

Dual-circuit power brake valve of compact design

LT 17

RE 66228

Edition: 01.2016

Replaces: 05.2014



- ▶ Series 4X
- ▶ Service brake pressure 40 to 125 bar

Features

- ▶ Dual-circuit brake valve, accumulator charging valve and shuttle valve in one housing
- ▶ Simple and quick assembly (Plug-and-Play solution)
- ▶ Optional electrical on/off parking brake valve
- ▶ Connection facility for separate parking brake valve
- ▶ Integration into existing hydraulic systems is possible
- ▶ Integrated actuation pedal
- ▶ Direct connection of the pressure accumulator is possible (separate accumulator block is not required)
- ▶ Quickly ready for operation
- ▶ Sensitive metering
- ▶ Low in maintenance
- ▶ Integrated maximum pressure limitation of the brake circuit
- ▶ Brake pressure proportional to actuation force and travel
- ▶ Synchronisation through low hysteresis
- ▶ Ergonomic adaption of the pedal blade angle possible
- ▶ All pedal variations with slip resistant, removable rubber plates

Fields of application

- ▶ Construction equipment
- ▶ Material handling vehicles
- ▶ Forestry and agricultural machines
- ▶ Municipal vehicles
- ▶ Special vehicles

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Functional description

The LT 17 is a dual-circuit brake valve in compact design with assembled foot pedal, which combines all necessary functions in one housing.

Accumulator charging valve

The accumulator charging valve (1) loads, as a priority, the accumulator. When the accumulator pressure falls below the switch-on pressure of the charging valve, the accumulators are loaded until the switch-off pressure is reached. The switching pressure differential is approx. 18 % of the cut-off pressure. The accumulators are loaded with a flow of e.g. 17 l/min (version B40). If the pump supplies more than e.g. 17 l/min, then the subsequent consumers (N) are supplied with the difference.

Note

If subsequent consumers (N) generate a higher pressure than the cut-off pressure of the accumulator charging valve, the pressure of the accumulator circuit is raised to this level!

Circuit separation

The valve supplies two separate braking circuits. These are separated by an inverted shuttle valve (2).

Dual-circuit brake valve

The dual-circuit brake valve LT 17 is a directly operated pressure reducing valve in three-way design with stepless mechanical operation. It has a maximum pressure relief of secondary circuits and infinitely adjustable pressure in the secondary circuits (brake circuits) which is in proportion to the actuation travel angle of the pedal. The LT 17 basically consists of two tandem design 3-way pressure reducing valves, which were actuated via the assembled foot pedal (5). The pressure in both brake circuits rises proportional to the actuation force and the actuation travel angle of the pedal. With the deflection of the pedals kept constant, the defined pressure in channels BR1 and BR2 is kept constant. Thereby the pressure in BR1 is only approx. 2 bar higher than in BR2. The valve of the 1st circuit (4.1) is directly operated. The pressure of the 2nd brake circuit (4.2) is controlled by the 1st brake valve.

If the hydraulic supply to the 1st brake circuit fails, then the 2nd brake circuit is directly actuated. When the foot pedal is released, the two pressure reducing valves move back to the starting position. Thus the secondary circuits (BR1 and BR2) are relieved.

Version without parking brake valve

On accumulator port S3 a separate hydraulic parking brake valve (e.g. LT 08) can be connected. For this, we recommend the optional version R (6) with check valve in S3.

