. Illumination light system	-
	2. A/C amplifier assembly	AC-193
Unable to access the diagnosis mode	A/C amplifier assembly	AC-193
DTC not recorded. Set mode is cleared when IG switch is turned off	1. Back-up power source circuit	AC-121
	2. A/C amplifier assembly	AC-193

TERMINALS OF ECU

1. AIR CONDITIONING AMPLIFIER



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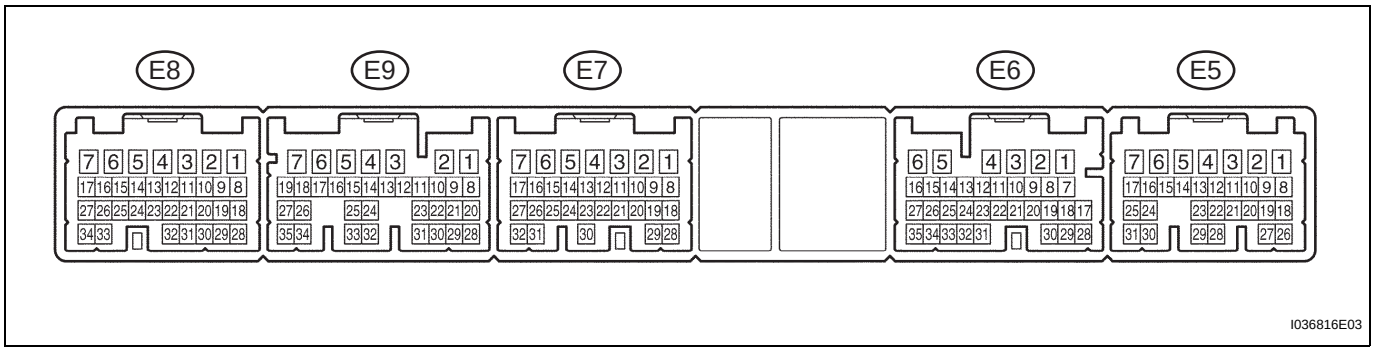
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AIR (A7-3) - GND (A8-6)	R - W-B	R/F switch	Ignition switch: ON R/F switch: FRESH → RECIRC	Below 1.0 → 11 to 14 V
AIF (A7-4) - GND (A8-6)	G - W-B	R/F switch	Ignition switch: ON R/F switch: RECIRC → FRESH	Below 1.0 → 11 to 14 V
AOF (A7-5) - GND (A8-6)	W - W-B	Mode switch	Ignition switch: ON Mode switch: DEF → FACE	Below 1.0 → 11 to 14 V
AOD (A7-6) - GND (A8-6)	B - W-B	Mode switch	Ignition switch: ON Mode switch: FACE → DEF	Below 1.0 → 11 to 14 V
TPI (A7-7) - SG-4 (A7-17)	BR - L	R/F switch	Ignition switch: ON R/F switch: RECIRC → FRESH	4.0 → 1.0 V
TPO (A7-8) - SG-3 (A7-18)	Y - R	Mode switch	Ignition switch: ON Mode switch: FACE → DEF	4.0 → 1.0 V
TPD (A7-9) - SG-1 (A7-20)	P - BR	Temperature switch (Driver side)	Ignition switch: ON Driver temperature switch: Max. COOL → Max. HOT	4.0 → 1.0 V
TPP (A7-10) - SG-2 (A7-19)	V - W	Temperature switch (Passenger side)	Ignition switch: ON Passenger temperature switch: Max. COOL → Max. HOT	4.0 → 1.0 V
SG (A7-11) - Body ground	L - Body ground	Ground for evaporator temperature sensor	Always	Below 1.0 Ω
TE (A7-12) - SG (A7-11)	GR - L	Evaporator temperature sensor	Ignition switch: ON Evaporator temperature: 0 → 15°C (32 → 59°F)	2.0 to 2.4 → 1.4 to 1.8 V
S5-4 (A7-13) - SG-4 (A7-17)	B - L	Power supply for air inlet damper position sensor	Ignition switch: ON	4.5 to 5.5 V
AMDC (A7-14) - GND (A8-6)	LG - W-B	Temperature switch (Driver side)	Ignition switch: ON Driver temperature switch: Max. HOT → Max. COOL	Below 1.0 → 11 to 14 V
AMDH (A7-15) - GND (A8-6)	O - W-B	Temperature switch (Driver side)	Ignition switch: ON Driver temperature switch: Max. COOL → Max. HOT	Below 1.0 → 11 to 14 V
AMPC (A7-16) - GND (A8-6)	R - W-B	Temperature switch (Passenger side)	Ignition switch: ON Passenger temperature switch: Max. HOT → Max. COOL	Below 1.0 → 11 to 14 V
SG-4 (A7-17) - Body ground	L - Body ground	Ground for air inlet damper position sensor	Always	Below 1.0 Ω
SG-3 (A7-18) - Body ground	R - Body ground	Ground for air outlet damper position sensor	Always	Below 1.0 Ω
SG-2 (A7-19) - Body ground	W - Body ground	Ground for air mix damper position sensor (Passenger side)	Always	Below 1.0 Ω
SG-1 (A7-20) - Body ground	BR - Body ground	Ground for air mix damper position sensor (Driver side)	Always	Below 1.0 Ω

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
S5-3 (A7-21) - SG-3 (A7-18)	V - R	Power supply for air outlet damper position sensor	Ignition switch: ON	4.5 to 5.5 V
S5-2 (A7-22) - SG-2 (A7-19)	L - W	Power supply for air mix damper position sensor (Passenger side)	Ignition switch: ON	4.5 to 5.5 V
S5-1 (A7-23) - SG-1 (A7-20)	GR - BR	Power supply for air mix damper position sensor (Driver side)	Ignition switch: ON	4.5 to 5.5 V
AMPH (A7-24) - GND (A8-6)	G - W-B	Temperature switch (Passenger side)	Ignition switch: ON Passenger temperature switch: Max. COOL → Max. HOT	Below 1.0 → 11 to 14 V
IG+ (A8-1) - GND (A8-6)	P - W-B	Ignition switch	Ignition switch: LOCK or ACC → ON	0 → 11 to 14 V
+B (A8-2) - GND (A8-6)	SB - W-B	Main power supply	Always	11 to 14 V
MPX+ (A8-3) - GND (A8-6)	BR - W-B	Terminal for BEAN	Engine idling after engine warmed up	Pulse generation
MPX- (A8-4) - GND (A8-6)	GR - W-B	Terminal for BEAN	Engine idling after engine warmed up	Pulse generation
GND (A8-6) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω
FDEF (A8-8) - GND (A8-6)	B - W-B	Front deicer switch	Ignition switch: ON Front deicer switch: OFF → ON	11 to 14 → Below 1.0 V
BLW (A8-9) - GND (A8-6)	L - W-B	Blower switch	Ignition switch: ON Blower switch: ON	Pulse generation
TSD (A8-10) - GND (A8-6)	R - W-B	Solar sensor (Driver side)	Ignition switch: ON Solar sensor covered with a cloth → Solar sensor exposed to electric light	Below 0.8 → 4.0 to 4.6 V
TSP (A8-11) - GND (A8-6)	Y - W-B	Solar sensor (Passenger side)	Ignition switch: ON Solar sensor covered with a cloth → Solar sensor exposed to electric light	Below 0.8 → 4.0 to 4.6 V
HR (A8-18) - GND (A8-6)	W - W-B	Blower switch	Ignition switch: ON Blower switch: OFF → ON	11 to 14 → Below 1.0 V
DFG (A8-19) - GND (A8-6)	G - W-B	Rear defogger switch	Ignition switch: ON Rear defogger switch: OFF → ON	11 to 14 → Below 1.0 V
TR (A8-21) - SG-5 (A8-26)	O - V	Room temperature sensor	Ignition switch: ON Cabin temperature: 25 → 40°C (77 → 104°F)	1.8 to 2.2 → 1.2 to 1.6 V
SG-5 (A8-26) - Body ground	V - Body ground	Ground for room temperature sensor	Always	Below 1.0 Ω

2. ECM

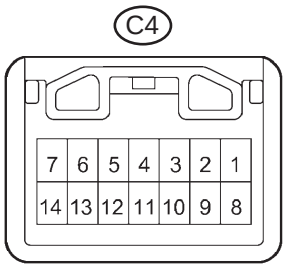


Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
THW (E8-19) - E2 (E8-28)	G-B - BR	Coolant temperature	Engine idling after engine warmed up Coolant temperature: 60 to 120°C (140 to 248°F)	0.2 to 1.0 V

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E2 (E8-28) - Body ground	BR - Body ground	Ground for power supply	Always	Below 1 Ω
E1 (E7-1) - Body ground	BR - Body ground	Ground for power supply	Always	Below 1 Ω
LCKI (E7-23) - E1 (E7-1)	W-L - BR	Compressor lock	Engine idling A/C switch: ON (Magnet clutch: ON)	Pulse generation
HP (E6-1) - Body ground	Y - Body ground	Pressure switch	Start engine Refrigerant pressure: Normal → More than 1,520 kPa (15.5 kgf/cm^2, 220psi)	Below 1.0 → 11 to 14 V
ACMG (E6-2) - E1 (E7-1)	O - BR	Compressor	Engine idling Magnet clutch: OFF → ON	11 to 14 → Below 1.0 V
MPX1 (E6-18) - E1 (E7-1)	R - BR	Terminal for BEAN	Engine idling after engine warmed up	Pulse generation
MPX2 (E6-29) - E1 (E7-1)	O - BR	Terminal for BEAN	Engine idling after engine warmed up	Pulse generation
TAM (E6-32) - E2 (E8-28)	V - BR	Ambient temperature sensor	Ambient temperature: 25°C (77°F)	1.24 to 1.84 V

AC

3. CENTER CLUSTER INTEGRATION (W/O LEXUS NAVIGATION SYSTEM)



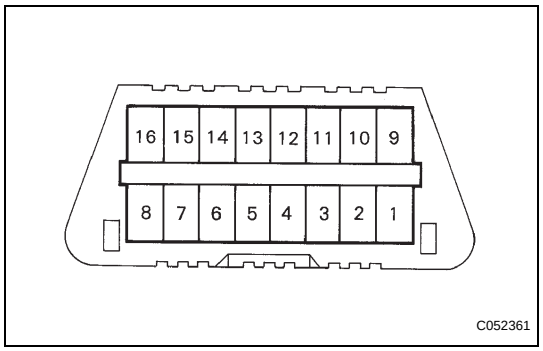
E068550E02

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
+B (C4-1) - GND (C4-7)	O - W-B	Main power supply	Always	11 to 14 V
ACC (C4-2) - GND (C4-7)	GR - W-B	ACC power supply	Ignition switch: ACC	11 to 14 V
LP (C4-4) - GND (C4-7)	P - W-B	Security indicator	Security: Operate	11 to 14 V
MPX+ (C4-5) - GND (C4-7)	L - W-B	Terminal for BEAN	Ignition switch: ON	Pulse generation
GND (C4-7) - Body ground	W-B - Body ground	Ground for power supply	Always	Below 1.0 V
ILL+ (C4-8) - ILL- (C4-14)	G - W	Power supply for night illumination	Dimmer switch: OFF → TAIL	Below 1.0 → 11 to 14 V
IG+ (C4-9) - GND (C4-7)	LG - W-B	IG power supply	Ignition switch: ON	11 to 14 V
F (C4-11) - GND (C4-7)	V - W-B	Hazard switch	Hazard switch: OFF → ON	11 to 14 → Below 1.0 V
MPX- (C4-12) - GND (C4-7)	GR - W-B	Terminal for BEAN	Ignition switch: ON	Pulse generation
ILL- (C4-14) - Body ground	W - Body ground	Ground for night illumination	Always	Below 1.0 V

4. MULTI DISPLAY ASSEMBLY (W/ LEXUS NAVIGATION SYSTEM)

HINT:

See page NS-37.



DIAGNOSIS SYSTEM

1. CHECK THE DLC3

(a) The air conditioning amplifier uses CAN and ISO 9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 9141-2 format.

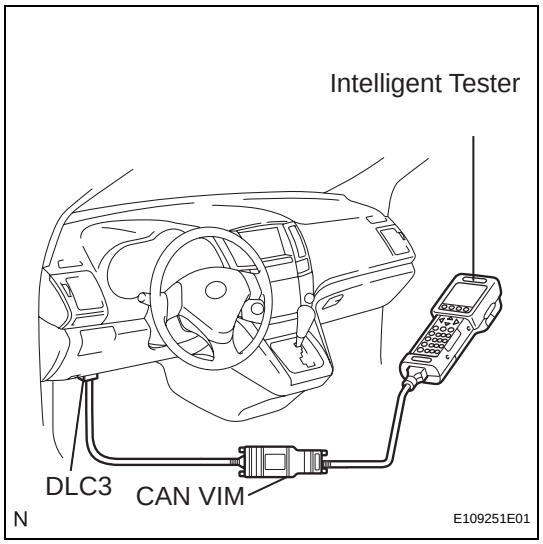
AC

Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SILO (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH-level CAN bus line	Ignition switch off	54 to 67 Ω
CANH (6) - Battery positive	HIGH-level CAN bus line	Ignition switch off	1 MΩ or higher
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition switch off	3 KΩ or higher
CANL (14) - Battery positive	LOW-level CAN bus line	Ignition switch off	1 MΩ or higher
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition switch off	3 KΩ or higher

HINT:

If the display shows a communication error message after connecting the intelligent tester cable to the DLC3 and turning the ignition switch to the ON position, there is a problem either with the vehicle or the tester.

- If communication is normal when connecting the tester to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when connecting the tester to another vehicle, the problem is probably in the tester itself. Consult the Service Department listed in the tester's operator's manual.



DTC CHECK / CLEAR

1. DTC CHECK USING INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON.
(c) Turn the tester ON.
(d) Enter the following menu items: DIAGNOSIS / OBD/ MOBD / DTC INFO / CURRENT CODES.
HINT:
Refer to the intelligent tester operator's manual for further details.
(e) Check the details of the DTCs.
(f) Clear the DTCs.
HINT:
After repairing the malfunctions, clear the DTC.
(1) Connect the intelligent tester to the DLC3.
(2) Turn the ignition switch ON.

(3) Enter the following menu items: DIAGNOSIS / OBD/MOBD / DTC INFO / CLEAR CODES.
HINT:
Refer to the intelligent tester operator's manual for further details.
(4) Press the YES button.

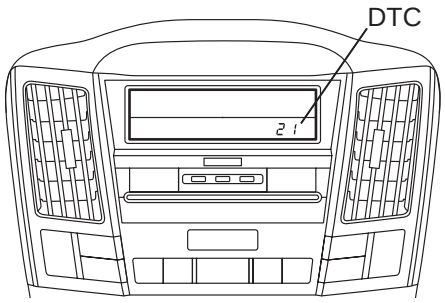
2. DTC CHECK (SENSOR CHECK)

(a) After the indicator check is completed, the system enters the DTC check mode automatically.

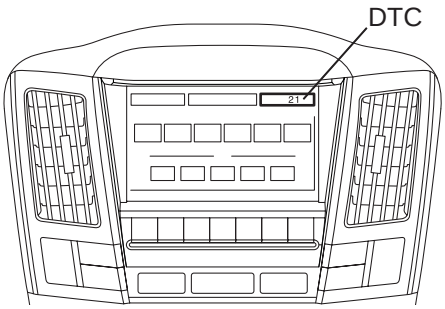
(b) Read the codes displayed on the panel. Refer to the list of codes when reading the codes. (Trouble codes are output on the temperature display.)
HINT:
Refer to the DTC chart (Diagnostic Trouble Code chart) for details of the codes (See page AC-26).

AC

w/o LEXUS Navigation System:

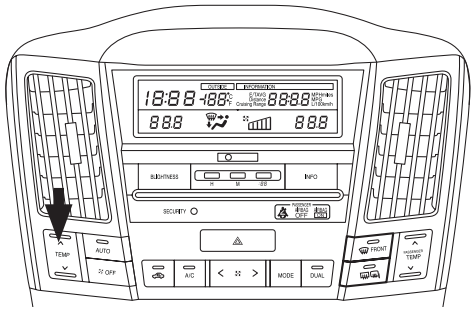


w/ LEXUS Navigation System:

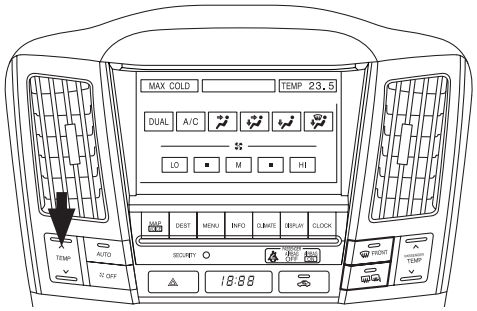


N E109250E01

w/o LEXUS Navigation System:



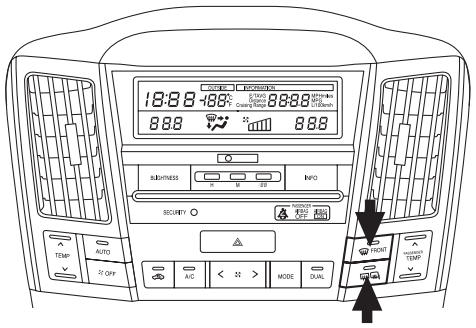
w/ LEXUS Navigation System:



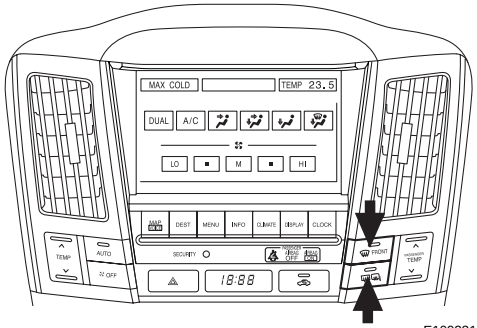
N E109231E05

(c) If the slower display is desired, press the "UPDr" switch and change it to the operation. Each time the "UPDr" switch is pressed, the display changes by 1 step.

w/o LEXUS Navigation System:



w/ LEXUS Navigation System:



N E109231E06

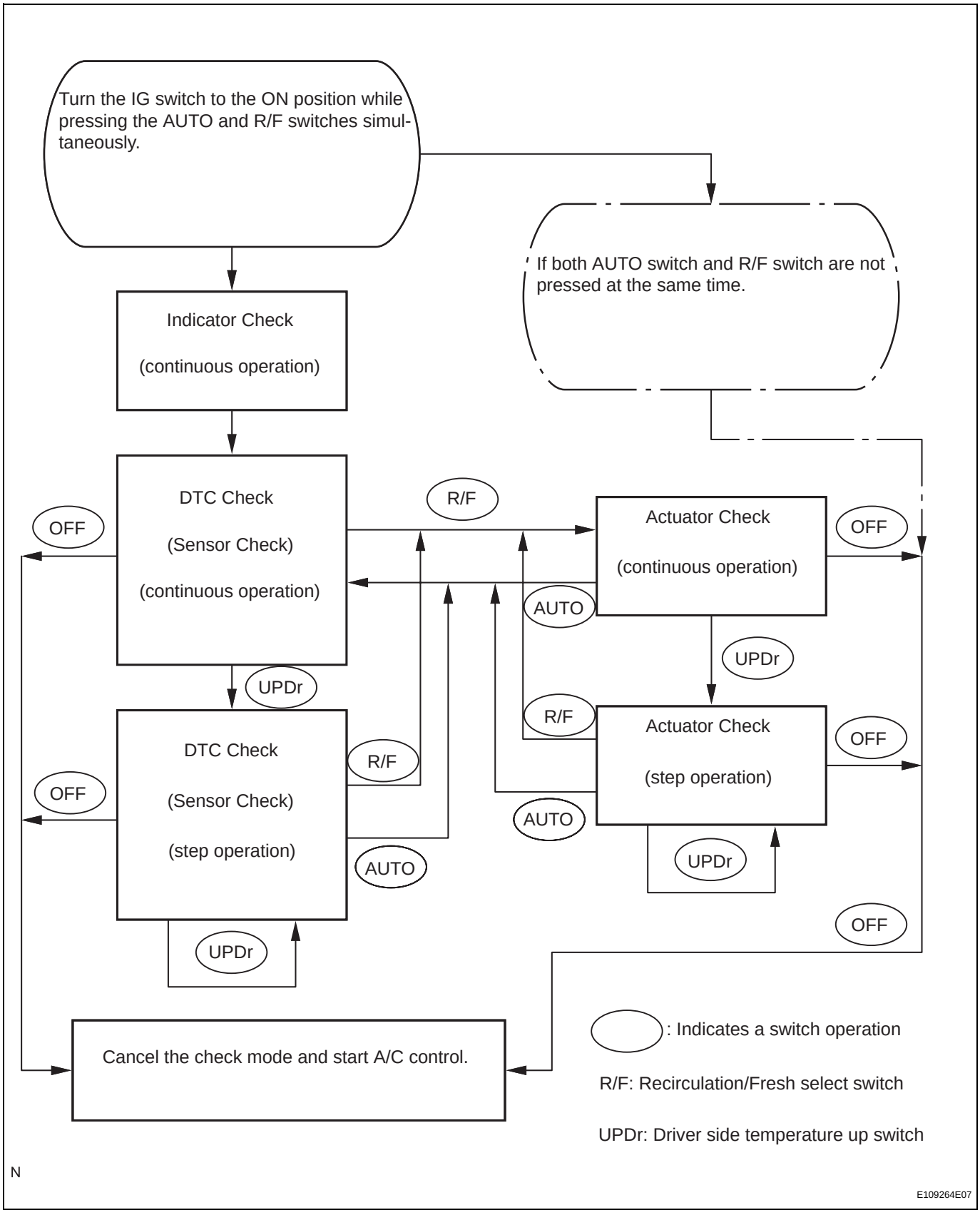
(d) Clear the DTCs.
HINT:
After repairing the malfunctions, clear the DTC.
(1) During sensor check, press the "Fr. DEF" switch and "Rr. DEF" switch at the same time.

AC

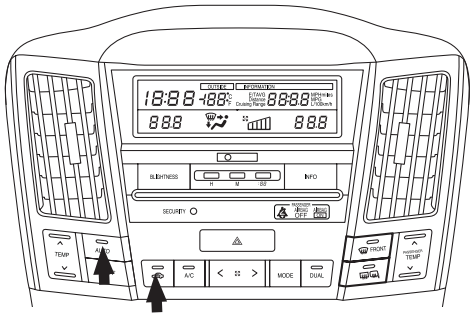
CHECK MODE PROCEDURE

1. LIST OF OPERATION METHODS

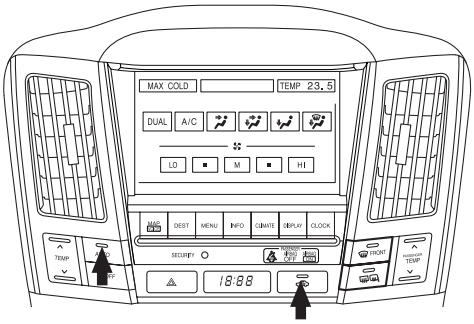
By operating each of the A/C control switches as shown in the diagram below, it is possible to enter the diagnostic check mode.


Turn the IG switch to the ON position while pressing the AUTO and R/F switches simultaneously.
If both AUTO switch and R/F switch are not pressed at the same time.
Indicator Check
(continuous operation)
DTC Check
(Sensor Check)
(continuous operation)
R/F
OFF
Actuator Check
(continuous operation)
OFF
AUTO
UPDr
DTC Check
(Sensor Check)
(step operation)
R/F
OFF
AUTO
Actuator Check
(step operation)
R/F
OFF
AUTO
UPDr
UPDr
OFF
Cancel the check mode and start A/C control.
: Indicates a switch operation
R/F: Recirculation/Fresh select switch
UPDr: Driver side temperature up switch
N
E109264E07

w/o LEXUS Navigation System:



w/ LEXUS Navigation System:

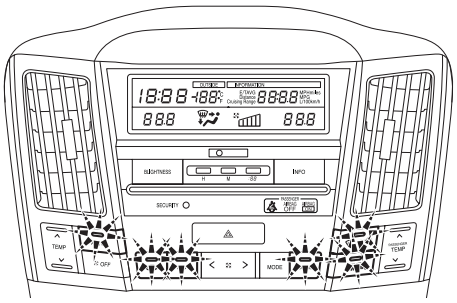


N E109231E04

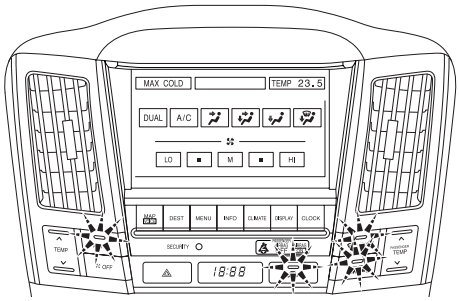
2. INDICATOR CHECK

(a) Turn the ignition switch to the ON position while pressing the A/C control "AUTO" switch and "R/F" switch simultaneously.

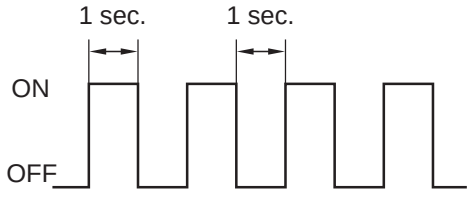
w/o LEXUS Navigation System:



w/ LEXUS Navigation System:



Indicator Blinking Pattern:



N

E109233E01

(b) Check that the indicators come on and go off 4 times in succession at 1 second intervals.
HINT:
- If a navigation system is installed, the indicator will blink and buzzer will sound.
- After the indicator check is completed, the system enters the DTC mode automatically.
- Press the "OFF" switch to cancel the check mode.

AC

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

From the DATA LIST displayed on the intelligent tester, you can read the value of the display, sensor, actuator and so on without parts removal. Reading the DATA LIST as the first step of troubleshooting is one way to shorten labor time.

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position.
(c) Enter the following menus: DIAGNOSIS / OBD/ MOBD / AIR CONDITIONER / DATA LIST.
(d) Check the value(s) by referring to the table below.

ALL:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/C SIG	A/C signal / ON or OFF	A/C ON: ON	-

AIR CONDITIONER:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
ROOM TEMP	Room temperature sensor / min.: -6.5°C max.: 57.25°C	Actual room temperature	-
AMBI TEMP SENS	Ambient temperature sensor / min.: -23.3°C max.: 65.95°C	Actual ambient temperature	-
AMBI TEMP	Adjusted ambient temperature / min.: -30.8°C max.: 50.8°C	-	-
EVAP TEMP	Evaporator temperature sensor / min.: -29.7°C max.: 59.55°C	Actual evaporator temperature	-
SOLAR SENS-D	Solar sensor (Driver side) / min.: 0 max.: 255	Changes depending on brightness (Driver side)	-
SOLAR SENS-P	Solar sensor (Passenger side) / min.: 0 max.: 255	Changes depending on brightness (Passenger side)	-
COOLANT TEMP	Engine coolant temperature / min.: 1.3°C max.: 90.55°C	Actual engine coolant temperature	-
SET TEMP-D	Set temperature (Driver side) Celsius / min.: 0 max.: 30 Fahrenheit / min.: 32 max.: 54	Actual set temperature (Driver side)	-
SET TEMP-P	Set temperature (Passenger side) Celsius / min.: 0 max.: 30 Fahrenheit / min.: 32 max.: 54	Actual set temperature (Passenger side)	-
A/M DAMP POS-D	Air mix damper position (Driver side) / min.: -5% max.: 105%	Changes depending on the set temperature (Driver side)	-
A/M DAMP POS-P	Air mix damper position (Passenger side) / min.: -5% max.: 105%	Changes depending on the set temperature (Passenger side)	-
A/I DAMP POS	Air inlet damper position / min.: -9.0% max.: 109.0%	Changes depending on air inlet power position	-
A/O DAMP POS	Air outlet damper position / min.: 0% max.: 100%	Changes depending on air outlet power position	-
A/M DAMP TARG-D	Air mix damper target position (Driver side) / min.: -5% max.: 105%	Changes depending on the set temperature (Driver side)	-
A/M DAMP TARG-P	Air mix damper target position (Passenger side) / min.: -5% max.: 105%	Changes depending on the set temperature (Passenger side)	-
A/I DAMP TARG	Air inlet damper target position / min.: -9% max.: 109%	Changes depending on air inlet power position	-

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/O DAMP TARG	Air outlet damper target position / min.: 0% max.: 100%	Changes depending on air outlet power position	-
BLOWER LEVEL	Blower motor speed level / min.: Level 0 max.: Level 31	Changes depending on blower level	-
REG PRESS SENS	Regulator pressure sensor	Actual room temperature (Rear)	-
REG CTRL CURRNT	Regulator control current	-	-
#CODES	Number of Trouble Codes / min.: 0 max.: 255	-	-
HAND FREE TEL	Hand free telephone / OFF, ON	-	-
SET TEMP SHIFT	Shift set temperature / 2C decr, 1C decr, NORMAL, 1C incr, 2C incr	Changes depending on shift set temperature *1	-
AIR INLET MODE	Air inlet mode / AUTO, MANUAL	Changes depending on air inlet mode *1	-
COMPRESSOR MODE	Compressor mode / AUTO, MANUAL	Changes depending on compressor mode *1	-
COMPRS/DEF MODE	Compressor/DEF operation mode / LINK, NORMAL	Changes depending on compressor/DEF operation mode *1	-
AIR INLET OPER	Air inlet (PSW/LOCK) operation mode / LINK, NORMAL	Changes depending on air inlet (PSW/LOCK) operation mode *1	-
BUTTON PRS BUZ	Button press buzzer / OFF, ON	Changes depending on button press buzzer *1	-
FOOT/DEF OPER	Foot/DEF auto mode / OFF, ON	Changes depending on Foot/DEF auto mode *1	-
AMBIENT TMP SET	Ambient temperature shift / 3C decr, 2C decr, 1C decr, NORMAL, 1C incr, 2C incr, 3C incr	-	-

AC

HINT:

*1: It differs depending on the user setting.

2. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the intelligent tester allows the relay, VSV, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one way to shorten labor time.

It is possible to display the DATA LIST on the intelligent tester during the ACTIVE TEST.

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position.
(c) Enter the following menus: DIAGNOSIS / OBD/ MOBD / AIR CONDITIONER /ACTIVE TEST.
(d) Check the value(s) by referring to the table below.

AIR CONDITIONER:

Item	Test Details / Display (Range)	Diagnostic Note
ACTUATOR CHECK	Actuator check / OFF, ON	-
BLOWER MOTOR	Blower motor / min.: Level 0 max.: Level 31	-
AIR MIX DAMP-D	Air mix damper (Driver side) / min.: -5% max.: 105%	-
AIR MIX DAMP-P	Air mix damper (Passenger side) / min.: -5% max.: 105%	-
A/O MODE DAMP	Air outlet damper position / min.: 0% max.: 100%	-

Item	Test Details / Display (Range)	Diagnostic Note
A/I DAMP-LINEAR	Air inlet damper position (linear) / min.:-9% max.: 109%	-
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	-
DEFOGGER RLY-R	Defogger relay (Rear) / OFF, ON	-
DEICER RLY-R	Deicer relay (Rear) / OFF, ON	-

DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTCs check (sensor check), check the circuit listed for the code in the table below (proceed to the page given for that circuit).

AIR CONDITIONING SYSTEM

DTC No.	Detection Item	Trouble Area	Memory*4	See page
B1411/11*1	Room Temperature Sensor Circuit	1. Cooler thermistor No. 1 2. Harness or connector between cooler thermistor No. 1 and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)	AC-30
B1412/12*2	Ambient Temperature Sensor Circuit	1. Cooler thermistor (ambient temperature sensor) 2. Harness or connector between cooler thermistor (ambient temperature sensor) and ECM 3. ECM 4. Multiplex communication circuit 5. A/C amplifier	Memorized (8.5 min. or more)	AC-34
B1413/13	Evaporator Temperature Sensor Circuit	1. Cooler thermistor No. 1 2. Harness or connector between cooler thermistor No. 1 and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)	AC-39
B1421/21*3	Solar Sensor Circuit (Passenger Side)	1. Automatic light control sensor 2. Harness or connector between automatic light control sensor and A/C amplifier or body ECU 3. A/C amplifier	Memorized*6 (8.5 min. or more) -*7	AC-43
B1422/22*5	Compressor Lock Sensor Circuit	1. Cooler compressor assembly 2. Cooler compressor assembly drive belt 3. Cooler compressor and magnetic clutch lock sensor 4. Harness and connector between ECM and cooler compressor assembly, cooler compressor assembly and body ground 5. Multiplex communication circuit 6. ECM 7. A/C amplifier	-	AC-48
B1423/23	Pressure Switch Circuit	1. Pressure switch 2. Harness or connector between pressure switch and ECM, Pressure switch and body ground 3. Multiplex communication circuit 4. Refrigerant pipe line 5. ECM 6. A/C amplifier	-	AC-51

AC

DTC No.	Detection Item	Trouble Area	Memory*4	See page
B1424/24*3	Solar Sensor Circuit (Driver Side)	1. Automatic light control sensor 2. Harness or connector between automatic light control sensor and A/C Amplifier or body ECU 3. A/C amplifier	Memorized*6 -*7	AC-55
B1431/31	Air Mix Damper Position Sensor Circuit (Passenger Side)	1. Damper position sensor 2. Harness or connector between damper servo sub-assembly and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-60
B1432/32	Air Inlet Damper Position Sensor Circuit	1. Damper position sensor 2. Harness or connector between damper servo sub-assembly and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-65
B1433/33	Air Outlet Damper Position Sensor Circuit	1. Damper position sensor 2. Harness or connector between damper servo sub-assembly and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-70
B1436/36	Air Mix Damper Position Sensor Circuit (Driver Side)	1. Damper position sensor 2. Harness or connector between damper servo sub-assembly and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-75
B1441/41	Air Mix Damper Control Servomotor Circuit (Passenger Side)	1. Damper servo sub-assembly 2. Damper position sensor 3. Harness or connector between damper servo sub-assembly and A/C amplifier 4. A/C amplifier	Memorized (15 sec.)	AC-80
B1442/42	Air Inlet Damper Control Servo Motor Circuit	1. Damper servo sub-assembly 2. Damper position sensor 3. Harness or connector between damper servo sub-assembly and A/C amplifier 4. A/C amplifier	Memorized (15 sec.)	AC-85
B1443/43	Air Outlet Damper Control Servo Motor Circuit	1. Damper servo sub-assembly 2. Damper position sensor 3. Harness or connector between damper servo sub-assembly and A/C amplifier 4. A/C amplifier	Memorized (15 sec.)	AC-90
B1446/46	Air Mix Damper Control Servomotor Circuit (Driver Side)	1. Damper servo sub-assembly 2. Damper position sensor 3. Harness or connector between damper servo sub-assembly and A/C amplifier 4. A/C amplifier	Memorized (15 sec.)	AC-95
B1499/99	Multiplex Communication Circuit	Open in multiplex communication circuit	-	AC-100

HINT:

- *1: If the room temperature is approx. -18.6°C (-3.7°F) or lower, DTC B1411/11 may be output even though the system is normal.
- *2: If the ambient temperature is approx. -52.9°C (-61.4°F) or lower, a malfunction code may be output even though the system is normal.
- *3: If the check is performed in a dark place, DTC B1421/21 or B1424/24 (solar sensor circuit abnormal) could be displayed.
- *4: The A/C amplifier memorizes the DTC of the respective malfunction that has occurred for a period of the time indicated in the brackets.
- *5: Compressor lock (DTC B1422/22) is indicated only for a current malfunction. To confirm DTC B1422/22, preform the following steps.

1. With the engine on, enter the DTC check mode.
2. Press the R/F switch to enter actuator check mode, and set the operation to Step No. 3.
3. Press the AUTO switch to return to DTC check mode.
4. The DTC is displayed after approx. 3 seconds.

- *6: Short in circuit
- *7: Open in circuit

DTC	B1411/11	Room Temperature Sensor Circuit

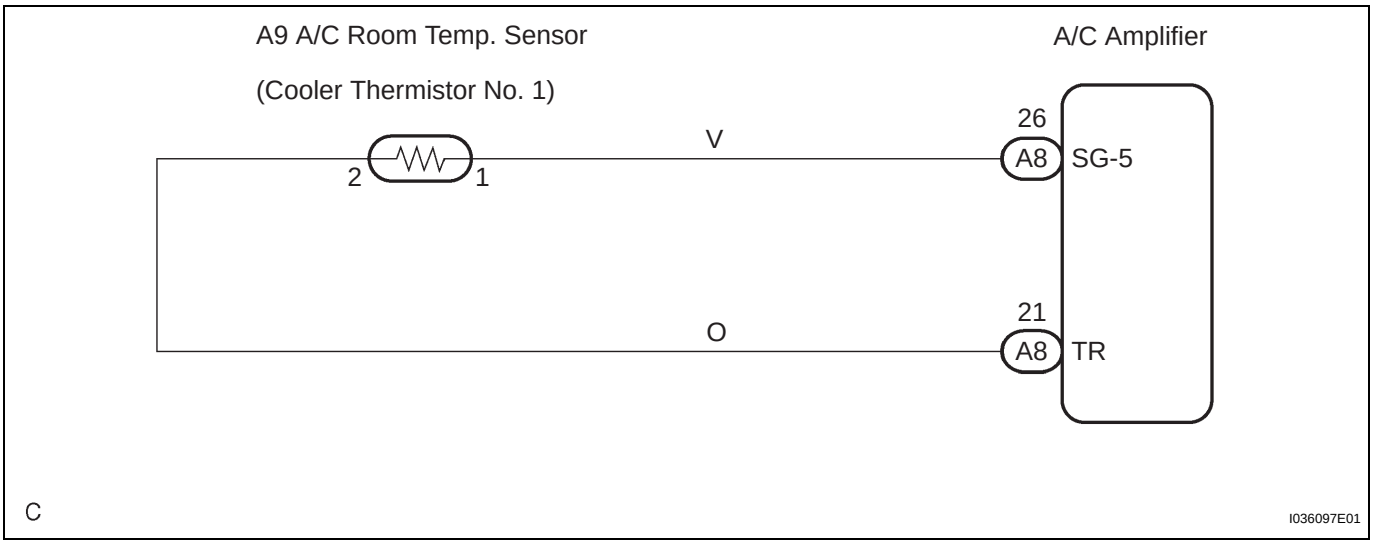
DESCRIPTION

This sensor detects the temperature inside the cabin and sends the appropriate signals to the A/C amplifier.

DTC No.	DTC Detection Condition	Trouble Area
B1411/11	Open or short in room temperature sensor circuit	• Cooler thermistor No. 1 • Harness or connector between cooler thermistor No. 1 and A/C amplifier • A/C amplifier

AC

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch ON.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
ROOM TEMP	Room temperature sensor / min.: -6.5°C max.: 57.25°C	Actual room temperature	-

Result

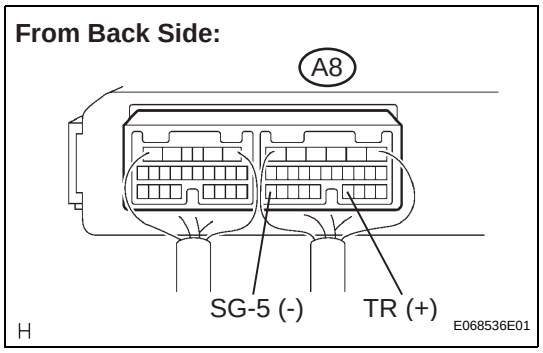
Result	Proceed to
NG	**A**
OK (Checking from the PROBLEM SYMPTOM TABLE)	**B**
OK (Checking from the DTC)	**C**

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → Go to step 5

A

2 INSPECT AIR CONDITIONING AMPLIFIER (TR - SG-5)



(a) Remove the A/C amplifier with connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
A8-21 (TR) - A8-26 (SG-5)	Ignition switch ON at 25°C (77°F)	2.0 +- 0.2 V
A8-21 (TR) - A8-26 (SG-5)	Ignition switch ON at 40°C (77°F)	1.4 +- 0.2 V

HINT:
As the temperature increases, the voltage decreases.

Result

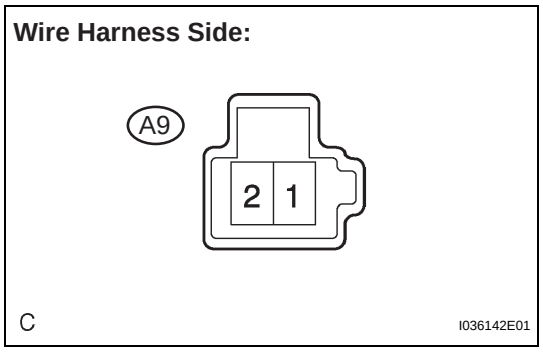
Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

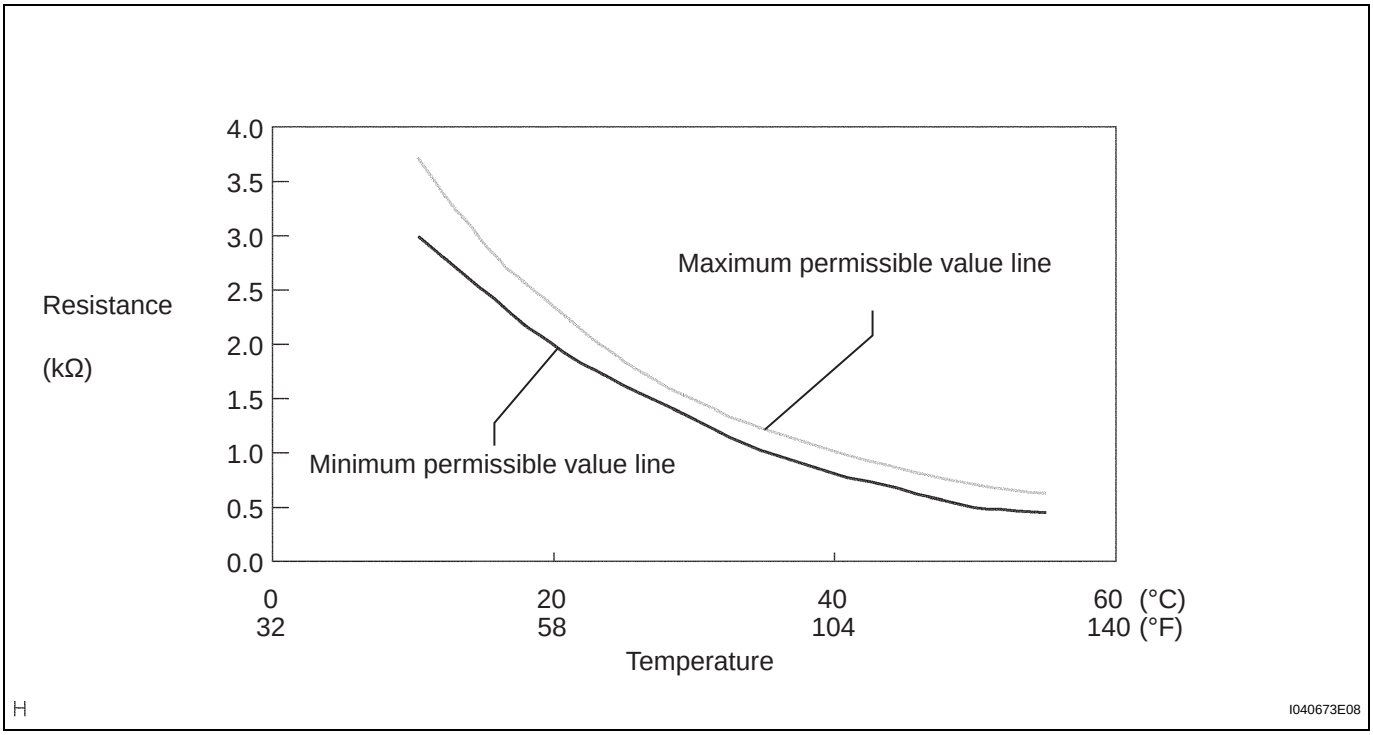
C → Go to step 5

A

3 INSPECT COOLER THERMISTOR NO.1



(a) Remove the cooler thermistor No. 1.
(b) Measure the resistance according to the value(s) in the table below.



AC

Standard resistance

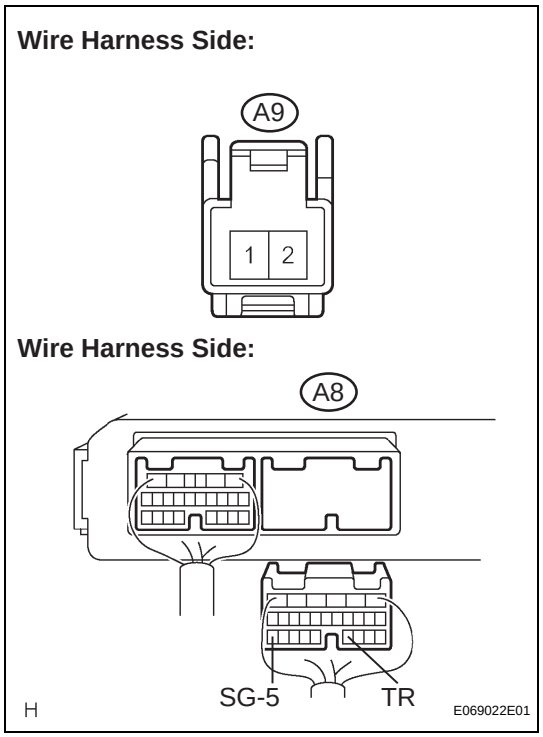
Tester connection	Condition	Specified condition
A9-1 - A9-2	10°C (50°F)	3.00 to 3.73 kΩ
A9-1 - A9-2	15°C (59°F)	2.45 to 2.88 kΩ
A9-1 - A9-2	20°C (68°F)	1.95 to 2.30 kΩ
A9-1 - A9-2	25°C (77°F)	1.60 to 1.80 kΩ
A9-1 - A9-2	30°C (86°F)	1.28 to 1.47 kΩ
A9-1 - A9-2	35°C (95°F)	1.00 to 1.22 kΩ
A9-1 - A9-2	40°C (104°F)	0.80 to 1.00 kΩ
A9-1 - A9-2	45°C (113°F)	0.65 to 0.85 kΩ
A9-1 - A9-2	50°C (122°F)	0.50 to 0.70 kΩ
A9-1 - A9-2	55°C (131°F)	0.44 to 0.60 kΩ
A9-1 - A9-2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:
Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.
HINT:
As the temperature increases, the resistance decreases (see the chart).

NG → **REPLACE COOLER THERMISTOR NO.1**

OK

4	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - COOLER THERMISTOR NO. 1)



(a) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
A8-26 (SG-5) - A9-2	Always	Below 1 Ω
A8-21 (TR) - A9-1	Always	Below 1 Ω
A8-26 (SG-5) - Body ground	Always	10 kΩ or higher
A8-21 (TR) - Body ground	Always	10 kΩ or higher

AC

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5	READ DTC OUTPUT

(a) Clear the DTCs.
(b) Read DTC at least 8.5 minutes after turning the ignition switch to the ON position.

Standard:

Normal codes are output.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

USE SIMULATION METHOD TO CHECK

DTC	B1412/12	Ambient Temperature Sensor Circuit

DESCRIPTION

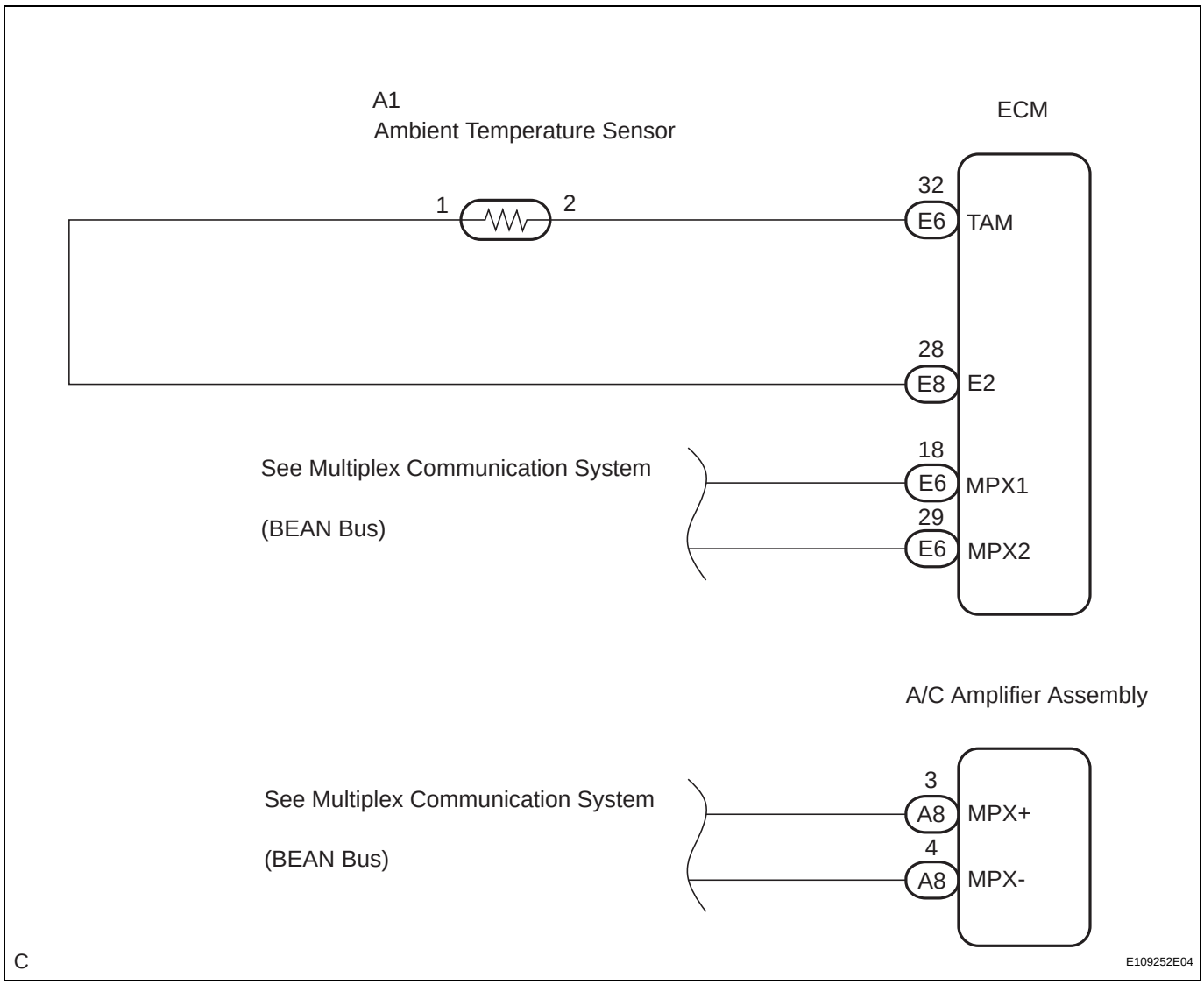
The A/C ambient temperature sensor is installed in the front part of the condenser to detect the ambient temperature and control the heater and air conditioner "AUTO" function. The sensor connected to the ECM detects fluctuation in the ambient temperature that is used for controlling the room temperature. The sensor sends a signal to the A/C amplifier assembly via the ECM. The resistance of the A/C ambient temperature sensor changes in accordance with the ambient temperature. As the temperature decreases, the resistance increases. As the temperature increases, the resistance decreases.

