

Reverse Lockout Troubleshooting

The way that the backup solenoid works is: When the backup lights are lit on your tow vehicle, 12 volt power should come down the blue wire through the trailer connector to energize the electric solenoid on the back of the A-60. The ground path is often from the solenoid brass body back to the trailer frame, back to the white ground wire back to the tow vehicle, a better ground path is a ground wire connected directly to the solenoid base. If you no longer can back up, it is almost always (90% plus) a wiring problem either with the tow vehicle or trailer. The solenoids are normally very reliable.

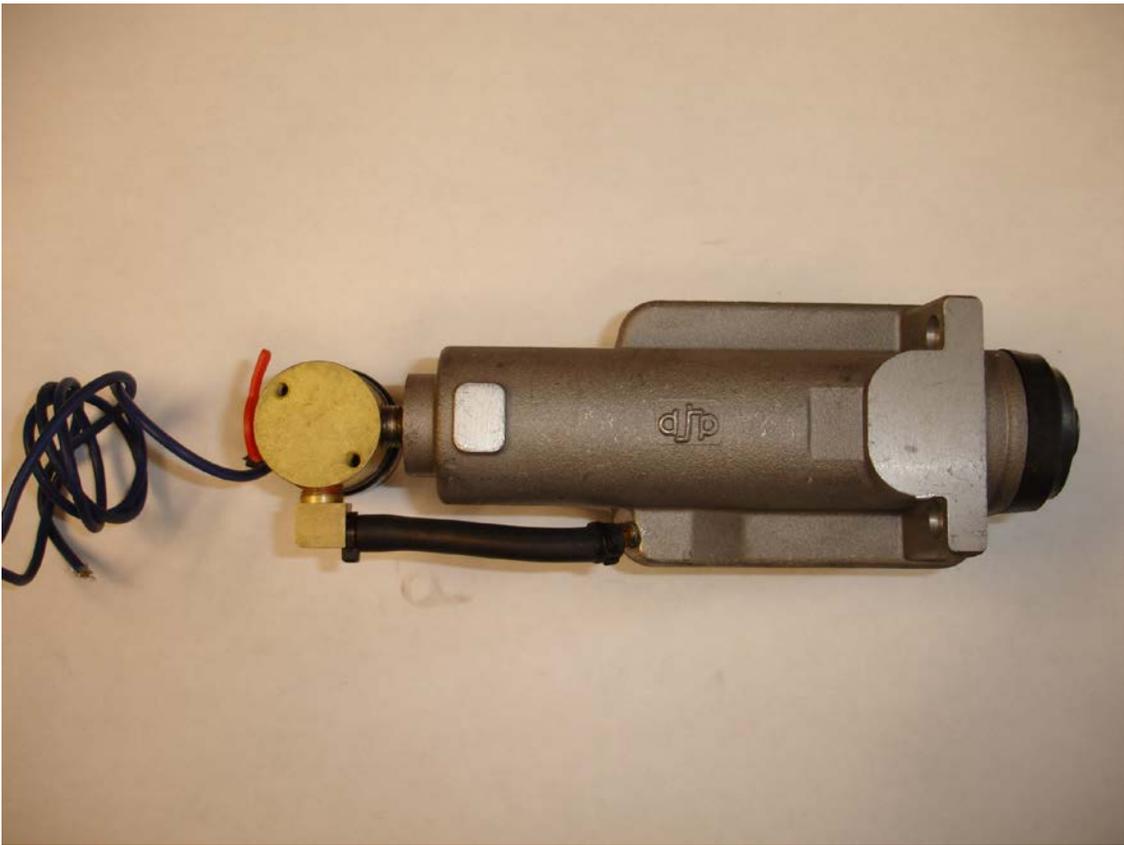
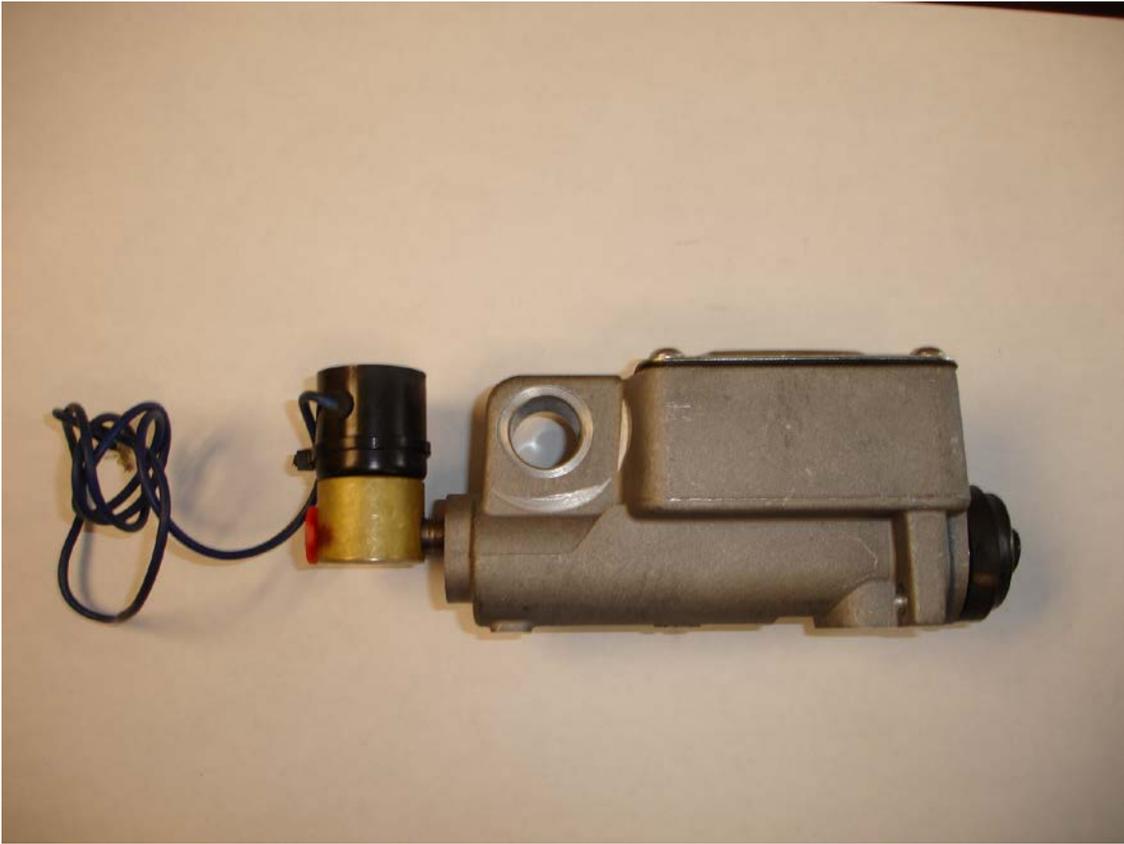
Things to Check:

1. Make sure trailer wiring is connected to tow vehicle. The trailer will not backup without the backup light circuit powered in reverse. If wiring is connected:
2. Set parking brake, make sure truck/trailer won't roll. Turn ignition on, but don't start tow vehicle. Shift transmission in reverse. Check for reverse lights working on tow vehicle. If trailer has backup lights built in, see if they work too. If no reverse lights on tow vehicle, check shift linkage for proper adjustment, you may wiggle shifter and lights come on. Still if no reverse lights on tow vehicle, check for blown fuse. If fuse blown, figure out what happened to the wiring (probably a short) prior to replacing fuse. If trailer has backup lights itself, and they are working, then the issue is limited to the solenoid, skip to step 5.

Wiring checks below assume the vehicle is in reverse, secured so it won't roll, and key is on so backup lights are illuminated:

3. If backup lights are working on tow vehicle, check the tow vehicle connector by using a volt meter, or preferably a test light between the blue backup positive wire and the white ground wire. The light should clearly light or you should see a full 12 volts between the blue and white wire. The lack of a working blue wire AND ground wire on the tow vehicle are the most common problem. Often, people will not pay attention to the ground on the tow vehicle, and lights/backup solenoid will intermittently still work ok, because the trailer frame partially grounds through the tow ball. However, when you back up, sometimes the actuator lifts off the ball slightly, breaking that ground path, and the solenoid will stop working. Make sure the tow vehicle blue and white wires are correctly wired and working before proceeding.
4. One other tow vehicle test, if you have a five wire flat connector, and are not sure the backup light (blue wire) circuit is working on the tow vehicle: Turn on the tow vehicle headlights. This will send 12v power down the brown wire of the tow vehicle connector. See that the taillights on the trailer are working. Then, disconnect the trailer/tow vehicle connector and temporarily reconnect in the following "incorrect" manner: the blue wire post on the trailer connector into the brown wire socket on the tow vehicle. This will send 12v power down the blue solenoid wire on the trailer, effectively "fooling" the trailer solenoid into working. If the solenoid works, and the trailer backs up, then the problem is again with the tow vehicle wiring. This particular trick will only work on an older trailer with a ground path through the trailer frame.
5. Once you are satisfied that the tow vehicle wiring and connectors are clearly good, then visually inspect the trailer wiring for loose connections. If the trailer wiring has Scotch Block type wiring tap connectors, make sure they are securely installed. Next, check the voltage at the trailer solenoid by using either a volt meter or test light between the blue wire at the solenoid and the brass body of the solenoid. If you have a test light with a probe point, you can pierce the insulation of the blue wire to check for voltage without removing the wire. If you clearly get 12 volts or better, a lighted test light between the blue wire on the solenoid and the brass solenoid body, then the solenoid itself is possibly bad (rare). Before giving up on the solenoid, we recommend that a ground wire be run from a 8-32 screw inserted one of the threaded holes in the bottom of solenoid brass body to the trailer frame for a secure ground. If a trailer has a folding tongue, or a rubber/flexible brake line coming from the actuator, sometimes this ground wire to the trailer frame is required for a good ground path from the solenoid. **IMPORTANT: TRAILERS BUILT AFTER ABOUT 2011 often have a fully grounded "integrated" wiring harness, grounding all the lights, but not the trailer frame, if so, be absolutely sure a dedicated ground wire in the harness was included to run to the brass solenoid base, or the solenoid will likely be isolated from ground and work poorly or not at all.**

All this wire troubleshooting is very worthwhile, as the overwhelming majority of solenoids returned work perfectly...and it is much easier to fix the wiring than change the solenoid. If, after checking the wiring out, the solenoid is still suspected, please contact UFP at 931-967-5101 x16 or warrantytn@ufpnet.com for assistance.



If the original backup solenoid appears to be defective, here's how to install a new one, or if easier, to replace its working parts. Service kit number 34866 is available for the solenoid: This is a fairly straightforward job, and takes an hour or two at the most, including bleeding the brakes. A separate set of instructions is available for bleeding the air out of the brake lines when done. If the trailer has a swing (folding) tongue and you fold the trailer tongue open, you can see the solenoid and how it is connected. On a non-swing tongue trailer, you will have to work from underneath the tongue, so be sure the trailer tongue is securely supported before climbing under.

1. Have some rags handy to catch any brake fluid and keep it off trailer paint. Disconnect the brake line going from the solenoid to the trailer. If it is a brake hose, you may have to loosen the hose to metal brake line joint on down the line so the hose will swivel out of the solenoid as you loosen it. When the hose is disconnected, plug the end of it to keep brake fluid from running out with a golf tee or other plug. This will save time later during bleeding the brakes.

2. Disconnect any ground wire to the solenoid base and the blue signal wire going to the solenoid.

3. Remove the snap rings from one side of the two 3/4" diameter slider pins for the brake actuator. With a punch or other driving tool, drive the slider pins out the other side of the actuator. Set the pins and snap rings aside for re-use.

Tip: These pins hold the inner workings of the inner slide together, so handle gently and slide the inner member forward and out of the outer member housing, keeping it together. Put the pins back in as soon as you can. Don't flip the assembly over after pulling it out, or the rollers and other parts may fall out. A nice trick: If you can easily make some (slightly shorter) temporary assembly pins out of approximately 3/4" round dowel, exactly 3 inches long, use them to drive the original pins out, and leave them in place to hold the actuator inner slide together as you pull it out and work on it.

4. Once you have the actuator out on a workbench to replace the solenoid:

- a. Cut the zip tie holding on the rubber hose to the solenoid bypass line.
- b. Gently pull off the hose from the solenoid. Leave the other end of the hose connected to the master cylinder.
- c. Unthread the solenoid and pipe nipple out of the back of the master cylinder, by gripping on the brass body bottom with a pair of channel lock or vice grip style pliers.
- d. Apply a very thin coat of pipe compound or blue loctite to the second/third male pipe threads prior to assembling the solenoid/pipe nipple back into the master cylinder. Don't get any compound inside. The tightening torque is only 10 foot pounds/120 inch pounds, which is practically just snug. When tightening the brake line with a wrench, use a pair of channel locks or vice grip pliers to lightly hold the brass solenoid body. When done, the solenoid should be upright. These are brass/aluminum parts, so don't overtighten, or damage with the vice grips/pliers. Generally, when you rethread the new solenoid and pipe nipple into the back of the master cylinder, it should take the same number of turns to tighten back into the master cylinder as it did to remove.

e. Reconnect the rubber hose to the solenoid bypass line, and secure with a new zip tie.

