

Function

The **Load Sensing Valve** is used to adjust the applied service brake pressure in relation to the load imposed on the vehicle's axles. The mechanical suspension **Load Sensing Valve** uses the movement between the vehicle's chassis and axle to "sense" the load imposed on the axles.

The valve is installed on the chassis and a linkage is required to connect the control arm of the valve to the axles. Any movement of the chassis changes the position of the valve's control arm which, in turn, alters the ratio of input pressure to output pressure.

Versions of the **Load Sensing Valve** are available with standard relay or relay emergency feature and with static or dynamic operation. A static valve uses the braking ratio at commencement of braking throughout the brake application. A dynamic valve adjusts the braking ratio throughout the brake application to counteract the effect of axle load change due to load transfer.

To adjust the rate of change of control ratio due to change in axle load, the effective length of the lever can be adjusted.

A trailer data plate showing the setting of the **Load Sensing Valve** is required by law.

Technical Features

Maximum Operating Pressure: 8.5 bar
 Operating Temperature Range: -40 °C to +80 °C
 Working Angle: 20°
 Weight: 2.3 kg approx.

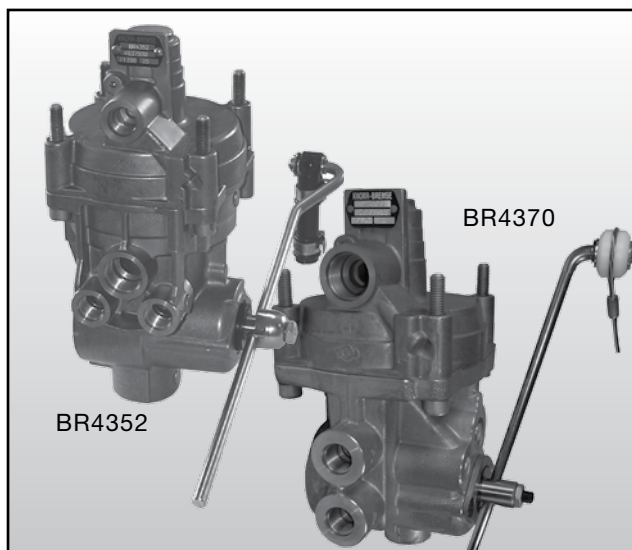
Range Overview

Part No.	Type No.	Operation Type	Relay Emergency Valve	Relay Function	Remark
K037590 ¹⁾	BR4352	dynamic	with	with	with rigid link
SEB00933	BR4370	static	without	without	with cable link

Part No.	Type No.	Port Threads				
		1	1-2	2	3	4
K037590 ¹⁾	BR4352	M16x1.5	M22x1.5	M16x1.5 (4x) M22x1.5 (2x)	-	M16x1.5
SEB00933	BR4370	M22x1.5	-	M16x1.5 (2x)	M22x1.5	-

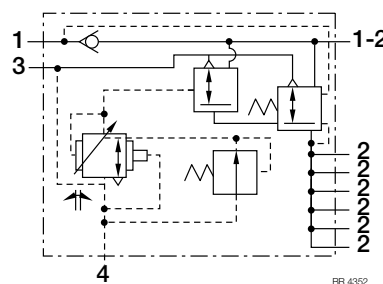
Maximum adjustable lever length: 300 mm.

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

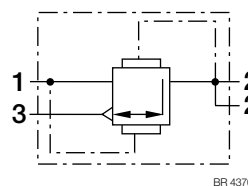


Standard Symbol as DIN ISO 1219

BR4352



BR4370



Service Parts:

Lever with Rubber Links for BR4352:
SEB01068

Lever with Cable Link for BR4370:
SEB01263

Accessories:
Tandem Axle Linkage **K051015 ¹⁾**

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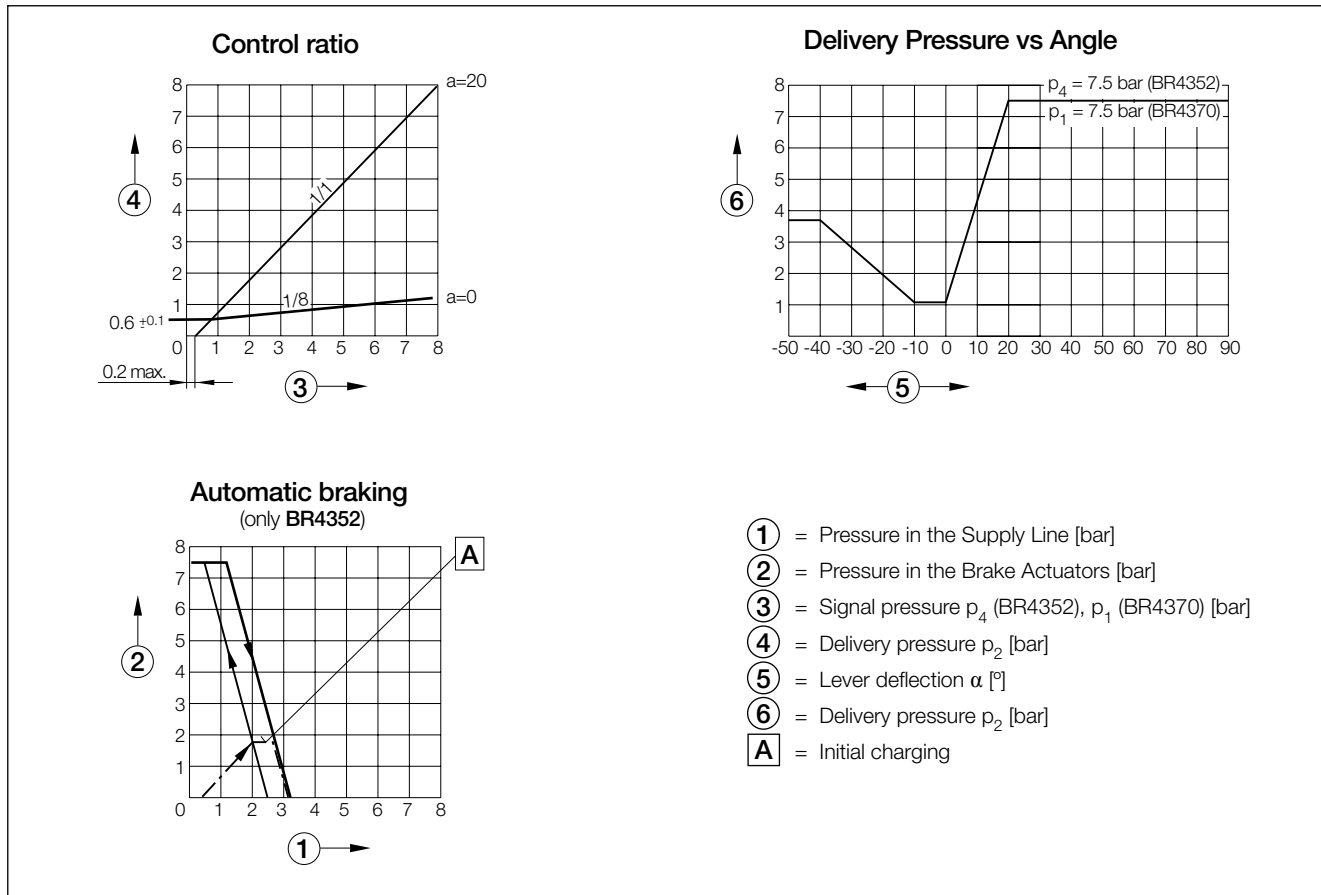
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BR43..

Load Sensing Valve - mechanically controlled

Doc. No. Y011344 (Rev. 003)
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Functional Diagrams



