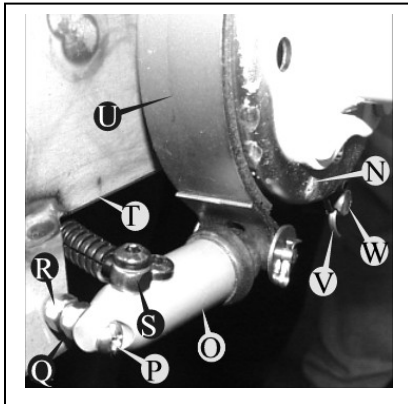
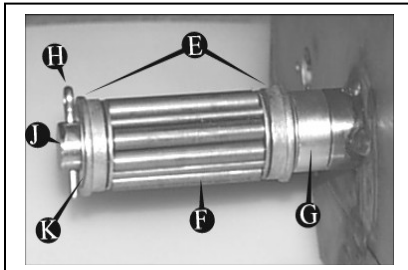
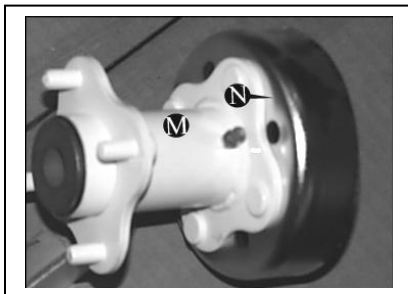
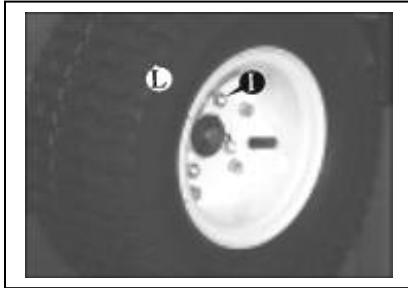
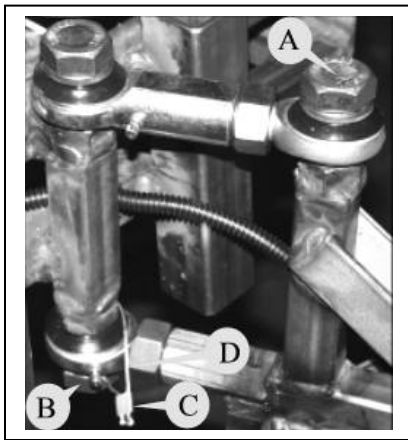


Only one Nozzle Sprays (Low flow or pressure)

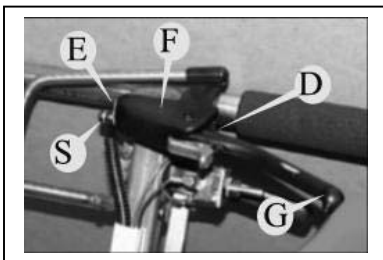
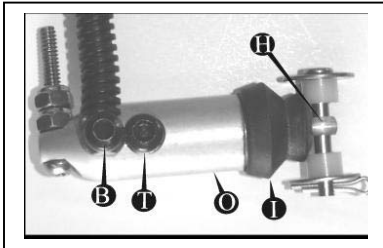
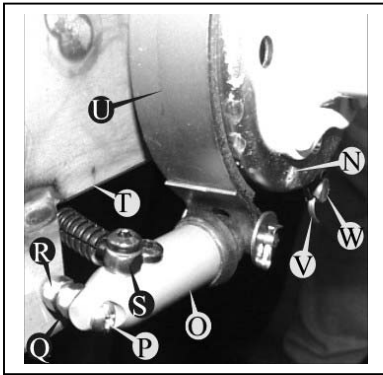
The pressure from the 12 volt diaphragm pump is controlled by a black plastic pressure relief valve (Unloader Valve) which is installed in the inside of the tank on the return flow line. This Unloader automatically controls the spray pressure to minimize drift. The Pressure is regulated to about 10 PSI. To prevent dripping of the fluid in the nozzles, each nozzle body has a check valve that opens at 8 PSI. Because there is only a small differential between the 2 pressures, the system is sensitive to materials such as grit sticking on the diaphragm of the unloader valve. The result is too much fluid returning back into the tank instead of out the nozzles. When the flow falls below the amount needed to open both nozzle check valves, one simply stops spraying. During the initial break in period, and periodically thereafter, it will be part of the normal maintenance of the machine to clean the diaphragms and check valves. The pump check valves should also be cleaned and lubricated.

