

WABCO AUTOMATED MANUAL TRANSMISSION (AMT)

Aftermarket solutions for gearbox control units
for Volvo applications



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 in Volvo vehicles since 2001, with our gearbox control units fitted to over 1.3 million trucks.

Our AMT solutions increase fuel savings through optimised gear-shifting, and help vehicle operators significantly reduce mechanical wear – thereby increasing vehicle uptime. With growing demand and a rapidly expanding number of units in operation, equipping your workshop to service our AMT technology for Volvo vehicles 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 Volvo applications, 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 unit. The majority of gearbox control unit repair cases for Volvo applications can be performed without the need for any specialist tools. It's a cost-effective strategy and greatly reduces 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 Volvo applications.

Tailored repair solutions

WABCO can supply a vast selection of repair kits that are designed to cater for the widest range of Volvo gearbox control units repair requirements.

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.

Product training

A system description guides through a frictionless gearbox control unit repair. In addition, WABCO Academy offers hands-on classroom training.

Find out more detailed information on the following pages.



EASY DIAGNOSTICS

Our AMT technology for Volvo vehicles can be easily diagnosed using multi-brand diagnostic solution supplied by WABCOWÜRTH (W.EASY®) – available for independent aftermarket workshops. It is competitively priced and 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



TAILORED REPAIR SOLUTIONS

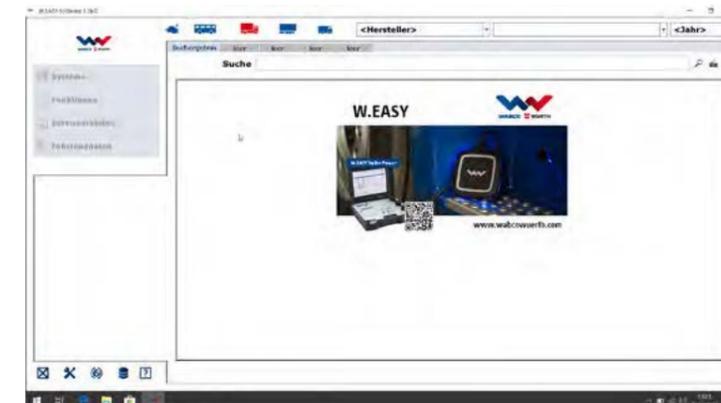
WABCO offers tailored repair kits, consisting of genuine parts, for frictionless, cost-efficient repairs. Vast experience working with OE manufacturers and WABCO's long-established reputation for high quality ensure each individual part will fit perfectly, without the compromise of last-minute rework.

WABCO makes AMT repair as straightforward as possible by offering clear and detailed schemes 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.



PRODUCT TRAINING

For those wanting hands-on classroom training, the WABCO Academy provides theoretical and practical knowledge in the area of the Volvo gearbox actuator troubleshooting.



The classroom training course contains teaching modules that cover:

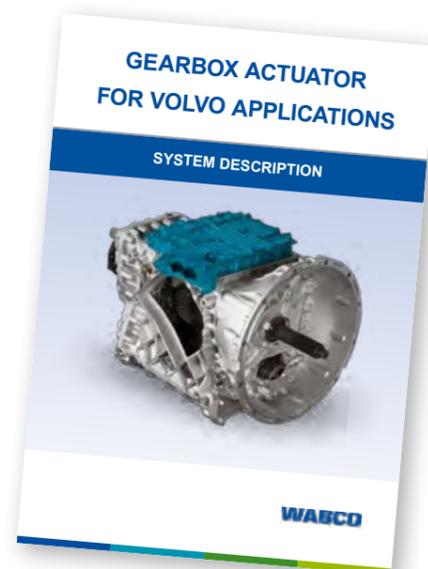
- The basic structure of a transmission and the power curves in all gears using Volvo examples.
- The design and function of the switch cover.
- A demonstration of the switching paths using the multi-brand diagnostic solution by WABCOWÜRTH.
- Dismantling and reassembly of the gear-shifting unit and its individual components.
- The installation of the WABCO repair kits with all necessary work steps (in the practical training section).
- A handout to look up areas of particular interest when back in the workplace.

