HOW TO PROCEED WITH TROUBLESHOOTING

1	VEHICLE BROUGHT TO WORK SHOP

2	CUSTOMER PROBLEM ANALYSIS

3	PROBLEM SYMPTOM CONFIRMATION

→ SYMPTOM OCCURS (GO TO STEP 4)

SYMPTOM DOES NOT OCCUR (GO TO STEP 5)

AC

4	CHECK AND CLEAR THE DTCS

5	SYMPTOM SIMULATION

6	DTC CHECK

→ TROUBLE CODE (GO TO STEP 7)

→ NORMAL SYSTEM CODE (GO TO STEP 8)

7	DTC CHART

→ GO TO STEP 10

8	PROBLEM SYMPTOMS TABLE

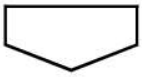
9	ACTUATOR CHECK



10	CIRCUIT INSPECTION



11	IDENTIFYING OF PROBLEMS

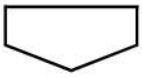


12	PARTS INSPECTION



13	REPAIR

AC

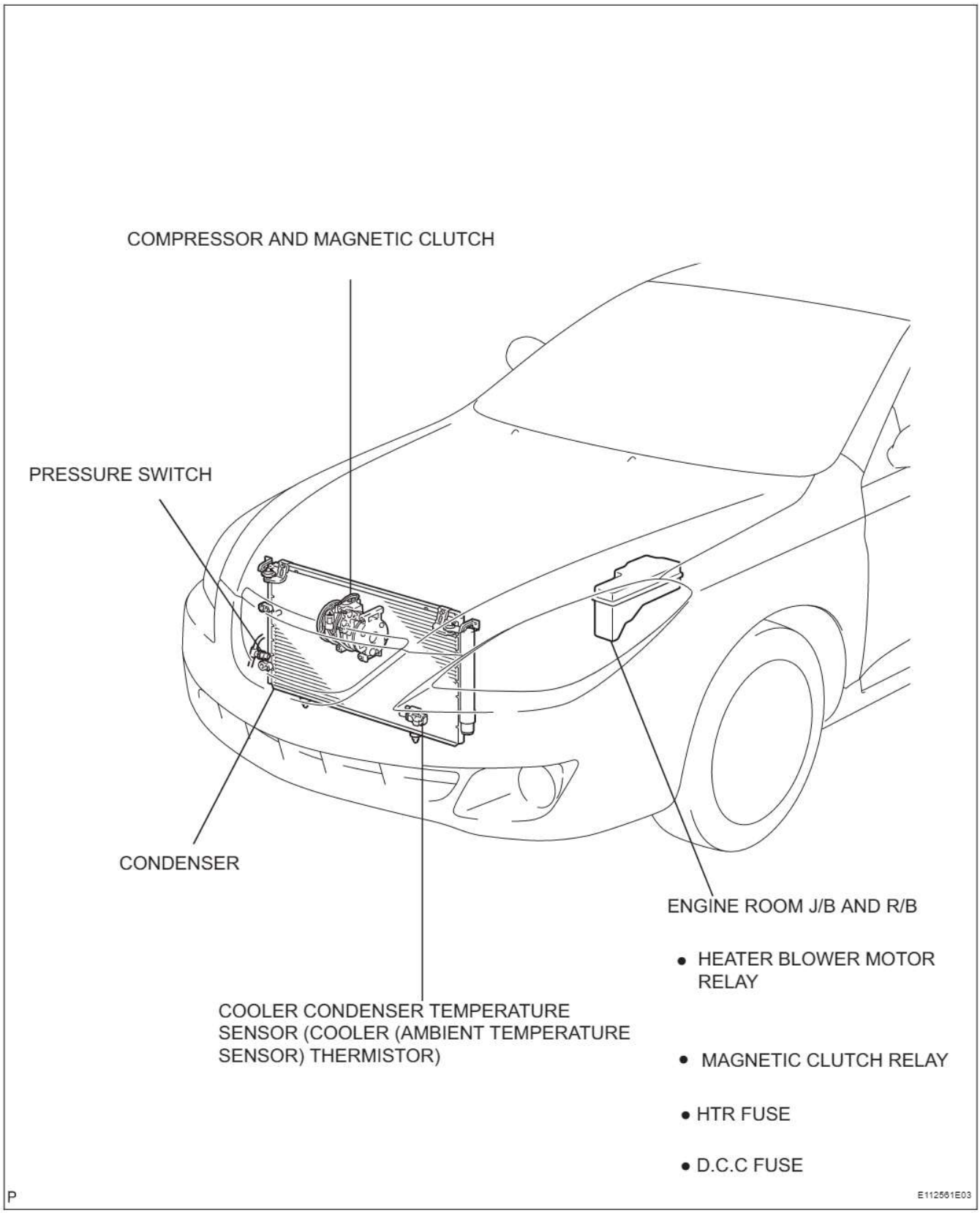


14	CONFIRMATION TEST

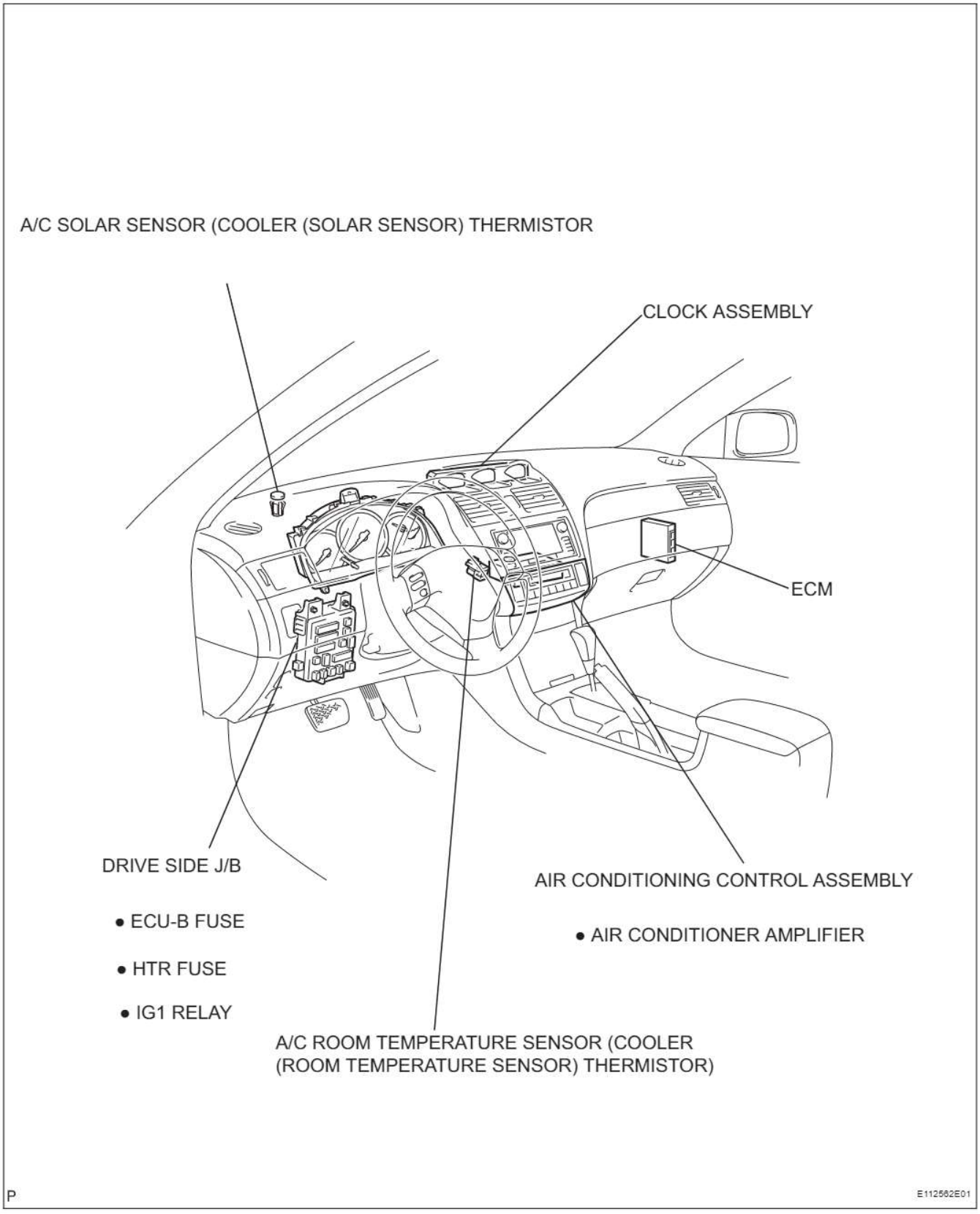


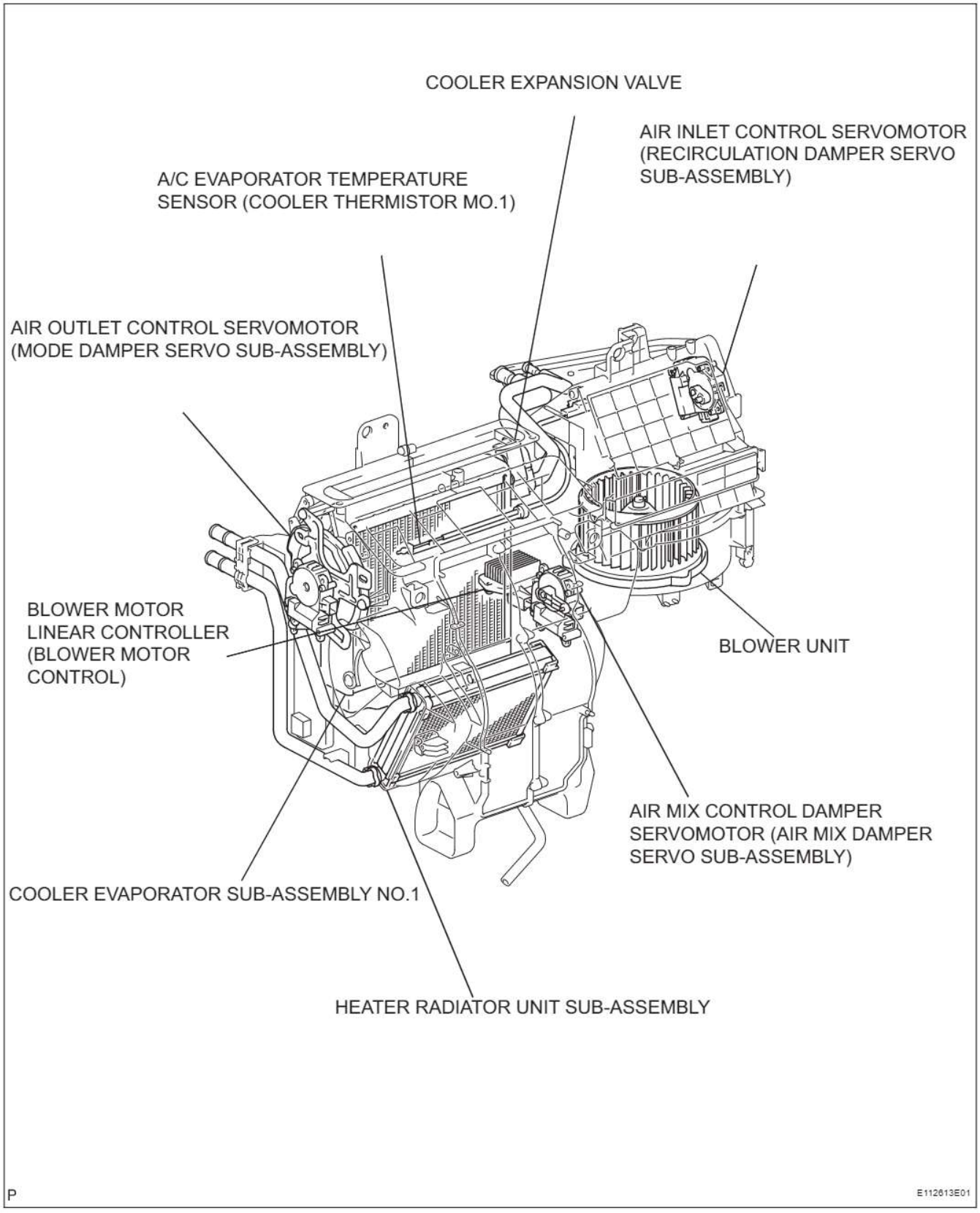
15	END

PARTS LOCATION



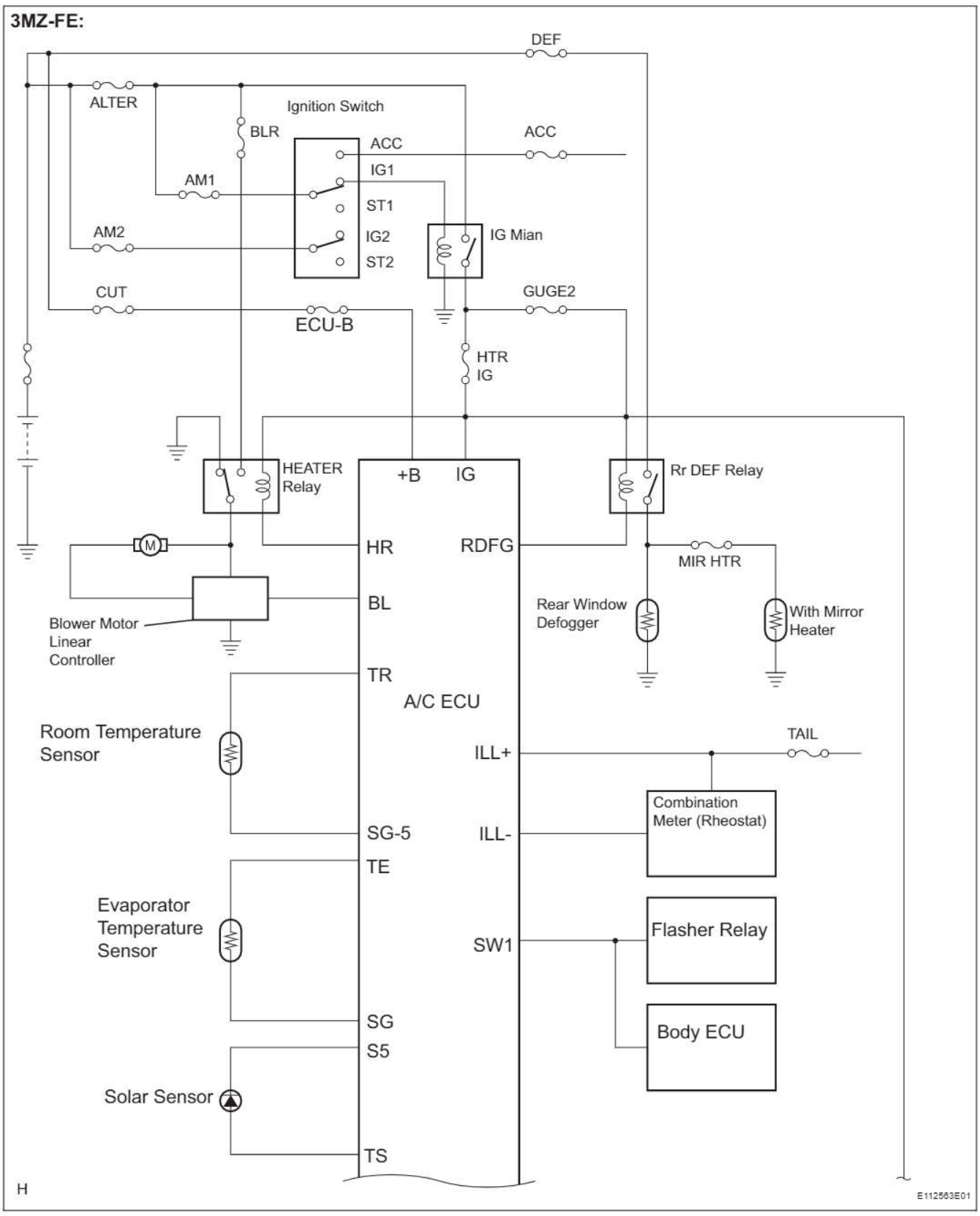
AC


A/C SOLAR SENSOR (COOLER (SOLAR SENSOR) THERMISTOR
CLOCK ASSEMBLY
ECM
DRIVE SIDE J/B
• ECU-B FUSE
• HTR FUSE
• IG1 RELAY
AIR CONDITIONING CONTROL ASSEMBLY
• AIR CONDITIONER AMPLIFIER
A/C ROOM TEMPERATURE SENSOR (COOLER (ROOM TEMPERATURE SENSOR) THERMISTOR)
P
E112562E01

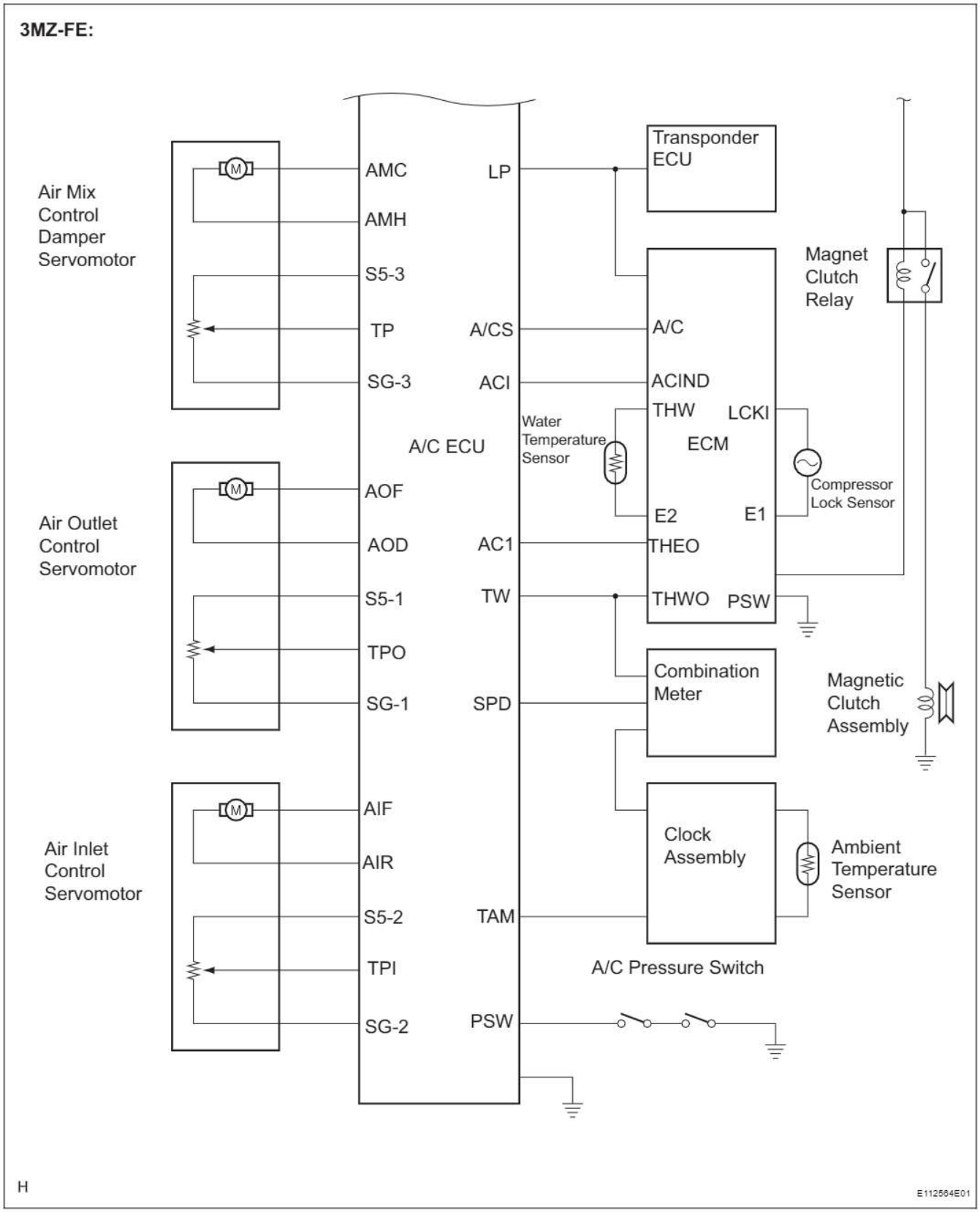

COOLER EXPANSION VALVE
AIR INLET CONTROL SERVOMOTOR (RECIRCULATION DAMPER SERVO SUB-ASSEMBLY)
A/C EVAPORATOR TEMPERATURE SENSOR (COOLER THERMISTOR MO.1)
AIR OUTLET CONTROL SERVOMOTOR (MODE DAMPER SERVO SUB-ASSEMBLY)
BLOWER MOTOR LINEAR CONTROLLER (BLOWER MOTOR CONTROL)
BLOWER UNIT
AIR MIX CONTROL DAMPER SERVOMOTOR (AIR MIX DAMPER SERVO SUB-ASSEMBLY)
COOLER EVAPORATOR SUB-ASSEMBLY NO.1
HEATER RADIATOR UNIT SUB-ASSEMBLY
P
E112613E01

AC

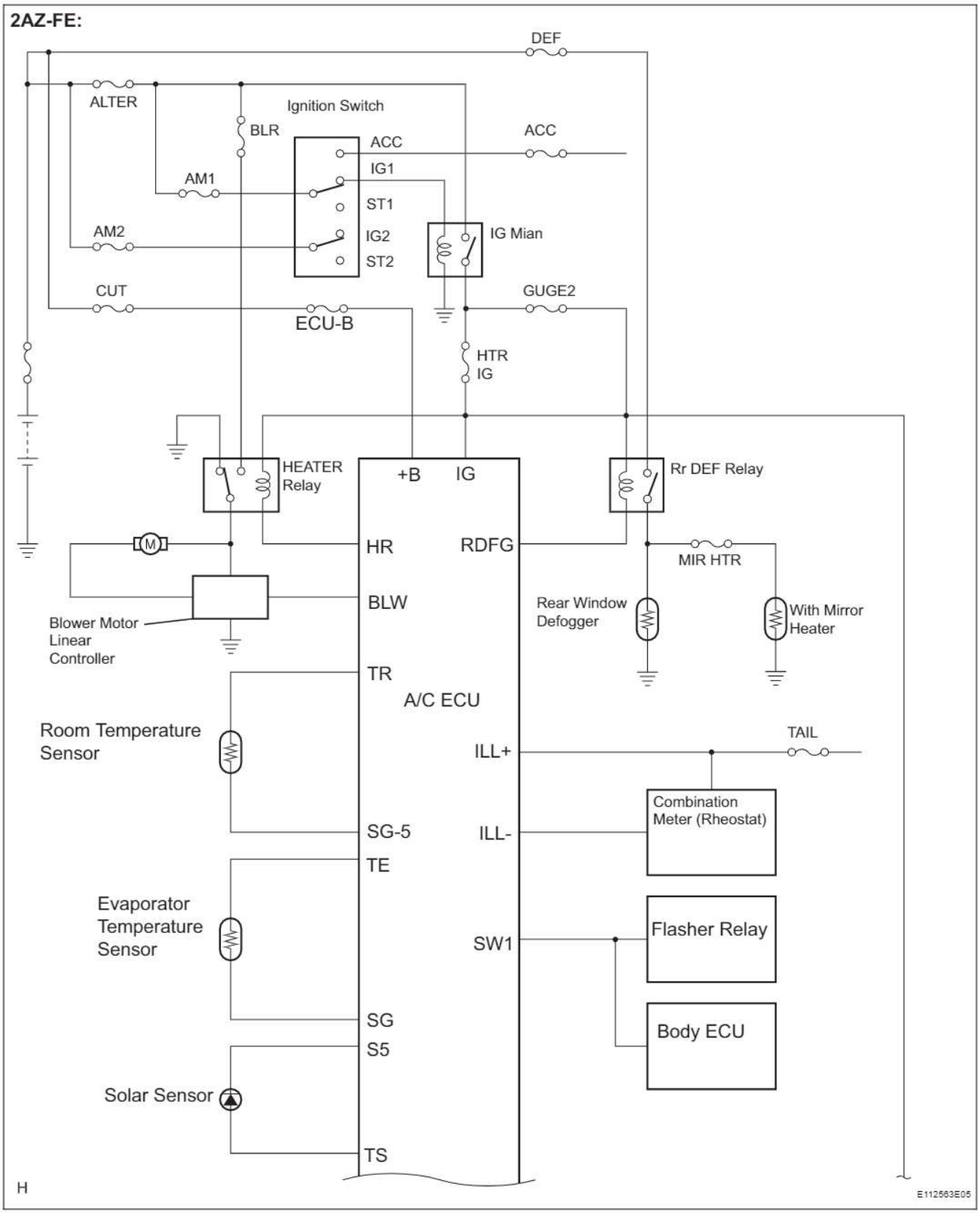
SYSTEM DIAGRAM



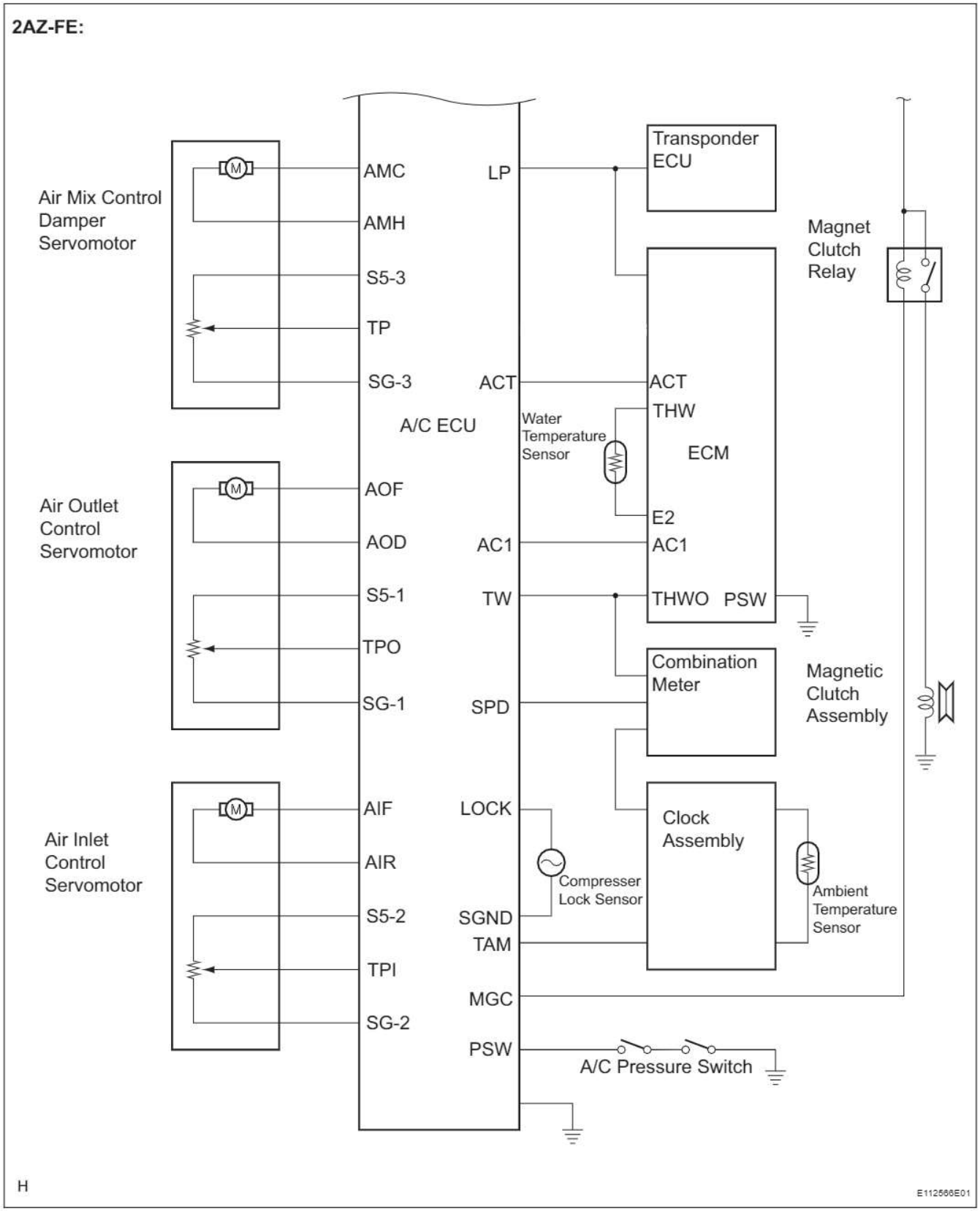
3MZ-FE:


Air Mix Control Damper Servomotor
Air Outlet Control Servomotor
Air Inlet Control Servomotor
AMC
AMH
S5-3
TP
SG-3
AOF
AOD
S5-1
TPO
SG-1
AIF
AIR
S5-2
TPI
SG-2
A/C ECU
LP
A/CS
ACI
AC1
TW
SPD
TAM
PSW
Transponder ECU
A/C
ACIND
THW
LCKI
ECM
E2
E1
THEO
THWO
PSW
Water Temperature Sensor
Compressor Lock Sensor
Magnet Clutch Relay
Magnetic Clutch Assembly
Combination Meter
Clock Assembly
Ambient Temperature Sensor
A/C Pressure Switch
H
E112564E01

AC


2AZ-FE:
DEF
ALTER
Ignition Switch
BLR
ACC
ACC
IG1
AM1
ST1
AM2
IG2
IG Mian
ST2
CUT
GUGE2
ECU-B
HTR
IG
HEATER
Relay
+B
IG
Rr DEF Relay
HR
RDFG
MIR HTR
BLW
Rear Window
Defogger
With Mirror
Heater
Blower Motor
Linear
Controller
TR
A/C ECU
Room Temperature
Sensor
TAIL
ILL+
Combination
Meter (Rheostat)
SG-5
ILL-
TE
Evaporator
Temperature
Sensor
Flasher Relay
SW1
Body ECU
SG
S5
Solar Sensor
TS
H
E112563E05

2AZ-FE:


Air Mix Control Damper Servomotor
Air Outlet Control Servomotor
Air Inlet Control Servomotor
AMC
AMH
S5-3
TP
SG-3
AOF
AOD
S5-1
TPO
SG-1
AIF
AIR
S5-2
TPI
SG-2
A/C ECU
LP
ACT
AC1
TW
SPD
LOCK
SGND
TAM
MGC
PSW
Transponder ECU
Water Temperature Sensor
ACT
THW
ECM
E2
AC1
THWO
PSW
Combination Meter
Clock Assembly
Compresser Lock Sensor
Ambient Temperature Sensor
Magnet Clutch Relay
Magnetic Clutch Assembly
A/C Pressure Switch
H
E112566E01

AC

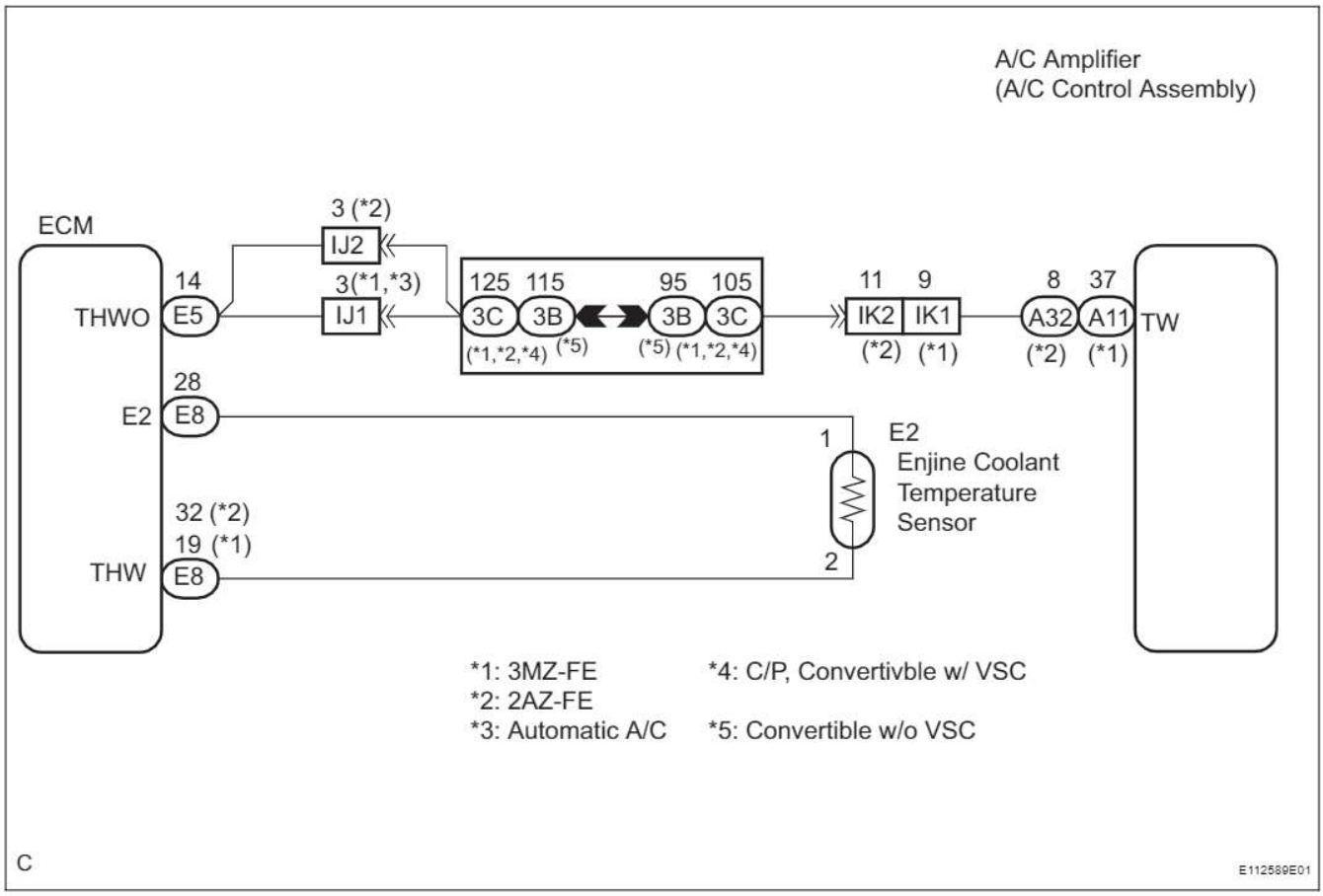
DTC	14	Engine Coolant Temperature Communication Circuit

DESCRIPTION

The sensor connected to the ECM detects the engine coolant temperature that is used for warm up control when the engine is cold. The sensor sends a signal to the A/C amplifier via the ECM.

DTC No.	Detection Item	Trouble Area
14	Open or short in engine coolant temperature communication circuit	• Engine coolant temperature sensor • ECM • Harness or connector between engine coolant temperature sensor and ECM • Harness or connector between ECM and A/C amplifier • A/C amplifier

WIRING DIAGRAM



1	DIAGNOSTIC TROUBLE CODE CHECK

(a) Is the DTC P0115 or P0117 or P0118 output?

Result:

DTC (P0115 or P0117 or P0118) is output.	A
DTC (P0115 or P0117 or P0118) is not output.	B

B → Go to step 2

A

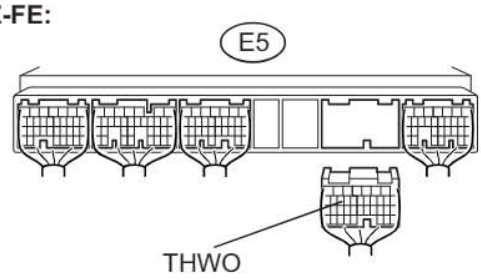
GO TO ENGINE CONTROL SYSTEM

2 CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - ECM)

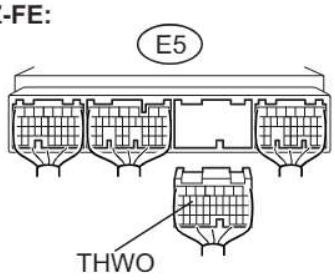
(a) Measure the resistance according to the value(s) in the table below.

ECM Connector Wire Herness View:

3MZ-FE:

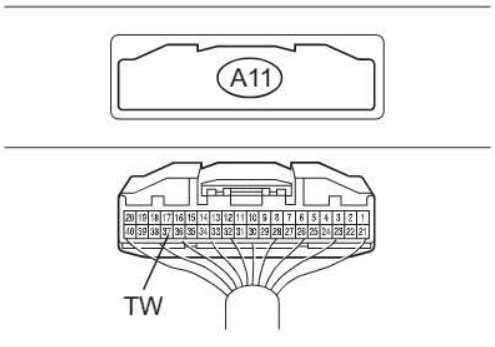


2AZ-FE:

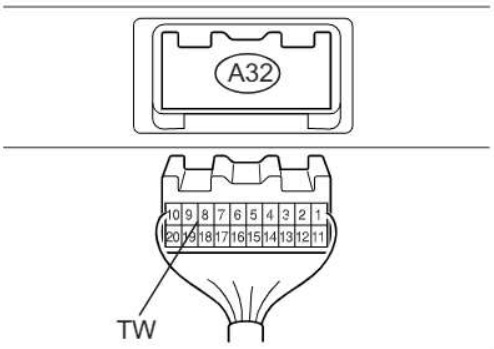


Air Conditioning Amplifier Connector Wire Herness View:

3MZ-FE:



2AZ-FE:



C

E112549E01

Standard resistance

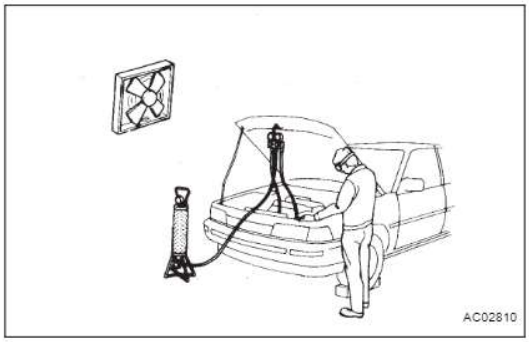
Tester connection	Condition	Specified condition
E5-14 (THWO) - A11-37 (TW)*1, A32-8 (TW)*2	Always	Below 1 Ω

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

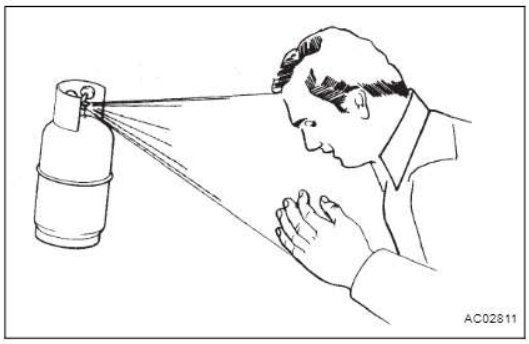
REPLACE AIR CONDITIONING AMPLIFIER



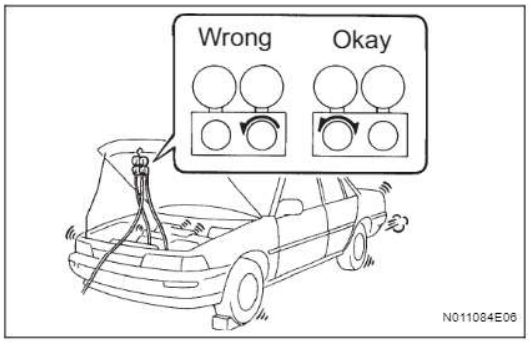
AIR CONDITIONING SYSTEM

PRECAUTION

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 NAKED FLAME**
5. **BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT**



6. **DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERANT SYSTEM**
   If there is not enough refrigerant in the refrigerant system, oil lubrication will be insufficient and compressor burnout may occur. 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 valves are 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. **DO NOT OPERATE ENGINE AND COMPRESSOR WITH NO REFRIGERANT FILLED**
   CAUTION:
   This may damage the inside of the compressor because the compressor parts always move regardless of whether the A/C system is turned on or off.

AC

10. PRECAUTION FOR DISCONNECTING THE BATTERY CABLE

NOTICE:

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

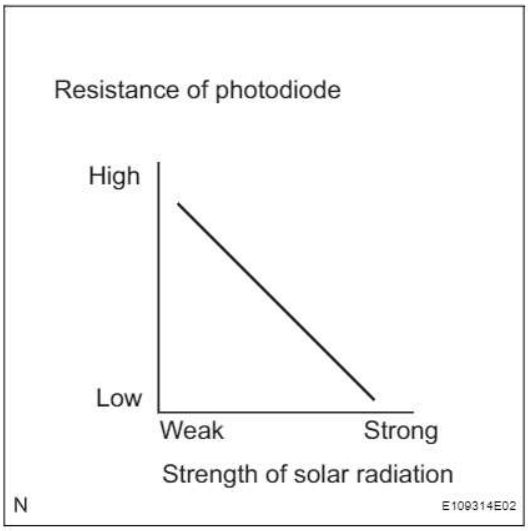
System Name	See Procedure
Power Window Control System	WS-6
Sliding Roof System	RF-4

AC

DTC	21	Solar Sensor Circuit

DESCRIPTION

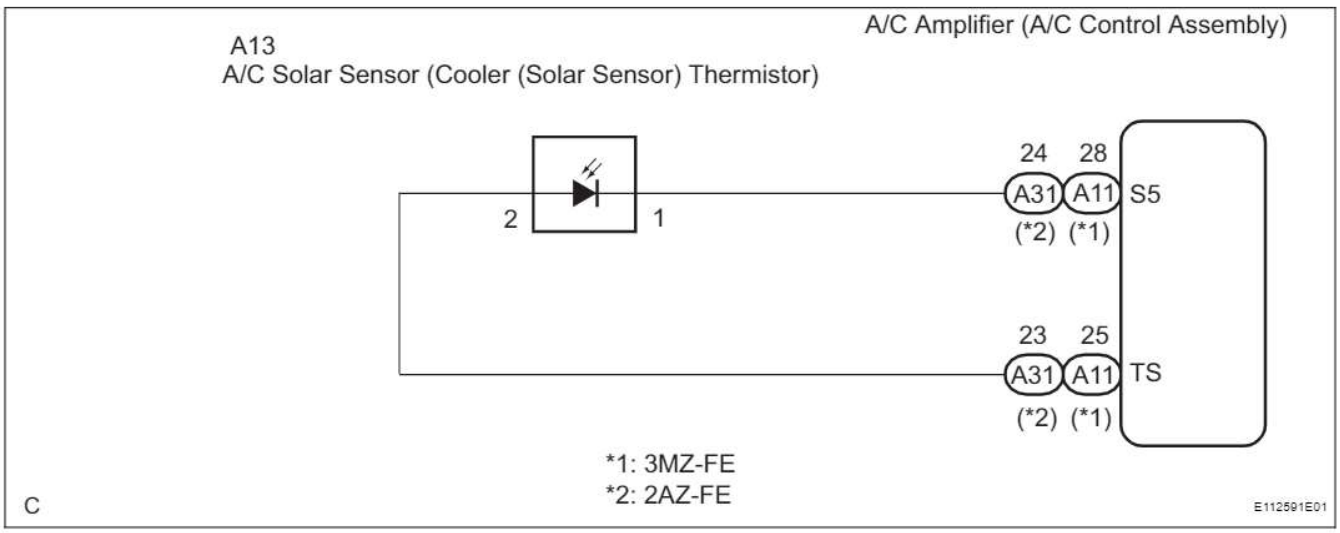
A photo diode in the A/C solar sensor (cooler (solar sensor) thermistor) detects solar radiation and sends signals to the A/C amplifier.



DTC No.	Detection Item	Trouble Area
21	Open or short in solar sensor circuit (If the check is performed in a dark place, DTC 21 may be displayed.)	• A/C solar sensor (cooler (solar sensor) thermistor) • Harness or connector between A/C solar sensor (cooler (solar sensor) thermistor) and A/C amplifier • A/C amplifier

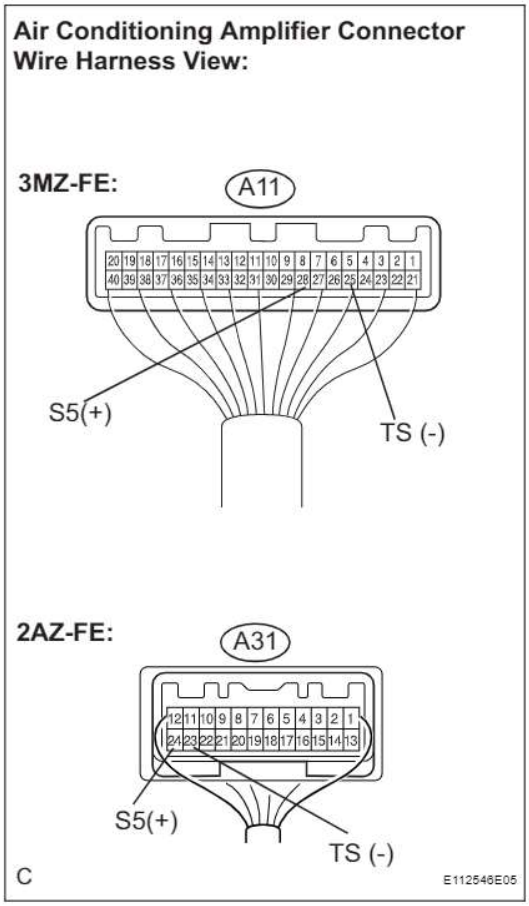
AC

WIRING DIAGRAM



1	INSPECT AIR CONDITIONING AMPLIFIER (TS - S5)

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



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

Standard voltage:

Move the light away from the sensor under the following conditions:

Voltage increases

Move the light closer to the sensor under the following conditions:

Voltage decreases

Tester connection	Condition	Specified condition
A11-28 (S5)*1, A31-24Å@(S5)*2 - A11-25 (TS)*1, A31-23Å@(TS)*2	Ignition switch ON	0.8 to 4.3 V

*1: 3MZ-FE

*2: 2AZ-FE

HINT:

- Use an incandescent lamp for inspection. Bring it within 30 cm (11.8 in.) of the A/C solar sensor (cooler (solar sensor) thermistor)

Result:

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**

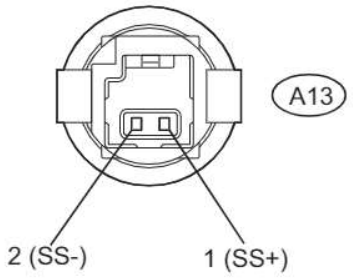
A

2 INSPECT A/C SOLAR SENSOR (COOLER (SOLAR SENSOR) THERMISTOR)

(a) Remove the A/C solar sensor (cooler (solar sensor) thermistor).

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

A/C Solar Sencer (Cooler (Solar Sensor) Thermistor) Connector Front View:



(c) Connect the positive (+) lead from the ohmmeter to terminal 1 and negative (-) lead to terminal 2 of the A/C solar sensor.

Standard resistance

Tester connection	Condition	Specified condition
A13-1 (SS+) - A13-2 (SS-)	Sensor is subject to electric light	Except ∞ Ω
A13-1 (SS+) - A13-2 (SS-)	Sensor is covered with a cloth	∞ Ω (No continuity)

NOTICE:
The connection procedure for using a digital tester such as an 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 A/C solar sensor.

HINT:

- As the inspection light is moved away from the sensor, the voltage increases.
- Use an incandescent lamp for inspection. Bring it within 30 cm (11.8 in.) of the A/C solar sensor (cooler (solar sensor) thermistor).

NG → **REPLACE A/C SOLAR SENSOR**

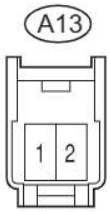
OK

AC

3	**CHECK HARNESS AND CONNECTOR (A/C SOLAR SENSOR - AIR CONDITIONING AMPLIFIER)**

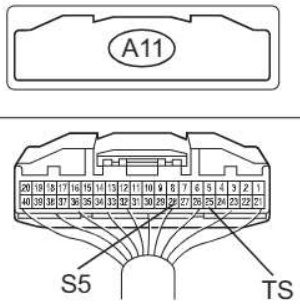
(a) Measure the resistance according to the value(s) in the table below.

A/C Solar Sensor (Cooler (Solar Sensor) Thermistor) Connector Front View:

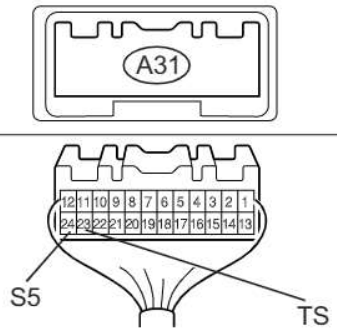


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112547E03

AC

Standard resistance

Tester connection	Condition	Specified condition
A11-28 (S5)*1, A31-24 (S5)*2 - A13-1	Always	Below 1Ω
A11-25 (TS)*1, A31-24 (TS)*2 - A13-2	Always	Below 1Ω
A11-28 (S5)*1, A31-24 (S5)*2 - Body ground	Always	10 kΩ or higher
A11-25 (TS)*1, A31-23 (TS)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

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

OK

REPLACE AIR CONDITIONING AMPLIFIER

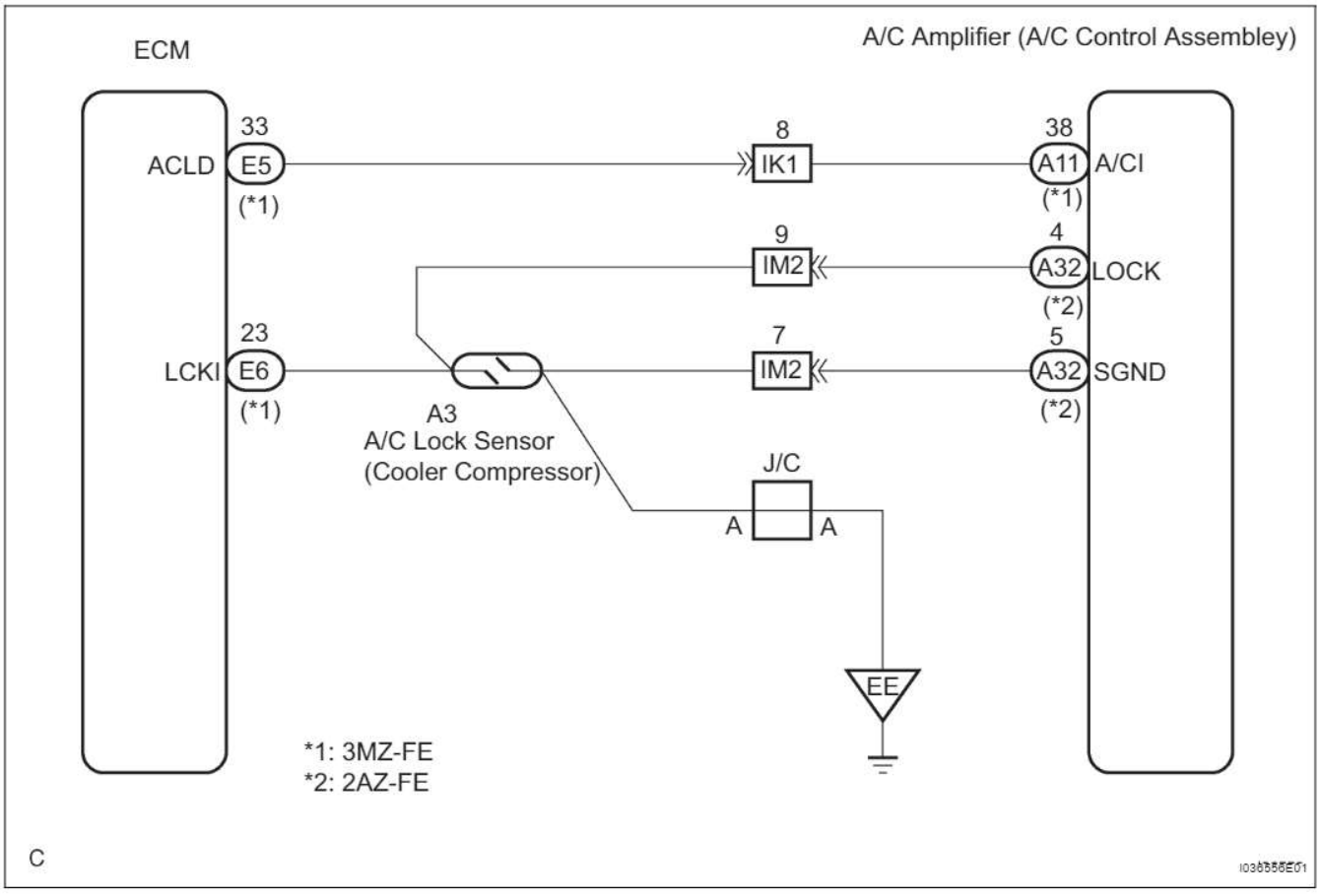
DTC	22	Compressor Lock Sensor Circuit

DESCRIPTION

This sensor sends 1 pulse per engine revolution to the ECM.
If the ratio between engine and compressor speed deviates 20 % or more in compression to normal operation, the ECM turns the cooler compressor off and the indicator blinks at approximately 1 second intervals.
The ECM ACLD terminal informs the A/C amplifier A/CI terminal of the cooler compressor's operating condition.

DTC No.	Detection Item	Trouble Area
22	All conditions below are detected for 3 sec. 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	• A/C lock sensor (cooler compressor assembly) • Compressor drive belt • Harness and connector between ECM and cooler compressor assembly, cooler compressor assembly and body ground. • ECM • A/C amplifier

WIRING DIAGRAM



1	CHECK COOLER COMPRESSOR ASSEMBLY

(a) Check and adjust compressor drive belt tension (see page).

(b) Check if the cooler compressor does not lock when starting the engine and turning the A/C switch on.
OK:
Cooler compressor assembly does not lock during operations
If the compressor drive belt slips when A/C switch is turned on, the magnetic clutch seems to be locked.
If the condition continues for more than 3 seconds, the A/C amplifier turns off the magnetic clutch for compressor drive belt protection.

NG → **REPLACE COOLER COMPRESSOR ASSEMBLY**

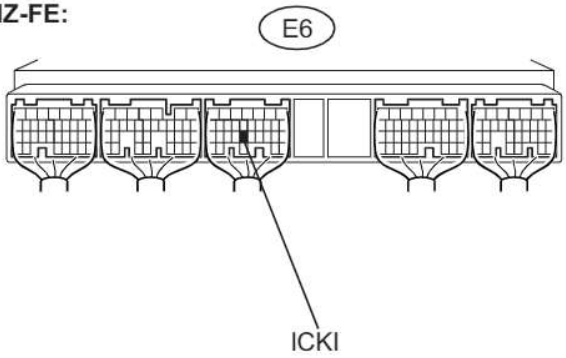
OK

2	INSPECT LOCK SIGNAL

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

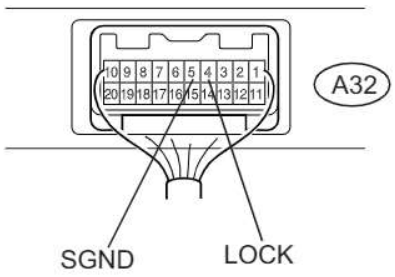
ECM Connector Wire Harness View:

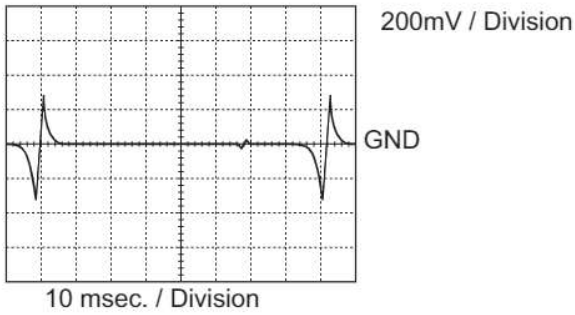
3MZ-FE:



Air Conditioning Amplifier Connecter Wire Harness View:

2AZ-FE:





C

E112559E01

AC

OK

Tester connection	Condition	Specified condition
E6-23 (LCKI)*1, A32-28 (LOCK)*2 - Body ground*1, A32-29 (SGND)*2	Ignition switch ON AUTO switch ON	Waveform operate as shown in the illustration

*1: 3MZ-FE
*2: 2AZ-FE

Result:

NG	A
OK (Checking from the PROBLEM SYMPTOMS TABLE)	B
OK (Checking from the DTC)*1	C
OK (Checking from the DTC)*2	D

*1: 3MZ-FE
*2: 2AZ-FE

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

C → **Go to step 5**

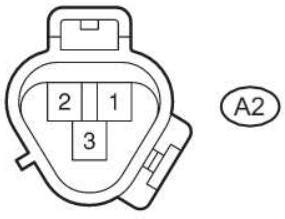
D → **REPLACE AIR CONDITIONING AMPLIFIER**

AC

A

3 INSPECT A/C LOCK SENSOR (COOLER COMPRESSOR ASSEMBLY)

A/C Lock Sensor (Coller Compressor Assembly) Connector Front View:



P E112579E01

(a) Disconnect the A/C lock sensor (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 20°C (68°F)	165 to 205 Ω

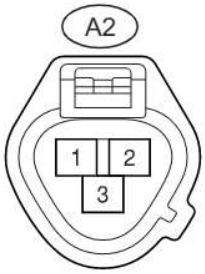
NG → **REPLACE A/C LOCK SENSOR**

OK

4	CHECK HARNESS AND CONNECTOR (A/C LOCK SENSOR - ECM or A/C AMPLIFIER)

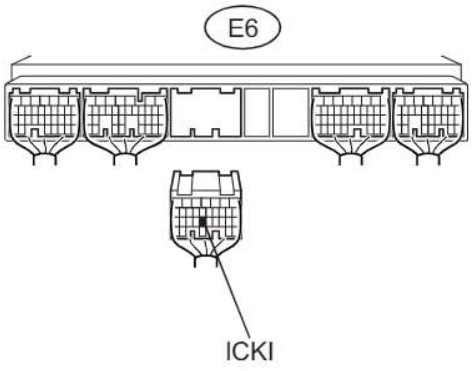
(a) Measure the resistance according to the value(s) in the table below.