The ECM applies voltage (5 V) to the A/C ambient temperature sensor and reads voltage changes as the resistance of the A/C ambient temperature sensor changes. The ECM sends the read signal to the A/C amplifier via body multiplex communications.

AC

DTC No.	DTC Detecting Condition	Trouble Area
B1412/12	Open or short in ambient temperature sensor circuit	• A/C ambient temperature sensor • Harness or connector between A/C ambient temperature sensor and ECM • ECM • Multiplex communication circuit • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
AMBIENT TEMP SENS	Ambient temperature sensor / min.: -23.3°C (-9.94°F) max.: 65.95°C (150.71°F)	Actual ambient temperature is displayed	Open in the circuit: -23.3°C (-9.94°F) Short in the circuit: 65.95°C (150.71°F)

OK:
The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

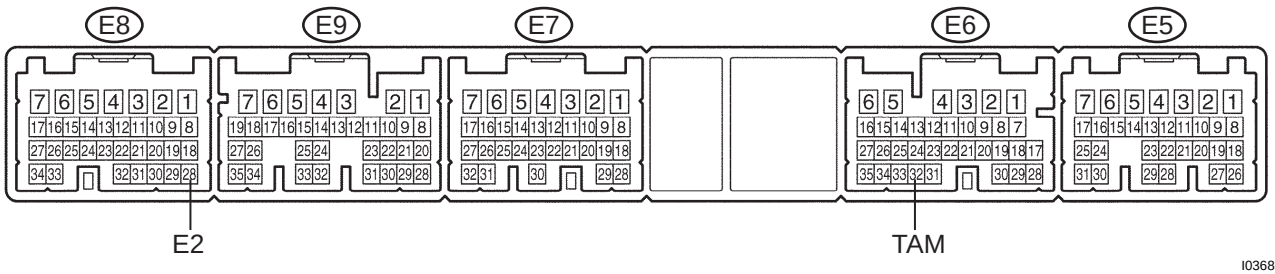
C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2	INSPECT ECM

(a) Remove the ECM with the connectors still connected.

Front Back Side:



(b) Measure the voltage according to the value(s) in the table below.
Standard voltage

Tester connection (Symbols)	Condition	Specified condition
E6-32 (TAM) - E8-28 (E2)	Ignition switch ON at 25°C (77°F)	1.7 to 2.1 V

Tester connection (Symbols)	Condition	Specified condition
E6-32 (TAM) - E8-28 (E2)	Ignition switch ON at 40°C (104°F)	1.0 to 1.4 V

HINT:
As the temperature increases, the voltage decreases.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

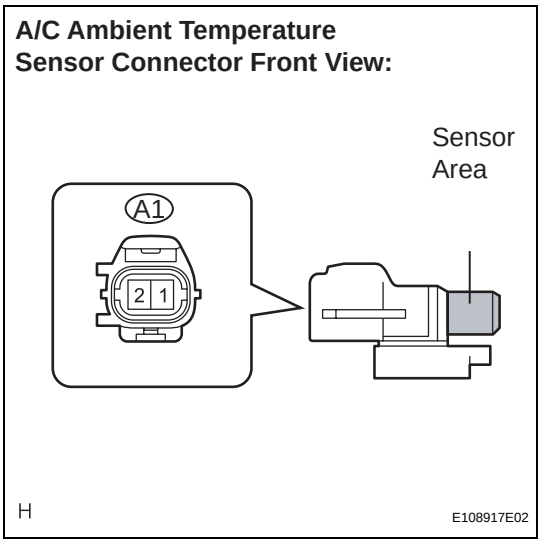
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE ECM**

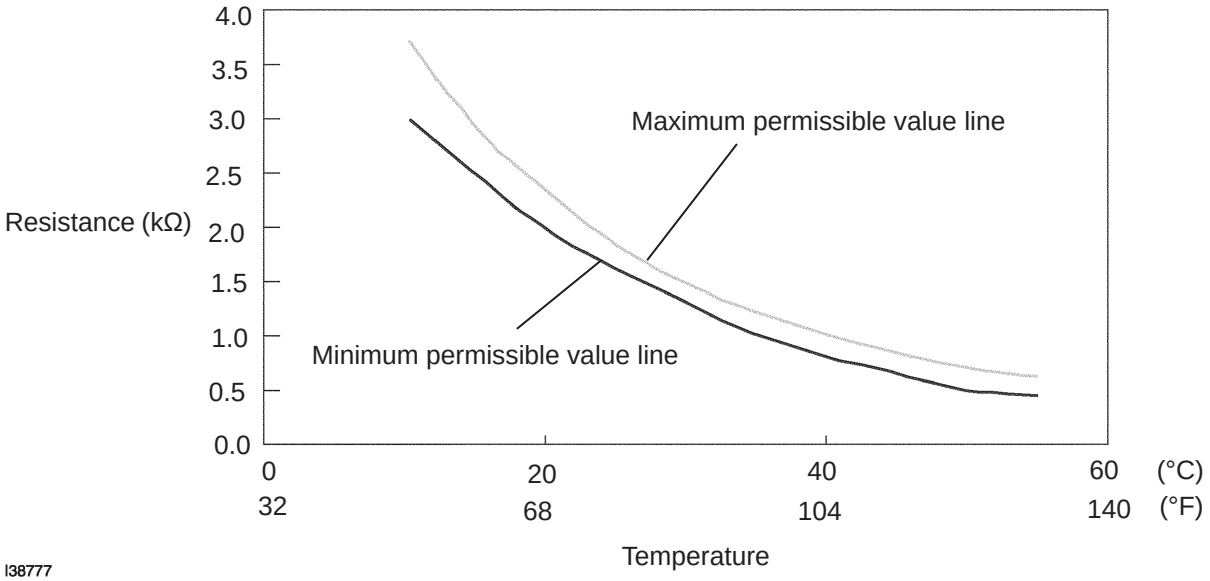
A

3 INSPECT A/C AMBIENT TEMPERATURE SENSOR

A/C Ambient Temperature Sensor Connector Front View:



(a) Remove the A/C ambient temperature sensor.
(b) Disconnect the connector from the A/C ambient temperature sensor.
(c) Measure the resistance according to the value(s) in the table below.



AC

Standard resistance

Tester connection	Condition	Specified condition
A1-1 - A1-2	10°C (50°F)	3.00 to 3.73 kΩ
A1-1 - A1-2	15°C (59°F)	2.45 to 2.88 kΩ
A1-1 - A1-2	20°C (68°F)	1.95 to 2.30 kΩ
A1-1 - A1-2	25°C (77°F)	1.60 to 1.80 kΩ
A1-1 - A1-2	30°C (86°F)	1.28 to 1.47 kΩ
A1-1 - A1-2	35°C (95°F)	1.00 to 1.22 kΩ
A1-1 - A1-2	40°C (104°F)	0.80 to 1.00 kΩ
A1-1 - A1-2	45°C (113°F)	0.65 to 0.85 kΩ
A1-1 - A1-2	50°C (122°F)	0.50 to 0.70 kΩ
A1-1 - A1-2	55°C (131°F)	0.44 to 0.60 kΩ
A1-1 - A1-2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

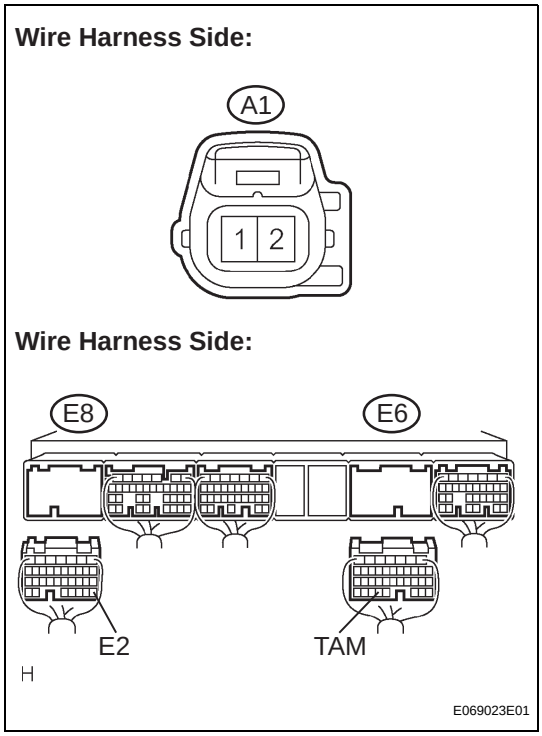
HINT:

As the temperature increases, the resistance decreases (see the graph).

NG → **REPLACE A/C AMBIENT TEMPERATURE SENSOR**

OK

4	CHECK HARNESS AND CONNECTOR (A/C AMBIENT TEMPERATURE SENSOR - ECM)



(a) Disconnect the connector from the ECM.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
E6-32 (TAM) - A1-2	Always	Below 1 Ω
E8-28 (E2) - A1-1	Always	Below 1 Ω
E6-32 (TAM) - Body ground	Always	10 kΩ or higher
E8-28 (E2) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE ECM

DTC B1413/13 Evaporator Temperature Sensor Circuit

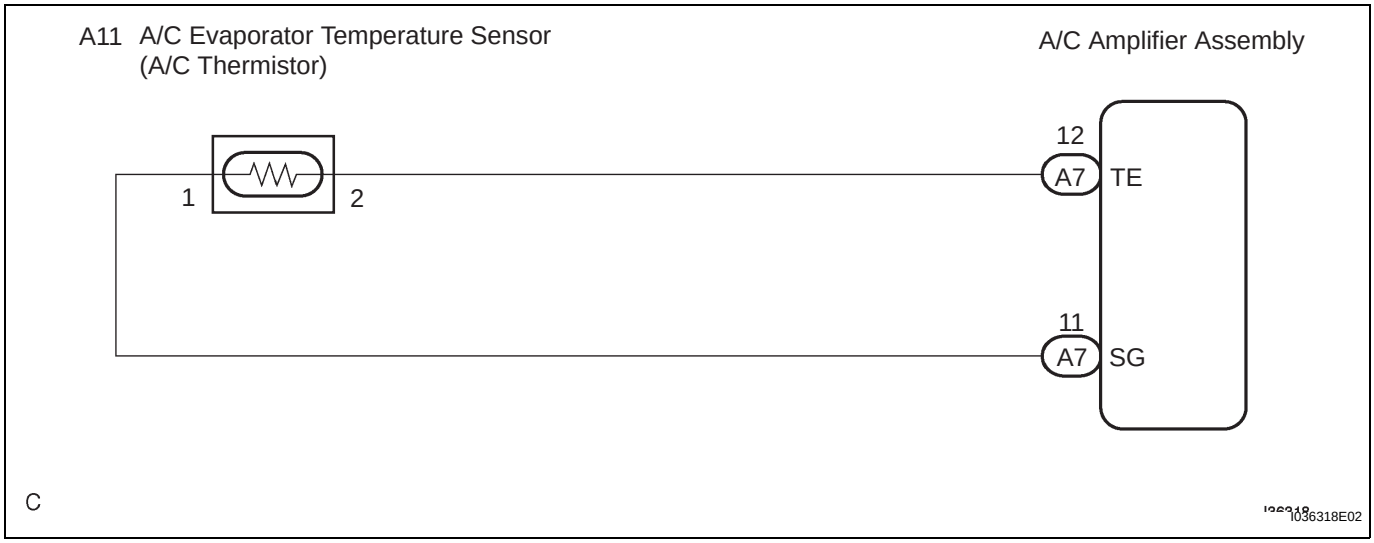
DESCRIPTION

The A/C evaporator temperature sensor (A/C thermistor) is installed on the evaporator in the air conditioner unit to detect the cooled air temperature that has passed through the evaporator and control the air conditioning. It sends appropriate signals to the A/C amplifier assembly. The resistance of the A/C evaporator temperature sensor (A/C thermistor) changes in accordance with the cooled air temperature that has passed through the evaporator. As the temperature decreases, the resistance increases. As the temperature increases, the resistance decreases.

The A/C amplifier assembly applies voltage (5 V) to the A/C evaporator temperature sensor (A/C thermistor) and reads voltage changes as the resistance of the A/C evaporator temperature sensor (A/C thermistor) changes. This sensor is used for frost prevention.

DTC No.	DTC Detecting Condition	Trouble Area
B1413/13	Open or short in evaporator temperature sensor circuit	• A/C evaporator temperature sensor (A/C thermistor) • Harness or connector between A/C evaporator temperature sensor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
EVAP TEMP	Evaporator temperature sensor / min.: -29.7°C (-21.46°F) max.: 59.55°C (139.19°F)	Actual evaporator temperature is displayed	Open in the circuit: -29.7°C (-21.46°F) Short in the circuit: 59.55°C (139.19°F)

OK:

The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

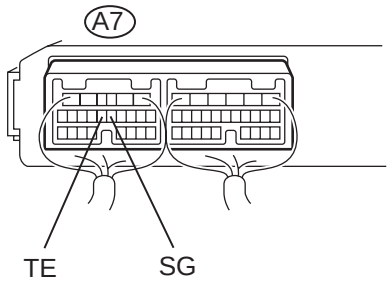
C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

AC

A

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



H

E109265E12

(a) Remove the A/C amplifier assembly with the connectors still connected.

(b) Measure the voltage according to the table value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-12 (TE) - A7-11 (SG)	Ignition switch ON at 0°C (32°F)	2.2 to 2.6 V
A7-12 (TE) - A7-11 (SG)	Ignition switch ON at 15°C (59°F)	1.3 to 1.7 V

HINT:

As the temperature increases, the voltage decreases.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from DTC)	C

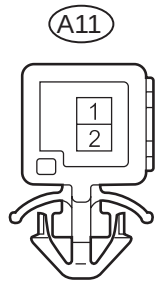
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

3 INSPECT A/C EVAPORATOR TEMPERATURE SENSOR

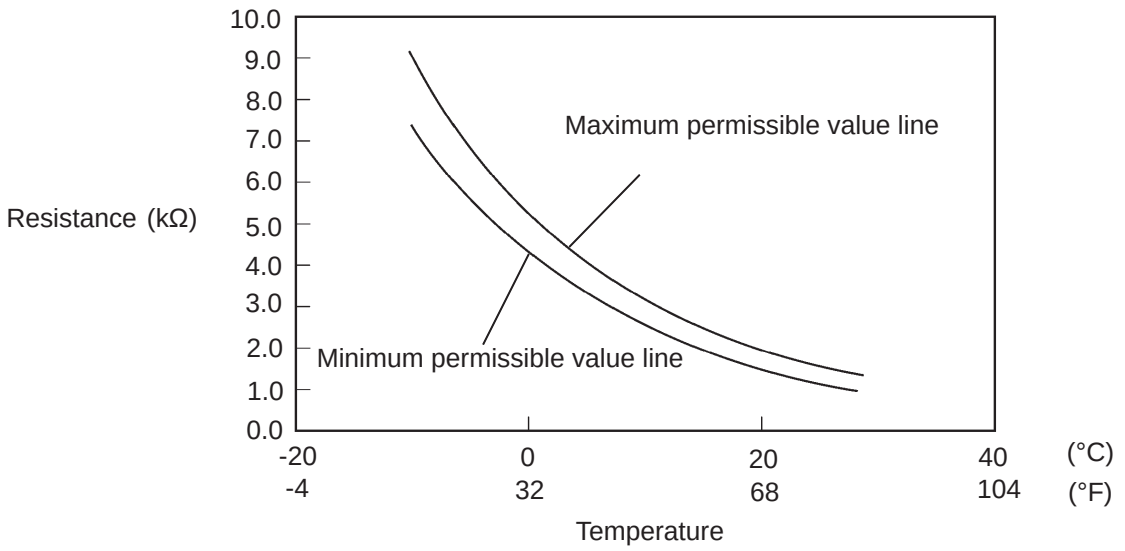
A/C Evaporator Temprature Sensor (A/C Thermistor) Connector Front View:



H

E112577E02

(a) Remove the A/C evaporator temperature sensor (A/C thermistor).
(b) Disconnect the connector from the A/C evaporator temperature sensor (A/C thermistor).
(c) Measure the resistance according to the value(s) in the table below.



C

I036421E01

Standard resistance

Tester connection	Condition	Specified condition
A11-1 - A11-2	-10°C (14°F)	7.30 to 9.10 kΩ
A11-1 - A11-2	-5°C (23°F)	5.65 to 6.95 kΩ
A11-1 - A11-2	0°C (32°F)	4.40 to 5.35 kΩ
A11-1 - A11-2	5°C (41°F)	3.40 to 4.15 kΩ
A11-1 - A11-2	10°C (50°F)	2.70 to 3.25 kΩ
A11-1 - A11-2	15°C (59°F)	2.14 to 2.58 kΩ
A11-1 - A11-2	20°C (68°F)	1.71 to 2.05 kΩ
A11-1 - A11-2	25°C (77°F)	1.38 to 1.64 kΩ
A11-1 - A11-2	30°C (86°F)	1.11 to 1.32 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature .**

HINT:

As the temperature increases, the resistance decreases (see the graph).

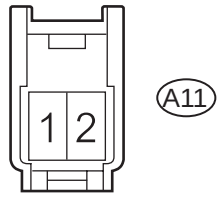
NG → **REPLACE A/C EVAPORATOR TEMPERATURE SENSOR**

AC

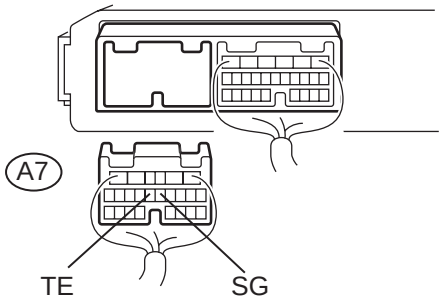
OK

4	CHECK HARNESS AND CONNECTOR (A/C EVAPORATOR TEMPERATURE SENSOR - A/C AMPLIFIER ASSEMBLY)

A/C Evaporator Temperature Sensor (A/C Thermistor) Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E108940E02

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-12 (TE) - A11-2	Always	Below 1 Ω
A7-11 (SG) - A11-1	Always	Below 1 Ω
A7-12 (TE) - Body ground	Always	10 kΩ or higher
A7-11 (SG) - Body ground	Always	10 kΩ or higher

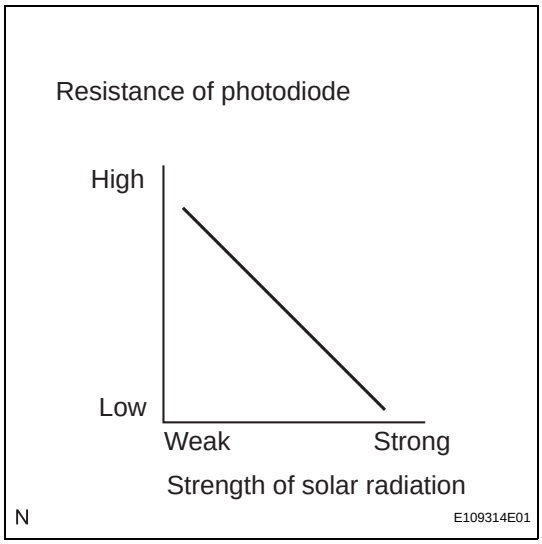
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1421/21	Solar Sensor Circuit (Passenger Side)

DESCRIPTION

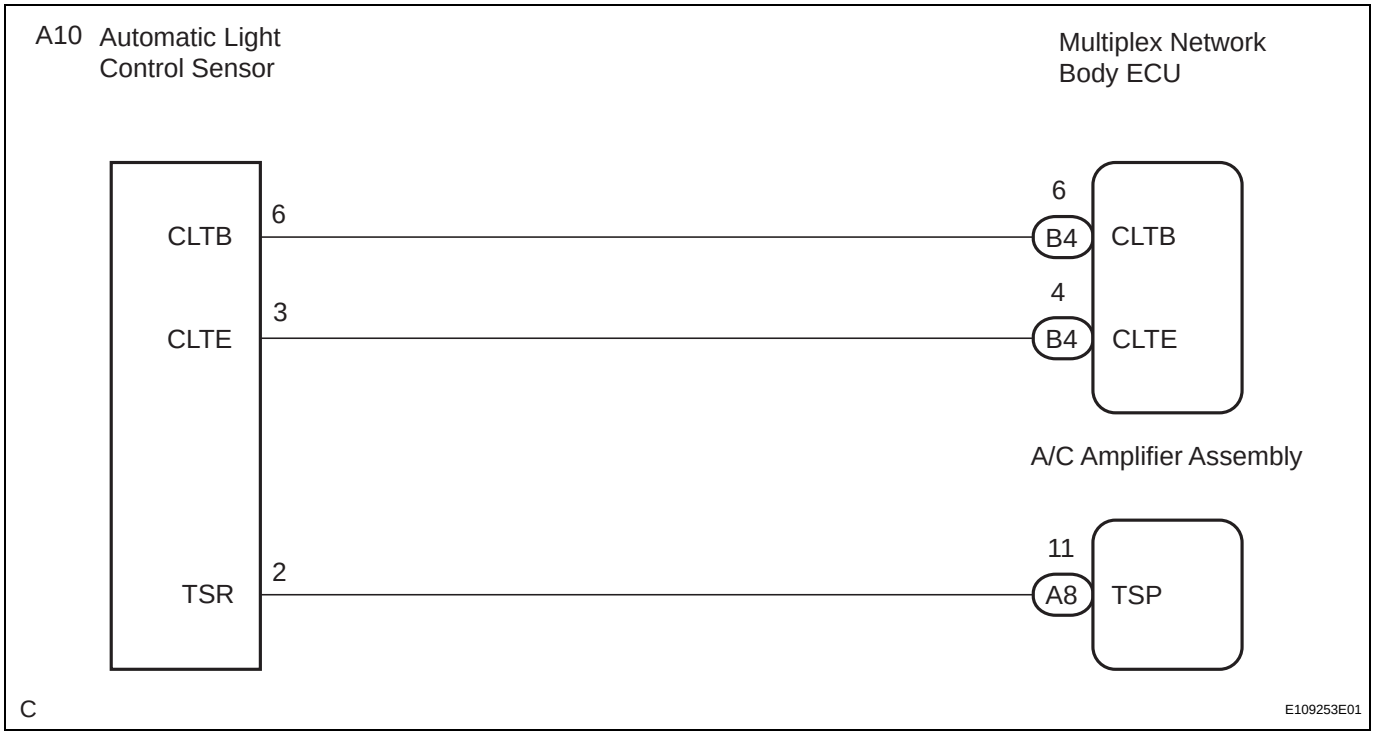


The automatic light control sensor is installed in the upper part of the instrument panel to detect the amount of solar sensor radiation with photo diode to control the heater and air conditioner "AUTO" function. It sends appropriate signals to the A/C amplifier assembly. The output voltage of the automatic light control sensor changes in accordance with the amount of solar radiation. As the amount increases, the voltage increases. As the amount decreases, the voltage decreases. The A/C amplifier assembly reads voltage output from the automatic light control sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1421/21	Open or short in solar sensor circuit (If the check is performed in a dark place, DTC B1421/21 may be displayed.)	• Automatic light control sensor • Harness or connector between automatic light control sensor and A/C amplifier assembly and multiplex network body ECU • A/C amplifier assembly

HINT:
If DTC B1244 is output at the same time, troubleshoot DTC B1244 first.

WIRING DIAGRAM



AC

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Symbols)	Normal Condition	Diagnostic Note
SOLAR SENS-P	Solar sensor (Passenger side) / min.: 0 max.: 255	Increases as brightness increases	Open in the circuit: 0 Short in the circuit: 255

OK:
The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

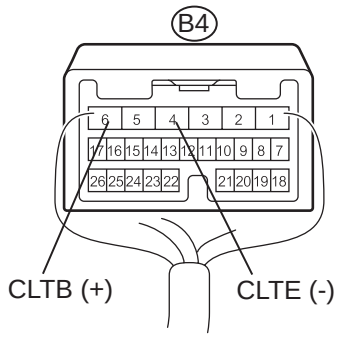
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 INSPECT MULTIPLEX NETWORK BODY ECU

Multiplex Network Body ECU Connector Wire Harness View:



(a) Remove the multiplex network body ECU with the connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

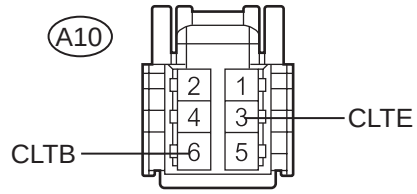
Tester connection (Symbols)	Condition	Specified condition
B4-6 (CLTB) - B4-4 (CLTE)	Ignition switch ON	10 to 14 V

OK → **Go to step 4**

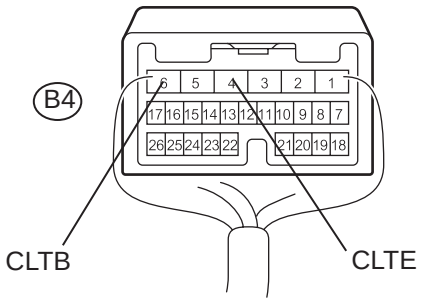
NG

3 CHECK HARNESS AND CONNECTOR (AUTOMATIC LIGHT CONTROL SENSOR - MULTIPLEX NETWORK BODY ECU)

Automatic Light Control Sensor Connector Wire Harness View:



Multiplex Network Body ECU Connector Wire Harness View:



(a) Disconnect the connector from the automatic light control sensor and multiplex network body ECU.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A10-6 (CLTB) - B4-6 (CLTB)	Always	Below 1 Ω
A10-3 (CLTE) - B4-4 (CLTE)	Always	Below 1 Ω
A10-6 (CLTB) - Body ground	Always	10 kΩ or higher
A10-3 (CLTE) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

AC

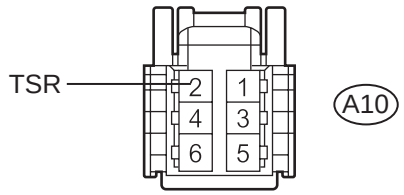
OK

REPLACE MULTIPLEX NETWORK BODY ECU

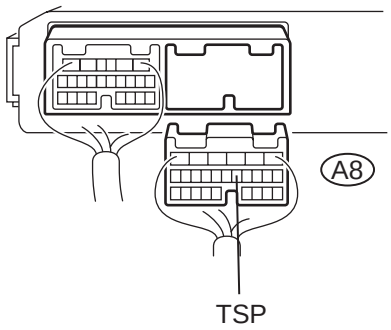
4	CHECK HARNESS AND CONNECTOR (AUTOMATIC LIGHT CONTROL SENSOR - A/C AMPLIFIER ASSEMBLY)

AC

Automatic Light Control Sensor Connector Wire Harness View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E108943E03

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

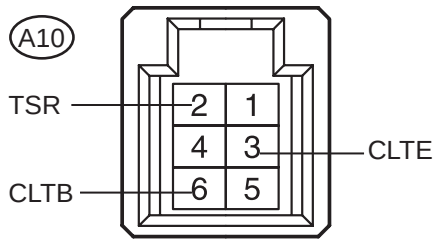
Tester connection (Symbols)	Condition	Specified condition
A8-11 (TSP) - A10-2 (TSR)	Always	Below 1 Ω
A8-11 (TSP) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5	INSPECT AUTOMATIC LIGHT CONTROL SENSOR

Automatic Light Control Sensor Connector Front View:



P E109215E08

(a) Remove the automatic light control sensor.
(b) Apply battery voltage between terminals A10-6 (CLTB) and A10-3 (CLTE) of the automatic light control sensor.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A10-2 (TSR) - A10-3 (CLTE)	Sensor is subject to electric light	0.8 to 4.3 V
A10-2 (TSR) - A10-3 (CLTE)	Sensor is covered with a cloth	Below 0.8 V

NOTICE:
The connection procedure for using a digital tester such as a TOYOTA electrical tester is shown above. When using an analog tester, connect the positive (+) lead to terminal 2 and negative (-) lead to terminal 1 of the automatic light control sensor.

HINT:
- As the inspection light moved away from the sensor, the voltage increases.
- Use an incandescent light for inspection. Bring it about 30 cm (11.8 in.) from the automatic light control sensor.

NG → **REPLACE AUTOMATIC LIGHT CONTROL SENSOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC

DTC	B1422/22	Compressor Lock Sensor Circuit

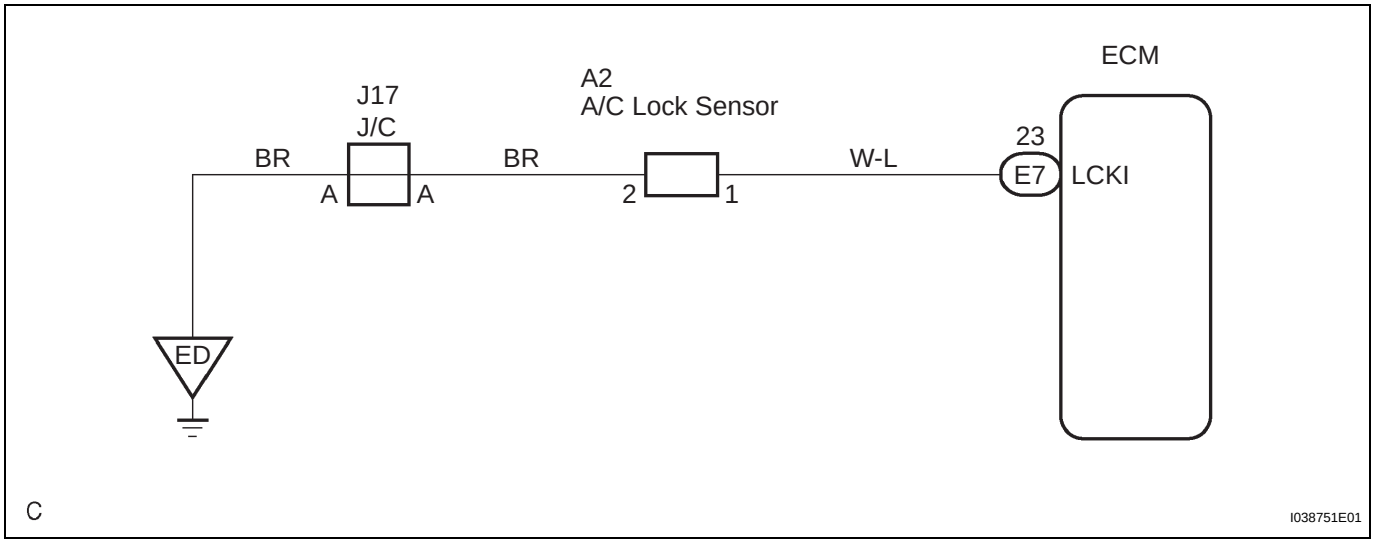
DESCRIPTION

This sensor sends 1 pulses per engine revolution to the ECM.
If the number ratio of the compressor speed divided by the engine speed is smaller than a predetermined value, the ECM turns the compressor off, and the indicator flashes at approx. 1 second intervals.

DTC No.	DTC Detection Condition	Trouble Area
B1422/22	All conditions below are detected for 3 secs. or more 1. Engine speed: 450 rpm or more 2. Ratio between engine and compressor speed deviates 20% or more in comparison to normal operation.	• Cooler compressor assembly • Cooler compressor assembly drive belt • Cooler compressor and magnetic clutch lock sensor • Harness and connector between ECM and cooler compressor assembly, cooler compressor assembly and body ground • Multiplex communication circuit • ECM • A/C amplifier

AC

WIRING DIAGRAM



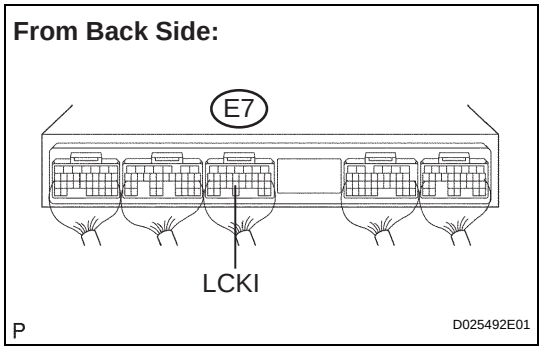
1	CHECK COOLER COMPRESSOR ASSEMBLY

(a) Check and adjust compressor drive belt tension (See page AC-169).
(b) Check if the cooler compressor does not lock during operation with engine started and below switch and A/C switch ON.
Standard:
Cooler compressor assembly does not lock during operation.

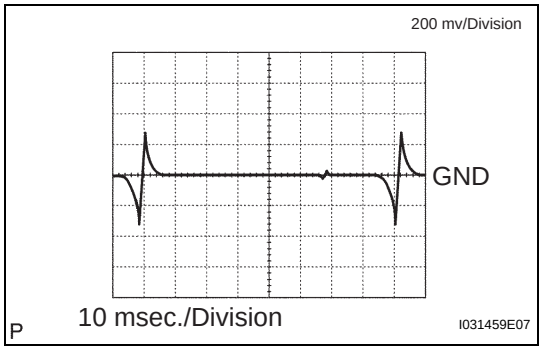
NG → **REPLACE COOLER COMPRESSOR ASSEMBLY**

OK

2 INSPECT ECM (LCK1 - BODY GROUND)



(a) Remove the ECM with connectors being connected.
(b) Start the engine and push AUTO switch.



(c) Measure the waveform according to the value(s) in the table below.

Waveform

Tester connection	Condition	Specified condition
E7-23 (LCKI) - Body ground	Ignition SW ON AUTO SW ON	Pulse generation

Result

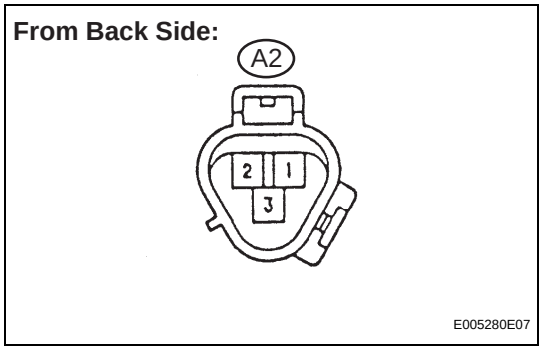
Condition	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **Go to step 5**

A

3 INSPECT COOLER COMPRESSOR ASSEMBLY



(a) Disconnect the cooler compressor assembly connector.
(b) Measure the resistance according to the value(s) in the table below.

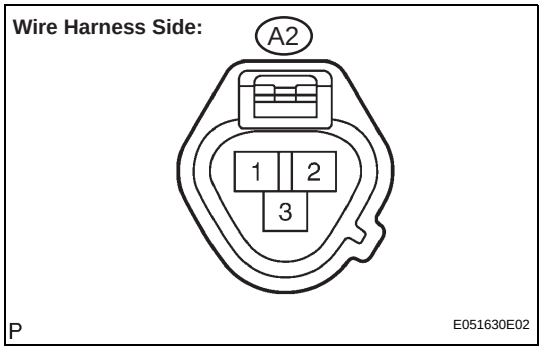
Standard resistance

Tester connection	Condition	Specified condition
1 - 2	at normal temperature	185 +- 20 Ω

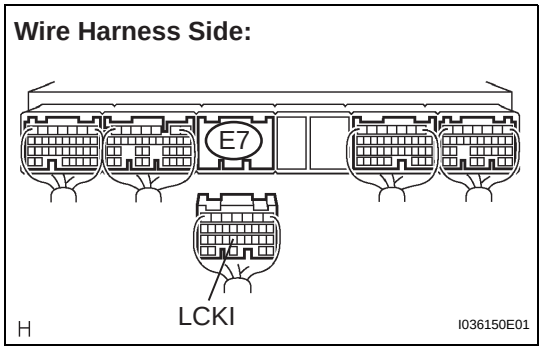
NG → **REPLACE COOLER COMPRESSOR ASSEMBLY**

OK

4	CHECK HARNESS AND CONNECTOR



(a) Disconnect the cooler compressor assembly connector.



(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
A2-1 - E7-23 (LCKI)	Always	Below 1 Ω
A2-2 - Body ground	Always	Below 1 Ω
A2-1 - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5	READ DTC OUTPUT

(a) Clear the DTCs.
(b) Read DTC at turning the ignition switch to the ON position.

Standard:

Normal codes are output.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

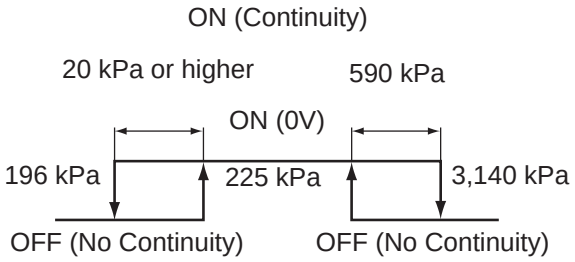
OK

USE SIMULATION METHOD TO CHECK

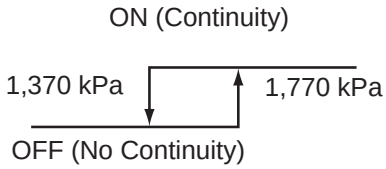
DTC	B1423/23	Pressure Switch Circuit

DESCRIPTION

Low and High Pressure Cut Side:



Middle Pressure Cut Side:



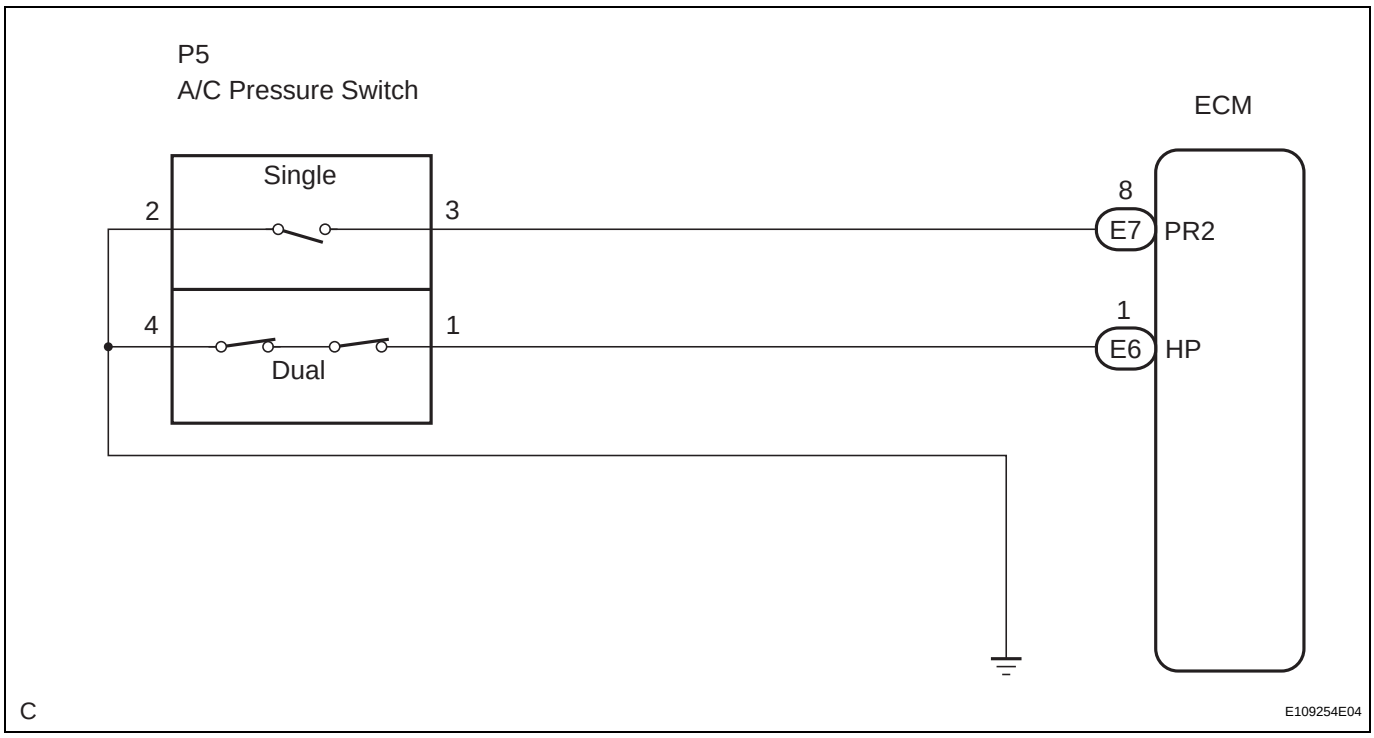
H

E109249E01

The A/C pressure switch to detect the refrigerant pressure is located in the sight glass side of the pipe on the high-pressure side. This DTC is output when the refrigerant pressure is either significantly low (below 196 kPa (2.0 kgf/cm^2, 28 psi) or significantly high (over 3,140 kPa (32.0 kgf/cm^2, 455 psi). Then the A/C pressure switch has built-in switches to detect high and low pressure and is turned off when either of them is determined to be detective. The A/C amplifier assembly continuously monitors the pressure switch signal after the ignition switch is turned on. It stops compressor control and outputs the DTC when it detects the signal indicating that the switch is turned off.

DTC No.	DTC Detecting Condition	Trouble Area
B1423/23	• Open or short in pressure switch circuit • Abnormal refrigerant pressure Below 196 kPa (2.0 kgf/cm^2, 28 psi) Over 3,140 kPa (32.0 kgf/cm^2, 455 psi)	• A/C Pressure switch • Harness or connector between pressure switch and ECM, A/C Pressure switch and body ground • Multiplex communication circuit • Refrigerant pipe line • ECM • A/C amplifier assembly

WIRING DIAGRAM



AC

1	INSPECT REFRIGERANT PRESSURE

(a) Set the manifold gauge (See page AC-124).
(b) Read the manifold gauge pressure when the following conditions are established.
- Temperature at the air inlet with the switch set at RECIRCULATION is 30 to 35°C (86 to 95°F)
- Ignition switch is ON.
- Blower speed control switch is at "HI" position
- Temperature control dial is at "COOL" position
- Air conditioning switch is ON
- Doors are fully open

Standard:

Pressure on high pressure side

1.37 to 1.57 MPa (13.9 to 16.0 kgf/cm^2, 198 to 228 psi)

HINT:

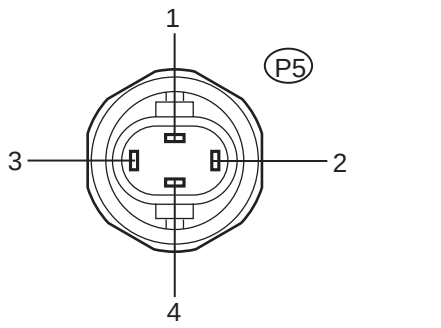
If the refrigerant pressure is below 196 kPa (2.0 kgf/cm^2, 28 psi), the refrigerant amount in the air conditioning cycle may have decreased significantly for reasons such as a gas leakage.

NG → **CHECK AND REPLACE AIR CONDITIONING CYCLE**

OK

2	**CHECK AIR CONDITIONING OPERATION**

A/C Pressure Switch Connector Front View:



(a) Disconnect the connector from the A/C pressure switch.
(b) Connect the terminals 1 and 4 of the connector of the pressure switch on the vehicle wire harness side using a service wire.
(c) Turn the ignition switch ON.
(d) Turn the air conditioning switch ON and check that the compressor is operated.
(e) Check that the compressor is not operated when terminals 1 and 4 (that were connected in the prior step) are disconnected.

OK:

Terminals 1 and 4 connected: the compressor is operated
Terminals 1 and 4 disconnected: the compressor is not operated

(f) Check that the electrical fan is operated when disconnecting terminals 2 and 3 (that were connected in the prior step).

OK:

Terminals 2 and 3 connected: the electrical fan is operated
Terminals 2 and 3 disconnected: the electrical fan is not operated

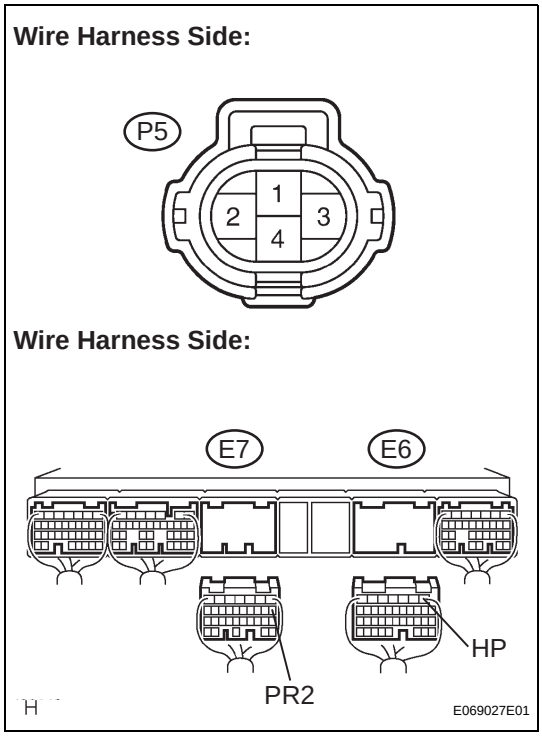
NG → **Go to step 3**

OK

REPLACE A/C PRESSURE SWITCH

AC

3	CHECK HARNESS AND CONNECTOR (A/C PRESSURE SWITCH - ECM)



(a) Disconnect the connectors from the A/C pressure switch and ECM.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
E7-8 (PR2) - P5-3	Always	Below 1 Ω
E6-1 (HP) - P5-1	Always	Below 1 Ω
E7-8 (PR2) - Body round	Always	10 kΩ or higher
E6-1 (HP) - Body ground	Always	10 kΩ or higher
P5-2 - Body ground	Always	Below 1 Ω
P5-4 - Body ground	Always	Below 1 Ω

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

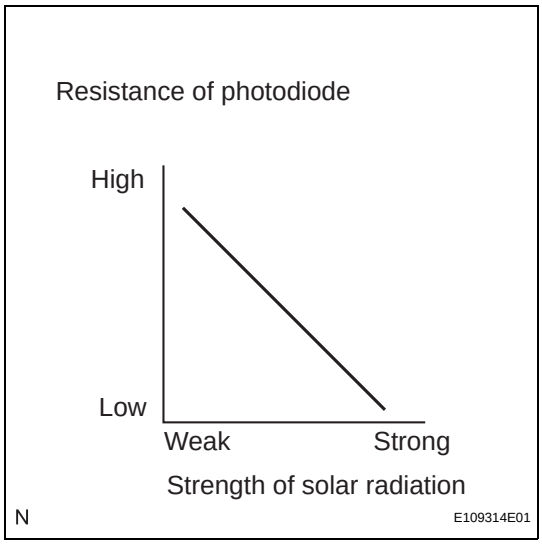
C → REPLACE ECM

A

REPAIR OR REPLACE HARNESS OR CONNECTOR

DTC	B1424/24	Solar Sensor Circuit (Driver Side)

DESCRIPTION

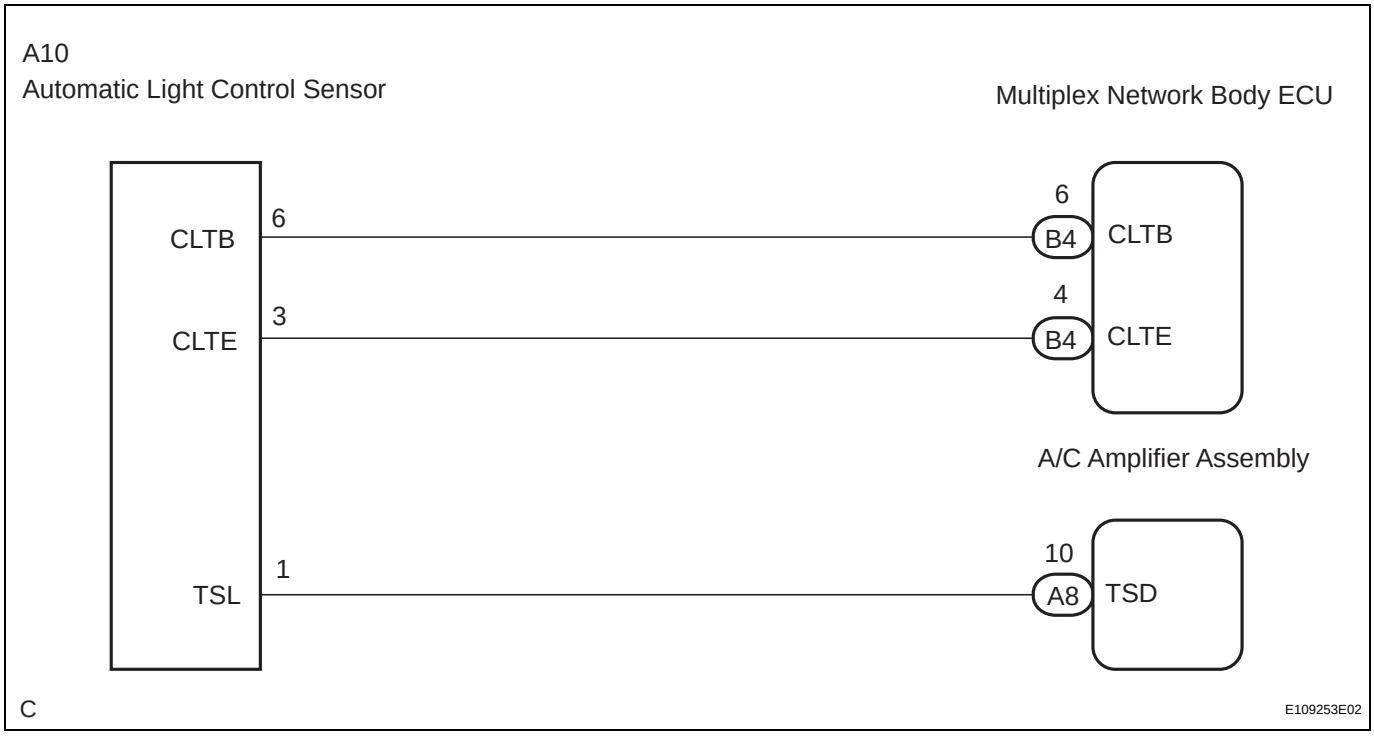


The automatic light control sensor is installed in the upper part of the instrument panel to detect the amount of solar sensor radiation with photo diode to control the heater and air conditioner "AUTO" function. It sends appropriate signals to the A/C amplifier assembly. The output voltage of the automatic light control sensor changes in accordance with the amount of solar radiation. As the amount increases, the voltage increases. As the amount decreases, the voltage decreases. The A/C amplifier assembly reads voltage output from the automatic light control sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1424/24	Open or short in solar sensor circuit (If the check is performed in a dark place, DTC B1424/24 may be displayed.)	• Automatic light control sensor • Harness or connector between automatic light control sensor and A/C amplifier assembly or multiplex network body ECU • A/C amplifier assembly

HINT:
If DTC B1244 is output at the same time, troubleshoot DTC B1244 first.

