HEATER, VENTILATION & AIR CONDITIONING (HVAC)

07
SECTION

07–03 SYMPTOM TROUBLESHOOTING

FOREWORD

A3U070301038W01

- See 00–00–1 HOW TO USE THIS MANUAL, Troubleshooting Procedure. Thoroughly read and understand the basic flow of troubleshooting in order to properly perform the procedures.
- The areas for inspection (steps) are given according to various circuit malfunctions. Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

TROUBLESHOOTING INDEX

A3U070301038W02

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Insufficient air (or no air) blown from vents.	• Problem with each vent and/or duct.	(See 07–03–2 NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS)
2	Amount of air blown from vents does not change.	• Malfunction in blower system.	(See 07–03–2 NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE)
3	Airflow mode does not change.	• Malfunction in heater unit and/or climate control unit airflow system.	(See 07–03–3 NO.3 AIRFLOW MODE DOES NOT CHANGE)
4	No temperature control with climate control unit.	• Malfunction in heater unit and/or climate control unit air mix system.	(See 07–03–4 NO.4 NO TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT)
5	Windshield fogged.	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.	(See 07–03–5 NO.5 WINDSHIELD FOGGED)
6	Air from vents not cold enough.	• Magnetic clutch operates but A/C system malfunctions.	(See 07–03–6 NO.6 AIR FROM VENTS NOT COLD ENOUGH)
7	No cool air.	• Magnetic clutch does not operate.	(See 07–03–9 NO.7 NO COOL AIR)
8	Noise while operating A/C system.	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.	(See 07–03–12 NO.8 NOISE WHILE OPERATING A/C SYSTEM)

NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

A3U070301038W03

1	**Insufficient air (or no air) blown from vents.**
DESCRIPTION	• Problem with each vent and/or duct.
POSSIBLE CAUSE	• Malfunction in VENT mode system (Steps 1—4) • Malfunction in HEAT mode system (Step 5) • Malfunction in DEFROSTER mode system (Steps 6—8)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIRFLOW MODE CONTROL SYSTEM, STARTING FROM CLIMATE CONTROL UNIT** • When airflow mode control dial is operated, is appropriate resistance felt and can it be moved to its full range?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No. 3.
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR ANOTHER MODES** • Does air blow out when in VENT mode?	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
4	**VERIFY THAT DUCT IN DASHBOARD IS INSTALLED** • Is duct in dashboard properly installed?	Yes	Inspect duct for clogging, deformity and air leakage, then go to Step 9.
		No	Install duct securely in the proper position, then go to Step 9.
5	**CHECK TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE** • Does air blow out when in HEAT mode?	Yes	Go to next step.
		No	Inspect vent for clogging, then go to Step 9.
6	**INSPECT DEFROSTER MODE** • Does air blow out when in DEFROSTER mode?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	Go to next step.
7	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
8	**VERIFY THAT DEFROSTER DUCT IS INSTALLED** • Is defroster duct properly installed?	Yes	Inspect duct for clogging, deformity, and air leakage, then go to next step.
		No	Install duct securely in the proper position, then go to next step.
9	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

A3U070301038W04

2	**Amount of air blown from vents does not change.**
DESCRIPTION	• Malfunction in blower system.
POSSIBLE CAUSE	• Blower relay, blower motor, resistor, fan switch malfunction (Step 1) • Blower unit malfunction (Steps 2—4)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BLOWER SYSTEM** • Inspect the following systems and electrical parts. — Blower relay — Blower motor — Resistor — Fan switch — Related wiring harnesses • Are they okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning part, then go to Step 5.

STEP	INSPECTION		ACTION
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE** • Turn ignition switch to ON position. • Turn fan switch on. • Recirculate air inside vehicle. • Does fan in blower unit rotate smoothly?	Yes	Go to Step 4.
		No	Go to next step.
3	**INSPECT BLOWER UNIT** • Inspect fan in blower unit. — Is fan free of interference from blower unit case? — Is fan free of foreign material and obstructions? • Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 5.
4	**INSPECT BLOWER UNIT INTAKE VENT** • Is blower unit intake vent clogged?	Yes	Remove obstruction, then go to next step.
		No	Inspect if there are any obstructions in passage between blower unit and heater unit, then go to next step.
5	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 AIRFLOW MODE DOES NOT CHANGE

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3	**Airflow mode does not change.**
DESCRIPTION	• Malfunction in heater unit and/or climate control unit airflow system.
POSSIBLE CAUSE	• Heater unit airflow mode link, airflow mode crank, airflow mode rod, airflow mode wire, wire clamp malfunction (Steps 1, 2) • Climate control unit rack-and-pinion, airflow mode wire malfunction (Step 3) • Malfunction in one or more heater unit doors (Steps 4, 5)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT HEATER UNIT AIRFLOW MODE SYSTEM** • Inspect heater unit airflow mode links, airflow mode cranks, airflow mode rods, and wire clamp. — Is there grease on links and cranks? — Are links, cranks and rods installed securely and in the proper position? — Is wire clamp free of deformation? • Are above items okay?	Yes	Go to next step.
		No	Apply grease or install links, cranks and rods securely in their proper positions, repair or replace wire clamp, then go to Step 6.
2	**VERIFY THAT AIRFLOW MODE WIRE FROM HEATER UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is airflow mode wire positioned securely and correctly in relation to the heater unit airflow mode links?	Yes	Go to next step.
		No	Adjust airflow mode wire or install correctly, then go to Step 6.
3	**INSPECT CLIMATE CONTROL UNIT** • Inspect climate control unit. — Is rack-and-pinion properly engaged? — Is airflow mode wire properly installed in correct direction on rack? • Are above items okay?	Yes	Go to next step.
		No	Properly engage rack-and-pinion or install airflow mode wire in correct direction, then go to Step 6.
4	**INSPECT HEATER UNIT AIRFLOW MODE DOORS** • Is there any foreign material or obstructions in any of heater unit doors?	Yes	Remove obstruction, then go to Step 6.
		No	Go to next step.
5	**VERIFY THAT ALL AIRFLOW MODE DOORS WITHIN HEATER UNIT IS POSITIONED SECURELY AND PROPERLY** • Are all doors within heater unit securely and properly positioned?	Yes	Inspect each door for cracks or damage, then go to next step.
		No	Install malfunction doors securely in proper position, then go to next step.

STEP	INSPECTION		ACTION
6	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does airflow mode change?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.4 NO TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT

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4	**No temperature control with climate control unit.**
DESCRIPTION	• Malfunction in heater unit and/or climate control unit air mix system.
POSSIBLE CAUSE	• Heater unit air mix link, air mix crank, air mix rod, air mix wire, wire clamp malfunction (Steps 2, 3) • Climate control unit rack-and-pinion, air mix wire malfunction (Step 4) • Heater unit air mix door malfunction (Steps 5, 6) • Heater piping malfunction (Step 7)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COOLANT TEMPERATURE** • Is coolant sufficiently warmed up?	Yes	Go to next step.
		No	Warm engine up, then go to Step 8.
2	**INSPECT HEATER UNIT AIR MIX SYSTEM** • Inspect heater unit air mix links, air mix cranks, air mix rods, and wire clamp. — Is there grease on links and cranks? — Are links, cranks, and rods securely installed in their proper positions? — Is wire clamp free of deformation? • Are above items okay?	Yes	Go to next step.
		No	Apply grease or install links, cranks, and rods securely in their proper positions, repair or replace wire clamp, then go to Step 8.
3	**VERIFY THAT AIR MIX WIRE FROM HEATER UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is air mix wire securely installed in the correct position in relation to heater unit air mix links?	Yes	Go to next step.
		No	Adjust air mix wire or install securely in correct position, then go to Step 8.
4	**INSPECT CLIMATE CONTROL UNIT** • Inspect climate control unit. — Is rack-and-pinion properly engaged? — Is air mix wire properly installed in correct position on rack? • Are above items okay?	Yes	Go to next step.
		No	Properly engage rack-and-pinion or install air mix wire in correct position, then go to Step 8.
5	**INSPECT HEATER UNIT** • Is there any foreign material or obstruction in heater unit air mix doors?	Yes	Remove obstruction, then go to Step 8.
		No	Go to next step.
6	**INSPECT HEATER UNIT AIR MIX DOORS** • Is heater unit air mix door securely and properly installed?	Yes	Inspect air mix door for cracks or damage, then go to next step.
		No	Install air mix door securely in proper position, then go to next step.
7	**INSPECT HEATER LINES** • Inspect heater lines. — Is heater piping free of damage and cracks? — Are heater piping connections free of engine coolant leakage? — Are heater piping connections securely tightened? — Are heater piping installation points on heater unit free of engine coolant leakage? • Are above items okay?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	If heater piping connections is loosed, tighten connections with specified torque. Repair or replace heater piping, then go to next step.
8	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does unit operate in every temperature setting?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.5 WINDSHIELD FOGGED

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- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

5	**Windshield fogged.**
DESCRIPTION	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
POSSIBLE CAUSE	• Climate control unit (B+ signal) system malfunction (Steps 2, 4, 5) • Air intake actuator malfunction (Steps 3, 7) • Climate control unit (RECIRCULATE, FRESH signal) system malfunction (Steps 9—11) • Malfunction in blower unit air intake doors (Steps 12, 13)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**COOL AIR BLOW OUT INSPECTION** • When both A/C and fan switch in climate control unit are on, does cool air blow out from front vent?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No.7.
2	**INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL** • Is climate control unit power supply fuse for B+ signal okay?	Yes	Go to next step.
		No	Inspect for a short to ground on blown fuse circuit. • Repair or replace as necessary. Install appropriate amperage fuse.
3	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. — Is there grease on link? — Is link securely and properly positioned? — Is link free of obstructions? • Are above items okay?	Yes	Go to next step.
		No	Apply grease or install link properly and securely, remove obstruction, then go to Step 14.
*4	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY** • Disconnect climate control unit connector (12-pin). • Turn ignition switch to ON position. • Test voltage at climate control unit connector terminal K (B+ signal). • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to Step 14.
*5	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR VOLTAGE** • Test voltage at climate control unit connector terminal E (Ground). • Is voltage **approximately 0V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and ground, then go to Step 14.
6	**VERIFY WHETHER MALFUNCTION IS IN BLOWER UNIT AIR INTAKE DOOR OR ELSEWHERE** • Turn ignition switch to LOCK position. • Connect climate control unit connector (12-pin). • Remove air intake actuator. • Turn ignition switch to ON position. • Set fan switch to 4th position. • Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?	Yes	Go to next step.
		No	Go to Step 12.
7	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. (See 07–40–4 AIR INTAKE ACTUATOR INSPECTION) • Is it okay?	Yes	Go to next step.
		No	Replace air intake actuator, go to Step 14.

STEP	INSPECTION		ACTION
8	**INSPECT AIR INTAKE SELECTOR SWITCH AND MICROSWITCH IN CLIMATE CONTROL UNIT** • Test voltage at climate control unit connector (12-pin) terminals A and I. • Is it okay?	Yes	Go to next step.
		No	Replace climate control unit, then go to Step 14.
*9	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Is there continuity between following climate control unit connector (12-pin) terminal and air intake actuator connector terminal? — Terminal A —Terminal F (FRESH signal) — Terminal I —Terminal A (RECIRCULATE signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
*10	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between following climate control unit connector (12-pin) terminal and ground? — Terminal A (FRESH signal) — Terminal I (RECIRCULATE signal)	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Go to next step.
*11	**INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn ignition switch to ON position • Test voltage at following climate control unit connector (12-pin) terminal. — Terminal A (FRESH signal) — Terminal I (RECIRCULATE signal) • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Replace climate control unit, then go to Step 14.
12	**INSPECT BLOWER UNIT AIR INTAKE DOOR** • Is there any foreign material or obstruction in blower unit air intake door?	Yes	Remove obstruction, then go to Step 14.
		No	Go to next step.
13	**VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY** • Is blower unit air intake door securely and properly positioned?	Yes	Inspect air intake door for cracks or damage, then go to next step.
		No	Install air intake door securely in proper position, then go to next step.
14	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.6 AIR FROM VENTS NOT COLD ENOUGH

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6	**Air from vents not cold enough.**
DESCRIPTION	• Magnetic clutch operates but A/C system malfunctions.
POSSIBLE CAUSE	• Drive belt malfunction (Step 2) • Malfunction in blower unit or condenser (Steps 4, 5) • Malfunction in receiver/drier or expansion valve (valve closes too much) (Steps 8, 9) • Malfunction in refrigerant lines (Steps 10, 11) • A/C compressor system malfunction, insufficient compressor oil (Steps 15, 16) • Over filling of compressor oil, malfunction in expansion valve or heater unit air mix link system (Steps 17—19)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVE BELT** • Inspect drive belt. (See 01–10B–3 DRIVE BELT INSPECTION [FS]) • Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 20. (See 01–10B–4 DRIVE BELT ADJUSTMENT [FS])

STEP	INSPECTION		ACTION
2	**INSPECT REFRIGERANT SYSTEM PERFORMANCE** • Perform refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST) • Is operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to next step.
3	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT INTAKE AND CONDENSER OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values both high?	Yes	Go to next step.
		No	Go to Step 6.
4	**INSPECT BLOWER UNIT INTAKE** • Is blower unit intake clogged?	Yes	Remove obstruction, then go to Step 20. (If air does not reach evaporator within cooling unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to next step.
5	**INSPECT CONDENSER** • Inspect condenser. (See 07–11–13 CONDENSER INSPECTION) • Is it okay?	Yes	Adjust refrigerant to specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 20.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values low?	Yes	Go to next step.
		No	Go to Step 14.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/ DRIER OR ELSEWHERE** • Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to next step.
		No	Go to Step 10.
8	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/ DRIER** • Turn A/C switch off and let air conditioner stop for **10 minutes**. • Start engine. • Turn both A/C switch and fan switch on. • Does malfunction occur after A/C compressor turns on?	Yes	Go to next step.
		No	Replace receiver/drier and vacuum refrigerant line **more than 30 minutes** by vacuum pump, add refrigerant to specified level, then go to Step 20. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.)
9	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN COOLING UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within cooling unit securely installed in proper position?	Yes	Replace expansion valve, then go to Step 20. (Since valve closes too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to Step 20.
10	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. — Is piping free of damage and cracks? — Are piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are piping installation points on condenser free of gas leakage? — Are piping installation points on receiver/ drier free of gas leakage? — Are piping installation points on A/C compressor free of gas leakage? — Are piping installation points on cooling unit free of gas leakage? — Perform gas leak inspection using gas leak tester. • Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) are damaged or cracked, replace them. Then go to Step 20. If there is no damage, go to Step 13.

STEP	INSPECTION		ACTION
11	**INSPECT EVAPORATOR PIPING CONNECTIONS IN COOLING UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in cooling unit free of gas leakage?	Yes	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 20.
		No	If piping is damaged or cracked, replace it. Then go to Step 20. If there is no damage, go to next step.
12	**INSPECT EVAPORATOR PIPING CONNECTIONS IN COOLING UNIT FOR LOOSE** • Are piping connections for evaporator in cooling unit loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
13	**INSPECT PIPING CONNECTIONS FOR LOOSE** • Are piping connections loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
14	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE** • Does refrigerant high-pressure value hardly increase?	Yes	Go to next step. (Pressure hardly increases.)
		No	Go to Step 17.
15	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE** • When engine is racing, does high-pressure value increase?	Yes	Return to Step 3.
		No	Go to next step.
16	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR** • After compressor oil is replenished each **10 ml {10 cc, 0.34 fl oz}**, does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace A/C compressor, then go to Step 20. (Cause is defective A/C compressor.)
17	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE** • Is only refrigerant low-pressure value high?	Yes	Go to Step 19.
		No	Go to next step.
18	**VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY** • Are heater unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Set fan switch to 4th position. Turn A/C switch on. Set FRESH mode. Set temperature control to MAX COLD. Set VENT mode. (1)Start and run the engine at **1,500 rpm** for **10 minutes**. (2)Run the engine at idle for **1 minute**. (3)Within **12 seconds**, idle → **4,000 rpm** → idle. Perform cycle **5 times**. (4) Run the engine at idle for **30 seconds**. (5)Drain the compressor oil completely from the A/C compressor and verify the amount. • If there is **approximately 90 ml {90 cc, 3.0 fl oz}** of compressor oil, go to Step 20. • If there is **more than 90 ml {90 cc, 3.0 fl oz}** of compressor oil, remove surplus oil and fill A/C compressor with **90 ml {90 cc, 3.0 fl oz}** of compressor oil. Repeat Steps (1) to (5). (Cause is excessive amount of compressor oil.)
		No	Repair or install links, cranks and rods securely in proper position, then go to Step 20.

STEP	INSPECTION		ACTION
19	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN COOLING UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within cooling unit securely installed in proper position?	Yes	Replace expansion valve, then go to next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to next step.
20	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does cool air blow out? (Are results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.7 NO COOL AIR

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- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

7	**No cool air.**
DESCRIPTION	• Magnetic clutch does not operate.
POSSIBLE CAUSE	• PCM A/C cut-off control system, coolant system malfunction (Steps 4, 17) • A/C amplifier, A/C switch malfunction (Steps 6—10) • PCM (A/C signal) system malfunction (Steps 11,12) • Refrigerant pressure switch, refrigerant system malfunction (Steps 13, 14) • PCM (IG1 signal) system malfunction (Steps 15, 16) • A/C compressor system malfunction (Step 18) • A/C relay system malfunction (Steps 19—21)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK AIRFLOW** • Does air blow out?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting indexes No. 1, 2.
2	**INSPECT A/C COMPRESSOR OPERATION** • Start engine. • Turn both A/C switch and fan switch on. • Does A/C compressor operate?	Yes	Go to Step 1 of troubleshooting index No. 6.
		No	Go to next step.
*3	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN A/C SWITCH AND FAN SWITCH)** • Turn both A/C switch and fan switch off. • Test voltage at climate control unit terminal D (A/C signal). • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and fan switch, then go to Step 22.
4	**CHECK FOR DTCS IN PCM** • Check the DTC for the PCM on-board diagnostic system. • Are any DTCs displayed? (See 01–03B–4 FOREWORD [FS]) (See 01–03A–4 FOREWORD [ZM])	Yes	Go to appropriate inspection procedure.
		No	Go to next step.
*5	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C AMPLIFIER SYSTEM OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect refrigerant pressure switch connector. • Turn ignition switch to ON position. • Set fan switch to 1st speed. • Test voltage at following terminal of refrigerant pressure switch connector (on wiring harness side). — Terminal A (A/C signal) • Is voltage **approximately 12 V** when A/C switch is off and **0 V** when it is on?	Yes	Go to Step 11.
		No	Reconnect refrigerant pressure switch connector, then go to next step.

