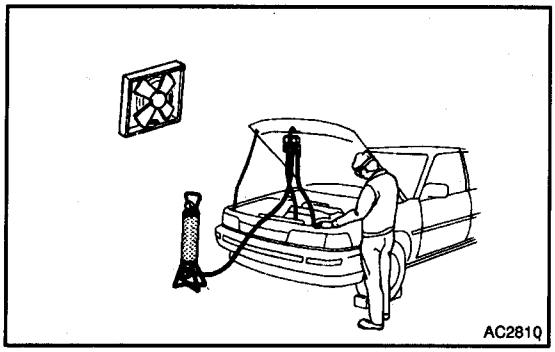
AIR CONDITIONING

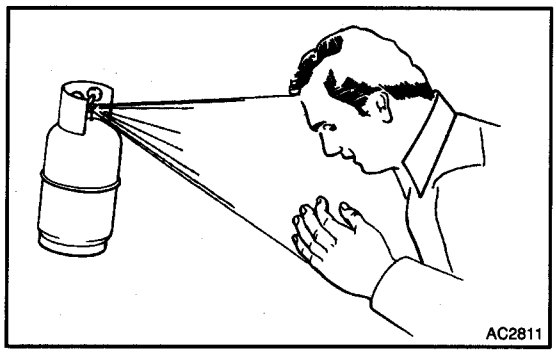


AIR CONDITIONING SYSTEM

PRECAUTION

AC0C1-07

1. **DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR WEAR A NAKED 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 cool water.

CAUTION:

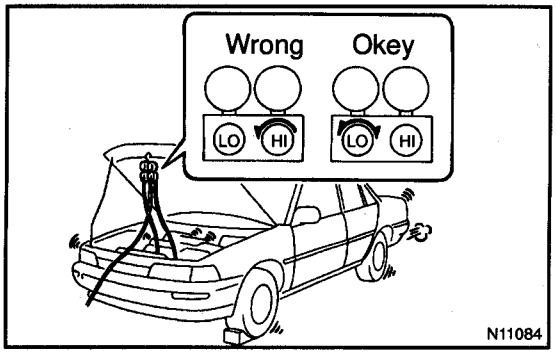
Do not rub your eyes or skin.

(b) Apply clean petroleum jelly to the skin.

(c) Go immediately to a physician or hospital for professional treatment.

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**

AC



6. **DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERATION SYSTEM**

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

7. **DO NOT OPEN PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATE**

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

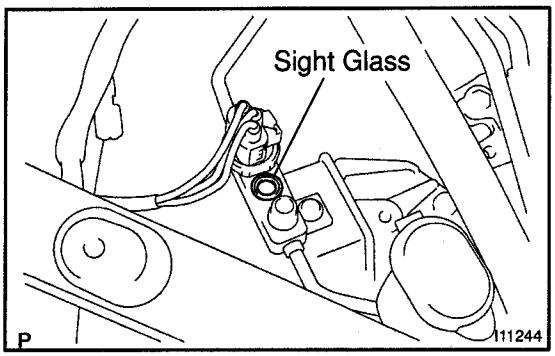
8. **BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT**

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

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The YARIS VERSO / ECHO VERSO are equipped with an SRS (Supplemental Restraint System) such as the driver and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices tn the RS section.

AC22F–04



ON–VEHICLE INSPECTION

1. INSPECT REFRIGERANT VOLUME

Observe the sight glass on the liquid tube.

Test conditions:

- Running engine at 1,500 rpm
- Blower speed control switch: "HI" position
- A/C switch ON
- Temperature control selector: "COOL" position
- Fully open the doors

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

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

2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

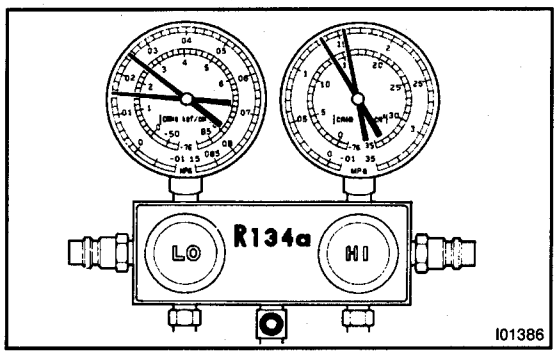
This is a method in witch the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the these conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 – 35 °C (86 – 95 °F)
- Engine running at 1500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position

HINT:

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



(1) Normally functioning refrigeration system.

Gauge reading:

Low pressure side:

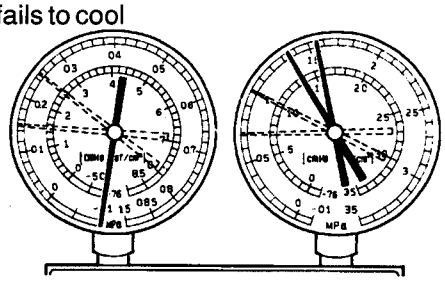
0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm^2)

High pressure side:

1.37 – 1.57 MPa (14 – 16 kgf/cm^2)

(2) Moisture present in refrigeration system.

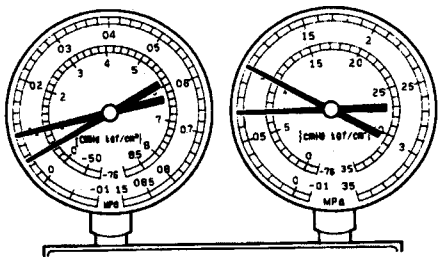
Condition : Periodically cools and then fails to cool



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

(3) Insufficient cooling

Condition: Insufficient cooling

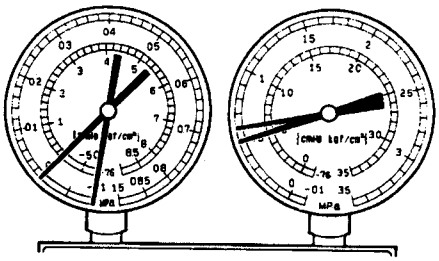


I01388

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

(4) Poor circulation of refrigerant

Condition: Insufficient cooling



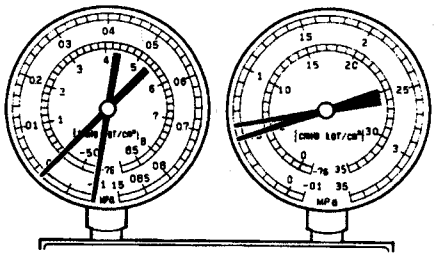
I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low in both low and high pressure sides • Frost on tube from receiver to unit	Refrigerant flow obstructed by dirt in drier	Condenser clogged	Replace drier

AC

(5) Refrigerant does not circulate

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



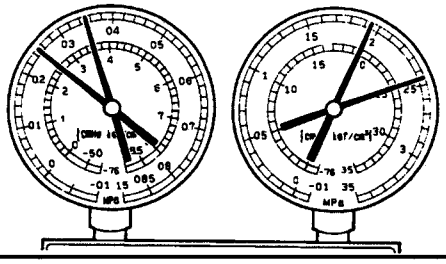
I01449

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/ drier or expansion valve	• 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 out dirt in expansion valve by blowing with air (3) Replace drier (4) Evacuate air and charge new refrigerant to proper amount (5) For gas leakage from expansion valve, replace expansion valve

(6) Refrigerant overcharged or insufficient cooling of condenser

AC

Condition: Insufficient cooling

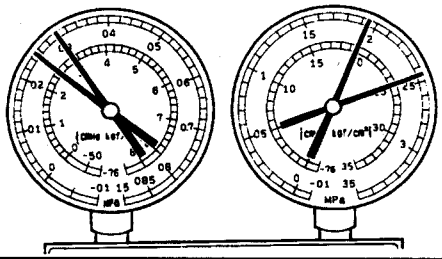


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No sir bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive refrigerant • Insufficient cooling of condenser	• Excessive refrigerant in cycle→refrigerant overcharged • Condenser cooling → condenser fins clogged or condenser fan faulty	(1) Clean condenser (2) Check cooling fan with fluid coupling operation (3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant

(7) Air present in refrigeration system

Condition: Insufficient cooling



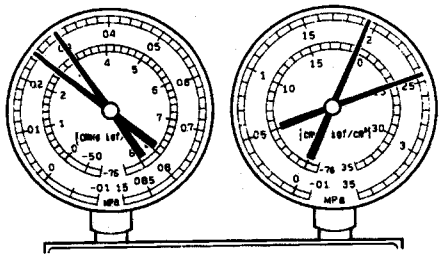
NOTE : These gauge indications are shown when the refrigeration system has been opens and the refrigerant charged without vacuum purging.

I01392

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • The low pressure piping hot to the touch • Bubbles seen in sight glass	Air entered in refrigeration system	• Air present in refrigeration system • Insufficient vacuum purging	(1) Check compressor oil to see if it is see if it is dirty or insufficient (2) Evacuate air and charge new refrigerant

(8) Expansion valve improperly

Condition: Insufficient cooling



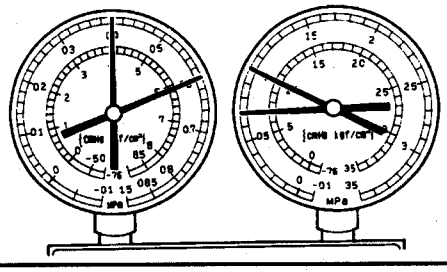
I01450

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	Check expansion valve Replace if defective

AC

(9) Defective compression compressor

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on low high pressure sides • Pressure too low to on high pressure side	Internal leak in compressor	• Compression defective • Valve leaking or broken sliding parts	Repair or replace compressor

3. INSPECT IDLE–UP SPEED

(a) Warm up engine.

(b) Inspect idle–up speed when the these conditions are established.

- Warm up engine
- Blower speed control switch at "HI" position
- A/C switch ON
- Put gear shaft in neutral
- Temperature control dial at "COOL" position

M/T:

Magnetic clutch condition	Idle–up speed
Magnetic clutch not engaged	600 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm

If idle speed is not as specified, check idle control system.

A/T:

Magnetic clutch condition	Idle–up speed
Magnetic clutch not engaged	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at low)	700 ± 50 rpm
Magnetic clutch engaged (Condenser fan speed at high)	875 ± 50 rpm

If idle speed is not as specified, check idle control system.

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4. INSPECT FOR LEAKAGE OF REFRIGERANT

(a) Perform in these conditions:
- Stop engine.
- Secure good ventilation (If not the gas leak detector may react to volatile gases witch are not refrigerant, such as evaporated gasoline and exhaust gas.)
- Repeat the test 2 or 3 times.
- Make sure that there is some refrigerant remaining in the refrigeration system.
  When compressor is OFF: approx. 392 – 588 kPa (4 – 6 kgf/ cm^2, 57 – 85 psi)

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

HINT:
- After the blower motor stopped, leave the cooling unit for more than 15 minutes.
- Expose the gas leak detector sensor the under the drain hose.
- When bring 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.

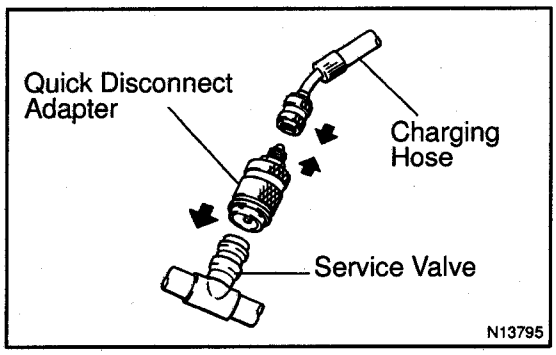
(c) If gas leak is not detected on the drain hose, remove the blower resistor from the cooling unit. Then insert the gas leak detector sensor into the unit and perform the test.

(d) Disconnect the connector and leave the pressure switch for approx. 20 minutes. Then bring the gas leak detector close to the pressure switch and perform the test.

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

AC0C4-06

EVACUATING



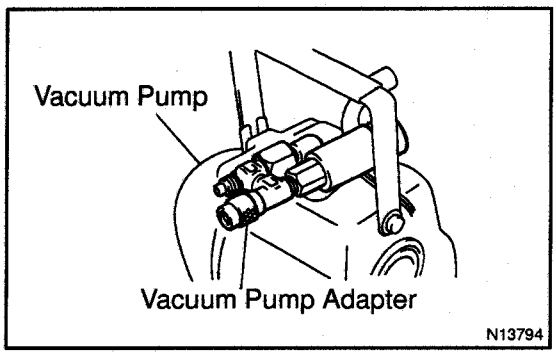
1. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

2. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES

3. SET ON MANIFOLD GAUGE SET

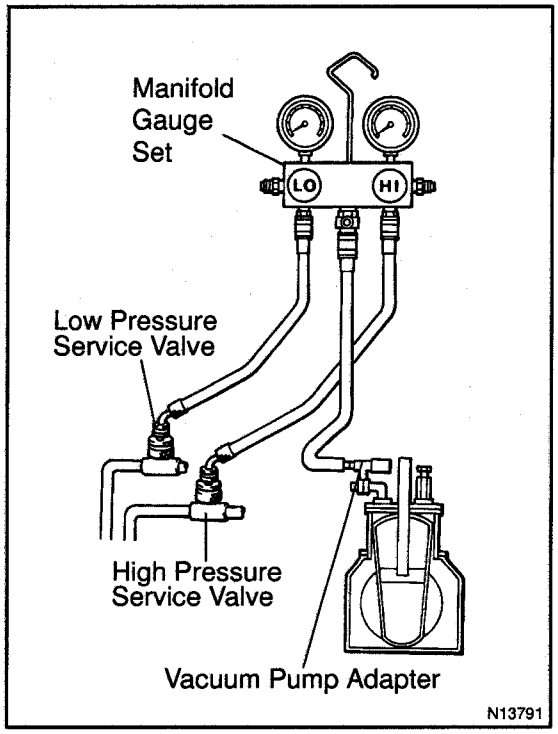
(a) Close both hand valves of manifold gauge set.

(b) Connect the quick disconnect adapters to the service valves.



4. EVACUATE AIR FROM REFRIGERATION SYSTEM

(a) Connect the vacuum pump adapter to the vacuum pump.



(b) Connect the center hose of the manifold gauge set to the vacuum pump adapter.

(c) Open both the high and low hand valves and run the vacuum pump.

(d) After 10 minutes or more, check that the low pressure gauge indicates 750 mmHg (30 in. Hg) or more.

HINT:

If the reading 750 mmHg (30 in. Hg) or more, close both hand valves of manifold gauge set and stop the vacuum pump.

Check the system for leaks and repair necessary.

(e) Close both the high and low hand valves and stop the vacuum pump.

(f) Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.

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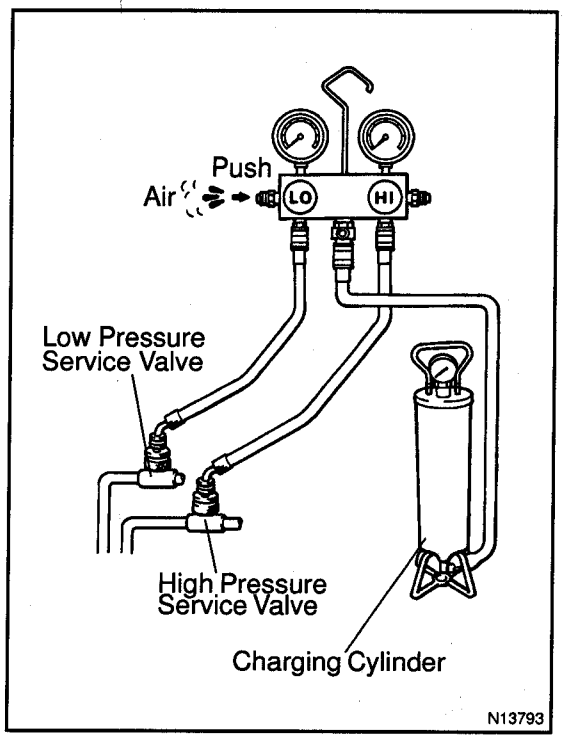
AC22G-04

CHARGING



1. INSTALL CHARGING CYLINDER

HINT:

When handling the charging cylinder, always follow the directions given in the instruction manual.

(a) Charge the proper amount of refrigerant into the charging cylinder.

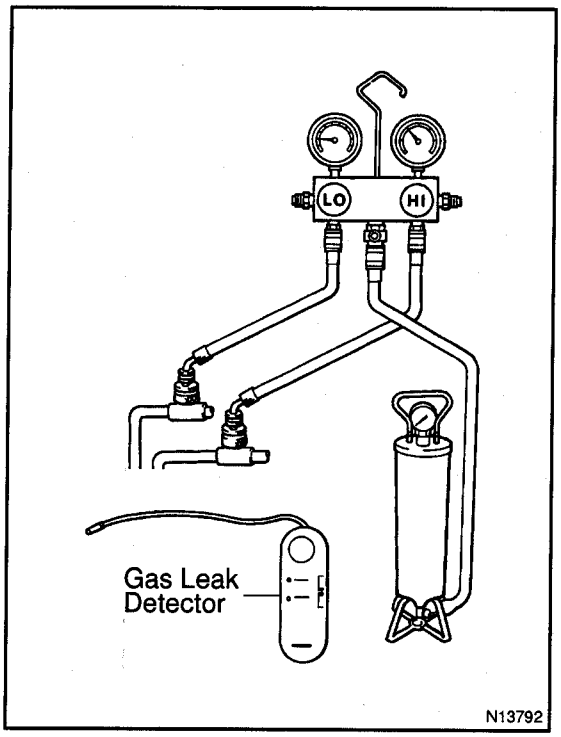
(b) Connect the center hose to the charging cylinder.

CAUTION:

Do not open both high and low hand valves of manifold gauge set.

(c) Open the valve of charging cylinder.

(d) Press the valve core on the side of manifold gauge and expel the air inside of the center hose.



2. INSPECT REFRIGERATION SYSTEM FOR LEAKS

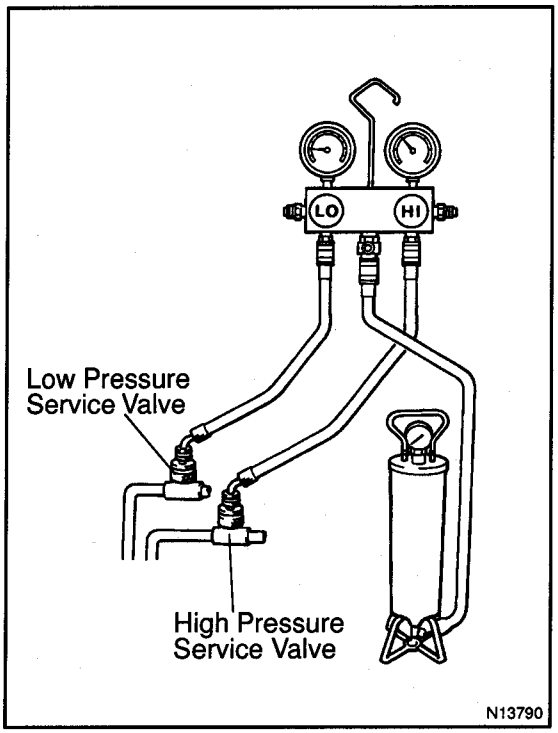
(a) Open the high pressure hand valve and charge refrigerant.

(b) When the low pressure gauge indicates 98 kPa (1 kgf/cm^2, 14 psi) close the high pressure hand valve.

(c) Using a gas leak detector, check the system for leakage.

CAUTION:

Use the refrigerant recovery/ recycling machine to recover the refrigerant whenever replacing parts.



3. CHARGE REFRIGERANT INTO REFRIGERANT SYSTEM

If there is no leak after refrigerant leak check, charge the proper amount of refrigerant into refrigeration system.

CAUTION:

- **Never run the engine when charging the system through the high pressure side.**
- **Do not open the low pressure hand valve when the system is being charged with liquid refrigerant.**

(a) Open the high pressure hand valve fully.

(b) Charge specified amount of refrigerant, then close the high pressure hand valve.

HINT:

A fully charged system is indicated by the sight glass being free of any bubbles.

(c) Charge partially refrigeration system with refrigerant.

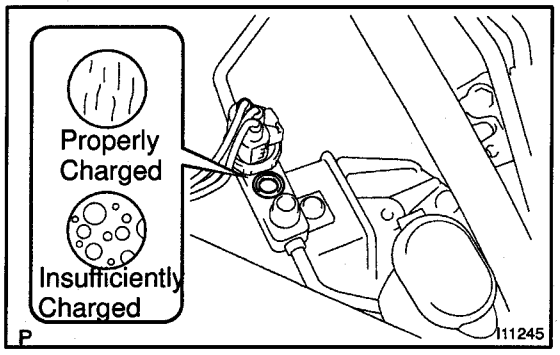
(1) Set vehicle in these condition:

- Running engine at 1,500 rpm
- Blower speed control switch: "HI"
- Temperature control selector: "MAX. COOL"
- Air inlet control selector: "RECIRC"
- Fully open doors (Sliding roof: closed)

(2) Open the low pressure hand valve.

CAUTION:

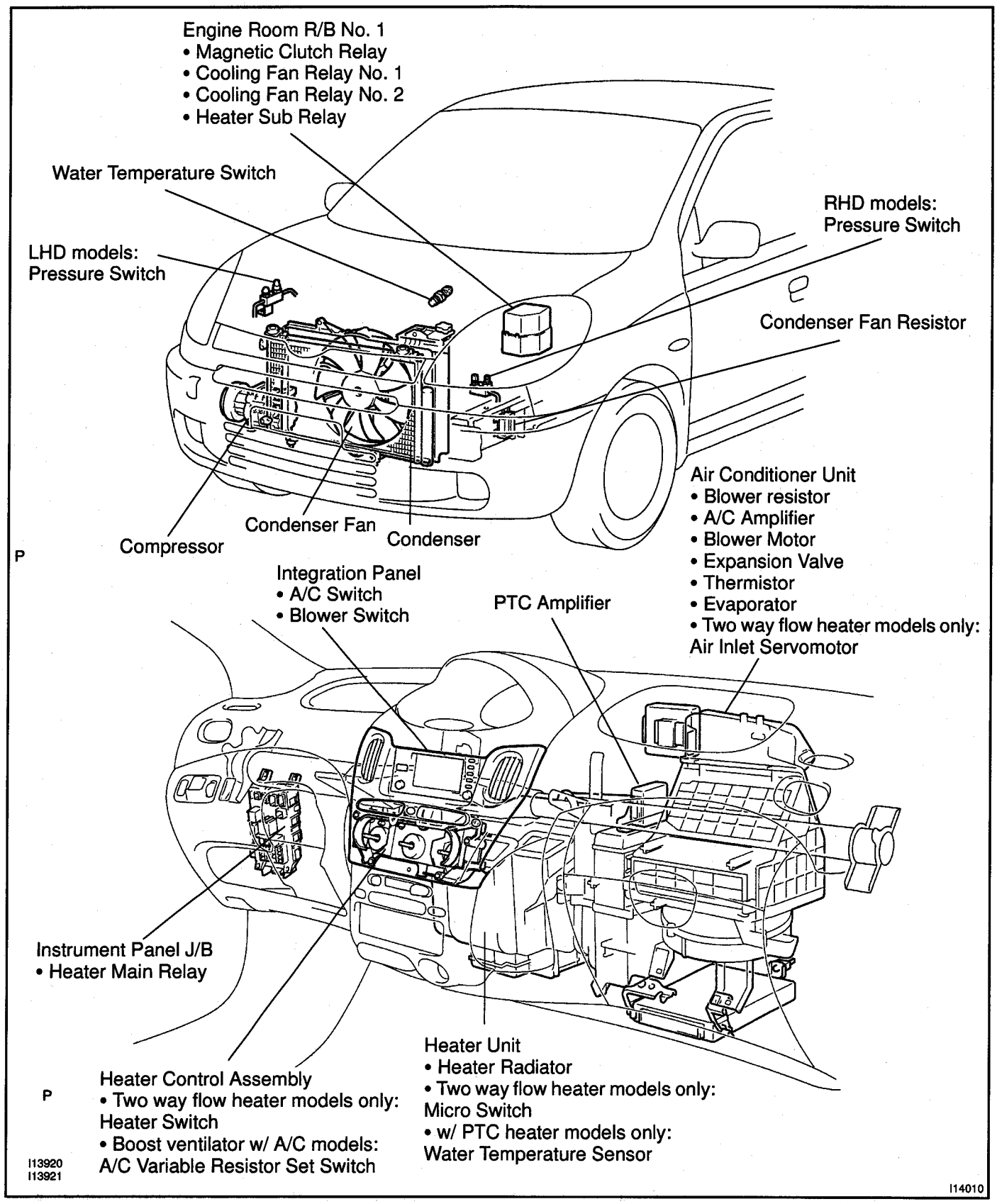
Do not open the high pressure hand valve.



(d) Charge refrigerant until bubbles disappear and check the pressure on the gauge through the sight glass.

