

Manual A/C-Heater Systems - RAV4

AIR CONDITIONING SYSTEM

PRECAUTION

1. **Do not handle refrigerant in an enclosed area or wear eye protection .**
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 much 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 open flame .**
5. **Be careful not to drop container and not to apply physical shocks to it .**
6. **Do not operate compressor without enough refrigerant in refrigeration system .**

If there is not enough refrigerant in the A/C system, oil lubrication will be insufficient and compressor burnout may occur. Care should be taken to avoid this.

7. **Do not open pressure manifold valve while compressor is operating .**

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

The RAV4 is 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 in

AIR BAG SAFETY PRECAUTIONS .

ON-VEHICLE INSPECTION

1. **Inspect Refrigerant Volume**

Observe the sight glass on the liquid tube.

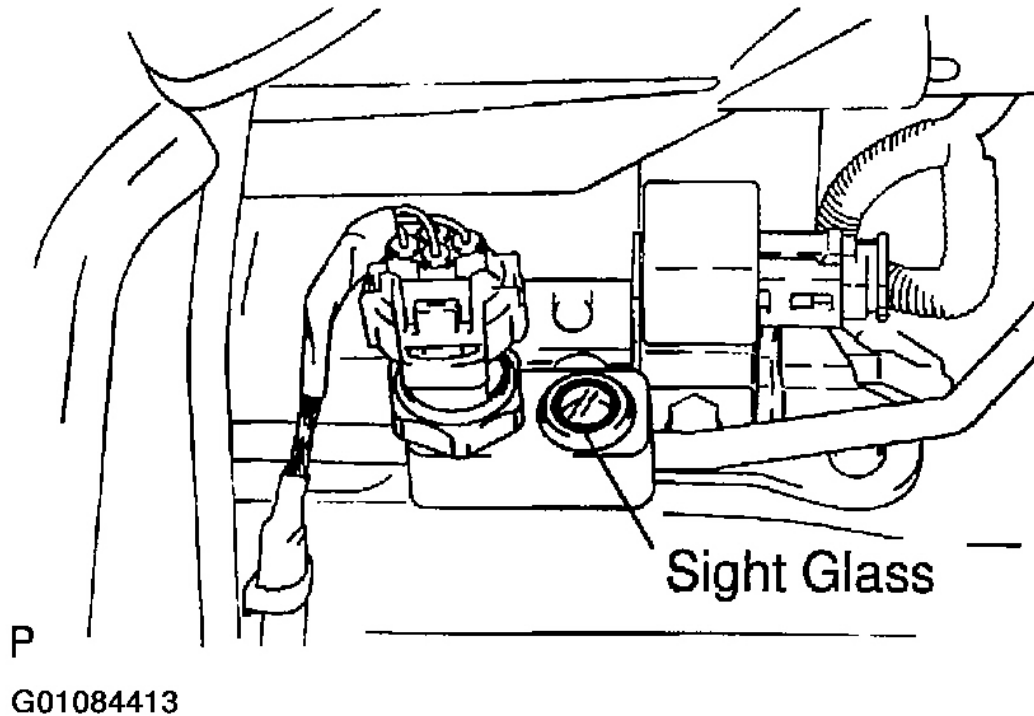


Fig. 1: Locating Sight Glass

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Test conditions:

- Running engine at 1500 RPM
- Blower speed control switch at "HI" position
- A/C switch ON
- Temperature control dial at "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 to items 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	1. Check for gas leakage with gas leak 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.

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Fig. 2: Displaying Remedies For Symptoms
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Inspect Refrigerant Pressure With Manifold Gauge Set .

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

Test Conditions:

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

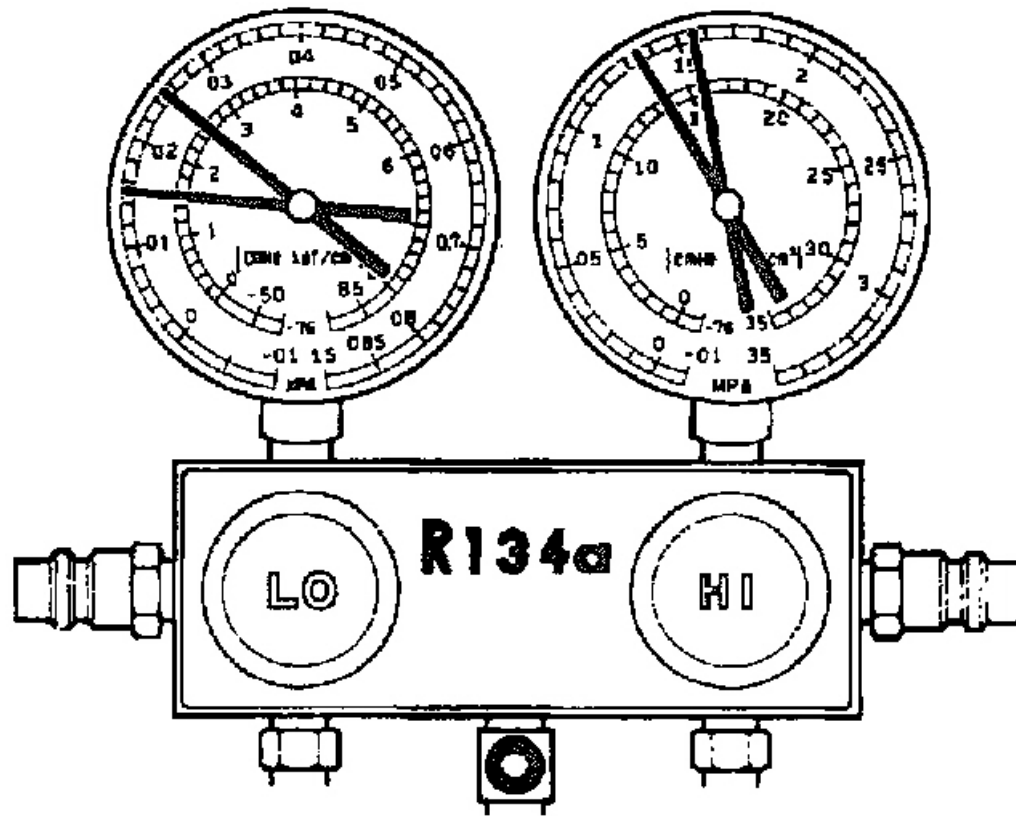
NOTE: It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.

1. Normally Functioning Refrigeration System

Gauge Reading:

Low Pressure Side: 0.15-0.25 MPa (1.5-2.5 kgf/cm²)

High Pressure Side: 1.37-1.57 MPa (14-16 kgf/cm²)

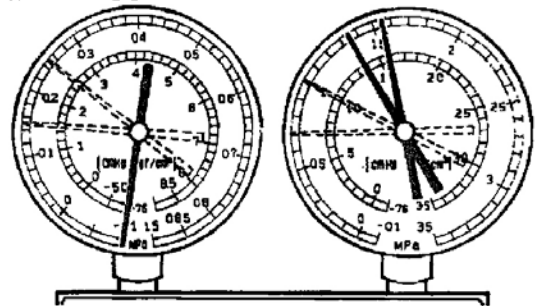


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Fig. 3: Displaying Normal Gauge Readings
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Moisture Present In Refrigeration System

Condition : Periodically cools and then fails to cool



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Fig. 4: Displaying Manifold Gauge Readings With Moisture Present
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

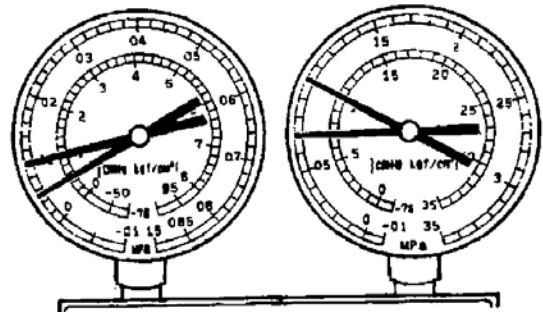
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time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

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Fig. 5: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Insufficient Cooling

Condition: Insufficient cooling



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Fig. 6: Displaying Gauge Readings With Insufficient Cooling Condition
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

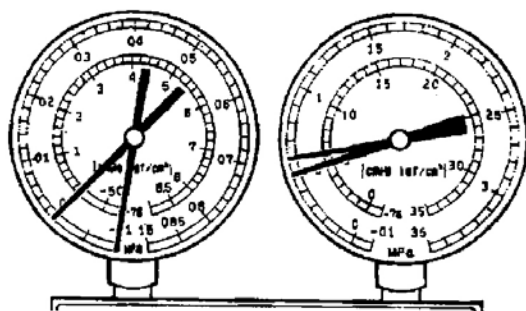
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low on both low and high pressure sides • Bubbles seen in sight glass continuously • Insufficient cooling performance	Gas leakage at some place in refrigeration system	• Insufficient refrigerant in system • Refrigerant leaking	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

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Fig. 7: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Poor Circulation Of Refrigerant

Condition: Insufficient cooling



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Fig. 8: Displaying Gauge Readings With Poor Circulation Condition
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

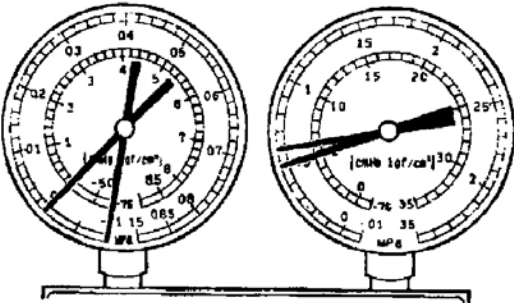
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low in both low and high pressure sides • Frost on tube from condenser to unit	Refrigerant flow obstructed by dirt in receiver	Modulator clogged	Replace condenser

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Fig. 9: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Refrigerant Does Not Circulate

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



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Fig. 10: Displaying Gauge Readings W/O Circulation In system
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

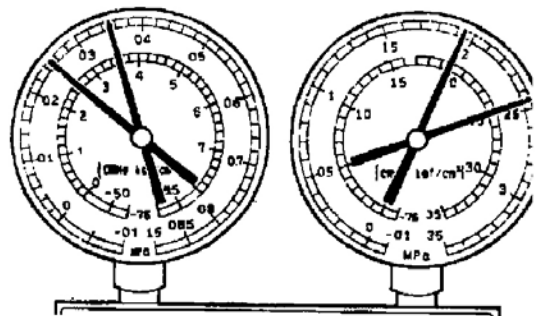
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/ drier or expansion valve	• Refrigerant flow obstructed by moisture or dirt in refrigeration 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 condenser 4. Evacuate air and charge new refrigerant to proper amount 5. For gas leakage from expansion valve, replace expansion valve

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Fig. 11: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. Refrigerant Overcharged Or Insufficient Cooling Of Condenser

Condition: Insufficient cooling



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Fig. 12: Displaying Gauge Readings With Overcharged System Or Insufficiently Cooled Condenser

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive • Insufficient cooling of condenser	• Excessive refrigerant in cycle→refrigerant overcharged • Condenser cooling insufficient→condenser fins clogged or cooling fan	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

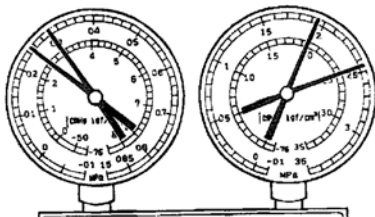
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Fig. 13: Displaying Symptom's Cause, Diagnosis & Remedy

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. Air Present In Refrigeration System

Condition: Insufficient cooling



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

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Fig. 14: Displaying Gauge Readings With Air Present In System

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

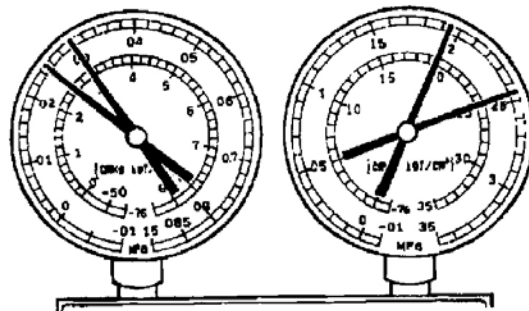
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • Low pressure piping hot to touch • Bubbles seen in sight glass	Air entered in refrigeration system	• Air present in refrigeration system • Insufficient vacuum purging	1. Check to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

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Fig. 15: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. Expansion Valve Operating Improperly

Condition: Insufficient cooling



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Fig. 16: Displaying Gauge Readings With Fault Expansion Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

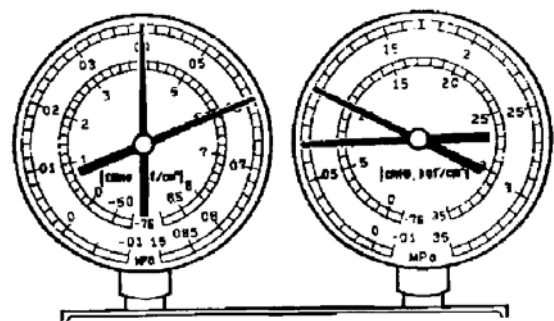
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	Check expansion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

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Fig. 17: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. Defective Compression Compressor

Condition : Does not cool



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Fig. 18: Displaying Gauge Readings With Faulty Compressor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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Fig. 19: Displaying Symptom's Cause, Diagnosis & Remedy
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Inspect Idle-Up Speed

- a. Warm up the engine.
- b. Inspect the idle-up speed when these conditions are established.
 - Shifter in "N" position.
 - Warm up engine.
 - Blower speed control switch at "HI" position.
 - A/C switch ON.
 - Temperature control dial at "COOL" position.

Magnetic clutch condition	Idle-up speed
Magnetic clutch not engaged	700 ± 20 rpm
Magnetic clutch engaged	750 ± 20 rpm

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Fig. 20: Displaying Magnetic Clutch Condition Based On Idle Speed
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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 which are not refrigerant, such as evaporated gasoline and exhaust gas.)
- Repeat the test 2 or 3 times.
- Make sure that there is some refrigerant remaining in the refrigeration system.

When compressor is OFF: approx. 392-588 kPa (4-6 kgf/cm² , 57-85 psi)

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

NOTE:

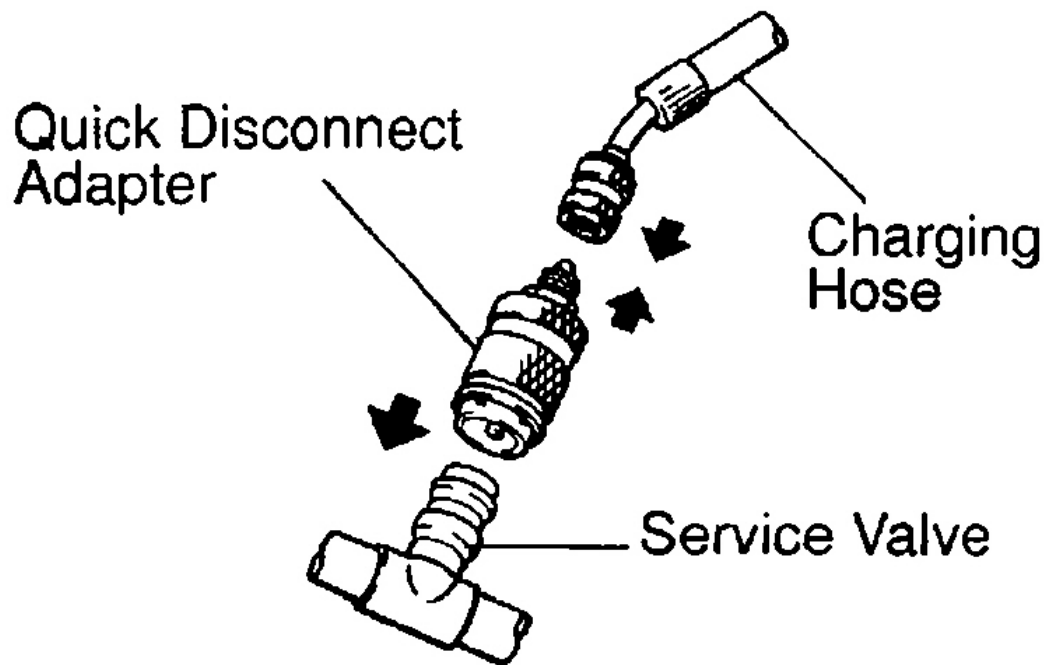
- **After the blower motor has stopped, leave the cooling unit for more than 15 minutes.**
- **Expose the gas leak detector sensor under the drain hose.**
- **When bringing the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to the volatile gases.**

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

- 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.

EVACUATING

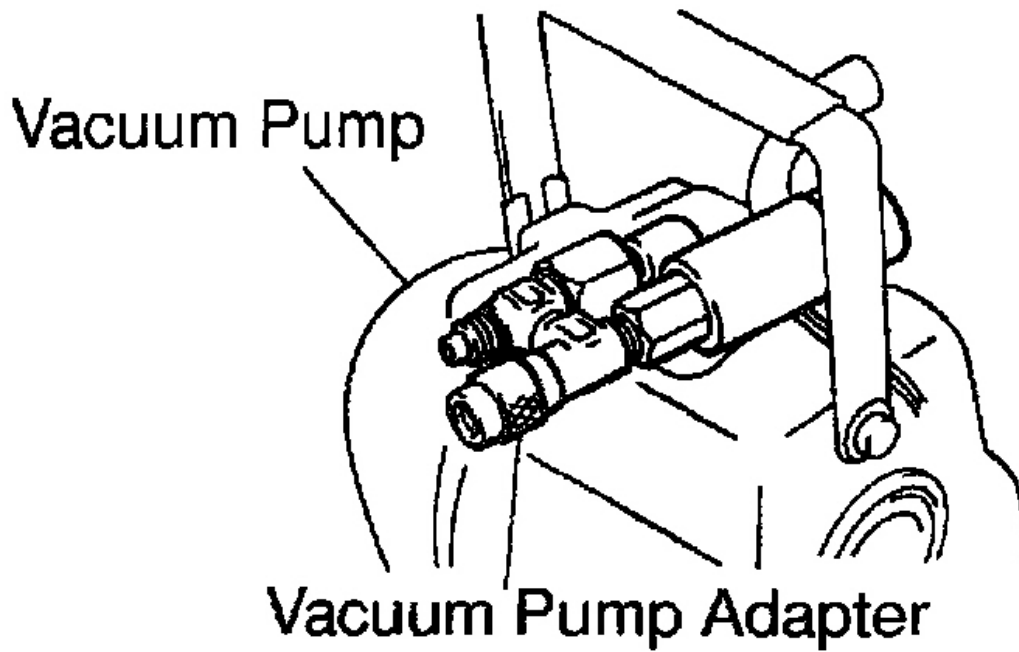
1. **Connect Quick Disconnect Adapter To Charging Hoses**



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Fig. 21: Identifying Quick Disconnect Adapter & Charging Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

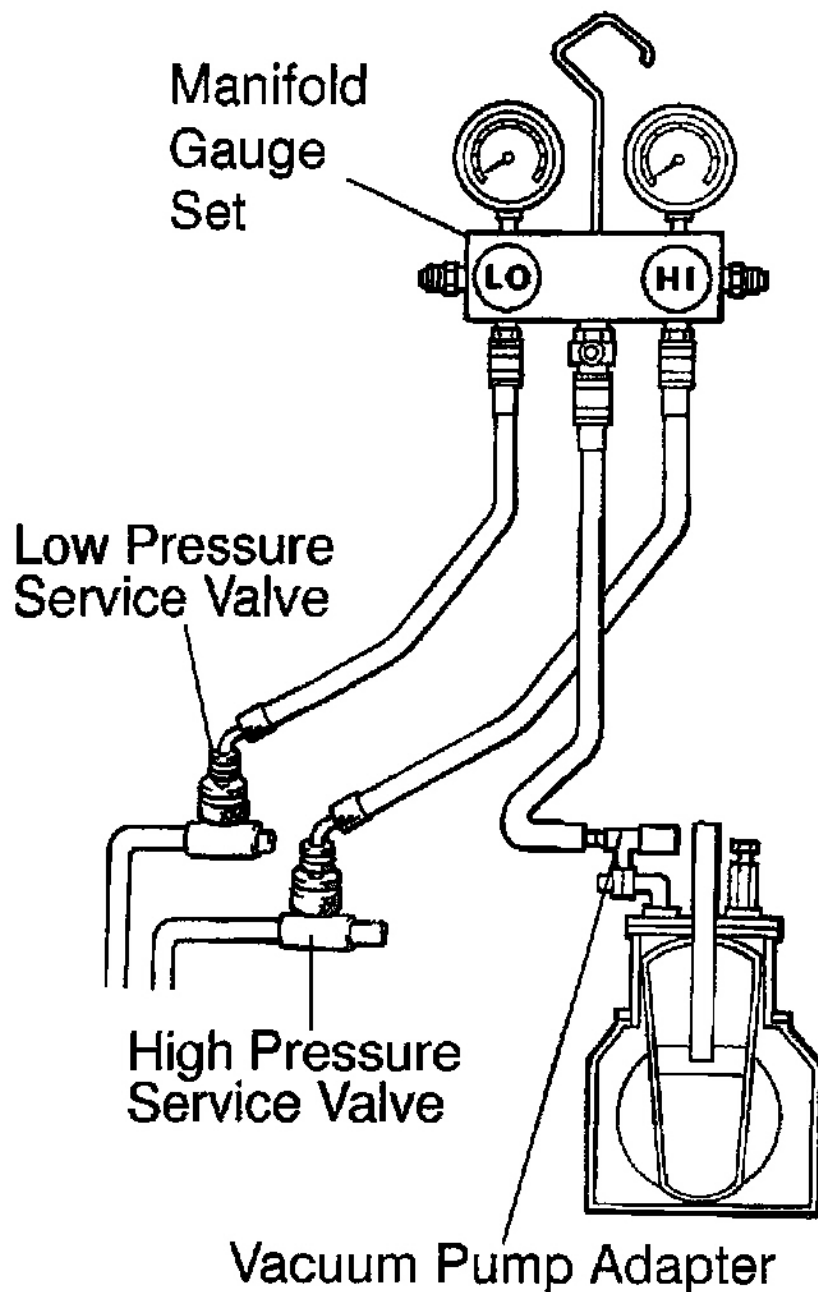
2. **Remove Caps From Service Valves On Refrigerant Lines**
3. **Set On Manifold Gauge Set**
 - a. Close both hand valves of manifold gauge set.
 - b. Connect the quick disconnect adapters to the service valves.
4. **Evacuate Air From Refrigeration System**
 - a. Connect the vacuum pump adapter to the vacuum pump.



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Fig. 22: Identifying Vacuum Pump & Adapter
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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Fig. 23: Evacuating Air From Refrigeration System
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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.

NOTE: **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 as 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 change in gauge indicator.

CHARGING

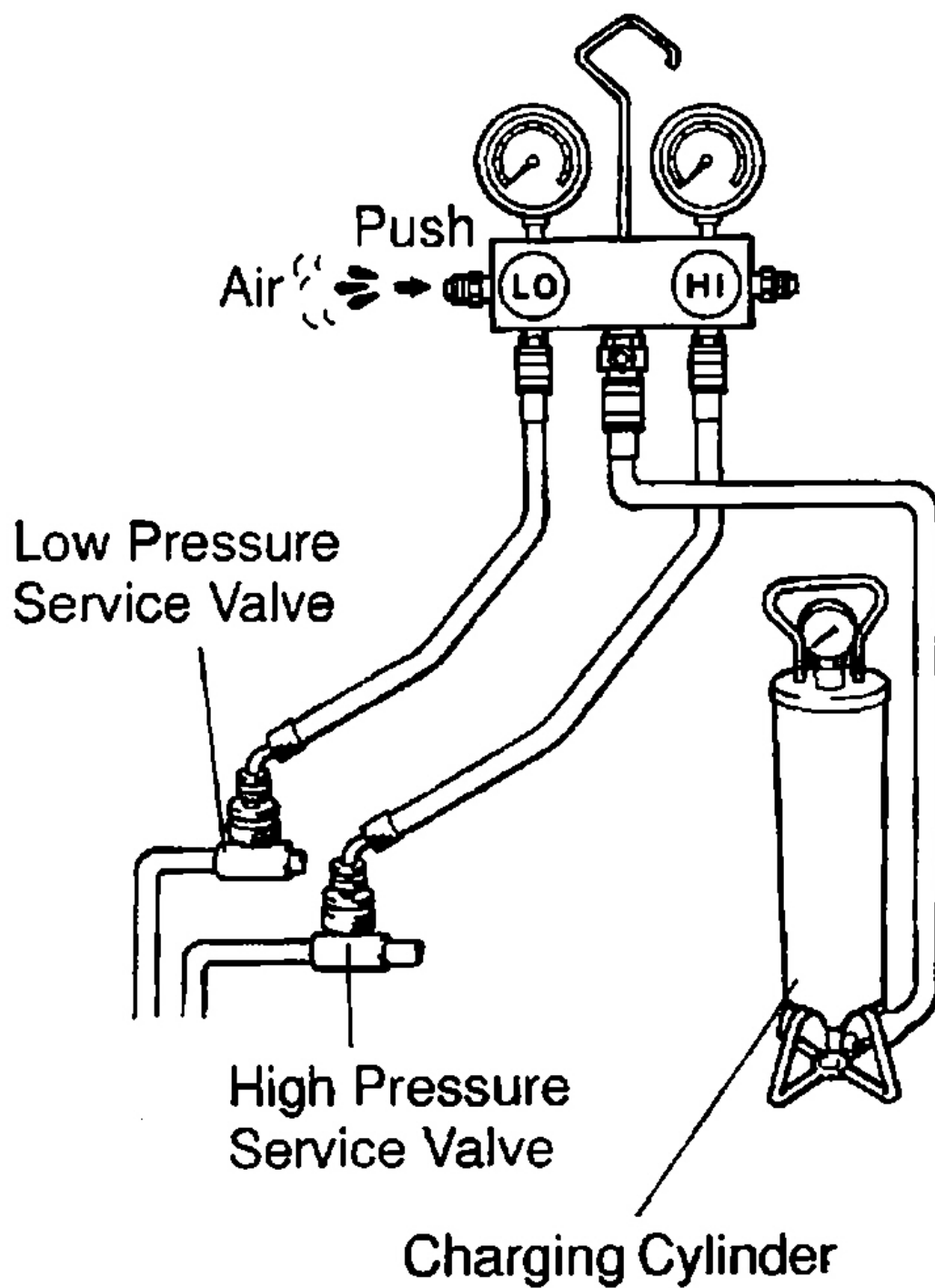
1. Install Charging Cylinder

NOTE: **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 purge the air from inside of the center hose.

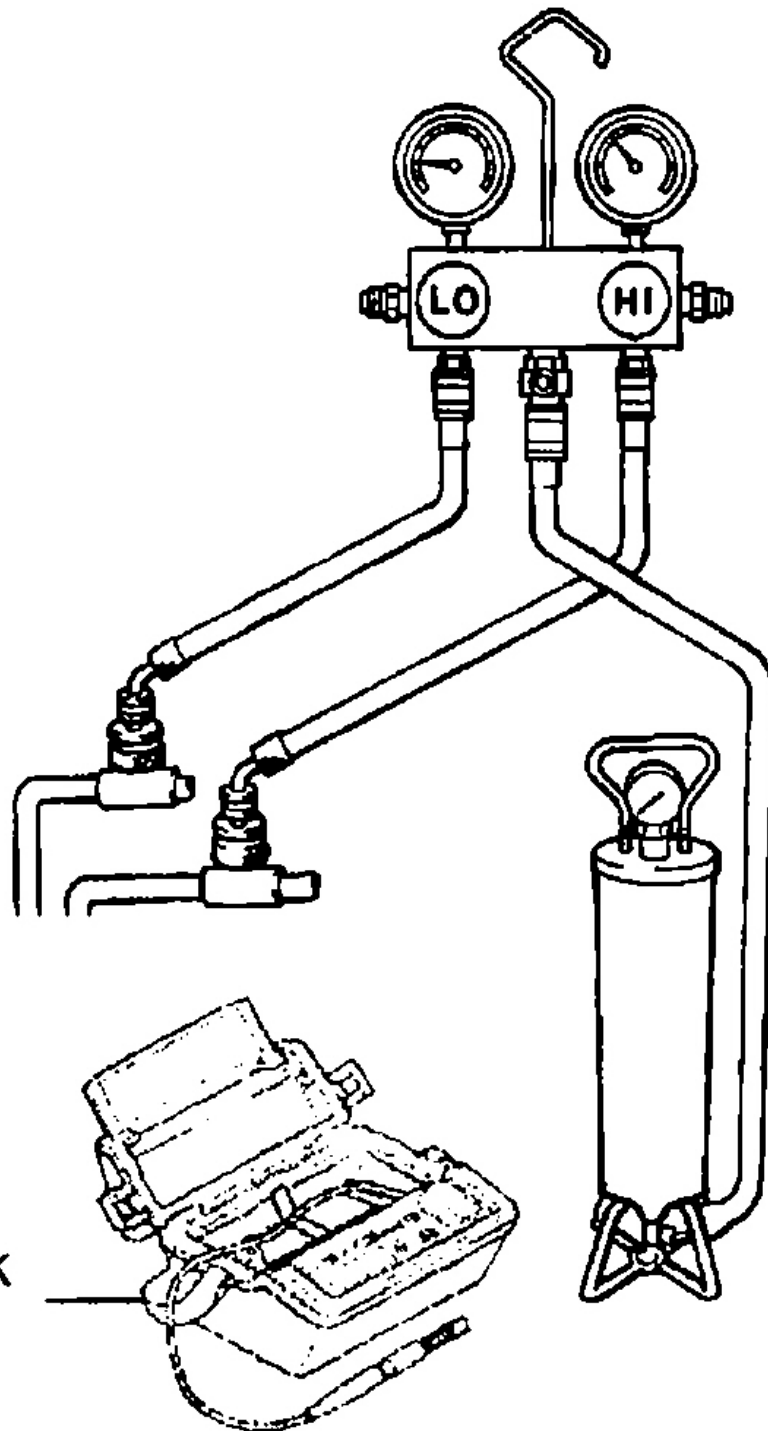


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Fig. 24: Expelling Air From Manifold Gauge
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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/cm² , 14 psi) close the high pressure hand valve.
- c. Using a gas leak detector, check the system for leakage.



Gas Leak
Detector

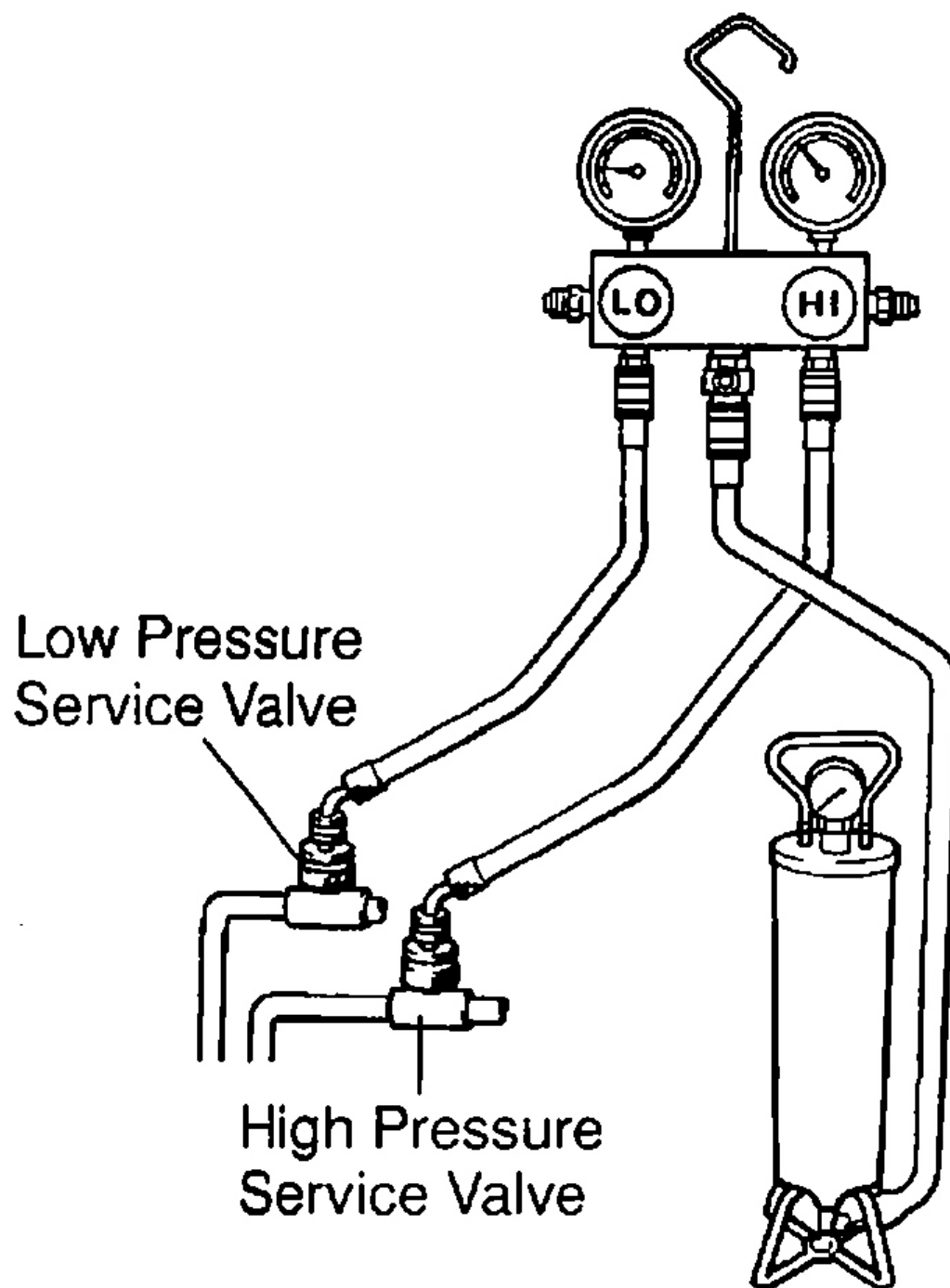
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Fig. 25: Displaying Gas Leak Detector

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. Charge Refrigerant Into Refrigerant System



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Fig. 26: Identifying Low & High Pressure Service Valves
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.**

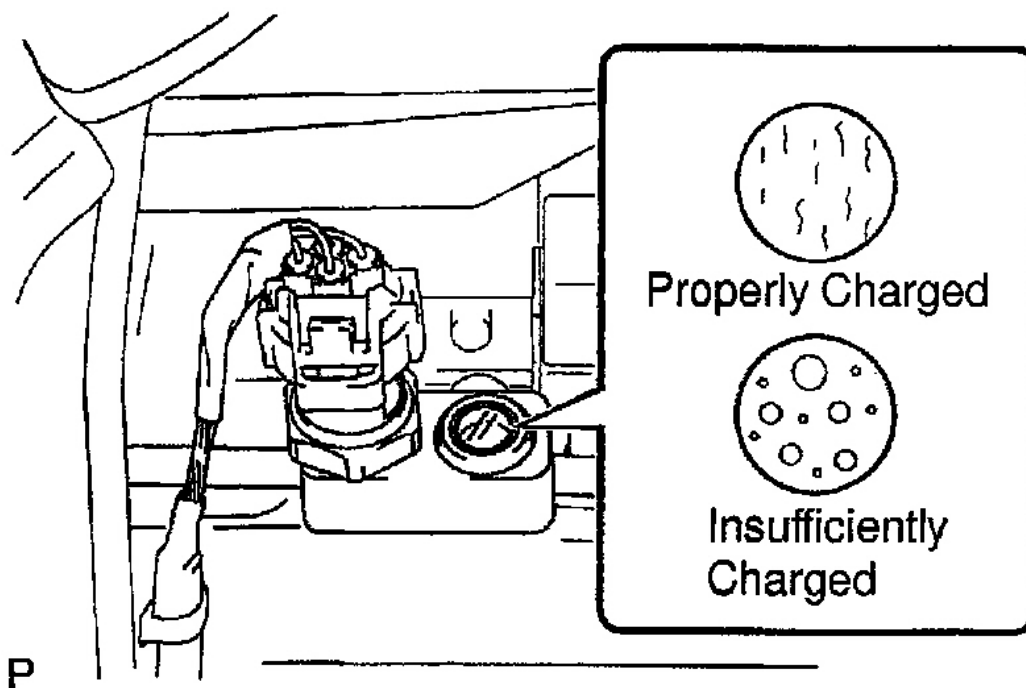
- a. Open the high pressure hand valve fully.
- b. Charge specified amount of refrigerant, then close the high pressure hand valve.

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

- c. Charge partially refrigeration system with refrigerant.
 1. Set the vehicle in these conditions:
 - Run engine at 1500 RPM
 - Blower speed control switch at "HI" position
 - Temperature control dial at "MAX. COOL" position
 - Air inlet control switch at "RECIRC"
 - Fully open doors (Sliding roof closed)
 2. Open the low pressure hand valve.

- CAUTION:**
- **Do not open the high pressure hand valve.**
 - **After charging the refrigerant, push the A/C switch ON and run the engine at 1800 RPM or less for one minute or more (Do not depress the accelerator pedal while the A/C switch is ON, before performing this task).**

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



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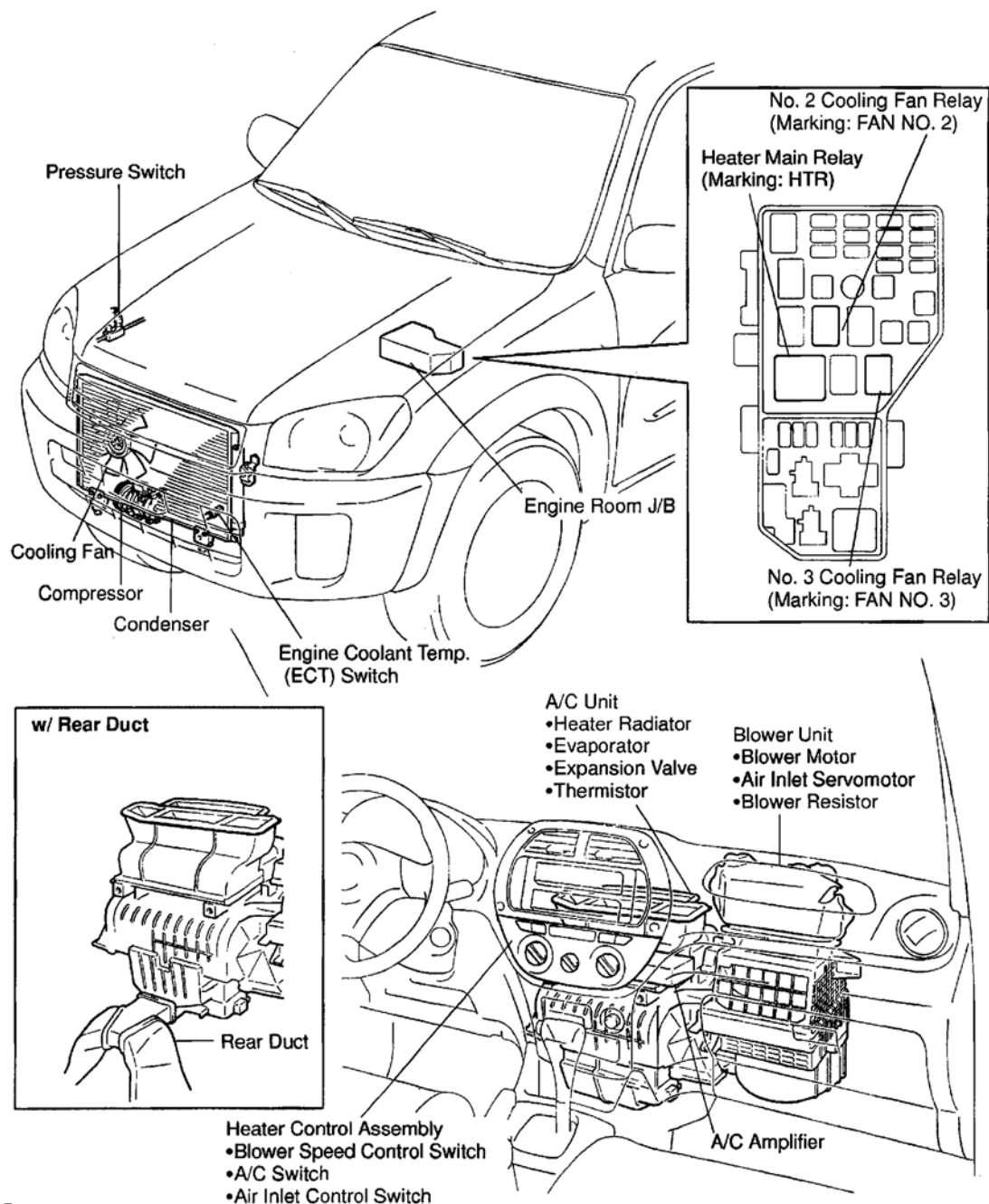
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Fig. 27: Checking Pressure On Gauge

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Replenishment to be 100 +/- 50 g after bubbles disappear.

LOCATION



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Fig. 28: Identifying Air Conditioning System Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TROUBLESHOOTING

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.

AIR CONDITIONING

Symptom/Suspected Area	Refer To
No Blower Operation	
HTR Fuse	(1)
Heater Main Relay	<u>HEATER MAIN RELAY</u>
Blower Motor	<u>BLOWER MOTOR</u>
Blower Resistor	<u>BLOWER RESISTOR</u>
Blower Speed Control Switch	<u>INSPECTION</u>
Wire Harness	(1)
No Blower Control	
Blower Motor	<u>BLOWER MOTOR</u>
Blower Resistor	<u>BLOWER RESISTOR</u>
Blower Speed Control Switch	<u>INSPECTION</u>
Wire Harness	(1)
No Air Temperature	
Engine Coolant Volume	(1)
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
No Compresor Operation	
Refrigerant Volume	<u>ON-VEHICLE INSPECTION</u>
AC Fuse	(1)
Magnetic Clutch	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Compressor Lock Sensor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Compressor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Pressure Switch	<u>PRESSURE SWITCH</u>
Heater Main Relay	<u>HEATER MAIN RELAY</u>
Blower Speed Control Switch	<u>INSPECTION</u>
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Thermistor	<u>THERMISTOR</u>
Wire Harness	(1)
No Cool Air Comes Out	
Refrigerant Volume	<u>ON-VEHICLE INSPECTION</u>
Refrigerant Pressure	<u>ON-VEHICLE INSPECTION</u>
Drive Belt	<u>DRIVE BELT</u>
Magnetic Clutch	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Compressor Lock Sensor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Pressure Switch	<u>PRESSURE SWITCH</u>
Thermistor	<u>THERMISTOR</u>
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Wire Harness	(1)

Insufficient Cooling	
Refrigerant Volume	<u>ON-VEHICLE INSPECTION</u>
Drive Belt	<u>DRIVE BELT</u>
Magnetic Clutch	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Compressor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Condenser	<u>CONDENSER</u>
Expansion Valve	<u>ON-VEHICLE INSPECTION</u>
Evaporator	<u>ON-VEHICLE INSPECTION</u>
Refrigerant Lies	<u>REFRIGERANT LINE</u>
Pressure Switch	<u>PRESSURE SWITCH</u>
Air Conditioning Control System	<u>ON-VEHICLE INSPECTION</u>
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
NoEngine Idle-Up With A/C	
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Engine ECU	(1)
Idle Control System	(1)
Wire Harness	(1)
No Air Inlet Control	
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Air Inlet Servomotor	<u>INSPECTION</u>
Wire Harness	(1)
No Mode Control	
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Wire Harness	(1)
Blinking Of A/C Indicator	
Compressor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Drive Belt	<u>DRIVE BELT</u>
Compressor Lock Sensor	<u>COMPRESSOR AND MAGNETIC CLUTCH</u>
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
Brightness Does Not Change When Light Control Switch Is Turned On	
Headlight & Taillight System	HEADLIGHT & TAILLIGHT SYSTEM - INSPECTION
Heater Control Assembly	<u>HEATER CONTROL ASSEMBLY</u>
(1) Repair, adjust or replace as necessary.	

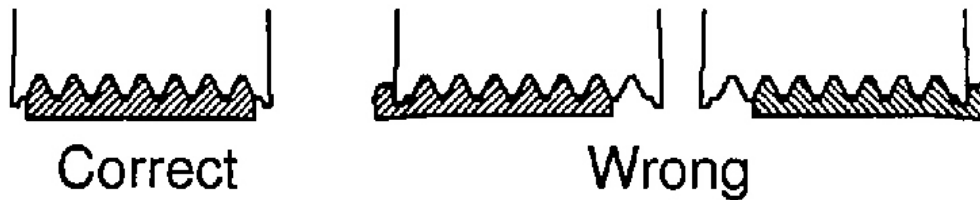
DRIVE BELT

ON-VEHICLE INSPECTION

1. Inspect Drive Belt Installation Condition

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

2. **Inspect Drive Belt Tension** See CHARGING SYSTEM .



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Fig. 29: Inspecting Drive Belt Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

1. **Remove Drive Belt .**

Hook SST on the hexagonal portion of the drive belt tensioner bracket, compress the drive belt tension by turning the drive belt tensioner bracket clockwise, and remove the drive belt.

SST 09249-63010

2. **Reinstall Drive Belt**

Hook SST on the hexagonal portion of the drive belt tensioner bracket, compress the drive belt tension by turning the drive belt tensioner bracket clockwise, and install the drive belt.

SST 09249-63010

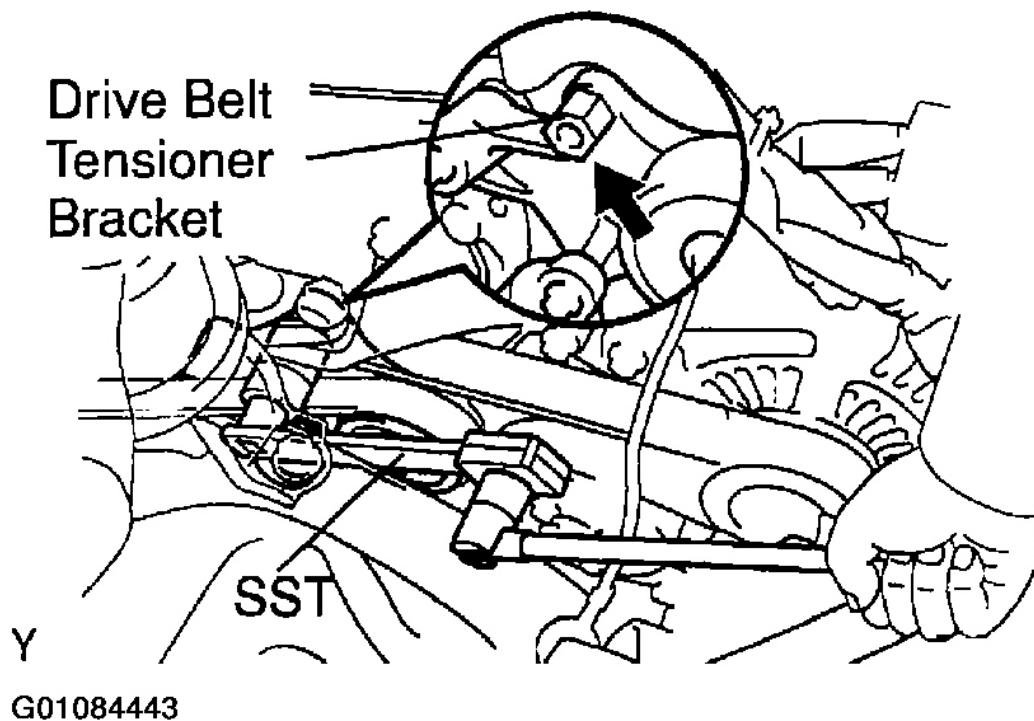
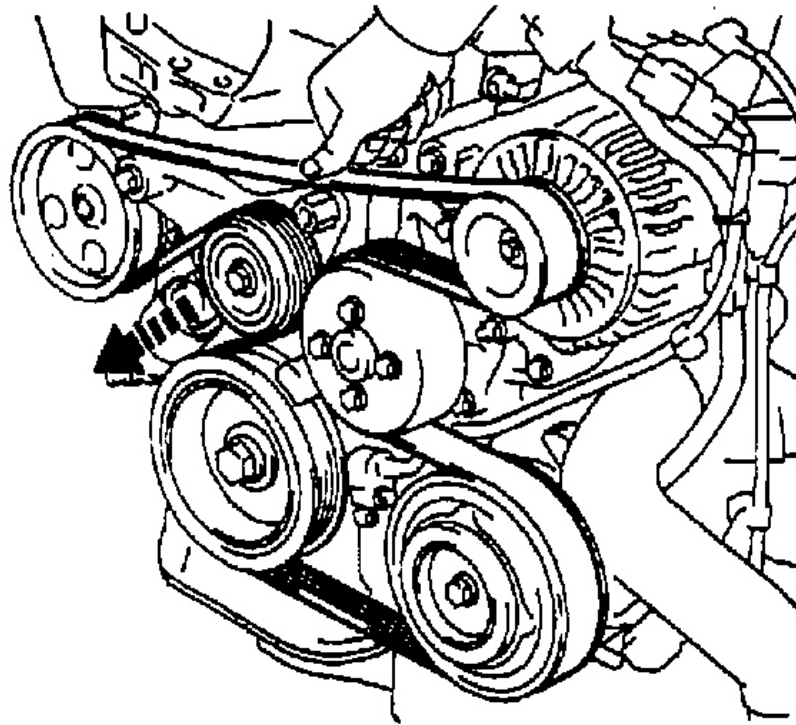


Fig. 30: Locating Drive Belt Tensioner Bracket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Check Drive Belt Installation Condition

- a. Check that the belt tensioner moves downward when the drive belt is pressed down at the points indicated in **Fig. 31** .



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Fig. 31: Checking Drive Belt Installation Conditions
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the alignment of the belt tensioner pulley to make sure the drive belt will not slip off the pulley.

If necessary, replace the belt tensioner.

MANIFOLD GAUGE SET

SET ON

1. **Connect charge hose to manifold gauge set .**

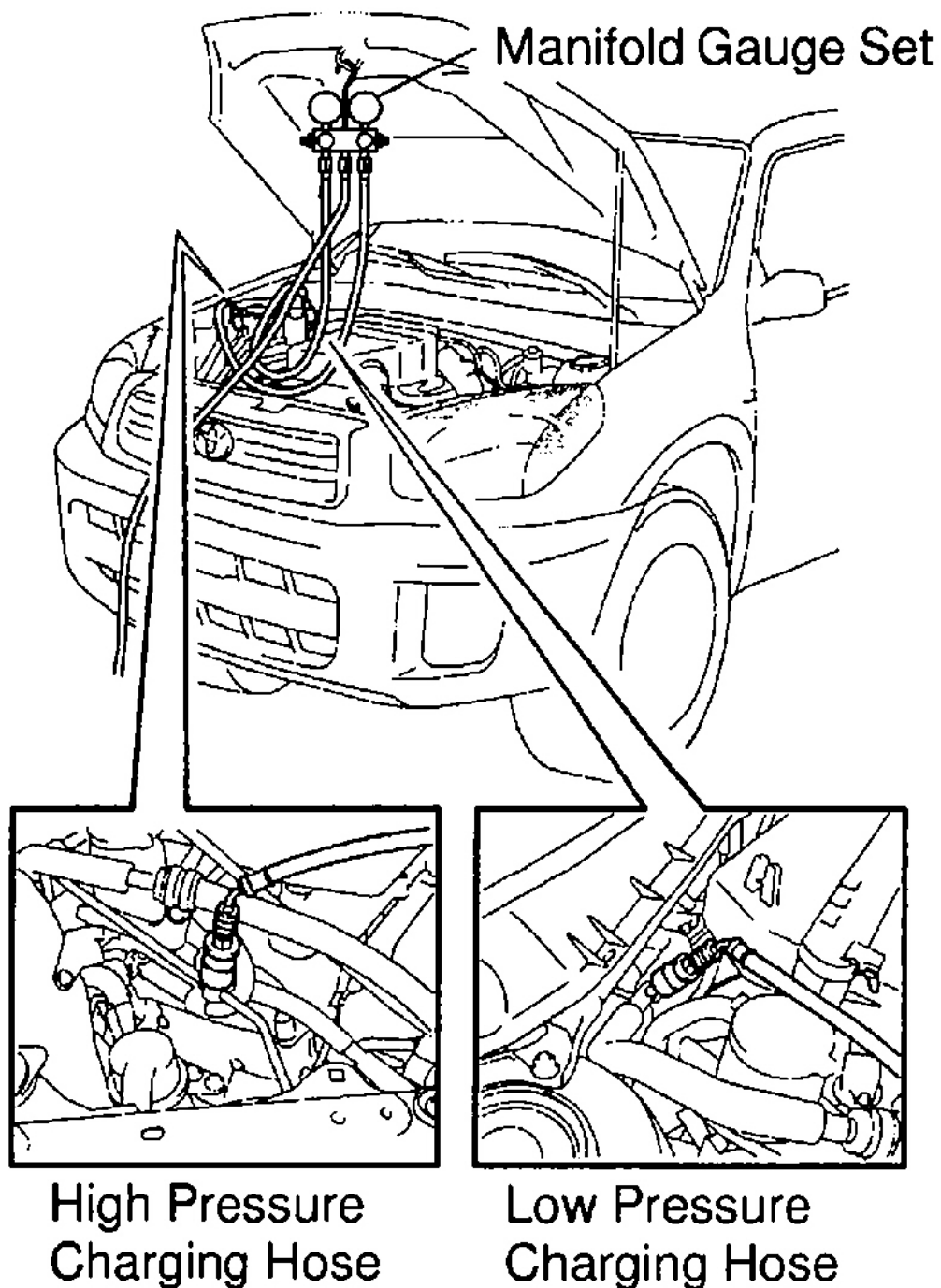
Tighten the nuts by hand.

CAUTION: Do not connect the wrong hoses.

2. **Connect Quick Disconnect Adapter To Charging Hoses**

Tighten the nuts by hand.

