

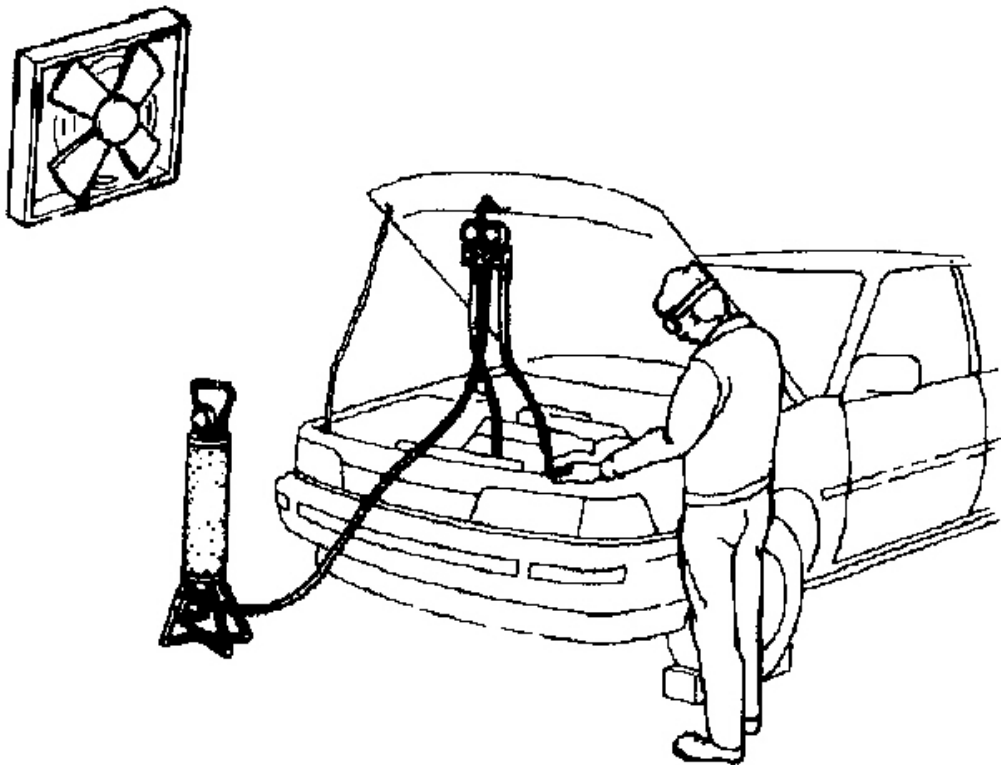
2004 HVAC

Air Conditioning - RAV4

AIR CONDITIONING SYSTEM

PRECAUTION

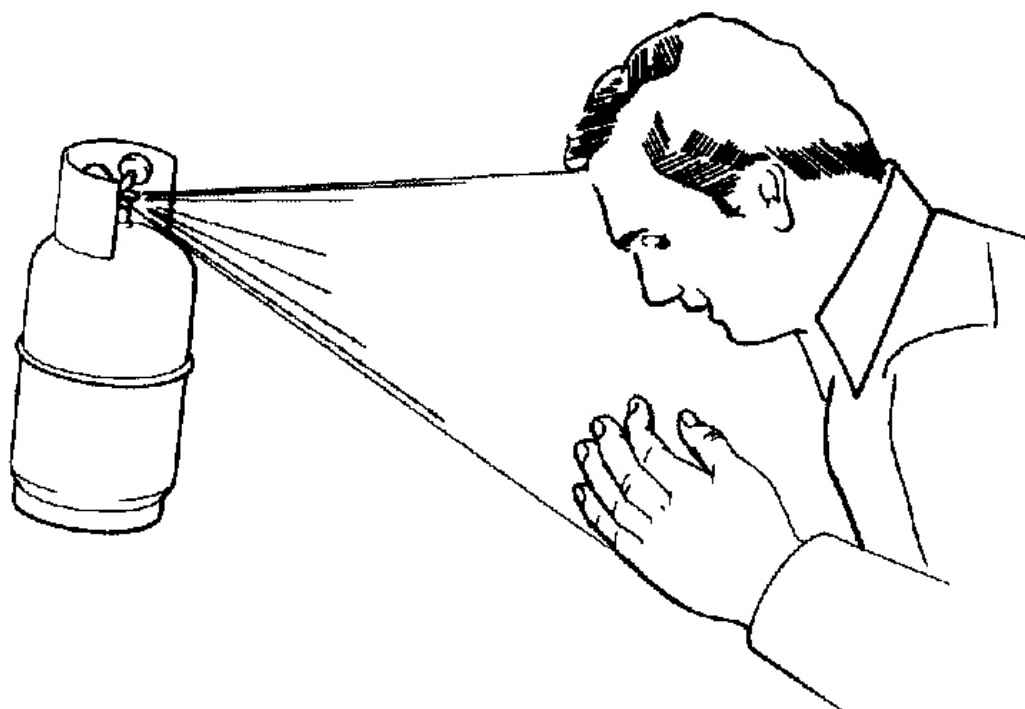
1. **DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA**
2. **ALWAYS WEAR EYE PROTECTION**



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Fig. 1: Wearing Eye Protection & Handling In Open Area
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN**



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Fig. 2: Avoiding Getting Liquid Refrigerant In Eyes Or On Skin
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

- a. Wash your eyes or skin with much cool water.

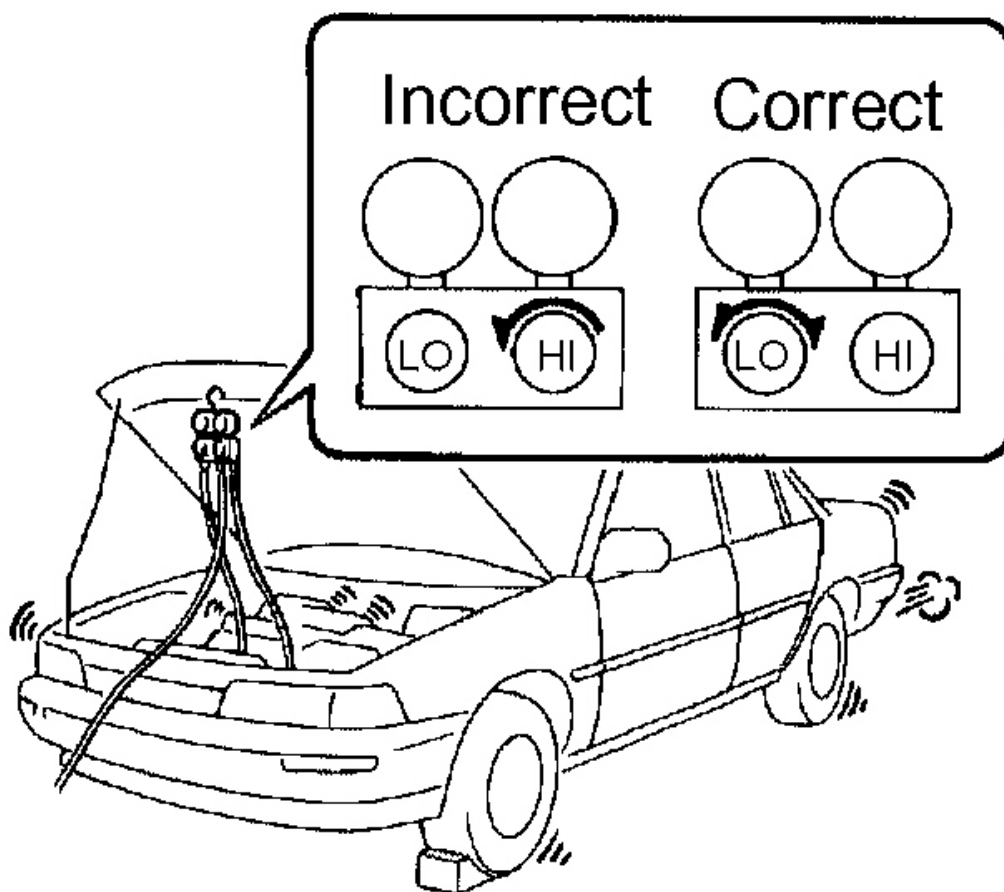
CAUTION: Do not rub your eyes or skin.

- b. Apply clean petroleum jelly to the skin.
- c. Go immediately to a 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 refrigerant system, oil lubrication will be insufficient and compressor burnout may occur. Care should be taken to avoid this.

7. DO NOT OPEN HIGH PRESSURE VALVE WHILE COMPRESSOR IS OPERATING

If the high pressure valve is opened, refrigerant may flow in the reverse direction and cause the charging cylinder to rupture. Open and close the low pressure valve only.



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Fig. 3: Avoiding Opening High Pressure Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT

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

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The RAV4 is equipped with an Supplemental Restraint System (SRS) such as the driver and front passenger airbags. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing and-leading to serious injury. 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.

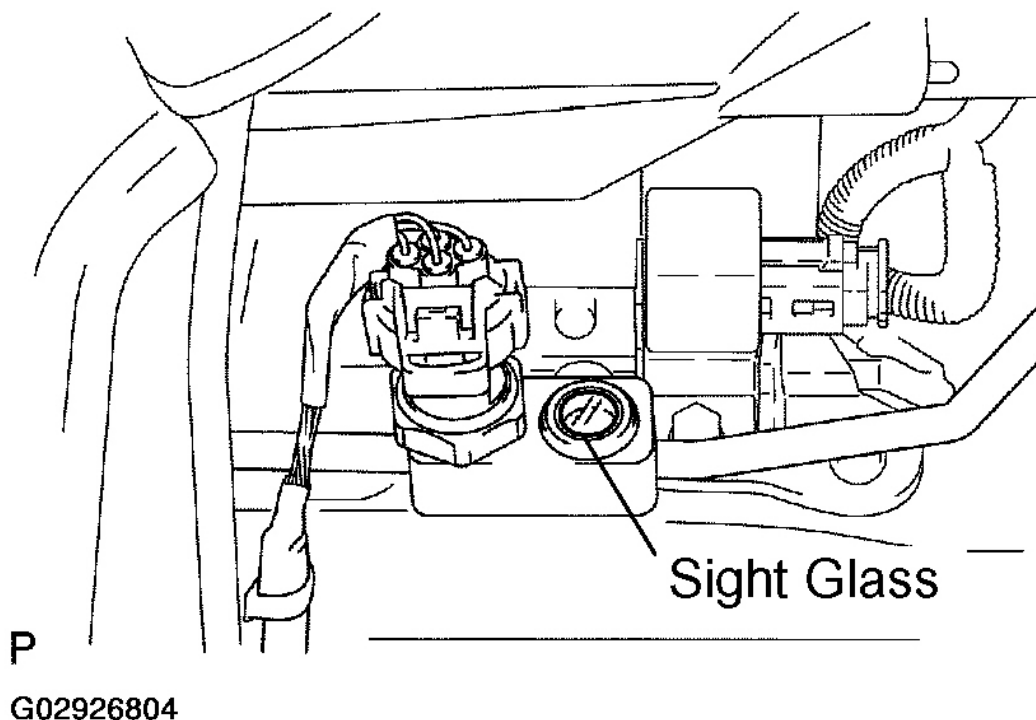


Fig. 4: Inspecting Refrigerant Volume
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Test conditions:

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

- Running engine at 1,500 RPM
- Blower speed control switch at "HI" position
- A/C switch ON
- Temperature control dial at "COOL" position
- Fully open doors

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	4. Check for gas leakage with gas leak detector and repair if necessary 5. 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	Sufficient 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	Sufficient	-

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

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Fig. 5: Refrigerant Amount Symptom Table

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

2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

Using this method, trouble can be located by a manifold gauge set. Read the manifold gauge pressure when these conditions are met.

Test conditions:

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

HINT:

Gauge indications may vary slightly due to ambient temperature conditions.

1. Normally functioning refrigeration system:

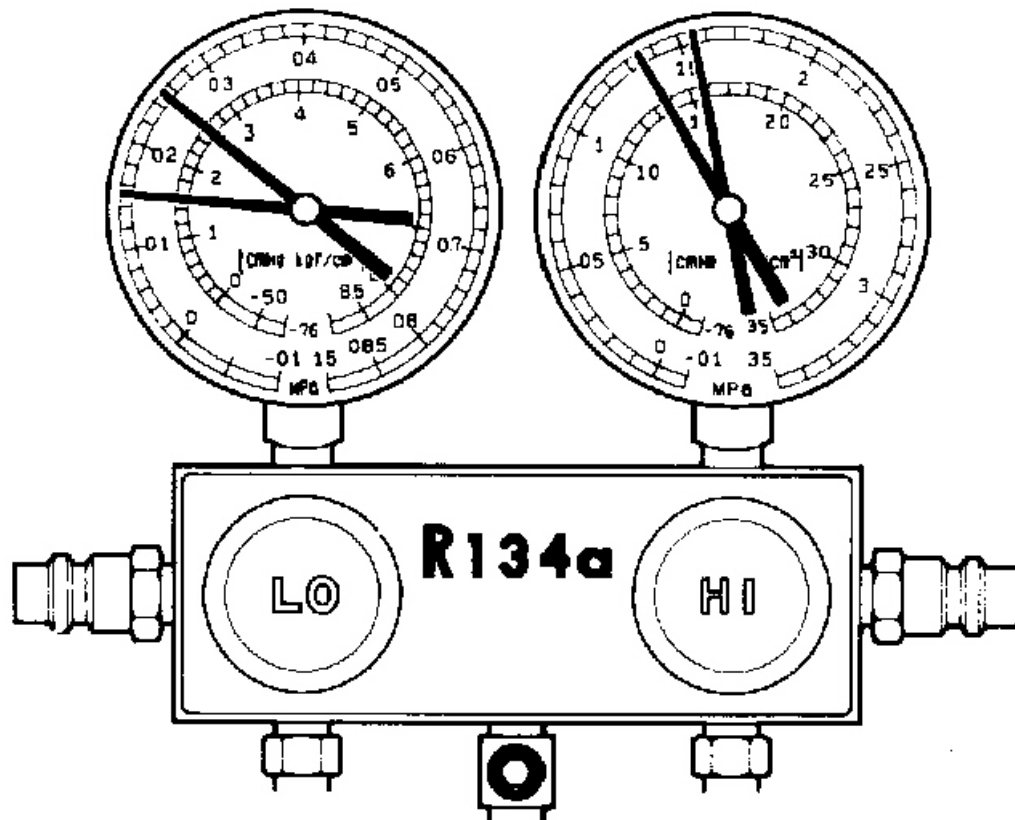
Gauge reading:

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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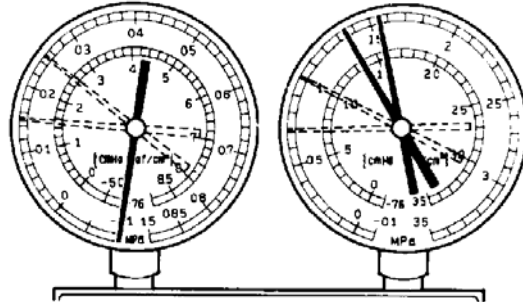
Fig. 6: Identifying Normal Functioning Refrigeration System
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Moisture present in refrigeration system:

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2004 HVAC Air Conditioning - RAV4

Condition : Periodically cools and then fails to cool



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Fig. 7: Testing Refrigerant Moisture In System
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

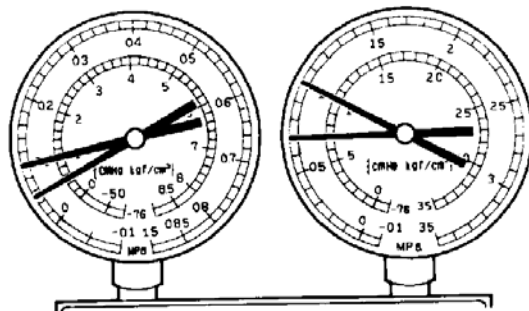
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometimes normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after the 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. 8: Symptom Refrigerant System Diagnosis Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Insufficient cooling

Condition: Insufficient cooling



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Fig. 9: Testing Insufficient Cooling

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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 places 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

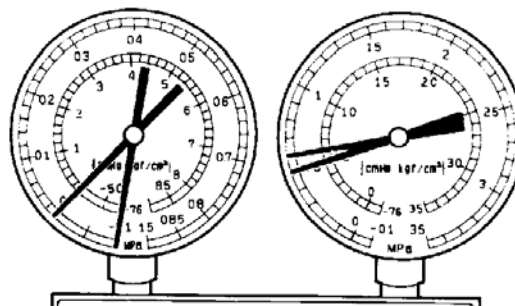
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Fig. 10: Insufficient Cooling Diagnosis Table

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

4. Poor circulation of refrigerant

Condition: Insufficient cooling



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Fig. 11: Testing Refrigerant Of Poor Circulation

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

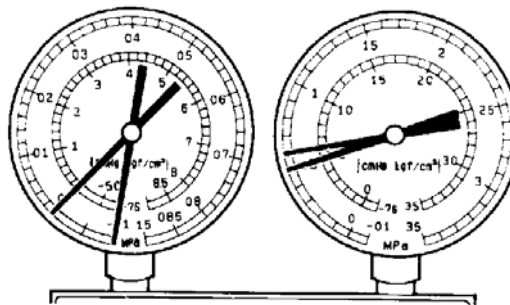
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Fig. 12: Poor Circulation Diagnosis Table

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. 13: Testing Refrigerant Does Not Circulate In System
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

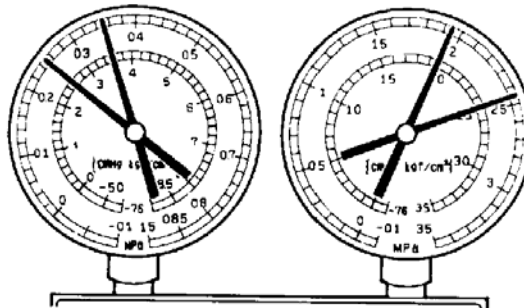
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/ drier or expansion valve	• Refrigerant flow obstructed by moisture or dirt in refrigeration 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. 14: Refrigerant Does Not Circulate Diagnosis Table
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. 15: Testing Refrigerant Over Charged Or Insufficient Cooling Of Condenser
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

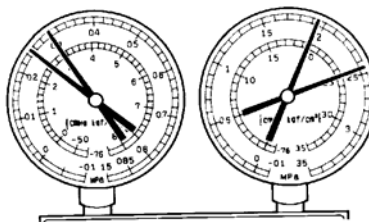
Symptom in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive refrigerant • Insufficient cooling of condenser	• 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. 16: Over Charged Or Insufficient Cooling Of Condenser Diagnosis Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. Air present in refrigeration system

Condition: Insufficient cooling



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

Fig. 17: Testing Air Present In Refrigeration System
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

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

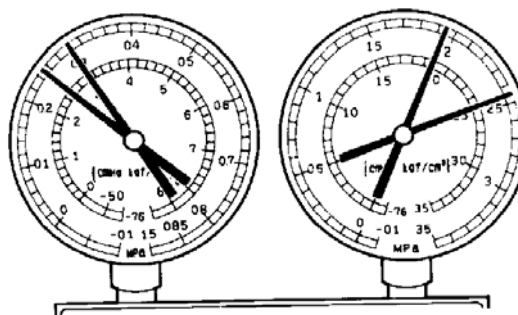
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Fig. 18: Air Present Diagnosis Table

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

8. Expansion valve improperly

Condition: Insufficient cooling



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Fig. 19: Testing Expansion Valve 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 • 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. 20: Expansion Valve Diagnosis Table

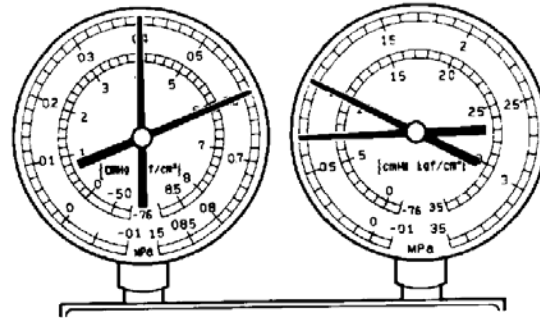
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. Defective compression compressor

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

Condition : Does not cool



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Fig. 21: Testing Defective Compression 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. 22: Defective Compressor Diagnosis Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSPECT IDLE-UP SPEED

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

MAGNETIC CLUTCH CONDITIONS & SPEEDS

Magnetic clutch condition	Idle-up speed
Magnetic clutch not engaged	700 +/- 20 RPM
Magnetic clutch engaged	750 +/- 20 RPM

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

4. INSPECT FOR LEAKAGE OF REFRIGERANT

- a. Inspect for leakage of refrigerant when these conditions are met.:
 - 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 some refrigerant remains in the refrigeration system.

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

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

HINT:

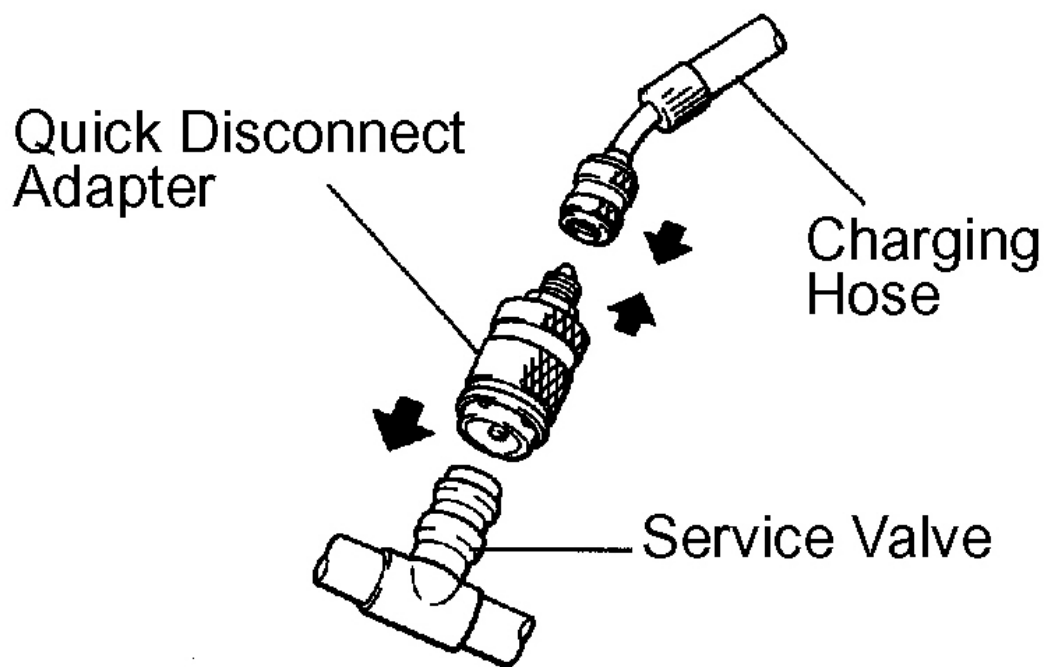
- After the blower motor stopped, leave the cooling unit for more than 15 minutes.
- Expose the gas leak detector sensor under the drain hose.
- When bringing the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to the volatile gases.

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**
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.



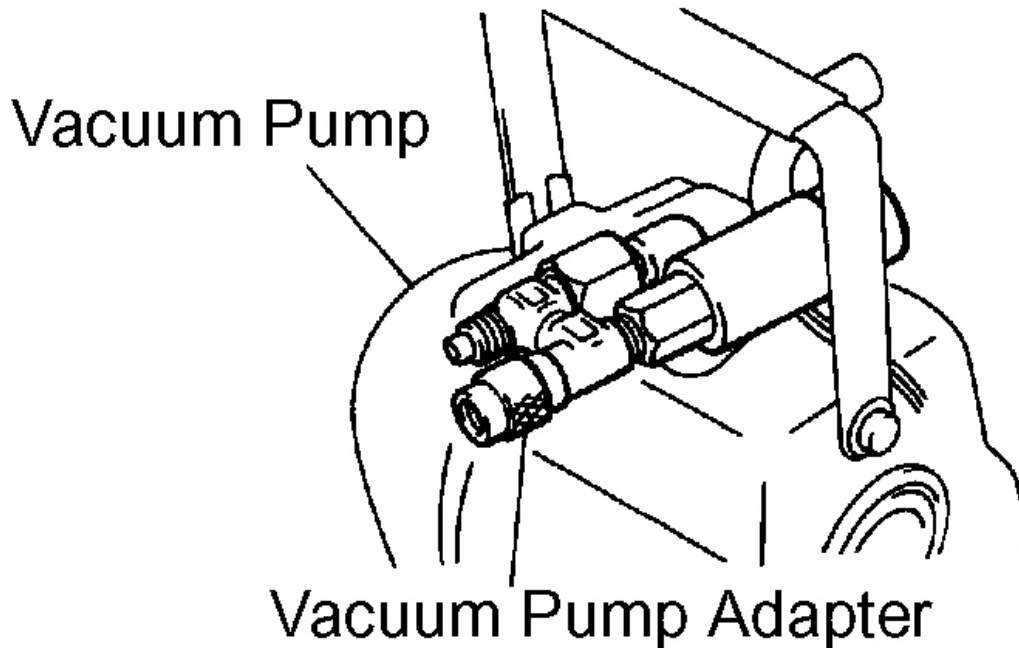
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Fig. 23: Closing Valves Of Manifold Gauge Set & Connecting Quick Disconnect Adapters To Service Valves

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

4. EVACUATE AIR FROM REFRIGERATION SYSTEM

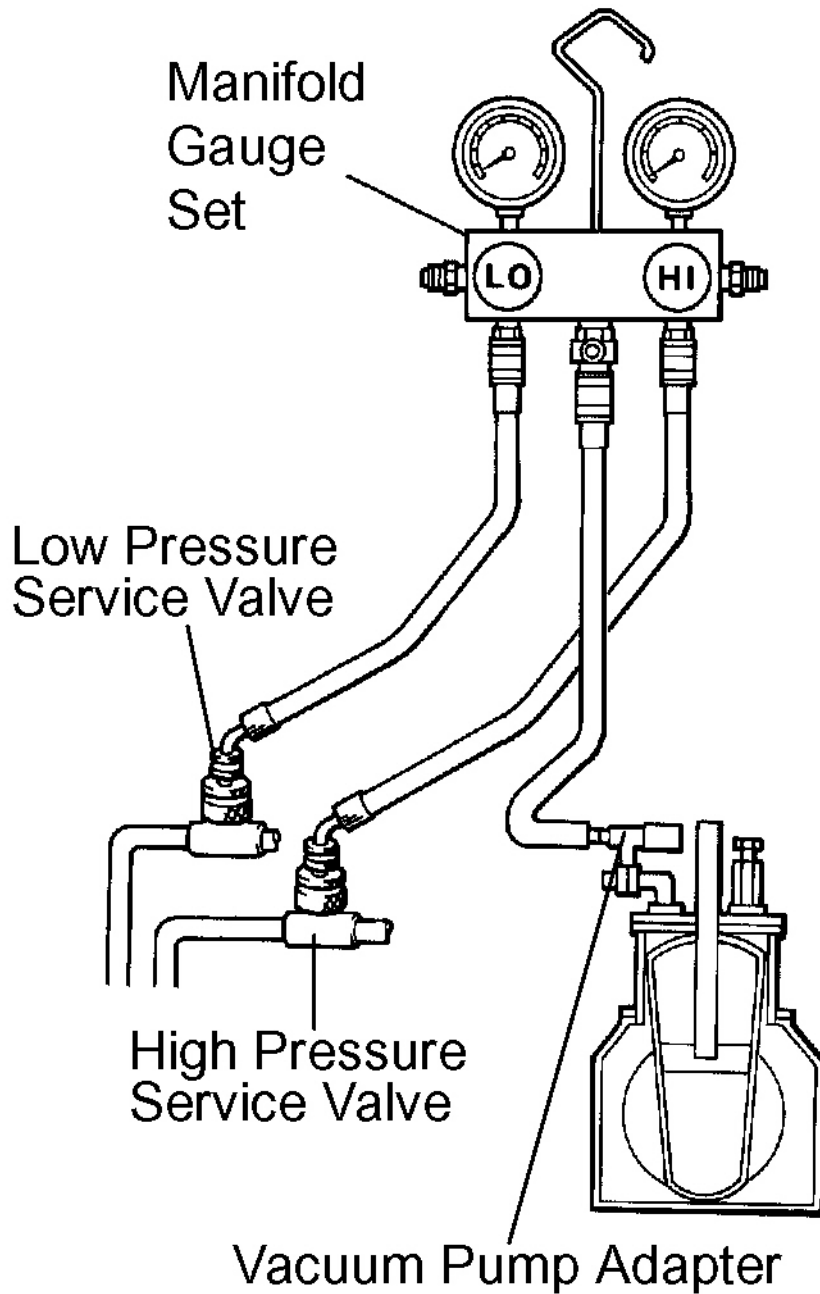
- a. Connect the vacuum pump adapter to the vacuum pump.



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Fig. 24: Connecting Vacuum Pump Adapter To Vacuum Pump
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the center hose of the manifold gauge set to the vacuum pump adapter.
- c. Open both the high and low hand valves and run the vacuum pump.



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Fig. 25: Connecting Center Hose Of Manifold Gauge Set To Vacuum Pump Adapter & Opening Valves

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

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

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

HINT:

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

Check the system for leaks and repair necessary.

- e. Close both the high and low hand valves and stop the vacuum pump.
- f. Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.

CHARGING

1. INSTALL CHARGING CYLINDER

HINT:

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

- a. Charge the proper amount of refrigerant into the charging cylinder.
- b. Connect the center hose to the charging cylinder.

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

- c. Open the valve of charging cylinder.

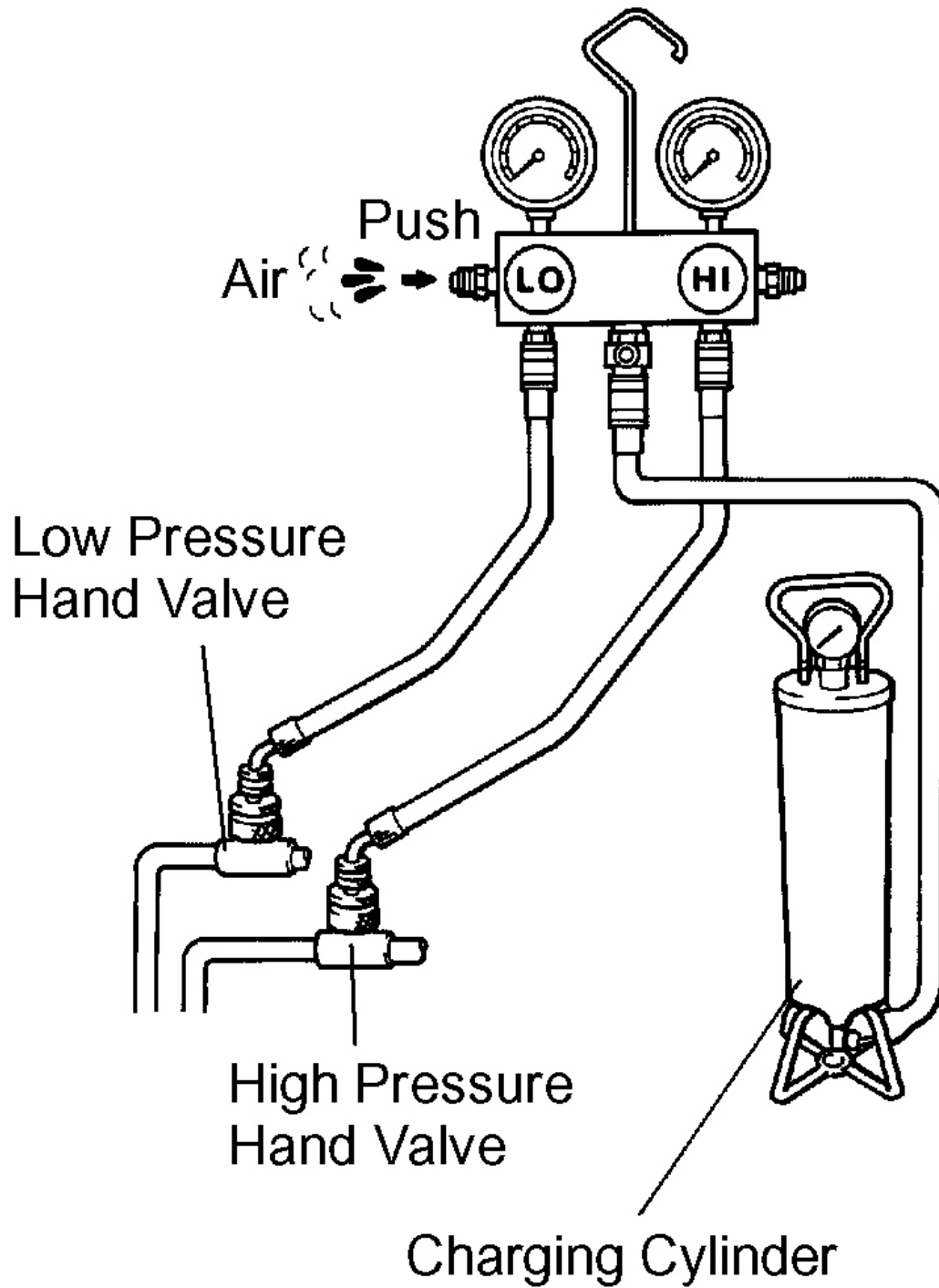


Fig. 26: Connecting Center Hose To Charging Cylinder & Opening Valve Of Charging Cylinder

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

- d. Press the valve core on the side of manifold gauge and purge the air inside of the center hose.

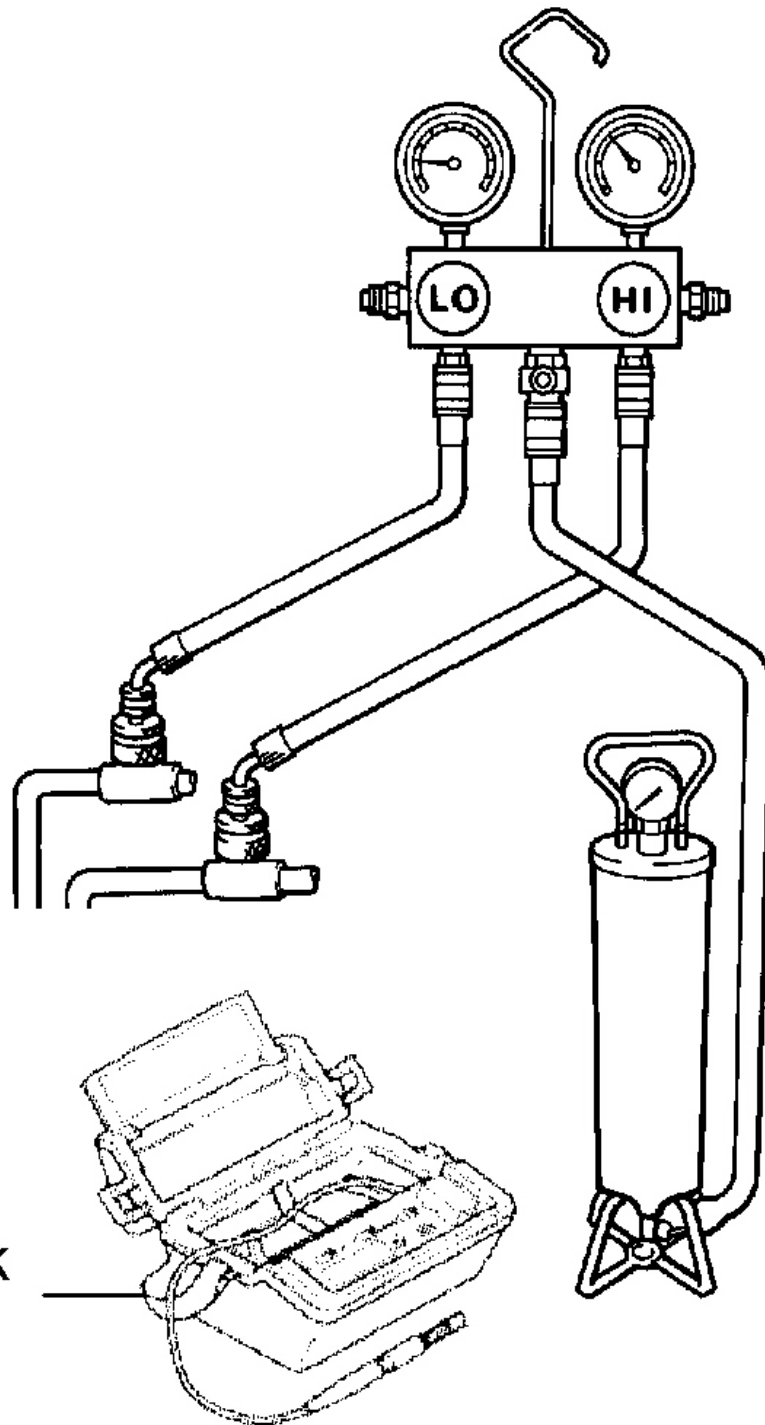
2. INSPECT REFRIGERATION SYSTEM FOR LEAKS

- a. Open the high pressure hand valve and charge refrigerant.
- b. When the low pressure gauge indicates 98 kPa (1 kgf/cm² , 14 psi), close the high pressure hand valve.
- c. Using a gas leak detector, check the system for leakage.

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

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



Gas Leak
Detector

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Fig. 27: Checking Refrigeration System For Leakage Using Gas Leak-Detector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. CHARGE REFRIGERANT INTO REFRIGERANT SYSTEM

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

CAUTION:

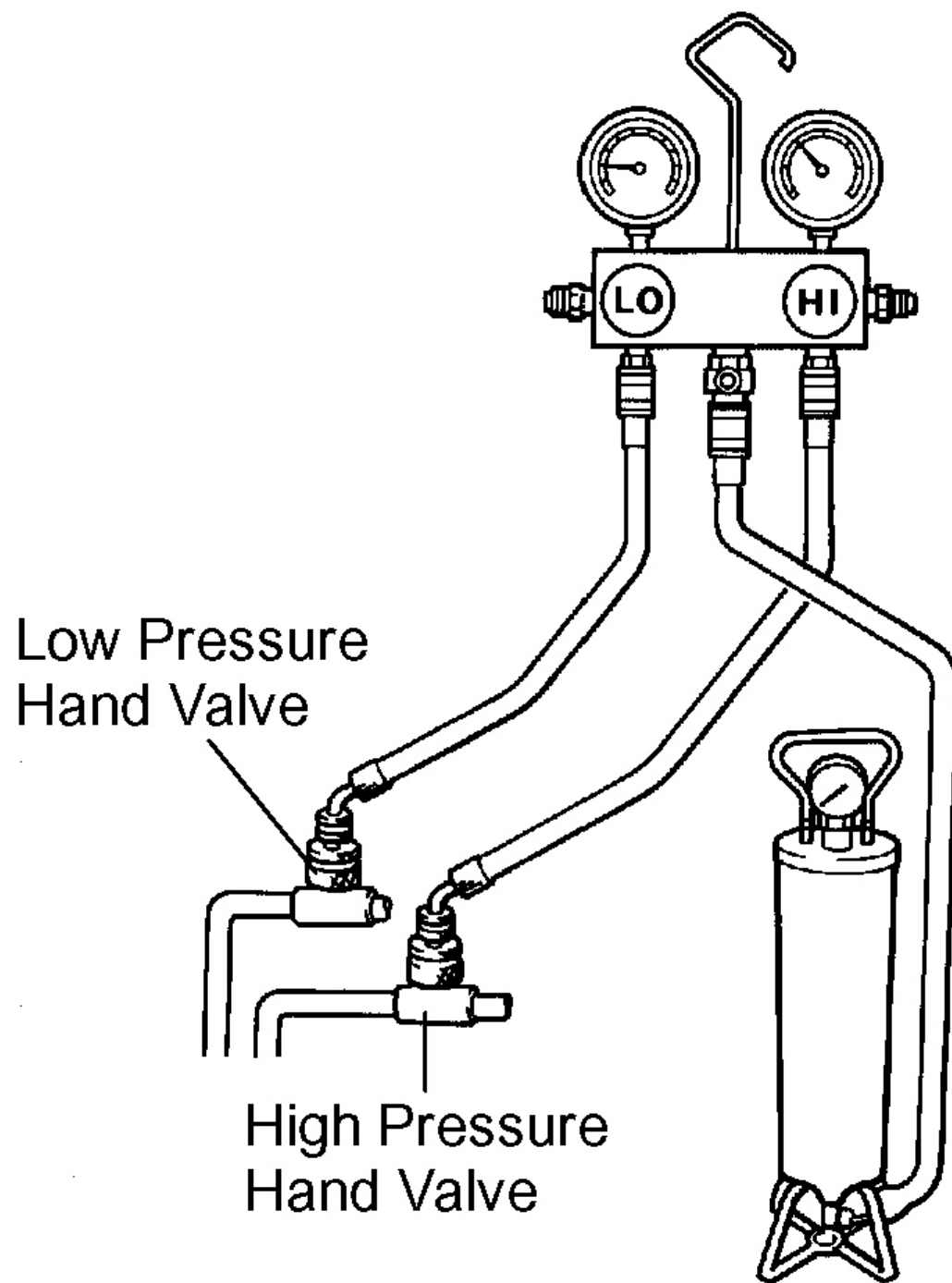
- **Never run the engine when charging the system through the high pressure service valve.**
- **Do not open the low pressure hand valve when the system is being charged with liquid refrigerant.**

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

HINT:

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

- c. Partially charge refrigeration system with refrigerant.
 1. Set the vehicle in these conditions:
 - Running engine at 1,500 RPM
 - Blower speed control switch at "HI"
 - Temperature control dial at "MAX. COOL"
 - Air inlet control switch at "RECIRC"
 - Fully open doors (Sliding roof at closed)
 2. Open the low pressure hand valve.



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Fig. 28: Opening/Closing Low And High-Pressure Hand Valves
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION:

- Do not open the high pressure hand valve.
 - After charging the refrigerant, turn the A/C switch ON and run the engine at 1,800 RPM or less for 1 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 and check the pressure on the gauge through the sight glass.
- e. Replenish refrigerant to be 100 +/- 50 g after bubbles disappear.

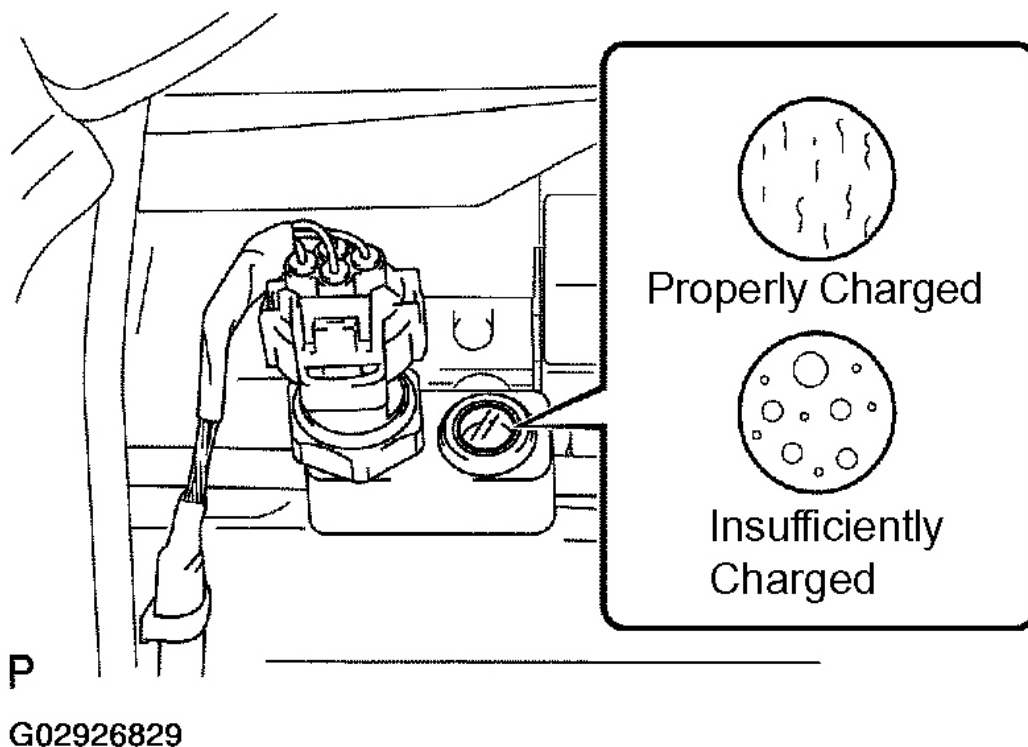
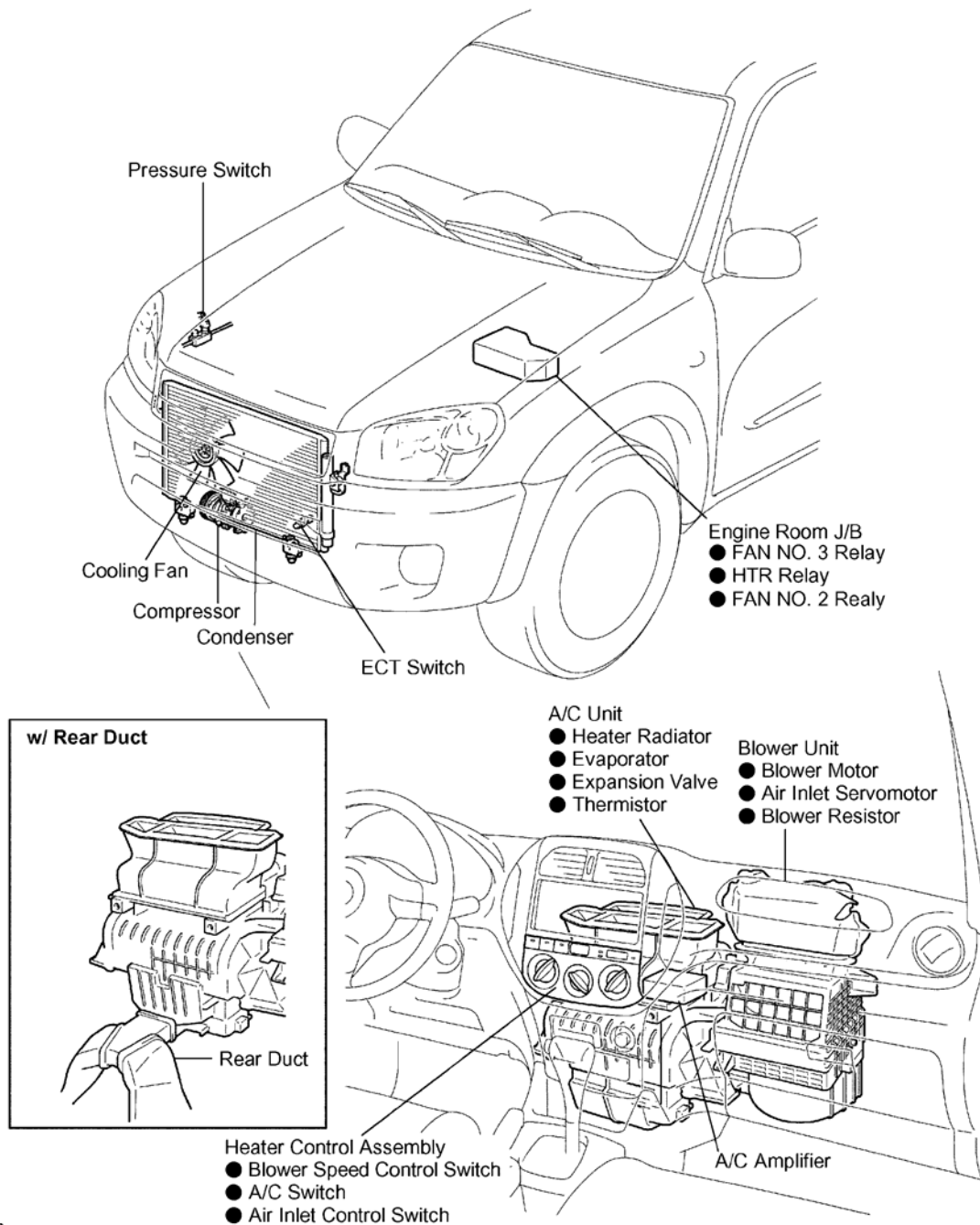


Fig. 29: Identifying Properly Charged Refrigerant
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

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Fig. 30: Locating Air Conditioning System Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

Use **Fig. 31** 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.

Symptom	Suspected Area
No blower operation	1. HTR fuse 2. HTR relay 3. Blower motor 4. Blower resistor 5. Blower speed control switch 6. Wire harness
No blower control	1. Blower motor 2. Blower resistor 3. Blower speed control switch 4. Wire harness
No air temperature	1. Engine coolant volume 2. Heater control assembly
No compressor operation	1. Refrigerant volume 2. A.C fuse 3. Magnetic clutch 4. Compressor lock sensor 5. Compressor 6. Pressure switch 7. Heater main relay 8. Blower speed control switch 9. Heater control assembly 10. Thermistor 11. Wire harness
No cool air comes out	1. Refrigerant volume 2. Refrigerant pressure 3. Drive belt 4. Magnetic clutch 5. Compressor lock sensor 6. Pressure switch 7. Thermistor 8. Heater control assembly 9. Wire harness
Insufficient cooling	1. Refrigerant volume 2. Drive belt 3. Magnetic clutch 4. Compressor 5. Condenser 6. Expansion valve 7. Evaporator 8. Refrigerant lines 9. Pressure switch 10. A/C control system 11. Heater control assembly
No engine idle-up with A/C switch ON	1. Heater control assembly 2. Engine ECU 3. Idle control system 4. Wire harness
No air inlet control	1. Heater control assembly 2. Air inlet servomotor 3. Wire harness
No mode control	1. Heater control assembly 2. Wire harness
Blinking of A/C indicator	1. Compressor 2. Drive belt 3. Compressor lock sensor 4. Heater control assembly
Brightness does not change when light control switch is turned on	1. Headlight and taillight system 2. Heater control assembly

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Fig. 31: Air Conditioning Troubleshooting Table

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

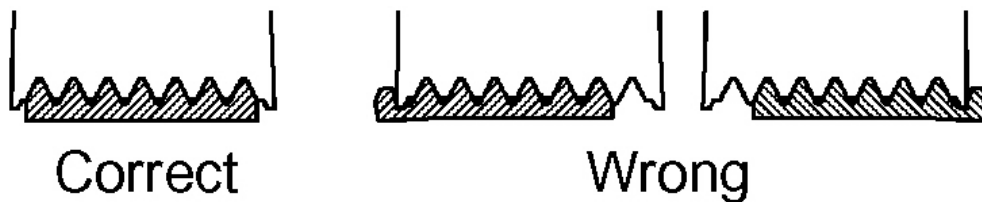
DRIVE BELT

ON-VEHICLE INSPECTION

1. INSPECT DRIVE BELT'S INSTALLATION CONDITION

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

2. INSPECT DRIVE BELT TENSION



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Fig. 32: Checking Drive Belt Properly Fitted

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

NOTE: Compress the drive belt tensioner by taking 3 seconds or more and installed the drive belt.

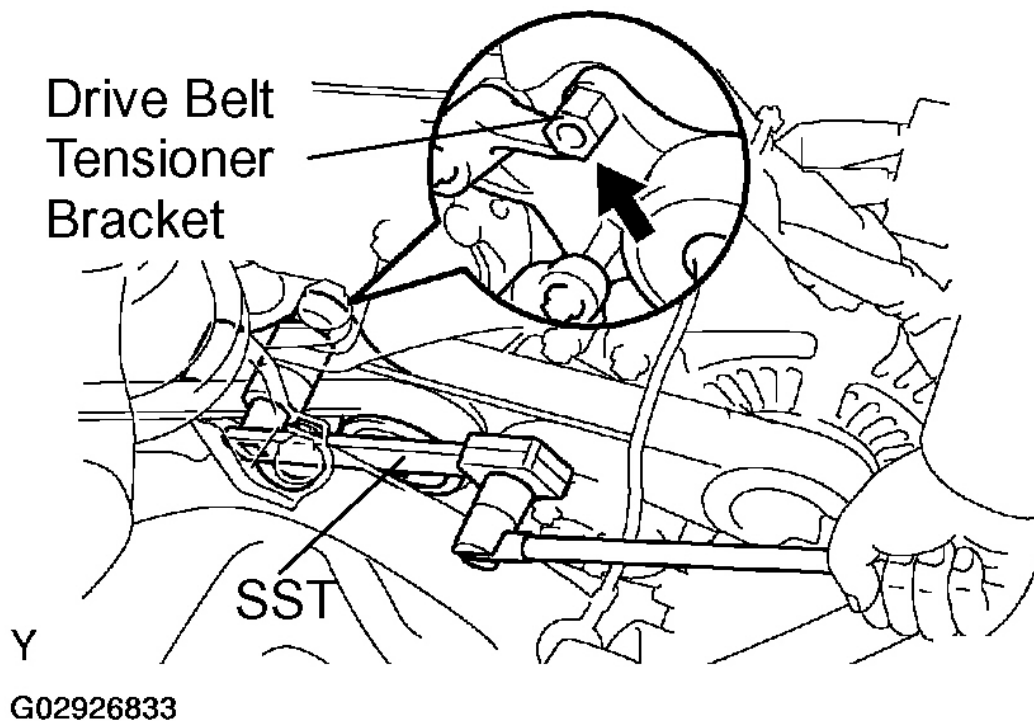
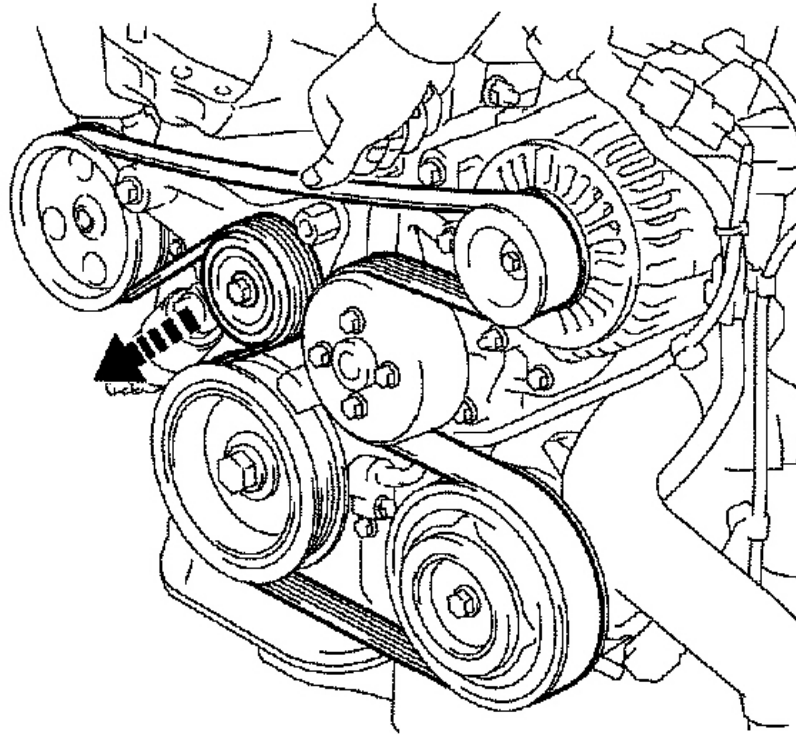


Fig. 33: Removing/Installing Drive Belt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. CHECK DRIVE BELT INSTALLATION CONDITION

- Check that the belt tensioner moves downward when the drive belt is pressed down at the points indicated in **Fig. 34**.
- 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.



