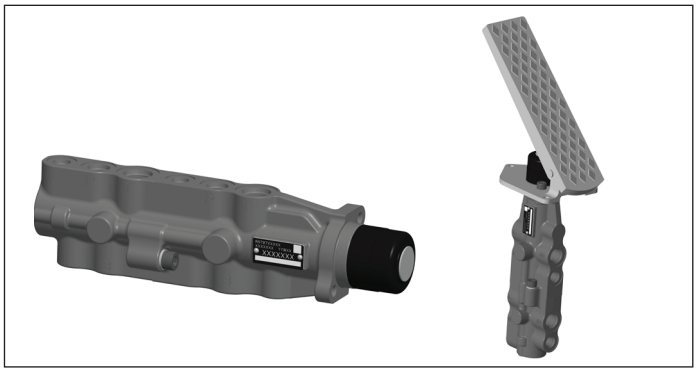
Hydraulic power brake valve

Model MB13–MD

RA 66207
Edition: 06.2013



- Component series 1X
- Service brake pressure 22, 30, 39, and 47 bar braking

Features

- Compact design
- Integrated maximum pressure limitation of the brake circuits
- Brake pressure proportional to actuation force
- Low hysteresis
- Brake line pressure synchronization
- Line mounted
- Rugged construction
- Optional treadle-style foot pedal

Contents

Ordering code

01	02		03	04	05		06		07	08	09		10		11
MB	**13**	**–**	**M**	**D**		**–**	**1X**	**/**			**19A**	**–**	**M**	**/**	

01 to 04	This information is used only for internal purposes and is always identical.	**MB13-MD**

Spool area gain

05	Standard gain notches	Ø 0.031 inch feedback orifice	**1**
	Intermediate gain notches	Ø 0.062 inch feedback orifice	**2**
	Intermediate gain notches	Ø 0.031 inch feedback orifice	**3**
	High gain notches	Ø 0.031 inch feedback orifice	**4**

Component series

06	10 and 11 (unchanged installation and connection dimensions)	**1X**

Service brake pressures

07	22 bar	325/445 PSI	22.4/30.6 bar	Linear	**22**
	30 bar	440/587 PSI	30/40 bar	Linear	**30**
	39 bar	560/740 PSI	38.6/51 bar	Linear	**39**
	47 bar	680/890 PSI	47/61.5 bar	Linear	**47**

Pressure tolerance

08	*Pressure tolerance at full actuator stroke (standard linear springs only – does not apply to DSM option, reference options below)*	
	Standard tolerance (–0/+34% minimum pressure)	**–**
	Reduced tolerance with shim adjustment (–0/+15% minimum pressure)	**L**

Line connections

09	SAE straight thread O-ring ports per J1926-1 or ISO 11926-1			**19A**
	Supply pressure port	P	SAE-06	
	Tank port	T	SAE-08	
	Brake service ports	B	SAE-06	
	Auxiliary pressure port	ACS	SAE-04	
	Brake pressure test port	(plugged)	SAE-03	

Seal material

10	NBR seals, suitable for mineral oil (HL, HLP) according to DIN 51524	**M**

Options

11	*Option codes – further details in clear text*	
	With optional treadle-style foot pedal (R978728913) – mounted	**FP**
	Dual-slope metering characteristics (with nested stage inner spring)	**DSM**

Service seal kit

Material description	Ordering No.
Kit-Seal, Brake Valve	**R978726722**

Note: Seal kit contains shaft seal, dust cover, and O-ring (seal between housing bodies).

Technical data

General				
Weight	Without pedal		lb (kg)	7.7 (3.5)
	With standard pedal		lb (kg)	9.0 (4.1)
Installation positions				Variable mount possible
Type of connection				SAE straight thread ports per J1926-1 or ISO 11926-1
Ambient temperature range		θ	°F (°C)	–13 to +176 (–25 to +80)

Hydraulic				
Maximum service brake pressure at port	B1, B2, BLS1, BLS2	p	PSI (bar)	1100 (76)
Maximum inlet pressure at port	P, ACS	p	PSI (bar)	4500 (310)
Maximum tank pressure at port	T	p	PSI (bar)	10 (0.7) Maximum continuous back pressure. No oscillation permitted.
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	°F (°C)	–13 to +176 (–20 to 80)
Viscosity range		ν	SSU (mm^2/s)	40 to 1800 (2.8 to 380)
Maximum permitted degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)				Class 17/14 or better

Note
For applications outside these parameters, please consult us!

