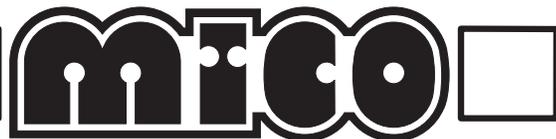


# Installation and Service Instructions

## THROTTLE CONTROL



*Model Number	Repair Kit	*Model Number	Repair Kit
12-460-065 (BF)	12-400-021	12-460-157 (BF)	12-400-009
12-460-150 (HO)	12-400-024	12-460-176 (HO)	12-400-012
12-460-151 (BF)	12-400-023	12-460-175 (BF)	12-400-025
12-460-154 (HO)	12-400-024		

HO - Hydraulic Oil    BF - Brake Fluid

\* NOTE: Complete units consist of pedal and actuator, slave cylinder and reservoir. See inside for more information on individual components.

### GENERAL

The customer must use proper installation procedures so as not to create any undo stress or adverse environmental exposure to the Throttle Control components. The customer must also approve, through testing, this device for use and performance on vehicle. This testing and approval must be completed before in-field service use.

### MOUNTING

#### BASE PLATE AND PEDAL ASSEMBLY

1. Select a convenient mounting location on vehicle floor board, tow board, or firewall. Be sure that base plate and pedal assembly do not interfere with other vehicle components.
2. Using the base plate as a template, drill two 8.8 mm (11/32") diameter holes.

#### ⚠ CAUTION

Observe vehicle manufacturer's recommendations or prohibitions before drilling.

3. Fasten base plate to mounting surface.
4. Attach actuator push rod to one of three threaded holes on pedal using screw and spacer provided.  
**NOTE: Spacer must fit between push rod and pedal.**

#### SLAVE CYLINDER

1. Mount slave cylinder in a convenient location close to carburetor, using a 1/4" screw or pin.  
**NOTE: Allow for pivotal movement of cylinder during application.**
2. Attach slave cylinder push rod to carburetor linkage. The push rod has standard 5/16-24 threads to accommodate available ball joints or clevises.  
**NOTE: Positioning of the slave cylinder will determine the desired maximum stroke of up to 60.3 mm (2.38"). A bell crank may be used to give pull action if the push action is not suitable for your particular installation.**
3. We recommend 3.2-4.5 kgf (7-10 lb) of return spring force at the slave cylinder push rod. Without return force on the push rod, the control will not be responsive to command and ideal revs may be inconsistent.

### RESERVOIR

1. Mount reservoir in a convenient location on the fire-wall.

#### ⚠ CAUTION

Be sure reservoir is higher than the pedal actuator and the slave cylinder so fluid can be gravity fed into them.

### PLUMBING

(Refer to Figures 1 and 2)

#### HYDRAULIC CONNECTIONS AND INSTALLATION TIPS

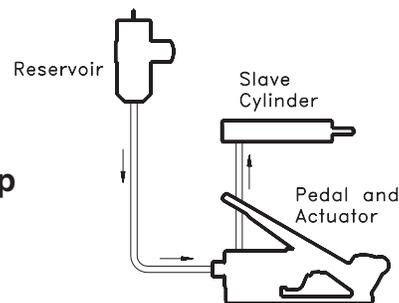
Standard 1/8" NPTF to 1/4" tube brass adaptor fittings may be used for all tubing connections. Copper, steel or plastic 1/4" tubing may be used for the hydraulic lines.

#### MINERAL BASED HYDRAULIC OIL SYSTEMS

When fluid line lengths become excessive, tubing I.D. should increase proportionately. If vehicle is subjected to low temperatures which could restrict the flow of fluid, we recommend the fluid be thinned by using a 50/50 mixture No. 1 fuel oil.

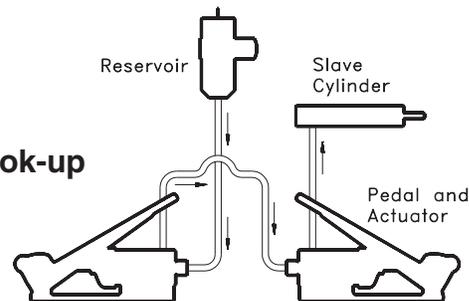
1. Connect slave to side port of pedal actuator.
2. Connect reservoir to end port of pedal actuator.

