

#9 Injector Performance (11.809)

Introduction

Lubecore has noticed recently that #9 injectors (11.809) installed at the end of very long main line systems do not reload consistently. Pressure losses in long mainline systems leading to high residual pressure in injector manifolds during the pump pause cycle are the cause for #9 injector reloading inconsistencies.

Discussion

In the system where this issue was found, there was a 400psi pressure loss from the pump to the last manifold in the system. The pressure loss is due to line restriction and therefore operates in both directions. A 1200 psi pressure generated 800 psi in the last manifold in the system. The 800psi manifold pressure could only drop to 400 psi during the pause cycle. The combination of back pressure and internal spring forces in the #9 injector prevented the injector from reloading. It has been determined that a #9 injector needs to be at 100 psi or less for it to reload easily.

Most #9 injectors are used on 5th wheels which have a short mainline. Pressure quickly falls below 100 psi and reload is achieved. For unique long mainline applications this may not be the case. The residual manifold pressure for other injectors doesn't need to be as low, as the spring forces within the injector creating resistance to injector shuttling spool motion are much lower. For the application where #9 injector reload became a concern, a #8.5 (0.7cc) injector functioned properly.

Recommendations

1. Ensure that manifold pressure falls below 100 psi when using #9 injectors (check with pressure gauge in manifold)

or

2. For long line applications use two smaller injectors to achieve similar grease delivery. Feed a grease point with two injectors through a tee fitting. Examples: 2 #8 injectors (0.4cc) deliver 0.8cc; or a #8 and #8.5 injector deliver 1.1cc. A secondary check valve is not required when teeing two injectors together.
3. Reduce mainline length if possible, which may require longer secondary lining.
4. Reduce mainline restriction by using larger ID mainline.
5. Install a secondary pump.

Future Developments

Components for internally modified injectors are being procured to test the ability to increase #9 injector reload pressures. These modifications will be subjected to fatigue testing to determine their viability.