TOL-O-MATIC, INC.

Parts Sheet

3999-0086_01

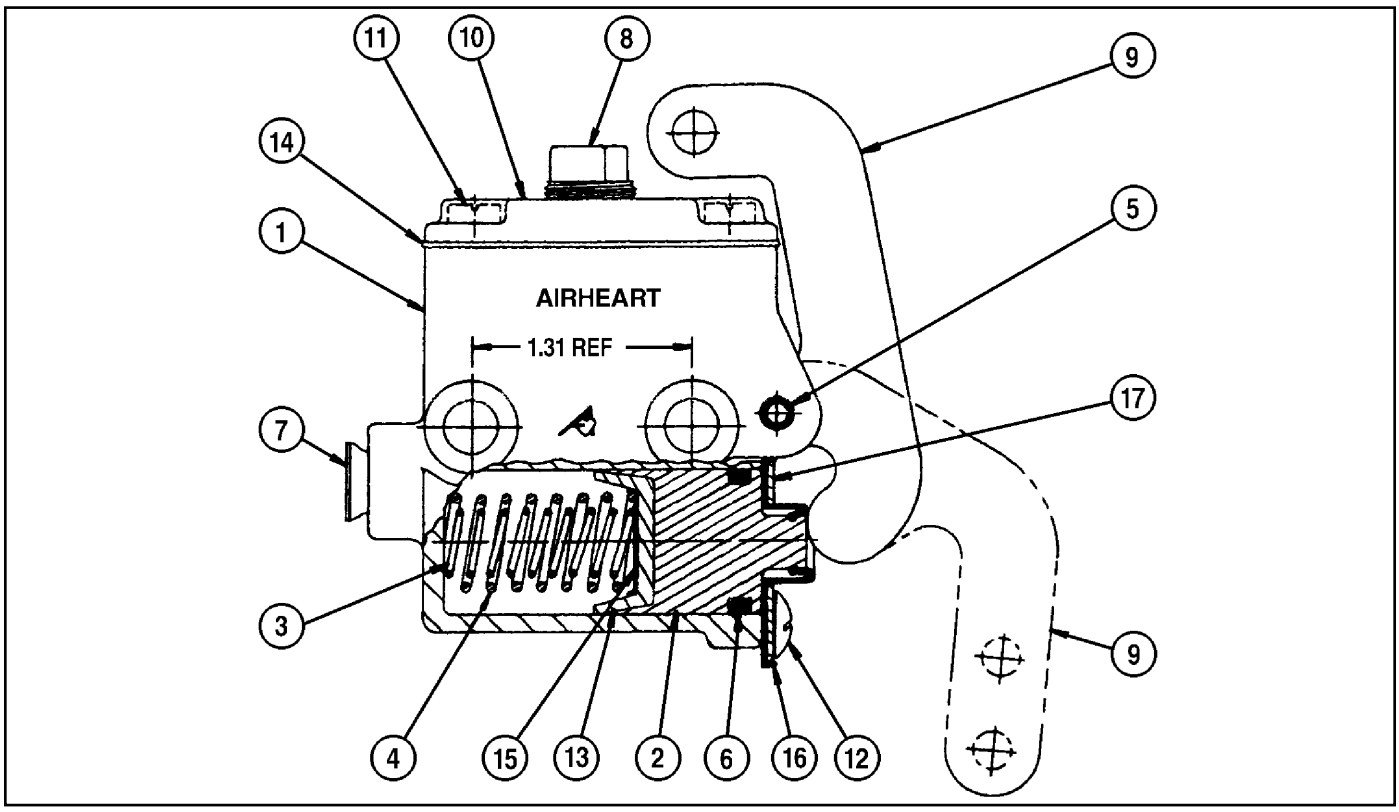
AIRHEART®

Small Displacement Master Cylinder

MODELS AVAILABLE:

Automotive Brake Fluid
3115-0400 Lever Up
3115-0402 Lever Down

Mineral Base "Red" Fluid
3115-0403 Lever Up
3115-0404 Lever Down
3115-0405 No Lever



Parts List

Item	Part No.	Description	3115-0400	3115-0402	3115-0403	3115-0404	3115-0405
1.	3115-1001	Housing, Brake Fluid	1	1			
	3115-1029	Housing, Mineral Fluid			1	1	1
2.	3115-1002	Piston	1	1	1	1	1
*3.	3115-1003	Small Compression Spring	1	1	1	1	1
*4.	3115-1004	Large Compression Spring	1	1	1	1	1
*5.	3115-1005	Roll Pin	1	1	1	1	
*6.	3115-1015	EPR Quad Ring Seal	1	1			
	3115-1025	Buna-N Quad Ring Seal			1	1	1
7.	3005-1018	Caplug	1	1	1	1	1
8.	3115-1006	Closure Plug	1	1	1	1	1
9.	3115-1007	Up Lever	1		1		
	3115-1021	Down Lever		1		1	

