

Dual-circuit power brake valve

LT 07

RE 66146

Edition: 04.2017

Replaces: 07.2016



- ▶ Series 2X
- ▶ Service brake pressure 40, 60, 80, 100, 120 and 140 bar
- ▶ Maximum inlet pressure 250 bar
- ▶ For modular designs

Features

- ▶ A direct-operated pressure reducing valve in 3-way design with continuous mechanical actuation
- ▶ Optimum piping possible through freely rotating mounting flange
- ▶ Brake pressure proportional to the actuating force
- ▶ Synchronization thanks to low hysteresis
- ▶ Integrated maximum pressure limitation of the brake circuits
- ▶ All consumer ports on one side
- ▶ Ergonomic adjustment of the pedal work angle possible
- ▶ All pedal models with detachable, slip resistant pedal rubber
- ▶ Compact mounting dimensions

Fields of application

- ▶ Construction machines
- ▶ Material handling vehicles
- ▶ Forestry and agricultural machinery
- ▶ Specialized vehicles

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Type code

01	02	03	04	05	06	07	08	09	10	11	12
LT 07		-	2X	/		/	02	M			*

Series

01	Dual-circuit power brake valve LT 07	LT 07
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Type of actuation

02	Mechanical	MKA
	Mechanical, reduced actuation force	MRA
	Combined mechanical/hydraulic	MHA

Series

03	30 to 39 (unchanged installation and connection dimensions)	2X
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Characteristic curve

04	Linear characteristic curve	L
	Progressive characteristic curve	P

Nominal pressure (Service brake BBA)	Preferred type MKA without pedal	Preferred type MKA with standard pedal				
			MKA	MRA	MHA	
05	40 bar		●	-	●	040
	60 bar	R900900612	●	-	●	060
	80 bar	R900907143	●	-	●	080
	100 bar	R900905251	●	●	●	100
	120 bar	R900907144	●	●	●	120
	140 bar		-	●	●	140

Line connections (see page 10)

06	Metric thread according to DIN 3852-1	02
	UNF thread according to ISO 11926	19
	Thread according to ISO 6149-1 (with O-ring seal)	50

Sealing material

07	NBR (nitrile rubber)	M
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Pedal (optional)

08	Standard pedal LT 19	12
	Special version LT 19 with shortened pedal plate	37

Electrical rotary angle sensor (optional)

09	Sensor, in the direction of travel left	S
10	Connector type DT04-2P (Deutsch)	K40
11	Output signal Volt	F

12	Further specifications in plain text	*
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● = Available - = Not available

Functional description

The dual-circuit power brake valve LT 07 is a direct-operated pressure reducing valve in 3-way design with continuous mechanical actuation.

It has a maximum pressure limitation of the secondary circuits and continuous dosing of the pressure in the secondary circuits (brake circuits) proportional to the path of the actuation element (4) or to the pedal opening angle (8). In case of failure of one brake circuit, the second brake circuit remains functional by means of mechanical contact of the two control spools (2). The actuating force of the pedal remains unchanged.

The dual-circuit power brake valve consists essentially of a housing (1) and control spool (2), the main regulator springs (3), actuation element (4) and the return springs (5) and (6). The valve is operated via the actuation element (4). This presses both of the main regulator springs (3) against both control spools (2). First, the control edges at channel **T** close, then the control edges of **SP** to **BR** open, creating pressure build-up in both brake circuits. The pressure then builds up in the brake lines, acting simultaneously on the brake pressure returns (7) located behind the control spools pushing against the main regulator springs (3), so that the brake pressure (secondary pressure) in both brake circuits rises in proportion to the deflection of the actuating element (4). In keeping the deflection of the actuation elements constant, the control spools (2) move into the control position and keep the pressure introduced in the channels **BR1** and **BR2** constant, whereby the pressure in **BR1** is only about 2 bar higher than in **BR2**. The actuation force of the actuation element is proportional to its deflection.

If the main regulator springs (3) are released, the return springs move the control spools back into the starting position. The control edges close from **SP** to **BR** and open from **BR** to **T**. The secondary circuits (braking circuits) are thereby released.

Combined mechanical/hydraulic actuation

The brake valve can be controlled mechanically by a pedal and/or hydraulically via the **Pst** port.

Version with rotary angle sensor (inching)

When the driver presses the brake pedal gently, only the hydrostatic drive brakes via the inch function. The rotary angle sensor converts the pedal angle into an electrical output signal.

When the pedal is pressed with more force, this causes the hydrostatics and the service brake to brake simultaneously. Thus, the braking process is composed of two parts: an electric and a hydraulic output signal.

The control of the pump is connected to the electrical angle sensor of the service brake via the on-board electronics.

In the first part of the overall braking action, only the electrical signal is sent, which then lets the drive pump swing back via the electronic system (inching). In the second part, the hydraulic braking pressure is built up (hydraulic braking).

Note

For versions with rotary angle sensor is cabin fitting for sensor assembly prescribed.