5. Reinstall the actuator inner slide into the trailer, being careful to keep the pieces in place. Install the front pin first. You may have to wiggle the pin slightly to line up any rollers and the shock in the front. Once that pin is in, pull the actuator all the way to the front of the slide, and install the rear pin. Again, you may have to wiggle the pin around to align the rear rollers and master cylinder. If you have some major alignment issues with the pin, don't force it. Something is out of place and needs to be fixed.

6. Reinstall the main brake line to the back of the solenoid. It seals with a double flare into a brass fitting, and only needs to be snug, It is much easier to tighten it some more if you have a leak than to strip or break off a fitting.

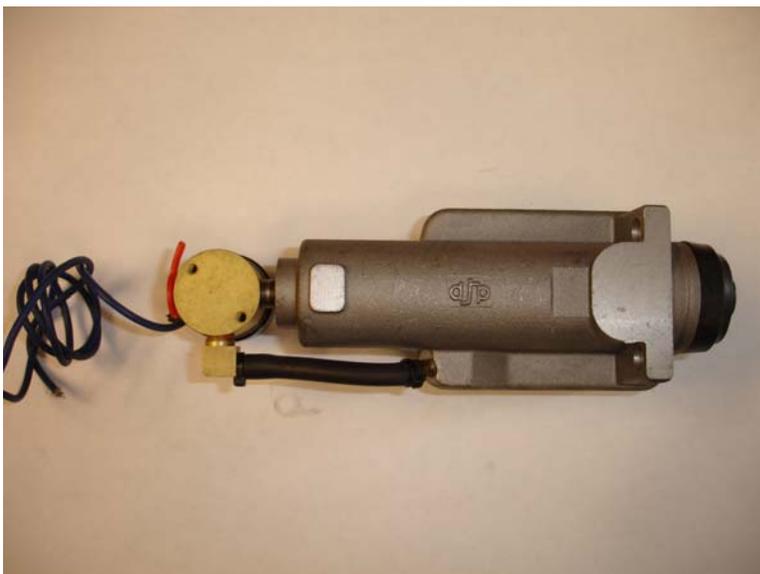
7. Reconnect the blue signal wire to the solenoid. If the solenoid does not have a ground wire factory installed to the bottom of the solenoid body, it is a great idea to add one now for future long term wiring reliability. Zip tie and secure the wiring as required.

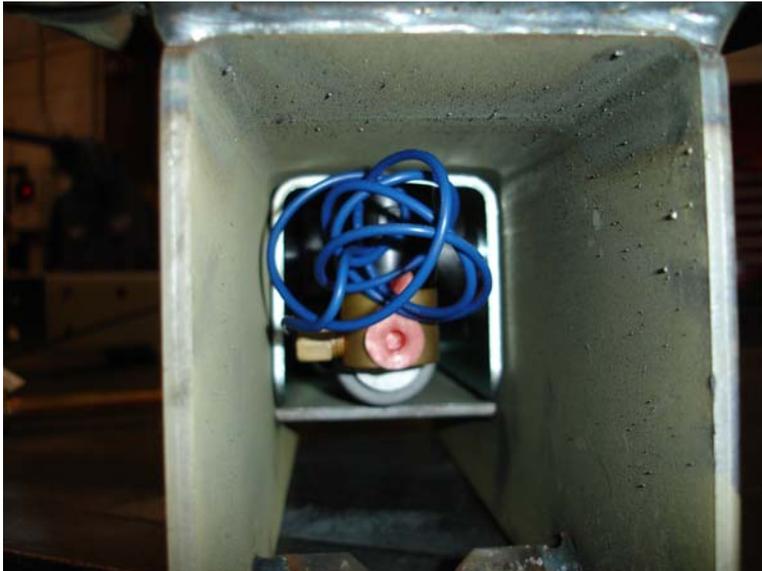
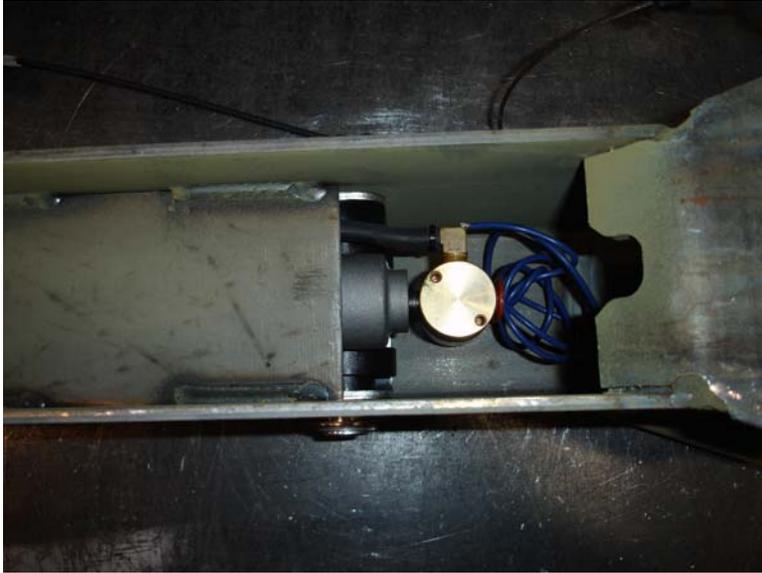
8. Bleed the air out of the solenoid and main brake line to the first branch/caliper on the line. Bleeding directions should be attached separately. If in question on the brake bleeding, you can bleed all calipers to get the most responsive brakes.