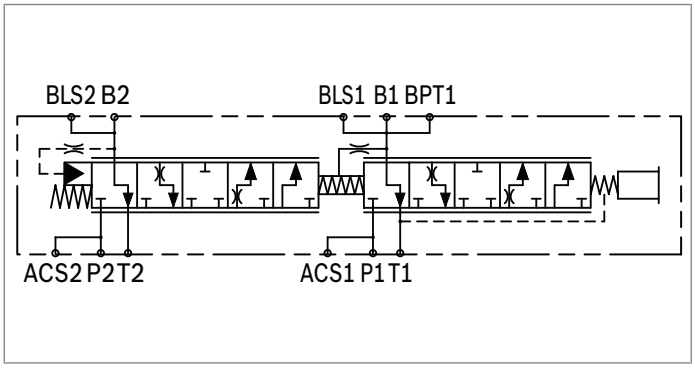
Function

The dual circuit hydraulic power brake valve contains two direct-operated 3-way pressure reducing valves in one assembly, with smooth mechanical operation. The two spools regulate brake line circuit pressure proportional to force applied to the actuator. In the event of failure of either single circuit, the operation of the remaining element is unaffected and operating force remains unchanged.

Dual circuit power brake valve components include: housing (**1 & 2**) regulating spool (**3**), regulating spring (**4**), actuator (**5**), and the return springs (**6 & 7**).

The operator depresses the actuator (**5**). The regulating spring (**4**) strokes the regulating spools (**3**), closing off the **T** ports and opening the brake circuit ports **B1 & B2** to accumulator pressure through supply pressure ports **P1 & P2**. Pressures from brake circuit ports **B1 & B2** are communicated to return spring chambers (**6 & 7**), where feedback force is developed, opposing the operator's input force. When the sum of feedback force and return springs preload (**6 & 7**) is equal to the operator input force transmitted through regulating spring (**4**), the regulating spools move to a blocked center condition where the **P**, **T**, **B1**, and **B2** ports are closed simultaneously. When operator (**5**) input force is removed, the regulating elements move to the standby position, blocking the pressure ports **P1 & P2** and venting the service ports **B1 & B2** to tank.