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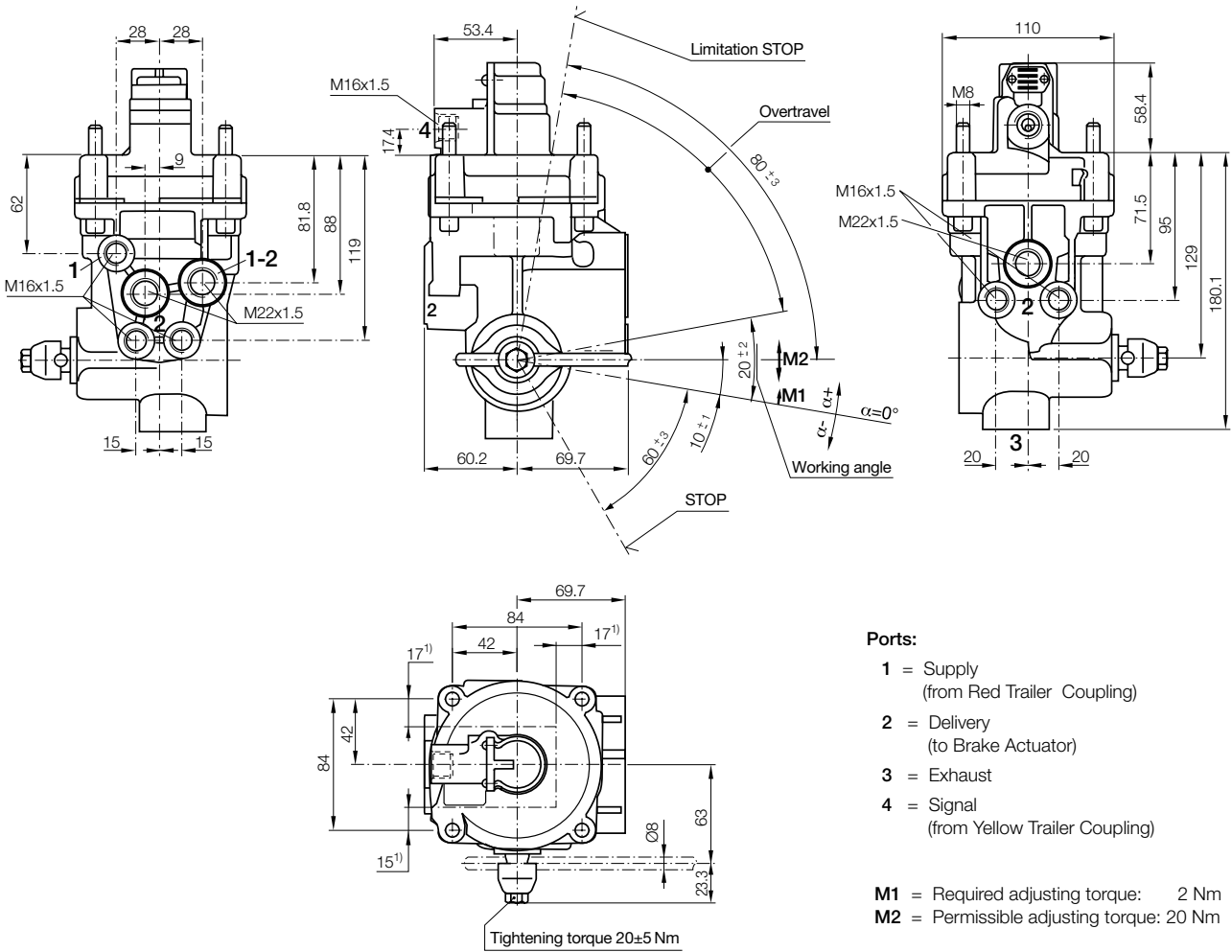
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Dimensions

BR4352 - K037590 (replaces BR4352 - SEB00659)



- Ports:**
- 1 = Supply
(from Red Trailer Coupling)
 - 2 = Delivery
(to Brake Actuator)
 - 3 = Exhaust
 - 4 = Signal
(from Yellow Trailer Coupling)