STEP	INSPECTION		ACTION
*6	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C AMPLIFIER (LACK OF CONTINUITY OR SHORT TO GROUND) AND WIRING HARNESS (LACK OF CONTINUITY OR SHORT TO GROUND BETWEEN FUSE BLOCK AND A/C AMPLIFIER) OR ELSEWHERE** • Turn ignition switch to LOCK position. • Disconnect A/C amplifier connector. • Start engine. • Turn both A/C switch and fan switch on. • When A/C amplifier connector terminals B and C (on wiring harness side) are shorted, does cool air blow out?	Yes	Go to next step.
		No	Go to Step 8.
*7	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY OR SHORT TO GROUND) IS IN A/C AMPLIFIER OR WIRING HARNESS (BETWEEN FUSE BLOCK AND A/C AMPLIFIER)** • Turn ignition switch to ON position. • Test voltage at A/C amplifier connector terminal A (IG2 signal). • Is voltage **approximately 12 V**?	Yes	Inspect A/C amplifier, then go to Step 22.
		No	Repair wiring harness between fuse block and A/C amplifier, then go to Step 22.
*8	**INSPECT WIRING HARNESS BETWEEN REFRIGERANT PRESSURE SWITCH AND A/C AMPLIFIER FOR SHORT TO B+** • Test voltage at A/C amplifier connector terminal B (A/C signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between refrigerant pressure switch and A/C amplifier, then go to Step 22.
		No	Go to next step.
*9	**INSPECT WIRING HARNESS BETWEEN REFRIGERANT PRESSURE SWITCH AND A/C AMPLIFIER FOR CONTINUITY** • Turn ignition switch to LOCK position. • Disconnect refrigerant pressure switch connector. • Inspect for continuity between A/C amplifier connector terminal B (A/C signal) and refrigerant pressure switch connector terminal A. • Is there continuity?	Yes	Go to next step.
		No	Repair wiring harness between refrigerant pressure switch and A/C amplifier, then go to Step 22.
*10	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND A/C AMPLIFIER)** • Turn ignition switch to ON position. • Turn A/C switch on. • Turn fan switch off. • Test voltage at climate control unit connector terminal B (A/C signal). • Is voltage **approximately 12 V**?	Yes	Inspect wiring harness between A/C amplifier and climate control unit, then go to Step 22.
		No	Inspect climate control unit, then go to Step 22.
*11	**CHECK TO SEE WHETHER MALFUNCTION IS IN PCM (LACK OF CONTINUITY) AND WIRING HARNESS (BETWEEN PCM AND REFRIGERANT PRESSURE SWITCH) OR ANOTHER AREA** • Test voltage at refrigerant pressure switch connector (on wiring harness side) terminal B (A/C signal). • Turn ignition switch to ON position. • Is voltage **approximately 12 V**?	Yes	Go to Step 13.
		No	Go to next step.
*12	**CHECK TO SEE WHETHER MALFUNCTION IS IN PCM OR WIRING HARNESS (BETWEEN PCM AND REFRIGERANT PRESSURE SWITCH FOR CONTINUITY)** • Test voltage at PCM connector (96-pin) terminal (A/C signal terminal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between PCM and refrigerant pressure switch, then go to Step 22.
		No	Inspect PCM, then go to Step 22.

STEP	INSPECTION		ACTION
13	**CHECK TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR ELSEWHERE** • When refrigerant pressure switch connector terminals A and B (on wiring harness side) are shorted, does cool air blow out?	Yes	Go to next step.
		No	Undo short, reconnect refrigerant pressure switch connector, then go to Step 15.
14	**INSPECT REFRIGERANT PRESSURE SWITCH** • Inspect refrigerant pressure switch. (See 07–40–9 REFRIGERANT PRESSURE SWITCH INSPECTION) • Is it okay?	Yes	If refrigerant amount empty, replace receiver/drier, vacuum refrigerant line **more than 30 minutes** by vaccum pump, and add refrigerant to specified level, then go to Step 21.
		No	Replace refrigerant pressure switch, then go to Step 22.
*15	**CHECK TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH SYSTEM OR ELSEWHERE** • Does magnetic clutch operate when terminal E of A/C relay connector is grounded?	Yes	Undo short, then go to next step.
		No	Go to Step 18.
*16	**INSPECT WIRING HARNESS BETWEEN A/C RELAY AND PCM FOR CONTINUITY** • Turn A/C switch off. • Test voltage at PCM connector (96-pin) terminal. • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between A/C relay and PCM, then go to Step 22.
*17	**INSPECT INPUT SIGNAL FOR PCM A/C CUT-OFF CONTROL** • Inspect the following input signal components: — Transaxle range switch and power steering pressure switch including PCM wiring harness (A/C cut-off control) • Are they okay?	Yes	Inspect coolant system operation. (See 01–03B–4 FOREWORD [FS]) (See 01–03A–4 FOREWORD [ZM])
		No	Inspect PCM.
*18	**CHECK TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH AND THERMAL PROTECTOR OR ELSEWHERE** • Test voltage at magnetic clutch stator and thermal protector terminal A (A/C control signal). • Is voltage **approximately 12 V**?	Yes	Inspect magnetic clutch, then go to Step 22.
		No	Go to next step.
19	**INSPECT A/C RELAY POWER SUPPLY FUSES** • Are A/C relay power supply fuses okay?	Yes	Go to next step.
		No	Inspect for a short to ground on blown fuse circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*20	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY FOR CONTINUITY** • Turn ignition switch to ON position. • Test voltage at the following A/C relay connector terminals: — Terminal A (IG2 signal) — Terminal C (A/C control signal) • Is voltage **approximately 12 V**?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 22.
*21	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C RELAY OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH)** • Test voltage at A/C relay terminal D (A/C control signal). • Is voltage **approximately 12 V**?	Yes	Repair wiring harness between A/C relay and stator and thermal protector, then go to next step.
		No	Inspect A/C relay, then go to next step.
22	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does cool air blow out? (Is refrigerant system performance test result correct?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.8 NOISE WHILE OPERATING A/C SYSTEM

A3U070301038W10

8	**Noise while operating A/C system.**
DESCRIPTION	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.
POSSIBLE CAUSE	• Magnetic clutch operation noise (Step 4) • A/C compressor vane noise (Steps 5—13) • A/C compressor slippage noise (Steps 14—17) • Hose or refrigerant line interference noise (Step 18)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**CHECK A/C COMPRESSOR VANE NOISE** • Is there a jingling, popping, beeping, or buzzing sound (A/C compressor vane noise)?	Yes	Go to Step 5.
		No	Go to next step.
2	**INSPECT A/C COMPRESSOR SLIPPAGE NOISE** • Is there a squeaking or whirling sound (A/C compressor slippage noise)?	Yes	Go to Step 14.
		No	Go to next step.
3	**INSPECT A/C COMPRESSOR INTERFERENCE NOISE** • Is there a rattling or vibrating sound (interference noise)?	Yes	Go to Step 18.
		No	Go to next step.
4	**INSPECT MAGNETIC CLUTCH OPERATION NOISE** • Is there a clicking sound (magnetic clutch operation noise)?	Yes	Adjust clearance between pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 19. (See 07–40–7 MAGNETIC CLUTCH ADJUSTMENT)
		No	Condition is normal. (Recheck malfunction symptoms.)
5	**INSPECT A/C COMPRESSOR NOISE TIME** • Is noise heard continuously for **more than 3 seconds** after A/C compressor comes on?	Yes	Go to next step.
		No	Condition is normal. (Noise occurs for **2—3 seconds** immediately after A/C compressor turns on.)
6	**INSPECT IDLE SPEED** • Inspect idle speed. (See 01–10B–26 Idle Speed Adjustment) • Is it okay?	Yes	Go to next step.
		No	Adjust idle speed, then go to Step 19.
7	**INSPECT REFRIGERANT AMOUNT** • Inspect refrigerant amount. • Is it okay?	Yes	Go to Step 10.
		No	Go to next step.
8	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. — Is piping free of damage and cracks? — Are piping connections free of oil grime? (Visual inspection) — Are piping connections free of gas leakage? — Are piping installation points on condenser free of gas leakage? — Are piping installation points on receiver/ drier free of gas leakage? — Are piping installation points on A/C compressor free of gas leakage? — Are piping installation points on cooling unit free of gas leakage — Perform gas leak inspection using gas leak tester. • Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) is damaged or cracked, replace then go to Step 19. If there is gas leakage, repair or replace connection and replace receiver/drier*, then go to Step 19.
9	**INSPECT EVAPORATOR PIPING CONNECTIONS IN COOLING UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in cooling unit free of gas leakage?	Yes	Adjust refrigerant amount to specified level, then go to Step 19.
		No	If piping is damaged or cracked, replace then go to Step 19. If there is gas leakage, repair or replace connection and replace receiver/drier*, then go to Step 19.
10	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL OR ELSEWHERE** • Add **20 ml {20 cc, 0.8 fl oz}** of compressor oil. • Is noise heard when racing engine?	Yes	Go to next step.
		No	Troubleshooting completed. Explain repair to customer.

STEP	INSPECTION		ACTION
11	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Drain compressor oil. • Is it contaminated with metal particles?	Yes	Go to next step.
		No	Replace A/C compressor, then go to Step 19.
12	**CHECK TO SEE WHETHER MALFUNCTION IS SOMEWHERE IN A/C SYSTEM OR ELSEWHERE** • Is compressor oil whitish and mixed with water?	Yes	Replace entire A/C system (excluding heater), then go to Step 19.
		No	Go to next step.
13	**INSPECT A/C COMPRESSOR OIL** • Is compressor oil darker than normal and contaminated with aluminum chips?	Yes	Replace A/C compressor and receiver/drier, then go to Step 19. (Since A/C compressor may be worn and receiver/drier may be clogged, replacement of receiver/drier is necessary.)
		No	Condition is normal. Recheck malfunction symptoms.
14	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE** • Is noise heard immediately after A/C compressor is stopped?	Yes	Replace A/C compressor, then go to Step 19. (A/C compressor discharge valve left open)
		No	Go to next step.
15	**INSPECT DRIVE BELT** • Inspect drive belt. (See 01–10B–3 DRIVE BELT INSPECTION [FS]) • Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 19. (See 01–03B–4 FOREWORD [FS]) (See 01–03A–4 FOREWORD [ZM])
16	**INSPECT DRIVE BELT CONDITION** • Is drive belt worn? • Does it have foreign material imbedded in it, or have oil on it?	Yes	Remove obstruction, remove oil, or replace drive belt, then go to Step 19.
		No	Go to next step.
17	**INSPECT MAGNETIC CLUTCH** • Inspect magnetic clutch. (See 07–40–8 MAGNETIC CLUTCH INSPECTION) • Is it okay?	Yes	Replace A/C compressor (excluding pressure plate, A/C compressor pulley, and stator), then go to Step 19.
		No	Replace magnetic clutch, then go to Step 19.
18	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINES** • Is noise emitted from A/C compressor?	Yes	Visually inspect A/C compressor, replace appropriate parts if necessary, then go to next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to next step.
19	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Has A/C compressor noise stopped?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

* : If there is gas leakage, air enters into the A/C system. The desiccant within the receiver/drier absorbs the moisture from the air and becomes saturated. If the A/C system is used in this condition, the inside of the A/C compressor will begin to rust due to this moisture, which may cause lock up or noise to occur. Therefore, replacement of the receiver/drier is necessary.

07–10 REFRIGERANT SYSTEM

REFRIGERANT SYSTEM SERVICE WARNINGS

A3U071001039W01

Using/Handling Unapproved Refrigerant

- **Using a flammable refrigerant, such as OZ-12, in this vehicle is dangerous. In an accident, the refrigerant may catch fire, resulting in serious injury or death. When servicing this vehicle, use only R-134a.**
- **Checking for system leakage on a vehicle that has been serviced with flammable refrigerant, such as OZ-12, is dangerous. Conventional leak detectors use an electronically generated arc which can ignite the refrigerant, causing serious injury or death. If a flammable refrigerant may have been used to service the system, or if you suspect a flammable refrigerant has been used, contact the local fire marshal or EPA office for information on handling the refrigerant.**

Handling Refrigerant

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**
- **Do not pressure test or leak test R-134a service equipment and/or vehicle air conditioning system with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**
- **Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above-mentioned heat sources and maintain adequate ventilation.**
- **Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.**

Storing Refrigerant

- **The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40 °C {104 °F}.**

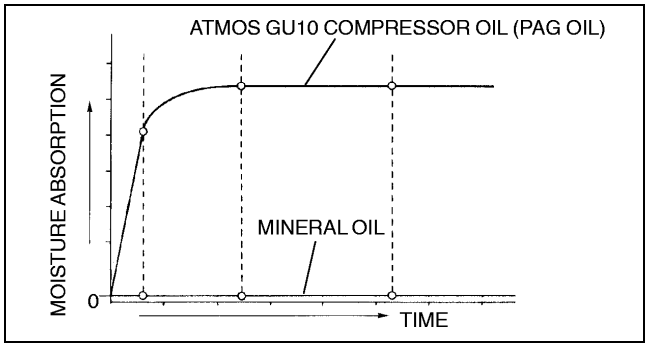
REFRIGERANT SYSTEM SERVICE CAUTIONS

A3U071001039W02

Handling Compressor Oil

- **Use only ATMOS GU10 compressor oil for this vehicle. Using a PAG oil other than ATMOS GU10 compressor oil can damage the A/C compressor.**
- **Do not spill ATMOS GU10 compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint.**
  - **If oil gets on the vehicle, wipe it off immediately.**

- **ATMOS GU10 compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.**



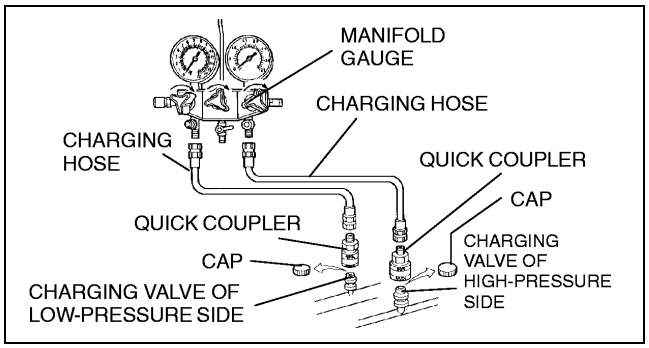
X3U710WA0

REFRIGERANT SYSTEM GENERAL PROCEDURES

A3U071001039W03

Manifold Gauge Set Installation

1. Fully close the valves of the manifold gauge.
2. Connect the charging hoses to the high- and low-pressure side joints of the manifold gauge.
3. Connect the quick couplers to the ends of the charging hoses.
4. Remove the caps from the charging valves.
5. Connect the quick couplers to the charging valves.

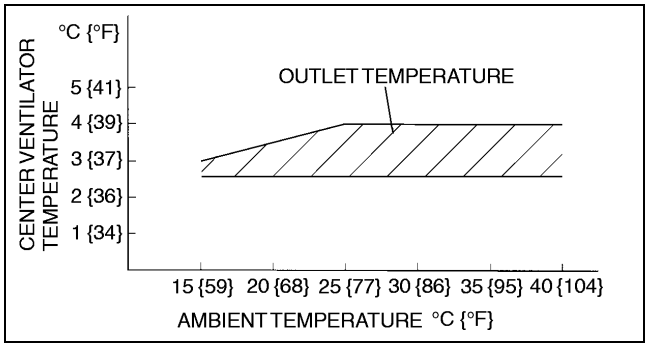


W6U710WA1

REFRIGERANT SYSTEM PERFORMANCE TEST

A3U071001039W04

1. Perform refrigerant pressure check. (See 07–10–3 REFRIGERANT PRESSURE CHECK.)
   - If they are correct, go to the next step.
   - If not as specified, troubleshoot refrigerant system. (See 07–03–1 TROUBLESHOOTING INDEX.)
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Close the hood.
4. Warm up the engine and run it at a constant **1,500 rpm.**
5. Set the fan switch to 4th position.
6. Turn the A/C switch on.
7. Set the RECIRCULATE mode.
8. Set the temperature control to MAX COLD.
9. Set the VENT mode.
10. Close all the doors and all the windows.
11. Wait until the air conditioner output temperature stabilizes. The output temperature is stable when the A/C compressor is repeatedly turned on and off based on the A/C compressor control of A/C amplifier.
12. Record driver-side center ventilator temperature.
13. Determine and record ambient temperature.
14. Verify that the temperature reading is in the shaded zone.
    - If the performance is not within the shaded zone, troubleshoot the refrigerant system. (See 07–03–1 TROUBLESHOOTING INDEX.)

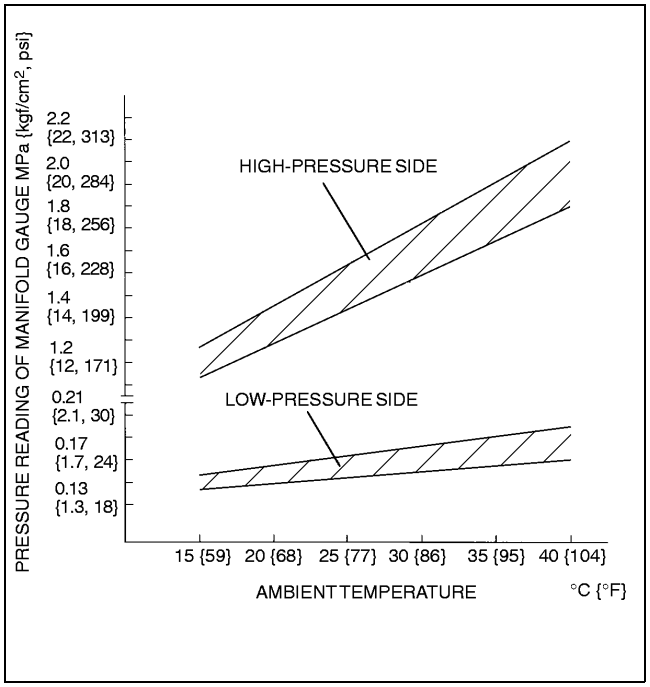


X3U710WA1

REFRIGERANT PRESSURE CHECK

A3U071078834W01

1. Install the manifold gauge set.
2. Close the hood.
3. Warm up the engine and run it at a constant **1,500 rpm**.
4. Set the fan switch to 4th position.
5. Turn the A/C switch on.
6. Set the RECIRCULATE mode.
7. Set the temperature control to MAX COLD.
8. Set the VENT mode.
9. Close all the doors and all the windows.
10. Measure the ambient temperature and the high- and low-pressure side readings of the manifold gauge.
    - If the high- and low-pressure side readings are in the shaded zone as shown in the figure, the refrigerant system is normal.
    - If the pressure is abnormal, see No.6 of symptom troubleshooting. (See 07–03–6 NO.6 AIR FROM VENTS NOT COLD ENOUGH.)