AC0C6-07

LOCATION



TROUBLESHOOTING

AC27Y-02

PROBLEM SYMPTOMS TABLE

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

Standard:

Symptom	Suspect Area	See page
No blower operation	1. HTR Fuse	–
	2. Heater main relay	AC–66
	3. Blower motor	AC–58
	4. Blower resistor	AC–60
	5. Blower speed control switch	AC–94
	6. Wire harness	–
No air temperature control	1. Engine coolant volume	–
	2. Heater control assembly	AC–84
No compressor operation	1. Refrigerant volume	AC–3
	2. A.C Fuse	–
	3. Magnetic clutch relay	AC–68
	4. Magnetic clutch	AC–43
	5. Compressor	AC–43
	6. Pressure switch	AC–63
	7. A/C switch	AC–94
	*1 A/C variable resistor set switch	AC–88
	8. A/C amplifier	AC–77
	9. Thermistor	AC–62
	10.Wire harness	–
No cool air comes out	1. Refrigerant volume	AC–3
	2. Refrigerant pressure	AC–3
	3. Drive belt	AC–16
	4. Magnetic clutch	AC–43
	5. Compressor	AC–43
	6. Pressure switch	AC–63
	7. Thermistor	AC–62
	8. A/C switch	AC–94
	9. A/C amplifier	AC–77
	10.Heater control assembly	AC–84
	11.Wire harness	–
Insufficient cooling	1. Refrigerant volume	AC–3
	2. Drive belt	AC–16
	3. Magnetic clutch	AC–43
	4. Compressor	AC–43
	5. Condenser	AC–50
	6. Expansion valve	AC–56
	7. Evaporator	AC–32
	8. Refrigerant lines	AC–21
	9. Pressure switch	AC–63
	10.A/C amplifier	AC–77
	11.Heater control assembly	AC–84
No engine idle–up when A/C switch ON	1. A/C amplifier	AC–77
	2. Engine (and ECT) ECU	–
	3. Wire harness	–
No air inlet control	Heater control assembly	AC–84
No mode control	Heater control assembly	AC–84

Symptom	Suspect Area	See page
No condenser fan operation	1. ECU – IG Fuse	–
	2. RDI Fuse	–
	3. Fan No. 1 relay	AC–69
	4. Water temperature switch	AC–96
	5. Fan motor	AC–70
	6. A/C amplifier	AC–77
	7. Engine (and ECT) ECU	–
	8. Wire harness	–
No condenser fan speed change	1. Fan No. 2 relay	AC–69
	2. Pressure switch	AC–63
	3. Condenser fan resistor	AC–76
	4. A/C amplifier	AC–77
	5. Wire harness	–

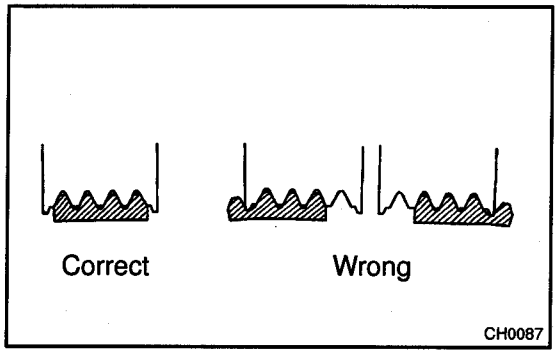
*1: Boost ventilator A/C models

Two way flow heater:

Symptom	Suspect Area	See page
No blower operation	1. GAUGE Fuse	–
	2. HTR Fuse	–
	3. Heater main relay	AC–66
	4. Blower motor	AC–58
	5. Blower resistor	AC–60
	6. Blower speed control switch	AC–94
	7. Wire harness	–
No air inlet control	1. ECU – IG Fuse	–
	2. Air inlet servomotor	AC–61
	3. Heater switch (Heater control assembly)	AC–88
	4. PTC amplifier	AC–77
	5. Wire harness	–
Air inlet door does not operate on the two way flow position, when perform in these conditions: • Air inlet selector: FRESH • Blower switch: ON • Temperature control selector: MAX. WARM • Mode selector: FOOT or FOOT/DEF.	1. A/C Fuse	–
	2. Micro switch (for MAX. WARM)	AC–40
	3. Micro switch (for FOOT, FOOT/DEF.)	AC–40
	4. Heater switch (Heater control assembly)	AC–88
	5. PTC amplifier	AC–77
	6. Air inlet servomotor	AC–61
	7. Wire harness	–

PTC heater:

Symptom	Suspect Area	See page
PTC heater does not operate, when perform in these conditions: • Engine coolant temp.: 60 °C (140 °F) or below • Engine speed: 650 rpm or above • Temperature control selector: MAX. COOL	1. A/C Fuse	–
	2. Micro switch (for MAX. WARM)	AC–40
	3. Micro switch (for FOOT, FOOT/DEF.)	AC–40
	4. Heater switch (Heater control assembly)	AC–88
	5. PTC heater (Heater radiator)	AC–40
	6. PTC amplifier	AC–77
	7. Air inlet servomotor	AC–61
	8. Wire harness	–



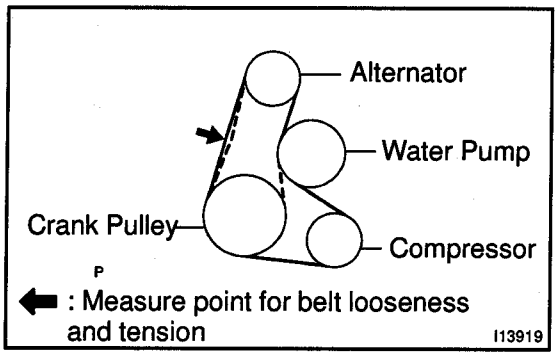
DRIVE BELT

ON–VEHICLE INSPECTION

AC2HJ–01

1. INSPECT DRIVE BELT'S INSTALLATION CONDITION

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



2. INSPECT DRIVE BELT DEFLECTION

(a) Using a belt tension gauge, apply load of 98 N (10 kgf, 22 lbf).

(b) Measure drive belt deflection.

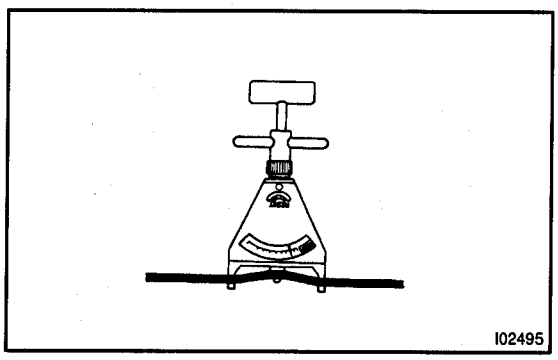
Drive belt deflection:

New belt: 7.0 – 8.5 mm (0.28 – 0.33 in.)

Used belt: 11.0 – 13.0 mm (0.43 – 0.51 in.)

HINT:

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



3. INSPECT DRIVE BELT TENSION (Reference)

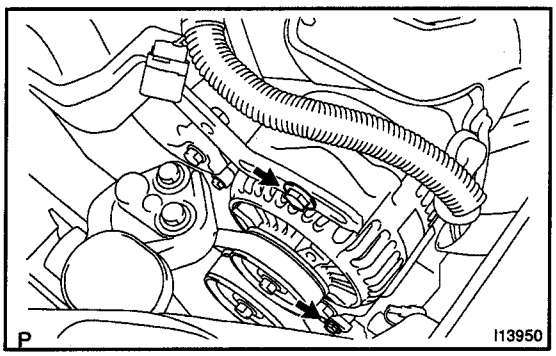
Using a belt tension gauge, check the drive belt tension.

Drive belt tension:

New belt: 540 – 640 N (55 – 65 kgf)

Used belt: 250 – 390 N (25 – 40 kgf)

AC2HK–01



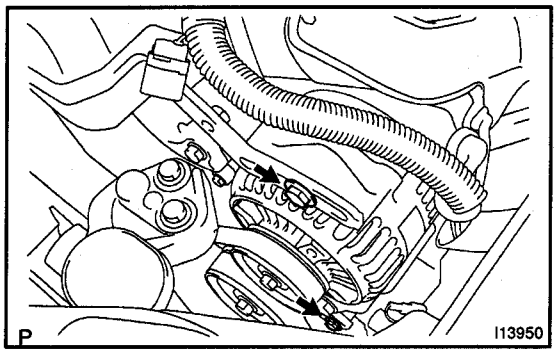
REMOVAL

REMOVE DRIVE BELT

(a) Loosen the pivot bolts.

(b) Loosen the drive belt tension by turning adjusting bolt and remove the drive belt.

AC2HL-01



INSTALLATION

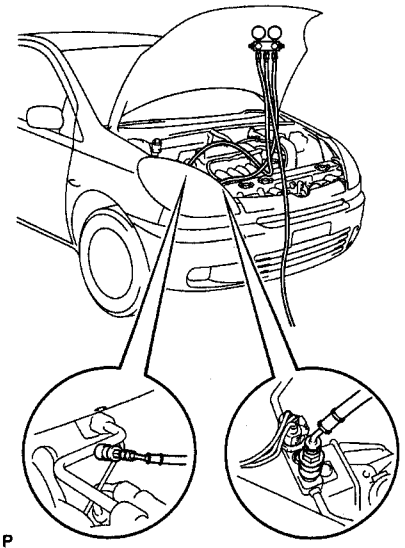
INSTALL DRIVE BELT

(a) Install the drive belt.

(b) Apply drive belt tension by turning adjusting bolt.
Drive belt tension
New belt: 7.0 – 8.5 (0.28 – 0.33 in.)
Used belt: 11.0 – 13.0 (0.43 – 0.51 in.)

(c) Tighten the pivot bolts.
Torque: 54 N·m (540 kgf·cm, 39 ft·lbf)

LHD:



MANIFOLD GAUGE SET

AC281-02

SET ON

1. CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

Do not connect the wrong hoses.

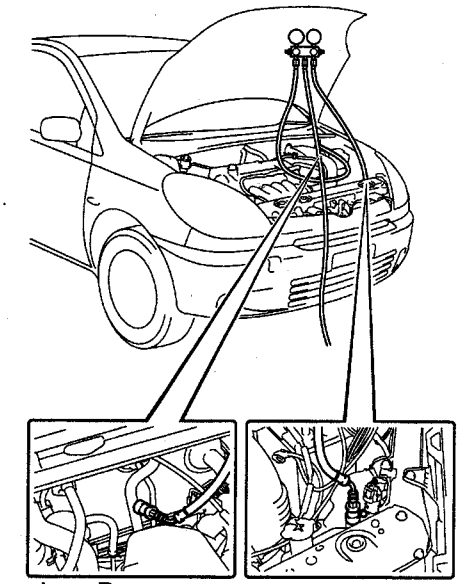
2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

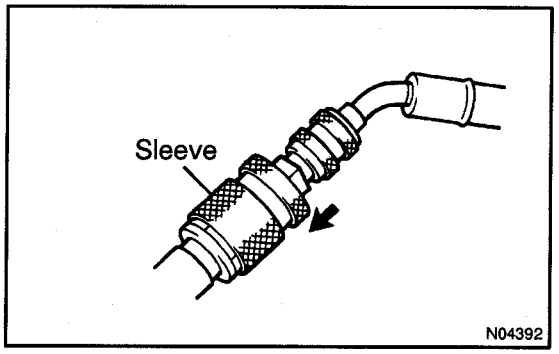
Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINE

RHD:



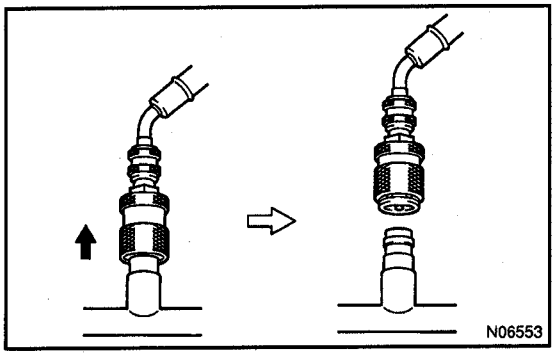


5. CONNECT QUICK DISCONNECT ADAPTERS TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, then slide, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC0CB–04



SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

REFRIGERANT LINE

AC0CC-01

ON–VEHICLE INSPECTION

1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS

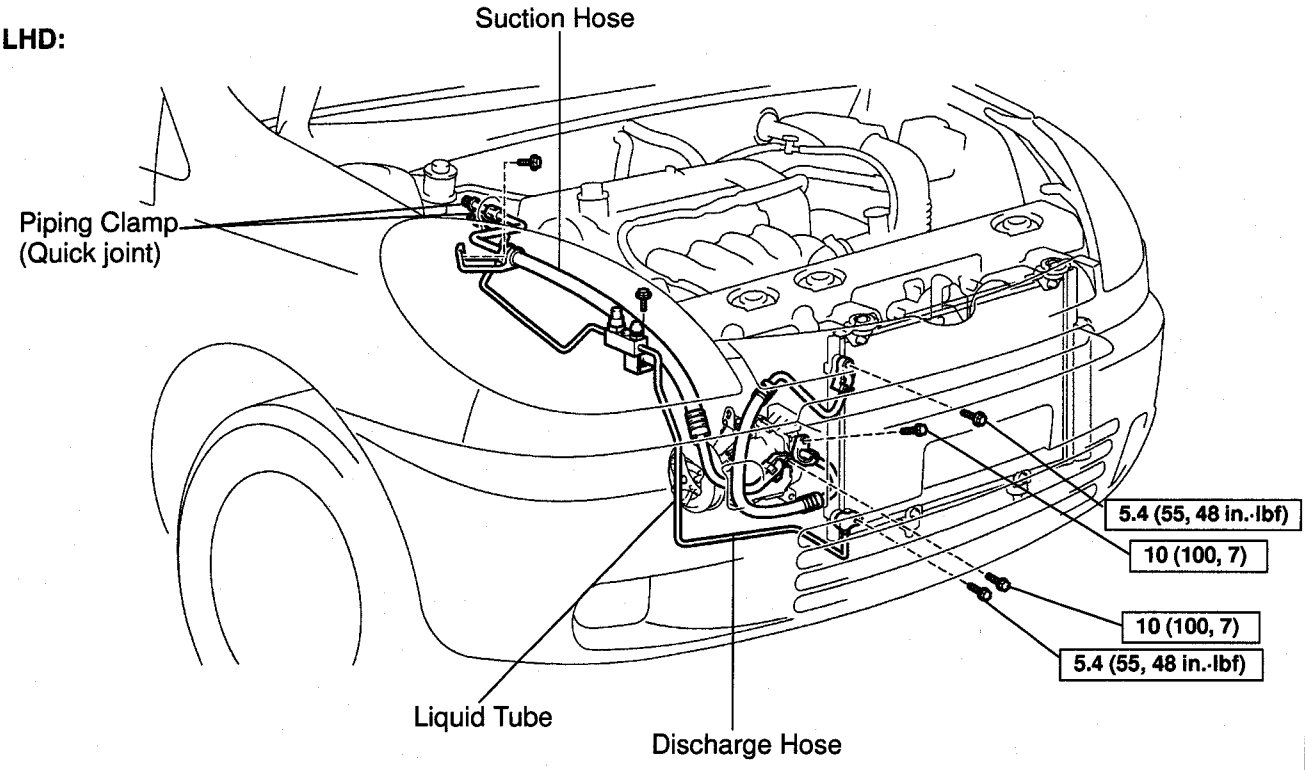
2. INSPECT HOSES AND TUBES FOR LEAKAGE

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

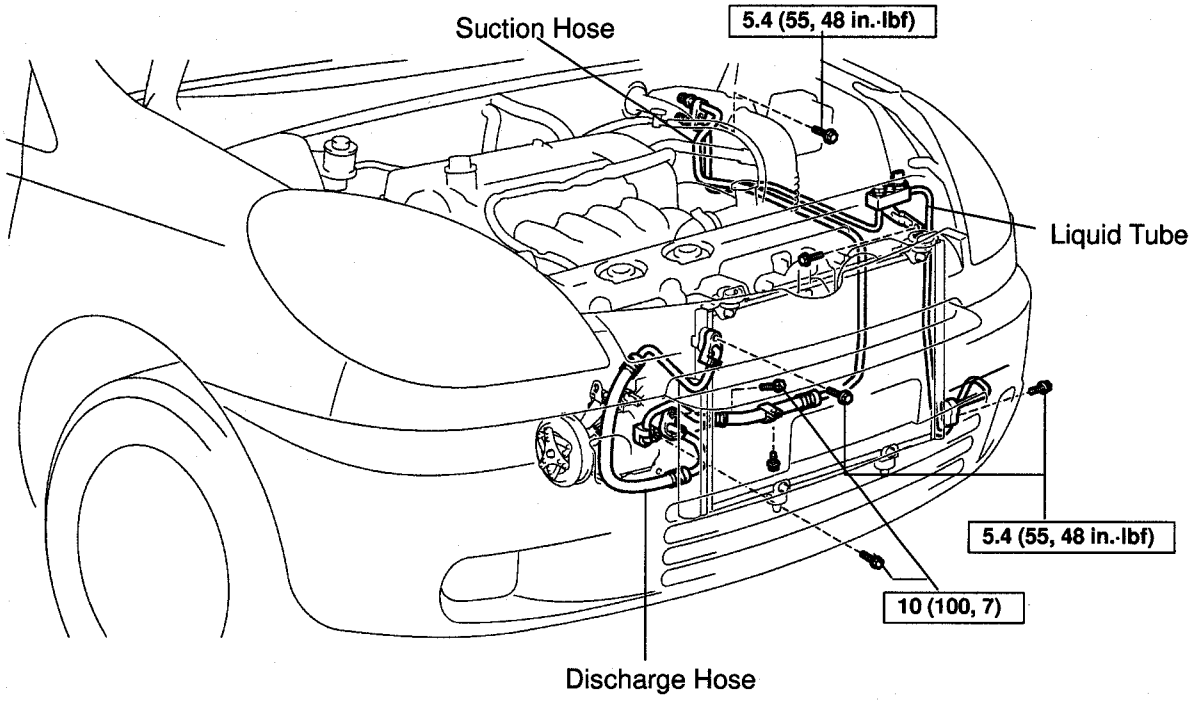
AC282-02

COMPONENTS

LHD:



RHD:



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

P

I14011

AC0CE-04

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TIGHTEN JOINT OF BOLT OR NUT AT SPECIFIED TORQUE

NOTICE:

Connections should not be torqued tighter than the specified torque.

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Discharge hose	5.4	55	48 in.·lbf
Condenser x Liquid tube	5.4	55	48 in.·lbf
A/C unit x Liquid and Suction hose (RHD only)	5.4	55	48 in.·lbf

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

Specified amount: 430 ± 30g (15.17 ± 1.06 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

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

6. INSPECT AIR CONDITIONING OPERATION

AIR CONDITIONER UNIT

AC283-01

ON–VEHICLE INSPECTION

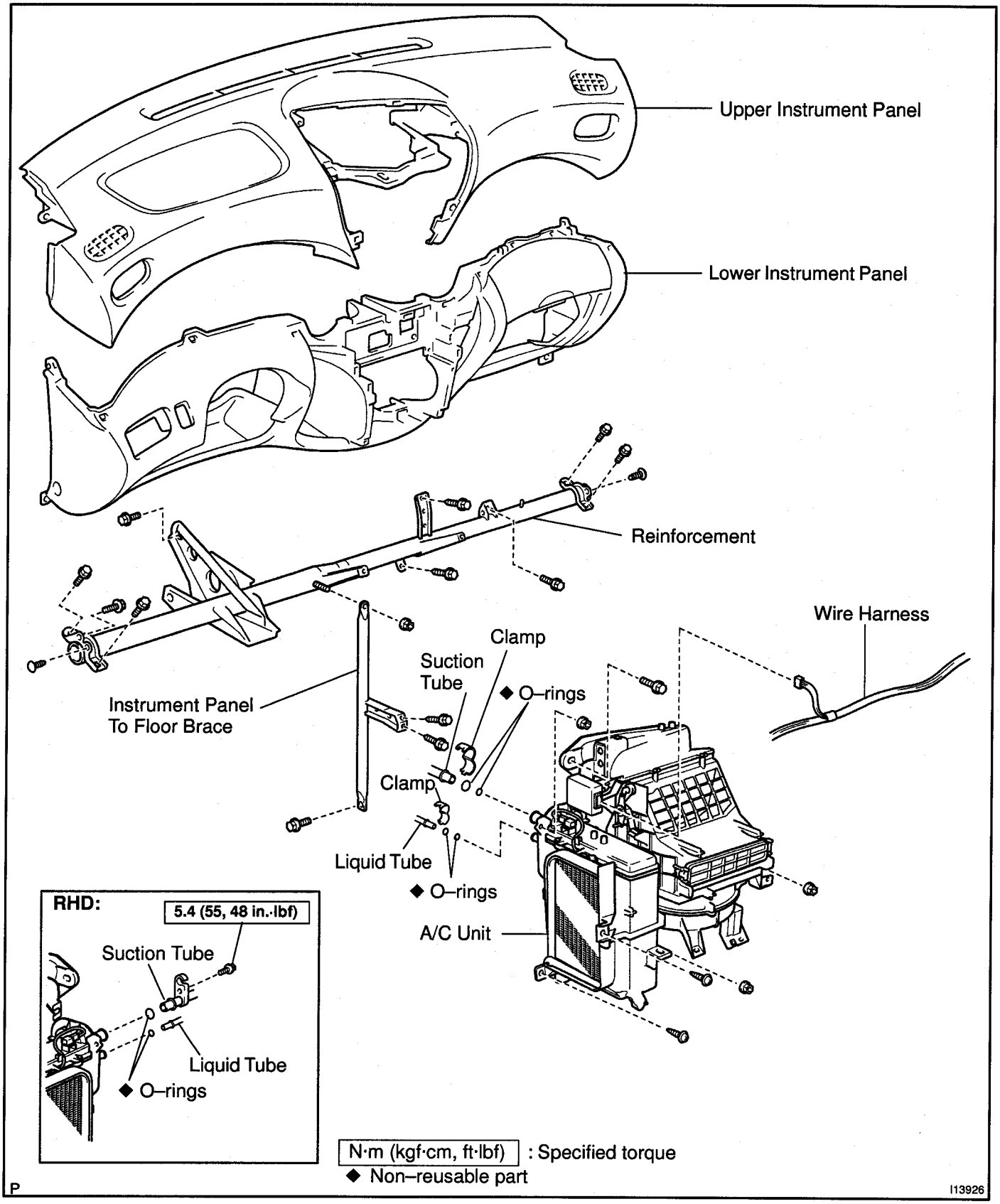
INSPECT FOR LEAKAGE OF REFRIGERANT

(a) Remove the glove compartment door (See page BO–86).
(b) Remove the blower resister.
(c) Using a gas leak detector, check for leakage of refrigerant.

