

TM 9-4910-709-14&P

**TECHNICAL MANUAL
OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS LIST

FOR

FILLER AND BLEEDER
MODEL T3401GVT-01
(EIS DIVISION-PARKER HANNIFIN CORP.)
(NSN 4910-00-273-3658)**

**HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1981**

TECHNICAL MANUAL

NO. 9-4910-709-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 25 September 1981

Operator's, Organizational, Direct Support and
General Support Maintenance Manual
(Including Repair Parts list)

For

**FILLER AND BLEEDER
MODEL T3401GVT-01
(NSN4910-00-273-3658)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this filler and bleeder is issued.

Manufactured by: EIS Division-Parker Hannifin Corp.
P.O. Box 701
Middletown, CT 06457

procured under Contract No. DAAA09-78-C-4512

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

- 1 - manufacturer's Federal Supply Code Number - 80724
- 2 - Manufacturer's Part Number exactly as listed herein.
- 3 - Nomenclature exactly as listed herein, including dimensions, if necessary.
- 4 - Manufacturer's Model Number - Model T3401GVT-01
- 5 - Manufacturer's Serial Number (End Item)
- 6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
- 7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

- (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number - 80724 followed by a colon and manufacturer's Part Number for the repair part.

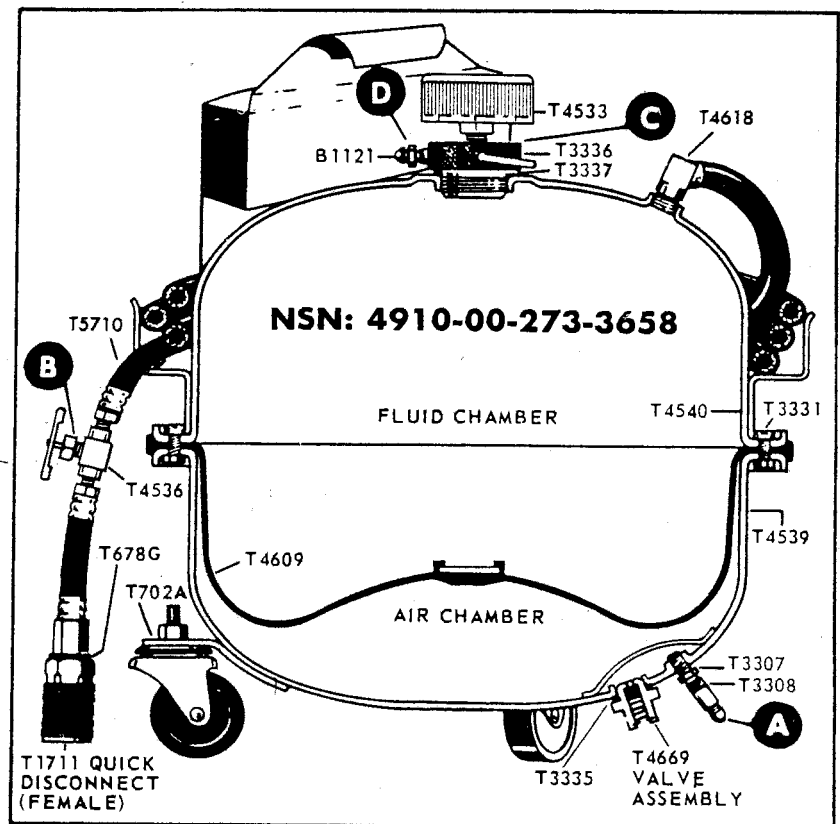
- (b) Complete Remarks field as follows:
Noun: (nomenclature of repair part)
For: NSN: 4910-00-273-3658
Manufacturer: EIS Division-Parker Hannifin Corp.