X3U710WA2

REFRIGERANT RECOVERY

A3U071078834W02

Warning

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

REFRIGERANT CHARGING

A3U071078834W03

Warning

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**

Caution

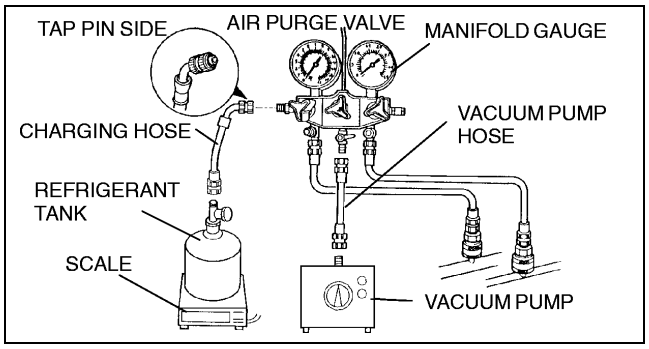
- **Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.**

Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

Charging New R-134a Refrigerant

1. Install the manifold gauge set.
2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.
3. Connect the vacuum pump hose to the center joint of the manifold gauge.
4. Connect the vacuum pump hose to the vacuum pump.
5. Connect the charging hose to the refrigerant tank.
6. Place the refrigerant tank on the scale.
7. Open all the valves of the manifold gauge.



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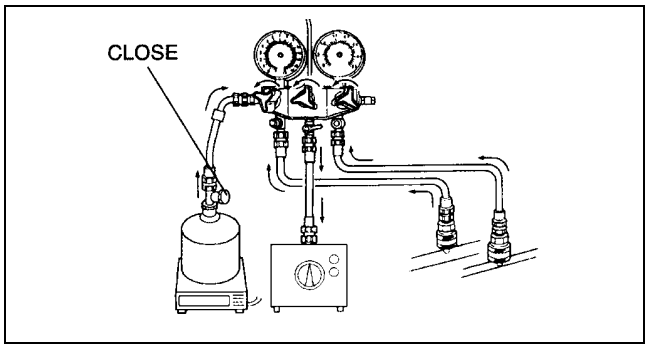
Caution

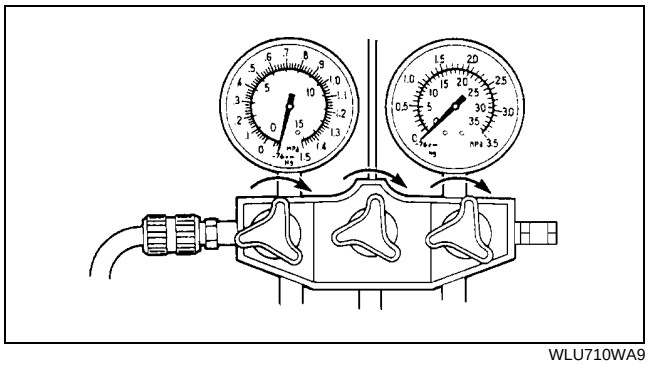
- **Close the manifold gauge valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will back flow into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.**

8. Start the vacuum pump and let it operate for **15 minutes**.



WLU710WA8

9. Verify that high-and low-pressure side readings of the manifold gauge are at **–101 kPa {–760 mmHg, –29.9 inHg}**. Close each valve of the manifold gauge.
10. Stop the vacuum pump and wait for **5 minutes**.
11. Inspect the high- and low-pressure side readings of the manifold gauge.
    - If the reading has changed, inspect for leakage and then repeat from Step 7.
    - If the reading has not changed, and go to next step.
12. Open the valve of the refrigerant tank.
13. Weigh the refrigerant tank.


WLU710WA9

Regular amount of refrigerant (approximate quantity)
600 g {21.2 oz}

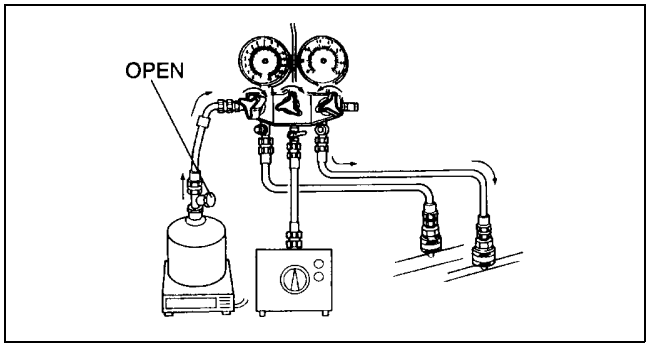
Warning

- **If the refrigerant system is charged with a large amount of refrigerant when checking for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when checking for gas leakage.**
- **If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

Caution

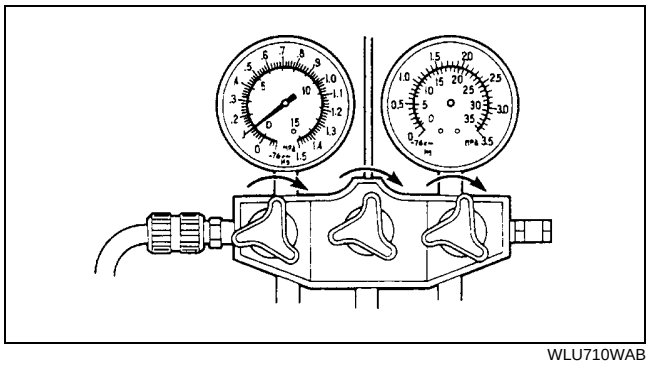
- **Always begin charging of refrigerant from the high-pressure side. If charging is begun from the low-pressure side, the vanes of the A/C compressor will not be released and abnormal noise may result.**

14. Open the high-pressure side valve of the manifold gauge.



WLU710WAA

15. When the low-pressure side reading increases to **0.098 MPa {1.0 kgf/cm^2, 14 psi}**, close the high-pressure side valve of the manifold gauge.
16. Inspect for leakage from the cooler pipe/hose connections using a gas leak tester.
    - If there is no leakage, go to Step 18.
    - If leakage is found at a loose joint, tighten the joint, then go to the next step.
17. Inspect for leakage again.
    - If there is no leakage after tightening the joint, go to the next step.
    - If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.



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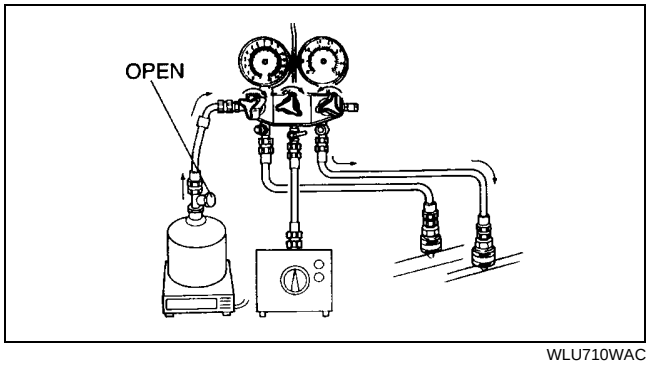
Warning

- **If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**

18. Open the high-pressure side valve of the manifold gauge and charge with refrigerant until the weight of refrigerant tank has decreased **300 g {10.6 oz}** from the amount in Step 13.



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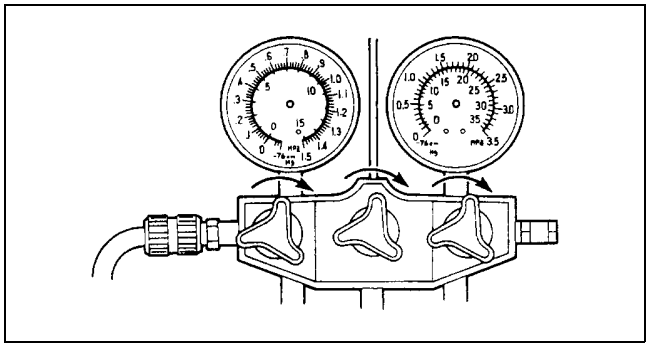
19. Close the high-pressure side valve of the manifold gauge.

Warning

- **If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**



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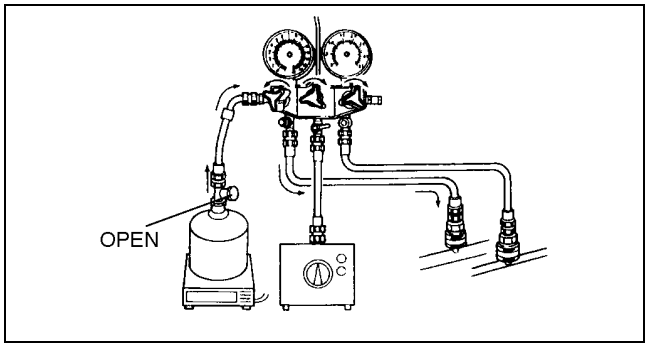
20. Start the engine and actuate the A/C compressor.

21. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of the refrigerant tank has decreased **600 g {21.2 oz}** from the amount in Step 13.
22. Close the low-pressure side valve of the manifold gauge and the valve of the refrigerant tank.
23. Stop the engine and A/C compressor.
24. Inspect for leakage using a gas leak tester.
    - If there is no leakage, go to Step 26.
    - If leakage is found at a loose joint, tighten the joint, go to the next step.
25. Inspect for leakage again.
    - If there is no leakage after tightening the joint, and go to the next step.
    - If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.
26. Disconnect the quick couplers from the charging valves.
27. Install the caps to the charging valves.



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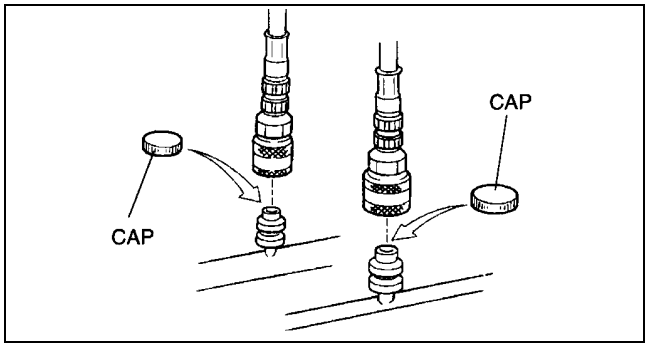

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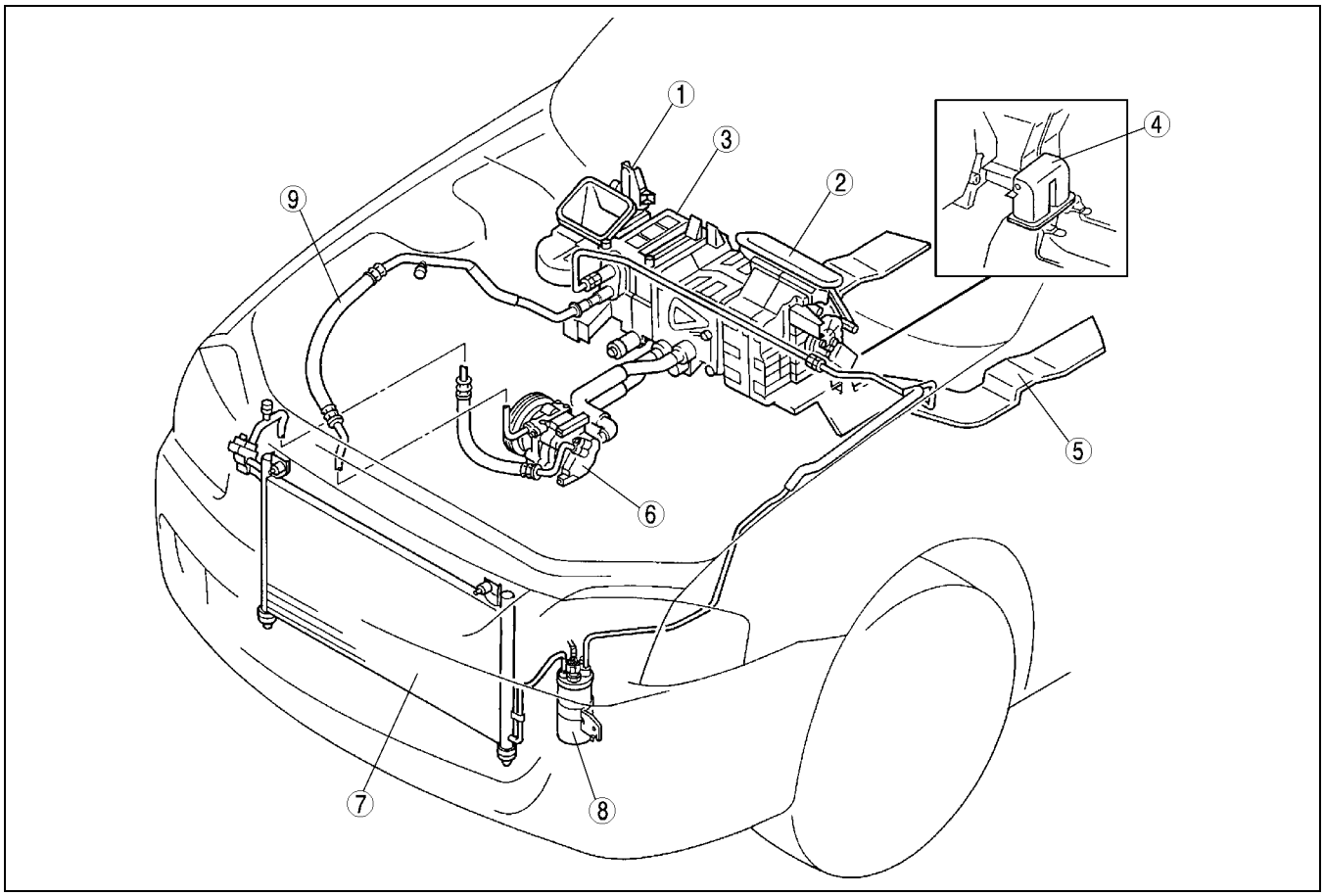
07–11 BASIC SYSTEM

BASIC SYSTEM LOCATION INDEX

A3U071101040W01



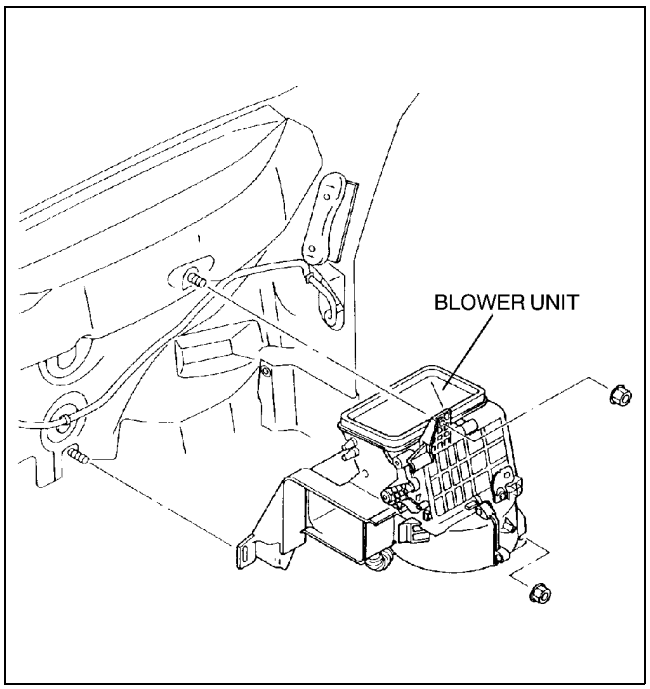
Z3U0711W001

1	Blower unit (See 07–11–3 BLOWER UNIT REMOVAL/ INSTALLATION) (See 07–11–3 BLOWER UNIT DISASSEMBLY/ ASSEMBLY)
2	Heater unit (See 07–11–7 HEATER UNIT REMOVAL/ INSTALLATION) (See 07–11–9 HEATER UNIT DISASSEMBLY/ ASSEMBLY)
3	Cooling unit (See 07–11–3 COOLING UNIT REMOVAL/ INSTALLATION) (See 07–11–4 COOLING UNIT DISASSEMBLY/ ASSEMBLY)
4	Rear duct (See 07–11–11 REAR DUCT REMOVAL/ INSTALLATION)
5	Rear heat duct (See 07–11–11 REAR HEAT DUCT REMOVAL/ INSTALLATION)
6	A/C compressor (See 07–11–11 A/C COMPRESSOR REMOVAL/ INSTALLATION)
7	Condenser (See 07–11–12 CONDENSER REMOVAL/ INSTALLATION) (See 07–11–13 CONDENSER INSPECTION)
8	Receiver/drier (See 07–11–13 RECEIVER/DRIER REMOVAL/ INSTALLATION)
9	Refrigerant lines (See 07–11–14 REFRIGERANT LINES REMOVAL/ INSTALLATION)

BLOWER UNIT REMOVAL/INSTALLATION

A3U071161140W01

1. Disconnect the negative battery cable.
2. Remove the dashboard. (See 09–17–1 DASHBOARD REMOVAL/INSTALLATION.)
3. Remove the cooling unit. (See 07–11–3 COOLING UNIT REMOVAL/INSTALLATION.)
4. Remove the blower unit.
5. Install in the reverse order of removal.



Z3U0711W002

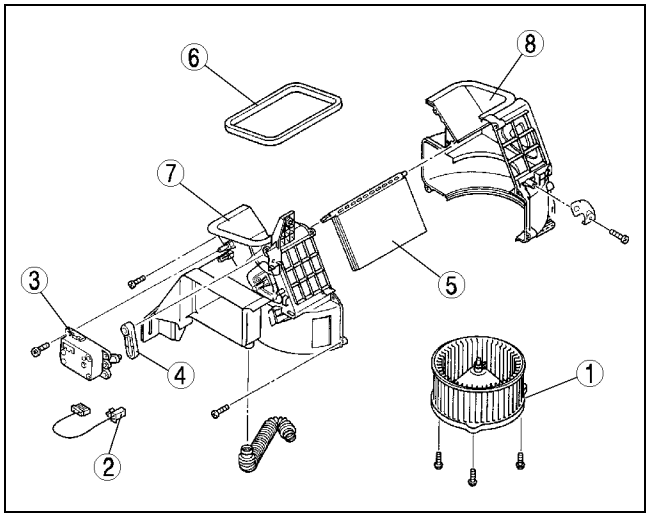
BLOWER UNIT DISASSEMBLY/ASSEMBLY

A3U071161140W02

1. Disassemble in the order indicated in the table.

1	Blower motor
2	Blower harness
3	Air intake actuator
4	Air intake crank
5	Air intake door
6	Polyurethane protector
7	Blower case (1)
8	Blower case (2)

2. Assemble in the reverse order of disassembly.



Z3U0711W003

COOLING UNIT REMOVAL/INSTALLATION

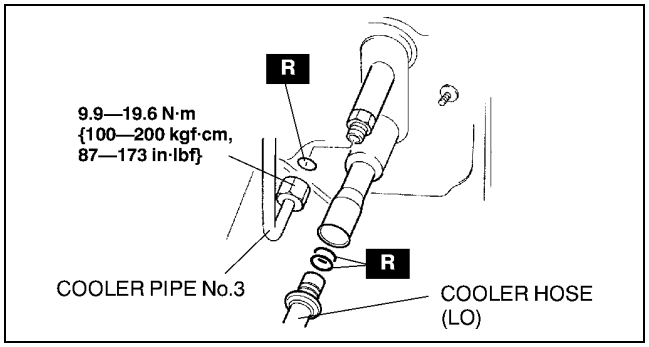
A3U071161520W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the passenger-side lower panel.
4. Remove the glove compartment and glove compartment cover.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

5. Disconnect cooler pipe No.3 and cooler hose (LO). (See 07–11–15 Refrigerant Lines Removal Note.) (See 07–11–16 Refrigerant Lines Installation Note.)

