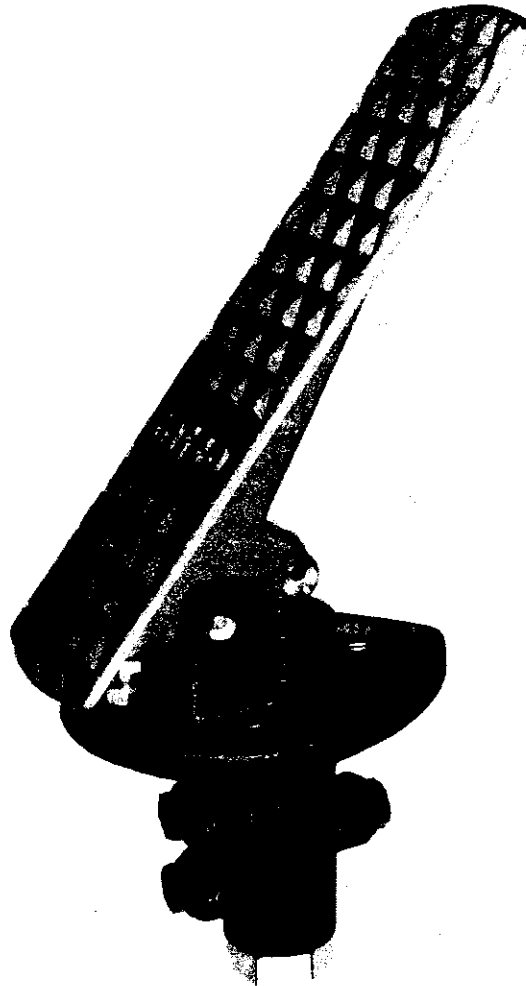


# 464 Series Pedal Actuated - Modulating HYDRAULIC POWER BRAKE VALVE

## SERVICE MANUAL



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## DISASSEMBLY

1. Separate pedal (20) from pedal base (28) by removing one e-ring (29) from pin (21) and sliding pin from base.
2. It is unnecessary to remove pin (22), cam (23), cap screw (24) or nut (25). Inspect pin (22) and cam (23) to make sure cam is in good working order and moving freely. NOTE: If for some reason cap screw (24) or nut (25) are loosened or removed they must be reset properly. Check dimensional drawing for correct measurements.
3. Separate pedal base (28) from valve assembly by removing cap screws (26) and washers (27).
4. Remove boot (1) from piston (2).
5. Remove piston (2), springs (3 & 4) and shim(s) (6) from housing bore. Note number of shim(s) being removed from housing.
6. Bearing (5) need not be removed from housing bore. NOTE: Excessive wear in both bearing (5) and piston (2) may require replacement.
7. Remove retainer (7) and ball (8) assembly from housing bore. NOTE: Ball (8) is pressed into retainer (7).
8. Remove plug (19) from housing (9). Remove spring (17), pins (16) and o-ring (18) from plug.
9. Remove spacer (10), sleeve (13) and spool (12) assembly from housing bore. NOTE: Care must be taken so as not to scratch housing bore. A wooden dowel will help in this procedure.

**CAUTION:** This assembly must be taken out by way of plug (19) end of housing (9).

10. Separate spacer (10) and spool (12) from sleeve (13). NOTE: Excessive wear on either spool (12) or sleeve (13) may require replacement.
11. Remove cup (11), o-rings (14) and o-rings (15) from sleeve (13). NOTE: Care must be taken so as not to damage cup and o-ring grooves or bore.

## ASSEMBLY

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT, SPOOL (12) AND SLEEVE (13) WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new cup (11), new o-rings (14) and new o-rings (15) on sleeve (13). Note direction of cup.
3. Carefully insert spool (12) into sleeve (13) from cup end of sleeve. Note direction of spool.
4. Insert spacer (10) into housing bore through plug (19) end. Note direction of spacer.
5. Carefully insert sleeve (13) and spool (12) assembly into housing bore. Note direction of assembly.
6. Install spring (17) into housing bore.
7. Install new o-ring (18) and new pins (16) on plug (19). Install in housing (9). Torque 25 - 35 ft. lbs.
8. Install retainer (7) and ball (8) assembly. NOTE: Depress retainer (7) until it bottoms on spacer (10). Spool (12) and retainer (7) should return when released. If the spool and retainer do not return when released, the bore of sleeve (13) was damaged when installed.
9. Install shim(s) (6), springs (3 & 4) and piston (2) in housing bore.

**CAUTION:** For proper brake pressure setting, install the same number of shims that were removed during disassembly. (If spool (12) or sleeve (13) were replaced, shim adjustment may be required.)

10. Install new boot (1) on housing (9).
11. Assembly valve assembly to pedal base (28) using cap screws (26) and washers (27). Torque cap screws 20 - 25 ft. lbs.
12. Align pedal (20) between ears of pedal base (28) and insert pin (21). Install e-ring (29).

