SERVICE INFORMATION

Intake manifold/electric drive module

Possible fault cause and replacement

Vehicle	Product	Intake manifold	Electric drive module
Opel Astra H, Vectra C, Signum with 1.9 l CDTi engine (Z19DTH) Zafira B Alfa Romeo: 147, 156, 159, GT (1.9 JTD) Fiat: Stilo (1.9 JTD)	**PIERBURG No.**	**7.00373.12.0**	**7.00521.14.0**
	Replacement for	7.00373.1 0.0/7.01860.00.0	7.00521.00.0/.11.0
	O.E. No.*	58 50 119/93179055 58 50 158/55206459 58 50 180/55210201	8 50 440/93183260 58 50 574/93185801 8 50 444/55205127

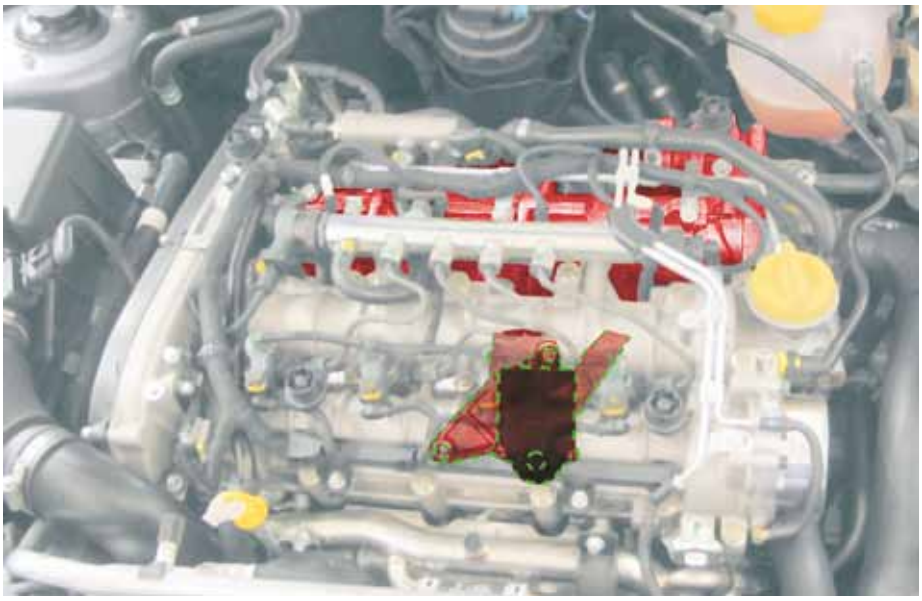
Possible customer complaints:

- Inadequate engine power
- Emergency operation
- Opel fault code P1109 “Swirl actuator malfunction”
- Malfunction indication

The vehicles listed above are provided with two separate inlet ports for each cylinder. In each case one of the two channels can be sealed off by means of a tumble flap.
The tumble flaps are linked by means of a lever arrangement and are actuated by an electric drive module.
In the case of the customer complaints mentioned, the error memory is read out in the course of the workshop check and the electric drive module is frequently replaced as being defective.

Often the error is not with the drive module!

The true fault cause are often worn out, tight tumble flaps in the intake manifold. The drive module can no longer move the tight tumble flaps and indicates an error.



Engine compartment of the Opel Vectra:
The intake manifold with the EGR flap is emphasised in red. The drive module is located, not being visible, “behind the engine” and is only hinted (green dashed line).

Electric drive modules are capable of “learning”:
After having operated the ignition several times, the electric drive modules are “set up” irreversibly matching the intake manifold to which they are fitted.

For this reason when exchanging the intake manifold, also the electric drive module must be replaced by a new one. The “old” drive module can no longer be used.

The right of changes and deviating pictures is reserved. Assignment and usage, refer to the each case current catalogues, TecDoc CD respectively systems based on TecDoc.
* The reference numbers given are for comparison purposes only and must not be used on invoices to the consumer.

