

hydraulically operated, hand control operated, pedal operated, and mechanically operated



Versatile, High-performance Remote Actuators

Why choose MICO?

MICO, Inc. designs, manufactures and markets hydraulic components, controls, and brake systems primarily for off-road markets. We have manufacturing facilities in:

- North Mankato, Minnesota U.S.A.
- Ontario, California U.S.A.
- · Empalme, Sonora, Mexico

Many of the world's largest off-highway OEMs value the knowledgeable staff at MICO and work with us to make their products better. Our custom-engineered products are designed with the customer requirements as the primary driver. It is our intent to help customers build their systems with our expertise in hydraulic components, braking systems and controls.

Our goal is to meet or exceed our customers' expectations in every aspect of our business.

Product lines we specialize in include:

- Actuators
- Brake Locks
- Brakes
- Controls
- Cylinders
- Electrohydraulics
- · Master Cylinders
- Valves

MICO is proud to be ISO 9001 and ISO 14001 certified and continuously strive for improvement while remaining a quality leader in our field. We have been a successful business for over 60 years. Privately owned, customer driven. We look forward to working with you!



Hydraulic Remote Actuators

MICO® Remote Actuators are designed with the same quality and dependability that goes into every MICO Braking System Product. This is an important consideration when you select any brake system component.

There are several functions the various types of MICO® Remote Actuators are designed to perform.

- Hydraulic remote actuators prevent the transfer of fluid from one system to another system when used with two master cylinders.
- Hand operated remote actuators also prevent fluid transfer between systems, but can be used as the master cylinder, or prime mover as well.
- Pedal operated actuators perform the same functions as the hand operated actuators, except the operator controls these units by foot.
- Mechanically operated actuators allow you to mount your own pedal or lever arrangement to meet the specific needs of your application.

MICO® Pressure Intensifiers are ideal for applications where a low pressure source is available and a small displacement of high pressure hydraulic fluid is required.

System fluids other than DOT 3, 4, 5, or 5.1 brake fluid or mineral based hydraulic oils may require special seals. Consult MICO, Inc. for recommendations.

This document is intended to provide general information about MICO Products. MICO, Inc. has attempted to present accurate information about MICO Products in its catalogs, brochures, and other printed materials. MICO, Inc. is not responsible for errors, inaccuracies, or inconsistencies that may exist in any catalog brochure or other printed materials or any damages arising from or related to reliance on information in them. Materials and specifications for MICO Products set forth in catalogs, brochures, and other printed materials are subject to change without notice or obligation. Refer to www.mico.com for the most recent versions of our literature. If you have any questions concerning MICO Products, please contact MICO, Inc. All MICO Products and service are sold and provided subject to the MICO Warranty at www.mico.com in effect on the date of sale or supply.

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Applications



Forestry Equipment



Agricultural Equipment



Heavy Construction Equipment



Swing Drive Equipment



Mining Equipment



In-Plant & Warehouse Equipment



Airport Support Vehicles



(hydraulically operated)

DESCRIPTION

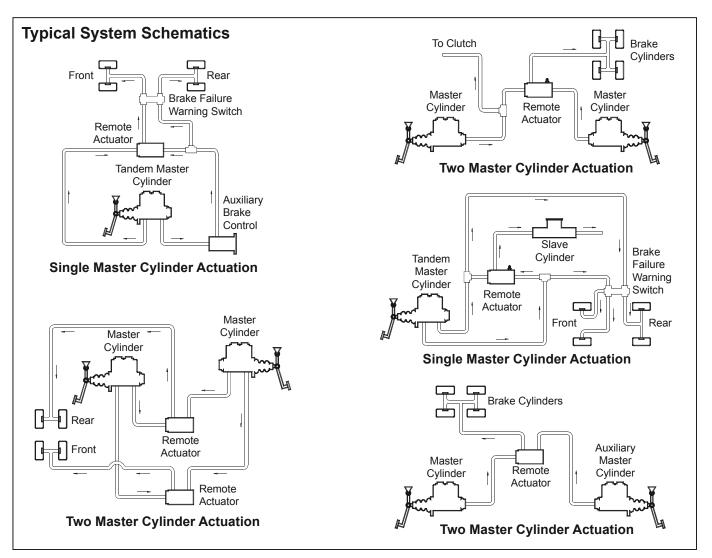
The MICO® Remote Actuators presented in this section are actuated by a remote hydraulic pressure source such as a master cylinder.

When hydraulic pressure is developed by the primary source, pressurized fluid forces the piston assembly in the remote actuator forward. When the stem seals against the rubber seat, a positive check is established at the secondary port. From that point, output pressure and volume are equal to the input pressure and volume.

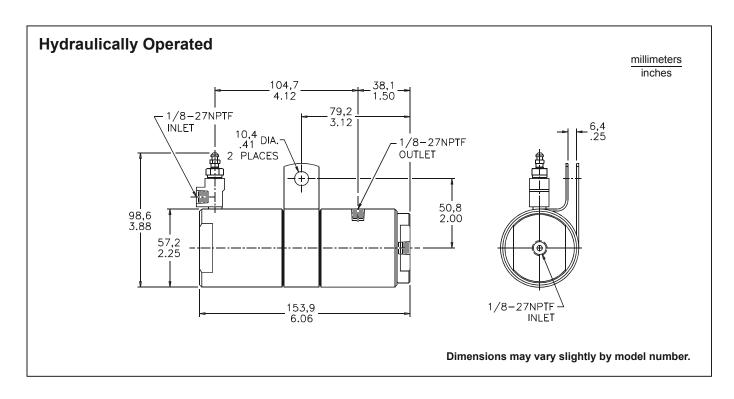
Since the bores are of the same diameter, input pressure will be the same as output pressure except when moving the piston. The spring preload must be overcome by the primary pressure source.