▼ **Symbol**

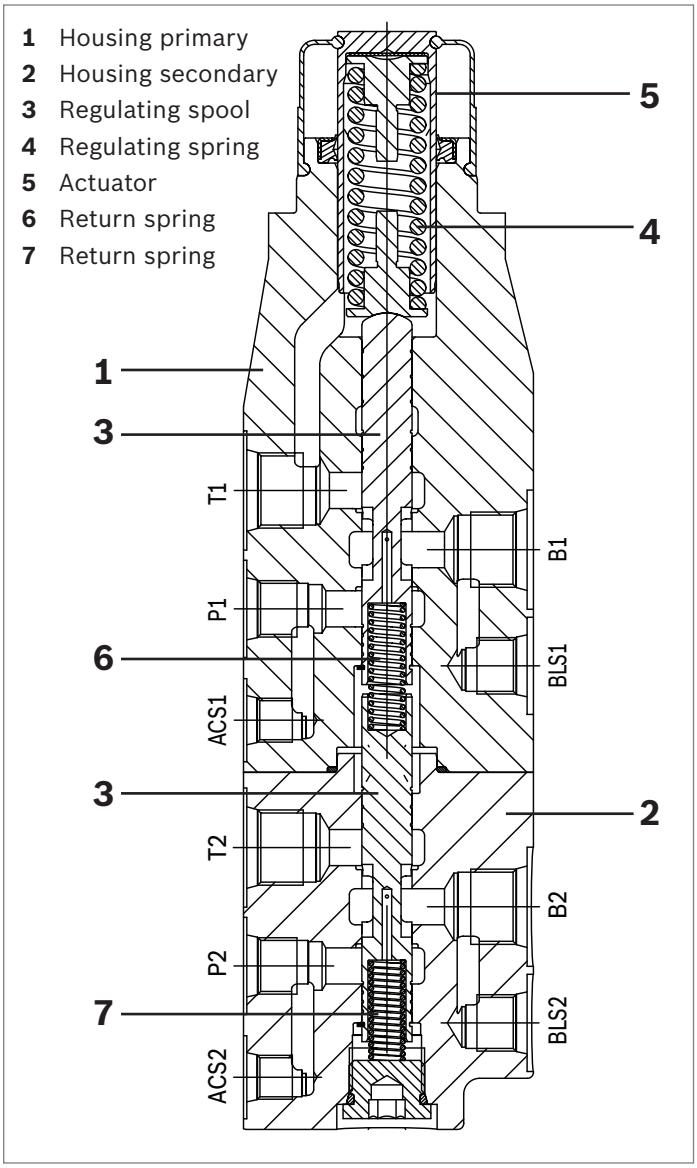


Ports	
ACS1, ACS2	Accumulator charge switch ports
P1, P2	Supply pressure ports
T1, T2	Tank ports
BLS1, BLS2	Brake light switch ports
B1, B2	Brake system work ports
BPT1	Brake pressure test port

If pressure falls in brake system line **B** or operator pushes harder on actuator (**5**), the supply pressure **P1 & P2** is re-connected to brake system ports **B1 & B2** until force is balanced again. If brake system ports **B1 & B2** are too high, fluid is bled to tank through the **T** port until balance is again established. When force to actuator is removed, the regulating spool (**3**) moves to standby position, blocking the supply pressure ports **P1 & P2** and venting the brake system work ports **B1 & B2** to tank **T**.

Pressure synchronization between the pressure regulating housing primary (**1**) is accomplished by using the feedback pressure from housing secondary (**2**), chamber (**6**) is common to both housings (**1 & 2**).

▼ **Cross-section**



General notes

Installation notes

- Rubber parts must not be painted.
- Operating elements must not be directly exposed to high-pressure jet cleaning.
- The tank must be mounted above the brake valve MB13-MD to avoid drainage of the brake valve.
- When assembling below the base plate it must be taken care that the movement of the pedal cannot be affected by dirt.

Notes for the repair

- Damaged valves must be repaired, even if their function is not impaired.

Installation position

- Variable mount possible.

Intended use

The MB13-MD is exclusively intended to be assembled together with other components to form partly completed or complete machinery. The component may only be commissioned if it has been integrated in the machine for which it is designed.

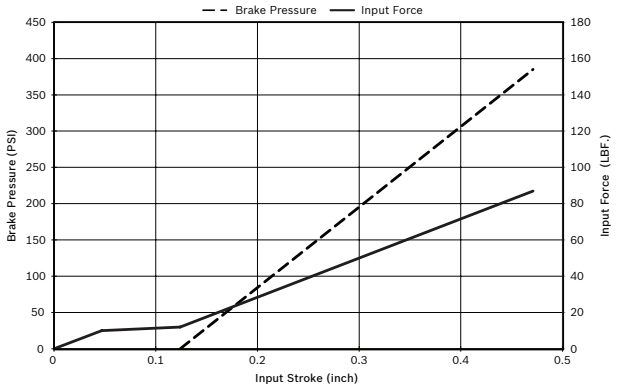
You may use the product as follows:

- The brake valves MB13-MD have been developed for the application in mobile working machinery.
- Comply with the technical data.
- The product is only intended for professional use and not for private use.

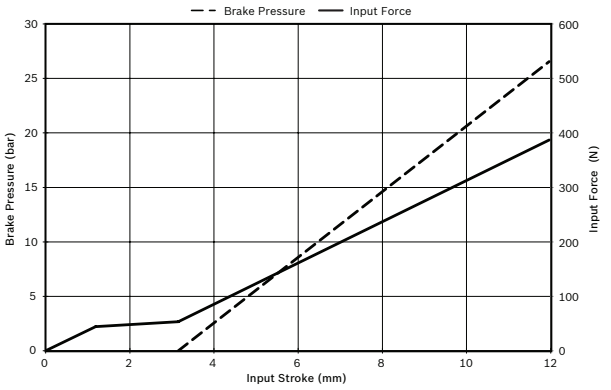
Characteristic curves

▶ Note: Charts depict nominal metering of secondary valve brake pressure. Primary valve pressure is 30 PSI (2.1 bar) higher than secondary pressure at all points on curve.