WIRING DIAGRAM



AC

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
SOLAR SENS-D	Solar sensor (Driver side) / min.: 0 max.: 255	Increases as brightness increases	Open in the circuit: 0 Short in the circuit: 255

OK:
The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

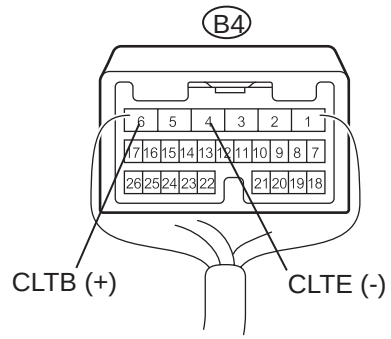
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 INSPECT MULTIPLEX NETWORK BODY ECU

Multiplex Network Body ECU Connector Wire Harness View:



(a) Remove the multiplex network body ECU with the connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

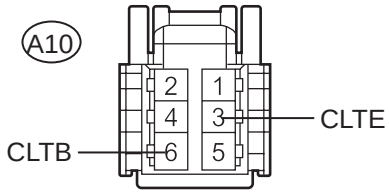
Tester connection (Symbols)	Condition	Specified condition
B4-6 (CLTB) - B4-4 (CLTE)	Ignition switch ON	10 to 14 V

OK → **Go to step 4**

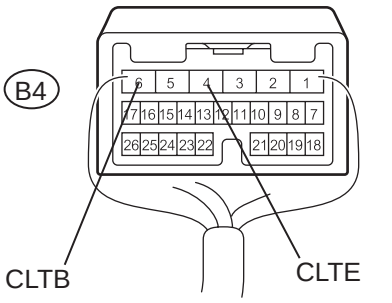
NG

3 CHECK HARNESS AND CONNECTOR (AUTOMATIC LIGHT CONTROL SENSOR - MULTIPLEX NETWORK BODY ECU)

Automatic Light Control Sensor Connector Wire Harness View:



Multiplex Network Body ECU Connector Wire Harnesss View:



(a) Disconnect the connector from the automatic light control sensor and multiplex network body ECU.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A10-6 (CLTB) - B4-6 (CLTB)	Always	Below 1 Ω
A10-3 (CLTE) - B4-4 (CLTE)	Always	Below 1 Ω
A10-6 (CLTB) - Body ground	Always	10 kΩ or higher
A10-3 (CLTE) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

AC

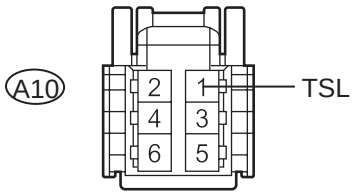
OK

REPLACE MULTIPLEX NETWORK BODY ECU

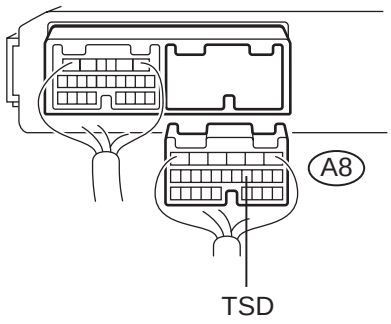
4	CHECK HARNESS AND CONNECTOR (AUTOMATIC LIGHT CONTROL SENSOR - A/C AMPLIFIER ASSEMBLY)

AC

Automatic Light Control Sensor Connector Wire Harness View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E108943E04

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

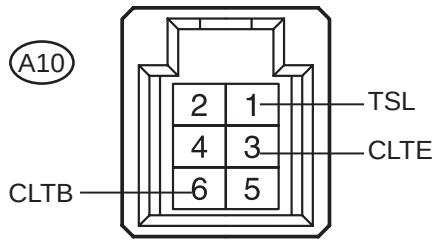
Tester connection (Symbols)	Condition	Specified condition
A8-10 (TSD) - A10-1 (TSL)	Always	Below 1 Ω
A8-10 (TSD) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5	INSPECT AUTOMATIC LIGHT CONTROL SENSOR

Automatic Light Control Sensor Connector Front View:



P E109215E09

(a) Remove the automatic light control sensor.
(b) Apply battery voltage between terminals A10-6 (CLTB) and A10-3 (CLTE) of the automatic light control sensor.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A10-1 (TSL) - A10-3 (CLTE)	Sensor is subject to electric light	0.8 to 4.3 V
A10-1 (TSL) - A10-3 (CLTE)	Sensor is covered with a cloth	Below 0.8 V

NOTICE:
The connection procedure for using a digital tester such as a TOYOTA electrical tester is shown above. When using an analog tester, connect the positive (+) lead to terminal 2 and negative (-) lead to terminal 1 of the automatic light control sensor.

HINT:
- As the inspection light is moved away from the sensor, the voltage increases.
- Use an incandescent lamp for inspection. Bring it about 30 cm (11.8 in.) from the automatic light control sensor.

NG → **REPLACE AUTOMATIC LIGHT CONTROL SENSOR**

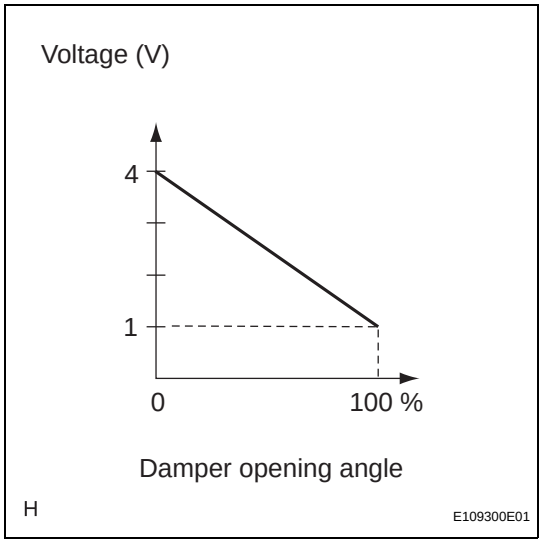
OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC

DTC	B1431/31	Air Mix Damper Position Sensor Circuit (Passenger Side)

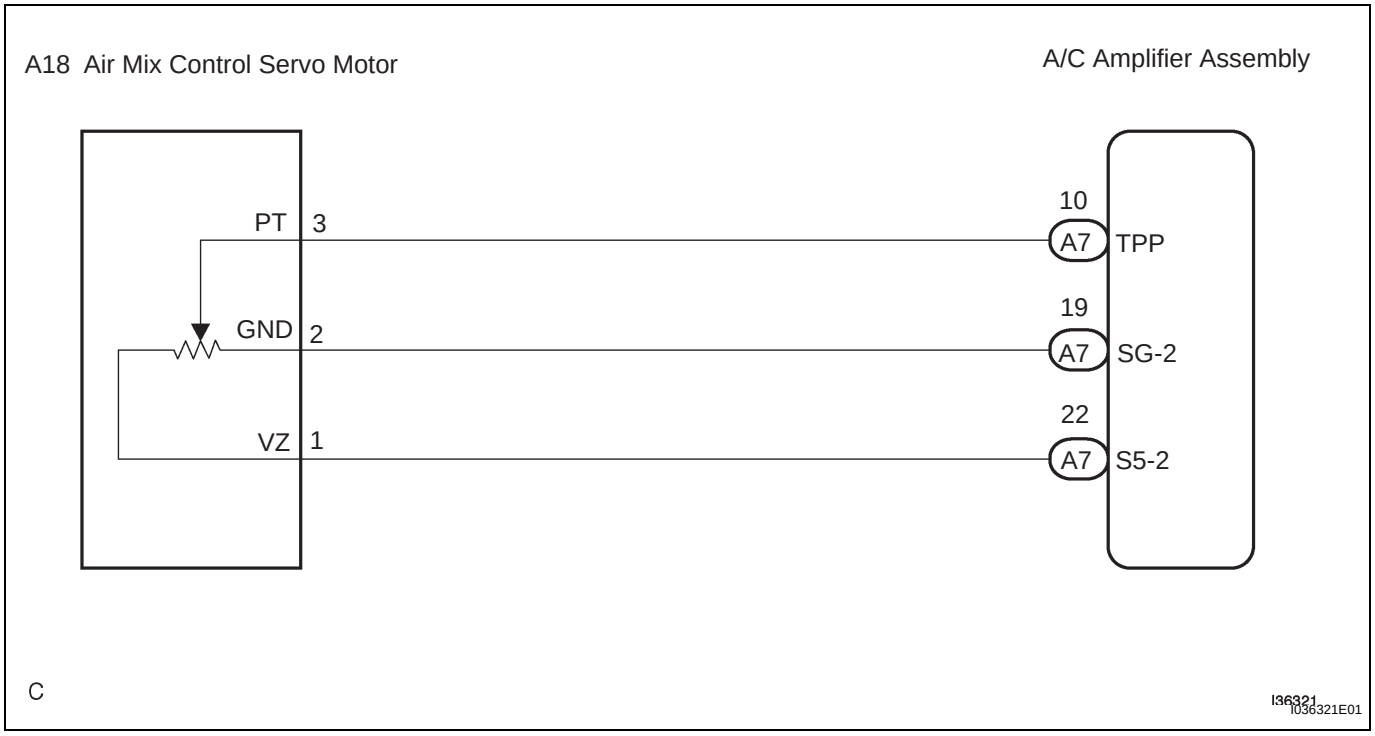
DESCRIPTION



This sensor detects the position of the air mix control servo motor (air mix damper) and sends the appropriate signals to the A/C amplifier assembly. The position sensor is built in the air mix control servo motor arm moves.
It outputs voltage (5 V) that is input to terminal 1 (VZ) and terminal 3 (PT) via the variable resistor, and then to the A/C amplifier assembly.
The A/C amplifier assembly reads the arm position with the input voltage from the position sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1431/31	Open or short in power source circuit in air mix damper position sensor circuit.	• Air mix control serv motor (air mix damper position sensor) • Harness and connector between air mix control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/M DAMP POS-P	Air mix damper position (Passenger side) / min.: -14% max.: 113.5%	Damper is at "MAX. COOL": -5% Damper is at "MAX. HOT": 105%	-
A/M DAMP TARG-P	Air mix damper target position (Passenger side) / min.: -14% max.: 113.5%		

OK:

The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

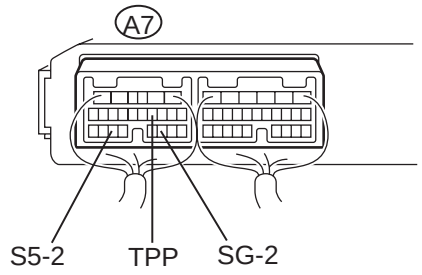
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2	INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



H

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(a) Remove the A/C amplifier assembly with the connectors still connected.
(b) Change the set temperature to activate the air mix servomotor.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-10 (TPP) - A7-19 (SG-2)	Ignition switch ON MAX. HOT position	0.82 to 0.88 V
A7-10 (TPP) - A7-19 (SG-2)	Ignition switch ON MAX. COOL position	4.12 to 4.18 V
A7-22 (S5-2) - A7-19 (SG-2)	Ignition switch ON	4.5 to 5.5 V
A7-22 (S5-2) - A7-19 (SG-2)	Ignition switch OFF	Below 1 V

HINT:
As the set temperature increases, the voltage decreases gradually without interruption.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

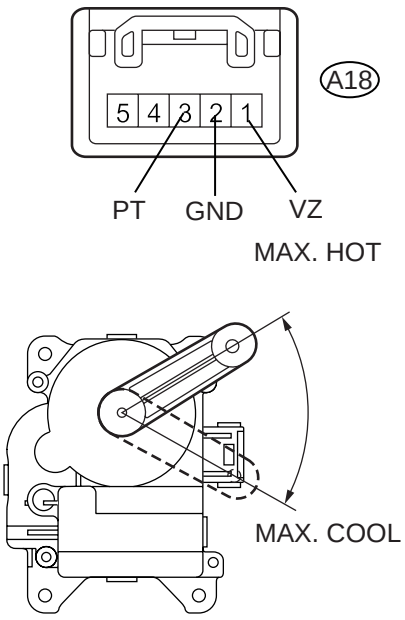
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

3 INSPECT AIR MIX CONTROL SERVO MOTOR

Air Mix Control Servo Motor Connector Front View:



H

E109236E03

(a) Remove the air mix control servo motor.
(b) Disconnect the connector from the air mix control servo motor.
(c) Measure the resistance according to the value(s) in the table below.

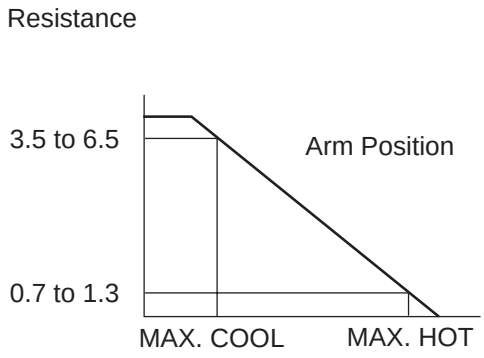
Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A18-1 (VZ) - A18-2 (GND)	Always	4.2 to 7.8 kΩ

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
A18-3 (PT) - A18-2 (GND)	MAX. COOL position	3.5 to 6.5 kΩ
A18-3 (PT) - A18-2 (GND)	MAX. HOT position	0.7 to 1.3 kΩ



H

E108925E03

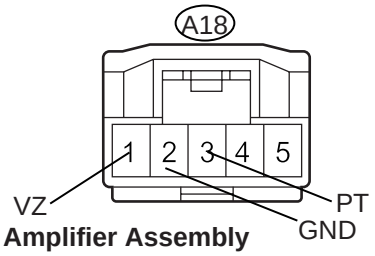
(e) As the air mix control servo motor moves from cool side to hot side, the resistance decreases gradually without interruption.
HINT:
For details regarding operation of the servo motor (See page AC-80).

NG → **REPLACE AIR MIX CONTROL SERVO MOTOR**

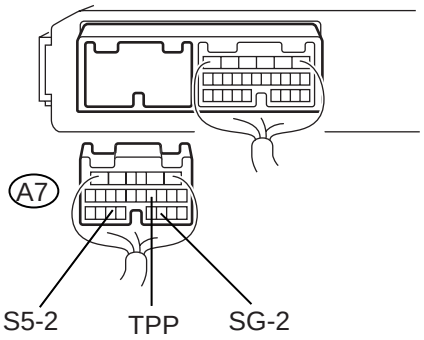
OK

4	CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)

Air Mix Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E09

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-10 (TPP) - A18-3 (PT)	Always	Below 1 Ω
A7-19 (SG-2) - A18-2 (GND)	Always	Below 1 Ω
A7-22 (S5-2) - A18-1 (VZ)	Always	Below 1 Ω
A7-10 (TPP) - Body ground	Always	10 kΩ or higher
A7-19 (SG-2) - Body ground	Always	10 kΩ or higher
A7-22 (S5-2) - Body ground	Always	10 kΩ or higher

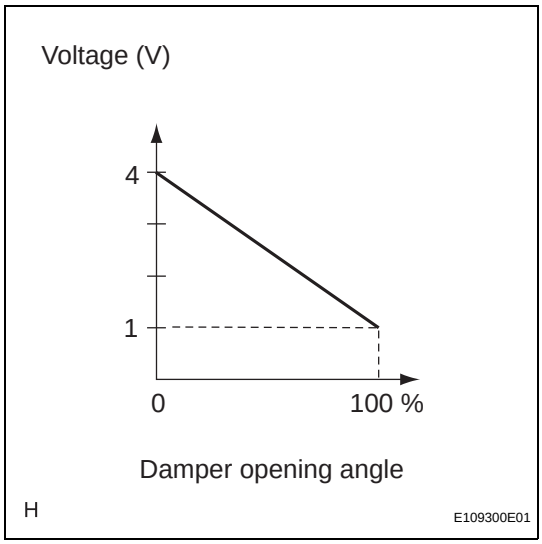
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1432/32	Air Inlet Damper Position Sensor Circuit

DESCRIPTION

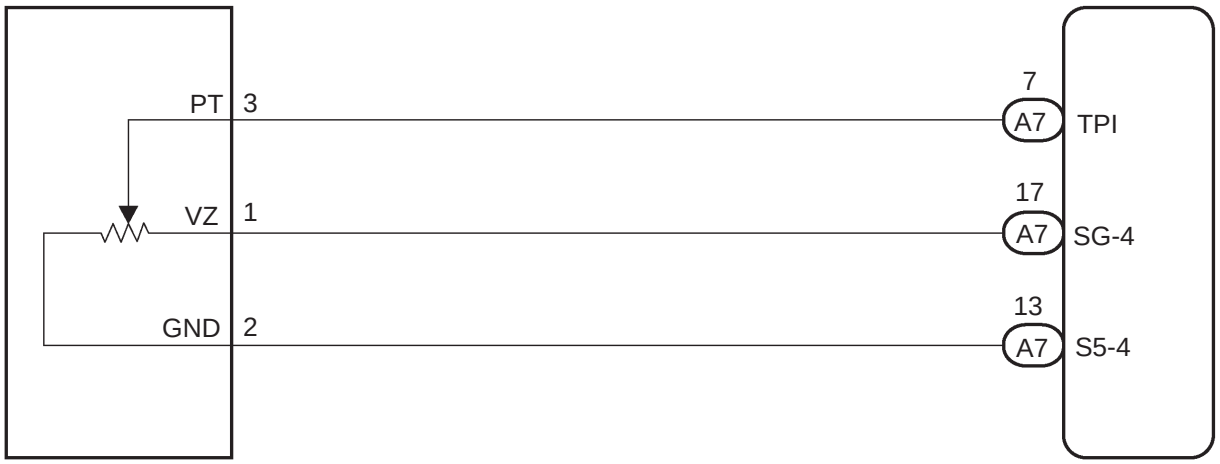


This sensor detects the position of the air inlet control servo motor and sends the appropriate signals to the A/C amplifier assembly. The position sensor is built in the air inlet control servo motor.
The position sensor's resistance changes as the air inlet control servo motor arm moves.
It outputs voltage (5 V) that is input to terminal 1 (VZ) and terminal 3 (PT) via the variable resister, and then to the A/C amplifier assembly.
The A/C amplifier reads the arm position with the input voltage from the position sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1432/32	Open or short in power source circuit in air inlet damper position sensor circuit	• Air inlet control servo motor (air inlet damper position sensor) • Harness or connector between air inlet control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM

A16 Air Inlet Control Servo Motor



C

I036321E11

AC

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/I DAMP POS	Air inlet damper position / min.: -14% max.: 113.5%	Damper is at "RECIRCULATION": -9% Damper is at "FRESH": 109% Damper is at "HALF-RECIRCULATION": 35 to 75%	Open in the circuit: 50.0%
A/I DAMP TARG	Air inlet damper target position / min.: -14% max.: 113.5%		

OK:

The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

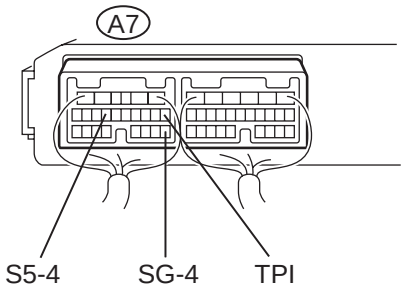
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



(a) Remove the A/C amplifier assembly with the connectors still connected.
(b) Change the set REC/FRS to activate the air inlet control servo motor.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-7 (TPI) - A7-17 (SG-4)	Ignition switch ON RECIRCULATION position	3.8 to 4.8 V
A7-7 (TPI) - A7-17 (SG-4)	Ignition switch ON FRESH position	0.2 to 1.2 V
A7-13 (S5-4) - A7-17 (SG-4)	Ignition switch ON	4.5 to 5.5 V
A7-13 (S5-4) - A7-17 (SG-4)	Ignition switch OFF	Below 1 V

HINT:
As the air inlet control servo motor is moved from REC side to FRS side, the voltage decreases gradually without interruption.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

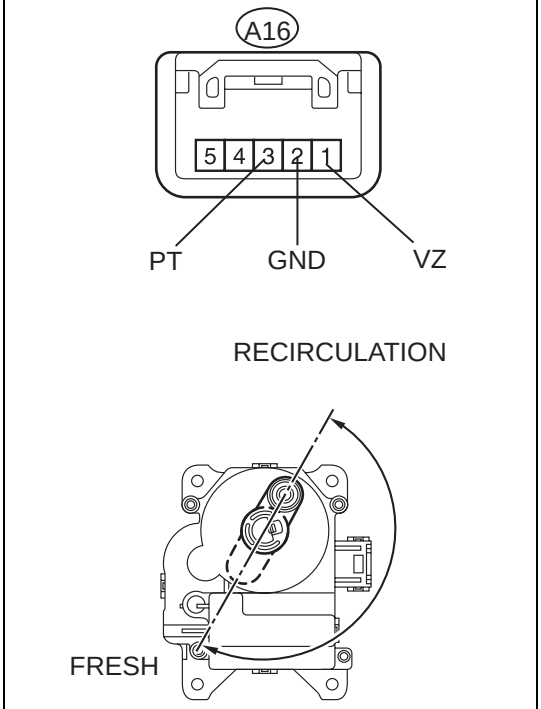
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

3 INSPECT AIR INLET CONTROL SERVO MOTOR

Air Inlet Control Servo Motor Connector Front View:



(a) Remove the air inlet control servo motor.
(b) Disconnect the connector from the air inlet control servo motor.
(c) Measure the resistance according to the value(s) in the table below.

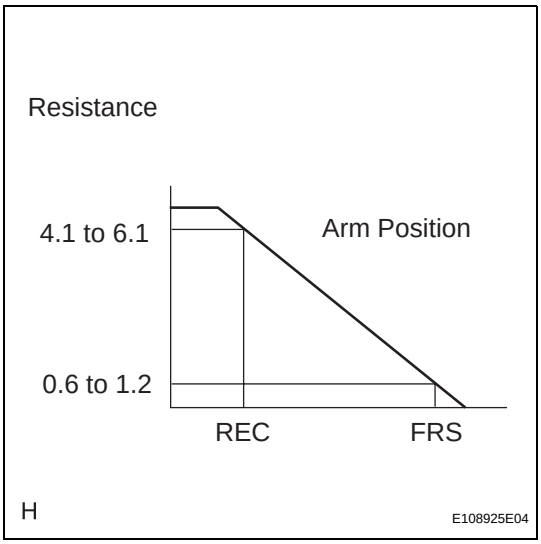
Standard resistance

Tester connection (Symbol)	Condition	Specified condition
A16-1 (VZ) - A16-2 (GND)	Always	4.2 to 7.8 kΩ

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A16-3 (PT) - A16-2 (GND)	RECIRCULATION position	4.1 to 6.1 kΩ
A16-3 (PT) - A16-2 (GND)	FRESH position	0.6 to 1.2 kΩ



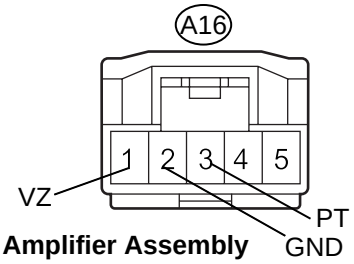
(e) As the air inlet control servo motor moves from fresh to recirculation, the resistance decreases gradually without interruption.
HINT:
For details regarding operation of the servo motor (See page AC-85).

NG → **REPLACE AIR INLET CONTROL SERVO MOTOR**

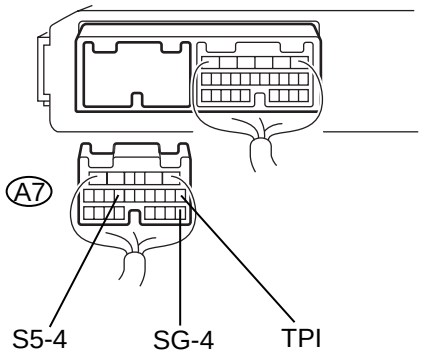
OK

4	CHECK HARNESS AND CONNECTOR (AIR INLET CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)

Air Inlet Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E10

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-7 (TPI) - A16-3 (PT)	Always	Below 1 Ω
A7-17 (SG-4) - A16-1 (VZ)	Always	Below 1 Ω
A7-13 (S5-4) - A16-2 (GND)	Always	Below 1 Ω
A7-7 (TPI) - Body ground	Always	10 kΩ or higher
A7-17 (SG-4) - Body ground	Always	10 kΩ or higher
A7-13 (S5-4) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

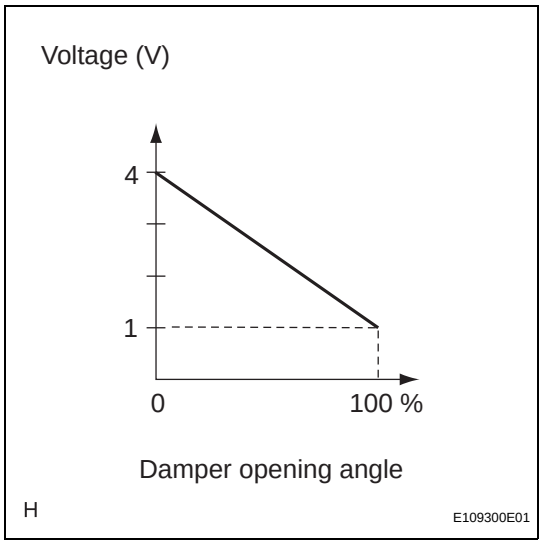
OK →

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC

DTC	B1433/33	Air Outlet Damper Position Sensor Circuit

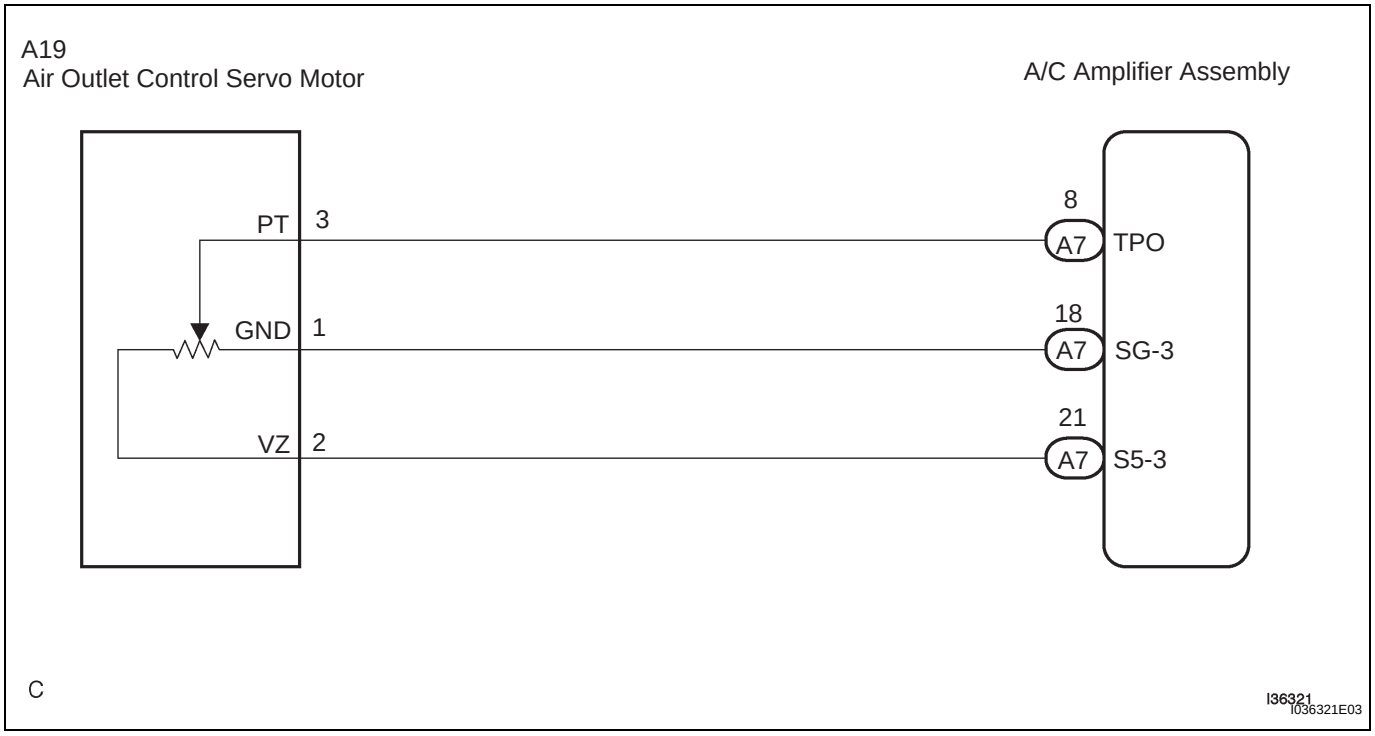
DESCRIPTION



This sensor detects the position of the air outlet control servo motor and sends the appropriate signals to the A/C amplifier assembly. The position sensor is built in the air outlet control servo motor. The potentiometer's resistance changes as the air outlet control servo motor arm moves.
It outputs voltage (5 V) that is input to terminal 2 (VZ) and terminal 3 (PT) via the variable resistor, and then to the A/C amplifier assembly. The A/C amplifier assembly reads the arm position with the input voltage from the position sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1433/33	Open or short in power source circuit in air outlet damper position sensor circuit.	• Air outlet control servo motor (air outlet damper position sensor) • Harness or connector between air outlet control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/O DAMP POS	Air outlet damper position / min.: -14% max.: 113.5%	Damper is at "FACE": 0% Damper is at "FACE/FOOT": 33.5% Damper is at "FOOT" (Manual): 53.5% Damper is at "FOOT" (Auto): 53.5% Damper is at "FACE/DEF": 73.5% Damper is at "DEF": 100%	Open in the circuit: 50.0%
A/O DAMP TARG	Air outlet damper target position / min.: -14% max.: 113.5%		

OK:
The display is as specified in the normal condition.

Result

Result	Proceed to
NG	**A**
OK (Checking from the PROBLEM SYMPTOM TABLE)	**B**
OK (Checking from the DTC)	**C**

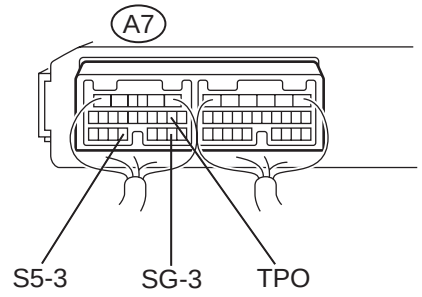
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2	INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



H

E109265E15

(a) Remove the A/C amplifier assembly with the connectors still connected.

(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-8 (TPO) - A7-18 (SG-3)	Ignition switch ON FACE position	3.97 to 4.03 V
A7-8 (TPO) - A7-18 (SG-3)	Ignition switch ON DEF position	0.97 to 1.03 V
A7-21 (S5-3) - A7-18 (SG-3)	Ignition switch ON	4.5 to 5.5 V
A7-21 (S5-3) - A7-18 (SG-3)	Ignition switch OFF	Below 1 V

HINT:

As the air outlet control servo motor is moved from the FACE side to DEF side, the voltage decreases gradually without interruption.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

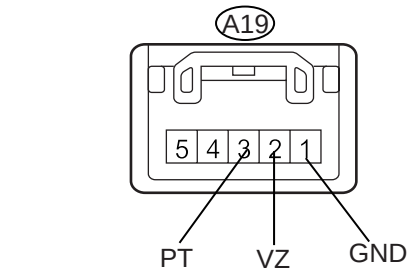
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

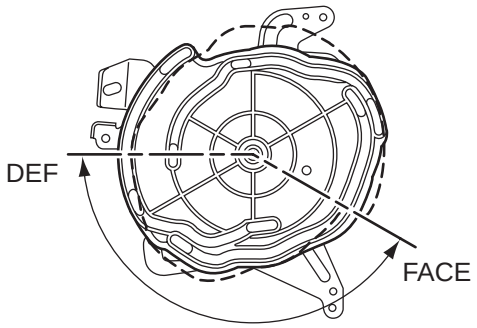
C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

3 INSPECT AIR OUTLET CONTROL SERVO MOTOR

Air Outlet Control Servo Motor Connector Front View:





H

E108927E03

(a) Remove the air outlet control servo motor.
(b) Disconnect the connector from the air outlet control servo motor.
(c) Measure the resistance according to the value(s) in the table below.

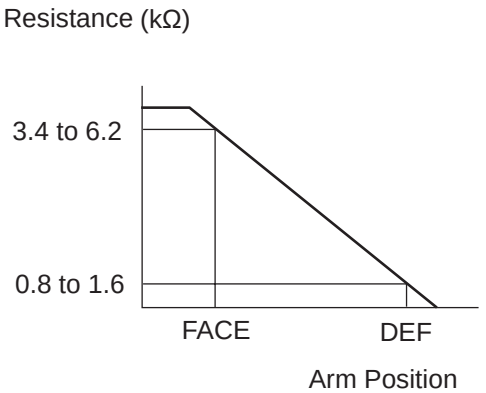
Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A19-2 (VZ) - A19-1 (GND)	Always	4.2 to 7.8 kΩ

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A19-3 (PT) - A19-1 (GND)	DEF position	0.8 to 1.6 kΩ
A19-3 (PT) - A19-1 (GND)	FACE position	3.4 to 6.2 kΩ



H

E108925E05

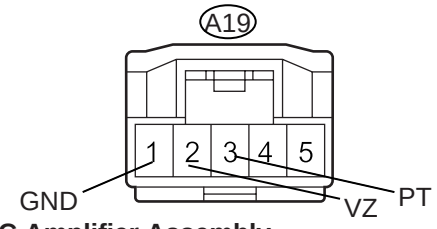
(e) As the air outlet control servo motor moved from the DEF side to FACE side, the resistance decreases gradually without interruption.
HINT:
For details regarding operation of the servo motor (See page AC-90).

NG → **REPLACE AIR INLET CONTROL SERVO MOTOR**

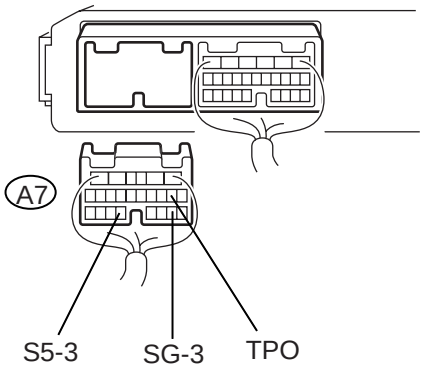
OK

4	**CHECK HARNESS AND CONNECTOR (AIR OUTLET CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)**

Air Outlet Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E11

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-8 (TPO) - A19-3 (PT)	Always	Below 1 Ω
A7-18 (SG-3) - A19-1 (GND)	Always	Below 1 Ω
A7-21 (S5-3) - A19-2 (VZ)	Always	Below 1 Ω
A7-8 (TPO) - Body ground	Always	10 kΩ or higher
A7-18 (SG-3) - Body ground	Always	10 kΩ or higher
A7-21 (S5-3) - Body ground	Always	10 kΩ or higher

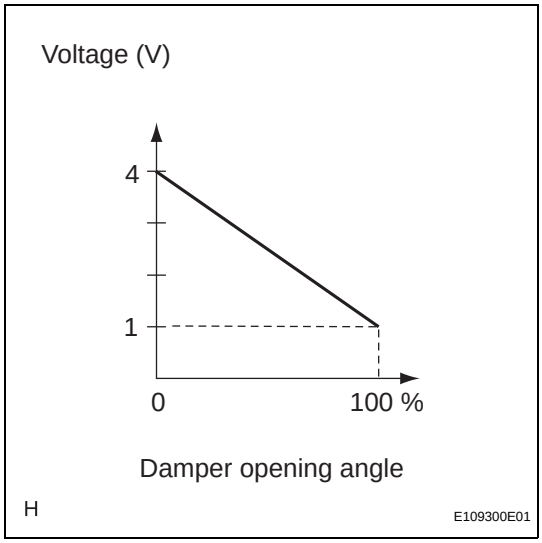
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1436/36	Air Mix Damper Position Sensor Circuit (Driver Side)

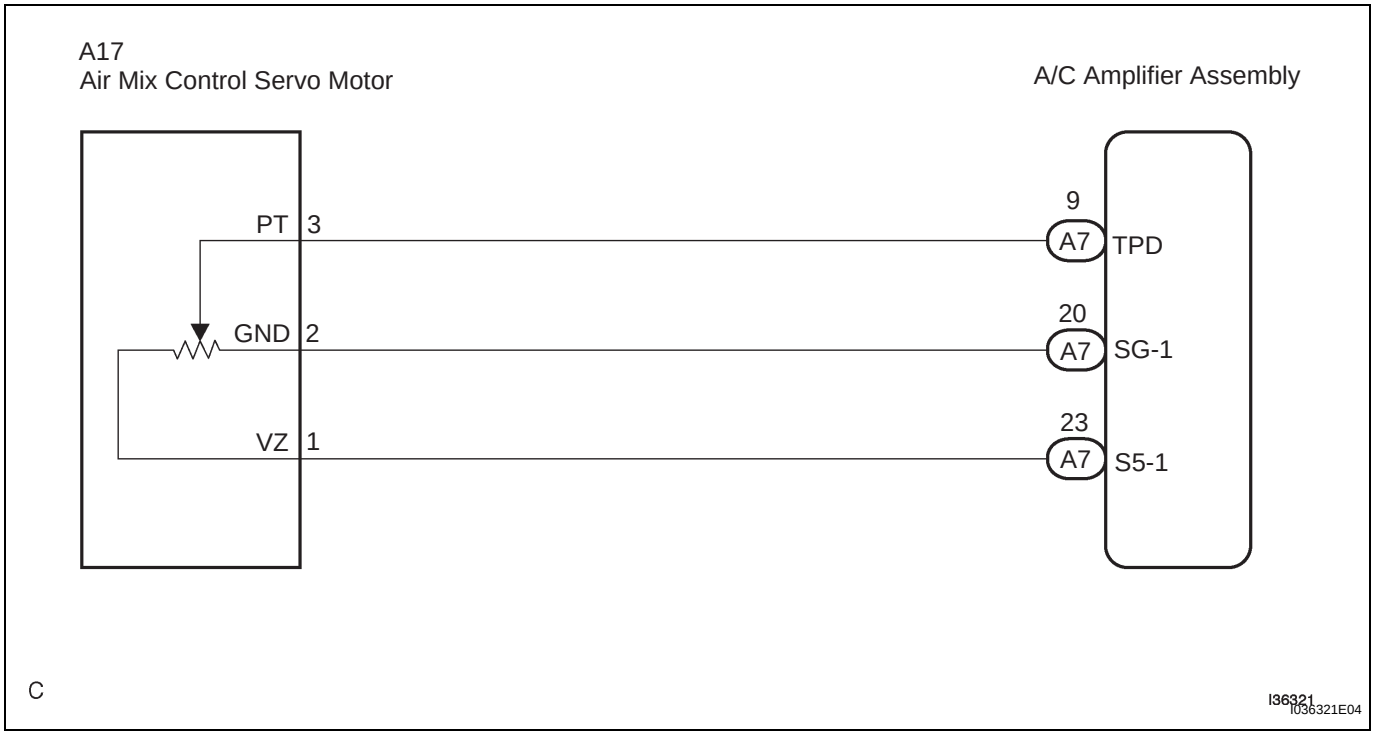
DESCRIPTION



This sensor detection the position of the air mix control servo motor (air outlet damper) and sends the appropriate signals to the A/C amplifier assembly. The position sensor is built in the air mix control servo motor. The position sensor resistance changes as the air mix control arm moves.
It outputs voltage (5 V) that is input to terminal 1 (VZ) and terminal 3 (PT) via the variable resistor, and then to the A/C amplifier assembly. The A/C amplifier assembly reads the arm position with the input voltage from the position sensor.

DTC No.	DTC Detecting Condition	Trouble Area
B1436/36	Open or short in power source circuit in air mix damper position sensor circuit.	• Air mix control servo motor (air mix damper position sensor) • Harness or connector between air mix control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



AC

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/M DAMP POS-D	Air mix damper position (Driver side) / min.: -14% max.: 113.5%	Damper is at "MAX. COOL": -5% Damper is at "MAX. HOT": 105%	-
A/M DAMP TARG-D	Air mix damper target position (Driver side) / min.: -14% max.: 113.5%		

OK:
The display is as specified in the normal condition.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

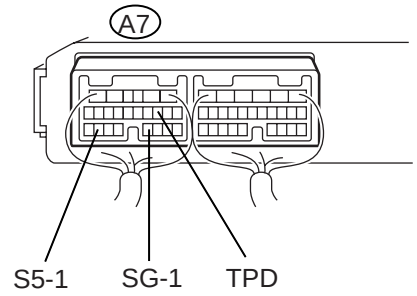
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



(a) Remove the A/C amplifier with the connectors still connected.
(b) Change the set temperature to activate the air mix control servo motor.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A7-9 (TPD) - A7-20 (SG-1)	Ignition switch ON MAX. HOT position	0.82 to 0.88 V
A7-9 (TPD) - A7-20 (SG-1)	Ignition switch ON MAX. COOL position	4.12 to 4.18 V
A7-23 (S5-1) - A7-20 (SG-1)	Ignition switch ON	4.5 to 5.5 V
A7-23 (S5-1) - A7-20 (SG-1)	Ignition switch OFF	Below 1 V

HINT:
As the set temperature increases, the voltage decreases gradually without interruption.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

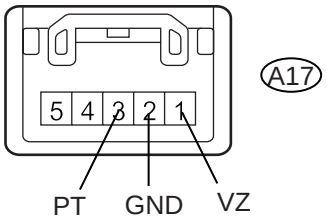
C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

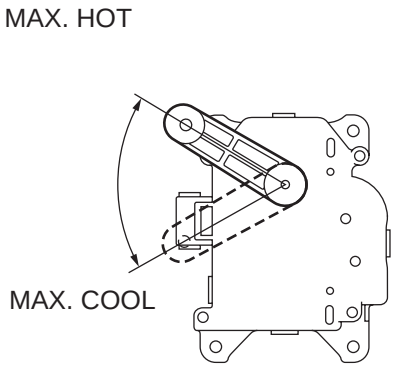
A

AC

3	INSPECT AIR MIX CONTROL SERVO MOTOR

Air Mix Control Servo Motor Connector Front View:





H

E109269E01

(a) Remove the air mix control servo motor.
(b) Disconnect the connector from the air mix control servo motor.
(c) Measure the resistance according to the value(s) in the table below.

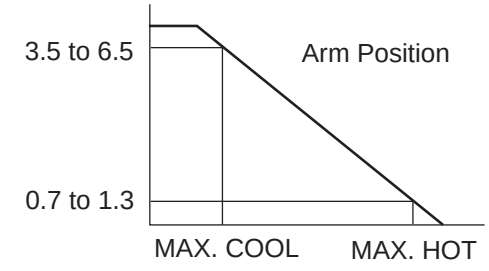
Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A17-1 (VZ) - A17-2 (GND)	Always	4.2 to 7.8 kΩ

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A17-3 (PT) - A17-2 (GND)	MAX. COOL position	3.5 to 6.5 kΩ
A17-3 (PT) - A17-2 (GND)	MAX. HOT position	0.7 to 1.3 kΩ



H

E108925E06

(e) As the air mix control servo motor moves from the COOL side to HOT side, the resistance decreases gradually without interruption.

HINT:

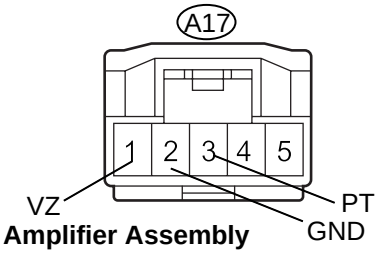
For details regarding operation of the servo motor (See page AC-95).

NG → **REPLACE AIR MIX CONTROL SERVO MOTOR**

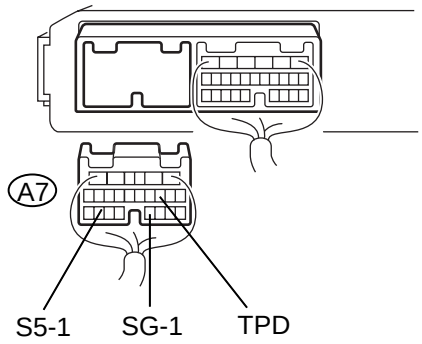
OK

4	CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)

Air Mix Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E12

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-9 (TPD) - A17-3 (PT)	Always	Below 1 Ω
A7-20 (SG-1) - A17-2 (GND)	Always	Below 1 Ω
A7-23 (S5-1) - A17-1 (VZ)	Always	Below 1 Ω
A7-9 (TPD) - Body ground	Always	10 kΩ or higher
A7-20 (SG-1) - Body ground	Always	10 kΩ or higher
A7-23 (S5-1) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC

DTC	B1441/41	Air Mix Damper Control Servomotor Circuit (Passenger Side)

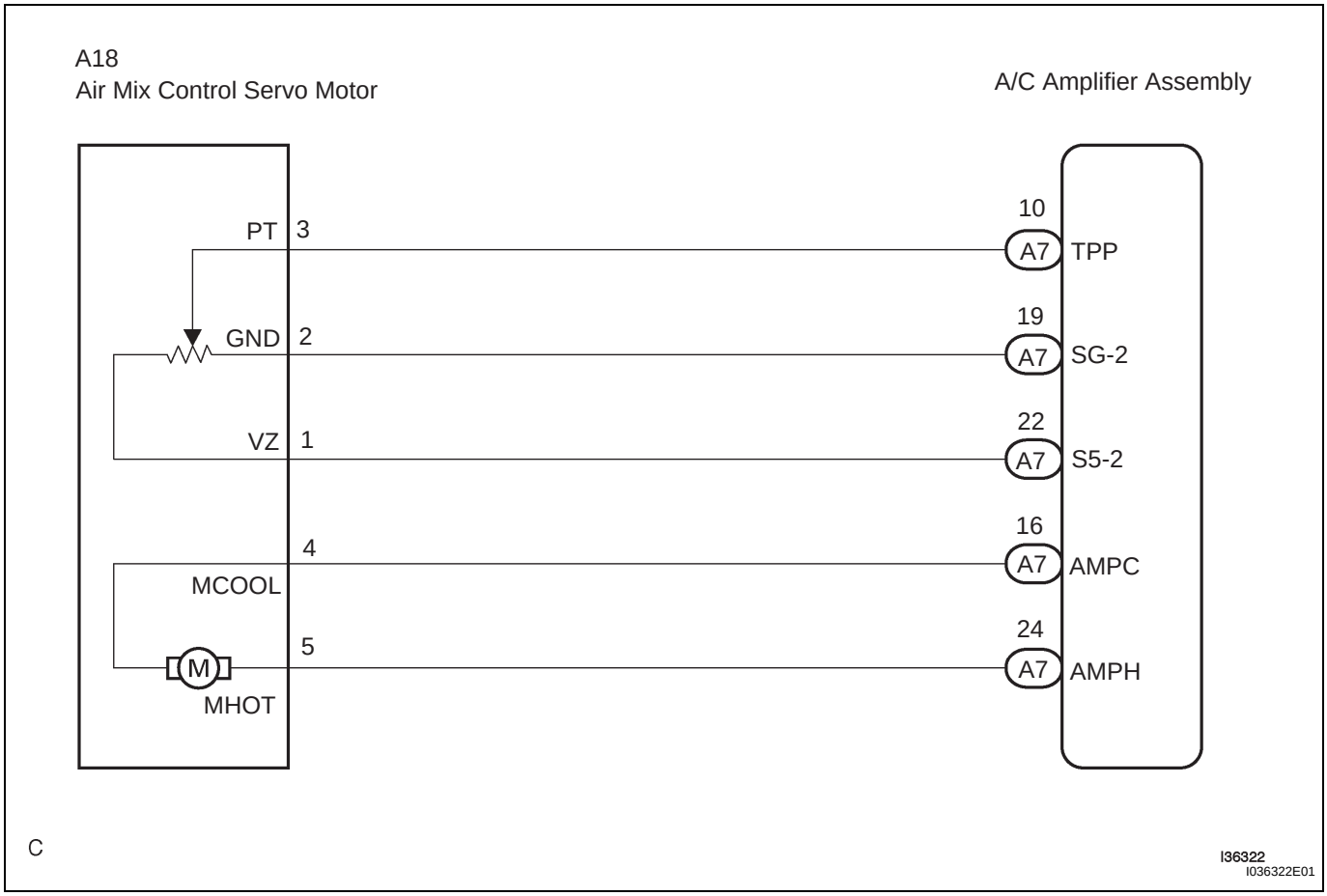
DESCRIPTION

The air mix control servo motor (air mix damper servo sub-assembly) is controlled by the A/C amplifier. The air mix control servo motor moves the air mix damper by rotating (normal, reverse) the motor with electrical power from the A/C amplifier assembly.
This adjusts the mix ratio of the air that passes through the evaporator and heater core and controls the air flow temperature. Air flow temperature changes when moving the air mix damper to the target point. The target point can be detected with the air mix damper position sensor.

AC

DTC No.	DTC Detecting Condition	Trouble Area
B1441/41	Air mix damper position sensor value does not change even if air conditioning amplifier assembly operates air mix control servo motor.	• Air mix control servo motor • Harness or connector between air mix control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.

(c) Select the item in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/M DAMP POS-P	Air mix damper position (Passenger side) / min.: -14% max.: 113.5%	Damper is at "MAX. COOL": -5% Damper is at "MAX. HOT": 105%	-
A/M DAMP TARG-P	Air mix damper target position (Passenger side) / min.: -14% max.: 113.5%		

OK:

When the target position is at the "MAX. COOL" (-5%), the actual opening angle is 19.0% or less.
When the target position is at the "MAX. HOT" (105%), the actual opening angle is 81.0% or more.

AC

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the air flow temperature by hand.

ACTIVE TEST / AIR CONDITIONER

Item	Test Details / Display (Range)	Diagnostic Note
AIR MIX DAMP-P	Air mix damper (Passenger side) / min.: -14% max.: 113.5%	-

OK:

When the lever is moved to the "MAX. HOT" side, warm air comes out.
When the lever is moved to the "MAX. COOL" side, cool air comes out.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

3	PERFORM ACTUATOR CHECK

AC

(a) Set the actuator check mode (See page AC-11).
(b) Press the UPDr switch and change to the step operation.
(c) Check the air flow temperature by hand.

