

2005 Shelby GR-1 CONCEPT Chassis

They started by attaching massive 19-inch wheels and tires using the Ford GT suspension system with a few modifications to accommodate the increased weight of a front-engine setup.

The new Ford GT earns praise for its combination of agility, grip and easy-to-drive character, a reflection of its sophisticated suspension design and the expertise of its chassis engineers. The Ford Shelby GR-1 concept applies the best of the GT suspension to a supercar with different performance intentions.

SOPHISTICATED SUSPENSION

A double-wishbone suspension design with unequal-length aluminum control arms, coil-over monotube shocks and stabilizer bars is used front and rear. The upper control arms are identical at all four wheels and are made with an advanced rheo-cast process that allows the complexity of form associated with casting while retaining the strength of forging. The metal, heated to just below its melting point, is the consistency of butter when it is injected into a mold at high pressure. Pressure is maintained as the part cures, preventing porosity in the final product for exceptional strength.

The steering rack also is borrowed from the Ford GT, with a few modifications. The steering, like the Ford GT's, draws on Ford's global driving dynamics DNA introduced with the Ford Focus's industry-leading steering column featuring light efforts, low friction and high stiffness. Braces between the front shock towers and below the isolated engine mounts improve torsional rigidity and aid steering response.

POWERFUL BRAKES

With more than 600 horsepower available at the throttle pedal, the brake pedal had to be equally potent. The team set braking distance targets comparable with today's best supercars, and turned to the Ford GT braking system for suitable components.

Brembo "monoblock" one-piece aluminum brake calipers with four pistons each grab cross-drilled, vented discs at all four wheels. The discs are a massive 14 inches in front and 13.2 inches in the rear, for fade-free stopping power. Brake balance is biased slightly to the front wheels to aid stability.

For packaging reasons, the team devised a novel offset actuation linkage for the brake booster and master cylinder, so the brake pedal can be placed in a normal position even though its hardware is off to the side of the engine bay. The kinematic linkage concept for the remote booster actuation was an idea borrowed from the European Ford Mondeo.

"The unique remote booster had to be just right so you can slow the car in a linear and proportional way. This means the pedal effort and travel are proportional to the vehicle deceleration rate, which is especially important in high-performance sports cars," said Rumpel.

The one-piece, 12-spoke BBS wheels are fitted with Goodyear Z-rated racing slicks. The fronts are 275/40R-19 while the rears are 345/35R-19.