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DEPARTMENT OF MECHATRONICS ENGINEERING

19MCE402 – AUTOTRONICS

Topic: Traction control system - Cruise control system

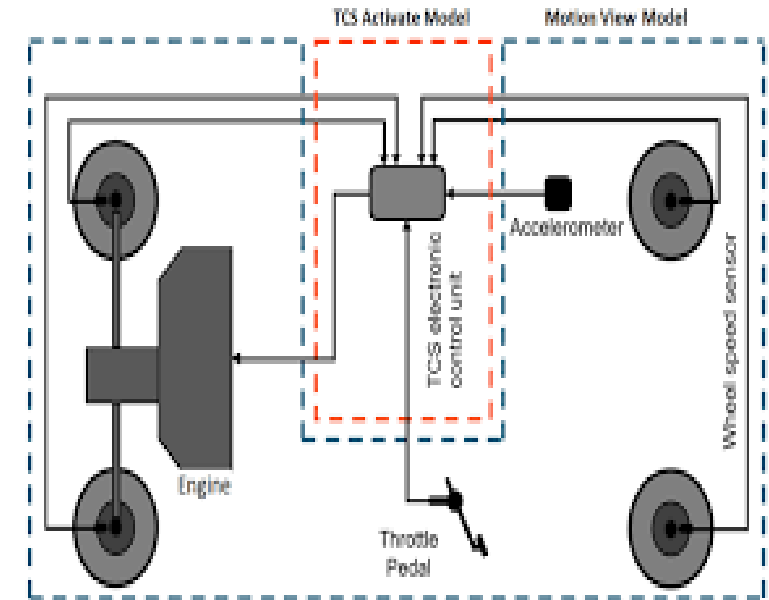


TRACTION CONTROL SYSTEM



A traction control system (TCS) is an essential automotive safety feature that helps maintain control and stability of a vehicle during acceleration, particularly in slippery or low-traction conditions. Here's a breakdown of TCS in points:

- 1. Purpose:** TCS is designed to prevent wheel spin during acceleration, ensuring that power is delivered to the road efficiently and minimizing the risk of skidding or loss of control.
- 2. Sensor Network:** TCS utilizes a network of sensors, including wheel-speed sensors, to continuously monitor the rotational speed of each wheel. These sensors feed data to the vehicle's control unit.
- 3. Throttle and Braking Control:** When the system detects wheel slip, it can reduce engine power (throttle control) and apply selective braking to specific wheels to regain traction and stability.
- 4. Low-Traction Scenarios:** TCS is especially valuable in low-traction situations, such as wet or icy roads, gravel, or off-road conditions. It helps prevent fishtailing and loss of control.

