what's new?

Z.oe change

BEFORE THEY COULD THINK OUTSIDE THE BOX, THE ENGINEERING TEAM FOR THE 2009 NISSAN 370Z HAD TO PLAY WITH A BOX. WORDS BY **MIKE MAGDA**

THE 2009 370Z WAS INTRODUCED AT THE 2008 LA AUTO SHOW. THE CAR IS ALREADY ON SALE IN THE USA AND COMES TO EUROPE THIS SUMMER

NEWS-IN-BRIEF

Tire giant Bridgestone has won two trademark infringement actions in China. As a result of the cases, two Chinese tire manufacturers have been ordered to cease using the brand names "Rockstone" and "Bridgesteel" on their products.

Michelin has launched the new Latitude Cross, a 4x4 tire claimed to provide the same traction on loose ground as an off-road tire, with the same driving comfort as a road tire. In tests it was shown to be as quiet as the Michelin Latitude Tour HP, a tire designed for 90% road use.

Digital TPMS specialist, BERU f1systems has developed an infra red sensor that can accurately record tire carcass temperature. Named DigiTyre IR, the sensor is said to provide temperature and pressure data unaffected by heat soak from the wheel rim and brakes. Says MD, John Bailey: "Engineers will now be able to correlate accurate tire carcass temperature to wear, traction and loading."

In the early stages of developing the next-generation of Nissan's FM platform – which is also used on the Infiniti G37 and FX35/50 models – the engineers made paper boxes to help simulate the body and chassis structure. A fully enclosed paper box was very rigid and hard to twist. With one end open, the box became extremely flimsy. That got the engineers thinking about body structure with the hood opening.

The engineers then put a paper ring around the top edge of the open box and started twisting. The resistance was similar to a closed box.

"We started playing with these very simple ideas when we began tackling the redesign of the 350Z," says Peter Bedrosian, Nissan senior manager of product planning.

Engineers had two primary objectives for the 370Z: to improve the power-to-weight ratio over the 350Z, and to improve handling dynamics. Taking out a 100mm section from behind the seats to shorten the wheelbase to 2,550mm was the starting point.

"The natural roll center is now at the driver's hip point instead of behind him," says Bedrosian. "Now the car rotates around the driver, so it has a very neutral, balanced feel."

The body surgery removed some storage space, which was recovered with a dash redesign, but more importantly, weight was reduced. The diet plan also included aluminum door panels, hood and hatch. By scrutinizing every component, engineers cut 102.1kg of weight over the previous Z. The fuel tank weighs 6.3kg less, the exhaust system is 1.7kg lighter, and even the audio system contributed 1.6kg.

A manual 370Z weighs 1,466kg (1,483kg for the automatic). Overall the 370Z is 43.1kg lighter than a comparable 350Z because some of the weight saved counters the additional mass from new safety features and enhanced body stiffening.

Up front, Nissan replaced the steel crossmember with a stronger high-vacuum die-cast aluminum cradle that supports the lower control arms and steering rack. A three-point strut-tower brace reinforces the hood opening.

In the rear, the previous aluminum subframe is replaced with a single steel stamping that is 12% stiffer. There's also a V-brace that ties the rear body structure to the mid-section and helps to reduce lateral bending. The strut-tower brace is integrated into the floorpan, and the rear tower supports are enhanced with an extruded aluminum crossbar mounted behind the seats.

Remember those paper boxes? "In the 370Z, the lower part of the box is the cradle," explains Bedrosian. "Up top we have structure around the hood opening, and reinforcement with the V-brace. The front section is the radiator support, which, as on GT-R, is in carbon-fiber composite.

"It's the same exercise in the rear," he adds. "There's a V-brace at the bottom and the hatch opening is reinforced to add more structure."

For the first time, Nissan is using new, ultra-high-tensile-strength steel in the sill area and to reinforce the A-pillars. The company says the 370Z has 30% more front body torsion rigidity than the 350Z. Rear body torsion rigidity is improved by 22%, and rear body vertical bending rigidity is also up 30%.

The chassis redesign lowered the vehicle's center of gravity by dropping the engine location 15mm and bringing the driver's hip point down 10mm. Static weight balance is unchanged from the previous model at 53/47 front to rear, but there was some apprehension about how the new chassis would handle.

"We were worried about ride characteristics with the shorter wheelbase," admits Bedrosian. "There was concern that the car might be a bit nervous."

