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HEAVY-DUTY TRUCKS



HERE COMES
2010

Some of the expected anxiety about the introduction of selective catalytic reduction (SCR) technology into the North American truck markets is being assuaged by very extensive testing being done by the truck manufacturers and their customers. Good examples are the two Freightliner Cascadia trucks with BlueTec SCR technology that were supplied to Schneider National earlier this year. The two trucks have amassed more than 50,000 miles since January.

COOLING THE PASSIONS

Historically poor truck sales combined with test results have removed much urgency surrounding EPA 2010 emissions choices

Go back about a little more than a year and it would be hard to imagine that anything could possibly overshadow the upcoming EPA 2010 emissions standards as a topic of discussion in the North American truck market.

But if there's one acronym that carries a greater weight these days than "EGR" and "SCR" among truck and engine manufacturers and their fleet and owner-operator customers, it might be this: *GNP*.

The economy and the historic low sales levels seen in the Class 8 markets over recent months have taken some of the heat out of the ongoing EGR vs. SCR battle as manufacturers and operators alike have focused more on surviving now than worrying about 2010 and beyond.

Yet another reason why there just doesn't seem to be quite as much argument as expected might be simply because the technology least familiar to the market — namely selective catalytic reduction (SCR) — appears to be answering a lot of questions, thanks to millions of miles and greater expo-

sure through myriad test programs and fleet trials.

Examples are the first two BlueTec emissions technology customer demo units (CDU) that were delivered to Schneider National, the nation's largest privately held truckload carrier, earlier this year. BlueTec is the SCR technology being used by Detroit Diesel in all Daimler Truck vehicles. Delivered in late January 2009, the Schneider CDUs are Freightliner Cascadia trucks equipped with Detroit Diesel DD15 engines. The two trucks have logged nearly 50,000 miles in regular service, and Steve Duley, Schneider's vice president of purchasing, said that Schneider is paying very close attention to the operation of the test trucks, to the tune of providing Detroit Diesel feedback every day.

"By actually field testing the technology, we are putting the units into real-life situations, which ultimately helps Detroit Diesel engineers to identify every possible issue in advance," said Duley. "We are confident the experience we gain from CDUs will give us additional time to prepare for the transition."

Schneider National has been a Detroit Diesel customer since 1991, and more than 90% of its 13,000-plus vehicle fleet is equipped with Detroit Diesel engines.

BlueTec technology has been applied to more than 200,000 trucks in Europe since 2005 and has amassed more than 13 million miles in testing and operation. By its rollout on Jan. 1, 2010, Detroit Diesel said BlueTec will surpass 25 million miles of testing — making it one of the most proven and tested emissions reduction technologies ever, the company said.

It will be commercially launched on the DD16, the most powerful engine offered by Detroit Diesel. The new 15.6 L diesel is targeted toward owner-operators, specialized heavy-haul applications and small fleet applications.

The third in a series of all-new heavy-duty engines engineered as a common platform design leveraged globally by Daimler Trucks, the DD16 incorporates the same amplified common rail fuel system (ACRS) and

HEAVY-DUTY TRUCKS



Mack Trucks said it has tested its SCR technology in both over-the-road and vocational applications, and said that customers operating test trucks have reported excellent performance, power and fuel economy.

turbo compounding technology as the earlier DD15 and DD13 (see February 2008, *Diesel Progress North American Edition*). It will be offered in a variety of outputs from 475 to 600 hp and torque ratings from 1750 to 2050 lb.ft.

The DD16 will be available in Western Star and Freightliner heavy-duty trucks in March 2010. The engine will be assembled beginning in 2010 at Detroit Diesel's production facility in Redford, Mich.

Mack Trucks said customer response to real-world testing of SCR-equipped Mack trucks confirms that SCR is a mature and established technology with significant support in vital industry sectors, according to David McKenna, director of powertrain sales and marketing. He added that the testing also verified Mack's SCR aftertreatment strategy results in significantly less active regeneration events of the diesel particulate filters (DPFs). In its over-the-road applications, Mack has eliminated active DPF regeneration, he said.

"Mack's testing revealed that our EPA '10 emissions control systems will allow near-zero amounts of NO_x and particulate matter," McKenna noted. "And as a direct result of this elegance of modern chemistry, our customers will experience near-zero DPF active regenerations.