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

AC284-02

COMPONENTS

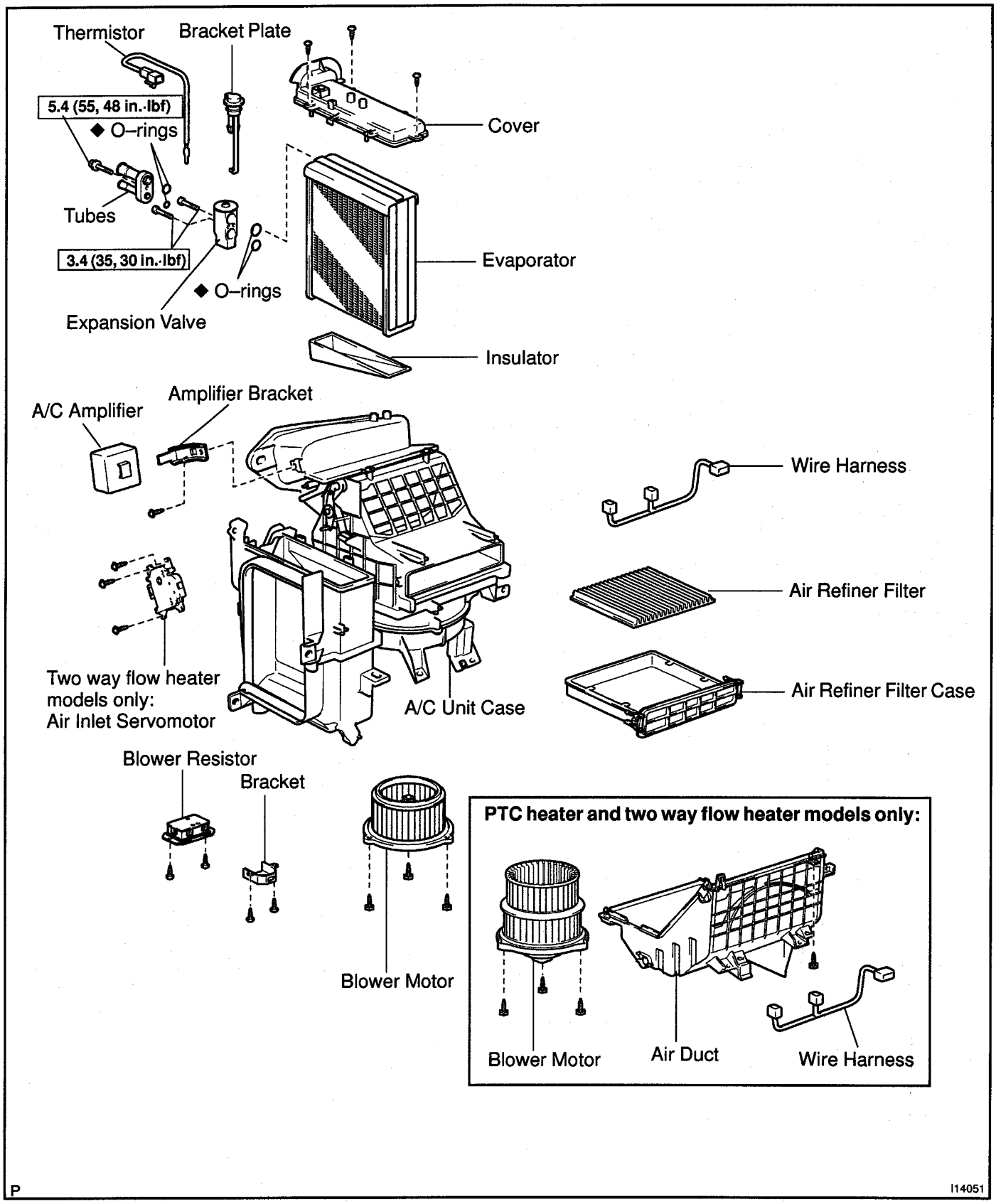


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

I13926


Thermistor
Bracket Plate
5.4 (55, 48 in.·lbf)
◆ O–rings
Cover
Tubes
3.4 (35, 30 in.·lbf)
Evaporator
◆ O–rings
Expansion Valve
Insulator
A/C Amplifier
Amplifier Bracket
Wire Harness
Air Refiner Filter
Air Refiner Filter Case
Two way flow heater models only: Air Inlet Servomotor
A/C Unit Case
Blower Resistor
Bracket
Blower Motor
PTC heater and two way flow heater models only:
Blower Motor
Air Duct
Wire Harness

AC2HM-01

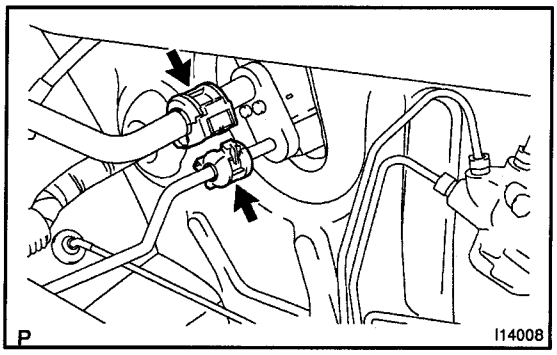
REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.
Evacuate air from refrigeration system.
Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)

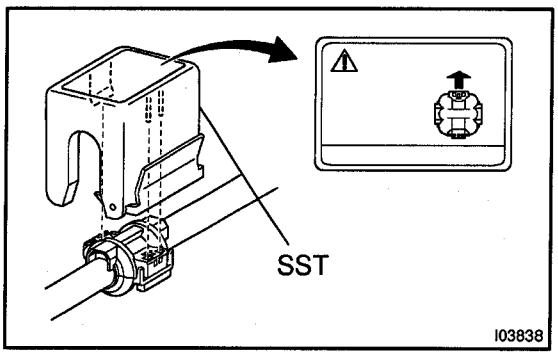


2. LHD models: DISCONNECT LIQUID TUBE

(a) Remove the grommet.

(b) Using SST, remove the 2 piping clamps.

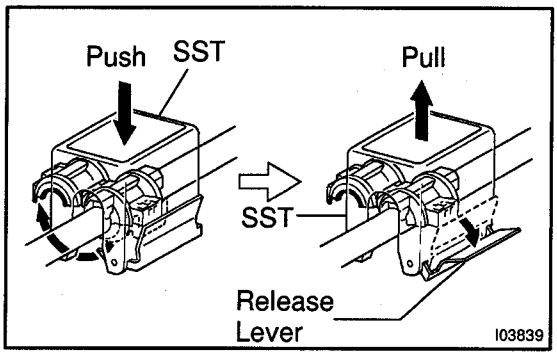
SST 09870–00025 (Liquid tube)
09870–00015 (Suction tube)



(1) Insert SST to piping clamp.

HINT:

Confirm the direction of the piping clamp claw and SST using the illustration showing on the caution label.



(2) Push down SST and release the clamp lock.

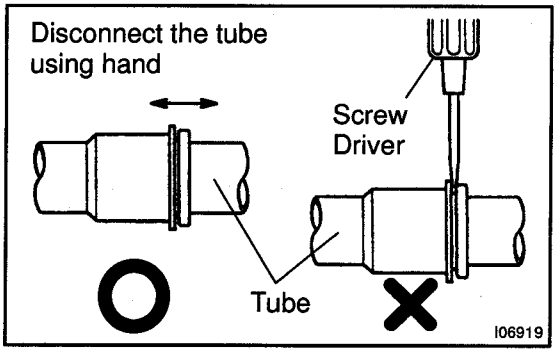
NOTICE:

Be careful not to deform the tubes, when pushing SST.

(3) Pull SST slightly and push the release lever, then remove the piping clamp with SST.

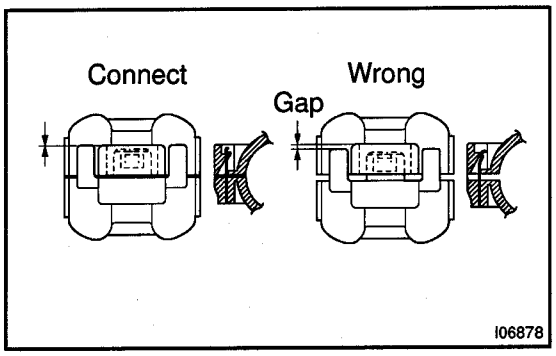
(4) Remove the piping clamp from SST.

(c) Disconnect the both tubes.

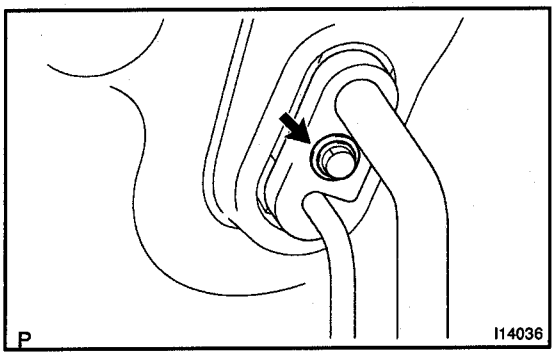


NOTICE:

- **Do not use tools like screwdriver to remove the tube.**
- **Cap the open fittings immediately to keep moisture or dirt out of the system.**



HINT:
At the time of installation, please refer to the following item.
- Lubricate 2 new O–rings with compressor oil and install them to the tubes.
- After connection, check the fitting for claw of the piping clamp.



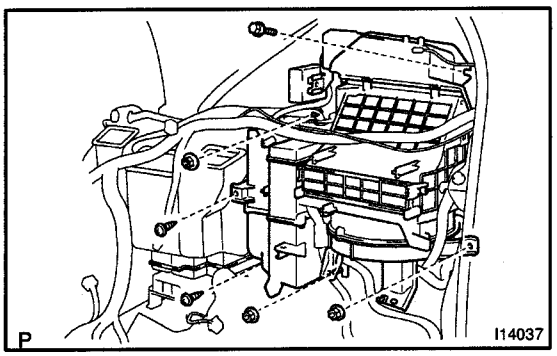
3. RHD models:
DISCONNECT LIQUID TUBE AND SUCTION HOSE

(a) Remove the grommet.
(b) Remove the bolt and slide the plate, then disconnect the both tubes.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

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

HINT:
At the time of installation, please refer to the following item.
Lubricate 2 new O–rings with compressor oil and install them to the tube.

4. REMOVE INSTRUMENT PANEL AND REINFORCEMENT (See page BO–86)



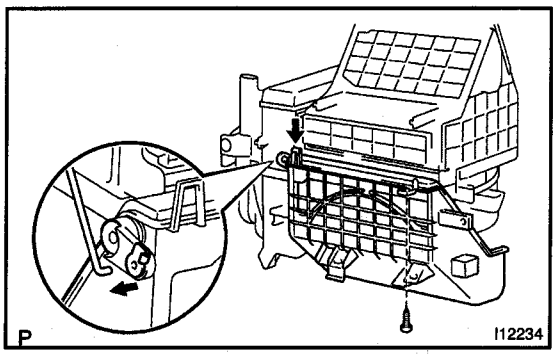
5. REMOVE A/C UNIT

(a) Disconnect the connectors.
(b) Disconnect the wire harness clamps.
(c) Remove the 2 bolts, nut, rivet and A/C unit.

HINT:
At the time of installation, please refer to the following item.
Do not reuse the rivet.

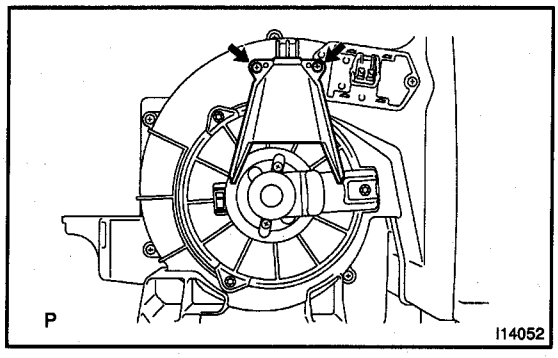
AC286-02

DISASSEMBLY



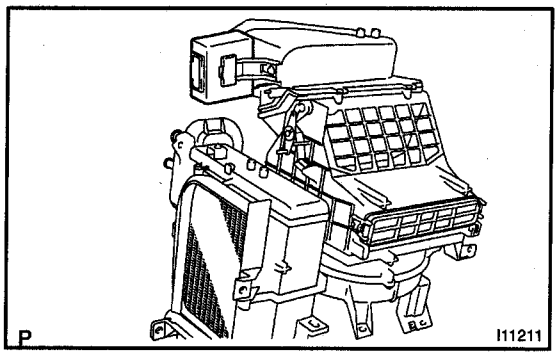
1. PTC heater and two way flow heater models only: REMOVE AIR DUCT (Motor cover)

(a) Disconnect the control link.
(b) Disconnect the connector clamps.
(c) Disconnect the wire harness clamps.
(d) Remove the 3 screws.
(e) Release the claw and remove the air duct.



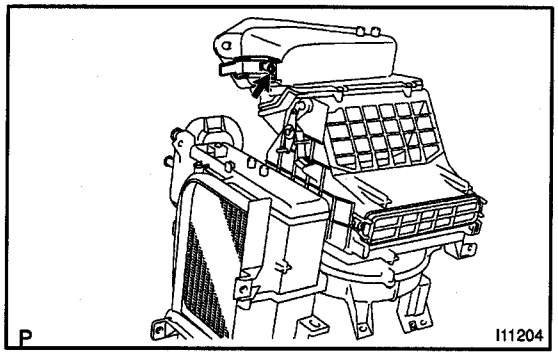
2. REMOVE BLOWER RESISTOR

(a) Standard heater models only:
Remove the 2 screws and bracket.
(b) Disconnect the connector.
(c) Remove the 2 screws and blower resistor.



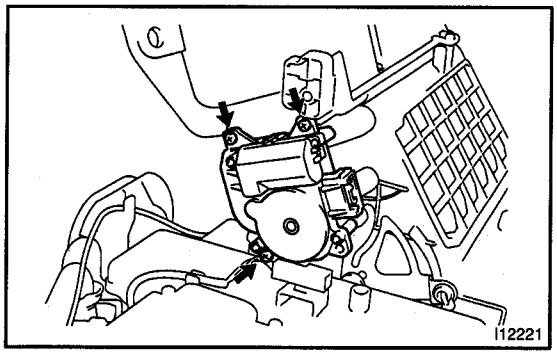
3. REMOVE A/C AMPLIFIER

Using a screwdriver, release the claw and remove the A/C amplifier.



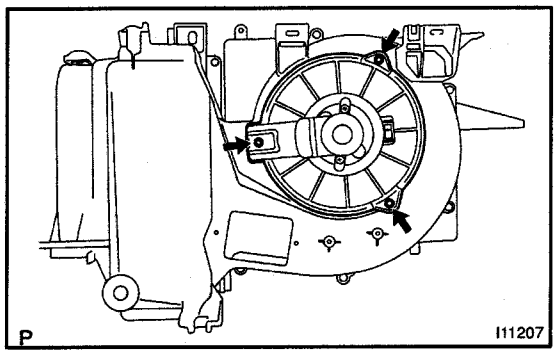
4. REMOVE AMPLIFIER BRACKET

Remove the screw and bracket.



5. Two way flow heater models only: REMOVE AIR INLET SERVOMOTOR

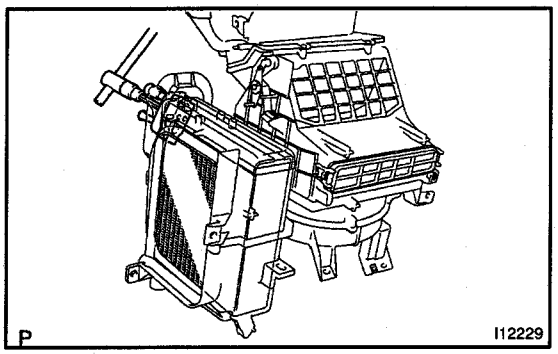
Remove the 3 screws and air inlet servomotor.



6. REMOVE BLOWER MOTOR

(a) Disconnect the connector.

(b) Remove the 3 screws and blower motor.

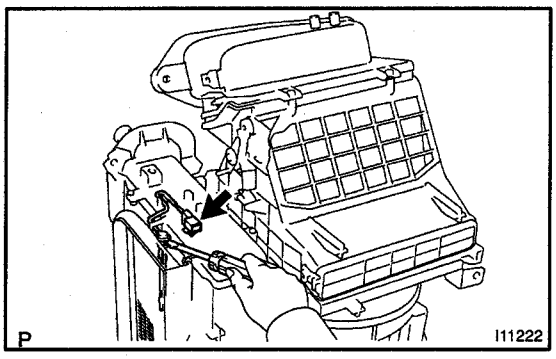


7. REMOVE EXPANSION VALVE

(a) LHD models:
Remove the bolt and A/C tube.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Using a hexagon wrench (5.0 mm, 0.20 in.), remove the 2 bolts and remove the tube and expansion valve.
Torque: 3.4 N·m (35 kgf·cm, 30 in.·lbf)

HINT:
At the time of reassembly, please refer to the following item.
Lubricate 4 new O–rings with compressor oil and install them to the tube.

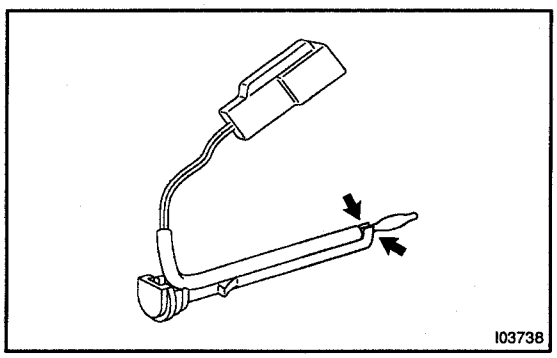


8. REMOVE THERMISTOR

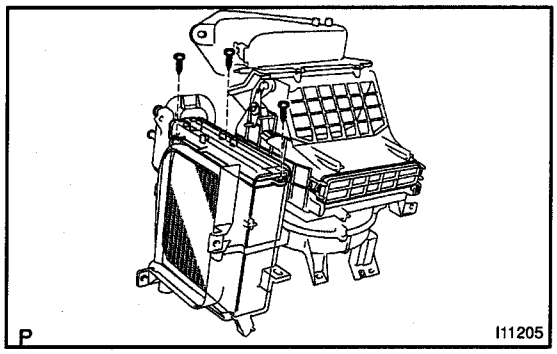
(a) Disconnect the connector clamp.

(b) Using a screwdriver, remove the thermistor.

HINT:
Tape the screwdriver tip before use.



(c) Release the 2 claws and remove the sensor from bracket plate.



9. REMOVE EVAPORATOR

(a) Remove the 3 screws cover.

(b) Pull out the evaporator.

HINT:

At the time of reassembly, please refer to the following item.

If evaporator is replaced, add compressor oil to evaporator.

Add 40 cc (1.4 fl.oz.)

Compressor oil: ND–OIL 8 or equivalent

AC287-01

INSPECTION

1. CHECK EVAPORATOR FINS FOR BLOCKAGE

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

NOTICE:

Never use to clean the evaporator.

2. CHECK FITTING FOR CRACKS FOR SCRATCHES

AC286-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–29).

AC289-01

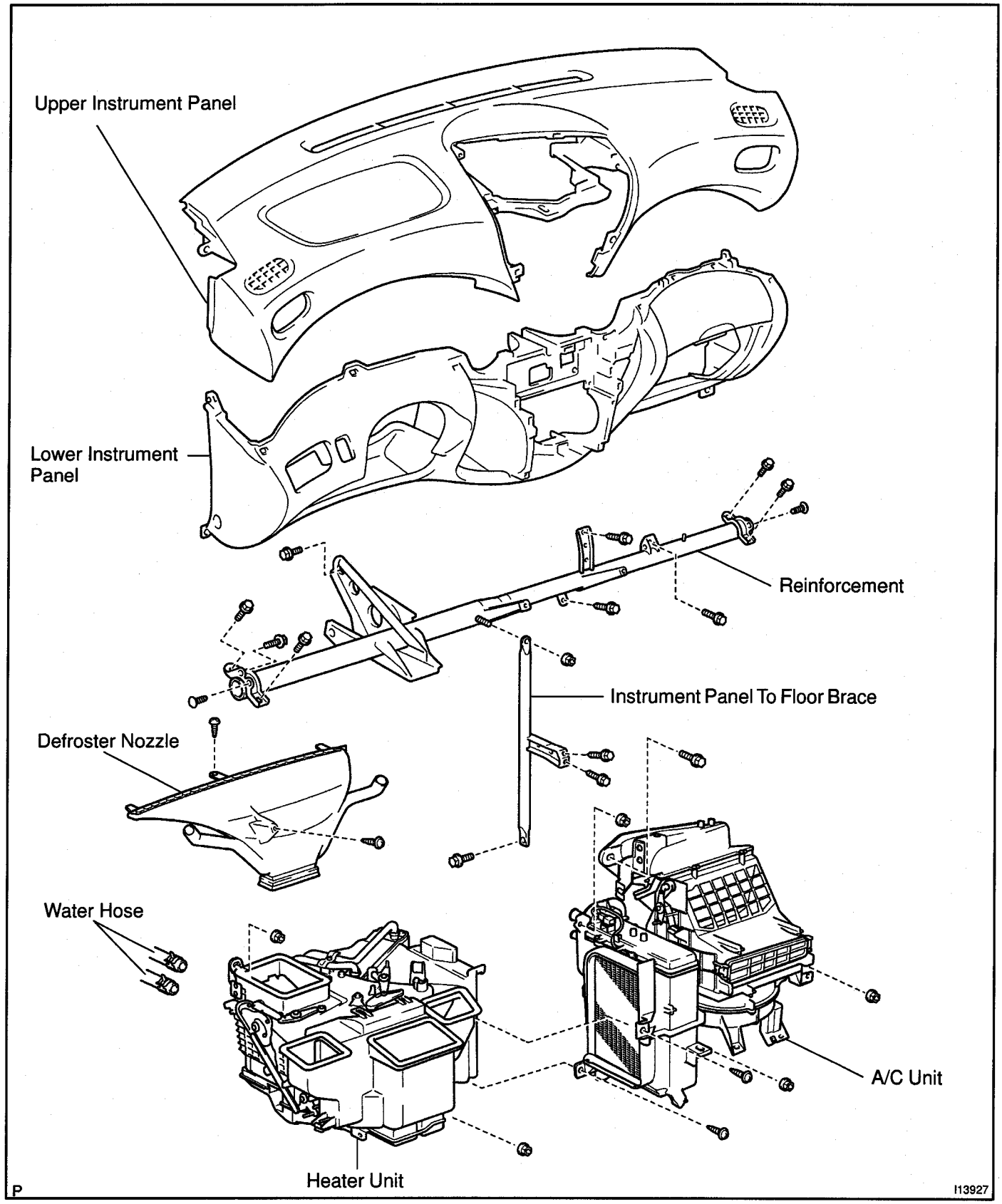
INSTALLATION

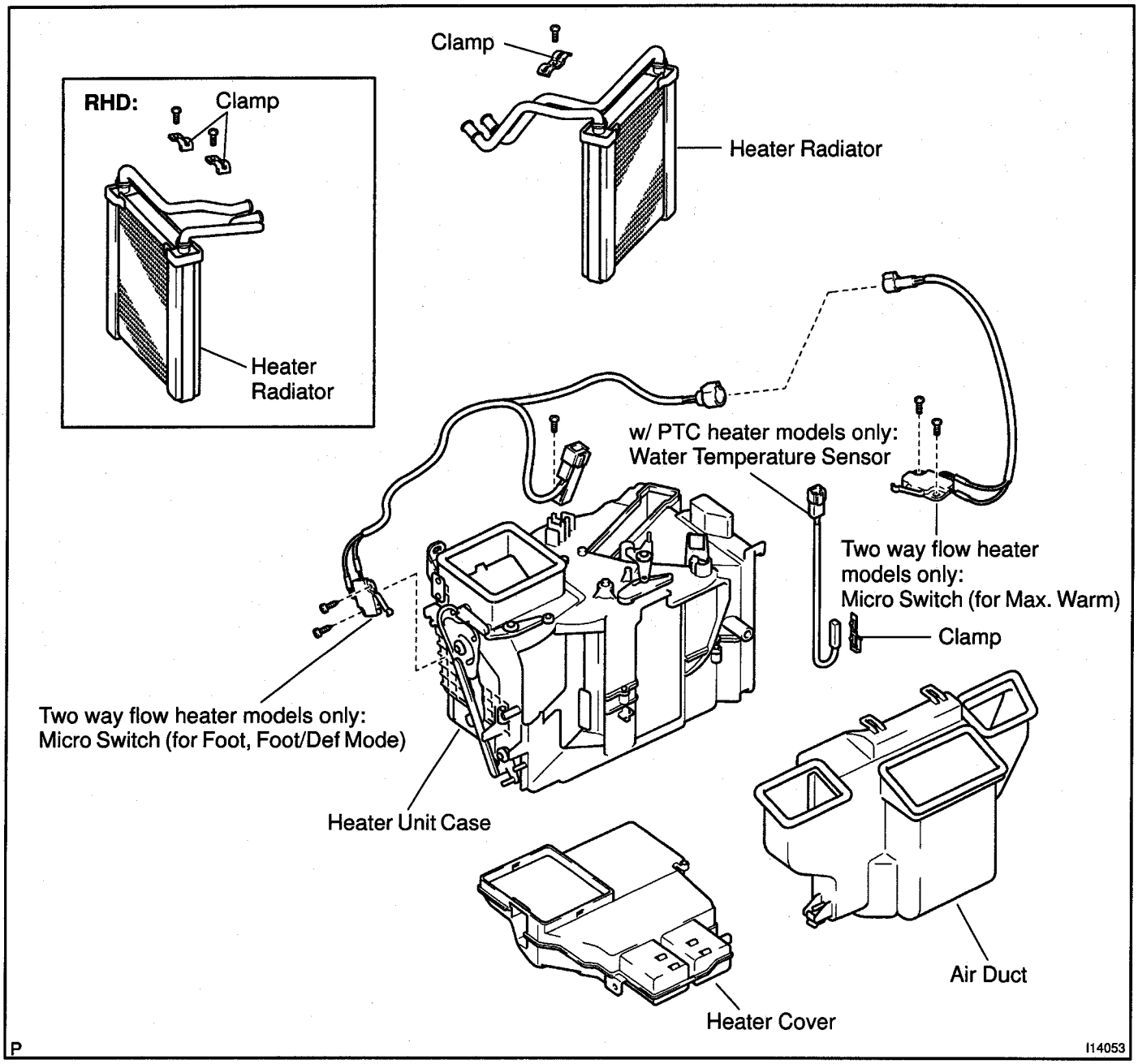
Installation is in the reverse order of removal (See page AC–27).