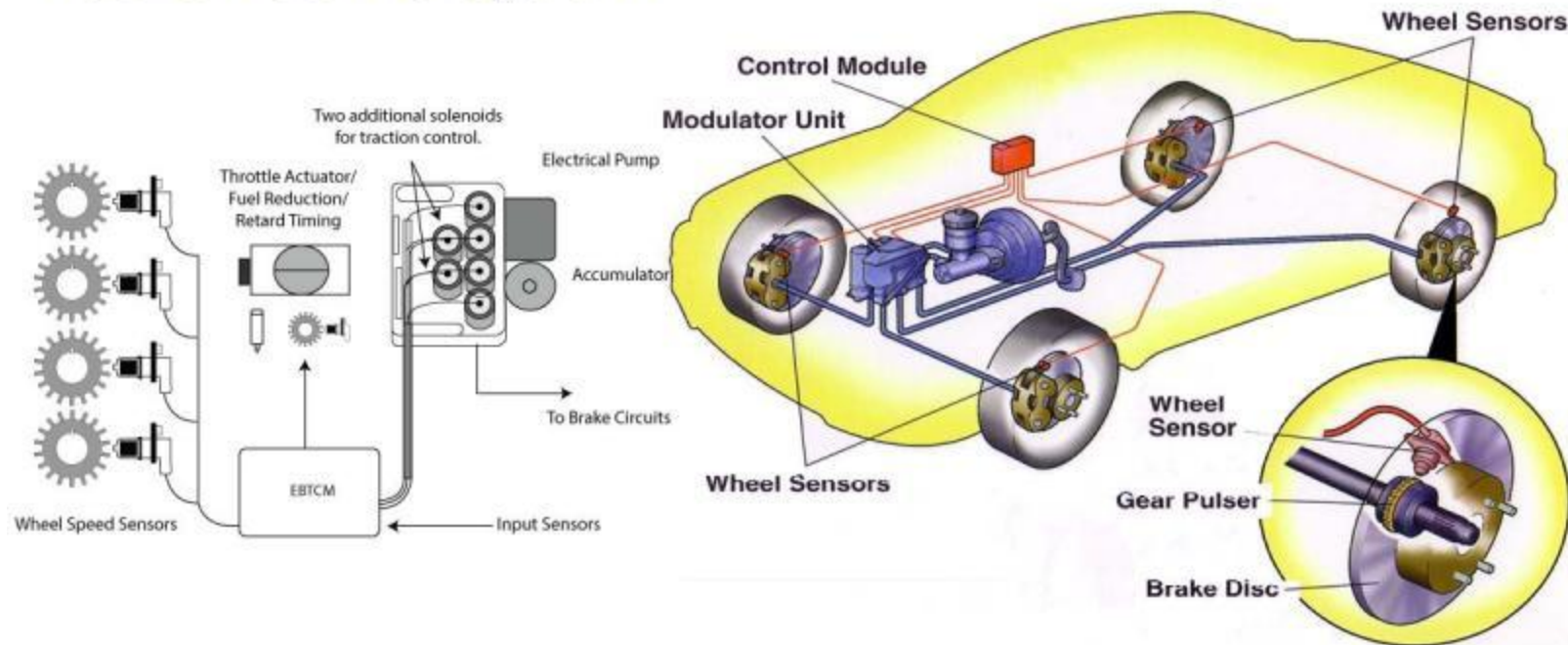




TRACTION CONTROL SYSTEM



Traction Control System





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- 5. Enhanced Safety:** TCS enhances safety by minimizing the risk of accidents due to wheel spin and skidding. It assists drivers in maintaining control of their vehicles.
- 6. User Benefits:** Drivers benefit from TCS as it allows them to accelerate with confidence on slippery surfaces, improving overall vehicle stability and performance.
- 7. Integration with Other Systems:** TCS often works in conjunction with other safety systems, such as electronic stability control (ESC), which further enhances a vehicle's handling and stability.
- 8. Override Option:** Some vehicles provide an option to disable TCS, which can be useful in specific situations, such as when the vehicle is stuck in deep snow or mud.
- 9. Warning Lights:** When TCS is actively engaged or when there's a system malfunction, a dashboard warning light typically alerts the driver.
- 10. Ongoing Development:** Automotive manufacturers are continually improving TCS and integrating it with advanced driver assistance systems (ADAS) to further enhance vehicle safety and performance.
- 11. Regulatory Requirement:** TCS is mandatory in many countries and has become a standard safety feature in modern vehicles.

In summary, a traction control system is a vital automotive feature that uses sensors and control mechanisms to prevent wheel spin and maintain vehicle stability during acceleration, particularly in challenging road conditions. It's an integral part of modern vehicle safety systems.



CRUISE CONTROL SYSTEM



Cruise control is an automotive feature that allows drivers to maintain a constant speed without the need for continuous manual throttle control. Here's an overview of cruise control in points:

- 1. Purpose:** Cruise control is designed to relieve the driver from the constant need to adjust the throttle, making long-distance highway driving more comfortable and reducing driver fatigue.
- 2. Activation:** It's typically activated by the driver setting the desired speed and engaging the cruise control system, often through a button on the steering wheel or control panel.
- 3. Maintains Speed:** Once activated, the system keeps the vehicle at the chosen speed without the driver needing to press the gas pedal. The driver can disengage cruise control by braking or turning it off manually.
- 4. Speed Adjustment:** Drivers can typically adjust the set speed using buttons or a lever on the steering wheel, allowing them to increase or decrease the vehicle's speed incrementally.
- 5. Resuming Speed:** Many cruise control systems have a "resume" function, which allows the vehicle to return to the previously set speed after the driver has temporarily disengaged cruise control, such as by braking.
- 6. Cancel Function:** There is usually a "cancel" function that immediately deactivates cruise control without turning it off. This is useful when the driver wants to quickly slow down, such as when approaching slower traffic.



CRUISE CONTROL SYSTEM



7. Brake or Accelerator Override: Cruise control is overridden when the driver presses the brake pedal or accelerates manually. This ensures safety in sudden or emergency situations.

8. Ideal Use: Cruise control is most effective on long, open highways with consistent speeds. It's less suitable for city driving or areas with frequent speed changes.

9. Fuel Efficiency: Using cruise control at a steady speed on the highway can contribute to improved fuel efficiency by maintaining a constant speed and reducing throttle fluctuations.

10. Speed Limitations: Cruise control systems may not be effective at very low speeds, as they are primarily designed for maintaining constant speeds on highways.

11. Safety Considerations: Drivers should use cruise control responsibly, always being alert and ready to take control of the vehicle if necessary. It's not recommended for use in heavy traffic or adverse weather conditions.

12. Modern Advancements: Advanced cruise control systems, such as adaptive cruise control, can automatically adjust vehicle speed to maintain a safe following distance from the vehicle ahead.

Cruise control is a convenient feature for highway driving, but drivers should use it judiciously and ensure they remain attentive to the road and traffic conditions. It is a valuable tool for reducing fatigue and optimizing fuel economy on long trips.



Thank You