



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUT302 – VEHICLE DYNAMICS AND STRUCTURES

III YEAR / V SEMESTER

Unit 4 – Longitudinal Dynamics and Control

Topic : ABS, Stability Control and Traction Control

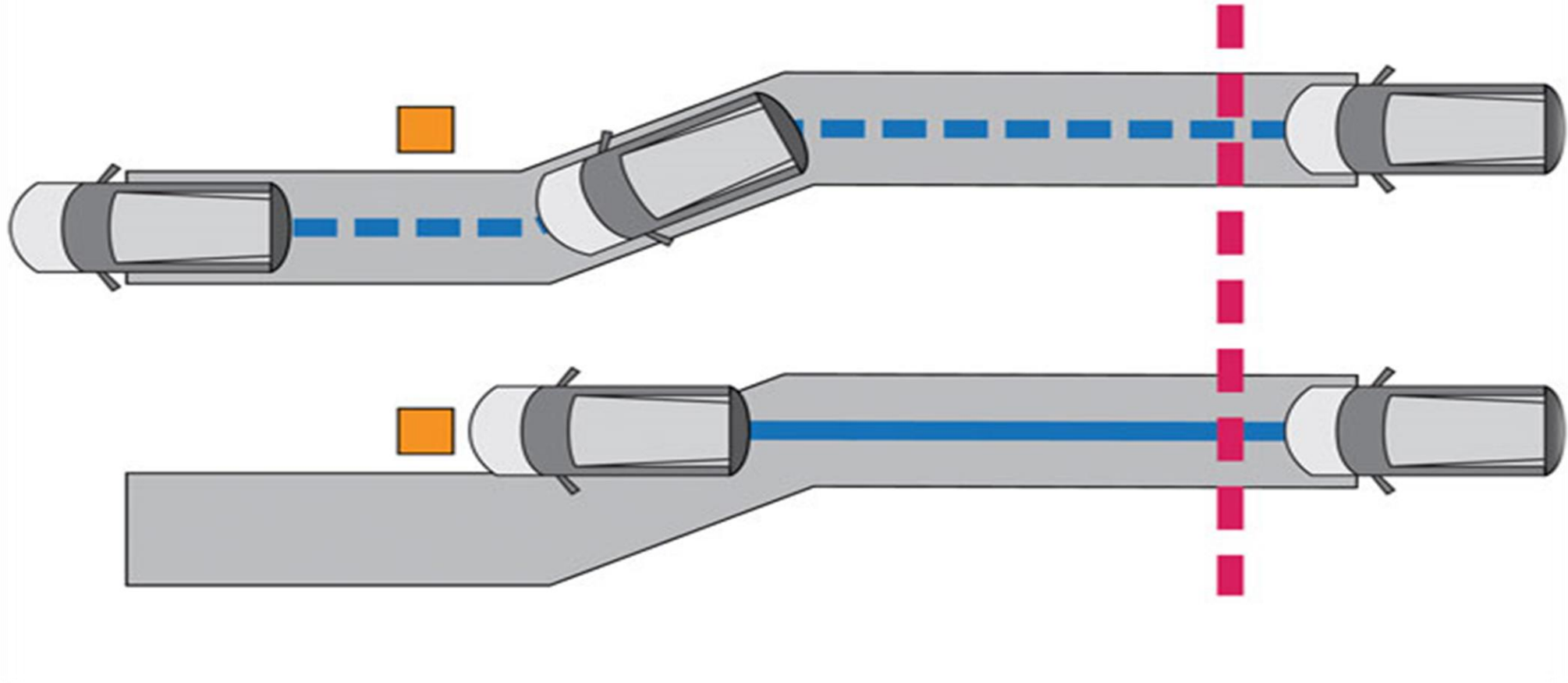


Need for ABS





Need for ABS





INTRODUCTION

- An anti-lock braking system (ABS) is a safety anti-skid braking system used on cars, motorcycles, trucks, and buses.
- ABS operates by preventing the wheels from locking up during braking.
- It maintains the tractive contact with the road surface and allowing the driver to maintain more control over the vehicle.