HEATER UNIT

COMPONENTS

AC28A–02



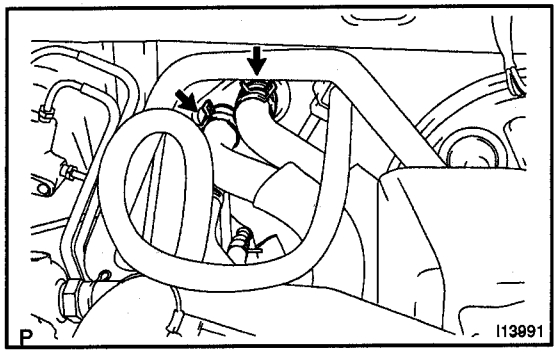

RHD:
Clamp
Heater Radiator
Clamp
Heater Radiator
w/ PTC heater models only:
Water Temperature Sensor
Two way flow heater models only:
Micro Switch (for Max. Warm)
Clamp
Two way flow heater models only:
Micro Switch (for Foot, Foot/Def Mode)
Heater Unit Case
Air Duct
Heater Cover
P
I14053

AC28B-02

REMOVAL

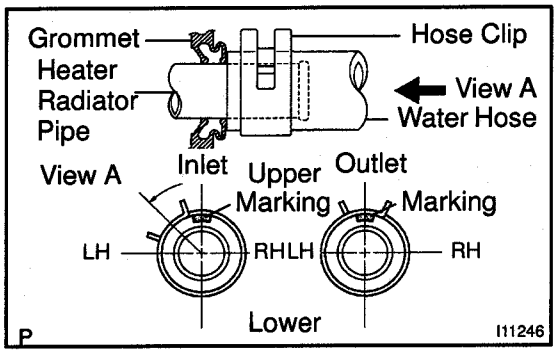
1. DRAIN ENGINE COOLANT FROM RADIATOR

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



2. DISCONNECT WATER HOSES FROM HEATER RADIATOR PIPES

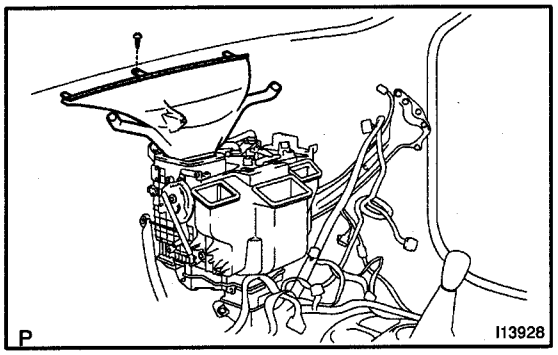
(a) Using pliers, grip the claws of the hose clip and slide the clip along the hose.
(b) Disconnect the water hoses.
(c) Remove the grommet.



HINT:
At the time of installation, please refer to the following items.

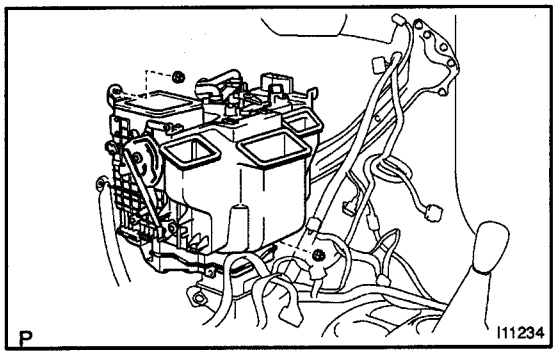
- Push the water hose onto the heater radiator pipe as far as the grommet.
- Install the hose clip in a position, as shown in the illustration.

3. REMOVE A/C UNIT (See page AC–27)



4. REMOVE HEATER UNIT

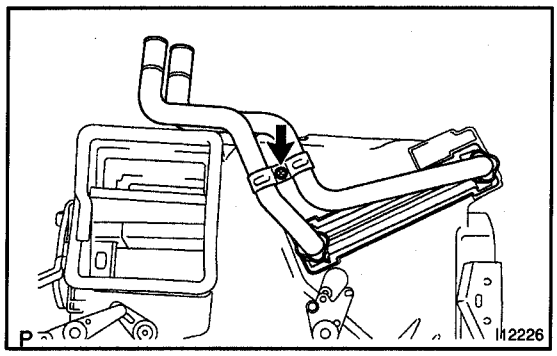
(a) Remove the clip and defroster nozzle.
(b) PTC heater and two way flow heater models only: Disconnect the connectors.



(c) Remove the 2 floor carpet set clips.
(d) Remove the 2 nuts and heater unit.

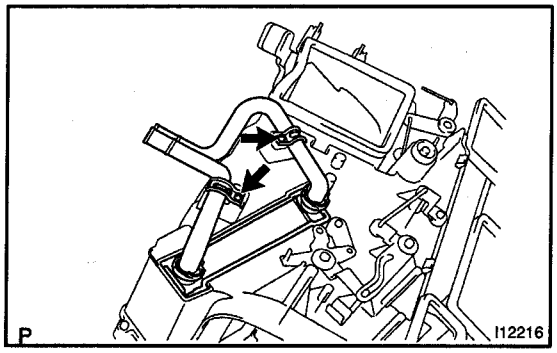
AC28C–02

DISASSEMBLY



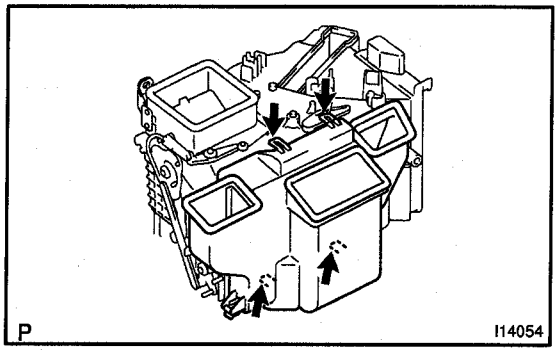
1. LHD models only:
REMOVE HEATER RADIATOR

(a) PTC heater models only:
Disconnect the connector clamp.
(b) Remove the screw and clamp.
(c) Pull out the heater radiator.



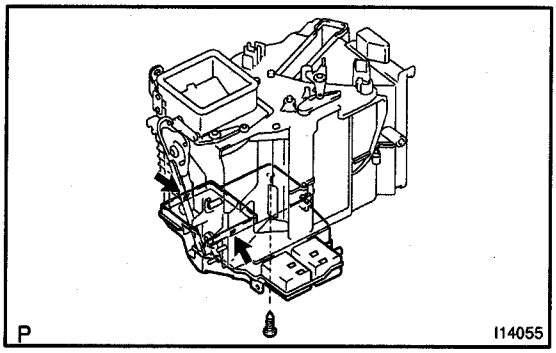
2. RHD models:
REMOVE HEATER RADIATOR

(a) PTC heater models only:
Disconnect the connector clamp.
(b) Remove the 2 screws and 2 clamps.
(c) Pull out the heater radiator.



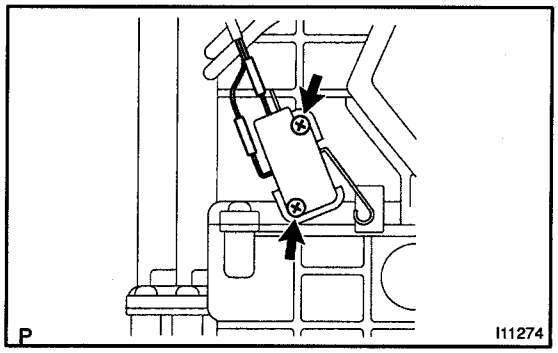
3. REMOVE AIR DUCT

Release the 4 claws and remove the air duct.



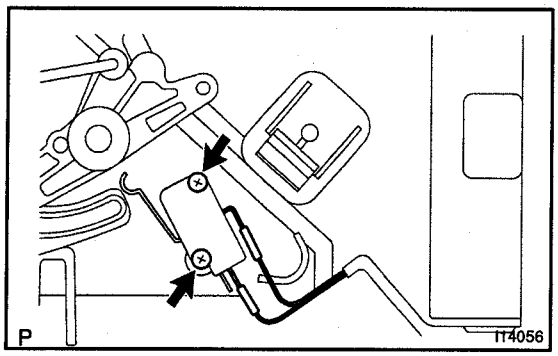
4. REMOVE HEATER COVER

Release the 2 claws, remove the screw and heater cover.



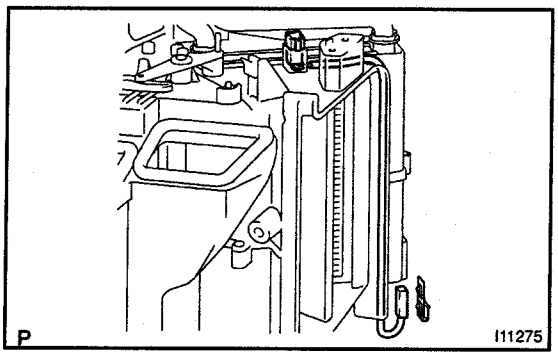
5. Two way flow heater models only:
REMOVE MICRO SWITCH (for FOOT, FOOT / DEF. mode)

(a) Disconnect the connector.
(b) Remove the connector set screw.
(c) Remove the 2 screws and switch.



6. Two way flow heater models only:
REMOVE MICRO SWITCH (for MAX. WARM)

Remove the 2 screws and switch.



7. w/ PTC heater models only:
REMOVE WATER TEMPERATURE SENSOR

(a) Disconnect the connector clamp.
(b) After pulling off the clamp, pull out the sensor.

8. PTC heater and two way flow heater models only:
REMOVE WIRE HARNESS

Remove the screw and wire harness.

AC28D-01

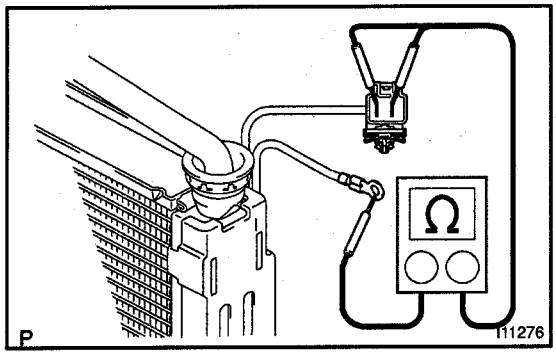
INSPECTION

1. CHECK HEATER RADIATOR FINS FOR BLOCKAGE

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

2. CHECK FITTING FOR CRACKS OR SCRATCHES

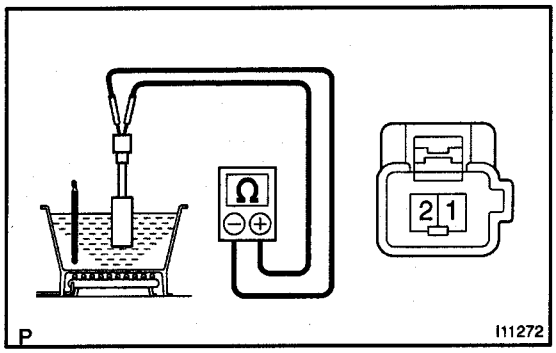
If necessary repair or replace.



3. PTC heater models only:
INSPECT PTC HEATER CONTINUITY

Using an ohmmeter, check continuity exists between each terminal of connector and earth wire.

If no continuity exists, replace the heater radiator.

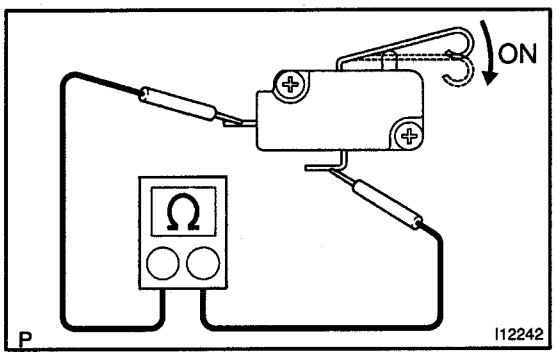


4. PTC heater models only:
INSPECT WATER TEMPERATURE SENSOR

Measure resistance between terminals at each temperature.

Standard resistance:
25 °C (77 °F): 5.0 ± 0.2 kΩ
40 °C (104 °F): 2.7 ± 0.15 kΩ
100 °C (212 °F): 0.3 ± 0.04 kΩ

If resistance is not as specified, replace the sensor.



5. Two way flow heater models only:
INSPECT MICRO SWITCH CONTINUITY

Check the continuity exists between terminals while switch is pressed.

If no continuity exists, replace the switch.

AC0CN–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–38).

AC0CO-01

INSTALLATION

Installation is in the reverse order of removal (See page AC–37).

COMPRESSOR AND MAGNETIC CLUTCH

AC0CZ-04

ON–VEHICLE INSPECTION

1. CHECK FOR LEAKAGE OF GREASE FROM CLUTCH BEARING

2. CHECK FOR SIGNS OF OIL ON PRESSURE PLATE OR ROTOR

3. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

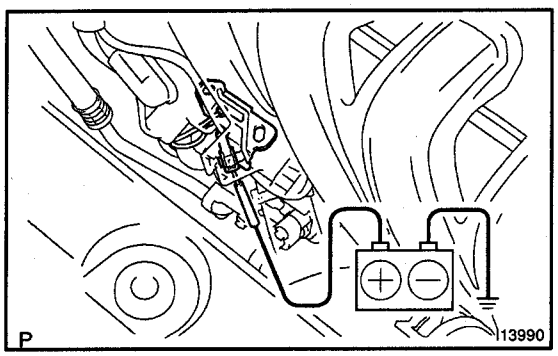
(a) Start engine.

(b) Check for abnormal noise from the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the magnetic clutch.

4. INSPECT MAGNETIC CLUTCH OPERATION

(a) Disconnect the connector.



(b) Connect the positive (+) lead from the battery to terminal of magnetic clutch connector and the negative (–) lead to the body ground.

(c) Check that the magnetic clutch energized.

If operation is not as specified, replace the magnetic clutch.

5. INSPECT COMPRESSOR FOR METALLIC SOUND

Check there is abnormal metallic sound from the compressor when the A/C switch is ON.

If abnormal metallic sound is heard, replace the compressor assembly.

6. INSPECT REFRIGERANT PRESSURE

(See page AC–3)

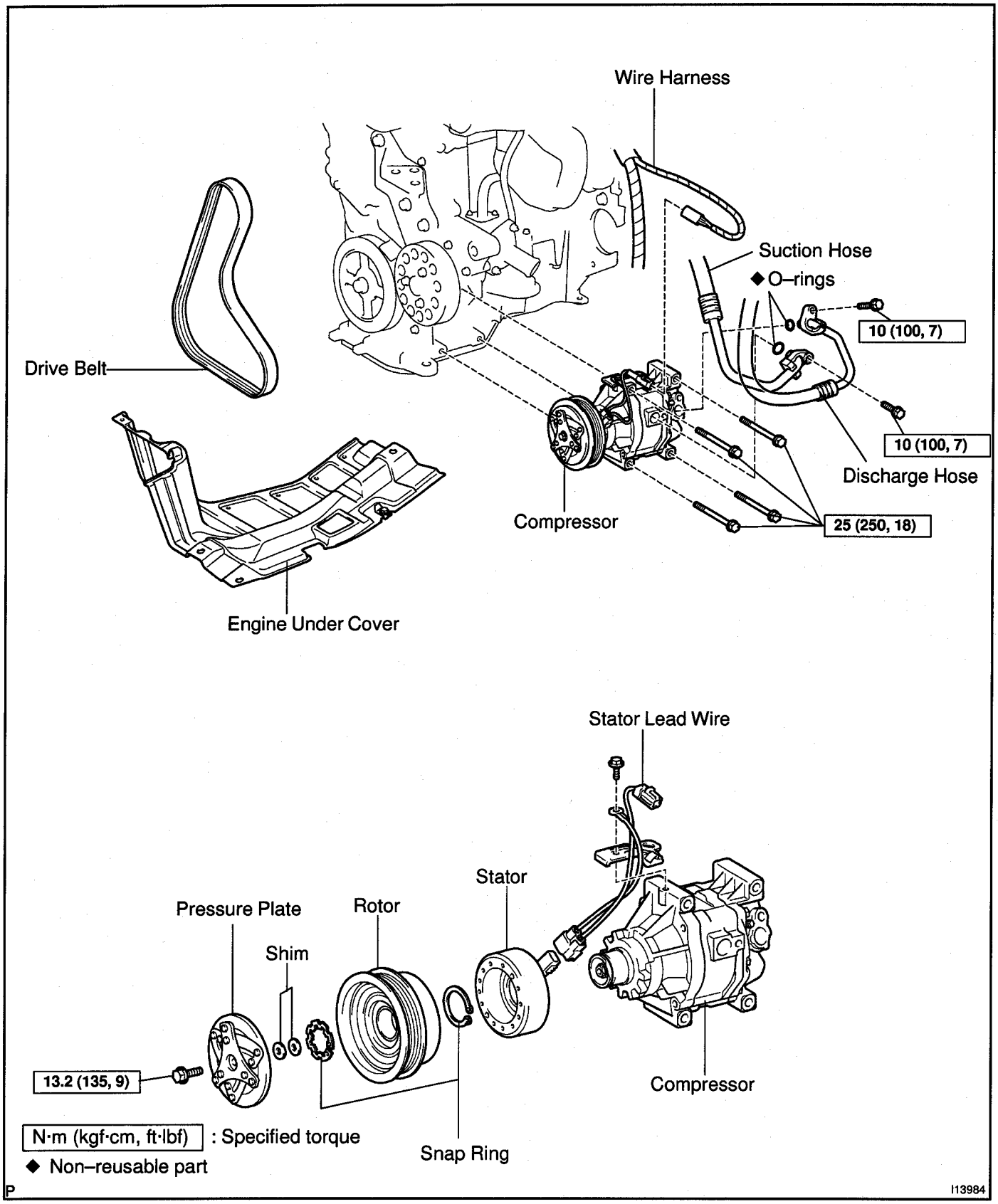
7. INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT

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

If there is any leakage, check the tightening torque at joints or replace compressor.

AC28E–02

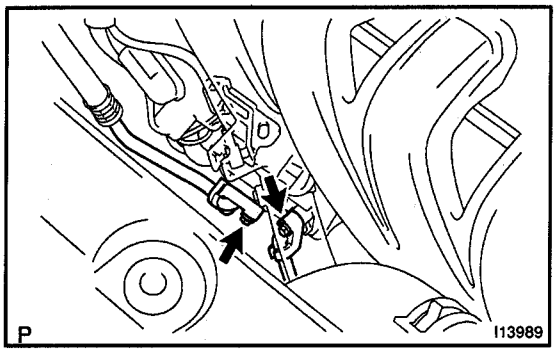
COMPONENTS



AC2HT-01

REMOVAL

1. **RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES**
2. **STOP ENGINE**
3. **DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY**
4. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
5. **REMOVE ENGINE UNDER COVER**
6. **DISCONNECT DRIVE BELT (See page AC–17)**

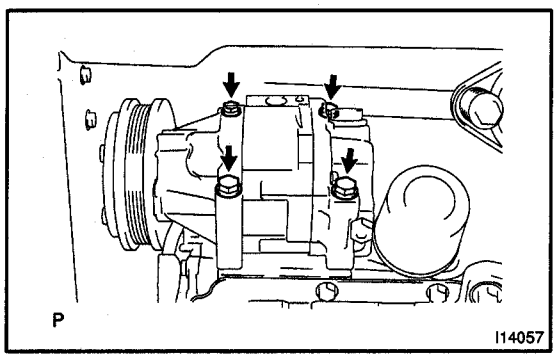


7. **DISCONNECT DISCHARGE AND SUCTION HOSES FROM COMPRESSOR**

Remove the 2 bolts and disconnect the both hoses.

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.



8. **REMOVE COMPRESSOR**

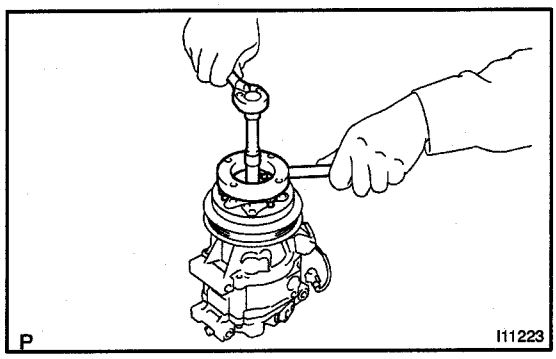
(a) Disconnect the connector.
(b) Disconnect the wire harness clamp.
(c) Remove the 4 bolts and compressor.

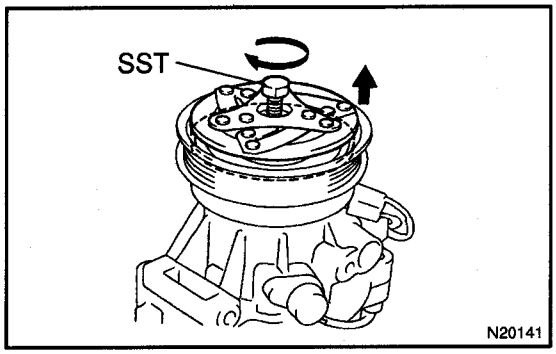
AC28G–02

DISASSEMBLY

1. REMOVE PRESSURE PLATE

(a) Using SST and a socket wrench, remove the shaft bolt.
SST 07112–76050
Torque: 13.2 N·m (135 kgf·cm, 9 ft·lbf)





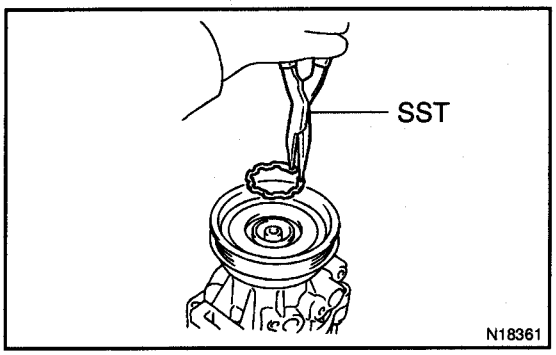
(b) Install SST to the pressure plate.
SST 07112–66040

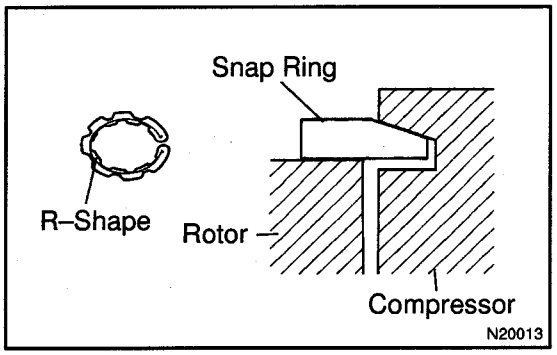
(c) Using SST and a socket wrench, remove the pressure plate.
SST 07112–76050, 07112–66040

(d) Remove the shims from the shaft.

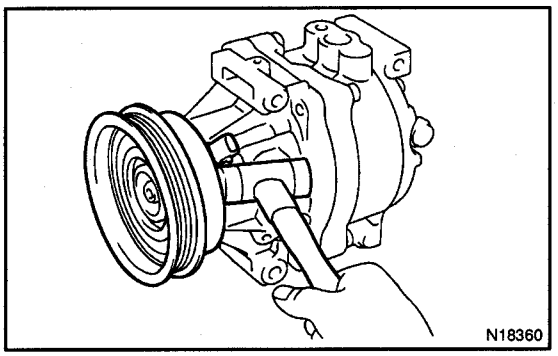
2. REMOVE ROTOR

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



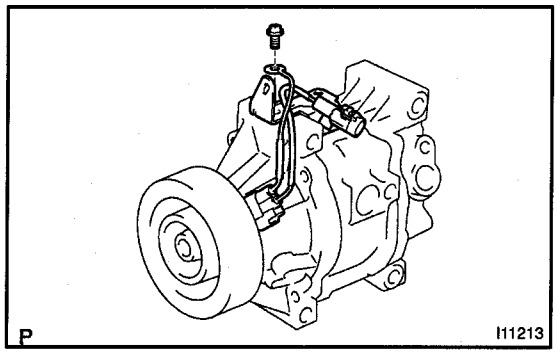


NOTICE:
At the time of reassembly, please refer to the following item.
The snap ring should be installed so that its beveled side faces up.



(b) Using a plastic hammer, tap the rotor off the shaft.

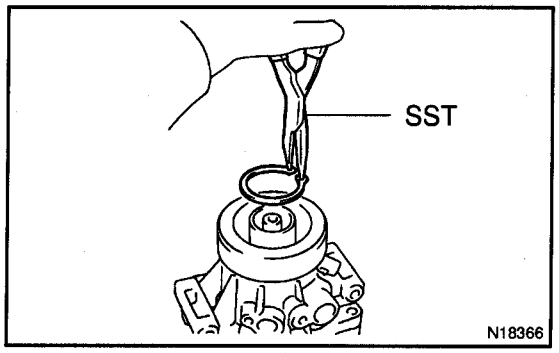
NOTICE:
Be careful not to damage the pulley when tapping on the rotor.



