McNeilus

Technical Service Information Bulletin

Meridian Arm Speed Troubleshooting

Date: June 23, 2021
Bulletin Name: FEL-TSIB-059
Model: Meridian Front Loader 78
Model Year: All Meridian model years

Purpose:

To accurately diagnose the problem for Meridian vehicles with arms that are not performing as designed. This bulletin will be used to inspect the hydraulic and electrical components to fix any potential issues that the vehicle may be experiencing.

Notice:

- This bulletin should be read and understood in its entirety before performing this procedure.
- All procedures outlined in the bulletin must be performed by skilled service personnel. Refer to the product service manual for descriptions of maintenance procedures.

SAFETY NOTICE

Perform your company's Lockout/Tagout procedure. If your company does not have a Lockout/Tagout procedure, follow OSHA 1910.147 and 1910.146 Confined Space as appropriate.

SAFETY NOTICE

Use appropriate Personal Protective Equipment (PPE) as required by your company.

Tools and Equipment Required:

Customer to supply:

- 9mm wrench

Procedure:

1. Perform your company's Lockout/Tagout procedure. If your company does not have a Lockout/Tagout procedure, follow OSHA 1910.147 and 1910.146 Confined Space as appropriate. Chock the vehicle's wheels and place the vehicle in park with the parking brake engaged.

2. Ensure the hydraulic oil temperature is above 71° Fahrenheit.

   2.1 All troubleshooting must be completed with the oil temperature at 100° F +/- 5° F.

   2.2 The rear pump is not active during normal operation until the operating temperature of the hydraulic oil is above 71° Fahrenheit.

   2.3 Once oil is at a sufficient temperature, make sure the heater is turned off or unplugged prior to troubleshooting.

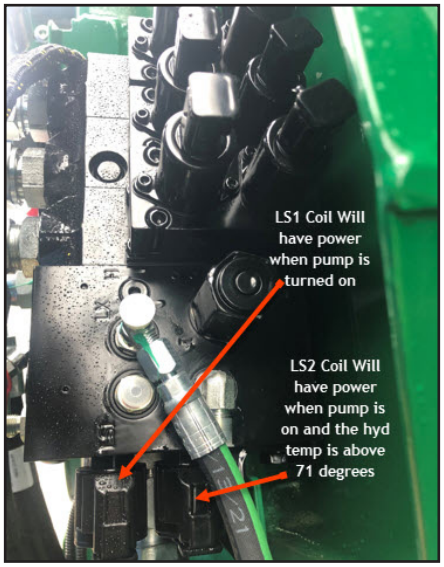
3. Inspect the body inclination sensor.

   3.1 Remove the cover from the control system modules (most modules will be located on the curb side of the truck).

   3.2 When inspecting the inclination sensor, ensure that the sensor is securely mounted to the bracket inside the cover and that the cable for the sensor is pointing down.

4. Check power to the LS Coils.

4.1 **NOTE:** When checking power, multimeter will not read a full 12VDC. The signal being transmitted is a duty cycle and may range from 5 – 9 VDC.

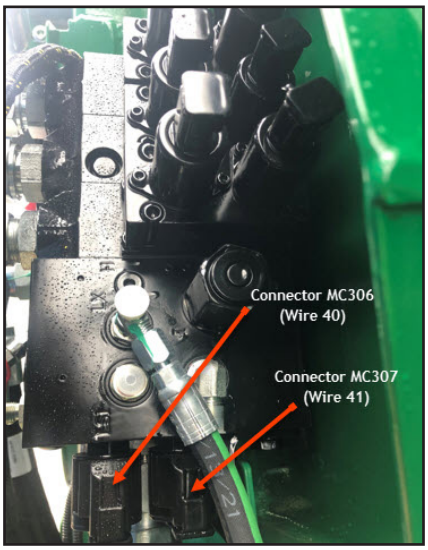


4.2 LS coils should be magnetic while energized.

4.2.1 Once it is determined that there is power being sent to each LS coil during the appropriate conditions, check to make sure each coil is functional by holding a metallic object at the end of the stem. If the coil is functional the coil will act like a magnet to the metallic object.