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Fig. 34: Checking Drive Belt Installation Conditions
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

MANIFOLD GAUGE SET

SET ON

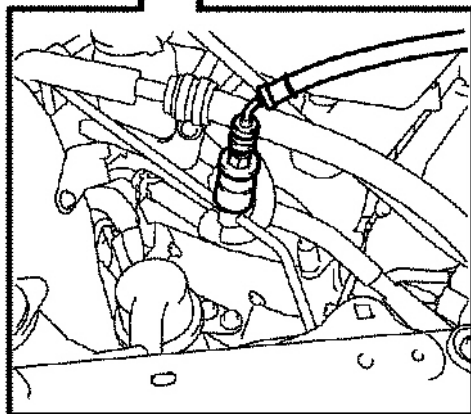
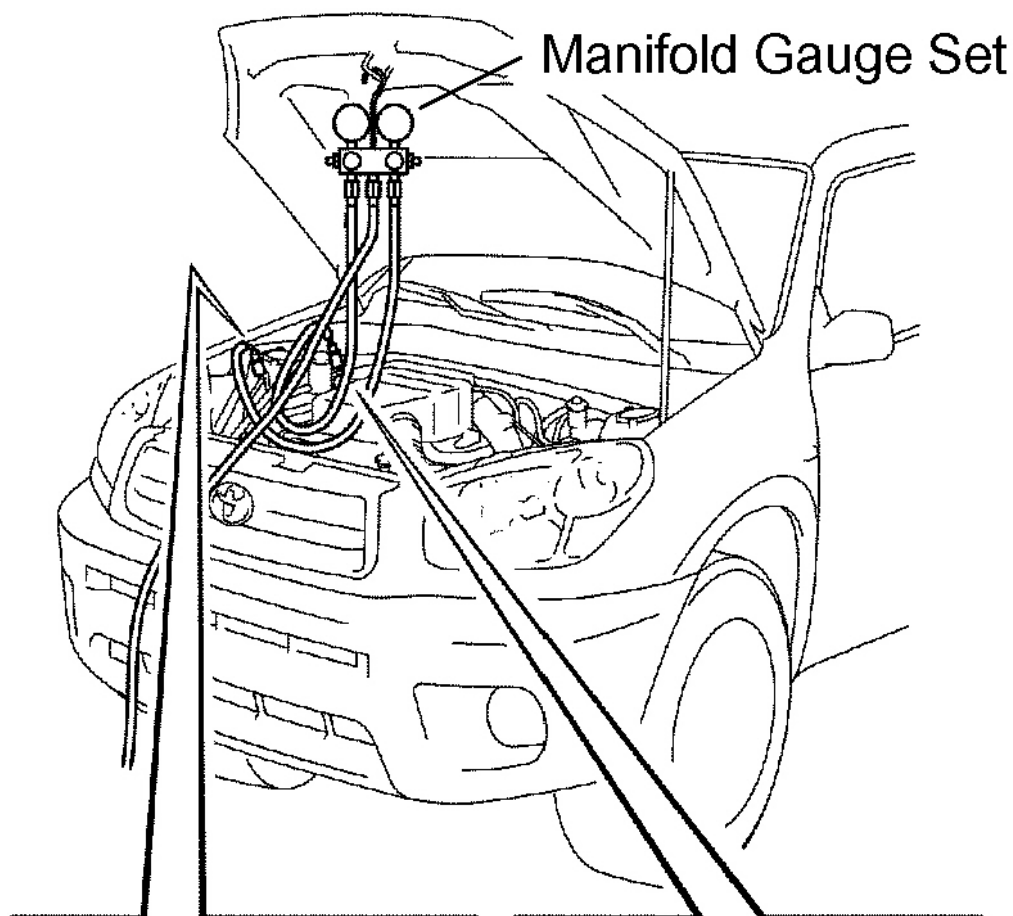
1. CONNECT CHARGE HOSE TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

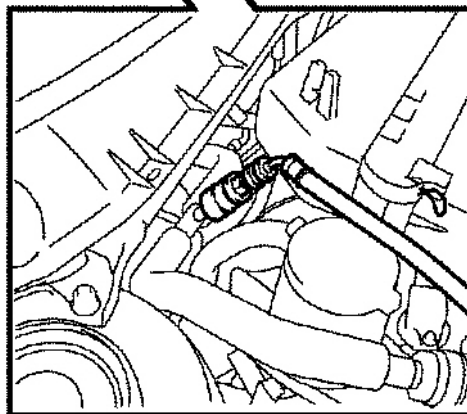
CAUTION: Do not connect the wrong hoses.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



High Pressure
Charging Hose



Low Pressure
Charging Hose

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Fig. 35: Connecting Charge Hose To Manifold Gauge Set

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

2. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVE ON REFRIGERANT LINE

5. CONNECT QUICK DISCONNECT ADAPTER TO SERVICE VALVES

HINT:

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

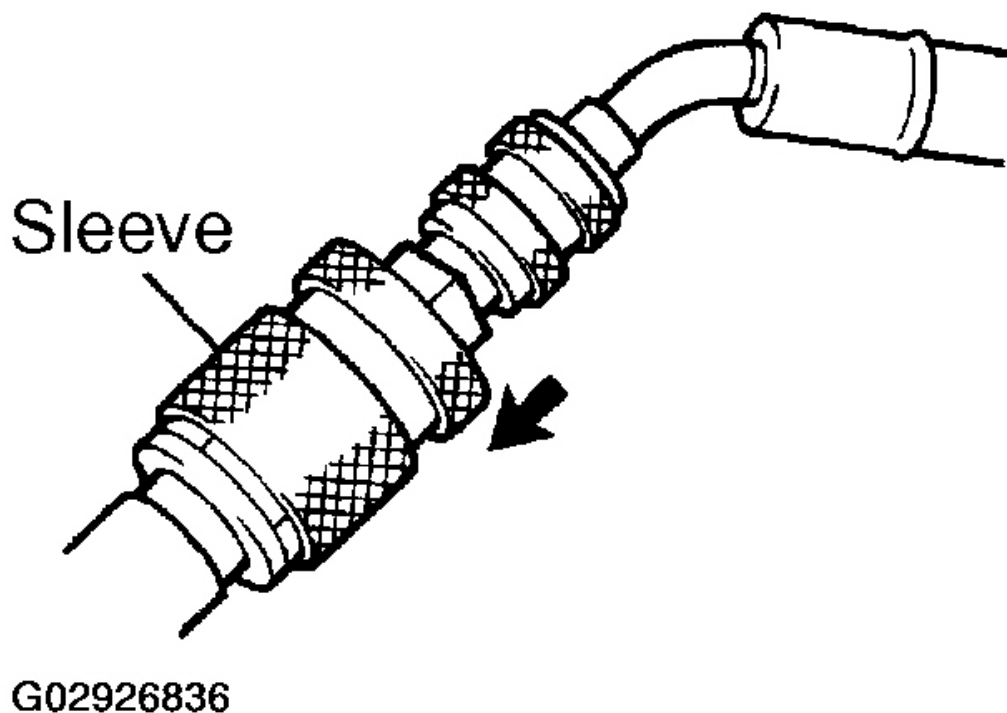


Fig. 36: Connecting Quick Disconnect Adapter

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

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

HINT:

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

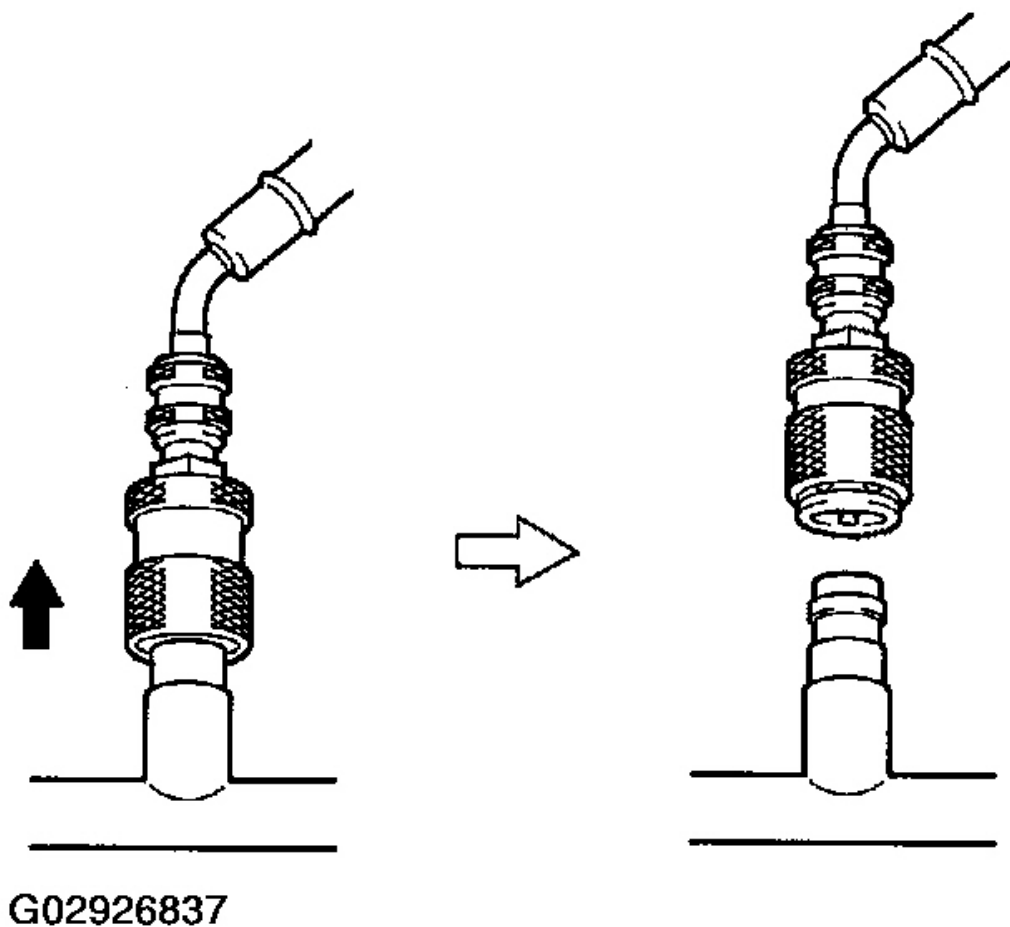


Fig. 37: Disconnecting Quick Disconnect Adapters
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

REFRIGERANT LINE

ON-VEHICLE INSPECTION

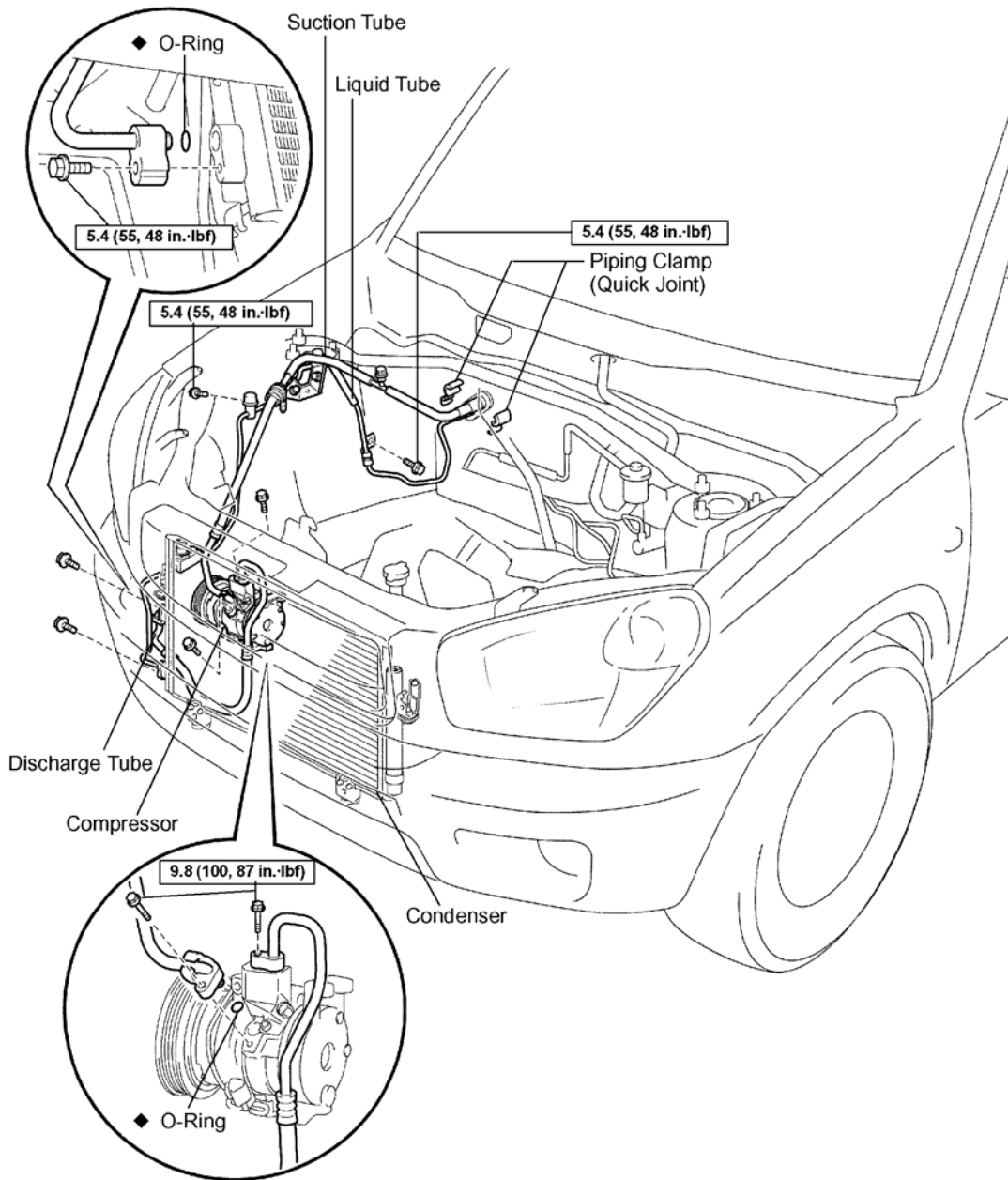
- 1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS**
- 2. INSPECT HOSES AND TUBES FOR LEAKAGE**

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

LOCATION

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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

◆ Non-reusable part

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Fig. 38: Locating Refrigerant Lines

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

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

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 torque.

TIGHTENING TORQUE SPECIFICATION

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

4. EVACUATE AIR IN REFRIGERATION SYSTEM AND 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.

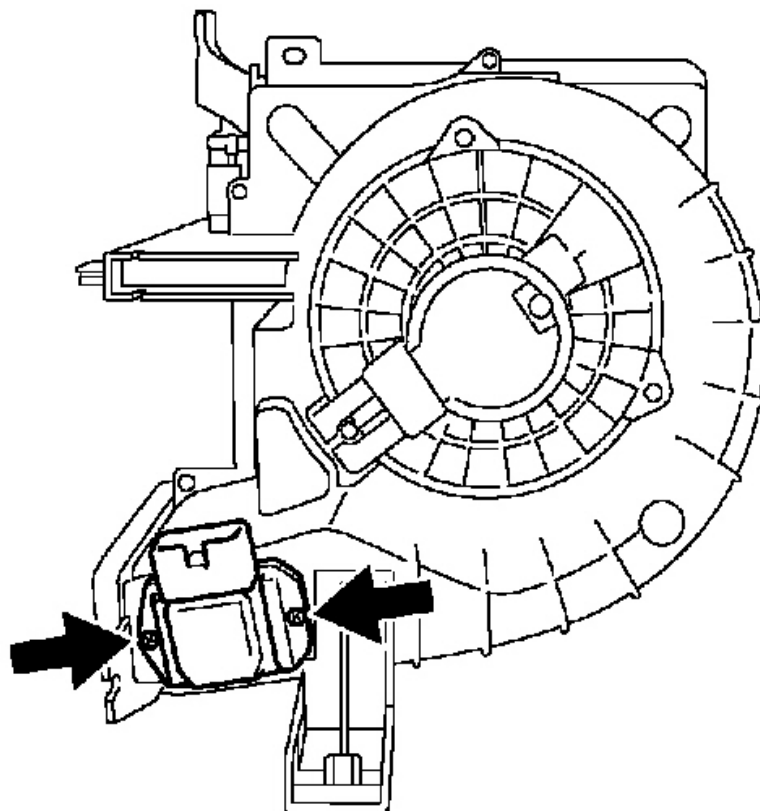
6. INSPECT AIR CONDITIONER OPERATION

AIR CONDITIONING UNIT

ON-VEHICLE INSPECTION

1. INSPECT FOR LEAKAGE OF REFRIGERANT

- Disconnect the blower resistor connector.
- Remove the 2 screws and blower resistor.



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Fig. 39: Removing Blower Resistor & 2 Screws

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. Set on the manifold gauge set.
- c. Run the engine.

1. Run the engine at 1,500 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.

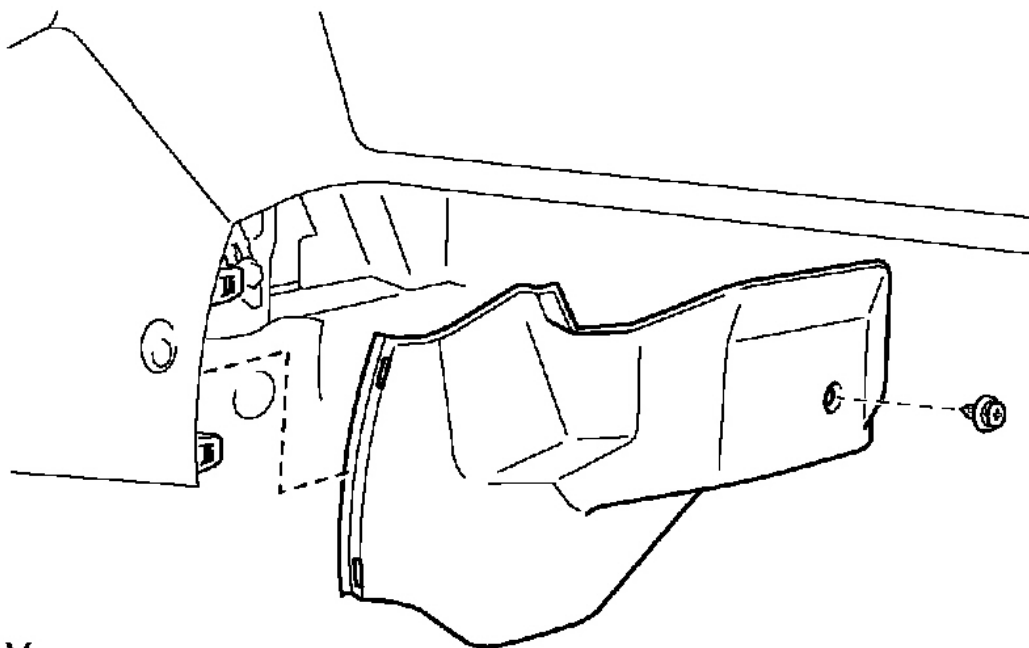
If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm² , 0 psi).

HINT:

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.



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Fig. 40: Removing Clips & No. 2 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.

Standard resistance: 1,500 ohm at 25°C (77°F)

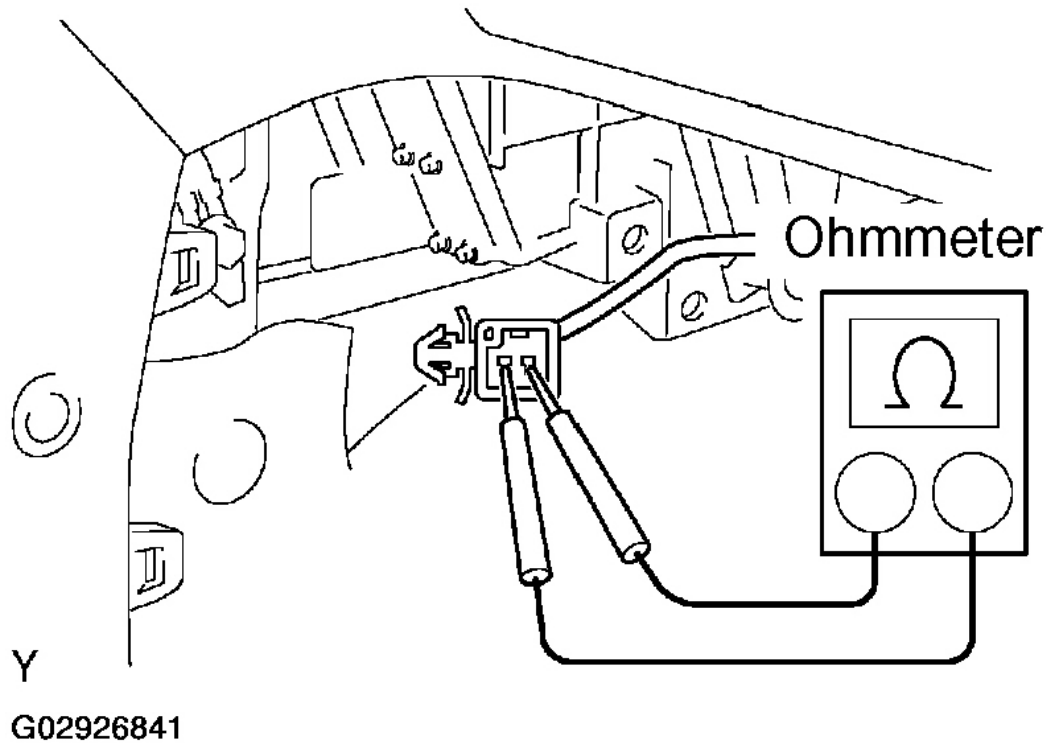


Fig. 41: Measuring Resistance Of Thermistor

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

If resistance is not as specified, replace the thermistor.

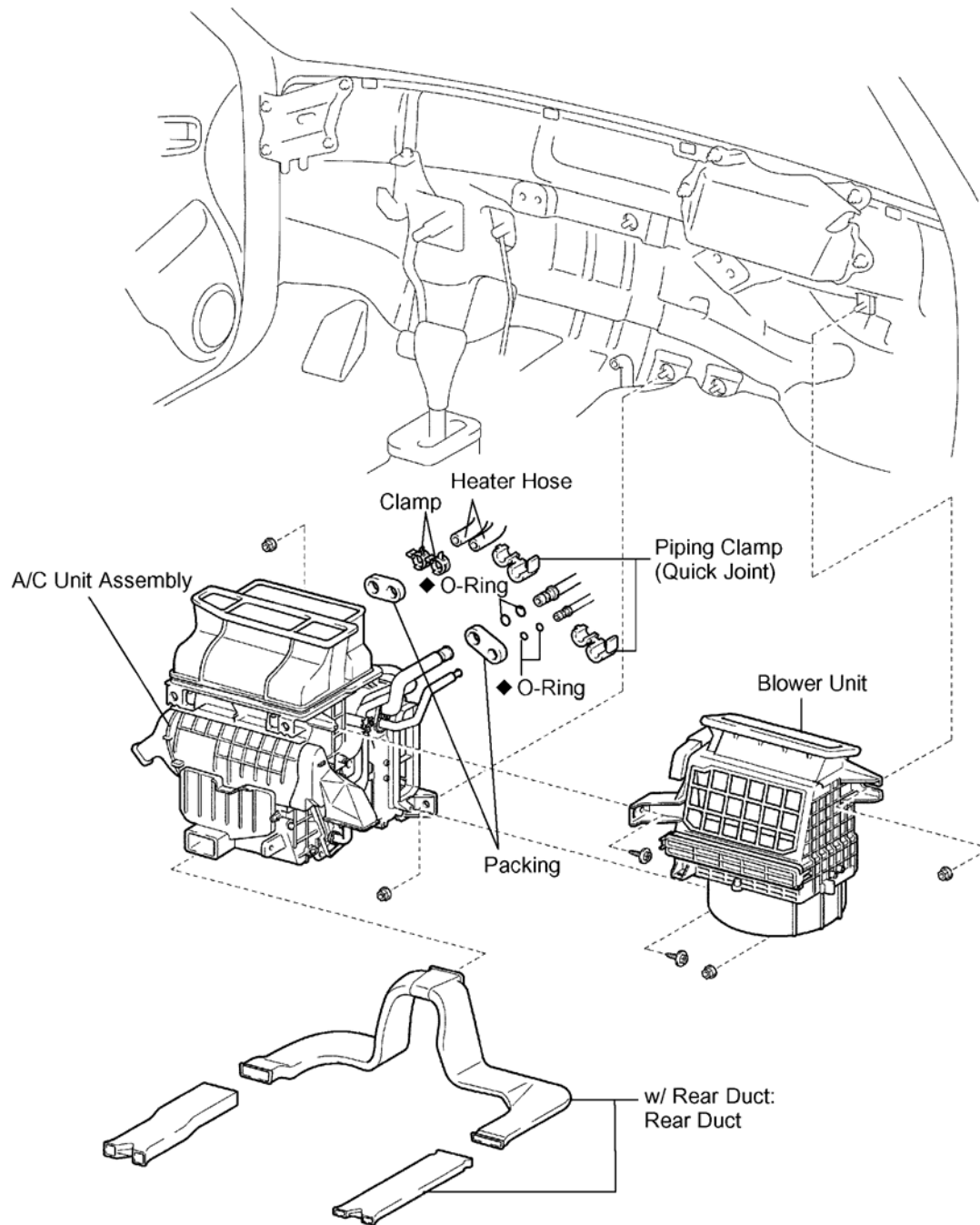
- c. Reconnect the thermistor connector and clamp.

5. REINSTALL NO. 2 INSTRUMENT PANEL UNDER COVER

COMPONENTS

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



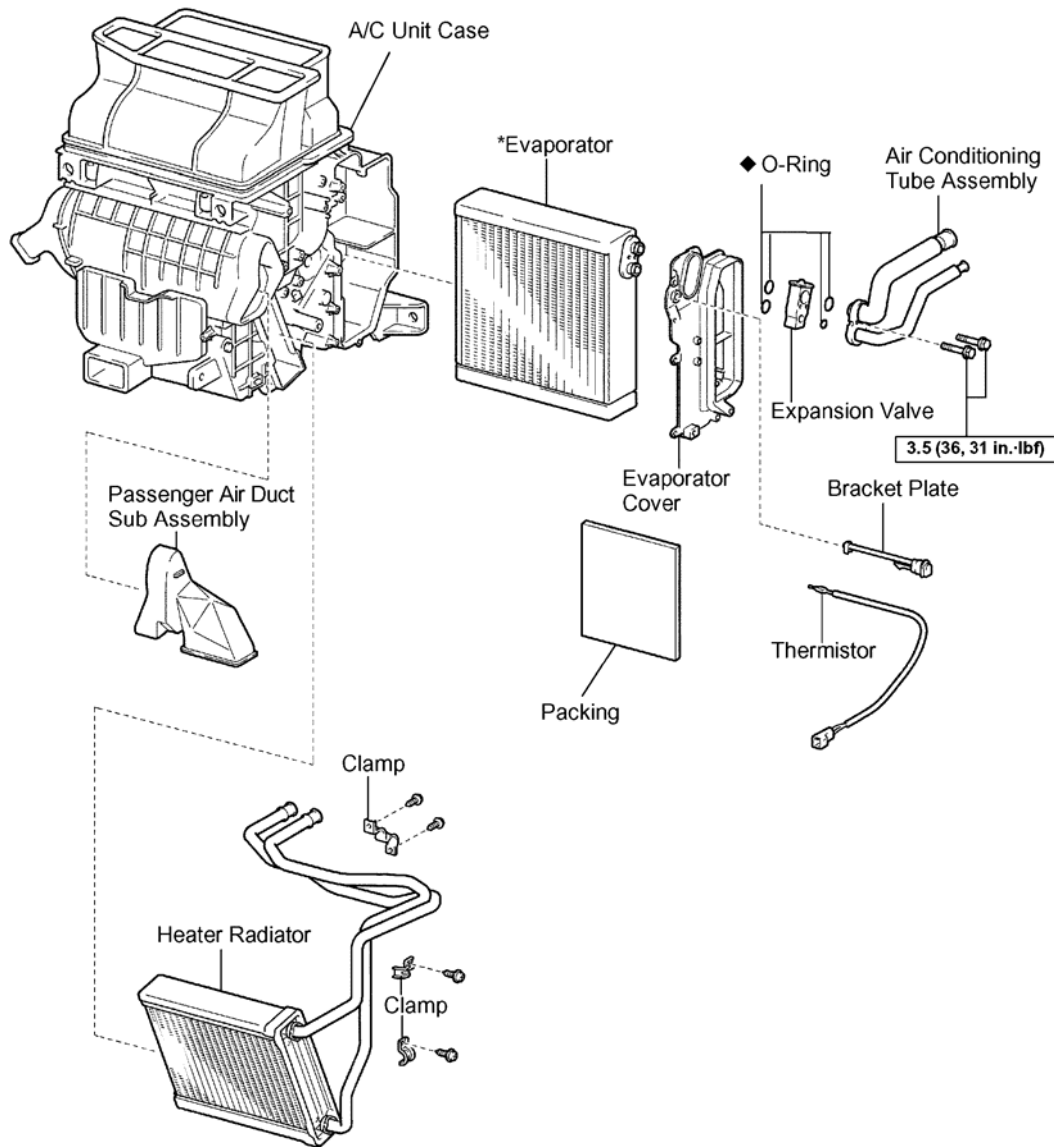
p ♦ Non-reusable part

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Fig. 42: Locating Air Conditioning Unit Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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)

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Fig. 43: Locating Air Conditioning Unit Components (2 Of 2)

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

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
2. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

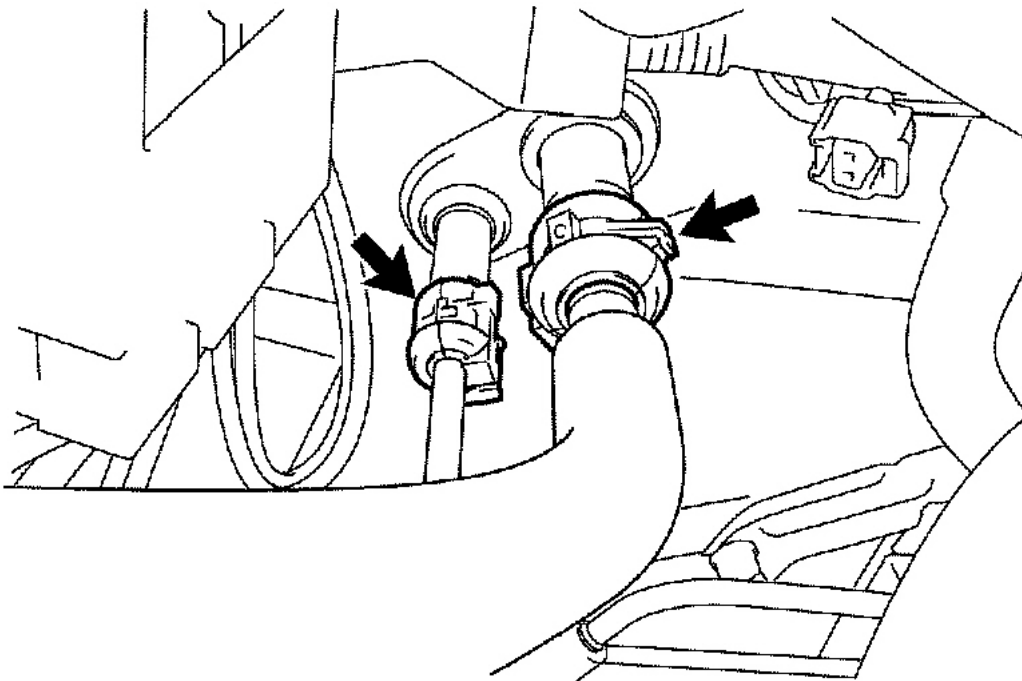
It is not necessary to drain out all coolant.

3. DISCONNECT LIQUID TUBE AND SUCTION HOSE

- a. Using SST, remove the 2 piping clamps.

SST 09870-00015 (Suction tube)

09870-00025 (Liquid tube)



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Fig. 44: Removing 2 Piping Clamps

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

1. Insert the SST to the piping clamp.

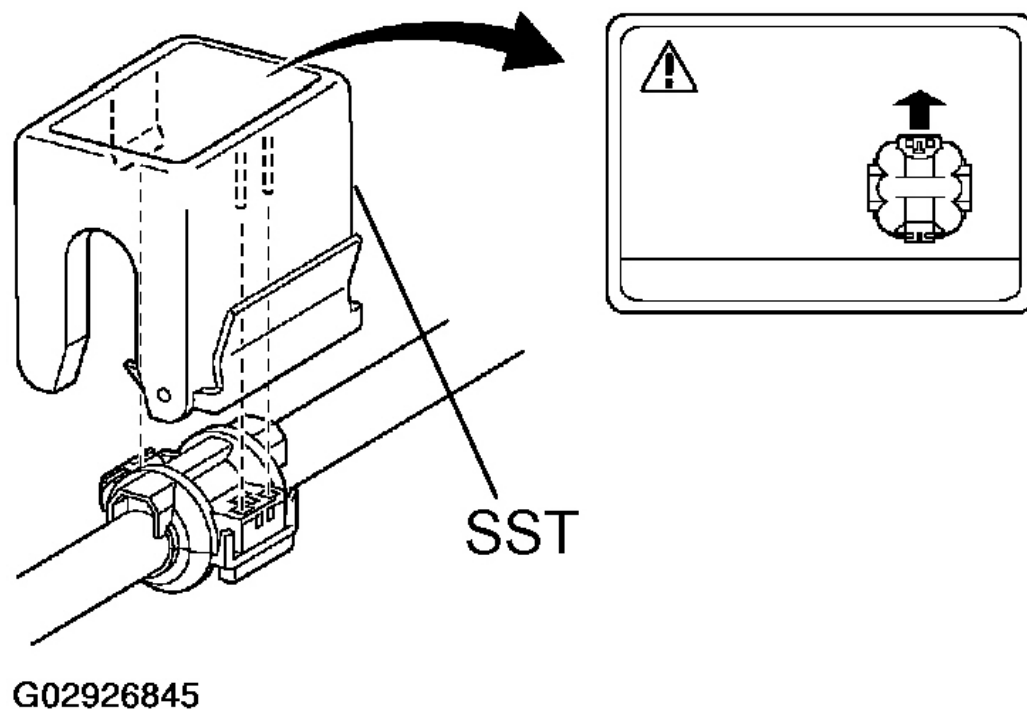


Fig. 45: Inserting SST To Piping Clamp

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

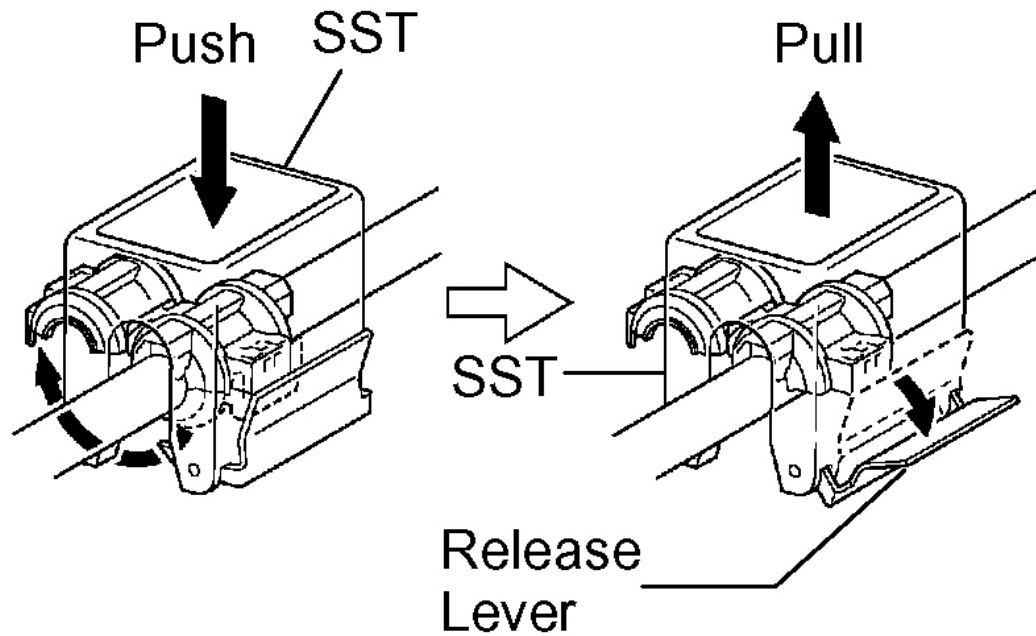
HINT:

Confirm the direction of the piping clamp claw and SST using **Fig. 45** shown on the caution label.

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

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

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.



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Fig. 46: Removing Piping Clamp With SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

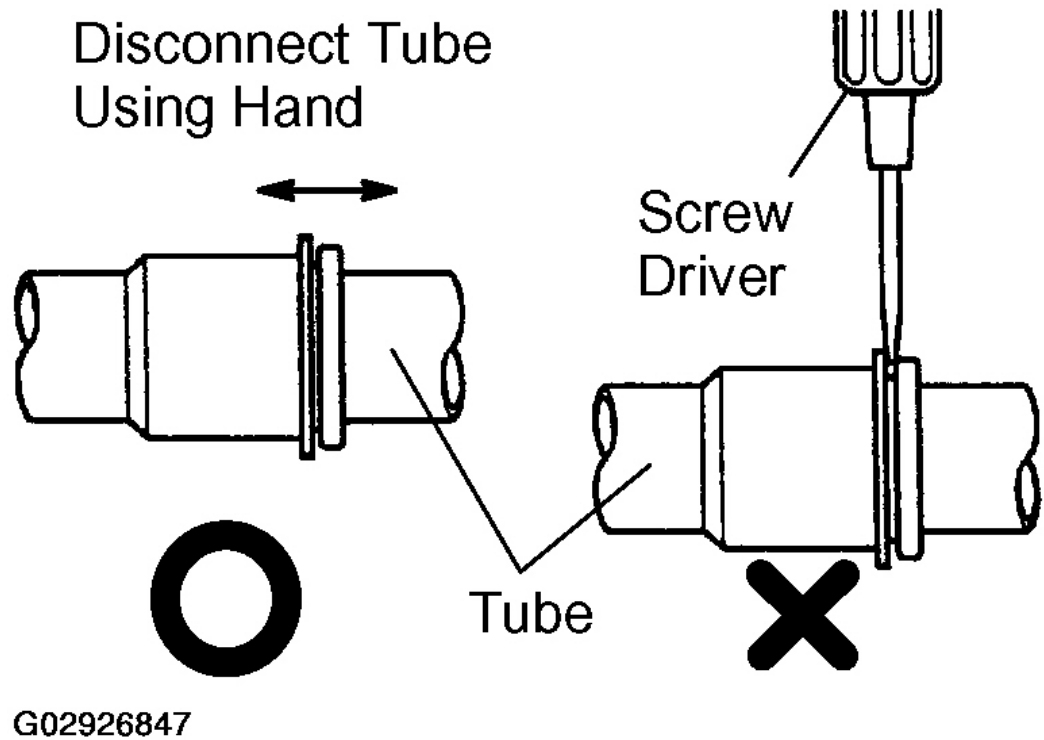
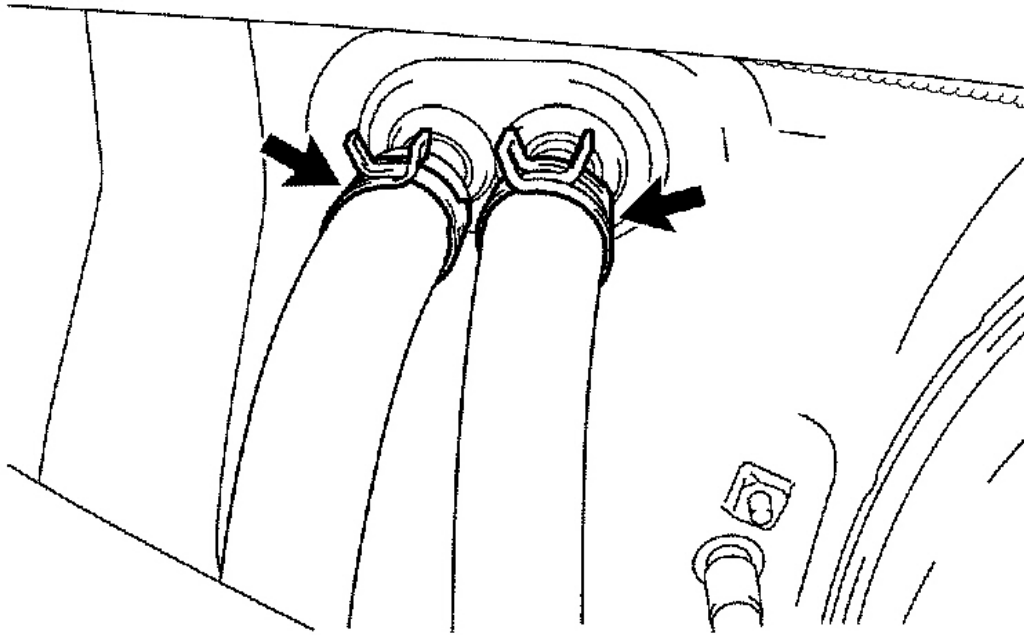


Fig. 47: Avoiding Using Tools To Remove Tube
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.



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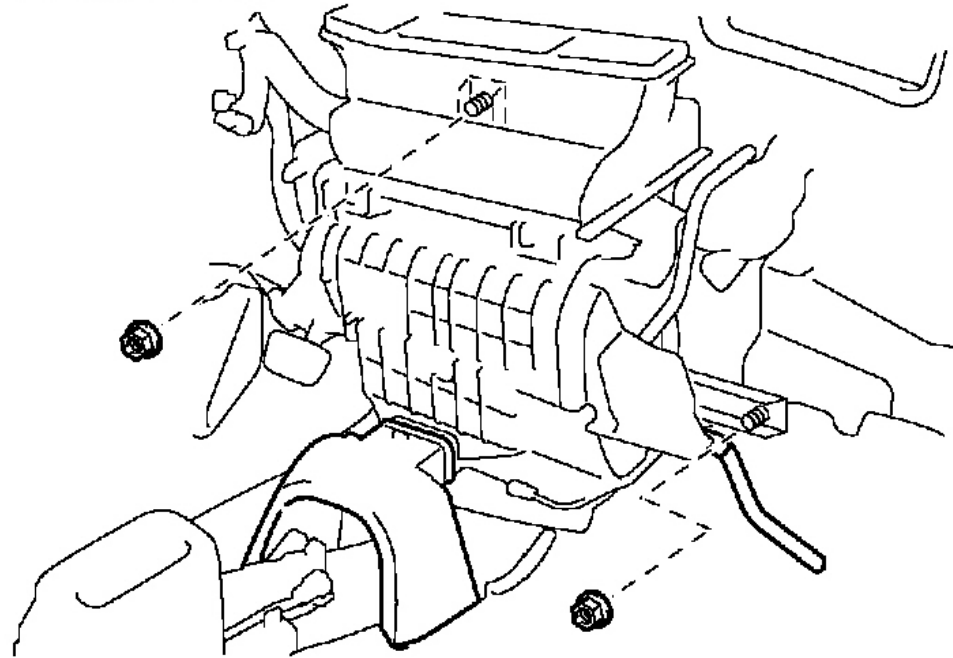
Fig. 48: Disconnecting 2 Heater Hoses

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

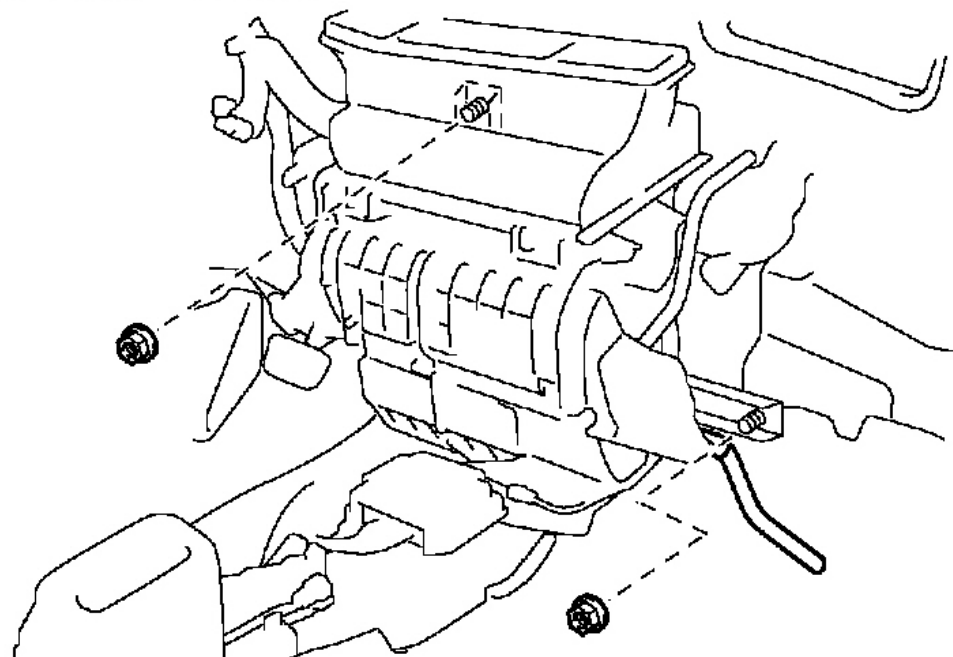
5. **REMOVE INSTRUMENT PANEL AND REINFORCEMENT (See REMOVAL)**
6. **REMOVE PIPE GROMMETS**
7. **REMOVE BLOWER UNIT (See REMOVAL)**
8. **REMOVE A/C UNIT**
 - a. w/Rear duct:

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

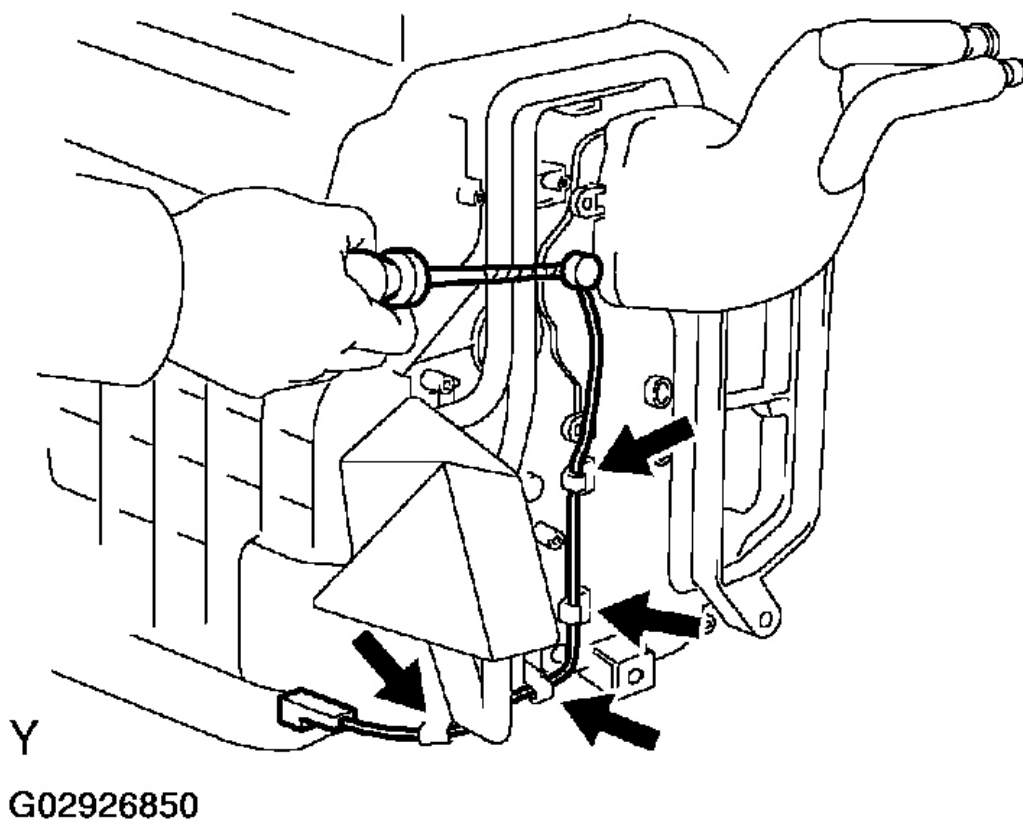
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Fig. 49: Removing A/C Unit & 2 Nuts

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

**Fig. 50: Pulling Out Thermistor From A/C Unit Case Using Screwdriver**

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

HINT:

Tape the screwdriver tip before use.

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

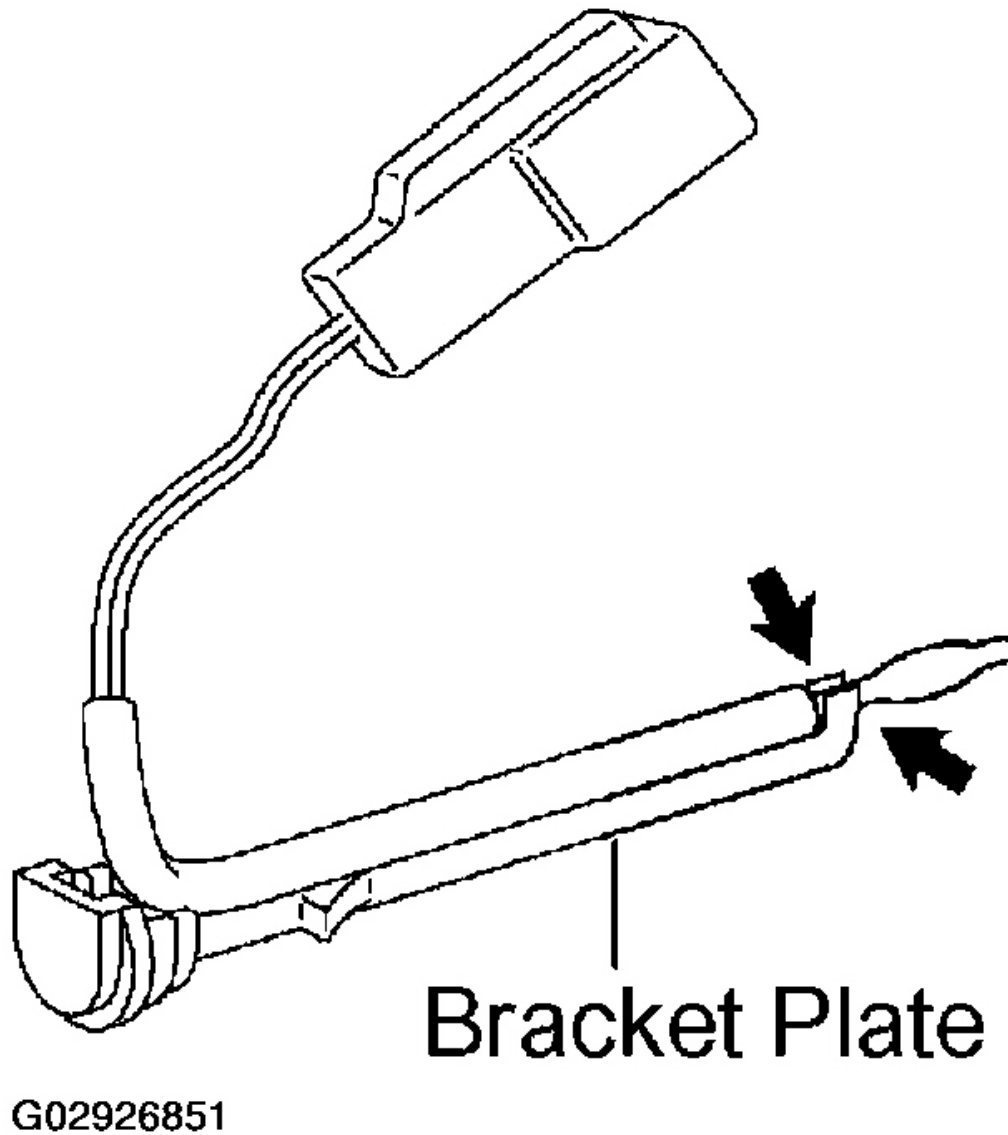


Fig. 51: Removing Thermistor From Bracket Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE EVAPORATOR

- a. Remove the 7 screws.
- b. Pull out the evaporator from the A/C unit case.
- c. Remove the packing.

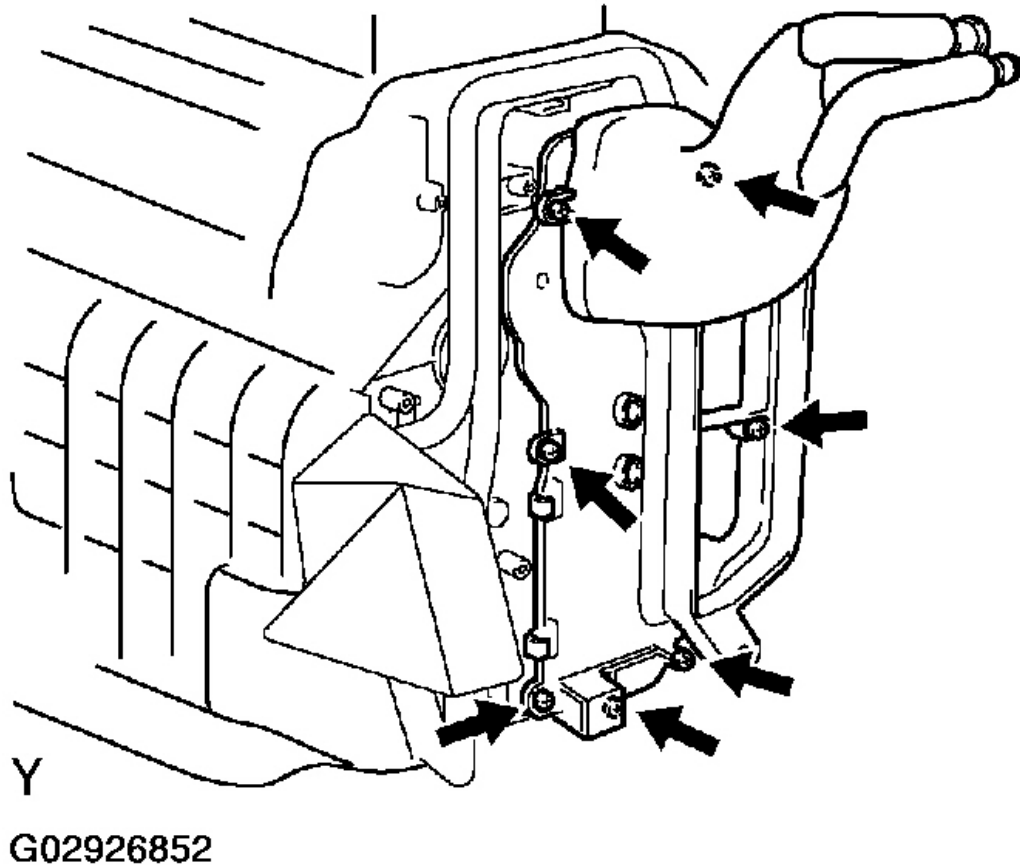
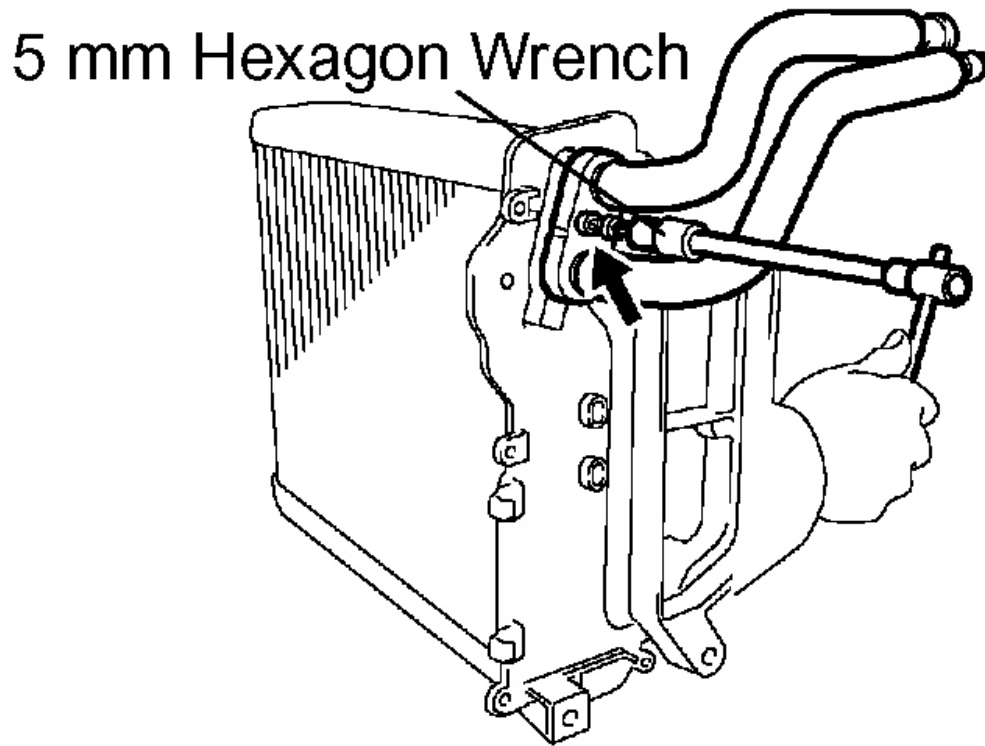


Fig. 52: Removing 7 Screws & Evaporator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.



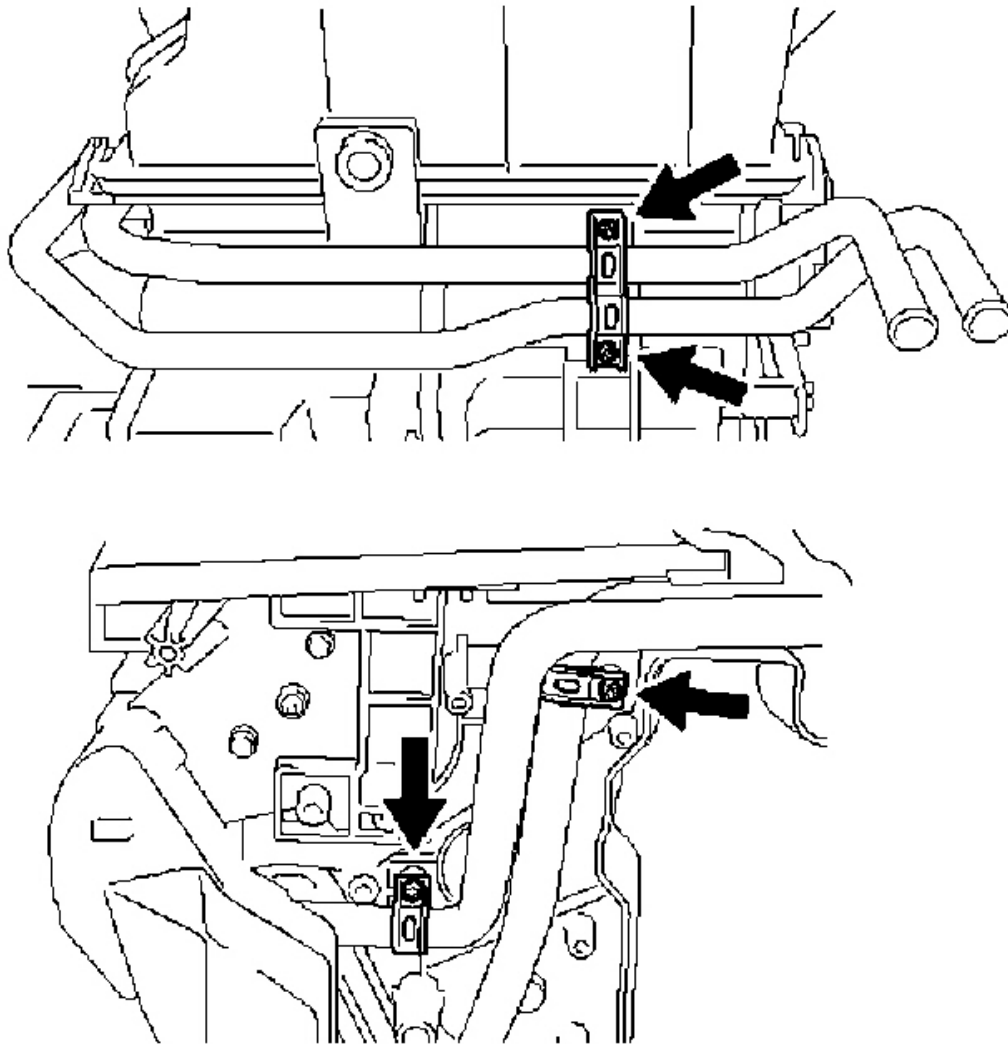
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Fig. 53: Removing 2 Bolts Using 5 MM Hexagon Wrench
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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. 54: Removing 4 Screws, 3 Clamps & 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.