Display Code	Air Mix Damper Operation
0	"COOL" side (-5%)
1	"COOL" side (-5%)
2	"COOL" side (-5%)
3	"COOL" side (-5%)
4	"COOL"/"HOT" (50.0% opened)
5	"COOL"/"HOT" (50.0% opened)
6	"COOL"/"HOT" (50.0% opened)
7	"HOT" side (105%)
8	"HOT" side (105%)
9	"HOT" side (105%)

OK:

Air flow temperature changes in accordance with each display code.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

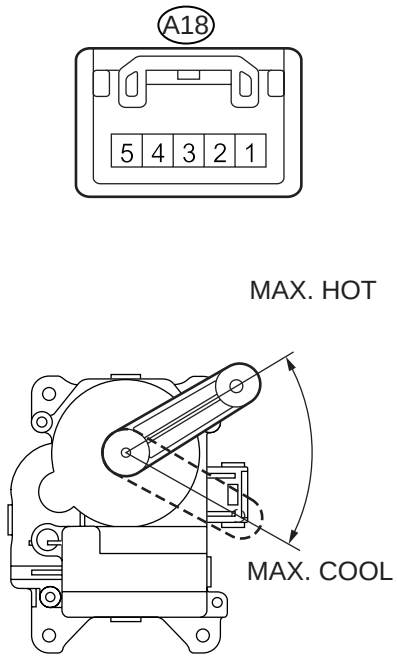
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

4	**INSPECT AIR MIX CONTROL SERVO MOTOR**

Air Mix Control Servo Motor Connector Front View:



(a) Remove the air mix control servo motor.
(b) Disconnect the connector from the air mix control servo motor.
(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that lever turns to "MAX. HOT" position smoothly.
OK:
Lever turns to "MAX. HOT" position smoothly.
(d) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that lever turns to "MAX. COOL" position smoothly.
OK:
Lever turns to "MAX. COOL" position smoothly.

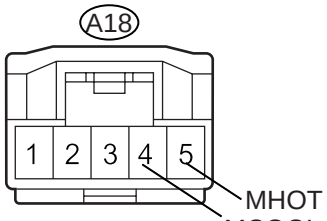
NG → **REPLACE AIR MIX CONTROL SERVO MOTOR**

OK

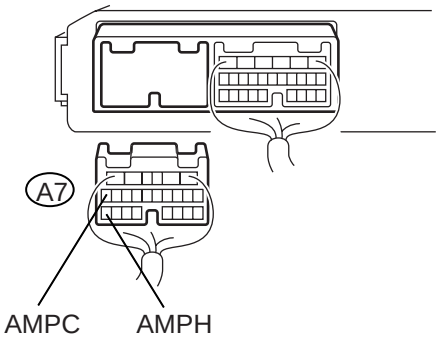
AC

5	**CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)**

Air Mix Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E13

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-16 (AMPC) - A18-4 (MCOOL)	Always	Below 1 Ω
A7-24 (AMPH) - A18-5 (MHOT)	Always	Below 1 Ω
A7-16 (AMPC) - Body ground	Always	10 kΩ or higher
A7-24 (AMPH) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1442/42	Air Inlet Damper Control Servo Motor Circuit

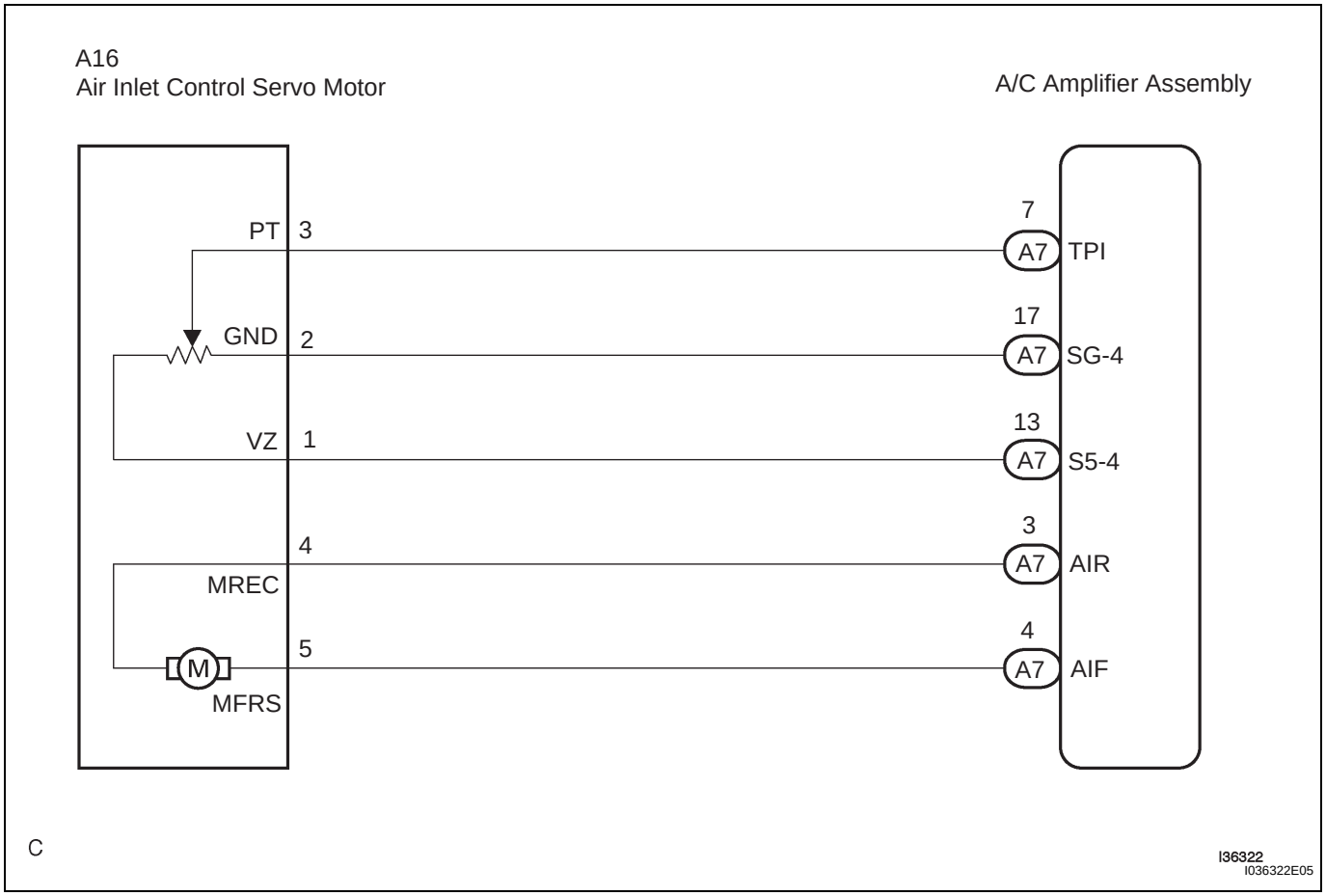
DESCRIPTION

The air inlet control servomotor is controlled by the A/C amplifier assembly and moves the air inlet control servo motor to the desired position.
The air inlet control servo motor switches between "RECIRCULATION" and "FRESH" by rotating the motor (normal, reverse) with electrical power from the A/C amplifier assembly. This controls intake air and switches "RECIRCULATION", "FRESH" and "HALF-RECIRCULATION".

DTC No.	DTC Detecting Condition	Trouble Area
B1442/42	Air inlet damper position sensor value does not change even if air conditioning amplifier assembly operates air inlet control servo motor.	• Air inlet control servo motor • Harness or connector between air inlet control servo motor and A/C amplifier assembly • A/C amplifier assembly

AC

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.

(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/I DAMP POS	Air inlet damper position / min.: -14% max.: 113.5%	Damper is at "RECIRCULATION": -9% Damper is at "HALF-RECIRCULATION": 35 to 75% Damper is at "FRESH": 109%	Open in the circuit: 50.0%
A/I DAMP TARG	Air inlet damper target position / min.: -14% max.: 113.5%		

OK:

When the target position is at the "RECIRCULATION" (-9%), the actual opening angle is 19.0% or less.
When the target position is at the "FRESH" (109%), the actual opening angle is 81.0% or more.

AC

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Remove the glove box to see and check the recirculation damper operation.
(b) Connect the intelligent tester to the DLC3.
(c) Turn the ignition switch ON and push the intelligent tester main switch on.
(d) Select the item below in the ACTIVE TEST and then check that the damper operates.

ACTIVE TEST / AIR CONDITIONER

Item	Test Details / Display (Range)	Diagnostic Note
A/I DAMP-LINEAR	Air inlet damper position (linear) / min.: -14% max.: 113.5%	-

OK:

Lever turns from "RECIRCULATION" side to "FRESH" side smoothly.
Lever turns from "FRESH" side to "RECIRCULATION" side smoothly.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

3 PERFORM ACTUATOR CHECK

(a) Remove the glove box to see and check the recirculation damper operation.
(b) Set the actuator check mode (See page AC-11).
(c) Press the UPDr switch in order and check the operation of recirculation damper.

Display Code	Recirculation damper position
0	FRESH (109%)
1	FRESH (109%)
2	R/F (50%)
3	RECIRCULATION (-9%)
4	FRESH (109%)
5	FRESH (109%)
6	FRESH (109%)
7	FRESH (109%)
8	FRESH (109%)
9	FRESH (109%)

OK:
Recirculation damper position changes in accordance with each display code.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

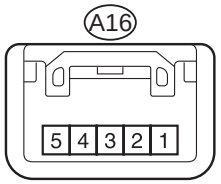
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

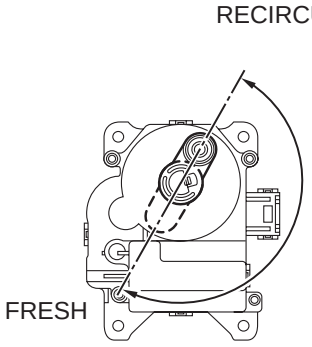
C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

4	**INSPECT AIR INLET CONTROL SERVO MOTOR**

Air Inlet Control Servo Motor Connector Front View:





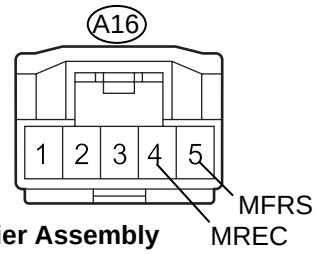
(a) Remove the damper air inlet control servo motor.
(b) Disconnect the connector from the air inlet control servo motor.
(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4 then check that the lever turns to "FRESH" position smoothly.
OK:
Lever turns to "FRESH" position smoothly.
(d) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5 then check that the lever turns to "RECIRCULATION" position smoothly.
OK:
Lever turns to "RECIRCULATION" position smoothly.

NG → **REPLACE AIR INLET CONTROL SERVO MOTOR**

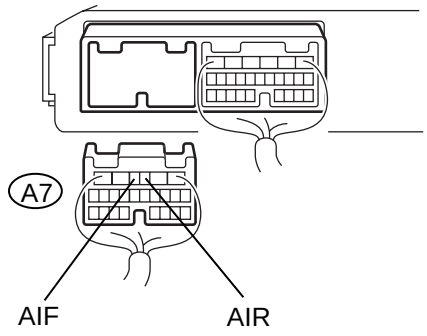
OK

5	CHECK HARNESS AND CONNECTOR (AIR INLET CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)

Air Inlet Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E14

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-3 (AIR) - A16-4 (MREC)	Always	Below 1 Ω
A7-4 (AIF) - A16-5 (MFRS)	Always	Below 1 Ω
A7-3 (AIR) - Body ground	Always	10 kΩ or higher
A7-4 (AIF) - Body ground	Always	10 kΩ or higher

AC

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1443/43	Air Outlet Damper Control Servo Motor Circuit

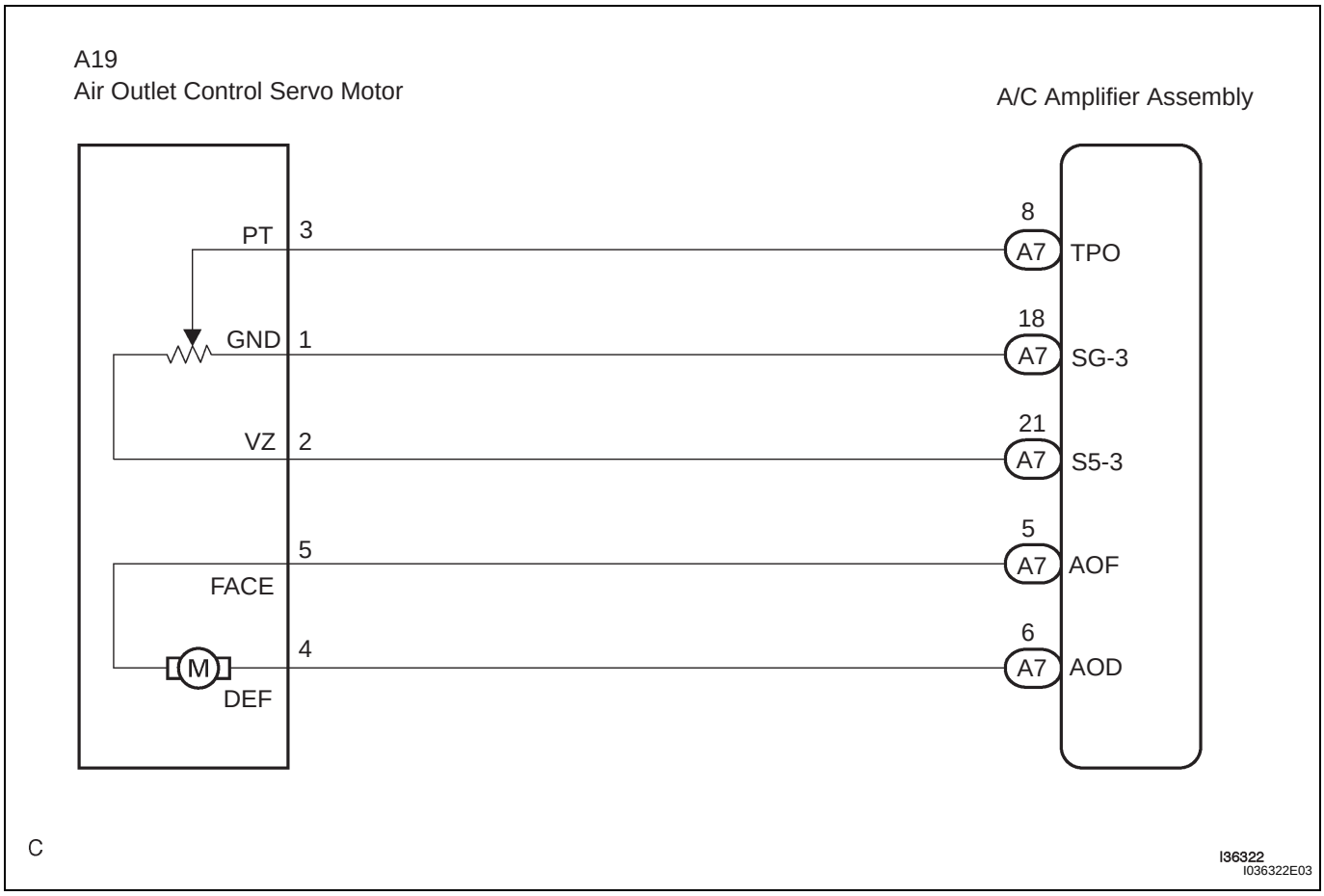
DESCRIPTION

This circuit turns the servo motor and changes each damper position by receiving the signals from the A/C amplifier assembly.
The air outlet damper servo switches the air outlet by rotating the motor (normal, reverse) with electrical power from the A/C amplifier assembly.
When the AUTO switch is on, the A/C amplifier assembly changes the mode between "FACE", "BI-LEVEL" and "FOOT" according to the temperature setting.

AC

DTC No.	DTC Detecting Condition	Trouble Area
B1443/43	Air outlet damper position sensor value does not change even if air conditioning amplifier assembly operated air outlet control servo motor.	• Air outlet control servo motor • Harness or connector between air outlet control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.

(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/O DAMP POS	Air outlet damper position / min.: -14% max.: 113.5%	Damper is at "FACE": 0% Damper is at "FACE/FOOT": 33.5% Damper is at "FOOT" (Manual): 53.5% Damper is at "FOOT" (Auto): 53.5% Damper is at "FACE/DEF": 73.5% Damper is at "DEF": 100%	Open in the circuit: 50.0%
A/O DAMP TARG	Air outlet damper target position / min.: -14% max.: 113.5%		

OK:

When the target position is at the "FACE" (0%), the actual opening angle is 19.0% or less.
When the target position is at the "DEF" (100%), the actual opening angle is 81.0% or more.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the air flow position by hand.

ACTIVE TEST / AIR CONDITIONER

Item	Test Details / Display (Range)	Diagnostic Note
A/O MODE DAMP-D	Air outlet damper position (Driver side) /min.: -14% max.: 113.5%	-

OK:

Air comes out from the selected air outlet.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

AC

B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

3 PERFORM ACTUATOR CHECK

AC

(a) Warm up the engine.
(b) Set the actuator check mode (See page AC-11).
(c) Press the UPDr switch and change to step operation.
(d) Press the UPDr switch and check the air flow by hand.

Display Code	Air flow condition
0	FACE (0%)
1	FACE (0%)
2	FACE (0%)
3	FACE (0%)
4	B/L (33.5%)
5	FOOT (AUTO) (53.5%)
6	FOOT (MANUAL) (53.5%)
7	FOOT (MANUAL) (53.5%)
8	F/D (73.5%)
9	DEF (100%)

OK:
Air flow position changes in accordance with each display code.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)	C

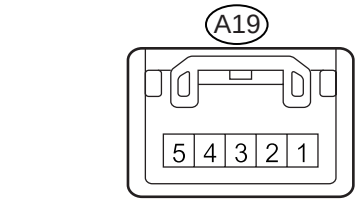
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

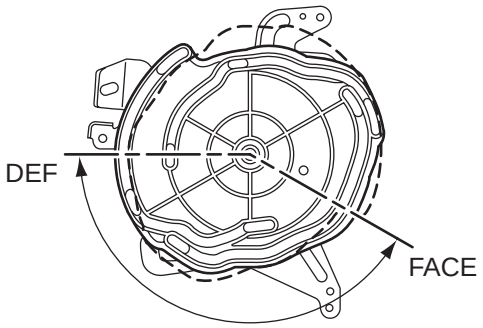
C → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

A

4	**INSPECT AIR OUTLET CONTROL SERVO MOTOR**

Air Outlet Control Servo Motor Connector Front View:





H

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(a) Remove the air outlet control servo motor.
(b) Disconnect the connector from the air outlet control servo motor.
(c) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5 then check that the lever turns to "DEF" position smoothly.
OK:
Lever turns to "DEF" position smoothly.
(d) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4 then check that the lever turn to "FACE" position smoothly.
OK:
Lever turns to "FACE" position smoothly.

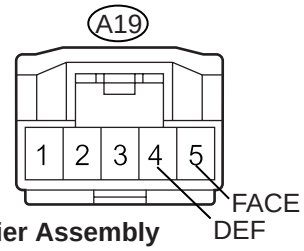
NG → **REPLACE AIR OUTLET CONTROL SERVO MOTOR**

OK

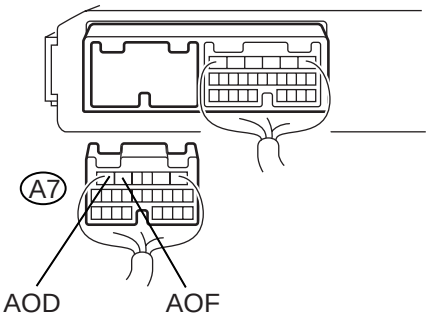
AC

5	CHECK HARNESS AND CONNECTOR (AIR OUTLET CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)

Air Outlet Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E15

(a) Disconnect the connector from the A/C amplifier assembly.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-5 (AOF) - A19-5 (FACE)	Always	Below 1 Ω
A7-6 (AOD) - A19-4 (DEF)	Always	Below 1 Ω
A7-5 (AOF) - Body ground	Always	10 kΩ or higher
A7-6 (AOD) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

DTC	B1446/46	Air Mix Damper Control Servomotor Circuit (Driver Side)

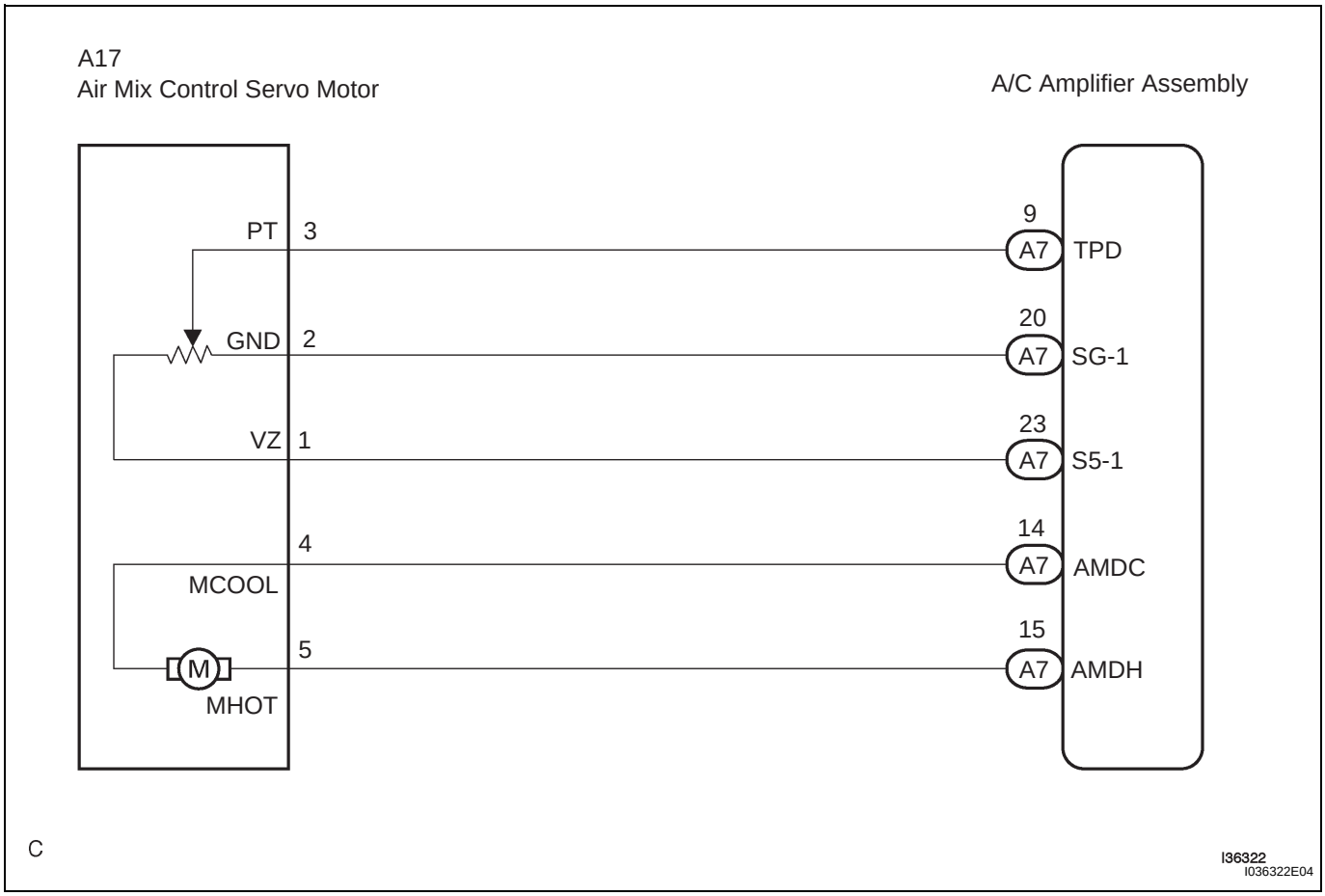
DESCRIPTION

The air mix control servo motor (air mix damper servo sub-assembly) is controlled by the A/C amplifier assembly.
The air mix control servo motor moves the air mix damper by rotating (normal, reverse) the motor with electrical power from the A/C amplifier assembly.
This adjusts the mix ratio of the air that passes through the evaporator and heater core and controls the air flow temperature. Air flow temperature changes when moving the air mix damper to the target point. The target point can be detected with the air mix damper position sensor.

AC

DTC No.	DTC Detecting Condition	Trouble Area
B1446/46	Air mix damper position sensor value does not change even if air conditioning amplifier assembly operates air mix control servo motor.	• Air mix control servo motor • Harness or connector between air mix control servo motor and A/C amplifier assembly • A/C amplifier assembly

WIRING DIAGRAM



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.

(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/M DAMP POS-D	Air mix damper position (Driver side) / min.: -14% max.: 113.5%	Damper is at "MAX. COOL": -5% Damper is at "MAX. HOT": 105%	-
A/M DAMP TARG-D	Air mix damper target position (Driver side) / min.: -14% max.: 113.5%		

OK:

When the target position is at the "MAX. COOL" (-5%), the actual opening angle is 19.0% or less.
When the target position is at the "MAX. HOT" (105%), the actual opening angle is 81.0% or more.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

2 PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the air flow temperature by hand.

ACTIVE TEST / AIR CONDITIONER

Item	Test Details / Display (Range)	Diagnostic Note
AIR MIX DAMP-D	Air mix damper (Driver side) /min.: -14% max.: 113.5%	-

OK:

When the lever is moved to the "MAX. HOT" side, warm air comes out.
When the lever is moved to the "MAX. COOL" side, cool air comes out.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

3 PERFORM ACTUATOR CHECK

(a) Set the actuator check mode (See page AC-11).
(b) Press the DEF switch and change to the step operation.
(c) Check the air flow temperature by hand.

Display Code	Air Mix Damper Operation
0	"COOL" side (-5%)
1	"COOL" side (-5%)
2	"COOL" side (-5%)
3	"COOL" side (-5%)
4	"COOL"/"HOT" (50% opened)
5	"COOL"/"HOT" (50% opened)
6	"COOL"/"HOT" (50% opened)
7	"HOT" side (105%)
8	"HOT" side (105%)
9	"HOT" side (105%)

OK:
Air flow temperature changes in accordance with each display code.

Result

Result	Proceed to
NG	A
OK (Checking from the PROBLEM SYMPTOM TABLE)	B
OK (Checking from the DTC)	C

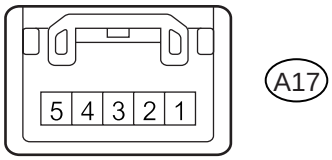
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

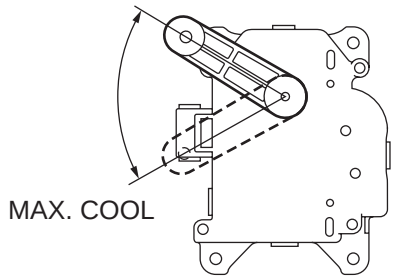
C → REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

A

4	INSPECT AIR MIX CONTROL SERVO MOTOR

Air Mix Control Servo Motor Connector Front View:





H

E109269E03

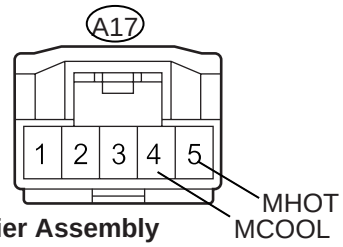
(a) Remove the air mix control servo motor.
(b) Disconnect the connector from the air mix control servo motor.
(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "MAX. HOT" position smoothly.
OK:
Lever turns to "MAX. HOT" position smoothly.
(d) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "MAX. COOL" position smoothly.
OK:
Lever turns to "MAX. COOL" position smoothly.

NG → **REPLACE AIR MIX CONTROL SERVO MOTOR**

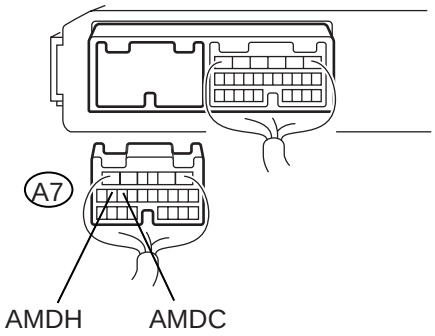
OK

5	**CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVO MOTOR - A/C AMPLIFIER ASSEMBLY)**

Air Mix Control Servo Motor Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109216E16

(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A7-14 (AMDC) - A17-4 (MCOOL)	Always	Below 1 Ω
A7-15 (AMDH) - A17-5 (MHOT)	Always	Below 1 Ω
A7-14 (AMDC) - Body ground	Always	10 kΩ or higher
A7-15 (AMDH) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC

DTC B1499/99 Multiplex Communication Circuit

DESCRIPTION

DTC No.	DTC Detecting Condition	trouble Area
B1499/99	Open in multiplex communication circuit	• Multiplex communication system

1 CHECK DIAGNOSTIC TROUBLE CODE (DTC B1499/99)

(a) Clear the DTC (See page AC-18).
(b) Read the DTC (See page AC-18).

Result

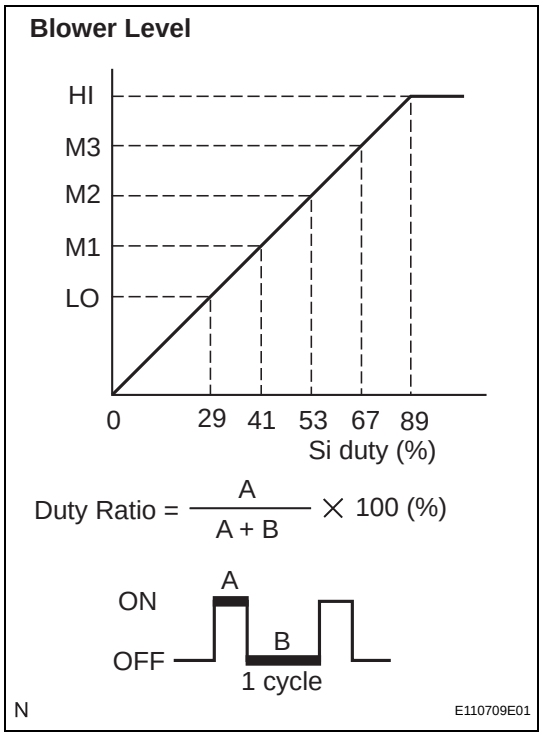
Result	Proceed to
DTC (B1499/99) is not output	A
DTC (B1499/99) is output	B

B → GO TO MULTIPLEX COMMUNICATION SYSTEM

A → SYSTEM OK

Blower Motor Circuit

DESCRIPTION

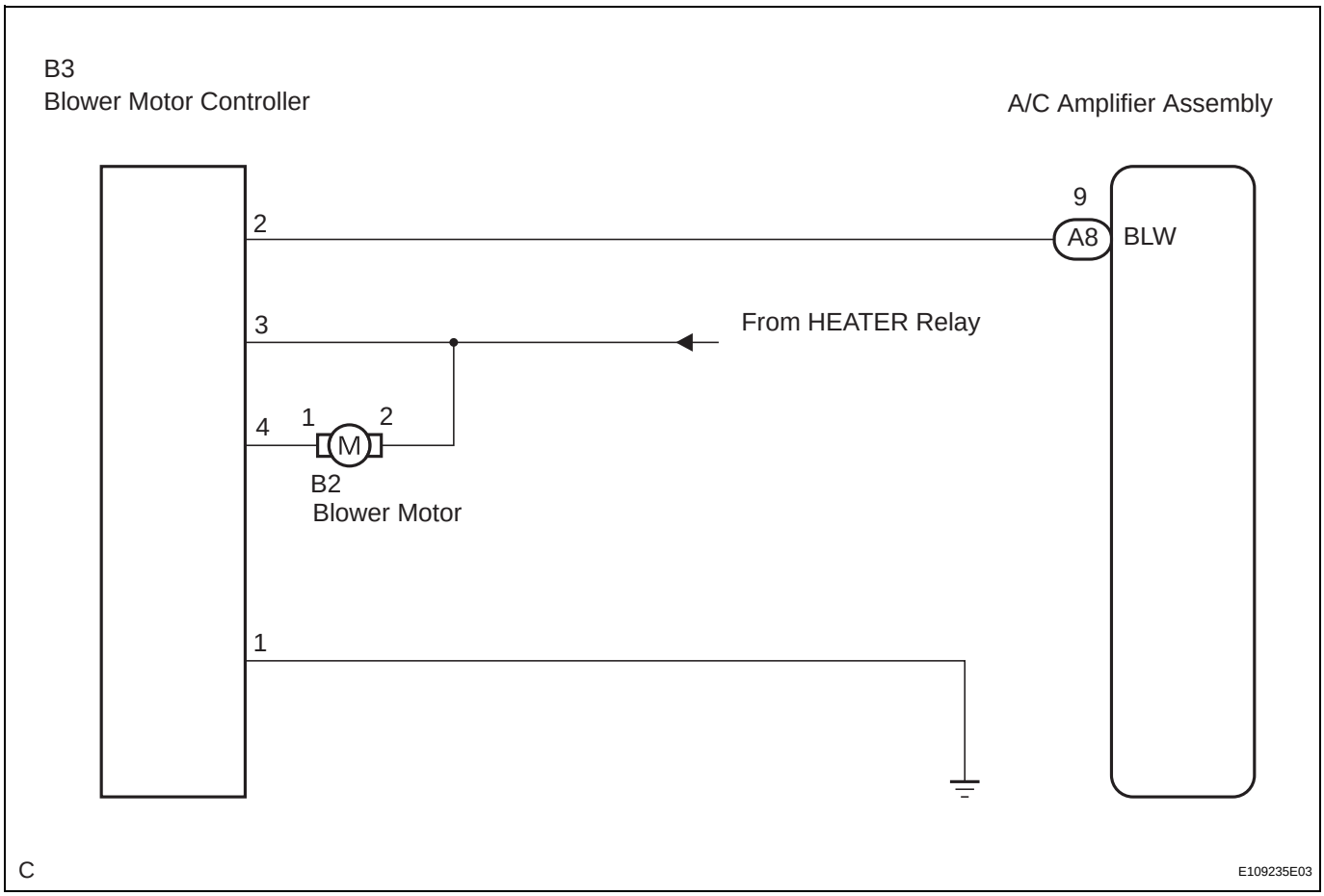


The blower motor is operated by signals from the A/C amplifier assembly. Blower motor speed signals are transmitted by changes in the duty ratio.

Duty Ratio:

The duty ratio is the ratio of the period of continuity in one cycle. For example, A is the period of continuity in one cycle, and B is the period of non-continuity.

WIRING DIAGRAM



AC

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the DATA LIST, and read the display on the intelligent tester.

DATA LIST / AIR CONDITIONER

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
BLOWER LEVEL	Blower motor speed level / min.: Level 0 max.: Level 31	Changes depending on blower level	-

OK:
The display is as specified in the normal condition.

NG → **Go to step 2**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

2	PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the blower motor operates.

ACTIVE TEST / AIR CONDITIONER

Item	Test Details / Display (Range)	Diagnostic Note
BLOWER MOTOR	Blower motor / min.: Level 0 max.: Level 31	-

AC

OK:
Blower motor operates and blower level changes.

NG → **Go to step 3**

OK →

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3	PERFORM ACTUATOR CHECK

(a) Set the actuator check mode (See page AC-11).
(b) Press the blower switch to change to the step operation.
(c) Check for air flow level by hand.

Display Code	Blower Level
0	0
1	1
2	17
3	17
4	17
5	17
6	17
7	17
8	17
9	31

OK:
Blower level changes in accordance with each display code.

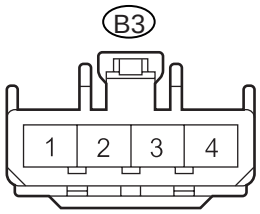
NG → **Go to step 4**

OK →

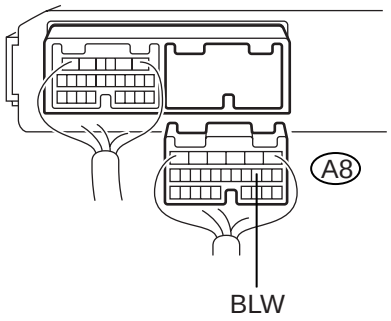
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

4	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR CONTROLLER - A/C AMPLIFIER ASSEMBLY)

Blower Motor Controller Connector Front View:



A/C Amplifier Assembly Connector Wire Harness View:



H

E109229E02

(a) Disconnect the connector from the A/C amplifier assembly and blower motor controller.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

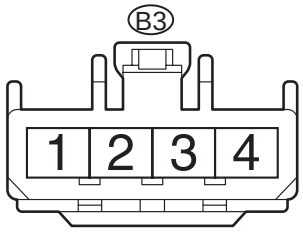
Tester connection (Symbols)	Condition	Specified condition
A8-9 (BLW) - B3-2	Always	Below 1 Ω
A8-9 (BLW) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR CONTROLLER - BODY GROUND)

Blower Motor Controller Connector Front View:



N

E108934E02

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance

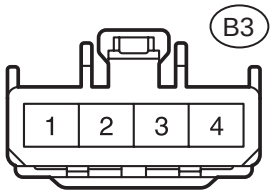
Tester connection	Condition	Specified condition
B3-1 - Body ground	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

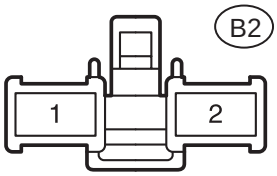
OK

6	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR CONTROLLER - BLOWER MOTOR)

Blower Motor Controller Connector Front View:



Blower Motor Connector Front View:



P E109238E01

(a) Disconnect the connector from the blower motor.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
B2-2 - Body ground	Ignition switch ON Blower switch: ON	10 to 14 V
B3-3 - Body ground	Ignition switch ON Blower switch: ON	10 to 14 V
B2-2 - Body ground	Ignition switch ON Blower switch: OFF	Below 1 V
B3-3 - Body ground	Ignition switch ON Blower switch: OFF	Below 1 V

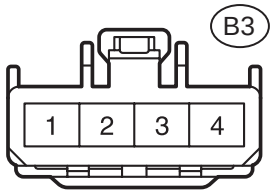
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

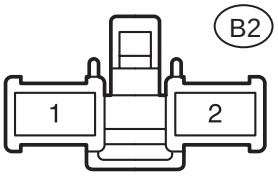
AC

7	CHECK HARNESS AND CONNECTOR (BLOWER MOTOR CONTROLLER - BLOWER MOTOR)

Blower Motor Controller Connector Front View:



Blower Motor Connector Front View:



P E109238E01

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance

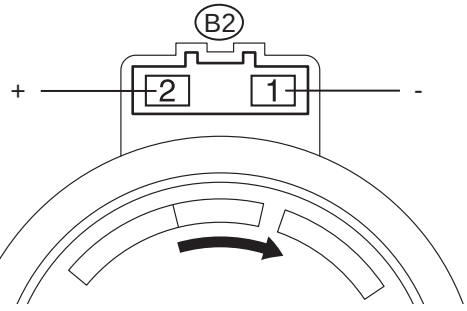
Tester connection	Condition	Specified condition
B2-1 - B3-4	Always	Below 1 Ω
B2-1 - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

8	INSPECT COOLING UNIT MOTOR SUB-ASSEMBLY W/FAN

Blower Motor Connector Front View:



N E108935E02

(a) Remove the cooling unit motor sub-assembly w/ fan.
(b) Connect the negative (-) lead to terminal 1 of blower motor connector, and the positive (+) lead to terminal 2.

OK:

Blower motor operates smoothly.

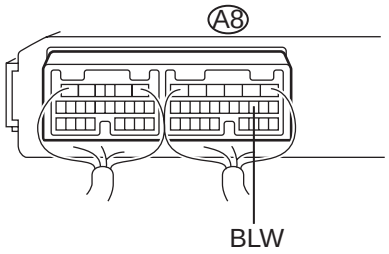
NG → **REPLACE COOLING UNIT MOTOR SUB-ASSEMBLY W/FAN**

OK

9	INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

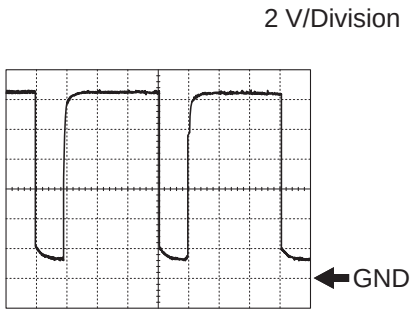
(a) Reconnect the connector to the A/C amplifier assembly.

A/C Amplifier Assembly Connector Wire Harness View:



H E109265E18

(b) Remove the A/C amplifier assembly with the connectors still connected.
(c) Turn the ignition switch ON.
(d) Blower speed control switch is at "LO" position.



P E108906E13

(e) Measure the waveform between terminal BLW (A8-9) of the A/C amplifier assembly and body ground.
OK:
Waveform appears as shown in the illustration.
HINT:
Waveform cycle varies with the blower level.

NG → **REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY**

OK

REPLACE BLOWER MOTOR CONTROLLER

AC

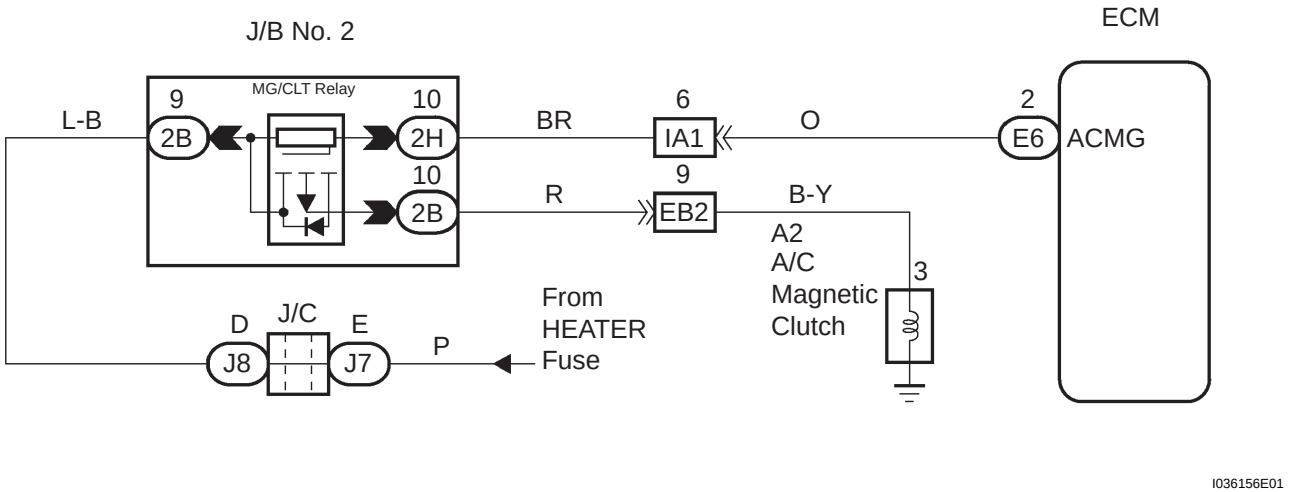
Compressor Circuit

DESCRIPTION

The air conditioning amplifier outputs the magnetic clutch ON signal from the MPX terminal to the ECM which receives this signal. It then sends the signal from the ACMG terminal and switches the magnetic clutch relay on, thus turning on the magnetic clutch.

WIRING DIAGRAM

AC



1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch ON.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.

ALL

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
A/C SIG	A/C signal / ON or OFF	A/C ON: ON	-

NG → **Go to step 7**

OK

2	PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Connect the intelligent tester to DLC3.
(b) Turn the ignition switch ON and push the intelligent tester main switch ON.
(c) Select the item below in the ACTIVE TEST and then check that the relay operates.

AC:

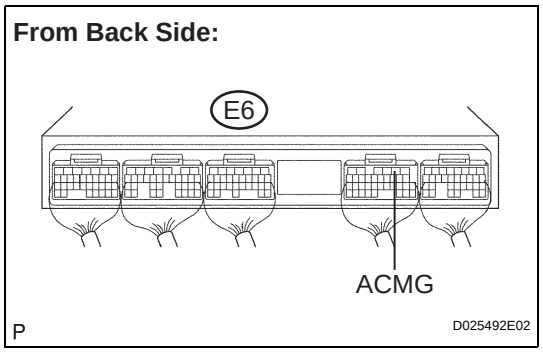
Item	Test Details / Display (Range)	Diagnostic Note
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	-

NG → Go to step 3

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3 INSPECT ECM (ACMG - BODY GROUND)



(a) Remove the ECM with connectors still connected.
(b) Start the engine and push the AUTO switch.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
E6-2 (ACMG) - Body ground	A/C switch OFF	11 to 14 V
E6-2 (ACMG) - Body ground	A/C switch ON	Below 1 V

Result

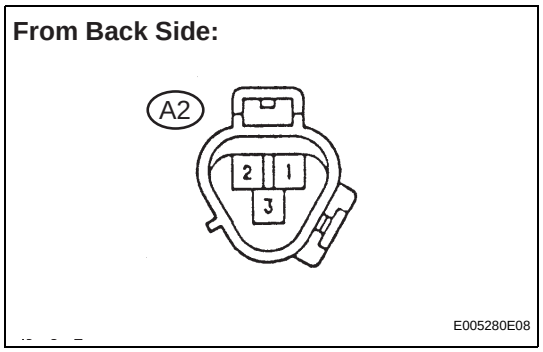
Condition	Proceed to
OK	A
NG (Always 11 to 14 V)	B
NG (Always below 1.0 V)	C

B → REPLACE ECM

C → Go to step 10

A

4 INSPECT MAGNETIC CLUTCH ASSEMBLY



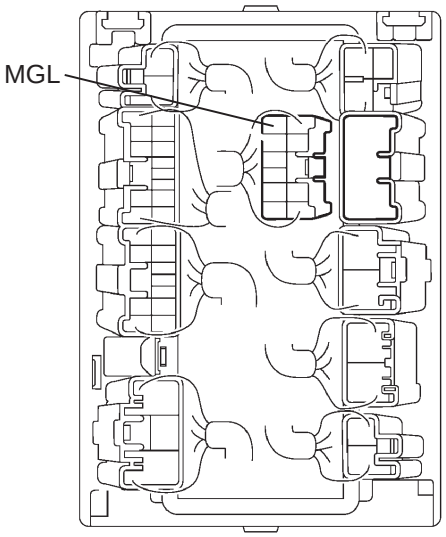
(a) Disconnect the connector from the magnet clutch assembly.
(b) Connect the positive (+) lead from the battery to terminal 3 and negative (-) lead to terminal body ground, then check that the magnetic clutch assembly is engaged.

NG → REPLACE MAGNET CLUTCH ASSEMBLY

OK

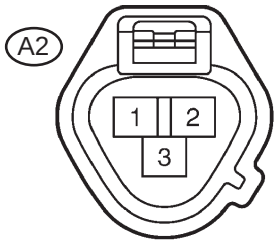
5	**CHECK HARNESS AND CONNECTOR (MAGNETIC CLUTCH ASSEMBLY - ENGINE ROOM JUNCTION BLOCK)**

Wire Harness Side:



(a) Disconnect the connector from the engine room junction block.

Wire Harness Side:



(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

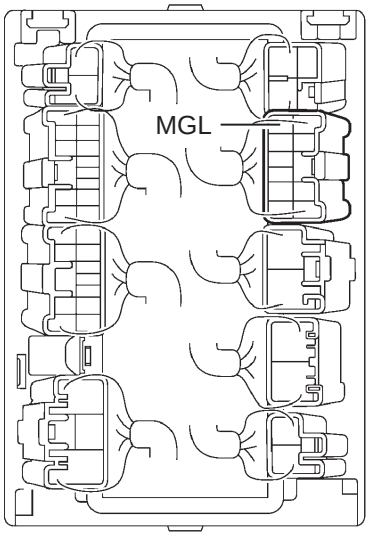
Tester connection	Condition	Specified condition
2B-10 (MGL) - A2-3	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

6	INSPECT ENGINE ROOM JUNCTION BLOCK (MGL - BODY GROUND)

From Back Side:



(a) Start the engine and push AUTO switch.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
2B-10 (MGL) - Body ground	AUTO switch ON	11 to 14 V

AC

NG → **REPLACE ENGINE ROOM JUNCTION BLOCK**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

7	CONFIRM MODEL

Result:

A:
w/o LEXUS Navigation System

B:
w/ LEXUS Navigation System

B → **Go to step 9**

A

8	REPLACE AIR CONDITIONING AMPLIFIER

NG → **REPLACE CENTER CLUSTER INTEGRATION SWITCH ASSEMBLY**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

9	REPLACE AIR CONDITIONING AMPLIFIER

NG → REPLACE MULTI-DISPLAY ASSEMBLY

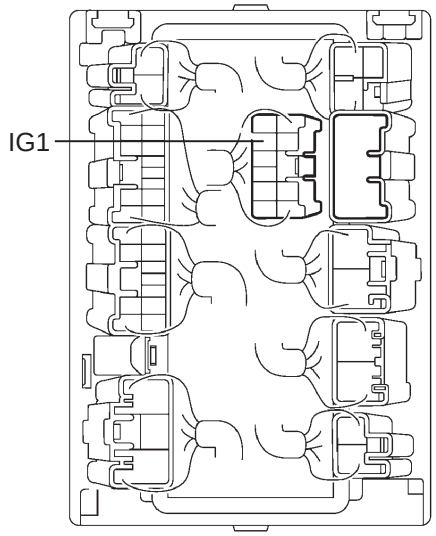
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

AC

10	INSPECT ENGINE ROOM JUNCTION BLOCK (IG1 - BODY GROUND)

Wire Harness Side:



(a) Disconnect the connector.
(b) Measure the voltage according to the value(s) in the table below.

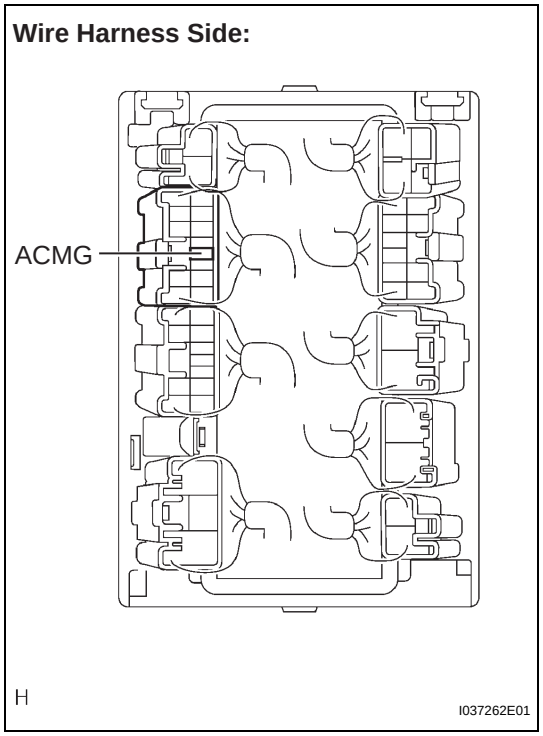
Standard voltage

Tester connection	Condition	Specified condition
2B-9 (IG1) - Body ground	Always	11 to 14 V

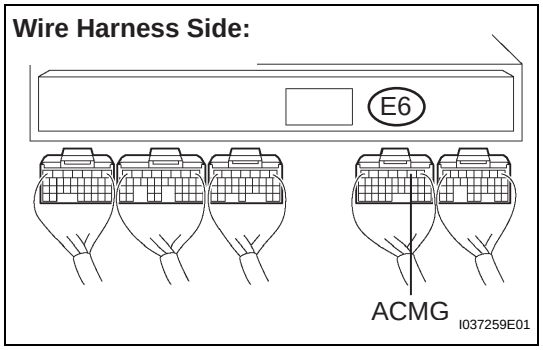
NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

11	CHECK HARNESS AND CONNECTOR (ENGINE ROOM JUNCTION BLOCK - ECM)



(a) Reconnect the connector to the engine room junction block.



