



WARD'S 10 Best Engines 2006

Powertrain trends include direct injection gasoline (DIG)

By Bill Visnic

Now in its 12th year, the annual Ward's 10 Best Engines competition continues as the industry barometer of powertrain development.

Although little has changed about the competition itself, 2006's 10 Best Engines are evidence that meaningful change is enveloping the industry's powertrain sector.

First, four of the 10 Best Engines employ forced induction — a new record for the list. This is significant because it indicates a trend toward the downsized engines and higher specific output some powertrain analysts have predicted.

Certainly 2005's high-profile run-up in fuel prices increased

the public's attention on fuel economy, but recent events that affected fuel prices could not have influenced the engineering development of the winning engines, which began years ago.

Forced induction — turbocharging, specifically — also is the “companion” technology to the powertrain sector's other emerging trend: direct injection gasoline (DIG) fuel delivery.

The number of DIG engine variants in North America and the rest of the world is quickly blossoming as the technology merges the attributes, to some degree, of spark-ignition and compression-ignition engines. Three of this

year's 10 Best Engines feature DIG technology, and we expect more in the future.

For 2006, Ward's 10 Best Engines judges nominated and tested 31 engines that must be available in regular-production vehicles on sale in the U.S. market no later than the first quarter of 2006. To be eligible, the engine also must be available in a vehicle with a base price of no more than \$52,500.

By limiting the competition to volume-market considerations, the annual 10 Best Engines awards have a high degree of relevance, we believe, to the majority of the industry's powertrain developers, as well as consumers.

High Performance, Low Cost

Mazda Motor Corp. 2.3L DISI Turbocharged DOHC I-4

Few hoods in the U.S. market cover a hotter engine that costs less. This 4-cyl. pounds out a Ferrari-like 119 horsepower per liter, but the *MAZDASPEED6*, in which it serves as the standard engine, costs less than a tuneup for a Ferrari.

Thanks to the complementary technologies of direct injection gasoline (DIG) — Direct Injection Spark Ignition (DISI) in Mazda-speak — and turbocharging, this engine is quieter, has less spastic throttle

response and presents a broader power band than the stun-grenade 4-cylinders of its Japanese rivals, whose engines, by comparison, constantly bark like a riverboat captain.

While most non-DIG turbocharged engines wallow at low speed, waiting for their turbos to wind up, the new DIG turbo mills snap to attention directly from idle. When the torque benefits of DIG are bleeding off at higher rpm, the turbocharger already is making efficient boost. Magnificent!

Engine type: 2.3L turbocharged

DOHC I-4

Displacement (cc): 2,260

Block/head material:
aluminum/aluminum

Bore X stroke (mm): 87.4 X 94
Horse-power (SAE net): 274 @
5,500 rpm

Torque: 280 lb.-ft. (380 Nm) @
3,000 rpm

Specific output: 119 hp/L

Compression ratio: 9.5:1

Fuel economy for tested vehicle
(EPA city/highway mpg): 19/25
Application tested: *MAZDASPEED6*
Grand Touring.

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