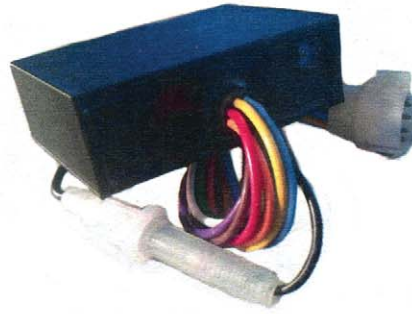


Jaguar / Daimler



JA-16

Replacement For C45402

Amplifier Module

For

Delanair MKII Climate Control System

Jaguar 1974-1987

Models

XJ6, XJ12, XJS

AC Amplifier Operational Summary

The Delanair Mark II air conditioning / heating system fitted to Series II & III Jaguar models XJ-6, XJ-6L, XJ-12, XJ-S and Daimler luxury cars is a climatic control type using two manual controls. One selects the desired temperature; the other selects



mode of operation.

The system can automatically maintain any temperature selected at the temperature selector (65°F - 85°F) by comparing the car's interior temperature with that selected at the manual selector. The difference in temperature at these two points produces an electronic signal which, through an amplifier to a motor driven camshaft (Servo), which driven in either direction, operates various relays, micro-switches, vacuum switches, linkage and flaps; programming the unit to automatically cause hot or cold air to flow to the car's interior, depending upon the temperature selector setting.

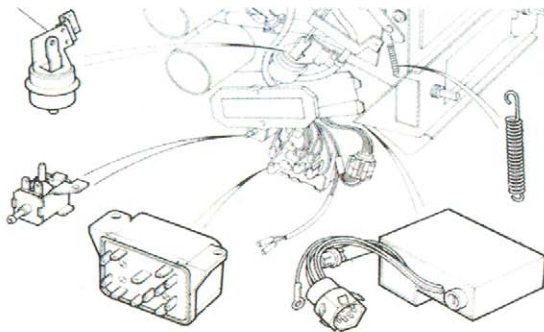
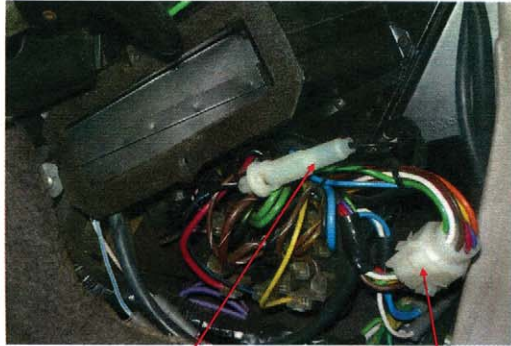
The air temperature entering the interior may be hot or cold or an infinitely variable mixture of the two. The air is first passed through the evaporator, to be cooled and dried, then through a series of blending flaps which temper it by varying the amount of air passing through the heater core and finally introduced into the interior by two four-speed fans.

If quick or slow air distribution of heating or cooling is desired, the automatic fan speed functions can be overridden to provide high or low fan speed. The low speed fan operates in Auto and LO positions automatically; however, if high or low speed fan is selected, all other functions still remain automatic.

Installation

The A/C amplifier is located on the left side of the transmission tunnel under the dash. Access is by removing the left side cheek & vent panel.

1. Disconnect the battery.
2. Remove the left side cheek & vent panel by removing the two screws in the vent and sliding the panel slightly toward the front of the car to disengage the retaining clip.
3. Remove four (4) screws from air outlet duct and remove duct.
4. Disconnect the amplifier black (Earth/Ground) fuse wire & multi-conductor cable plug.
5. Remove nut retaining the vacuum solenoid and relay box.
6. Remove remaining nut securing relay box and swing relay box clear to provide access to amplifier unit.
7. Release amplifier from spring retaining clip and remove amplifier from beneath heater / cooler unit.
8. Perform pre-installation **Sensing System Tests**.
9. Install the Replacement Amplifier by reversing steps 1-7.
10. Perform Post-Installation Calibration as detailed below.



Post-Installation Calibration

1. Begin calibration after vehicle engine has been warmed to normal operating temperature by driving. Once warm, calibration may be performed at idle.

Warning: Do Not conduct calibration while vehicle is in motion!

