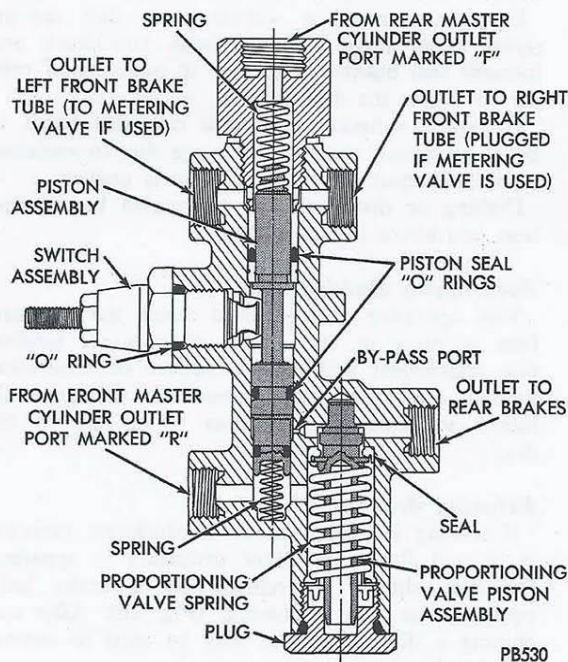
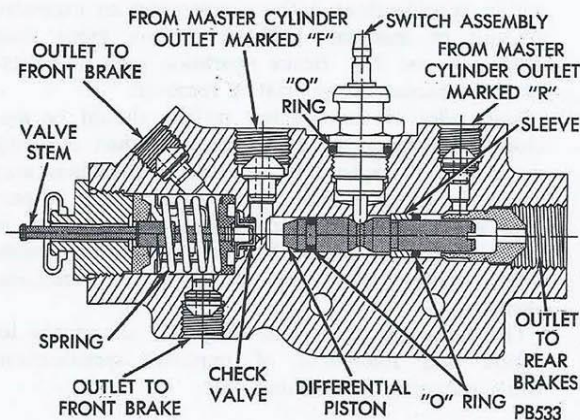


# BRAKE VALVES OVERVIEW

## 5-54 DISC BRAKE—FLOATING CALIPER



**Fig. 22 - Brake Warning Switch/Proportioning Valve Assembly (Sectional)**



**Fig. 24 - Brake Warning Switch/Metering Valve Assembly (Sectional)**

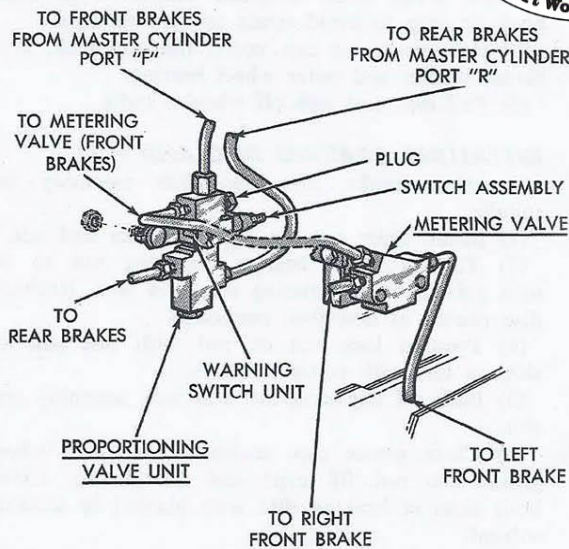
### CAUTION:

When refacing a braking disc (Fig. 20), the manufacturers of the refacing equipment instructions should be followed closely, and the correct brake disc mounting adaptors must be used to obtain the required specifications.

### PROPORTIONING, METERING VALVES

Two brake control valve systems are used with floating caliper disc brake, depending on models, as follows:

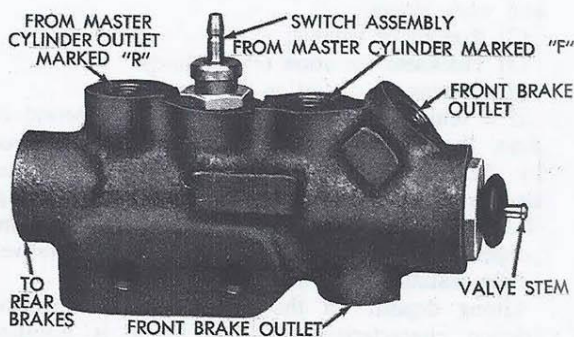
- (1) Satellite and Barracuda Models use a dual



## 1970-71 E/B Body

**Fig. 23 - Brake Warning Switch/Proportioning Valve and Metering Valve Assembly**

## 1972,73,74 E/B Body



**Fig. 25 - Brake Warning Switch/Metering Valve unit, brake warning switch/proportioning valve assembly (Fig. 22), and separate metering valve (Fig. 23).**