9. Important: Now that you are done, be sure and depress the brake release lever one more time on the bottom of the actuator to be sure the brakes were not inadvertently left on by the bleeding operation. Be sure any swing tongue hose is not kinked, and folds neatly into the tongue when shut.

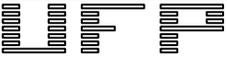
10. Road test the trailer to be sure the bleeding was complete and the wiring was correct.

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



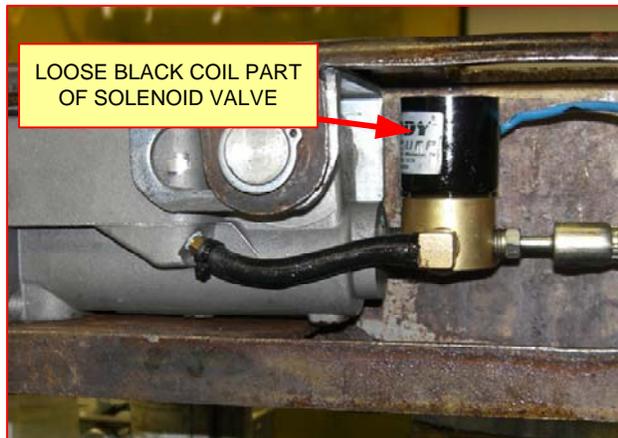


Note: The above photos and procedure assume the actuator has to be removed from the front of the trailer tongue for service, which is the most common arrangement. However, on our heavy duty A160 actuators, and some trailers with top mount actuators, the solenoid is directly accessible for service. Also on some five inch swing tongues, it is possible to temporarily remove the actuator safety pin and lanyard, $\frac{3}{4}$ " actuator slider pins, and swing tongue bolt/pin; take the swing tongue apart, and slide the actuator backward and out the rear of the swing tongue housing without disconnecting the brake line. It is then possible to replace only the black electric solenoid and plunger without disconnecting brake lines and bleeding brakes, saving a lot of time. A procedure for servicing the electric part of the solenoid and plunger (which are all of the working parts of the solenoid assembly) follows: The solenoid repair parts kit is UFP PN 34866.
A complete replacement solenoid assembly is UFP PN 34500.

 WORK INSTRUCTION		SOLENOID REPAIR		Docu. #	Rev
CH Page 4	Description REPLACE ELECTRIC COMPONENTS AND PLUNGER			Date:	
				Checked:	
			Author:		

DISASSEMBLY

- UNPLUG SOLENOID ELECTRIC LINE.
- LOOSE BLACK COIL PART OF SOLENOID VALVE.
- TAKE OUT OLD PLUNGER.



RE-ASSEMBLY & TIGHTEN

- PUT **NEW PLUNGER** INTO COIL.
- HAND TIGHT COIL.
- RETIGHT TORQUE TO 52-62 IN-LB (4.4-5.2 FT-LB).
 - **REFERENCE:** DRAWING A REFERENCE LINE ON COIL AND BRASS BASE. RETIGHT. CHECK THE LINE SHIFT .03"-.07" (OR 3 - 7°).



- ALL REPLACEMENT WORK CAN BE DONE WITHIN 5-10 MINUTES WITHOUT REBLEEDING BRAKE SYSTEM. IF YOU DISASSEMBLE AND LEAVE SOLENOID OPEN OVER 1 HOUR, YOU NEED TO REBLEED BRAKE SYSTEM TO REMOVE ANY AIR.