

A first report behind the wheel of Navistar's 2010 diesels

We'd heard lots of talk from Navistar International about its 2010 diesels, which use a different technology than all other engine makers to meet strict new federal emissions standards that go into effect Jan. 1. And we've seen displays of the new engines at several truck shows. But hearing and seeing is not necessarily believing for reporters, so last month the company put its products where its collective mouth was.

The company assembled a group of International trucks and tractors powered by very clean-burning 2010-model MaxxForce engines and turned them over to trade-press editors for riding and driving. What we saw were diesels that ran cool, just as Navistar executives had been saying and in spite of competitors' contrary speculation.

Of course, the Chicago-area event happened on a rainy and chilly day. Under these conditions engine heat wouldn't be an issue for anybody. Yet in mid-October it could've been 30 degrees warmer, and it's likely that the engines with Advanced Exhaust-Gas Recirculation and other enhancements would have performed as well had it been. Executives promised us later experiences in hotter weather.

Navistar might just have something with these A-EGR diesels, and the company will be a real contender in sales wars against competitors using selective catalytic reduction-equipped 2010 diesels. That's based on drives of two trucks (Executive Editor Steve Sturgess drove two others) and on a briefing at the event.

Trucks provided included medium-duty DuraStars with MaxxForce

keeping their COOL

7 V-8s, heavy-duty ProStar tractors with MaxxForce 13 inline-6s, and a medium-heavy WorkStar with the midrange MaxxForce DT, the latest iteration of the venerable and highly regarded DT466.

For starters they assigned me to the WorkStar, and off I went into Chicago's northwest suburbs.

WorkStar

Navistar engineers spec'd the WorkStar as a development test bed, so it wasn't set up for any customer application. That explains its Eaton Fuller 10-speed manual transmission, which otherwise would not be found in a truck like this. Lou Maza, a senior project engineer who rode shotgun, explained that this tranny is likely to be pulled and replaced with others over the truck's life.

But of course the point of this ride was the engine, and it behaved just fine. The much-refined 300-horse-

power 6.4-liter diesel ably moved the 30,000-pound truck (16,000 pounds of chassis and 14,000 pounds of concrete blocks on a flatbed body) away from the many red lights we encountered on our two-hour, 40-mile trek along boulevards and semi-rural highways. At first I used a light foot and every gear beyond 3rd, which was low enough for starting on level pavement, but acceleration was way too slow. After a while I put my foot into it and skip-shifted in Low range to get us up to speed in shorter order.

The engine would rev as high as I wanted, but I usually up-shifted at 2,000 to 2,200 rpm and cruised at 2,000 and 40 to 45 mph in 9th gear. A few times I got it into 10th and 50 to 55 mph, where revs were below 1,600. On the tollways the truck loped along at 65 mph and 2,200. At low revs the engine didn't complain, but there was more power at 1,500 and higher, and 2,000 was good for speeding up and slowing down with traffic. Power and torque output seemed almost completely even throughout the usable rev range, with no "lighting up" at any point on the tachometer.

The one gauge I checked often was for water temperature, and it stayed right at 180 degrees throughout the trip with no help from the fan, at least none that I heard. Maza and his colleagues seem to have gotten the cooling system to perform consistently and flawlessly. I jokingly accused him of gluing the needle

Tom Berg • Senior Editor



The ProStar for 2010 is powered by the International big-bore MaxxForce 13 rated 475 horsepower, which uses Advanced EGR to meet the latest EPA regulations. The truck rode quietly and pulled strongly at a full 80,000 pounds.

erating away from a turn.” He also drove a DuraStar with the MaxxForce 7 V-8 (see sidebar).

My ProStar drive was brief, but enough to show that its cooling system kept water, and the engine, at a constant and low temperature, the same 180 as with the MaxxForce DT in the WorkStar. I repeated my accusation about the gauge needle – “You glued it at 180, didn’t you?” – to Regula, and he laughed, too.

“No, no, that’s how it’s supposed to work,” he said. Cooling systems on all trucks also worked well in high-altitude tests west of Denver, he said, along I-70 through the Eisenhower tunnel (11,158 feet above sea level) and on

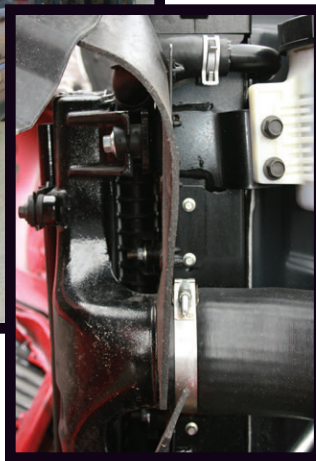
Loveland Pass (11,900 feet) on a twisting stretch of U.S. 6. Thin air up there makes engines run hotter and heat exchangers less effective, but Navistar’s cooling modules did what they are supposed to.

The details

In a morning briefing, engineers led by Ramin Younessi, group vice president for product development and strategy, explained the features of the engines.

On both medium- and heavy-duty trucks, a 2010 cooling module includes a large, two-core radiator, an air-to-air charge air cooler and an air conditioning condenser. Most MaxxForce diesels will be double-turbocharged, and big-bore versions

The midrange MaxxForce DT on the WorkStar, hidden behind pipes, filters and a fluid bottle, ran cool on its suburban run, with the water-temp gauge staying practically fixed at 180 degrees.