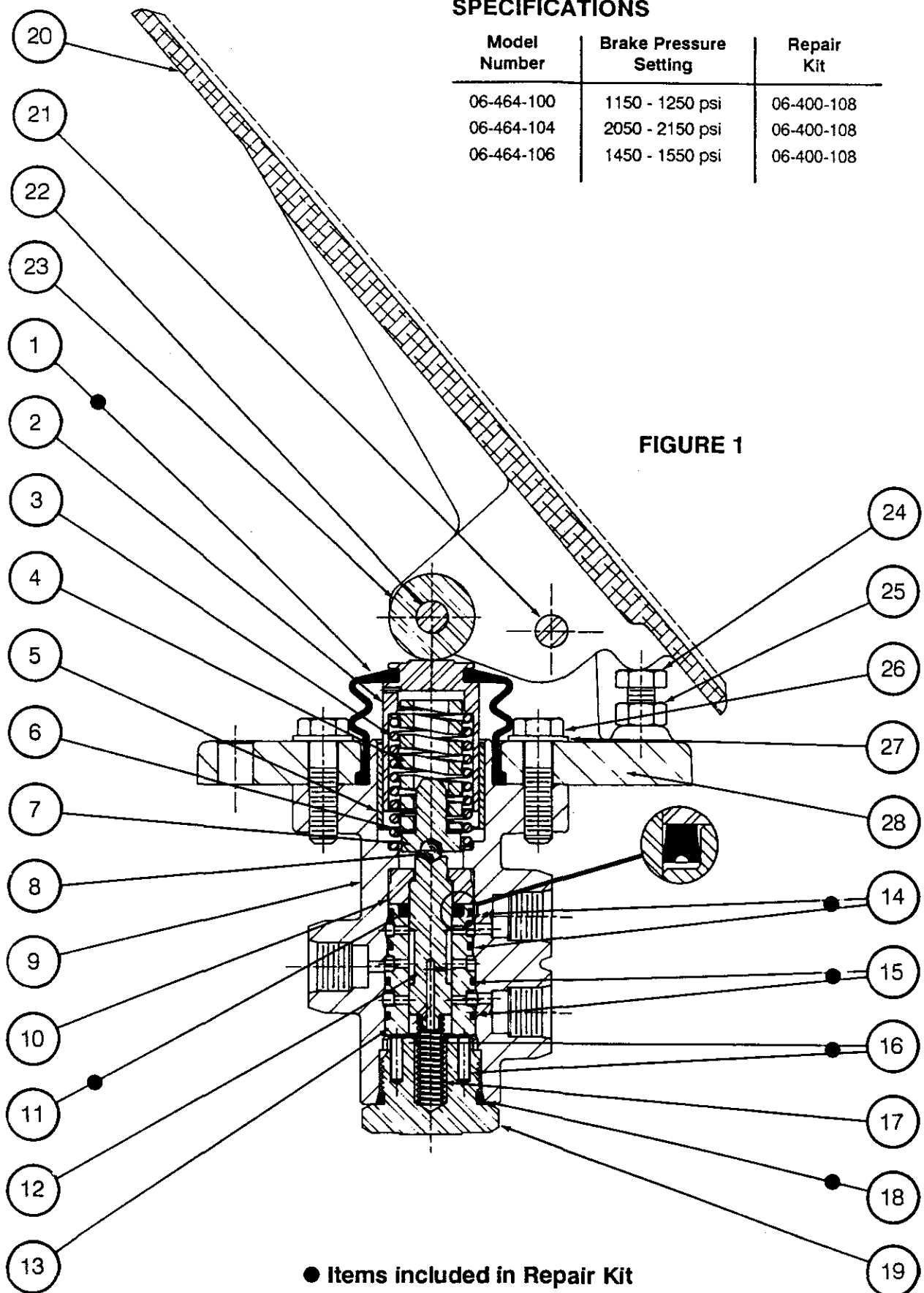
## PARTS LIST

ITEM	DESCRIPTION
1	● BOOT
2	PISTON
3	SPRING
4	SPRING
5	BEARING
6	SHIM(S) (as required)
7	RETAINER
8	BALL
9	HOUSING
10	SPACER
11	● CUP
12	SPOOL
13	SLEEVE
14	● O-RINGS (2)
15	● O-RINGS (2)
16	● PINS (2)
17	SPRING
18	● O-RING
19	PLUG
20	PEDAL
21	PIN
22	PIN
23	CAM
24	CAP SCREW
25	NUT
26	CAP SCREWS (2)
27	WASHERS (2)
28	PEDAL BASE
29	E-RINGS (4) (not shown)

# SPECIFICATIONS

Model Number	Brake Pressure Setting	Repair Kit
06-464-100	1150 - 1250 psi	06-400-108
06-464-104	2050 - 2150 psi	06-400-108
06-464-106	1450 - 1550 psi	06-400-108

FIGURE 1



## BLEEDING

Brakelines should be bled very carefully as soon as the valve is installed in the machine. Air in the system will not allow the brakes to release properly and may severely damage them.

1. Start engine and allow accumulator to reach full charge. Shut down engine, then slowly apply and release brakes, waiting one minute between applications until brakes will not apply. Repeat this step three times.
2. Operate engine to maintain accumulator pressure within working limits

throughout the bleeding procedure.

3. Open bleeder screw at wheel closest to brake valve and apply brakes cautiously until all air is bled out of line. Then close bleeder screw. Repeat this step at each wheel, moving to the next farthest wheel from the brake valve each time, as follows:
  - a. Left front
  - b. Right front
  - c. Right rear
  - d. Left rear

4. Release brake pressure for at least one (1) minute.
5. Apply brakes, holding pedal down 10 seconds; then release pressure for one (1) minute. Repeat this step two more times.
6. Repeat step 3.
7. Check for system leaks and be sure of proper brake operation.

## SERVICE CHECKS FOR 464 SERIES SINGLE PEDAL VALVES

### BRAKES SLOW TO APPLY

1. No gas charge in accumulator
  1. Check gas charge
2. Brakes not properly adjusted
  2. Adjust brakes
3. Defective brakes
  3. Check brakes
4. Hydraulic lines or fittings leaking
  4. Check for leaks and repair
5. Defective automatic adjuster (Goodrich Hi-torque Brakes only)
  5. Check adjuster operation
6. Damaged hydraulic brake lines
  6. Check lines for dents that restrict flow of oil

### BRAKES WON'T RELEASE

1. Pedal angle out of adjustment
  1. Check for proper pedal angle
2. Defective brakes
  2. Check brakes
3. Defective automatic adjusters
  3. Check operation of adjusters
4. Defective brake valve
  4. Replace brake valve

### INSUFFICIENT BRAKES

1. No oil or low oil level in tank
  1. Check oil level in tank
2. Brakes not properly adjusted
  2. Check brake adjustment
3. Oil or grease on brake lining

3. Clean or install new linings
4. Brake line mashed
  4. Check lines and replace
5. Defective automatic adjusters
  5. Check operation of adjusters
6. No gas charge in accumulator
  6. Check gas charge
7. Defective brakes
  7. Check brakes
8. Brake valve defective
  8. Replace valve

### EXCESSIVE BRAKING

1. Defective brakes
  1. Check brakes
2. Defective brake valve
  2. Replace brake valve

### BRAKES WILL NOT RELEASE COMPLETELY

1. Brakes not properly adjusted
  1. Adjust brakes
2. Defective brakes
  2. Check brakes
3. Pedal angle out of adjustment
  3. Adjust pedal angle
4. Defective wheel cylinders
  4. Replace wheel cylinders
5. Defective automatic adjuster
  5. Check operation of adjusters
6. Air in brakes (when automatic adjusters used Goodrich Hi-torque

- Brakes only)
6. Bleed brakes
  7. Defective brake valve
    7. Replace brake valve
  8. Back pressure on return line too high
    8. Remove restriction

### NO BRAKES

1. No oil in hydraulic system
  1. Check oil level in tank
2. Broken or mashed brake line
  2. Check lines for breaks or mashed condition
3. Brakes not properly adjusted
  3. Adjust brakes
4. Defective system relief valve
  4. Check pressure in pressure line to valve
5. Worn pump
  5. Check pressure in pressure line to valve
6. Defective automatic adjuster
  6. Check brake line pressure
7. Defective or worn brakes
  7. Check brakes
8. Defective brake valve
  8. Replace brake valve

### PEDAL KICKBACK WHEN BRAKES ARE APPLIED

1. Air in brakes
  1. Bleed brakes

## SERVICE DIAGNOSIS

All item numbers discussed here refer to Figures 1.

### BRAKES WILL NOT RELEASE COMPLETELY

1. Piston (2) sticking.
2. Pedal angle out of adjustment
3. Spring (17) broken.

### BRAKE WON'T RELEASE

1. Defective spool (12).
2. Defective sleeve (13).
3. Piston (2) binding.

### NO BRAKES

1. Piston (2) stuck.
2. Broken Spring (4).

### EXCESSIVE BRAKING

1. Too many Shims (6) installed in valve.

### EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE APPLIED

1. Defective Spool (12).
2. Defective sleeve (13).
3. O-ring leaking (14).
4. O-ring leaking (15).

### EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE NOT BEING USED

1. Defective spool (12).
2. Defective sleeve (13).
3. O-ring (14) leaking.
4. O-ring (15) leaking.
5. Spring (bottom) (17) broken.

