INSTALLATION PROCESS:
FK003D702Complete Brake Line Kit
1998-2001 HONDA ST 1100 w/ ABS

Step 1:
Identify the key components that complete our brake line kit:
You should have Fifteen (15) hoses, Two (2) double banjo bolts, sixteen (16) single banjo bolts, three (3) drawings, and a picture CD. There are also a total of forty six (46) washers and six (6) “olive” conic inversors. Forty washers will be used, the rest are spares.

Step 2:
Familiarize yourself with the brake lines, which are labeled for application. Lettered brake hoses A, B, C, D, E, F, G, H, I, J are installed on the front of the motorcycle, while brake hoses (K, L, M, N and O) are installed on the rear. Each label will reference a different drawing, which will show you the location of the key brake system components.

Step 3:
To ensure no paint damage from a brake fluid spill, completely cover the bike. This process can be messy, and brake fluid WILL drip!

Step 3:
Dry out (bleed) your OEM hoses, and take note of how the stock system is installed. You may want to take a couple pictures, in case you need to re-install.

Step 4:
Remove the stock hoses on the front of the motorcycle, and replace with Galfer hoses labeled A,B,C,D,E,F,G. Locate line A. this hose will run from the master cylinder down to the front ABS modulator. Line B will run from the (ABS MODULATOR) down the right side into the GALFER t-block NOTE: that line B, C, D will be attached to the GALFER t-block. LINE: C will travel from t-block down to the right caliper upper mounting hole. LINE: B will travel from t-block over front fender to left caliper upper mounting hole. Locate and install line E; this hose will run from the lower proportioning valve down to the right caliper lower mounting point, now LINE: F will travel from the front ABS modulator down to the upper mounting point of the proportioning valve LOCATE: G this line will be mounted from the inner mounting point of the proportioning valve over to the left delay valve line g-h will be connected with a double banjo bolt and will be mounted to the delay valve. LINE: H will travel down to lower mounting hole of the left caliper. Now locate LINE: I this line will connect to the top of the delay valve and travel up to the O. E. M tubing you will need to connect the female fitting with a conic inversor this will cause the seal. LINE: J will travel from the front ABS modulator to the right side O. E. M tubing using a conic inversor.

Torque all single and double banjo bolts at 17-20 ft. pounds, and make sure there is a washer between every banjo mating surface.

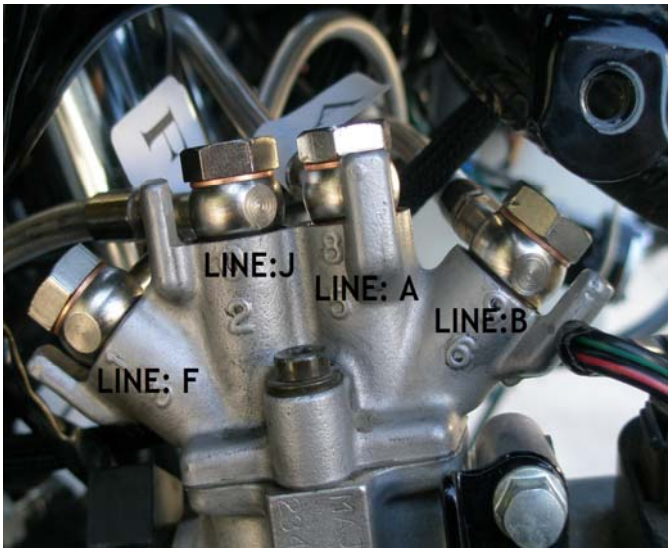
See pictures for sequences and positioning (lines A, B,C,D,E,F,G,H,I.J,K,L,M,N,O

Step 5:
Remove the stock hoses on the rear of the motorcycle, one at a time replace with Galfer hoses labeled K, L, M, N, O. LINE L, M (NOTE: LINE L, M WILL USE A DOUBLE BANJO BOLT AT THE REAR MASTER CYLINDER) LINE L will run from the master cylinder to the O, E, M tubing with a conic inversor leaving it snug but not completely tight. LINE M travel from rear master cylinder to middle lower side of the rear ABS modulator LINE K will travel from top O. E. M tubing to the middle upper ABS modulator unit.
Locate LINE N this line will be installed to the lower back side of the rear caliper and travel to outer O. E. M tubing with a conic inversor . LINE O will be installed to the top of the rear caliper and travel to the inner O. E. M tubing running along the swing arm.
Torque all single and double banjo bolts to 17-20 ft. pounds, and make sure there is a washer between every banjo.
See pictures.
Before you proceed to the next step, please check for clearance of the lines. Compress the suspension to make sure that the lines are not binding with anything. When the front and rear end are fully extended or fully compressed, double check that the lines are traveling correctly and clear from any obstructions.
Step 6:
Bleed brake system according to owner's manual, and build appropriate pressure. Finish with Galfer DOT-4 brake fluid.
Step 7:
Once the bleeding has been done, please check brake fluid level on master cylinder. Close brake fluid reservoir, and zip-tie the brake lever to the throttle for at least 2 hours to ensure no leaks or other possible issues. For the rear, set a jug or something similar on the brake pedal to apply pressure. If the lines are not leaking and all looks OK (bolts are tight, washers in between), you may now ride with the new system. Make sure the rider is aware that the overall braking feel has dramatically changed. We suggest taking it easy to get used to the new brake lever feel and pressure. We recommend checking your brake system periodically; keep in mind brake lines must be checked **very** carefully! If there are any signs of damage or stress to the lines, the complete brake system must be replaced. Remember, our brake lines have a LIFETIME WARRANTY! If you have any problems or questions, don't hesitate to call us at **(800) 685-6633.**

