GENERAL: This group contains information on the coach service brakes from the brake pedal to the brake shoes at each wheel. It includes the master cylinder, booster cylinders, wheel cylinders, and associated hydraulic lines and fittings.

SPECIFICS: As applicable

...Booster Cylinders

...Brake Pedal

...Brake Shoes

...Hydraulic Lines, Tees, and Fittings

...Master Cylinder

...Warning Switch

...Wheel Cylinders

GROUP 9

BRAKE-SERVICE

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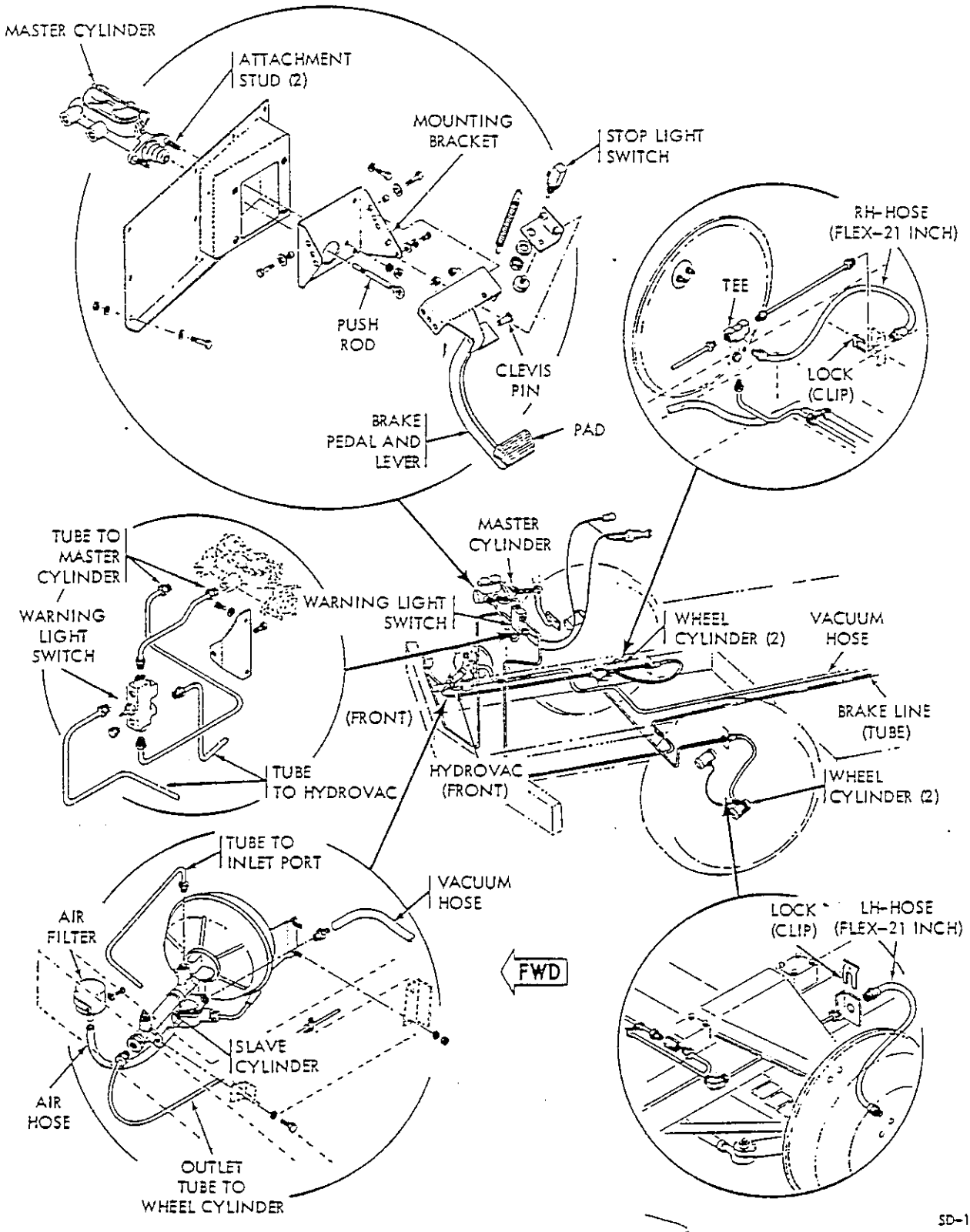

Figure 9-1. Brake System (Sheet 1 of 2)

RED = LEFT WHEELS
BLUE = RIGHT WHEELS
ORANGE = SUPPLY FROM MASTER TO REAR HYDROVAC
GREEN = SUPPLY FROM MASTER TO FRONT HYDROVAC

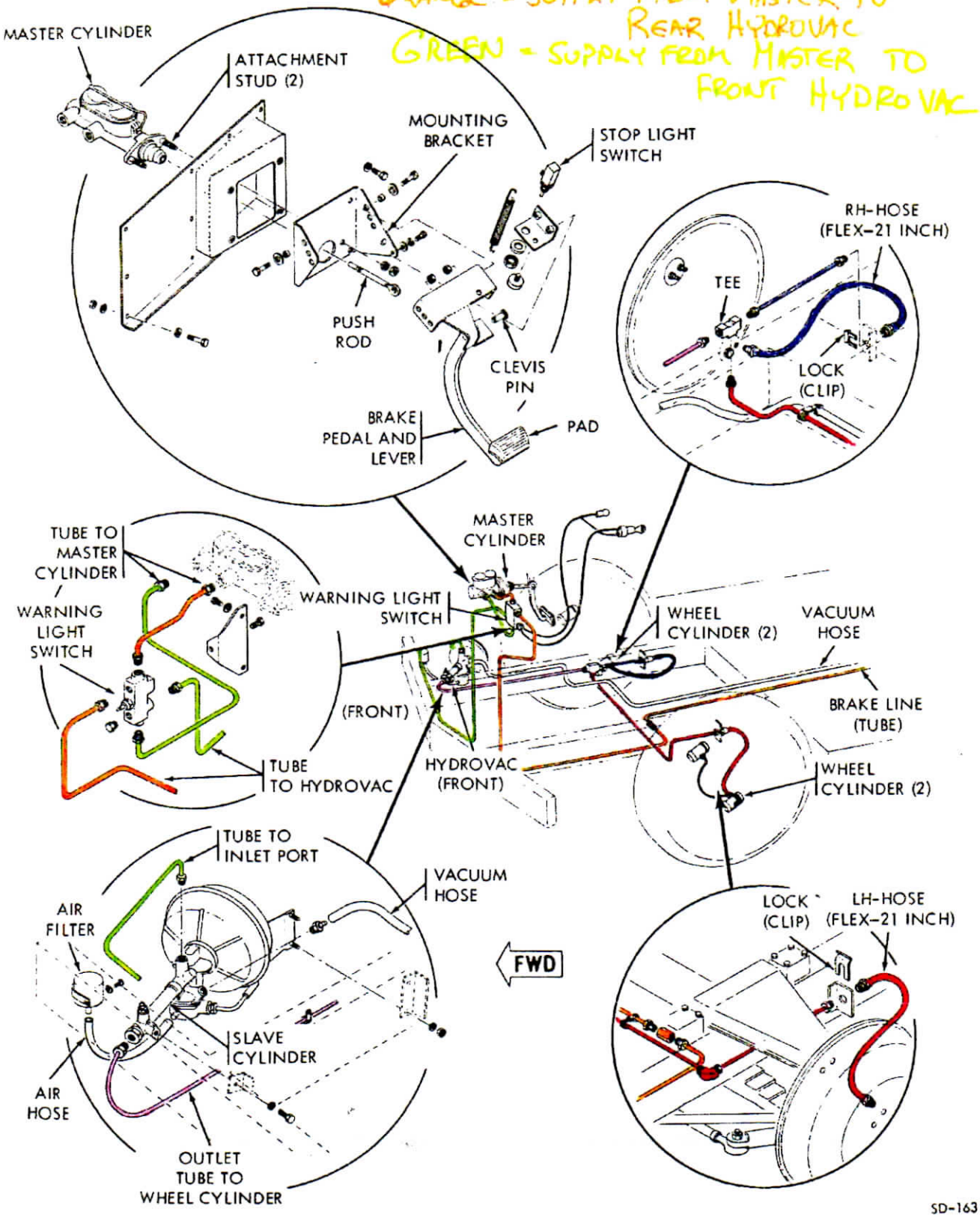

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Figure 9-1. Brake System (Sheet 1 of 2)

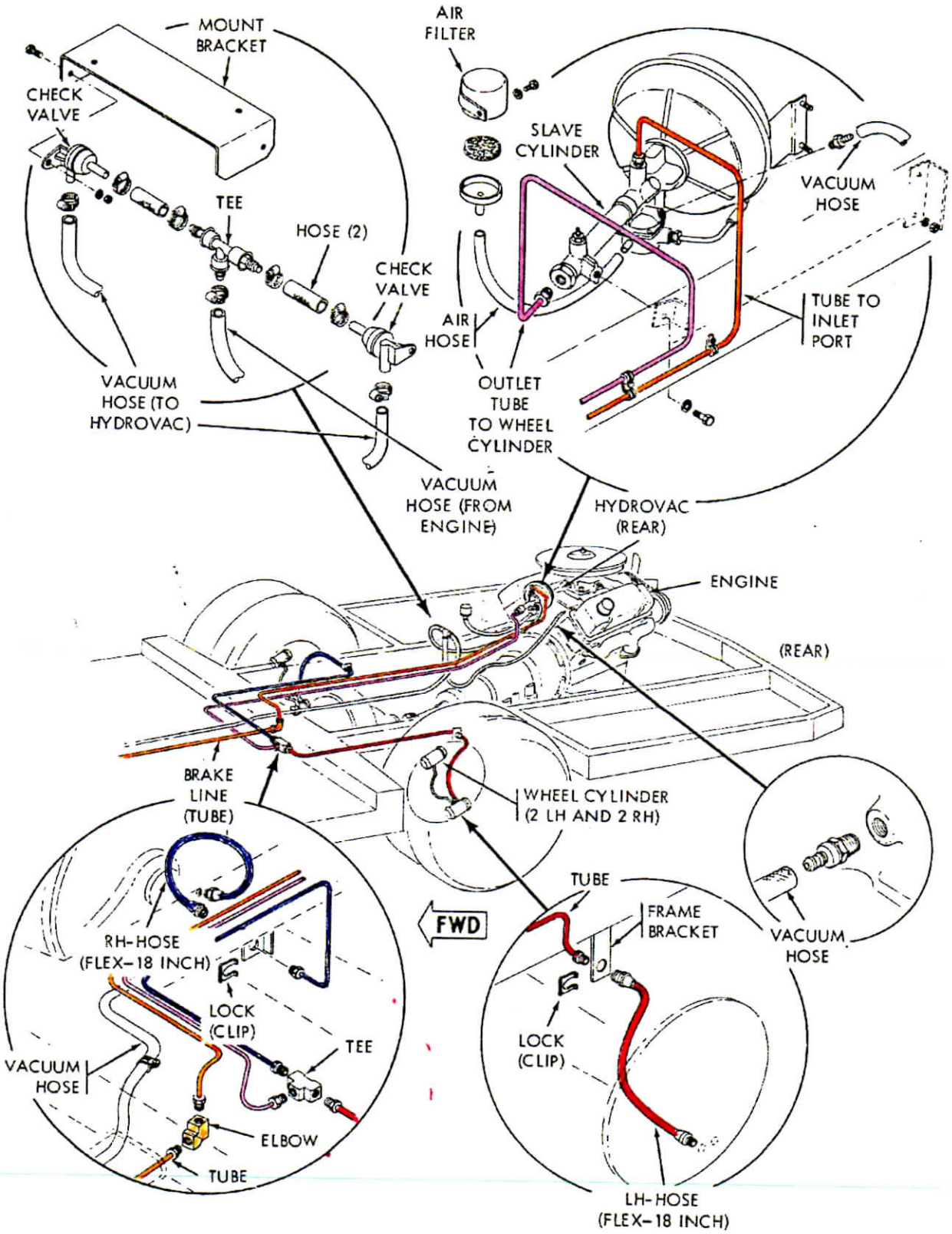

Figure 9-1. Brake System (Sheet 2 of 2)

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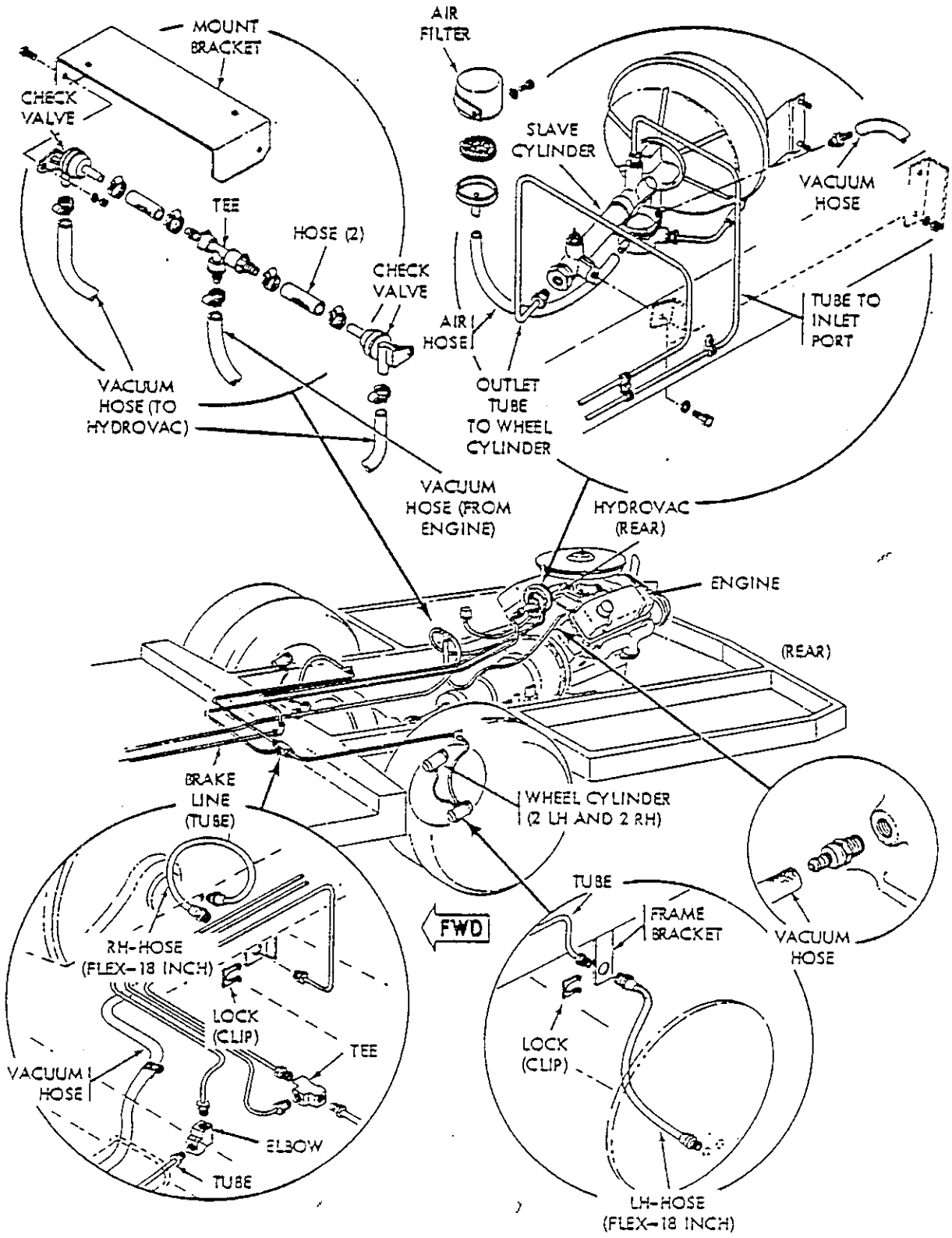

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Figure 9-1. Brake System (Sheet 2 of 2)

Group 9

BRAKE-SERVICE

9-1. DESCRIPTION

a. General (fig. 9-1). The coach incorporates dual-system, vacuum-boosted hydraulic brakes. The front and rear systems function independently except that they are both actuated by the same foot pedal and lever assembly. If either the front or rear half of the dual system should fail, the remaining system will continue to function. The foot pedal provides a leverage ratio of 6.0 to 1. The amount of pressure applied at the foot pedal is multiplied (increased) 6.0 times where the push rod contacts the master cylinder primary piston. The force on the master cylinder piston is transmitted via pressurized hydraulic fluid through the lines to route through a vacuum booster unit (hydrovac), then to the wheel cylinders. The hydrovac boosts the hydraulic pressure by utilizing engine vacuum to actuate an integral hydraulic slave cylinder. This provides boosted pressure to the inlet pressure fittings on the wheel cylinders. The brake lines from the hydrovac connect into the pressure fitting in the middle of each wheel cylinder. This fitting is located so that it injects the fluid between the cups on the inner ends of each cylinder's two integral pistons. When the pressurized fluid forces each piston outward, an interconnecting link forces the brake shoe linings against the drum thus stopping wheel rotation.

NOTE

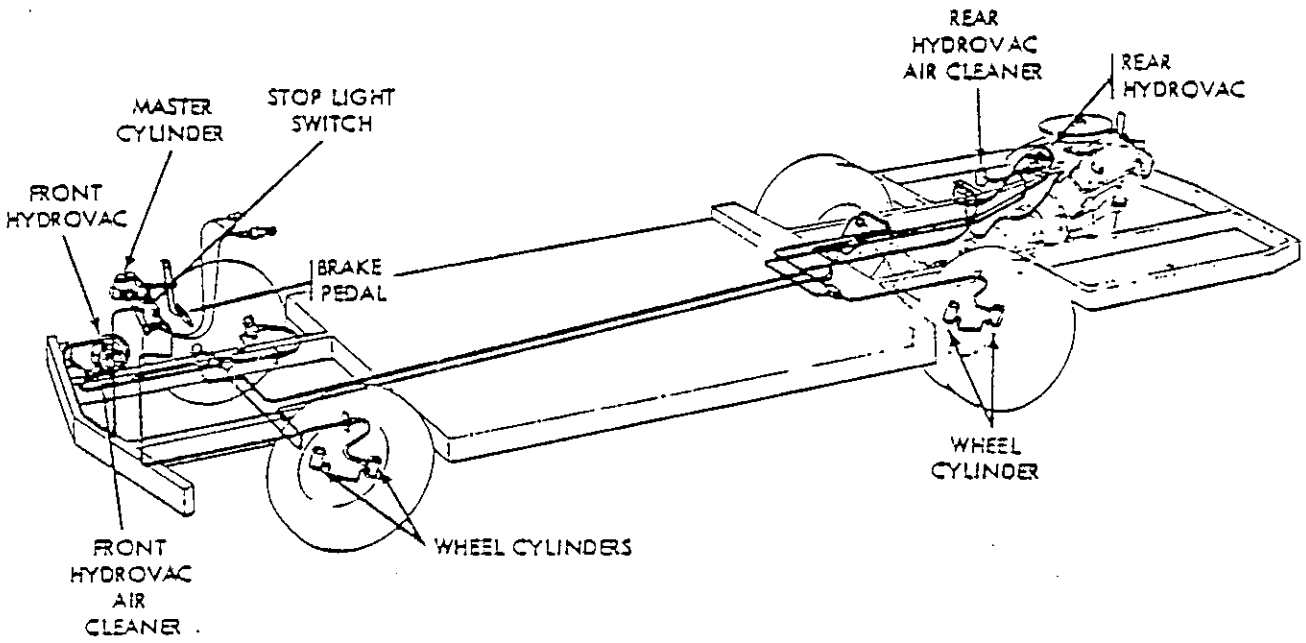
A spring between the cups holds them firm against the piston heads when fluid pressure is neutral (brakes released).