(b) Disconnect the connector from the ECM.
(c) Measure the resistance according to the value(s) in the table below.

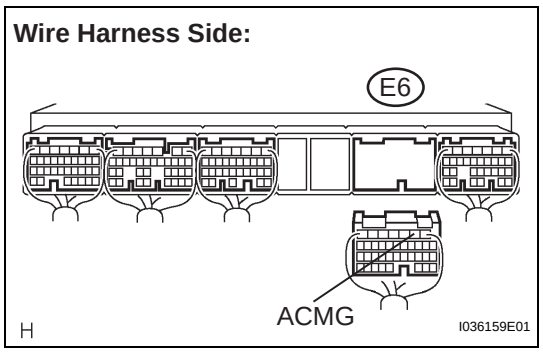
Standard resistance

Tester connection	Condition	Specified condition
2H-10 (ACMG) - E6-2 (ACMG)	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

12	INSPECT ECM (ACMG - BODY GROUND)



(a) Disconnect the connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
E6-2 (ACMG) - Body ground	Always	11 to 14 V

NG → **REPLACE ENGINE ROOM JUNCTION BLOCK**

OK

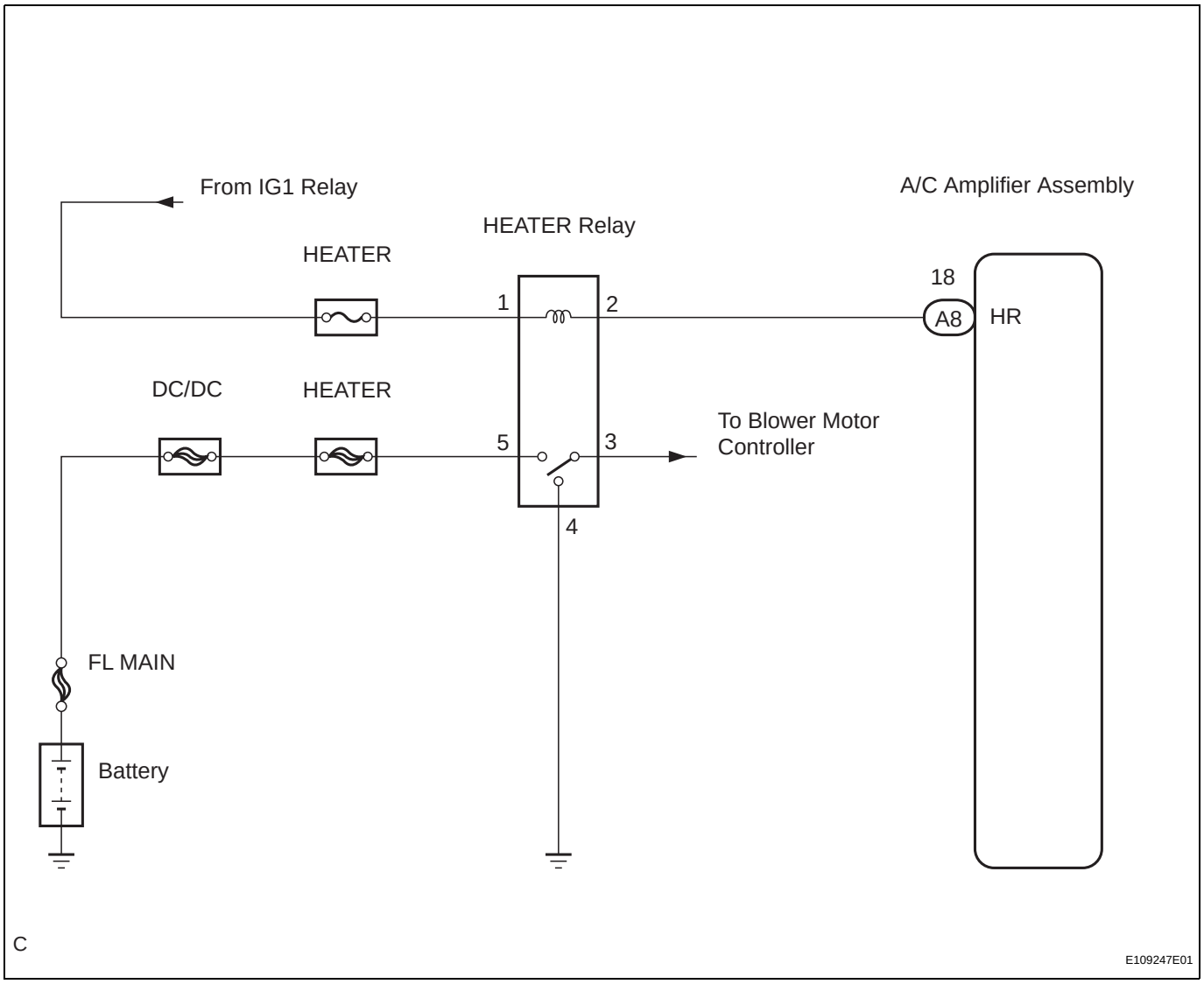
REPLACE ECM

Heater Relay Circuit

DESCRIPTION

The heater relay is turned on by signals from the A/C amplifier assembly. It supplies power to the blower motor controller.

WIRING DIAGRAM



1	CHECK HEATER FUSE

(a) Remove the HEATER fuse from the instrument panel J/B.

(b) Measure the resistance according to the value(s) in the table below.

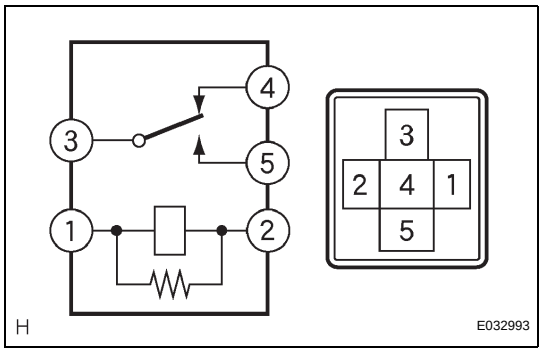
Standard resistance

Tester item	Condition	Specified condition
HEATER fuse	Always	Below 1 Ω

NG → REPLACE HEATER FUSE

OK

2 INSPECT HEATER RELAY



(a) Remove the HEATER relay from the R/B No. 3.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

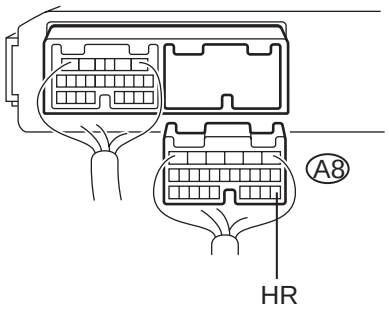
Tester connection	Condition	Specified condition
3 - 5	Always	10 kΩ or higher
3 - 5	When battery voltage applied to terminals 1 and 2	Below 1 Ω
3 - 4	Always	Below 1 Ω
3 - 4	When battery voltage applied to terminals 1 and 2	10 kΩ or higher

NG → REPLACE HEATER RELAY

OK

3 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER ASSEMBLY - BODY GROUND)

A/C Amplifier Assembly Connector Wire Harness View:



(a) Remove the A/C amplifier assembly with the connectors still connected.
(b) Disconnect the connector from the A/C amplifier assembly.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A8-18 (HR) - Body ground	Ignition switch position OFF Blower switch position OFF	Below 1 V
A8-18 (HR) - Body ground	Ignition switch position ON Blower switch position ON	Below 1 V
A8-18 (HR) - Body ground	Ignition switch position ON Blower switch position OFF	10 to 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

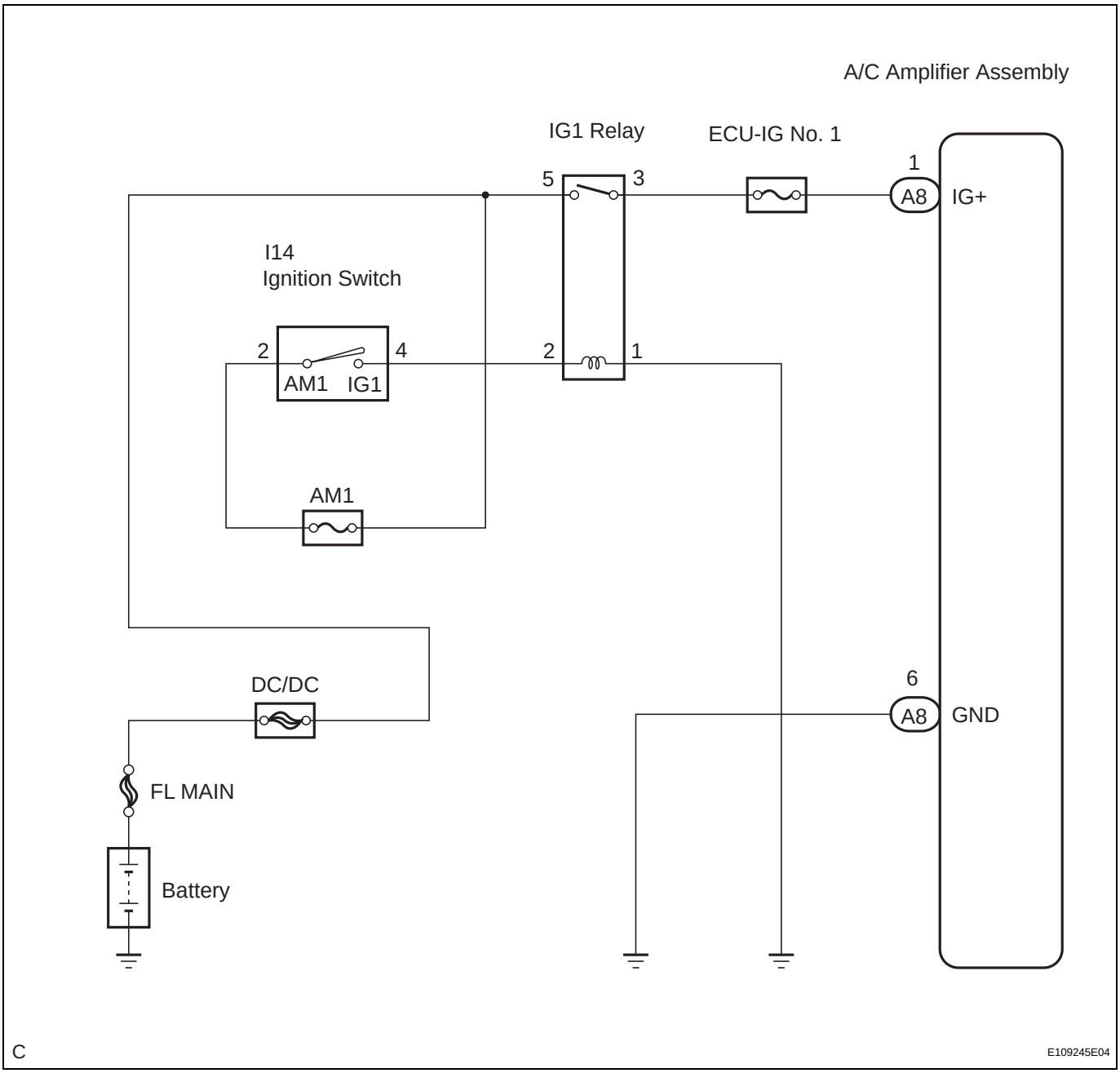
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

IG Power Source Circuit

DESCRIPTION

This is the main power source supplied to the A/C amplifier assembly when the ignition switch is turned to the ON position. The power source is used for operating the A/C amplifier assembly and servomotor, etc.

WIRING DIAGRAM



1	INSPECT ECU-IG NO.1 FUSE

(a) Remove the ECU-IG No. 1 fuse from the instrument panel J/B.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

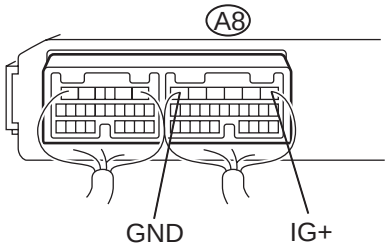
Tester item	Condition	Specified condition
ECU-IG No. 1 fuse	Always	Below 1 Ω

NG → **REPLACE ECU-IG NO.1 FUSE**

OK

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



(a) Remove the A/C amplifier assembly with the connectors still connected.

(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A8-1 (IG+) - A8-6 (GND)	Ignition switch ON	10 to 14 V

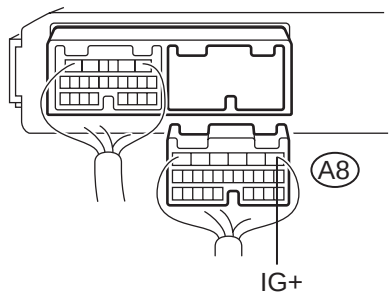
NG → **Go to step 3**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER ASSEMBLY - BODY GROUND)

A/C Amplifier Assembly Connector Wire Harnesss View:



(a) Disconnect the connector from the A/C amplifier assembly.

(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

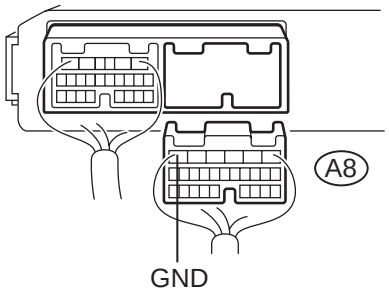
Tester connection (Symbols)	Condition	Specified condition
A8-1 (IG+) - Body ground	Ignition switch ON	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4	CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER ASSEMBLY - BODY GROUND)

A/C Amplifier Assembly Connector Wire Harness View:



H

E109218E10

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection (Symbols)	Condition	Specified condition
A8-6 (GND) - Body ground	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

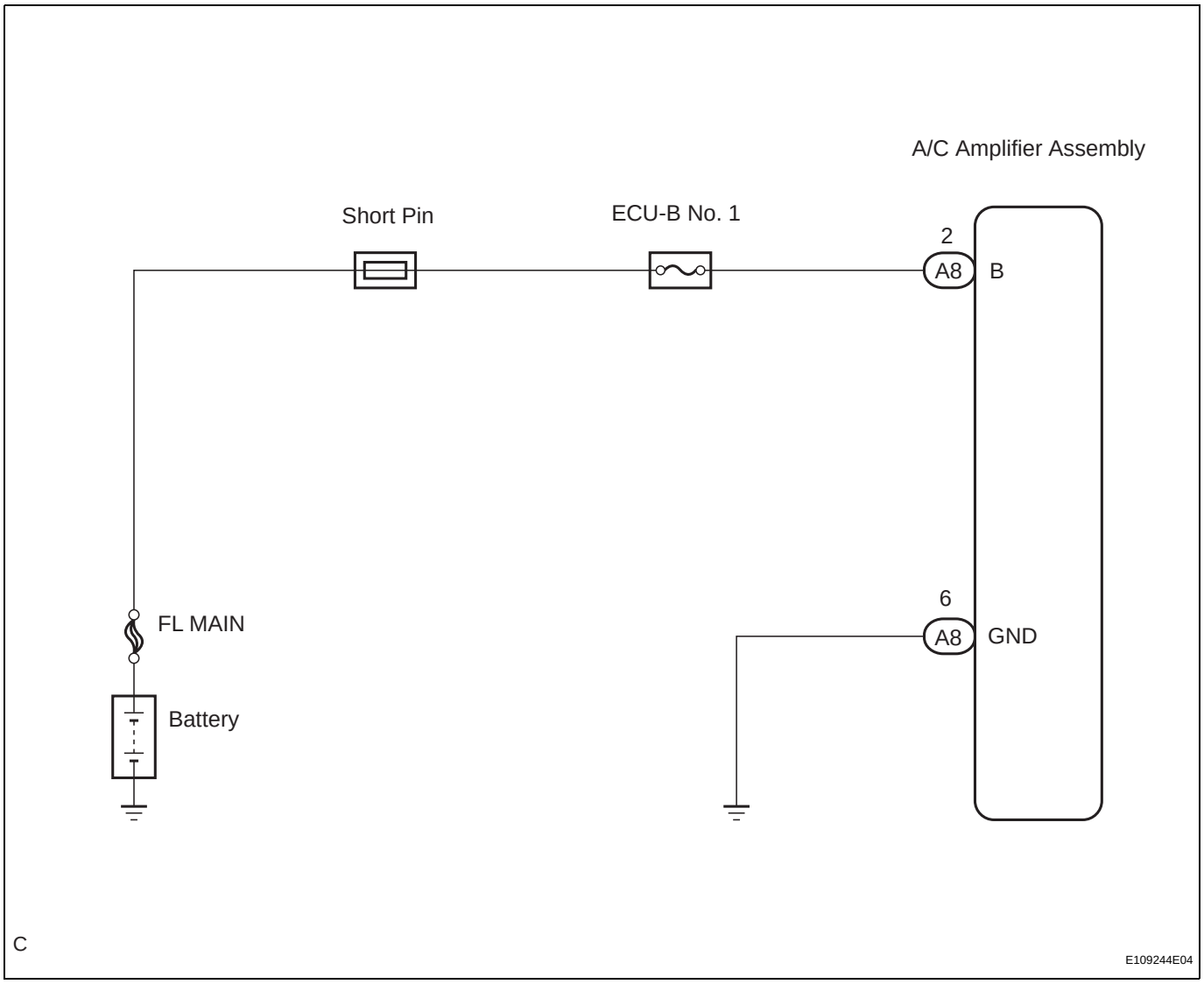
REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

Back-up Power Source Circuit

DESCRIPTION

This is the back-up power source circuit for the A/C amplifier assembly. Power is supplied even when turning the ignition switch off and is used for diagnostic trouble code memory, etc.

WIRING DIAGRAM



1	INSPECT ECU-B NO.1 FUSE

(a) Remove the ECU-B No. 1 fuse from the fusible link block.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

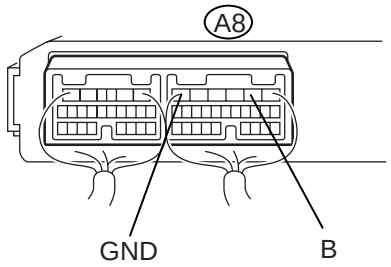
Tester item	Condition	Specified condition
ECU-B No. 1 fuse	Always	Below 1 Ω

NG → REPLACE ECU-B NO.1 FUSE

OK

2 INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

A/C Amplifier Assembly Connector Wire Harness View:



H

E109265E20

(a) Remove the A/C amplifier assembly with the connectors still connected.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection (Symbols)	Condition	Specified condition
A8-2 (B) - A8-6 (GND)	Always	10 to 14 V

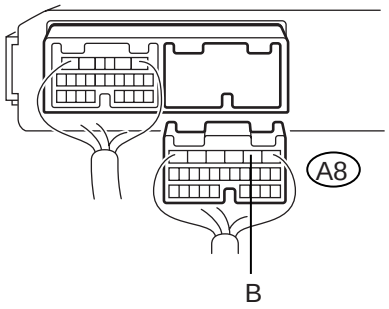
NG → Go to step 3

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER ASSEMBLY - BODY GROUND)

A/C Amplifier Assembly Connector Wire Harness View:



H

E109218E14

(a) Disconnect the connector from the A/C amplifier assembly.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

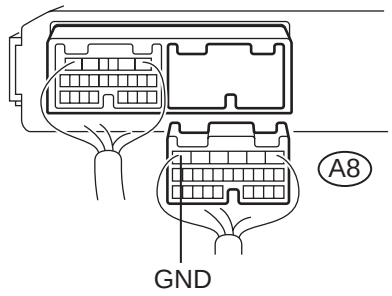
Tester connection (Symbols)	Condition	Specified condition
A8-2 (B) - Body ground	Always	10 to 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER ASSEMBLY - BODY GROUND)

A/C Amplifier Assembly Connector Wire Harness View:



H

E109218E13

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance

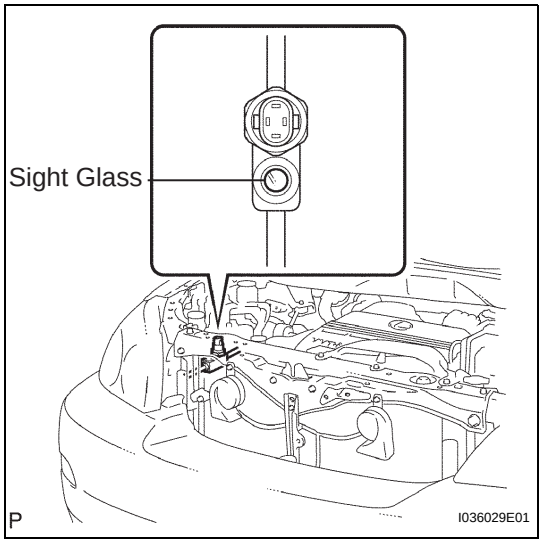
Tester connection (Symbols)	Condition	Specified condition
A8-6 (GND) - Body ground	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

AC



REFRIGERANT

ON-VEHICLE INSPECTION

1. INSPECT REFRIGERANT VOLUME

(a) Check the sight glass on the air conditioning tube & accessory assembly.

(1) Prepare the vehicle according the chart below.

Item	Condition
Vehicle door	Fully open
Temperature setting	MAX COLD
Blower speed	HI
A/C	ON

(2) Compare the sight glass to the following chart.

Item	Symptom	Amount of refrigerant	Corrective Actions
1	Bubbles exist	Insufficient*	1. Check for gas leakage and repair if necessary 2. Add refrigerant until bubbles disappear
2	No bubbles exist (DTC 76 is output)	Empty, insufficient or excessive	Refer to 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	1. Check for gas leakage and repair if necessary 2. Evacuate the AC system and recharge the proper amount of refrigerant
4	Considerable temperature difference between compressor inlet and outlet.	Proper or excessive	Refer to 5 and 6
5	Immediately after air conditioning is turned off, refrigerant remains clear	Excessive	1. Discharge refrigerant 2. Evacuate the AC system and recharge the proper amount of refrigerant
6	Immediately after air conditioning is turned off, refrigerant foams and then becomes clear	Proper	-

*: Bubbles in the sight glass with the vehicle's interior above 35°C (95°F) can be considered normal if cooling is sufficient.

2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

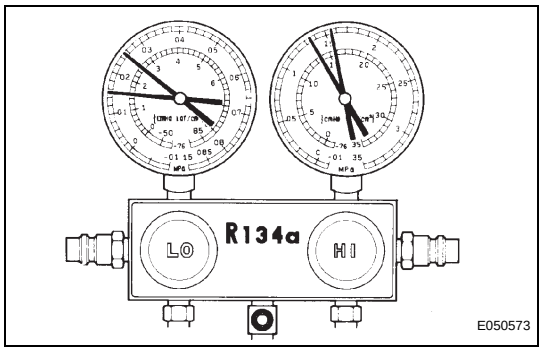
HINT:

This is a method where a manifold gauge set is used to help locate the problem.

(a) Read the manifold gauge pressure when these conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 to 35°C (86 to 95°F)
- Engine is running at 1,500 rpm
- Blower speed control switch is at "HI"
- Temperature control dial is at "COOL"
- A/C switch is ON
- Doors are fully open
- Ignition switch in a position that enables the AC compressor to run.



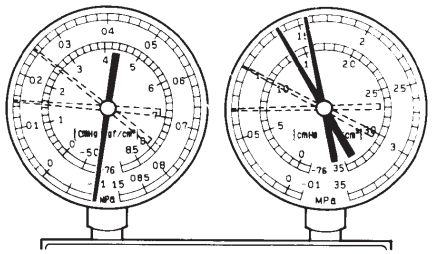
(1) Normally functioning refrigeration system
Gauge reading:
Low pressure side:
0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2, 21.3 to 35.5 psi)
High pressure side:
1.37 to 1.57 MPa (14 to 16 kgf/cm^2, 199.1 to 227.5 psi)

(2) Moisture is present in refrigeration system.

AC

Condition :

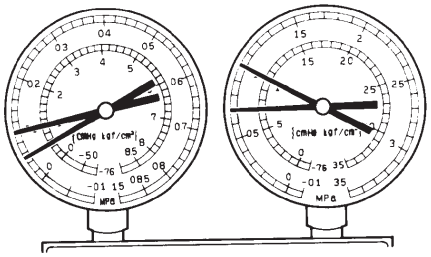
Periodically cools and then fails to cool



Symptom	Probable cause	Diagnosis	Corrective Actions
During operation, pressure on low pressure side cycles between normal and vacuum	Moisture in AC system will freeze at the expansion valve orifice, causing the refrigeration cycle to temporarily stop After the system stop, and warms up again, the ice will melt and normal operation will be temporarily restored	• Dryer in oversaturated state • Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	1. Replace condenser 2. Remove moisture in system by repeatedly evacuating air 3. Supply a proper amount of new refrigerant

(3) Insufficient cooling

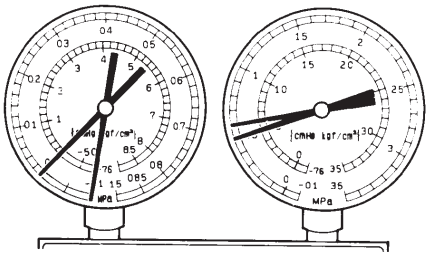
Condition : Cooling system does not function effectively.



Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is low on both low and high pressure sides • Bubbles are seen through sight glass continuously • Insufficient cooling performance	Gas leakage from the refrigeration system	• Insufficient refrigerant • Refrigerant leaking	1. Check for gas leakage and repair if necessary 2. Supply a proper amount of new refrigerant 3. If the gauge indicates a pressure of close to 0, then it will be necessary to evacuate the system after repairing the leak

(4) Poor circulation of refrigerant

Condition : Cooling system does not function effectively.

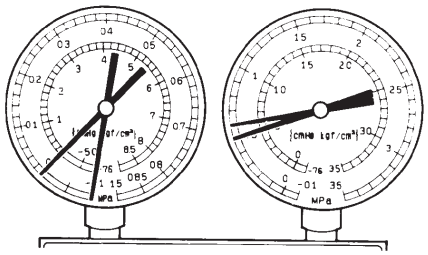


I022119E01

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is low on both low and high pressure sides • Frost exists on pipe from condenser to unit	Refrigerant flow is obstructed by dirt inside the pipes of the condenser core	Receiver is clogged	Replace condenser

(5) Refrigerant does not circulate.

Condition : Cooling system does not function. (Sometimes it may function)

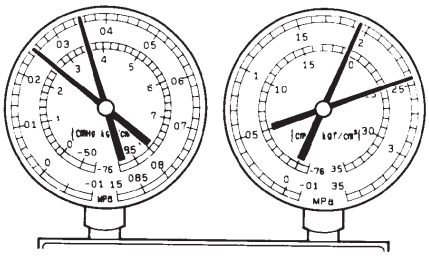


I022120E01

Symptom	Probable cause	Diagnosis	Corrective Actions
• Vacuum is indicated on low pressure side and very low pressure is indicated on high pressure side • Frost or condensation is seen on piping on both sides of receiver/drier or expansion valve	• Refrigerant flow is obstructed by moisture or dirt in refrigeration system • Refrigerant flow disrupted by gas leaking internally through the expansion valve	Refrigerant does not circulate	1. Check the expansion valve 2. Replace expansion valve 3. Replace condenser 4. Evaporate air and supply a proper amount of new refrigerant 5. For internal gas leak at expansion valve, replace expansion valve

(6) Refrigerant is overcharged or cooling effectiveness of condenser is insufficient.

Condition : Cooling system does not function.



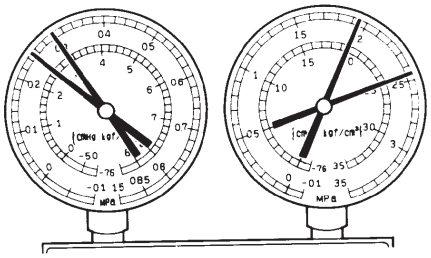
I022121E01

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is too high on both low and high pressure sides • No air bubbles are seen through sight glass even when engine rpm lowers	• Unable to develop sufficient performance due to excessive use of refrigeration system • Cooling effectiveness of condenser is insufficient	• Excessive refrigerant in cycle → excessive refrigerant was recharged • Condenser cooling effectiveness is insufficient → condenser fins are clogged at cooling fan	1. Clean condenser 2. Check the operation of the condenser cooling fan 3. If 1 and 2 are normal state, check the amount of refrigerant and supply proper amount of refrigerant

(7) Air is present in refrigeration system.

Condition: Cooling system does not function.

NOTE: These gauge indications occur when the refrigeration system opens and the refrigerant is charged without vacuum purging.

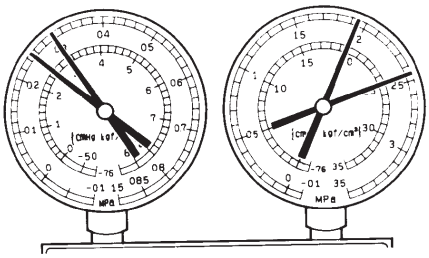


I022122E06

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is too high on both low and high pressure sides • The low pressure piping is too hot to touch • Bubbles can be seen through sight glass	Air in system	• Air present in refrigeration system • Insufficient vacuum purging	1. Check compressor oil to see if it is dirty or insufficient 2. Evacuate the system and recharge it with new or purified refrigerant

(8) Expansion valve malfunction

Condition: Insufficient cooling

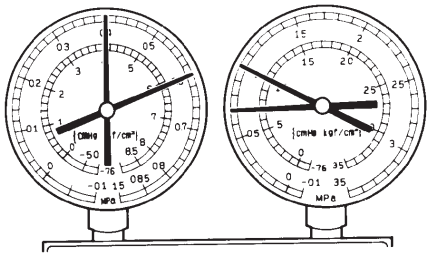


I022123E05

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is too high on both low and high pressure sides • Frost or a large amount of condensation on piping on low pressure side	Expansion valve may be sticking	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	Check expansion valve

(9) Insufficient compressor compression

Condition: Insufficient cooling



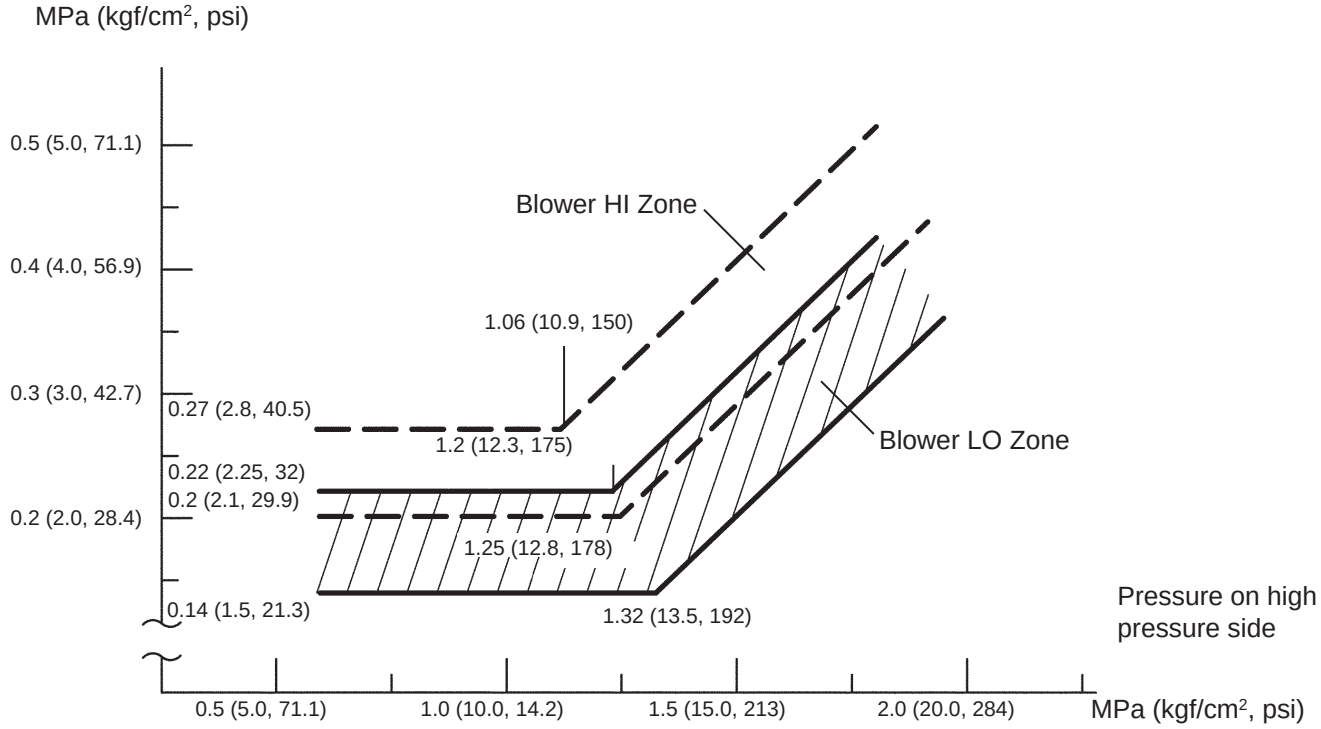
I022124E05

AC

Symptom	Probable cause	Diagnosis	Corrective Actions
• Pressure is too high both on low and high pressure sides • Pressure is too low on high pressure side	Internal leak in compressor	• Low compression • Leak from a damaged valve, or parts may be broken	Replace compressor

Gauge readings (Reference)

Pressure on low pressure side



I030081E07

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

(a) Turn the A/C switch on.

(b) Operate the A/C with the setting temperature at 25°C (77°F) and the blower level at LO for 10 minutes to circulate the refrigerant and collect compressor oil remaining in each component into the cooler compressor as much as possible.

(c) Turn the ignition switch OFF.

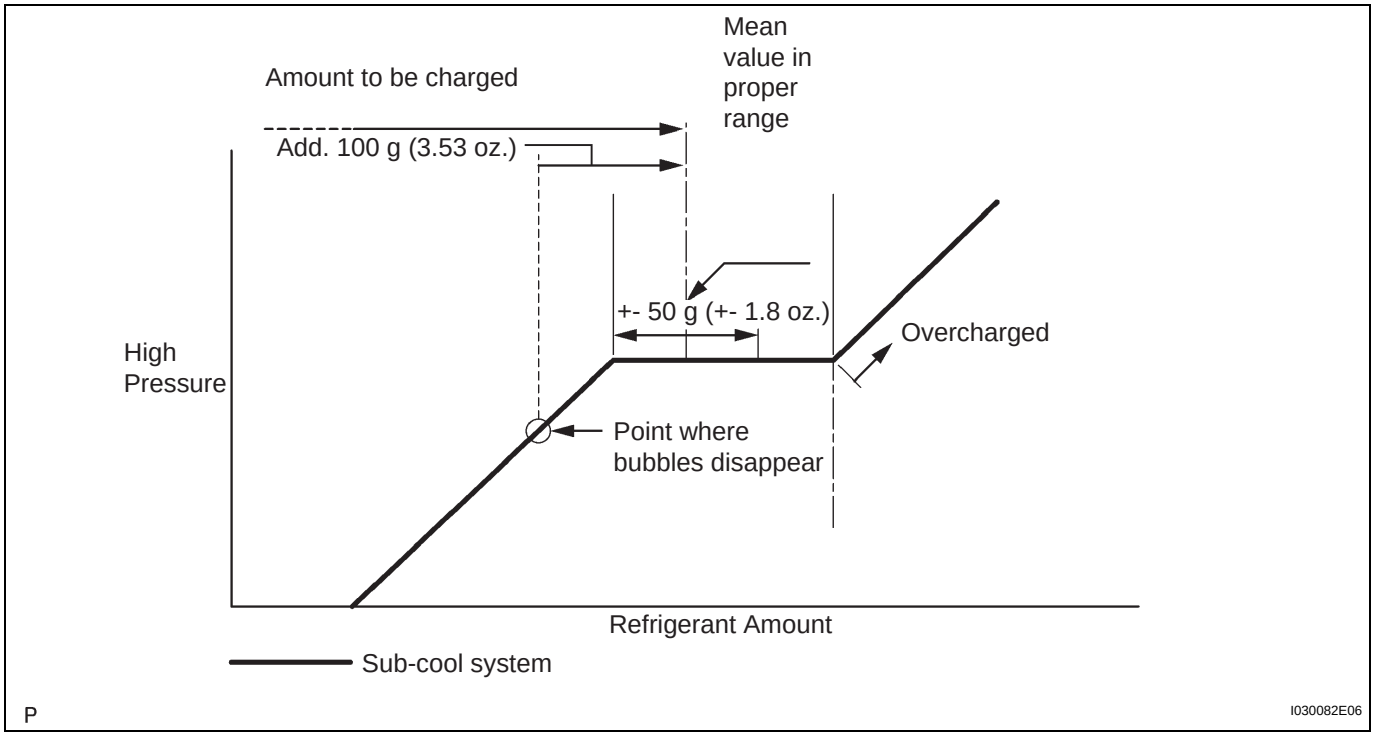
(d) Using SST, let the refrigerant gas out.

SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

2. CHARGE WITH REFRIGERANT

(a) Perform vacuum purging using a vacuum pump.

(b) Charge with refrigerant HFC-134a (R134a).



Standard:
550 to 650 g (19.4 to 22.9 oz.)

SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

NOTICE:

- **Do not turn the A/C on before charging with refrigerant because the compressor will overheat as a result of the cooler compressor not working properly without refrigerant.**

AC

- **Approximately 100 g (3.53 oz.) of refrigerant may need to be charged after bubbles disappear.**
  The refrigerant amount should be checked by quantity, and not with the sight glass.
- **Avoid using the gauge manifold set that had been used for vehicles with conventional compressor oil (ND-OIL8 or equivalent) as much as possible. This will cause compressor oil remaining in the manifold to enter the vehicle, resulting in insulation performance deterioration. A gauge manifold set that had been used 3 times or less can be reused if an appropriate one is not available.**

HINT:
Prepare a service can to recharge refrigerant if using the refrigerant gas collected with the freon collection/recycling device because the collective rate of the device is approximately 90%.

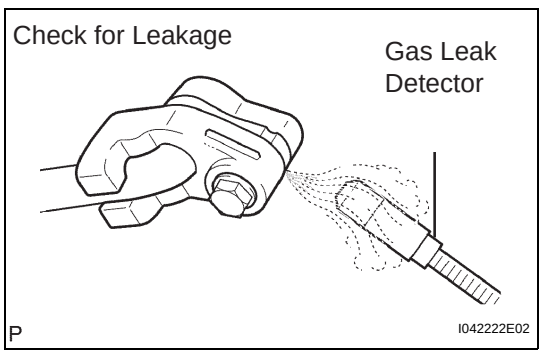
3. WARM UP COMPRESSOR

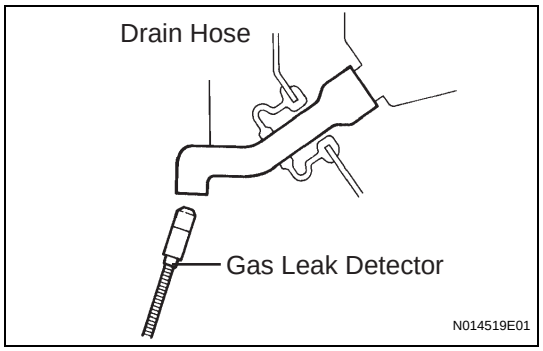
(a) Keep the A/C switch on for at least 2 minutes to warm up the compressor.
NOTICE:
Be sure to warm up the compressor when turning the A/C on after removing and installing the cooler refrigerant lines (including the compressor), to prevent damage to the compressor.

4. CHECK FOR LEAKAGE OF REFRIGERANT

(a) After recharging refrigerant gas, check for leakage of refrigerant gas using a halogen leak detector.
(b) Carry out the test under the following conditions:
- IG OFF
- Secure good ventilation (the gas leak detector may react to volatile gases which are not refrigerant, such as evaporated gasoline and exhaust gas).
- Repeat the test 2 or 3 times.
- Make sure that there is some refrigerant remaining in the refrigeration system.
  When the compressor is off: approx. 392 to 588 kPa (4 to 6 kgf/cm^2, 57 to 85 psi)

(c) Using a gas leak detector, check for leakage of the refrigerant line.





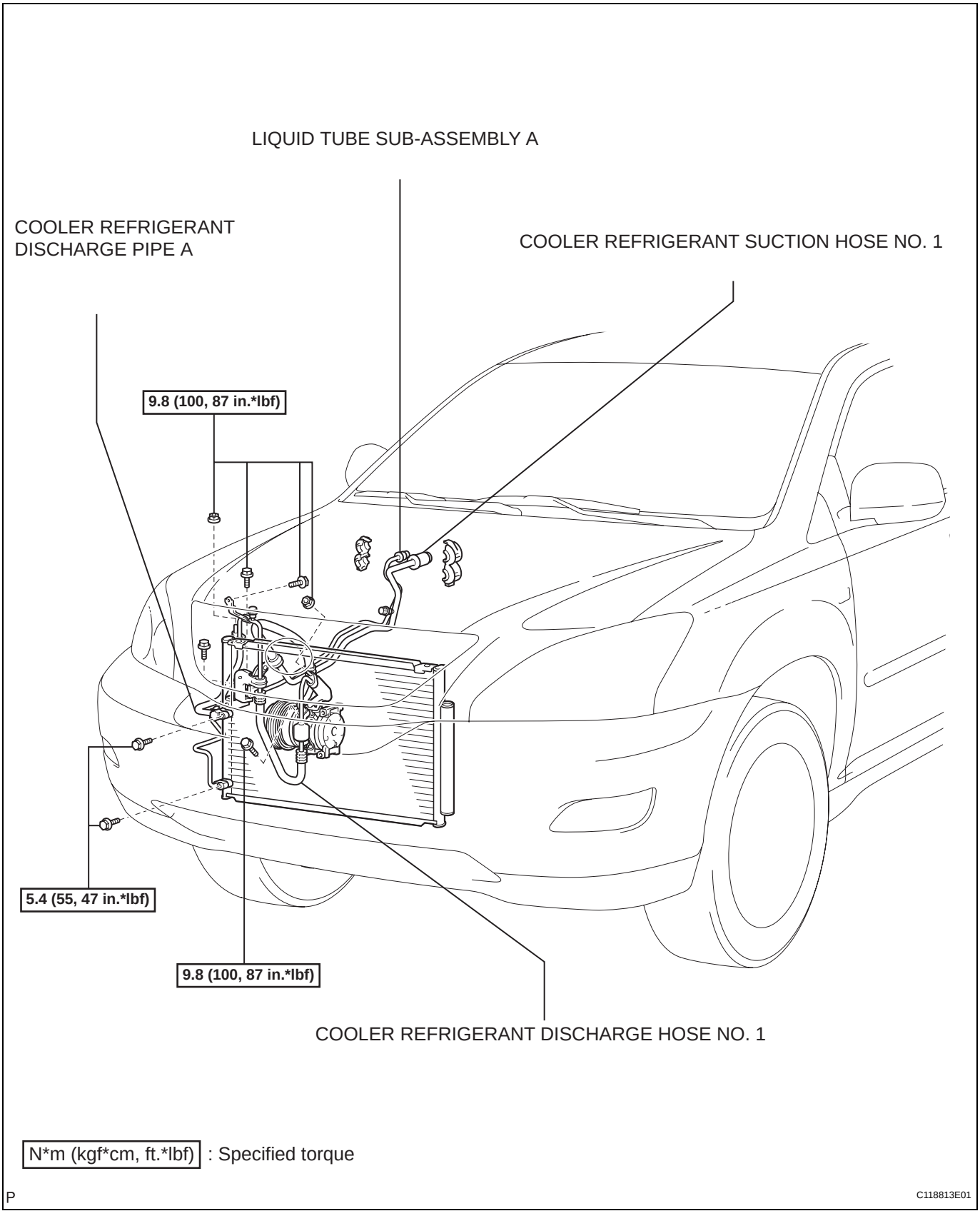
(d) Bring the gas leak detector close to the drain hose with the detector's power off.
HINT:
- After the blower motor has stopped, let the cooling unit stand for more than 15 minutes.
- Bring the gas leak detector sensor under the drain hose.
- When bringing the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to volatile gases.
If such reaction is unavoidable, the vehicle must be lifted up.

(e) If a gas leak is not detected on the drain hose, remove the blower motor control from the cooling unit. Insert the gas leak detector sensor into the unit and perform the test.

(f) Disconnect the pressure switch connector and leave it for approximately 20 minutes. Bring the gas leak detector close to the pressure switch and perform the test.

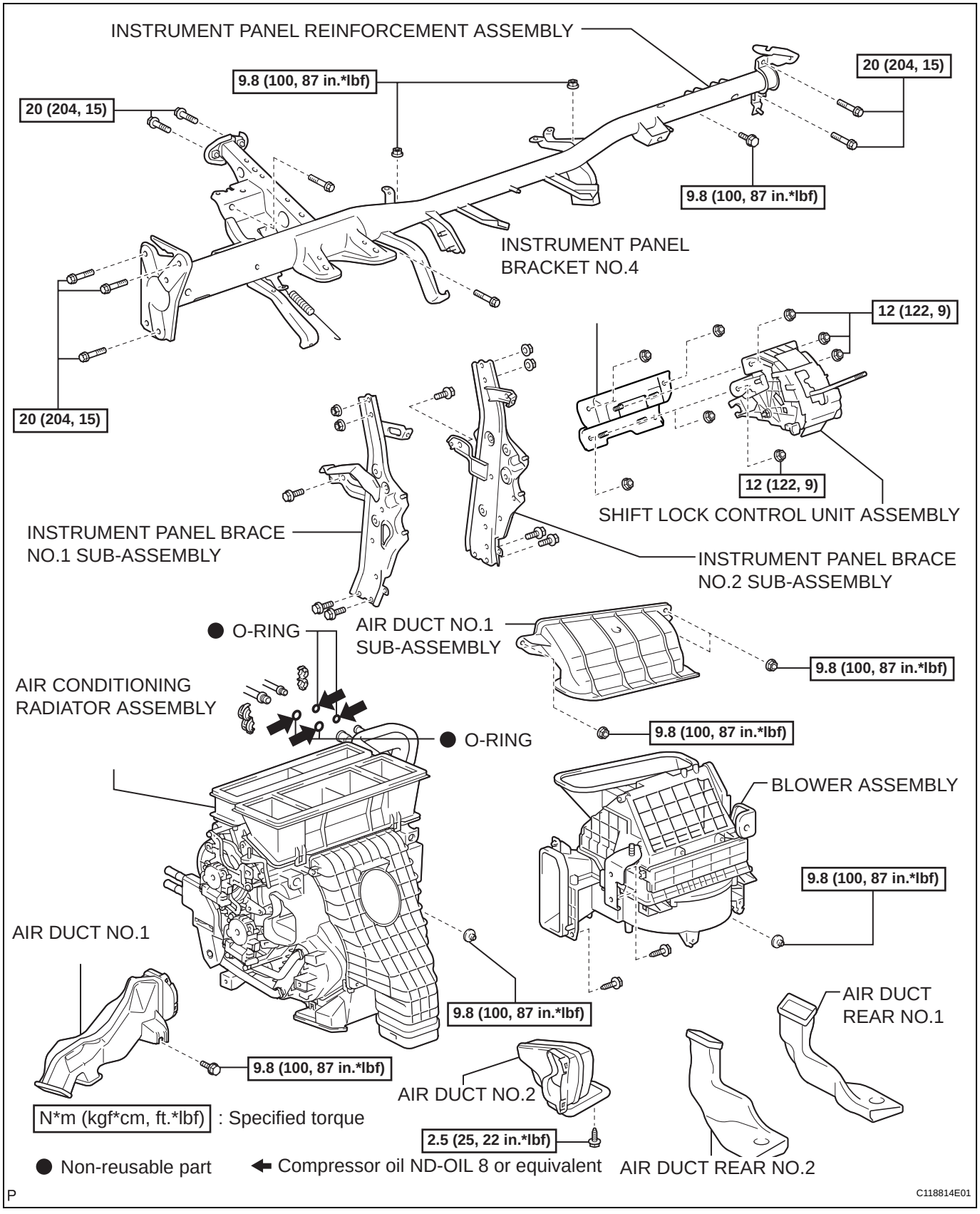
REFRIGERANT LINE

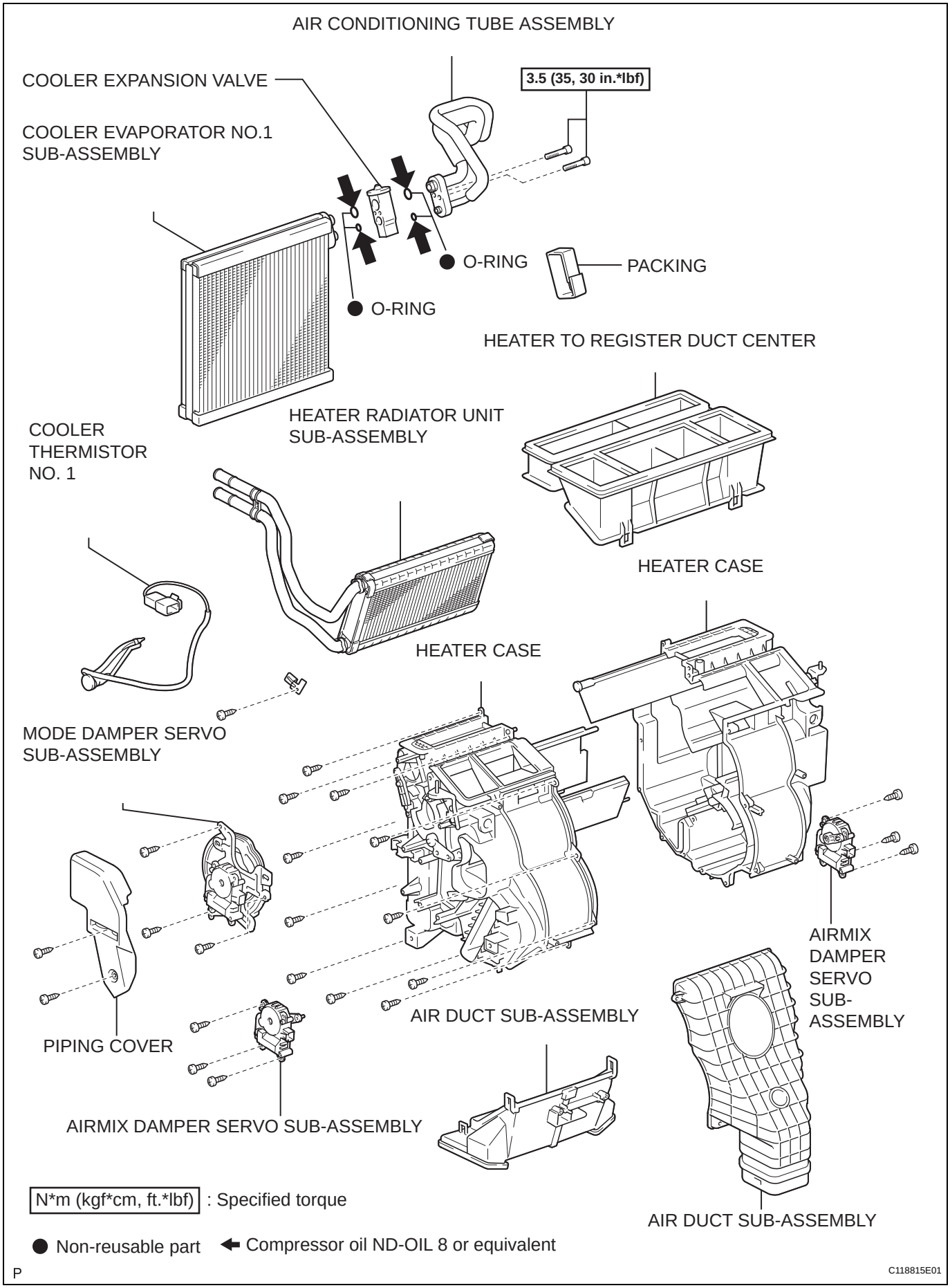
COMPONENTS



AIR CONDITIONING UNIT

COMPONENTS




AIR CONDITIONING TUBE ASSEMBLY
COOLER EXPANSION VALVE
3.5 (35, 30 in.*lbf)
COOLER EVAPORATOR NO.1 SUB-ASSEMBLY
O-RING
PACKING
O-RING
HEATER TO REGISTER DUCT CENTER
HEATER RADIATOR UNIT SUB-ASSEMBLY
COOLER THERMISTOR NO. 1
HEATER CASE
HEATER CASE
MODE DAMPER SERVO SUB-ASSEMBLY
AIRMIX DAMPER SERVO SUB-ASSEMBLY
AIR DUCT SUB-ASSEMBLY
PIPING COVER
AIRMIX DAMPER SERVO SUB-ASSEMBLY
AIR DUCT SUB-ASSEMBLY
N*m (kgf*cm, ft.*lbf) : Specified torque
Non-reusable part
Compressor oil ND-OIL 8 or equivalent
P
C118815E01

REMOVAL

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
   HINT:
   See page AC-128.

