

Climate Control (12.00)

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Climate Control (12.00)

Body Ventilation (12.01)

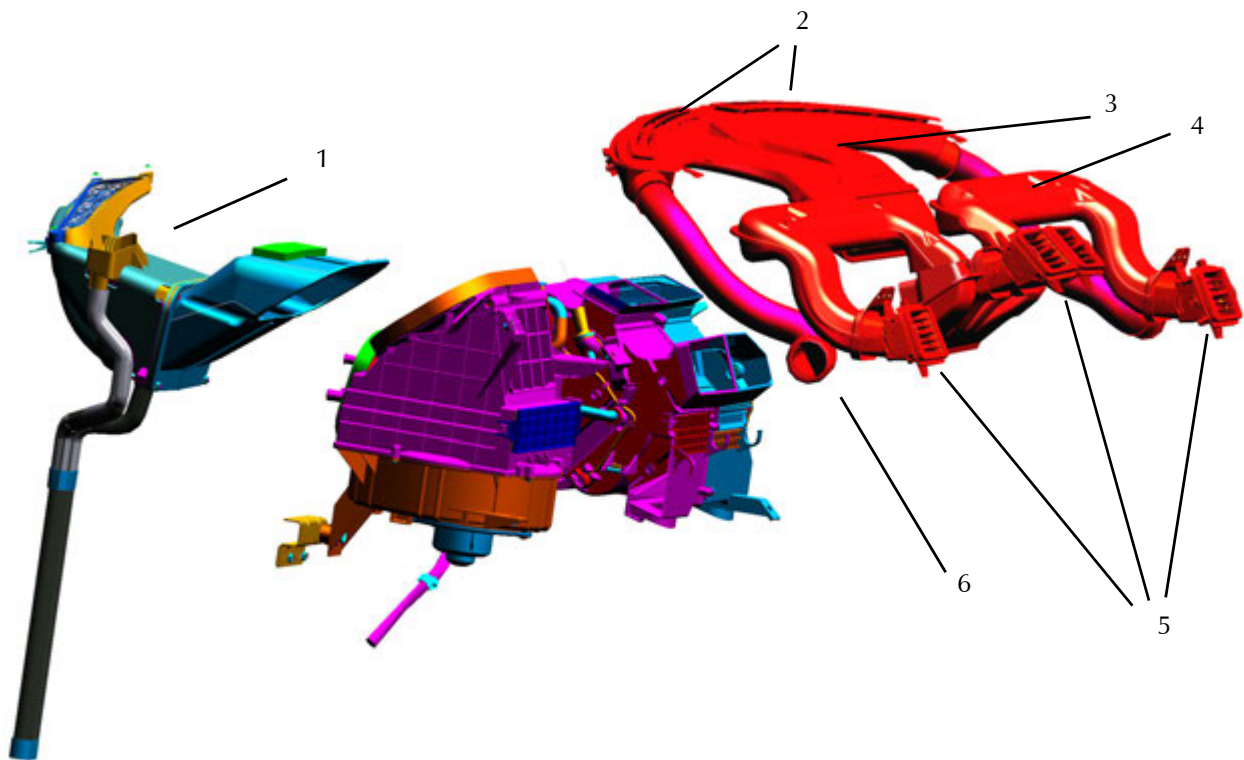
Air Intake & Distribution System

Outside air enters the plenum via inlets at the base of the windscreen.

Fresh mode - Air is drawn in through the plenum and into the blower unit. From the blower unit air enters the A/C unit where it is cooled and dehumidified as it passes through the evaporator. It is then 'reheated' to the selected temperature as it passes through the heater matrix,.

Air flows from the cabin into the boot via air vent grilles and through apertures in the rear parcel shelf. The air is exhausted from the vehicle through extraction vent assemblies (incorporating one way flaps) in the lower part of the rear bumpers, concealed by the bumper trim.

Recirculation mode - The air in the passenger compartment is drawn into the A/C system via the recirculation air inlets on the blower unit.



Item	Description	Item	Description
1.	Air Intake	4.	Cabin Distribution Box
2.	Windscreen air outlets	5.	Cabin air vents
3.	Defrost/Demist Ducting	6.	Side window air outlets

The A/C unit is linked and sealed to the defrost / demisting and cabin air ducting assemblies. The A/C unit incorporates two actuator operated flaps which regulate airflow to the selected air flow mode and temperature blend.

The centre vent duct incorporates a baffle plate which balances the volume of airflow of the centre and end of dash vents.

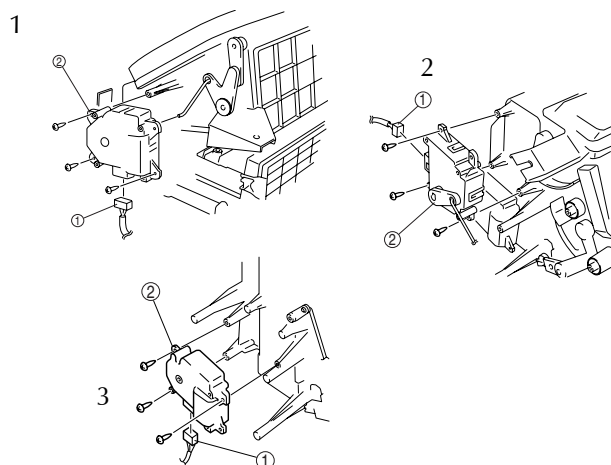
Maintenance

Actuators

Repair Operation Time (ROT)	
Item	Code
Actuators Renew	TBA

The A/C and blower unit assembly uses three actuators

- Blower unit
 - 1 Air intake actuator
- A/C unit
 - 2 Air mode actuator
 - 3 Air mix actuator



The removal procedure is the same for all three actuators.

To remove the blower unit actuator remove the A/C unit from the IP (Refer to 'A/C Unit', page 12-3-11).

Removal

1. Remove the IP from the vehicle (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).

To gain access to the Air mode and Air mix actuators remove the A/C control module (screws x3).

2. Disconnect the actuator control rod.



The lower actuator on the A/C unit requires to be firstly removed from the A/C unit.



3. Remove the wiring harness plugs and the screws (x3). Withdraw the actuator.

Install

1. Install the actuator (screws x3). Connect the wiring harness plug.
2. Connect the actuator control rod.
3. Install the A/C control module. Connect the wiring harness plug.
4. If removed, install the A/C unit to the IP (Refer to ' ', page 12-3-10).
5. Install the IP to the vehicle (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).

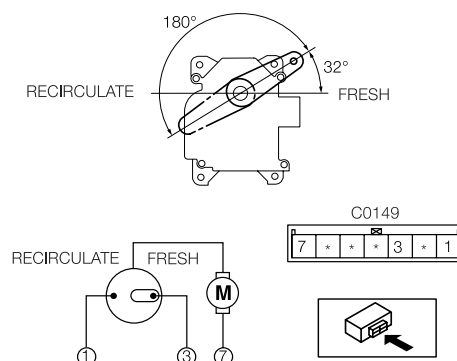
Air Intake Actuator

Inspection

1. Connect the battery positive voltage to Intake Actuator terminal 1 (or 3), and ground to terminal 3 (or 1).
2. Verify that the Air Intake Actuator operates as shown.

If the operation condition is not normal, replace the Air Intake Actuator.

Terminal (C0149)		Air Intake Actuator Operation
1	3	
Ground	B+	Fresh > Recirculate
B+	Ground	Recirculate > Fresh





Air Mix Actuator

Inspection

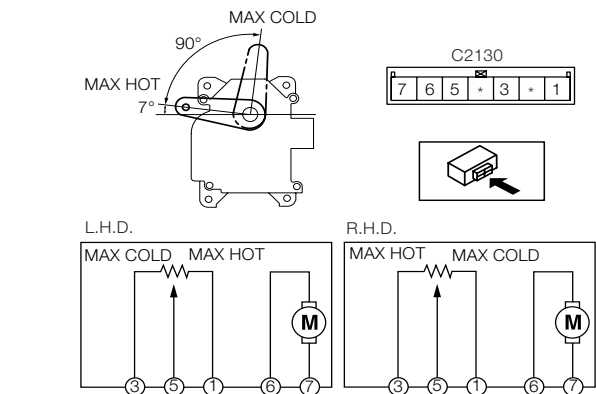
1. Connect the battery positive voltage to Air Mix Actuator terminal 6 (or 7), and ground to terminal 7 (or 6). Verify that the Air Mix Actuator operates as shown.

If the operation condition is not normal, replace the Air Mix Actuator.

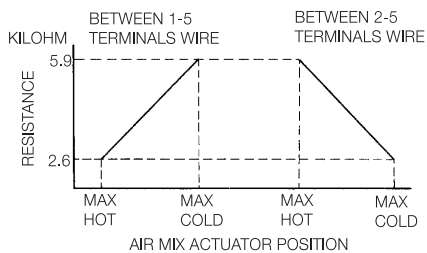
Terminal (C2130)		Air Intake Actuator Operation
1	3	
B+	Ground	Cold - Hot (LHD) Hot - Cold (RHD)
Ground	B+	Hot - Cold (LHD) Cold - Hot (RHD)

2. Check that the resistance between terminals 3 and 5, and 1 and 5 matches the Air Mix Actuator operation as shown in the graph below.

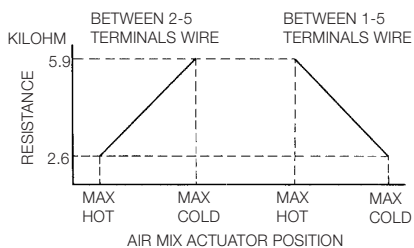
If the operation condition and resistance are not normal, replace the Air Mix Actuator.



LHD



RHD



Airflow Mode Actuator

Inspection

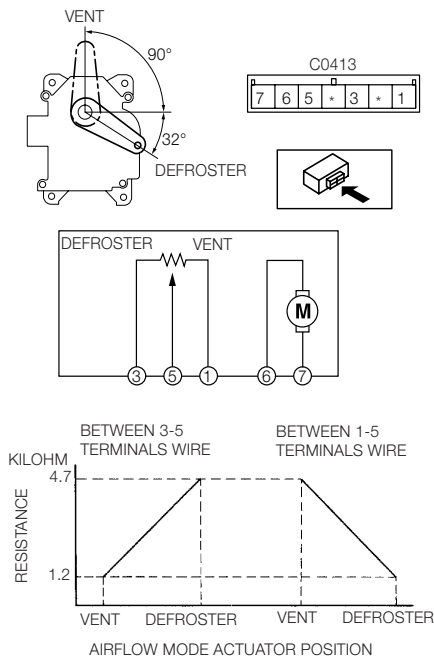
1. Connect the battery positive voltage to the Airflow Mode Actuator terminal 6 (or 7), and ground to terminal 7 (or 6). Verify that the Airflow Mode Actuator operates as shown.

If the operation condition is not normal, replace the Airflow Mode Actuator.

Terminal		Airflow Mode Actuator operation
6	7	
B+	Ground	Defroster - Vent
Ground	B+	Vent - Defroster

2. Verify that the resistance between terminals 1 and 5, and 3 and 5 matches the Airflow Mode Actuator operation as shown in the graph below.

If the operation condition and resistance are not normal, replace the Airflow Mode Actuator.



