

Troubleshooting Dragging Surge Brakes and Performing Actuator "Swirl Test"
(See attached Manuals for A160 and A60/75/84 Actuators for parts reference)

This procedure assumes that brakes are dragging on all braked wheels. Probability is such that if more than one brake is dragging, all will be dragging, and the troubleshooting attention should be on the actuator and main brake line feeding out of it. With the exception of poor drum brake adjustment and general corrosion on all braking components, dragging brakes are almost always either a one wheel or all wheels question.

Note: It is extremely helpful to all parties to take the time and troubleshoot brake problems. The parts themselves are highly reliable, and most problems are related to basic issues. The vast majority of brake actuators, master cylinders, and disk brake calipers returned for inspection are found to be in good working condition.

If brakes are clearly dragging on only one wheel, then all attention should be placed on that wheel and the brake lines/hardware going to it. Some items to check for:

- a. General corrosion on brake drum, rotor, caliper, or brake shoes causing them to stick and drag.
- b. Water intrusion into hydraulic system has caused caliper or wheel cylinder to rust/stick.
- c. Drum brakes adjusted too tight.
- d. Metal brake line going to affected caliper is run with insufficient flexibility to allow caliper to move. Loops or "Z"s should have been placed in the metal line to allow the caliper to move at least 1/2".
- e. Brake hose going to caliper or wheel cylinder is pinched, blocked with debris, or internally broken down, and holding residual pressure on part of system.
- f. Caliper or wheel cylinder is stuck (This is rare, but more than one on the same trailer is extremely unlikely).
- g. Brake linings have decomposed or debris is hung up in them.
- h. Really badly warped drum or rotor.
- i. Bearing adjustment is way off or bearings are imminently failing.
- j. Caliper banjo bolt or fitting is plugged (rare).

If brakes are dragging on all braked wheels (or more than one) the problem is most likely in the actuator or the main brake line or hoses coming immediately from it. However, before blaming the actuator, please check first the following most common causes of brake problems;

- a. Breakaway cable in A60-A84 actuator must have no history of being pulled (check for clip presence per manual). Press brake release lever on A60, A75, or A84 and look for presence of "C" clip as first check. If brake release lever releases brakes, follow up on why they were set. If emergency cable has been pulled, emergency brake mechanism can be damaged and may need replacement. This is the most common issue with dragging brakes.
- b. On A160 Breakaway lever is in off (towable) position, and is not in any way up on the ratcheting lock plate. On A160, make sure cable is completely released, and no components are bent. If the lever is truly off, it should feel loose (like you can rattle it around side to side and forward/aft slightly with your hand). If the lever seems like it has any pressure on it at all, most likely the master cylinder pushrod (Item #24 on parts breakdown) was possibly not adjusted right and the brakes will drag.
- c. Trailer is towed boat with the tongue down and not level or is using a load equalizer hitch that artificially loads the brakes. Trailer must be level or slightly nose up when towing.
- d. Impact or jackknife damage has occurred to actuator, which has bent the housing.
- e. Trailer with A60, A75, or A84 has overrun tow ball while hitching and has bent the brake release lever backward, which will cause brakes to drag

f. Trailer was parked for a long period of time with actuator in “brakes on” position (usually trailer was backed up into parking space, and actuator left “pushed in” for a long time in storage.) Master cylinder bore may be rusted up and stuck. Also major corrosion on all items due to salt spray in storage may cause similar problems. Actuator should be pulled forward manually if trailer is to be left for long periods in storage.

g. The main brake line leaving the actuator is kinked. This is most likely with trailers equipped with a folding tongue. The actuator generates plenty of pressure to apply the brakes through the kink, but the kink will prevent the brakes from releasing.

h. Metal brake lines going directly to brake calipers not installed with enough flexibility to allow them to move approximately ½” in/out. This most likely will show up on a single caliper and not all of them.

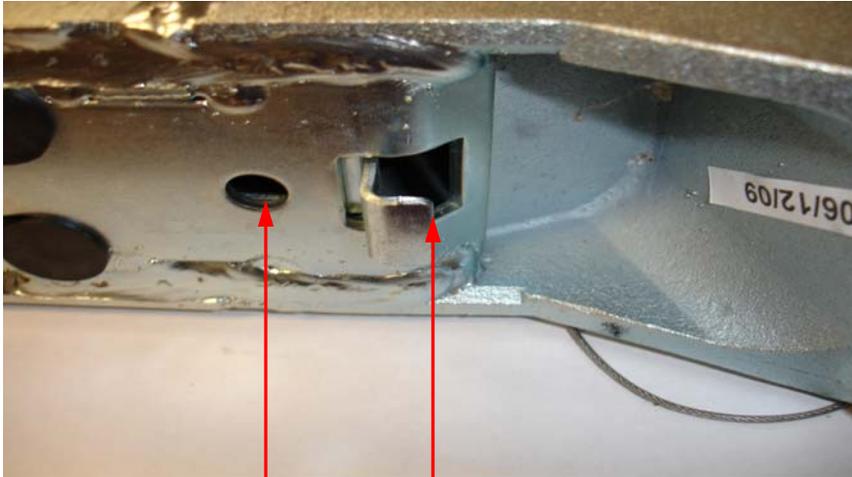
If all of the above has been checked out and all brakes are still dragging, the actuator can be ruled clearly in or out of the problem by the fluid swirl test outlined below. (Also discussed on page 19 of the A60, A75, A84 actuator manual)