1. REFERRING TO SECOND AND THIRD PICTURES, CLEAN THE PRESSURE UNLOADER (K) (located inside the tank). NOTE: Do not mix up the 8 psi nozzle PRESSURE CAP (P) with UNLOADER PRESSURE CAP (Q which has no number stamped on the circumference of the cap)
 - a. Remove the entire PRESSURE UNLOADER (K) by unscrewing from the tank fitting.
 - b. Remove pressure cap (P), check plunger for smooth operation, clean or replace.
 - c. Inspect and clean DIAPHRAGM (Q), replace if cut or damaged.
 - d. Wrap the pipe threads with Teflon tape.
 - e. Re-install DIAPHRAGM and PRESSURE CAP being sure that the pressure cap is tightened on the diaphragm.
 - f. Check operation.
2. Referring to the first picture, clean NOZZLE (J and I), STRAINER (G), and DIAPHRAGM (E).
 - a. Use water or air clean nozzle parts. Do NOT use sharp objects.
 - b. Check operation of the spring-loaded plunger in PRESSURE CAP (C).
3. Set the high engine speed (in neutral) to 3500 to 3600 RPM's (SEE Choke and Speed adjustment instructions).
 - a. Check operation.
4. Clean Pump Check Valves and lubricate the bearing.
 - a. Check operation.
 - b. Replace pump if necessary.
5. Check flow of suction line to pump inlet.
 - a. Remove hose clamp, remove hose, and check flow into a bucket.
 - b. Clean SUCTION STRAINER (M picture 3) in tank for build up of product on the mesh filter. Check operation.
 - c. If not working, force water or air into the Suction line to back-flush the line.
 - d. Replace hose and clamp.
 - e. Check operation
6. Use a 12-volt battery or battery charger to jump power directly to the pump.
 - a. Turn off machine, and disconnect the pump at the plug connector.
 - b. Jump the pump.
 - c. Check operation.
 - d. If successful, replace the generator or clean the generator brushes



Replace Sulky

1. Loosen (but do not remove)
 - a. Lug nuts [L] on the rear sulky wheels [L].
 - b. The upper rear articulating rod end bolt [A].
 - c. The lower front articulating joint rod end bolt [B].
2. Balance the machine on the front of the hopper.
 - a. Remove most of the fertilizer from the hopper and liquid from the tank.
 - b. Stand in front of the machine, and pull the handlebar forward raising the rear wheels off the ground.
 - c. Slowly continue rotating the machine around the front axle. The sulky will tip to one side.
 - d. Rest the front of the hopper on the ground balancing the sulky in the air.
3. Remove:
 - a. The rear wheels by removing the lug nuts.
 - b. The wheel hubs [M] by removing the cotter pins [H].
 - c. The brake cylinders [O] along with the brake bands [U] in one piece by removing the rear cotter pin [V] from BRAKE BAND PIN [W], followed by the BRAKE CYLINDER lock nut [not shown behind fender [T] opposite Jamb nut [R]. **IMPORTANT: DO NOT Loosen or Disturb the hydraulic connections [S] to the cylinders or Tee [not shown] as this will result in lost of brake fluid and extra bleeding steps.**
 - d. Cut the wire ties securing the brake lines to the sulky freeing the entire brake assembly from the sulky.
 - e. Cut the safety wire [D] and remove the bolts from the upper rear and lower front rod end bolts removing the sulky from the machine.
4. Install the new sulky in reverse order. **NOTE: Use liquid Bolt thread locker (such as Loctite®) on the rod end bolts.**
 - a. Install the safety cable, hammering or crimping the clamp [C] in place.
5. Attach the brake assembly to the sulky in reverse order. **NOTE: When tightening the front cylinder screw [P] to the fender [T] do NOT tighten the BRAKE CYLINDER between Jamb nut [Q] and screw [P] that will prevent the cylinder from moving slightly during operation and cause premature failure of the system.**
6. Remove the NEW wheel bearings and bearing retainers from the axle. **NOTE: Position of spacers [G] and washers [K].**
7. Replace wheel bearings:
 - a. Place the brake drum [N] end of the hub flat on a workbench.
 - b. Hammer the center of the bearing retainer [E] until the flange cracks and the bearing retainer drives the bearing [F] and opposite retainer out of the hub.
 - c. Drive the top retainer out of the hub.
 - d. Replace 1 retainer insert bearing and tap in the last retainer.
8. Install wheel hubs.
 - a. Install washers and cotter pins.
9. Adjust brakes [SEE page ____]
10. Install Rear wheels
11. Secure brake lines.
12. Test Operation
13. Set up a schedule to inspect rod end bolts and all fasteners.

