

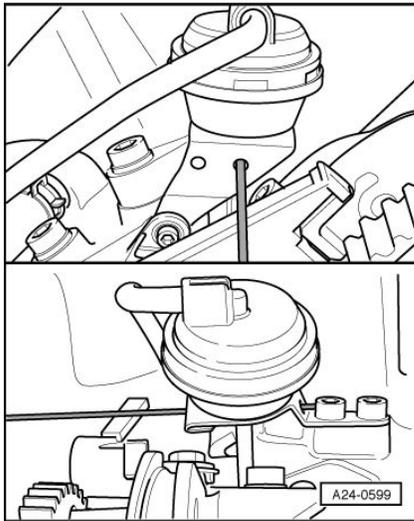
The flaps vary the area of the inlet manifold through which the incoming air flows, depending on engine speed, load etc.

The movement of the flaps is via a vacuum actuator. The vacuum supply to the actuator is controlled by a valve, which is, in turn, controlled by the ECU.

When vacuum is applied, the actuator lifts about 15 mm, and the output shaft, which is linked to the flap spindle via a bell crank, rotates the flap spindle, and raises the flaps.

Note: The normal position of the flaps, when the engine is running, is the raised position, with a vacuum present on the actuator. They only drop to the lowered position above about 2800 rpm, when the vacuum is released, and the spring in the actuator moves the shaft down. This is a bit counter intuitive, well it was to me anyway!

Because the default position of the flaps is raised (by vacuum applied to the actuator), when assembling the manifold, the actuator must be locked in the raised position, by inserting a small rod through a hole in the mounting bracket, through the actuator shaft, out the other side, and then through another hole in the bracket, like this:



Unless the car has been idle for a long time (or there is a vacuum leak) there will be enough residual vacuum to hold the flaps in the raised position, so when the ignition is switched on (but before the engine starts) the vacuum is purged, the actuator will fall (it has a return spring), and the flaps will move to the lower position (manifold fully open).

As soon as the engine starts, the actuator moves the flaps to the normal raised position (manifold partially closed). The flaps will remain in the raised position until engine revs get above about 2800 rpm, when they will move to the low state (manifold fully open).

Once the manifold is assembled, and the locking rod is removed (allowing the flaps to drop), but still on the bench, the flap operation should be checked. This is done by applying a vacuum to the actuator, and watching the flaps move from the low to raised, then back again when the vacuum is released. This can be done by fitting a length of suitable hose to the actuator nipple, and sucking the other end!

Once it's clear all is well, and the flaps are moving easily and smoothly, the assembly can be fitted to the engine.

The actual position of the flap spindle is monitored by the sensor mounted on the end of the shaft. It feeds back to the ECU. If the sensor (and flap spindle) position is not exactly what the ECU expects, an error is recorded. I believe it takes three errors to trigger the EML light and the P1031 code on VCDS.

When the manifold has been stripped and re-assembled, the relative positions of the sensor (a potentiometer) and the flap spindle will not be exactly as before. To correct this, a calibration (or adaptation) must be carried out, using VCDS, like this, an extract from the A2 Workshop Manual:

Adaption of intake manifold flaps must be performed on replacement of lower part of intake manifold (Self-diagnosis, Basic setting, Measured value block 142).

Turn the key on but do not start the car.

[Select]
[01 - Engine]
[Measuring Blocks - 08]

Enter Group 060

[Go!]
[Switch to basic settings]

Once you do this you will see the top right display say ADP RUN. The TB adaptation is being done as soon as you switch to basic settings. You will see the values change and hear the TB cycle for the first few seconds then it will stop. Leave it in Basic Settings for about 30 seconds.

[Switch to Meas. Blocks] button and you're all set.

Be sure not to touch the accelerator and make sure the engine is NOT running when you do this!

.

.