FIGURE 1



1 Unit Hook-up

FIGURE 2



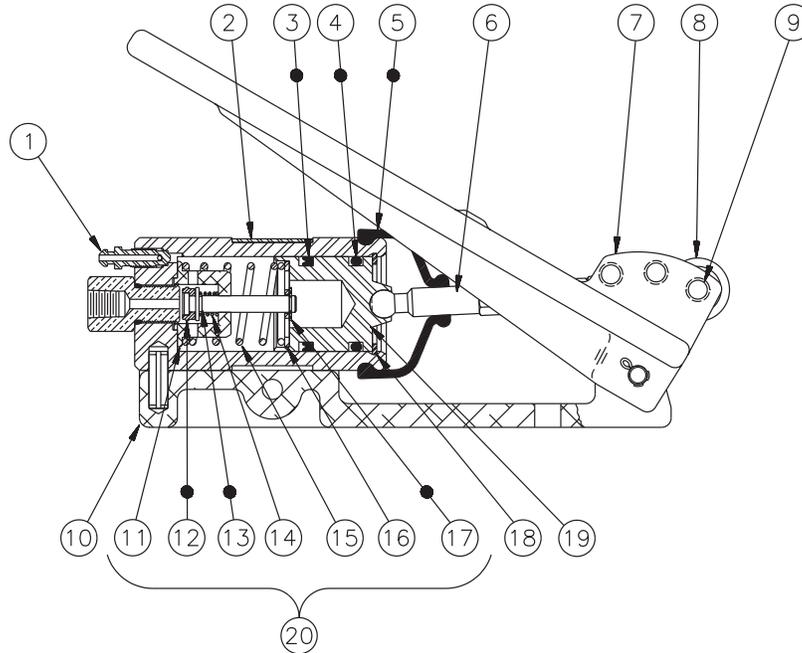
2 Unit Hook-up

Model Number	Repair Kit	Model Number	Repair Kit
* 12-460-003 (BF)	12-400-007	12-460-124 (HO)	12-400-002
* 12-460-006 (HO)	12-400-002	12-460-125 (BF)	12-400-007
* 12-460-064 (HO)	12-400-002	12-460-126 (HO)	12-400-002
* 12-460-067 (BF)	12-400-007	12-460-170 (HO)	12-400-002
12-460-121 (BF)	12-400-021		

HO - Hydraulic Oil    BF - Brake Fluid

\* Actuator assembly only, no pedal or base

**FIGURE 3**



● **Items included in Repair**

**PEDAL ACTUATOR DISASSEMBLY**

(Refer to Figure 3)

1. Disconnect necessary fluid lines.
2. Remove unit from vehicle by removing two mounting bolts.
3. Remove screw (9) and spacer that attaches pedal (7) to rod end (8).
4. Remove screw that attaches clamp (2) to base (10).
5. Remove bleeder screw (1) and drain fluid before starting disassembly.
6. Remove boot (5). Remove snap ring (18).
7. Pull push rod (6) and piston (19) out of actuator bore.
8. Remove cup(3) and o-ring (4) from piston (19).
9. Remove stem assembly (20) from actuator bore.

**▲ CAUTION**

When removing cup and o-ring, be careful not to scratch or mar finished surfaces.

10. Remove snap ring (17) from stem (13).

**▲ CAUTION**

Care must be taken when removing snap ring as it is under tension of spring (15).

11. Disassemble retainer (16), spring (15), retainer (11), stem (13) and spring (14).
12. Remove seat (12) from stem (13).

**PEDAL ACTUATOR ASSEMBLY**

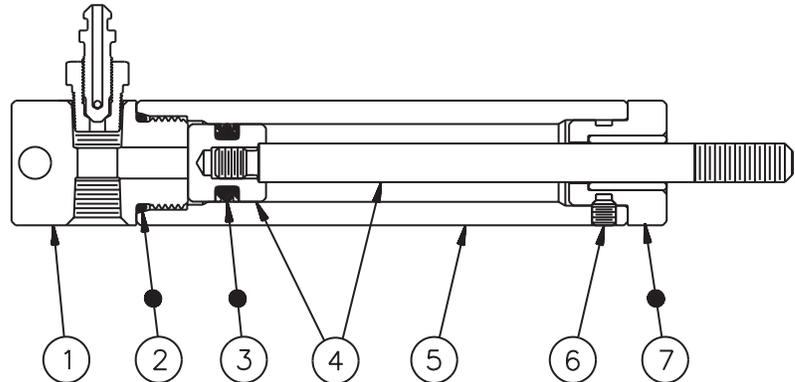
(Refer to Figure 3)