WABCO ACADEMY



www.wabco.info/i/611

Check out the website and sign in today for a training course in your area: www.wabco-academy.com



www.wabco.info/i/1132

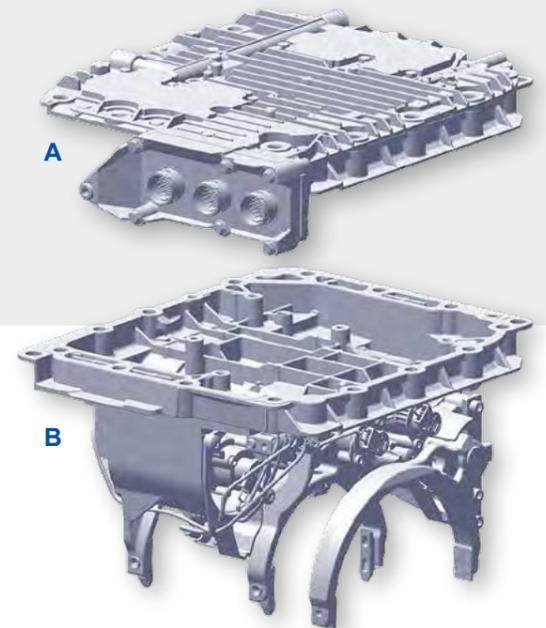
Discover our webshop for more product information.

Click on the tab "Documents" to access related publications.

FUNCTIONALITY

The AMT gearbox actuator for Volvo commercial vehicles makes driving easier, safer and more comfortable by automating the shifting process.

With regard to shafts and gear wheel sets, it is very similar to a standard manual transmission. However, the shift linkage and the manual gear control lever are replaced with an electronically-controlled and electro-pneumatically operated gear changing system. The transmission has 12 forward gears and four reverse gears.



Structure

The gear control unit consists of two main parts: cover and base.

The cover (A) contains:

- A transmission control unit
- A solenoid valve for controlling air cylinders in the base section
- A pressure sensor for monitoring supply pressure
- Pneumatic and electrical connections for the gear changing system

The base (B) contains:

- Three of the four shift forks
- Pneumatic cylinders for moving the shift forks
- Locking mechanisms which allow the shift forks to engage in the last shifted position
- A position sensor for each shift fork
- Rotary encoders for the main shaft and countershaft

Generations

There are different generations of Volvo gearbox actuators on the market. Identifying each generation is easy: simply check the name plate, located at the top of the transmission bell housing, and look for the final letter:

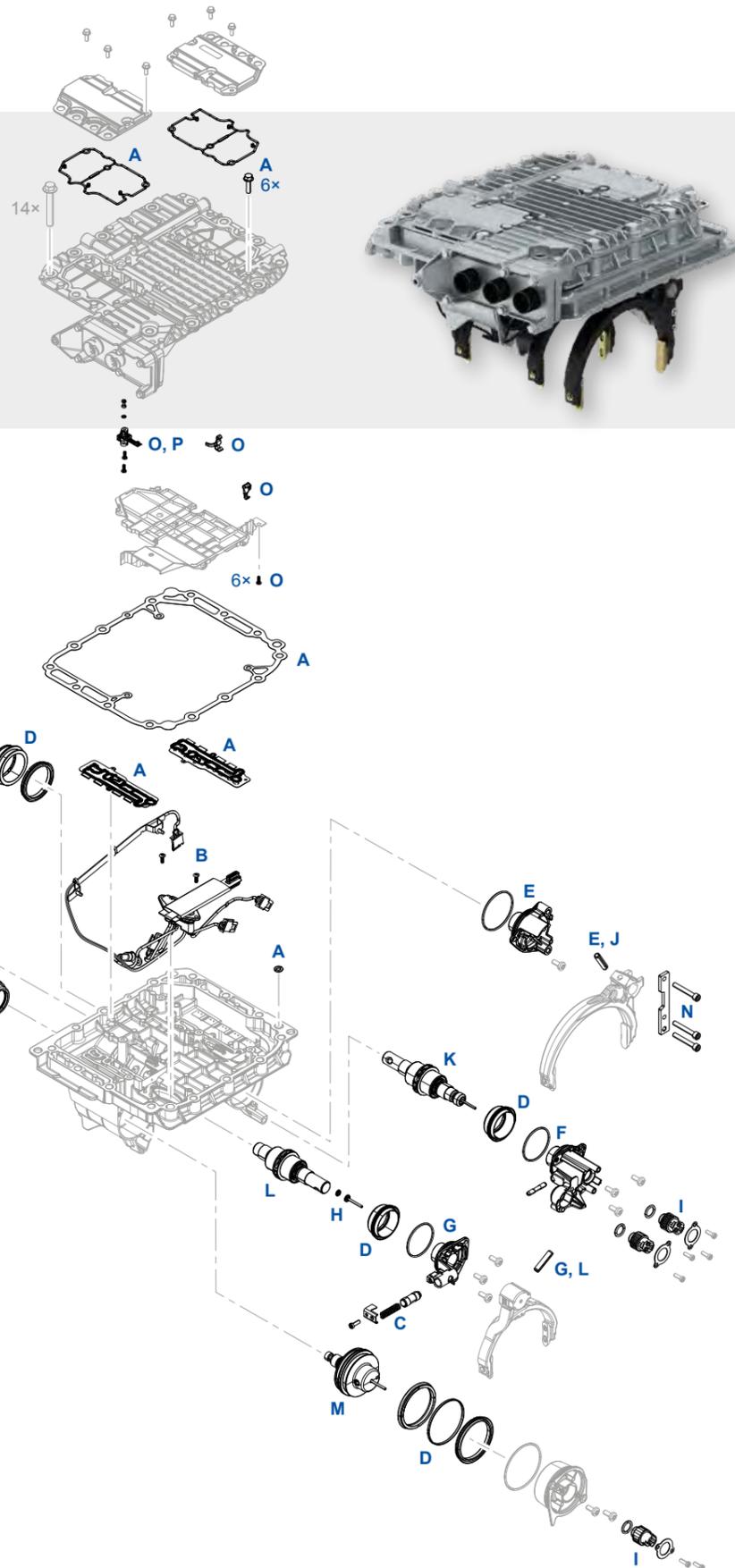
VOLVO SWEDEN	
COMPONENT	AT2420
	GP 319424
SERVICE CATEGORY	2
COMP. ID	7102221
SERIAL NO.	200722029



REPAIR SOLUTIONS FOR GENERATION B

DEVICE STRUCTURE

Generation B has an external clutch cylinder installed on the outside. It has been available for series supply since 2001.



OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references	
			Volvo	Renault
A	Static sealing	421 365 920 2	20785252	7420785252
B	Connector bridge	421 365 921 2	20562627	7420562627
C	Kit with detents	421 365 922 2	20562629	7420562629
D	Lip seal & piston kit	421 365 923 2	20562630	7420562630
E	Cylinder cover (split cylinder)	421 365 924 2	20562631	7420562631
F	Cylinder cover (1/R cylinder)	421 365 925 2	20562633	7420562633
G	Cylinder cover (2/3 cylinder)	421 365 926 2	20562635	7420562635
H	Armature, conical spring for shift fork 2/3	421 365 928 2	20562640	7420562640
I	Distance sensor	421 365 929 2	20562642	7420562642
J	Piston rod for split cylinder	421 365 932 2	21786063	7421786063
K	Piston rod for 1/R cylinder	421 365 933 2	21302092	7420562107
L	Piston rod for 2/3 cylinder	421 365 934 2	22781280	7422781280
M	Range piston	421 365 935 2	20562111	7420562111
N	Stop sheet metal for the split group	421 365 939 2	20845917	7420845917
O	Pressure sensor kit	421 365 947 2	21068286	7421068286
P	Pressure sensor module	421 367 900 2	22242765	—

