Single
MODULATING VALVE
(464 Series)

Service Instructions

TABLE 1 (Specifications)

Model Number	Repair Kit Number	Brake Pressure Setting	
		bar	(PSI)
03-464-104	06-400-247	82.7 ± 3.5	(1200 ± 50)

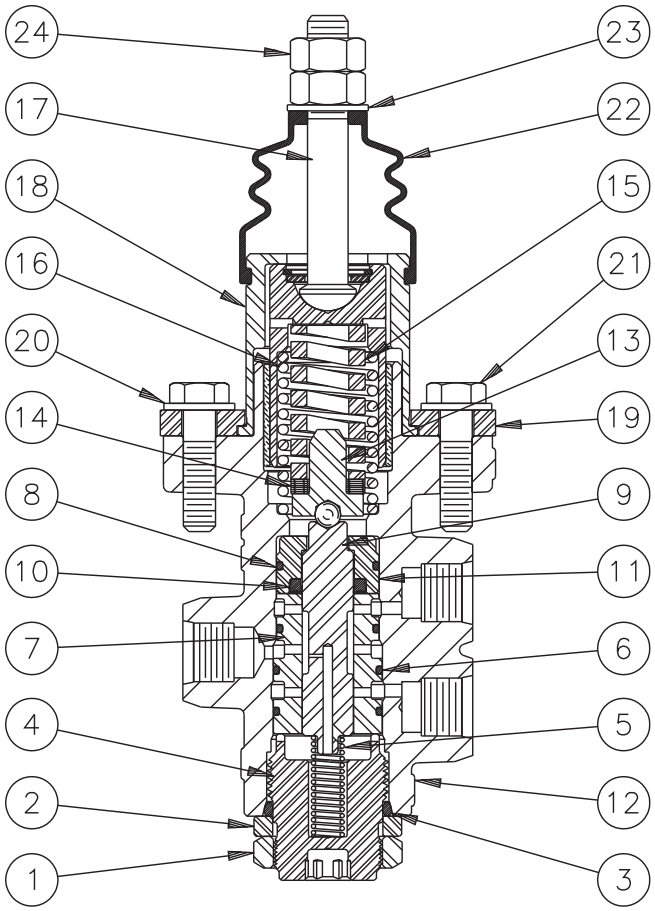

FIGURE 1

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DISASSEMBLY
(Refer to Figures 1 & 2)

NOTE

Spool (9) and sleeve (7) are manufactured as a matched set. Do not intermix spool (9) or sleeve (7) with other parts.

1. Prevent contamination to the brake valve and hydraulic system. Thoroughly clean brake valve and surrounding area of all dirt, grease, oil, etc. Remove nuts (24), cap screws (21) and washers (20) and remove brake valve from vehicle.
2. Remove washer (23) and boot (22).
3. Remove plate (19), sleeve (18), piston assembly (17), springs (16 & 15) and shim(s) (14). Piston assembly (17) need not be disassembled.
4. Remove retainer assembly (13) from housing bore. **NOTE: Ball is pressed into retainer.**
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. Use a wooden dowel and remove spacer (11), sleeve (7) and spool (9) assembly from housing bore. **NOTE: Be careful not to scratch or mar sleeve (7) or housing bore.**
7. Separate spacer (11) and spool (9) from sleeve (7). **NOTE: Excessive wear on either spool (9) or sleeve (7) may require replacement.**
8. Remove o-ring (8) and cup (10) from spacer (11). **NOTE: Be careful not to damage cup or o-ring grooves or spacer bore.**
9. Remove o-ring (8) and o-rings (6) from sleeve (7). **NOTE: Be careful not to damage o-ring grooves or sleeve bore.**

