

MAKING AFTERTREATMENT AN AFTERTHOUGHT

Isuzu's newest compact diesels highlight maintenance-free aftertreatment for Tier 4 final



Isuzu Diesel has unveiled new engines designed to meet Tier 4 final engine emissions regulations. The 4JJ diesel is an inline, liquid-cooled, four-cylinder engine with a displacement of 2.99 L available in ratings of 112 and 93 hp. It utilizes a selective catalytic reduction (SCR) system that the company said is designed to last the life of the engine.

BY MIKE BREZONICK

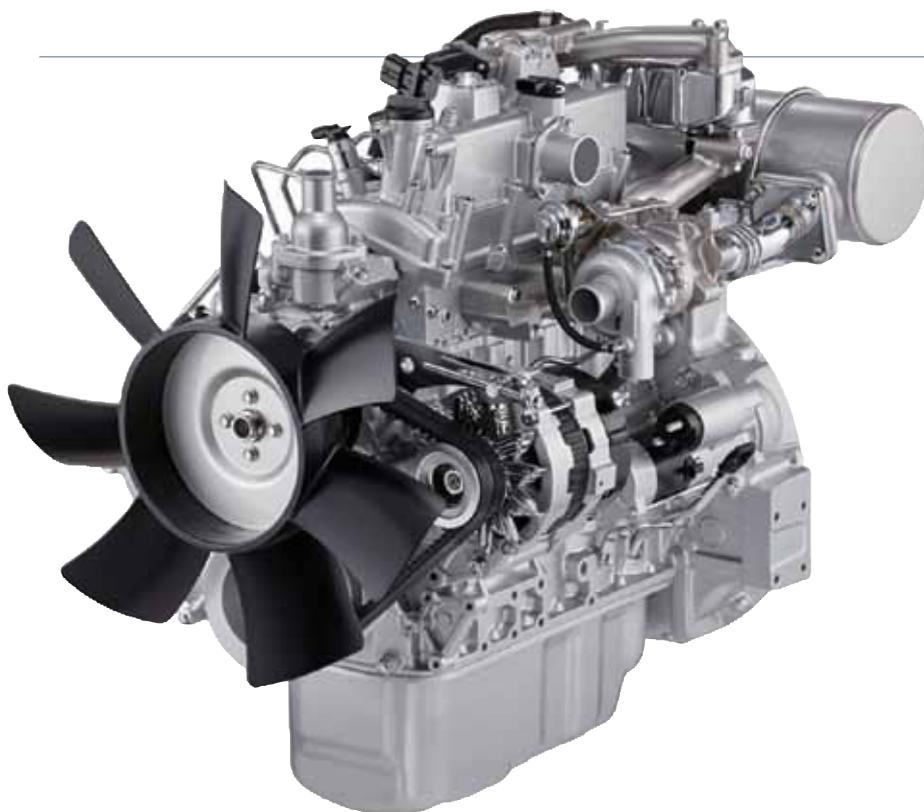
As Tier 4 interim and Tier 4 final exhaust emissions standards have made their way through the various power bands of the off-highway diesel engine industry, they have brought with them an alphabet soup of technical acronyms, particularly relating to aftertreatment systems. Along with cleaner air, it's fair to say that such technologies as DOCs, DPFs and SCR have brought with them more than a little anxiety, as the equipment

and operating community wonders about issues such as durability, longevity and service requirements.

With that in mind, Isuzu Diesel is launching its newest Tier 4 final diesels underscoring a simple message: when it comes to the aftertreatment used on its engines, it won't be worth worrying about.

"We're going to find our niche with SCR and aftertreatment that's maintenance-free," said John Dutcher,

director, Sales & Marketing at Isuzu Diesel's North American headquarters in Plymouth, Mich. "We're truly different in going that route. We're going to make sure that it's a set-for-engine-life product — that once it's validated to be used in an application, it's going to work in all environments that application will be trouble-free. That extends beyond the engine, into the exhaust aftertreatment including the urea dosing system.



Isuzu's new 4LE2 diesel is a four-cylinder, liquid-cooled 2.197 L engine that is available in ratings of 62 and 66 hp and utilizes a diesel oxidation catalyst to meet Tier 4 final emissions standards.

"We historically have had very low warranty rates with our engines and we expect to keep it that way, even with the SCR products."

The first new Tier 4 models being launched by Isuzu are the 4LE2 and the 4JJ1 diesels. The 4LE2 engine is a four-cylinder, liquid-cooled engine with bore and stroke dimensions of 85 x 96 mm for a total displacement of 2.197 L. While engineered to provide a compact envelope (29.1 in. long, 30.4 in. wide, 30.4 in. high with a dry weight of 478 lb.) for a broad range of small mobile and stationary equipment applications, it is available in ratings of 49 and 62 hp at 2400 rpm and 40 and 66 hp at 1800 rpm. Maximum torque is 159 lb.ft. at 1800 rpm.

The inline four-cylinder, overhead valve engine is water-cooled and incorporates a number of components that contribute to high efficiency and reduced emissions, the company said. These include an electronically controlled high-pressure common rail

fuel injection system, wastegate turbocharger and an exhaust gas recirculation (EGR) system that combines a high-efficiency plate-and-fin cooler with a variable control EGR valve.

A lube-oil cooler also provides for longer oil change intervals and improved performance, the company said.

To meet the Tier 4 final emissions requirements, the 4LE2 diesel also incorporates diesel oxidation catalyst (DOC) aftertreatment with a metallic substrate that is designed for durability and reliability.

"We've learned a few lessons from our automotive side," Dutcher said. "To meet the on-highway standards in North America, we still apply a DPF (diesel particulate filter) in the exhaust stream. That's not necessary for off-highway and we can offer the DOC with confidence.

"From an economy of scale standpoint, we are able to use the same catalysts, but they're packaged much differently than on the automotive side. We use more robust containers. Being

part of a high-volume automotive manufacturer, we've learned how to do that."

The larger 4JJ1 diesel is an inline, liquid-cooled, four-cylinder engine with a bore and stroke of 95 x 105 mm and an overall displacement of 2.99 L. Available in ratings of 112 hp at 2200 rpm and 70 and 93 hp at 1800 rpm, the engine offers a maximum torque of 276 lb.ft. at 1800 rpm.

Like the 4LE2, the 4JJ1 engine utilizes dual overhead cams, a high-pressure common rail fuel system and either a wastegate or variable geometry turbocharger. Also like its smaller sibling, the 4JJ1 employs the same high efficiency cooled EGR system and DOC, but adds an SCR system. With that, it still maintains a compact configuration (30.8 in. long, 28.6 in. wide and 33.3 in. high) and dry weight is 723 lb.

A benefit of the Tier 4 final engines will be an improvement in fuel economy in many applications, Dutcher said. "They'll be certainly as strong or stronger than Tier 3 in terms of fuel economy," he said. "And versus Tier 4 interim products which primarily were (particulate) filter products, there was a regeneration process with those that could reduce the fuel economy.

"We're confident our engines will be leaders in the industry in terms of fuel economy."

Dutcher said that the engines would be validated for each application to ensure that there are no issues later on. "We're going to prevalidate the dosing system, the cooling package, the exhaust run, the air intake system — those are going to be applied to accommodate configurations for a variety of applications and they'll be fully engineered ahead of release," he said.

"We have strong installation guidelines and once the engine is validated that application and those rules are followed, we're confident we have better engine solutions for 2014 and into the future." **dp**

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