This group provides service instructions for the service brake system and its components. For service information on related systems such as wheels and tires, refer to Group 8. When applicable, other groups are referenced. For information on part numbers and procurement of replacement parts, refer to Group 9 in the 2900R Parts Catalog.

b. Service Brake System Components. The service brake system major components are the master cylinder, foot pedal and lever assembly, brake warning light switch, two vacuum boosters (hydrovacs), hoses and lines (tubes), and four brake assemblies.

c. Master Cylinder (fig. 9-2). The master cylinder is mounted forward of the brake pedal and lever assembly on the forward coach panel. A push rod attaches to the master cylinder piston and is connected by a clevis pin to the pedal and lever assembly on the opposite end. The master cylinder contains two individual fluid reservoirs, one for the front and one for the rear systems. A cover and an expansion diaphram are held in place on top of the reservoir by a detachable wire bail snapped into the grooves on the cover top.

Two ports, containing tube seat inserts and residual pressure check valves, are incorporated in the master cylinder body on the lh side adjacent to the integral cylinder which houses the primary and secondary pistons. The brake lines (tubes) to each system connect to the two ports. When the tube fittings are removed from the ports, the tube seat inserts seat and hold the fluid in the cylinder reservoir. The residual pressure check valves maintain a slight positive pressure on the system when the brakes are not in use, to prevent air from entering in the event a leak should develop. Primary and secondary pistons contact primary and secondary cups, which seal against the cylinder walls to force fluid out through the lines to the brakes whenever the pistons are pushed by brake pedal lever action. The cups are not attached to the pistons. They stay against the pistons on the braking stroke because of the force of the hydraulic pressure. On the return stroke, the piston return spring pushes the cups and piston to the neutral position, thus keeping the cups seated against the face of the pistons when the brakes are inactive.



Brake System-Service

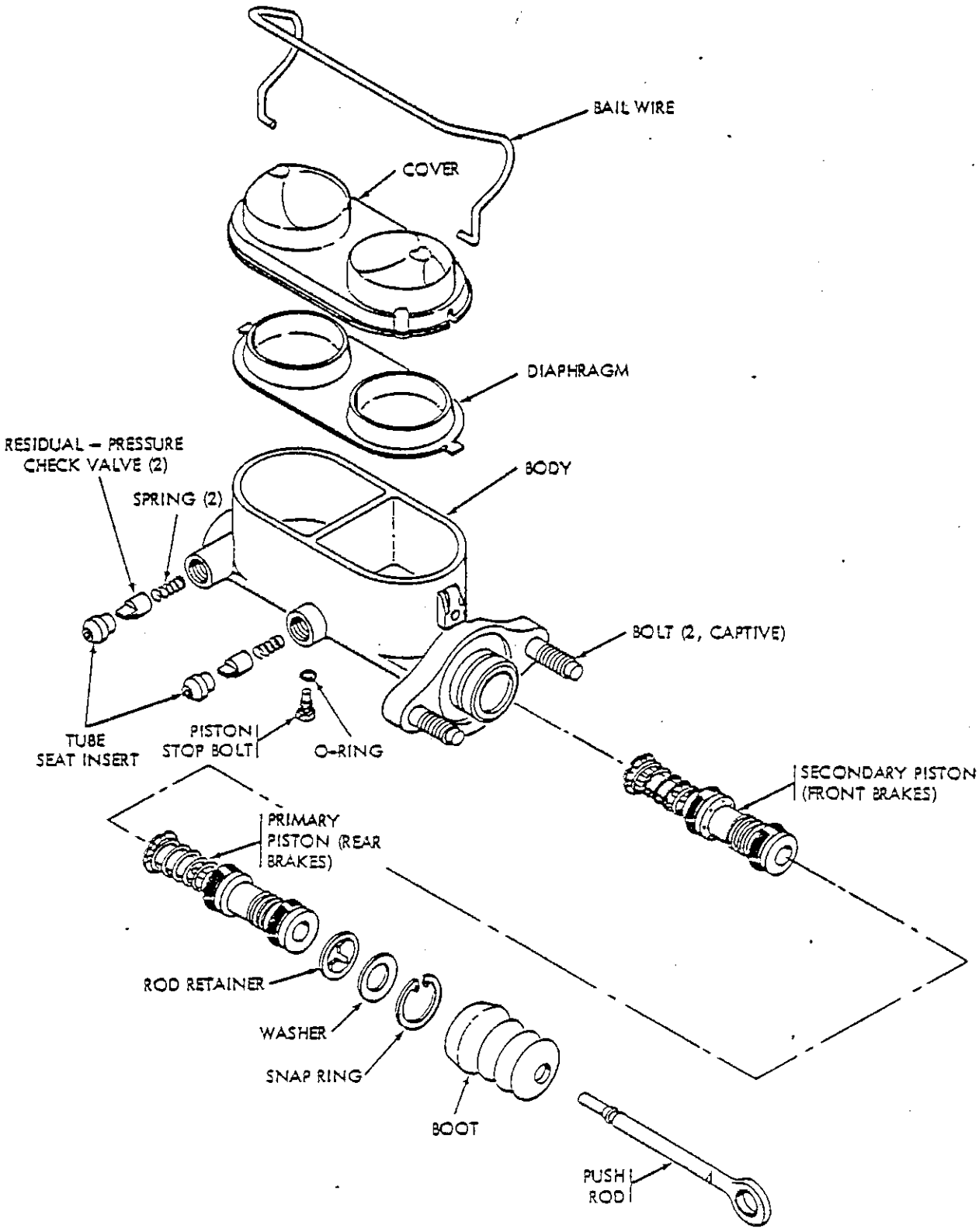


Figure 9-2. Master Cylinder

d. Brake Warning Light Switch. A brake warning light switch is mounted on the left-hand forward side of the forward panel on which the brake master cylinder is located. The warning light switch assembly is hydraulically connected by two tubes to the master cylinder, and two other tubes connect the switch assembly to the front and rear brake systems. The switch is electrically connected to a warning light on the dash panel. The two hydraulic lines from the master cylinder connect to two ends of the warning light switch cylinder which connect through outlet ports to the lines going to the brake systems. The warning light switch cylinder contains a small piston. As long as the pressures in each end of the cylinder remain equal, which they are normally, the warning switch piston remains centered (inactive). If a leak or failure should develop in either system, the force of hydraulic pressure from the other normal system will be higher and cause the piston to move in the cylinder. This creates an electrical ground for the warning light circuit. If the ignition switch is on, the light on the dash panel will then illuminate. Details of the electrical circuit function are contained in Group 4.

e. Brake Stop Light Switch. A push switch, mounted on the brake lever attachment bracket, actuates when the brake pedal is depressed to close contacts and energize the circuit to the stop lights on the rear of the coach. When the brake pedal returns to "brakes released" position, the actuating arm on the push switch is contacted by the brake lever and pressed in. This opens the contacts in the switch and deenergizes the brake light circuit.

f. Vacuum Booster (Hydrovac) (fig. 9-3). The front hydrovac unit is bolted to the underside of the coach frame forward of the right hand front wheel well and the rear unit is located in the right hand side of the engine compartment. Each is a self-contained unit having no external rods or levers. Power for operation of the hydrovac is supplied by the vacuum from the engine intake manifold and external atmospheric pressure. The hydrovac boosts the hydraulic pressure from the brake system master cylinder and the combined boosted pressures are applied to the wheel cylinders. In case of an engine failure and loss of vacuum power, the brakes will function as in a conventional non-powered hydraulic brake system. Hydraulic lines route brake fluid from the master cylinder through the brake warning switch to the fluid inlet port of the hydrovac slave cylinder. Another line connects at the cylinder outlet port on the end of the cylinder and routes fluid through a tee fitting to the flexible hose lines connecting to the left hand and right hand wheel cylinders. Bleed fittings are installed in the end of each hydrovac cylinder. Vacuum hoses connect each unit to the engine intake manifold. An air hose connects each to an air filter. The filters are located in close proximity to the hydrovac. The filter has a hair type element which may be cleaned periodically.

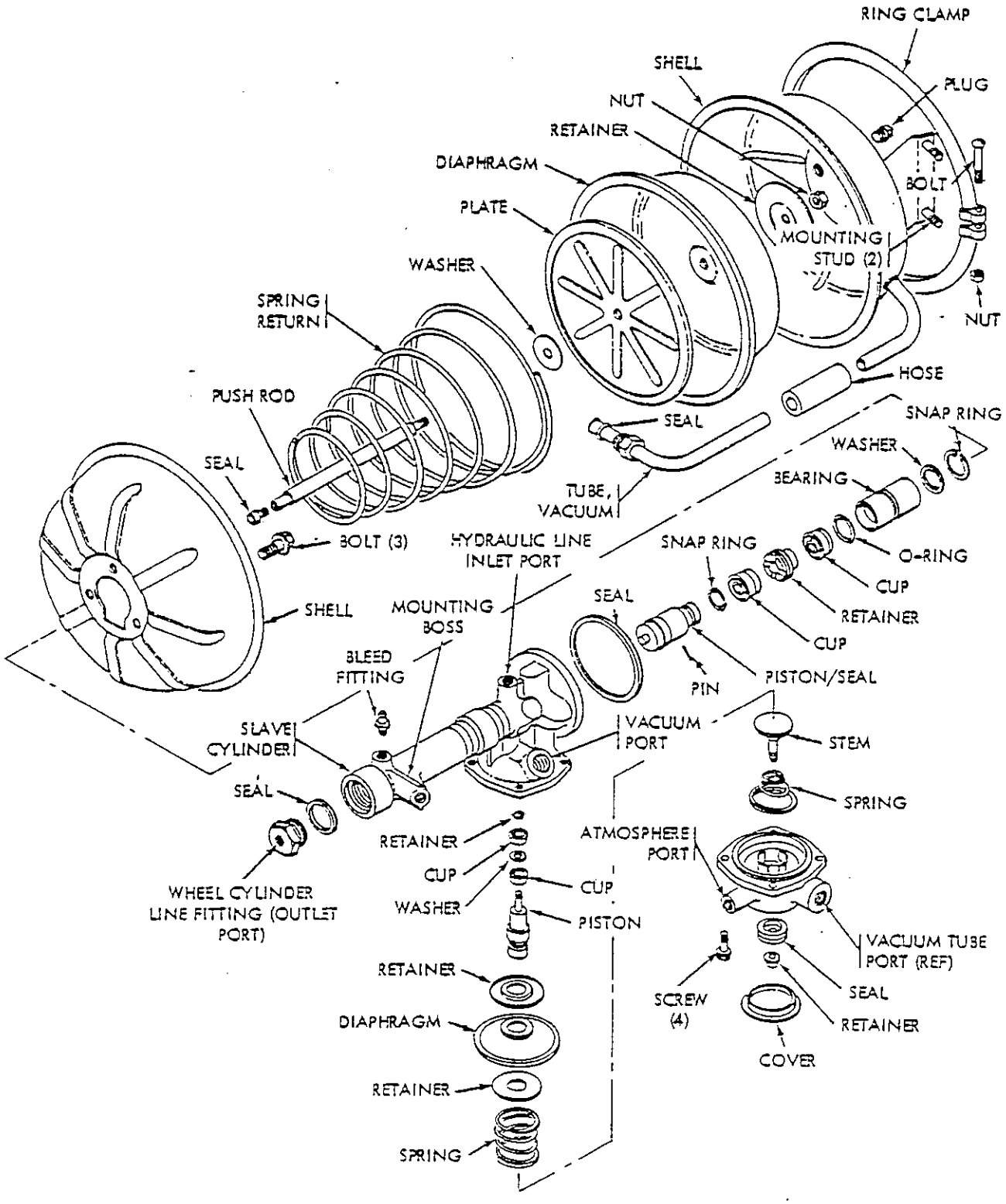


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Figure 9-3. Vacuum Booster (Hydrovac)

g. Brake Assembly (fig. 9-4). The four brake assemblies, two in the forward braking system and two in the rear, contain identical components, as shown in figure 9-4. The brake assemblies are located inside the drums of each of the four wheels. Each of the four brake assemblies has two brake-shoe-actuating wheel cylinders. A connector (jumper) tube, between the two cylinders, provides equal fluid pressure to each. External adjustment of the brake shoe-to-drum clearance can be made with the adjusting screws (star wheel). They are accessible from the inboard side of the backing plate through two removable snap-in clip type covers.

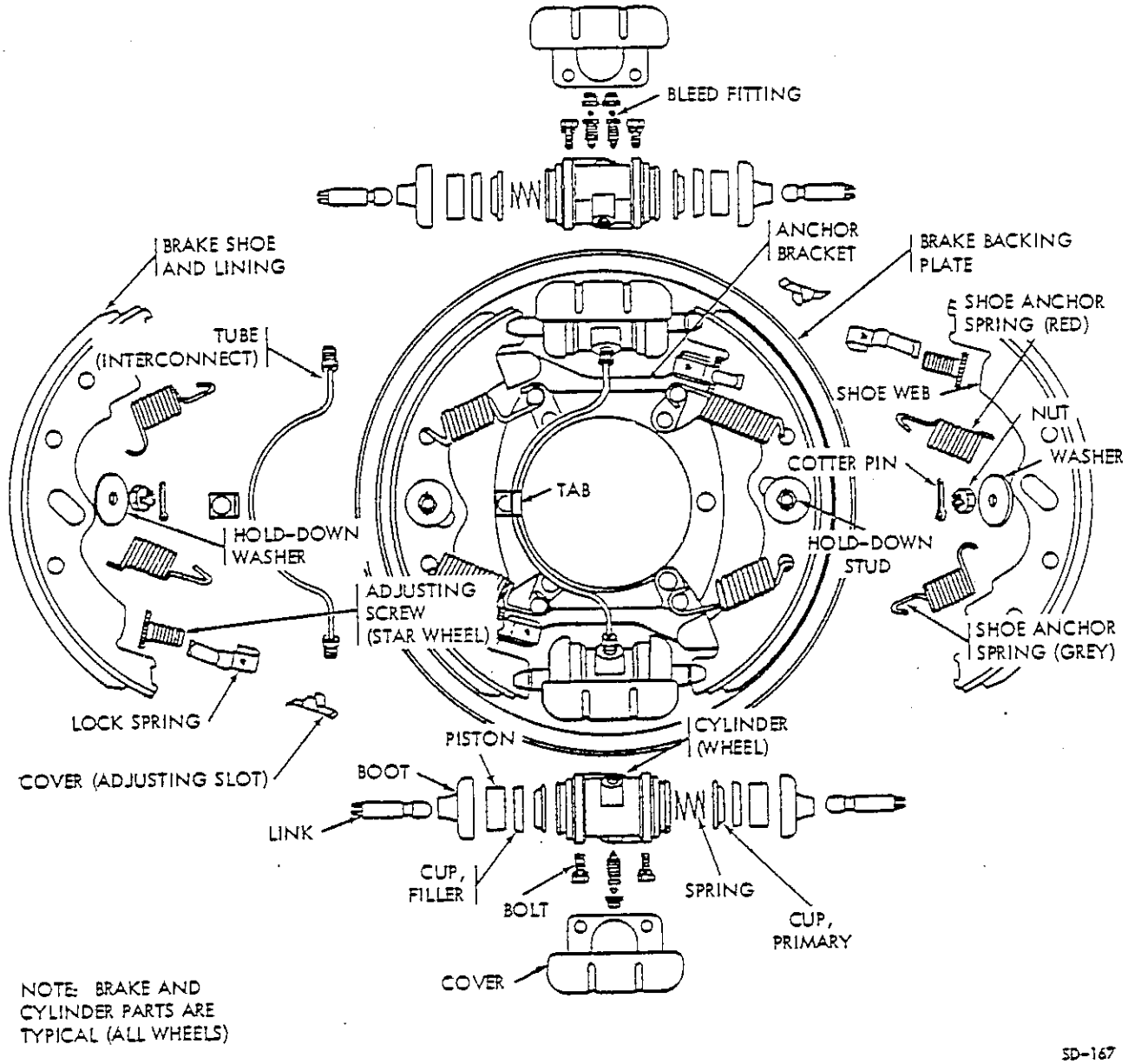

Figure 9-4. Brake Assembly (Typical)

9-2. TROUBLESHOOTING

Instructions for troubleshooting the brake system are contained in table 9-1. Prior to troubleshooting a preliminary visual inspection to assist in locating the problem should be made as outlined in paragraph 9-6.