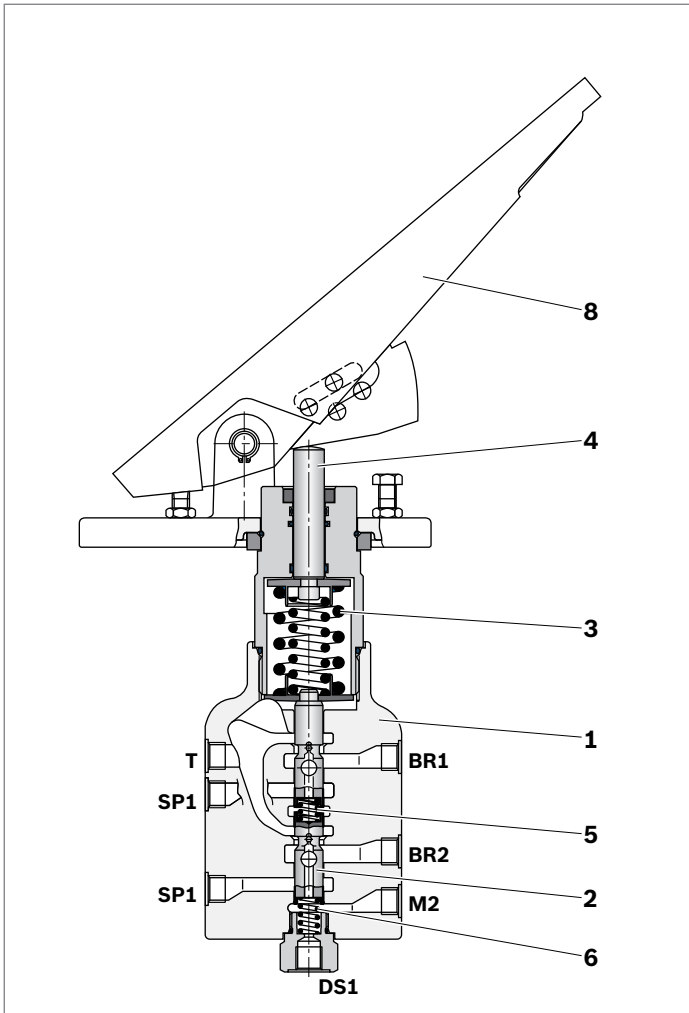
Ports

SP1	Supply to service brake circuit 1
SP2	Supply to service brake circuit 2
T	Tank
BR1	Service brake circuit 1
BR2	Service brake circuit 2
M1	Brake pressure return (service brake circuit 1) ¹⁾
M2	Brake pressure return (service brake circuit 2) ¹⁾
DS1	Pressure switch (brake lights)
Pst	Control pressure

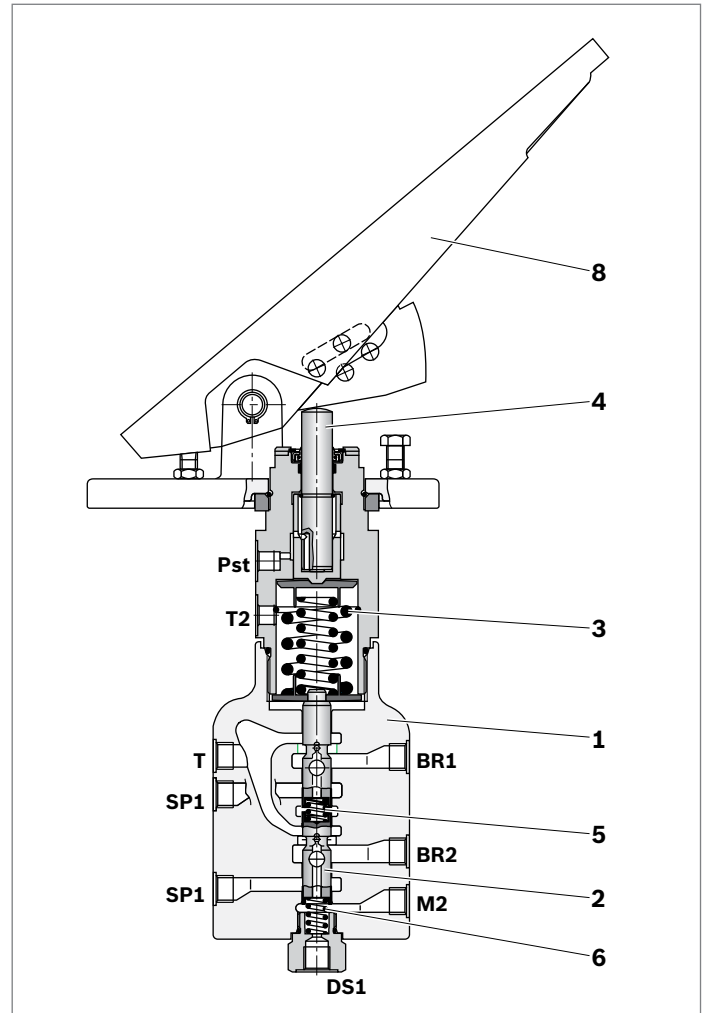
¹⁾ Pressure switch optional (brake lights)