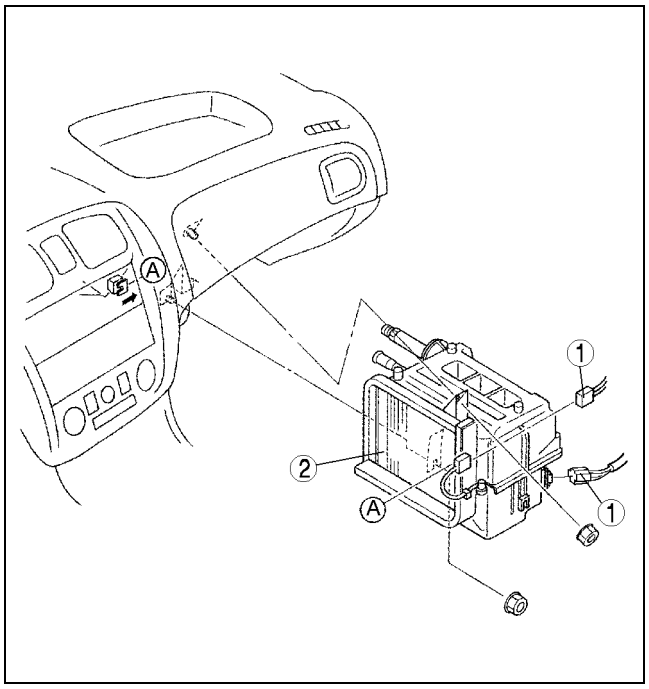


Z3U0711W004

6. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Connector
2	Cooling unit (See 07–11–4 Cooling Unit Installation Note)

7. Install in the reverse order of removal.
8. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



Z3U0711W005

Cooling Unit Installation Note

1. When installing a new cooling unit (evaporator), add a supplemental amount of ATMOS GU10 compressor oil into the refrigeration cycle.

   Supplemental amount (approximate quantity)
   30 ml {30 cc, 1.0 fl oz}

COOLING UNIT DISASSEMBLY/ASSEMBLY

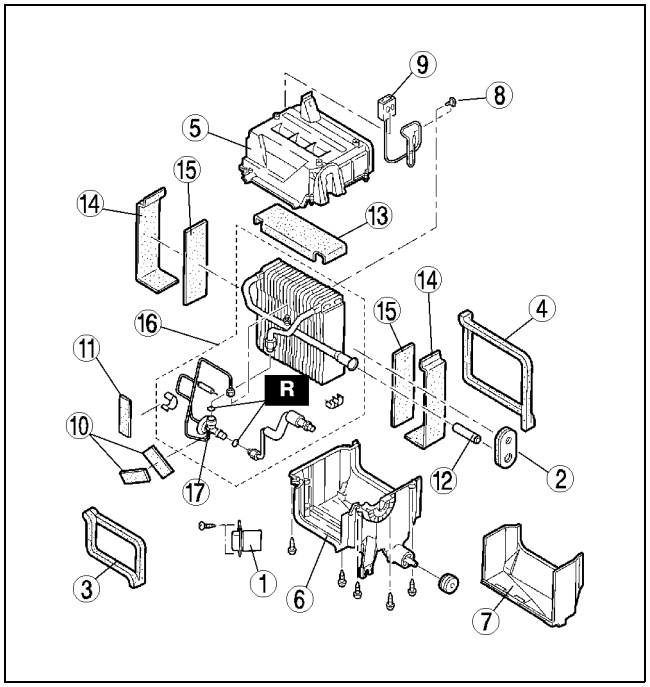
A3U071161520W02

1. Disassemble in the order indicated in the table.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

1	Resistor
2	Polyurethane foam
3	Polyurethane protector (1)
4	Polyurethane protector (2)
5	Cooler case (1)
6	Cooler case (2)
7	Polyethylene foam (See 07–11–7 Polyethylene Foam Assembly Note)
8	Sensor clamp (See 07–11–7 Sensor Clamp Assembly Note)
9	A/C amplifier (See 07–11–6 A/C Amplifier Assembly Note)
10	Insulator (See 07–11–6 Insulator Assembly Note)
11	Adhesive sponge rubber (See 07–11–6 Adhesive Sponge Rubber Assembly Note)
12	Sponge rubber
13	Polyurethane protector (3)
14	Polyethylene protector
15	Polyurethane protector (4)
16	Evaporator (See 07–11–6 Evaporator Assembly Note)
17	Expansion valve (See 07–11–5 Expansion Valve Assembly Note)

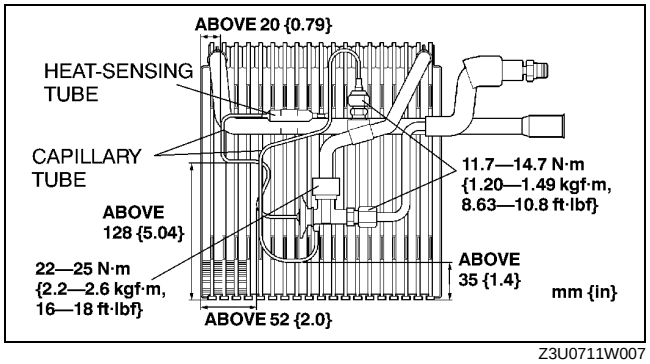


Z3U0711W006

2. Assemble in the reverse order of disassembly.

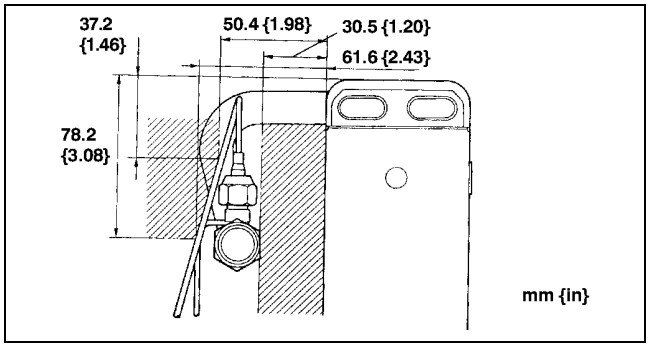
Expansion Valve Assembly Note

1. Apply compressor oil to the O-rings and connect the joint.
2. Tighten the nut of the joint by hand.
3. Tighten the joint with the specified torque with a spanner and torque wrench.
4. Assemble the heat-sensing tube as shown in the figure.
5. Route the capillary tube as shown in the figure.



Z3U0711W007

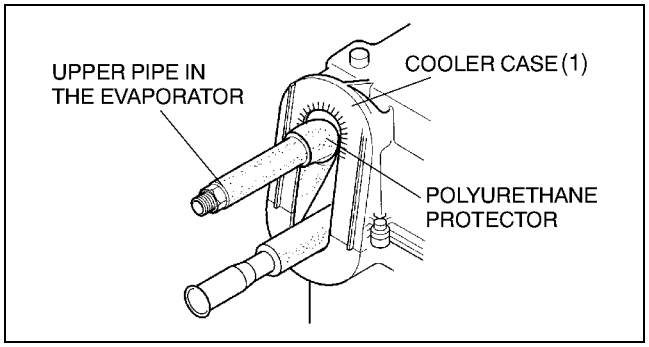
6. Verify that the capillary tube is not in the shaded zone



Z3U0711W008

Evaporator Assembly Note

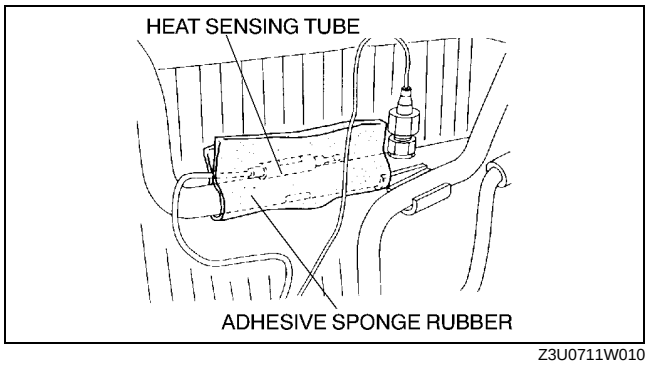
1. Verify that the dent caused by contact with the polyuretane protector and cooler case (1) in the shaded zone is **3 mm {0.12 in} or less**.



A3U0711W002

Adhesive Sponge Rubber Assembly Note

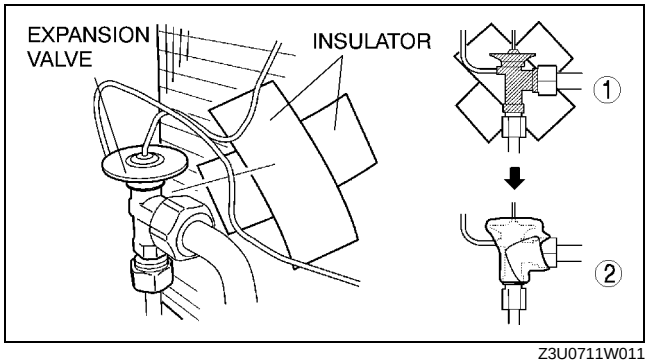
1. Attach the adhesive sponge rubber so that the heat sensing tube is hidden.



Z3U0711W010

Insulator Assembly Note

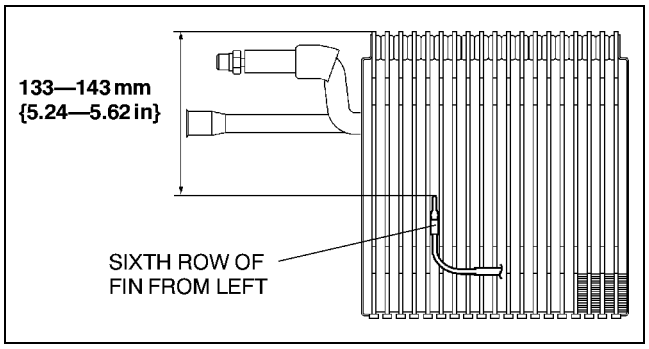
1. Make the two insulators cross.
2. Attach the insulator so that the shaded zone of expansion valve is hidden.



Z3U0711W011

A/C Amplifier Assembly Note

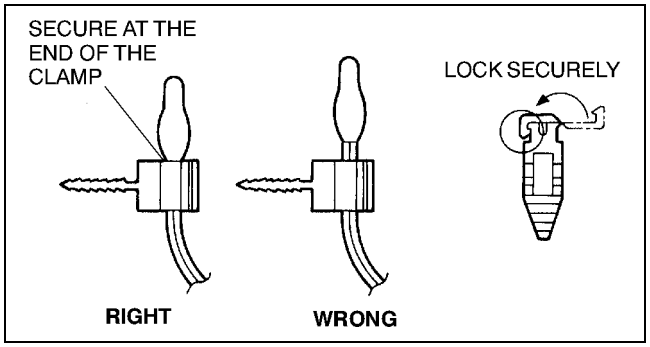
1. Assemble the evaporator temperature sensor as shown in the figure.



Z3U0711W012

Sensor Clamp Assembly Note

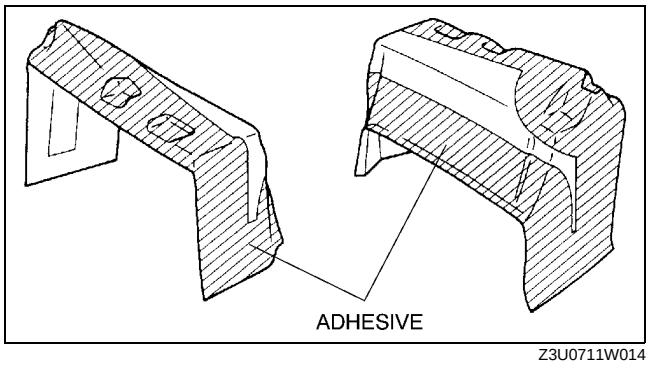
1. Assemble the sensor clamp as shown in the figure.



Z3U0711W013

Polyethylene Foam Assembly Note

1. Apply the adhesive to a range of **50 mm {1.97 in}** from the edge of polyethylene foam, and around the drain outlet. Apply the polyethylene foam to the cooler case (2).



Z3U0711W014

EVAPORATOR INSPECTION

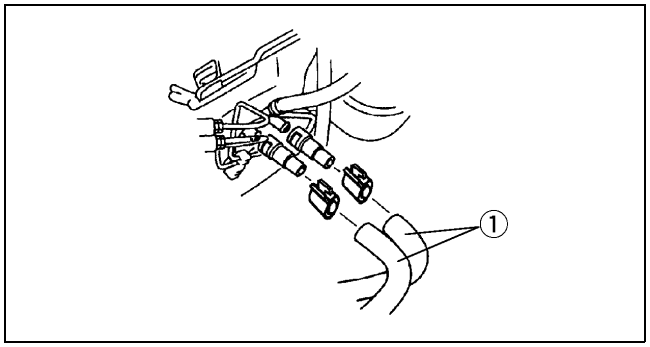
A3U071161810W01

1. Remove the cooling unit. (See 07–11–3 COOLING UNIT REMOVAL/INSTALLATION.)
2. Remove the evaporator from the cooling unit.
3. Inspect for cracks, damage, and oil leakage.
   - If any problems are found, replace the evaporator.
4. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.

HEATER UNIT REMOVAL/INSTALLATION

A3U071161130W01

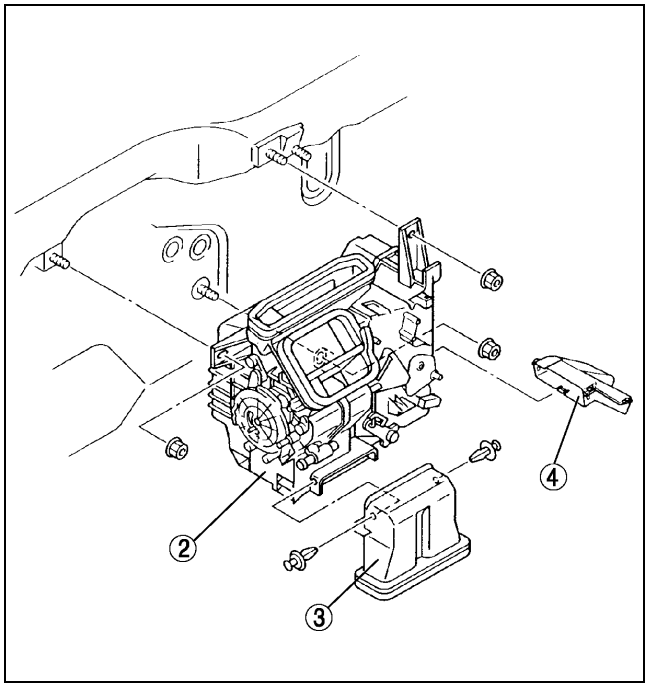
1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See 01–12–3 ENGINE COOLANT REPLACEMENT.)
3. Remove the dashboard. (See 09–17–1 DASHBOARD REMOVAL/INSTALLATION.)
4. Remove the cooling unit. (See 07–11–3 COOLING UNIT REMOVAL/INSTALLATION.)
5. Remove in the order indicated in the table.



X3U711WAB

1	Heater hose
2	Heater unit
3	Rear duct
4	Heat duct

6. Install in the reverse order of removal.

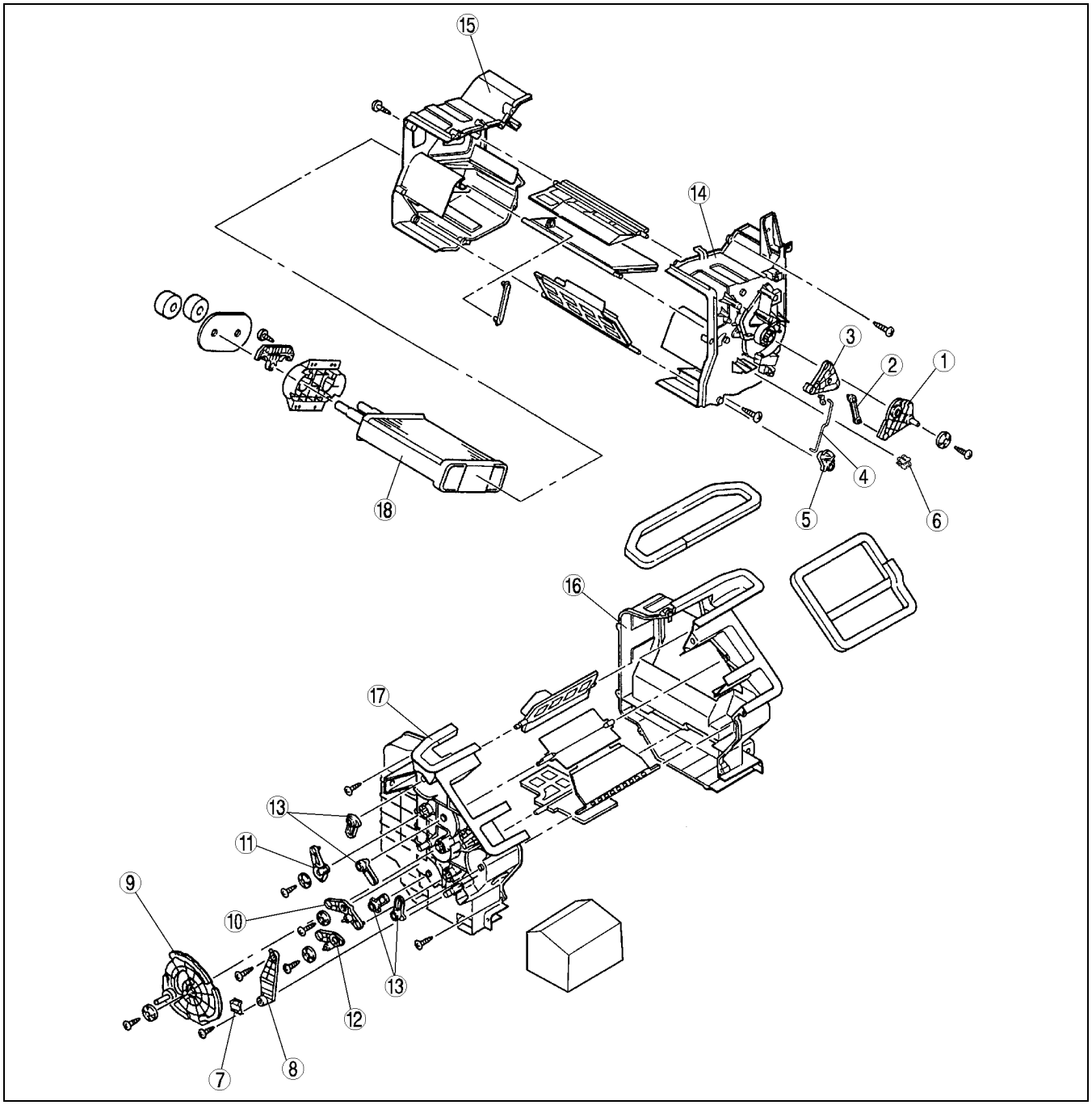


X3U711WAC

HEATER UNIT DISASSEMBLY/ASSEMBLY

A3U071161130W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A3U0711W003

1	Air mix link
2	Air mix rod (2)
3	Air mix crank (1)
4	Air mix rod (1)
5	Air mix crank (2)
6	Wire clamp
7	Wire clamp
8	Bracket
9	Airflow mode main link (See 07–11–10 Airflow Mode Main Link Installation Note)