1. Clean all parts thoroughly and allow to dry before reassembling.
2. Lubricate rubber components from repair kit in clean system fluid.
3. Install new seat (12) on stem (13).
4. Install spring (14) over stem (13) and insert into retainer (11). Note direction of retainer (11) and stem (13).
5. Slide spring (15) and retainer (16) over stem (13). Then install snap ring (17) on stem (13).
6. Install stem assembly (20) into actuator bore.
7. Install new o-ring (4) and new cup (3) on piston (19).
8. Insert piston (19) and push rod (6) into actuator bore, twisting slightly to avoid damaging seals.
9. Install snap ring (18). Install new boot (5).
10. Install actuator clamp (2) and attach with screw.
11. Align rod end (8) with pedal (7) and attach with screw (9) and spacer. **NOTE: Spacer must fit between push rod and pedal.**
12. Install actuator on vehicle. Connect fluid lines. Bleed system of air. Tighten fittings if leaks occur. Make several applications to be sure actuator is working correctly.

Model Number	Repair Kit
12-120-007 (BF)	12-100-009
12-120-010 (HO)	12-100-010
12-120-013 (BF)	*12-100-011

HO - Hydraulic Oil    BF - Brake Fluid  
 \* Also includes new boot and clamp

**FIGURE 4**



● **Items included in Repair Kits**

**SLAVE CYLINDER DISASSEMBLY**

(Refer to Figure 4)

1. Disconnect fluid line from slave cylinder inlet port. Plug line to prevent excess fluid loss.
2. Remove slave cylinder from vehicle.
3. Place slave cylinder in a soft jawed vise and remove end cap (1). Remove o-ring (2) from end cap.

**⚠ CAUTION**

Do not place slave cylinder in vise or any other tool that will damage housing.

4. Remove piston & push rod assembly (4) from housing (5).
5. Remove T-seal assembly (3) from piston end of assembly (4).

**⚠ CAUTION**

Care must be taken so as not to scratch piston when removing T-seal.

6. Remove the three set screws (6) which are holding end cap & bearing assembly (7) in housing (5).
7. Remove end cap & bearing assembly (7) from housing (5).

**SLAVE CYLINDER ASSEMBLY**

(Refer to Figure 4)

1. Clean all parts thoroughly and allow to dry before reassembling.
2. Lubricate rubber components from repair kit in clean system fluid.
3. Install new T-seal assembly (3) on piston & push rod assembly (4). Install one nylon back-up ring on each side of T-seal.

**⚠ CAUTION**

Be careful not to scratch piston when installing seal and back-up rings.

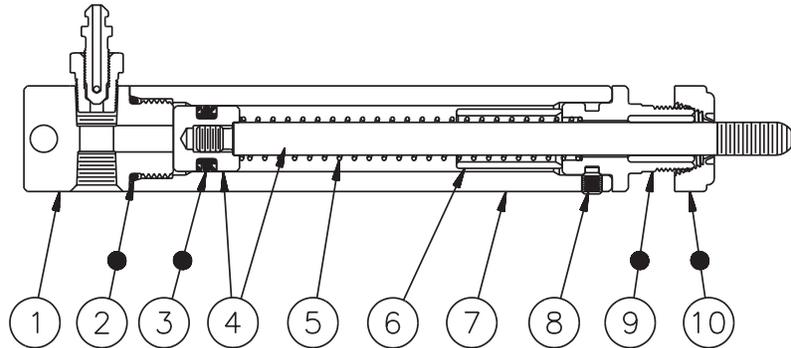
4. Slightly lubricate all of piston & push rod assembly (4) with clean system fluid and install into housing (5). **NOTE: To avoid damaging new T-seal assembly (3) install piston & push rod assembly into housing through end cap (1) end.**
5. Install new o-ring (2) on end cap (1) and install end cap in housing (5). Torque 20.3 N-m (15 lb-ft).
6. Install new end cap & bearing assembly (7) over push rod (4) and into housing (5). Install and tighten three set screws (6).
7. Install slave cylinder on vehicle. Connect linkage and fluid line.
8. Fill system reservoir with clean system fluid and bleed system until all air is removed. Tighten fittings if leaks occur.
9. Make several applications to be sure slave cylinder is working properly.