3. **Close Both Hand Valves Of Manifold Gauge Set**



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Fig. 32: Displaying Manifold Gauge Set

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **Remove Caps From Service Valve On Refrigerant Line**
5. **Connect Quick Disconnect Adapter To Service Valves**

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

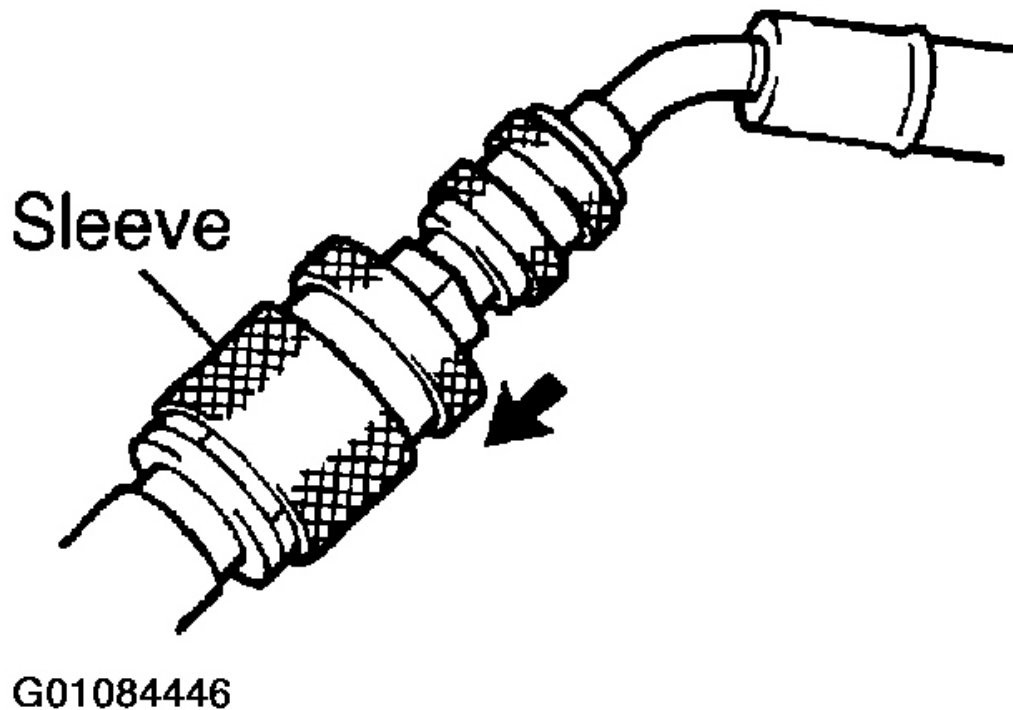


Fig. 33: Identifying Adapter & Service Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SET OFF

1. **Close Both Hand Valves Of Manifold Gauge Set**
2. **Disconnect Quick Disconnect Adapters From Service Valves On Refrigerant Line**

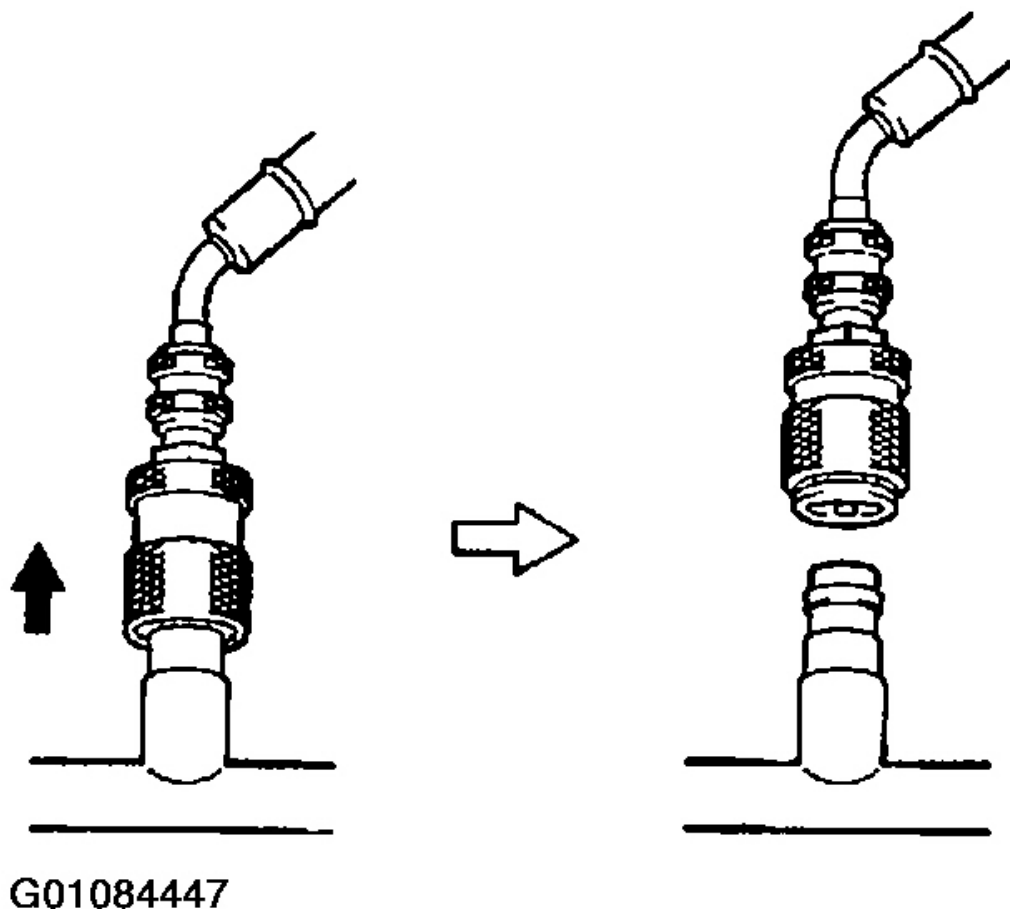


Fig. 34: Disconnect Quick Disconnect Adapters
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: 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

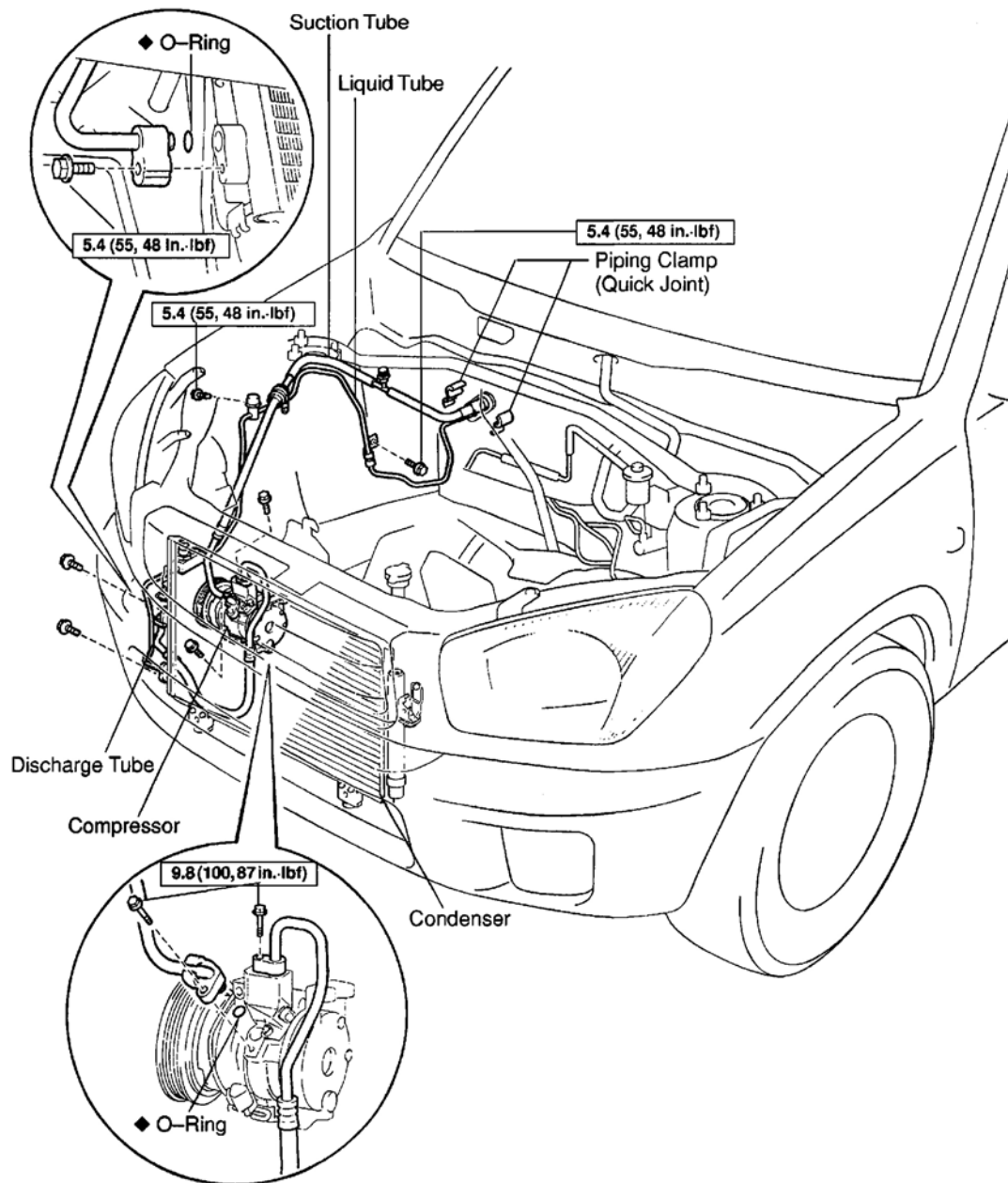
REFRIGERANT LINE

ON-VEHICLE INSPECTION

1. Inspection Hose & Tube Connections For Looseness
2. Inspect Hoses & Tubes For Leakage

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

LOCATION



P

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

◆ Non-reusable part

G01084448

Fig. 35: Locating Air Conditioning Refrigerant Line
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

- 1. **Discharge Refrigerant From Refrigeration System**
- 2. **Replace Faulty Tube Or Hose**

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

- 3. **Torque Connections To Specified Torque**

NOTE: **Connections should not be torqued tighter than the specified. See Fig. 36 .**

Part tightened	N·m	kgf·cm	ft·lbf
Condenser x Discharge tube	5.4	55	48 in.·lbf
Condenser x Liquid tube	5.4	55	48 in.·lbf
Compressor x Discharge hose	9.8	100	87 in.·lbf
Compressor x Suction hose	9.8	100	87 in.·lbf
Expansion valve x Evaporator	3.5	36	31 in.·lbf

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Fig. 36: Displaying Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 4. **Evacuate Air In Refrigeration System & Charge With Refrigerant**

Specified Amount: 500 +/- 50 g (17.64 +/- 1.76 oz.)

- 5. **Inspect For Leakage Of Refrigerant**

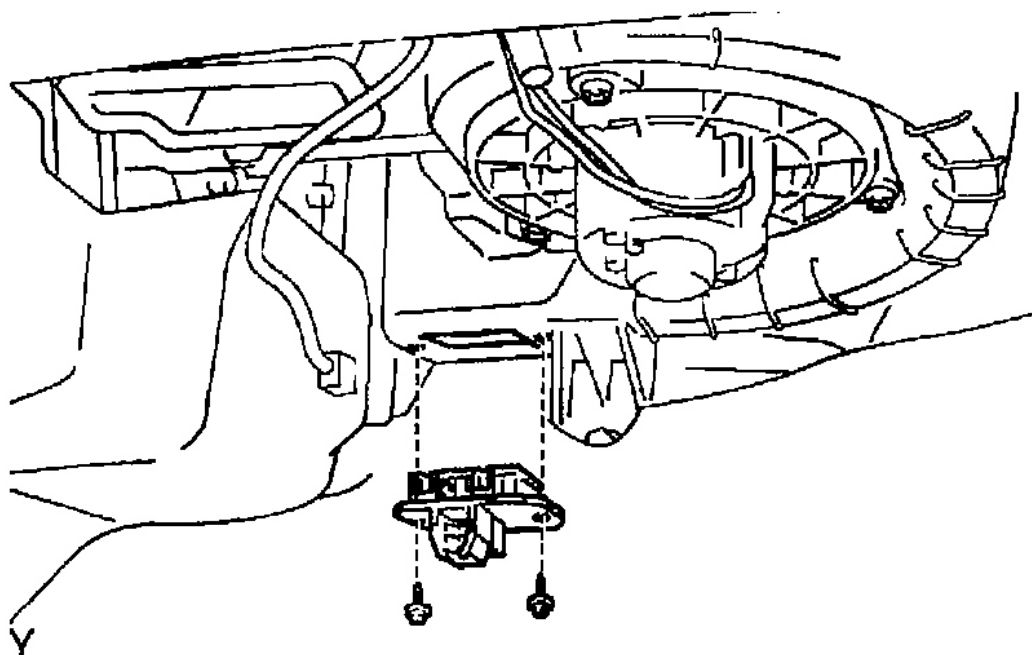
Using a gas leak detector, check for leakage of refrigerant.

- 6. **Inspect Air Conditioner Operation**

AIR CONDITIONING UNIT

ON-VEHICLE INSPECTION

- 1. **Inspect For Leakage Of Refrigerant**
 - a. Disconnect the blower resistor connector.
 - b. Remove the 2 screws and blower resistor.



G01084450

Fig. 37: Removing Screws & Blower Resistor
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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, expansion valve, A/C tube and O-rings.

- d. Reinstall the blower resistor with the 2 screws.
- e. Reconnect the blower resistor connector.

2. **Inspect Expansion Valve**

- a. Check the quantity of gas during refrigeration cycle.
- b. Connect manifold gauge set.
- c. Run the engine.
 - 1. Run the engine at 1500 RPM for at least 5 minutes.
 - 2. Then check that the high pressure reading is 1.37-1.57 MPa (14-16 kgf/cm² , 199-228 psi).
- d. Check the expansion valve.

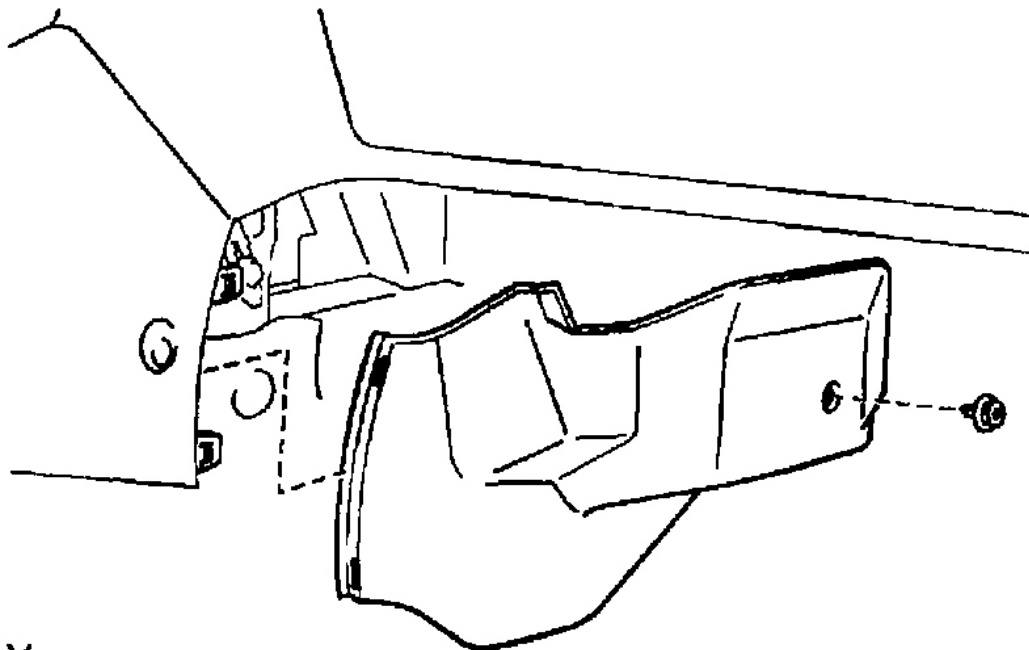
If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm² , 0 psi).

NOTE:

When the low pressure drops to 0 kPa (0 kgf/cm² , 0 psi), feel the receiver's IN and OUT sides for zero temperature difference.

3. Remove No. 2 Instrument Panel Under Cover

Remove the clip and No. 2 instrument panel under cover.



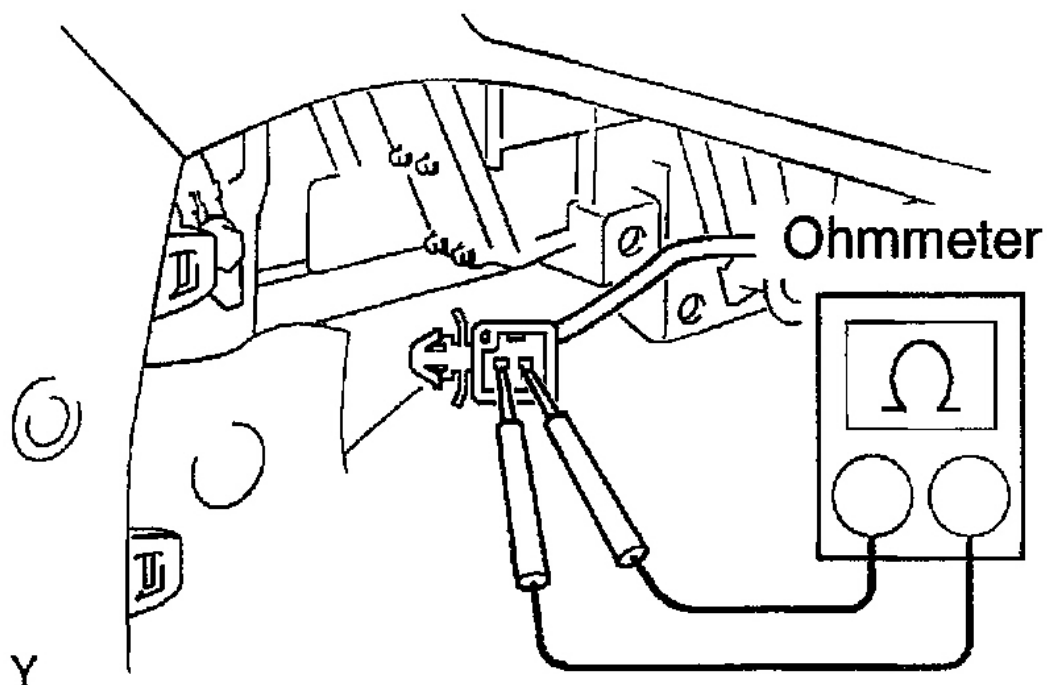
Y

G01084451

Fig. 38: Identifying & Removing Instrument Panel Under Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Inspect Thermistor Resistance

- a. Disconnect the thermistor connector and clamp.
- b. Using an ohmmeter, measure the resistance between the terminals.



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Fig. 39: Inspecting Thermistor Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

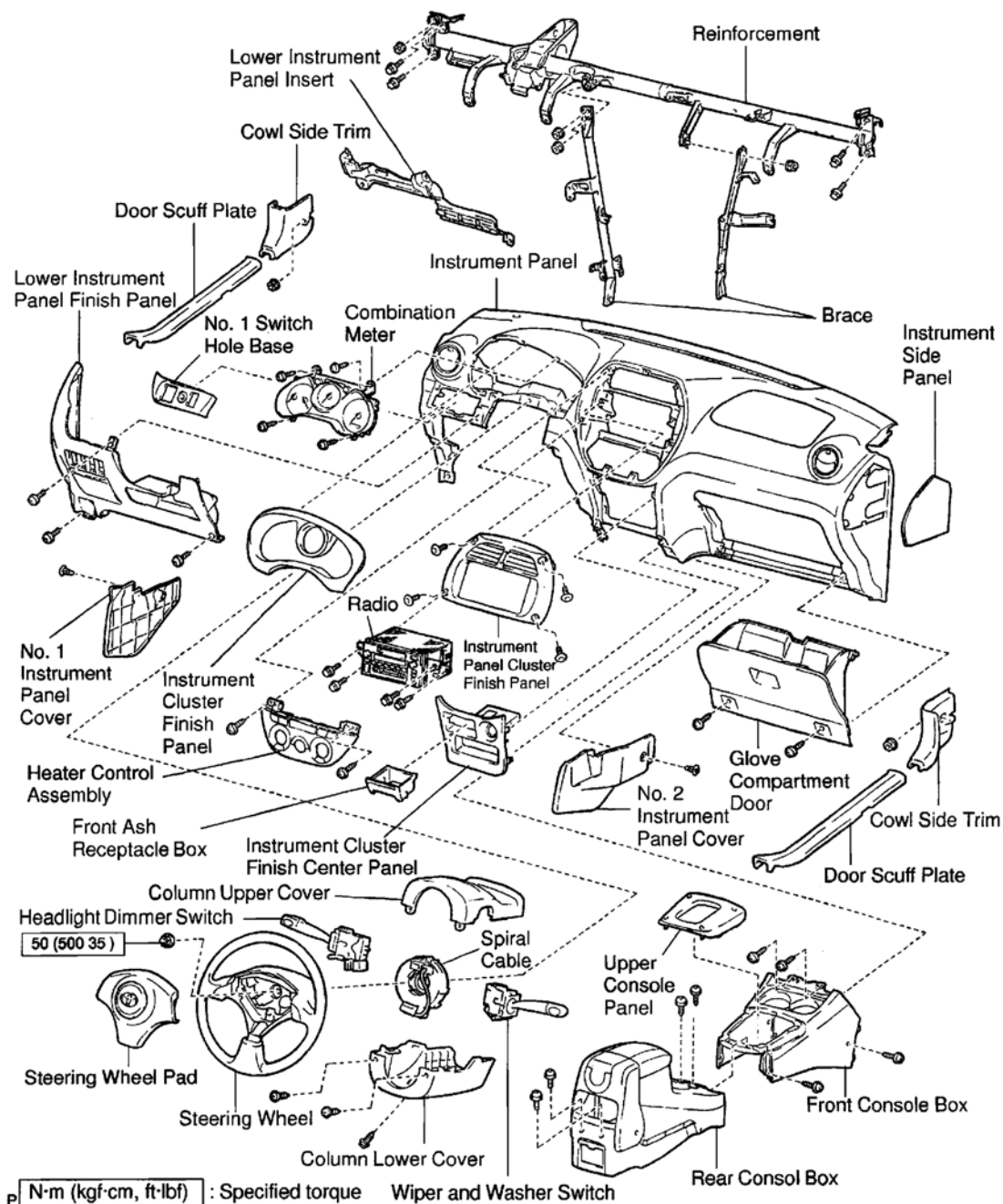
Standard Resistance: 1500 ohms at 25°C (77°F)

If resistance is not as specified, replace the thermistor.

c. Reconnect the thermistor connector and clamp.

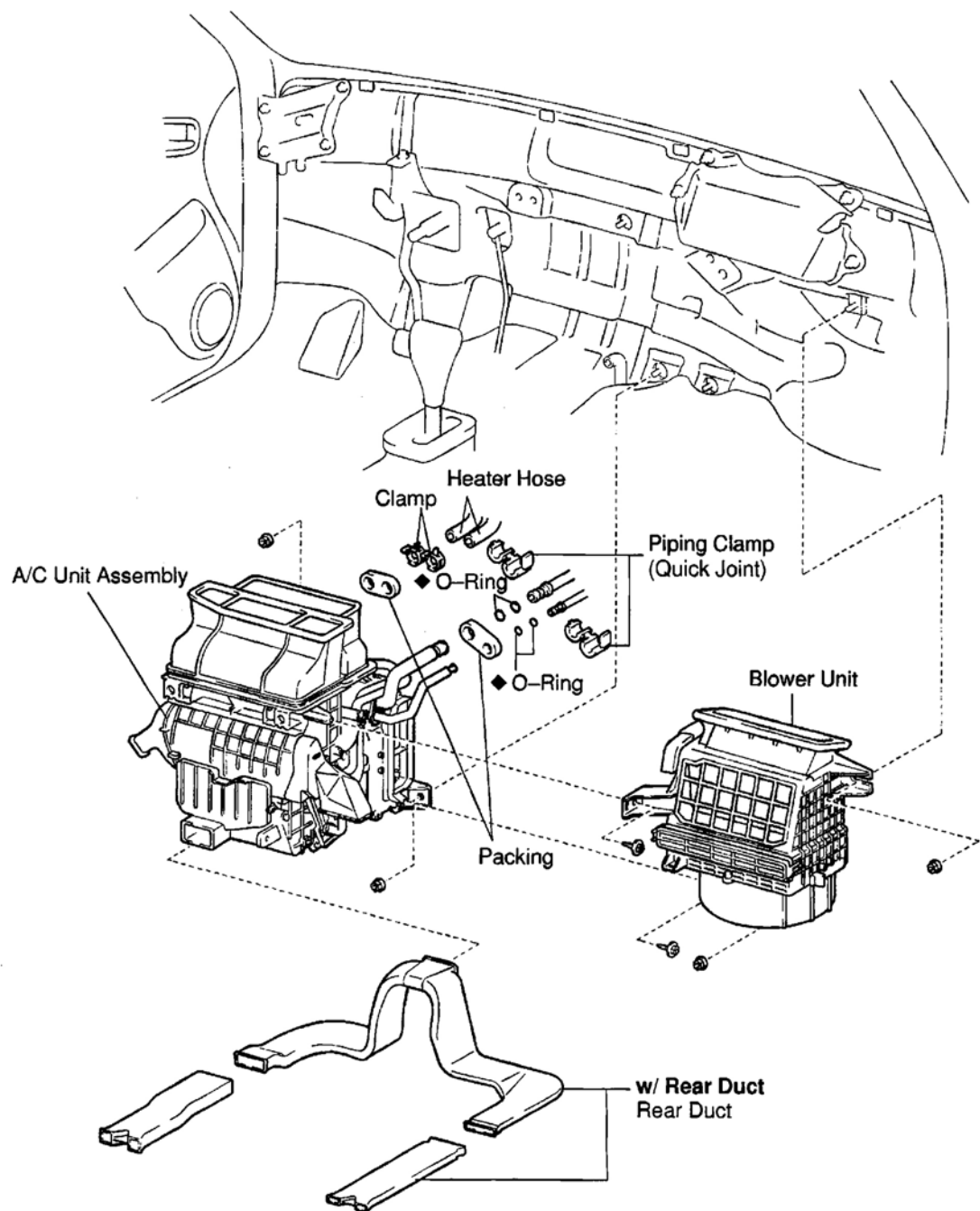
5. Reinstall No. 2 Instrument Panel Under Cover

COMPONENTS



P N-m (kgf-cm, ft-lbf) : Specified torque
G01084453

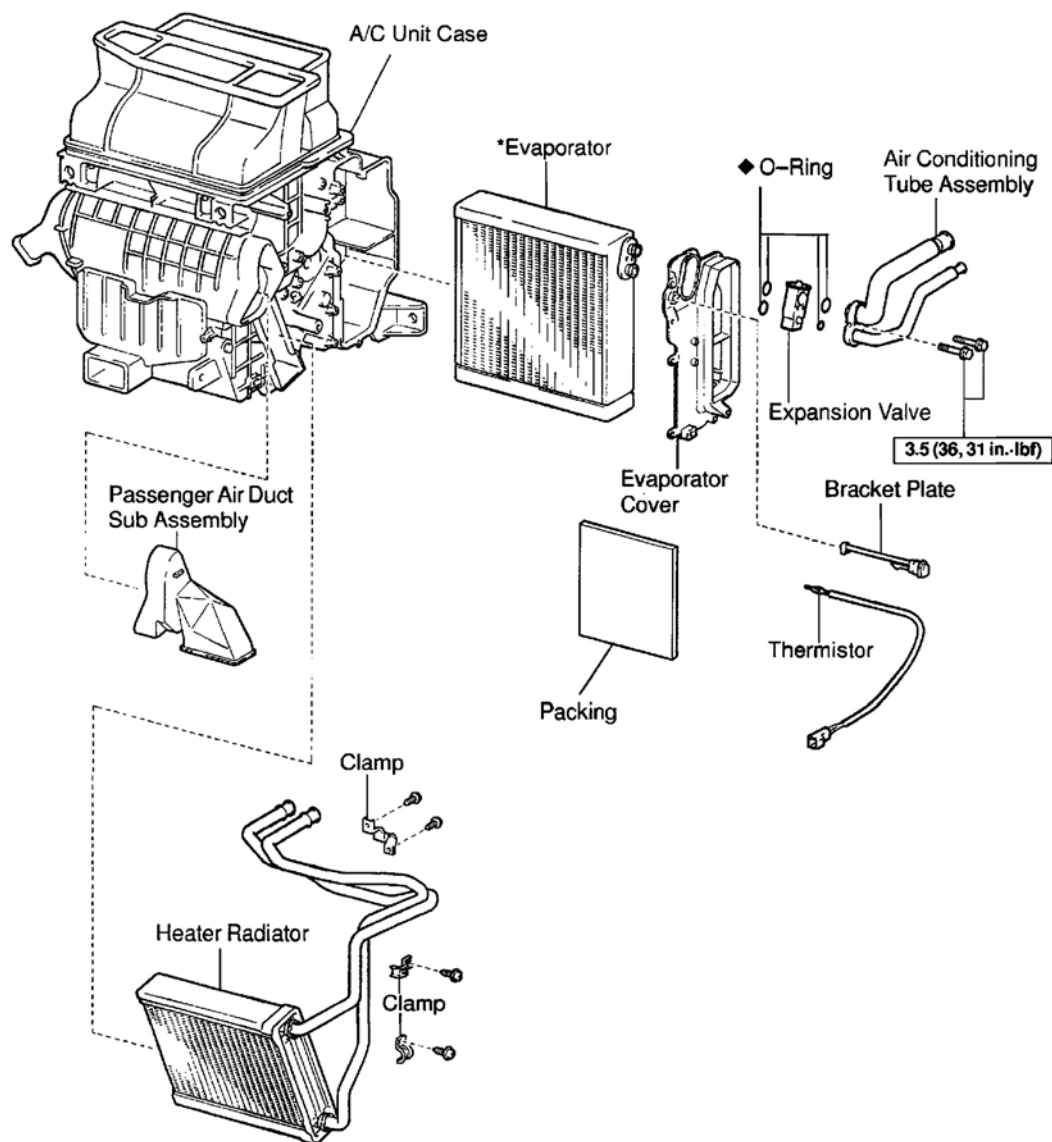
Fig. 40: Displaying Air Conditioning Unit Components (1 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



◆ Non-reusable part

G01084454

Fig. 41: Displaying Air Conditioning Unit Components (2 Of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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

◆ Non-reusable part

P *If evaporator is replaced, add 40 cc (1.4 fl.oz.) of compressor oil (ND-OIL 8 or equivalent)

G01084455

Fig. 42: Displaying Air Conditioning Unit Components (3 Of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

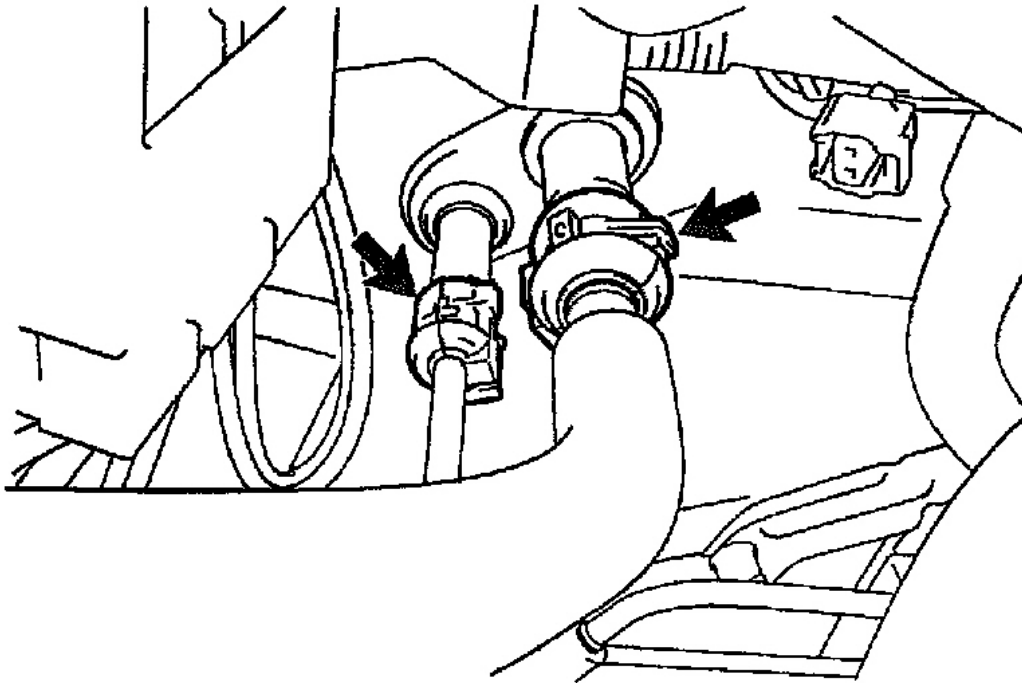
REMOVAL

1. **Discharge Refrigerant From Refrigeration System**
2. **Drain Engine Coolant From Radiator**

NOTE: It is not necessary to drain out all coolant.

3. Disconnect Liquid Tube & Suction Hose

- a. Using SST, remove the 2 piping clamps.
SST 09870-00015 (Suction tube)
SST 09870-00025 (Liquid tube)



G01084456

Fig. 43: Locating Piping Clamps

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Insert the SST to the piping clamp.

NOTE: Confirm the direction of the piping clamp claw and SST using the illustration shown on the caution label. See Fig. 44 .

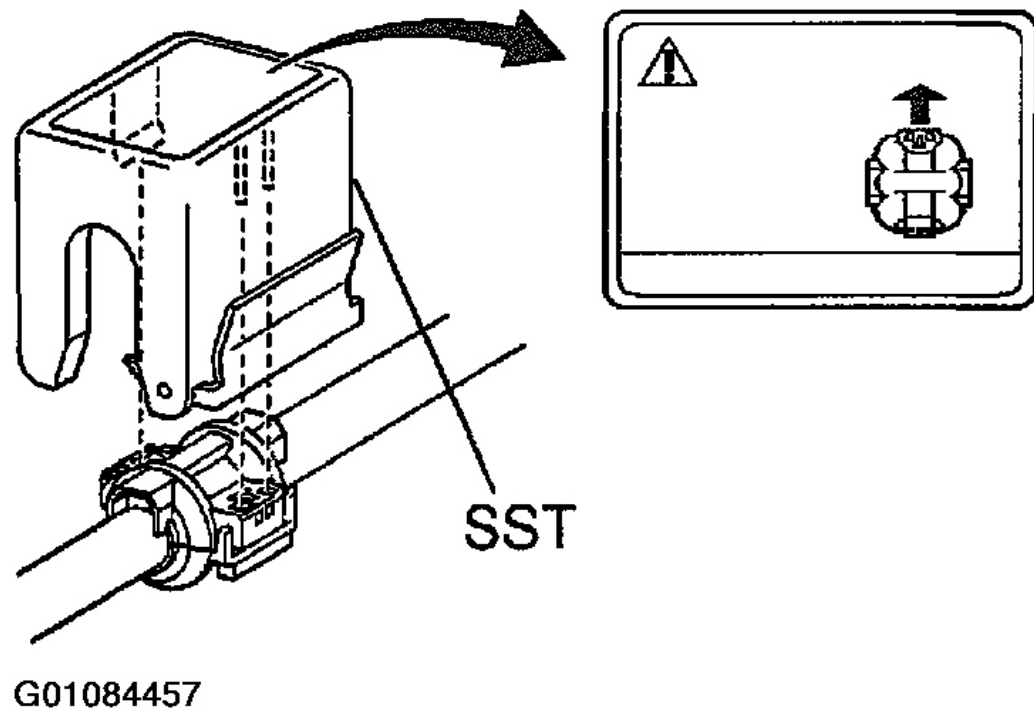
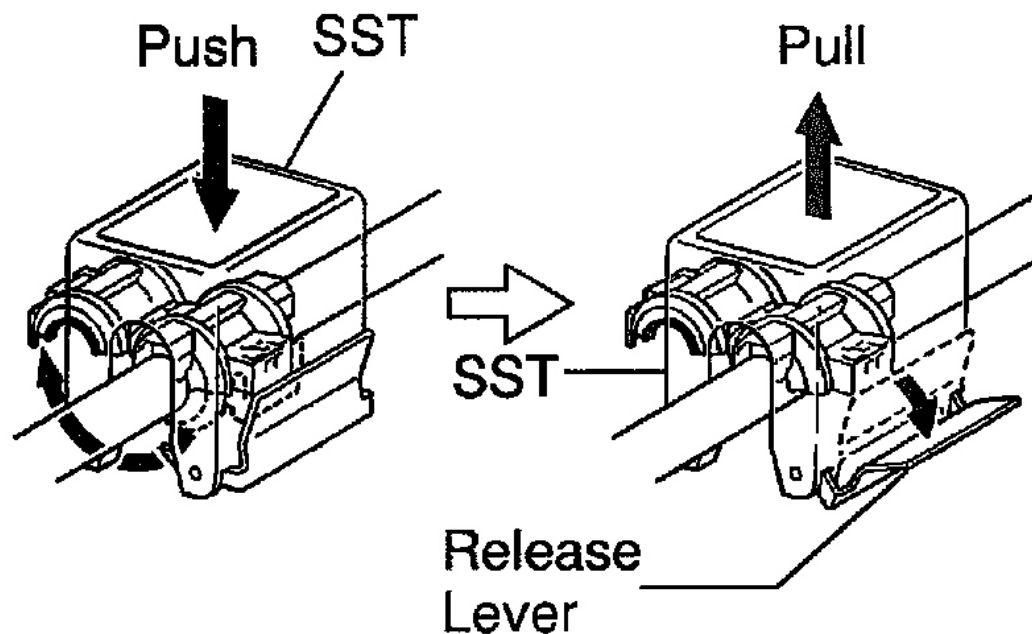


Fig. 44: Inserting SST To Piping Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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



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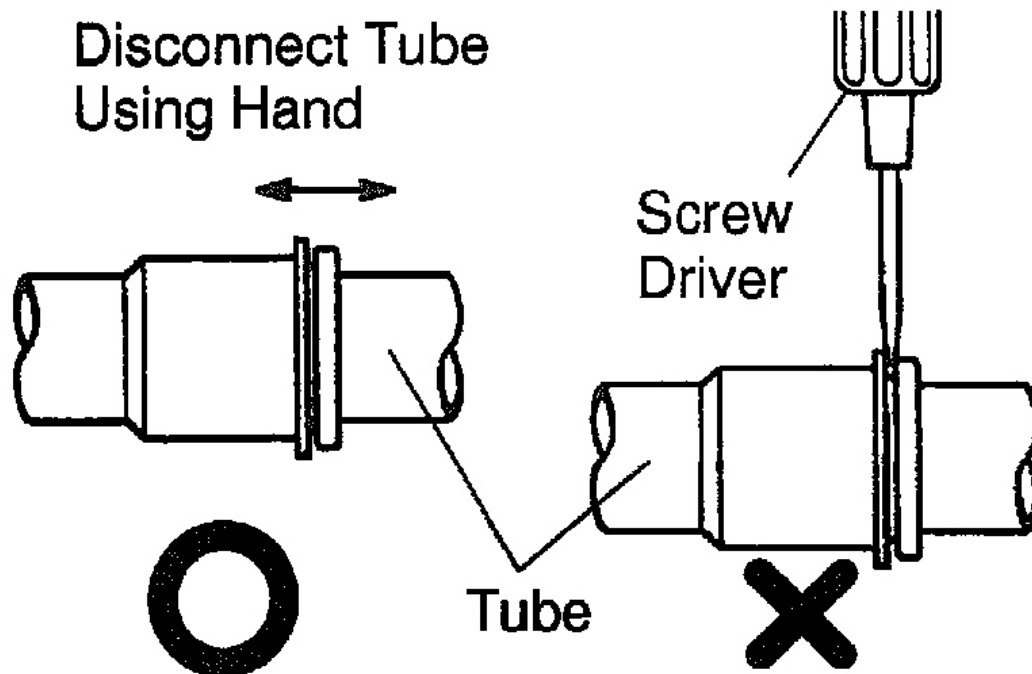
Fig. 45: Removing Clamp Lock

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Pull the SST slightly and push the release lever, then remove the piping clamp with SST.
 4. Remove the piping clamp from the SST.
- b. Disconnect both tubes.

NOTE:

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

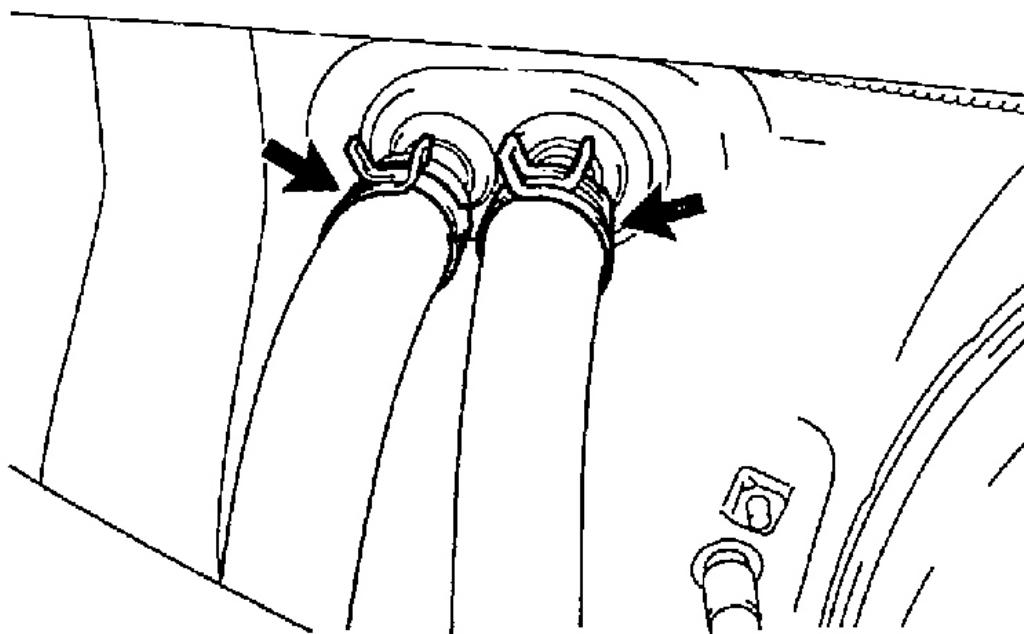


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Fig. 46: Displaying Tube Removal Do's & Don'ts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Disconnect Water Hoses From Heater Radiator Pipes

- a. Using pliers, grip the claw of the hose clip and slide the hose clip along the hose.
- b. Disconnect the 2 heater hoses.



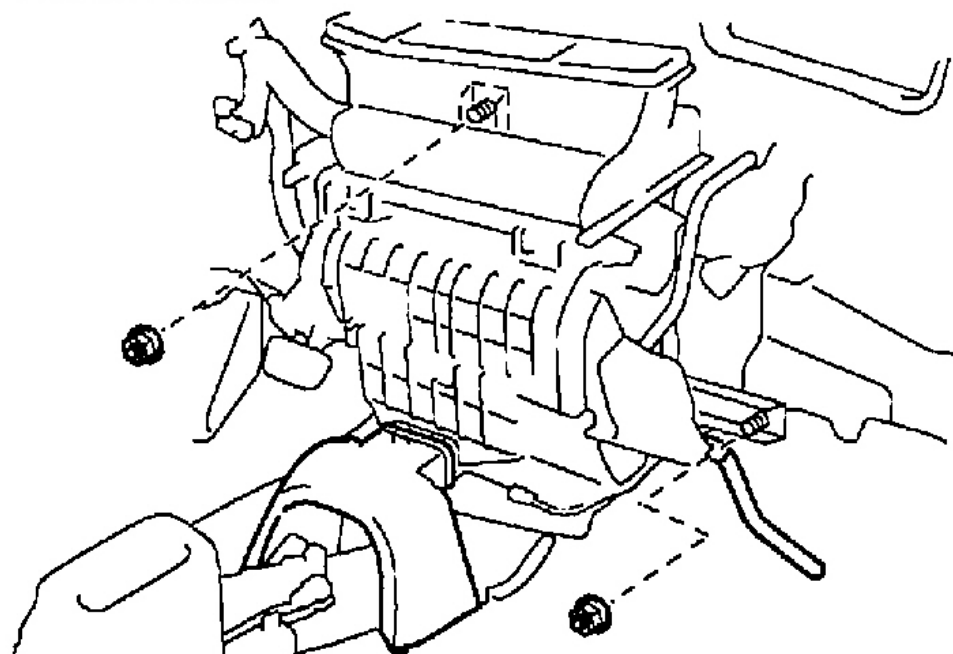
G01084460

Fig. 47: Disconnecting Water Hoses

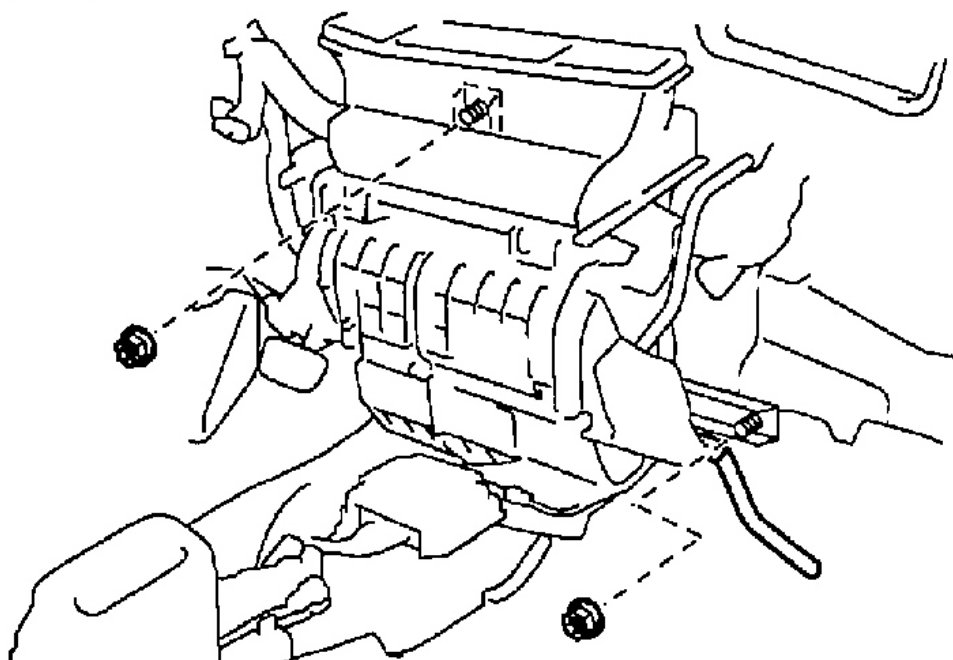
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **Remove Instrument Panel & Reinforcement** See REMOVAL .
6. **Remove Pipe Grommets**
7. **Remove Blower Unit** See REMOVAL .
8. **Remove A/C Unit**
 - a. If equipped with rear duct, remove the rear duct.
 - b. Remove the drain hose.
 - c. Remove the 2 nuts and A/C unit.

w/ Rear Duct



w/o Rear Duct



Y

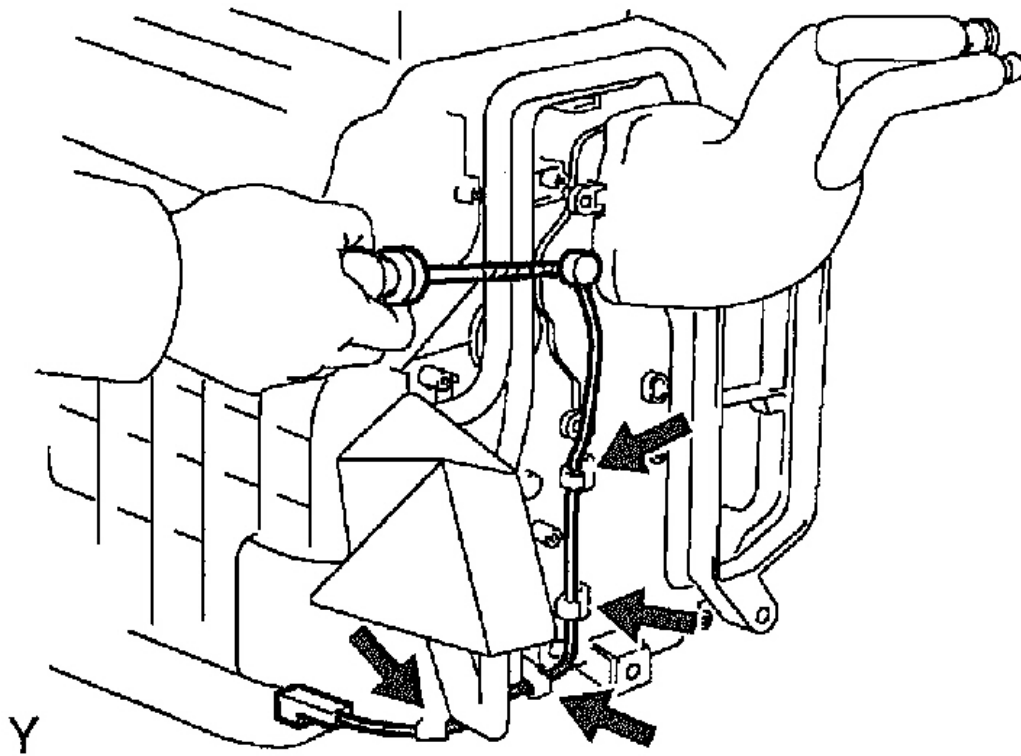
G01084461

Fig. 48: Identifying A/C Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. Remove Thermistor

- a. Disconnect the connector clamp.
- b. Release the 4 claws and remove the harness from the plate.



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Fig. 49: Locating & Removing Harness Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a screwdriver, pull out the thermistor from the A/C unit case.

NOTE: **Tape the screwdriver tip before use.**

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

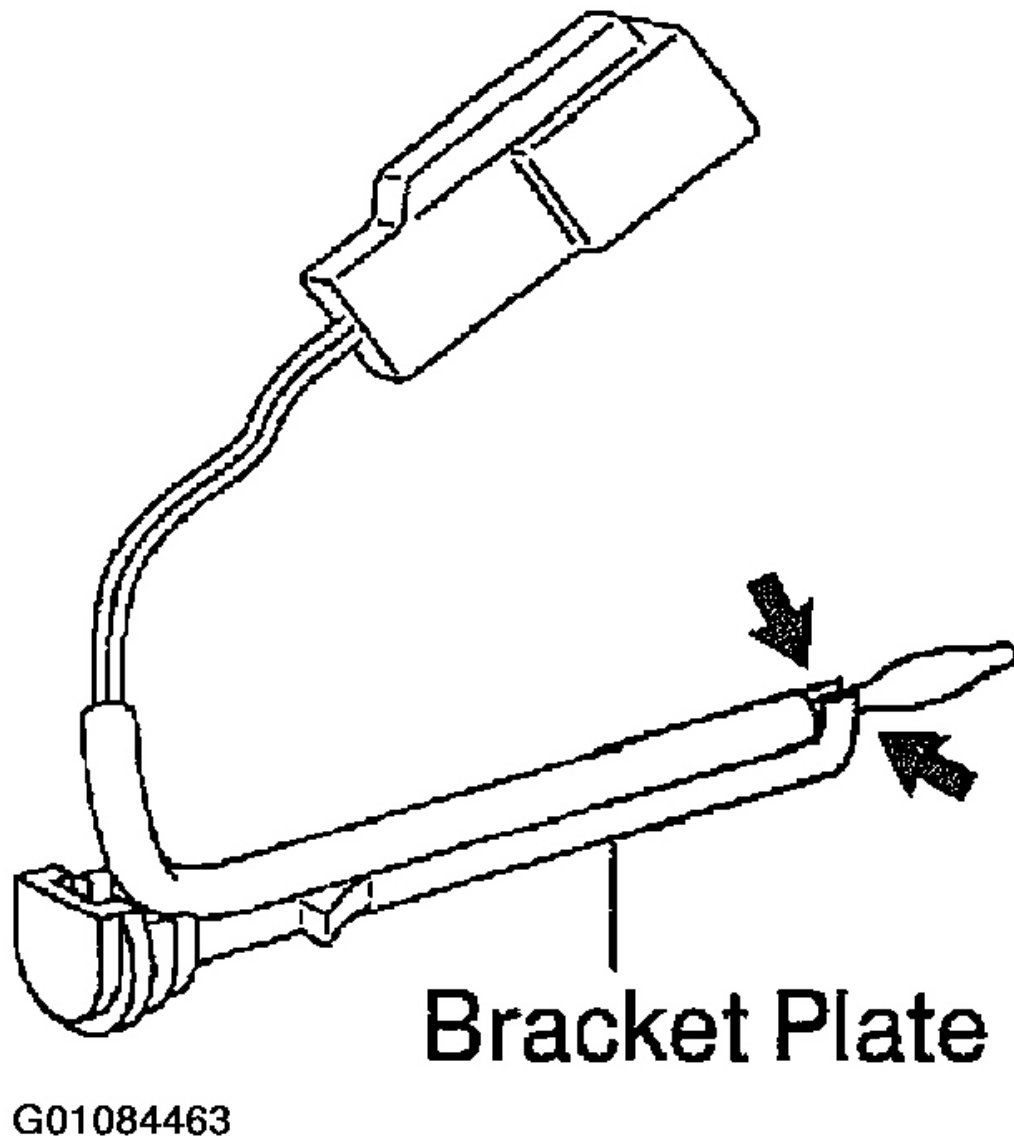
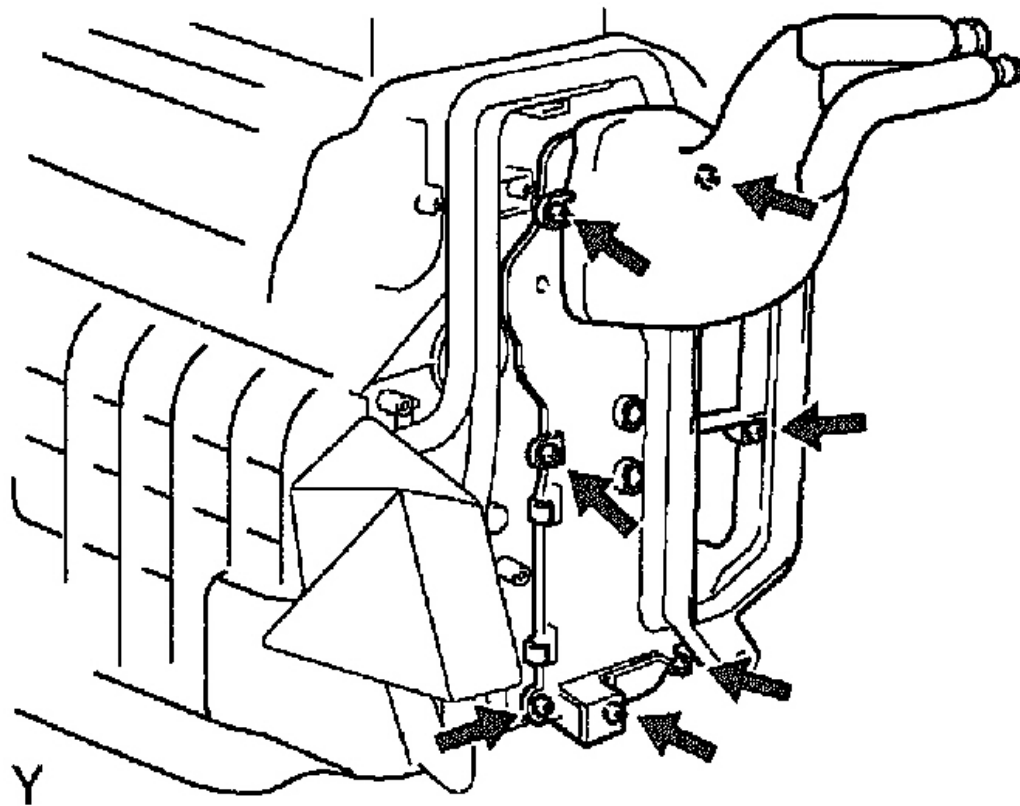


Fig. 50: Identifying Bracket Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Remove Evaporator**
 - a. Remove the 7 screws.

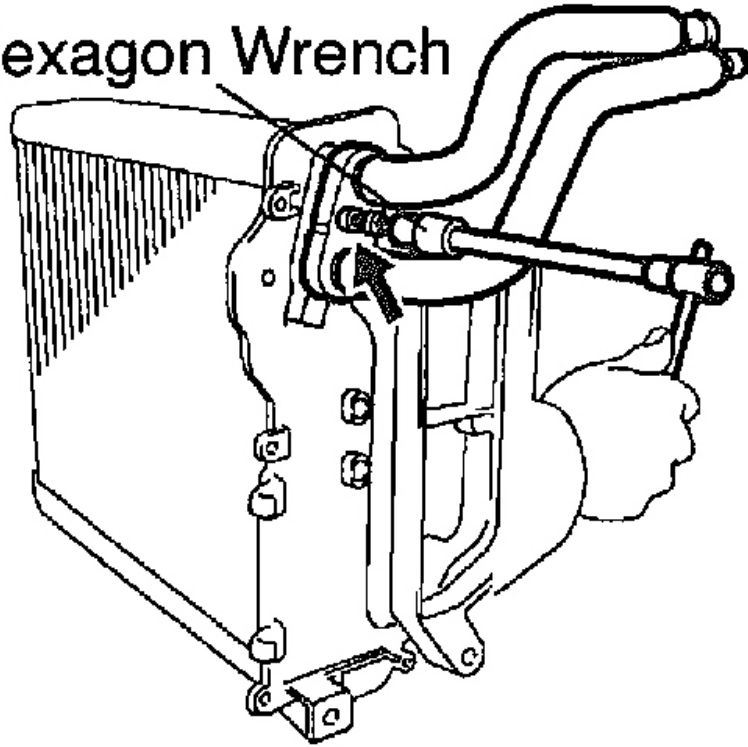


G01084464

Fig. 51: Locating Screws For Evaporator Removal
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Pull out the evaporator from the A/C unit case.
- c. Remove the packing.
- 3. **Remove Expansion Valve**
 - a. Remove the evaporator cover.
 - b. Using a 5 mm hexagon wrench, remove the 2 bolts, and separate the expansion valve and evaporator.

5 mm Hexagon Wrench



Y

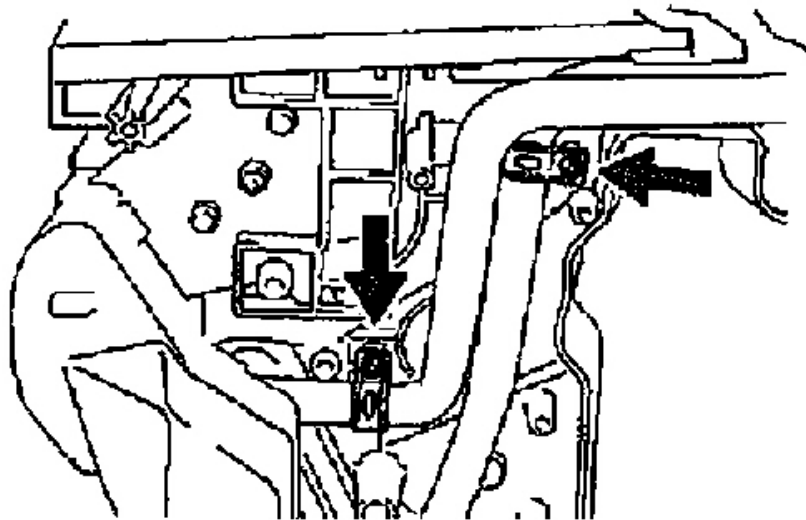
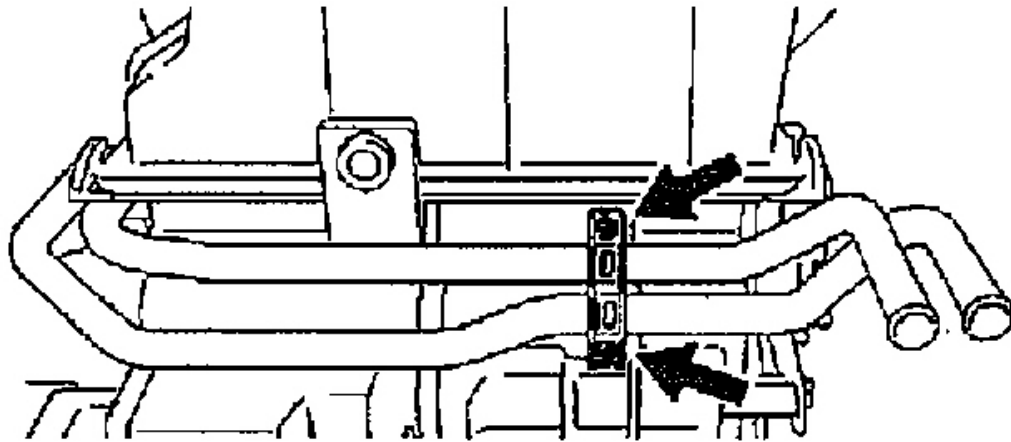
G01084465

Fig. 52: Removing Expansion Valve

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Remove Heater Radiator

- a. Remove the 4 screws and 3 clamps.
- b. Remove the passenger air duct subassembly.
- c. Pull out the heater radiator from the A/C unit case.



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Fig. 53: Removing Heater Radiator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. Inspect Evaporator

- Check evaporator fins for blockage.

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

NOTE: **Never use water to clean the evaporator.**

- b. Check fitting for cracks or scratches.

If necessary, repair or replace.

2. Inspect Heater Radiator

Inspect fins for blockage.