A/C Lock Sensor (Cooler Compressor Assembly) Connector Wire Harness View:



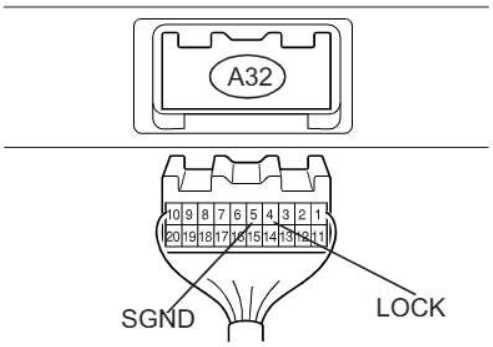
ECM Connector Wire Harness View:

3MZ-FE:



Air Conditioning Amplifier Connecter Wire Harness View:

2AZ-FE:



C

E112560E01

Standard resistance

Tester connection	Condition	Specified condition
A2-1 - E6-23 (LCKI)*1, A32-4 (LOCK)*2	Always	Below 1 Ω
A2-2 - Body ground*1, A32-5 (SGND)*2	Always	Below 1 Ω
A2-1 - Body ground*1, A32-5 (SGND)*2	Always	10 kΩ or higher
E6-23 (LCKI)*1, A32-4 (LOCK)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

Result:

OK (3MZ-FE)	A
OK (2AZ-FE)	B
NG	C

B	REPLACE AIR CONDITIONING AMPLIFIER

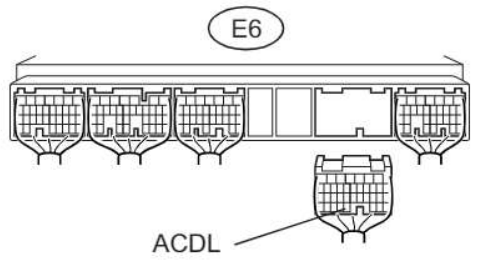
AC

C → REPAIR OR REPLACE HARNESS OR CONNECTOR

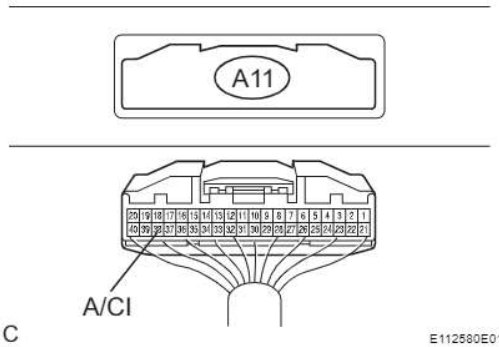
A

5 CHECK HARNESS AND CONNECTOR (ECM - AIR CONDITIONING AMPLIFIER)

ECM Connector Wire Harness View:



Air Conditioning Amplifier Connecter Wire Harness View:



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

Standard resistance

Tester connection	Condition	Specified condition
E5-33 - (ACLD) - A11-38 (A/CI)	Always	Below 1 Ω
E5-33 (ACLD) - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

AC

OK

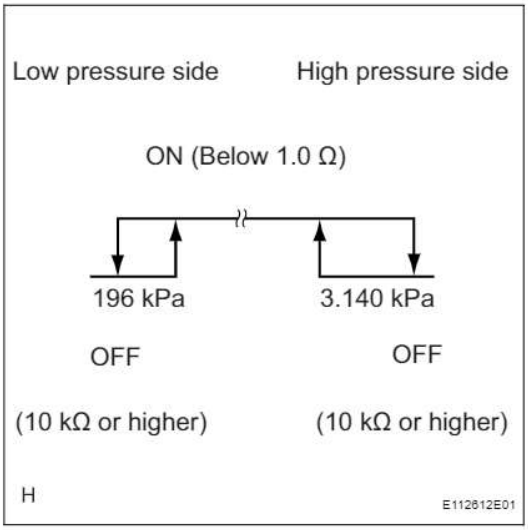
REPLACE AIR CONDITIONING AMPLIFIER

DTC	23	Pressure Switch Circuit

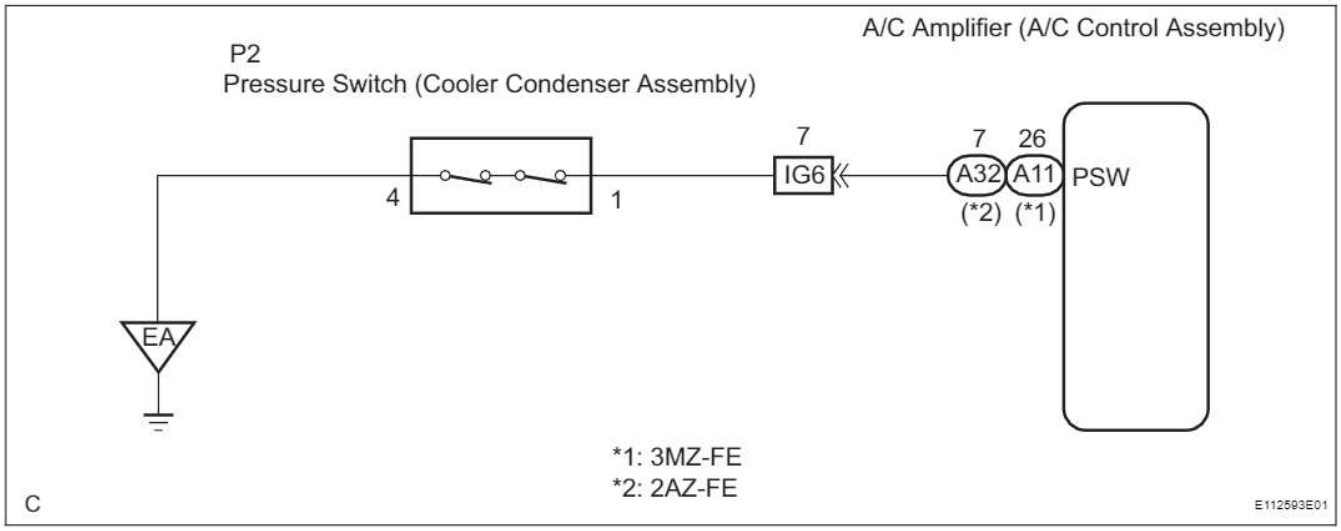
DESCRIPTION

The pressure switch sends the appropriate signals to the A/C amplifier when the A/C refrigerant pressure drops too low or rises too high. When the A/C amplifier receives these signals, it outputs signals through the A/C amplifier to turn the magnetic clutch relay off and turns the magneticic clutch off.

DTC No.	Detection Item	Trouble Area
23	•Open in pressure sensor 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)	• Pressure switch (cooler condenser assembly) • Harness or connector between pressure switch (cooler condenser assembly) and A/C amplifier, pressure switch (cooler condenser assembly) and body ground • Refrigerant pipe line • A/C amplifier



WIRING DIAGRAM



1	INSPECT REFRIGERANT PRESSURE

(a) Set the manifold gauge.
(b) 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 running at 1,500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- Air conditioning switch ON
- Fully open doors

StandardÅ@pressure:
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 the air conditioning cycle may have decreased significantly for reasons such as a gas leakage.

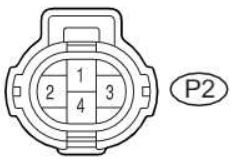
AC

NG → **INSPECT AND REPAIR AIR CONDITIONING CYCLE**

OK

2	CHECK AIR CONDITIONING OPERATION

Pressure Switch (Cooler Condenser Assembly) Connector Wire Harness View:



C E112581E01

(a) Disconnect the pressure switch connector.
(b) Connect terminals 1 and 4 of the connector of the pressure switch on the vehicle wire harness side using a service wire.
(c) Start the engine.
(d) Turn the air conditioning switch is on and check that the magnetic clutch is turned on.
(e) Check that the magnetic clutch is turned off when disconnecting terminals 1 and 4 (that are connected in the prior step).
OK:
Terminals 1 and 4 connected: magnetic clutch is on
Terminals 1 and 4 disconnected: magnetic clutch is off

NG → **Go to step 3**

OK

REPLACE PRESSURE SWITCH (COOLER CONDENSER ASSEMBLY)

3	CHECK HARNESS AND CONNECTOR (PRESSURE SWITCH - AIR CONDITIONING AMPLIFIER)

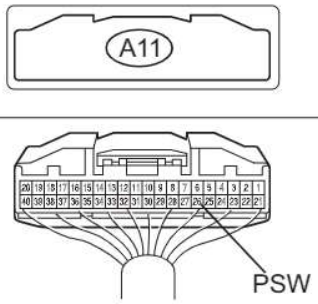
(a) Measure the resistance according to the value(s) in the table below.

Pressure Switch (Cooler Condenser Assembly) Connector Wire Harness View:

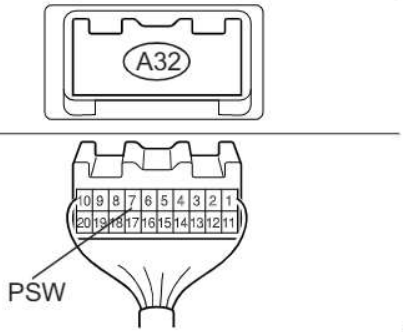


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112550E01

Standard resistance

Tester connection	Condition	Specified condition
A11-26 (PSW)*1, A32-7 (PSW)*2 - P2-1	Always	Below 1Ω
P2-4 - Body ground	Always	Below 1 Ω
A11-26 (PSW)*1, A32-7 (PSW)*2 - Body ground	Always	10 kΩ or higher
P2-1 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

Result:

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

A

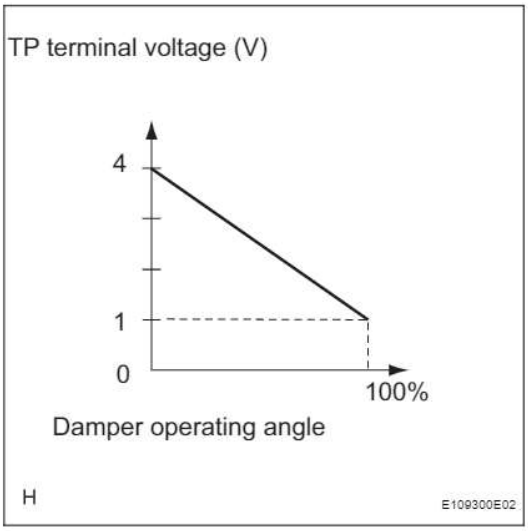
REPAIR OR REPLACE HARNESS OR CONNECTOR

AC

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

DESCRIPTION

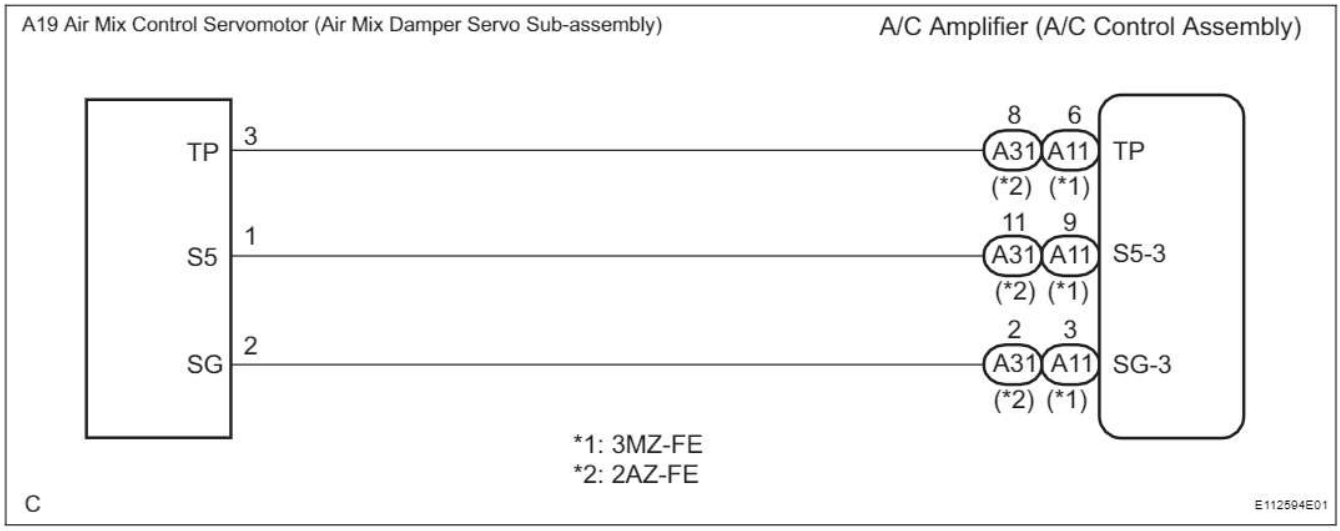
This sensor detects the position of the air mix control servomotor (air mix damper servo sub-assembly) and sends the appropriate signals to the A/C amplifier. The position sensor is built in the air mix control servomotor (air mix damper servo sub-assembly).



DTC No.	Detection Item	Trouble Area
31	Short to ground or short in power source circuit in air mix damper position sensor circuit	• Air mix control servomotor (air mix damper servo sub-assembly) • Harness or connector between air mix control servomotor (air mix damper servo sub-assembly) and A/C amplifier • A/C amplifier

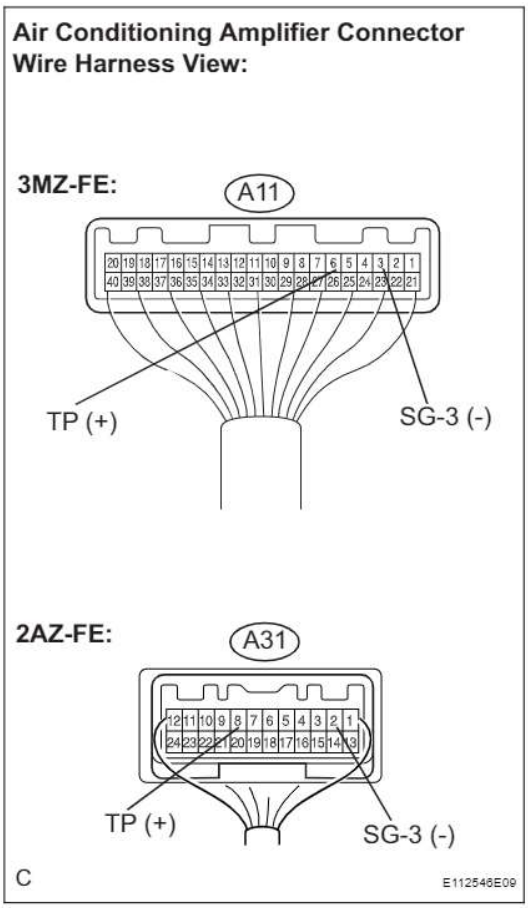
AC

WIRING DIAGRAM



1	INSPECT AIR CONDITIONING AMPLIFIER

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier with the connector still connected.
(b) Turn the ignition switch to the ON position.
(c) Change the temperature setting to activate the air mix control servomotor (air mix damper servo sub-assembly).
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
A11-6 (TP)*1, A31-8 (TP)*2 - A11-3 (SG-3)*1, A31-2 (SG-3)*2	MAX. Hot	0.97 to 1.03 V
A11-6 (TP)*1, A31-8 (TP)*2 - A11-3 (SG-3)*1, A31-2 (SG-3)*2	MAX. Cool	3.97 to 4.03 V

*1: 3MZ-FE
*2: 2AZ-FE
HINT:
As the temperature setting increases, the voltage decreases gradually without interruption.

Result:

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

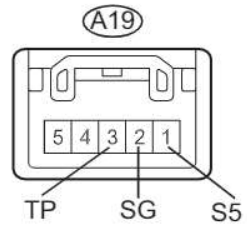
C → REPLACE AIR CONDITIONING AMPLIFIER

A

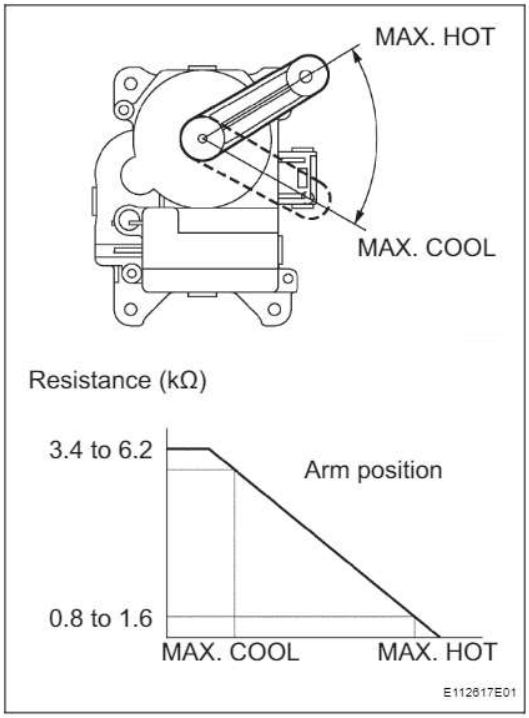
AC

2	INSPECT AIR MIX CONTROL SERVOMOTOR (AIR MIX DAMPER SERVO SUB-ASSEMBLY)

Air Mix Control Servomotor (Air Mix Damper Servo Sub-assembly) Connector Front View:



(a) Remove the air mix control servomotor (air mix damper servo sub-assembly).



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

Standard resistance

Tester connection	Condition	Specified condition
A19-1 (S5) - A19-2 (SG)	Always	4.2 to 6.8 kΩ

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

HINT:

For details, regarding operation of servomotor. (See page AC-72)

Standard resistance

Tester connection	Condition	Specified condition
A19-3 (TP) - A19-2 (SG)	Max. Cool	3.4 to 6.2 kΩ
A19-3 (TP) - A19-2 (SG)	Max. Hot	0.8 to 1.6 kΩ

HINT:

As the air mix control servomotor (air mix damper servo sub-assembly) moves from the cool side to the warm side, the resistance decreases gradually without interruption.

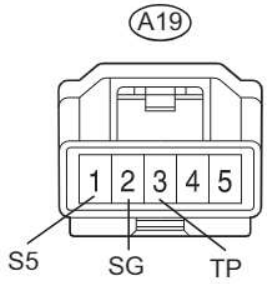
NG → REPLACE AIR MIX CONTROL SERVOMOTOR

OK

3	CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

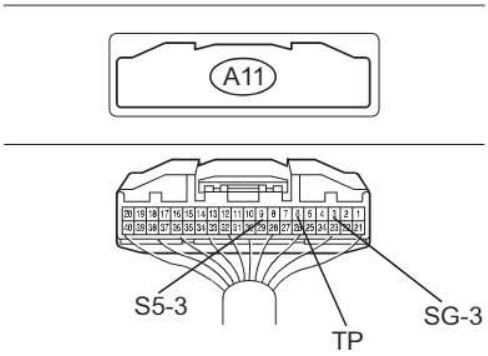
(a) Measure the resistance according to the value(s) in the table below.

Air Mix Control Servomotor (Air Mix Damper Servo Sub-assembly) Connector Wire Harness View:

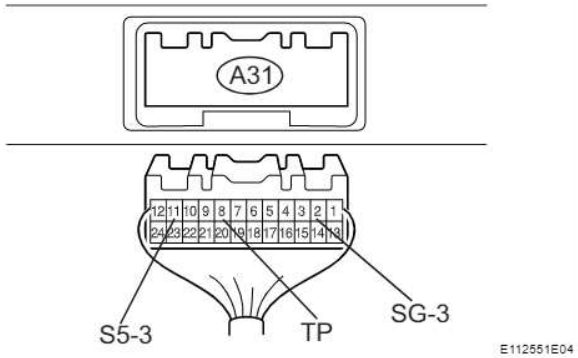


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



AC

Standard resistance

Tester connection	Condition	Specified condition
A11-9 (S5-3)*1, A31-11 (S5-3)*2 - A19-1 (S5)	Always	Below 1 Ω
A11-3 (SG-3)*1, A31-2 (SG-3)*2 - A19-2 (SG)	Always	Below 1 Ω
A11-6 (TP)*1, A31-8 (TP)*2 - A19-3 (TP)	Always	Below 1 Ω
A11-9 (S5-3)*1, A31-11 (S5-3)*2 - Body ground	Always	10 kΩ or higher
A11-3 (SG-3)*1, A31-2 (SG-3)*2 - Body ground	Always	10 kΩ or higher
A11-6 (TP)*1, A31-8 (TP)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

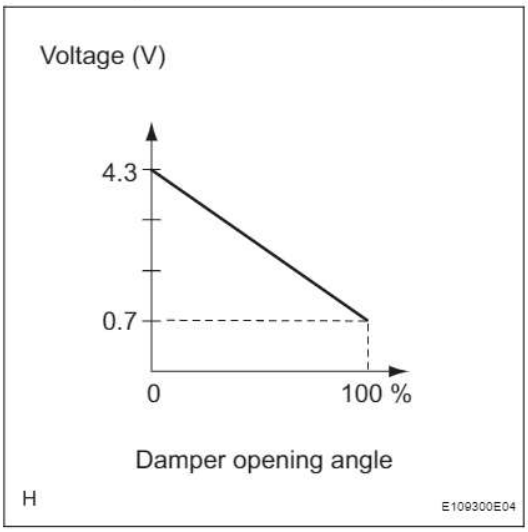
OK

REPLACE AIR CONDITIONING AMPLIFIER

DTC	32	Air Inlet Damper Position Sensor Circuit

DESCRIPTION

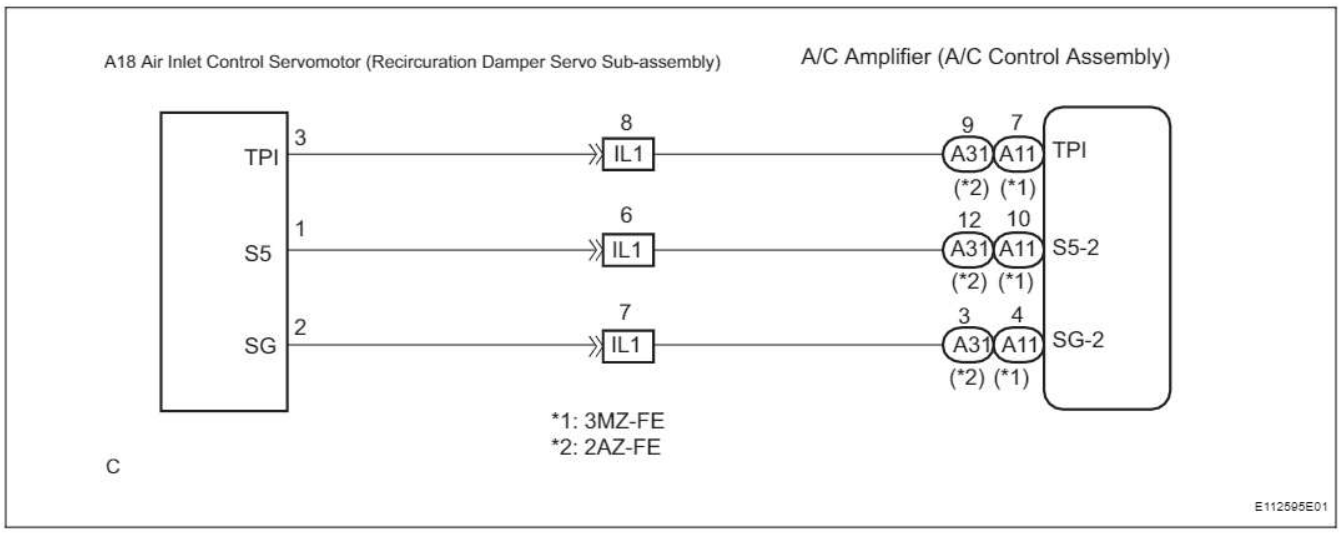
This sensor detects the position of the air inlet control servomotor (recirculation damper servo sub-assembly) and sends the appropriate signals to the A/C amplifier. The position sensor is built in the air inlet control servomotor (recirculation damper servo sub-assembly).



DTC No.	Detection Item	Trouble Area
32	Short to ground or short in power source circuit in air inlet damper position sensor circuit	• Air inlet control servomotor (recirculation damper servo sub-assembly) • Harness or connector between air inlet control servomotor (recirculation damper servo sub-assembly) and A/C amplifier • A/C amplifier

AC

WIRING DIAGRAM



1	INSPECT AIR CONDITIONING AMPLIFIER (TPI - SG-2)

(a) Remove the A/C amplifier with the connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Change the RECIRC/FRESH setting to activate the air inlet control servomotor (recirculation damper servo sub-assembly).
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

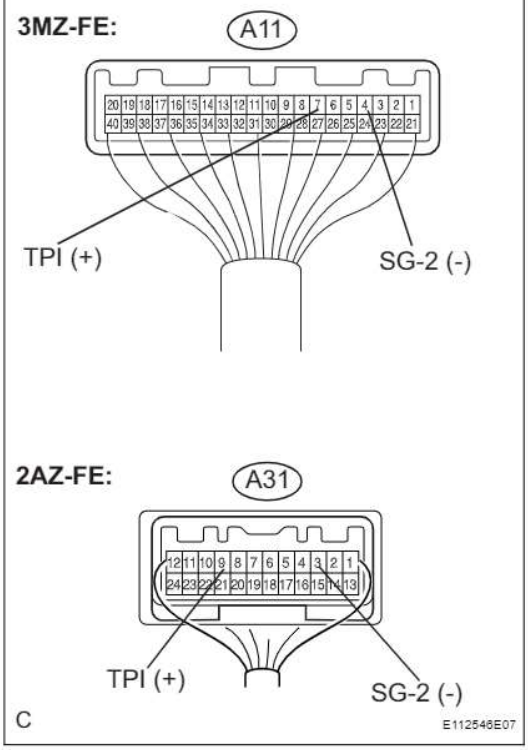
Tester connection	Condition	Specified condition
A11-7 (TPI)*1, A31-9 (TPI)*2 - A11-4 (SG-2)*1, A31-3 (SG-2)*2	RECIRC	4.27 to 4.33 V
A11-7 (TPI)*1, A31-9 (TPI)*2 - A11-4 (SG-2)*1, A31-3 (SG-2)*2	FRESH	0.67 to 0.73 V

*1: 3MZ-FE
*2: 2AZ-FE
HINT:
As the recirculation damper servo sub-assembly moves from the RECIRC side to the FRESH side, the voltage decreases gradually without interruption.

Result:

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

Air Conditioning Amplifier Connector Wire Harness View:



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

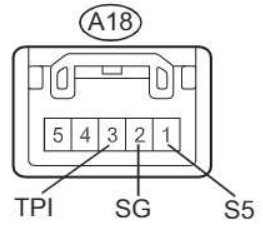
C → REPLACE AIR CONDITIONING AMPLIFIER

A

2	INSPECT AIR INLET CONTROL SERVOMOTOR (RECIRCULATION DAMPER SERVO SUB-ASSEMBLY)

(a) Remove the air inlet control servomotor (recirculation damper servo sub-assembly).

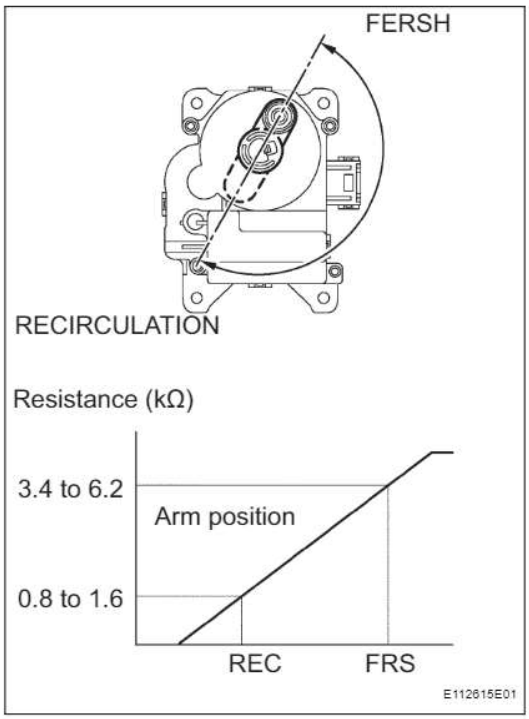
Air Inlet Control Servomotor (Recirculation Damper Servo Sub-assembly) Connector Front View:



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

Standard resistance

Tester connection	Condition	Specified condition
A18-1 (S5) - A18-2 (SG)	Always	4.2 to 7.8 kΩ



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

HINT:

For details, regarding operation of servomotor. (See page AC-75)

Standard resistance

Tester connection	Condition	Specified condition
A18-3 (TPI) - A18-2 (SG)	RECIRCULATION	0.8 to 1.6 kΩ
A18-3 (TPI) - A18-2 (SG)	FRESH	3.4 to 6.2 kΩ

HINT:

As the air inlet control servomotor (recirculation damper servo sub-assembly) moves from the FRESH side to the RECIRCULATION side, the resistance decreases gradually without interruption.

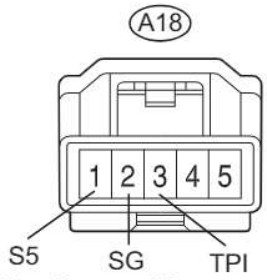
NG → **REPLACE AIR INLET CONTROL SERVOMOTOR**

OK

3	CHECK HARNESS AND CONNECTOR (AIR INLET CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

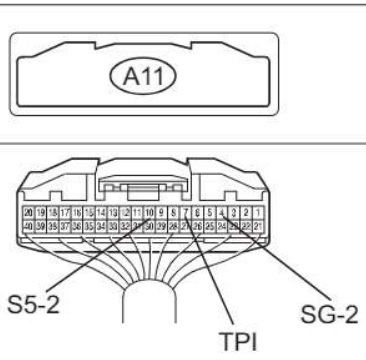
(a) Measure the resistance according to the value(s) in the table below.

Air Inlet Control Servomotor (Recirculation Damper Servo Sub-assembly) Connector Wire Harness View:

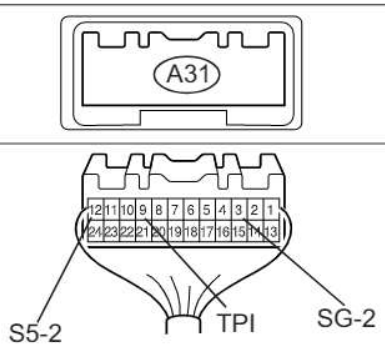


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



E112551E01

AC

Standard resistance

Tester connection	Condition	Specified condition
A11-10 (S5-2)*1, A31-12 (S5-2)*2 - A18-1 (S5)	Always	Below 1 Ω
A11-4 (SG-2)*1, A31-3 (SG-2)*2 - A18-2 (SG)	Always	Below 1 Ω
A11-7 (TPI)*1, A31-9 (TPI)*2 - A18-3 (TPI)	Always	Below 1 Ω
A11-10 (S5-2)*1, A31-12 (S5-2)*2 - Body ground	Always	10 kΩ or higher
A11-4 (SG-2)*1, A31-3 (SG-2)*2 - Body ground	Always	10 kΩ or higher
A11-7 (TPI)*1, A31-9 (TPI)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

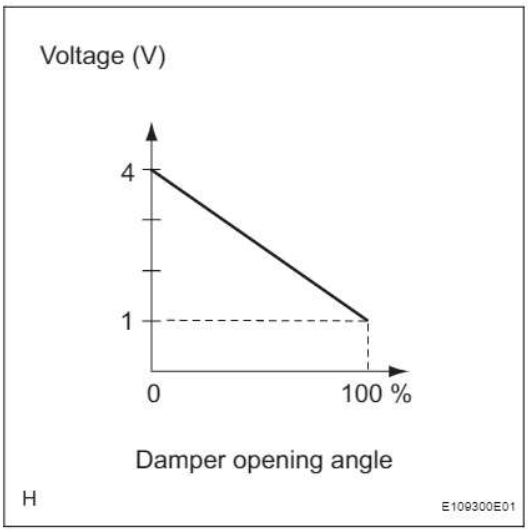
OK

REPLACE AIR CONDITIONING AMPLIFIER

DTC	33	Air Outlet Damper Position Sensor Circuit

DESCRIPTION

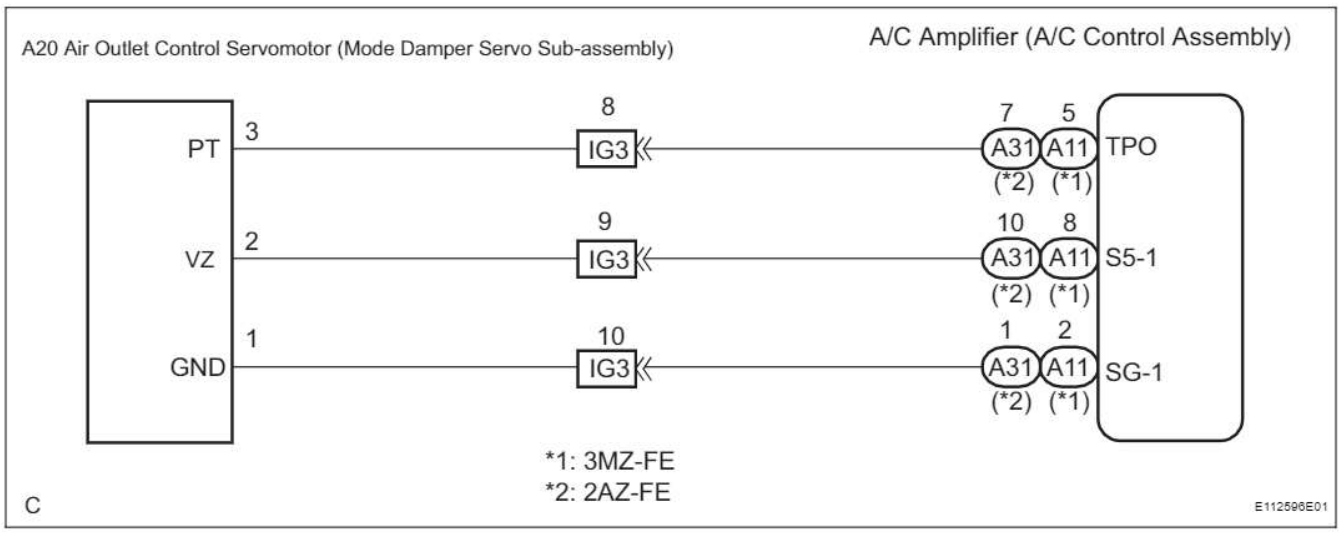
This sensor detects the position of the air outlet control servomotor (mode damper servo sub-assembly) and sends the appropriate signals to the A/C amplifier. The position sensor is built in the air outlet control servomotor (mode damper servo sub-assembly).



DTC No.	Detection Item	Trouble Area
33	Short to ground or short in power source circuit in air outlet damper position sensor circuit	• Air outlet control servomotor (mode damper servo sub-assembly) • Harness or connector between air outlet control servomotor (mode damper servo sub-assembly) and A/C amplifier • A/C amplifier

AC

WIRING DIAGRAM



1	INSPECT AIR CONDITIONING AMPLIFIER (TPO - SG-1)

(a) Remove the A/C amplifier with the connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Change the mode setting to activate the mode air outlet control servomotor (damper servo sub-assembly).
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

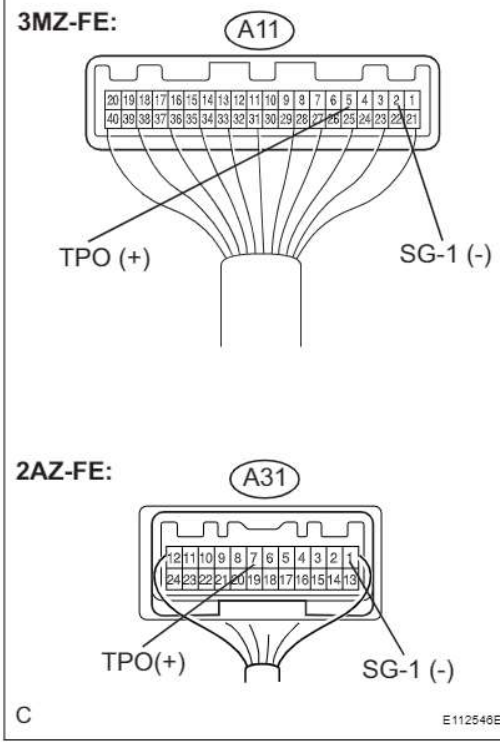
Tester connection	Condition	Specified condition
A11-5 (TPO)*1, A31-7 (TPO)*2 - A11-2 (SG-1)*1, A31-1 (SG-1)*2	FACE	3.97 to 4.03 V
A11-5 (TPO)*1, A31-7 (TPO)*2 - A11-2 (SG-1)*1, A31-1 (SG-1)*2	DEF	0.97 to 1.03 V

*1: 3MZ-FE
*2: 2AZ-FE
HINT:
As the air outlet control servomotor (mode damper servo sub-assembly) moves from the FACE side to the DEF side, the voltage decreases gradually without interruption.

Result:

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

Air Conditioning Amplifier Connector Wire Harness View:



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

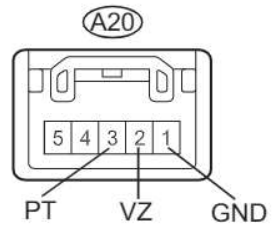
C → REPLACE AIR CONDITIONING AMPLIFIER

A

2	INSPECT AIR OUTLET CONTROL SERVOMOTOR (MODE DAMPER SERVO SUB-ASSEMBLY)

(a) Remove the air outlet control servomotor (mode damper servo sub-assembly).

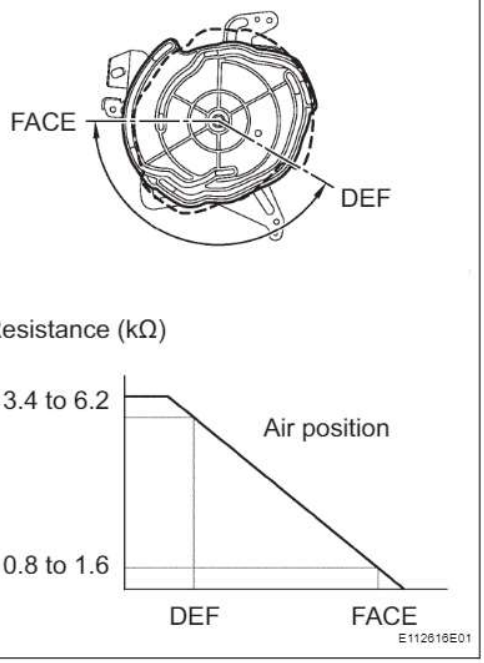
Air Outlet Control Servomotor (Mode Damper Servo Sub-assembly) Connector Front View:



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

Standard resistance

Tester connection	Condition	Specified condition
A20-2 (VZ) - A20-1 (GND)	Always	4.2 to 7.8 kΩ



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

HINT:

For details, regarding operation of the servomotor. (See page AC-79)

Standard resistance

Tester connection	Condition	Specified condition
A20-3 (PT) - A20-1 (GND)	DEF	3.4 to 6.2 kΩ
A20-3 (PT) - A20-1 (GND)	FACE	0.8 to 1.6 kΩ

HINT:

As the air outlet control servomotor (mode damper servo sub-assembly) moves from the DEF side to the FACE side, the resistance decreases gradually without interruption.

AC

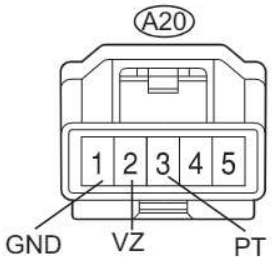
NG → **REPLACE AIR OUTLET CONTROL SERVOMOTOR**

OK

3	CHECK HARNESS AND CONNECTOR (AIR OUTLET CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

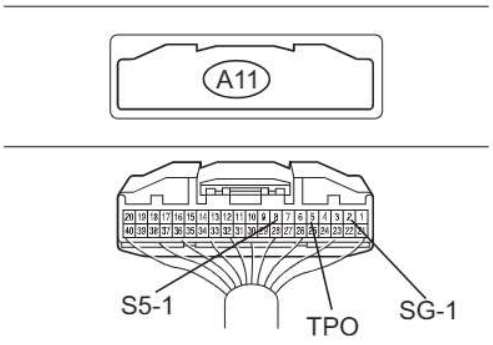
(a) Measure the resistance according to the value(s) in the table below.

Air Outlet Control Servomotor (Mode Damper Servo Sub-assembly)
Connector Wire Harness View:

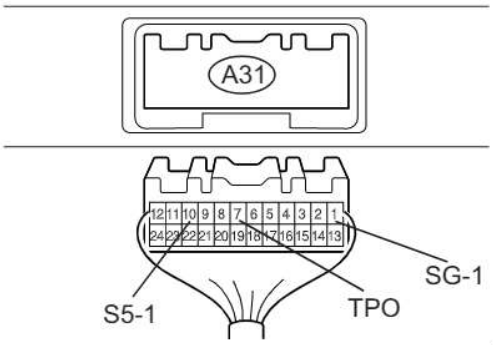


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112551E02

AC

Standard resistance

Tester connection	Condition	Specified condition
A11-8 (S5-1)*1, A31-10 (S5-1)*2 - A20-2 (VZ)	Always	Below 1 Ω
A11-2 (SG-1)*1, A31-1 (SG-1)*2 - A20-1 (GND)	Always	Below 1 Ω
A11-5 (TPO)*1, A31-7 (TPO)*2 - A20-3 (PT)	Always	Below 1 Ω
A11-8 (S5-1)*1, A31-10 (S5-1)*2 - Body ground	Always	10 kΩ or higher
A11-2 (SG-1)*1, A31-1 (SG-1)*2 - Body ground	Always	10 kΩ or higher
A11-5 (TPO)*1, A31-7 (TPO)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

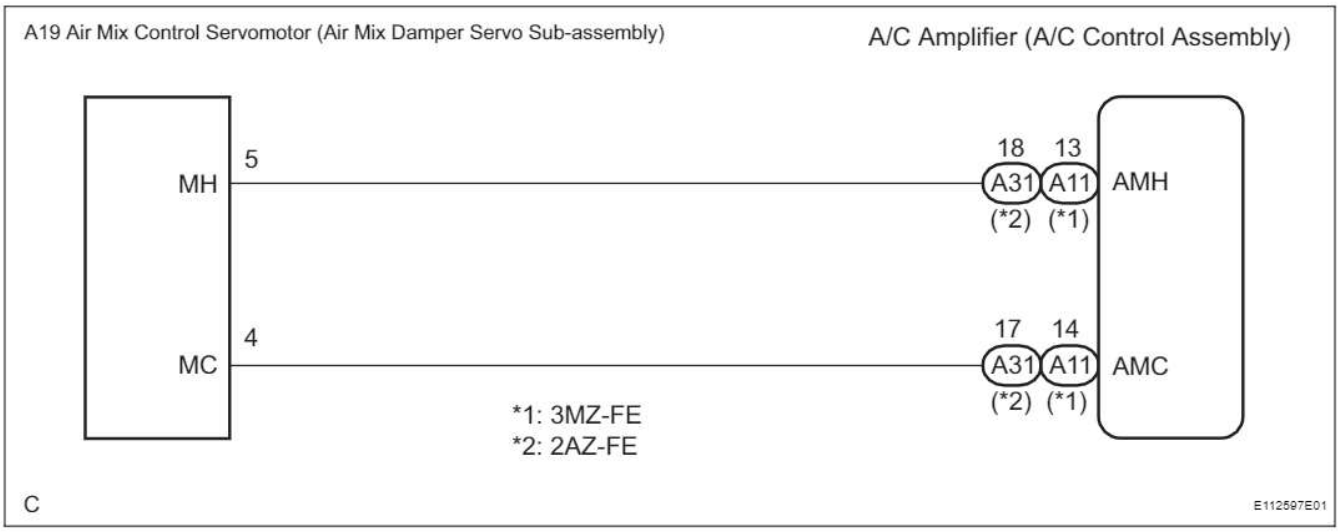
DTC	41	Air Mix Damper Control Servomotor Circuit (Passenger Side)

DESCRIPTION

The air mix control servomotor (air mix damper servo sub-assembly) is controlled by the A/C amplifier. 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.

DTC No.	Detection Item	Trouble Area
41	Air mix damper position sensor value does not change even if air conditioner amplifier assembly operates air mix servomotor	• Air mix control servomotor (air mix damper servo sub-assembly) • Harness or connector between air mix control servomotor (air mix damper servo sub-assembly) and A/C amplifier • A/C amplifier

WIRING DIAGRAM



1	PERFORM ACTUATOR CHECK

(a) Set the actuator check mode (See page AC-14).
(b) Press the DEF switch to change to the step operation.
(c) Check the air flow temperature by hand.

Display Code	Air mix damper position
0	COOL side (0% open)
1	COOL side (0% open)
2	COOL side (0% open)
3	COOL side (0% open)
4	COOL/HOT (50% open)
5	COOL/HOT (50% open)
6	HOT side (100% open)
7	HOT side (100% open)
8	HOT side (100% open)
9	HOT side (100% open)

AC

OK:

Air flow temperature changes in accordance with each display code.

Result:

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

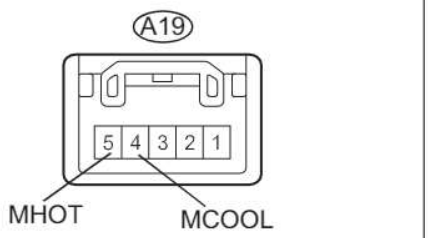
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER**

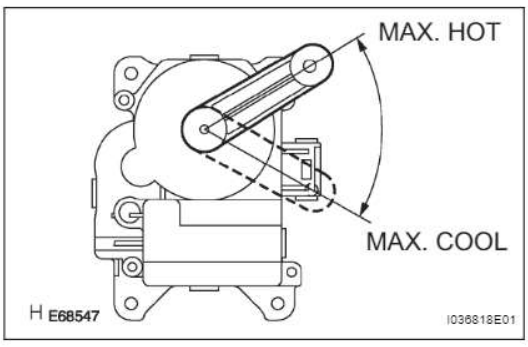
A

2 INSPECT AIR MIX CONTROL SERVOMOTOR (AIR MIX DAMPER SERVO SUB-ASSEMBLY)

Air Mix Control Servomotor (Air Mix Damper Servo Sub-assembly) Connector Front View:



(a) Remove the air mix control servomotor (air mix damper servo sub-assembly).



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

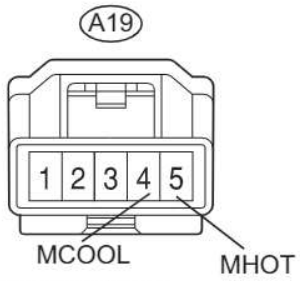
NG → **REPLACE AIR MIX CONTROL SERVOMOTOR**

OK

3 CHECK HARNESS AND CONNECTOR (AIR MIX CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

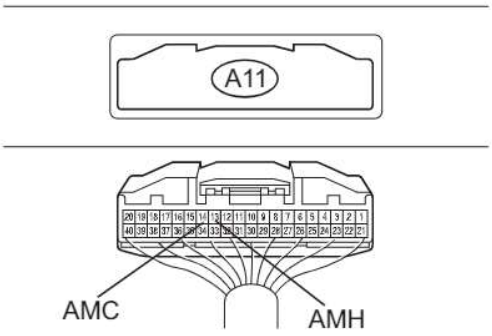
(a) Measure the resistance according to the value(s) in the table below.

Air Mix Control Servomotor (Air Mix Damper Servo Sub-assembly) Connector Wire Harness View:

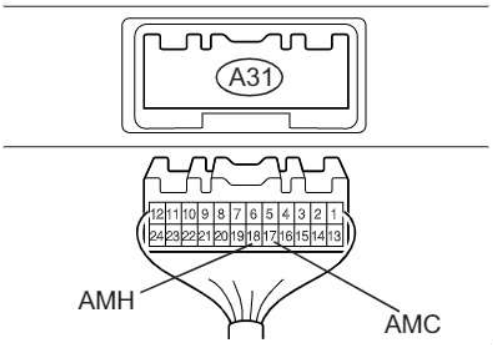


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112551E05

AC

Standard resistance

Tester connection	Condition	Specified condition
A11-14 (AMC)*1, A31-17 (AMC)*2 - A19-4 (MCOOL)	Always	Below 1 Ω
A11-13 (AMH)*1, A31-18 (AMH)*2 - A19-5 (MHOT)	Always	Below 1 Ω
A11-14 (AMC)*1, A31-17 (AMC)*2 - Body ground	Always	10 kΩ or higher
A11-13 (AMH)*1, A31-18 (AMH)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

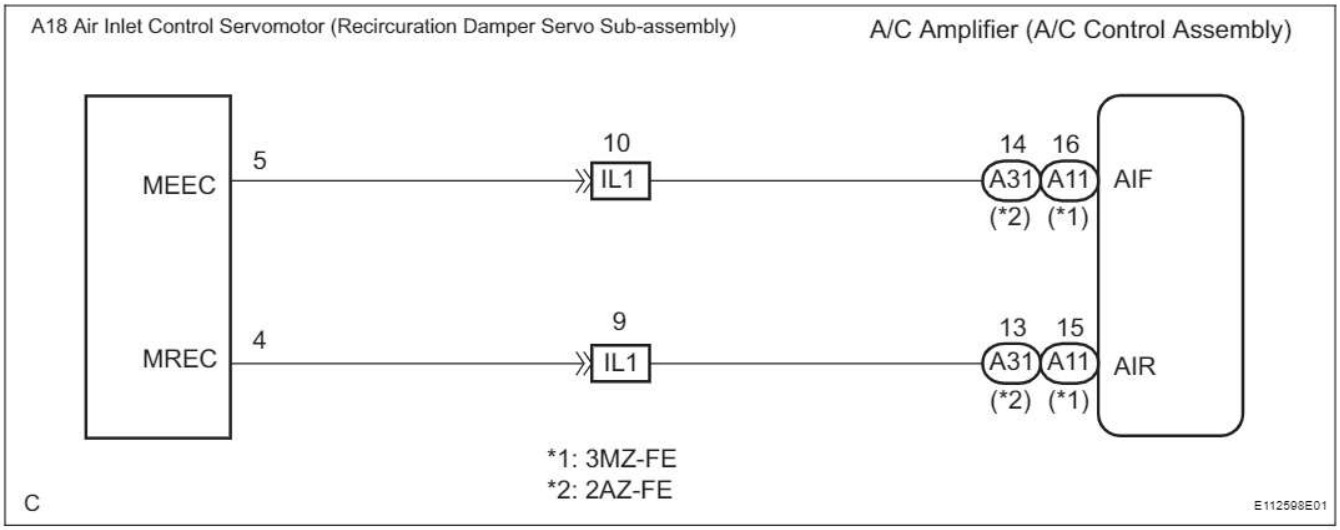
DTC	42	Air Inlet Damper Control Servomoter Circuit

DESCRIPTION

The air inlet control servomotor (recirculation damper servo sub-assembly) is controlled by the A/C amplifier and moves the air inlet control servomotor (recirculation damper servo sub-assembly) to the desired position.

DTC No.	Detection Item	Trouble Area
42	Air inlet damper position sensor value does not change even if A/C control assembly operates air inlet damper control servomotor	• Air inlet control servomotor (recirculation damper servo sub-assembly) • Harness or connector between air inlet control servomotor (recirculation damper servo sub-assembly) and A/C amplifier • A/C amplifier

WIRING DIAGRAM



AC

1	PERFORM ACTUATOR CHECK

(a) Remove the glove box to see and check the air inlet control servomotor (recirculation damper servo sub-assembly) operation.
(b) Set the actuator check mode (See page AC-14).
(c) Press the DEF switch to change to the step operation.
(d) Press the DEF switch in order and check the operation of the air inlet control servomotor (recirculation damper servo sub-assembly).

Display code	Recirculation damper position
0	FRESH
1	FRESH
2	FRESH
3	RECIRCULATION / FRESH
4	RECIRCULATION
5	RECIRCULATION
6	RECIRCULATION

Display code	Recirculation damper position
7	RECIRCULATION
8	RECIRCULATION
9	RECIRCULATION

OK:

Recirculation damper position changes in accordance with each display code.

Result:

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

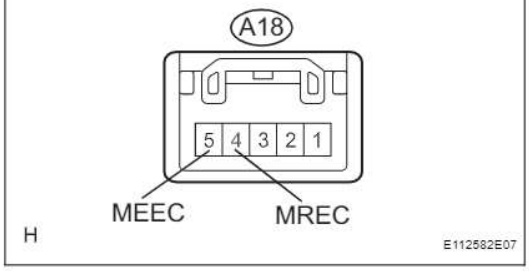
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER**

A

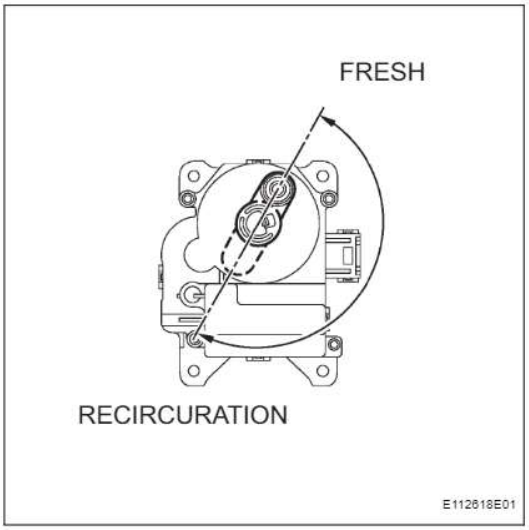
2 INSPECT AIR INLET CONTROL SERVOMOTOR (RECIRCULATION DAMPER SERVO SUB-ASSEMBLY)

Air Inlet Control Servomotor (Recircuration Damper Servo Sub-assembly) Connector Front View:



(a) Remove the air inlet control servomotor (recirculation damper servo sub-assembly).

AC



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

NG → **REPLACE AIR INLET CONTROL SERVOMOTOR**

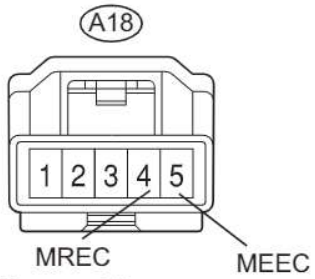
OK

3	CHECK HARNESS AND CONNECTOR (AIR INLET CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

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

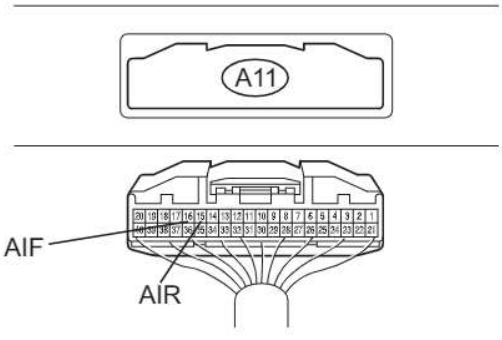
AC

Air Inlet Control Servomotor (Recircuration Damper Servo Sub-assembly) Connector Wire Harness View:

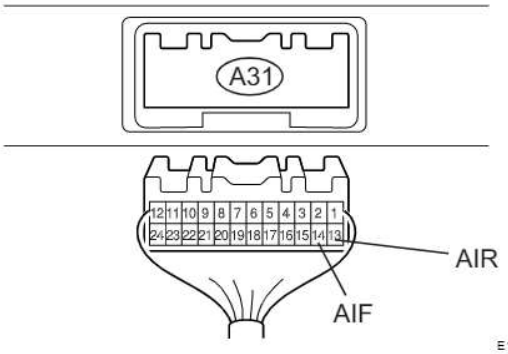


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112551E06

Standard resistance

Tester connection	Condition	Specified condition
A11-16 (AIF)*1, A31-14 (AIF)*2 - A18-5 (MEEC)	Always	Below 1 Ω
A11-15 (AIR)*1, A31-13 (AIR)*2 - A18-4 (MREC)	Always	Below 1 Ω
A11-16 (AIF)*1, A31-14 (AIF)*2 - Body ground	Always	10 kΩ or higher
A11-15 (AIR)*1, A31-13 (AIR)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

AC

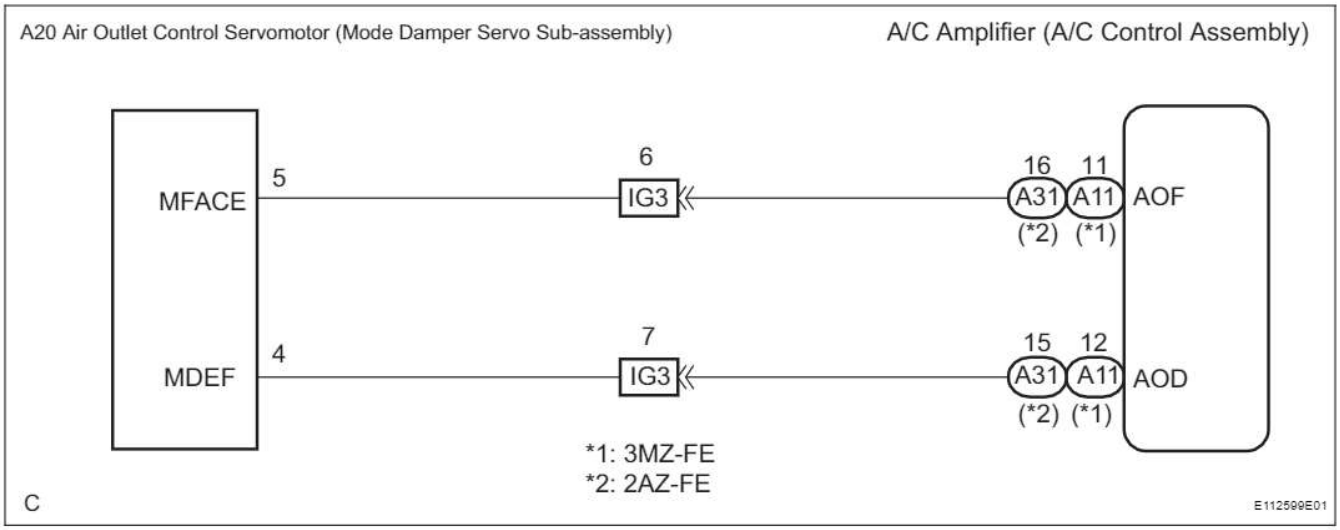
DTC	43	Air Outlet Damper Control Servomotor Circuit

DESCRIPTION

This circuit turns the servomotor and changes each damper position by receiving the signals from the A/C amplifier assembly. When the AUTO switch is on, the A/C amplifier changes the mode between "FACE", "BI-LEVEL" and "FOOT" according to the temperature setting.

DTC No.	Detection Item	Trouble Area
43	Air outlet damper position sensor value does not change even if air conditioner amplifier operates air outlet damper control servomotor	• Air outlet control servomotor (mode damper servo sub-assembly) • Harness or connector between air outlet control servomotor (mode damper servo sub-assembly) and A/C amplifier • A/C amplifier

WIRING DIAGRAM



AC

1	PERFORM ACTUATOR CHECK

(a) Warm up the engine.
(b) Set the actuator check mode (See page AC-14).
(c) Press the DEF switch to change to the step operation.
(d) Press the DEF switch and check the air flow by hand.

Display code	Air flow position
0	FACE
1	FACE
2	FACE
3	FACE
4	FACE
5	BI-LEVEL
6	FOOT (MANUAL)
7	FOOT (AUTO)
8	FOOT/DEF
9	DEF

OK:

Air flow position changes in accordance with each display code.

Result:

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

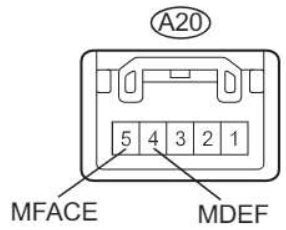
B → **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

C → **REPLACE AIR CONDITIONING AMPLIFIER**

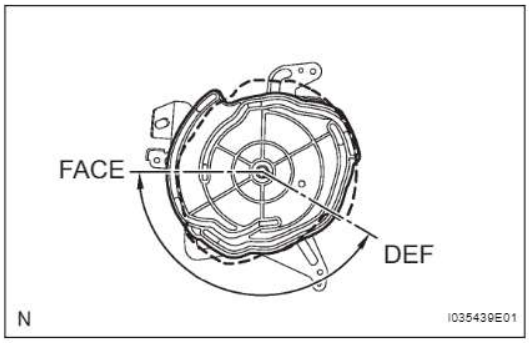
A

2 INSPECT AIR OUTLET CONTROL SERVOMOTOR (MODE DAMPER SERVO SUB-ASSEMBLY)

Air Outlet Control Servomotor (Mode Damper Servo Sub-assembly) Connector Front View:



(a) Remove the air outlet control servomotor (mode damper servo sub-assembly).



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

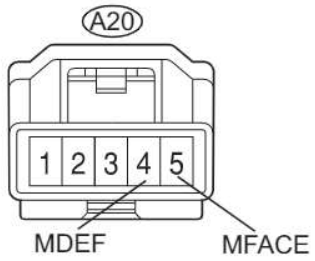
NG → **REPLACE AIR OUTLET CONTROL SERVOMOTOR**

OK

3 CHECK AND REPLACE HARNESS AND CONNECTOR (AIR OUTLET CONTROL SERVOMOTOR - AIR CONDITIONING AMPLIFIER)

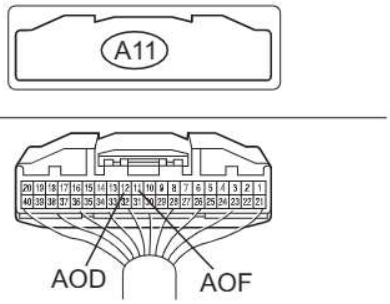
(a) Measure the resistance according to the value(s) in the table below.

Air Outlet Control Servomotor (Mode Damper Servo Sub-assembly) Connector Wire Harness View:

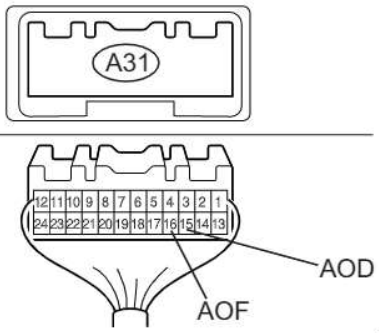


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

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AC

Standard resistance

Tester connection	Condition	Specified condition
A11-11 (AOF)*1, A31-16 (AOF)*2 - A20-5 (MFACE)	Always	Below 1 Ω
A11-12 (AOD)*1, A31-15 (AOD)*2 - A20-4 (MDEF)	Always	Below 1 Ω
A11-11 (AOF)*1, A31-16 (AOF)*2 - Body ground	Always	10 kΩ or higher
A11-12 (AOD)*1, A31-15 (AOD)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

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

OK

REPLACE AIR CONDITIONING AMPLIFIER

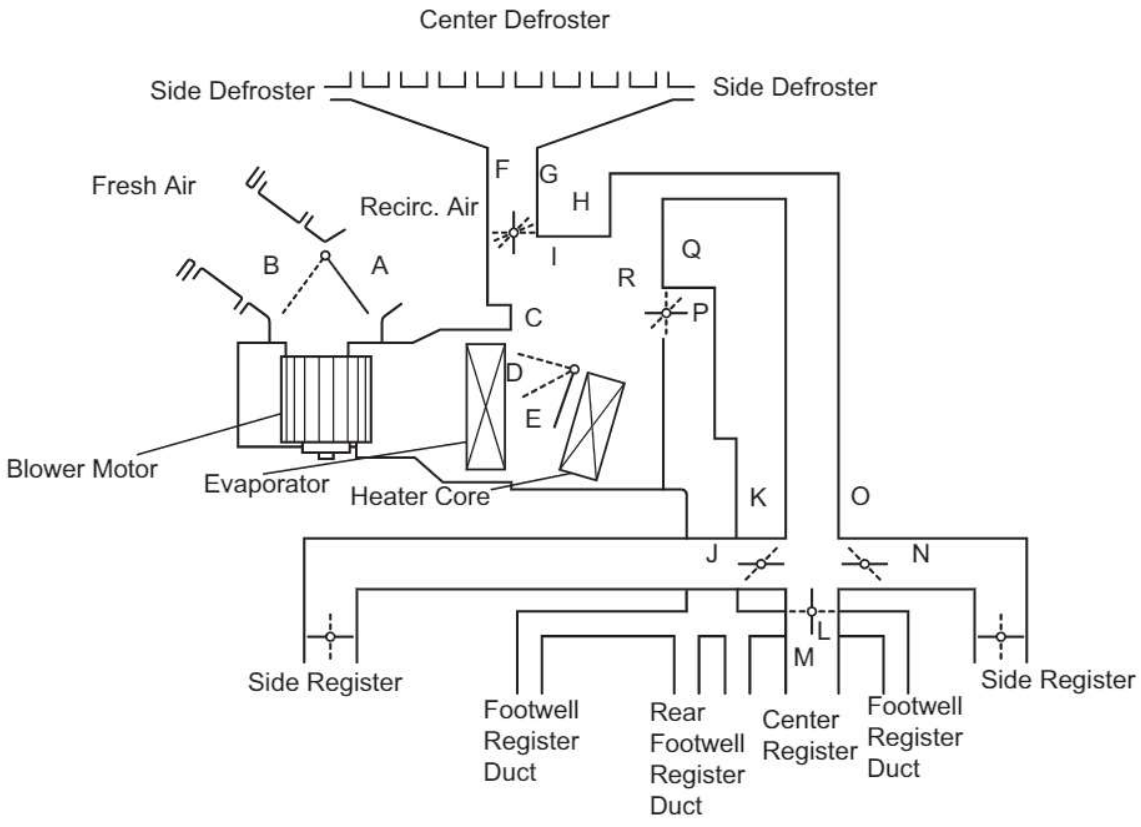
SYSTEM DESCRIPTION

1. GENERAL

(a) The air conditioning system in the '04 CAMRY SOLARA has the following features:

- A compact, lightweight, and low-noise swash plate type compressor has been adopted.
- 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 and the air conditioning switch indicator blinks.
- The compressor and water temperature sensor are connected to the ECM.
- The A/C amplifier receives the vehicle speed signal from the combination meter.

