

# Bravo for Fiat

Profit, a product offensive and cutting edge development – at Fiat? **Tristan Honeywill** reports



**F**iat is celebrating. After seven years of financial turmoil, the firm has announced a trading profit of €291 million for 2006, its first time in the black since 2000. The group's improving health is due to strong European sales growth, up by 18 per cent to 1.1 million units. Its B-segment models, the Fiat Punto and Grande Punto have done well for the company.

To maintain momentum and to make the money necessary to fund its plans for further expansion, Fiat needs to sell more cars in the C-segment. This has been a large part of Fiat's problems. The Stilo was expensive to develop and by Fiat's own admission, had too many shortcomings.

Its replacement, the Bravo, is a key development for Fiat. Buyers in the C-segment go for a lot of the optional extras that make a relatively inexpensive car quite lucrative. If it sells as Fiat expects, then its Piedimonte Saint Germano plant will produce 120,000 cars a year for 55 countries. And the firm will have more cash to fund its expansion in emerging markets.

Developing the Bravo also forced Fiat to take a significant step forward in its engineering. This will come in very handy – the firm is getting ready for a product offensive. By 2010, Fiat Group plans to launch 46 new models and increase international sales, including commercial vehicles and its joint ventures to 3.5 million units.

The Bravo was Fiat's first completely virtual programme. It cost just €360 million and 18

**It looks like the Grande Punto and Fiat hopes the Bravo will sell as well in the C-segment**

months to develop. Not having to build prototypes saved time and money, but the priority was time to market, says chief technical officer Harald Wester. "Replacing the unsuccessful Stilo with something attractive will make the real difference," he says.

Having the data from the Stilo made the Punto an ideal candidate for Fiat's first attempt at completely virtual development; it also helped to keep the CAE's maturation cycles at less than nine weeks. "The level of predictability on things such as the suspension, structure and crashworthiness is quite high now," says Wester. "The finished vehicle in fact out-performed our predictions."

The project was also given a helping hand by Magna Steyr, which has developed some renown for its virtual engineering skills. The Austrian engineering firm handled around 20 per cent of the project, says Wester, involved mainly in the design of the body and interior.

It is not clear whether the Austrian engineering firm will continue to provide services on future programmes, but virtual engineering will play an important part in Fiat's future development plans.

Now that the Bravo is in production, Wester is looking closely at the project plan and what was achieved. "We can do it quicker," he says. "We can see where the differences and trade-offs were on the Bravo and we'll integrate all these experiences as the process becomes part of our product development."

No major changes, but there is room for small

## THE SUPPLIERS BEHIND THE BRAVO

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| <b>Allevarud Rejna Autosuspensions</b> Front and rear stabiliser bars  | computer; exhaust system; suspension   |
| <b>Autoliv</b> Driver airbag and knee airbag   | <b>Mazzucconi</b> Aluminium cylinder heads   |
| <b>BASF Coatings</b> Basecoats and clearcoats  | <b>Meridian Technologies</b> Magnesium parts for hybrid instrument panel beam  |
| <b>Bosch</b> Injection systems for diesel and gasoline engines; brake control systems; calipers  | <b>MTA</b> Battery distribution unit; additional distribution unit; quick lock battery terminal; radiator cap  |
| <b>Catelsa</b> Brake diaphragms  | <b>Neumayer Tekfor</b> Conrods; wheel hubs; spindles, gears, input and output shafts   |
| <b>Dana</b> Cylinder-head gasket (2.0-litre diesel)  | <b>Paulstra</b> Vehicle suspension bush, front top mount   |
| <b>Denso</b> Front and rear wipers; alternators; HVAC and compressor; front end modules  | <b>Rieter</b> Headliner  |
| <b>Eagle Picher Wolvering</b> Anti-noise shim material   | <b>Saint-Gobain Sekurit</b> All vehicle glass  |
| <b>Gates Power Transmission</b> Accessory belt (1.9-litre diesel)  | <b>Saturno</b> Sun visors  |
| <b>GM</b> Six-speed manual transmission  | <b>Scapa</b> Technical adhesive tapes  |
| <b>Hirschvogel Automotive Group</b> Output shaft for six-speed manual  | <b>Sogefi Filter Division</b> Oil filter module (1.4-litre gasoline)   |
| <b>Hutchinson</b> Water, brake and DPF hoses; fuel system; belts   | <b>Southco</b> Glove box latch & strike  |
| <b>Johnson Controls</b> Interior door panel  | <b>Speedline</b> Aluminium wheels 18in and 16in 100%   |
| <b>Kautex Textron</b> Fuel tank and filler; floor air ducts  | <b>Teksid Aluminum</b> Cylinder head and valvetrain (gasoline); cylinder head (diesel)   |
| <b>Key Safety Systems</b> Side impact protection system  | <b>TRW Automotive</b> Ball joint-lower; base and leather steering wheel and switches; seatbelt buckles, height adjusters and retractors; electric power steering column drive; lane departure warning with haptic feedback; driver and passenger airbag modules and inflators; stabiliser link |
| <b>Lames</b> Electric and manual window regulators   | <b>TRW Engineered Fasteners &amp; Components</b> Fuel inspection cover   |
| <b>LJF</b> Total Seal 4301   | <b>Visteon</b> CD player & MP3 option  |
| <b>Luvata</b> Resistance welding electrodes  | <b>WET Automotive Systems</b> Seat heaters   |
| <b>Magna Closures</b> Cables, side door latch  | <b>Wahler</b> Thermostats for diesels  |
| <b>Magna Powertrain</b> Oil and water pumps  | <b>Webasto</b> Outer sliding roof  |
| <b>Magna Steyr</b> Fuel Cap, oil cap and fuel filler head  | <b>ZF</b> Chassis mounts, stabiliser links   |
| <b>Magneti Marelli</b> Rear lamps and bumper lights; halogen front headlights and fog lights; instrument panel; navigation and infotainment system; body |  |