4 **LT 07** | Power brake valve
Functional description

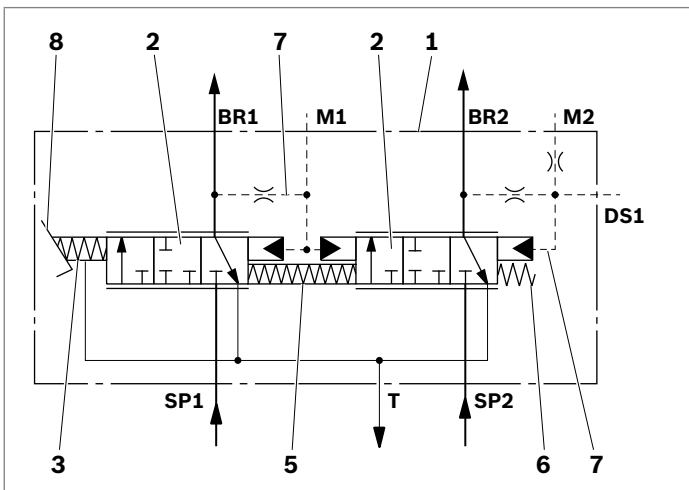
▼ **Cross section LT 07 MKA**



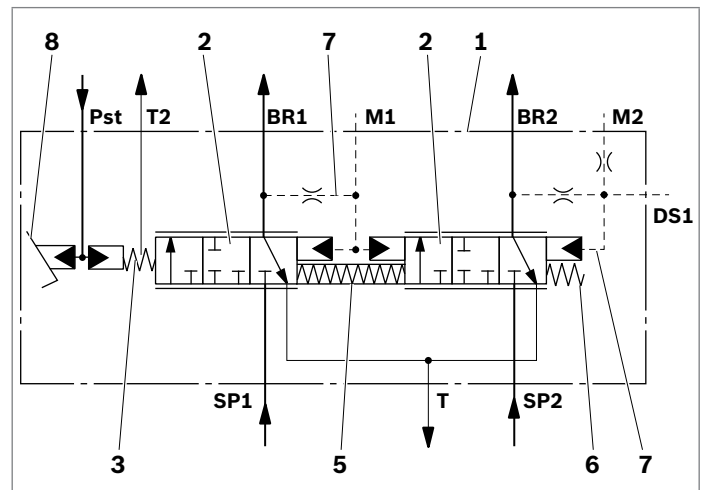
▼ **Cross section LT 07 MHA**



▼ **Symbol LT 07 MKA**



▼ **Symbol LT 07 MHA**



- | | |
|--------------------------|-------------------------|
| 1 Housing | 5 Return spring |
| 2 Control spool | 6 Return spring |
| 3 Main regulator springs | 7 Brake pressure return |
| 4 Actuation element | 8 Standard brake pedal |

Technical data

General				
Weight	Excluding pedal		kg	4.7
	With standard pedal		kg	6.4
Installation position	Preferably standing			
Connection type	See page 10			
Ambient temperature range		θ	°C	-25 to +80
Priming	One-coat paint RAL 5010			
Hydraulic				
Maximum nominal pressure at port	BR1, BR2	p_{BR}	bar	40 ... 140
Maximum inlet pressure at port	SP1, SP2	p	bar	200
	Pst	p_{St}	bar	30
Maximum tank pressure at port	T	p	bar	0.5 (The tank pressure must not exceed the contact pressure of the brake. Tank pressure peaks due to flow operations are permitted.)
Hydraulic fluid	Mineral oil (HL, HLP) according to DIN 51524, other hydraulic fluids, e.g. HEES (Synthetic ester) according to ISO 15380 and hydraulic fluids as specified in data sheet 90221, on request			
Hydraulic fluid temperature range		θ	°C	-20 to +80
Viscosity range		ν	mm ² /s	2.8 to 380
Maximum admissible degree of contamination of the hydraulic fluid, Cleanliness level according to ISO 4406 (c)	Class 20/18/15, we recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$			
Electric				
Voltage type	DC voltage			
Supply voltage		V		10 to 30
Output signal		V		0.5 to 4.5
Type of protection according to VDE 0470-1 (DIN EN 60529), DIN 40050-9	IP67 with installed and locked plug-in connector ¹⁾			

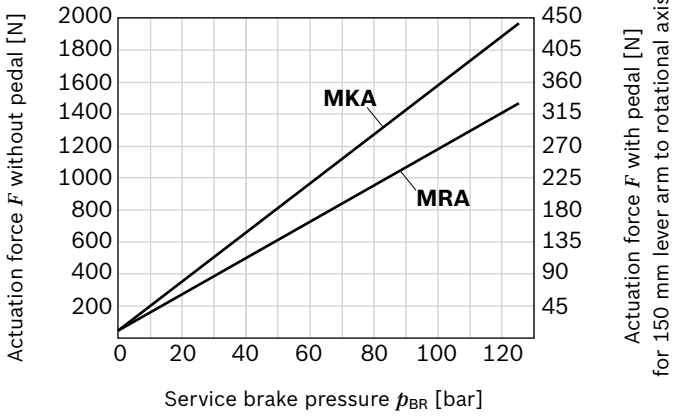
Note

Please contact us if the unit is to be used outside the specified range of values.