Item	Part No.	Description	3115-0400	3115-0402	3115-0403	3115-0404	3115-0405
10.	3115-1009	Master Cylinder Cover	1	1	1	1	1
11.	3115-1010	Fillister Head Screw, 3/8"	2	2	2	2	2
12.	3115-1011	Pan Head Screw, 5/16"	1	1	1	1	1
*13.	3115-1012	EPR Cup	1	1			
	3115-1026	Buna-N Cup			1	1	1
*14.	3115-1013	Gasket	1	1	1	1	1
*15.	3115-1018	Cup Protector	1	1	1	1	1
*16.	3115-1020	EPR Boot	1	1			
	3115-1024	Buna-N Boot			1	1	1
*17.	3115-1019	Retainer	1	1	1	1	1

**Included in Overhaul Kits: 3115-9001 (Mineral Base "Red" Fluid, with Buna-N seals)*
3115-9000 (Automotive Brake Fluid, with EPR seals)

INSTALLATION INSTRUCTIONS

1. Make certain that the master cylinder you are using has the correct seals to be compatible with the hydraulic fluid being used in the braking system. Master cylinders with EPR seals are designed for use with Automotive Brake Fluid which meets the standards of SAE J-1703 and DOT 3. Master cylinders with Buna-N seals are designed for use with mineral base "Red" hydraulic fluid which meets the standards of Mil.Spec. MIL-5606.
2. Install the master cylinder by using the two through holes in the housing. These holes have clearance for 5/16" diameter bolts. Make certain the master cylinder is level.

Do not exceed 19 foot-pounds of torque when mounting the master cylinder. Excessive torque applied to the mounting screws can cause distortion to the bore of the master cylinder which can result in brake failure.

3. Connect the brake linkage.

BLEEDING

The goal of the bleeding procedure is to remove any air from the brake system. Air in the system will result in poor brake performance.

CAUTION!

Wear adequate eye protection, gloves and clothing. Brake fluid will cause eye irritation. In case of eye contact, flush with water for 20 minutes and get immediate medical attention.

***NOTE:* When filling the brake system, use clean, fresh brake fluid from an unopened container. Brake fluid exposed to air can absorb water. Contaminated brake fluid can cause brake system failure.**

Make certain that the master cylinder is mounted upright and level above the level of the brakes.

1. Connect the hydraulic line to the master cylinder outlet port (1/8-27 NPT). **DO NOT ATTEMPT TO ENLARGE THE OUTLET PORT IN ANY WAY.** Use TEFLON® tape to seal all pipe thread joints.
2. Check the single small hole (Bypass Port) in the floor of the master cylinder reservoir with a very thin wire (0.015" diameter) to see that there are no obstructions. The Cup (#13) must not block the Bypass Port when the piston is retracted. If necessary, adjust the Piston Assembly to retract the Cup further.
3. If new brake calipers have been installed, pre-fill calipers by gravity feeding them with fresh brake fluid into the inlet port on the brake, with the bleeder screw open. When the brakes are full, close the bleeder screws and connect all the lines to the brakes and master cylinder.
4. Start by bleeding the brake caliper with the longest run of tubing from the master cylinder and conclude with the brake caliper nearest to the master cylinder.
5. A short length of rubber tubing that fits the bleed plug nipples tightly should be used to draw off fluid from each caliper during bleeding. The free end of the tube must be submerged below some brake fluid at the bottom of a vessel such as a 1 quart glass jar. The tube end must remain submerged at all times, or air will be drawn back into the system.
6. First, make sure the bleeder port plugs on the brakes are closed. Then, with the Cover (#10) and Gasket (#14) removed, fill the reservoir with fresh high temperature brake fluid which meets the specifications for SAE J-1703 or DOT 3. (For those braking systems using mineral base "Red" hydraulic fluid make certain the fluid meets Mil.Spec. MIL-5606.)

NOTE: If DOT 5 brake fluid (silicon) is to be used, the entire brake system MUST be disassembled and washed down with solvent. ALL traces of DOT 3 brake fluid must be removed before the introduction of DOT 5 fluid. Mixing DOT 3 and DOT 5 fluids can result in vapor lock, causing inadequate or unstable brake performance.

