

WABCO AUTOMATED MANUAL TRANSMISSION (AMT)

Aftermarket solutions for gearbox control units
for ZF transmissions



Available to
independent
aftermarket
workshops!

WABCO

WABCO AUTOMATED MANUAL TRANSMISSION (AMT) AFTERMARKET REPAIR SOLUTIONS

GROW YOUR BUSINESS WITH WABCO

Truck maintenance involves many challenges – but with WABCO's automated manual transmission (AMT) solutions, gearbox actuator repair does not have to be one of them. WABCO's AMT technology has been used more than 1.2 million times in heavy duty applications fitted with ZF transmissions since 2000.

Our AMT solutions increase fuel savings through optimised gear-shifting, and help vehicle operators significantly reduce mechanical wear – thereby increasing vehicle uptime. With aftermarket demand expected to be strong and stable across the next decade, equipping your workshop to service our ZF AMT technology represents an excellent return on investment in a market with strong potential for growth.

ORIGINAL PARTS MATTER

Retaining original equipment has many advantages. It guarantees a perfect fit and offers frictionless operation. WABCO's repair kits cover the widest range of repair cases of gearbox control units used in ZF transmissions, and can be sourced swiftly and easily through our comprehensive worldwide distribution network.

EASIER THAN YOU THINK – AND COST-EFFECTIVE TOO

Repairing an AMT may appear difficult – but with a WABCO repair kit, the reality is much, much simpler. WABCO offers an extensive portfolio of repair solutions for a failsafe repair of many components and in the majority of cases, this repair will replace the requirement to substitute the entire gearbox control unit. Most of the repair cases for ZF transmissions can be performed without the need for any specialist tools and without the need to disassemble the complete transmission. It's a cost-effective strategy and greatly reduces vehicle downtime. And WABCO wouldn't be WABCO if we didn't make things even easier for you by providing you with:

Easy diagnostics

Supplied via WABCOWÜRTH, we offer a wide range of diagnostic solutions for fast and precise failure detection on gearbox control units for ZF transmissions.

Tailored repair solutions

WABCO can supply repair kits that are designed to cater for the widest range of gearbox control units repair requirements for ZF transmissions. Reman offers are completing the portfolio.

Simple teach-in procedure

Our software-guided teach-in procedure is designed to ensure the vehicle is running again with minimal downtime after a repair.

Find out more detailed information on the following pages.



EASIER THAN YOU THINK

EASY DIAGNOSTICS

Our AMT technology used in ZF transmissions for heavy-duty trucks can be easily diagnosed using multi-brand diagnostic solution supplied by WABCOWÜRTH (W.EASY®) – available for independent aftermarket workshops. It is expertly tailored for WABCO products, resulting in excellent reliability and precision for our gearbox control units repair solutions.

The WABCOWÜRTH diagnostic software is clearly structured, with an easy-to-operate interface. All critical diagnostic functions are displayed, enabling swift and straightforward system analysis. This includes:

- Automatic system scan
- Display and delete functions for fault codes
- Selection, reading and comparison of actual values
- Actuators
- Calibration and coding

How to order

W.EASY can be ordered via the WABCOWÜRTH distribution network. Each W.EASY diagnostic solution consists of a basic package, to which individual software/hardware can be added. For further details, please visit www.wabcowuerth.com



EASIER & MORE COST-EFFECTIVE THAN YOU THINK

TAILORED REPAIR SOLUTIONS

WABCO offers tailored repair kits, consisting of genuine WABCO parts, for frictionless, cost-efficient repairs. Vast experience working with OE manufacturers and WABCO's long-established reputation for high quality ensure each individual part will fit perfectly, without the compromise of last-minute rework.

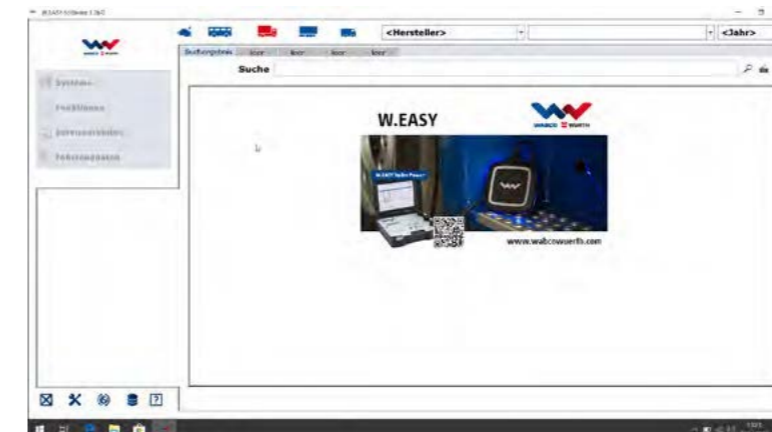


WABCO makes AMT repair as straightforward as possible by offering clear and detailed drawings for each repair kit, providing clarity for the workshop technician by explaining what is inside the package and where each component is located.

