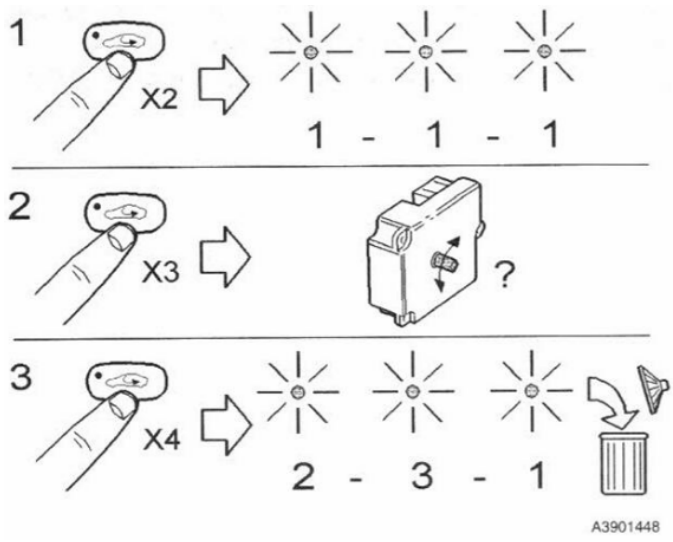
INFORMATION AND REPAIR

Diagnostic trouble codes (DTCs)

If the control module detects a fault, it stores a diagnostic trouble code (DTC) and the orange LEDs in the REC and the air conditioning (A/C) buttons flash for approximately 20 seconds. The control module can store up to 38 diagnostic trouble codes (DTCs). If the total diagnostic trouble codes (DTCs) exceeds 10 the five first diagnostic trouble codes (DTCs) will always be saved, while the last five become the latest diagnostic trouble code (DTCs) to be stored.
If for some reason a fault disappears after the diagnostic trouble code (DTC) has been permanently stored in the control module, information about the fault is stored in the control module.
Every diagnostic trouble code (DTC) has a counter which records the number of cycles which have been fault-free since the diagnostic trouble code (DTC) was stored (intermittent fault). A cycle is defined from when the ignition was turned on, was then on for at least 10 seconds and then turned off. Every time the cycle runs without the control module registering the fault again, increases the counter by 1. Using the counter, it is possible to determine if the control module interprets

diagnostic trouble code (DTC) as permanent or intermittent. When the counter is at 0 the transmission control module (TCM) treats the fault as a permanent fault. If the counter value is greater than 0 the control module interprets this as meaning the fault is intermittent.

Diagnostic functions



The Volvo on-board diagnostic (OBD) system functions are activated by pressing the REC button on the unit. The following functions are available:
— 1 reading off diagnostic trouble codes (DTCs) (initiated by pressing button twice)
— 2 self-adjustment of the damper motors (initiated by pressing button three times)
— 3 erasing diagnostic trouble codes (DTCs) (initiated by pressing button four times)
Refer to the picture for information on how to initiate the sequences and how to interpret the flashes from the indicator LED.

`Note!` `The REC button has to be in the ON position (pressed in) and then pressed again (OFF position) to be counted as part of the sequence.`

To activate diagnostics:
— The ignition must be ON
— The battery voltage must be normal.

Reading and erasing diagnostic trouble codes (DTCs)

Stored diagnostic trouble codes (DTCs) can be read and erased using this service.
The on-board diagnostic (OBD) system can identify up to **10 faults**, displayed as diagnostic trouble codes (DTCs). For fault-tracing, see **MMB – DTC table for manual climate control unit, page 161**.

Reading Diagnostic Trouble Codes (DTCs)

1. Turn the ignition to position **I** or **II**.
2. Press the **REC** button **twice within three seconds**.
   - **Note:** The button must be pressed within three seconds of switching the ignition on.
3. Read the flashes from the **REC indicator LED**.
   - The REC LED flashes **for 1 second**, then is off **for 0.5 seconds**.
   - The interval **between digits in a DTC code** is **2 seconds**.
   - The interval **between different DTC codes** is **5 seconds**.
4. If the display shows **1-1-1**, the control module has **no stored DTCs**.