2. MODEL POSITION AND DAMPER OPERATION

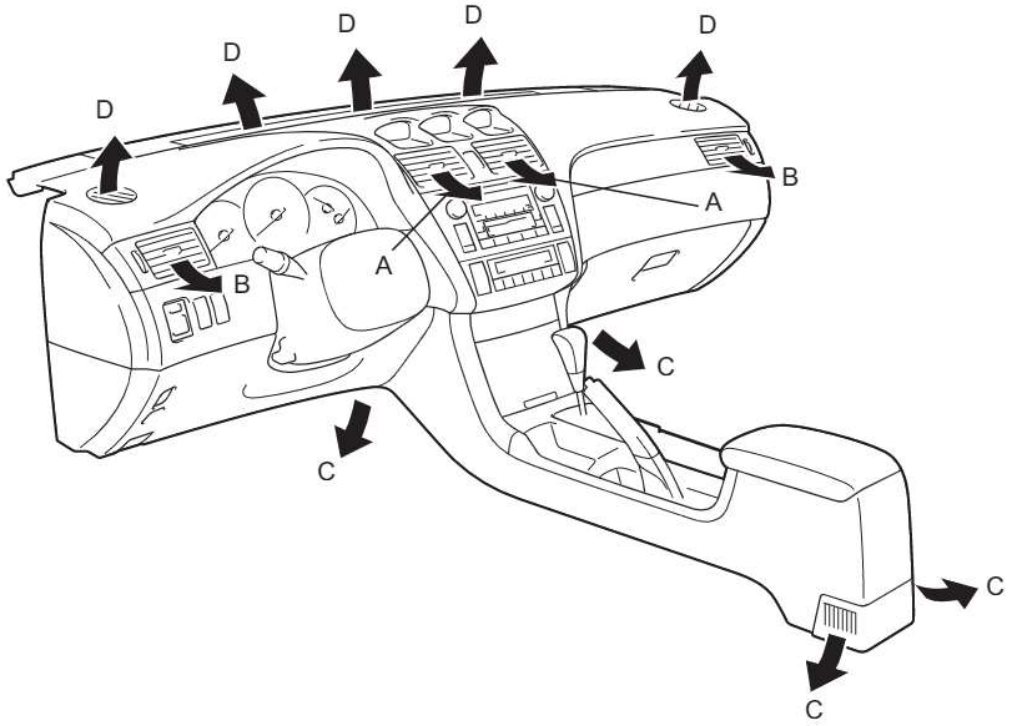


Control Damper	Control Position	Damper Position	Operation
Air Inlet Control Damper	FRESH	A	Brings in fresh air.
	RECIRC	B	Recirculates internal air.

Control Damper	Control Position	Damper Position	Operation
Air Mix Control Damper	MAX. COLD to MAX. HOT TEMP. SETTING {18°C (64.4°F) to 32°C (89.6°F)}	C to D to E	Varies the mixture ratio of the fresh air and the recirculation air in order to regulate the temperature continuously from HOT to COOL.
Mode Control Damper	DEF 	F,K,L,O,R	Defrosts the windshield through the center defroster, side defrosters, and side registers.
	FOOT/DEF 	G,K,L,O,Q	Defrosts the windshield through the center defroster, side defrosters, and side registers, while air is also blown out from the front and rear footwell register duct.
	FOOT 	H,K,L,O,P	Air blows out of the front and rear footwell register ducts, and side registers. In addition, air blows out slightly from the center defroster and side defrosters.
	BI-LEVEL 	I,J,M,N,P	Air blows out of the center register, side registers and footwell register ducts.
	FACE 	I,J,M,N,R	Air blows out of the center register and side registers

AC

3. AIR OUTLETS AND AIR VOLUME RATIONS



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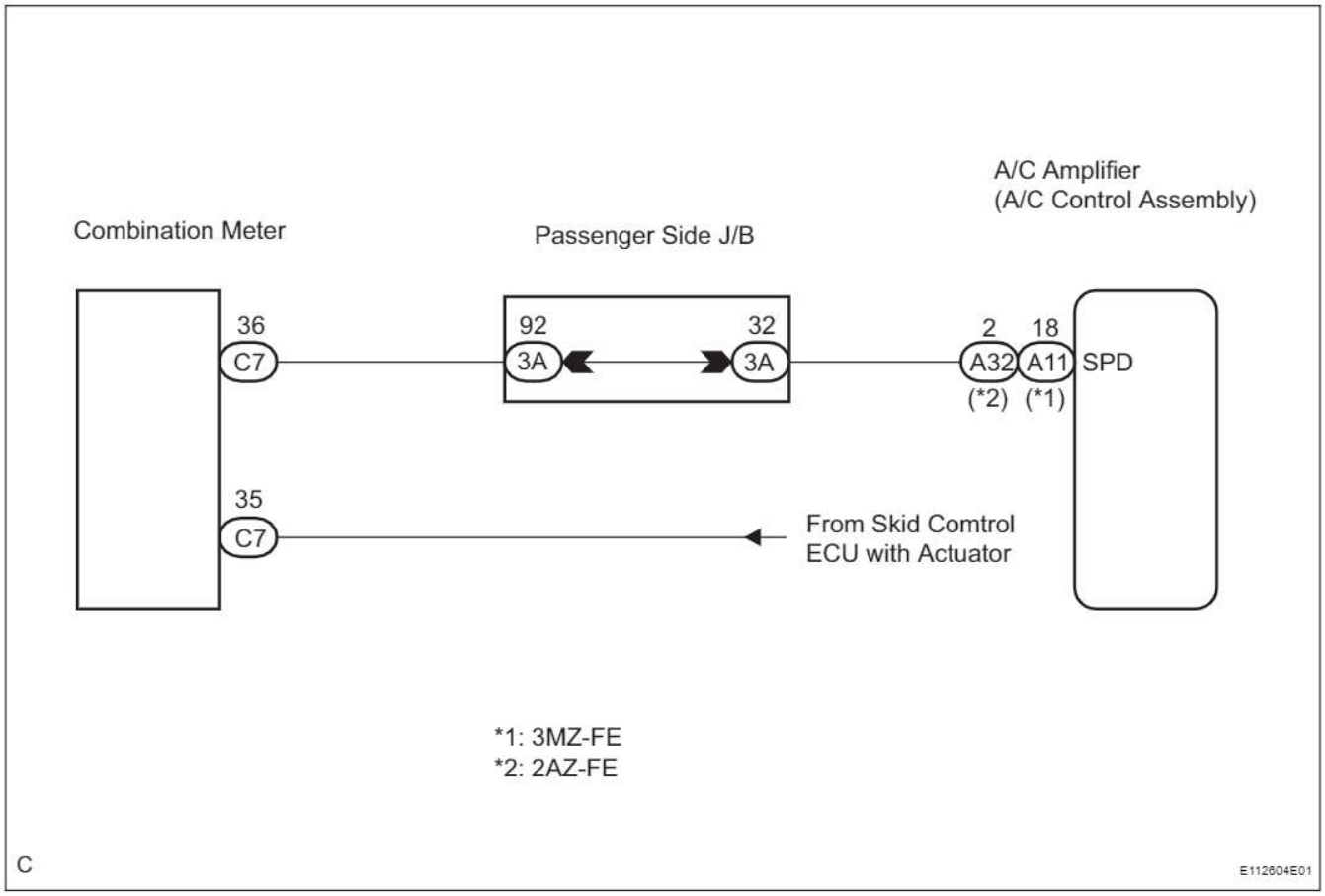
Air Outer Mode	A	B	C	D
	Center Face	Side Face	Foot	Defroster
FACE	◯	◯	—	—
BI-LEVEL	○	○	○	—
FOOT	—	○	◯	○
FOOT/DEF	—	○	◯	○
DEF	—	○		◯

Vehicle Speed Signal Circuit

DESCRIPTION

The A/C amplifier monitors signals from the speed sensor via the combination meter.
The A/C amplifier assembly uses these signals to revise the ambient temperature sensor signal.
Check that the speedometer in the combination meter operates normally before inspecting the vehicle speed signal circuit.
If the meter does not operate normally, refer to the combination meter system (See page ME-10).

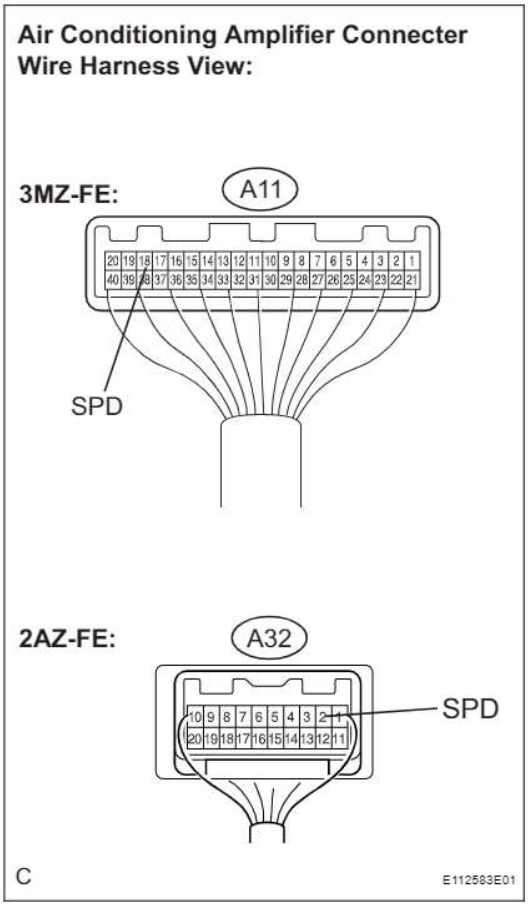
WIRING DIAGRAM



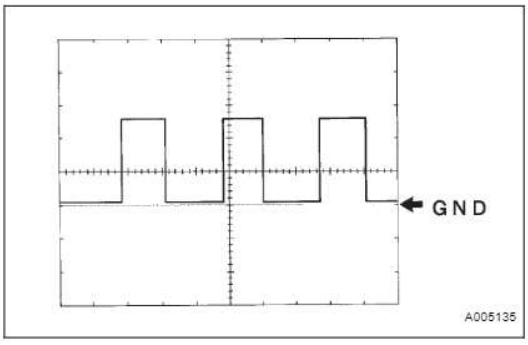
AC

1	INSPECT AIR CONDITIONING AMPLIFIER (SPD)

(a) Remove the A/C amplifier assembly with the connectors still connected.
(b) Move the shift lever to the Neutral position.
(c) Lift up the vehicle.
(d) Turn the ignition switch to the ON position.



(e) Connect the oscilloscope to terminal A11-18 (SPD) and body ground.



(f) Check the signal waveform according to the condition(s) in the table below.

OK

Waveform operate as shown in the illustration.

Item	Condition
Tool setting	5 V/DIV, 20 ms/DIV
Vehicle condition	Driving at approx. 20 km/h (12 mph)

HINT:
As vehicle speed increases, the cycle of the signal waveform narrows.

NG → **Go to step 2**

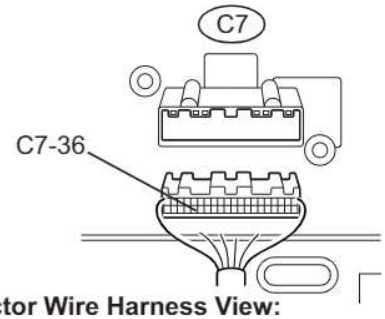
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

2	CHECK HARNESS AND CONNECTOR (COMBINATION METER - AIR CONDITIONING AMPLIFIER)

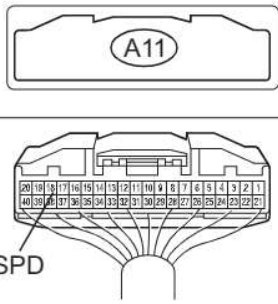
(a) Measure the resistance according to the value(s) in the table below.

Combination Meter Assembly Connector Front View:

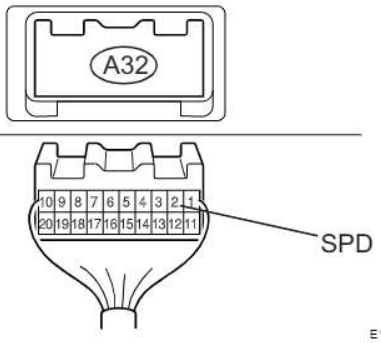


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112554E01

AC

Standard resistance

Tester connection	Condition	Specified condition
C7-36 - A11-18 (SPD)*1, A32-2 (SPD)*2	Always	Below 1 Ω
A11-18 (SPD)*1, A32-2 (SPD)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

GO TO COMBINATION METER SYSTEM

Blower Motor Circuit

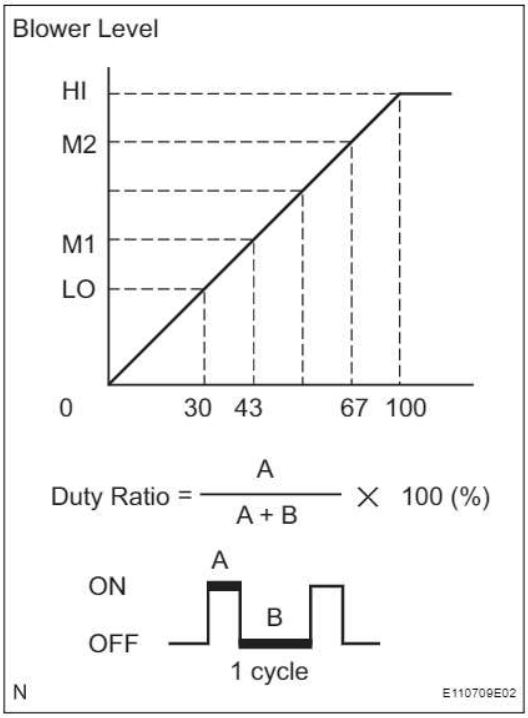
DESCRIPTION

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

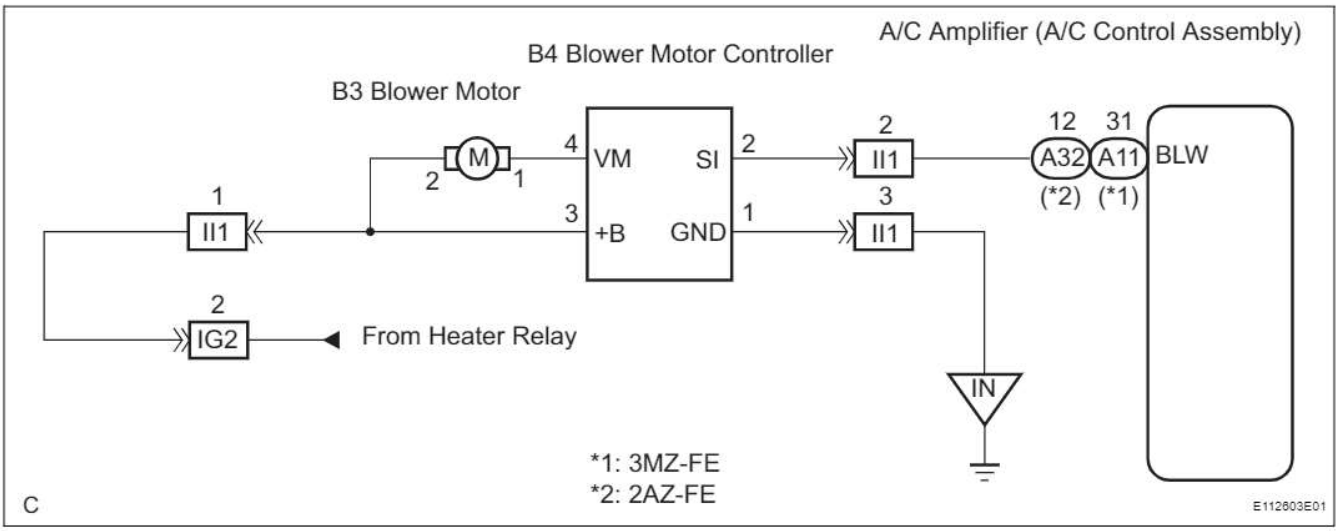
The duty ratio is the ratio of the period of continuity in one cycle. For example, A is the period of continuity in one cycle, and B is the period of non-continuity.

The blower motor controller controls the blower motor speed.



AC

WIRING DIAGRAM



1	PERFORM ACTUATOR CHECK

(a) Set the actuator check mode (See page AC-14).
(b) Press the blower switch to change to the step operation.
(c) Check the air flow level by hand.

Display Code	Blower level
0	0
1	1
2	14
3	14
4	14
5	14
6	14
7	14
8	14
9	31

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

NG → **Go to step 2**

OK

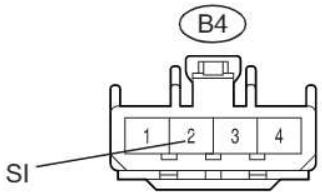
AC

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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

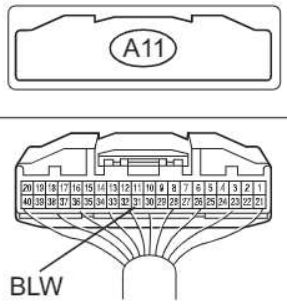
(a) Measure the resistance according to the value(s) in the table below.

Blower Motor Controller Connector Front View:

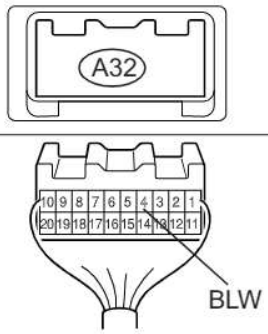


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

E112553E01

AC

Standard resistance

Tester connection	Condition	Specified condition
A11-31 (BLW)*1, A32-12 (BLW)*2 - B4-2 (SI)	Always	Below 1 Ω
A11-31 (BLW)*1, A32-12 (BLW)*2 - Body ground	Always	10 kΩ or higher

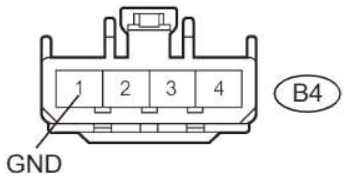
*1: 3MZ-FE
*2: 2AZ-FE

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

OK

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

Blower Motor Controller Connector Front View:



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

Standard resistance

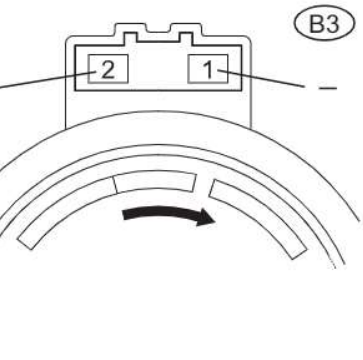
Tester connection	Condition	Specified condition
B4-1 (GND) - Body ground	Always	Below 1 Ω

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

OK

4	INSPECT BLOWER W/FAN MOTOR SUB-ASSEMBLY

Blower w/ Fan Motor Sub-assembly Front View:



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

Standard:

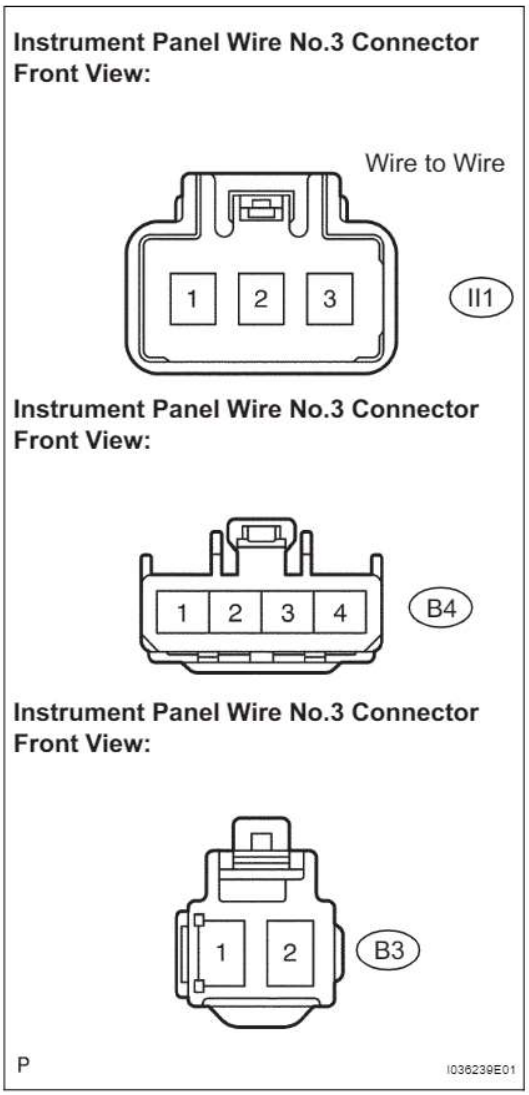
Blower motor operates smoothly.

NG → **REPLACE BLOWER W/FAN MOTOR SUB-ASSEMBLY**

OK

AC

5	CHECK INSTRUMENT PANEL WIRE NO.3



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

Standard resistance

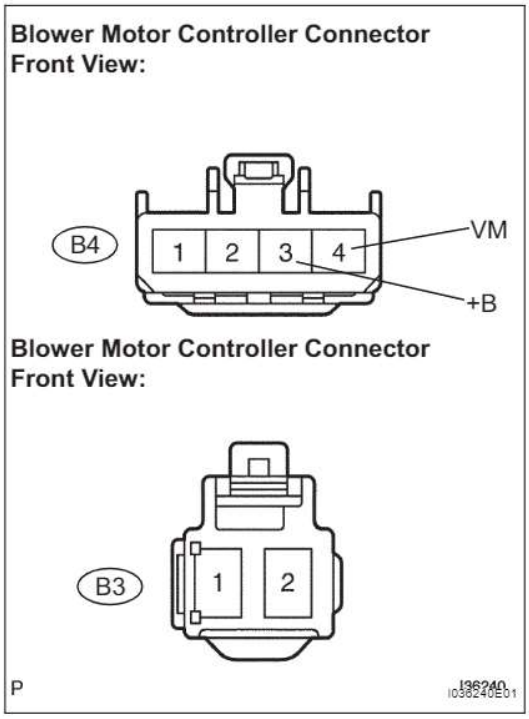
Tester connection	Condition	Specified condition
II1-1 - B4-1	Always	Below 1 Ω
II1-3 - B3-1	Always	Below 1 Ω

NG → **REPAIR OR REPLACE INSTRUMENT PANEL WIRE NO.3**

OK

AC

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



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

Standard resistance

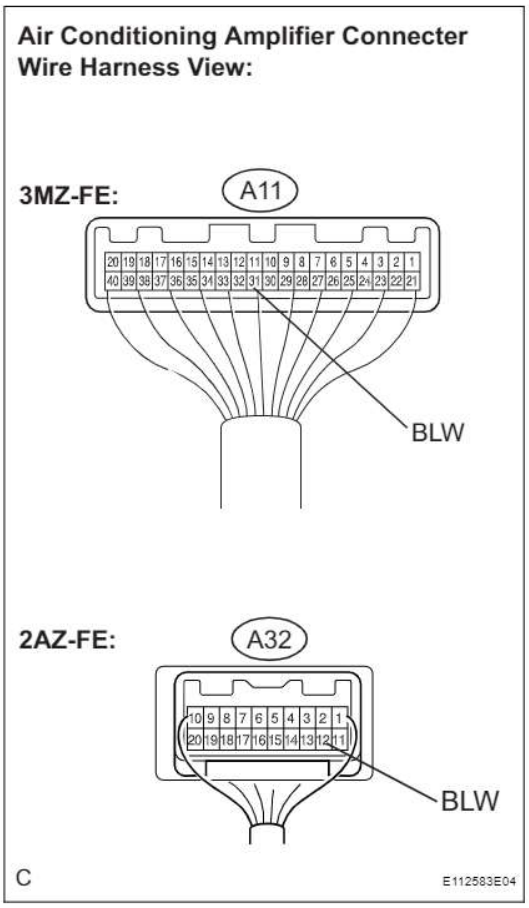
Tester connection	Condition	Specified condition
B4-4 (VM) - B3-1	Always	Below 1 Ω
B4-3 (+B) - Body ground	Always	Below 1 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

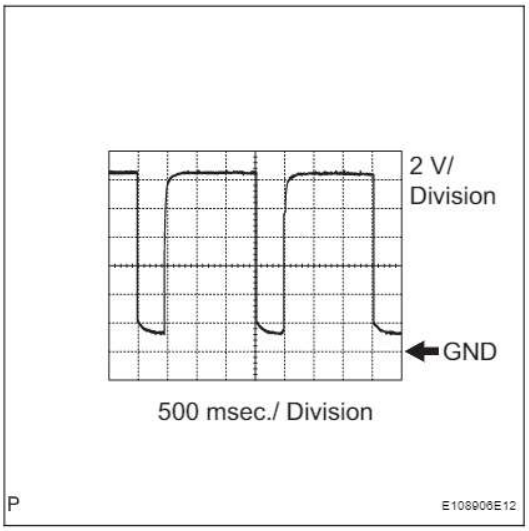
OK

AC

7	INSPECT AIR CONDITIONING AMPLIFIER (BLW - BODY GROUND)



(a) Remove the A/C amplifier with the connectors still connected.
(b) Turn the ignition switch to the ON position.
(c) Turn the blower switch on (Lo).



(d) Measure the waveform between terminal BLW (A11-31) of the A/C amplifier and body ground.
OK:
Waveform operate as shown in the illustration.
HINT:
Waveform varies with the blower level.

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

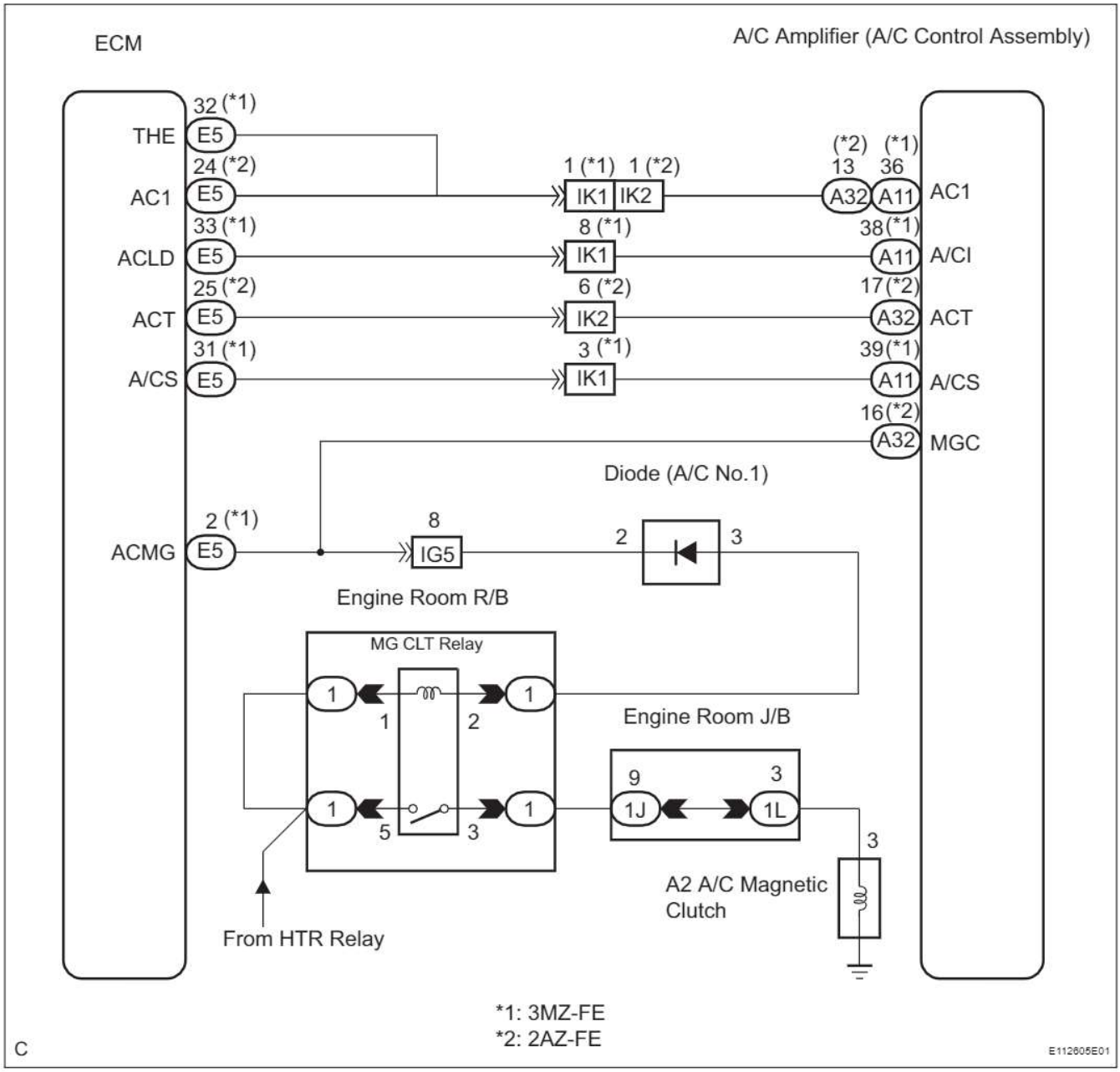
REPLACE BLOWER MOTOR CONTROL

Compressor Circuit

DESCRIPTION

The A/C amplifier outputs the magnetic clutch ON signal from terminal AC1 to the ECM receives this signal, it sends a signal from terminal ACMG (MGC) and switches the magnetic clutch relay ON, thus turning on the magnetic clutch.

WIRING DIAGRAM



3MZ-FE:

1	READ VALUE OF INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.

(b) Turn the ignition switch to the ON position and turn the intelligent tester main switch on.
(c) Select the items below in the DATA LIST, and read the displays on the intelligent tester.
ENGINE AND ECT / ALL:

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

NG → **Go to step 9**

OK

2 PERFORM ACTIVE TEST USING INTELLIGENT TESTER

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position and turn the intelligent tester main switch on.
(c) Select the item below in the ACTIVE TEST and then check that the relay operates.
ENGINE AND ECT / ALL:

Item	Test Details/Display (Range)	Diagnostic Note
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	Operating sound can be heard

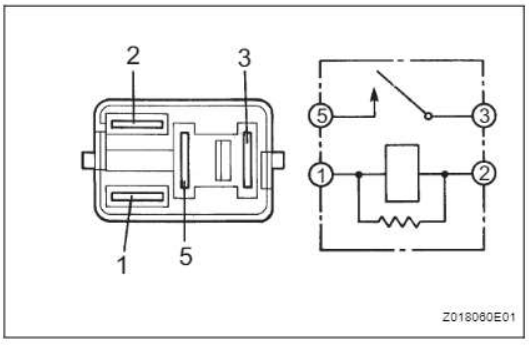
AC

NG → **Go to step 3**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

3 INSPECT MAGNETIC CLUTCH RELAY



(a) Remove the relay (MG CLT relay) from the engine room R/B.
(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

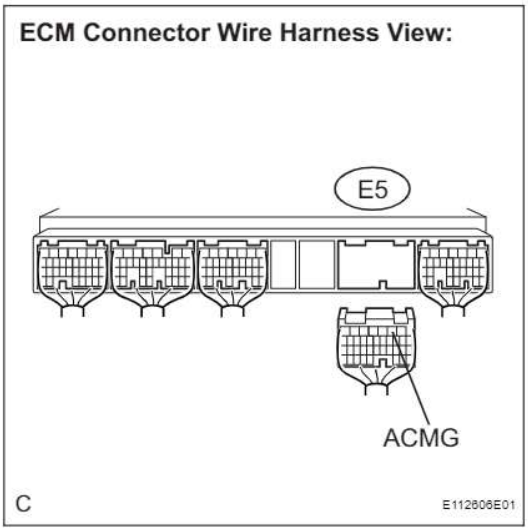
NG → **REPLACE MAGNETIC CLUTCH RELAY**

OK

4 INSPECT ECM (ACMG - BODY GROUND)

(a) Remove the ECM.

ECM Connector Wire Harness View:



(b) Disconnect the connector from the ECM.
(c) Start the engine and turn the A/C switch on.
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

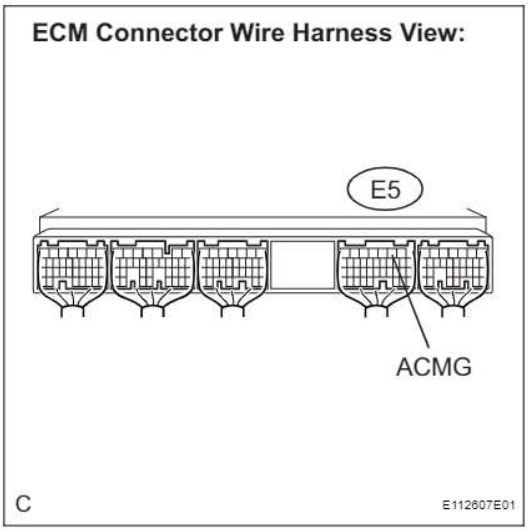
Tester connection	Condition	Specified condition
E5-2 (ACMG) - Body ground	Always	10 to 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5 INSPECT ECM (ACMG - BODY GROUND)

ECM Connector Wire Harness View:



(a) Remove the ECM with the connectors still connected.
(b) Start the engine and turn the A/C switch on.
(c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
E5-2 (ACMG) - Body ground	A/C switch OFF	10 to 14 V
E5-2 (ACMG) - Body ground	A/C switch ON	Below 1 V

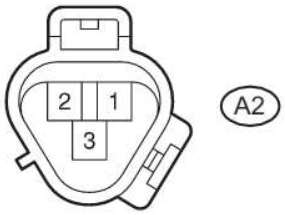
NG → Go to step 9

OK

6 INSPECT MAGNETIC CLUTCH ASSEMBLY

(a) Disconnect the connector from the magnetic clutch assembly.

Magnetic Clutch Assembly Connector Front View:



P E112579E03

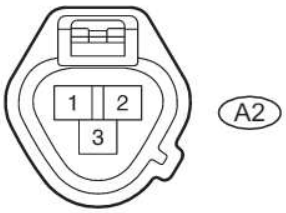
(b) Connect the positive (+) lead from the battery to terminal 3 and negative (-) lead to body ground, then check that the magnetic clutch assembly is engaged.

NG → **REPLACE MAGNETIC CLUTCH ASSEMBLY**

OK

7 CHECK HARNESS AND CONNECTOR (MAGNET CLUTCH ASSEMBLY - BODY GROUND)

Magnetic Clutch Assembly Connector Wire Harness View:



P E112585E01

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

Standard voltage

Tester connection	Condition	Specified condition
E5-2 (ACMG) - A2-3	A/C switch ON	10 to 14 V

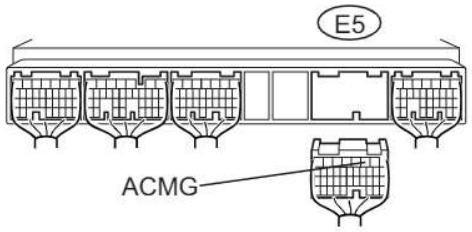
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

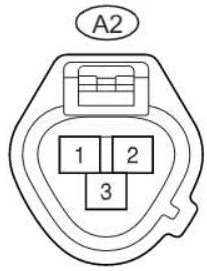
8 CHECK HARNESS AND CONNECTOR (ECM - MAGNET CLUTCH ASSEMBLY)

(a) Disconnect the connector from ECM.

ECM Connector Wire Harness View:



Magnetic Clutch Assembly Connector Waire Harness View:



C E112608E02

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

Standard voltage

Tester connection	Condition	Specified condition
E5-2 (ACMG) - A2-3	A/C switch ON	10 to 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

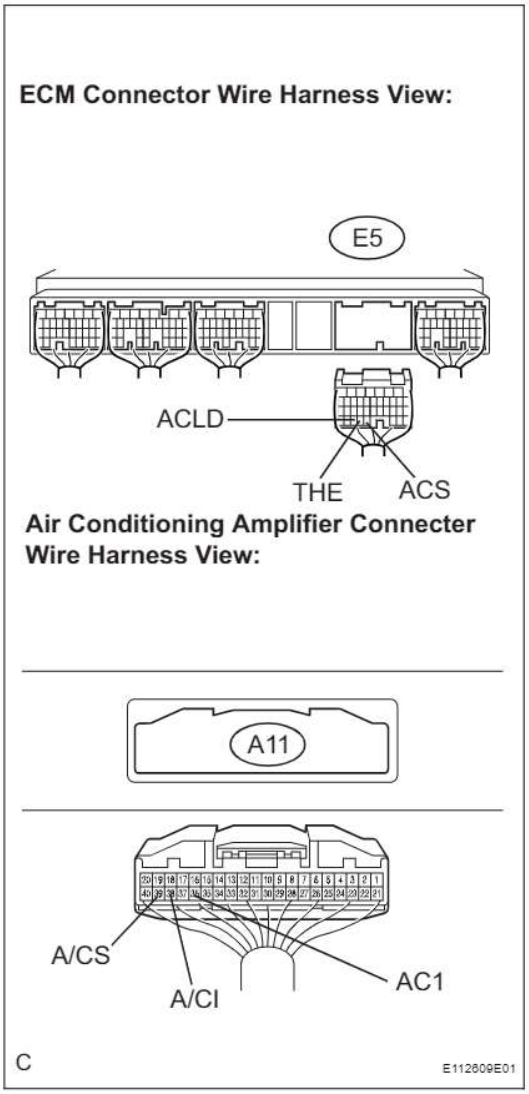
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

9	CHECK HARNESS AND CONNECTOR (ECM - AIR CONDITIONING AMPLIFIER)

(a) Disconnect the connector from the ECU.

AC



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

Standard resistance

Tester connection	Condition	Specified condition
E5-32 (THE) - A11-36 (AC1)	Always	Below 1.0 Ω
E5-33 (ACLD) - A11-38 (A/CI)	Always	Below 1.0 Ω
E5-31 (A/CS) - A11-39 (A/CS)	Always	Below 1.0 Ω

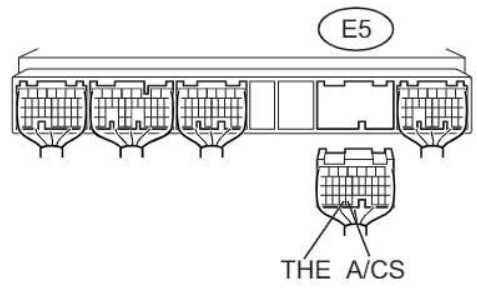
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

10	INSPECT AIR CONDITIONING AMPLIFIER

(a) Remove the ECM with the connectors still connected.
(b) Start the engine and turn the A/C switch on.

ECU Connector Wire Harness View:



(c) Measure the voltage according to the condition(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
E5-32 (THE) - Body ground	Start engine A/C switch ON	Pulse generation
E5-31 (A/CS) - Body ground	Start engine A/C switch ON	Pulse generation

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

REPLACE ECM

2AZ-FE:

1 READ VALUE OF INTELLIGENT TESTER

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

ENGINE AND ECT / ALL:

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

NG → **Go to step 9**

OK

2 PERFORM ACTIVE TEST USING INTELLIGENT TESTER

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

ENGINE AND ECT / ALL:

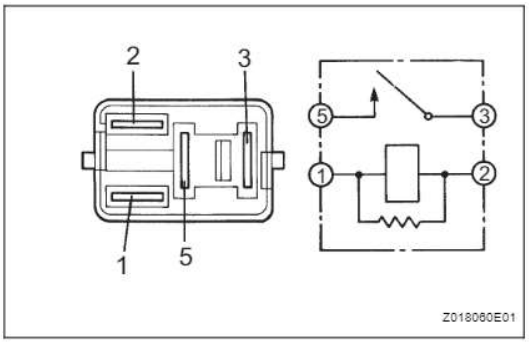
Item	Test Details/Display (Range)	Diagnostic Note
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	Operating sound can be heard

NG → **Go to step 3**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOM S TABLE

3 INSPECT MAGNETIC CLUTCH RELAY



(a) Remove the relay (magnetic clutch relay) from the engine room R/B.
(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

NG → REPLACE MAGNETIC CLUTCH RELAY

OK

AC

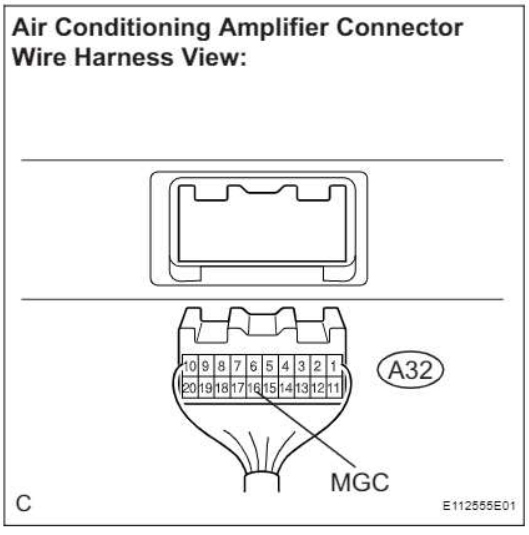
4 INSPECT AIR CONDITIONING AMPLIFIER (MGC - BODY GROUND)

(a) Remove the A/C amplifier.
(b) Disconnect the connector.
(c) Start the engine and turn the A/C switch on.
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
A32-16 (MGC) - Body ground	Always	10 to 14 V

Air Conditioning Amplifier Connector Wire Harness View:



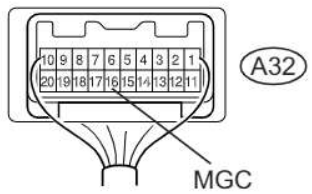
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5 INSPECT AIR CONDITIONING AMPLIFIER (MGC - BODY GROUND)

(a) Remove the A/C amplifier with the connectors still connected.
(b) Start the engine and turn the A/C switch on.

Air Conditioning Amplifier Connector Wire Harness View:



C E112556E01

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

Standard voltage

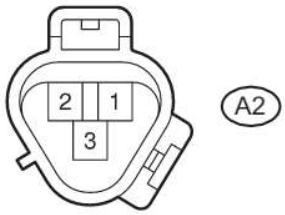
Tester connection	Condition	Specified condition
A32-16 (MGC) - Body ground	A/C switch OFF	10 to 14 V
A32-16 (MGC) - Body ground	A/C switch ON	Below 1 V

NG → Go to step 9

OK

6 INSPECT MAGNETIC CLUTCH ASSEMBLY

Magnetic Clutch Assembly Connector Front View:



P E112579E03

(a) Disconnect the connector from the magnetic clutch assembly.

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

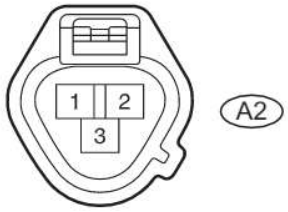
NG → REPLACE MAGNETIC CLUTCH ASSEMBLY

OK

AC

7	CHECK HARNESS AND CONNECTOR (MAGNET CLUTCH ASSEMBLY - BODY GROUND)

Magnetic Clutch Assembly Connector Wire Harness View:



P E112585E01

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

Standard voltage

Tester connection	Condition	Specified condition
A32-16 (MGC) - A2-3	A/C switch ON	10 to 14 V

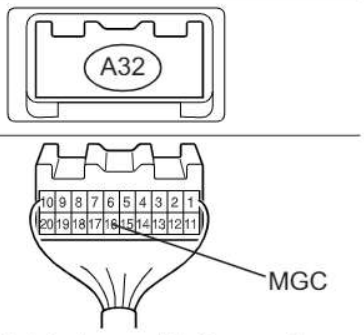
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

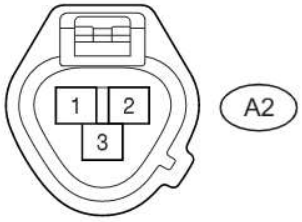
8	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - MAGNET CLUTCH ASSEMBLY)

AC

Air Conditioning Amplifier Connector Wire Harness View:



Magnetic Clutch Assembly Connector Wire Harness View:



C E112557E01

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

Standard voltage

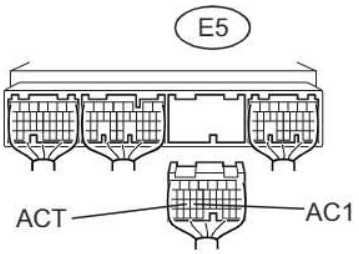
Tester connection	Condition	Specified condition
A32-16 (MGC) - A2-3	A/C switch ON	10 to 14 V

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

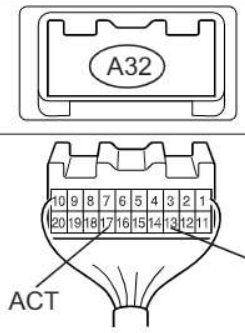
OK

9	CHECK HARNESS AND CONNECTOR (ECM - AIR CONDITIONING AMPLIFIER)

ECM Connector Wire Harness View:



Air Conditioning Amplifier Connecter Wire Harness View:



C E112611E01

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

Standard resistance

Tester connection	Condition	Specified condition
E5-24 (AC1) - A32-13 (AC1)	Always	Below 1.0 Ω
A32-17 (ACT) - E5-25 (ACT)	Always	Below 1.0 Ω

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

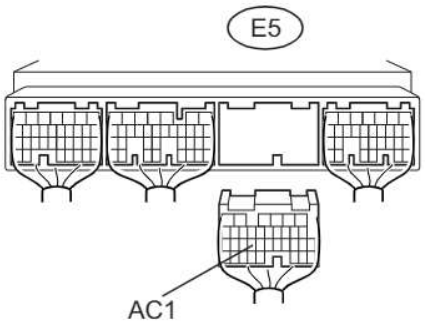
AC

OK

10	INSPECT AIR CONDITIONING AMPLIFIER

(a) Remove the ECM with the connectors still connected.
(b) Start the engine and turn the A/C switch on.

ECM Connector Wire Harness View:



(c) Measure the voltage according to the condition(s) in the table below.

Standard voltage

Tester connection	Condition	Specified condition
E5-24 (AC1) - Body ground	Start engine A/C switch ON	Pulse generation

NG → **REPLACE AIR CONDITIONING AMPLIFIER**

OK

REPLACE ECM

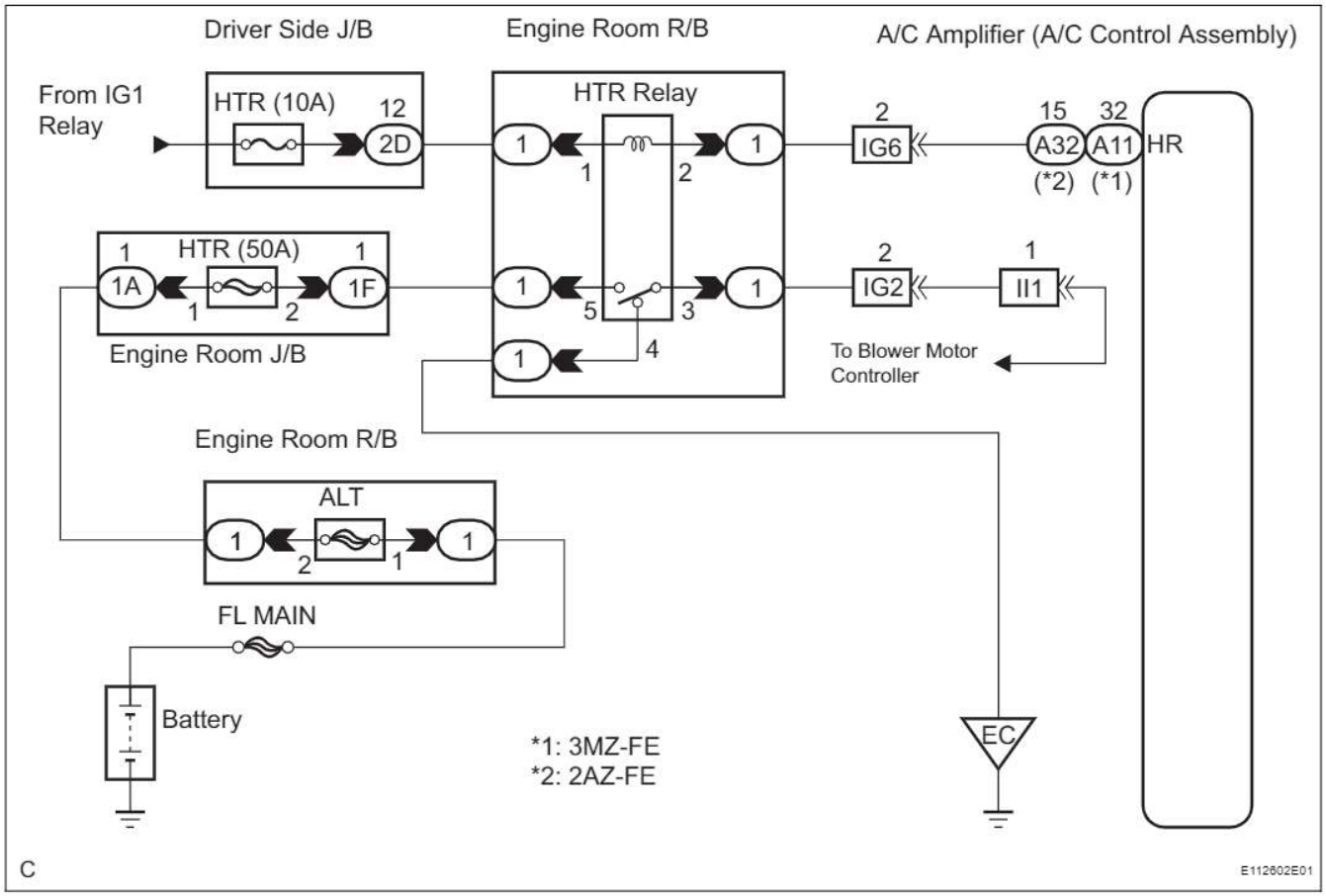
AC

Heater Relay Circuit

DESCRIPTION

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

WIRING DIAGRAM



1	CHECK FUSE (HTR)

(a) Remove the HTR fuse from the driver side J/B.
(b) Measure the resistance according to the value(s) in the table below.

Standard resiststance

Tester item	Condition	Specified condition
HTR fuse (10 A)	Always	Below 1 Ω

NG → CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED FAILURE FUSE

OK

2 CHECK FUSE (HTR)

(a) Remove the HTR fuse from the engine room J/B.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

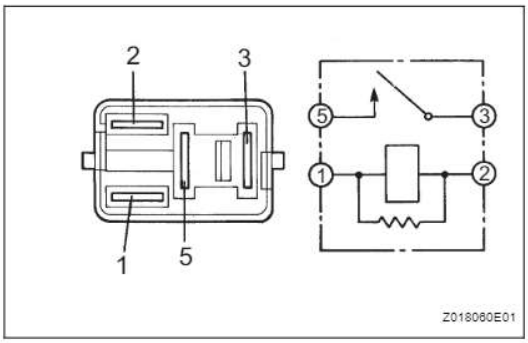
Tester item	Condition	Specified condition
HTR fuse (50 A)	Always	Below 1 Ω

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED FAILURE FUSE**

OK

INSPECT HEATER RELAY

3 INSPECT HEATER RELAY



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

Standard resistance

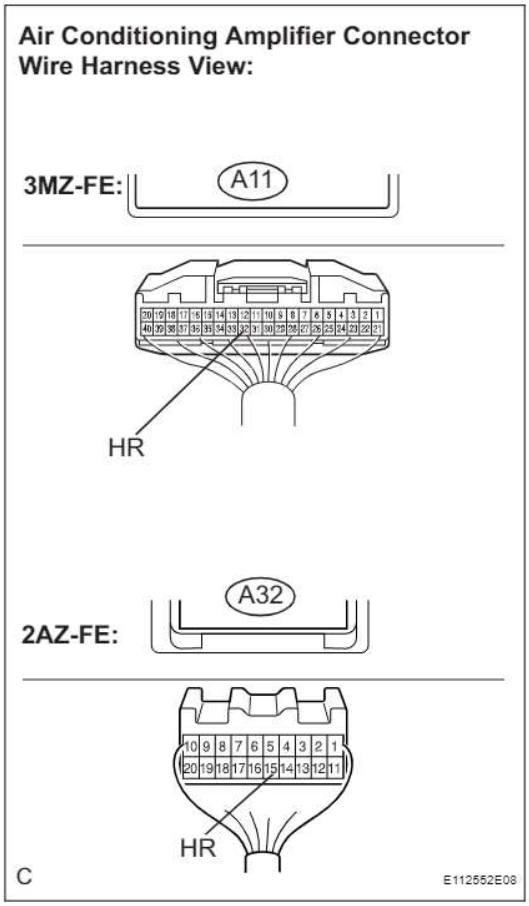
Terminal No.	Condition	Specified condition
3 - 5	Always	10 kΩ or higher
3 - 5	When battery voltage applied to terminals 1 and 2	Below 1 Ω

NG → **REPLACE HEATER RELAY**

OK

4 INSPECT AIR CONDITIONING AMPLIFIER

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



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

Standard voltage

Tester connection	Condition	Specified condition
A11-32 (HR)*1, A32-15 (HR)*2 - Body ground	Ignition switch OFF → ON	Below 1 V → 10 to 14 V

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

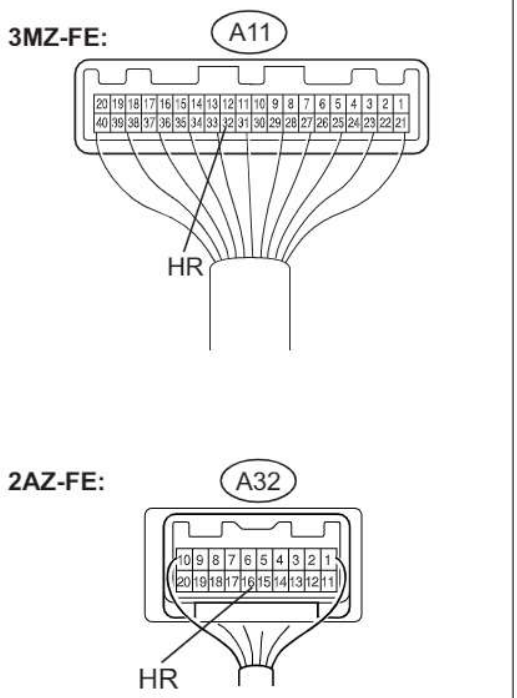
OK

5	CHECK HARNESS AND CONNECTOR (A/C AMPLIFIER - BATTERY)

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

AC

Air Conditioning Amplifier Connecter Wire Harness View:



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

Standard voltage

Tester connection	Condition	Standard
A11-32 (HR)*1, A32-15 (HR)*2 - Body ground	Ignition switch position: OFF Blower switch position: OFF	Below 1 V
A11-32 (HR)*1, A32-15 (HR)*2 - Body ground	Ignition switch position: ON Blower switch position: ON	Below 1 V
A11-32 (HR)*1, A32-15 (HR)*2 - Body ground	Ignition switch position: ON Blower switch position: OFF	10 to 14 V

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPLACE AIR CONDITIONING AMPLIFIER

AC

OK

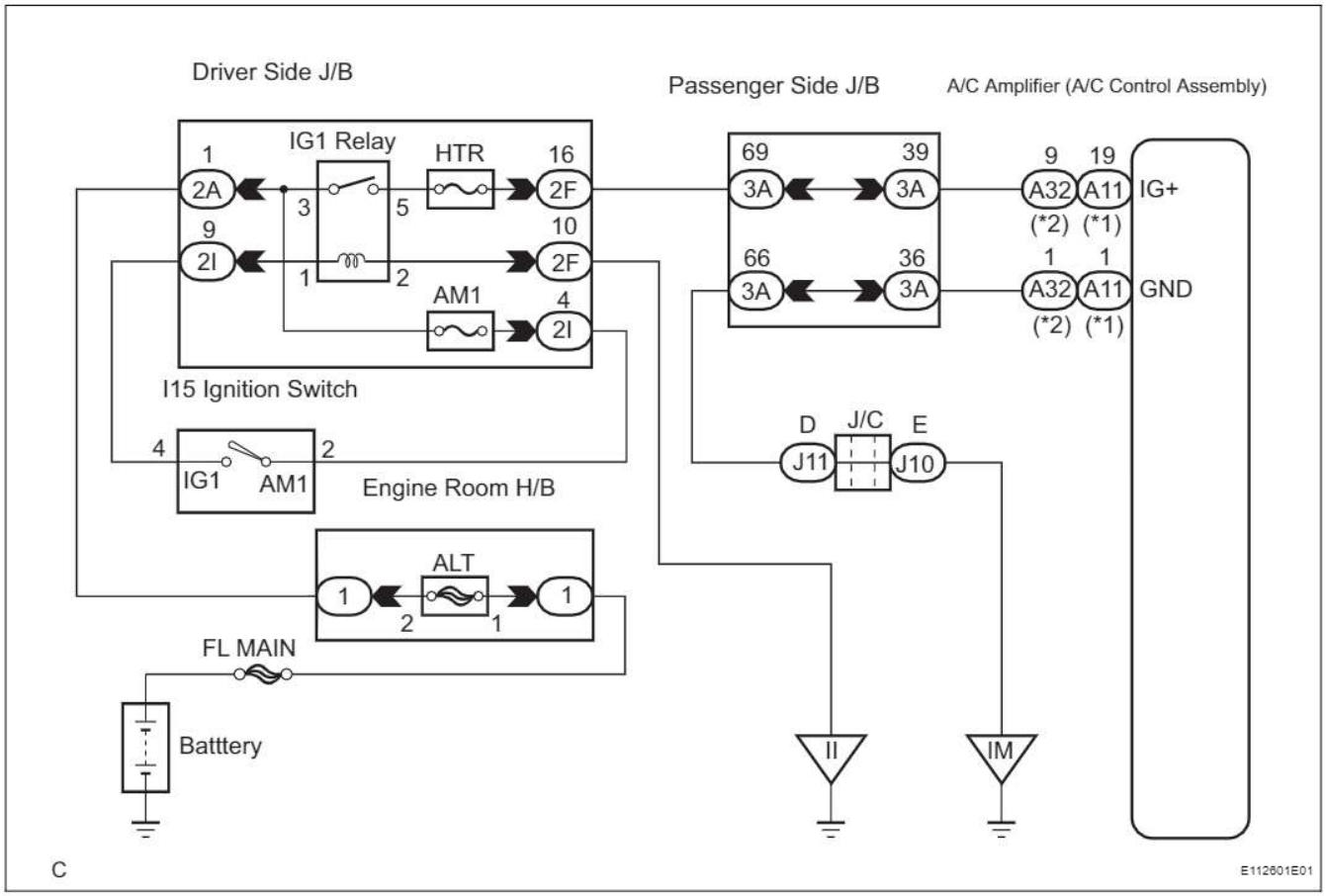
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

IG Power Source Circuit

DESCRIPTION

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

WIRING DIAGRAM



HINT:
Start the engine before inspection. Check the IG1 relay or battery if the engine does not start.
If the engine still does not start, see the SFI system (See page ES-1 for 2AZ-FE, ES-5) for 3MZ-FE.