Model Number	Repair Kit
12-120-015 (BF)	12-100-013
12-120-016 (HO)	12-100-014
12-120-017 (BF)	12-100-013
12-120-020 (HO)	12-100-012
20-120-004 (HO)	12-100-016

HO - Hydraulic Oil    BF - Brake Fluid

**FIGURE 5**

● **Items included in Repair Kits**



**SLAVE CYLINDER DISASSEMBLY**

(Refer to Figure 5)

1. Disconnect fluid line from slave cylinder inlet port. Plug line to prevent excess fluid loss.
2. Remove slave cylinder from vehicle.
3. Remove wiper seal (9) by threading off end of push rod (4). Note, not all cylinders use wiper seal.
4. Place slave cylinder in a soft jawed vice and remove end cap (1). Remove o-ring (2) from end cap.
5. Remove piston & push rod assembly (4), spring (5) and sleeve (6) from housing (7).
6. Remove T-seal assembly (3) from piston end of assembly (4).

**▲ CAUTION**

Do not place slave cylinder in vise or any other tool that will damage housing.

7. Remove the three set screws (8) which are holding end cap & bearing assembly (9) in housing (7).

**▲ CAUTION**

Care must be taken so as not to scratch piston when removing T-seal.

8. Remove end cap & bearing assembly (9) from housing (7).

**SLAVE CYLINDER ASSEMBLY**

(Refer to Figure 5)

1. Clean all parts thoroughly and allow to dry before reassembling.
2. Lubricate rubber components from repair kit in clean system fluid.
3. Install new T-seal assembly (3) on piston & push rod assembly (4). Install one nylon back-up ring on each side of T-seal.

**▲ CAUTION**

Be careful not to scratch piston when installing seal and back-up rings.

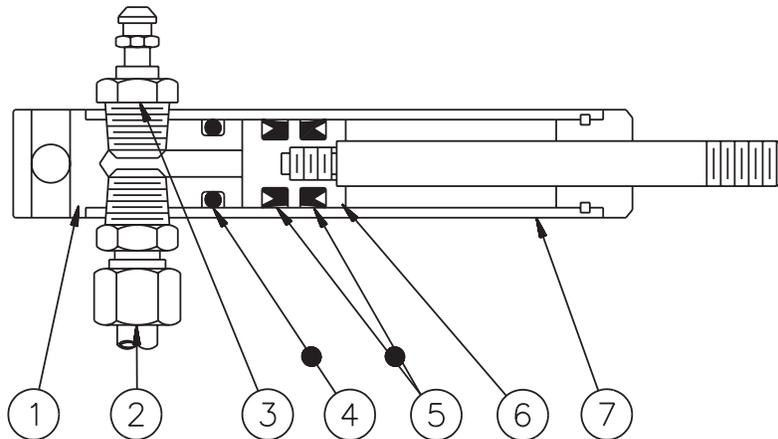
4. Slightly lubricate all of piston & push rod assembly (4) with clean system fluid and install into housing (7). **NOTE: To avoid damaging new T-seal assembly (3) install piston & push rod assembly into housing through end cap (1) end.**
5. Install spring (5) and sleeve (6) over push rod end of (4) and slide into housing (7).
6. Install new o-ring (2) on end cap (1) and install end cap in housing (7). Torque 20.3 N-m (15 lb-ft).
7. Install new end cap & bearing assembly (9) over push rod (4) and into housing (7). Install and tighten three set screws (8).
8. Carefully install new wiper seal (10) by threading on end of push rod (4) and then threading on end cap (9). Note, not all cylinders use wiper seal.
9. Install slave cylinder on vehicle. Connect linkage and fluid line.
10. Fill system reservoir with clean system fluid and bleed system until all air is removed. Tighten fittings if leaks occur.
11. Make several applications to be sure slave cylinder is working properly.