M1 = Required adjusting torque: 2 Nm
M2 = Permissible adjusting torque: 20 Nm

1) maximum Mounting Plate Dimension

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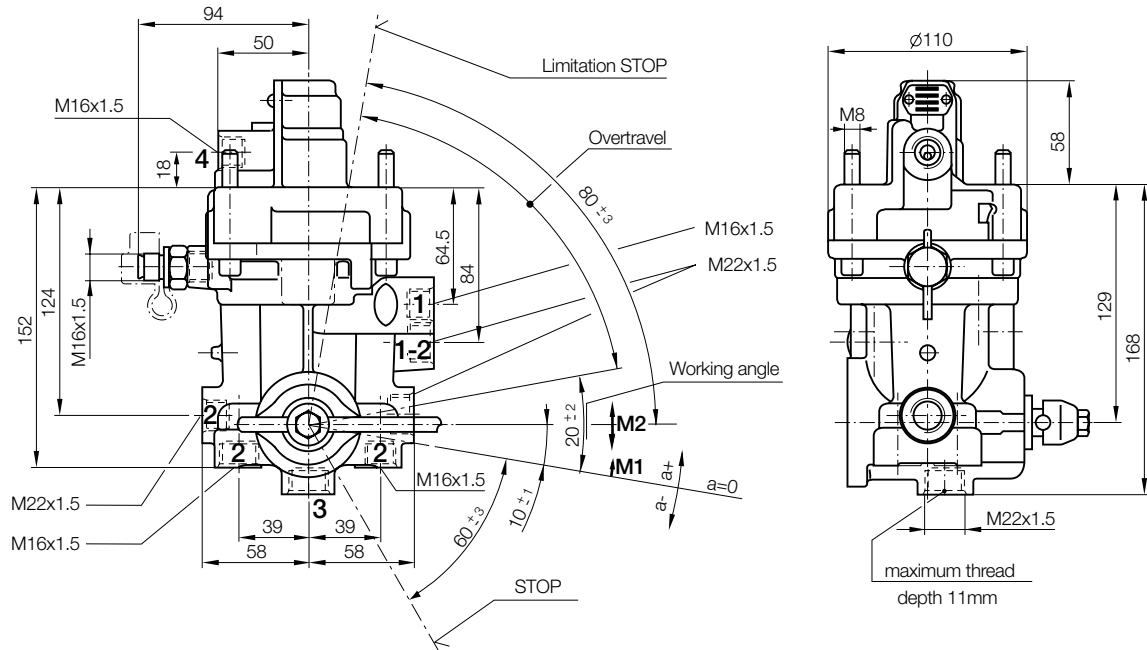


