



**Oronite**

video transcript

## testing oronite's heavy duty engine oil technology

### **Jimmy Pitta, field test engineer**

Field test is where the magic happens because we deal with things like load, duty cycle, and temperature extremes. This provides us feedback from real-world conditions. I think Oronite does have a world-class field testing program.

### **James Booth, lead research engineer**

We validate technology in the field because we fully understand this is where technology needs to be proven. In addition to the integrity of the product based on lab, engine, and field testing, we build robustness and confidence in the claims through statistical design.

### **Jimmy Pitta**

So there's three things that we look for when we choose a field test site. First one is the engine manufacturer. So the second thing we look for is maintenance. So the fleet has to have a good maintenance record. And the third thing we look for is mileage.

So what we look at with injectors is we're looking at the tips themselves to make sure that there's no carbon buildup and that the ports are open. We also look at the tip to make sure that there is no threading or any issues.

We look at the rollers themselves, verify that there is no issue with the rollers, that they're all free and that there's no pitting or threading.

First, we start off by looking at the liners. We look on the outside just to verify that the coolant was doing its job, making sure that there is no pitting or rust on the outside. Then we look on the inside to verify that there is cross hatch and that there is no polishing.

We also take a look at the cams. Look to see if there is any scratching, any issues, any wear, any pitting. We'll take this part back to tribology. They'll take a look at this area and try to verify the integrity of the metal itself.

### **James Booth**

A foundation of product development is based on a fundamental mechanistic understanding of what's going on in the engine and how additive chemistry behaves.

This is an area that we invest very heavily on and is a constant throughout. This helps feed a pipeline of new chemistries and also a combination of chemistries called additive packages. From there they go through very rigorous bench and lab engine testing. We've also developed our own in-house tests for screening that in some cases are even more rigorous than the industry standard.

### **Jimmy Pitta**

In addition to rigorous in-house testing, used oil analysis is conducted during the entire duration of a field test. Used oil analysis can provide an early indication of potential issues and is also used to confirm good added performance through oil drain intervals.

So when we're looking at the cam bushing, here, we're looking at percent overlay that's been removed. We run a number of different formulations on the same type of engine. And that way, we look at the relative wear across all formulations.

We look at the bearings. And this is the lower half where we don't see too many issues, just a little bit of discoloration.

So with the pistons, we start off with looking at the top of the piston. We look for carbon buildup and you'll see the markings from how the injectors are firing. That's one way to show how well the injectors are doing, also. So from there we look at the lands, we use the CRC rating method to rate each land. And also the grooves. So we rate carbon within the grooves.

So we also look at the rings. We give it a percentage on how much is actually contacting the liner. And that indicates how well they ran in the engine.

So, here we're rating the piston. We use the CRC rating method to rate the piston. We do that for each of these segments. So the top, second, and third land. The top groove, the second and third groove.

So the rating method and what it does, is it tells us how well the engine has performed. How well the additive is working. So, of course, the less carbon in there the better control that we had.

So the truck that we looked at this week is very typical for a field test. Truck has about 540,000 miles on it. We look at everything. So everything gets inspected and photographed. We think this field test is critical to validating the formulation of our test oils.

#### **James Booth**

We invest heavily in data collection. So it's something we can build into connected performance models to support product claims. We are dedicated to advancing heavy duty engine oil technology. Therefore, we formulate with a forethinking approach.