### INSUFFICIENT BRAKES

1. Broken Pressure Regulating Spring (4). Boot cut, allowing dirt to accumulate under Piston (2) Flange.

# 464 Series Single Pedal Actuated POWER BRAKE VALVES

## GENERAL INSTRUCTIONS

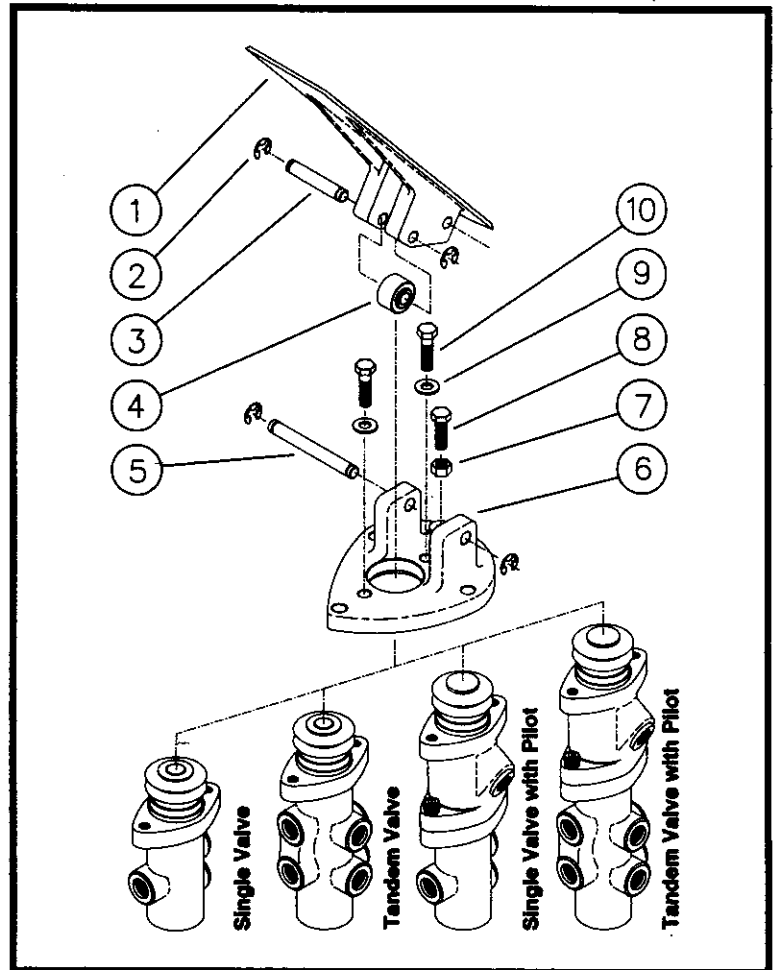


### PEDAL DISASSEMBLY

1. Separate pedal (1) from pedal base (6) by removing one e-ring (2) from pin (5) and sliding pin from base.
2. Inspect pin (3) and cam (4) to make sure cam is in good working order and moving freely.
3. It is unnecessary to remove pin (3), cam (4), cap screw (8) or nut (7) unless damaged.  
**NOTE: If for some reason cap screw (8) or nut (7) are loosened or removed they must be reset properly. Check dimensional drawing or contact MICO, Inc. for correct measurements.**
4. Separate valve assembly from base (6) by removing cap screws (10) and washers (9).

### PEDAL ASSEMBLY

1. Attach valve assembly to the base (6) by using cap screws (10) and washers (9). Torque cap screws 20 - 25 ft. lbs.
2. Align pedal (1) between ears of pedal base (6) and insert pin (5). Install e-ring (2).



### SPECIFICATIONS

Model Number	Valve Assembly Number	Brake Pressure	Description
06-464-100	20-100-328	1200 $\pm$ 50 psi	Single Power Brake Valves
06-464-102	20-100-342	900 $\pm$ 50 psi	
06-464-104	20-100-343	2100 $\pm$ 50 psi	
06-464-106	20-100-368	1500 $\pm$ 50 psi	
06-464-108	20-100-392	2000 $\pm$ 50 psi	
06-464-110	20-100-394	550 $\pm$ 50 psi	
06-464-200	20-100-345	1200 $\pm$ 75 psi	Tandem Power Brake Valves
06-464-202	20-100-379	2200 $\pm$ 100 psi	
06-464-206	20-100-381	1500 $\pm$ 75 psi	
06-464-400	20-100-361	1200 $\pm$ 75 psi	Pedal/Pilot-Tandem Power Brake Valves
06-464-402	20-100-383	2200 $\pm$ 100 psi	

SEE REVERSE SIDE FOR DIMENSIONAL DRAWING

DIMENSIONS WILL VARY SLIGHTLY BETWEEN UNITS AND ARE TO BE USED FOR REFERENCE PURPOSES ONLY.



**mico**  
WEST DIVISION

**Printed in U.S.A.**

Service Instructions  
**464 Series - Single  
 POWER BRAKE VALVE**

REPAIR KIT 06-400-136



**SPECIFICATIONS**

Model Number	Brake Pressure Setting
06-464-914	1200 $\pm$ 50 psi

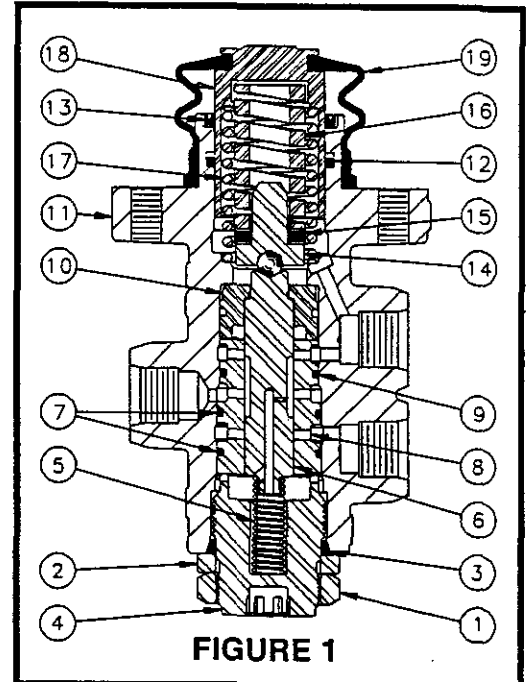
**DISASSEMBLY**

1. Remove boot (19) from piston (18).
2. Remove piston (18), springs (16 & 17) and shim(s) (15) from housing bore.
3. Remove retainer assembly (14) from housing bore. **NOTE: Ball is pressed into retainer.**
4. Carefully remove seal (13) and quad ring (12) from housing (11) bore.
5. Loosen nut (1) and remove end plug (4) from housing. Remove spring (5), nut (1), washer (2), and o-ring (3) from end plug (4).
6. Remove spacer (10), sleeve (8) and spool (6) assembly from housing bore. This assembly must be taken out by way of end plug (4) end of housing (12). **NOTE: Care must be taken so as not to scratch housing bore. A wooden dowel will help in this procedure.**
7. Separate spacer (10) and spool (6) from sleeve (8). **NOTE: Excessive wear on either spool (6) or sleeve (8) may require replacement.**
8. Remove o-ring (9) and o-rings (7) from sleeve (8). **NOTE: Care must be taken so as not to damage o-ring grooves or bore.**