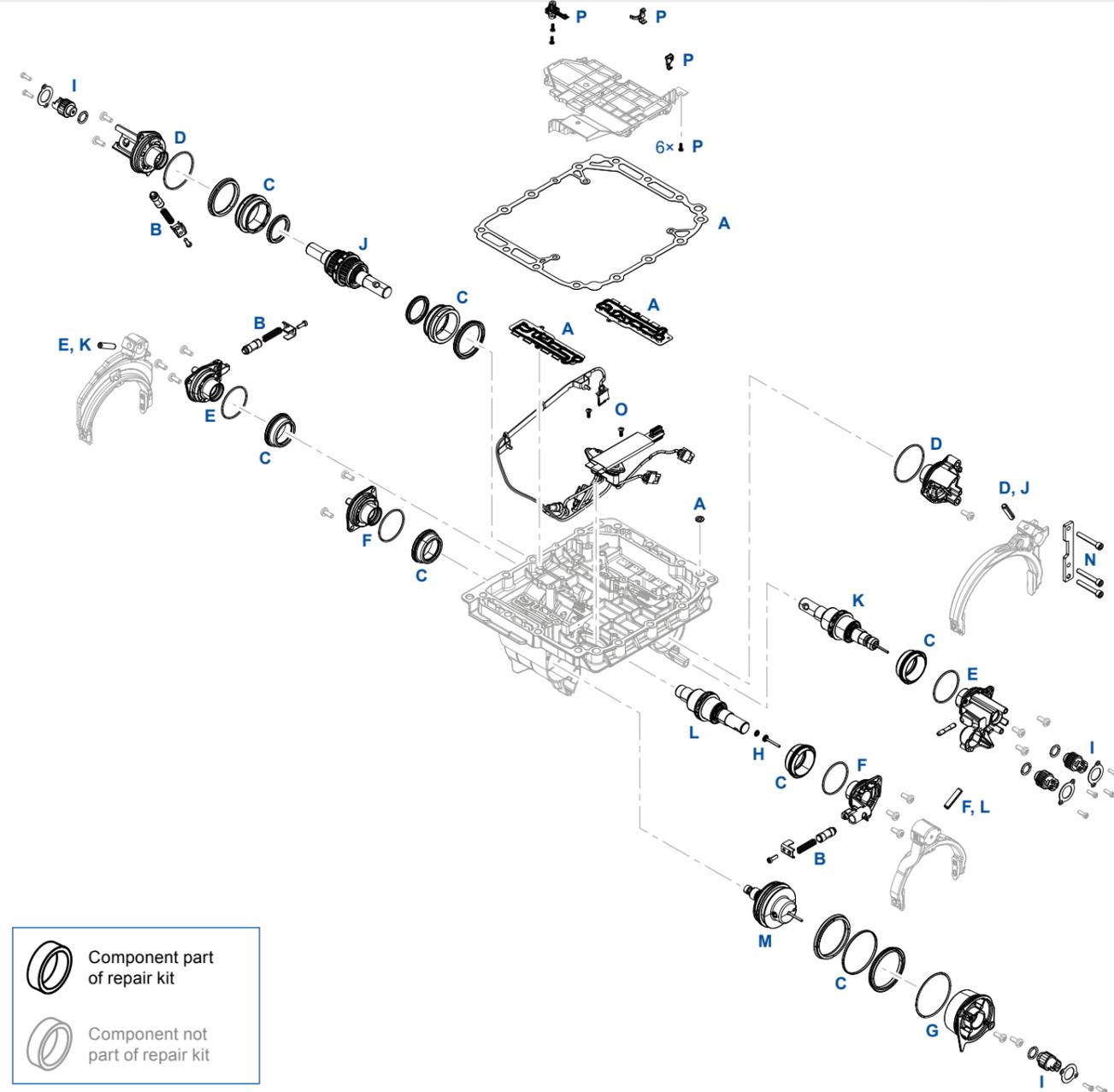
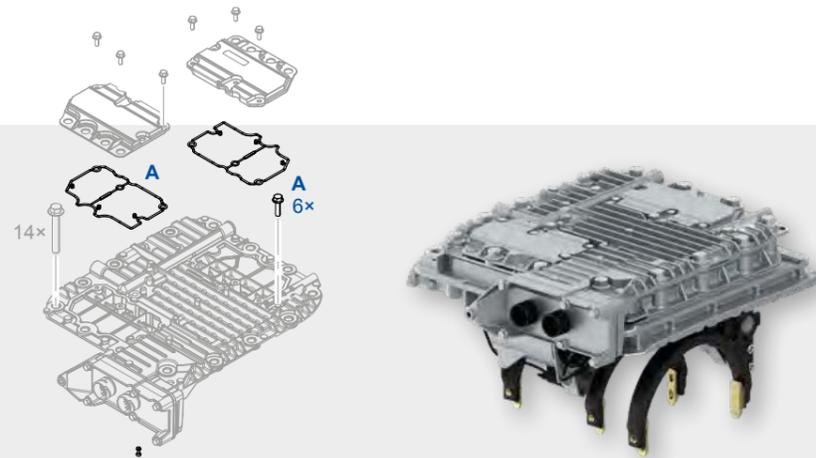
REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device 421 365 000 0
A	421 365 920 2	✓
B	421 365 921 2	✓
C	421 365 922 2	✓
D	421 365 923 2	✓
E	421 365 924 2	✓
F	421 365 925 2	✓
G	421 365 926 2	✓
H	421 365 928 2	✓
I	421 365 929 2	✓
J	421 365 932 2	✓
K	421 365 933 2	✓
L	421 365 934 2	✓
M	421 365 935 2	✓
N	421 365 939 2	✓
O	421 365 947 2	✓
P	421 367 900 2	✓