When energizing the system from the secondary pressure source, the pressure and volume at the outlet port will equal input pressure and volume, less the stem clearance.

- Back to back cups prevent transfer of fluid from one system to the other
- Standard porting for easy tubing connections
- Available with seals for DOT 3, 4, 5 and 5.1 brake fluid or mineral base hydraulic oil





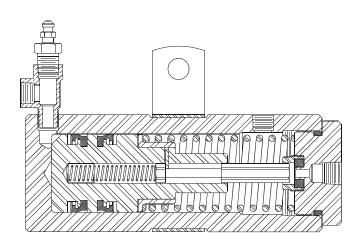


SPECIFICATIONS

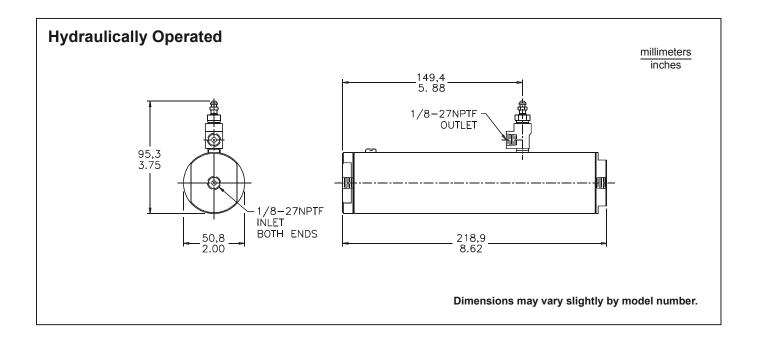
Model Number	Fluid Type	Bore Diameter	neter Stroke Stroke		Output Effective Displacement	Remote Actuating Displacement
02-460-046	BF	1.50 in	1.05 in	0.96 in	1.69 in ³	1.85 in³
03-460-090	HO	1.50 in	1.05 in	0.96 in	1.69 in ³	1.85 in³

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



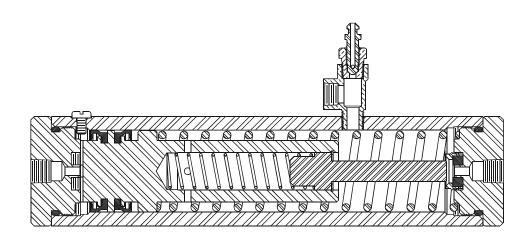




Model Number	Fluid Type	Bore Diameter Total Stroke Stroke 1.50 in 2.12 in 2.0 in		Output Effective Displacement	Remote Actuating Displacement	
02-460-051	BF	1.50 in	2.12 in	2.0 in	3.5 in³	3.74 in ³
02-460-052	HO	1.50 in	2.12 in	2.0 in	3.5 in³	3.74 in ³

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.





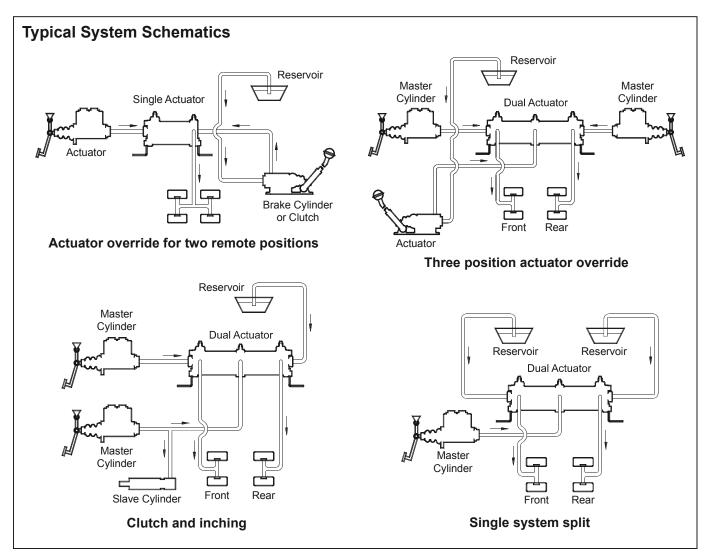
(hydraulically operated)

DESCRIPTION

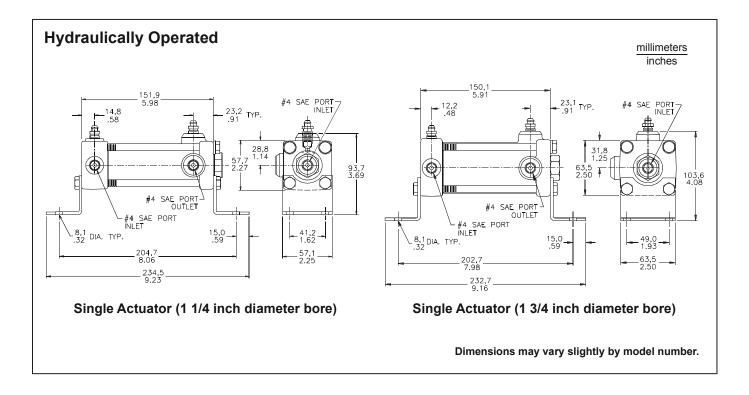
MICO® Actuators of this type are mechanical devices that link the vehicles hydraulics with the brake system. The single actuators are used for connecting to a brake line controlled by a single input and the dual actuators are used for connecting to two brake lines controlled by a single input. Actuators are available in two different bore sizes and are capable of displacing 1.77 in³ and 2.89 in³ per side.