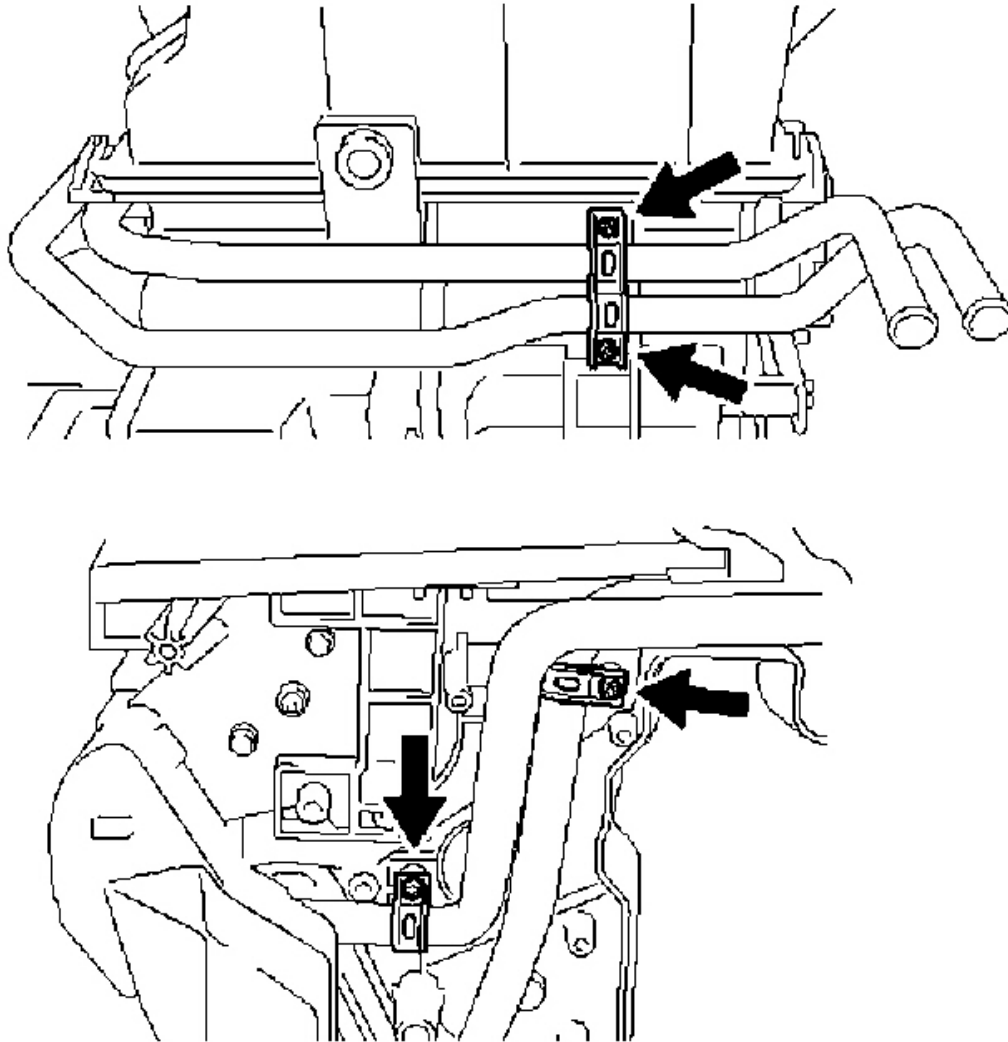
3. INSPECT THERMISTOR (See INSPECTION)

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.



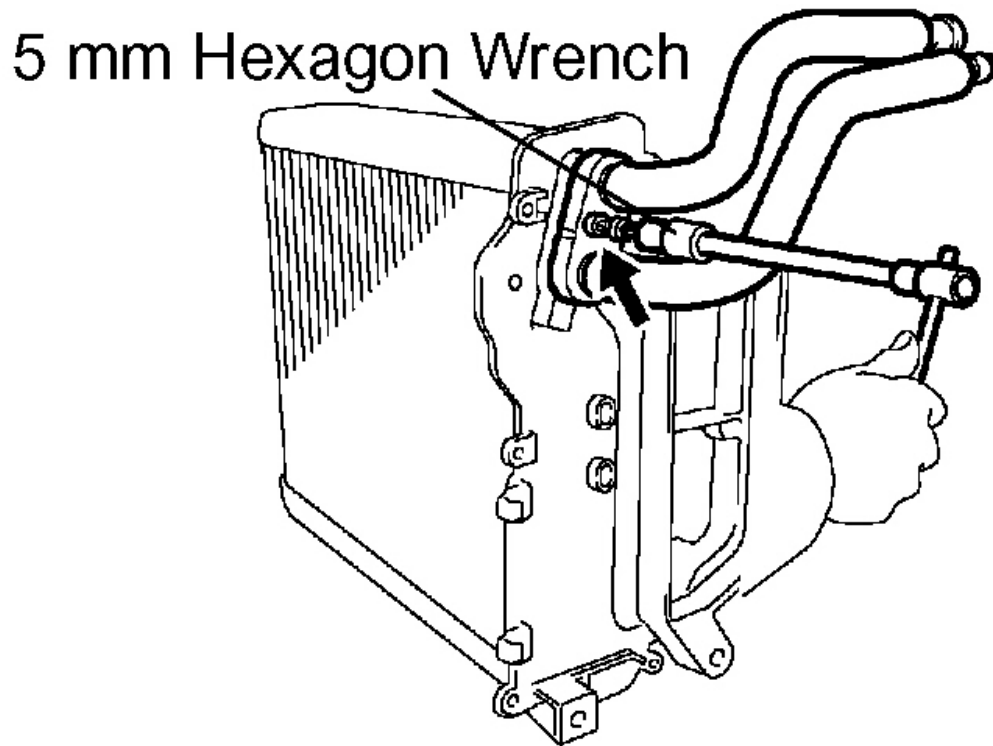
G02926855

Fig. 55: Installing 4 Screws, 3 Clamps & 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)



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Fig. 56: Installing Expansion Valve With Using 5 MM Hexagon Wrench
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

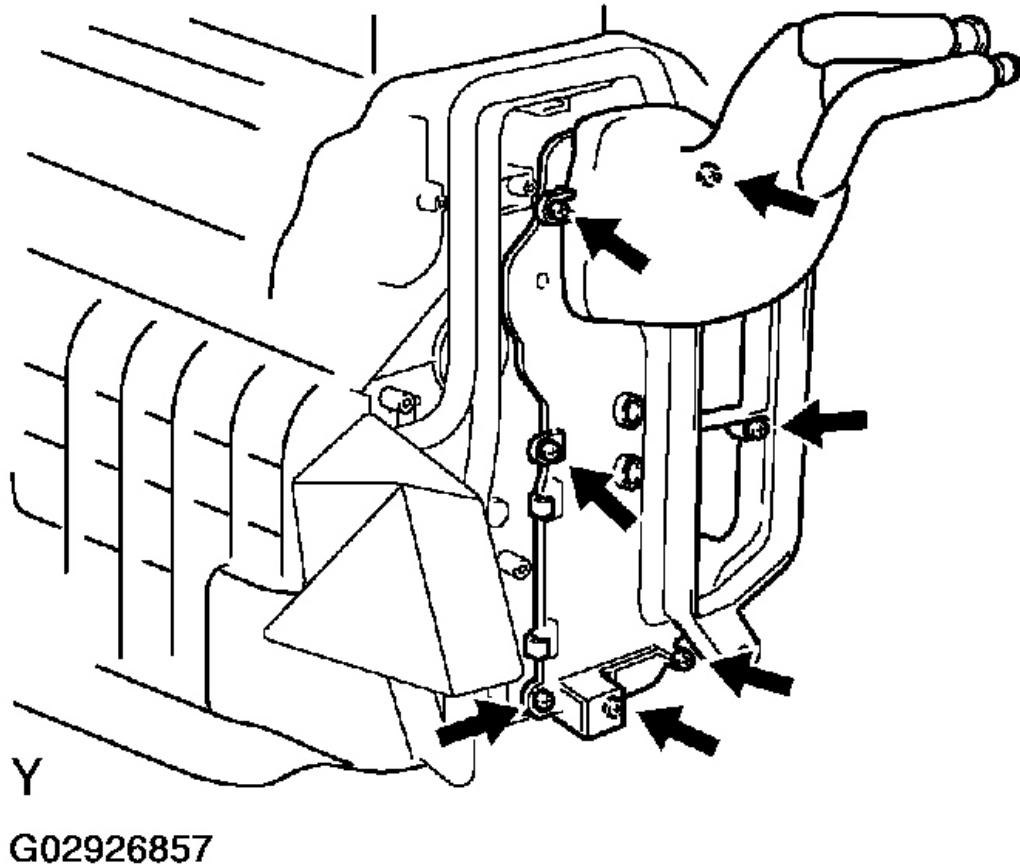


Fig. 57: Installing Evaporator With 7 Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL THERMISTOR

- a. Install the thermistor to the bracket plate as shown in **Fig. 58** .

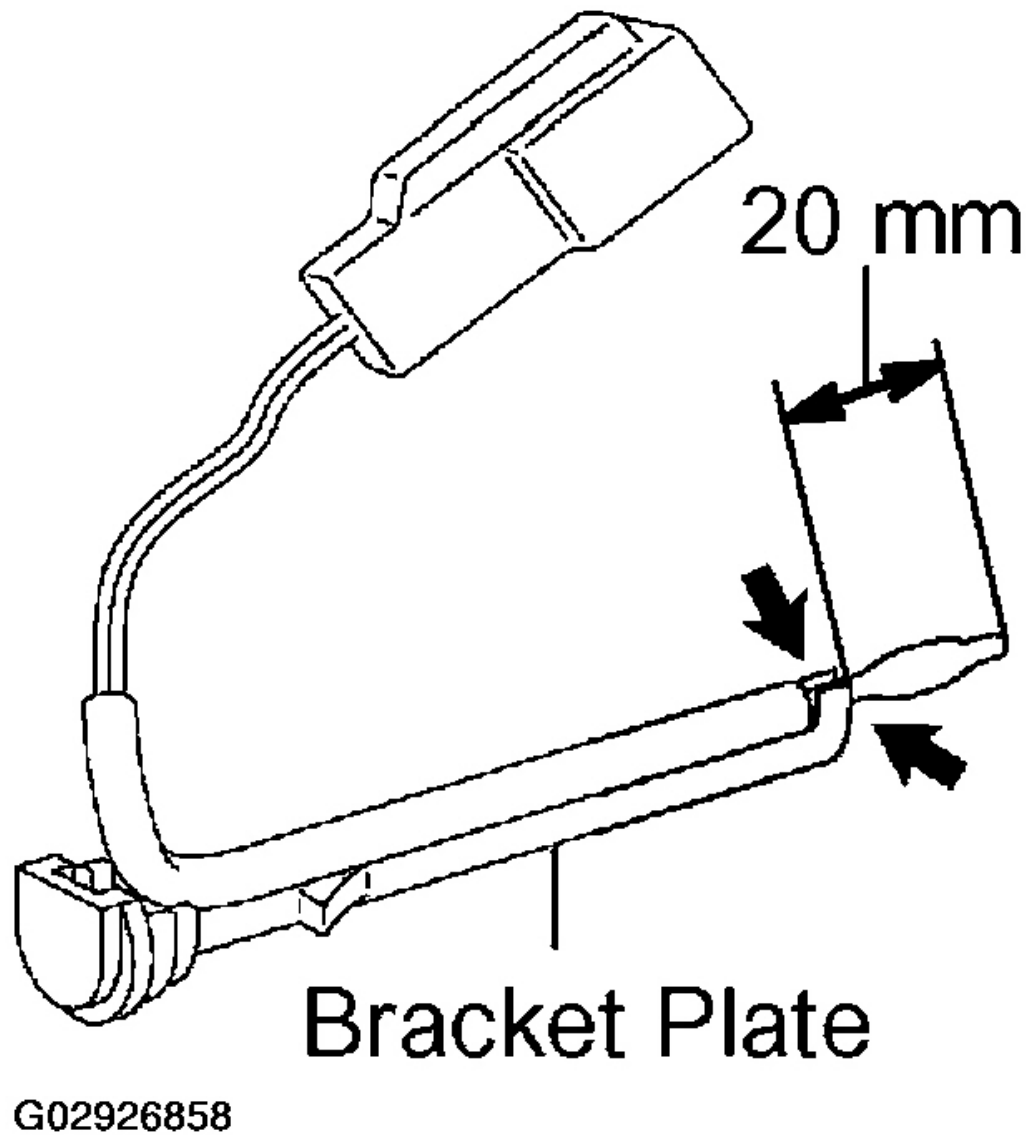


Fig. 58: Installing Thermistor To Bracket Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Push into the thermistor to the A/C unit case.
- c. Connect the connector clamp.

INSTALLATION

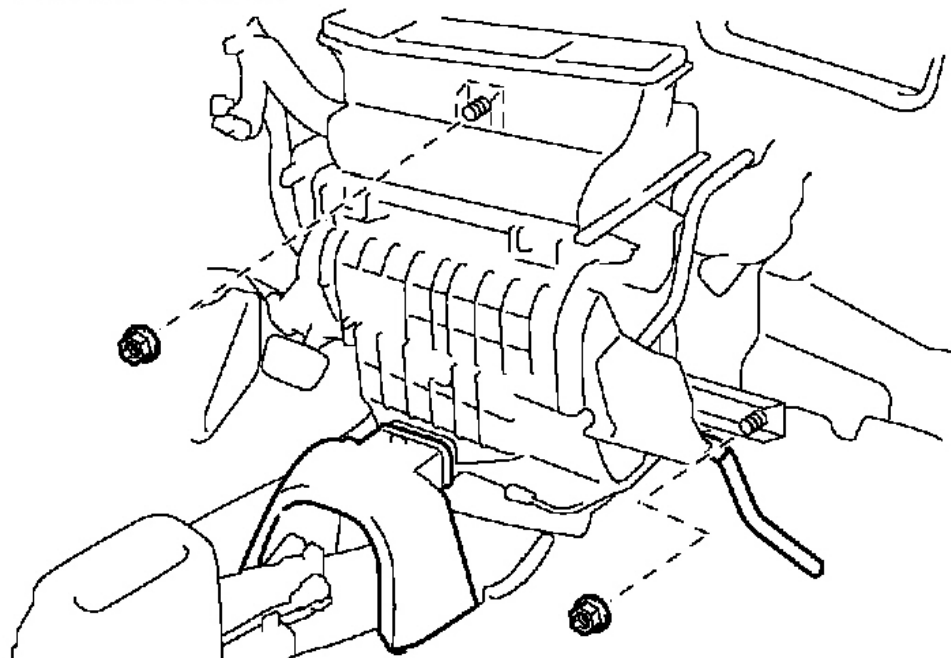
2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

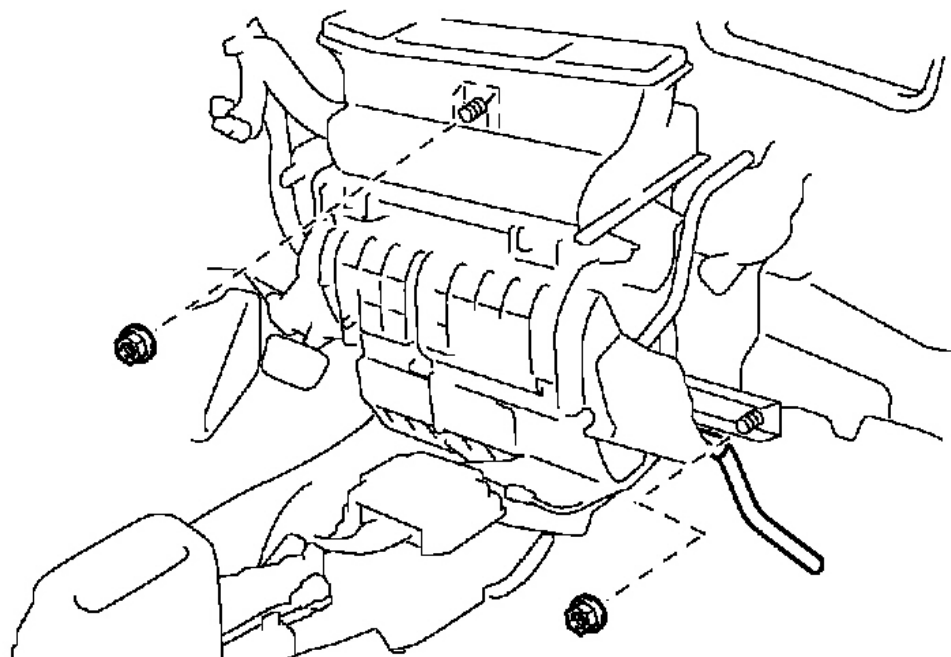
1. INSTALL A/C UNIT

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

w/ Rear Duct



w/o Rear Duct



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Fig. 59: Installing A/C Unit With 2 Nuts

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

- b. w/Rear duct:

Install the rear duct.

- c. Install the drain hose.

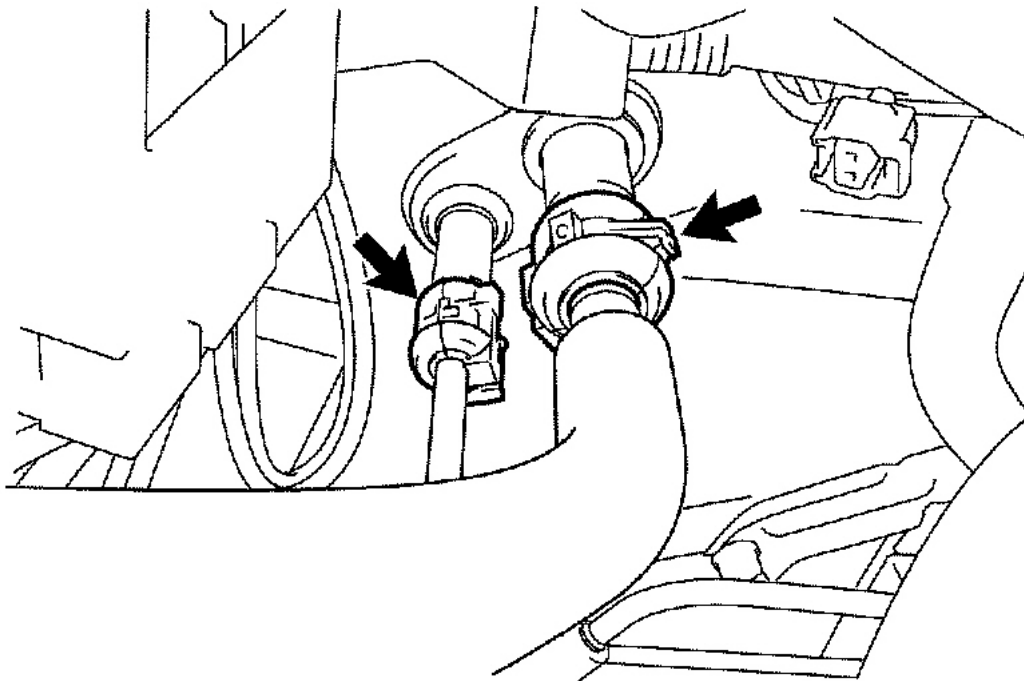
2. **INSTALL BLOWER UNIT (See INSTALLATION)**

3. **INSTALL PIPE GROMMETS**

4. **INSTALL INSTRUMENT PANEL AND REINFORCEMENT (See INSTALLATION)**

5. **CONNECT LIQUID TUBE AND SUCTION TUBE**

- a. Connect both tubes.
- b. Install the 2 piping clamps.



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Fig. 60: Installing 2 Piping Clamps

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

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

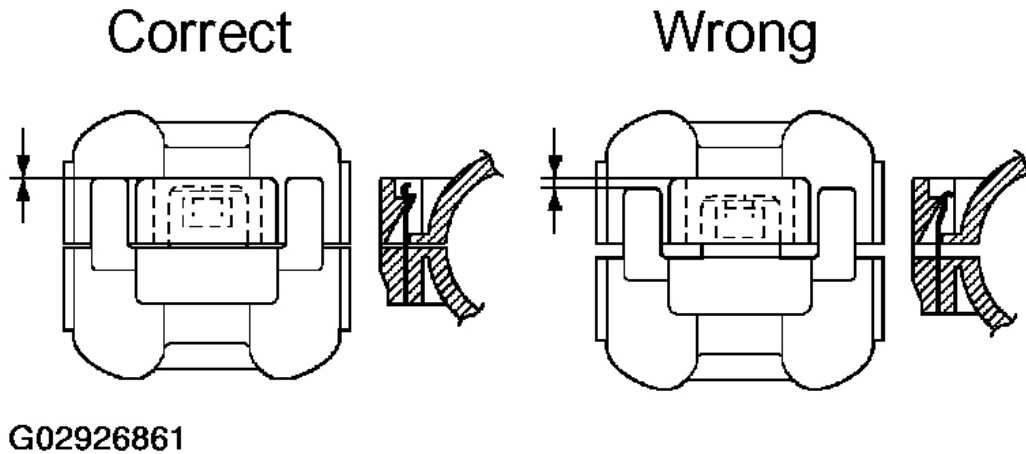
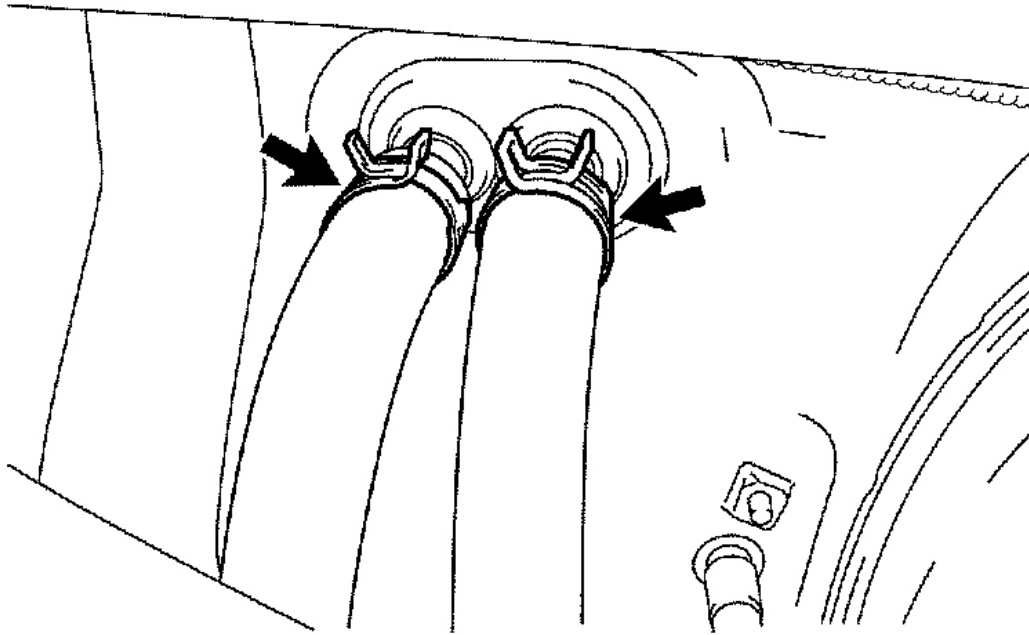


Fig. 61: Checking Fitting For Claw Of Piping Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **CONNECT WATER HOSES TO HEATER RADIATOR PIPE**
 - a. Connect the 2 heater hoses.



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Fig. 62: Connecting 2 Heater Hoses

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

- b. Push the water hose onto the heater radiator pipe as further as the grommet.
- c. Install the hose clip in a position, as shown in **Fig. 63** .

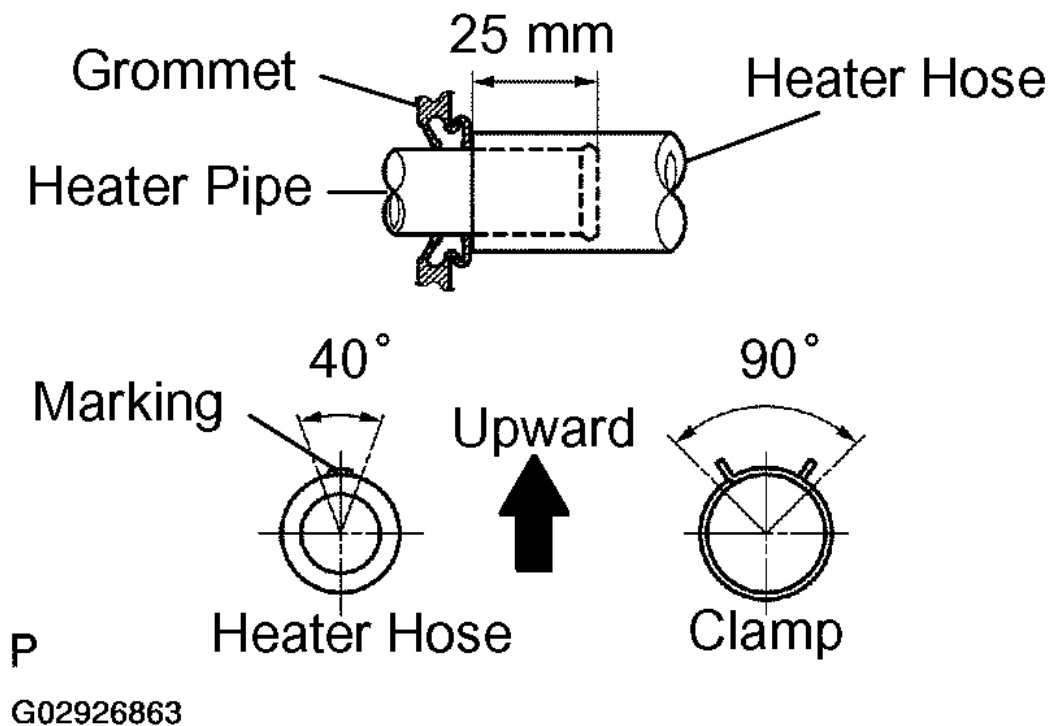


Fig. 63: Installing Hose Clip In Position

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.

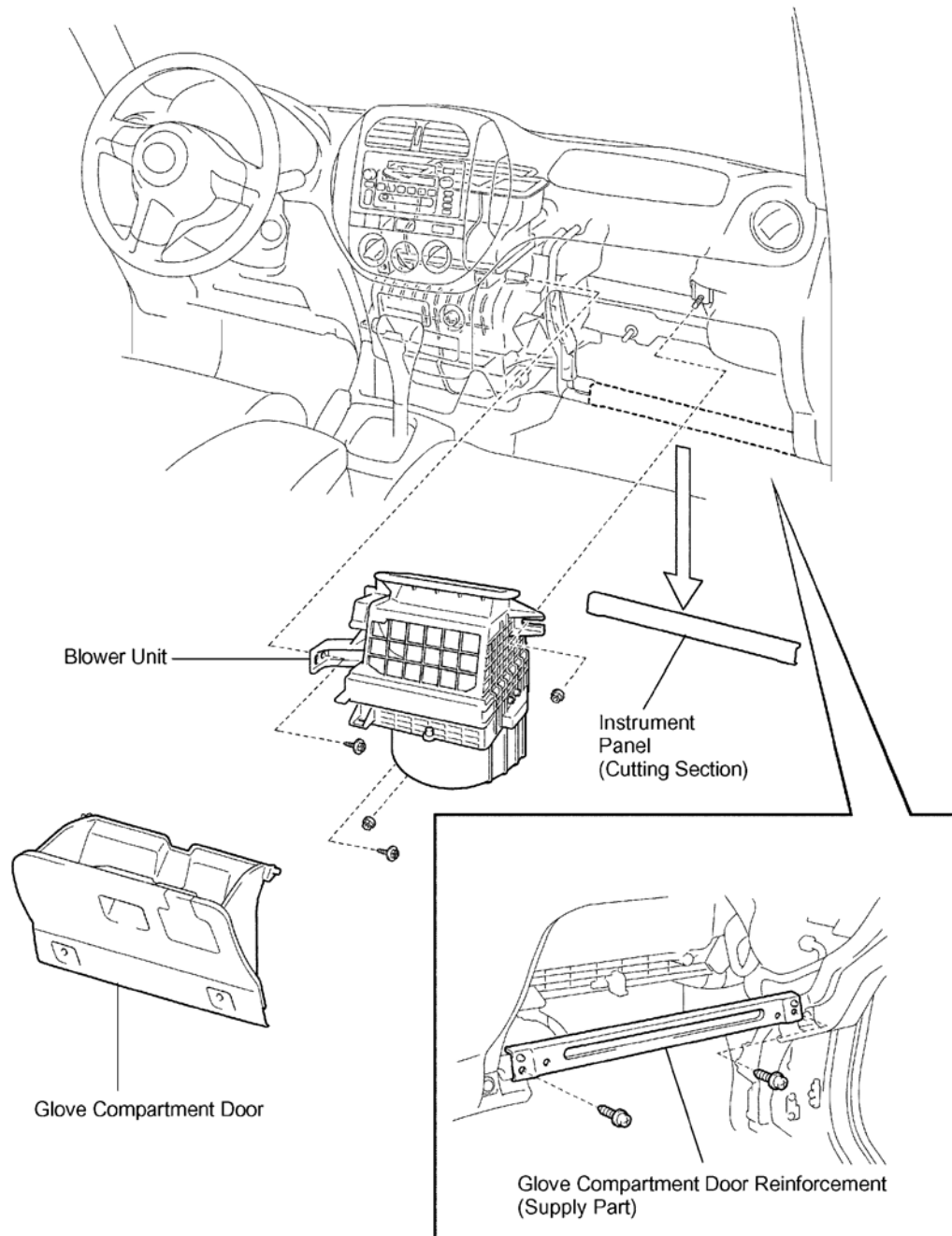
Specified amount: 500 +/- 50 g (17.64 +/- 1.76 oz.)

BLOWER UNIT

COMPONENTS

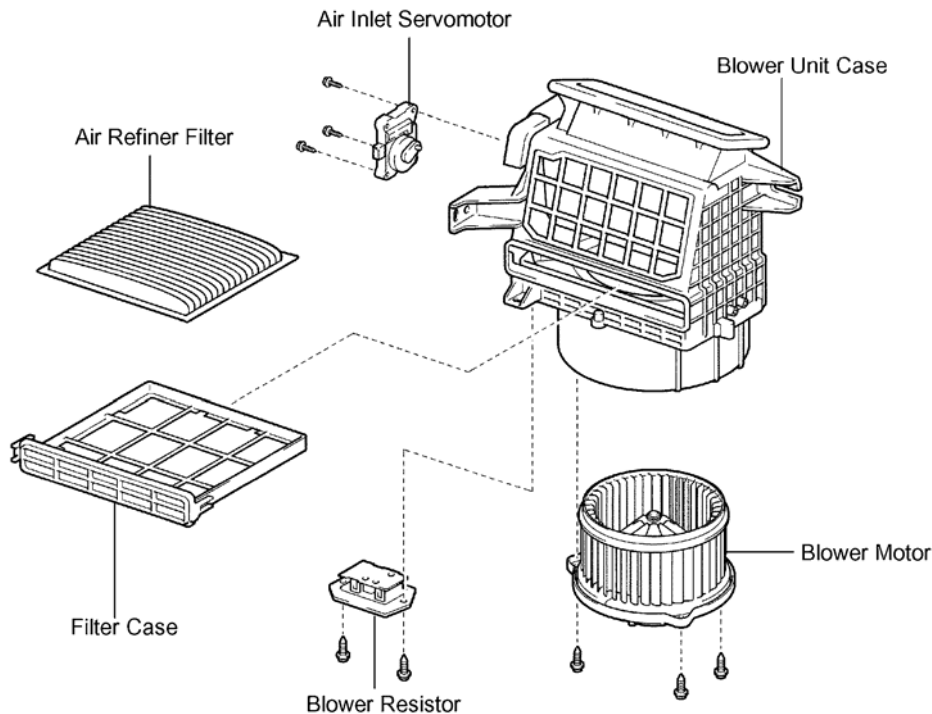
2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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Fig. 64: Locating Blower Unit Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 65: Locating Blower Unit Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

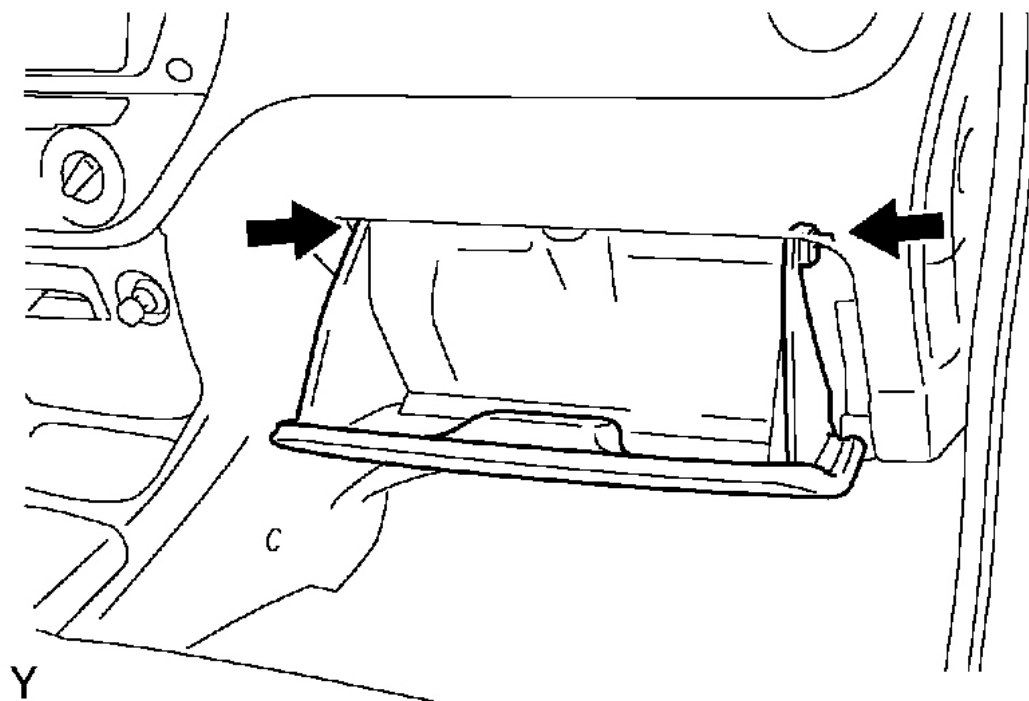
REMOVAL

1. REMOVE GLOVE COMPARTMENT DOOR

- a. Open 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.



G02926866

Fig. 66: Removing 2 Screws & Glove Compartment Door
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Cut out the instrument panel as shown in **Fig. 67** .

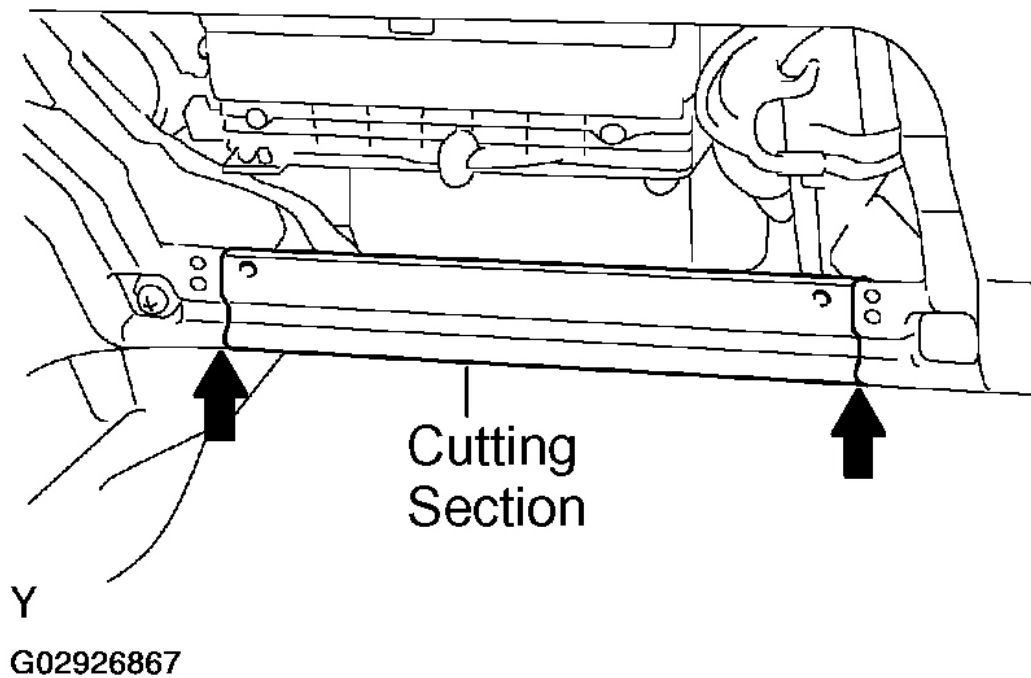


Fig. 67: Cutting Out Instrument Panel

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

HINT:

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

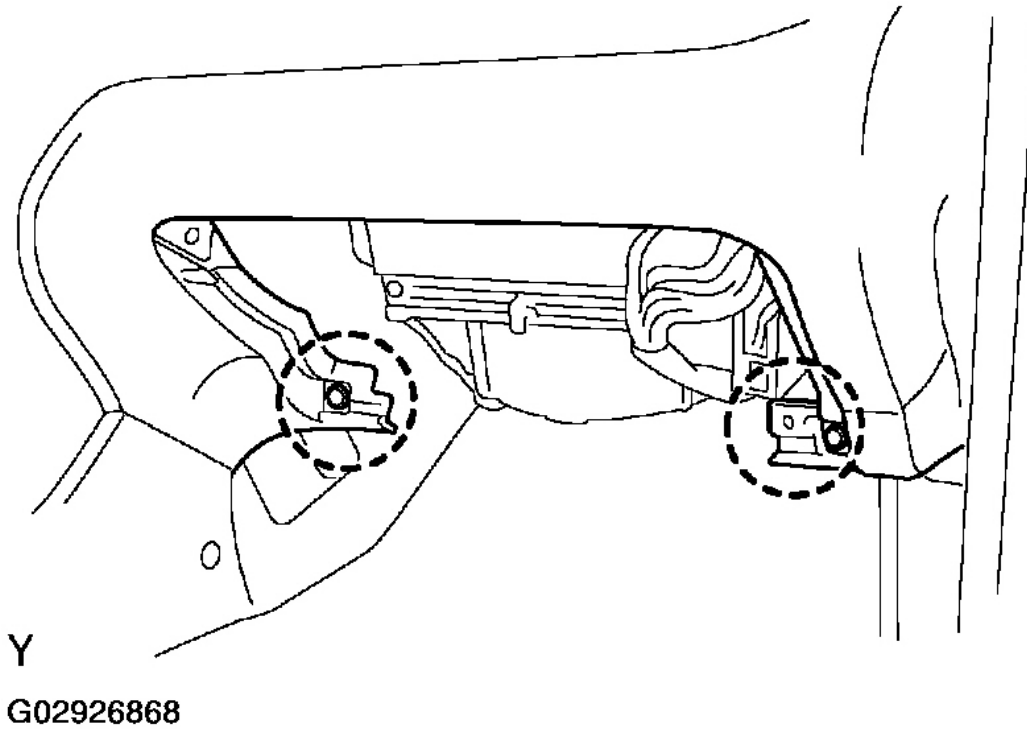


Fig. 68: Filing Cutting Face & Smoothing Surface
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

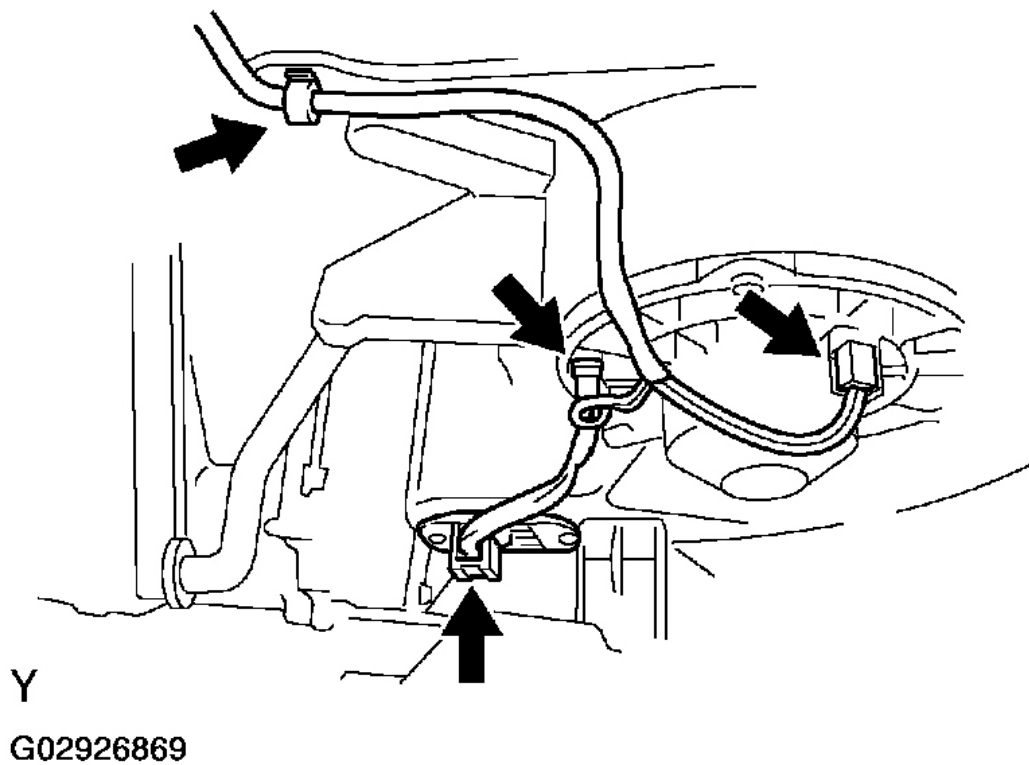


Fig. 69: Disconnecting Blower Resistor, Blower Motor Connectors & Harness Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

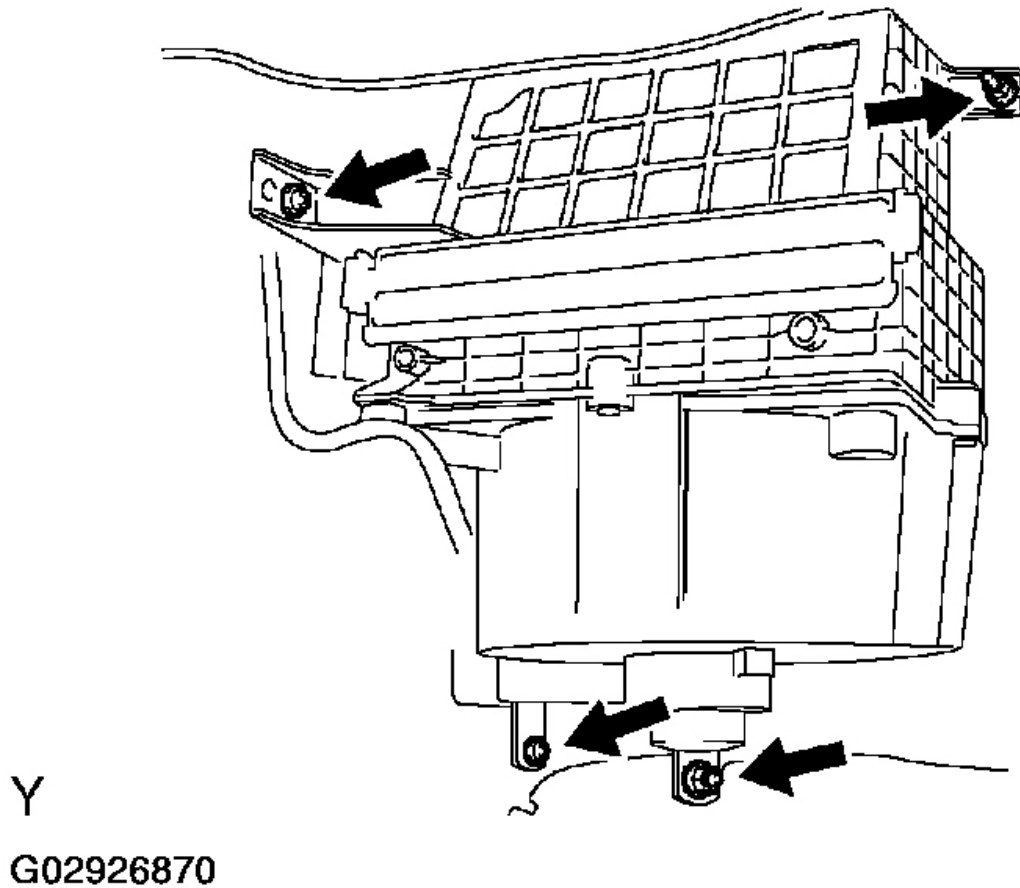
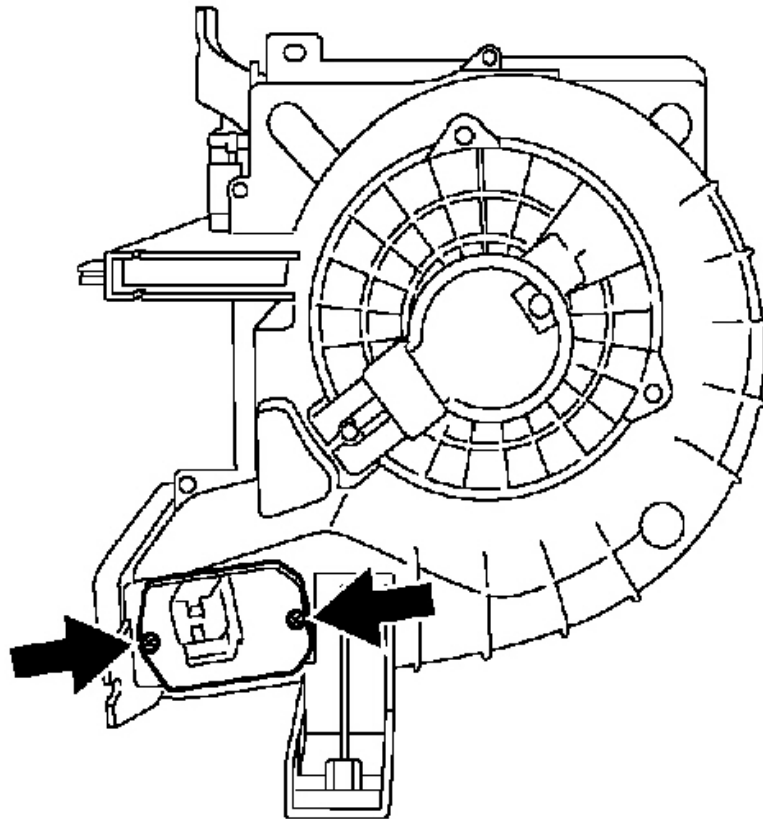


Fig. 70: Removing 2 Screws, 2 Nuts & Blower Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE BLOWER RESISTOR

Remove the 2 screws and blower resistor.



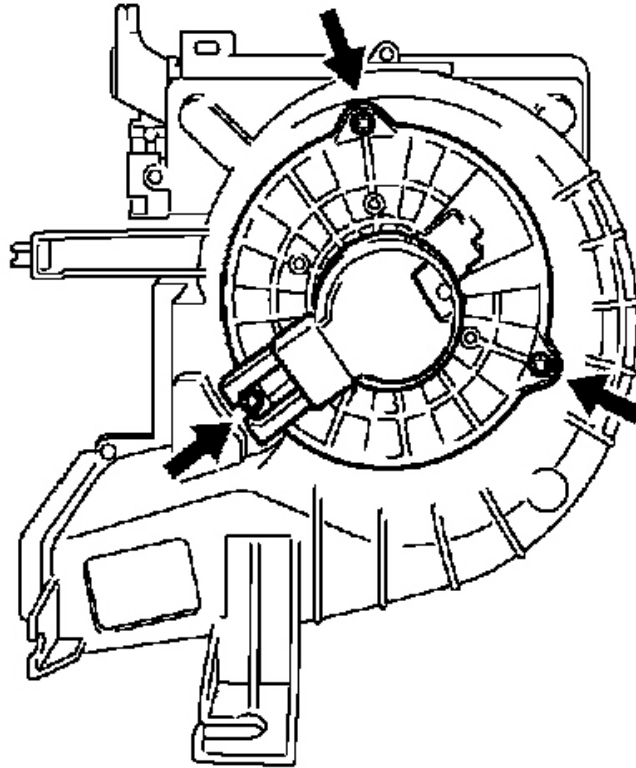
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Fig. 71: Removing Blower Resistor With 2 Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.



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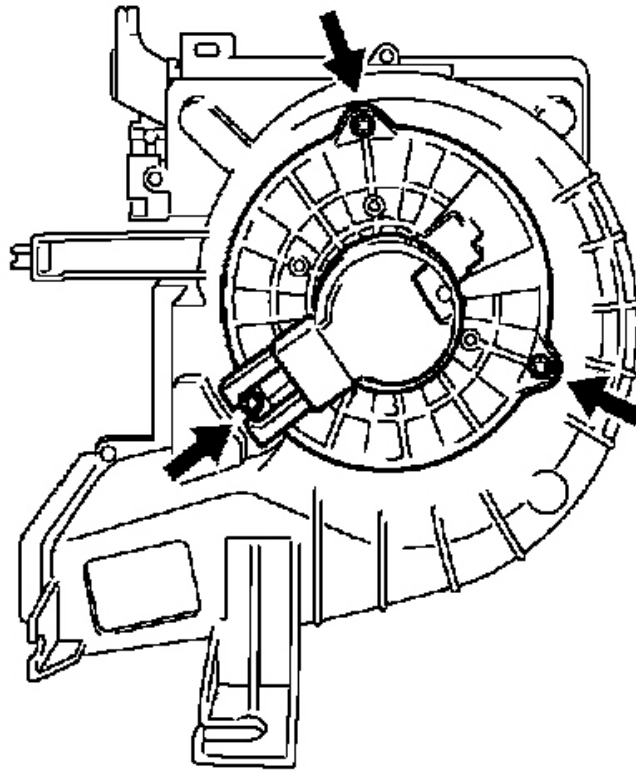
Fig. 72: Removing Blower Motor With 3 Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. INSPECT BLOWER MOTOR (See INSPECTION)

REASSEMBLY

1. INSTALL BLOWER MOTOR

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



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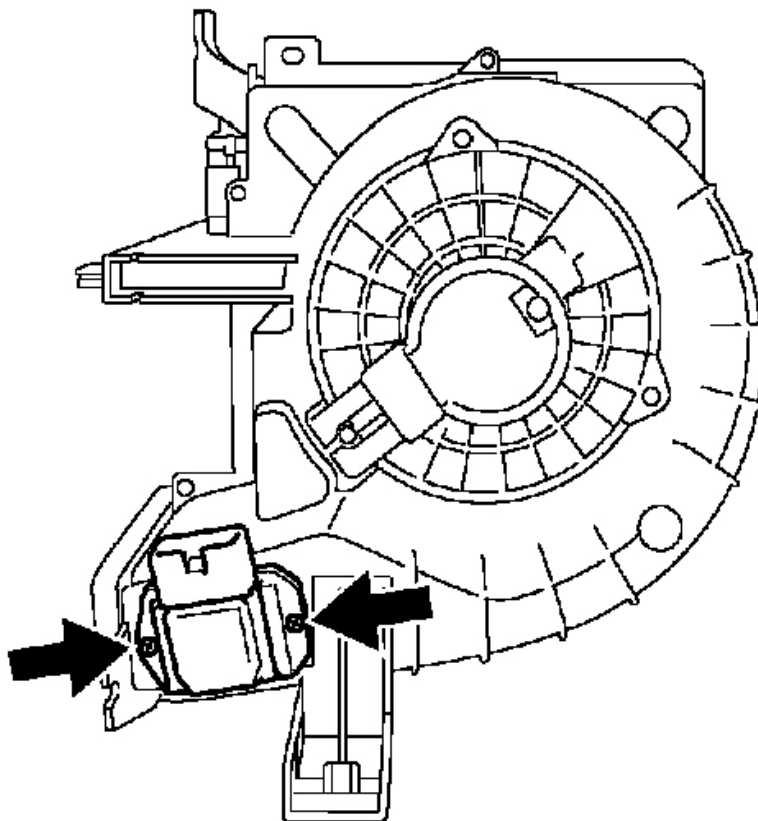
Fig. 73: Installing Blower Motor With 3 Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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. 74: Installing Blower Resistor With 2 Screws
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.

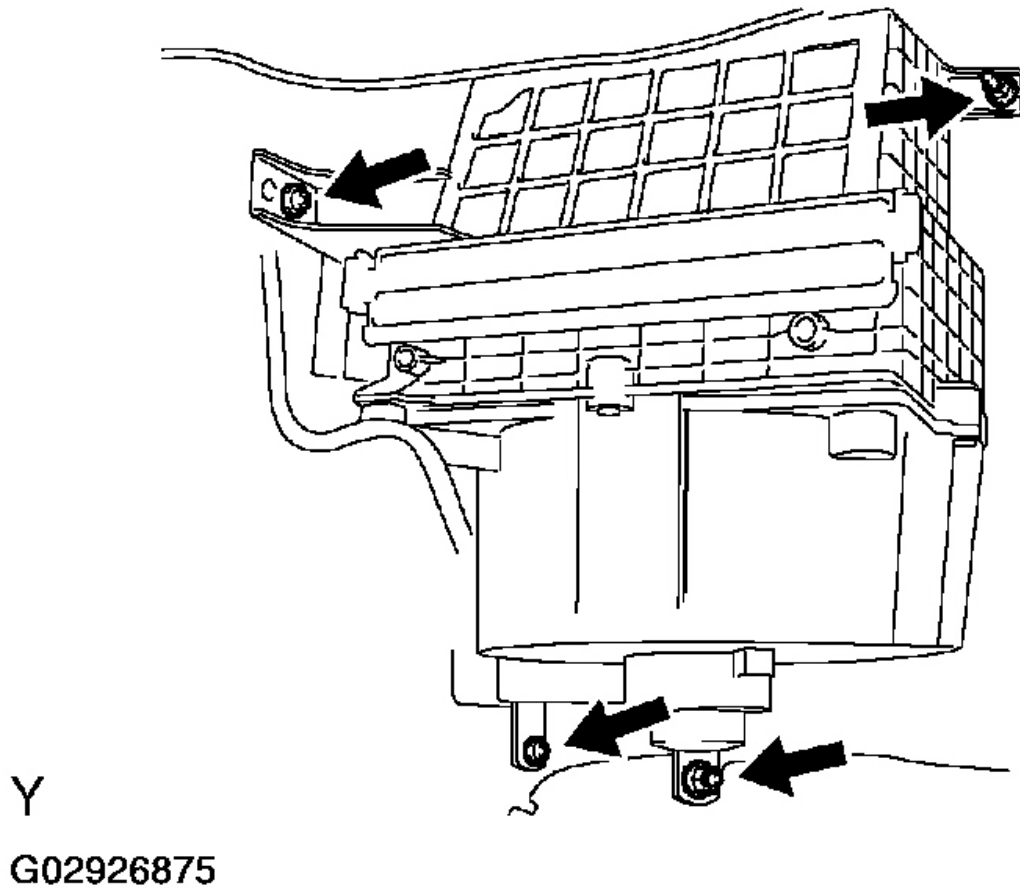


Fig. 75: Installing Blower Unit With 2 Screws And 2 Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

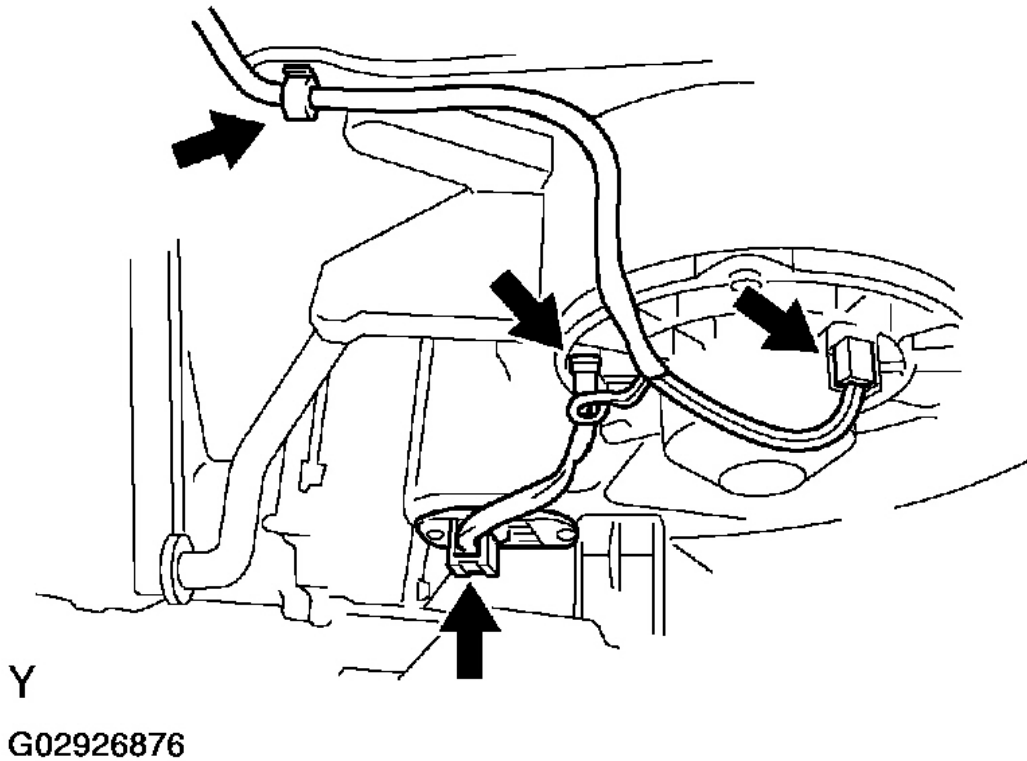
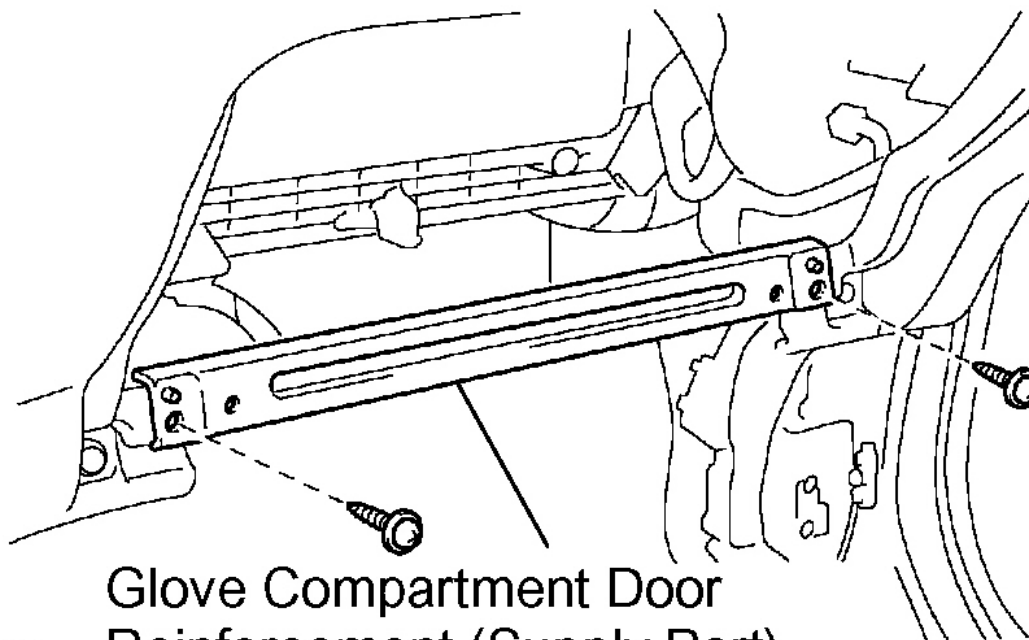


Fig. 76: Connecting Blower Resistor, Blower Motor Connectors & Harness Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



Glove Compartment Door
Reinforcement (Supply Part)

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Fig. 77: Installing Glove Compartment Door Reinforcement
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL GLOVE COMPARTMENT DOOR

COMPRESSOR & MAGNETIC CLUTCH

COMPRESSOR AND 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.