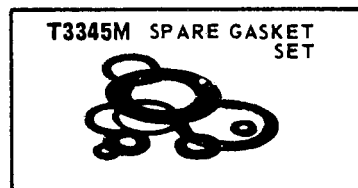
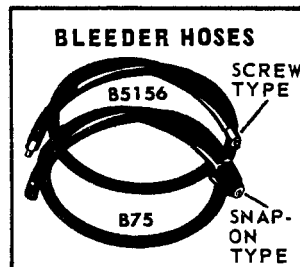
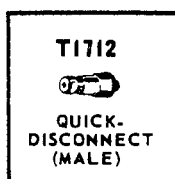
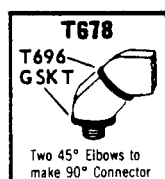
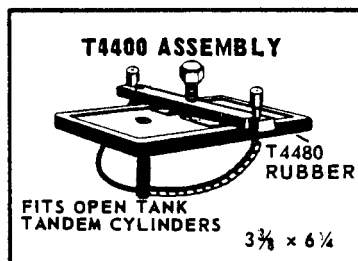
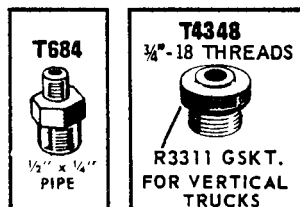
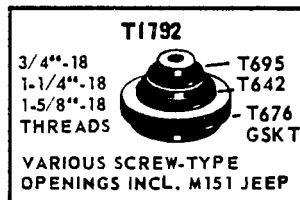
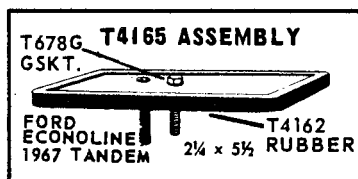
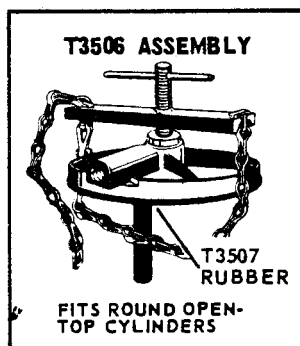
Model: T3401GVT-01
Serial : (of end item)

Any other pertinent information such as Frame Number,
Type, Dimensions, etc.

OPERATION & MAINTENANCE MANUAL for **FILLER BLEEDER**

HYDRAULIC BRAKE SYSTEM, AUTOMOTIVE



BLEEDER ADAPTERS**ONE EACH SUPPLIED
WITH BLEEDER TANK****PARTS LIST**

MANUF. PART NO.	NOMENCLATURE
T642	-Rubber Gasket for T1792 (1 1/4" I.D.)
T676	-Rubber Gasket for T1792 (1 5/8" I.D.)
T678	-45° Elbow (2supplied for 90° angle)
T678G	-Fibre Gasket for Adapters T1697 & T4165 and T5710 Hose End
T684	-Combination Adapter (1 1/2" x 1 1/4" I.P.)
T695	-Rubber Gasket for T1792 (3/4" I.D.)
T696	-Rubber Gasket for T678 & T1712
T702A	-Caster
T1697	-Adapter for GMC & Chev. Truck
T1711	-Quick Disconnect Coupler-Female
T1712	-Quick Disconnect Coupler-Male
T1717	-Rubber for T1697
T1792	-3 Thread Adapter (3/4", 1 1/4" & 1 5/8")
T3307	-Air Stem
T3308	-Air Chuck (Std. Schrader No. 616)
R3311	-Rubber Gasket for T4348
T3331	-No. 12-24 Oven Hd. Screw & Nut
T3335	-"O" Ring for Safety Release Valve
T3336	-Tank Filler Plug
T3337	-"O" Ring for Filler Plug
T3345M	-Spare Gasket Set
T3506	-Adapter-Universal for Open Round Tanks & 1 1/4", 1 5/8" Threaded Inlets
T3507	-Rubber for T3506 (Diam. 3 1/4")
T4162	-Rubber for T4165
T4165	-Adapter-Ford Econoline Tandem 1967
T4348	-Adapter-Vertical Truck (Cl. & Br.) 1961 & up (3/4" 18 Thds.)
T4400	-Adapter for all Open-Tank Tandem Cyls.
T4480	-Rubber for T4400
T4536	-Shut-Off Valve
T4533	-Pressure Gage (2" Diam.)
T4539	-Tank Shell -32 Hole (Bottom)
T4540	-Tank Shell -32 Hole (Top)
T4609	-Diaphragm -32 Hole
T4618	-90° Street Elbow
T4669	-Safety Valve-Complete Assembly
T5710	-Hose Assembly - 84" long with T4536 & T1711
B75	-Bleeder Hose (Snap-on type)
B1121	-Bleeder Screw
B5156	-Bleeder Hose (Screw type)

INSTRUCTIONS FOR DISASSEMBLY

In the event the Bleeder Tank Diaphragm needs replacement, remove all screws (T3331) and separate the shells (T4539 & T4540). Clean and dry thoroughly. Install new diaphragm (T4609) on bottom shell (T4539). Replace top shell (T4540) and tighten all screws (T3331) securely and uniformly. Test tank at 50 PSI for leaks.

