

## Bendix® MV-2™ Control Module

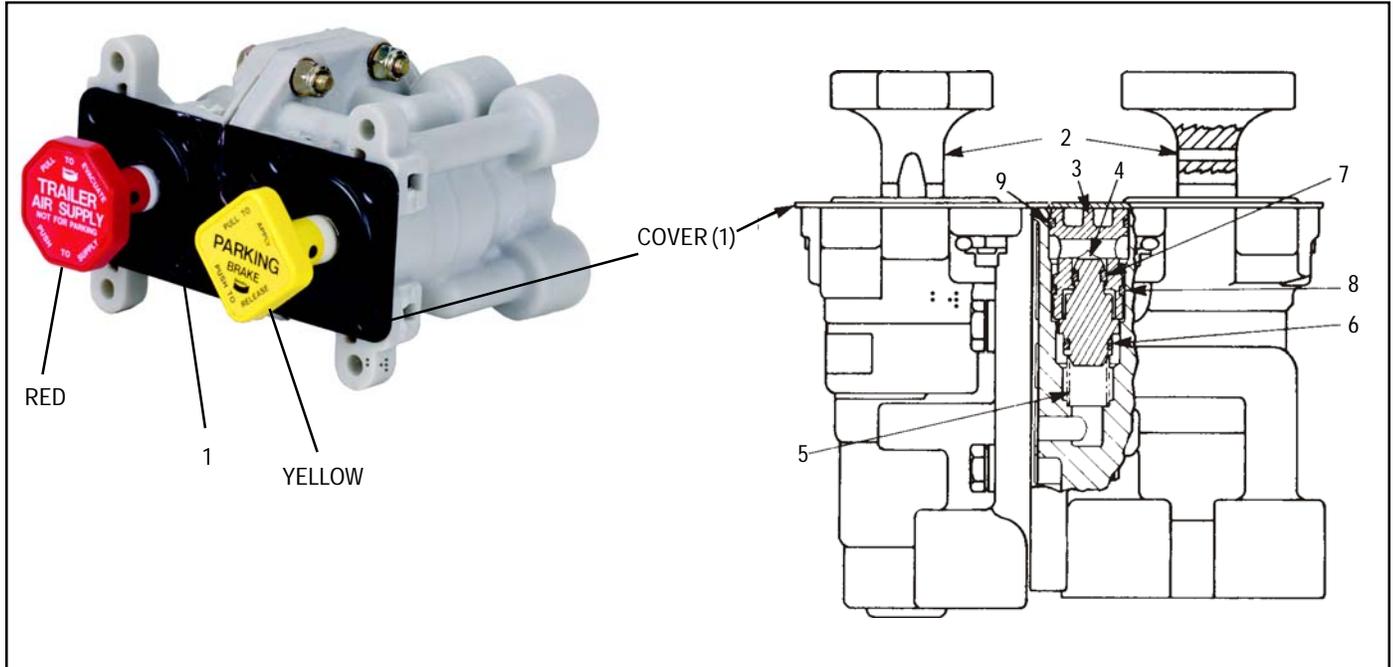


FIGURE 1

FIGURE 2

### DESCRIPTION

The Bendix® MV-2™ control module is an integrated control assembly designed for control panel mounting in a truck-tractor. The bodies for the module, as well as “spool” inserts, are molded of a nonmetallic, noncorrosive material. The assembly consists of two push-pull valves and a dual circuit supply valve which triggers at a preset pressure differential. The valve “spool” inserts, as well as the dual circuit supply valve spool and shuttle, may be removed from the valve bodies without disconnecting the air lines.

The MV-2™ module provides all the functions of a standard three valve combination plus supply reservoir source selection:

1. Tractor protection control
2. Trailer service air supply
3. System park
4. Trailer park only
5. Trailer charge with tractor spring brakes applied (tractor park only)
6. Supply reservoir selection

The MV-2™ module includes a spring loaded dual circuit supply valve which selects, as the air source for both control valves, the No. 1 reservoir at all times unless the pressure in the No. 1 reservoir falls not more than 30 P.S.I. below that of the No. 2 reservoir, when the dual circuit supply valve will shuttle and establish the No. 2 reservoir as the supply. An auxiliary air delivery port is also available which receives its supply from the dual circuit supply valve. All air connections are at the bottom of the valve, as shown on Figure 3, including the auxiliary air delivery port.

