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

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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.