ASSEMBLY
(Refer to Figures 1 & 2)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT, SPOOL (9), AND SLEEVE (7) WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new cup (10) in spacer (11) and one new o-ring (8) on spacer (11). Note direction of cup.
3. Install new o-rings (6) on large diameter end of sleeve (7) and one new o-ring (8) on smaller diameter end of sleeve (7).
4. Carefully insert spool (9) into sleeve (7). Note direction of spool.
5. Insert spacer (11) into housing bore through end plug (4) end of housing. Note direction of spacer.
6. Carefully insert sleeve (7) and spool (9) 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 10.9-20.3 N·m (96-180 lb·in) to seat sleeves. Then loosen end plug 1/4 turn and torque 1.1-6.8 N·m (10-60 lb·in). Install new o-ring (3), washer (2) and nut (1). Hold end plug (4) with a wrench and torque nut 67.8-81.4 N·m (50-60 lb·ft).
9. Install retainer assembly (13) in housing. **NOTE: Depress retainer (13) until it bottoms on spacer (11). Spool (9) and retainer (13) should return when released. If the spool and retainer do not return when released, the bore of sleeve (7) may be damaged.**
10. Install shim(s) (14), springs (15 & 16) and piston assembly (17) in housing bore.
11. Install sleeve (18), plate (19) and new boot (22).
12. Reinstall brake valve on vehicle using washers (20), cap screws (21), washer (23) and nuts (24). Torque cap screws (21) 24.4-29.8 N·m (18-22 lb·ft). Adjust and torque nuts (24) according to vehicle manufacturer specifications.

NOTE

After service, the brake valve must develop the pressure indicated in the specifications, TABLE 1. Shim(s) (14) may be added or removed to obtain the correct pressure setting.