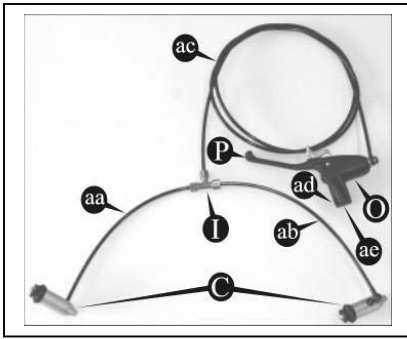


Adjust Brakes

1. Tip the machine on its nose:
 - a. Refer to Replace Sulky step 2
2. Check for proper adjustment
 - a. The BRAKE BAND [U] normally angles away from the BRAKE DRUM [N] at the top.
 - i. If excessive misalignment is discovered, use a hammer to straighten out the rear BRAKE BAND RETAINING PIN [W].
 - ii. If BAND is twisted, worn, or deformed replace it.
 - b. Spin the rear wheels one at a time.
 - c. Some light resistance should be felt between the brake BAND and DRUM.
 - d. Resistance should be equal on both wheels.
 - e. If not adjust.
3. Remove lug nuts on rear wheels and remove wheels leaving the hubs in place.
4. Pull the rubber BELLOWS [I] on the BRAKE CYLINDER [O] towards the BRAKE BAND exposing the square end of the BRAKE CYLINDER piston and insert an 8 mm open-end wrench.
 - a. To increase brakes
 - i. Turn the piston counter-clockwise that extends the CONNECTING ROD [H].
 - b. To decrease brakes
 - i. Turn piston clockwise retracting the Connecting rod.
5. Recheck for proper adjustment (step 2) and readjust as necessary.
6. Return bellows and install wheels
7. Test drive machine
 - a. Brakes should be able to lock up the rear wheels
 - b. Both wheels should stop equally keeping sulky traveling in a straight line.
 - c. If when driving forward the machine pulls to one side, the opposite side brake is too tight.
 - d. Drive machine at full speed for about 1 minute without using the brakes, and carefully check the BRAKE DRUM for excessive heat buildup.
8. Fine-tune Brake System by turning the BRAKE MASTER CYLINDER ADJUSTING SCREW [D] on the MASTER CYLINDER LEVER [G].
 - a. Turning clockwise increases brakes
 - b. Turning counter clockwise decreases

Repairing Brakes

Most brake work is more easily done while the machine is tipped on its nose – [SEE Working on hard to reach components page ____].