See page 25 for Fluid Reservoirs.

- Dual actuators support two separate fluid lines
- All actuators have SAE #4 o-ring ports
- Actuator pistons are hard coat anodized aluminum
- Heavy duty return springs are an advantage in "inching" applications
- Bleeders and/or brackets can be repositioned
- Reservoir can be remotely mounted for easy accessibility, see page 25



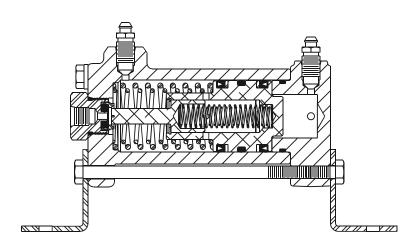




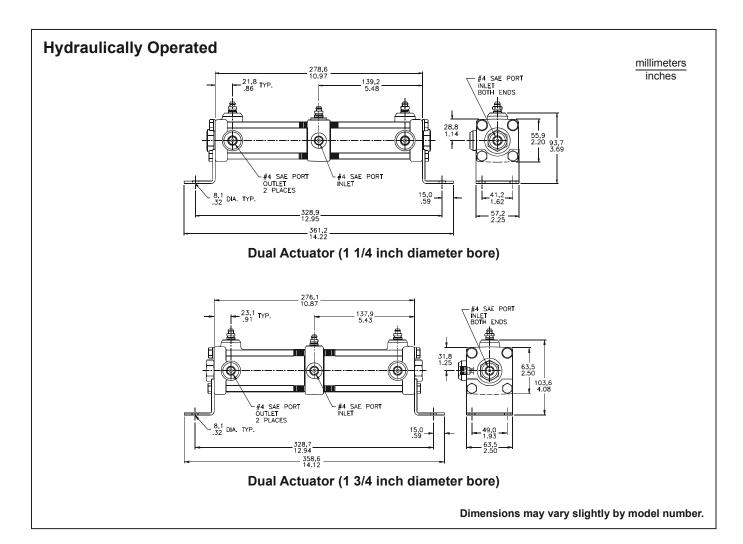
Model Number	Fluid Type	Description	Bore Diameter	Effective Stroke	Effective Displacement
20-460-013	BF	Single	1.750 in	1.20 in	2.89 in ³
20-460-014	НО	Single	1.750 in	1.20 in	2.89 in ³
20-460-018	BF	Single	1.250 in	1.43 in	1.77 in ³

HO = mineral base hydraulic oil

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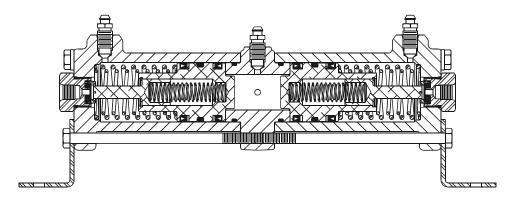


SPECIFICATIONS

Model Number	Fluid Type	Description	Bore Diameter	Effective Stroke	Effective Displacement
20-460-012	BF	Dual	1.750 in	1.20 in	2.89 in ³
20-460-015	HO	Dual	1.750 in	1.20 in	2.89 in ³
20-460-017	BF	Dual	1.250 in	1.43 in	1.77 in ³

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.





(hand control operated)

DESCRIPTION

MICO® Remote Actuators of this type are actuated by a force exerted on the push rod by various types of hand controls.

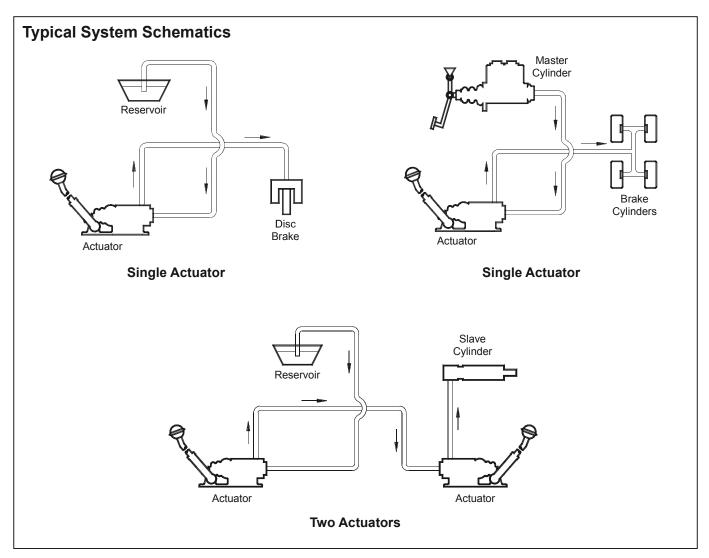
Initial application pressure moves the floating piston assembly forward. This action seals off fluid flow from the reservoir.

Further application builds up pressure and forces fluid out of the outlet port to the brake or clutch.

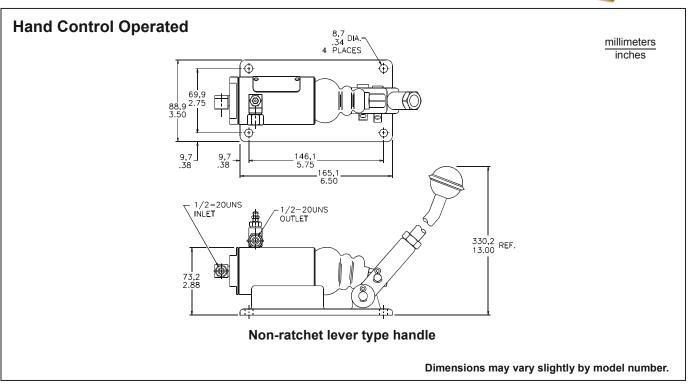
When application pressure is released, the floating piston assembly is forced back by the return spring.