Standard resistance: 165 - 205 ohm at 20°C (68°F)

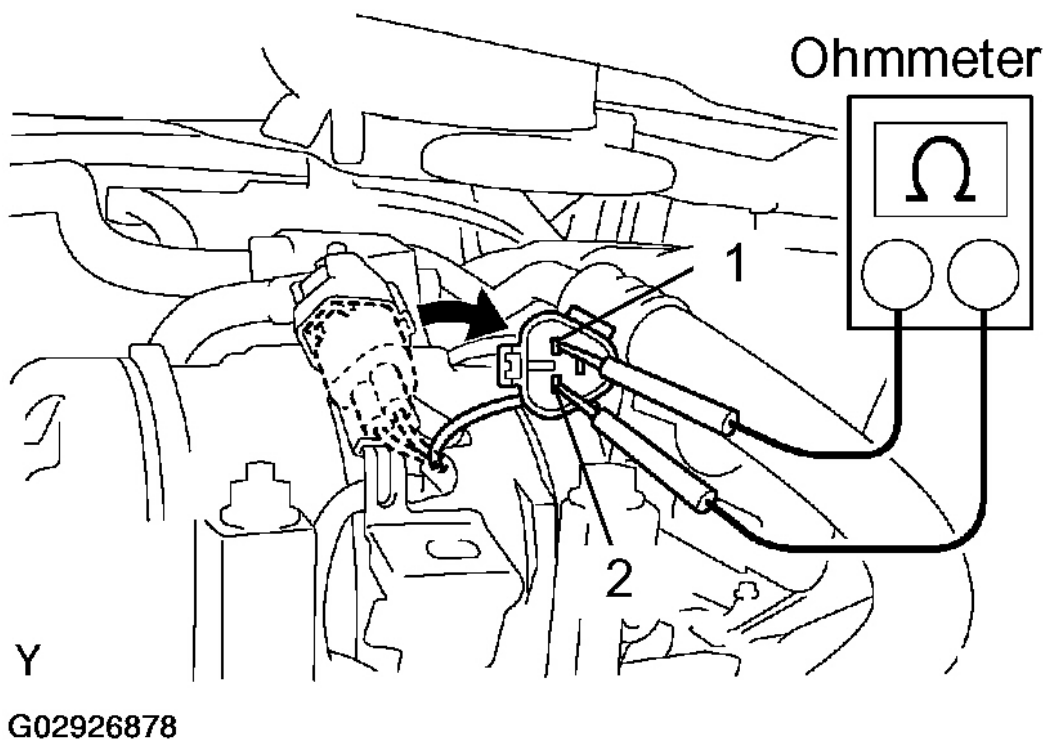


Fig. 78: Measuring Resistance Between Sensor Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

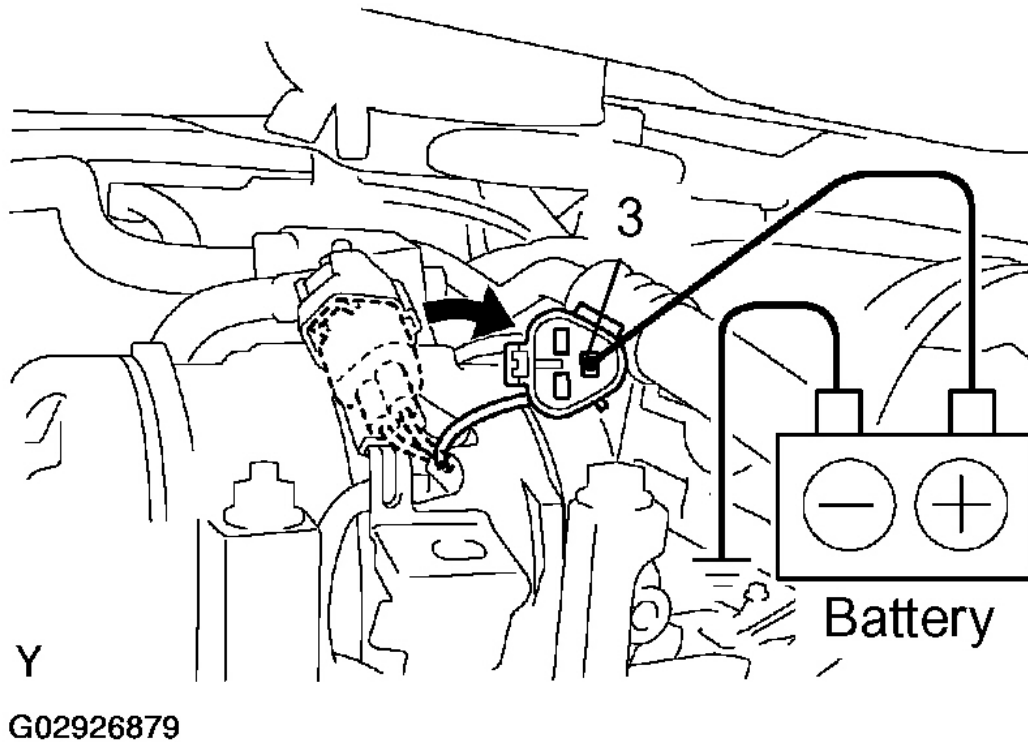


Fig. 79: Inspecting Magnetic Clutch Operation

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

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

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

COMPONENTS

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

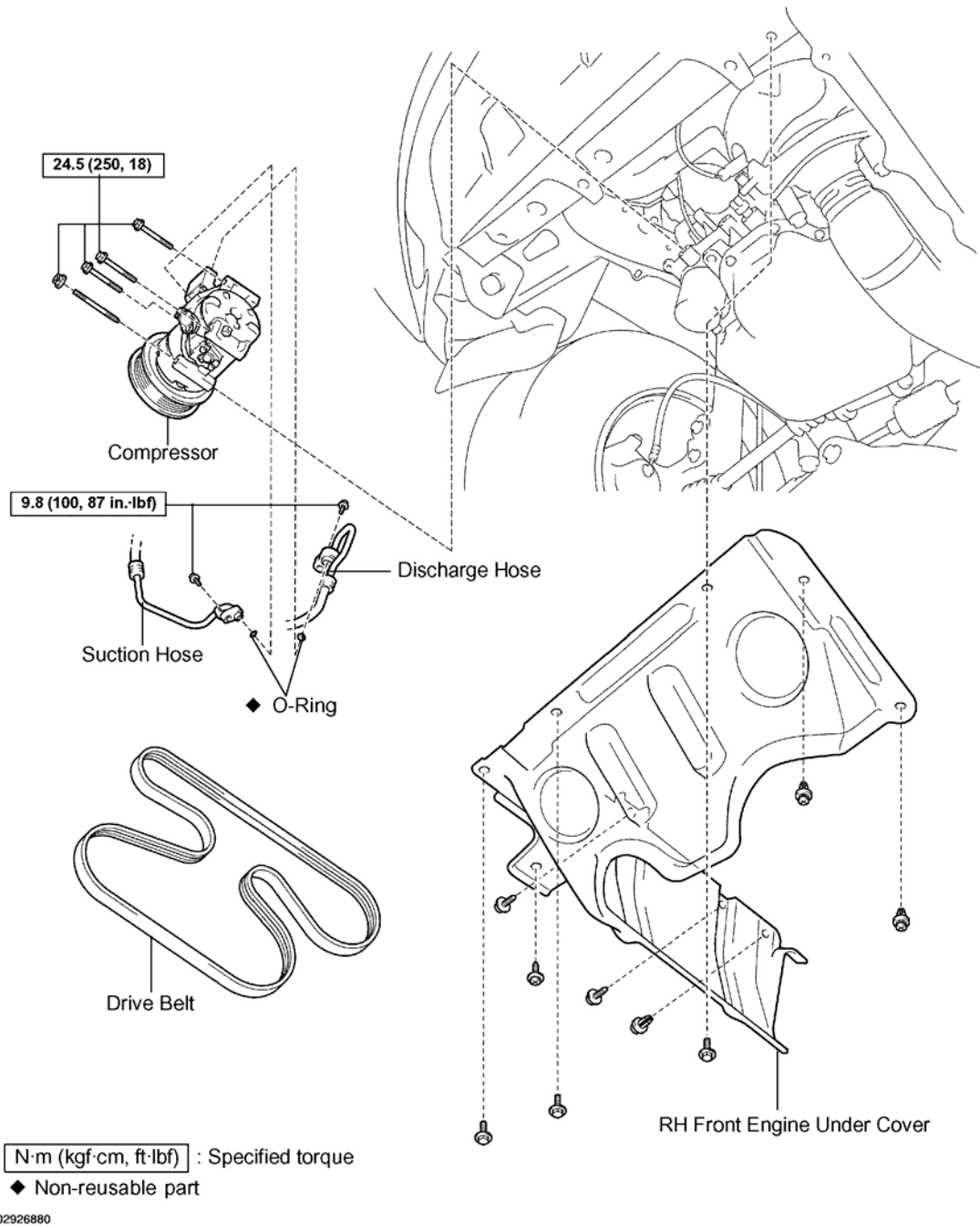
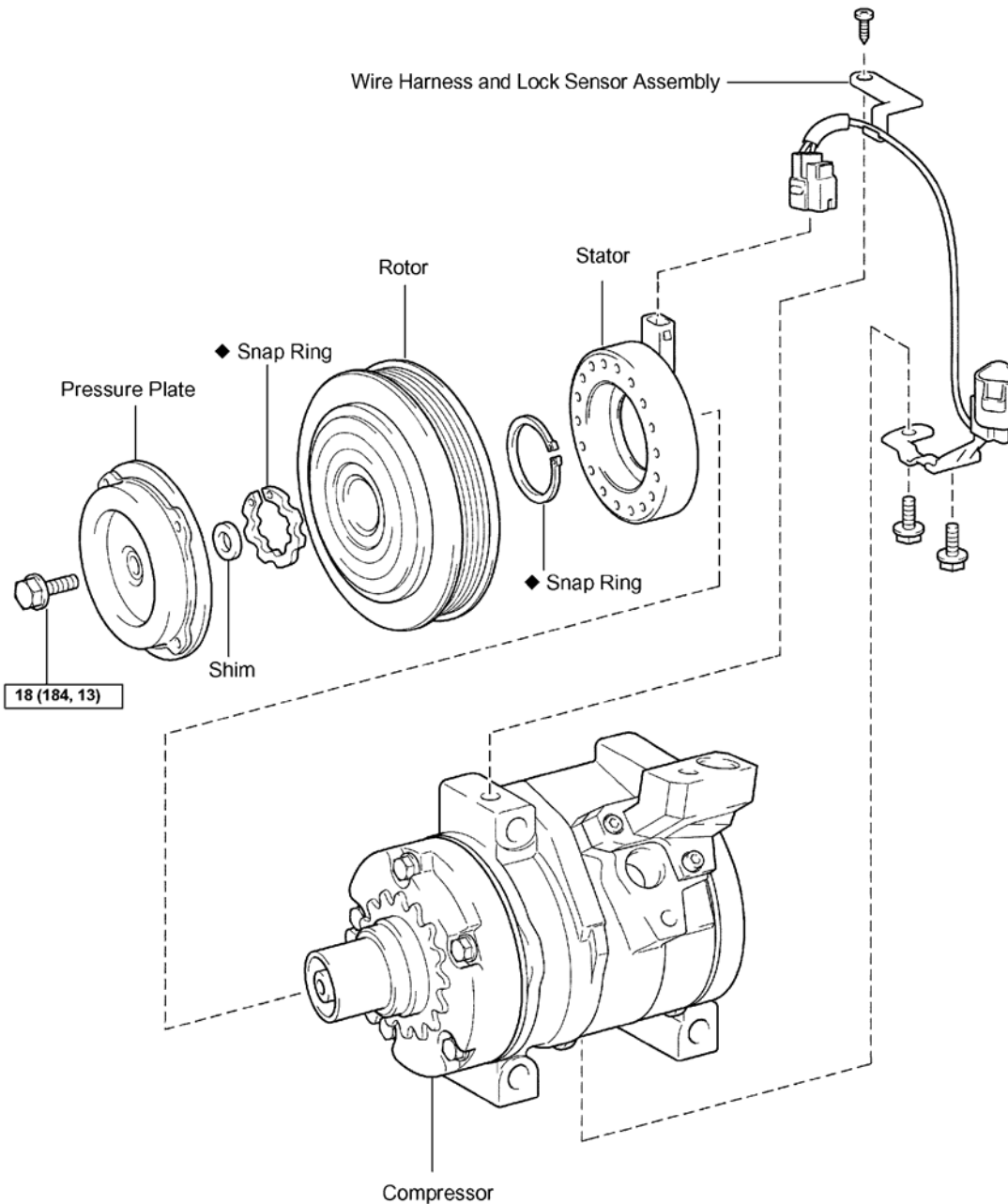


Fig. 80: Identifying Components For A/C Compressor Removal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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

P ◆ Non-reusable part

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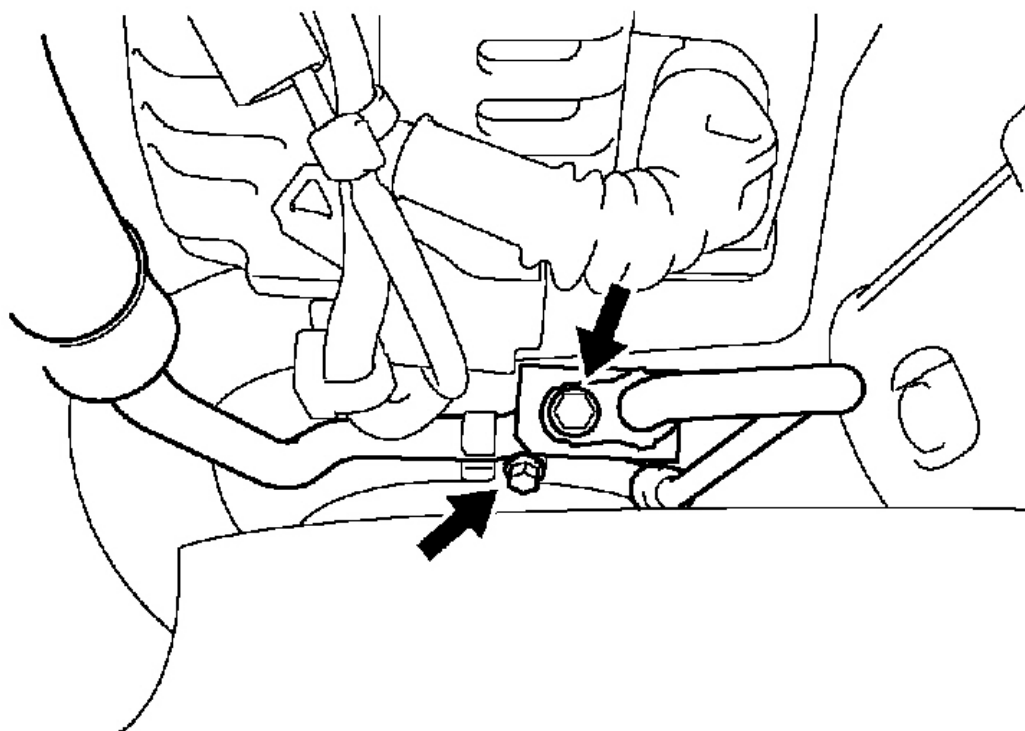
Fig. 81: Identifying Magnetic Clutch Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 .**

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



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Fig. 82: Disconnecting Discharge And Suction Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

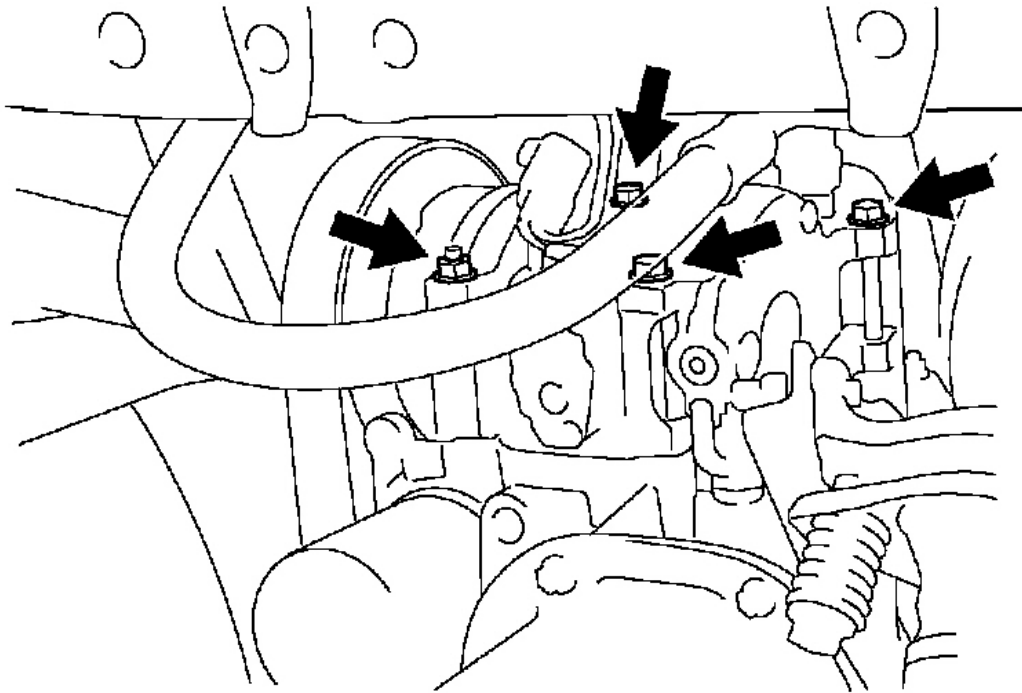
7. **DISCONNECT DISCHARGE AND SUCTION HOSES**

Remove the 2 bolts and disconnect both hoses.

8. **REMOVE COMPRESSOR**

- a. Disconnect the connector.

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



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Fig. 83: Removing Compressor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

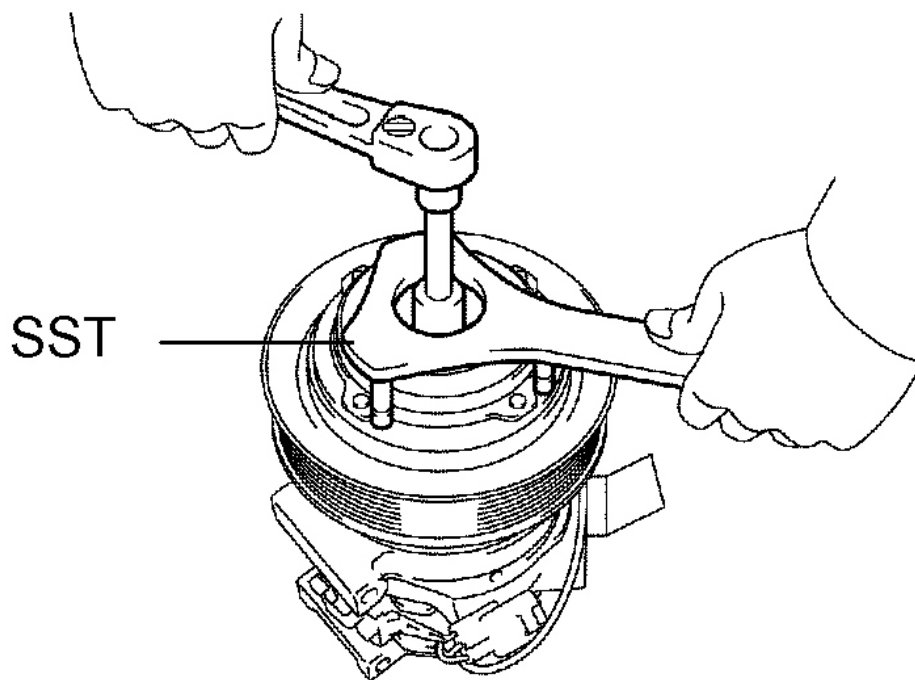
- b. Remove the 3 bolts, nut, stud bolt and compressor.

DISASSEMBLY

1. REMOVE PRESSURE PLATE

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

SST 07112-76060



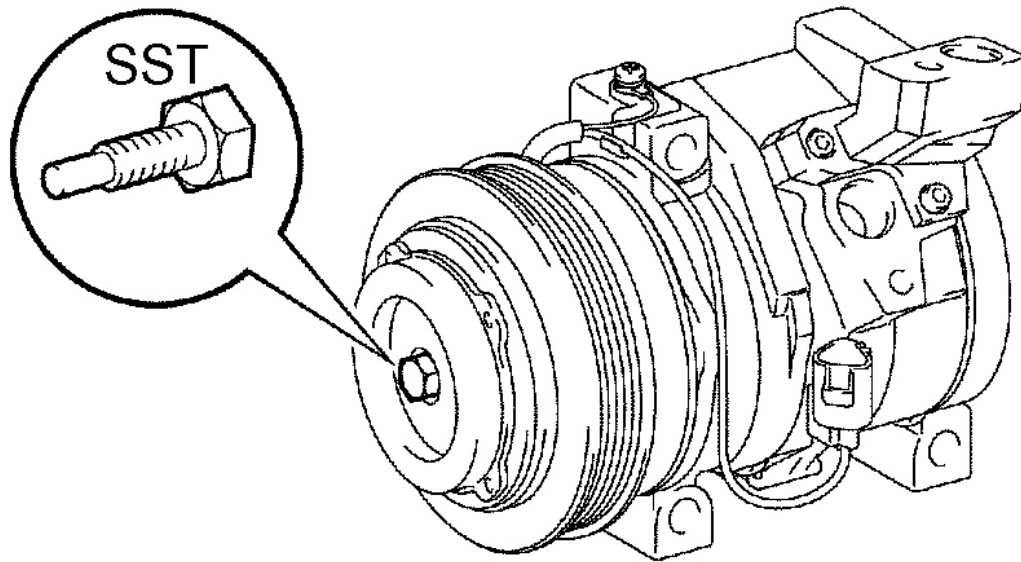
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Fig. 84: Removing Shaft Bolt Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install SST on the pressure plate.

SST 07112-66040



P

G02926885

Fig. 85: 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, 07112-7606

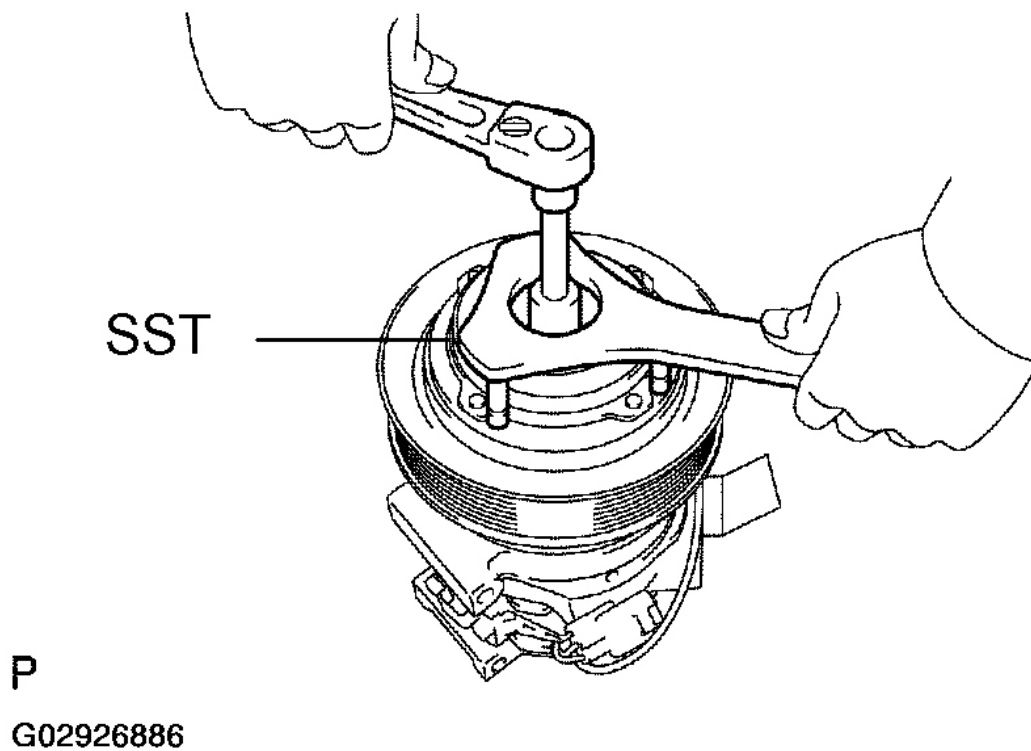


Fig. 86: Removing Pressure Plate Using SST And Socket Wrench
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the shims from the pressure plate.

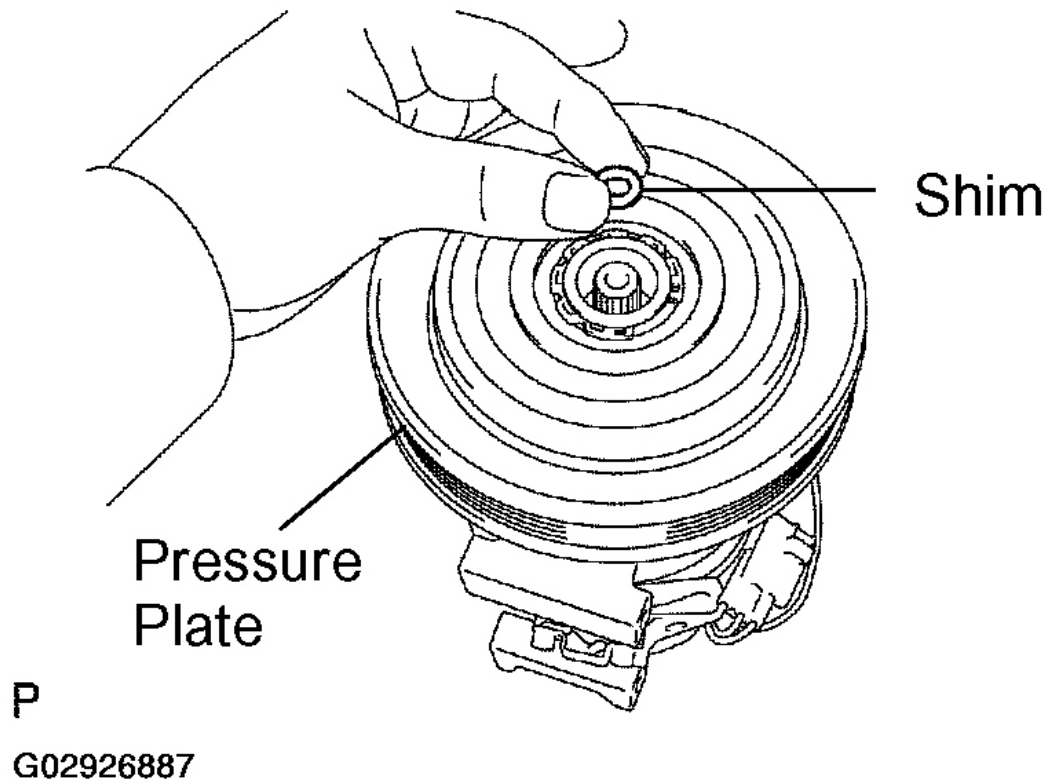
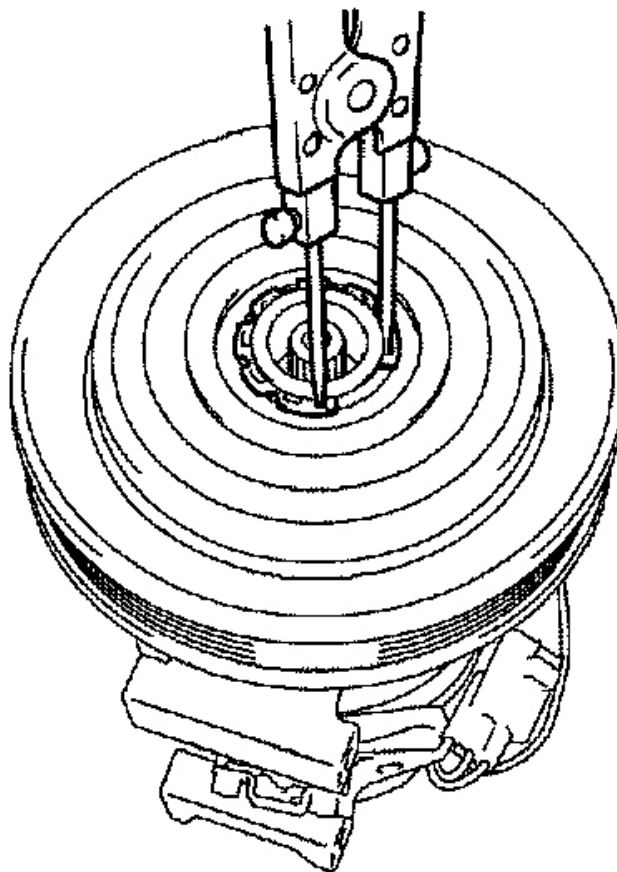


Fig. 87: Removing Shims From Pressure Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE ROTOR

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

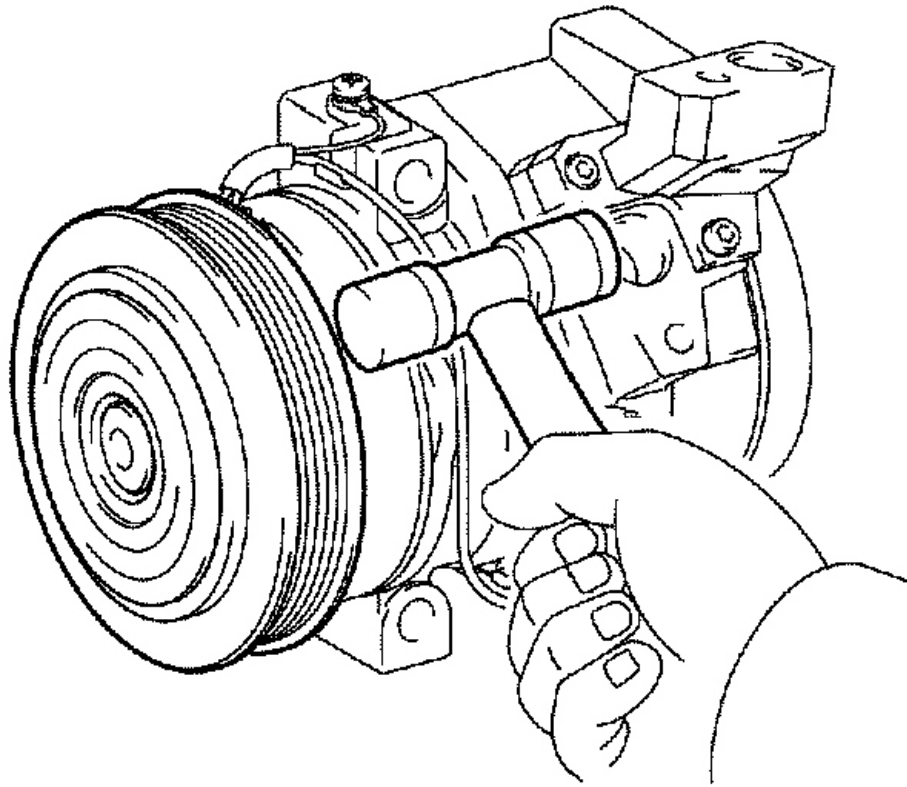


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Fig. 88: Removing Snap Ring Using Snap Ring Pliers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



P

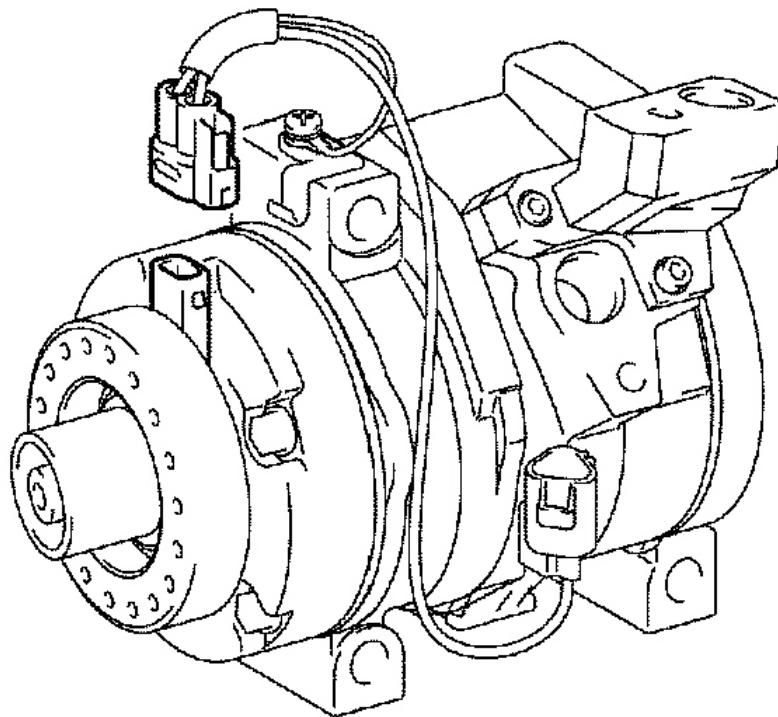
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Fig. 89: Tapping Rotor Off Shaft Using Plastic Hammer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. REMOVE STATOR

- a. Disconnect the connector from the stator.

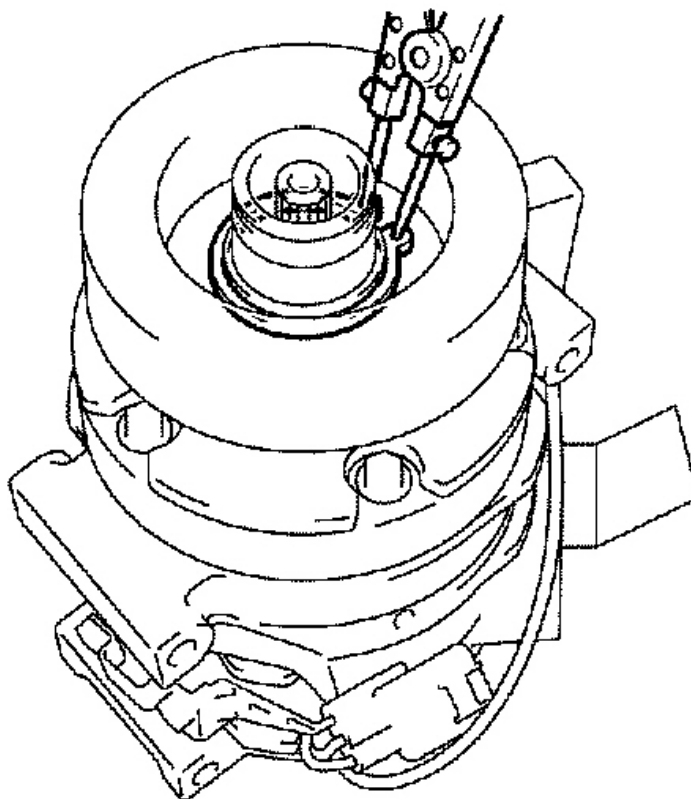


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Fig. 90: Disconnecting Connector From Stator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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Fig. 91: Removing Snap Ring Using Snap Ring Pliers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the stator.

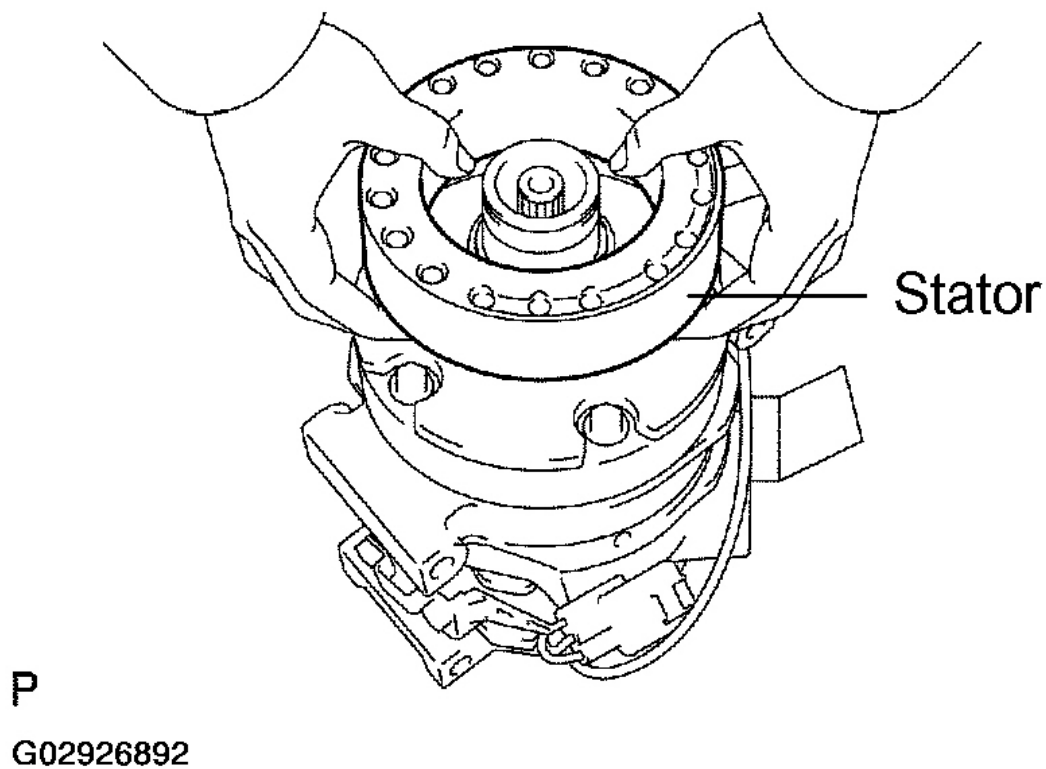
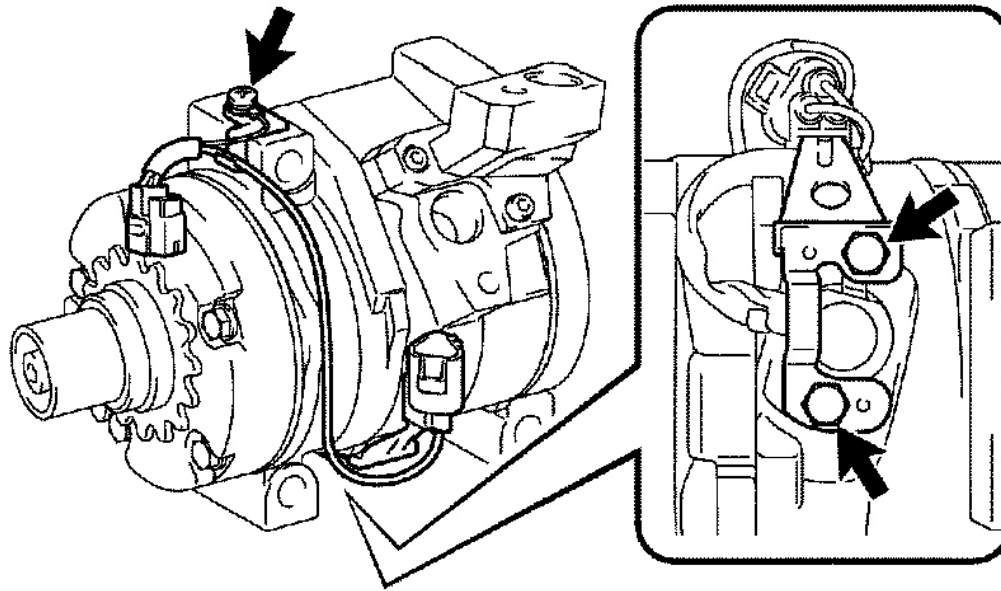


Fig. 92: Removing Stator

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

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



P

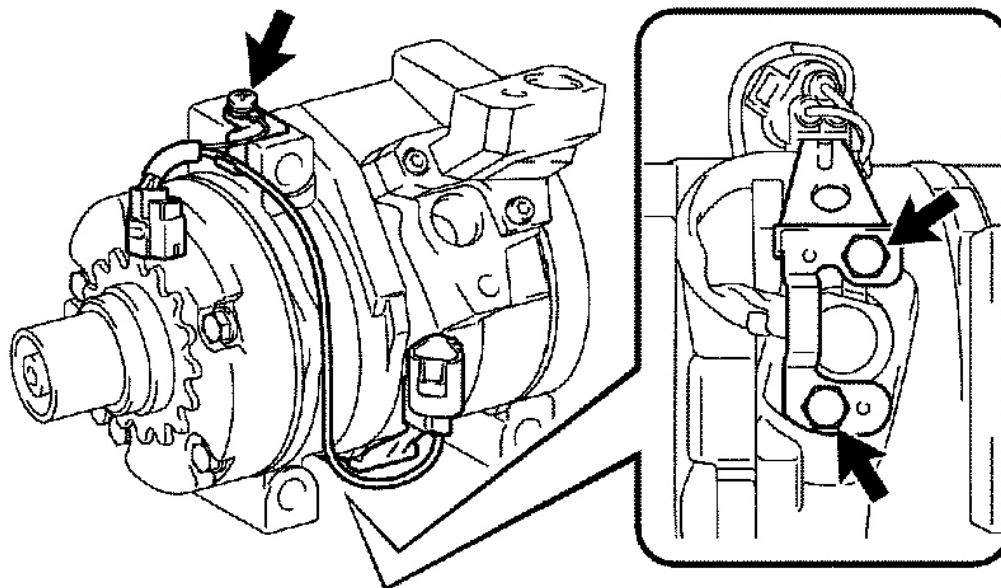
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Fig. 93: Removing Lock Sensor Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. INSTALL STATOR

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



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Fig. 94: Installing Wire Harness And Lock Sensor Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the stator.

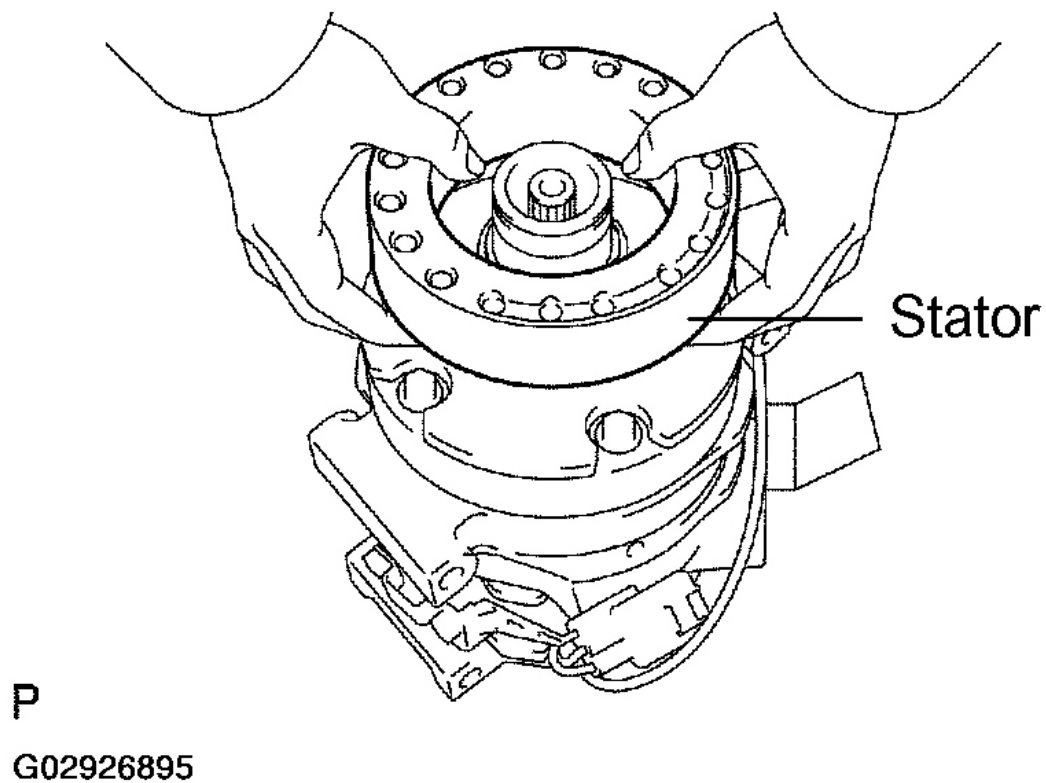
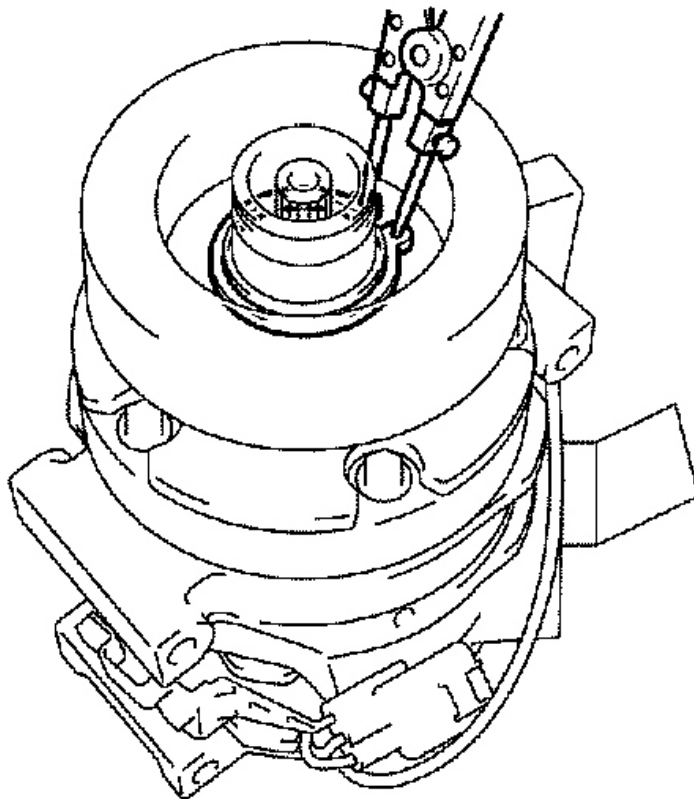


Fig. 95: Installing Stator

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

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



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Fig. 96: Installing Snap Ring Using Snap Ring Pliers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

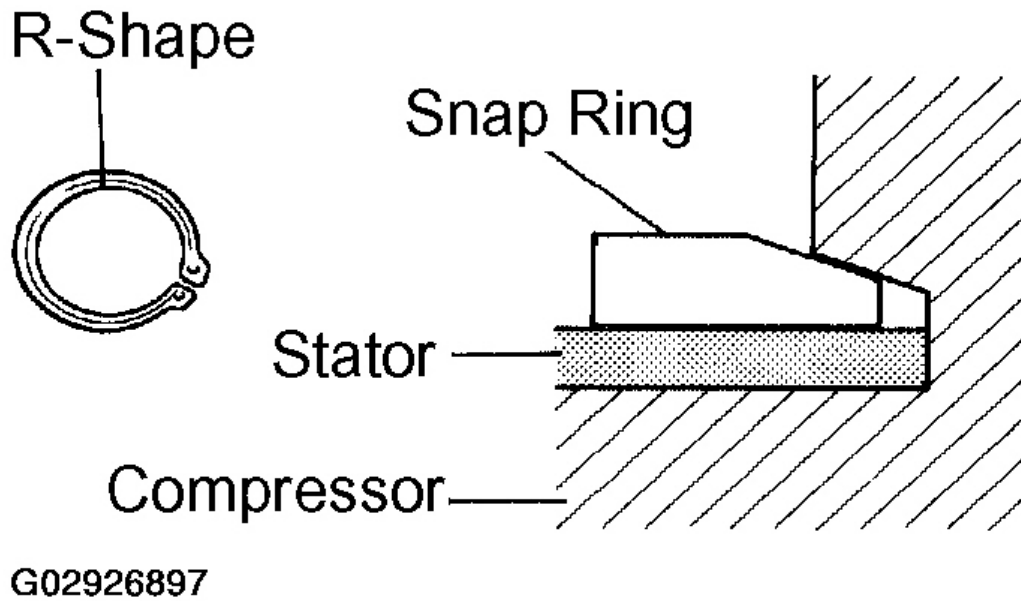
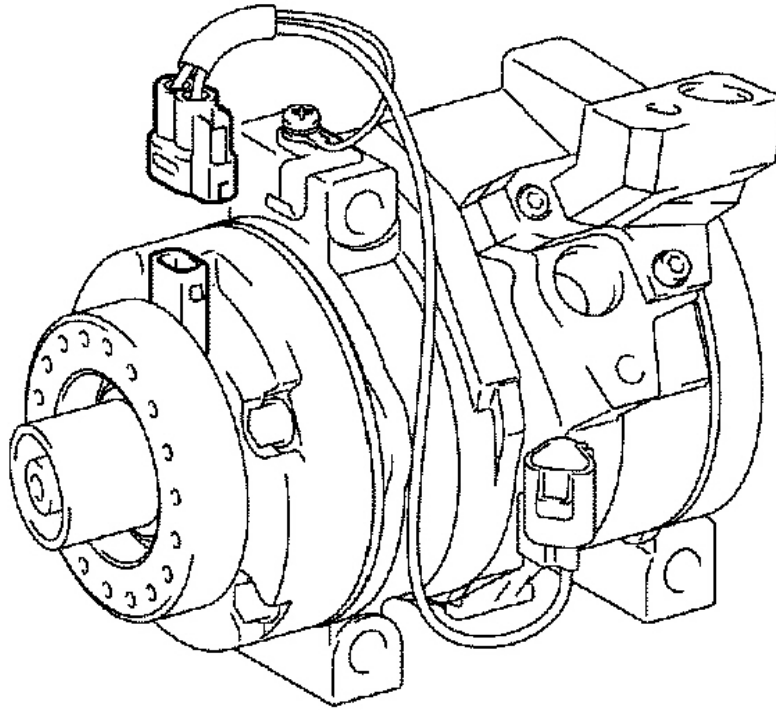


Fig. 97: Locating Snap Ring Beveled Side Face Direction
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Connect the connector to the stator.



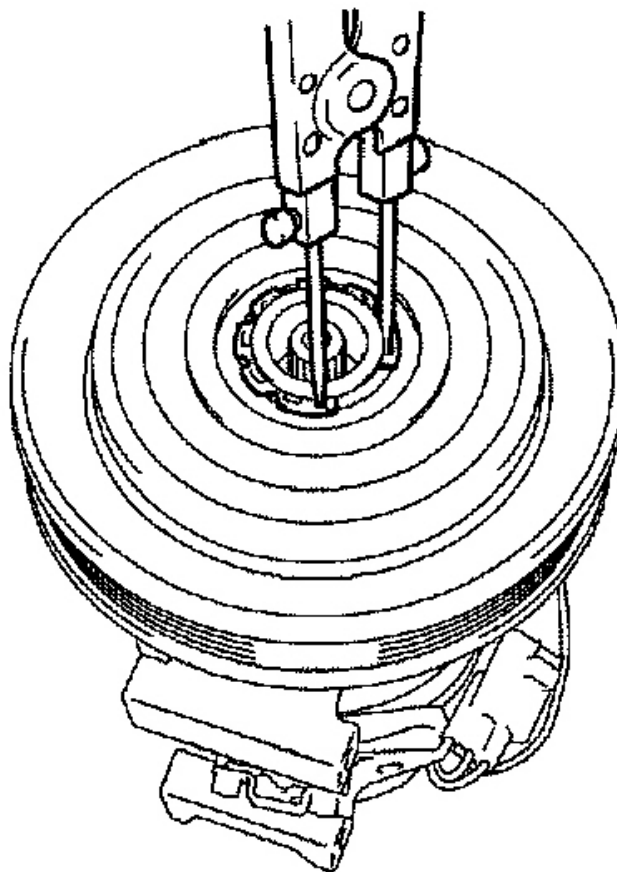
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Fig. 98: Connecting Connector To Stator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL ROTOR

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

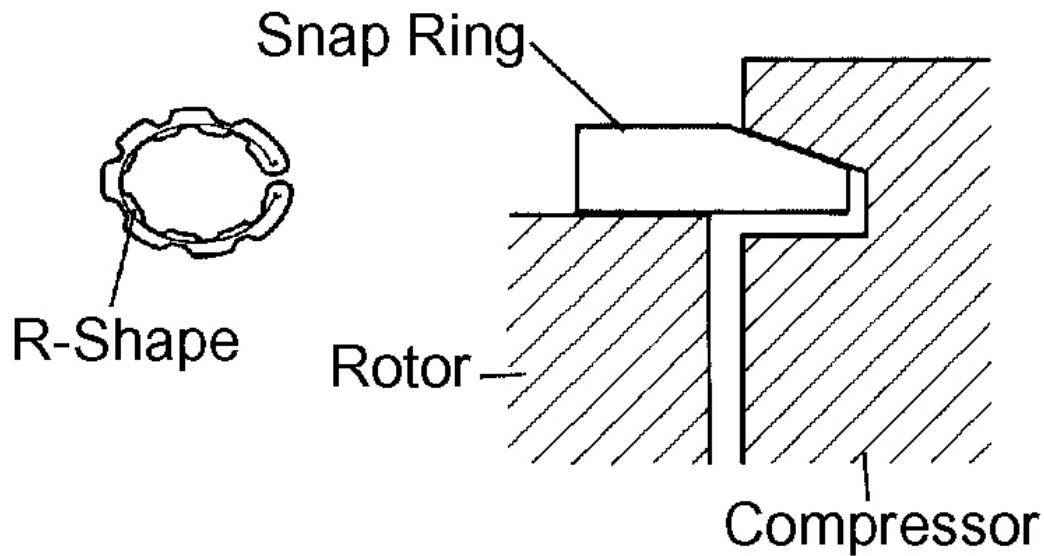


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Fig. 99: Installing Snap Ring Using Snap Ring Pliers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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Fig. 100: Locating Snap Ring Beveled Face Direction
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.