1. Brake Assembly Replacement

- a. Remove rear wheels leaving the brake hubs in place.
- b. Remove the MASTER CYLINDER [F] by removing the two screws [J] and saddle [K].
- c. Open up the hinged cover on the tan plastic raceway going down the handle bar.
- d. Pull the old brake line down between the rubber splash-guard under the tank and the frame bringing the Master cylinder with it. Note: You may have to twist and maneuver the Master Cylinder to feed it through the gap available.
- e. Trace the brake line as it winds its way towards the sulky, and cut all the wire ties that secure it to the frame and sulky. NOTE: Make any notes or sketches necessary to enable you to install the new Brake Assembly in the same location.
- f. Remove the Generator [refer to Replacing Generator page ____] and continue pulling the tubing and master cylinder through the frame.
- g. Cut
- h.

2. Hot brake drum

- a. Adjusted too tight – [refer to Adjusting Brakes page ____]
- i.

3. Leaks

- a. Find source of leak. Check connectors, tubing, and Cylinder pistons –

4. Noises.

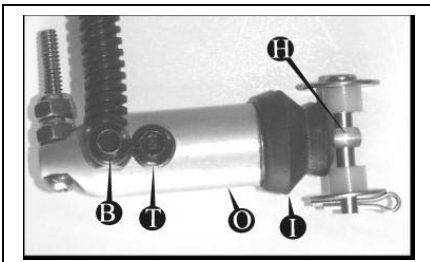
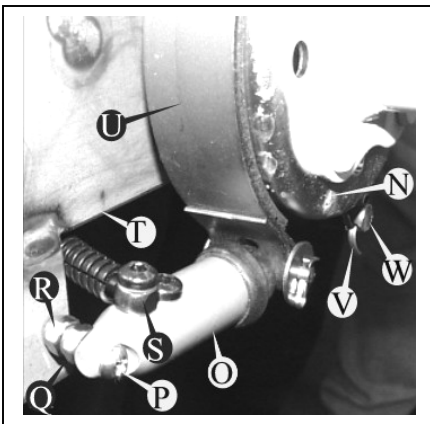
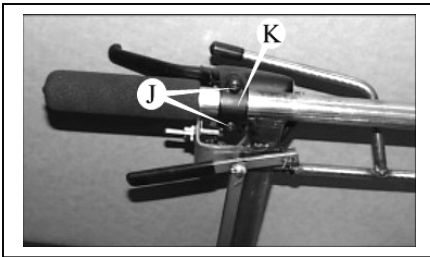
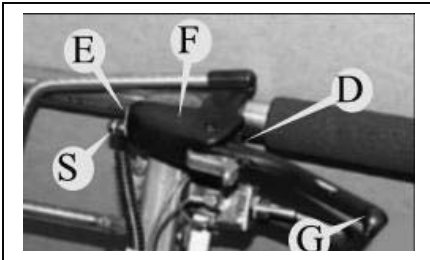
- a. See 2. Hot brake drum above.

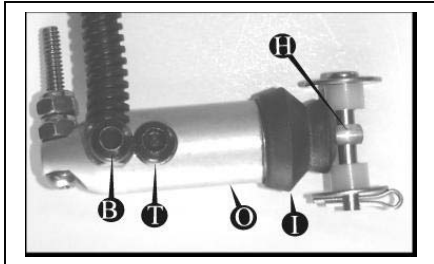
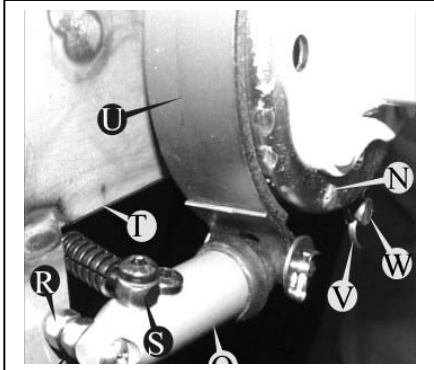
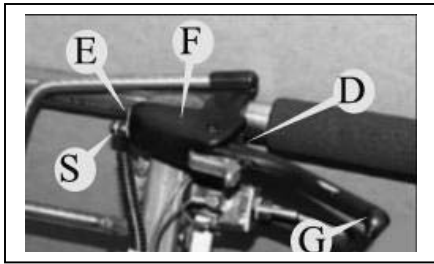
5. Pulls to one side

