BENDIX HYDROVAC

Dodge (M400 & M500)
Ford (M450 & M500)

NOTE — For other units used, see Power Brake Unit Index.

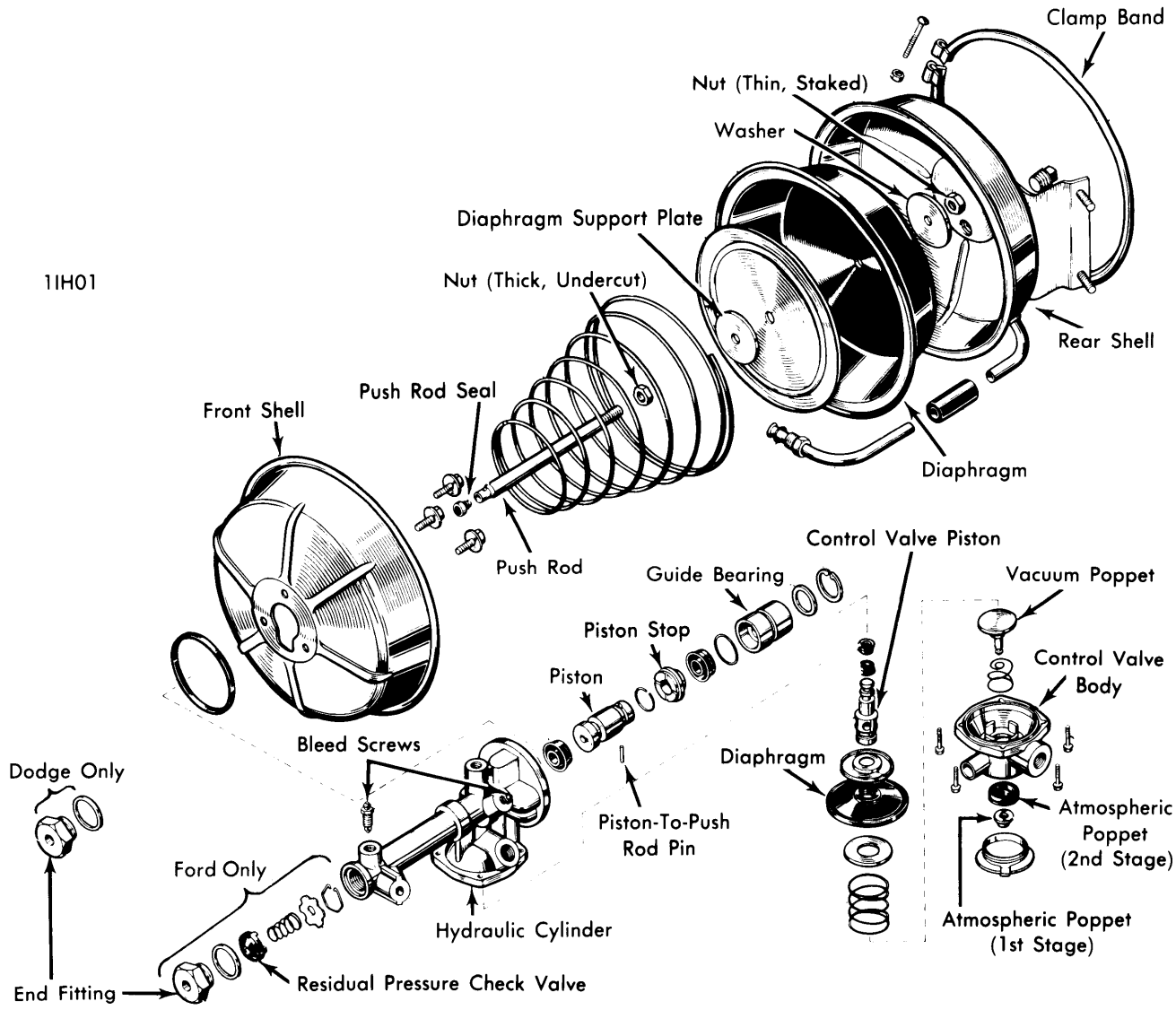
DESCRIPTION

Unit is single diaphragm vacuum operated and is made up of three functional components: power section, hydraulic slave cylinder, and vacuum control valve. Power section contains a power diaphragm and push rod that connects power diaphragm to slave cylinder piston. Hydraulic slave cylinder contains hydraulic piston and cup assembly and, on Ford only, a residual pressure check valve assembly (see illustration). Vacuum control valve is hydraulically actuated to proportion power output of power section in accordance with hydraulic pressure developed by vehicle master cylinder. Unit is frame mounted.

OVERHAUL

Disassembly — 1) Scribe across front and rear shells. Clamp hydraulic cylinder in bench vise. Disconnect control tube nut from control valve port and slide hose off rear shell control tube. Remove nut and bolt from clamp band and remove band and rear shell.