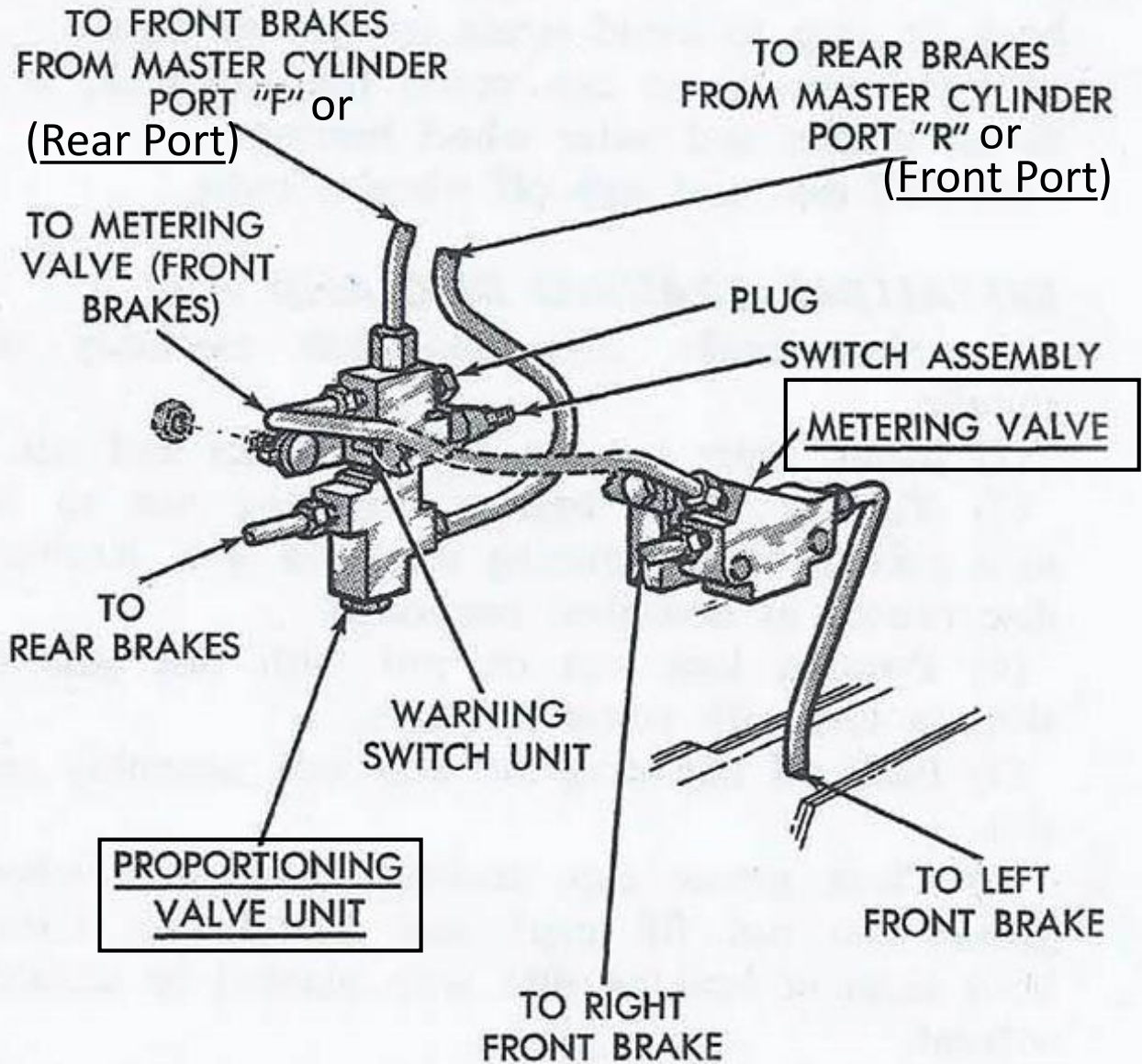
- (2) Fury, Chrysler and Imperial models use a dual unit, brake warning switch/metering valve assembly (Figs. 24 and 25).

### PROPORTIONING VALVE

The proportioning valve unit operates by restricting, at a given ratio, hydraulic pressure to the rear brakes when system hydraulic pressure reaches a certain point.

On light pedal application the valve allows full brake hydraulic pressure to the rear brakes.

# Brake Valve, Combination, TA, AAR



PB532

**Fig. 23 - Brake Warning Switch/Proportioning Valve and Metering Valve Assembly**

The Finest Valve Used 1970-1971



## DISC BRAKE—FLOATING CALIPER 5-53

connect brake line). Suspend caliper from wire hook or loop to avoid strain on flexible hose.

(3) Remove grease cap, cotter pin, nut lock, nut, thrust washer and outer wheel bearing.

(4) Pull disc and hub off wheel spindle.

### INSTALLING BRAKING DISC AND HUB

(1) Slide brake disc and hub assembly on spindle.

(2) Install outer bearing, thrust washer and nut.