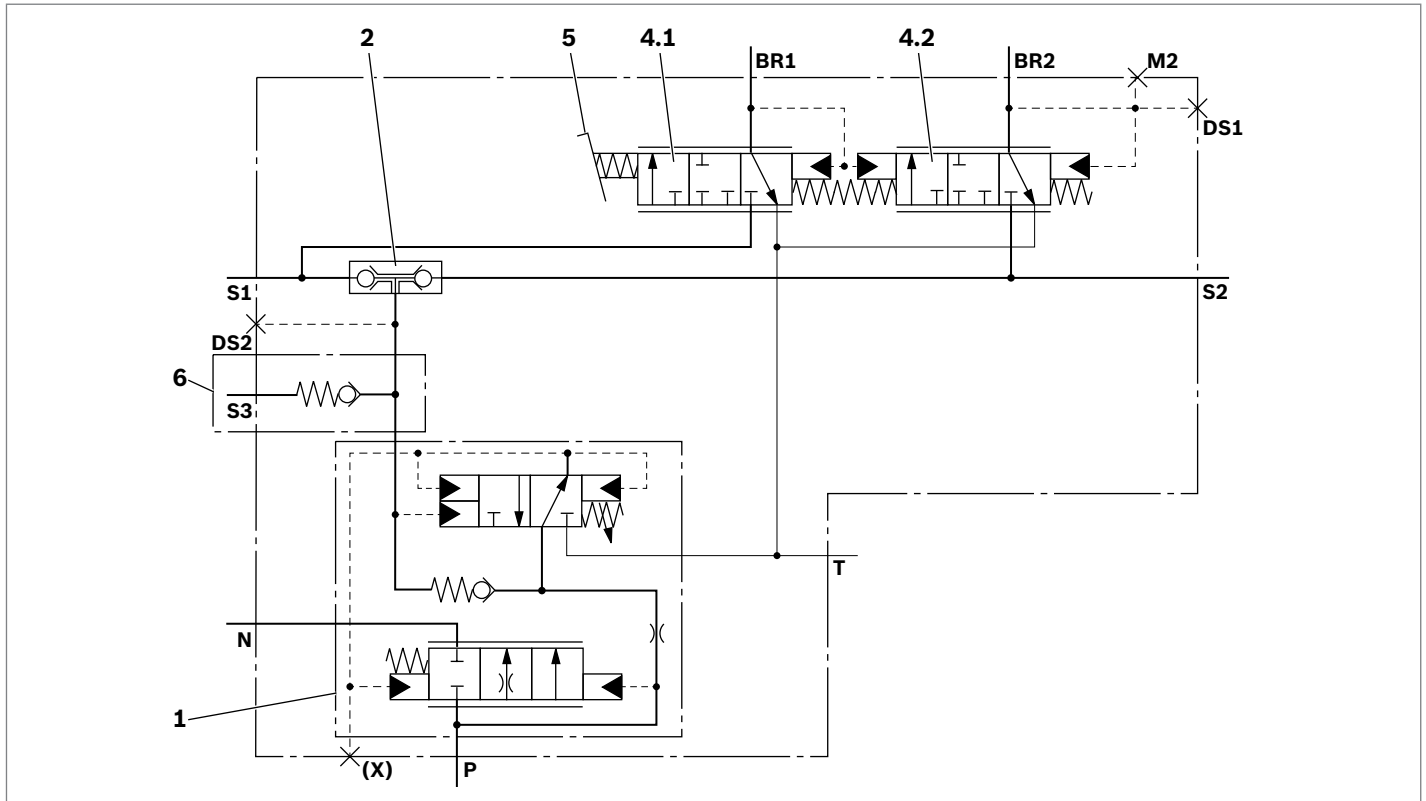
Version with parking brake valve

The electrically switched parking brake (3) is a 3/2-way directional valve. When the valve is switched with an electrical signal, then the port BR3 is connected with port S3. The present accumulator pressure S3 supplies the parking brake via BR3. By switching off or failure of the electrical signal, the parking brake valve connects BR3 with T and the applied pressure in the parking brake valve can be released. The auxiliary brake function cannot be performed.