REPAIR SOLUTIONS FOR GENERATION D

DEVICE STRUCTURE

The C and D generation have an internal clutch cylinder. In comparison to the C generation, the **D generation** is equipped with a modified rotational speed sensor. It has been available for series supply since 2008.



OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references	
			Volvo	Renault
A	Static sealing	421 365 920 2	20785252	7420785252
B	Kit with detents	421 365 922 2	20562629	7420562629
C	Lip seal & piston kit	421 365 923 2	20562630	7420562630
D	Cylinder cover (split cylinder)	421 365 924 2	20562631	7420562631
E	Cylinder cover (1/R cylinder)	421 365 925 2	20562633	7420562633
F	Cylinder cover (2/3 cylinder)	421 365 926 2	20562635	7420562635
G	Range cylinder cover with sealing	421 365 927 2	20562636	7420562636
H	Armature, conical spring for shift fork 2/3	421 365 928 2	20562640	7420562640
I	Distance sensor	421 365 929 2	20562642	7420562642
J	Piston rod for split cylinder	421 365 932 2	21786063	7421786063
K	Piston rod for 1/R cylinder	421 365 933 2	21302092	7420562107
L	Piston rod for 2/3 cylinder	421 365 934 2	22781280	7422781280
M	Range piston	421 365 935 2	20562111	7420562111
N	Stop sheet metal for the split group	421 365 939 2	20845917	7420845917
O	Connection bridge	421 365 946 2	21068284	7421068284
P	Pressure sensor kit	421 365 947 2	21068286	7421068286