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

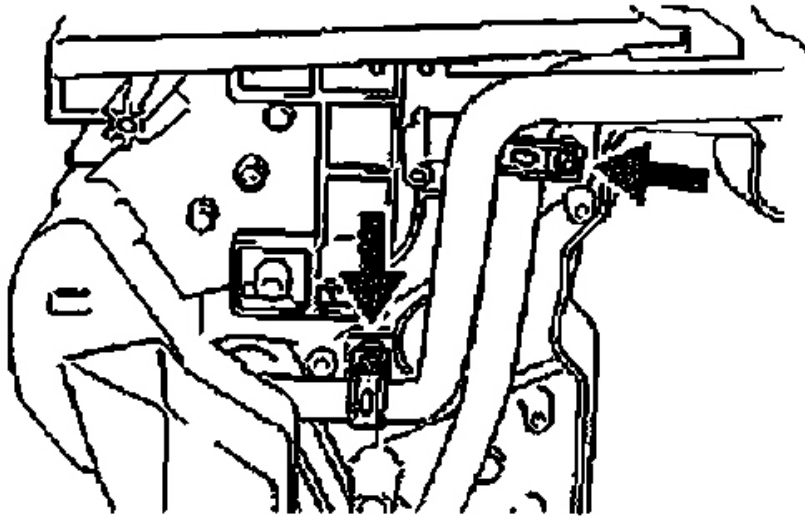
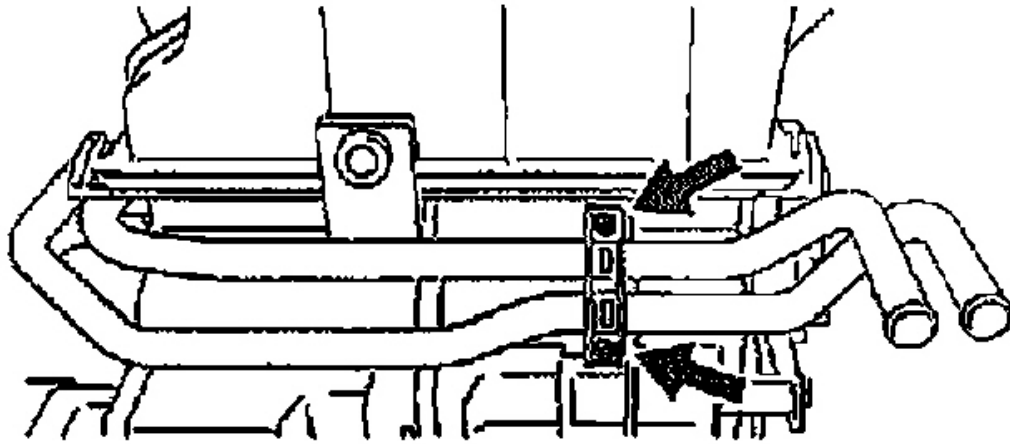
3. Inspect Thermistor See INSPECTION .

4. Inspect Expansion Valve See ON-VEHICLE INSPECTION .

REASSEMBLY

1. Install Heater Radiator

- a. Push into the heater radiator to the A/C unit case.
- b. Install the 4 screws and 3 clamps.
- c. Install the passenger air duct subassembly.



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Fig. 54: Installing Heater Radiator

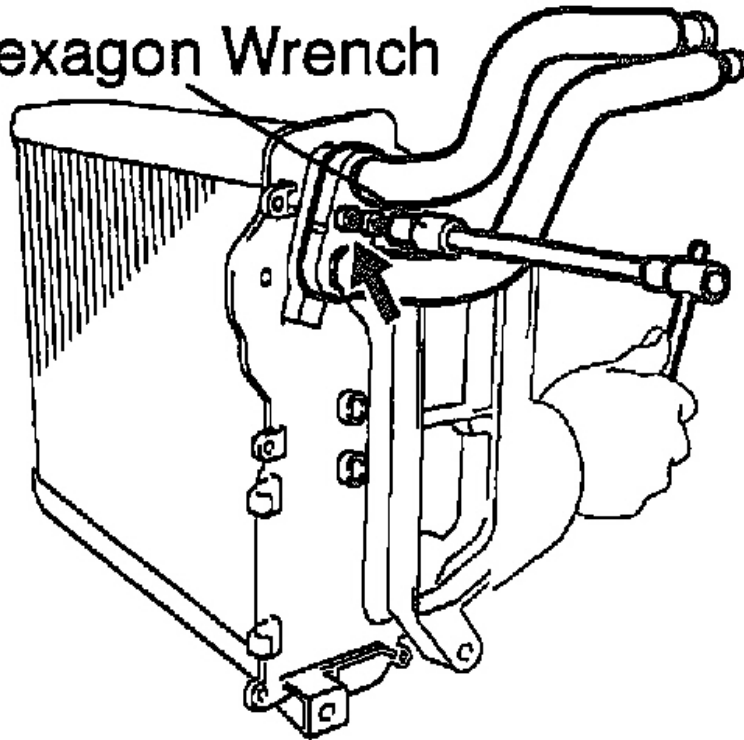
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Install Expansion Valve

- Coat 4 new O-rings with the compressor oil.
- Using a 5 mm hexagon wrench, install the expansion valve to the evaporator with the 2 bolts.

Torque: 3.5 N.m (36 kgf.cm, 31 in.lbf)

5 mm Hexagon Wrench



Y

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Fig. 55: Installing Expansion Valve

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

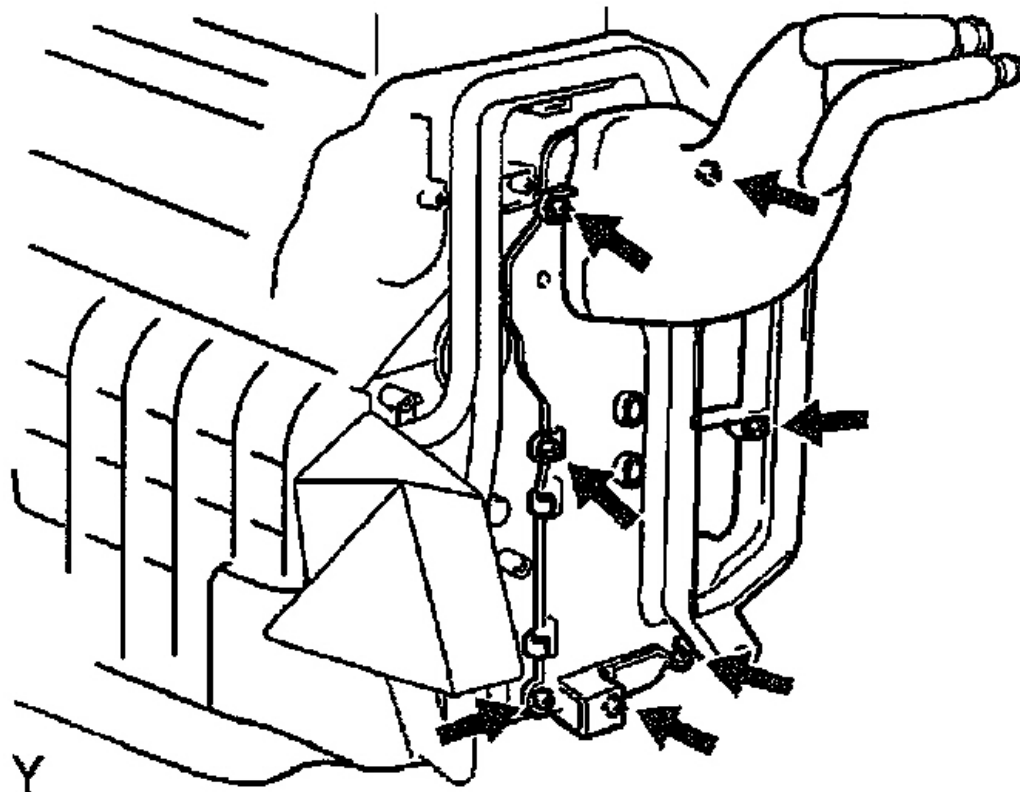
3. Install Evaporator

- a. Install the evaporator with the 7 screws.
- b. Wrap the packing.

If evaporator was replaced, add compressor oil to the compressor.

Add 40 cc (1.4 fl.oz.)

Compressor Oil: ND-OIL 8 or equivalent



G01084469

Fig. 56: Installing Evaporator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Install Thermistor

- a. Install the thermistor to the bracket plate as shown in the illustration.
- b. Push into the thermistor to the A/C unit case.
- c. Connect the connector clamp.

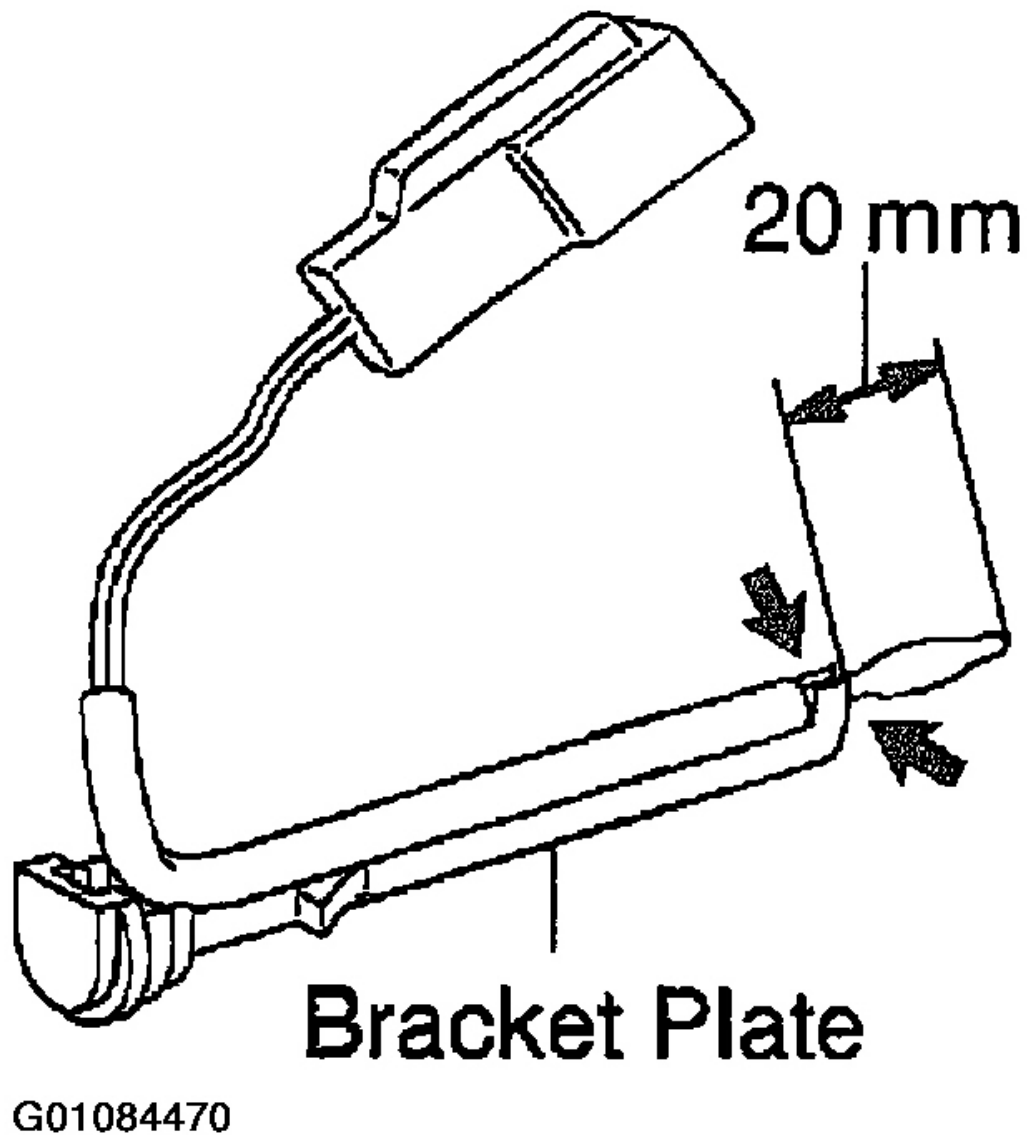
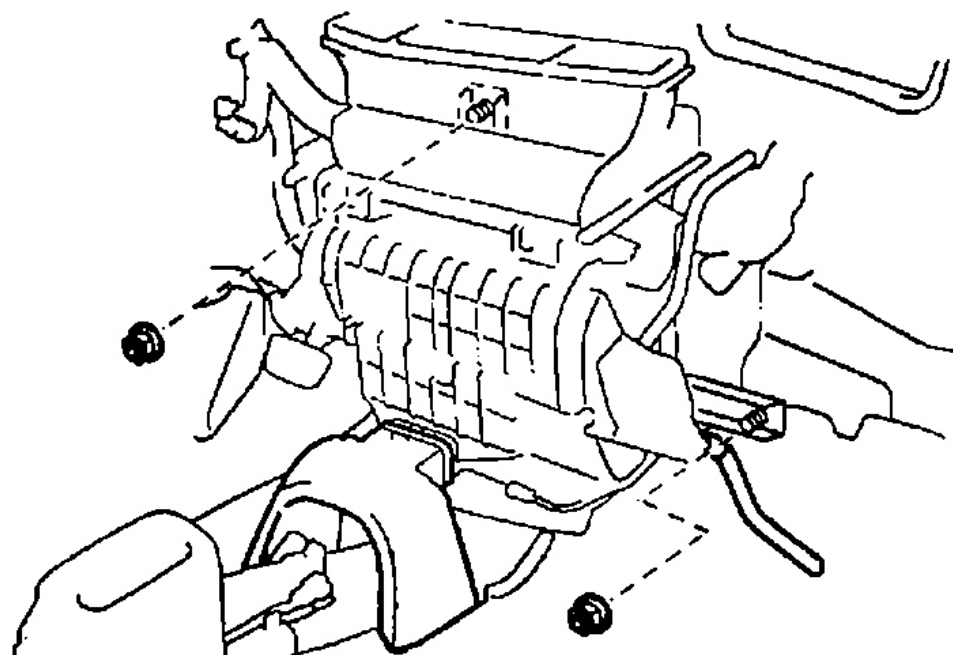


Fig. 57: Installing Thermistor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

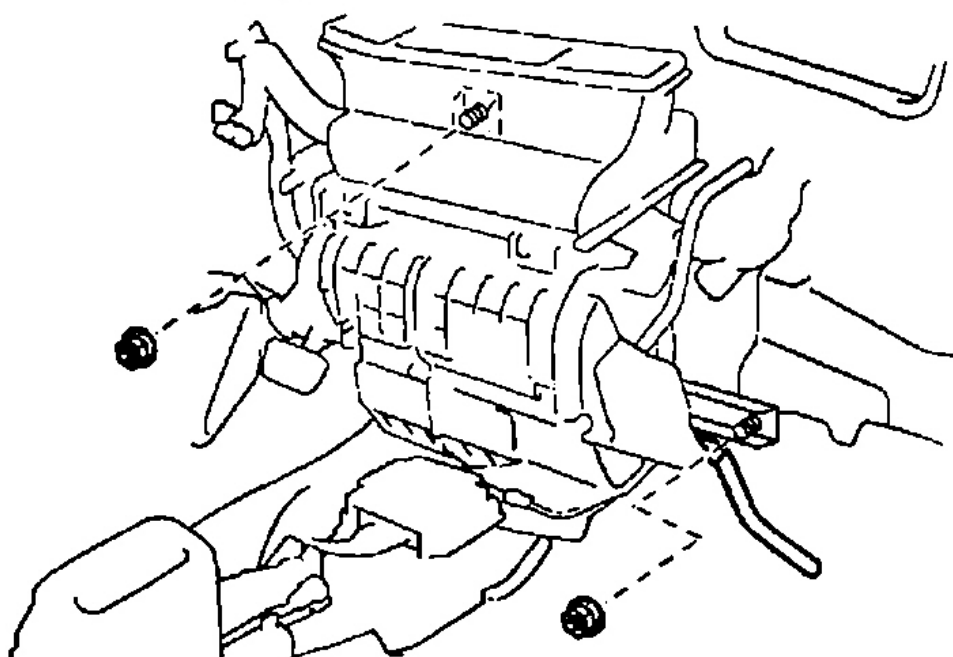
INSTALLATION

1. **Install A/C Unit**
 - a. Install the A/C unit with the 2 nuts.

w/ Rear Duct



w/o Rear Duct



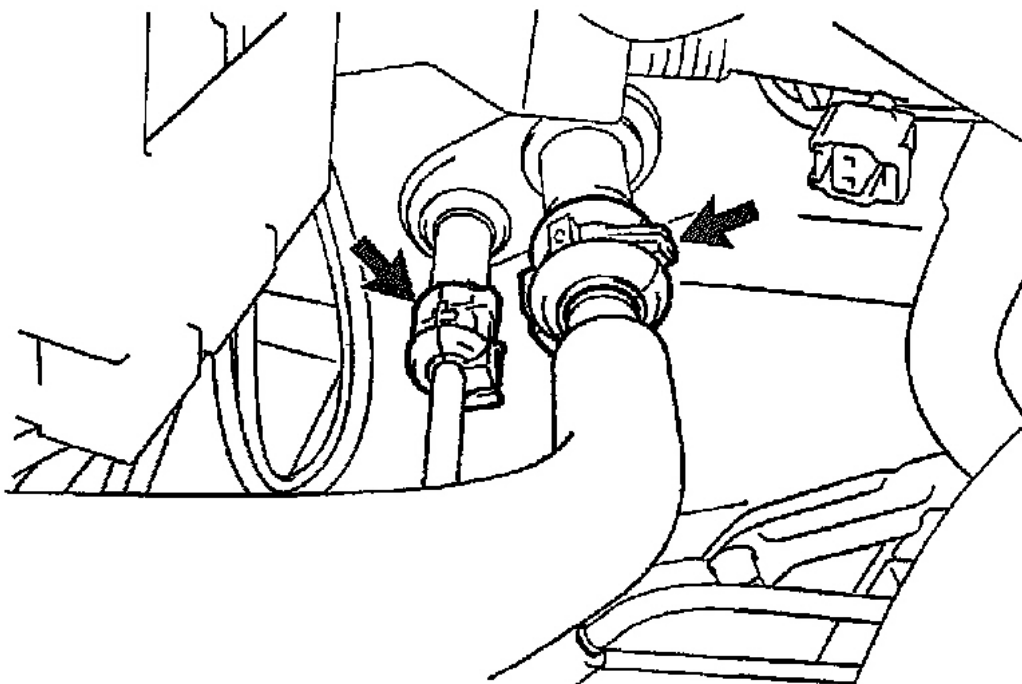
Y

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Fig. 58: Installing A/C Unit

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. With rear duct, install the rear duct.
 - c. Install the drain hose.
2. **Install Blower Unit** See INSTALLATION .
3. **Install Pipe Grommets**
4. **Install Instrument Panel & Reinforcement** See INSTALLATION .
5. **Connect Liquid Tube & Suction Tube**
 - a. Connect both tubes.
 - b. Install the 2 piping clamps.



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Fig. 59: Connecting Liquid Tube & Suction Tube

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

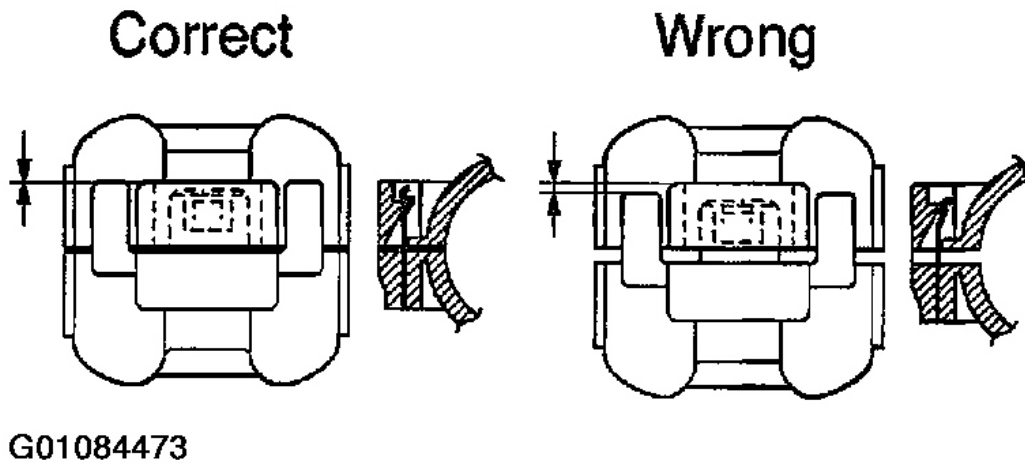
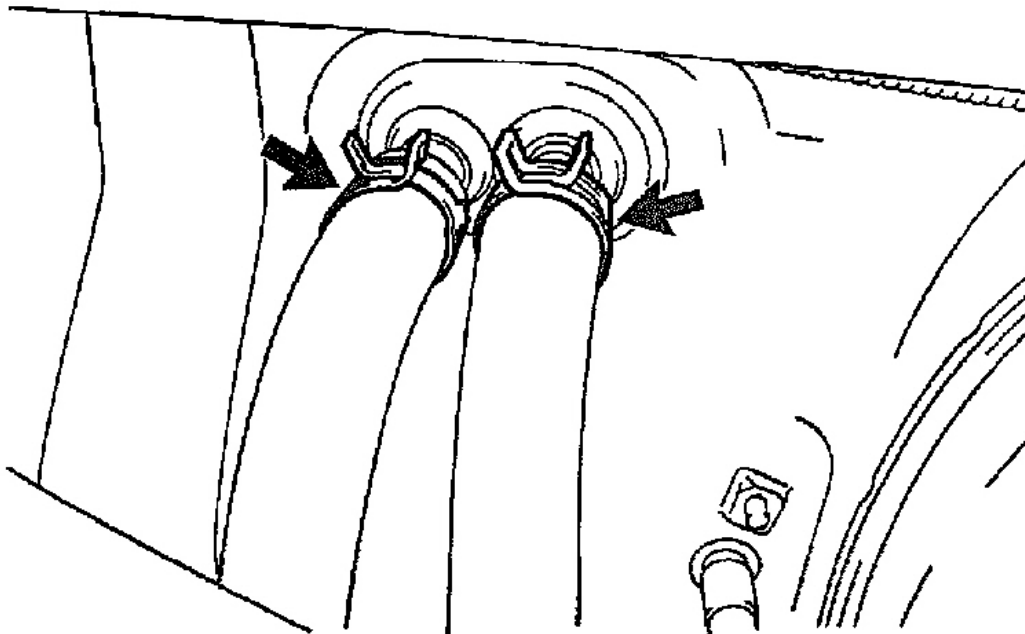


Fig. 60: Checking Claw Fitting
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. Connect Water Hoses To Heater Radiator Pipe

- a. Connect the 2 heater hoses.
- b. Push the water hose onto the heater radiator pipe as further as the grommet.



G01084474

Fig. 61: Connecting Heater Hoses

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the hose clip in a position, as shown in **Fig. 62** .

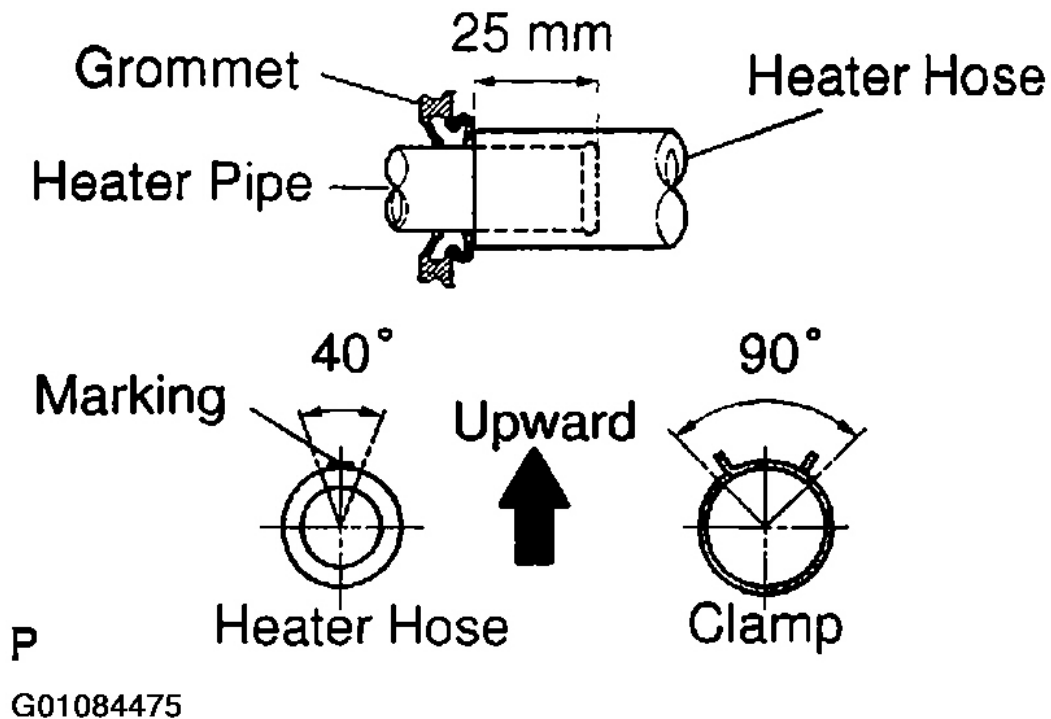


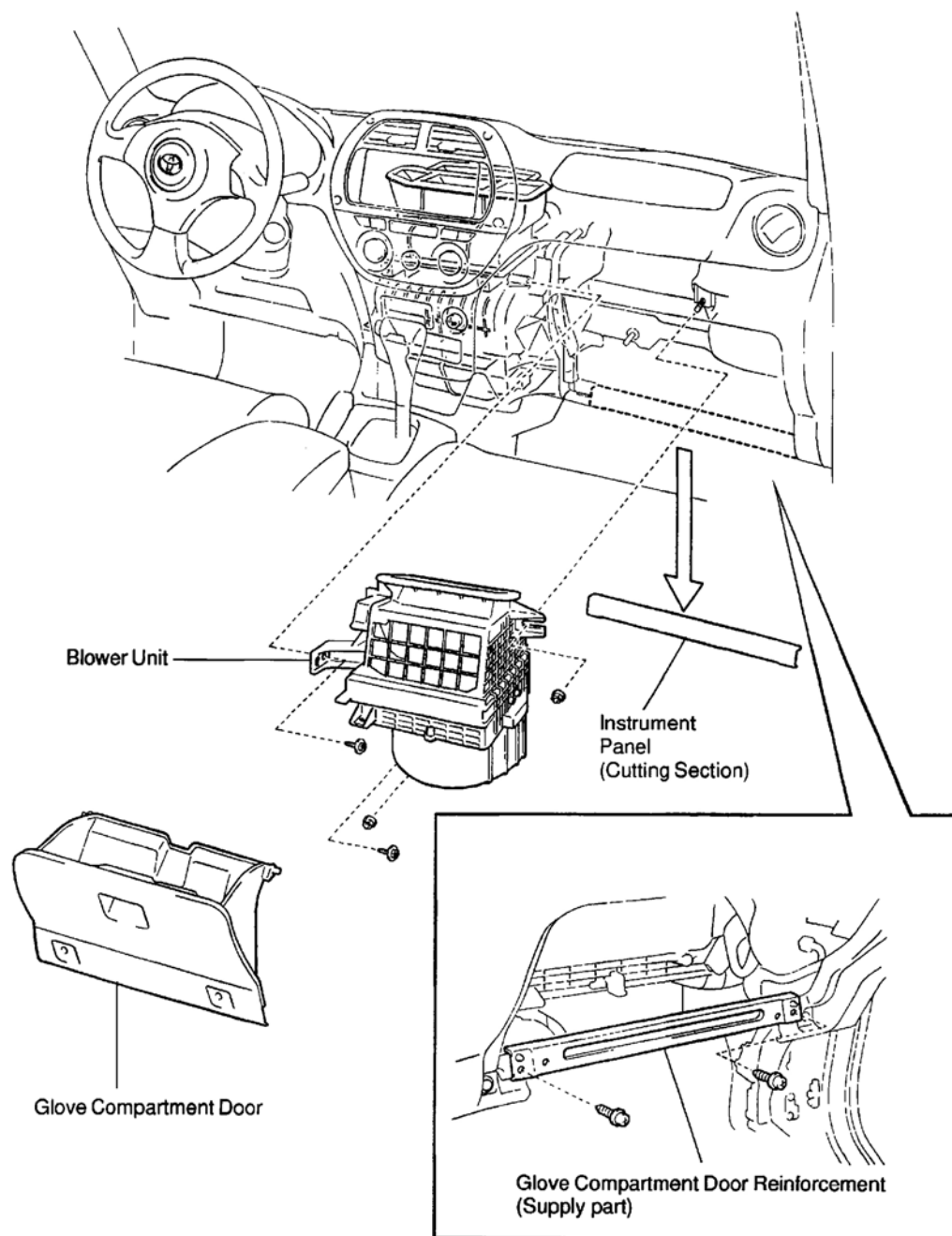
Fig. 62: Installing Hose Clip

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using pliers, grip the claw of the hose clip and slide the hose clip.
7. **Fill With Engine Coolant** See **REPLACEMENT** .
8. **Charge Refrigerant To Refrigeration System**
 - a. Evacuate air from refrigeration system.
 - b. Charge system with refrigerant and inspect for leakage of refrigerant.
Specified Amount: 500 +/- 50 g (17.64 +/- 1.76 oz.)

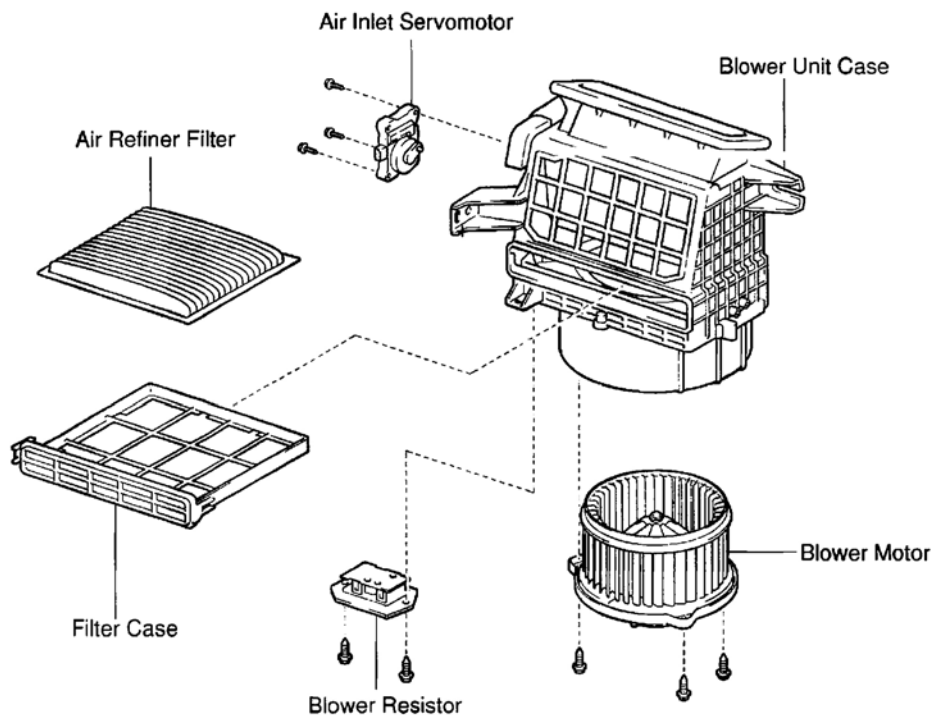
BLOWER UNIT

COMPONENTS



P
G01084476

Fig. 63: Displaying Blower Unit Components (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



P

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Fig. 64: Displaying Blower Unit Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

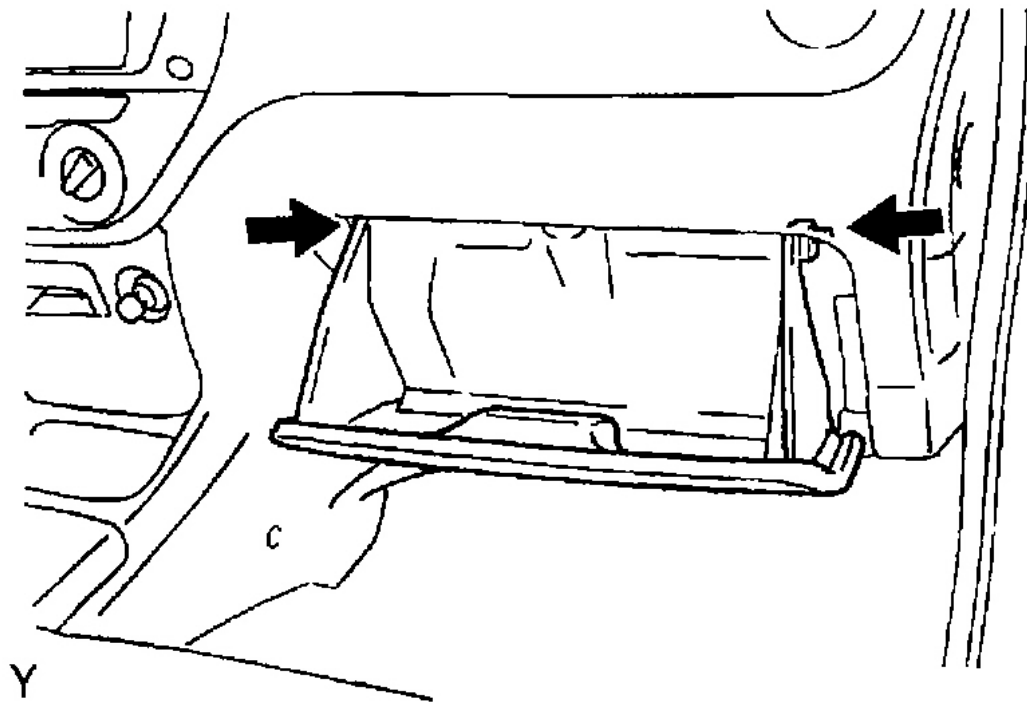
REMOVAL

1. Remove Glove Compartment Door

- a. Disconnect the glove compartment door.

Push both side inward one after another and pull out the glove compartment door.

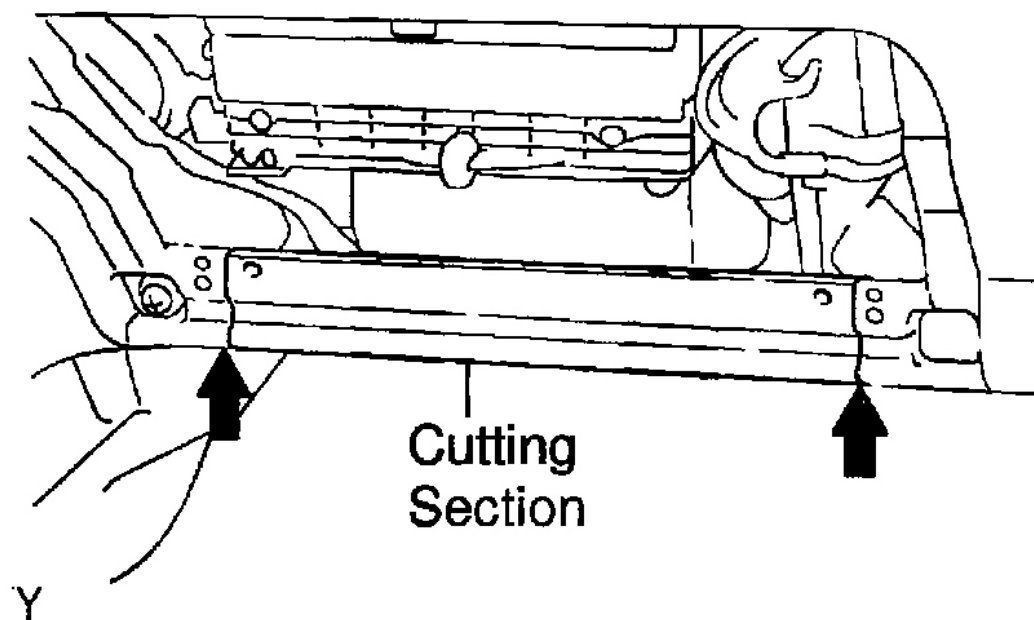
- b. Remove the 2 screws and glove compartment door.



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Fig. 65: Removing Glove Compartment Door
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

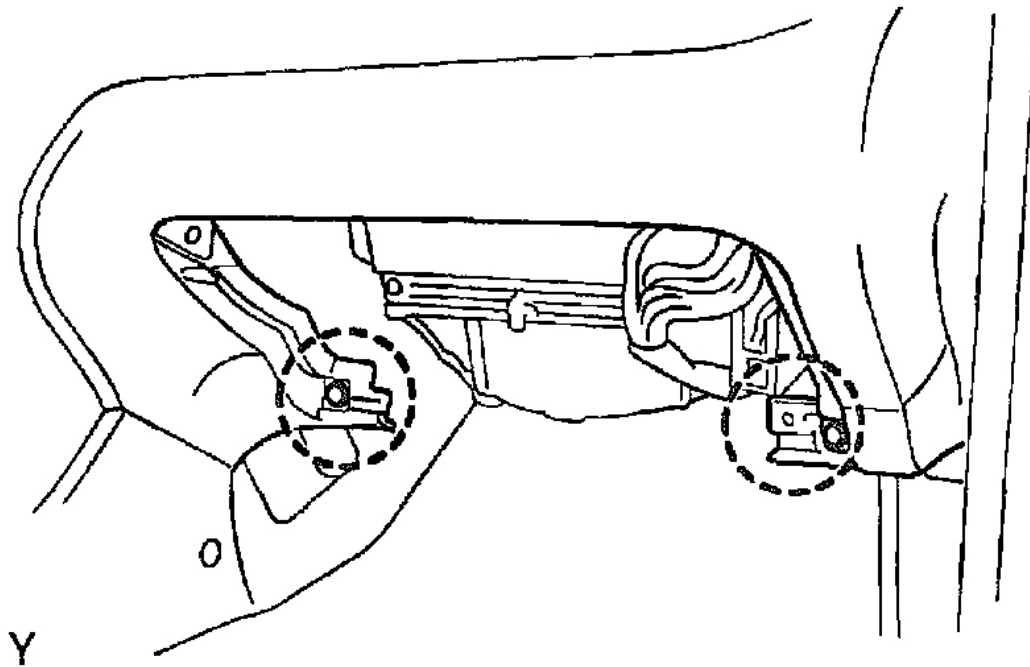
- c. Cut out the instrument panel as shown in **Fig. 66** .



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Fig. 66: Locating Instrument Panel Cutting Section
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: After cut out the instrument panel, file the cutting face and smooth the surface.



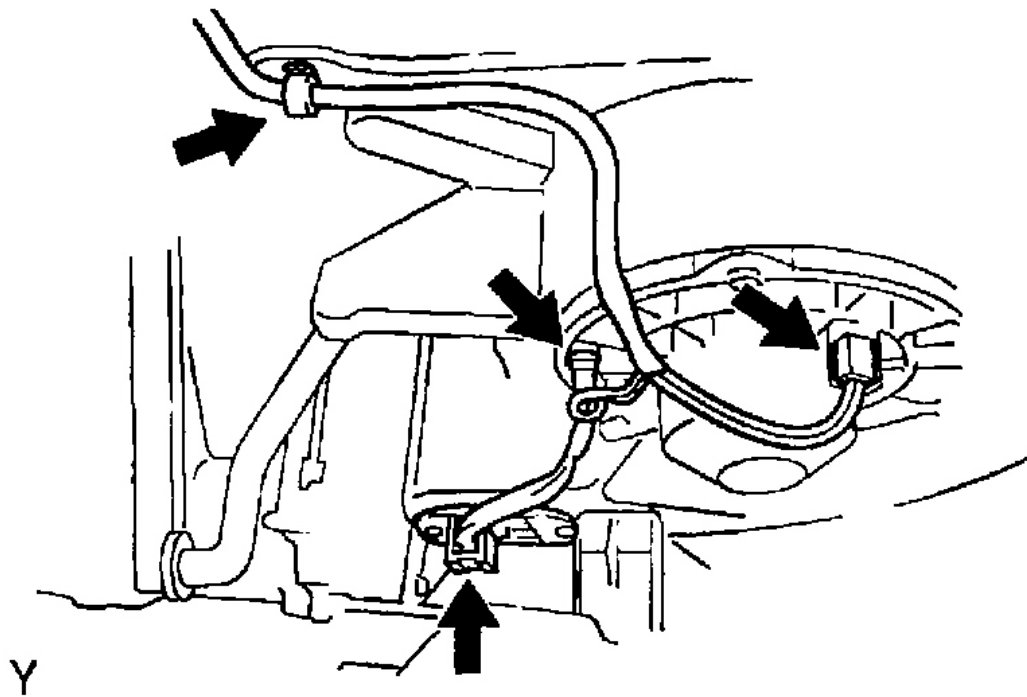
G01084480

Fig. 67: Identifying Cut Out Surface

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove Blower Unit

- a. Disconnect the blower resistor, blower motor connectors and harness clamps to the blower unit.
- b. Disconnect the air inlet servomotor connector.



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G01084481

Fig. 68: Locating Clamps

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 2 screws, 2 nuts and blower unit.

Y

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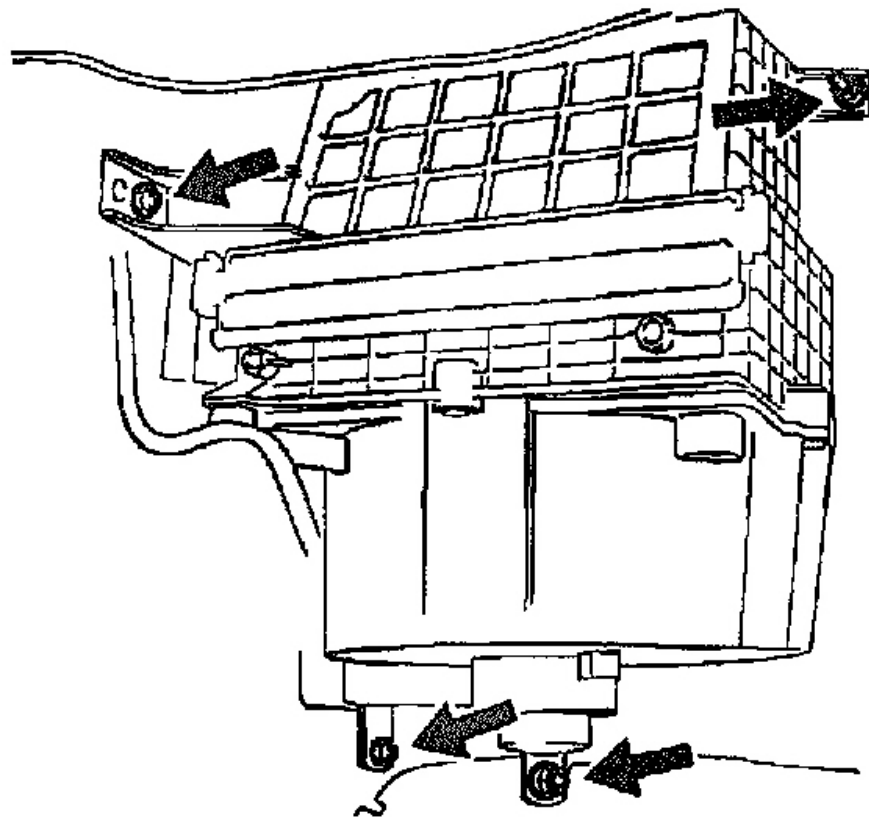
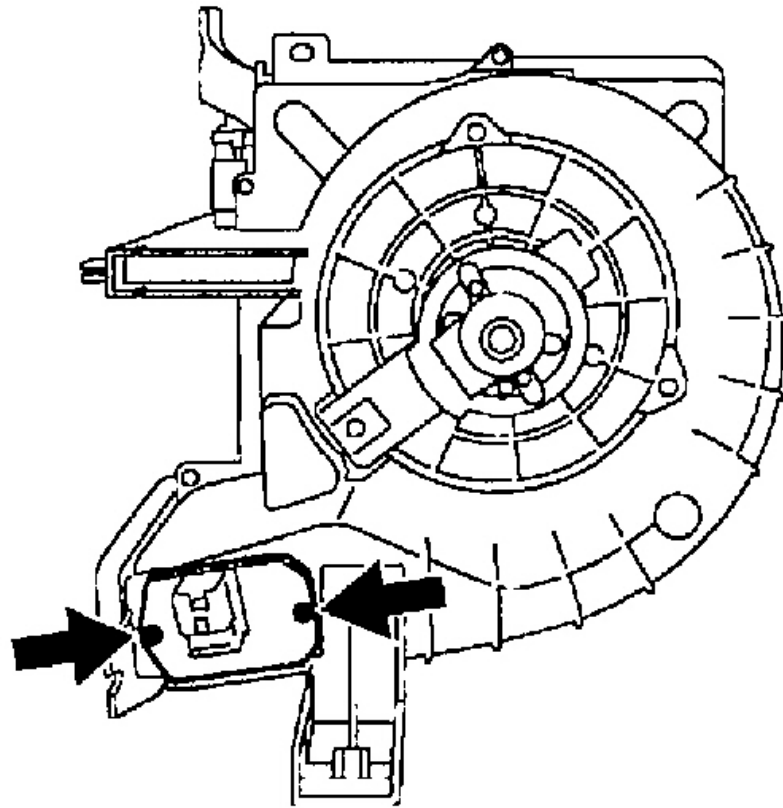


Fig. 69: Removing Blower Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. Remove Blower Resistor

Remove the 2 screws and blower resistor.



Y

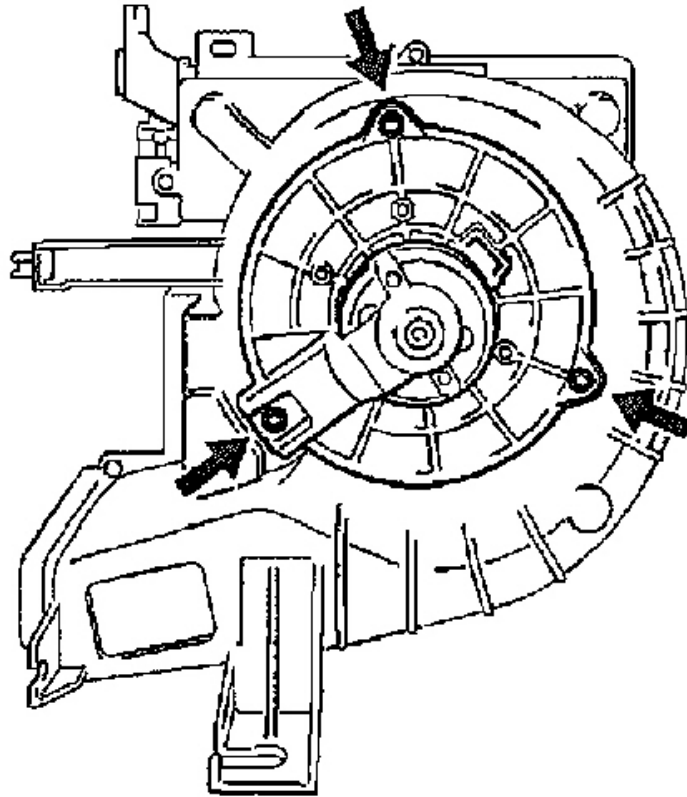
G01084483

Fig. 70: Locating & Removing Blower Resistor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Inspect Blower Resistor** See INSPECTION .
3. **Remove Air Refiner Filter**
 - a. Pull out the filter cover.
 - b. Remove the filter from the frame.
4. **Remove Blower Motor**

Using a torx wrench, remove the 3 screws and blower motor.

5. **Inspect Blower Motor** See INSPECTION .



Y

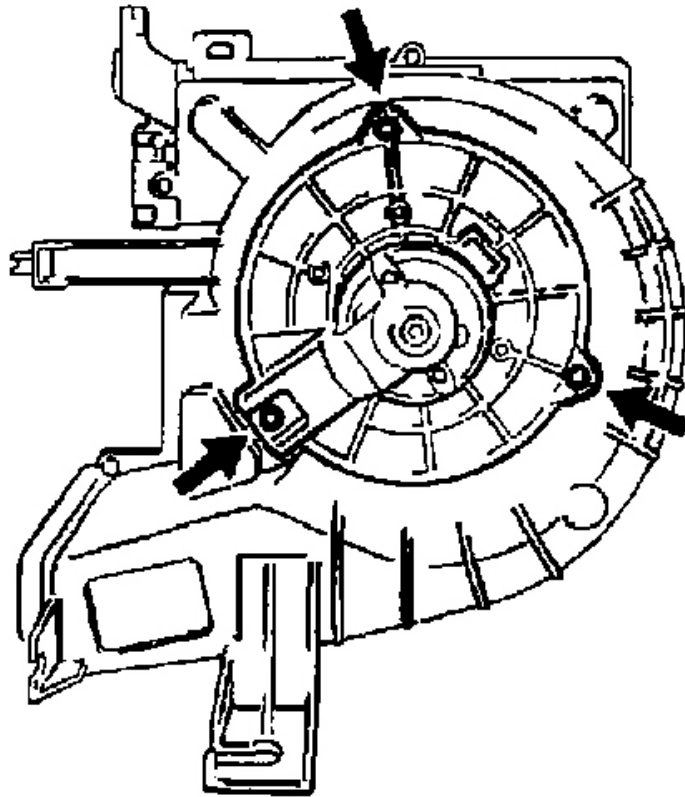
G01084484

Fig. 71: Identifying & Removing Blower Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. Install Blower Motor

Using a torx wrench, install the blower motor with the 3 screws.



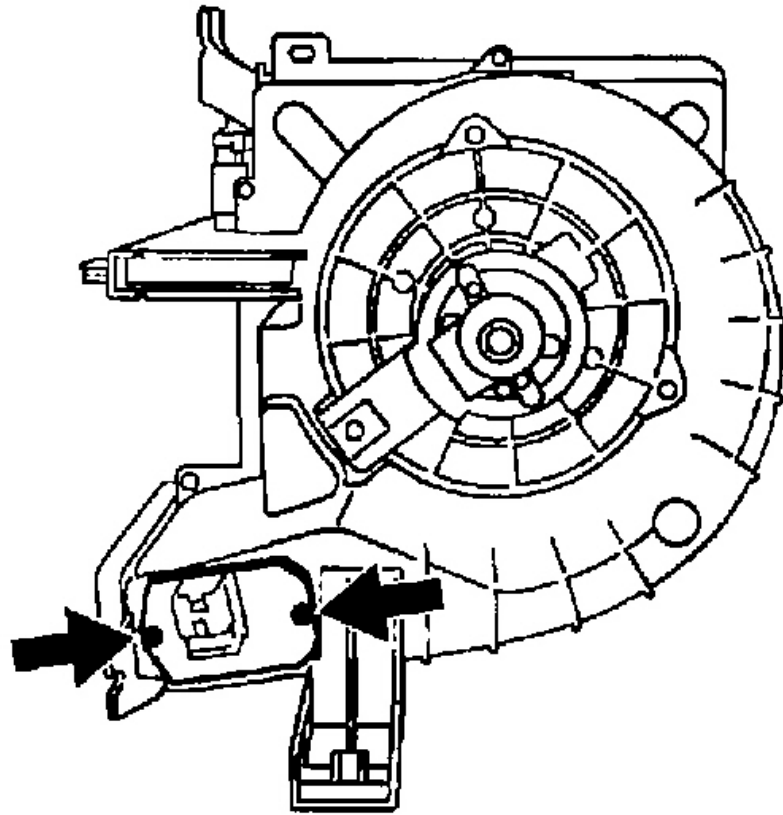
Y

G01084485

Fig. 72: Installing Blower Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Install Air Refiner Filter**
 - a. Install the filter to the frame.
 - b. Push into the filter cover.
3. **Install Blower Resistor**

Install the blower resistor with the 2 screws.



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Fig. 73: Installing Blower Resistor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **Install Blower Unit**
 - a. Install the blower unit with the 2 screws and 2 nuts.

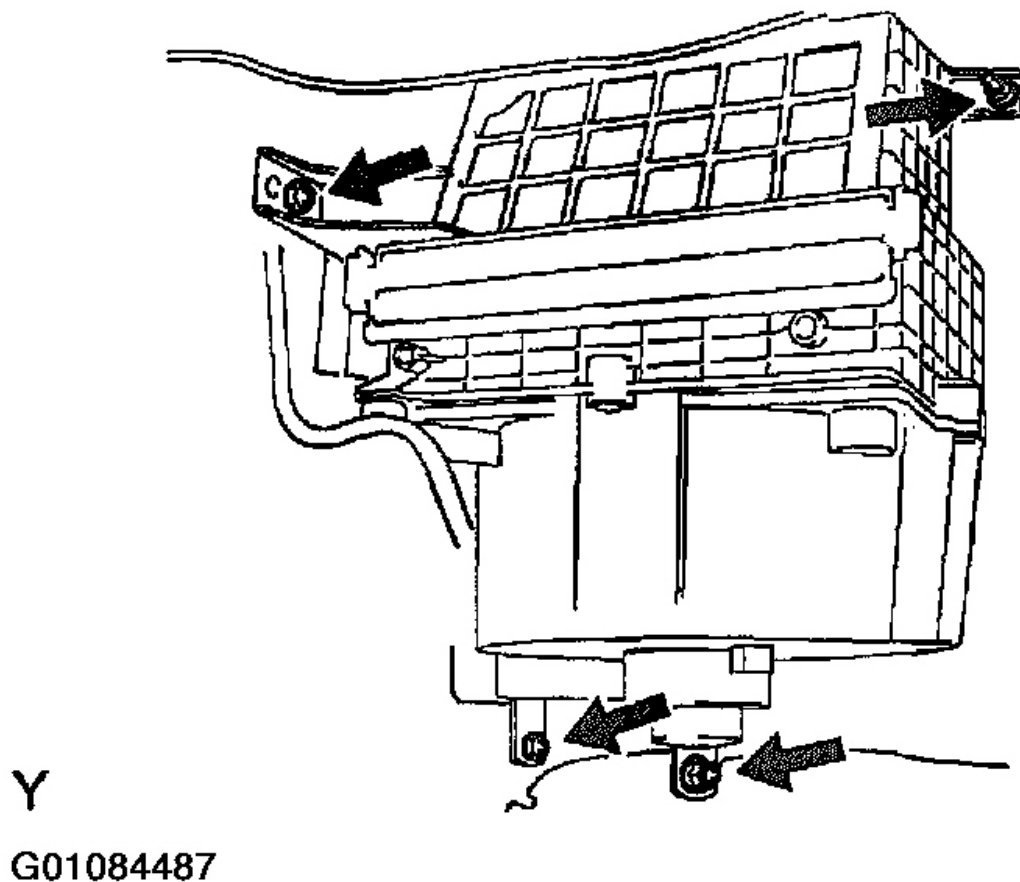
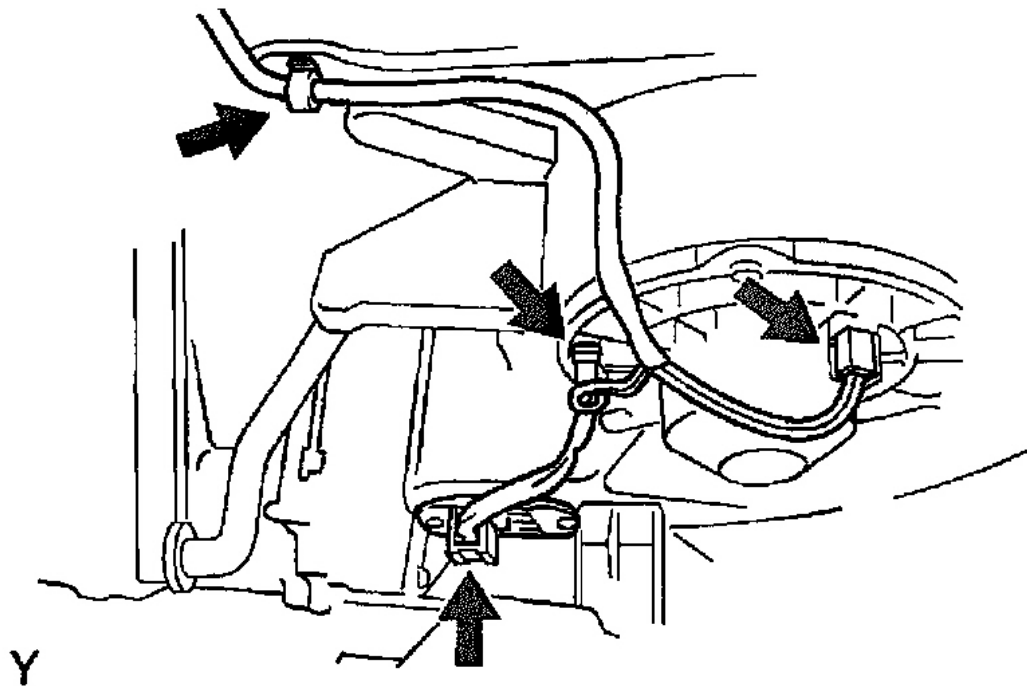


Fig. 74: Installing Blower Unit

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

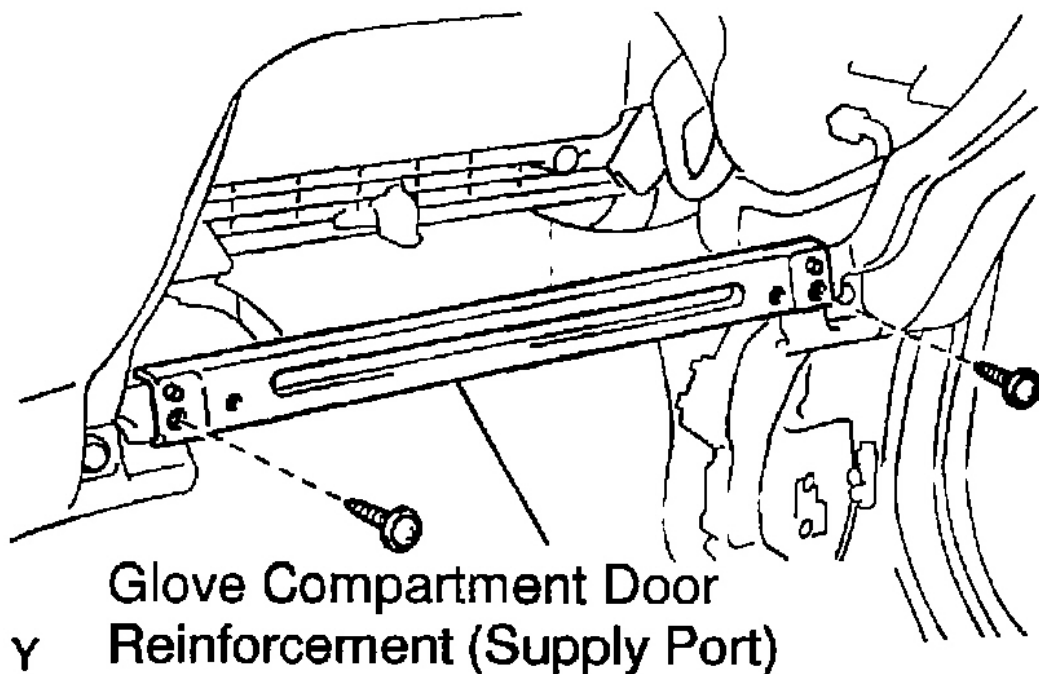
- b. Connect the blower resistor, blower motor connectors and harness clamps to the blower unit.
- c. Connect the air inlet servomotor connector.