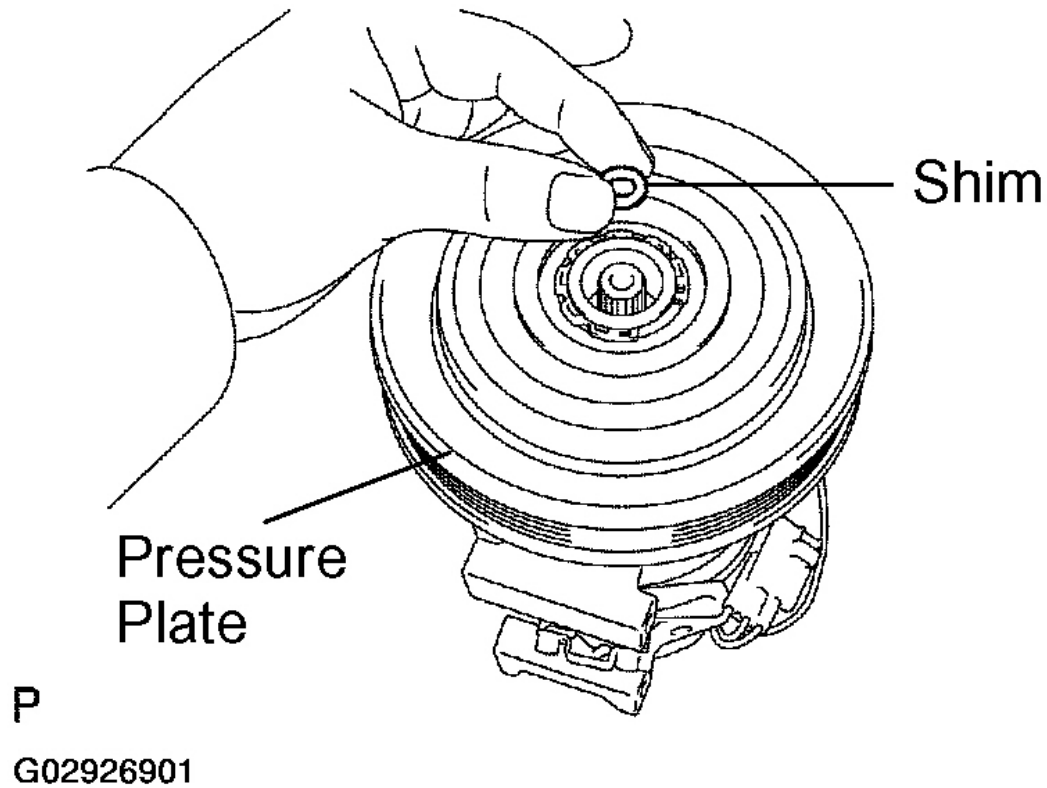


Fig. 101: Installing Shim To Pressure Plate

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)

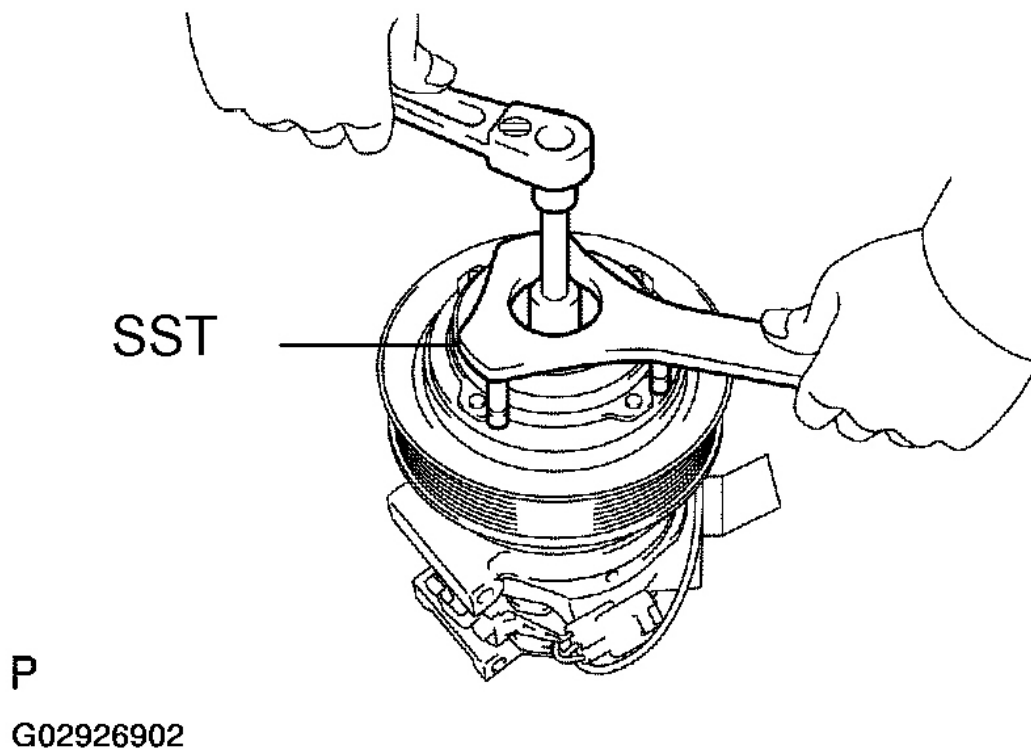


Fig. 102: Installing Shaft Bolt Using SST Torque Wrench
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

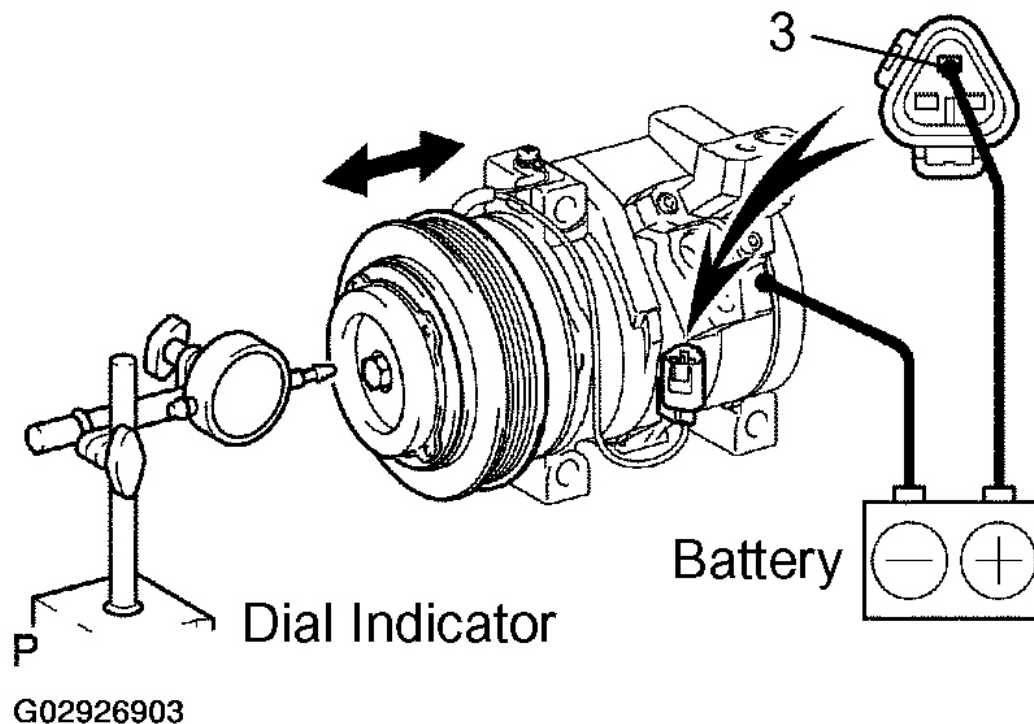


Fig. 103: Inspecting Magnetic Clutch Clearance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.)

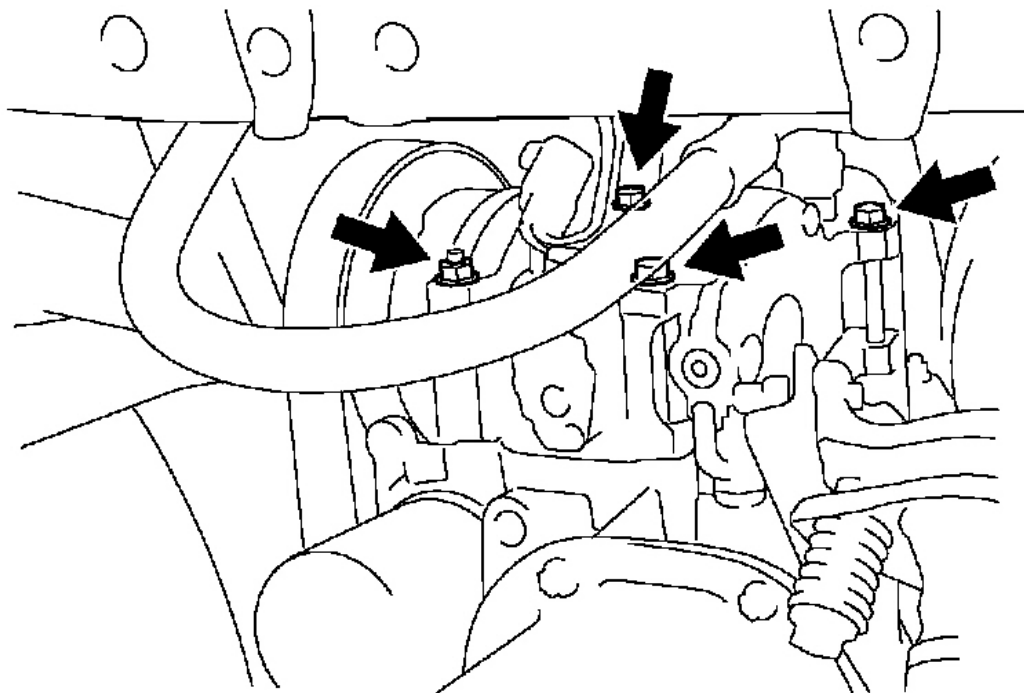
0.5 mm (0.020 in.)

1. INSTALL COMPRESSOR

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

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

- b. Connect the connector.



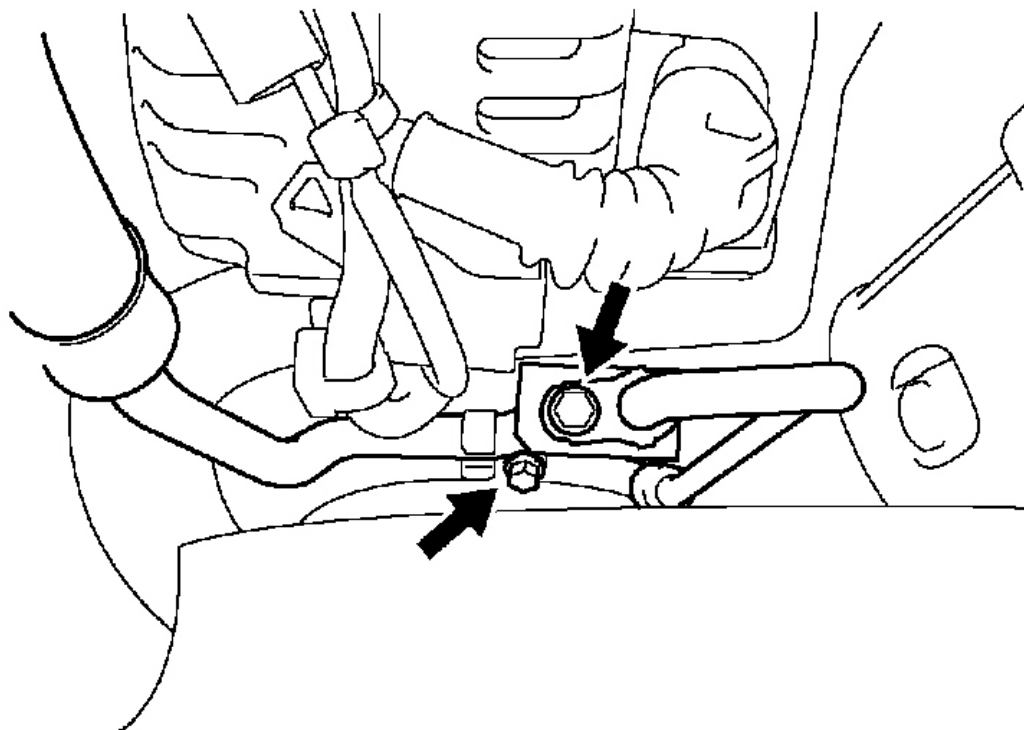
G02926904

Fig. 104: Installing Compressor

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

2. CONNECT DISCHARGE AND 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.



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Fig. 105: Connecting Discharge And Suction Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

3. INSTALL AND CHECK DRIVE BELT .

See **ON-VEHICLE INSPECTION** .

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

4. **CONNECT NEGATIVE (-) TERMINAL CABLE TO BATTERY**
5. **EVACUATE AIR FROM REFRIGERATION SYSTEM CHARGE SYSTEM WITH REFRIGERANT**

Specified amount: 500 +/- 50 g (17.64 plus or minus; 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.

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

NOTE: Be careful not to damage the fins.

2. **INSPECT CONDENSER AND FITTINGS FOR LEAKAGE**

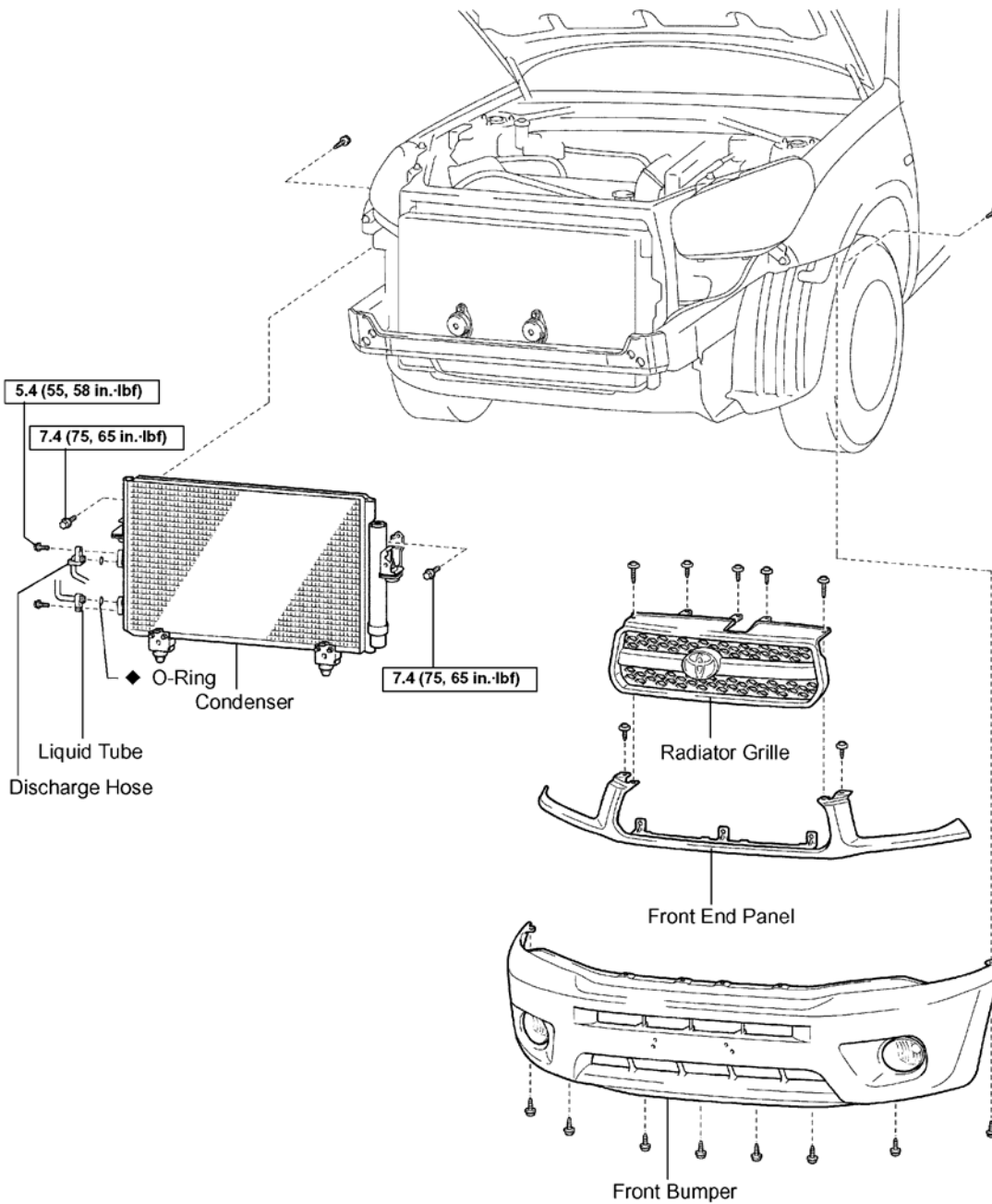
Using a gas leak detector, check for leakage of refrigerant.

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

COMPONENTS

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



P N·m (kgf·cm, ft·lbf) : Specified torque ♦ Non-reusable part

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Fig. 106: Identifying Condenser Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

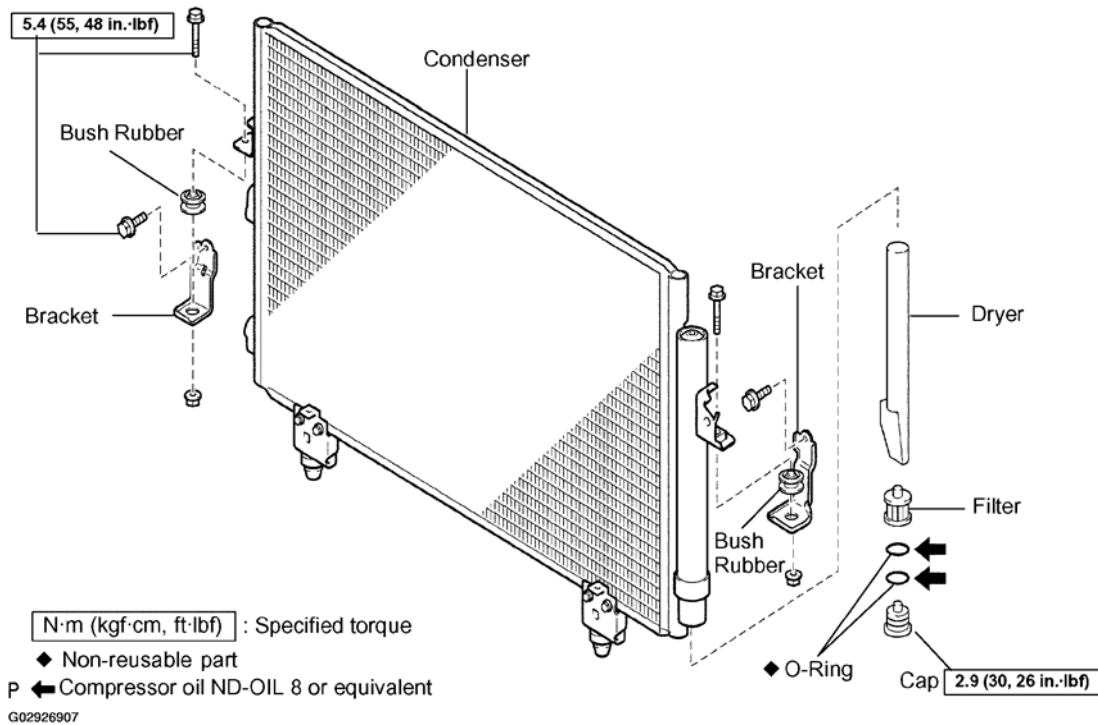


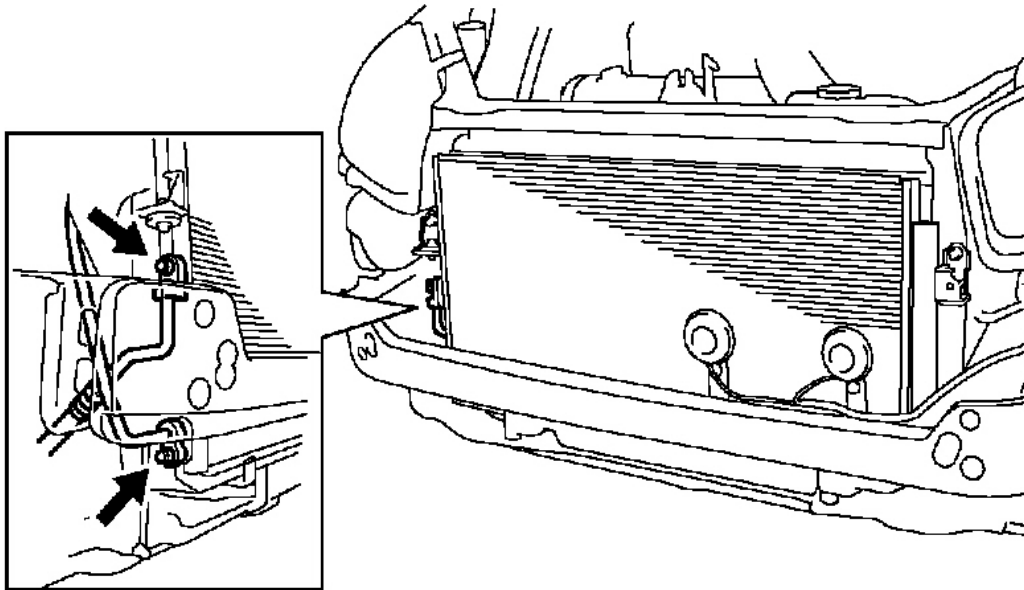
Fig. 107: Identifying Condenser Components (2 Of 2)

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 AND DISCHARGE TUBE**

Remove the 2 bolts and both tubes.



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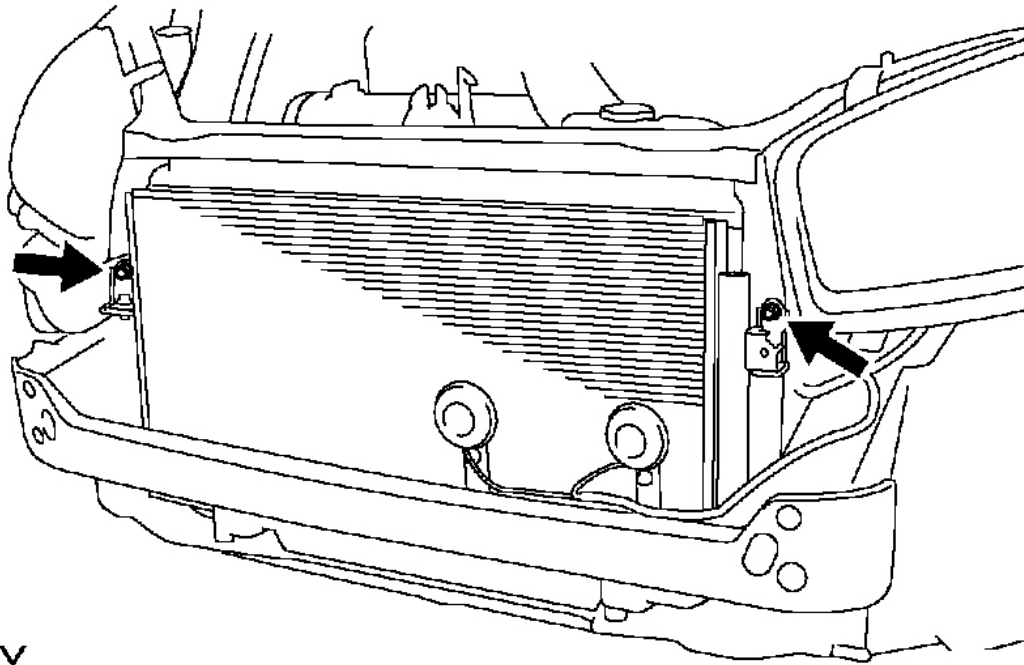
Fig. 108: Removing Liquid Tube & Discharge Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

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



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Fig. 109: 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.

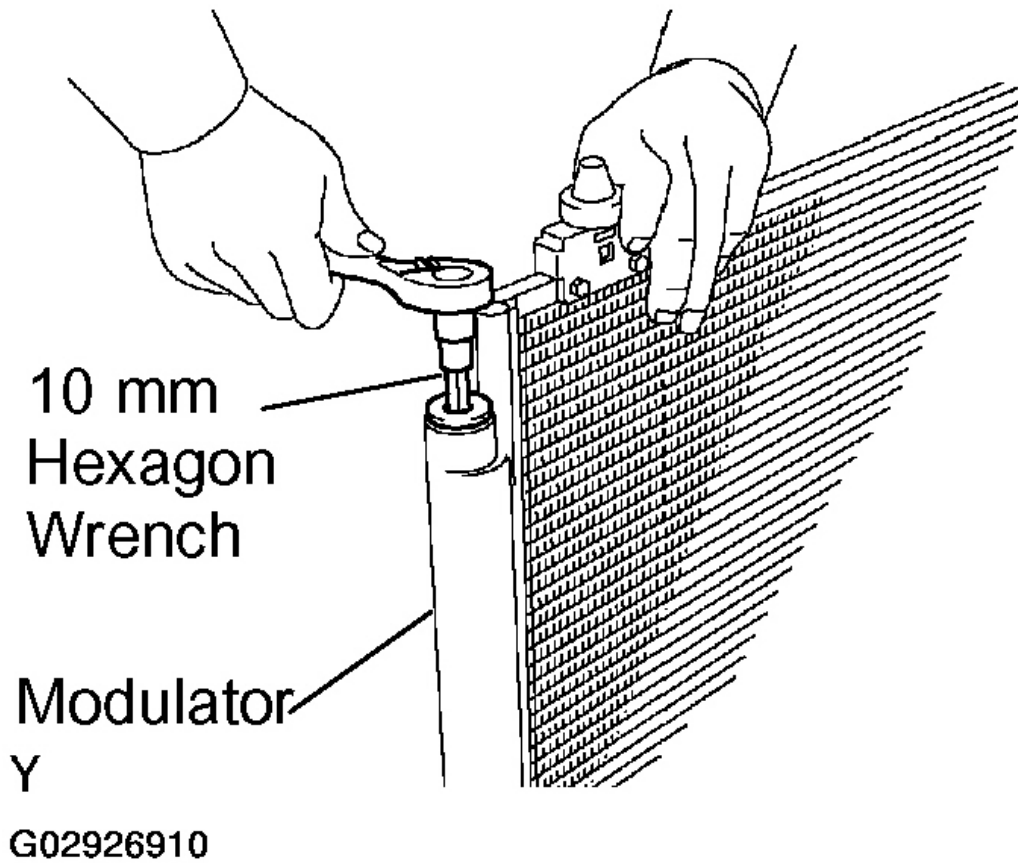
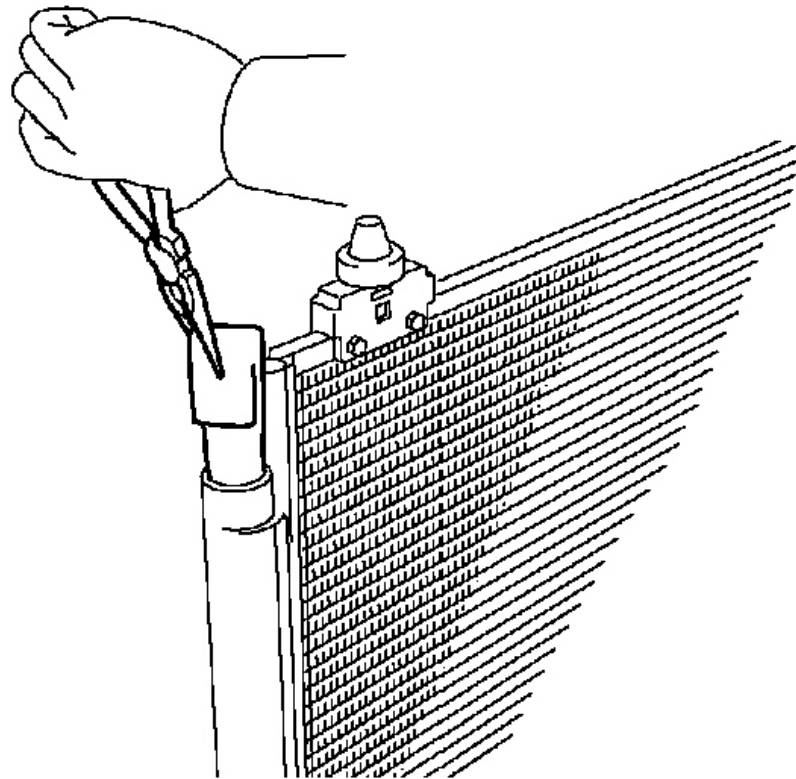


Fig. 110: Removing Cap From Modulator

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

- b. Remove the filter from the modulator.
- c. Using pliers, remove the dryer.



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Fig. 111: Removing Dryer Using Pliers

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

- d. Insert a new dryer into the modulator.

NOTE:

- Do not remove the dryer from a vinyl bag until inserting it into the modulator.
- Install the dryer with its 2 layered parts facing up to the modulator.

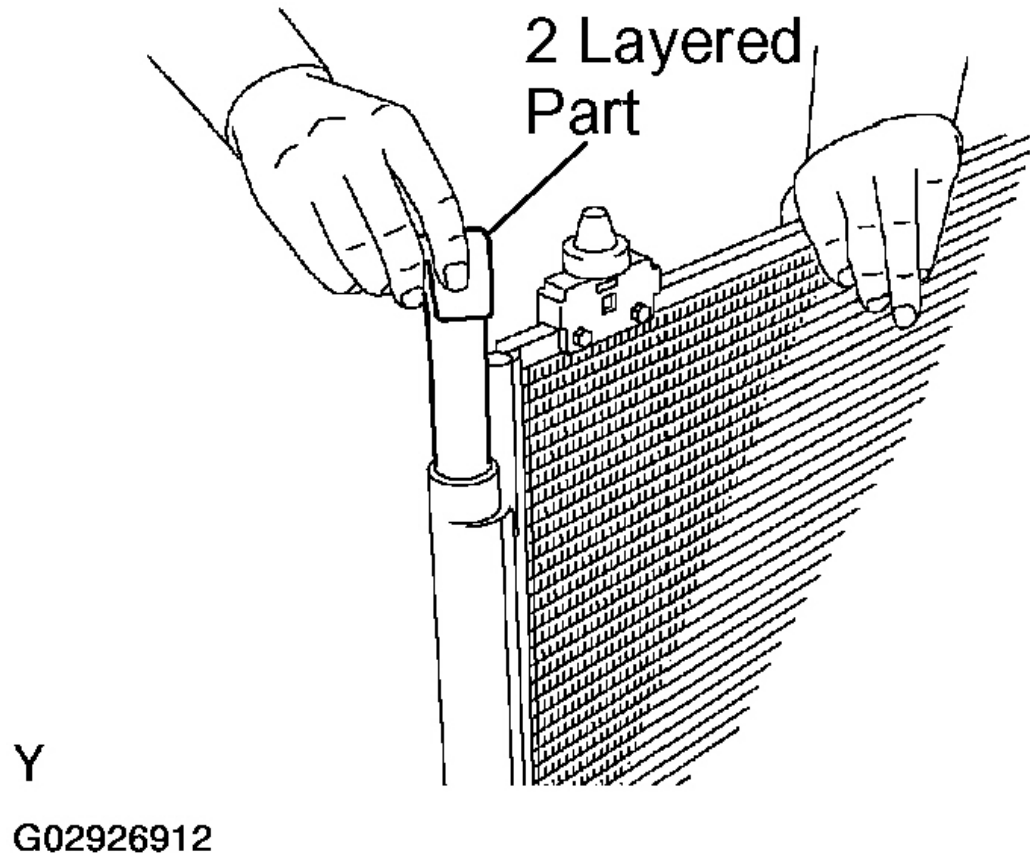
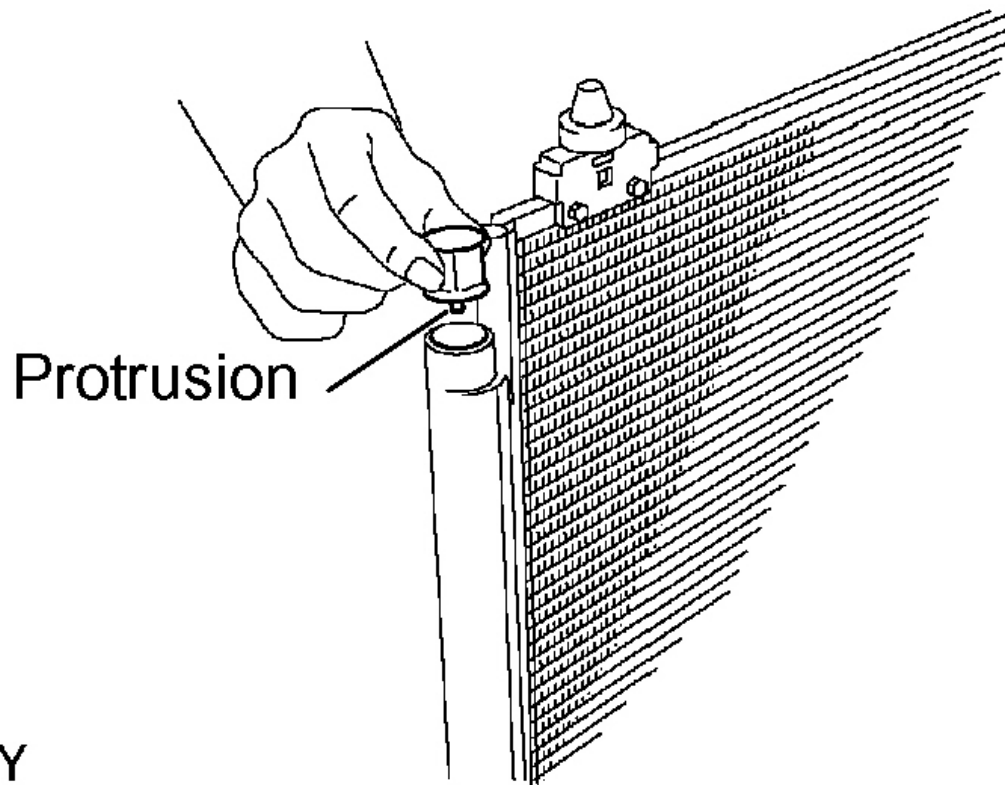


Fig. 112: Inserting New Dryer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Insert the filter into the modulator.

NOTE: Install the filter with its protrusion facing down to the modulator.



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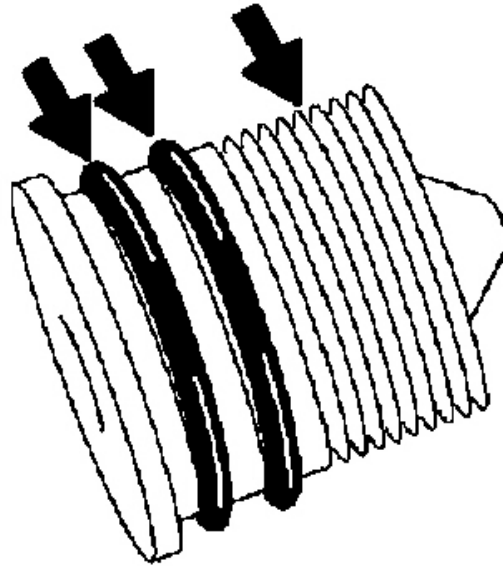
Fig. 113: Inserting New Filter Into Modulator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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

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

Torque: 2.9 N.m (30 kgf.cm, 26 in.lbf)



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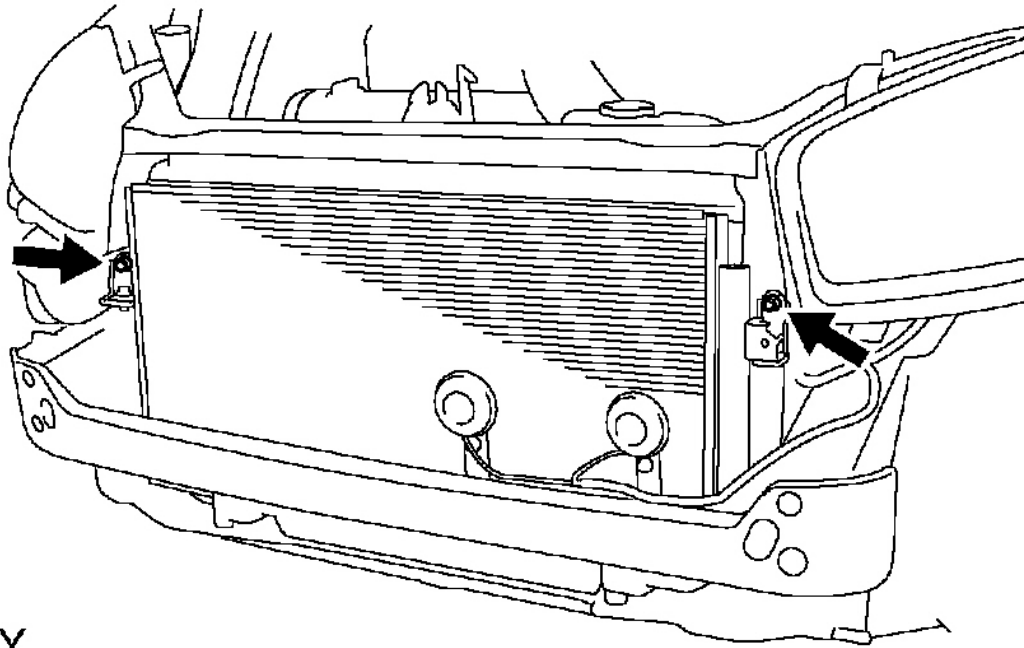
Fig. 114: Installing Cap To Modulator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL CONDENSER

Install the condenser with the 2 bolts.

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



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Fig. 115: Installing Condenser

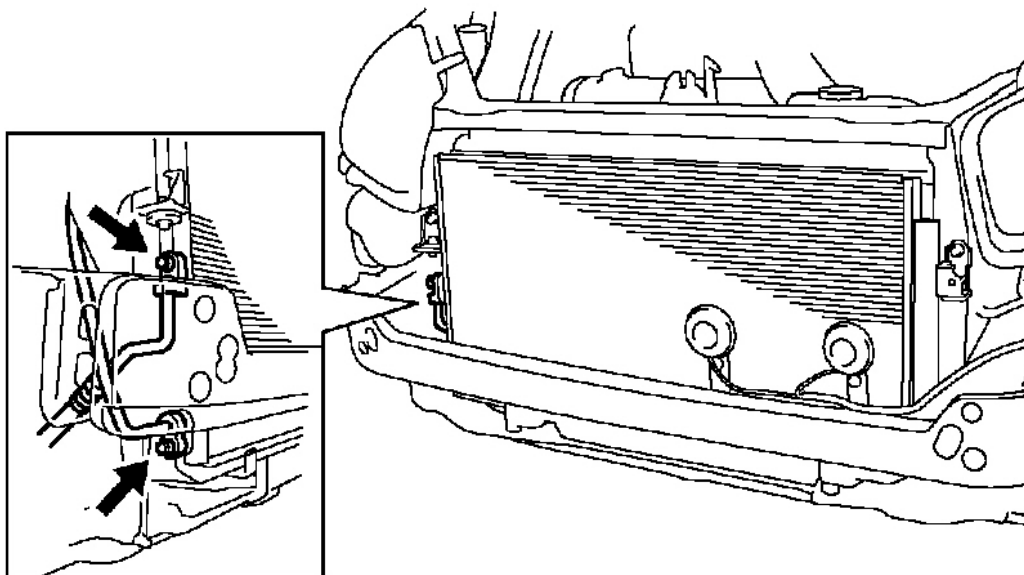
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

2. INSTALL LIQUID TUBE AND 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. 116: Installing Liquid Tube And Discharge Tube
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.)

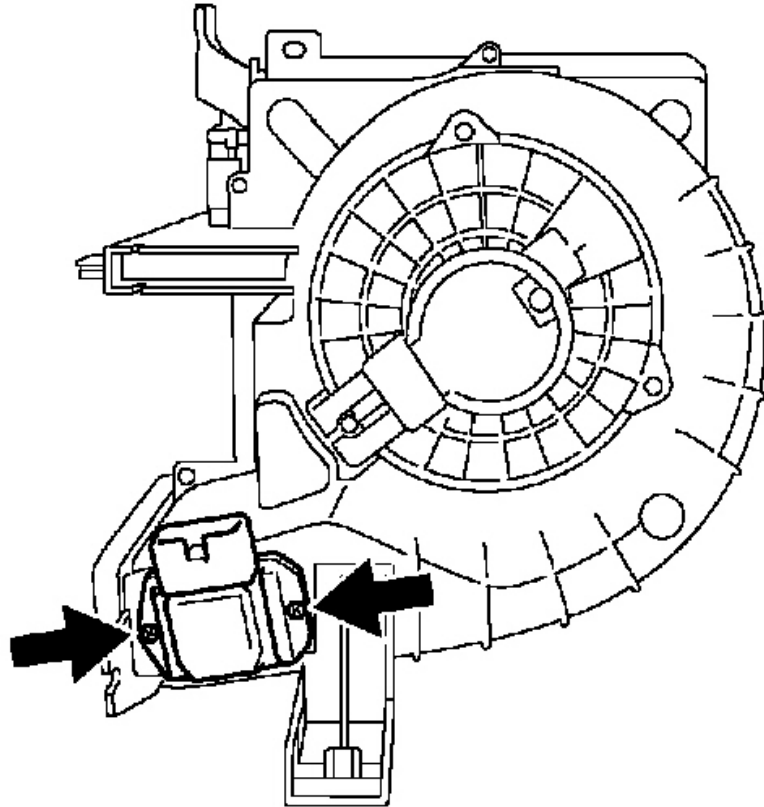
BLOWER MOTOR

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. 117: Removing Blower Motor Connector And Wire Harness Clamp
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.

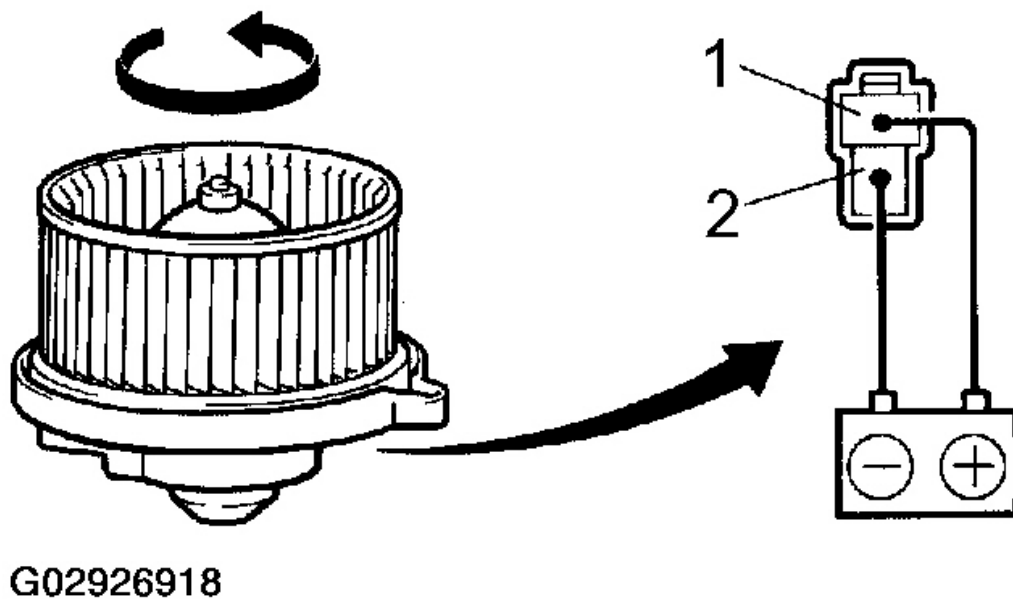


Fig. 118: Inspecting Blower Motor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. INSTALL BLOWER MOTOR

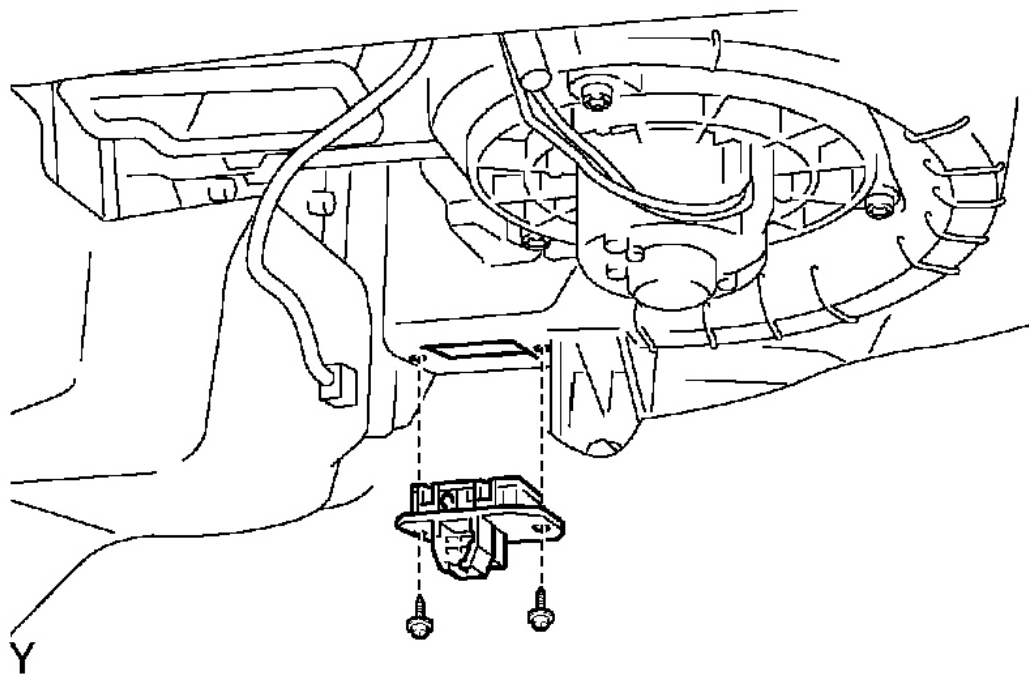
- Using a Torx wrench, install the blower motor with the 3 screws.
- Connect the blower motor connector and wire harness clamp.

BLOWER RESISTOR

INSPECTION

1. REMOVE BLOWER RESISTOR

- Disconnect the blower resistor connector.
- Remove the 2 screws and blower resistor.

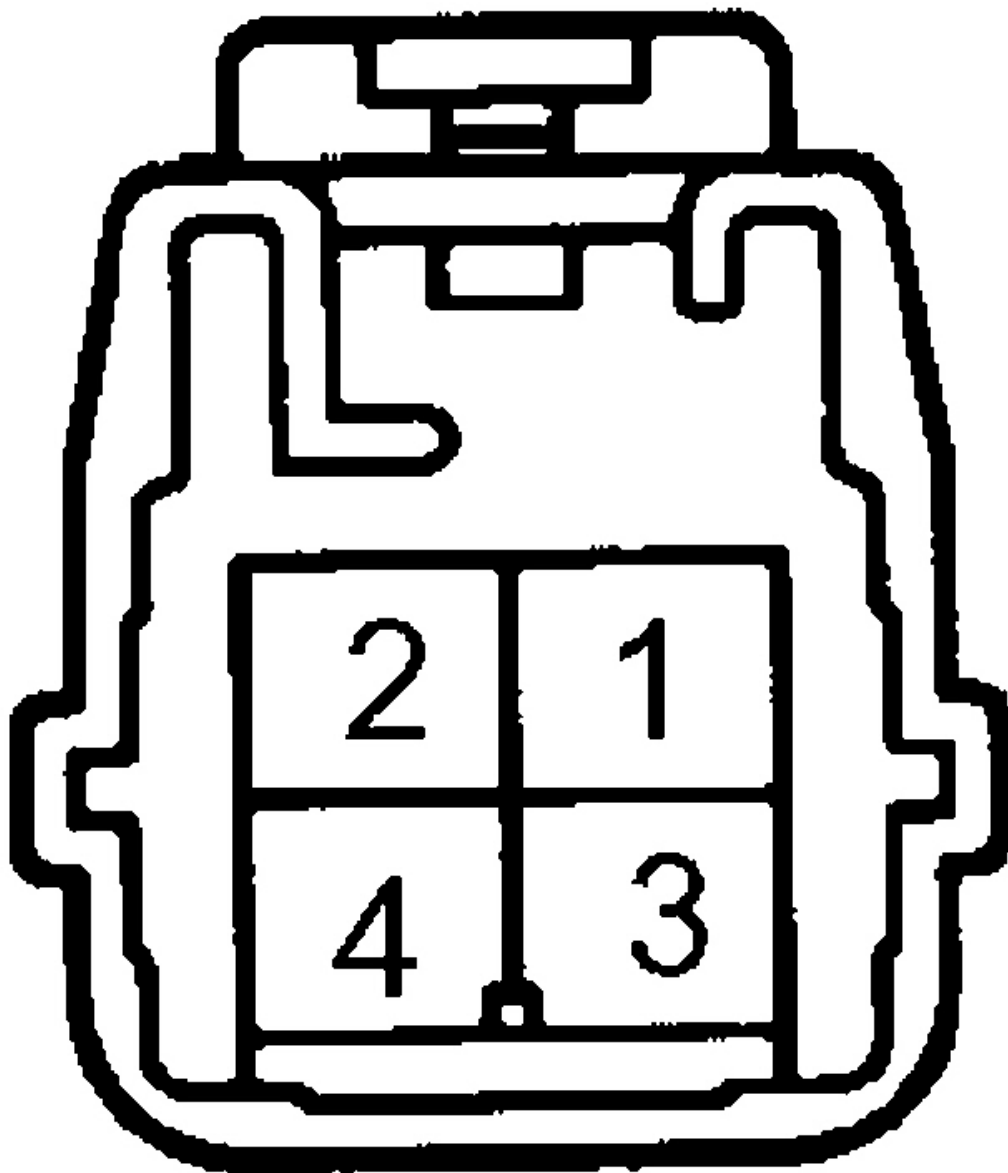


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Fig. 119: Removing Blower Resistor & Screws

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

2. INSPECT BLOWER RESISTOR CONTINUITY



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Fig. 120: Identifying Blower Resistor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

IDENTIFYING BLOWER RESISTOR CONTINUITY

Condition	Tester connection	Specified condition

Constant

1 - 2 - 3 - 4

Continuity

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

3. REINSTALL BLOWER RESISTOR

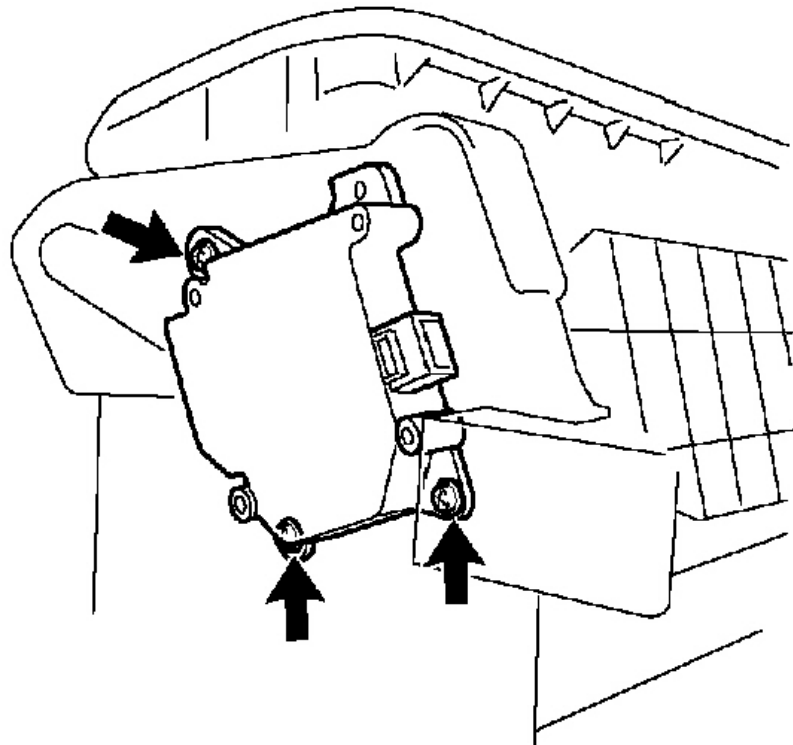
- a. Install the blower resistor with the 2 screws.
- b. Connect the blower resistor connector.

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 Air Inlet Servomotor & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

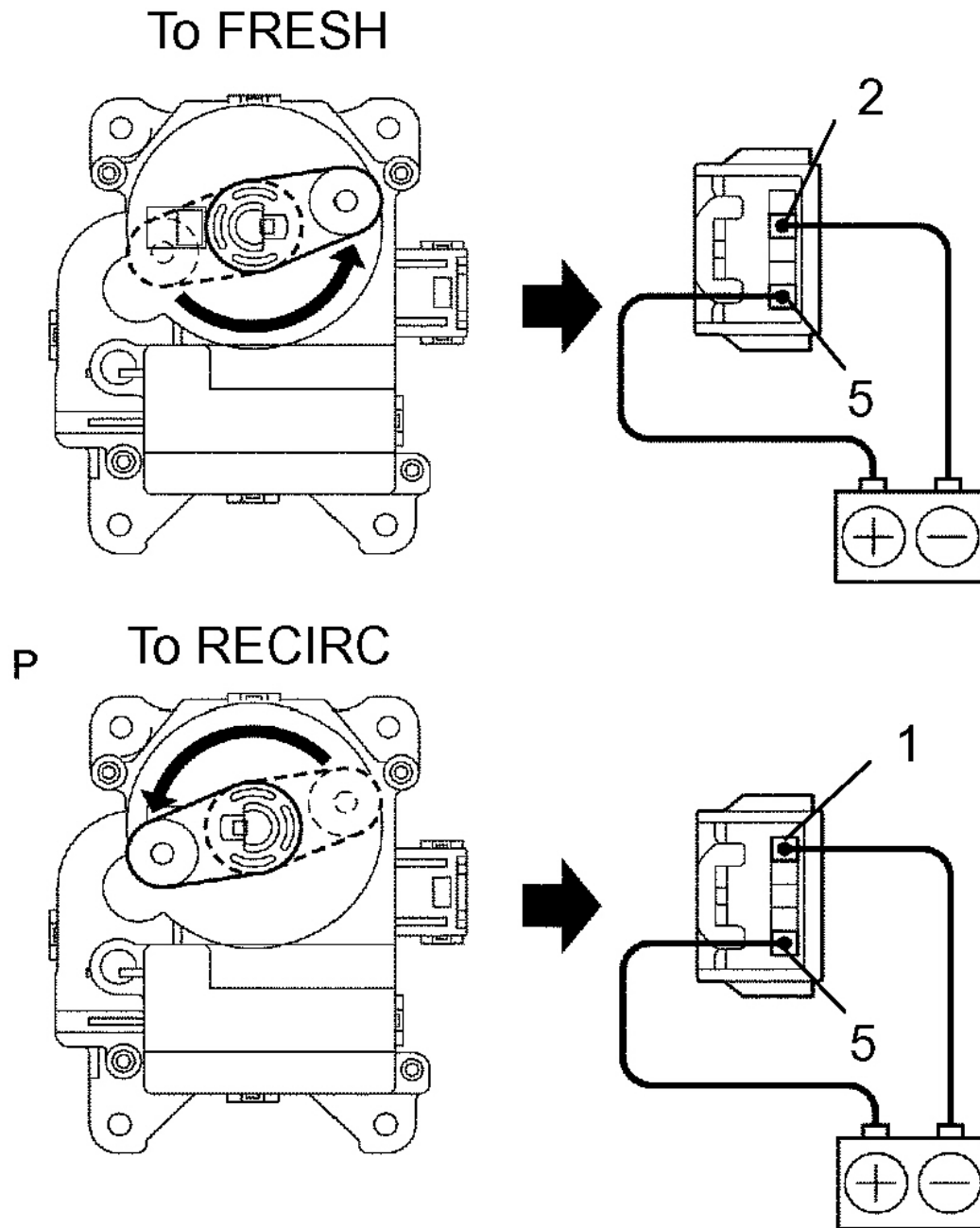
INSPECTION

Inspect Air Inlet Servomotor

Inspect the servomotor operation.

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

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



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Fig. 122: Inspecting Air Inlet 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.

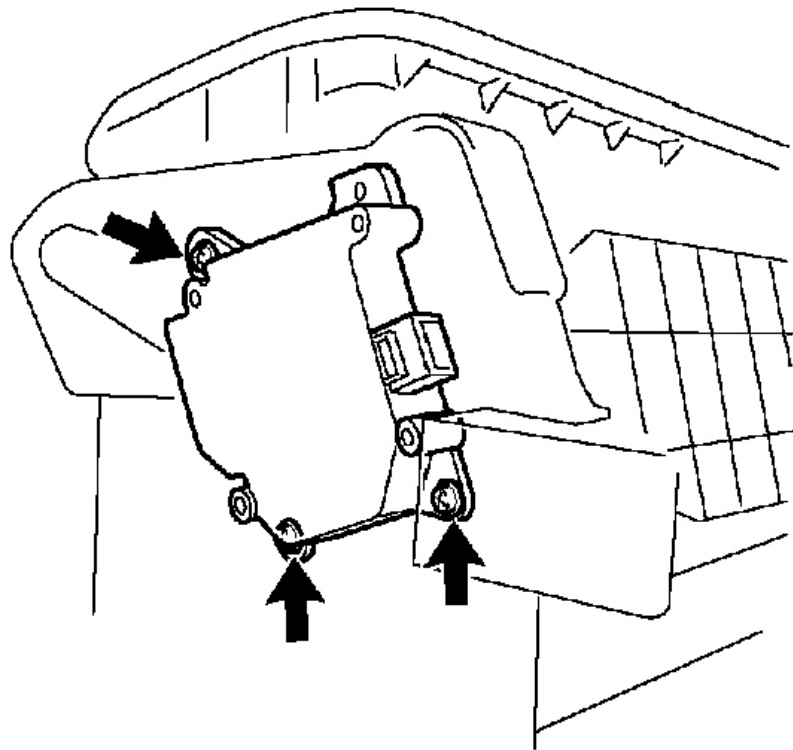
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Fig. 123: Installing Air Inlet Servomotor & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL BLOWER UNIT (See INSTALLATION)**THERMISTOR****INSPECTION**

- 1. REMOVE BLOWER UNIT (See REMOVAL)**
- 2. REMOVE THERMISTOR**

- a. Disconnect the thermistor connector.
- 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.

HINT:

Tape the screwdriver tip before use.