Table 9-1. Troubleshooting Brake System

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Wear braking	Brakes out of adjustment	Adjust brakes; refer to paragraph 9-3
	Low brake fluid	Correct any leaks; then fill master cylinder
	Low hydrovac vacuum	Check engine vacuum. Check vacuum lines and tighten clamps to correct leaks
	Sticking brake shoe	Lubricate shoe contact points on backup plate with lubriplate; refer to table 9-2
	Excessively worn lining	Replace lining; refer to paragraphs 9-5c and 9-5d
	Malfunctioning hydrovac	Check air filter for clogging. Check connections; tighten as necessary. Replace defective unit; refer to paragraph 9-5g
	Obstructed hydraulic brake line	Clean with compressed air or replace line. Relieve any constricting pressure. Bleed system following cleaning or replacement of lines; refer to paragraph 9-4c.
Erratic braking	Brakes out of adjustment	Adjust brakes; refer to paragraph 9-3
	Lubricant or brake fluid on lining	Correct any leaks, then clean or replace lining
	Brake drum has hard spots, or is deformed	Replace drum; refer to Group 8
	Loose or defective wheel bearing	Clean, pack, tighten or replace bearing; refer to Group 8
	Shoe web-to-hold down washer gap not set to 0.015 inch	Check and reset as required; refer to paragraph 9-5d(11)
Brakes chatter or squeak	Loose backup plate mounting bolts	Tighten loose bolts. Torque front 86 to 94 foot pounds; rear 54 to 59

Table 9-1. Troubleshooting Brake System - Continued

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Brakes chatter or squeak (cont)	Dirt, dust, or other foreign matter in brake	Clean drum, backup plate, and shoes with compressed air
	Distorted or damaged brake drum or shoe	Tighten or replace defective part. To replace drum, refer to Group 8
	Loose lining or incorrectly ground drum	Replace lining; refer to paragraph 9-5c and 9-5d or cam-grind drum
Brakes fail to release	Brakes out of adjustment	Adjust brakes; refer to paragraph 9-3
	Brake pedal lever sticking pedal return spring weak	Lubricate pedal lever clevis pin, replace spring
	Broken brake shoe return spring	Replace spring; refer to paragraphs 9-5c and 9-5d
	Distorted brake shoe	Replace shoe; refer to paragraphs 9-5c and 9-5d
	Obstructed brake line	Clean or replace defective line. Relieve any constricting pressure
	Distorted or swollen cup(s) in wheel cylinder or master cylinder	Replace defective cylinder
	Loose or defective wheel bearing	Clean, pack, or replace bearing; refer to Group 8
	Loose backup plate mounting bolt(s)	Tighten loose bolt(s) (torque front 86 to 94 foot pounds; rear 54 to 59)
	Hydrovac not releasing pressure	Check air filter for clogging and air line for constriction; correct any faults and check; replace defective unit; refer to paragraphs 9-5g and 9-5h
Braking fades	Brakes out of adjustment	Adjust brakes; refer to paragraph 9-3
	Lining saturated with fluids	Correct any leaks, then replace lining; refer to paragraphs 9-5c and 9-5d
	Brake drum too thin	Replace; refer to Group 8

Table 9-1. Troubleshooting Brake System - Continued

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Braking fades (cont)	Brake fluid condition deteriorated (low boiling temperature)	Drain and flush hydraulic system; then fill and bleed system; refer to paragraph 9-4c
	Hydrovac leaks	Check and correct leaks, or replace leaking unit; refer to paragraphs 9-5g and 9-5h. Tighten loose connections
Low pedal	Low fluid level	Check and correct leaks; fill master cylinder
"Soft" pedal operation	Air in hydraulic system	Bleed system; refer to paragraph 9-4
	Lining soaked with lubricant or hydraulic fluid	Correct any leaks, then replace lining; refer to paragraphs 9-5c and 9-5d
"Hard" pedal operation	Brakes out of adjustment	Adjust brakes; refer to paragraph 9-3
	Inoperative brake hydrovac	Replace unit; refer to paragraphs 9-5g and 9-5h
	Obstructed hydraulic brake line	Clean or replace defective line
	Binding pedal lever	Lubricate pedal and lever clevis pin with lubriplate, then check for free operation; or replace spring
Wheel drum binds	Wheel drum out of true	Replace distorted wheel or drum; refer to Group 8
	Lining saturated with fluid	Correct any leaks, then replace lining; refer to paragraphs 9-5c and 9-5d
	Loose lining	Replace lining; refer to paragraphs 9-5c and 9-5d
Excessive lining wear	Foreign material in brake drum	Clean drum, brake, backing plate, and shoes with compressed air
	Shoe web to hold-down washer gap not set to 0.015 inch	Check and reset as required; refer to paragraph 9-5d(11)

Table 9-1. Troubleshooting Brake System - Continued

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Excessive lining wear (cont)	Loose wheel bearing	Clean, pack, and tighten or replace bearing; refer to Group 8
	Defective hydrovac control valve (causing constant pressure on brakes)	Replace unit; refer to paragraphs 9-5g and 9-5h
	Brake drum has hard spots or is deformed	Replace drum; refer to Group 8
Slow return of brake pedal	Broken return spring	Replace

9-3. BRAKE ADJUSTMENT

a. General. The following procedures cover adjustment of the service brakes. A brake adjustment tool is required. Adjust brakes in sets, front or rear.

b. Jacking Vehicle.

(1) Assure that engine is not operating, that all brakes are off, and that wheel set remaining on ground is securely blocked against movement.

(2) Place lifting pad of jack under jacking point on vehicle frame or center of front spring.

> *Caution*
>
> Never attempt to lift vehicle by a bumper. The bumper energy-absorber mechanism could be damaged.

(3) Operate jack to raise vehicle, then place truck jack stand under adjacent jack point.

(4) Lower vehicle to rest on truck jack stand. Check that vehicle is securely supported by stand.

c. Preliminary Check. Turn wheel to check for any unusual conditions and free rotation. If malfunctions are indicated, troubleshoot brake system; refer to table 9-1.

d. Adjusting Brakes (fig. 9-5).

(1) Remove two snap-in clip type covers from inboard side of backing plate for access to brake adjustment screws (star wheel).

(2) Tighten each adjustment screw until linings are felt to contract drum firmly, then turn screw in reverse direction while counting clicks of the screw lock spring. Turn screw until seven clicks are heard.

(3) Reinstall snap-in covers over adjustment screw (star wheel) access holes.

e. Post-Adjustment Procedures.

(1) Raise vehicle by operating jack at point specified in step b(2) above.

(2) Remove truck jack stand.

(3) Operate jack to lower wheels to ground.

(4) Remove wheel blocking and place blocks against adjusted set of wheels, if other set is to be adjusted. Perform previous procedures for opposite wheel.

(5) Road check brake operation.

9-4. BLEEDING BRAKE SYSTEM

a. General. Bleed the brake system whenever the system is disconnected at any point. Use pressure bleeder Grigg G-300 (or equal) to bleed system. Always discard brake fluid which has passed through the brake system.

b. Preparation for Bleeding Brakes.

(1) Depress brake pedal several times to relieve system pressure, then check hydraulic system for leaks; correct any leakage problems.

(2) Clean dirt from around top cover of master cylinder reservoir. Snap-off the wire bail, then remove reservoir cover (with diaphragm).

(3) If required, fill master cylinder reservoir to about 1/2 inch below top with new brake fluid conforming to the current SAE specification number J1703. The 1/2 inch air pocket is prescribed to trap any air in the fluid during bleeding procedures.

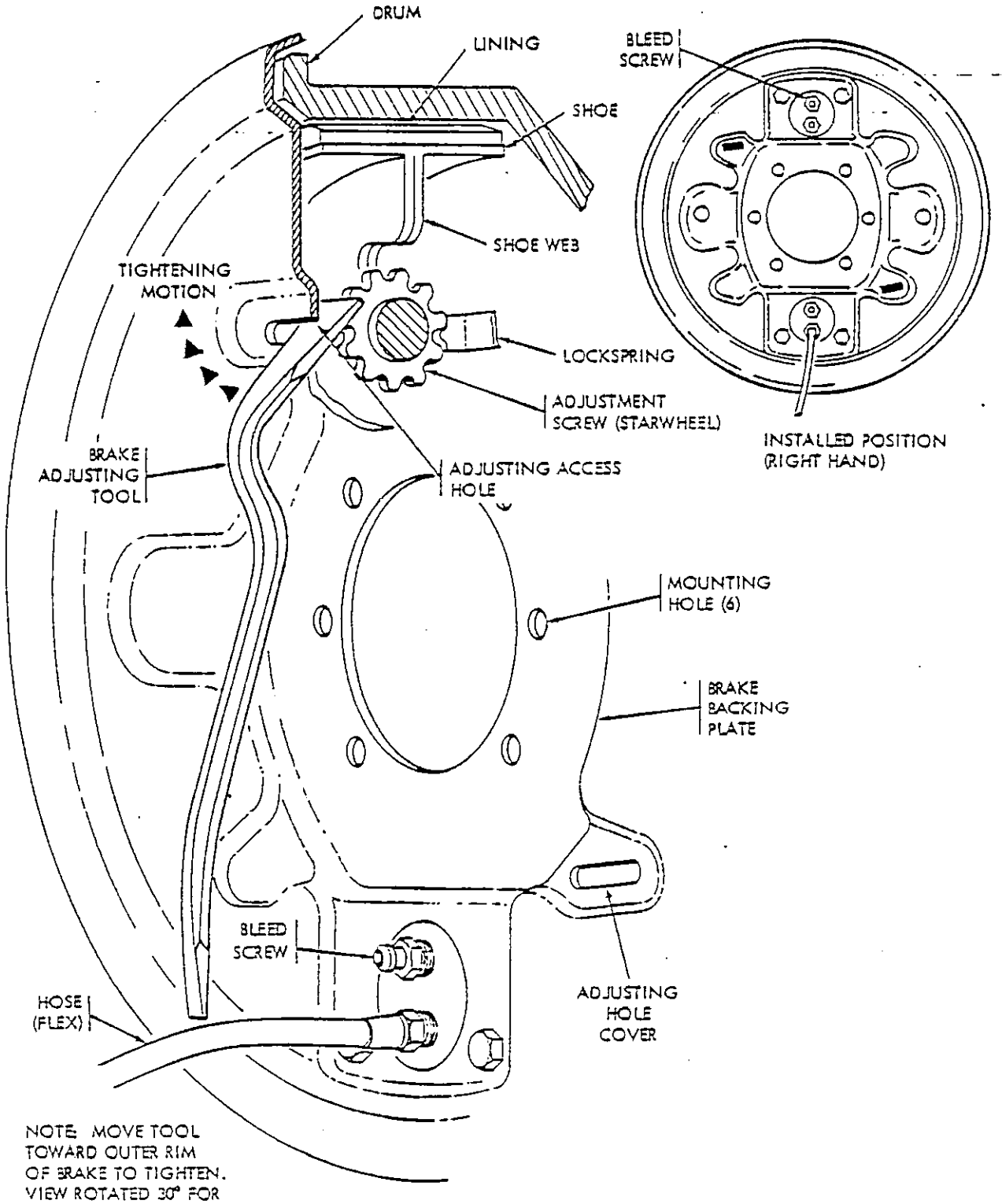

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Figure 9-5. Brake Adjustment

> *Caution*
>
> Use only new brake fluid conforming to the current SAE specification number J1703. Fluid with "boiling point" below specified fluid could cause brake system malfunction.

(4) Connect automatic bleeder fill nozzle to coupling on end of bleeder unit hose, then open shut-off valve and bleed air from line using suitable drain container.

(5) Connect shop air pressure line and charge the pressure bleeder to 15 to 20 psi on gauge. Do not allow pressure to fall below 15 psi.

(6) Secure bleeder adapter over master cylinder and tighten hold-down bolts.

c. Bleeding Brake System.

NOTE

Prior to bleeding system, bleed master cylinder if it is new or has been drained for maintenance. Refer to paragraph 9-4d.

In bleeding the front or rear hydraulic system, the hydrovac cylinder should be bled first. The rear brake hydrovac is in the right hand side of the engine compartment; the forward brake hydrovac is mounted in front of the right wheel well.

(1) Attach bleeder drain hose to bleed fitting on top of small end of hydrovac booster slave cylinder. Place other end in drain container.

NOTE

Wipe off bleed fittings with clean cloth before attaching drain hose.

(2) Open hydrovac bleed fitting about 3/4 turn to allow air and brake fluid to flow into container.

(3) When no air is present in the flowing fluid, close bleed fitting. Remove drain hose, then tighten fitting.

(4) Attach bleed drain hose to left brake upper wheel cylinder at top bleed fitting. Place free end of hose in drain container.

(5) Open bleed fitting about 3/4 turn to allow air and brake fluid to flow into container.

(6) When no air is present in the flowing fluid, close fitting. Remove hose and container, then tighten bleed fitting.

(7) Repeat steps 4 through 6 on brake upper wheel cylinder at right.

(8) Repeat procedures for other brake system, if required.

(9) Close shutoff valve in pressure bleeder, then remove hose and adapter from reservoir.

(10) If required, fill master cylinder reservoir with NEW brake fluid conforming to the current SAE specification number J1703.

(11) Replace reservoir cover (with diaphragm in place), then secure cover by positioning wire bail to snap into grooves on top.

(12) Check brake system operation.

d. Bleeding Brake Master Cylinder. The master cylinder should be bled, if new or if drained during maintenance, to remove any air accumulation in the cylinder, tube passages, or reservoir. Prior to bleeding the brake system, bleed the master cylinder as follows:

(1) Disconnect the two tubes at the tube attachment fittings on the right-hand side of the cylinder.

(2) Locally fabricate two short bleed tubes with a fitting installed on one end. Use fittings of the same size as the fittings on the tubes connecting to the brake warning light. Remove cover and diaphragm from master cylinder. Install bleed tube fittings into the master cylinder ports and position other tube end to extend down into each reservoir.

(3) Fill reservoir with new brake fluid, conforming to the current SAE specification number 1703, to approximately 1/4 inch below top.

(4) Slowly pump brake pedal until no air bubbles emit from top of fluid in either reservoir.

(5) Remove bleed tubes and reconnect the two system tube fittings to the master cylinder ports.

> *Caution*
>
> Do not exceed 200 INCH pounds torque on tube fitting nuts in cylinder; overtorquing could damage the tube seat inserts.

(6) Bleed brake system.

9-3. REMOVAL/INSTALLATION

a. General. Step-by-step instructions for replacement of brake system components are provided in this section. Replacement parts should be procured from those listed in the 2900R Parts Catalog. Tools required are: lug wrench, jack, torque wrench, brake spring remover/installer, and cylinder link compressor. Materials required are: thread lube, lubriplate (number 110) and wheel-bearing grease. During procedures, use a suitable container to catch released hydraulic fluid.

b. Drum Removal. Remove front or rear wheel drum according to instructions in Group 8.

c. Brake Parts Removal (fig. 9-4).

(1) Use spring remover/installer tool and remove the four anchor springs.

(2) Remove cotterpin, nut and washer from hold-down stud; remove each brake shoe.

(3) Remove the lock spring from anchor bracket, then remove brake adjusting screw (star wheel).

(4) Place drain pan under lower wheel cylinder.

> **Caution**
>
> Ensure that engine is not running and there is no vacuum pressure on hydro-vac before disconnecting hydraulic lines.

(5) Unscrew interconnect tube nut at each wheel cylinder fitting; detach clamp at the center of the tube, then remove tube.

(6) Disconnect hydraulic flexible hose from tube mounted on frame bracket near wheel, by removing mounting lock (clip) from hose, then unscrew flexible hose from tube end and on opposite end from wheel cylinder fitting.

(7) Remove backing plate (with anchor brackets) and attaching six bolts and washers. Use vise-grip pliers to hold four nuts on front wheel spindles when turning.

(8) Remove each wheel cylinder and its cover from backing plate (two screws with captive lockwashers).

d. Brake Parts Installation (fig. 9-4).

(1) Apply a light coat of thread-lube to threads of bolts used to attach brake backing plate. Install tube plastisol protector tab support clip on mounting bolt located where center of cylinder connector (jumper) tube will be. Use six bolts and washers to mount backing plate (use vice-grip pliers to hold four nuts in inboard side of spindle of each front wheel). Torque front wheel backing plate attaching bolts to 86 to 94 foot pounds; torque rear wheel backing plate attaching bolts to 54 to 59 foot pounds.

(2) Install each cylinder and its cover with two screws (captive lockwasher attached). Torque screws to 130 to 230 INCH-pounds.

(3) Install interconnect tube between two wheel cylinders. Torque tube fitting nuts to 120 to 190 INCH-pounds. Secure interconnect tube center with tube plastisol protector tab support clip.

> **Caution**
>
> The front flexible hoses are 21 inches long and the rear hoses are 18 inches long. Make sure that hoses of the correct length are installed at the front and rear brakes during replacement. Consult the 2900R Parts Catalog when ordering replacement hose assemblies.

(4) At lower wheel cylinder inlet port (inboard side of backing plate) connect inverted flare-fitting end of flexible hose.

(5) Pass other end of hose through bracket on frame and connect it to the hydraulic tube fitting. Secure hose to mounting bracket with lock (clip).

(6) Apply lubriplate (number 110) to threads of each adjustment screw (star wheel) and install in anchor brackets.

(7) Adjust star wheel until top of head is 1.60 (± 0.03) inches from adjacent hole centerline in anchor bracket.

(8) Apply light coat of lubriplate (number 110) to points of the shoe edges contacting backing plate ledges; to shoe web area underneath the shoe hold-down washer; to anchor bracket areas contacting the shoe web; and to the ends of the cylinder connecting links which contact shoe web.

(9) Install each shoe, with ends inserted into slots on each wheel cylinder connecting link, then position over stud on backing plate.

(10) Install hold-down washer and hold-down nut on each stud. Adjust nut until a 0.015 inch clearance between hold-down washer and brake shoe web is obtained. Secure nut with cotter pin.

> **Caution**
>
> Make sure specified clearance is obtained, to prevent shoe from sticking and dragging on drum.

(11) Using spring removal/installation tool, install each red spring, at the locations shown in figure 9-4 as follows: Place long hook end through hole in shoe web and through hole in backing plate; connect other end to closest stud in anchor bracket stud.

(12) With spring tool, install each grey spring where shown, between hole in shoe web and closest stud in anchor bracket.

(13) Install front or rear wheel drums according to instructions in Group 8.

(14) Adjust brakes; refer to paragraph 9-3d.

(15) Bleed brake system; refer to paragraphs 9-4a through 9-4c.

e. Hydrovac Removal. The rear unit is accessible at the right-hand engine compartment door; the front unit is accessible froward of the right-hand wheel well. Use a suitable container to catch any hydraulic fluid released.

> **Caution**
>
> There must be no vacuum in the hydrovac unit when disconnecting vacuum hose. Do not depress brake pedal during maintenance.

(1) Make sure that engine is not running, then depress brake pedal several times to relieve all vacuum in system.

(2) Loosen clamp on air cleaner hose near hydrovac air inlet; disconnect hose.

(3) Loosen clamp on vacuum hose near hydrovac air inlet; disconnect hose.

(4) Place drain pan under two hydraulic tubes connected to booster (slave) cylinder inlet and outlet ports, unscrew fittings, then disconnect tubes.

(5) Remove front bolts and washers attaching hydrovac to mount bracket and two aft nuts and washers at rear; remove hydrovac.

(6) Remove air filter assembly.

f. Hydrovac Installation (fig. 9-1).

(1) Install air filter assembly.

(2) Secure hydrovac to rear mounting bracket with two nuts and washers.

(3) Secure hydrovac to forward bracket with bolt and washer.

(4) Install fittings of two hydraulic tubes into slave cylinder inlet and outlet ports. Tighten tube fittings until resistance is felt, then tighten them about 1/6 turn more.

(5) Connect vacuum hose to hydrovac vacuum port, then tighten hose clamp.

(6) Connect air hose to air filter and to booster air inlet, then tighten hose clamp.

(7) Bleed and test brake system; refer to paragraphs 9-3a through 9-3c.

g. Master Cylinder Removal (fig. 9-1). The master cylinder is accessible from the left-hand front access door.

NOTE

Place cloth under cylinder end of tube to absorb tube fluid contents. The master cylinder is equipped with tube seat inserts which seat to hold fluid in cylinder when tubes are disconnected.

(1) Disconnect upper tube fittings from master cylinder and brake warning light switch; remove tube assembly.

(2) Disconnect forward tube fittings from master cylinder and brake warning light switch; remove tube assembly.