See page 25 for Fluid Reservoirs.

- Rugged heavy duty construction
- Reservoir can be remotely mounted for easy accessibility, see page 25
- Available with seals for DOT 3, 4, 5 and 5.1 brake fluid or mineral base hydraulic oil
- Some models feature a ratchet type lock/release mechanism in the handle





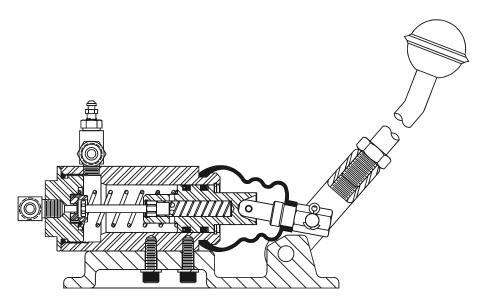


SPECIFICATIONS

	Model Number	Fluid Type	Bore Diameter			Effective Displacement	Actuator Only	
- 1	02-460-093	BF	1.125 in	1.25 in	1.19 in	1.18 in ³	20-080-075	
	03-460-028	HO	1.125 in	1.25 in	1.19 in	1.18 in ³	20-080-076	

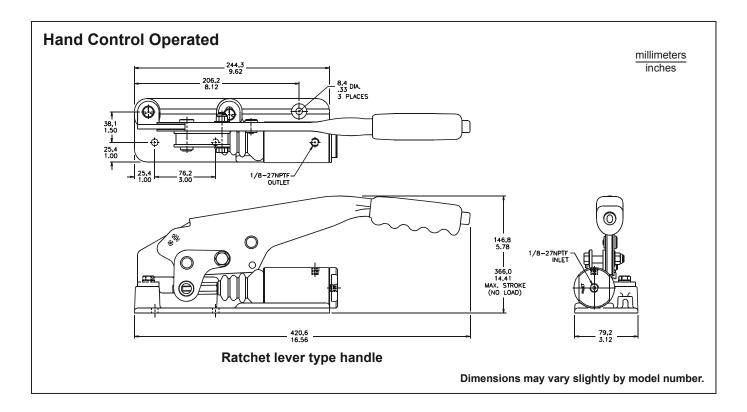
HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



(Non-ratchet lever type handle)
100 lb maximum handle force at 875 maximum outlet pressure

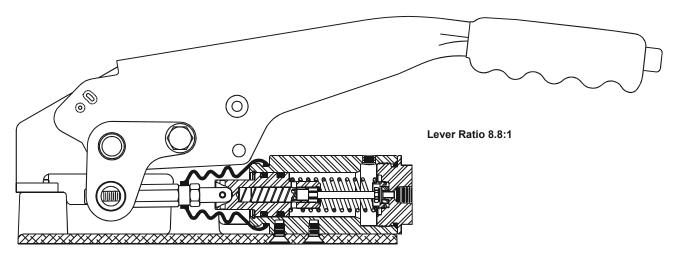




Model Number	Fluid Type	Bore Diameter	Total Stroke	Effective Stroke	Effective Displacement	Actuator Only
02-460-147	BF	1.125 in	1.25 in	1.19 in	1.18 in ³	None
02-460-148	НО	1.125 in	1.25 in	1.19 in	1.18 in ³	None

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



(Ratchet lever type handle with release button) 90 lb maximum lever pull



(pedal operated)

DESCRIPTION

MICO® Remote Actuators of this type are actuated by force applied to the push rod by various types of foot pedal controls.

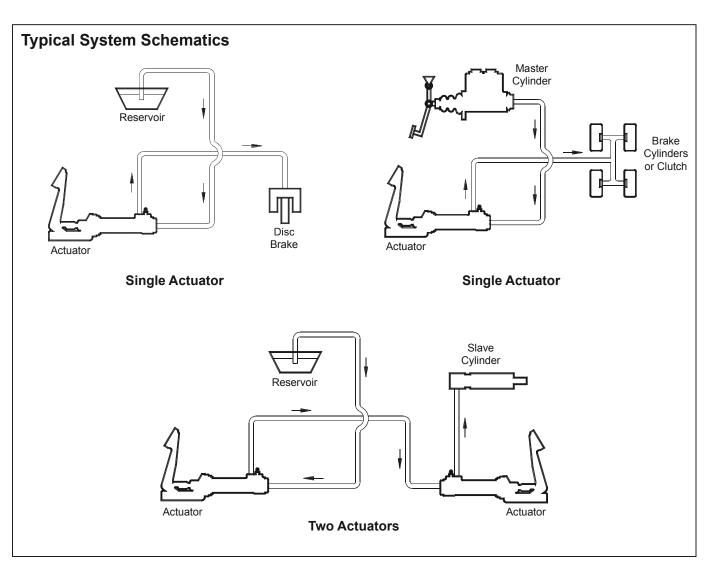
Initial application pressure moves the floating piston assembly forward. This action seals off fluid flow from the reservoir.

Further application builds up pressure and forces fluid out of the outlet port to the brake or clutch.