Climate Control (12.00)

Heater System (12.02)

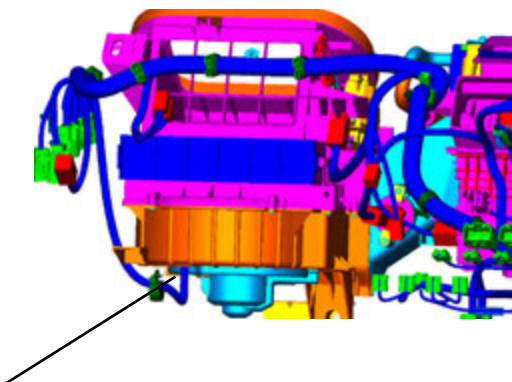
Maintenance

Blower Motor

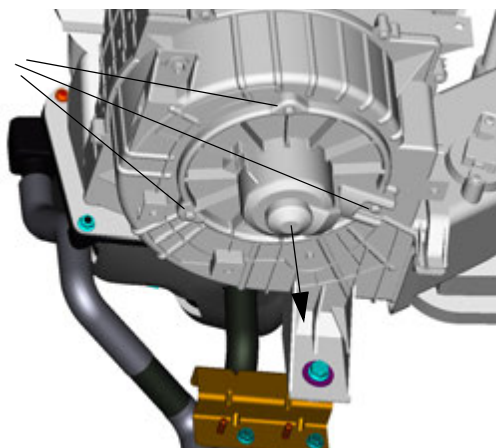
Repair Operation Time (ROT)	
Item	Code
Blower Motor Renew	12.02.BB

Removal

1. Disconnect the vehicle battery.
2. Disconnect the wiring harness plug.



3. Remove screws (x3). Withdraw the blower motor.

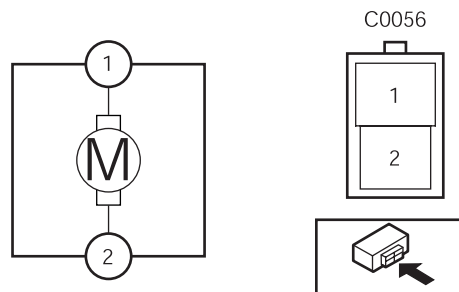


Installation

1. Install the blower motor to the blower unit body.
2. Install bolts (x3). Connect the wiring harness plugs.

Inspection

1. Connect the battery positive voltage to blower motor terminal 1, ground to terminal 2, and then verify that the blower motor operates smoothly.



2. If the operation condition is not normal, replace the blower motor.

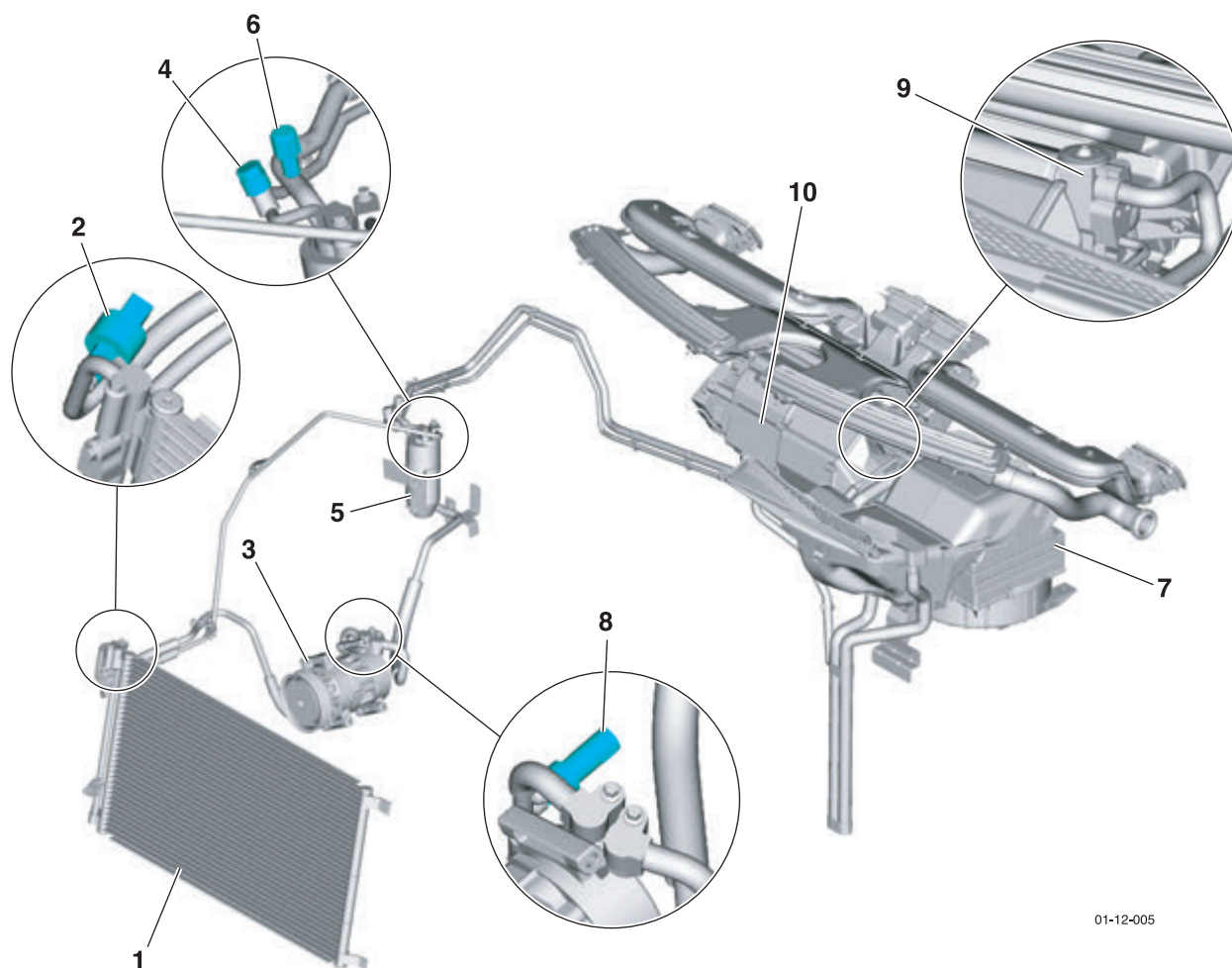


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Climate Control (12.00)

Air Conditioning (A/C) System (12.03)



01-12-005

Item	Description	Item	Description
1.	Condenser	6.	Low-side charge.
2.	Trinary switch	7.	Blower Unit.
3.	Compressor assembly	8.	Switch, A/C Cut-Off.
4.	High-side charge port	9.	Expansion valve.
5.	Receiver drier.	10.	A/C Unit.

Major Components

Compressor

- Engine mounted, driven by the accessory drive belt
- Variable displacement type
- High-pressure relief valve, to avoid system over-pressure
- ECU controlled clutch energised via a relay

Receiver drier

- Vertically mounted on the right-hand side of the engine bay
- The high-side charge port is installed to the high side entry pipe to the receiver drier

Condenser

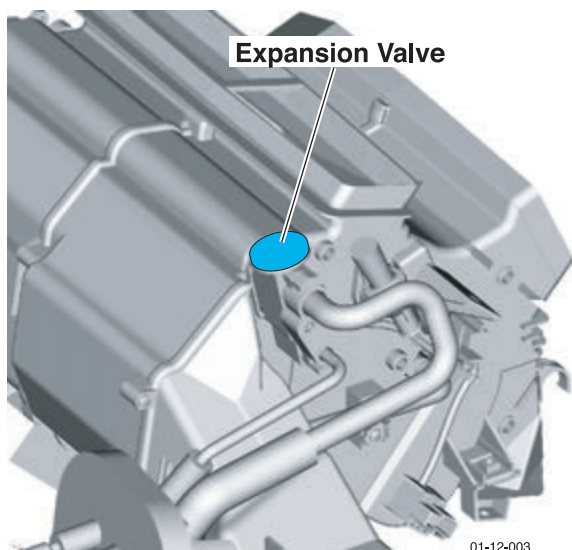
- Multi-pass fin-over-tube type, mounted in front of the engine cooling pack and directly to the radiator

Trinary switch

Located in the compressor discharge pipe

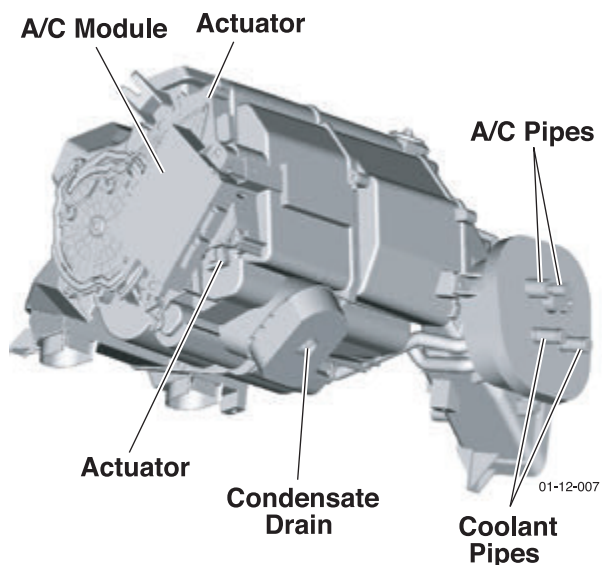
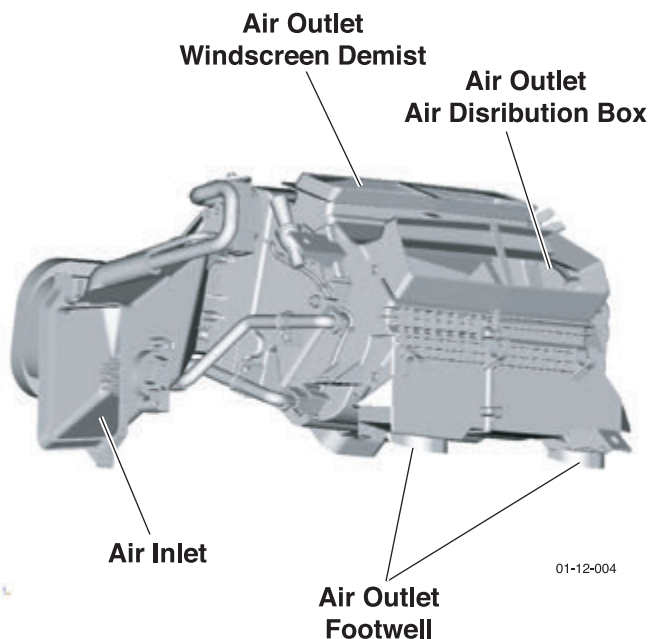
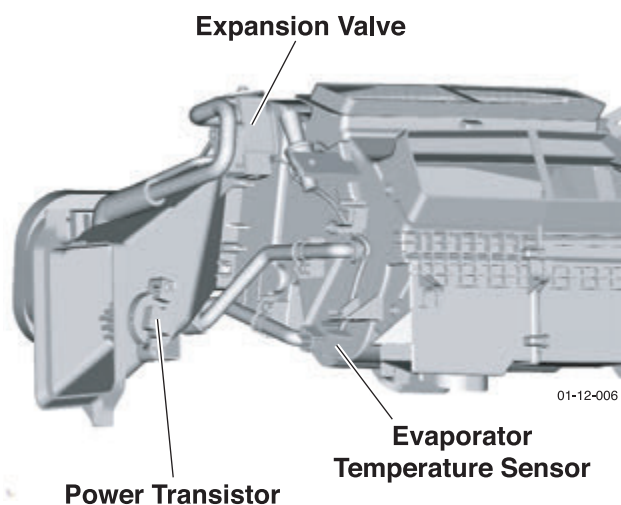
- Provides a signal, via the A/C module, to the PCM, to disengage the compressor clutch should the refrigerant pressure be less than 2 bar or greater than 30 bar
- Provides a hard-wired signal to the PCM, to switch the cooling fans to HIGH speed at 22 bar rising pressure and to LOW speed at 17,5 bar falling pressure
- Provides a hard-wired signal to the PCM, to switch the radiator cooling fans to LOW speed at 12 bar rising pressure and to switch the fans OFF at 8 bar falling pressure

Expansion Valve



The expansion valve is located on the outside of the A/C unit and comprises of a diaphragm, connected by a capillary tube to a temperature sensing bulb, which regulates the valve according to temperature variations at the evaporator outlet pipe. This component is **not** serviceable.