(3) Remove cotter pin from the clevis pin attaching brake cylinder actuating push rod to brake pedal lever; detach push rod.

(4) Remove rubber boot from push rod.

(5) Remove two master cylinder mount stud attaching nuts and washers.

(6) Pull master cylinder forward in the service access compartment until clear of structure then lift out cylinder.

h. Master Cylinder Installation.

(1) Insert cylinder into forward left-hand service access compartment and position attachment studs through mount holes in mount bracket

forward panel structure.

(2) Install lockwashers and nuts on master cylinder attachment studs.

(3) Install rubber boot over cylinder actuating push rod and connect push rod to brake pedal, using clevis pin; secure with cotter pin.

(4) Install upper and forward brake-warning-switch-to-master-cylinder tubes; tighten fitting nuts.

> *Caution*
>
> Do not exceed 200 INCH pounds torque on fitting nuts in cylinder; over-torquing could damage the tube seat inserts.

(5) Bleed master cylinder, if required; refer to paragraph 9-3d.

(6) Bleed brake system; refer to paragraphs 9-3a through 9-3c.

9-6. INSPECTION/CLEANING

a. General. Inspect brake system in accordance with the following, then troubleshoot system, if required; refer to table 9-1. Clean system and parts, if required.

b. System Visual Checkout. Visually check brake system for signs of leakage, loose connections, damaged lines (hoses and tubings), secure component mounting, fluid condition, and fluid level. If trouble is suspected, remove wheel, drum, and linings for visible defects. Check cylinders for leakage past piston cups (pull bottom end of end seals partially off to see if fluid is present).

c. Manual Wheel Check. Jack vehicle per procedure 9-3b. Spin wheel to check for any unusual condition and free rotation. Analyze troubles and troubleshooting brake system; refer to table 9-1.

d. Brake Road Check. Carefully operate brakes while vehicle is moving on a level low-traffic street or other suitable area. Check brake operation in forward and reverse motion; check especially for unusual noises caused during braking, and for unusual heating of brake drums. If braking is insufficient, troubleshoot brake system; refer to table 9-1.

e. Cleaning Brake System. Clean hydraulic system and parts with clean denatured alcohol. A clean bristle brush, brass wire brush, or cleaning cloth may be used with the denatured alcohol, as required. Lines and parts may also be flushed or bathed with denatured alcohol as necessary.

> *Caution*
>
> Never use petroleum distillates or carbon tetrachloride to clean cylinder parts; these solvents attack rubber parts in the system. Use only clean denatured alcohol.

9-7. GENERAL INFORMATION

a. General. This section contains general information relative to service data contained in the previous paragraphs.

b. Fluids and Lubricants. Fluids and lubricants used for the service brake system are listed in table 9-2.

Table 9-2. Fluids and Lubricants

Item	Specification	Quantity
Hydraulic fluid	Conforming to current SAE J1703	As specified
Lubricant	Lubriplate (number 110)	As specified
Cleaning solvent	Denatured alcohol	As specified

c. Torque Requirements. Torque requirements for the service brake system are given in table 9-3.

Table 9-3. Torque Requirements

Part	Attaching Part(s)	Torque
Front brake backing plate	Bolt	86 to 94 Foot Pounds
Rear brake backing plate	Bolt	54 to 59 Foot Pounds
Brake wheel cylinder attaching	Bolt (2) (with lockwasher)	130 to 230 INCH Pounds
Interconnect tube between brake wheel cylinders	Nut (2) (part of tube assy)	120 to 190 INCH Pounds

d. Clearance and Adjustment Requirements. Clearance and adjustment dimensions required in assembling and maintaining the service brake system are listed in table 9-4.

Table 9-4. Clearance and Adjustments

Affected Part(s)	Requirement	Procedure
Brake shoe web to hold-down washer	0.015 inch clearance	Brake installation
Brake-adjust screw (star wheel)	Tighten until linings seat firmly on drums, then reverse-rotate seven clicks	Brake adjustment
Brake-adjust screw to center of closest bolt in anchor bracket (initial setting)	1.60 (± 0.03) inch distance	Brake installation

FMC CORPORATION
RECREATIONAL VEHICLE DIVISION
BOX 664, SANTA CLARA, CALIFORNIA 95052

☐ URGENT ☒ MANDATORY ☐ ROUTINE ☐ INFORMATIONAL

Service Bulletin

DATE 24 April 1973 NUMBER 2909 20001

ATTENTION: SERVICE MANAGER AND OWNERS

GROUP 9

SUBJECT: SERVICE BRAKE FOOT PEDAL MODIFICATION

MODEL (S) AFFECTED: 2900R

(Factory Use Only) Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

DESCRIPTION

This bulletin provides instructions for increasing the leverage on the service brake foot pedal assembly, thus reducing the amount of force needed for brake application.

This is accomplished by relocating the pedal pivot bolts to the lowest set of holes in the mount bracket.

COMPLIANCE

Dealers should comply with this bulletin prior to delivery of coach to owner. Present owners should return coach to dealer for this modification as soon as practicable.

MANPOWER

Estimated accomplishment time for one mechanic is one-half hour.

MATERIAL

Two spacer/bushings per coach; RVD part number 5100574.

ACCOMPLISHMENT INSTRUCTIONS

1. To accomplish this modification, the coach dash panel lower edge must first be trimmed back slightly to make space for the repositioned pedal. To trim panel proceed as follows;

   a. Depress brake pedal forward and temporarily secure in this position to allow access to the lower forward edge of the dash panel in the area just behind the pedal.

   b. Using a rotary file or other tool suitable for grinding or cutting vinyl/fiberglass, trim dash panel edge back about 1/2 inch and across to about a 3 inch width, where the pedal will rest when brake is in released position. Sand off rough edges, then release pedal and check that it does not contact edge of dash panel.

2. Reposition the brake pedal to mounting bracket pivot bolts as follows:

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Service Bulletin

DATE 24 April 1973 NUMBER 2909 20001

ATTENTION: SERVICE MANAGER AND OWNER

GROUP 9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only) Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

a. To hold the pedal in place while repositioning the pivot bolts, temporarily insert two 3/8 inch bolts through center holes of the brake pedal and mating mount bracket holes.

b. Remove the jam nut from the inside of the brake pedal mounting bracket at each inner end of the two pivot bolts.

c. Using wrench, unscrew each pivot bolt from the threaded holes in the lever mounting bracket; remove bolt, washer and spacer/bushing from each side.

NOTE

Discard existing spacer/bushings if worn or distorted, and use new ones for this modification.

d. Apply thin coat of lubriplate to spacer/bushing inside and outside diameters and to the pivot bolts.

e. See figure 1. Install the spacer/bushing in the lowest of the three holes in the pedal mount bracket.

f. Install washer on pivot bolt, insert through the spacer/bushing previously installed, then thread bolt in the lowest hole in the pedal mounting plate; tighten bolt.

g. Repeat previous steps d through f on opposite mounting plate.

h. Install jam nut on both pivot bolt ends and tighten.

i. Remove the two bolts temporarily installed in the center hole.

j. Check brake pedal for proper operation and check that stop light illuminates when pedal is depressed and goes out when pedal is released.

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BOX 364, SANTA CLARA, CALIFORNIA 95052

☐ URGENT ☐ ROUTINE
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Service Bulletin

DATE 24 April 1973 NUMBER 2909 20001

ATTENTION: SERVICE MANAGER AND OWNERS

GROUP
9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

NOTE

Make sure brake pedal does not bind at pivot bolts and returns to full aft position when released.

k. Road test brakes for proper operation.

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RECREATIONAL VEHICLE DIVISION
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Service Bulletin

DATE 24 April 1973 NUMBER 2909 20001

ATTENTION: SERVICE MANAGER AND OWNERS

GROUP
9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

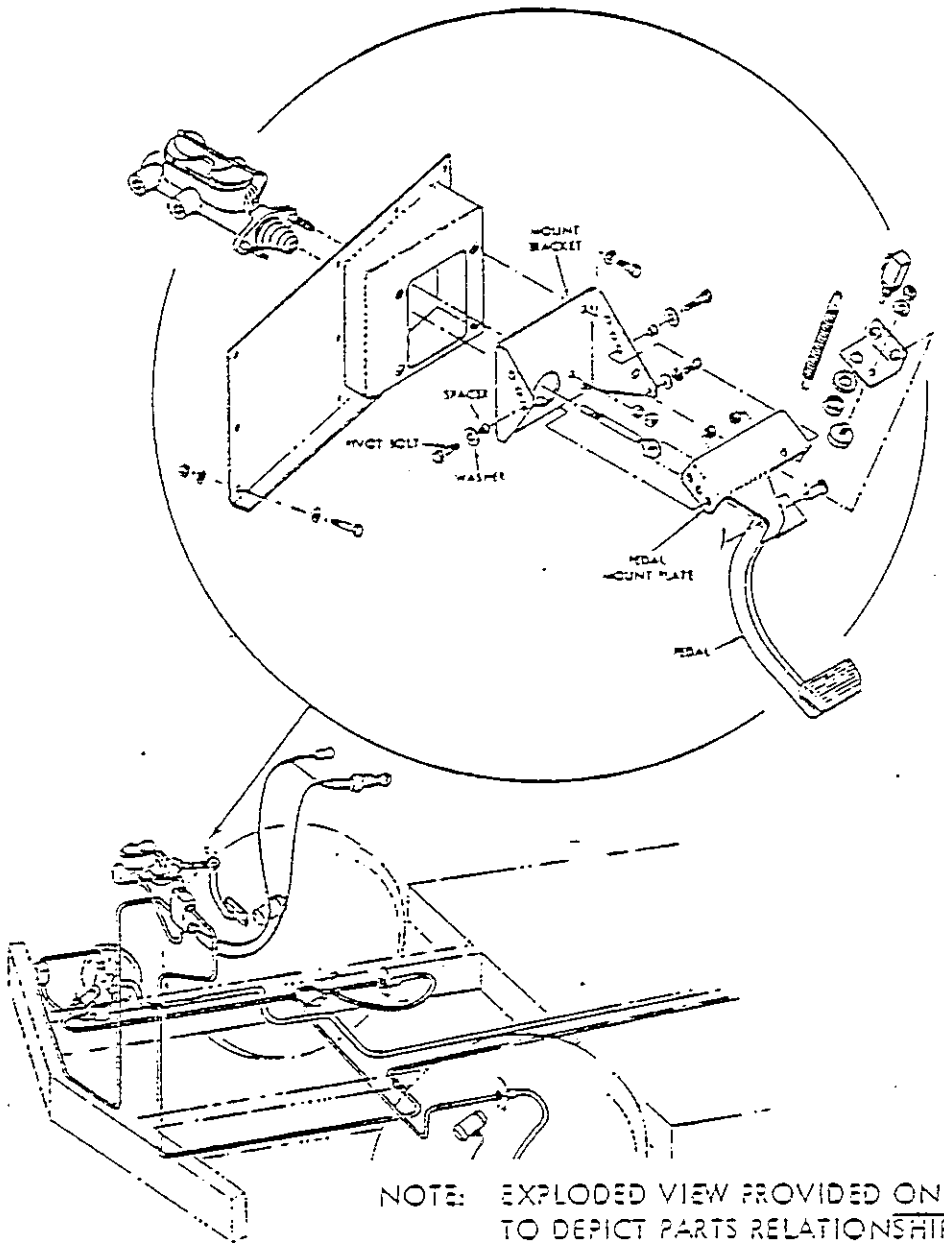
OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER



NOTE: EXPLODED VIEW PROVIDED ONLY TO DEPICT PARTS RELATIONSHIP. ACCOMPLISH MODIFICATION AS SPECIFIED IN TEXT.

Figure 1
BRAKE FOOT PEDAL PIVOT BOLT RELOCATION

FMC Corporation
Recreational Vehicle Division
333 Brokaw Road Box 664 Santa Clara, California 95052

☐ URGENT ☐ ROUTINE
☒ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 29 November 1973 NUMBER 2909 20002

ATTENTION: SERVICE MANAGER

GROUP
9

SUBJECT
SERVICE BRAKE FOOT-PEDAL/LEVER INSPECTION AND ADJUSTMENTS

MODEL (S) AFFECTED
2900R

(Factory Use Only)
Information added to:
OWNER MANUAL (S)
SERVICE MANUAL (S)
PARTS MANUAL (S)
WARRANTY MANUAL (S)
OTHER

This bulletin provides a method for checking and correcting any obstruction which could prevent the service brake foot pedal from returning to its "full-released" position when foot pressure is removed. Brake drag, causing excessive lining wear, can result from operating the coach with even a slight constant pressure applied to the lever. To ensure that the pedal/lever is free to return all the way to its "full-released" position, inspect as follows:

1. Check that the pedal/lever clears the lower forward edge of the dash panel a minimum of 1/8 inch. If not, accomplish a and b below, then proceed with steps 2 or 3.

a. Depress brake pedal forward and temporarily secure in this position to allow access to the lower forward edge of the dash panel in the area just behind the pedal/lever.

b. Using a rotary file or other tool suitable for grinding or cutting vinyl/fiberglass, trim dash panel edge back about 1/2 inch and across to about a 3 inch width, where the pedal will rest when brake is in released position. Sand off rough edges, then release pedal and recheck for proper clearance.

2. On coaches 00001 through 00200, check that the pedal/lever is in full released position when the bracket on the RH side of the pedal/lever contacts the rubber head of the adjustable stop bolt (located adjacent to the stop-light switch). Adjust stop bolt, if required, by loosening the nut/lockwasher on top of bracket; retighten nut when complete. Also check that the lower threaded portion of the adjustable stop-light switch body is 0.031 to 0.063 inch (1/32 to 1/16 inch) above the lever bracket. The lever bracket must depress the switch actuating shaft a minimum of 0.125 ($\pm$ 0.030) inch (1/8 $\pm$ 1/32 inch) to ensure that the contacts break.

3. On coaches 00201 and up, there is no adjustable stop bolt. Check that the lower threaded portion of the adjustable stop-light switch is 0.031 to 0.063 inch (1/32 to 1/16 inch) above the pedal/lever bracket with pedal in "full-released" position.

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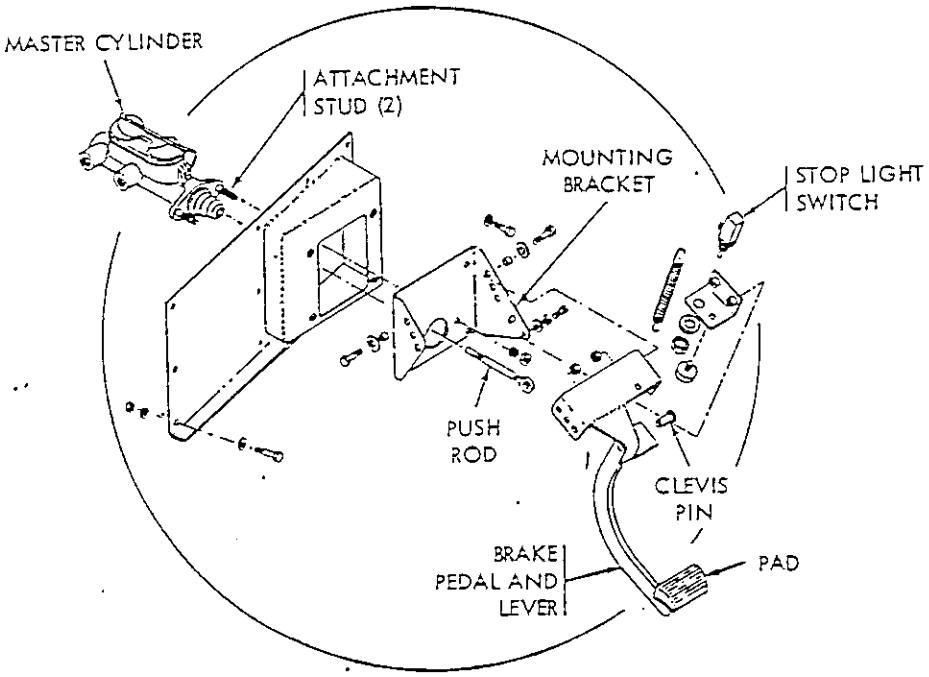
Service Bulletin

DATE 29 November 1973 NUMBER 2909 20002

ATTENTION: SERVICE MANAGER



NOTE: EXPLODED VIEW PROVIDED ONLY TO DEPICT PARTS RELATIONSHIP. ACCOMPLISH MODIFICATIONS AS SPECIFIED IN TEXT.

Please make certain all model 2900R coaches, now in your possession are in compliance with the instructions contained in this bulletin. Also please inspect and make the necessary modifications according to this bulletin on customer coaches when they are being serviced by your dealership.

John L Strever

JOHN L. STREVER
Service Manager

GROUP
9

SUBJECT
SERVICE BRAKE FOOT-PEDAL/LEVER INSPECTION AND ADJUSTMENTS

MODEL (S) AFFECTED
2900R

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

FMC Corporation
Motor Coach Division
333 Brokaw Road Box 364 Santa Clara California 95052

☐ URGENT ☒ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE October 15, 1974 NUMBER 2909-30001

ATTENTION: SERVICE MANAGERS AND OWNERS

DESCRIPTION: It has been brought to our attention that some coaches were assembled with the front to rear hydrovac hose placed inside the rear frame rail. This position is too close to the engine exhaust manifold where it could possibly become brittle and break loose.

INSTALLATION:

Inspect coach through right rear access door. If vacuum hose is placed inside frame rail, drill a 2" hole in hydrovac dust pan as close to corner as possible (See Figure). Disconnect vacuum hose at brake manifold and reroute hose through hole keeping hose outside rear frame rail and away from engine exhaust manifold. Use a grommet or Permagum around edge of hole. If hose appears brittle or damaged in any way, splice in a new section by using a short length of stiff tubing and secure with clamps. See figure on next page.

Max F Snavely
MAX SNAVELY

SERVICE MANAGER

GROUP
9

SUBJECT
PROPER ROUTING OF HYDROVAC VACUUM HOSES.

