SVAB
Precision Control Systems

Excavator and Backhoe loader Control GPC

Tiltrotator/Attachments, Wheels, Tracks and additional functions

153000

Application Contents

Revision I

Revision table

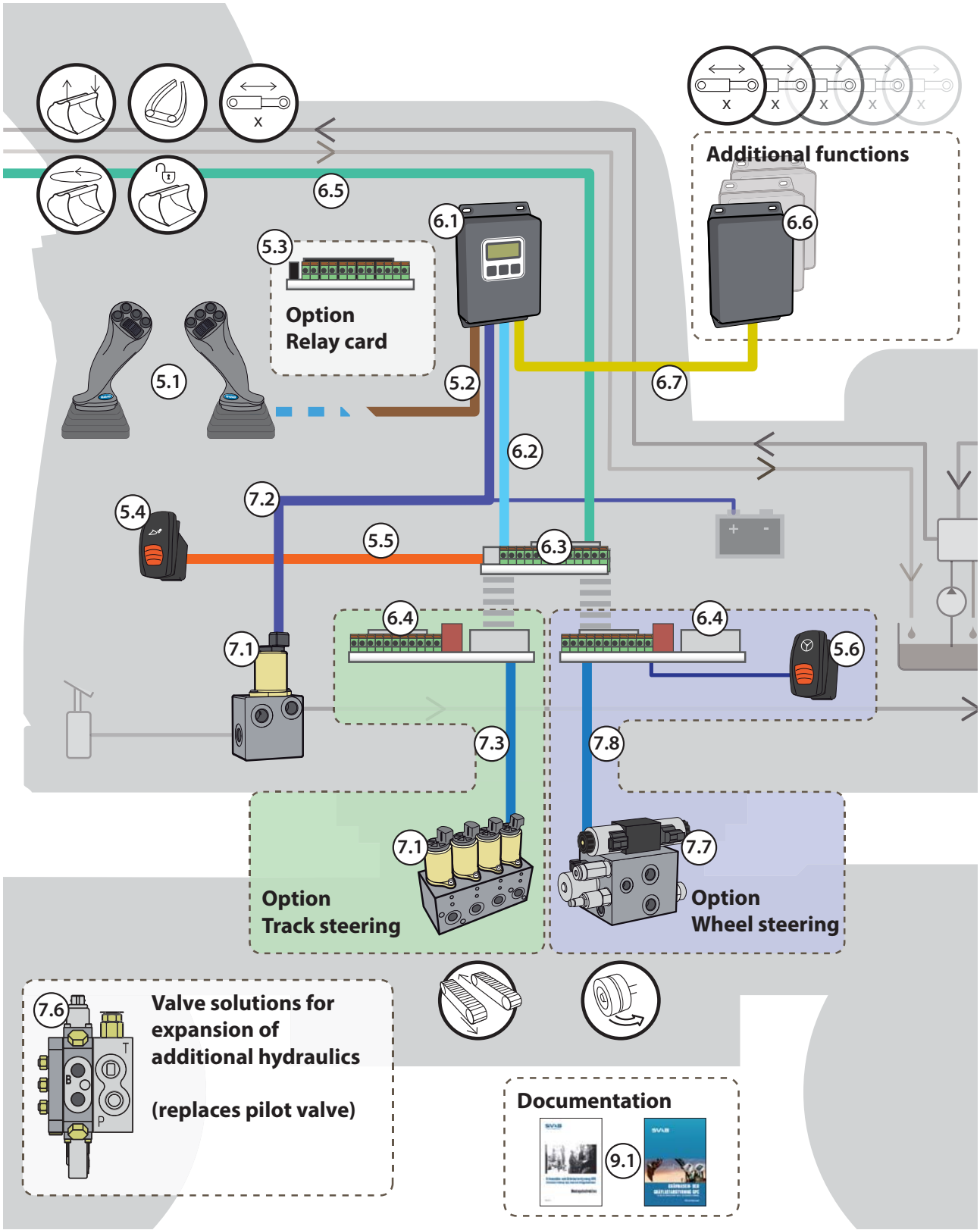
Revision	Description	Page	Date	Signature	Authorized
B	Amended in L8 text for properties.	10	130508	FRJA	FRER
C	Added feedback section at the end of the documentation	-	130628	FRJA	FRER
D	Corrected wrong art. no. and description in wheel steering activation. Changed incorrect designation "bucket lock" to "tool lock".	17 -	130916	FRJA	FRJA
E	Changed name of the Application Contents. Added "additional functions" and function symbols to the system overviews. New chapter "Additional Functions". Removed trunk cable from 4-hose system overview.	- - 21 -	131016	FRJA	FRER
F	New article: Relay card for joystick grips. New article: Service tool. L8, New property "Pre-connectorized for GP systems". Merged rollers and buttons columns to "Fitted with".	15 31 10	140218	FRJA	FRER
G	TRUNK CABLE ACCESSORIES: Changed and added (new article 300975) related cables for attachment plates. Overviews: Added supply for supply pilot valve cables. Added supply cable on the overviews CAN and 4-hose. Added info on supply cable 146123. New articles: Dokumentation.	20 24 32	140328	FRJA	FRER
H	Multilingual documentation. New article: SVAB Hand-Rest L8 146562. Added info on weld bracket 200333. Removed steering valve 135007-XXX from adapter 200583. New article: Adapter LS Eaton 200678. New article: Adapter plate steering valve 200558. New articles: CAN cable 147616, 147616-3. New articles: Wheel steering activation and accessories 200672, 200673, 200674, 200675. Added info on trunk cables. New article: Cable support 200373. New article: User Manuals 630006, 630013.	32 12 20 29 29 29 21 17 20 12 32	140821	FRJA	FRER
I	New articles: Operator manuals in several languages: 113019, 113020, 113021, 113022. New article: Spacer Ring Hand Rest L8.	32 14	140916	FRJA	FRER

CONTENTS

1. SYSTEM OVERVIEW, 2-HOSE SYSTEM

The overview shows the components included in the system for Tiltrotator steering GPC.

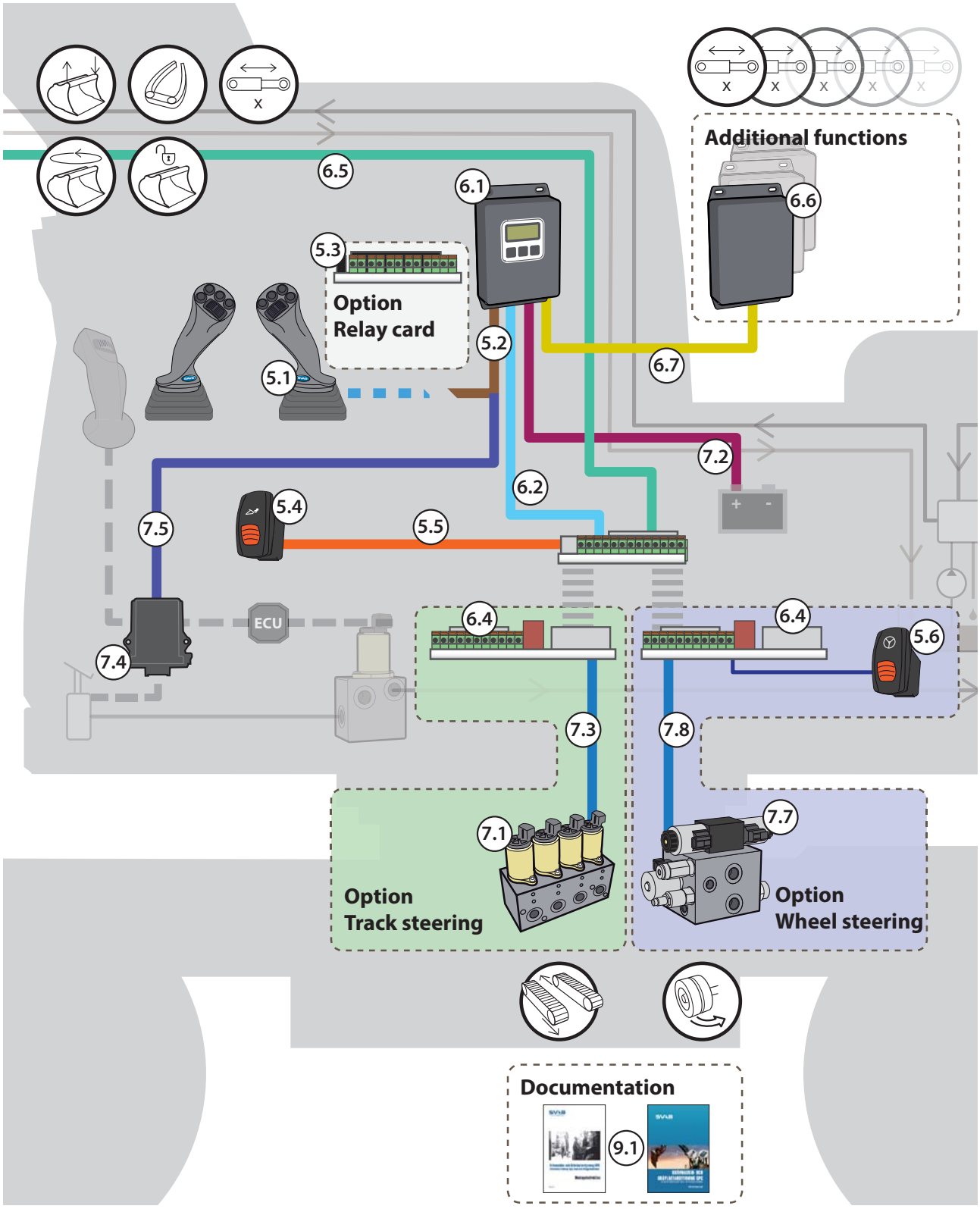
To read more about the included components, see the marking in the overview ◯. The marking refers to the list of contents and has the same number as the chapter in question.



