

HINO

FIRING ON FIVE

When introducing its new Euro 5 truck range, Hino unveiled a new five cylinder engine to power the heart of its medium duty range. Tim Giles gets the details on the new 500 and 700 Series models.

As it has been for many of the major truck manufacturers, the shift across to the Euro 5 exhaust emission rules has been a relatively painless one for the Australian truck market's number two brand, Hino. In the process of reducing exhaust gas emissions from ADR 80/02 to ADR 80/03, the company has made changes to its model line-up including some new models and configurations plus the return of an old favourite, in a new guise, the five cylinder JO7E 6.5L engine. Most of the changes made to the model range to meet the new exhaust emission rules come in terms of adding after treatment to the exhaust stream. Hino will also be introducing some models using the SCR system which will require the use of Adblue. This system has become more widespread in the Australian truck market in recent times and will be used on engines in the 700 Series range. The 700 Series model range sees a number of new models being introduced and some realignment of specifications, simplifying engine choice and extending suitability for some applications. The number of models in the range is extended from 7 to 11. The smaller 437hp engine offering is now only

available in the smaller rigid and 6x4 models, the rest of the 6x4 models use the 480hp version. One all-new model has been labelled the SH. It is a 4x2 prime mover to fill a gap in the range that Hino has not previously competed in. This uses a 450hp version of the heavy duty engine. The other innovation is an 8x4 rigid, the FY, this is a model which has been long in gestation and has finally arrived. Currently, the front suspension is not classified as load sharing, thus limiting the vehicles GVM capabilities. A load sharing variant may be appearing further down the track. "With the 8x4, we have to start somewhere," says Hino Product Development Manager, Alex Stewart. "On introduction it is not load share. Australia is the only market in the world which demands load share suspension. The Hino global 8x4 model has been sold successfully in many markets overseas. Yes, there will be some limited markets for it at the outset. I expect through time we will develop a load share solution." The successfully introduced ZF AS Tronic AMT gearbox will also be making its way into the rigid trucks. Previously, it was only available in the larger SS prime movers. This AMT will be standard on the SH 4x2 prime mover. Across all of the new Euro 5 engines from Hino, there has been a new piston design introduced. The head of the piston now

uses a double lip and the skirt on the pistons in the smaller engines has been done away with. At the same time the variable nozzle turbocharger has been redesigned with new vane shapes and improved bearings. A major innovation in the new engine for the 700 Series is the introduction of an SCR unit. This means the truck engine is now using both EGR and SCR to get exhaust emissions down to the ADR 80/03 levels. The compact system developed by Hino is a dual system using a DPR and SCR unit to clean up exhaust emissions. "Hino's focus is all about maximum efficiency," says Alex. "We're talking about maximising fuel economy and power delivery via the most efficient combustion process. We always focus on fuel consumption, so we have a fairly unique system for the Australian market, with a Japanese product. We are managing nitrogen oxide production through EGR as well as minimising particulate matter through efficient combustion. This makes sure we get the best bang for our buck. This means down at the end, in the cleanup process, we can balance it by using a combined DPR and SCR unit." With the introduction of the 4x2 SH model, Hino is using its new model as a platform to evaluate the new technology which is available for trucks. It is fitted

with disc brakes all-round and uses an EBS system to control the braking. The four bag rear air suspension system comes with a remote control height system, similar to those normally employed in a European truck. "If we think about what the future will hold and why we would bring a truck like the SH, with disc brakes and EBS, to the market, it is to take the technology, bring it here and test its viability in this market," says Alex. "If we can prove its market acceptance, we can feed that back into the product development program in Japan. Then we can have improved specifications and options available for our other heavy duty trucks in the future." The SH model will also come with the Hino Vehicle Stability Control system (VSC), as developed by parent company Toyota. This system is designed to control the sideways and rotating motion of the truck, to stop jackknifing and rollover situations developing and causing accidents. Visibly, from the outside, all of the new trucks in the Hino range will look little changed. Hino has retained the 500 cab it introduced back in 2003 and the 700 cab from a couple of years later. The designs were a great leap forward at the time and still retain a modern look out on the highway. This contemporary feel is enhanced by the new colour

