Air/Hydraulic Actuators

master cylinders, stem seal master cylinders, and stem seal actuators with air chambers

Convert Air Pressure to Hydraulic Pressure
Air/Hydraulic Actuators

The same dependability and performance that goes into every MICO Braking System Product also goes into our versatile, high-performance Air/Hydraulic Actuators and their components. This is an important consideration when you select an actuator for a system requiring air/hydraulic power.

The MICO® Air/Hydraulic Actuators presented in this catalog are designed to take advantage of available pressurized air sources to produce high hydraulic pressures. This design feature is especially important for towing self-propelled hydraulically braked vehicles when towing vehicle is equipped with air. The towed vehicle’s brakes are controlled by the air/hydraulic actuator when used with a remote air reservoir and relay emergency valve. These actuators can also be used for industrial applications.

Air chamber sizes are available from 12 to 36 square inches and hydraulic displacement from 1.4 to 5.9 cubic inches. Both remote or integral reservoir models are available for mineral base hydraulic oil or brake fluid.

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.

Combining the speed of air operation with the control and high force of fluid can result in an ideal circuit.

Air/Hydraulic Actuators are the combination of a fluid actuator and an air chamber. The air chamber is used to convert low air pressure to high hydraulic pressure. The conversion ratio is the ratio of the hydraulic output pressure to air input pressure.

There are three types of MICO® Air/Hydraulic Actuators to choose from; the Master Cylinder Type, the Stem Seal Master Cylinder Type with Integral Reservoir and the Straight Bore Actuator Type for use with a remote reservoir. Each has its own advantages to offer.

Complete the appropriate Application Data Sheet online, www.mico.com. The MICO Applications Department will analyze your specifications and based on your input recommend a air/hydraulic actuator suitable for your requirements.

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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!

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**FEATUES**

- Available with or without internal residual check valve
- Incorporates a conventional master cylinder
- Available for industrial and mobile applications
- Sealed diaphragm fluid reservoir

**DESCRIPTION**

The MICO® Master Cylinder Type Air/Hydraulic Actuator is the combination of a conventional master cylinder and an air chamber. The master cylinder is a single acting type with one piston. Air pressure is used to actuate a push rod in the air chamber. The push rod in turn moves the piston in the master cylinder which forces the hydraulic fluid into the system.

![Model No. 12-460-017 shown](image)

Typical System Schematic
NOTE: Contact MICO, Inc. for additional installation information.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Internal Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI)</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-460-017</td>
<td>BF</td>
<td>Yes</td>
<td>30 cm³ (12 in³)</td>
<td>83 bar (1200 PSI)</td>
<td>35.1 mm (1.38 in)</td>
<td>28.6 mm</td>
<td>1.125 in</td>
</tr>
<tr>
<td>12-460-025</td>
<td>BF</td>
<td>No</td>
<td>30 cm³ (12 in³)</td>
<td>83 bar (1200 PSI)</td>
<td>35.1 mm (1.38 in)</td>
<td>28.6 mm</td>
<td>1.125 in</td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid.
All model numbers have a maximum air pressure rating of 8 bar (120 PSI).
All model numbers have right side mounting brackets when viewed from the air chamber end of actuator.
Air/Hydraulic Actuator
(master cylinder with air chamber)

FEATURES
- Available with or without internal residual check valve
- Incorporates a conventional master cylinder
- Available for industrial and mobile applications
- Actuator components are protected from environmental contaminate

DESCRIPTION
The Air/Hydraulic Actuators listed here are similar to those found in the previous section. The models in this section however, use a larger straight bore master cylinder for more displacement and a larger air chamber for more pressure.

Like the models in the previous section, air pressure is used to actuate a push rod in the air chamber. In turn the push rod moves the master cylinder piston which forces hydraulic fluid into the system.

Model No. 02-460-580 shown

Typical System Schematic
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Internal Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI)</th>
<th>Air Pressure</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
<th>Filler Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-460-580</td>
<td>BF</td>
<td>Yes</td>
<td>91 cm³ (36 in³)</td>
<td>103 bar (1500 PSI)</td>
<td>96.7 cm³ (5.9 in³)</td>
<td>62.2 mm (2.45 in)</td>
<td>44.5 mm (1.750 in)</td>
<td>Vented</td>
<td></td>
</tr>
<tr>
<td>02-461-580</td>
<td>BF</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>103 bar (1500 PSI)</td>
<td>96.7 cm³ (5.9 in³)</td>
<td>62.2 mm (2.45 in)</td>
<td>44.5 mm (1.750 in)</td>
<td>Vented</td>
<td></td>
</tr>
<tr>
<td>* 03-460-437</td>
<td>BF</td>
<td>Yes</td>
<td>76 cm³ (30 in³)</td>
<td>50 bar (720 PSI)</td>
<td>88.5 cm³ (5.4 in³)</td>
<td>57.2 mm (2.25 in)</td>
<td>44.5 mm (1.750 in)</td>
<td>Ported / 1/2-20UNF</td>
<td></td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid.
All model numbers have a maximum air pressure rating of 8 bar (120 PSI).
All model numbers have right side mounting brackets when viewed from the air chamber end of actuator.
* Special mounting bracket. Contact MICO for more information.
 FEATURES

- Contains an internal residual check valve
- Incorporates a conventional master cylinder
- Available for industrial and mobile applications
- Actuator components are protected from environmental contaminates

DESCRIPTION

This actuator is also the combination of a conventional master cylinder and an air chamber. The model in this section uses a large straight bore master cylinder for greater displacement.