1	INSPECT FUSE (HTR)

(a) Remove the HTR fuse from the driver side J/B.
(b) Measure the resistance according to the value(s) in the table below.
Standard resistance

Tester item	Condition	Specified condition
HTR fuse	Always	Below 1 Ω

NG → CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED FAILURE FUSE

OK

2	INSPECT AIR CONDITIONING AMPLIFIER (IG+ - BODY GROUND)

(a) Remove the A/C amplifier assembly 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.

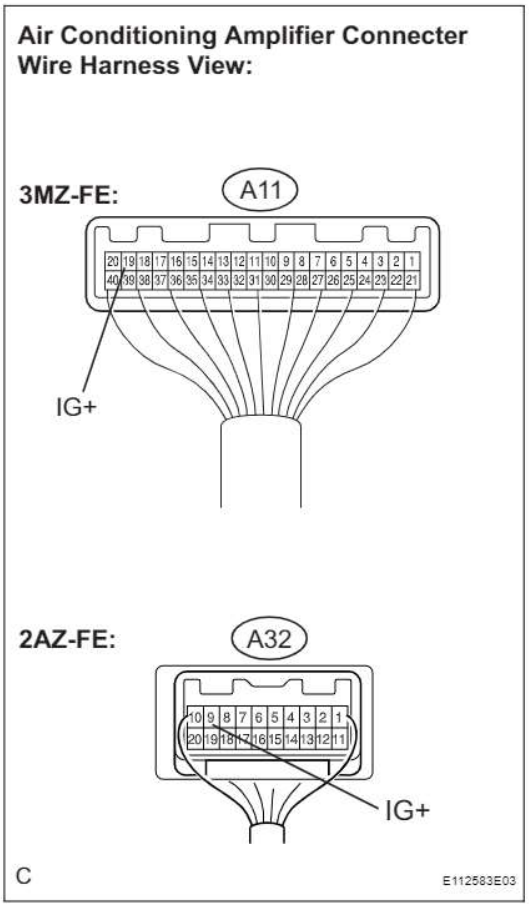
Standard voltage

Tester connection	Condition	Specified condition
A11-19 (IG+)*1, A32-9 (IG+)*2 - Body ground	Ignition switch ON	10 to 14 V

*1: 3MZ-FE
*2: 2AZ-FE

NG → Go to step 3

Air Conditioning Amplifier Connecter Wire Harness View:

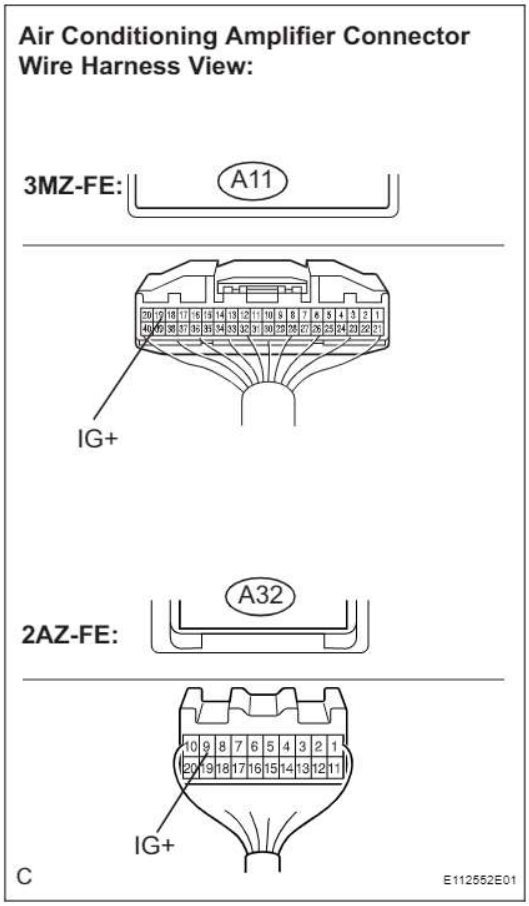


OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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

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



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

Standard voltage

Tester connection	Condition	Specified condition
A11-19 (IG+)*1, A32-9 (IG+)*2 - Body ground	Ignition switch OFF → ON	Below 1.0 V → 10 to 14 V

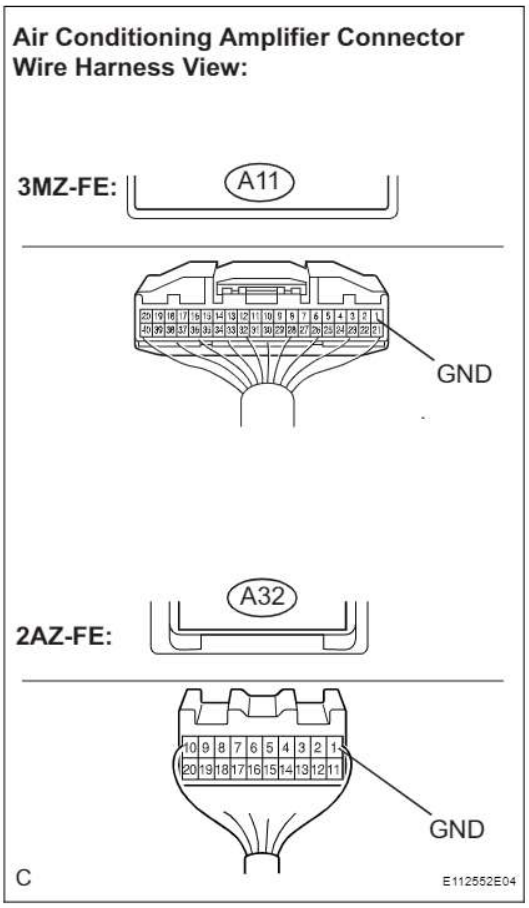
*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

AC

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



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

Standard resistance

Tester connection	Condition	Specified condition
A11-1 (GND)*1, A32-1 (GND)*2 - Body ground	Always	Below 1 Ω

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

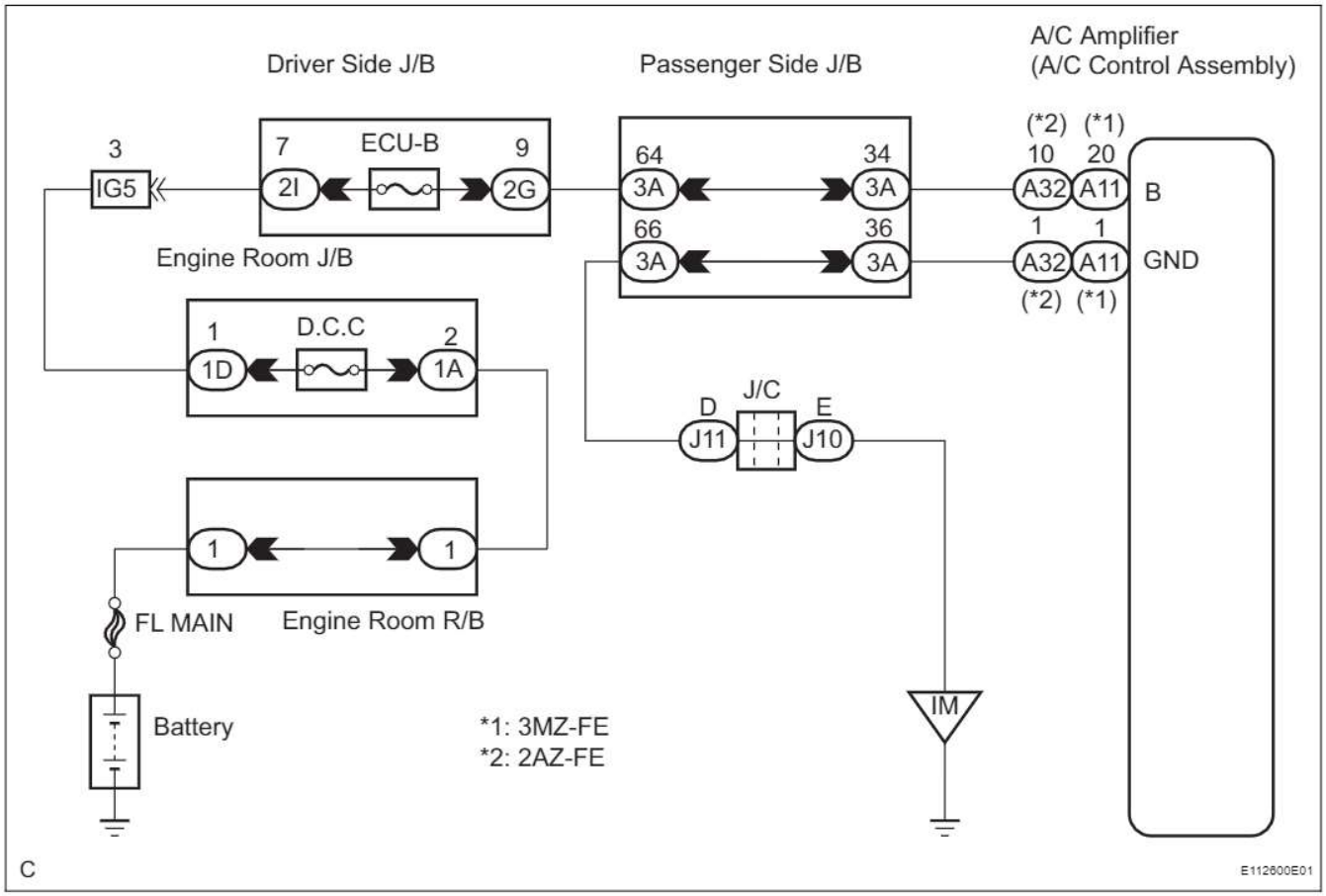
AC

Back-up Power Source Circuit

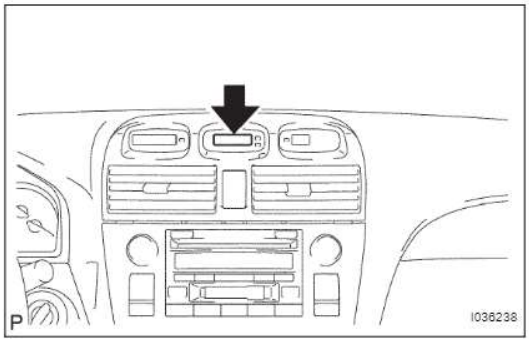
DESCRIPTION

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

WIRING DIAGRAM



1	INSPECT CLOCK ASSEMBLY



(a) Turn the ignition switch to the ON position.
(b) Set the time displayed on the clock assembly to any time but 0:00.
(c) Turn the ignition switch OFF.
(d) Turn the ignition switch to the ON position.
(e) Confirm that the time displayed on the clock assembly shows any time but 0:00.

OK:

Time displayed on the clock assembly is any time but 0:00

HINT:

The A/C amplifier and clock assembly use the D.C.C fuse for backup power source. If the D.C.C fuse fails, clock assembly backup power source also fails.

AC

NG → CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED FAILURE FUSE (D.C.C FUSE)

OK

2 INSPECT FUSE (ECU-B)

(a) Remove the ECU-B fuse from the driver side J/B.
(b) Measure the resistance according to the value(s) in the table below.
StandardÅ@resistance

Tester item	Condition	Specified condition
ECU-B fuse	Always	Below 1 Ω

NG → CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED FAILURE FUSE

OK

3 INSPECT AIR CONDITIONING AMPLIFIER (B - GND)

AC

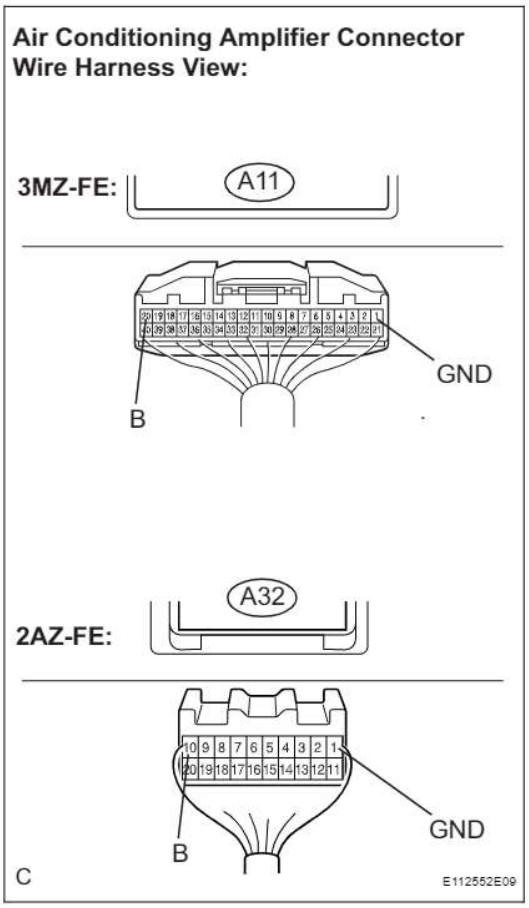
(a) Remove the A/C amplifier assembly.
(b) Disconnect the connector from the A/C amplifier.
(c) Measure the voltage according to the value(s) in the table below.
Standard voltage

Tester connection	Condition	Specified condition
A11-20 (B)*1, A32-10 (B)*2 - A11-1 (GND)*1, A32-1 (GND)*2	Always	10 to 14 V

*1: 3MZ-FE
*2: 2AZ-FE

NG → Go to step 4

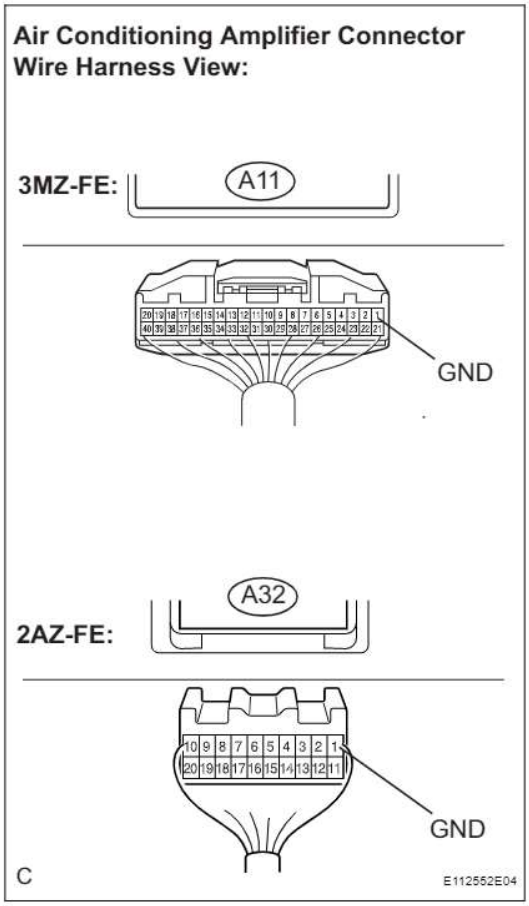
Air Conditioning Amplifier Connector Wire Harness View:



OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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



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

Standard resistance

Tester connection	Condition	Specified condition
A11-1 (GND)*1, A32-1 (GND)*2 - Body ground	Always	Below 1 Ω

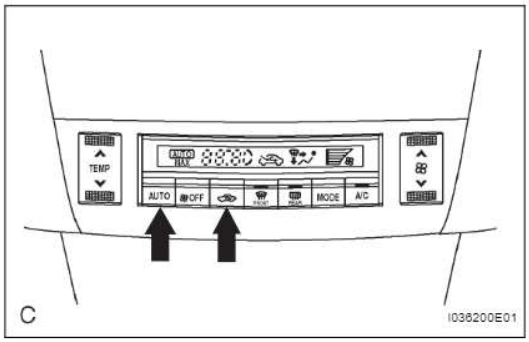
*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

AC

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR (D.C.C FUSE - A/C AMPLIFIER)



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

ACTUATOR CHECK

1. ACTUATOR CHECK

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

(b) As each damper, 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 a slower display is desired, press the d temperature up switch and change the display in the step operation. Each time the temperature up 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	Condition				
		Blower level	Air Flow vent	Air inlet damper	Magnetic clutch	Air mix damper
1	0	0	FACE	FRESH	OFF	"COOL" side (Fully close)
2	1	1	FACE	FRESH	OFF	"COOL" side (Fully close)
3	2	14	FACE	FRESH	ON	"COOL" side (Fully close)
4	3	14	FACE	RECIRCULATION / FRESH	ON	"COOL" side (Fully close)
5	4	14	FACE	RECIRCULATION	ON	"COOL" / "HOT" (50% opened)
6	5	14	B / L	RECIRCULATION	ON	"COOL" / "HOT" (50% opened)
7	6	14	FOOT (MANUAL)	RECIRCULATION	ON	"HOT" side (Fully opened)
8	7	14	FOOT (AUTO)	RECIRCULATION	ON	"HOT" side (Fully opened)
9	8	14	FOOT / DEF	RECIRCULATION	ON	"HOT" side (Fully opened)
10	9	31	DEF	RECIRCULATION	ON	"HOT" side (Fully opened)

AC

PROBLEM SYMPTOMS TABLE

AIR CONDITIONING SYSTEM

Symptom	Suspected area	See page
Entire A/C system does not operate	1.IG power source circuit	AC-104
	2.A/C amplifier assembly	AC-16
Air Flow Control : No blower operation	1.Blower motor controller	AC-81
	2.Blower w/ fan motor sub-assembly	AC-81
	3.A/C amplifier assembly	AC-16
Air Flow Control : No blower control	1.Blower motor controller	AC-81
	2.Blower w/ fan motor sub-assembly	AC-81
	3.A/C amplifier assembly	AC-16
Air Flow Control : Insufficient air output	1.Blower motor controller	AC-81
	2.Blower w/ fan motor sub-assembly	AC-81
	3.A/C amplifier assembly	AC-16
Temperature Control : No cool air comes out	1.Volume of refrigerant	AC-111
	2.Drive belt tension (for 2AZ-FE)	AC-153
	3.Drive belt tension (for 3MZ-FE)	AC-160
	4.Refrigerant pressure	AC-111
	5.Compressor circuit	AC-88
	6.Compressor lock sensor circuit	AC-47
	7.Pressure switch circuit	AC-52
	8.Air mix damper control servomotor circuit	AC-68
	9.Air mix damper position sensor circuit	AC-56
	10.Room temperature sensor circuit	AC-26
	11.Ambient temperature sensor circuit	AC-31
	12.A/C amplifier assembly	AC-16
Temperature Control : No warm air comes out	1.Air mix damper control servomotor circuit	AC-68
	2.Air mix damper position sensor circuit	AC-56
	3.Ambient temperature sensor circuit	AC-31
	4.Room temperature sensor circuit	AC-26
	5.Evaporator temperature sensor circuit	AC-36
	6.A/C amplifier assembly	AC-16
	7.Heater radiator	-
Temperature Control : Output air is warmer or cooler than set	1.Room temperature sensor circuit	AC-26
	2.Ambient temperature sensor circuit	AC-31
	3.Solar sensor circuit	AC-43
	4.Air mix damper control servomotor circuit	AC-68
	5.Air mix damper position sensor circuit	AC-56
	6.A/C amplifier assy	AC-16
Temperature Control : No temperature control	1.Air mix damper control servomotor circuit	AC-68
	2.Air mix damper position sensor circuit	AC-56
	3.A/C amplifier assembly	AC-16
No air inlet control	1.Air inlet damper control servomotor circuit	AC-71
	2.Air inlet damper position sensor circuit	AC-60
	3.A/C amplifier assembly	AC-16
No air outlet control	1.Air outlet damper control servomotor circuit	AC-75
	2.Air outlet damper position sensor circuit	AC-64
	3.A/C amplifier assembly	AC-16

AC

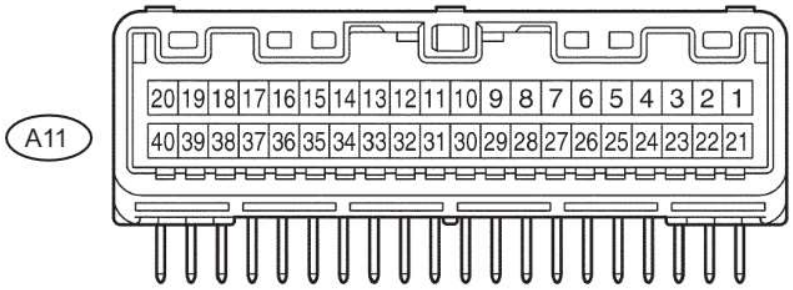
Symptom	Suspected area	See page
Engine idle up does not occur, or is continuous	1.Compressor circuit	AC-88
	2.Compressor lock sensor circuit	AC-47
	3.A/C amplifier assembly	AC-16
Displayed set temperature value does not match up with operation of temperature control switch	1.A/C amplifier assembly	AC-16
Brightness does not change when rheostat volume or light control switch is adjusted	1.Combination meter (Rheostat)	ME-13
	2.Illumination circuit	-
	3.A/C amplifier assembly	AC-16
Unable to access the diagnosis mode	1.A/C amplifier assembly	AC-16
DTCs are not recorded. Set mode is cleared when IG switch is turned off	1.Back-up power source circuit	AC-108
	2.A/C amplifier assembly	AC-16

AC

TERMINALS OF ECU

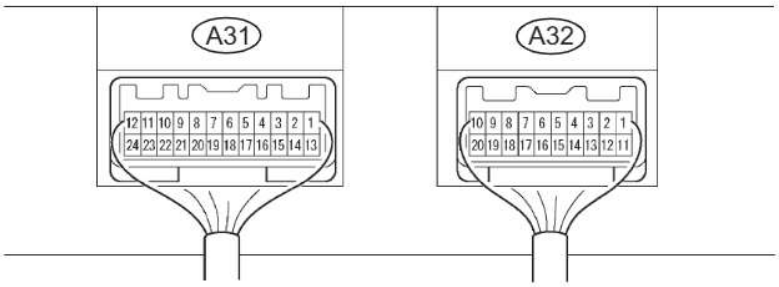
1. AIR CONDITIONING AMPLIFIER

3MZ-FE:



P I031398E01

2AZ-FE:



C I036567E01

AC

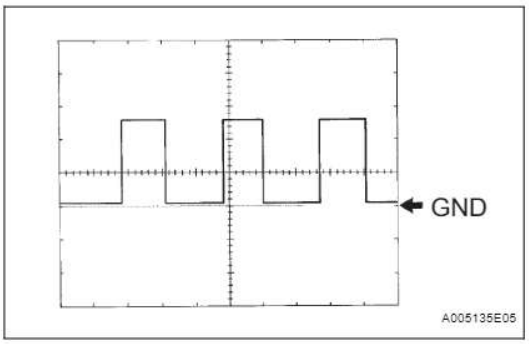
Symbols (Terminal No.)	Wiring color	Terminal Description	Condition	Specification
GND (A11-1)*1, (A32-1)*2 - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω
SG-1 (A11-2)*1, (A31-1)*2 - Body ground	LG-B - Body ground	Ground for air outlet damper position sensor	Always	Below 1.0 Ω
SG-3 (A11-3)*1, (A31-2)*2 - Body ground	LG-B - Body ground	Ground for air mix damper position sensor	Always	Below 1.0 Ω
SG-2 (A11-4)*1, (A31-3)*2 - Body ground	LG-B - Body ground	Ground for air inlet damper position sensor	Always	Below 1.0 Ω
TPO (A11-5)*1, (A31-7)*2 - SG-1 (A11-2)*1, (A31-1)*2	B-Y - LG-B	Mode damper position sensor signal	Ignition switch: ON Mode switch: FACE → DEF	4.0 → 1.0 V
TP (A11-6)*1, (A31-8)*2 - SG-3 (A11-3)*1, (A31-2)*2	L-R - LG-B	Air mix damper position sensor signal	Ignition switch: ON Temperature switch: Max. COOL → Max. HOT	4.0 → 1.0 V
TPI (A11-7)*1, (A31-9)*2 - SG-2 (A11-4)*1, (A31-3)*2	L-R - LG-B	Recirculation damper position sensor signal	Ignition switch: ON R/F switch: RECIRC → FRESH	4.0 → 1.0 V
S5-1 (A11-8)*1, (A31-10)*2 - SG-1 (A11-2)*1, (A31-1)*2	V - LG-B	Power supply for air outlet damper position sensor	Ignition switch: ON	4.5 to 5.5 V
S5-3 (A11-9)*1, (A31-11)*2 - SG-3 (A11-3)*1, (A31-2)*2	V - LG-B	Power supply for air mix damper position sensor	Ignition switch: ON	4.5 to 5.5 V
S5-2 (A11-10)*1, (A31-12)*2 - SG-2 (A11-4)*1, (A31-3)*2	V - LG-B	Power supply for air inlet damper position sensor	Ignition switch: ON	4.5 to 5.5 V
AOF (A11-11)*1, (A31-16)*2 - GND (A11-1)*1, (A32-7)*2	P - W-B	Mode damper servomotor operation voltage	Ignition switch: ON Mode switch: DEF → FACE	Below 1.0 → 10 to 14 V
AOD (A11-12)*1, (A31-15)*2 - GND (A11-1)*1, (A32-1)*2	O - W-B	Mode damper servomotor operation voltage	Ignition switch: ON Mode switch: FACE → DEF	Below 1.0 → 10 to 14 V
AMH (A11-13)*1, (A31-18)*2 - GND (A11-1)*1, (A32-1)*2	B-W - W-B	Air mix damper servomotor operation signal	Ignition switch: ON Temperature switch: Max. COOL → Max. HOT	Below 1.0 → 10 to 14 V

Symbols (Terminal No.)	Wiring color	Terminal Description	Condition	Specification
AMC (A11-14)*1, (A31-17)*2 - GND (A11-1)*1, (A32-1)*2	LG-R - W-B	Air mix damper servomotor operation signal	Ignition switch: ON Temperature switch: Max. HOT → Max. COOL	Below 1.0 → 10 to 14 V
AIR (A11-15)*1, (A31-13)*2 - GND (A11-1)*1, (A32-1)*2	R-L - W-B	Recirculation damper servomotor operation voltage	Ignition switch: ON R/F switch: FRESH → RECIRC	Below 1.0 → 10 to 14 V
AIF (A11-16)*1, (A31-14)*2 - GND (A11-1)*1, (A32-1)*2	L - W-B	Recirculation damper servomotor operation voltage	Ignition switch: ON R/F switch: RECIRC → FRESH	Below 1.0 → 10 to 14 V
TAM (A11-17)*1, (A32-11)*2 - GND (A11-1)*1, (A32-1)*2	G-Y - W-B	Ambient temperature signal	Ignition switch: ON	Pulse generation
SPD (A11-18)*1, (A32-2)*2 - GND (A11-1)*1, (A32-1)*2	V-W - W-B	Vehicle speed signal	Ignition switch: ON Turn front wheel slowly	Pulse generation (see waveform 1)
IG+ (A11-19)*1, (A32-9)*2 - GND (A11-1)*1, (A32-1)*2	L-B - W-B	Power source (IG)	Ignition switch: LOCK or ACC → ON	0 → 10 to 14V
B (A11-20)*1, (A32-10)*2 - GND (A11-1)*1, (A32-1)*2	W-R - W-B	Power source (Back-up)	Always	10 to 14 V
SG (A11-21)*1, (A31-20)*2 - Body ground	LG-B - Body ground	Ground for evaporator temperature sensor	Always	Below 1.0 Ω
SG-5 (A11-22)*1, (A31-19)*2 - Body ground	LG-B - Body ground	Ground for room temperature sensor	Always	Below 1.0 Ω
TE (A11-23)*1, (A31-5)*2 - SG (A11-21)*1, (A31-20)*2	L-W - LG-B	Evaporator temperature sensor signal	Ignition switch: ON Evaporator temperature: 0 → 15 °C (32 → 59 °F)	2.0 to 2.4 → 1.4 to 1.8V
TR (A11-24)*1, (A31-4)*2 - SG-5 (A11-22)*1, (A31-19)*2	B - LG-B	Room temperature sensor signal	Ignition switch: ON Cabin temperature: 25 → 40 °C (77 → 104 °F)	1.8 to 2.2 → 1.2 to 1.6 V
TS (A11-25)*1, (A31-23)*2 - GND (A11-1)*1, (A32-1)*2	O - W-B	Solar sensor signal	Ignition switch: ON	0.8 to 4.3 V
PSW (A11-26)*1, (A32-7)*2 - GND (A11-1)*1, (A32-1)*2	L-B - W-B	Pressure switch signal	Ignition switch: START Refrigerant pressure: Normally → Less than 0.19 MPa (2.0 kgf/ cm ^{2}, 28 psi) or more than 1.34 MPa (13.7 kgf/ cm ^{2}, 195 psi)	Below 1.0 → 10 to 14 V
S5 (A11-28)*1, (A31-24)*2 - GND (A11-1)*1, (A32-1)*2	V - W-B	Ground for solar sensor	Always	Below 1.0 Ω
RDEF (A11-30)*1, (A32-14)*2 - GND (A11-1)*1, (A32-1)*2	Y-G - W-B	Rear defogger switch signal	Ignition switch: ON Rear defogger switch: OFF → ON	10 to 14 → Below 1.0 V
BLW (A11-31)*1, (A32-12)*2 - GND (A11-1)*1, (A32-1)*2	L-O - W-B	Blower motor speed control voltage	Ignition switch: ON Blower switch: ON	Pulse generation See waveform 1
HR (A11-32)*1, (A32-15)*2 - GND (A11-1)*1, (A32-1)*2	L-W - W-B	Heater relay signal	Ignition switch: ON Blower switch: OFF → ON	10 to 14 → Below 1.0 V
AC1 (A11-36)*1, (A32-13)*2 - GND (A11-1)*1, (A32-1)*2	Y-B - W-B	Magnet clutch signal	Ignition switch: START A/C magnet clutch: Not engaged → engaged	10 to 14 → Below 1.0 V
TW (A11-37)*1, (A32-8)*2 - GND (A11-1)*1, (A32-1)*2	Y-G - W-B	Water temperature sensor signal	Ignition switch: ON	Pulse generation
A/CI (A11-38)*1 - GND (A11-1)*1,	B*1 - W-B	Compressor signal	Ignition switch: START A/C switch: OFF → ON	10 to 14 → Below 1.0 V
A/CS (A11-39)*1 - GND (A11-1)*1	P-L*1 - W-B	A/C switch signal	Ignition switch: ON A/C switch: OFF → ON	10 to 14 → Below 1.0 V

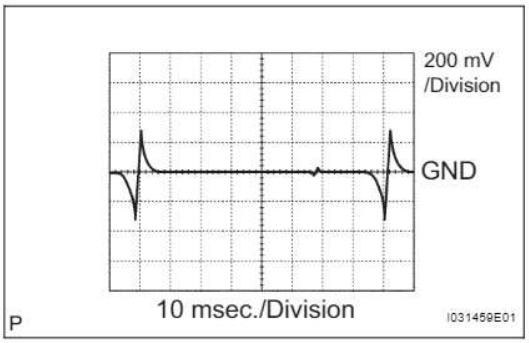
AC

Symbols (Terminal No.)	Wiring color	Terminal Description	Condition	Specification
ACT (A32-17)*2 - GND (A32-1)*2	LB-G - W-B	Magnet clutch ON permission signal	Ignition switch: ON A/C switch: OFF → ON	Below 1.0 → 10 to 14 V
LOCK (A32-4)*2 - SGND (A32-5)*2	W-L - BR	Compressor lock sensor signal	Engine idling A/C switch: ON (Magnet clutch: ON)	Pulse generation See waveform 2
MGC (A32-6)*2 - GND (A32-1)*2	L-W - B	Magnet clutch relay signal	Ignition switch: ON Blower switch: ON A/C switch: OFF → ON	10 to 14 → Below 1.0 V

*1: 3MZ-FE
*2: 2AZ-FE



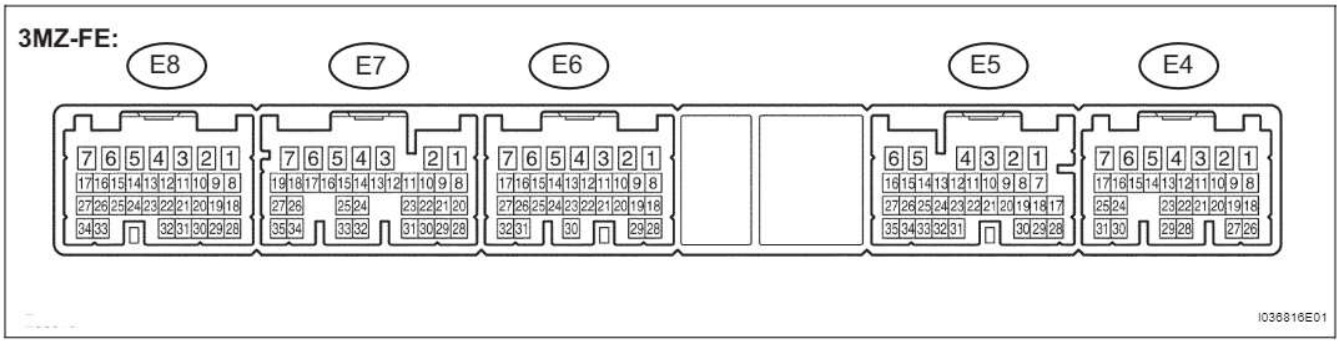
(a) waveform 1:
(1) Measure the voltage between terminal SPD of the A/C amplifier assembly connector and body ground when turning the rear wheel slowly.
OK:
Waveform operate as shown in the illustration.
HINT:
As vehicle speed increases, the cycle of the signal waveform narrows.

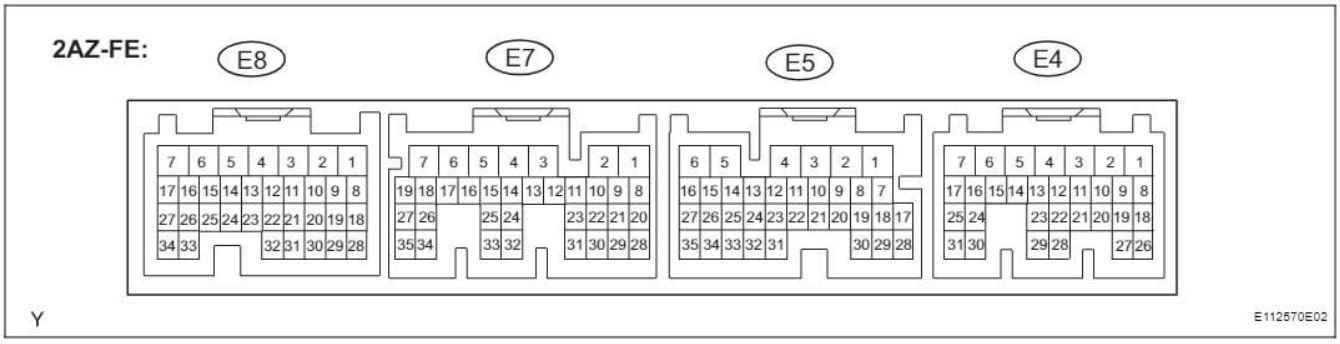


(b) waveform 2:
(1) Measure the waveform between terminal LCK1 (E6-23) of the ECM and body ground.
OK:
Waveform operate as shown in the illustration.
HINT:
As vehicle speed increases, the cycle of the signal waveform narrows.

AC

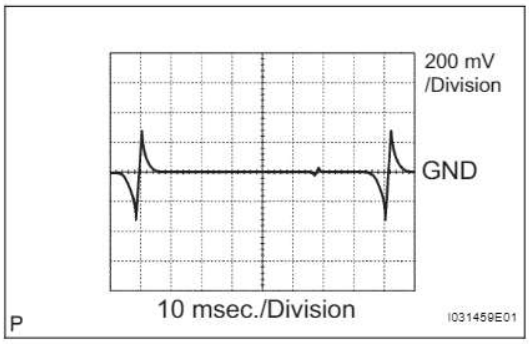
2. ECM





Symbols (Terminal No.)	Wiring color	Terminal Description	Condition	Specification
THW (E8-19)*1, (E8-32)*2 - E2 (E8-28)	(*1) G-B - BR (*2) SB- BR	Water temperature signal	Engine idling after engine warmed up Coolant temperature: 60 to 120°C (140 to 248°F)	0.2 to 1.0 V
E2 (E8-28)*1, (E8-3)*2 - Body ground	BR - Body ground	Ground for power supply	Always	Below 1.0 Ω
E1 (E6-1)*1 - Body ground	BR - Body ground	Ground for power supply	Always	Below 1.0 Ω
LCKI (E6-23)*1 - E1 (E6-1)	W-L - BR	Compressor lock signal	Engine idling A/C switch: ON (Magnet clutch: ON)	Pulse generation (see waveform 1)
HP (E5-1) - Body Ground (*1)	(*1) BR - Body ground	Pressure switch signal	Start engine Refrigerant pressure: Normal → More than 1,520 kPa (15.5 kgf/cm 2, 220psi)	Below 1.0 → 10 to 14 V
ACMG (E5-2)*1 - E1 (E6-1)	L-W - BR	Compressor operation signal	Engine idling Magnet clutch: OFF → ON	10 to 14 → Below 1.0 V

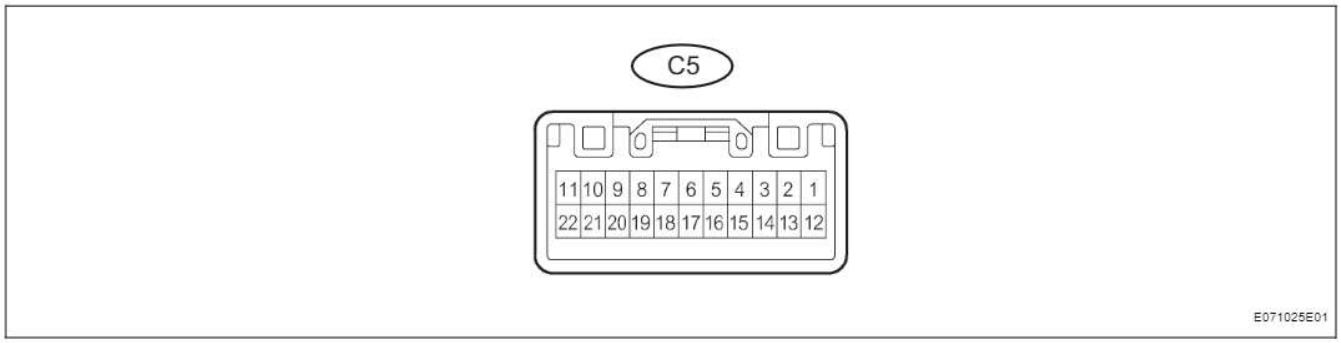
*1: 3MZ-FE
*2: 2AZ-FE



(a) waveform 1:
(1) Measure the waveform between terminal LCK1 (E6-23) of the ECM and body ground.
OK:
Waveform operate as shown in the illustration.
HINT:
As vehicle speed increases, the cycle of the signal waveform narrows.

AC

3. CLOCK ASSEMBLY

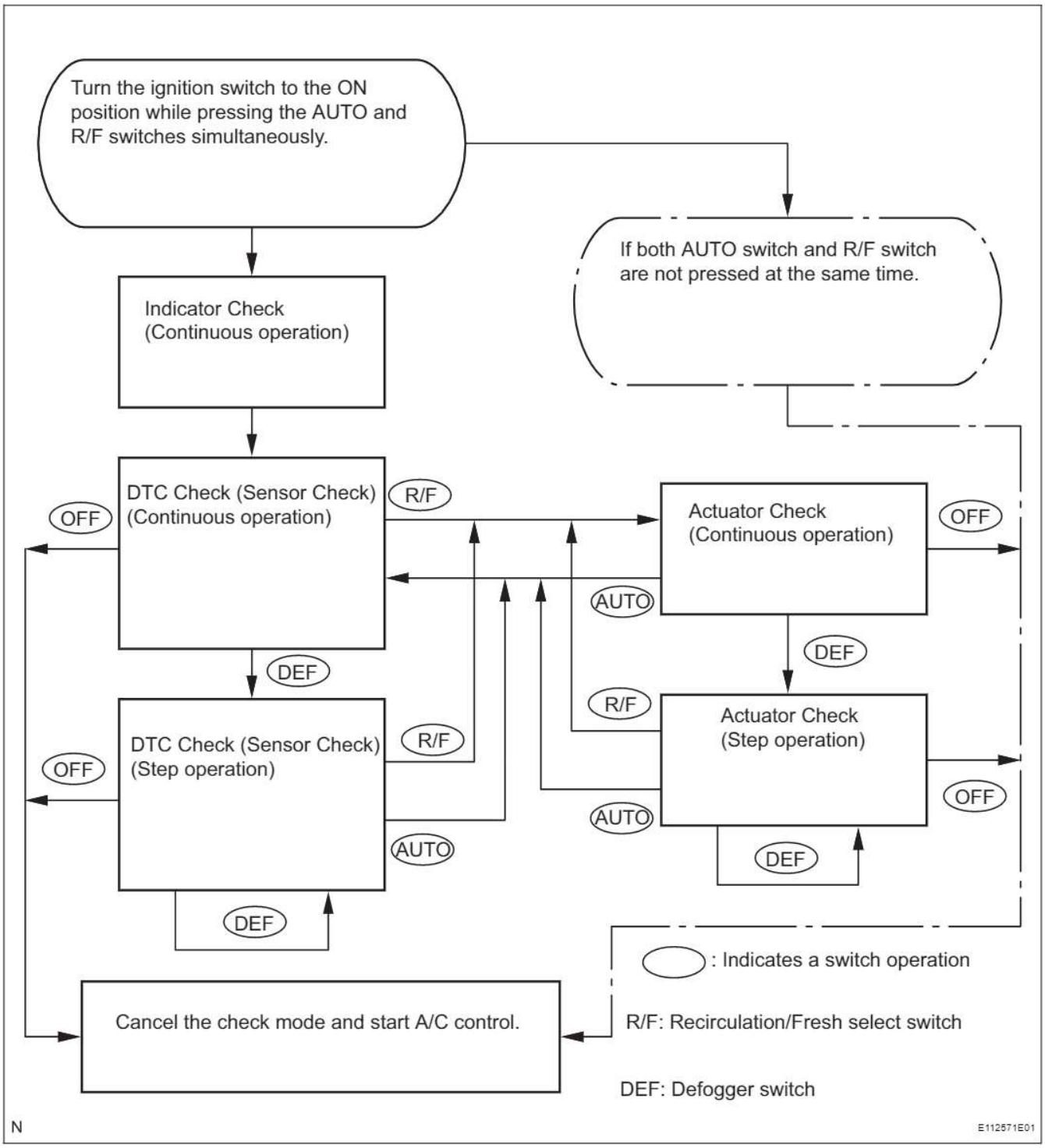


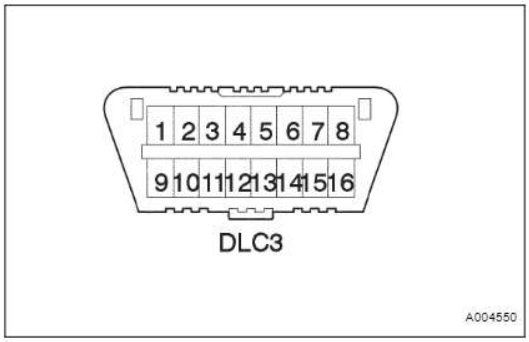
Symbols (Terminal No.)	Wiring color	Terminal Description	Condition	Specification
TH+ (C5-3) - TH- (C5-2)	G-R - B-W	Ambient temperature signal	Ignition switch: ON Ambient temperature: 25°C (77°F) → 40°C (104°F)	1.4 to 1.8 → 0.9 to 1.3 V

DIAGNOSIS SYSTEM

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.

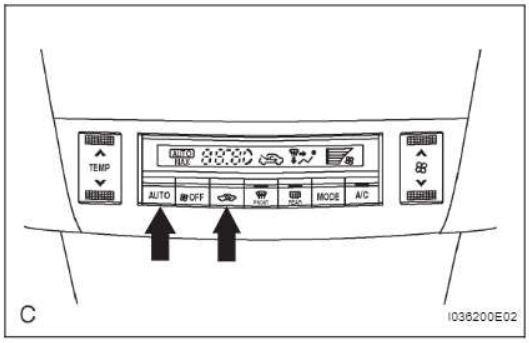




2. CHECK DLC3

(a) The vehicle's ECM uses ISO 9141-2 for communication. The terminal arrangement of the DLC3 complies with SAEJ1962 and matches the ISO 9141-2 format.

Terminal No.	Connection/Voltage or Resistance	Condition
7	Bus + Line/Pulse generation	During transmission
4	Chassis Ground - Body Ground/1 Ω or less	Always
5	Signal Ground - Body Ground/1 Ω or less	Always
16	Battery Positive - Body Ground/9 to 14 V	Always

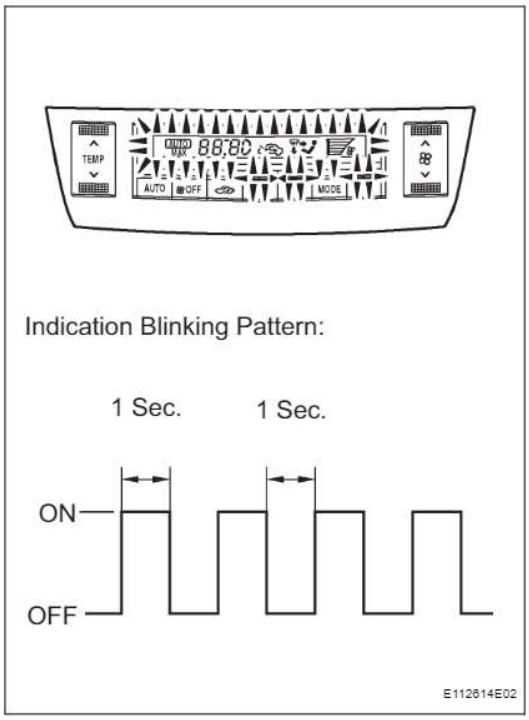


DTC CHECK / CLEAR

1. INDICATOR CHECK

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

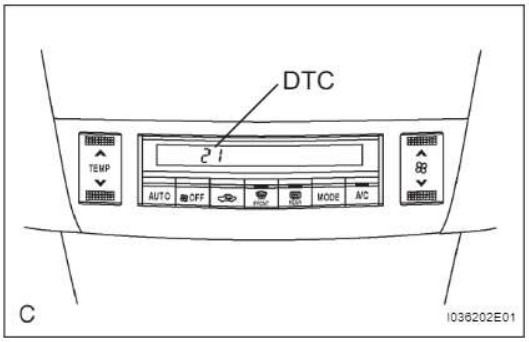
AC



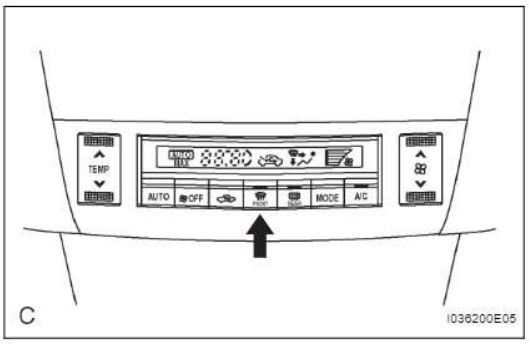
(b) Check that the indicators come on and go off 4 times in succession at 1 second intervals.
HINT:
- After the indicator check is completed, the system enters the DTC mode automatically.
- Press the "OFF" switch to cancel the check mode.

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-23)



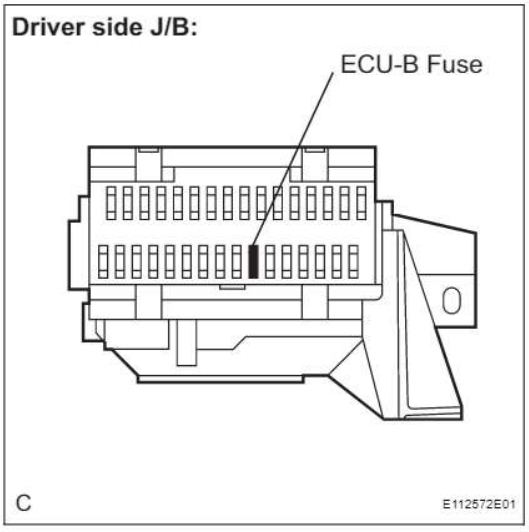
(c) If a slower display is desired, press the front DEF switch and change the display in the step operation. Each time the temperature up switch is pressed, the display changes by 1 step.

3. CLEARING DTC

(a) There are two methods for clearing the diagnostic trouble codes.

(1) Method "1"
During sensor check, press the "DEF" switch and "Rr. DEF" switch at the same time.

(2) Method "2"
Pull out the ECU-B fuse in the driver side J/B for 20 seconds or longer to clear the DTC memory.



AC

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

From the DATA LIST displayed on the intelligent tester, you can read the values of the displays, sensors, actuators 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) From the display on the tester, select the "DATA LIST".

ENGINE AND ECT / ALL:

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

2. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the intelligent tester allows the relays, VSV, actuators 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) From the display on the tester, perform the "ACTIVE TEST".

AC

ENGINE AND ECT / ALL:

Item	Test Details / Display (Range)	Diagnostic Note
A/C MAG CLUTCH	Magnetic clutch relay / OFF, ON	Operating sound can be heard

DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTC 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
11*1	Room Temperature Sensor Circuit	1. A/C room temperature sensor (cooler (room temp. sensor) thermitor) 2. Harness or connector between A/C room temperature sensor (cooler (room temp. sensor) themistor) and A/C and amplifier 3. A/C amplifier	Memorized (8.5 min. or moer)	AC-26
12*2	Ambient Temperature Sensor Circuit	1. A/C ambient temperature sensor (cooler (ambient temp. sensor) thermistor 2. Harness and connector between A/C ambinet temperature sensor (cooler (ambinet temp. sensor) and clock assembly 3. Harness or connector between clock assembly and A/C control assembly 4. Clock 5. A/C amplifier	Memorized (8.5 min. or more)	AC-31
13	Evaporator Temperature Sensor Circuit	1.A/C evaporator temperature sensor (cooler thermistor No.1) 2. Harness or connector between A/C evaporator temperature sensor (cooler thermistor No.1) and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)	AC-36
14	Engine Coolant Temperature Communication Circuit	1. Engine coolant temperature sensor 2. ECM 3. Harness or connector between engine coolant temperature sensor and ECM 4. Harness or connector between ECM and amplifier 5. A/C amplifier	Memorized (8.5 min. or more)	AC-40
21*3	Solar Sensor Circuit	1. A/C solar sensor (cooler (solar sensor) thermistor) 2. Harness or connector between A/C solar sensor (cooler (solar sensor) thermistor) and A/C amplifier 3. A/C amplifier	Memorized (8.5 min. or more)*6 -*7	AC-43

AC

DTC No.	Detection Item	Trouble Area	Memory*4	See page
22*5	Compressor Lock Sensor Circuit	1. A/C lock sensor (cooler compressor assembly) 2. Cooler compressor assembly drive belt 3. Cooler compressor assembly and magnetic clutch lock sensor 4. Harness and connector between ECM and cooler compressor assembly, cooler compressor assembly and body ground 5. ECM 6. A/C amplifier	-	AC-47
23	Pressure Switch Circuit	1. Pressure switch (cooler condenser assembly) 2. Harness or connector between pressure switch (cooler condenser assembly) and A/C amplifier, pressur switch (cooler condenser assembly) and body ground 3. Refrigerant pipe line 4. A/C amplifier	-	AC-52
31	Air Mix Damper Position Sensor Circuit (Passenger Side)	1. Air mix control servomotor (air mix damper servo sub-assembly) 2. Harness or connector between air mix control servomotor (air mix servo sub-assembly) and A/C amplifier A/C amplifier	Memorized (1 min. or more)	AC-56
32	Air Inlet Damper Position Sensor Circuit	1. Air inlet control servomotor (recirculation damper servo sub-assembly) 2. HArness or connector between air inlet control servomotor (recirculation damper servo sub-assembly) and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-60
33	Air Outlet Damper Position Sensor Circuit	1. Air outlet control servomotor (mode damper servo sub-assembly) 2. Harness or connector between air outlet control servomotor (mode damper servo sub-assembly) and A/C amplifier 3. A/C amplifier	Memorized (1 min. or more)	AC-64

AC

DTC No.	Detection Item	Trouble Area	Memory*4	See page
41	Air Mix Damper Control Servomotor Circuit (Passenger Side)	1.Air mix contorl servomotor (air mix damper servo sub-assembly) 2, Harness or connector between air mix control servomotor (air mix damper servo sub-assembly) and A/C amplifier 3. A/C amplifier	Memorized (15 sec.)	AC-68
42	Air Inlet Damper Control Servomoter Circuit	1. Air inlet control servomotor (recirculation damper servo sub-assembly) 2.Harness or connector between air inlet control servmotor (recirculation damper servo sub-assembly) and A/C amplifier 3.A/C amplifier	Memorized (15 sec.)	AC-71
43	Air Outlet Damper Control Servomotor Circuit	1. Air outlet control servomotor (mode damper servo sub-assembly) 2. Harness or connector between air outlet control servomotor (mode damper servo sub-assembly) and A/C amplifier 3. A/C amplifier	Memorized (15 sec.)	AC-75

AC

HINT:

- *1: If the room temperature is approximately -18.6°C (-1.48°F) or lower, DTC 11 may be output even though the system is normal.
- *2: If the ambient temperature is approximately -52.9°C (-63.2°F) or lower, trouble code may be output even though the system is normal.
- *3: If the check is performed in a dark place, DTC 21 (solar sensor circuit abnormal) may be output.
- *4: The A/C amplifier memorizes the DTC of the respective malfunction that has occurred for the period of time indicated in brackets.
- *5: Compressor lock (DTC 22) is indicated only for a current malfunction.
  To confirm DTC 22, perform the following steps.
  (a) With the engine on, enter the DTC check mode.
  (b) Press the R/F switch to enter ctuator check mode and set the operation to step No.3.
  (c) Press the AUTO switch to return to DTC check mode.
  (d) The DTC is displayed after approximately 3 seconds.
- *6: Short
- *7: Open

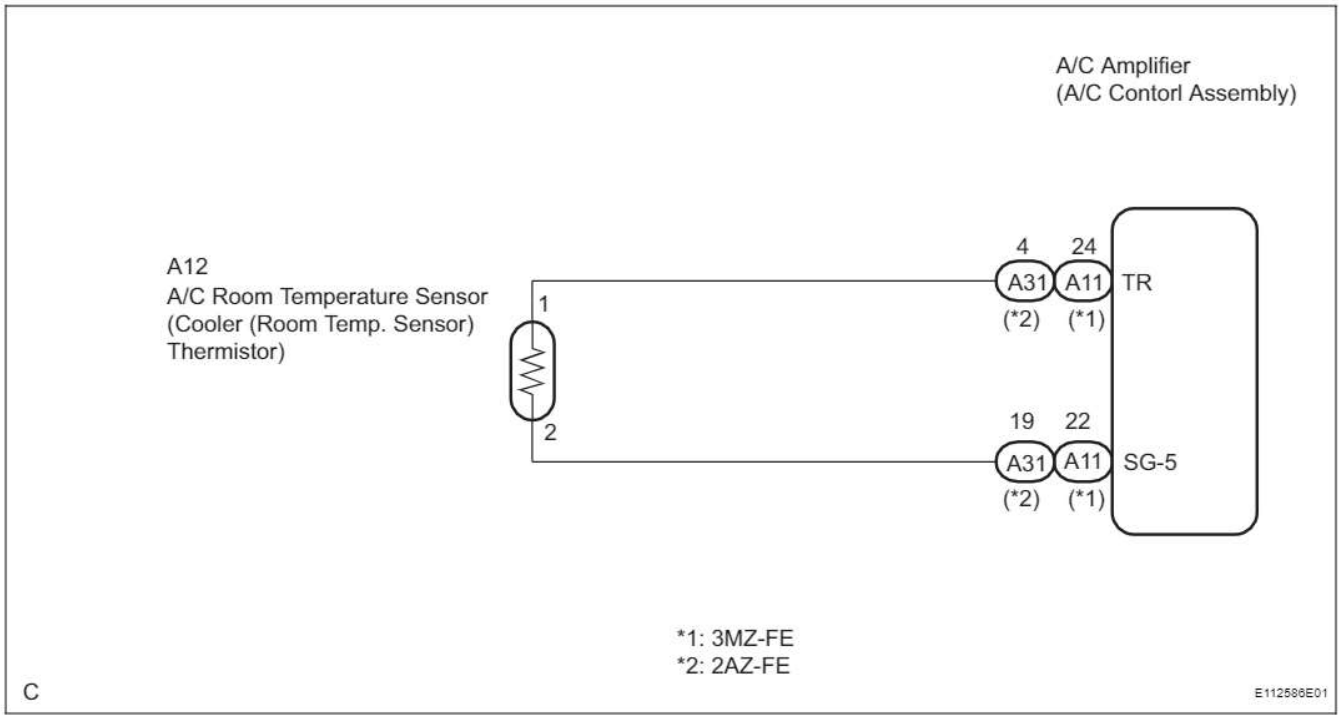
DTC	11	Room Temperature Sensor Circuit

DESCRIPTION

This sensor detects the interior temperature that is used as the basis for temperature control and sends appropriate signals to the A/C amplifier.

DTC No.	Detection item	Trouble Area
11	Open or short in room temperature sensor circuit	• A/C room temperature sensor (cooler (room temp. sensor) thermistor) • Harness or connector between A/C room temperature sensor (cooler (room temp. sensor) thermistor) and A/C amplifier • A/C amplifier

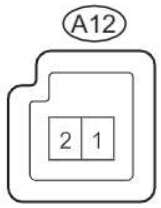
WIRING DIAGRAM



AC

1	INSPECT A/C ROOM TEMPERATURE SENSOR (COOLER (ROOM TEMP.SENSOR) THERMISTOR))

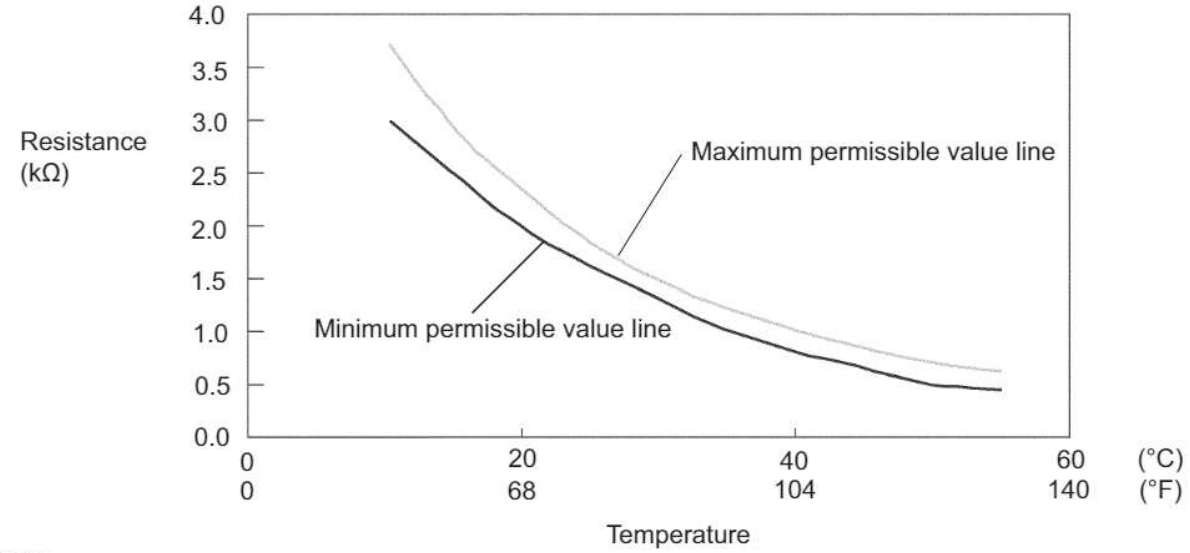
A/C Room Temperature Sensor (Cooler (Room Temp. Sensor) Thermistor) Connector front View:



H

E112573E01

(a) Remove the A/C room temperature sensor (cooler (room temp. sensor) thermistor).
(b) Measure the resistance according to the value(s) in the table below.