SIMPLE TEACH-IN PROCEDURE

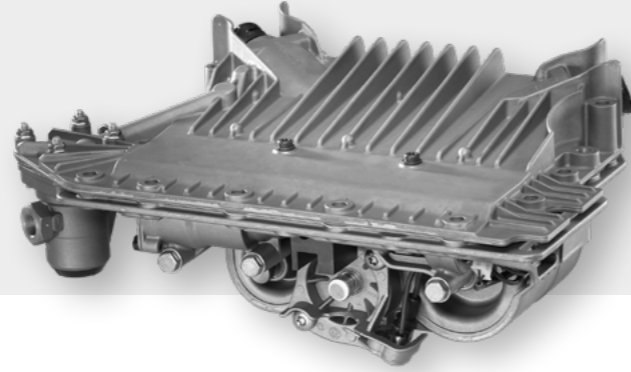
Following repair, a teach-in procedure must be performed on the gearbox control unit. It could not be easier with the multi-brand diagnostic solution W.EASY offered by WABCOWÜRTH. Simply:

1. Connect the system via the on-board diagnostics (OBD) interface.
2. Start the teach-in procedure via the WABCOWÜRTH diagnostic.
3. Follow the instructions given by the software.



FUNCTIONALITY

The WABCO gearbox control unit used in commercial vehicles equipped with ZF transmissions makes driving easier, safer and more comfortable by automating the shifting process.



The gearbox actuator (GS 3.X) is used in commercial vehicles with a maximum of 16 gears. It is designed to perform swift gear changes, intelligently adapting to the specific driving situation. The GS range is an electronically-driven pneumatic actuator with four cylinders (Gear, Gate, Range, Split) and an integrated Electronic Control Unit (ECU) for shifting the gears of an AMT.

Application

WABCO AMT solutions are used with ZF transmissions on trucks and busses from DAF, Iveco and MAN.

There are different generations of ZF gearbox actuators on the market:

- Generation 3.0 for trucks launched in 2000
- Generation 3.3 for trucks launched in 2005
- DAF-only generation 3.6 launched in 2012.
- Variants for bus application GS 3.0 (421 355 022 0) and GS 3.3 (421 355 023 0) are also available.

WABCO REMAN SOLUTIONS

Supporting our repair kit range, WABCO Reman Solutions offers both – a mechanical repair kit as well as complete devices (without software on ECU).

WABCO Reman Solutions does not simply re-build for function, we remanufacture for perfection using the latest technologies and industry knowhow gained from Original Equipment manufacturing. Every WABCO Reman Solutions product performs to the same standards as the original product and is given the same warranty as a new product, guaranteeing a quality that you can truly rely on!



ECO LOGICAL
NOMICAL

WABCO
REMAN SOLUTIONS

REMAN mechanical repair kit

WABCO Reman number	Description	Cross references	
		WABCO	ZF
421 355 950 R	GS 3.0/3.3 repair unit (lower part) without ECU Gasket set 421 355 928 2 is selling separately.	421 355 950 2	6009274088

REMAN complete devices for AMT specialists

The GS devices mentioned below are sold without software (empty ECU).

To purchase these products directly, a special contract is required. The alternative option is to purchase them via one of our dedicated distributors. For more information, please contact your local WABCO sales representative.

WABCO Reman number	Description	Cross references	
		WABCO	ZF
421 355 011 R	Gearbox actuator GS 3.0 Standard, without software	421 355 011 0	6009274069 6009074900
421 355 012 R	Gearbox actuator GS 3.3 Standard, without software	421 355 012 0	6009297007 6009097900
421 355 015 R	Gearbox actuator GS 3.6 Standard, without software	421 355 015 0	6009297017
421 355 022 R	Gearbox actuator GS 3.0 Bus, without software	421 355 022 0	6009274070 6009074901
421 355 023 R	Gearbox actuator GS 3.3 Bus, without software	421 355 023 0	6009297008 6009097901