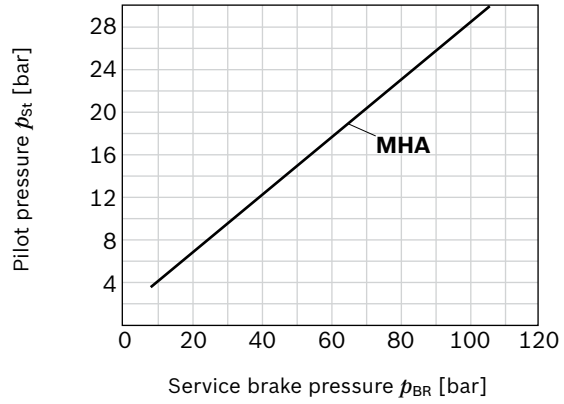
¹⁾ Plug-in connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.

Theoretical curves

▼ Mechanical actuation, linear characteristic curve

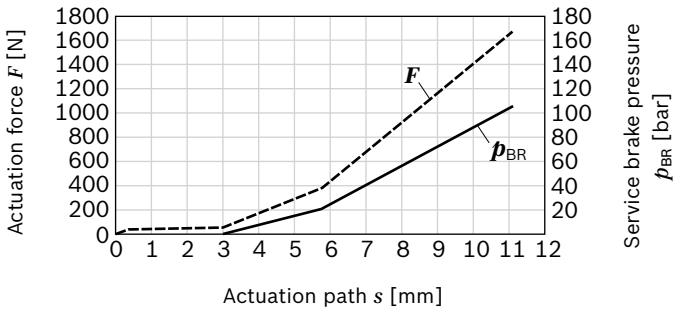


▼ Combined mechanical/hydraulic actuation, linear characteristic curve

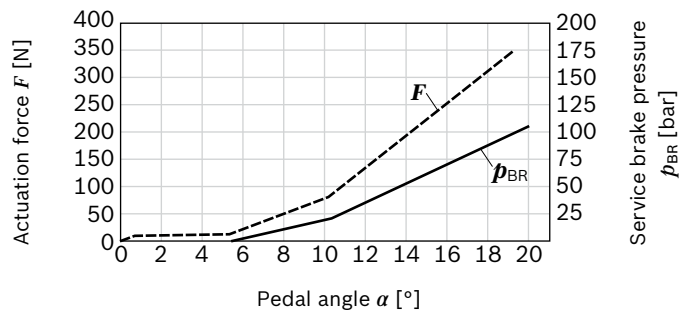


▼ Mechanical actuation, progressive characteristic curve (example: version MKA, 100 bar)