I38777
H

I040673E03

Standard resistance

Tester connection	Condition	Specified condition
A12-1 - A12-2	10°C(50°F)	3.00 to 3.73 kΩ
A12-1 - A12-2	15°C(59°F)	2.45 to 2.88 kΩ
A12-1 - A12-2	20°C (68°F)	1.95 to 2.30 kΩ
A12-1 - A12-2	25°C (77°F)	1.60 to 1.80 kΩ
A12-1 - A12-2	30°C (86°F)	1.28 to 1.47 kΩ
A12-1 - A12-2	35°C (95°F)	1.00 to 1.22 kΩ
A12-1 - A12-2	40°C (104°F)	0.80 to 1.00 kΩ
A12-1 - A12-2	45°C (113°F)	0.65 to 0.85 kΩ
A12-1 - A12-2	50°C (122°F)	0.50 to 0.70 kΩ

Tester connection	Condition	Specified condition
A12-1 - A12-2	55°C (131°F)	0.44 to 0.60 kΩ
A12-1 - A12-2	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:

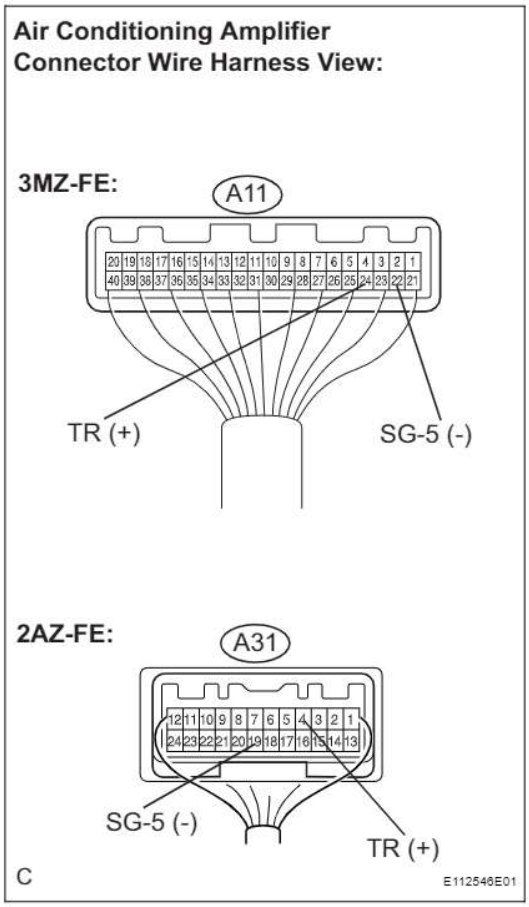
As the temperature increases, the resistance decreases (see the graph).

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

OK

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

Air Conditioning Amplifier Connector Wire Harness View:



(a) Remove the A/C amplifier with connector 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
A11-24 (TR)*1,A31-4 (TR)*2 - A11-22 (SG-5)*1, A31-19 (SG-5)*2	Ignition switch ON at 25°C (77°F)	1.8 to 2.2 V
A11-24 (TR)*1,A31-4 (TR)*2 - A11-22 (SG-5)*1, A31-19 (SG-5)*2	Ignition switch ON at 40°C (104°F)	1.2 to 1.6 V

*1: 3MZ-FE
*2: 2AZ-FE

HINT:

As the temperature increases, the voltage decreases.

Result:

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**

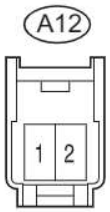
A

AC

3	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING AMPLIFIER - A/C ROOM TEMPERATURE SENSOR)

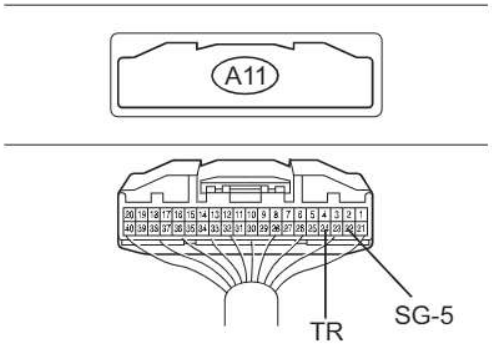
(a) Measure the resistance according to the value(s) in the table below.

A/C Room Temperature Sensor (Cooler (Room Temp. Sensor) Thermistor) Connector Front View:

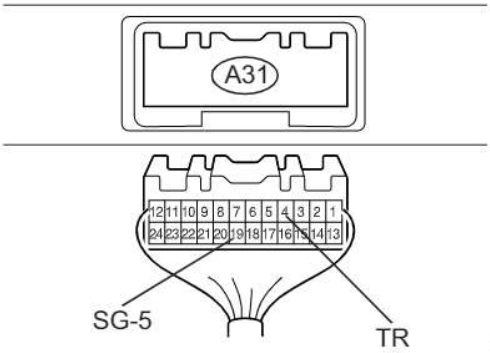


Air Conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



Standard resistance

Tester connection	Condition	Specified condition
A11-24 (TR)*1,A31-4 (TR)*2 - A12-1	Always	Below 1 Ω
A11-22 (SG-5)*1, A31-19 (SG-5)*2 - A12-2	Always	Below 1 Ω
A11-24 (TR)*1,A31-4 (TR)*2 - Body ground	Always	10 kΩ or higher
A11-22 (SG-5)*1, A31-19 (SG-5)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

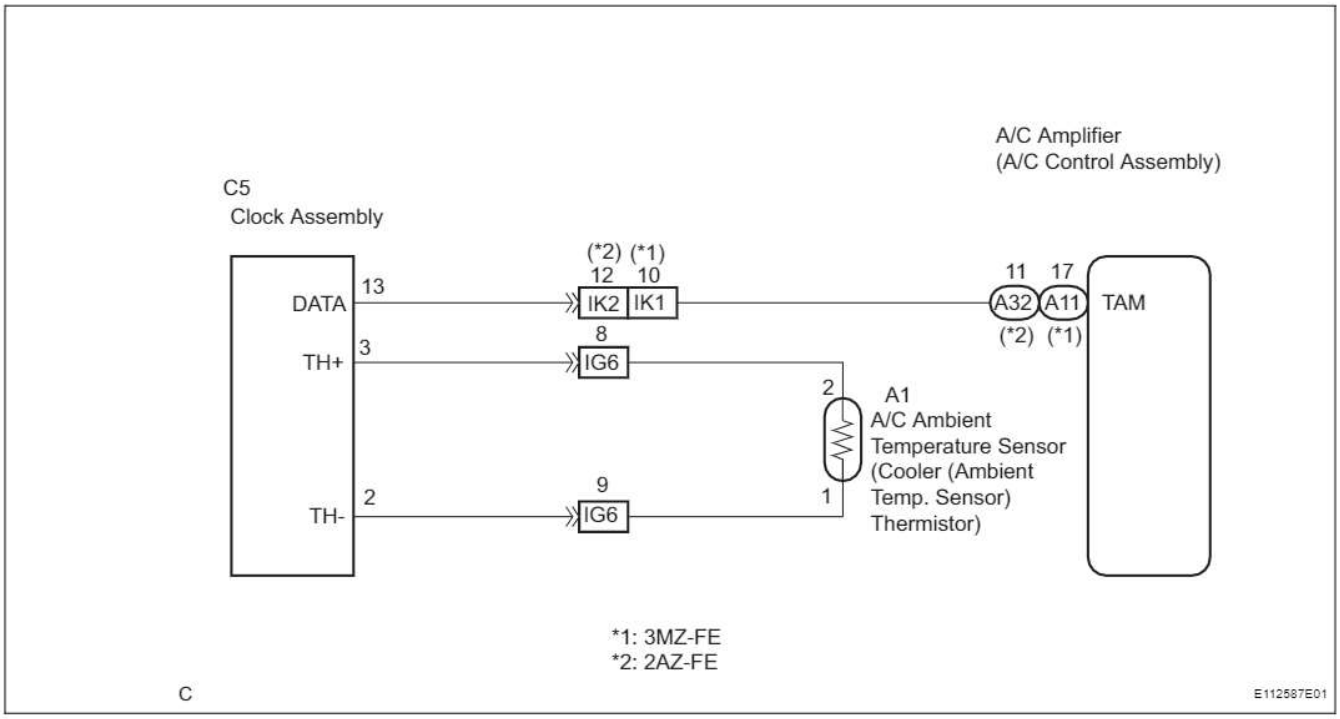
DTC	12	Ambient Temperature Sensor Circuit

DESCRIPTION

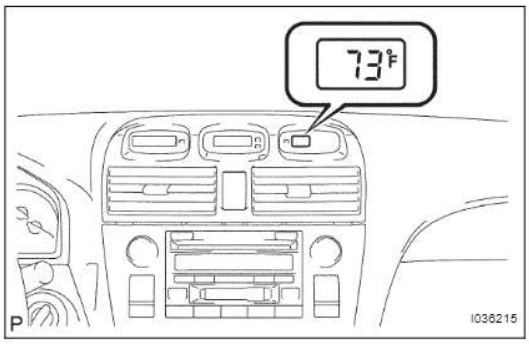
The sensor connected to the clock detects fluctuations in the ambient temperature that is used for controlling the interior temperature. The sensor sends a signal to the A/C amplifier via the clock.

DTC No.	Detection item	Trouble Area
12	Open or short in ambient temperature sensor circuit	• A/C ambient temperature sensor (cooler (ambient temp. sensor) thermistor) • Harness or connector between A/C ambient temperature sensor (cooler (ambient temp. sensor) thermistor) and clock assembly • Harness or connector between clock assembly and A/C control assembly • Clock • A/C amplifier

WIRING DIAGRAM



1 INSPECT CLOCK ASSEMBLY



(a) Check the difference in ambient temperature between the value displayed on the clock assembly and the actual temperature.

OK:

The ambient temperature displayed on the clock assembly and the actual ambient temperature are almost the same.

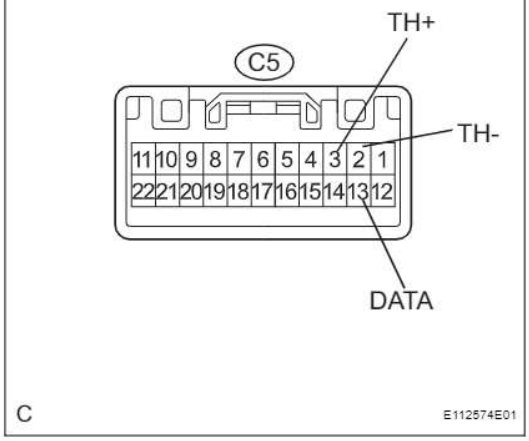
HINT:

The temperature displayed on the clock assembly and the actual temperature detected by the sensor may differ when the ambient temperature rises significantly (such as when the vehicle stops immediately after start-up).

OK	Go to step 5
NG	Go to step 2

2 INSPECT CLOCK ASSEMBLY (TH+ - SG)

Clock Assembly Connector Front View:



(a) Remove the clock assembly with the connector 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
C5-3 (TH+) - C5-2 (TH-)	Ignition switch ON at 25°C (77°F)	1.8 to 2.2 V
C5-3 (TH+) - C5-2 (TH-)	Ignition switch ON at 40°C (104°F)	1.2 to 1.6 V
C5-13 (DATA) - Body ground	Each temperature	Pulse generation

HINT:

As the temperature increases, the voltage decreases.

Result:

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	Go to step 5

A

AC

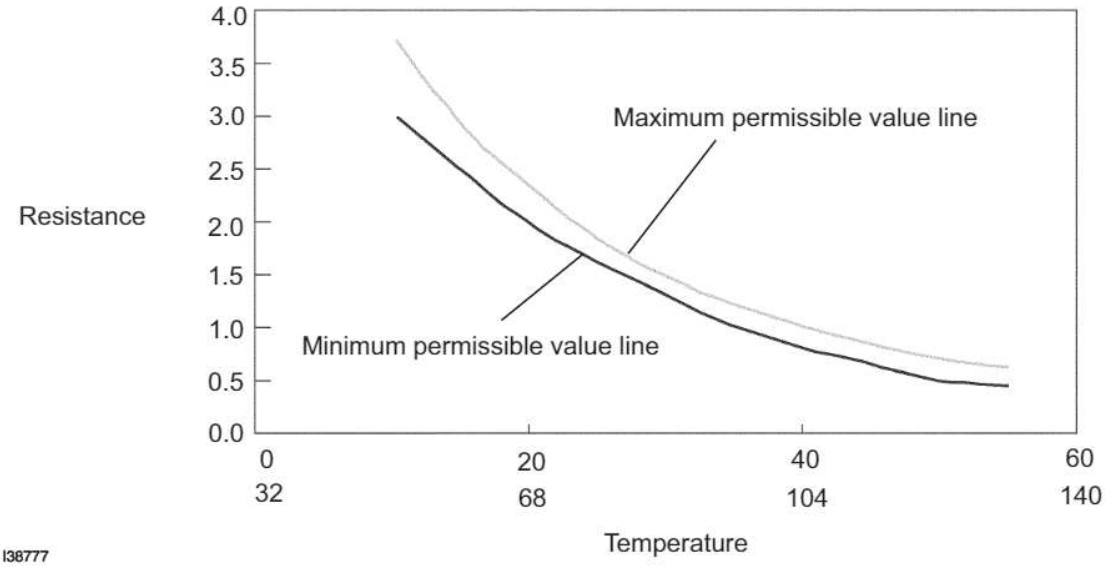
3	INSPECT A/C AMBIENT TEMPERATURE SENSOR (COOLER (AMBIENT TEMP. SENSOR) THERMISTOR)

A/C Ambient Temperature Sensor (Cooler (Ambient Temp. Sensor) Thermistor) Connector Front View:



P E112575E03

(a) Remove the A/C ambient temperature sensor (cooler (ambient temp. sensor) thermistor).
(b) Measure the resistance according to the value(s) in the table below.



I38777
H I040673E02

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

Tester connection	Condition	Specified condition
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.**

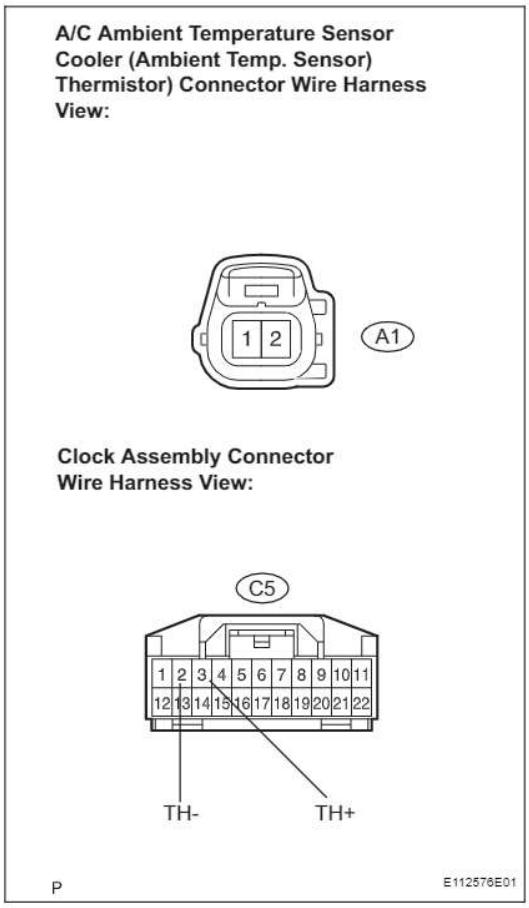
HINT:

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

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

OK

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



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

Standard resistance

Tester connection	Condition	Specified condition
C5-3 (TH+) - A1-2	Always	Below 1 Ω
C5-2 (TH-) - A1-1	Always	Below 1 Ω
C5-3 (TH+) - Body ground	Always	10 kΩ or higher
C5-2 (TH-) - Body ground	Always	10 kΩ or higher

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

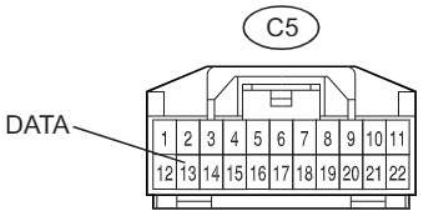
OK

REPLACE CLOCK ASSEMBLY

5	CHECK HARNESS AND CONNECTOR (CLOCK ASSEMBLY - A/C CONTROL ASSEMBLY)

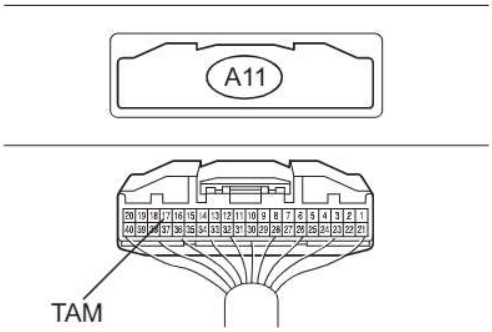
(a) Measure the resistance according to the value(s) in the table below.

Clock Assembly Connector Wire Harness View:

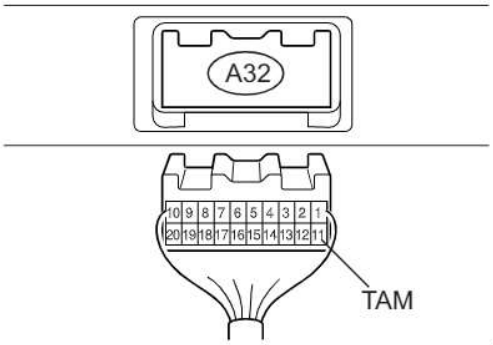


Air Conditioning Amplifier Connecter Wire Harness View:

3MZ-FE:



2AZ-FE:



Standard resistance

Tester connection	Condition	Specified condition
C5-13 (DATA) - A11-17 (TAM)*1, A32-11 (TAM)*2	Always	Below 1 Ω
C5-13 (DATA) - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE AIR CONDITIONING AMPLIFIER

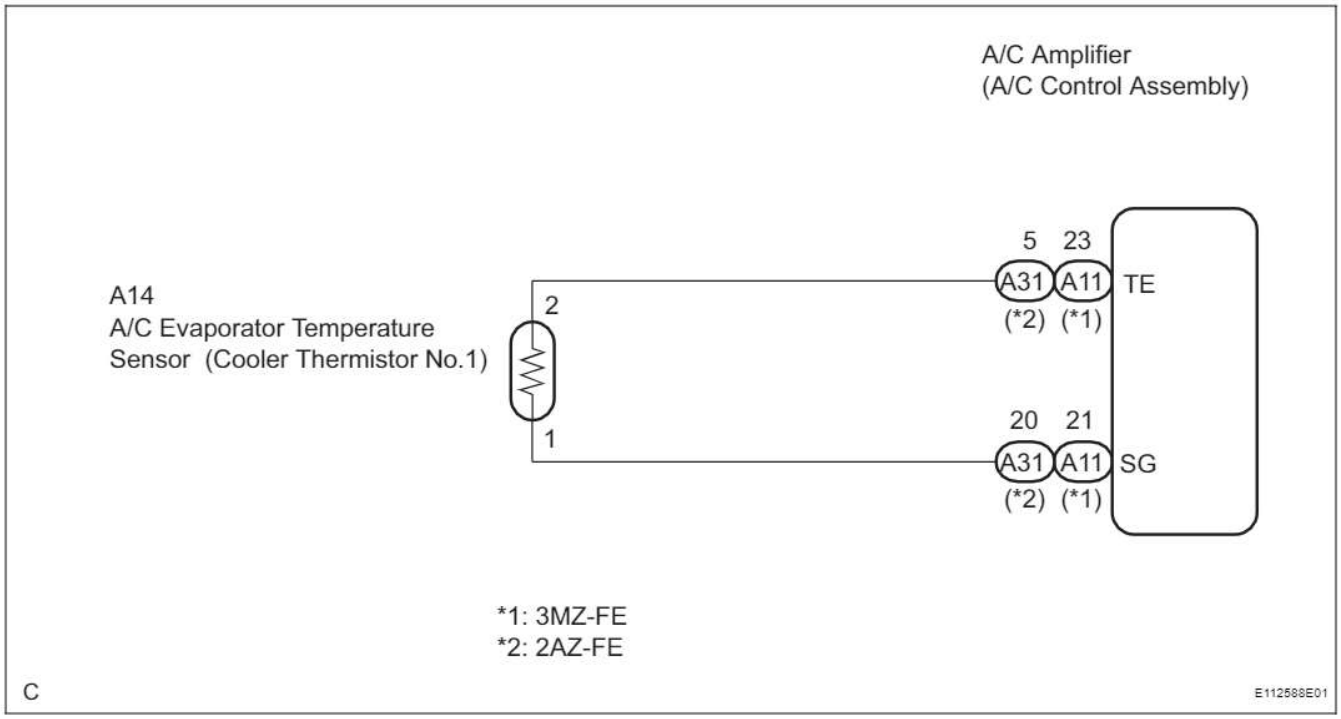
DTC	13	Evaporator Temperature Sensor Circuit

DESCRIPTION

This sensor detects the evaporator temperature and sends the appropriate signals to the A/C amplifier. It is used for frost prevention.

DTC No.	Detection Item	Trouble Area
13	Open or short in evaporator temperature sensor circuit	• A/C evaporator temperature sensor (cooler thermistor No.1) • Harness or connector between A/C evaporator temperature sensor (cooler thermistor No.1) and A/C amplifier • A/C amplifier

WIRING DIAGRAM

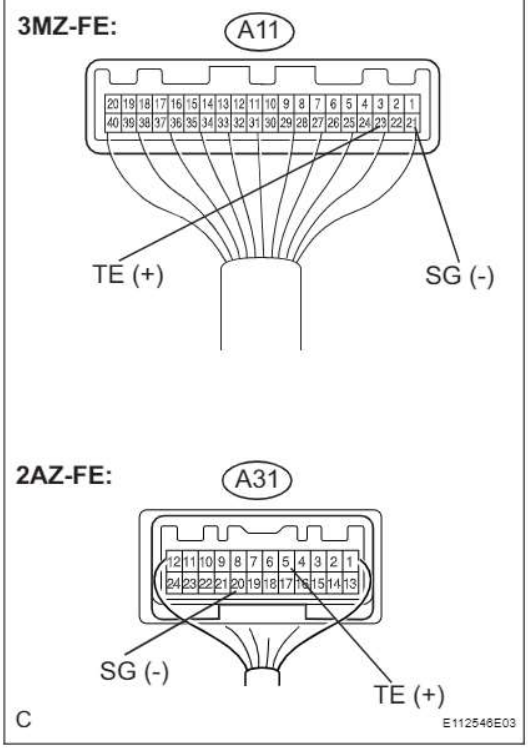


AC

1	INSPECT AIR CONDITIONING AMPLIFIER (TE - SG)

(a) Remove the A/C amplifier with connector still connected.
(b) Turn the ignition switch to the ON position.

Air Conditioning Amplifier Connector Wire Harness View:



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

Standard voltage

Tester connection	Condition	Specified condition
A11-23 (TE)*1, A31-5 (TE)*2 - A11-21 (SG)*1, A31-20 (SG)*2	Ignition switch ON at 0°C (32°F)	1.8 to 2.4 V
A11-23 (TE)*1, A31-5 (TE)*2 - A11-21 (SG)*1, A31-20 (SG)*2	Ignition switch ON at 15°C (59°F)	1.4 to 1.8 V

*1: 3MZ-FE
*2: 2AZ-FE
HINT:
As the temperature increases, the voltage decreases.

Result:

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**

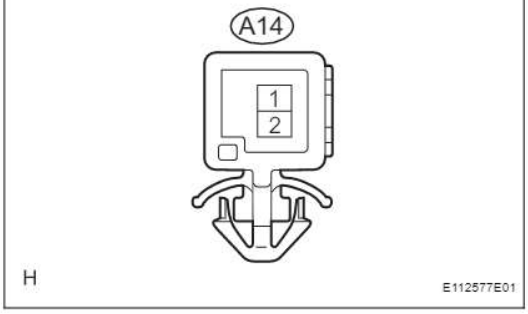
C → **REPLACE AIR CONDITIONING AMPLIFIER**

AC

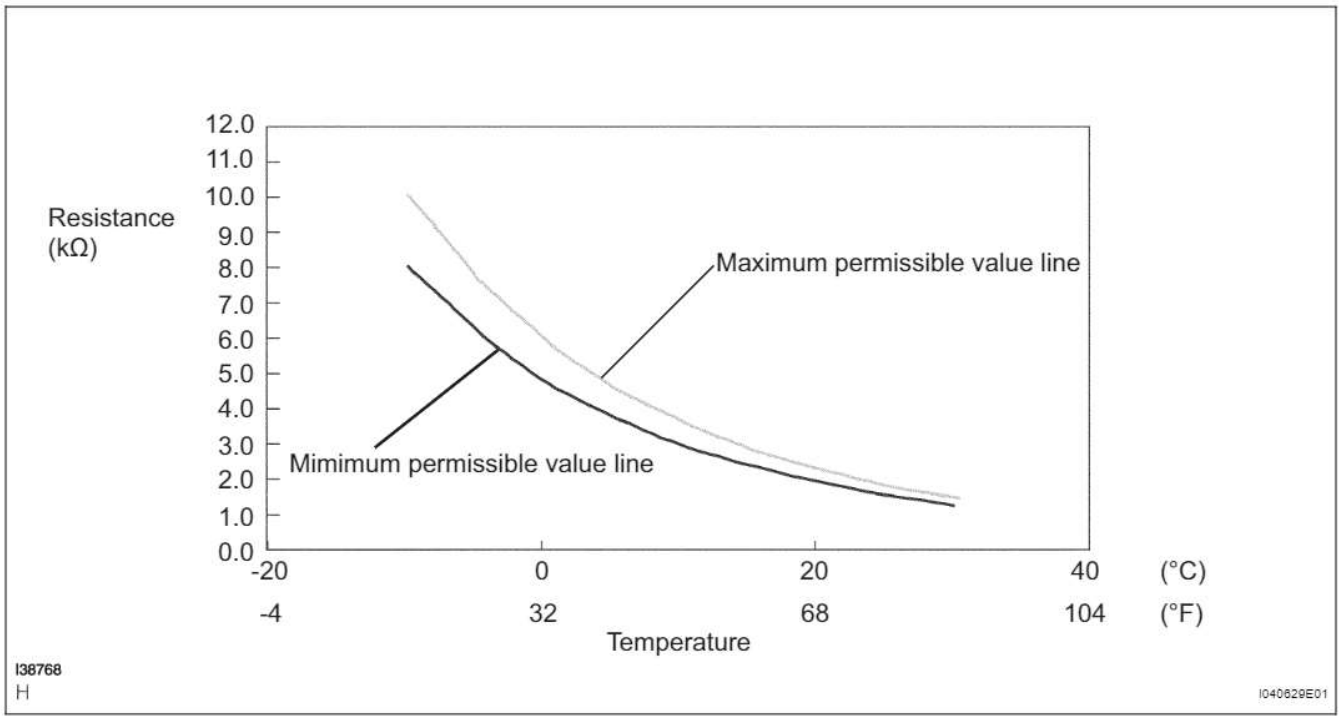
A

2 INSPECT A/C EVAPORATOR TEMPERATURE SENSOR (COOLER THERMISTOR NO.1)

A/C Evaporator Temprature Sensor (Cooler Thermistor No.1) Connector Front View:



(a) Remove the A/C evaporator temperature sensor (cooler thermistor No.1).
(b) Measure the resistance according to the value(s) in the table below.



Standard voltage

Tester connection	Condition	Specified condition
A14-1 - A14-2	-10°C (14°F)	8.00 to 10.00 kΩ
A14-1 - A14-2	-5°C (23°F)	6.15 to 7.65 kΩ
A14-1 - A14-2	0°C (32°F)	4.75 to 5.85 kΩ
A14-1 - A14-2	5°C (41°F)	3.70 to 4.55 kΩ
A14-1 - A14-2	10°C (50°F)	2.91 to 3.55 kΩ
A14-1 - A14-2	15°C (59°F)	2.32 to 2.80 kΩ
A14-1 - A14-2	20°C (68°F)	1.85 to 2.22 kΩ
A14-1 - A14-2	25°C (77°F)	1.48 to 1.77 kΩ
A14-1 - A14-2	30°C (86°F)	1.20 to 1.43 kΩ

AC

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 decrease (see the graph).

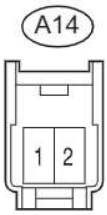
NG → **REPLACE A/C EVAPORATOR TEMPERATURE SENSOR**

OK

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

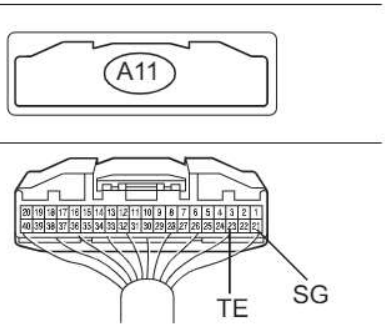
(a) Measure the resistance according to the value(s) in the table below.

A/C Evaporator Temperature Sensor (Cooler Thermistor Connecter No.1)
Connector Wire Harness View:

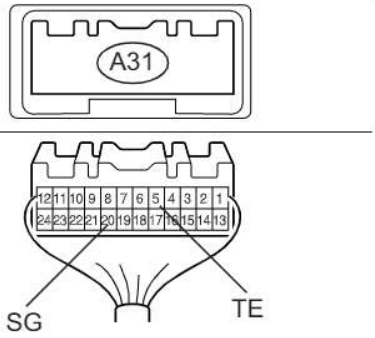


Air conditioning Amplifier Connector Wire Harness View:

3MZ-FE:



2AZ-FE:



C

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AC

Standard resistance

Tester connection	Condition	Specified condition
A11-23 (TE)*1, A31-5 (TE)*2 - A14-2	Always	Below 1 Ω
A11-21 (SG)*1, A31-20 (SG)*2 - A14-1	Always	Below 1 Ω
A11-23 (TE)*1, A31-5 (TE)*2 - Body ground	Always	10 kΩ or higher
A11-21 (SG)*1, A31-20 (SG)*2 - Body ground	Always	10 kΩ or higher

*1: 3MZ-FE
*2: 2AZ-FE

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

OK

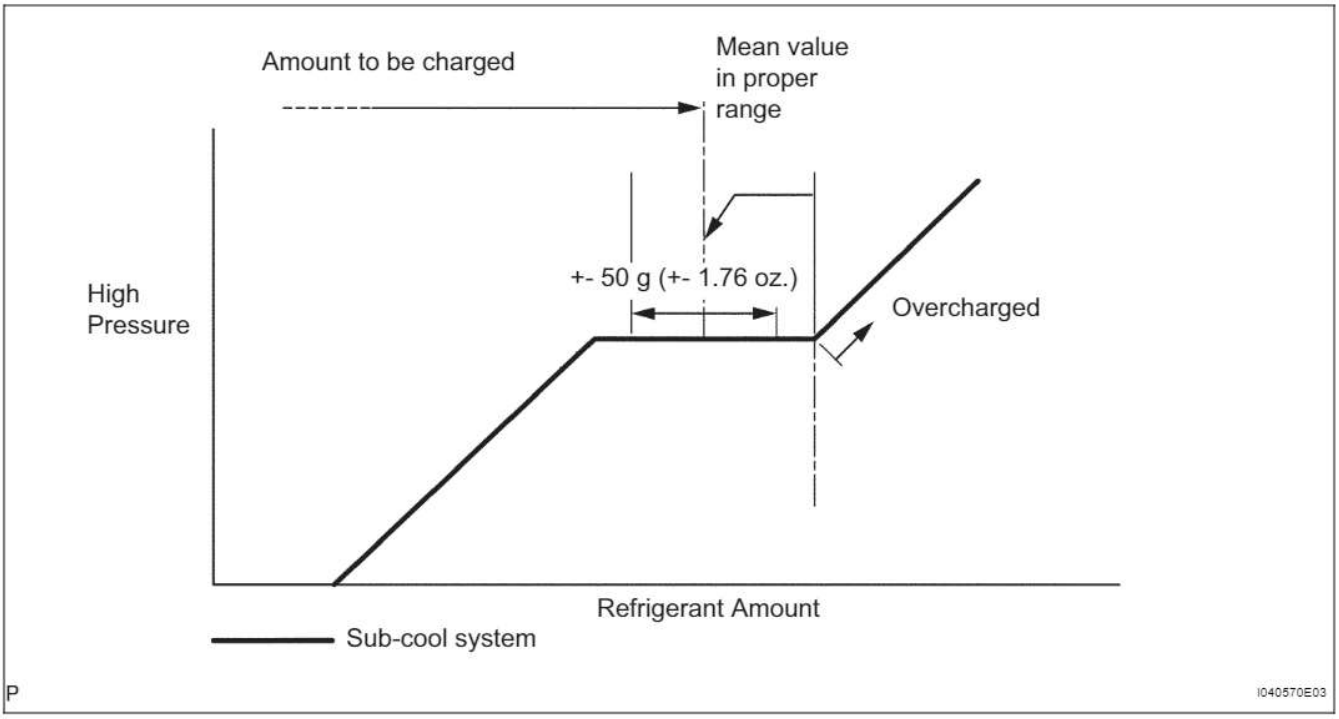
REPLACE AIR CONDITIONING AMPLIFIER

REPLACEMENT

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
   (a) Start up the engine.
   (b) A/C switch is ON.
   (c) Operate the cooler compressor with an engine speed of approximately 1,000 rpm for 5 to 6 minutes to circulate the refrigerant and collect the compressor oil remaining in each component into the cooler compressor.
   (d) Stop the engine.
   (e) Using SST, discharge the refrigerant gas.
   SST 07110-58060 (07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

2. **CHARGE REFRIGERANT**
   (a) Perform vacuum purging using a vacuum pump.
   (b) Charge refrigerant HFC-134a (R134a).
   Standard:
   550 +- 50 g (19.39 +- 1.76 oz.)
   SST 07110-58060 (07117-58060, 07117-58070, 07117-58080, 07117-58090, 07117-78050, 07117-88060, 07117-88070, 07117-88080)

AC



NOTICE:
Do not operate the cooler compressor before charging refrigerant as the cooler compressor will not work properly without any refrigerant, and will overheat.

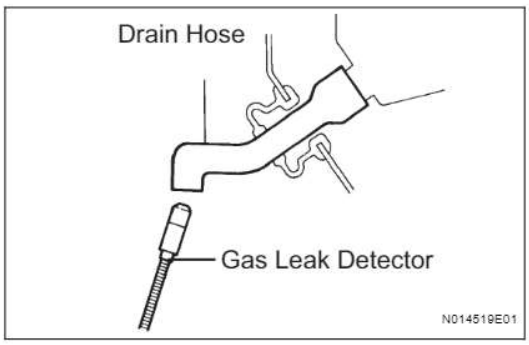
3. **WARM UP ENGINE**
   (a) Warm up the engine at less than 2,000 rpm for 2 minutes or more after charging the refrigerant.

4. CHECK FOR LEAKAGE OF REFRIGERANT

(a) After recharging the refrigerant gas, check for refrigerant gas leakage using a halogen leak detector.

(b) Perform the operation under these conditions:
- Stop the engine.
- Secure good ventilation (the gas leak detector may react to volatile gases other than refrigerant, such as evaporated gasoline or exhaust gas).
- Repeat the test 2 or 3 times.
- Make sure that some refrigerant remains in the refrigeration system. When compressor is off:

  approximately 392 to 588 kPa (4 to 6 kgf*cm^2, 57 to 85 psi)



(c) Bring the gas leak detector close to the drain hose before performing the test.

HINT:
- After the blower motor has stopped, leave the cooling unit for more than 15 minutes.
- Expose 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 the volatile gases.

If such reaction is unavoidable, the vehicle must be lifted up.

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

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

(f) Bring the gas leak detector close to the refrigerant lines and perform the test.

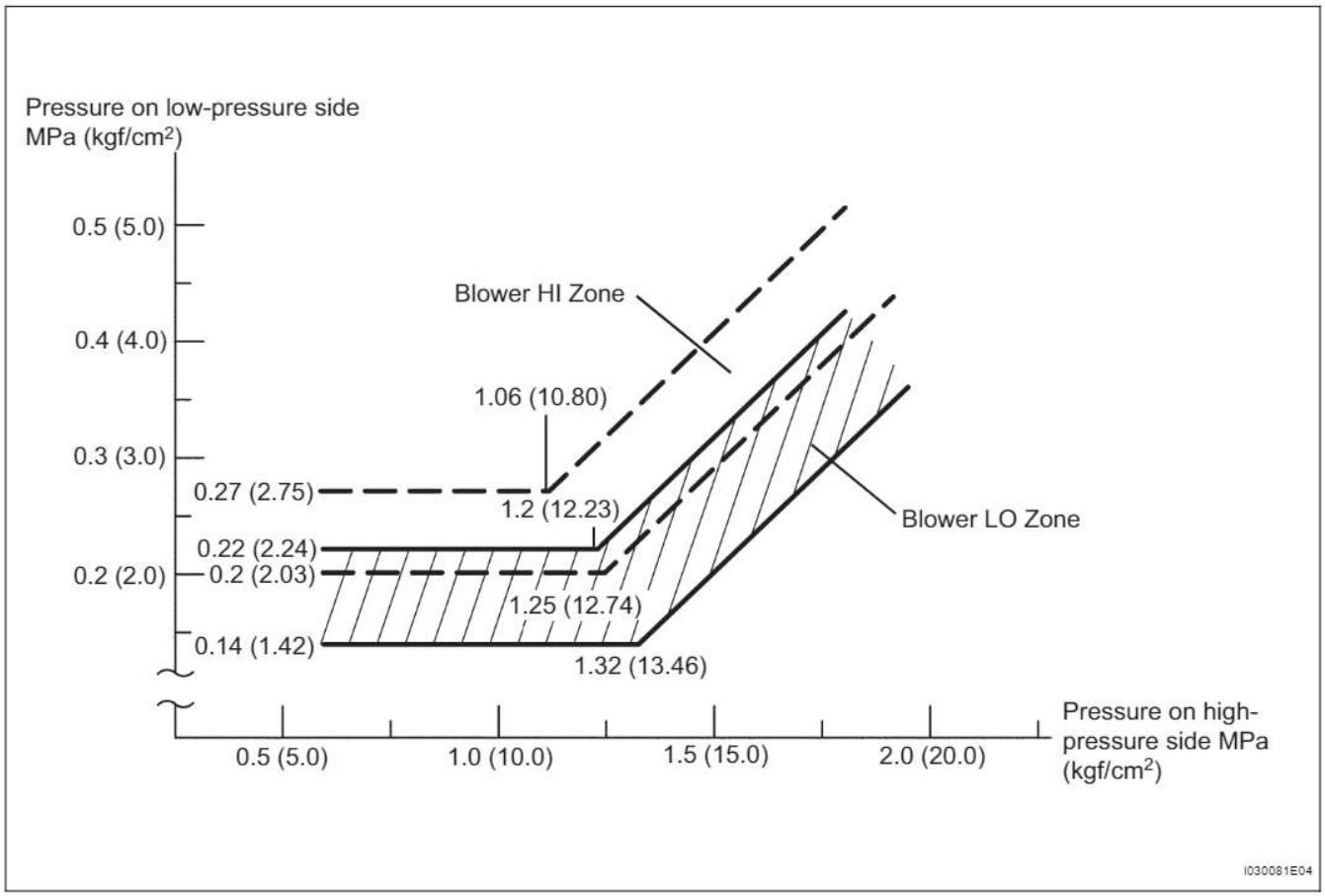
AC

REFRIGERANT

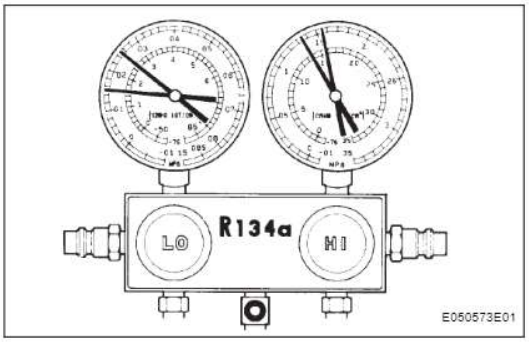
ON-VEHICLE INSPECTION

1. **INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET**
   (a) This method uses a manifold gauge set to locate problem areas. Read the manifold gauge pressure when these conditions are established.
   Test conditions:
   - Temperature at the air inlet is 30 to 35°C (86 to 95°F).
   - Engine is running at 1,500 rpm.
   - All doors are fully open.
   - Blower speed control switch is at HI.
   - Temperature control switch is at MAX. COOL.
   - A/C switch is ON.

   (b) Gauge readings (Reference)



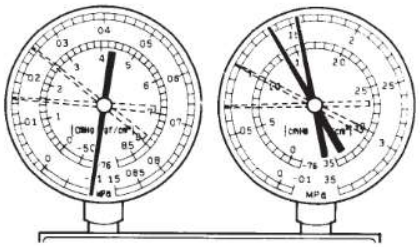
AC



(1) Normally functioning refrigeration system
Gauge reading

Pressure side	Refrigerant volume
Low	0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2)
High	1.37 to 1.57 MPa (14 to 16 kgf/cm^2)

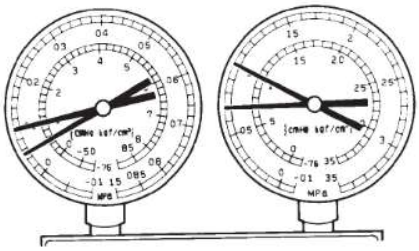
(2) The A/C system periodically changes between normal and improper function due to moisture in the refrigerant system.



Symptoms	Probable Cause	Diagnosis	Corrective Actions
During operation, pressure on low - pressure side cycles between normal and vacuum	Moisture in refrigeration system freezes at expansion valve orifice, causing temporary stop of cycle. However, when melted, normal state is restored	- Drier is overly saturated - Moisture in refrigeration system freezes at expansion valve orifice and blocks refrigerant circulation	1. Replace cooler drier 2. Remove moisture from cycle by repeatedly evacuating air 3. Supply appropriate volume of new refrigerant

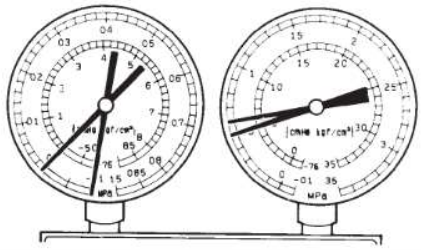
AC

(3) The A/C system does not function effectively due to insufficient cooling.



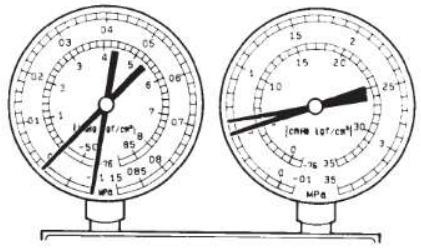
Symptoms	Probable Cause	Diagnosis	Corrective Actions
- Pressure low on both low and high-pressure sides - Cooling performance insufficient	Gas leakage from refrigeration system	- Insufficient refrigerant - Refrigerant leakage	1. Check for gas leakage and repair if necessary 2. Supply appropriate volume of new refrigerant 3. If indicated pressure value close to 0 when connected to gauge, create vacuum after inspecting and repairing the location of leakage

(4) The A/C system does not function effectively due to poor circulation of the refrigerant.



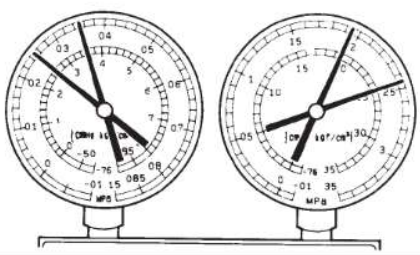
Symptoms	Probable Cause	Diagnosis	Corrective Actions
- Pressure low on both low and high-pressure sides - Frost exists on piping from condenser to A/C unit	Refrigerant flow obstructed by dirt in condenser	Condenser clogged	Replace condenser

(5) The A/C system does not function intermittently because the refrigerant does not circulate.



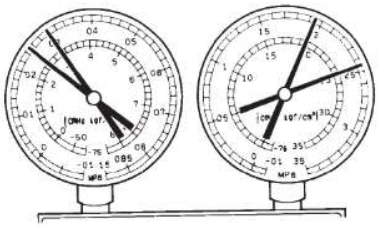
Symptoms	Probable Cause	Diagnosis	Corrective Actions
- Vacuum indicated on low-pressure side, and extremely low pressure indicated on high-pressure side - Frost or condensation seen on piping on both sides of condenser or expansion valve	- Refrigerant flow obstructed by moisture or dirt in refrigeration system - Refrigerant flow obstructed by gas leakage from expansion valve	Refrigerant does not circulate	1. Check expansion valve 2. Clean expansion valve by blowing air 3. Replace condenser 4. Evacuate air and charge appropriate volume of new refrigerant 5. For gas leakage from expansion valve, replace expansion valve

(6) The A/C system does not function effectively due to overcharged refrigerant or insufficient cooling of the condenser.



Symptoms	Probable Cause	Diagnosis	Corrective Actions
Pressure extremely high on both low and high-pressure sides	- Excessive refrigerant - Cooling performance of condenser insufficient	- Condenser is dirty - Condenser fan motor is malfunctioning - Excessive refrigerant	1. Clean condenser 2. Check condenser fan motor operation 3. If 1 and 2 normal, check the amount of refrigerant and supply appropriate volume of refrigerant

(7) The A/C system does not function due to air in the refrigeration system.
CAUTION:
The low-pressure piping may be very hot and cause serious burns.



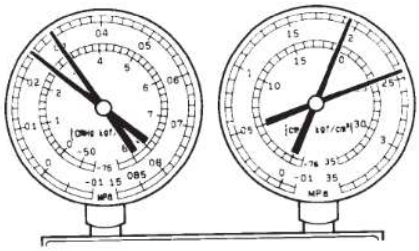
HINT: These gauge indications occur when the refrigeration system opens and the refrigerant is charged without vacuum purging

I022122E03

Symptoms	Probable Cause	Diagnosis	Corrective Actions
- Pressure extremely high on both low and high-pressure sides - The low-pressure piping is too hot to touch	Air in refrigeration system	- Air in refrigeration system - Vacuum purging insufficient	1. Check if compressor oil is dirty or insufficient 2. Evacuate air and charge new refrigerant

AC

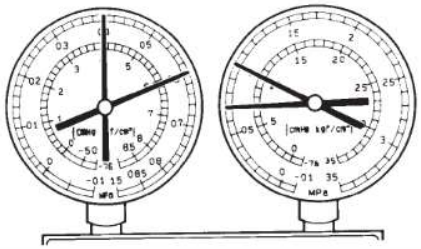
(8) The A/C system does not function effectively due to an expansion valve malfunction.



I022123

Symptoms	Probable Cause	Diagnosis	Corrective Actions
-Pressure extremely high on both low and high-pressure sides -Frost or condensation on piping on low-pressure side	Problem with expansion valve	- Excessive refrigerant in low pressure piping - Expansion valve too wide open	Replace expansion valve

(9) The A/C system does not function due to a defective compressor.



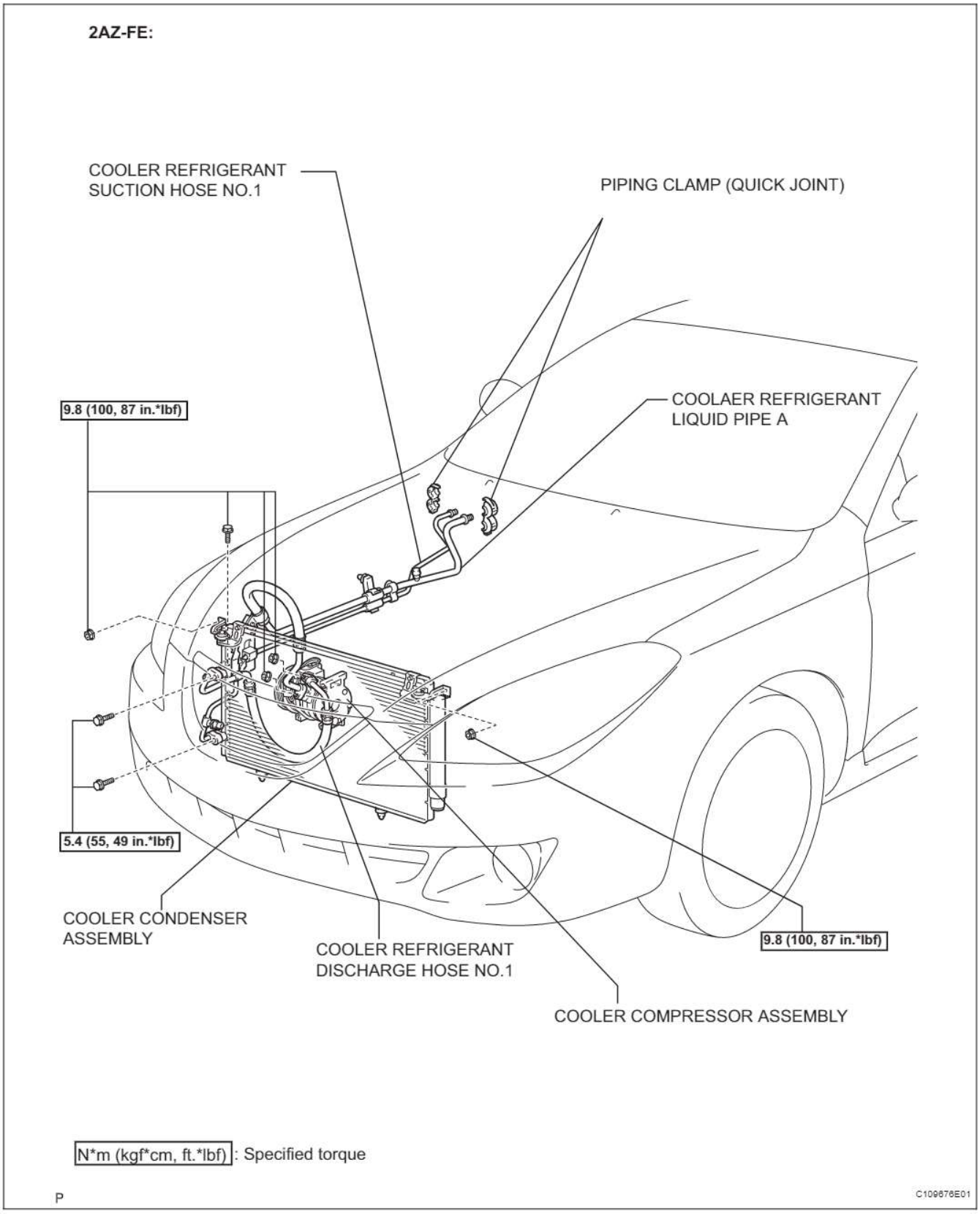
I022124

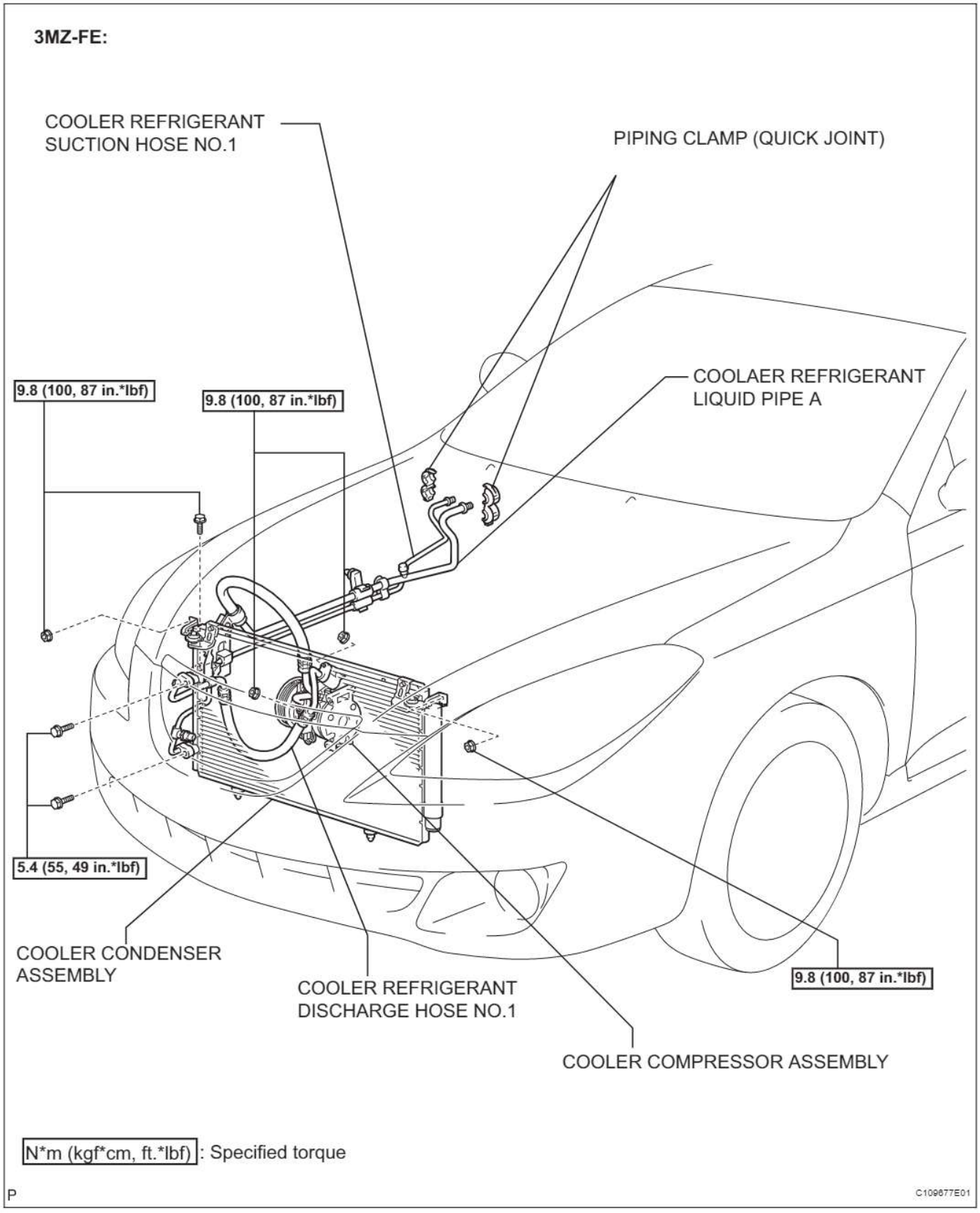
Symptoms	Probable Cause	Diagnosis	Corrective Actions
-Pressure extremely high on both low and high-pressure sides -Pressure extremely low on high-pressure side	Internal leakage in compressor	- Compression failure - Leakage from damaged valve or broken sliding parts	Repair or replace compressor

AC

REFRIGERANT LINE

COMPONENTS




3MZ-FE:
COOLER REFRIGERANT SUCTION HOSE NO.1
PIPING CLAMP (QUICK JOINT)
COOLAER REFRIGERANT LIQUID PIPE A
9.8 (100, 87 in.*lbf)
9.8 (100, 87 in.*lbf)
5.4 (55, 49 in.*lbf)
COOLER CONDENSER ASSEMBLY
COOLER REFRIGERANT DISCHARGE HOSE NO.1
9.8 (100, 87 in.*lbf)
COOLER COMPRESSOR ASSEMBLY
N*m (kgf*cm, ft.*lbf): Specified torque
P
C109677E01

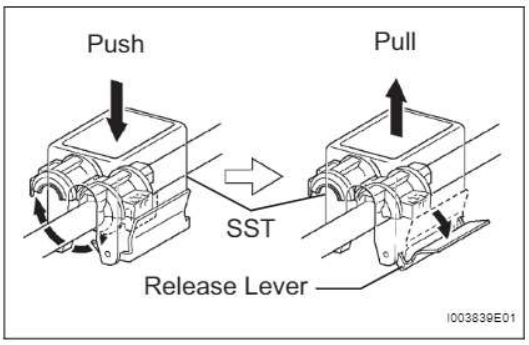
AC

REMOVAL

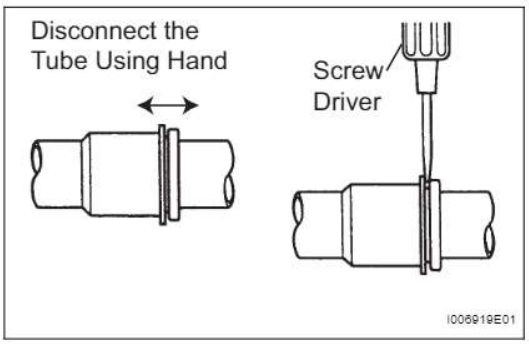
HINT:
- Installation is in the reverse order of removal.
- COMPONENTS: See page AC-120.

1. **DISCHARGE REFRIGERANT FROM REFRIGRATION SYSTEM (See page AC-115)**

2. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**
   (a) Install SST to the piping clamp.
   SST 09870-00015
   HINT:
   Check the direction of the piping clamp claw and SST by referring to the illustration shown on the caution label.



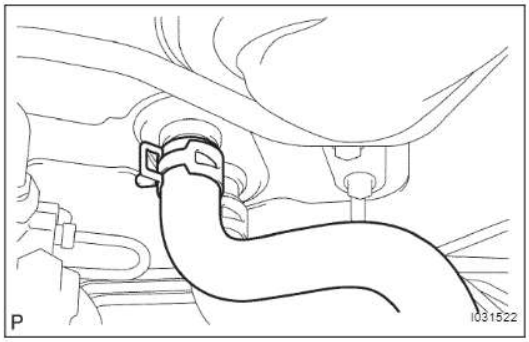
   (b) Push down on the SST and release the clamp lock.
   NOTICE:
   Be careful not to deform the hose when pushing down on the SST.
   (c) Pull the SST slightly and push the release lever, then remove the piping clamp with the SST.



   (d) Disconnect the cooler refrigerant suction hose No.1.
   NOTICE:
   - **Do not use tools such as a screwdriver to remove the hose.**
   - **Cap the open fittings immediately to keep moisture or dirt out of the system.**
   (e) Remove the 2 O-rings from the cooler refrigerant suction hose No.1.
   NOTICE:
   Seal the openings of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

3. **DISCONNECT COOLER REFRIGERANT LIQUID PIPE A**
   SST 09870-00025
   HINT:
   Disconnection of the cooler refrigerant liquid pipe A is the same as the cooler refrigerant suction hose No.1.

AC



4. DISCONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT)

(a) Using pliers, grip the claws of the clip and slide the clip. Disconnect the heater water outlet hose A (from the heater unit).

NOTICE:

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

5. DISCONNECT HEATER WATER INLET HOSE A (for 2AZ-FE)

HINT:

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

6. DISCONNECT HEATER OUTLET WATER HOSE (for 3MZ-FE)

HINT:

Disconnection of the heater outlet water hose is the same as the heater water outlet hose A.

7. DISCONNECT HEATER INLET WATER HOSE (for 3MZ-FE)

HINT:

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

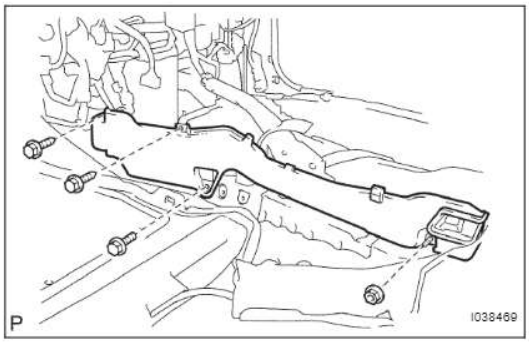
AC

8. REMOVE INSTRUMENT PANEL SAFETY PAD

See page IP-6

HINT:

Refer to the instructions for removal of the instrument panel safety pad sub-assembly with passenger air bag assembly.



9. REMOVE AIR DUCT REAR NO.1

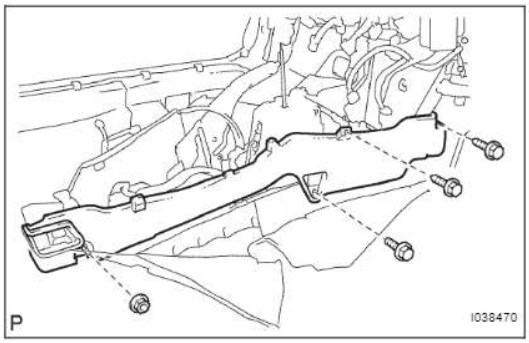
(a) Fold back the floor carpet.

HINT:

Fold back the floor carpet so that the air duct rear No.1 can be removed.

(b) Remove the 2 screws, bolt and nut.

(c) Remove the air duct rear No.1.



10. REMOVE AIR DUCT REAR NO.2

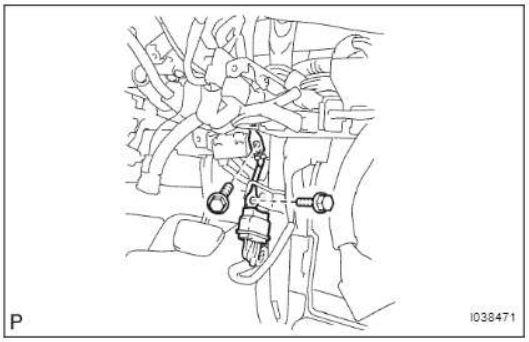
(a) Fold back the floor carpet.

HINT:

Fold back the floor carpet so that the air duct rear No.2 can be removed.

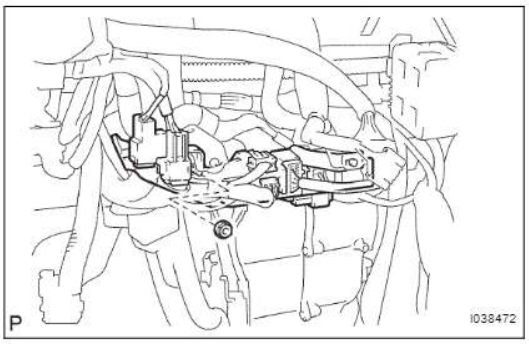
(b) Remove the 2 screws, bolt and nut.

(c) Remove the air duct rear No.2.