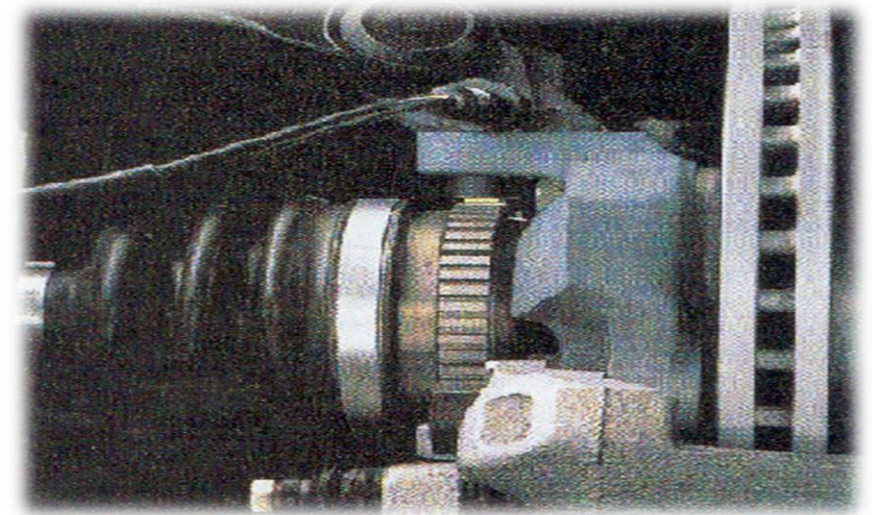




COMPONENTS OF ABS

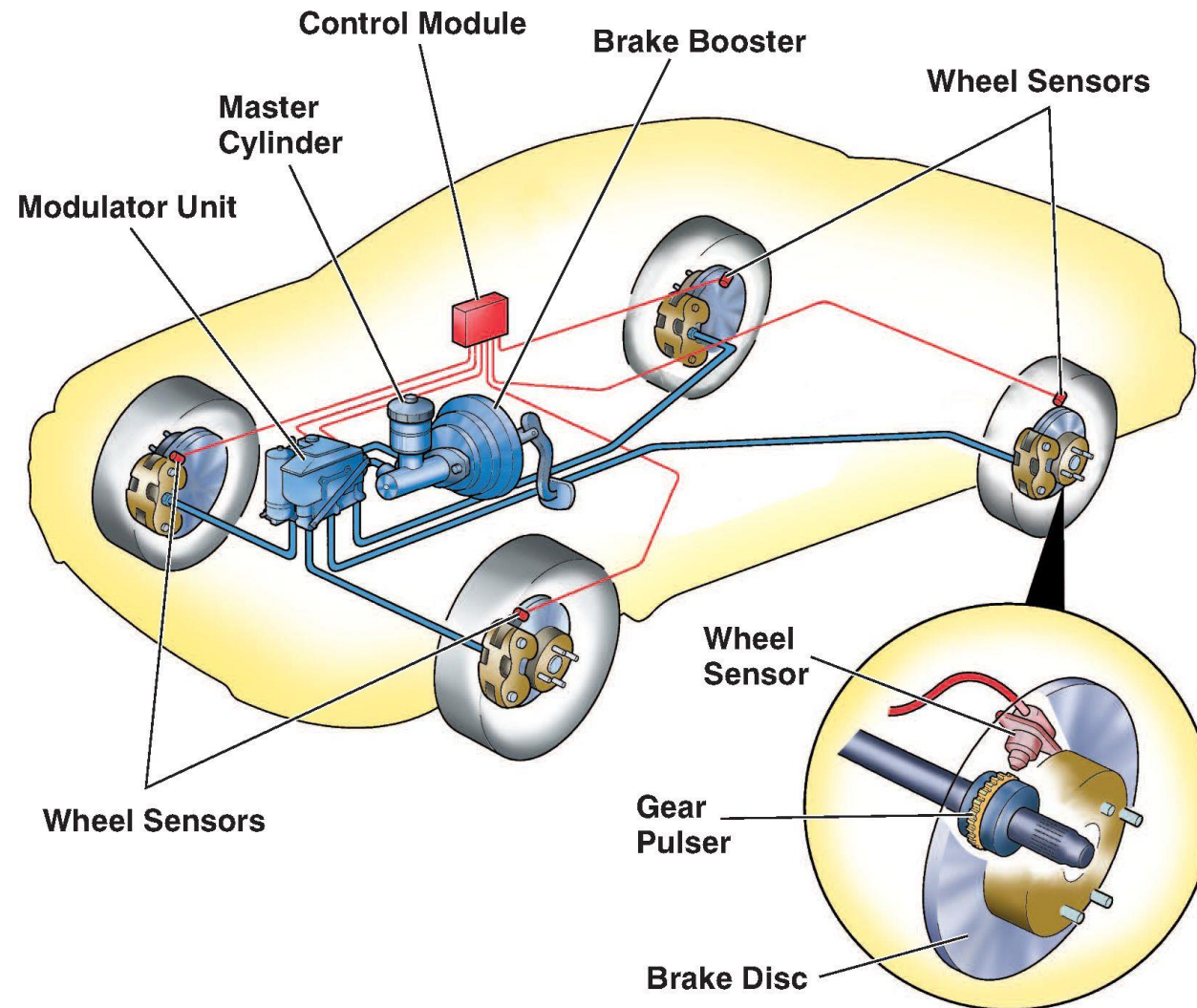


- ❖ Speed sensors