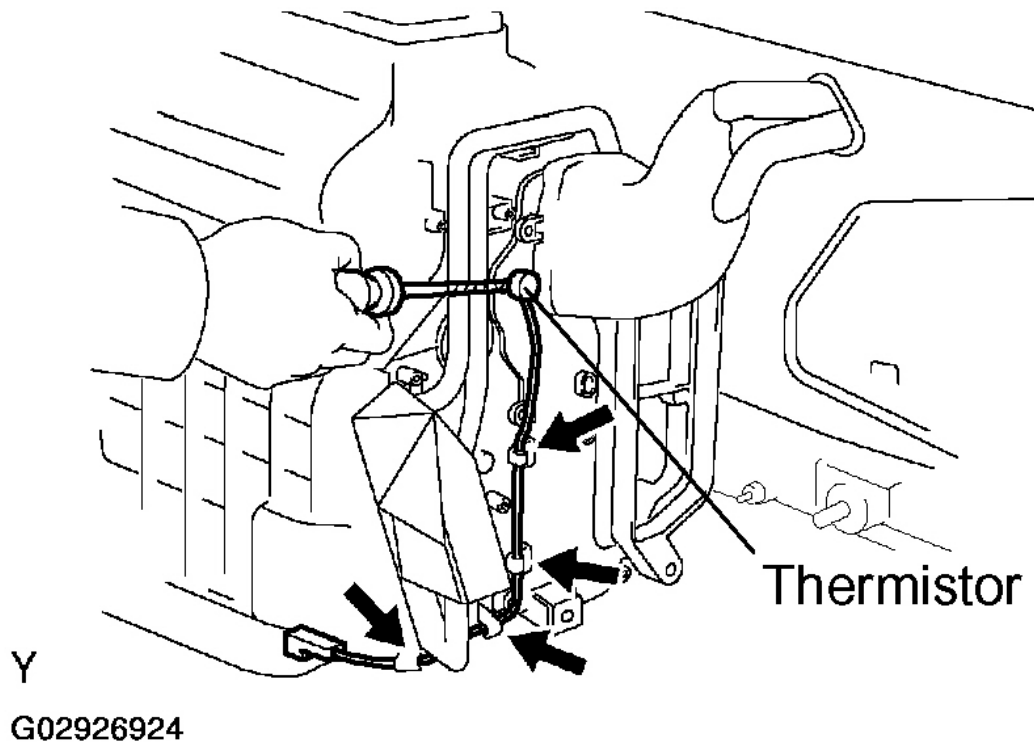


Fig. 124: Releasing Harness Claws & Removing Thermistor From A/C Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

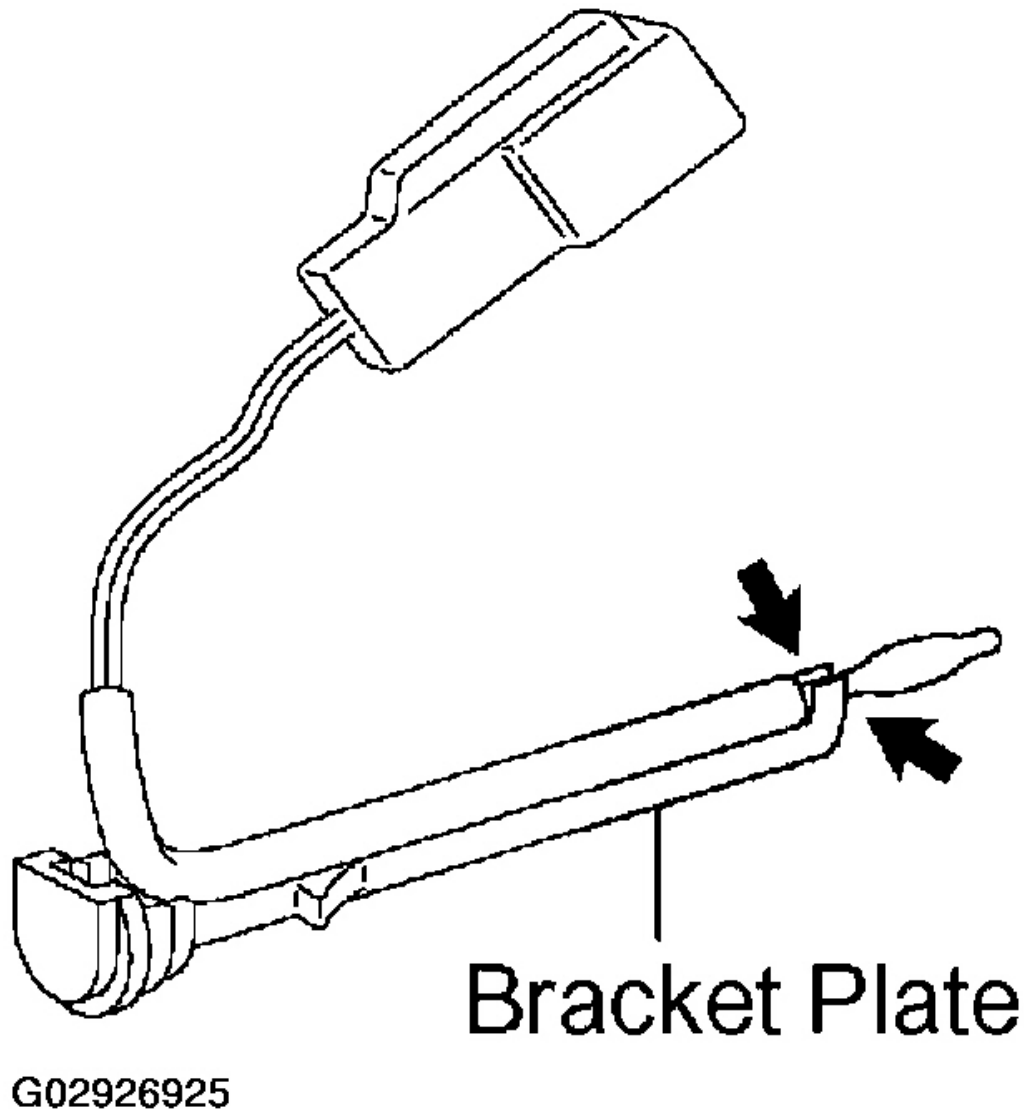


Fig. 125: Releasing Claws & Removing Thermistor From Bracket Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

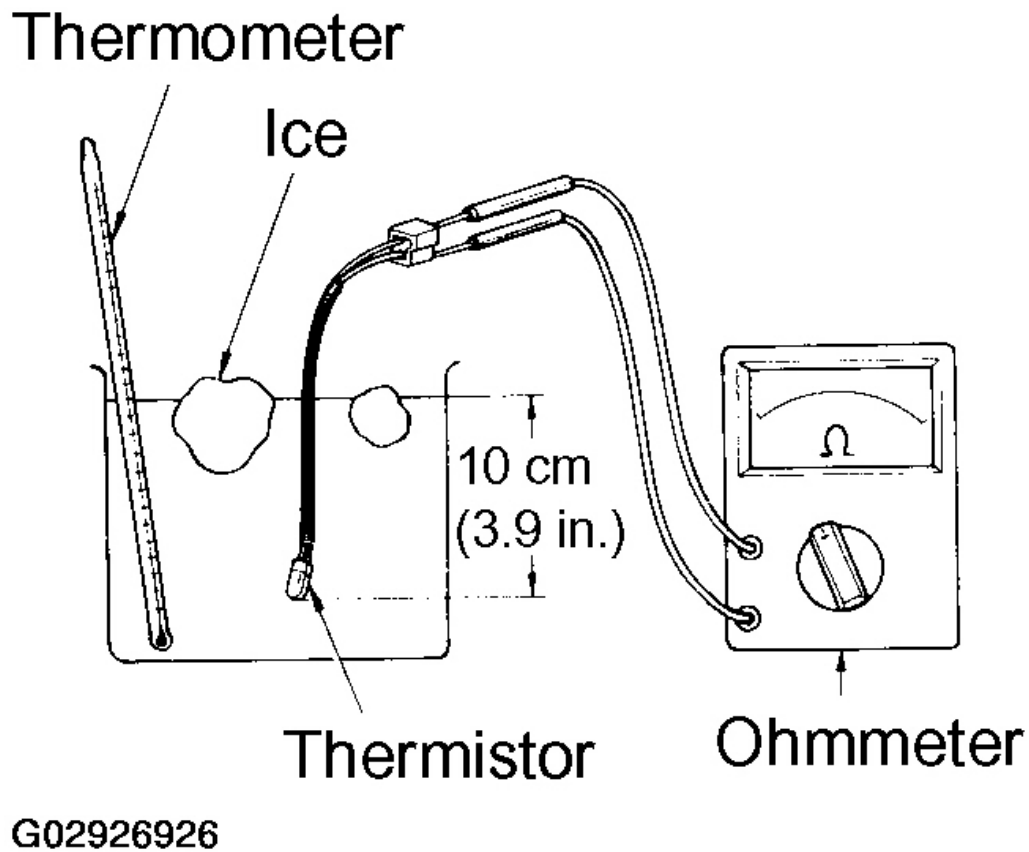
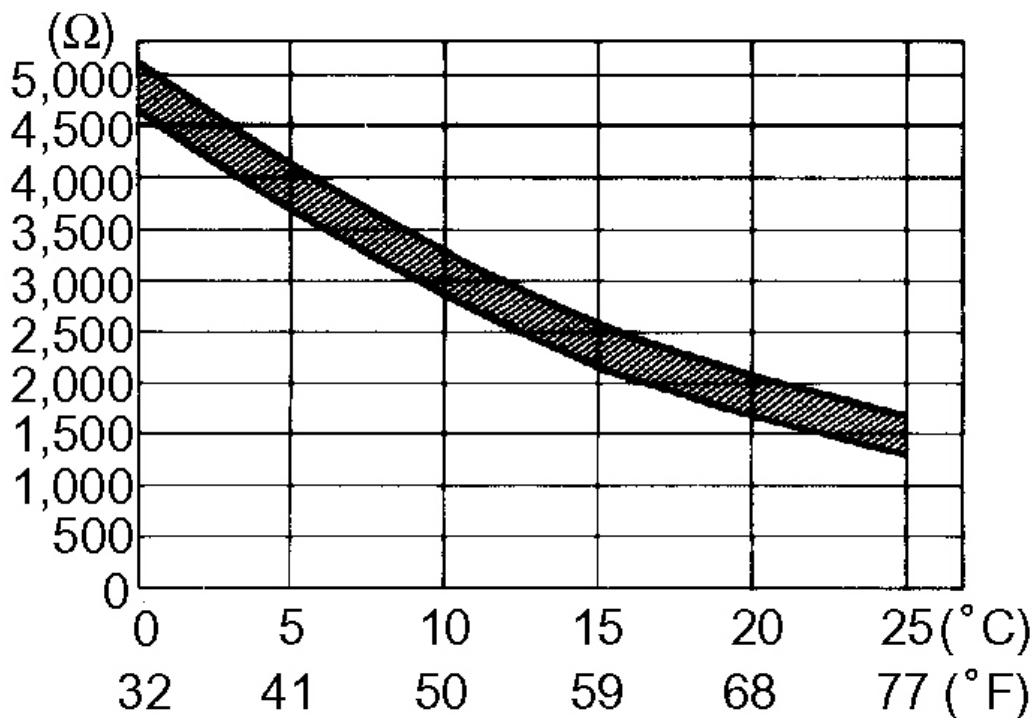


Fig. 126: Placing Thermistor In Cold Water & Measuring Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Compare the 2 readings on the graphs.

If resistance is not as specified, replace the thermistor.



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Fig. 127: Thermistor Resistance Graph

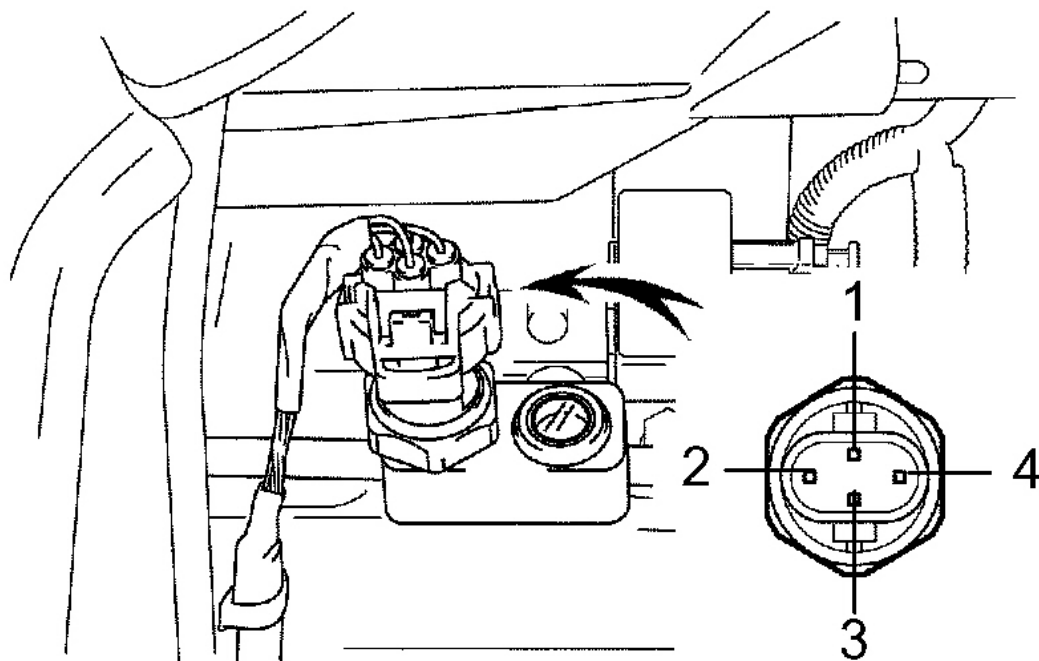
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REINSTALL THERMISTOR

- Install the thermistor to the bracket plate.
- Install the thermistor to the A/C unit case.
- Connect the connector clamp.
- Connect the thermistor connector.

5. REINSTALL BLOWER UNIT (See REMOVAL)**PRESSURE SWITCH****ON-VEHICLE INSPECTION**

- SET ON MANIFOLD GAUGE SET (See SET ON)**
- DISCONNECT CONNECTOR FROM PRESSURE SWITCH**
- RUN ENGINE AT APPROX. 1,500 RPM**



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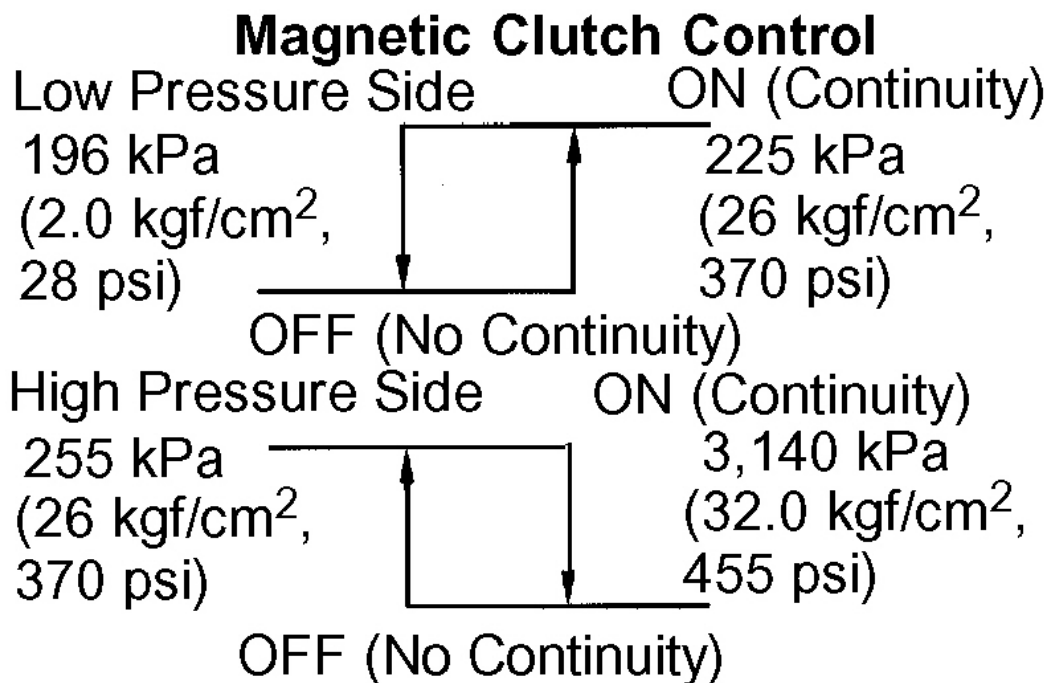
Fig. 128: Identifying Pressure Switch

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**.

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



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

5. Condenser fan control: INSPECT PRESSURE SWITCH OPERATION

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

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

Condenser Fan Control

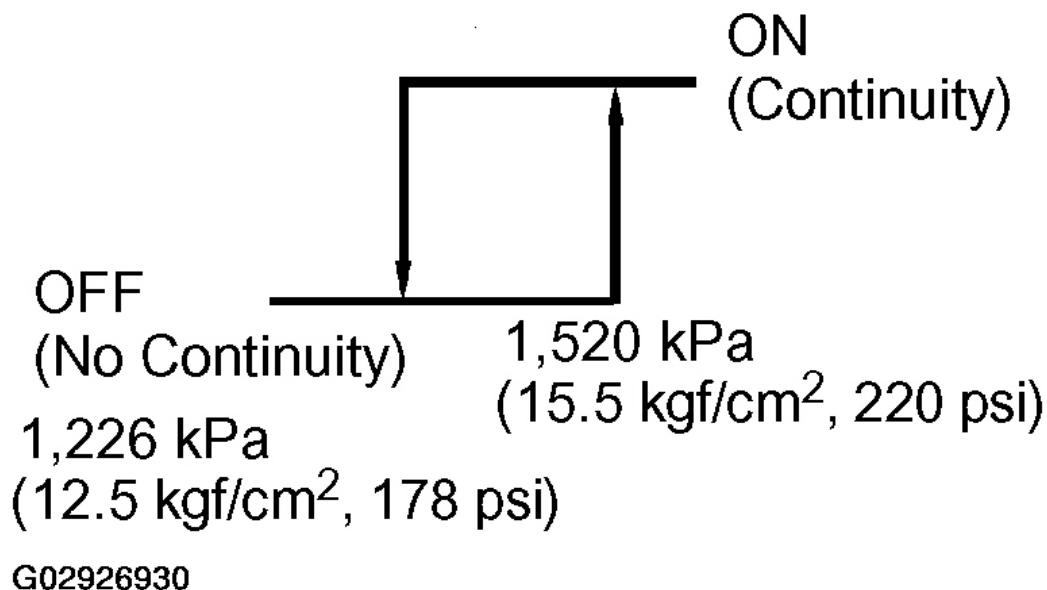


Fig. 130: Identifying Condenser Fan Control Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

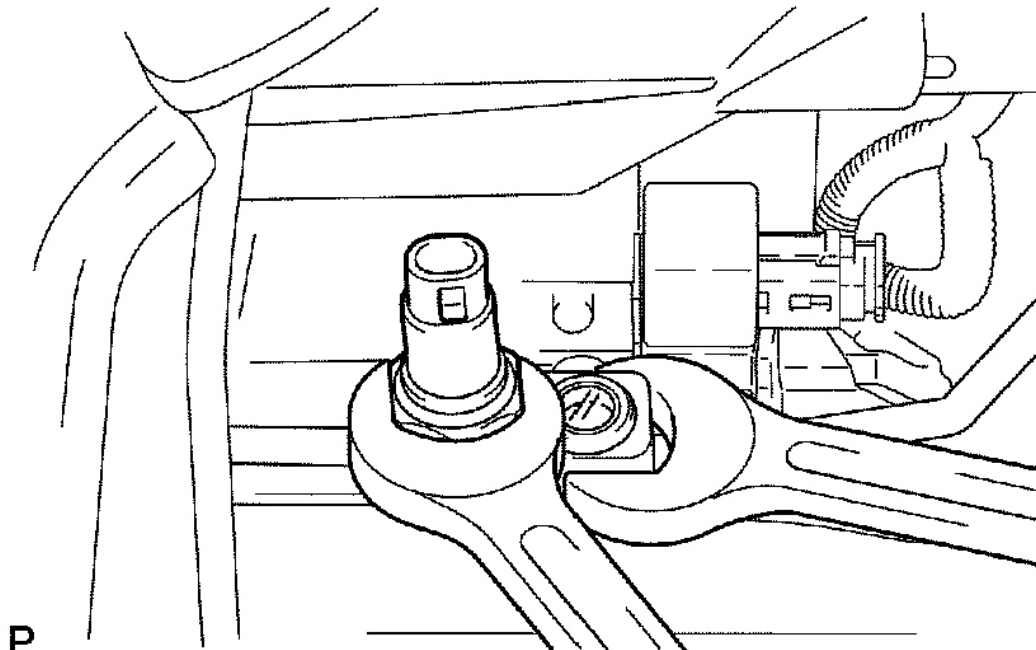
6. STOP ENGINE AND SET OFF MANIFOLD GAUGE SET
7. RECONNECT CONNECTOR TO PRESSURE SWITCH

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.

HINT:

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



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Fig. 131: Removing Pressure Switch

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

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)

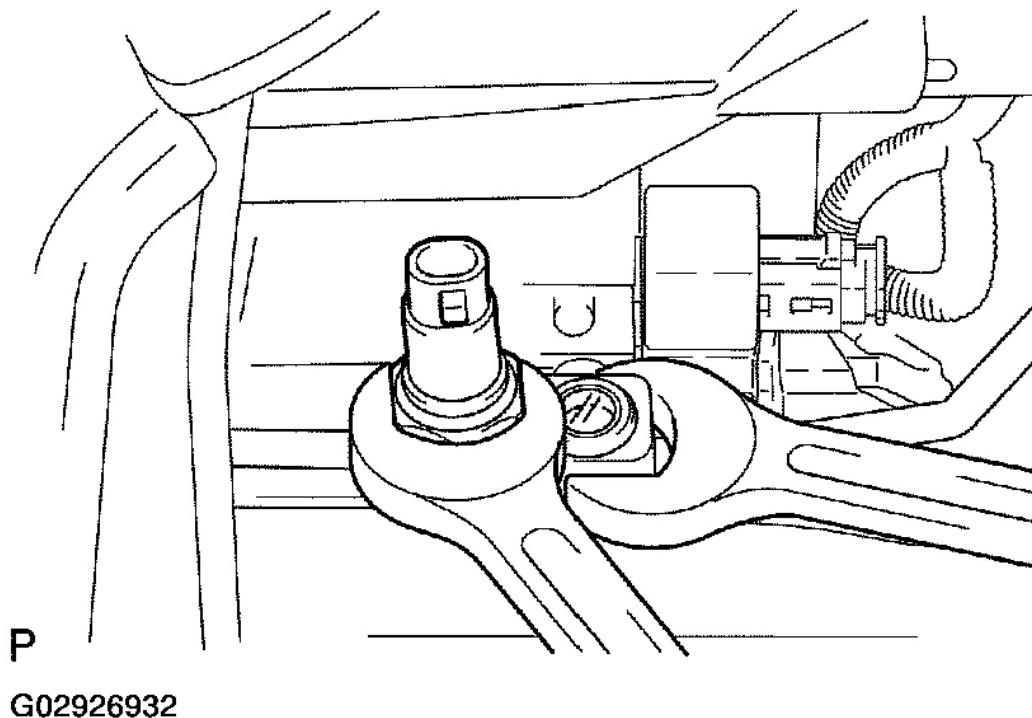


Fig. 132: Installing Pressure Switch To Liquid Tube
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CHARGE REFRIGERANT TO REFRIGERANT SYSTEM (See CHARGING)

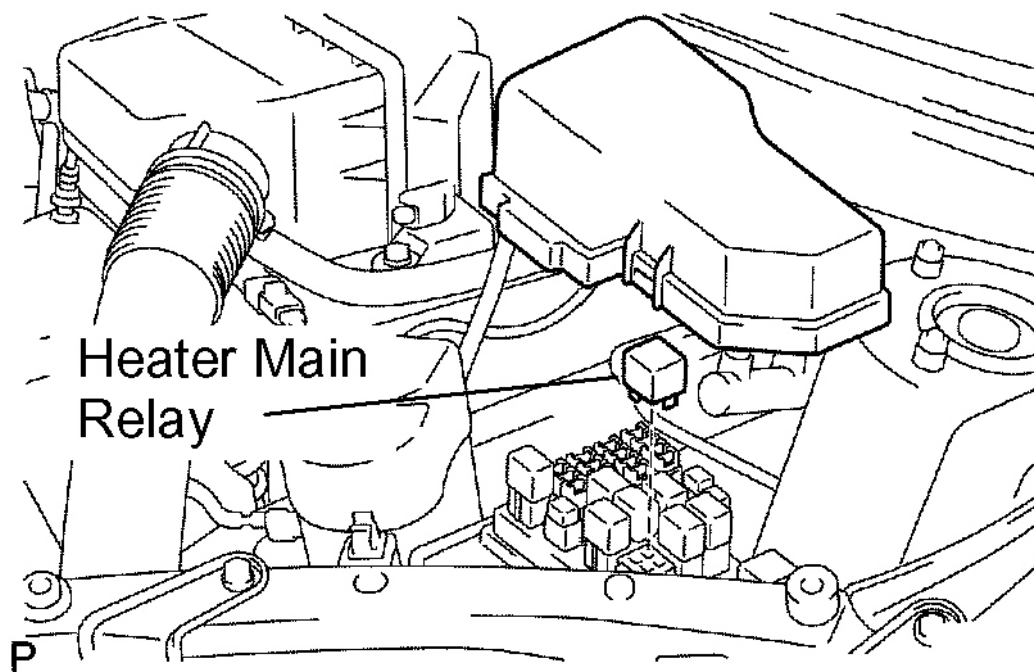
- a. Evacuate air from the refrigeration system.
- b. Charge system with refrigerant and inspect for leakage of refrigerant.

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**



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Fig. 133: Removing 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.

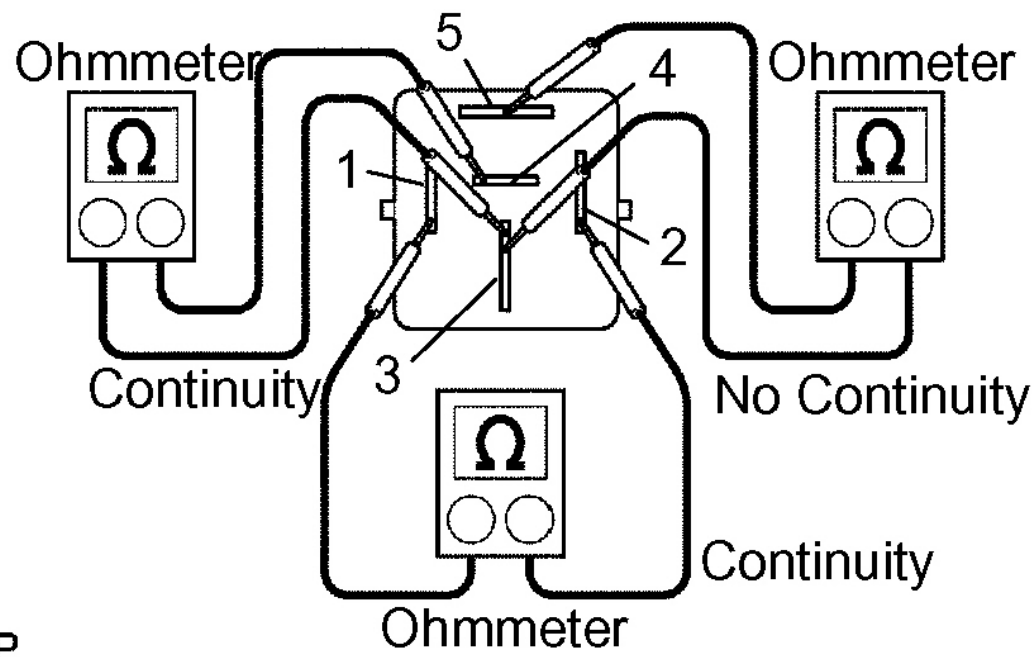
If there is no continuity, replace the relay.

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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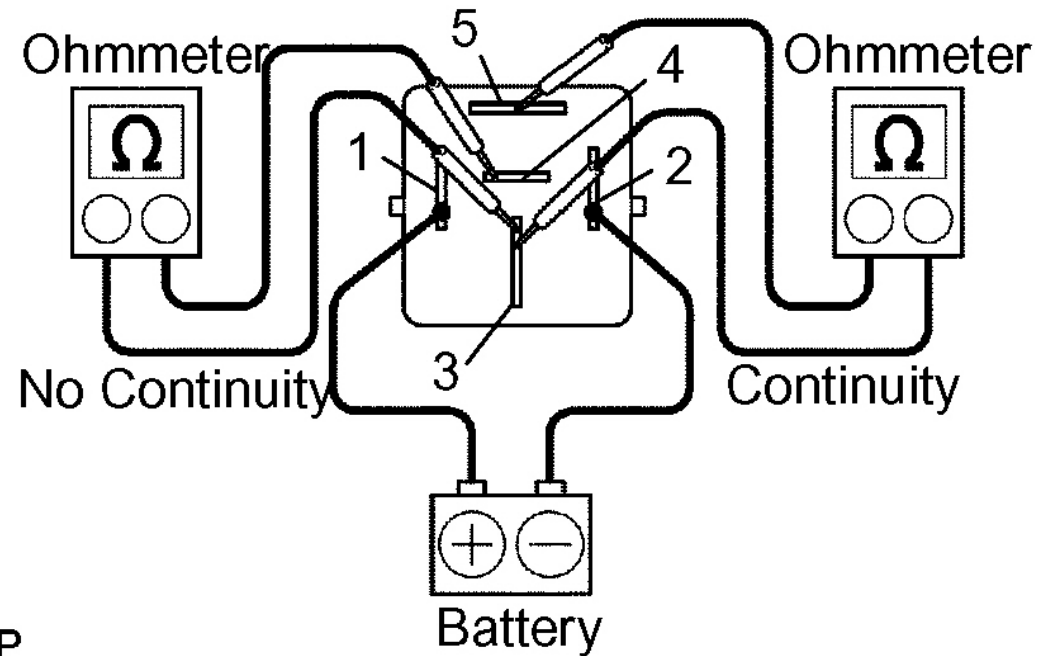
Fig. 134: Inspecting Heater Main Relay Continuity (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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.



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Fig. 135: Inspecting Heater Main Relay Continuity (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REINSTALL HEATER MAIN RELAY

COOLING FAN RELAY

INSPECTION

1. REMOVE NO. 2 COOLING FAN RELAY (Marking: FAN NO. 2) FROM ENGINE ROOM J/B

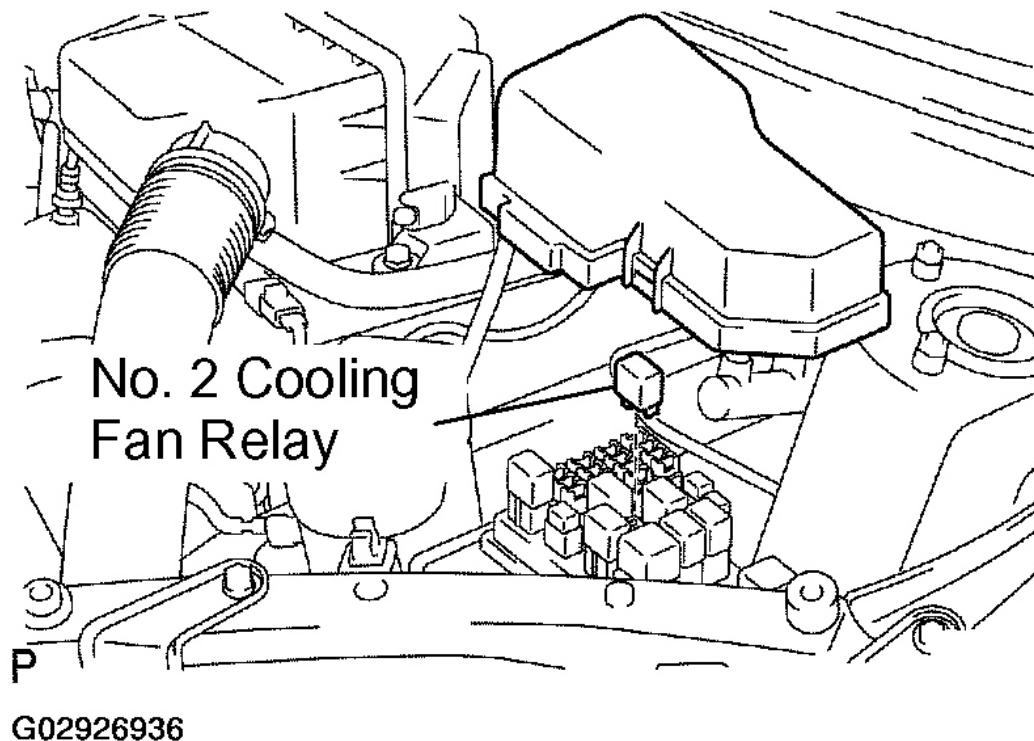


Fig. 136: Removing Cooling Fan Relay No. 2
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

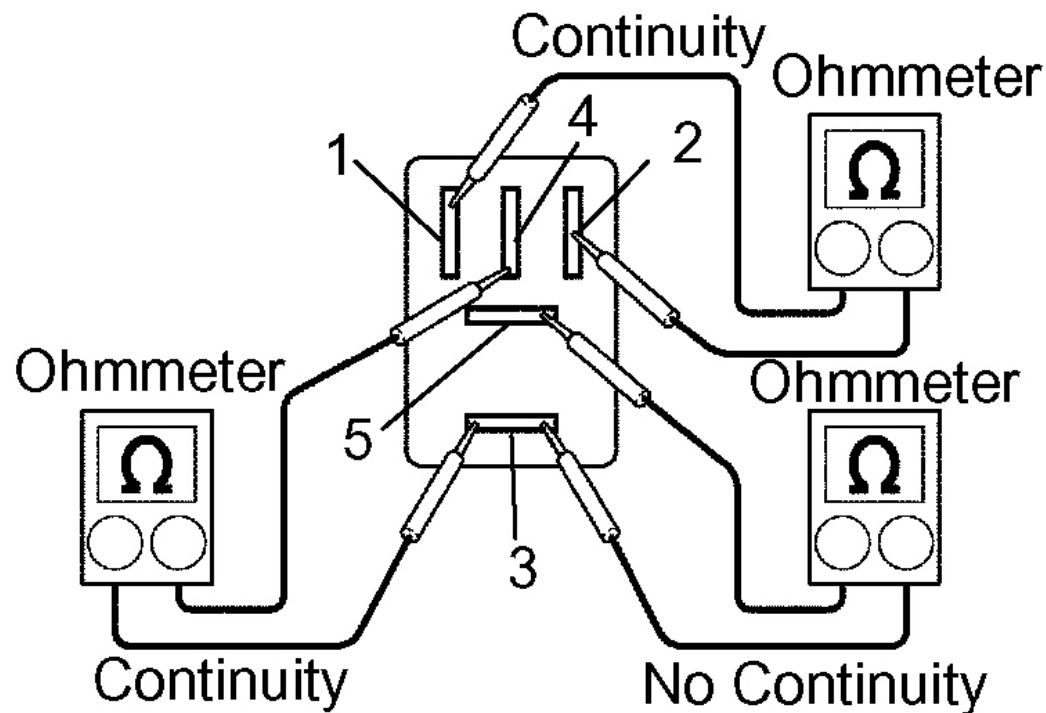
2. INSPECT NO. 2 COOLING FAN RELAY

- a. Inspect the relay continuity.
 - a. Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.
 - b. Check that there is continuity between terminals 3 and 4.

If there is no continuity, replace the relay.
 - c. Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



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Fig. 137: Inspecting No. 2 Cooling Fan Relay Continuity (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Inspect the relay operation.
 - a. Apply battery positive voltage across terminals 1 and 2.
 - b. Using an ohmmeter, check that there is no continuity between terminals 3 and 4.

If there is continuity, replace the relay.

- c. Check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

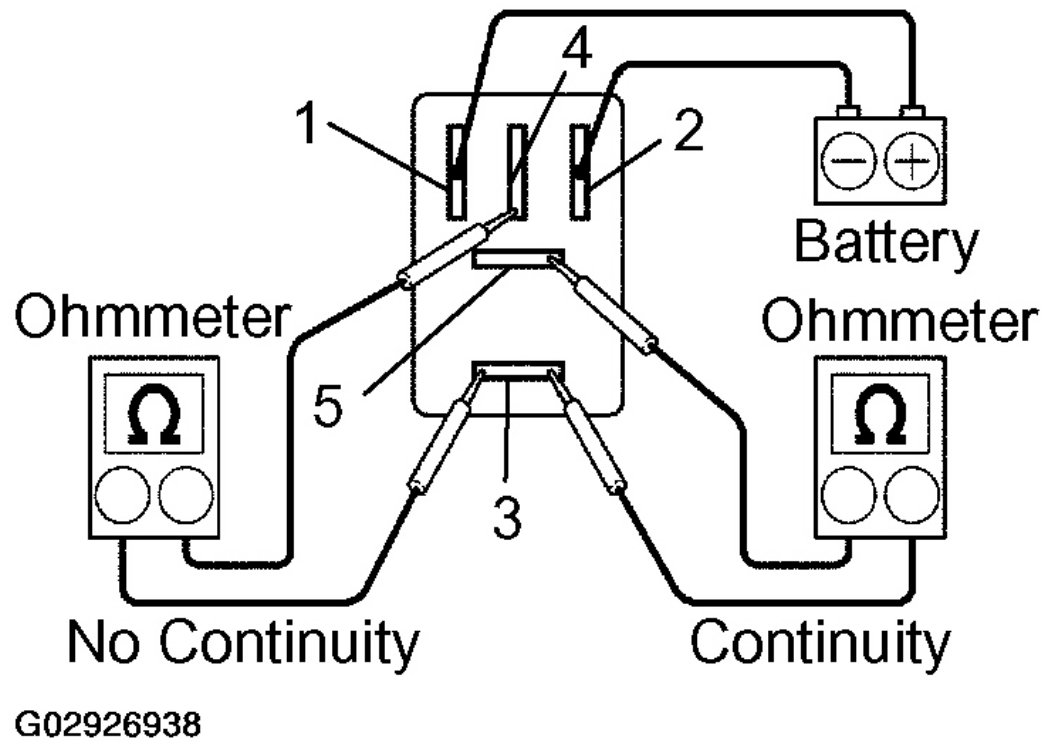


Fig. 138: Inspecting No. 2 Cooling Fan Relay Continuity (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REINSTALL NO. 2 COOLING FAN RELAY
4. REMOVE NO. 3 COOLING FAN (Marking: FAN NO. 3) RELAY FROM ENGINE ROOM J/B

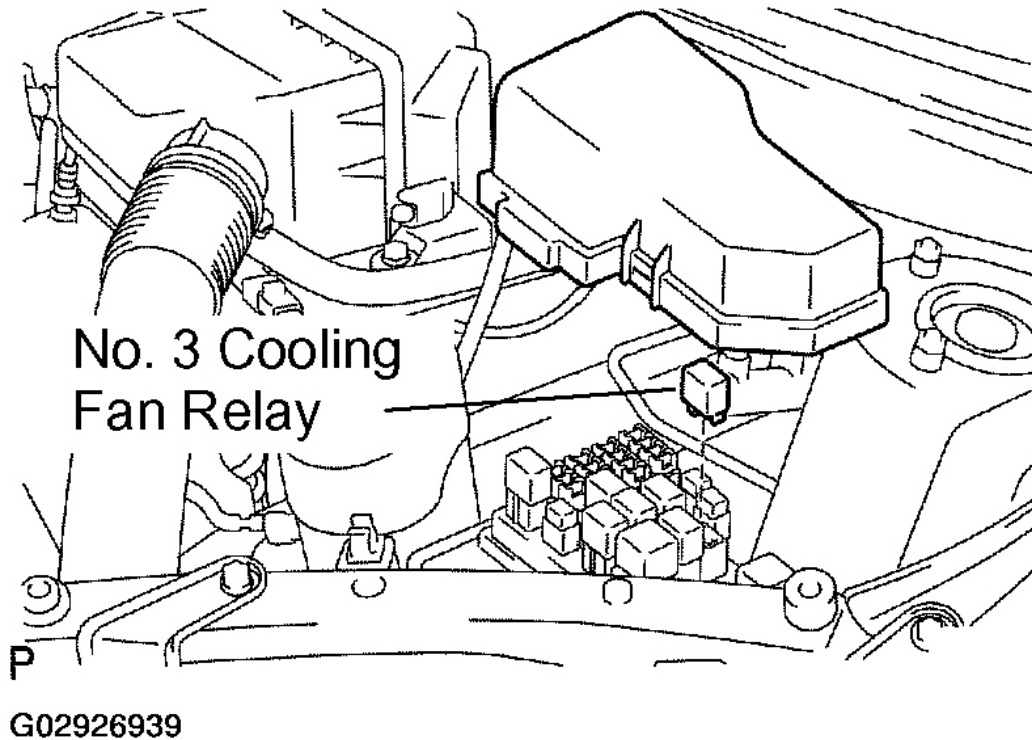


Fig. 139: Removing Cooling Fan Relay No. 3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. INSPECT NO. 3 COOLING FAN 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 no continuity between terminals 3 and 5.

If there is continuity, replace the relay.

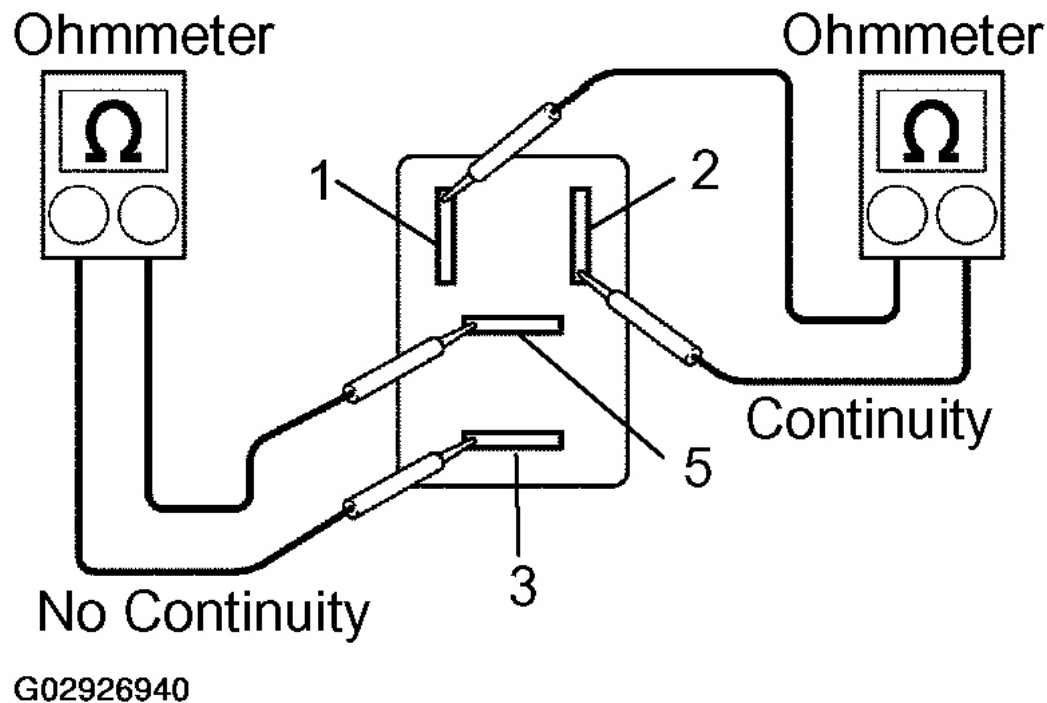


Fig. 140: Inspecting No. 3 Cooling Fan Relay Continuity (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 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.

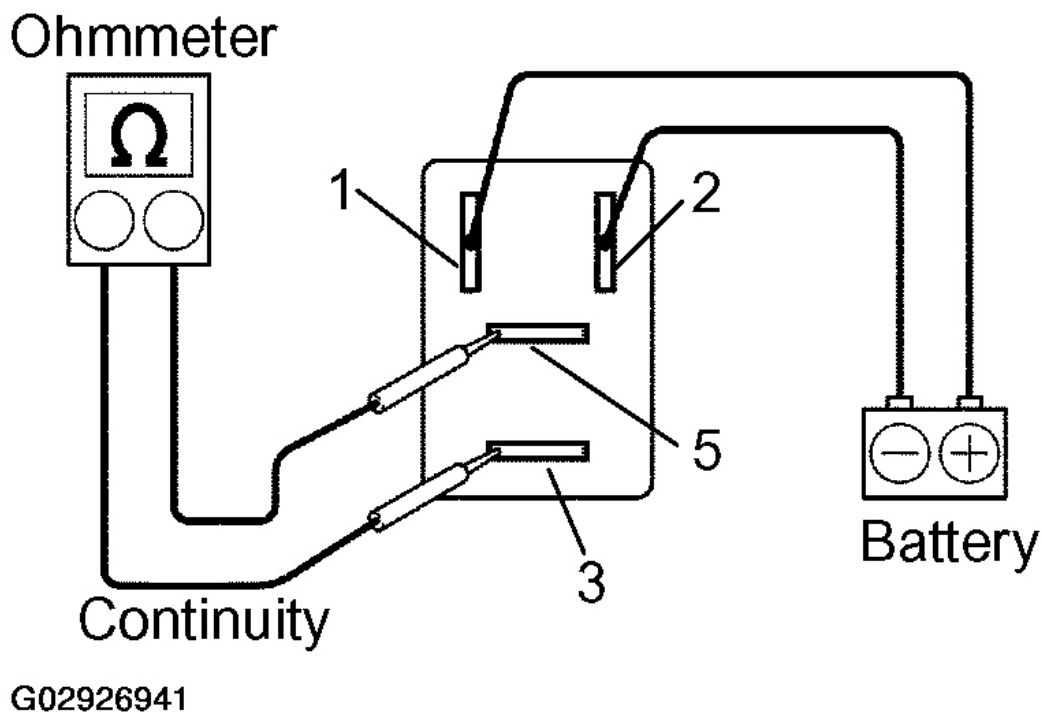


Fig. 141: Inspecting No. 3 Cooling Fan Relay Continuity (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. REINSTALL NO. 3 COOLING FAN RELAY

CONDENSER FAN

ON-VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

Inspect fan operation under these condition, as shown in **FAN OPERATION CONDITIONS & SPEED** .

Test conditions:

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

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

- A/C switch ON

FAN OPERATION CONDITIONS & SPEED

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)

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

2. INSPECT CONDENSER FAN MOTOR OPERATION

- Disconnect the connector.
- Connect the battery and ammeter as shown in **Fig. 142**.
- 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)

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.

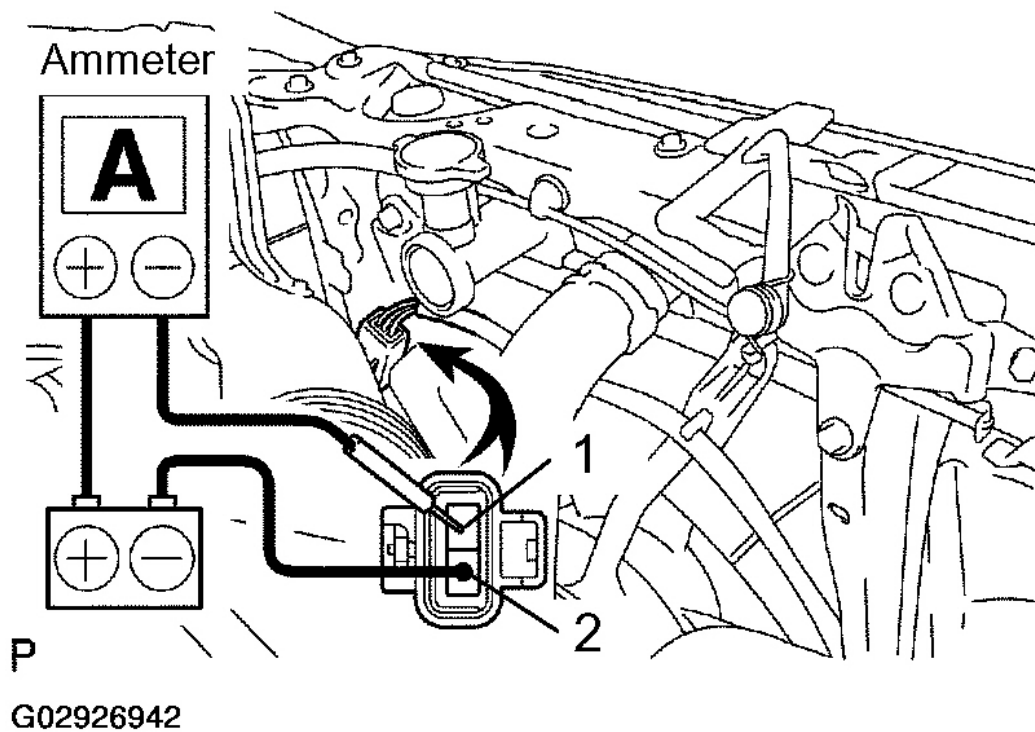
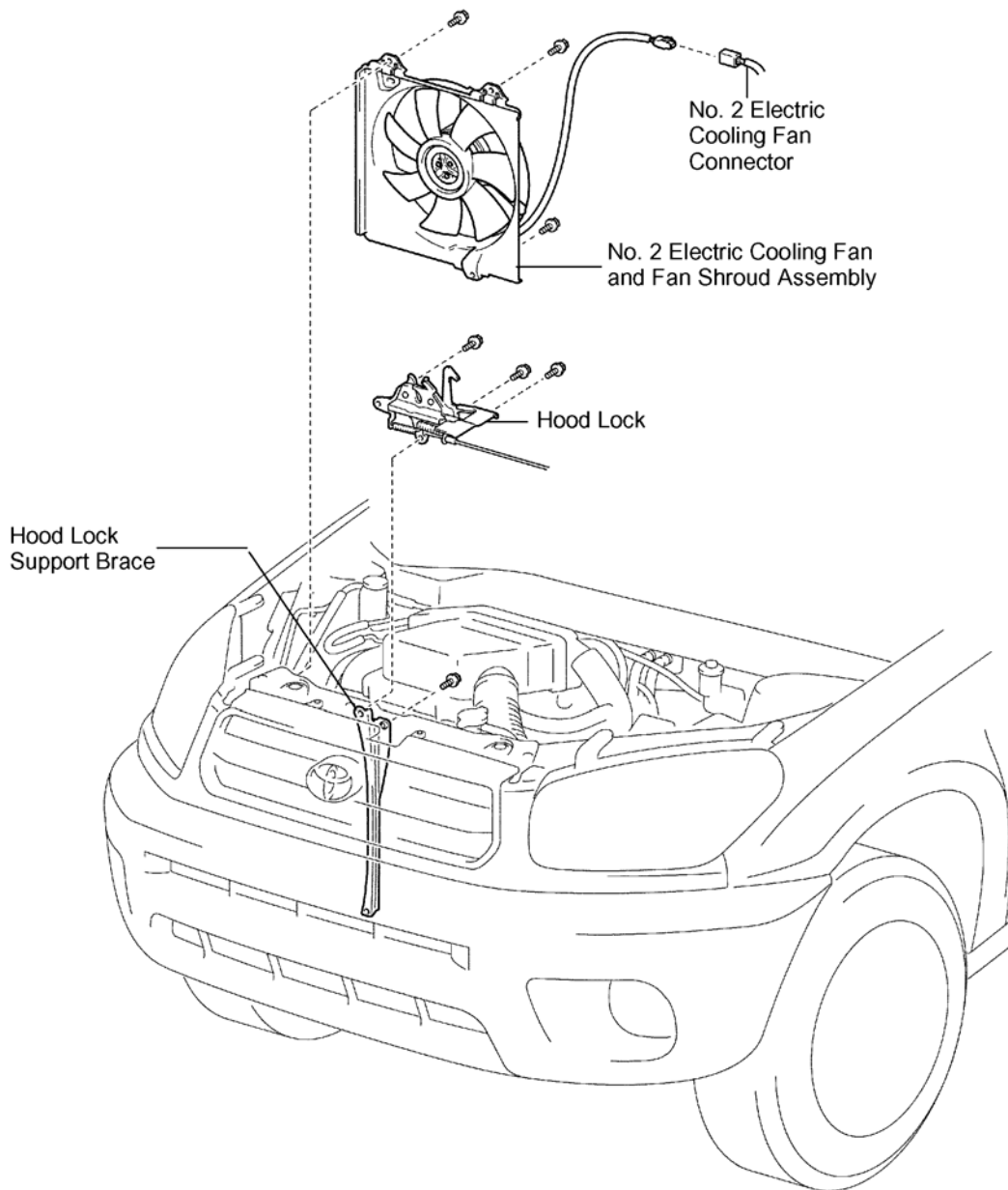


Fig. 142: Inspecting Condenser Fan Motor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPONENTS

2004 Toyota RAV4

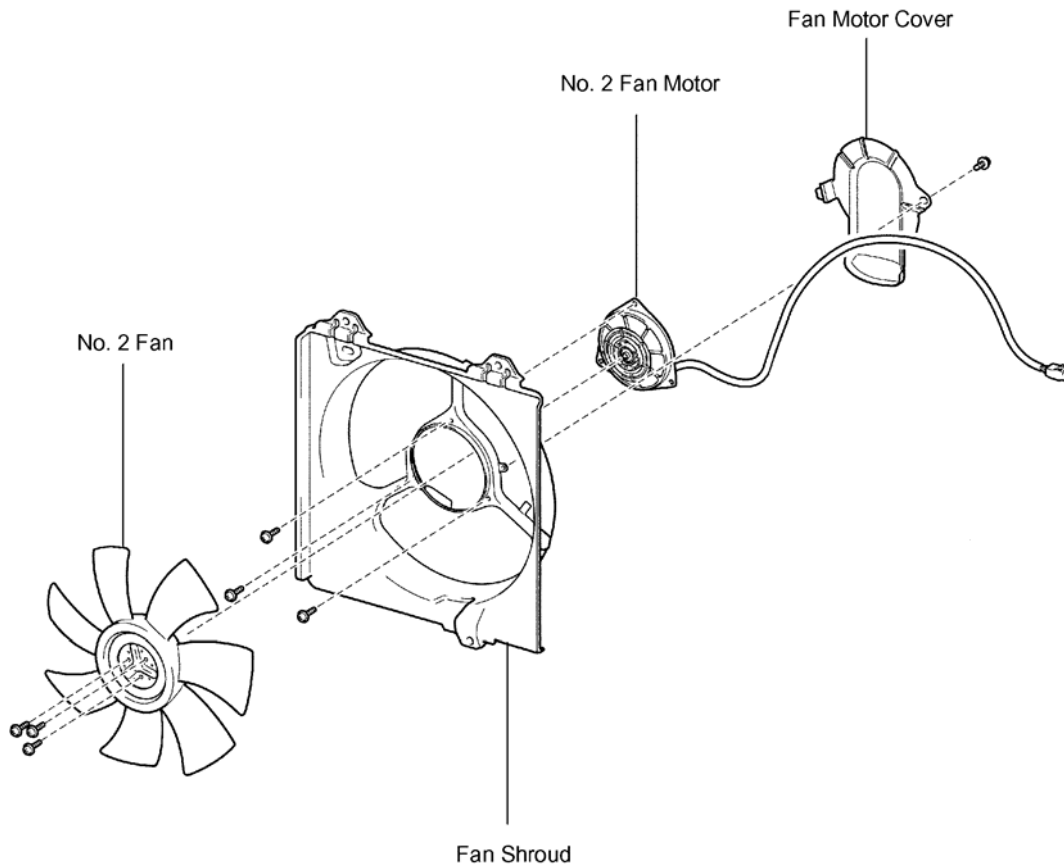
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Fig. 143: Identifying Condenser Fan Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



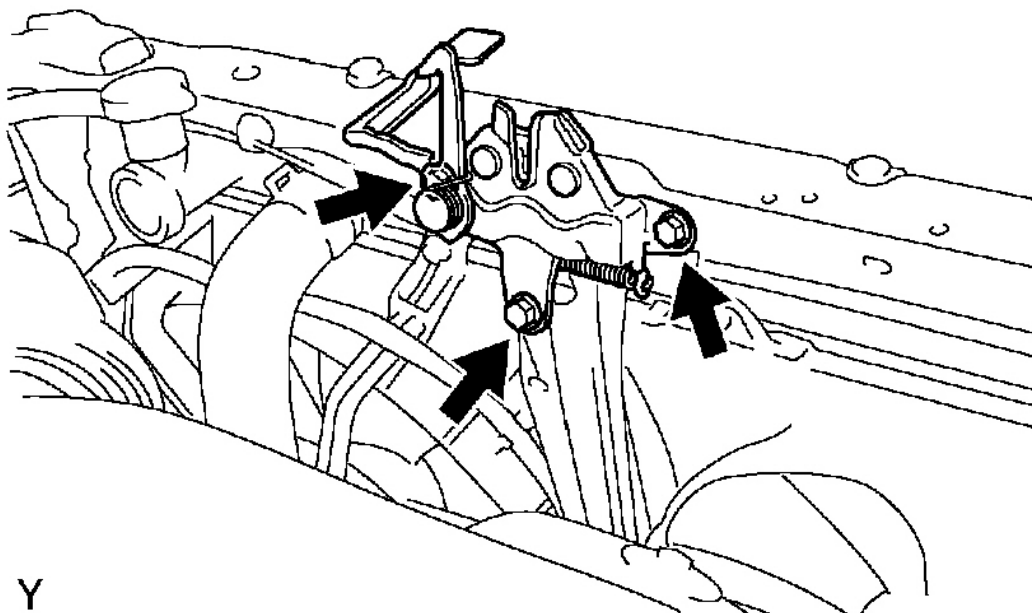
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Fig. 144: Identifying Condenser Fan Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE HOOD LOCK

Remove the 3 bolts and hood lock.



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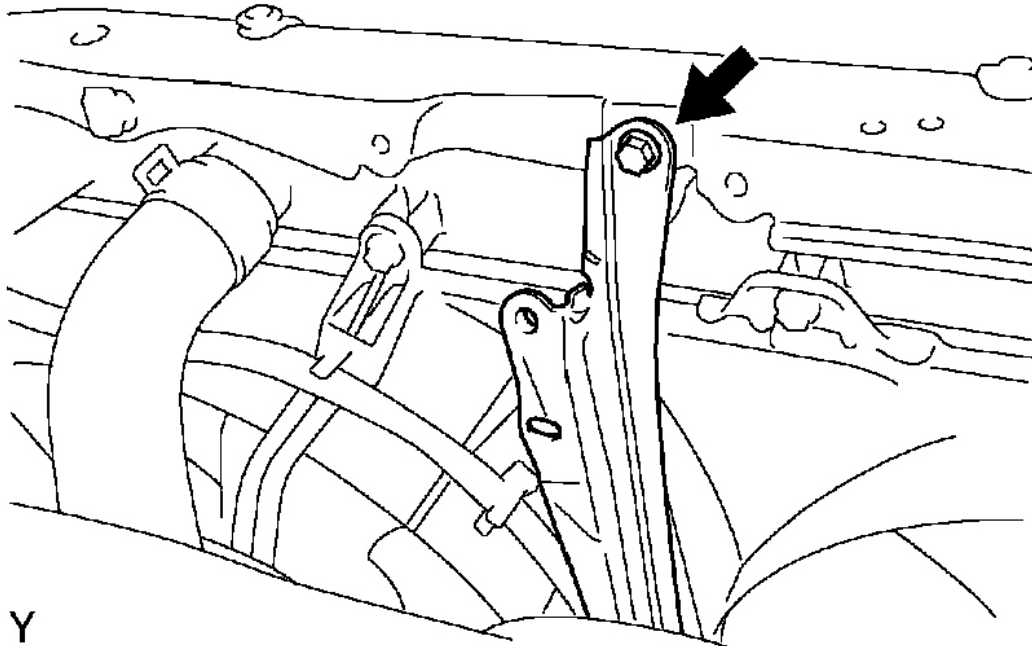
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Fig. 145: Removing Hood Lock & Bolts

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

2. DISCONNECT HOOD LOCK SUPPORT BRACE

Remove the bolt.