"Since we use SCR to remove NO_x from the exhaust downstream from the DPF, we are able to tune the engine to produce better performance and fuel economy, while using the NO_x in the exhaust to passively regenerate the DPF. We're making simple chemistry work in our favor."

Mack said customers operating test trucks in both vocational and highway applications reported excellent performance, power and fuel economy using Mack MP Series engines with SCR aftertreatment. "These experiences confirm that our customers will benefit from our SCR technology," McKenna said. "Mack's SCR technology allows us to use the same proven base engines we do today, with a straightforward design requiring only one turbocharger, only one intercooler and only one radiator. Service technicians are already very familiar with this easily serviced engine." **dp**

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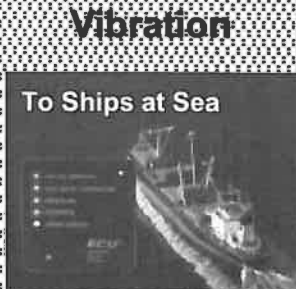
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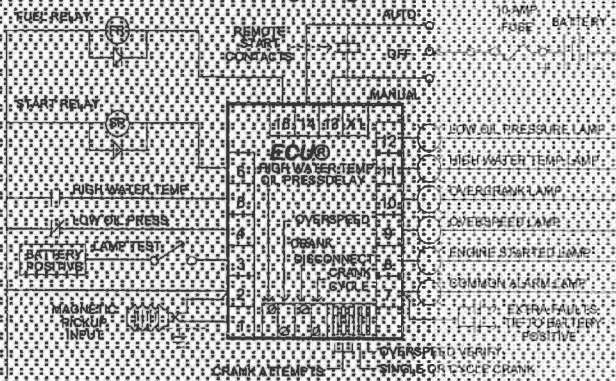
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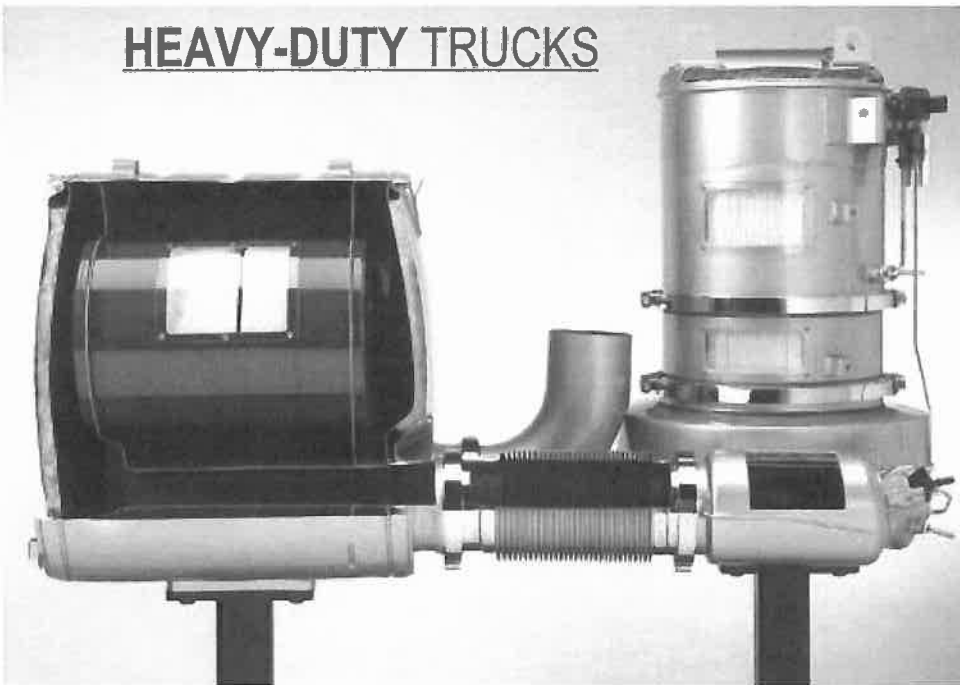
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Volvo Trucks North America has begun taking orders and will, before the year's end, begin deliveries of trucks equipped with its selective catalytic reduction (SCR) exhaust aftertreatment system, shown here in cutaway. In operation, exhaust enters the diesel particulate filter (DPF) at right, where particulate matter is captured. From there, the exhaust flows to the diesel exhaust fluid (DEF) decomposition zone where DEF is injected into the hot exhaust. As it then passes through the SCR catalytic converter at left, the NO_x is converted into nitrogen gas and water, and exits through the exhaust pipe at center.