2. **DISCONNECT BATTERY NEGATIVE TERMINAL**
   CAUTION:
   Wait for 90 seconds after disconnecting the cable to prevent the airbag working.

3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See page WW-37)**

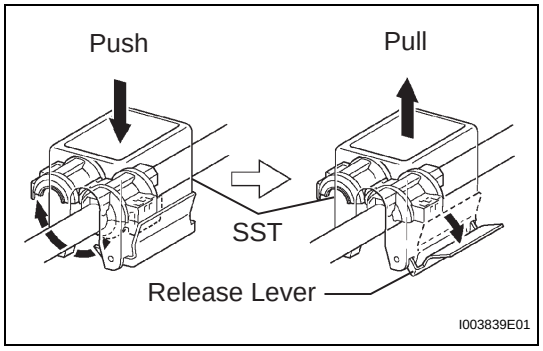
4. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See page WW-37)**

5. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See page WW-37)**

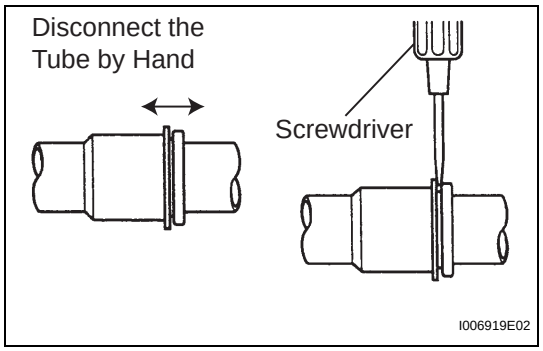
6. **REMOVE WINDSHIELD WIPER LINK ASSEMBLY (See page WW-37)**

7. **REMOVE COWL TOP PANEL OUTER SUB-ASSEMBLY (See page EM-113)**

8. **DISCONNECT AIR CONDITIONING TUBE AND ACCESSORY ASSEMBLY**
   (a) Install SST on the piping clamp.
   SST 09870-00025
   HINT:
   Make sure the direction of the piping clamp and SST by seeing the illustration shown on the caution label.



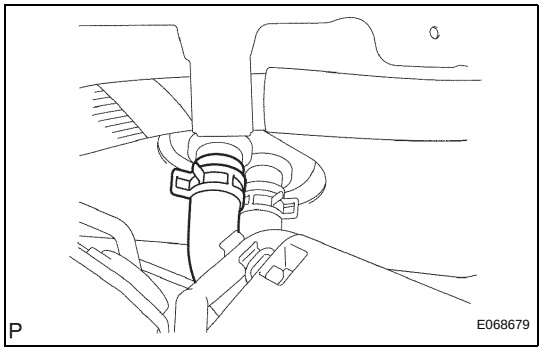
   (b) Push down SST and release the clamp lock.
   NOTICE:
   Do not deform the tube when pushing the SST.
   (c) Pull the SST slightly and push the release lever, and then remove the piping clamp with SST.



   (d) Disconnect the air conditioning tube and accessory assembly.
   NOTICE:
   - **Do not use tools like a screwdriver to remove the tube.**
   - **Cap the open fittings immediately to keep moisture or dirt out of the system.**
   (e) Remove the 2 O-rings from the air conditioning tube and accessory assembly.

9. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**
   SST 09870-00015

HINT:
Disconnection of the cooler refrigerant suction hose No. 1 is the same as the air conditioning tube and accessory assembly.



10. DISCONNECT HEATER WATER OUTLET HOSE

(a) Using pliers, grip the claws of the clip and slide the clip, and then disconnect the heater water outlet hose.

NOTICE:

- **Do not apply any excessive force to the heater water outlet hose.**
- **Prepare a drain pan or cloth for cooling water leaks.**

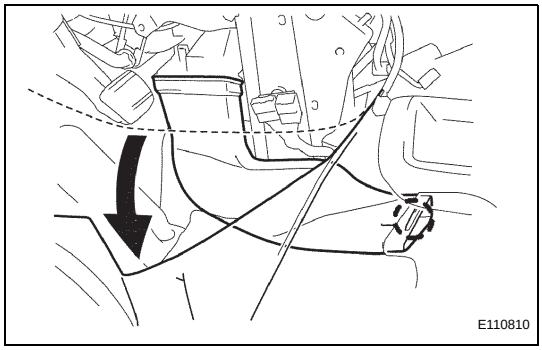
11. DISCONNECT HEATER WATER INLET HOSE

HINT:
Disconnection of the heater water inlet hose is same as the heater water outlet hose.

12. REMOVE INSTRUMENT PANEL ASSEMBLY

HINT:
Refer to the instructions for removal of the instrument panel assembly (See page IP-10).

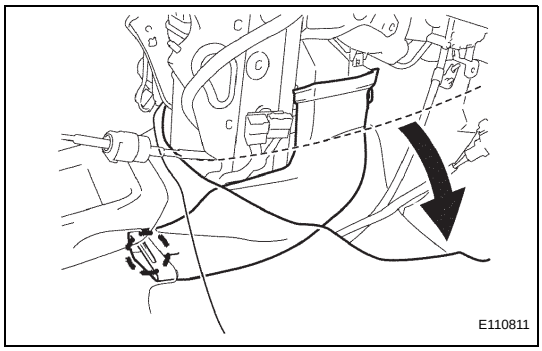
13. REMOVE AIR CONDITIONER AMPLIFIER ASSEMBLY (See page AC-193)



14. REMOVE AIR DUCT REAR NO.2

(a) Turn back the floor carpet.
HINT:
Turn back the floor carpet so that the air duct rear No. 2 can be removed.

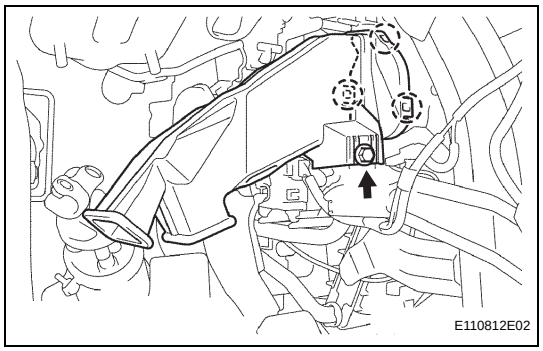
(b) Release the claw and remove the air duct rear No. 2.



15. REMOVE AIR DUCT REAR NO.1

(a) Turn back the floor carpet.
HINT:
Turn back the floor carpet so that the air duct rear No. 1 can be removed.

(b) Release the claw and remove the air duct rear No. 1.



16. REMOVE AIR DUCT NO.1

(a) Remove the bolt.

(b) Release the 3 claws and remove the air duct No. 1.

17. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

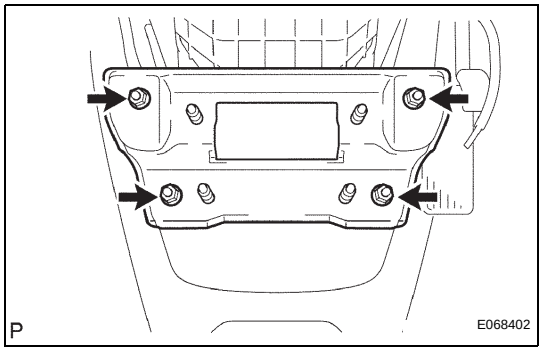
HINT:

See page AX-160 for U151E, AX-160 for U151F.

18. REMOVE SHIFT LEVER

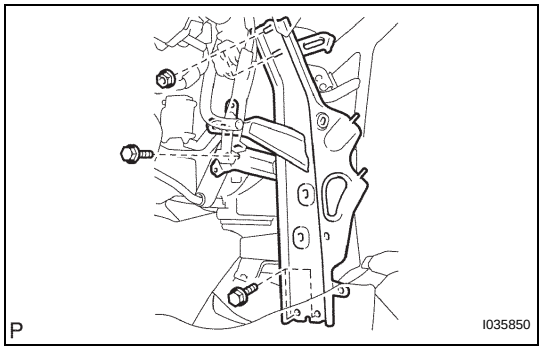
HINT:

See page AX-178 for U151E, AX-181 for U151F.



19. REMOVE INSTRUMENT PANEL BRACKET NO.4

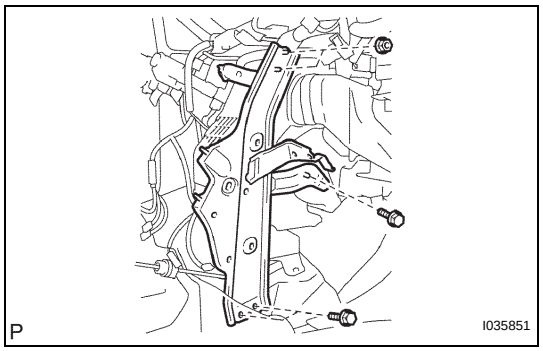
(a) Remove the 4 nuts and instrument panel bracket No. 4.



20. REMOVE INSTRUMENT PANEL BRACE NO.1 SUB-ASSEMBLY

(a) Remove the clamp and disconnect the connector.

(b) Remove the 3 bolts and 2 nuts and instrument panel brace No. 1 sub-assembly.



21. REMOVE INSTRUMENT PANEL BRACE NO.2 SUB-ASSEMBLY

(a) Remove the clamp and disconnect the connector.

(b) Remove the 3 bolts and 2 nuts and instrument panel brace No. 2 sub-assembly.

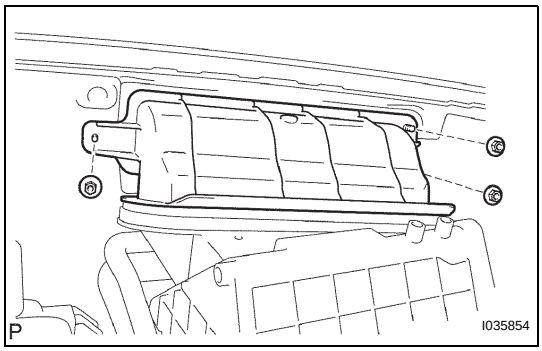
22. SEPARATE STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY (Manual Tilt Type) (See page SR-40)

23. SEPARATE STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY (Power Tilt and Power Type) (See page SR-51)

24. REMOVE STEERING COLUMN ASSEMBLY (Manual Tilt Type) (See page SR-41)

25. REMOVE STEERING COLUMN ASSEMBLY (Power Tilt and Power Type) (See page SR-52)

AC



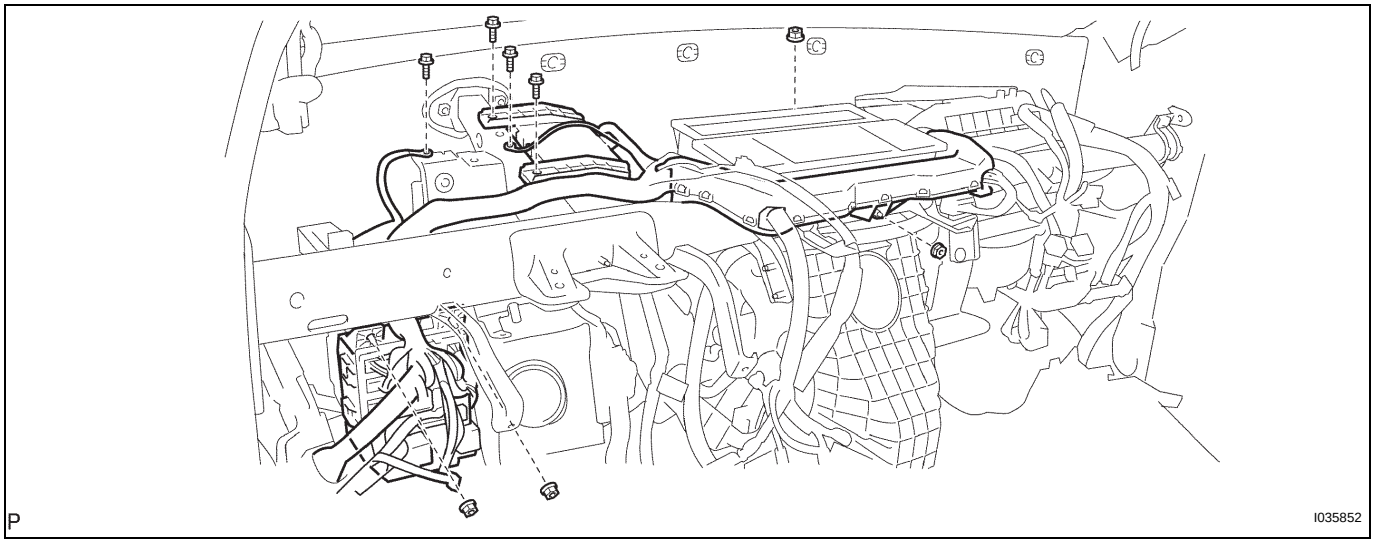
26. REMOVE AIR DUCT NO.1 SUB-ASSEMBLY

(a) Remove the 3 nuts and air duct No. 1 sub-assembly.

27. REMOVE INSTRUMENT PANEL REINFORCEMENT ASSEMBLY

(a) Remove the 4 bolts and 4 nuts.

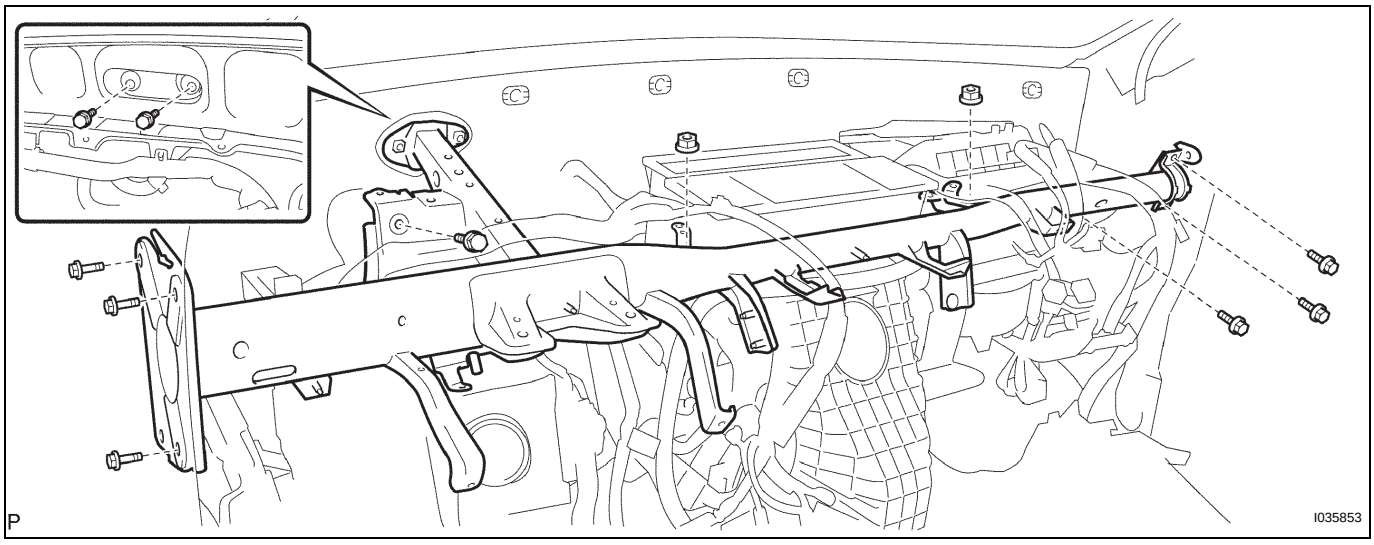
AC



(b) Remove the clamp.

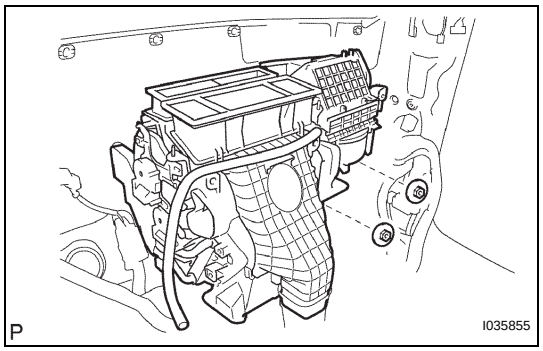
(c) Disconnect the connectors.

(d) Remove the 9 bolts and the 2 nuts and then remove the instrument panel reinforcement while holding the air conditioner unit assembly.



HINT:

Make sure to hold the air conditioner unit assembly securely as its bracket installation parts may be damaged.

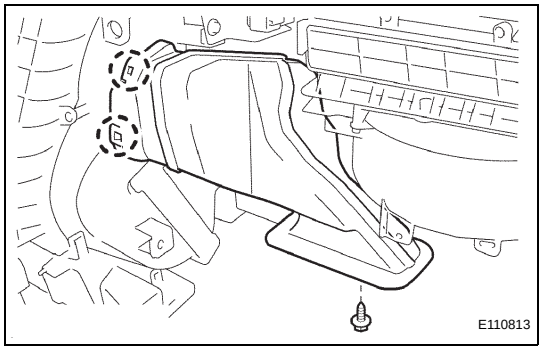


28. REMOVE AIR CONDITIONER UNIT ASSEMBLY

(a) Remove the 2 nuts and air conditioner unit assembly.

HINT:

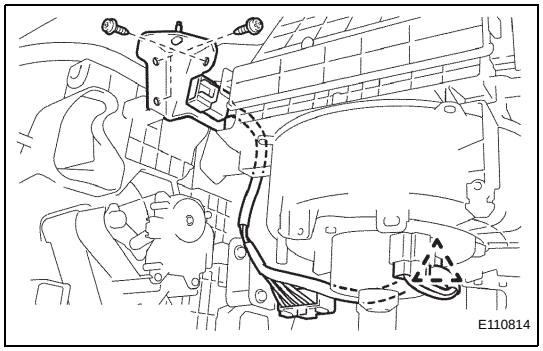
Make sure to hold the air conditioner unit assembly securely as its bracket installation parts may be damaged.



29. REMOVE AIR DUCT NO.2

(a) Remove the screw.

(b) Release the 2 claws and remove the air duct No. 2.

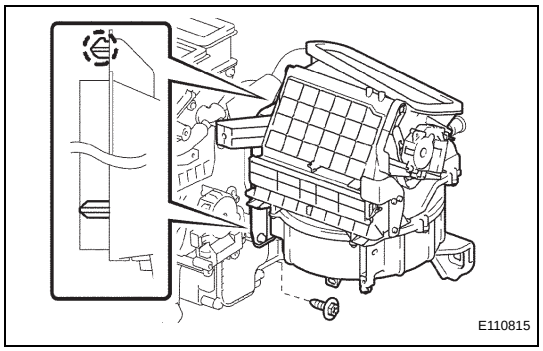


30. REMOVE WIRING AIR INDICATOR HARNESS NO.2 SUB-ASSEMBLY

(a) Remove the 3 screws.

(b) Remove the clamp and disconnect the 2 connectors.

(c) Remove the wiring air indicator harness No .2 sub-assembly.

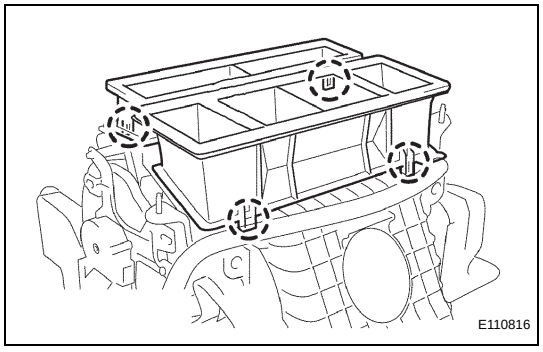


31. REMOVE BLOWER ASSEMBLY

(a) Remove the screw.

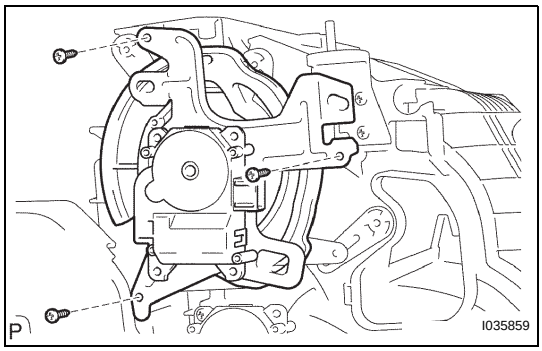
(b) Release the claw and remove the blower assembly.

DISASSEMBLY



1. REMOVE HEATER TO REGISTER DUCT CENTER

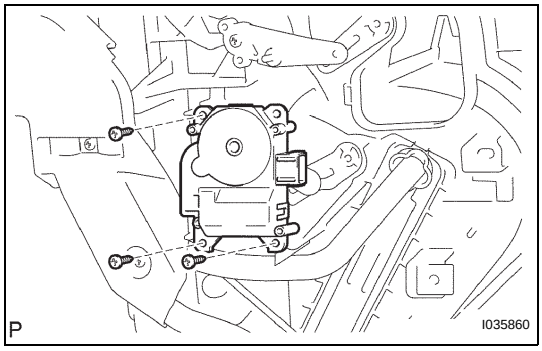
(a) Release the 4 claws and remove the heater to register duct center.



2. REMOVE AIR OUTLET CONTROL SERVO MOTOR

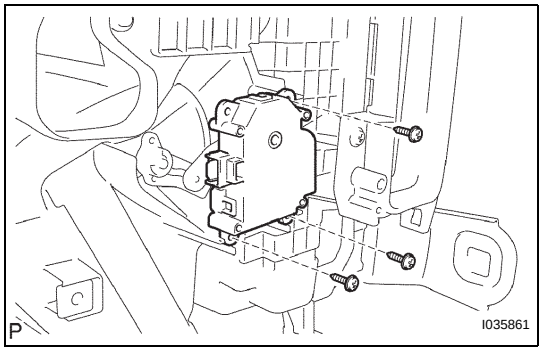
(a) Remove the 3 screws and air outlet control servomotor.

AC

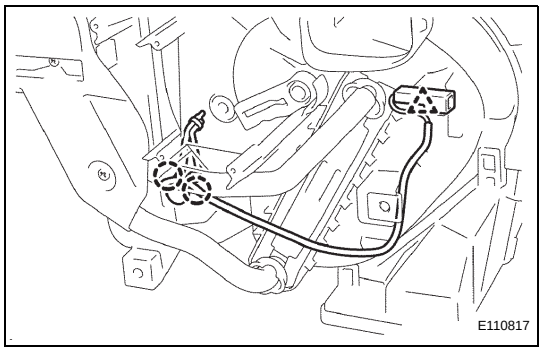


3. REMOVE AIR MIX CONTROL SERVO MOTOR

(a) LH side:
Remove the 3 screws and air mix control servomotor.



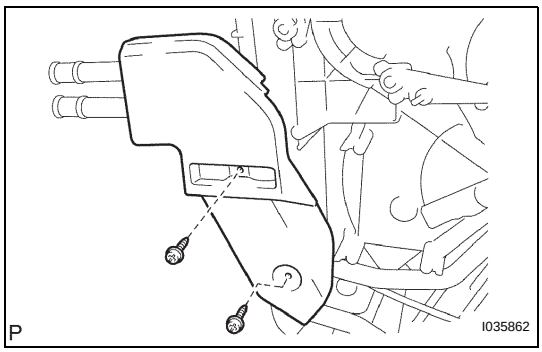
(b) RH side:
Remove the 3 screws and air mix control servomotor.



4. REMOVE EVAPORATOR TEMPERATURE SENSOR

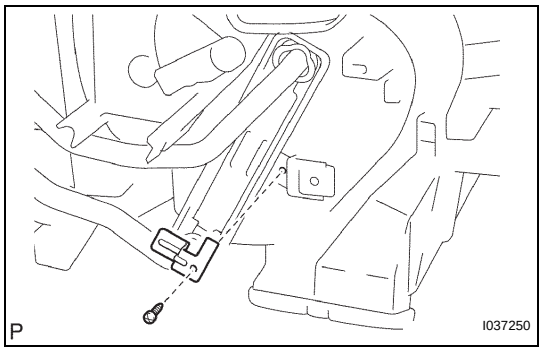
(a) Release the clamp and connector.

(b) Release the 2 claws and remove evaporator temperature sensor.

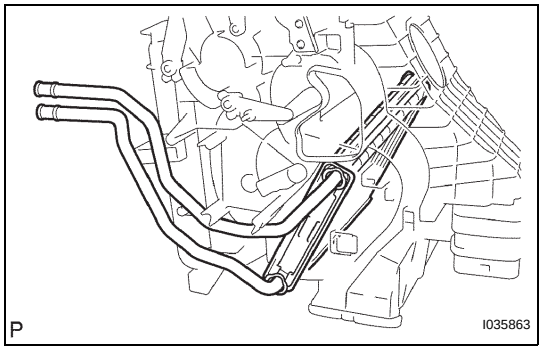


5. REMOVE HEATER RADIATOR UNIT SUB-ASSEMBLY

(a) Remove the 2 screws and piping cover.

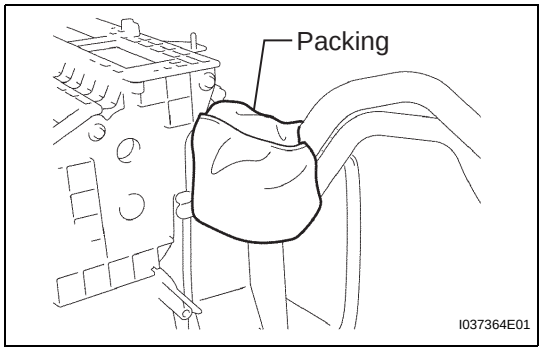


(b) Remove the screw and bracket.



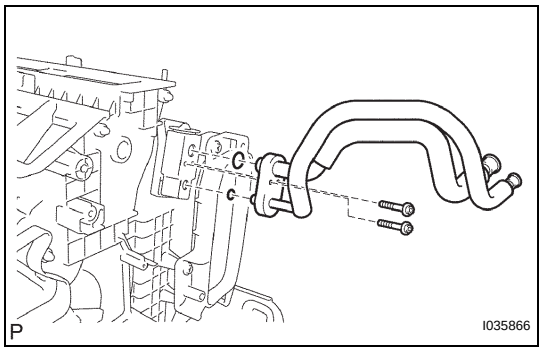
(c) Remove the heater radiator unit sub-assembly.
NOTICE:
Prepare a drain pan or cloth for cooling water leaks.

AC



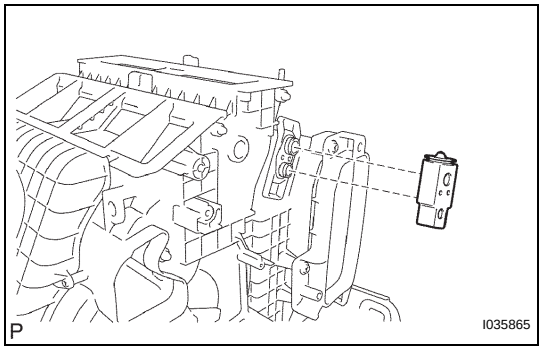
6. REMOVE AIR CONDITIONING TUBE ASSEMBLY

(a) Remove the packing.



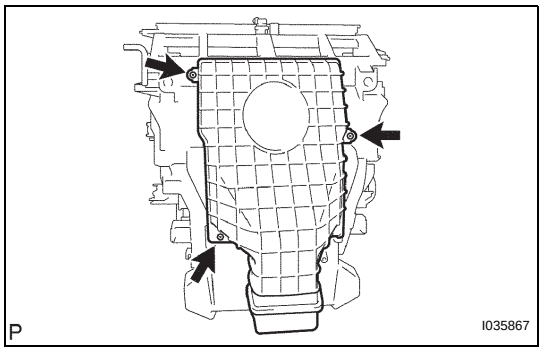
(b) Using a hexagon wrench 4.0 mm, remove the 2 hexagon bolts and air conditioning tube assembly.

(c) Remove the 2 O-rings from the air conditioning tube assembly.



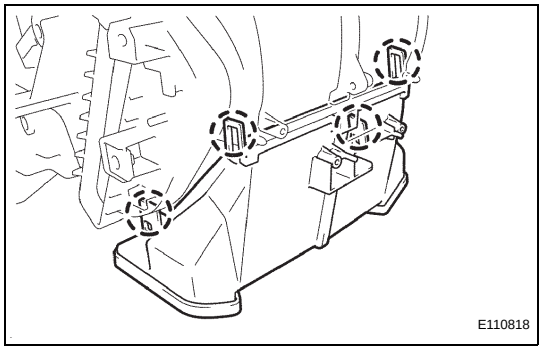
7. REMOVE COOLER EXPANSION VALVE

(a) Remove the cooler expansion valve from the cooler evaporator sub-assembly No. 1.

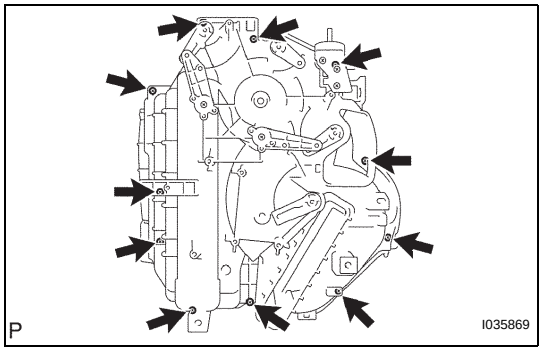


8. REMOVE COOLER EVAPORATOR NO.1 SUB-ASSEMBLY

(a) Remove the 3 screws and air duct sub-assembly.

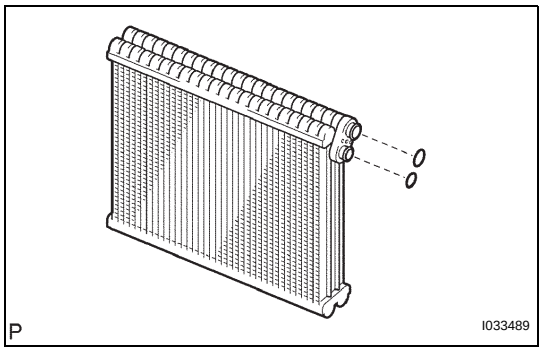


(b) Release the 4 claws and remove the air duct sub-assembly.

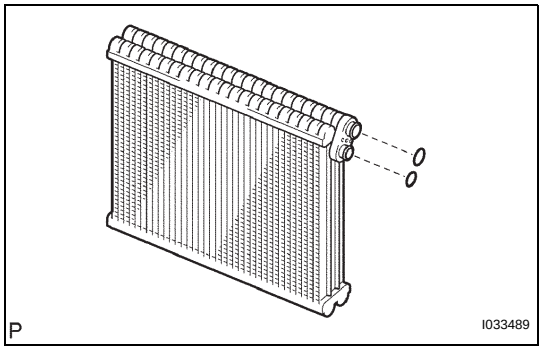


(c) Remove the 11 screws and separate the heater case.

(d) Remove the cooler evaporator No. 1 sub-assembly.



(e) Remove the 2 O-rings from the cooler evaporator No. 1 sub-assembly.



REASSEMBLY

1. INSTALL COOLER EVAPORATOR NO.1 SUB-ASSEMBLY

(a) Sufficiently apply compressor oil to 2 new O-rings and fitting surface of the cooler expansion valve.

Compressor oil:

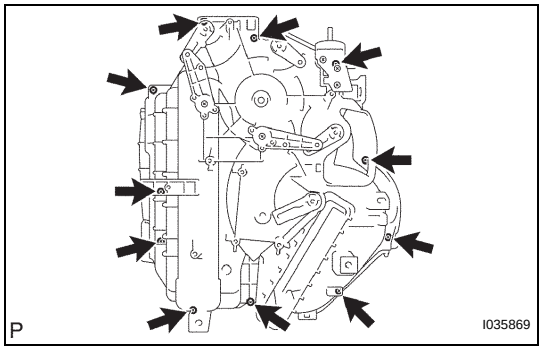
ND-OIL 11 or equivalent

NOTICE:

- **Do not use any compressor oil other than ND-OIL 11 or equivalent.**

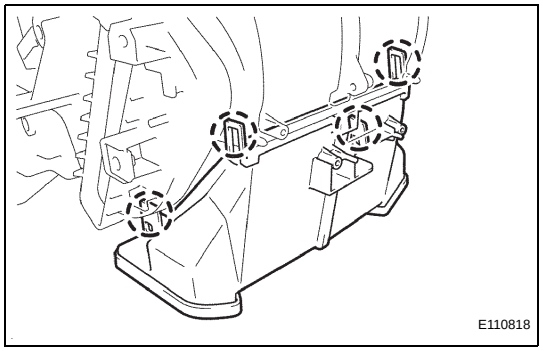
- **If any compressor oil other than ND-OIL 11 or equivalent is used, compressor motor insulation performance may decrease, resulting in leakage of electric power.**

(b) Install the 2 O-rings on the cooler evaporator No. 1 sub-assembly.

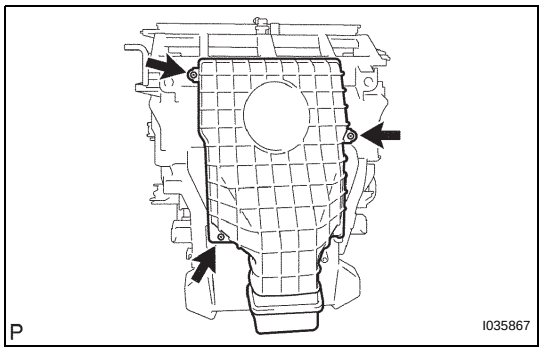


(c) Install the cooler evaporator No. 1 sub-assembly to the heater case.

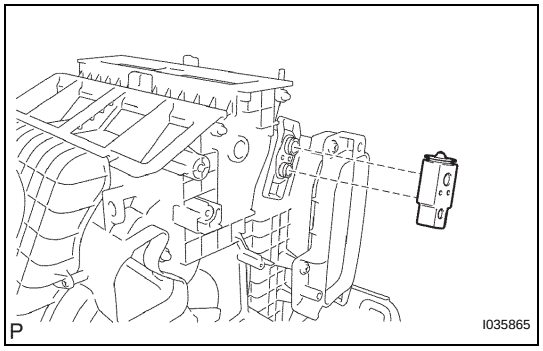
(d) Install the heater case with the 11 screws.



(e) Install the air duct sub-assembly with the 4 claws.

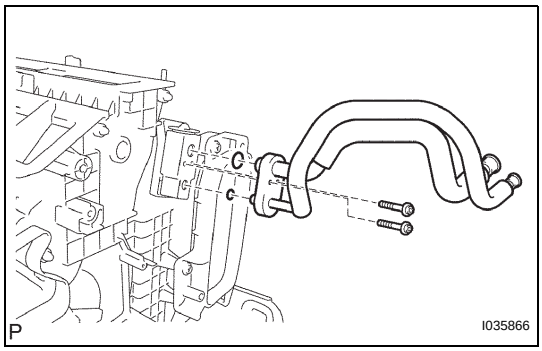


(f) Install the air duct sub-assembly with the 3 screws.



2. INSTALL COOLER EXPANSION VALVE

(a) Install the cooler expansion valve to the cooler evaporator No. 1 sub-assembly.



3. INSTALL AIR CONDITIONING TUBE ASSEMBLY

(a) Sufficiently apply compressor oil to 2 new O-rings and fitting surface of the air conditioning tube assembly.

Compressor oil:
ND-OIL 11 or equivalent

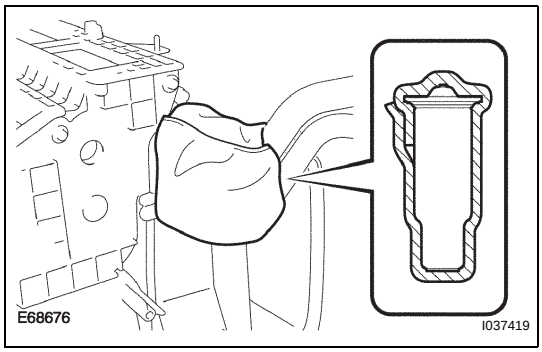
NOTICE:

- **Do not use any compressor oil other than ND-OIL 11 or equivalent.**
- **If any compressor oil other than ND-OIL 11 or equivalent is used, compressor motor insulation performance may decrease, resulting in leakage of electric power.**

(b) Install the 2 O-rings on the air conditioning tube assembly.

(c) Using a hexagon wrench 4.0 mm, install the air conditioning tube assembly with the 2 hexagon bolts.

Torque: 3.5 N*m (35 kgf*cm, 30 in.*lbf)



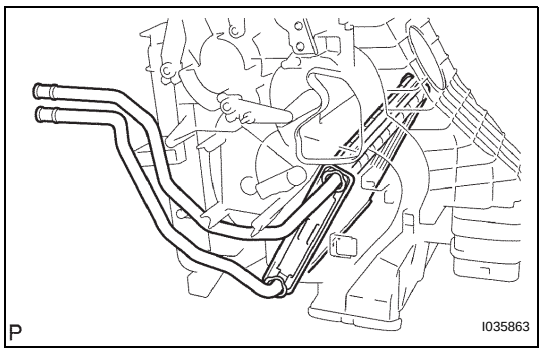
(d) Install a new packing.

NOTICE:

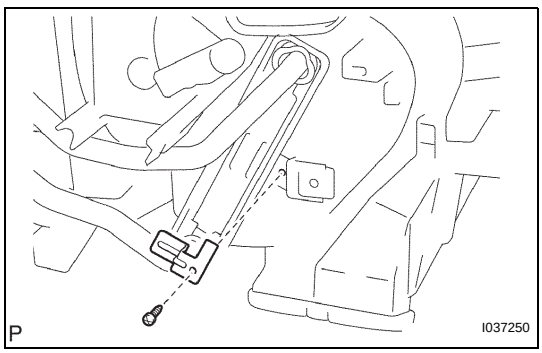
- **Be sure to install the packing securely so that there is no clearance.**
- **Wrap the packing with a shop rag or a piece of cloth as shown in the illustration to prevent moisture from entering.**

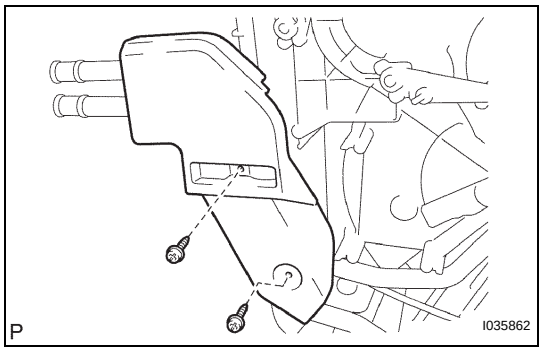
4. INSTALL HEATER RADIATOR UNIT SUB-ASSEMBLY

(a) Install the heater radiator unit sub-assembly.

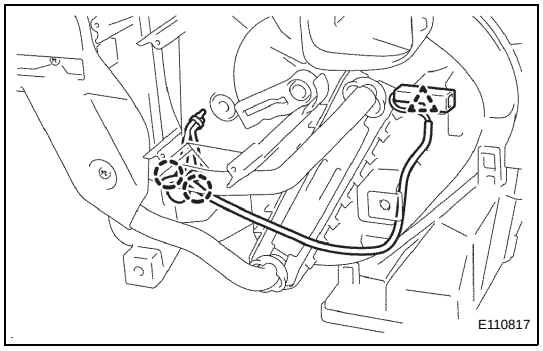


(b) Install the bracket with the screw.





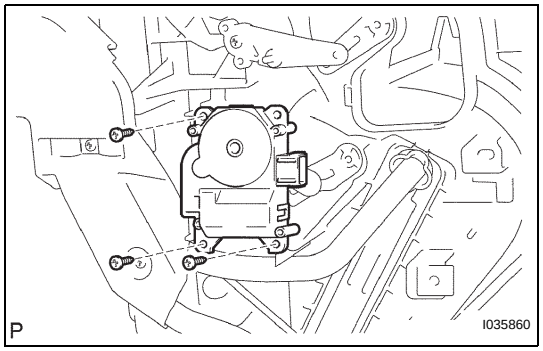
(c) Install the piping cover with the 2 screws.



5. INSTALL EVAPORATOR TEMPERATURE SENSOR

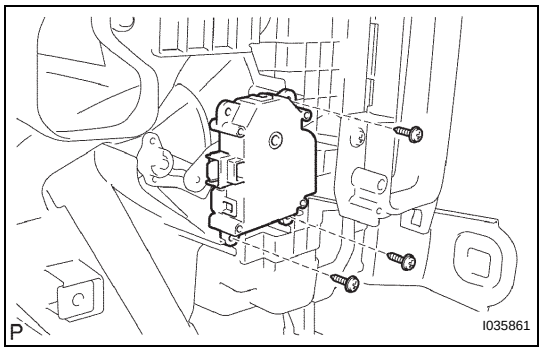
(a) Engage the 2 claws to install the evaporator temperature sensor.

(b) Engage the clamp to install the connector.

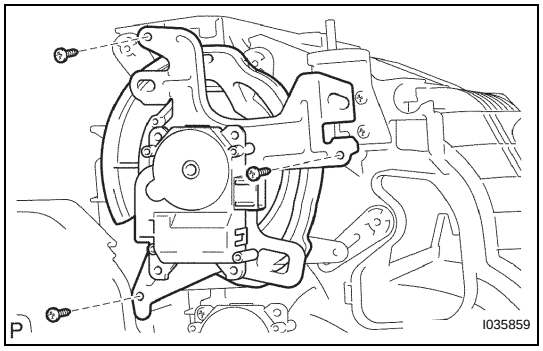


6. INSTALL AIR MIX CONTROL SERVO MOTOR

(a) LH side:
Install the air mix control servomotor with the 3 screws.



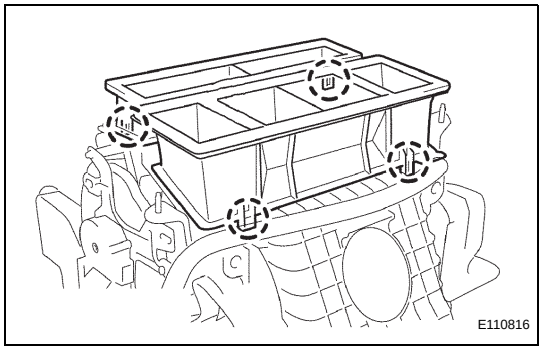
(b) RH side:
Install the air mix control servomotor with the 3 screws.



7. INSTALL AIR OUTLET CONTROL SERVO MOTOR

(a) Install the air outlet control servomotor with the 3 screws .

AC

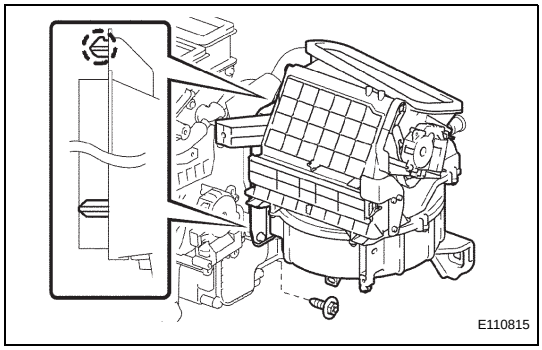


8. INSTALL HEATER TO REGISTER DUCT CENTER

(a) Engage the 4 clamps to install the heater to register duct center.

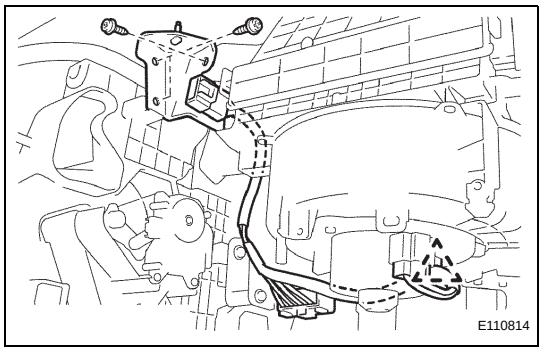
AC

INSTALLATION



1. INSTALL BLOWER ASSEMBLY

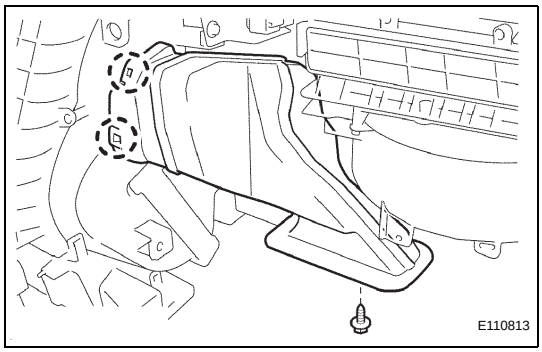
(a) Engage the claw to install the blower assembly.



2. INSTALL WIRING AIR INDICATOR HARNESS NO.2 SUB-ASSEMBLY

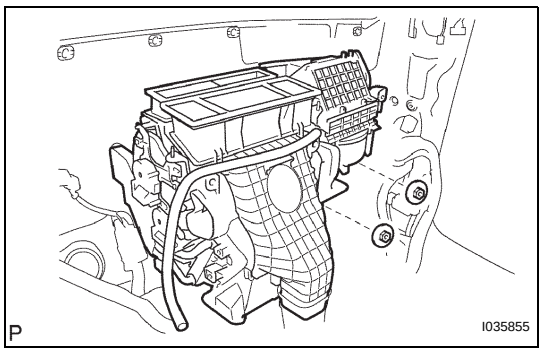
(a) Install the wiring air indicator harness No. 2 sub-assembly with the 3 screws.

(b) Connect the connectors and clamp.



3. INSTALL AIR DUCT NO.2

(a) Install the air duct No. 2 with the screw.
Torque: 2.5 N*m (25 kgf*cm, 22 in.*lbf)

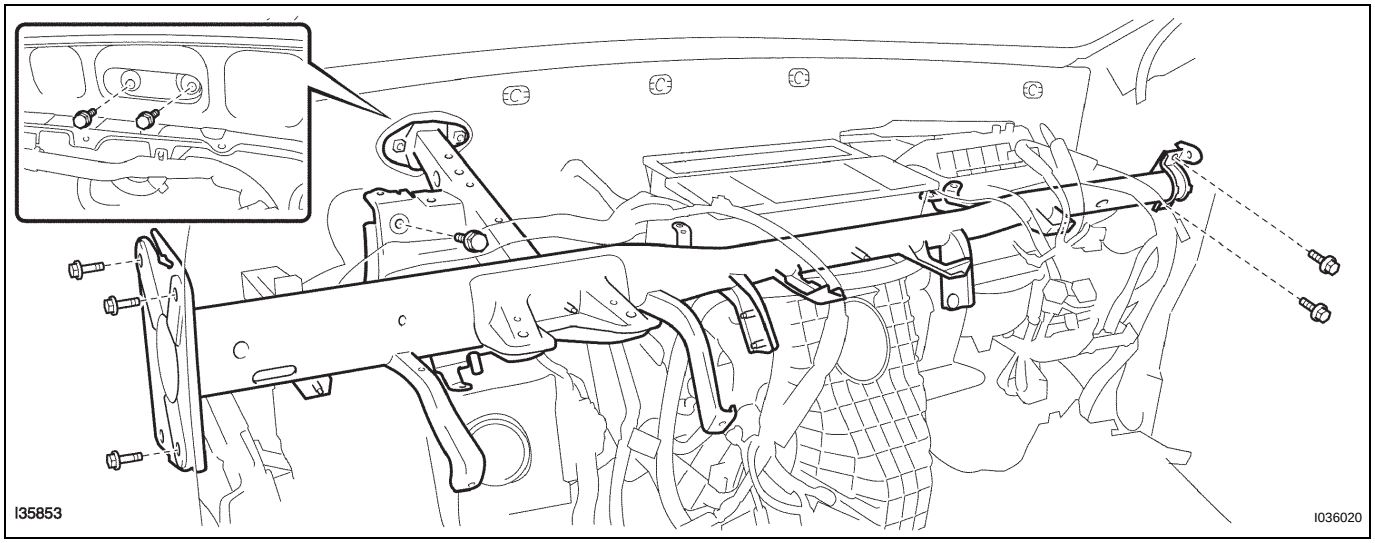


4. TEMPORARILY TIGHTEN AIR CONDITIONER UNIT ASSEMBLY

(a) Temporarily tighten the air conditioner unit assembly with the 2 nuts.
HINT:
Make sure to hold the air conditioner unit assembly securely as its bracket installation parts may be damaged.

