



Remote Actuator

Installation and Service Instructions

BE SURE TO READ GENERAL INSTALLATION GUIDELINES SHEET (81-600-001) BEFORE PROCEEDING

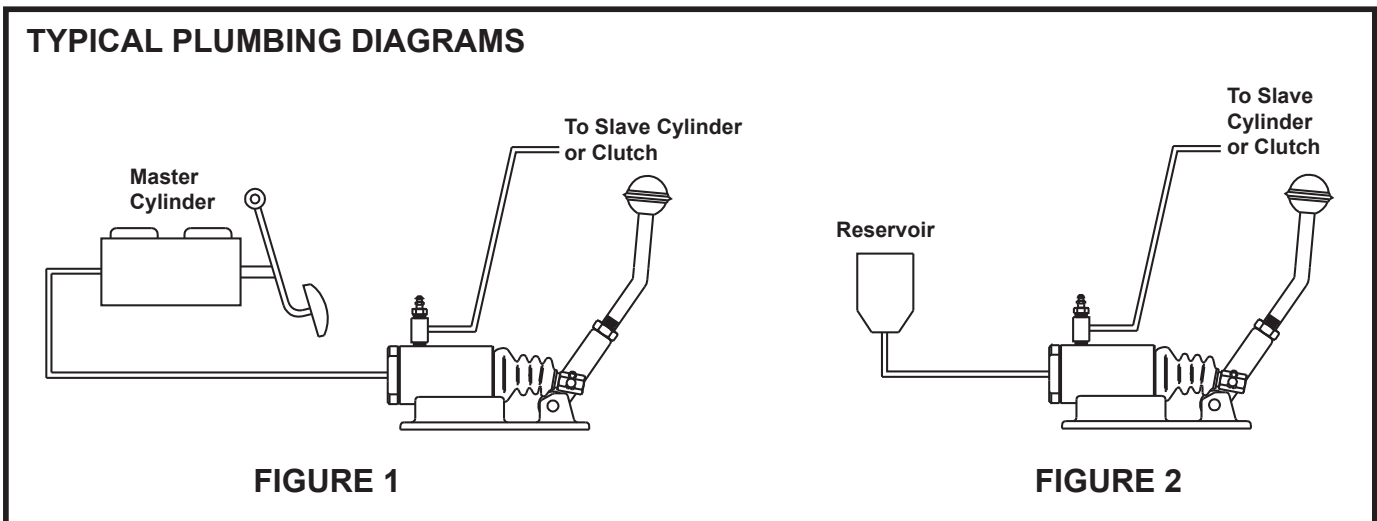
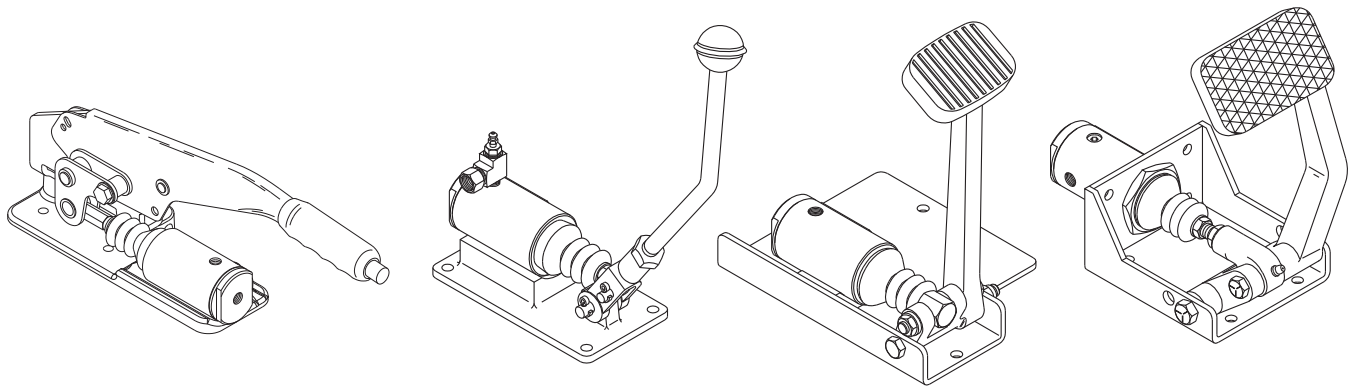
TABLE 1