THE FUTURE IS NOW FOR VOLVO

Company to begin 2010 truck production in the fall; deliveries to commence before the end of the year

BY MIKE BREZONICK

One thing you can say about Volvo Trucks North America as an organization: it does like to get out front on things.

Earlier this year, the company became the first supplier to publicly put a price tag on meeting EPA 2010 emissions when it said its '10 model trucks with selective catalytic reduction (SCR) would be approximately \$9600 more than its current vehicles. That continued the company's tradition of being the first out of the gate on pricing, as prior to the implementation of the EPA's 2007 regulations, Volvo was also the first supplier to go public with its pricing plans.

Now the company has gone a step further, announcing that it would begin production on 2010 trucks this fall and would actually commence deliveries within weeks of the start of production — well before the EPA's stringent new emissions levels take effect on Jan. 1, 2010. Volvo said the trucks will not be prototypes or test models, but rather production vehicles.

"A number of customers have expressed an interest in placing SCR-equipped units in their fleets ahead of 2010," said Scott Kress, Volvo Trucks senior vice president — sales and marketing. "This gives early adopters the opportunity to gain familiarity with the technology and the benefits of SCR. It's another example of Volvo Trucks following through on our commitment to customers to be ready to go for 2010. Volvo is ready. How many other manufacturers can say that?"

Volvo said orders for approximately 50 trucks equipped with SCR had been received by mid-June. Orders for EPA '10-ready trucks can be placed through Volvo dealers.

Volvo's confidence in its SCR technology is the result of its use of SCR in European trucks for more than two years, along with its extensive testing and validation efforts in North America. The company has approximately 40 trucks in its own corporate engineering test fleets and has some 30 trucks in test in customer fleets.

Another 23 trucks have been driven more than 9 million miles as part of an SCR demonstration and test fleet.

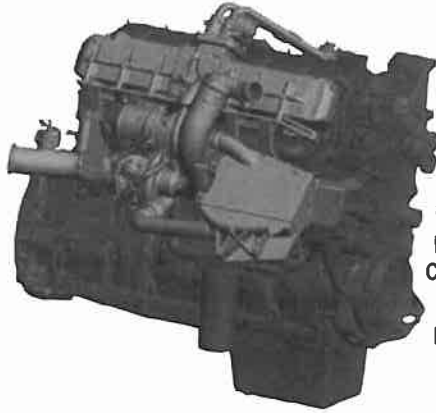
A byproduct of that experience is Volvo's assertion that Volvo trucks equipped with SCR emissions control systems will not undergo active regeneration of diesel particulate filters (DPFs) during normal highway operating conditions.

"This is a huge development for our customers, since their drivers no longer have to monitor DPF status or worry about managing DPF regenerations — because a Volvo on-highway truck with SCR will not require active regeneration," Kress said, adding that Volvo has also achieved near-zero active regeneration in its vocational applications. "These trucks will deliver the near-zero emissions and improved fuel economy SCR-equipped Volvo trucks have demonstrated over two winters and more than 3 million miles of North American customer testing."

Volvo said that initiating the truck production process sooner will also provide the opportunity to more efficiently and effectively ramp up production of EPA '10 trucks on its production line at the New River Valley plant in Dublin, Va., before the complete changeover next year. **dp**

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Navistar's new MaxxForce 15, which will begin reaching the market later next year, is an inline six-cylinder diesel available in an output range of 435 to 550 hp. It will incorporate major structural components from the Caterpillar C15 diesel and the fuel, air handling and control systems from the existing MaxxForce 13 engine.

STICKING TO THE FAMILIAR FORMULA

MaxxForce 15 development continues Navistar's strategy of leveraging its own capabilities and scale with that of partners

BY MIKE BREZONICK

When the first customers get ahold of the first MaxxForce 15 truck engines sometime in the second half of next year, the engines will be brand new. But it might be hard for those selected fleets and owner-operators to shake the sensation that they've seen this before.

And that's not surprising because any resemblance between the new 15 L engine and earlier MaxxForce Big Bore models and the Caterpillar C15 truck engine, is strictly intentional.

The new MaxxForce 15, soon to be the flagship of Navistar's heavy-duty engine range, is yet another example of Navistar's preferred method of new product development.