Erasing Diagnostic Trouble Codes (DTCs)

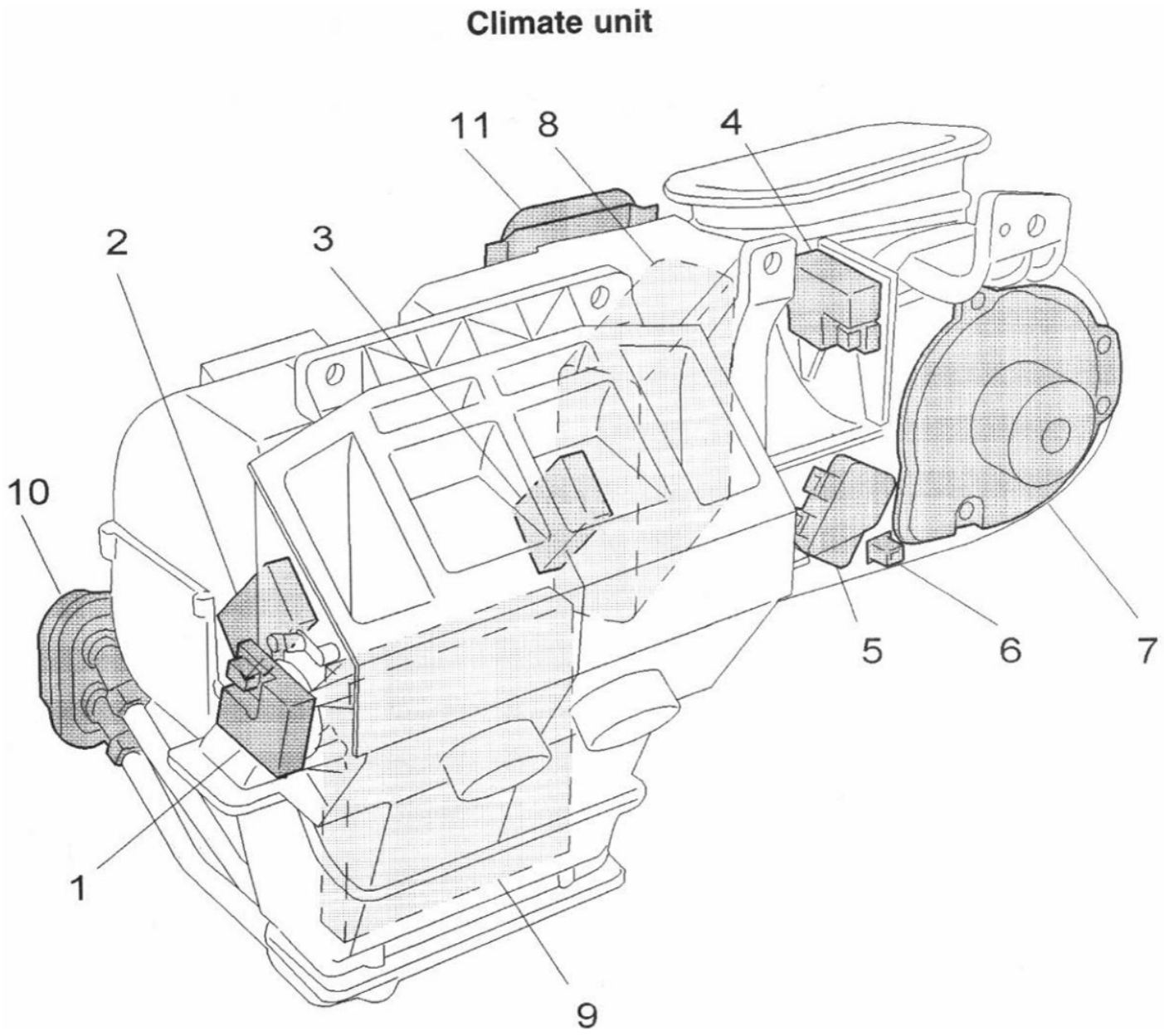
1. Turn the ignition to position **I** or **II**.
2. Press the **REC** button **four times within three seconds**.
   - **Note:** The button must be pressed within three seconds of turning the ignition on.
3. After erasing the codes, **perform another DTC readout** to confirm that no new codes have been stored.