NOTES:
- When referring to right and left, it will be as if you were sitting on the motorcycle. For example, the right caliper is on your right when you are sitting on the motorcycle (left if you are looking at it head on).
- All female ends require a brass conic inversor, more commonly referred to as an "olive".

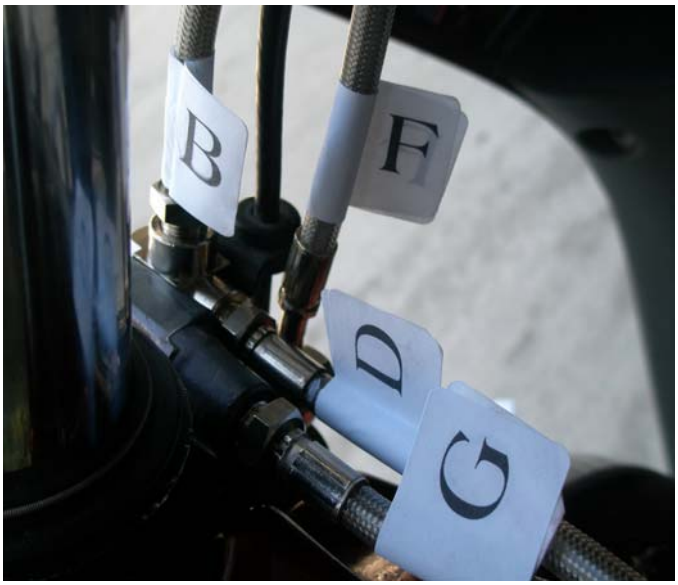
GALFER USA DIVISION
310 Irving Drive, Oxnard, CA 93030
(800) 685-6633 (805) 988-2900
FAX (805) 988-2948