2. Set the temperature selector at 75 and run vehicle at 1500 rpm.

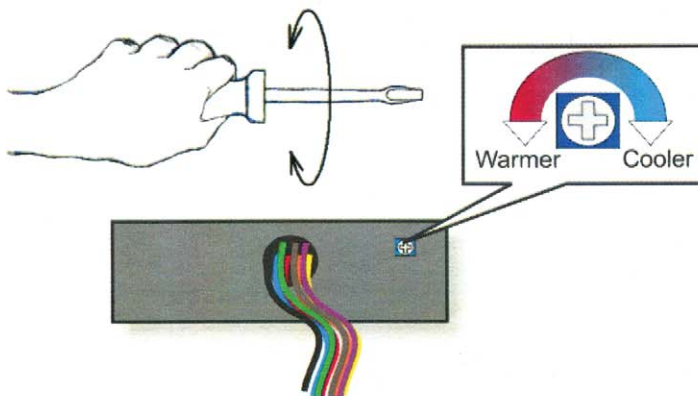
3. Ensure engine temperature is normal and cabin temperature is fairly stable.

4. Measure the air temperature in the region of the in-car sensor using a mercury thermometer.

5. When the selected temperature and the cabin temperature of the system become balanced, the fan speed will drop to low and the Servo camshaft will cease to move. The temperature on the Mercury thermometer should be stabilized. Note the difference in temperature between the 75 selected at the temperature selector and that registered by the mercury thermometer.



6. Every 5°F between the two items equals 45° angular rotation of the temperature control.

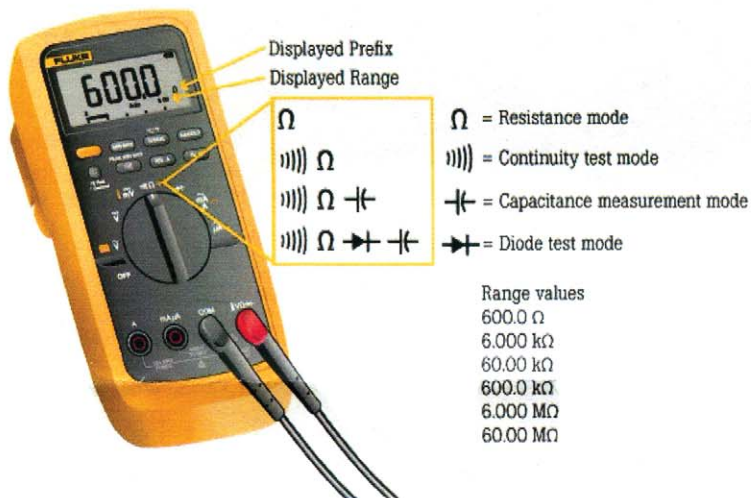


7. If the temperature is higher at the Mercury thermometer than that selected at the temperature selector, rotate the amplifier potentiometer adjusting screw clockwise by the same angular amount as that estimated at the temperature selector. Similarly, if temperature is lower at the Mercury thermometer, adjust in a counter-clockwise direction.

How to Measure Resistance

Note: These are general instructions, each meter will vary. Consult your meter manufacturers instruction manual for specific details.

1. Turn dial to Ω (resistance, or ohms), which often shares a spot on the dial with one or more other test/measurement modes (continuity, capacitance or diode; see illustration below).



2. First insert the black test lead into the COM jack.

3. Then insert the red lead into the V Ω jack.

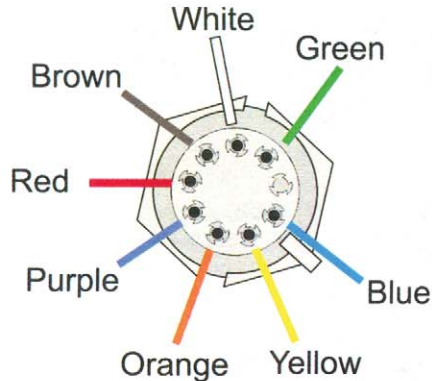
4. Connect test leads across the component being tested. Make sure that contact between the test leads and circuit is good.

Other factors that can affect resistance readings: Foreign substances (dirt, solder flux, oil), body contact with the metal ends of the test leads, or parallel circuit paths. The human body becomes a parallel resistance path, lowering total circuit resistance. Thus avoid touching metal parts of test leads to avoid errors.

5. Read the measurement on the display.

Sensing System Testing:

Disconnect Amplifier plug from harness Socket. Perform following test at harness



socket:

- ◆ Pin 7 (Blue wire) to Pin 4 (White wire). *Temperature Selector should vary from 0 to 10K.*

- ◆ Pin 7 (Blue wire) to Pin 3 (Brown wire).