"The MaxxForce 15 will use the same proven formula that enabled us to successfully bring the MaxxForce 11 and MaxxForce 13 to market — collaboration," said Eric Tech, vice president and general manager, Navistar Engine Group. "Just as we collaborated with MAN on the MaxxForce 11 and MaxxForce 13, in this case we're collaborating with Caterpillar on the MaxxForce 15.

"This approach is consistent with our strategy to leverage what we have and what others have built in order to bring better products to our customers."

The MaxxForce 15 is an inline six-cylinder diesel with a bore and stroke of 137 x 171 mm for an overall displacement of 15.2 L. Incorporating an overhead cam design and four valves per cylinder, it will be available in an output range of 435 to 550 hp at engine speeds of 1800 to 2000 rpm and torque ratings from 1550 to 1850 lb.ft. (see related chart).

The compression ratio for the new diesel is 17:1 and it will offer engine braking capability up to 600 hp. Dimensions are 56.6 in. long, 47.1 in. wide and 56.5 in. high, and the dry weight is 3130 lb.

The new engine will be an interesting mix between Caterpillar and Navistar technologies, with Cat supplying the muscle and Navistar the brains.

"The five 'Cs' typically associated with an engine — the cranks, cams, cylinder head, cylinder block, connecting rods — and certain mechanical elements like the water pump are going to be the guts from the C15," said Tech. "Hundreds of thousands of C15s have been in service for literally more than a billion miles of real-world durability.

"One thing that's been really very encouraging is that as we've put the engine onto the test bench and run

them in our labs, because we're dealing with the Cat block and mechanicals, that engine will motor all day long. We're not running into the problems you would typically have in an engine development program — getting the right cooling passages, getting the oil channels right — because the proven structure is already there."

Much of the upper works of the engine — the air-handling system, electronic fuel system, control algorithms, etc. — will be derived from the 13 L MaxxForce 13 engine. The new engine will incorporate a twin series turbocharger arrangement, incorporating larger and smaller Borg Warner turbos with the target of providing fast response with strong high-end performance. The smaller turbo is designed to spin up quickly for immediate boost at low engine speeds. As the air exits the first turbo it enters an inter-stage cooler where it is cooled, increasing air density, as it flows into the larger second turbo. The cooler, denser air provides greater flow through the larger turbocharger and provides peak power to maintain speeds and climb hills, the company said.

The MaxxForce 15 diesels will also incorporate a second-generation Bosch high-pressure common rail fuel system, the same used on the 13 L engine, but with higher injection pressures, Tech said. The system is electronically programmable and able to deliver fuel at high pressure — up to 31,800 psi — at low engine speeds and in several metered or staged sequences within each combustion cycle.

"The fuel, air and electronic systems are the same systems being used on the MaxxForce 13, with millions of miles of testing and real-world use," Tech added.

The MaxxForce 15 will also follow another traditional formula — that of using exhaust gas recirculation (EGR) as its primary emissions reduction technology. Navistar calls its system Advanced EGR, and even here the

MaxxForce 15 Specs		
Preliminary Horsepower (bhp)	Preliminary Peak Torque (lb.ft.)	Preliminary Gov. Speed (rpm) On-hwy/Severe Service
435	1550/1750	1800
450	1550	1800
450	1550	2000
450	1550/1750	1800
450	1750	2000
500	1650	1800
500	1650	2000
500	1650/1850	1800
500	1850	1800
500	1850	2000
550	1850	2000

company is sticking to its philosophy of leveraging scale whenever possible.

"One of the things I like to point out is the innovative approach our engineering team is taking," Tech said. "They determined that the EGR cooler on the MaxxForce 13 doesn't have enough heat rejection for the MaxxForce 15, so they had to figure out how they were going to get around that problem.

"They looked at our parts bin and saw we have a 7.6 L DT engine that, like all of our engines, also has an EGR cooler. They did the math and they literally took two DT EGR coolers and packaged it as a twin EGR cooler for the MaxxForce 15.

"Those parts have already been through all the validation, the shaker, the corrosion, the coaking, etc.

They're clearly validated and all we had to do now is plumb them. The only new part is a T-fitting rather than an elbow fitting to plumb the new parts into the system."

The only other significant change to the engine is in the combustion chamber, where the Caterpillar cylinder head and upscaled Mahle steel-crowned piston were resulting in about a 20% increase in the size of the combustion chamber.

"We used the same piston bowl design into the upscaled piston from the MaxxForce 13, put it into the C15 structure and right out of the gate, we're getting some outstanding results," Tech said.