Model Number	Fluid Type	Repair Kit Number	Type Actuation	Model Number	Fluid Type	Repair Kit Number	Type Actuation
02-460-093	BF	02-400-066	Lever	03-460-028	HO	02-400-067	Lever
02-460-124	HO	02-400-162	Pedal	03-460-030	HO	02-400-067	Lever
02-460-127	BF	02-400-066	Pedal	03-460-067	BF	02-400-066	Pedal
02-460-128	HO	02-400-067	Pedal	03-460-068	HO	02-400-067	Pedal
02-460-129	BF	02-400-066	Pedal	03-460-069	BF	02-400-066	Pedal
02-460-136	HO	02-400-162	Pedal	* 20-080-107	BF	02-400-066	None
02-460-147	BF	02-400-066	Lever	* 20-080-120	HO	02-400-162	None
02-460-148	HO	02-400-067	Lever	* 20-030-135	HO	02-400-162	None
02-460-151	BF	02-400-066	Pedal	* 20-080-139	HO	02-400-162	None
03-460-026	HO	02-400-067	Lever	* 20-080-156	HO	02-400-067	None

BF = Brake Fluid HO - Mineral Base Hydraulic Oil

* Actuator only, no pedal and base assembly

NOTE: If your product number is not listed, contact ZF Off-Highway Solutions Minnesota Inc. for information.



Models: 02-460-093 03-460-028
03-460-026 03-460-030

INSTALLATION

(Refer to Figures 1, 2, and 3)

1. Mount actuator assembly (4) in a convenient location using four 5/16 inch diameter bolts, lock washers, and lock nuts. The mounting bracket can be used as a template to locate mounting holes.
2. Install knob (1) on the course threaded end of handle (2).
3. Thread nut (3) on handle (2). Install handle (2) in clevis on actuator assembly (4) and tighten nut.
4. Install hydraulic fittings (5, 6, & 7) as necessary to make hydraulic connections. Install bleeder screw (8) and torque 16.3-19.0 N·m (12-14 lb·ft). **NOTE: Bleeder screw must be kept in an upright position.**
5. Bleed the system until all air is removed. Apply hydraulic pressure and check for leaks. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

DISASSEMBLY

(Refer to Figure 4)

1. Remove actuator by disconnecting the necessary fluid lines and removing the four mounting bolts. Drain fluid from the actuator.
2. Disconnect push rod (14) by removing cotter pin (16) and pin (19).
3. Remove screws (18) and lock washers (17) and separate the actuator assembly from base assembly (15).
4. Separate push rod (14) from piston (10) by folding back boot (13) and removing spring pin (11).
5. Remove boot (13) from push rod (14).
6. Place the actuator assembly in a vise and remove end plug assembly (1), spring (6), and piston assembly (7). **NOTE: Not all models use spring (6).**

CAUTION

End plug (2) is under tension of spring (6).

7. Remove cups (8 & 9) from piston (10). Note direction of cups (8 & 9) for reassembly. **NOTE: Be careful not to scratch or mar piston when removing cups.**
8. Remove o-ring (5), retainer (4) and seat (3) from end plug (2).

ASSEMBLY

(Refer to Figure 4)

LUBRICATE ALL RUBBER COMPONENTS FROM THE REPAIR KIT WITH CLEAN TYPE FLUID USED IN SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new cups (8 & 9) on piston (10). Note direction of cups (8 & 9).
3. Lubricate piston assembly (7) and install in housing (12) bore. Twist slightly to avoid damaging the cups.
4. Install new seat (3), new retainer (4), and new o-ring (5) on end plug (2).
5. Install spring (6) and end plug assembly (1) in housing (12) bore. Torque end plug 67.8-108.5 N·m (50-80 lb·ft). **NOTE: Not all models use spring (6).**
6. Remove the actuator assembly from vise. Apply Loctite to the threads of screws (18). Attach actuator assembly and base assembly (15) using screws (18) and lock washers (17). Torque screws (18) 16.3-19.0 N·m (12-14 lb·ft).