7. When the tubes from the bleeder plugs are submerged in brake fluid, depress the brake pedal or lever and hold in position. Then, open one bleeder plug. Repeat the procedure until air bubbles no longer appear at the end of the tubing when the pedal or lever is depressed.
8. **Remember to close the bleeder plug port BEFORE releasing the brake pedal or lever.** Allow the pedal or lever to return slowly. Avoid using excessive pedal pressure during bleeding, as it can cause an unexpected surge of air and fluid from the bleeders.
9. Repeat the procedure with each brake. Repeat the procedure until the brake pedal or lever has a firm feel to it.
10. Fluid level MUST be maintained in the reservoir. Check the fluid level frequently during bleeding and add more fluid if required.
11. After the system has been bled, the following test should be performed. Observe the fluid in the reservoir as the piston is actuated for the first time (depress brake pedal or lever). An upward surge in the fluid should occur, indicating pressure in the system as the piston is released. A HEAVY upward surge in the fluid, however, indicates that air is still in the system and the bleeding procedure must be repeated.

PRESSURE BLEEDING

If you are using a pressure bleeding device, be sure the vessel contains a sufficient quantity of brake fluid. Prepare each brake for bleeding as described above. Charge the device with 20 to 25 PSI of air pressure. Fasten the correct master cylinder adapter to the master cylinder (1/8-27 NPT port). Open the feed line to the master cylinder. Open the bleeder plugs on the brake. Close the bleeder plugs on the brake when no air bubbles escape from the submerged ends of the rubber tubing in the vessels containing the brake fluid.

NOTE: If the master cylinder is located well above the brake, allow the vehicle to sit for a few hours to enable any air trapped in the system time to work out of the lines and back up to the reservoir.

DISASSEMBLY

1. Disconnect the linkage and brake line. Remove the master cylinder from the vehicle.
2. Remove the Master Cylinder Cover Screws (#11), the Cover (#10) and the Gasket (#14). Then drain the fluid from the reservoir.
3. Drive the Roll Pin (#5) out with a 1/4" diameter metal rod and remove the Lever (#9).
4. Hold the Piston Retainer (#17) in place and remove the Retaining Screw (#12). Release the Retainer slowly to avoid loss of parts. Remove all the parts.
5. Discard all rubber parts and clean all metal parts with solvent. Use compressed air to dry parts, or allow enough time for the solvent to evaporate completely, before reassembling them with new seals. Lubricate parts with brake fluid before reassembling.

ASSEMBLY

1. Lubricate the housing bore with brake fluid.
2. Lubricate the Cup (#13) with brake fluid (or mineral base "Red" hydraulic fluid). Place the Cup on a flat surface and insert the Cup Protector (#15) into the Cup, smooth side down.
3. Place the Small Compression Spring (#3) inside the Large Compression Spring (#4).
4. Place one end of the Spring Assembly into the Cup Protector (#15).
5. Pick up the Housing (#1) and carefully slide it down over the Spring Assembly, Cup Protector (#15) and Cup (#13), until the Cup starts into the bore.
6. Keeping the cylinder vertical, pick up the Housing and gently push the Cup into the bore until the Spring Assembly starts to compress. Then turn the assembly over.
7. Lubricate the Quad Ring Seal (#6) (as required) and place it in the Quad Ring groove on the Piston (#2).
8. Lubricate the Cup and the Piston (#2) (as required) and insert the Piston into the bore, flat side first.
9. Place the Boot (#17) over the Piston (#2) and the Retainer (#16) over the Boot. Then install the Pan Head Screw (#12) to hold the Retainer in place.
10. Replace the Lever (#9) and the Roll Pin (#5) so that the split in the Roll Pin is facing away from the Housing (#1).
11. Reinstall the master cylinder, connect the brake linkage and brake line and follow the Bleeding Instructions.

SPECIFICATIONS

FLUID:
Automotive Brake Fluid - SAE J-1703 or DOT 3
Mineral Base "Red" Hydraulic Fluid, Mil.Spec. MIL-5606

Displacement:	.378 cubic inches
Bore Diameter:	.875 inch
Stroke Length:	.63 inch
Weight:	13 ounces
Port:	1/8-27 NPT

MAXIMUM OPERATING PRESSURE: 1000 PSI

Teflon® is a registered trademark of the E.I.DuPont de Nemours Co., www.dupont.com

Airheart®, A and heart symbols are registered trademarks of the Airheart® Brake Division of Tol-O-Matic, Inc.

TOL-O-MATIC, INC.
3800 County Road 116, Hamel, MN 55340
http://www.Tolomatic.com • Email: Help@Tolomatic.com
Phone: (763) 478-8000 • Fax: (763) 478-8080 • Toll Free: 1-800-328-2174