**ASSEMBLY**

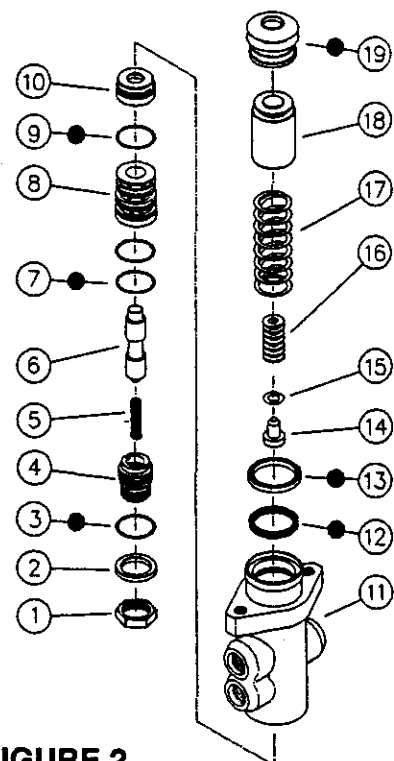
LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT, SPOOL (6) AND SLEEVE (8) WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Carefully install new seal (13) and new quad ring (12) in housing (11) bore. **NOTE: Seal (13) lip to face out.**
3. Install new o-rings (7) on large diameter end of sleeve (8) and new o-ring (9) on smaller diameter end of sleeve (8).
4. Carefully insert spool (6) into sleeve (8). Note direction of spool.
5. Insert spacer (10) into housing bore through end plug (4) end. Note direction of spacer.
6. Carefully insert sleeve (8) and spool (6) assembly into housing bore using a wooden dowel. Note direction of assembly.
7. Install spring (5) into housing bore.
8. Install end plug (4) and torque to 8 - 15 ft. lbs. Install new o-ring (3), washer (2), and nut (1). Torque nut (1) to 50 - 60 ft. lbs.
9. Install retainer assembly (14) in housing. **NOTE: Depress retainer (14) until it bottoms on spacer (10). Spool (6) and retainer (14) should return when released. If the spool and retainer do not return when released, the bore of sleeve (8) was possibly damaged when installed.**
10. Install shim(s) (15), springs (16 & 17) and piston (18) in housing bore. **NOTE: For proper brake pressure setting, install the same number of shims and spacer that were removed during disassembly. (If spool (6), sleeve (8), or spring (16) were replaced, shim adjustment may be required.)**
11. Install new boot (19) on piston (18).



**FIGURE 1**

• **Items included in  
 Repair Kit 06-400-136**



**FIGURE 2**

## BLEEDING

Brakelines should be bled very carefully as soon as the valve is installed in the machine. Air in the system will not allow the brakes to release properly and may severely damage them.

1. Start engine and allow accumulator to reach full charge. Shut down engine, then slowly apply and release brakes, waiting one minute between applications until brakes will not apply. Repeat this step three times.
2. Operate engine to maintain accumulator pressure within working limits

- throughout the bleeding procedure.
3. Open bleeder screw at wheel closest to brake valve and apply brakes cautiously until all air is bled out of line. Then close bleeder screw. Repeat this step at each wheel, moving to the next farthest wheel from the brake valve each time, as follows:
    - a. Left front
    - b. Right front
    - c. Right rear
    - d. Left rear

4. Release brake pressure for at least one (1) minute.
5. Apply brakes, holding pedal down 10 seconds; then release pressure for one (1) minute. Repeat this step two more times.
6. Repeat step 3.
7. Check for system leaks and be sure of proper brake operation.

## SERVICE CHECKS FOR 464 SERIES SINGLE PEDAL VALVES

### BRAKES SLOW TO APPLY

1. No gas charge in accumulator
1. Check gas charge
2. Brakes not properly adjusted
2. Adjust brakes
3. Defective brakes
3. Check brakes
4. Hydraulic lines or fittings leaking
4. Check for leaks and repair
5. Defective automatic adjuster (Goodrich Hi-torque Brakes only)
5. Check adjuster operation
6. Damaged hydraulic brake lines
6. Check lines for dents that restrict flow of oil

### BRAKES WON'T RELEASE

1. Pedal angle out of adjustment
1. Check for proper pedal angle
2. Defective brakes
2. Check brakes
3. Defective automatic adjusters
3. Check operation of adjusters
4. Defective brake valve
4. Replace brake valve

### INSUFFICIENT BRAKES

1. No oil or low oil level in tank
1. Check oil level in tank
2. Brakes not properly adjusted
2. Check brake adjustment
3. Oil or grease on brake lining
3. Clean or install new linings

4. Brake line mashed
4. Check lines and replace
5. Defective automatic adjusters
5. Check operation of adjusters
6. No gas charge in accumulator
6. Check gas charge
7. Defective brakes
7. Check brakes
8. Brake valve defective
8. Replace valve

### EXCESSIVE BRAKING

1. Defective brakes
1. Check brakes
2. Defective brake valve
2. Replace brake valve

### BRAKES WILL NOT RELEASE COMPLETELY

1. Brakes not properly adjusted
1. Adjust brakes
2. Defective brakes
2. Check brakes
3. Pedal angle out of adjustment
3. Adjust pedal angle
4. Defective wheel cylinders
4. Replace wheel cylinders
5. Defective automatic adjuster
5. Check operation of adjusters
6. Air in brakes (when automatic adjusters used Goodrich Hi-torque Brakes only)
6. Bleed brakes

7. Defective brake valve
7. Replace brake valve
8. Back pressure on return line too high
8. Remove restriction

### NO BRAKES

1. No oil in hydraulic system
1. Check oil level in tank
2. Broken or mashed brake line
2. Check lines for breaks or mashed condition
3. Brakes not properly adjusted
3. Adjust brakes
4. Defective system relief valve
4. Check pressure in pressure line to valve
5. Worn pump
5. Check pressure in pressure line to valve
6. Defective automatic adjuster
6. Check brake line pressure
7. Defective or worn brakes
7. Check brakes
8. Defective brake valve
8. Replace brake valve

### PEDAL KICKBACK WHEN BRAKES ARE APPLIED

1. Air in brakes
1. Bleed brakes

## SERVICE DIAGNOSIS

All item numbers discussed here refer to Figures 1 & 3.