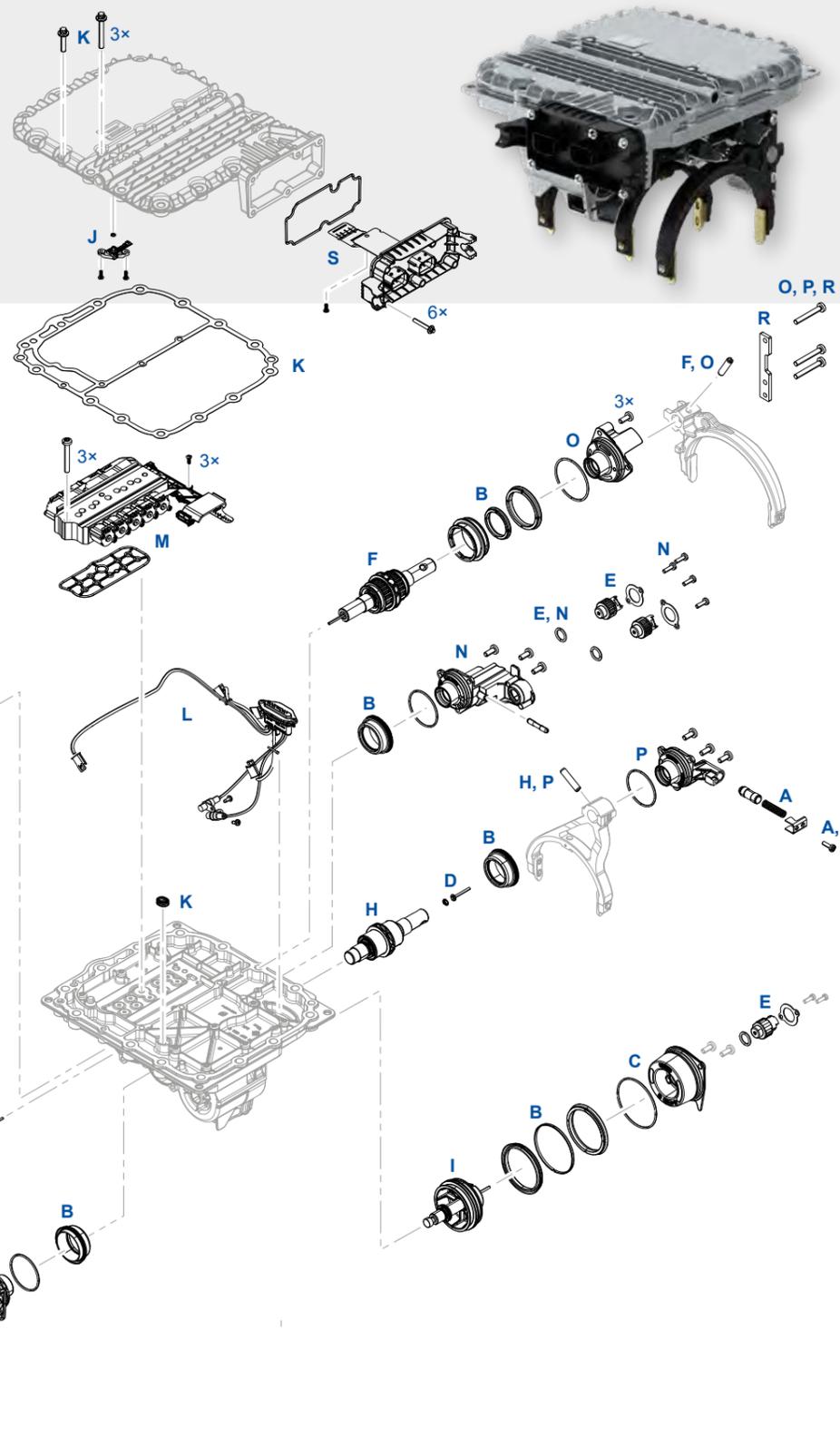
REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device		
		12 V	24 V	24 V Retarder
		421 364 002 0	421 365 005 0	
		421 364 003 0	421 365 007 0	
			421 365 008 0	421 365 006 0
			421 365 010 0	421 365 009 0
			421 365 011 0	421 365 012 0
			421 365 013 0	
A	421 365 920 2	✓	✓	✓
B	421 365 922 2	✓	✓	✓
C	421 365 923 2	✓	✓	✓
D	421 365 924 2	✓	✓	✓
E	421 365 925 2	✓	✓	✓
F	421 365 926 2	✓	✓	✓
G	421 365 927 2	✓	✓	✓
H	421 365 928 2	✓	✓	✓
I	421 365 929 2	✓	✓	✓
J	421 365 932 2	✓	✓	✓
K	421 365 933 2	✓	✓	✓
L	421 365 934 2	✓	✓	✓
M	421 365 935 2	✓	✓	✓
N	421 365 939 2	✓	✓	✓
O	421 365 946 2	✓	✓	✓
P	421 365 947 2	✓	✓	✓

REPAIR SOLUTIONS FOR GENERATION E & F

DEVICE STRUCTURE

Generation E & F have been adjusted to meet Euro 6 requirements and are available in a 12V and 24V version. They have been available for series supply since 2013.



OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references	
			Volvo	Renault
A	Kit with detents	421 365 922 2	20562629	7420562629
B	Lip seal & piston kit	421 365 923 2	20562630	7420562630
C	Range cylinder cover with sealing	421 365 927 2	20562636	7420562636
D	Armature, conical spring for shift fork 2/3	421 365 928 2	20562640	7420562640
E	Distance sensor	421 365 929 2	20562642	7420562642
F	Piston rod for split cylinder	421 365 932 2	21786063	7421786063
G	Piston rod for 1/R cylinder	421 365 933 2	21302092	7420562107
H	Piston rod for 2/3 cylinder	421 365 934 2	22781280	7422781280
I	Range piston	421 365 935 2	20562111	7420562111
J	Pressure sensor module	421 367 900 2	22242765	-
K	Static sealing	421 367 921 2	21911585	7421911585
L	Connecting bridge	421 367 922 2	21911586	7421911586
M	Valve unit with sealing	421 367 924 2	21911584	7421911584
N	Cylinder cover for 1/R cylinder	421 367 927 2	21911592	7421911592
O	Cylinder cover for split cylinder	421 367 928 2	21911591	7421911591
P	Cylinder cover 2/3 cylinder	421 367 929 2	21911596	-
R	Sheet for split cylinder	421 367 930 2	22242766	-
S	Connection support with sealing	421 367 931 2	22242764	-

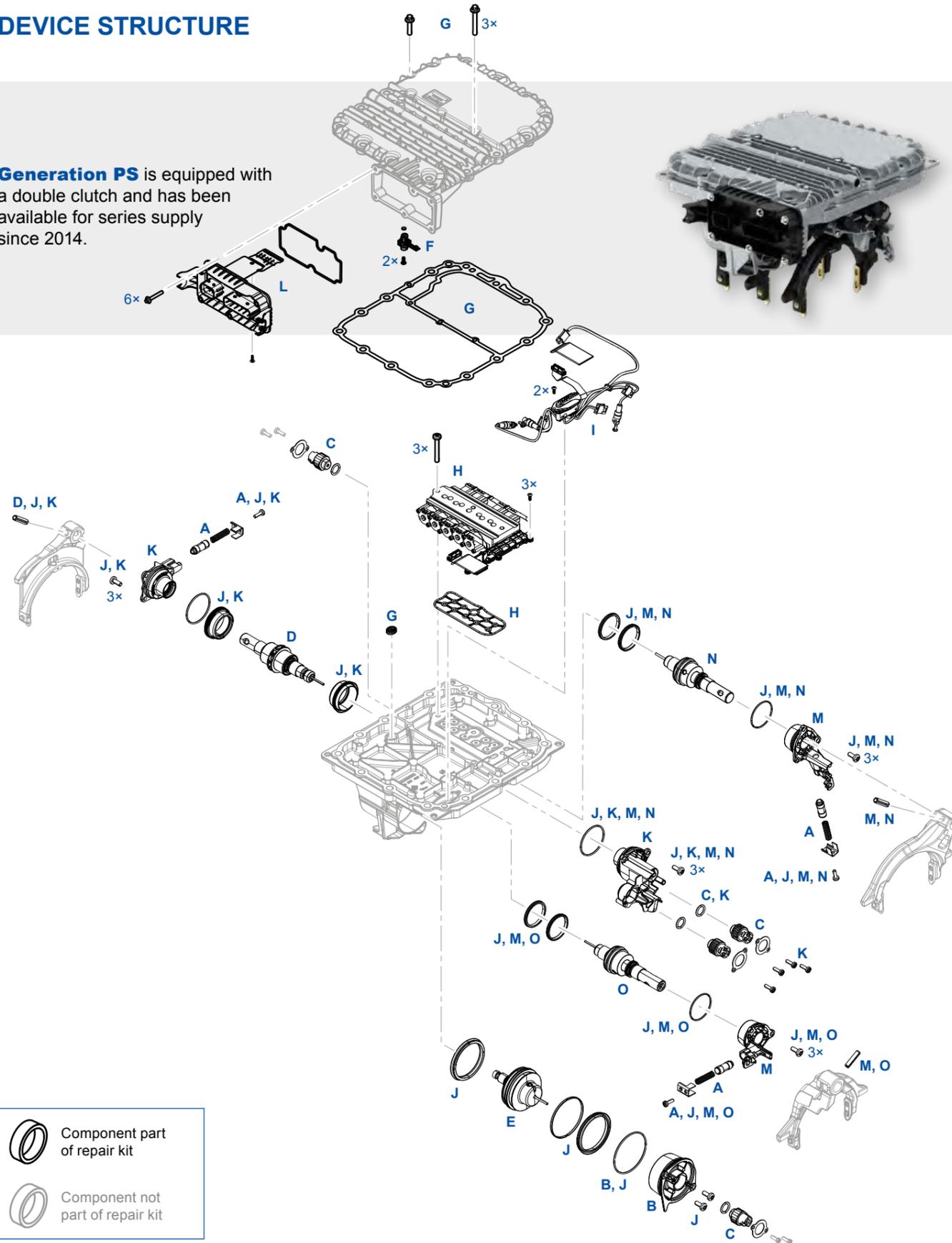
REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device			
		Generation E	Generation F		
		421 367 001 0	421 366 001 0	421 366 002 0	421 367 002 0
A	421 365 922 2	✓	✓	✓	✓
B	421 365 923 2	✓	✓	✓	✓
C	421 365 927 2	✓	✓	✓	✓
D	421 365 928 2	✓	✓	✓	✓
E	421 365 929 2	✓	✓	✓	✓
F	421 365 932 2	✓	✓	✓	✓
G	421 365 933 2	✓	✓	✓	✓
H	421 365 934 2	✓	✓	✓	✓
I	421 365 935 2	✓	✓	✓	✓
J	421 367 900 2	✓	✓	✓	✓
K	421 367 921 2	✓	✓	✓	✓
L	421 367 922 2	✓	✓	✓	✓
M	421 367 924 2	✓	-	-	✓
N	421 367 927 2	✓	✓	✓	✓
O	421 367 928 2	✓	✓	✓	✓
P	421 367 929 2	✓	✓	✓	✓
R	421 367 930 2	✓	✓	✓	✓
S	421 367 931 2	✓	✓	✓	✓