A/C Unit



The A/C unit houses the evaporator, heater matrix and air flow flaps.

The unit also incorporates two servo motor operated air distribution flaps.

1. Regulates airflow to the cabin vents.
 2. Regulates airflow to the defrost / demist air ducting.
- When the cabin air flap is open, air is ducted to the cabin via face and foot level air vents.

Condensate (water) which forms on the evaporator fins is drained out of the unit case through a drain hose, located at underneath / rear of the evaporator.

Refrigerant System

Handling Refrigerant

⚠ Warning ⚠

Avoid breathing A/C refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, Aston Martin recommend the use of a recovery / recycling / recharging unit when draining R-134a from the A/C system.

If accidental A/C system discharge occurs, ventilate work area before resuming service.

⚠ Warning ⚠

Do not perform a pressure test or leak test for R-134a service equipment and or vehicle A/C using 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.

⚠ Warning ⚠

Do not allow refrigerant to leak near a fire or any kind of heat. A poisonous gas may be generated if 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.

⚠ Warning ⚠

Handling liquid refrigerant is dangerous. A drop of refrigerant on the skin can result in localized frostbite. When handling refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.

Storing Refrigerant

⚠ Warning ⚠

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 personnel. Store refrigerant at temperatures below 40 °C (104 °F).

Handling Insufficient Refrigerant Level

Caution

If an insufficient refrigerant level is detected while troubleshooting, do not charge (add) the refrigerant. Because an accurate amount of refrigerant cannot be determined from the pressure indicated on the recovery / recycling / recharging unit, never charge the refrigerant.

Caution

If there is too much or too little refrigerant from the refilling, there may be secondary problems such as damage to the refrigerant cycle parts, or a decrease of cooling performance. Therefore, if it is determined that the refrigerant level is insufficient, completely remove refrigerant from the refrigerant cycle and refill with refrigerant to the specified amount.

Handling Compressor Oil

Caution

Use only ND8 compressor oil for this vehicle. Using a PAG oil other than DENSO OIL8 compressor oil can damage the A/C compressor.

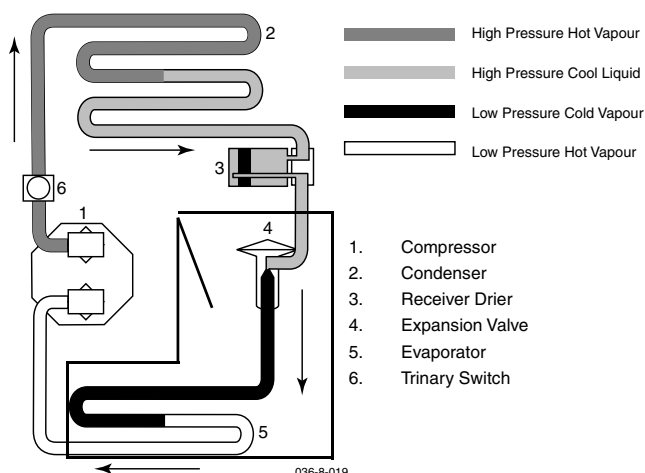
Caution

Do not spill the ND8 compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can damage the paint work. If oil gets on the vehicle, wipe it off immediately.

Caution

ND8 compressor oil has a high moisture absorption efficiency. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Ensure caps are installed immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.

Refrigeration Cycle





Operation

1. The Compressor (1) draws low pressure, low temperature, refrigerant vapour from the evaporator (5) and compresses it, raising the refrigerant pressure and temperature.
2. This high pressure, hot, refrigerant vapour enters the condenser (2), where it is cooled by the flow of ambient air and changes state into a cooler, high pressure liquid.
3. From the condenser, the liquid passes into the receiver drier (3) which has three functions:
 - Removes moisture from the refrigerant using a desiccant
 - Filters the refrigerant to remove system contaminants
 - Stores the refrigerant to cope with varying system refrigerant demands
4. The filtered liquid refrigerant, still at high pressure, then enters the expansion valve (4). Here it passes through a controlled orifice and emerges as an atomised liquid spray. This has the effect of reducing the refrigerant pressure and temperature. The cold refrigerant spray now flows into the evaporator (5).
5. As refrigerant passes through the evaporator core, it cools the incoming airflow. Heat is absorbed by the refrigerant, during this process and it once again changes state, from an atomised cool liquid into a vapour. The refrigerant vapour then returns to the compressor for the cycle to be repeated.

An automatic safety valve is incorporated in the compressor, which will open if the system pressure rises above 41 bar. The valve will reseal when the pressure drops below 27,6 bar. When the safety valve is open, the compressor will 'free wheel' and the excess pressure will be dissipated through the expansion valve. When the pressure drops below 27.6 bar, the safety valve will close again and the compressor will be operative.

The terms 'high' and 'low' pressure (or side) refer to the pressure differential between the compressor and expansion valve ports. This differential is critical to system fault diagnosis and efficiency checks.

The high side starts at the compressor and includes the trinary switch, condenser, receiver drier and expansion valve.

The low side starts at the expansion valve outlet and includes the evaporator and all connections back to the compressor.

The trinary switch (6) monitors system pressure between the compressor and condenser. If the pressure rises above 30 bar or falls below 2 bar the compressor clutch is de-energised to prevent damage to system components.

Specifications

Refrigerant and Lubricant

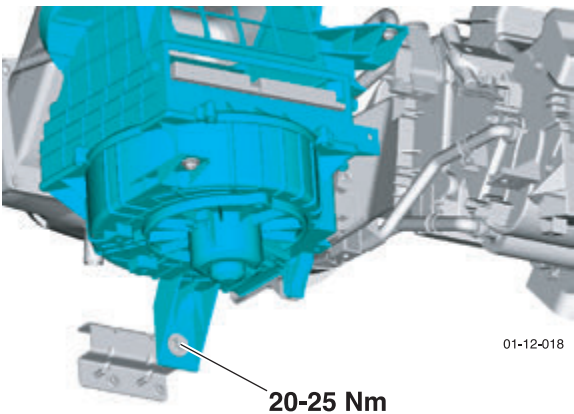
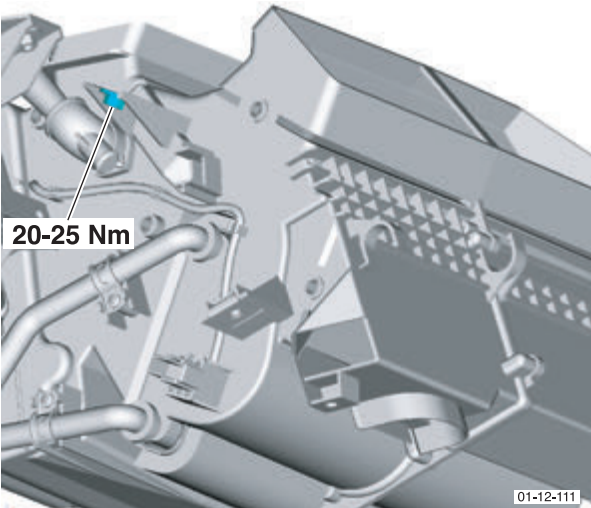
Refrigerant	R-134a
Compressor Lubricant	ND8 (DENSO)

Capacities

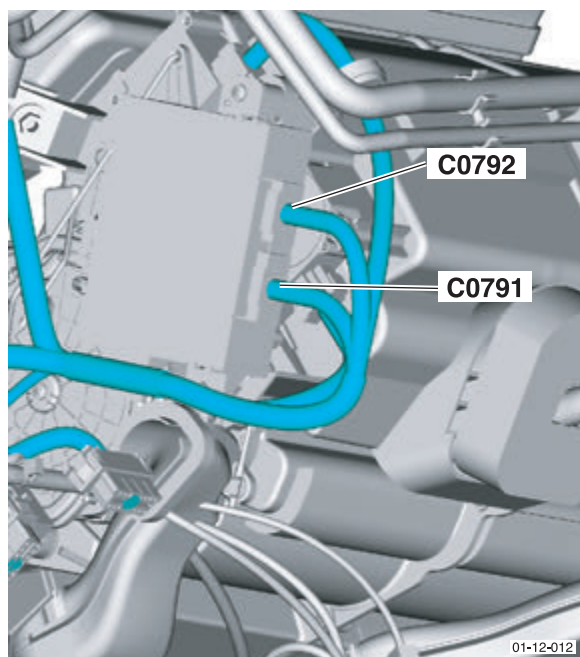
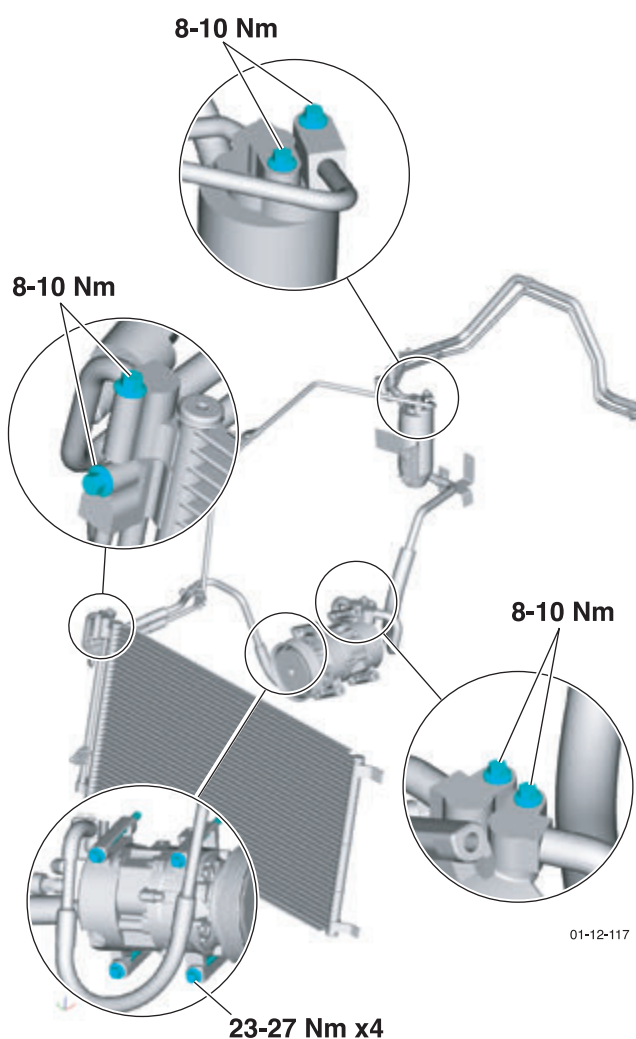
Refrigerant charge	Weight 850g (30 oz.)
Compressor Lubricant	Sealed volume (approx. quantity) 150 cc (pre-charged)