- a. Brakes not equally adjusted – Adjust properly [see Adjusting Brakes

6. Reverse has weaker brakes.

- a. The physics of band brakes make them work better in one





Troubleshooting Brake Problems

Like your truck, this brake system is hydraulically operated. As you pull the MASTER CYLINDER [F] lever, it pushes a piston that forces the brake fluid through the brake tubing and a variety of connectors to 2 BRAKE CYLINDERS [O]. As the fluid enters the brake cylinder it forces the brake piston to extend. The piston is threaded to an adjustable connecting rod that is connected to the BRAKE BAND [U]. As the brake band is tightened around the BRAKE DRUM [N] friction causes the machine to stop.

Most brake problems occur when brake fluid leaks out of the system, which can be caused by bumping into something that disturbs or loosens one of the compression fittings, cuts a brake tube, or bends or loosens the supports for the Brake Cylinders or brake bands. Periodically the brakes must also be adjusted by using the adjustable connecting rods.

1. A properly operating brake system

- While driving at full speed on flat ground, the brake system should be able to lock up both rear wheels.
- The machine should stop in a straight line, not pulled to the side.
- The parking brake should hold the machine from rolling forward on a hillside.
- There should not be excessive heat build up on the brake drums or brake bands.
- There should be no fluid leaking.

2. Hot brake drum

- Adjusted too tight – [refer to Adjusting Brakes page ___]
- Parking brake engaged - Release
- The brake band is not releasing.
 - Something jammed in mechanism - Clear
 - Rear BRAKE BAND PIN [W] or fender [T] bent -Straighten

3. Leaks

- Find source of leak. Check connectors, tubing, and Cylinder pistons – Repair [see Repairing Brakes page ___]

4. Noises.

- See 2. Hot brake drum above.
- Examine brake band lining for signs of wear – Repair [see Repairing Brakes page ___]

5. Pulls to one side

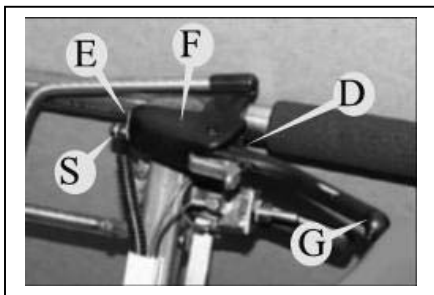
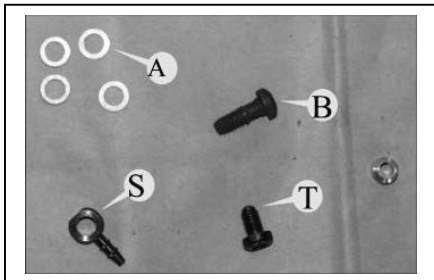
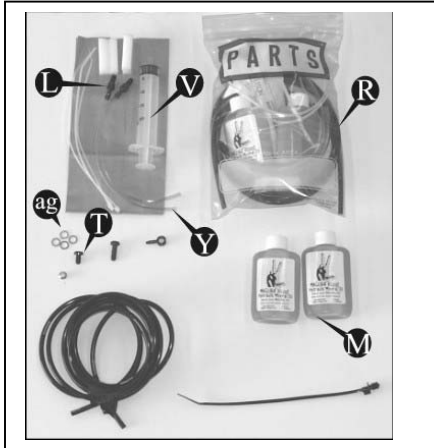
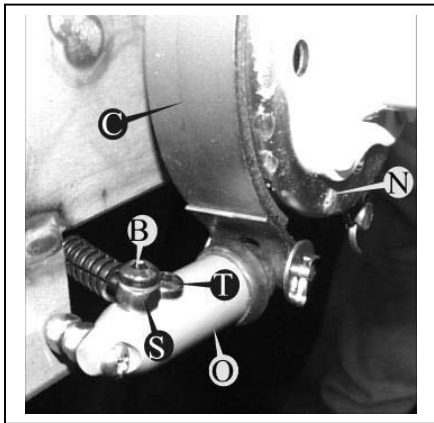
- Brakes not equally adjusted – Adjust properly [see Adjusting Brakes page ___]
- Oil or grease on Brake drum or band – Clean or dry
- Disconnected brake band and connecting rod [H]- Repair [see Repairing Brakes page ___]

6. Reverse has weaker brakes.

- The physics of band brakes make them work better in one direction. If the brakes are working well while going forward,
- When operating the machine in reverse ALWAYS have the engine running and use Reverse gear to power the machine backwards, so that the gear reduction in reverse gear can control the speed.