### BRAKES WILL NOT RELEASE COMPLETELY

1. Piston (18) sticking.
2. Pedal angle out of adjustment
3. Spring (5) broken.

### BRAKE WON'T RELEASE

1. Defective spool (6).
2. Defective sleeve (8).
3. Piston (18) binding.

### NO BRAKES

1. Piston (18) stuck.
2. Broken spring (16).

### EXCESSIVE BRAKING

1. Too many shims (15) installed in valve.

### EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE APPLIED

1. Defective spool (6).
2. Defective sleeve (8).
3. O-rings leaking (7).
4. O-rings leaking (9).

### EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE NOT BEING USED

1. Defective spool (6).
2. Defective sleeve (8).
3. O-rings (7) leaking.
4. Spring (bottom) (5) broken.

### INSUFFICIENT BRAKES

1. Broken pressure regulating spring (16). Boot cut, allowing dirt to accumulate under piston (18) flange.



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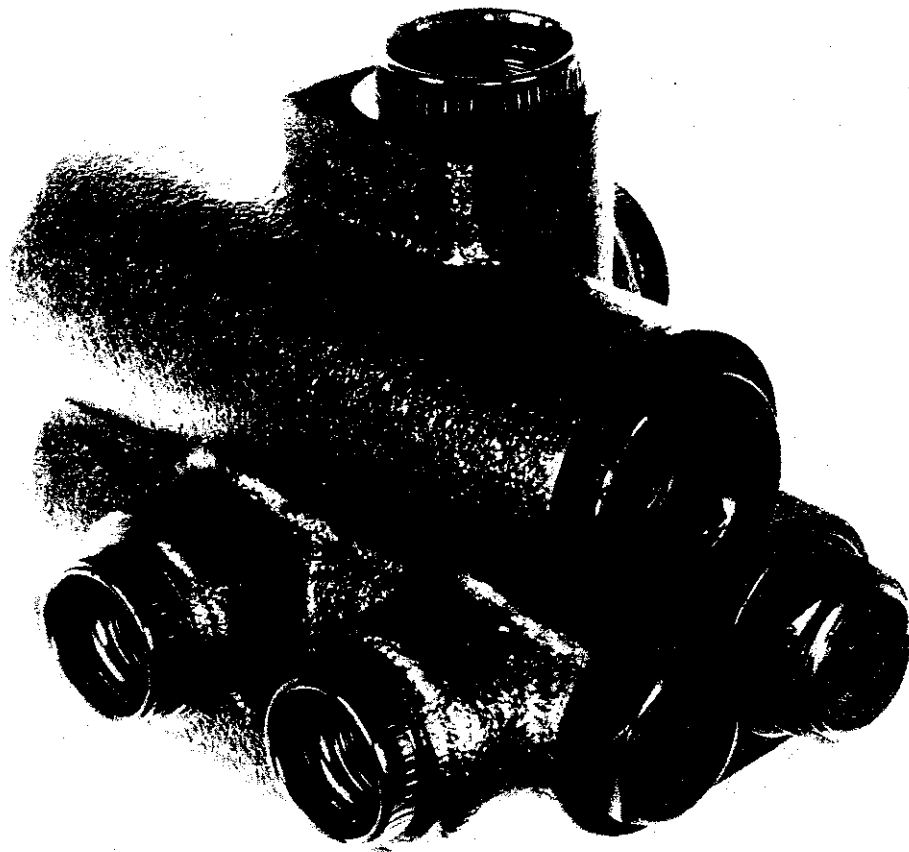
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20 GPM Single  
**ACCUMULATOR  
CHARGING  
VALVE**

**SERVICE MANUAL**



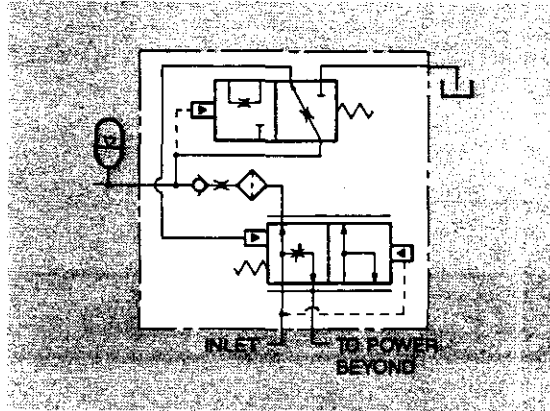
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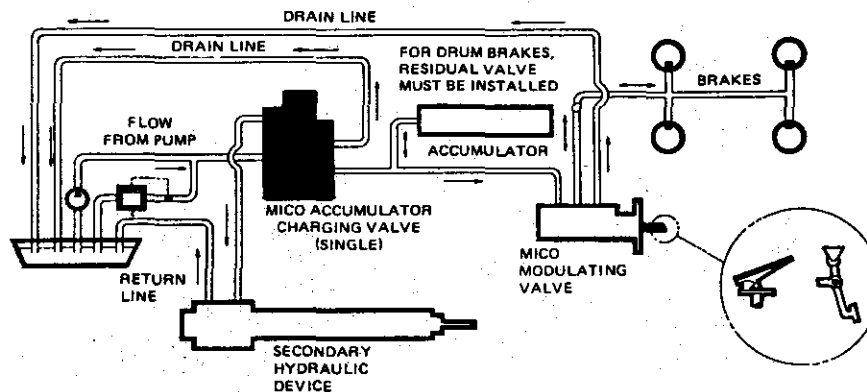


# SINGLE accumulator charging valve



## TYPICAL SYSTEM AS USED IN A BRAKE CIRCUIT

Figure 1



## REPRESENTATIVE PERFORMANCE DATA

System pressure	..... to 3,500 psi
Flow thru capacity	..... 2 - 20 gpm
Flow thru pressure drop	..... 70 psi at 15 gpm
Accumulator pressure, maximum	..... to 3,000 psi
Accumulator charging rate	..... 0.5 to 3.2 gpm at 1,000 psi (in three ranges)
Accumulator capacity	..... Determined from brake line pressure, displacement and number of off power emergency brake applications.

Technical Data for any specific model furnished upon request.

# DESCRIPTION AND OPERATION OF THE MICO SINGLE ACCUMULATOR CHARGING VALVE

The MICO Single Accumulator Charging Valve is designed for installation in an open center hydraulic system between the pump and its relief valve and the downstream secondary hydraulic devices; for example, a power steering control valve and cylinder installed in the same hydraulic circuit (see Typical System Schematic - Figure 1).

The charge valve supplies oil to an accumulator from an open center circuit on demand. This is accomplished at a preset rate (gpm) at a selected pressure and is relatively constant within the preset pressure limits.

The flow to the downstream secondary hydraulic devices will be reduced fractionally for a short time when the accumulator is charging. This does not noticeably affect the operation of these components. Full system pressure is available to the downstream secondary hydraulic devices at all times, provided oil delivery and pressure from the pump and relief valve are not impeded.

The accumulator charging flow rates and upper and lower accumulator pressure limits are set at the time of manufacture. Various charge rates, high and low limit settings, and band widths between high and low limits are available to conform to specific customer requirements.

An internal filter is incorporated in the charge valve through which all the oil must flow that is used in the accumulator. Hydraulic system cleanliness and adequate circuit filtration is imperative in any hydraulic system. Therefore, 10 micron filtration is desired. The internal filter can also be removed in certain applications where additional filtration is not required.

System schematics of the internal circuitry and individual component function under typical conditions of operation are shown and described below.

When the accumulator is charged above its lower limit, the CHARGING VALVE SPOOL is held against the SPOOL STOP by normal system back pressure through drilled passage which directs the pressure to one end of the spool. The LOWER LIMIT CHECK BALL is held on its seat by accumulator pressure.

When the pressure in the accumulator reaches its lower limit, the PILOT VALVE SPRING will unseat the LOWER LIMIT CHECK BALL and, at the same time, seat the UPPER LIMIT CHECK BALL. The PILOT VALVE SPOOL permits only one of these balls to be seated at any time. When the LOWER LIMIT CHECK BALL is unseated, pressure from the accumulator enters the chamber back of the CHARGING VALVE SPOOL. This allows the CHARGING VALVE SPRING and the accumulator hydraulic force to balance the hydraulic force due to the pump pressure acting on the opposite end of the CHARGING VALVE SPOOL. This means that the pump pressure is always higher than the accumulator pressure which causes the accumulator to charge. The rate at which the accumulator is charged depends on the orifice in the CHECK VALVE SEAT. When the accumulator is charged to its high limit, this pressure will unseat the UPPER LIMIT CHECK BALL and seat the LOWER LIMIT CHECK BALL. When the UPPER LIMIT CHECK BALL is unseated, the pressure in the chamber back of the CHARGING VALVE SPOOL is allowed to flow to return; thus permitting the CHARGING VALVE SPOOL to unload the pump. When the operating pressure in the system is greater than the pressure in the accumulator, the CHECK VALVE at the accumulator charging orifice forced off its seat; thus charging the accumulator to system pressure without the aid of the charging valve.