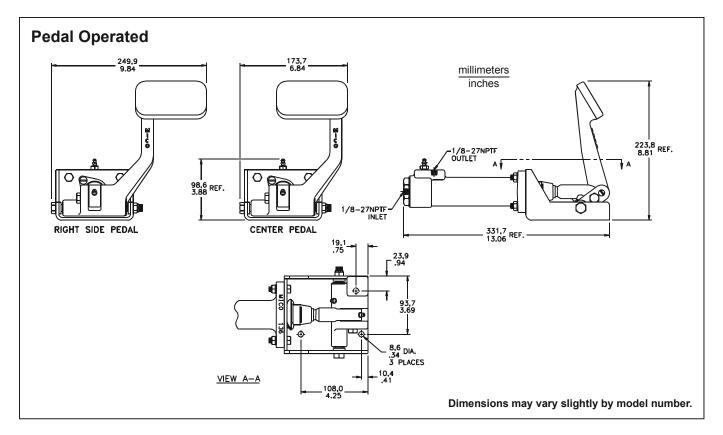
When application pressure is released, the floating piston assembly is forced back by the return spring.

See page 25 for Fluid Reservoirs.

- Heavy duty industrial design
- Reservoir can be remotely mounted for easy accessibility
- Cups do not pass over replenishing ports
- Ideal for remote application of brakes or clutch
- Available with seals for DOT 3, 4, 5 or 5.1 brake fluid or mineral base hydraulic oil
- Reservoir can be remotely mounted for easy accessibility, see page 25



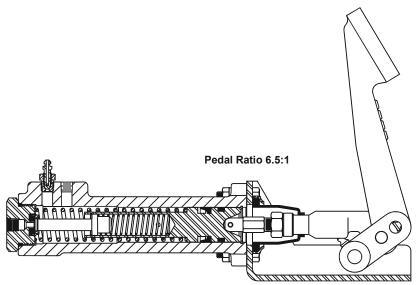




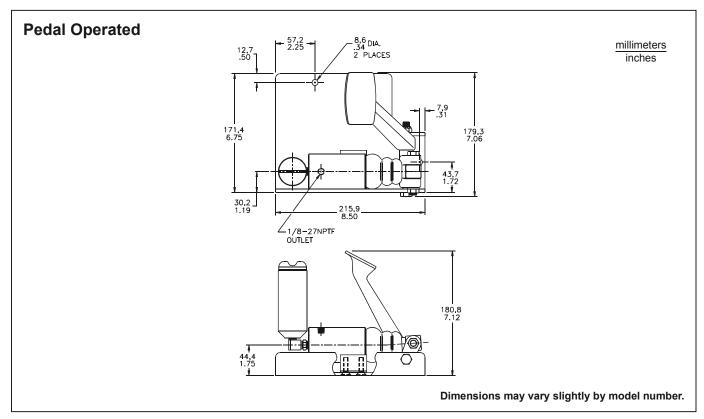
Model Number	Fluid Type	Pedal Position	Bore Diameter	Total Stroke	Effective Stroke	Effective Displacement	Actuator Only
03-460-055	BF	Right Side	1.125 in	1.062 in	1.000 in	0.99 in ³	03-460-131
03-460-057	BF	Center	1.125 in	1.062 in	1.000 in	0.99 in ³	03-460-131
03-460-058	НО	Right Side	1.125 in	1.062 in	1.000 in	0.99 in ³	None
03-460-062	НО	Center	1.125 in	1.062 in	1.000 in	0.99 in ³	None

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.







SPECIFICATIONS

Model Number	Fluid Type	Pedal Position	Bore Diameter	Total Stroke	Effective Stroke	Effective Displacement	Actuator Only
* 02-460-127	BF	Right Side	1.125 in	1.250 in	1.187 in	1.18 in ³	20-080-077
* 02-460-128	НО	Right Side	1.125 in	1.250 in	1.187 in	1.18 in ³	20-080-078
03-460-067	BF	Right Side	1.125 in	1.250 in	1.187 in	1.18 in ³	20-080-077
03-460-068	НО	Right Side	1.125 in	1.250 in	1.187 in	1.18 in ³	20-080-078

^{*} Includes 20-920-002 fluid reservoir.

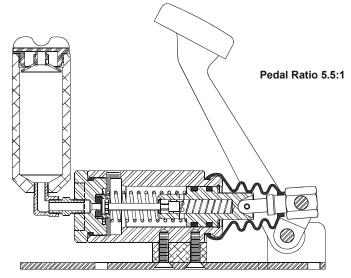
HO = mineral base hydraulic oil E

BF = DOT 3, 4, 5 and 5.1 brake fluid.

RESERVOIR

Model Number	Fluid Type	Capacity
** 20-920-002	BF or HO	3.3 in ³

^{**} Filler cap with baffle and breather.





(mechanically operated)

DESCRIPTION

MICO® Remote Actuators of this type are actuated by a force exerted on the push rod by various types of mechanical linkage.

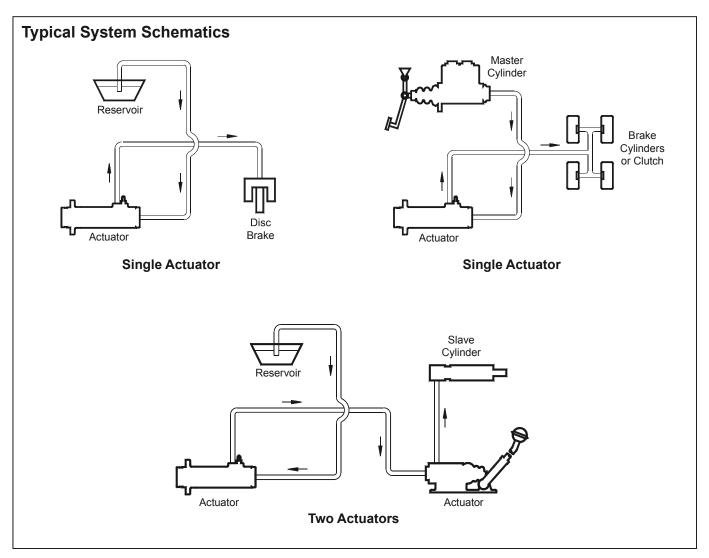
Initial application pressure moves the floating piston assembly forward. This action seals off fluid flow from the reservoir.