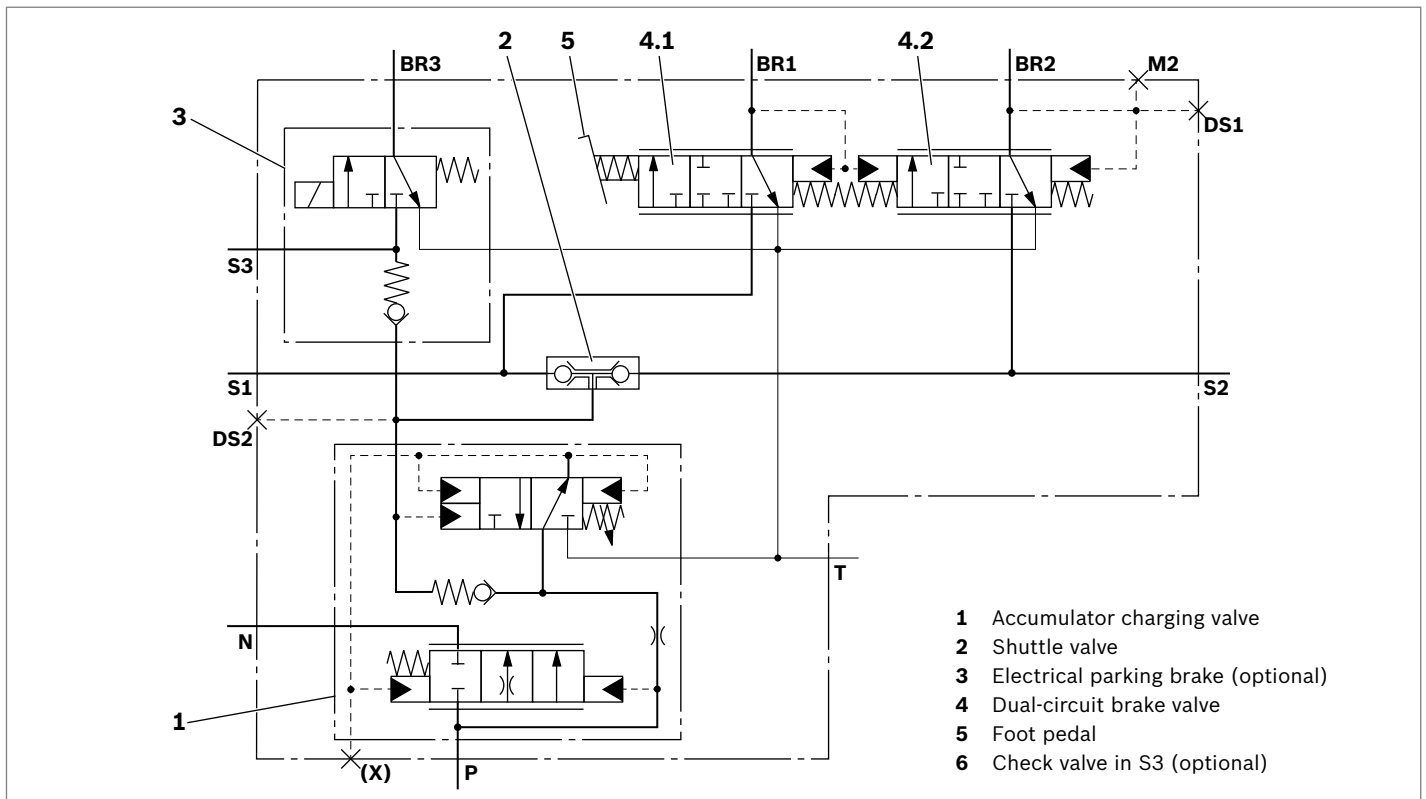
Ports	
BR1	Service brake (1st brake circuit)
BR2	Service brake (2nd brake circuit)
BR3	Parking brake
DS1	Pressure switch brake light
DS2	Pressure switch accumulator pressure
S1	Supply service brake (1st brake circuit)
S2	Supply service brake (2nd brake circuit)
S3	Supply parking brake
P	Pump
T	Tank
N	Subsequent consumers
M2	Pressure switch brake light (alternative to DS1)
X	Load-sensing (LS) (optional, version SO4*)

Symbols

▼ Version without parking brake valve



▼ Version with parking brake valve



- 1 Accumulator charging valve
- 2 Shuttle valve
- 3 Electrical parking brake (optional)
- 4 Dual-circuit brake valve
- 5 Foot pedal
- 6 Check valve in S3 (optional)

Technical data

General					
Weight			kg	12	
Installation position				Upright preferred	
Type of connection				Metric threads	
Ambient temperature range		θ	°C	−25 to +80	
Priming				Priming RAL 5010	
Hydraulic					
Maximum service brake pressure at port		BR1, BR2	p_{Br}	bar	125
Maximum parking brake pressure with version E at port		BR3	p	bar	210 (according to the set accumulator pressure)
Maximum inlet pressure	without FBA at port	P	p	bar	250
	with FBA at port	P	p	bar	210
Maximum tank pressure at port		T	p	bar	0.5 (Tank pressure must not exceed the pressure being applied by the brake.)
Maximum accumulator pressure at port	S1, S2		p	bar	250
	S3		p	bar	210
Maximum pressure at port		N	p	bar	30 % less than the set accumulator pressure
Maximum accumulator charging pressure	Switch-off pressure		p	bar	210
	Switch-on pressure		p	bar	ca. 18 % below switch-off pressure
Maximum flow	P → S			l/min	ca. 4.5 (Standard, B18) ca. 17 (B40)
	P → N			l/min	70
Hydraulic fluid				Mineral oil (HL, HLP) according to DIN 51524, other hydraulic fluids, such as HEES (synthetic esters) according to VDMA 24568 as well as hydraulic fluids as specified in the data sheet 90221, on inquiry.	
Hydraulic fluid temperature range			θ	°C	−20 to +80
Viscosity range			ν	mm²/s	2.8 to 380
Maximum permitted degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)				Class 20/18/15, for this we recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$	
Electric (version E with parking brake valve) ¹⁾					
Power consumption at 20 °C			W	14.4	
Duty cycle			%	100	
Protection category according to DIN 40050				IP6K5	

