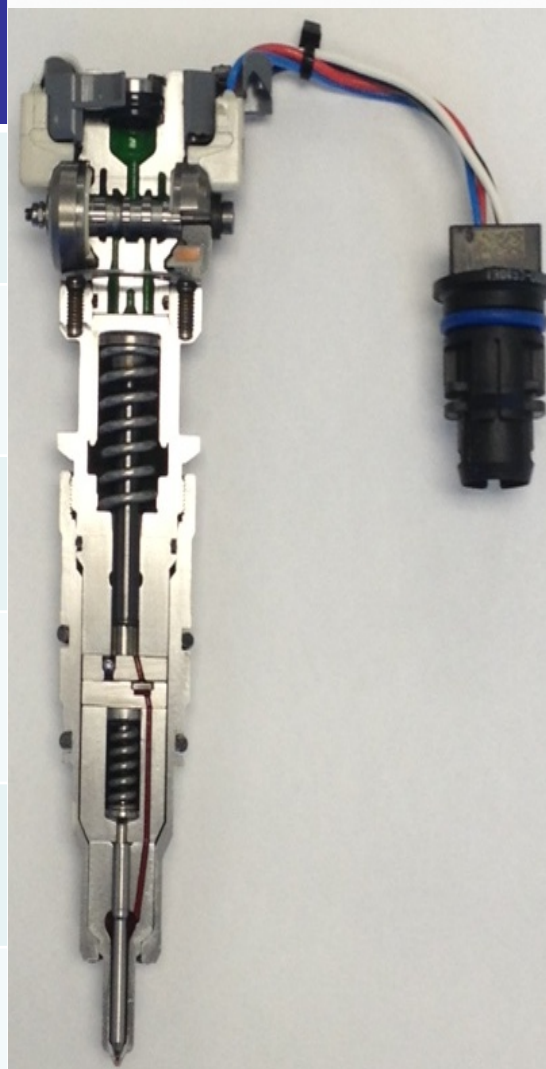


Remanufactured 6.0L Injector Comparison

Tab #	Injector Component*	PurePower	Competition	PurePower Benefit
1	Coil Assembly	Cold start design fix added to solenoid coil	Mixture of parts found with and without cold start fix.	Proven OEM fix to cold start spool stiction issue.
2	Intensifier Body & Plunger	100% Re-honed IB to OE match clearances	Reused sets with higher match clearance	Greater Durability and reliability. Minimal fuel in oil dilution found in engine.
3	Control Valve Body & Spool	High pressure clean the Body and match New Spools	Used Body and Spools	Optimal injection pressure and operation
4	Tip Leak	100% in process verification of seal of outer components to OE level	Parts found new in box that fail OE leak tests.	Reduced chance of failure due to gas ingestion. Emissions performance.
5	Intensifier Spring	Always replaced with OE part	Used in many cases. Springs are worn and short.	Superior robustness and cold start ability.
6	Nozzle	Meets OE specification for needle lift.	May use parts with high needle lift	Nozzles have longer life expectancy.