(3) Tighten wheel bearing adjusting nut to 90 inch pounds while rotating disc and hub. Recheck disc runout as described previously.

(4) Position lock nut on nut with one pair of slots in line with cotter pin hole.

(5) Back off adjusting nut and lock assembly one slot.

(6) Clean grease cap, coating inside with wheel grease (do not fill cap) and install cap. Clean both sides of braking disc with alcohol or suitable solvent.

(7) Install caliper assembly, as described in "Installing Caliper" paragraph.

### REFINISHING (REFACING) BRAKING DISC

Before refinishing or refacing a braking disc, the disc should be checked and inspected for the following conditions:

(1) Scoring, rust, impregnation of lining material and worn ridges.

(2) Runout or wobble.

(3) Thickness variation (Parallelism).

(4) Dishing or distortion (Flatness).

If a vehicle has not been driven for a period of time, the discs will rust in the area not covered by the lining and cause noise and chatter, excessive wear and scoring of the discs and lining. Wear ridges on the discs can cause temporary improper lining contact if ridges are not removed before installation of new lining (pads).

Lining deposit on the disc, may cause erratic friction characteristics if new lining is installed

without resurfacing or cleaning the disc.

Excessive runout or wobble in a disc can increase pedal travel due to piston knockback and increase seal bushing wear due to necessity of caliper to follow the disc wobble.

Thickness variation in a disc can also result in pedal pulsation, chatter and surge due to variation in brake output when disc section is uneven.

Dishing or distortion can be caused by extreme heat and abuse of the brakes.

### Resurfacing Braking Disc

This operation can be used when the disc surface is rusty or has lining deposits. A sanding disc attachment will remove surface contamination without removing much material. It will generally follow variations in thickness which are in the disc.

### Refacing Braking Disc

If scoring is deep, runout or thickness variation is beyond limits, or other distortion is apparent, the disc should be refaced on a brake lathe equipped for disc machining. (Fig. 20). After machining a disc, a grinder may be used to remove tool marks.

A new disc and hub assembly should be installed if the old one cannot be refaced to bring it within specifications without removing an excessive amount of material. Do not remove more than .050 inch per disc. Brake operation may be affected if an excess of material is removed.

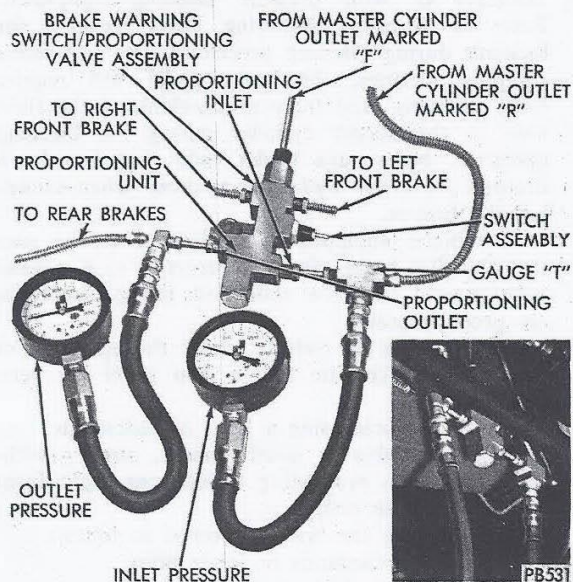
Both sides of the braking surface should be machined or ground an equal amount when servicing since small variations in resurfacing machines may cause the newly finished surface to be out of parallel with the opposite unfinished side resulting in a thickness variation beyond acceptable limits. Disc brakes are very sensitive to thickness variation.

The following chart and (Fig. 21) shows the location and tolerances of required specifications when servicing the braking disc:

	Thickness	Minimum Thickness	Thickness Variation	Runout	Micro Finish
Braking Disc (Floating Caliper)					
All Except, Satellite and Barracuda	1.250-1.240	1.180	.0005	.0025	15-80
Satellite and Barracuda	1.000-1.010	0.940	.0005	.0025	15-80



## DISC BRAKE—FLOATING CALIPER 5-55



**Fig. 26 - Testing Proportioning Valve Unit**

If hydraulic pressure is lost in the front brake system, rear brake system hydraulic pressure moves the brake warning switch piston and open and by-pass in the proportioning unit allowing full rear brake hydraulic pressure.

### TESTING PROPORTIONING VALVE

When a premature rear wheel slide is obtained on brake application, it usually is an indication that the fluid pressure to the rear brakes is above the 50% reduction ratio for the rear line pressure and that a malfunction has occurred within the proportioning valve, which should be tested.

To test the proportioning valve, proceed as follows:

(1) Install one of gauge set C-4007A and "T" between brake line from master cylinder port marked R and brake warning switch/proportioning valve assembly, and remaining gauge between output end of valve unit and rear brake line (Fig. 26) be sure all joints are fluid tight.