MODEL (S) AFFECTED
2900R MOTOR HOMES
Serial 00001 to 00600 approximately

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

FMC Corporation
Motor Coach Division
1111 Brokaw Road Box 664 Santa Clara California 95052

☐ URGENT ☒ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE October 15, 1974 NUMBER 2909-30001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP
9

SUBJECT
PROPER ROUTING OF HYDROVAC VACUUM HOSES

MODEL (S) AFFECTED
2900R MOTOR HOMES SERIAL 00001 TO 00600 APPROXIMATELY

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

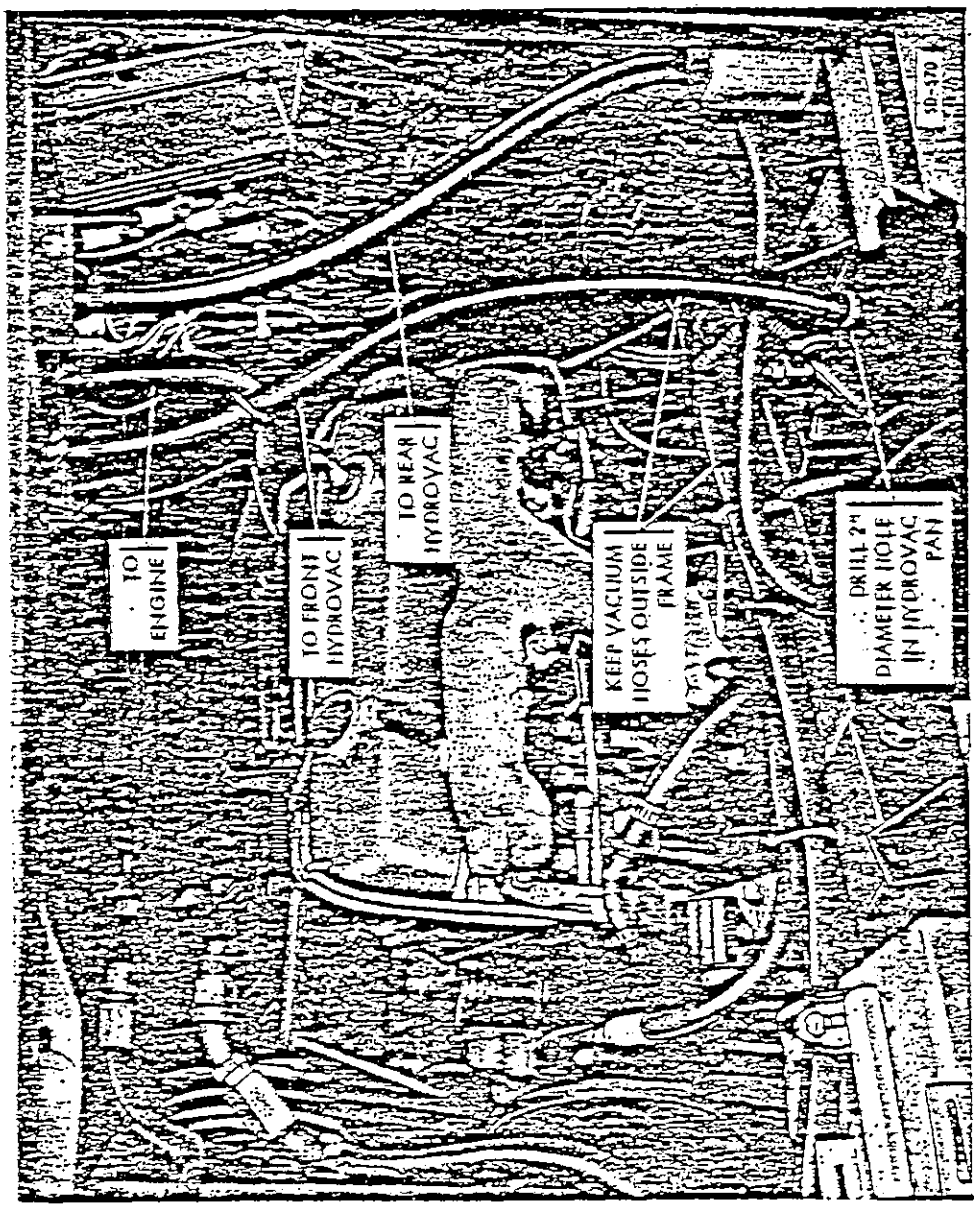


FIGURE 1. RELOCATION OF VACUUM HOSES

RVO-34 (6-72)

9

FMC Corporation

Motor Coach Division
333 Brokaw Road Box 364
Santa Clara California 95052
(408) 2990111

October 28, 1975

Dear FMC Motorcoach Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

The Motor Coach Division of FMC Corporation has determined that a defect which relates to motor vehicle safety may exist in your FMC motor coach. This defect is created after a brake application and the brake pedal is released. The residual pressure left in the hydraulic brake line from the master cylinder to the hydrovac does not allow the hydrovac to completely release the brakes. The vehicle can still move but if the brakes are still sufficiently applied they will heat up and may catch fire.

The dual brake system allows the front and rear systems to operate independent of one another; thus, if the above failure occurs you would still have braking available on the coach but the stopping power would be somewhat reduced. There may be no warning to the driver on a loss of braking capacity, although smoke may be a warning of loss of braking capacity as well as fire. A fire could result in serious injury to occupants of a vehicle or to persons outside of vehicle as well as damage to the vehicle.

As a precaution we strongly recommend that the vehicle not be operated until the defect is repaired. If the vehicle must be driven it should be operated with EXTREME caution. FMC Motor Coach Division will repair the defect at authorized dealers without charge to the purchaser. This recall campaign A0904 must be completed as soon as possible. FMC Motor Coach Division has estimated that parts as described in the Service Bulletin enclosed, will be available within 10 days of this notification.

If you no longer own the vehicle identified on enclosed RVD 30 Form, please fill out and mail the prepaid card so that we may adjust our records accordingly. Although FMC Motor Coach Division has informed the Department of Transportation of this recall, we are required by Federal Law to provide you with the address of the Secretary of Transportation in case you want to write to him about it.

His address is:

Administrator
Motor Vehicle Programs
National Highway Traffic Safety Administration
Washington, D. C. 20590

We are sorry to cause you this inconvenience; however, we have taken this action in the interest of your continued satisfaction with our products.

Your prompt cooperation is urged.

Sincerely,

Wayne J. Biondi

WAYNE J. BIONDI
Service Manager

Enclosure

WJB/pf

FMC Corporation
Motor Coach Division
333 Brokaw Road Box 564 Santa Clara California 95052

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT: SERVICE-BRAKE MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED: MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

DESCRIPTION

This bulletin provides instructions for inspecting the brake master cylinder and hydrovac installation to determine if proper combinations are present, and if not, provides the required modification to correct any improper combinations.

COMPLIANCE

Dealers MUST comply with this bulletin prior to delivery of coach to owner. Present owners MUST return coach to dealer for compliance with this bulletin. Owners should contact dealer and arrange for an appointment to have coach inspected as soon as practicable after receipt of this bulletin. If there is no dealer in your home state call the MCD service department at 408-289-3665.

MANPOWER

A. The estimated accomplishment time for the inspection required by PART I of this bulletin is one labor hour for which FMC Motor Coach Division will allow reimbursement on a properly submitted Warranty Claim (Form RVD 69).

B. The estimated accomplishment time for the modification Part II is approximately two labor hours for which FMC Motor Coach Division will allow reimbursement on a properly submitted Warranty Claim (Form RVD 69).

MATERIAL

The parts required to accomplish instructions will be provided by FMC/MCD on a no-charge basis.

ACCOMPLISHMENT INSTRUCTIONS - PART I, INSPECTION

A. Inspect the brake system master cylinder and hydrovac for proper combinations as specified in TABLE I. The master cylinder is accessible from the left-hand front access door. The rear hydrovac unit is accessible at the right-hand engine compartment door; the front unit is accessible forward of the right-hand wheel well.

FMC Corporation
Motor Coach Division
333 Broxaw Road Box 664 Santa Clara California 95052

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT: SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED: MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

ACCOMPLISHMENT INSTRUCTIONS - PART I, INSPECTION (CONT)

TABLE I. Proper Combinations of Master Cylinder and Hydrovac Assemblies

Master Cylinder	Hydrovac (Booster) Assembly
CONDITION-1	
5100457-02 Cylinder Bendix 2228225 ("8225" is rubber stamped on side of housing) (See Fig. 1).	5100457-01 Hydrovac Assembly Bendix 2504150 (Item has a 1/8 NPT pipe plug in rear shell. The letters "IH" are stamped above the plug. Part Number 2504150 is stamped on tag on shell clamping ring).
CONDITION-2	
5106496-01 Cylinder Bendix 2231900 ("1900" is metal stamped on front of housing) (See Fig. 1).	5107135 Hydrovac Assembly Bendix 2510813 (Item has no plug in rear shell. Part Number 2510813 is stamped on tag on shell clamping ring).
CONDITION-3	
5106496-01 Cylinder Bendix 2231900 ("1900" is metal stamped on front of housing) (See Fig. 1).	5107516 Hydrovac Assembly Bendix 2508827 (Item has orange spot on rear shell. Part Number 2508827 is stamped on tag on shell clamping ring).

WARNING

If coach has a 5100457-02 Master Cylinder (Bendix 2228225) and either a 5107135 Hydrovac (Bendix 2510813) or a 5107516 Hydrovac (Bendix 2508827) a dangerous brake condition exists and must be corrected per accomplishment instructions in Part II of this bulletin.

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Service Bulletin

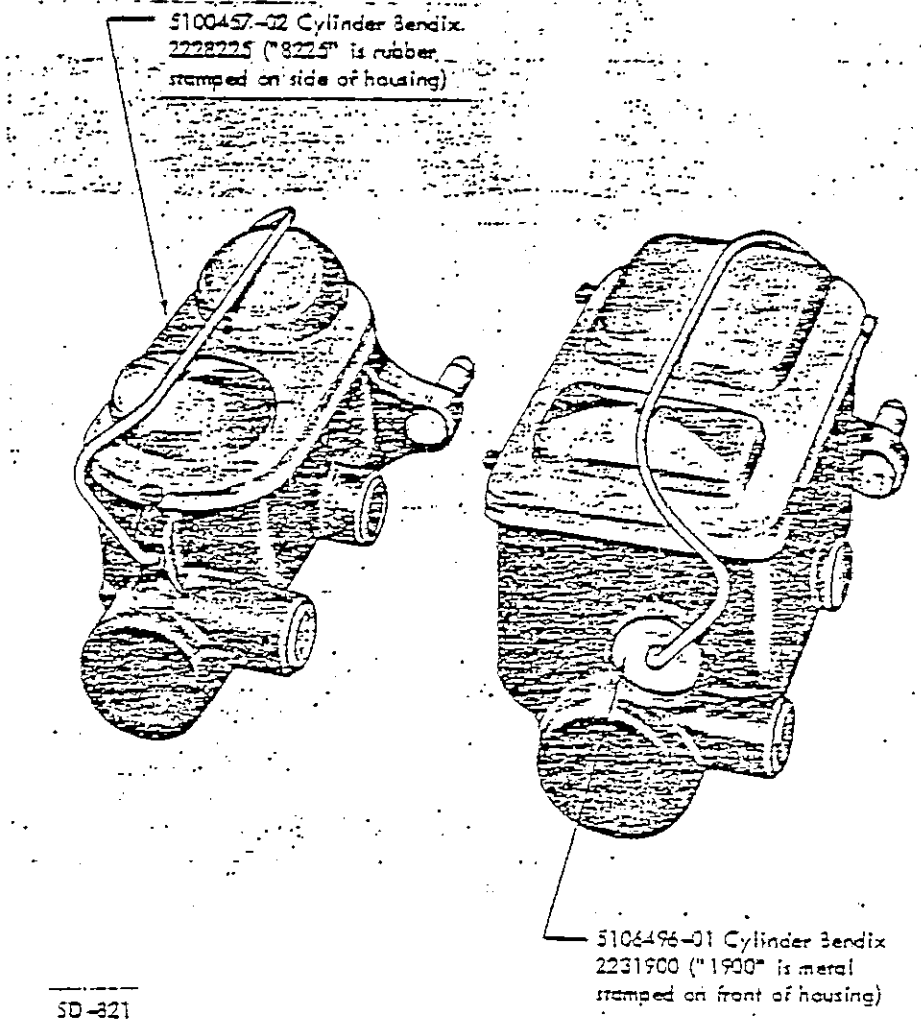
DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP
9

SUBJECT
SERVICE-BRAKE MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED
MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE



SD-821

FIGURE 1. MASTER CYLINDERS

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☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP
9

SUBJECT
SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED
MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

ACCOMPLISHMENT INSTRUCTIONS - PART I, INSPECTION (CONT)

B. If the inspections prescribed in TABLE I determine that either a condition -2 or condition -3 exists, further inspect for presence of a 5106793-01 residual pressure check valve (Bendix 2226939) in the end of each hydrovac, connecting the hydrovac to the brake hydraulic line. See Figure 2.

- If the check valve is present in the condition -2 combination, no further action is required. If check valve is not present, install valve in the line at end of hydrovac cylinder, accomplish steps (1), (2), (6), (7) and (8) below.

- If the check valve is present in the condition -3 combination, further check for presence of an internal residual pressure check valve (inside hydrovac cylinder) as follows;

  (1) Make sure that engine is not running, then depress brake pedal several times to relieve all vacuum in system.

  (2) Place drain pan under hydraulic tube and hydrovac (slave) cylinder end cap area and unscrew tube fitting.

  (3) Remove the residual pressure check valve from the end cap of hydrovac cylinder.

  (4) Remove hydrovac cylinder end cap fitting and seal.

  (5) Inspect interior of end of hydrovac cylinder for presence of a snap ring and a residual pressure check valve, including a coil spring and washer. If these components are present, remove them from cylinder, then reinstall the seal and end cap fitting.

  (6) Install 5106793-01 residual check pressure valve (Bendix 2226939) in end cap of hydrovac cylinder.

  (7) Install the tube end fitting in the end of valve.

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GROUP
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SUBJECT
SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED
MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

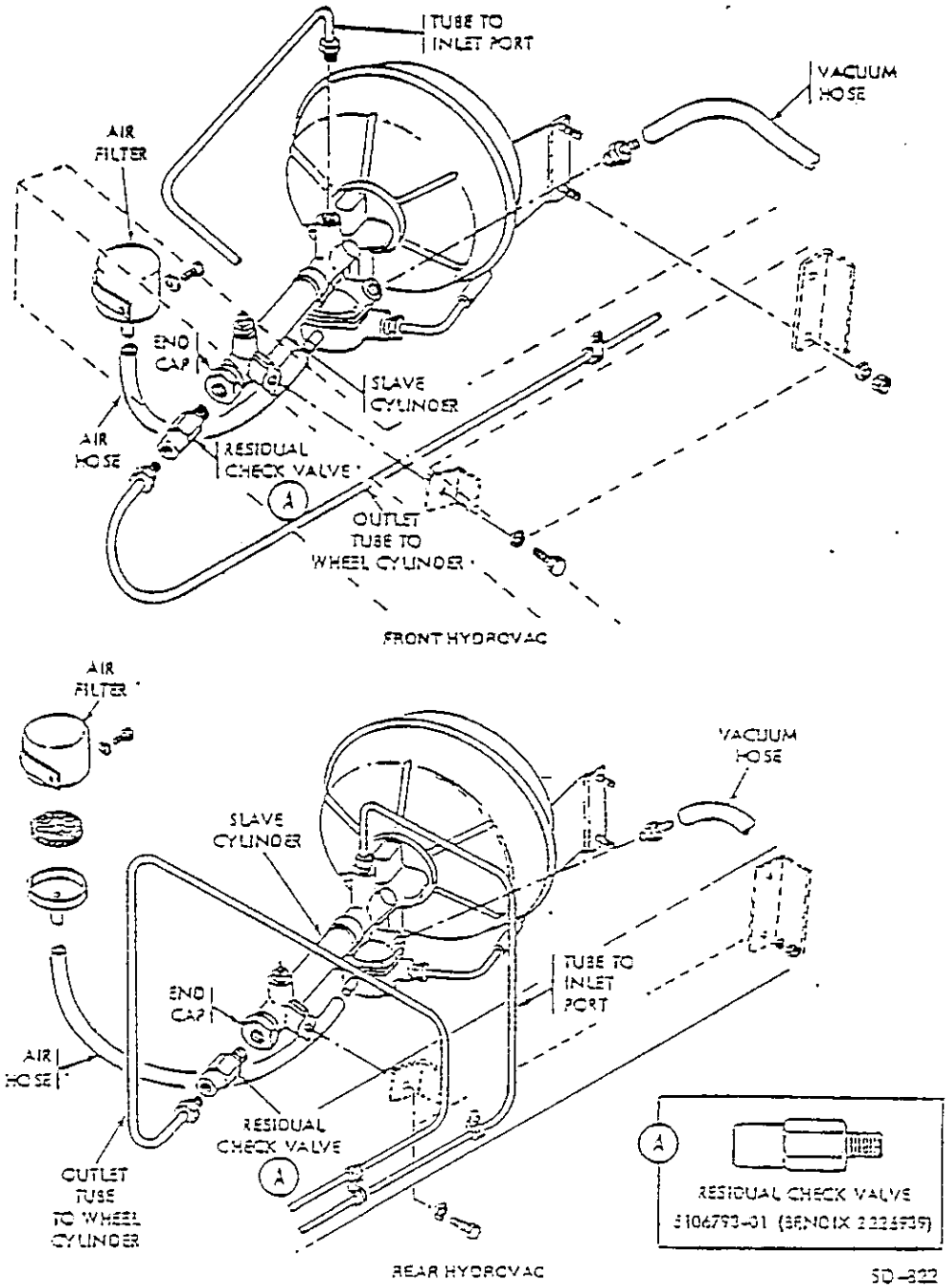

FIGURE 2. RESIDUAL CHECK VALVE ON HYDROVAC END CAP

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Motor Coach Division
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☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT: SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED: MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

ACCOMPLISHMENT INSTRUCTIONS - PART I, INSPECTION (CONT)

(8) Bleed system refer to FMC Service Manual, Group 9.

ACCOMPLISHMENT INSTRUCTIONS - PART II, MODIFICATION

A. If coach is found to be in the condition described in the TABLE I WARNING, the hydrovacs must be replaced with 5100457-01 Hydrovac (Bendix 2504150). The rear hydrovac unit is accessible at the right-hand engine compartment door; the front unit is accessible forward of the right-hand wheel well. Use a suitable container to catch any hydraulic fluid released.

CAUTION

There must be no vacuum in the hydrovac unit when disconnecting vacuum hose. Do not depress brake pedal during maintenance.

(1) Make sure that engine is not running, then depress brake pedal several times to relieve all vacuum in system.

(2) Loosen clamp on air cleaner hose near hydrovac air inlet; disconnect hose.

(3) Loosen clamp on vacuum hose near hydrovac air inlet; disconnect hose.

(4) Place drain pan under two hydraulic tubes connected to hydrovac (slave) cylinder inlet and outlet ports, unscrew fittings, then disconnect tubes.

(5) Remove front bolts and washers attaching hydrovac to mount bracket and two aft nuts and washers at rear.

(6) Remove and clean or replace air filter assembly.

(7) Install new 5100457-01 hydrovac (Bendix 2504150) by securing to rear mounting bracket with two nuts and washers.

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☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT: SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED: MOTOR HOMES AND CLUB COACHES: REFER TO EFFECTIVITY LIST ON LAST PAGE

ACCOMPLISHMENT INSTRUCTIONS-PART II, MODIFICATION (CONT)

(8) Secure hydrovac to forward bracket with bolts and washer.

(9) Install fittings of two hydraulic tubes into slave cylinder inlet and outlet ports. Tighten tube fittings until resistance is felt, then tighten them about 1/6 turn more.