MASTER CYLINDERFRONT



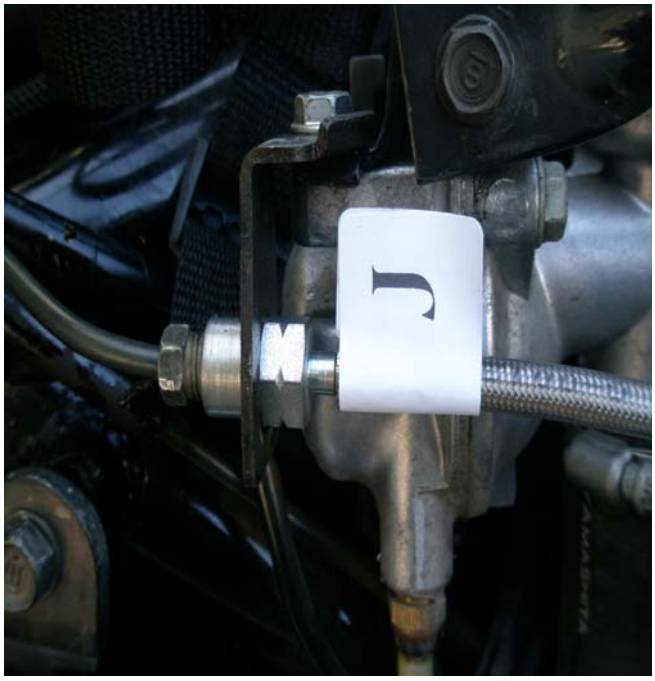
ABS MODULATOR UNIT

RIGHT CALIPER / PROPORTIONIN

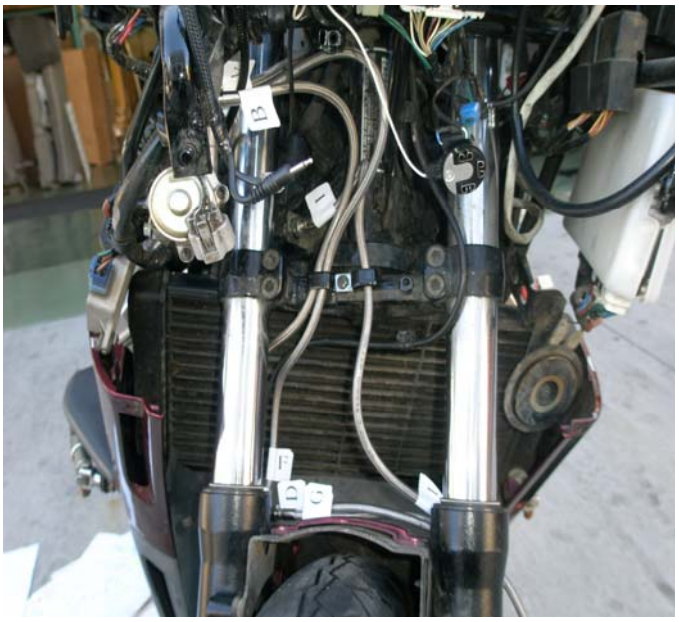


TOP VIEW OF T-BLOCK