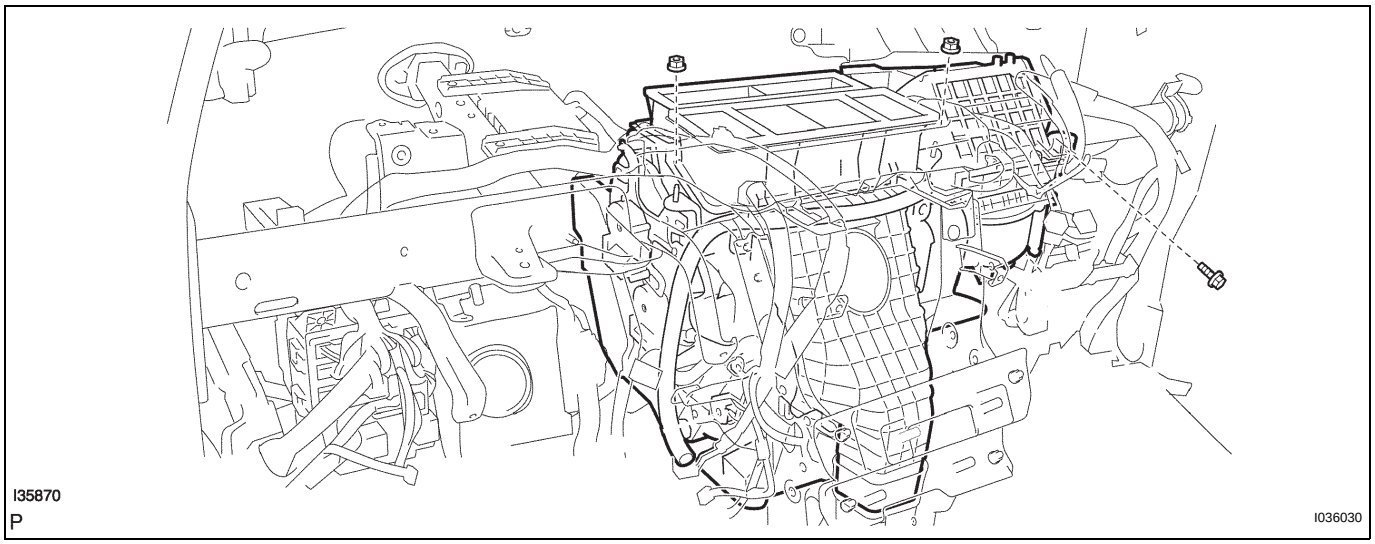
5. INSTALL INSTRUMENT PANEL REINFORCEMENT ASSEMBLY

(a) Install the instrument panel reinforcement with the 8 bolts.



Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

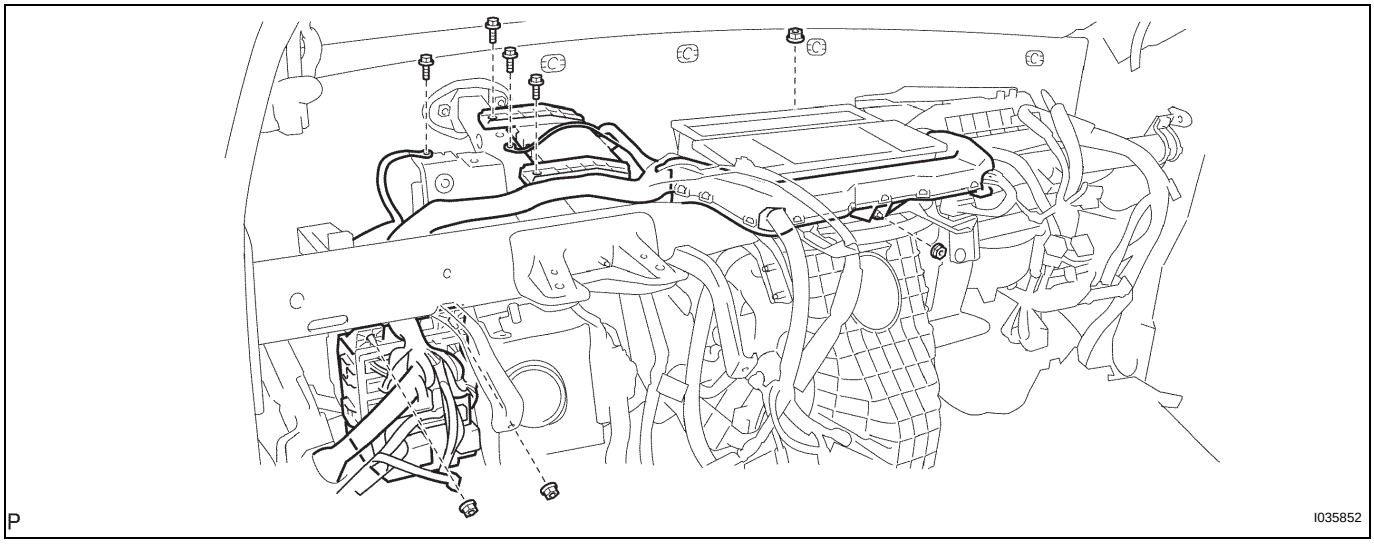
(b) Temporarily tighten the air conditioner unit assembly with the 2 nuts and bolt.

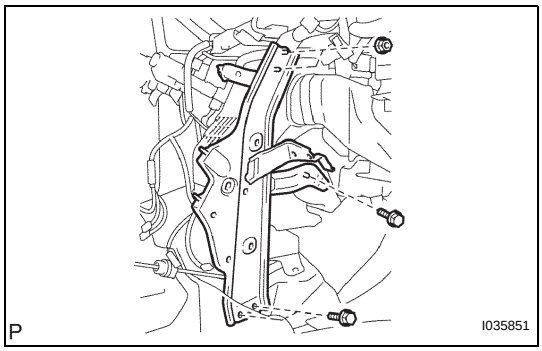


(c) Install the 4 bolts and 4 nuts.

(d) Install the clamps.

(e) Connect the connectors.

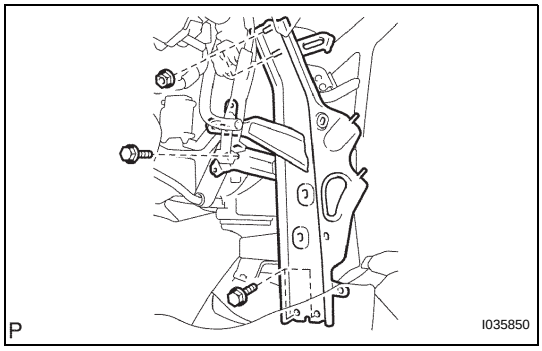




6. INSTALL INSTRUMENT PANEL BRACE NO.2 SUB-ASSEMBLY

(a) Install the instrument panel brace No. 2 sub-assembly with the 3 bolts and 2 nuts.

(b) Install the clamps and connect the connectors.

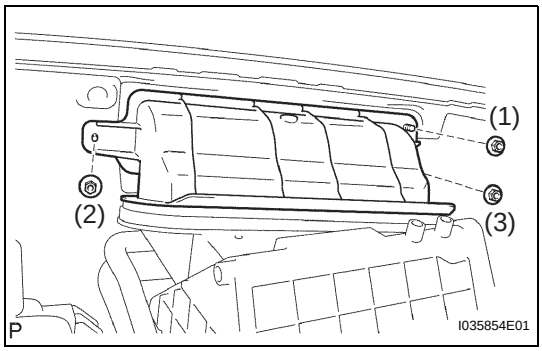


7. INSTALL INSTRUMENT PANEL BRACE NO.1 SUB-ASSEMBLY

(a) Install the instrument panel brace No. 1 sub-assembly with the 3 bolts and 2 nuts.

(b) Install the clamps and connect the connectors.

8. INSTALL INSTRUMENT PANEL BRACKET NO.4



9. INSTALL AIR DUCT NO.1 SUB-ASSEMBLY

(a) Install the air duct No. 1 sub-assembly with the 3 nuts.

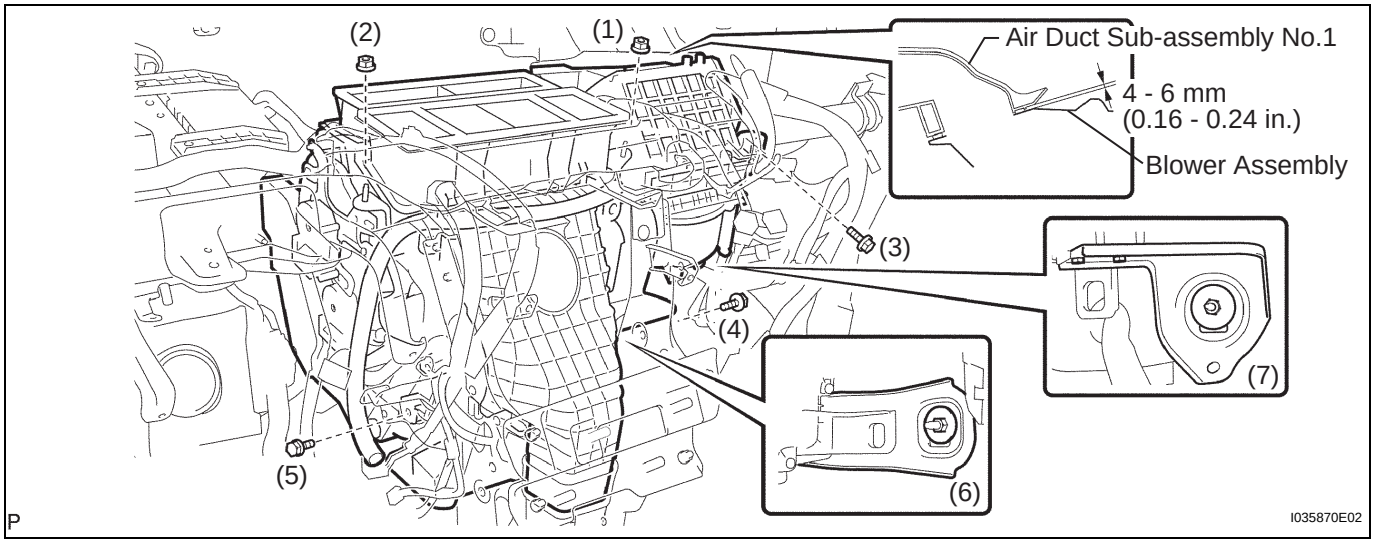
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

NOTICE:

Tighten the bolts in numerical order shown in the illustration to install the air duct No. 1 sub-assembly.

10. FULLY TIGHTEN AIR CONDITIONER UNIT ASSEMBLY

(a) Fully tighten the air conditioner unit assembly with the 3 bolts and 4 nuts.



Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

NOTICE:

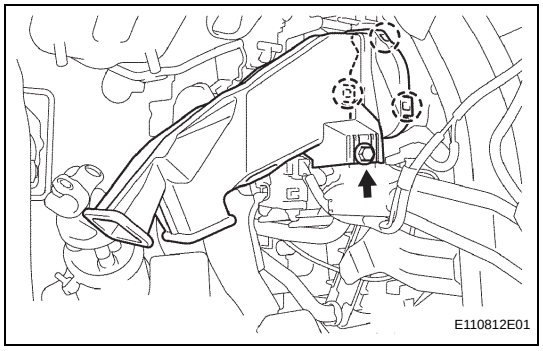
- **Tighten the bolts in numerical order shown in the illustration to install the air conditioner unit assembly.**
- **Install the air conditioner unit assembly so that there is no clearance between the duct and blower assemblies.**

11. INSTALL STEERING COLUMN ASSEMBLY (Manual Tilt Type) (See page SR-44)

12. INSTALL STEERING COLUMN ASSEMBLY (Power Tilt and Power Type) (See page SR-56)

13. CONNECT STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY (Manual Tilt Type) (See page SR-45)

14. INSTALL STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY (Power Tilt and Power Type) (See page SR-56)



15. INSTALL AIR DUCT NO.1

(a) Install the air duct No. 1 with the bolt.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

16. INSTALL AIR CONDITIONER AMPLIFIER ASSEMBLY

17. INSTALL SHIFT LEVER

HINT:
See page AX-186 for U151E, AX-189 for U151F.

18. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

HINT:
See page AX-163 for U151E, AX-163 for U151F.

19. INSPECT SHIFT LEVER POSITION

AC

20. ADJUST SHIFT LEVER POSITION

HINT:

See page AX-182 for U151E, AX-185 for U151F.

21. INSTALL AIR DUCT REAR NO.1

22. INSTALL AIR DUCT REAR NO.2

23. INSTALL INSTRUMENT PANEL ASSEMBLY

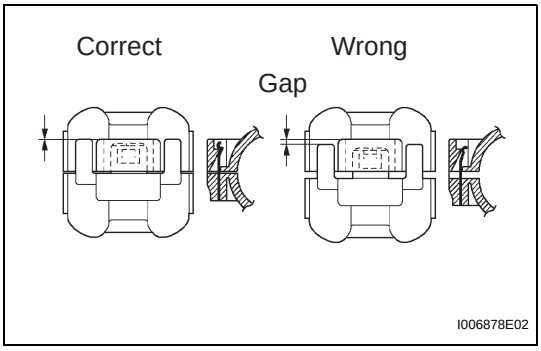
HINT:

Refer to the installation procedures for the instrument panel assembly (See page IP-24).

AC

24. INSTALL HEATER WATER INLET HOSE

25. INSTALL HEATER WATER OUTLET HOSE



26. INSTALL COOLER REFRIGERANT SUCTION PIPE NO.1

(a) Remove the attached vinyl tape from the hose.

(b) Coat a new O-ring with compressor oil and install it to the hose.

Compressor oil:
ND-OIL 11 or equivalent

NOTICE:

- **Do not use any compressor oil other than ND-OIL 11 or equivalent.**
- **If any compressor oil other than ND-OIL 11 or equivalent is used, compressor motor insulation performance may decrease, resulting in leakage of electric power.**

(c) Install the cooler refrigerant suction pipe No. 1 and piping clamp.

HINT:

- Be sure to connect the hose securely.
- After connection, check the fitting for the claw of the piping clamp.

27. INSTALL AIR CONDITIONING TUBE AND ACCESSORY ASSEMBLY

(a) Remove the attached vinyl tape from the hose.

(b) Coat a new O-ring with compressor oil and install it to the pipe.

Compressor oil:
ND-OIL 11 or equivalent

NOTICE:

- **Do not use any compressor oil other than ND-OIL 11 or equivalent.**
- **If any compressor oil other than ND-OIL 11 or equivalent is used, compressor motor insulation performance may decrease, resulting in leakage of electric power.**

(c) Install the air conditioning tube and accessory assembly and piping clamp.

HINT:

- Be sure to connect the hose securely.
- After connection, check the fitting for the claw of the piping clamp.

28. **INSTALL COWL TOP PANEL OUTER SUB-ASSEMBLY (See page EM-127)**

29. **INSTALL WINDSHIELD WIPER LINK ASSEMBLY (See page WW-39)**

30. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY**

31. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH (See page WW-39)**

32. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH (See page WW-40)**

33. **ADD ENGINE COOLANT**
HINT:
See page CO-1.

34. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

35. **CHARGE REFRIGERANT**
HINT:
See page AC-128.

36. **WARM UP COMPRESSOR**
HINT:
See page AC-128.

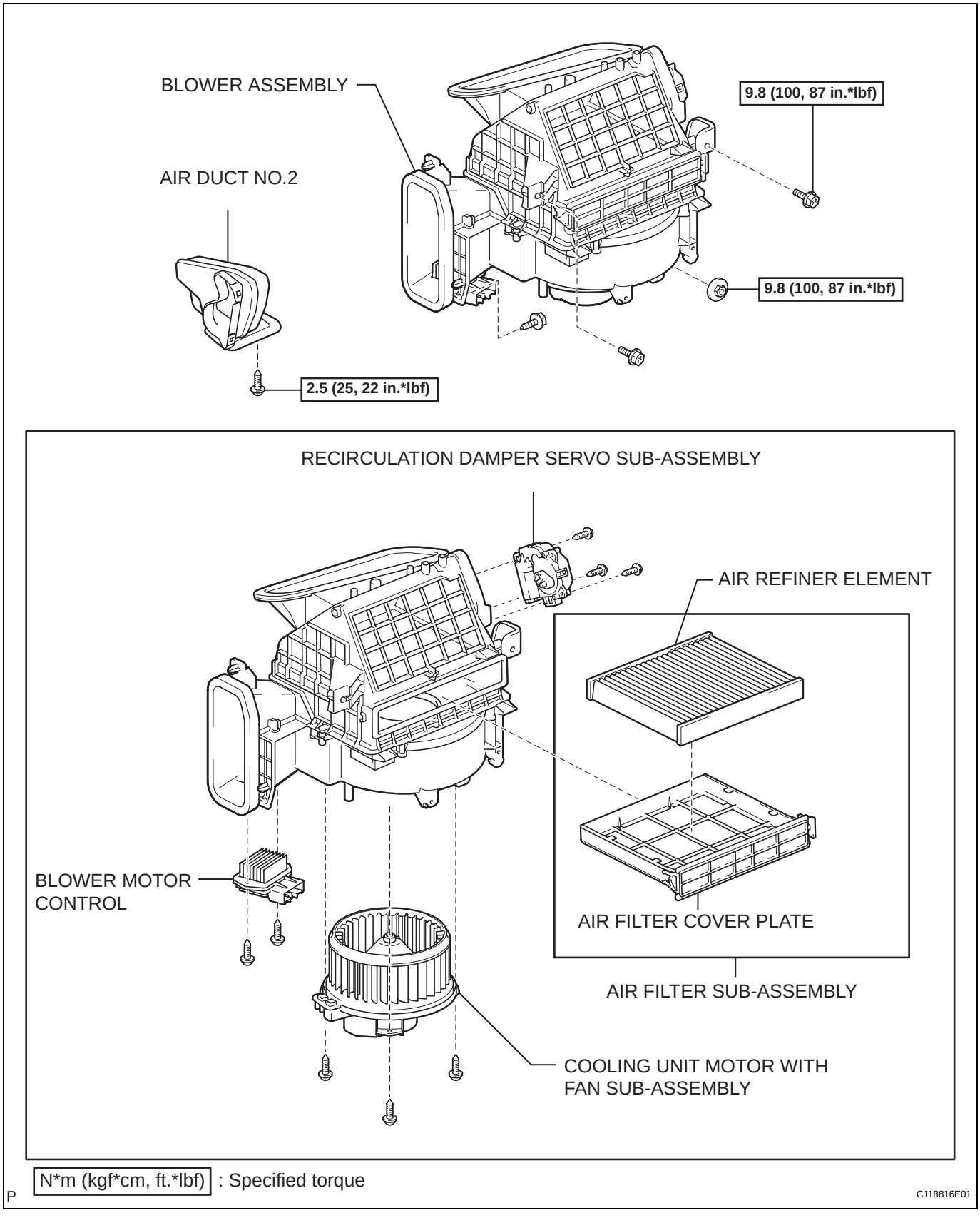
37. **CHECK FOR ENGINE COOLANT LEAKS**
HINT:
See page CO-1.

38. **CHECK FOR LEAKAGE OF REFRIGERANT**
HINT:
See page AC-128.

39. **REMOVE PERFORM INITIALIZATION**
NOTICE:
Some systems need initialization when disconnecting the cable from the negative battery terminal.

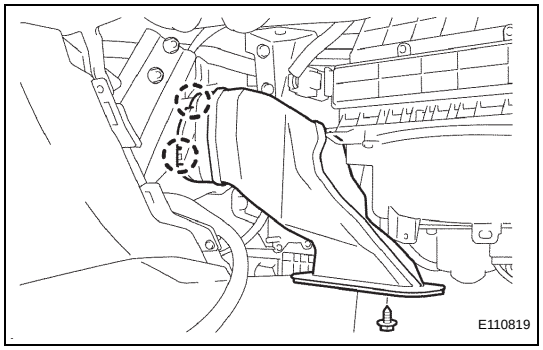
BLOWER UNIT

COMPONENTS

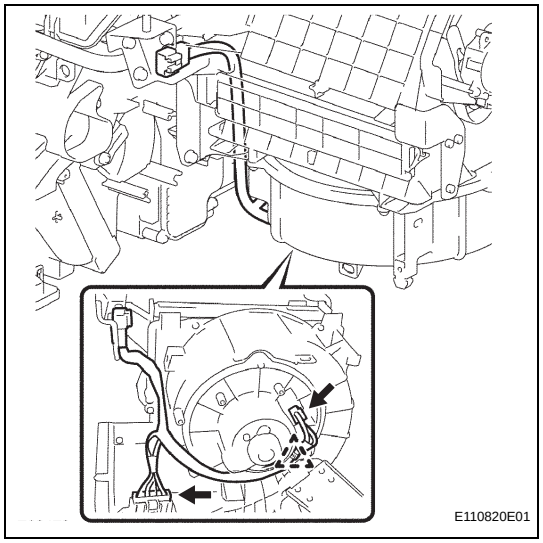


REMOVAL

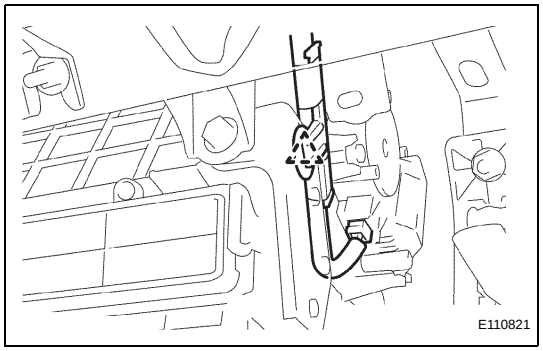
1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
2. **REMOVE FRONT DOOR SCUFF PLATE RH**
3. **REMOVE COWL SIDE TRIM RH SUB-ASSEMBLY**
4. **REMOVE INSTRUMENT PANEL UNDER COVER NO.2 SUB-ASSEMBLY (See page IP-13)**
5. **REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY (See page IP-13)**



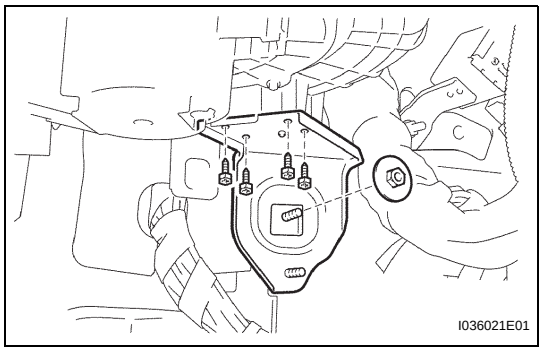
6. **REMOVE AIR DUCT NO.2**
   (a) Remove the screw.
   (b) Release the 2 claws and remove the air duct No. 2.



7. **DISCONNECT WIRING AIR INDICATOR HARNESS NO.2 SUB-ASSEMBLY**
   (a) Remove the clamp and disconnect the 2 connectors.

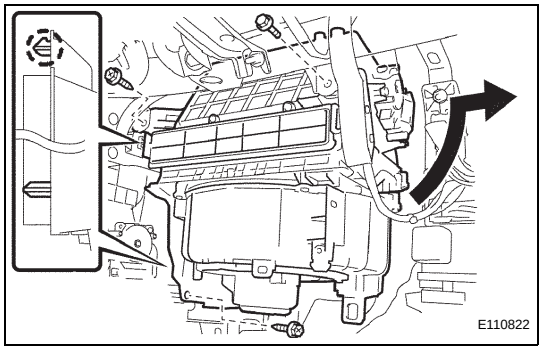


8. **REMOVE BLOWER ASSEMBLY**
   (a) Remove the clamp and disconnect the connectors.



(b) Remove the 4 screws and the nut, and then the bracket.

AC

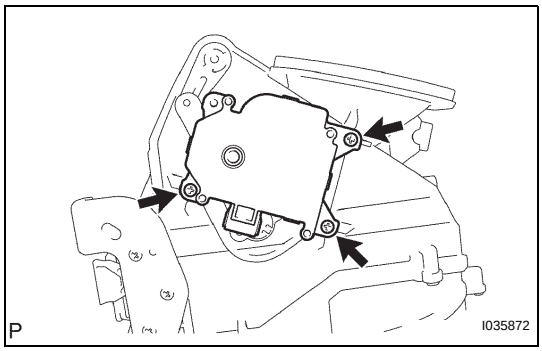


(c) Remove the bolt and 2 screws.
(d) Release the claw and remove the blower assembly.

DISASSEMBLY

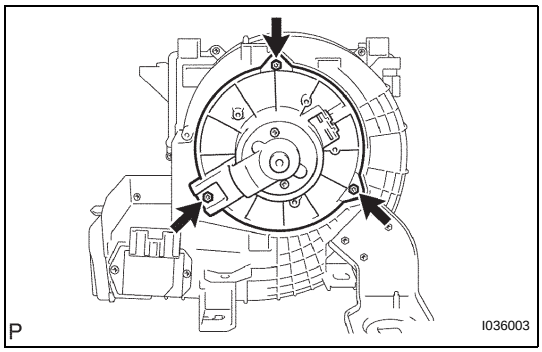
1. REMOVE AIR INLET SERVO MOTOR

(a) Remove the 3 screws and air inlet servomotor.



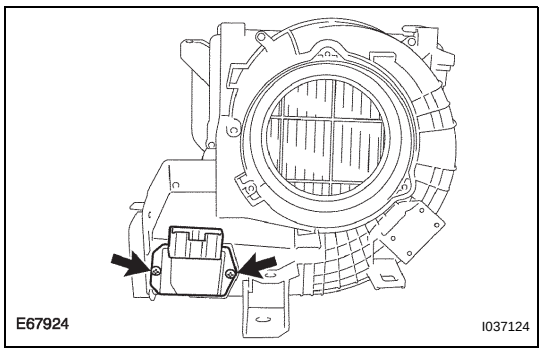
2. REMOVE COOLING UNIT MOTOR WITH FAN SUB-ASSEMBLY

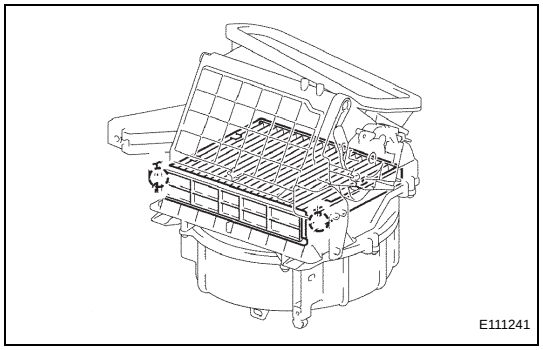
(a) Remove the 3 screws and cooling unit motor with fan sub-assembly.



3. REMOVE BLOWER MOTOR CONTROL

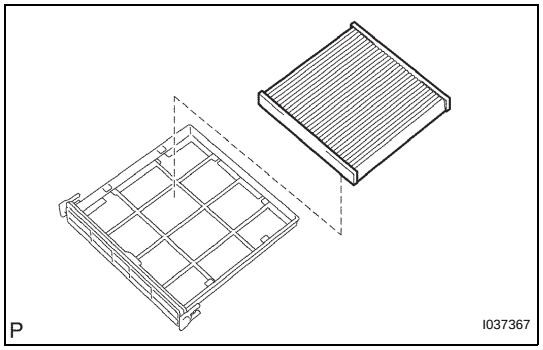
(a) Remove the 2 screws and blower motor control.





4. REMOVE CLEAN AIR FILTER

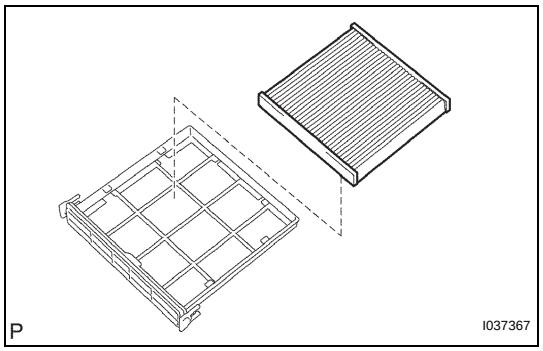
(a) Release the 2 claws and remove the air filter sub-assembly.



(b) Remove the air refiner element from the air filter cover plate.

AC

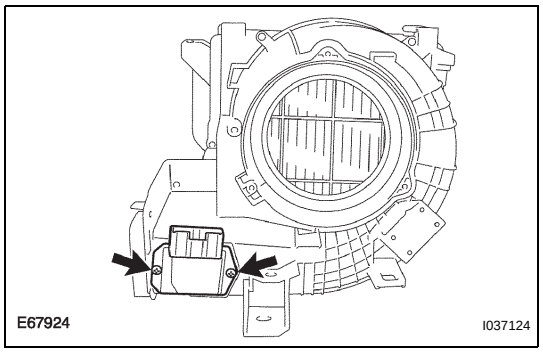
REASSEMBLY



1. INSTALL CLEAN AIR FILTER

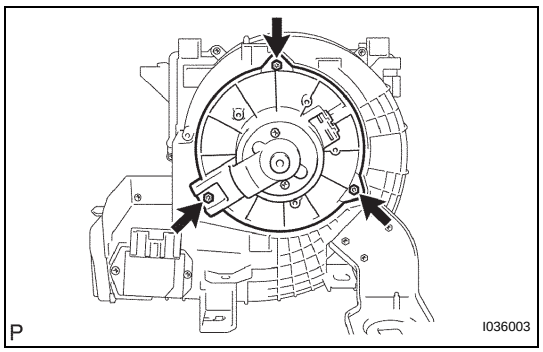
(a) Install the clean air filter.

(b) Engage the 2 claws to install the air filter sub-assembly.



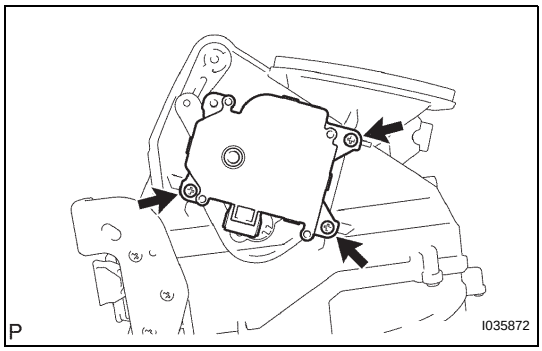
2. INSTALL BLOWER MOTOR CONTROL

(a) Install the blower motor control with the 2 screws.



3. INSTALL COOLING UNIT MOTOR WITH FAN SUB-ASSEMBLY

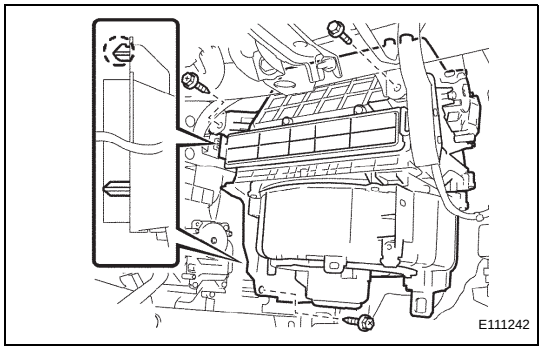
(a) Install the cooling unit motor with fan sub-assembly with the 3 screws.



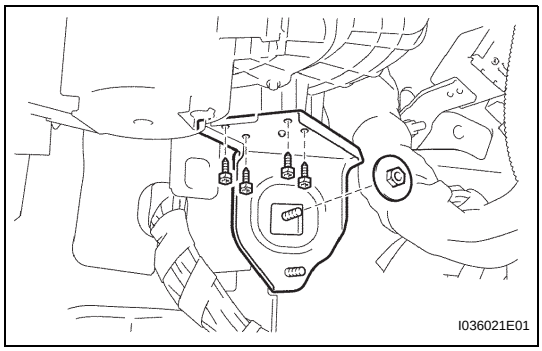
4. **INSTALL AIR INLET SERVO MOTOR**
   (a) Install the air inlet servomotor with the 3 screws.

AC

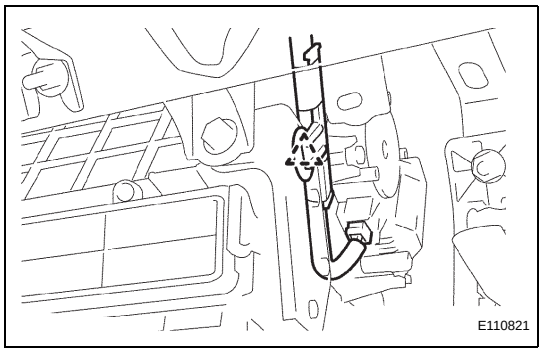
INSTALLATION



1. **INSTALL BLOWER ASSEMBLY**
   (a) Install the blower assembly with the claw.
   (b) Install the bolt and 2 screws.
   Torque: BOLT
   9.8 N*m (100 kgf*cm, 87 in.*lbf)

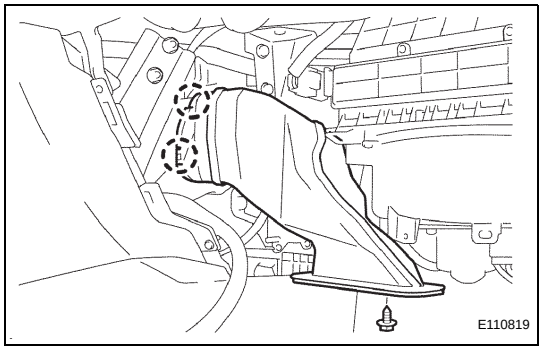


   (c) Install the bracket with the 4 screws and nut.
   Torque: NUT
   9.8 N*m (100 kgf*cm, 87 in.*lbf)



   (d) Install the clamp and connect the connectors.

2. **INSTALL WIRING AIR INDICATOR HARNESS NO.2 SUB-ASSEMBLY**



3. **INSTALL AIR DUCT NO.2**
   (a) Install the air duct No. 2 with the screw.
   Torque: 2.5 N*m (25 kgf*cm, 22 in.*lbf)
4. **INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY (See page IP-27)**
5. **INSTALL INSTRUMENT PANEL UNDER COVER NO.2 SUB-ASSEMBLY (See page IP-28)**
6. **INSTALL COWL SIDE TRIM RH SUB-ASSEMBLY**
7. **INSTALL FRONT DOOR SCUFF PLATE RH**

8. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

9. **PERFORM INITIALIZATION**
NOTICE:
Some systems need initialization when disconnecting the cable from the negative battery terminal.

BLOWER MOTOR

ON-VEHICLE INSPECTION

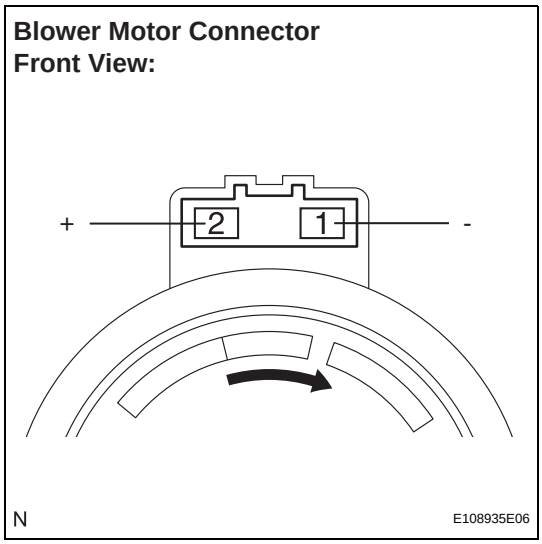
1. INSPECT COOLING UNIT MOTOR SUB-ASSEMBLY W/FAN

(a) Remove the cooling unit motor sub-assembly w/ fan.

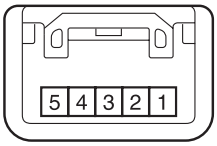
(b) Connect the negative (-) lead connected to terminal 1 of the blower motor connector, the positive (+) lead to terminal 2.

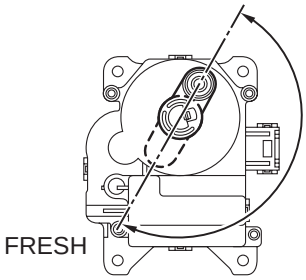
OK:

Blower motor operates smoothly.



Air Inlet Control Servo Motor Connector Front View:





N

E109217E07

AIR INLET CONTROL SERVO MOTOR

INSPECTION

1. INSPECT AIR INLET CONTROL SERVO MOTOR

(a) Remove the air inlet control servo motor.

(b) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "FRESH" side smoothly.

(c) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "RECIRCULATION" side smoothly.

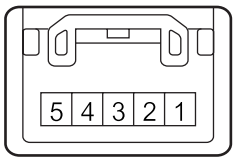
NOTICE:

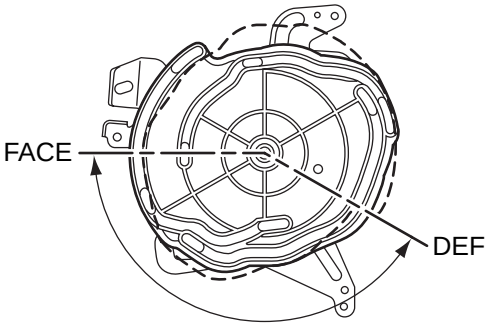
While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

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

AC

Air Outlet Control Servo Motor Connector Front View:





H

E108927E09

AIR OUTLET CONTROL SERVO MOTOR

INSPECTION

1. INSPECT AIR OUTLET CONTROL SERVO MOTOR

(a) Remove the air outlet control servo motor.

(b) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "DEF" position.

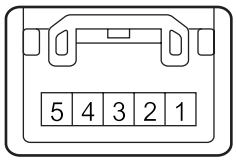
(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "FACE" position.

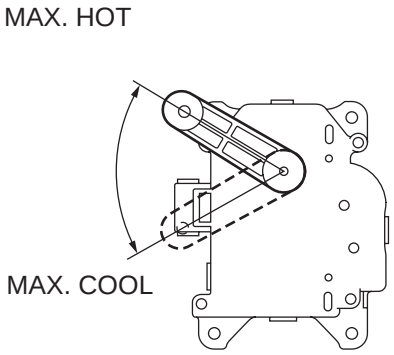
NOTICE:

While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

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

Air Mix Control Servo Motor Connector Front View:





H

E109269E07

AIR MIX CONTROL SERVO MOTOR (for Driver Side)

INSPECTION

1. INSPECT AIR MIX CONTROL SERVO MOTOR

(a) Remove the air mix control servo motor.

(b) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "COOL" side smoothly.

(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "HOT" side smoothly.

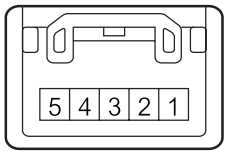
NOTICE:

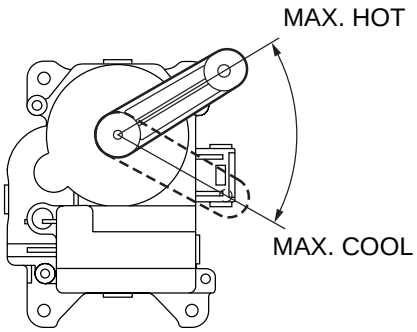
While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

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

AC

Air Mix Control Servo Motor Connector Front View:





H

E109236E09

AIR MIX CONTROL SERVO MOTOR (for Front Passenger Side)

INSPECTION

1. INSPECT AIR MIX CONTROL SERVO MOTOR

(a) Remove the air mix control servo motor.

(b) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the lever turns to "COOL" side smoothly.

(c) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 4, then check that the lever turns to "HOT" side smoothly.

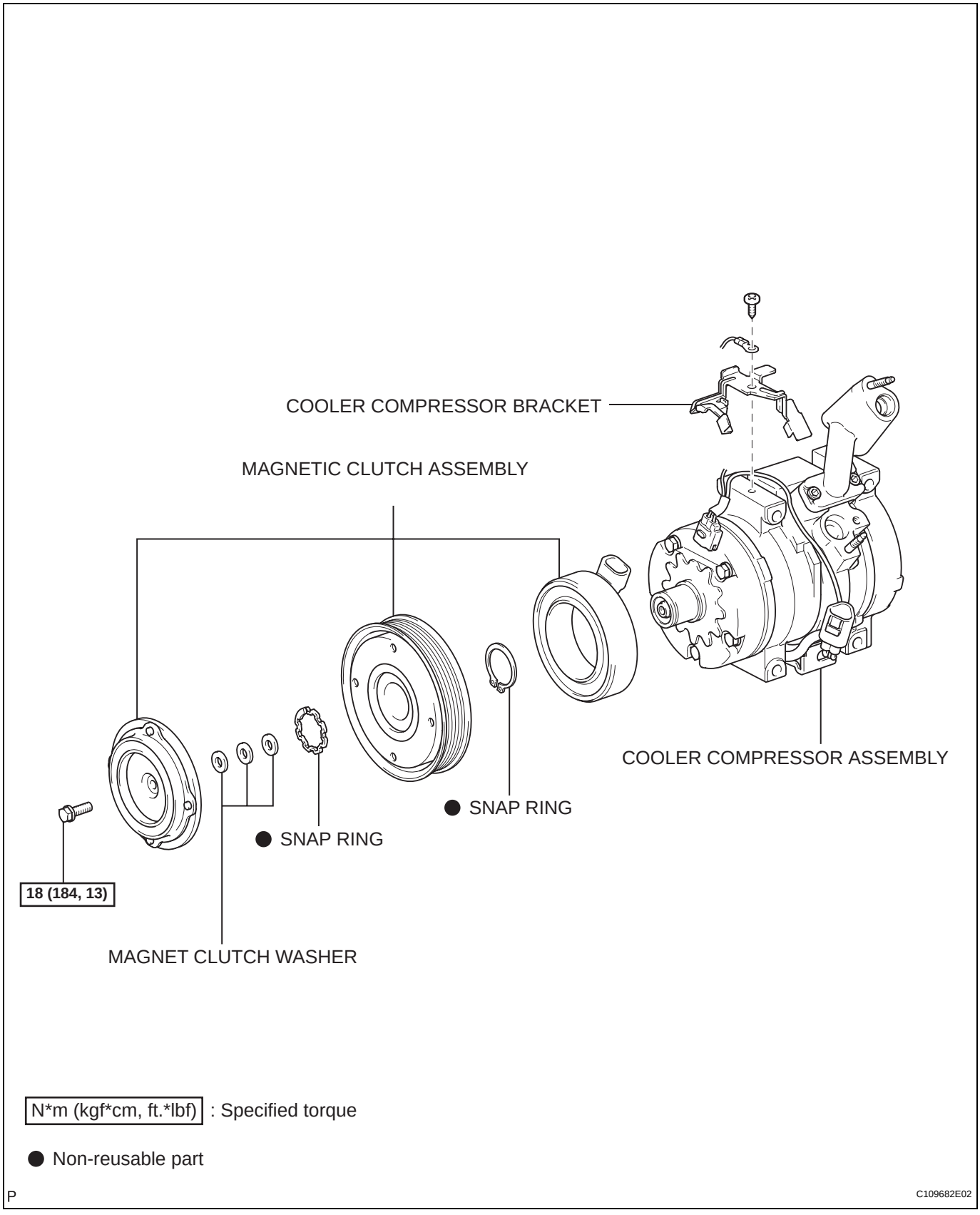
NOTICE:

While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

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

COMPRESSOR AND MAGNETIC CLUTCH

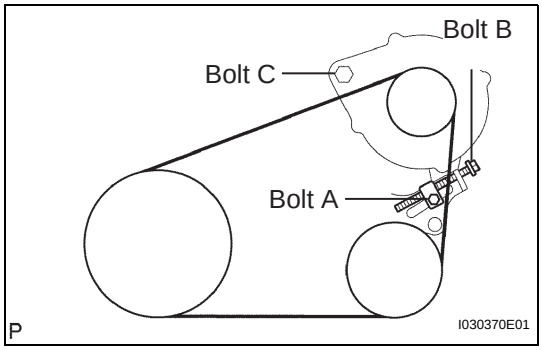
COMPONENTS



REMOVAL

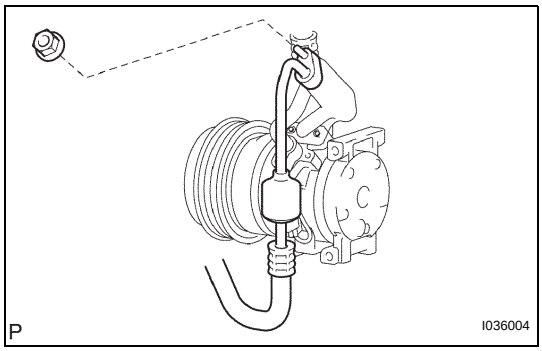
1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



2. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Loosen the bolt C.
(b) Loosen the bolt A.
(c) Loosen the bolt B and remove the V (cooler compressor to crankshaft pulley) belt No. 1.

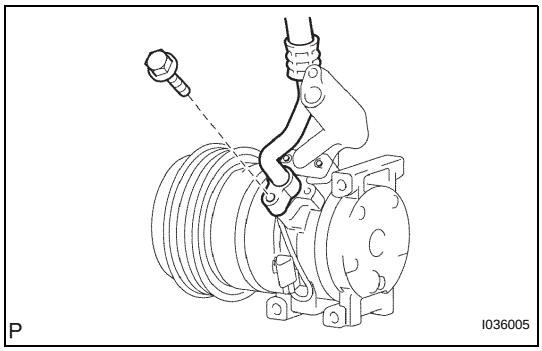


3. DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1

(a) Remove the nut and disconnect the cooler refrigerant discharge hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant discharge hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

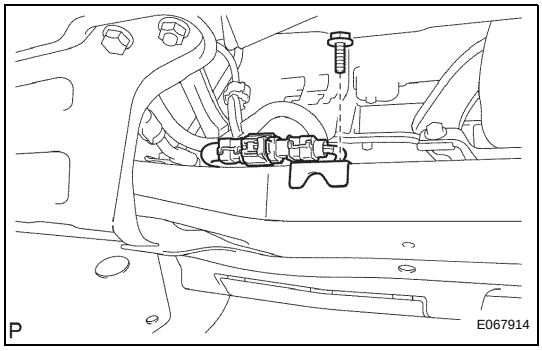
4. REMOVE ENGINE UNDER COVER NO.1



5. DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1

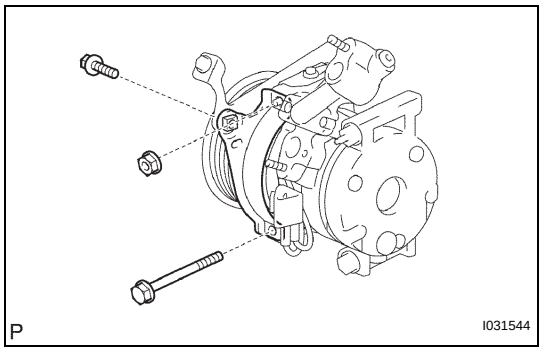
(a) Remove the bolt and disconnect the cooler refrigerant suction hose No. 1 from the compressor and magnetic clutch.
(b) Remove the O-ring from the cooler refrigerant suction hose No. 1.

NOTICE:
Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

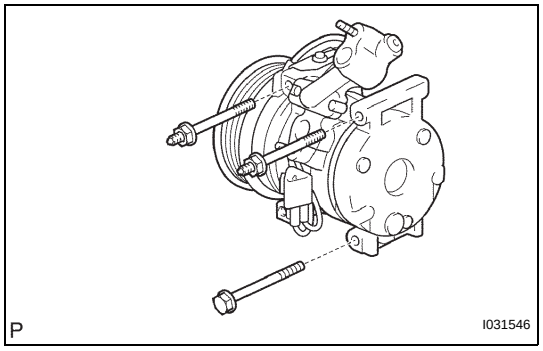


6. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Remove the bolt and bracket.
(b) Disconnect the connector and clamp.



(c) Remove the 2 bolts, nut and the cooler compressor bracket.

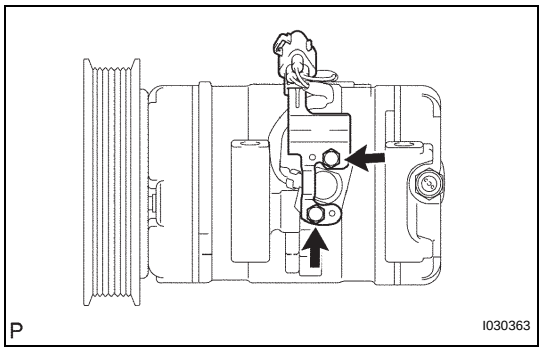


(d) Remove the 3 bolts and the compressor and magnetic clutch.

AC

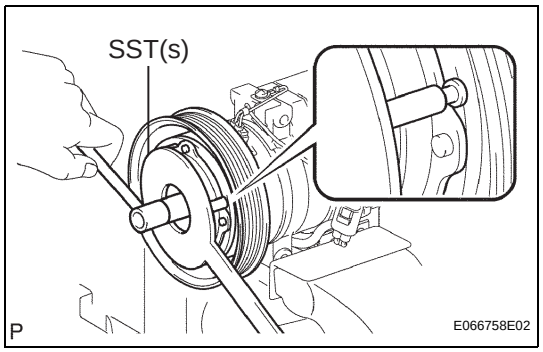
DISASSEMBLY

1. REMOVE MAGNETIC CLUTCH ASSEMBLY



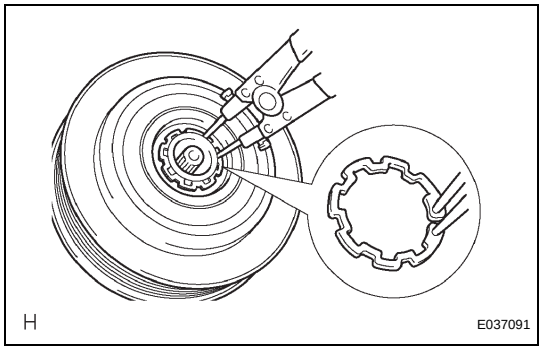
(a) Remove the 2 bolts and the bracket.

(b) Place the compressor and magnetic clutch in a vise.
NOTICE:
Do not get the bracket and harness caught in the vise.



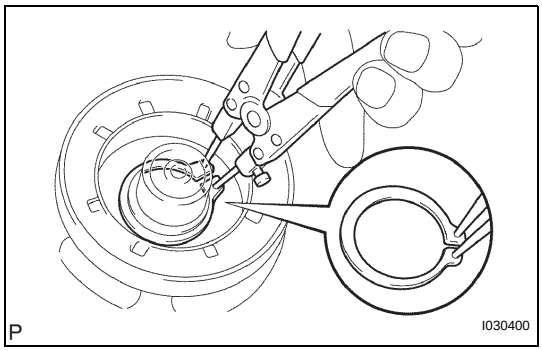
(c) Using SST(s), hold the magnet clutch hub.
SST 95047-10040

(d) Remove the bolt, magnet clutch hub and magnet clutch washer.
HINT:
There is no set number of magnet clutch washers since they are used for adjusting.



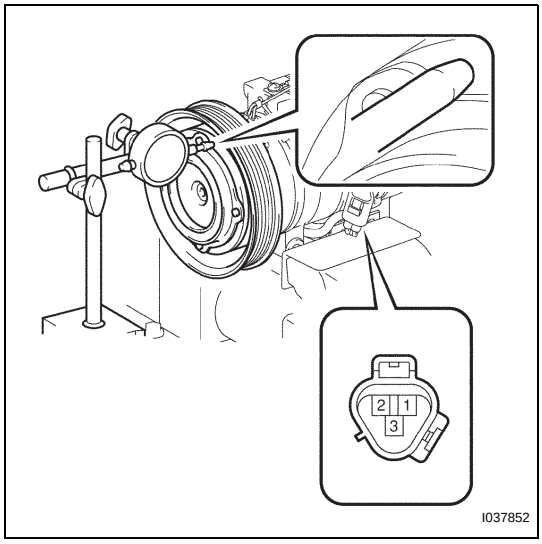
(e) Using a snap ring expander, remove the snap ring and magnet clutch rotor.
NOTICE:
Do not damage the seal cover of the bearing when removing the snap ring.