(10) Connect vacuum hose to hydrovac vacuum port, then tighten hose clamp.

(11) Connect air hose to air filter and to booster air inlet, then tighten hose clamp.

(12) Bleed and test brake system; refer to FMC Service Manual, Group 9.

(13) Tag and identify all parts removed from coach and return to FMC Motor Coach Division. Attention Service Department.

FMC Corporation
Motor Coach Division
333 Brokaw Road Box 664 Santa Clara California 95052

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE 30 October 1975 NUMBER 2909 10001

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP
9

SUBJECT
SERVICE-BRAKES MASTER CYLINDER AND HYDROVAC COMPATIBILITY

MODEL (S) AFFECTED
MOTOR HOMES AND CLUB COACHES: REFER TO LIST

LIST OF AFFECTED COACHES

S-5-10-J-00669
S-5-11-E-00679
S-5-11-J-00680
S-5-11-J-00682
S-5-11-J-00684
S-5-11-J-00686
S-5-11-J-00688
S-5-10-J-00690
S-5-12-J-00692
S-5-12-J-00694
S-5-12-J-00696
S-5-12-J-00699
S-5-12-A-00701
S-5-12-A-00702
S-5-12-J-00704
S-5-12-A-00705
S-5-12-A-00706
S-5-12-A-00707
S-5-12-A-00708
S-5-12-A-00709
S-5-12-J-00711
S-5-12-J-00712
S-5-02-J-00713
S-5-12-J-00714
S-5-12-J-00715
S-5-02-A-00716
S-5-01-J-00717
S-5-01-J-00718
S-5-01-J-00719
S-5-01-J-00720
S-5-01-J-00722
S-5-01-J-00723
S-5-01-J-00725
S-5-01-J-00726
S-5-01-E-00727
S-5-01-E-00728
S-5-01-J-00729
S-5-01-J-00731
S-5-01-J-00734
S-5-01-J-00735
S-5-01-J-00736
S-5-01-J-00737
S-5-01-J-00738

Wayne J. Biondi

WAYNE J. BIONDI
Service Manager

MCD-84 (2-75)

FMC FMC Corporation
Motor Coach Division
333 Brokaw Road Box 664 Santa Clara California 95052

☐ URGENT ☒ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE January 15, 1976

NUMBER 2909 30002

ATTENTION: SERVICE MANAGERS

GROUP

9
SERVICE BRAKES

SUBJECT

DISC BRAKE SHOE/LINING (FRICTION PAD) INSPECTION AND REPLACEMENT

MODEL (S) AFFECTED

ALL TRANSIT COACHES WITH DISC BRAKES (SERIAL NUMBERS 00652 AND UP)

DESCRIPTION

This bulletin provides instructions for inspecting the disc brake shoe/linings (friction pads) and procedures for replacement, if required. This inspection is required every 3000 miles and shoe/lining and piston seal replacement must be accomplished if lining wear is excessive or uneven.

COMPLIANCE

Vehicles affected by this bulletin will be completed by March 1, 1976. The accomplishment of this bulletin prior to the above mentioned date will not jeopardize your existing warranty. You are urged to comply by the above date to avoid possible adverse consequences.

ACCOMPLISHMENT INSTRUCTIONS - PART I, INSPECTION

At every 3000 mile interval, inspect the disc brake shoe/linings for excessive or uneven wear. Recommend a small mirror (inspector's mirror) be used to obtain a close-up view of the linings. Visually inspect the inboard and outboard shoe/linings in each of the four disc brake calipers. If lining thickness is less than 1/4 inch, or if wear is uneven (thicker on one end than the other), replace shoe/linings and piston seal in caliper in accordance with PART II.

ACCOMPLISHMENT INSTRUCTIONS - PART II, SHOE/LINING AND SEAL REPLACEMENT

NOTE

REPLACEMENT OF THE DISC BRAKE SHOE/LINING AND PISTON SEAL REQUIRES ACCOMPLISHMENT OF CERTAIN PROCEDURES CONTAINED IN GROUP T9 OF THE SERVICE MANUAL. MAKE SURE THE INSTRUCTIONS IN THE MANUAL ARE ADHERED TO WHEN ACCOMPLISHING THIS BULLETIN.

When shoe/linings do not pass inspection as specified in PART I, they must be replaced and the caliper must be removed to enable replacement of the piston seal, which is a requirement each time the shoe/linings are replaced. Refer to SECTION II of the above referenced Service Manual and proceed as follows:

F.M.C., AS OF 12/31/75, [illegible]GER
HONORS PARTS [illegible] REIMBURSEMENT
AS OUTLINED IN THIS BULLETIN

MCD-84 (2-75)

FMC Corporation
Motor Coach Division
333 Brokaw Road Box 664 Santa Clara California 95052

☐ URGENT ☒ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE January 15, 1976 NUMBER 2909 30002

ATTENTION: SERVICE MANAGER S

GROUP
9
SERVICE BRAKES

SUBJECT
DISC BRAKE SHOE/LINING (FRICTION PAD) INSPECTION AND REPLACEMENT

MODEL (S) AFFECTED
ALL TRANSIT COACHES WITH DISC BRAKES (SERIAL NUMBERS 00652 AND UP)

ACCOMPLISHMENT INSTRUCTIONS - PART II, SHOE/LINING AND SEAL REPLACEMENT (CONT)

NOTE
Shoe/linings should be replaced in axle pairs to get the same braking on both sides of the vehicle.

CAUTION
Prior to accomplishing subsequent steps, make sure the opposite brake caliper assembly is installed. Work must be limited to one brake at a time, to avoid popping the piston out of the opposite caliper.

(1) Remove caliper per Service Manual.
(2) Stand caliper on suitable work bench with the piston side up. Place a block of wood opposite the piston. (CAUTION: Keep fingers away from this area). Force dry air through the caliper inlet port to blow the piston out of the bore.
(3) Clean and inspect the piston. It must be free from pits and scoring.
(4) Work the boot out of the caliper groove with a screw driver.
(5) Remove the seal from the caliper bore.
(6) Blow out all passageways with clean, dry air. Use crocus cloth in the bore to remove any contamination or burrs. Make certain that the machined surfaces are clean.
(7) Coat the cylinder bore in caliper with fluid.
(8) Coat a new seal (P/N 5106598-02) with fluid and install the seal into the lower groove of the cylinder bore.
(9) Place the small diameter of the dust boot (use new boot if needed) over the piston so that the large diameter extends beyond the bottom of the piston. Work the large diameter of the boot into the upper groove of the cylinder bore with the seal extractor. Then apply even pressure on piston until it bottoms. The small diameter of the boot will automatically position itself into the piston groove.
(10) Reinstall caliper and new shoe/linings per Service Manual.

FMC Corporation
Motor Coach Division
333 Brokaw Road Box 664 Santa Clara California 95052

☐ URGENT ☒ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE January 15, 1976 NUMBER 2909 30002

ATTENTION: SERVICE MANAGERS

GROUP
9
SERVICE BRAKE

SUBJECT
DISC BRAKE SHOE/LINING (FRICTION PAD) INSPECTION AND REPLACEMENT

MODEL (S) AFFECTED
ALL TRANSIT COACHES WITH DISC BRAKES (SERIAL NUMBERS 00652 AND UP)

ACCOMPLISHMENT INSTRUCTIONS - PART II, SHOE/LINING AND SEAL REPLACEMENT (CONT)

CAUTION

TO ENSURE PROPER CALIPER SLIDING ACTION, THE METAL-TO-METAL CONTACT POINTS ON THE CALIPER AND ON THE ANCHOR PLATE MUST BE POLISHED WITH A WIRE BRUSH OR CROCUS CLOTH, THEN COATED WITH HEAVY DUTY, RUST INHIBITOR LUBRICANT, LPS NO. ESA-100 (LPS RESEARCH LAB, LOS ANGELES, CA) OR APPROVED EQUILAVENT.

W. BIONDI
SERVICE MANAGER

FMC Corporation

Motor Coach Operations
Box 1201
San Jose, California 95108
(408) 289 0111

(9)

July 19, 1979

FMC

Dear FMC Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

FMC Motor Coach Operations has determined that a defect which relates to motor vehicle safety exists in the FMC motorhome and transit vehicles. The defect in question is the brake tubes within the braking system. Their function is to distribute brake fluid upon a brake application from the master cylinder into the hydrovacs and to the wheel cylinders. It has been determined that some of the existing tubes may be subject to heavy corrosive action under certain climatic conditions. Should this condition exist within your vehicle, they may become perforated causing a loss of brake fluid. If either the front or rear half of the dual system should fail, the remaining system will continue to function and a warning light on the instrument panel would be triggered, it would limit the braking capabilities of your unit.

We at FMC feel the new tubes, which have a greater resistance to corrosion over the tubes presently used, must be installed immediately to avoid any adverse conditions possibly causing an accident and injury. As a precaution, we strongly recommend that the vehicle be operated minimally until it has been thoroughly checked for leaking tubes or the defective tubes replaced.

The vehicle should be cautiously driven to a qualified brake repair center or an FMC service dealer with the necessary equipment as described in Service Bulletin #2902-10002. If you have difficulties in locating a dealer able to make these corrections, please contact Motor Coach Operations at (408) 289-3665 or 289-3220 and we will assist you.

To correct this condition on your vehicle, the dealer should perform the modification as described in the attached service bulletin #2902-10002. FMC Motor Coach Operations will furnish you the necessary replacement parts upon our receipt of the enclosed pink pre-addressed post card. Our receipt of the information on this card is imperative! It will assure us of the proper address and vehicle serial number, without this card, we will be unable to determine the proper kit needed for your vehicle. If you have sold or disposed of the subject vehicle, please note on the prepaid card so that we may adjust our records accordingly.

We are requesting each owner initially pay for the service rendered for this modification. FMC Motor Coach will then reimburse you a maximum of three-hundred dollars ($300) per vehicle when you submit a copy of the repair bill to: Motor Coach Operations, P.O. Box 1201, San Jose, CA. 95108. There will be no charges for the replacement parts. Should there be any discrepancies in the allowable time as described in the bulletin, contact Motor Coach Operations customer service Dept. at (408) 289-3665 or 289-3220 prior to beginning work. Please allow 30 days to receive your reimbursement. After the new parts have been installed, please complete and mail the enclosed yellow pre-addressed post card.

We wish to inform each owner that they may submit a complaint to the Administrator, National Highway Traffic Safety Administration, Washington, D.C. if you feel that FMC relinquished their responsibility by not correcting the defect without charge and within a reasonable time of this notice.

Your prompt cooperation in this recall is urged.

Sincerely,

DAVE ENGET
Service Manager

DE/pf

Enclosure

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT Brake Tubing

MODEL (S) AFFECTED

(Factory Use Only) Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

DESCRIPTION

This bulletin provides instructions for replacement of the brake lines (metal tubing) for the front and rear brakes on each coach.

COMPLIANCE

Service managers and owners must comply with this bulletin as soon as possible per recall notification No. A0910. Do not attempt to deviate from this bulletin. If a vehicle can not be retrofitted within the guide lines of this bulletin call MCO service department 408-289-3220 or 408-289-3665.

MANPOWER

Estimated accomplishment time for one mechanic to install all new brake lines (metal tubing) and bleed the brake system is 12 hours. FMC/MCO will reimburse for labor up to a maximum of 12 hours. Any labor charges which exceed $300.00 must have FMC/MCO approval BEFORE proceeding with this bulletin. A signed yellow 'Status Report Card' must accompany your bill before reimbursement can be made.

TOOLS REQUIRED

Tools that should be on hand to accomplish this retrofit are as follows:

1 Electric wire crimper
1 7/16 inch brake tube wrench
1 1/2 inch brake tube wrench
1 9/16 inch brake tube wrench
1 Tube bender for 1/4 inch tubing
1 Air or electric drill
1 Drill bit 1/8 inch
1 Drill bit 3/16 inch
1 Pop rivet gun w/ 1/8 and 3/16 mandrels
1 Brake Bleeder Tank

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

MATERIAL

Replacement parts supplied no charge by FMC/MCO are:

Kit I - For Motor Homes 00001 to 00785

Line Number	Description
1	Master cylinder to Brake Warning Switch (Rear Portion)
2	Master cylinder to Brake Warning Switch (Front Portion)
3	Brake warning switch to front booster
4	Front Tee to right wheel frame connection
5	Rear elbow to rear booster
6	Rear booster to rear frame tee
7	Front booster to front tee
8	Rear brake tee to right wheel frame connection
9	Rear brake tee to left wheel frame connection
10	Brake warning switch to front elbow
11	Frame tee to left frame connection
12	Front elbow to rear tee (See note below)
	Package of rivets (36-3/16 x 61/64) (10-1/8 x 21/32)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 1.

NOTE: Line number 12 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

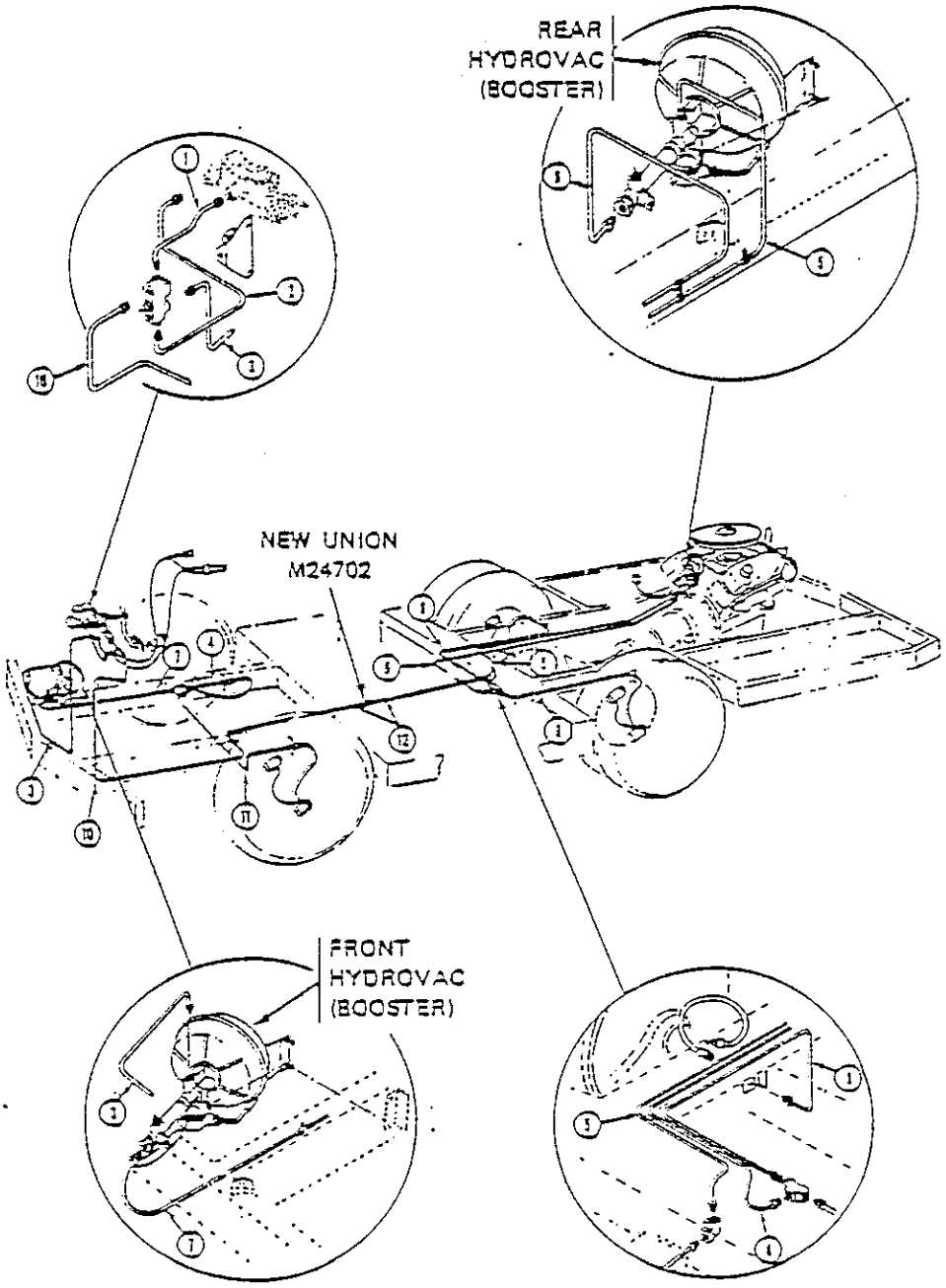

Figure 1. Line Location for Kit I.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
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Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

Kit II - For Motor Homes 00786 to 01012

Line Number	Description
13	Front Tee to Right Wheel Frame Connection
14	Rear Elbow to Rear Booster
15	Rear Booster to Rear Frame Tee
16	Rear Brake Tee to Right Wheel Frame Connection
17	Rear Brake Tee to Left Wheel Frame Connection
18	Front Tee to Left Wheel Frame Connection
19	Front Elbow to Rear Elbow (See Note Below)
20	Brake Warning Switch to Front Elbow
21	Brake Warning Switch to Front Booster
22	Front Booster to Front Tee
23	Master Cylinder to Brake Warning Switch (front portion)
24	Master Cylinder to Brake Warning Switch (rear portion)
	Package of rivets (36- 3/16 x 61/64) (10- 1/8 x 21/32)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 2.