REPAIR SOLUTIONS FOR GENERATION PS

DEVICE STRUCTURE

Generation PS is equipped with a double clutch and has been available for series supply since 2014.



OVERVIEW OF REPAIR KITS

Position	Main component	WABCO number	Cross references	
			Volvo	Renault
A	Kit with detents	421 365 922 2	20562629	7420562629
B	Range cylinder cover with sealing	421 365 927 2	20562636	7420562636
C	Distance sensor	421 365 929 2	20562642	7420562642
D	Piston rod for 1/R cylinder	421 365 933 2	21302092	7420562107
E	Range piston	421 365 935 2	20562111	7420562111
F	Pressure sensor module	421 367 900 2	22242765	–
G	Static sealing	421 367 921 2	21911585	7421911585
H	Valve unit with sealing	421 367 924 2	21911584	7421911584
I	Connecting bridge	421 369 921 2	21911587	–
J	Dynamic sealing kit	421 369 923 2	21911588	–
K	Cover and piston kit for 1/R cylinder	421 369 924 2	21911595	–
L	Connection support with sealing	421 369 925 2	–	–
M	Cylinder cover for 2/3 cylinder, lip seals and o-ring for cylinder	421 369 926 2	21911597	–
N	Rod kit for 3 cylinder, lip seals and o-ring for cylinder	421 369 927 2	21911598	–
O	Rod kit for 2 cylinder, lip seals and o-ring for cylinder	421 369 928 2	21911599	–

REPAIR KITS FOR BASIC DEVICES

Position	Repair kit	Basic device 421 369 001 0
A	421 365 922 2	✓
B	421 365 927 2	✓
C	421 365 929 2	✓
D	421 365 933 2	✓
E	421 365 935 2	✓
F	421 367 900 2	✓
G	421 367 921 2	✓
H	421 367 924 2	✓
I	421 369 921 2	✓
J	421 369 923 2	✓
K	421 369 924 2	✓
L	421 369 925 2	✓
M	421 369 926 2	✓
N	421 369 927 2	✓
O	421 369 928 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

WABCO