Further application builds up pressure and forces fluid out of the outlet port to the brake or clutch.

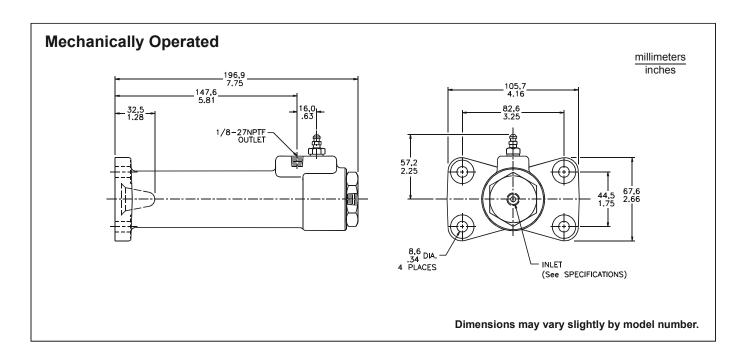
When application pressure is released, the floating piston assembly is forced back by the return spring.

See page 25 for Fluid Reservoirs.

- Rugged heavy-duty construction
- Reservoir can be remotely mounted for easy accessibility
- Case hardened piston for extended service life
- Ideal for remote application of brakes or clutch
- Available with seals for DOT 3, 4, 5 or 5.1 brake fluid or mineral hydraulic oil
- Reservoir can be remotely mounted for easy accessibility, see page 25





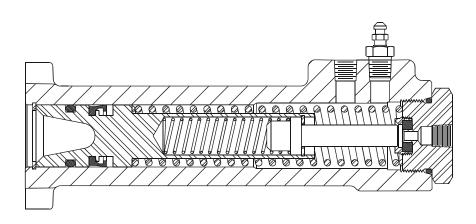


SPECIFICATIONS

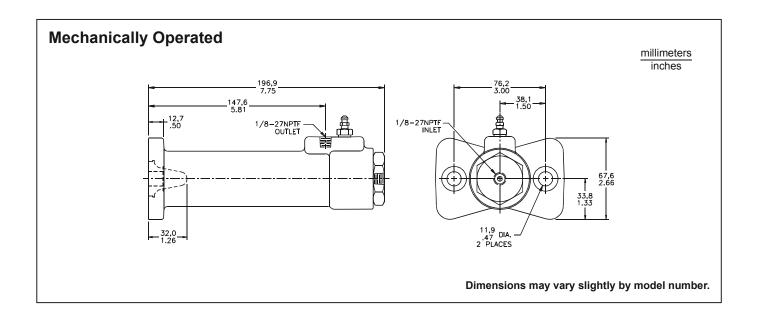
Model Number	Fluid Type	Bore Diameter	Total Effective Stroke Stroke		Effective Displacement	Inlet Port
02-460-066	BF	1.125 in	1.593 in	1.437 in	1.43 in ³	1/8-27NPTF
02-460-072	НО	1.125 in	1.593 in	1.437 in	1.43 in ³	1/8-27NPTF
02-460-152	НО	1.125 in	1.593 in	1.437 in	1.43 in ³	1/4-18NPTF

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.





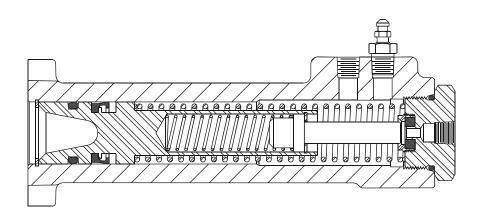


SPECIFICATIONS

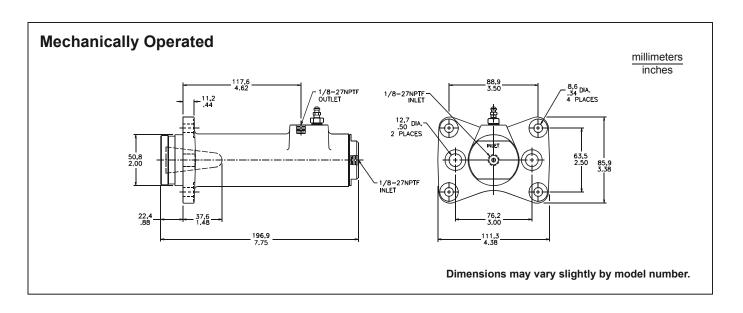
Model Number	er Type Diam		Total Stroke	Effective Stroke	Effective Displacement
02-460-068	НО	1.125 in	1.593 in	1.437 in	1.43 in ³
12-460-002	BF	1.125 in	1.593 in	1.437 in	1.43 in ³

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



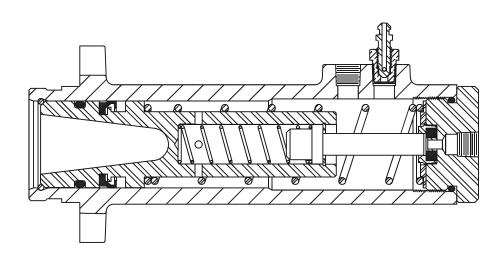




Model Number	Fluid Type	Bore Diameter	Total Stroke	Effective Stroke	Effective Displacement
02-460-061	BF	1.500 in	1.593 in	1.437 in	2.54 in ³
03-460-054	HO	1.500 in	1.593 in	1.437 in	2.54 in ³

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.