MAINTENANCE

1. Bleeder tank and fittings should be kept clean at all times. Tank and fittings should not be permitted to come into contact with mineral oil products such as kerosene, gasoline, motor oil, thinners, etc. Water should not be used to wash out tank at any time. Never reuse fluid that has been bled through the brake system.
2. Fittings cleaned in any medium other than brake fluid should be thoroughly dried inside and out before being put into use.
3. Cleaning Air Chamber—Clean out periodically in order to remove any water, oil and dirt sludge that may have been introduced from the air system used to fill the tank. The safety valve (T4669) should be removed; the air chamber and safety valve should be cleaned and flushed with alcohol and drained thoroughly.
4. Fluid chamber needs no attention unless dirt or improper fluid may have to be removed. Rinse with clean alcohol. Be sure to drain and dry completely to avoid contaminating next fill of fluid.

ALL RUBBER COMPONENTS IN THIS UNIT ARE DESIGNED FOR USE ONLY WITH HYDRAULIC BRAKE FLUID SAE TYPE J1702a & J1703a, MILITARY SPECIFICATION VV-B-680 AND MILITARY ARCTIC SPECIFICATION MIL-H-13910 (NON-MINERAL OIL TYPE).

5. The Safety Valve (T4669) on the bottom of the tank is set to blow off at about 50 PSI. When pressure is relieved, it will reset itself at about 30 PSI. **The safety valve should never be tampered with. If defective, replace it!** (See step 3, above.)

MAXIMUM OPERATING PRESSURE • 50 PSI

NOTICE - Protect Vehicle Finish from Fluid Drippings

BRAKE FLUID WILL DAMAGE PAINTED SURFACES

FILLING - See tank sketch on Page 1

1. TO FILL UNIT—Loosen valve cap "A" to exhaust air chamber—leave valve "A" open. Be sure valve "B" is fully opened.
2. Wipe dirt from top of tank and open filler plug "C". Fill fluid chamber to brim of inlet with DOT type hydraulic brake fluid. (See 4, below.)
3. Close plug "C" hand tight by gripping pins—tighten air cap "A" securely—fill with air thru cap "A" until gauge reads in black, 20-30 PSI. 20 PSI is sufficient to bleed all vehicles (except Midland Hypowers, see Pg. 4). Do not charge with air in excess of 50 PSI. Do not use sharp tools or other probes to return diaphragm to its normal down position.
4. Open bleeder screw "D" to bleed any air that may be trapped in fluid section.
5. On initial filling only, hose should be bled by using T1712 male quick disconnect fitting.

BLEEDER IS NOW READY FOR OPERATION

CONNECTING TO MASTER CYLINDER

1. Clean top of master cylinder to avoid dirt dropping into opening. Remove filler cap from the cylinder and clean gasket seat thoroughly. Select proper adapter, proper gasket and install. On most adapters hand tightening is sufficient with clean surfaces and proper gasket. Others may require a wrench to tighten, in order to hold pressure.
2. Screw T1712 quick disconnect male fitting into the adapter on the master cylinder and hand tighten.
3. Connect quick disconnect female attached to end of long hose directly to male adapter on the cylinder and proceed to bleed wheel cylinders. If adapter on master cylinder is not accessible, use T698 angle fittings.
4. Be sure valve "B" is open.

VEHICLE /S r40W READY FOR BLEEDING

BLEEDING

1. Check for leaks at all line, hose and cylinder connections that you have made on vehicle.
2. Bleed units in the following order: Master cylinders (some have bleeder screws), Booster or power units, line bleeder screws, and finally all wheel cylinders.
3. Attach bleeder hose B75 or B5 156 to each bleeder screw in turn and insert open end of hose into the bottom of a glass container. End of hose should be submerged in fluid. Open screw to permit all air to escape. Watch air bubbles in fluid for a positive check. When fluid flows clear without any sign of air bubbles, close bleeder screw and tighten securely. To remove most of the air from the master cylinder quickly, it is suggested that the left front wheel cylinder be bled first, then right rear, left rear, right front then left front again. It is good practice to re-bleed the four wheels again to insure perfect air-free system.
4. To disconnect bleeder, always cover quick disconnect with a cloth before disconnecting to avoid fluid spill on finish. Just uncouple quick disconnect, then remove adapter from cylinder, be sure reservoir is filled at least within $\frac{1}{2}$ " or less of top, and replace gasket and filler cap. CAUTION: Always cover fenders and keep hose clean to avoid damaging finish.