## CHARGING VALVE SCHEMATICS

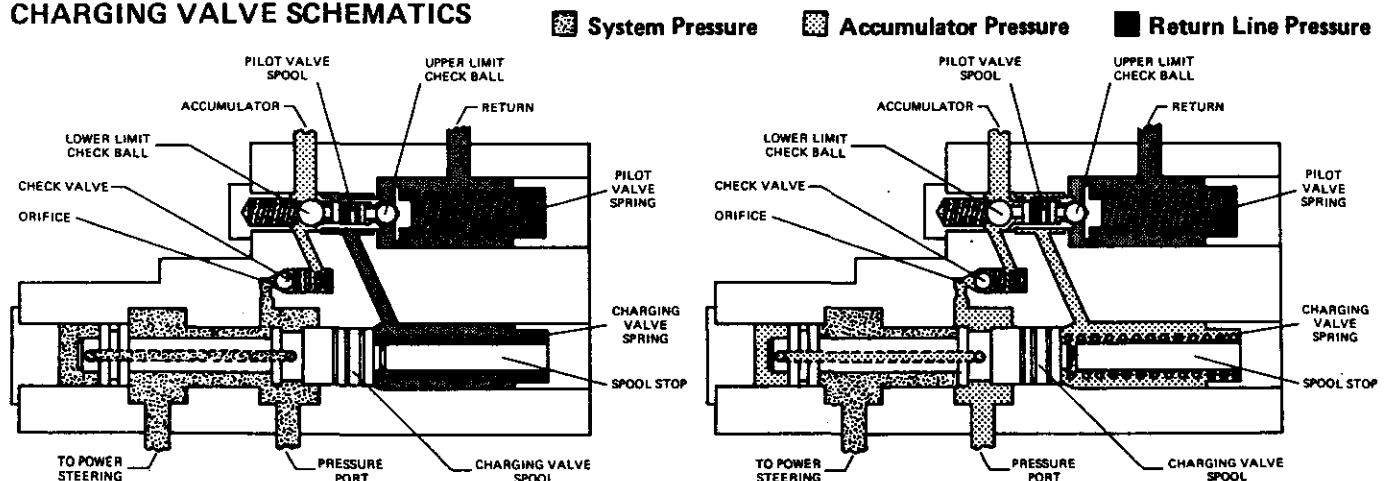
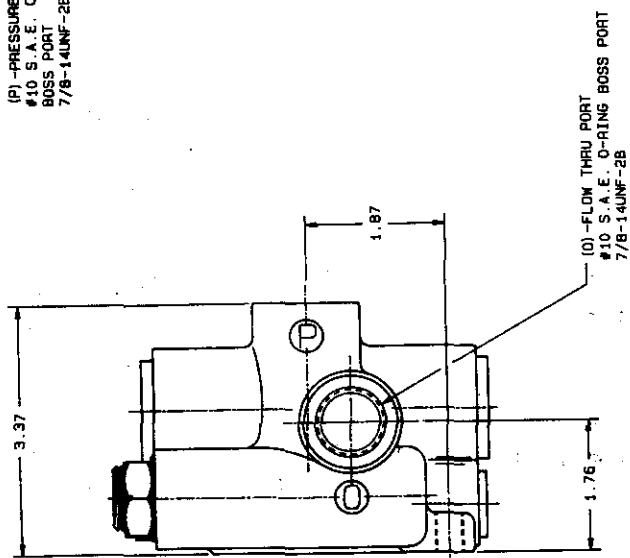
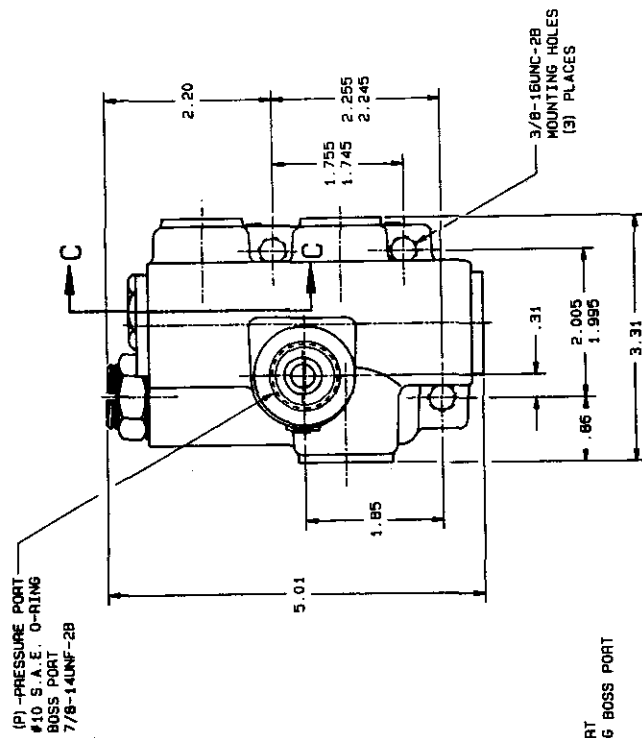
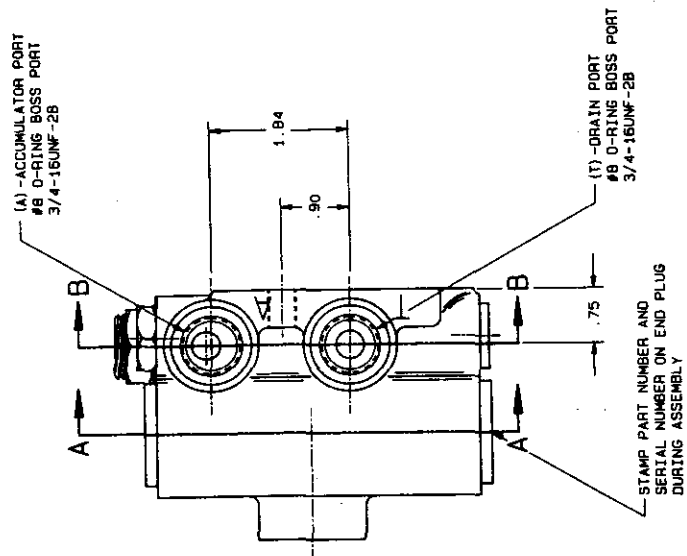
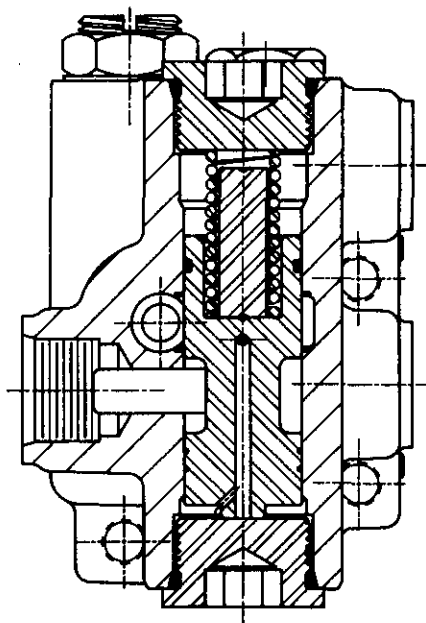