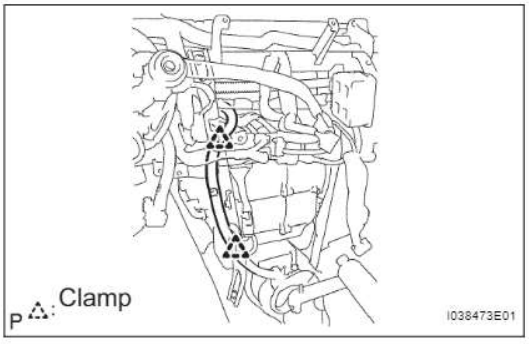


11. REMOVE INSTRUMENT PANEL BRACE SUB-ASSEMBLY NO.1

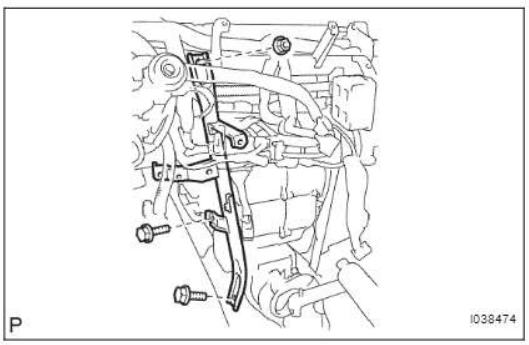
(a) Remove the 2 bolts and 2 earth wires.



(b) Remove the nut and release the connector holder.

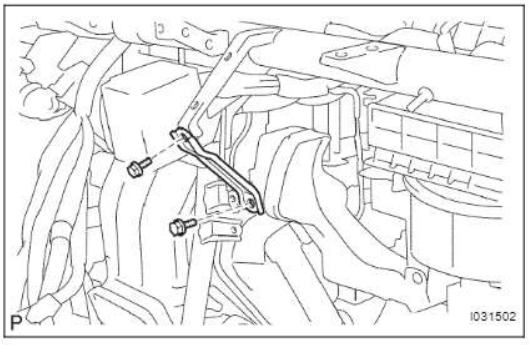


(c) Disconnect the 2 wire harness clamps.



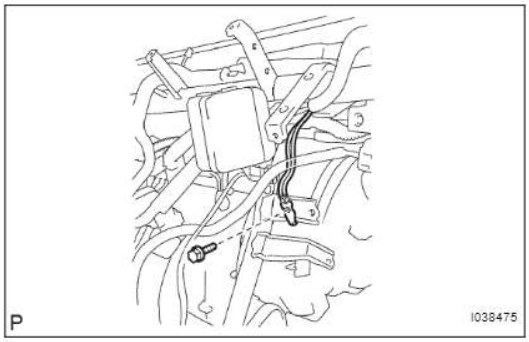
(d) Remove the bolt and screw.

(e) Remove the nut and instrument panel brace sub-assembly No.1.



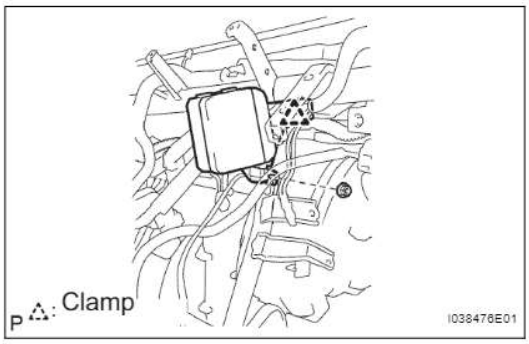
12. REMOVE INSTRUMENT FINISH PANEL RETAINER NO.1

(a) Remove the 2 bolts and instrument finish panel retainer lower No.1.



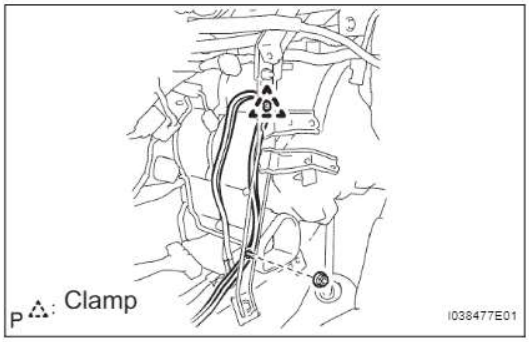
13. REMOVE INSTRUMENT PANEL BRACE SUB-ASSEMBLY NO.2

(a) Remove the bolt and earth wire.

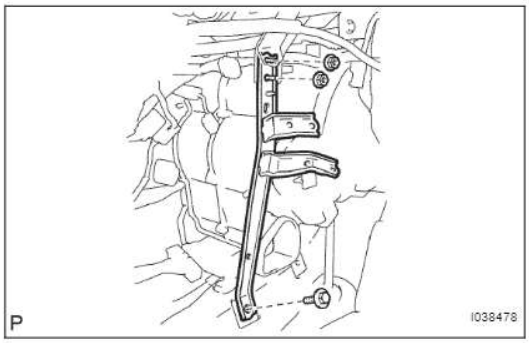


(b) Remove the nut.

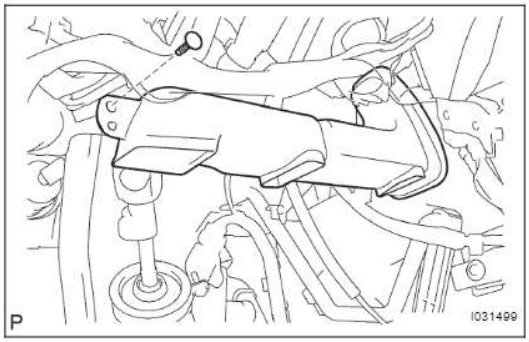
(c) Disconnect the passenger side junction block clamp.



(d) Remove the nut and amplifier antenna assembly clamp.

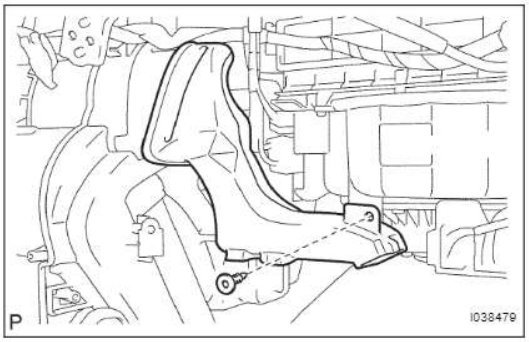


(e) Remove the 2 nuts, bolt and instrument panel brace sub-assembly No.2.



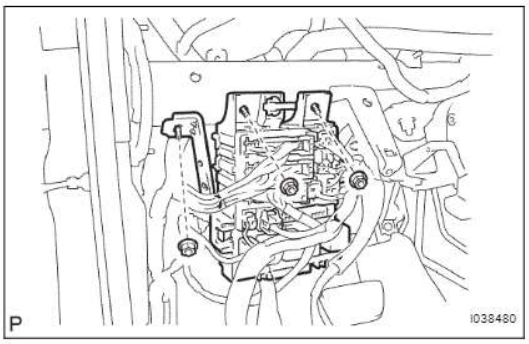
14. REMOVE HEATER TO FOOT DUCT NO.3

(a) Remove the clip and heater to foot duct No.3.



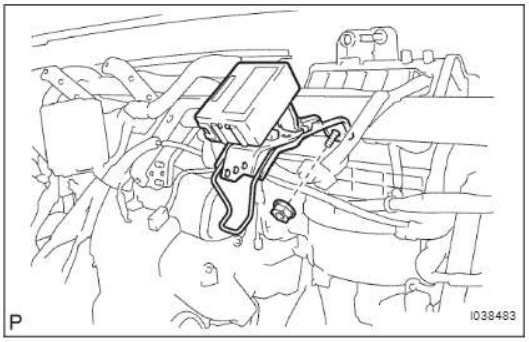
15. REMOVE HEATER TO FOOT DUCT NO.1

(a) Remove the clip and heater to foot duct No.1.



16. DISCONNECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

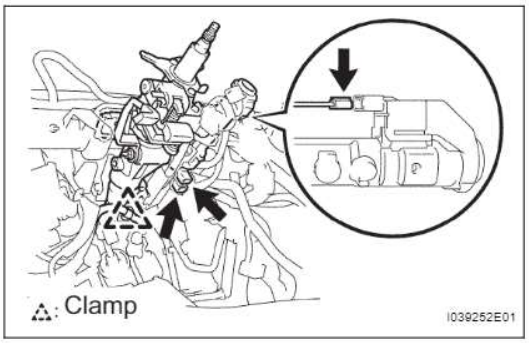
(a) Remove the 3 nuts and instrument panel junction block assembly.



17. REMOVE INSTRUMENT PANEL BRACKET SUB-ASSEMBLY CENTER

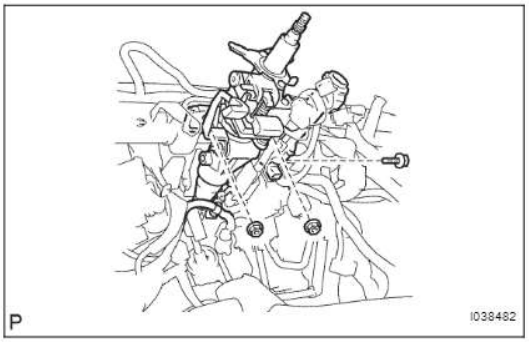
(a) Remove the nut and instrument panel bracket sub-assembly center.

AC



18. DISCONNECT STEERING COLUMN ASSEMBLY

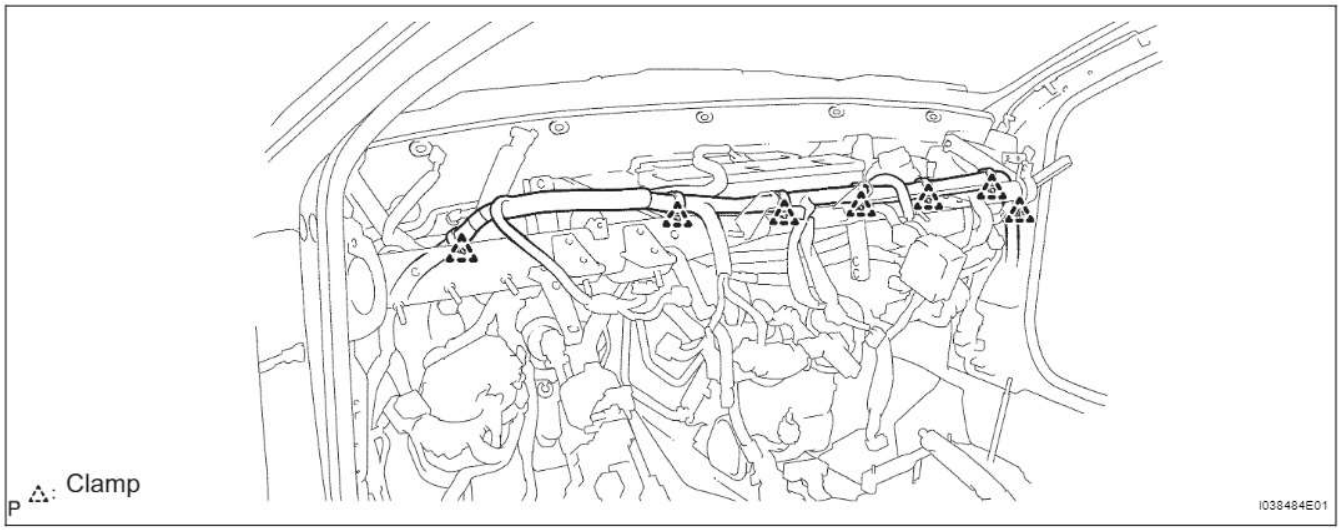
(a) Release the wire harness clamp and 3 connectors.



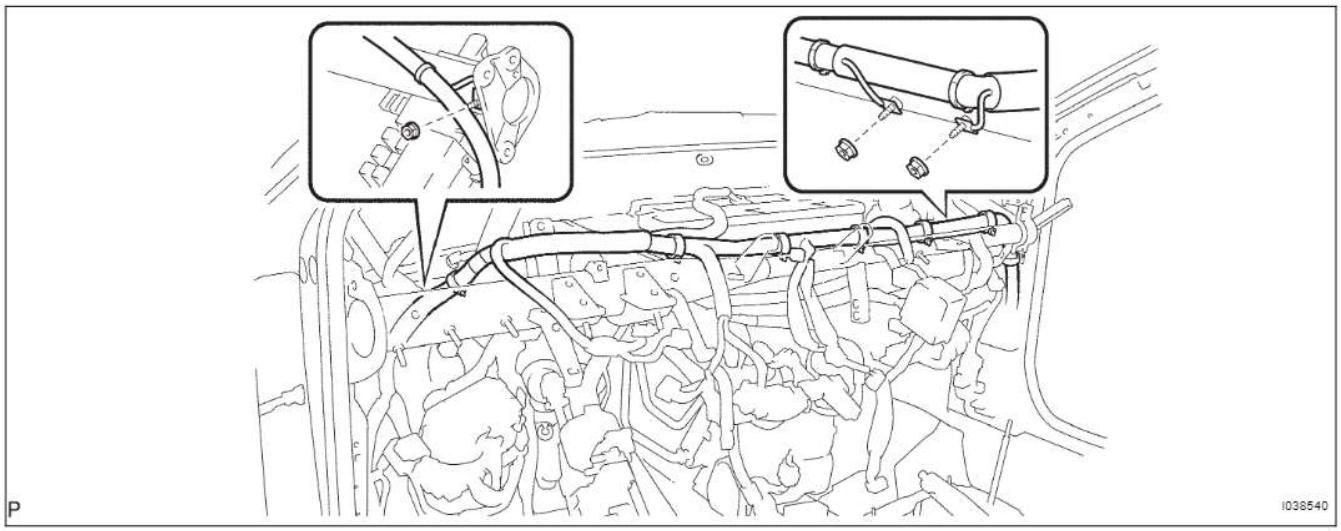
(b) Remove the bolt and 2 nuts and disconnect the steering column assembly.

19. REMOVE INSTRUMENT PANEL REINFORCEMENT ASSEMBLY

(a) Disconnect the 7 wire harness clamps from the instrument panel reinforcement assembly.

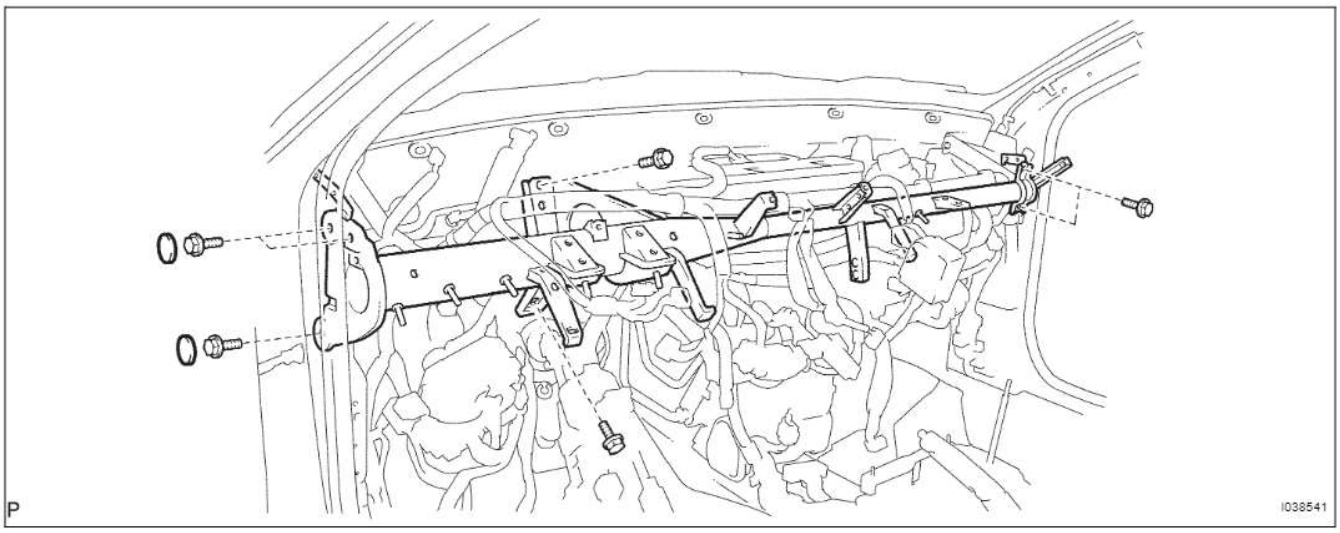


(b) Remove the 3 nuts, and disconnect the 3 earth wires from the instrument panel reinforcement assembly.



AC

(c) Remove the 3 caps, 7 bolts and instrument panel reinforcement.



20. REMOVE STEREO COMPONENT AMPLIFIER ASSEMBLY

HINT:

See page AV-85

21. REMOVE ECM

HINT:

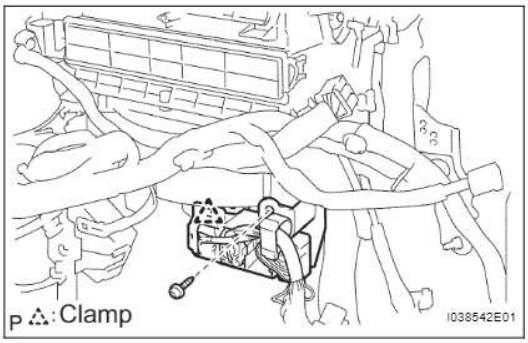
- 2AZ-FE (See page ES-333)
- 3MZ-FE (See page ES-366)

22. REMOVE BLOWER ASSEMBLY

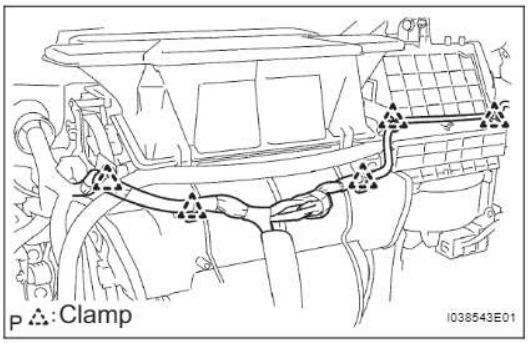
(a) Disconnect the connectors.

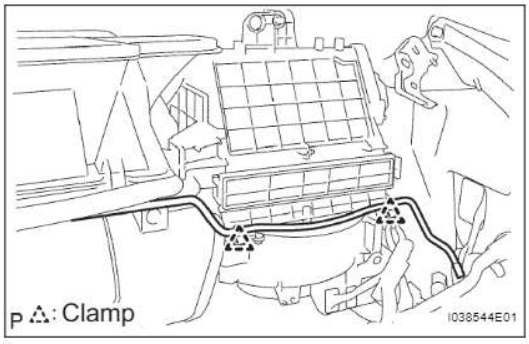
(b) Remove the screw.

(c) Disconnect the blower connector holder clamp.

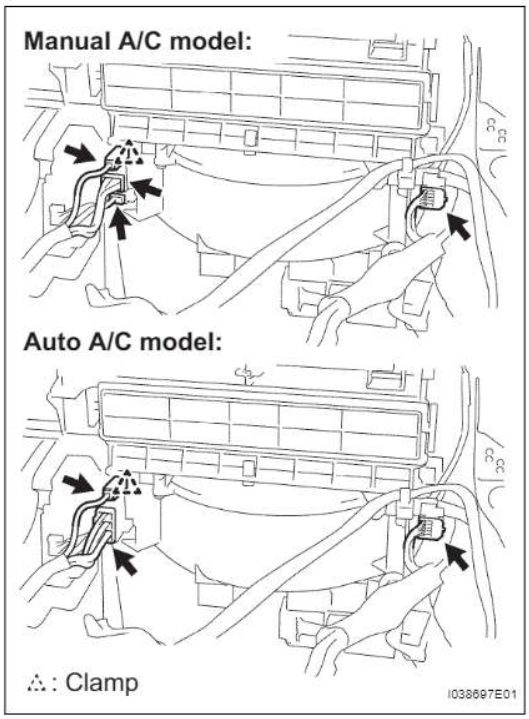


(d) Disconnect the 5 wire harness clamps.

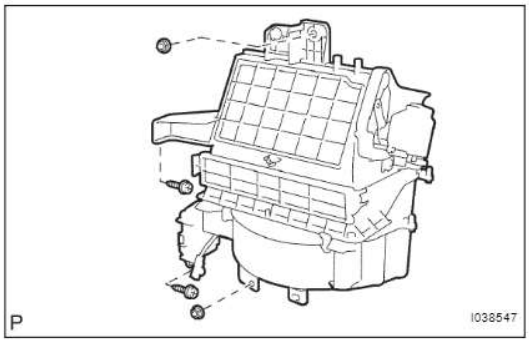




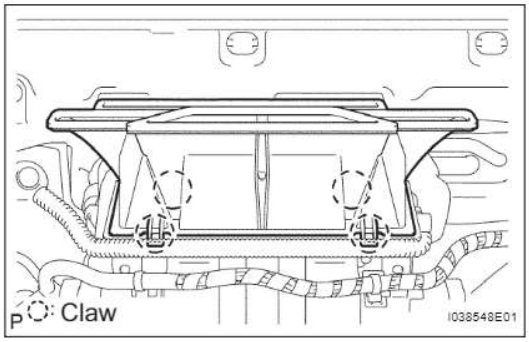
(e) w/ stereo component amplifier assembly:
Disconnect the 2 wire harness clamps.



(f) Manual A/C model:
Disconnect the 4 connectors and remove the clamp.
(g) Auto A/C model:
Disconnect the 3 connectors and remove the clamp.



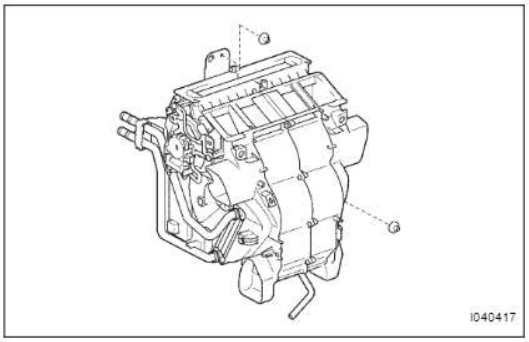
(h) Remove the 2 screws, 2 nuts and blower assembly.



23. REMOVE DEFROSTER NOZZLE ASSEMBLY LOWER

(a) Release the 4 fitting claws and remove the defroster nozzle assembly lower.

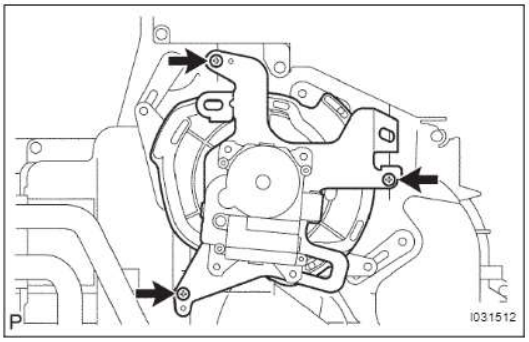
AC



24. REMOVE AIR CONDITIONING RADIATOR ASSEMBLY

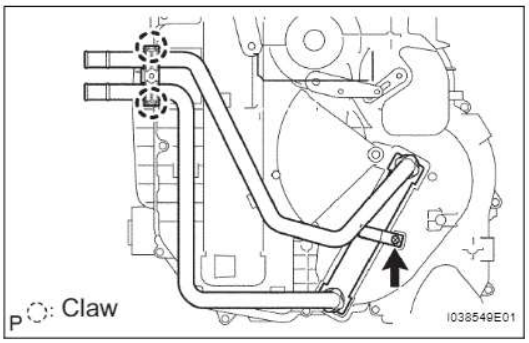
(a) Remove the drain hose.
(b) Disconnect the connectors.
(c) Remove the 2 nuts and air conditioning radiator assembly.

DISASSEMBLY



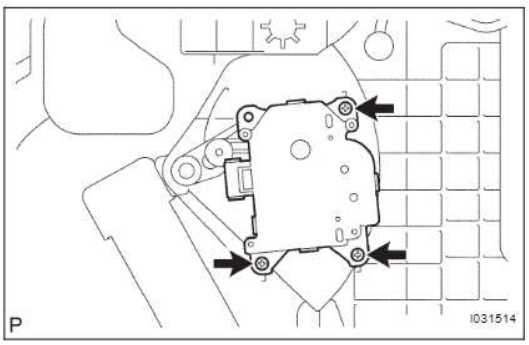
1. REMOVE MODE DAMPER SERVO SUB-ASSEMBLY

(a) Remove the 3 screws and air outlet control servomotor (mode damper servo sub-assembly).



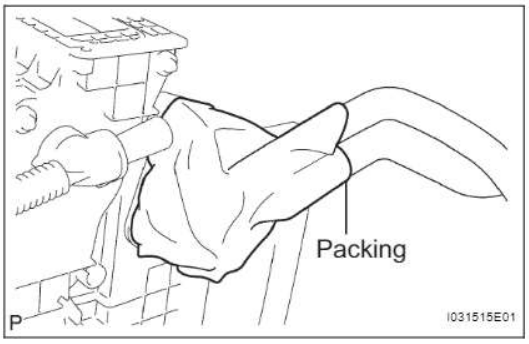
2. REMOVE HEARTER RADIATOR UNIT SUB-ASSEMBLY

(a) Remove the screw and plate.
(b) Release the 2 fitting claws and remove the piping clamp.
(c) Remove the heater radiator unit sub-assembly.
NOTICE:
Prepare a drain pan or cloth for when the cooling water leaks.



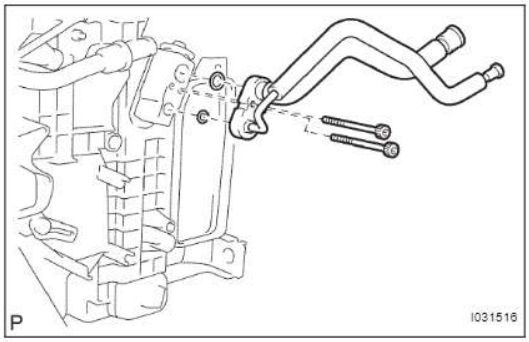
3. REMOVE AIRMIX DAMPER SERVO SUB-ASSEMBLY

(a) Remove the 3 screws and airmix control servomotor (airmix damper servo sub-assembly).

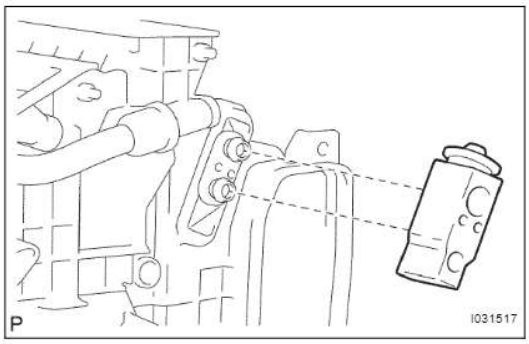


4. REMOVE AIR CONDITIONING TUBE ASSEMBLY

(a) Remove the packing.
NOTICE:
Be careful not to break the packing as it is to be reused.

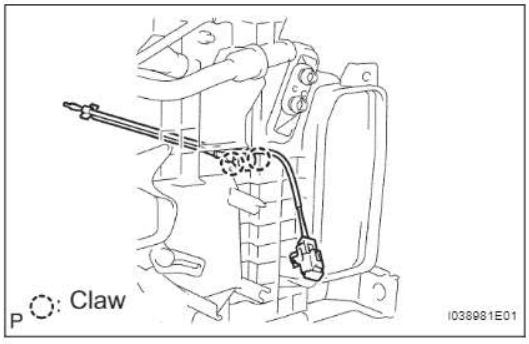


(b) Using a hexagon wrench 4 mm (0.16 in.), remove the 2 hexagon bolts and air conditioning tube assembly.
(c) Remove the 2 O-rings from the air conditioning tube assembly.



5. REMOVE COOLER EXPANSION VALVE

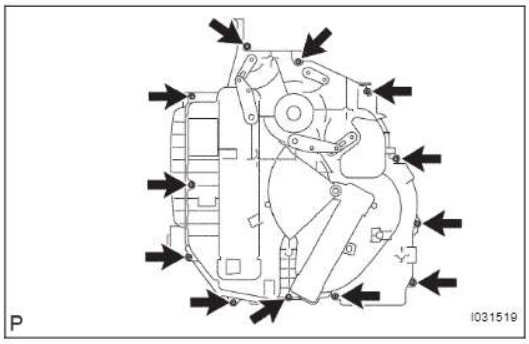
(a) Remove the cooler expansion valve from the cooler evaporator sub-assembly No.1.



6. REMOVE COOLER THERMISTOR NO.1

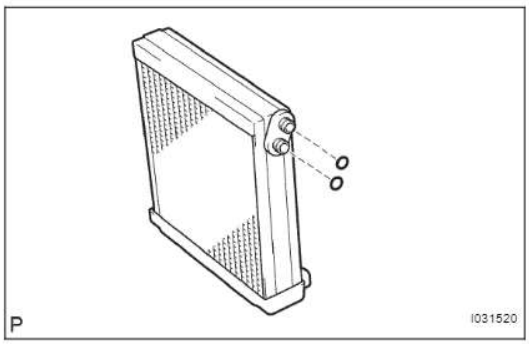
(a) Release the 2 fitting claws and remove the evaporator temperature sensor (cooler thermistor No.1).

AC



7. REMOVE COOLER EVAPORATOR SUB-ASSEMBLY NO.1

(a) Remove the 12 screws and heater case LH.



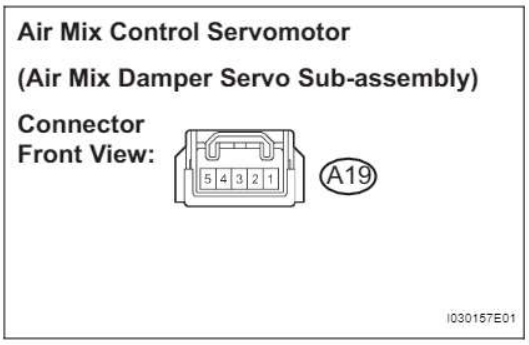
(b) Remove the cooler evaporator sub-assembly No.1 from the heater case RH.
(c) Remove the 2 O-rings from the cooler evaporator sub-assembly No.1.

INSPECTION

1. INSPECT AIR MIX DAMPER SERVO (AIR MIX DAMPER SERVO SUB-ASSEMBLY)(MANUAL AIR CONDITIONING)

HINT:

The air mix control servomotor (air mix damper servo sub-assembly) can be removed following the disassembly procedure for air conditioning radiator assembly (see page AC-130).

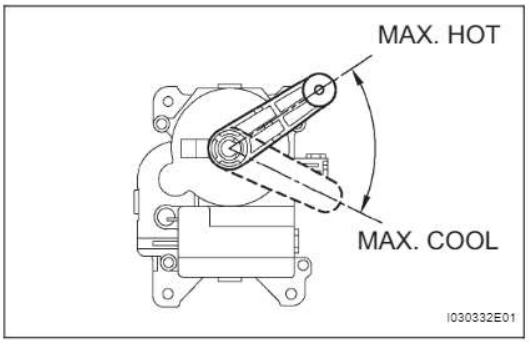


(a) Inspect servomotor operation.

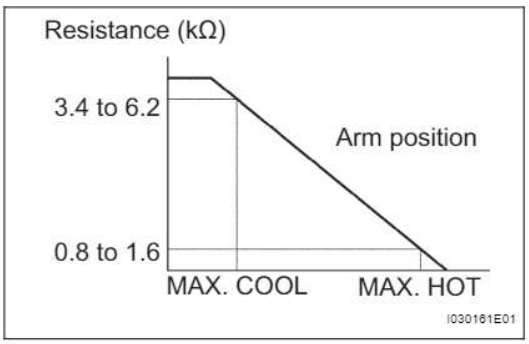
(1) Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 5, then check that the arm turns to the "MAX. COOL" side smoothly.

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

If operations are not as specified, replace the air mix servomotor.



(b) Inspect position sensor resistance.



(1) Measure the resistance between terminals at each servomotor arm position as shown in the chart.

Standard resistance

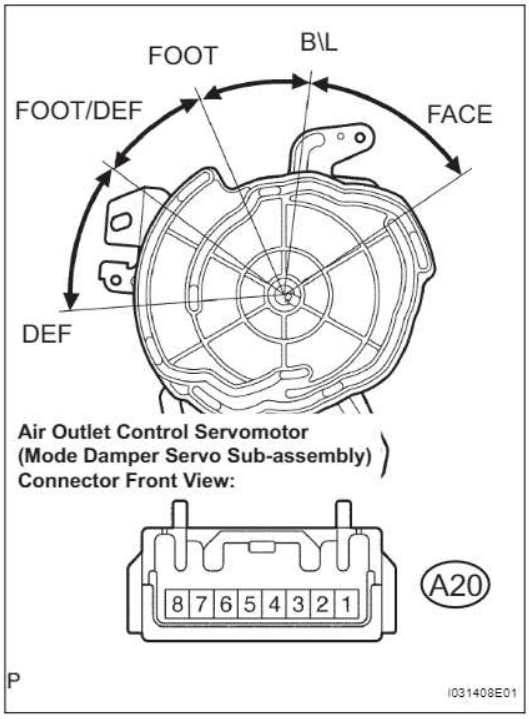
Tester Connection	Condition	Specified Condition
1 - 2	Constant	4.2 to 6.8 kΩ
1 - 3	Arm position at "MAX. COOL"	3.4 to 6.2 kΩ
1 - 3	Arm position at "MAX. HOT"	0.8 to 1.6 kΩ

If the resistance is not as specified, replace the servomotor.

2. INSPECT AIR OUTLET CONTROL SERVOMOTOR (MODE DAMPER SERVO SUB-ASSEMBLY)(MANUAL AIR CONDITIONING)

HINT:

The air outlet control servomotor (mode damper servo sub-assembly) can be removed following the disassembly procedure for air conditioning radiator assembly (see page AC-130).



(a) Inspect servomotor operation.
(1) Connect the positive (+) lead from the battery to terminal 7 and the negative (-) lead to terminal 8.
(2) Connect the negative (-) lead from the battery to each terminal as shown in the chart, and check that the shaft rotates to each position, as shown in the illustration.

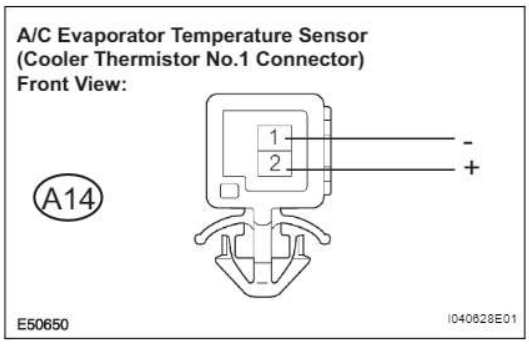
Connected terminal	Position
1	DEF
2	FOOT/DEF
3	FOOT
5	B/L
6	FACE

If operation is not as specified, replace the servomotor.

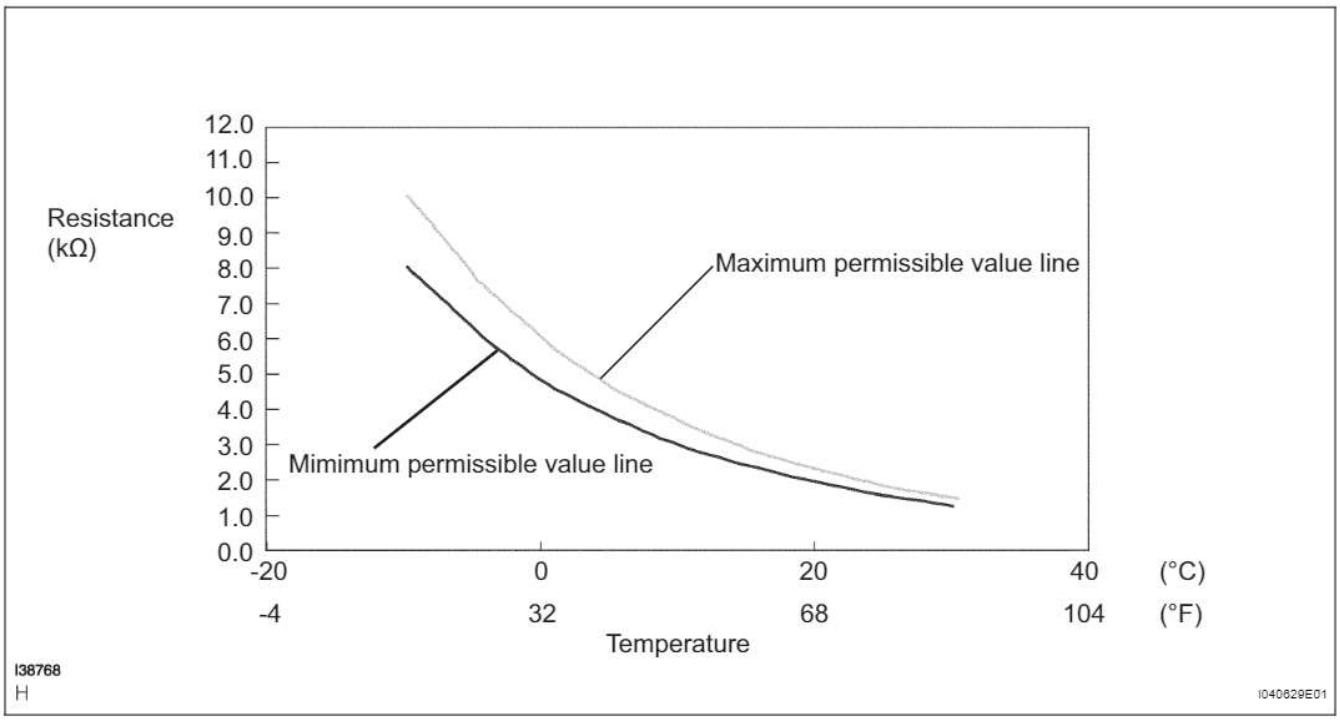
3. INSPECT A/C EVAPORATOR TEMPERATURE SENSOR (COOLER THERMISTOR NO.1)(MANUAL AIR CONDITIONING)

HINT:
The A/C evaporator temperature sensor (cooler thermistor No.1) can be removed following the disassembly procedure for the air conditioning radiator assembly (see page AC-130).

(a) Remove the A/C evaporator temperature sensor (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
1 - 2	-10°C (-50°F)	8.00 to 10.00 kΩ
1 - 2	-5°C (-41°F)	6.15 to 7.65 kΩ
1 - 2	0°C (32°F)	4.75 to 5.85 kΩ
1 - 2	5°C (41°F)	3.70 to 4.55 kΩ
1 - 2	10°C (50°F)	2.91 to 3.55 kΩ
1 - 2	15°C (59°F)	2.32 to 2.80 kΩ
1 - 2	20°C (68°F)	1.85 to 2.22 kΩ
1 - 2	25°C (77°F)	1.48 to 1.77 kΩ
1 - 2	30°C (86°F)	1.20 to 1.43 kΩ

NOTICE:

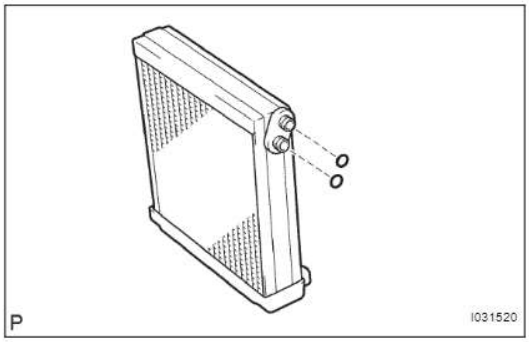
- **Even slightly touching the sensor may change the resistance value. Be sure to hold the connector of the sensor.**
- **When measure the sensor temperature must be the same as the ambient temperature.**

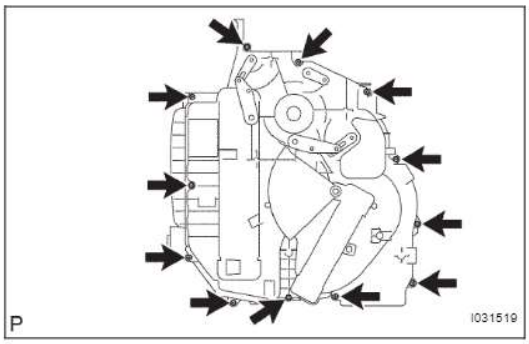
HINT:

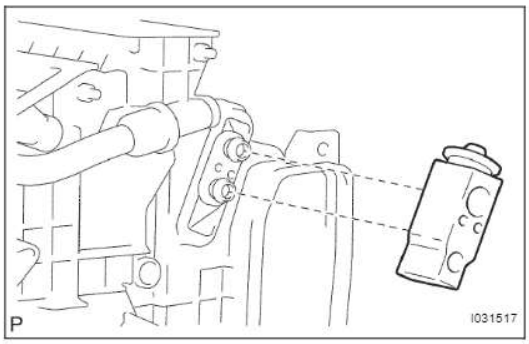
As the temperature increases, the resistance decrease (see the graph).

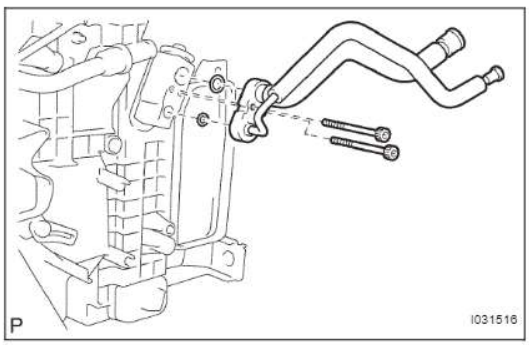
If the resistance value is not as specified, replace the A/C evaporator temperature sensor (cooler thermistor No.1).

If the resistance value is not as specified, replace the A/C evaporator temperature sensor (coolant thermistor No.1).









REASSEMBLY

1. INSTALL COOLER EVAPORATOR SUB-ASSEMBLY NO.1

(a) Sufficiently apply compressor oil to the 2 new O-rings and fitting surface of the cooler expansion valve.
Compressor oil:
ND-OIL 8 or equivalent

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

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

(d) Install the heater case LH with the 12 screws.

2. INSTALL COOLER EXPANSION VALVE

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

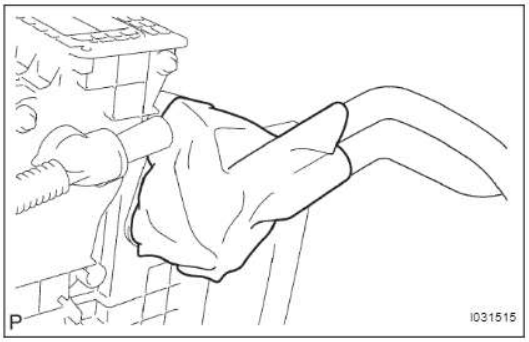
AC

3. INSTALL AIR CONDITIONING TUBE ASSEMBLY

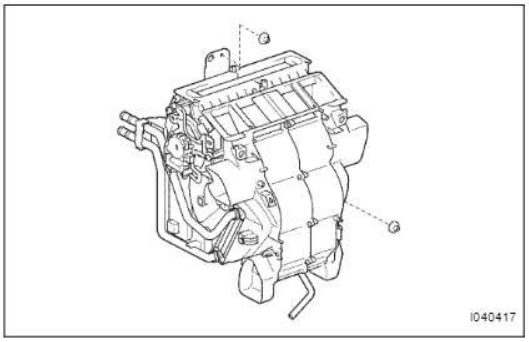
(a) Sufficiently apply compressor oil to the 2 new O-rings and fitting surface of the air conditioning tube assembly.
Compressor oil:
ND-OIL 8 or equivalent

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

(c) Using a hexagon wrench 4 mm (0.16 in.), install the air conditioner tube assembly with the 2 hexagon bolts.
Torque: 3.5 N*m (35 kgf*cm, 30 in.*lbf)



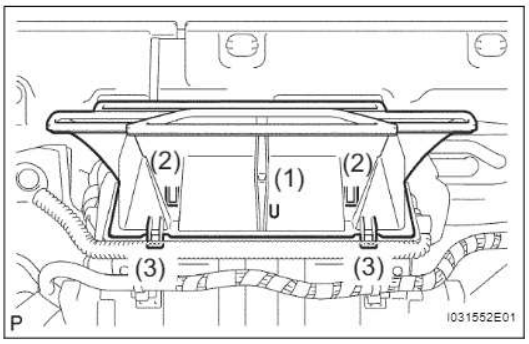
(d) Install the packing.
HINT:
Securely attach so that a gap in the packing will not occur.



INSTALLATION

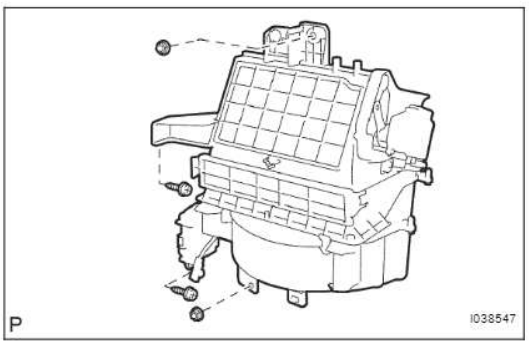
1. INSTALL AIR CONDITIONING RADIATOR ASSEMBLY

(a) Install the air conditioning radiator assembly with the 2 nuts.
Torque: 1.5 N*m (15 kgf*cm, 12 in.*lbf)
(b) Connect the connector.
(c) Install the drain hose.



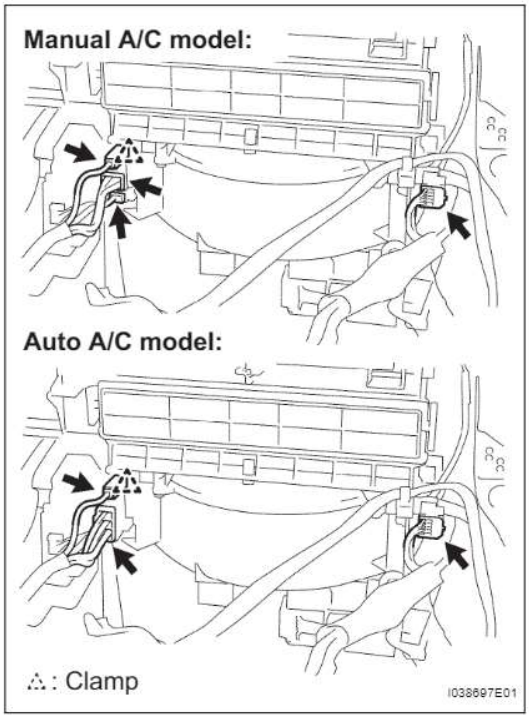
2. INSTALL DEFROSTER NOZZLE ASSEMBLY LOWER

(a) Install the defroster nozzle assembly lower.
NOTICE:
Install the pins in the order as shown in the illustration.

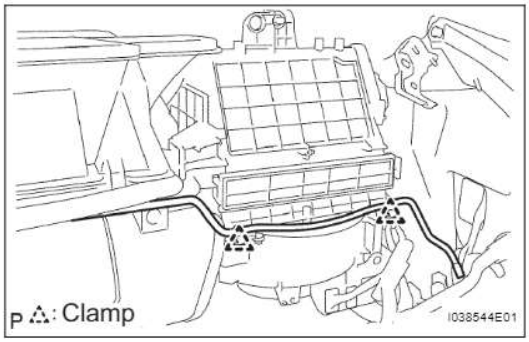


3. INSTALL BLOWER ASSEMBLY

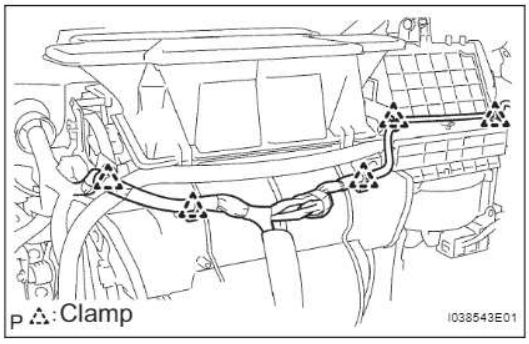
(a) Install the blower assembly with the 2 screws and 2 nuts.
Torque: Nut
1.5 N*m (15 kgf*cm, 12 in.*lbf)



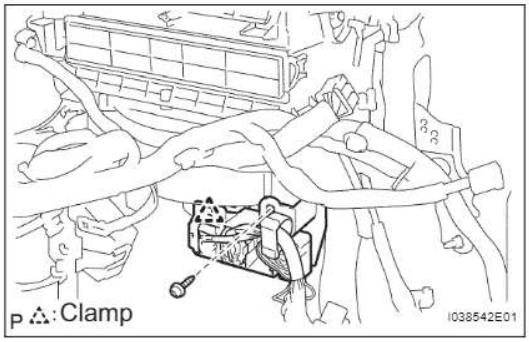
(b) Manual A/C model:
Install the clamp and connect the 4 connectors.
(c) Auto A/C model:
Install the clamp and connect the 3 connectors.



(d) w/ stereo component amplifier assembly:
Install the 2 wire harness clamps.



(e) Install the 5 wire harness clamps.

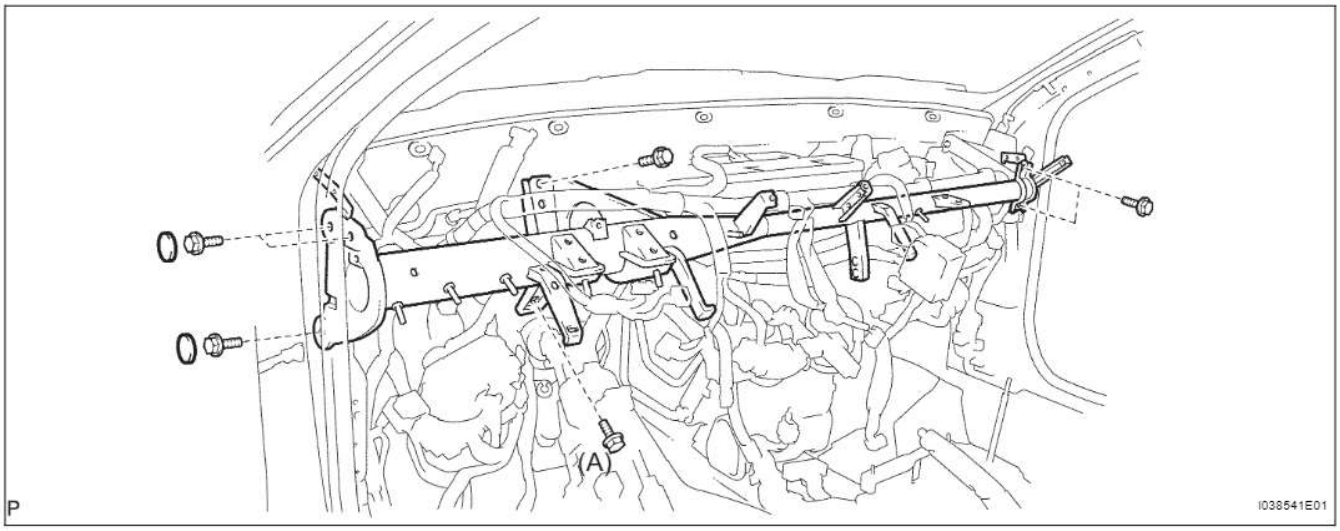


(f) Install the blower connector holder with the screw and clamp.
(g) Connect the connectors.

AC

4. INSTALL INSTRUMENT PANEL REINFORCEMENT ASSEMBLY

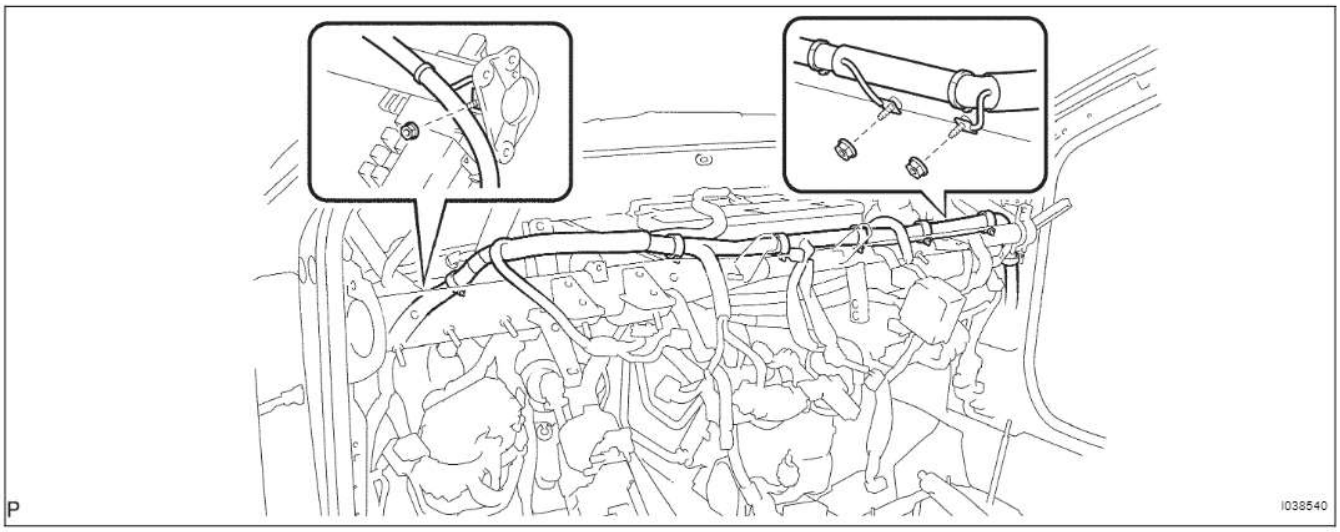
(a) Install the instrument panel reinforcement with the 7 bolts and 3 caps.



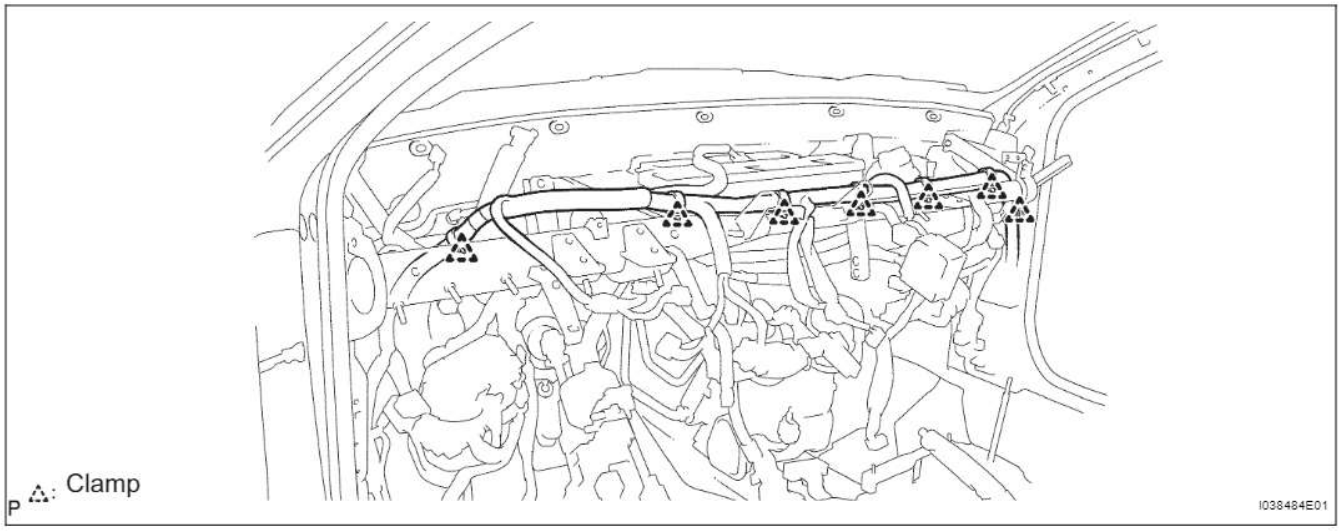
Torque: Bolt A
20 N*m (204 kgf*cm, 15 ft.*lbf)

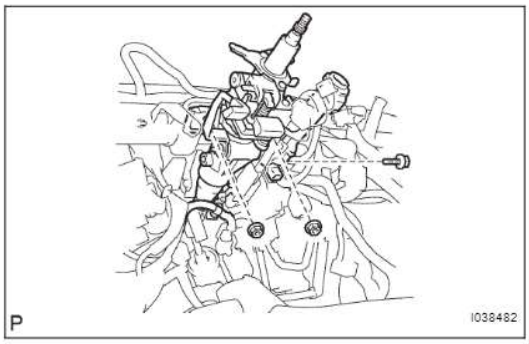
(b) Install the 3 earth wires with the 3 nuts.

AC



(c) Install the 7 wire harness clamps.

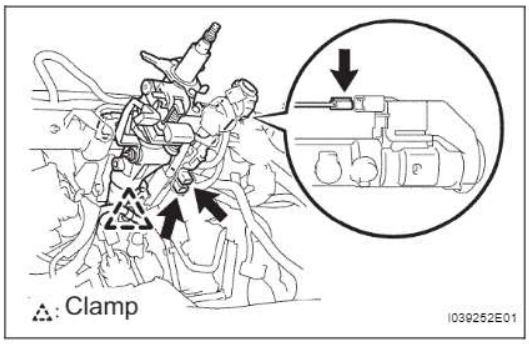




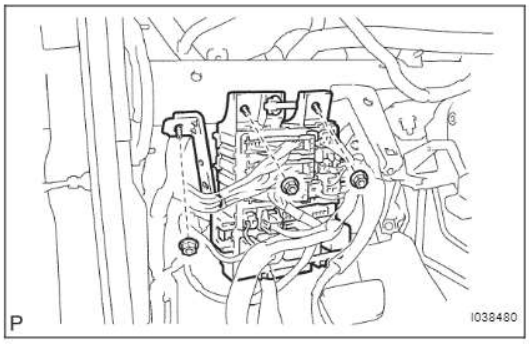
5. INSTALL STEERING COLUMN ASSEMBLY

(a) Install the steering column assembly with the 3 bolts and 2 nuts.
Torque: 21 N*m (210 kgf*cm, 15 ft.*lbf)

AC

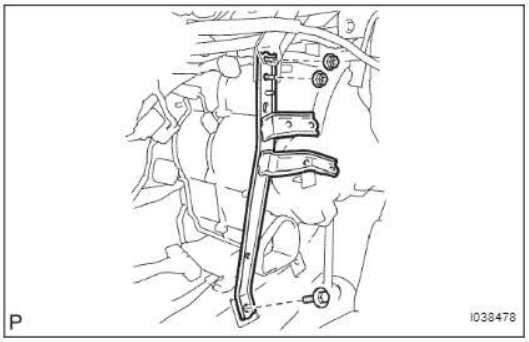


(b) Install the wire harness clamp and 3 connectors.



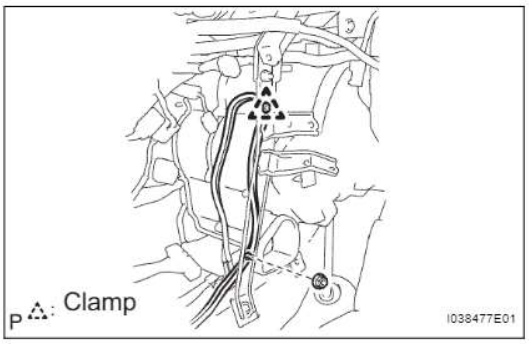
6. INSTALL INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

(a) Install the instrument panel junction block assembly with the 3 nuts.
Torque: 8.4 N*m (85 kgf*cm, 73 in.*lbf)

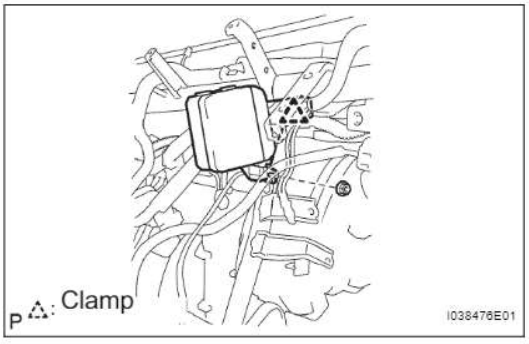


7. INSTALL INSTRUMENT PANEL BRACE SUB-ASSEMBLY NO.2

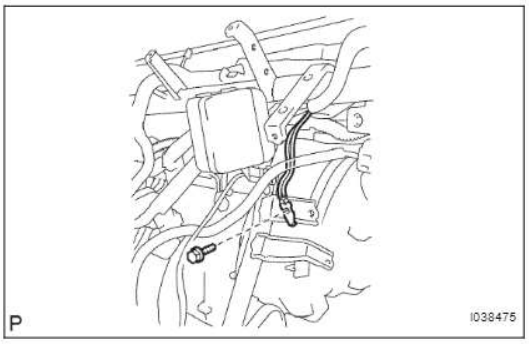
(a) Install the instrument panel brace sub-assembly No. 2 with the 2 nuts and bolt.