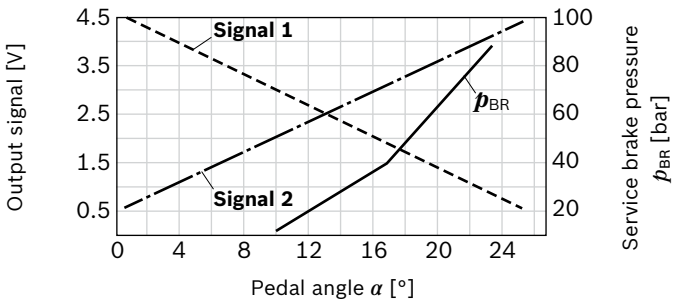
Excluding pedal



Including pedal

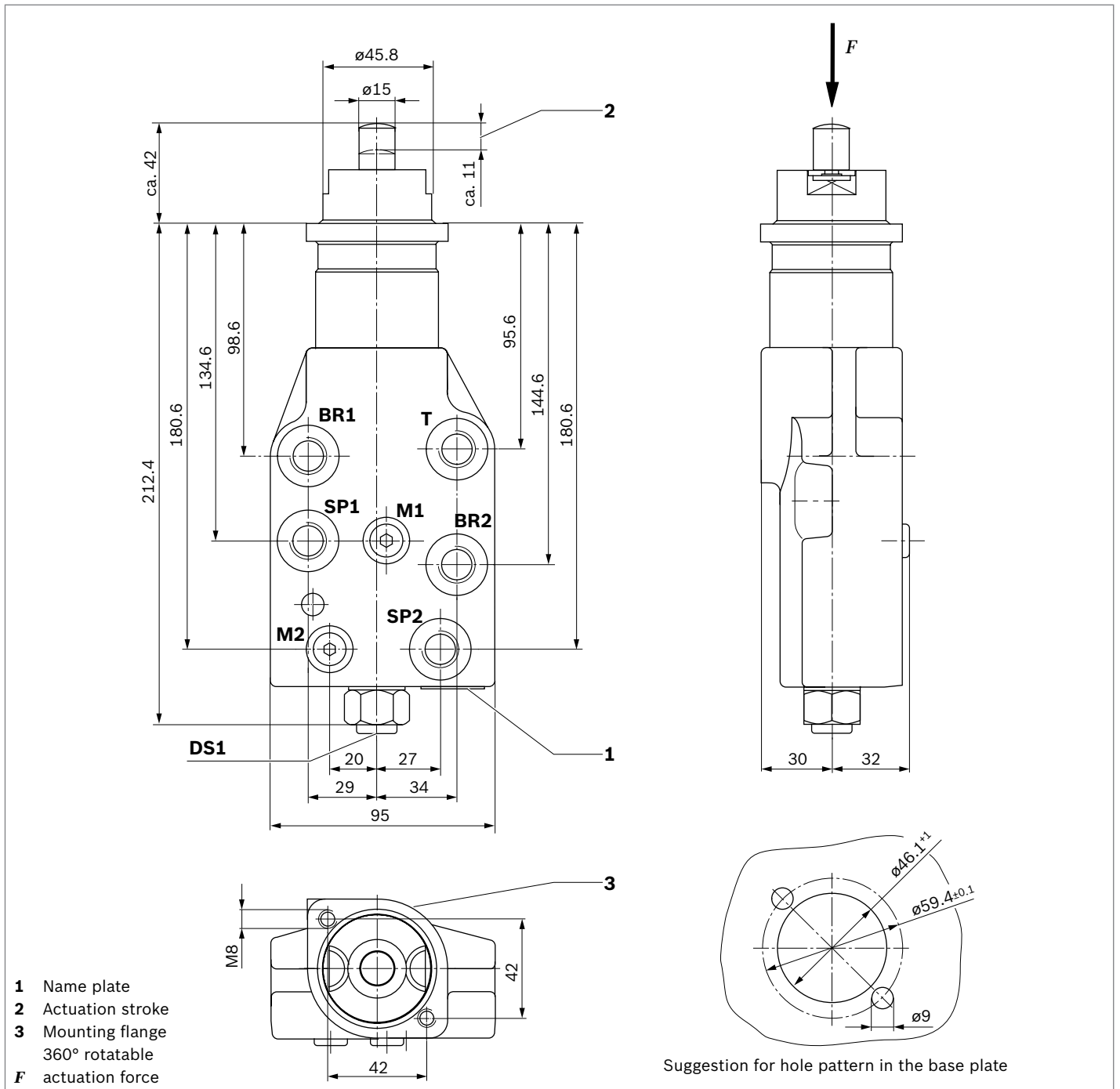


▼ Brake pressure and rotary angle sensor voltage signal, progressive characteristic curve