- ❖ Pump
- ❖ Valves
- ❖ Controller



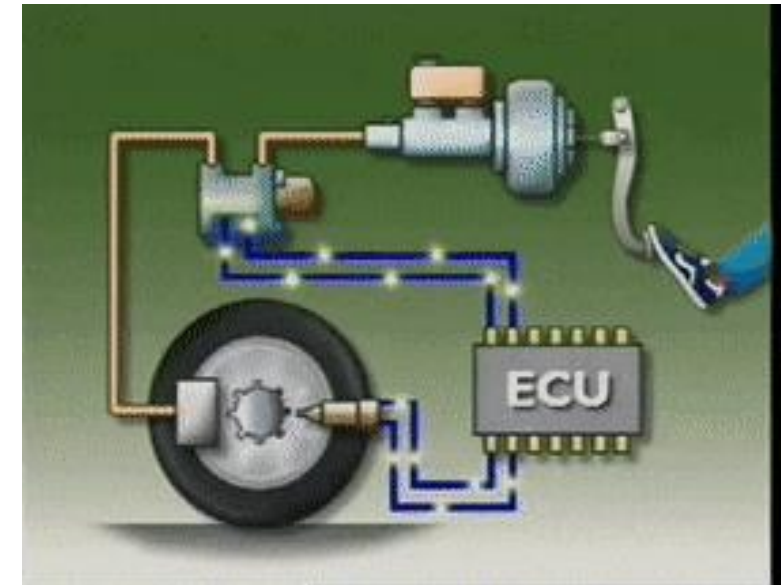
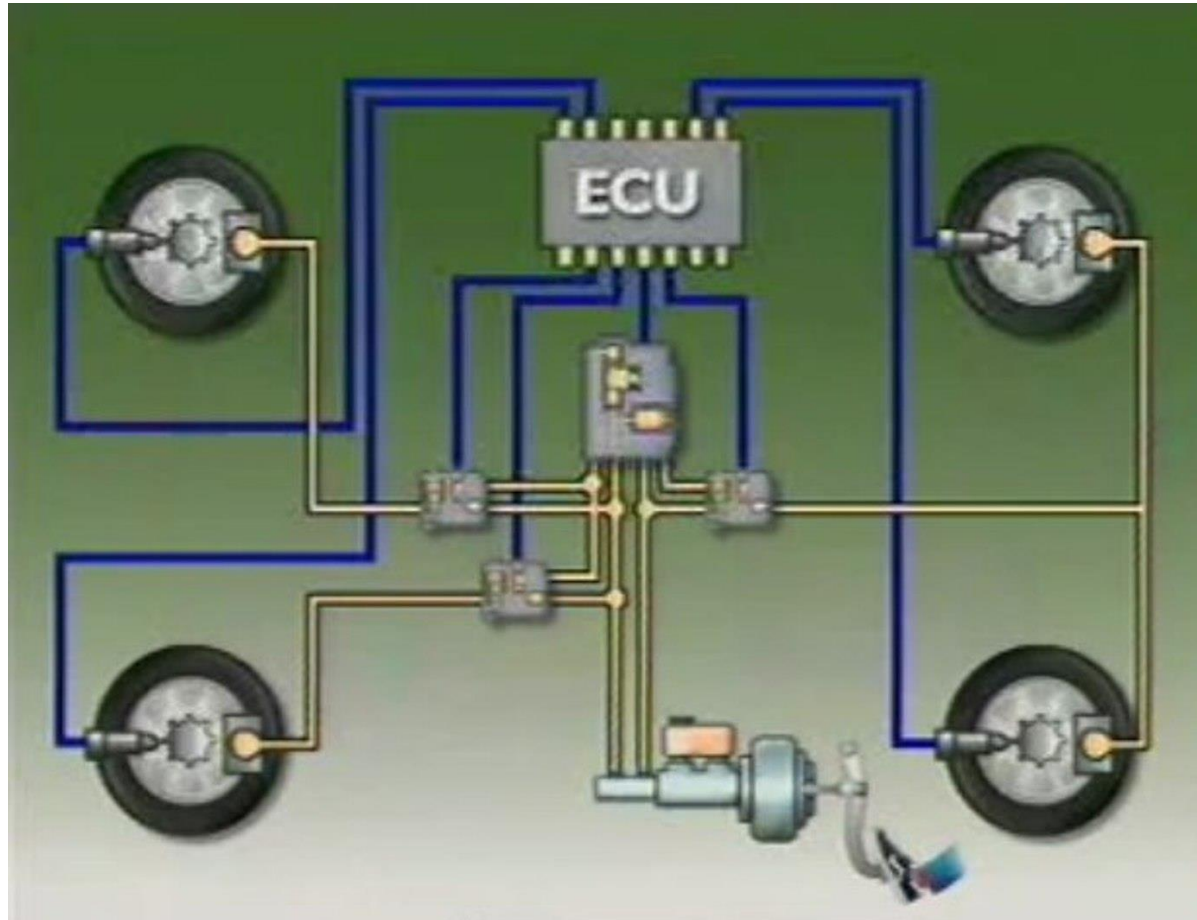