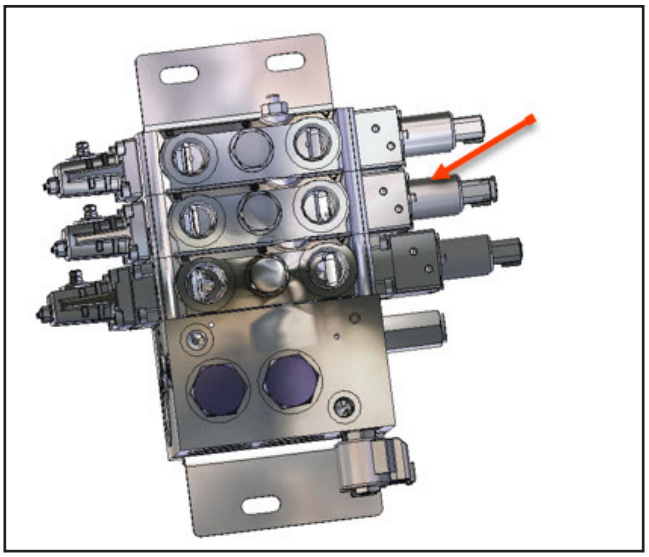
4.2.2 If there is power to the coil, but it is not magnetic, replace the coil and stem (McNeilus PN 1579184).

5. Ensure the proper connectors and wires are connected to the correct LS coils.



6. Review parameter settings in step 11 to make sure they are in a reasonable range.

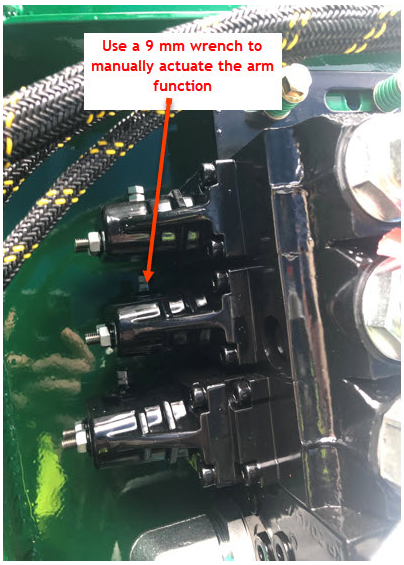
7. Operate other functions such as forks and auto-pack. If the arm function is the only function that is slow, the issue may be related to arm section of the street side valve.



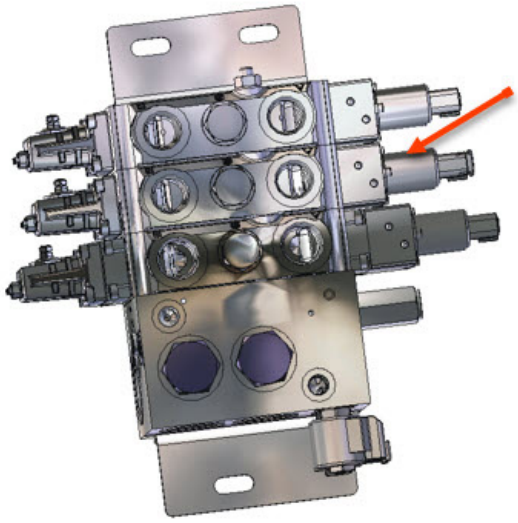
8. Manually operate the arm function with the mechanical override on the street side valve using a 9 mm wrench. (**NOTE:** If there is a residential can on the forks, make sure to roll the forks out of the hopper PRIOR to completing the manual operation test.)

8.1 If the arm speed is the same speed as operating the arm with the joystick, proceed to step 9.

8.2 If the arm speed is faster by operating the function manually than operating the function with the joystick, continue with step 8.3.