10	Airflow mode sub link (1)
11	Airflow mode sub link (2)
12	Airflow mode sub link (3)
13	Airflow mode crank
14	Heater case (1)
15	Heater case (2)
16	Heater case (3)
17	Heater case (4)
18	Heater core

HEATER CORE INSPECTION

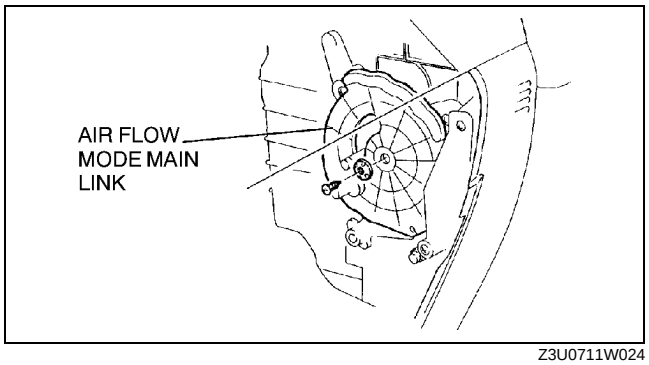
A3U071161910W01

1. Remove the heater unit. (See 07–11–7 HEATER UNIT REMOVAL/INSTALLATION.)
2. Remove the heater core from the heater unit.
3. Inspect for cracks, damage, and coolant leakage.
   - If any problems are found, replace the heater core.
4. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.
5. Verify that the heater core inlet and outlet are not distorted or damaged. Repair with pliers if necessary.

AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION

A3U071161030W01

1. Disconnect the airflow mode wire from the airflow mode main link.
2. Remove in the airflow mode main link. (See 07–11–10 Airflow Mode Main Link Installation Note)
3. Install in the reverse order of removal.
4. Adjust the airflow mode wire. (See 07–40–11 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.)



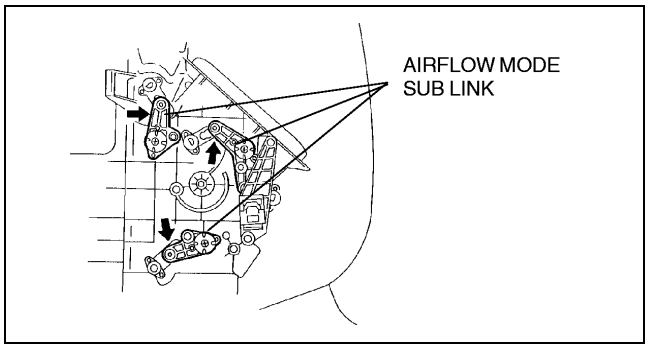
Z3U0711W024

Airflow Mode Main Link Installation Note

Caution

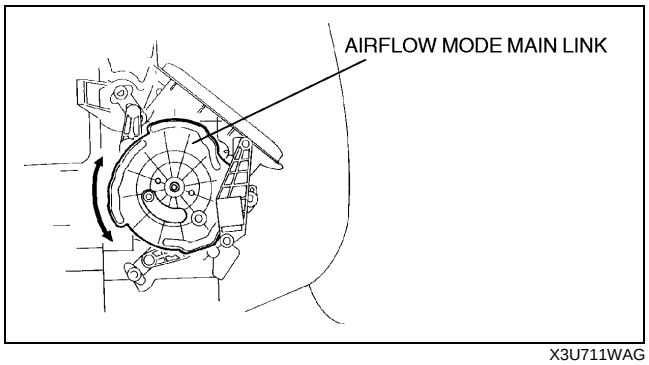
- **If any grease other than the specified grease is applied to the links, abnormal noise will occur or the links will not properly operate. Therefore, do not apply any grease to the links.**

1. Push and hold each airflow mode sub link in the direction shown by the arrow.



X3U711WAF

2. Set the airflow mode main link to the heater unit as shown in the figure.
3. Press the airflow mode main link lightly and rotate it in the direction shown by the arrow, then set the projections of each airflow mode sub link into the grooves of the airflow mode main link.
4. Rotate airflow mode main link and verify that each mode is accessed properly.

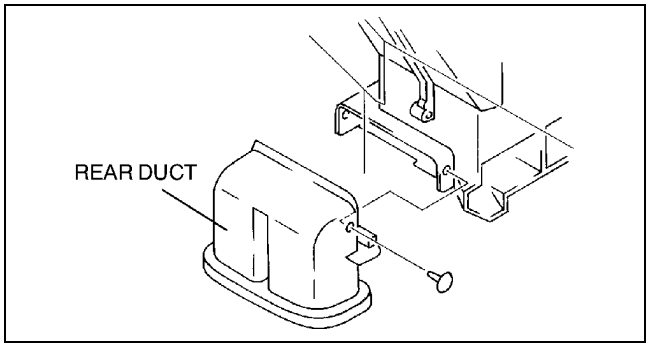


X3U711WAG

REAR DUCT REMOVAL/INSTALLATION

A3U071161271W01

1. Remove the side wall.
2. Remove in the rear duct.
3. Install in the reverse order of removal.



Z3U0711W025

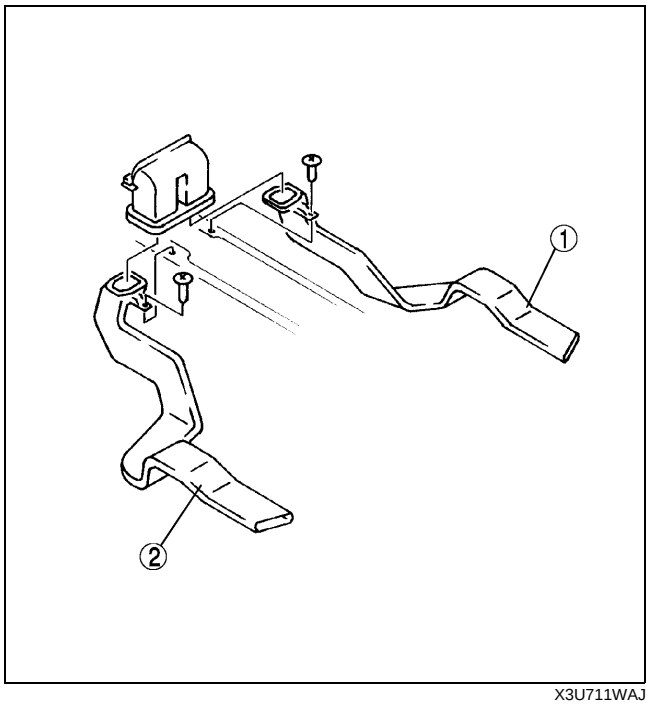
REAR HEAT DUCT REMOVAL/INSTALLATION

A3U071161273W01

1. Turn the floor covering over. (See 09–17–17 FLOOR COVERING REMOVAL/INSTALLATION.)
2. Remove in the order indicated in the table.

1	Rear heat duct (RH)
2	Rear heat duct (LH)

3. Install in the reverse order of removal.



X3U711WAJ

A/C COMPRESSOR REMOVAL/INSTALLATION

A3U071161450W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT RECOVERY.) (See 07–10–3 REFRIGERANT CHARGING.)
3. Remove the splash shield (RH) and fresh-air duct.
4. Loosen the mounting bolts, nuts, and the adjusting lock bolt of the power steering oil pump.
5. Loosen the drive belt (P/S + A/C) and remove it. (See 01–10B–4 DRIVE BELT ADJUSTMENT [FS].)

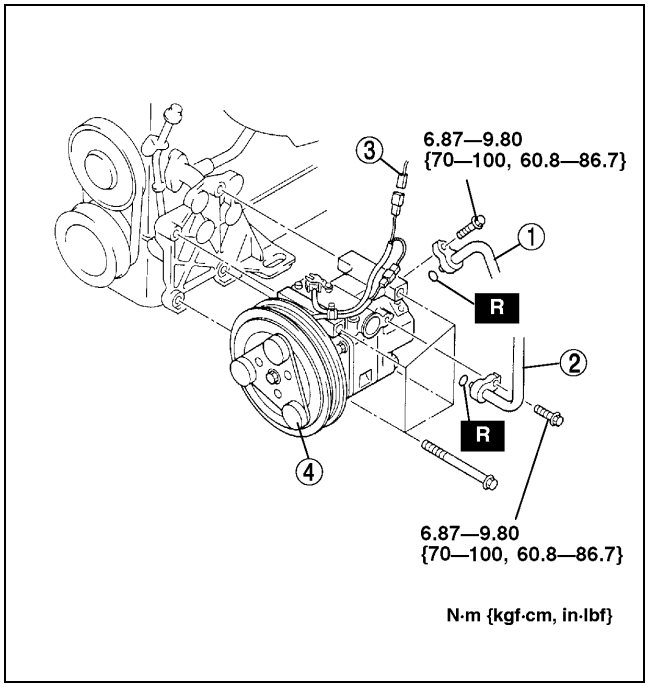
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

6. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See 07–11–16 Refrigerant Lines Installation Note)
2	Cooler hose (LO) (See 07–11–16 Refrigerant Lines Installation Note)
3	Connector
4	A/C compressor (See 07–11–12 A/C Compressor Installation Note)

7. Install in the reverse order of removal.
8. Adjust the drive belt (P/S + A/C). (See 01–10B–4 DRIVE BELT ADJUSTMENT [FS].)
9. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



Y3U711WA1

A/C Compressor Installation Note

1. Remove the following amount of compressor oil from the new A/C compressor when replacing the A/C compressor.

   Compressor oil to be removed (approximate quantity)
   150 ml {150 cc, 5.07 fl oz} - [compressor oil from old A/C compressor + 15 ml {15 cc, 0.5 fl oz}]

CONDENSER REMOVAL/INSTALLATION

A3U071161480W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT CHARGING.)
3. Pull up the coolant reservoir.
4. Remove the fresh-air duct, radiator bracket, air cleaner, resonance chamber, and mass airflow sensor connector.

Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

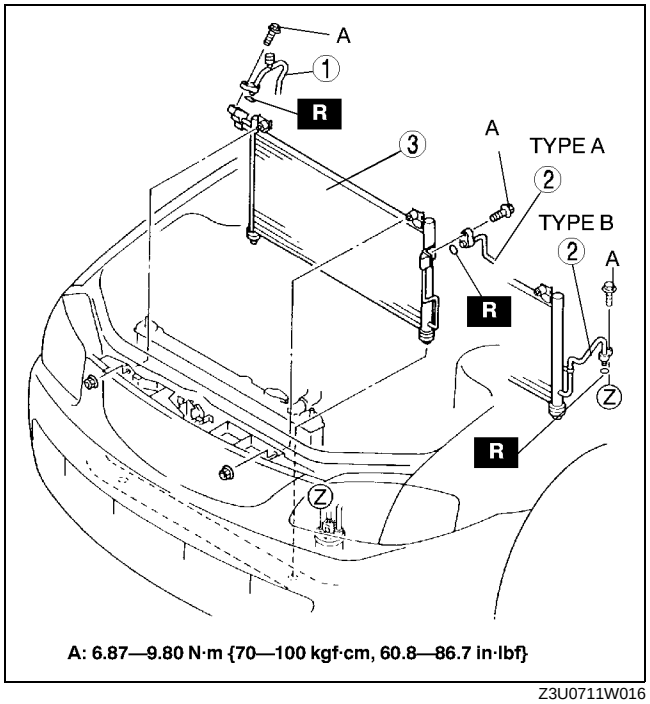
Note

- Two kinds of condensers are used:
  — TYPE A (condenser without pipe)
  — TYPE B (condenser with pipe)

5. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See 07–11–16 Refrigerant Lines Installation Note)
2	Cooler pipe No.1 (type A) or outlet pipe of condenser (type B) (See 07–11–16 Refrigerant Lines Installation Note)
3	Condenser (See 07–11–13 Condenser Installation Note)

6. Install in the reverse order of removal.
7. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



Z3U0711W016

Condenser Installation Note

1. When installing a new condenser, add a supplemental amount of ATMOS GU10 compressor oil into the refrigeration cycle.

   Supplemental amount (approximate quantity)
   30 ml {30 cc, 1.0 fl oz}

CONDENSER INSPECTION

A3U071161480W02

1. Inspect for cracks, damage, and oil leakage.
   - If any are found, replace the condenser.
2. Inspect for fins clogged by dust.
   - If any are clogged, remove the dust from the fins.
3. Inspect for bent fins.
   - If any are bent, use a flathead screwdriver to straighten them.

RECEIVER/DRIER REMOVAL/INSTALLATION

A3U071161501W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT RECOVERY.) (See 07–10–3 REFRIGERANT CHARGING.)
3. Pull up the coolant reservoir.
4. Remove the fresh-air duct, air cleaner, and resonance chamber.

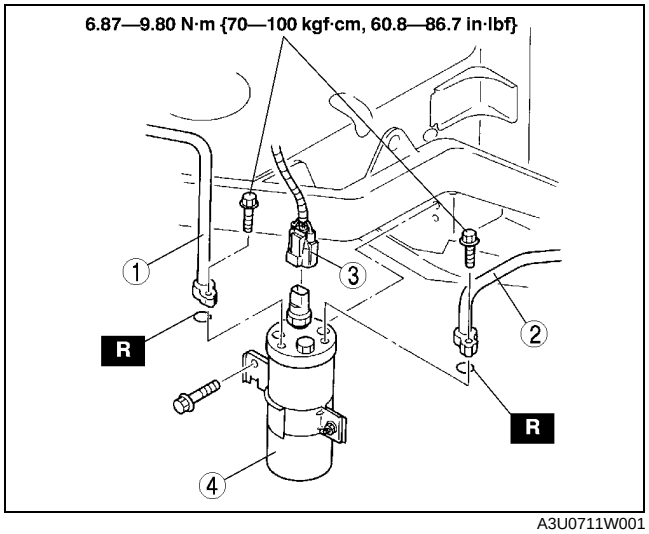
Caution

- **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

5. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler pipe No.2 (See 07–11–16 Refrigerant Lines Installation Note)
2	Cooler pipe No.1 (type A) or outlet pipe of condenser (type B) (See 07–11–16 Refrigerant Lines Installation Note)
3	Connector
4	Receiver/drier (See 07–11–14 Receiver/drier Installation Note)

6. Install in the reverse order of removal.
7. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)



A3U0711W001

Receiver/drier Installation Note

1. When installing a new receiver/drier, add a supplemental amount of ATMOS GU10 compressor oil into the refrigeration cycle.

   Supplemental amount (approximate quantity)
   10 ml {10 cc, 0.3 fl oz}

REFRIGERANT LINES REMOVAL/INSTALLATION

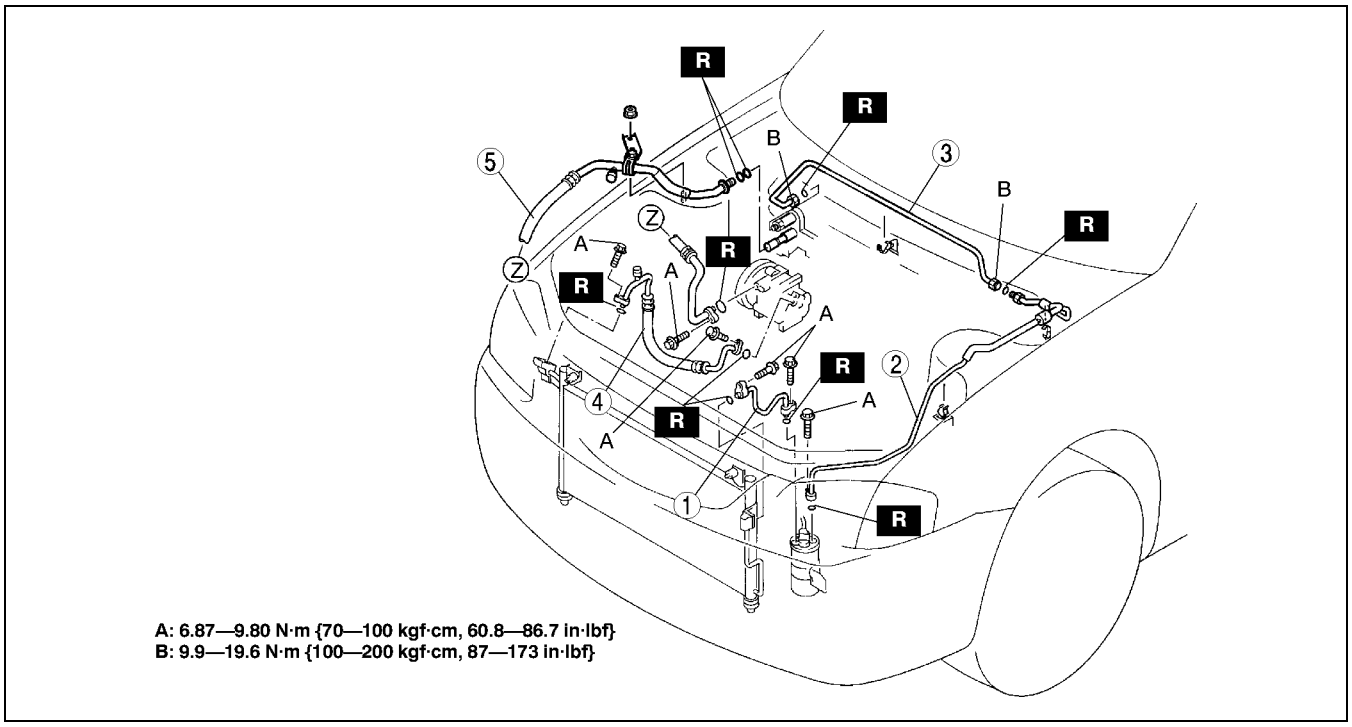
A3U071161460W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See 07–10–3 REFRIGERANT RECOVERY.) (See 07–10–3 REFRIGERANT CHARGING.)
3. Pull up the coolant reservoir.
4. Remove the fresh-air duct, radiator bracket, air cleaner, and resonance chamber.