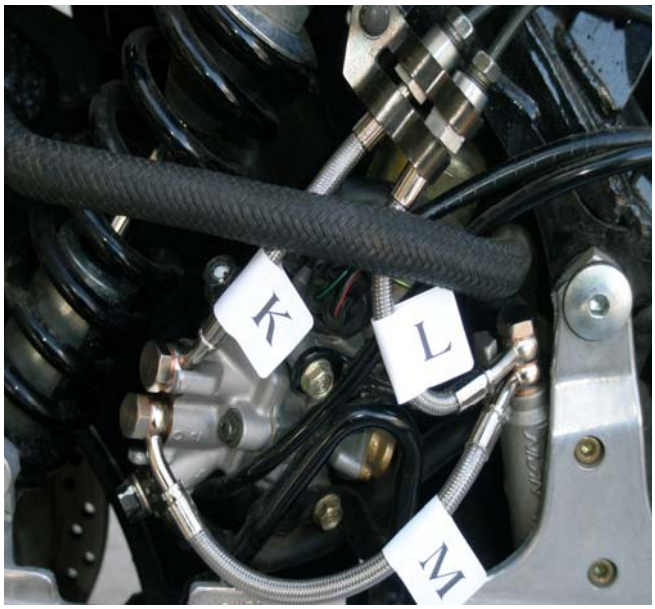
LEFT CALIPER / DELAY VALVE



LINE I&J CONNECTS TO THE O.E.M TUBING WITH A CONIC INVERSOR

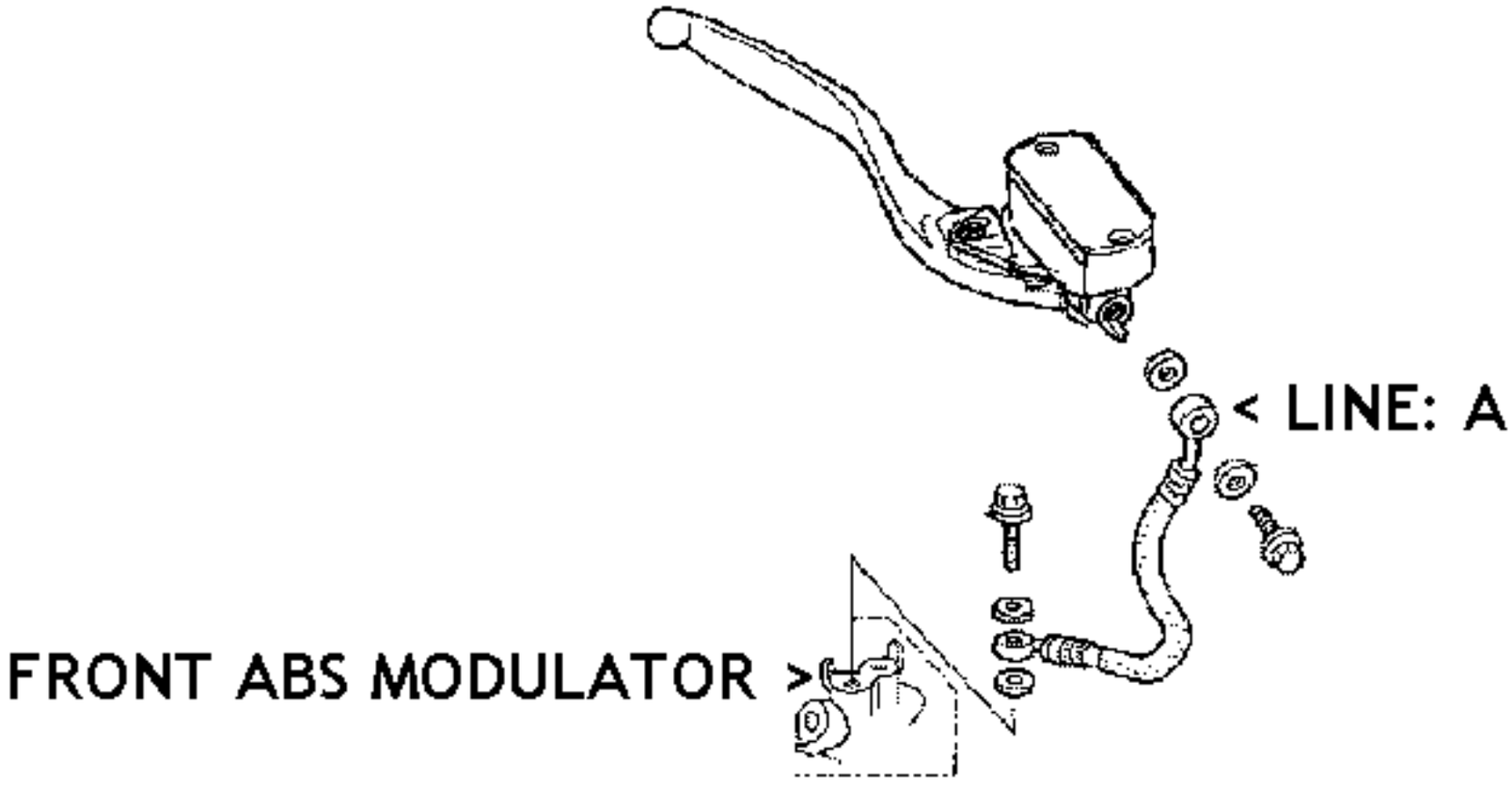