scheme being used on the 500 Series cab interiors, the charcoal and grey tones add to the feeling of modernity. The new look for the interior of the 500 Series is accompanied by the new feel from the engine. The return of the five cylinder engine means some models will now enjoy increased power and torque. Hino also claims better fuel economy can be expected from the JO7E than from the JO8E it is replacing in the 10.5, 12 and 14 tonne models. This new engine will be available in the FC, FD and FE models. When the JO7 engine was available in the past, before the last emissions rules change, it proved to be a flexible and responsive power unit. This is the engine which was chosen by UD to power its MK range for a few years when it did not have

a suitable engine from its own stable available. This Euro 5 version of the five cylinder engine features a new engine control unit and a new and improved variable nozzle turbocharger. EGR is used, at quite a high recirculation rate, to reduce emissions with after-treatment on the exhaust stream including a diesel oxidation catalyst and a particulate filter. The Hino version of the particulate filter is called a DPR and its introduction sees this kind of technology now appearing on virtually all Japanese medium duty trucks. Some of the Japanese manufacturers introduced this technology during the previous exhaust emission rules change and their competitors had pointed to the disadvantage of having a particulate filter



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which has to go through a reformation process. The need for the exhaust system to go through this cleaning cycle, which generates considerable heat and occasionally needs to be activated with the truck stationary, is now common across most of the trucks sold in this market segment.

“I think the FC model has seen the biggest benefit with the introduction of the new JO7E engine,” says Alex.

“It receives a 26% increase in power and a 30% torque improvement when compared to the old model. In plain and simple language, it’s a ball tearer.”

To best utilise the improved flexibility of the new engine, Hino has made changes to the driveline to get the best out of the new power plant. Gearbox ratios and rear axle ratios have been changed to improve gradeability and performance. This change is most noticeable on the smaller FC model rather than the larger FD and FE models. Out on the road on a short test drive, it is clear the new, more flexible engine and the improved driveline make for a truck which is very responsive to driver inputs via their right foot.

The models in the 500 Series with the wider cab retain the six cylinder JO8E engine as the power plant. This new, lower emission version of the engine produces an extra 21hp when compared to its predecessor. This revised engine also includes the new ECU and DPR as used on its five cylinder brother.

In the previous model range, the 12 tonne GVM model was designated as a

GD. This has been replaced by the new FE model, which has a dual GVM rating at either 12 or 14 tonnes. Currently, this dual rating is only available using air suspension but a steel spring suspended model should be arriving later this year. “This has been a growing market segment over the last couple of years, moving into the 14 tonne GVM area,” says Alex. “You can see the benefits, if you take an FG model with a GVM of 15.5 tonnes and look at the payload, it will be about the same as you get with the FE. However, the application uses are quite different because FE is air over hydraulic brakes whereas the FG is full air brakes. FE is on 19.5 inch rims with low profile tyres while the FG is on 22.5 inch rims with standard tyres. The low frame height and low tare weight, make the FE ideal for short distance local distribution in a truck with easy driver access.”

Further up the range, in the FM and FL models, 6x4 and 6x2 configurations, several new longer 6.5m wheelbase variations have been introduced. The two engine options are still available rated at 280hp and 320hp but with the new lower emission after-treatment systems added.

The upper end of the Hino 500 Series model range, at 6x4 and 6x2, uses the A09C engine which is rated at 300hp for auto drive lines and 320 for manual. In the changeover to Euro 5 the 300hp engine remains the same, in performance terms, but the 320 gets an 18% improvement in engine torque.

“On the Euro 5 engines everything is bigger with EGR,” says Alex. “We have to get EGR valves, bigger gas pipes, new turbocharger and new pistons. In the fuel injection system, common rail pressure is up to 200 MPA, that’s 29,007 PSI.”

Apart from the new colour scheme inside the cab, the other change the driver will notice is the addition of a multi-information display in the middle of the dashboard. The information displayed is the kind of useful data the driver or owner may need to know. It also provides feedback about the current situation of the DPR. The system will tell the driver how close the soot buildup in the DPR has come to the level of 30%, the point at which it will start to attempt to burn off the excess soot.

The project for Hino, over the past ten years, has been to continually extend and nuance its range to better suit Australian tastes and requirements. These latest model changes see more specification gaps getting filled and more application specific models coming on line.

With the introduction of an 8x4, a major area of deficiency for Japanese manufacturers has been filled.

Presumably, a load sharing version will follow if the market continues to need it. With the introduction of a 4x2, and a number of high tech innovations, the company is definitely showing the route ahead and demonstrating the ability of the Hino organisation, as part of Toyota, to meet the technological demands of the future.