MOTORSERVICE

Electric Fuel Pumps

Our knowledge for your work

SERVICE
TIPS & INFOS

POSTER
INSIDE

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It won’t work without! – Electric Fuel Pumps

The heart of the vehicle

The electric fuel pump is an important component in the vehicle.
If there is a malfunction in the fuel pump, or if it fails completely, it is often difficult for a workshop to determine the cause of the damage with absolute certainty.
After a new pump has been installed, damages and malfunctions often occur again within a brief period of time because although the damaged components were replaced, the actual cause of the damage was not remedied.

Therefore a more comprehensive approach to the entire fuel system is required.
In the workshop a defective or returned pump can be assessed only according to its outward appearance and delivery rate or pressure (please refer to Section 5.2 as well).
In many cases, the decision on whether a complaint is justified or not can be made only when the fuel pump is opened and the damage is viewed “from inside”.

Views of hidden areas

An important concern of this brochure is to explain what could have been responsible for the failure of a fuel pump.
This brochure offers assistance in diagnosing and determining the causes.
Based on common instances of damage, we show what it looks like inside defective or returned pumps, and what the causes of the damage could be.

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3.2 Contaminated fuel

3.2.1 Damage through contamination

The most common cause of malfunctions in the fuel system or premature failure of fuel pumps is contamination by larger or smaller particles.

The effects of contamination are varied:
- Clogged filters
- Reduced flow rate
- Fuel pump is excessively noisy
- Pump runs dry
- Jammed pump system

Here are some possible causes:
- Rust or chalk particles ("water damage", see section 3.2.2)
- Dirt entering the fuel tank from outside (e.g. on refuelling)
- Ageing of the fuel due to longer periods at standstill (build-up of deposits)
- Maintenance intervals (filter replacement) not complied with
- Poor fuel quality (see section 3.2.3)
- Old, porous fuel hoses
- Entry of dirt and water through a scuffed tank ventilation hose, or due to incorrect subsequent rerouting of the tank ventilation hose

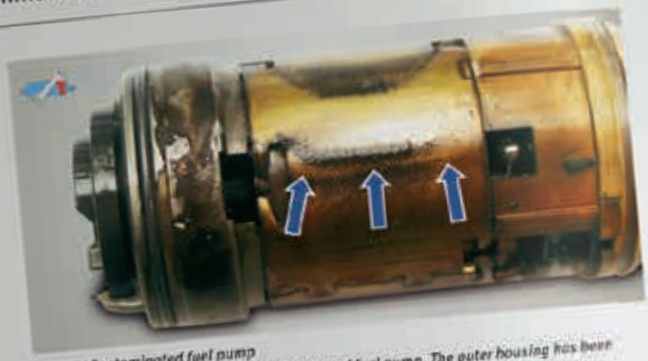

Fig. 17: Contaminated fuel pump
The illustration shows a severely contaminated fuel pump. The outer housing has been removed, and dirt particle deposits can be seen running down the side.

Fig. 18: A sectional view of the housing of an E3T toothed ring pump, clogged with debris

Fig. 19: A jammed pump system (trochoidal toothed ring) of an E3T toothed ring pump

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Clogged filters
If fuel filters or sieves on the intake side are clogged with dirt, the initial symptoms are as follows:
- Inadequate delivery rate
- Insufficient pressure
- Excessive operating noise from the fuel pump
- Engine misfires (due to fuel vapour locks)

This can result in failure of the fuel pump and vehicle breakdown.

Most modern fuel pumps are flushed through with fuel, which lubricates and cools them. If this does not happen to a sufficient extent, e.g. because a prefilter or the sieve filter in the fuel pump inlet is blocked, there is a risk of "dry running". Dry running very quickly leads to damages in the pump system.

Fig. 20: dry run

Fig. 22: Sieve filter of an E1F vane-type pump. Left: clogged - Right: new

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Extract from the brochure

Details on this subject can be found in our brochure „Electric Fuel Pumps – Models, Damage, Reasons".
Order-No.: 50 003 855-02 (English)
or via www.ms-motorservice.com

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The Motorservice Group is the sales organisation for the global aftermarket activities of KSPG (Kolbenschmidt Pierburg). It is one of the leading suppliers of engine components for the independent aftermarket, including the premium brands KOLBENSCHMIDT, PIERBURG and TRW Engine Components, as well as the BF brand. Our comprehensive product range allows our customers to obtain engine components from a single source. As a problem solver for dealers and garages, Motorservice offers extensive service and the technical expertise that you would expect from the subsidiary of one of the largest automotive suppliers.