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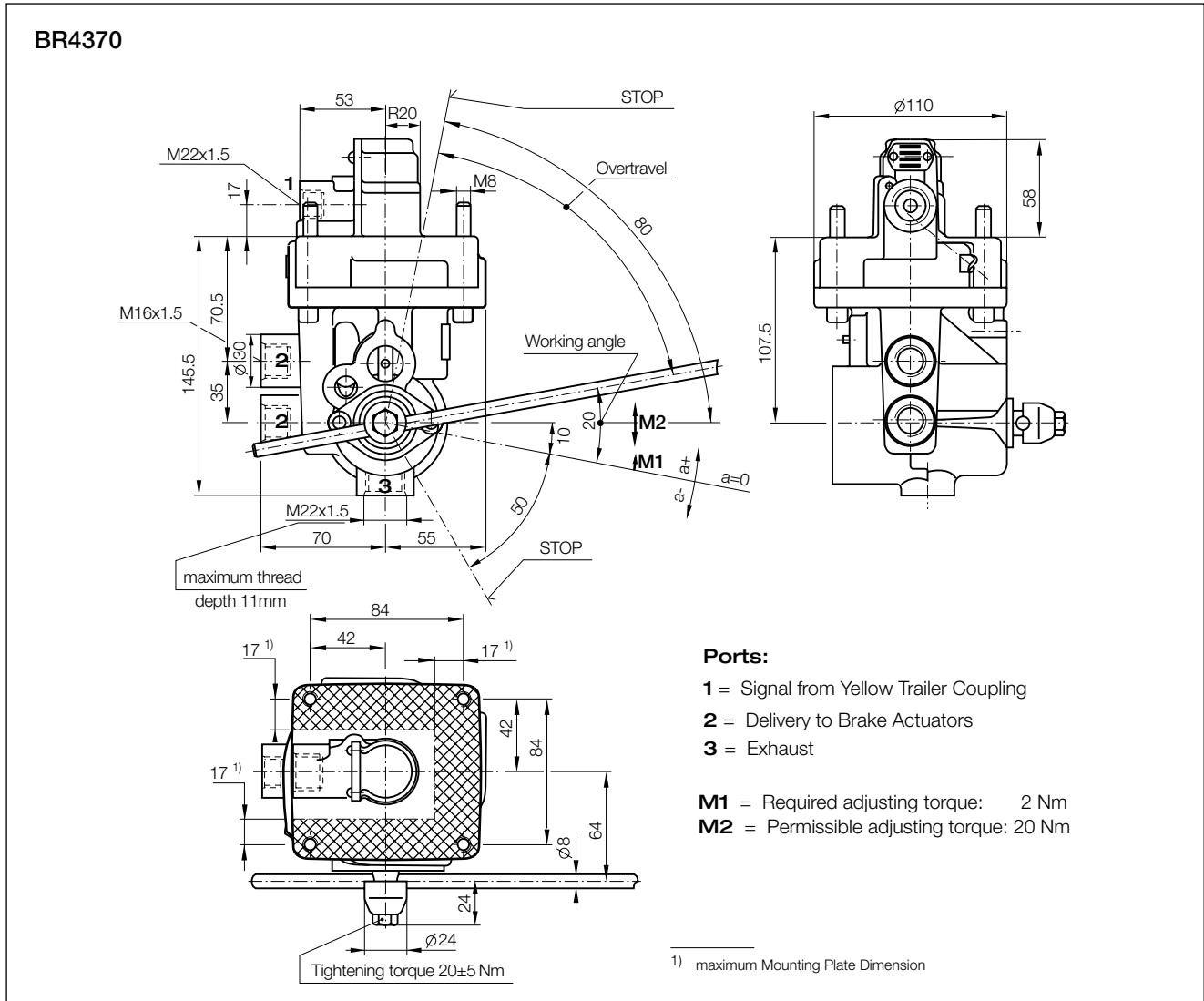
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Load Sensing Valve Data Plate