Like its current 2007 engines, the MaxxForce 15 will incorporate a combination diesel oxidation catalyst/diesel particulate filter and Tech said it will initially meet the 2010 emissions standards through the use of banked emissions credits.

"Almost all Navistar engines are
continued on page 20

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generating credits in one form or another," Tech said. "And we'll be able to generate credits until Dec. 31 of this year. As of the end of the year we'll have a fixed number of credits and we will utilize those as we go forward. That will give us quite a bit of time based on our current projections for us to transition to the next level and that's really exactly why credit generation exists.

"What we're doing from '07 to 2010 is reducing approximately 60% of the NO_x in-cylinder. It's our goal to continue down that path and continue to take the NO_x out in-cylinder to reach the 0.2 g NO_x standard. We're not talking about 'unobtainium' here, we have engines in our labs today that have achieved this.

"For 2010, we have that 60% reduction in NO_x and it's our stated goal — and we have data to back it up — that we're not going to see a degradation in fuel economy in any of our platforms.

And it is our goal that when we reach 0.2 NO_x level, it's going to be the same. We know we have the formula to do it and we will be ready with production-capable engines at the time we'll need them, based on how sales go relative to the credits that we have.

"The physics work. And you know what? SCR works as well. They both achieve their stated goal. But when you get down to what we consider the onerous nature of SCR and the burden to the customer, the complexity of the system and the weight of the system and some of the other issues we've been highlighting, we clearly think we've got the better way."

Navistar has not issued a specific launch timetable for the MaxxForce 15 — "You'll start to see it in selected test fleets and in customers' hands sometime in 2010 and that will accelerate into 2011," Tech said — and the company has a plan in place to accommo-

date the needs of customers requiring 15 L engines. He said it would be through "a combination of (Cummins) ISX availability beyond Jan. 1 as well as migration of some of our customers to the MaxxForce 13, which has 475 hp capability.

"When we overlaid the power range of the MaxxForce 13 to the current ISX, 80% of our current ISX users have the ability to go into a MaxxForce 13," Tech added. "So it's a relatively small group that really needs that 15 L power."

The MaxxForce 15 engines will be assembled at the new Big Bore facility in Huntsville, Ala. "It's another opportunity to reuse what we already have," he noted. "It will be assembled on the same line as the MaxxForce 13. When we commissioned that plant and equipment, we had the foresight to make it scaleable up and scalable down. It's a very flexible line and we can build a variety of engines on that line." **dp**

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Diesel Progress now has its own Twitter site. For you fans of Twitter, the site will provide a handy headline service of the industry's latest news and activity — yet another



way to stay on top of the latest products, technology and industry news for all the engine-powered equipment markets, globally. Follow us on Twitter at <http://twitter.com/dieselprogress> or search for [dieselprogress](http://twitter.com/dieselprogress).

The **Center for Compact and Efficient Fluid Power (CCEFP)** has launched a new website, designed to make finding information about the organization's research and initiatives easier. New features on the site include a search box, the Highlights media center with videos and photo album, a calendar and events section, access to the online collaboration tool Sakai, and a new members' section with a discussion forum,



downloads section and webcast archive. To visit the site, go to www.ccefp.org.

Champion Laboratories Inc., a specialist in fuel-dispensing and heavy-duty filtration, has launched a new online catalog at the ShowMeTheParts.com private-label catalog program. Champion said the enhanced online catalog incorporates easier and faster application searches, a new products feature that includes a buyer's guide, partial-parts number search capability, an improved