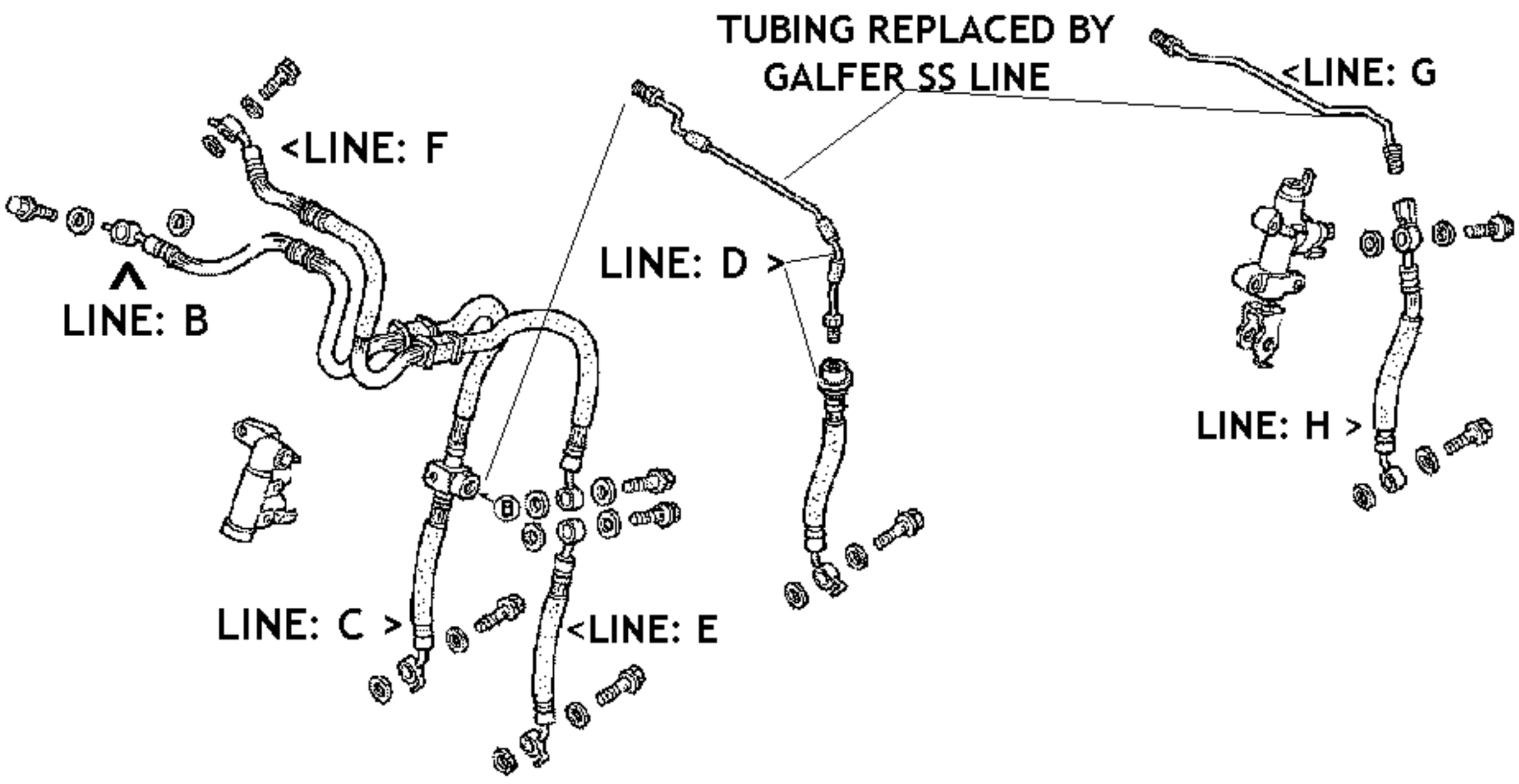
FRONT VIEW



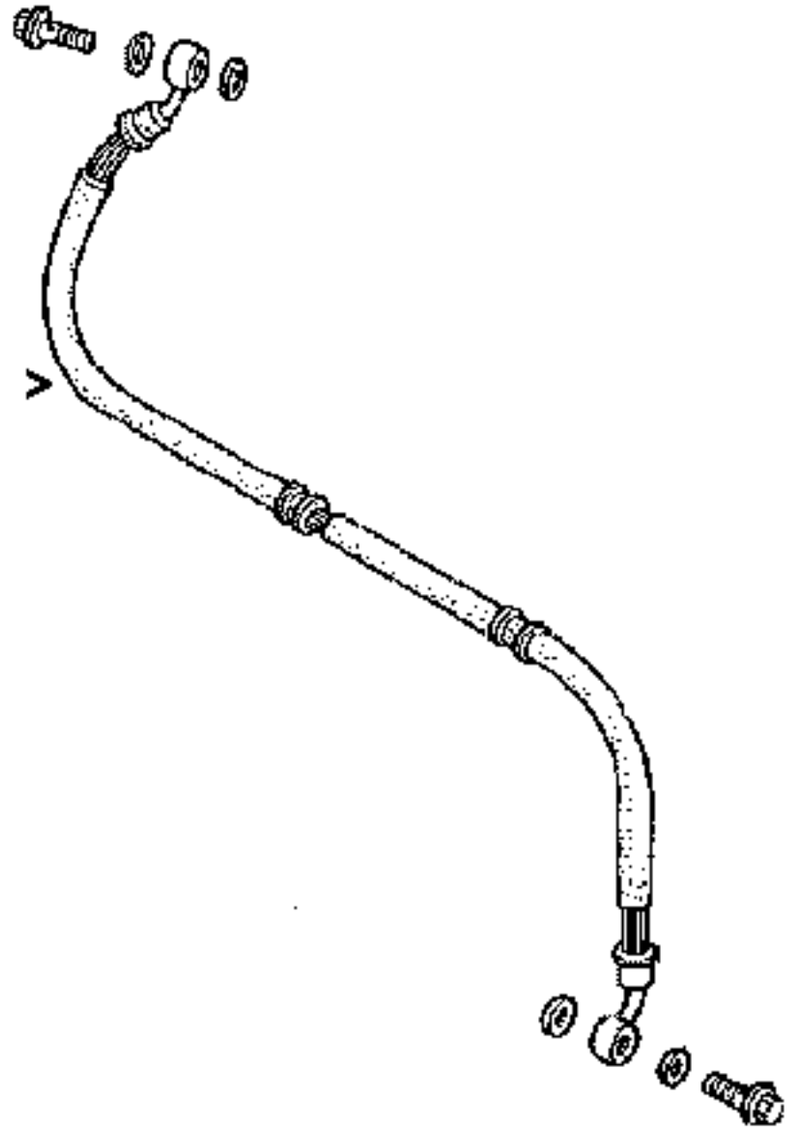
REAR ABS MODULATOR UNIT

REAR CALIPER


< LINE: A
FRONT ABS MODULATOR >