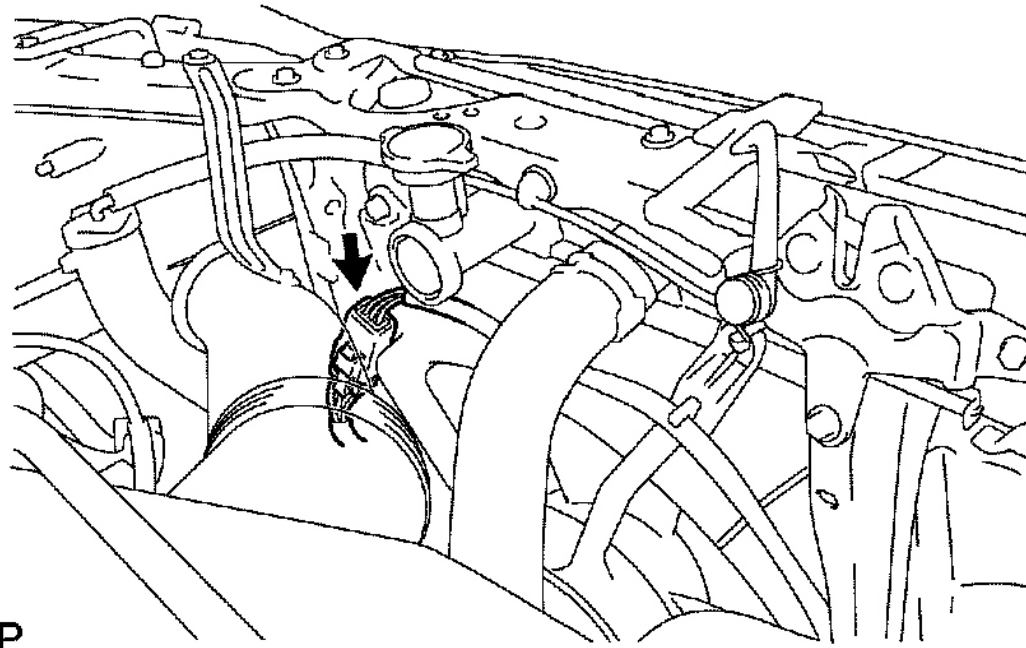


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Fig. 146: Removing Hood Lock Support Brace & Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **REMOVE NO. 2 ELECTRIC COOLING FAN AND FAN SHROUD ASSEMBLY**
 - a. Disconnect the cooling fan connector and clamp.



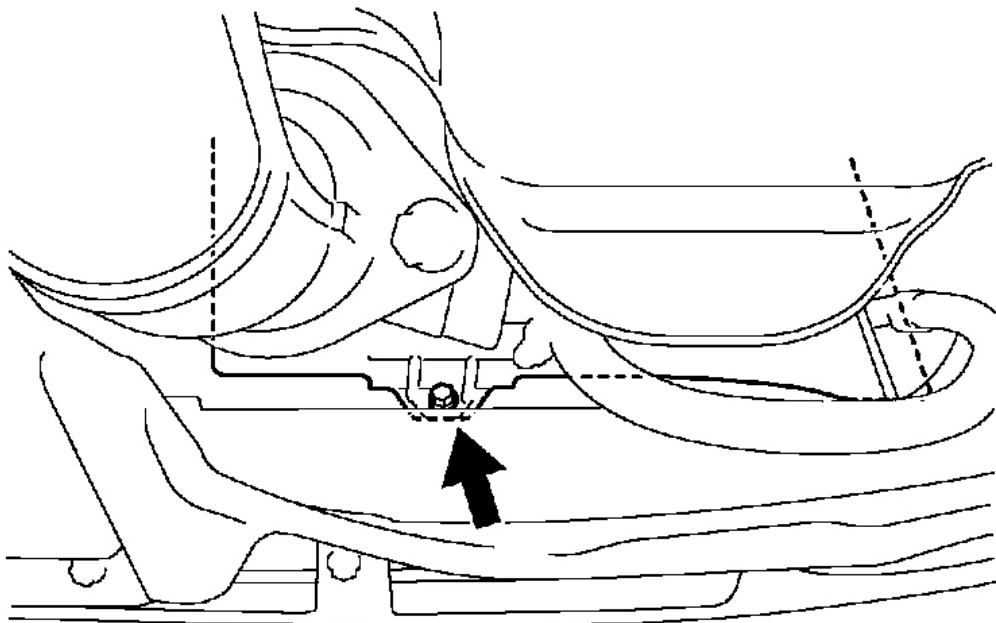
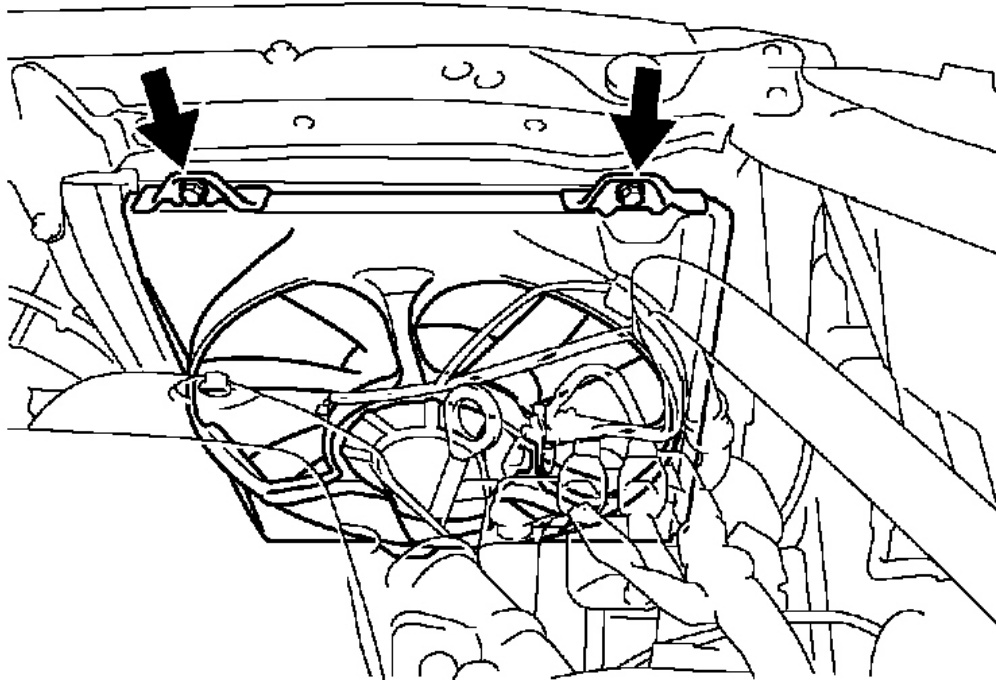
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Fig. 147: Disconnecting Cooling Fan Connector & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 bolts, the cooling fan and fan shroud assembly.

2004 Toyota RAV4

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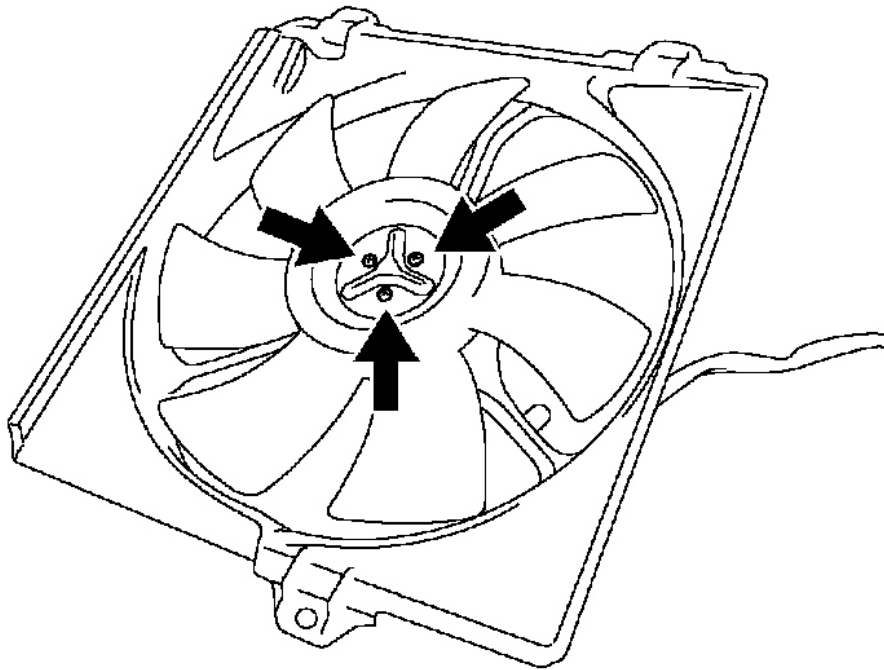
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Fig. 148: Removing Bolts, Cooling Fan & Shroud Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE NO. 2 FAN

Remove the 3 screws and fan.



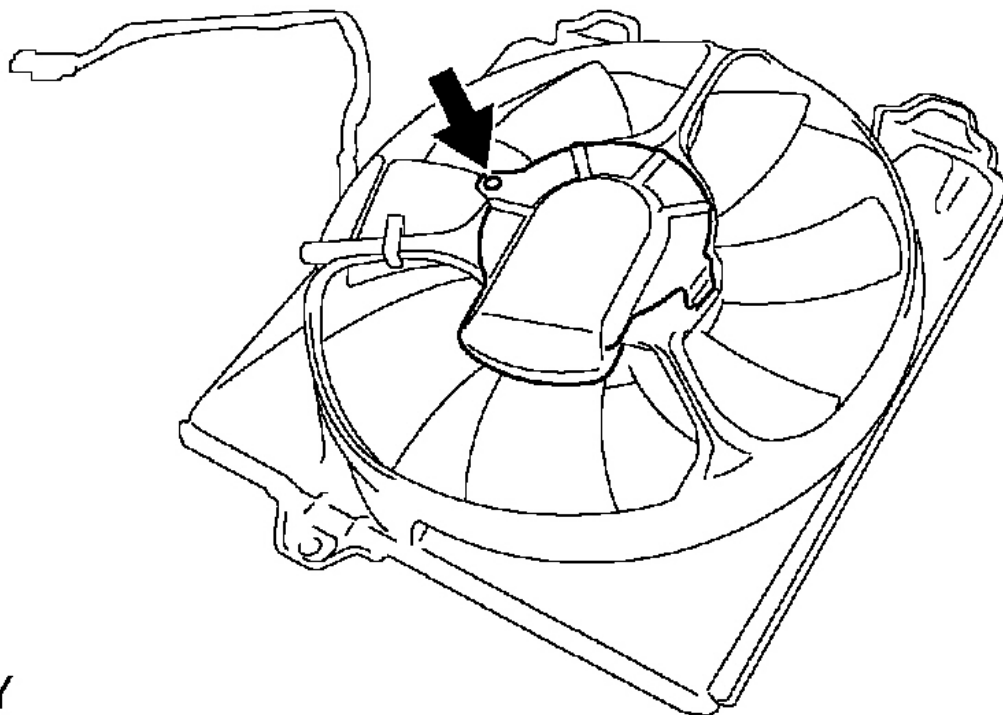
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Fig. 149: Removing No. 2 Fan & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE NO. 2 FAN MOTOR

- a. Remove the screw and fan motor cover.

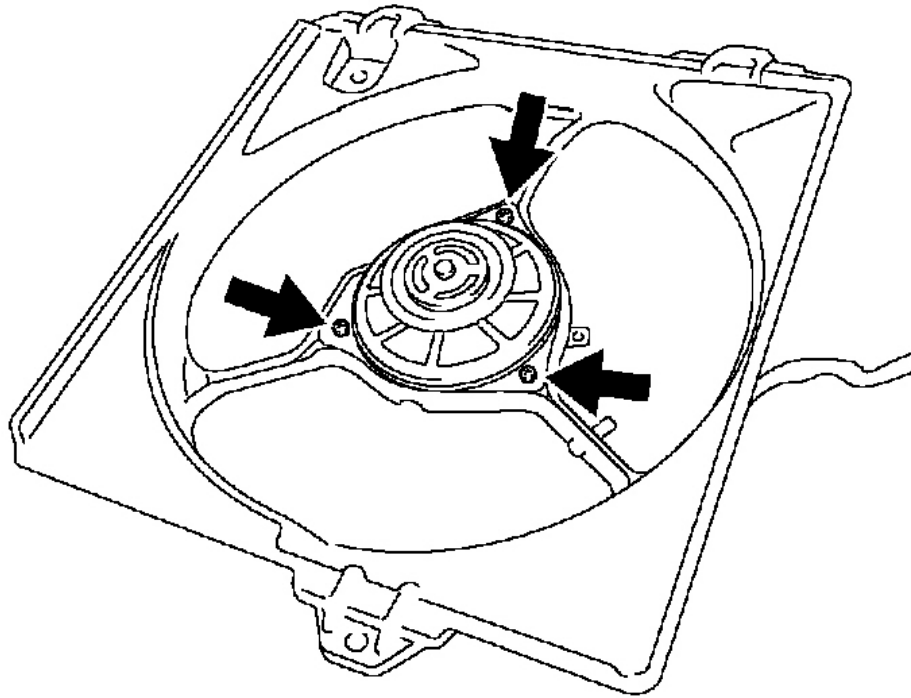


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Fig. 150: Removing No. 2 Fan Motor Cover & Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 screws and fan motor.



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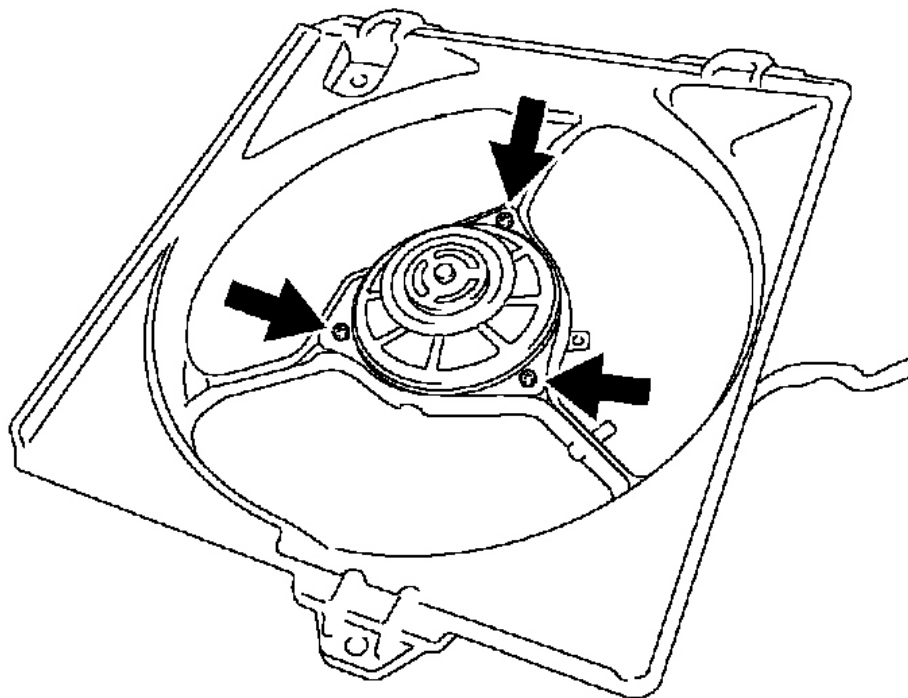
Fig. 151: Removing Screws & Fan Motor

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

REASSEMBLY

1. INSTALL NO. 2 FAN MOTOR

- a. Install the fan motor with the 3 screws.



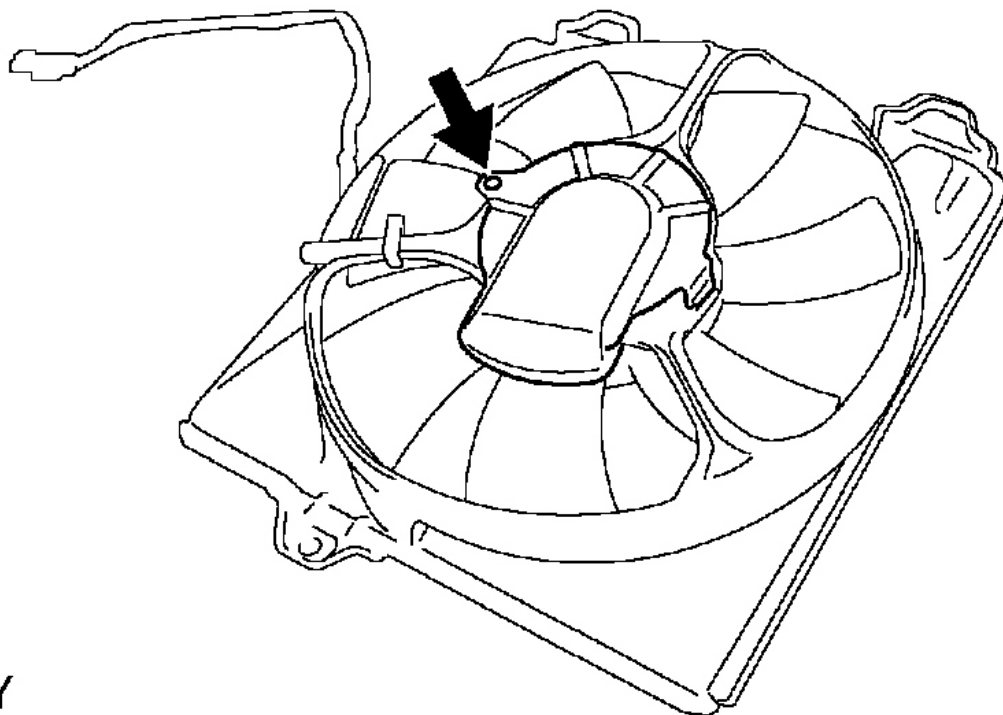
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Fig. 152: Installing No. 2 Fan Motor & Screws

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

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



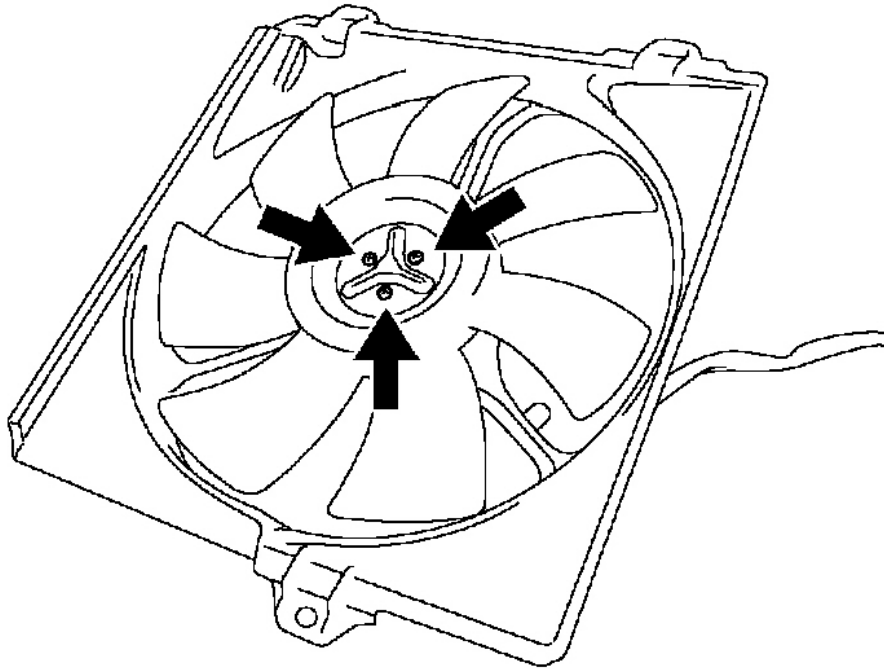
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Fig. 153: Installing No. 2 Fan Motor Cover & Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL NO. 2 FAN

Install the fan with the 3 screws.



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Fig. 154: Installing No. 2 Fan & Screws

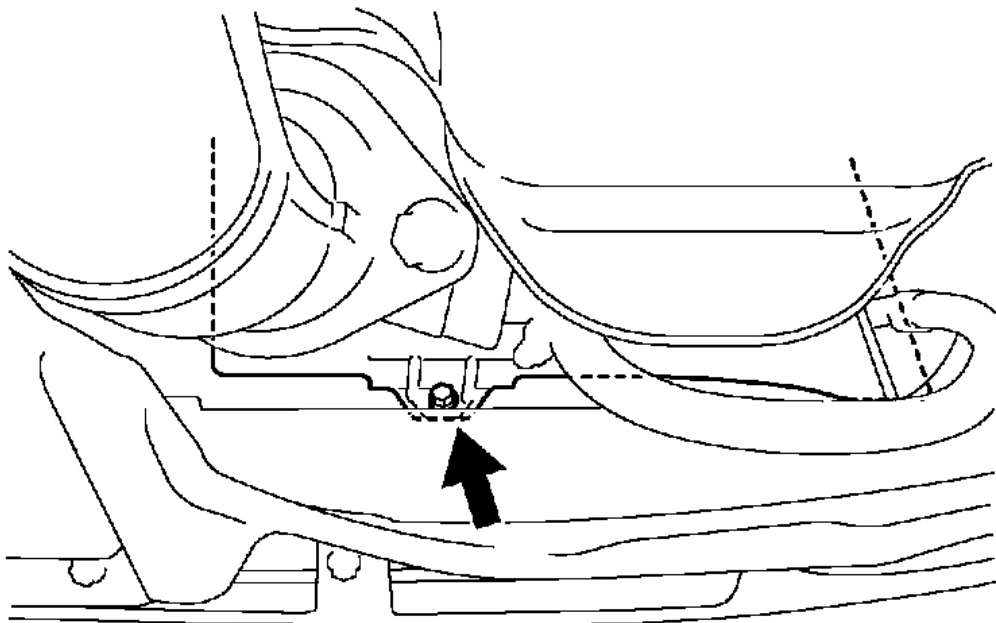
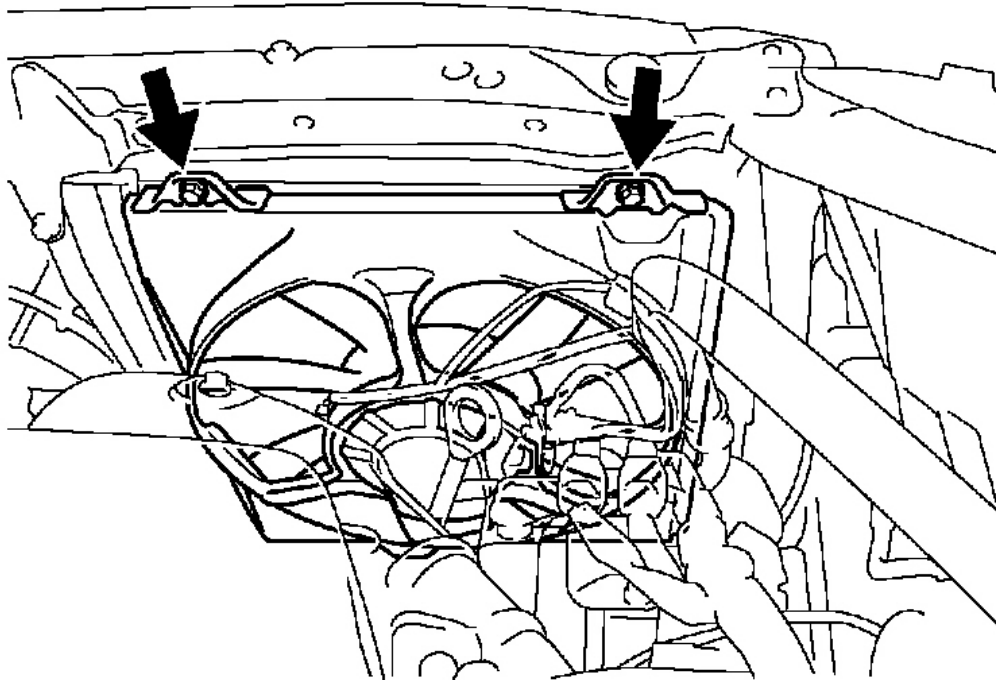
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **INSTALL NO. 2 ELECTRIC COOLING FAN AND FAN SHROUD ASSEMBLY**
 - a. Install the cooling fan and fan shroud assembly with the 3 bolts.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

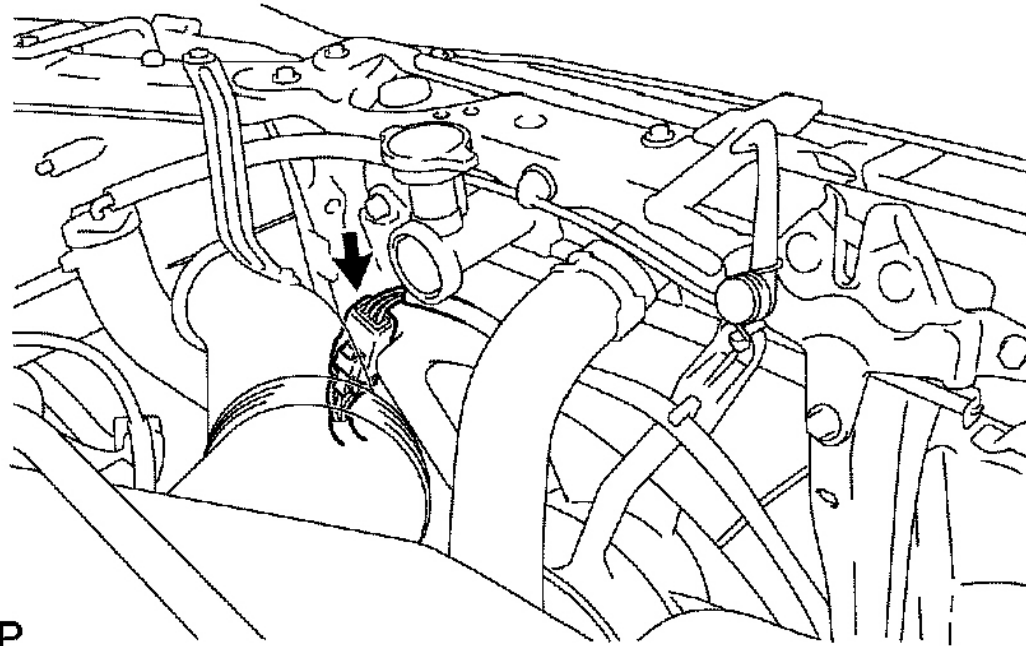


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Fig. 155: Installing No. 2 Electric Cooling Fan, Shroud Assembly & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the cooling fan connector and clamp.



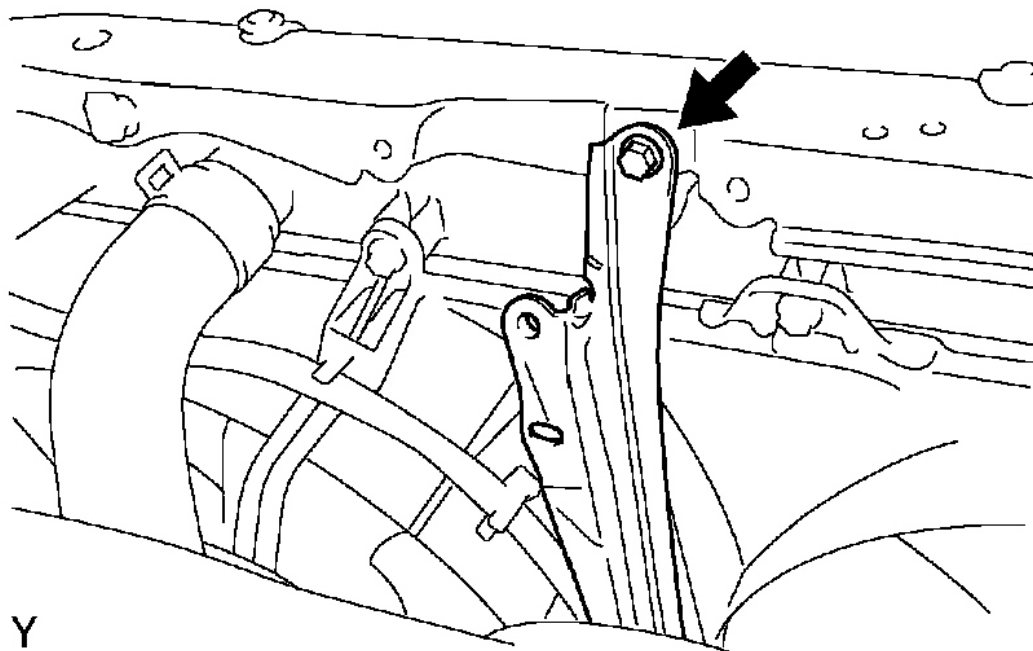
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Fig. 156: Connecting Cooling Fan Connector & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL HOOD LOCK SUPPORT BRACE

Install the bolt.



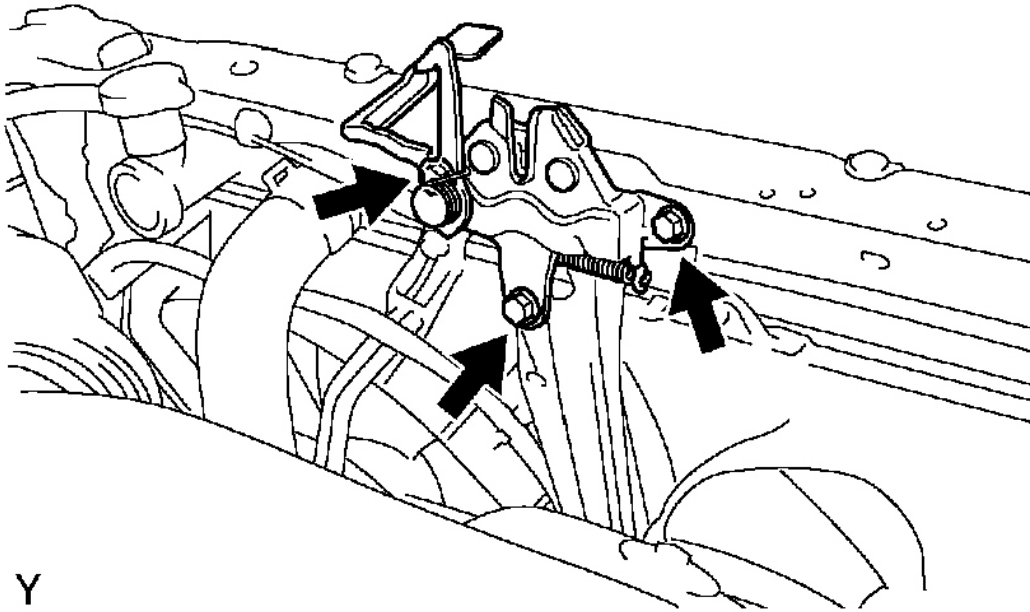
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Fig. 157: Installing Hood Lock Support Brace & Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL HOOD LOCK

Install the hood lock with the 3 bolts.



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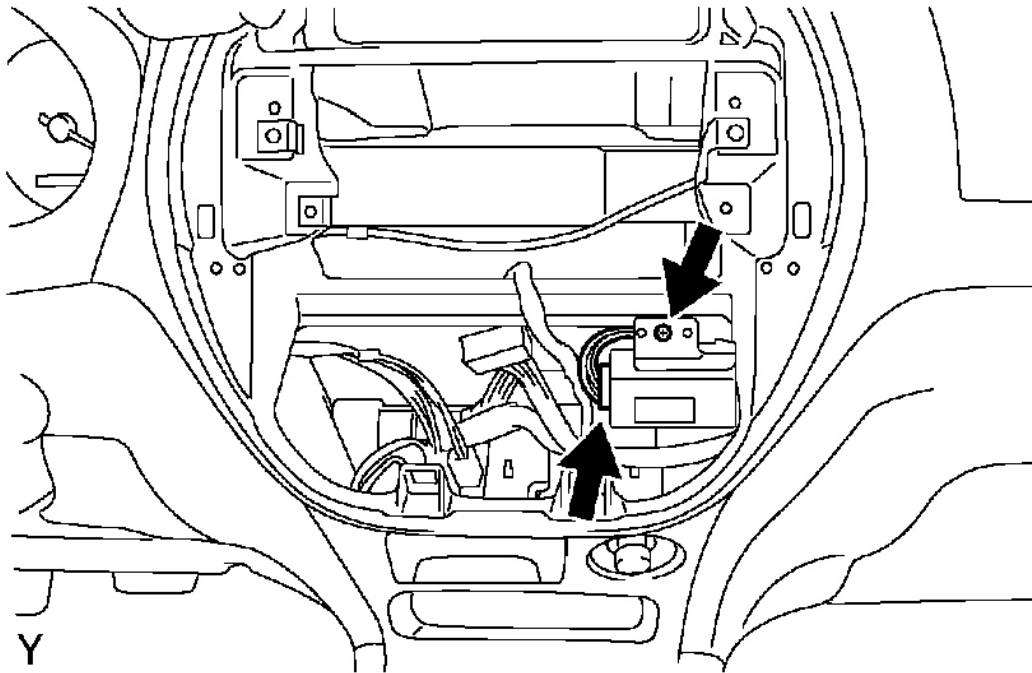
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Fig. 158: Installing Hood Lock & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

AIR CONDITIONING AMPLIFIER

ON-VEHICLE INSPECTION

1. **REMOVE HEATER CONTROL PANEL (See REMOVAL)**
2. **INSPECT AMPLIFIER CIRCUIT**
 - a. Disconnect the amplifier connector.



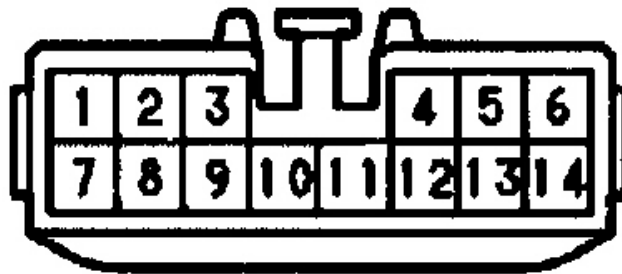
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Fig. 159: Disconnecting Amplifier Connector

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

- b. Remove the screw and amplifier from the instrument panel.
- c. Inspect the connector on wire harness side as shown in **Fig. 161** .

Wire Harness Side



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Fig. 160: Identifying Amplifier Connector 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. 161: Identifying Air Conditioning Amplifier Specified Condition Table

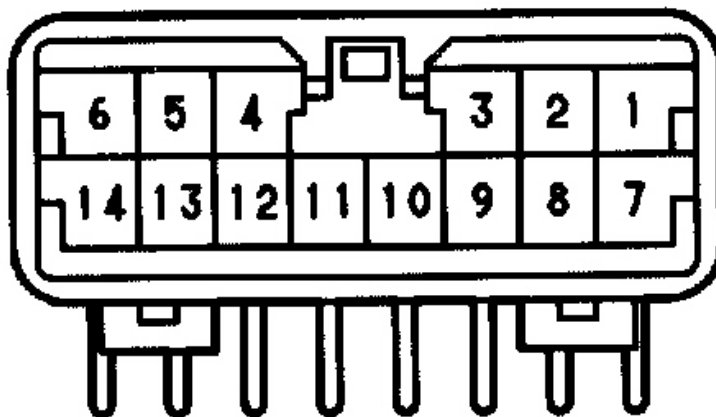
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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, as shown in **Fig. 163**.

From Back Side



e-14-2-F

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Fig. 162: Identifying A/C Amplifier Connector Back Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Test conditions:

- Running engine at idle speed

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

- 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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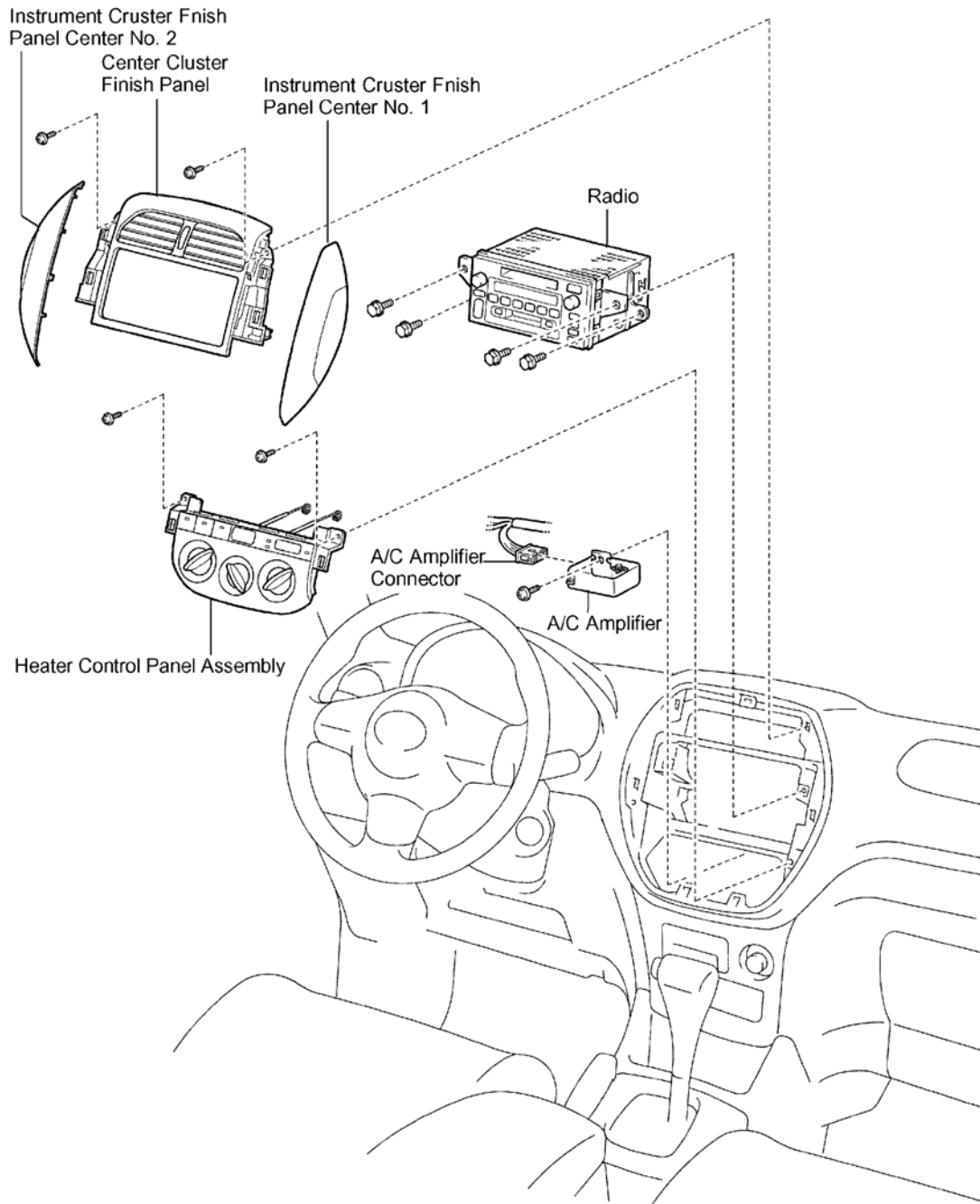
Fig. 163: Identifying A/C Amplifier Specified Condition Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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Fig. 164: Identifying Air Conditioning Amplifier Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HEATER CONTROL ASSEMBLY

ON-VEHICLE INSPECTION

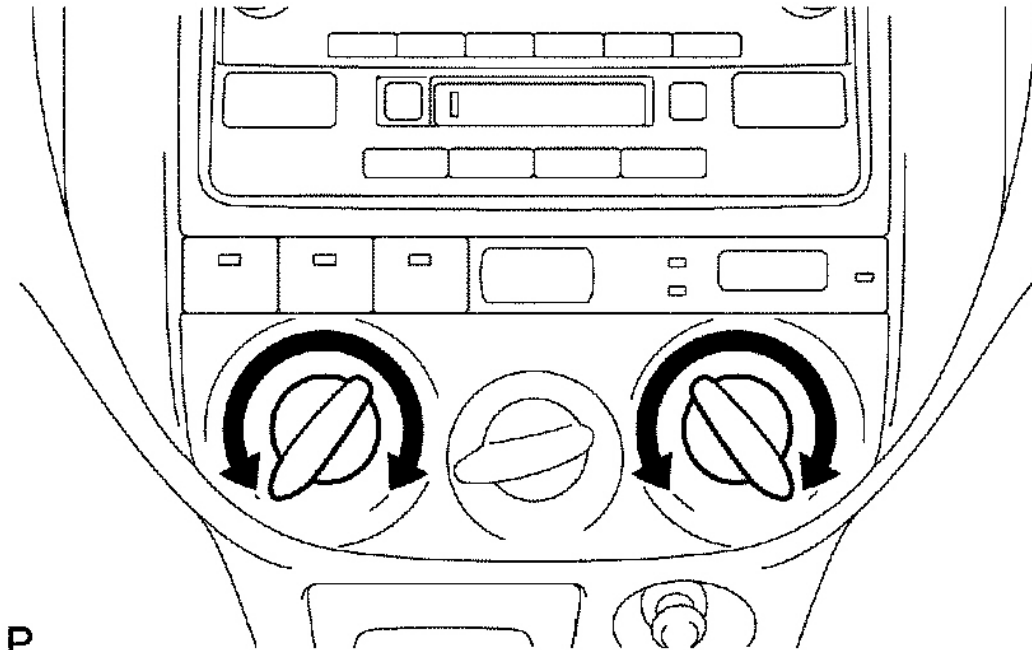
2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

Inspect Heater Control Dials Operation

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

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



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Fig. 165: Inspecting Heater Control Dials Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPONENTS

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4

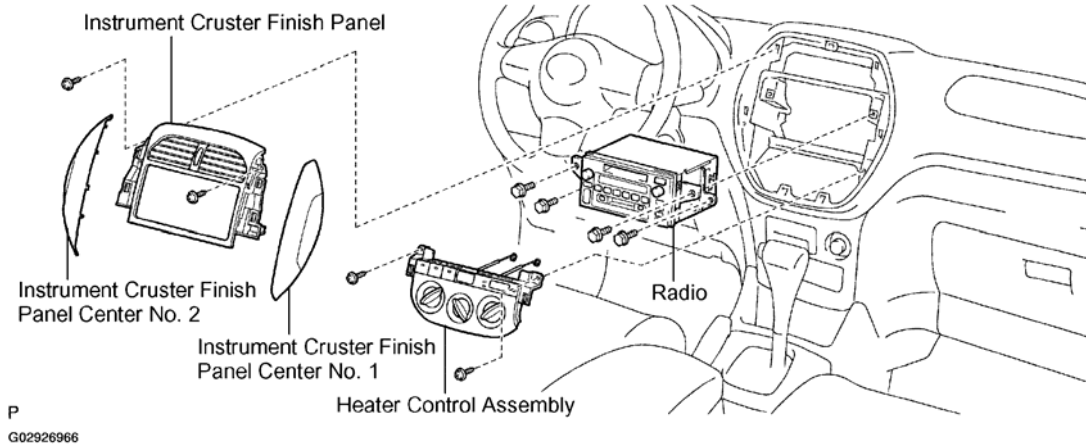


Fig. 166: Identifying Heater Control Assembly Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

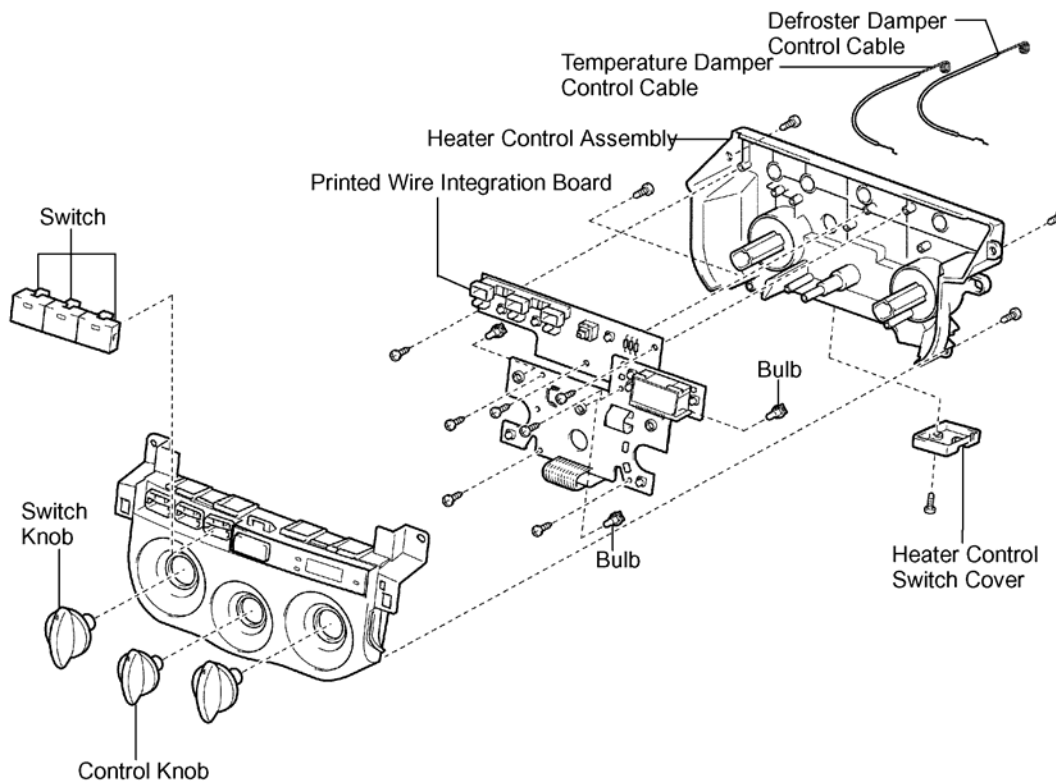


Fig. 167: Identifying Heater Control Assembly Components (2 Of 2)

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

REMOVAL

1. REMOVE INSTRUMENT CLUSTER FINISH PANEL CENTER

- a. Using a screwdriver, pry out the 2 finish panels.

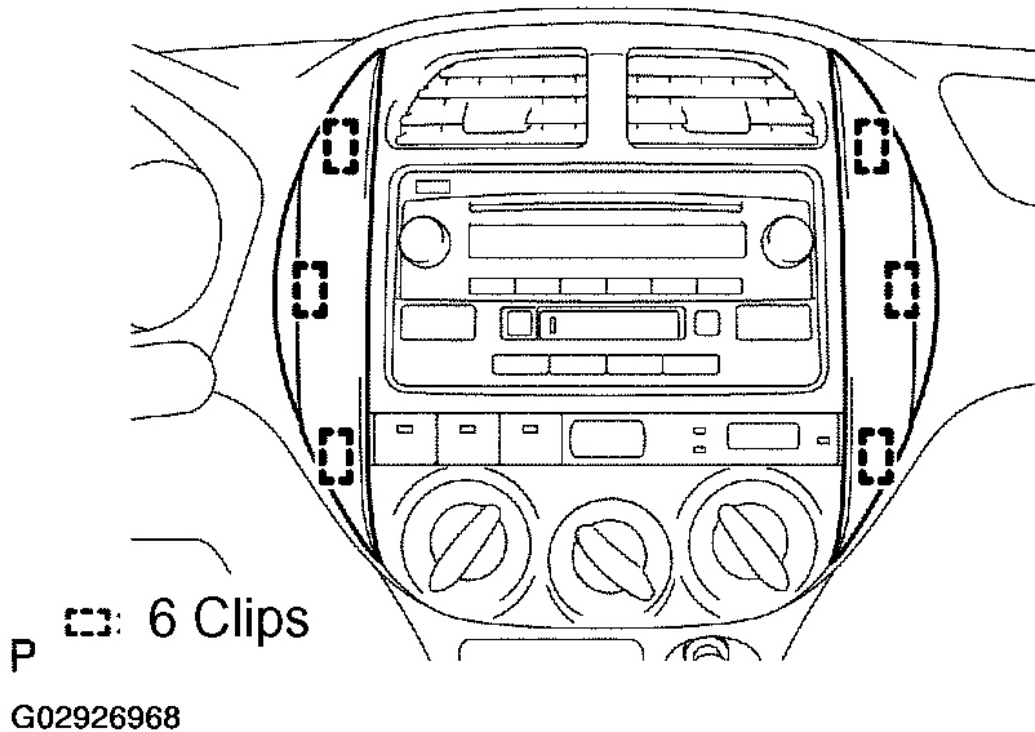


Fig. 168: Removing Instrument Cluster Finish Panel Center
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Tape the screwdriver tip before use.

2. REMOVE INSTRUMENT CLUSTER FINISH PANEL

- a. Remove the 2 screws.
- b. Using a screwdriver, pry out the finish panel.

HINT:

Tape the screwdriver tip before use.

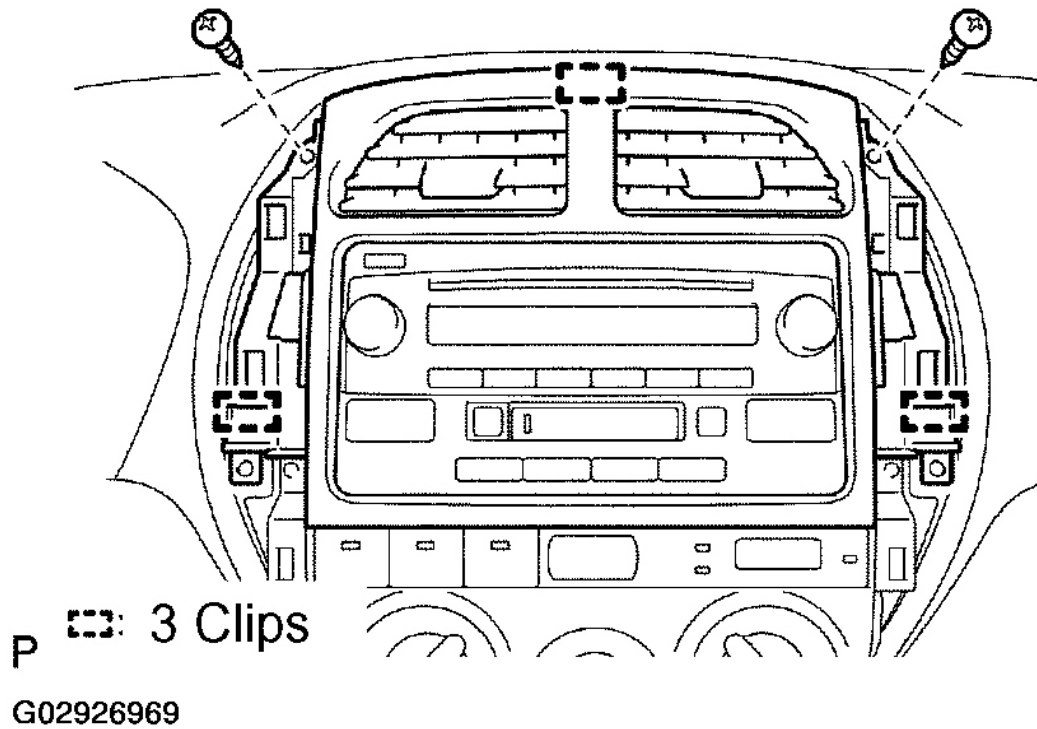


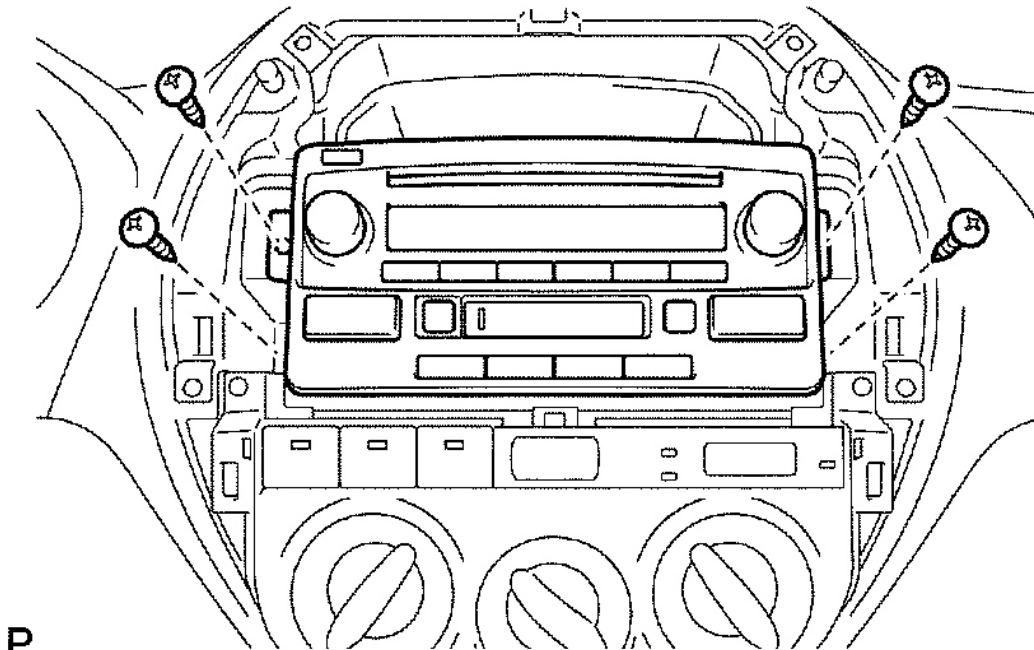
Fig. 169: Removing Instrument Cluster Finish Panel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. w/o Radio:

Remove the 4 bolts and stereo opening cover.

w/Radio:

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



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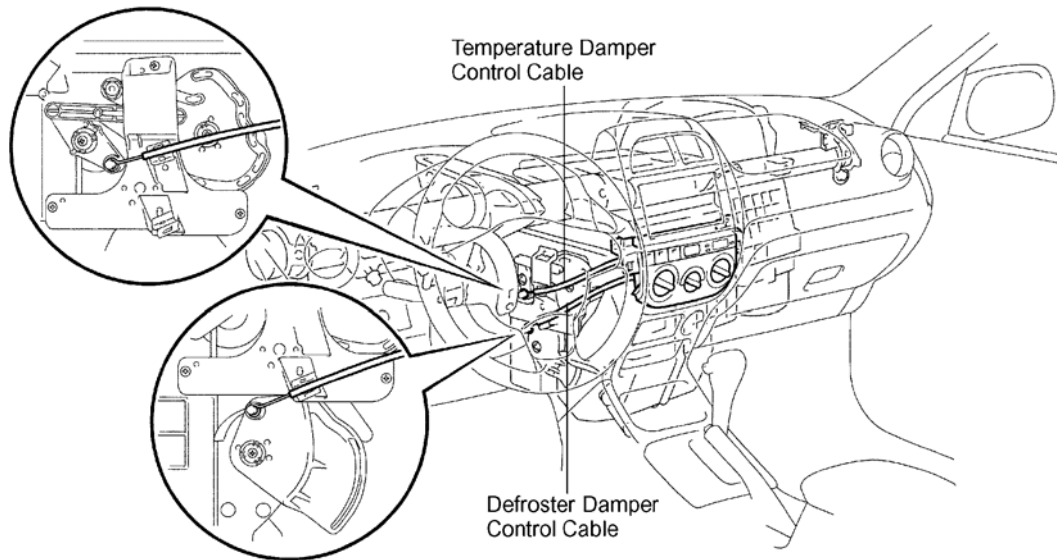
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Fig. 170: Removing Bolts & Stereo Opening Cover Or Radio
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. DISCONNECT HEATER CONTROL CABLES

Remove the No. 1 instrument panel under cover sub-assembly.

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



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Fig. 171: Disconnecting Heater Control Cables
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE HEATER CONTROL ASSEMBLY

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

HINT:

Tape the screwdriver tip before use.

- c. Disconnect the 2 connectors.

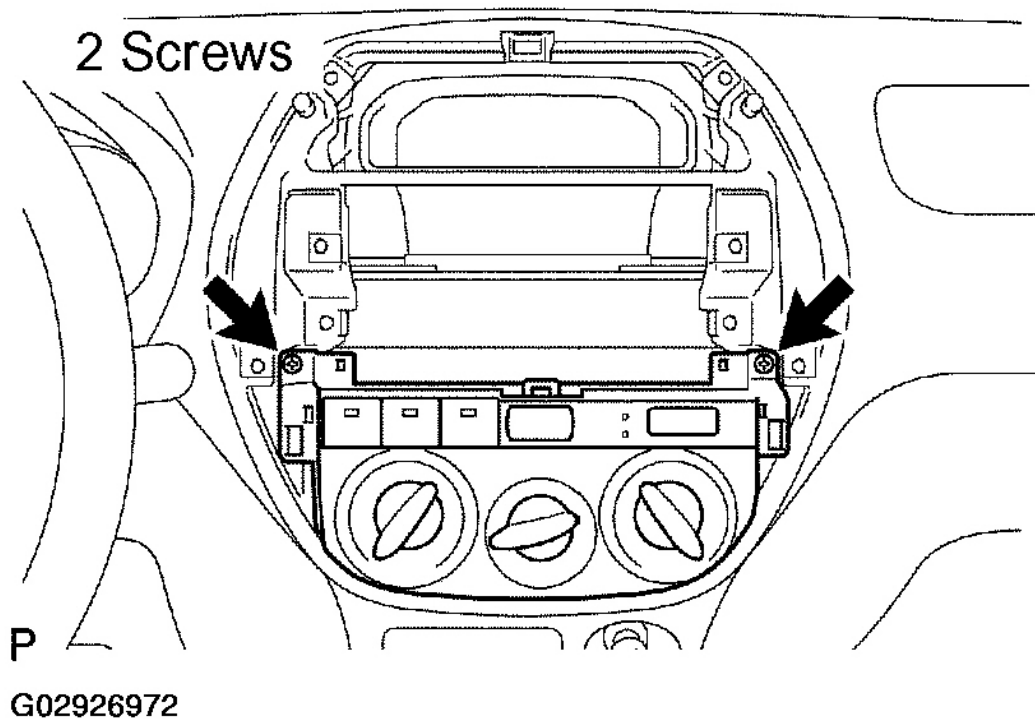


Fig. 172: Removing Heater Control Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. **REMOVE HEATER CONTROL CABLES**
 - a. Pull out the outer cables.
 - b. Remove the inner cables.