7. Install new boot (13) on push rod (14). Fold back boot (13) and connect push rod (14) and piston (10) using new spring pin (11). Connect new boot (13) to housing (12).
8. Align the hole in push rod (14) with the hole in the clevis on base assembly (15). Install pin (19) and cotter pin (16).
9. Install the actuator on the vehicle. Connect the fluid lines. Bleed the system of air. Tighten fittings if leaks occur. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

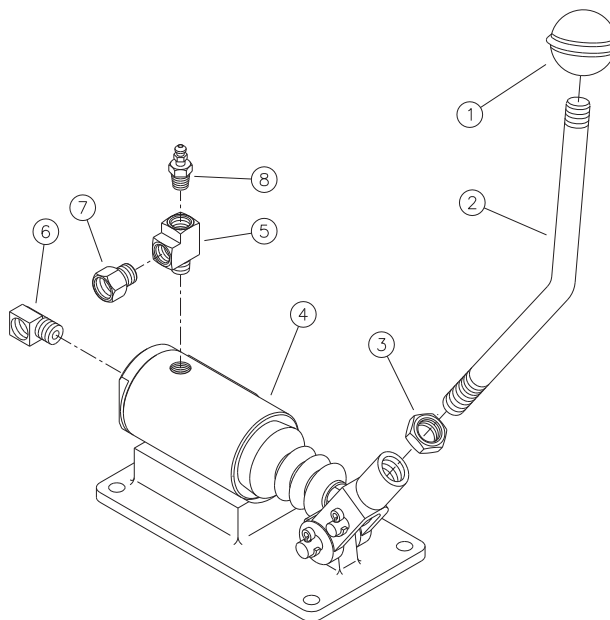


FIGURE 3

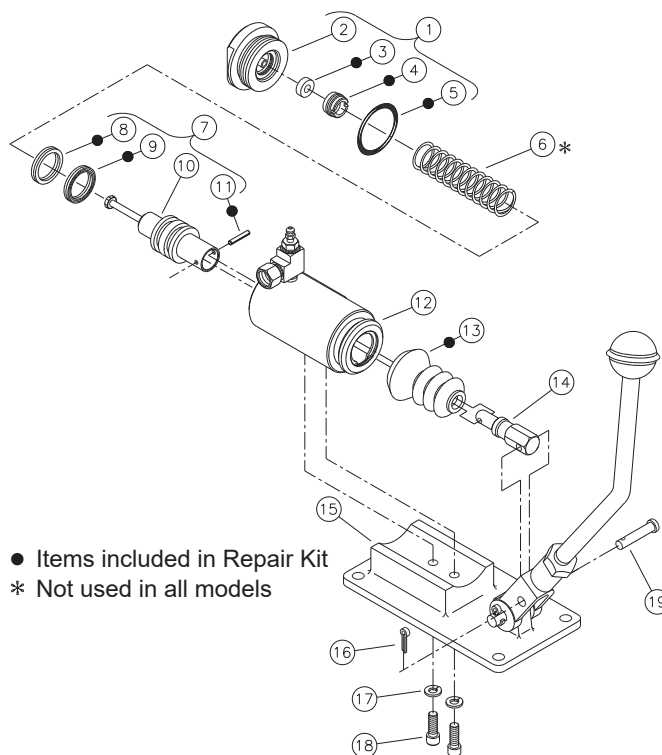


FIGURE 4

Models: 02-460-127 03-460-068
02-460-128 03-460-069
03-460-067

INSTALLATION

(Refer to Figures 1 and 2)

1. Mount the remote actuator in a convenient location for the operator. The mounting plate can be used as a template to locate mounting holes.
2. Bleed the system until all air is removed. Apply hydraulic pressure and check for leaks. Make several applications to be sure actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

DISASSEMBLY

(Refer to Figure 5)

1. Remove actuator by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.
2. Disconnect push rod (14) from pedal by removing nut (16), lock washer (17) and cap screw (20) from pedal and base assembly (19).
3. Remove screws (18) and separate actuator assembly and adapter (15) from pedal and base assembly (19).
4. Separate push rod (14) from piston (10) by folding back boot (13) and removing spring pin (11).
5. Remove boot (13) from push rod (14).
6. Place actuator in a vise and remove end plug assembly (1), spring (6), and piston assembly (7).