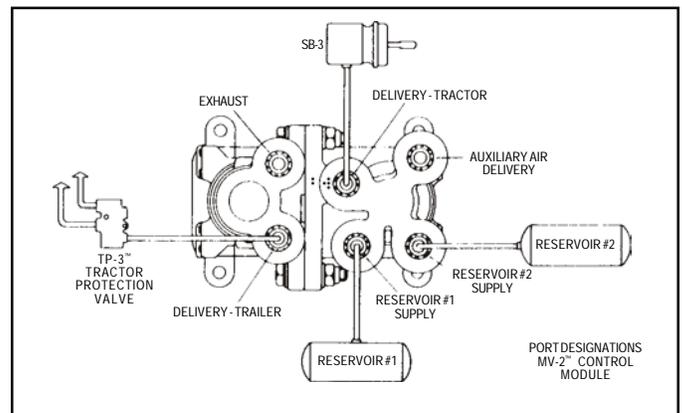


FIGURE 3

The trailer air supply valve (red button) (see Figure 1) delivers air to the trailer supply line and also will trip (Pop out) automatically and shut off the trailer supply if pressure decreases to  $40 \pm 5$  P.S.I.

NOTE: Reservoir No. 1 must be the reservoir that supplies the rear tractor axle(s).

Reservoir No. 2 must be the reservoir that supplies the front axle.

The parking brake valve (yellow button) controls the spring brakes on the tractor and when exhausted, simultaneously causes the trailer supply valve to trip and exhaust, thus applying both tractor and trailer parking brakes as required by Federal Regulations. The trailer brakes may be independently released by pushing only the trailer air supply valve (red button) in.

## OPERATION

### Initial Charge

With the system completely discharged, both buttons are out (Figure 4). When system pressure reaches 65 P.S.I., the red button (trailer supply) may be pushed in (Figure 5) and should stay in, charging the trailer system and releasing the trailer brakes. The yellow button may now be pushed in which will supply air to the tractor spring brakes, releasing them.

### Normal Operating Position (Figure 7)

With both buttons pushed in, air is now being supplied to the trailer and to the tractor spring brakes; all brakes are released.

### Actuation of Trailer Park or Emergency Brakes (Figure 6)

To actuate the trailer brakes only, the red button is pulled out, exhausting the trailer supply line. The trailer brakes are now applied either by air emergency or spring brakes, depending on the type of trailer system. This mode would be used to uncouple from the trailer and during bobtail operation.

### System Park (Figure 4)

With both buttons in for normal run modes, the parking brakes on both tractor and trailer may be actuated by pulling the yellow (parking brake) button out, which exhausts the air from the tractor spring brakes and simultaneously causes the red (trailer supply) button to pop out, applying the trailer brakes. This complies with Federal Regulations that one control must apply all the parking brakes on the vehicle.

### Trailer Charge (Figure 5)

If both valves are out, parking the combination vehicle, and it is desired to recharge the trailer (leaving the tractor spring brakes applied,) the red button may be pushed in repressurizing the trailer supply line. This mode might also be used to park a combination vehicle with air actuated emergency brakes on the trailer to provide demonstrated parking capability with tractor spring brakes only.

## Automatic Application

With both buttons in, in the normal run configuration, if the supply pressure to the push-pull valves is reduced to  $40 \pm 5$  P.S.I., the red button (trailer supply valve) must pop out, applying the emergency or parking brakes on the trailer. If the red button is held in manually and the pressure decreases to  $30 \pm 5$  P.S.I., a tripper piston within the trailer control spool will move upward, exhausting the trailer supply, effecting the required non-override feature. The yellow (parking brake) button will pop out at approx. 20-30 P.S.I.