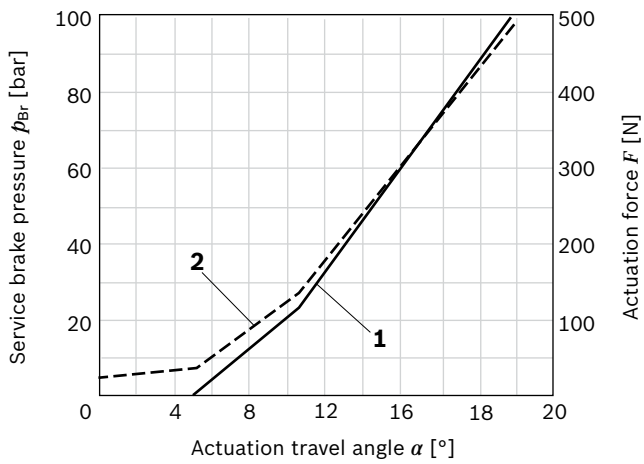
Note

For applications outside these parameters, please consult us.

1) Further details see data sheet 58007

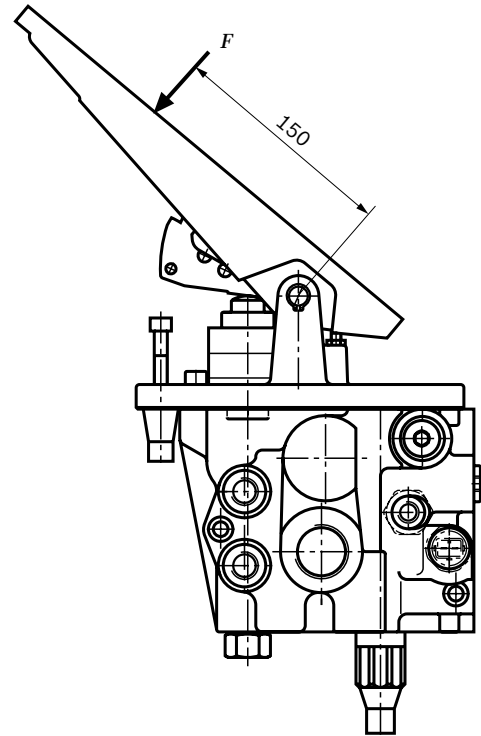
Characteristic curve

▼ Service brake pressure and actuation force depending on the pedal angle, z. B. 100 bar (Standard)



- 1 Service brake pressure
- 2 Actuation force

▼ Actuation force F at pedal with lever of 150 mm



Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
LT 17	M	4X	/								/		M	14	*

Model code

01	Dual-circuit power brake valve of compact design LT 17	LT 17
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Type of actuation service brake (BBA)

02	Mechanical	M
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Series

03	40 to 49 (unchanged installation and connection dimensions)	4X
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Characteristic curve

04	Linear characteristic curve	L
	Progressive characteristic curve	P

Service brake pressure (BBA)

05	40 bar	040
	60 bar	060
	65 bar	065
	70 bar	070
	80 bar	080
	85 bar	085
	90 bar	090
	95 bar	095
	100 bar	100
	105 bar	105
	120 bar	120
	125 bar	125

Type of actuation parking brake (FBA)

06	Without FBA	-
	Electrically switched ¹⁾	E

Parking brake pressure (FBA)

07	¹⁾	XXX
	Without FBA	000

Accumulator charging pressure

08	100 bar	A
	120 bar	B
	150 bar (Standard)	C
	160 bar	D
	185 bar	E
	200 bar	F
	210 bar	G

Accumulator charging flow

09	Approx. 4.5 l/min (standard)	B18
	Approx. 17 l/min	B40
	Approx. 4.5 l/min with check valve	R18
	Approx. 17 l/min with check valve	R40

¹⁾ With electrically switched FBA, the parking brake pressure of the FBA corresponds to the accumulator charging pressure. Observe the switching hysteresis!