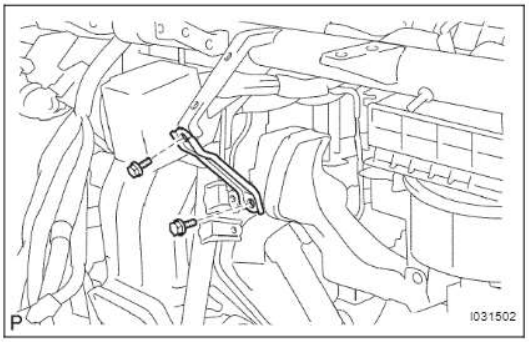
(b) Install the amplifier antenna assembly with the nut and clamp.



(c) Install the passenger side junction block with the nut and clamp.
Torque: 8.4 N*m (85 kgf*cm, 73 in.*lbf)

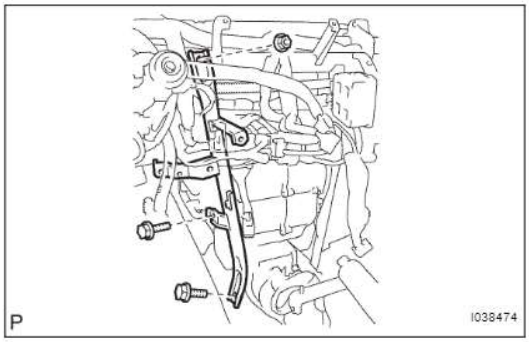


(d) Install the earth wire with the bolt.



8. INSTALL INSTRUMENT FINISH PANEL RETAINER NO.1

(a) Install the instrument finish panel retainer lower with the 2 bolts.



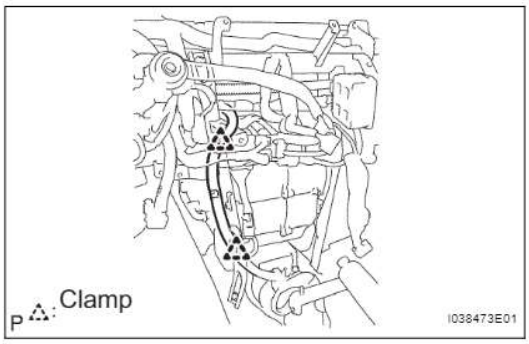
9. INSTALL INSTRUMENT PANEL BRACE SUB-ASSEMBLY NO.1

(a) Install the instrument panel brace sub-assembly No.1 with the nut and bolt.

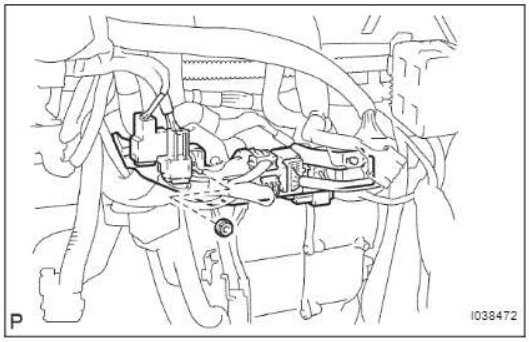
(b) Install the screw.

Torque: Screw

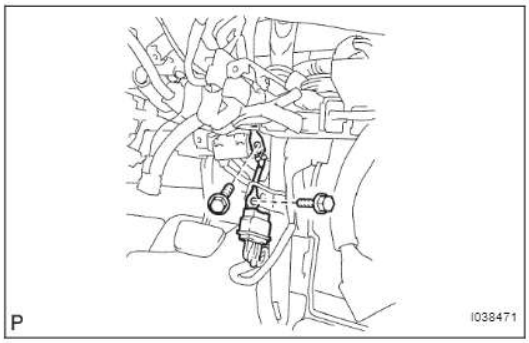
9.8 N*m (100 kgf*cm, 87 in.*lbf)



(c) Install the wire harness with the 2 wire harness clamps.



(d) Install the connector holder with the nut.

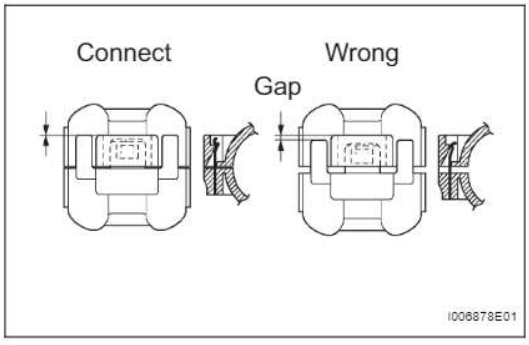


(e) Install the 2 earth wires with the 2 bolts.

10. INSTALL INSTRUMENT PANEL SAFETY PAD

HINT:

See page IP-14



11. INSTALL COOLER REFRIGERANT SUCTION HOSE 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 8 or equivalent

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

HINT:

- Be sure to connect the hose securely.

AC

- After connection, check the fitting claw of the piping clamp.

12. **REMOVE COOLER REFRIGERANT LIQUID PIPE A**
HINT:
Install in the same way as the cooler refrigerant suction hose No.1.

13. **ADD ENGINE COOLANT**
HINT:
- 2AZ-FE (See page CO-8)
- 3MZ-FE (See page CO-7)

14. **CHARGE REFRIGERANT (See page AC-115)**

15. **WARM UP ENGINE (See page AC-116)**

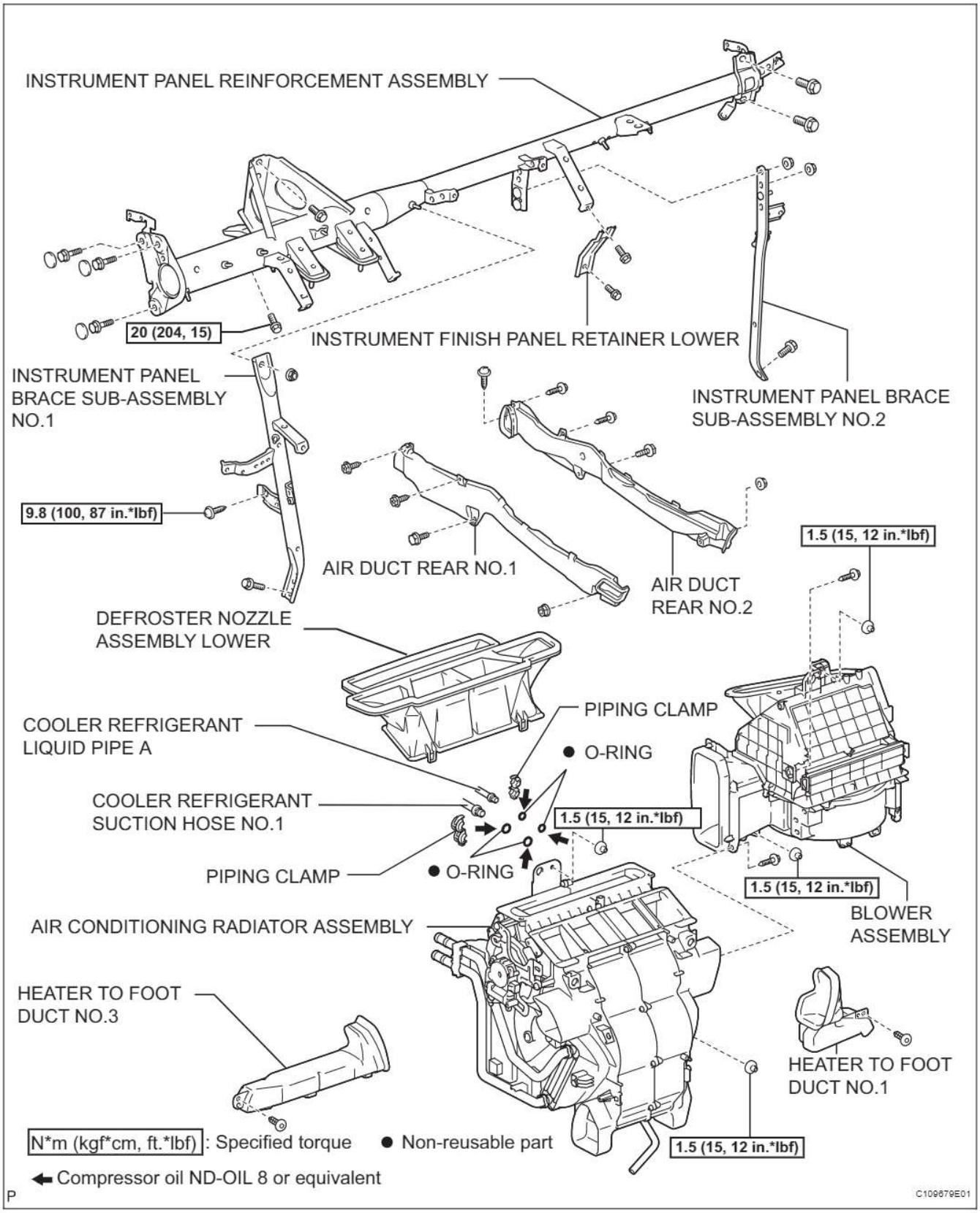
16. **CHECK FOR ENGINE COOLANT LEAKS**
HINT:
- 2AZ-FE (See page CO-9)
- 3MZ-FE (See page CO-8)

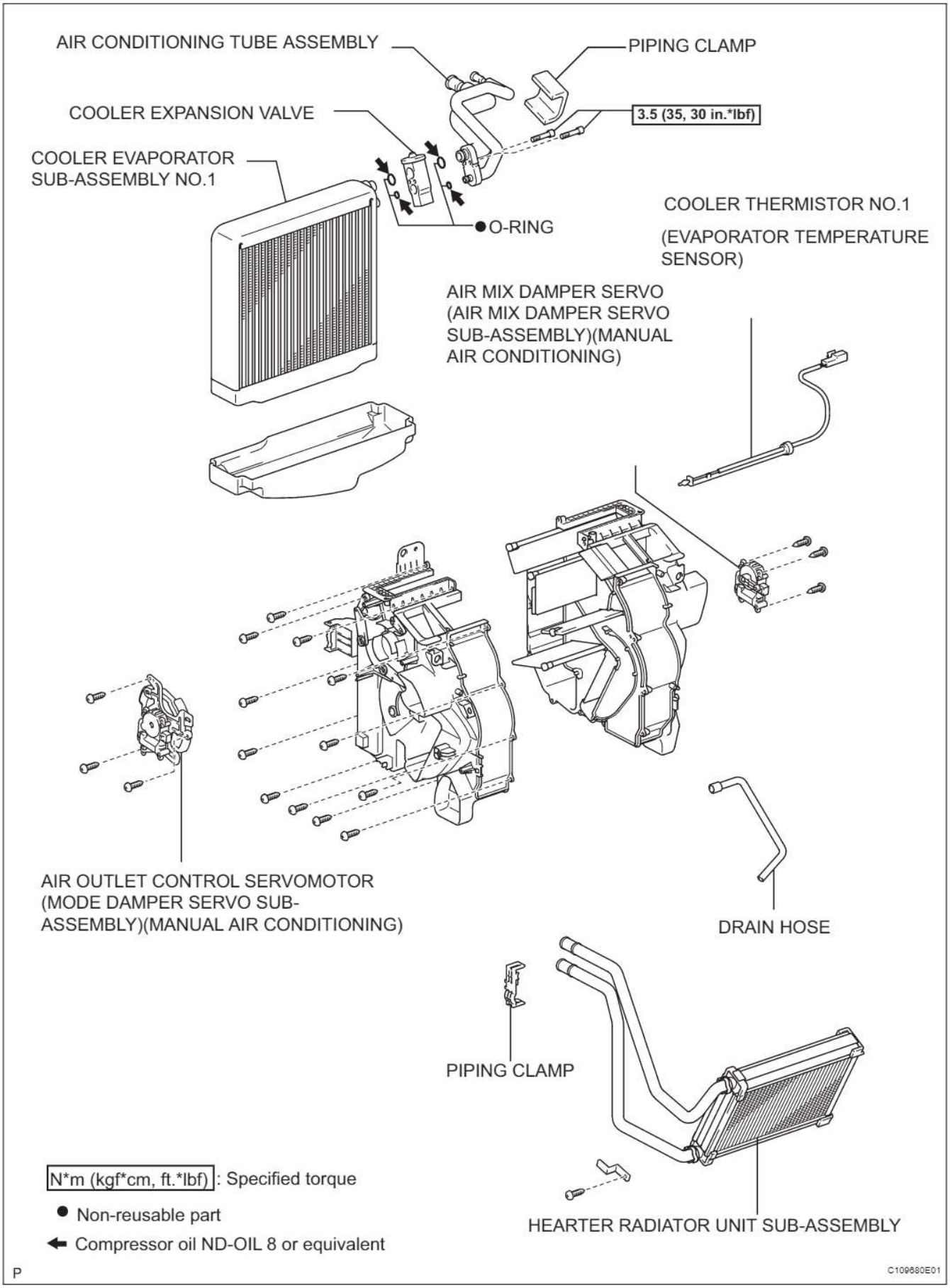
17. **INSPECT LEAKAGE OF REFRIGERANT (See page AC-116)**

AC

AIR CONDITIONING UNIT

COMPONENTS




AIR CONDITIONING TUBE ASSEMBLY
PIPING CLAMP
COOLER EXPANSION VALVE
3.5 (35, 30 in.*lbf)
COOLER EVAPORATOR SUB-ASSEMBLY NO.1
O-RING
COOLER THERMISTOR NO.1
(EVAPORATOR TEMPERATURE SENSOR)
AIR MIX DAMPER SERVO (AIR MIX DAMPER SERVO SUB-ASSEMBLY)(MANUAL AIR CONDITIONING)
AIR OUTLET CONTROL SERVOMOTOR (MODE DAMPER SERVO SUB-ASSEMBLY)(MANUAL AIR CONDITIONING)
DRAIN HOSE
PIPING CLAMP
HEARTER RADIATOR UNIT SUB-ASSEMBLY
N*m (kgf*cm, ft.*lbf): Specified torque
Non-reusable part
Compressor oil ND-OIL 8 or equivalent
P
C109680E01

AC

INSPECTION

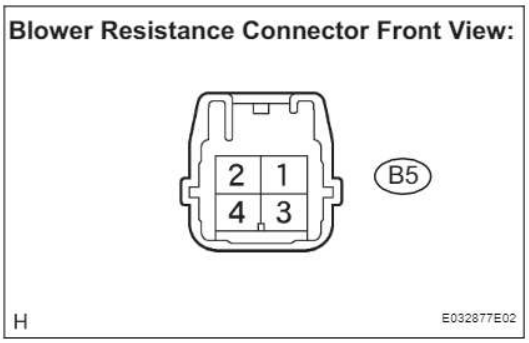
1. INSPECT BLOWER RESISTOR

HINT:
The blower resistor can be removed following the removal and disassembly procedure for the blower assembly (See page AC-145 and AC-144).

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

Tester Connection	Specified Condition
1 - 2	1.398 to 1.605 Ω
1 - 3	0.465 to 0.535 Ω
1 - 4	3.069 to 3.531 Ω

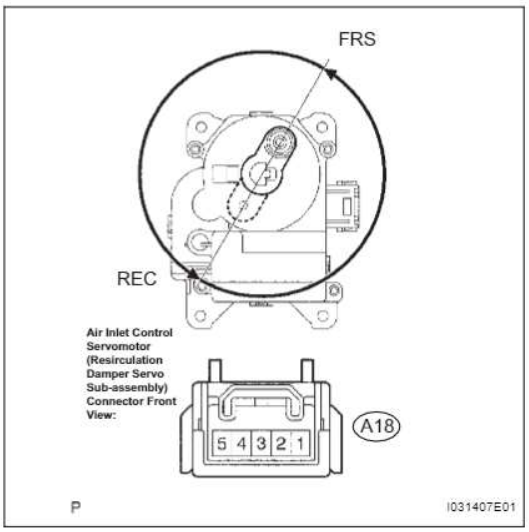
If the resistance is not as specified, replace the blower resistor.



2. INSPECT AIR INLET CONTROL SERVOMOTOR (RECIRCULATION DAMPER SERVO SUB-ASSEMBLY)

HINT:
The air inlet control servomotor (recirculation damper servo sub-assembly) can be removed following the removal procedure for the blower assembly (See page AC-144).

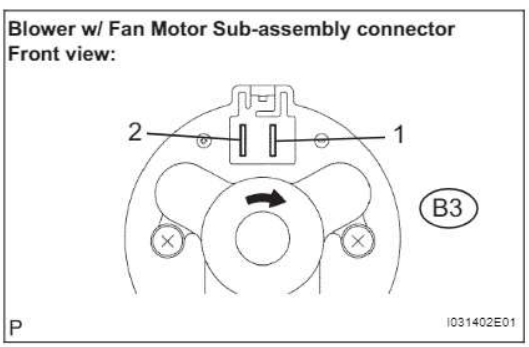
(a) Inspect servomotor operation.
(1) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 1, then check that the arm turns to the "REC" side smoothly.
(2) Connect the positive (+) lead from the battery to terminal 5 and negative (-) lead to terminal 2, then check that the arm turns to the "FRS" side smoothly.
If operations are not as specified, replace the servomotor.



3. INSPECT BLOWER W/FAN MOTOR SUB-ASSEMBLY

HINT:
The blower w/fan motor sub-assembly can be removed following the removal and disassembly procedure for the blower assembly.
(See page AC-145 and AC-144).

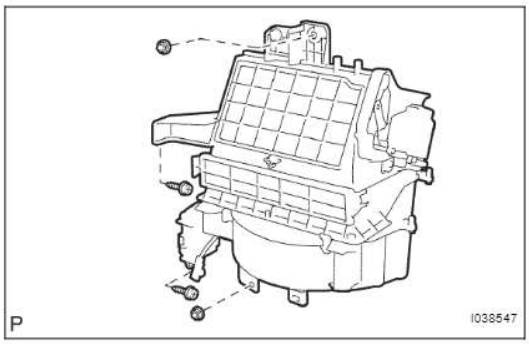
(a) Connect the positive (+) lead from the battery to terminal 2 and negative (-) lead to terminal 1, then check that the motor operates smoothly.
If operation is not as specified, replace the blower motor.



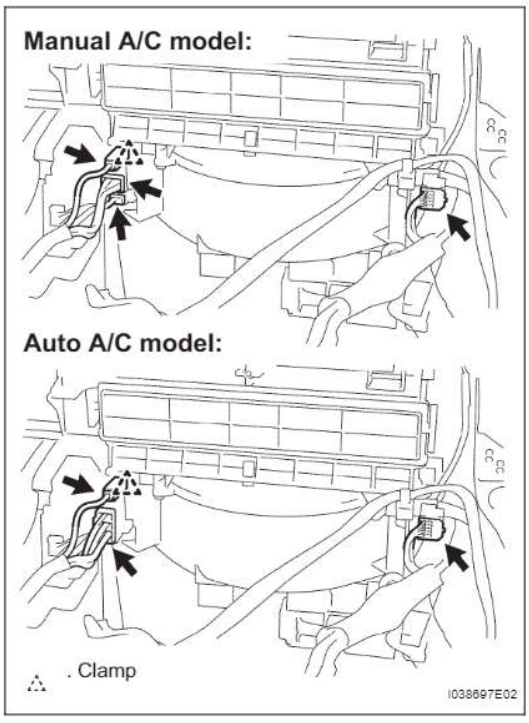
REASSEMBLY

1. INSTALL BLOWER W/FAN MOTOR SUB-ASSEMBLY
2. INSTALL BLOWER MOTOR CONTROL
3. INSTALL BLOWER RESISTOR
4. INSTALL INSTRUMENT PANEL WIRE NO.3
5. INSTALL RECIRCULATION DAMPER SERVO SUB-ASSEMBLY
6. INSTALL COWL WIRE NO.2
7. INSTALL CLEAN AIR FILTER

INSTALLATION

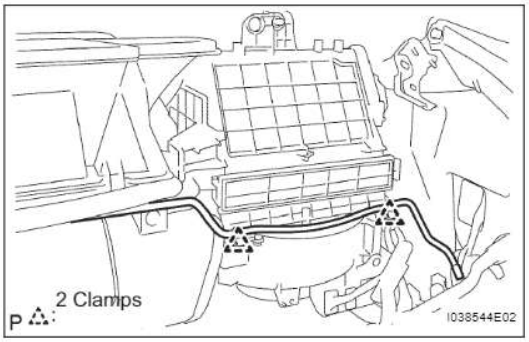


1. INSTALL BLOWER ASSEMBLY
   (a) Install the blower assembly with the 2 screws and 2 nuts.
   Torque: Nut
   1.5 N*m (15 kgf*cm, 12 in.*lbf)

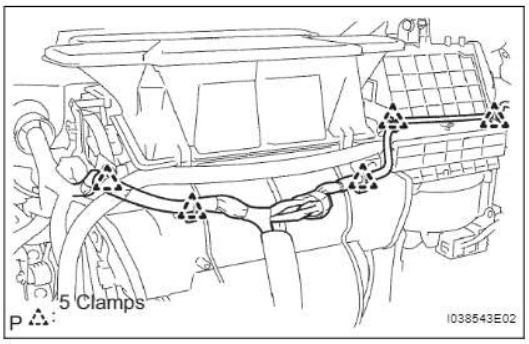


   (b) Manual A/C model:
   Install the clamp and connect the 4 connectors.
   (c) Auto A/C model:
   Install the clamp and connect the 3 connectors.

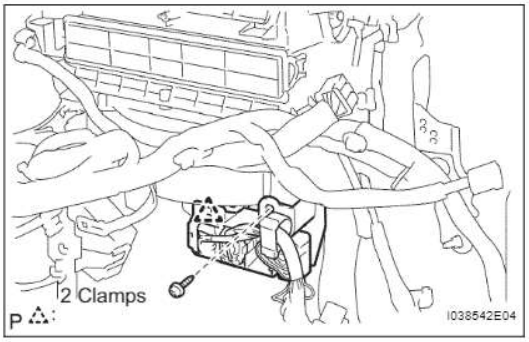
AC



(d) w/ stereo component amplifier assembly:
Install the 2 wire harness clamps.



(e) Install the 5 wire harness clamps.



(f) Install the blower connector holder with the screw and clamp.
(g) Connect the connectors.

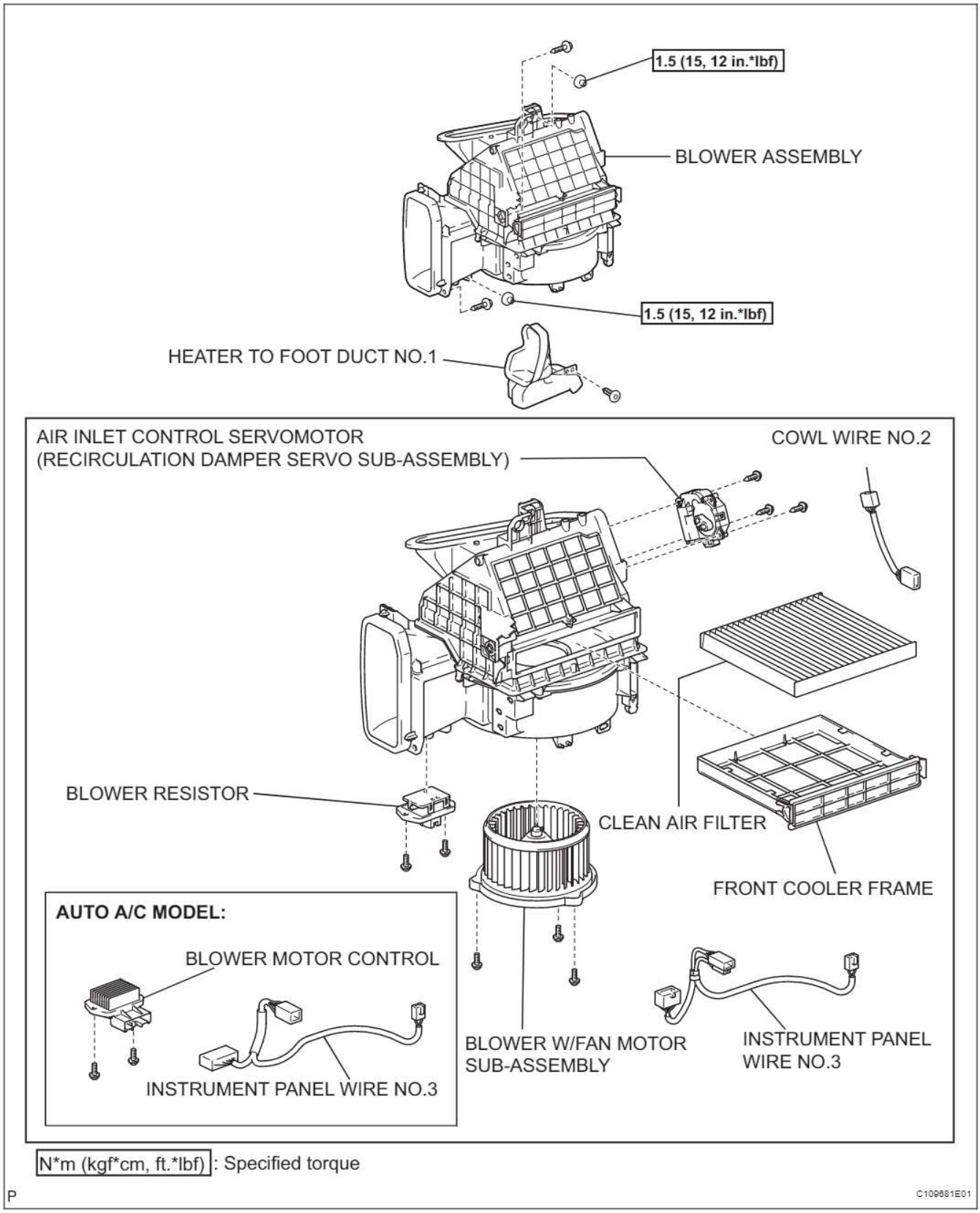
2. INSTALL INSTRUMENT PANEL SAFETY PAD

HINT:
See page IP-14

AC

BLOWER UNIT

COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

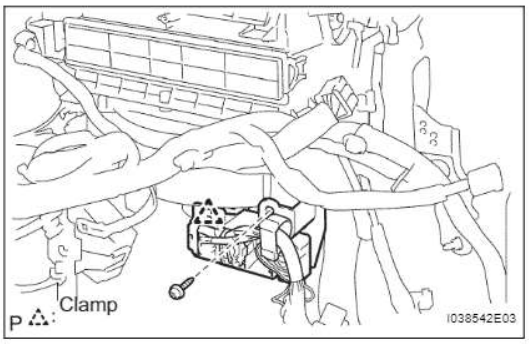
P C109681E01

AC

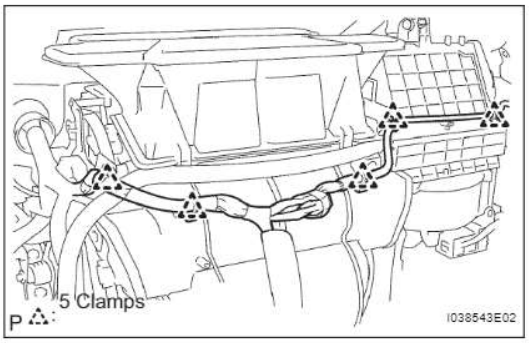
REMOVAL

HINT:
- Installation is in the reverse order of removal.
- COMPONENTS: See page AC-143 and IP-1

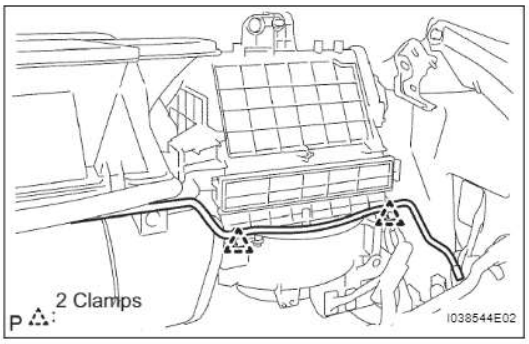
1. **REMOVE INSTRUMENT PANEL SAFETY PAD**
   HINT:
   See page IP-6
2. **REMOVE HEATER TO FOOT DUCT NO.1 (See page AC-126)**
3. **REMOVE STEREO COMPONENT AMPLIFIER ASSEMBLY**
   HINT:
   See page AV-85
4. **REMOVE ECM**
   HINT:
   - 2AZ-FE (See page ES-333)
   - 3MZ-FE (See page ES-366)
5. **REMOVE BLOWER ASSEMBLY**
   (a) Disconnect the connectors.
   (b) Remove the screw, clamp and blower connector holder.

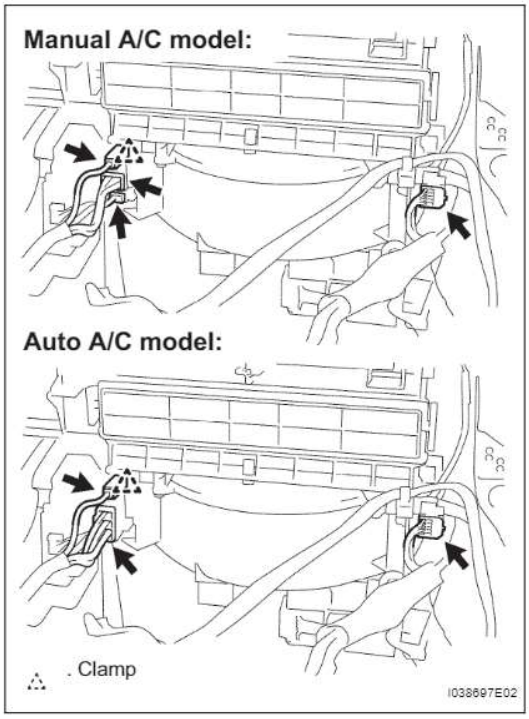


(c) Disconnect the 5 wire harness clamps.

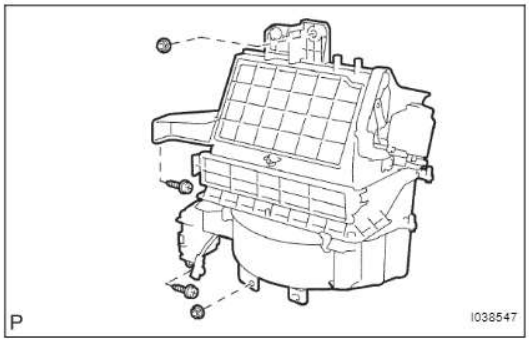


(d) w/ stereo component amplifier assembly:
Disconnect the 2 wire harness clamps.





(e) Manual A/C model:
Disconnect the 4 connectors and remove the clamp.
(f) Auto A/C model:
Disconnect the 3 connectors and remove the clamp.

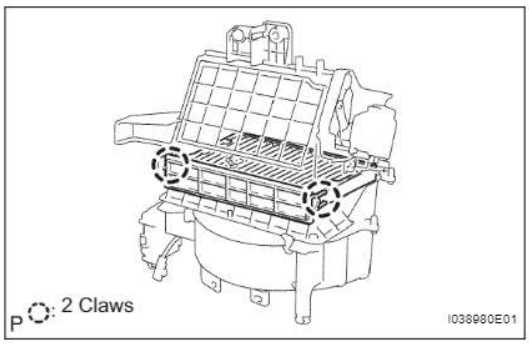


(g) Remove the 2 screws, 2 nuts and blower assembly.

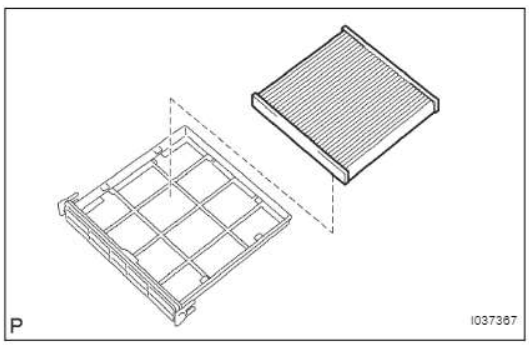
AC

DISASSEMBLY

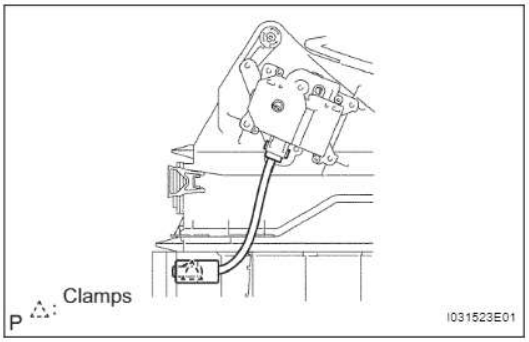
1. REMOVE CLEAN AIR FILTER



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

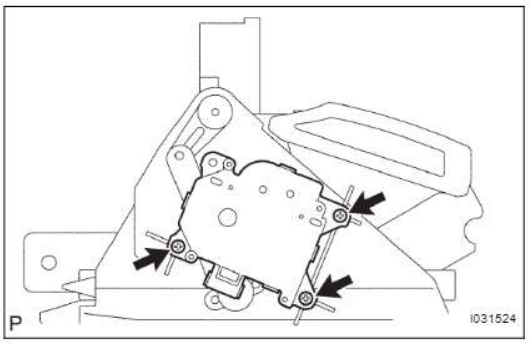


(b) Remove the clean air filter from the front cooler frame.



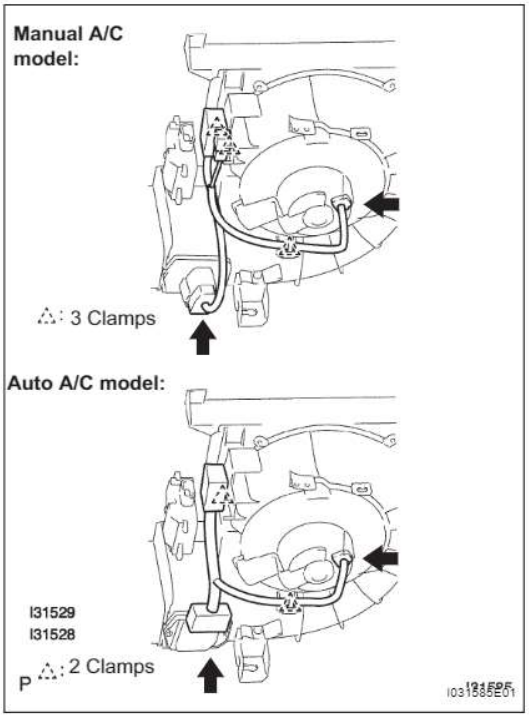
2. REMOVE COWL WIRE NO.2

(a) Remove the clamp and cowl wire No. 2.



3. REMOVE RECIRCULATION DAMPER SERVO SUB-ASSEMBLY

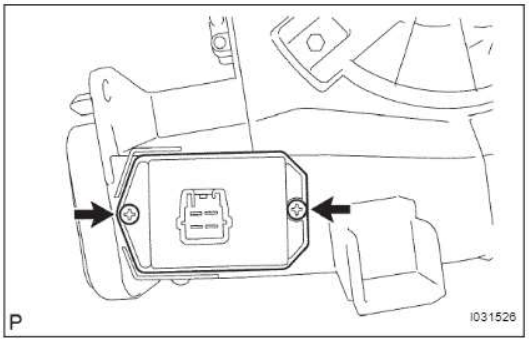
(a) Remove the 3 screws and air inlet servomotor (recirculation damper servo sub-assembly).



4. REMOVE INSTRUMENT PANEL WIRE NO.3

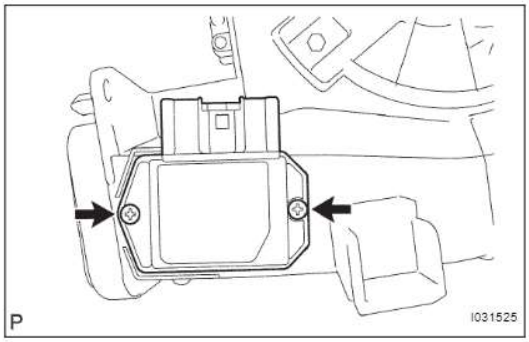
(a) Manual A/C model:
Disconnect the 2 connectors and remove the 3 clamps and instrument panel wire No. 3.

(b) Auto A/C model:
Disconnect the 2 connectors and remove the 2 clamps and instrument panel wire No. 3.



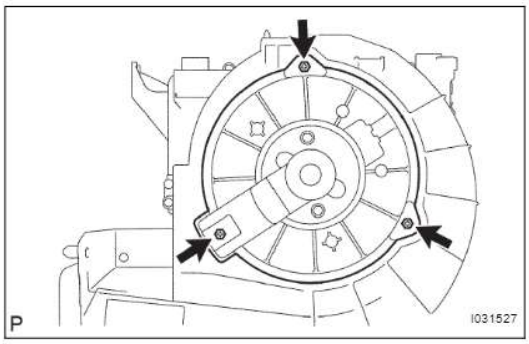
5. REMOVE BLOWER RESISTOR

(a) Remove the 2 screws and blower resistor.



6. REMOVE BLOWER MOTOR CONTROL

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



7. REMOVE BLOWER W/FAN MOTOR SUB-ASSEMBLY

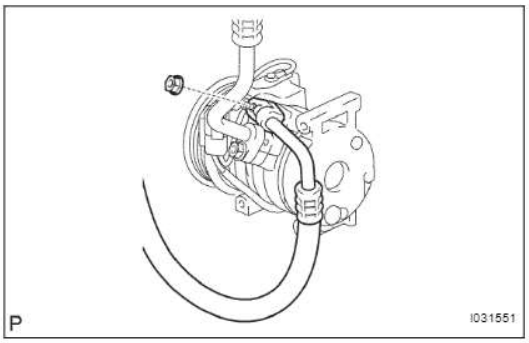
(a) Remove the 3 screws and blower w/ fan motor sub-assembly.

AC

REMOVAL

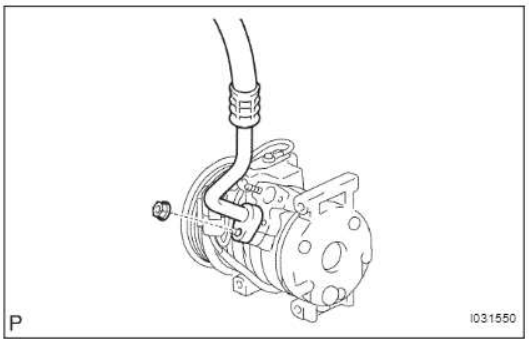
HINT:
COMPONENTS: See page AC-150

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page AC-115)**
2. **REMOVE FAN AND GENERATOR V BELT**
   SST 09249-63010
   HINT:
   See page EM-5
3. **REMOVE ALTERNATOR ASSEMBLY W/ REGULATOR (See page CH-8)**
4. **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.

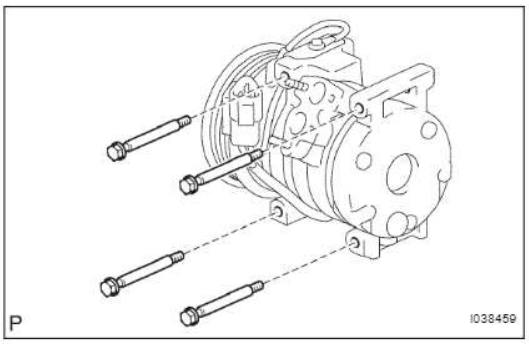


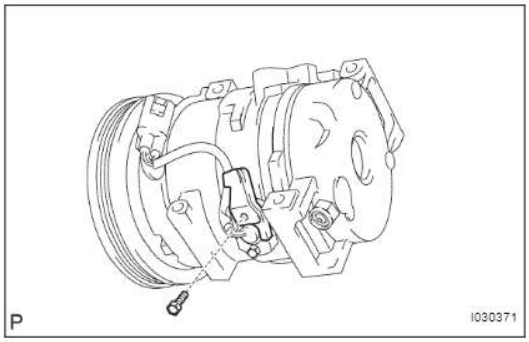
AC

5. **DISCONNECT COOLER REFRIGERANT SUCTION HOSE NO.1**
   (a) Remove the nut 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) Disconnect the connector.
   (b) Remove the 4 bolts and compressor and magnetic clutch.

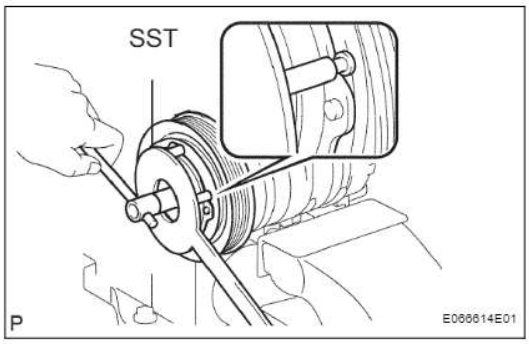




7. REMOVE MAGNET CLUTCH ASSEMBLY

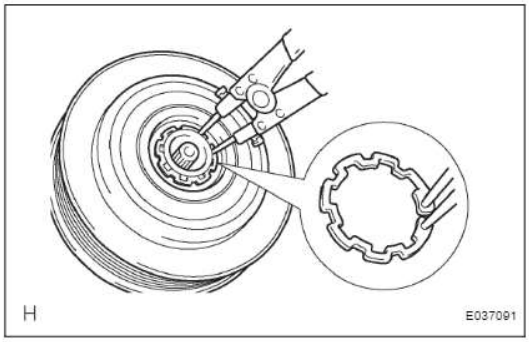
(a) Remove the bolt and bracket.

(b) Place the compressor and magnetic clutch in a vise.



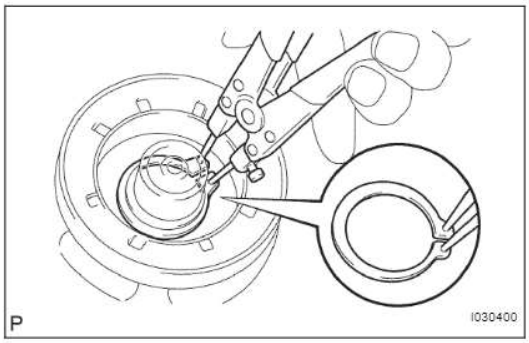
(c) Using SST, hold the magnet clutch hub.
SST 95047-10400

(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.

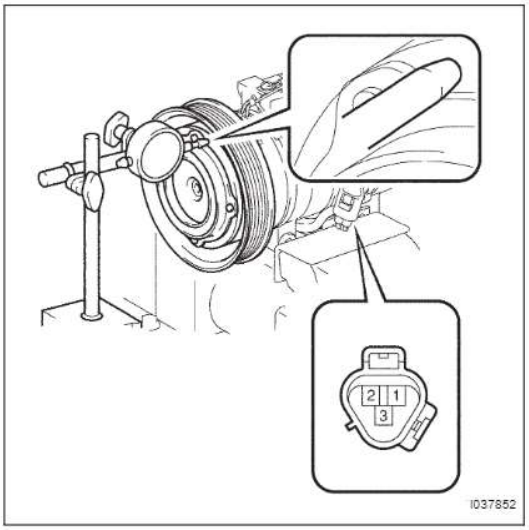


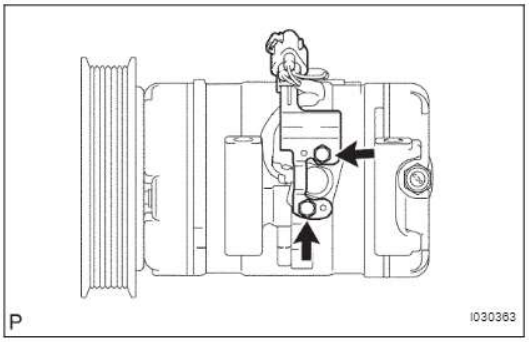
(e) Using a snap ring expander, remove the snap ring and magnet clutch rotor.
NOTICE:
Do not damage the seal cover of the bearing when removing the snap ring.

(f) Disconnect the connector.



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





INSPECTION

1. INSPECT MAGNETIC CLUTCH CLEARANCE

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

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

Standard clearance:

0.35 to 0.60 mm (0.014 to 0.024 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 the bracket with the 2 bolts.

2. ADJUST 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.

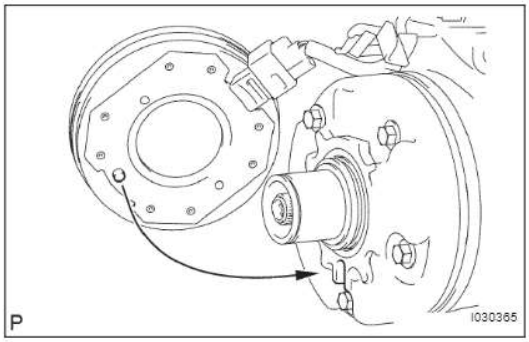
Amount of oil:

(Oil capacity inside new compressor and magnetic clutch: 120 + 15 cc (4.1 + 0.51 fl.oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing from the new compressor)

NOTICE:

- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing 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.**

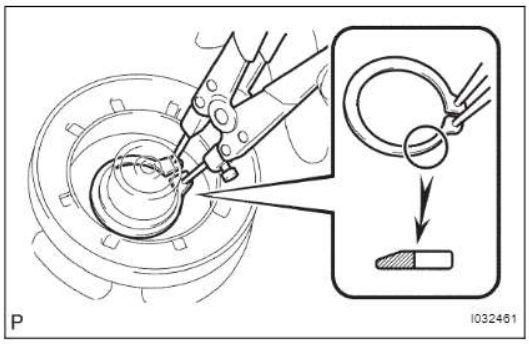
AC



INSTALLATION

1. INSTALL MAGNET CLUTCH ASSEMBLY

(a) Matching the parts shown in the illustration, install the magnet clutch starter.

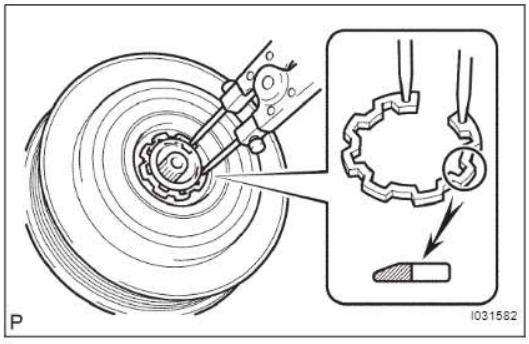


(b) Using a snap ring expander, install a new snap ring with the chamfered side facing up.

NOTICE:

Do not damage the seal cover of the bearing when installing the snap ring.

(c) 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.

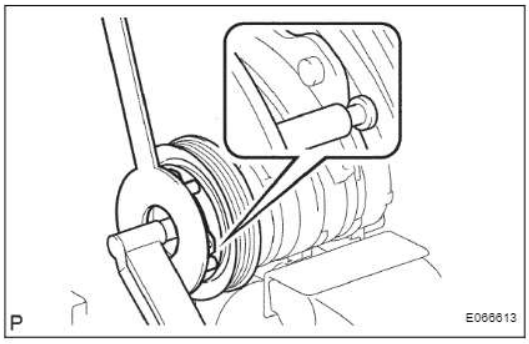
NOTICE:

- **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 installing 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 vise pliers, hold the magnet clutch hub and install the bolt.

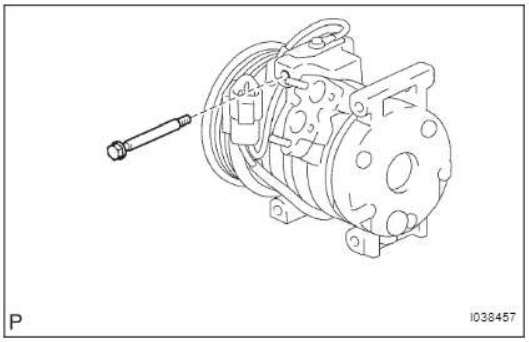
SST 95047-10400

Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)

NOTICE:

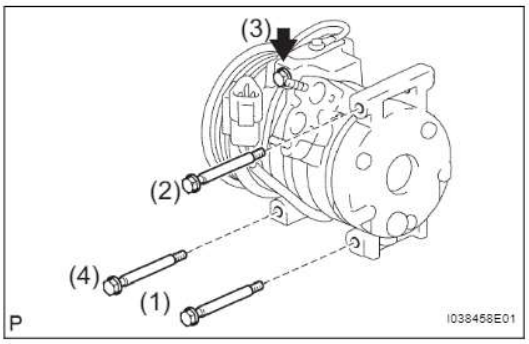
Make sure that there is no foreign matter or oil on the compressor shaft, bolt, and clutch hub.

AC



2. TEMPORARILY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

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



3. FULLY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

(a) Tighten the compressor and magnetic clutch with the 4 bolts.
Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)
NOTICE:
Tighten the bolts in the numerical order shown in the illustration to install the compressor and magnetic clutch.

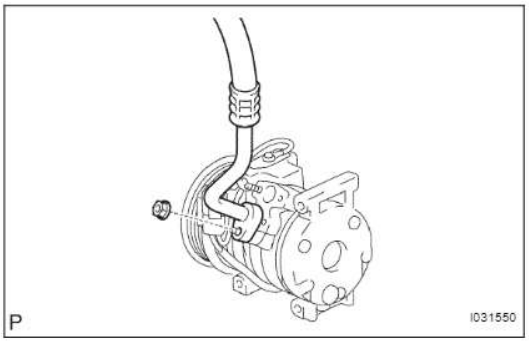
(b) Connect the connector.

4. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

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

(b) Sufficiently apply compressor oil to a 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 nut .
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

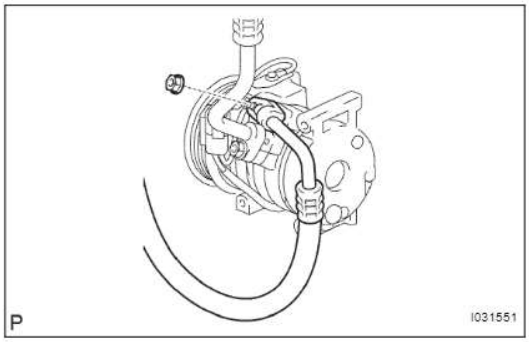
5. INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1

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

(b) Sufficiently apply compressor oil to a 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.

AC



(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)

6. **INSTALL ALTERNATOR ASSEMBLY W/ REGULATOR (See page CH-14)**

7. **INSTALL FAN AND GENERATOR V BELT**
SST 09249-63010
HINT:
See page EM-5

8. **CHARGE REFRIGERANT (See page AC-115)**

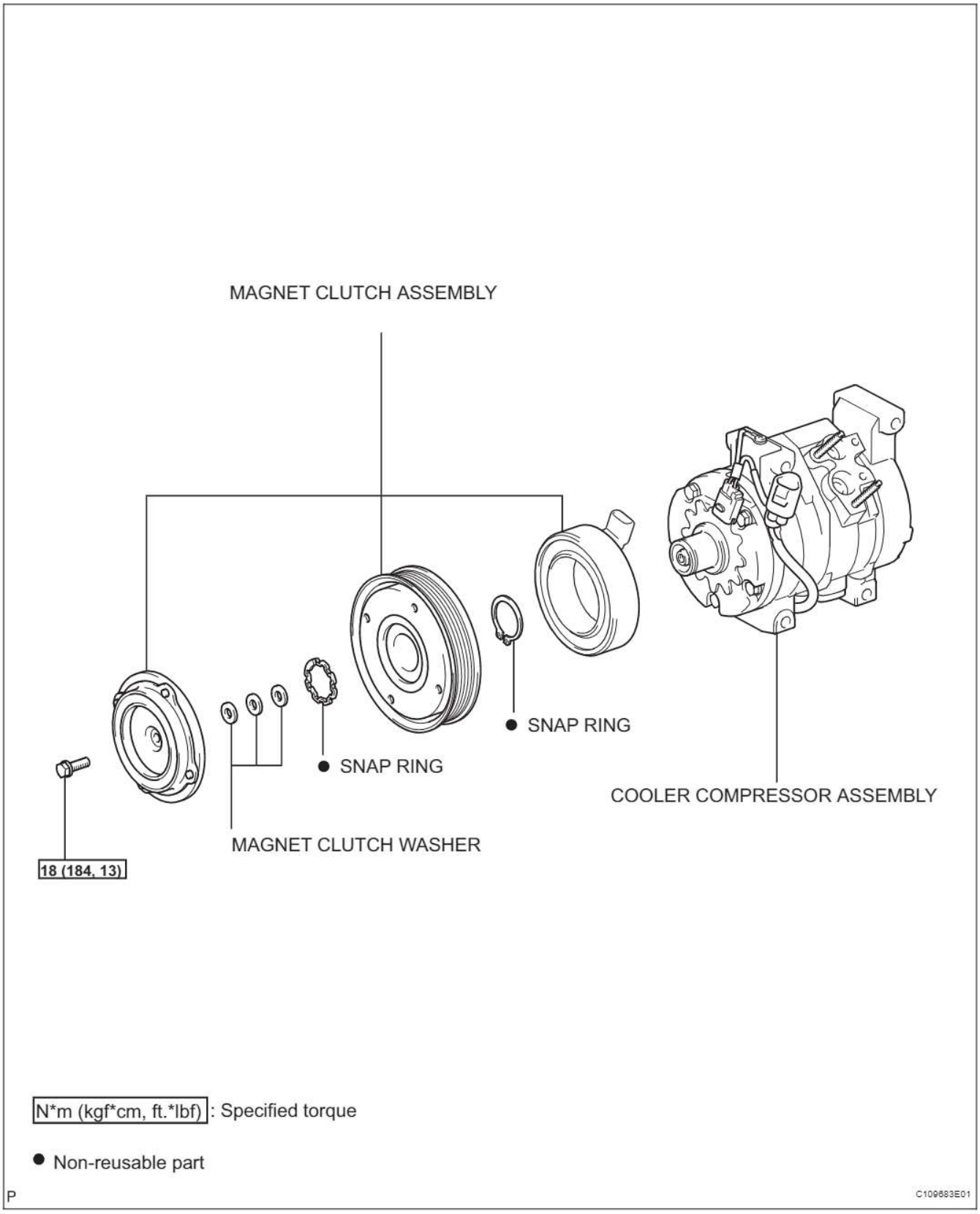
9. **WARM UP ENGINE (See page AC-116)**

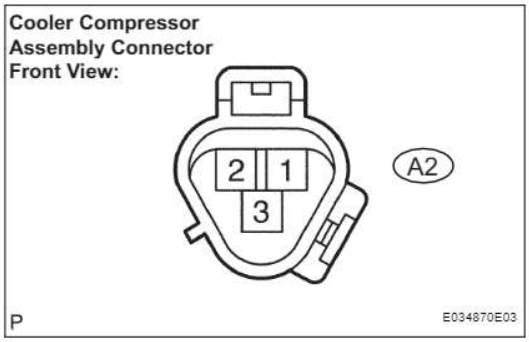
10. **INSPECT LEAKAGE OF REFRIGERANT (See page AC-116)**

AC

2AZ-FE COMPRESSOR AND MAGNETIC CLUTCH

COMPONENTS





ON-VEHICLE INSPECTION

1. 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 20°C (68°F)	185 +- 20 Ω

If the resistance is not as specified, replace the cooler compressor assembly.

AC

REMOVAL

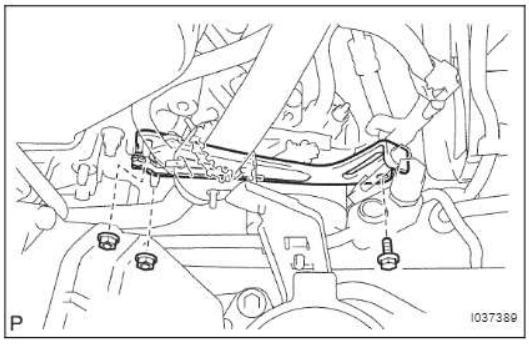
HINT:
COMPONENTS : See page AC-157

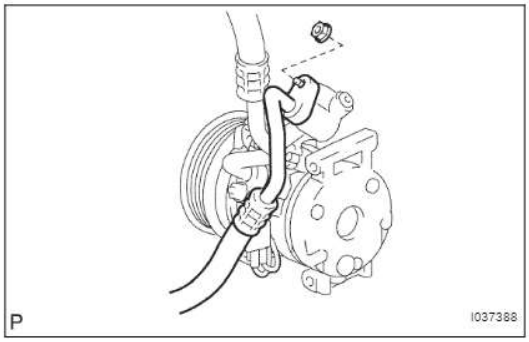
1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM (See page AC-115)**

2. **REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
   SST 09249-63010
   HINT:
   See page EM-6

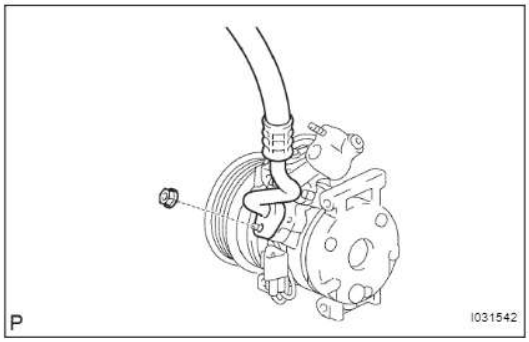
3. **REMOVE ALTERNATOR ASSEMBLY W/ REGULATOR (See page CH-8)**

4. **REMOVE GENERATOR BELT ADJUSTING BAR**
   (a) Remove the 2 nuts, bolt and generator belt adjusting bar.



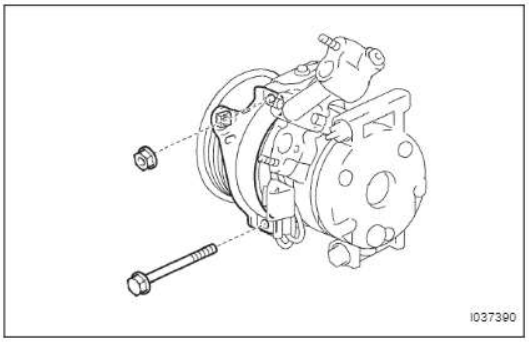


5. **REMOVE COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the nut and disconnect the cooler refrigerant discharge hose No.1.
   (b) Remove the O-ring from the cooler refrigerant discharge hose No.1.
   NOTICE:
   Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.



6. **REMOVE COOLER REFRIGERANT SUCTION HOSE NO.1**
   (a) Remove the nut and disconnect the cooler refrigerant suction hose No.1.
   (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.

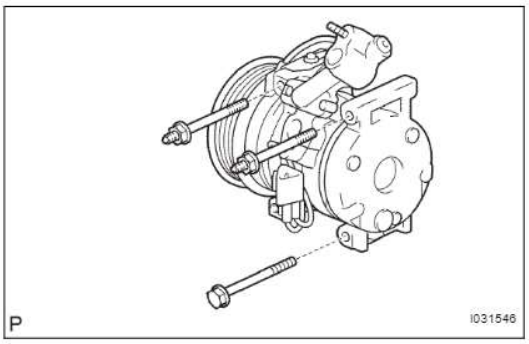
AC



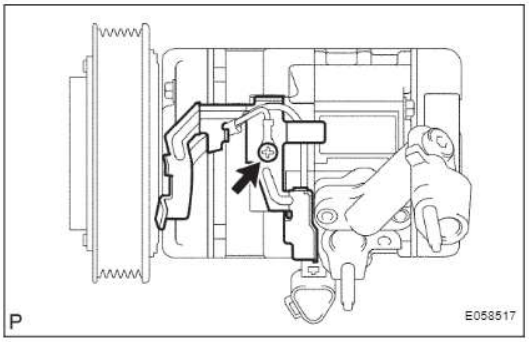
7. REMOVE COMPRESSOR AND MAGNETIC CLUTCH

(a) Disconnect the connector and clamp.

(b) Remove the bolt, nut and cooler compressor bracket.



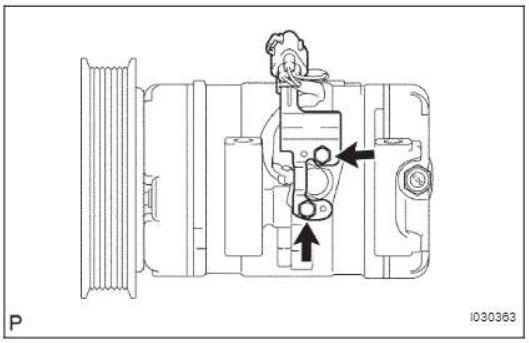
(c) Remove the 3 bolts and compressor and magnetic clutch.



8. REMOVE MAGNET CLUTCH ASSEMBLY

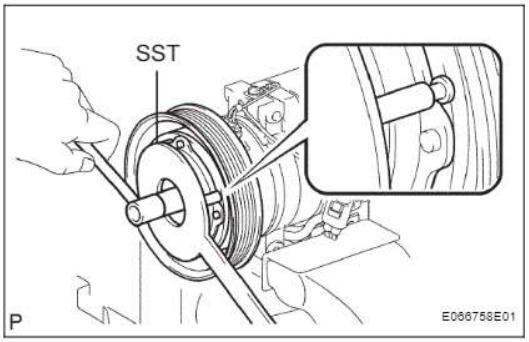
(a) Remove the screw, earth wire and cooler compressor bracket.