2) With hydraulic cylinder held firmly in vise in a horizontal position with control valve up, roll bead of diaphragm back from flange of front shell. Compress diaphragm return spring slightly and remove lock ring with suitable pliers from groove in end of cylinder. Remove diaphragm, spring, push rod, and hydraulic parts as an assembly. Slide diaphragm return spring carefully off hydraulic piston end and lay assembly on clean work bench.



HYDROVAC POWER UNIT ASSEMBLY (TYPICAL)

BENDIX HYDROVAC (Cont.)

3) Remove three capscrews, front shell, and gasket from hydraulic cylinder. *NOTE — Disassemble diaphragm and push rod parts only if necessary to replace a damaged part.* To disassemble, grip flat on push rod with wrench and remove nut on threaded end. Then slide other parts, including diaphragm, off threaded end of push rod.

4) Working on clean work bench, lift retainer ring from groove in hydraulic piston. Press pin from holes in piston and push rod, and then slide piston, stop, seal, bearing, washer, and lock ring off push rod. Remove cup from piston and "O" ring from bearing. If new push rod seal is available, use pliers to pull seal out of push rod, being careful to avoid damaging push rod.

5) Scribe across flanges of valve body and hydraulic cylinder housing. Remove four screws, valve body, and all control valve parts. Remove two back-to-back cups from valve piston. Remove washers and diaphragm from piston. Use screwdriver in slot to pry cover carefully out of valve body. Press large plastic poppet in against its seat and pry small atmospheric poppet off, then remove other parts attached. Remove end fitting and seal. Remove snap ring with needle-nose pliers or thin screwdriver and disassemble residual pressure check valve parts (Ford only).

Reassembly — Install residual pressure check valve with spring, washer and snap ring in end fitting (Ford only). Install seal and fitting in hydraulic cylinder. Assemble two cups, back-to-back on control valve piston, then assemble washer and diaphragm on piston. Be sure inner bead of diaphragm seats in piston groove.

2) Lay piston and diaphragm assembly on clean work bench and assemble small coil of vacuum poppet return spring on stem of vacuum poppet, and install both parts in valve body. Assemble large atmospheric poppet flat side up and small retainer poppet on stem of vacuum poppet. Invert valve body, rest vacuum poppet on small block of wood and tap small retainer poppet lightly with soft hammer until it snap-locks on stem.

3) Assemble plastic cover in valve body. Assemble spring retainer with flange down on control valve diaphragm return spring in valve body. Dip control valve piston and cups in clean brake fluid and insert in valve bore of hydraulic cylinder. Align scribe marks on flanges of valve body and housing and attach with four screws.

4) To assemble a new push rod seal in push rod, place new seal on clean block of wood, rubber side down. With push rod resting vertically on seal stem, strike threaded end of push rod with rawhide hammer to seat seal. Be sure shoulders of seal and rod are in contact. Wet hydraulic parts in clean brake fluid. Slide lock ring, retainer washer, guide bearing with "O" ring seal in outer groove on guide bearing, seal cup and seal retainer on push rod. Slide retainer ring on end of hydraulic piston next to ring groove and attach piston to push rod with retaining pin.

5) Lock retaining pin in hole with retainer ring. Be sure ring is fully seated in ring groove on piston. Dip cup in brake fluid and assemble on piston. *NOTE — If power diaphragm and push rod parts were disassembled, grip flat near threaded end of push rod with wrench and install thick nut, undercut side first. Then install washer, plate, diaphragm, washer and thin nut. Stake thin nut in two places.*

6) Grip hydraulic cylinder in vise in horizontal position with control valve body up and place new gasket in groove at flange end of hydraulic cylinder. Align cutout in front shell with port in hydraulic cylinder flange and assemble shell with three capscrews to flange. Assemble diaphragm return spring, large coil first, against power diaphragm support plate. Pick up the spring, diaphragm, push rod and hydraulic piston assembly and dip hydraulic parts into clean brake fluid.

7) Roll back outer bead of diaphragm and seat small coil end of diaphragm return spring around outside of the three capscrews. Ease hydraulic piston, cup, stop, and bearing parts into bore of cylinder. Press against diaphragm to compress return spring and use both hands to guide hydraulic parts into bore. Then use suitable pliers to seat lock ring securely in cylinder groove before releasing pressure on spring. *CAUTION — Parts damage and/or personal injury may result if lock ring is not seated securely.*

8) Lightly coat both sides of diaphragm bead with silicone lubricant of medium consistency or talcum powder. Align rear shell to scribe marks. Press rear shell flange and diaphragm bead into position against front shell flange. Make certain diaphrgm bead is positioned between shell flanges all the way around. Assemble clamp band on shells, scribe marks aligned, and tighten nut and bolt. Tap band lightly with rawhide hammer in three places 90° apart and retighten bolt and nut.

9) Place new ring seal on end of control tube and slide vacuum hose onto both sections of control tube, then secure control tube to valve body with tube nut. Tighten tube nut. If removed, install pipe plug in rear shell and tighten plug. If removed, install two bleed screws in bleed ports above end fitting and beside input port and tighten screws.