8.3 Replace the pilot coil pack (McNeilus PN 1502635).



8.3.1 Prior to removing the pilot coil pack, ensure that to follow the proper LOCKOUT/TAGOUT procedure.

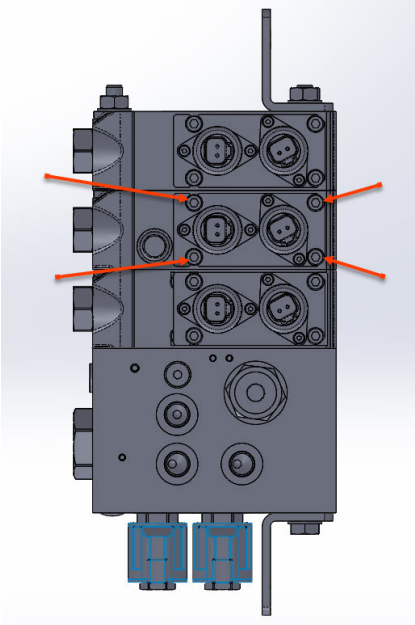
8.3.2 If a new pilot coil pack is not immediately available, try swapping the arms pilot coil pack with the forks pilot coil pack.

8.3.3 To remove the coil pack:

8.3.3.1 Thoroughly clean the area around the pilot coil packs. Even the smallest piece of contamination could damage the pilot coil pack or even the entire valve. Place arms in the stow position or the down position prior to starting pilot coil pack replacement. Relieve the pressure in the circuit but manually actuating the affected sections with a 9 mm wrench.

8.3.3.2 Remove the four socket head Allen bolts. There are formed O-ring seals underneath the pilot coil pack. Be careful not to damage the seals if they need to be reused.

8.3.3.3 **Take note during removal of the pilot coil that you mount the replacement pilot coil pack in the proper orientation**.

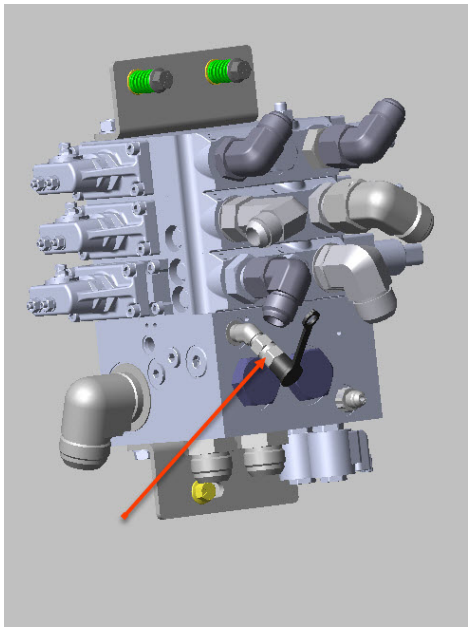


8.4 If the issue was not resolved after replacing the pilot coil pack, continue to step 9.

8.4.1 If the pilot coil was swapped with the forks pilot coil and the issue followed the pilot coil, replace the failed pilot coil pack.

9. Check current system pressures.

9.1 Connect a digital pressure gauge to the test port on the street side valve. Ensure that you use an accurately calibrated gauge.



9.2 Start the truck to read the standby pressure without turning the pump on.

9.2.1 Standby pressure of the front pump should be 420 PSI +/- 5%.

9.2.2 Step 10.3.1 – 10.3.2 will need to be completed to verify the standby pressure of the rear pump and reset the standby pressure for the front pump.

9.2.3 If standby pressures for both pumps are within specifications, continue with step 9.3.

9.2.4 If standby pressures remain out of spec, use step 9 to troubleshoot standby pressures. Return to step 8.3 when standby troubleshooting is complete.

9.3 Check the maximum system pressure by operating functions.

9.3.1 Turn the pump on and deadhead the arms up.

9.3.1.1 Maximum system pressure should be 2620 PSI +/- 20 psi.

9.3.1.2 If pressure is out of spec, try manually operating the arms up as directed in step 5.

9.3.1.3 If deadheading the arms manually shows the system pressure within specification but operating the arms with the joystick has the pressure out of specification, replace the street side valve (McNeilus PN 1565534).