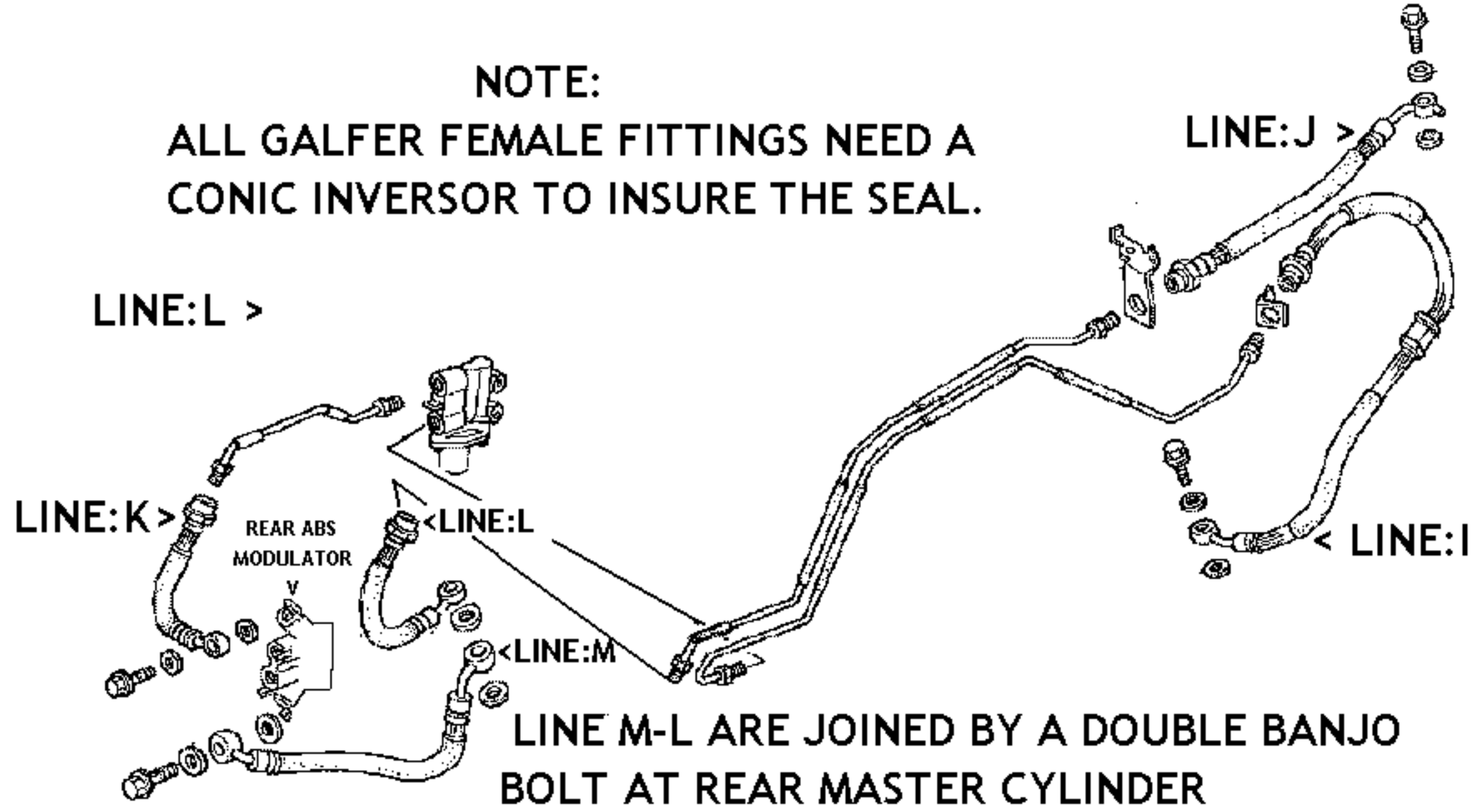

TUBING REPLACED BY
GALFER SS LINE
<LINE: F
LINE: B
LINE: D >
<LINE: G
LINE: H >
LINE: C >
<LINE: E

CLUTCH LINE >



NOTE:

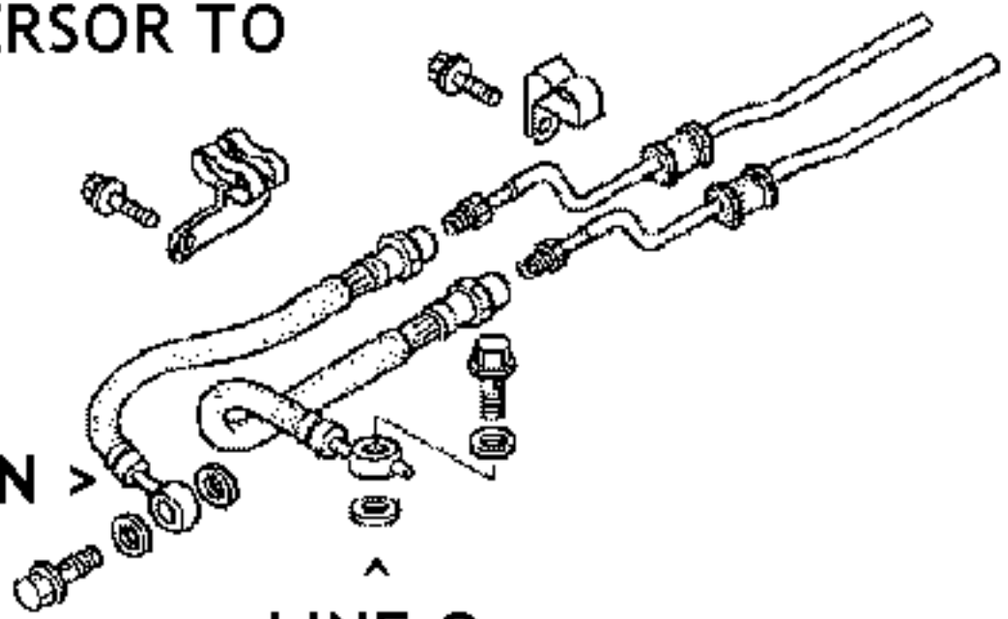
ALL GALFER FEMALE FITTINGS NEED A CONIC INVERSOR TO INSURE THE SEAL.



LINE M-L ARE JOINED BY A DOUBLE BANJO BOLT AT REAR MASTER CYLINDER

NOTE:

ALL GALFER FEMALE FITTINGS NEED A CONIC INVERSOR TO INSURE THE SEAL.



LINE: N >

REAR CALIPER

^

LINE:O

ST1100 Maintenance Tips

Flushing or Bleeding the Brakes and Clutch

The first procedures, flushing the system, assume that you haven't got air in the system. Flushing the system cleans out the old, contaminated, brake fluid. Per your ST1100 owner's manual, this procedure should be done every two years or 12,000 miles, whichever comes first. Brake fluid is hygroscopic, and absorbs moisture from the atmosphere. Over time, this moisture will lead to corrosion of the internals of the brake system. That's why the fluid should be changed regularly.

If you have disassembled a caliper or master cylinder, changed brake lines, etc., you have air in the system, and you will have to skip to the latter sections.

Tools and supplies

1. Number 2 Phillips screwdriver for the reservoir cover attachment screws.
2. Wrenches for the bleeder screws - size 8mm and 10mm.
3. Allen wrench for lower fairing removal - size 5mm.
4. A foot or so of 3/16" clear vinyl tubing
5. Old glass jar for capturing the waste fluid.
6. Plastic syringe or suction like device (MIGHTY VAC).
7. Supply of fresh DOT-4 brake fluid.
8. Clean, lint-free rags.

Flushing the clutch system for all models.

1. Remove the lower fairing to gain access to the bleeder on the clutch slave cylinder. You will find it on the front face of the engine, above the oil drain plug.
2. Use a towel or some rags to cover and protect the top shelter and fairing from any brake fluid splatter.
3. With the bike on the center stand, remove the cover from the clutch master cylinder.
4. With your mighty vac, suction all the fluid from the master cylinder reservoir. Wipe the remainder of fluid out of the bottom of the reservoir. Clean up any muck that you find there and on the sight glass. Make sure you don't deposit any lint into the reservoir while doing this.
5. Fill the reservoir with fresh DOT 4 brake fluid.
6. With the box end wrench (or a hex socket), momentarily open the bleeder screw on the clutch slave cylinder only about 1/8 turn and then close it. In case the screw has partly frozen in place, this will prevent damage to the hex on the bleeder screw. Attach the vinyl tubing to the tip of the bleeder screw, and put the other end into your waste jar.
7. Open the bleeder screw and make one full stroke clutch lever application. **DON'T RELEASE THE LEVER YET.** Hold the lever in the applied position and have a helper close the bleeder screw. Release the lever while the bleeder screw is closed. Repeat this step once more. This process forces all the contaminated fluid from the master cylinder bore.
   Note: If you don't have a helper, and your arms aren't long enough to enable you do this alone, wrap several stout rubber bands around the handlebar and clutch lever. This will make the application and holding the lever applied automatic. Then open the bleeder screw to allow the fluid to exit. Close the bleeder and pull the lever away from the handlebar. Repeat the process.
8. Remove the rubber bands from the clutch lever, so the lever will return to the resting position. Open the bleeder screw on the slave cylinder about one full turn. Gravity will allow fluid to flow through the system and into the waste container. Keep an eye on the fluid level in the reservoir. **Do not let the reservoir get empty!** If it gets empty, you will get air into the system which adds a lot of grief to your life, and you will have to bleed the air from the system. (See last section.) Keep topping it up and watch the color of the fluid draining into the jar.
9. When the draining fluid looks clean, close the bleeder screw.
10. Fill the reservoir to the upper level marks (see owner's manual) and replace the cover.
11. Wash the areas where you may have got brake fluid spread. Brake fluid is a pretty effective paint remover if you don't clean it off.
12. Install the lower fairing.