The 350Z was praised for a unique front suspension design that received 14 patents. The multilink arrangement included a long upper wishbone and two lower links, each with its own ball joint. This double-pivot design provided a more optimum wheel-center location and reduced camber change through the wheel's movement.

For the 370Z, Nissan went to a more conventional double-wishbone arrangement but spent considerable time on the computer to improve the geometry. The pickup points were moved outward 12mm, increasing the front track to 1,549mm.

"We went with that design for more accurate wheel camber," he says. "With the rigidity we got a better ride, and along with the improved geometry we get less understeer and more direct steering feel."

The front stabilizer bar is a hollow construction and was redesigned for lighter weight, yet the lever ratio improved 35%. The stabilizer-bar mounts on the lower control arm were also redesigned. The spring/shock package was enhanced, and new 'high-response' shock absorbers are used. In the rear, the four-link design returns, but many individual components were strengthened, lightened or both, and the geometry was improved.

The VDC stability control system received upgraded logic, and the driver can now disengage the VDC completely when desired.

"This is something our customers wanted," says Bedrosian. "Many like to take their car to the track and the VDC was coming on. Some guys with dedicated track cars were cutting up the wires and it was just messy."

The 370Z chassis engineers were not restrained for fear of encroaching on performance levels of the GT-R. "There's a distinction between the two cars," says Bedrosian. "The GT-R was developed at the track for the track. The Z was developed for the street."

SPECIFICATIONS

Nissan 370Z

Dimensions 4,247mm (L) x 1,844mm (W) x 1,316mm (H)
Wheelbase 2,550mm; track width (18in wheels) 1,549mm (F), 1,595mm (R)

Engine: 3.7-liter V6 with VVEL (Variable Valve Event and Lift). 326bhp; 366Nm; 7,000rpm redline

Gearbox: Six-speed manual with Synchro Rev Control (automatic blipping on downshift), or seven-speed automatic

Steering: Rack-and-pinion, fixed 14.7:1 ratio

Brakes: Standard are 320mm front discs and 308mm rears with floating cast-iron calipers. Optional brakes are 356mm front rotors with fixed four-piston aluminum calipers and 351mm rear rotors with two-piston calipers. Nissan also designed a variable-ratio brake pedal for easier modulation at higher speeds.

Wheels/tires: Standard 18in alloys and Yokohama ADVAN Sport P225/50R18 (F) and P245/45R18 (R) tires. Optional are 19in RAYS forged alloys with Bridgestone Potenza RE050A P245/40R19 (F), P275/35R19 (R) tires

ON THE WEB

Available elsewhere on vehicledynamicsinternational.com – more on the European-spec 370Z, including driving impressions

NEWS -IN-BRIEF

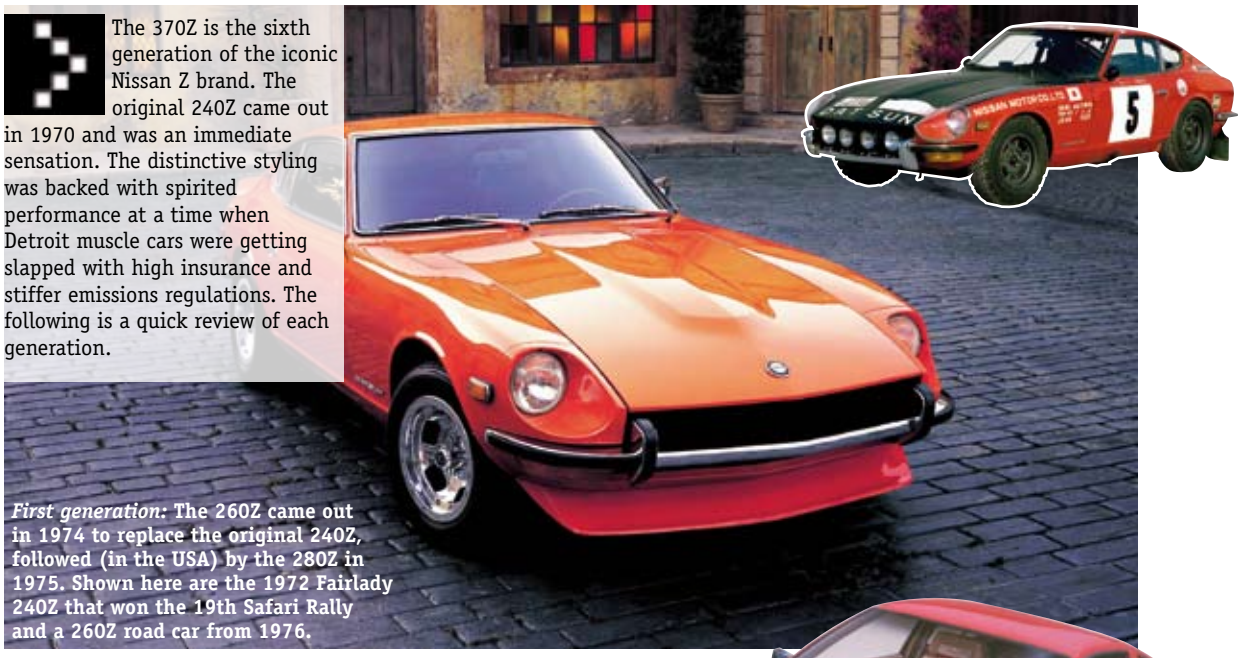
Building on the heritage of the iconic DS model, Citroën is to launch a new line of products to broaden its current range. Positioned in the small, medium and large car segments, the three vehicles will be launched successively from 2010 and be badged DS3, DS4 and DS5. The French OEM says the new product line will illustrate its new spirit of "Créative Technologie".