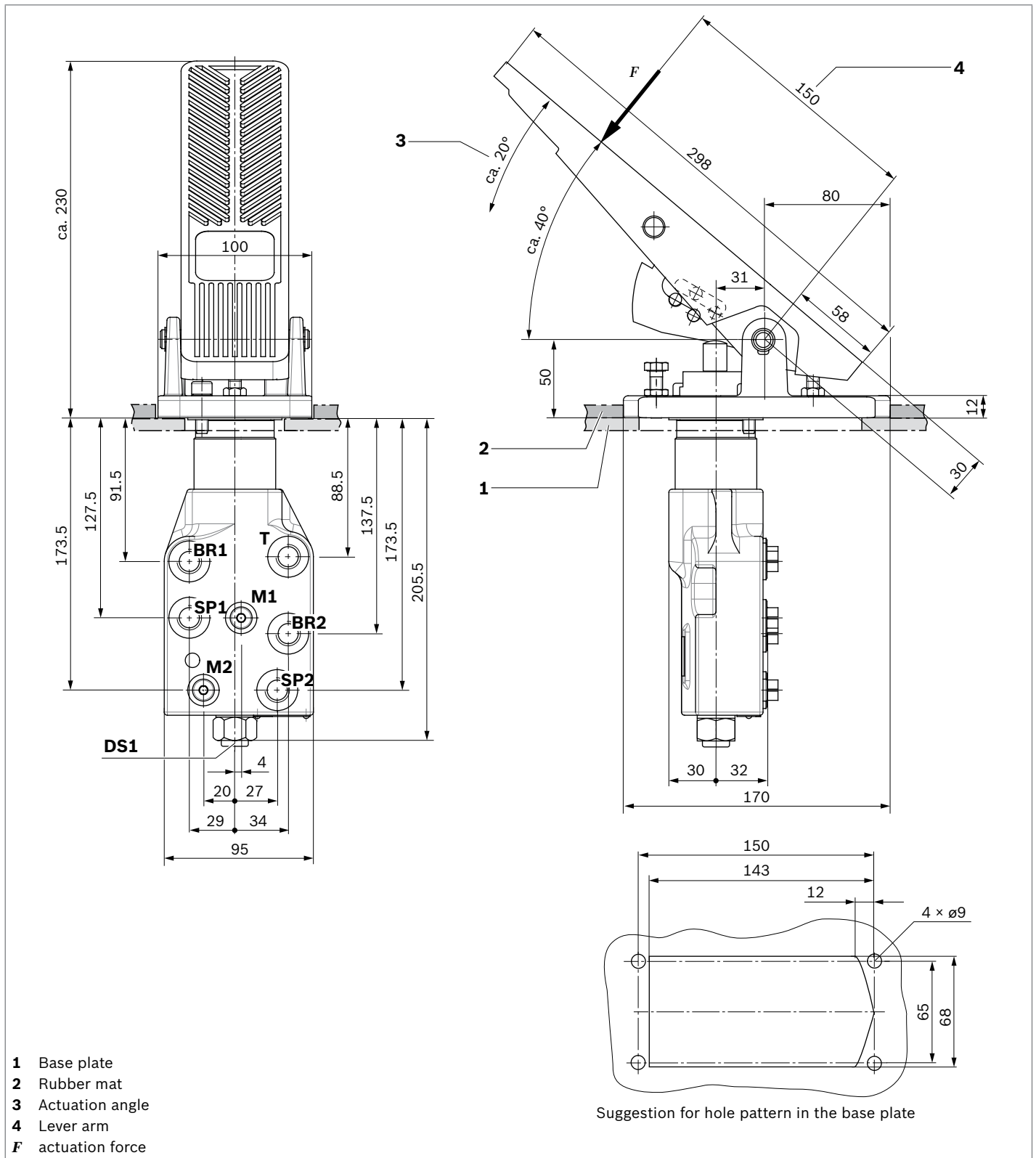


Dimensions

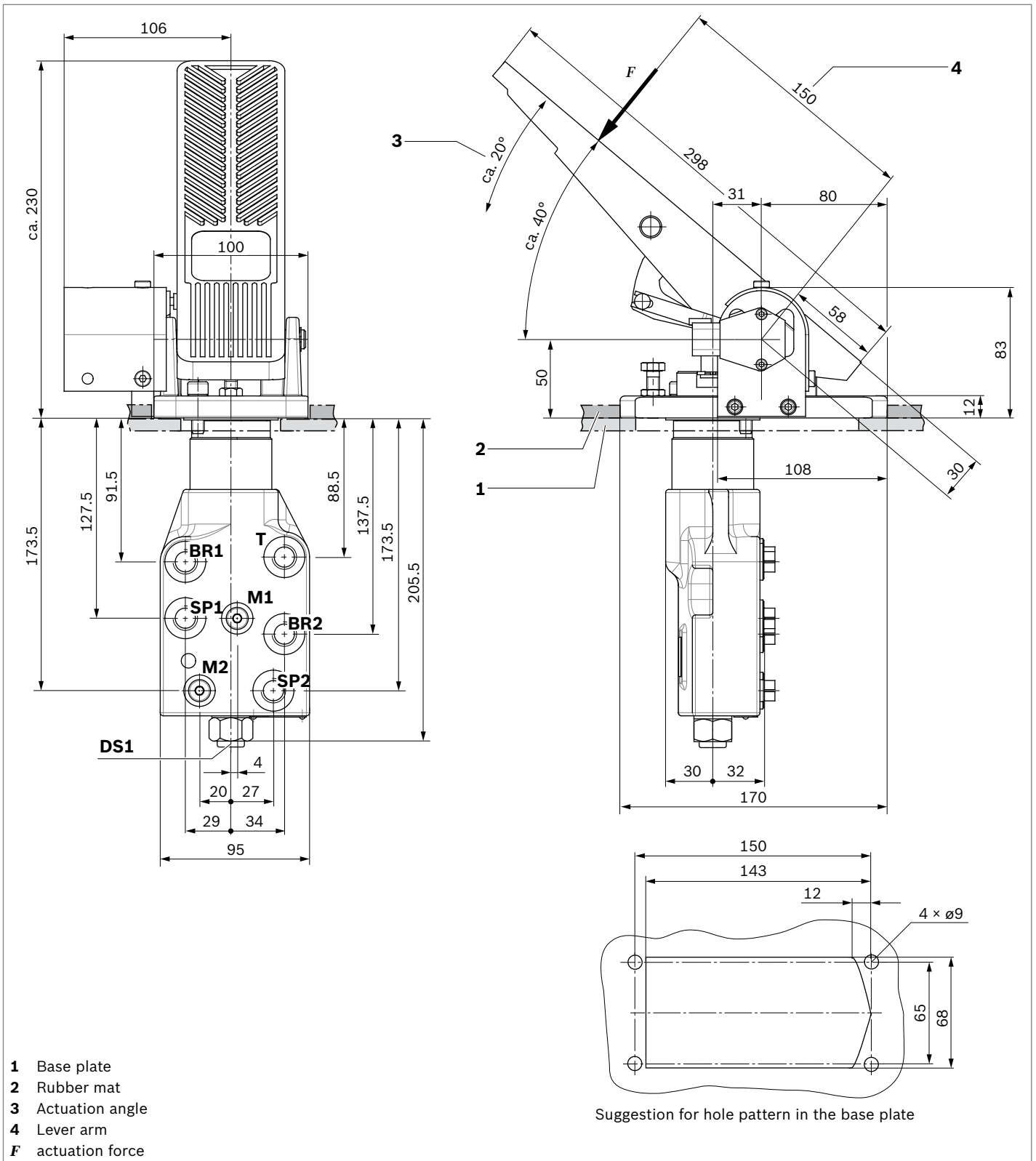
▼ **LT 07 excluding pedal**



▼ **LT 07 with mounted standard pedal LT 19**

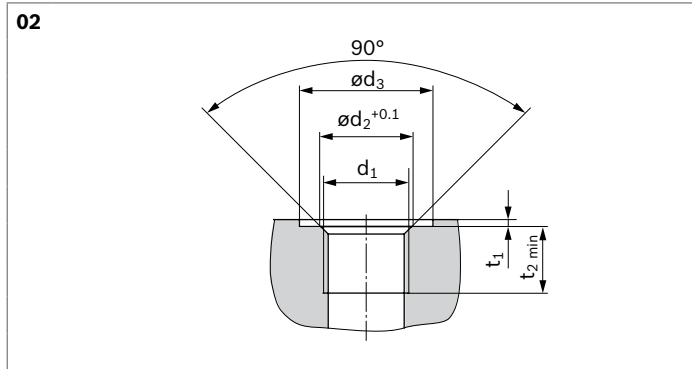


▼ **LT 07 with mounted standard pedal LT 19 and rotary angle sensor S**



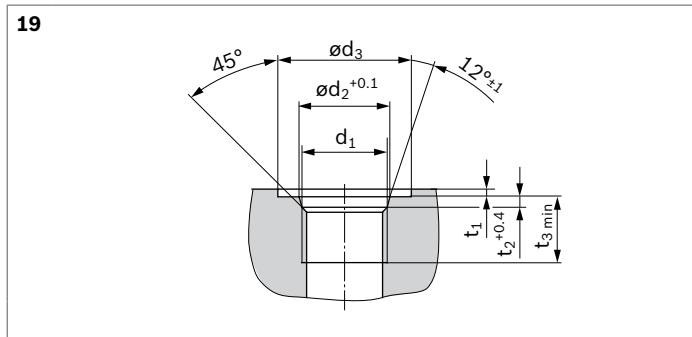
Line connections

▼ **Metric thread according to DIN 3852-1**



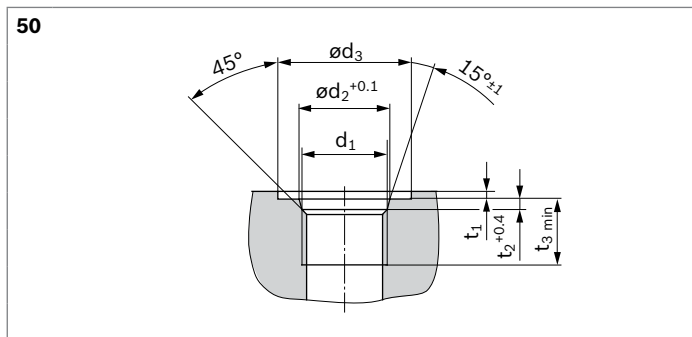
Port	d_1	$\varnothing d_2$	$\varnothing d_3$	t_1	t_2
BR1; BR2	M16 × 1.5	16.4	26	1.5	12
SP1; SP2	M16 × 1.5	16.4	26	1.5	12
T	M16 × 1.5	16.4	26	1.5	12
DS1	M12 × 1.5	-	20	0.9	11
M1	M10 × 1	-	20	1	8
M2	M10 × 1	-	20	1.5	8