CAUTION

End plug (2) is under tension of spring (6).

7. Remove cups (8 & 9) from piston (10). Note direction of cups (8 & 9) for reassembly. **NOTE: Be careful not to scratch or mar piston when removing cups.**
8. Remove o-ring (5), retainer (4), and seat (3) from end plug (2).

ASSEMBLY

(Refer to Figure 5)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new cups (8 & 9) on piston (10). Note direction of cups (8 & 9).
3. Lubricate piston assembly (7) and install in housing (12) bore. Twist slightly to avoid damaging cups.
4. Install new seat (3), new retainer (4), and new o-ring (5) on end plug (2).
5. Install spring (6) and end plug assembly (1) in housing (12) bore. Torque end plug 67.8-108.5 N·m (50-80 lb·ft).
6. Remove the actuator assembly from vise. Apply Loctite to the threads of screws (18). Attach actuator assembly and adapter (15) to pedal and base assembly (19) using screws (18). Torque screws (18) 9.0-10.2 N·m (80-90 lb·in).
7. Install new boot (13) on push rod (14). Fold back boot (13) and connect push rod (14) and piston (10) using new spring pin (11). Connect new boot (13) to housing (12).
8. Align the hole in push rod (14) with the hole in pedal. Install cap screw (20), lock washer (17), and nut (16). Torque nut (16) 27.1-32.5 N·m (20-24 lb·ft).
9. Install the actuator on the vehicle. Connect the fluid lines. Bleed the system of air. Tighten fittings if leaks occur. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

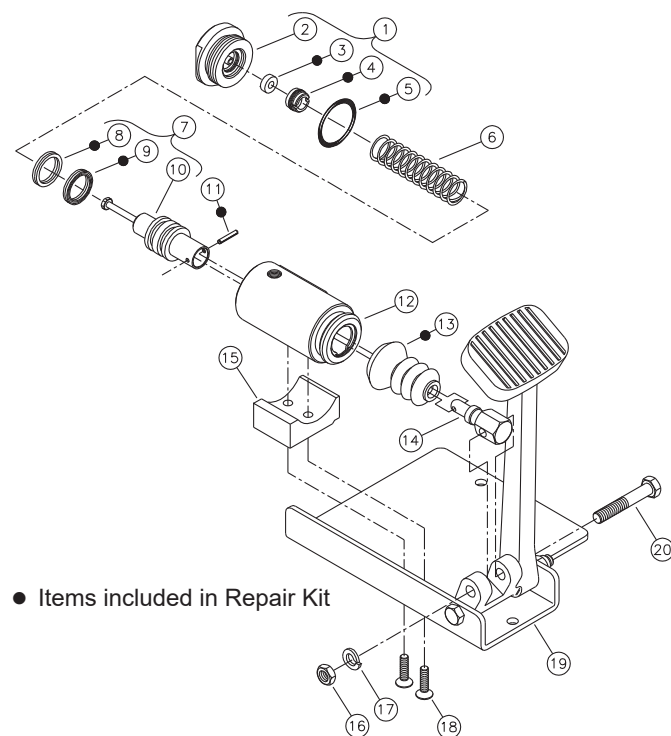


FIGURE 5

Models: 02-460-124 * 20-080-107 * 20-080-156
 02-460-129 * 20-080-120
 02-460-136 * 20-080-135
 02-460-151 * 20-080-139

* Actuator only, no pedal base assembly

INSTALLATION

(Refer to Figures 1 and 2)

1. Mount the remote actuator in a convenient location for the operator. The mounting bracket can be used as a template to locate the mounting holes.
2. Bleed the system until all air is removed. Apply hydraulic pressure and check for leaks. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

DISASSEMBLY

(Refer to Figure 4)

1. Remove actuator by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.
2. Separate push rod (15) on pedal and base assembly (16) by folding back boot (13) and removing spring pin (11).
3. Remove nut (14) and separate actuator assembly from pedal and base assembly (16).
4. Remove boot (13) from push rod (15).
5. Place actuator in a vise and remove end plug assembly (1), spring (6), and piston assembly (7).