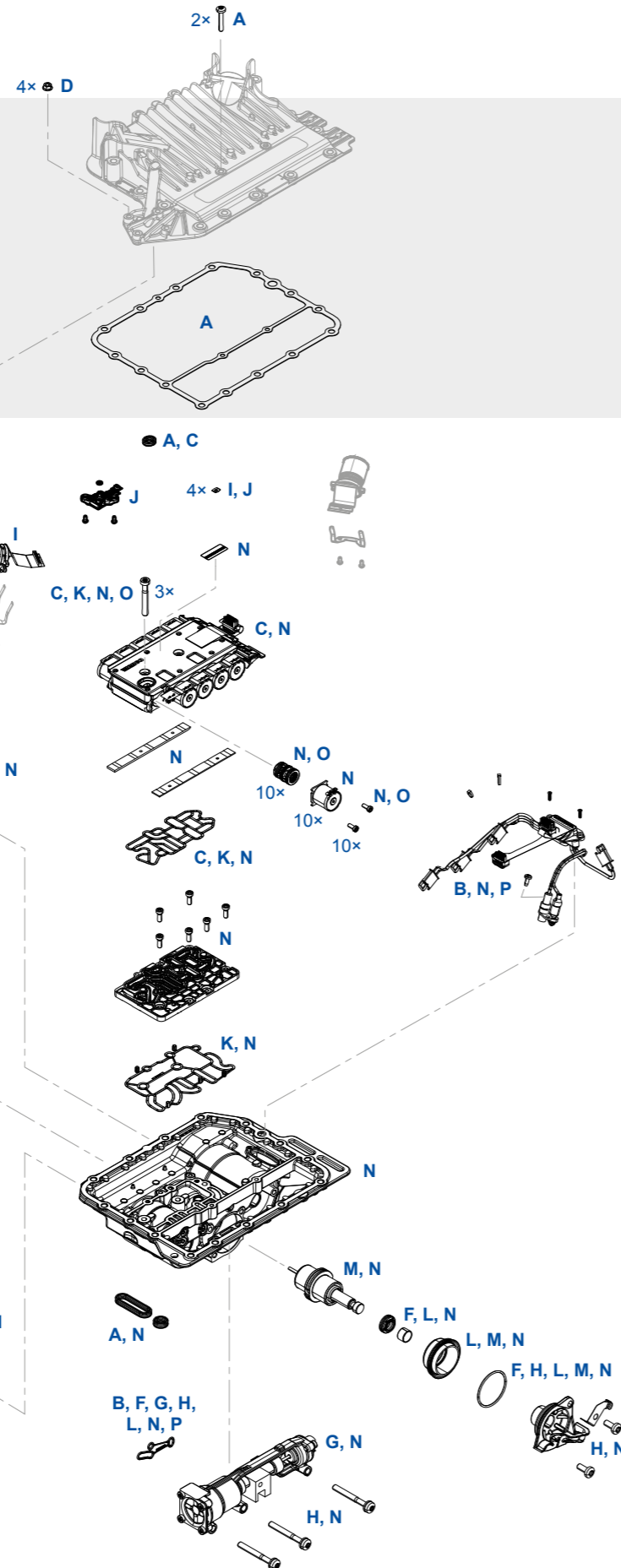
REPAIR SOLUTIONS FOR TRUCK VARIANTS



DEVICE STRUCTURE

GS 3.0 truck variant is the first version of GS 3.X. It features a 20-pole external connector.

GS 3.3 truck variant has a higher performance and an updated ECU compared to GS 3.0.

GS 3.6 variant was specifically designed to fit DAF applications. It features an additional active speed sensor and an adapted ECU, compared to the regular GS 3.3 unit.



-  Component part of repair kit
-  Component not part of repair kit

OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references ZF
A	Gasket set between ECU and lower actuator	421 355 928 2	501.323.922
B	Connector bridge and sealing for gate-cylinder	421 355 929 2	501.321.146
C	Solenoid block + screws, gaskets	421 355 930 2	501.321.147
D	Pressure limiting valve	421 355 931 2	501.320.849
E	1 distance sensor + o-ring and screws	421 355 932 2	501.321.148
F	Repair kit for range-, gear- and split-cylinder	421 355 933 2	501.321.149
G	Complete sleeve cylinder + gasket	421 355 934 2	501.321.182
H	End cover for gear-cylinder + screws	421 355 936 2	501.322.661
I	Repair kit electrical connector	421 355 943 2	501.323.630
J	Pressure sensor	421 355 946 2	501.323.627
K	Sealings for seat	421 355 947 2	501.330.103
L	Sealing kit for range-, gear- and split-cylinder	421 355 948 2	501.324.253
M	Pistons and sealings for gear-cylinder	421 355 949 2	501.324.254
N	Gearbox unit lower part	421 355 950 2	600.927.408.8
O	Single valve	421 355 951 2	501.323.914
P	Connector bridge and sealing for gate-cylinder	421 355 954 2	501.330.983