7. Weak, Spongy, or no brakes.

- See 3. Leaks above
- Improperly adjusted – adjust [see Adjusting Brakes page ___]
- Oil or grease on Brake drum or band – Clean or dry
- Disconnected brake band and connecting rod [H]- Repair [see Repairing Brakes page ___]



Bleeding Brakes

SPECIAL NOTE: All the Hydraulic brake components are metric. Before beginning to work on the brake system it is essential to have a set of Metric Allen wrenches, an 8 mm open end wrench, a 13mm open end wrench, and HYDRAULIC REPAIR KIT [R].

1. Loosen, but DO NOT remove, lug nuts on the rear wheels.
2. Tip the machine on its nose as described in ACCESSING COMPONENTS page ____.
3. Prepare for bleeding:
 - a. Back the MASTER CYLINDER ADJUSTMENT SCREW [D] out, but DO NOT remove it from the BRAKE LEVER [G]
 - b. Insert syringe [V] into bleed tube [Y].
 - c. Fill syringe with Factory approved BLOOD MINERAL OIL [M]. NOTE: NEVER use automotive DOT type brake fluid, because it will destroy the seals in the brake system. Vegetable oil may be substituted in an emergency but must be drained as soon as the BLOOD MINERAL OIL is available.
4. Remove
 - a. Rear tires
 - b. BLEED PLUG [E] from MASTER CYLINDER [F] on the handle bar. NOTE: DO NOT disturb or loosen the brake TUBING COMPRESSION FITTING [S, next to the bleed plug] as this may permit fluid to leak out of the system during and after the bleeding is finished.
5. Install the filled syringe in the bleed port.
 - a. Tighten the BLEED TUBE FITTING [L] into the bleed port with an 8 mm wrench.
6. Remove the BLEED PLUG [T] from the BRAKE CYLINDER [O] without disturbing the brake tubing connector [B] from the uppermost brake cylinder on the sulky.
7. Install the second Bleed tube in the bleed port of the brake cylinder.
8. Push the plunger on the syringe forcing enough fluid through the brake tube to push all the air out of the brake tube through the bleed tube on the brake cylinder and collect it in an open bottle of Blood Mineral Oil for re-use.
9. When no air bubbles are visible:
 - a. Replace the bleed tube in the Brake Cylinder with the Bleed plug. NOTE: Be sure to install the ALUMINUM SEALING WASHER [A].
 - b. Refill and replace the syringe with fluid if necessary. NOTE: As long as the Brake Cylinder bleed port is properly plugged the fluid will not leak out.
 - c. Rotate the LOWER WHEEL HUB to the top position on the sulky.
 - d. Bleed the second Brake cylinder and Plug as before.
10. Remove the syringe and bleed tube from the Master Cylinder, and install the bleed plug in the bleed port.
11. Test the Brake system.
 - a. Carefully wipe off the areas around ALL the bleed plugs and tubing Compression Fittings.
 - b. Operate the Brake Lever a few times.
 - c. With white tissue paper, wipe around ALL the same areas looking for ANY sign of BLOOD MINERAL OIL.
12. If none is found
 - a. Install the rear wheels
 - b. Test brake operation in the field
 - c. Use the MASTER CYLINDER ADJUSTMENT SCREW to increase brakes, or
 - d. Adjust the brakes if necessary (SEE page____)
13. If fluid is found:
 - a. Repeat step 11
 - b. Re-bleed if necessary.