Model Number	Repair Kit
12-120-115 (BF)	12-100-001
12-120-116 (HO)	12-100-004

HO - Hydraulic Oil    BF - Brake Fluid

**NOTE**  
These model numbers are no longer available; however, the repair kits are.

**FIGURE 6**



● **Items included in Repair Kits**

**SLAVE CYLINDER DISASSEMBLY**

(Refer to Figure 6)

1. Disconnect necessary fluid lines.
2. Remove tubing from inlet fitting (2). This may be plugged to prevent excessive fluid loss.
3. Remove unit from vehicle.
4. Remove bleeder screw assembly (3) and inlet fitting (2) from housing (7).

**⚠ CAUTION**

Do not place slave cylinder in vise or any other tool that will damage housing.

5. Remove end plug (1) from housing (7).
6. Remove push rod & piston assembly (6) from housing (33).
7. Remove cups (5) from push rod & piston assembly (6).
8. Remove o-ring (4) from end plug (1).

**SLAVE CYLINDER ASSEMBLY**

(Refer to Figure 6)

1. Clean all parts thoroughly and allow to dry before reassembling.
2. Lubricate rubber components from repair kit in clean system fluid.
3. Install new o-ring (4) on end plug (1).
4. Install new cups (5) on push rod & piston assembly (6). Note direction of cups.
5. Insert push rod & piston assembly into housing (7).

**⚠ CAUTION**

Do not allow cups to extrude up into the two 1/8 - 27 ports.

6. Insert end plug (1) into housing (7). Align bleeder screw assembly (3) and fitting holes.
7. Install bleeder screw assembly (3). Install inlet fitting (2).
8. Install unit on vehicle.
9. Connect fluid lines. Bleed system of air. Tighten fittings if leaks occur. Make several applications to be sure slave cylinder is working properly.

## BLEEDING

### GRAVITY BLEEDING

1. Fill system with proper fluid.

#### CAUTION

Models 12-460-175 & 12-460-151 are for brake fluid only and Models 12-460-176 & 12-460-150 are for hydraulic oil only. Never use mineral based hydraulic oil in a brake fluid system or brake fluid in a mineral based hydraulic oil system. If the wrong fluid is used, it will ruin the seals in the system.

2. Bleed pedal actuator at bleeder screw, then bleed slave cylinder at bleeder screw making sure all air is eliminated from the system.

### PRESSURE BLEEDING

Depending on the routing of the connecting tubing, gravity bleeding may not be adequate. Therefore, pressure bleeding would be recommended.

1. Actuator must be at full pedal return position.
2. Set the pressure bleeder at approximately 1.38 bar (20 psi).
3. Attach the bleeder hose connector to the reservoir.
4. Open both actuator and slave cylinder bleeder screws.
5. Open the bleeder valve.
6. When all air has been removed and clear system fluid is observed, close the actuator bleeder and then the slave cylinder bleeder.
7. Close pressure bleeder valve.
8. Remove bleeder.

MICO could not possibly know of and give advice with respect to all conceivable applications in which this product may be used and the possible hazards and/or results of each application. MICO has not undertaken any such wide evaluation. Therefore, anyone who uses an application which is not recommended by the manufacturer, first must completely satisfy himself that a danger will not be created by the application selected, or by the particular model of our product that is selected for the application.

MICO has made every attempt to present accurate information in catalogs, brochures and other printed material. MICO can accept no responsibility for errors from unintentional oversights that may exist. Due to a continuous program of product improvement, both materials and specifications are subject to change without notice or obligation.

MICO is a registered trademark of MICO, Incorporated. MICO is registered in the U.S. Patent and Trademark Office as well as in Canada, Great Britain, South Korea, Australia, and Japan.

### MICO, Incorporated

1911 Lee Boulevard (Zip Code 56003-2507)  
P.O. Box 8118 / North Mankato, MN U.S.A. 56002-8118  
 507.625.6426 **Facsimile** 507.625.3212

### MICO West Division

701 East Francis Street (Zip Code 91761-5514)  
P.O. Box 9058 / Ontario, CA U.S.A. 91762-9058  
 909.947.4077 **Facsimile** 909.947.6054