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Fig. 75: Connecting Air Inlet Servomotor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the glove compartment door reinforcement (supply part) with the 2 screws.
- 2. Install Glove Compartment Door**



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Fig. 76: Installing Glove Compartment Door Reinforcement
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPRESSOR & MAGNETIC CLUTCH

ON-VEHICLE INSPECTION

1. 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.

2. Inspect Refrigerant Pressure See ON-VEHICLE INSPECTION .

3. Inspect Visually For Leakage Of Refrigerant

Using a gas leak detector, check for leakage of refrigerant. If there is any leakage, replace the compressor assembly.

4. Inspect Compressor Lock Sensor Resistance

- a. Disconnect the connector.
- b. Using an ohmmeter, measure the resistance between the terminals 1 and 2.

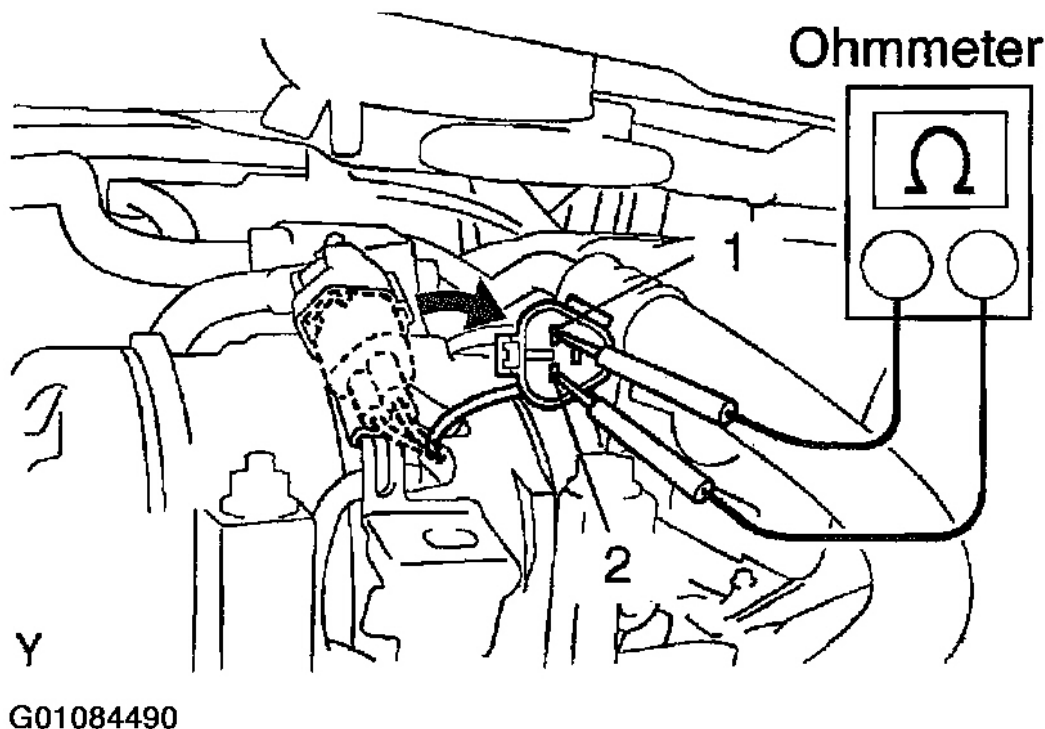


Fig. 77: Inspecting Compressor Lock Sensor Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance: 165-205 ohms at 20°C (68°F)

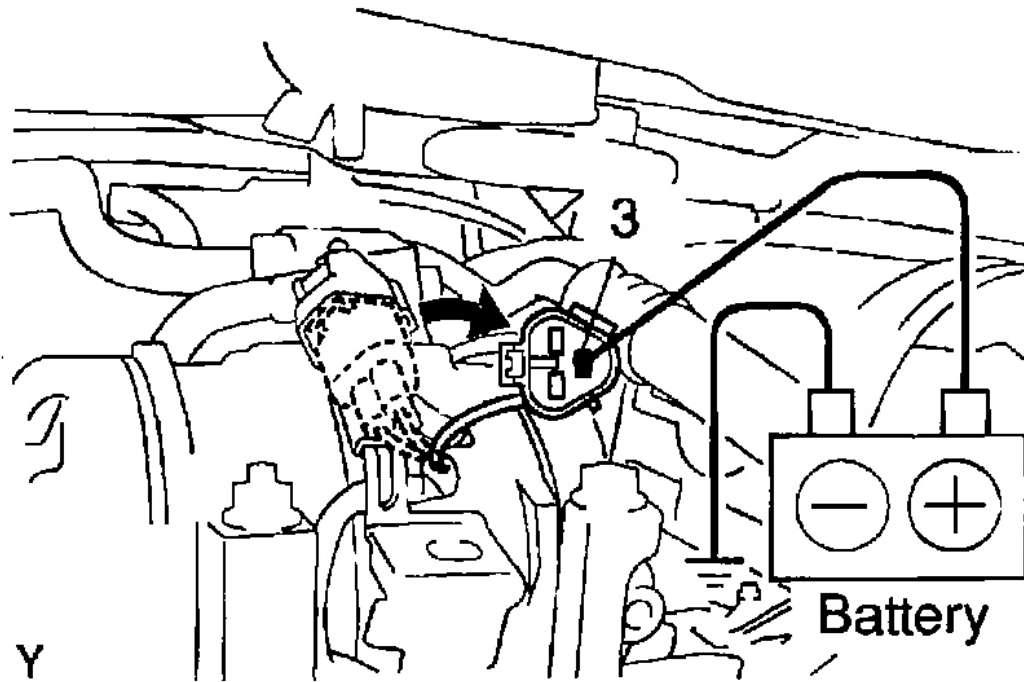
If resistance is not as specified, replace the sensor.

5. **Check For Leakage Of Grease From Clutch Bearing**
6. **Check For Signs Of Oil On Pressure Plate Or Rotor**
7. **Inspect Magnetic Clutch Bearing For Noise**
 - a. Start the 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.

8. **Inspect magnetic clutch operation .**

- a. Disconnect the connector.
- b. Connect the positive (+) lead from the battery to the terminal 3 and negative (-) lead to the body ground.
- c. Check that the magnetic clutch energized.

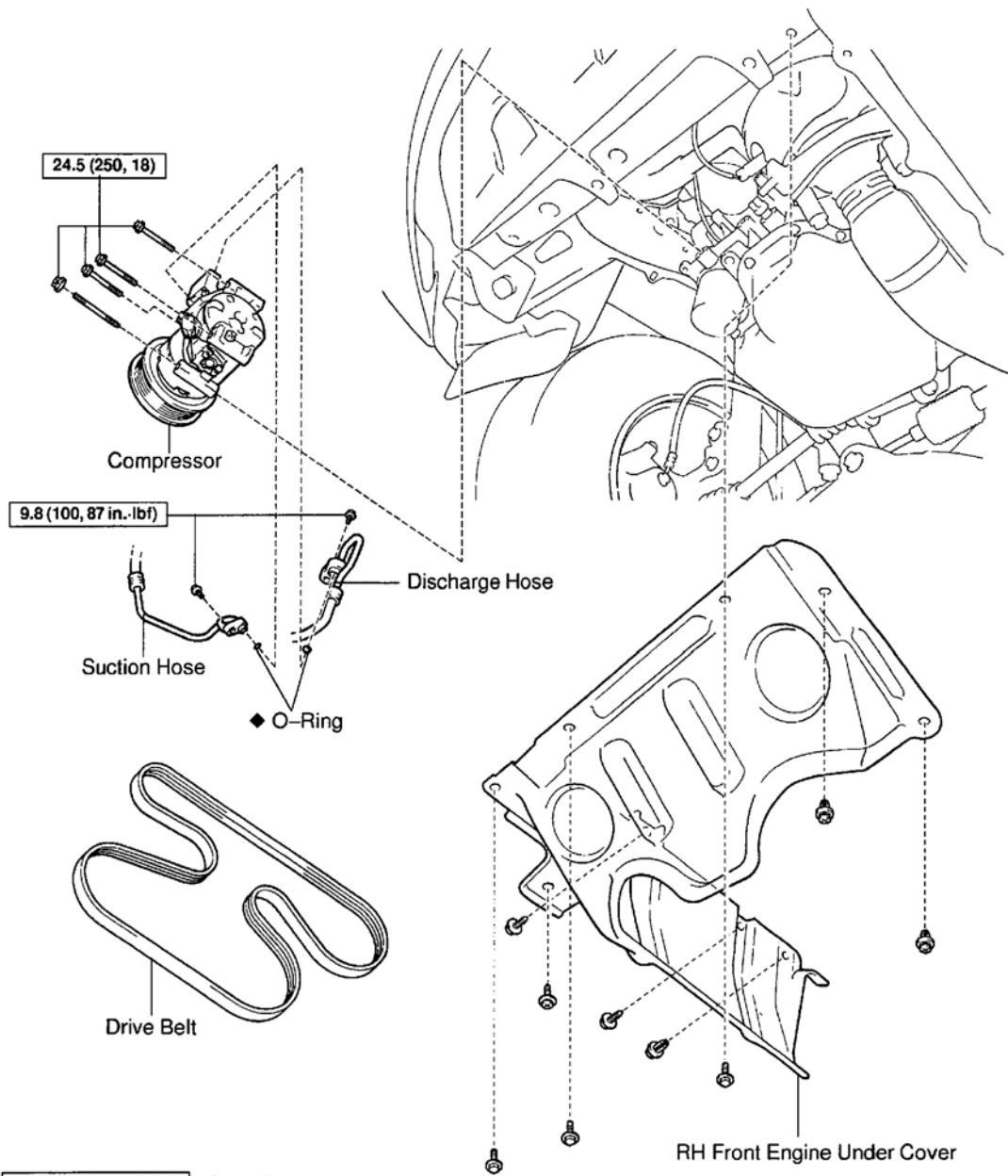


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Fig. 78: Inspecting Magnetic Clutch Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

COMPONENTS

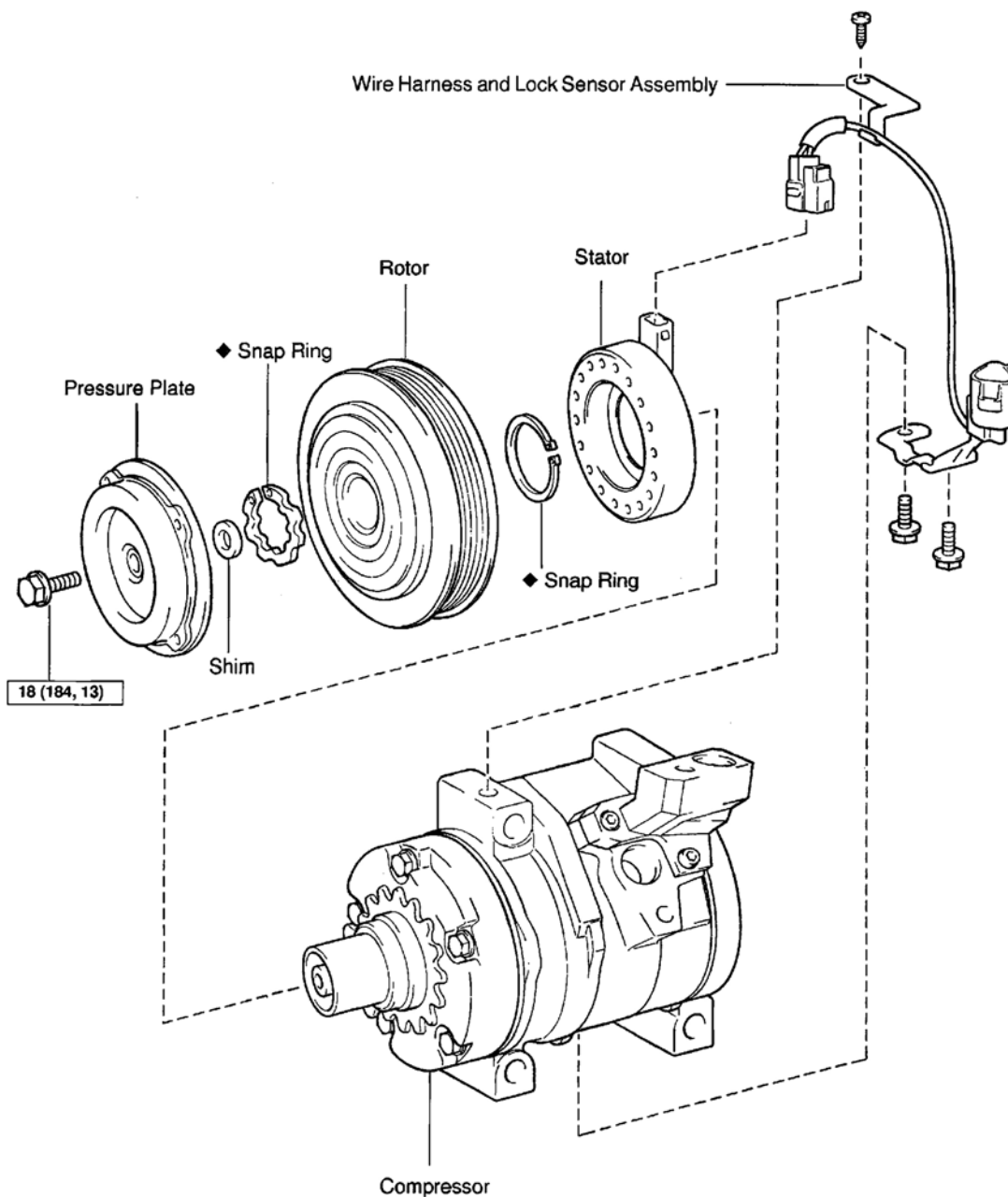


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

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Fig. 79: Displaying Compressor & Magnetic Clutch Components (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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

P ◆ Non-reusable part

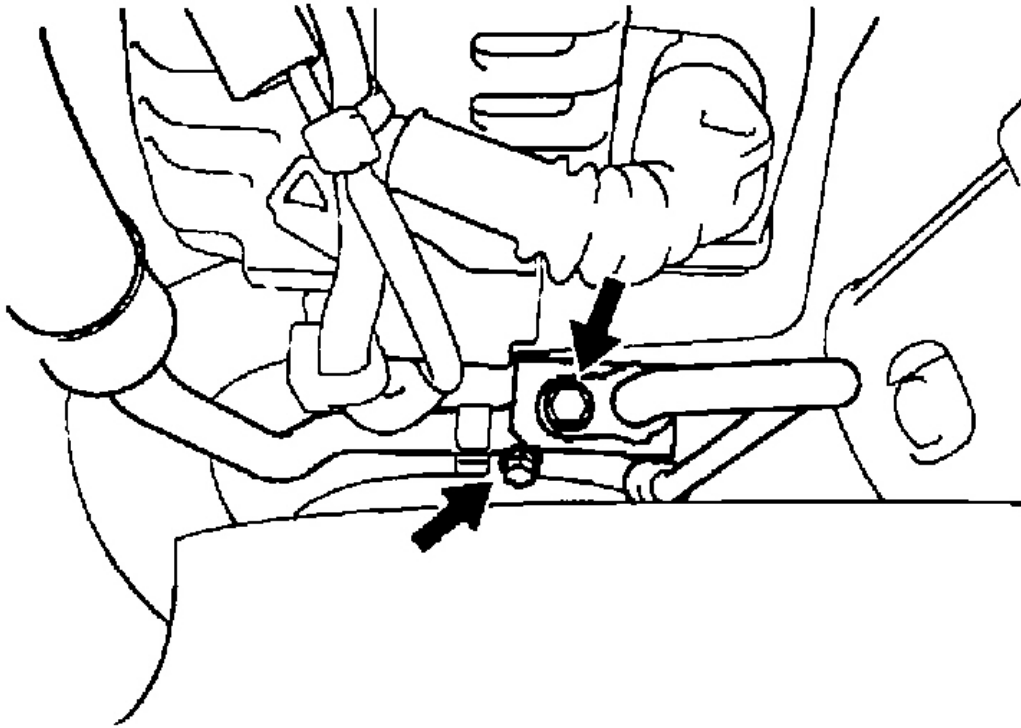
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Fig. 80: Displaying Compressor & Magnetic Clutch Components (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 RH Front Engine Under Cover**
6. **Remove Drive Belt See REPLACEMENT .**
7. **Disconnect Discharge & Suction Hoses**



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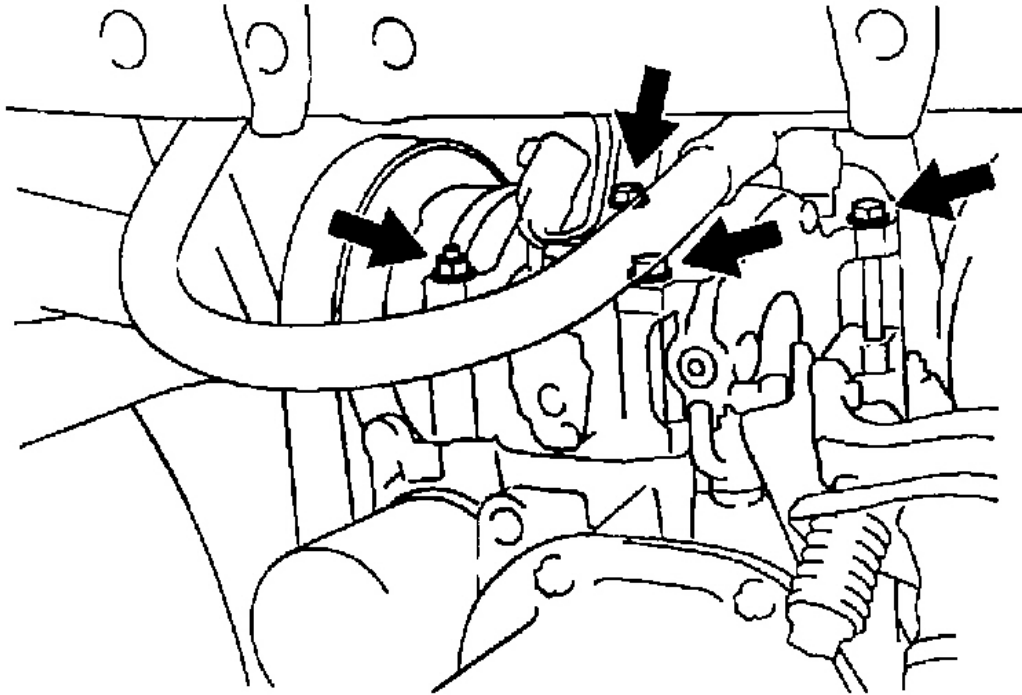
Fig. 81: Disconnecting Discharge & Suction Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Remove the 2 bolts and disconnect both hoses.

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

8. **Remove Compressor**
 - a. Disconnect the connector.

- b. Remove the 3 bolts, nut, stud bolt and compressor.



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Fig. 82: Removing Compressor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

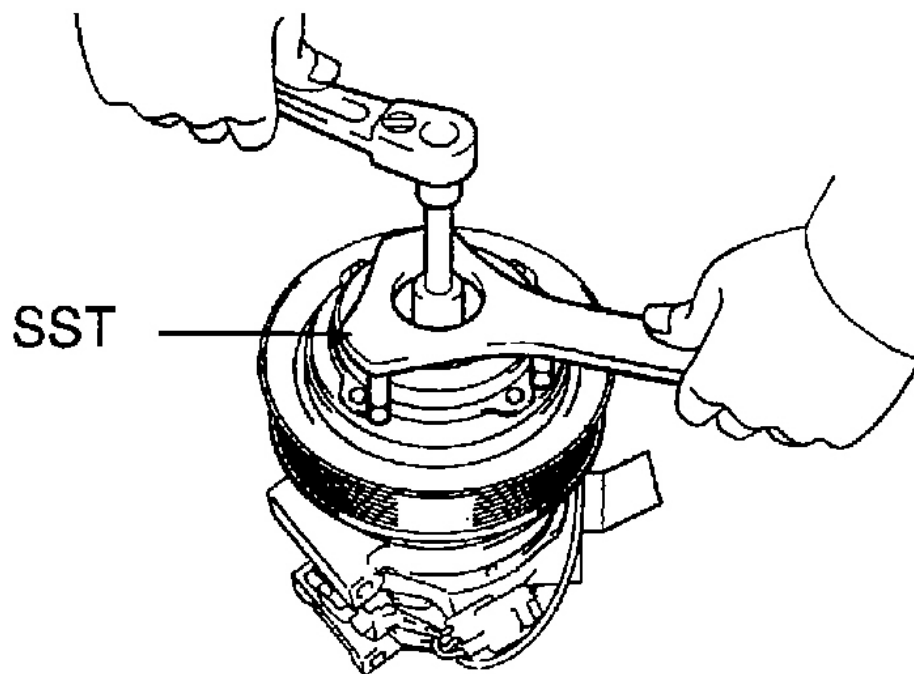
NOTE: Be careful not to damage the discharge and suction hose.

DISASSEMBLY

1. Remove Pressure Plate

- a. Using SST and a socket wrench, remove the shaft bolt.

SST 07112-76060

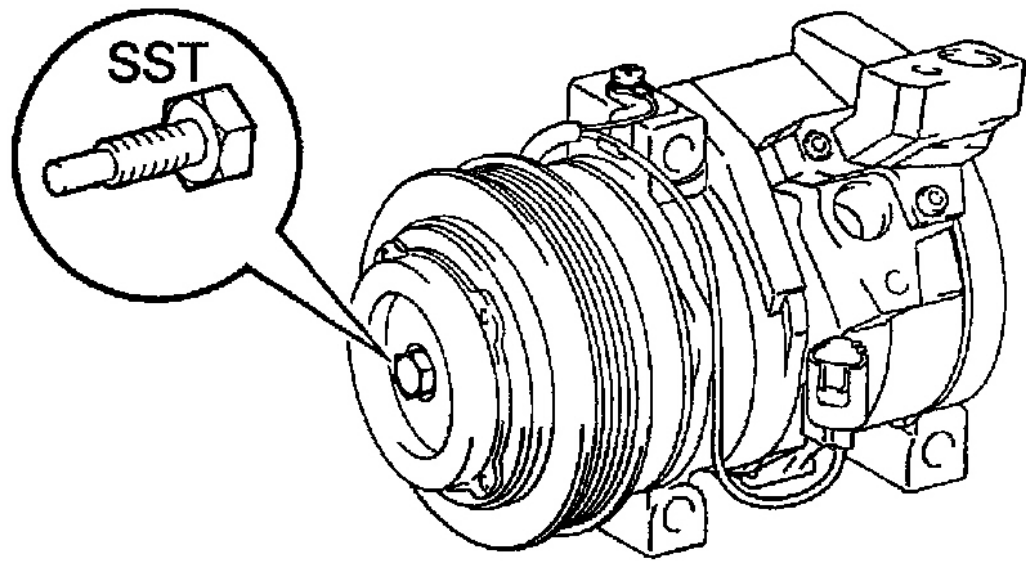


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Fig. 83: Removing Pressure Plate Shaft Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install SST on the pressure plate.
SST 07112-66040

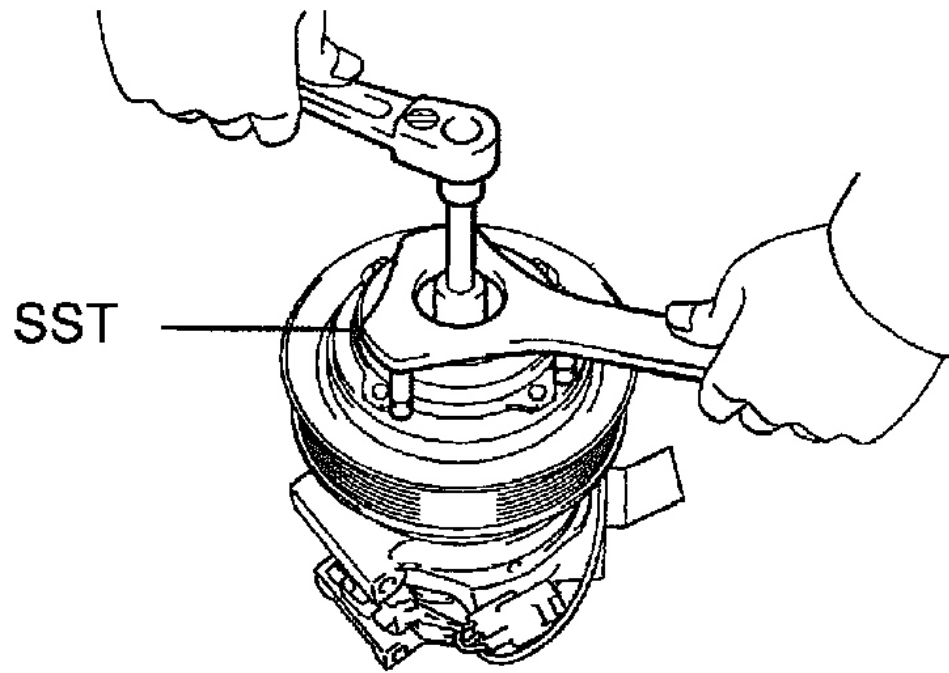


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Fig. 84: Installing SST On Pressure Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and socket wrench, remove the pressure plate.
SST 07112-66040, 07112-76060



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Fig. 85: Removing Pressure Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the shims from the pressure plate.

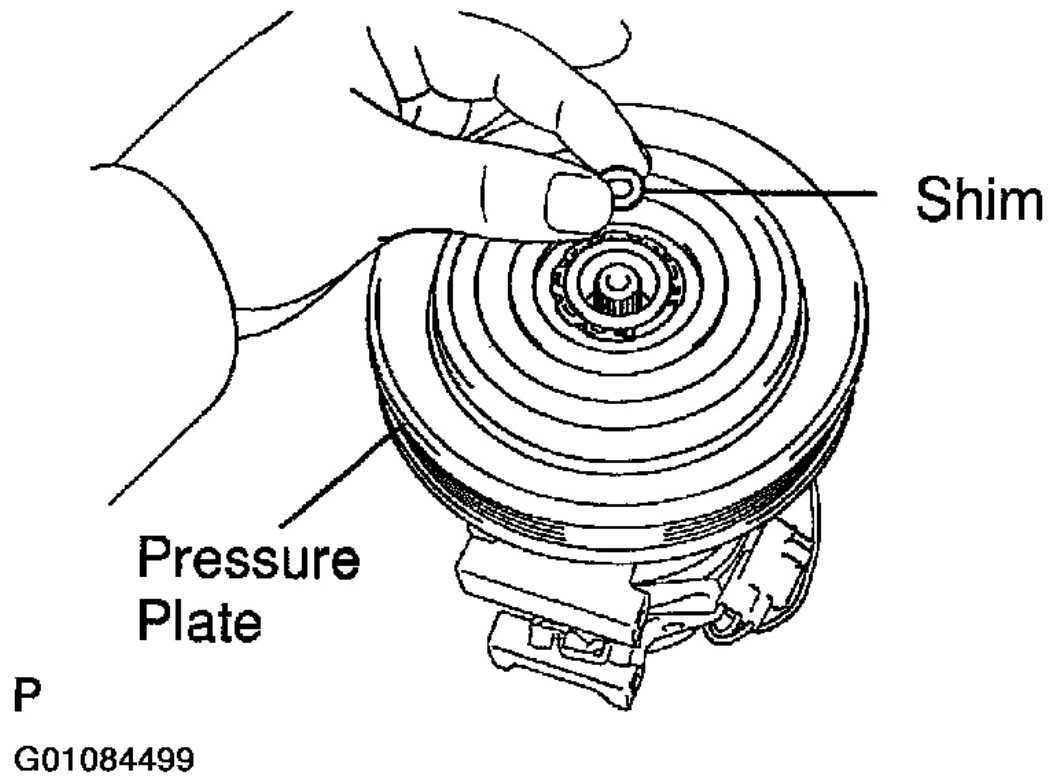
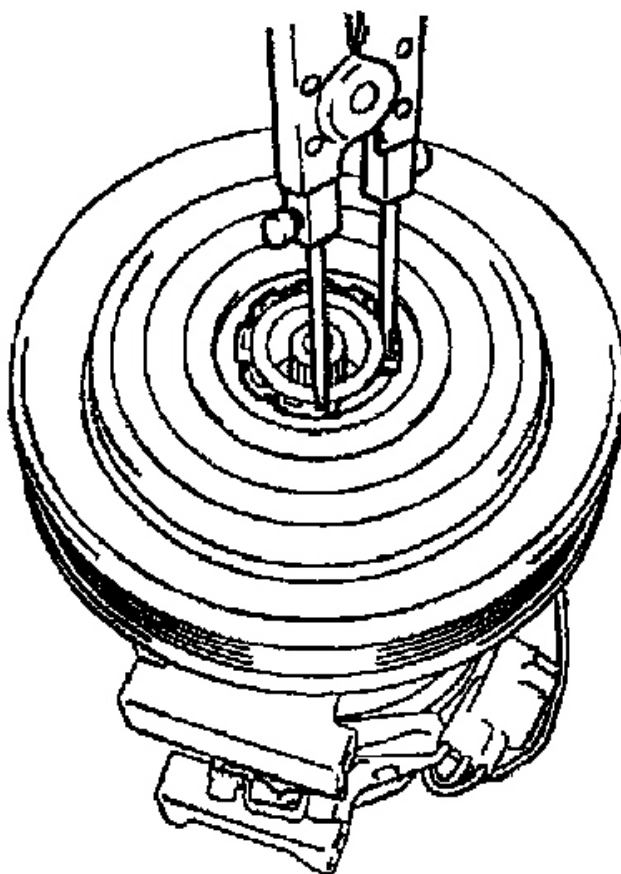


Fig. 86: Identifying Shims & Pressure Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove Rotor

- a. Using snap ring pliers, remove the snap ring.



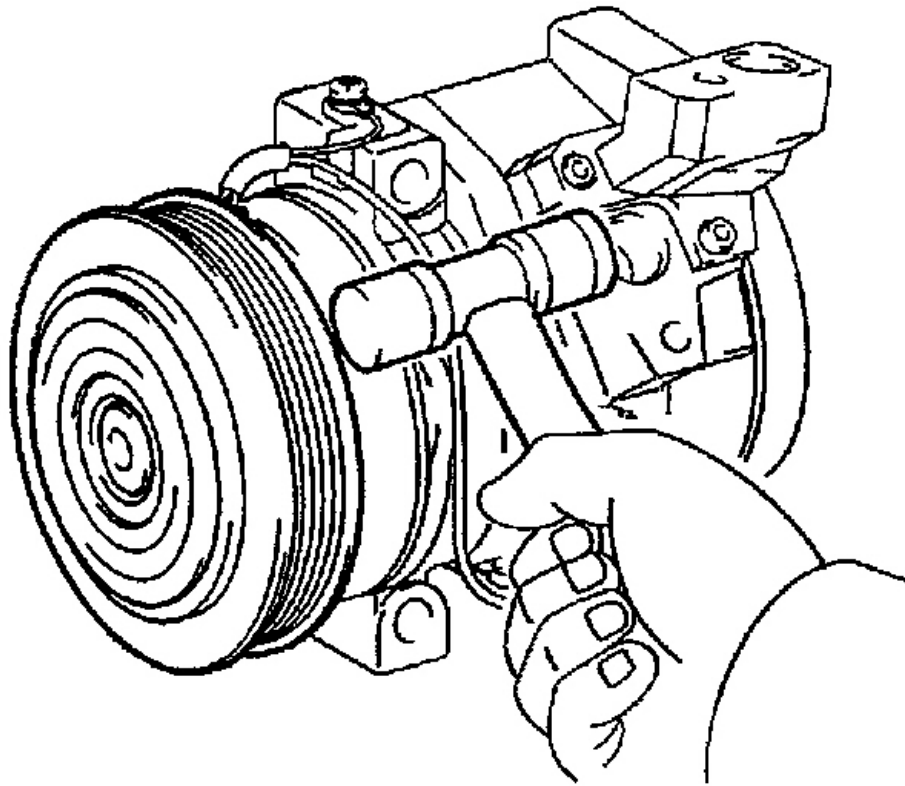
P

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Fig. 87: Removing Snap Ring

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



P

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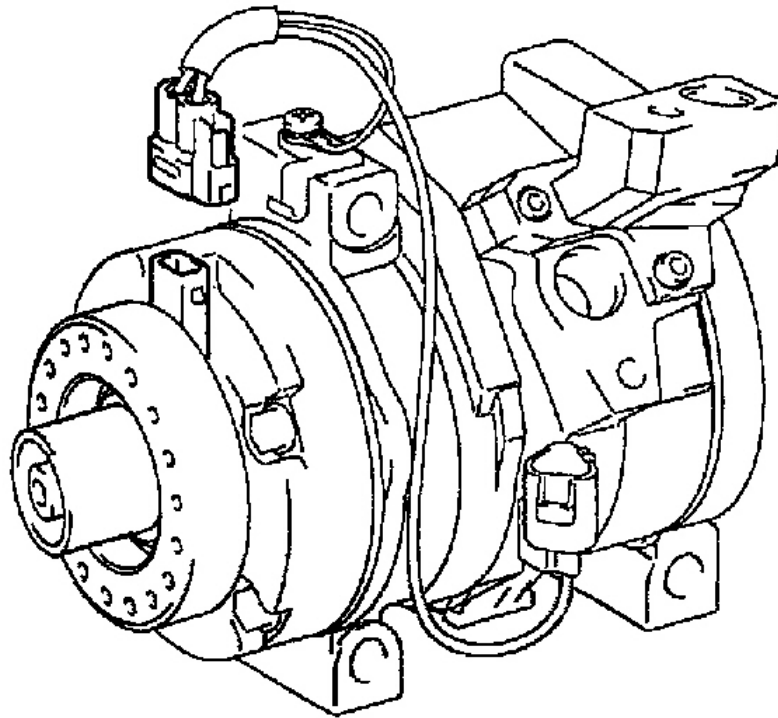
Fig. 88: Taping Rotor Off Shaft

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. Remove Stator

- a. Disconnect the connector from the stator.

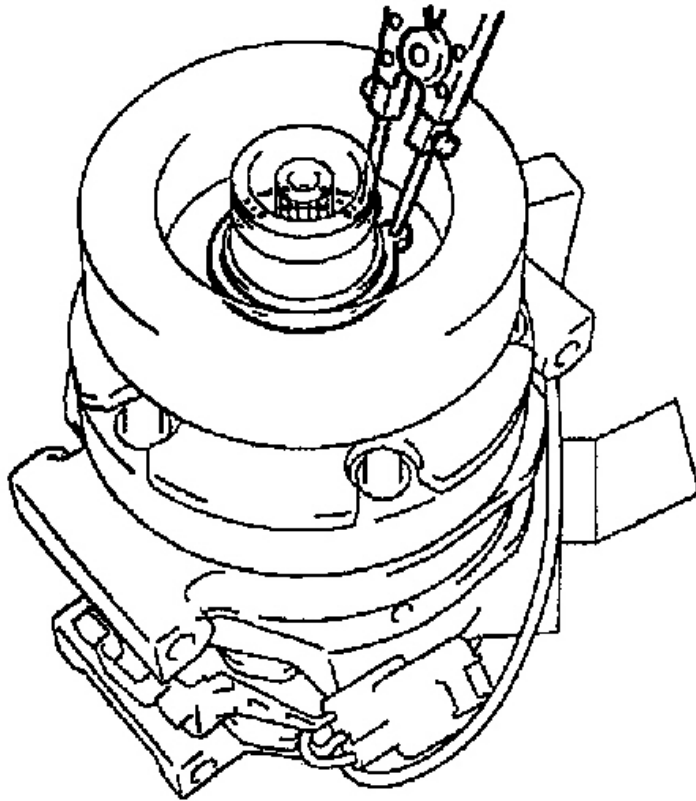


P

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Fig. 89: Disconnecting Connector From Stator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using snap ring pliers, remove the snap ring.

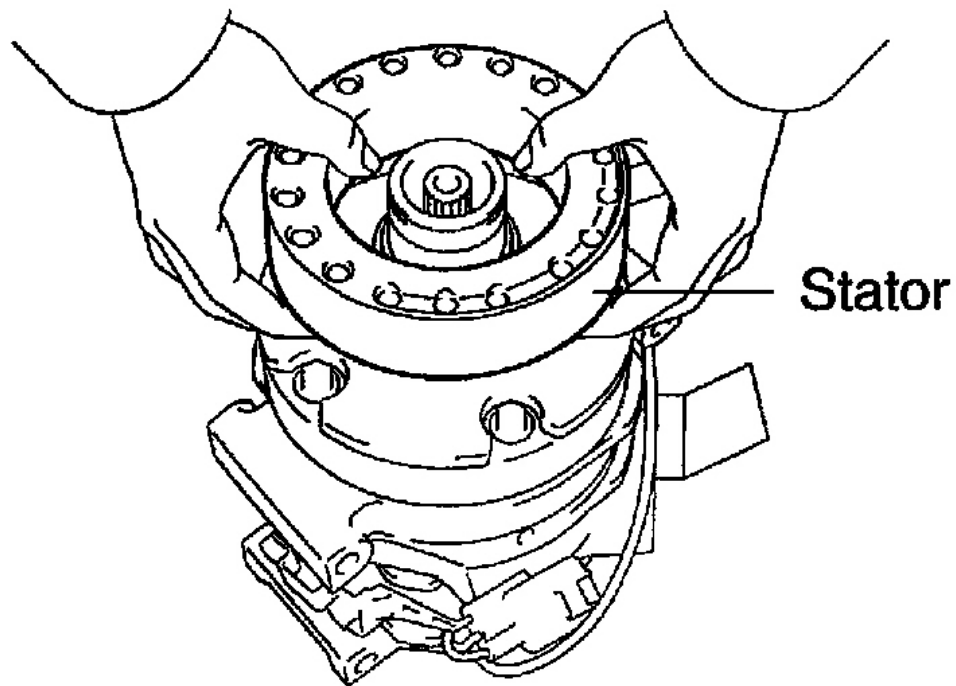


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G01084503

Fig. 90: Using Snap Ring Pliers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the stator.

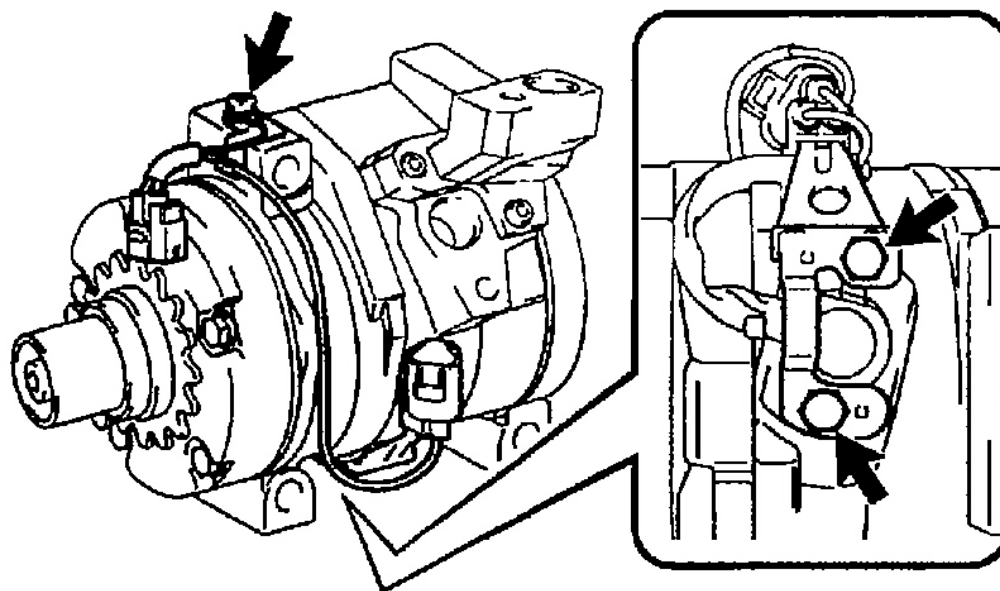


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Fig. 91: Identifying & Removing Stator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 2 bolts, screw, wire harness and lock sensor assembly.



P

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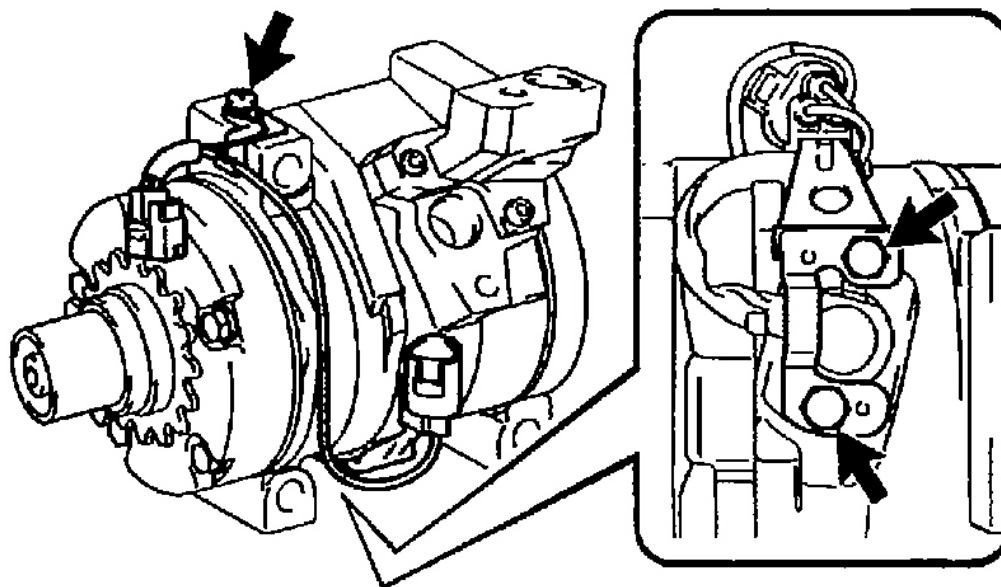
Fig. 92: Locating Bolts & Screw

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. Install Stator

- a. Install the wire harness and lock sensor assembly with the 2 bolts and screw.



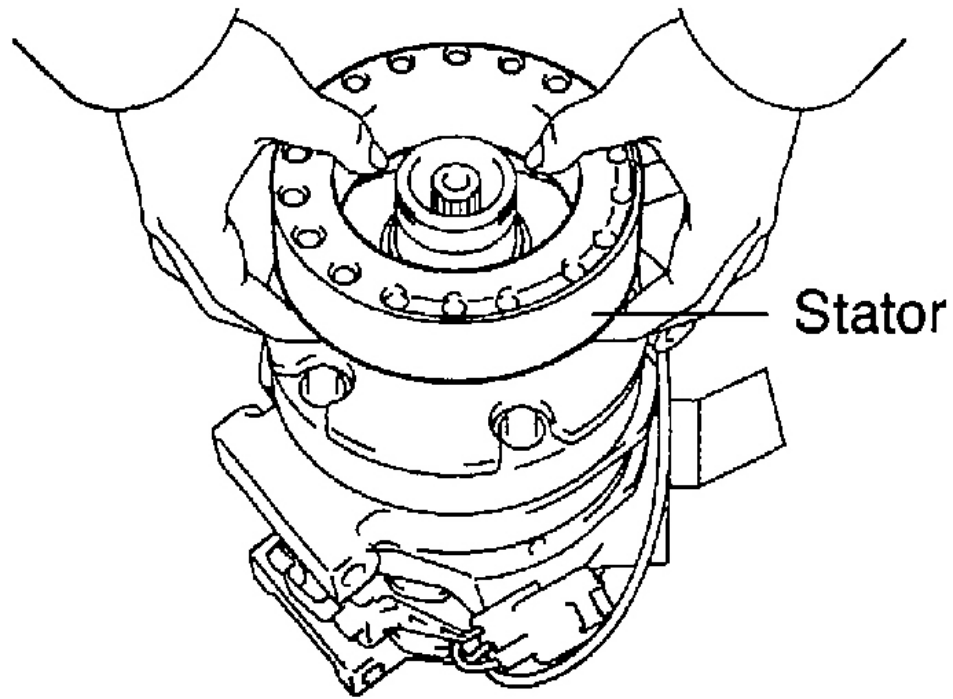
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Fig. 93: Identifying Bolts & Screw

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the stator.



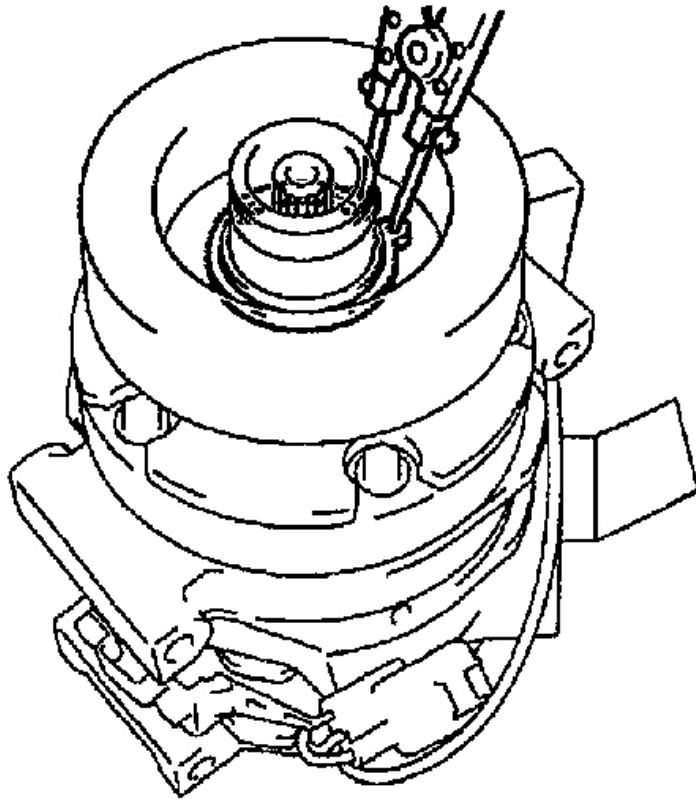
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Fig. 94: Installing Stator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using snap ring pliers, install the snap ring.

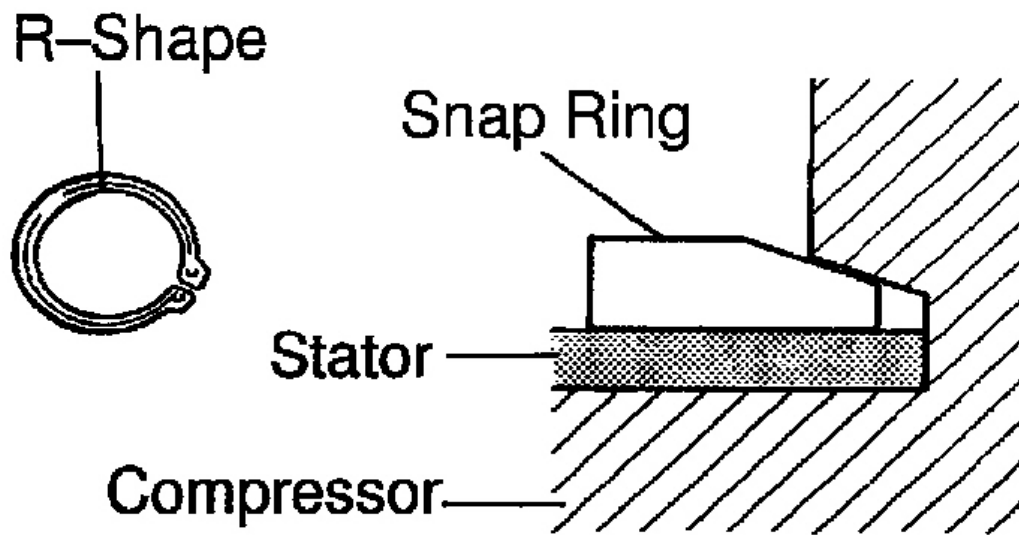


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Fig. 95: Installing Snap Ring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

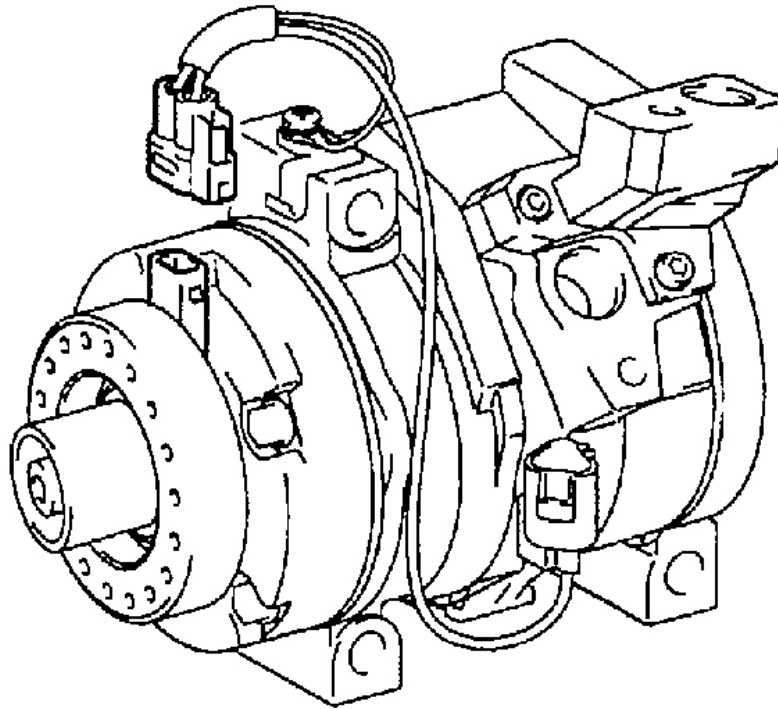
NOTE: The snap ring should be installed so that its beveled side faces up.



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Fig. 96: Displaying Proper Snap Ring Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Connect the connector to the stator.



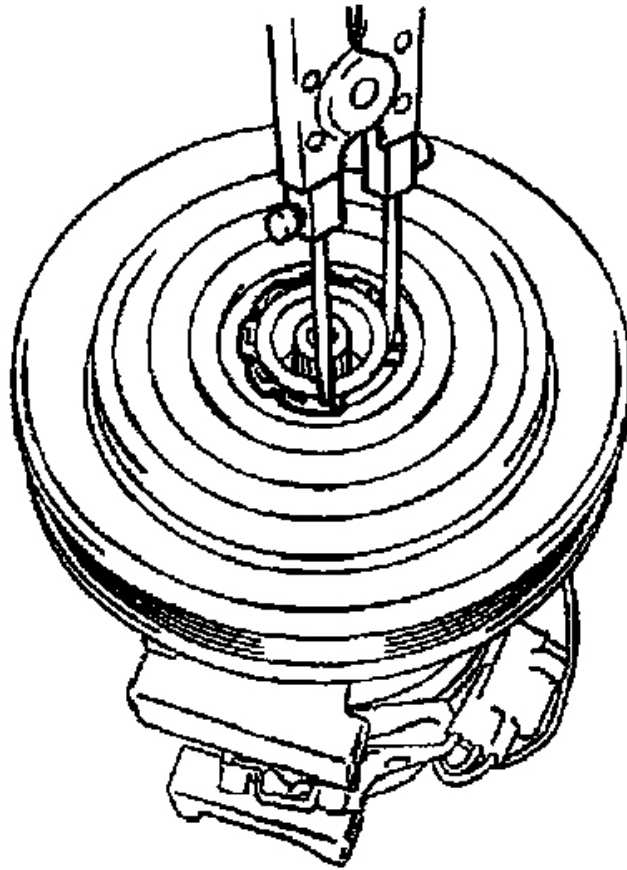
P

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Fig. 97: Connecting Connector To Stator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Install Rotor

- a. Install the rotor.
- b. Using snap ring pliers, install the snap ring.



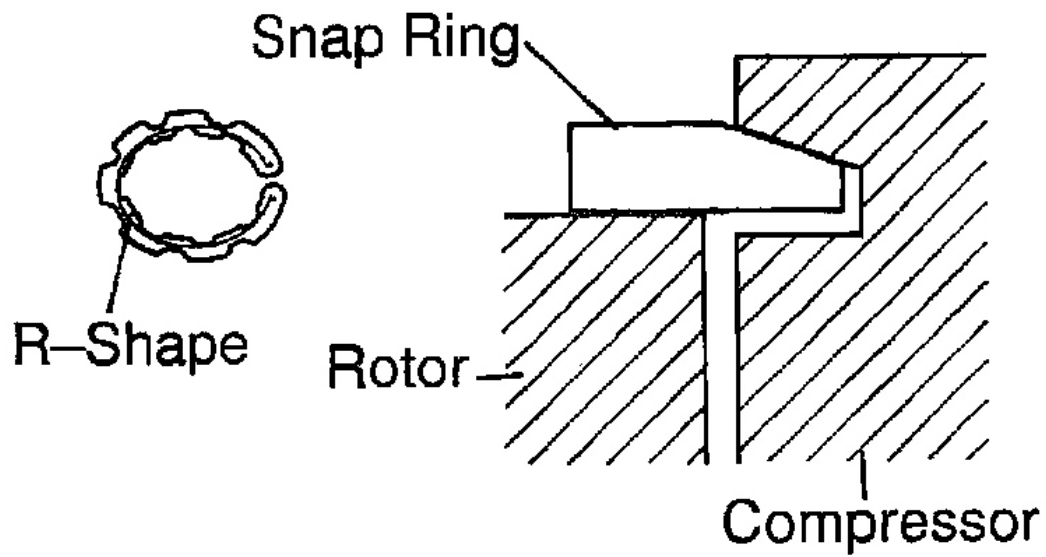
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Fig. 98: Installing Stator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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Fig. 99: Installing Snap Ring

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Install Pressure Plate

- a. Install the shims to the pressure plate and install the pressure plate on the rotor.

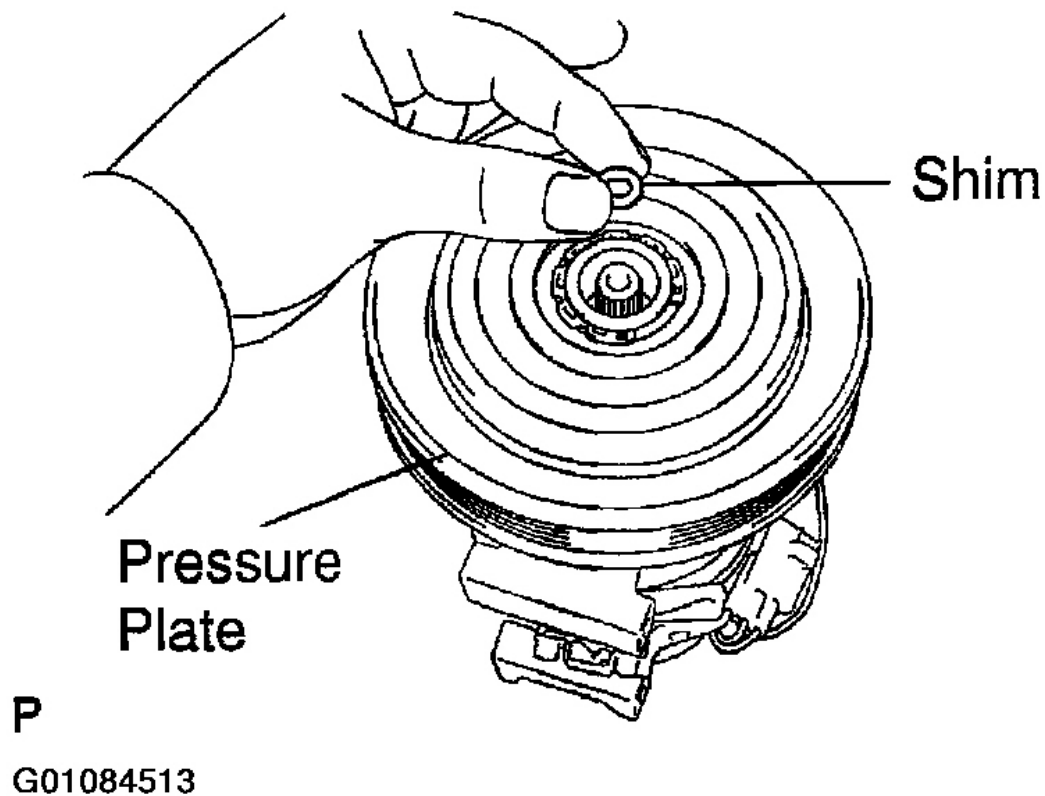
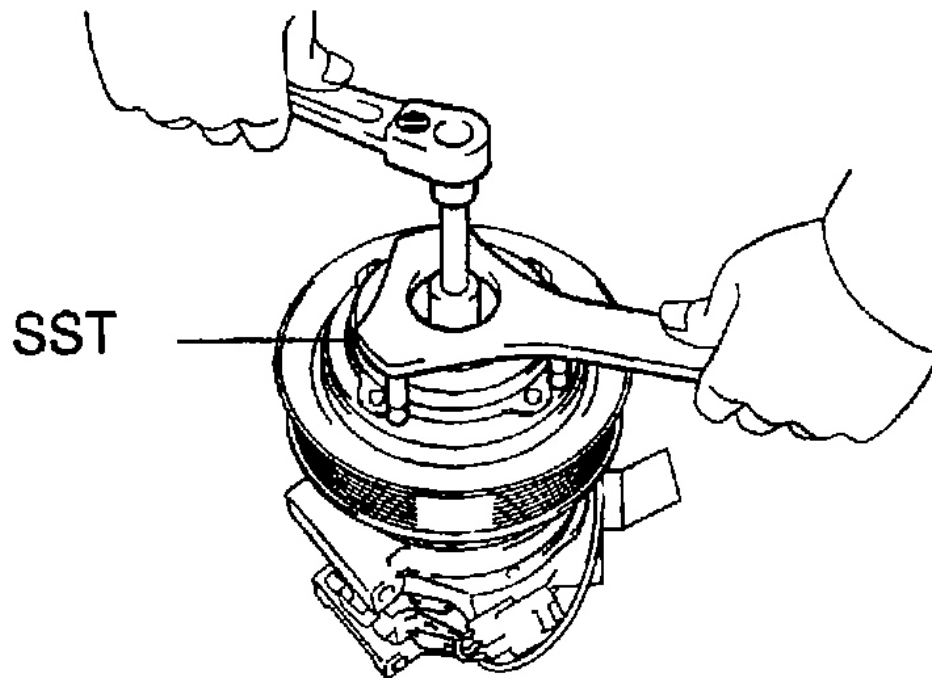


Fig. 100: Identifying Shim & Pressure Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a torque wrench, install the shaft bolt.
SST 07112-66040, 07112-76060
Torque: 18 N.m (184 kgf.cm, 13.2 ft.lbf)



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Fig. 101: Installing Shaft Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Inspect Magnetic Clutch Clearance

- a. Set the dial indicator to the pressure plate of the magnetic clutch.
- b. Connect the positive (+) lead from the battery to the terminal 3 and the negative (-) lead to the ground.
- c. Check the clearance between the pressure plate and rotor when connecting the negative (-) terminal to the battery.