Voltage at the switching solenoid

10	12 Volt	AG12
	24 Volt	AG24

Connector type (standard with manual override)²⁾

11	Cubic connector	K4
	Deutsch plug	K40
	Junior timer, 2-pole (AMP)	C4

Line connections

12	Metric threads	02
	Metric threads, reduced	40
	UNF threads	19

Seal material

13	NBR seals, suitable for mineral oil (HL, HLP) according to DIN 51524	M
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Additional equipment

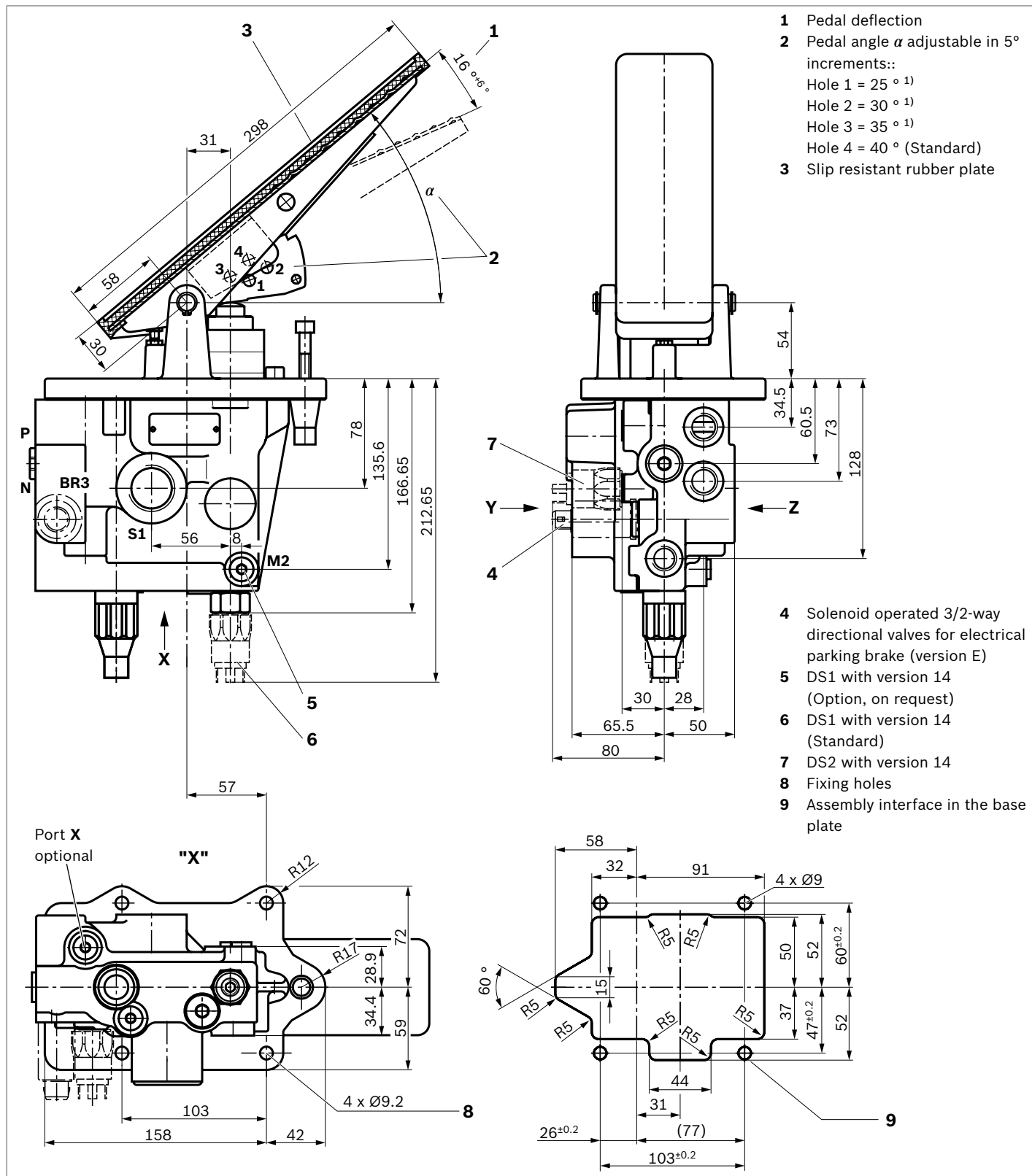
14	With pressure switch	14
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15	Further details in clear text	*
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²⁾ Mating connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.

