



Installation Instructions

HYDROBOOST
REPLACEMENT KIT
Piece No. 5015671

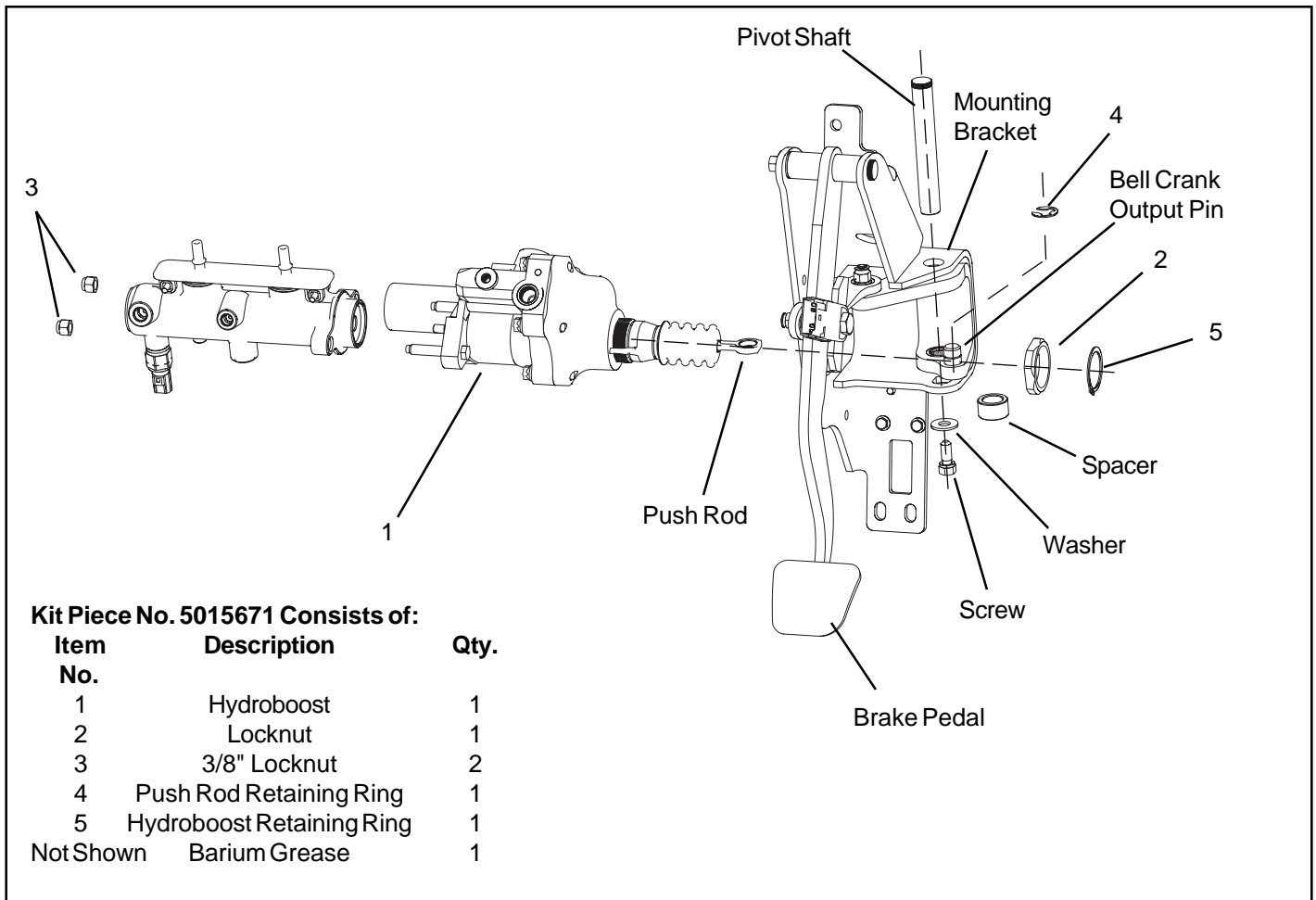


Figure 1 Hydroboost Replacement Kit

DESCRIPTION

This kit contains all of the components necessary to replace the Hydroboost on the Blue Diamond brake control module for hydraulic brake low cab forward (LCD) International and Ford trucks. The components contained in the kit are shown above.

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

When working on or around brake systems and components, the following precautions should be observed at all times:

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. When working around or under the vehicle, stop the engine and remove the key from the ignition. Always wear safety glasses.
2. 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 the use of those tools.
4. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
5. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or pipe plug unless you are certain all system pressure has been depleted. If uncertain about the system pressure, slowly remove a fitting to deplete pressure before component detachment.
6. Never exceed manufacturer's recommended pressure.
7. Never attempt to disassemble a component until you have read and understand all recommended procedures. Some components contain powerful springs and injury can result

- if not properly disassembled. Use only proper tools and observe all precautions pertaining to use of those tools.
8. Use only genuine Bendix® replacement parts, components and kits.
 - A. Use only components, devices and mounting and attaching hardware specifically designed **for use in hydraulic brake systems**.
 - B. All replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as the original equipment.
 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.