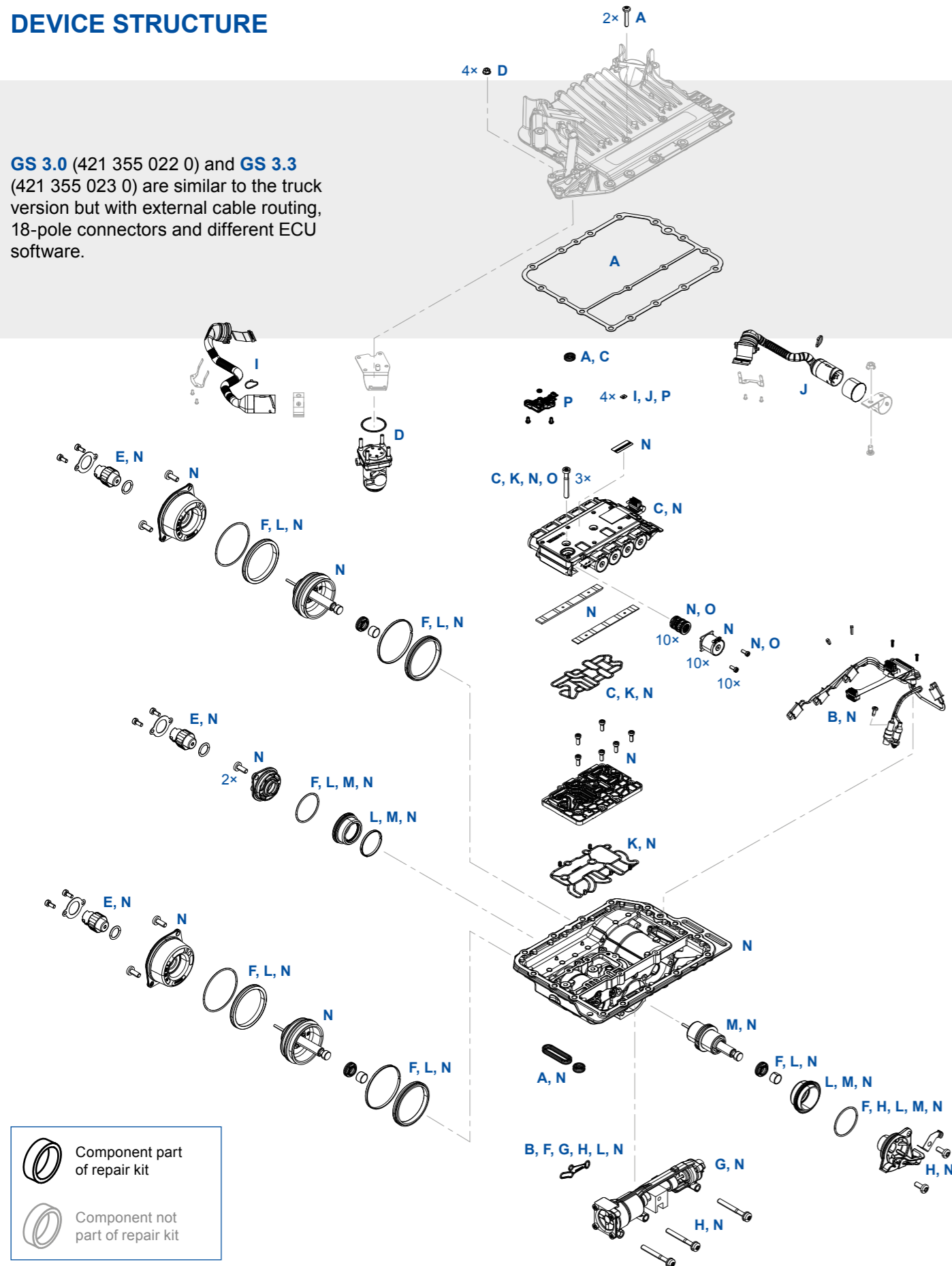
REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device			
		Variant: GS 3.0 truck	GS 3.3 truck		GS 3.6 DAF truck
		WABCO: 421 355 011 0 ZF: 600 927 406 9	421 355 012 0 600 929 700 7	421 355 014 0 600 939 776 9	421 355 015 0 600 929 701 7
A	421 355 928 2	✓	✓	✓	✓
B	421 355 929 2	✓	✓	✓	–
C	421 355 930 2	✓	✓	✓	✓
D	421 355 931 2	✓	✓	✓	✓
E	421 355 932 2	✓	✓	✓	✓
F	421 355 933 2	✓	✓	–	✓
G	421 355 934 2	✓	✓	–	✓
H	421 355 936 2	✓	✓	–	✓
I	421 355 943 2	✓	✓	–	✓
J	421 355 946 2	✓	✓	–	–
K	421 355 947 2	✓	✓	✓	✓
L	421 355 948 2	✓	✓	–	✓
M	421 355 949 2	✓	✓	–	✓
N	421 355 950 2	✓	✓	–	–
O	421 355 951 2	✓	✓	–	✓
P	421 355 954 2	–	–	–	✓

