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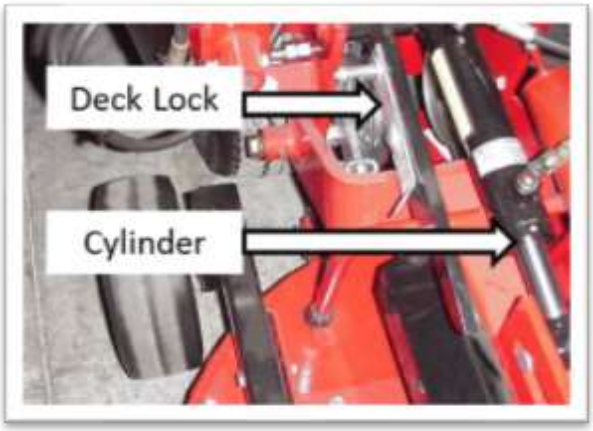
Pro-Flex 120 HYDRAULIC SYSTEM TROUBLE SHOOTING

In total there are seven hydraulic cylinders used on each Pro-Flex: five to raise and lower the decks and one for each left and right hand wing. The only difference between the deck and wing cylinders is the port location. They use a common seal kit.

If a user complains about a *deck not holding*, the culprit could be that oil is by-passing at the tractor's control valve, or one of the cylinders is by-passing internally. The following guide will help you trouble shoot a deck drifting complaint. Make sure you refer to the correct hose configuration for your Pro-Flex.



HYDRAULIC SYSTEM DESIGN

It is normal for the deck(s) to drift down slightly over a period of several hours when placed in a raised position, without the deck locks securing the decks. This is NOT considered a fault nor should it impede normal operation.

The 7 hydraulic cylinders used on a Pro Flex are arranged in a PARALLEL circuit. This can make it more challenging to locate a problem as a fault in one area can show up in a different area.

It is important to know that the front and rear deck lift arms (to which the cylinder mounts) are different lengths. Therefore, the rear decks (with the longer lift arm) will most often drift down before a front deck will, regardless of the location of the issue. Additionally, as most Pro-Flex's are parked with the wings raised and locked, (which removes weight from the outer rear deck cylinders), the rear center deck will be the first to drift. As a result the center deck cylinder is often incorrectly deemed to be faulty. Unfortunately this is a characteristic of a parallel hydraulic circuit and why a systematic approach to diagnosing is required to ensure the true cause of the issue is found.

HYDRAULIC SYSTEM SERVICE PRECAUTIONS

WARNING! **Risk of personal injury! Wear safety glasses and use protective gloves.**

Relieve all trapped pressure before performing any service to the hydraulic system. Pressure can be maintained in the hydraulic circuits long after the power source and pump have been shut down.

Maintenance should always be performed by a qualified service technician familiar with servicing similar equipment, using good safety and workmanship practices.

TROUBLE SHOOTING

As stated, it is normal for the deck(s) to drift down over a period of several hours when placed in a raised position, without the deck locks securing the decks. Progressive recommends that the deck locks are used whenever a Pro-Flex is parked with the decks raised, or the mower is being transported. See the Operators Manual.

Determine that a cylinder problem actually exists.

- Ensure that the ¼ turn valve (manual or automatic version) is in good condition internally and the ¼ turn valve closes, fully blocking oil flow. Service as required.
- Ensure the tractor's hydraulic reservoir is at the proper level and the oil is not aerated. Correct as required and ensure all air is bled from the mower's hydraulic system.
- Ensure the tractor's control valve returns fully to the center (blocked) position. Correct as required. Try an alternate valve section – do not connect to a motor spool valve.
- Ensure that the tractor's relief valve is not by-passing under the static load of the mower decks (approximately 900 psi)
- Make sure that the quick coupler poppets do not leak when disconnected.
- Make sure there is no external leakage at any connection or cylinder rod seal. Correct as required.
- Ensure the mower's hydraulic system is bled by cycling the cylinders many times and retest.

Pro-Flex Equipped with Pro Lift-N-Turn™ s/n 13271777 and UP

STEP 1

In a safe area, secure the deck locks so they do not engage. Ensure the ¼ turn valve is closed (handle is 90 degrees to the hose, or on s/n 15272165 and up, the rope is fully released). When it is safe to do so, raise all the decks fully. The wings should not move. Shut off the tractor. If the decks drift noticeably in a short period of time, note the time and distance of the fastest drifting deck (normally a rear deck).

STEP 2

Ensure the ¼ turn valve is fully closed (see step one). When it is safe to do so, raise all the decks fully and shut off the tractor (the wings should not move). Wearing protective equipment, immediately disconnect the two quick couplers from the tractor. Re-time the same deck as in STEP 1 and determine if the time it takes for the deck to drift or the distance it moves has changed.