## PREVENTIVE MAINTENANCE

**Important:** Review the Bendix Warranty Policy before performing any intrusive maintenance procedures. A warranty may be voided if intrusive maintenance is performed during the warranty period.

No two vehicles operate under identical conditions, as a result, maintenance intervals may vary. Experience is a valuable guide in determining the best maintenance interval for air brake system components. At a minimum, the MV-2™ module should be inspected every 6 months or 1500 operating hours, whichever comes first, for proper operation. Should the MV-2™ module not meet the elements of the operational tests noted in this document, further investigation and service of the valve may be required.

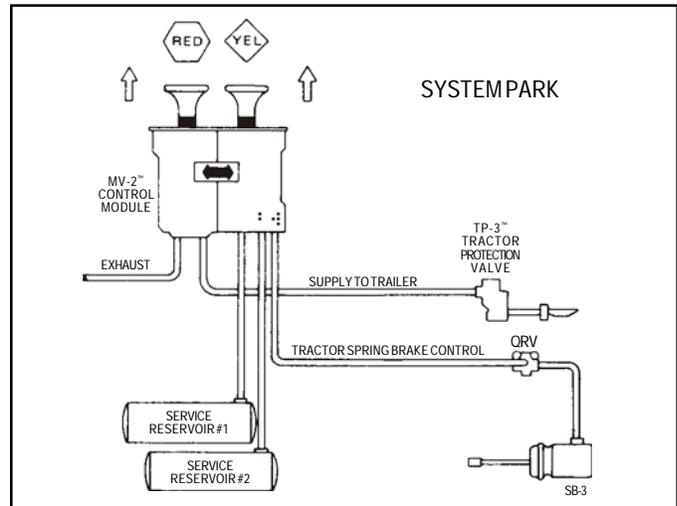


FIGURE 4

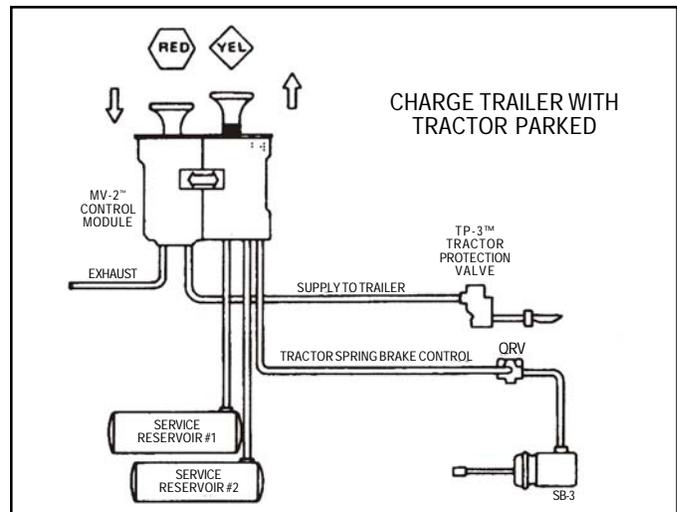


FIGURE 5

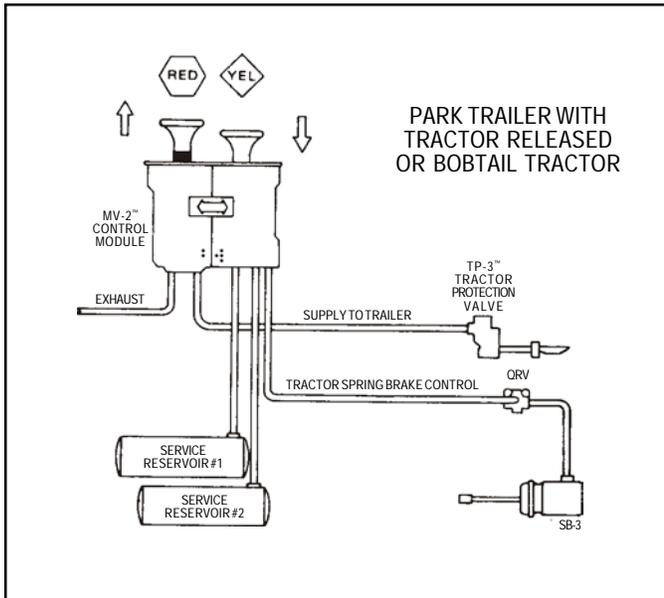


FIGURE 6

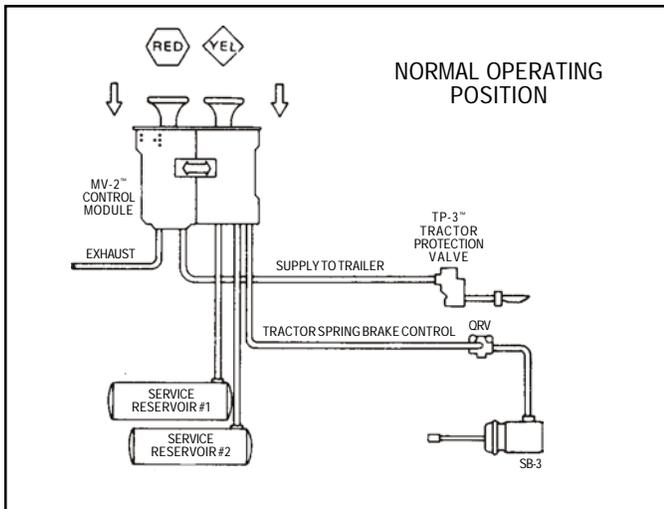


FIGURE 7

## OPERATING & LEAKAGE TEST

1. Charge the air brake system to 65 P.S.I. and check for leakage between body seals, body and cover plates. No leakage permitted.
2. With supply pressure still at 65 P.S.I., push the red button in. The button must stay in. Leakage at the exhaust port must not exceed a 1" bubble in 5 seconds.
3. Develop a leak in the line delivering air to the trailer supply circuit. The red button must pop at  $40 \pm 5$  P.S.I. and maintain the supply pressure. Leakage at the exhaust port must not exceed a 1" bubble in 5 seconds.
4. Hold the red button in and again develop a leak in the supply circuit. Air must start to escape from the exhaust port when the trailer supply line pressure reaches  $30 \pm 5$  P.S.I.
5. Release the red button and rebuild the supply pressure to at least 40 P.S.I. Push in the yellow button; the yellow button must remain in. Leakage at the exhaust port should not exceed a 1" bubble in 5 seconds.