9.3.2 If the pressure is out of specification range when operating the arms with the joystick or manually, try deadheading the forks up. Operating multiple functions helps determine that the issue is/is not related to only one function.

9.3.2.1 Maximum pressure for forks up has the same specification as arms up.

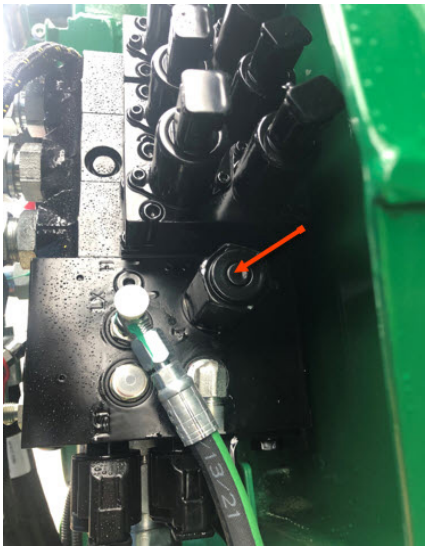
9.3.2.2 If operating the forks achieves a system pressure reading within specification, but operating the arms cannot achieve system pressure, replace the street side valve (McNeilus PN 1565534).

9.4 If the maximum system pressure is out of specification for both the arm and fork functions, inspect the O-ring on the sequence valve.

9.4.1 Prior to removing the sequence valve, ensure that you follow the proper LOTO procedure.

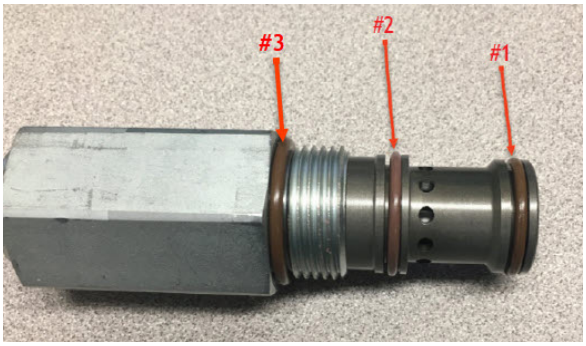
9.4.2 Thoroughly clean the area around the sequence valve. Even the smallest piece of contamination could damage the sequence valve or even the entire valve.

9.4.3 Locate and remove the sequence valve on the street side valve. The sequence valve is either a round or hex shaped cartridge that is installed into the inlet section of the street side valve.



9.4.4 Inspect each O-ring to make sure that it is present and that there is no damage to each O-ring.

9.4.4.1 If there are any O-rings missing or damaged, replace all O-rings with new O-ring kit (McNeilus PN 1619802).



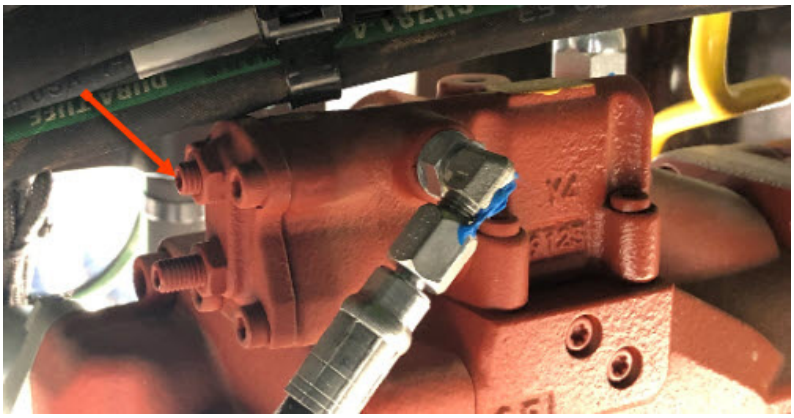
10. Test pump pressure settings

10.1 Connect the pressure gauge to the street side valve (as shown in step 9.1).

10.2 Start the truck and read the digital pressure gauge. The pressure that is initially read is the standby pressure for the front pump. The reading should be 420 PSI +/- 5%.

