

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 stabilizer 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 heat-treated aluminum castings. 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 progressive valve. 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 three-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 (ABS)

The 4-channel Anti-Lock Braking System controls each wheel independently with a 16-bit microprocessor. 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 was 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.

For 1994, the NSX features wider, larger diameter seven-spoke wheels, for even better steering response and enhanced cornering ability. The rear wheels are 8.5 x 17 inch, and the front wheels are 7 x 16 inch.

TIRES

The suspension engineers, working in conjunction with Yokohama Tire Company and Bridgestone Tire Company, sought to produce tires that would not only provide excellent traction and handling, but also allow the driver to “feel” the limits of the tires’ performance.

The resulting uniquely designed tires were remarkable, meeting all the high performance targets the engineers established early in the program. But since any tire is a delicate compromise, the engineers compromised heavily in favor of performance.

For 1994, the NSX features larger, lower aspect ratio tires, front and rear, for even more responsive handling and increased cornering capability. The tire sizes are 215/45 ZR16 front and 245/40 ZR17 rear. These tires provide excellent wet- and dry-weather traction, high-speed stability and immediate and predictable reaction to steering input.