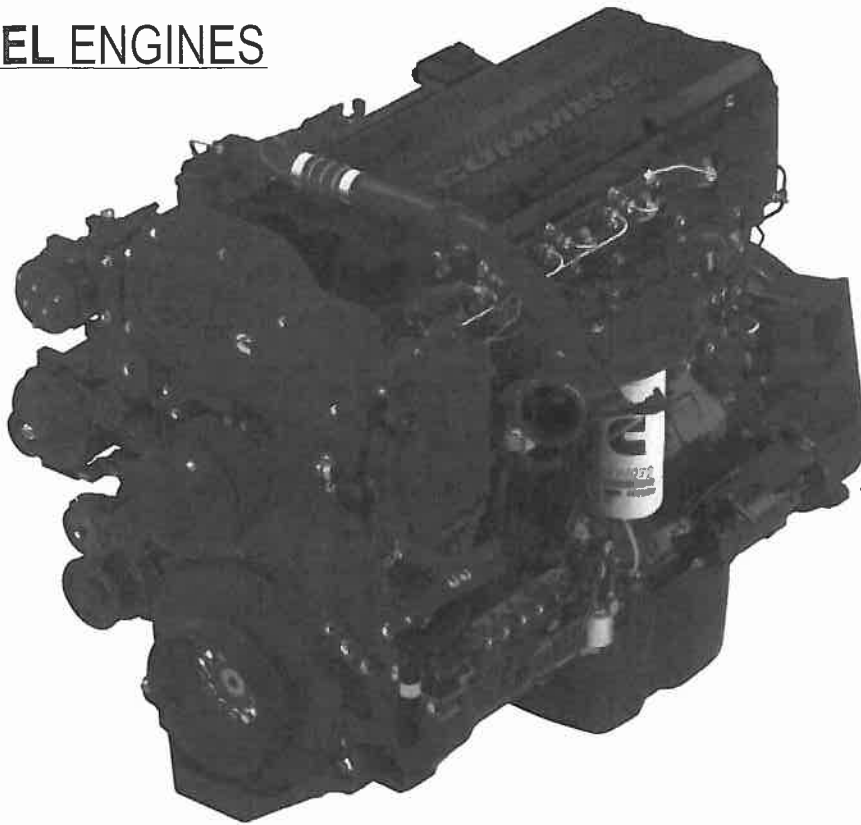
cross-reference and part-search feature and a new comprehensive knowledge center with tech bulletins and installation instructions. Go to www.showmethethparts.com to access the catalog.

Engine Control Systems (ECS) has launched a School Bus section to its website that is designed to provide information on how ECS emissions control products



can be applied to school buses. It includes ECS' verifications from CARB and EPA. Also included is a map that provides information on Clean Air School Bus programs within individual states, as well as more details on the ECS' Purifier, Purifier Plus, AZ Purifiers and Closed Crankcase Ventilation Systems for school bus applications. Access the page at www.enginecontrolsystems.com/schoolbus.

DIESEL ENGINES



HERE COMES
2010

The flagship of the Cummins heavy-duty truck line for 2010 is the ISX15, which is available in ratings from 400 to 600 hp with torque outputs from 1450 to 2050 lb.ft.

A BIGGER “SWEET SPOT” FOR 2010

Cummins sees upcoming emissions standards as opportunity in heavy-duty truck markets

BY MIKE BREZONICK

Probably as much as any engine manufacturer in the world, Cummins Inc. has embraced the concept of tougher diesel engine emissions standards. Not just because it's good for the environment, although that's certainly part of it. Rather it's more that when it comes right down to it, emissions standards have been pretty good for Cummins, too.

And the Columbus, Ind.-headquartered company expects that trend to continue when the new EPA heavy-duty truck engine standards take effect on Jan. 1 of next year.

“We're ready to go and on schedule,” said Jim Kelly, president of Cummins Engine Business. “We're excited for 2010 to get here because at each emissions change for the last 15 years, we've had the opportunity to make

share gains and we've accomplished that. And we feel we'll do it again.”

To do that, Cummins will field a line-up of heavy-duty and midrange products — including a new 11.9 L engine — that the company said will offer a wider operating “sweet spot” and overall will provide significant improvements in fuel economy, while maintaining performance and reliability.

“The 2010 Cummins ISX15 and ISX11.9 and the midrange products, compared to current Cummins products, will deliver up to 5% improvement in fuel economy,” said Jeff Jones, Cummins vice president of sales and marketing. “We believe we'll see gains of up to 9% compared to what we anticipate from in-cylinder only solutions.

“What also has us very excited is the wider operating ‘sweet spot’ our engines have. It gives us much more

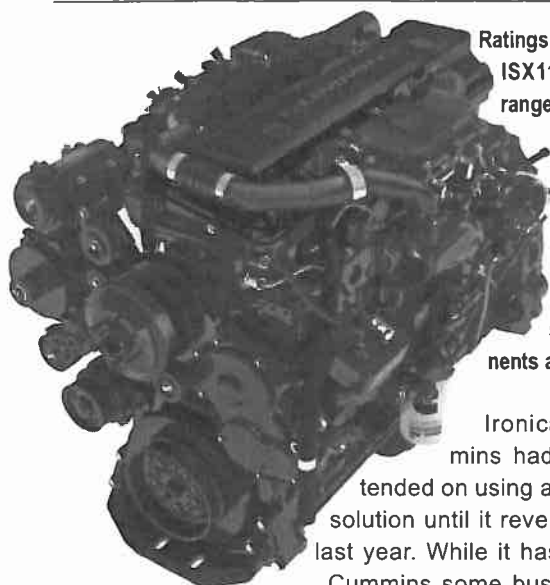
variability and tolerance for different driving techniques.”