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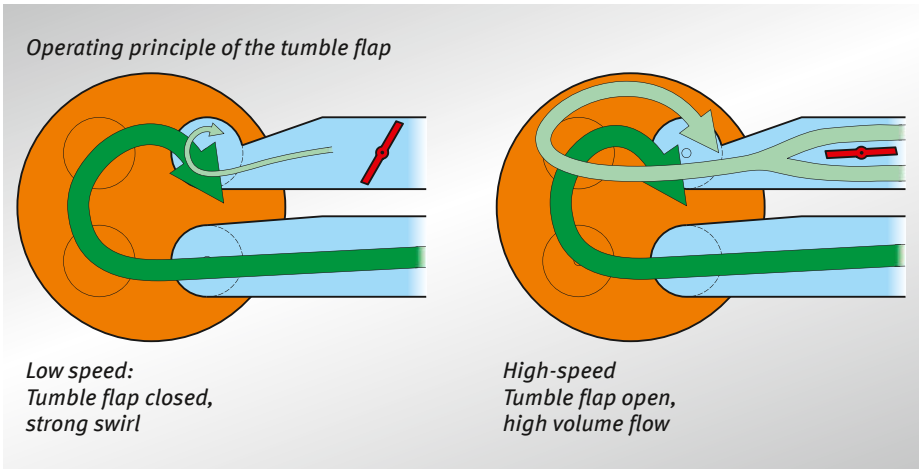
Operation of the Tumble Flaps

So that the fuel/air mixture is combusted in the CDTi engine as quickly as possible and as best as possible, the air entering through two separate intake channels for each cylinder is provided with a swirl.
One of these intake channels in each case is equipped in addition with an adjustable tumble flap which is actuated through a lever arrangement by the electric drive module.
Through the position of the tumble flaps, swirling of the fresh air in the cylinder can be adapted to the specific load conditions of the engine.
In this way the quantity of emitted pollutants and the power can be optimally set up depending on the specific load conditions.



Intake manifold 7.00373.12.0 with drive module 7.00521.14.0

Electric Drive Module EAM-i

EAM-i stands for **E**lektrisches **A**ntriebs-**M**odul (electric drive module) with integrated “intelligence”.
It permits an adjustment to any point within the operating angle range.
An integrated angle sensor acquires the actual position. In case a deviation with respect to the setpoint position is detected, this is then indicated as an error to the engine controller.
The position of the tumble flaps in the intake manifold itself is not acquired. This can only be performed indirectly through the angle position of the drive module.
For this reason malfunctions at the tumble flaps or at the lever the arrangement are sometimes attributed to the drive module.

Electric drive module EAM-i

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Diagnosis information

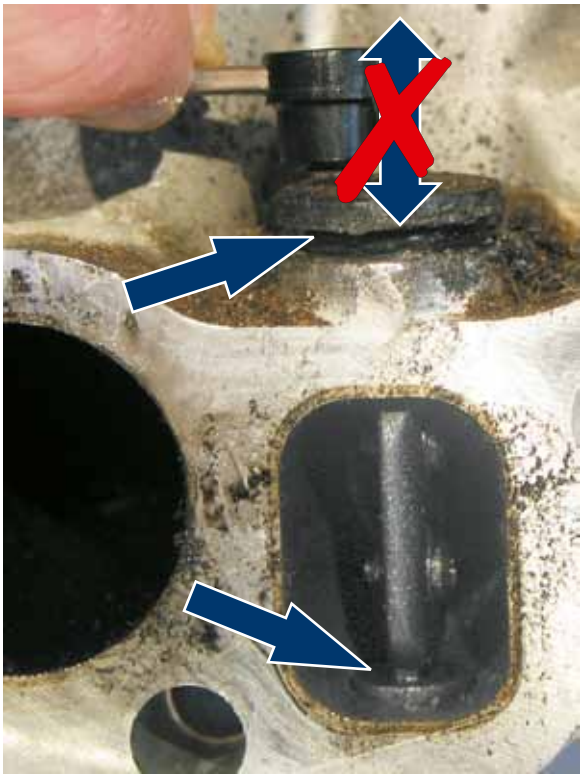
The cause for these malfunctions are often stiff or sticking tumble flaps. Deposits or sticking tumble flaps can be caused by very oily intake or charging air. There are many reasons for this.

- Bad, dirty combustion
- Faults in the engine management
- Incorrect software revision of the engine controller
- Frequent short-run operation
- Malfunctions in the crankcase vent

When the faulty intake manifold remains in the vehicle and only the drive module is changed, this error will reappear quite quickly.

- Perform an actuator diagnosis (according to manufacturer's information for the diagnosis unit) of the drive module: if the drive module switches, power supply and drive module are electrically in order.
- Check to ensure that there is a proper link ("lever arrangement") between the drive module and the tumble flaps.
- Check to ensure that the tumble flaps can move freely. The actuating lever must, after being deflected, return to its initial position within a period of 1 to 2 seconds.
- It must not be possible to move the tumble flaps in the axial direction (see figure).

Lever arrangement at the intake manifold in the Opel Vectra (top emphasised in red and detailed view)



Worn out bearings at the tumble flaps

- In the case of constantly open tumble flaps, the soot levels in the exhaust gas increase at low engine speeds.
- In the case of constantly closed tumble flaps, the soot levels increase at high engine speeds.

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