2. SYSTEM OVERVIEW – ORIGINAL CAN BUS

The overview shows the components included in the system in those cases where the machine controls the pilot valve function with its original CAN bus system. Excavator and Backhoe loader Control GPC replaces signals from the machine's original steering control.

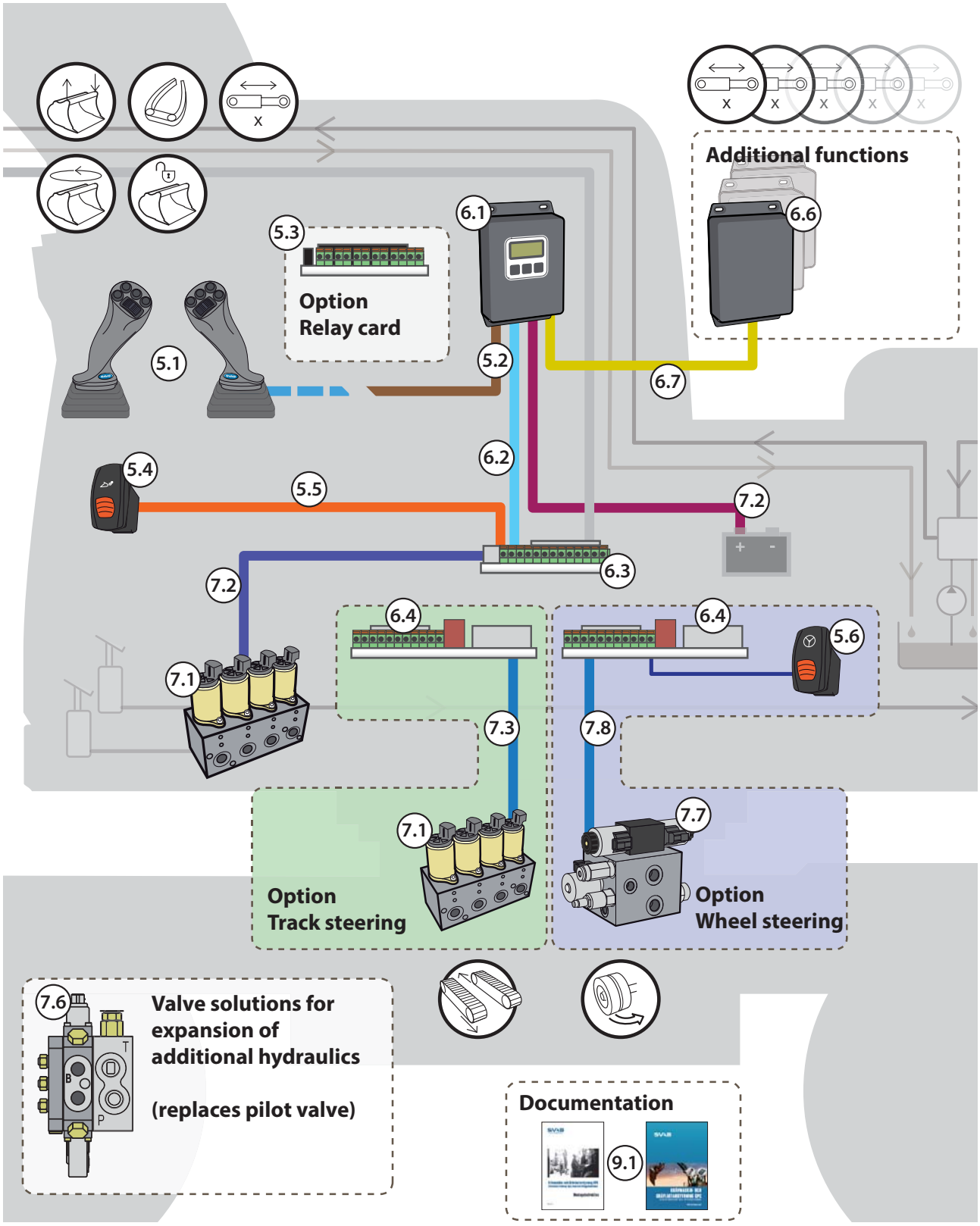
To read more about the included components, see the marking in the overview ◯. The marking refers to the list of contents and has the same number as the chapter in question.



3. SYSTEM OVERVIEW, 4-HOSE SYSTEM

The overview shows the components included in the system in those cases where the attachment is to be controlled with a 4-hose solution.

To read more about the included components, see the marking in the overview ◯. The marking refers to the list of contents and has the same number as the chapter in question.



4. INTRODUCTION

The Excavator and Backhoe loader Control GPC application is a freestanding, independent control system for tiltrotators and attachments that are controlled in a similar way to tiltrotators. The system facilitates flexible and variable control of the machine's tiltrotator, and can be expanded with options such as track steering and wheel steering. This material describes the components that are included in the Excavator and Backhoe loader Control GPC application.

The system comprises an electronics unit, two joystick grips, a valve for sending out oil to the attachment as well as associated cabling.

GP Controller is the electronics unit that regulates and controls the steering, and which is configured to provide the operator with optimum control over the functions. The unit monitors the tool lock and provides a clear warning if the tool is unlocked. This is done to minimize the risk of personal injury.

Joystick grips with proportional thumb rollers are necessary for efficient control of the tiltrotator. The machine's original joystick grips are replaced with grips that have proportional thumb rollers.

A pilot valve (proportional pressure reduction valve with shuttle) is installed in the machine for pilot control of the machine's main valve, which in turn sends oil out to the tiltrotator. The pilot control of the machine's main valve is electro-hydraulic and the machine operator does not have to control the supply to the tiltrotator with a foot pedal. Instead, the system's supply is controlled through the same rollers that control the tiltrotator's functions. This, along with flow requirement control (flow adapted according to current needs), means that the machine's various functions do not affect or disrupt each other when they are run simultaneously.

Excavator and Backhoe loader Control GPC has been developed in accordance with the Machinery Directive, which means that the system has been risk-assessed and designed to minimize the risk of personal injury. A machine equipped with Excavator and Backhoe loader Control GPC from SVAB can easily be CE marked.

Excavator and Backhoe loader Control GPC is compatible with the majority of machine and tiltrotator makes on the market.