That wider sweet spot is a direct result of Cummins' decision to embrace selective catalytic reduction (SCR) as its primary NO_x reduction strategy, according to Steve Charlton, vice president of Heavy-Duty Engineering at Cummins.

“With our in-cylinder solution, we can get the NO_x down to about 1.5 to 1.7 g and we can have lower levels of EGR,” Charlton said. “Then we use the SCR to take us down the remainder of the way with more than 90% efficiency.

“This lets us really optimize the engine for better fuel economy over a wider range of conditions, giving us the wider sweet spot. That would be much more of a challenge with just an in-cylinder solution.”

DIESEL ENGINES



Ratings for the new ISX11.9 diesel range from 310 to 425 hp with torques from 1150 to 1650 lb.ft. The engine shares many of the same components as the ISX15.

Ironically, Cummins had initially intended on using an EGR-only solution until it reversed course last year. While it has likely cost Cummins some business — as its single biggest heavy truck engine customer, Navistar, has firmly rejected SCR and will field the only truck manufactured in North America to offer EGR-only engines — Charlton said it was clear that the company's decision to change, prompted by better-than-expected performance from its copper zeolite catalyst technology being used in midrange, was the right one.

"I think there are some real challenges down the road for the in-cylinder solution," Charlton said. "As you try to force more and more EGR on the engine, pumping 45% of the exhaust gas back into the intake has to cost energy.

"If you can't cool it adequately — really down to low temperatures — then you have a negative impact on flame temperatures in the cylinder, which is going to drive NO_x . If you can cool it, you've got a parasitic overhead — you've got to get rid of that heat. So you've got to look at more radiator frontal area or maybe more fan power or fan usage.

"So there are pretty good reasons why trying to jam all that EGR in the cylinder to get those low NO_x levels is tough. The physics supports it, as we said before. If you can get the EGR in there, the NO_x will go down. But it's getting it in there efficiently and having the subsystems to support it, the fuel system especially, that's difficult.

"We thought we had all of that and I think we did. But when copper zeolite came along, it was a great opportunity to take another look."

Heading into 2010, the flagship for the Cummins truck engine line remains the ISX15, which will be available in ratings from 400 to 600 hp with torque outputs from 1450 to 2050 lb.ft. At the heart of the engine is the XPI fuel system, developed by Cummins in cooperation with European truck and engine manufacturer Scania. Capable of injection pressures in excess of 33,000 psi, the system also offers multiple injection events per injection cycle, which provides both high fuel efficiency and improved response to changes in engine loads. "As they say," Charlton quipped, "you could write your

continued on page 26



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Two key components of the ISX15 and ISX11.9 engines are the XPI fuel system and the Cummins Aftertreatment System. XPI, developed by Cummins in cooperation with European truck and engine manufacturer Scania, is capable of injection pressures in excess of 33,000 psi and multiple injection events within the injection cycle. The Cummins Aftertreatment System includes an SCR catalyst for NO_x reduction.

name in the snow with this fuel system."

Other key components include a variable geometry turbocharger from Cummins Turbo Technologies, the cooled EGR system and additional emissions technology, much of it from other Cummins subsidiaries. This includes a coalescing crankcase filtration system from Cummins Filtration and the Cummins Aftertreatment System from Cummins Emissions Solutions that combines the SCR catalyst technology with the Cummins Particulate Filter used on current engines.

Joining the ISX15 on the larger end of the Cummins truck line is the new ISX11.9 diesel, which is targeted toward medium-bore engine applications such as vocational trucks, day cabs, emergency vehicles and motor-coaches. Ratings range from 310 to 425 hp with torques from 1150 to 1650 lb.ft.

"This is really derived from the ISX15," said Charlton. "It's got lots of common systems, common software, ECMS, fuel systems, aftertreatment. At the same time, it's still a clean sheet design from the ground up and that's exciting because it gave us a chance to use all the computer simu-

lation and analytical tools we've got.