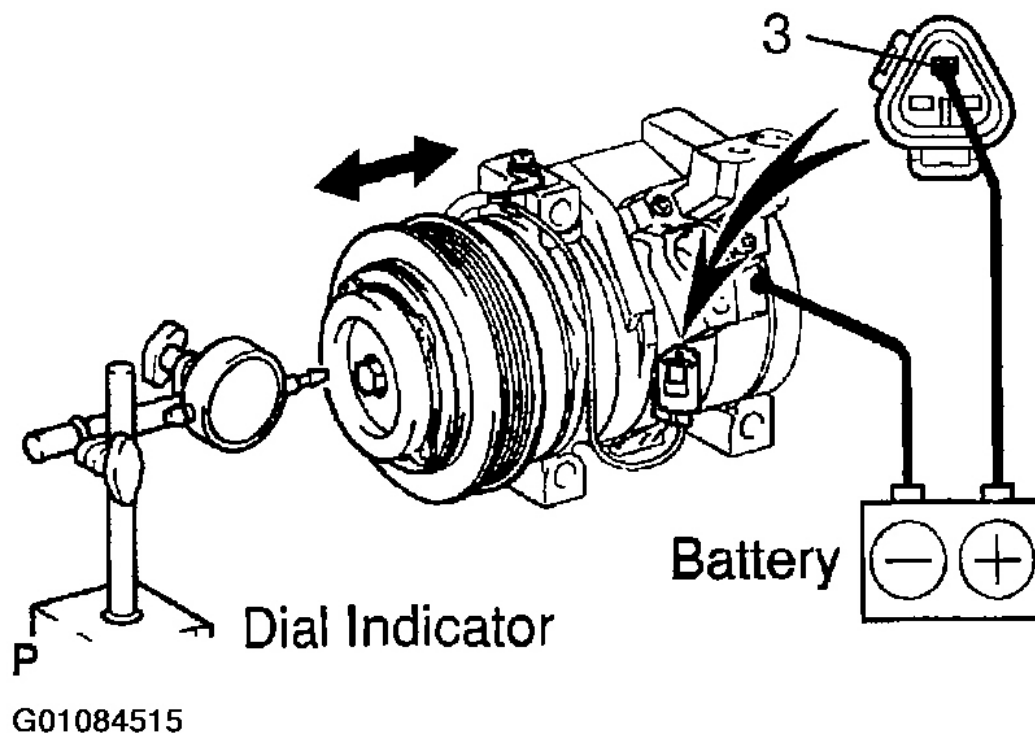


Fig. 102: Inspecting Magnetic Clutch Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Clearance:

0.45 + 0.15 mm (0.018 + 0.006 in.)

0.45 - 0.10 mm (0.018 - 0.004 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.)

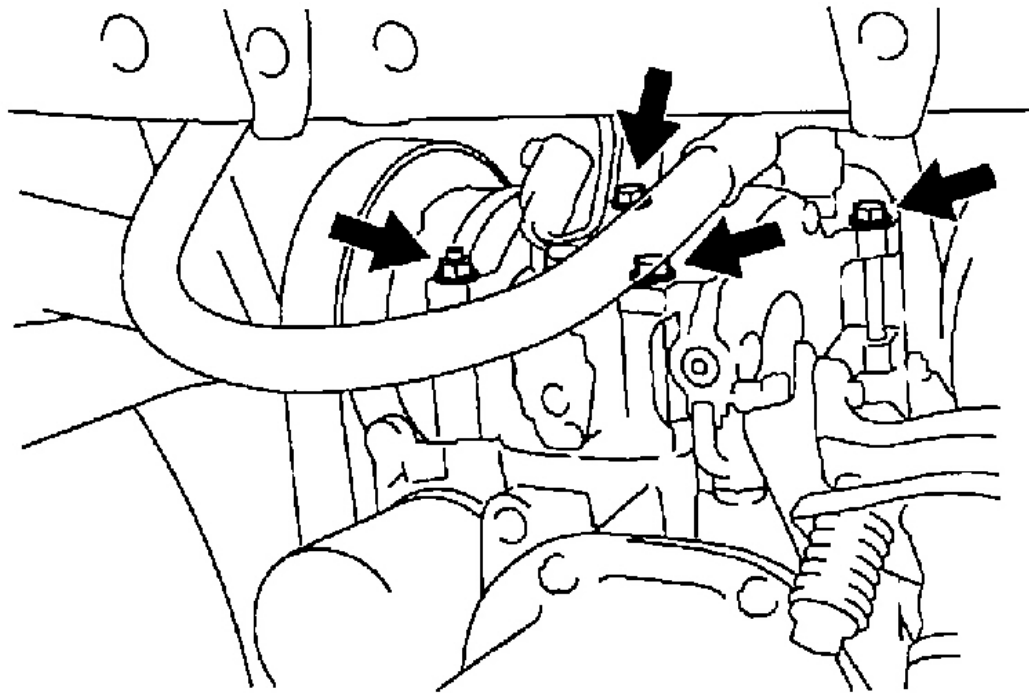
0.5 mm (0.020 in.)

INSTALLATION

1. Install Compressor

- Install the compressor with the 3 bolts, nut and stud bolt.

Torque: 24.5 N.m (250 kgf.cm, 18 ft.lbf)



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Fig. 103: Installing Compressor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the connector.
2. **Connect Discharge & Suction Hoses**
 - a. Lubricate 2 new O-rings with compressor oil and install them to the hoses.
 - b. Connect the both hoses with the 2 bolts.

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

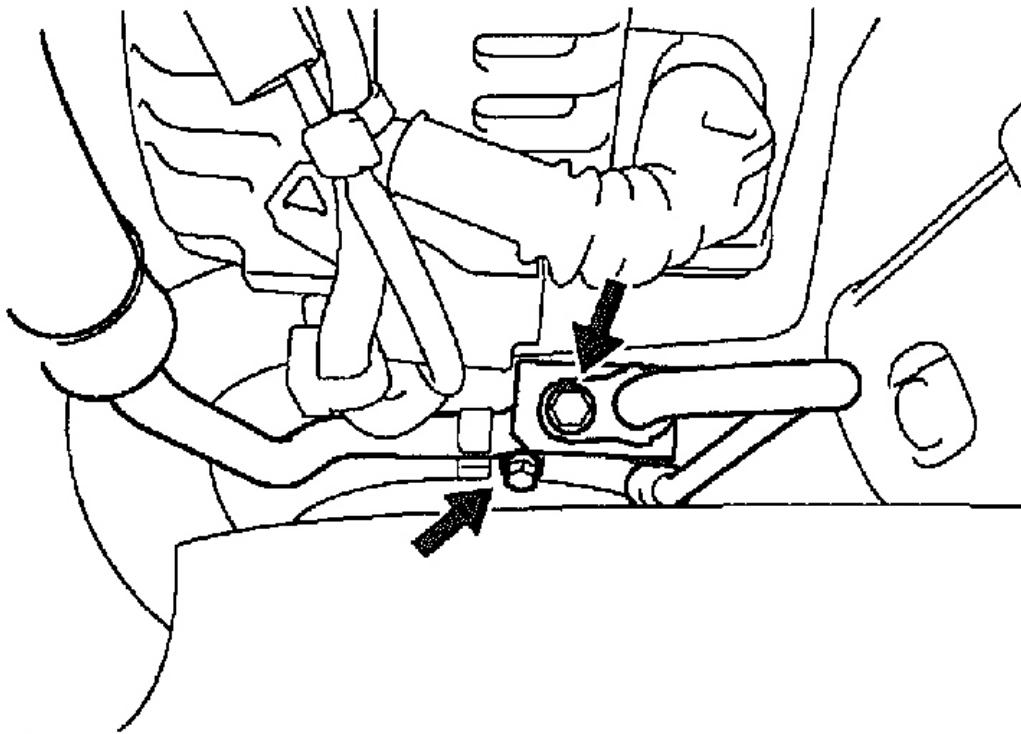
If compressor was replaced, add compressor oil to the compressor.

Add: 100 cc (3.5 fl.oz.)

Compressor Oil: ND-OIL 8 or equivalent

NOTE:

- **Hose should be connected immediately after the caps have been removed.**
- **Be careful not to damage the discharge and suction hose.**



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Fig. 104: Connecting Discharge & Suction Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **Install & Check Drive Belt** See ON-VEHICLE INSPECTION .
4. **Connect Negative (-) Terminal Cable To Battery** .
5. **Evacuate Air From Refrigeration System Charge System With Refrigerant**
Specified Amount: 500 +/- 50 g (17.64 +/- 1.76 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

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.

NOTE: Be careful not to damage the fins.

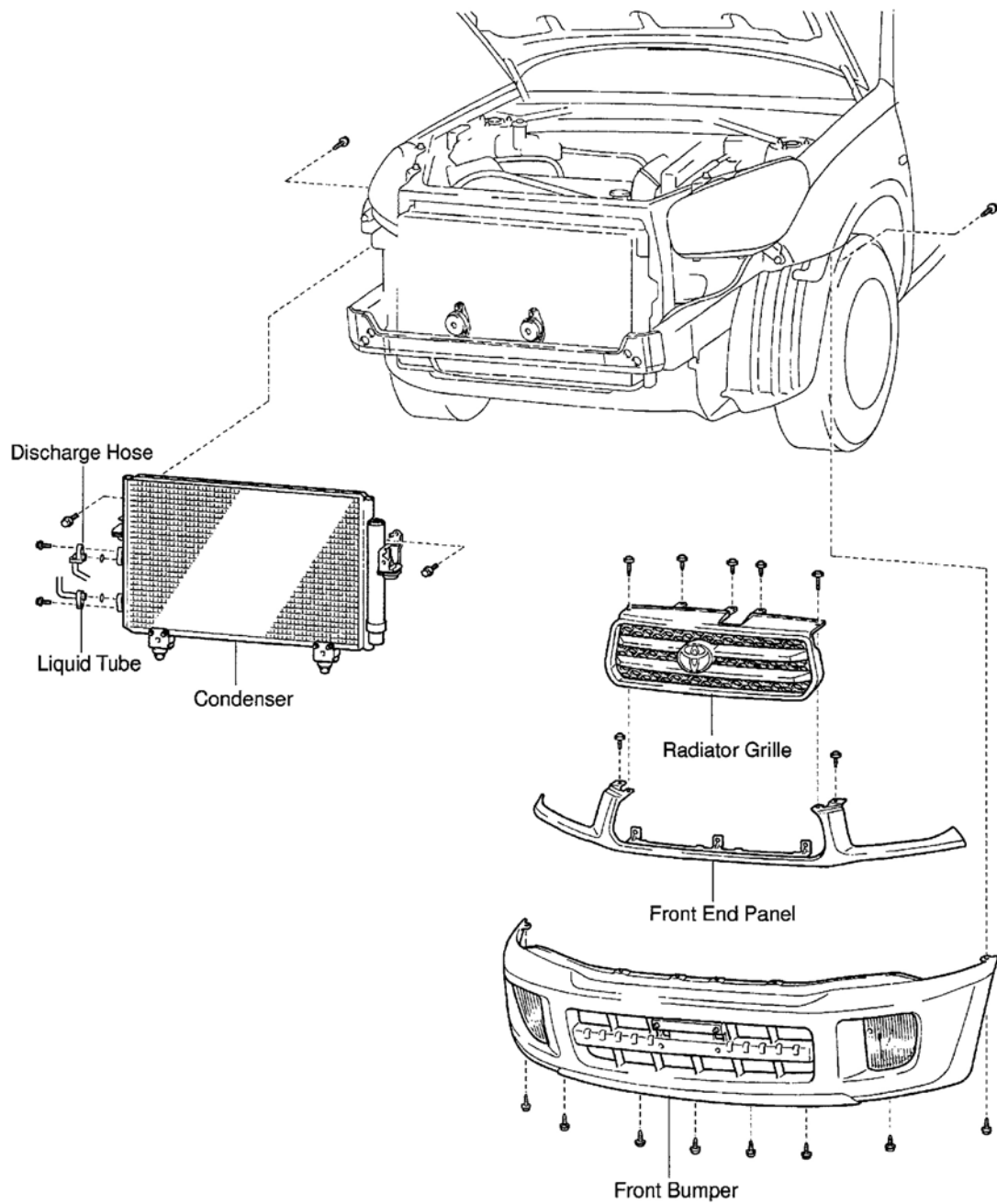
If the fins are bent, straighten them with a screwdriver or pliers.

2. **Inspect Condenser & Fittings For Leakage**

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

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

COMPONENTS



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Fig. 105: Displaying Condenser Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

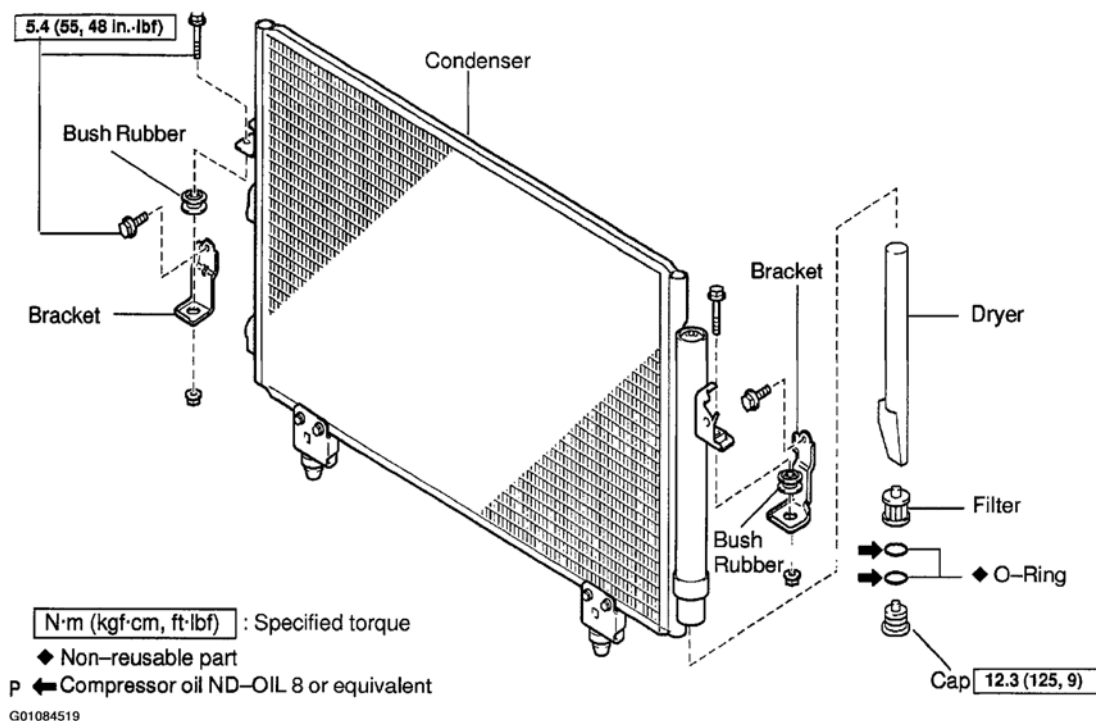
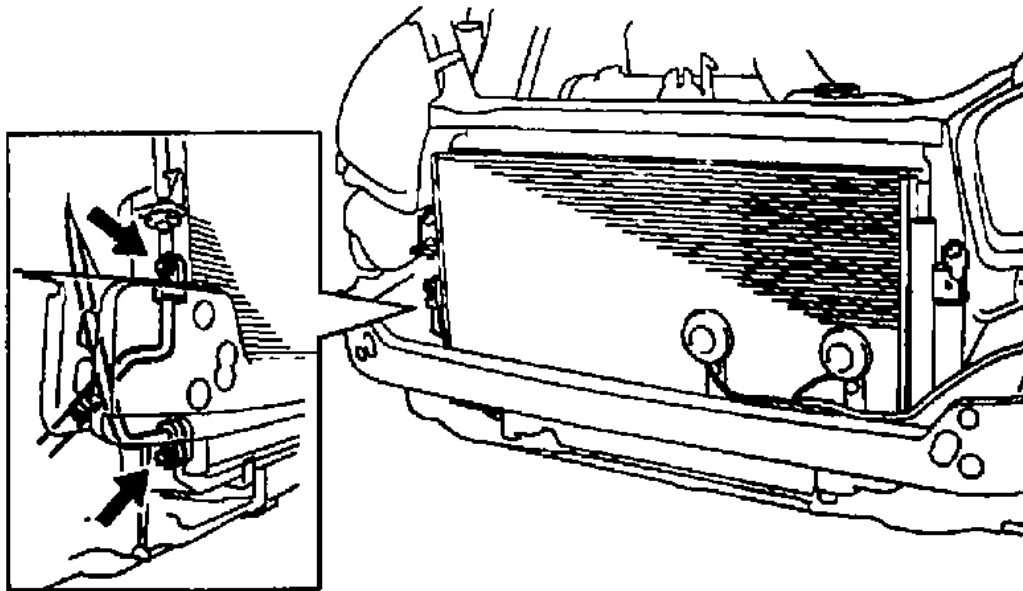


Fig. 106: Displaying Condenser Components (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **Discharge Refrigerant From Refrigeration System**
2. **Remove Front Bumper** See COMPONENTS .
3. **Remove Liquid Tube & Discharge Tube**



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Fig. 107: Locating Liquid & Discharge Tube Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

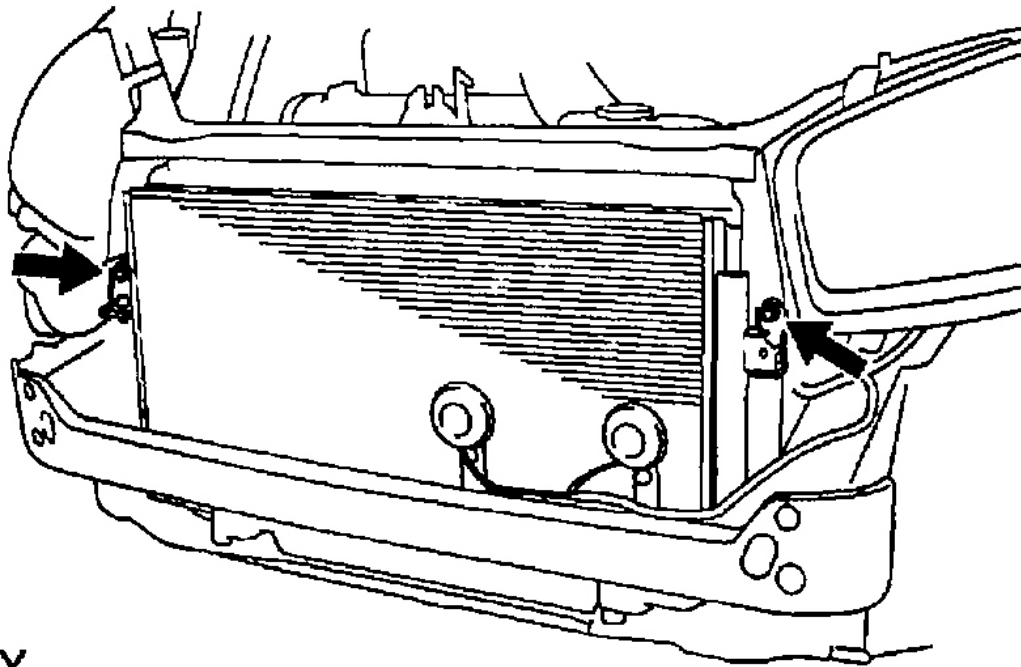
Remove the 2 bolts and both tubes.

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

4. Remove Condenser

- a. Remove the 2 bolts.
- b. Pull up the condenser at upward.

NOTE: Be careful not to damage the radiator and condenser.



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Fig. 108: Locating Bolts & Removing Condenser
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

Replace Dryer From Modulator

- a. Using a 10 mm hexagon wrench, remove the cap from the modulator.
- b. Remove the filter from the modulator.

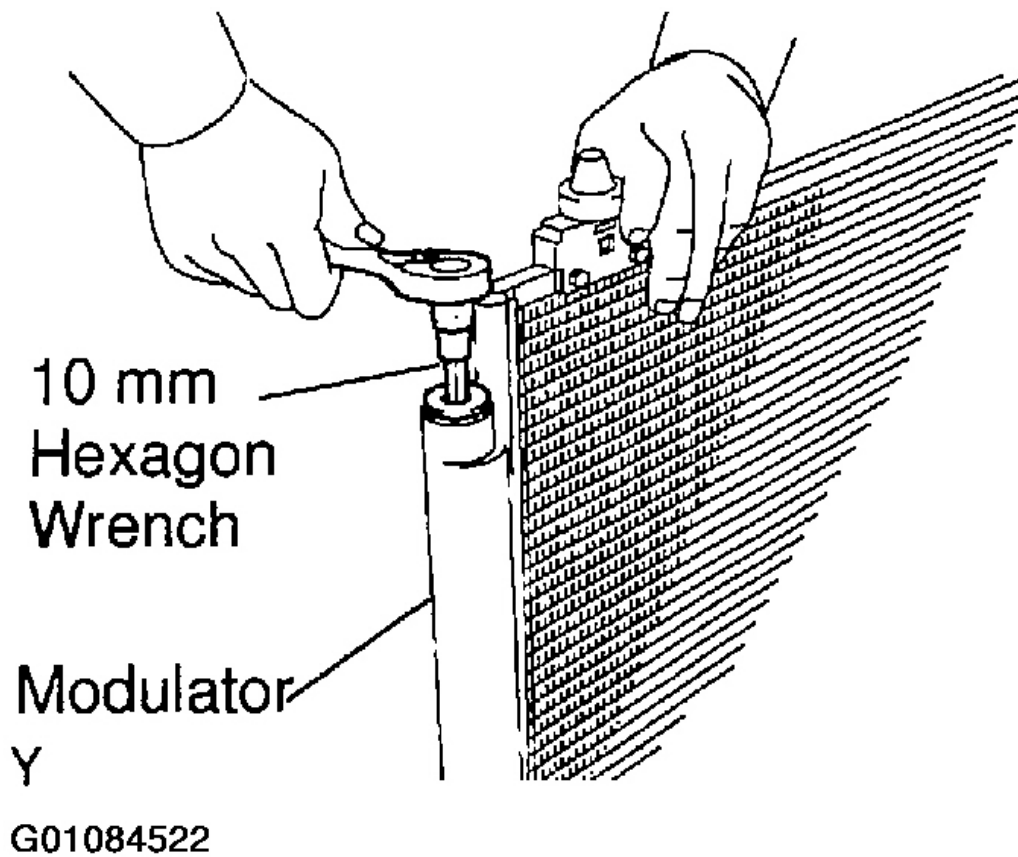
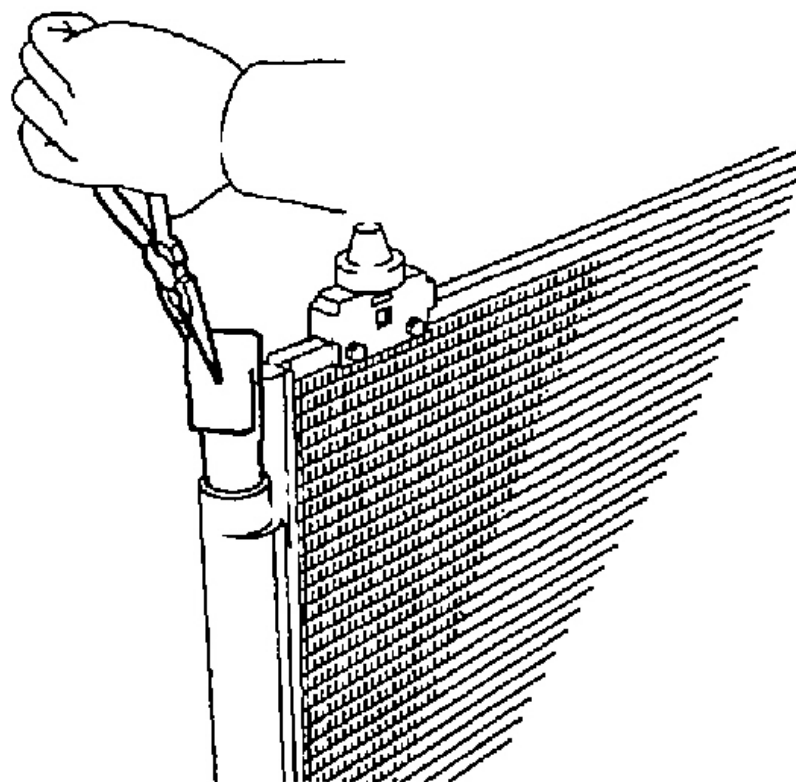


Fig. 109: Removing Filter From Modulator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using pliers, remove the dryer.



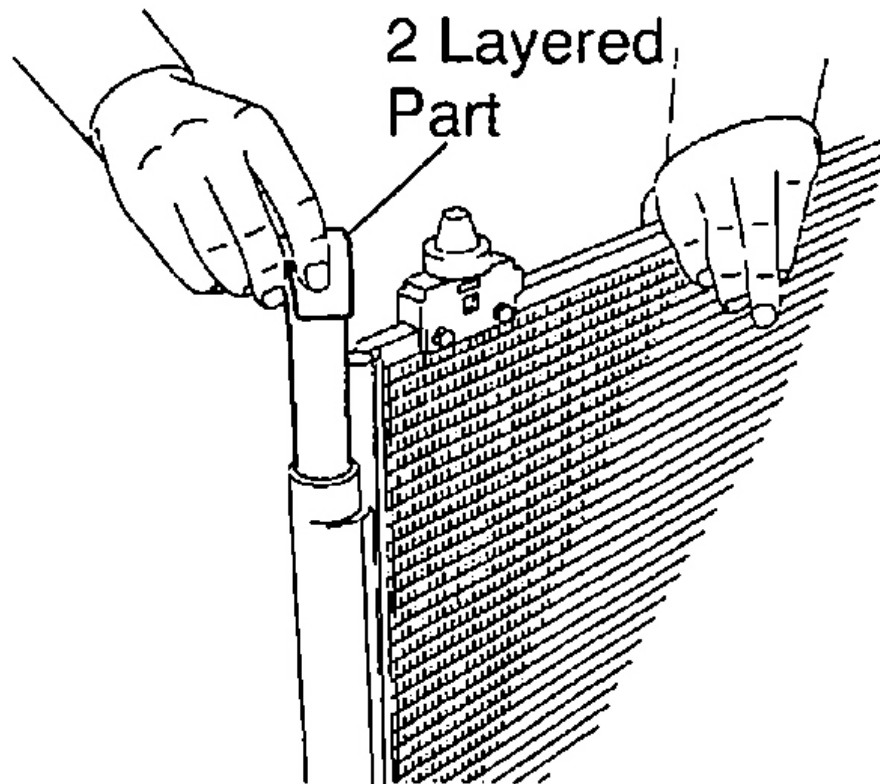
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Fig. 110: Removing Dryer

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Insert a new dryer into the modulator.



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Fig. 111: Inserting New Dryer

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

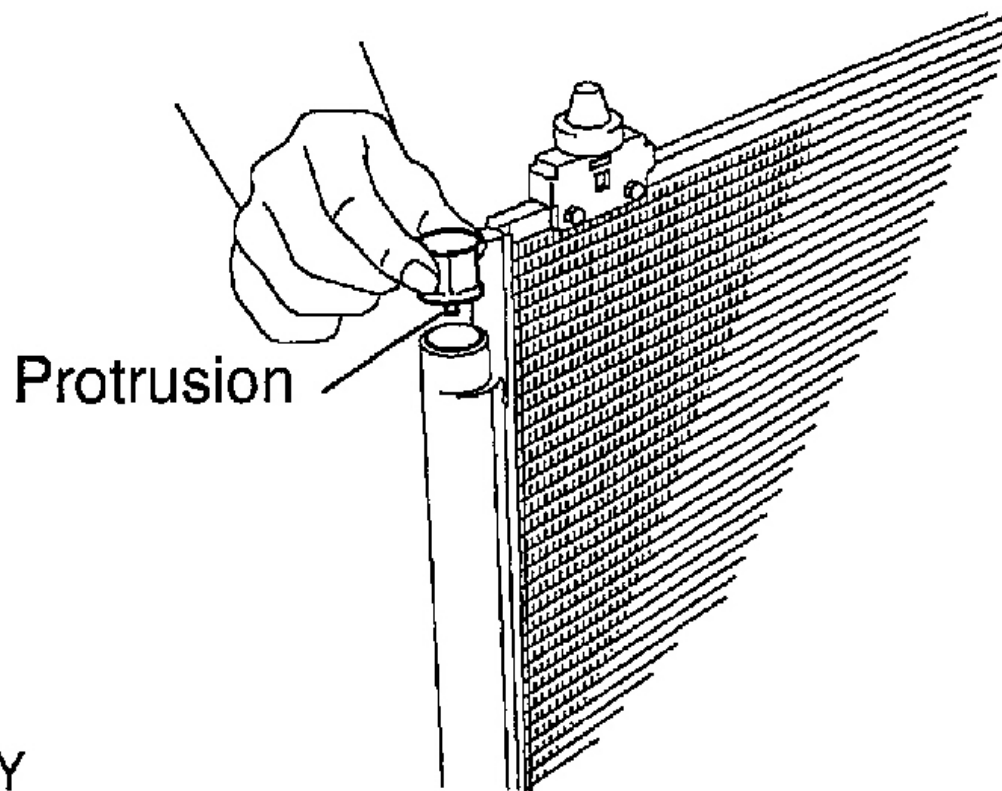
NOTE:

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

e. Insert the filter into the modulator.

NOTE:

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



Y

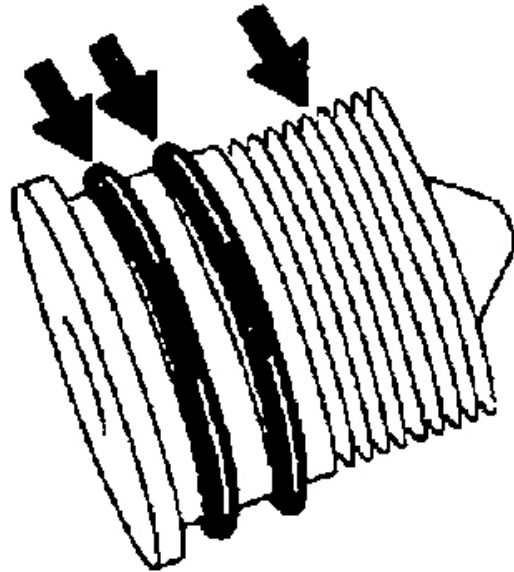
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Fig. 112: Inserting Filter To Modulator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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



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Fig. 113: Installing Cap To Modulator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Using a 10 mm hexagon wrench, install the caps.

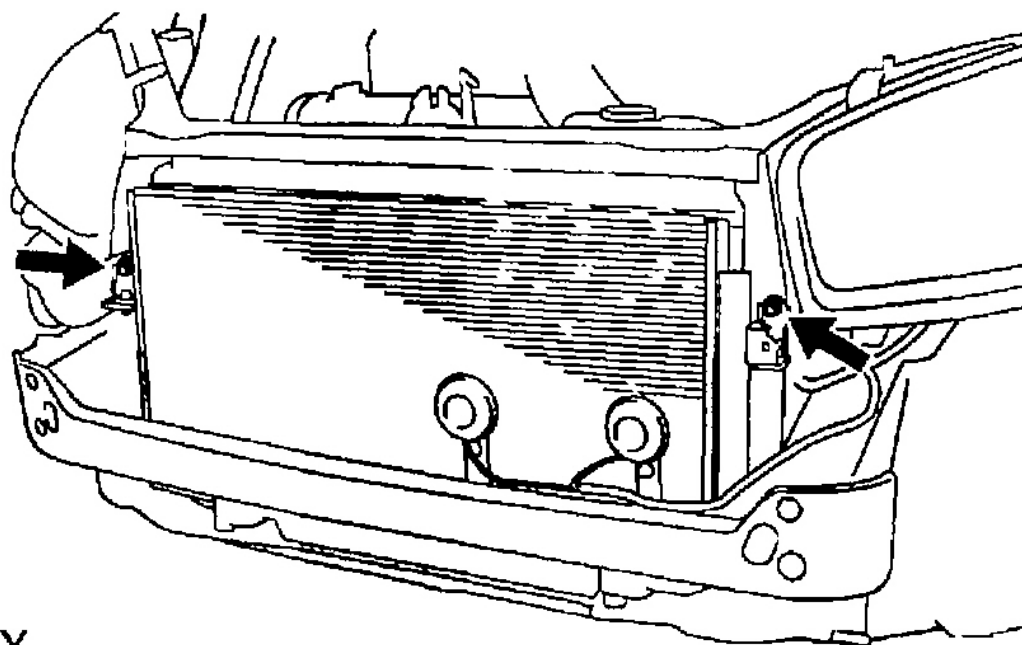
Torque: 12.3 N.m (125 kgf.cm, 9 ft.lbf)

INSTALLATION

1. Install Condenser

Install the condenser with the 2 bolts.

Torque: 7.35 N.m (75 kgf.cm, 65 in.lbf)



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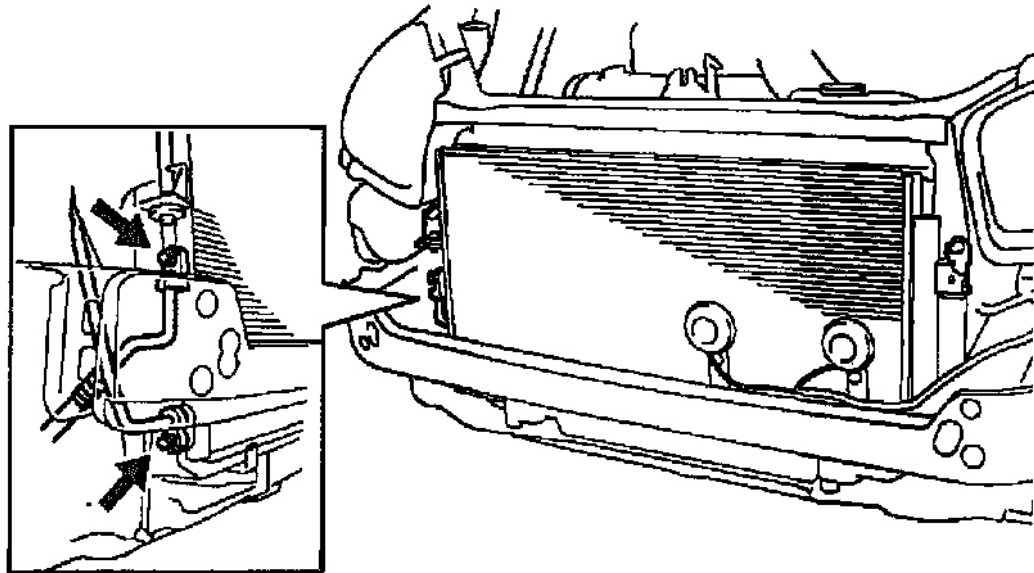
Fig. 114: Identifying Bolts & Installing Condenser
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the condenser and radiator.

2. Install Liquid Tube & Discharge Tube

- a. Remove the cap.
- b. Coat 2 new O-rings with compressor oil.
- c. Install both tubes with the 2 bolts.

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



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Fig. 115: Installing Liquid Tubes & Discharge Tubes
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Add: 40 cc (1.4 fl.oz.)

Compressor Oil: ND-OIL 8 or equivalent

3. Charge Refrigerant To Refrigeration System

- a. Evacuate air from the refrigeration system.
- b. Charge system with refrigerant and inspect for leakage of refrigerant.

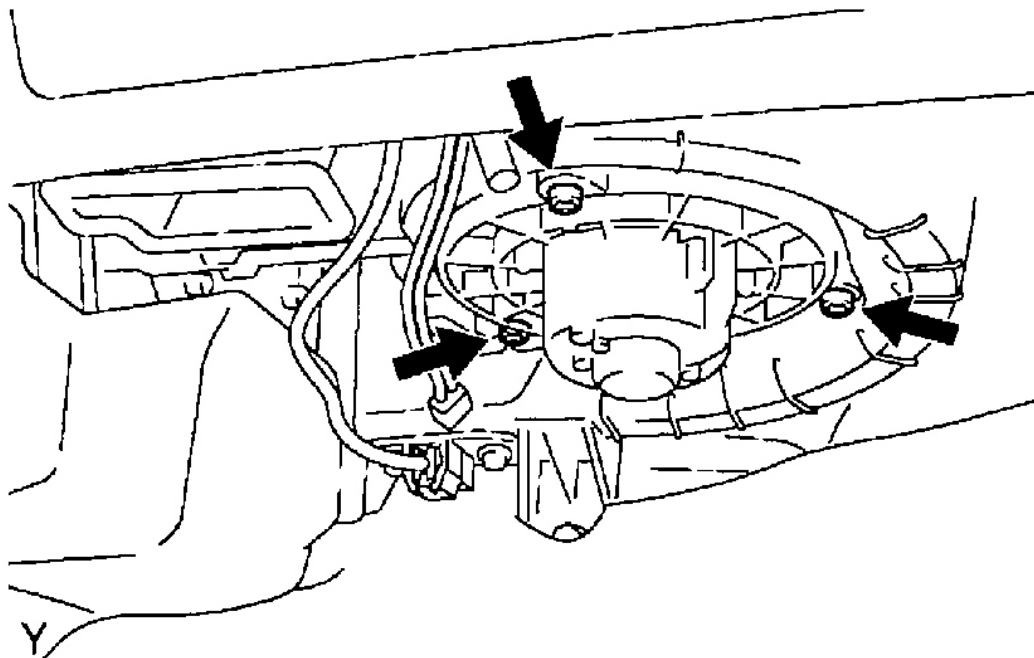
Specified Amount: 500 +/- 50 g (17.64 +/- 1.76 oz.)

BLOWER MOTOR

INSPECTION

1. Remove Blower Motor

- a. Disconnect the blower motor connector and wire harness clamp.
- b. Using a torx wrench, remove the 3 screws and blower motor.



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Fig. 116: Removing Blower Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **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.

3. **Install Blower Motor**

- a. Using a torx wrench, install the blower motor with the 3 screws.
- b. Connect the blower motor connector and wire harness clamp.

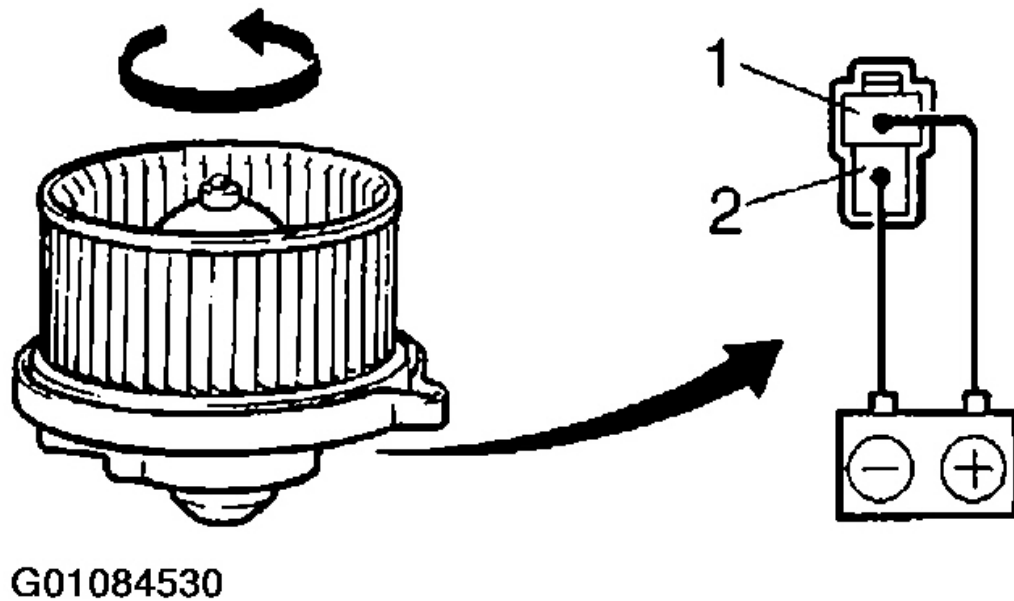
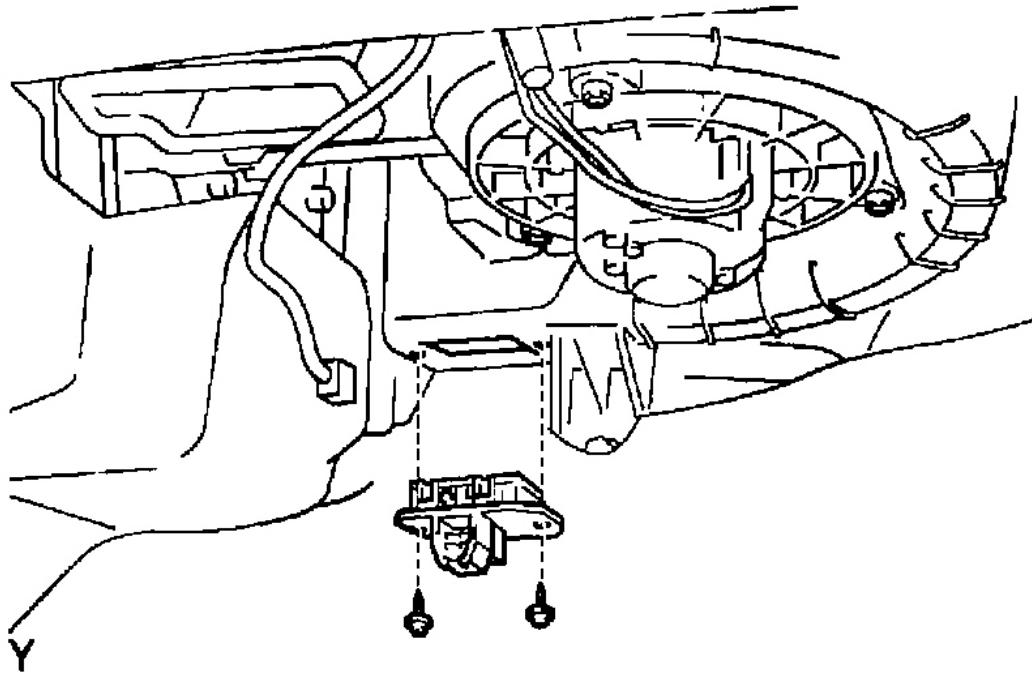


Fig. 117: Testing Blower Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

BLOWER RESISTOR

INSPECTION

1. **Remove Blower Resistor**
 - a. Disconnect the blower resistor connector.
 - b. Remove the 2 screws and blower resistor.

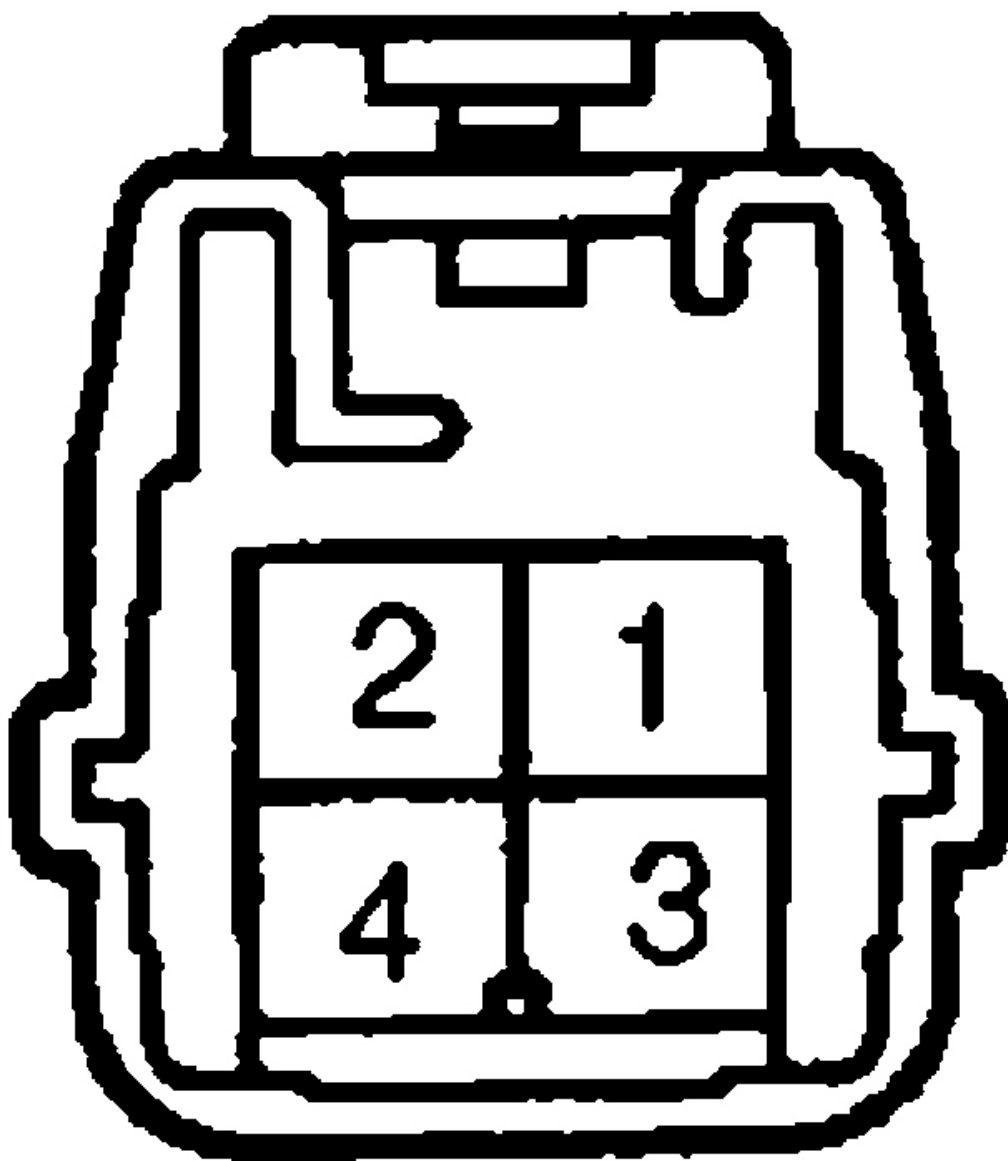


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Fig. 118: Removing Blower Resistor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Inspect Blower Resistor Continuity



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Fig. 119: Displaying Blower Resistor Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Condition	Tester connection	Specified condition
Constant	1 – 2 – 3 – 4	Continuity

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Fig. 120: Displaying Blower Resistor Continuity Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Reinstall Blower Resistor

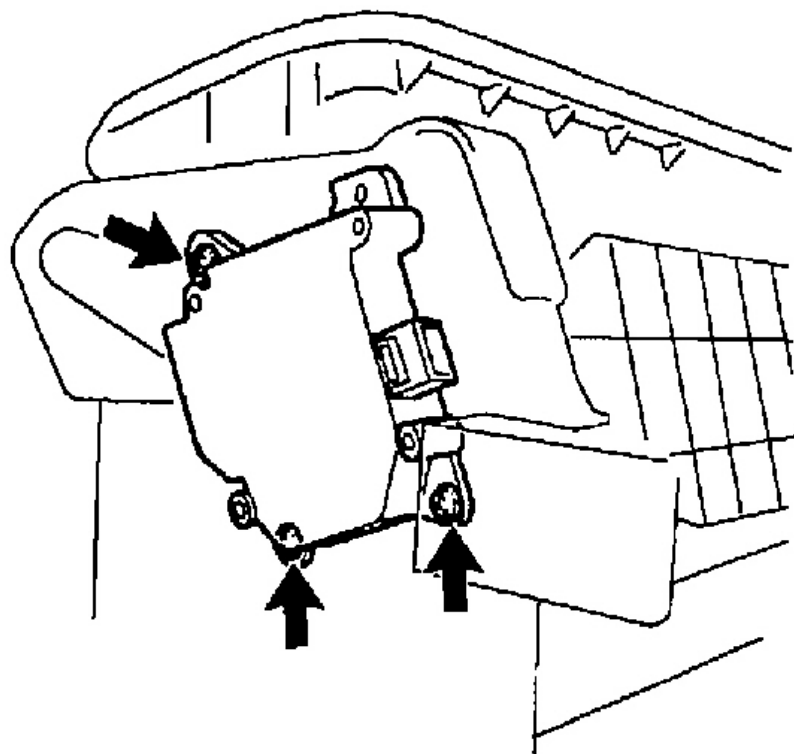
- a. Install the blower resistor with the 2 screws.
- b. Connect the blower resistor connector.

AIR INLET SERVOMOTOR

REMOVAL

1. **Remove Blower Unit** See REMOVAL .
2. **Remove Air Inlet Servomotor**

Remove the 3 screws and air inlet servomotor.



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Fig. 121: Removing Screws & Air Inlet
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

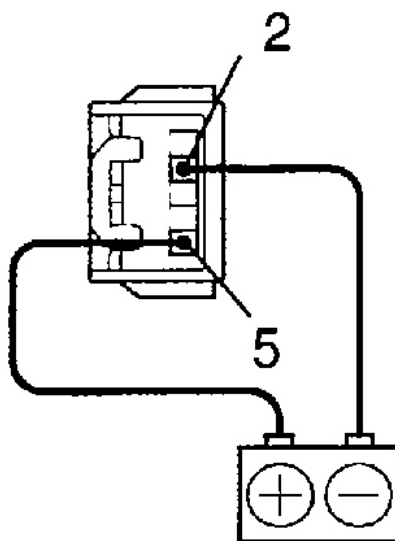
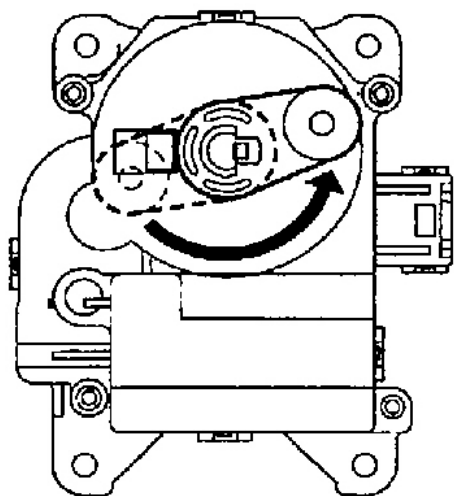
Inspect Air Inlet Servomotor

Inspect The Servomotor Operation

1. Connect the positive (+) lead of the battery to terminal 5 and negative (-) lead to terminal 2.
2. Check the motor arm rotates counterclockwise and arm stops on the "FRESH" position.
3. Connect the positive (+) lead of the battery to terminal 5 and negative (-) lead to terminal 1.
4. Check the motor arm rotates counterclockwise and arm stops on the "RECIRC" position.

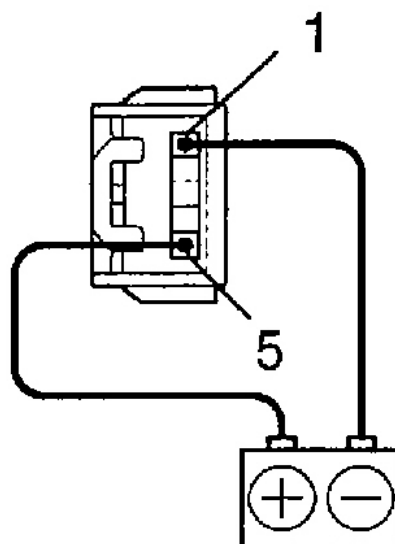
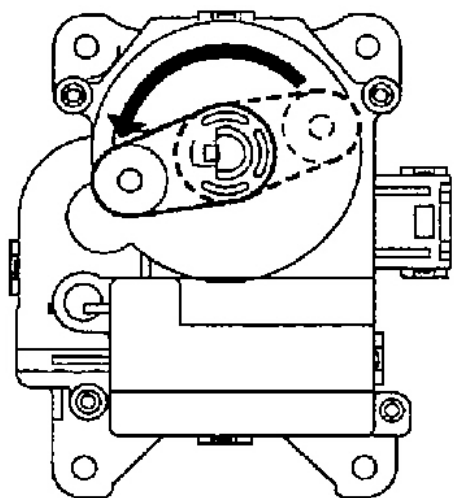
If operations are not as specified, replace the air inlet servomotor.

To FRESH



P

To RECIRC



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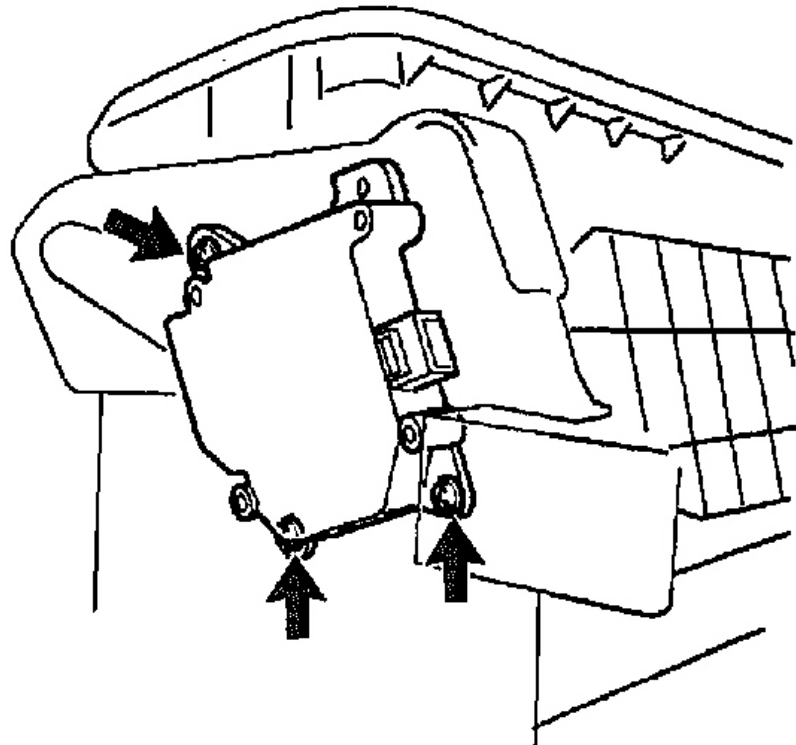
Fig. 122: Inspecting Servomotor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **Install air inlet servomotor .**

Install the air inlet servomotor with the 3 screws.

2. **Install blower unit (See INSTALLATION) .**



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Fig. 123: Installing Air Inlet Servomotor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

THERMISTOR

INSPECTION

1. **Remove blower unit** See REMOVAL .
2. **Remove thermistor**
 - a. Disconnect the thermistor connector.