   Caution
   - **If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.**

5. Remove in the order indicated in the table. Do not allow compressor oil to spill.
6. Install in the reverse order of removal.

7. Perform the refrigerant system performance test. (See 07–10–2 REFRIGERANT SYSTEM PERFORMANCE TEST.)

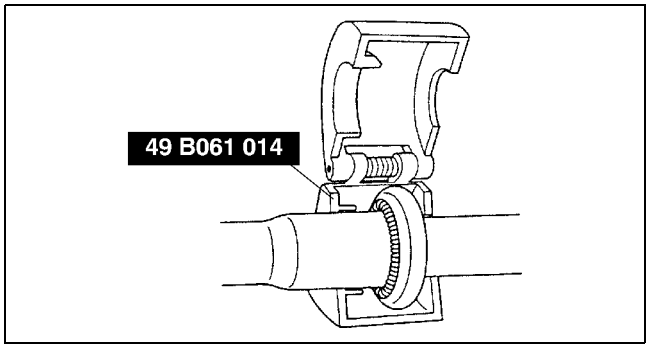


Z3U0711W018

1	Cooler pipe No.1 (type A only) (See 07–11–16 Refrigerant Lines Installation Note)
2	Cooler pipe No.2 (See 07–11–15 Refrigerant Lines Removal Note) (See 07–11–16 Refrigerant Lines Installation Note)
3	Cooler pipe No.3 (See 07–11–15 Refrigerant Lines Removal Note) (See 07–11–16 Refrigerant Lines Installation Note)
4	Cooler hose (HI) (See 07–11–16 Refrigerant Lines Installation Note)
5	Cooler hose (LO) (See 07–11–15 Refrigerant Lines Removal Note) (See 07–11–16 Refrigerant Lines Installation Note)

Refrigerant Lines Removal Note
Nut joint type
1. Loosen the nut using 2 spanners, then remove the cooler pipe or hose.

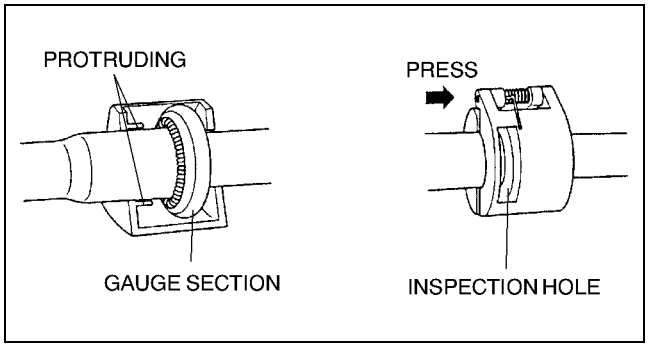
Spring-lock coupling type
1. Set the **SST**.



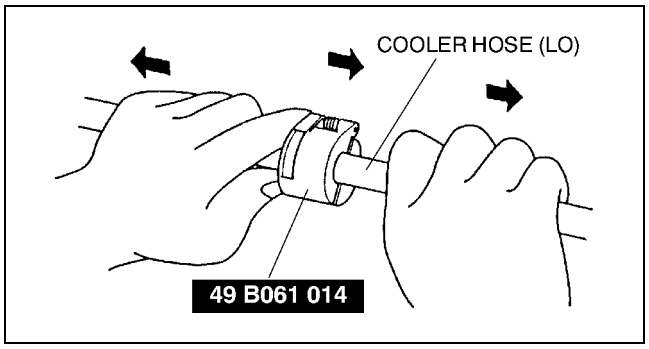
Z3U0711W019

2. While looking through the inspection hole of the **SST**, insert the protruding part of the **SST** until it makes contact with the gauge section.
3. Use the **SST** to disconnect the cooler hose (LO) from cooling unit by pulling the cooler hose (LO) side.

Note
- The cooler hose (LO) can be disconnected easily from cooling unit by pulling from the cooler hose (LO) while maintaining the pressure of the protruding part of the **SST**.



Z3U0711W020



Z3U0711W021

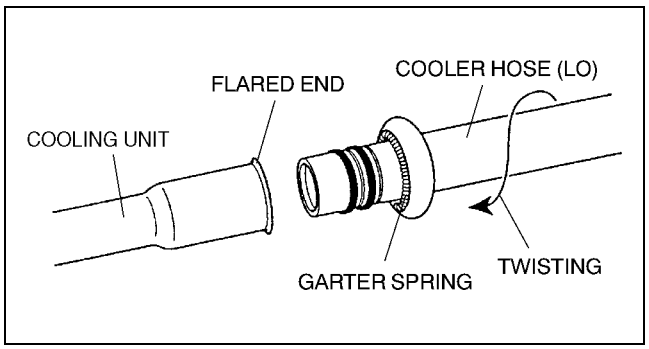
Refrigerant Lines Installation Note
1. When installing a new cooler pipe or hose, add a supplemental amount of ATMOS GU10 compressor oil into the refrigeration cycle.

   Supplemental amount (approximate quantity)
   5 ml {5 cc, 0.2 fl oz}

2. Apply compressor oil to the O-rings and connect the joints.
3. Tighten the joints.

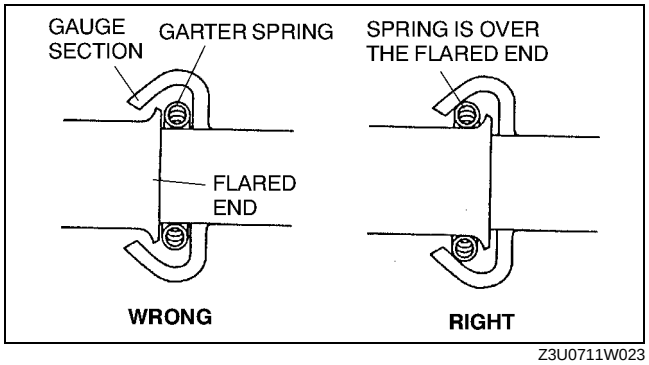
Nut or block joint type
1. Tighten the nut or bolt of the joint by hand.
2. Tighten the joint to the specified torque wrench.

Spring-lock coupling type
1. Connect the cooler hose (LO) by twisting it onto cooling unit until the garter spring at the cooler hose (LO) is over the flared end of cooling unit.



Z3U0711W022

Note
- When the cooler hose (LO) is replaced, the indicator ring comes out after connecting to indicate that it is locked.

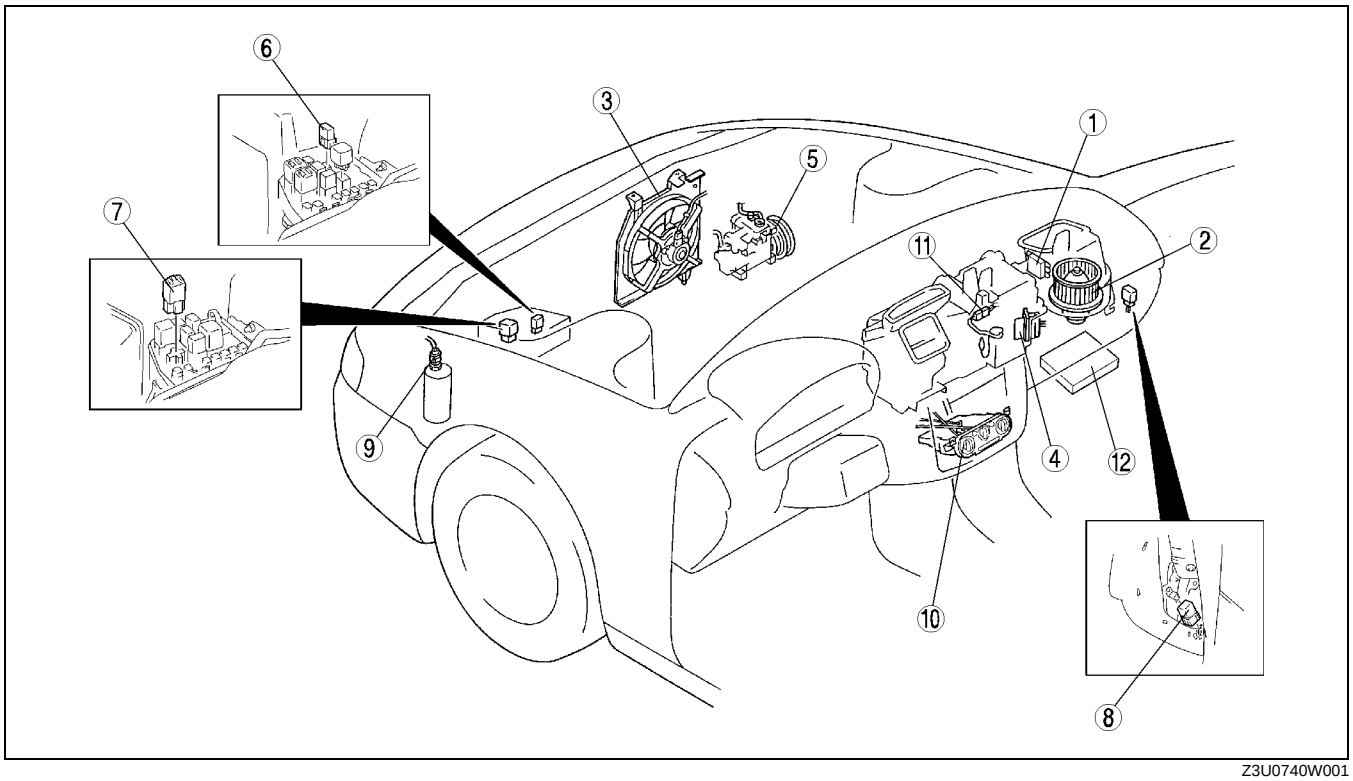


Z3U0711W023

07–40 CONTROL SYSTEM

CONTROL SYSTEM LOCATION INDEX

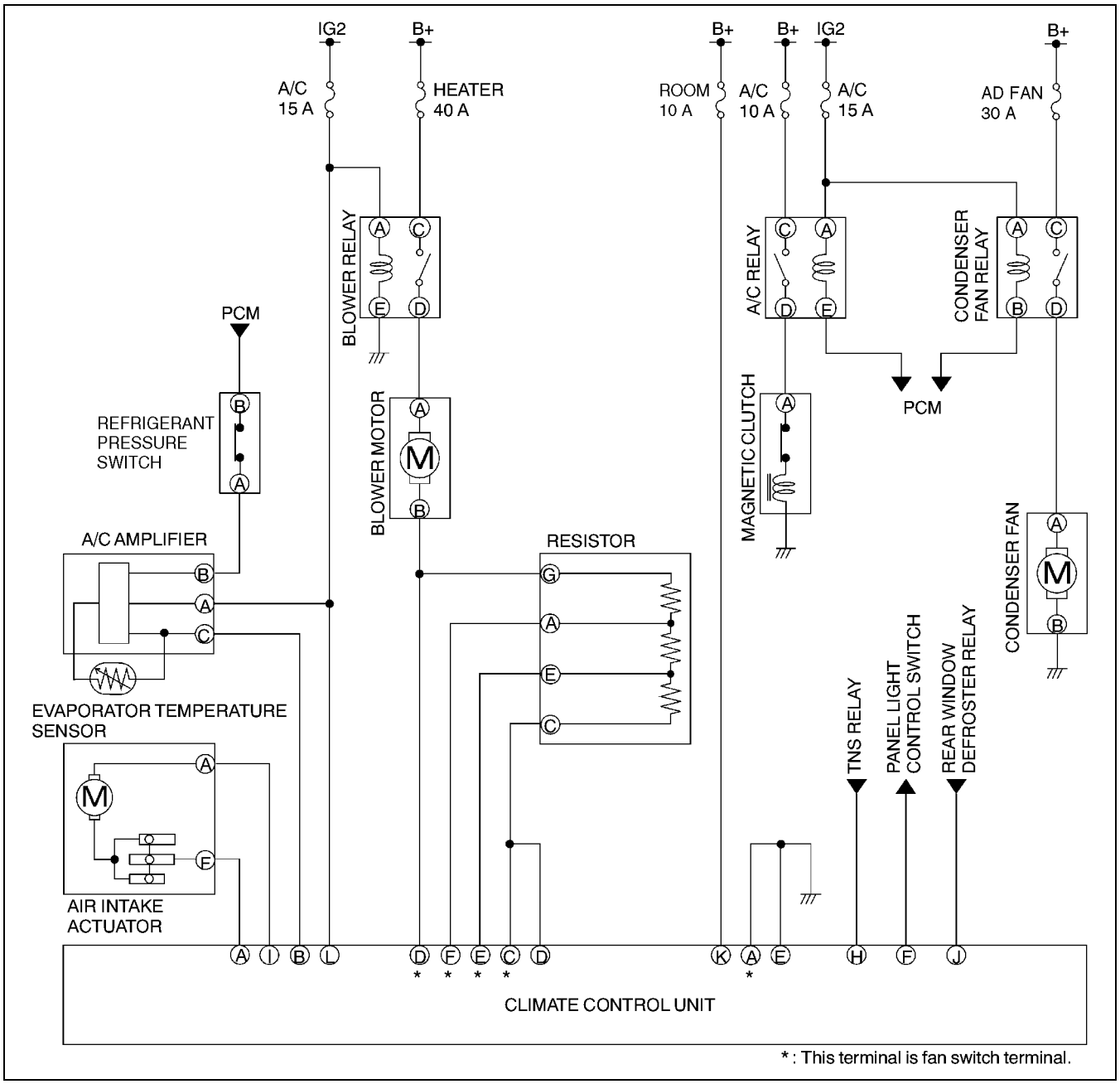
A3U074001070W01



Z3U0740W001

1	Air intake actuator (See 07–40–3 AIR INTAKE ACTUATOR REMOVAL/INSTALLATION) (See 07–40–4 AIR INTAKE ACTUATOR INSPECTION)
2	Blower motor (See 07–40–4 BLOWER MOTOR REMOVAL/INSTALLATION) (See 07–40–5 BLOWER MOTOR INSPECTION)
3	Condenser fan (See 07–40–5 CONDENSER FAN REMOVAL/INSTALLATION) (See 07–40–5 CONDENSER FAN INSPECTION)
4	Resistor (See 07–40–6 RESISTOR REMOVAL/INSTALLATION) (See 07–40–6 RESISTOR INSPECTION)
5	Magnetic clutch (See 07–40–6 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY) (See 07–40–7 MAGNETIC CLUTCH ADJUSTMENT) (See 07–40–8 MAGNETIC CLUTCH INSPECTION)
6	A/C relay (See 09–21–5 RELAY INSPECTION)
7	Condenser fan relay (See 09–21–5 RELAY INSPECTION)
8	Blower relay (See 09–21–5 RELAY INSPECTION)
9	Refrigerant pressure switch (See 07–40–9 REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION) (See 07–40–9 REFRIGERANT PRESSURE SWITCH INSPECTION)
10	Climate control unit (See 07–40–9 CLIMATE CONTROL UNIT REMOVAL) (See 07–40–10 CLIMATE CONTROL UNIT INSTALLATION) (See 07–40–10 CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY) (See 07–40–11 CLIMATE CONTROL UNIT INSPECTION)
11	A/C amplifier (See 07–40–13 A/C AMPLIFIER INSPECTION)
12	PCM (See 01–40B–7 PCM REMOVAL/INSTALLATION [FS]) (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM]) (See 01–40B–7 PCM INSPECTION [FS]) (See 01–40A–7 PCM INSPECTION [ZM])

System Wiring Diagram



Z3U0740W002

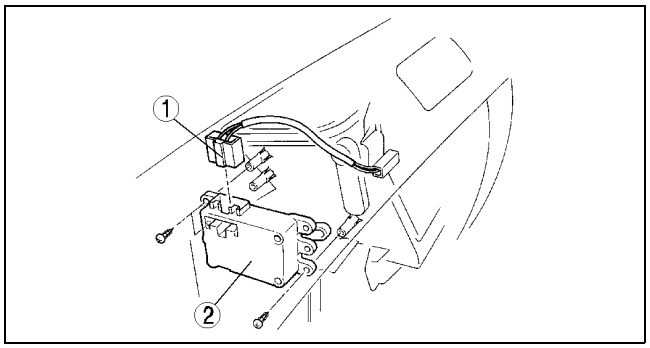
AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

A3U074061060W01

1. Disconnect the negative battery cable.
2. Remove the cooling unit. (See 07–11–3 COOLING UNIT REMOVAL/INSTALLATION.)
3. Remove in the order indicated in the table.

1	Connector
2	Air intake actuator

4. Install in the reverse order of removal.



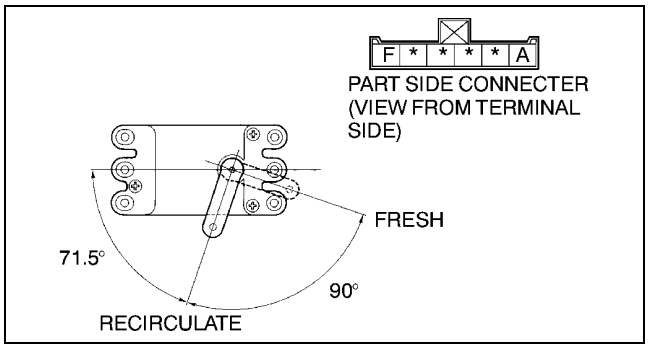
Z3U0740W003

AIR INTAKE ACTUATOR INSPECTION

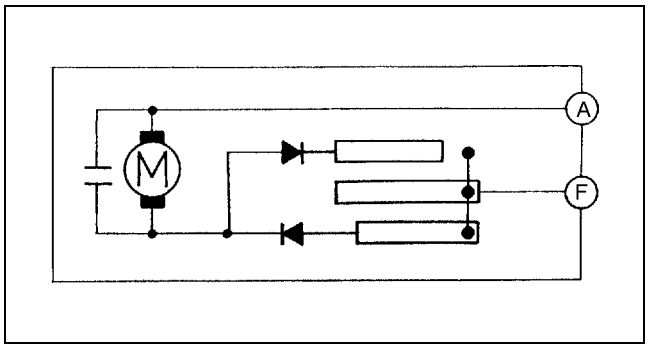
A3U074061060W02

1. Remove the air intake actuator. (See 07–40–3 AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.)
2. Connect B+ to terminal A or F and ground to terminal F or A of the air intake actuator.
3. Verify that the air intake actuator operates as shown below.

