Technical *Bulletin*

Subject: **Remanufactured HydroVac Boosters**

Effective November 15, 1995 all remanufactured HydroVac Boosters will be shipped with a vacuum check valve, part number 2511065. The installation instruction sheet that is normally included with all replacement HydroVac boosters has been revised to include the check valve and a vacuum system troubleshooting section has been added to aid the installer in evaluating the condition of the vehicle's vacuum system. A sample of the two-sided instruction sheet is attached to this bulletin for reference.

Bendix®

Installation Instructions

Replacement HydroVac Power Brake Booster

COMMONIZED HYDROVAC
INSTALLATION DATA SHEET

MOUNTING INSTALLATION - 3 TYPES

A. Mounting bracket with studs - use existing mounting hardware from original unit.
B. Mounting bracket with universal holes - use 3/8"-16 bolts along with washers and nuts provided with re placement units.
C. Mounting lugs - hydraulic cylinder will have threaded lugs. Reuse original bolts and hardware.

FLUID INLET/OUTLET PORTS

Both the fluid inlet port (line in from master cylinder) and outlet port (line out to wheel cylinders) are 1/2"-20 thread. Some vehicle applications will require use of adaptors (supplied with replacement unit to accept 7/16"-24 line fittings.

VACUUM PORT

A threaded frame nipple is provided to adapt the vacuum port of the control valve from 1/2" to 3/8" where required.

ATMOSPHERIC PORT

Some applications will require adaptors (supplied with replacement unit) to be used in the atmospheric port allowing use of either 1/2" or 3/4" hose. Use caution when installing adaptor; avoid cross-threading or overtightening of adaptor. (IMPORTANT: Using an inch pound torque wrench, tightening adaptor to 80-120 in. lb.) Be sure to use O-ring provided to obtain proper seal.

VACUUM CHECK VALVE

Remove and discard the existing vacuum check valve (typically located in engine compartment or screwed into vacuum port of old HydroVac). Install the vacuum check valve, supplied with the Remanufactured HydroVac, at a point HIGHER than the vacuum source (typically the manifold of engine).

BLEEDING POWER BRAKE UNITS ON VEHICLE

WARNING: TO AVOID PERSONAL INJURY, BLEEDING MUST BE DONE WITH THE ENGINE OFF AND ALL VACUUM REMOVED FROM THE POWER BRAKE SYSTEM.

MANUAL BLEEDING

Fill master cylinder reservoir with DOT 3 or DOT 4 Brake Fluid. Attach a drain hose to the bleed screw on the control valve of the power brake hydraulic cylinder and immerse the other end in a jar partially full of fluid. Open the bleed screw 3/4 turn and depress the brake pedal slowly. Close the bleed screw before releasing the brake pedal. Repeat bleeding operation until fluid flowing into jar is clean and free of air bubbles. CHECK AND REFILL MASTER CYLINDER RESERVOIR FREQUENTLY. DO NOT REUSE OLD FLUID. Attach drain hose to bleed screw on end cap, if provided, or open and close tube nut in outlet port, using rag to catch fluid. Continue bleeding at wheel brakes, the longest hydraulic line first. Fill master cylinder reservoir and install cover.

PRESSURE BLEEDING

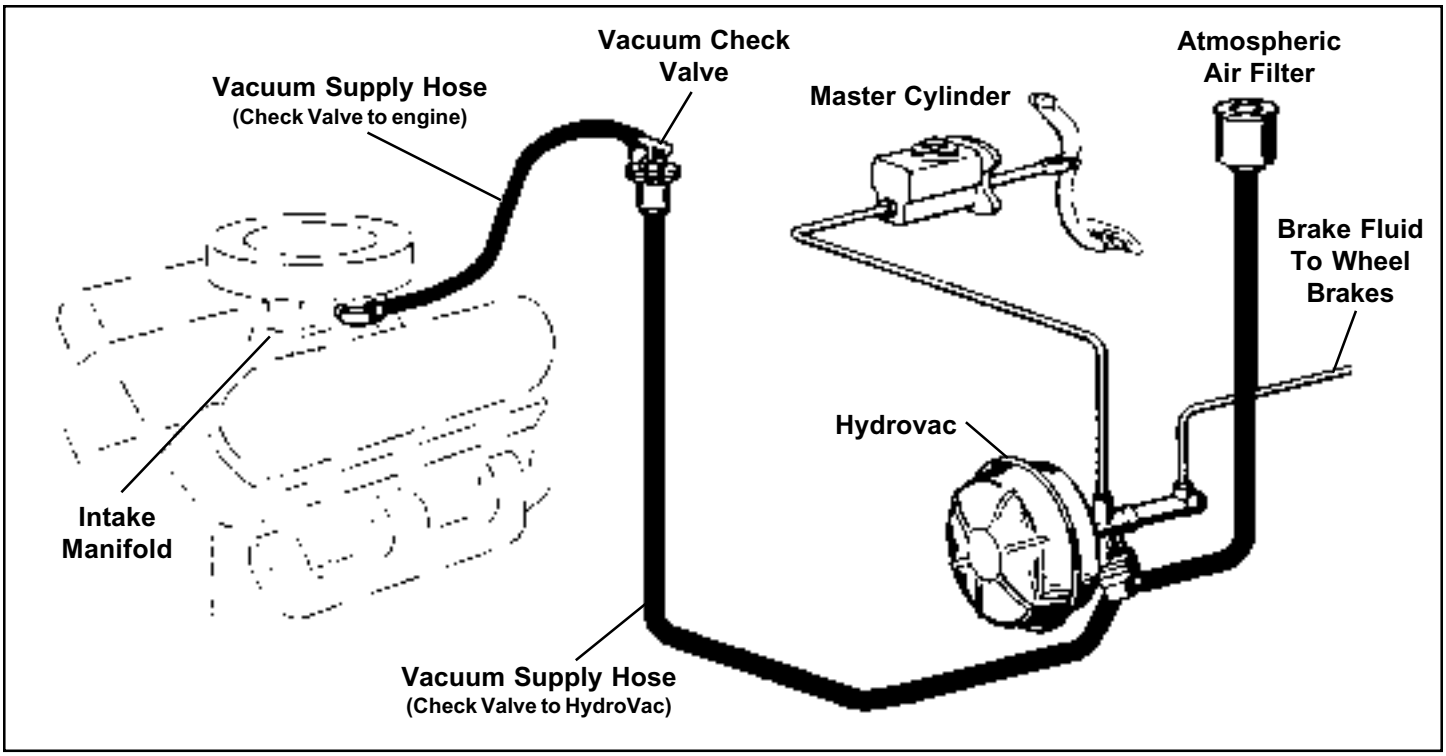
Fill master cylinder reservoir with DOT 3 or DOT 4 Brake Fluid. Attach pressure bleeder tank that contains under 25-30 psi pressure to the master cylinder reservoir. Apply pressure to remove air from hose before tightening hose connection at reservoir.