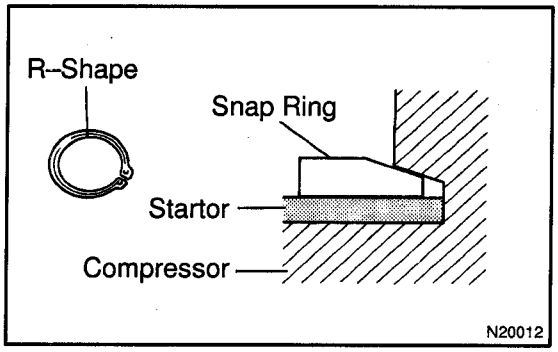
3. REMOVE STATOR

(a) Disconnect the connector from the stator.

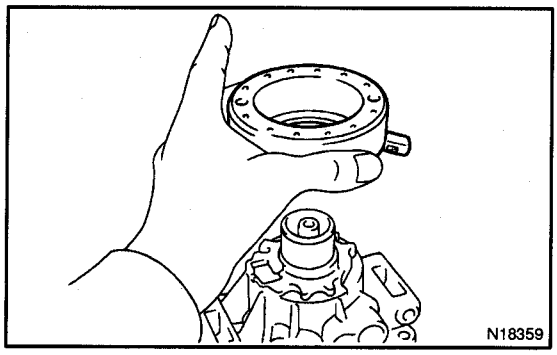
(b) Remove the screw and stator lead wire.



(c) Using SST, remove the snap ring.
SST 07114–84020



NOTICE:
At the time of reassembly, please refer to the following item.
The snap ring should be installed so that its beveled side faces up.

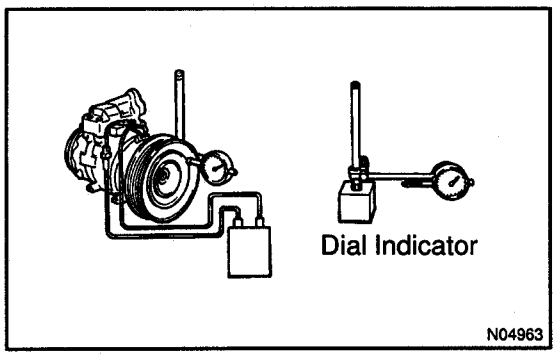


(d) Remove the stator.

AC0D3–05

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–46).



CHECK CLEARANCE OF MAGNETIC CLUTCH

HINT:

After reassembly, check the magnetic clutch clearance.

(a) Set the dial indicator to the pressure plate of the magnetic clutch.

(b) Connect the magnetic clutch lead wire to the positive (+) terminal of the battery.

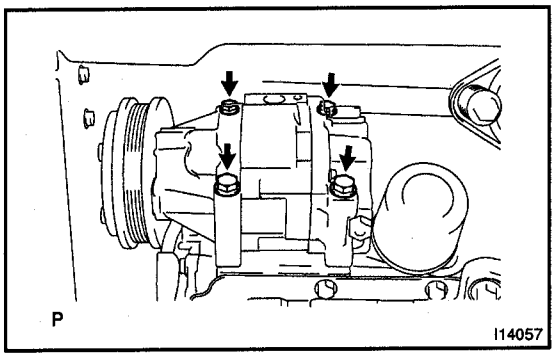
(c) Check the clearance between the pressure plate and rotor when connecting the negative (–) terminal to the battery.

Standard clearance:
0.5 ± 0.15 mm (0.020 ± 0.0059 in.)

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

Shim thickness:
0.1 mm (0.004 in.)
0.3 mm (0.012 in.)
0.5 mm (0.020 in.)

AC2HU-01

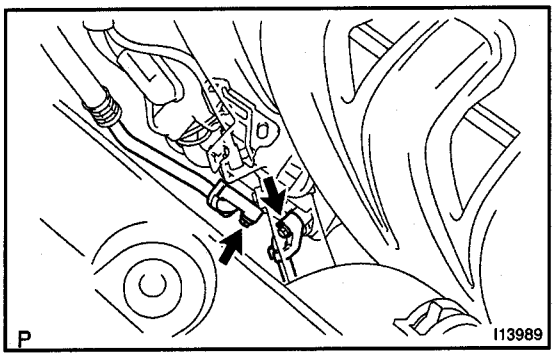


INSTALLATION

1. INSTALL COMPRESSOR

(a) Install the compressor with 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.



2. CONNECT DISCHARGE AND SUCTION HOSES FROM COMPRESSOR

(a) Lubricate 2 new O–rings with compressor oil and install them to the both hoses.

(b) Connect the both hoses with 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

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

3. CONNECT DRIVE BELT (See page AC–18)

4. INSTALL ENGINE UNDER COVER

5. CHARGE SYSTEM WITH REFRIGERANT

(a) Evacuate air from refrigeration system.

(b) Charge system with refrigerant and inspect for leakage of refrigerant.
Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)

6. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.
If there is leakage, check the tightening torque at the joints.

7. INSPECT A/C OPERATION

CONDENSER

AC0D8-02

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FINS FOR BLOCKAGE OR DAMAGE

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

NOTICE:

Be careful not to damage the fins.

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

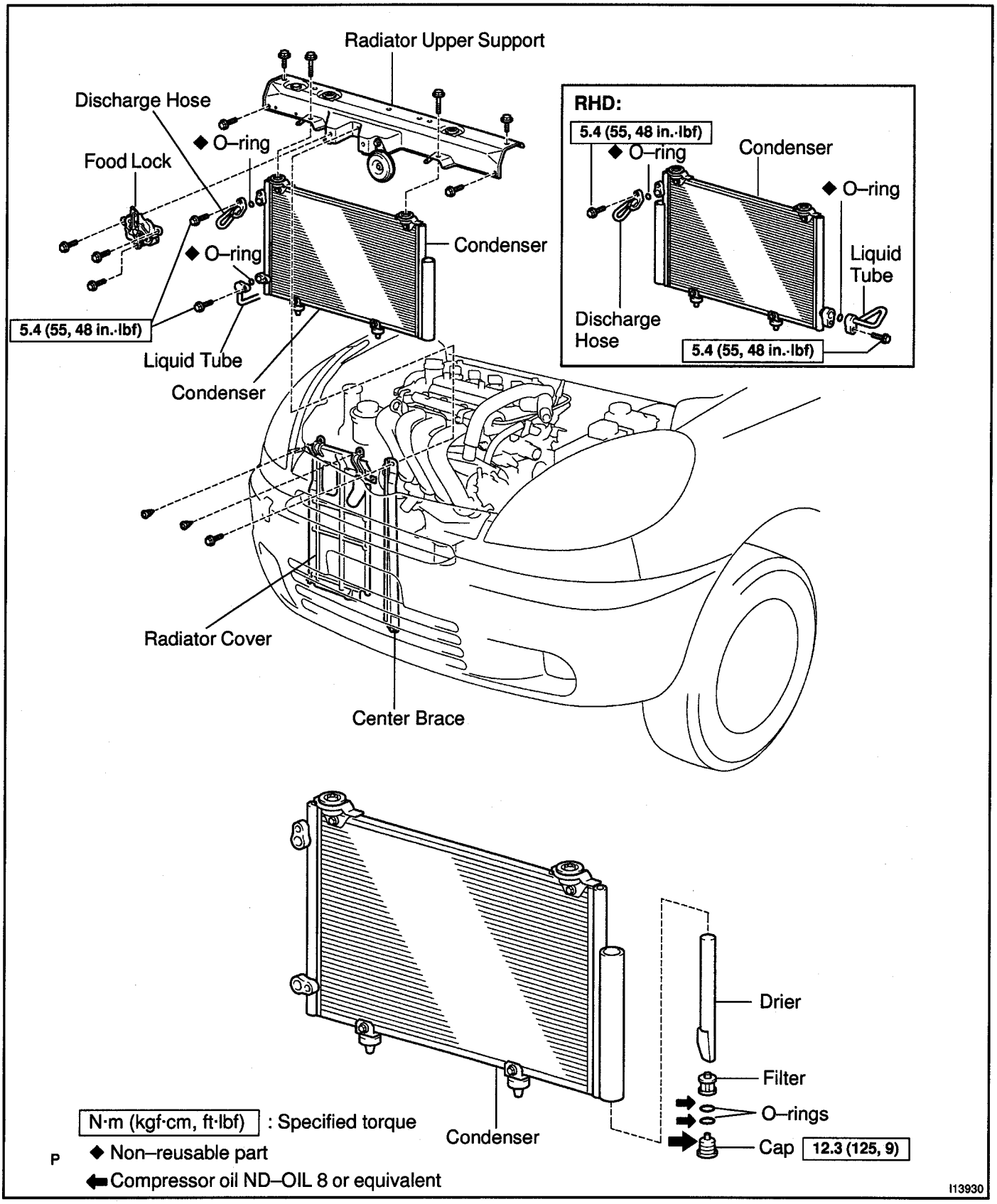
2. INSPECT CONDENSER AND FITTINGS FOR LEAKAGE OF REFRIGERANT

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

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

AC28I-03

COMPONENTS



AC28J–02

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

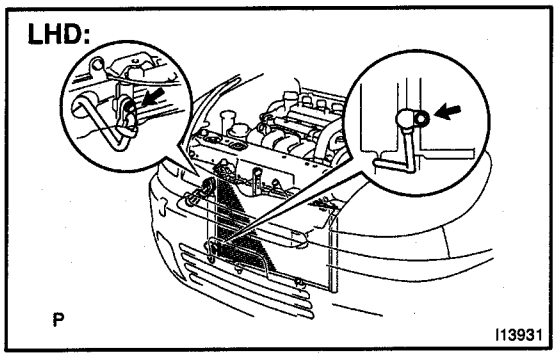
HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)



2. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE

Remove the 2 bolts and disconnect the hose and tube.

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

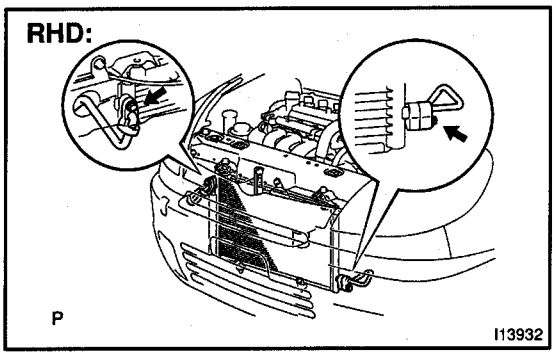
NOTICE:

Cap open the fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O–rings with compressor oil and install them to the tubes.



3. REMOVE RADIATOR UPPER SUPPORT

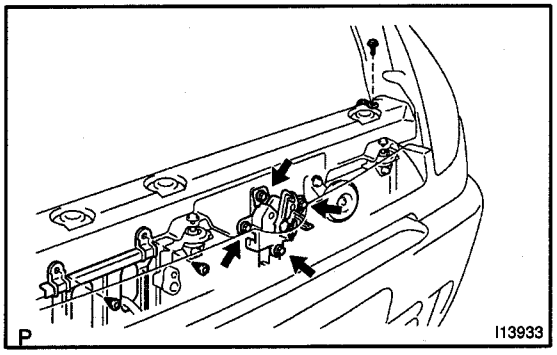
(a) Remove the 3 hood lock set bolts.

(b) Remove the center brace set bolt.

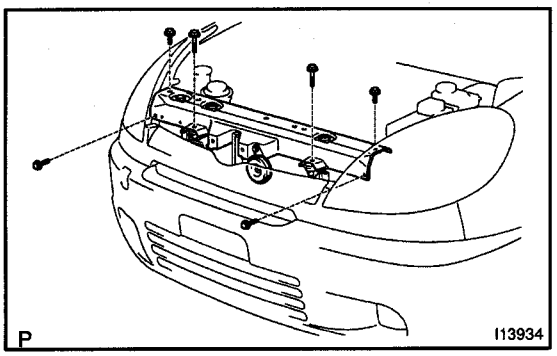
(c) Remove the 2 radiator cover set clips.

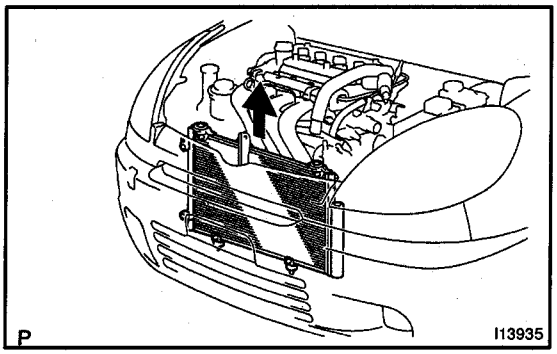
(d) Disconnect the connector from the hone.

(e) Remove the earth wire set bolt.



(f) Remove the 6 bolts and radiator upper support.





4. REMOVE CONDENSER

Pull out the condenser upward.

HINT:

At the time of installation, please refer to the following item.

If condenser is replaced, add compressor oil to the compressor.

Add 40 cc (1.4 fl.oz.)

Compressor oil: ND–OIL 8 or equivalent

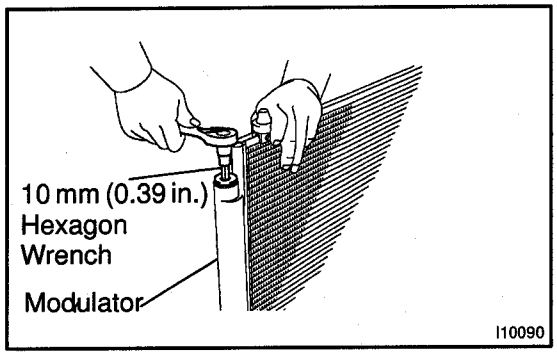
AC28K–03

REPLACEMENT

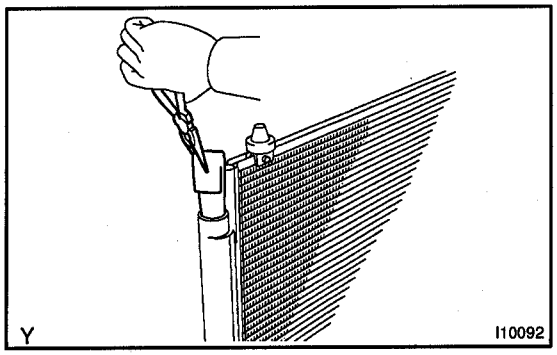
REPLACE DRIER FROM MODULATOR

(a) Using a hexagon wrench (10 mm, 0.39 in.), remove the cap from the modulator.

(b) Remove the filter from the modulator.



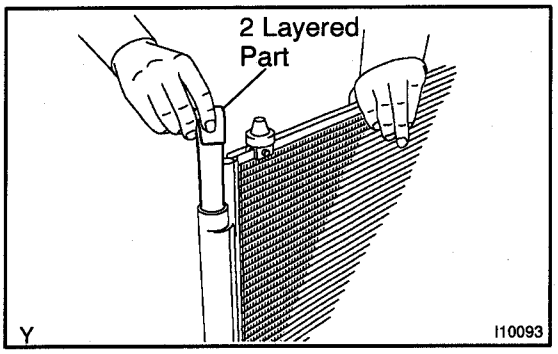
(c) Using pliers, remove the drier.



(d) Insert a new drier into the modulator.

NOTICE:

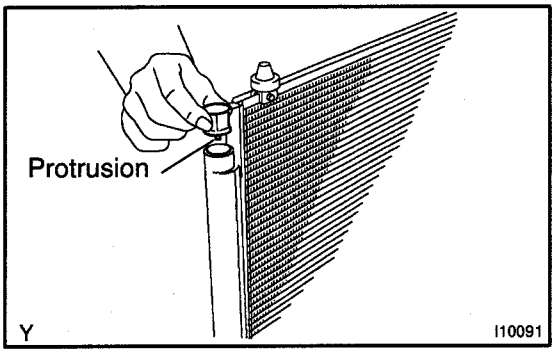
- **Do not remove the drier from a vinyl bag until inserting it into the modulator.**
- **Install the drier with its 2 layered part faced upward to the modulator.**



(e) Insert the filter into the modulator.

NOTICE:

Install the filter with its protrusion faced downward to the modulator.



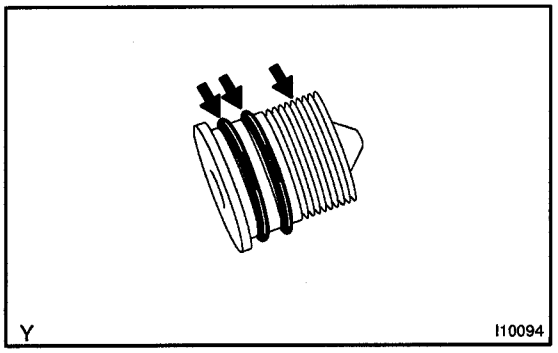
(f) Install the cap to the modulator.

(1) Apply compressor oil to the O–rings and screw part of the cap.

Compressor oil: ND–OIL 8 or equivalent

(2) Using a hexagon wrench (10 mm, 0.39 in.), install the caps.

Torque: 12.3 N·m (125 kgf·cm, 9 ft·lbf)



AC0DA–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–52).

EXPANSION VALVE

AC28L–01

ON–VEHICLE INSPECTION

1. CHECK QUANTITY OF GAS DURING REFRIGERATION CYCLE

2. SET ON MANIFOLD GAUGE SET (See page AC–19)

3. RUN ENGINE

Run the engine at 1,500 rpm for at least 5 minutes.

Then check that the high pressure reading is 1.37 – 1.57 MPa (14 – 16 kgf/cm^2, 199 – 228 psi).

4. CHECK EXPANSION VALVE

If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm^2, 0 psi).

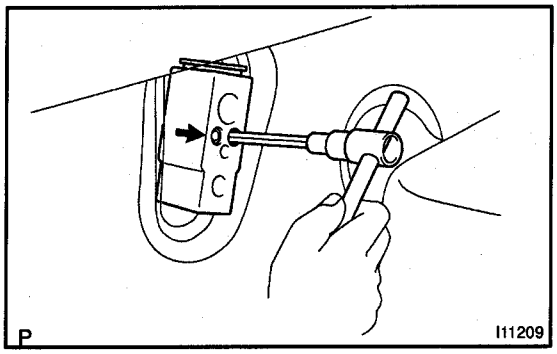
HINT:

When the low pressure drops to 0 kPa (0 kgf/cm^2, 0 psi), check the receiver's IN and OUT sides is no temperature difference.

AC2HN-01

REPLACEMENT

1. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
2. **DISCONNECT LIQUID TUBE AND SUCTION HOSE FROM A/C UNIT (See page AC–27)**



3. **REMOVE EXPANSION VALVE**

Using a hexagon wrench (5.0 mm, 0.20 in.), remove the 2 bolts and separate the expansion valve and evaporator.

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

4. **INSTALL NEW EXPANSION VALVE**

(a) Lubricate 2 new O–rings with compressor oil and install them to the expansion valve.

(b) Install the expansion valve.

(c) Using a hexagon wrench (5.0 mm, 0.20 in.), install the 2 bolts.

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

5. **CONNECT LIQUID TUBE AND SUCTION HOSE (See page AC–34)**
6. **CHARGE SYSTEM WITH REFRIGERANT**

(a) Evacuate air from refrigeration system.

(b) Charge system with refrigerant and inspect for leakage of refrigerant.

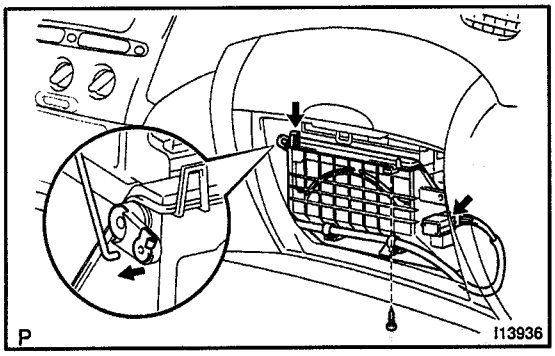
Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)

BLOWER MOTOR

AC2HV–01

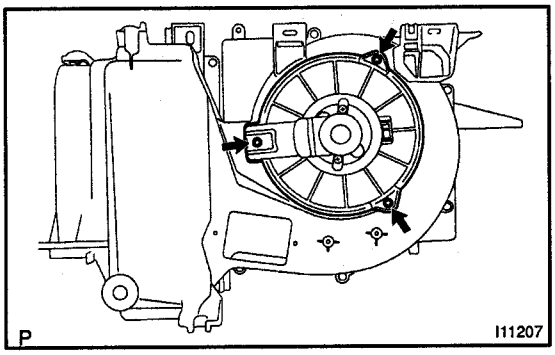
INSPECTION

1. **REMOVE GLOVE COMPARTMENT DOOR (See page BO–86)**



2. **Two way flow heater models only: REMOVE AIR DUCT (Motor cover)**

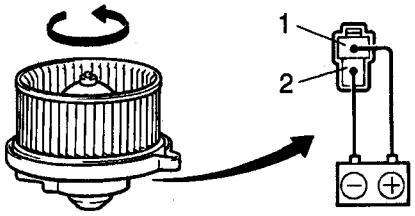
(a) Disconnect the control link.
(b) Disconnect the connectors.
(c) Disconnect the connector clamps.
(d) Disconnect the wire harness clamps.
(e) Remove the screw.
(f) Release the claw and remove the air duct.



3. **REMOVE BLOWER MOTOR**

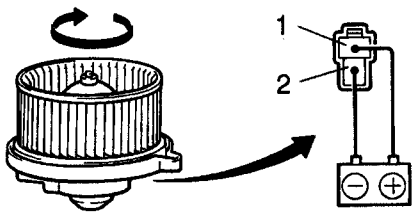
(a) Disconnect the connector.
(b) Remove the 3 screws and blower motor.

Standard heater (LHD):



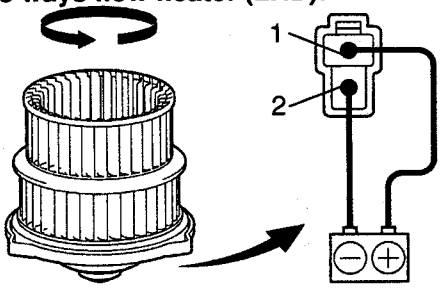
I07284

Standard heater (RHD):



I15051

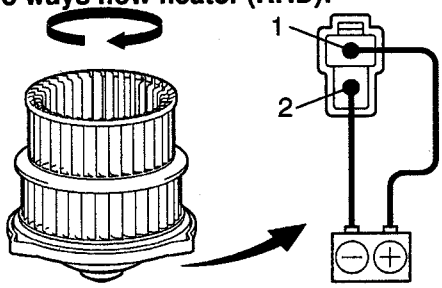
Two ways flow heater (LHD):



P

I12231

Two ways flow heater (RHD):



I15052

4. INSPECT BLOWER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2, then check that the motor operations smoothly.

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

5. INSTALL BLOWER MOTOR

6. Two way flow heater models only:
INSTALL AIR DUCT (Motor cover)

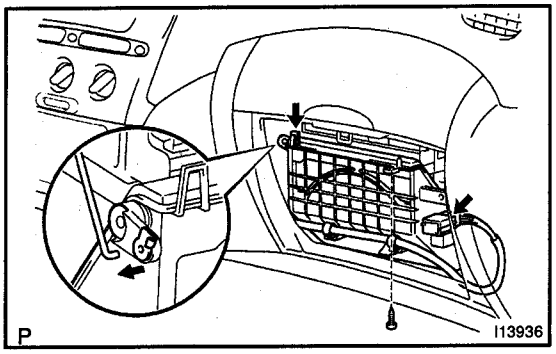
7. INSTALL GLOVE COMPARTMENT DOOR
(See page BO–95)

BLOWER RESISTOR

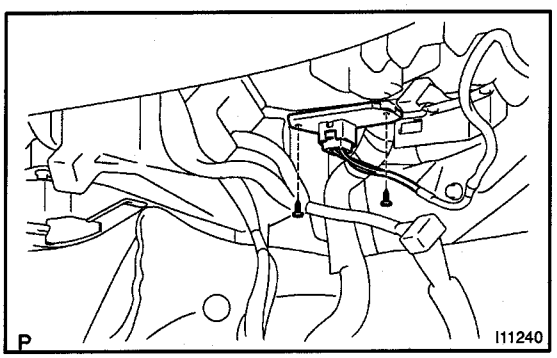
AC2HW–01

INSPECTION

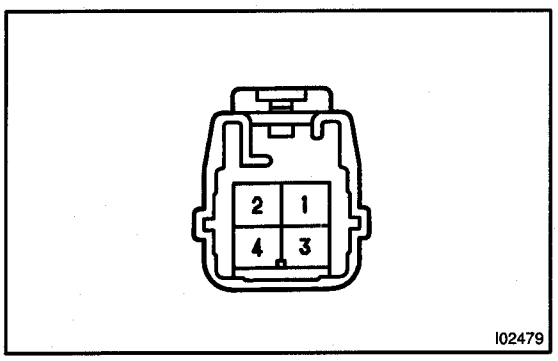
1. **REMOVE GROVE COMPARTMENT DOOR**
   (See page BO–86)



2. **Two way flow heater models only:**
   REMOVE AIR DUCT (Motor cover)
   (a) Disconnect the control link.
   (b) Disconnect the connector clamps.
   (c) Remove the screw.
   (d) Release the claw and remove the air duct.