improvements when the approach is used to develop the Cinquecento and in future Alfa Romeo and Lancia programmes.

The product gives some indication of Fiat's increasing seriousness. Its torsional stiffness is 50 per cent greater than the Stilo with 21,258 Nm/degree. And it features two new turbocharged 1.4 litre gasoline engines, which produce 110kW (150bhp) and 90kW (120bhp) and peak torque of 206 Nm. Upgrade to the sport version and you get button on the dash that can give you an extra 24Nm. It launches with versions of the 1.9 litre diesel, but a new 2.0-litre is expected later this year.

The figures are respectable, but the model does not set out to top performance charts; it's about profitability. The turbo's inlet and outlet pipes have been placed directly on the oil filter module and not on the engine as usual. This reduces the need for extra pipes and holes and has cost advantages.

Fiat instead set the Bravo the aim of being the benchmark in its class for residual value, operating costs, reliability and price. If visibility through the rear window is relatively poor, it is because the luggage compartment cover is slightly raised so that the Punto can beat rivals on storage space.

It is a down-to-earth approach that recognises that buying habits are changing. These are perhaps the most important considerations for the 3.4 million people that buy C-segment vehicles each

year in Europe. It is particularly true in the corporate market, which accounts for 850,000 vehicles.

Safety is naturally an important part of the package. The Bravo can be fitted with up to seven airbags. In the event of a head-on collision, occupants are protected by a restraint system that automatically adapts the activation parameters to the severity of the the accident. The driver's bag is a two-stage unit. The system also controls the activation of the seat-belt pre-tensioners.

Key Safety Systems developed the restraint system, but dealt direct with Fiat rather than talking to the other third party suppliers. In order to meet the target cost, it developed a four-piece side bag module that integrated the gas generator into the metal housing without the need for an additional fastener. The head bag uses a crimping technology to secure the metal bracket to the gas generator.

TRW developed the lane departure warning system. It uses a small video camera mounted in the vehicle's windscreen to analyse the vehicle trajectory in relation to the road layout. It warns the driver if it looks like he is wandering out of his lane using haptic feedback.

The good sense is tempered with GT-type styling similar to the successful Grande Punto and a sporty interior that uses different materials such as a carbon fibre effect.

Several suppliers have commented that the Bravo was managed more decisively than previous Fiat programmes and targets were clearer from the outset. This was a conscious move by the company, says Wester.

"Target setting, deployment and achieving – these form the backbone of a good development process," he says. "Our programmes will not always be virtual, but Fiat is starting to get more ambitious in the way it manages development."

One such vehicle will be the Linea, a three-box version of the Grande Punto that will be built in Turkey, Brazil and China for emerging markets. Fiat will not build as many prototypes as before, but the programme has so far been more traditional.

"It's part of our international product development programme, so you have people in Italy, Brazil, China and Turkey working on it as well as suppliers everywhere," says Wester.

Fiat has done a lot of work with its Turkish partner Tofas to create an organisation that is integrated with its main technical resources. It has responded well to the time pressures on the Linea and Fiat plans to extend its operations there this year.

The lessons learned on the Bravo programme are likely to help Fiat to develop further variants of the Linea to take advantage of demand for low cost cars. It looks like Fiat's fortunes are improving.

A few years ago the concern was that Fiat had lost touch and would struggle to compete with low cost manufacturers from the East, that it was a spent force in the C-segment. It remains to be seen whether the Linea will develop overseas markets for the brand in the same way that Logan is doing for Renault. The Bravo's sales figures this year will be a good indicator of how in touch with the market Fiat really is.