Pst	M10 × 1	-	20	1	8
T2	M10 × 1	-	20	1	8

▼ **UNF thread according to ISO 11926**



Port	d_1	$\varnothing d_2$	$\varnothing d_3$	t_1	t_2	t_3
BR1; BR2	9/16-18	15.6	25	1.5	2.5	13
SP1; SP2	9/16-18	15.6	25	1.5	2.5	13
T	9/16-18	15.6	25	1.5	2.5	13
DS1	7/16-20	12.4	21	0.9	2.4	12
M1, M2	7/16-20	12.4	21	1.5	2.4	11.5
Pst	M10 × 1	-	20	1	-	8
T2	M10 × 1	-	20	1	-	8

▼ **Thread according to ISO 6149-1**



Port	d_1	$\varnothing d_2$	$\varnothing d_3$	t_1	t_2	t_3
BR1; BR2	M16 × 1.5	17.8	27	1.5	2.4	13
SP1; SP2	M16 × 1.5	17.8	27	1.5	2.4	13
T	M16 × 1.5	17.8	27	1.5	2.4	13
DS1	M12 × 1.5	12.4	20	0.9	-	11
M1, M2	M10 × 1	-	27	1.5	-	9
Pst	M10 × 1	-	20	1	-	8
T2	M10 × 1	-	20	1	-	8