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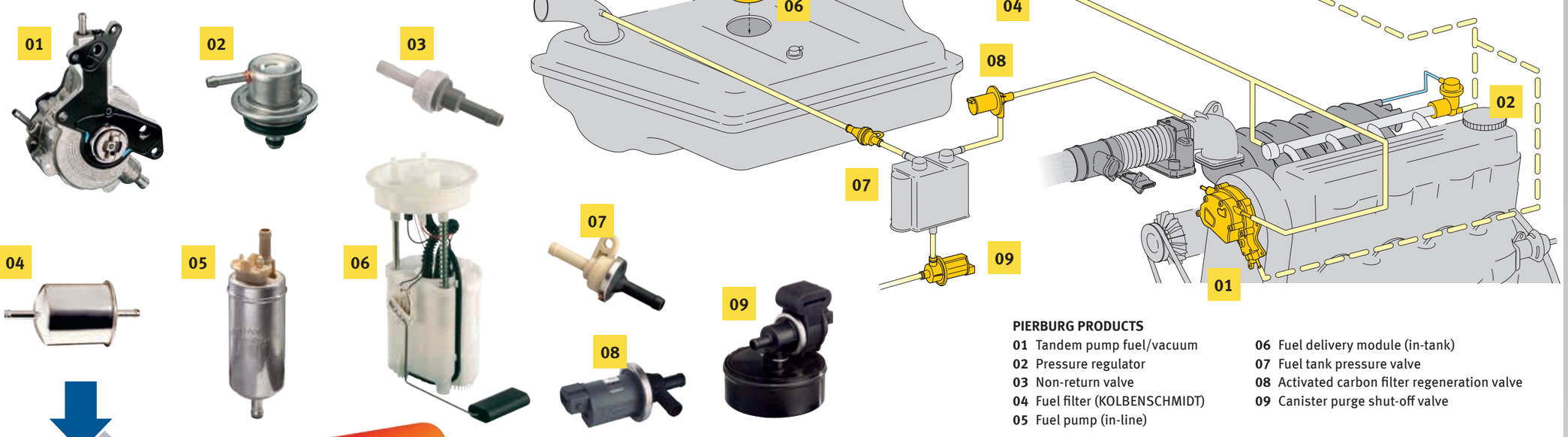
OBD and Fuel Supply

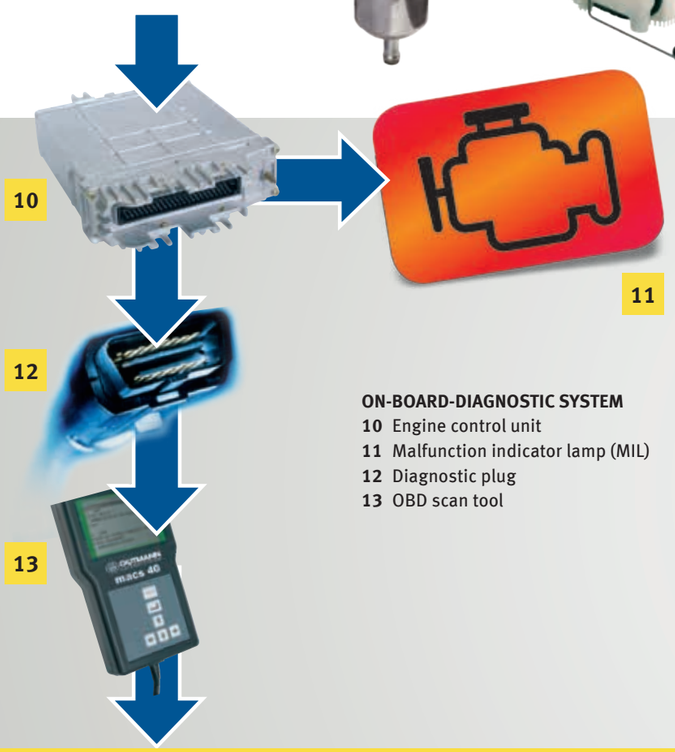
Finding and remedying faults

Fuel supply system and surroundings



PIERBURG PRODUCTS

01 Tandem pump fuel/vacuum
02 Pressure regulator
03 Non-return valve
04 Fuel filter (KOLBENSCHMIDT)
05 Fuel pump (in-line)
06 Fuel delivery module (in-tank)
07 Fuel tank pressure valve
08 Activated carbon filter regeneration valve
09 Canister purge shut-off valve



ON-BOARD-DIAGNOSTIC SYSTEM

10 Engine control unit
11 Malfunction indicator lamp (MIL)
12 Diagnostic plug
13 OBD scan tool

From practical experience

Scorching due to dry running

Rusted pump inlet (water damage)

Stuck sieve filter and new condition

Contact corrosion

Code	Fault	Next steps/Possible remedies
P0005/ P0006/ P0007	**Fuel shut-off solenoid valve – open circuit; signal too high/too low** • Fuel shut-off solenoid valve defective • Connector defective, cable interrupted	• Measure current supply/wire harness, replace if necessary • Check fuel shut-off solenoid valve, replace if necessary
P0087	**Fuel rail/system pressure too low** • Pump/fuel regulator defective • Fuel supply line/fuel filter stuck • Filter on intake side of pump (in case of retrofitting/replacement)	• Check fuel pump/fuel regulator, replace if necessary • Check fuel supply line/fuel filter, replace if necessary • Remove filter that may be fitted on the intake side of the pump
P0172	**Mixture too rich** • Activated carbon filter magnetic valve stuck (permanently open): Fuel-enriched air from the activated carbon filter is drawn into the intake air system • Diaphragm of pneumatic fuel regulator leaky: Fuel is drawn into the intake tract through the vacuum line • Stuck/carbonised EGR valve is always open	• Check ACF solenoid valve, replace if necessary • Check fuel regulator, replace if necessary • Check EGR valve: If the EGR valve is always open exhaust gas is permanently recirculated Replace EGR valve when stuck, find out the causes of sticking
P0441	**Fuel vapour collecting system – incorrect flow rate** • Leaks in activated carbon filter system (ACF system), e.g. hose connections leaky • ACF solenoid valve stuck (always open)	• Examine ACF system for leaks, e.g. by checking hose connections, replace if necessary • Check ACF solenoid valve, replace if necessary
P0462/ P0463	**Fuel level sensor – input signal too low/too high** • Sender unit shows that fuel level is too low • Engine shuts off automatically or does not start	• Check sender unit or module with sender unit, replace if necessary

Details on this subject can be found in our brochure “Service Tips & Infos – Emission control and OBD”.

Further information can be obtained directly from your local Motorservice partner or at www.ms-motorservice.com

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