6. Develop a leak in the tractor spring brake delivery circuit. The yellow button must pop at  $25 \pm 5$  P.S.I. and maintain supply pressure. Leakage at the exhaust port should not exceed a 1" bubble in 5 seconds.
7. Charge the system to 120 P.S.I. and push both buttons in. Pull the red button out. The yellow button must remain in.
8. Push the red button in and pull the yellow button out. The red button must pop out almost instantaneously.
9. Install a gauge to monitor tractor spring brake delivery pressure. Apply 120 P.S.I. to both reservoirs (No. 1 & No. 2). Push in the yellow button. Delivery pressure should equal the pressure in reservoir No. 1. Reduce the pressure in No. 1 reservoir. Delivery pressure and No. 1 reservoir pressure should descend together to 105-90 P.S.I. at which point the dual circuit supply valve shuttle should switch to No. 2 reservoir and delivery pressure should increase to No. 2 reservoir pressure. After the No. 1 reservoir pressure is reduced to zero, there should not be audible leakage at the No. 1 reservoir opening. Close the leak which had been created in the No. 1 reservoir.
10. Leaving the yellow button in, recharge the No. 2 reservoir to 120 P.S.I. The delivery pressure should also read 120 P.S.I. Recharge the No. 1 reservoir to 100 P.S.I. Slowly vent the No. 2 reservoir. As the No. 2 reservoir pressure and the delivery line pressure descend, pressure should stabilize at approx. 100 P.S.I.
11. Close all vents or leakage points and charge both reservoirs to 120 P.S.I. Position the red button out and the yellow button in. Develop a leak in the spring brake delivery line and hold the yellow button in. No. 1 reservoir pressure must reduce to zero and No. 2 reservoir pressure to 20 - 30 P.S.I. The dual circuit supply valve shuttle should cycle several times during this leakdown period.