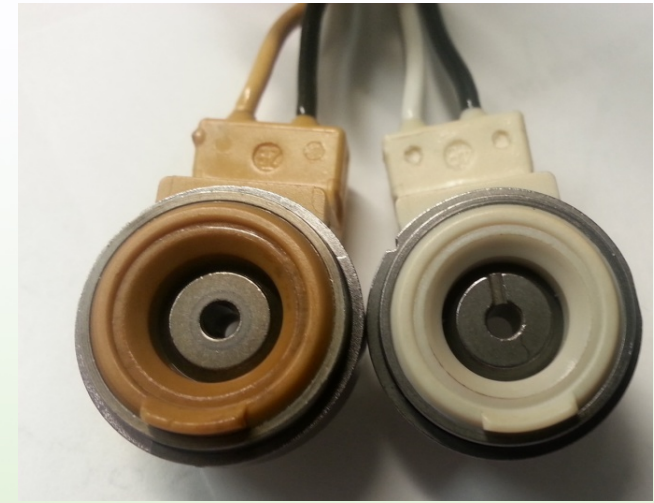


**** All PurePower remanufactured fuel injectors are tested on the same equipment as new components***

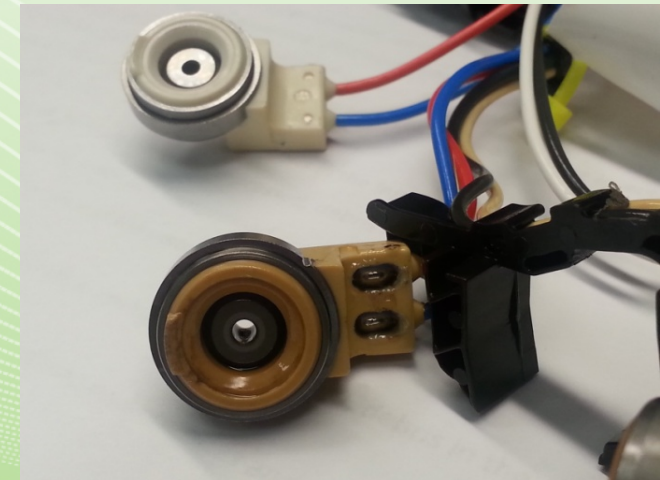
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1 Coil Assembly

- **PurePower** Makes sure that all endcaps used contain the design fix for engine cold start concerns. Each coil is performance evaluated individually and then also as an injector assembly. Only PPT has access to OE replacement coil parts
- PPT will only reuse parts which meet the same standards as OE. We have not found any acceptable rework procedures to repair damaged solenoid coils.
- **Competitors** re-uses and rework all kinds of coil assemblies.
 - Very few competitor parts, inspected, have the cold start fix installed. The lack of this design change will likely lead to engine starting issues that are most severe in cold conditions.
 - Competitors attempt to rework by resoldering connections to the solenoid coils. The overmolding provides support for the joint against vibration and spool impacts. Modifying it in any way may cause coil failures resulting in a complete injector failure.



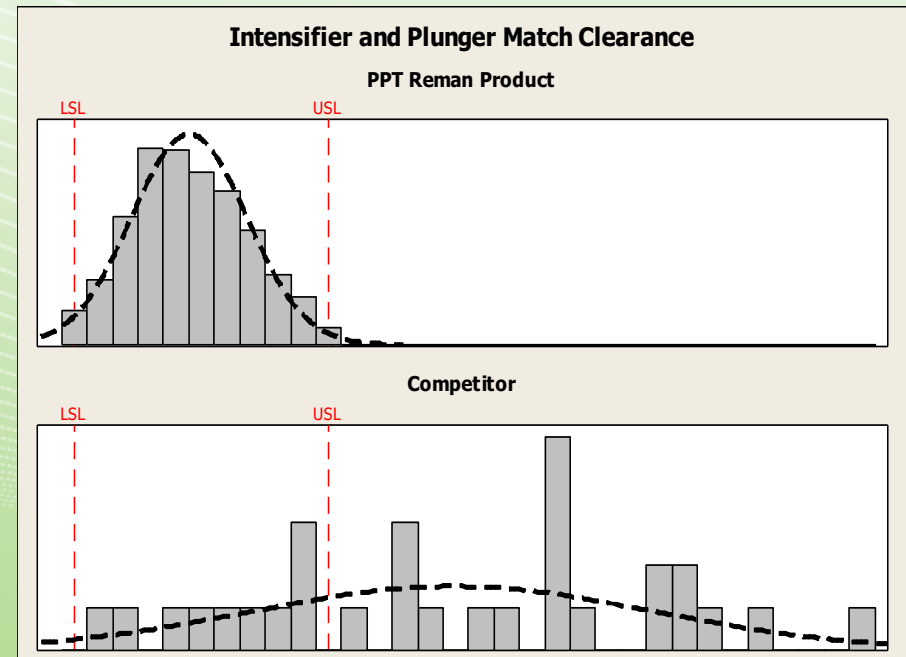
Cold start coil on right



Competitor repaired coil below

2 Intensifier Body and Plunger

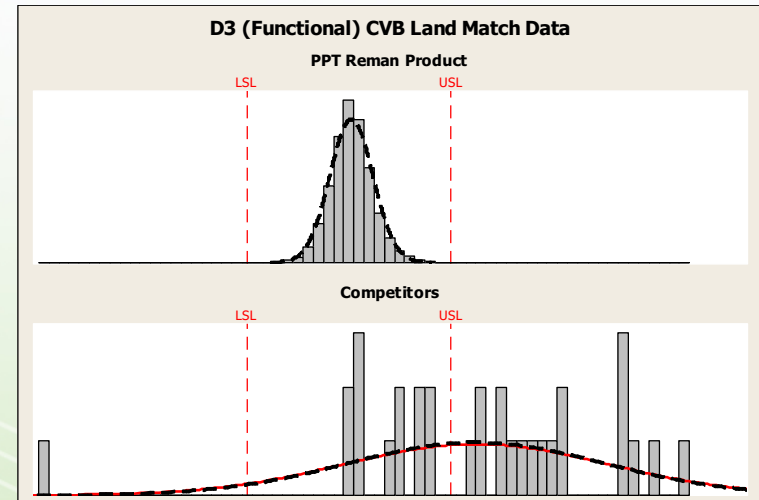
- **PurePower** intensifier body and plunger are precision match honed to operate at extreme pressures and temperatures.
- 100% of PPT Reman intensifier bodies are re-honed to certified plungers using the OE process and spec.
- Good and bad parts can't be visually differentiated for this feature.
- **Competitors** reuse the plunger and bodies without any rehoning, leaving an increase in plunger body clearance. High match clearance causes excessive diesel fuel in oil dilution, which can reduce the lubricity properties of the engine oil. This, in extreme cases, leads to engine failure.