- a. Make sure actuator is fully extended to the front (brakes released position).
- b. Press brake release tab if you are working on A60, A75, A84 actuator.
- c. Remove fluid reservoir outer plastic cap and inner rubber plug.
- d. Make sure fluid reservoir is filled to proper level with brake fluid.
- e. There are two small fluid outlet holes in the bottom of the fluid reservoir. (You may need a flashlight or good backlighting to see clearly the bottom of the reservoir through the fluid.) One hole is almost directly under the rubber plug, the other is towards the rear of the reservoir (facing towards the rear of the trailer). Make sure you can see them clearly, particularly the vent port.



VENT PORT (SWIRL)

- f. You will need to be able to slightly stroke the master cylinder to begin to engage the brakes.
1. With the larger A160 actuator, this can be done by first temporarily removing the two 7/16" bolts and the safety stop metal plate on the top of the actuator (Manual Items 21, 22, and 23) so the breakaway lever can be easily operated. The master cylinder can then be stroked by pulling the breakaway lever forward.
 2. With the A60, A75, and A84 actuators, see figure 16 on page 25 of the manual. Insert a 3/16" wide standard screwdriver into the hole in the bottom of the actuator to press the pushrod. You will have to press the brake release bracket to release each time after you stroke the pushrod.



Pushrod Access Hole

Brake Release Tab

g. With either actuator, while watching the fluid in the reservoir, slowly stroke the master cylinder. In the first 1/4" of stroke, fluid should jet (slightly) up out of the hole in the back of the reservoir, and the fluid in the reservoir should swirl, or sort of flip over.

PASS: If this swirling happens, the actuator cannot be part of the dragging brakes problem. The swirling proves that the rear pressure release port is open to the brake lines when the actuator is in the released position, and brake line pressure is reducing to zero. Repeat this several times to be sure. If you have swirling, check the rest of the trailer for the cause of the braking problem (hoses and lines first, and then braking components at the wheels) (If trailer passes the swirl test, reassemble parts as necessary and press brake release lever on A60, A75, and A84 one last time to release brakes).

FAIL: If you don't have swirling (the fluid in the master cylinder remains dead calm while stroking the pushrod) there is likely something wrong with the actuator.

If you are unsure about the swirl test, tow the trailer so that the brakes are applied and should release a couple of times. Then stop on level ground and pull the tow vehicle or actuator fully forward to the released position when stopped. In other words, theoretically brakes should be "off." Block the trailer so it will not roll, and then go to the brakes that are dragging and slightly open a bleed screw on the caliper or brake cylinder. If fluid squirts out, there is residual pressure in the system, either caused by a broken down or kinked hose or problem with the actuator.

If swirling test **FAILED** or residual pressure clearly found in the system and no hose problems confirmed, then check actuator:

1. For stuck shocks
2. For incorrect pushrod length adjustment on A160
3. For missing or broken/dislodged c-clip on pushrod. The c-clip keeps the spring compressed on the pushrod to the proper length. If the c-clip is broken, damaged, or the spring/barrel on the pushrod are loose (not under compression) replace the pushrod.



SNAP RING

4. For other problems in the emergency breakaway mechanism in the A60-A84, including damage to the knurled pushrod barrel, bent pieces, or a misrouted emergency brake cable. If the emergency brake cable has been pulled previously (usually the c-clip is missing, or the S-hook will be straightened out, the pieces of that mechanism should be replaced.
5. (Rare) Master cylinder piston stuck and holding pressure in system.

Mechanical notes if swirl test **FAILED**:

With the A160, issues with the emergency brake lever and pushrod can be addressed by removing the emergency brake lever and disassembling the actuator from the front. (No need to remove master cylinder or open up brake lines)

With the A60, A75 and A84, the inner member needs to be removed for disassembly, and brakes will have to be re-bled.

Please feel free to contact UFP with any questions at 931-967-5101 x16 or warrantytn@ufpnet.com.