- Items included in repair kit

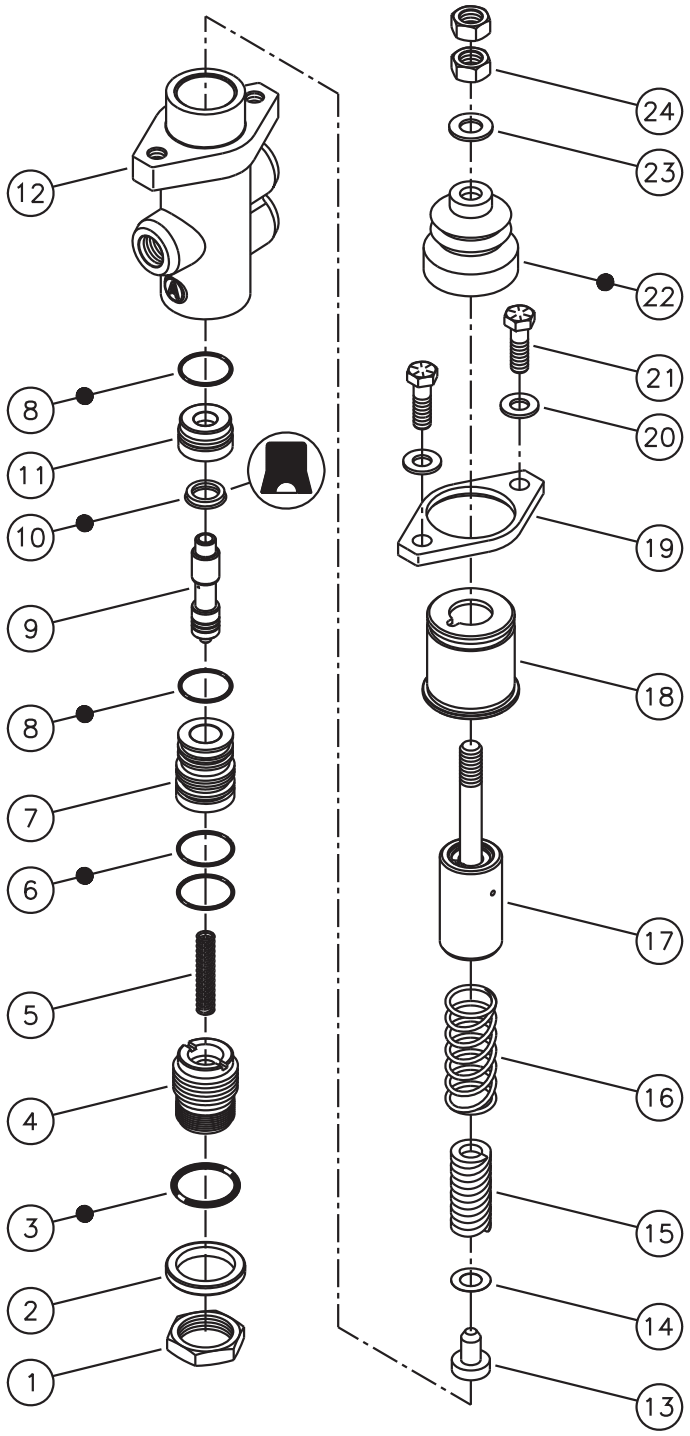

FIGURE 2

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 closest 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 ten (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 or improper gas charge in accumulator
1. **Check gas charge**
2. Brakes not properly adjusted
2. **Adjust brakes**
3. Inoperative brakes
3. **Check brakes**
4. Hydraulic lines or fittings leaking
4. **Check for leaks and repair**
5. Inoperative 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 WILL NOT RELEASE

1. Pedal angle out of adjustment
1. **Check for proper pedal angle**
2. Inoperative brakes
2. **Check brakes**
3. Inoperative automatic adjusters
3. **Check operation of adjusters**
4. Inoperative 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 damaged
4. **Check lines and replace**
5. Inoperative automatic adjusters
5. **Check operation of adjusters**
6. No or improper gas charge in accumulator
6. Check gas charge
7. Inoperative brakes
7. **Check brakes**
8. Brake valve inoperative
8. **Replace valve**

EXCESSIVE BRAKING

1. Inoperative brakes
1. **Check brakes**
2. Inoperative brake valve
2. **Replace brake valve**

BRAKES WILL NOT RELEASE COMPLETELY

1. Brakes not properly adjusted
1. **Adjust brakes**
2. Inoperative brakes
2. **Check brakes**
3. Pedal angle out of adjustment
3. **Adjust pedal angle**
4. Inoperative wheel cylinders
4. **Replace wheel cylinders**
5. Inoperative automatic adjuster
5. **Check operation of adjusters**
6. Air in brakes (when automatic adjusters used Goodrich Hi-torque Brakes only)
6. **Bleed brakes**
7. Inoperative 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 damaged brake line
2. **Check lines for breaks or damaged condition**
3. Brakes not properly adjusted
3. **Adjust brakes**
4. Inoperative system relief valve
4. **Check pressure in pressure line to valve**
5. Worn pump
5. **Check pressure in pressure line to valve**
6. Inoperative automatic adjuster
6. **Check brake line pressure**
7. Inoperative or worn brakes
7. **Check brakes**
8. Inoperative brake valve
8. **Replace brake valve**

PEDAL KICKBACK WHEN BRAKES ARE APPLIED

1. Air in brakes
1. **Bleed brakes**

SERVICE DIAGNOSIS

(Refer to Figures 1 & 2)

BRAKES WILL NOT RELEASE COMPLETELY

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

BRAKE WILL NOT RELEASE

1. Binding spool (9)
2. Damaged sleeve (7)
3. Piston (18) binding

NO BRAKES

1. Piston (18) binding
2. Broken spring (15)

EXCESSIVE BRAKING

1. Too many shims (14) installed in valve

EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE APPLIED

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

EXCESSIVE ACCUMULATOR LEAKAGE WHEN BRAKES ARE NOT BEING USED

1. Damaged spool (9)
2. Damaged sleeve (7)
3. O-rings (6) leaking
4. Spring (5) broken

INSUFFICIENT BRAKES

1. Broken pressure regulating spring (15)
2. Boot cut, allowing dirt to accumulate under piston (18) flange