Connection		Movement
B+	GND	
A	F	FRESH → RECIRCULATE
F	A	RECIRCULATE → FRESH



Z3U0740W004



Z3U0740W005

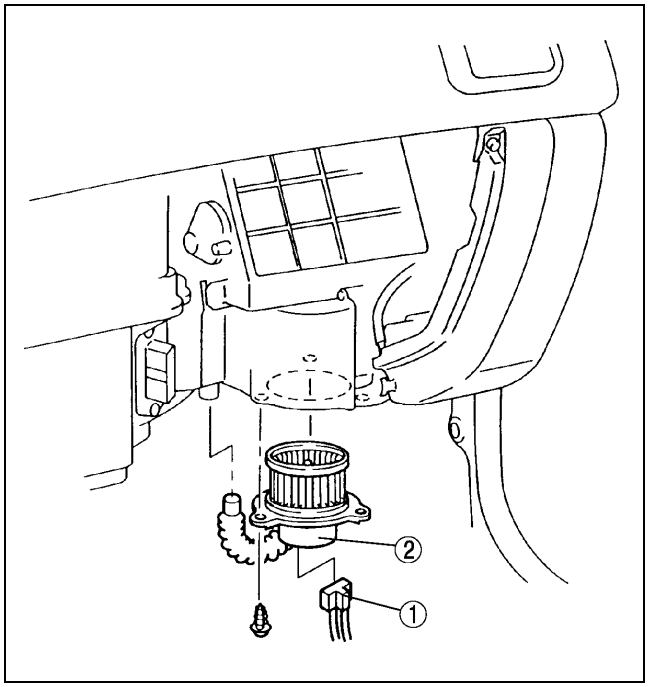
BLOWER MOTOR REMOVAL/INSTALLATION

A3U074061020W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Connector
2	Blower motor

4. Install in the reverse order of removal.

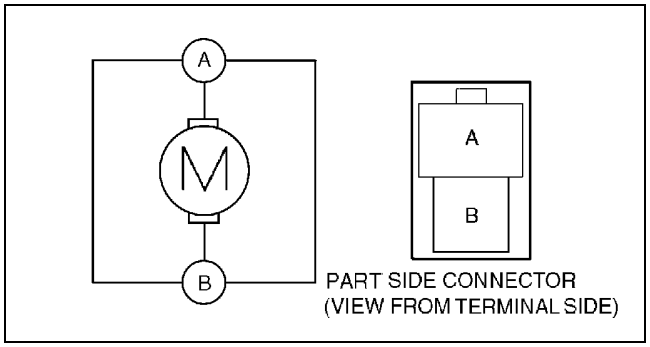


X3U740WA1

BLOWER MOTOR INSPECTION

A3U074061020W02

1. Disconnect the blower motor connector.
2. Connect B+ to terminal A and ground to terminal B of the blower motor and verify its operation.
   - If not as specified, replace the blower motor.



Y3U740WA0

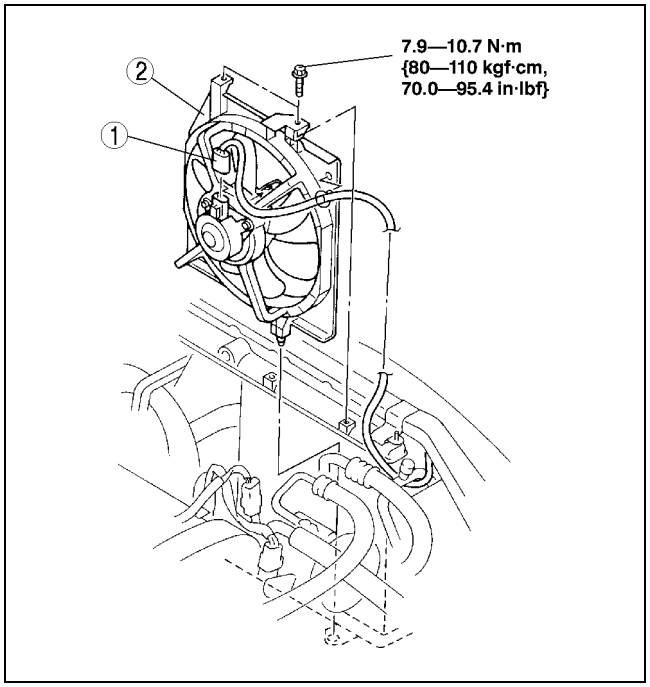
CONDENSER FAN REMOVAL/INSTALLATION

A3U074061710W01

1. Disconnect the negative battery cable.
2. Remove the fresh-air duct.
3. Remove in the order indicated in the table.

1	Connector
2	Condenser fan

4. Install in the reverse order of removal.

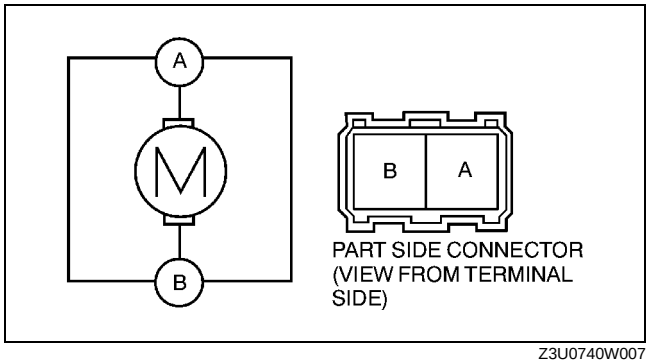


Z3U0740W006

CONDENSER FAN INSPECTION

A3U074061710W02

1. Disconnect the condenser fan connector.
2. Connect B+ to terminal A and ground to terminal B of the condenser fan and verify its operation.
   - If not as specified, replace the condenser fan.



Z3U0740W007

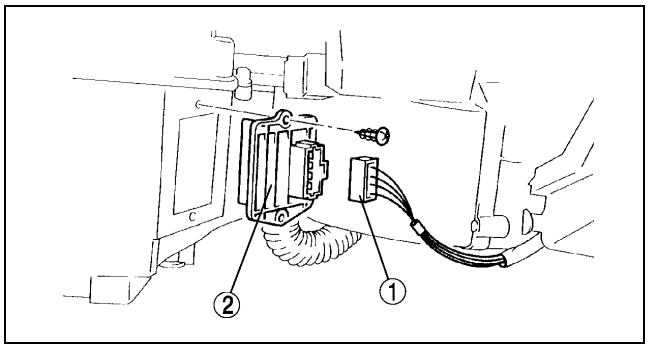
RESISTOR REMOVAL/INSTALLATION

A3U074061015W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Connector
2	Resistor

4. Install in the reverse order of removal.



X3U740WA5

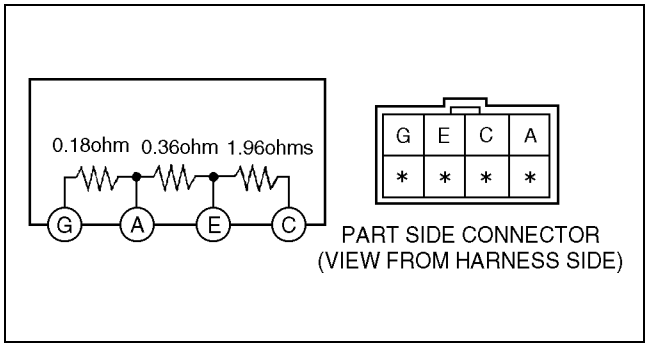
RESISTOR INSPECTION

A3U074061015W02

1. Remove the glove compartment.
2. Disconnect the resistor connector.
3. Verify that the resistance between the terminals of the resistor is as indicated in the table.

Terminal	Resistance (ohm)
G-A	0.17—0.19
G-E	0.51—0.58
G-C	2.35—2.70

- If not as specified, replace the resistor.



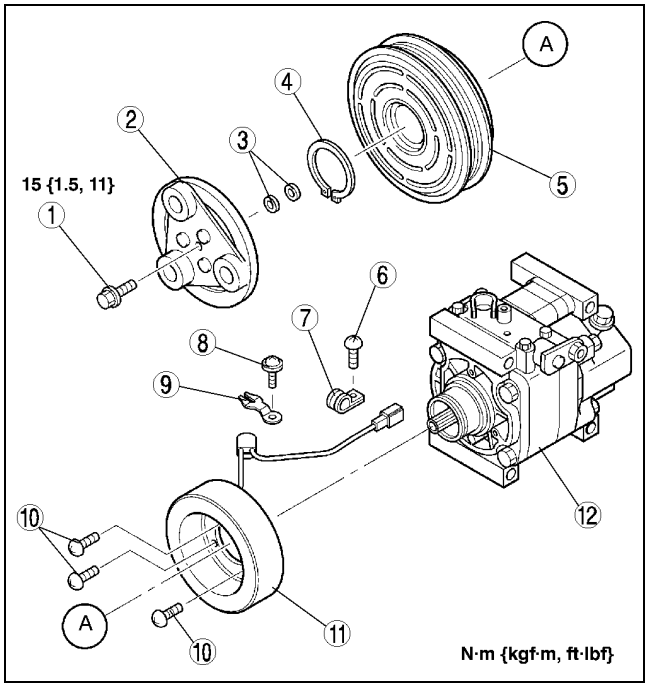
Z6E8540W002

MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY

A3U074061010W01

1. Disassemble in the order indicated in the table.

1	Bolt (See 07–40–7 Bolt Removal/Installation Note)
2	Pressure plate
3	Shim
4	Snap ring (See 07–40–7 Snap Ring Installation Note)
5	A/C compressor pulley
6	Screw (See 07–40–7 Screw Installation Note)
7	Clip
8	Screw (See 07–40–7 Screw Installation Note)
9	Clamp (See 07–40–7 Clamp Installation Note)
10	Screw (See 07–40–7 Screw Installation Note)
11	Stator and thermal protector (See 07–40–7 Stator and Thermal Protector Removal Note) (See 07–40–7 Stator and Thermal Protector Installation Note)
12	A/C compressor body

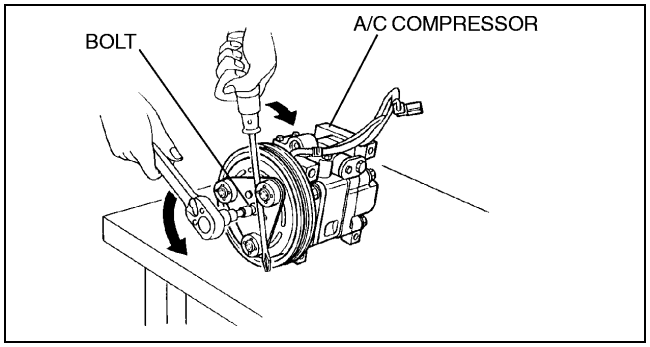


Z3U0740W009

2. Assemble in the reverse order of disassembly.
3. Adjust the magnetic clutch clearance. (See 07–40–7 MAGNETIC CLUTCH ADJUSTMENT.)

Bolt Removal/Installation Note

1. When removing or installing the bolt, hold the pressure plate in place as shown in the figure.
2. When installing a new A/C compressor body, replace the bolt.



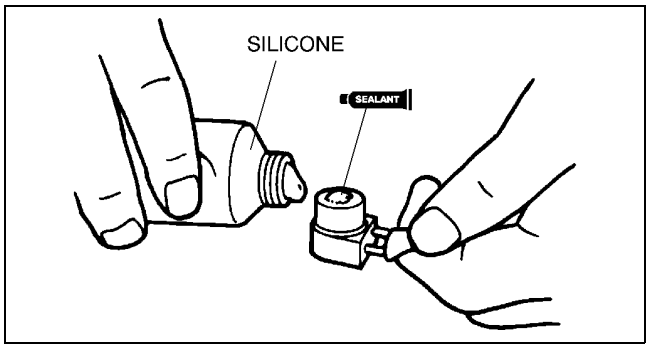
X3U740WA8

Stator and Thermal Protector Removal Note

1. After removing the thermal protector, completely remove the silicone adhering to the A/C compressor side.

Stator and Thermal Protector Installation Note

1. Apply **approximately 1 g {0.04 oz}** of silicone (Shin-Etsu Silicone KE-347W or similar)



Z3U0740W010

Screw Installation Note

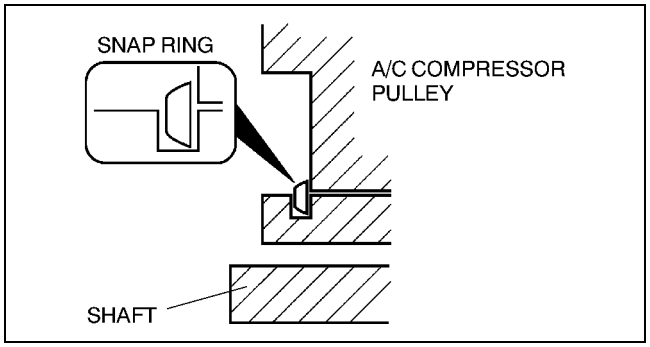
1. When installing a new stator and thermal protector, replace the screw.

Clamp Installation Note

1. When installing a new stator and thermal protector, replace the clamp.

Snap Ring Installation Note

1. When installing a new pressure plate, A/C compressor pulley, stator and thermal protector, or A/C compressor body, replace the snap ring.



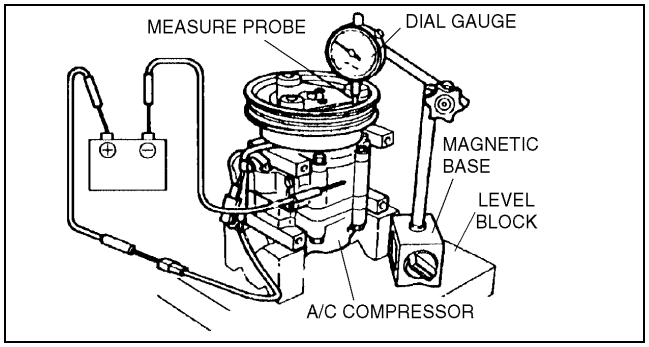
Z3U0740W011

MAGNETIC CLUTCH ADJUSTMENT

A3U074061010W02

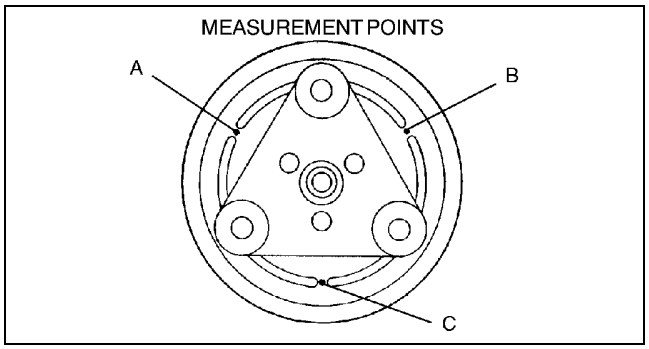
1. Set the A/C compressor on a level block.
2. Turn on the magnetic clutch by connecting the B+ to the magnetic clutch connector terminal and the ground to the A/C compressor body.

3. Fix a dial gauge on a magnetic base and set the measuring probe onto point A on the pressure plate surface.
4. Turn off the magnetic clutch by disconnecting the ground from the A/C compressor body, then measure the dial gauge readings.



X3U740WA9

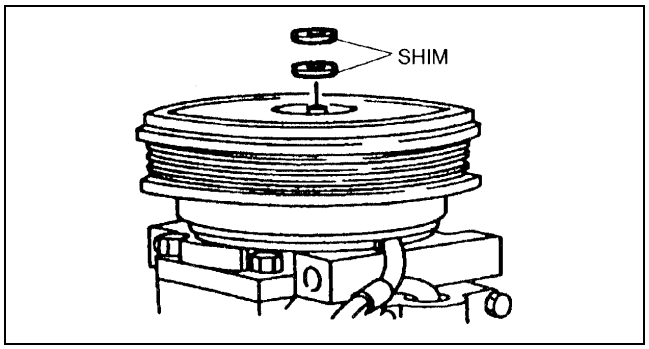
5. Measure the clearance for points B and C on the pressure plate surface by repeating the above Steps 2 through 4.



Z3U0740W020

6. Verify that the clearance is within the specification.
   - If not within the specification, remove the pressure plate and adjust the clearance by changing the shim (**0.2 mm {0.008 in}, 0.5 mm {0.02 in}**) or the number of shims. (See 07–40–6 MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY.)

   Clearance
   0.4—0.6 mm {0.016—0.023 in}

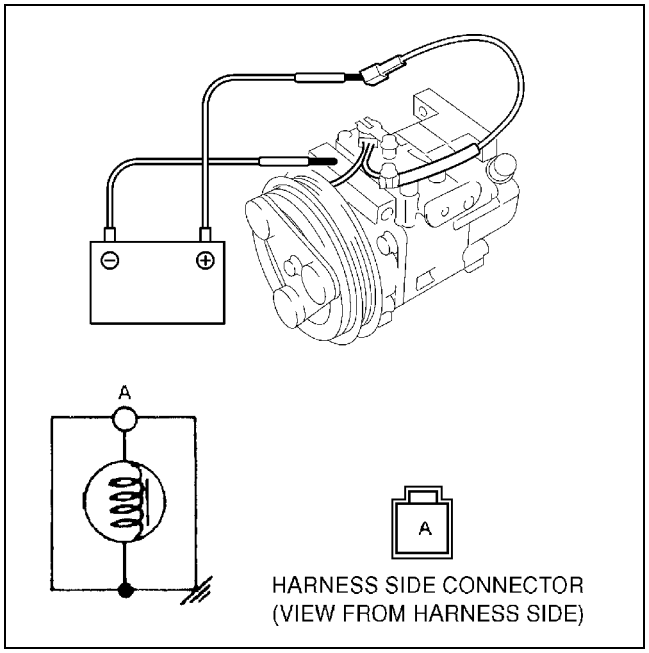


X3U740WAB

MAGNETIC CLUTCH INSPECTION

A3U074061010W03

1. Disconnect the magnetic clutch connector.
2. Connect B+ to terminal A of magnetic clutch and ground to the A/C compressor body.
3. Verify that the magnetic clutch operates.
   - If not as specified, replace the stator and thermal protector.

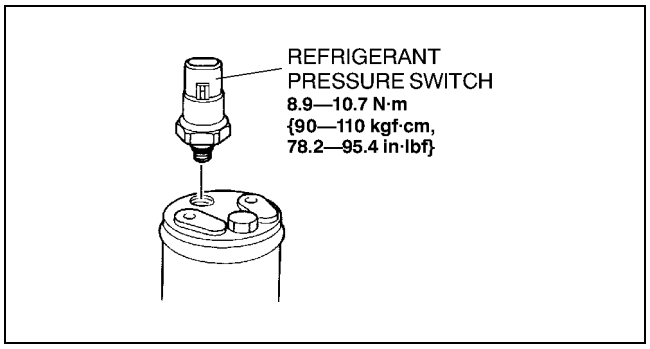


Z3U0740W012

REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

A3U074061503W01

1. Disconnect the negative battery cable.
2. Remove the receiver/drier. (See 07–11–13 RECEIVER/DRIER REMOVAL/INSTALLATION.)
3. Remove the refrigerant pressure switch. (See 07–40–9 Refrigerant Pressure Switch Installation Note)
4. Install in the reverse order of removal.