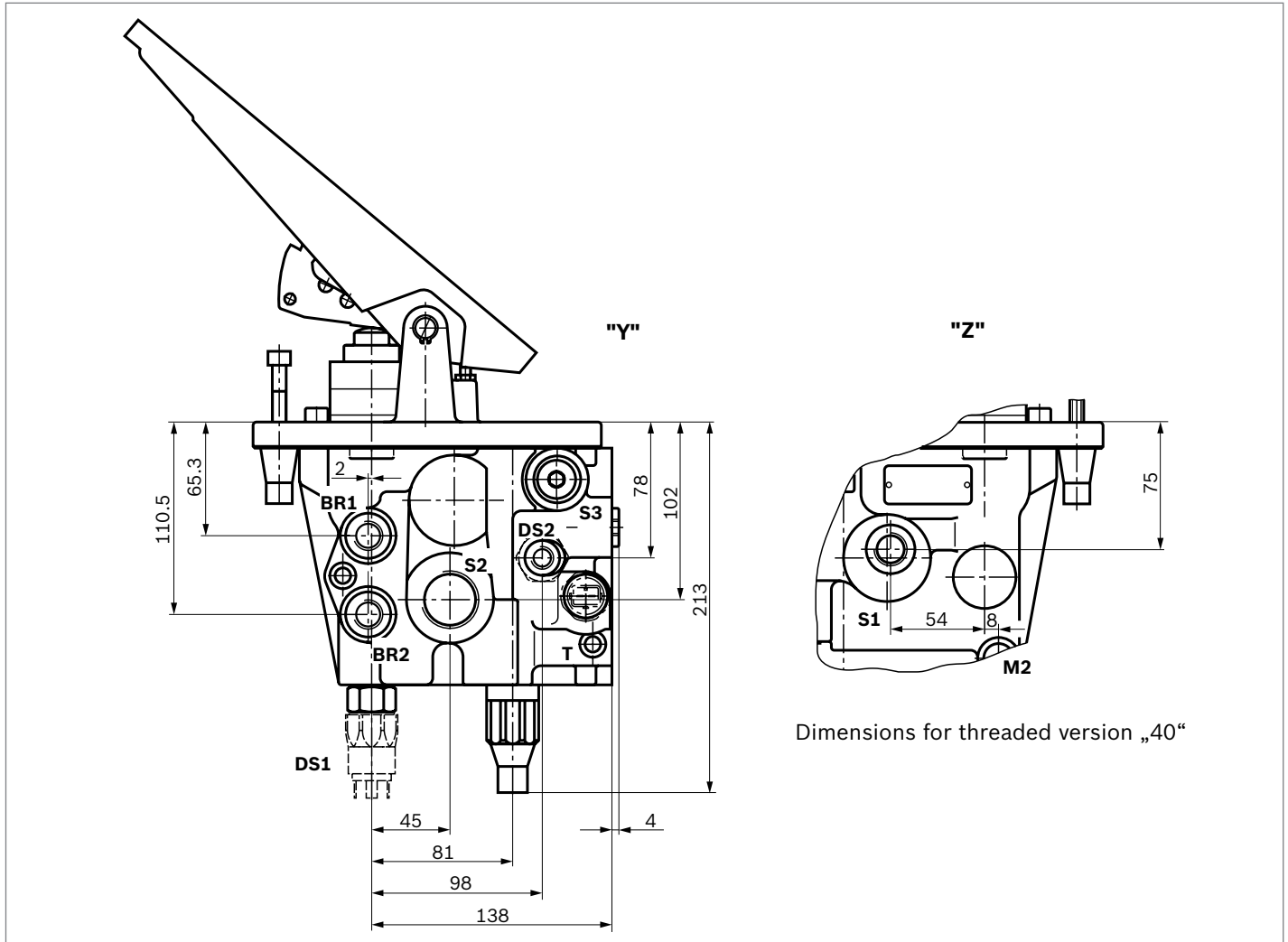
Dimensions

Standard version



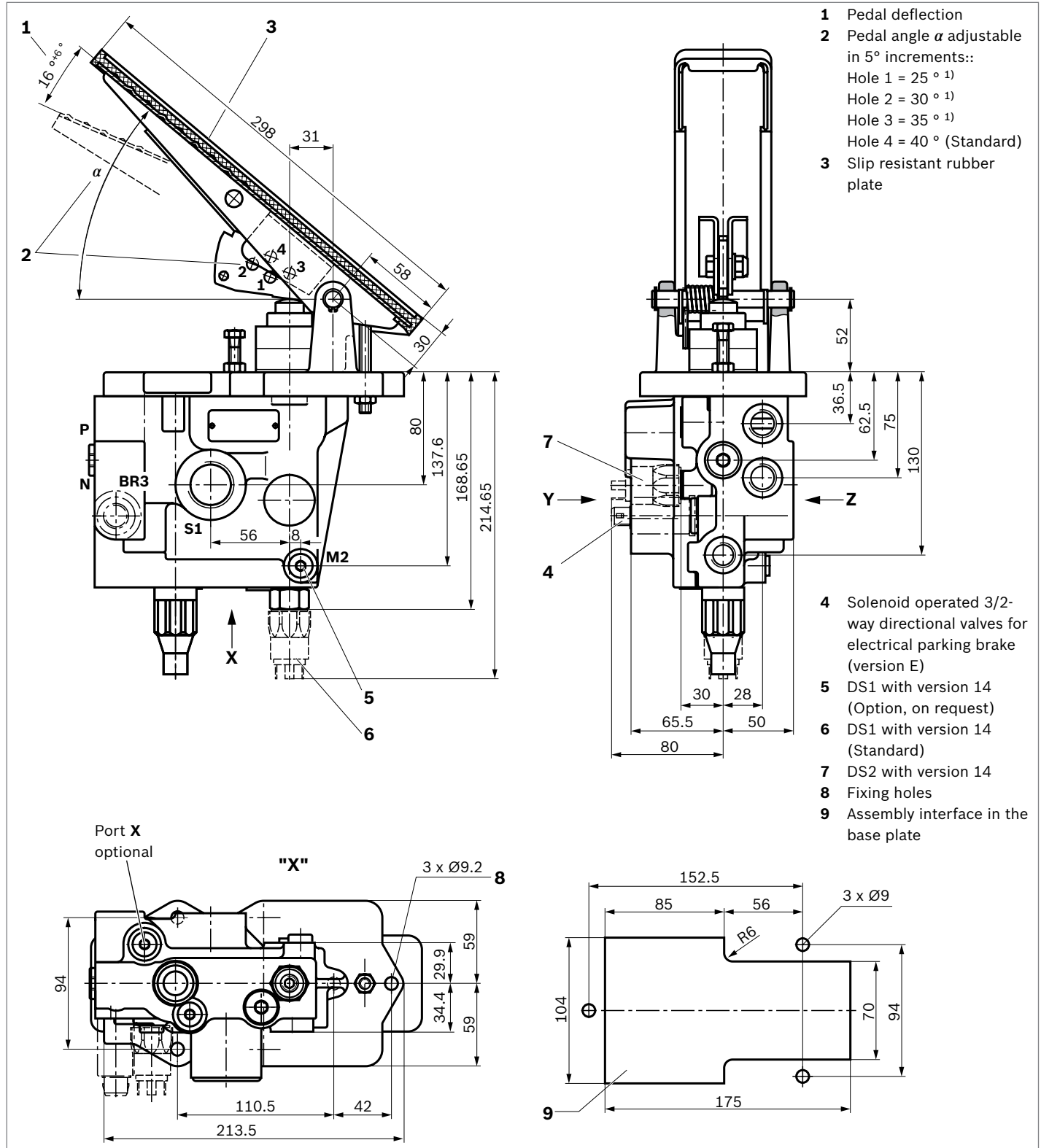
Line connections see page 12

¹⁾ Possible as a special version

Standard version

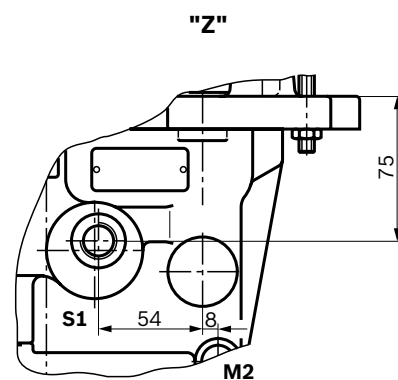
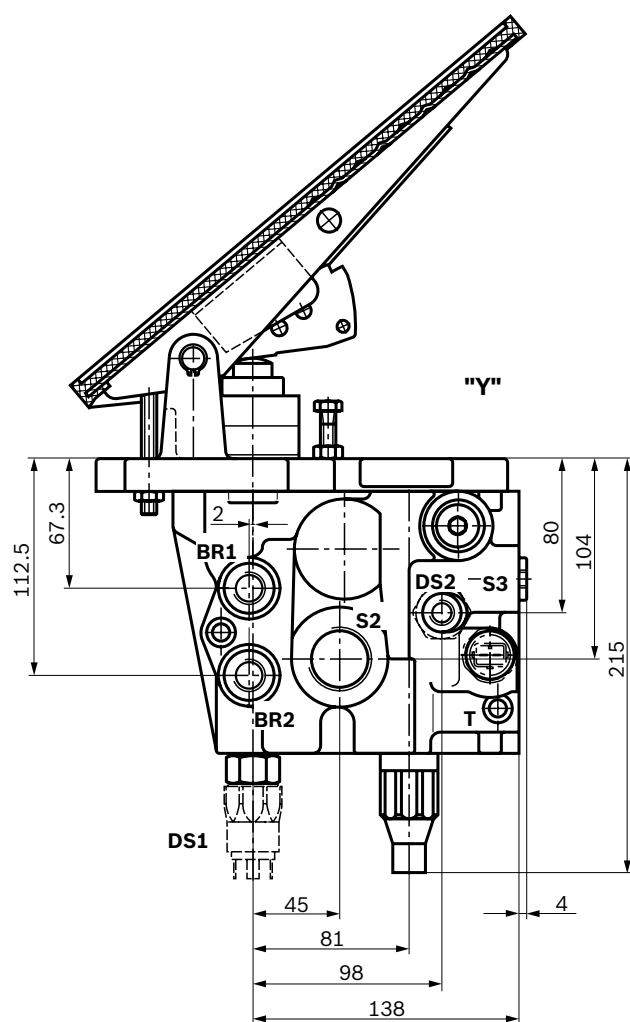
2-pole plug for solenoid:: AMP Junior Timer
Line connections see page 12

Version...SO6 – Replaces for series 3X



Line connections see page 12

¹⁾ Possible as a special version

Version ...SO6 – Replaces for series 3X

Dimensions for threaded version „40“

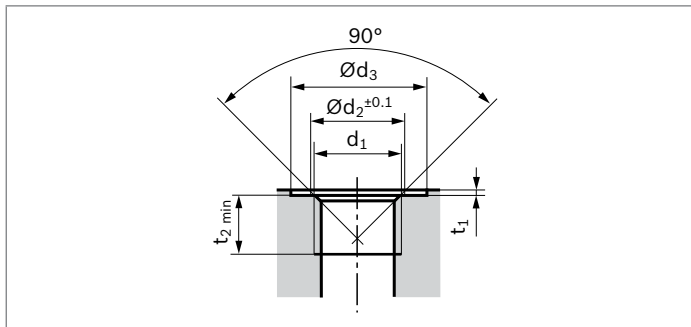
2-pole plug for solenoid: AMP Junior Timer
Line connections see page 12