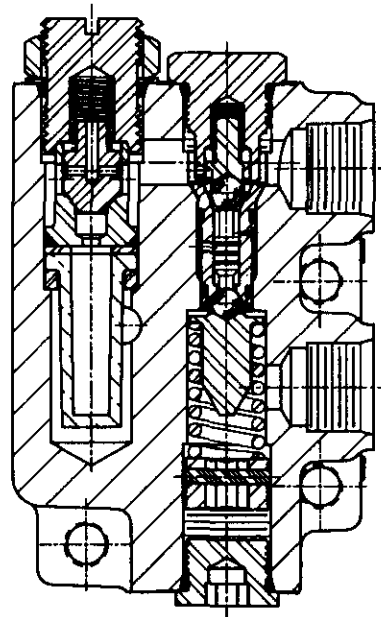
Figure 3 (Accumulator Charged)

Figure 4 (Accumulator Being Charged)

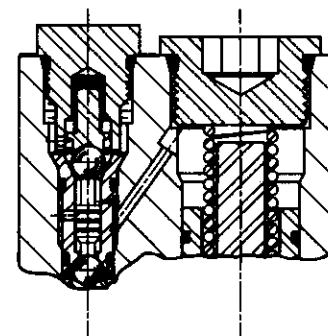




**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

**SPECIFICATIONS**

Model Number	Accumulator Charge Rate - GPM	Accumulator High Limit - PSI	Accumulator Low Limit - PSI
06-463-006	1.2 - 2.2	1450 - 1550	1150 - 1250
06-463-008	2.0 - 3.2	1350 - 1400	925 - 1025
06-463-010	2.0 - 3.2	1275 - 1325	550 - 650

## DISASSEMBLY

1. Remove plug (1) from housing (7) - plug is under spring tension. Remove o-ring (2) from plug.
2. Remove spring (4) and rod (3) from housing (7).
3. Remove plug (9) from housing. Remove o-ring (8) from plug.
4. Remove spool (6) from housing thru plug (1) end ONLY. Remove seal (5) from spool.
5. Loosen nut (10) and remove screw assembly (11) from housing. Remove o-ring (12) from screw assembly.
6. Remove spring (13), poppet (14), seat (15), o-ring (16), washer (17), filter (18) and washer (19) from housing.
7. Remove plug (34) from housing. Remove o-ring (33) from plug.
8. BEFORE moving screw (32), ACCURATELY MEASURE ITS DEPTH from the end of housing and record for reassembly purposes. Remove screw (32) from housing.
9. Remove spring (31), retainer (30) and ball (29). Be sure to keep ball separate for reassembling.
10. Remove pin (35) from screw (32) using a drive pin punch. Take care not to damage threads.
11. Remove plug (20) from housing. Remove o-ring (21) from plug.
12. Remove spring (22), stop (23) and ball (24) from housing.
13. Place housing on bench with plug (20) end down. Spool (25) may or may not fall out at this point.
14. Using a 1/4 - 5/16 dia. wood or plastic dowel, carefully remove insert (26) and spool (25) from housing. Insert (26) must come out plug (20) end of housing. Be careful not to scratch or mar valve seats on insert.

15. Remove spool (25) from insert (26). Remove o-rings (27 & 28) from insert.

## ASSEMBLY

CLEAN ALL PARTS WITH CLEAN SOLVENT AND DRY. LUBRICATE ALL RUBBER PARTS WITH CLEAN SYSTEM FLUID PRIOR TO ASSEMBLY. BE SURE ENTIRE ASSEMBLY PROCEDURE IS DONE WITH CONTAMINATION FREE METHODS.

1. Install new o-ring (8) on plug (9) and torque into housing 40 - 50 ft. lbs.
2. Install new seal (5) on spool (6). Be sure seal does not twist in groove.
3. Lubricate spool (6) and properly insert into housing.
4. Install spring (4) and rod (3) into housing.
5. Install new o-ring (2) on plug (1) and torque into housing 40 - 50 ft. lbs.
6. Install new o-rings (27 & 28) on insert (26) and place into housing. Note direction of assembly. Seat insert with 1/2" dia. wood dowel.
7. Install spool (25) into insert (26) in housing. Note direction of spool - long shoulder end is up toward end plug (20).
8. Install ball (24), .281 dia., on insert (26) in housing. Install stop (23) over ball and spring (22) over stop correctly.
9. Install new o-ring (21) on plug (20) and carefully install into housing, centering spring (22). Torque 40 - 50 ft. lbs.
10. Turn housing so plug (34) is vertically upward. Install ball (29), .250 dia. Be sure ball is centered in bottom of hole in housing. Drop retainer (30) and spring

(31) into housing.

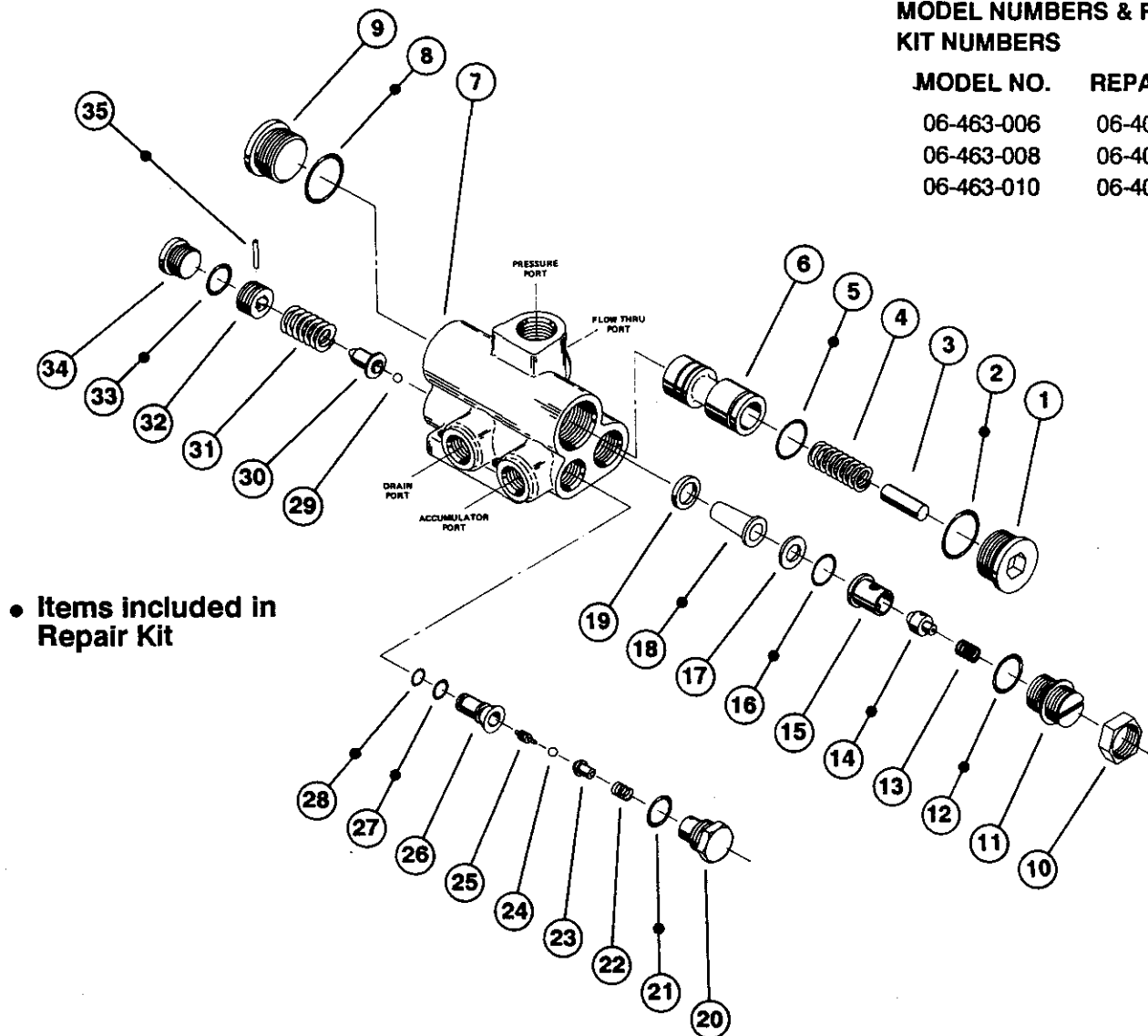
11. Insert new pin (35) in screw (32). Be sure plug is aligned properly and is evenly driven into screw. Do not damage threads.
12. Thread screw (32) in housing to the depth recorded during disassembly.
13. Install new o-ring (33) on plug (34) and install plug in housing. Tighten.
14. Install new o-ring (12) on screw (11).
15. Install washer (19), new filter (18), washer (17), new o-ring (16), seat (15), poppet (14), spring (13) and screw (11) into housing. Torque screw 18 - 22 ft. lbs.
16. Install nut (10) on screw (11) and torque 18 - 22 ft. lbs.