GP Controller

SVAB Grip L8

Pilot valve

SYSTEM SPECIFICATION – EXCAVATOR AND BACKHOE LOADER CONTROL GPC	
Supply voltage	9-36V
Operating temperature	-40°C to +70°C
Approved areas of use	Rotor/tilt units for excavators, excavator loaders or backhoes, and as alternative steering for excavators.
Approved functions for steering according to the Machinery Directive.	Direct proportional function with performance level up to b per ISO 13849-1. Pilot valve-controlled proportional function (functions that use a proportionally controlled pilot valve) with performance level up to b per ISO 13849-1. Wheel steering function with performance level d, category 2 per ISO 13849-1 for use at maximum speed of 20 km/h per ISO 5010. Track steering with utilization of direct proportional function as per the description above. Tool lock with performance level d per ISO 13849-1.
Max. number of rollers (Divided between 2 x SVAB Grip L8)	6
System functions	• Tiltrotator and grapple – Proportional steering with thumb roller. • Extra – Proportional steering with thumb roller. • Tool lock – Lockable switch for tool lock. • CDC-W (Wheel steering) – Proportional steering with thumb roller. • CDC-C (Track steering) – Proportional operation with thumb roller. • UI (User Interface) – Alphanumeric display, 8x2 characters and keypad. • Ergonomic handles – Compatible with all joystick bases on the market. • Modular (Expandable system) – CAN bus-based, which makes it easy to expand with more units to add more functions.

5. STEERING CONTROLS

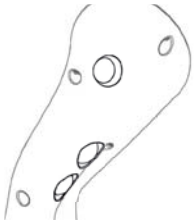
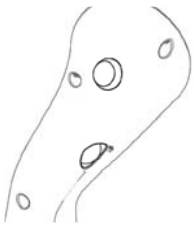
5.1 SVAB GRIP L8

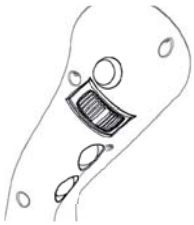
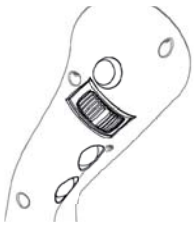
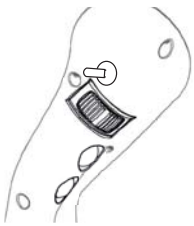
SVAB GRIP L8

SVAB Grip L8 replaces the machine's original joystick grip and can be equipped with 3 rollers per grip.

Properties

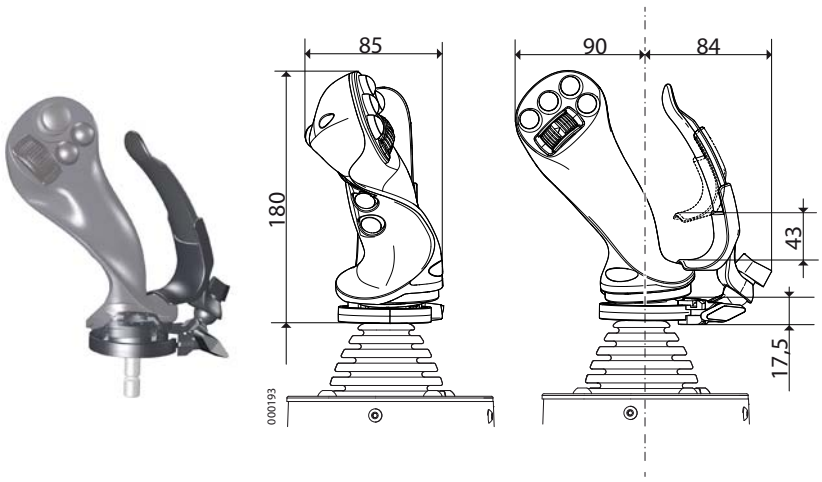
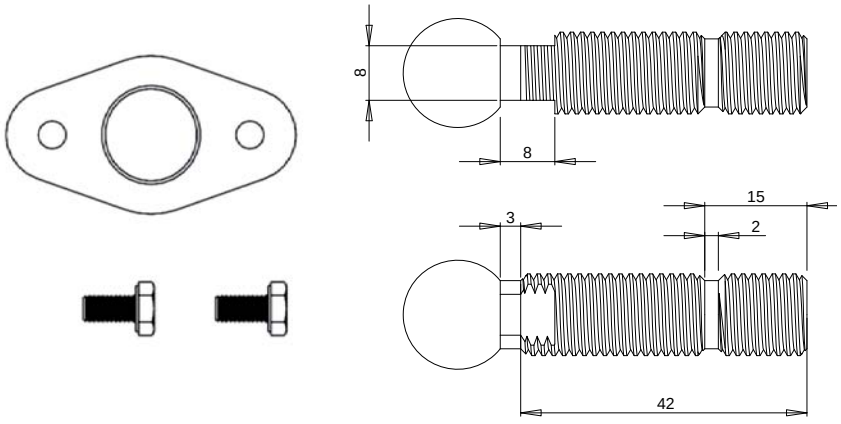
- Double sensors in the rollers.
- Vacant buttons can be used for other functions and can cope with 3 amps.
- Compatible with all joystick bases on the market.
- Ergonomic, easy-to-grip design.
- Facilitates operation with both thumb roller and index finger roller at the same time.
- Available in variants with up to three rollers, of which two are for the thumb and one is for the index finger.
- Pre-connectorized for GP systems.

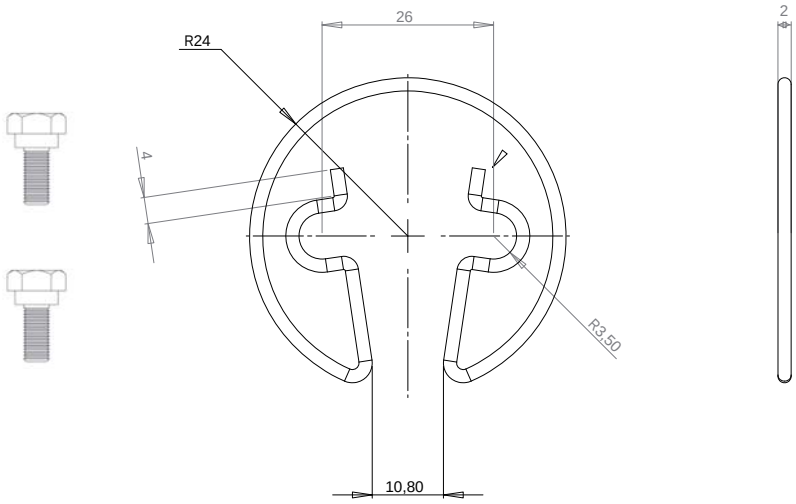
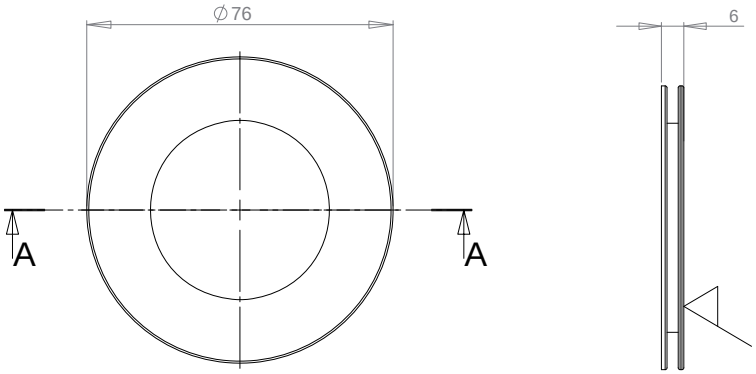
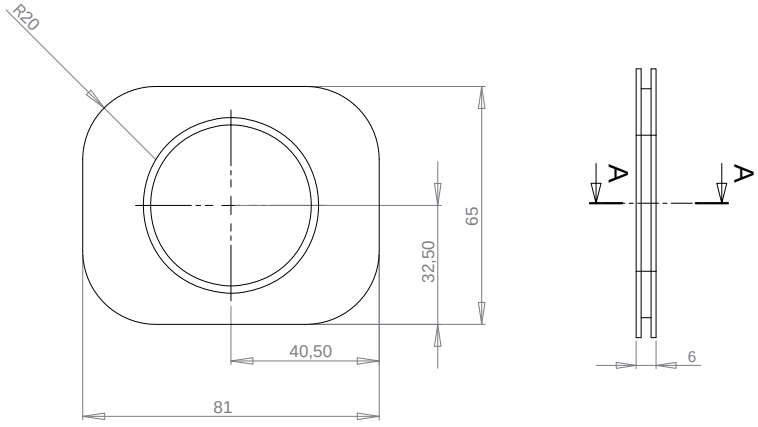
Article number	Name	Fitted with	Layout, front right (reverse layout for left-hand grip)	Layout, rear right (reverse layout for left-hand grip)	Description (two rollers are always used for tilt rotator control)
170100 (right) 171100 (left)	Grip L8 1pr 5sw (14)	1 Roller. 5 OTTO buttons.			Standard joystick grip.
170101 (right) 171101 (left)	Grip L8 1pr 7sw (14)	1 Roller. 7 OTTO buttons.			Variant fitted with the maximum number of buttons.
170103 (right) 171103 (left)	Grip L8 1pr 4sw FNR (13)	1 Roller. 4 OTTO buttons. 1 DATEK Rocker.			Can be combined with 171200 in order to achieve a solution for wheel steering with forward/reverse rocker.
170105 (right) 171105 (left)	Grip L8 1pr 3sw (11)	1 Roller. 3 OTTO buttons.			Can be used for compact machines that only have a few functions.