DTC table ECC

Diagnostic trouble code (DTC)	Notes
ECC-121	Outside temperature sensor, signal too low
ECC-122	Outside temperature sensor, signal too high
ECC-123	Passenger compartment temperature sensor, signal too low
ECC-124	Passenger compartment temperature sensor, signal too high
ECC-135	Engine coolant temperature (ECT) sensor, signal missing
ECC-141	Passenger compartment temperature selector left, faulty signal
ECC-143	Passenger compartment temperature selector right, faulty signal
ECC-211	Damper motor position sensor temperature driver, signal too high
ECC-212	Damper motor position sensor temperature driver, signal too low
ECC-221	Damper motor position sensor air distribution, signal too low
ECC-222	Damper motor position sensor air distribution, signal too high
ECC-231	Damper motor position sensor temperature passenger, signal too high
ECC-232	Damper motor position sensor temperature passenger, signal too low
ECC-235	Damper motor position sensor recirculation, signal too high
ECC-236	Damper motor position sensor recirculation, signal too low

Diagnostic trouble code (DTC)	Notes
ECC-311	Damper motor temperature driver, faulty signal
ECC-312	Damper motor temperature driver, active too long
ECC-313	Damper motor temperature passenger, faulty
ECC-314	Damper motor temperature passenger, active too long
ECC-315	Damper motor recirculation, faulty signal
ECC-316	Damper motor recirculation, active too long
ECC-317	Damper motor air distribution, faulty signal
ECC-322	Damper motor air distribution, active too long
ECC-411	Power unit blower fan motor, faulty signal
ECC-412	Fan motor passenger compartment temperature sensor, signal too low
ECC-413	Fan motor passenger compartment temperature sensor, signal too high
ECC-414	Fan motor passenger compartment temperature sensor, faulty signal
ECC-420	ECC control module memory circuits, internal fault
ECC-421	ECC control module PROM (programmable read only memory), internal fault
ECC-422	Self-adjustment of damper motors temperature driver, faulty
ECC-423	Self-adjustment of damper motors temperature passenger, faulty
ECC-424	Self-adjustment of damper motors air distribution, faulty
ECC-425	Self-adjustment of damper motors recirculation, faulty
ECC-431	Blower fan speed selector switch, signal too high
ECC-432	Blower fan speed selector switch, signal too low
ECC-433	Blower fan motor, current too high
ECC-441	Program download to control module, not carried out
ECC-442	Program download to control module, faulty