## VALVE ADJUSTMENT

1. Reinstall valve correctly. Tee an accurate pressure gauge into the accumulator line.
2. Start pump and allow approximately one minute for charging to start (pressure in gauge will read accumulator pre-charge plus). If valve does not begin to charge, turn screw (32) in, stopping when gauge shows an increase in pressure. Check the high limit specifications (1500 - 1550) and adjust screw (32) until the high limit setting is met. This pressure can be checked correctly only if after each adjustment of screw (32) the accumulator pressure is reduced to below the low limit setting of 1000 and the system recharges the accumulator pressure to its high limit.
3. Once the high limit setting is accurately adjusted, install o-ring (33) and plug (34) into housing. Torque 25 - 35 ft. lbs.

# MODEL NUMBERS & REPAIR KIT NUMBERS

MODEL NO.	REPAIR KIT
06-463-006	06-400-099
06-463-008	06-400-099
06-463-010	06-400-099



## PARTS LIST

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	PLUG	18	• FILTER
2	• O-RING	19	WASHER
3	ROD	20	PLUG
4	SPRING	21	• O-RING
5	• SEAL	22	SPRING
6	SPOOL	23	STOP
7	HOUSING	24	BALL
8	• O-RING	25	SPOOL
9	PLUG	26	INSERT
10	NUT	27	• O-RING
11	SCREW ASSEMBLY	28	• O-RING
12	• O-RING	29	BALL
13	SPRING	30	RETAINER
14	• POPPET	31	SPRING
15	SEAT	32	SCREW
16	• O-RING	33	• O-RING
17	WASHER	34	PLUG
		35	• PIN

## SERVICE CHECKS FOR HYDRAULIC SYSTEMS

### ACCUMULATOR CHARGING CYCLE REPEATS FREQUENTLY WHEN ACCUMULATOR IS NOT NORMALLY BEING DIS-CHARGED IN SERVICE

1. Leaking accumulator lines or fittings
1. **Check lines and fittings for leaks and correct**
2. Accumulator gas charge too low
2. **Check accumulator gas charge**
3. Accumulator gas charge too high
3. **Check accumulator gas charge**
4. Line to accumulator plugged
4. **Replace line**
5. Defective charging valve
5. **Replace charging valve**

### ACCUMULATOR STARTS TO CHARGE BUT DOESN'T REACH HIGH LIMIT

1. No oil or low oil level in tank
1. **Check oil level**
2. Defective or worn pump (pump doesn't deliver full flow or pressure)
2. **Check pump pressure and flow**
3. Defective system relief valve (valve leaking or has low setting so full flow and pressure are not available)
3. **Check relief valve**
4. Defective charging valve
4. **Replace charging valve**

### ACCUMULATOR CHARGING TIME TOO LONG

1. No oil or low oil level in tank
1. **Check oil level**
2. Relief valve setting too low
2. **Check valve setting**
3. Pump worn or defective and not delivering full flow or pressure
3. **Check pump**
4. Defective charging valve
4. **Replace charging valve**

### ACCUMULATOR FAILS TO START CHARGING

1. No oil or low oil level in tank
1. **Check oil level**
2. Worn or defective pump
2. **Check pump pressure and flow**
3. Defective relief valve
3. **Check relief valve setting**
4. Defective charging valve
4. **Replace charging valve**

### VERY RAPID CYCLING OF CHARGING VALVE

1. Accumulator gas charge too low
1. **Check gas charge**
2. Accumulator gas charge too high
2. **Check gas charge**
3. No gas charge in accumulator
3. **Check gas charge**
4. Defective charging valve
4. **Replace charging valve**

### LACK OF ADEQUATE FLOW THRU VALVE

1. Defective pump
1. **Check pump pressure and delivery**
2. Defective relief valve
2. **Check relief valve setting**
3. Blocked lines
3. **Replace lines**
4. Defective charging valve
4. **Replace charging valve**

## SERVICE DIAGNOSIS

All numbers shown refer to Figure on page 7

### ACCUMULATOR CHARGING CYCLE REPEATS FREQUENTLY WHEN ACCUMULATOR IS NOT NORMALLY BEING DIS-CHARGED IN SERVICE

1. Poppet (14) leaking.
2. O-ring (16) leaking.
3. Pilot Valve Ball (24) leaking.
4. Defective seat on insert (26).

### ACCUMULATOR STARTS TO CHARGE BUT DOESN'T REACH HIGH LIMIT

1. O-rings (27 & 28) on Pilot Valve (8)

Body defective or damaged.

2. Seal (5) on Charging Valve Spool (6) has been damaged or worn.

### ACCUMULATOR CHARGING TIME TOO LONG

1. Broken Charging Valve Spring (4).
2. Charging Valve Spring (4) has taken a set.
3. Dirt in Filter (18).
4. Poppet (14) stuck, partially closed.

### ACCUMULATOR FAILS TO START CHARGING

1. Broken Pilot Valve Spring (31).
2. Broken Charging Valve Spring (4).
3. O-ring (2) defective.
4. Charging Valve Spool (6) stuck.
5. Dirt in Filter (18).

### VERY RAPID CYCLING OF CHARGING VALVE

1. Pilot Valve (25 & 26) worn.