Torque Figures

Torque Figures		
Description	Nm.	lb. / ft.
AC unit Mounting	20-25	15-18.5
Compressor Mounting	23-27	17-20
Trinary switch		
A/C pipes to condenser	8-10	6-7.5

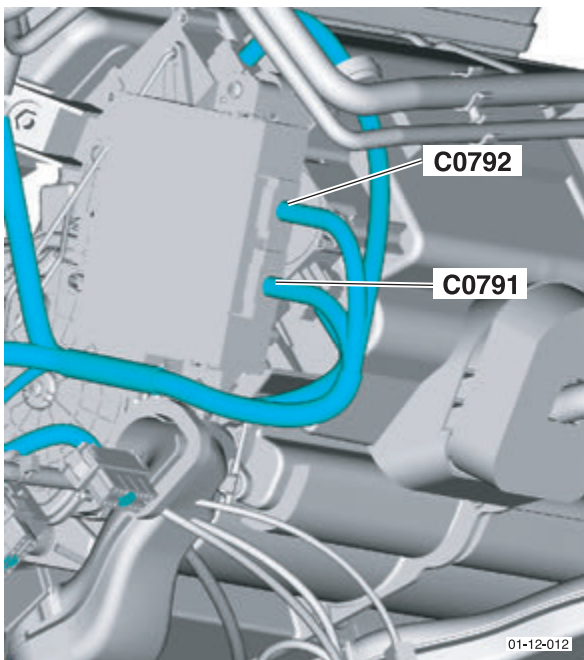


Diagnostics Electrical Connectors



A/C Module (C0792)

Pin	Specification
1	V Battery (from CCM)
2	V Ignition (from comfort relay) Recirculation acuator
3	Blank
4	Air flow mode actuator (input)
5	Solar sensor (input)
6	Ambient Temperature sensor
7	Engine coolant temperature (input)
8	Ref. voltage - Solar sensor (output) Ref. voltage - Temperature actuator (output) Ref. voltage - Air flow mode actuator (output)
9	Blank
10	Blank
11	Blank
12	Temperature actuator (input)
13	Evaporation sensor (input)
14	In-vehicle temperature sensor (input)
15	Ground
16	Sensor ground (In-vehicle, Evaporator, Air flow mode actuator, Temperature mode actuator)



A/C Module (C0791)

Pin Specification

1	Air flow mode actuator (output)
2	Temperature actuator (output)
3	Blank
4	Blank
5	Blank
6	A/C On (A/C pressure sensor)
7	Blank
8	Recirculation actuator (output)
9	Blank
10	Blank
11	Temperature level (RHD)
12	Blower speed regulator (Output)
13	Air flow mode actuator (output)
14	Temperature actuator (output)
15	Blank
16	Output
17	HAVAC ECU (input)
18	Blank
19	Blower relay (engine bay fusebox)
20	Recirculation actuator (output)
21	Blank
22	blank
23	Temperature level (LHD)
24	Blower speed regulator input)

DTC Inspection

Using WDS

1. Connect the WDS to the **body** diagnostic socket (Refer to 'Appendix & Glossary', page 20-1-2).
2. Select 'Air-Con' from the menu.
3. Read the fault codes from the WDS screen.

DTC Fault Codes

DTC	Fault Code Definition
10	Switchpack 1 disconnected.
20	Switchpack 2 disconnected.
30	Analogue digital converter 100us timeout.
40	Serial transmit 10ms timeout.
111	Temperature control - short circuit to ground on A.
122	Temperature control - short circuit to 5 volts on A.
133	Temperature control - short circuit to ground on B.
144	Temperature control - short circuit to 5 volts on B.
250	Temperature – bad pair.
260	Mode control - short circuit to ground.
270	Mode control - short circuit to 5 volts.
280	Fan control - short circuit to ground.
355	Fan control – short circuit to 5 volts.
366	Bad response data - temperature.
377	Bad response data - mode.

DTC	Fault Code Definition
388	Bad response data - fan speed.
412	Bad response data - recirculation.
423	Serial communications error – header.
434	Serial communications error – checksum.
445	Serial communications error – overrun.
556	Serial communications error – framing.
567	Serial communications error – parity.
578	Electrically erasable programmable read only memory - command 120ms timeout.
589	Electrically erasable programmable read only memory - access error.
613	Electrically erasable programmable read only memory - protection error.
624	Electrically erasable programmable read only memory - not blank on verification.
635	Dynamic stability control 10 second timeout.
646	Temperature forced to default.
790	Blower speed forced to default.
791	Mode forced to default.
792	Power switch output - short circuit.
793	Electrically erasable programmable read only memory - command not ready.
794	Heating ventilating air conditioning control module – in car sensor - current fault.
795	Heating ventilating air conditioning control module – in car sensor - past fault.
796	Heating ventilating air conditioning control module – external air sensor - current fault.
797	Heating ventilating air conditioning control module – external air sensor - past fault.
798	Heating ventilating air conditioning control module – post evaporator sensor - current fault.
799	Heating ventilating air conditioning control module – post evaporator sensor - past fault.
880	Heating ventilating air conditioning control module – coolant temperature sensor - current fault.
881	Heating ventilating air conditioning control module – coolant temperature sensor - past fault.
882	Heating ventilating air conditioning control module – solar radiation sensor - current fault.
883	Heating ventilating air conditioning control module – air mix actuator cool/hot - current fault.
884	Heating ventilating air conditioning control module – air mix actuator cool/hot - past fault.
885	Heating ventilating air conditioning control module – mode actuator face/defrost - current fault.
886	Heating ventilating air conditioning control module – mode actuator face/defrost - past fault.
887	Heating ventilating air conditioning control module – air mix actuator fail.
888	Heating ventilating air conditioning control module – mode actuator fail.
889	Electrically erasable programmable read only memory - data checksum error.



Maintenance

Assessment of the A/C system operating efficiency and fault classification may be achieved by using the facilities on a Recovery / Recycling / Recharging unit.

Follow the manufacturer's instructions implicitly and observe all safety considerations.

Connections

Only use hoses with connectors which are dedicated to HFC 134a charge ports.

Warning

Under no circumstances should connections be made with the A/C system in operation or valves open. Should valves be open and a vacuum pump or refrigerant container attached, an explosion could occur as a result of high pressure refrigerant being forced back into the vacuum pump or container.

Recovery

Warning

Handling liquid refrigerant is dangerous. A drop of refrigerant on the skin can result in localized frostbite. When handling refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.

Caution

Do not attempt to adapt this unit for R-12 as an A/C system failure will result. Recovery / Recycle / Recharging equipment has special connections to avoid cross contamination with R-12 systems.

The A/C unit's overfill limitation mechanism has been calibrated specifically for use with the 50 lb. (23 Kg) refillable refrigerant tank.

Run the A/C system for a few minutes before starting the recovery procedure as this will enable more refrigerant to be recovered. Turn the A/C system off before starting the procedure.

Ensure the A/C system has pressure in it before beginning the recovery process; if there is no system pressure there is no refrigerant to recover.

Ensure that the oil drain valve is closed.

Read manufacture's instructions and warnings before completing any recovery / evacuating and charging operations.

Caution

The Recovery / Recycling / Recharging unit relies on a weighing mechanism to weight the quantity of oil removed. Ensure that the Recovery / Recycle / Recharging unit is not disturbed during the recovery procedure.

1. Connect an R-134a Recovery / Recycling / Recharging unit to the vehicle A/C system.
2. Follow the Recovery / Recycling / Recharging unit manufacturer's instructions to evacuate the A/C system.

Compressor oil may be drawn out during this process, take note of the quantity recovered so that it may be replaced.

Evacuation

The removal of unwanted air and moisture, is critical to the correct operation of the A/C system. Moisture in the system can be highly destructive and may cause internal blockages due to freezing; water suspended in the lubricating oil will damage the compressor. Once the A/C system has been dismantled, or the refrigerant charge recovered, all traces of moisture must be removed before charging.

It is recommended that initially only the high-side valve be opened at the start of the procedure. After a short time a small depression should be seen on the low-side, at which point the low-side valve may be opened and the evacuation process completed. If a vacuum is not registered on the low-side, it may indicate that the expansion valve is permanently closed or that the system is blocked. This simple check may save time and effort when the system is recharged.

Read manufacture's instructions and warnings before completing any Recovery / Recycling / Recharging operation.

1. Connect an R-134a Recovery / Recycling / Recharging unit to the vehicle A/C system.
2. Follow the Recovery / Recycling / Recharging unit manufacturer's instructions to evacuate the A/C system.

Charging

Caution

Do not exceed the specification when charging the A/C system with refrigerant. Doing so will decrease the efficiency of the A/C unit or damage the refrigeration cycle parts.

Caution

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

Read manufacture's instructions and warnings before completing any Recovery / Recycling / Recharging operation.

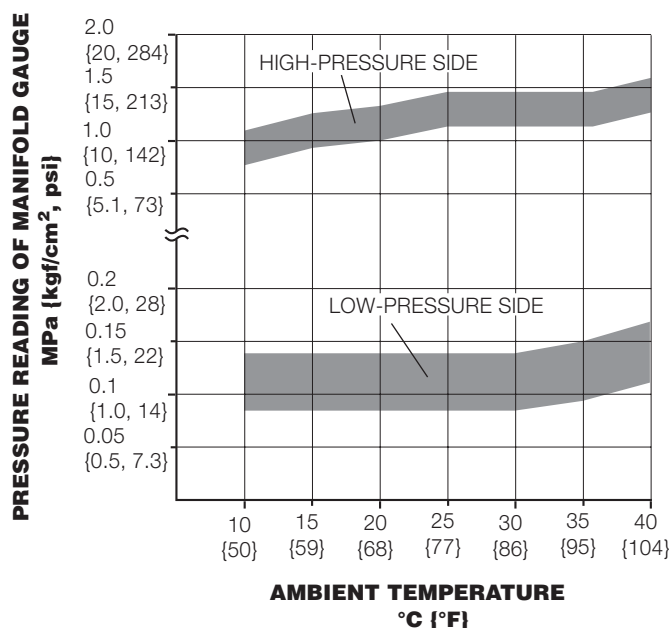
1. Connect an R-134a Recovery / Recycling / Recharging unit to the vehicle A/C system.
2. Follow the Recovery / Recycling / Recharging unit manufacturer's instructions to charge the A/C system.

A/C System Testing

It is recommended that a free standing air mover is placed in front of the condenser / cooling system.

Pressure Check

1. Connect the Recovery / Recycling / Recharging unit.
2. Start the engine. Allow to warm up then run at a constant 1,500 rpm.
3. Set the following A/C controls:
 - Air Circulation to 'Recirculate'
 - Temperature to 'Max' Cold
 - Air Flow to 'Vent'
4. Close all the vehicle doors and windows.
5. Measure the ambient temperature and high / low pressure side reading of Recovery / Recycling / Recharging unit gauges.
6. Verify that the intersection of the pressure reading of the Recovery / Recycling / Recharging unit gauges and the ambient temperature is in the shaded zone.



If there is any fault, inspect the refrigerant system according to the troubleshooting chart.