3. **REMOVE BLOWER RESISTOR**
   (a) Disconnect the connector.
   (b) Remove the 2 screws and blower resistor.



4. **INSPECT BLOWER RESISTOR RESISTANCE**

Tester connection	Condition	Specified condition
1 – 3	Constant	Approx. 0.4 Ω
1 – 2	Constant	Approx. 1.5 Ω
1 – 4	Constant	Approx. 2.8 Ω

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

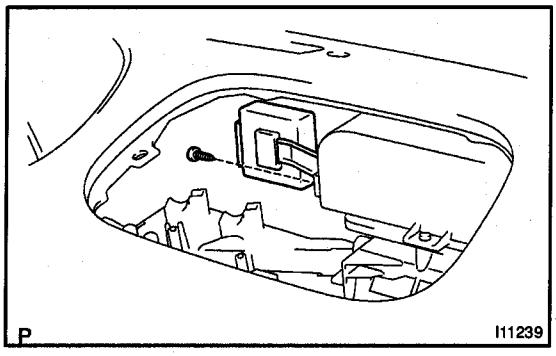
5. **INSTALL BLOWER RESISTOR**
6. **Two way flow heater models only:**
   INSTALL AIR DUCT
7. **INSTALL GLOVE COMPARTMENT DOOR**
   (See page BO–95)

AIR INLET SERVOMOTOR

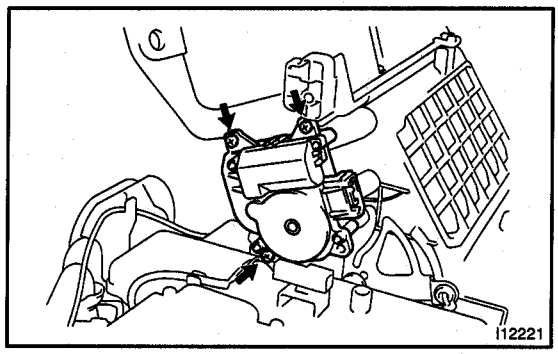
AC28P-02

INSPECTION

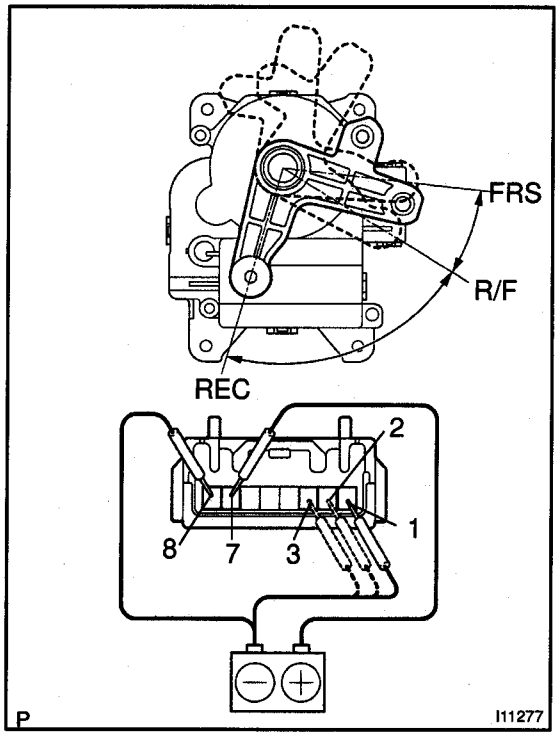
1. **REMOVE FRONT PASSENGER AIRBAG**
(See page RS–29)



2. **REMOVE A/C AMPLIFIER WITH BRACKET**
(a) Disconnect the connector.
(b) Remove the screw and A/C amplifier with bracket.



3. **REMOVE AIR INLET SERVOMOTOR**
(a) Disconnect the connector.
(b) Remove the 3 screws and servomotor.



4. **INSPECT AIR INLET SERVOMOTOR OPERATION**
(a) Connect the positive (+) lead from the battery to terminal 7 and the negative (–) lead to terminal 8.
(b) Connect the negative (–) lead from the battery to each terminal and check that the shaft rotates at each position, as shown in the chart.

Connected terminal	Position
REC	1
R/F	2
FRS	3

If operation is not as specified, replace the servomotor.

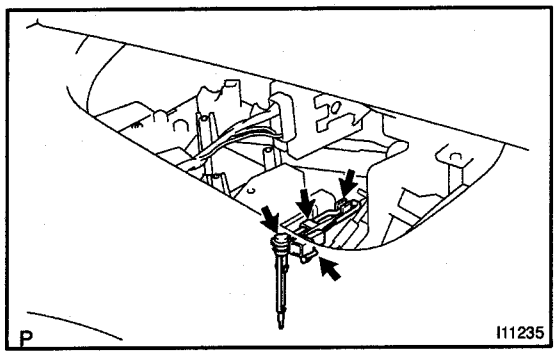
5. **INSTALL AIR INLET SERVOMOTOR**
6. **INSTALL A/C AMPLIFIER WITH BRACKET**
7. **INSTALL FRONT PASSENGER AIRBAG**
(See page RS–38)

THERMISTOR

AC28Q-02

INSPECTION

1. **REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)**

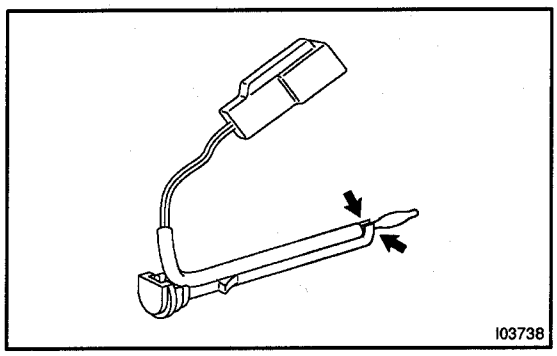


2. **REMOVE THERMISTOR**

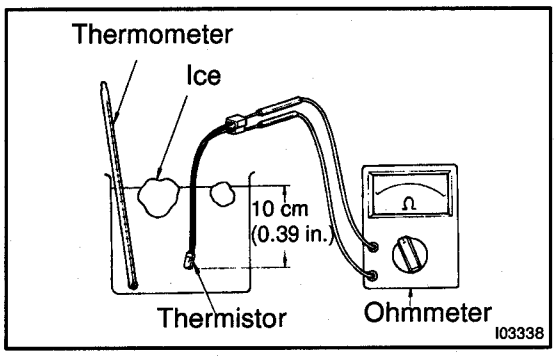
(a) Disconnect the connector.

(b) Disconnect the wire harness clamps.

(c) Using a screwdriver, pull out the thermistor.

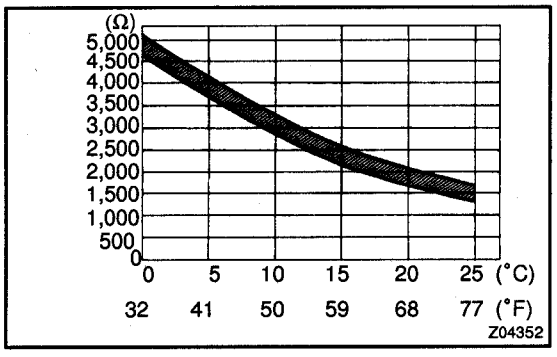


(d) Release the 2 claws and remove the thermistor from bracket plate.



3. **INSPECT THERMISTOR RESISTANCE**

(a) Place the thermistor in cold water and while changing the temperature of the water, measure resistance at the connector and at the same time, measure temperature of the water with a thermometer.



(b) Compare the 2 readings on the chart.

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

4. **INSTALL THERMISTOR**

(a) Install the thermistor to A/C unit.

(b) Connect the wire harness clamps.

(c) Connect the connector.

5. **INSTALL FRONT PASSENGER AIRBAG (See page RS–38)**

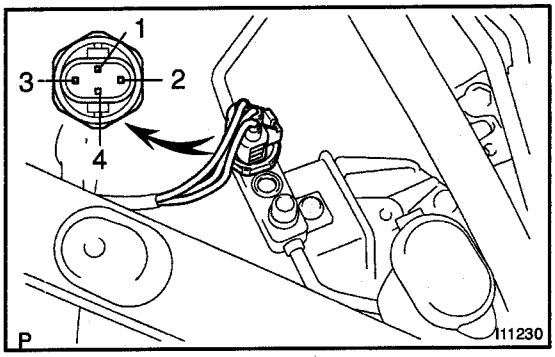
PRESSURE SWITCH

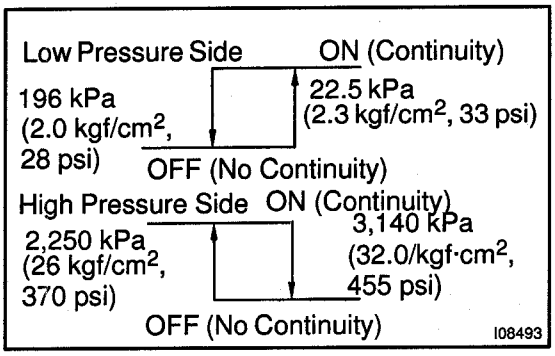
AC28R-02

ON–VEHICLE INSPECTION

1. **START ENGINE**
2. **SET BLOWER SPEED CONTROL SWITCH TO "HI" POSITION**
3. **SET TEMPERATURE CONTROL SELECTOR TO "MAX COOL" POSITION**
4. **PUSH A/C SWITCH**
5. **RACE ENGINE AT 1,500 RPM**
6. **INSPECT PRESSURE SWITCH OPERATION**

(a) Disconnect the connector.



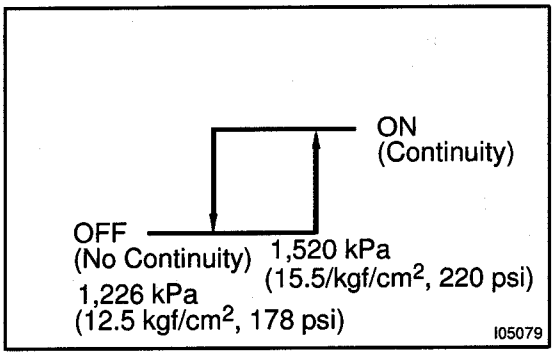


(b) Inspect pressure switch continuity (Magnetic Clutch Control).

(1) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (–) lead to terminal 1.

(2) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If continuity is not as specified, replace the pressure switch.



(c) Inspect pressure switch continuity (Condenser Fan Control).

(1) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (–) lead to terminal 3.

(2) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.

AC0E8-05

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

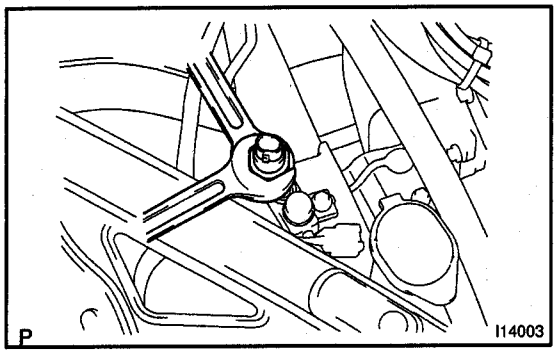
HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 430 ± 30 g (15.17 ± 1.06 oz.)



2. REMOVE PRESSURE SWITCH FROM LIQUID TUBE

Disconnect the connector and remove the pressure switch.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

HINT:

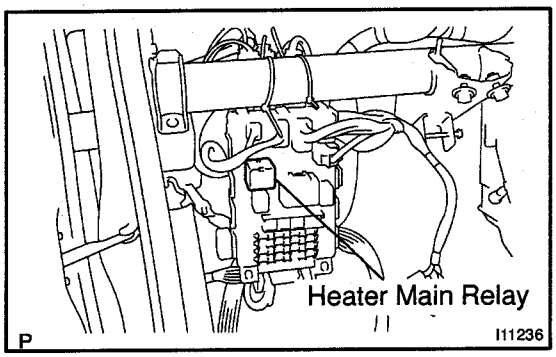
- Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.
- At the time of installation, please refer to the following item.

  Lubricate a new O–ring with the compressor oil and install them to the switch.

AC0E9-01

INSTALLATION

Installation is in the reverse order of remval (See page AC–64).

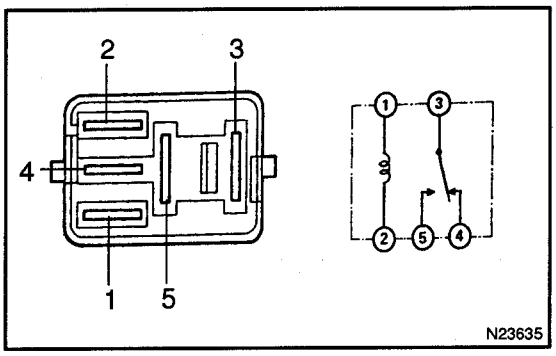


HEATER MAIN RELAY

AC230-04

INSPECTION

1. **REMOVE INSTRUMENT PANEL (See page BO–86)**
2. **REMOVE HEATER MAIN RELAY FROM INSTRUMENT PANEL J / B**

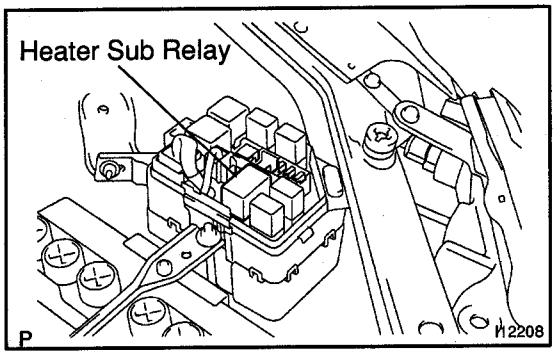


3. **INSPECT HEATER MAIN RELAY CONTINUITY**

Condition	Tester connection	Specified condition
Constant	1 – 2 3 – 4	Continuity
Apply B+ between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the relay.

4. **INSTALL HEATER MAIN RELAY TO INSTRUMENT PANEL J / B**
5. **INSTALL INSTRUMENT PANEL (See page BO–95)**

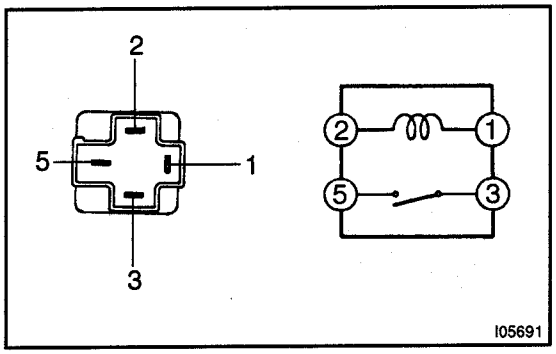


HEATER SUB RELAY

AC2HO-01

INSPECTION

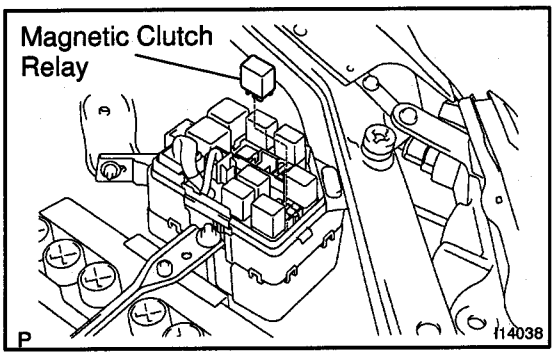
1. REMOVE HEATER SUB RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1



2. INSPECT HEATER SUB RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the relay.

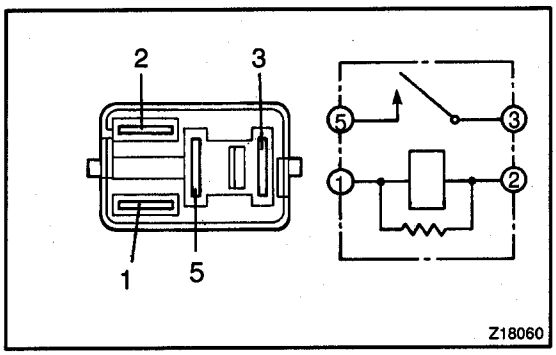


MAGNETIC CLUTCH RELAY

AC28T–02

INSPECTION

1. REMOVE MAGNETIC CLUTCH RELAY (Marking: A/C MG) FROM ENGINE ROOM RELAY BLOCK

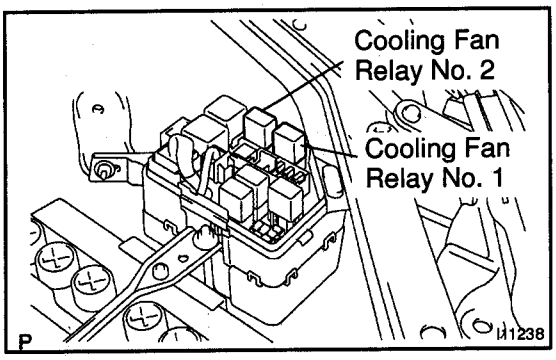


2. INSPECT MAGNETIC CLUTCH RELAY (Marking: A/C MG) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the relay.

3. INSTALL MAGNETIC CLUTCH RELAY TO ENGINE ROOM RELAY BLOCK

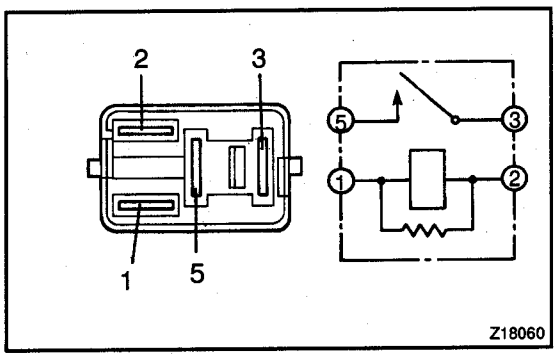


COOLING FAN RELAY

AC28U-02

INSPECTION

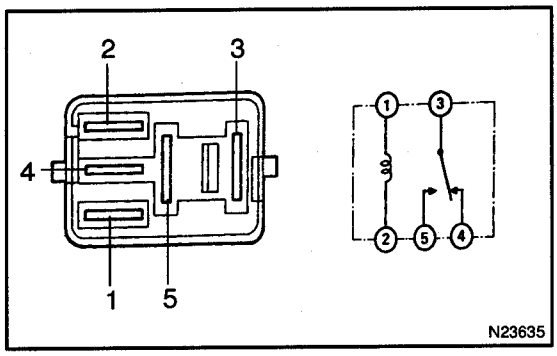
1. **REMOVE COOLING FAN RELAYS NO. 1 AND NO. 2 FROM ENGINE ROOM RELAY BLOCK**



2. **INSPECT NO. 1 COOLING FAN RELAY (Marking: FAN1) CONTINUITY**

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the relay.



3. **INSPECT NO. 2 COOLING FAN RELAY (Marking: FAN2) CONTINUITY**

Condition	Tester connection	Specified condition
Constant	1 – 2 3 – 4	Continuity
Apply B+ between terminals 1 and 2	3 – 5	Continuity

If continuity is not as specified, replace the relay.

4. **INSTALL COOLING FAN RELAYS NO. 1 AND NO. 2 FROM ENGINE ROOM RELAY BLOCK**

CONDENSER FAN

AC28V–02

ON–VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

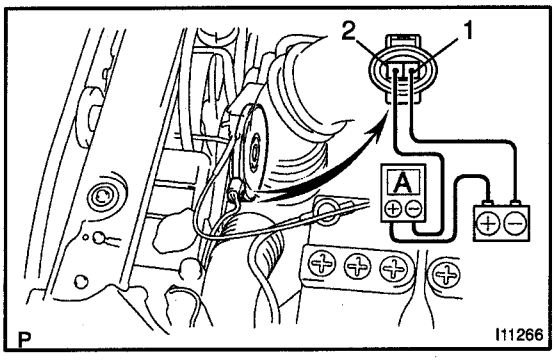
Inspect the fan operation at these conditions, as shown in the chart below.

Test conditions:

- Start engine
- Blower speed control switch position "HI"
- Temperature control dial at "COOL" position
- Set on manifold gauge set
- A/C switch ON

Condition	Fan operation (Fan Speed)
Water temperature below 83 °C (121 °F)	Rotate (Low speed)
Water temperature above 90 °C (194 °F)	Rotate (High speed)
Refrigerant pressure is less than 1,520 kPa (15.5 kgf·cm^2, 220 psi)	Rotate (Low speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf·cm^2, 220 psi) or above	Rotate (High speed)

If operation is not as specified, proceed to the next inspection.



2. INSPECT CONDENSER FAN MOTOR OPERATION

(a) Disconnect the fan connector.

(b) Connect battery and ammeter to fan connector, as shown in the illustration.

(c) Check that the fan rotates smoothly, and then check the reading on the ammeter.

Specified amperage:

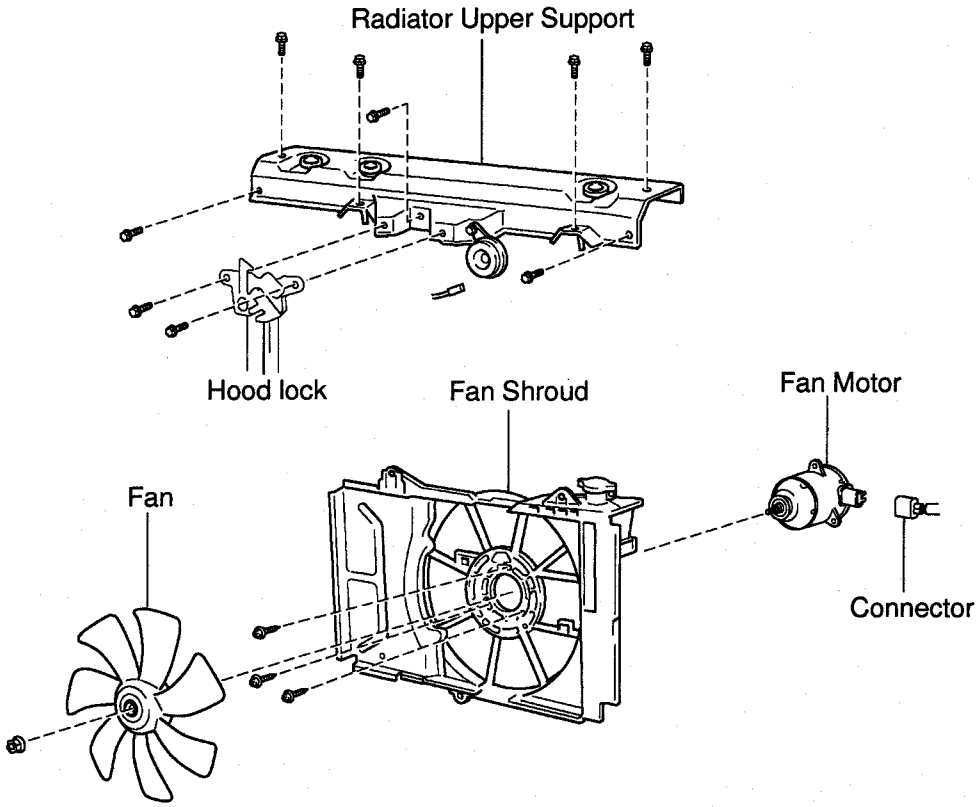
Marking 1 (80 W): 6.5 ± 1.0A at 25 °C (77 °F)

Marking 2 (120 W): 9.8 ± 1.0A at 25 °C (77 °F)

- If operation is not as specified, replace the fan motor.
- If operation is as specified, check the pressure switch, cooling fan relays and water temp. switch.