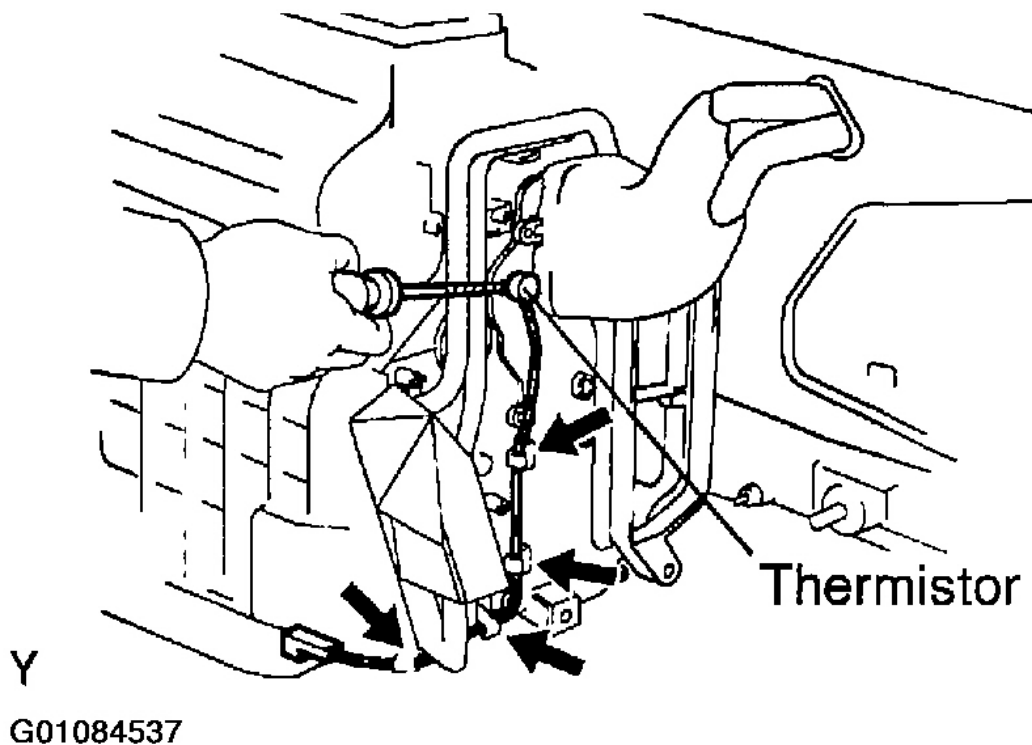
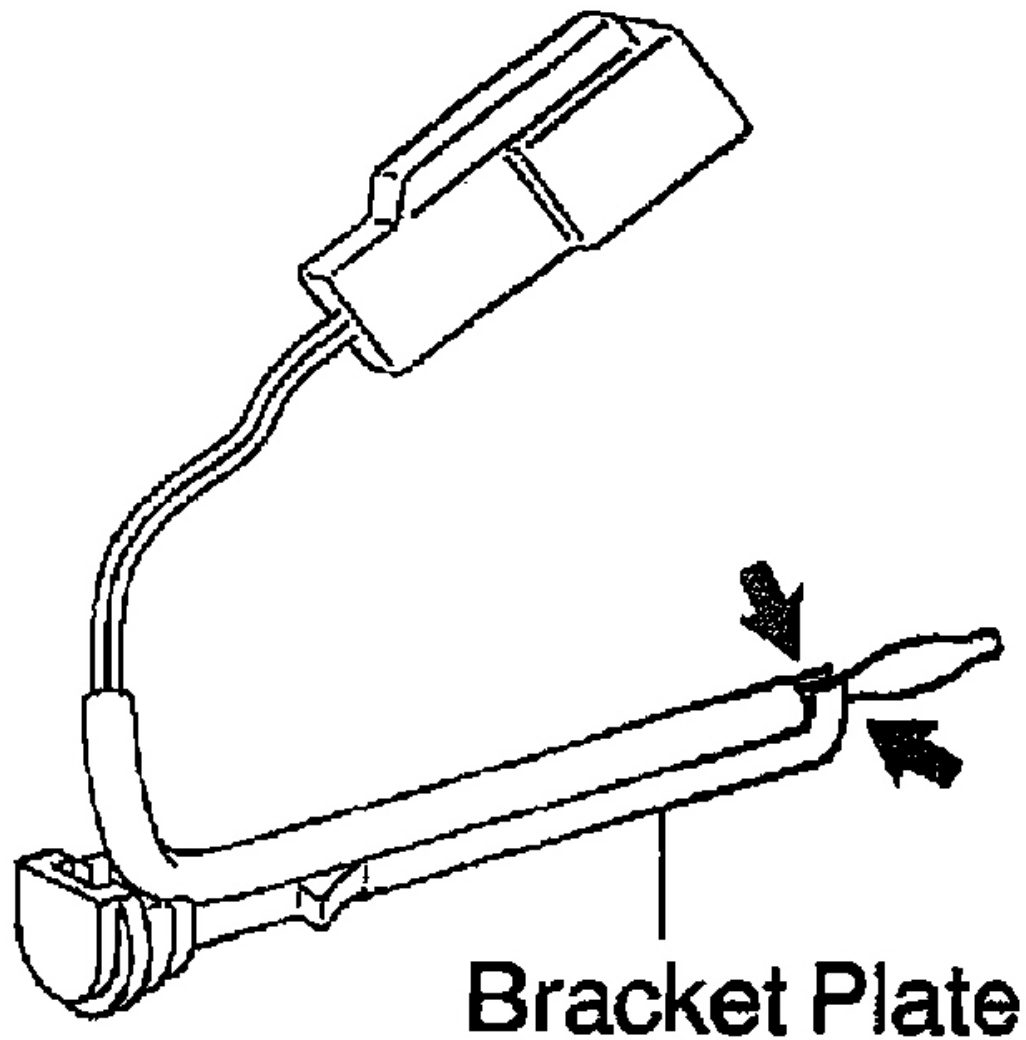


Fig. 124: Locating Thermistor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the connector clamp.
- c. Release the 4 claws and remove the harness.
- d. Using a screwdriver, pull out the thermistor from the A/C unit.

NOTE: **Tape the screwdriver tip before use.**

- e. Release the 2 claws and remove the thermistor from the bracket plate.



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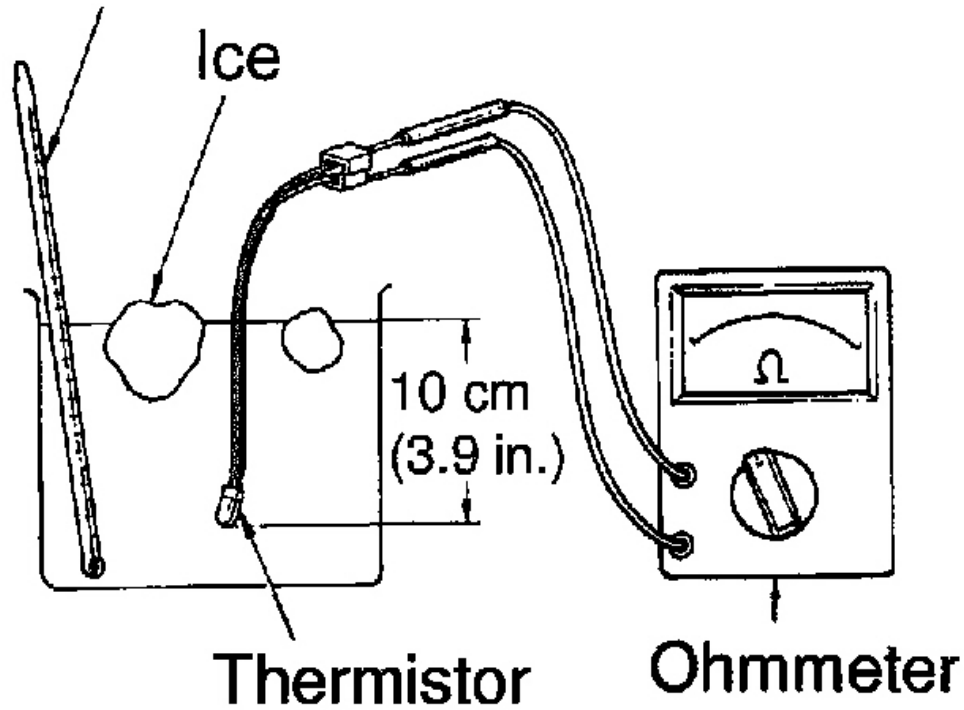
Fig. 125: Identifying Bracket Plate

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Inspect thermistor .

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

Thermometer

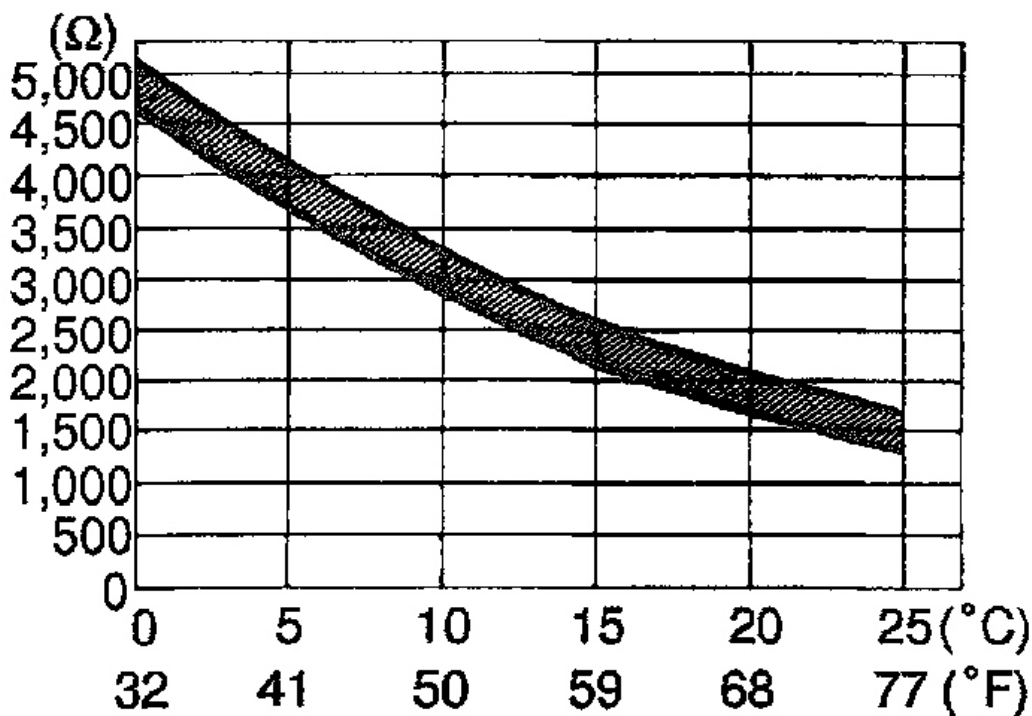


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Fig. 126: Inspecting Thermistor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Compare the 2 readings on the graphs.



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Fig. 127: Displaying Resistance & Temperature Graph
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If resistance is not as specified, replace the thermistor.

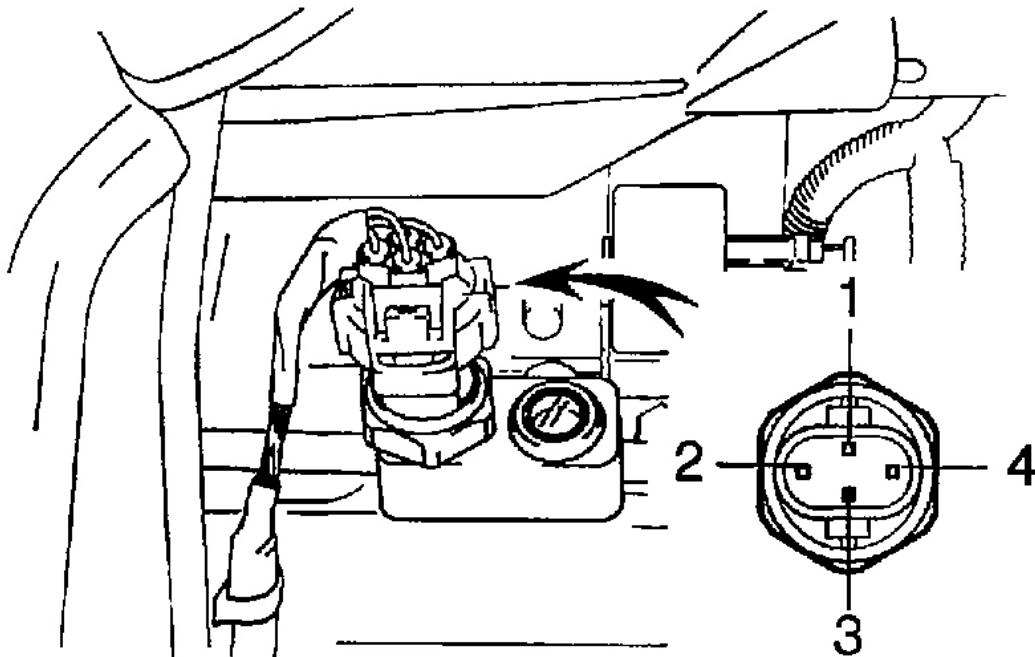
4. **Reinstall thermistor .**
 - a. Install the thermistor to the bracket plate.
 - b. Install the thermistor to the A/C unit case.
 - c. Connect the connector clamp.
 - d. Connect the thermistor connector.
5. **Reinstall blower unit (See REMOVAL .**

PRESSURE SWITCH

ON-VEHICLE INSPECTION

1. **Set On Manifold Gauge Set See SET ON .**

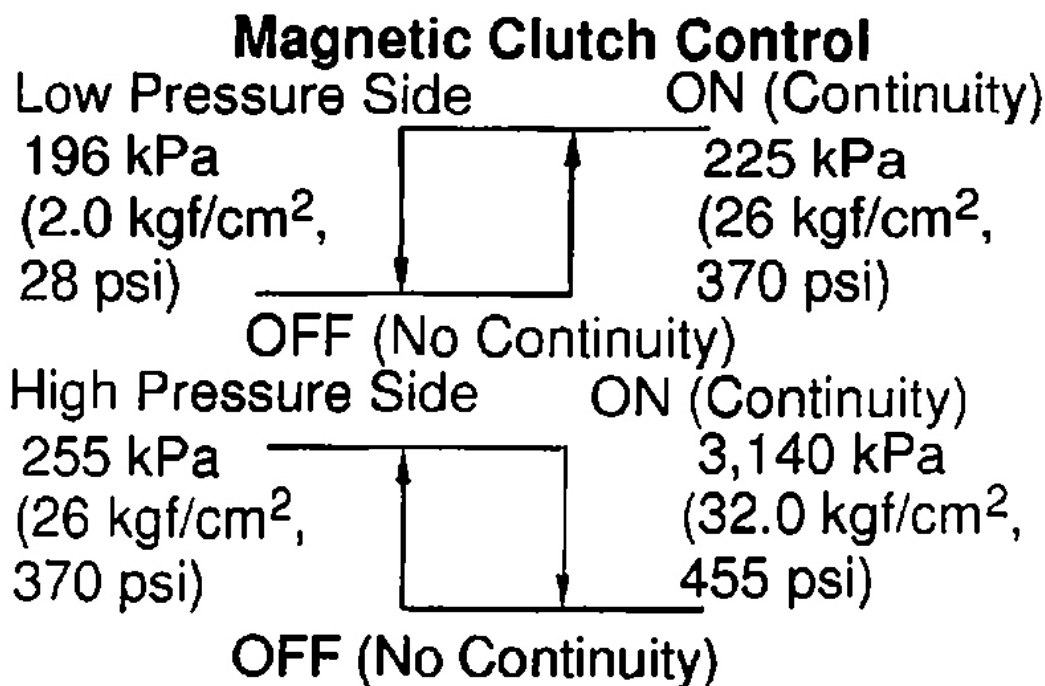
2. **Disconnect connector from pressure switch .**
3. **Run Engine At Approx. 1500 RPM**



G01084541

Fig. 128: Disconnecting Connector From Pressure Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **Magnetic Clutch Control: Inspect Pressure Switch Operation:**
 - a. Connect the positive (+) lead from the ohmmeter to terminal 3 and the negative (-) lead to terminal 1.
 - b. Check continuity between terminals when refrigerant pressure is charged, as shown in **Fig. 129** .



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Fig. 129: Displaying Magnetic Clutch Control Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

5. Condenser fan control: Inspect pressure switch operation

- a. Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (-) lead to terminal 4.
- b. Check continuity between terminals when refrigerant pressure is changed, as shown in **Fig. 130**.

Condenser Fan Control

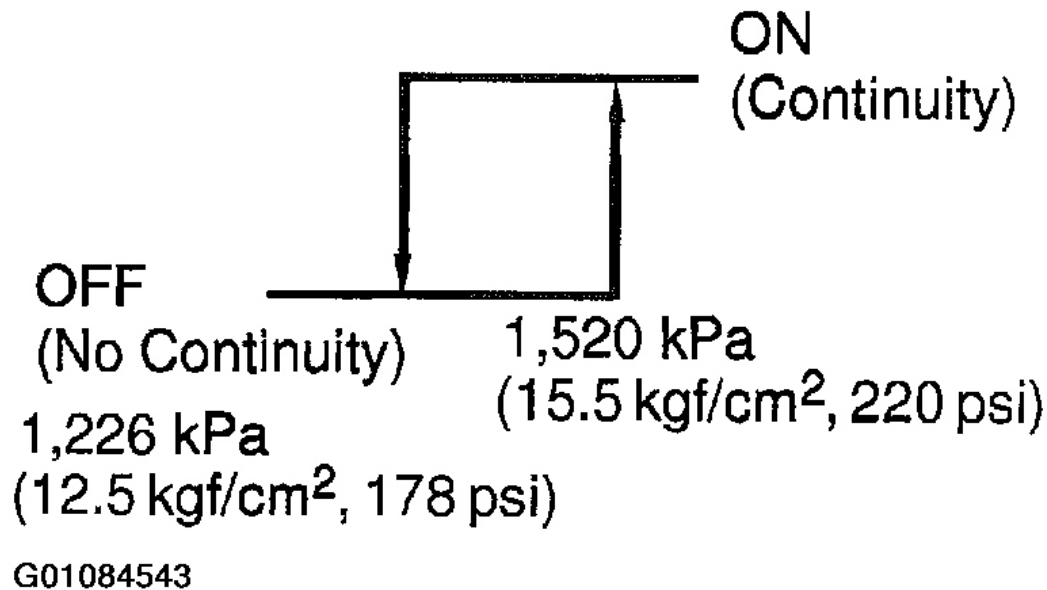


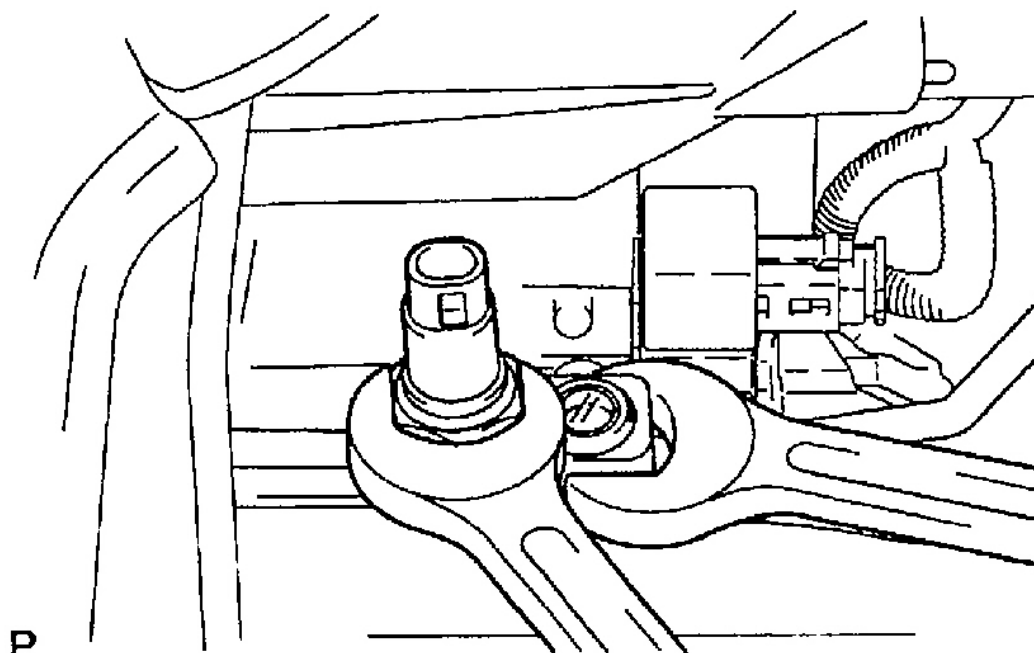
Fig. 130: Displaying Condenser Fan Control Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

6. **Stop Engine And Set Off Manifold Gauge Set**
7. **Reconnect Connector To Pressure Switch**

REMOVAL

1. **Discharge Refrigerant From Refrigerant System See EVACUATING .**
2. **Remove Pressure Switch**
 - a. Disconnect the pressure switch connector.
 - b. Remove the pressure switch from the liquid tube.



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Fig. 131: Removing Pressure Switch

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.

INSTALLATION

1. Install Pressure Switch

- a. Coat a new O-ring with compressor oil.
- b. Install the pressure switch to the liquid tube.

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

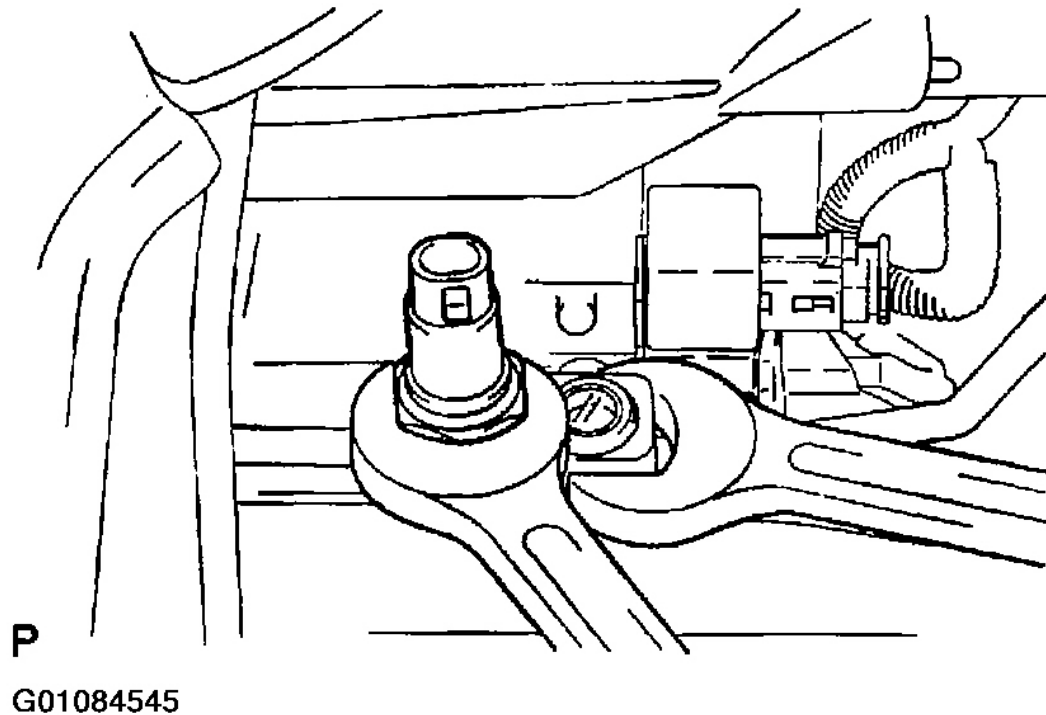


Fig. 132: Installing Pressure Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Charge Refrigerant To Refrigerant System** See **CHARGING** .
 - a. Evacuate air from the refrigeration system.
 - b. Charge system with refrigerant and inspect for leakage of refrigerant.
Specified amount: 500 +/- 50 g (17.64 +/- 1.76 oz.)

HEATER MAIN RELAY

INSPECTION

1. **Remove Heater Main Relay (Marking: Htr) From Engine Room J/b**

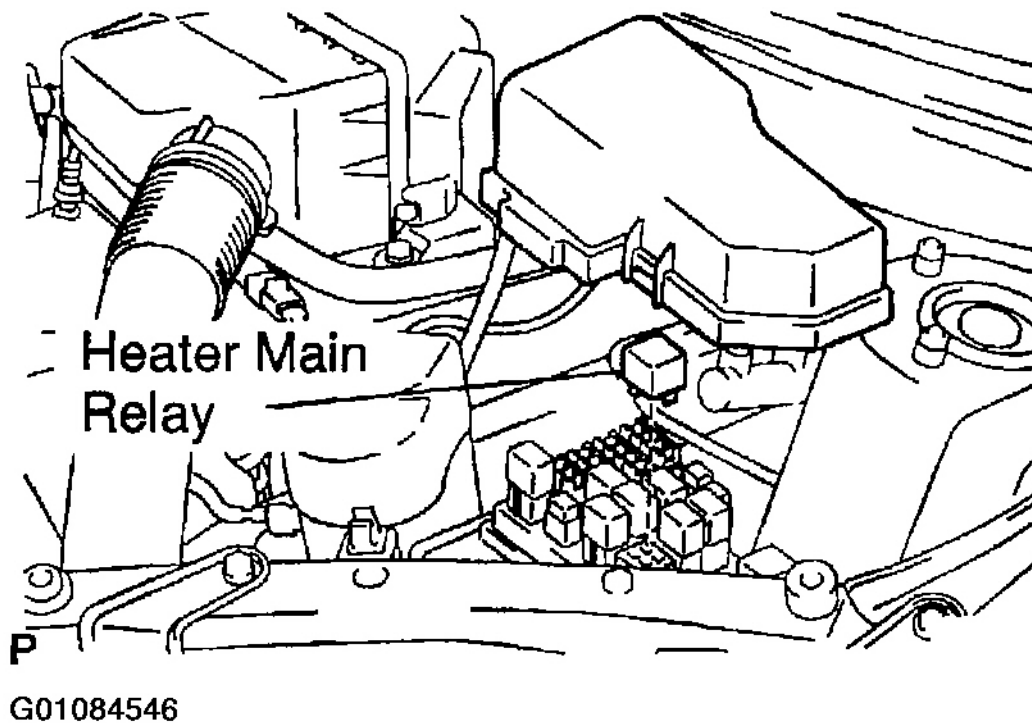


Fig. 133: Locating Heater Main Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Inspect Heater Main Relay

a. Inspect the relay continuity.

1. Using an ohmmeter, check that there is continuity between terminals 1 and 2.

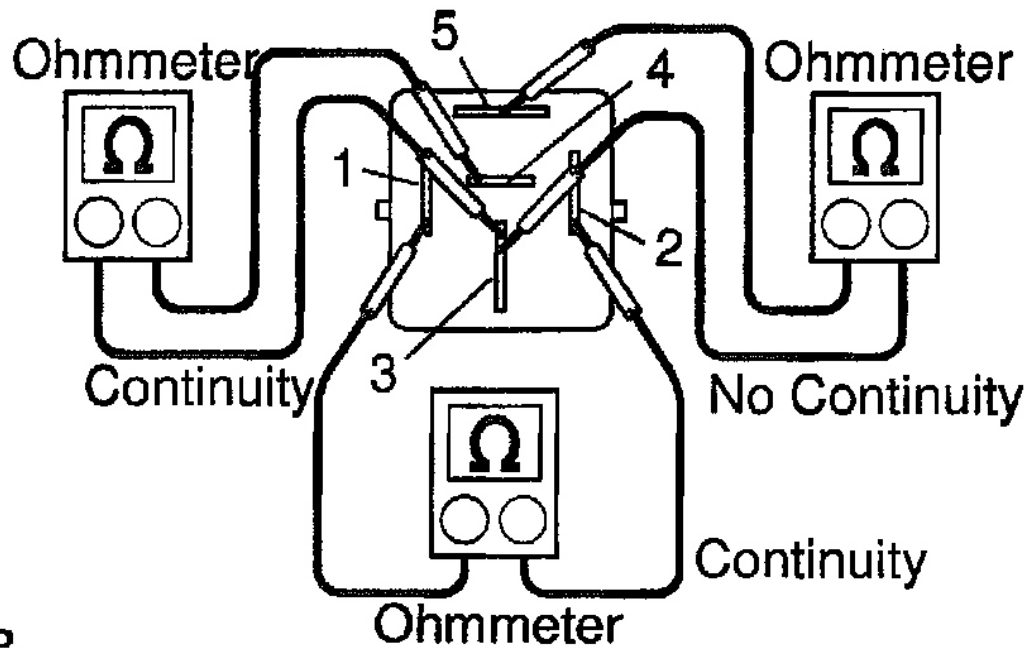
If there is no continuity, replace the relay.

2. Check that there is continuity between terminals 3 and 4.

If there is no continuity, replace the relay.

3. Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



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Fig. 134: Inspecting Relay Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Inspect the relay operation.
1. Apply battery positive voltage across terminals 1 and 2.
 2. Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

3. Check that there is no continuity between terminals 3 and 4.

If there is continuity, replace the relay.

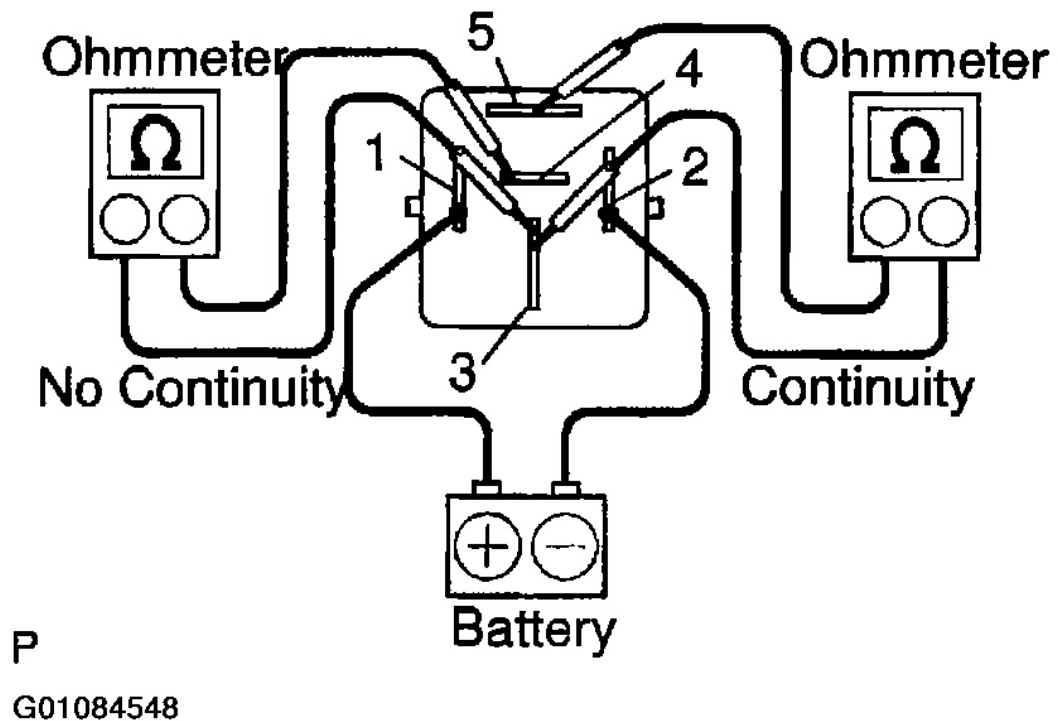


Fig. 135: Inspecting Relay Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Reinstall heater main relay .

CONDENSER FAN

ON-VEHICLE INSPECTION

1. Inspect condenser fan operation .

Inspect the fan operation at these condition, as shown in the table.

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)
Engine coolant temp. 88°C (190°F) or below	Rotated (Low speed)
Engine coolant temp. 98°C (208°F) or above	Rotated (High speed)
Refrigerant pressure is less than 1,520 kPa (15.5 kgf/cm ² , 220 psi)	Rotated (Low speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf/cm ² , 220 psi) or above	Rotated (High speed)

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Fig. 136: Displaying Condenser Fan Operation Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

2. Inspect condenser fan motor operation .

- a. Disconnect the connector.
- b. Connect the battery and ammeter as shown in illustration.
- c. Check that the fan rotates smoothly, and then check the reading on the ammeter.

Specified amperage: 9.2 - 11.0 A at 20°C (68°F)

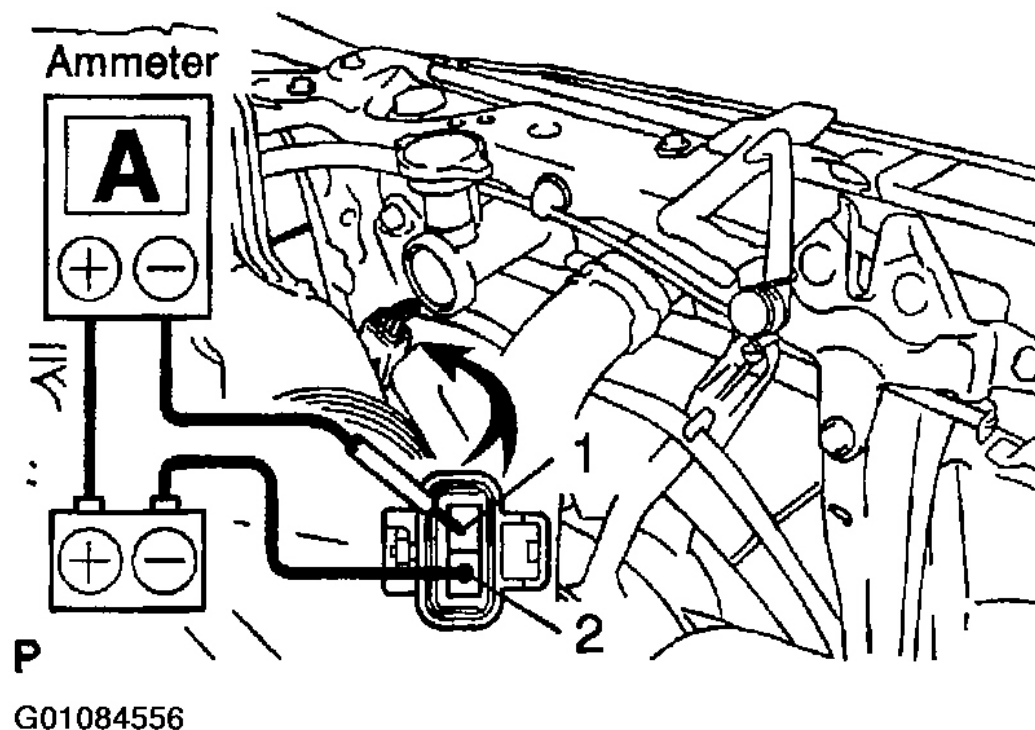
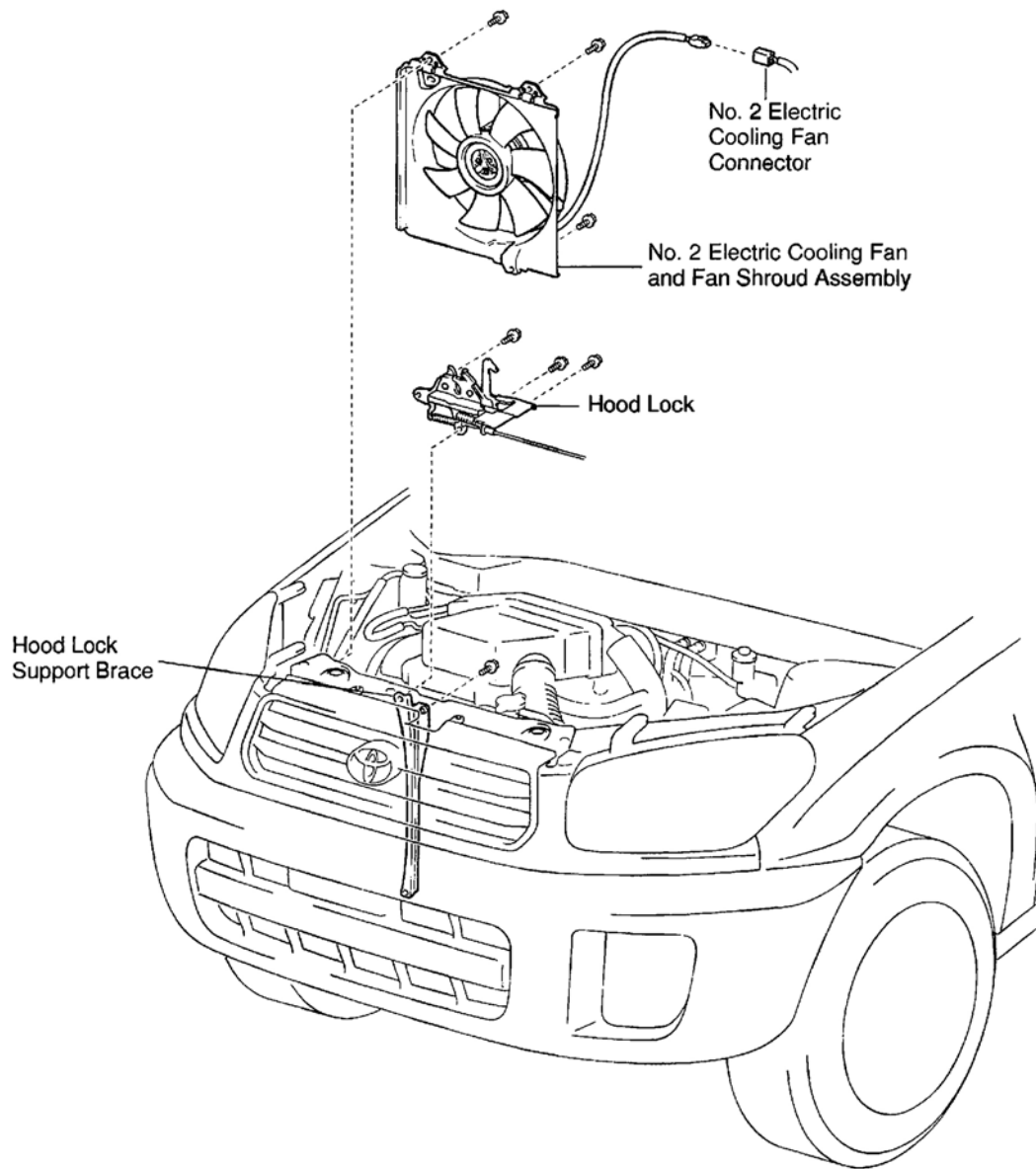


Fig. 137: Inspecting Condenser Fan Motor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

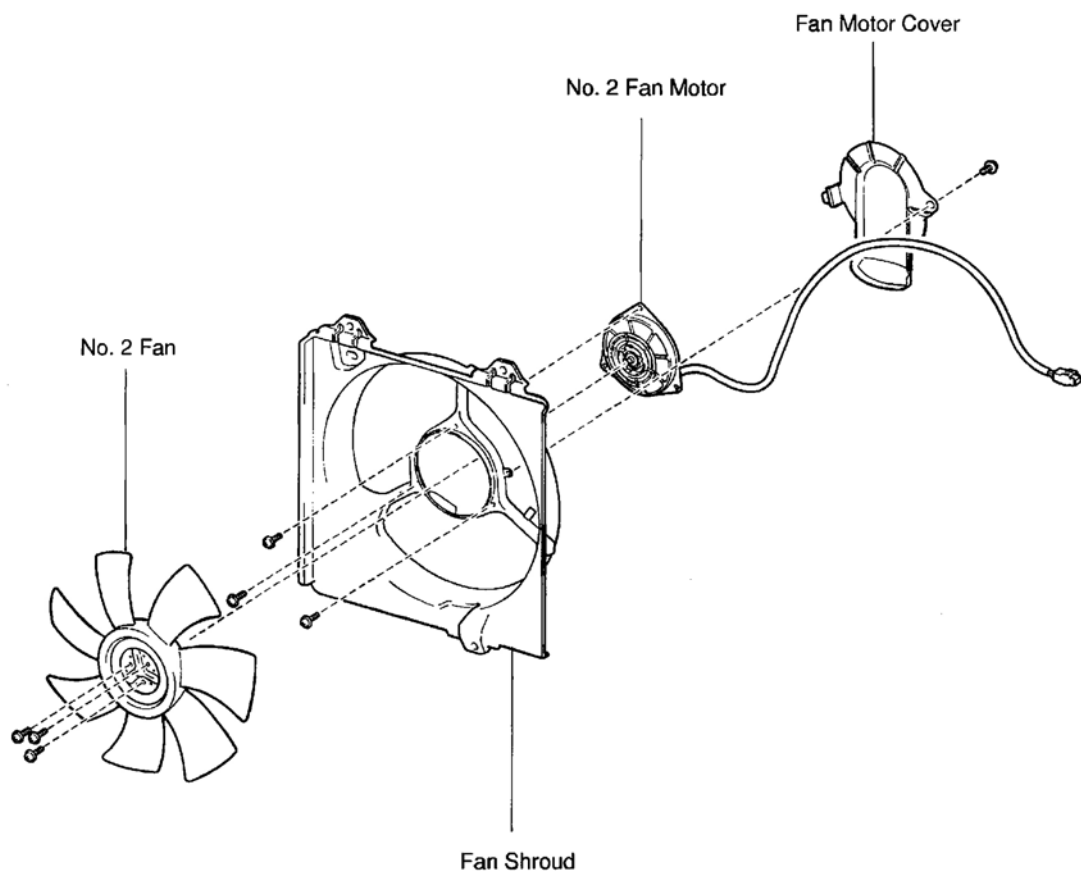
If operation is as specified, check the pressure switch, cooling fan relays and water temperature switch.

COMPONENTS



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Fig. 138: Displaying Condenser Fan Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

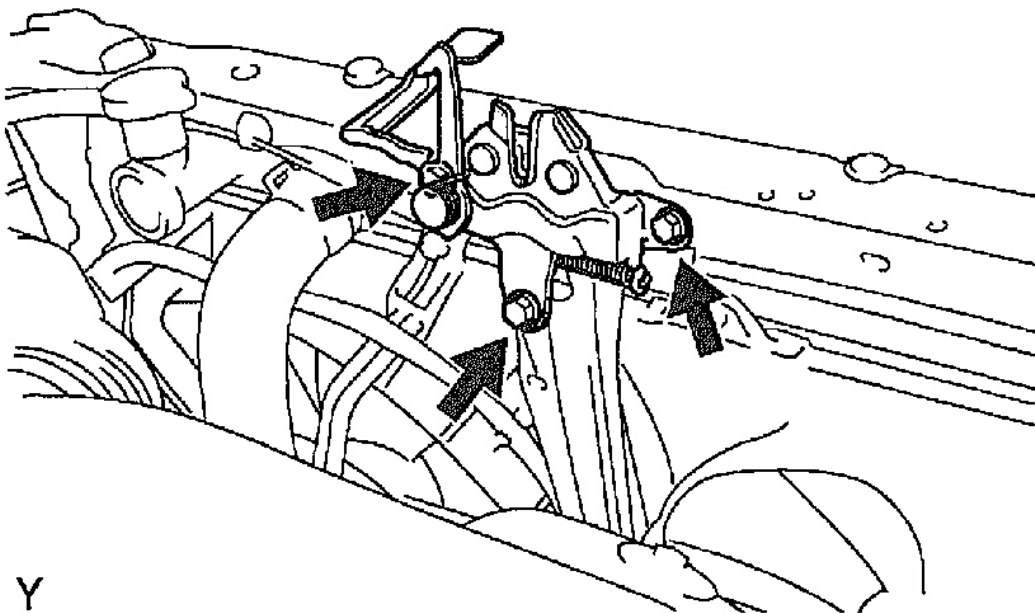


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Fig. 139: Displaying Condenser Fan Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. Remove Hood Lock



Y

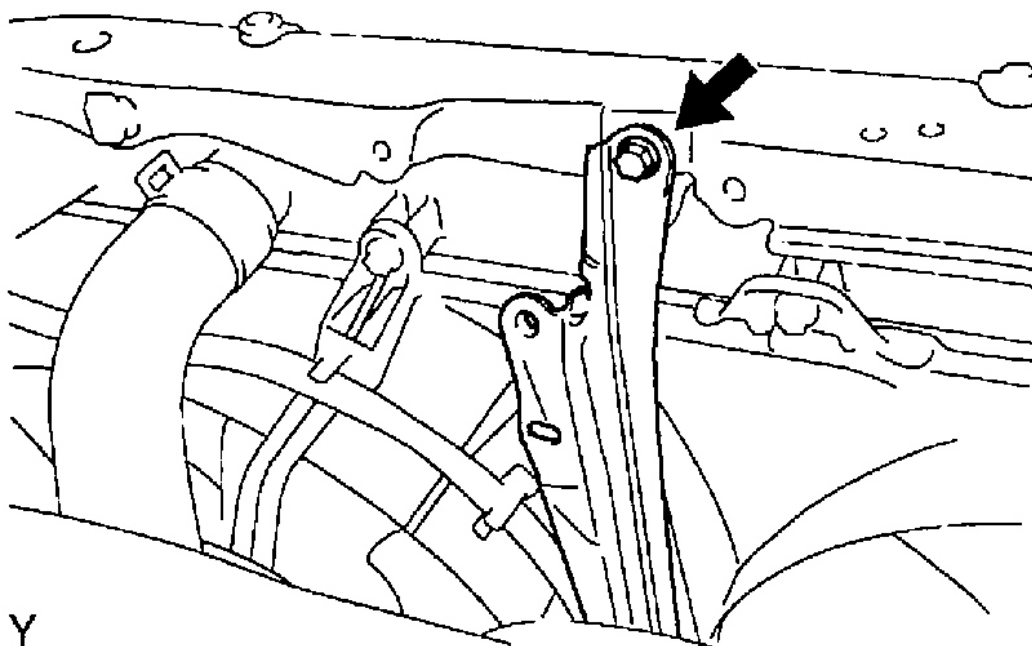
G01084559

Fig. 140: Removing Hood Lock

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Remove the 3 bolts and hood lock.

2. Disconnect Hood Lock Support Brace



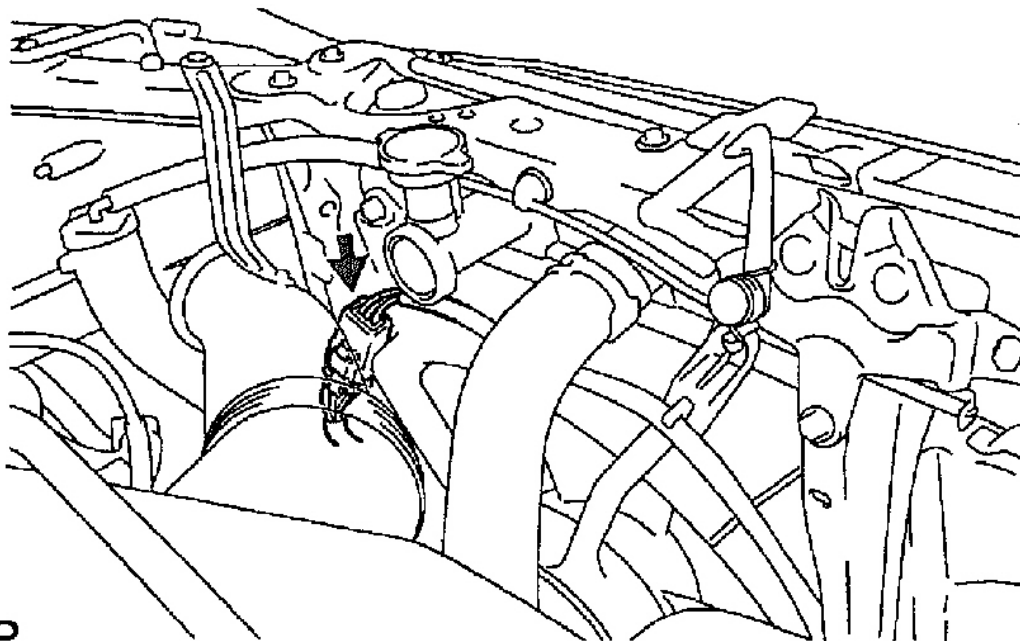
Y

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Fig. 141: Disconnecting Hood Lock Support Brace
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Remove the bolt.

3. **Remove No. 2 Electric Cooling Fan And Fan Shroud Assembly .**
 - a. Disconnect the No. 2 electric cooling fan connector and clamp.

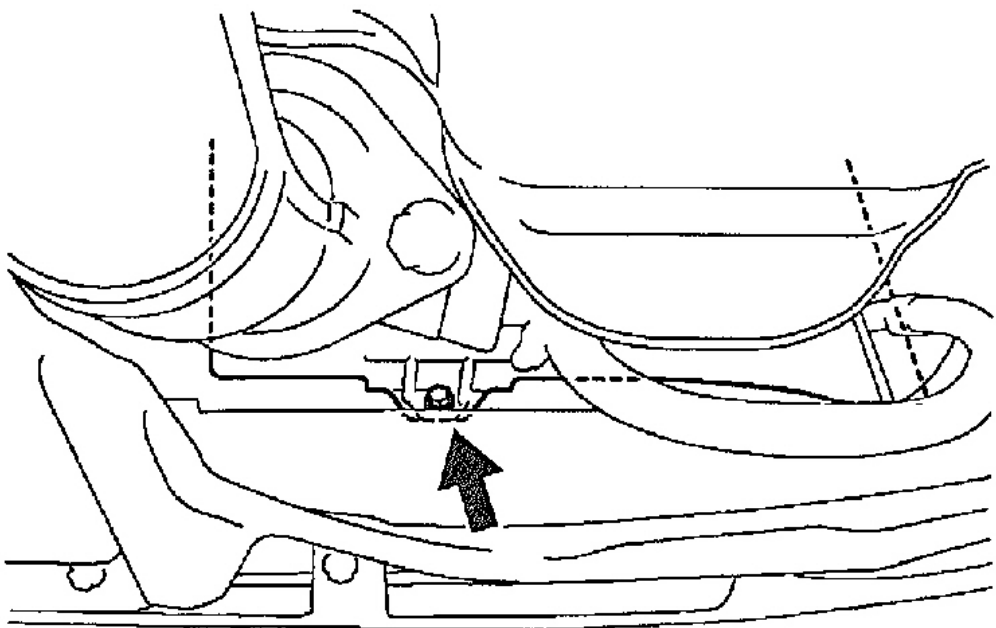
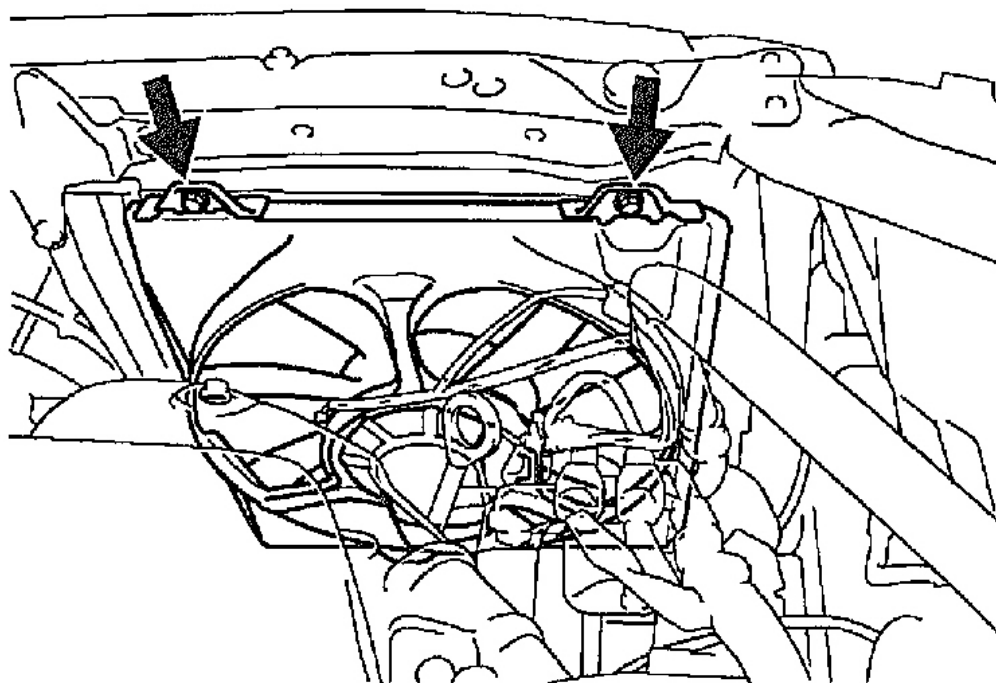


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Fig. 142: Disconnecting No. 2 Electric Cooling Fan Connector & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 bolts, the No. 2 electric cooling fan and fan shroud assembly.



Y

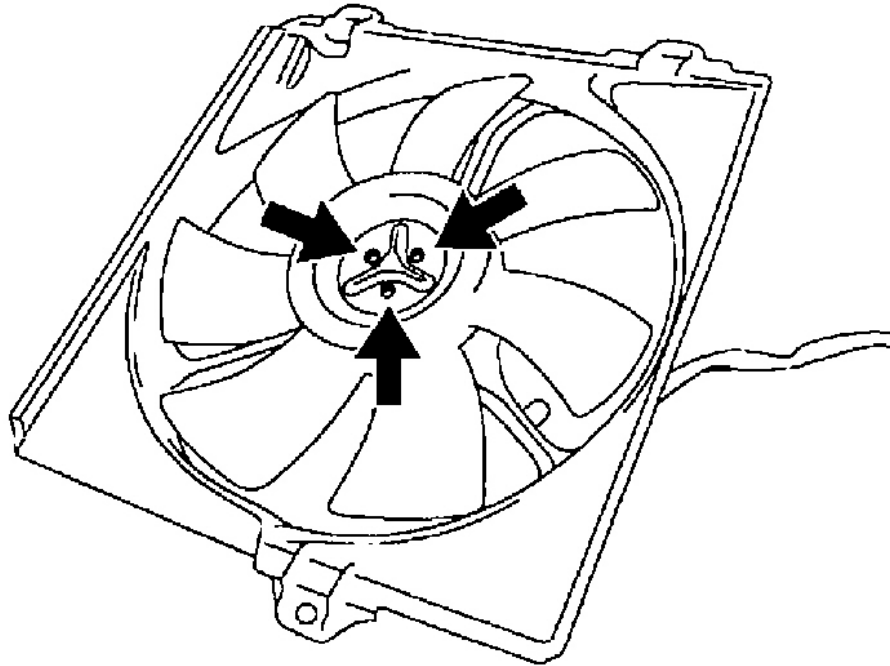
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Fig. 143: Removing No. 2 Electric Cooling Fan Connector & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. Remove No. 2 Fan

Remove the 3 screws and No. 2 fan.



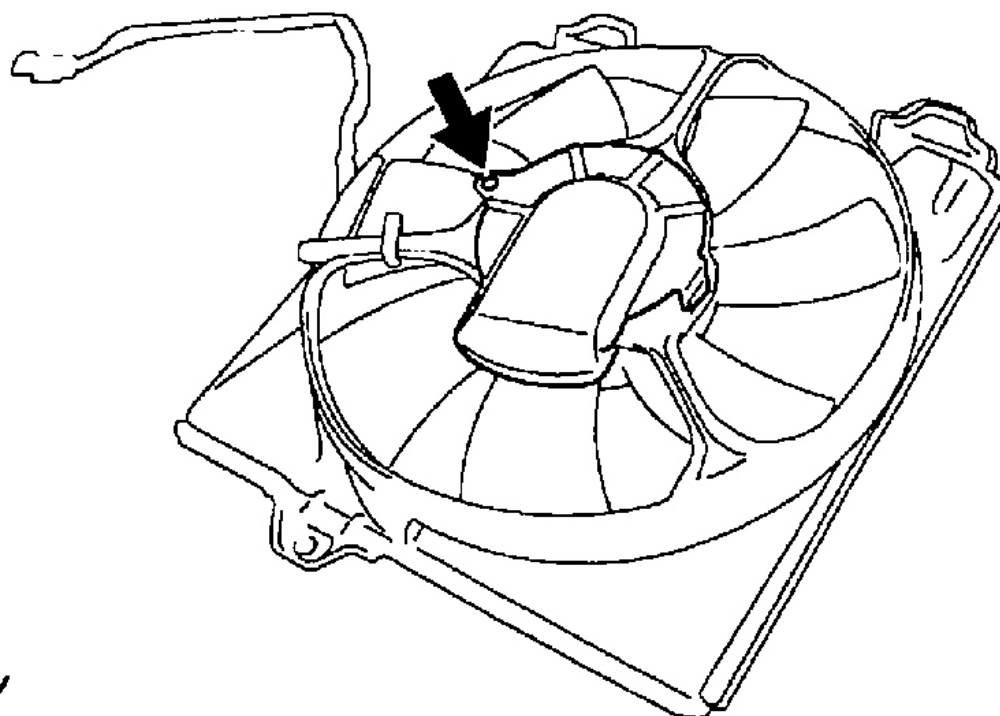
Y

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Fig. 144: Removing No. 2 Fan
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove No. 2 Fan Motor

- a. Remove the screw and fan motor cover.

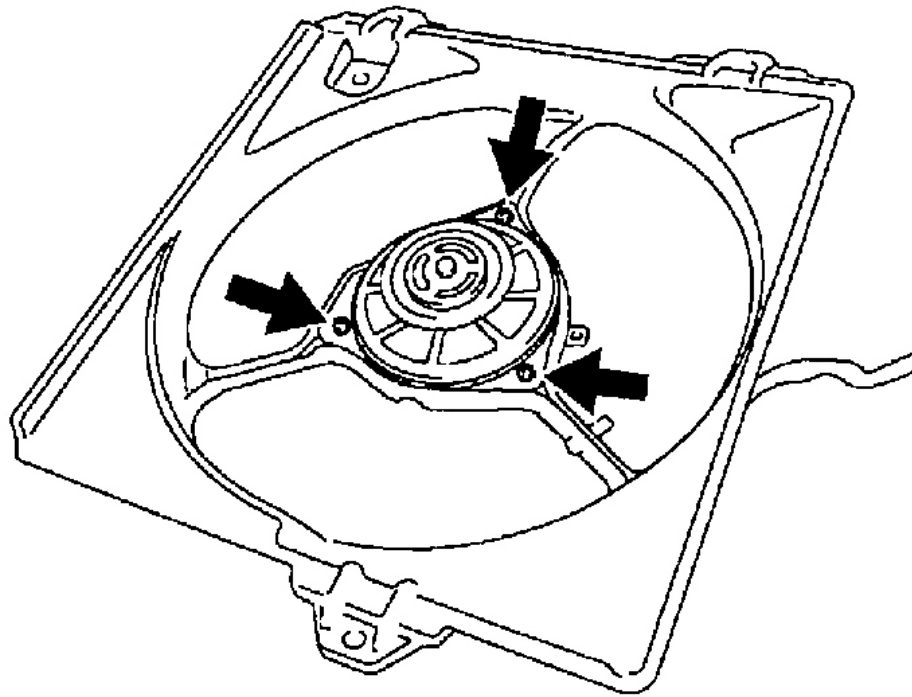


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Fig. 145: Removing No. 2 Fan Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 screws and No. 2 fan motor.