POWER BRAKES

1. Follow procedure above, except DO NOT bleed with the motor running, and exhaust all vacuum.
2. If power unit has a bleeder screw, bleed first. Some have two—bleed at highest screw first.
3. When bleeding treadle-vac, use low pressure 10-12 PSI in bleeder tank.
4. When bleeding hydro-vac, double stage control valve (Studebaker, Cadillac) rebleed highest bleeder screw three or four times to insure complete air removal.

CLUTCH SYSTEMS

1. Follow normal bleeding procedures.
2. Clutch pedals will always go to floor, and will not build up same as a brake pedal, pumping will not help.

VERTICAL TYPE WHEEL CYLINDERS -2 Per Wheel

1. Such cylinders with an internal cross connecting line should be prefilled before installing. Connect cylinders with the cross line hand tightened on the bench and prefill the cylinders; moving the pistons slightly will help to assure complete filling. Hoses and lines should be pressure bled before connecting the wheel cylinders. Rebleed units after installing. Also note below.

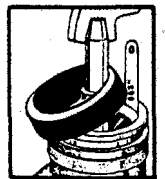
OTHER DIAGONAL OR VERTICAL CYLS. -Some Trucks **SURGE BLEEDING:**

On such cylinders, the bleeder screw is not always the highest point to allow air to escape, therefore, complete bleeding is difficult. Surge bleeding will help:

1. Bleed each wheel with pressure bleeder.
2. Open one bleeder screw at a time and have someone kick the brake pedal vigorously a few times. This will cause turbulence in the cylinder forcing additional air out of the cylinder.

BLEEDING WITH THE USE OF A SHIM

Another way to insure proper bleeding on such cylinders is by inserting a .002" feeler beyond the cup into the cylinder and permitting all air to bleed out.



MIDLAND HYPOWERS REQUIRING 60 PSI TO OPEN HIGH PRESSURE VALVE

Used on various models GMC trucks and Chev. trucks since 1960.

1. CAUTION: Stop engine and exhaust vacuum before opening any bleeder valve.
2. Make sure fluid level of pressure bleeding units is up to operating level. Bleeder should be set at 35 to 45 PSI.
3. NOTE: A minimum of 60 PSI is required to open the high pressure check valve in the power cylinder; therefore, it is necessary, when bleeding the power cylinder, to run the engine and apply brake pedal two full strokes with 40-50 PSI on pressure system. Repeat this operation after bleeding wheel cylinders.
4. Disconnect pressure tank and turn off ignition key and stop engine, and readjust all brake shoes.

MORaine & BENDIX TANDEM CYLINDERS-

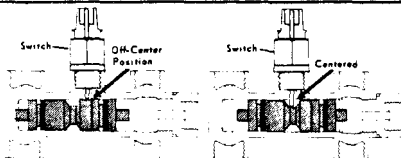
With Single Long Type Cover (Bolt or Bale Type).

1. On 1962 & later models with open type reservoir, the T4400 adapter should be used. This adapter is designed to fill both sides of the Tandem reservoir automatically. Both front & rear wheel cylinders may be bled with one hook-up of the adapter.
2. After removing adapter plate fill both sections of reservoir to reservoir top.

DASH WARNING LIGHT & TANDEM BRAKE SYSTEMS

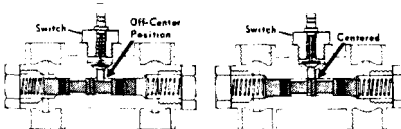
Since 1967 cars are equipped with a warning light operated by a pressure differential safety valve indicating loss of fluid pressure in one half (front or rear) of the system. The switch is usually located below the master cylinder. A glowing warning light on the dash indicates a failure which has created the unequal hydraulic pressures in the brake system.

After the system has been repaired and bled, the warning light will usually continue to glow because the valve remains in the off-center position. To recenter the valve it is necessary to relieve pressure in the half of the system which did not fail or has not been bled, but only to the point where the valve returns to the center position. Remember the bore and stroke of the switch are small and short. The person pressing pedal is key to the operation. Bleeding with pressure bleeder will not activate valve.



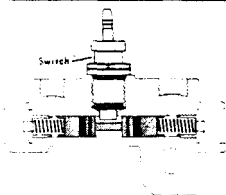
FORD TYPE VALVE

- 1) Turn ignition switch to On or Acc. position.
- 2) Loosen (do not disconnect) the brake tube at the Master Cylinder outlet port for the half of the system which did not fail or the half that was not bled.
- 3) Depress the brake pedal slowly until the light goes out; valve is then centered.
- 4) Immediately tighten the connection.
- 5) Should the light flash off and back on, the piston in the valve has moved to the opposite end and the procedure must be repeated on the other half of the system applying less pressure on the brake pedal.