		Automatisch-Lastabhängige Bremskraftregelrichtung (ALB) für Typ: Load Sensing Device for Type: Dispositif de correction automatique de freinage pour type:			
Vorderachse, Front Axle, Essieu avant		Hinterachse, Rear Axle, Essieu arrière			
Feder-Nr Spring No Ressort No		Feder-Nr Spring No Ressort No			
Ventile Nr Valves No Valves No		Ventile Nr Valves No Valves No			
l = <input type="text"/> mm		Eingangsdruck Input Pressure Pression de entrée <input type="text"/> bar		l = <input type="text"/> mm	
Achslast Axle Load Charge essieu kg	Ausgangsdruck Output Pressure Pression de sortie bar	Weg s am Hebel Stroke s at Lever Course s ou Levier mm	Achslast Axle Load Charge essieu kg	Ausgangsdruck Output Pressure Pression de sortie bar	Weg s am Hebel Stroke s at Lever Course s ou Levier mm

DIN 74267-C for mechanically controlled suspension, **BR43..**

Part No.: **3EB01629**

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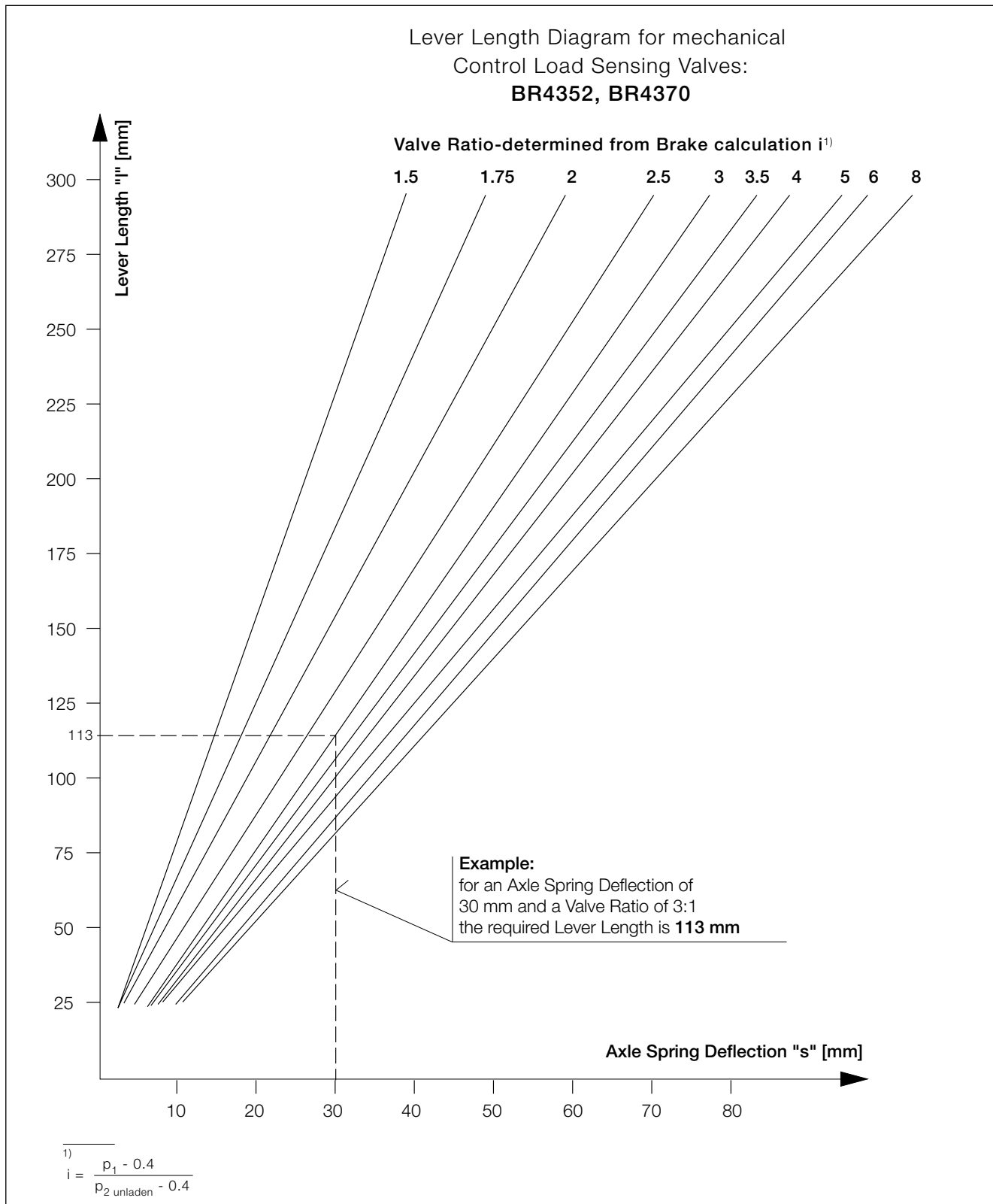
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Determining the Lever Length "l" - graphical method



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Item No. K022461



Determining the Lever Length "l" - arithmetic method

Axle Spring Deflection:	s [mm] =	
Control (Yellow) Line pressure - input:	p_1 [bar] =	
Load dependent brake actuator pressure - unladen:	$p_{2 \text{ unladen}}$ [bar] =	
Load dependent brake actuator pressure - laden:	$p_{2 \text{ laden}}$ [bar] =	

Valve Ratio (unladen):	$i_L = \frac{p_{2 \text{ unladen}} - 0.4}{p_1 - 0.4} =$	
Valve Ratio (laden):	$i_V = \frac{p_{2 \text{ laden}} - 0.4}{p_1 - 0.4} =$	

Secondary variable A [angle degree]:	$A = 22.8 \times i_L - 12.8 =$	
Secondary variable B [angle degree]:	$B = 22.8 \times i_V - 12.8 =$	
Secondary variable C:	$C = \sin(A) - \sin(B) =$	

Lever Length „l“ [mm]:	$l = \frac{\text{Axle Spring Deflection } s}{\text{Secondary variable C}} =$	<div style="border: 1px solid black; width: 150px; height: 40px; margin: 0 auto;"></div>
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A computer calculation program is available on request.

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How to adjust a mechanically controlled Load Sensing Valve BR43..

