IC BUS

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**B-1246-A**
**May 11, 2009**

# *General Information*

EFFECTIVE: MAY 11, 2009 THROUGH MAY 6, 2011

## DID YOU KNOW?
## 2010 SCR MYTHS VS. ADVANCED EGR FACTS

The truth is MaxxForce® Advanced EGR is the 2010 emissions compliant technology that is less cost, less hassle, better for the environment and takes the burden of compliance off of the bus customer. Yet, there are myths and misconceptions circulating in the marketplace that call into question those facts. Let's clear the air with the truth.

**SCR MYTH:** **SCR is greener.**

**ADVANCED EGR FACT:** **MaxxForce engines are greener.** Navistar chose to make its engines cleaner than EPA emissions as early as 2004. So, Navistar has been making cleaner engines for years. Unfortunately, our competitors didn't reduce their engine emissions as much as we did, so their engines have been putting out more emissions than ours, for years.

Additionally, because SCR engines can continue to run for periods of time without appropriate urea, SCR buses can pollute the environment in excess of EPA emissions requirements unless the urea tank is properly maintained or filled.

**SCR MYTH:** **SCR will yield a 5% - 9% fuel economy advantage.**

**ADVANCED EGR FACT:** **This has not been proven or tested.** Since IC Bus is the only bus manufacturer using an Advanced EGR engine for 2010, we would have had to loan our competitors a MaxxForce Advanced EGR engine for testing. Since we did not do that, this myth is completely unsupported.

Based on SAE fuel economy tests, our MaxxForce engines already enjoy a fuel economy advantage (by as much as 12.9%) over competitive engines today. So the competition has a lot of ground to make up with their coming 2010 engine designs just to get *comparable* to the fuel economy of our MaxxForce engines. And even if competitive engines did make up that ground, bus customers would still be left with the complexities of dealing with urea.

Additionally, even if SCR buses do have a fuel economy advantage, bus owners still have to consider their total cost of operations increase with SCR which will include urea purchase, handling, storage and maintenance, as well as driver and service technician training. All of

this should be taken into account when considering any potential fuel economy advantage which is yet unproven.

**SCR MYTH:** **SCR is proven.**

**ADVANCED EGR FACT:** **SCR is proven *in Europe*.** European emission standards are not as strict as EPA 2010 so the hardware is not simply "plug and play" in North America.

Also, in Europe there is no governance for managing engine compliance when urea is not used. In other words, they use the honor system. Vehicles with no urea in Europe are completely drivable at full power. However, in North America, EPA 2010 guidelines regulate a vehicle's drivable distance and speed when there is no urea in the system.

**AVERAGE TEMPERATURE**

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|---|---|---|---|
| **EUROPEAN:** | Stuttgart, Germany<br>High: 73° F<br>Low: 27° F | Madrid, Spain<br>High: 91° F<br>Low: 37° F | Oslo, Norway<br>High: 71° F<br>Low: 20° F |
| **NORTH AMERICA:** | Chicago, IL<br>High: 85° F<br>Low: 16° F | Phoenix, AZ<br>High: 107° F<br>Low: 44° F | Edmonton, Alberta<br>High: 73° F<br>Low: 3° F |

Keep in mind that SCR is <u>unproven</u> in North American road conditions and climates. As noted in the table above, average temperatures between the two continents vary significantly, so making an apples to apples comparison is inaccurate.

Alternatively, Advanced EGR is an evolution of the current technology that almost all North American engine manufacturers are using on the road today. You can count on knowing that MaxxForce Advanced EGR engines have been thoroughly tested and proven in North America.

**SCR MYTH:** **An SCR bus will not shut down if the urea tank is empty.**

**ADVANCED EGR FACT:** **An SCR bus will not shut down, but it *will* derate to 5 mph after a period of time.** With Advanced EGR engines you do not have to worry about a 5 mph derate. Ever. You are compliant when you turn the key. Period. With Advanced EGR, drivers do not have to worry about what to do with your passengers in a bus that will only travel at 5mph.

**SCR MYTH:** **An SCR bus will maintain current service intervals.**

**ADVANCED EGR FACT:** **There is information to suggest that testers of of 2010 SCR systems in Canada have experienced an increase in service intervals.** Reports claim that SCR test vehicles are being serviced more often to remove crystallized urea build-up on the doser nozzle. This is another example

of how SCR components can create additional maintenance requirements.

**SCR MYTH:** **Once derated and the urea tank is filled, full power of an SCR engine will resume.**

**ADVANCED EGR FACT:** **This depends on the engine manufacturer.** Although the EPA does not appear to require a reset, it is our understanding that at least one engine manufacturer using SCR, will require an engine reset that can only be performed through a service call. With MaxxForce Advanced EGR engines you do not have to worry about a vehicle derate or engine reset — our engines are always 2010 compliant and all you have to do is turn the key.

**SCR MYTH:** **DEF is expected to cost the same as diesel fuel.**

**ADVANCED EGR FACT:** **There is no evidence in the marketplace to support this.** It's too early for anyone to predict what the cost of urea will be in 2010 and beyond. We've seen containers of urea sell for around $12 per gallon in Europe and as high as $35 per gallon in America. And while some have claimed that prices will come down with bulk sales, early plans for bulk sales have been vague at best.

It is important to note that urea is subject to fluctuations in natural gas prices, which swing wildly. Buying urea in small containers might be a simple way to avoid handling and testing complications, but the prices are expected to be higher for smaller-sized containers. Buying urea in bulk might bring the price down, but this method requires purification testing as well as the cost of a storage infrastructure ($50,000 - $1 million).

**SCR MYTH:** **Urea will be readily available everywhere.**

**ADVANCED EGR FACT:** **Urea will be available in jugs for sale at a limited number of truck stops.** Do you have easy access to a truck stop? If not, do you plan to install the infrastructure (costing $50,000 or more) on your own property to store and dispense it on site? Remember that with urea's need to be temperature controlled, it is not as simple as keeping a jug or two in a cabinet in your shop.

**SCR MYTH:** **Advanced EGR reduces engine life by 20-25%**

**ADVANCED EGR FACT:** **False.** MaxxForce Advanced EGR engines will maintain their current service life.

This myth is usually based on concerns about heat or soot. As for heat, since we are managing the heat of combustion the heat is, therefore, not in the engine. Also, though we are flowing more EGR we are also cooling that flow more so any additional heat is in the EGR cooler. We

have upgraded our EGR cooler and are better managing that heat with its own radiator flow circuit.

As for soot, which is unburned fuel, the high-pressure common rail, twin turbos, piston bowl, and multiple injections make a more efficient burn, therefore the opportunity to make soot is reduced.

Our MaxxForce Advanced EGR technology takes all of these things into account so that our current engine life is maintained. (The MaxxForce 7 engine B50 life is 375,000 miles and the MaxxForce DT engine B50 life is 450,000 miles.)

**SCR MYTH:** **SCR has no complex changes to the engine.**

**ADVANCED EGR FACT:** **Advanced EGR engines are an evolution of the engines with which you are familiar.** We are adding a turbo and a larger cooler, both of which are familiar to you and your service techs.

SCR adds new after-treatment hardware, a system which requires new lights for drivers and new training for service technicians.

**SCR MYTH:** **SCR is simple.**

**ADVANCED EGR FACT:** **Advanced EGR requires no new driver or service technician training.** However, SCR adds new after-treatment hardware, requires a new fluid to be maintained, requires new training for drivers and service technicians. MaxxForce Advanced EGR requires none of these things.