Volkswagen unveiled a mid-engined roadster concept at the Detroit Auto Show. According to insiders at VW, the diesel-powered Concept BlueSport makes clever use of existing chassis components, including a 'back to front' axle at the rear, to strengthen the business case for any potential future production car.

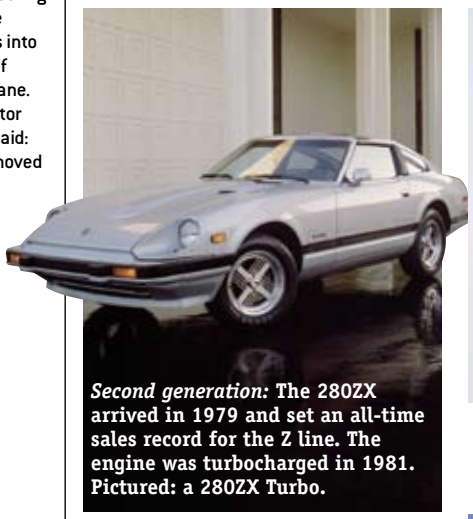
History from A to Z

THE NEW 370Z IS THE LATEST IN A DISTINGUISHED LINE OF NISSAN SPORTS CARS TO WEAR THE NAME 'Z'. **MIKE MAGDA** LOOKS BACK OVER THE CARS THAT CAME BEFORE

The 370Z is the sixth generation of the iconic Nissan Z brand. The original 240Z came out in 1970 and was an immediate sensation. The distinctive styling was backed with spirited performance at a time when Detroit muscle cars were getting slapped with high insurance and stiffer emissions regulations. The following is a quick review of each generation.



First generation: The 260Z came out in 1974 to replace the original 240Z, followed (in the USA) by the 280Z in 1975. Shown here are the 1972 Fairlady 240Z that won the 19th Safari Rally and a 260Z road car from 1976.



Second generation: The 280ZX arrived in 1979 and set an all-time sales record for the Z line. The engine was turbocharged in 1981. Pictured: a 280ZX Turbo.

Third generation: A complete redesign resulted in the 300ZX introduced in 1983 (see cutaway, above). Nissan dropped the Datsun brand for good during this generation, and Paul Newman started collecting SCCA trophies in his race-prepped Z.

Fourth generation: Awesome power came with the 1990 300ZX Twin Turbo, and the new body style earned rave reviews. US auto magazines started a heated rivalry between the Z and the Chevy Corvette. Few changes were made in the following years and production ended in 1996. Above: a 1992 car

Fifth generation: The Z line was revived for the 2003 model year with the 350Z (above). Numerous special editions were offered, including a 35th anniversary model.

NEWS-IN-BRIEF

Former Siemens VDO executive John G. Sanderson has been named president and general manager of BorgWarner Transmission Systems, Drivetrain Group, and vice-president of BorgWarner Inc.

Toyota has extended its strategic partnership with LMS International to full vehicle thermal management analysis. The LMS engineering team will provide Toyota with three energy management flow simulators for the Corolla, Prius, and iQ.

SAIC Motor UK Technical Centre (SMTC UK) and MG Motor UK Limited now share the Longbridge site after engineering and R&D completed a move from its Leamington offices into new premises, on the site of the MG factory on Lowhill Lane. Ian Horton, SMTC UK's director of business development, said: "We are delighted to have moved to Longbridge to be closer to the product and to the HQ functions of MG UK."