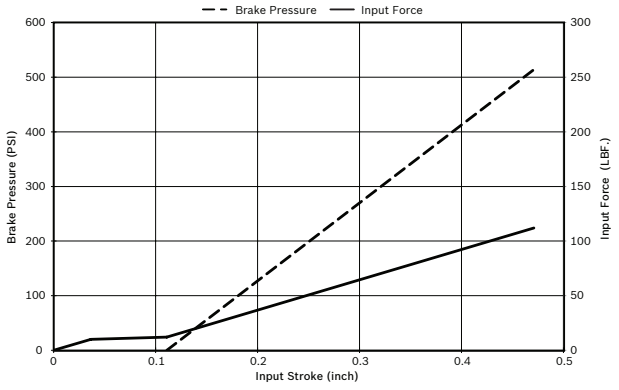
▼ Nominal metering performance, 22, English



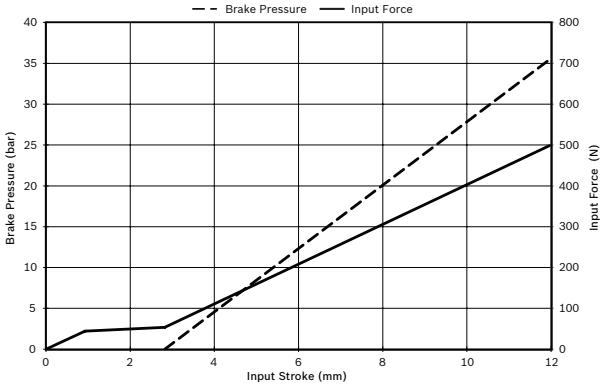
▼ Nominal metering performance, 22, Metric



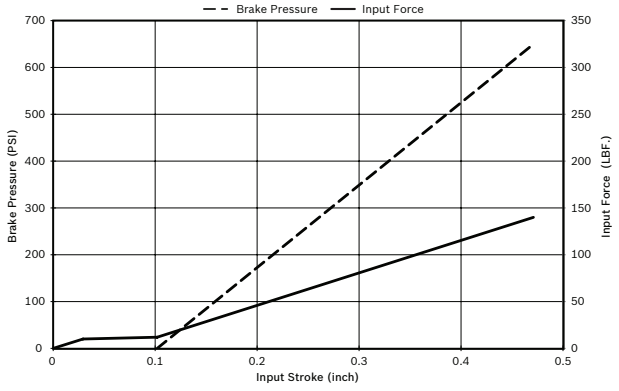
▼ Nominal metering performance, 30, English



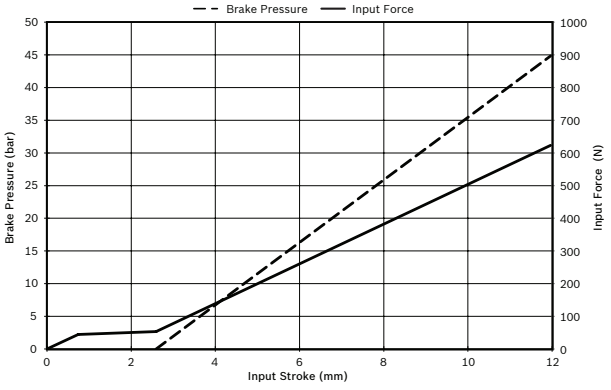
▼ Nominal metering performance, 30, Metric



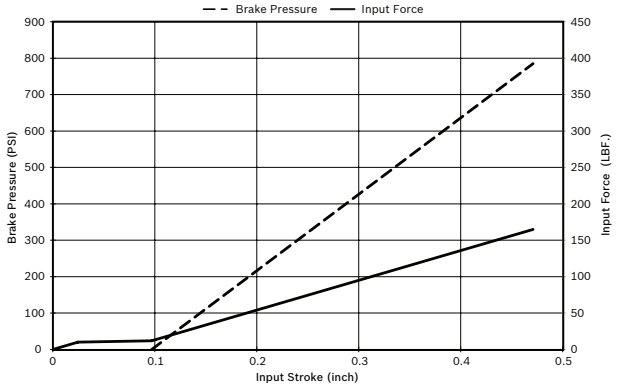
▼ Nominal metering performance, 39, English



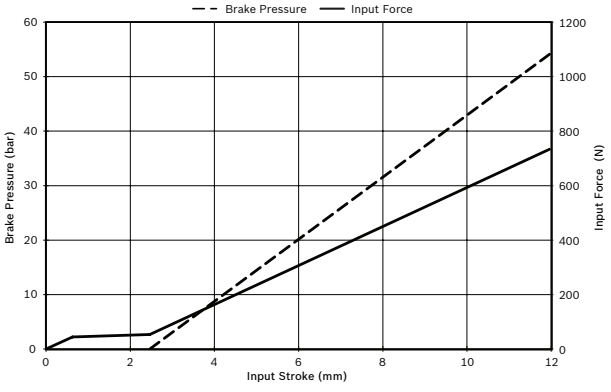
▼ Nominal metering performance, 39, Metric