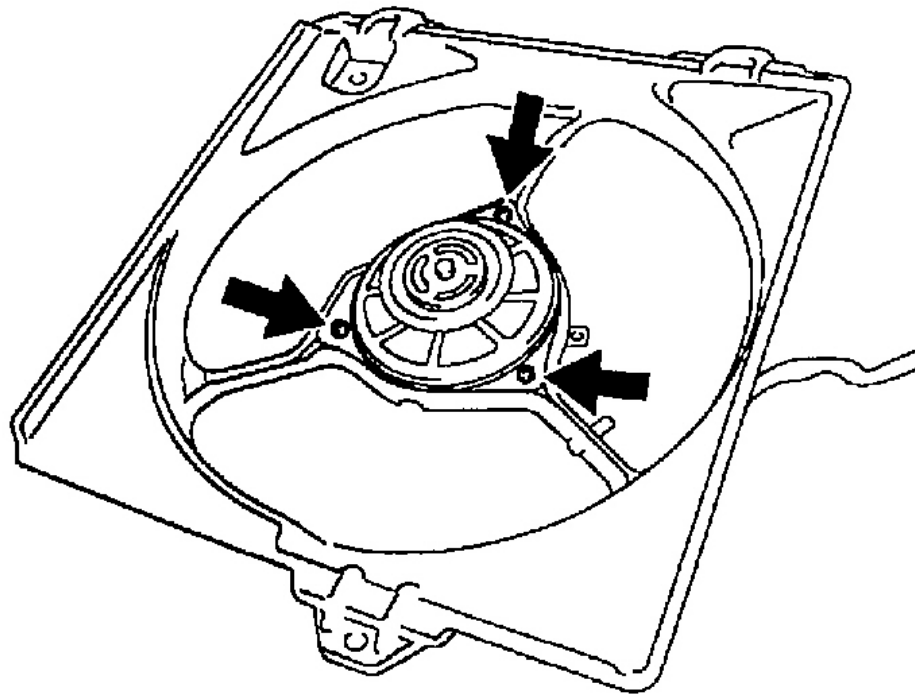
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Fig. 146: Removing Screws & No. 2 Fan Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. **Install No. 2 Fan Motor**
 - a. Install the No. 2 fan motor with the 3 screws.

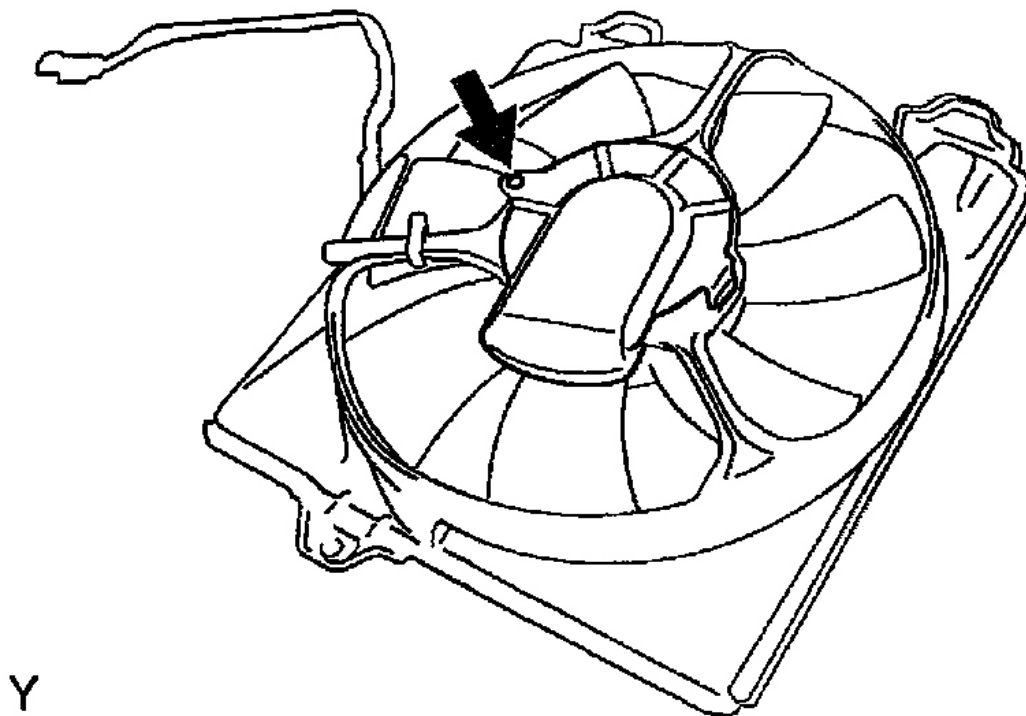


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Fig. 147: Installing No. 2 Fan Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the fan motor cover with the screw.



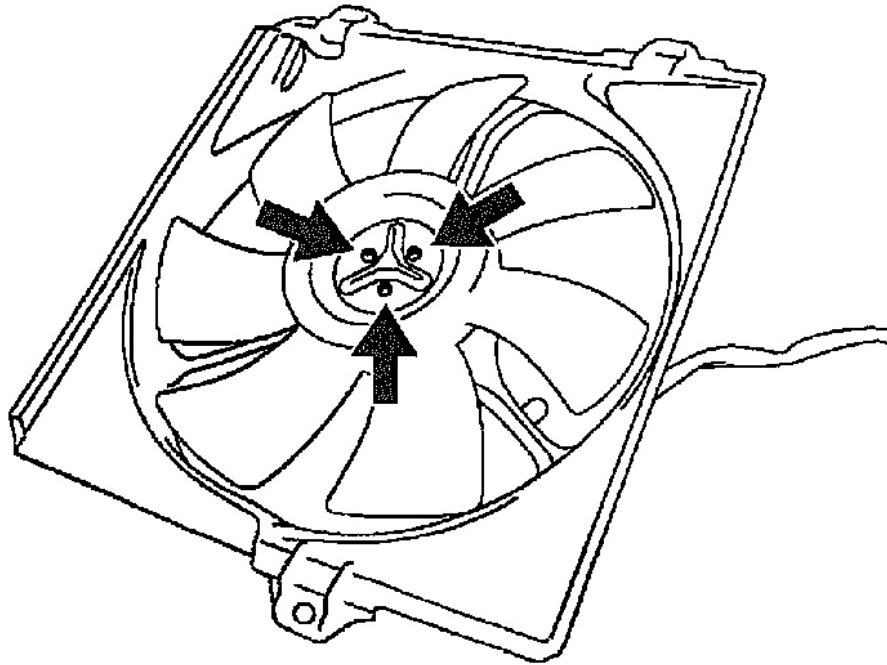
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Fig. 148: Installing No. 2 Fan Motor Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Install No. 2 Fan On Motor

Install the No. 2 fan with the 3 screws.



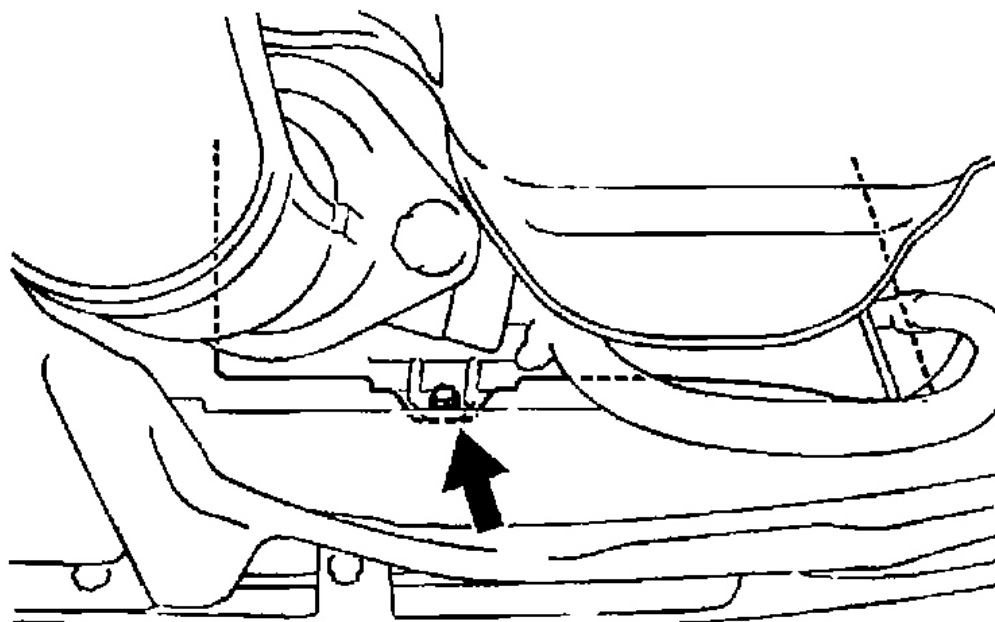
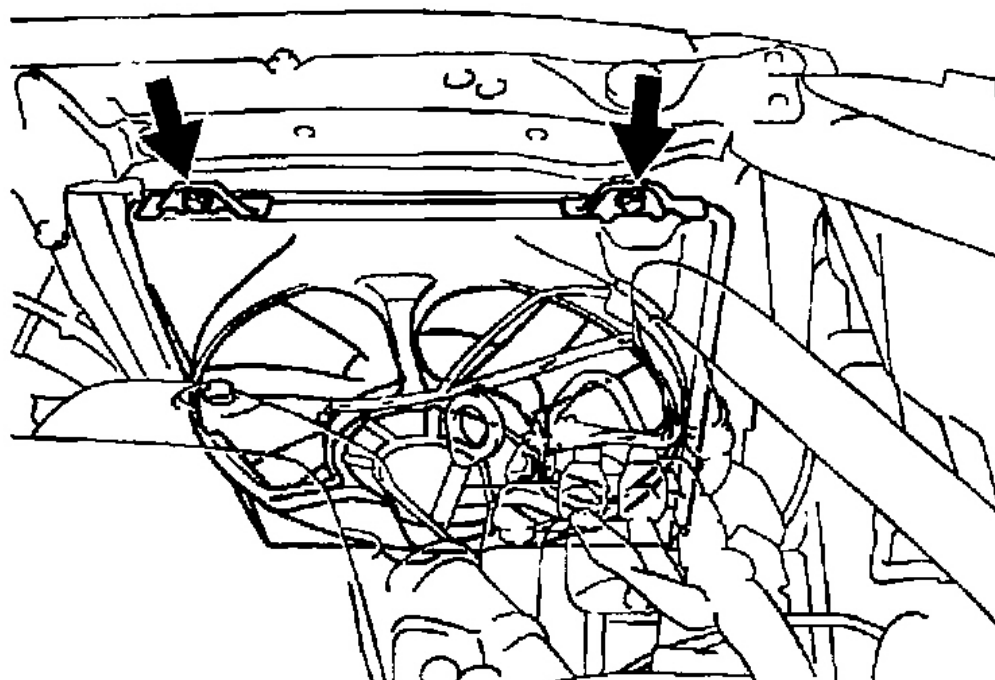
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Fig. 149: Installing No. 2 Fan On Motor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

- 1. Install No. 2 Electric Cooling Fan & Fan Shroud Assembly .**
 - a. Install the No. 2 electric cooling fan and fan shroud assembly with the 3 bolts.

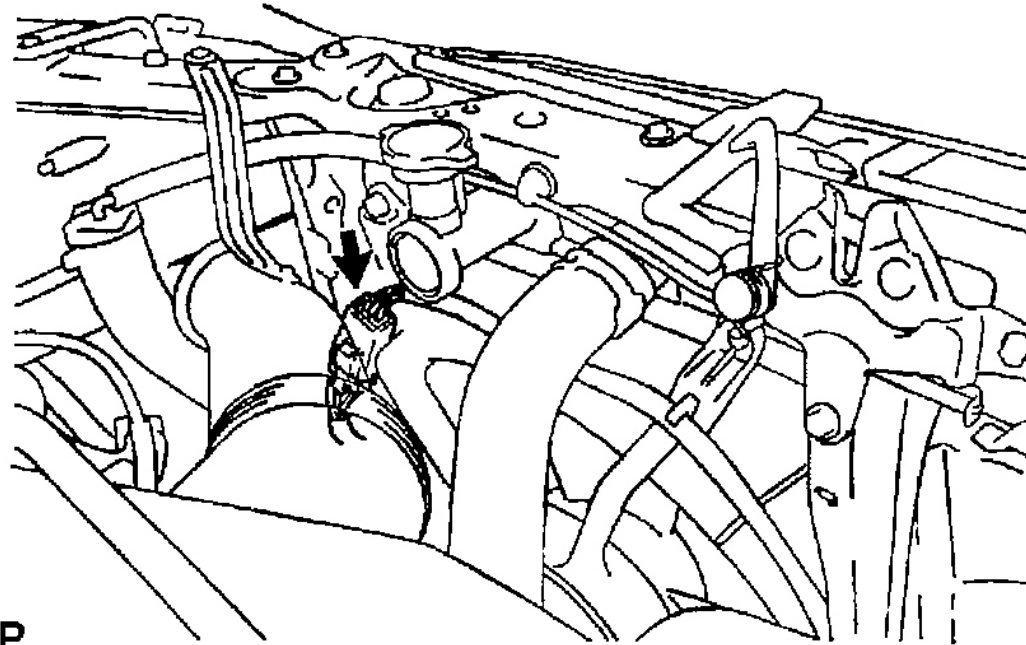


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Fig. 150: Installing No. 2 Electric Cooling Fan & Fan Shroud Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the No. 2 electric cooling fan connector and clamp.



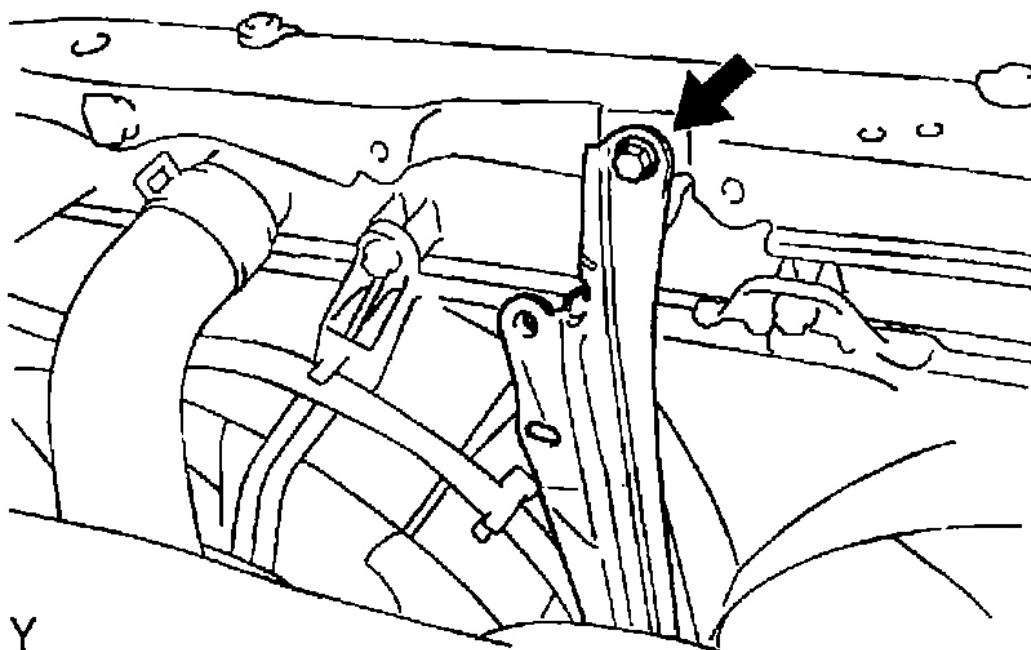
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Fig. 151: Connecting No. 2 Electric Cooling Fan Connector & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Install Hood Lock Support Brace

Install the bolt.



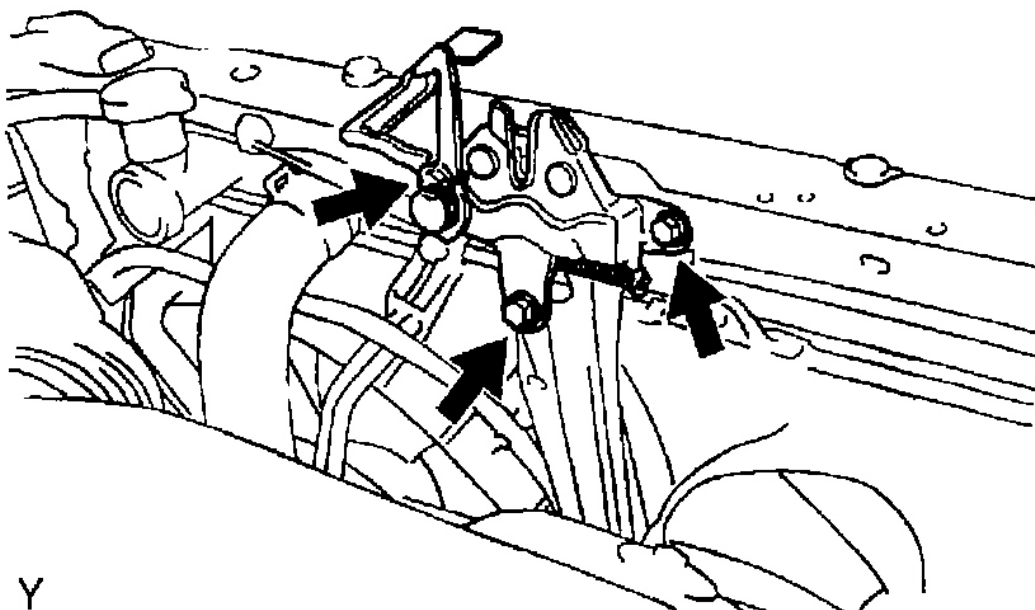
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Fig. 152: Installing Hood Lock Support Brace
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **Install Hood Lock**

Install the hood lock with the 3 bolts.



Y

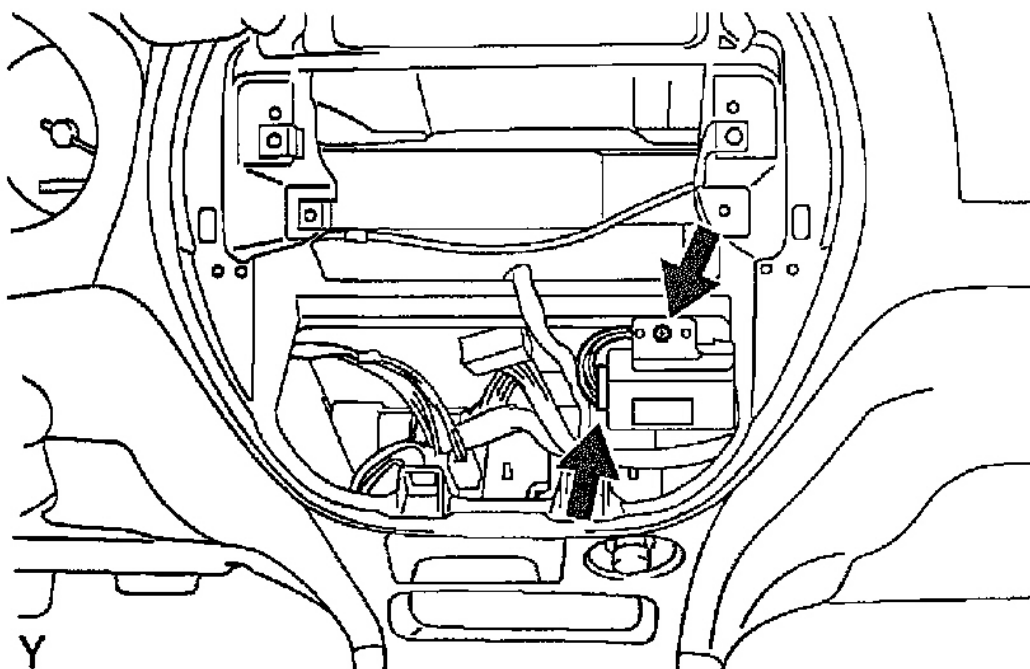
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Fig. 153: Installing Hood Lock
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

AIR CONDITIONING AMPLIFIER

ON-VEHICLE INSPECTION

1. **Remove Heater Control Panel** See **REMOVAL** .
2. **Inspect Amplifier Circuit**
 - a. Disconnect the amplifier connector.
 - b. Remove the screw and amplifier from the instrument panel.



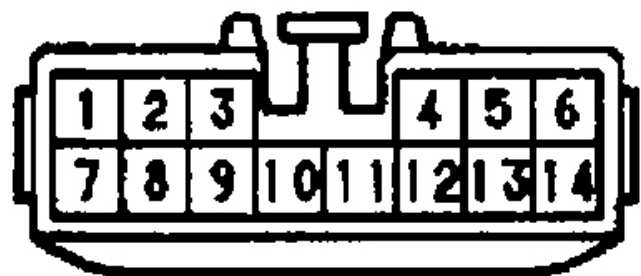
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Fig. 154: Removing Screws & Amplifier

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Inspect the connector on wire harness side. Refer to **Fig. 155** and **Fig. 156** .

Wire Harness Side



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Fig. 155: Displaying Connector Terminals On Wire Harness Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Test conditions:

- Ignition switch ON
- Temperature damper control dial at "MAX. COOL" position
- Blower speed control switch at "HI" position

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
8 – 5	A/C switch ON	10 – 14 V
	Defroster damper control dial DEF. position	
	A/C switch OFF	0 V
9 – 13	Evaporator temperature at 25°C (77°F)	Approx. 1.5 kΩ
14 – 13	Constant	Approx. 115 Ω at 20°C (68°F)
10 – 5	A/C switch ON	1.0 V or more
	A/C switch OFF	0 V

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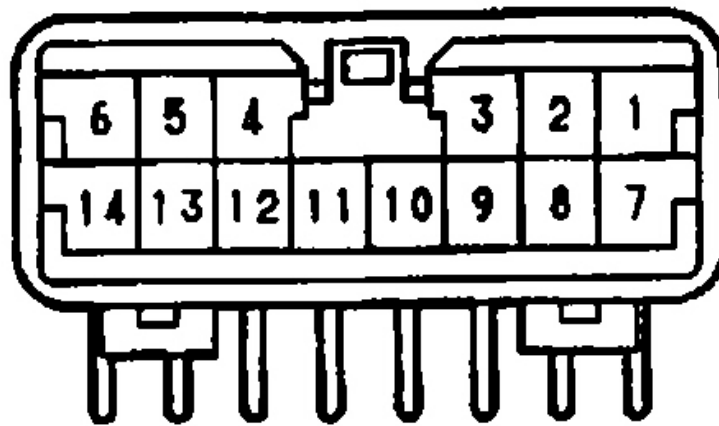
Fig. 156: Displaying Specifications Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If circuit value is not as specified, replace the amplifier.

If the circuit value is as specified, inspect the circuits connected to other parts.

- d. Connect the connector to A/C amplifier and inspect wire harness side connector from the back side. Refer to **Fig. 157** and **Fig. 158**.

From Back Side



e-14-2-F

G01084576

Fig. 157: Displaying Connector Terminals Of Harness From Back Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Test conditions:

- Running engine at idle speed
- A/C switch ON
- Temperature damper control dial at "MAX. COOL" position

- Blower speed control switch at "HI" position
- Set on manifold gauge set

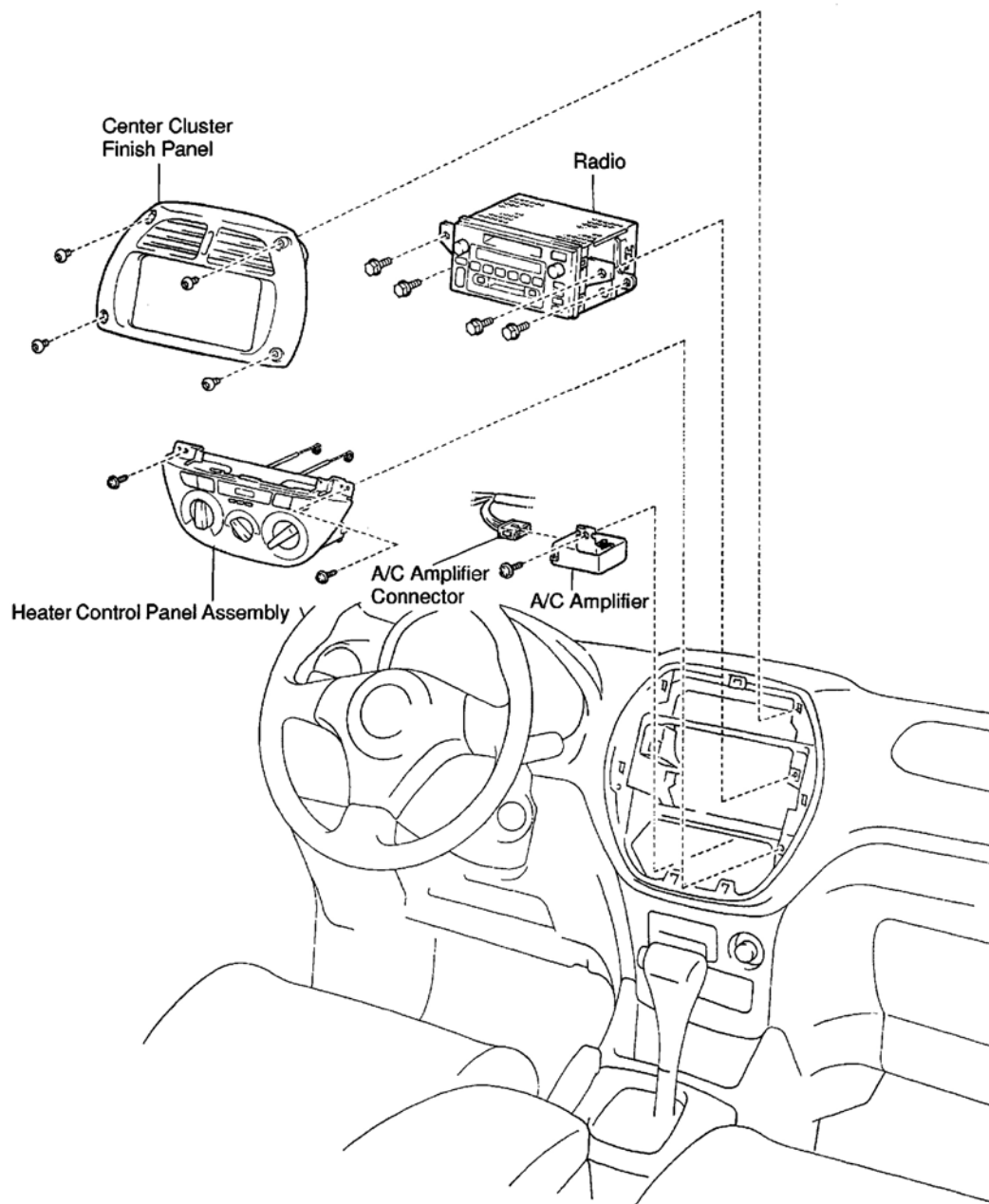
Tester connection	Condition	Specified condition
2 – 5	Refrigerant pressure 196 – 3,138 kPa	10 – 14 V
	Refrigerant pressure less than 196 kPa or more than 3,138 kPa	0 V
6 – 5	Magnetic clutch is not engaged	Below 1.0 V
	Magnetic clutch is engaged	10 – 14 V
12 – 5	A/C amplifier sends signal to engine ECU to turn magnetic clutch ON (while A/C switch is ON)	Below 1.0 V
	A/C switch OFF	10 – 14 V

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Fig. 158: Displaying Specifications Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the circuit value is not as specified, replace the amplifier. If the circuit value is as specified, inspect the circuits connected to other parts.

COMPONENTS



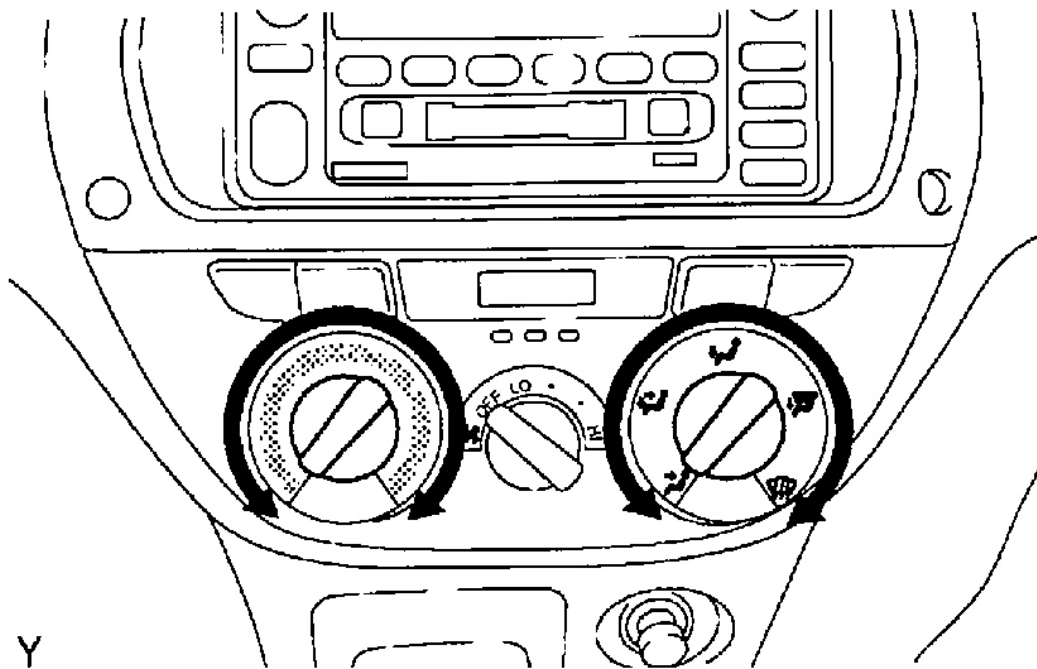
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Fig. 159: Displaying Air Conditioning Amplifier Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HEATER CONTROL ASSEMBLY

ON-VEHICLE INSPECTION

Inspect Heater Control Dials Operation



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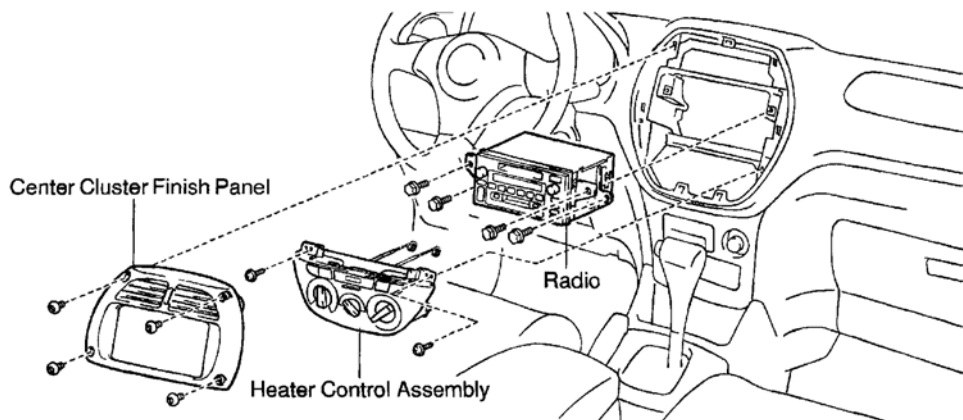
Fig. 160: Identifying Heater Control Dials

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Turn the 2 control dials left and right then check that click sound can be heard, and recoil is felt.

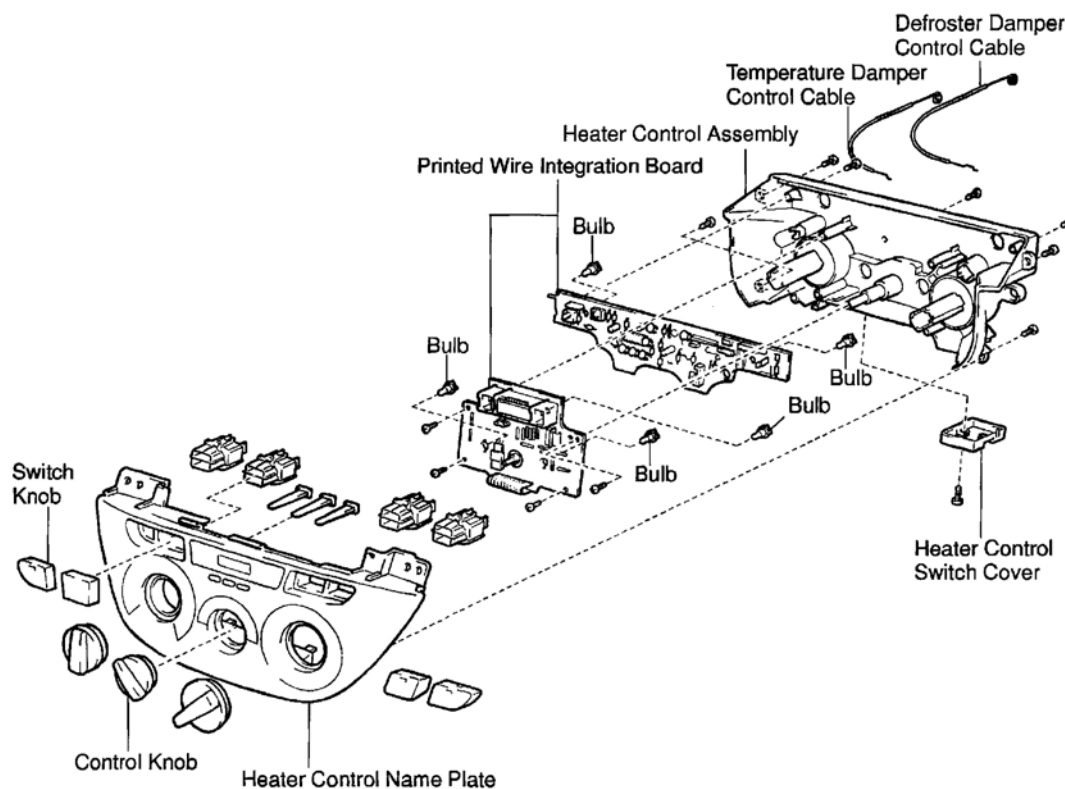
If click sound can not be heard or recoil is felt, adjust the control cable or check control cable and heater control assembly.

COMPONENTS



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Fig. 161: Displaying Heater Control Assembly Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 162: Displaying Heater Control Assembly Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. Remove Center Cluster Finish Panel

- a. Using a hexagon wrench, remove the 4 bolts.
- b. Using a screwdriver, remove the instrument cluster finish panel.

NOTE: **Tape the screwdriver tip before use.**

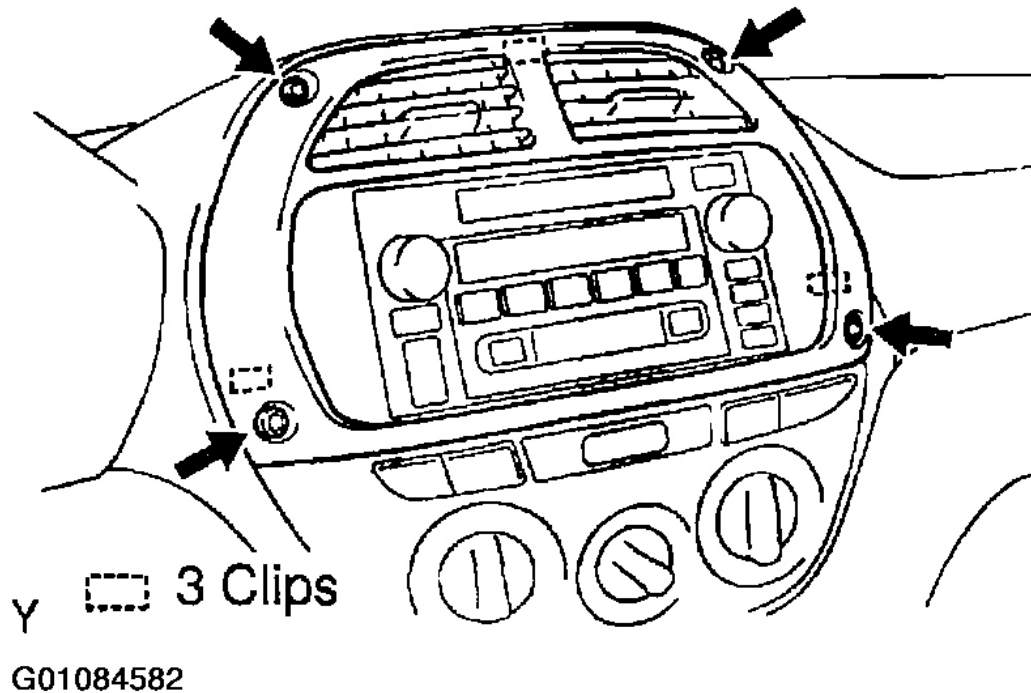


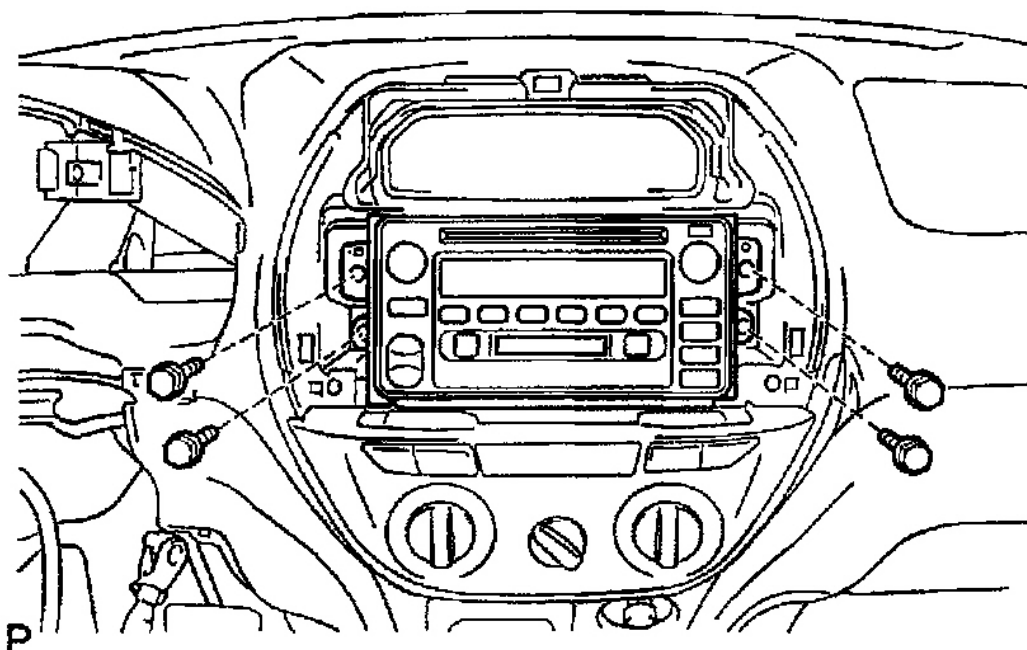
Fig. 163: Removing Instrument Finish Panel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Without Radio:

Remove the 4 bolts and stereo opening cover.

With Radio:

Remove the 4 bolts and radio, then disconnect the connectors.



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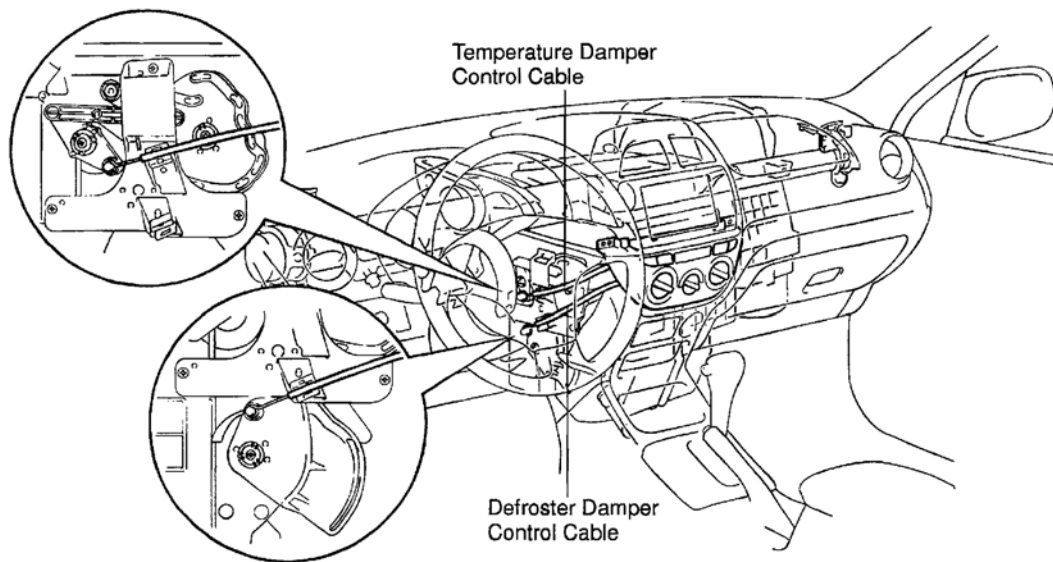
Fig. 164: Removing Radio

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Disconnect heater control cables .

Remove the No. 1 instrument panel under cover subassembly.

NOTE: When the cables are disconnected, be careful not to bend the cables.



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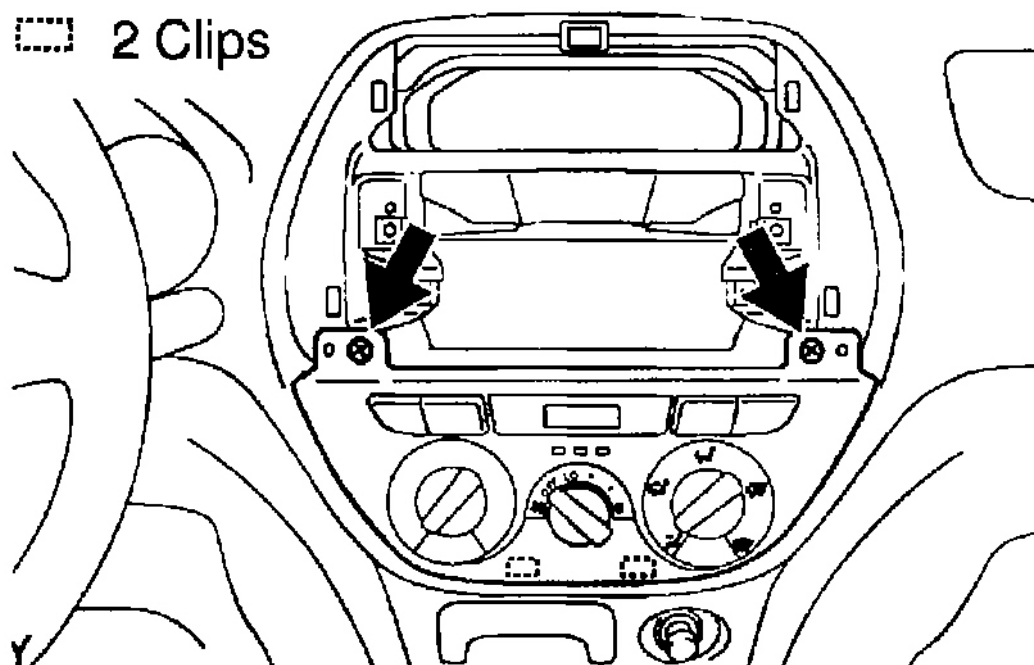
Fig. 165: Locating Temperature Damper & Defroster Damper Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Remove heater control assembly .

- a. Remove the 2 screws.
- b. Using a screwdriver, remove the heater control assembly.

NOTE: Tape the screwdriver tip before use.

- c. Disconnect the 2 connectors.

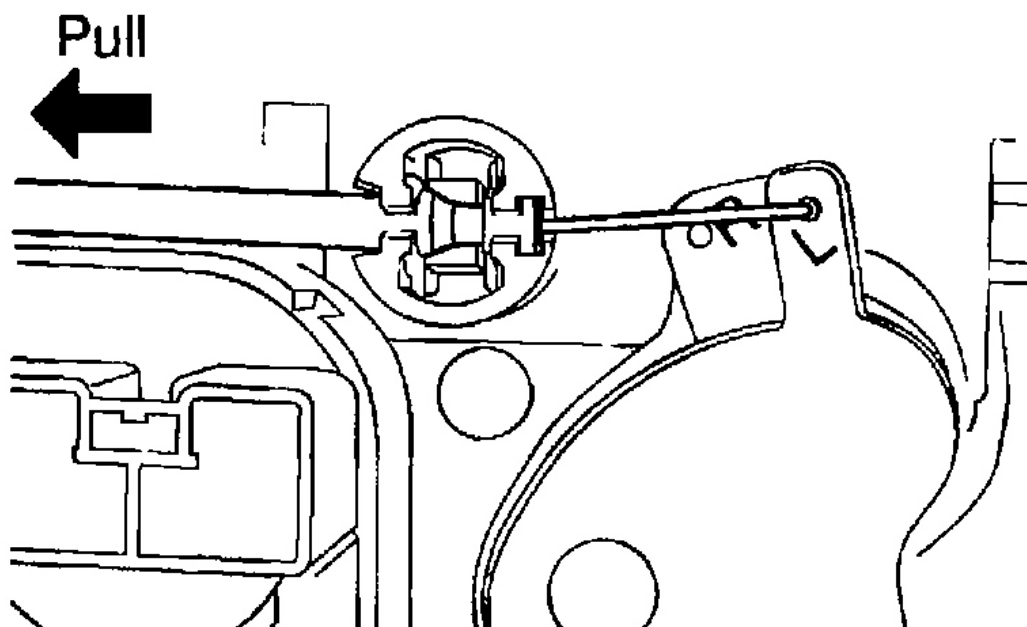


G01084585

Fig. 166: Remove Heater Control Assembly Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. **Remove Heater Control Cables**
 - a. Pull out the outer cables.
 - b. Remove the inner cables.

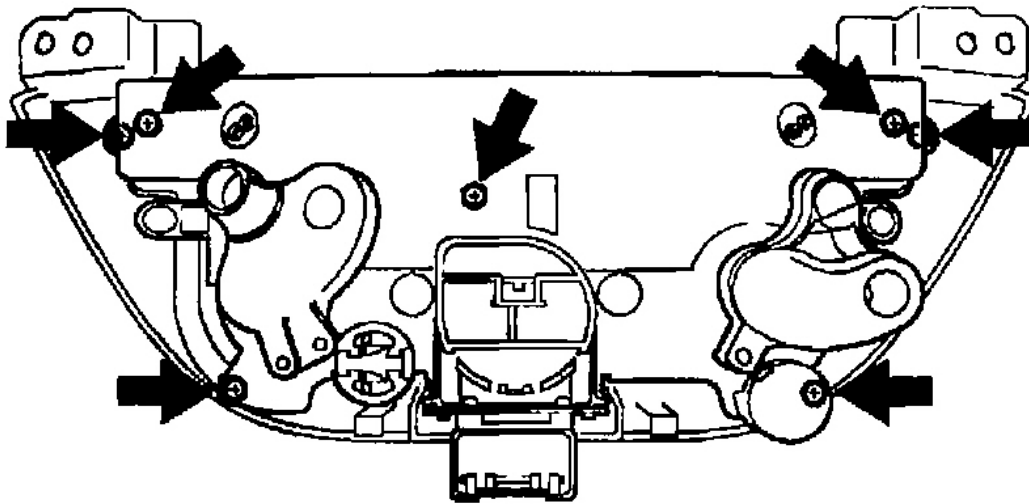


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Fig. 167: Removing Heater Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove Heater Control Name Plate

- a. Remove the 3 knobs.
- b. Remove the 7 screws.

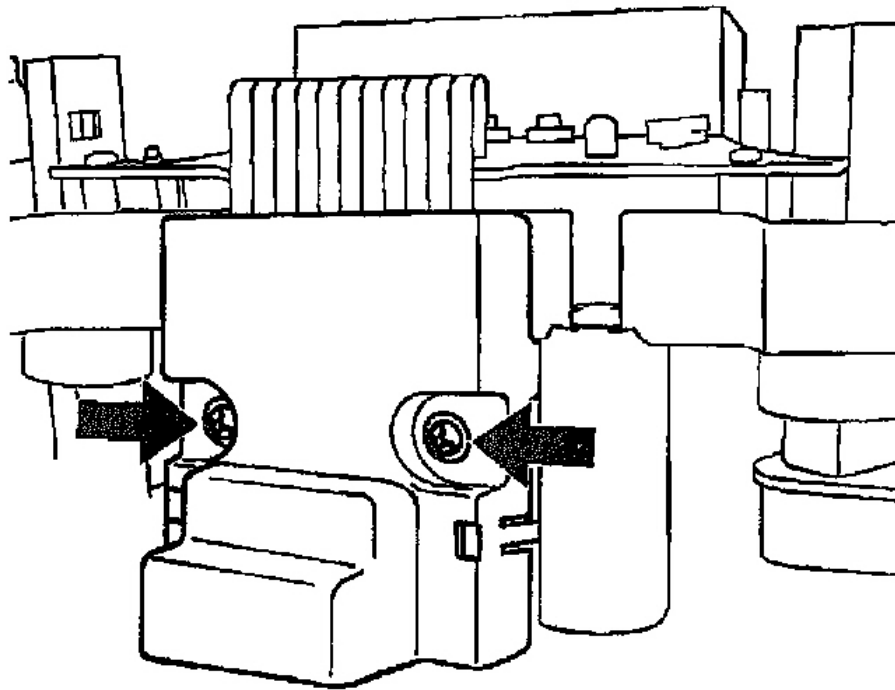


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Fig. 168: Locating & Removing Heater Control Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the heater control name plate and printed wire integration board from the heater control assembly.
3. **Remove Clock Integration Board**
 - a. Remove the 2 screws and heater control switch cover.

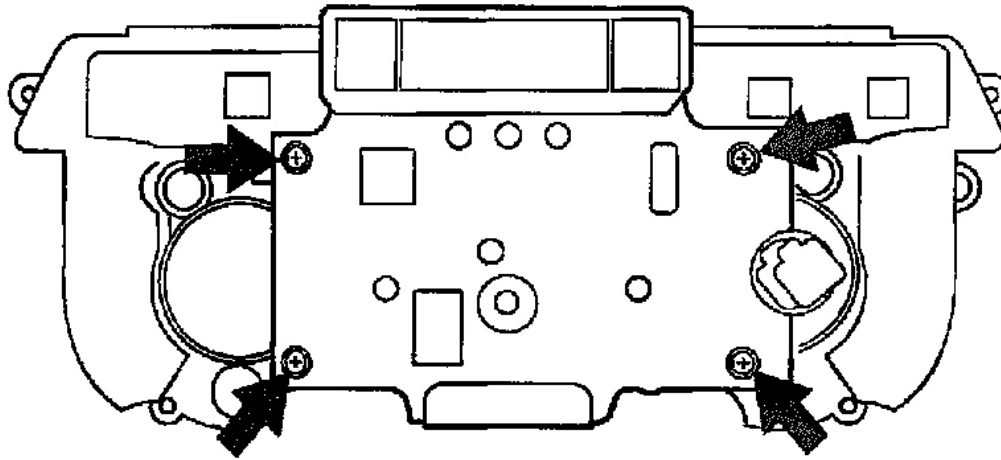


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Fig. 169: Removing Heater Control Switch Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 4 screws and clock plate.



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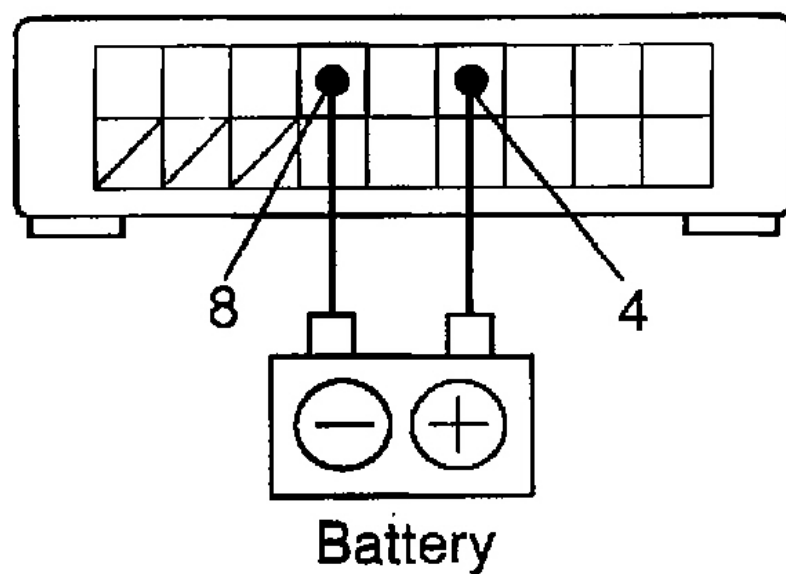
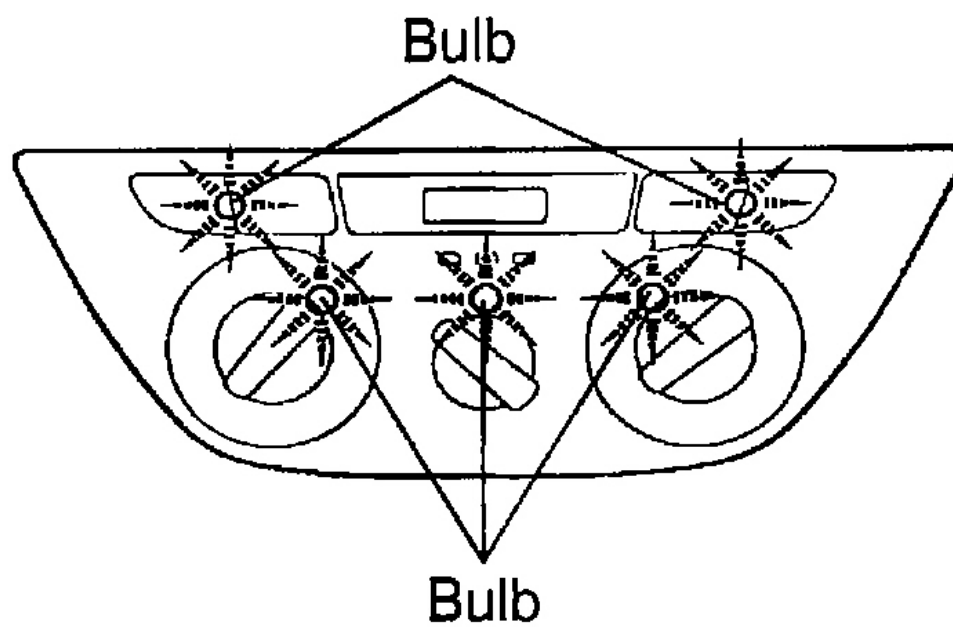
Fig. 170: Removing Screws & Clock Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the connector.

INSPECTION

1. Inspect Illumination Operation

- a. Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to terminal 6 then check that the illuminations light up.

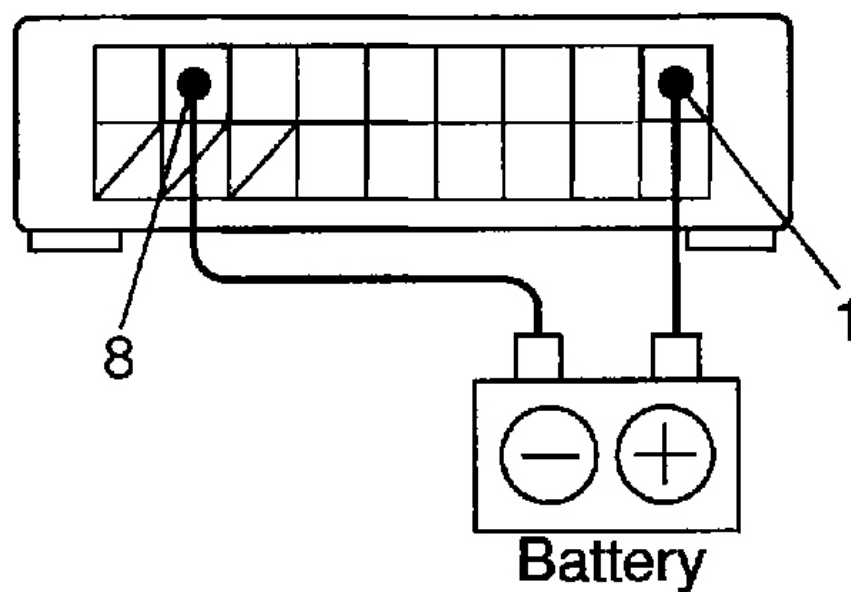
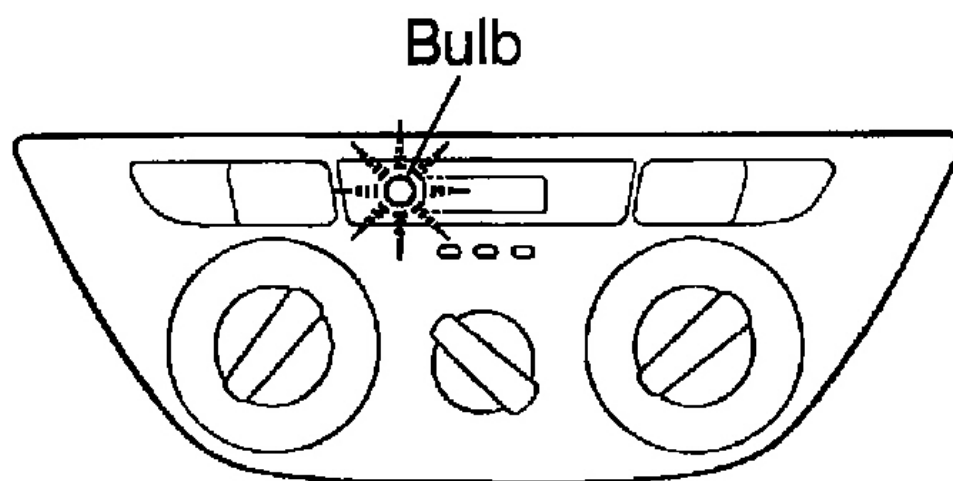


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Fig. 171: Checking Illuminations Light Up
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 8 then check that the passenger side seat belt illumination lights up.