(f) Remove the screw and disconnect the connector.



(g) Using a snap ring expander, remove the snap ring and magnet clutch stator.

2. REMOVE COOLER COMPRESSOR ASSEMBLY



INSPECTION

1. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial gage to the magnet clutch hub.

(b) Connect the positive battery lead to terminal 3 of the magnet clutch connector and the negative lead to the earth wire. Turn on and off the magnet clutch and measure the clearance.

Standard clearance:

0.35 to 0.60 mm (0.013 to 0.023 in.)

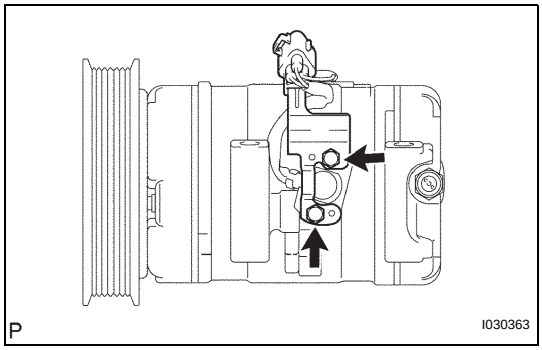
If the measured value is not within the standard range, remove the magnet clutch hub and adjust it with magnet clutch washers.

NOTICE:

Adjustment shall be performed with 3 or less magnet clutch washers.

(c) Remove the compressor and magnetic clutch from the vise.

(d) Install bracket with the 2 bolts.



2. INSPECT COMPRESSOR OIL

(a) When replacing the compressor and magnetic clutch with a new one, after gradually removing the refrigerant gas from the service valve, drain the following amount of oil from the new compressor and magnetic clutch before installation.

Standard:

(Oil capacity inside new compressor and magnetic clutch: 120 + 15 cc (4.0 + 0.5 fl. oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing)

NOTICE:

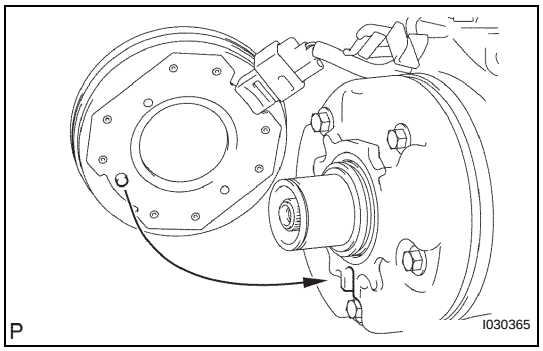
- **When checking the compressor oil level, observe the precautions on the cooler removal / installation.**
- **When a new compressor and magnetic clutch is installed without removing the oil remaining in the pipes (of the vehicle), the oil amount will become excessive, which prevents heat exchange in the refrigerant and causes refrigerant failure.**

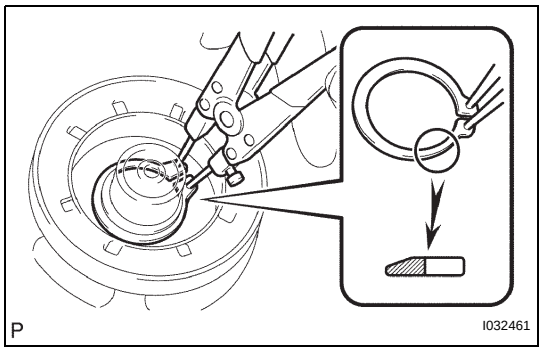
- **If the remaining oil in the removed compressor and magnetic clutch is too small in volume, check for oil leakage.**
- **Be sure to use ND-OIL 8 for compressor oil.**

REASSEMBLY

1. INSTALL MAGNETIC CLUTCH ASSEMBLY

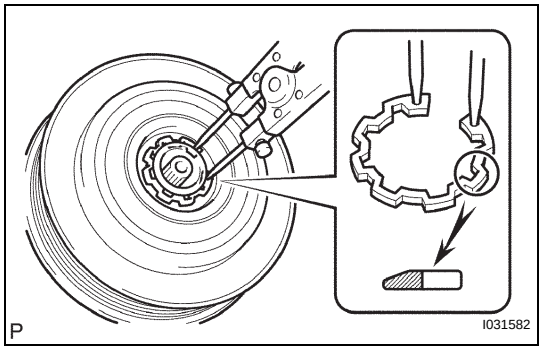
(a) Fit the parts as shown in the illustration and install the magnet clutch stator.





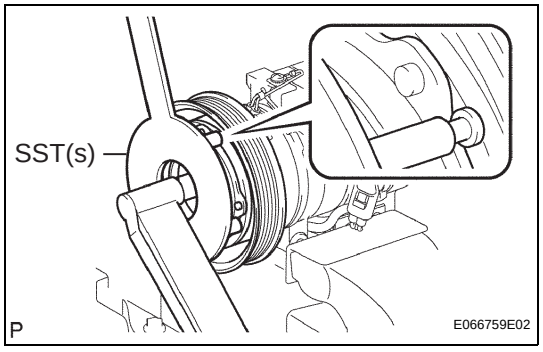
(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.
NOTICE:
Do not damage the seal cover of the bearing when removing the snap ring.

(c) Install the screw and connect the connector.



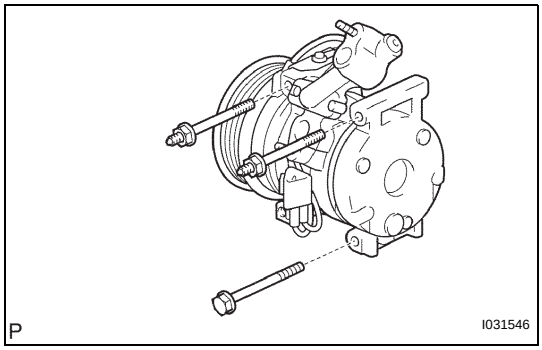
(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.
NOTICE:
- **Do not expand the snap ring by more than 30.5 mm when installing it.**
- **Do not damage the seal cover of the bearing when removing the snap ring.**

(e) Install the magnet clutch washer and magnet clutch hub.
NOTICE:
Do not change the combination of the magnet clutch washers used before disassembly.



(f) Using SST(s), hold the magnet clutch hub and install the bolt.
Torque: 18 N*m (183 kgf*cm, 13 ft.*lbf)
NOTICE:
Make sure that there is no foreign matter or oil on the compressor shaft, bolt, and clutch hub.

AC

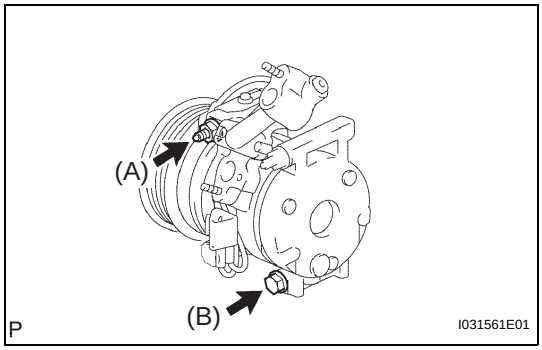


INSTALLATION

1. TEMPORARILY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

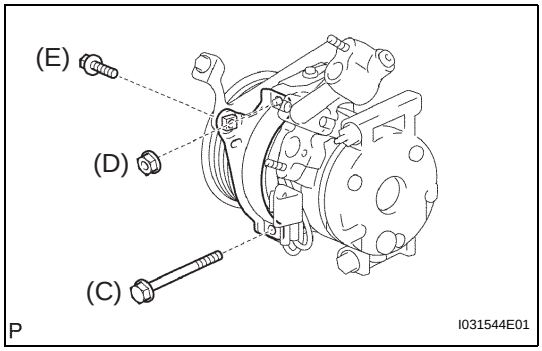
(a) Temporarily tighten the compressor and magnetic clutch with the 3 bolts.

AC

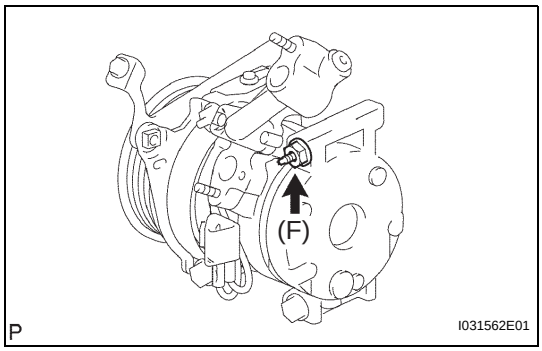


2. FULLY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

(a) Fully tighten the compressor and magnetic clutch with the bolt (A) and bolt (B).
Torque: 25 N*m (250 kgf*cm, 18 in.*lbf)

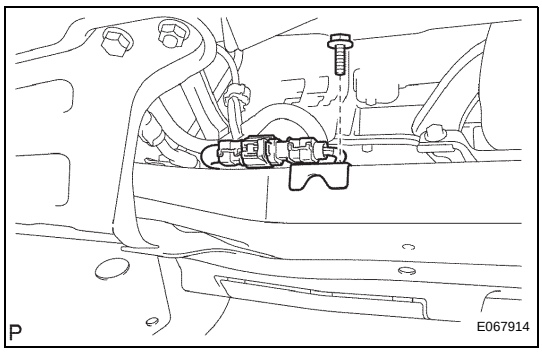


(b) Install the cooler compressor bracket with the 2 bolts and nut.
Torque: Bolt (C)
25 N*m (250 kgf*cm, 18 in.*lbf)
Nut (D)
25 N*m (250 kgf*cm, 18 in.*lbf)
Bolt (E)
18 N*m (184 kgf*cm, 13 in.*lbf)



(c) Tighten the compressor and magnetic clutch with the bolt (F).
Torque: 25 N*m (250 kgf*cm, 18 in.*lbf)

(d) Connect the connector and clamp on the cooler compressor bracket.



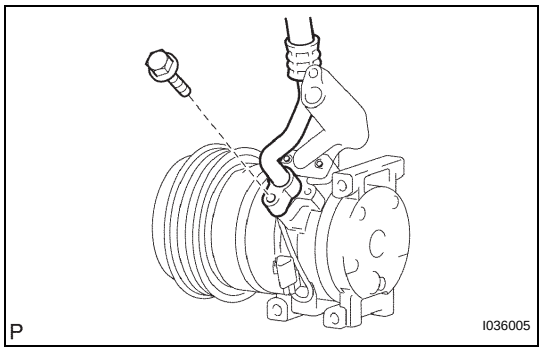
(e) Install the bracket with the bolt.

3. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

(a) Remove the attached vinyl tape from the hose.

(b) Sufficiently apply compressor oil to the new O-ring and fitting surface of the compressor and magnetic clutch.
Compressor oil:
ND-OIL 8 or equivalent

(c) Install the O-ring to the cooler refrigerant suction hose No. 1.



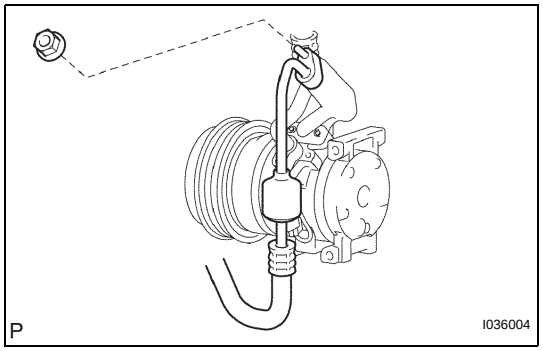
(d) Install the cooler refrigerant suction hose No. 1 to the compressor and magnetic clutch with the bolt.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

4. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

(a) Remove the attached vinyl tape from the hose.

(b) Sufficiently apply compressor oil to the new O-ring and fitting surface of the compressor and magnetic clutch.
Compressor oil:
ND-OIL 8 or equivalent

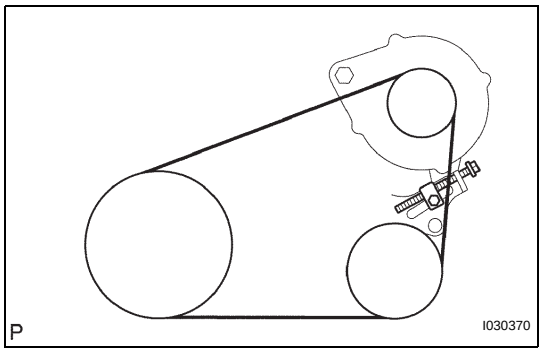
(c) Install the O-ring to the cooler refrigerant discharge hose No. 1.



(d) Install the cooler refrigerant discharge hose No. 1 to the compressor and magnetic clutch with the nut.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

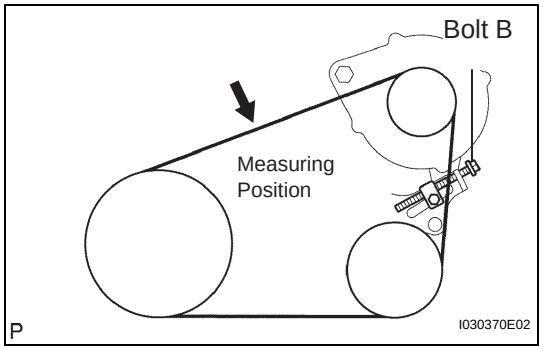
5. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

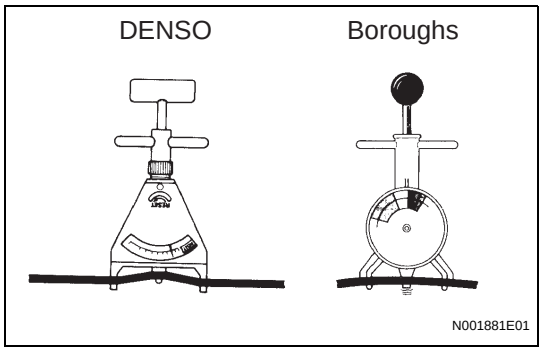
(a) Temporarily install the V (cooler compressor to crankshaft pulley) belt No. 1 as illustrated.



6. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

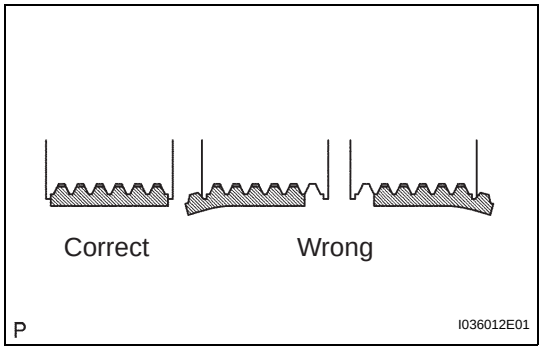
(a) Apply drive belt tension by turning the bolt B.
Drive belt tension:
New Belt:
170 +- 10 lbf
Used belt:
125 +- 10 lbf
HINT:
- "New belt" refers to a belt which has been used on a running engine at idling for 5 minutes or more.
- "Used belt" refers to a belt which has used on a running engine at idling for 5 minutes or more.



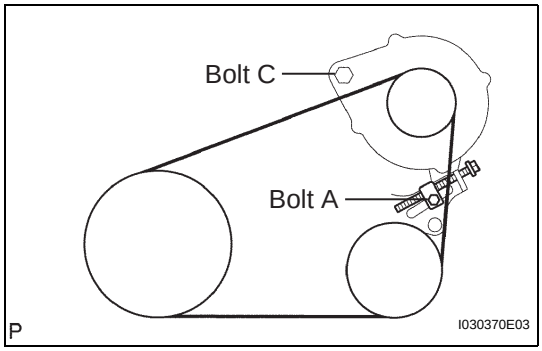


(b) Using a belt tension gauge, check the V belt tension.

AC



(c) Check that the drive belt fits properly in the ribbed grooves.



7. FULLY TIGHTEN V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

(a) Tighten the bolt A.
Torque: 18 N*m (183 kgf*cm, 13 ft.*lbf)

(b) Tighten the bolt C.
Torque: 58 N*m (591 kgf*cm, 43 ft.*lbf)

8. CHARGE REFRIGERANT

SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

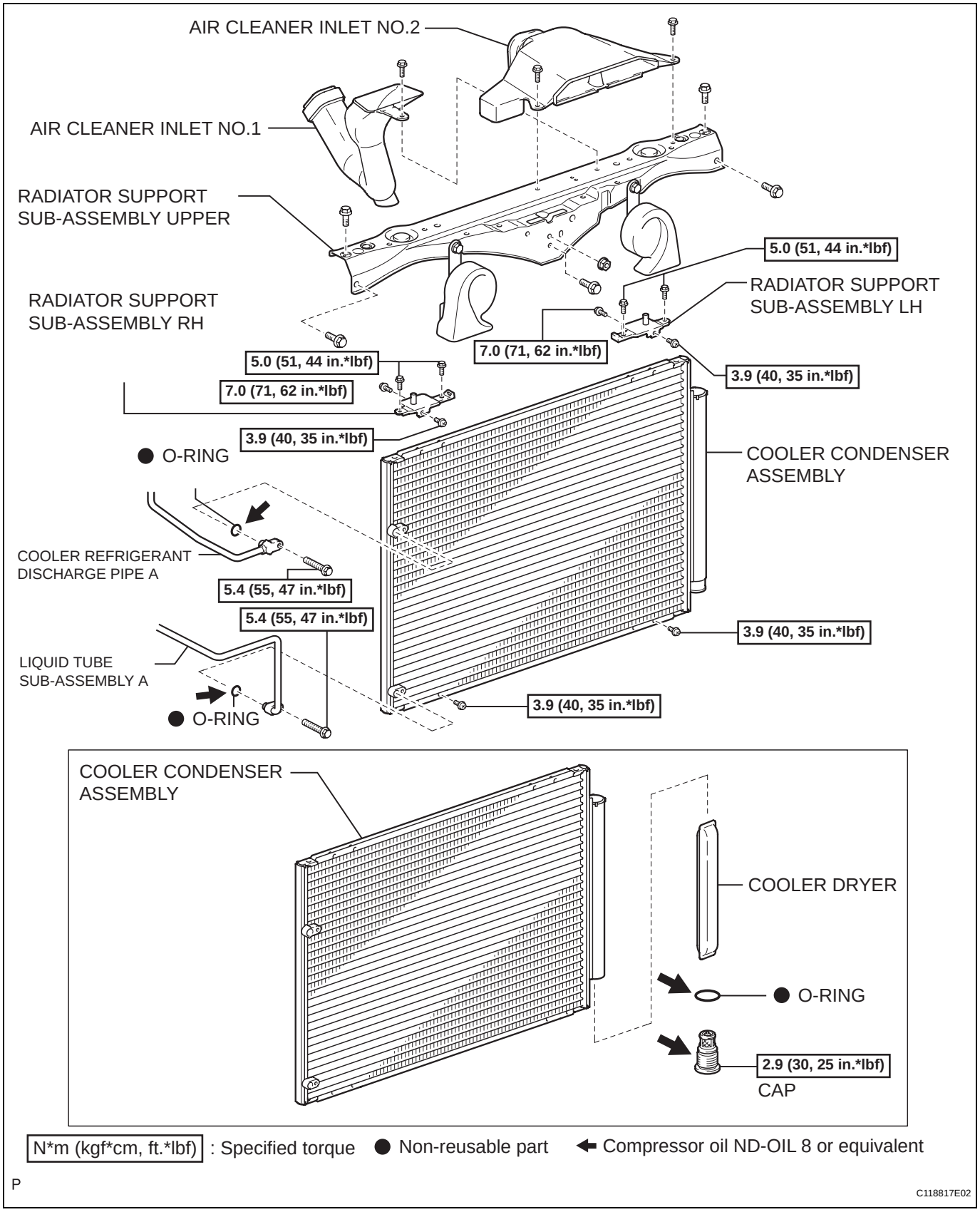
Specified amount:
600 +- 50 g (21.15 +- 1.76 oz.)

9. WARM UP ENGINE

10. INSPECT REFRIGERANT LEAKAGE

CONDENSER

COMPONENTS



ON-VEHICLE INSPECTION

1. INSPECT COOLER CONDENSER ASSEMBLY

(a) If the fins of the cooler condenser assembly are dirty, clean them with water and dry them with compressor air.

NOTICE:

Do not damage the fin of the cooler condenser assembly.

(b) If the fins of the cooler condenser assembly are bent, make them straight using a screwdriver or pliers.

2. INSPECT CONDENSER FOR LEAKAGE OF REFRIGERANT

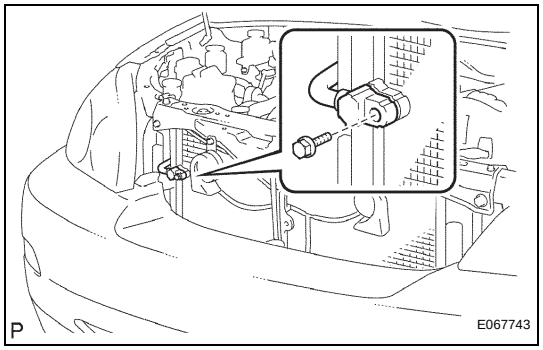
(a) Using a halogen leak detector, check the pipe joints for gas leakage.

(b) If gas leakage is detected in a joint, check the torque of the joint.

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)



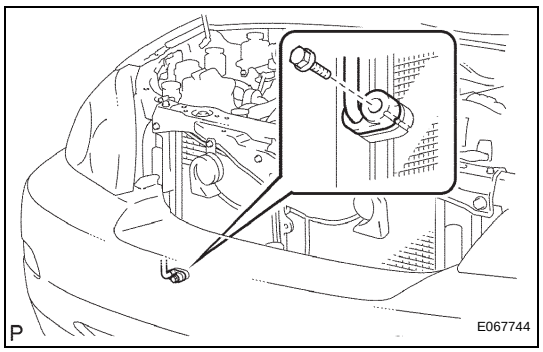
2. DISCONNECT COOLER REFRIGERANT DISCHARGE PIPE A

(a) Remove the bolt and disconnect the cooler refrigerant discharge pipe A from the cooler condenser assembly.

(b) Remove the O-ring from the cooler refrigerant discharge pipe A.

NOTICE:

Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



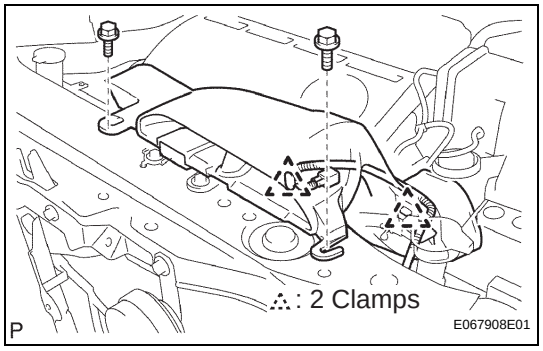
3. DISCONNECT LIQUID TUBE SUB-ASSEMBLY A

(a) Remove the bolt and disconnect the liquid tube sub-assembly A from the cooler condenser assembly.

(b) Remove the O-ring from the liquid tube sub-assembly A.

NOTICE:

Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

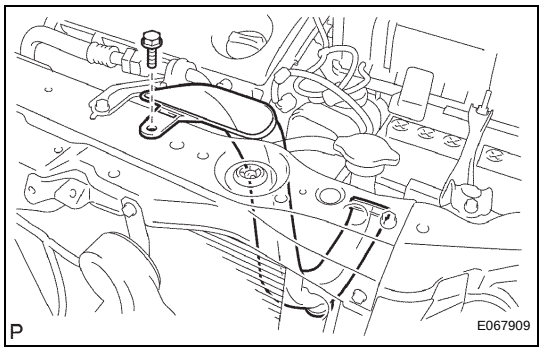


4. REMOVE AIR CLEANER INLET NO.2

(a) Release the vacuum hose.

(b) Remove the 2 bolts.

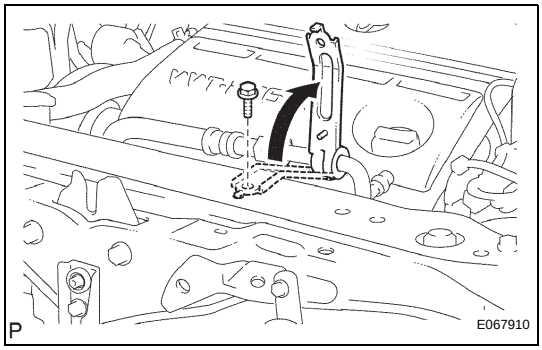
(c) Release the 2 clamps and remove the air cleaner inlet No. 2.



5. REMOVE AIR CLEANER INLET NO.1

(a) Remove the bolt and air cleaner inlet No. 1.

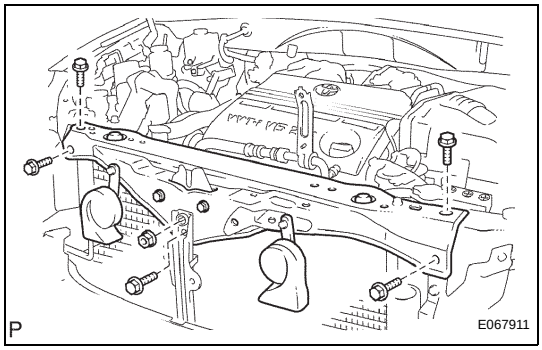
AC



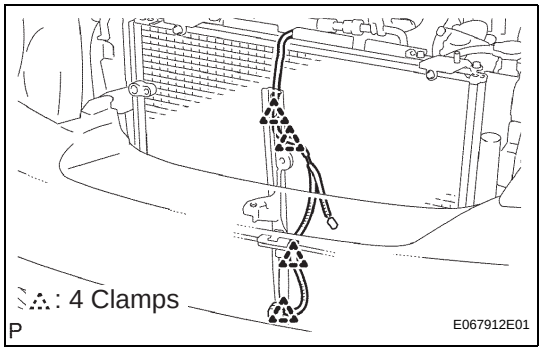
6. DISCONNECT RADIATOR SUPPORT SUB-ASSEMBLY UPPER

(a) Remove the bolt and raise the bracket as shown in the illustration.
(b) Remove the cap.
(c) Disconnect the connector.

AC

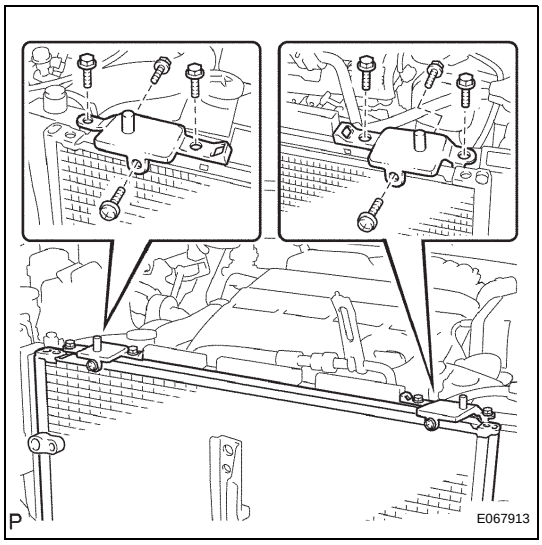


(d) Remove the 5 bolts, nut and radiator support sub-assembly.

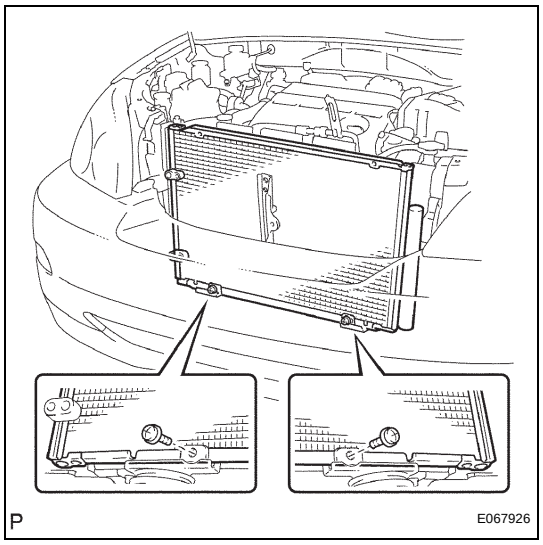


7. REMOVE RADIATOR SUPPORT SUB-ASSEMBLY RH

(a) Release the 4 clamps and disconnect the connector.



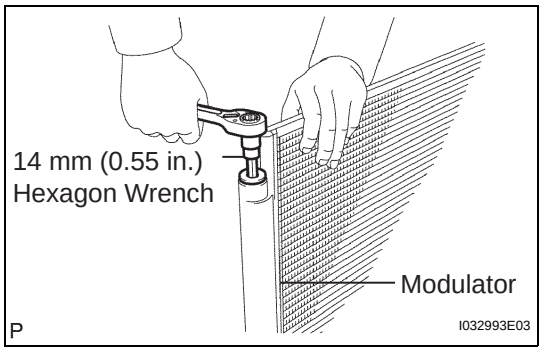
(b) Remove the 6 bolts, 2 screws and 2 radiator support sub-assembly RH.



8. REMOVE COOLER CONDENSER ASSEMBLY

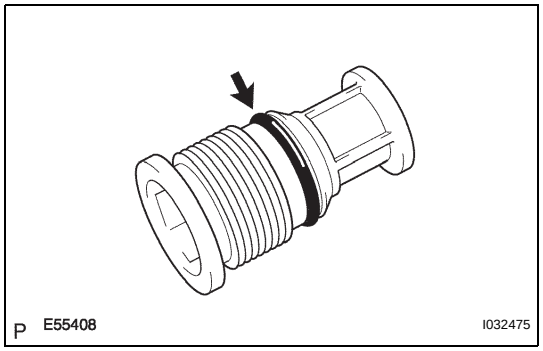
(a) Remove the 2 screws and cooler condenser assembly.

DISASSEMBLY

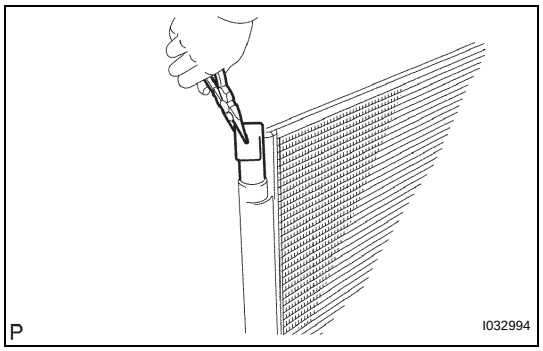


1. REMOVE COOLER DRYER

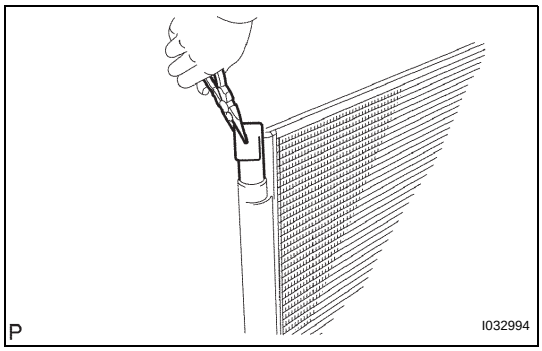
(a) Using hexagon wrench 14 mm (0.55 in.), remove the cap and filter from the modulator.



(b) Remove the O-ring from the cap.



(c) Using needle nose pliers, remove the cooler dryer.

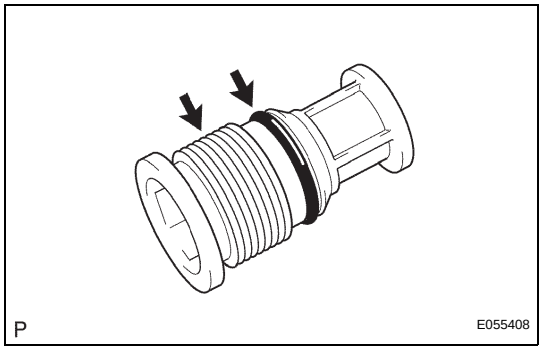


REASSEMBLY

1. INSTALL COOLER DRYER

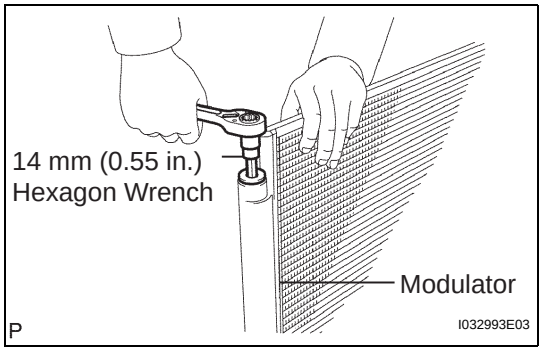
(a) Using needle nose pliers, install the cooler dryer.

AC



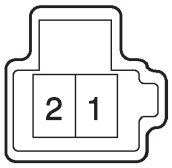
(b) Install new O-ring to the cap.

(c) Sufficiently apply compressor oil to the fitting surfaces of the O-ring and the cap.
Compressor oil:
ND-OIL 8 or equivalent



(d) Using hexagon wrench 14 mm (0.55 in.), install the cap to the cooler condenser assembly.
Torque: 2.9 N*m (30 kgf*cm, 25 in.*lbf)

A/C Room Temperature Sensor:



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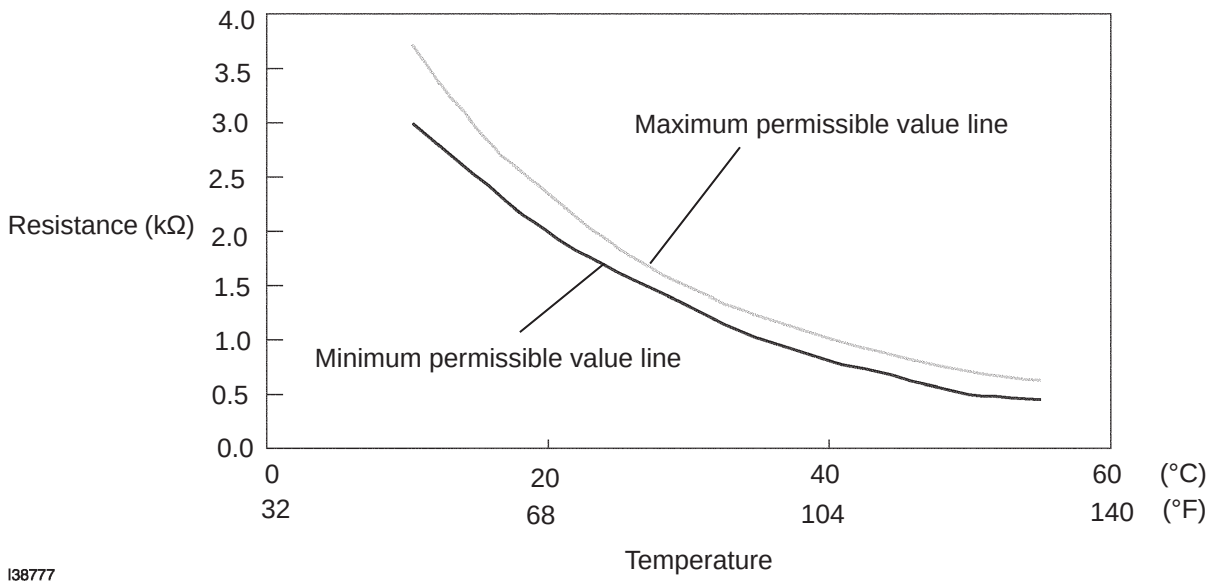
ROOM TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

1. INSPECT A/C ROOM TEMPERATURE SENSOR

(a) Remove the A/C room temperature sensor.
(b) Disconnect the connector from the A/C room temperature sensor.
(c) Measure the resistance according to the value(s) in the table below.

AC



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Standard resistance

Tester connection	Condition	Specified condition
1 - 2	10°C (50°F)	3.00 to 3.73 kΩ
1 - 2	15°C (59°F)	2.45 to 2.88 kΩ
1 - 2	20°C (68°F)	1.95 to 2.30 kΩ
1 - 2	25°C (77°F)	1.60 to 1.80 kΩ
1 - 2	30°C (86°F)	1.28 to 1.47 kΩ
1 - 2	35°C (95°F)	1.00 to 1.22 kΩ
1 - 2	40°C (104°F)	0.80 to 1.00 kΩ
1 - 2	45°C (113°F)	0.65 to 0.85 kΩ
1 - 2	50°C (122°F)	0.50 to 0.70 kΩ
1 - 2	55°C (131°F)	0.44 to 0.60 kΩ
1 - 2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

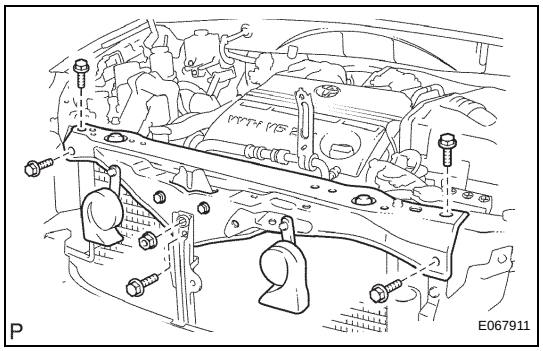
HINT:
As the temperature increases, the resistance decreases (see the graph).

INSTALLATION

1. INSTALL COOLER CONDENSER ASSEMBLY

2. INSTALL RADIATOR SUPPORT SUB-ASSEMBLY RH

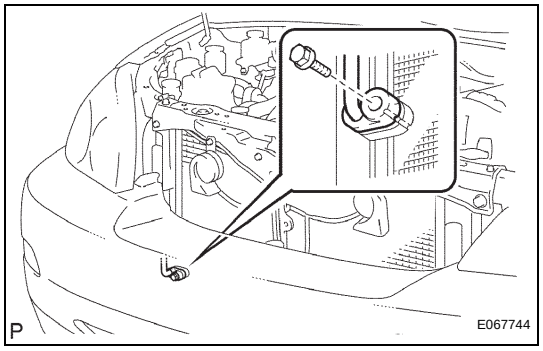
3. INSTALL RADIATOR SUPPORT SUB-ASSEMBLY UPPER



(a) Install the radiator support sub-assembly upper with the 5 bolts and nut.
(b) Connect the connectors.
(c) Install the cap.

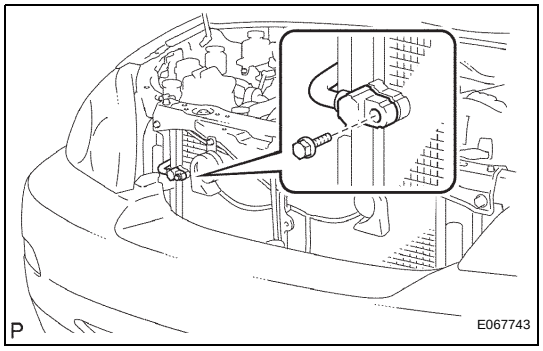
4. INSTALL LIQUID TUBE SUB-ASSEMBLY A

(a) Remove the attached vinyl tape from the tube and connecting part of the cooler condenser assembly.
(b) Sufficiently apply compressor oil to the new O-ring and fitting surface of the pipe joint.
Compressor oil:
ND-OIL 8 or equivalent
(c) Install the O-ring on the liquid tube sub-assembly A.
(d) Connect the air conditioning tube assembly to the cooler condenser assembly with the bolt.
Torque: 5.4 N*m (55 kgf*cm, 47 in.*lbf)



5. INSTALL COOLER REFRIGERANT DISCHARGE PIPE A

(a) Remove the attached vinyl tape from the tube and connecting part of the cooler condenser assembly.
(b) Sufficiently apply compressor oil to the new O-ring and fitting surface of the pipe joint.
Compressor oil:
ND-OIL 8 or equivalent
(c) Install the O-ring to the discharge hose sub-assembly.
(d) Connect the cooler refrigerant discharge pipe A on the cooler condenser assembly with the bolt.
Torque: 5.4 N*m (55 kgf*cm, 47 in.*lbf)



6. CHARGE REFRIGERANT
SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)
Specified amount:
600 +- 50 g (21.15 +- 1.76 oz.)

7. WARM UP ENGINE

8. INSPECT REFRIGERANT LEAKAGE

AC

AMBIENT TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

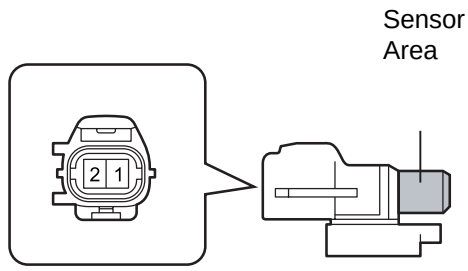
1. INSPECT A/C AMBIENT TEMPERATURE SENSOR

(a) Remove the A/C ambient temperature sensor.

(b) Disconnect the connector from A/C ambient temperature sensor.

(c) Measure the resistance according to the value(s) in the table below.

A/C Ambient Temperature Sensor Connector Front View:



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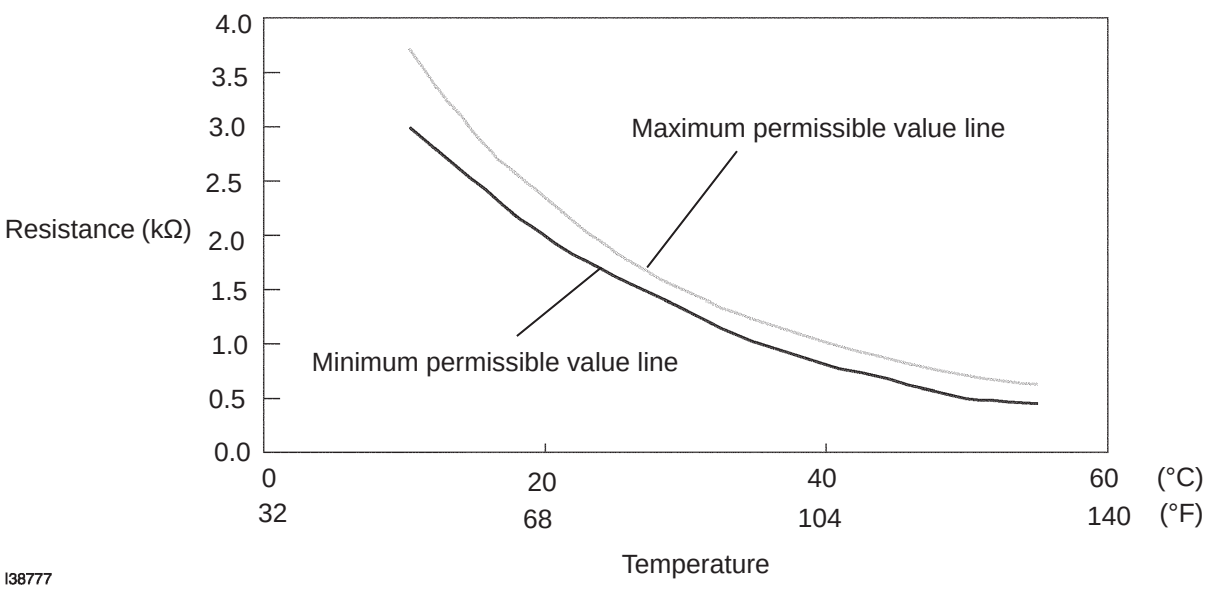

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Standard resistance

Tester connection	Condition	Specified condition
1 - 2	10°C (50°F)	3.00 to 3.73 kΩ
1 - 2	15°C (59°F)	2.45 to 2.88 kΩ
1 - 2	20°C (68°F)	1.95 to 2.30 kΩ
1 - 2	25°C (77°F)	1.60 to 1.80 kΩ
1 - 2	30°C (86°F)	1.28 to 1.47 kΩ
1 - 2	35°C (95°F)	1.00 to 1.22 kΩ

Tester connection	Condition	Specified condition
1 - 2	40°C (104°F)	0.80 to 1.00 kΩ
1 - 2	45°C (113°F)	0.65 to 0.85 kΩ
1 - 2	50°C (122°F)	0.50 to 0.70 kΩ
1 - 2	55°C (131°F)	0.44 to 0.60 kΩ
1 - 2	60°C (140°F)	0.36 to 0.50 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

HINT:

As the temperature increases, the resistance decreases (see the graph).

EVAPORATOR TEMPERATURE SENSOR

ON-VEHICLE INSPECTION

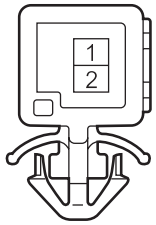
1. INSPECT A/C EVAPORATOR TEMPERATURE SENSOR

(a) Remove the A/C evaporator temperature sensor (A/C thermistor).

(b) Disconnect the connector from the A/C evaporator temperature sensor (A/C thermistor).

(c) Measure the resistance according to the value(s) in the table below.

A/C Evaporator Temprature Sensor (A/C Thermistor) Connector Front View:



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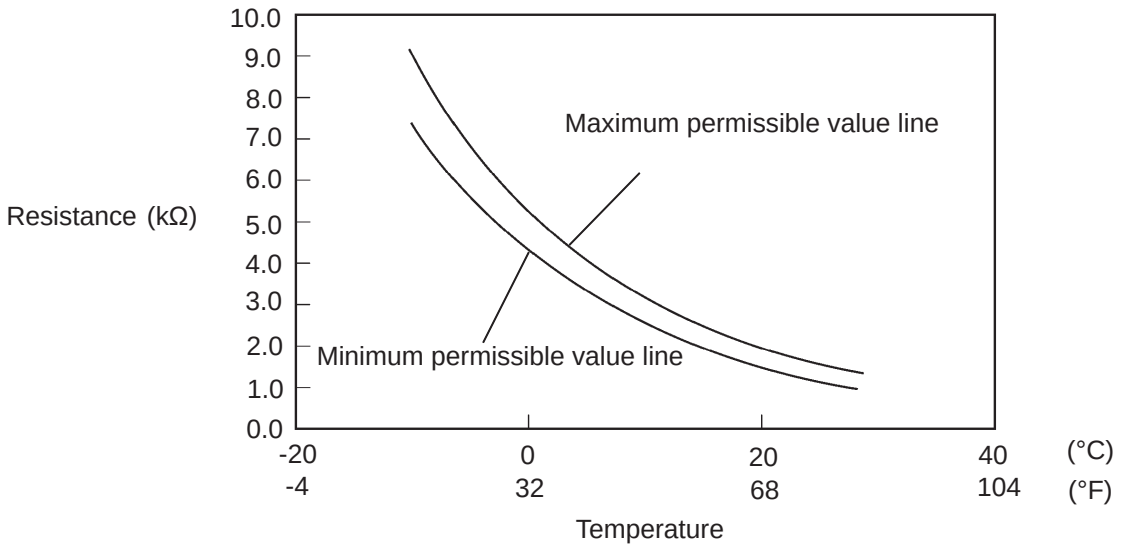

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I036421E01

Standard resistance

Tester connection	Condition	Specified condition
1 - 2	-10°C (14°F)	7.30 to 9.10 kΩ
1 - 2	-5°C (23°F)	5.65 to 6.95 kΩ
1 - 2	0°C (32°F)	4.40 to 5.35 kΩ
1 - 2	5°C (41°F)	3.40 to 4.15 kΩ

Tester connection	Condition	Specified condition
1 - 2	10°C (50°F)	2.70 to 3.25 kΩ
1 - 2	15°C (59°F)	2.14 to 2.58 kΩ
1 - 2	20°C (68°F)	1.71 to 2.05 kΩ
1 - 2	25°C (77°F)	1.38 to 1.64 kΩ
1 - 2	30°C (86°F)	1.11 to 1.32 kΩ

NOTICE:

- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measuring, the sensor temperature must be the same as the ambient temperature.**

HINT:

As the temperature increases, the resistance decreases (see the graph).

PRESSURE SWITCH

ON-VEHICLE INSPECTION

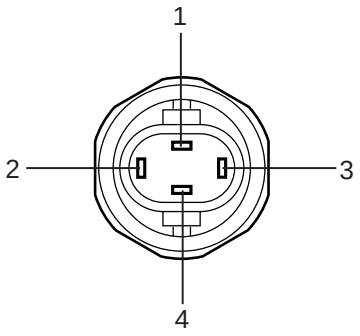
1. INSPECT A/C PRESSURE SWITCH

(a) Low and high pressure cut side:
Inspect pressure switch operation.

(1) Set the manifold gauge.

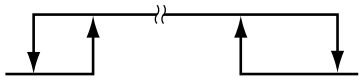
(2) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (-) lead to terminal 1.

(3) Check continuity between the terminals when refrigerant pressure is changed, as shown in the illustration.
If operation is not as specified, replace the liquid tube sub-assembly.



Low pressure side High pressure side

ON (Continuity)



196 kPa (2.0 kgf/cm^2, 28 psi) 3,140 kPa (32.0 kgf/cm^2, 455 psi)

OFF (No continuity)

H

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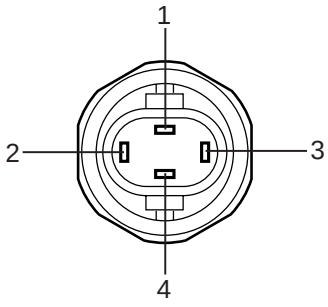
(b) Middle pressure cut side:
Inspect pressure switch operation.

(1) Set the manifold gauge.

(2) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (-) lead to terminal 3.

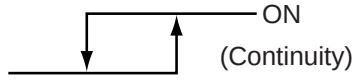
(3) Check continuity between the terminals when refrigerant pressure is changed, as shown in the illustration.
If operation is not specified, replace the liquid tube sub-assembly A.



Middle pressure side

1,770 kPa

(18.1 kgf/cm^2, 257 psi)



OFF (No continuity) (Continuity)

1,370 kPa

(14 kgf/cm^2, 199 psi)

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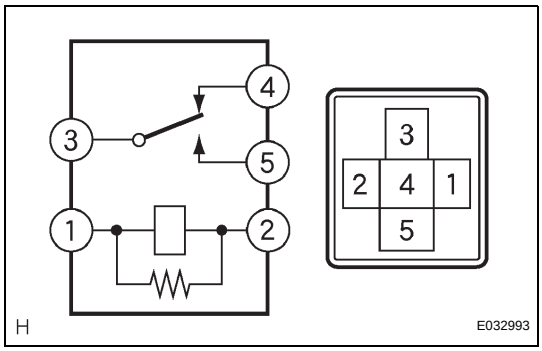
AC



HEATER RELAY

ON-VEHICLE INSPECTION

1. INSPECT HEATER RELAY

(a) Remove the heater relay from the instrument panel J/B.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester connection	Condition	Specified condition
3 - 4	Always	Below 1 Ω
3 - 4	When battery voltage applied to terminals 1 and 2	10 kΩ or higher
3 - 5	Always	10 kΩ or higher
3 - 5	When battery voltage applied to terminals 1 and 2	Below 1 Ω

If the resistance is not as specified, replace the heater relay.

NOTICE:

While using the battery during inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

AC