AC28W–02

COMPONENTS



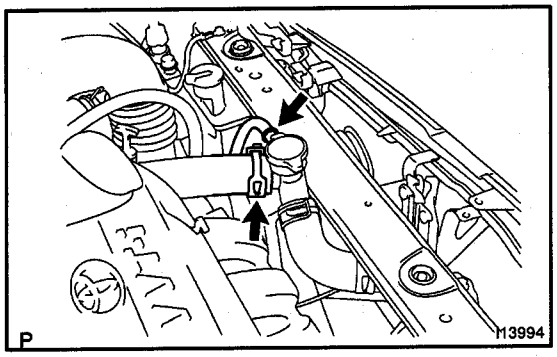
N

I13937

AC28X-02

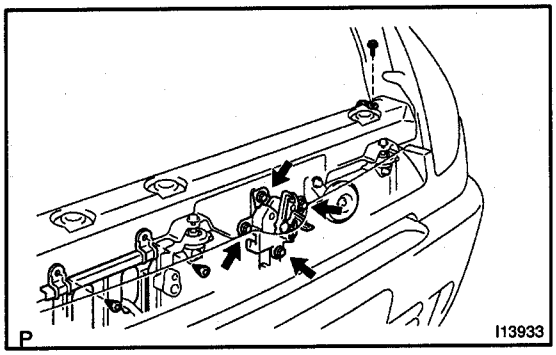
REMOVAL

1. DRAIN ENGINE COOLANT FROM RADIATOR



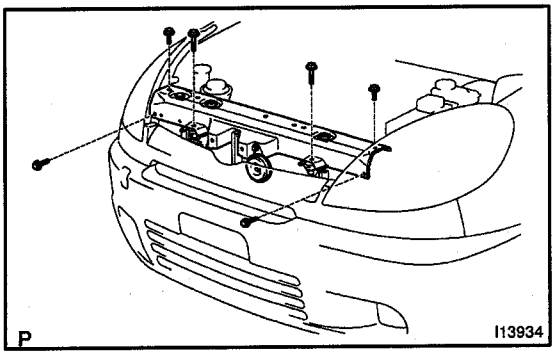
2. DISCONNECT UPPER RADIATOR HOSE

3. DISCONNECT RESERVOIR HOSE

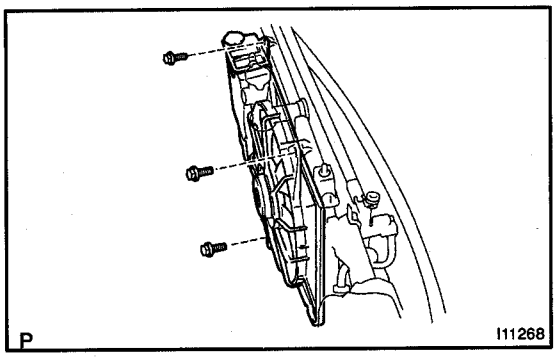


4. REMOVE RADIATOR UPPER SUPPORT

(a) Remove the 3 hood lock set bolts.
(b) Remove the center brace set bolt.
(c) Remove the 2 radiator cover set the hone.
(d) disconnect the connector from the hone.
(e) Remove the earth wire set bolt.



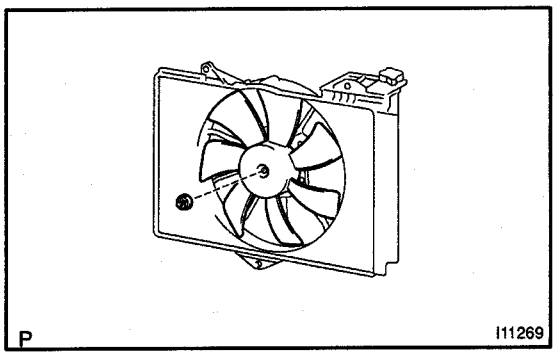
(f) Remove the 6 bolts and radiator upper support.



5. REMOVE CONDENSER FAN

(a) Disconnect the connector.
(b) Remove the 3 bolts and condenser fan.
Torque: 7.5 N·m (80 kgf·cm, 69 in.·lbf)

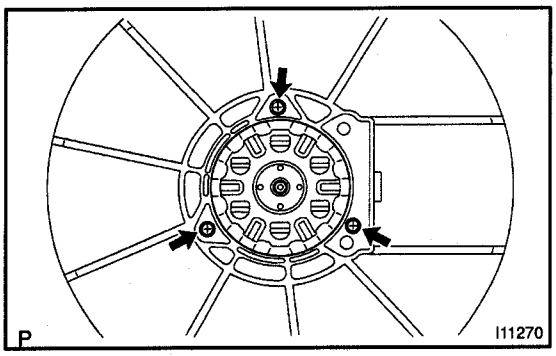
AC28Y–02



DISASSEMBLY

1. REMOVE FAN

Remove the nut and fan.



2. REMOVE FAN MOTOR

Remove the 3 screws and fan motor.

AC28Z–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–73).

AC290–01

INSTALLATION

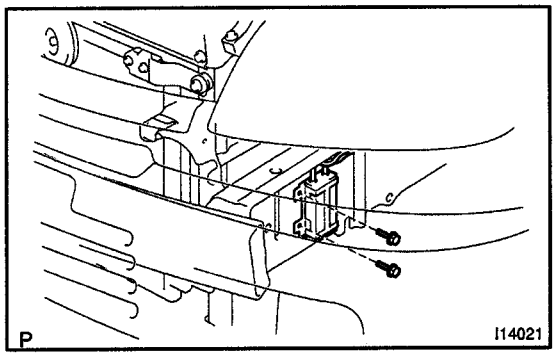
Installation is in thereverse order of removal (See page AC–72).

CONDENSER FAN RESISTOR

AC291-02

INSPECTION

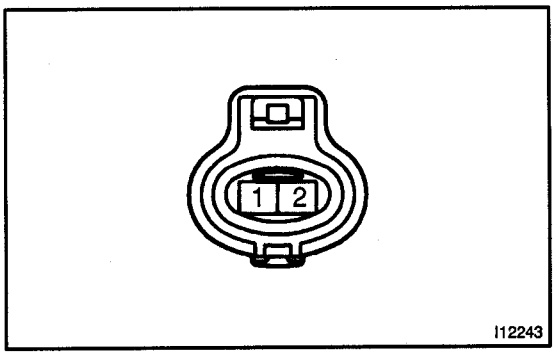
1. REMOVE ENGINE UNDER COVER LH



2. REMOVE CONDENSER FAN RESISTOR

(a) Disconnect the connector.

(b) Remove the 2 bolts and condenser fan resistor.



3. INSPECT CONDENSER FAN RESISTOR RESISTANCE

Measure resistance between terminals.

Standard resistance: 1.3 ± 0.13 Ω

If resistance is not as specified, replace the condenser fan resistor.

4. INSTALL CONDENSER FAN RESISTOR

(a) Install the condenser fan resistor with 2 bolts.

(b) Connect the connector.

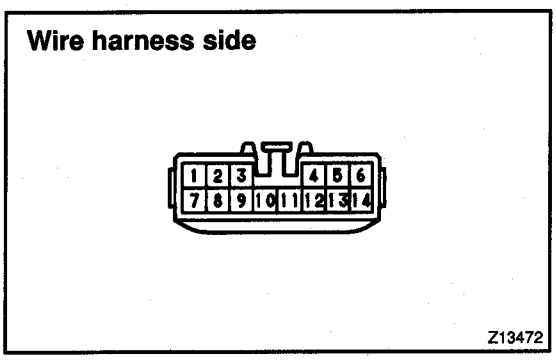
5. INSTALL ENGINE UNDER COVER LH

AIR CONDITIONER AMPLIFIER

AC2HP–01

ON–VEHICLE INSPECTION

1. **REMOVE INSTRUMENT PANEL UPPER SIDE (See page BO–86)**
2. **CONNECT CONNECTORS TO FRONT PASSENGER AIRBAG, COMBINATION METER AND CENTER CLUSTER SWITCH**

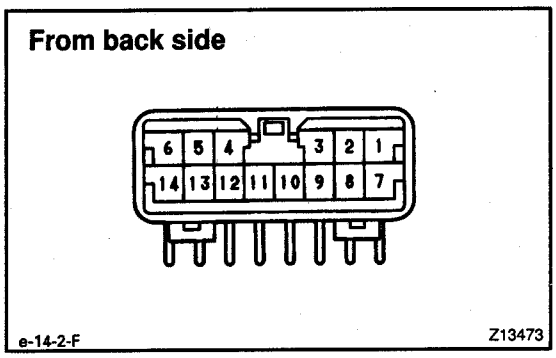


3. **Standard A/C models: INSPECT A/C AMPLIFIER CIRCUIT**

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

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
3 – 13	Evaporator temp.: 25 °C (77 °F)	1.5 kΩ
3 – 9 (Boost ventilator A/C)	Temperature control selector: OFF	3.0 kΩ
	Temperature control selector: COOL	0 kΩ

If circuit is as specified, try to replace the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.



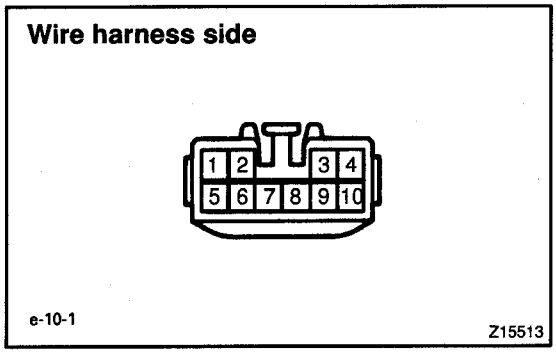
(b) Connect the connector to amplifier and inspect wire harness side connector from the back side, as shown in the chart below.

Test conditions

- Running engine at idle speed
- Blower speed control switch: "HI" position
- A/C switch ON
- Temperature control selector "Max COOL" position
- Set on manifold gauge set

Tester connection	Condition	Specified condition
1 – Ground	Constant	4.0 – 7.0 V
	Engine speed: Idle– up speed	Below 1.0 V
2 – Ground	Refrigerant pressure 196 – 1,340 kPa	Battery positive voltage
	Refrigerant pressure less than 196 or more than 3,140 kPa	No voltage
6 – Ground	Magnetic clutch: ON	Below 2.0 V
	Refrigerant pressure: Above 1,520kPa Water temperature: Above 83 °C (181 °F)	Below 1.0 V
	Condenser fan: OFF	Battery positive voltage
7 – Ground	Magnetic clutch: ON	Below 1.0 V
	Magnetic clutch: OFF	4.0 – 5.0 V
11 – Ground	Refrigerant pressure: Above 1,520kPa (15.5 kgf/cm^2, 220 psi) Water temperature: Above 83 °C (181 °F)	Below 1.0 V
	Refrigerant pressure: Above 1,520kPa (15.5 kgf/cm^2, 220 psi) Water temperature: Below 90 °C (194 °F)	Battery voltage
12 – Ground	Magnetic clutch: ON	Below 2.0 V
	Magnetic clutch: OFF	Battery voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

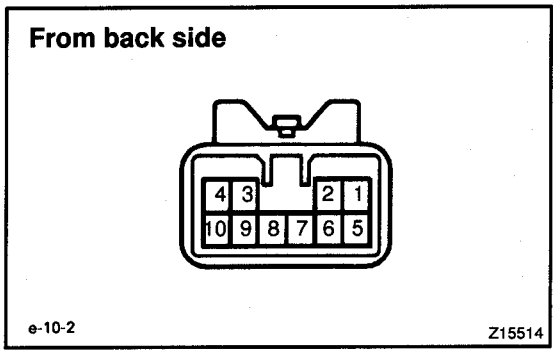


4. Two way flow heater models: INSPECT PTC AMPLIFIER

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

Tester connection	Condition	Specified condition
1 – Ground	IG ON	Battery voltage
	IG OFF	No voltage
4 – Ground	Constant	Continuity

If the circuit is as specified, try to replace the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

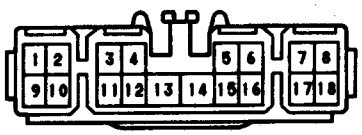


(b) Connect the connector to the amplifier and inspect the wire harness side connector from the back side, as shown in the chart below.
Test conditions
- Ignition switch: ON
- Blower speed control switch: HI

Tester connection	Condition	Specified condition
3 – Ground	Air inlet selector: FRESH	Battery voltage
	Air inlet selector: Except FRESH	Below 1.0 V
5 – Ground	Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT / DEF.	Battery positive voltage
	Temperature control selector: Except MAX. WARM Mode selector: Except FOOT or FOOT / DEF.	No voltage
7 – Ground	Air inlet selector: FRESH Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT / DEF.	Below 1.0 V
	Air inlet selector: RECIRC Temperature control selector: Except MAX. WARM Mode selector: Except FOOT, FOOT / DEF.	No voltage
8 – Ground	Air inlet selector: FRESH Temperature control selector: MAX. WARM Mode selector: FOOT or FOOT /DEF.	Below 1.0 V
	Air inlet selector: Except FRESH Temperature control selector: Except MAX. WARM Mode selector: Except FOOT or FOOT / DEF.	No voltage
9 – Ground	Air inlet selector: RECIRC	Below 1.0 V
	Air inlet selector: FRESH	No voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

Wire harness side



I12240

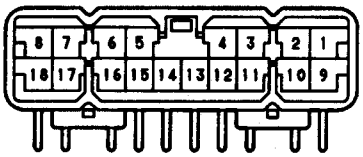
5. PTC heater and two way flow heater models: INSPECT PTC AMPLIFIER CIRCUIT

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

Tester connection	Condition	Specified condition
6 – Ground	Constant	Continuity
12 – 16	Water temperature: 25 °C (77 °F)	5.0 kΩ
3 – Ground	IG ON	Battery voltage
	IG OFF	No voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

From back side



I12241

(b) Connect the connector to amplifier and inspect wire harness side connector from the back side, as shown in the chart below.

Test conditions

- Ignition switch: ON
- Blower speed control switch: HI

Tester connection	Condition	Specified condition
4 – Ground	Temperature control selector: MAX. WARM	Battery voltage
	Temperature control selector: Except MAX. WARM	No voltage
7 – Ground	Running engine: 1,600 rpm Water temp.: 55 °C (131 °F) or below Temperature control selector: MAX. WARM	Below 1.0 V
	Temperature control selector: Except MAX. WARM	Battery voltage
	Water temp.: 65 °C (149 °F) or above	Battery voltage
8 – Ground	Air inlet selector: FRESH	Below 1.0 V
	Air inlet selector: RECIRC	No voltage
9 – Ground	Air inlet selector: RECIRC	Below 1.0 V
	Air inlet selector: FRESH	No voltage
10 – Ground	Air inlet selector: FRESH	Battery voltage
	Air inlet selector: RECIRC	Below 1.0 V
13 – Ground	Air inlet selector: FRESH	Below 1.0 V
	Air inlet selector: RECIRC	No voltage

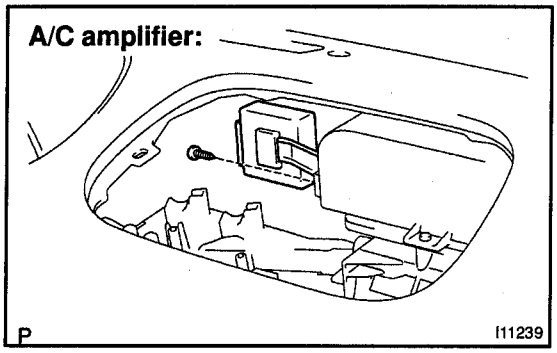
18 – Ground	Mode selector: FOOT or FOOT / DEF. Temperature control selector: MAX. WARM	Below 1.0 V
	Mode selector: Except FOOT or FOOT / DEF.	No voltage
15 – Ground	Running engine: 1,600 rpm Water temp.: 55 °C (131 °F) or below Temperature control selector: MAX. WARM	Below 1.0 V
	Temperature control selector: Except MAX. WARM	Battery voltage
	Water temp.: 65 °C (149 °F) or above	Battery voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

AC293-02

REMOVAL

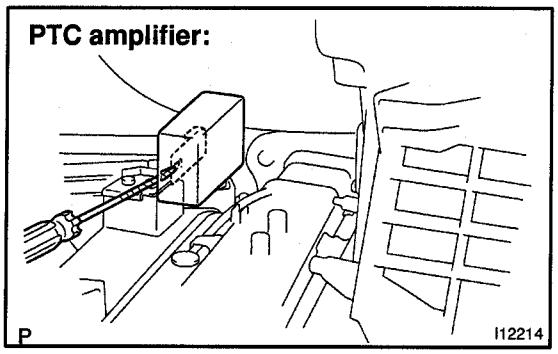
1. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)



2. REMOVE A/C AMPLIFIER

(a) Disconnect the connector.

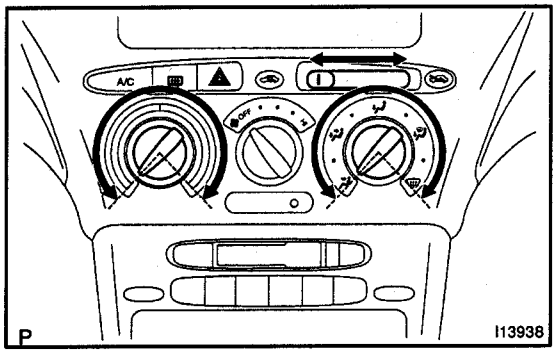
(b) Using a screwdriver, release the claw and remove the A/C amplifier.



AC294–01

INSTALLATION

Installation is in the reverse order of removal (See page AC–82).



HEATER CONTROL ASSEMBLY

AC295-02

ON–VEHICLE INSPECTION

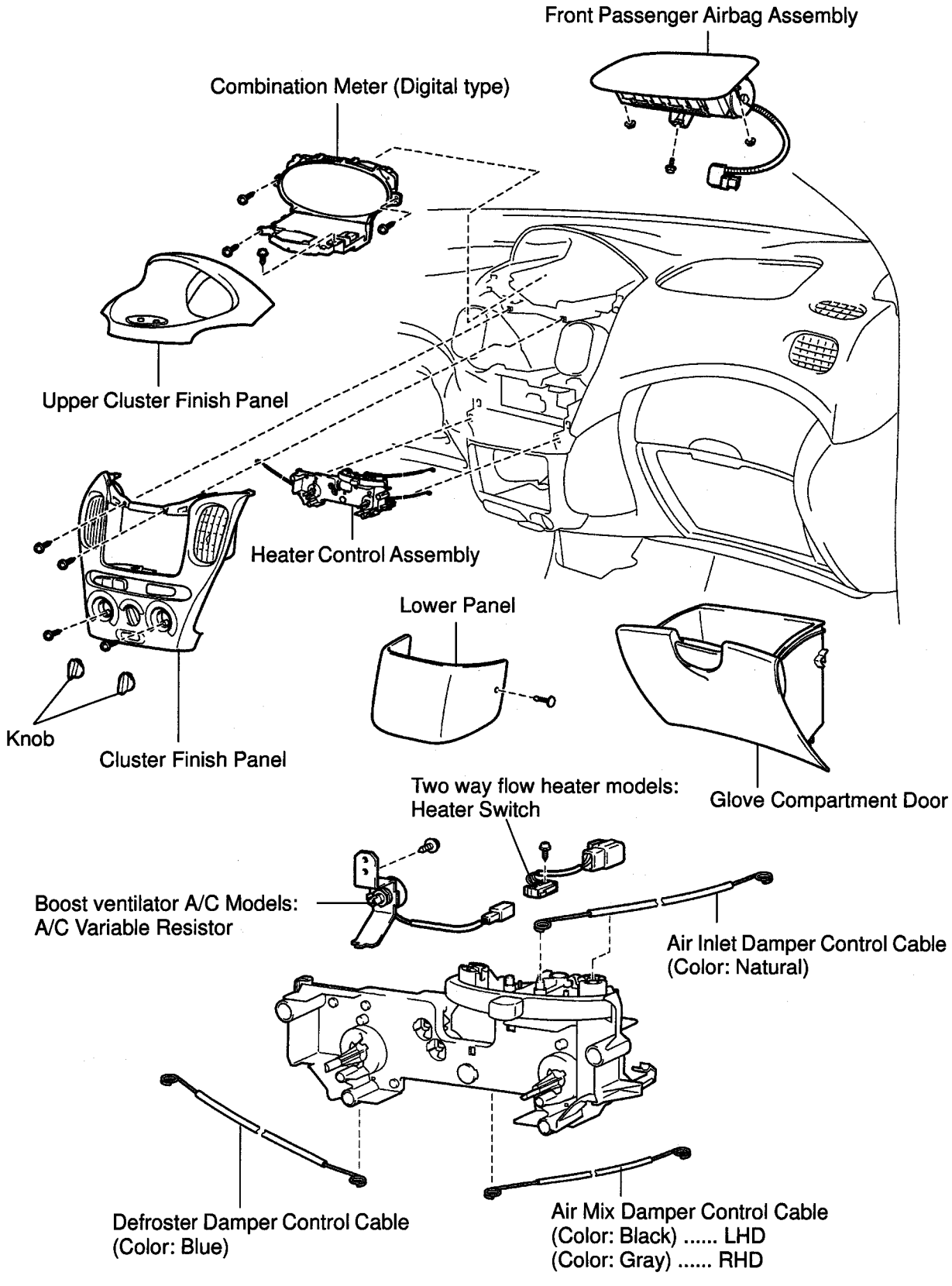
INSPECT HEATER CONTROL DIALS OPERATION

Turn the control lever and dials left and right then check that click sound can be heard and recoil is felt.

If click sound can not be heard or recoil is felt, adjust the control cable or check control cable and heater control assembly.

AC296-02

COMPONENTS



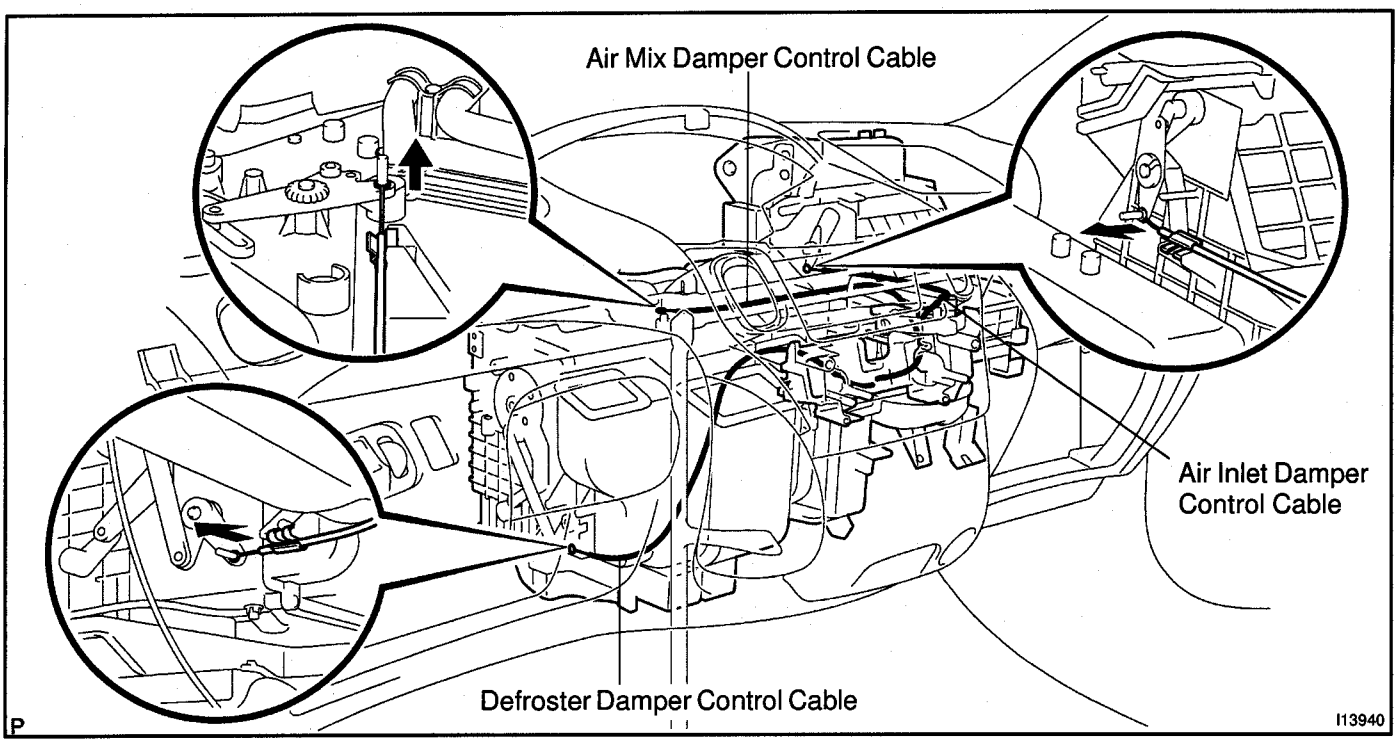
P

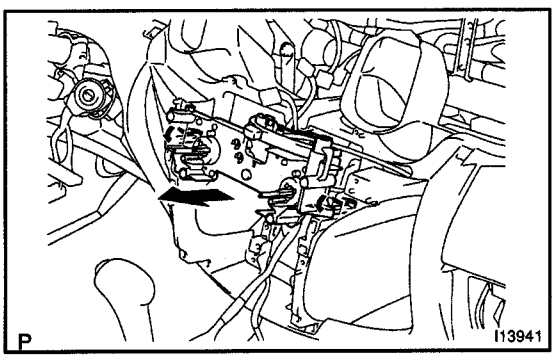
I14012

AC2HQ-01

REMOVAL

1. **REMOVE CLUSTER FINISH PANEL (Integration panel) (See page BO–86)**
2. **REMOVE FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–29)**
3. **REMOVE CLUSTER PANEL (Combination meter)**
4. **REMOVE COMBINATION METER**
5. **DISCONNECT HEATER CONTROL CABLES**





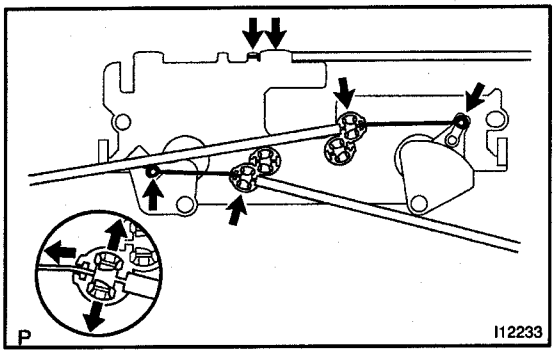
6. **REMOVE HEATER CONTROL ASSEMBLY**

(a) w/ A/C models:
Release the 2 claws and pull out the heater control assembly.