3

Control Valve Body and Spool

- Both the control valve body and spool are precision ground to specific diametrical tolerances and 100% checked for clearance and sealing.
- PurePower** Verifies Reman CVB's and spool 100% dimensionally. The assembly is also leak tested on the injector to detect issues that can't be found in the individual parts.
- Competitors** re-use these parts as is with high CVB match clearances. This could lead to
 - Engine hard start as the injector fails to build necessary pressure to inject.*
 - Reduce performance at the top of the power band as the pump can no longer overcome the fluid losses to reach necessary rail pressures.*
 - Misdiagnosis of other injectors on rail as failures due to non firing.*

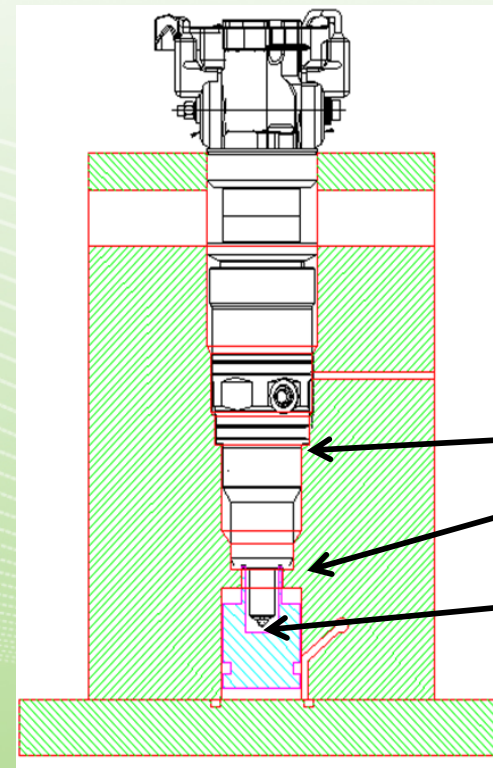


Worn edges of CVB Spool

4 Tip Leakage

- Being directly in the cylinder, the foot of the injector forms part of the seal which contains gases during operation.
- **PurePower** Verifies 100% that injectors will seal against the cylinder back pressures. This test checks multiple sealing joints within the injector.
- **Competitors** injectors have been found to fail PPT OE level leak tests. An injector that leaks will.
 - *Increase the risk for broken internal components due to cavitation.*
 - *Generate high levels of exhaust smoke levels leading to performance and or emission concerns.*
 - *In engine applications with a Diesel Particulate Filter installed. The filter will clog faster leading to excessive regeneration cycles.*