CONSTRUCTION





WORKING

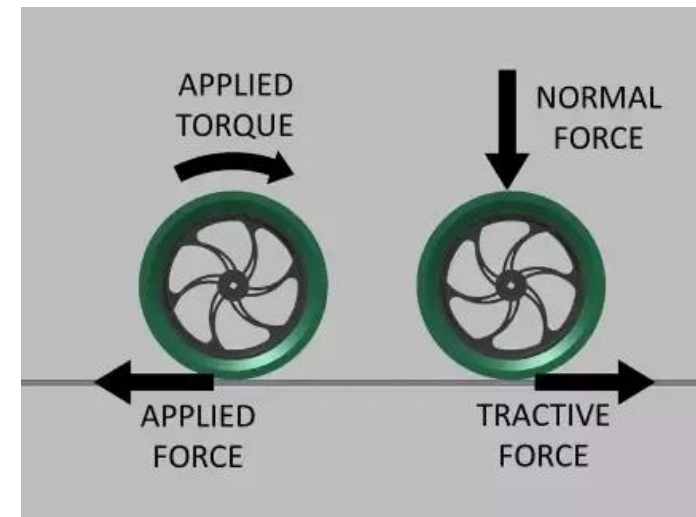




TRACTION



- The force available at the contact between the drive wheel tyres and road is known as '**tractive effort**'.
- The ability of the drive wheels to transmit this **effort** without slipping is known as '**traction**'
- Traction is the friction between a drive wheel and the road surface
- Traction will be less in Slippery Roads.





