

2022 CHEVROLET CORVETTE SERVICE MANUAL

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Front Suspension Description and Operation

The front suspension has two primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

The front suspension absorbs the impact of the road while travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road.

The steering knuckle is connected to a front upper control arm and a front lower control arm through permanently sealed ball joints at the outermost points of the arms.

The up and down motion of the steering knuckle, as the vehicle travels over bumps, is absorbed predominantly by the front coil spring. A front shock absorber is used in conjunction with the front coil spring to dampen oscillations. The front shock absorber is filled with oil and has a moveable shaft that connects to a piston inside the front shock absorber. Valves inside the front shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. The front shock absorber assembly consists of a front shock absorber, front coil spring, front shock absorber mount, and different combinations of insulators, dust boots, bumpers, and hardware. The front shock absorber assembly is held together, under tension, by a front shock absorber shock rod mount nut at the top of the assembly. The upper end of the front shock absorber assembly attaches to the vehicle body and the lower end attaches to the front lower control arm.

Some vehicles are equipped with a magnetic selective ride control system. The magnetic selective ride control system individually controls the damping force of each of the vehicle shock absorbers to keep the vehicle body as calm as possible. Changes of the damping forces can be accomplished within milliseconds and suspension characteristics can be changed at any time by activating the different available modes. For more information, refer to Electronic Suspension Control Description and Operation.

Some vehicles are equipped with a front ride height control system. The system consists of front shock absorbers with built in two-position lift actuators, hoses, lines, hydraulic fluid reservoir and a electro-hydraulic control unit. The benefit of the system is to provide increased ground clearance to navigate speed bumps, steep driveways or service events to clear drive on hoists, frame contact hoists or floor jacks. For more information, refer to Electronic Suspension Control Description and Operation.

The front lower control arm is connected to the drivetrain and front suspension cradle through two rigid bushings which allows the front lower control arm to pivot up and down with respect to the vehicle body structure. The front lower control arm is attached to the drivetrain and front suspension cradle through front lower control arm adjust bolts equipped with front lower control arm adjust cams. The front lower control arm attachment points at the drivetrain and front suspension cradle are slotted permitting camber and caster adjustments by rotating the front lower control arm adjust bolts and cams as necessary. A ball joint at the outermost end of the front lower control arm allows the steering knuckle to maintain the perpendicular relationship to the road surface and to rotate as the steering wheel is turned.

A front stabilizer shaft is used to help reduce body roll when the vehicle is driven around a turn. The front stabilizer shaft is mounted to the drivetrain and front suspension cradle by two front stabilizer shaft clamps and insulators. Front stabilizer shaft links are used to connect the ends of the front stabilizer shaft to each front lower control arm. Each front stabilizer shaft link has a permanently sealed ball joint on each end.