REMOVAL OF HYDROBOOST UNIT

1. Identify and mark all hydraulic and electrical lines connected to the hydroboost or master cylinder.
2. Before loosening any hoses, tubing or fittings, be sure to pump the brake pedal at **least 20 times** to bleed off any residual pressure the hydroboost accumulator.
3. Remove the inlet and return port hoses. Plug the open end of the hoses and port fittings. **CAUTION: Do not apply the brakes after removal of the input hoses. This could result in serious injury and inlet check valve failure if fluid pressure is still present in the accumulator.**
4. Remove the two locknuts(3).
5. Move the master cylinder out of the way (to the left).
6. Remove the screw and washer from the bellcrank pivot shaft. Slide the pivot shaft upward and remove the spacer from the assembly.
7. Remove the pushrod retaining ring(4) and disconnect the push rod from the bell crank output pin.
8. Remove the retaining ring(5) and locknut(2) from the booster.
9. Slide the hydroboost(1) out and away from the brake pedal area.
10. Discard the removed items (1) through (5).

ASSEMBLY

Use the contents contained in this kit for assembly.

1. Apply barium grease (provided) on the bell crank output pin.
2. Insert the hydroboost(1) into the brake pedal housing.
3. Slide locknut(2) over the end of push rod and start thread. Do not tighten at this point - Assembly of hydraulic lines will be easier.
4. Align the push rod with the bell crank output pin.
5. Install push rod retaining ring(4). Check the retaining ring groove for proper installation.
6. Place the spacer beneath the bellcrank, fully insert pivot shaft (align the D-Shape in hole) and install screw and washer. Tighten to 180-220 in.-lbs.
7. Remove the plugs and caps from port fittings and hoses and reconnect the inlet and return hoses to the hydroboost(1). Torque per Blue Diamond's specifications.

8. Tighten the locknut(2) to 95-149 ft.-lbs.
9. Install the retaining ring(5) in the retaining ring groove of the hydroboost body. Ensure that the retaining ring is secure.
10. Install the master cylinder on the hydroboost mounting studs. Secure using two 3/8" locknuts(3). Tighten to 180-220 in.-lbs.
11. Before placing the vehicle in service, perform the **Refilling & Bleeding and Testing Procedures**.

REFILLING & BLEEDING PROCEDURE

Master Cylinder Priming – In-vehicle or bench

WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with eyes. Wash hands thoroughly after handling. If brake fluid contacts eyes, flush eyes with running water for 15 minutes. Get medical attention if irritation persists. If taken internally, drink water and induce vomiting. Get medical attention immediately.

CAUTION: Do not allow the brake master cylinder reservoir to run dry during the bleeding operation. Keep the brake master cylinder reservoir filled with the specified brake fluid. Never reuse the brake fluid that has been drained from the hydraulic system.

CAUTION: Brake fluid is harmful to painted and plastic surfaces. If brake fluid is spilled onto a painted or plastic surface, immediately wash it with water.

NOTE: When any part of the hydraulic system has been disconnected for repair or replacement, air can enter the system and cause spongy brake pedal action. This requires bleeding of the hydraulic system after it has been properly connected. The hydraulic system can be bled manually or with pressure bleeding equipment.

NOTE: When the brake master cylinder has been replaced or the system has been emptied, or partially emptied. It should be primed to prevent air from entering the system.

1. For in-vehicle priming, disconnect the brake lines.
2. Install short brake tubes with the ends submerged in the brake master cylinder reservoir, and fill the brake master cylinder reservoir with brake fluid specified by the vehicle manufacturer.
3. Have an assistant pump the brake pedal, or slowly depress the primary piston until clear fluid flows from both brake tubes, without air bubbles
4. Remove the short brake tubes and install brake outlet tubes. Tighten the fittings to 25 Nm (18 lb-ft).
5. Fill the brake master cylinder reservoir with brake fluid specified by the vehicle manufacturer.

NOTE: Always bleed the brake system by starting at the wheel end that is furthest from the master cylinder and work towards the closest.

6. Bleed each brake tube at the master cylinder as follows:
 - A. Have an assistant pump the brake pedal and hold firm pressure on the brake pedal.
 - B. Loosen the brake tube fitting closest to the hydroboost unit until a stream of brake fluid comes out. While the assistant maintains pressure on the brake pedal, tighten the brake tube fitting.
 - C. Repeat this operation until clear, bubble-free fluid comes out.
 - D. Refill the brake master cylinder reservoir as necessary. Repeat the bleeding operation for the tube furthest from the hydroboost unit.

Four Wheel Anti-Lock Brake System (4WABS) Hydraulic Control Unit (HCU)

NOTE: This procedure only needs to be performed if the 4-wheel anti-lock brake (4WABS) hydraulic control unit (HCU) has been replaced or if air is suspected in the HCU.