NOTE: Line number 19 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

RVD-34 (6-73)

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

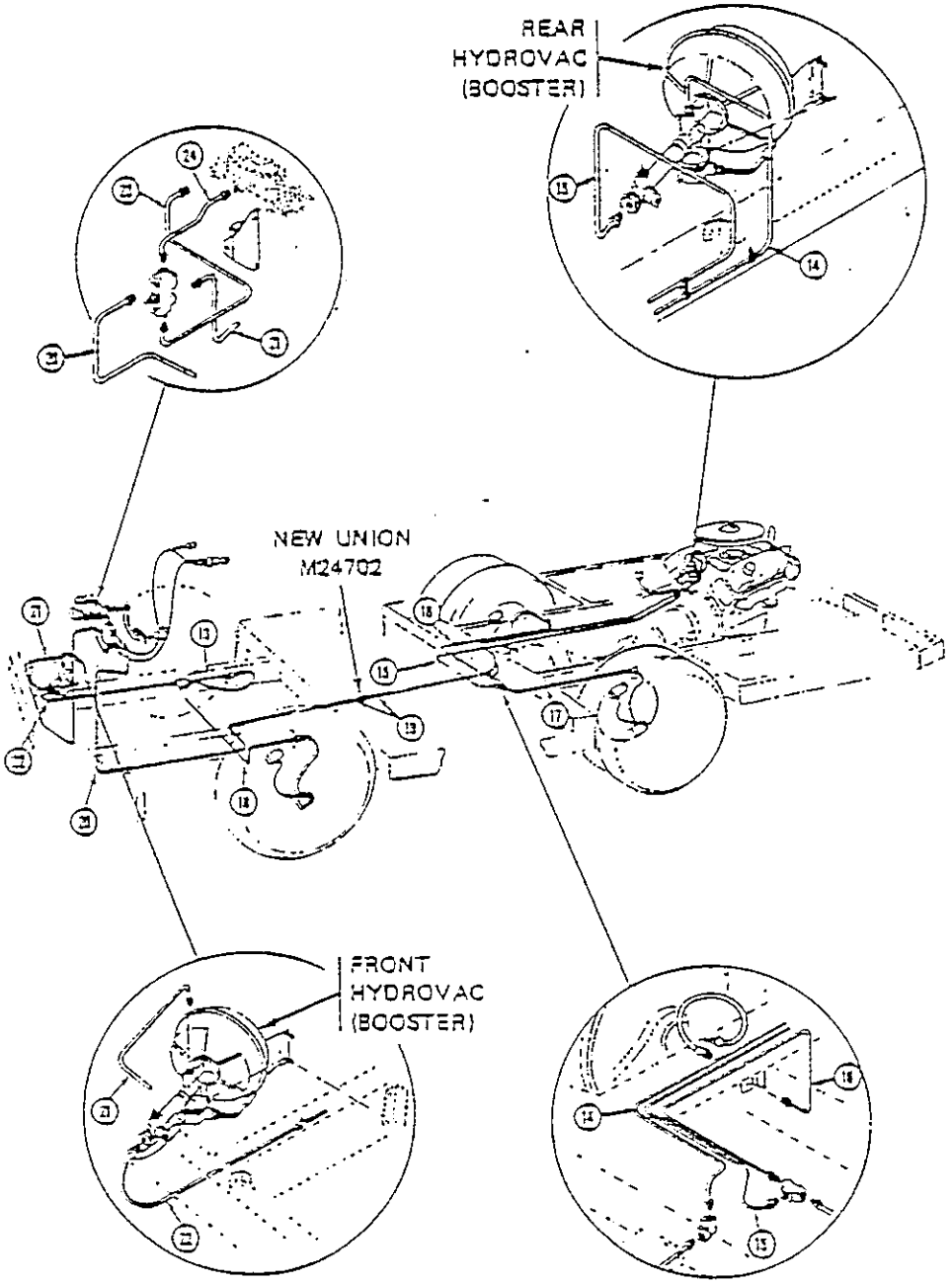

Figure 2. Line Location for Kit II.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

Kit III - For Motor Homes 01013 and Up

Line Number	Description
25	Front Tee to Right Front Wheel Frame Connection
26	Rear Elbow to Booster
27	Rear Booster to Rear Frame Tee
28	Rear Brake Tee to Right Rear Frame Connection
29	Rear Brake Tee to Left Rear Frame Connection
30	Front Tee to Left Front Wheel Frame Connection
31	Front Elbow to Rear Elbow (See Note Below)
32	Master Cylinder to Brake Warning Switch (rear portion)
33	Master Cylinder to Brake Warning Switch (front portion)
34	Brake Warning Switch to Front Elbow
35	Brake Warning Switch to Front Booster
36	Front Booster to Front Tee
	Package of rivets (36- 3/16 x 61/64)
	(10- 1/8 x 21/32)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 3.

NOTE: Line number 31 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

RVD-34 (8-73)

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

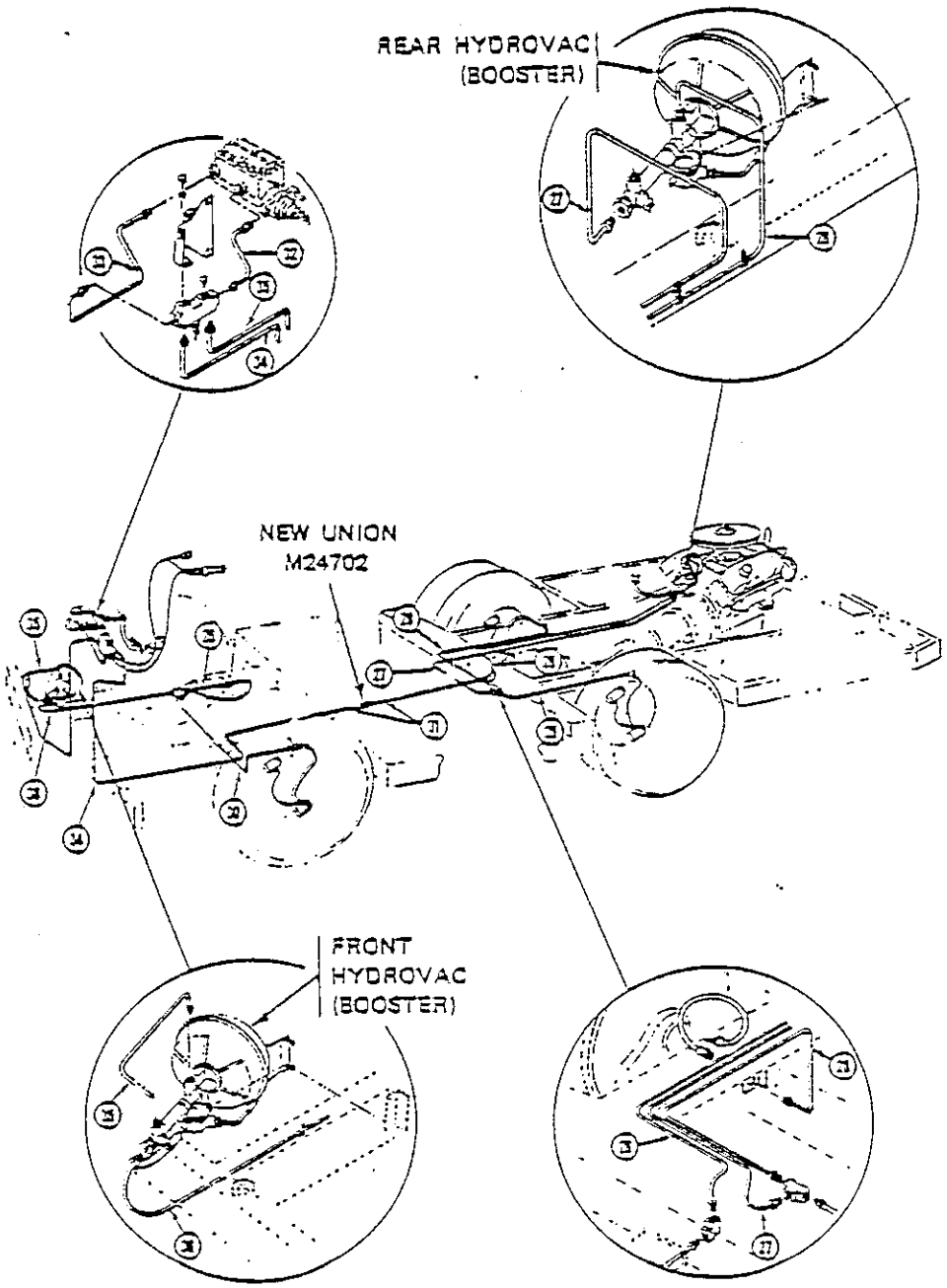

Figure 3. Line Location for Kit III.

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Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

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Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

Kit IV - For Transit Coaches 00530 to 00651

Line Number	Description
37	Master Cylinder to Brake Warning Switch (rear)
38	Master Cylinder to Brake Warning Switch (front)
39	Foot Brake Warning Switch to Front Hydrovac
40	Front Tee to Right Wheel Frame Connection
41	Rear Hydrovac to Frame Tee
42	Elbow to Rear Hydrovac
43	Front Hydrovac to Front Tee
44	Rear Brake Tee to Right Wheel Frame Connection
45	Rear Brake Tee to Left Wheel Frame Connection
46	Brake Warning Switch to Union
47	Front Tee to Left Wheel Frame Connection
48	To Elbow at Rear of Coach (See Note Below)
49	Actuator Output to Rear Wheel
50	Rear Booster to Actuator
	Package of rivets (36- 3/16 x 61/64) (10- 1/8 x 21/32)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 4.

NOTE: Line number 48 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

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ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

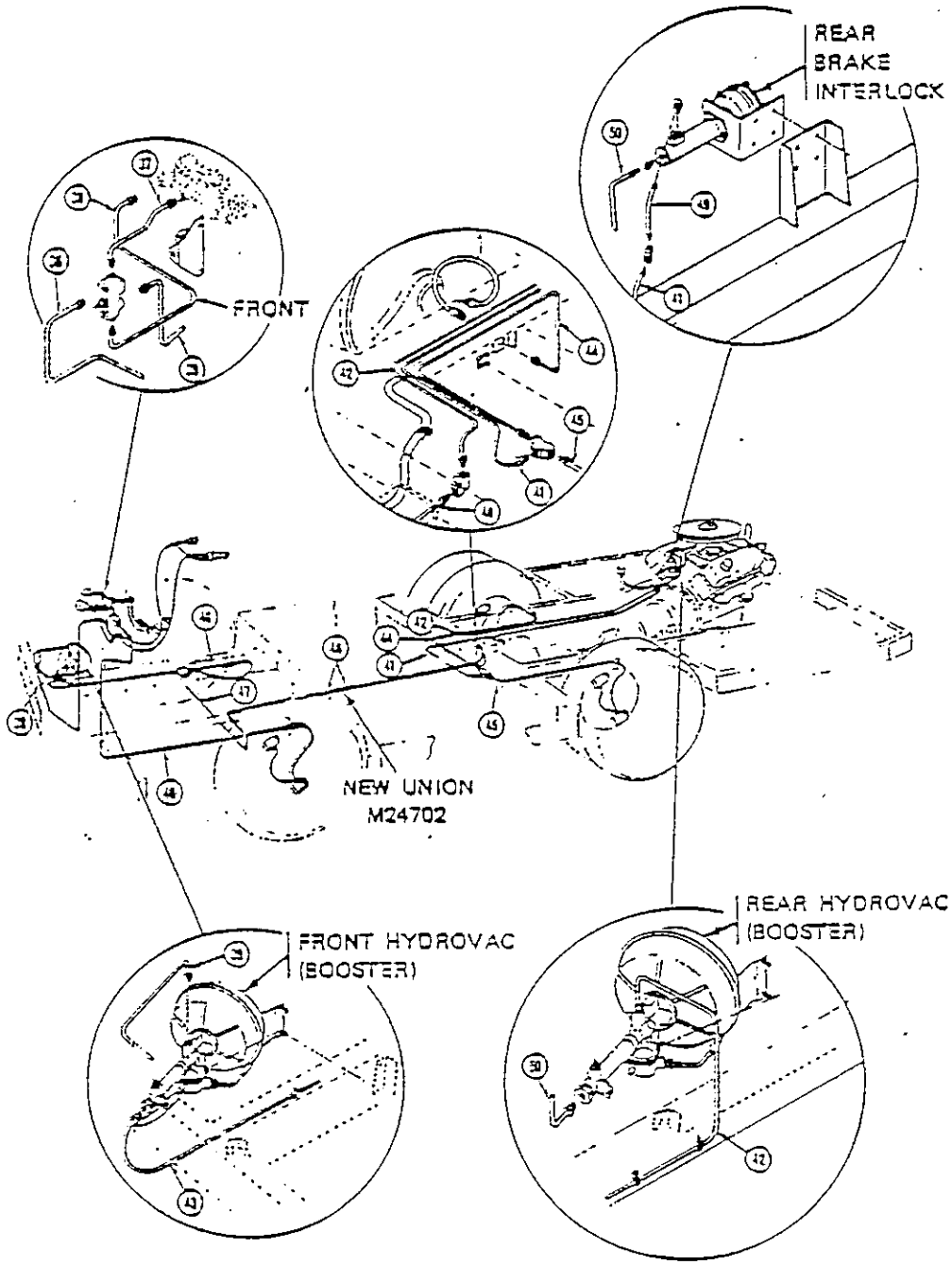

Figure 4. Line Location for Kit IV.

FMC Corporation
Motor Coach Operation
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San Jose, California 95108

☒ URGENT ☐ ROUTINE
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Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

Kit V - For Transit Coaches 00652 to 00785

Line Number	Description
51	Brake Warning Switch to Front Booster
52	Front Tee and Elbow to Hose
53	Master Cylinder to Warning Switch (front)
54	Master Cylinder to Warning Switch (rear)
55	Tee to Right Brake Hose
56	Tee to Left Brake Hose
57	Rear Booster to Connector
58	Frame Tee (RH) to Frame Elbow (LH)
59	Front Booster to Frame Tee
60	Rear Booster Frame Connector to Elbow (See Note Below)
61	Brake Warning Switch to Rear Booster
62	Elbow to Actuator
63	Actuator to Tee
	Package of rivets (36- 3/16 x 61/64)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 5.

NOTE: Line number 60 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

GROUP

SUBJECT

MODEL (S) AFFECTED

ATTENTION: SERVICE MANAGERS AND OWNERS

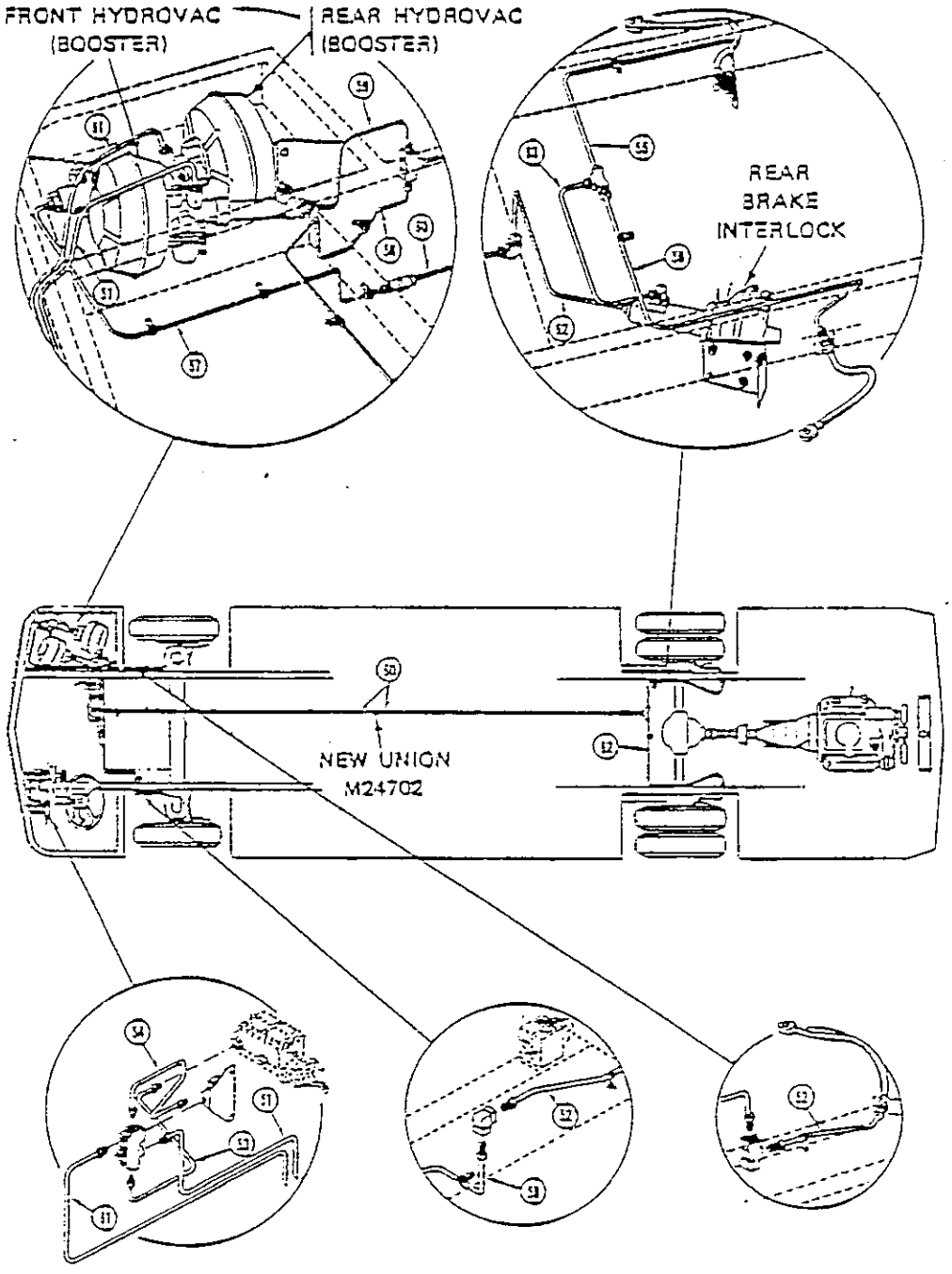

Figure 5. Line Location for Kit V.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
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Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

Kit VI - For Transit Coaches 00786 and Up

Line Number	Description
64	Tee to Right Rear Wheel
65	Rear Brake Line to Tee
66	Tee to Left Rear Wheel
67	Rear Brake Through Frame (See Note Below)
68	Master Cylinder to Warning Switch (rear brakes)
69	Master Cylinder to Warning Switch (front brakes)
70	Rear Booster to Air/Hydraulic Actuator
71	Front Booster to Frame Tee
72	Brake Warning Switch to Rear Booster
73	Brake Warning Switch to Front Booster
74	Front Tee to Elbow (left side)
75	Front Tee to Elbow (right side)
76	Front Tee to Hose (right side)
77	Front Elbow to Hose (left side)
78	Actuator to Rear Brake Connector
	Package of rivets (36- 3/16 x 61/64) (10- 1/8 x 21/32)

Rivets are used to reinstall the front nose cone. Line numbers above correspond with line numbers in Figure 6.