Line connections

Thread type 02 (ports similar to DIN 3852-1)

Port	d ₁	Ød ₂ ^{±0.1}	Ød ₃	t ₁	t _{2 min}
BR1, BR2, BR3¹⁾	M16 x 1.5	16.4	26	1.4	12
DS1	M12 x 1.5	12.4	20	0.9	11
DS2	M12 x 1.5	12.4	–	–	11
S1, S2	M33 x 1.5	33.5	–	–	20
S3	M16 x 1.5	16.4	26	1	12
M2	M12 x 1.5	12.4	–	–	11
P, N	M18 x 1.5	18.4	28	1.5	12
T	M16 x 1.5	16.4	26	1	12
X	M12 x 1.5	12.4	24	4	12

Port **M2** plugged by default.



Thread type 40 (ports similar to DIN 3852-1)

Port	d ₁	Ød ₂ ^{±0.1}	Ød ₃	t ₁	t _{2 min}
BR1, BR2, BR3¹⁾	M16 x 1.5	16.4	26	1.4	12
DS1	M12 x 1.5	12.4	20	0.9	11
DS2	M12 x 1.5	12.4	–	–	11
S1, S2	M18 x 1.5	18.4	28	1.6	12
S3	M16 x 1.5	16.4	26	1	12
M2	M12 x 1.5	12.4	–	–	12
P, N	M18 x 1.5	18.4	28	1.5	11
T	M16 x 1.5	16.4	26	1	12
X	M12 x 1.5	12.4	24	4	12

Port **M2** plugged by default.

Accessory „14“

Pressure switch (optional accessories and spare parts)

Port	Function	Switch pressure	Material no.
DS1	Brake light	5 bar	R901355130
DS2	Accumulator pressure	100 bar	R901373063

Note

Bosch Rexroth uses pressure switches manufactured by SUCO / Bietigheim-Bissingen.

Related documents

Title	Document number	Document type
Hydraulic power brake valves for mobile applications	66200-B	Operating instructions
System documentation from the machine manufacturer		Operating instructions

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