NOTE: When pressure-bleeding a Multi-Vac unit, do NOT attach pressure bleeder to port in side of master cylinder reservoir. The brake tube from this port to the compensating valve port in the end cap of the Multi-Vac must be connected to provide fluid and pressure to the output side of this high-pressure relief valve in the hydraulic piston of the power brake.

Attach a drain hose to the bleed screw on the control valve of the power brake hydraulic cylinder and immerse the other end in a jar partially full of fluid. Open the pressure bleeder valve. Open the bleed screw 3/4 turn. When fluid flow is clean and free of air bubbles, close bleed screw and disconnect drain hose. Attach drain hose to bleed screw on end cap, if provided, or open and close tube nut in outlet port, using rag to catch fluid. Continue bleeding at wheel brakes, the longest hydraulic line first. Disconnect pressure bleeder tank, fill master cylinder reservoir and install cover. If the pedal is spongy after a complete pressure bleed of a Multi-Vac system, air may have been trapped inside the hydraulic piston. Manually bleed the hydraulic cylinder at the bleed screw or output port tube nut on top of the end cap, using sufficient brake pedal pressure to open the high-pressure relief valve. (See WARNING, above.)

Testing The Installation

Replacement HydroVac Power Brake Booster



Typical HydroVac Vacuum System

IMPORTANT

When replacing the HydroVac brake booster Inspect and Test the vacuum system to assure proper operation.

INSPECTION

The following areas should be inspected;

A. Vacuum line from HydroVac to Check Valve
B. Vacuum line from engine manifold to Check Valve
C. Atmospheric Air Filter

Pay particular attention to the condition of the hose between the engine and vacuum check valve. Make certain to check the hose area around the hose clamps for breaks. Breaks or signs of deterioration in hoses A or B indicate the possibility of heat, fuel or oil damage and require replacement of the affected lengths. The atmospheric Air Filter should be cleaned or replaced when the HydroVac is replaced.

TESTING

1. Remove the vacuum hose from the HydroVac and install a vacuum gauge (0 - 30 inches of mercury) in the end of the hose.
2. Start the engine and allow it to idle for several minutes and attain operating temperature. Note the vacuum gauge reading. A minimum vacuum of 16 inches of mercury is required for proper brake boost from the HydroVac. If the vacuum reading is less than 16" HG then check the vacuum at the engine manifold. If manifold vacuum is less than 16" HG repair the engine. If the reading is above 16" HG then a problem exists between the HydroVac and engine manifold (e.g.; inner core of hose collapsing, check valve inoperative or improperly installed, excessive vacuum leakage). Inspect and repair before proceeding to step 3.
3. Check for system leakage using a watch (with second hand) and vacuum gauge. Build up full vacuum, shut the engine off and observe the gauge.

A. For a vacuum system with a separate vacuum reservoir, a drop of no more than 2 inches of mercury in 60 seconds should be observed.
B. For a vacuum system without a separate vacuum reservoir, a drop of no more than 2 inches of mercury in 15 seconds should be observed.

GENERAL

With 150 lbs. applied to the brake pedal and vacuum of 16" HG , hydraulic pressure at the wheel brakes should be a minimum of 1000 psi.

Refer to AlliedSignal Bendix publication BW1399 entitled "Troubleshooting the Vacuum Hydraulic Brake System" for complete troubleshooting, testing and values of both the vacuum and hydraulic portions of the brake system. A copy of this 6 page publication can be obtained from your local authorized AlliedSignal Truck Brake Systems Co. parts outlet.