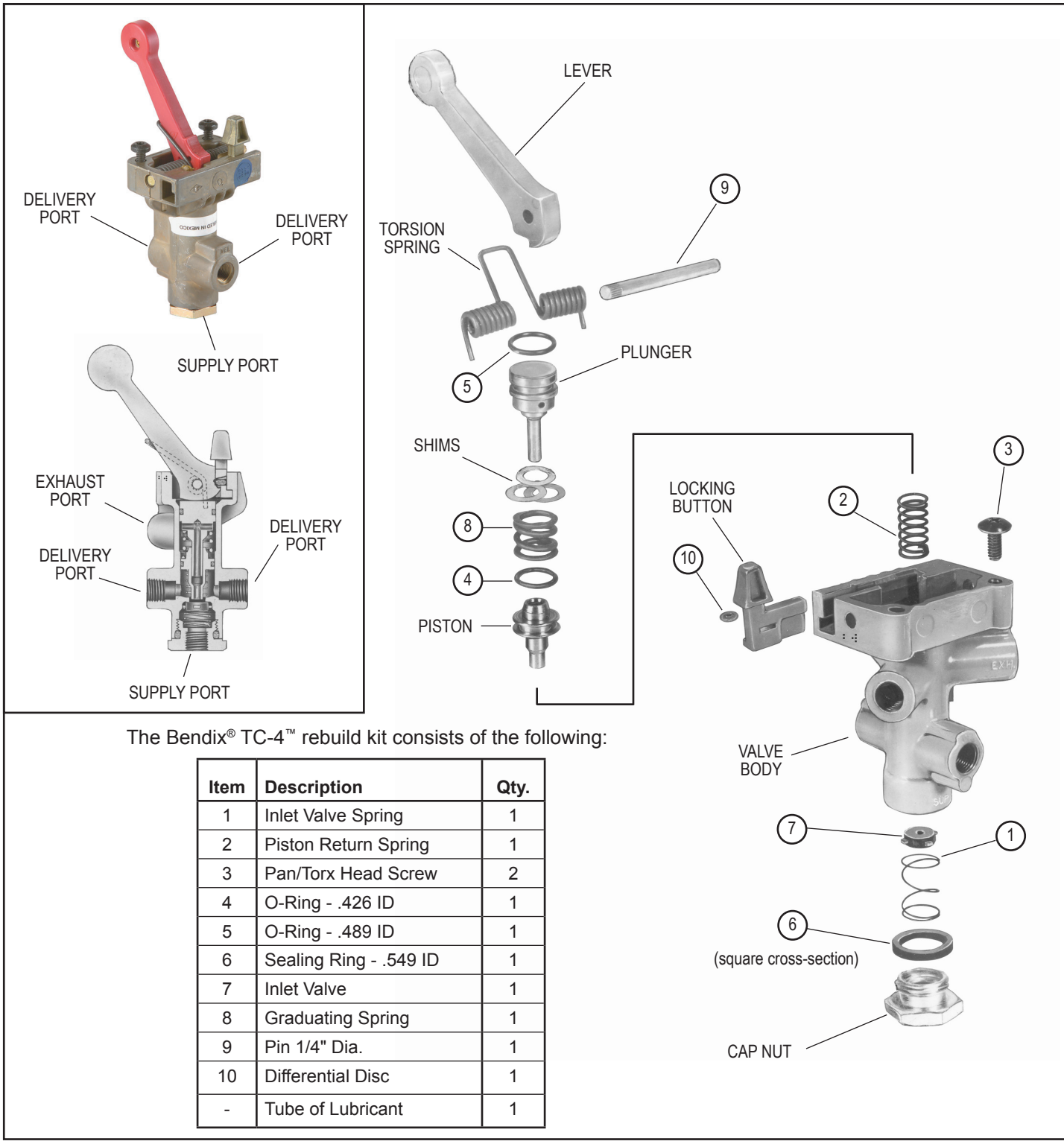
Installation Instructions

Bendix® TC-4™ Modulating Control Valve



The Bendix® TC-4™ rebuild kit consists of the following:

Item	Description	Qty.
1	Inlet Valve Spring	1
2	Piston Return Spring	1
3	Pan/Torx Head Screw	2
4	O-Ring - .426 ID	1
5	O-Ring - .489 ID	1
6	Sealing Ring - .549 ID	1
7	Inlet Valve	1
8	Graduating Spring	1
9	Pin 1/4" Dia.	1
10	Differential Disc	1
-	Tube of Lubricant	1

Figure 1 – Bendix® TC-4™ Valve Rebuild Kit Contents

GENERAL SAFETY GUIDELINES

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

When working on or around a vehicle, the following guidelines should be observed AT ALL TIMES:

- **Park the vehicle on a level surface, apply the parking brakes and always block the wheels. Always wear personal protection equipment.**
- **Stop the engine and remove the 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.**
- **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.**
- **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 a Bendix® AD-IS® air dryer system, a Bendix® DRM™ dryer reservoir module, or a Bendix® AD-9si™ air dryer, be sure to drain the purge reservoir.**
- **Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.**
- **Never exceed manufacturer's recommended pressures.**
- **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.**
- **Use only genuine Bendix® brand 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.**
- **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.**
- **Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.**
- **For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.**
- **The power MUST be temporarily disconnected from the radar sensor whenever any tests USING A DYNAMOMETER are conducted on a Bendix® Wingman® Advanced™-equipped vehicle.**
- **You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.**

DESCRIPTION

This kit is for use in rebuilding a Bendix® TC-4™ modulating control valve.

VALVE REMOVAL

1. Block and hold vehicle by means other than the air brakes. Drain all air brake system reservoirs.
2. Identify, mark and disconnect all air lines to the TC-4 valve.
3. Remove the two mounting screws (3) then the valve.

DISASSEMBLY (REFER TO FIGURE 1)

1. With the valve in the upright position, remove the cap nut and cap nut sealing ring (6).
2. Remove the inlet valve spring (1) and inlet valve (7).
3. Remove the locking button and rubber friction disc (10).
4. With the valve gently held in a vise, mark the lever in relation to the body. Also, mark the torsion spring in relation to the handle so that proper position can be determined during assembly.

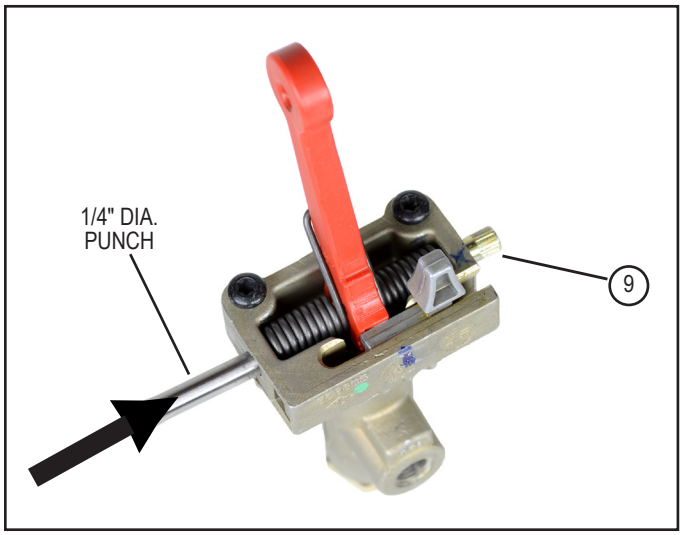


Figure 2 – Bendix® TC-4™ Valve Pin Removal

5. On the side of the valve — opposite the locking button — use a small drift (1/4" diameter) punch and a dead blow hammer to carefully remove the pin (9) from the valve body. Remove the lever and torsion spring. *See Figure 2.*
6. Remove the plunger, shims (if present) the graduating spring (8), the piston and piston return spring (2). Small needle-nose pliers may be necessary to remove some of the smaller items.
7. Remove the o-rings (4 and 5) from the plunger and piston.
8. Discard all of the removed items (1-10) that are replaced by the kit contents.