"It also let us steal some of the best ideas from the 15 L. These two engines were developed by the same team and so all of the qualities that are in the 15 L you'll see in the 11.9."

The ISX11.9 indeed shares most of the critical components, including the EGR systems, the VGT turbocharger, the XPI fuel system, electronic controls and aftertreatment. One of the few differences is that the Intebrake integrated engine brake is standard on the ISX15, while a compression brake is optional on the ISX11.9. The engines differ slightly in cylinder dimensions, as the ISX11.9 has a bore and stroke of 130 x 150 mm and the ISX15 remains unchanged at 137 x 169 mm.

Cummins 2010 MidRange engines — which include the ISB6.7, ISC8.3 and ISL9 are essentially the same as the 2007 models, save for the addition of the Cummins Aftertreatment System. The most significant change is that the 2010 MidRange engines share a common ECM with the heavy-duty engines, which allows full integration of the Cummins engine

and aftertreatment system. Engine braking capability on Cummins MidRange engines is provided by the VGT Turbocharger, and an optional compression brake is available for the ISC8.3 and ISL9.

Cummins ISB6.7 truck ratings are 200 to 325 hp with peak torques of 520 to 750 lb.ft. Truck ratings for the ISC8.3 are 260 to 350 hp with torques of 660 to 1000 lb.ft. The ISL9 will be offered in truck ratings of 345 to 380 hp with torques of 1150 to 1300 lb.ft.

The company said that all of its 2010 on-highway MidRange and heavy-duty engines are compatible with long-life coolants and biodiesel blends up to B20.

Cummins on-highway engines for the U.S. and Canada are assembled in the U.S. at Cummins manufacturing facilities in Jamestown, N.Y.; Rocky Mount, N.C.; and Columbus, Ind. Limited production of 2010 engines is scheduled to begin in the fourth quarter, with full production in January 2010. **dp**

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Kenworth Expands Truck Line



Kenworth has expanded its truck line with the Class 7 and 8 T470 model, intended for vocational and municipal applications. It is powered by a 2007 9.0 L Cummins ISL diesel engine rated 345 hp and comes with a variety of transmission and axle options.

Kenworth has added the new T470 model to its truck line-up. Available as a Class 7 or Class 8 truck, it has a GVWR of 33,000 to 68,000 lb., depending on configuration. The T470 is intended for heavy front-axle vocational and municipal applications, such as snowplow, dump, mixer, winch and refuse trucks.

The truck is powered by a 2007 9.0 L Cummins ISL diesel engine rated 345 hp with 1150 lb.ft. of torque. The engine is equipped with a Behr Systems radiator, Donaldson air cleaner and Cummins oil filters.

Eaton Fuller's FRO13210C 10-speed manual transmission comes standard on the T470 truck. As an option, an Eaton Fuller 10-, 11- or 12-speed manual transmission can also be specified, in addition to Allison's automatic five- and six-speed HS and RDS transmissions.

A Dana Spicer driveshaft powers Dana Spicer or Meritor axles, depending on truck variation, to Dana Spicer nonplanetary final drives. A Dana Spicer axle with a 12,000 lb. load capacity is standard on the front, but can be fitted with a higher 13,200 to 22,000 lb. capacity axle or a Meritor axle rated 12,000 to 20,000 lb. For the rear, a Dana Spicer, 21,000 lb. single axle is standard, while a Dana Spicer or Meritor 23,000 to 26,000 lb. axle can be selected or tandem axles rated 40,000 to 46,000 lb.

The T470 truck is equipped with a grille hood and has a 50.5 in. bumper setting for the installation of a front engine PTO, said Kenworth. The hood also allows for full extended frame rails for its heat-treated 120,000 psi steel frame.

Kenworth fitted the T470 model with the company's multiplexed dash in-

stalled throughout its Class 8 product line. The dash is designed with a larger panel for the installation of body controls and gauges. The Kenworth Driver Information Center is also standard, said the company. For additional driver comfort, the Extended day cab is an available option, offering an additional 6 in. of length and 5 in. of height to the cab, compared to Kenworth's traditional day cab.

The T470 joins Kenworth's Class 7 and 8 truck families, including the Class 8 T660, T2000, T800, W900, C500 truck models and the Class 7 T370.

The T470 is currently available for order with production scheduled to begin in July. Kenworth said it expects all of its North American truck plants to manufacture the new truck. **dp**

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