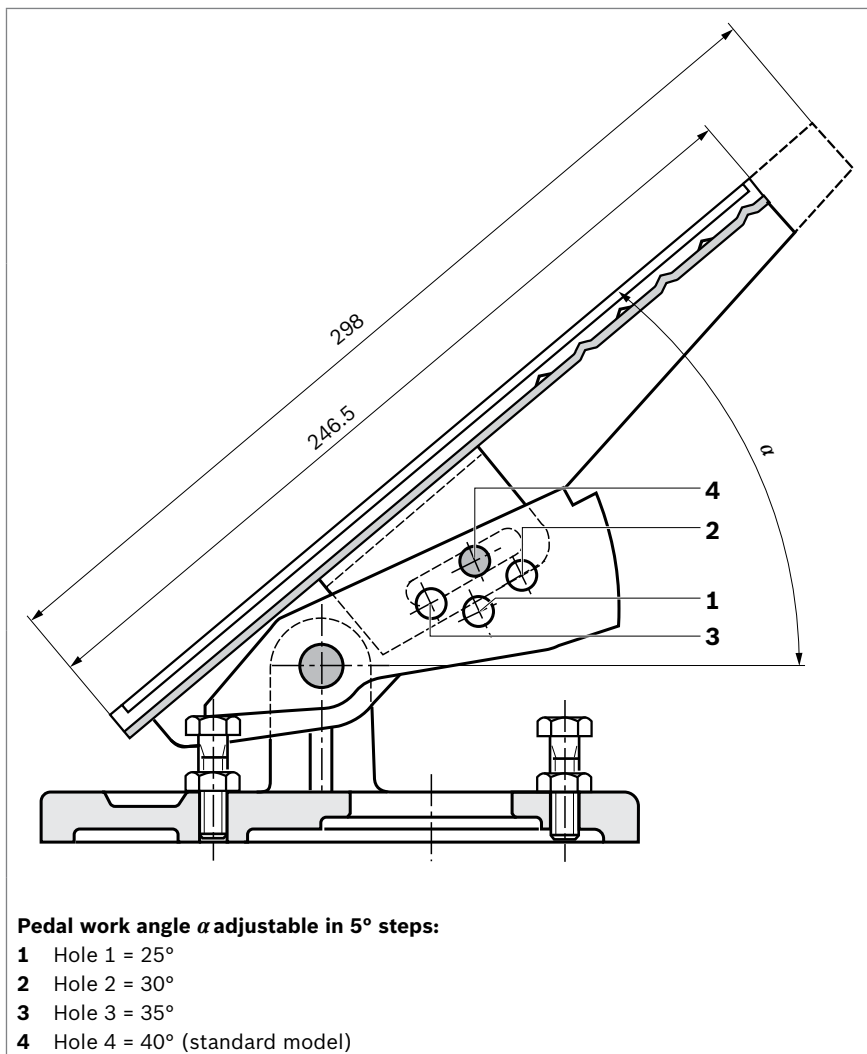
Note

- ▶ Ports **DS1**, **M1** and **M2** are usually closed.

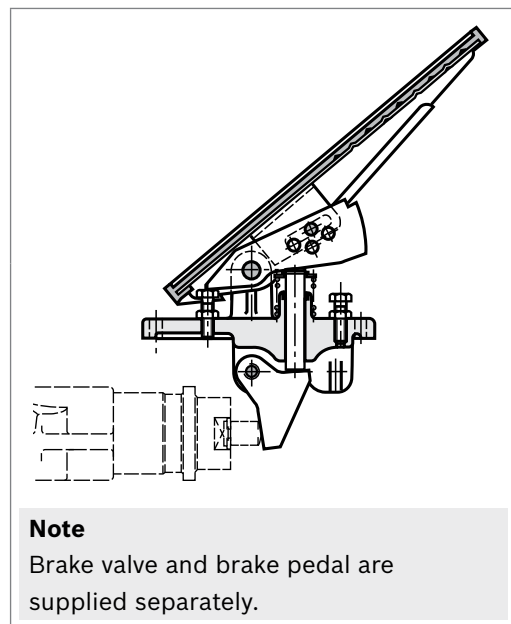
Brake pedal models

The power brake valve LT 07 is supplied with or without pedal. Pedals LT 19 and LT 20 are available (other models on request).

▼ LT 19 standard version / special version with shortened pedal plate



▼ LT 20 for horizontally-installed brake valve



Note

- ▶ All pedal models come equipped with a slip-resistant, removable rubber mat.
- ▶ The inching function is only possible at a 40° angle.

Related documents

Further information on installation, commissioning, and operation can be found in the instruction manual 66200-B: „Hydraulic power brake valves for mobile applications“.

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