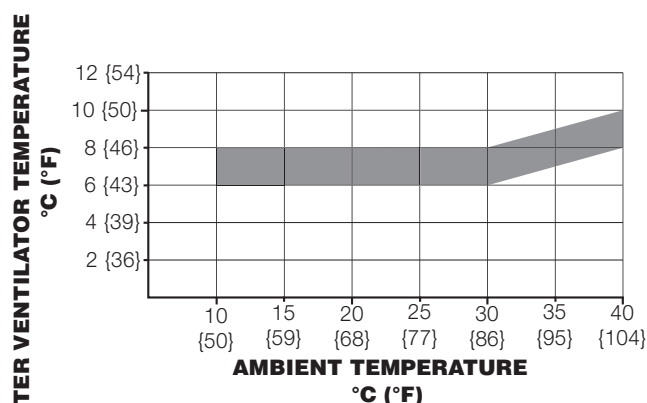
Performance Test

1. Check the refrigerant pressure.
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Start the engine. Allow to warm up then run at a constant 1,500 rpm.
4. Set the A/C unit fan speed to 'Max Hi'.
5. Turn the A/C system on.
6. Set the following A/C controls:
 - Air Circulation to 'Recirculate'
 - Temperature to 'Max' Cold
 - Air Flow to 'Vent'

7. Close all the doors and windows.
8. Wait until the A/C output temperature stabilizes.

*Stabilized condition.
The A/C compressor repeatedly turns on and off at regular intervals.*

9. After the blower air is stabilized, read the dry-bulb thermometer.
10. Verify the ambient temperature.
11. Verify the temperature is in the shaded zone.



If there is any fault, inspect the refrigerant system according to the troubleshooting chart.

Vacuum Check

1. Stop the vacuum pump, note the high and low pressure side readings of the Recovery / Recycling / Recharging unit gauges and wait for 5 min.
2. Check the high and low pressure side readings of the Recovery / Recycling / Recharging unit gauges.
 - 1 If the readings have changed, inspect for leaks and go to Evacuation (Refer to 'Evacuation', page 12-3-8).
 - 2 If the readings have not changed, go to Charging (Refer to 'Charging', page 12-3-8).



Leaks

Faults associated with low refrigerant charge weight and low pressure may be caused by leakage. Leaks traced to mechanical connections may be caused by torque relaxation or joint face contamination. Evidence of oil around such areas is an indicator of leakage.

Leak Detection

Fluorescent Tracer Dye - A fluorescent tracer dye is incorporated into the refrigeration system and can be checked for non-apparent leaks by scanning with a high intensity ultraviolet lamp. The location of leaks can be pinpointed by the bright yellow glow of the tracer dye.

Caution

Observe ALL safety precautions associated with ultraviolet equipment.

Automatic Refrigerant Leak Detector - (various manufacturers) Hand-held, portable, battery operated leak detector. Place in and around A/C system to detect refrigerant leaks.

System Pressure Fault Classification

If erratic or unusual gauge movements occur, check the equipment against known Recovery / Recycling / Recharging unit gauges.

This table should be used in conjunction with the graphical representations of 'High side' pressure / ambient temperature and 'Low side' pressure / evaporator temperature.

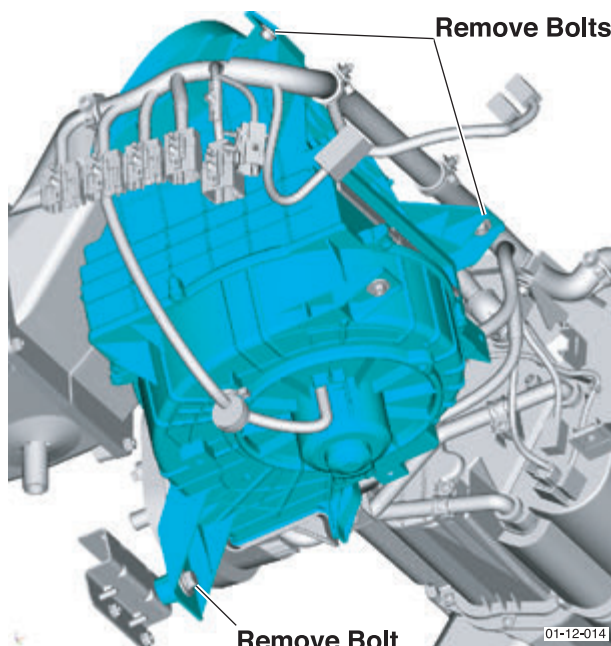
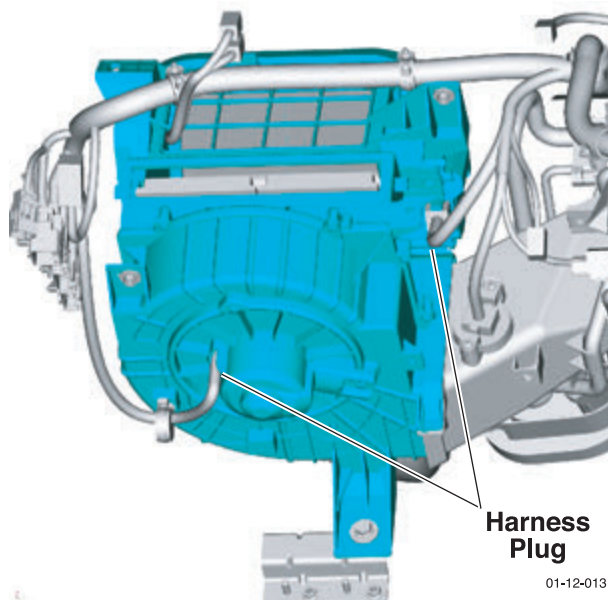
Low side gauge reading	High side gauge reading	Fault	Cause
Normal	Normal	Discharge air initially cool then warms up	Moisture in system
Normal to low	Normal	As above	As above
Low	Low	Discharge air slightly cool	Refrigerant charge low
Low	Low	Discharge air warm	Refrigerant charge very low
Low	Low	Discharge air slightly cool or frost build up at expansion valve	Expansion valve stuck closed
Low	Low	Discharge air slightly cool, sweating or frost after point of restriction	Restriction in High side of system
High	Low	Compressor noisy	Defective compressor reed valve
High	High	Discharge air warm and high side pipes hot	Refrigerant charge high or inefficient condenser cooling due to air flow blockage or engine cooling fans not working
High	High	Discharge air warm Sweating or frost at evaporator	Expansion valve stuck open

A/C Unit

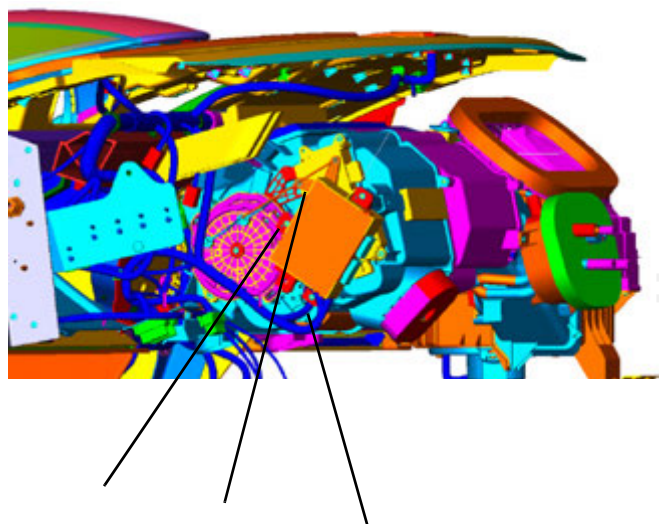
Repair Operation Time (ROT)	
Item	Code
A/C Unit Renew	12.03.EB

Removal

1. Connect the WDS and record any logged fault codes in the A/C system.
2. Disconnect the vehicle battery.
3. Recover the refrigerant from the A/C system (Refer to 'Recovery', page 12-3-8).
4. Drain the engine coolant.
5. Remove the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
6. Remove the blower unit.
 - 6.1 Disconnect the wiring harness plugs (x2).
 - 6.2 Remove bolts (x3). Withdraw the blower unit.



7. Disconnect the wiring harness plugs (x3).

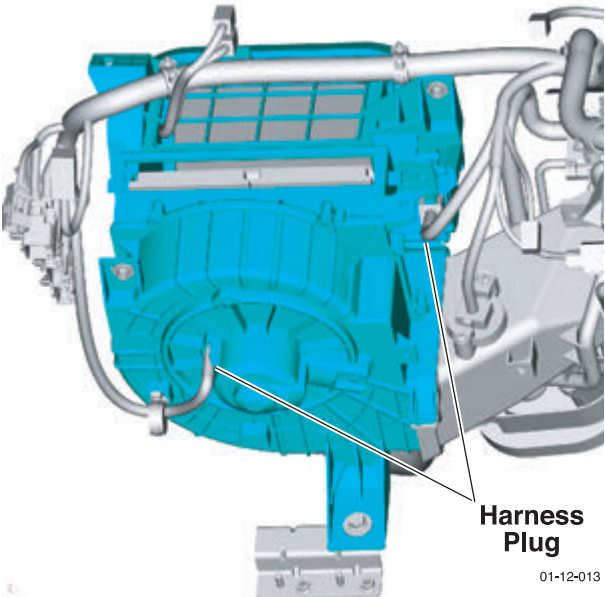
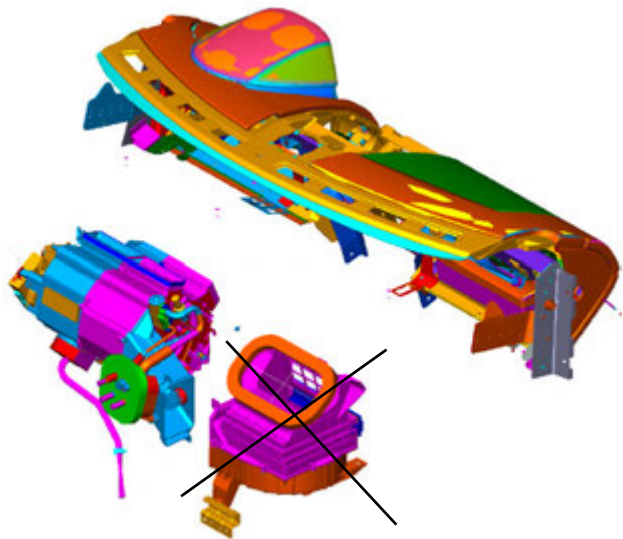


8. Remove bolt (x1) and nuts (x2). Withdraw the A/C unit.

Image to Follow



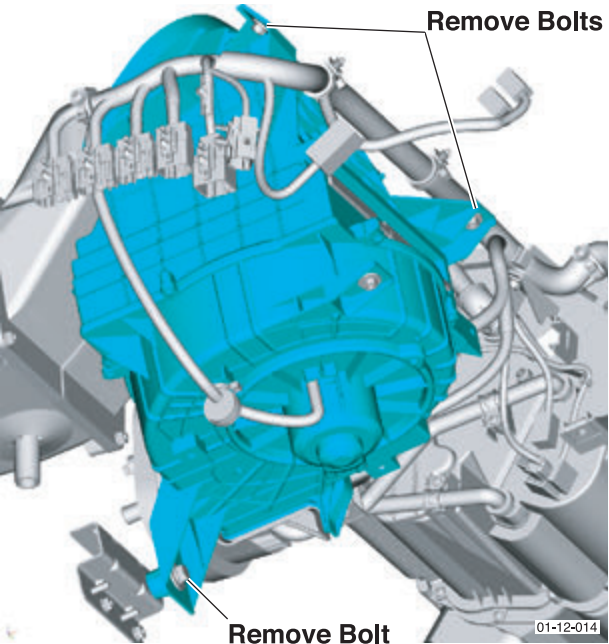
9. Unlatch the A/C unit from the defrost air duct (Push the A/C unit up into the IP). Withdraw the A/C unit.
5. Remove the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
6. Remove the blower unit assembly.
 - 6.1 Disconnect the wiring harness plug (x1).
 - 6.2 Remove bolts (x3). Withdraw the blower unit.