A3U0740W001

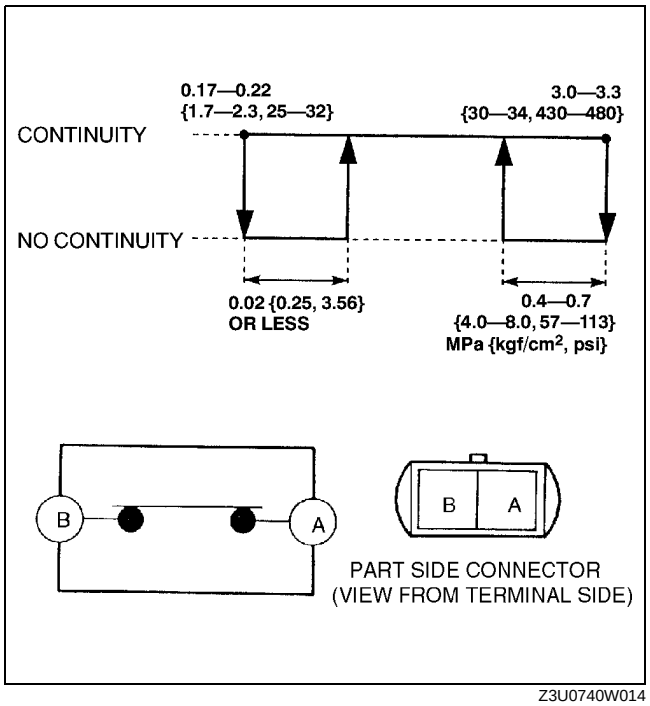
Refrigerant Pressure Switch Installation Note

1. Apply compressor oil to the O-ring and connect the joint.

REFRIGERANT PRESSURE SWITCH INSPECTION

A3U074061503W02

1. Install the manifold gauge set.
2. Disconnect the refrigerant pressure switch connector.
3. Verify the high-pressure side reading of the manifold gauge and continuity between the terminals of the refrigerant pressure switch.
   - If not as specified, replace the refrigerant pressure switch.

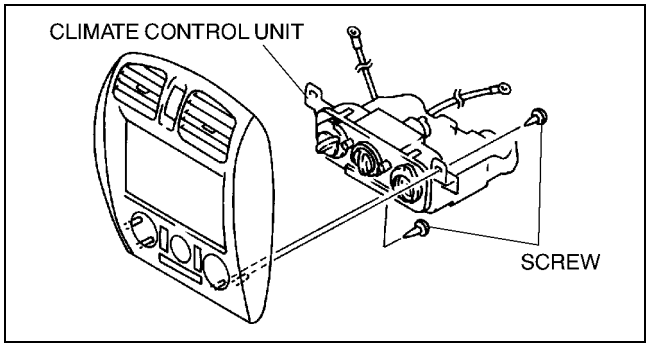


Z3U0740W014

CLIMATE CONTROL UNIT REMOVAL

A3U074061190W01

1. Disconnect the negative battery cable.
2. Disconnect the air mix and airflow mode wires from each wire clamp and link.
3. Remove the center panel. (See 09–17–4 CENTER PANEL REMOVAL/INSTALLATION.)
4. Remove the screws and the climate control unit.

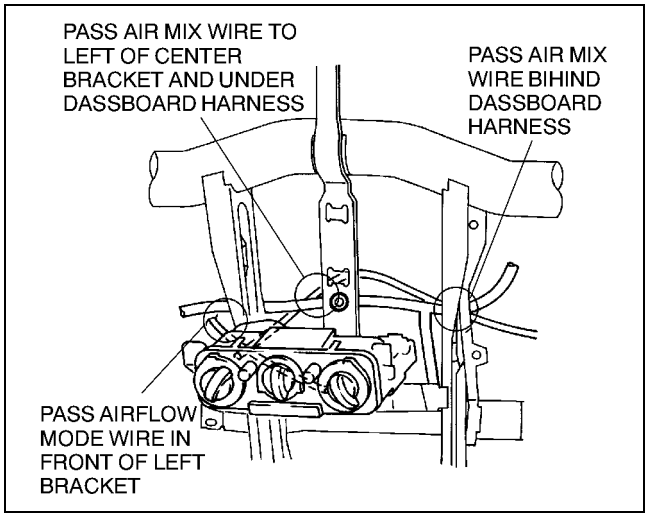


Z3U0740W015

CLIMATE CONTROL UNIT INSTALLATION

A3U074061190W02

1. Install the climate control unit to the center panel.
2. Pass each wire through the following routes then connect to each unit.
3. Connect the climate control unit connectors.
4. Install the center panel.
5. Adjust the climate control unit wire. (See 07–40–11 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.)
6. Connect the negative battery cable.



Z3U0740W016

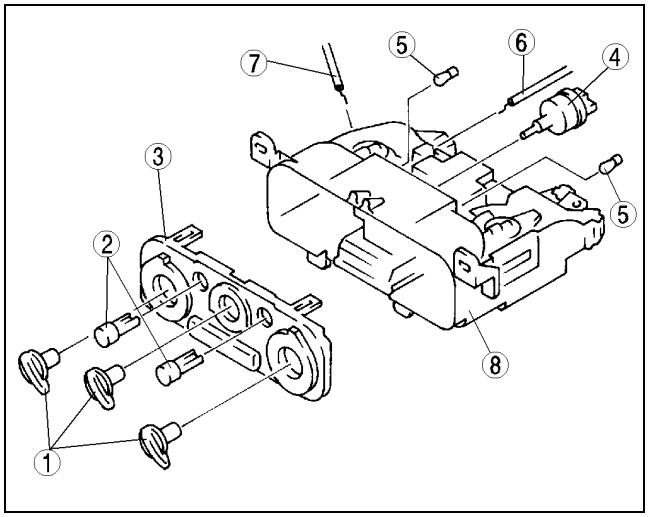
CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY

A3U074061190W03

1. Disassemble in the order indicated in the table.

1	Dial
2	Knob
3	Panel
4	Fan switch
5	Illumination bulb
6	Air mix wire (See 07–40–10 Wire Disassembly Note) (See 07–40–11 Wire Assembly Note)
7	Airflow mode wire (See 07–40–10 Wire Disassembly Note) (See 07–40–11 Wire Assembly Note)
8	Body

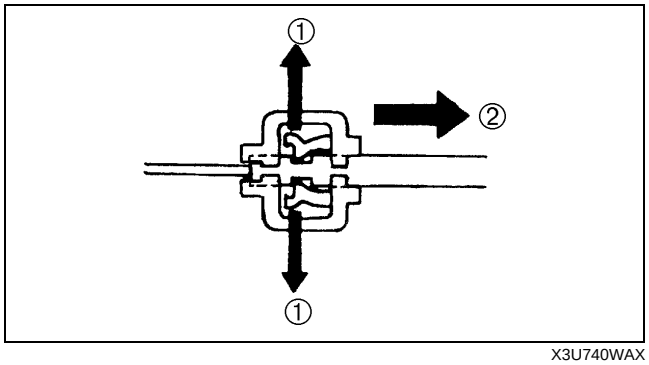
2. Assemble in the reverse order of disassembly.



Y3E8540W028

Wire Disassembly Note

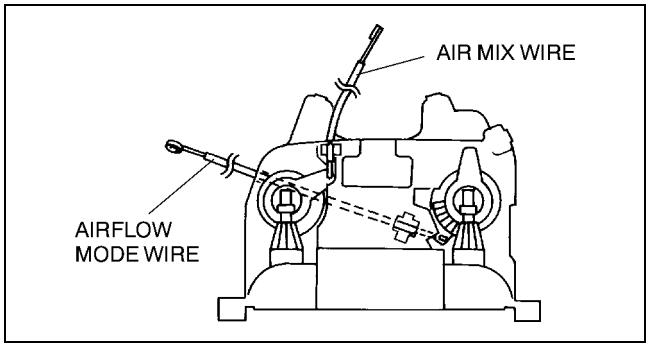
1. Disassemble the wires in the order indicated in the table.



X3U740WAX

Wire Assembly Note

1. Assemble the wires in the order indicated in the table.



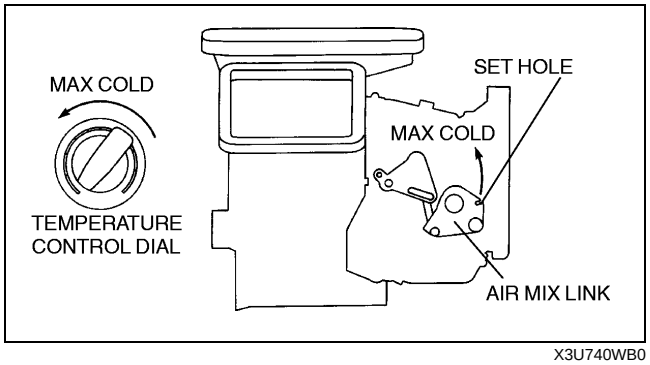
Z3U0740W018

CLIMATE CONTROL UNIT WIRE ADJUSTMENT

A3U074061190W04

Air Mix Wire

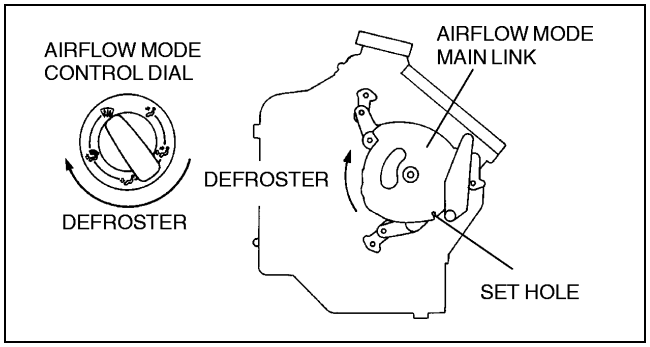
1. Set the temperature control dial at max cold.
2. Set the air mix link to max cold in the direction shown by the arrow and insert a screwdriver at the set hole.
3. Connect the air mix wire to air mix link.
4. Clamp the air mix wire to wire clamp.
5. Verify that the temperature control dial moves its full stroke.



X3U740WB0

Airflow Mode Wire

1. Set the airflow mode control dial at defroster.
2. Set the airflow mode main link to defroster in the direction shown by the arrow and insert a screwdriver at the set hole.
3. Connect the airflow mode wire to airflow mode main link.
4. Clamp the airflow mode wire to wire clamp.
5. Verify that the airflow mode control dial moves its full stroke.



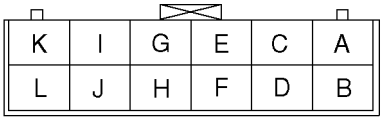
X3U740WB1

CLIMATE CONTROL UNIT INSPECTION

A3U074061190W05

1. Remove the climate control unit.
2. Connect the climate control unit connector.
3. Turn the ignition switch to ON position.
4. Measure the voltage at each climate control unit terminal and refer to the terminal voltage list.
   - If not as specified, inspect the parts listed under “Action” and the related wiring harness.
     — If there is any malfunction, replace the climate control unit.

Terminal voltage list (Reference)



PART SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Y3E8540W027

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A	Fresh signal	Air intake actuator	RECIRCULATE	0.3	• Inspect air intake actuator • Inspect related harness
			FRESH	11.3	
B	A/C signal	A/C amplifier	Fan switch ON, A/C switch ON	1.45	• Inspect for continuity or short circuit (Climate control unit—A/C amplifier: B—C) • Inspect A/C amplifier
			Fan switch OFF	10.3	
C	—	—	—	—	—
D	A/C signal	Fan switch	Fan switch OFF	B+	• Inspect for continuity or short circuit (Climate control unit—Fan switch, Resistor: D—C, C) • Inspect fan switch • Inspect resistor • Inspect related harness
			Fan switch 1st	0.12	
			Fan switch 2nd	0.65	
			Fan switch 3rd	0.60	
			Fan switch 4th	0.30	
E	GND	Ground	Under any condition	Below 1.0	• Inspect for continuity (A/C amplifier—Ground: E—GND) • Inspect related harness
F	TNS signal	Panel light control switch	Light switch ON and panel light control switch at max. illumination	0.2	• Inspect for continuity or short circuit (Climate control unit—Panel light control switch: F—C) • Inspect panel light control switch • Inspect related harness
			Light switch ON and panel light control switch at min. illumination	9.7	
			Light switch OFF	0.1	
G	—	—	—	—	—
H	TNS signal	TNS relay	Light switch ON	B+	• Inspect for continuity or short circuit (Climate control unit—TNS relay: H—C) • Inspect TNS relay • Inspect headlight switch • Inspect related harness
			Light switch OFF	Below 1.0	• Inspect for short circuit (Climate control unit—TNS relay: H—C) • Inspect TNS relay • Inspect headlight switch
I	Recirculate signal	Air intake actuator	RECIRCULATE	11.3	• Inspect air intake actuator • Inspect related harness
			FRESH	0.3	
J	Rear window defroster relay control signal	Rear window defroster relay	Rear window defroster switch ON	0.1	• Inspect for continuity or short circuit (Climate control unit—Rear window defroster relay: J—E) • Inspect rear window defroster relay • Inspect related harness
			Rear window defroster switch OFF	B+	
K	Power supply	ROOM 10 A fuse	Under any condition	B+	• Inspect ROOM 10 A fuse • Inspect related harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
L	IG2	A/C 15 A fuse	Ignition switch at ON position	B+	• Inspect for continuity (Climate control unit—Fuse : L—A/C 15 A fuse) • Inspect A/C 15 A fuse • Inspect related harness
			Ignition switch at LOCK position	0.1	• Inspect for short circuit (Climate control unit—Fuse: L—A/C 15 A fuse)

Fan switch

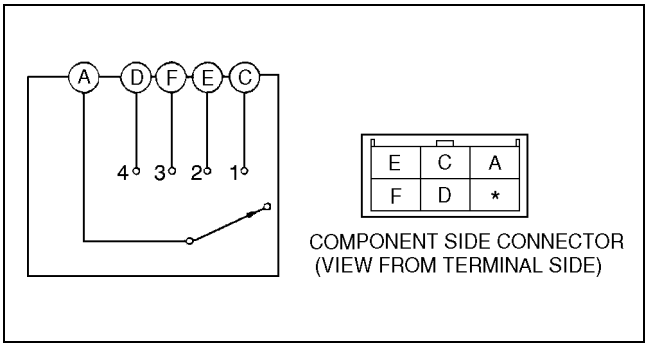
1. Remove the climate control unit.
2. Inspect for continuity between the fan switch terminals using an ohmmeter.

○—○ : Continuity

Switch position	Terminal				
	A	C	E	F	D
0					
1	○	○			
2	○		○		
3	○			○	
4	○				○

Y3E8540W026

- If not as specified, replace the fan switch.



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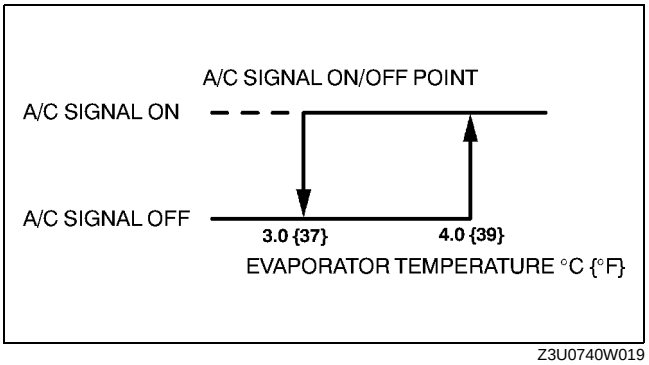
A/C AMPLIFIER INSPECTION

A3U074061790W01

Note

- A/C amplifier controls A/C signal as shown in the figure at right.

1. Remove the glove compartment.
2. Pull out the A/C amplifier with the connector still connected.
3. Turn the ignition switch to ON position.
4. Measure the voltage at each A/C amplifier terminal or climate control unit terminal and refer to the terminal voltage list.
   - If not as specified, inspect the parts listed under “Action” and the related wiring harness.
   - If there is no malfunction under “Action”, replace the A/C amplifier.



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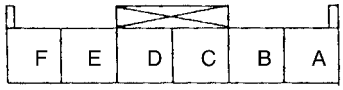
Terminal Voltage List (Reference)



PART SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

Y3E8540W024

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A	IG2	A/C 15 A fuse	Ignition switch at ON position	B+	• Inspect for continuity or short circuit (Fuse —A/C amplifier:A/C 15 A fuse —A) • Inspect A/C 15 A fuse • Inspect related harness
			Ignition switch at LOCK position	Below 1.0	
B	A/C signal	Refrigerant pressure switch	Fan switch at 1st position, A/C switch ON	0.6	• Inspect for continuity or short circuit (PCM—Refrigerant pressure switch:4F—B) (Refrigerant pressure switch—A/C amplifier:A—B) • Inspect terminal voltage of A/C amplifier (C) • Inspect refrigerant pressure switch • Inspect PCM (See 01–40B–7 PCM INSPECTION [FS]) (See 01–40A–7 PCM INSPECTION [ZM]) • Inspect related harness
			Fan switch OFF	12	
C	A/C switch	A/C switch	Fan switch OFF	11.5	• Inspect for short circuit (A/C amplifier—climate control unit: C—B) • Inspect terminal voltage of A/C amplifier (A)
			Fan switch at 1st position, A/C switch ON	0.6	• Inspect for continuity or short circuit (A/C amplifier—climate control unit: C—B) (climate control unit—fan switch:A—C) • Inspect A/C switch • Inspect fan switch
D	—	—	—	—	—
E	—	—	—	—	—
F	—	—	—	—	—

07–50 TECHNICAL DATA

HVAC TECHNICAL DATA

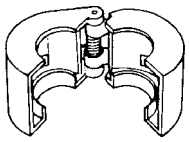
A3U075001038W01

Item			Specification
REFRIGERANT SYSTEM			
Refrigerant	Type		R-134a
	Regular amount (approximate quantity) (g {oz})		600 {21.2}
BASIC SYSTEM			
A/C compressor	Lubricating oil	Type	ATMOS GU10
		Sealed volume (approximate quantity) (ml {cc, fl oz}/rev)	150 {150, 5.07}
CONTROL SYSTEM			
Magnetic clutch	Clearance (mm {in})		0.4—0.6 {0.016—0.023}

07–60 SERVICE TOOLS

HVAC SST

A3U076001038W01

49 B061 014 Spring lock coupling disconnect tool 	—	—