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Fig. 172: Checking Passenger Side Seat Belt Light Illumination
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

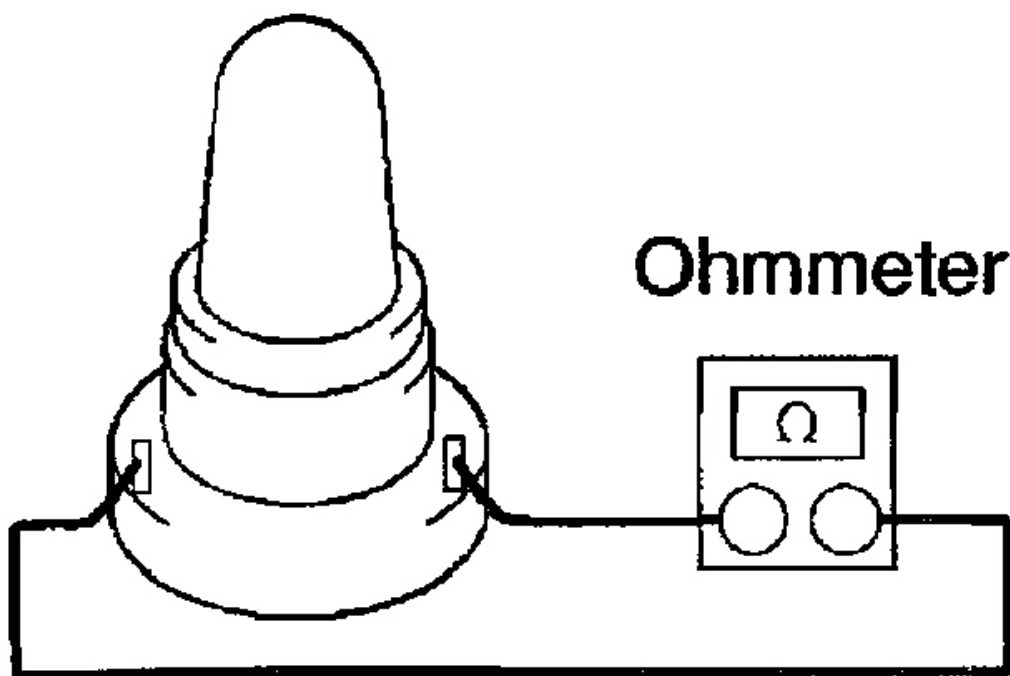
If operation is not as specified, check the faulty bulb.

2. Inspect Bulb

Using an ohmmeter, apply the tester as shown in **Fig. 173** to test for continuity.

If continuity exists, replace the heater control.

If no continuity exists, replace the bulb.



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Fig. 173: Testing Light Bulb For Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Inspect A/C Switch Indicator Operation

- a. Connect the positive (+) lead from the battery to terminal No. 1 and negative (-) lead to terminal No. 13.

- b. Push the A/C button in and then check that the A/C indicator lights up.

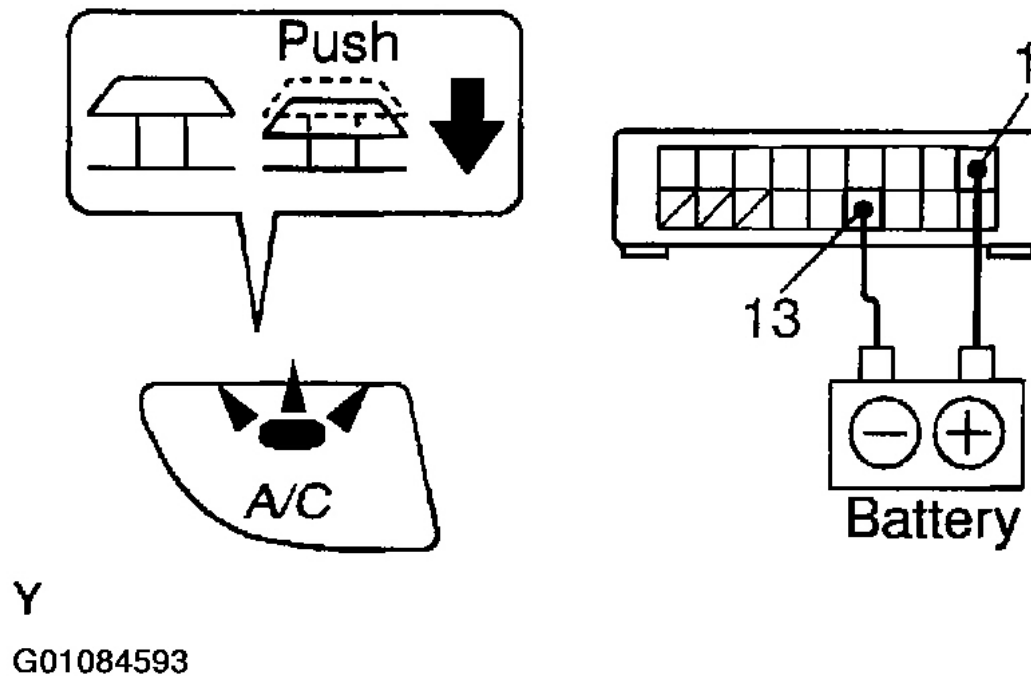


Fig. 174: Inspecting A/C Switch Indicator Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the A/C switch.

4. Inspect A/C Switch Indicator Dimming Operation

- a. Connect the positive (+) lead from the battery to terminal No. 1 and negative (-) lead to terminal No. 13 while pressing the switch.
- b. Connect the positive (+) lead from battery to terminal 4 and then check that the A/C indicator dims.

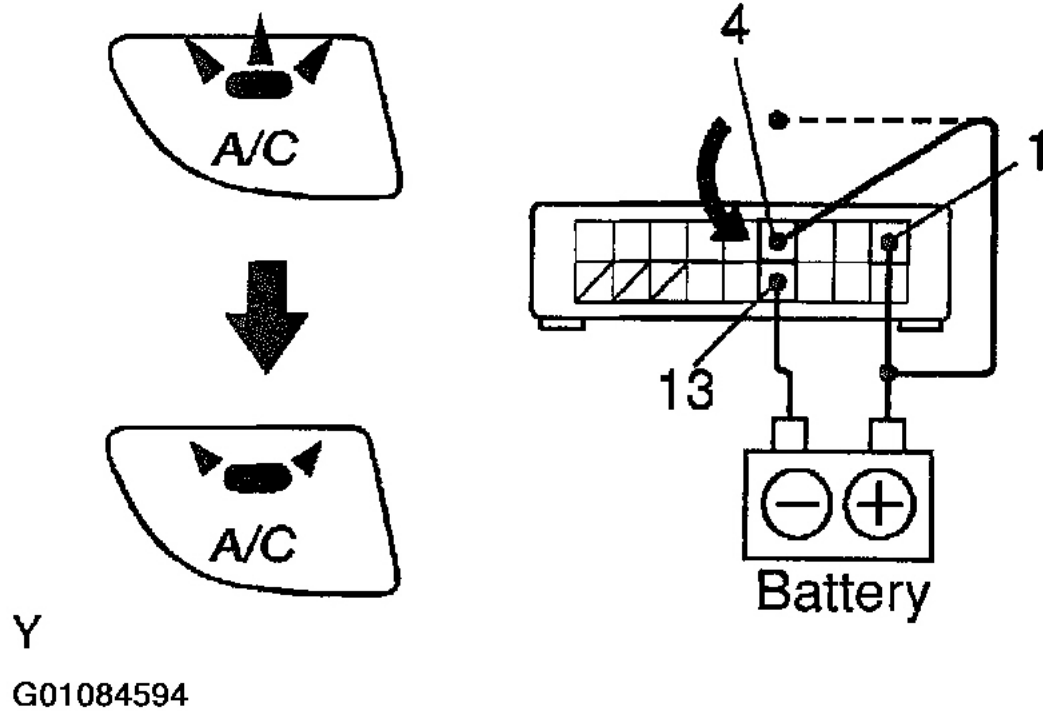
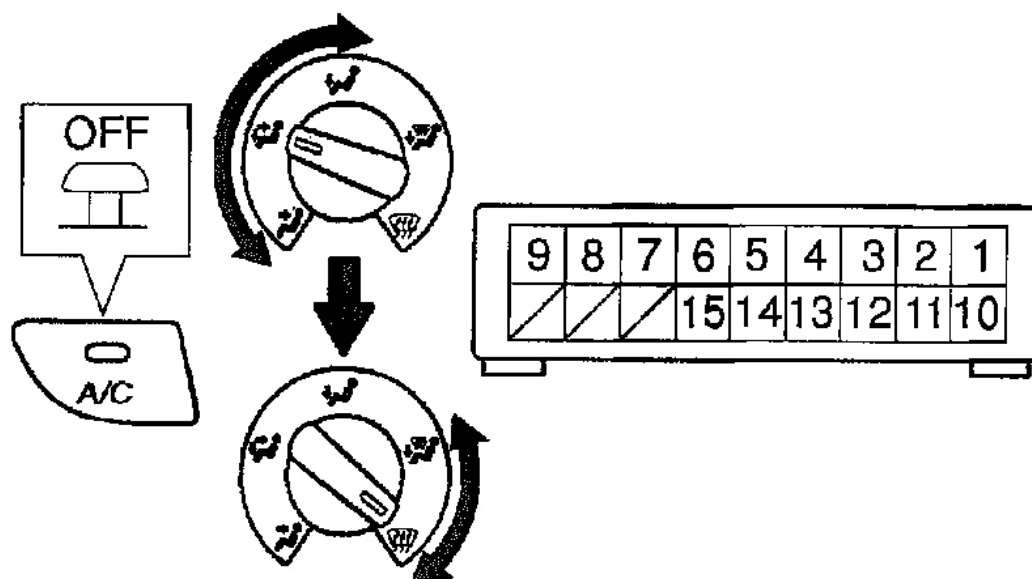


Fig. 175: Inspecting A/C Switch Indicator Dimming Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the A/C switch.

5. Inspect A/C Switch Continuity



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Fig. 176: Displaying A/C Switch Control
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Condition/ Circuit	Tester connection	Specified condition
A/C switch OFF	—	No continuity
A/C switch ON	1 – 13	Continuity
Defroster damper control dial at "FACE – FOOT" position	—	No continuity
Defroster damper control dial at "DEF–FOOT – DEF" position	1 – 13	Continuity
Illumination circuit	4 – 6	Continuity

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Fig. 177: Inspecting A/C Switch Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Switch continuity: If continuity is not as specified, replace the A/C switch.

Illumination circuit: If continuity is not as specified, replace the bulb.

6. Inspect Air Inlet Control Switch Indicator .

- a. Connect the positive (+) lead from the battery to terminal No. 1 and negative (-) lead to terminal No. 12.
- b. Push the air inlet control switch in and then check that the air inlet control switch lights up.

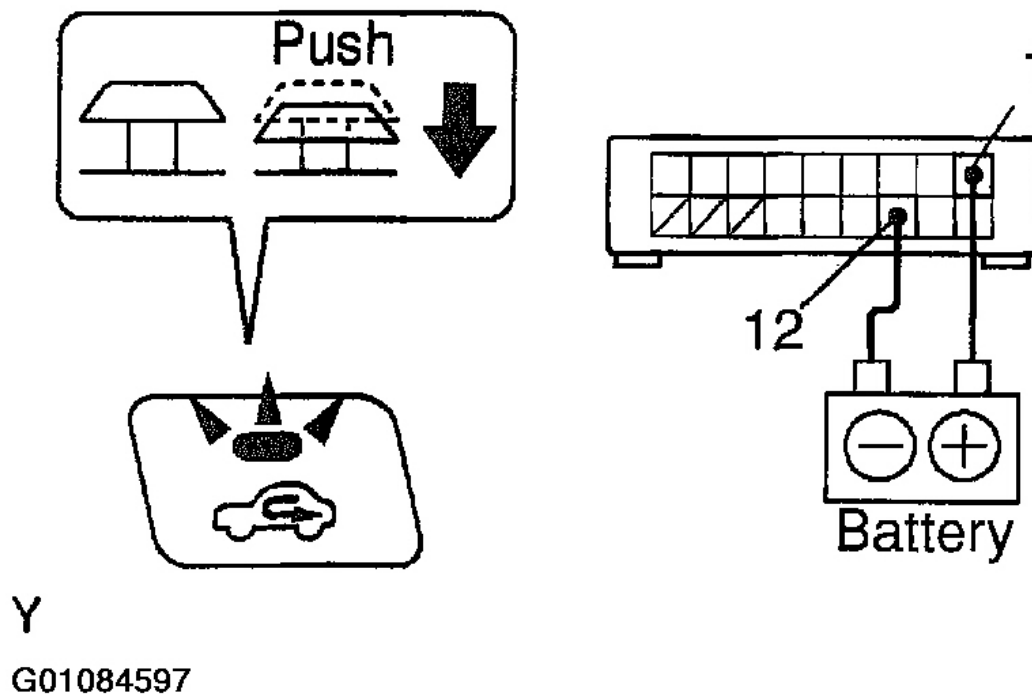


Fig. 178: Inspect Air Inlet Control Switch Indicator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

7. Inspect Air Inlet Control Switch Indicator Dimming Operation

- a. Connect the positive (+) lead from the battery to terminal No. 1 and negative (-) lead to terminal No. 12 while pressing the switch.
- b. Connect the positive (+) lead from battery to terminal No. 4 and then check that the air inlet control

switch indicator dims.

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

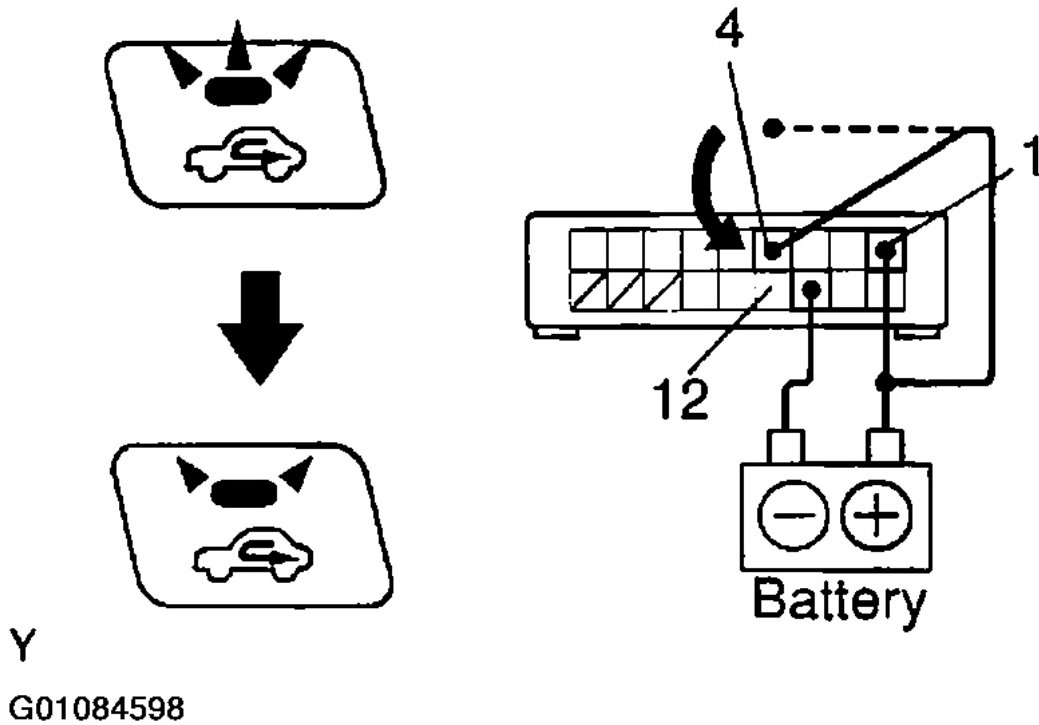


Fig. 179: Inspecting Air Inlet Control Switch Indicator Dimming Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. Inspect Air Inlet Control Switch Continuity

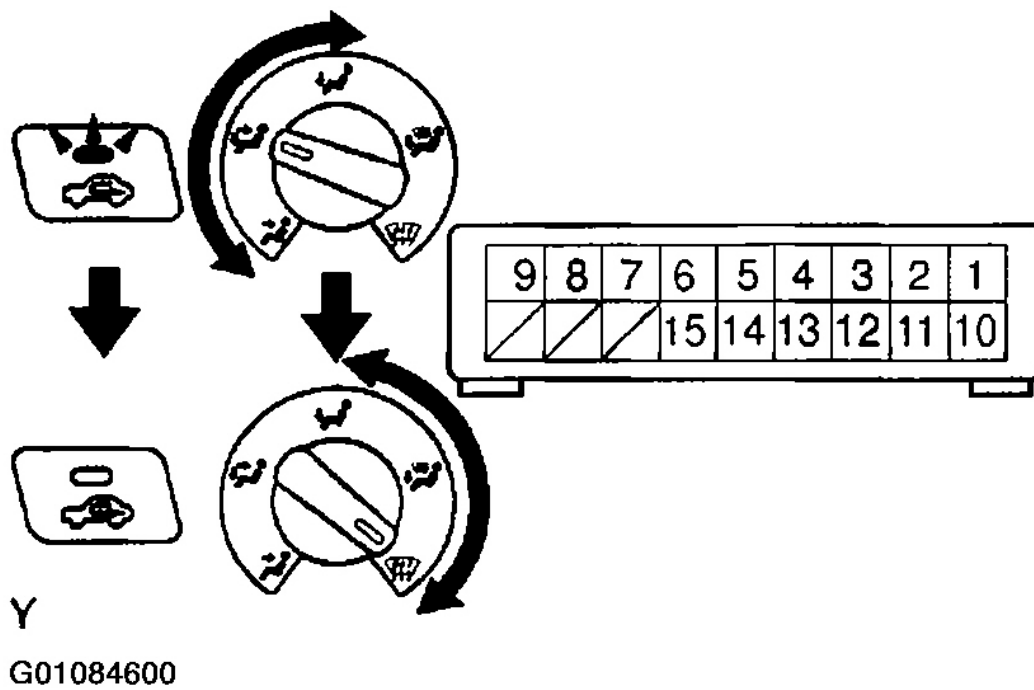


Fig. 180: Displaying Air Inlet Control Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Condition / Circuit	Tester connection	Specified condition
Air inlet control switch OFF	—	No continuity
Air inlet control switch ON	1 – 12	Continuity
Defroster damper control dial at "FACE – FOOT" position	—	No continuity
Defroster damper control dial at "DEF – FOOT" position	1 – 12	Continuity
Illumination circuit	4 – 6	Continuity

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Fig. 181: Displaying Air Inlet Control Switch Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the air inlet control switch.

9. Defroster Damper Control Dial: Inspect Air Inlet Control Switch Indicator Operation

- a. Connect the positive (+) lead from the battery to terminal No. 1 and negative (-) lead to terminal No. 12.

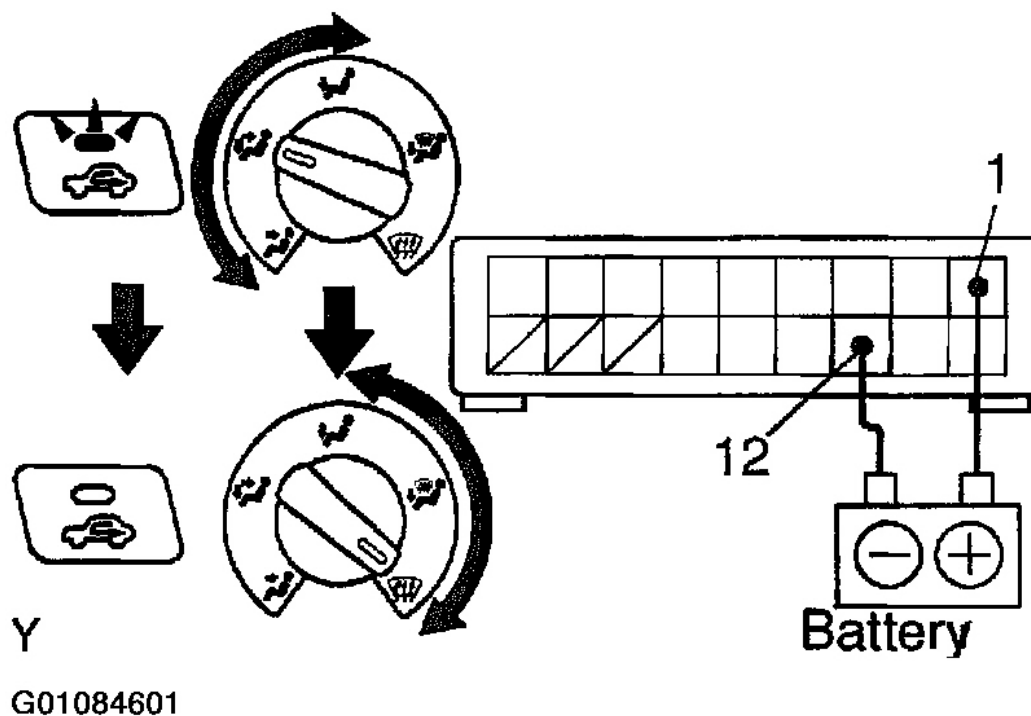
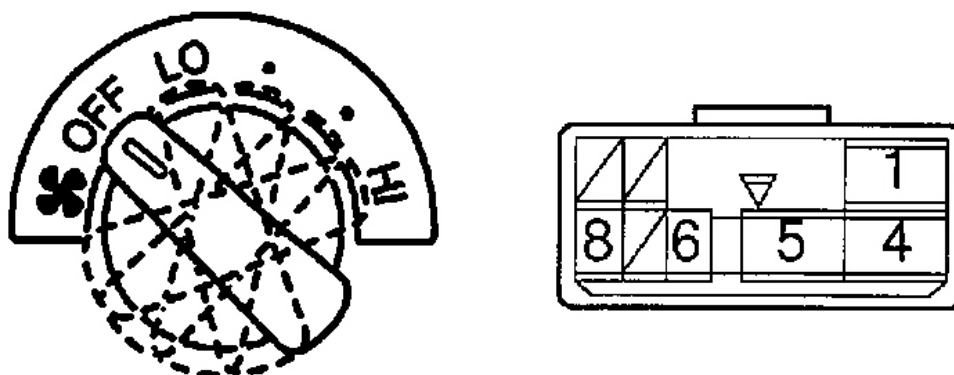


Fig. 182: Inspecting Air Inlet Control Switch Indicator Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Push the air inlet control switch in and then check that the air inlet control switch lights up.
- c. Turn the defroster damper control dial to the "DEF - FOOT" position and check that the air inlet control switch indicator lights off.

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

10. **Inspect Blower Speed Control Switch Continuity**



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Fig. 183: Displaying Blower Speed Control Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Position/ Circuit	Tester connection	Specified condition
OFF	—	No continuity
LO	1 – 8	Continuity
M1	1 – 6 – 8	Continuity
M2	1 – 5 – 8	Continuity
Hi	1 – 4 – 8	Continuity

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Fig. 184: Inspecting Blower Speed Control Switch Continuity
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the switch.

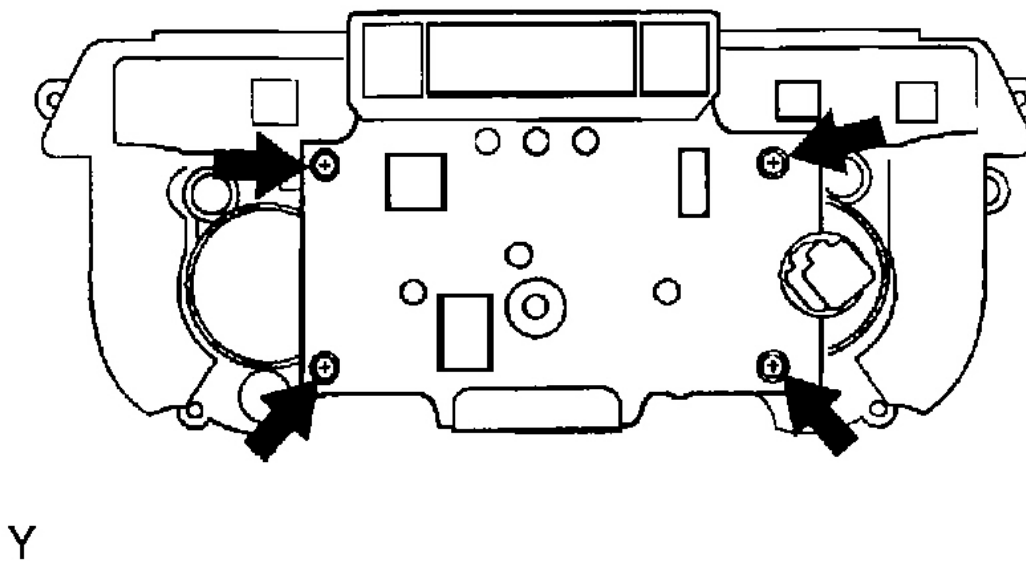
11. **Inspect Rear Defogger Switch Operation** See INSPECTION .

12. Inspect Hazard Warning Signal Switch

REASSEMBLY

1. Install Clock Integration Board

- a. Install the clock plate with the 4 screws.



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Fig. 185: Identifying Clock Integration Board Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the heater control switch cover with the 2 screws.

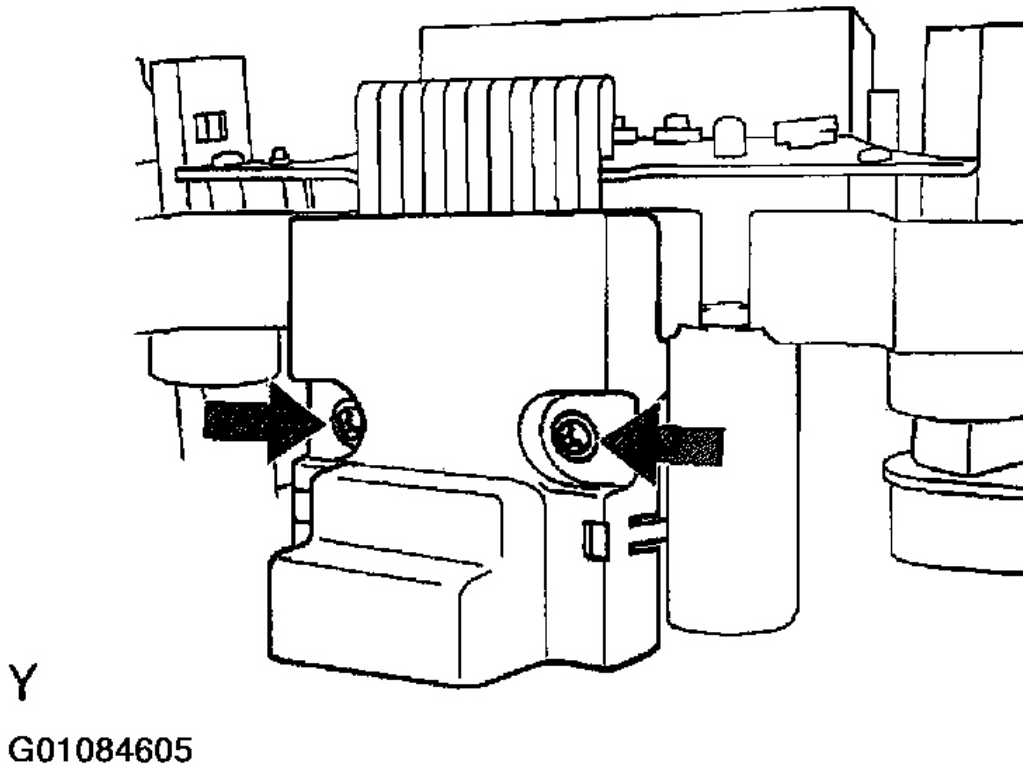
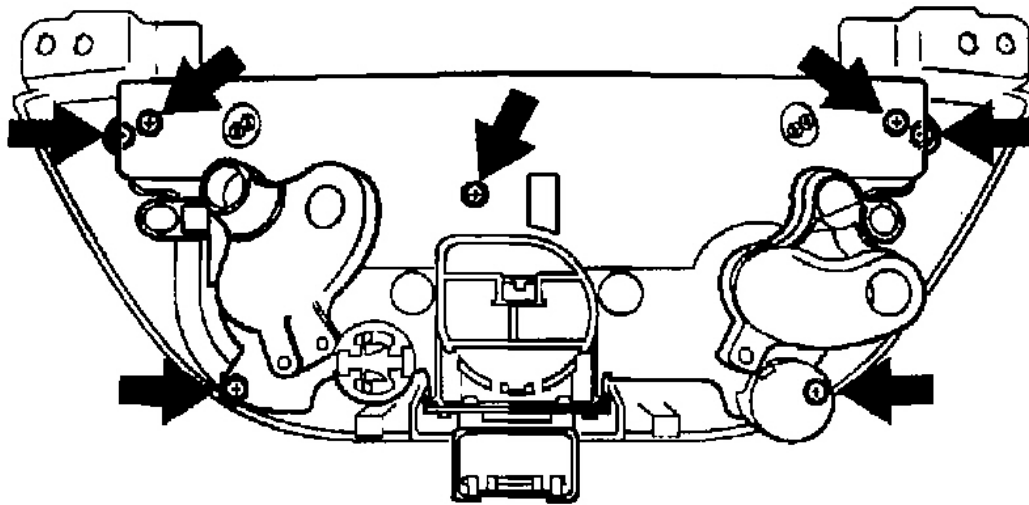


Fig. 186: Identifying Heater Control Switch Cover Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Install Heater Control Name Plate

- a. Install the 4 switch knobs to the heater control name plate.
- b. Install the 3 knobs.
- c. Install the heater control name plate and printed wire integration board with the 7 screws.



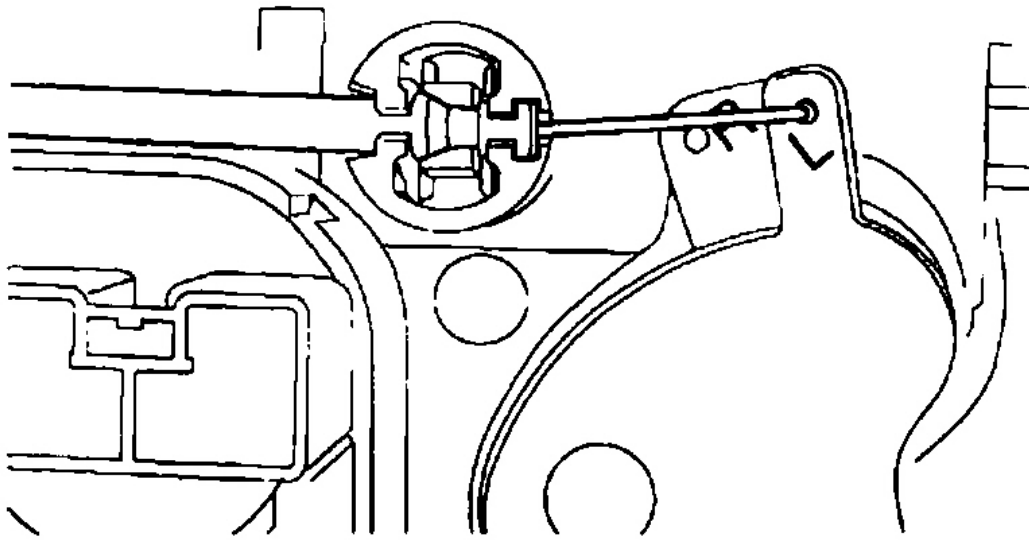
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Fig. 187: Identifying Wire Integration Board Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Install Heater Control Cables

- a. Install the inner cables as shown in **Fig. 188** .



G01084607

Fig. 188: Installing Heater Control Cables
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the outer cables.

INSTALLATION

1. Install Heater Control Assembly

- a. Connect the 2 connectors to the heater control assembly.
- b. Pass through the A/C control cables as shown in **Fig. 189** .

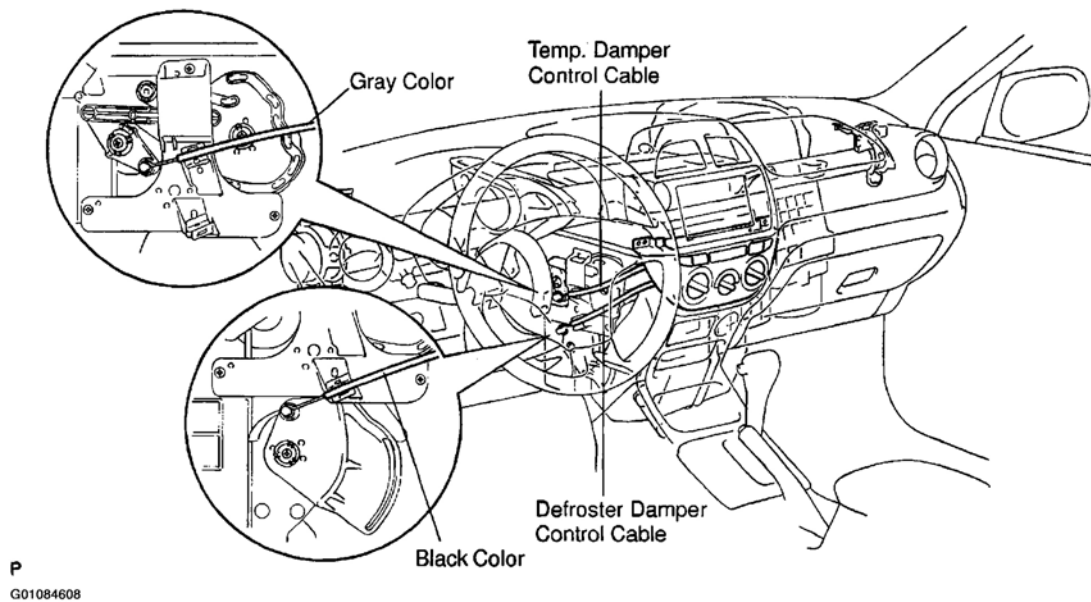
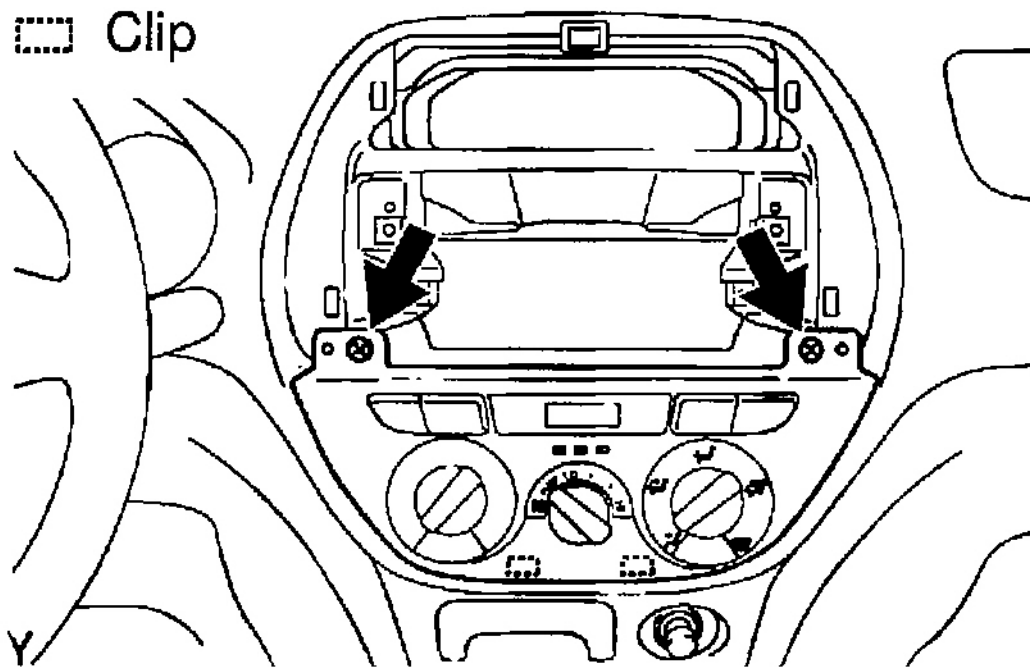


Fig. 189: Identifying Temperature & Defroster Damper Control Cables
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the heater control assembly with the 2 screws.



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Fig. 190: Installing Heater Control Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

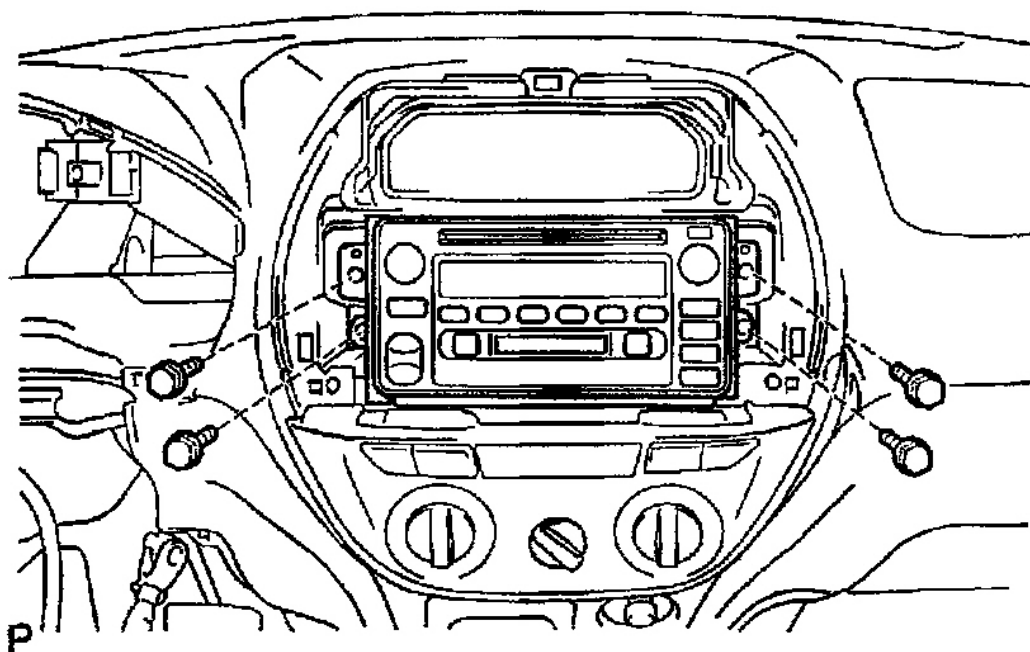
2. Install Center Cluster Finish Panel

a. Without Radio:

Install the stereo opening cover with the 4 bolts.

With Radio:

Connect the connectors and install the radio with the 4 bolts.

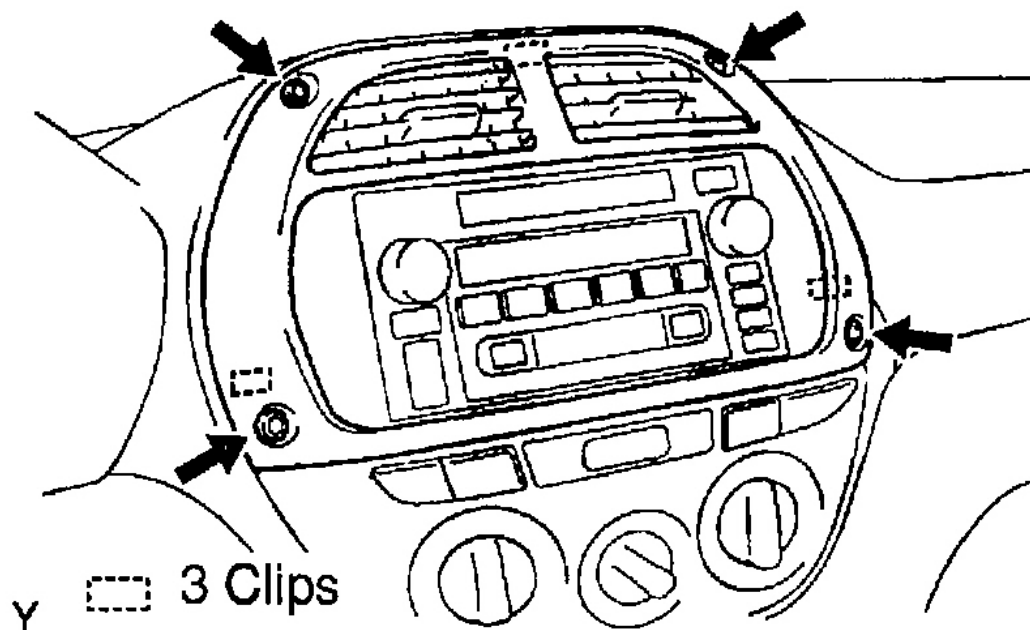


G01084610

Fig. 191: Installing Radio

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the instrument cluster finish panel with the 4 bolts.

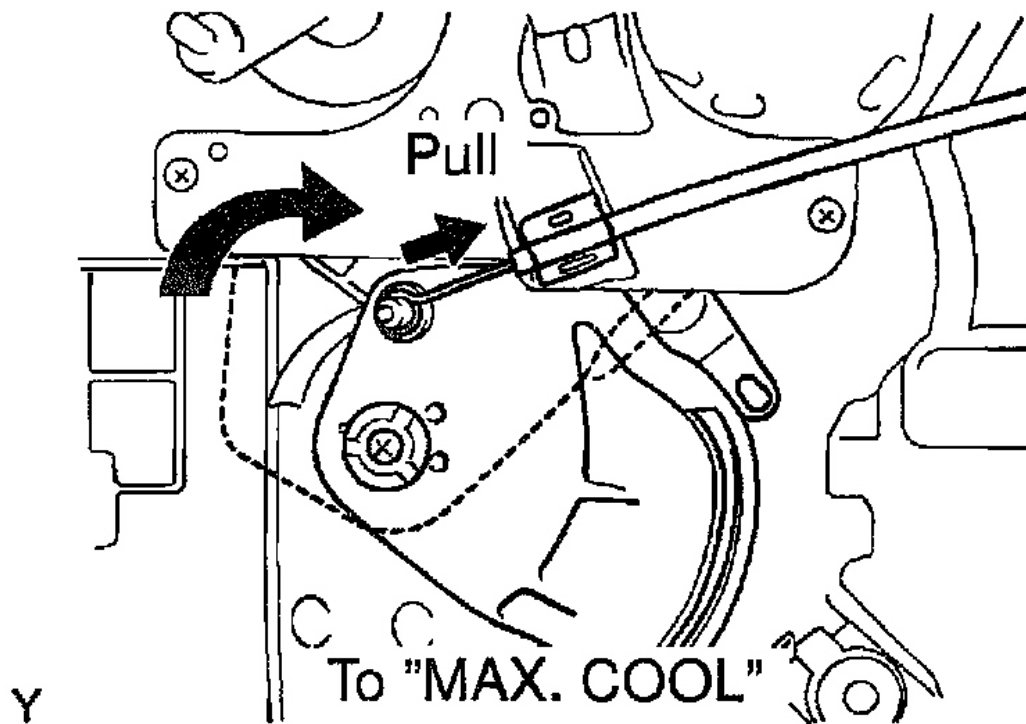


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Fig. 192: Installing Instrument Cluster Finish Panel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Connect Heater Control Cables

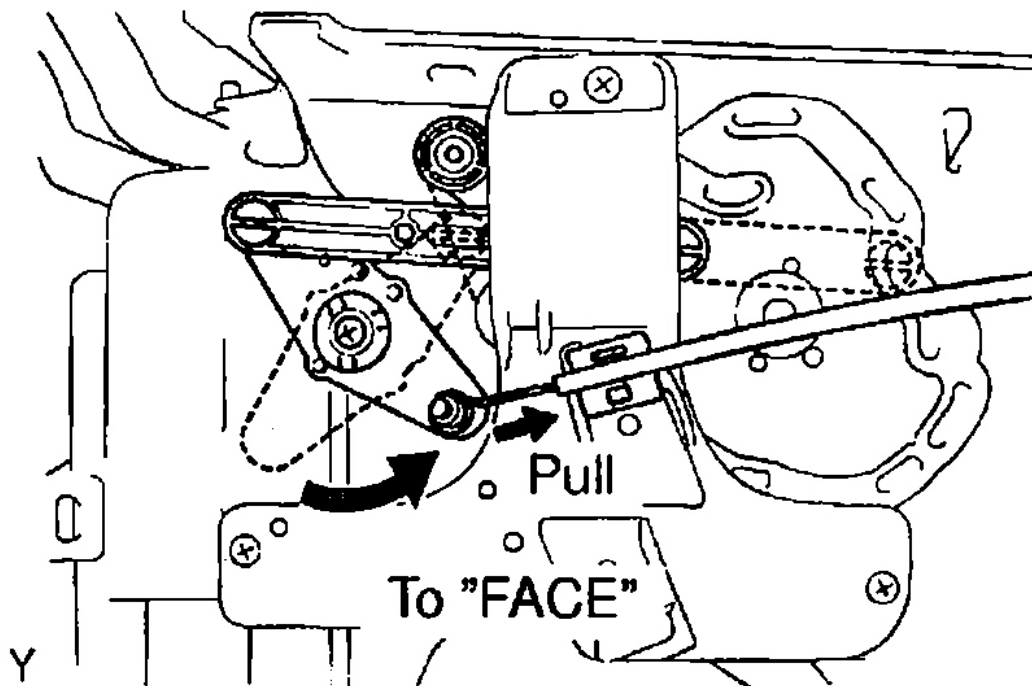
- a. Set the temperature control dial at "MAX. COOL" position.



G01084612

Fig. 193: Adjusting Air Mix Damper Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Set the mode control dial at "FACE" position.



G01084613

Fig. 194: Adjusting Mode Control Cable
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Adjust the air mix damper control cable.

Set the air mix damper control lever at "MAX. COOL" position, connect the inner cable to the lever pin and lock the outer cable to the clamp.

NOTE: Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in Fig. 193 .

- d. Adjust the mode control cable.

Set the mode control lever at "FACE" position, connect the inner cable to the lever pin and lock the outer cable to the clamp.

NOTE: Lock the clamp while lightly pulling the outer cable to the direction shown by arrow in Fig. 194 .

- e. Install the No. 1 instrument panel under cover sub-assembly.

ENGINE COOLANT TEMPERATURE (ECT) SWITCH

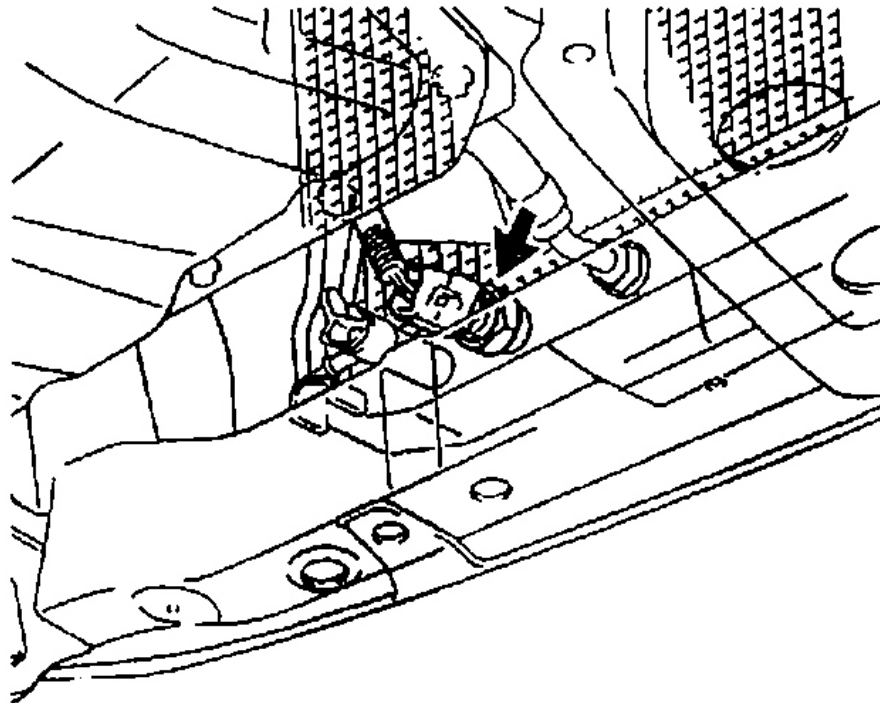
INSPECTION

1. Drain Engine Coolant From Radiator

NOTE: It is not necessary to drain out all coolant.

2. Remove ECT Switch

- a. Remove the RH engine under cover.
- b. Disconnect the ECT switch connector.



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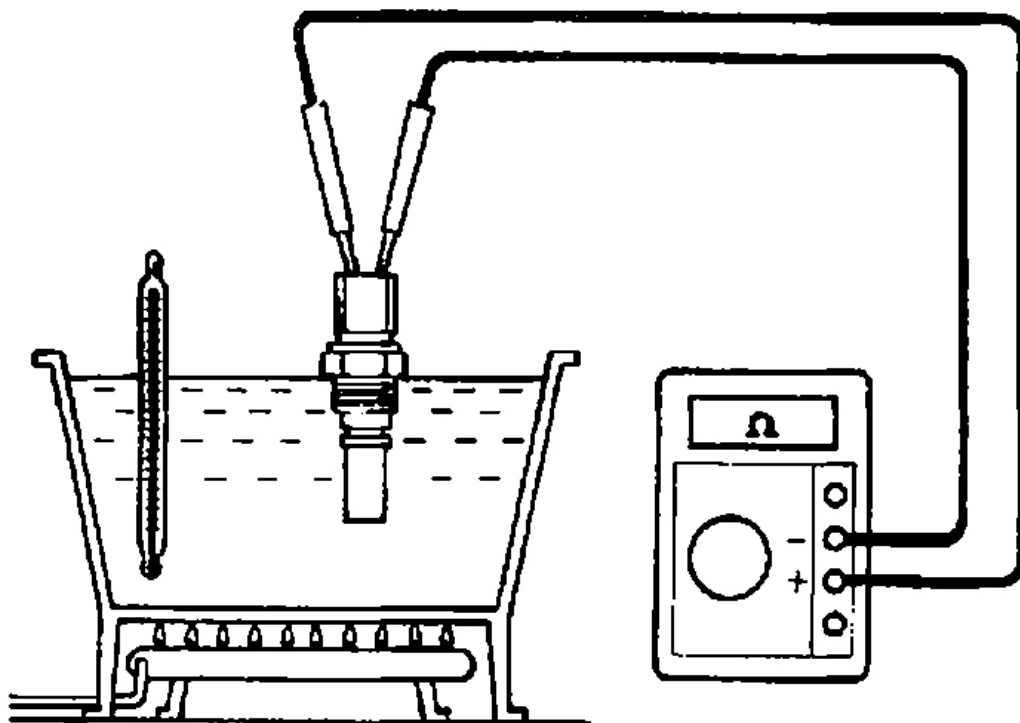
Fig. 195: Removing ECT Switch

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the ECT switch.

3. Inspect ECT switch continuity .

- a. Using an ohmmeter, check no continuity exists between terminals when the coolant temperature is above 90°C (194°F).



G01084615

Fig. 196: Inspecting ECT Switch Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity exists, replace the switch.

- b. Using an ohmmeter, check continuity exists between terminals when the coolant temperature is below 83°C (181°F).

If no continuity exists, replace the switch.

4. Reinstall ECT Switch

- a. Install a new O-ring with the ECT switch.

Torque: 7.4 N.m (75 kgf.cm, 65 in.lbf)

- b. Connect the ECT switch connector.

c. Install the RH engine under cover.

5. **Refill With Engine Coolant** See COOLANT .

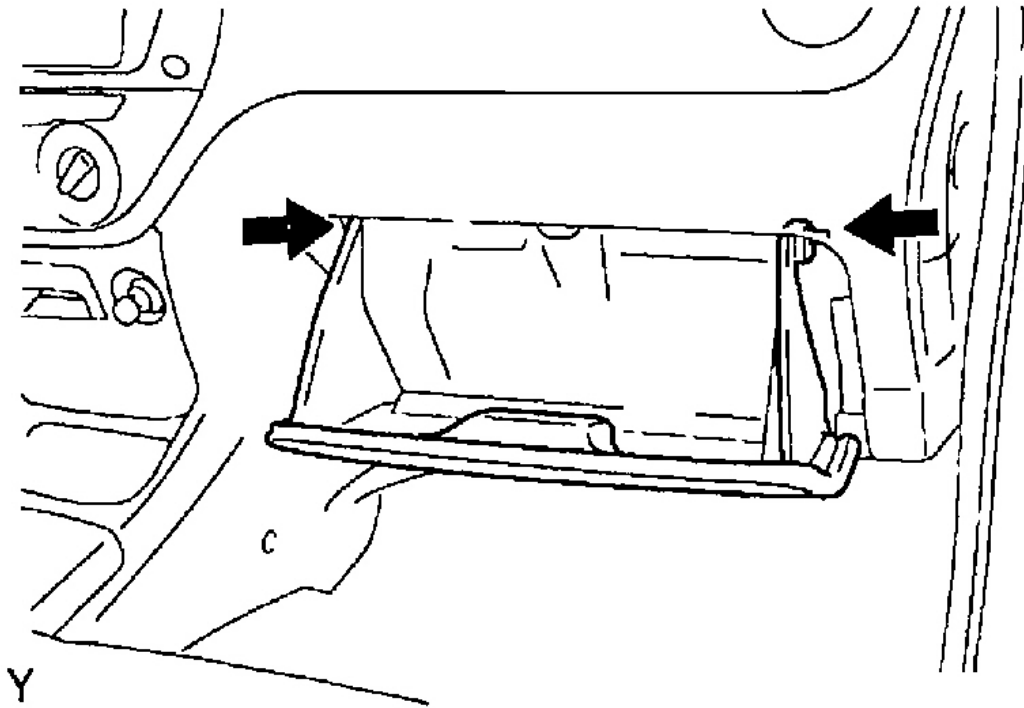
AIR REFINER FILTER

REPLACEMENT

1. **Remove Air Refiner Filter**

a. Disconnect the glove compartment door.

Push both sides inward one after another and pull out the glove compartment door.



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Fig. 197: Removing Glove Compartment Door
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Pull out the filter case.

c. Remove the air refiner filter from the filter case.

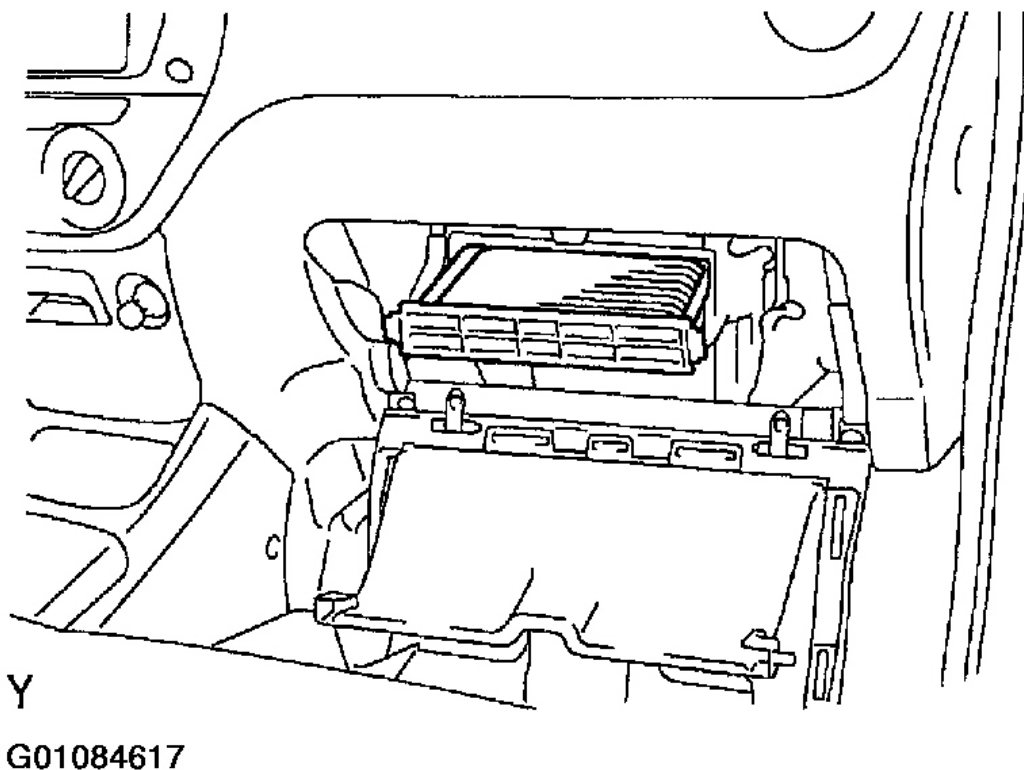


Fig. 198: Removing Air Refiner Filter
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Reinstall Air Refiner Filter

- Install the air refiner filter to the filter case.
- Install the filter case.
- Connect the glove compartment door.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Clutch Pressure Plate-To-Compressor Shaft Bolt	13 (18)
Compressor Mounting Bolt	18 (24)
No. 2 Intermediate Shaft Assembly Yoke Bolt	26 (35)
Steering Column Retaining Bolt	15 (20)
Steering Column Sliding Yoke Bolt	26 (35)
Steering Wheel Nut	37 (51)

	INCH Lbs. (N.m)
Condenser Retaining Bolt	65 (7.3)
Drier-To-Modulator Cap	109 (12.3)
Driver's Side Air Bag Torx Screw	78 (8.8)
ECT Sensor	65 (7.3)
Expansion Valve Bolt	31 (3.5)
Pressure Switch	87 (9.8)
Refrigerant Hose-To-Compressor Bolt	87 (9.8)
Refrigerant Hose-To-Condenser Bolt	48 (5.4)

SPECIFICATIONS

SPECIFICATIONS

Application	Specification
Compressor Type	(1)
Compressor Belt Tension	(2)
Compressor Oil Capacity ⁽³⁾	3.5 ozs.
Condenser Oil Capacity ⁽³⁾	1.4 ozs.
Evaporator Oil Capacity ⁽³⁾	1.4 ozs.
Refrigerant (R-134a) Capacity	15.9-19.4 ozs.
System Operating Pressures ⁽⁴⁾	
High Side	199-228 psi (14-16 kg/cm ²)
Low Side	21-36 psi (1.5-2.5 kg/cm ²)
(1) Information is not available from manufacturer. (2) Automatic belt tensioner is used. Adjustment is not required. (3) Use ND-OIL 8 refrigerant oil or equivalent. (4) With ambient temperature at 86-95°F (30-35°C) at air inlet with switch in RECIRC position, engine at 1500 RPM, blower switch in HI position and temperature control dial in COOL position.	