CAUTION

End plug (2) is under tension of spring (6).

6. Remove cups (8 & 9) from piston (10). Note direction of cups (8 & 9) for reassembly. **NOTE: Be careful not to scratch or mar piston when removing cups.**
7. Remove o-ring (5), retainer (4), and seat (3) from end plug (2).

ASSEMBLY

(Refer to Figure 6)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new cups (8 & 9) on piston (10). Note direction of cups (8 & 9).
3. Lubricate piston assembly (7) and install in housing (12) bore. Twist slightly to avoid damaging cups.
4. Install new seat (3), new retainer (4), and new o-ring (5) on end plug (2).
5. Install spring (6) and end plug assembly (1) in housing (12) bore. Torque end plug 67.8-108.5 N·m (50-80 lb·ft).
6. Remove the actuator assembly from vise. Attach the actuator assembly to pedal and base assembly (16) using nut (14). Be sure actuator assembly is positioned properly. Apply Loctite to the threads of nut (14) and torque 94.9-122.0 N·m (70-90 lb·ft).
7. Install new boot (13) on push rod (15). Fold back boot (13) and connect push rod (15) and piston (10) using new spring pin (11). Connect new boot (13) to housing (12).
8. Install the actuator on the vehicle. Connect the fluid lines. Bleed the system of air. Tighten fittings if leaks occur. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

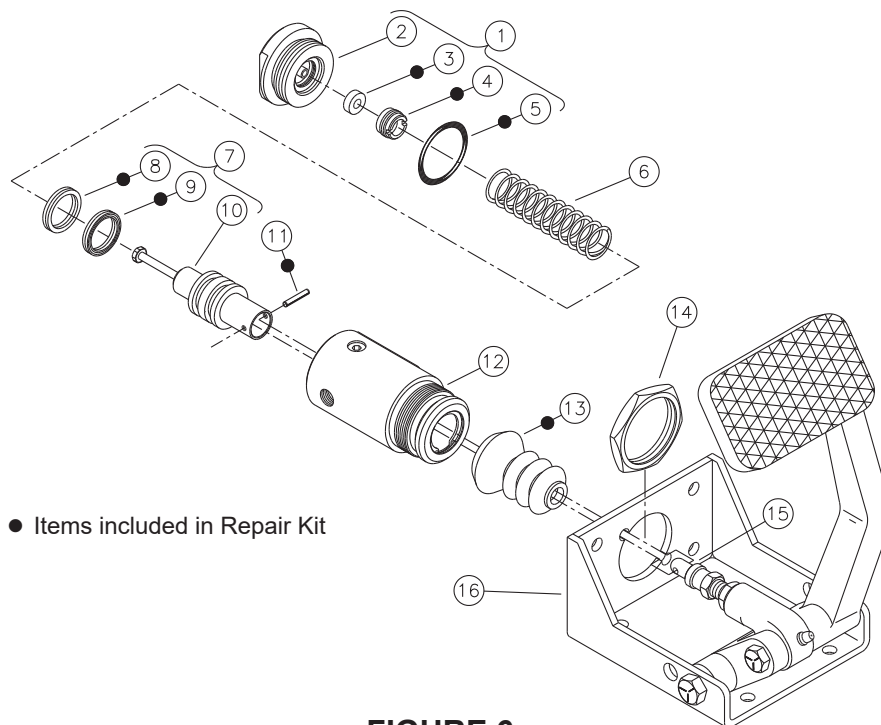


FIGURE 6

Models: 02-460-147
02-460-148

INSTALLATION

(Refer to Figures 1 and 2)

1. Mount the actuator assembly in a convenient location using three 5/16 inch diameter bolts, lock washers, and nuts. The base plate can be used as a template to locate mounting holes.
2. Make the necessary hydraulic connections.
3. Bleed the system until all air is removed. Apply hydraulic pressure and check for leaks. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

DISASSEMBLY

(Refer to Figure 7)

1. Remove actuator assembly by disconnecting necessary fluid lines and removing mounting bolts.
2. Disconnect push rod (12) from lever cam by removing cap screw (18) and lock washer (17).
3. Remove two flat head screws (15). Remove the actuator and drain fluid from the assembly.
4. Place the actuator in a vise and remove end plug assembly (1), spring (6), and piston assembly (7).