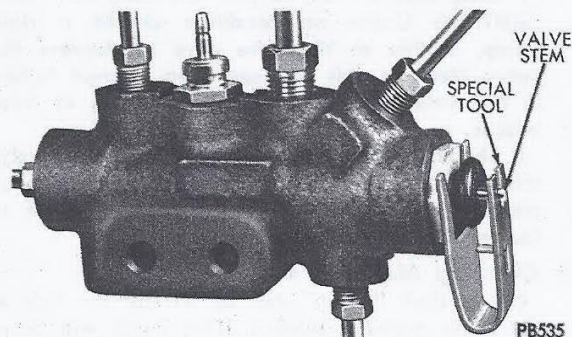
(2) Have a helper exert pressure on brake pedal (holding pressure). Obtain a reading on master cylinder output of approximately 500 p.s.i.

(3) While pressure is being held as above, reading on valve outlet Gauge should be 360-405 p.s.i.

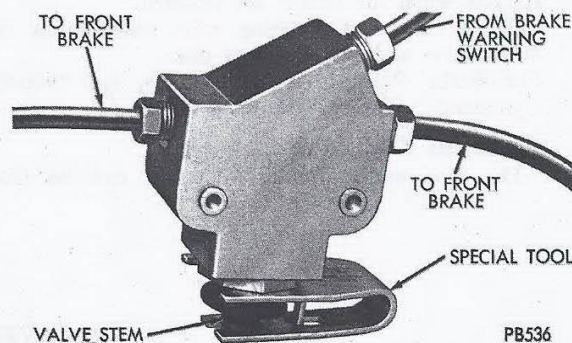
If proportioning valve pressure readings do not meet specifications, the valve should be removed and a new valve installed.

### PRESSURE METERING VALVE

All disc brake vehicles except Valiant models, are equipped with a pressure metering valve (Figs. 27 and 28). The valve is located on the left frame



**Fig. 27 - Holding Valve open (Brake Warning Switch/Metering Valve Assembly)**



**Fig. 28 - Holding Valve open (Metering Valve)**  
rail. The use of the metering valve is to better match front disc brakes with the rear drum brakes, resulting in improved braking and steering control on icy surfaces.

Due to operating characteristics of the valve, which causes complete shut-off of the flow of brake fluid between approximately 3 and 135 psi, front brake bleeding procedures should be done as follows:

(1) **Gravity Bleed:** This method of bleeding is not effected by the metering valve, as fluid pressures are always below 3 psi. Remove master cylinder reservoir cover and gasket, then fill reservoirs with approved brake fluid. Open disc brake bleeder screws, and allow fluid and air to drain until stream of fluid is free of air.

(2) **Pedal Bleed:** This method of bleeding is not effected by the metering valve, as fluid pressures are in excess of 135 psi. Follow normal procedure of pumping pedal and opening bleeder screws. **Do not pump master cylinder dry!**

(3) **Pressure Bleed:** This method of bleeding is influenced by the metering valve. Bleed pressure, which is normally about 35 psi, is high enough to cause the metering valve to close, stopping the flow of fluid to the front brakes. However, the valve (Fig. 27 or 28) can be held open manually



## 5-56 DISC BRAKE—MASTER CYLINDER

by using **Tool C-4121**, to pull the valve stem out.  
**CAUTION:** Under no condition should a rigid clamp, wedge or block be used to depress the valve stem, as this can cause an internal failure in the valve, resulting in complete loss of front brakes.

It should be noted that the pressure release valve stem is in its innermost position when there is no pressure present. No attempt should be made to further depress the valve stem.

### Checking Metering Valve

(1) A slight "bump" can be felt by the foot as the brake pedal is stroked. This bump will occur after the pedal has been stroked about 1 inch.

(2) A visual check will show that the valve stem extends slightly when the brakes are applied and retracts when the brakes are released.

(3) In case of a metering valve malfunction, remove valve and install a new one.

For Brake Warning Switch service, see "Master Cylinders".

### BLEEDING DISC BRAKE

The disc brake hydraulic system can be bled

manually or with pressure bleeding equipment. Refer to "Pressure Metering Valve" section for lock-out during bleeding procedure. On disc brake equipped vehicles, the brake pedal will require more pumping, and frequent checking of the fluid level in the master cylinder during the bleeding operation. **Never use brake fluid that has been drained from the hydraulic system, when bleeding the brakes.**

On vehicles equipped with disc brakes, be sure that the disc brake piston is returned to a normal position and that the shoe and lining assemblies are properly seated.

Before driving the vehicle, check the operation of the brakes to be sure that a firm pedal has been obtained.

(1) Raise vehicle using a hoist or jackstands.

(2) Bleed brakes in usual manner, starting with right rear, then proceeding to left rear, right front and left front in order.

After bleeding the brakes, proceed as follows:

(1) Remove jackstands or lower hoist.

(2) Test drive vehicle to be sure brakes are operating correctly and that pedal is solid.