Installation

1. Install the A/C unit to the IP. Torque bolts to **5.5 Nm**.

Ensure the A/C unit interlocks with the defrost duct.
2. Install the blower unit to the IP. Torque bolts to **5.5 Nm**.
3. Connect the wiring harness plugs.
 - (x3) to the A/C unit
 - (x2) to the blower unit
4. Install the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
5. Recharge the A/C system (Refer to 'Charging', page 12-3-8).
6. Fill the engine coolant system (Refer to 'Cooling System (03.03)', page 3-4-1).
7. Connect the vehicle battery.
8. Start the engine. Allow the cooling system to come to normal operating temperature.
9. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).



Heater Matrix

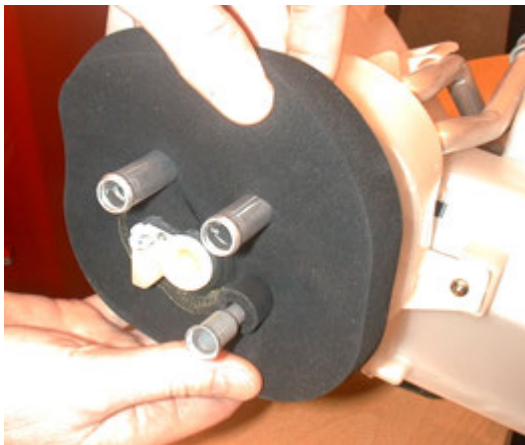
Repair Operation Time (ROT)	
Item	Code
Heater Matrix Renew	12.02.CB

Remove

1. Connect the WDS and record any logged fault codes in the A/C system (Refer to 'Appendix & Glossary', page 20-1-2).
2. Disconnect the vehicle battery.
3. Recover the refrigerant from the A/C system (Refer to 'Recovery', page 12-3-8).
4. Drain the engine coolant (Refer to 'Cooling System (03.03)', page 3-4-1).

7. Remove the blower unit to A/C unit adaptor and pipe locator.

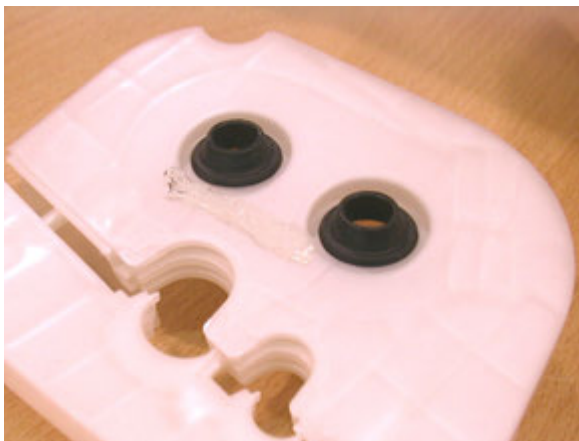
- 7.1 Remove the foam.



- 7.2 Remove the pipe location plate (screws x4). Part the pipe location plate and withdraw.

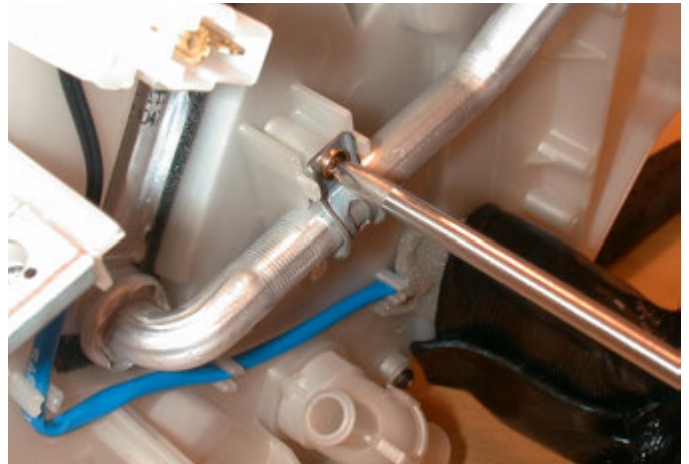


Note the orientation of the two rubber grommets.



- 7.3 Remove the adaptor (screws x2), clip (x1) and disconnect one plastic locator.

8. Remove the pipe clips (x2) that secure the heater pipes.



9. Withdraw the heater matrix.

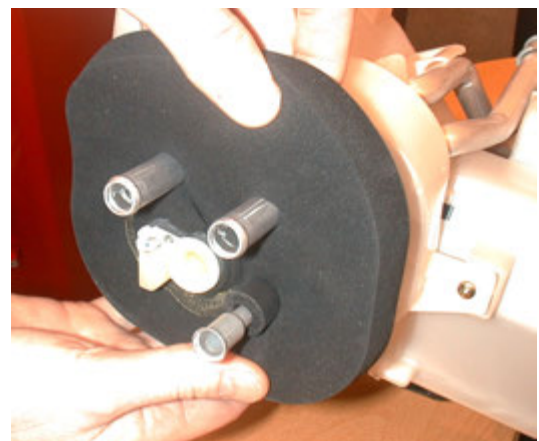


Installation

1. Install the heater matrix into the A/C unit. Ensure the heater matrix is pushed fully in.
2. Install the pipe clips.
3. Install the blower unit to A/C unit adaptor and pipe locator.

Ensure that the two rubber grommets are located correctly.

4. Install the foam around the pipes





5. Install the blower unit. Torque bolts to **10-13 Nm**.
 6. Install the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
 7. Recharge the A/C system (Refer to 'Charging', page 12-3-8).
 8. Fill the engine coolant system (Refer to 'Cooling System (03.03)', page 3-4-1).
 9. Connect the vehicle battery.
 10. Start the engine. Allow the cooling system to come to normal operating temperature.
 11. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).
5. Remove the expansion valve
 - 5.1 Remove protective material from around the expansion valve.
 - 5.2 Remove screws (x2). Remove the A/C pipes clamp.

Evaporator

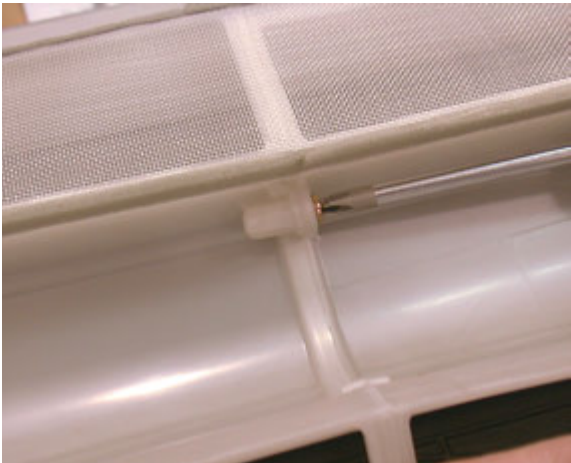
Repair Operation Time (ROT)	
Item	Code
Evaporator Renew	12.03.CB

Removal

1. Remove the A/C unit (Refer to 'A/C Unit', page 12-3-11).
2. Move the in-vehicle temperature pipe to one side.
3. With a sharp knife cut the filter gauze and foam where the two halves of the A/C unit meet.



4. Remove clip (x1) and screws (x9) that secure the two halves of the A/C unit. Part the two halves of the A/C unit.



- 5.3 Withdraw the A/C pipes.



- 5.4 Withdraw the expansion valve. Discard 'O' rings.



- Remove the clips (x2) that secure the evaporator temperature sensor element to the evaporator.



- Withdraw the evaporator.



Installation

- Insert the evaporator (inlet / outlet first) into the half of the A/C unit which houses the expansion valve.
- Complete with new 'O' rings, install the expansion valve.
- Complete with new 'O' rings, install the A/C pipes clamp (screws x2).
- Install the clips (x2) that secure the evaporator temperature sensor element to the evaporator.
- Place the two halves of the A/C unit together.

Take care to correctly locate the vent flaps.

- Install clip (x1) and screws (x9) that secure the two halves of the A/C unit.
- Connect (glue) the filter gauze and foam where the two halves of the A/C unit meet.
- Install the in-vehicle temperature pipe to the A/C unit clips.
- Install the A/C unit to the IP (Refer to 'A/C Unit', page 12-3-11).
- Install the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
- Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).

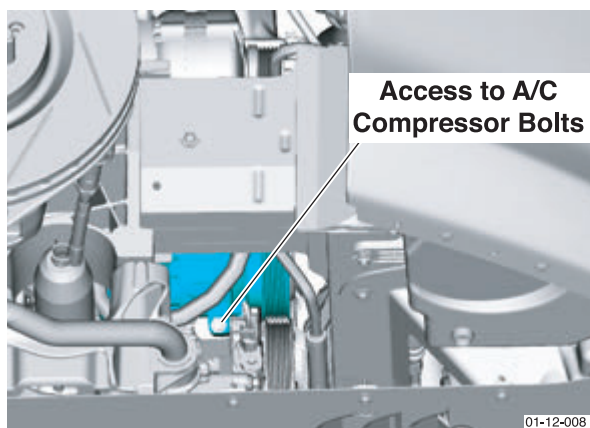
A/C Compressor

Repair Operation Time (ROT)

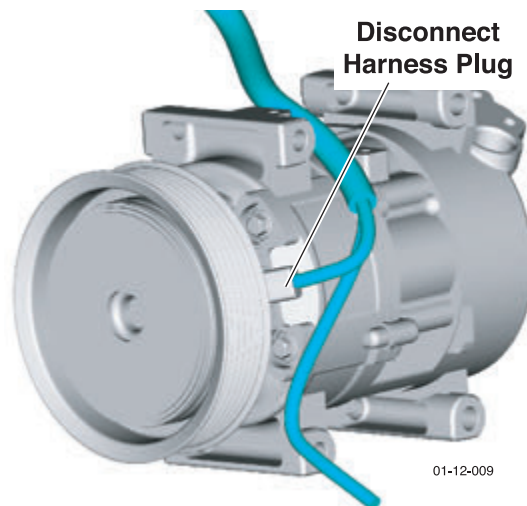
Item	Code
A/C Compressor Renew	12.03.AB

Removal

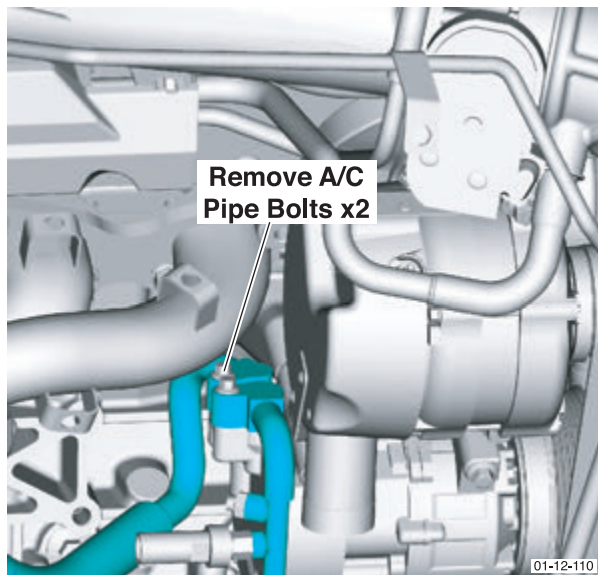
- Disconnect the vehicle battery.
- Recover the refrigerant from the A/C system (Refer to 'Recovery', page 12-3-8).
- Remove the road wheel and road wheel arch liner (for access to the A/C compressor securing bolts).



