

SUSPENSION

The desired goals for the NSX suspension went well beyond the typical goals of high lateral adhesion, transient response and linear response to control input. The engineers wanted a suspension that allowed the driver to easily control the car right to the limit.

The basic configuration is similar to that of a Formula One car in that it employs an upper and lower control arm (or double-wishbone) design with a coil-over shock absorber and anti-roll bar front and rear. The rear suspension also has an additional transverse link for greater wheel control. All the suspension arms are made of extremely rigid and durable forged aluminum. The front steering knuckles and the rear hub carriers are also made from aluminum forgings. The springs are straight rate with an extended rubber bump stop mounted on the chassis which acts as a progressive springing element at the limit of wheel travel.

The shock absorbers are nitrogen filled and feature a newly designed Honda Progressive Valve (HPV). The progressive opening of this valve produces a more favorable damping profile and more precise damping control than a conventional valve system in which the fluid control orifices are either fully opened or closed.

The front and rear suspension components are mounted on separate aluminum subframes. These subframes are castings mounted to the chassis by rubber bushings, designed to reduce vibration, yet limit flex and shift of the subframes relative to the chassis.

The suspension development program was far-ranging and took place at the Tochigi Proving Grounds, the Suzuka circuit and the 179-turn Nurburgring course in Germany. In addition to the standard evaluations conducted in-house by the suspension engineers, the car was subjected to evaluation by top-rank drivers such as two-time Formula One World Champion Ayrton Senna, Indianapolis 500 winner Bobby Rahal, and Formula One driver Satoru Nakajima.

BRAKES

The NSX is equipped with 4-wheel ventilated disc brakes and dual piston steel calipers. The diameter of the front and rear discs are 282 mm (11.1 in.). The braking targets were to set new standards of braking performance, fade resistance, provide good pedal feel, linear braking response and low pedal effort.

FOUR-CHANNEL ANTI-LOCK BRAKING SYSTEM

Developed by Honda R&D, this new 4-channel Anti-Lock Braking System controls each wheel independently with a new 16-bit micro-processor. This 4-wheel, independent capability allows fine control of the anti-lock function especially when the car is braking on a surface with a split coefficient of friction — for instance, if the left side wheels are on snow, ice or standing water and the right side wheels are on dry pavement.

The basic configuration is independent parallel hydraulic circuits. In addition to the primary, non-anti-lock braking circuit, the anti-lock system has its own hydraulic reservoir, pump, modulator unit, solenoids and control pistons. If a failure in the anti-lock hydraulic circuit should occur, normal braking force will be fully retained by the primary braking circuit.

RACK-AND-PINION STEERING SYSTEM

NSX models with the manual transmission are equipped with a manual, non-assisted rack-and-pinion steering system. To ensure maximum reliability, it features a sealed gearbox design.

VARIABLE ELECTRIC POWER-ASSISTED STEERING SYSTEM

Available only on the automatic transmission-equipped NSX, this power-assisted steering system is the first of its kind on the American market. The system consists of a rack-and-pinion steering gear with an electric motor installed concentrically around the steering rack. The steering system is a direct design which functions with no assist at higher vehicle speeds. A speed sensor in the electronic control unit determines road speed and, coupled with a steering sensor for torque and rotation, feeds a signal to the motor. To ensure reliability, the electrical system for this unit features gold-plated connectors.

FORGED ALLOY WHEELS

To further reduce unsprung weight and provide the highest strength possible, the engineers specified forged-aluminum alloy wheels. To produce the wheels, a new facility was built exclusively for this purpose by Sumitomo Light Metals. The result is a very light wheel with the strength and impact resistance of a much heavier steel wheel. The rear wheels are 8x16 inch, and the front wheels are 6-1/2x15 inch. Compared to cast aluminum, the total weight savings of all four wheels amounts to 12 kilograms. (26.4 pounds).

TIRES

The suspension engineers, working in conjunction with Yokohama Tire Company, sought to produce a tire that would allow the driver to readily "feel" the limits of the tires' performance.

As a result of computer design work and track testing, the tires on the NSX are not only different sizes front and rear (205/50 ZR15 front, and 225/50 ZR16 rear), but they also feature a different tread block configuration and different compounds front and rear. Called the A-O22, the tires use a mixture of two compounds, the tread compound and the undertread compound. The tread compound contributes to wet and dry traction while the undertread compound contributes to handling stability, high-speed stability and predictable reaction to steering input.