▼ Nominal metering performance, 47, English

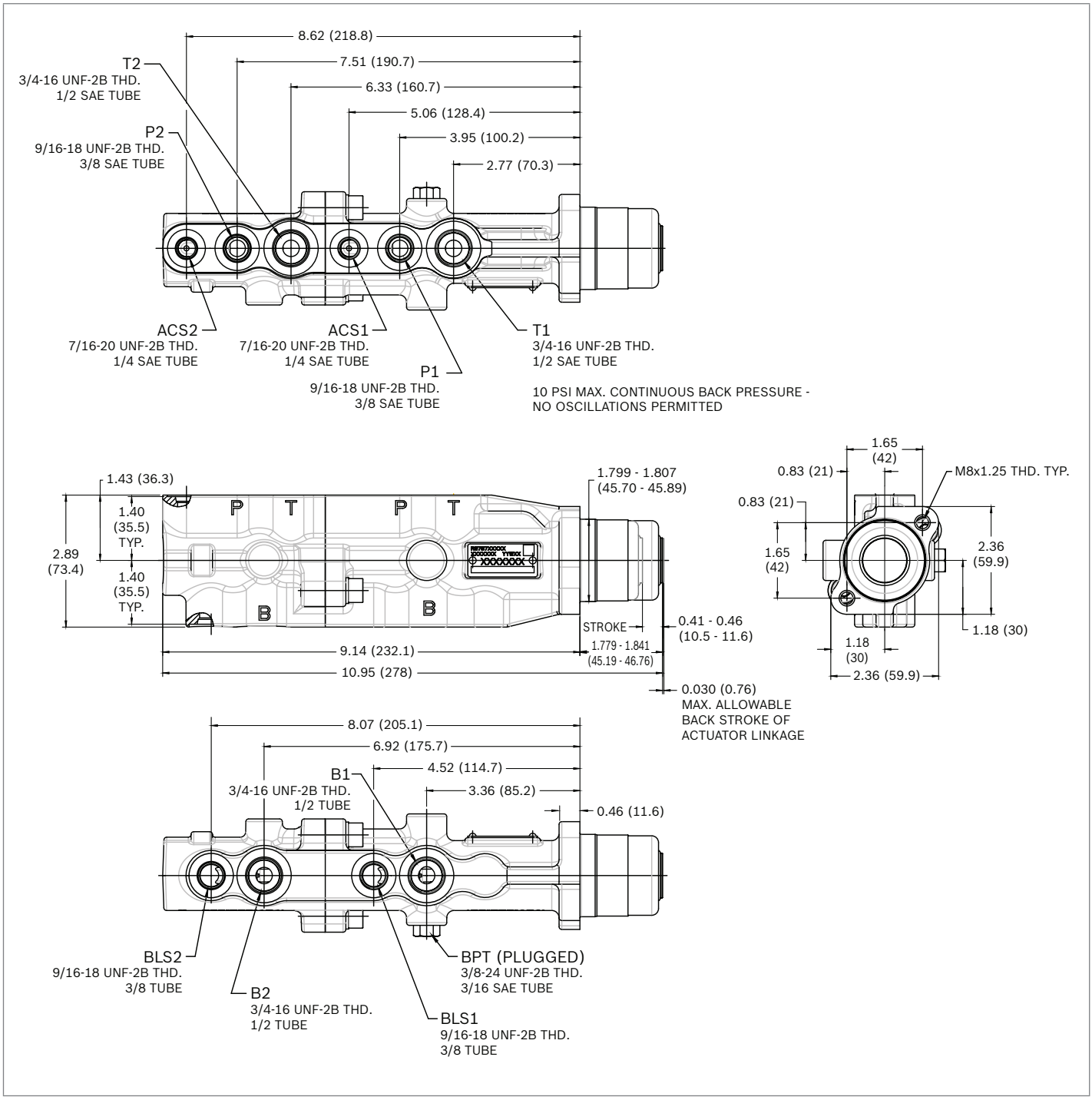


▼ Nominal metering performance, 47, Metric



Dimensions

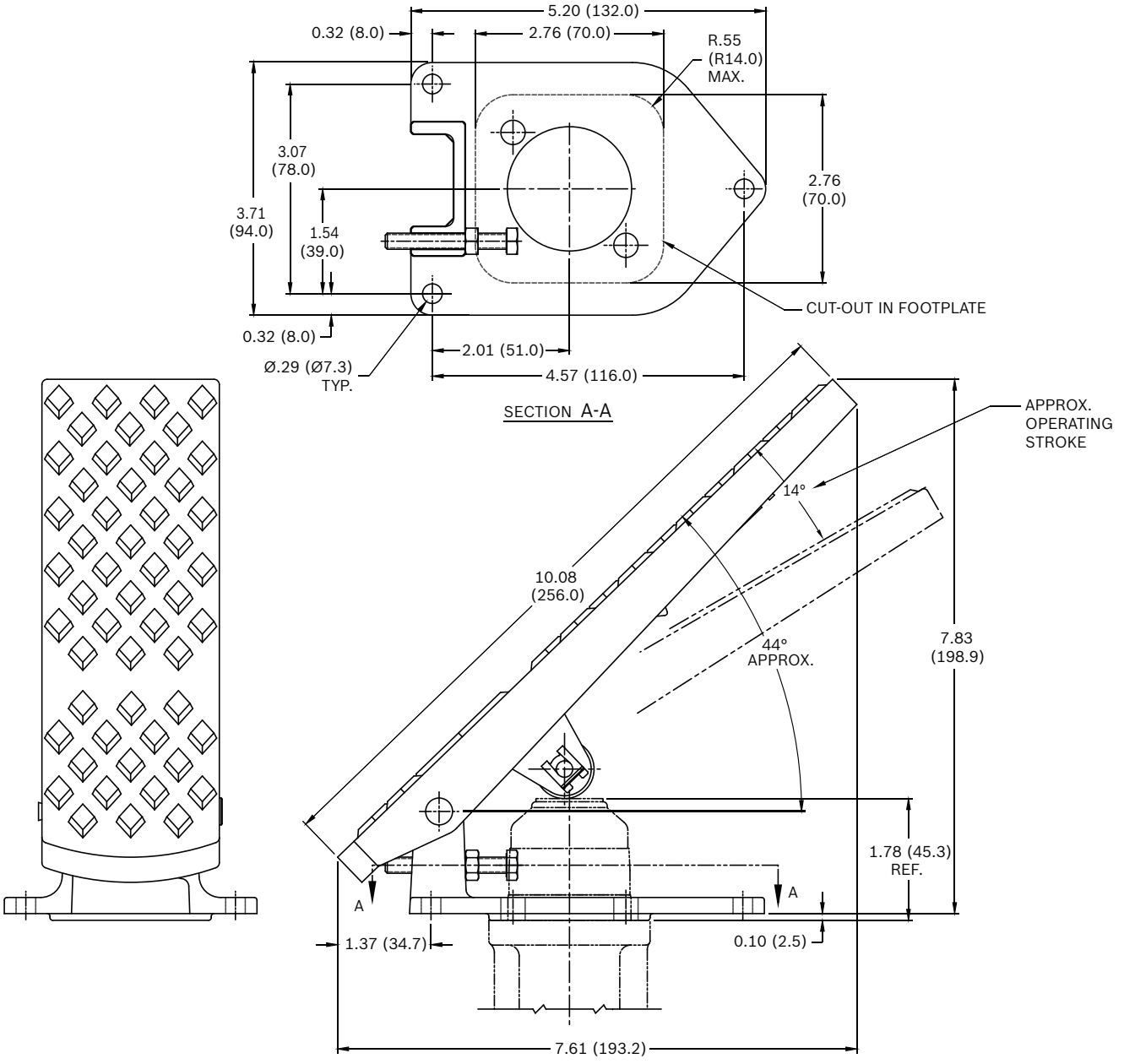
▼ **Without pedal**



Ports according to ISO 11926-1

Port	Dimensions	
BPT (plugged)	3/8 - 24 UNF	SAE-03
ACS1, ACS2	7/16 - 20 UNF	SAE-04
BLS1, BLS2, P1, P2	9/16 - 18 UNF	SAE-06
T1, T2, B1, B2	3/4 - 16 UNF	SAE-08

▼ **With treadle-style foot pedal for option code “FP”**



Assembly interface in base plate

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