Supplier	Parts Failed for Tip Leak
Supplier A	1 out of 15
Supplier B	5 out of 15



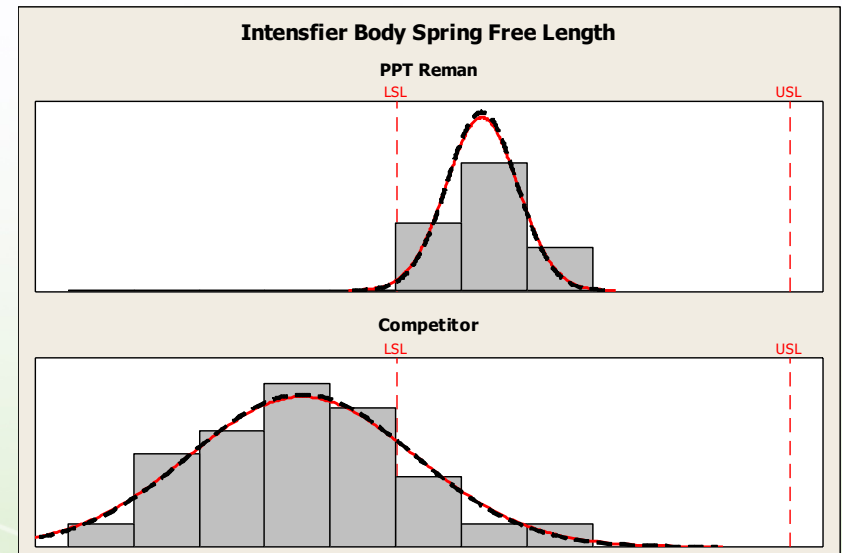
Leak Points

1. Lower O ring
2. Cone Nut and Nozzle
3. Needle and Nozzle

Tip leakage test fixture

5 Intensifier Spring

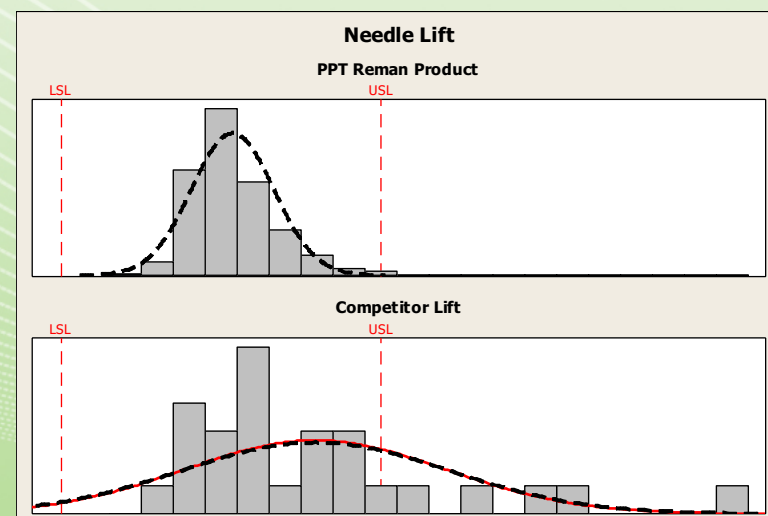
- The springs are designed to provide consistency to the return of the moving injector components between injections.
- **PurePower** Always replaces the springs with the same new OE parts that have always been used.
- **Competitors** re-use these parts even if they are worn or shortened. This could lead to
 - *Starting issues in cold weather as the fuel pressure can't return the plunger between injections by itself in these conditions.*
 - *Possibility for the piston to bottom out in the intensifier body causing damage to both parts. In worst case complete injector failure can occur.*



Spring found in competitors injector on left

6 Nozzle Assembly

- The nozzle, with its high accuracy spray holes, atomizes the fuel to a precise pattern
- **All PurePower** remanufactured nozzle assemblies are chemically treated and micro brushed to remove carbon and fuels prior to inspection and test. Each nozzle is then tested for proper performance by checking the flow, needle lift, and leakage. All remanufactured nozzles that do not meet the validated specifications are replaced with new nozzles.
- **Competitors may use nozzles which would have failed PPT's flow and needle lift test. Nozzles with high needle lift measurements have**
 - Higher impact loads from the needle on to the sealing seat. This can accelerate seat wear leading to cracked nozzles
 - The time to shut the injector at the end of an injection increases. This can cause over fuelling, soot and smoke.



Things That Set US Apart from Our Competition

- **Knowledge & Experience**



PurePower has 14 years of design experience, understanding the design intent of each component which could effect vehicle performance.



PurePower is the injector Original Equipment Manufacture (OEM). Injectors are remanufactured following the same strict manufacturing processes as new.



Competitors produce and market our injectors at low prices by salvaging parts which are outside of tolerance. Worn out features are not reworked, changing the geometry of the injector itself. Leaving it unable to function as intended in the engine leading to reduced performance or complete failure.



FUEL INJECTION
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DIESEL **DONERIGHT**

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Things That Set US Apart from Our Competition

- **Quality System**

- **PurePower** has a receiving and inspection process for all supplied components that has been implemented since 2000
- **PurePower** uses gages which meet the TS16949 certification requirements
- **PurePower** has an implemented Corrective Action Process which has a Continuous Improvement Process built into the system
- **PurePower** uses calibrated OEM Test Equipment
- **PurePower** has a fully implemented **QUALITY SYSTEM** as demonstrated by industry leading injector remanufacturing quality
- **PurePower** has a complete **WARRANTY Dept** as required by industry leading OEM injector manufacturing quality, with complete metallurgy and forensic lab



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