Flushing the brakes on all ST1100 standards and 1990-95 ABS.

The procedure is essentially the same as flushing the clutch except:

1. A few obvious things, such as you don't have to remove the lower fairing, you remove the right hand side panel to access the reservoir for the rear brake master cylinder, etc.
2. Flush the right front caliper before flushing the left front.

Flushing the brakes on all ST1100 ABS-II (1996-2002).

Since the linked brake system on the later model ABS bikes incorporates a secondary master cylinder, delay valve and proportional control valve, I don't believe it's possible to achieve a brake system flush using gravity flow as in the previous sections. It is necessary to do a brake system bleed as described later, although it will be a lot easier not having to get air out of the system.

Bleeding the systems.

If your brake or clutch system has air inside the hydraulic circuits, it won't function properly. The procedure is much like what is outlined in parts of the flushing procedures.

Bleeding the clutch system.

1. Remove the lower fairing to gain access to the bleeder on the clutch slave cylinder. You will find it on the front face of the engine, above the oil drain plug.
2. Use a towel or some rags to cover and protect the top shelter and fairing from any brake fluid splatter.
3. With the bike on the centerstand, remove the cover from the clutch master cylinder.
4. With your mighty vac, suction all the fluid from the master cylinder reservoir. Wipe the remainder of fluid out of the bottom of the reservoir. Clean up any muck that you find there and on the sight glass. Make sure you don't deposit any lint into the reservoir while doing this.
5. Fill the reservoir with fresh DOT 4 brake fluid.
6. Actuate the clutch lever while watching the fluid in the reservoir. One or more small bubbles may float to the surface. If so, you need to repeat this action until the bubbles stop appearing. Note, it may take many dozens of applications. The applications don't have to be full stroke. A partial stroke is all that's required.
7. When the bubbles cease to appear, the master cylinder is bled.
8. With the box end wrench (or a hex socket), momentarily open the bleeder screw on the clutch slave cylinder only about 1/8 turn and then close it. In case the screw has partly frozen in place, this will prevent damage to the hex on the bleeder screw. Attach the vinyl tubing to the tip of the bleeder screw, and put the other end into your waste jar.
9. Open the bleeder screw and make one full stroke clutch lever application. **DON'T RELEASE THE LEVER YET.** Hold the lever in the applied position and have a helper close the bleeder screw. Release the lever while the bleeder screw is closed.
   Note: If you don't have a helper, and your arms aren't long enough to enable you do do this alone, wrap several stout rubber bands around the handlebar and clutch lever. This will make the application and holding the lever applied automatic. Then open the bleeder screw to allow the fluid to exit. Close the bleeder and pull the lever away from the handlebar.
10. Continue repeating the process. Keep an eye on the fluid level in the reservoir. **Do not let the reservoir get empty!** If you do, you will get air into the system and you are back to square one. Keep topping it up and watch for the presence of bubbles in the fluid draining into the jar.
11. When the draining fluid shows no more bubbles, close the bleeder screw.
12. Fill the reservoir to the top of the sight gauge and replace the cover. Remove the rubber bands.
13. Wash the areas where you may have got brake fluid spread. Brake fluid is a pretty effective paint remover if you don't clean it off.
14. Install the lower fairing.

Bleeding the brakes on all ST1100 standards and 1990-95 ABS.

The procedure is essentially the same as bleeding the clutch except:

1. A few obvious things, such as: you don't have to remove the lower fairing, you remove the right hand side panel to access the reservoir for the rear brake master cylinder, etc.
2. Bleed the right front caliper before bleeding the left front.
3. **Tip:** Periodically tap the brake caliper you're bleeding with something like the plastic handle of a screwdriver. This will shake loose any of the small air bubbles which may be adhering to the caliper internals.

Bleeding the brakes on all ST1100 ABS-II (1996-2002).

Same as above, except a different sequence is required in the procedure. This is as follows:

1. Left front caliper upper bleed valve, using the front brake lever.
2. Right front caliper upper bleed valve, using the front brake lever
3. Left front caliper lower bleed valve, using the rear brake pedal.
4. Right front caliper lower bleed valve, using the rear brake pedal.
5. Rear caliper front bleed valve, using the rear brake pedal.
6. Rear caliper rear bleed valve, using the rear brake pedal.

GALFER USA DIVISION
310 Irving Drive, Oxnard
(800) 685-6633 – (805) 988-2900