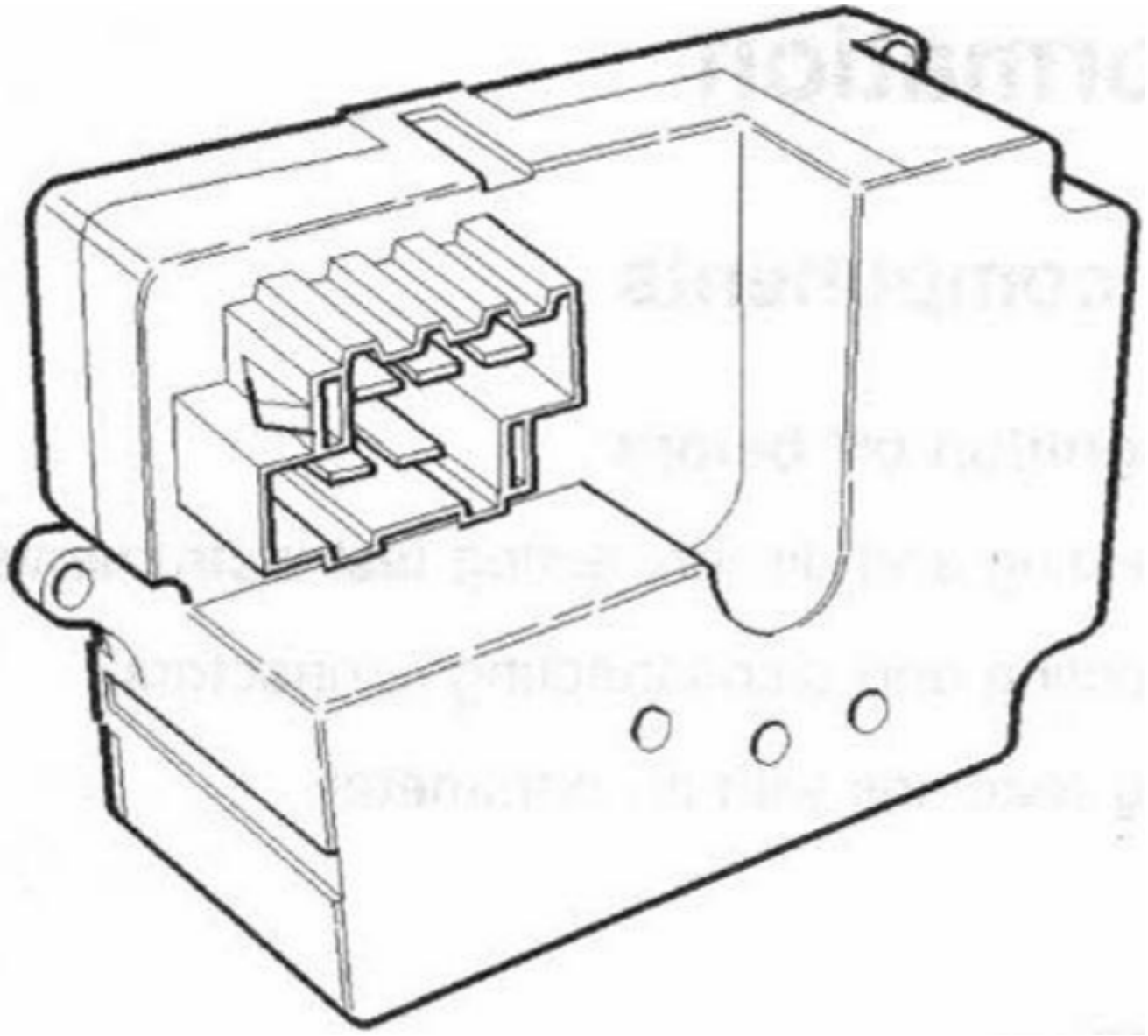
Climate Unit



Component List

1. **Damper motor – air distribution**
2. **Damper motor – left temperature** (ECC)
3. **Damper motor – right temperature** (ECC)
4. **Damper motor – recirculation**
5. **Power unit – blower fan (ECC) / Blower fan resistor (MCC)**
6. **Outside temperature sensor** (Part No. 8702376)
7. **Blower fan**
8. **Evaporator**
9. **Heater unit**
10. **Coolant pipe connection** (to/from engine compartment)
11. **Refrigerant pipe connection** (to/from engine compartment)

Self-adjustment of blend door motors



The blend door motors are self-adjusting after any of them has been removed or replaced, or other work is carried out on the motor or linkage.

To activate self-adjustment, proceed as follows:

1. Ignition ON, position I or II
2. press in the REC button three times within three seconds.

NOTE! The button must be pressed within three seconds of the ignition being turned on!

NOTE! The control module automatically does a self-adjustment when it is connected to the car or when it registers that the power has been disconnected (e.g. battery disconnected) for more than 30 seconds.

How does the blend door motor function?

The motor sends a voltage signal back to the controller between 0.5V to 4.8V.

Based on the user's desired temperature, the motor turns to a desired position based on the voltage signal back from the motor.

If the motor turns more than the voltage limits, the calibration errors out and the motor is stuck in position until a calibration is successful.

Why does my blend door motor not calibrate?

I would say there are two main reasons the motor does not calibrate.

1. The motor has an internal fault such as a failed component
2. The black plastic shaft which the square drive slots into has cracked. When this square hole cracks, the shaft slips inside the square hole and prevents the motor from finding the two limit points.

How to fix the cracked black plastic input shaft

I bought "Brass Round Tube 300mm Length 11mm OD 0.5mm Wall Thickness" I cut this into a 3mm wide piece and hammered it on the end of the rod to clamp it shut.

This prevents the square drive of the motor slipping inside the hole and lets the motor calibrate.

Revision #6
Created 2025-06-22 12:22:46 UTC by Kyle Robertson
Updated 2025-12-03 20:17:05 UTC by Kyle Robertson