## MASTER CYLINDER

### Disc Brakes

### INDEX

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Brake Warning Switch.....	60	Master Cylinder Removal.....	57
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Disassembling Master Cylinder.....	57	Testing Master Cylinder.....	59
General Information.....	56	Testing Brake Warning Switches.....	60

### GENERAL INFORMATION

The tandem master cylinder (Fig. 1) is of the compensating type with the reservoirs cast integrally. The master cylinder consists of a front and rear piston (in tandem) two outlets, with 1 containing a residual pressure valve and spring (rear brake line outlet only), (Fig. 3).

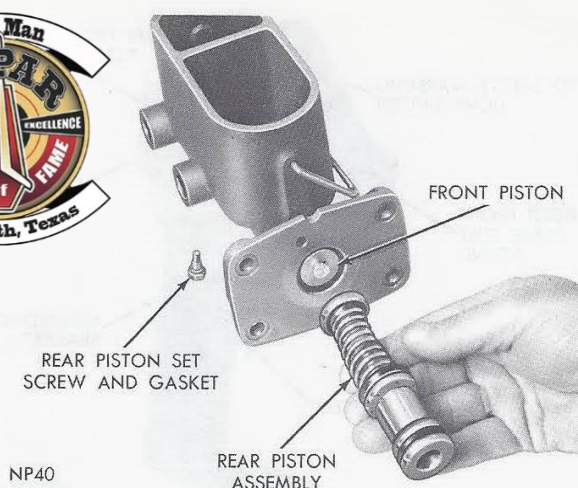
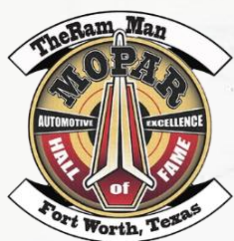
The front outlet tube from the master cylinder is connected to the brake warning switch proportioning valve assembly (Fig. 10) and then to the rear

brakes. The rear outlet tube from the master cylinder is also connected to the switch and the front brakes.

The master cylinder used on vehicles not equipped with power brake units is serviced in the same manner as the master cylinder with power brakes with one exception, the master cylinder with power brakes does not include the push rod.

The drum brake master cylinder is different than the disc brake master cylinder and is covered in the service brake section of this group.





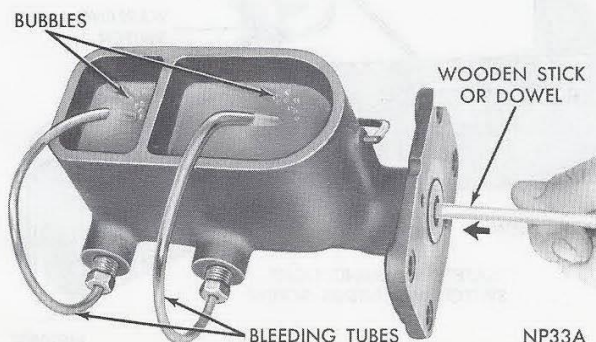
**Fig. 6—Installing Rear Piston Assembly**

both ports. This can be done by applying the pedal lightly with the engine running (power brakes) and observing for a gyser of fluid squirting up in the reservoirs. This may only occur in the front chamber and so to determine if the rear compensating port is open, it will be necessary to pump up the brakes rapidly and then hold the pedal down. Have an observer watch the fluid in the rear reservoir while the pedal is raised. A disturbance in the fluid indicates that the compensating port is open.

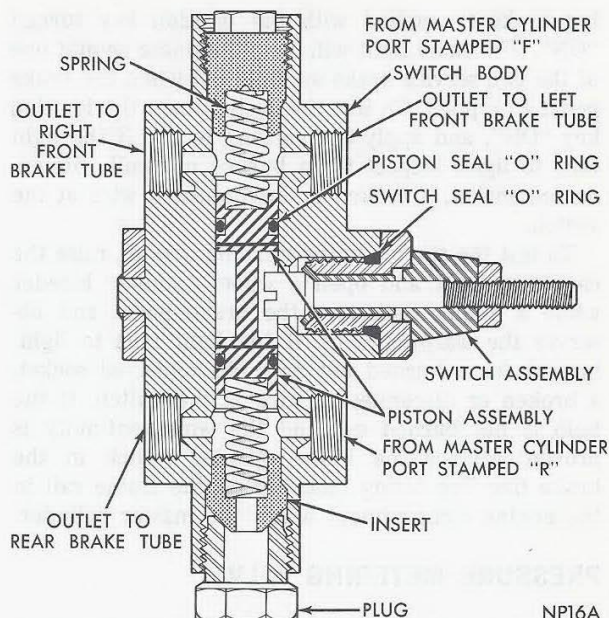
## HYDRAULIC SYSTEM SAFETY SWITCH

The hydraulic system safety switch (Figs. 8 and 9) is used to warn the vehicle operator that one of the hydraulic systems has failed. A failure in one part of the brake system does not result in failure of the entire hydraulic brake system. As an example, failure of the rear brake system will leave the front brake system still operative.