REPAIR SOLUTIONS FOR BUS VARIANTS

DEVICE STRUCTURE

GS 3.0 (421 355 022 0) and **GS 3.3** (421 355 023 0) are similar to the truck version but with external cable routing, 18-pole connectors and different ECU software.



OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references ZF
A	Gasket set between ECU and lower actuator	421 355 928 2	501.323.922
B	Connector bridge and sealing for gate-cylinder	421 355 929 2	501.321.146
C	Solenoid block + screws, gaskets	421 355 930 2	501.321.147
D	Pressure limiting valve	421 355 931 2	501.320.849
E	1 distance sensor + o-ring and screws	421 355 932 2	501.321.148
F	Repair kit for range-, gear- and split-cylinder	421 355 933 2	501.321.149
G	Complete sleeve cylinder + gasket	421 355 934 2	501.321.182
H	End cover for gear-cylinder + screws	421 355 936 2	501.322.661
I	Cable	421 355 944 2	501.323.629
J	External cable (vehicle)	421 355 945 2	501.323.628
K	Sealings for seat	421 355 947 2	501.330.103
L	Sealing kit for range-, gear- and split-cylinder	421 355 948 2	501.324.253
M	Pistons and sealings for gear-cylinder	421 355 949 2	501.324.254
N	Gearbox unit lower part	421 355 950 2	600.927.408.8
O	Single valve	421 355 951 2	501.323.914
P	Pressure sensor	421 355 946 2	501.323.627

REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device	
		Variant: GS 3.0 bus	GS 3.3 bus
		WABCO: 421 355 022 0 ZF: 600 927 407 0	421 355 023 0 600 929 700 8
A	421 355 928 2	✓	✓
B	421 355 929 2	✓	✓
C	421 355 930 2	✓	✓
D	421 355 931 2	✓	✓
E	421 355 932 2	✓	✓
F	421 355 933 2	✓	✓
G	421 355 934 2	✓	✓
H	421 355 936 2	✓	✓
I	421 355 944 2	✓	✓
J	421 355 945 2	✓	✓
K	421 355 947 2	✓	✓
L	421 355 948 2	✓	✓
M	421 355 949 2	✓	✓
N	421 355 950 2	✓	✓
O	421 355 951 2	✓	✓
P	421 355 946 2	✓	✓

FURTHER INFORMATION

Information on WABCO products can be found in our webshop (webshop.wabco-auto.com) by entering the product number in the “Search Products” field.

Please contact your WABCO partner for further information: www.wabco-auto.com/findwabco

WABCO

Mobilizing Vehicle Intelligence



ACE AUTONOMOUS
CONNECTED
ELECTRIC

WABCO (NYSE: WBC) is the leading global supplier of braking control systems and other advanced technologies that improve the safety, efficiency and connectivity of commercial vehicles. Originating from the Westinghouse Air Brake Company founded nearly 150 years ago, WABCO is powerfully “Mobilizing Vehicle Intelligence” to support the increasingly autonomous, connected and electric future of the commercial vehicle industry. WABCO continues to pioneer innovations to address key technology milestones in autonomous mobility and apply its extensive expertise to integrate the complex control and fail-safe systems required to efficiently and safely govern vehicle dynamics at every stage of a vehicle’s journey – on the highway, in the city and at the depot. Today, leading truck, bus and trailer brands worldwide rely on WABCO’s differentiating technologies. Powered by its vision for accident-free driving and greener transportation solutions, WABCO is also at the forefront of advanced fleet management systems and digital services that contribute to commercial fleet efficiency. In 2018, WABCO reported sales of over \$3.8 billion and has more than 16,000 employees in 40 countries. For more information, visit:

www.wabco-auto.com

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