Air pressure is used to actuate a push rod in the air chamber, which moves the master cylinder piston and forces hydraulic fluid into the system.

Typical System Schematic
Model No. 03-460-436 shown

NOTE: Contact MICO, Inc. for additional installation information.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Internal Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI) Air Pressure</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-460-436</td>
<td>BF</td>
<td>Yes</td>
<td>30 cm³ (12 in³)</td>
<td>31 bar (450 PSI)</td>
<td>85.2 cm³ (5.2 in³)</td>
<td>44.5 mm (1.75 in)</td>
<td>44.5 mm (1.750 in)</td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid.
Maximum air pressure rating of 8 bar (120 PSI).
FEATURES

- Positive alignment of actuating components eliminates cup wear
- Actuator components protected from environmental contaminate
- Ideal for spring brakes
- Available for industrial and mobile applications using hydraulic oil or brake fluid
- Includes stroke indicator
- Internal valving enhances bleeding process and extends normal service life of primary seal

DESCRIPTION

These MICO® Air/Hydraulic Actuators are a combination of a fluid actuator and an air chamber. They are designed to take advantage of available pressurized air sources to produce hydraulic pressure. This design feature allows them to be used in many brake applications in the construction, material handling, mining, forestry and farming industries as well as many industrial applications.

When sizing an air/hydraulic actuator to a particular application, the hydraulic displacement and required system pressure must be determined. The required system fluid depends upon the type of wheel brake system on the vehicle. These air/hydraulic actuators have a greater displacement output than the wheel brake system input plus an adequate reserve. Consult the brake or axle manufacturer for the needed displacement.

The stem seal master cylinder eliminates cup cutting by allowing the cups to move freely in the master cylinder without passing over any ports.
NOTE: Contact MICO, Inc. for additional installation information.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Internal Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI) Air Pressure</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
<th>Filler Cap</th>
<th>Mounting Bracket</th>
</tr>
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<tbody>
<tr>
<td>02-460-501</td>
<td>BF</td>
<td>Yes</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
<td>02-460-502</td>
<td>HO</td>
<td>Yes</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
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<td>BF</td>
<td>No</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
<td>02-460-504</td>
<td>HO</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-505</td>
<td>BF</td>
<td>Yes</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
<td>02-460-506</td>
<td>HO</td>
<td>Yes</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
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<tr>
<td>02-460-507</td>
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<td>Yes</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
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<tr>
<td>02-460-514</td>
<td>HO</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>141 bar (2045 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-515</td>
<td>BF</td>
<td>No</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-516</td>
<td>HO</td>
<td>No</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-517</td>
<td>BF</td>
<td>No</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-518</td>
<td>HO</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-519</td>
<td>BF</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
<tr>
<td>02-460-521</td>
<td>BF</td>
<td>Yes</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
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<td>BF</td>
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<td>61 cm³ (24 in³)</td>
<td>136 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
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<tr>
<td>02-460-527</td>
<td>BF</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
<td>02-461-501</td>
<td>BF</td>
<td>No</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
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<tr>
<td>02-461-502</td>
<td>HO</td>
<td>No</td>
<td>91 cm³ (36 in³)</td>
<td>138 bar (2000 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
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<td>02-461-505</td>
<td>BF</td>
<td>No</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
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<tr>
<td>02-461-506</td>
<td>HO</td>
<td>No</td>
<td>76 cm³ (30 in³)</td>
<td>117 bar (1700 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Right</td>
</tr>
<tr>
<td>02-461-521</td>
<td>BF</td>
<td>No</td>
<td>61 cm³ (24 in³)</td>
<td>93 bar (1350 PSI)</td>
<td>57.4 cm³ (3.5 in³)</td>
<td>50.8 mm (2.00 in)</td>
<td>38.1 mm (1.500 in)</td>
<td>Vented</td>
<td>Left</td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid.
All model numbers have a maximum air pressure rating of 8 bar (120 PSI).
★ When viewed from the air chamber end of actuator.
Air/Hydraulic Actuator
(stem seal actuator with air chamber)

FEATURES
- Allows towed vehicle’s brakes to be controlled from brake pedal of towing vehicle
- Ideal for spring brakes - cup seals never pass over ports
- Available for industrial and mobile applications

DESCRIPTION
The MICO® Straight Bore Actuator Type Air/Hydraulic Actuator is also the combination of a remote actuator and an air chamber.