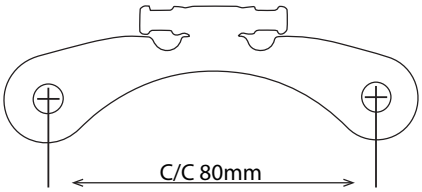
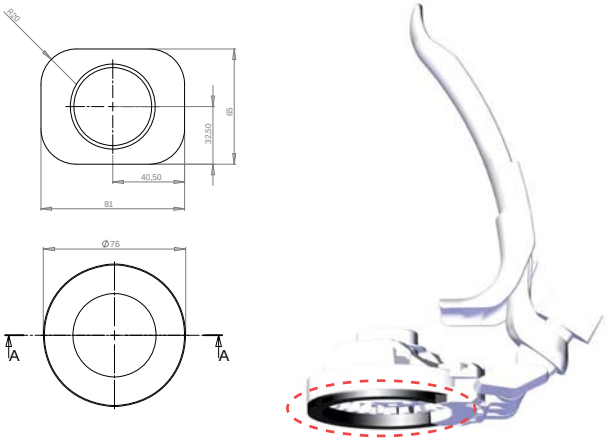
Article number	Name	Fitted with	Layout, front right (reverse layout for left-hand grip)	Layout, rear right (reverse layout for left-hand grip)	Description (two rollers are always used for tilt rotator control)
170200 (right) 171200 (left)	Grip L8 2pr 5sw (14)	2 Rollers. 5 OTTO buttons.			Can be used for wheel or track steering, where an extra function can also be controlled at the same time.
170201 (right) 171201 (left)	Grip L8 2pr 7sw (14)	2 Rollers. 7 OTTO buttons.			Can be used for wheel or track steering with max. number of buttons for additional on/off functions.
170203 (right) 171203 (left)	Grip L8 2pr 4sw FNR (13)	2 Rollers. 4 OTTO buttons. 1 DATEK rocker.			Can be used for wheel steering with forward/reverse rocker. One extra roller function.
170205 (right) 171205 (left)	Grip L8 2pr 3sw (11)	2 Rollers. 3 OTTO buttons.			Can be used for compact excavators with track steering.
170208 (right) 171208 (left)	Grip L8 2pr 6sw FNR (13)	2 Rollers. 6 OTTO buttons. 1 DATEK rocker.			Suitable for wheel steering with forward/reverse rocker. One extra roller function and max. number of buttons.
170300 (right) 171300 (left)	Grip L8 3pr 5sw (22)	3 Rollers. 5 OTTO buttons.			Can be used for track steering, with one extra roller for one additional function. Maximum number of buttons.
170303 (right)	Grip L8 3pr f/b 1-0-1 4sw (22)	3 Rollers. 4 OTTO buttons. 1 SPDT rocker.			Alternative wheel steering variant with index finger rocker. Two extra roller functions and maximum number of buttons.

Article number	Name	Fitted with	Layout, front right (reverse layout for left-hand grip)	Layout, rear right (reverse layout for left-hand grip)	Description (two rollers are always used for tilt rotator control)
170305 (right) 171305 (left)	Grip L8 3pr 3sw (22)	3 Rollers. 3 OTTO buttons.			Can be used for track steering, with one extra roller for one additional function.

5.1.1 SVAB GRIP L8 - ACCESSORIES

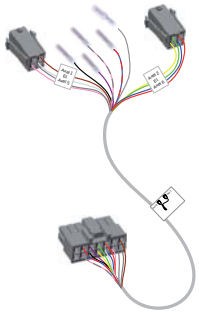
SVAB GRIP L8 - ACCESSORIES		
Article number	Name	Description and Dimensions
146562	Hand-Rest L8	SVAB Hand-Rest L8 increases comfort, relieves the hands and reduces the risk of repetitive strain injuries. The hand-rest improves control of the steering and allows a flexible adjustment for different hand sizes and personal preferences. The installation of the hand-rest is easy and can be done by the machine owner. Installing the hand-rest can be done without disconnecting the joystick cabling.  !
167110	Handle adapter L8 M12, M14 & M14x1.5	The adapter ball is screwed into the machine's joystick base and then secured to L8. 3 different dimensions of screw are supplied with this article. M12, M14 and M14x1.5. 

Article number	Name	Description and Dimensions
167120	Bellows holder L8 with screw	Standard bellows holder made of steel. Makes it possible to secure joystick bellows to L8. Can also be used with Hand Rest L8. 
200572	Bellows washer L8 D=76	Bellows holder adapter that is used together with bellows holder (167120) to adapt to bellows with the specified dimensions: 
200424-1	Bellows washer, Liebherr, machined	Bellows holder adapter that is used together with bellows holder (167120) to adapt to bellows with the specified dimensions: 

Article number	Name	Description and Dimensions
200373	Cable support joystick base, set of 2 pcs incl. instruction	Brackets which are mounted on the joystick bases and fixates joystick grip cables. The bracket enhances the quality of the joystick installation since the cables are attached so that the risk of cable damage is better avoided. 
200714	Spacer Ring Hand Rest L8	The spacer ring is needed for bellow washers 200572 and 200424-1 if these bellow washers are to be mounted on an L8 equipped with a hand-rest. The spacer allows the bellow washer to be mounted correctly and flat against the hand-rest. If the spacer is missing the bellow washer will have an angled incorrect mounting. 

5.2 JOYSTICK GRIP CABLES

JOYSTICK GRIP CABLES



For connecting the joystick grip and GP Controller.

One cable is required for each joystick grip.

Article number	Name	For number of rollers	Length	Description
146108	Handle cable GP/RT 2x4-pole Microfit 3m	2	3m	-
146115	Handle cable GP/RT 3x4-pole Microfit 3m	3	3m	-
146113	Handle cable GP/RT 2x4-pole Microfit 3m CAN	2	3m	Cable with CAN bus connection. Required for systems with CAN splitter.
146116	Handle cable GP/RT 3x4-pole Microfit 3m CAN	3	3m	Cable with CAN bus connection. Required for systems with CAN splitter.

5.3 RELAY CARD FOR JOYSTICK GRIPS (ADDITIONAL DIRECT FUNCTION CONTROL)

RELAY CARD FOR JOYSTICK GRIPS (ADDITIONAL DIRECT FUNCTION CONTROL)

A relay card for joystick grips is used to advantage when several machine functions is to be controlled directly from buttons or rockers on the joystick grip. Relay cards are available in several designs, tailored for different supply voltages.

Artikel number	Name	Supply voltage	Controllable functions	Description
146012	Relay card RT Grip 12V	12V	4	For 4 on / off -functions.
146013	Relay card 12V FNR, 1-2-3	12V	2	Provides signal in all 3 positions for 2x 3-position switches.
146024	Relay card RT Grip 24V	24V	4	For 4 on / off -functions.
146025	Relay card RT Grip 24V Gear FBN D	24V	1	Provides signal in all 3 positions for 1x 3-position switch. With Deutsch contact.
146027	Relay card RT Grip 5V Gear FBN D	5V	1	Provides signal in all 3 positions for 1x 3-position switch. With Deutsch contact.
146030	Relay card RT Grip	5V	4	Standard card for 4 on / off -functions.