NEED FOR TRACTION CONTROL SYSTEM

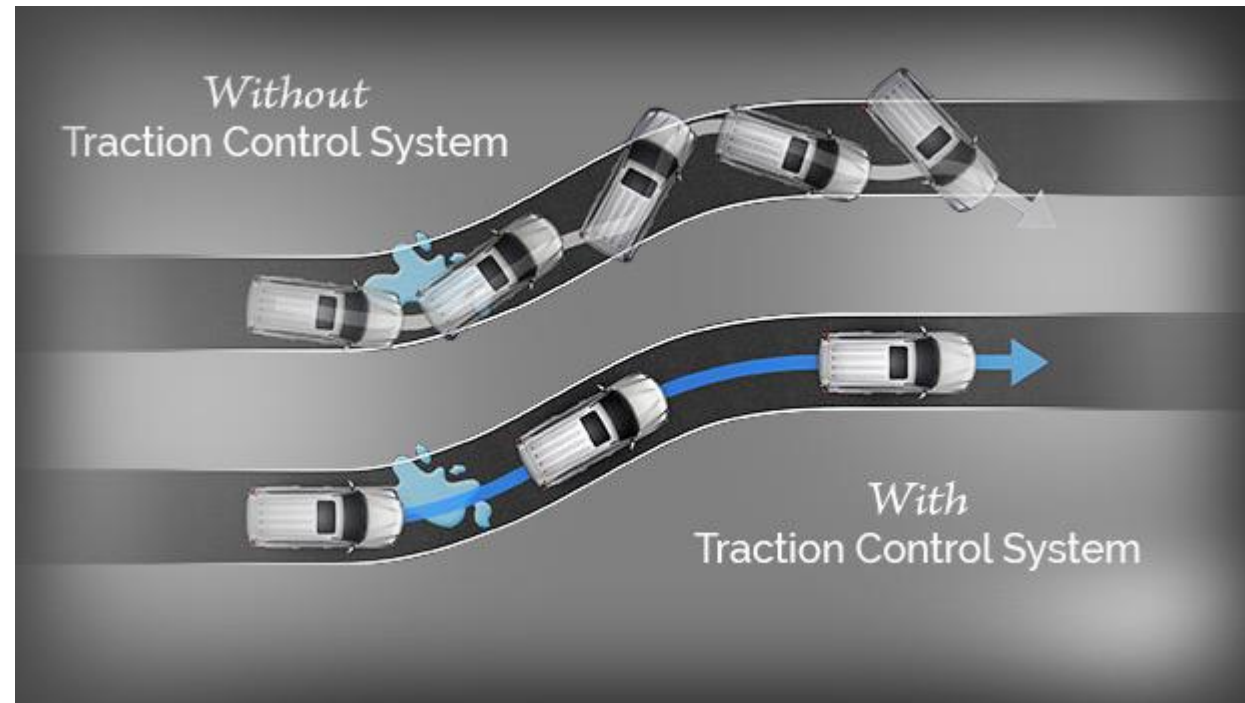




INTRODUCTION TO TRACTION CONTROL SYSTEM



- **Traction control** is an active vehicle safety feature designed to help vehicles make effective use of all the **traction** available on the road when accelerating on low-friction road surfaces.