AMERICAN MOTORS TYPE VALVE

- 1) Before any work is performed, remove the switch from the housing.
- 2) Depress brake pedal slightly to enable removal of the plastic probe to prevent breakage.
- 3) After repairs have been made and the complete system pressure bled, reinstall the plastic probe and switch.
- 4) Turn ignition switch to On or Acc. to check the valve for proper location of the plunger.
- 5) Bleeding with pressure bleeder will not activate valve as it does not supply sufficient pressure to center valve spool; use foot pedal only.



GENERAL MOTORS & CHRYSLER TYPE VALVE

This valve is spring loaded on both ends. The light is activated only while the brake pedal is in an applied position. Switch is inactive when pressure is released. No recenter procedure is required for this type of valve. Some switches have been found to have a rust buildup between the switch and body assembly causing a closed circuit. Clean off rust and reinstall. Many of these cars use the same bulb on the dash for the emergency brake. Light remaining on could mean problems in that area, emergency brake not fully released or a malfunctioning switch.

CAUTION: All switches; Light is activated when starting engine. This is a test of the bulb only.

DISC BRAKE SYSTEMS

1) Same as conventional wheel cylinder systems:

Master cylinder and power units with bleeder screws must be bled first. Bleed rear wheel cylinders: first right, then left.

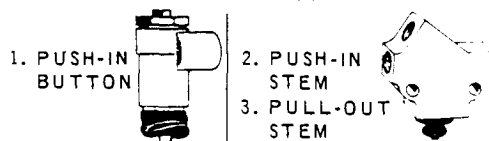
2) Bleed front calipers.

The construction of some calipers result in fluid passageways, on external crossover lines being above the bleeder screws. Air will rise to top and remain trapped in the caliper or lines. In these cases the caliper should be bled, disconnected from the Steering Knuckle if possible. This is done by rotating and rolling the caliper to insure that all air has been moved up to the bleeder screw chamber.

METERING VALVE-Used on vehicles with Disc Brake Installations

Metering valve must be in released position to achieve correct bleeding of front disc calipers. Three types of valves are used as illustrated. Use an assistant or a suitable clip to hold valve in released position while bleeding calipers: Be Sure to remove clip upon completion.

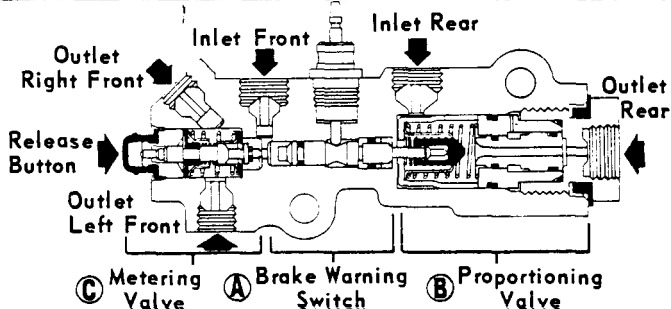
VALVE TYPES



COMBINATION VALVE: Used on several vehicles (since 1970) with Disc Brake Installations.

A combination valve consists of two or more valves in one body: (A) Brake Warning Switch (B) Proportioning Valve and/or (C) Metering Valve.

See instructions under Metering Valve to achieve correct bleeding of system. To recenter the Brake Warning Switch after a failure and repair of same, apply brake pedal several times.



CAUTION & BEFORE PUTTING VEHICLE ON THE ROAD CHECK THE FOLLOWING:

- Always check all connections and units for leaks with heavy pedal pressure, before releasing vehicle for road. Recheck after road test.
- Check Master Cylinder after installing.
- Fill Master Cylinder with brake fluid to top of reserve tank.
- Always check bypass port in Master Cylinder to be clear when system is at rest. Never probe small hole. When applying brakes there should be a ripple in the fluid in the reserve tank. After applying brakes a few times there also should be a ripple caused by returning fluid. Checking visually with a bright light is also advisable.
- Warning: If bypass port is not clear, system will lock up and cause damage. On standard brakes always check for free pedal clearance ($\frac{1}{4}$ " to $\frac{1}{2}$ "). On power brakes it is more difficult to check bypass port opening.

By Order of the Secretary of the Army:

Official:

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ROBERT M. JOYCE
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Parts list specifies 4 adapters No. M3821;
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