As pressure falls in one system, the other system's normal pressure forces the piston to the inoperative side; contacting the switch terminal, causing a red



**Fig. 7—Bleeding Master Cylinder**



**Fig. 8—Hydraulic System Safety Switch (Sectional)**

warning light to come on in the instrument panel, thus warning the operator of the vehicle, that one of the systems has failed and should be repaired.

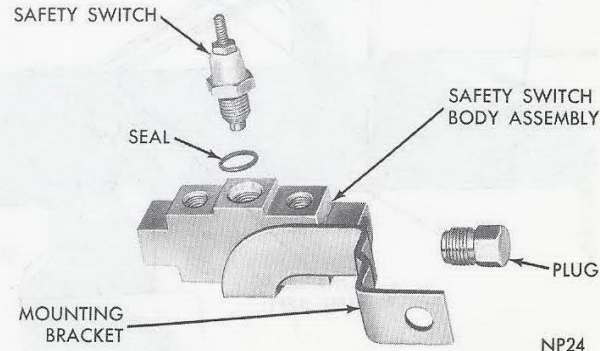
The safety switch is mounted on the frame in a vertical position, with the brake tubes connected, (Fig. 8).

If a malfunction occurs within the switch, disconnect tubes from body assembly and install a new assembly. **The component parts of the switch body are not serviced.** However, the terminal unit can be removed if a malfunction occurs, and a new terminal unit installed.

If a new safety switch body assembly is installed, bleed the brake system.

## TESTING HYDRAULIC SYSTEM SAFETY SWITCH

The brake warning light flashes only when the park-safety switch



**Fig. 9—Hydraulic System Safety Switch (Exploded View)**

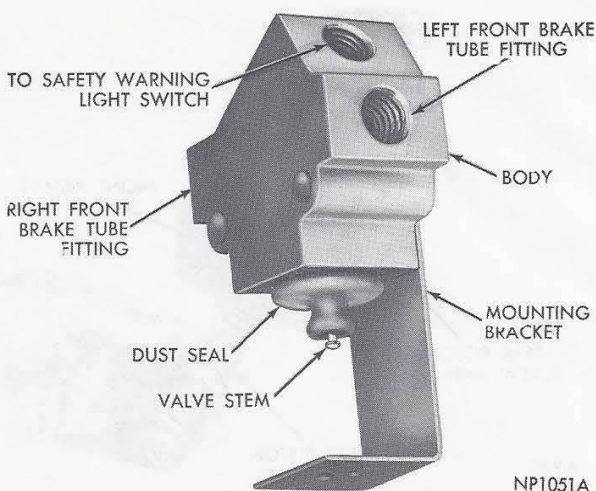


ing brake is applied with the ignition key turned "ON". The same light will also illuminate should one of the two service brake systems fail when the brake pedal is applied. To test the system turn the ignition key "ON", and apply the parking brake. If the light fails to light, inspect for a burned out bulb, disconnected socket, a broken or disconnected wire at the switch.

To test the service brake warning system, raise the car on a hoist and open a wheel cylinder bleeder while a helper depresses the brake pedal and observes the warning light. If the light fails to light, inspect for a burned out bulb, disconnected socket, a broken or disconnected wire at the switch. If the bulb is not burned out and the wire continuity is proven, replace the brake warning switch in the brake line Tee fitting mounted on the frame rail in the engine compartment below the master cylinder.