AC



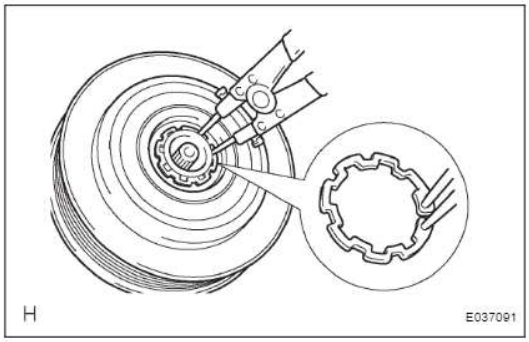
(b) Remove the 2 bolts and the bracket.

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

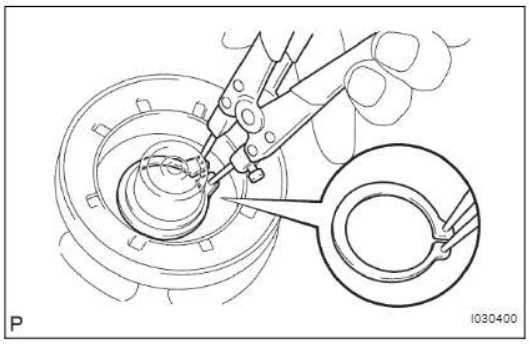


(d) Using SST, hold the magnet clutch hub.
SST 95047-10400

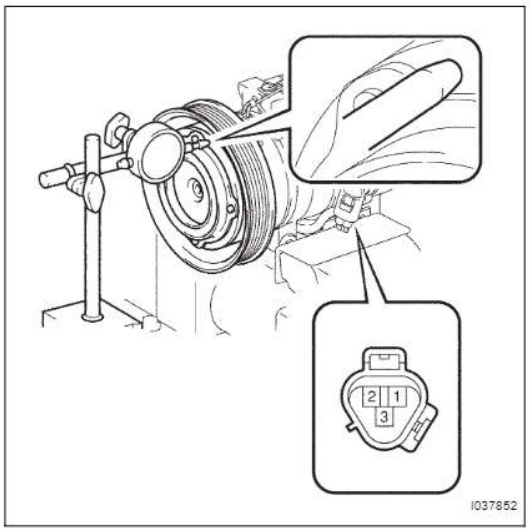
(e) Remove the bolt, magnet clutch hub and magnet clutch washer.
HINT:
There is no set number of magnet clutch washers since they are used for adjusting.



(f) 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.
(g) Disconnect the connector.



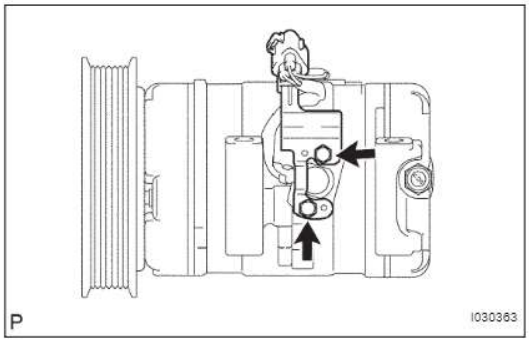
(h) Using a snap ring expander, remove the snap ring and magnet clutch starter.



INSPECTION

1. INSPECT MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the magnet clutch hub.
(b) Connect the battery positive lead to terminal 3 of the magnet clutch connector and the negative lead to the earth wire. Turn the magnet clutch on and off and measure the clearance.
Standard clearance:
0.35 to 0.60 mm (0.014 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 the bracket with the 2 bolts.



2. ADJUST 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.
Amount of oil:
(Oil capacity inside new compressor and magnetic clutch: 120 + 15 cc (4.1 + 0.51 fl.oz.)) - (Remaining oil amount in the removed compressor and magnetic clutch) = (Oil amount to be removed when replacing from the new compressor)

AC

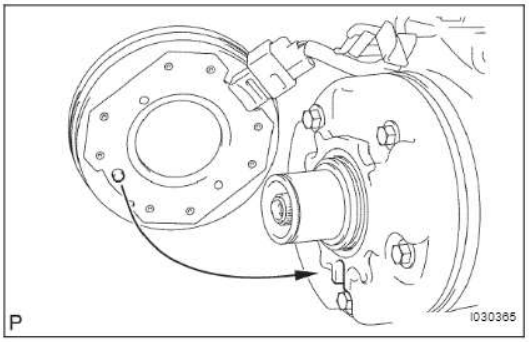
NOTICE:

- **When checking the compressor oil level, observe the precautions on the cooler removal/installation.**
- **Because compressor oil remains in the pipes of the vehicle, if a new compressor and magnetic clutch is installed without removing some oil inside, the oil amount becomes too much, preventing heat exchange in the refrigerant cycle and causing 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.**

INSTALLATION

1. INSTALL MAGNET CLUTCH ASSEMBLY

(a) Matching the parts shown in the illustration and install the magnet clutch starter.

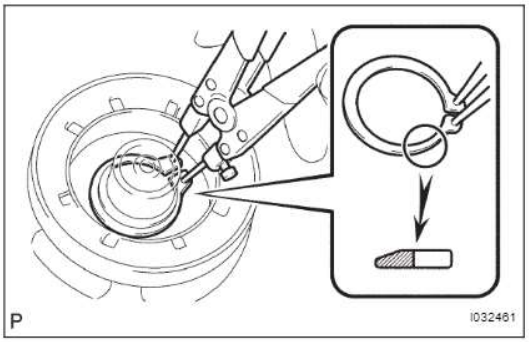


AC

(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 installing the snap ring.

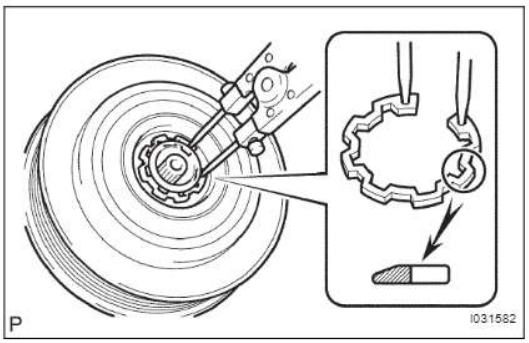


(c) Connect the connector.

(d) Using a snap ring expander, install the magnet clutch rotor and a new snap ring with the chamfered side facing up.

NOTICE:

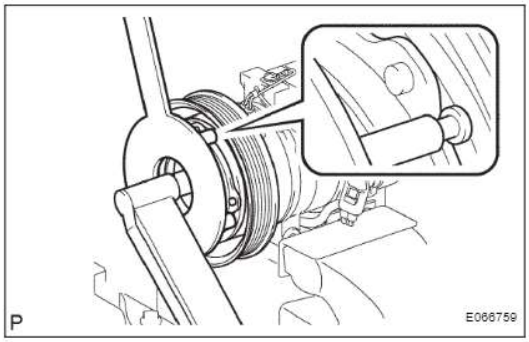
- **Do not expand the snap ring by more than 30.5 mm when installing it.**
- **Do not damage the seal cover of the bearing when installing the snap ring.**



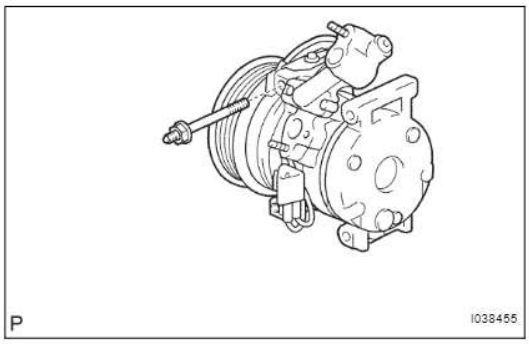
(e) Install the magnet clutch washer and magnet clutch hub.

NOTICE:

Do not change the combination of the magnet clutch washers used before disassembly.

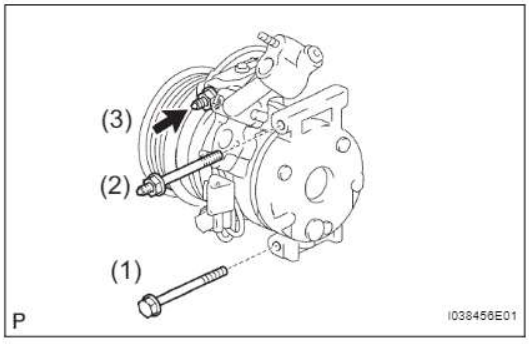


(f) Using SST, hold the magnet clutch hub and install the bolt.
SST 95047-10400
Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)
NOTICE:
Make sure that there is no foreign matter or oil on the compressor shaft, bolt, and clutch hub.



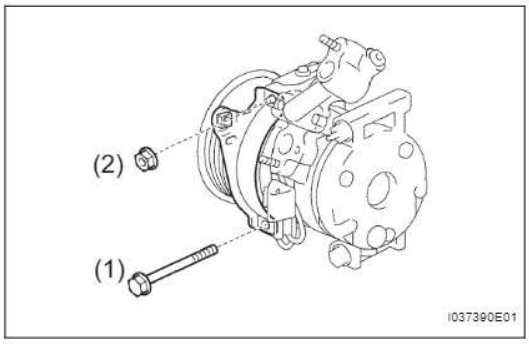
2. TEMPORARILY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

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



3. FULLY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH

(a) Tighten the compressor and magnetic clutch with the 3 bolts.
Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)
NOTICE:
Tighten the bolts in the numerical order shown in the illustration to install the compressor and magnetic clutch.



(b) Install the cooler compressor bracket with the bolt and nut.
Torque: Bolt (1)
25 N*m (250 kgf*cm, 18 ft.*lbf)
NOTICE:
Tighten the bolts in the numerical order shown in the illustration to install the compressor and magnetic clutch.

(c) Connect the connector.

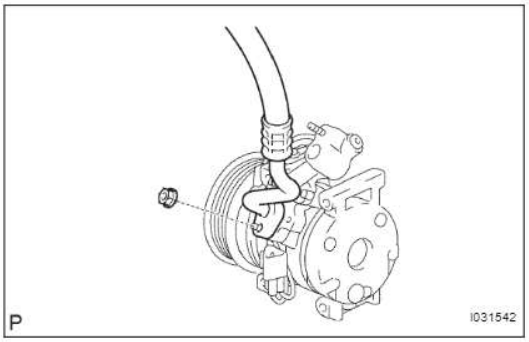
4. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1

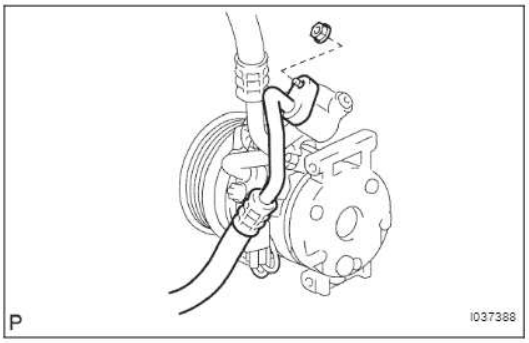
(a) Remove the attached vinyl tape from the hose.

(b) Sufficiently apply compressor oil to a 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.

AC





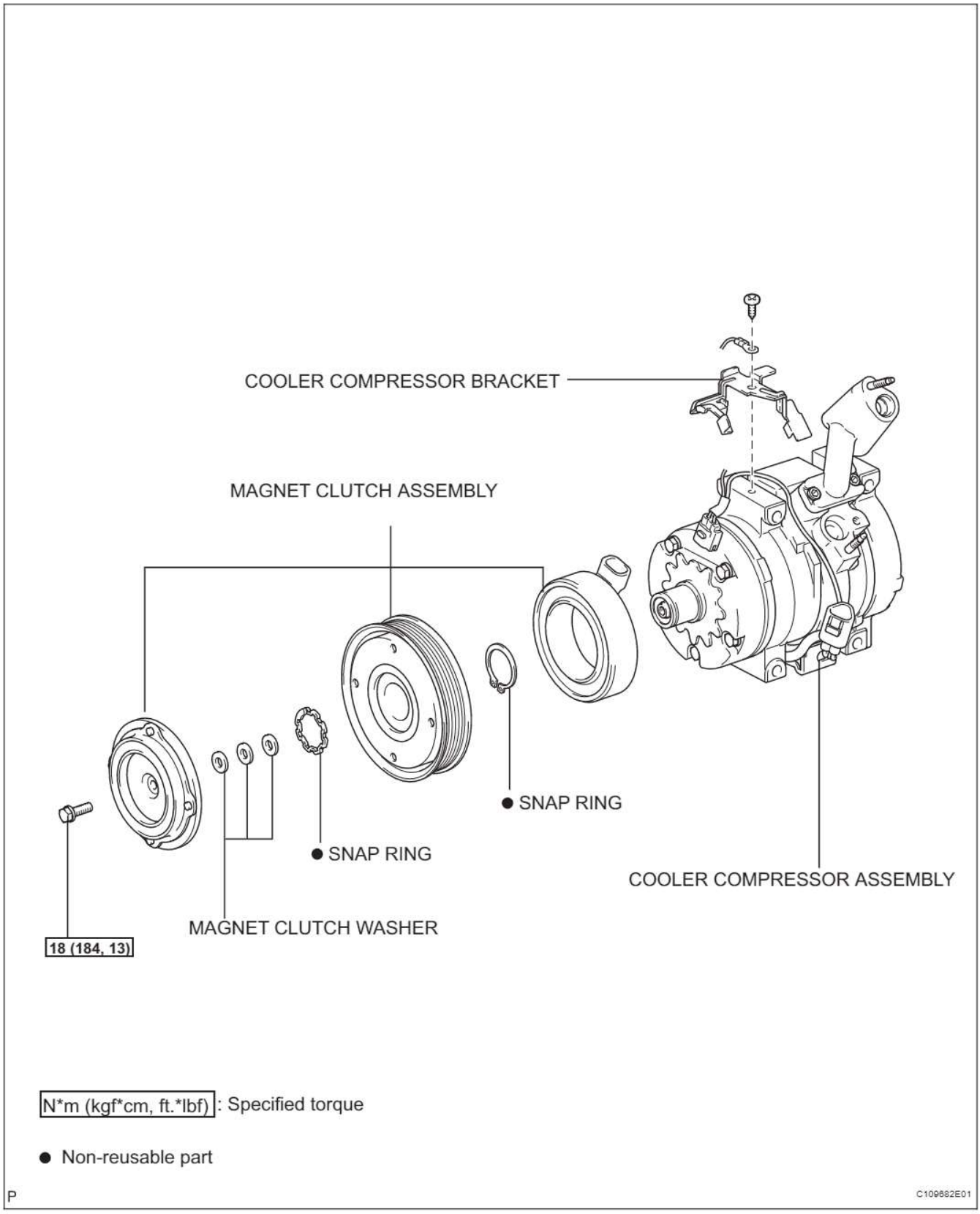
(d) Install the cooler refrigerant suction hose No.1 to the compressor and magnetic clutch with the nut.
Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)

5. **INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the attached vinyl tape from the hose.
   (b) Sufficiently apply compressor oil to a 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)
6. **INSTALL ALTERNATOR ASSEMBLY W/ REGULATOR (See page CH-14)**
7. **INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
   SST 09249-63010
   HINT:
   See page EM-6
8. **CHARGE REFRIGERANT (See page AC-115)**
9. **WARM UP ENGINE (See page AC-116)**
10. **INSPECT LEAKAGE OF REFRIGERANT (See page AC-116)**

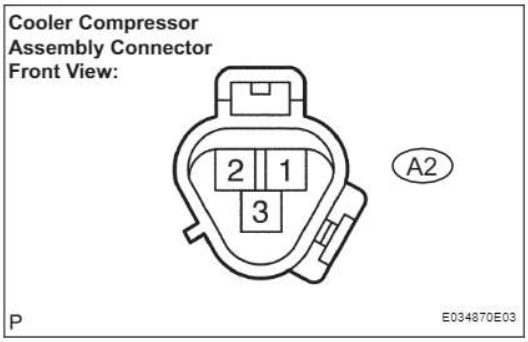
AC

3MZ-FE COMPRESSOR AND MAGNETIC CLUTCH

COMPONENTS



AC



ON-VEHICLE INSPECTION

1. 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 20°C (68°F)	185 +- 20 Ω

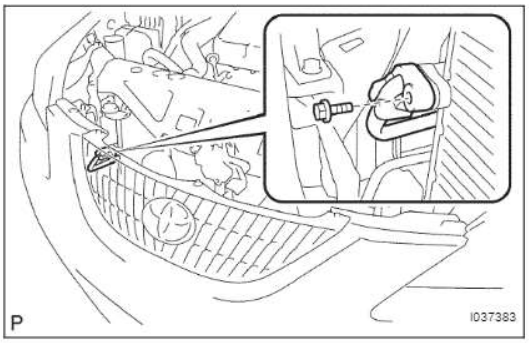
If the resistance is not as specified, replace the cooler compressor assembly.

AC

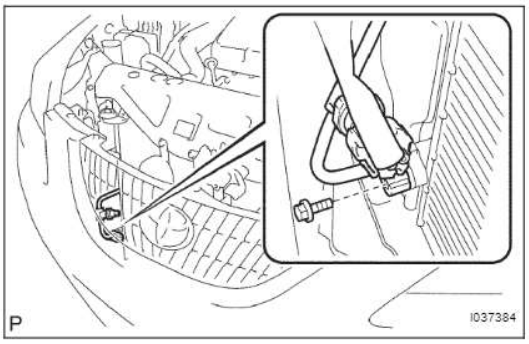
REMOVAL

HINT:
- Installation is in the reverse order of removal.
- COMPONENTS: See page AC-164

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSMTEM (See page AC-115)**



2. **DISCONNECT COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the bolt and disconnect the cooler refrigerant discharge hose No.1 from the cooler condenser assembly.
   (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.

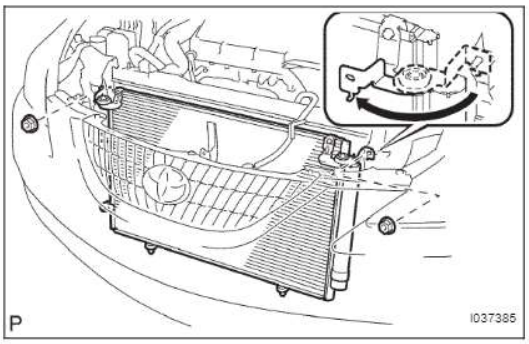


3. **DISCONNECT COOLER REFRIGERANT LIQUID PIPE A**
   CO-17
   CO-16
   (a) Remove the bolt and disconnect the cooler refrigerant liquid pipe A from the cooler condenser assembly.
   (b) Remove the O-ring from the cooler refrigerant liquid pipe A.
   NOTICE:
   Seal the opening of the disconnected parts using vinyl tape to prevent moisture and foreign matter from entering.

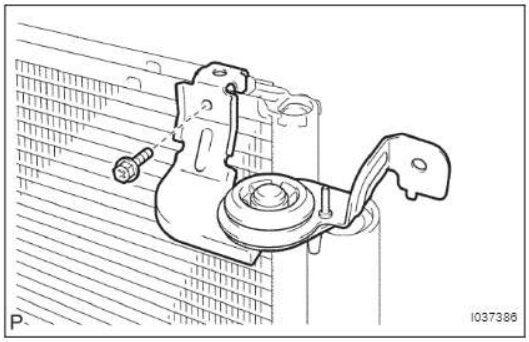
AC

4. **REMOVE AIR CLEANER INLET ASSEMBLY**
   HINT:
   - 2AZ-FE (See page CO-17)
   - 3MZ-FE (See page CO-16)

5. **REMOVE RADIATOR SUPPORT UPPER**
   HINT:
   - 2AZ-FE (See page CO-17)
   - 3MZ-FE (See page CO-16)

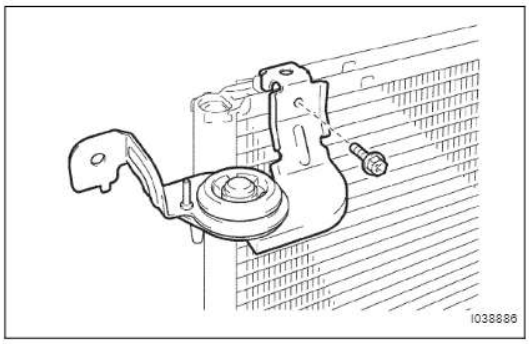


6. **REMOVE COOLER CONDENSER ASSEMBLY**
   (a) Remove the 2 nuts and cooler condenser assembly.



7. REMOVE COOLER CONDENSER BRACKET NO.2

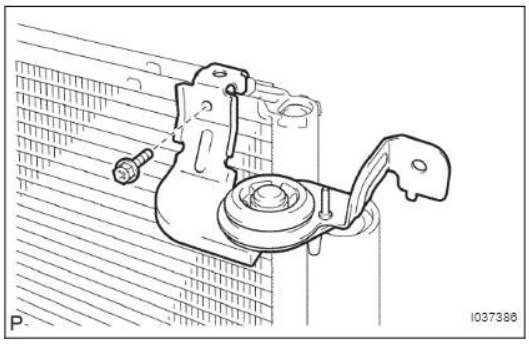
(a) Remove the nut and cooler condenser bracket No.2.



8. REMOVE COOLER CONDENSER BRACKET NO.1

(a) Remove the nut and cooler condenser bracket No.1.

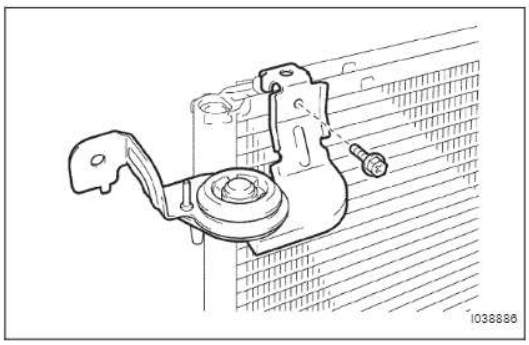
INSTALLATION



1. INSTALL COOLER CONDENSER BRACKET NO.2

(a) Install the cooler condenser bracket No.2 with the bolt.

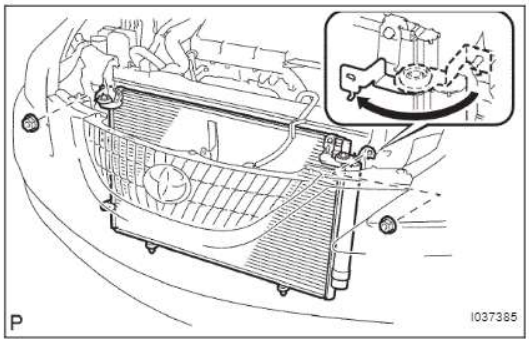
Torque: 4.4 N*m (45 kgf*cm, 39 in.*lbf)



2. INSTALL COOLER CONDENSER BRACKET NO.1

(a) Install the cooler condenser bracket No.1 with the bolt.

Torque: 4.4 N*m (45 kgf*cm, 39 in.*lbf)



3. INSTALL COOLER CONDENSER ASSEMBLY

(a) Install the cooler condenser assembly with the 2 nuts.

Torque: 9.8 N*m (100 kgf*cm, 85 in.*lbf)

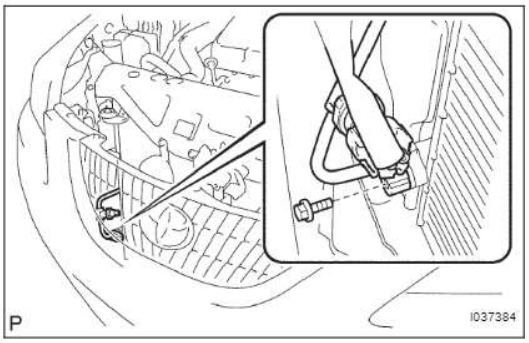
4. INSTALL RADIATOR SUPPORT UPPER

HINT:

- 2AZ-FE (See page CO-22)
- 3MZ-FE (See page CO-20)

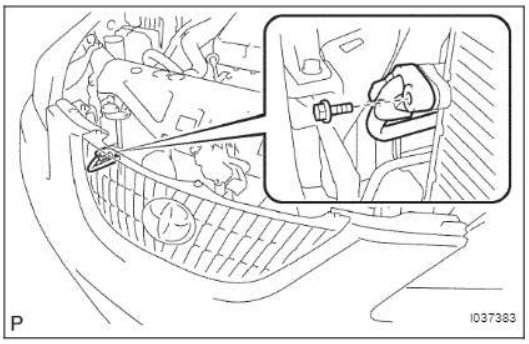
AC

5. **INSTALL COOLER REFRIGERANT LIQUID 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 a new O-ring and pipe joint.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring to the cooler refrigerant liquid pipe A.



   (d) Connect the cooler refrigerant liquid pipe A to the cooler condenser assembly with the bolt.
   Torque: 5.4 N*m (55 kgf*cm, 47 in.*lbf)

6. **INSTALL COOLER REFRIGERANT DISCHARGE HOSE NO.1**
   (a) Remove the attached vinyl tape from the tube and connecting part of the cooler condenser assembly.
   (b) Sufficiently apply compressor oil to a new O-ring and hose joint.
   Compressor oil:
   ND-OIL 8 or equivalent
   (c) Install the O-ring to the cooler refrigerant discharge hose No.1.



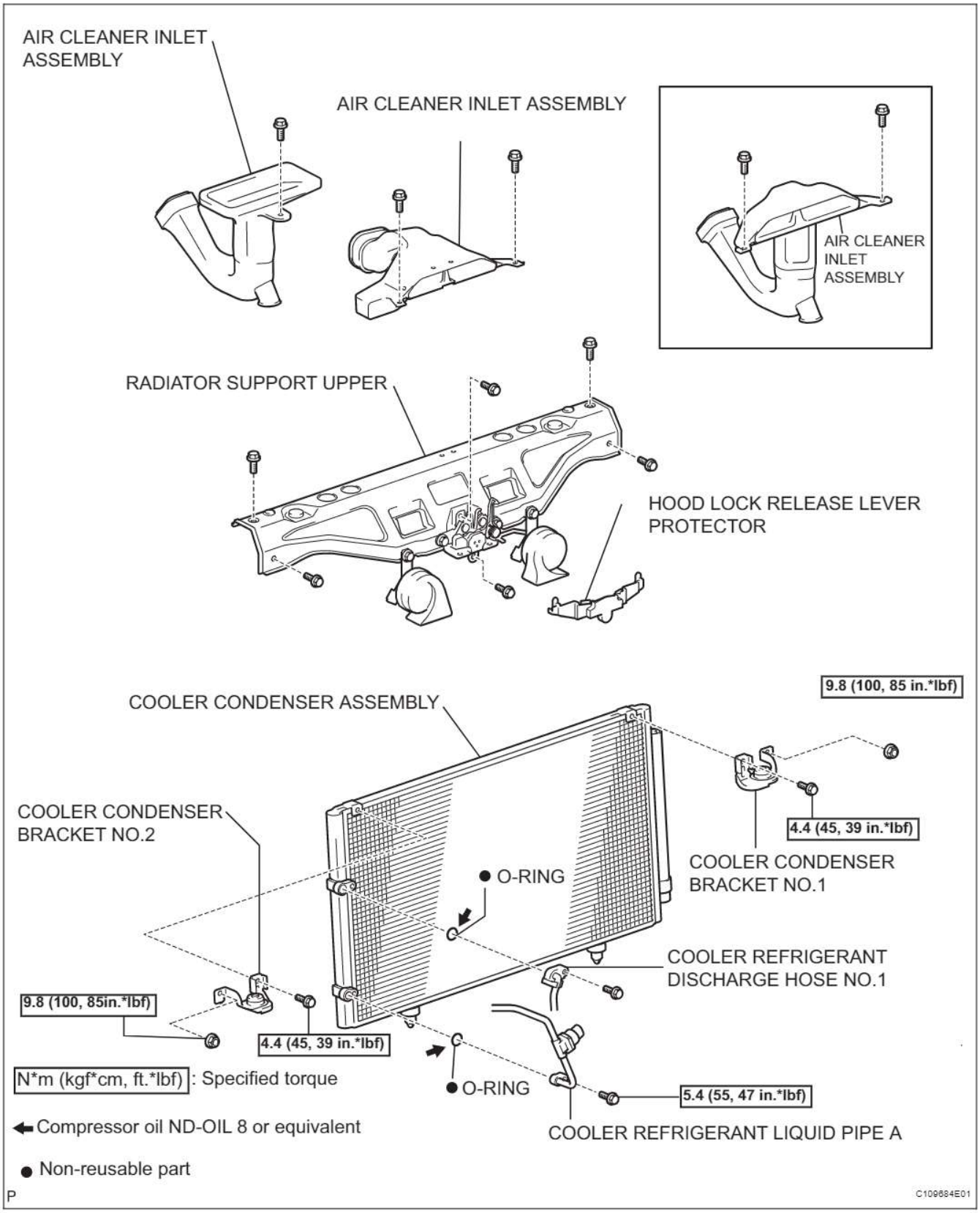
   (d) Connect the cooler refrigerant discharge hose No.1 to the cooler condenser assembly with the bolt.
   Torque: 5.4 N*m (55 kgf*cm, 47 in.*lbf)

7. **CHARGE REFRIGERANT (See page AC-115)**
8. **WARM UP ENGINE (See page AC-116)**
9. **INSPECT LEAKAGE OF REFRIGERANT (See page AC-116)**

AC

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 compressed air.

NOTICE:

Do not damage the fins of the cooler condenser assembly.

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

2. INSPECT CONDENSER FOR REFRIGERANT LEAKAGE

(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.

AC

PRESSURE SWITCH

ON-VEHICLE INSPECTION

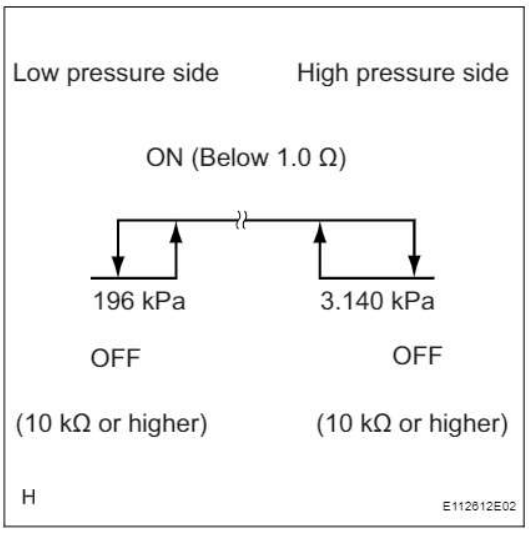
HINT:

- The pressure switch is installed on the air conditioning pipe on the high pressure side.
- The pressure switch has two functions. It detects abnormal pressure in the air conditioning cycle and turns the compressor on or off as necessary (magnet clutch control). It also turns the condenser fan on or off in accordance with pressure in the cycle (cooling fan control).

1. INSPECT PRESSURE SWITCH (for Magnet Clutch Control)

HINT:

- The switch on the low pressure side detects a drop in refrigerant pressure, such as from refrigerant leakage, etc. and turns the magnet clutch off (*1)to prevent damage to the compressor.
- The switch on the high pressure side detects abnormally high pressure in the air conditioning cycle and turns the magnet clutch off (*1)to prevent damage to parts in the air conditioning cycle.
  (*1): The ECM turns the magnet clutch on or off upon receiving the signal from the pressure switch.
- As the pressure switch operates when there is a malfunction with the refrigerant pressure, its function cannot be inspected on-vehicle. Follow the procedures below to inspect it.



(a) Inspect refrigerant pressure in air conditioning cycle.

(b) Read the manifold gauge pressure when these conditions are established (Procedure "A").

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 to 35°C (86 to 95°F)
- Engine running at 1,500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- Air conditioning switch ON
- Fully open doors

Standard pressure:

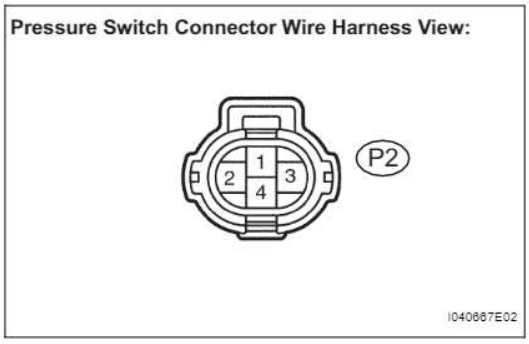
Pressure on high pressure side:

1.37 to 1.57 Mpa (13.9 to 16.0 kgf-cm^2, 198 to 228 psi)

HINT:

- If the refrigerant pressure is not within the standard value, inspect and repair the air conditioning cycle (See page AC-111).
- Proceed to step (See procedure "A") if the refrigerant pressure is within the specified range.

- 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.



(c) Check air conditioning operation.
(1) Disconnect the pressure switch connector.
(2) Connect terminals 1 and 4 of the connector of the pressure switch on the vehicle wire harness side using a service wire.
(3) Start the engine.
(4) Turn the air conditioning switch on and check that the magnet clutch is turned on.
(5) Check that the magnet clutch is turned off when disconnecting terminals 1 and 4 (that are connected in the prior step).

OK:

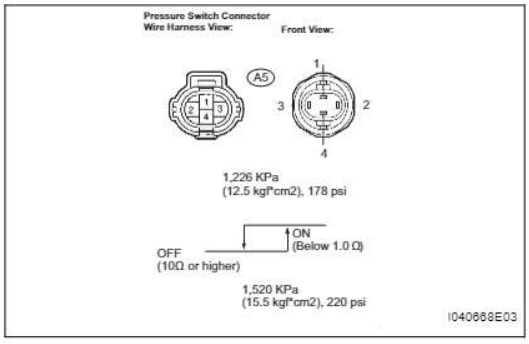
Terminals 1 and 4 connected: magnet clutch is on
Terminals 1 and 4 disconnected: magnet clutch is off

Replace the pressure switch if the magnet clutch is operated normally. Inspect and repair the wire harness between the pressure switch and the ECM.

2. INSPECT PRESSURE SWITCH

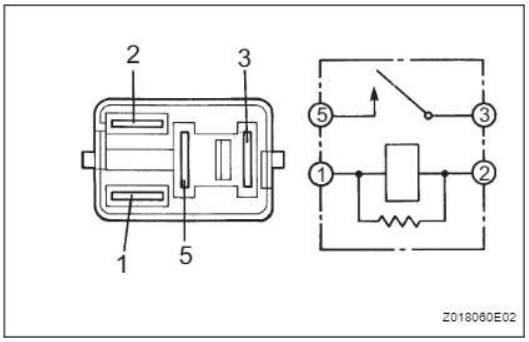
HINT:
The switch turns the condenser fan on or off in accordance with pressure in the cycle so that heat exchange in the condenser can be effectively within the normal pressure range.

(a) Set the manifold gauge.



(b) Disconnect the pressure switch connector and connect terminals 1 and 4 using a tool such as a service wire.
(c) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (-) lead to terminal 3.
(d) Start the engine and turn the air conditioning switch on.
(e) Check that the continuity between terminals 2 and 3 changes in accordance with the refrigerant pressure as shown in the illustration on the left.
If operation is not as specified, replace the pressure switch.

AC



HEATER BLOWER MOTOR RELAY

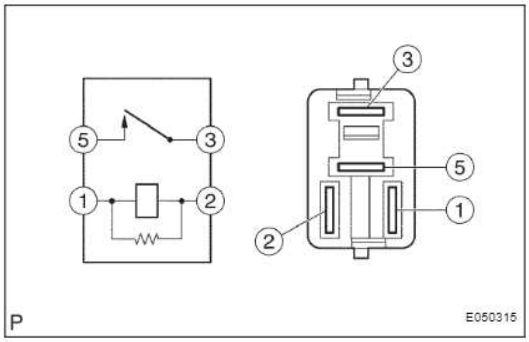
INSPECTION

1. **INSPECT HEATER BLOWER MOTOR RELAY ASSEMBLY**
   (a) Remove the relay (heater blower motor relay) from the engine room R/B.
   (b) Measure the resistance according to the value(s) in the table below.
   Standard resistance

Terminal No.	Condition	Specified Condition
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 blower motor relay.

AC



MAGNETIC CLUTCH RELAY

INSPECTION

1. INSPECT MAGNET-CLUTCH RELAY

(a) Remove the relay (magnet clutch relay) from the engine room R/B.

(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

If the resistance is not as specified, replace the magnet clutch relay.

AC

INSPECTION

1. **INSPECT AIR CONDITIONING CONTROL ASSEMBLY (AUTO AIR CONDITIONING)**
   HINT:
   See page AC-2.

REASSEMBLY

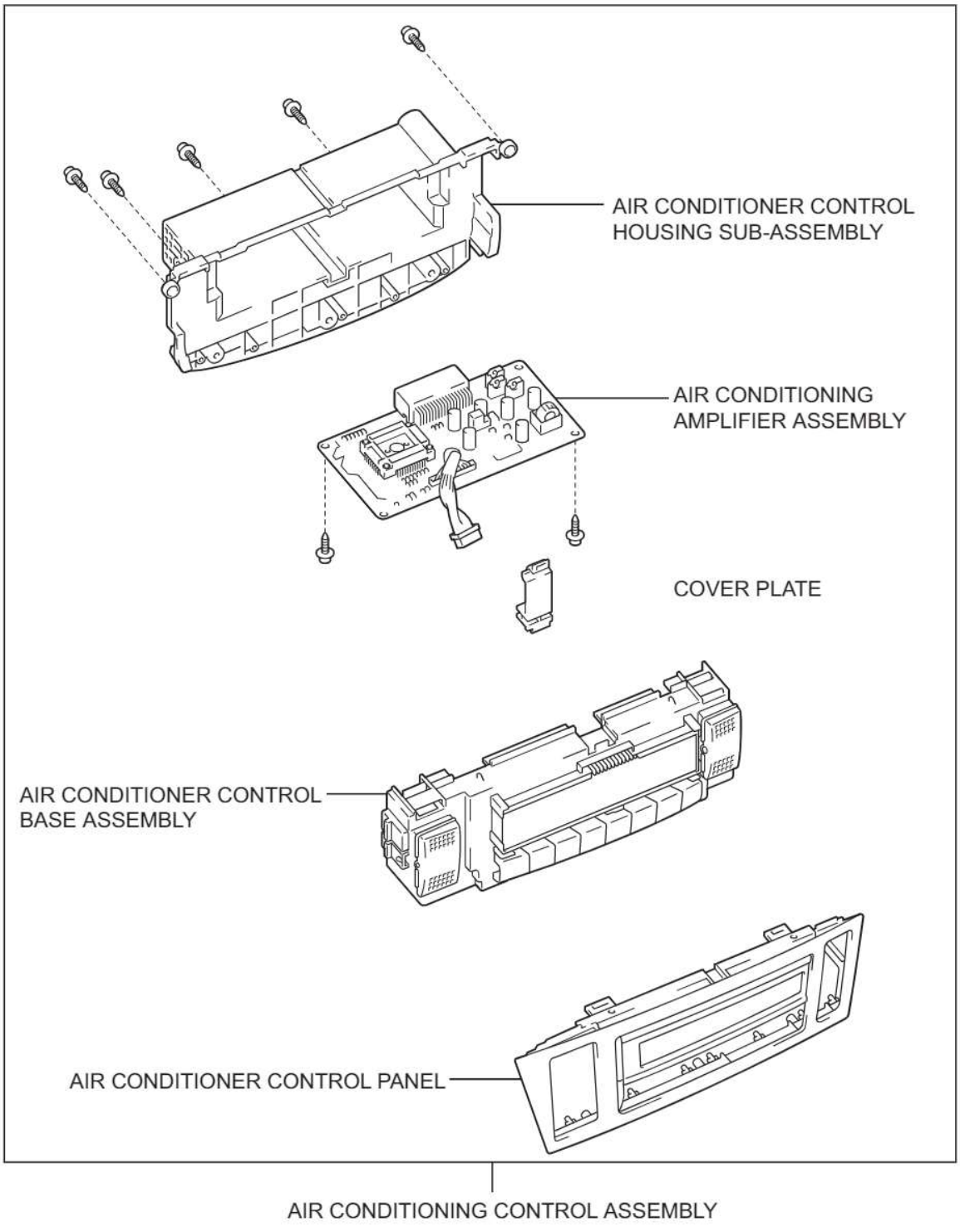
1. INSTALL AIR CONDITIONER AMPLIFIER ASSEMBLY
2. INSTALL AIR CONDITIONING CONTROL ASSEMBLY
3. INSTALL CENTER CLUSTER INTEGRATION PANEL ASSEMBLY (w/o Navigation System)
4. REMOVE CENTER CLUSTER INTEGRATION PANEL ASSEMBLY (w/ Navigation System)
5. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER
6. INSTALL CONSOLE PANEL SUB-ASSEMBLY UPPER
7. INSTALL CONSOLE UPPER REAR PANEL SUB-ASSEMBLY
8. INSTALL COMBINATION METER ASSEMBLY
9. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY
10. INSTALL INSTRUMENT PANEL REGISTER ASSEMBLY NO.1
11. INSTALL INSTRUMENT PANEL FINISH PANEL LOWER
12. INSTALL INSTRUMENT PANEL FINISH PLATE
13. INSTALL INSTRUMENT CLUSTER FINISH PANEL LOWER

AC

AIR CONDITIONING CONTROL ASSEMBLY

COMPONENTS

AUTO AIR CONDITIONING:

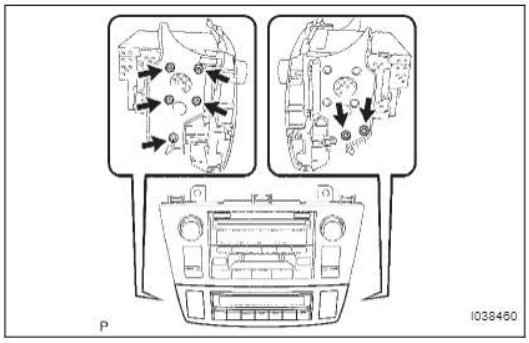


DISASSEMBLY

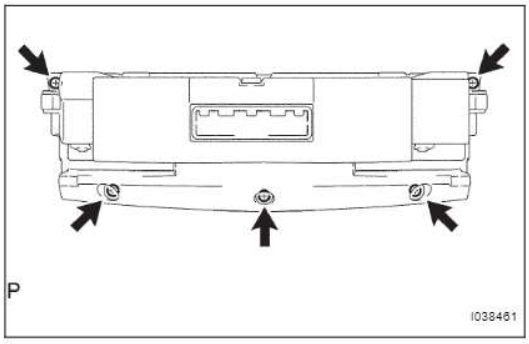
HINT:

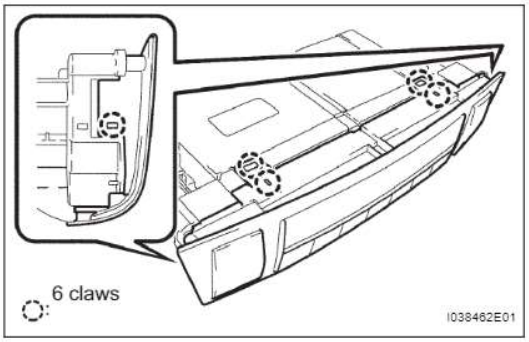
- Installation is in the reverse order of removal.
- COMPONENTS: See page AC-172

1. **REMOVE INSTRUMENT CLUSTER FINISH PANEL LOWER (See page IP-7)**
2. **REMOVE INSTRUMENT PANEL FINISH PLATE**
3. **REMOVE INSTRUMENT PANEL FINISH PANEL LOWER (See page IP-7)**
4. **REMOVE INSTRUMENT PANEL REGISTER ASSEMBLY NO.1 (See page IP-8)**
5. **REMOVE INSTRUMENT PANEL CLUSTER FINISH PANEL SUB-ASSEMBLY (See page IP-8)**
6. **REMOVE COMBINATION METER ASSEMBLY (See page IP-8)**
7. **REMOVE CONSOLE UPPER REAR PANEL SUB-ASSEMBLY (See page IP-9)**
8. **REMOVE CONSOLE PANEL SUB-ASSEMBLY UPPER (See page IP-10)**
9. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY CENTER (See page IP-10)**
10. **REMOVE CENTER CLUSTER INTEGRATION PANEL ASSEMBLY**
    HINT:
    - See page AV-83 for w/o navigation system.
    - See page NS-119 for w/ navigation system.
11. **REMOVE AIR CONDITIONING CONTROL ASSEMBLY**
    (a) Remove the 4 bolts, 3 screws and air conditioning control assembly.

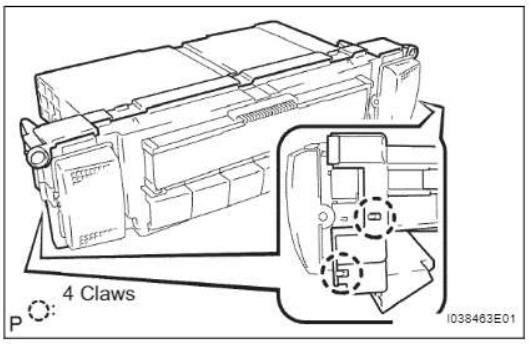


12. **REMOVE AIR CONDITIONING AMPLIFIER ASSEMBLY**
    (a) Remove the 5 screws.

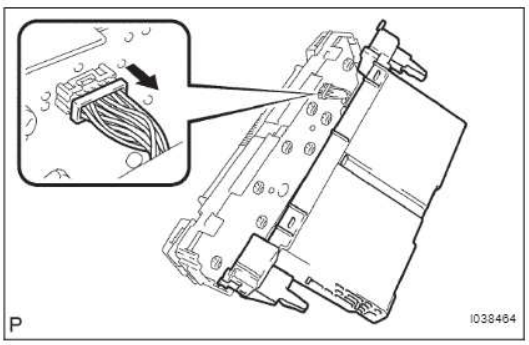




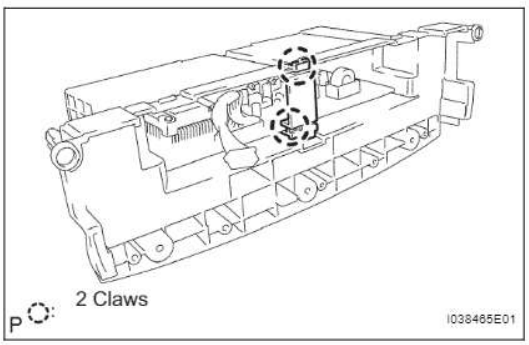
(b) Release the 6 fitting claws and remove the air conditioner control panel.



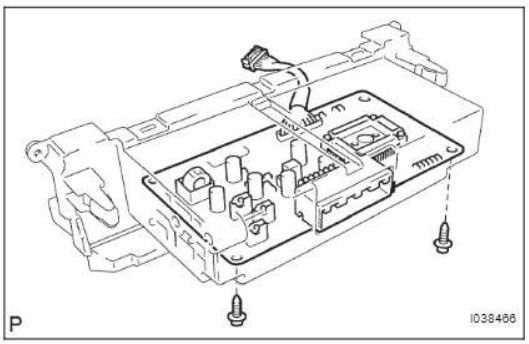
(c) Release the 4 fitting claws.



(d) Disconnect the connector and remove the air conditioner control housing sub-assembly.



(e) Release the 2 fitting claws and remove the cover plate.



(f) Remove the 2 screws and air conditioner amplifier.

INSTALLATION

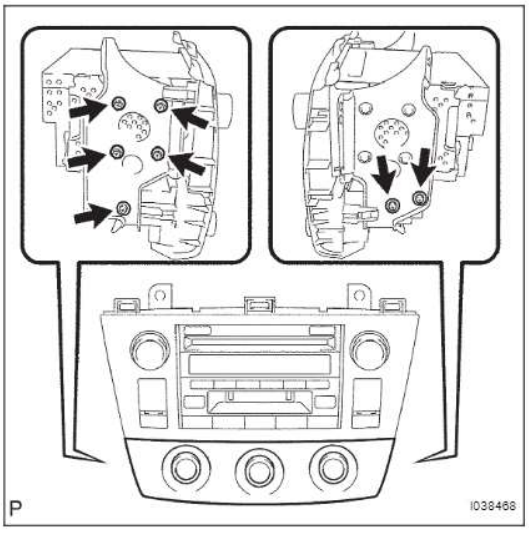
1. INSTALL AIR CONDITIONING PANEL SUB-ASSEMBLY
2. INSTALL CENTER CLUSTER INTEGRATION PANEL ASSEMBLY (w/o Navigation System)
3. INSTALL CENTER CLUSTER INTEGRATION PANEL ASSEMBLY (w/ Navigation System)
4. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY
5. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY
6. INSTALL CONSOLE UPPER REAR PANEL SUB-ASSEMBLY
7. INSTALL COMBINATION METER ASSEMBLY
8. INSTALL INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY
9. INSTALL INSTRUMENT PANEL REGISTER ASSEMBLY NO.1
10. INSTALL INSTRUMENT PANEL FINISH PANEL LOWER
11. INSTALL INSTRUMENT PANEL FINISH PLATE
12. INSTALL INSTRUMENT CLUSTER FINISH PANEL LOWER

AIR CONDITIONING PANEL ASSEMBLY

REMOVAL

HINT:
Installation is in the reverse order of removal.

1. **REMOVE INSTRUMENT CLUSTER FINISH PANEL LOWER (See page IP-7)**
2. **REMOVE INSTRUMENT PANEL FINISH PLATE**
3. **REMOVE INSTRUMENT PANEL FINISH PANEL LOWER (See page IP-7)**
4. **REMOVE NO.1 INSTRUMENT PANEL REGISTER ASSEMBLY (See page IP-8)**
5. **REMOVE INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY (See page IP-8)**
6. **REMOVE COMBINATION METER ASSEMBLY (See page IP-8)**
7. **REMOVE CONSOLE UPPER REAR PANEL SUB-ASSEMBLY (See page IP-9)**
8. **REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY (See page IP-10)**
9. **REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY (See page IP-10)**
10. **REMOVE CENTER CLUSTER INTEGRATION PANEL ASSEMBLY**
    HINT:
    - See page AV-83 for w/o navigation system.
    - See page NS-119 for w/ navigation system.
11. **REMOVE AIR CONDITIONING PANEL SUB-ASSEMBLY**
    (a) Remove the 4 bolts, 3 screws and air conditioning panel sub-assembly.

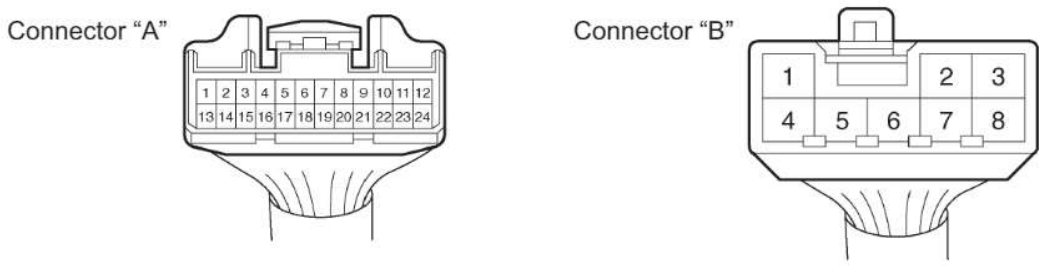


INSPECTION

1. INSPECT AIR CONDITIONING PANEL SUB-ASSEMBLY (for Manual Air Conditioning)

(a) Disconnect the connectors from the air conditioning panel sub-assembly and inspect the connectors on the wire harness side, as shown in the chart below.

Wire Harness Side Connnector Front View:

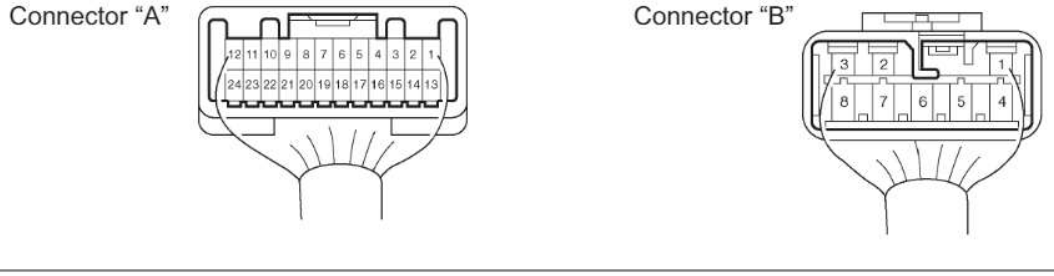


Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
+B (A10) - GND (A12)	W-B - W-B	Main power supply	Always	10 to 14 V
IG+ (A9) - GND (A12)	L-B - W-B	Ignition switch signal	Ignition switch: LOCK or ACC → ON	Below 1.0 → 10 to 14 V
GND (A12) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω
E (B1) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω

If the circuit is as specified, replace the air conditioning panel sub-assembly with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

(b) Connect the connectors to the heater air conditioning panel sub-assembly and inspect the back side from the wire harness side, as shown in the chart below.

Connector Front View:



Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E1 (B1) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω
HI (B7) - E (B1)	L - W-B	Blower switch signal	Ignition switch: ON Blower switch: OFF → HI	10 to 14 → Below 1.0 V
M2 (B6) - E (B1)	L-B - W-B	Blower switch signal	Ignition switch: ON Blower switch: OFF → M2	10 to 14 → Below 1.0 V
M1 (B5) - E (B1)	L-O - W-B	Blower switch signal	Ignition switch: ON Blower switch: OFF → M1	10 to 14 → Below 1.0 V
Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition

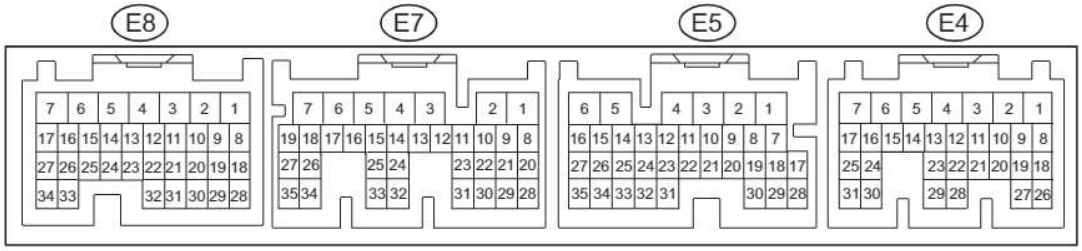
Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
LO (B3) - E (B1)	L-W - W-B	Blower switch signal	Ignition switch: ON Blower switch: OFF → LO	10 to 14 → Below 1.0 V
A/CB (A2) - GND (A12)	L-B - W-B	Blower switch signal	Ignition switch: ON Blower switch: OFF → ON (LO, M1, M2, HI)	0 → 10 to 14 V
+B (A10) - GND (A12)	W-R - W-B	Main power supply	Always	10 to 14 V
IG+ (A9) - GND (A12)	L-B - W-B	Ignition switch signal	Ignition switch: LOCK or ACC → ON	0 → 10 to 14 V
REC (A5) - GND (A12)	L - W-B	Recirculation/Fresh switch signal	Ignition switch: ON Recirculation/Fresh switch: FRESH → RECIRCULATION	Below 1.0 → 10 to 14 V
FRS (A6) - GND (A12)	R-L - W-B	Recirculation/Fresh switch signal	Ignition switch: ON Recirculation/Fresh switch: RECIRCULATION → FRESH	Below 1.0 → 10 to 14 V
DEF (A20) - GND (A12)	B-W - W-B	Mode switch signal	Ignition switch: ON Mode select switch: Except DEF → DEF	Below 1.0 → 10 to 14 V
F/D (A19) - GND (A12)	LG-R - W-B	Mode switch signal	Ignition switch: ON Mode select switch: Except FACE/DEF → FACE/DEF	Below 1.0 → 10 to 14 V
FOOT (A18) - GND (A12)	L-R - W-B	Mode switch signal	Ignition switch: ON Mode select switch: Except FOOT → FOOT	Below 1.0 → 10 to 14 V
B/L (A17) - GND (A12)	BR-W - W-B	Mode switch signal	Ignition switch: ON Mode select switch: Except BI LEVEL → BI LEVEL	Below 1.0 → 10 to 14 V
FACE (A16) - GND (A12)	GR - W-B	Mode switch signal	Ignition switch: ON Mode select switch: Except FACE → FACE	Below 1.0 → 10 to 14 V
TCOL (A3) - GND (A12)	P-L - W-B	Temperature switch signal	Ignition switch: ON Temperature select switch: MAX. HOT → MAX. COOL	Below 1.0 → 10 to 14 V
THOT (A4) - GND (A12)	P - W-B	Temperature switch signal	Ignition switch: ON Temperature select switch: MAX. COOL → MAX. HOT	Below 1.0 → 10 to 14 V
S5 (A21) - GND (A12)	V - W-B	Power supply for air mix damper servo sub-assembly	Ignition switch: LOCK → ON	0 → 5.0 V
SG (A7) - Body ground	B-R - W-B	Ground for air mix damper servo sub-assembly	Always	Below 1.0 Ω
TEST (A22) - SG (A7)	G-B - B-R	Temperature switch signal	Ignition switch: ON Temperature select switch: MAX. HOT → MAX. COOL	Below 1.0 → Above 4.0 V
A/C (A23) - GND (A12)	W - W-B	A/C switch signal	Ignition switch: ON Blower switch: ON (LO, M1, M2, HI) A/C switch: OFF → ON	Below 2.0 → Above 6.0 V
ACID (A1) - GND (A12)	Y-B - W-B	A/C switch signal	Ignition switch: ON Blower switch: ON (LO, M1, M2, HI) A/C switch: OFF → ON	Below 1.0 → 10 to 14 V
GND (A12) - Body ground	W-B - Body ground	Ground for main power supply	Always	Below 1.0 Ω

If the circuit is as specified, replace the air conditioning panel sub-assembly with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

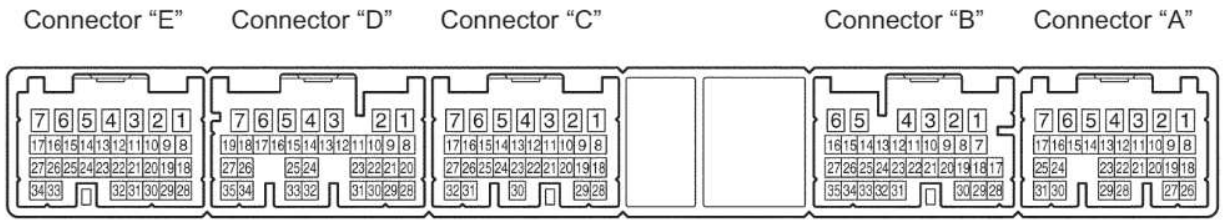
AC

2. INSPECT ECM (for Manual Air Conditioning)

2AZ-FE Engine: Connector Front View:



3MZ-FE Engine: Connector Front View:

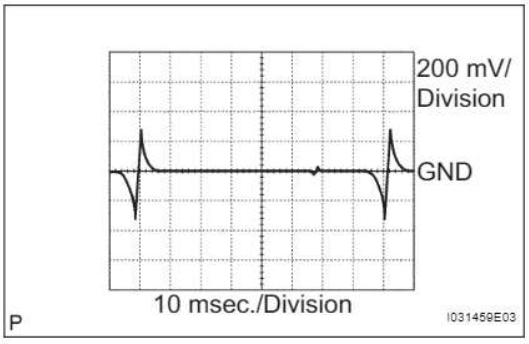


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Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
ACMG (C2) - Body ground (*1)	L-W - Body ground	Pressure switch signal	Start engine. Refrigerant pressure: Normally → Less than 196 kPa (2.0 kgf*cm^2, 28 psi) or more than 3,140 kPa (32.0 kgf*cm^2, 455 psi)	Below 1.0 → 10 to 14 V
HP (B1) - Body ground (*2)	L-B - Body ground	Pressure switch signal	Start engine. Refrigerant pressure: Normally → Less than 196 kPa (2.0 kgf*cm^2, 28 psi) or more than 3,140 kPa (32.0 kgf*cm^2, 455 psi)	Below 1.0 → 10 to 14 V
A/CS (B30) - Body ground (*1)	W - Body ground	A/C switch signal	Ignition switch: ON A/C switch: OFF → ON	10 to 14 V → Below 1.0
A/CS (B31) - Body ground (*2)	W - Body ground	A/C switch signal	Ignition switch: ON A/C switch: OFF → ON	0 → → Below 1.0 V
ACLD (B33) - Body ground	Y-B - Body ground	Magnet clutch signal	Ignition switch: ON Magnet clutch: OFF → ON	10 to 14 → Below 1.0 V
THE (B32) - E2 (E28)	L-W - Body ground	Evaporator temperature signal	Ignition switch: ON Evaporator temperature: 0°C (32°F) → 15°C (59°F)	2.0 to 2.4 → 1.4 to 1.8 V
E2 (E28) - Body ground	BR - Body ground	Ground for main power supply	Always	Below 1.0 Ω
LCKI (C23) - Body ground	W-L - Body ground	Magnet clutch signal	Ignition switch: ON Magnet clutch: OFF → ON	Pulse generation (see waveform 1)

*1: 2AZ-FE
*2: 3MZ-FE



(a) waveform 1:
Measure the waveform between terminal LCKI (C23) of the ECM and body ground.
OK:
Waveform operate as shown in the illustration.
If the waveform is as specified, replace the ECM with a new one. If the waveform is not as specified, inspect the circuits connected to other parts.

AC