5.4 TOOL LOCK SWITCH

TOOL LOCK SWITCH

Article number	Name	Panel hole dimensions	Description	Picture
371053	Switch, 2-position 1-1 ratio. Contura V, bucket lock	21x41 mm	Standard switch, Carling, for locking and opening the tool lock. The switch fits in panel hole with dimensions 22x44 with the accessory “frame for Carling switch” 200341.	
371020	Switch, 2-position 0-1 ratio. SWF 533, bucket lock	22x44 mm	Alternative switch for locking and opening the tool lock.	
370794 370795	Switch, 2-position 0-1 ratio. SWF 511, bucket lock Symbol plate red, white symbol (lock)	22x44 mm	Alternative switch for locking and opening the tool lock.	
370794-01	Switch, 2-position 1-1 ratio. Contura II (cat)	21x41 mm	Alternative Carling switch. Suitable for CAT machines.	

5.4.1 TOOL LOCK SWITCH – ACCESSORIES

TOOL LOCK SWITCH – ACCESSORIES				
Article number	Name	Panel hole dimensions	Description	Picture
200341	Frame for Carling switch, SWF511	22x44 mm	Frame for Carling switch (371053 Contura V), which allows installation of Contura V in panel hole with dimensions 22x44 (SWF 511 standard).	

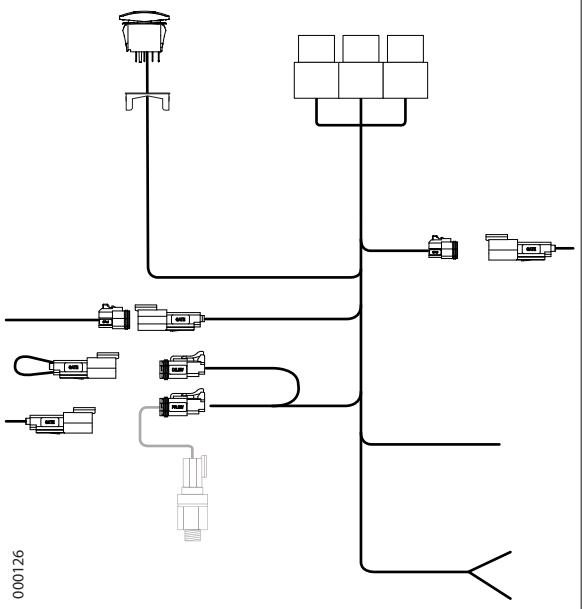
5.5 TOOL LOCK SWITCH CABLES

TOOL LOCK SWITCH CABLES	
	Cable between tool lock switch and APL card. **Length:** 2.5m

Article number	Name	Description
302141	Bucket lock switch cable GP/RT, SWF 511	Cable for tool lock switch 370794 (SWF 511).
302142	Bucket lock switch cable GP/RT, SWF 533	Cable for tool lock switch 371020 (SWF 533).
302143	Bucket lock switch cable GP/RT, Carling switch	Cable for tool lock switch 371053 (Carling Contura V and Contura II).

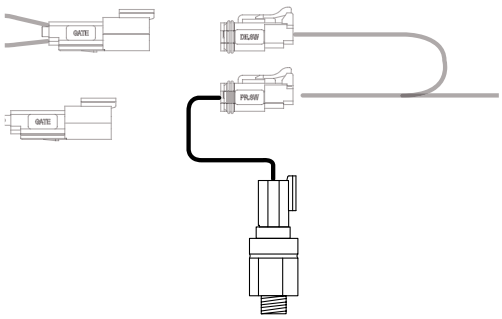
TOOL LOCK SWITCH KITS				
Article number	Name	Length	Description	Picture
810449	Tool lock switch with cable, APL/APL2 Carling Contura V	2.5m	Carling Contura V tool lock switch with cable.	
371013	Tool lock switch APL SWF511	2.5m	SWF 511 tool lock switch with cable.	

5.6 WHEEL STEERING ACTIVATION

WHEEL STEERING ACTIVATION				
Art. No.	Name	Panel hole dim.	Description	Picture
200672	Interlock Steering GPC 24V	21x41mm alt. 22x44mm	Kit for safe wheel steering function. Conditions for activation and inactivation can be connected to: - Security gate. - Steering wheel (orbitrol). - Switches. Also allows connection to the machine for speed limitation. The kit includes circuit breakers, wiring, connectors and relays.	
200673	Interlock Steering GPC 12V			

PANEL SWITCH FOR WHEEL STEERING ACTIVATION				
Article number	Name	Panel hole dimensions	Description	Picture
372041	Switch, 2-position 1-1 ratio. Contura V, lock. wheel + SVAB	21x41 mm	Switch for activating/deactivating wheel steering. SVAB does not supply cabling for this switch. This switch can be combined with 200341 for fitting in panel hole with dimensions 22x44, see chapter "5.4.1 TOOL LOCK SWITCH – ACCESSORIES".	

5.6.1 WHEEL STEERING ACTIVATION - ACCESSORIES

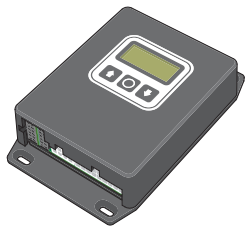
WHEEL STEERING ACTIVATION - ACCESSORIES			
Art. No.	Name	Description	Picture
200674	Pressure Switch 10-50 bar	Accessory for kit "Safe wheel steering function" (200672 and 200673). The pressure switch provides the kit for safe wheel steering function additional functionality. With the pressure switch the wheel steering is disabled when the operator turns the steering wheel.	
200675	Pressure Switch 10-100 bar		

6. STEERING ELECTRONICS

6.1 GP CONTROLLER

GP Controller is the electronics unit that regulates and controls the steering. The unit has wide-ranging configuration options and monitors the tool lock, as well as providing a clear warning if the tool is unlocked. This is done to minimize the risk of personal injury. The machine operator can switch between different user profiles via the unit's keypad and display.

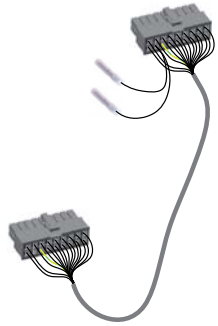
GP Controller is supplied as standard without configuration, although it can be supplied pre-set with settings suitable for the machines and system solutions indicated below.

GP CONTROLLER		
	**Dimensions** (width x height x depth): 94x147x35 mm	
Article number	Name	Description
147000	GP Controller	Standard configuration GP Controller.
147000-CANP	GP-Controller CAN pilot valve	Configured for machines with CAN pilot valve.
147000-EWC	GP-Controller, Volvo EWC/ECC	Configured for Volvo EW-C and EW-D machines with wheel steering.

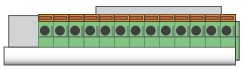
6.1.1 GP CONTROLLER - ACCESSORIES

GP CONTROLLER - ACCESSORIES		
Article number	Name	Description and Dimensions
210000	Attachment plate Plexi for GP/RT Box assembly	Attachment plate for installation of GP Controller with contact cover for collecting cables. Contains complete kit with attachment plate. **Dimensions** (width x height x depth): 95x300x8 mm 

6.2 CONNECTION CARD CABLE

CONNECTION CARD CABLE			
	For connecting the APL/APLX card and GP Controller.		
Article number	Name	Length	Description
147160	Connection card cable GP 1.5m APL	1.5m	-
147161	Connection card cable GP 2.5m APL	2.5m	-

6.3 CONNECTION CARD APL

CONNECTION CARD APL		
	The connection card connects GP Controller with various tiltrotator models.	
Article number	Name	Description
146180	Connection card APL	-

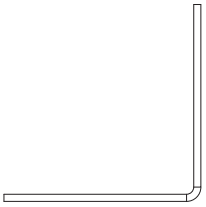
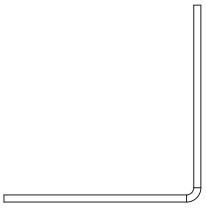
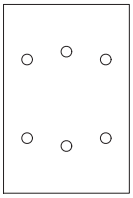
6.4 CONNECTION CARD APLX FOR WHEEL AND TRACK STEERING

CONNECTION CARD APLX FOR WHEEL AND TRACK STEERING		
	Connection card APLX is used to expand the APL card in order to facilitate connection of wheel or track steering.	
Article number	Name	Description
147181	Connection card APLX Wheel steering	Connection card for the wheel steering option.
147180	Connection card APLX Track steering	Connection card for the track steering option.

