HYDRAULIC BRAKE BLEEDING

► CHANGES, CAUTIONS, CORRECTIONS

► *DISC BRAKE FLUID CAUTION* – Disc brake systems, or combination drum and disc brake systems, use special high temperature brake fluid, usually blue in color. Do not use ordinary fluid on any car with disc brakes, and do not mix ordinary brake fluid with special disc brake fluid.

► *DISC BRAKE BLEEDING CAUTION* – During bleeding, air tends to cling to caliper walls; therefore, lightly tapping caliper will assist in removal of this air.

► *1967-70 AMERICAN MOTORS BLEEDING CAUTION* – Before bleeding brakes, disconnect wire from warning light switch and remove nylon switch terminal, spring, and nylon plunger with contact. After bleeding brakes, reassemble switch and connect wire. If warning light switch is triggered, light will stay on. Switch may be reset by removing and replacing plunger as described above. If plunger will not come out easily, apply slight pressure to brake pedal while removing plunger.

► *1971-73 AMERICAN MOTORS BLEEDING CAUTION* – On disc brakes, disable the metering valve section of combination valve, using suitable tool (J-23774), to hold valve stem at correct length. On drum brakes, remove the pressure differential warning switch terminal and plunger from valve assembly.

► *1973 CHRYSLER CORP. BLEEDING CAUTION* – If equipped with combination warning, proportioning, metering valve, hold valve open during bleeding, using suitable tool (C-4121). Brake warning light will come on and moderate brake application after bleeding will hydraulically recenter valve and turn light out. Before bleeding, it is recommended that brakes be adjusted until locked (to reduce cup movement and assist bleeding).

► 1967-73 FORD MOTOR CO. BLEEDING CAUTION – On disc brakes, hold metering valve stem out with suitable tool (J-22742), while bleeding. After any repair or bleeding, brake warning (pressure differential) switch should be recentralized: Turn ignition to ON or ACC and depress pedal; switch will centralize and light will go out.

► *1967-70 GENERAL MOTORS BLEEDING CAUTION* – On vehicles with combined drum and disc brakes, the metering valve in the line to front (disc) brakes must be held open by depressing plunger, when using pressure bleeder, except on Cadillac Eldorado. The metering valve on Eldorado has a knob which must be pulled out. After bleeding, release valve. On all vehicles, this procedure is not necessary when bleeding manually.

► *1971-73 GENERAL MOTORS BLEEDING CAUTION* – If equipped with combination metering, proportioning, warning switch, hold switch open during bleeding, with suitable tool (J-23709). On Cadillac with Track Master, bleed modulator valve first.

► *WHEEL CYLINDER BLEEDING NOTE* – Dual master cylinder systems will bleed more efficiently if wheel cylinder bleed screw is opened more than one turn. Disc brake calipers will bleed effectively without pressure application. DO NOT let master cylinder run dry.

► *LOW PEDAL ON FIRST STOP CORRECTION* – If pedal is low or goes almost to floor on first application after vehicle has been sitting for several hours, but comes to normal height on successive applications, the cause may be air in system or incorrect push rod adjustment. To correct, bleed system thoroughly, opening bleed screws more than one turn, then check for master cylinder compensation. See *master cylinder articles in this Section.*

DESCRIPTION

Bleed brakes at all four wheels if pedal feels spongy, or lines at master cylinder have been disconnected, or single master cylinder has run dry. If dual master cylinder runs dry, master cylinder will have to be bled separately before bleeding wheel cylinders. If line at only one wheel has been disconnected, then only that wheel needs bleeding. If line is disconnected at any point between master cylinder and wheel cylinders, then all wheels serviced by that line must be bled.

Pressure Tank Bleeding

► *PRESSURE TANK CAUTIONS:* To safeguard against air entering system, observe the following:

1) Do not shake or agitate pressure tank after air pressure has been introduced.

2) Do not move pressure tank position, but bring air line to tank when additional air pressure is required.

3) Be sure that valves on pressure tank lines are not defective and allowing air to be sucked in when fluid passes through lines.

4) Keep pressure tank at least 1/3 full of fluid at all times.

5) When pressure tank is full of air bubbles, release air pressure so bubbles can escape, then repressurize.

Bleeding Procedure - Clean master cylinder cap and surrounding area, then remove cap. With pressure tank more than 1/3 full and with hose and master cylinder both filled with specified fluid, attach hose to master cylinder filler opening using suitable adapter as required. Attach bleeder valve hose to first bleeder valve according to correct bleeding sequence. *NOTE - See "Bleeding Sequence" below for each car model.* Place other end of hose in a clean glass jar partly filled with new brake fluid so hose is submerged in fluid. Unscrew bleeder valve ¾-1 turn, and open pressure tank hose valve to supply fluid under pressure. *NOTE - Follow equipment manufacturers pressure specifications except if noted in chart below.* When fluid flowing from cylinder bleeder valve hose into glass jar is free of air bubbles, close bleeder valve securely. Bleed the other cylinders in correct sequence and in the same manner.

HYDRAULIC BRAKE BLEEDING (Cont.)

Special Oldsmobile Procedure – Charge bleed ball as specified (use maximum allowable, without ball leaking). Bleed master cylinder first. Bleed both front units together. After opening bleed screw 3/4 turn, apply pressure with bleed ball. To ensure complete air evacuation, tap pedal 1/4-1/2" during bleeding. Repeat procedure, bleeding both rear units at same time. *NOTE – On disc brakes, ensure combination valve is held open as described.*

Pressure Bleeder Settings

Application	Pressure (psi)
Buick & Pontiac	35 (Max.)
Cadillac	30 (Min.)
Chevrolet	20-30
Chrysler Corp.	Approx. 35
Ford Motor Co.	10-30
Oldsmobile	35-60

Manual Bleeding

NOTE - Manual bleeding not recommended on Chrysler Corp. models.

Fill master cylinder, install bleeder hose and glass jar to bleeder valve as in pressure bleeding (above). Unscrew bleeder valve ¾-1 turn. Depress brake pedal a full stroke, then allow pedal to return to released position. *CAUTION - If pedal returns quickly, air will be drawn into system.* Repeat this operation until fluid flowing from bleeder valve into glass jar is free of air bubbles, then close bleeder valve and proceed to other cylinders in proper sequence. *See "Bleeding Sequence" below. NOTE - Check fluid level in master cylinder frequently during bleeding operation to insure that air will not enter system.* Refill master cylinder to proper level.

Bleeding Sequence

Before bleeding, exhaust all vacuum from power unit by pushing brake pedal several times. Bleed master cylinder, if equipped with bleed screws, then bleed wheel cylinders in sequence listed:

Application	Sequence
American Motors	Longest Line First
Chrysler Corp.	RR, LR, RF, LF
Ford Motor Co.	RR, LR, RF, LF
General Motors	
Buick & Oldsmobile(1)	LF, RF, LR, RR
Cadillac & Pontiac	RR, LR, RF, LF
Chevrolet	Nearest to Master Cyl. First

(1) – Oldsmobile sequence if manually bleeding.