(b) Boost ventilator A/C models:
Release the 2 claws and pull out the heater control assembly, then disconnect the connector.

AC298-02

DISASSEMBLY



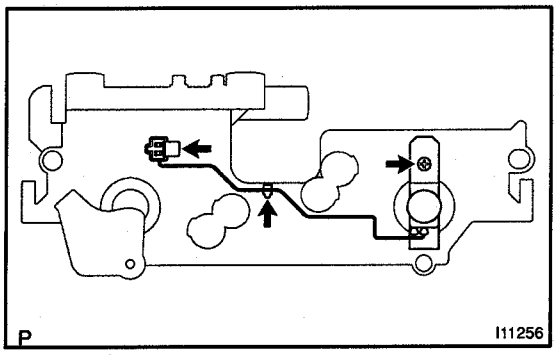
1. REMOVE HEATER CONTROL CABLES

(a) Using a screwdriver, open the claw of the cable clamp and disconnect the outer cable.

HINT:

Tape the screwdriver tip before use.

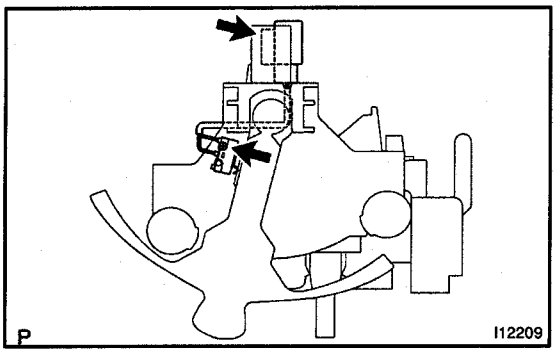
(b) Remove the inner cable from the heater control assembly.



2. Boost ventilator A/C models:
REMOVE A/C VARIABLE RESISTOR SET SWITCH

(a) Disconnect the wire harness clamps.

(b) Remove the screw and A/C variable resistor set switch.

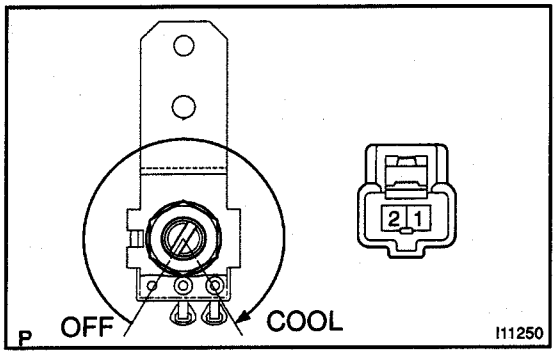


3. Two way flow heater models:
REMOVE HEATER SWITCH

(a) Disconnect the connector clamp.

(b) Remove the screw and heater switch.

AC299-02

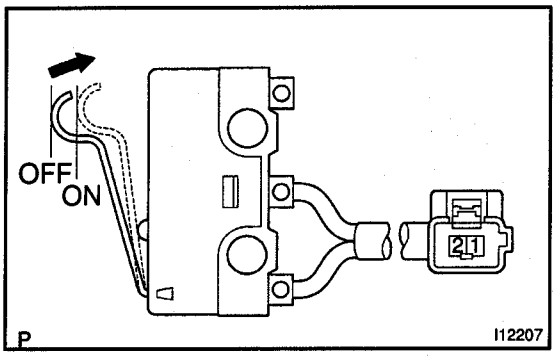


INSPECTION

1. Boost ventilator A/C models:
INSPECT A/C VARIABLE RESISTOR SET SWITCH OPERATION

Gradually turn the switch from "OFF" side to "COOL" side them check that the resistance between terminals decrease from 3 to 0 kΩ.

If operation is not as specified replace the switch.



2. Two way flow heater models:
INSPECT HEATER SWITCH CONTINUITY

Check the continuity exists between terminals while switch is pressed.

If no continuity exists, replace the heater switch.

AC29A–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–87).

AC29B-02

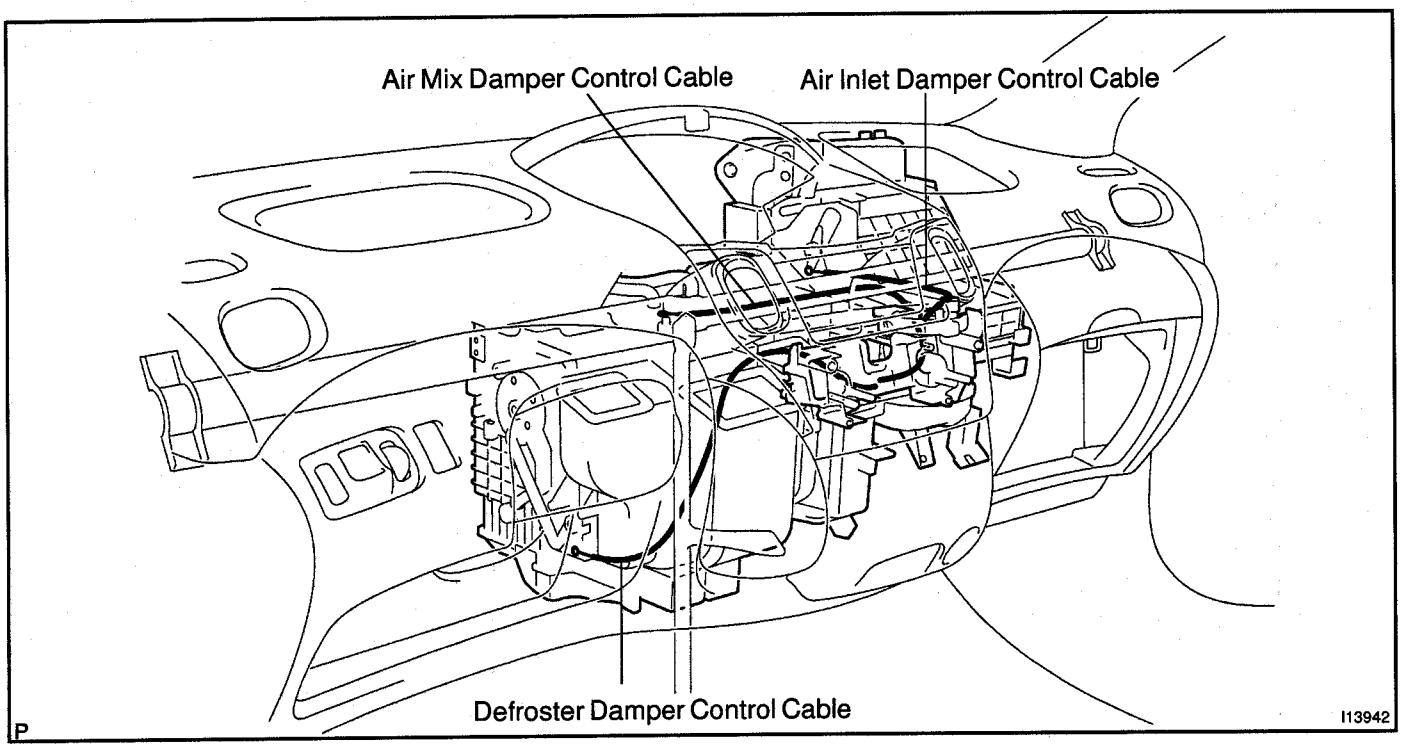
INSTALLATION

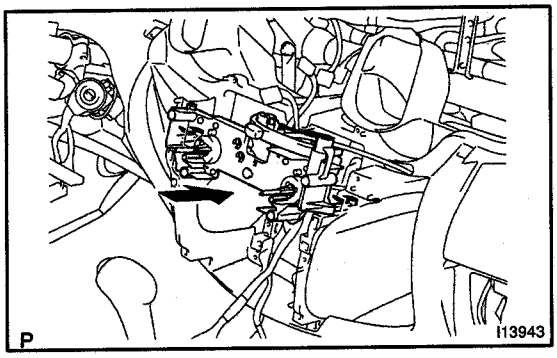
1. INSTALL HEATER CONTROL ASSEMBLY

(a) Boost ventilator A/C models:
Connect the connector.

(b) Install the heater control assembly temporarily.

(c) Pass the heater control cables as shown in the illustration.





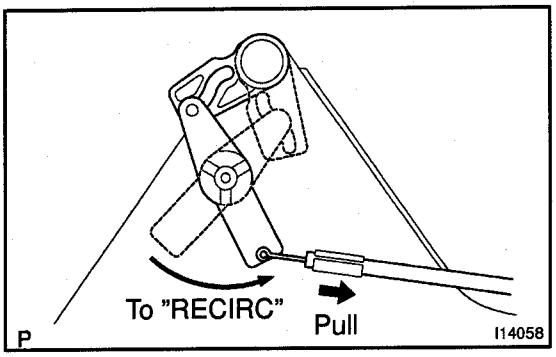
(d) Fit the 2 claws of heater control assembly in the instrument panel hole.

2. CONNECT HEATER CONTROL CABLES

(a) Set air inlet selector to "RECIRC" position.

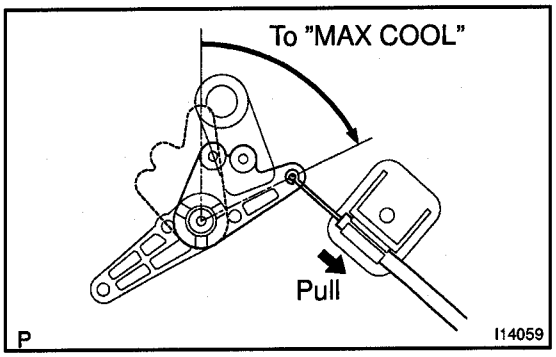
(b) Set temperature control selector to "MAX. COOL" position.

(c) Set mode selector to "FACE" position.



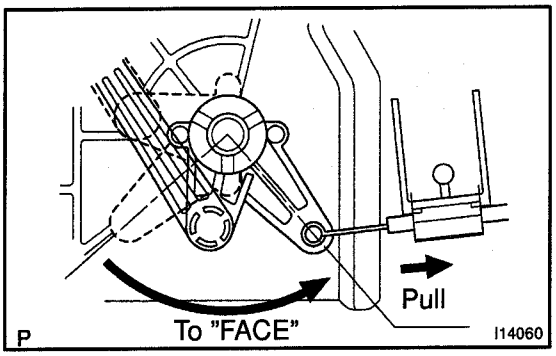
(d) Standard heater models only:
Adjust air inlet control cable.
Set air inlet damper control lever to "RECIRC" position and connect the inner cable to lever pin and clamp the outer cable.

HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.



(e) Adjust air mix control cable.
Set air mix damper control lever to "MAX. COOL" position and connect the inner cable to lever pin and clamp the outer cable.

HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.



(f) Adjust defroster control cable.
Pull the air inlet control link to "FACE" position, connect the control cable and lock the clamp.

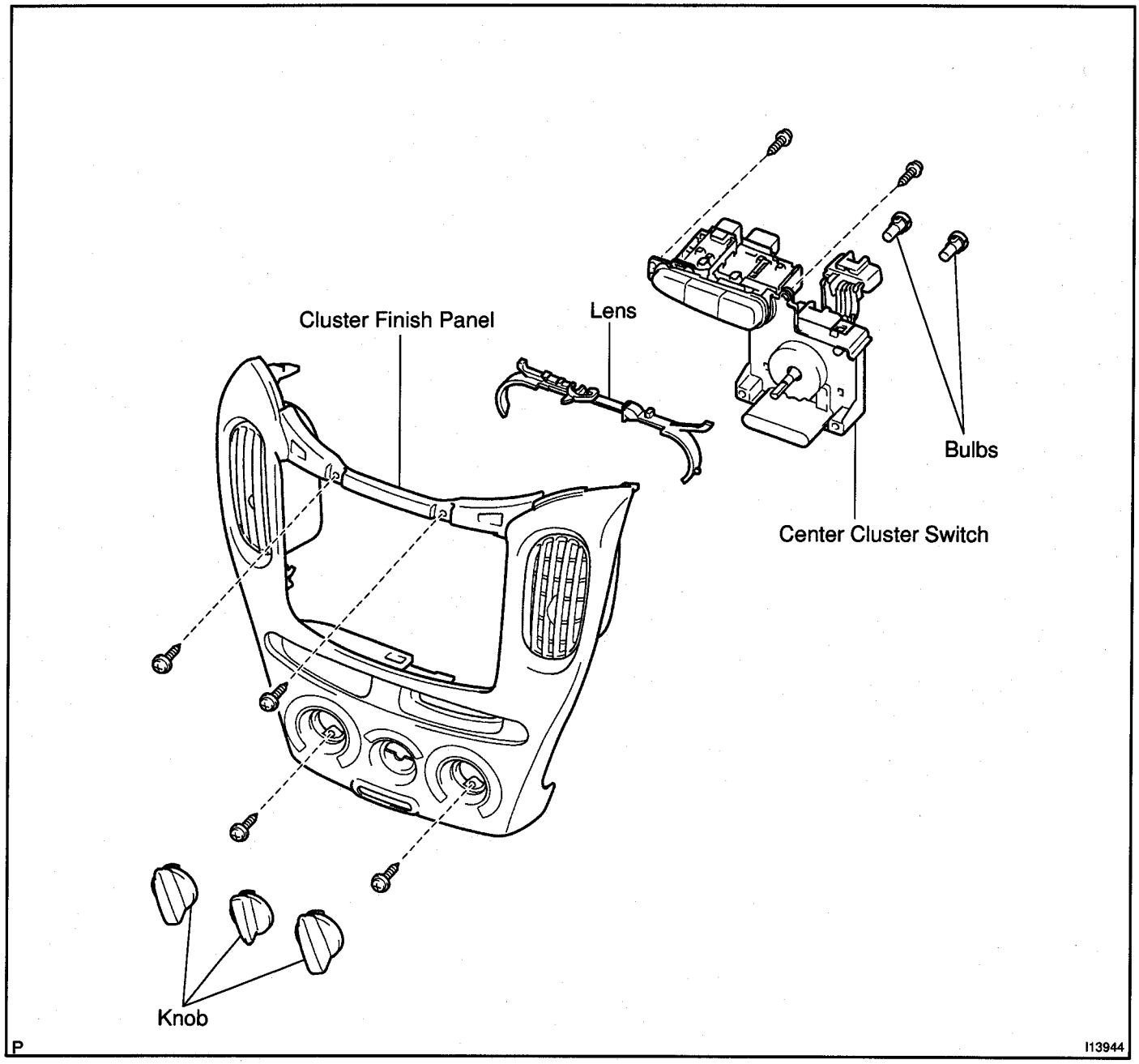
HINT:
Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in the illustration.

3. **INSTALL COMBINATION METER**
4. **INSTALL CLUSTER FINISH PANEL (Combination meter)**
5. **INSTALL FRONT PASSENGER AIRBAG ASSEMBLY (See page RS–38)**
6. **INSTALL CLUSTER FINISH PANEL (See page BO–95)**

HEATER CONTROL ASSEMBLY (Center Cluster Integration)

COMPONENTS

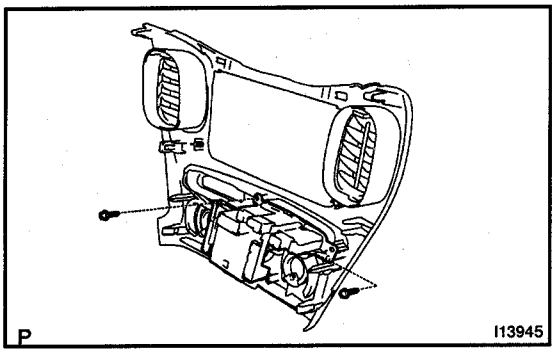
AC29C–02



AC2HR–01

DISASSEMBLY

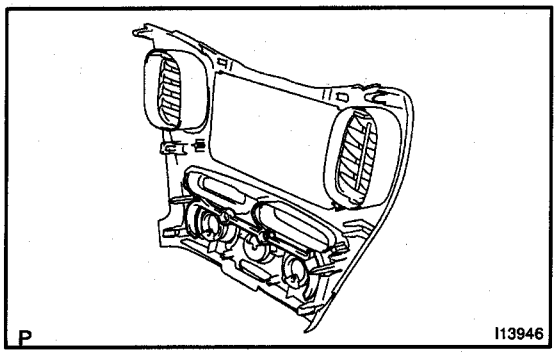
1. REMOVE CLUSTER FINISH PANEL
(See page BO–86)



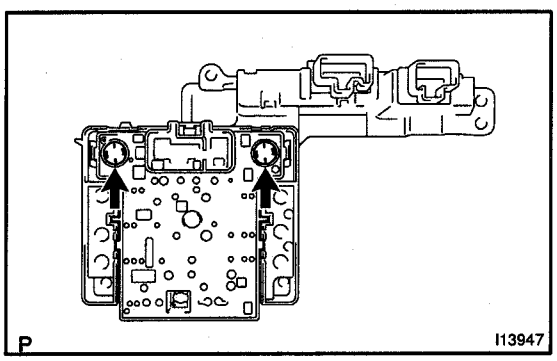
2. REMOVE CENTER CLUSTER SWITCH

(a) Remove the knob.

(b) Release the 2 claws and remove the switch.



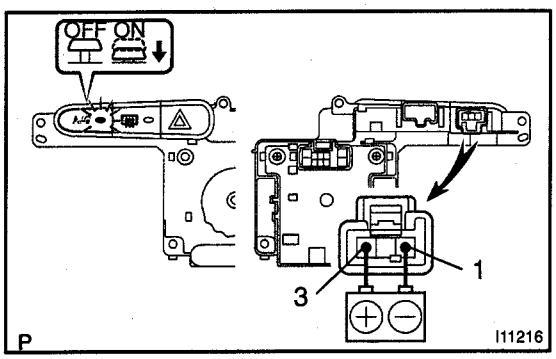
3. REMOVE LENS



4. REMOVE BULB

Using a screwdriver, turn the bulb to the left and pull out the bulb.

AC29E-02

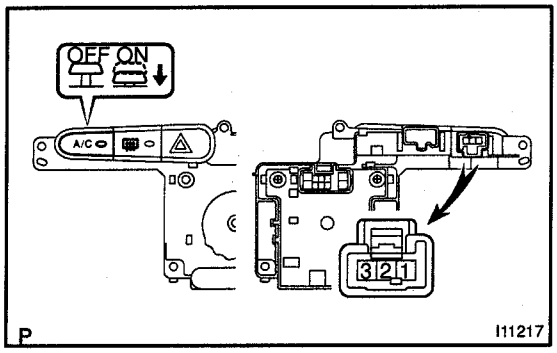


INSPECTION

1. INSPECT A/C INDICATOR OPERATION

Connect the positive (+) lead from the battery to terminal 3 and negative (–) lead to terminal 1, then check that the A/C indicator lights up while A/C switch is pressed.

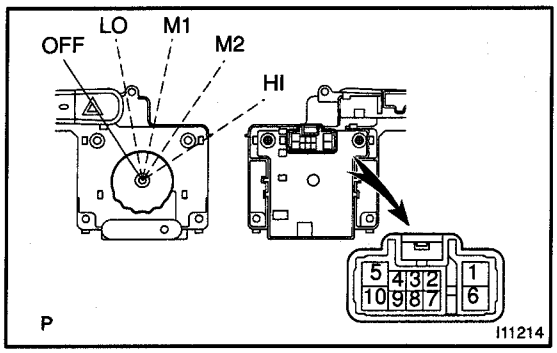
If operation is not as specified, replace the center cluster switch.



2. INSPECT A/C SWITCH CONTINUITY

Check the continuity exists between terminals 2 and 3 while switch is pressed.

If no continuity exists, replace the center cluster switch.



3. INSPECT BLOWER SWITCH CONTINUITY

Position / Circuit	Tester connection	Specified condition
OFF	–	No continuity
LO	1 – 2	Continuity
M1	1 – 2 – 7	Continuity
M2	1 – 2 – 6	Continuity
HI	1 – 2 – 10	Continuity
Illumination circuit	1 – 4	Continuity

Switch continuity:

If continuity is not as specified, replace the center cluster switch.

Illumination circuit:

If continuity is not as specified, replace the bulb.

AC29F–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC–93).

WATER TEMPERATURE SWITCH

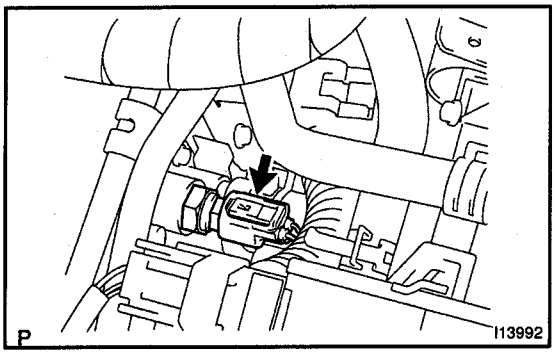
AC29G–02

INSPECTION

1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

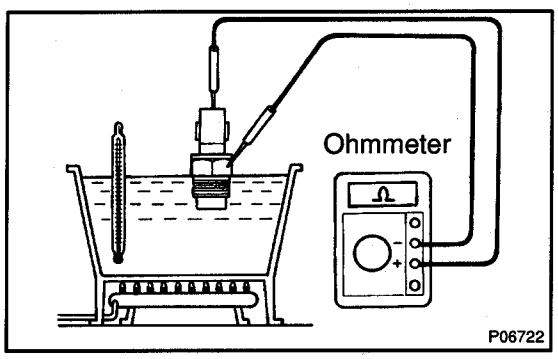
It is not necessary to drain out out all the coolant.



2. REMOVE WATER TEMPERATURE SWITCH

(a) Disconnect the connector.

(b) Remove the water temperature switch.



3. INSPECT SWITCH CONTINUITY

(a) Using an ohmmeter, check that no continuity exists between the terminal and switch body when the coolant temperature is above 83 °C (181 °F).

If continuity exists, replace the switch.

(b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 90 °C (194 °F).

If no continuity exists, replace the switch.

4. INSTALL WATER TEMPERATURE SWITCH

(a) Install the water temperature switch.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Connect the connector.

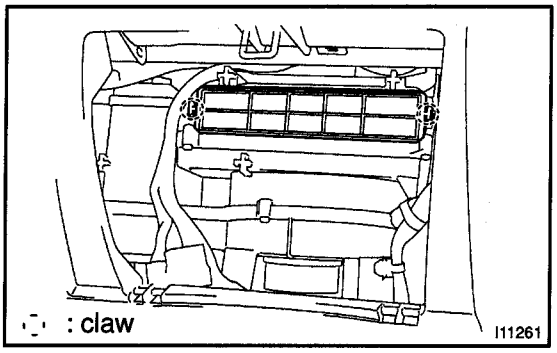
5. FILL WITH ENGINE COOLANT

AIR REFINER FILTER

AC29H-02

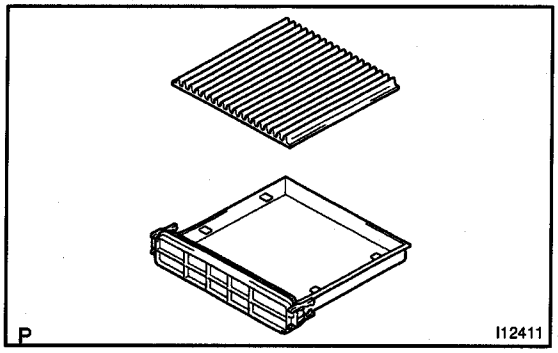
REPLACEMENT

1. REMOVE GLOVE COMPARTMENT DOOR



2. REPLACE AIR REFINER FILTER

(a) Release the 2 claws and pull out the filter case.



(b) Remove the filter.
(c) Install the new filter.
(d) Install the filter case to A/C unit.

3. INSTALL GLOVE COMPARTMENT DOOR