6.5 TRUNK CABLE

TRUNK CABLE			
	The trunk cable is the link between the tiltrotator's unit cable and the APL card.		
Article number	Name	Length	Description
300820	Trunk cable 16m ILME, 16-pole, Engcon	16m	Fits models: EC10B, EC15B, EC206, EC209, EC214, EC219, EC226, EC30.
300974	Trunk cable 10m ILME, 10-pole, Engcon	10m	Passar till modeller: EC02B, EC05B.
301000	Trunk cable 10m ILME, 10-pole, Indexator	10m	-
301001	Trunk cable 16m ILME, 10-pole, Indexator	16m	-
301010	Trunk cable 11m ILME, 16-pole, Steelwrist	11m	-
301011	Trunk cable 16m ILME, 16-pole, Steelwrist	16m	-

6.5.1 TRUNK CABLE ACCESSORIES

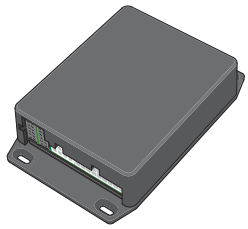
TRUNK CABLE – ACCESSORIES			
Article number	Name	Description	Picture
200319	Attachment plate Ilme 105-82/45	Attachment plate for trunk cable Indexator, 301000, 301001. Installed on stick for attaching the trunk cable's ILME device.	
200320	Attachment plate Ilme 64-48/40	Attachment plate for trunk cable Engcon, 300820, 300974 and 300975. Also for trunk cable Steelwrist 301010, 301011. Installed on stick for attaching the trunk cable's ILME device.	
200333	Welded mount 80x80 Ilme attachment plate	Many machine manufacturers advise against drilling in the machine's stick. This weld bracket is welded on the stick and used for attachment plates 200319 and 200320. The attachment plate is then screwed in the weld brackets pre-drilled holes.	

6.6 ADDITIONAL FUNCTIONS WITH GPR CONTROLLER

In cases where the base system, both has tiltrotator control and wheel or track control, but additional functionality is desired such as control of dozer blade or triple-articulated booms, one or more additional electronic units might be required. These electronic units are called GPR Controllers.

GPR Controller is an electronic unit that lacks display and keypad as its purpose is to add additional inputs/outputs and configuration options to the system. Programming of the GPR Controller is done via the display and keypad of the GP Controller.

Larger systems with GPR Controller often include components that are not part of our standard product range. Contact SVAB if you are interested in additional functions with GPR Controller.

GPR CONTROLLER		
	With GPR Controller the system can be expanded with functions that control: -Dozer blade -Outriggers -Telescope stick -Triple-articulated boom -Boom swing -BM attachment -Oscillation lock -Front loading **Dimensions** (width x height x depth): 94x147x35mm	
Article number	Name	Description
147001-XX	GPR-Controller	Electronic unit for additional functions in Excavator and Backhoe loader Control system GPC

6.7 GPR CONTROLLER - CAN CABLE

GPR CONTROLLER - CAN CABLE		
	For connection and communication between GP Controller and GPR Controller.	
Article number	Name	Description
147616	CAN cable GP for Minifit Male 3m	Standard cable, 3m.
147616-3	CAN cable GP for Minifit Male 1,5m	1,5m.

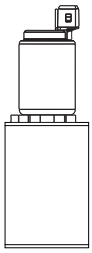
7. HYDRAULICS

By installing a pilot valve (proportional pressure reduction valve with shuttle) in the machine, GP Controller can control the oil flow to the tiltrotator. The machine's pedal can be connected in parallel with the valve, which means that the pedal can still be used to control the flow out to the tiltrotator. The pedal's function thereby remains unchanged.

The pilot valves have been developed to fit the majority of machines on the market.

7.1 PILOT VALVE

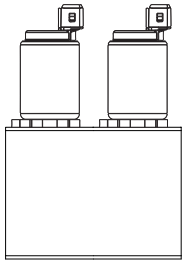
SINGLE PILOT VALVE



A single pilot valve is used to pilot steer the machine's valve function, which is used to supply the tiltrotator with oil.

Article number	Name	Voltage	Bar	Flow	Dimensions LxWxH	Description
135061-1220	Proportional pressure reduction valve 12v/20 bar with Shuttle valve in block	12V	20	3 l/min	60x40x122 mm	Standard single pilot valve.
135051-1220	Proportional pressure reduction valve 12v/20 bar in block	12V	20	3 l/min	60x40x122 mm	**Single pilot valve without shuttle valve cartridge** is used when there is no need to connect the machine's pedal in parallel.
135061-1232	Proportional pressure reduction valve 12v/32 bar with Shuttle in block	12V	32	3 l/min	60x40x122 mm	Alternative single pilot valve.
135051-1232	Proportional pressure reduction valve 12v/32 bar in block	12V	32	3 l/min	60x40x122 mm	**Alternative single pilot valve without shuttle valve cartridge** is used when there is no need to connect the machine's pedal in parallel.
135071-1232	Proportional pressure reduction valve 12v/32 bar 10 l/min. with Shuttle valve in block	12V	32	10 l/min	60x45x140 mm	**Simple Highflow** is only used in machines with hydraulic systems where air pockets are formed more often than normal. Air pockets can cause uneven control of the tiltrotator. A highflow valve ensures that the air pockets and problems caused by these are reduced.

DOUBLE PILOT VALVE

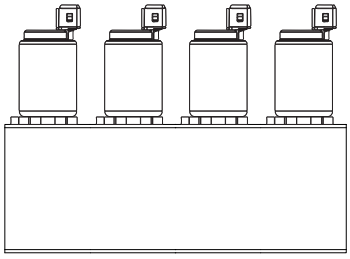


A double pilot valve is used when it is necessary to be able to operate the machine's extra outputs with dual action.

For example, a double pilot valve allows attachments other than the tiltrotator to be controlled with rollers.

Article number	Name	Voltage	Bar	Flow	Dimensions LxWxH	Description
135062-1220	2 proportional pressure reduction valves 12v/20 bar & Shuttle valves in block	12V	20	3 l/min	60x80x122 mm	Standard double pilot valve.
135052-1220	2 proportional pressure reduction valves 12v/20 bar in block	12V	20	3 l/min	60x80x122 mm	**Double pilot valve without shuttle valve cartridge** is used when there is no need to connect the machine's pedal in parallel.
135062-1232	2 proportional pressure reduction valves 12v/32 bar & Shuttle valves in block	12V	32	3 l/min	60x80x122 mm	Alternative double pilot valve.
135052-1232	2 proportional pressure reduction valves 12v/32 bar 10 l/min in block	12V	32	3 l/min	60x80x122 mm	**Alternative double pilot valve without shuttle valve cartridge** is used when there is no need to connect the machine's pedal in parallel.
135072-1232	2 proportional pressure reduction valves 12v/32 bar 10 l/min with Shuttle valve in block	12V	32	10 l/min	60x85x140 mm	**Double Highflow** is only used in machines with hydraulic systems where air pockets are formed more often than normal. Air pockets can cause uneven control of the tiltrotator. A highflow valve ensures that the air pockets and problems caused by these are reduced.
135082-1232	2 proportional pressure reduction valves 12v/32 bar, 3 shuttles & measurement output in block	12V	32	3 l/min	60x85x140 mm	**Double with Measurement output** is used for machines that have pressure sensors for activation of the hydraulics in the pedal. The machine's pressure sensors are moved to measurement output on valve.

4-PILOT VALVE (FOR TRACK STEERING OR 4-HOSE SYSTEM)



The 4-pilot valve replaces the need for track control operation via the pedal, by instead allowing the operator to control track steering via the joystick grips rollers.

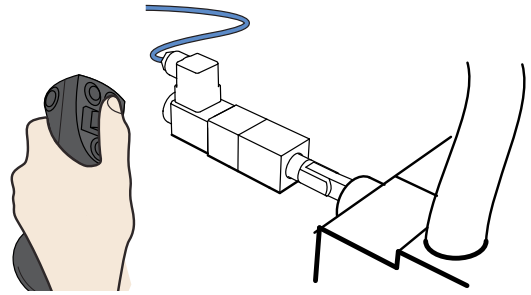
The valve is connected in series with the servo hoses from the pedal, and in parallel with the pedal's P and T connections. If the machine's pedals are fitted with pressure sensors, this valve must be used.

If the machine's pedals have pressure sensors, see 135082-1232 in the table DOUBLE PILOT VALVE on page 23.