CLEANING AND INSPECTION

1. Remove the Bendix® TC-4™ valve body from the vise.
2. Wash all metal parts in mineral spirits. Wipe all rubber parts dry.
3. Inspect all parts for signs of wear or deterioration; check springs for cracks, corrosion or distortion. Inspect the piston and inlet and exhaust seat for nicks or burrs.
4. Do not reuse rubber components. It is recommended that all rubber parts and any other parts showing signs of wear or deterioration be replaced.

ASSEMBLY

Prior to assembly, lubricate the piston, o-rings, sealing ring and body bores with the barium grease included in this kit. *Refer to Figure 1 for proper assembly.*

To correctly identify the o-rings/sealing rings (4-6) contained in this kit, place all three side-by-side. The sealing ring (6) has a square cross-section and is larger in diameter than the o-rings. In comparing o-rings (4) and (5), o-ring (5) is larger in diameter.

1. Install o-ring (4) on the piston and o-ring (5) on the plunger.
2. Install the shims, if present in the original assembly, and graduating spring (8) on the plunger.
3. Install the piston on the plunger.
4. Install the piston return spring (2) on the piston; holding this assembly vertical, place the body over the top of the piston assembly, then turn it over letting the assembly fall into place.
5. Install the torsion spring over the lever noting that parts are in correct relation to body as previously marked.
6. Place the ends of the torsion spring in holes in the body. Install pin (9) and center in place.
7. Verify the handle assembly is correct by noting the torsion spring and handle assembly will move the piston past the inlet seat surface. (This can be seen by looking at the supply port end of the valve.) If handle is not assembled into body correctly, reassemble.
8. Install the inlet valve (7) and inlet valve spring (1).
9. Install the sealing ring (6) on the cap nut; install the cap nut in the body. Torque to 50–100 in-lbs.
10. Install the disc (10) in the locking button and install the button into valve.
11. Test the valve as outlined in “Operating and Leakage Test” section.

INSTALLATION

1. Clean the air lines to the valve.
2. Mount the valve securely with two mounting screws (3).
3. Connect the air lines to valve in their appropriate ports.

OPERATING AND LEAKAGE TESTS

If the valve is to be tested while on the vehicle, be sure to block the vehicle wheels. Build the system pressure to approximately 100 psi and place the lever in the “apply” position and observe that spring brakes apply.

With the lever in the apply position, lock the lever in place with the locking button. Coat the exhaust port with a soap solution; the leakage should not exceed a one inch bubble in less than five seconds. (NOTE: If the line is connected to the exhaust port, disconnect the line or remove the pipe plug from the other exhaust port.) Excessive leakage would indicate a faulty inlet valve.

Release the locking button and place the lever in the release position; observe that the brakes fully release. Coat the exhaust port with a soap solution; the leakage should not exceed a one inch bubble in not less than five seconds. Excessive leakage would indicate exhaust valve or lower o-ring leakage. (If the line at the exhaust port was disconnected, connect the line and/or tighten the fitting or pipe plug.)

Remove the dial; while making a full foot valve application, coat the top of valve with a soap solution. The leakage permitted is a one inch bubble in not less than five seconds.

Excessive leakage would indicate upper o-ring leakage. (If the line is not connected to the exhaust port, it will be necessary to apply 100 psi to the exhaust port to check for upper o-ring leakage.) Soap the area around supply port cap nut to check for cap nut o-ring leakage. No leakage is permitted. Blow out or dry all the soap solution and replace the dial. To check modulation of the valve it will be necessary to test it while the vehicle is in motion. Select a suitable location to perform the braking test. With the vehicle in motion, apply the Bendix® TC-4™ control valve several times.

Note that the valve is correctly modulating the brake application. If the valve does not function as described, or if leakage is excessive, it is recommended that it be replaced with a new or remanufactured unit or repaired with genuine Bendix parts available at Bendix outlets.