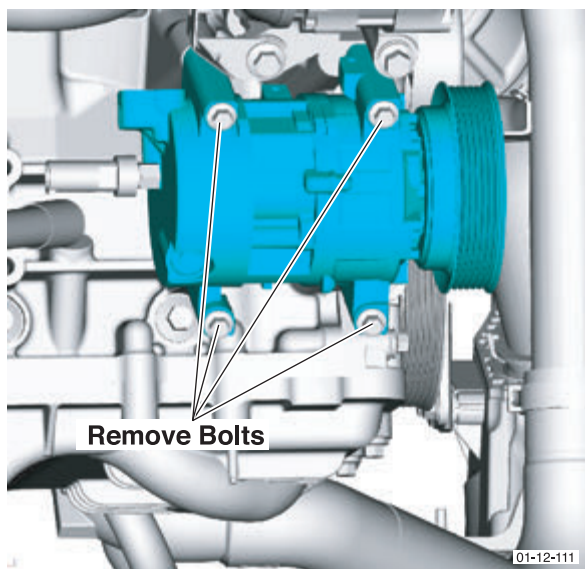
- Remove the accessory drive belt (Refer to 'Accessory Drive System (03.05)', page 3-6-1).
- Disconnect the wiring harness plug.



6. Remove the A/C pipes. Discard the O-rings.
Install suitable blanking plugs.



7. Remove bolts (x3) and withdraw the A/C compressor.



8. Measure the amount of oil held in the A/C compressor.

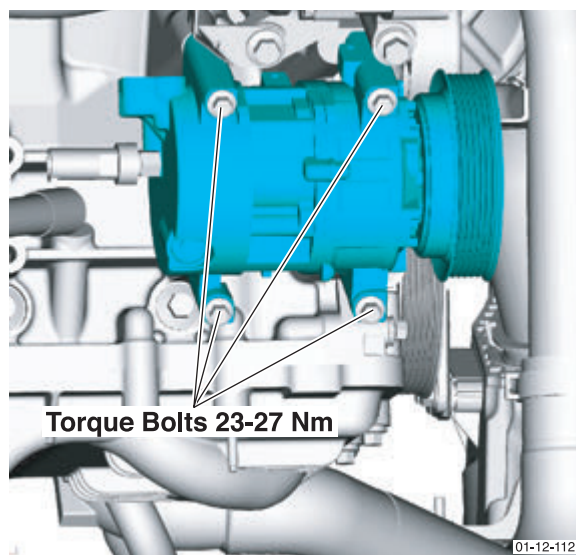
This step is not necessary in the case of refrigerant loss.

- 8.1 Pour oil from the old A/C compressor into a suitable measuring container. Note the amount and discard oil.
- 8.2 Install blanking plugs to the old A/C compressor.
- 8.3 Note the volume of oil recovered with the refrigerant.

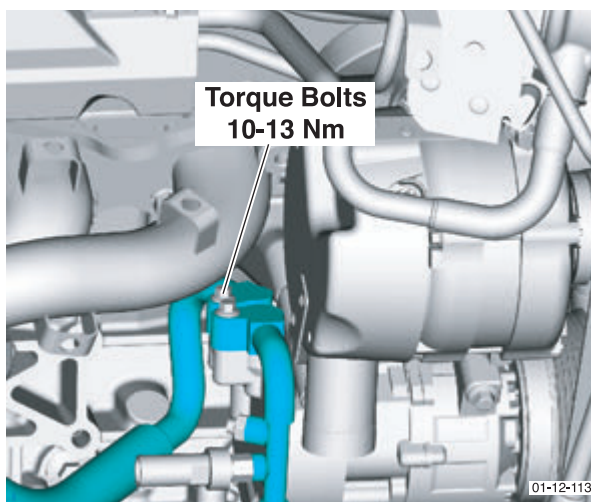
Installation

If replacing a faulty A/C compressor with internal mechanical damage, also replace the receiver drier which could also be contaminated with mechanical debris.

1. Fill the new A/C compressor with the correct amount of oil.
 - 1.1 Remove the blanking plugs from the A/C compressor.
 - 1.2 Fill the A/C compressor with same amount of oil that was recovered from the original A/C compressor, plus the amount recovered from the recovery equipment.
 - 1.3 Install the blanking plugs to the A/C compressor.
2. Install the A/C compressor. Torque bolts (x4) to **23-27 Nm**.

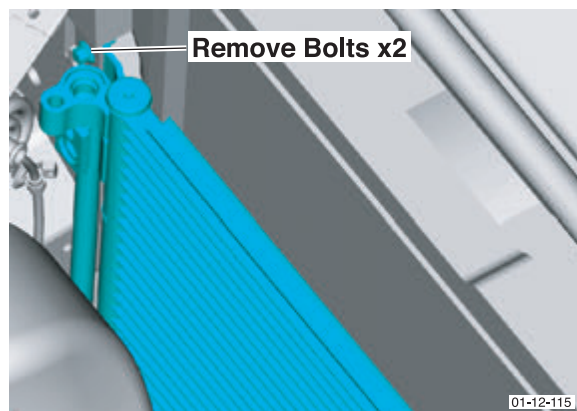
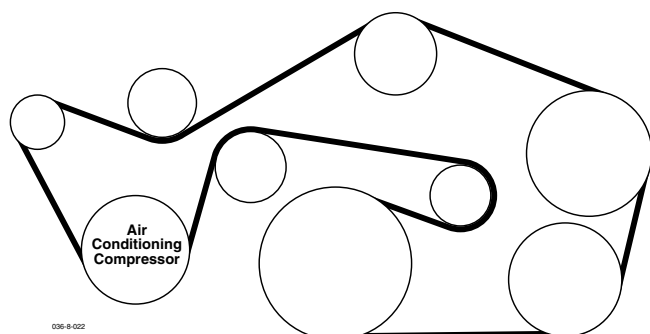


3. Install both A/C pipes. Use new O-rings. Torque bolts (x2) to **10-13 Nm**.



4. Connect the wiring harness plug.

5. Install the accessory drive belt (Refer to 'Accessory Drive System (03.05)', page 3-6-1).
6. Remove bolts (x2).



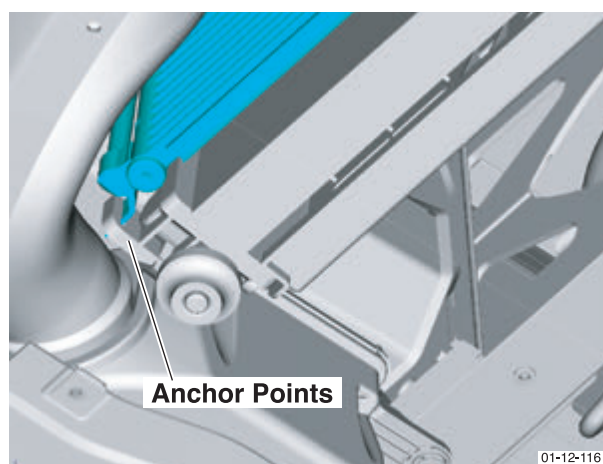
6. Connect the vehicle battery.
7. Install the road wheel arch liner and road wheel (Refer to 'Road Wheel Nut Torque Tightening', page 4-5-7).
8. Recharge the A/C system.
9. Start the engine. Allow the engine cooling system to rise to normal running temperature.
10. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).

7. Withdraw the condenser upwards.

Installation

If a new condenser is to be installed ensure the correct amount of A/C system oil is added.

1. Insert the condenser, locate the bottom of the condenser into the anchor points (x2). Install bolts (x2).



Condenser

Repair Operation Time (ROT)	
Item	Code
A/C Condenser Renew	12.03.BB

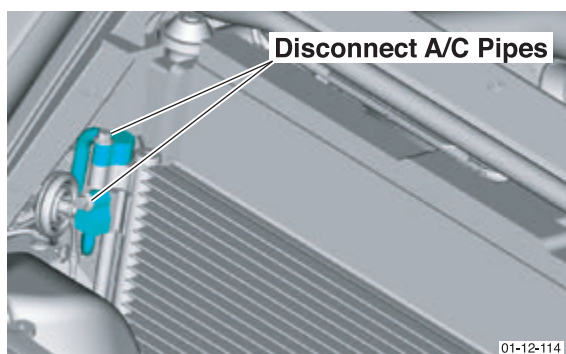
Removal

1. Disconnect the vehicle battery.
2. Recover the A/C refrigerant (Refer to 'Recovery', page 12-3-8).
3. Drain the engine coolant system (Refer to 'Cooling System (03.03)', page 3-4-1).

Caution

Ensure open ends are plugged immediately after disconnecting refrigeration parts. If moist air or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other faults may occur.

4. Remove the 'slam' panel.
5. Disconnect the A/C pipes. Discard the O-rings. Install suitable blanking plugs.



2. Install both A/C pipes. Use new O-rings. Torque bolts (x2) to **10-13 Nm**.
3. Install the 'slam' panel.
4. Fill the coolant system (Refer to 'Cooling System (03.03)', page 3-4-1) and charge the A/C system (Refer to 'Charging', page 12-3-8).

Receiver Drier Assembly

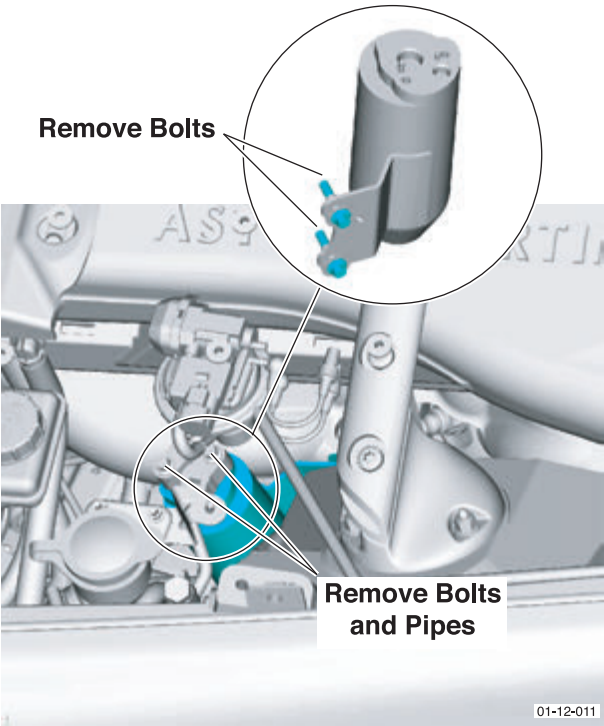
Repair Operation Time (ROT)	
Item	Code
A/C Receiver Drier Renew	12.03.DB

Removal

1. Disconnect the vehicle battery.
2. Recover the refrigerant (Refer to 'Recovery', page 12-3-8).
3. Disconnect the A/C pipes from the receiver drier assembly. Remove and discard the 'O' rings. Install suitable blanking plugs.

Caution

Ensure open ends are plugged immediately after disconnecting refrigeration parts. If moist air or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other faults may occur.



