Do you really want to play injector roulette?

QUALITY...there is no “free lunch.” The Cummins ReCon® CELECT injector plant looks more like a laboratory than an injector remanufacturing facility. Everything is the latest in Cummins fuel systems technology for CELECT. The wall-to-wall equipment is truly impressive. And clean? That’s part of the process... even dirt that you and I can’t see is a problem when these products are being produced. With a price tag of well over one million dollars to do this product, it’s safe to say that it’s not easy to do a CELECT injector right.

DON’T PLAY INJECTOR ROULETTE. In the past, people who would clean, repair and rebox injectors could do it with a fairly low risk of product quality issues. No more! This approach simply does not work with today’s CELECT injector. Getting a CELECT injector to original performance specs is 20 times more complicated than it used to be. Mechanical injectors have one high pressure sealing joint while CELECT injectors have ten. In addition CELECT injectors have a much tougher cleanliness requirement and are much more difficult to assemble. Even if a rebuilder could assemble a CELECT injector, they would have no idea if it would work unless they have very specialized testing equipment. Plus there are critical hydraulic flow specifications that must be met in order for the engine to idle properly. Assessment of these characteristics requires additional specialized equipment that is only available to Cummins. In other words, if you buy CELECT injectors that are not genuine Cummins ReCon®, sooner or later you are going to have problems.

DISTURBING RESULTS. To prove the point Cummins engineers purchased samples of injectors from three competitors and put them to the test. The results are not surprising, but they are disturbing—especially for those who run non-genuine injectors. We’ll tell you what we learned by examining these injectors from competitors who claim to match OEM quality. Hmmm?

COMPETITOR A. Close examination revealed that two of five injectors had non-usable spill ports. This causes the injector to deliver excessive fuel to the engine creating rough idle, smoke, poor fuel economy and engine misfire. ReCon® has carefully studied this defect and only uses acceptable components based on proper function. Some of the core we receive has this same problem. The difference is that we have a remanufacturing process that includes a visual inspection with documented criteria to make sure this kind of defect never makes it into a Cummins ReCon® box ...and our customers sure do appreciate it.

The injectors were placed on a test rig that simulates engine operating conditions. One of the injectors failed miserably. The tip of the cup actually broke under normal operating stress causing an immediate loss of pressure. If this injector would have been on an engine it would have failed after only 44 hours of operation and left the customer stranded on the highway.

Key Take-Aways

- CELECT Injectors are 20 times more complicated than PT injectors and demand serious expertise to remanufacture
- A multi-million dollar investment is required to do the job right
- Specialized testing equipment available only to Cummins guarantees Cummins ReCon quality
- All three competitors failed to remanufacture CELECT injectors successfully on a consistent basis

This broken tip would leave a customer stranded on the side of the road.
COMPETITOR B. We purchased six injectors from Competitor B and, right out of the box, we noticed a wire defect that could easily short circuit the injector causing immediate failure. Next, Cummins engineers performed tests and measurements on twelve criteria. Eight of the twelve tests resulted in failure:

- 6 of 6 injectors had nozzle assembly and functional defects. Some had multiple defects.
- 4 of 6 injectors had nozzle defects
- 3 of 6 injectors were out of spec on barrel and plunger flows
- 5 of 6 injectors were out of spec on injector fuel delivery
- 4 of 6 injectors had internal high pressure leaks
- 4 of 6 injectors had external leakage
- One cup and one metering barrel actually broke while testing for durability on the rig.

What does this mean for the customer? 100% of the injectors in this set would have failed in the engine. The failures range from critical, immediate failures such as broken components to failures that would dramatically reduce engine durability. If these injectors would have made it onto an engine, the customer would experience rough idle, misfire, loss of engine power, poor fuel efficiency, dilution of the engine oil with fuel due to leaking injectors and excessive train wear. In addition, this set of injectors from Competitor B would cause the engine to be non-compliant with emission standards.

COMPETITOR C. We purchased six injectors from our next competitor and discovered how consistent our competition is when it comes to defects and failure. Again, our engineers performed tests and measurements on twelve criteria.

This time, seven of the twelve tests resulted in failure:

- 4 of 6 injectors had nozzle defects
- 4 of 6 injectors had the barrel and plunger assembly not functioning to specification
- 3 of 6 injectors were out of spec on injector fuel delivery
- 4 of 6 injectors had internal high-pressure leakage
- 4 of 6 injectors had external leaks
- 5 of 6 injectors failed a barrel examination
- 3 of 6 injectors had mismatched parts

Most of these deficiencies would not cause immediate engine failure, but over time the customer would experience degradation in engine performance. The injector’s incorrect assembly would however cause immediate engine failure. The individual components were evaluated against the latest Cummins engineering standards for material variation and to determine if the latest engineering changes from Cummins are employed in their process. During this process we discovered that the competitor uses the incorrect style injector spacer valves with the wrong subassembly components. This outdated design causes increased fueling over time. Cummins solved this problem by redesigning the subassembly components.

CONCLUSION

All three competitors were unable to remanufacture CELECT injectors successfully on a consistent basis. This is not surprising when you consider the complexity of the product, the tremendous financial investment necessary for remanufacturing/testing equipment and the amount of engineering talent required to do the job. If you want happy customers, make sure they only run with genuine Cummins ReCon® CELECT injectors.