- Determine the lever length with the help of the brake calculation, the nomogram and the formula.
- Fit the Cable attachment on the lever at this length.
- Write the following data on the Load Sensing Valve Data Plate: input pressure; output pressure of the Load Sensing Valve, unladen and laden, axle load, unladen and laden; lever length and spring deflection.
- With the lever of the Load Sensing Valve horizontal, the connecting link should be at right angles to it. The length of the link can be adjusted using the clamp screw.
- Ensure that the vehicle is on level ground and chock the wheels.
- Axle weight must be according to the data of the axle manufacturer for an unladen vehicle.
- Check that sufficient service pressure is available.
- Connect pressure gauges to the Control Line input of the Load Sensing Valve and to the output (Brake Actuators).
- Apply input (Control Line) pressure as stated on the Data Plate.
- Read the output pressure on the gauge and correct if necessary (shorten the link to give lower unladen brake pressure and vice versa).
- See Attention note below.
- Disconnect the cable and with reference to a suitable measuring device, raise the lever a distance „s“, i.e. the distance of spring deflection as taken from the data plate.
- Apply input (Control Line) pressure as stated on the Data Plate.
- Read the output pressure and check it is the same as the Laden pressure as defined on the data plate. If it is not then correct by adjusting the lever length (shorten to increase output pressure and vice versa). Check and adjust until both unladen (with cable fitted) and laden settings are correct. See Attention note below.

After finishing the test ensure that the lever and cable clamps are tightened securely.

Attention:

To adjust valve BR4370 with static characteristic the supply pressure must be released to make any adjustment and then the output pressure re-checked.

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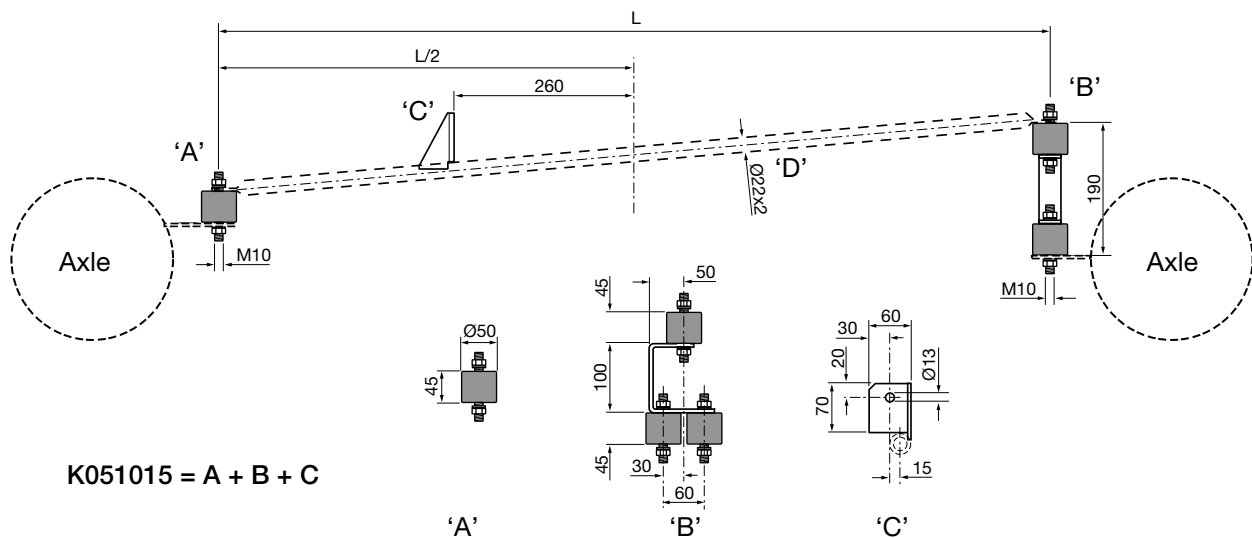
Rubber mounting for suspension equalisation

Function

Rubber mounts are used in mechanically suspended tandem bogies to get an elastic connection between the axles. The arrangement as shown below, 'averages' the movements of both axles.

Installation recommendation

Use the tandem axle mounting kit K051015(see drawing) to connect the linkage of the Load Sensing Valve to the axles. Attach mounting brackets to the axles for the rubber mountings ("A" and "B"). The rubber mountings are connected to each other using a tube or angle section link "D". Part "C" provides an attachment point on link "D" for the Load Sensing Valve linkage.



Note: Item "D" is not supplied by Knorr-Bremse and must be manufactured by the installer to the necessary dimensions.

For further information contact your Knorr-Bremse distributor.

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