## PRESSURE METERING VALVE

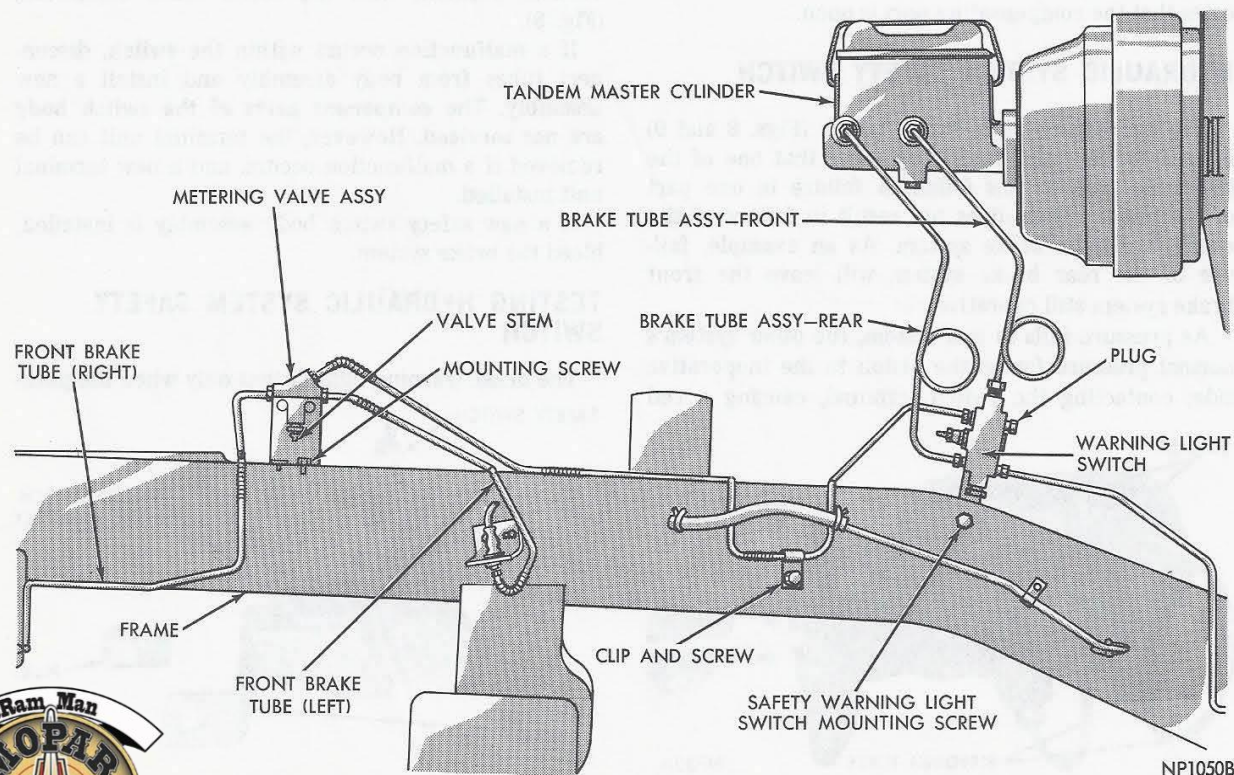
All disc brake vehicles are equipped with a pressure metering valve (Figs. 1, 2, 3 and 4). The valve is located on the left frame rail. The use of the metering valve is to better match front disc brakes with the rear drum brakes, resulting in improved braking and steering control on icy surfaces.



**Fig. 1—Metering Valve Assembly**

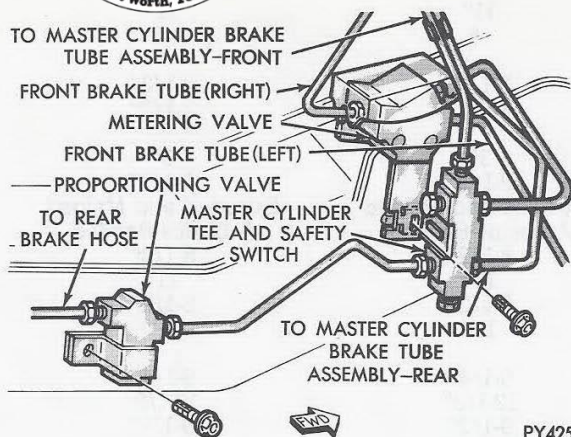
Due to operating characteristics of the valve, which causes complete shut-off of the flow of brake fluid between approximately 3 and 135 p.s.i. front brake bleeding procedures should be done as follows:

(1) **Gravity Bleed:** This method of bleeding is not effected by the metering valve, as fluid pressures are always below 3 p.s.i. Remove master cylinder reservoir cover and gasket, then fill reservoirs with approved



**Fig. 2—Metering Valve Mounting (Fury Models)**





PY425

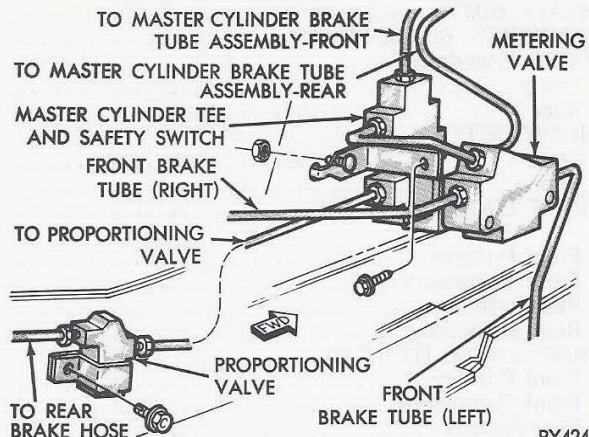
**Fig. 3—Metering Valve Mounting (Satellite Models)**

brake fluid. Open disc brake bleeder screws, and allow fluid and air to drain until stream of fluid is free of air.

(2) **Pedal Bleed:** This method of bleeding is not affected by the metering valve, as fluid pressures are in excess of 135 p.s.i. Follow normal procedure of pumping pedal and opening bleeder screws. **Do not pump master cylinder dry!**

(3) **Pressure Bleed:** This method of bleeding is influenced by the metering valve. Bleed pressure, which is normally about 35 p.s.i., is high enough to cause the metering valve to close, stopping the flow of fluid to the front brakes. However, the valve can be held open manually by using Tool C-4121, to pull the valve stem down.

**CAUTION:** Under no condition should a rigid clamp, wedge or block be used to depress the valve stem as



PY424

**Fig. 4—Metering Valve Mounting (Barracuda)**

this can cause an internal failure in the valve, resulting in complete loss of front brakes.