<u>AMBIENT TEMP.</u>	<u>MODE CONTROL</u>	<u>OTHER MODES</u>
<u>APPROXIMATELY</u>	<u>AT DEFROST</u>	
60°	43K ohms	16K ohms
70°	40K	13K
75°	38K	11K
80°	37K	10K
85°	36.5K	2.5K

- ◆ Pin 9 (Orange wire) to Pin 8 (Yellow wire). *Feedback Potentiometer = 2K*

- ◆ Pin 9 (Orange wire) to Pin 5 (Green wire). *Feedback Potentiometer (Track to wiper arm) 0 - 2K ohms.*
If 0, servo in full heat position.
If 2K, servo in full cool.

- ◆ Pin 1 (Purple wire) to Pin 2 (Red wire). 30 ohms (*servo motor resistance maximum acceptable 100 ohms*).

Control System Functional Test

- A. With engine cold, turn TEMPERATURE SELECTOR to 85 and MODE CONTROL to AUTO.
- B. Start engine - run at 1,000 rpm. Servo motor "whir" should be heard.
- C. The fans should **not** operate until engine temperature reaches 40°C (103°F).
- D. At 40°C (103°F) the fans should come on at MED 1 (2nd) speed.
Check for correct speed by selecting LO at MODE CONTROL.
Fans should drop to low (1st) speed.
Place MODE CONTROL back to AUTO.
Compressor clutch should be energized.
- E. Air from the outlets will gradually increase in temperature as the engine temperature increases.
- F. With engine warm, turn TEMPERATURE SELECTOR to 65. The unit should go through the following sequence in about 20 seconds:
- Blower speed will drop to low.
- Incoming temperature will decrease, the upper vent temperature dropping more quickly than footwell temperature.
- After about 10 seconds, the center outlet vent flap will open.
- About 1 second later, the fan speed will shift to MED 1 (2nd speed).
- Another second later, the fan speed will shift to MED 2 (3rd speed).
- Another second later, the fan speed will shift to maximum (4th speed). At the same time, the fresh air vents will close and the recirculation flaps will open. A rush of air will be felt along the bottom edge of the lower center console trim panels.
- G. Turn MODE CONTROL to LO which should cause the fan speed to drop:
- H. Return MODE CONTROL to AUTO.
NOTE: On some cars the change of the fan speeds may be hard to detect.
- I. Within ten minutes, depending upon ambient conditions, the unit should shift off recirculation and the blowers will drop to one of the intermediate speeds.
(This test should be carried out on the road to get faster thermistor response.)
- J. Turn MODE CONTROL to DEFROST.
The center dash flap should close and the windscreen vent outlets open.
Air to the footwells should cut off leaving air supply to the upper vent outlets only.
Fans should shift to maximum (4th) speed and hot air should flow from the upper outlets.
Check that air can be cut off at dash face level outer outlets.
- K. Set MODE CONTROL to AUTO.
Set temperature selector to 75 and wait for unit to settle.
The fans should now be on low speed - depending on Ambient temperature.
- L. Turn MODE CONTROL to HIGH - Maximum (4th) speed should now engage.

Warranty

Thank you for your interest in the products and services of Jag-Aire, LLC

This Limited Warranty applies to the physical goods, and only for physical goods, purchased from Jag-Aire, LLC, (the "Product").

What does this Limited warranty cover?

This limited warranty covers any defects in material or workmanship under normal use during the Warranty Period. During the Warranty Period, Jag-Aire, LLC will repair or replace, at no charge, products (or parts of a product) that proves defective because of improper material or workmanship, under normal use and maintenance.

What will we do to correct problem(s)?

Jag-Aire, LLC will either repair or replace the product at no charge, using new or refurbished replacement parts. Jag-Aire, LLC will not ship replacement parts for a warranty claim unless the allegedly defective part has been inspected/approved by Jag-Aire, LLC or a deposit for the full value of the replacement has been made.

How long does the coverage last?

The Warranty Period for Products purchased from Jag-Aire, LLC is one (1) year from date of purchase. A replacement Product or part assumes the remaining warranty of the original Product; or one (1) year from the date of replacement or repair, whichever is longer.

What does this warranty not cover?

This Limited Warranty does not cover any problem that is caused by:

- Conditions, malfunctions, or damage not resulting from defects in material or workmanship such as damage to the product as a result of failure to perform the pre-installation tests of in-car equipment.

What do you have to do?

To obtain warranty service, you must first contact us to determine the problem and the most appropriate solution for you.