



HOW DOES A NAVIGATION SYSTEM OPERATE?

Navigation systems use the Global Positioning System (GPS) – a network of communications satellites placed in precise, very high orbits around the earth. These satellites continuously transmit signals that are received by the vehicle's navigation system. The vehicle's navigation system receives signals from three of these satellites simultaneously. By using triangulation, it then can determine the vehicle's location with an incredible degree of accuracy anywhere on the earth. Typically, the navigation system will be able to pinpoint a vehicle's location to within a few yards.

By knowing where the vehicle is at any given instant, and knowing where the driver wishes to go, the system can calculate the most preferred route using its vast database of information on all the available roads and highways.

In addition, the system includes:

- a gyro sensor in the navigation electronic control unit (ECU). This sensor detects a change in the direction of vehicle travel.
- vehicle speed sensors.

By processing information from the GPS, the gyro sensor, and the vehicle speed sensors, the navigation system can determine where the vehicle is at all times, which direction it is going, and how far it has traveled.

The navigation system then translates this information, and gives it to the driver in a format that can be easily understood: map, text, or voice prompt. This last format allows the driver to follow the directions without having to look away from the road.

The system is so quick to act, and so accurate, that if a vehicle continues past a spot where the route suggested it turn – for example, at an intersection – the system nearly immediately begins recalculating a new set of directions to get the vehicle back on to its intended course. This new route is relayed to the driver both through the map display and voice guidance.