10.3 Check the standby pressure for the rear pump.

10.3.1 Loosen the jam nut and use an Allen wrench to back out the screw for the load sense (LS) on the FRONT PUMP to lower the standby pressure of the front pump below the standby pressure of the rear pump. Double check and make sure the heater is turned off or unplugged if parameter cannot be accessed.



10.3.1.1 Back out (counterclockwise) the LS screw on the front pump until the reading on the digital pressure gauge stops dropping. When the digital pressure gauge stops dropping, the gauge is now reading the standby pressure of the rear pump.

10.3.1.2 If pressure cannot be dropped below ≈330 PSI, back out the LS screw on the rear pump to see if the pressure changes. Pressure change should be observed within a ¼ turn.

10.3.1.3 If backing out both LS screws does not drop the standby pressure, complete step 10.4.5 to replace the front compensator.

10.3.2 The standby pressure of the rear pump should be 330 PSI +/- 5%.

10.3.2.1 If the pressure reading is within the tolerance, continue to step 10.4.

10.3.2.2 If the pressure reading is out of specifications, continue with step 10.3.3.

10.3.3 Adjust the standby pressure of the rear pump.

10.3.3.1 Loosen the jam nut for the LS screw on the rear pump.

10.3.3.2 Use an Allen wrench and the LS screw clockwise to increase the standby pressure and counterclockwise to decrease the standby pressure.

10.3.3.3 If pressure can be set within the specifications, tighten the jam nut by holding the LS screw within an Allen wrench and use a wrench to lock the jam nut. Then continue on step 10.4.

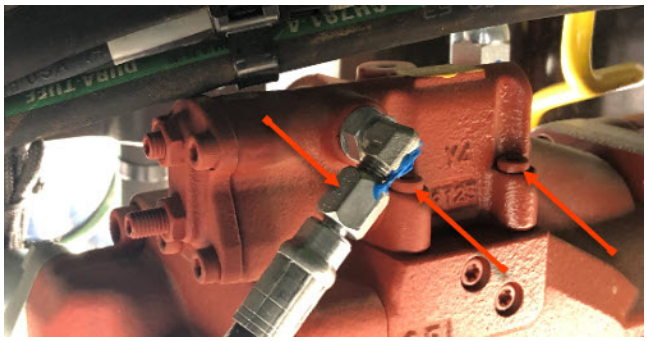
10.3.3.4 If pressure cannot be adjusted into the specification range, the continue on step 10.3.4.

10.3.4 Replace the rear pump compensator (McNeilus PN 1596863).

10.3.4.1 Prior to starting the compensator replacement, ensure to follow the proper LOTO procedure.

10.3.4.2 Thoroughly clean the area around the compensator. Even the smallest piece of contamination could damage the compensator or even the entire pump.

10.3.4.3 Remove the LS hydraulic line and the four bolts holding the compensator to the pump. There are two bolts on each side of the compensator. Make sure all four O-rings come off with the compensator being removed.



10.3.4.4 Install the new compensator onto the pump. Take care to not damage the O-rings that are located in between the pump and the compensator.

10.3.4.5 Once the four bolts are installed and secured, reinstall the hydraulic line on to the compensator.

10.3.4.6 Complete step 9.3.3 again to try to set the standby pressure of the rear pump.

- If pressure can be set within the specifications, continue to step 10.4.
- If pressure cannot be set with in the specification range, replace the pump (McNeilus PN 1586214).

10.4 Reset the standby pressure of the front pump.

10.4.1 Standby pressure should be 420 +/- 5%.

10.4.2 Use an Allen wrench and the LS screw clockwise to increase the standby pressure.

10.4.3 If pressure can be set within the specifications, tighten the jam nut by holding the LS screw within an Allen wrench and use a wrench to lock the jam nut. Then continue on step 10.5.