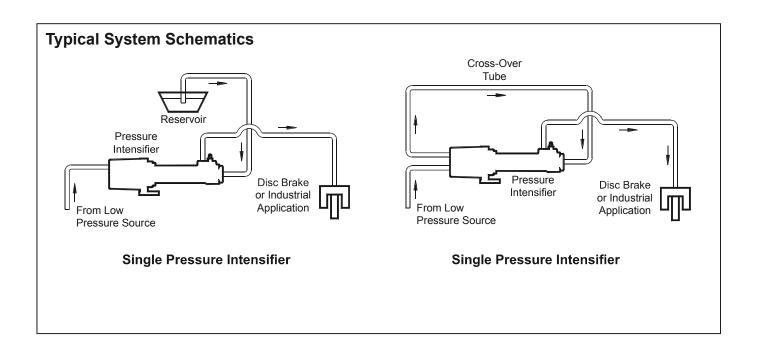
DESCRIPTION

There are MICO® Intensifier models available that act as fluid separators. Different fluids can be used in the assist section than in the cylinder section.

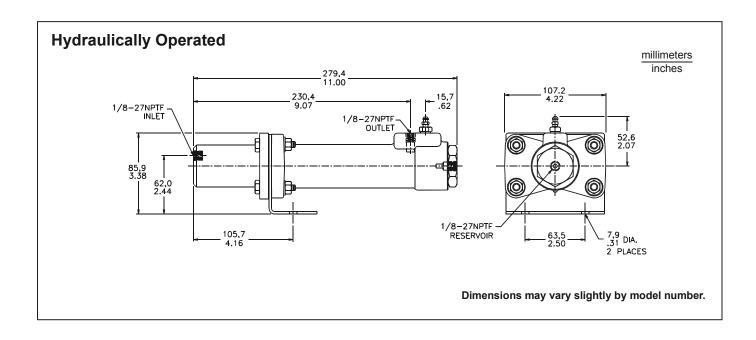
In mechanically linked intensifiers of this type the piston in the assist section is forced forward. This action moves the piston assembly in the cylinder section forward, thus preventing fluid flow from the reservoir. With additional pressure the fluid in the cylinder section is forced out the outlet port to a disc brake or other application.

See page 25 for Fluid Reservoirs.

- For use when a low pneumatic or hydraulic pressure source is available
- For use when a relatively small displacement of high pressure hydraulic fluid is required
- Intensifiers available in output to input pressure ratios of 2:1, 5:1 and 9:1, also 1:1
- Ideal for disc brake applications and various industrial applications
- Reservoir can be remotely mounted for easy accessibility, see page 25







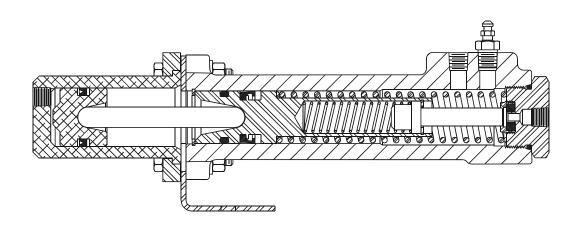
SPECIFICATIONS

Model	Fluid	Туре	Ratio Effective Maximum		Maximum	Maximum Output	Maximum Input
Number	Inlet	Outlet	Approximately	Stroke	Output	Pressure	Pressure
* 02-465-029	НО	BF	1:1	1.44 in	1.44 in ³	2000 PSI	2000 PSI
02-465-031	НО	BF	2:1	1.44 in	1.44 in ³	2000 PSI	1000 PSI
02-465-032	НО	НО	2:1	1.44 in	1.44 in ³	2000 PSI	1000 PSI