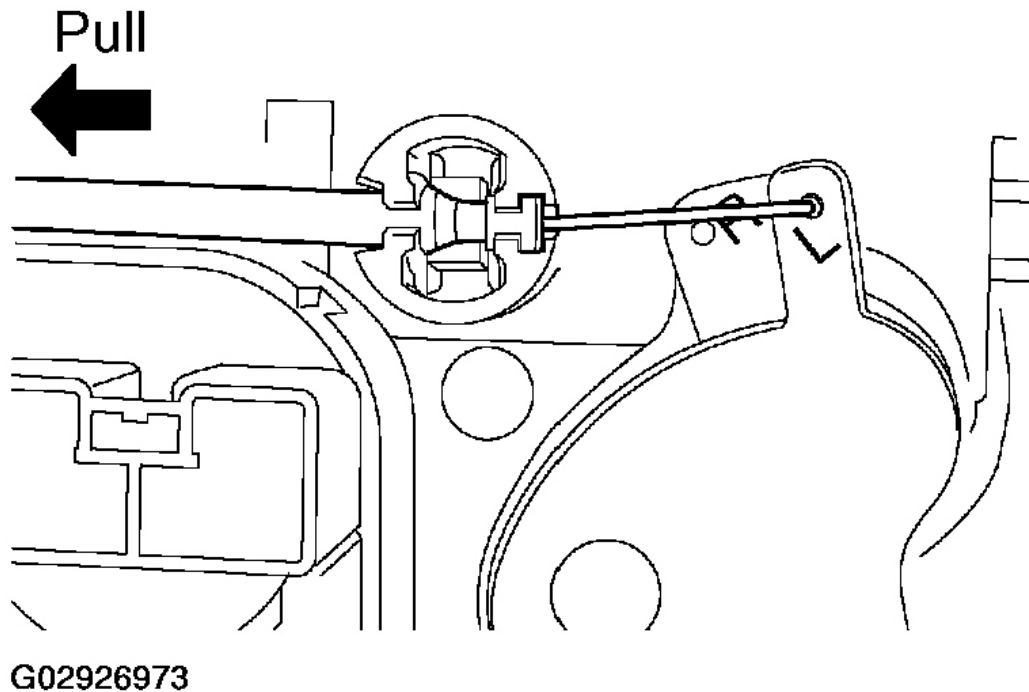


Fig. 173: Removing Heater Control Cables

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

2. REMOVE HEATER CONTROL NAME PLATE

- a. Remove the 3 knobs.
- b. Remove the 8 screws.
- c. Remove the 3 switches.
- d. Remove the heater control cover.

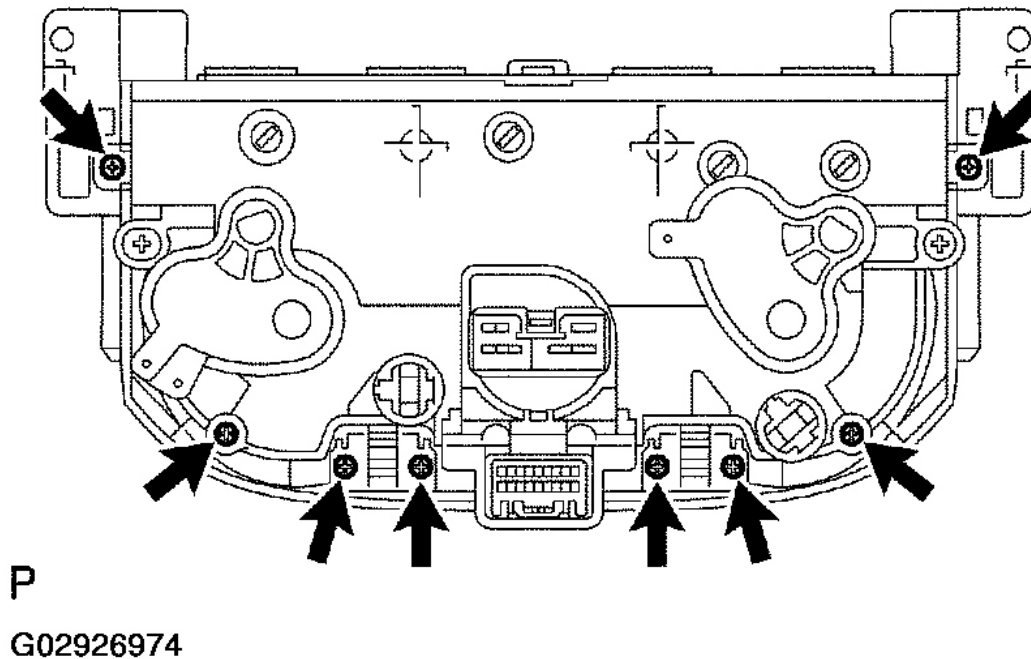
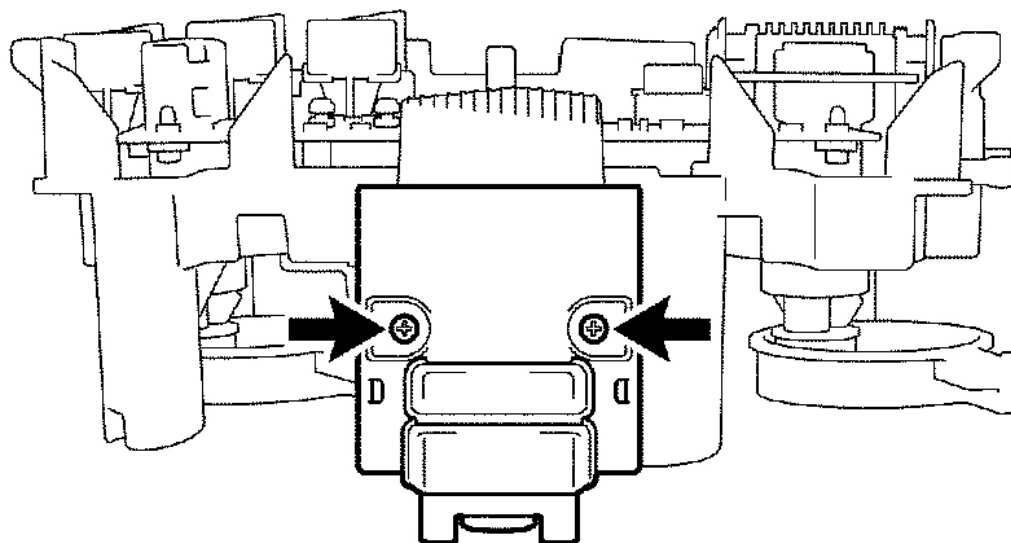


Fig. 174: Removing Heater Control Name Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **REMOVE PRINTED WIRE INTEGRATION BOARD**
 - a. Remove the 2 screws and heater control switch cover.

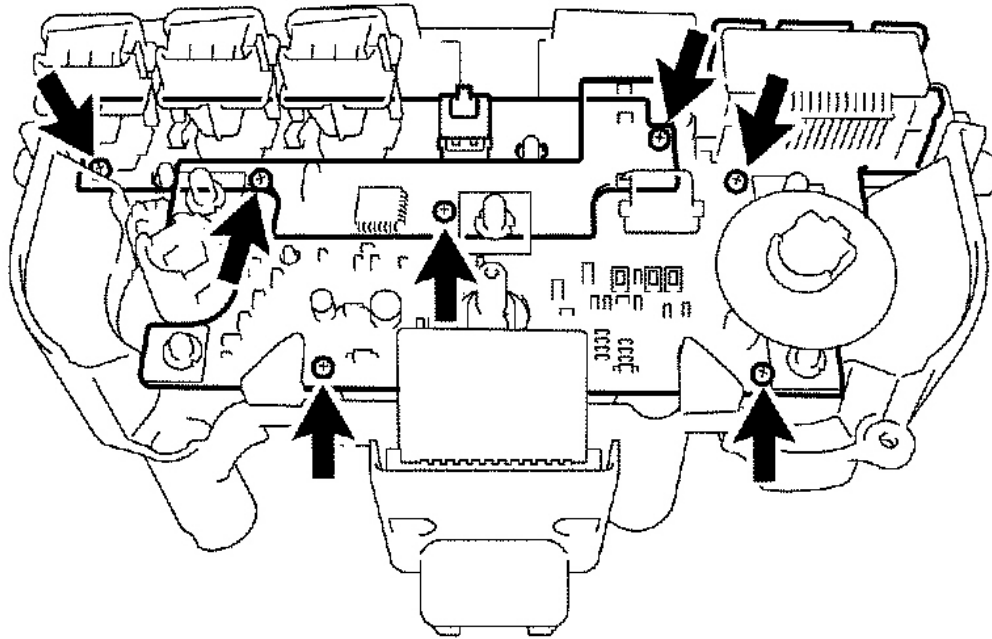


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Fig. 175: Removing Heater Control Switch Cover & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 7 screws and integration board.



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Fig. 176: Removing Integration Board & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

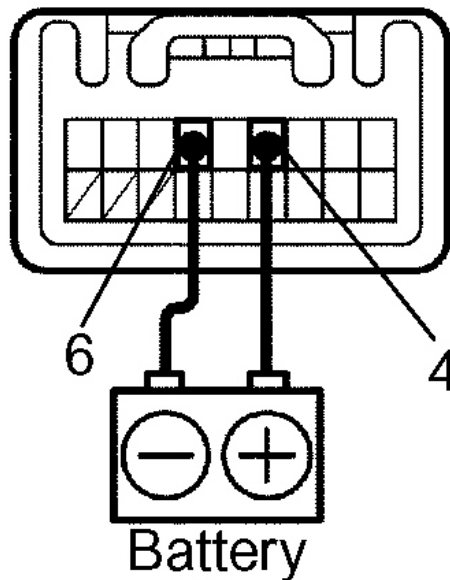
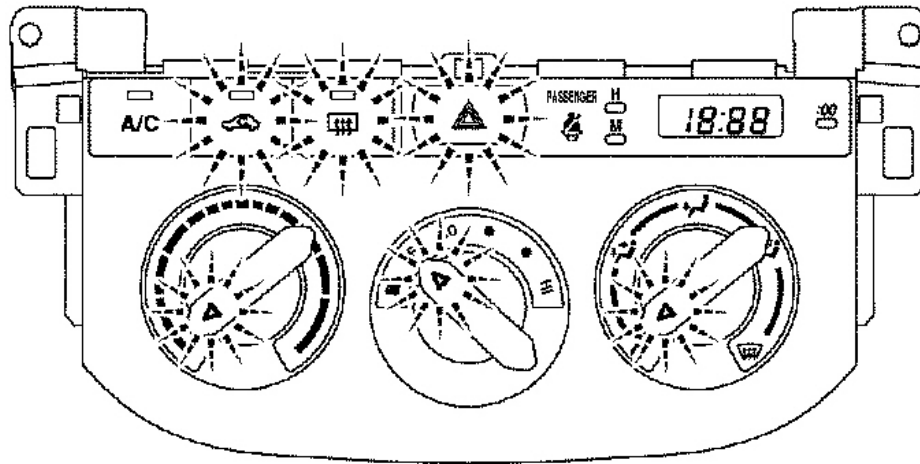
INSPECTION

1. INSPECT ILLUMINATION OPERATION

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

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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Fig. 177: Checking Illumination Lights Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

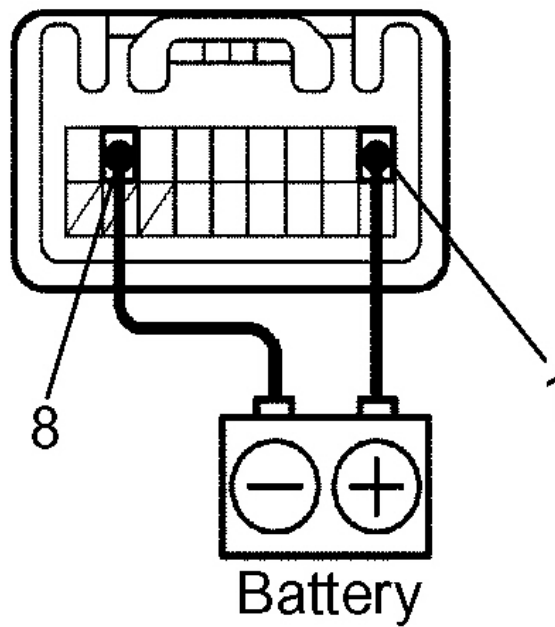
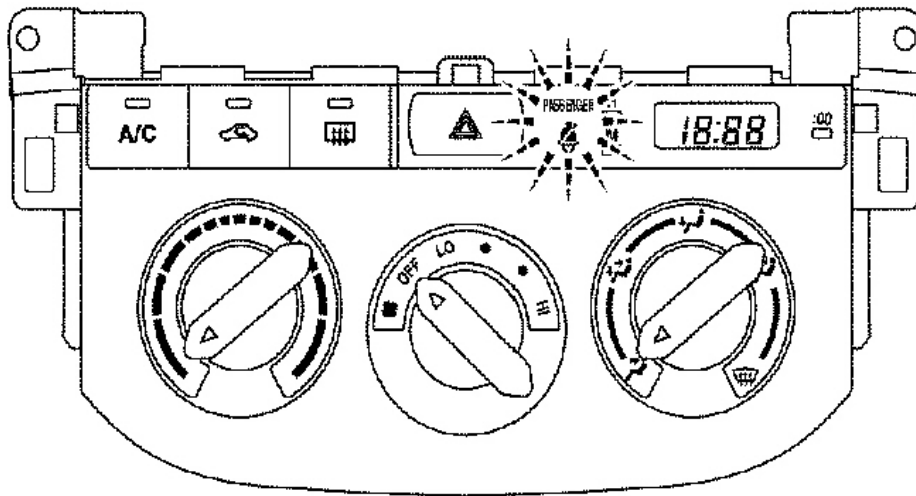
b. Connect the battery's positive (+) lead to terminal 1 and negative (-) lead to terminal 8. Then check

2004 Toyota RAV4
2004 HVAC Air Conditioning - RAV4

that the passenger side seat belt illuminations light up.

2004 Toyota RAV4

2004 HVAC Air Conditioning - RAV4



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Fig. 178: Checking Passenger Side Seat Belt Illumination Light Operation

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

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

2. INSPECT AIR INLET CONTROL SWITCH INDICATOR OPERATION

- Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 13.
- Push the A/C button in and then check that the A/C indicator lights up.

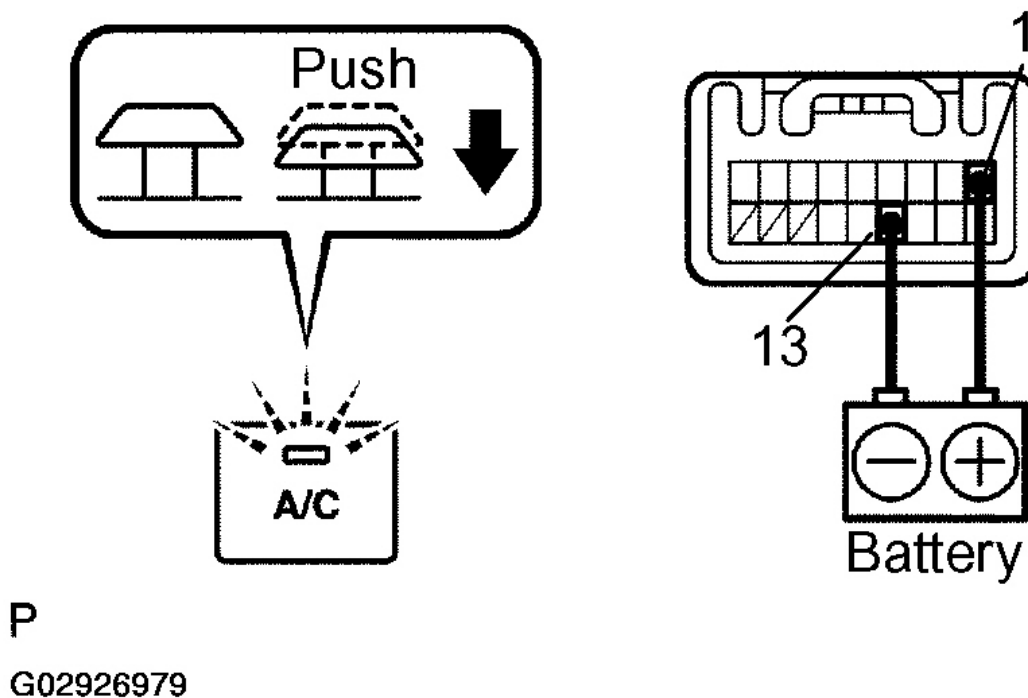
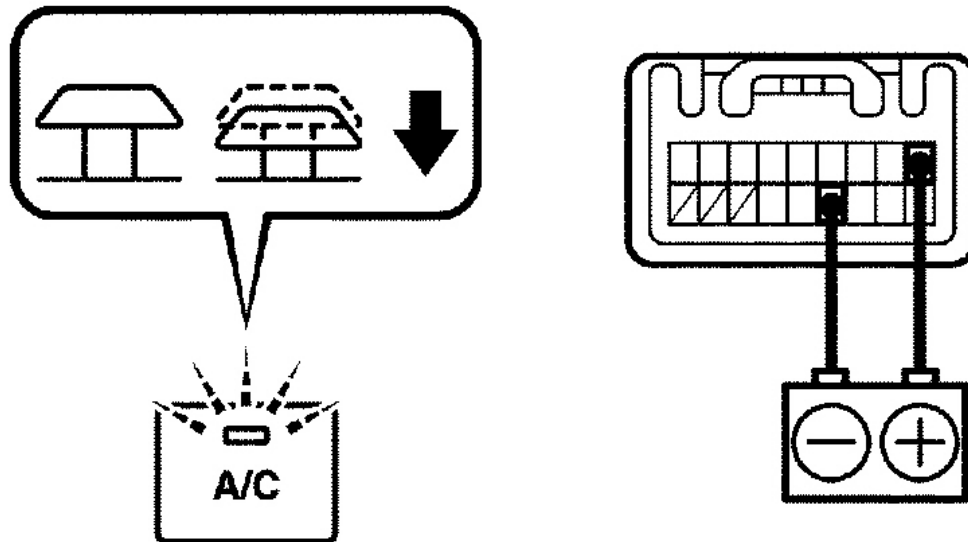


Fig. 179: Checking Air Inlet Control Switch Indicator Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. INSPECT A/C SWITCH INDICATOR OPERATION

- Connect the battery's positive (+) lead to terminal 1 and negative (-) lead to terminal 13.
- Push the A/C button in and then check that the A/C indicator illuminates.



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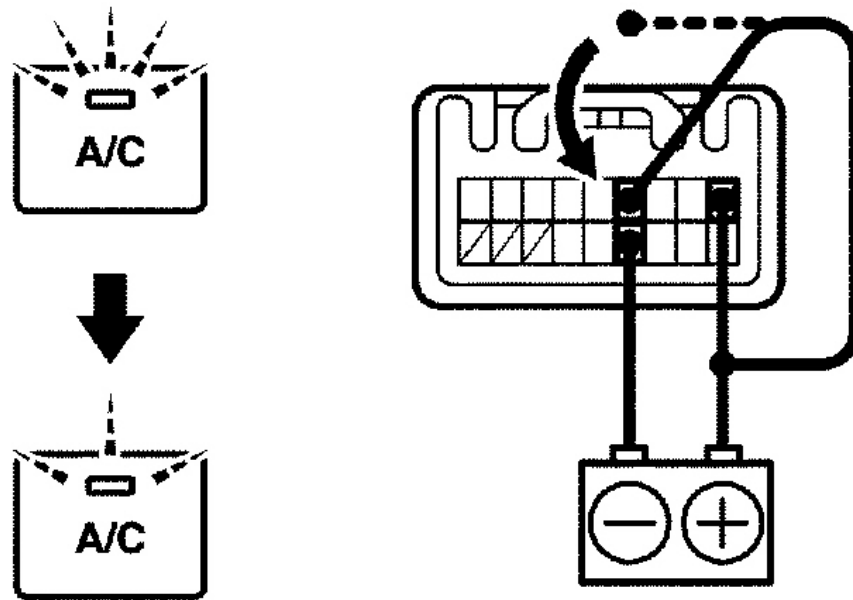
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Fig. 180: Inspecting A/C Switch Indicator Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

4. INSPECT A/C SWITCH INDICATOR DIMMING OPERATION

- a. Connect the battery's positive (+) lead to terminal 1 and negative (-) lead to terminal 13 while pressing the switch.
- b. Connect the battery's positive (+) lead to terminal 4 and then check that the A/C indicator dims.



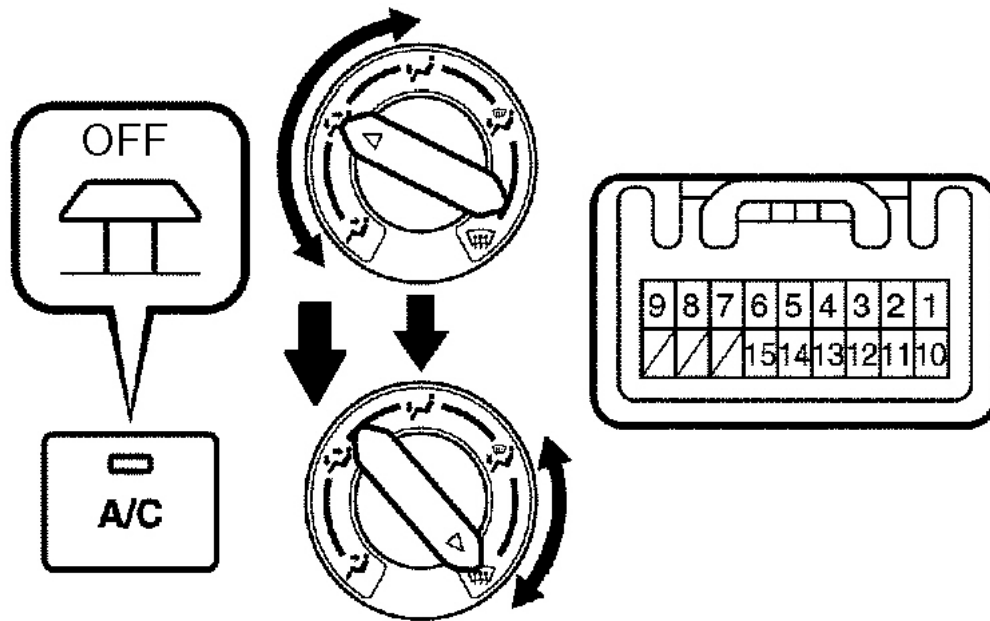
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Fig. 181: Inspecting A/C Switch Indicator Dimming Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

5. INSPECT A/C SWITCH RESISTANCE



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Fig. 182: Inspecting A/C Switch Resistance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

IDENTIFYING A/C SWITCH SPECIFIED CONDITIONS

Condition/Circuit	Tester Connection	Specified Condition
A/C switch OFF	-	Below 1 ohm
A/C switch ON	1 - 13	Below 1 ohm
Defroster damper control dial at "FACE - FOOT"	-	10 kohm or higher
Defroster damper control dial at "DEF-FOOT - DEF"	1 - 13	Below 1 ohm
Illumination circuit	4 - 6	Below 1 ohm

Switch circuit:

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

Illumination circuit:

If the result is not as specified, replace the bulb.

6. INSPECT AIR INLET CONTROL SWITCH INDICATOR

- Connect the battery's positive (+) lead to terminal 1 and negative (-) lead to terminal 12.
- Push the air inlet control switch in and then check that the air inlet control switch illuminates.

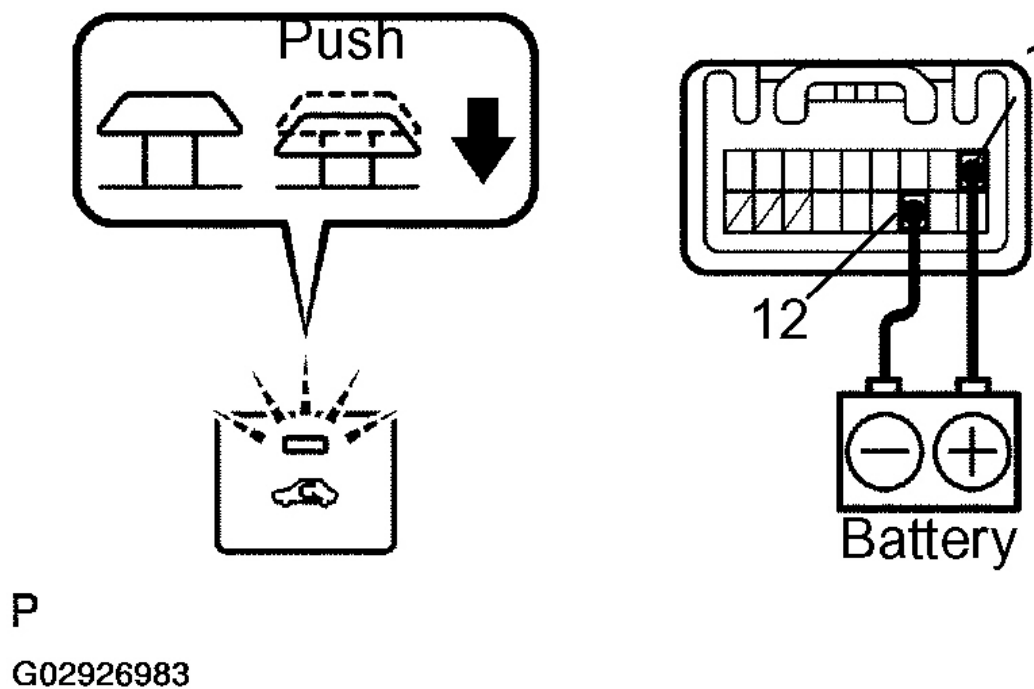


Fig. 183: Inspecting Air Inlet Control Switch Indicator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

7. INSPECT AIR INLET CONTROL SWITCH INDICATOR DIMMING OPERATION

- Connect the battery's positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 12 while pressing the switch.
- Connect the battery's positive (+) lead from battery to terminal 4 and then check that the air inlet control switch indicator dims.

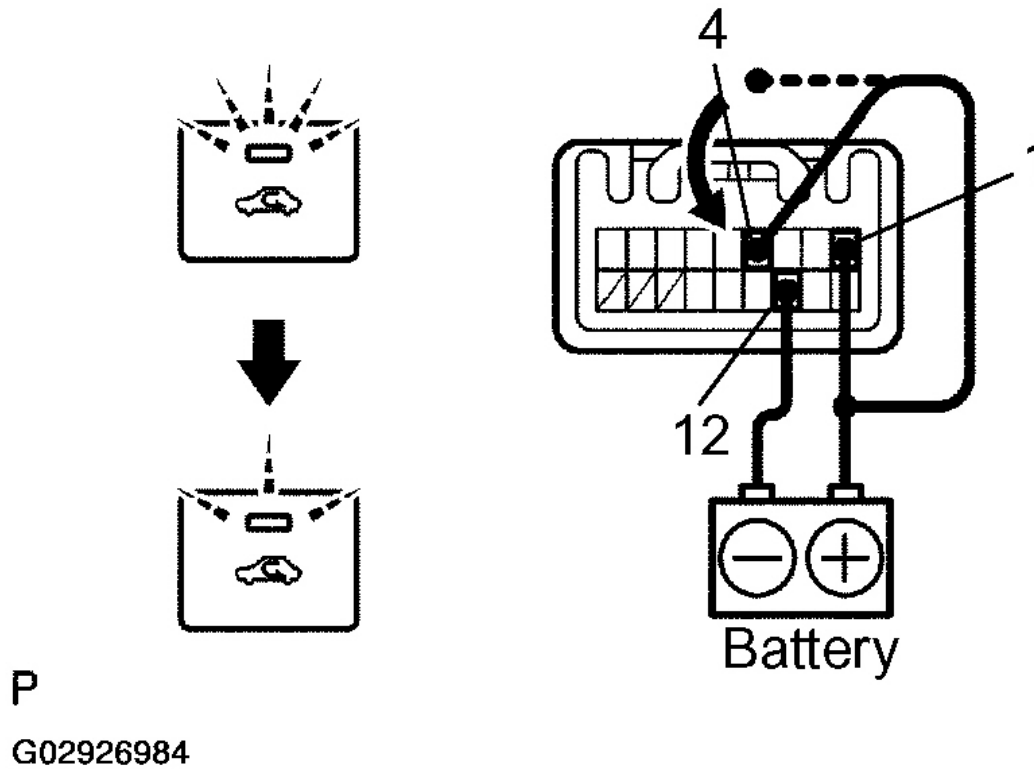
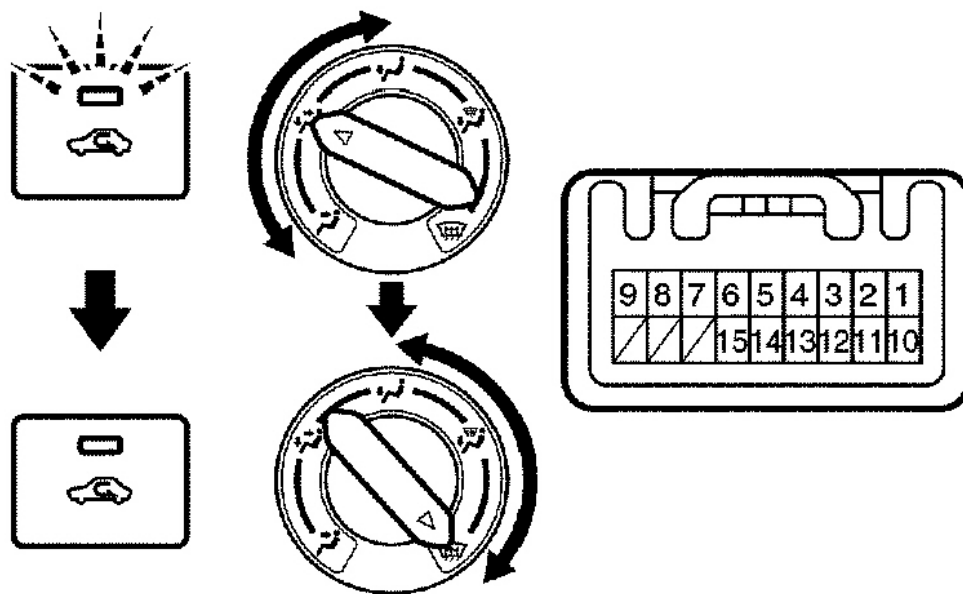


Fig. 184: Inspecting Air Inlet Control Switch Indicator Dimming Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

8. INSPECT AIR INLET CONTROL SWITCH RESISTANCE



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Fig. 185: Inspecting Air Inlet Control Switch Resistance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

AIR INLET CONTROL SWITCH SPECIFIED CONDITIONS

Condition/Circuit	Tester Connection	Specified Condition
Air inlet control switch OFF	-	10 kohm or higher
Air inlet control switch ON	1 - 12	Below 1 ohm
Defroster damper control dial at "FACE - FOOT"	-	10 kohm or higher
Defroster damper control dial at "DEF - FOOT"	1 - 12	Below 1 ohm
Illumination circuit	4 - 6	Below 1 ohm

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

9. Defroster damper control dial: INSPECT AIR INLET CONTROL SWITCH INDICATOR OPERATION

- Connect the battery's positive (+) lead to terminal 1 and negative (-) lead to terminal 12.
- Push the air inlet control switch in and then check that the air inlet control switch illuminates.
- Turn the defroster damper control dial to the "DEF - FOOT" position and check that the air inlet control switch indicator turns off.

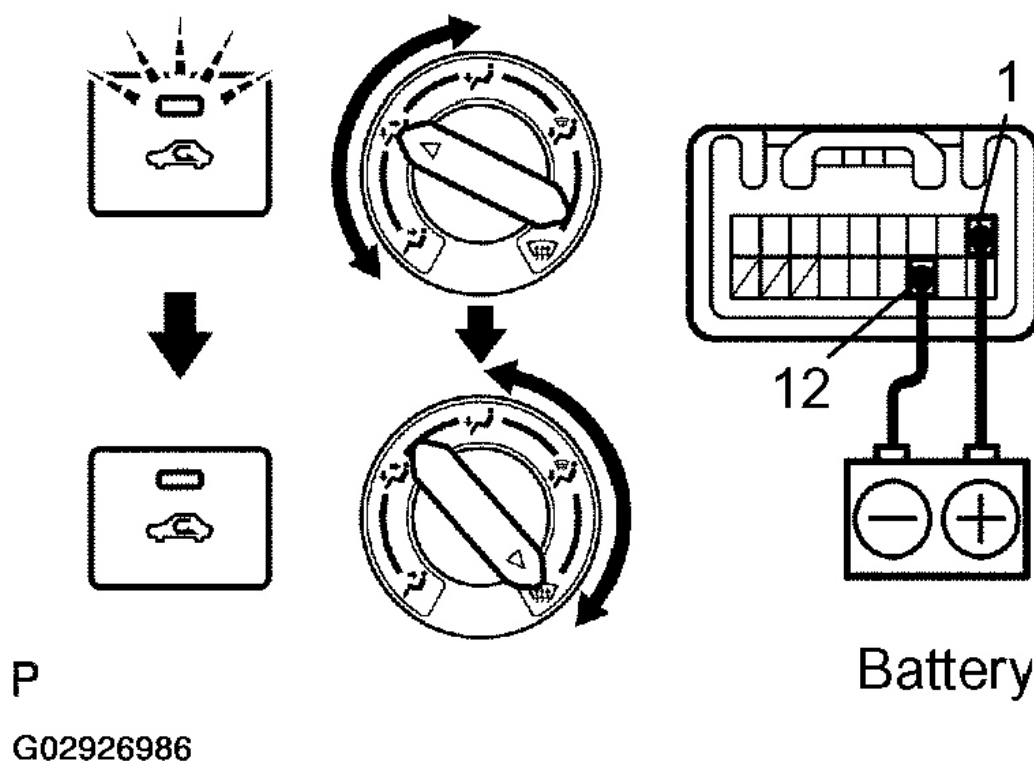
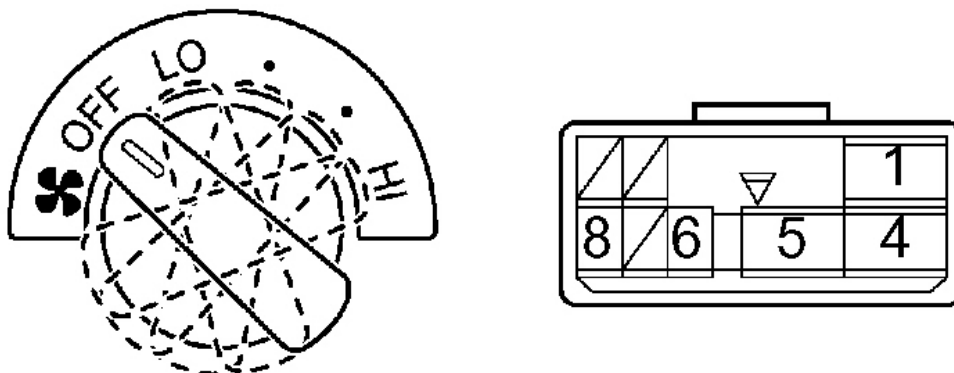


Fig. 186: Inspecting Air Inlet Control Switch Indicator Operation Of Defroster Damper Control Dial

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

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

10. INSPECT BLOWER SPEED CONTROL SWITCH RESISTANCE



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Fig. 187: Inspecting Blower Speed Control Switch Resistance

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

BLOWER SPEED CONTROL SWITCH SPECIFIED CONDITIONS

Position/Circuit	Tester Connection	Specified Condition
OFF	-	10 kohm or higher
LO	1 - 8	Below 1 ohm
M1	1 - 6 - 8	Below 1 ohm
M2	1 - 5 - 8	Below 1 ohm
HI	1 - 4 - 8	Below 1 ohm

If the result is not as specified, replace the switch.

11. **INSPECT REAR DEFOGGER SWITCH OPERATION** (See INSPECTION)
12. **INSPECT HAZARD WARNING SIGNAL SWITCH** (See INSPECTION)

REASSEMBLYThe reassembly procedures are the disassembly procedures in reverse order (see DISASSEMBLY).**INSTALLATION**

1. **INSTALL HEATER CONTROL ASSEMBLY**

- a. Connect the 2 connectors to the heater control.
- b. Pass through the A/C control cables as shown in **Fig. 188**.

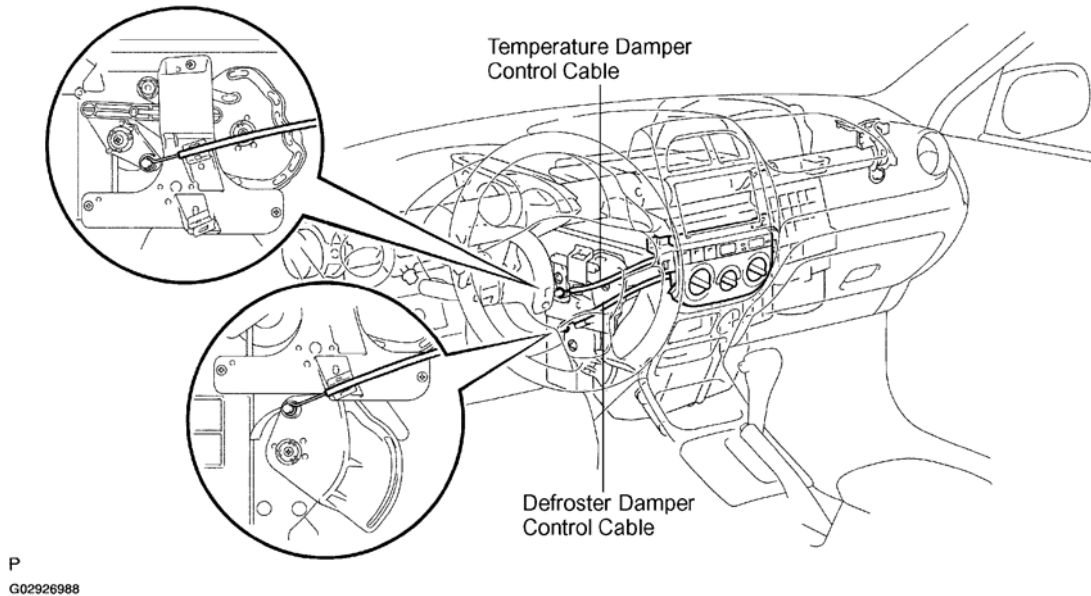


Fig. 188: Installing Through Control Cables

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

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

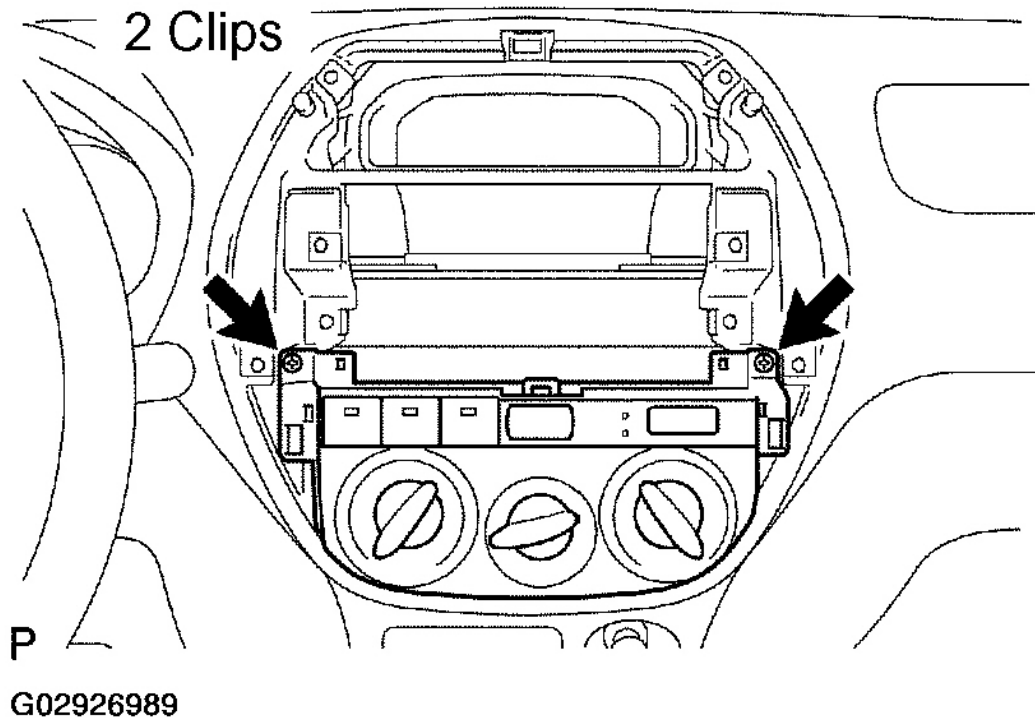


Fig. 189: Installing Heater Control Assembly & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

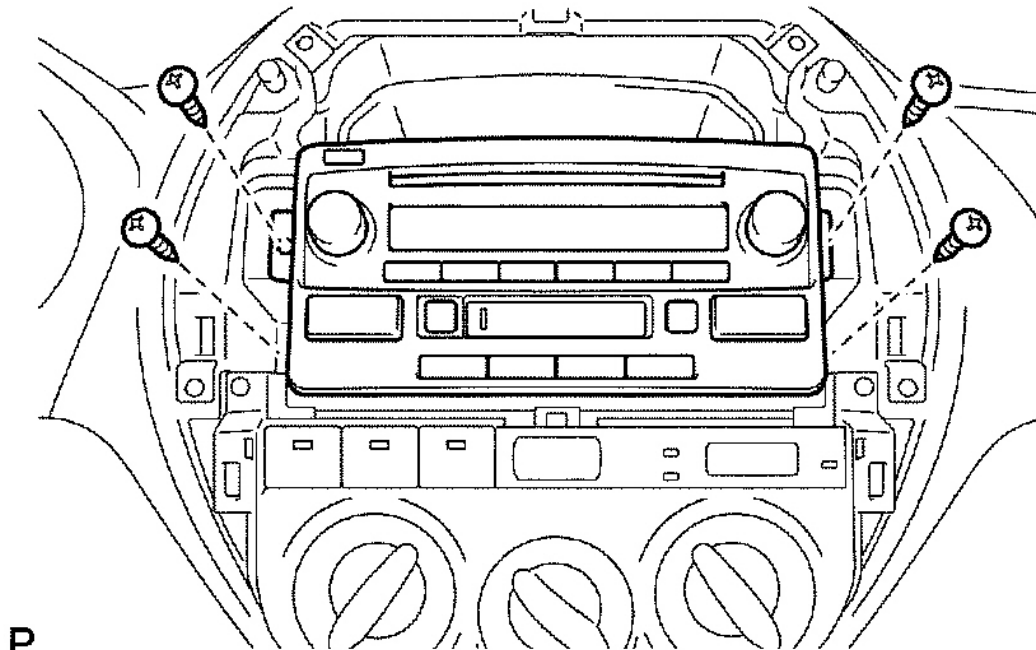
2. INSTALL INSTRUMENT CLUSTER FINISH PANEL

a. w/o Radio:

Install the stereo opening cover with the 4 bolts.

w/Radio:

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



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Fig. 190: Installing Stereo Opening Cover Or Radio & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL INSTRUMENT CLUSTER FINISH PANEL

- a. Install the finish panel with the 2 screws.

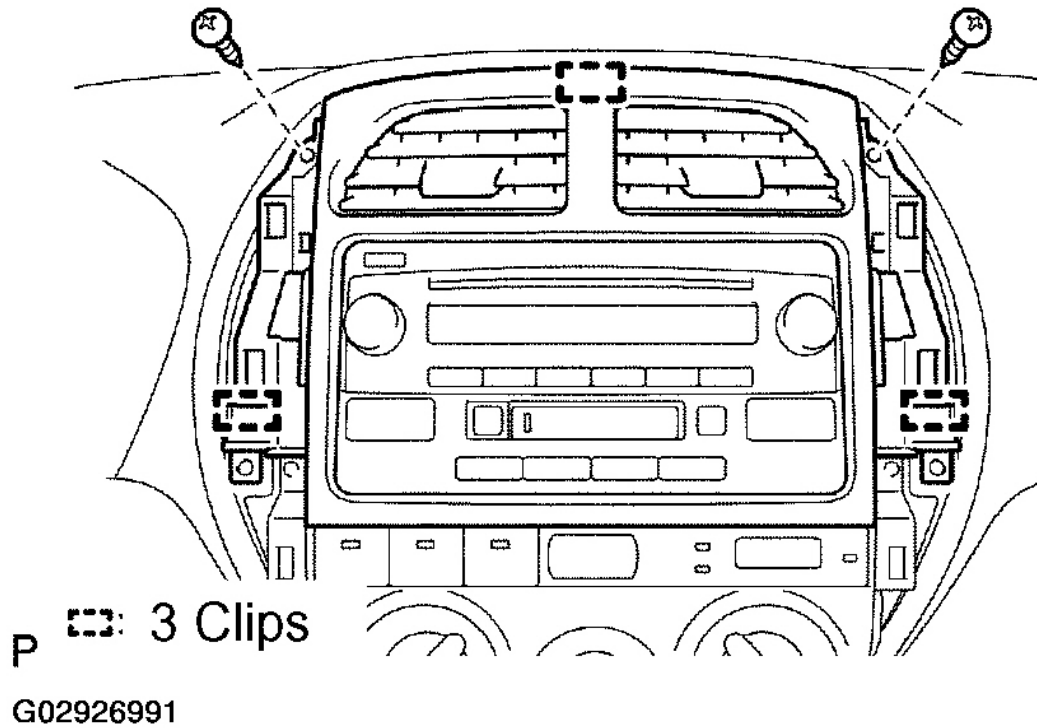


Fig. 191: Installing Instrument Cluster Finish Panel & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL INSTRUMENT CLUSTER FINISH PANEL CENTERS

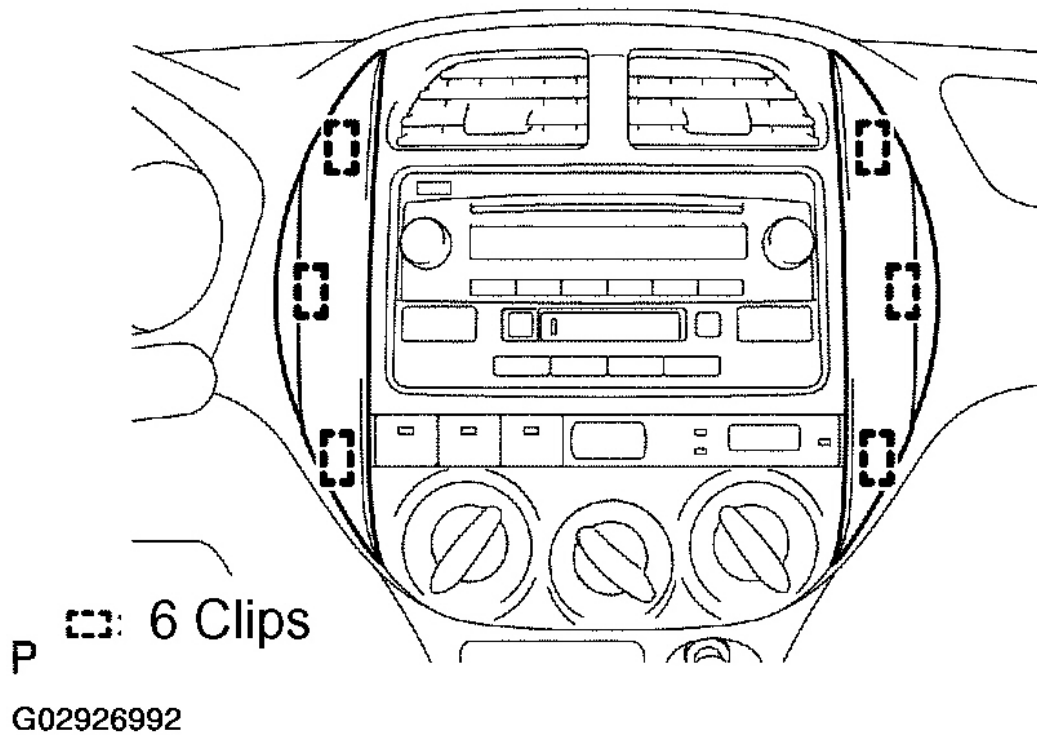


Fig. 192: Installing Instrument Cluster Finish Panel Centers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. CONNECT HEATER CONTROL CABLES

- a. Set the temperature control dial at "MAX. COOL"
- b. Set the mode control dial at "FACE"
- c. Adjust the air mix damper control cable.

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

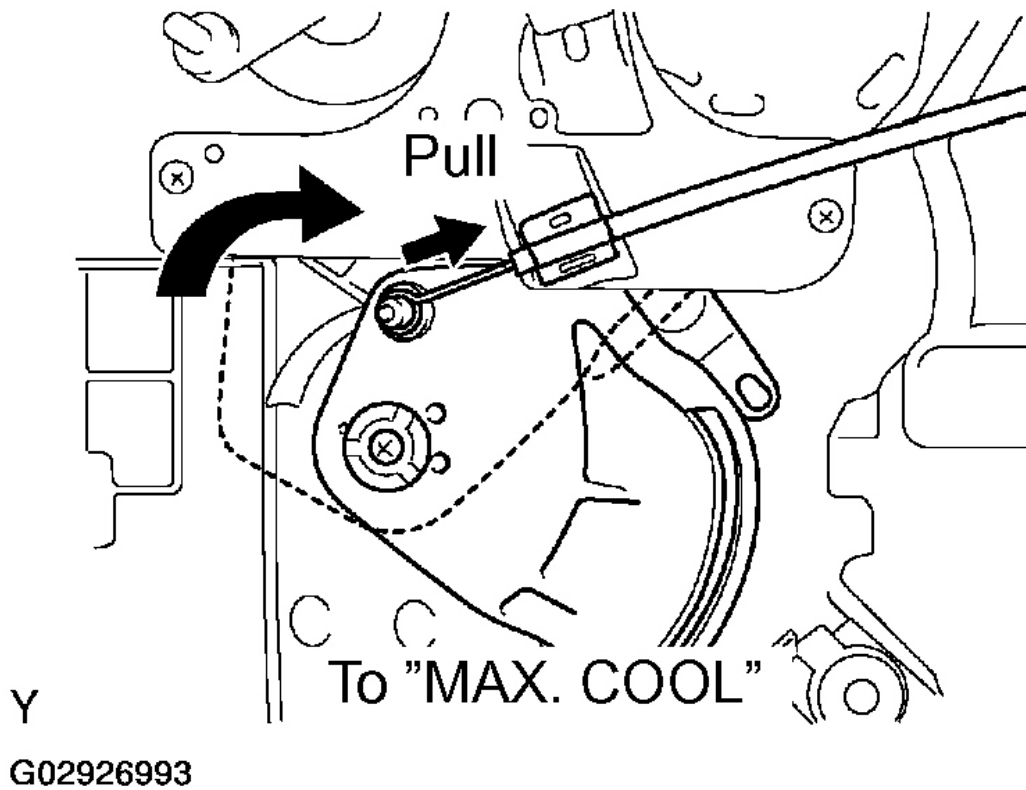


Fig. 193: Adjusting Air Mix Damper Control Cable
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

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

- 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.

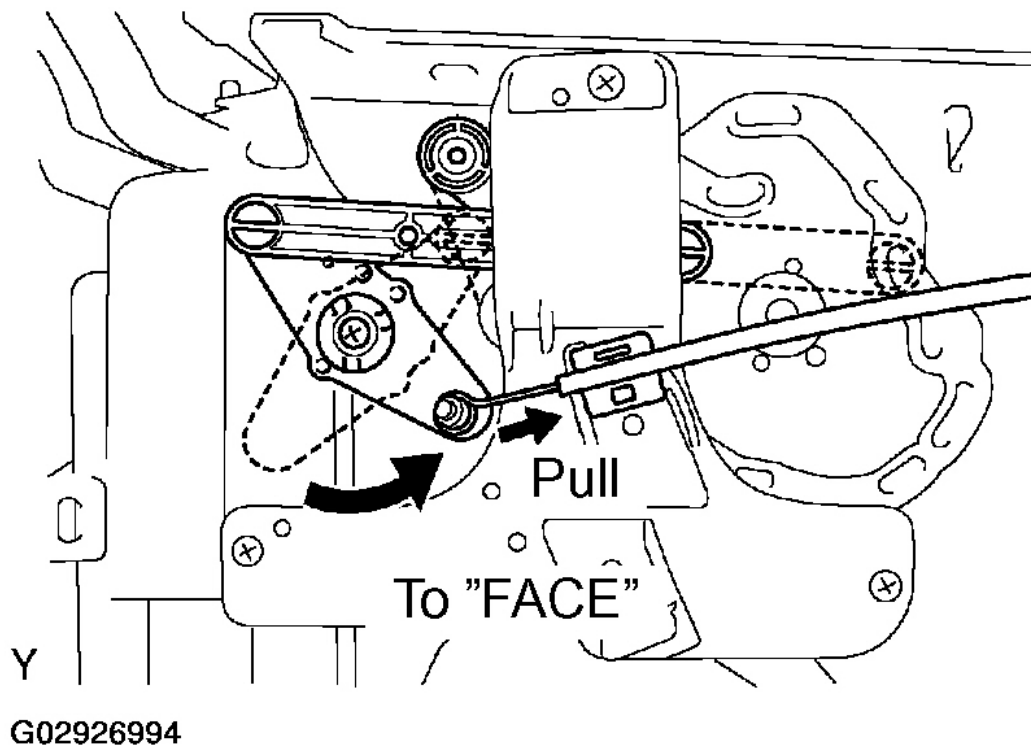


Fig. 194: Adjusting Mode Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

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

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

ENGINE COOLANT TEMPERATURE (ECT) SWITCH

TEMPERATURE (ECT) SWITCH INSPECTION

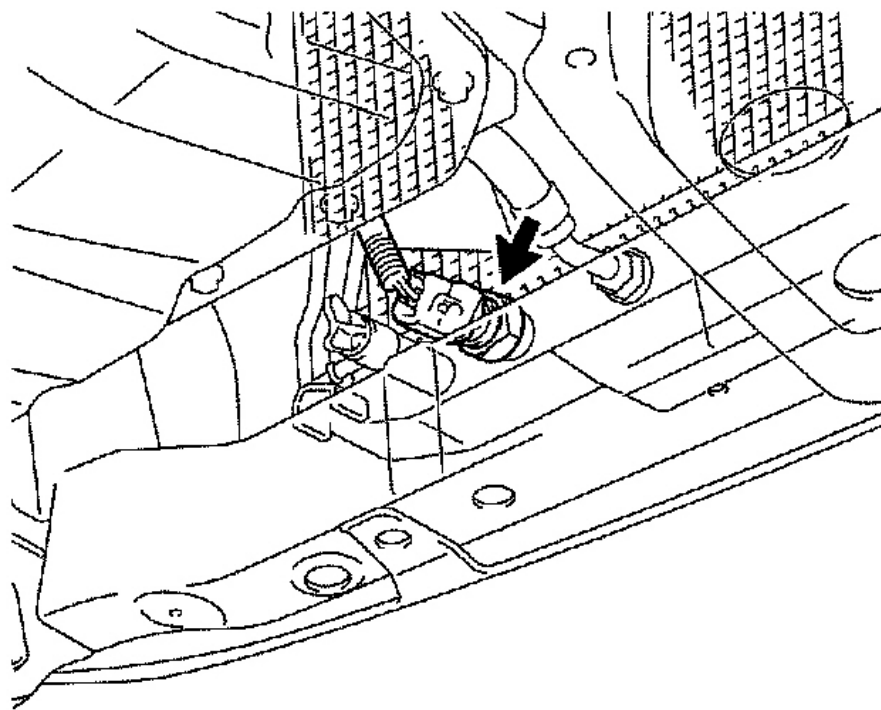
1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

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.
- c. Remove the ECT switch.



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Fig. 195: Removing ECT Switch

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

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).

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.

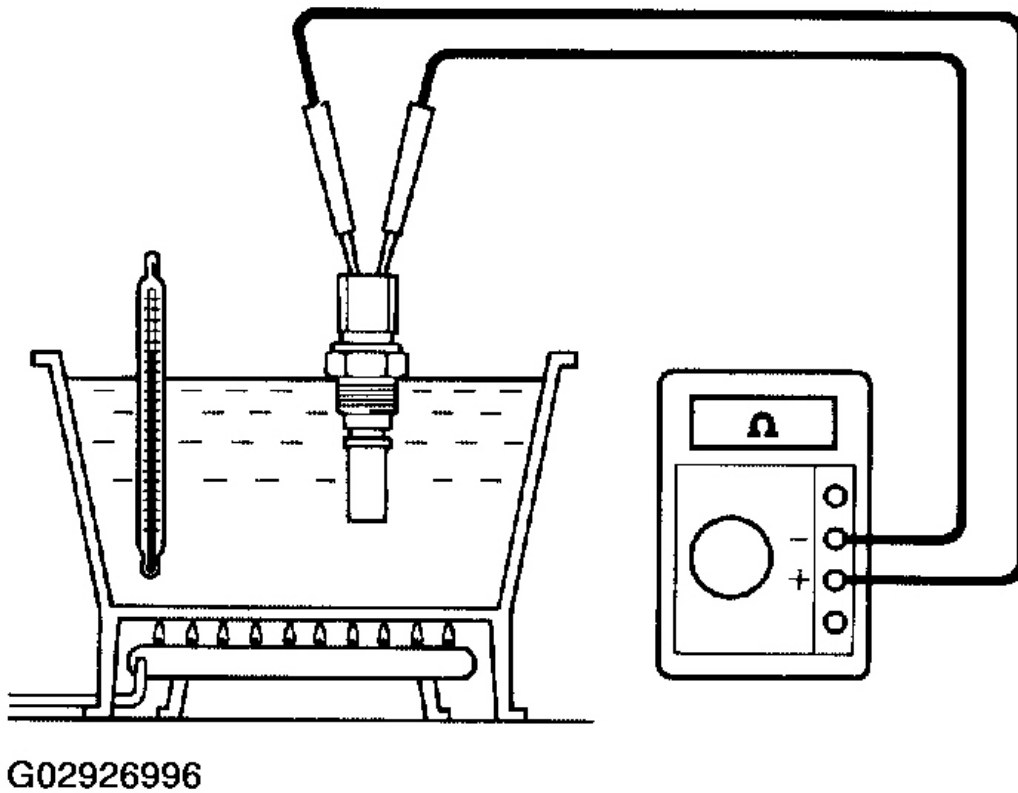


Fig. 196: Inspecting ECT Switch Continuity

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

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 REPLACEMENT)