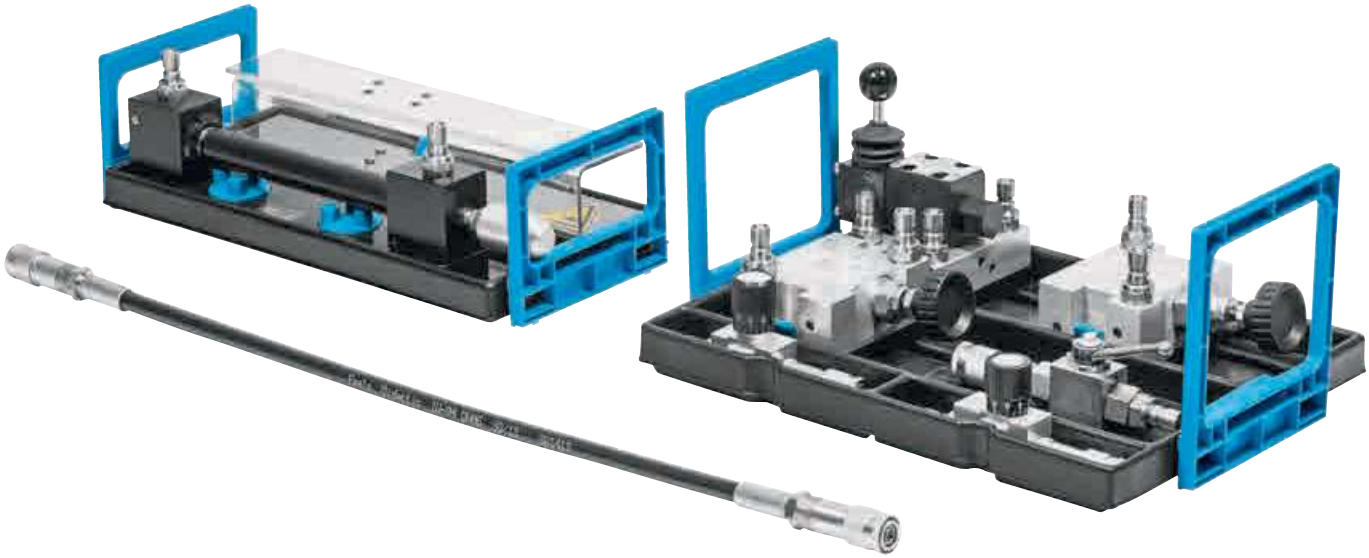
Equipment set TP 501+ – Advanced level

Systematic troubleshooting



Realistic

Equipment set TP 501+ from Festo Didactic is an extension to equipment set TP 501. TP 501+ contains components with specified, realistic defects. It enables hydraulic circuits to be constructed with the TP 501 and individual components to be replaced by defective ones.

Using our experience in industrial environments, we were able to define typical error patterns for hydraulic systems and adapt them to the components contained in equipment set TP 501+.

Professional

Systematic troubleshooting and professional error elimination are an essential part of everyday operations in many jobs in the fields of mechanics, mechatronics, and electrical engineering. In order to acquire skills in this area via a structured, yet safe, procedure, it is important that systematic troubleshooting is both learned and practiced. Keys to this are:

- Understanding circuits and discerning any non-conformities
- Delimiting/precluding any error areas
- Locating and rectifying errors

This procedure assumes specialist knowledge, such as modes of operation of individual components and their system limits

Pressure relief valve with broken spring

One example of a defective component is a pressure relief valve with a broken spring. This defect may be due to a continuous load or a material flaw. The defect results in the spring length being shortened and hence, in a reduction in the maximum pressure that can be set. The conspicuous symptoms result in a lower cylinder force. Pressure sensors or force sensors may not switch, which can lead to interruptions to operation cycles or process safety being put at risk.

Flow control valve with damaged pressure compensator

Another example of a defect is a two-way flow control valve with a damaged pressure compensator. While intact, the valve ensures a constant volumetric flow rate, regardless of the load pressure. However, in this case, the pressure compensator is not working. The differential pressure is no longer being regulated via the throttle valve. Here, the flow control valve behaves like an unregulated throttle valve. A fault like this occurs if dirt has entered the system and as a result, the pressure compensator's piston has seized up in the open position.

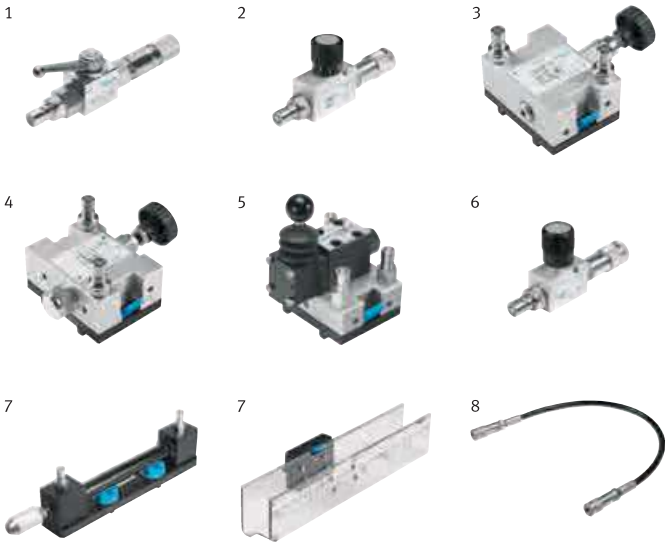
Complete equipment set TP 501+ in equipment tray		**8060229**

The most important components at a glance:

1	1x Shut-off valve, defective	8065301
2	1x One-way flow control valve , defective	8065298
3	1x Pressure relief valve, defective	8065175
4	1x 2-way flow control valve, defective	8065174
5	1x 4/3-way hand lever valve, H-center position, detenting (PTAB)	8065281
6	1x Flow control valve	152842
7	1x Differential cylinder 16/10/200, defective	8065195
8	1x Hose line with quick release couplings, clogged	8065327

Necessary accessories, also order:

Aluminum profile plate ➔ Page 39
Hydraulic power pack ➔ Pages 148 – 149



Requirements
Building on from Basic Level Hydraulics, the Advanced Level contains eight components appropriate for equipment set TP 501. Possible troubleshooting tasks are aimed at all job areas involving maintenance and repair activities. Special measuring equipment is not required since all symptoms are observable. However, error patterns can also be quantified using measuring equipment such as a flowmeter or pressure gauge.

Study materials
A description is included for each defective component describing both its function and the fault. A flow chart, which guides learners systematically from observation of the symptom to the repair task, is also included.

Supplementary media
– Design and simulation using FluidSIM®
– Diagnostic system TP 810 with FluidLab®-M
– Textbook: Basic principles of hydraulics and electrohydraulics
– WBT hydraulics
– Web-based training, electrohydraulics
– Hydraulics poster set