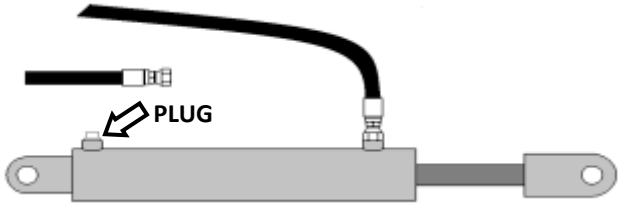
Step 2 Continued
STEP 2A If the drifting stops or is much slower than in STEP 1, then investigate internal leakage within the tractors hydraulic system.
STEP 2B If the time is the same you will need test the deck lift cylinders. Move to STEP 3.

STEP 3

Determining the Deck Suspect Cylinder

As the deck cylinders are connected in a parallel circuit, (see accompanying illustrations for your Pro-Flex), they can be tested simultaneously, saving diagnostic time. Test as instructed below.

STEP 3A When it is safe to do so, raise the all decks and engage the deck locks. Turn off the tractor and relieve the residual hydraulic pressure. For each deck cylinder, remove the hose to the BASE end of the cylinder and immediately cap the hose and plug the cylinder port and with a suitable steel fitting, ensuring a leak free seal.



STEP 3B When it is safe to do so, restart the tractor and apply light pressure to the retract port (rod end) as if trying to raise the decks. Do not hold over relief for long periods of time. Note the following:

- Cylinder(s) do not extend. A cylinder with a good piston seal should not extend. Investigate other areas of leakage (i.e. ¼ turn lock valve or tractors spool valve.)
- Cylinder rod extends. If a cylinder's piston seals are by passing internally, that cylinder will SLOWLY extend as the pressure acts on the larger piston surface of the base end of the cylinder. Replace or service the cylinder as deemed necessary.
    - Repeat **Step 3A** but cap both hoses to the cylinder that extends and retest as in **Step 3B** to determine if another cylinder extends to ensure that a second fault does not exist.

When the test is complete, turn off the tractor and relieve the residual hydraulic pressure and reconnect the hoses. Cycle all decks to purge air from the system before returning the mower to service.

Pro-Flex NOT Equipped with Pro Lift-N-Turn™ - prior to s/n 12271776

On older Pro-Flex 120's prior to s/n 12271776, the wing and deck functions cannot be operated independently of the other. In this case, the hydraulic lines to both wing lift cylinders must be first removed and plugged with suitable steel plugs. When it is safe to do so, cycle the hydraulic system several times to purge any air that may have entered. Then test each cylinder as described above in Step 3.

If you suspect a faulty cylinder:

- For cylinders still within the PTE warranty period, please consult PTE for direction. DO NOT disassemble. The return of the unopened cylinder maybe required under a RGA.
- For cylinders not within the PTE warranty period, the cylinder should be disassembled and inspected by a qualified service technician to determine the cause of the by-pass. Repair kits are available.

Always make sure that air is fully purged from the cylinder and lines and that the tractor's reservoir is at the proper level. Frequently check the reservoir level during testing.

Automatic Lock valve

As standard equipment, an automatic lock valve has recently been incorporated into the wing lock release mechanism. It replaces the manual ¼ turn valve that is found on earlier models.

Progressive is pleased to announce that the AUTOMATIC WING CYLINDER LOCK VALVE (circled in the photo) can be added to an older Pro-Flex 120. Order update kit p/n 600600. This kit is suitable for any vintage of the Pro-Flex, however it does not add Pro Lift-N-Turn™ to a mower that is not already so equipped.

For more information on the correct operation of the ¼ turn valve and updating to the Automatic Wing Cylinder Lock Valve, see: www.progressiveturfequip.com/pf120automaticvalve.pdf

Pictorial Schematics of the Pro-Flex Hydraulic Circuit

Over the years there have been a few modifications to the method of hydraulic connection to the tractor. The cylinders are and have always been connected in a simple parallel circuit.
Select the correct pictorial schematic for your serial number of Pro-Flex 120.
During operation (mowing) the seven cylinders used on a Pro-Flex are positioned as follows:

Wing Cylinders

When the wings are flat (mowing position) the cylinders are fully retracted.

Deck Cylinders

When the decks are on the ground the cylinders should be fully extended

Note: When replacing a cylinder on a Pro-Flex:
Progressive uses one 90 degree restrictor fitting in each cylinder as follows:

- in the base end of each wing cylinder
- in the rod end of each deck cylinder

Always ensure the restrictor is in the proper location.

Pictorial Pro-Flex Hydraulic Schematics