It should be noted that the pressure release valve stem is in its uppermost position when there is no pressure present. No attempt should be made to further depress the valve stem.

### Checking the Metering Valve

(1) A slight "bump" may be felt by the foot as the brake pedal is stroked. This bump will occur after the pedal has been stroked about 1 inch.

(2) A visual check will show that the valve stem extends slightly when the brakes are applied and retracts when the brakes are released.

(3) In case of a metering valve malfunction, remove valve and install a new one.

## SPECIFICATIONS

### BRAKES—SERVICE AND PARKING

Type	6 Cyl.	V-8 & H.D.
DRUM DIAMETER	Duo-Servo Single Anchor 9"	Duo-Servo Single Anchor 10"
NUMBER OF BRAKE SHOES	8	8
Front	2-9/16" wide	2-9/16" wide
Rear	2-1/16" wide	1-13/16" wide
BRAKE LINING	Extruded and Molded Asbestos-Bonded	Extruded and Molded Asbestos-Bonded
Front Primary	2-1/4" wide 7-5/8" long	2-1/2" wide 8-1/2" long
Front Secondary	2-1/2" wide 9-5/8" long	2-1/2" wide 11" long
Rear Primary	2" wide 7-5/8" long	1-3/4" wide
Rear Secondary	2" wide 9-5/8" long	1-3/4" wide
Thickness Primary	3/16"	3/16"
Secondary	1/4"	1/4"
WHEEL CYLINDER	4 per car	4 per car
Front Wheel Cylinder Bore	1"	1-3/16"
Rear Wheel Cylinder Bore	13/16"	15/16"
MASTER CYLINDER BORE	1"	1"
Type	Duo-Servo Single Anchor	Duo-Servo Single Anchor
DRUM DIAMETER	10"	10"





## SPECIFICATIONS

(HEAVY DUTY) .....	11"	11"
NUMBER OF BRAKE SHOES .....	8	8
WIDTH (Standard)		
Front .....	2-1/2"	2-1/2"
Rear .....	1-3/4"	2-1/2"
(HEAVY DUTY)		
Front .....	3"	3"
Rear .....	2-1/2"	2-1/2"
BRAKE LINING (10-INCH) .....	Extruded and Molded Asbestos-Bonded	Extruded and Molded Asbestos-Bonded
Front Primary .....	8-1/2"	8-1/2"
Front Secondary .....	11"	11"
Rear Primary .....	8-1/2"	8-1/2"
Rear Secondary .....	11"	11"
BRAKE LINING (11 INCH)		
Front Primary .....	9-1/4"	9-1/4"
Front Secondary .....	12-1/8"	12-1/8"
Rear Primary .....	9-1/2"	9-1/4"
Rear Secondary .....	12-1/8"	12-1/8"
Thickness Primary .....	3/16"	3/16"
Secondary .....	1/4"	1/4"
WHEEL CYLINDER		
Front Wheel Cylinder Bore .....	1-3/16"	1-3/16"
Rear Wheel Cylinder Bore .....	15/16"	15/16"
MASTER CYLINDER BORE .....	1"	1"

## POWER BRAKE TIGHTENING REFERENCE

Pedal Link to Pedal Bolt .....	30 Foot Pounds
Master Cylinder Mounting Nuts .....	100 Inch Pounds
Power Brake Unit to Dash Panel Nuts .....	150 Inch Pounds

## KELSEY HAYES DISC BRAKE

Type of Brake .....	Fixed Caliper Disc
Location .....	Front Wheels Only
Master Cylinder Reservoir .....	Horizontal Tandem (Dual)
Proportioning Valve Location .....	Left Sill
Brake Adjustment .....	None (Automatic)
Residual Valve Location .....	In Master Cylinder Outlet (to rear brakes only)

### CALIPER ASSEMBLY

Shoe and Lining Removal .....	Radially Outward (Remove Clips)
Number of Pistons .....	4 (Each Unit)
Piston Diameter .....	1-5/8"
Piston Bore Diameter .....	1.636"
Maximum Allowable (After Honing) .....	1.638"
Piston Seals .....	Moulded Rubber (Square Section) .092" Wide, .100" Radial Thickness
Piston Dust Boots .....	External Moulded Rubber 4 Per Unit
Bleeder Screw Location .....	Outer Housing 3/8"
Transfer Tube Type .....	Short Overhead

### BRAKING DISC

Type .....	Ventilated Cast Iron
Diameter Outside .....	11.04"
Inside .....	6.91"
Disc Runout (Maximum Allowable) T.I.R. ....	.0025"
Disc Surface Finish .....	15 to 80 Micro Inches
Disc Thickness .....	.810"
Disc Parallelism (Total Variation in Thickness) .....	.0005"

### BRAKE SHOE AND LINING

Type .....	Bonded
Lining Thickness .....	.400" (Nominal)