4. Remove bolts (x2) and withdraw the receiver drier assembly.
5. Recover the spacers and ferrules for reuse.

Installation

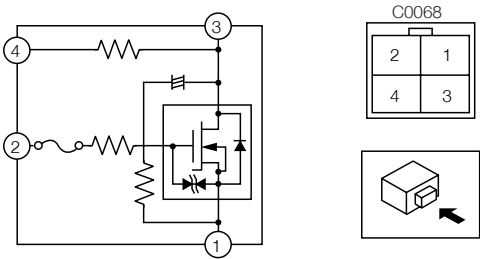
1. Install receiver drier assembly. Torque bolts to **2-3 Nm**.
2. Connect the refrigerant lines. Torque to **2-3 Nm**.

Install new 'O' rings to the A/C system connectors.

3. Charge the A/C system (Refer to 'Charging', page 12-3-8).
4. Connect the vehicle battery. Start the engine. Allow the engine cooling system to rise to normal running temperature.

5. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).

Power Transistor Inspection



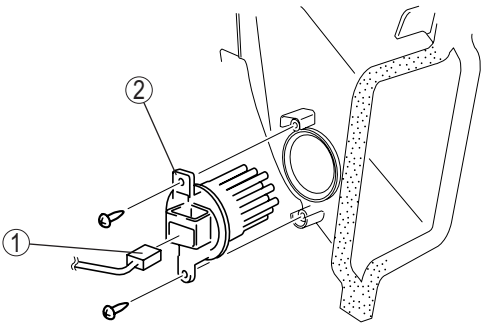
1. Verify that the continuity between the power transistor terminals is as indicated in the table below.
If there is any fault, replace the power transistor.

If the blower motor operation is not normal even though no fault can be verified, inspect the A/C module.

Tester lead		Resistance (kilo hm)
+	-	
1	3	Infinity
1	2	11.0
1	4	Infinity
3	1	Continuity detected
3	2	Continuity detected
3	4	1.5
2	1	11.0
2	3	Infinity
2	4	Infinity
4	1	Continuity detected
4	3	1.5
4	2	Continuity detected

Removal

1. Disconnect the vehicle battery.
2. Remove the glove box.
3. Disconnect the wiring harness plug.
4. Remove the power transistor.



Installation

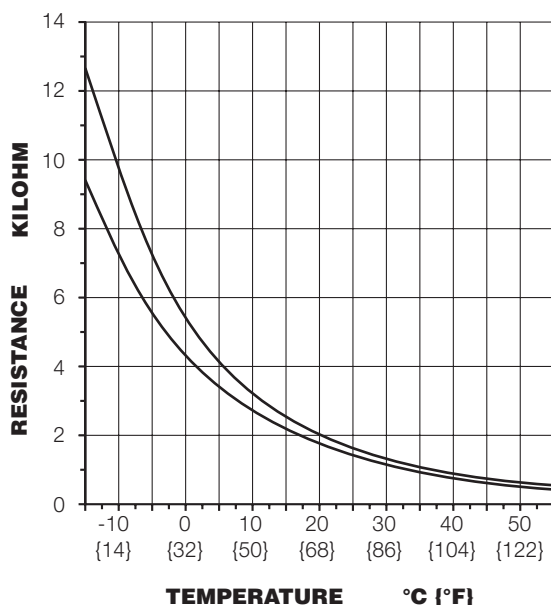
1. Install the power transistor and connect the wiring harness plug.
2. Install the glove box.
3. Connect the vehicle battery.

Evaporator Temperature Sensor Inspection

Inspect the Evaporator Temperature Sensor when it is installed in the A/C unit.

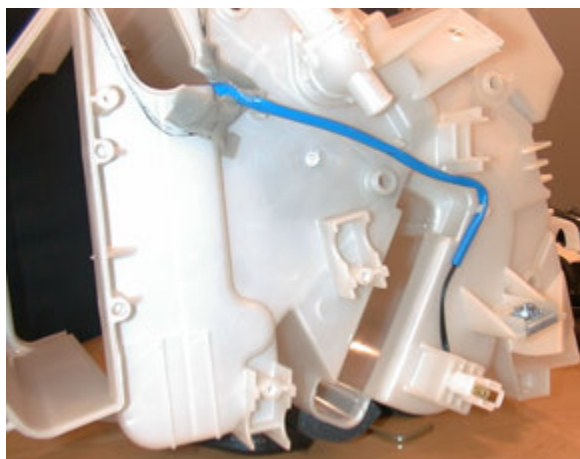
1. Set the fan speed Max. Hi.
2. Set the temperature control to Max. Cold.
3. Set the air intake mode to Recirculate.
4. Turn the A/C switch off.
5. Close all the doors and windows. Wait for 5 minutes.
6. Disconnect the Evaporator Temperature Sensor connector.
7. Measure the temperature at the air intake.
8. Measure the resistance between the Evaporator Temperature Sensor terminals.

If the characteristics of the Evaporator Temperature Sensor are not as shown in the graph, replace the Evaporator Temperature Sensor.



Removal

1. Disconnect the vehicle battery.
2. Remove the A/C unit (Refer to 'A/C Unit', page 12-3-11).
3. Remove the evaporator (Refer to 'Evaporator', page 12-3-14).
4. Remove the wiring harness plug from the A/C unit.
5. Remove the evaporator temperature sensor.



Installation

1. Install the evaporator temperature sensor.
2. Insert the evaporator (inlet / outlet first) into the half of the A/C unit which houses the expansion valve.
3. Complete with new 'O' rings, install the expansion valve and the A/C pipes clamp (screws x2).
4. Install the clips (x2) that secure the evaporator temperature sensor element to the evaporator.
5. Secure the two halves of the A/C unit together.

Take care to correctly locate the two vent flaps.

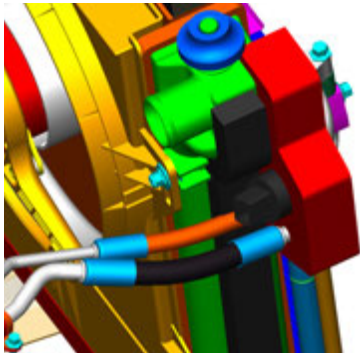
6. Connect (glue) the filter gauze and foam where the two halves of the A/C unit meet.
7. Install the in-vehicle temperature pipe to the A/C unit clips.
8. Install the A/C unit to the IP (Refer to 'A/C Unit', page 12-3-11).
9. Install the IP (Refer to 'Instrument Panel (IP) (01.12)', page 1-9-1).
10. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).

Trinary Switch

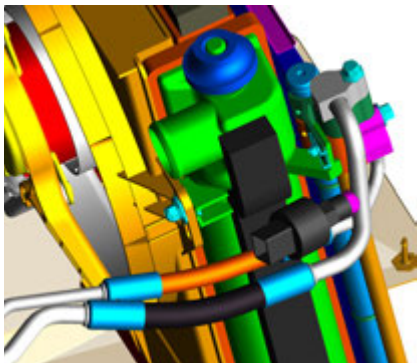
Repair Operation Time (ROT)	
Item	Code
A/C Trinary Switch Renew	TBA

Removal

1. Disconnect the vehicle battery.
2. Recover the refrigerant from the A/C system.
3. Remove the foam surround.



4. Disconnect the wiring harness plug.
5. Hold the piping block with pliers or a similar tool and loosen the trinary switch using a wrench. Withdraw the trinary switch.



Installation

1. Install the trinary switch. Torque to **TBA Nm**.

Apply compressor oil to the O-ring joint.

2. Connect the wiring harness plug.
3. Install the foam surround.
4. Charge the A/C system (Refer to 'Charging', page 12-3-8).
5. Connect the vehicle battery. Start the engine. Allow the engine cooling system to rise to normal running temperature.
6. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).

Expansion Valve

Repair Operation Time (ROT)	
Item	Code
A/C Expansion Valve Renew	TBA

Removal

1. Disconnect the vehicle battery.
2. Recover the refrigerant from the A/C system.
3. Remove protective material from around the expansion valve.
4. Remove screws (x2). Remove the A/C pipes clamp.



5. Withdraw the A/C pipes. Discard 'O' rings.



6. Withdraw the expansion valve. Discard 'O' rings.



Installation

<i>Install new 'O' rings.</i>

<i>Apply compressor oil to the 'O'-ring joints.</i>

1. Install the expansion valve to the A/C unit body.
2. Install the A/C pipes to the expansion valve.
3. Install the A/C pipes clamp.
4. Install sealant around the evaporator pipes.
5. Install the in-vehicle temperature pipe to the A/C unit clips.
6. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9)
7. Connect the vehicle battery. Start the engine. Allow the engine cooling system to rise to normal running temperature.
8. Carry out A/C system actuator check and functional check to ensure correct operation (Refer to 'A/C System Testing', page 12-3-9).



Troubleshooting

The areas for inspection (steps) are given according to various circuit malfunctions. Use the following chart to verify the symptoms of the trouble in order to diagnose the appropriate area.

Symptom(1)	Description	Possible Cause
Insufficient air (or no air) blown from vents.	Problem with each vent / duct or both. Airflow mode does not change.	• Fault in Airflow Mode Actuator • Fault in 'Vent' mode system • Fault in 'Heat' mode system • Fault in 'Defroster' mode system
Symptom(2)	Description	Possible Cause
Amount of air blown from vents does not change.	Fault in blower system.	• Blower motor fault • Blower unit fault • Power transistor system fault • Climate control unit fault
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		
Symptom(3)	Description	Possible Cause
Air intake mode does not change.	Air intake mode does not change when switching REC FRESH mode.	• Air Intake Actuator fault • Air intake door fault
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		
Symptom(4)	Description	Possible Cause
No temperature control with A/C Module.	Temperature does not change with operating temperature control dial	• Air Mix Actuator (5 V signal) system fault • A/C Module (potentiometer GND signal) system fault • Air Mix Actuator (potentiometer input signal) system fault • Air Mix Actuator (potentiometer GND signal, motor drive signal) system fault • Air Mix Actuator system fault • A/C unit air mix door fault
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		
Symptom(5)	Description	Possible Cause
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	• A/C Module (B+ signal) system fault • Air intake actuator fault • A/C Module (RECIRCULATE, FRESH signal) system fault • Fault in blower unit air intake doors
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		

Symptom(6)	Description	Possible Cause
Air from vents not cold enough.	Magnetic clutch operates but A/C system malfunctions.	• Drive belt fault • Fault in blower unit or condenser • Fault in Receiver / Drier or expansion valve (valve closes too much) • Fault in refrigerant lines • A/C compressor system fault, insufficient compressor oil • Over filling of compressor oil, fault in expansion valve or A/C unit air mix link system
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		
Symptom(7)	Description	Possible Cause
No cool air.	Magnetic clutch does not operate.	• Fault in PCM A/C cut control system • Fault in A/C Module • Fault in refrigerant pressure switch • Fault in PCM (A/C signal) • Fault in PCM (IG1 signal) • Fault in A/C compressor • Fault in A/C relay • Fault in Evaporator Temperature Sensor
<i>Shake the wiring harness and connectors while performing 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 harnesses are connected correctly and undamaged.</i>		
Symptom(8)	Description	Possible Cause
Noise while operating A/C system.	Noise from magnetic clutch, A/C compressor, hose or refrigerant line.	• Magnetic clutch operation noise • A/C compressor slippage noise • Hose or refrigerant line interference noise



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