10.4.4 If pressure cannot be adjusted into the specification range, the continue on step 10.4.5.

10.4.5 Replace the front pump compensator.

10.4.5.1 Prior to starting the compensator replacement, ensure to follow the proper LOTO procedure.

10.4.5.2 Thoroughly clean the area around the compensator. Even the smallest piece of contamination could damage the compensator or even the entire pump

10.4.5.3 Remove the LS hydraulic line and the four bolts holding the compensator to the pump. There are two bolts on each side of the compensator. Make sure all four O-rings come off with the compensator being removed.

10.4.5.4 Install the new compensator onto the pump. Take care to not damage the O-rings that are located in between the pump and the compensator.

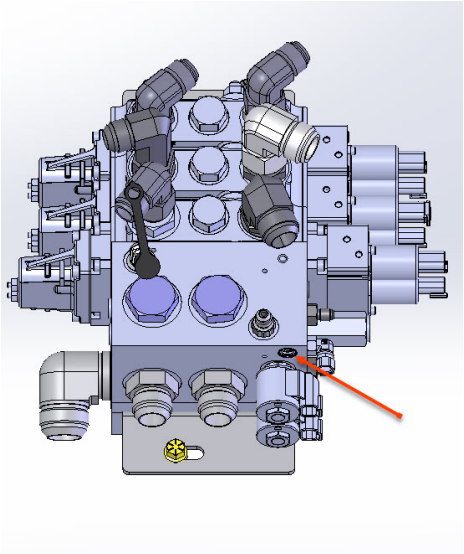
10.4.5.5 Once the four bolts are installed and secured, reinstall the hydraulic line on to the compensator.

10.4.5.6 Complete step 10.3.3 again to try to set the standby pressure of the rear pump.

- If pressure can be set within the specifications, continue to step 10.5.
- If pressure cannot be set with in the specification range, replace the pump (McNeilus PN 1586214).

10.5 Check the maximum pressure for the rear pump.

10.5.1 Remove the plastic cap from the LS relief.



10.5.2 Use an Allen wrench to turn in (clockwise) the LS relief until it stops and then back it out (counterclockwise) ¼ turn. **(DO NOT LEAVE LS RELIEF BOTTOMED OUT.)**

10.5.3 Disconnect MC306 for the LS1 coil.

10.5.4 Deadhead the arms or forks up and check the digital pressure gauge. (It is always a good idea to test multiple full pressure functions when testing system pressure.)

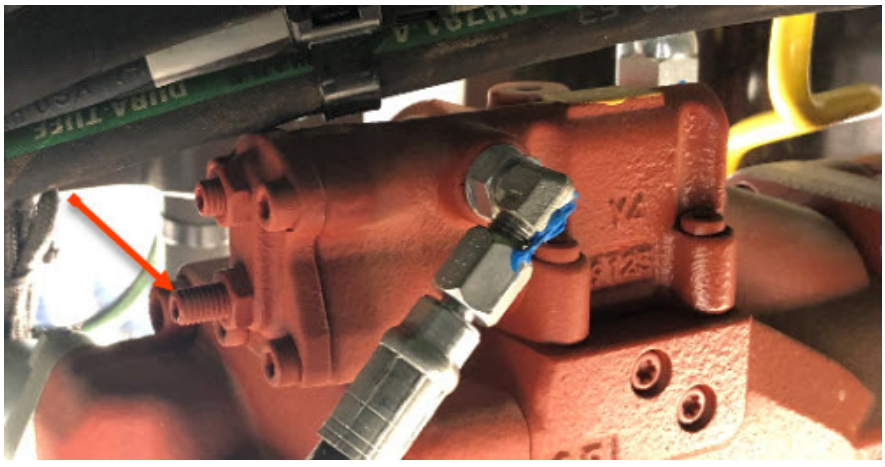
10.5.4.1 The maximum pressure for the rear pump should be 2620 PSI +20/-0.

10.5.4.2 If pressure is within specifications, continue on step 10.5.4.

10.5.4.3 If pressure is out of specification, continue on step 10.5.5.

10.5.5 Adjusting the maximum pressure for the rear pump.

10.5.5.1 Loosen the jam nut for the Pressure Compensator (PC) screw on the rear pump.



10.5.5.2 Use an Allen wrench and the PC screw clockwise to increase the PC pressure and counterclockwise to decrease the PC pressure.