NOTE: Line number 67 has been cut into two sections (for shipping purposes) and is joined by a 1/4 inch union when installed in the coach. Union part number is M24702.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

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ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

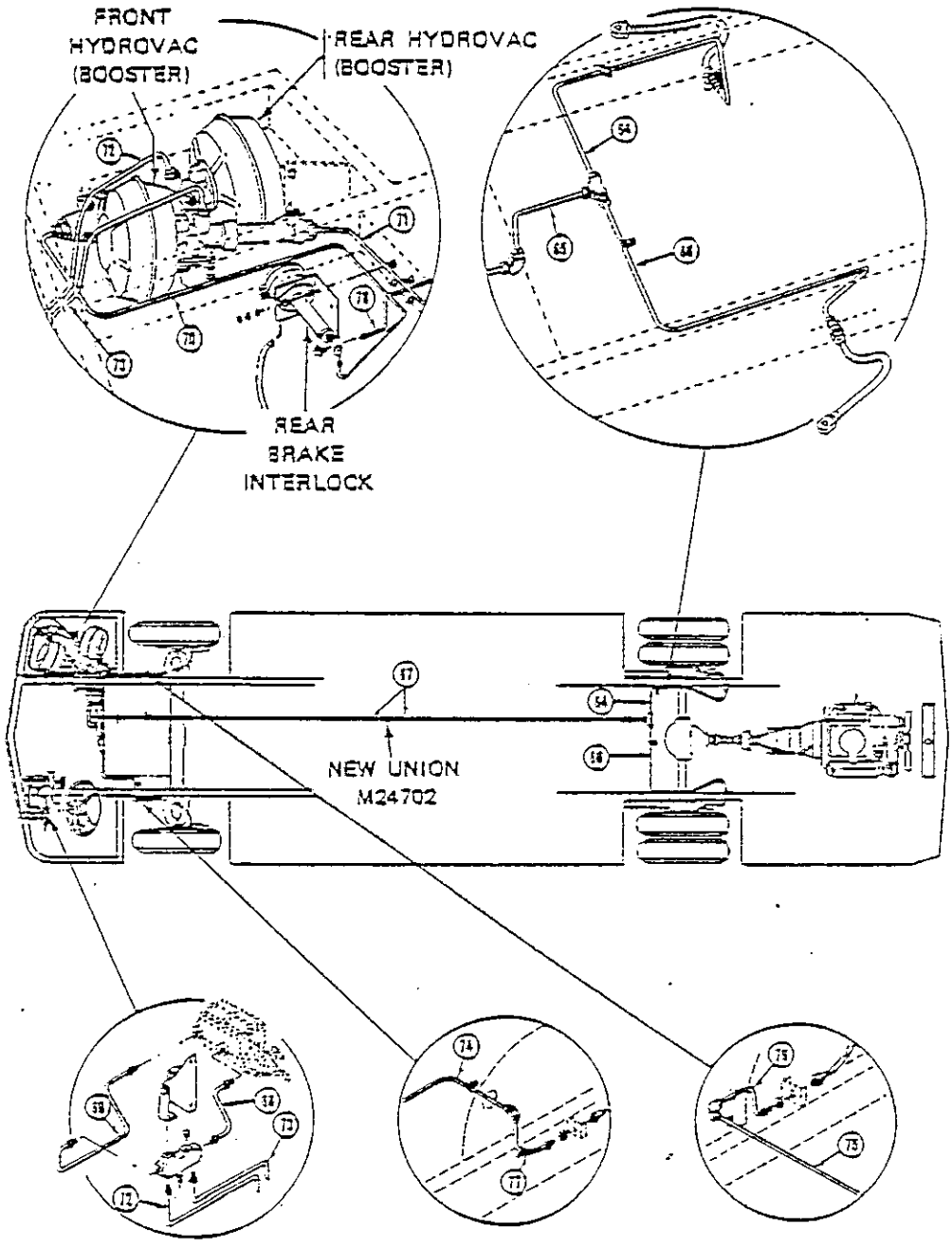

Figure 6. Line Location for Kit VI.

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP
9

SUBJECT

MODEL (S) AFFECTED

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

ACCOMPLISHMENT INSTRUCTIONS

1. Depress brake pedal several times to relieve system pressure, then check and record brake pedal height BEFORE you change any brake line.

2. Check the nose cone for chipped paint, cracks, or areas which may have had previous damage. Note any of the above conditions on the work order and point out any deficiencies to the coach owner before proceeding with the work.

3. Remove front bumper from coach.

4. Remove front nose cone as follows: (See Fig. 7)

   a. Pull molding from vertical riveted strip that joins the front nose cone panel to the forward right-hand panel.

   b. Drill out rivets (3/16 diameter) from vertical strip and remove strip from vehicle.

   c. Drill out rivets (1/8 diameter) from vertical strip around driver's door opening and carefully move forward section away from coach.

      NOTE: Driver's door must be open to gain access to rivets holding strip to door frame.

   d. Drill out rivets (3/16 diameter) from left-hand edge of nose panel.

   e. Remove rubber trim from right side of nose cone.

   f. Drill out rivets (3/16 diameter) holding nose cone trim molding to nose cone and carefully move molding away from right side of nose cone.

   g. Drill out rivets (3/16 diameter) that secure top of front nose panel to panel mounting brackets.

   h. Drill out rivets (3/16 diameter) that secure bottom edge of front panel to coach lower frame.

   i. Remove front nose panel from coach.

   j. Cut the four wires that ground the headlights and directional lights in a manner that will allow their reinstallation by splicing. Move front nose cone out of the way.

FMC Corporation
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ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

SUBJECT

MODEL (S) AFFECTED

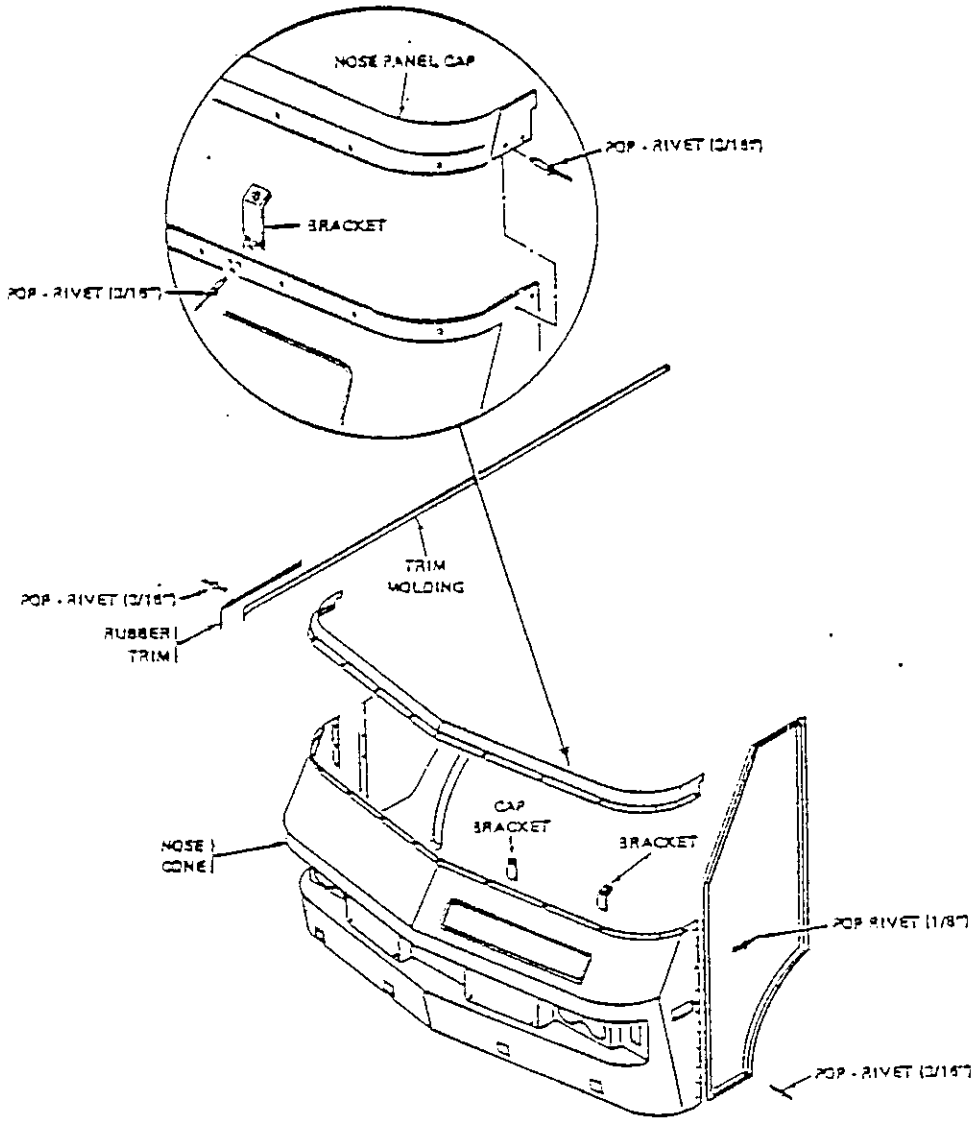

Figure 7. Front Nose Cone.

MCO-84 (2-75)

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
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Service Bulletin

DATE August 1, 1979 NUMBER 2909-10002

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

SUBJECT

MODEL (S) AFFECTED

5. Cut foam insulation away from brake lines on the front cowling.

6. Remove brake lines as indicated on specific kit illustration for your vehicle.

NOTE: Use standard brake line tools on all fittings and connections to avoid damage to threads of interconnecting components.

7. Install new brake lines and bend each line to conform with the old line.

CAUTION: Use correct brake line mandrels when bending lines. Avoid sharp bends or kinks that could restrict the free flow of brake fluid in the line.

8. Check all connections to make sure each line is secure and tight.

DRUM BRAKES – BLEEDING THE SYSTEM

a. General. Bleed the brake system using a Grigg G-300 or equal. Always discard old brake fluid.

b. Preparation for Bleeding.

1. Clean dirt from around top cover of master cylinder reservoir. Snap-off the wire bail, then remove cover.

2. Connect automatic bleeder fill nozzle to coupling on end of bleeder unit hose, then open shut-off valve and bleed air from line using suitable drain connector.

3. Connect shop air pressure line and charge the pressure bleeder to 15 to 20 psi on gauge. Do not allow pressure to fall below 15 psi.

4. Secure bleeder adapter over master cylinder and tighten hold-down bolts.

c. Bleeding the System.

1. Disconnect the two tubes located on the right side of the master cylinder.

2. Fabricate two short bleed tubes from existing brake lines with a fitting on one end. Use fittings from existing lines that connect to the brake warning light.

(Factory Use Only)
Information added to:

OWNER MANUAL (S)

SERVICE MANUAL (S)

PARTS MANUAL (S)

WARRANTY MANUAL (S)

OTHER

FMC Corporation
Motor Coach Operation
1105 Coleman Avenue P.O. Box 1201
San Jose, California 95108

☒ URGENT ☐ ROUTINE
☐ MANDATORY ☐ INFORMATIONAL

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ATTENTION: SERVICE MANAGERS AND OWNERS

3. Remove cover and diaphragm from master cylinder. Install bleed tube fittings into master cylinder ports and position other tube end to extend down into each reservoir.

4. Fill master cylinder reservoir with new brake fluid, conforming to the current SAE specification number J1703, to approximately 1/2 inch from the top.

5. Slowly pump brake pedal until no air bubbles are present.

6. Remove bleed tubes and reconnect the two system tube fittings to the master cylinder ports.

CAUTION

Do not exceed 200 inch pounds torque on tube fitting nuts in cylinder; over torquing could damage the tube seat inserts.

7. After master cylinder has been bled, bleed the brake hydrovac (booster) cylinders.

NOTE: The rear brake hydrovac (booster) is in the right hand side of the engine compartment; the forward brake hydrovac (booster) is mounted in front of the right wheel well (See Figures 1 to 6).

8. Attach bleeder drain hose to bleed fitting on top of small end of hydrovac (booster) slave cylinder. Place other end in drain container. Wipe off bleed fittings with a clean cloth before attaching drain hose.

9. Open hydrovac (booster) bleed fitting about 3/4 turn to allow air and brake fluid to flow into container.

10. When no air is present in the fluid, close bleed fitting. Remove drain hose, then tighten fitting.

11. Attach bleed drain hose to left rear lower wheel cylinder. Place free end of hose in container and drain wheel cylinder. Open bleed fitting about 3/4 turn to allow air and fluid to flow into container.

12. When no air is present in the system, drain the upper left rear wheel cylinder. Then do the same with the lower and upper cylinders on the right rear brake assembly.

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ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP 9

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13. Repeat steps 11 and 12 on the lower and upper front wheel brake cylinders. Bleed the lower cylinder first, then the upper.

14. When no air is present in the system close fittings, remove hose and container, then tighten all fittings.

15. Close shutoff valve in pressure bleeder, then remove hose and adapter from reservoir.

16. If required, fill master cylinder reservoir with new brake fluid.

CAUTION

Use only new brake fluid conforming to the current SAE specification number J1703.

17. Install master cylinder reservoir cover (with diaphragm in place), then secure cover by positioning wire bail to snap into grooves on top.

18. Check brake system for operation and leaks.

19. Check brake pedal height. It should be same as height measured and recorded in Step 1 under Accomplishment Instructions (Page 14).

DISC BRAKES – BLEEDING THE SYSTEM (Transit Coaches Only)

a. General. Bleed the brake system using a Grigg G-300 or equal. Always discard old brake fluid.

b. Preparation for Bleeding.

1. Clean dirt from around top cover of master cylinder reservoir, snap-off the wire bail, then remove cover.

2. Connect automatic bleeder fill nozzle to coupling on end of bleeder unit hose, then open shut-off valve and bleed air from line using suitable drain connector.

3. Connect shop air pressure line and charge the pressure bleeder to 15 to 20 psi on gauge. Do not allow pressure to fall below 15 psi.

4. Secure bleeder adapter over master cylinder and tighten hold-down bolts.

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CAUTION

There must be no air pressure in the line to the rear brake interlock assembly when bleeding the rear brakes. Coach doors must be closed, door control lever in mid (neutral) position and door master switch in OFF position during accomplishment of the bleeding procedures on the rear brakes.

c. Bleeding the System. Bleed the rear brake hydraulic system first, then bleed the front system. The rear system sequence is as follows:

- Bleed the rear hydrovac (booster).
- Bleed the rear brake interlock.
- Bleed the left rear calipers.
- Bleed the right rear calipers.

Bleed the front brake hydraulic system as follows:

- Bleed the front hydrovac (booster).
- Bleed the left front calipers.
- Bleed the right front calipers.

1. Complete preparations for bleeding, then attach clear-type bleeder drain hose to bleed fitting on top of small end of hydrovac (booster) slave cylinder. Place other end of hose in container. Wipe off bleed fittings with clean cloth before attaching bleeder drain hose.

2. Open hydrovac (booster) bleed fitting about 3/4 turn to allow brake fluid to flow into container.

3. When no air is present in the fluid, close bleed fitting. Remove drain hose and torque fitting to 6-15 pounds.

NOTE: Bleed the brake interlock after you have bled the rear hydrovac. Make sure coach doors are closed, door control lever in mid (neutral) position, and door master switch in OFF position.

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4. Attach clear type bleed drain hose to left brake caliper bleed fitting. Place free end of hose in container.

5. With wheel and tire assembly removed from coach, unscrew the allen head locking screw which secures the caliper retaining key.

6. Tap out the caliper retaining key and the caliper support spring.

7. Lift caliper slightly to clear the anchor plate. Do not lift high enough for shoes (pads) to clear the disc (rotor). Be careful not to allow the caliper to hang by the brake hose. It is not necessary to disconnect the brake hose.

8. Rotate caliper upward over disc (with shoes remaining over outer surfaces of disc) until the bleed fitting is approximately 5 to 8 degrees upward from a horizontal plane (about level with the flexible hose inlet fitting). A suitable stand may be used to hold caliper in this position, or place a wire hook or loop on the vehicle suspension and hang the caliper on it.

   NOTE: The above positioning is necessary to assist in eliminating formation of an air pocket within the caliper cylinder bore during these bleeding procedures. During accomplishment of the next step, tap exterior of caliper with mallet, slightly rock caliper and shake as much as possible to slosh fluid to aid in bleeding out any trapped air.

9. Comply with the above note and open bleed fitting about 3/4 turn to allow air and brake fluid to flow into container.

10. When no air is present in the fluid, close fitting. Remove hose and container, then torque bleed fitting 6 to 15 foot pounds.

    NOTE: Polish the metal-to-metal contact points on the caliper and the anchor plate with a wire brush or a crocus cloth.

11. Reposition the caliper by rotating downward (with shoes remaining over outer surfaces of disc) to seat on the attachment points on the anchor plate.

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12. Hold the caliper assembly securely against the anchor plate abutment and slide the retaining key and the caliper support spring into the key slot, making sure the semi-circular slot in the key is over the threaded screw hole in the anchor plate. Complete the assembly by installing the allen head lockscrew so that the head of the screw seats on the anchor plate (not on the retaining key). Torque screw to approximately 10 foot pounds.

13. Reinstall wheel assembly.

14. Repeat steps (4) through (13) on brake caliper at right.

15. Repeat bleeding procedures for other brake system.

16. Close shutoff valve in pressure bleeder, then remove hose and adapter from reservoir.

CAUTION

Use only new brake fluid conforming to the current SAE specification number J1703.

17. Fill master cylinder reservoir to 1/2 inch below top edge of housing with NEW brake fluid conforming to specification J1703.

18. Replace reservoir cover (with diaphragm in place), then secure cover by positioning wire bail to snap into grooves on top.

19. Check brake system for leaks.

20. Check pedal height. It should be same as height measured and recorded in Step 1 under Accomplishment Instructions (Page 14).

INSTALLING FRONT NOSE CONE

To install the front nose cone panel, proceed as follows: (See Figure 7)

a. Position front nose panel in proper location on coach and splice ground wires for headlights and directional lights.

b. Using a pop-rivet tool, secure panel to coach on bottom, top, and both sides with 3/16 diameter rivets.

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c. Carefully bend rubber trim molding around front right side of coach and secure with 3/16 diameter rivets.

d. Insert rubber trim into molding.

e. Using pop-rivet tool, secure aluminum molding to nose cone at left side using 3/16 diameter rivets.

f. Carefully bend drivers door frame molding back into position and secure with 1/8 diameter rivets.

g. Install vertical strip on right side where nose panel mates with right forward side panel using 3/16 diameter rivets.

h. Install molding over vertical strip and apply pressure to snap in place.

i. Install front bumper.

ROAD TEST

Road test vehicle and check operation of brakes.

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Bleeding at FMC factory:

In 1971, after the Factory had bleeding problems, with the Bendix representative, we reviewed proper bleeding and found this, the following, the best way for the FMC.

A "T" on the hose from the bleeder, hook up two short lines compatible with the pressure ports on the brake switch block where the steel lines from the master cylinder to the brake switch block were removed. With 30lbs fluid pressure bleed both hydrovacs first, then the brakes furthest from the hydrovac next and the brakes closest to the hydrovacs last. Reinstall brake lines from the master cylinder to the brake switch block. Pedal bleed the master cylinder and lines to the brake switch by pressing the pedal and cracking open the fittings at the master cylinder and brake switch block to get the air out of the lines. You should then have brakes.

I believe in following factory proven recommendations. Anything we do to chassis, suspension, brakes, wheels, tires etc. that is not with the department of transportation testing and approval is a federal felony.

Hope this helps clear up bleeding.

Jim Black
RVS Corporation

The VACUUM BRAKE bleed procedure is to remove all the bleed screws and coat the threads with grease.

Then apply vacuum source to all bleed screws,in turn, which when opened one-eighth turn will allow brake fluid to be pulled from master cylinder(which must always be kept filled).

After all bleed screws have been vacuum bleed, then start coach engine and repeat the vacuum process with the Brake System in the DYNAMIC MODE.

The only change during SECOND BLEED is to cycle the BRAKE PEDAL after each wheel has been completed.

When done properly the brake system will have full pedal on first stroke.

As you will note I intentionally wrote this so that you may complete procedure whether you have 4 wheel drum brake system or 4 wheel disc brake system.

HAPPY TRAILS - Leslie Hoagland
Motor Coach Restoration
1-800-786-1536