Article number	Name	Voltage	Bar	Flow	Dimensions LxWxH	Description
135064-1220	4 proportional pressure reduction valves 12v/20 bar & Shuttle valves in block	12V	20	3 l/min	60x160x122 mm	Standard 4-pilot valve.
135064-1232	4 proportional pressure reduction valves 12v/32 bar & Shuttle valves in block	12V	32	3 l/min	60x160x122 mm	Alternative 4-pilot valve.

Article number	Name	Voltage	Bar	Flow	Dimensions LxWxH	Description
2x 135082-1232	2 proportional pressure reduction valves 12v/32 bar, 3 shuttles & measurement output in block	12V	32	3 l/min	60x85x140 mm	**Double with Measurement output** is used for machines that have pressure sensors for activation of the hydraulics in the pedal. The machine's pressure sensors are moved to measurement output on valve. 2 of these valves are used for **track steering** instead of a 4-pilot valve on machines whose pedals have pressure sensors.

ACTUATOR PILOT VALVE



Contact SVAB for more information regarding the operation of mechanical valve banks.

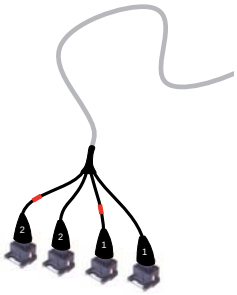
7.2 SUPPLY/PILOT VALVE'S CABLES

SUPPLY/PILOT VALVE'S CABLES

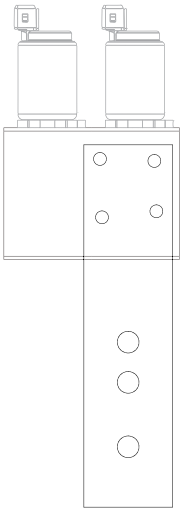
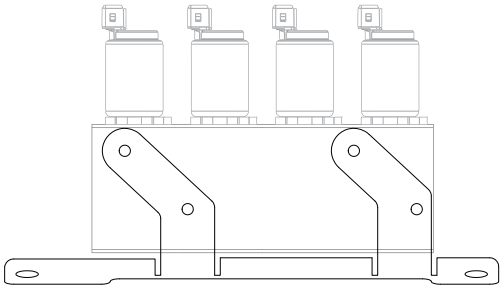
The Supply/pilot valve's cable connects the pilot valve with GP Controller.

Article number	Name	Contact type and length of relevant cable	Description
146124	Supply/pilot valve cable GP/RT 2xAMP-J	2x AMP Junior 4m	Standard cable.
146120	Supply/pilot valve cable RT-C. 2m, 4m	1x AMP Junior 4m 1x Hirschmann 4m	Used for actuator pilot valve.
146133	Supply/pilot valve cable GP/RT Deutsch,	2x Deutsch 4m	Used when cable to pilot valve is connected via a Deutsch connector.
146123	Supply cable GP/RT	3m	Only used for power supply of the GP Controller. Used for the CAN splitter system and for 4-hose solutions.

7.3 VALVE CABLES FOR TRACK STEERING

VALVE CABLES FOR TRACK STEERING			
	Connects the valve for track steering together with the APLX card.		
Article number	Name	Length	Description
146145	Solenoid cable with 4 AMP-Junior 4m RT	4m	Solenoid cable for track steering.
146147	Solenoid cable with 2 AMP-Junior 4m RT	4m	2 of these cables are used as solenoid cables together with 2 double pilot valves with double measurement outputs (135082-1232), see page 23.

7.3.1 PILOT VALVE – ACCESSORIES

BRACKETS			
Article number	Name	Description	Picture
200321	Bracket, pilot valve	Bracket for installing pilot valve. Can be installed both horizontally and vertically against the pilot valve. 1x bracket is used for both single and double pilot valves. 2x brackets are used for 4-pilot valves.	
200409	Attachment plate, 4-pilot valve.	Alternative bracket for installing 4-pilot valve. The bracket has a 90° angle.	

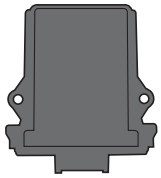
HOSE KITS

Hose kits include a hose as well as couplings and nipples for the hydraulic installation of the pilot valve function.

Article number	Name	Description
350007	Hose kit Volvo EWC pilot valve	Adapted for Volvo EW-C and EW-D.
350009	Hose kit with Bracket, Volvo EWC Extra	Adapted for Volvo EW-C and EW-D.
350011	Hose kit, Liebherr A900, single pilot valve	Adapted for Liebherr A900.
350013	Hose kit, Liebherr 314, single pilot valve	Adapted for Liebherr 314.

7.4 CAN SPLITTER

CAN SPLITTER



A CAN splitter makes SVAB Excavator and Backhoe loader Control GPC compatible with machines that control the pilot valve function with a separate CAN bus system.

The CAN splitter replaces signals that come from the machine's original controls.

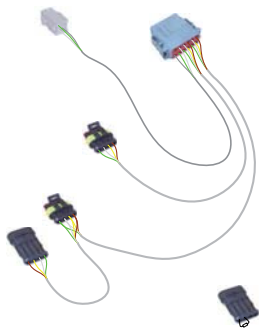
Always check with our sales staff to ensure that the CAN splitter is compatible with your machine.

Dimensions (width x height x depth): 11.7x27.4x35mm.

Article number	Name	Description
147010	CAN Splitter, 1-pedal	For 1-pedal Case New Holland wheeled excavator.
147011	CAN Splitter, 2-pedal	For 2-pedal Case New Holland wheeled excavator.
147011-1	CAN Splitter, 2-pedals, low flow	For 2-pedal Case New Holland wheeled excavator.

7.5 CAN CABLE FOR CAN SPLITTER

CAN CABLE FOR CAN SPLITTERS



Connects GP Controller with CAN splitter and the machine's ECU.

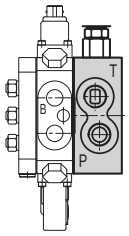
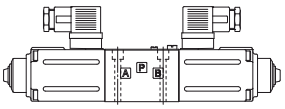
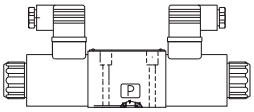
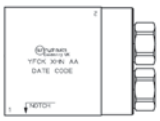
Article number	Name	Contact type and length of relevant cable	Description
147612	CAN Cable CAN Splitter	MiniFit Jr. - 4m AMP Superseal 1.5 – 0.6m	The CAN-splitter cable is connected together with joystick grip cables 146113 (see page 14) and 146116 (see page 14).

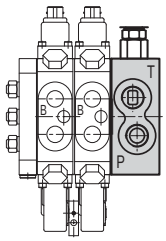
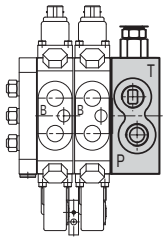
7.6 VALVE SOLUTION FOR EXPANSION OF ELECTRO-HYDRAULICS ON THE MACHINE

DIRECTIONAL VALVE, 1 SECTION (USED FOR 2-HOSE SYSTEM)

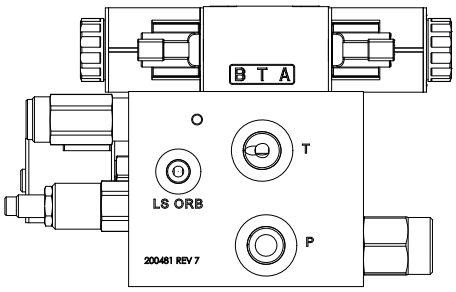
If the machine does not have its own solution for extra hydraulics, e.g. "hammer hydraulics", the machine needs to be supplemented with a valve solution for this.

If you cannot find a solution for your machine, contact SVAB.