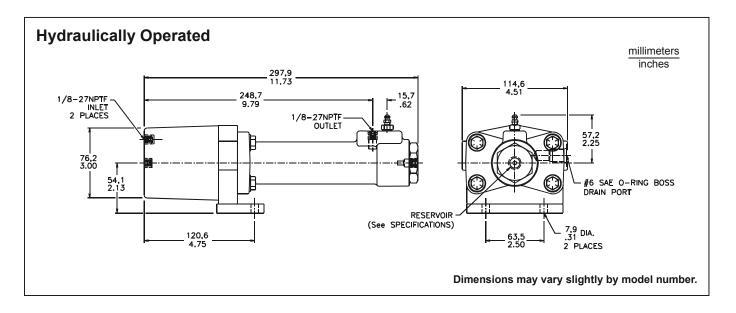
^{*} For use as a fluid separator

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



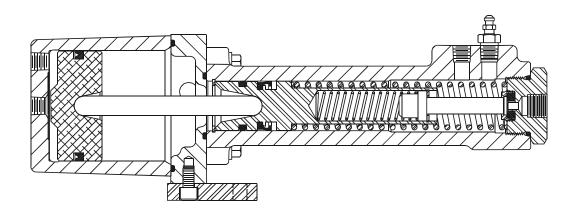




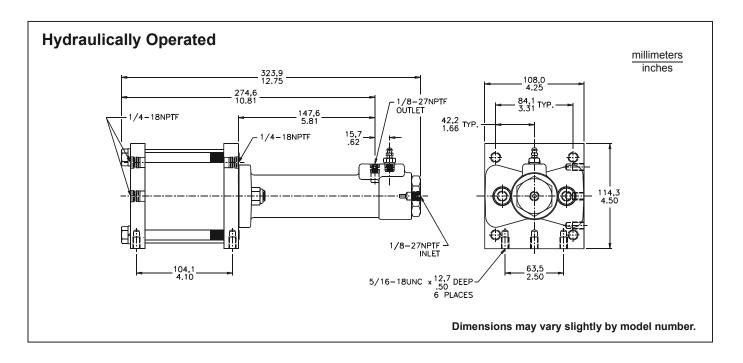
	Model	Fluid Type		Fluid Type Ratio E	Effective Maximum	Maximum Output	Maximum Input	Reservoir	
	Number	Inlet	Outlet	Approximately	Stroke	Output	Pressure	Pressure	Port
ı	03-465-020	НО	НО	5:1	1.44 in	1.44 in ³	2000 PSI	400 PSI	1/4-18NPTF
	03-465-022	HO	HO	5:1	1.44 in	1.44 in ³	2000 PSI	400 PSI	1/8-27NPTF

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.



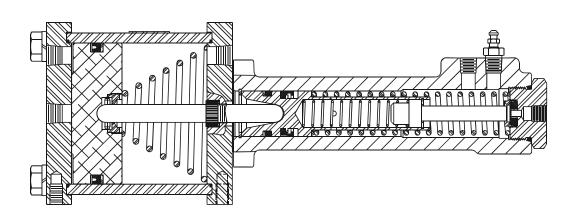




Model	Fluid Type		ype Ratio Ef		Effective Maximum	Maximum Output	Maximum Input	
Number	Inlet	Outlet	Approximately	Stroke	Output	Pressure	Pressure	
03-465-134	НО	BF	9:1	1.91 in	1.90 in ³	2000 PSI	225 PSI	
03-465-140	НО	НО	9:1	1.91 in	1.90 in ³	2000 PSI	225 PSI	

HO = mineral base hydraulic oil

BF = DOT 3, 4, 5 and 5.1 brake fluid.





For Direct or Remote Mounting



POLYALLOMER RESERVOIR

- Translucent for easy view of fluid level
- Diaphragm seals out environmental contaminants
- Adaptable outlet fittings
- Sediment trap inherent to design
- Easy screw on and off filler cap
- 238 cm³ (14.5 in³) usable fluid capacity
- For use with hydraulic oil or brake fluid (contact MICO regarding phosphate ester fluids)

METAL RESERVOIR

- Rugged anodized aluminum housing
- Easy screw on and off filler cap with baffle and breather
- 54 cm³ (3.3 in³) usable fluid capacity
- Compact design for ease of mounting
- Adaptable outlet fittings
- For use with hydraulic oil or brake fluid (contact MICO regarding phosphate ester fluids)

SPECIFICATIONS

Poylallomer Reservoirs

Model Number	Fluid Type	Outlet Fitting	Mounting Bracket	Diaphragm Part Number
20-920-500	НО	9/16-18UNF-2A	Yes	32-490-009
20-920-520	НО	9/16-18UNF-2A	No	32-490-009
20-920-512	НО	1/4-18NPTF (internal)	Yes	32-490-009
20-920-514	НО	1/4-18NPTF (internal)	No	32-490-009
20-920-505	BF	9/16-18UNF-2A	Yes	32-490-010
20-920-509	BF	1/4-18NPTF (internal)	Yes	32-490-010
20-920-515	BF	1/4-18NPTF (internal)	No	32-490-010

HO = mineral base hydraulic oil.

BF = DOT 3, 4, 5 and 5.1 brake fluid.

SPECIFICATIONS

Metal Reservoirs

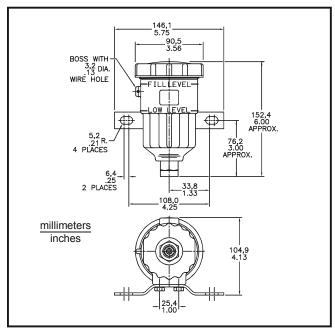
Model Number	Fluid Type	Mounting Bracket	
* 20-920-002	BF or HO	No	
** 20-920-006	BF or HO	Yes	
20-920-009	BF or HO	Yes	

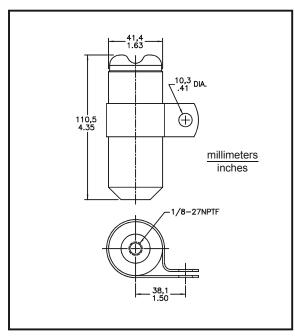
* Includes 1/8-27NPTF male 90° elbow fitting.

** Includes two 1/4-27NPTF x 1/4 tube fittings.

HO = mineral base hydraulic oil.

BF = DOT 3, 4, 5 and 5.1 brake fluid.







MICO, Incorporated

1911 Lee Boulevard North Mankato, MN U.S.A. 56003-2507

Tel: +1 507 625 6426 **Fax**: +1 507 625 3212

Web Site: www.mico.com

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PRODUCT LINE:

Brakes

Caliper Disc Brakes Multiple Disc Brakes

Brake Locks

Electric Mechanical

Controls

Electronic Controls
Hydraulic Throttle Controls
Pedal Controls
Switches
Transducers/Sensors

Cylinders

Drive Axle Brake Actuators Slave Cylinders Wheel Cylinders

Master Cylinders

Boosted Cylinders Hydraulically and Air Actuated Straight Bore Cylinders Two-Stage Cylinders

Valves

Accumulator Charging Electrohydraulic Brake Park Brake Pressure Modulating

Miscellaneous Components

In-line Residual Check Valves Pump with Integrated Valves Reservoirs