10.5.5.3 If pressure can be set within the specifications, tighten the jam nut by holding the PC screw within an Allen wrench and use a wrench to lock the jam nut. Then continue on step 10.5.6.

10.5.5.4 If pressure cannot be adjusted into the specification range, then replace pump (McNeilus PN 1586214).

10.5.6 Plug MC306 back into the LS1 coil.

10.6 Check the maximum pressure for the front pump.

10.6.1 Disconnect MC307 for the LS2 coil.

10.6.2 Deadhead the arms or forks up and check the digital pressure gauge.

10.6.2.1 The maximum pressure for the rear pump should be 2750 PSI +/- 50.

10.6.2.2 If pressure is within specifications, continue on step 10.6.4.

10.6.2.3 If pressure is out of specification, continue on step 10.6.3.

10.6.3 Adjusting the maximum pressure for the front pump.

10.6.3.1 Loosen the jam nut for the Pressure Compensator (PC) screw on the front pump.

10.6.3.2 Use an Allen wrench and the PC screw clockwise to increase the PC pressure and counterclockwise to decrease the PC pressure.

10.6.3.3 If pressure can be set within the specifications, tighten the jam nut by holding the PC screw within an Allen wrench and use a wrench to lock the jam nut. Then continue on step 10.6.4.

10.6.3.4 If pressure cannot be adjusted into the specification range, then replace pump (McNeilus PN 1586214).

10.6.4 Plug MC307 back into the LS2 coil.

11. Check Arm parameter settings

11.1 Each setting can be fine-tuned to optimize performance. However, changing parameters will not make a significant difference in arm speed. If parameters are within the following ranges and the truck is still experiencing noticeable speed deficiencies, the issue is not parameter related.

11.2 Arm Down Max – Setting should be around 1100 +/- 50

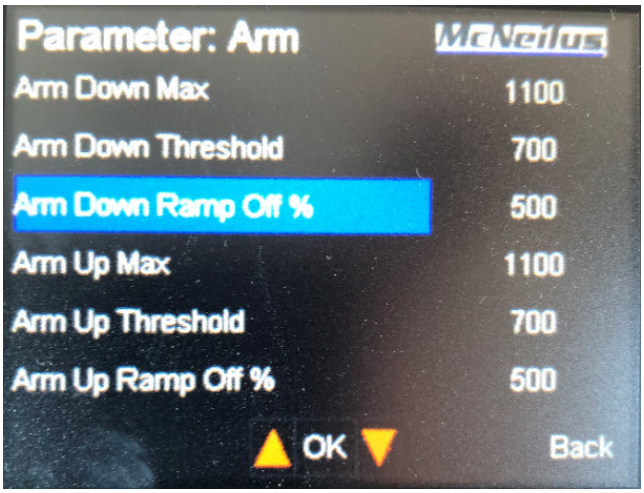
11.3 Arm Down Threshold – 700 +/- 50

11.4 Arm Down Ramp Off % - 500 +/- 50

11.5 Arm Up Max – 1100 +/- 50

11.6 Arm Up Threshold – 700 +/- 50

11.7 Arm Up Ramp Of % - 500 +/- 50



Other options to check before replacing the street side valve.

12. If there has been recent work completed on the street side valve and now the truck is experiencing a hydraulic function issue, check to make sure the LS coil stems are not bent.

12.1 LS coil stems can be damaged by being bumped by a tool. Stems can appear straight but not actuate when energized.

12.2 If there is any question that the stem maybe damaged, replace the stem and coil (McNeilus PN 1579184).

13. Remove your company's Lockout/Tagout per your company's procedure. If your company does not have a Lockout/Tagout procedure, follow OSHA 1910.147 and 1910.146 Confined Space as appropriate. Remove the chocks on the vehicle's wheels. Take the vehicle out of park and disengage the parking brake.