Part no.	Name	Voltage	Bar	Flow	Description	Picture and dimensions LxWxH
370959	Directional valve MV-99, 1-sect. 90L, LS without shock, 260 bar	12V	260	90 l/min	Used to create an extra dual-action output.	 130x264.5x177
401044	NG6 proportional directional valve ATOS 12V	12V	-	-	Used together with shunt valve on smaller machines that are originally equipped with an on/off NG6 directional valve. The on/off valve is replaced with this NG6 proportional valve and NG6 shunt valve.	 247x46x85
370551	NG6 proportional directional valve "High-flow" 12v	12V	-	-	Alternative valve for 401004 which can cope with a higher flow.	 215x45.5x90
400974	NG6 Shunt valve with shuttle	-	-	-	Supplement in order to use NG6 proportional valve (370551) in an open circuit (OC). Used for tracked excavators with a separate pump for the extra hydraulics.	 63x44x86
365500	Screw MC6S M5 x 100 for NG6 with shunt	-	-	-	-	

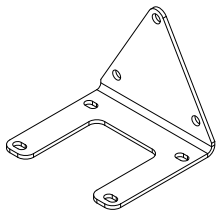
DIRECTIONAL VALVE, 2 SECTION (USED FOR 4-HOSE SYSTEM)						
Part no.	Name	Voltage	Bar	Flow	Description	Picture
310013	Directional valve MV99 4-hose RT control LS inlet. 60 liters	12V	-	60 l/min	Used to create extra hydraulics for a 4 hose system.	 173x264.5x177
370977	Directional valve MV99 2-sect. 90L LS with shock	12V	-	90 l/min	Used to create extra hydraulics for a 4 hose system.	 173x264.5x177

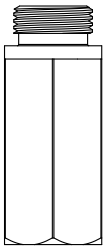
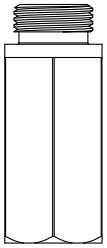
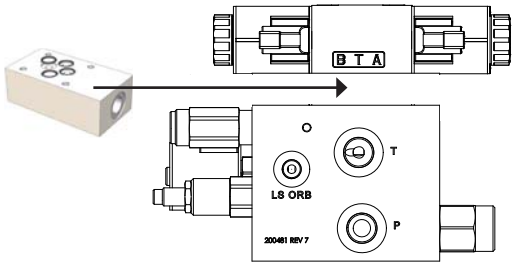
7.7 VALVE FOR WHEEL STEERING

VALVE FOR WHEEL STEERING	
	The SVAB steering valve has been developed to be used as alternative steering for machines with conventional Orbitrol steering. The valve has a built-in prioritization function, which means that the machine's original steering always has priority. The valve handles both static and dynamic LS, as well as open systems.

Article number	Name	Voltage	Bar	Flow	Dimensions LxWxH	Description
135003-1212	Steering valve LS with shut off 12/12	12	12	38 l/min	247x108x155	-
135003-1224	Steering valve LS with shut off 12/24	12	24	38 l/min	247x108x155	-
135004-1212	Steering valve OC with shut off 12/12	12	12	38 l/min (P to A&B). 76 l/min (P to S).	247x115x165	-
135004-1224	Steering valve OC with shut off 12/24	12	24	38 l/min (P to A&B). 76 l/min (P to S).	247x115x165	-
135007-1212	Steering valve OC shut off 12/12 (CF)	12	12	38 l/min (P to A&B). 76 l/min (P to S).	247x115x200	CF or Pump 12V
135007-1224	Steering valve OC shut off 12/24 (CF)	12	24	38 l/min (P to A&B). 76 l/min (P to S).	247x115x200	CF or Pump 24V

7.7.1 VALVE FOR WHEEL STEERING – ACCESSORIES

BRACKETS			
Article number	Name	Description	Picture
200539	Bracket, steering valve SO	Bracket for steering valve.	

MISCELLANEOUS			
Article number	Name	Description	Picture
200583	Adapter LS, SD ORB OSPC+OLSA	Used to obtain LS pressure from Sauer-Danfoss OSPC+OLSA steering orbitrols. Connected to PP in steering valve 135004-1212 and 135004-1224.	 
200678	Adapter LS, Eaton ORB (JCB, Hitachi)	Used to obtain LS pressure from Eaton steering orbitrols. Connected to PP in steering valve 135004-1212 and 135004-1224.	 
200558	Adapter plate NG6, T-plug cpl with screw and seal.	Used to provide the directional control valve on steering valves 135004-XXXX a separate tank connection. In some cases the S-port of the steering valve proceeds to another consumer (eg brake charging) which at times results in a high pressure. This can cause the steering valve to stop functioning. The adapter plate is mounted between the control valve and valve block. The adapter plate is then attached to (T)ank to rectify problems that occur with high pressure.	

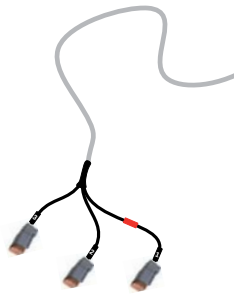
HOSE KITS

Hose kits include a hose as well as couplings and nipples for the hydraulic installation of the wheel steering valve.

Article number	Name	Description
350019	Hose kit Volvo EWC Steering valve OC with Shut off	Adapted for wheel steering in Volvo EW-C and EW-D.

7.8 VALVE CABLES FOR WHEEL STEERING

VALVE CABLES FOR WHEEL STEERING



Connects the valve for wheel steering together with the APLX card.

Article number	Name	Length	Description?
147190	Solenoid cable, Steering RT/GP deutsch	5m	Solenoid cable for wheel steering.

8. SERVICE TOOLS

SVAB service tools streamlines the work for service technicians and installers.

8.1 GP CONFIG (COM-KIT)

GP CONFIG (COM-KIT)

GP Config is a software for PC that you run on your computer. With the included Com-kit for GP Controller, the computer is connected to the GP Controller via USB. From your computer the GP Controller can then be configured.

GP Config easily lets you save settings for later quick set up of a GP Controller. You can also copy the settings from a previously programmed GP Controller and save these settings on your computer.

GP Config has I / O monitoring, simplifying diagnostics.

Article number	Name	Operative system support (PC)	Contents
401273	Com-kit for GP-Controller	Microsoft Windows XP, Microsoft Windows Vista, Microsoft Windows 7 32&64 bit	• Interface and cables. • USB stick with the software GP Config. • 12V transformer to power the GP Controller. • Computer not included.

8.2 SVAB SPARE PART KIT TILTROTATOR CONTROL

SVAB SPARE PART KIT TILTROTATOR CONTROL

SVAB Spare part kit consists of the parts that we know from experience is good to have close at hand as a service provider. SVAB Spare part Kit components are heavily discounted.

SVAB Spare parts kit also includes tools for example, stripping, crimping and removal.

You choose if you want to buy the whole kit including chassi and boxes, or if you only want to buy loose boxes with contents.

Article number	Name	Brief description of the contents. (Contact SVAB for further detalis).
201000	Spare part Kit SVAB CPL	Complete spare part kit containing all the boxes and chassi.
201001	Box 1, Spare part Kit SVAB	Contains spare parts for joystick grips, such as buttons and rollers.
201002	Box 2, Spare part Kit SVAB	Contains electronic units (RT / GP) and connection cards.
201003	Box 3, Spare part Kit SVAB	Contains valves, valve accessories and tools for example, stripping, crimping and removal.
201004	Box 4, Spare part Kit SVAB	Contains cables, connectors and Com-kit.
201005	SVAB Chassi Spare part Kit	Chassi without content.

9. DOCUMENTATION

9.1 MOUNTING INSTRUCTION, OPERATORS AND USER MANUAL

MOUNTING INSTRUCTION AND OPERATORS MANUAL

Article number	Name	Description
112092 112088	Mounting instruction GPC general-EN Mounting instruction GPC general-SV	These mounting instructions are a guide to mounting a SVAB GP Controller system. These mounting instructions shall be used in the technical documentation for the machine's CE marking.
113010 113009 113019 113020 113021 113022	Op. Manual Excavator Ctrl. GPC-EN Op. Manual Excavator Ctrl. GPC-SV Op. Manual Excavator Ctrl. GPC-NO Op. Manual Excavator Ctrl. GPC-DA Op. Manual Excavator Ctrl. GPC-DE Op. Manual Excavator Ctrl. GPC-FI	The operator's manual describes how our system should be used and contains important information and safety precautions. The manual shall be placed in the machine's cab.
630006 630013	User Manual GP Controller SV User Manual GP Controller EN	The User Manual describes how the system is configured and adjusted via the GP Controller. The manual is intended for the installer and service technician and should NOT be sent along with the machine or be placed in the machine cab.

SVAB Hydraulik AB has extensive experience in hydraulics, control electronics and ergonomic design for industrial vehicles, with guaranteed quality production and prompt delivery.

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Document name and revision:	Excavator and Backhoe loader Control GPC - Application Contents Revision I


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