## REMOVING AND REPLACING SPOOL ASSEMBLIES

Block the wheels or otherwise secure the vehicle and drain all reservoirs. It should be unnecessary to remove the MV-2™ module from the vehicle. Remove any panel, plate or whatever is necessary to expose the valve cover plates. It is recommended that the valve be serviced by replacing the complete spool assemblies. The dual circuit supply valve feature may be serviced by replacing four (4) o-rings and one (1) spring, available in a maintenance kit.

### DISASSEMBLY - Spools (Figure 2)

1. Remove the cover plate screws. (Four in each cover) and cover (1).
2. Carefully pull the spool assemblies out of their respective body bores by pulling on the buttons.
3. Remove the roll pins (2) which retain the buttons on the spool stems and remove buttons and cover plates.

## DISASSEMBLY - Dual Circuit Supply Valve

1. The dual circuit supply valve is located in the tractor control body. (The one from which the spool with the yellow button has been removed.) Grasp the web in the top of the valve spool (3) (Figure 2) with narrow nose pliers, twist and pull valve spool out. The shuttle (4) should also come out with the spool. Remove the shuttle return spring (5) and o-rings (6), (7), (8) and (9).

## CLEANING & INSPECTION

The non metallic components which comprise most of the parts of the MV-2™ module **should not be immersed in any solvent type cleaner.** Old lubricant should be wiped off parts to be reused and the bores of the body wiped out with a clean dry cloth.

## ASSEMBLY - Dual Circuit Supply Valve (Figure 2)

Lubricate o-rings, bore and sliding surfaces with silicone lubricant Bendix 291126 BW-650-M Dow Corning 55-M.

1. Place the shuttle return spring (5) in the dual circuit supply valve bore in the body.
2. Install o-rings (6) & (7) on the shuttle (4) and (8) & (9) on the valve spool (3).
3. Insert the small end of the shuttle in the spool and insert the assembly into the valve bore, flush with top of body. The dual circuit supply valve spool is retained in the body by the same cover plate which also retains the tractor control (yellow button) spool.

## ASSEMBLY - SPOOLS

If old spools are being used, the o-rings and all sliding surfaces should be lubricated with Bendix BW-650-M Silicone Lubricant (291126). If new service replacement spools are being installed, they will be pre-lubricated.

1. Place cover plates over each plunger stem. The cover plates are identical and are installed convex side up.
2. Place the red button on the longer spool (for trailer air supply), matching the groove in the button with the tongue in the cover plate (where applicable), and secure the button with the button roll pin. Place the yellow button on the shorter spool (for tractor air supply), matching button and cover (where applicable) and securing with button roll pin as before. If new service spools are used, a new roll pin will be found in each spool package.
3. Insert the shorter spool assembly (yellow button) in the tractor supply bore (housing with the dual supply valve). If the entire valve assembly has been removed, position the assembly so that the tractor control body housing is at 3 o'clock. With the open bore (trailer supply) at 9 o'clock, rotate the button until wording on top-center is horizontally readable. The stepped side of the cover plate should be covering the dual supply valve. Secure the plate with the four flat head Phillips screws; torque to 25 inch pounds. Insert the longer spool assembly (red button) in the remaining bore. The stepped sides of the cover plates should key with each other when the remaining four flat head screws are torqued to 25 inch pounds.

## SERVICE TEST

Repeat the "Operating and Leakage Test".

## **WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:**

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
3. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning **ANY** work on the vehicle. If the vehicle is equipped with an AD-IS™ air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
6. Never exceed manufacturer's recommended pressures.
7. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
8. Use only genuine Bendix® replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
9. Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
10. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.