1. Clean all dirt from and remove the brake master cylinder filler cap, and fill the brake master cylinder reservoir with the specified brake fluid.
2. Connect a clear waste line to the RH rear bleeder screw and submerge the free end of the tube in a container partially filled with clean brake fluid.
3. With the RH rear bleeder screw open, cycle the brake pedal until no more air is seen in the waste line.
4. Tighten the RH rear bleeder screw and disconnect the waste line.
5. Repeat steps 2 through 4 for the LH rear bleeder screw, the RH front disc brake caliper bleeder screw and the LH front disc brake caliper bleeder screw, in that order.
6. Connect the diagnostic tool cable adapter into the vehicle data link connector (DLC) under the dash, and follow the diagnostic tool instructions.
7. Repeat the system bleed procedure as outlined in steps 1 through 5.

BRAKE SYSTEM BLEEDING Manual

WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with eyes. Wash hands thoroughly after handling. If brake fluid contacts eyes, flush eyes with running water for 15 minutes. Get medical attention if irritation persists. If taken internally, drink water and induce vomiting. Get medical attention immediately.

CAUTION: Do not allow the brake master cylinder reservoir to run dry during the bleeding operation. Keep the brake master cylinder reservoir filled with the specified brake fluid. Never reuse the brake fluid that has been drained from the hydraulic system.

CAUTION: Brake fluid is harmful to painted and plastic surfaces. If brake fluid is spilled onto a painted or plastic surface, immediately wash it with water.

NOTE: When any part of the hydraulic system has been disconnected for repair or replacement, air can enter the system and cause spongy brake pedal action. This requires bleeding of the hydraulic system after it has been properly connected. The hydraulic system can be bled manually or with pressure bleeding equipment.

1. Clean all dirt and remove the brake master cylinder filler cap and fill with brake fluid specified by the vehicle manufacturer.
2. Place a box-end wrench on the RH rear bleeder screw. Attach a rubber drain tube to the RH rear bleeder screw and submerge the free end of the tube in a container partially filled with clean brake fluid.
3. Have an assistant pump the brake pedal and then hold firm pressure on the brake pedal.
4. Loosen the RH rear bleeder screw until a stream of brake fluid comes out. While the assistant maintains pressure on the brake pedal, tighten the RH rear bleeder screw.
 - A. Repeat until clear, bubble-free fluid comes out.
 - B. Refill the brake master cylinder reservoir as necessary.
5. Tighten the RH rear bleeder screw to 35 Nm (26 lb-ft).
6. Repeat steps 2 through 5 for the LH rear bleeder screw.
7. Place a box-end wrench on the RH front disc brake caliper bleeder screw. Attach a rubber drain tube to the RH front disc brake caliper bleeder screw, and submerge the free end of the tube in a container partially filled with clean brake fluid.
8. Have an assistant pump the brake pedal and then hold firm pressure on the brake pedal.
9. Loosen the RH front disc brake caliper bleeder screw until a stream of brake fluid comes out. While the assistant maintains pressure on the brake pedal, tighten the RH front disc brake caliper bleeder screw.
 - A. Repeat until clear, bubble-free fluid comes out.
 - B. Refill the master cylinder reservoir as necessary.
10. Tighten the RH front disc brake caliper bleeder screw.
11. Repeat Steps 7 through 10 for the LH front disc brake caliper bleeder screw.

Pressure

1. Clean all dirt from and remove the brake master cylinder filler cap and fill the brake master cylinder reservoir with DOT 3 motor vehicle brake fluid.
2. **NOTE:** Master cylinder pressure bleeder adapter tools are available from various manufacturers of pressure-bleeding equipment. Follow the instructions of the manufacturer when installing the adapter. Install the bleeder adapter to the brake master cylinder reservoir, and attach the bleeder tank hose to the fitting on the adapter.
3. **NOTE:** Bleed the longest line first. Make sure the bleeder tank contains enough specified brake fluid to complete the bleeding operation. Place a box-end wrench on the RH rear bleeder screw. Attach a rubber drain tube to the RH rear bleeder and submerge the free end of the tube in a container partially filled with clean brake fluid.

4. Open the valve on the bleeder tank.
5. Loosen the RH rear bleeder screw. Leave open until clear, bubble-free brake fluid flows, then tighten the RH rear bleeder screw to 35 Nm (26 lb-ft) and remove the rubber hose.
6. Continue bleeding the rear of the system, going in order from the LH rear bleeder screw to the RH front disc brake caliper bleeder screw, ending with the LH front disc brake caliper bleeder screw.
7. Close the bleeder tank valve. Remove the tank hose from the adapter and remove the adapter.

TESTING THE SYSTEM

1. **NOTE:** Brake fluid is water-soluble and it is possible that all evidence of fluid leakage has been washed off if the vehicle has been operated in the rain or snow. Make sure the master cylinder reservoir is full.
2. Start the engine.
3. Apply the brakes several times and make sure the pedal feel is not spongy. If necessary, bleed the system.
4. Verify that the reservoir level is not dropping.
5. If the reservoir level is dropping, inspect the brake components, fittings and lines to locate the source of the leak.
6. Stop the engine. Check the fluid level in the power steering pump reservoir. Add fluid if necessary.