The International cooling package consists of the air conditioning condenser and the interstage cooler up front, the charge-air cooler next, then the high temperature cooling heat exchanger and finally the main vehicle radiator. There’s also a fan shroud for optimal fan performance. Engines run cooler than previously despite additional EGR flows.

right at 180. He did acknowledge that this day’s wet, chilly weather helped keep the radiator and engine cool, but the gauge wouldn’t show much more than 200 degrees even in hot, dry conditions.

ProStar

It was the same story in the ProStar sleeper-cab tractor. It had a MaxxForce 13 with the maximum rating – 475 horsepower and 1,700 pounds-feet – and was coupled to an Eaton 13-speed. Happily, I had no trouble with this tranny, which shifted easily almost every time, including high and low splits of the top four gears. Splitting wasn’t needed on tollways, but was fun to do and somewhat useful on ramps. In 8th-high (the 13th ratio) and 65 mph, the engine loafed along at under 1,300 rpm, right where it should be for top economy, said my rider, Mike Regula, director of Navistar’s big-

bore engine program.

Steve Sturgess drove two other ProStars with this engine (he got one stuck on a muddy shoulder, but never mind about that), and reported that despite the MaxxForce 13s making 100 pounds-feet less than a typical 15-liter engine, the 13s performed well enough.

“On the relatively flat topography out the Northwest Tollway to Rockford and back, once in the top hole, there was no need to shift the transmission because the engine would lug down well and just hang in,” he said. “I found shifting at 1,400 rpm and splitting the ratios in the high side of the transmission (one had an 18-speed, the other a 13-speed) got the truck up to speed well on entering the freeway or accel-

will have a water-to-air cooler between the two turbos, as do current models, while midrange diesels won't need the "interstage" air cooler. Recirculated exhaust gas on midrange models runs through a single-pass cooler before going to the intake manifold, while big-bore

engines use a two-pass gas cooler.

A-EGR, Younessi said, is far more than just upping the EGR that was used on EPA'07 engines. Navistar's 2010 diesels will also have enhanced

combustion-chamber design, more capable electronic controls, and very high-pressure fuel injection.

On the MaxxForce 13, pressures at the injectors will be as high as 32,000 psi, but will be much lower in the rails and fuel lines to minimize leaks.

There'll be considerable weight advantages, they say – 300 to 400 pounds because Navistar will avoid SCR and its heavy and bulky equipment, and another 500 to 600 pounds if Navistar customers buy the idea of choosing a 13-liter diesel instead of a 15. (They'll have to for six to eight months into the new year, because the new MaxxForce 15 won't be ready for a while.)

Competitors have been calling Navistar's Advanced EGR rates "massive," but they're not, Younessi insisted. A-EGR will run no more than a 37 percent exhaust-gas rate at the intake manifold, with the other 63 percent being clean air, and the rate will average about 25 percent. Recirculated exhaust gas displaces oxygen and cools combustion, which lowers formation of NOx. Navistar's rates are only a few percent higher than competitors' 2010 diesels using EGR as well as SCR. Fuel economy will be as good or better than current engines, and improved aerodynamics on ProStar highway tractors will make them even more competitive, he said.

Asking whether these engines will hold up in day to day service for a long time might be a bit like asking a barber if you need a haircut, but I asked it of Lou Maza anyway. "Absolutely," he declared. "Sure, these are our products, but from what I've seen, they're doing very well." Testing in labs and in Navistar's own trucks has covered many millions of miles, Younessi had said, and MaxxForce-powered vehicles will soon be in customers' hands for their own trials. Those and user experience in coming years will truly tell the tale. ■

DuraStar's a Treat



An additional treat at the ride 'n drive was the DuraStar, the Class 6 chassis powered by the MaxxForce 7 diesel. This V-8 is now exclusive to International, as Ford is going its own way with its in-house Power Stroke diesel.

But this 6.4-liter V-8 is much more than a pickup truck engine. For 2010 it goes to 300 horsepower and 660 pounds-feet of torque. This dispels the myth that additional EGR to meet the new emissions limits makes high output difficult to achieve from small displacement. Indeed, this rating is likely to be popular in a wide variety of applications, including beverage and roll-back towing whose operators prefer a little extra horsepower.

We found the demo truck to be quiet and civilized, and well able to keep pace with freeway traffic. With its 6-speed Allison transmission it was a joy to scoot around urban and suburban neighborhoods. The seating position is high and the big windshield gives a great forward view, especially close-in as the nose slopes down in front. The diesel is relatively quiet and the overall impression is of an oversized sport-utility, with precise steering and good, all-disc hydraulic brakes.

Loaded to 24,000 pounds, it showed the latest MaxxForce 7 is well able to haul around diverse loads, from a busful of school kids to a full load of soft drinks. And it gives the driver a really relaxing ride while it is doing it.

— Steve Sturgess, Executive Editor

The DuraStar gets higher ratings with the MaxxForce 7 V8 now going to 300 horsepower and 660 pounds-feet of torque. Additional vocations are seen for the truck, with beverage and roll back suitable targets for the higher V-8's performance.



The V-8 is a tucked in under here, though hard to see. Twin turbochargers in series flow significant air with good throttle response. The big control unit in foreground will become the common engine controller across all MaxxForce engines.

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