CAUTION

End plug (2) is under tension of spring (6).

5. Remove boot (14).
6. Remove cups (8 & 9) and spring pin (11) from piston (10). **NOTE: Be careful not to scratch or mar piston when removing cups.**
7. Remove o-ring (3), retainer (5) and seat (4) from end plug (2).

ASSEMBLY

(Refer to Figure 7)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new o-ring (3), new seat (4) and new retainer (5) on end plug (2).
3. Install new cups (8 & 9) and new spring pin (11) on piston (10). Note direction of cups.
4. Insert piston assembly (7) into threaded end of actuator bore. Twist slightly to avoid damaging seals.
5. Install spring (6) and end plug assembly (1) in housing (13) bore. Torque end plug 67.8-108.5 N·m (50-80 lb·ft).
6. Remove actuator assembly from vise. Apply Loctite to the threads of screws (15). Attach actuator to base plate using two flat head screws (15). Torque screws 9.0-10.2 N·m (80-90 lb·in).
7. Align push rod (12) with lever cam and attach using cap screw (18) and lock washer (17). Torque cap screw 12.9-13.1 N·m (114-116 lb·in).
8. Install the actuator on the vehicle. Connect the fluid lines. Bleed the system of air. Tighten fittings if leaks occur. Make several applications to be sure the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

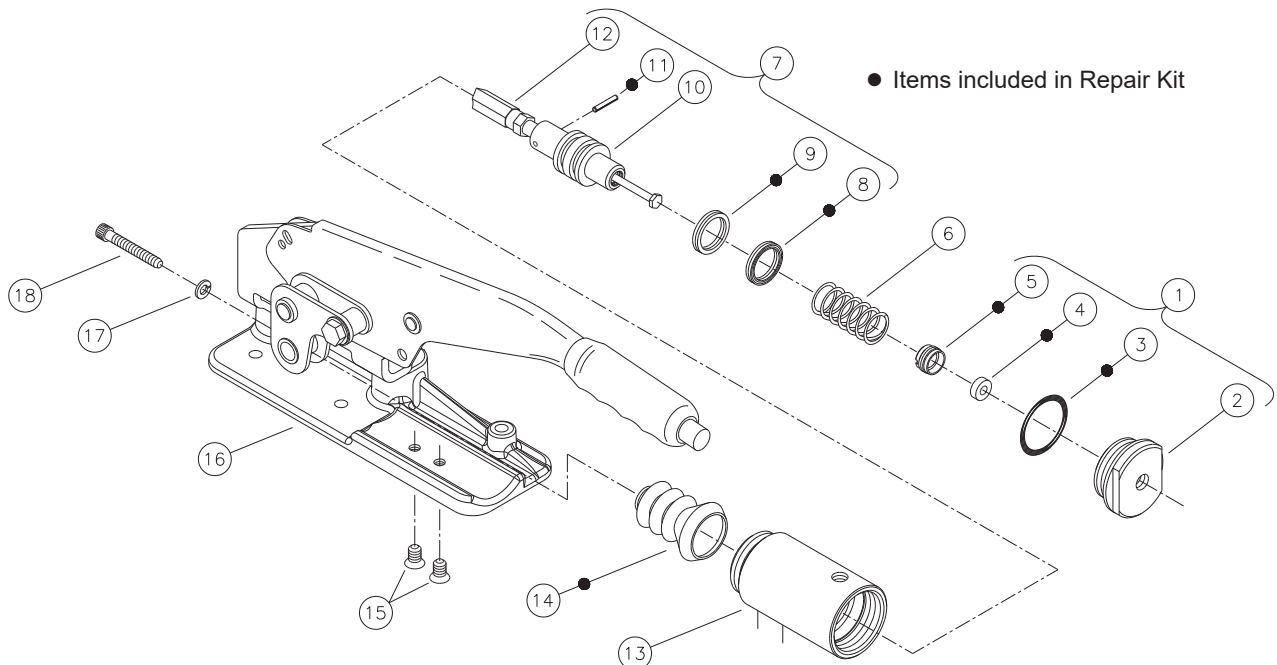


FIGURE 7

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