Air pressure is used to actuate a push rod in the air chamber. The push rod in turn moves a piston in the hydraulic chamber which closes the reservoir feed port of the high pressure piston. The continued movement of the hydraulic piston then generates high hydraulic pressures at the outlet port. The stem seal actuator eliminates cup cutting by allowing the cups to move freely in the actuator without passing over any ports.

Model No. 03-460-148 shown

Typical System Schematic
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Internal Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI) Air Pressure</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>03-460-147</td>
<td>BF</td>
<td>No</td>
<td>91.0 cm³ (36 in³)</td>
<td>103 bar (1500 PSI)</td>
<td>96.0 cm³ (5.8 in³)</td>
<td>62.0 mm (2.44 in)</td>
<td>44.5 mm (1.750 in)</td>
</tr>
<tr>
<td>03-460-148</td>
<td>HO</td>
<td>No</td>
<td>91.0 cm³ (36 in³)</td>
<td>103 bar (1500 PSI)</td>
<td>96.0 cm³ (5.8 in³)</td>
<td>62.0 mm (2.44 in)</td>
<td>44.5 mm (1.750 in)</td>
</tr>
<tr>
<td>03-460-338</td>
<td>HO</td>
<td>No</td>
<td>51.0 cm³ (2.0 in³)</td>
<td>55 bar (800 PSI)</td>
<td>83.8 cm³ (5.1 in³)</td>
<td>54.0 mm (2.13 in)</td>
<td>44.5 mm (1.750 in)</td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid.  
HO = mineral base hydraulic oil.  
All model numbers have a maximum air pressure rating of 8 bar (120 PSI).  
All model numbers have right side mounting brackets when viewed from the air chamber end of actuator.
Air/Hydraulic Actuator
(stem seal actuator with air chamber)

FEATURES
- Allows towed vehicle’s brakes to be controlled from brake pedal of towing vehicle
- Ideal for spring brakes - cup seals never pass over ports
- Available for industrial and mobile applications

DESCRIPTION
The MICO® Straight Bore Actuator Type Air/Hydraulic Actuator is the combination of a remote actuator and an air chamber. The remote actuator has a single acting piston with a stem seal. Air pressure is used to actuate a push rod in the air chamber. The push rod in turn moves a piston in the hydraulic chamber which causes the stem seal to close off the fluid reservoir port. The continued movement of the hydraulic piston then generates high hydraulic pressures at the outlet port. The stem seal actuator eliminates cup cutting by allowing the cups to move freely in the master cylinder without passing over any ports.

This Air/Hydraulic Actuator allows either one of two pressure sources to operate a slave cylinder, brake or other device. If connected to a remote reservoir this actuator can be used as a single source.

Typical System Schematic
NOTE: Contact MICO, Inc. for additional installation information.

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>External Residual Check Valve</th>
<th>Air Chamber Size</th>
<th>Hydraulic Pressure @ 6.9 bar (100 PSI) Air Pressure</th>
<th>Effective Displacement</th>
<th>Effective Stroke</th>
<th>Bore Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-460-031</td>
<td>BF</td>
<td>Yes</td>
<td>61.1 cm² (24 in²)</td>
<td>94 bar (1360 PSI)</td>
<td>41.8 cm³ (2.5 in³)</td>
<td>36.6 mm (1.44 in)</td>
<td>38.1 mm (1.500 in)</td>
</tr>
<tr>
<td>12-460-032</td>
<td>HO</td>
<td>No</td>
<td>61.1 cm² (24 in²)</td>
<td>94 bar (1360 PSI)</td>
<td>41.8 cm³ (2.5 in³)</td>
<td>36.6 mm (1.44 in)</td>
<td>38.1 mm (1.500 in)</td>
</tr>
</tbody>
</table>

BF = DOT 3, 4, 5 and 5.1 brake fluid. HO = mineral base hydraulic oil.

All model numbers have a maximum air pressure rating of 8 bar (120 PSI).

All model numbers have a maximum fluid pressure rating of 172 bar (2500 PSI).
Fluid Reservoirs
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
Poyallomer Reservoirs

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

HO = mineral base hydraulic oil.
BF = DOT 3, 4, 5 and 5.1 brake fluid.

SPECIFICATIONS
Metal Reservoirs

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Fluid Type</th>
<th>Mounting Bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 20-920-002</td>
<td>BF or HO</td>
<td>No</td>
</tr>
<tr>
<td>** 20-920-006</td>
<td>BF or HO</td>
<td>Yes</td>
</tr>
<tr>
<td>20-920-009</td>
<td>BF or HO</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* 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.
NOTES
BRAKES

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Two-Stage Cylinders

Valves
Accumulator Charging
Electrohydraulic Brake
Park Brake
Pressure Modulating

Miscellaneous Components
In-line Residual Check Valves
Pump with Integrated Valves
Reservoirs