COMPONENTS

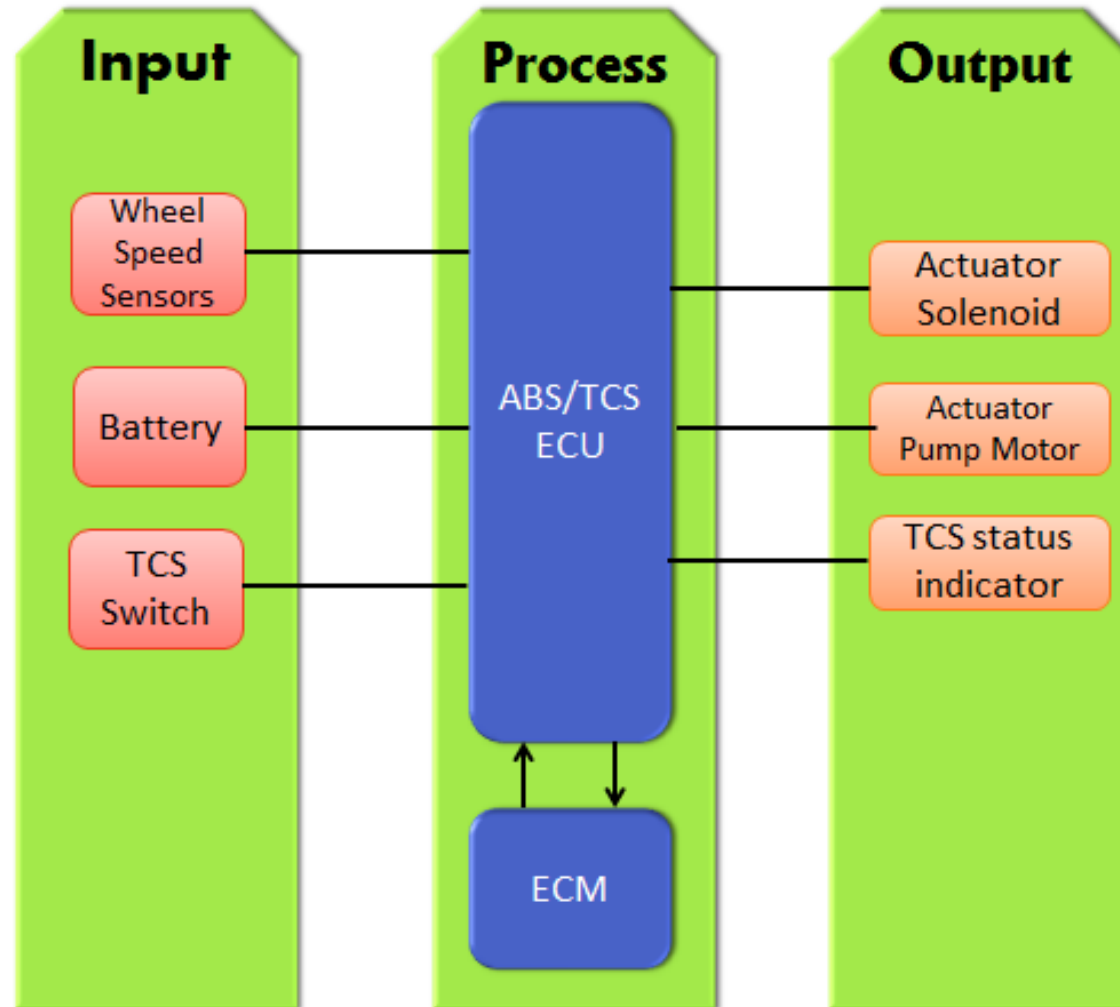


- Wheel Speed Sensors
- Traction Control Module
- Hydraulic Modulator





WORKING

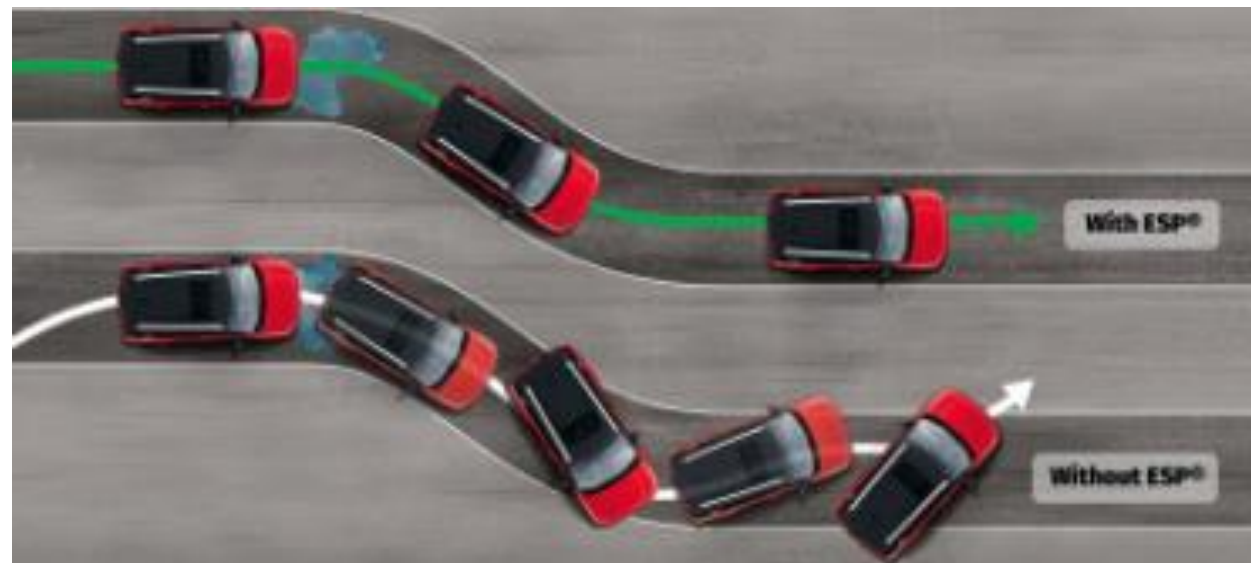




ELECTRONIC STABILITY PROGRAMME



- Electronic Stability Program (ESP), also known as Electronic Stability Control (ESC), is a vehicle safety feature that helps drivers maintain control of their vehicle in slippery or high-risk driving conditions.
- ESP is designed to prevent skidding and loss of control during cornering and sudden maneuvers.





COMPONENTS



❖ Sensors

- Wheel Speed Sensor
- Steering Angle Sensor
- Yaw Rate Sensor
- Lateral Acceleration Sensor
- Brake Pressure Sensor

❖ Control Unit (ECU)

❖ Hydraulic Modulator Unit

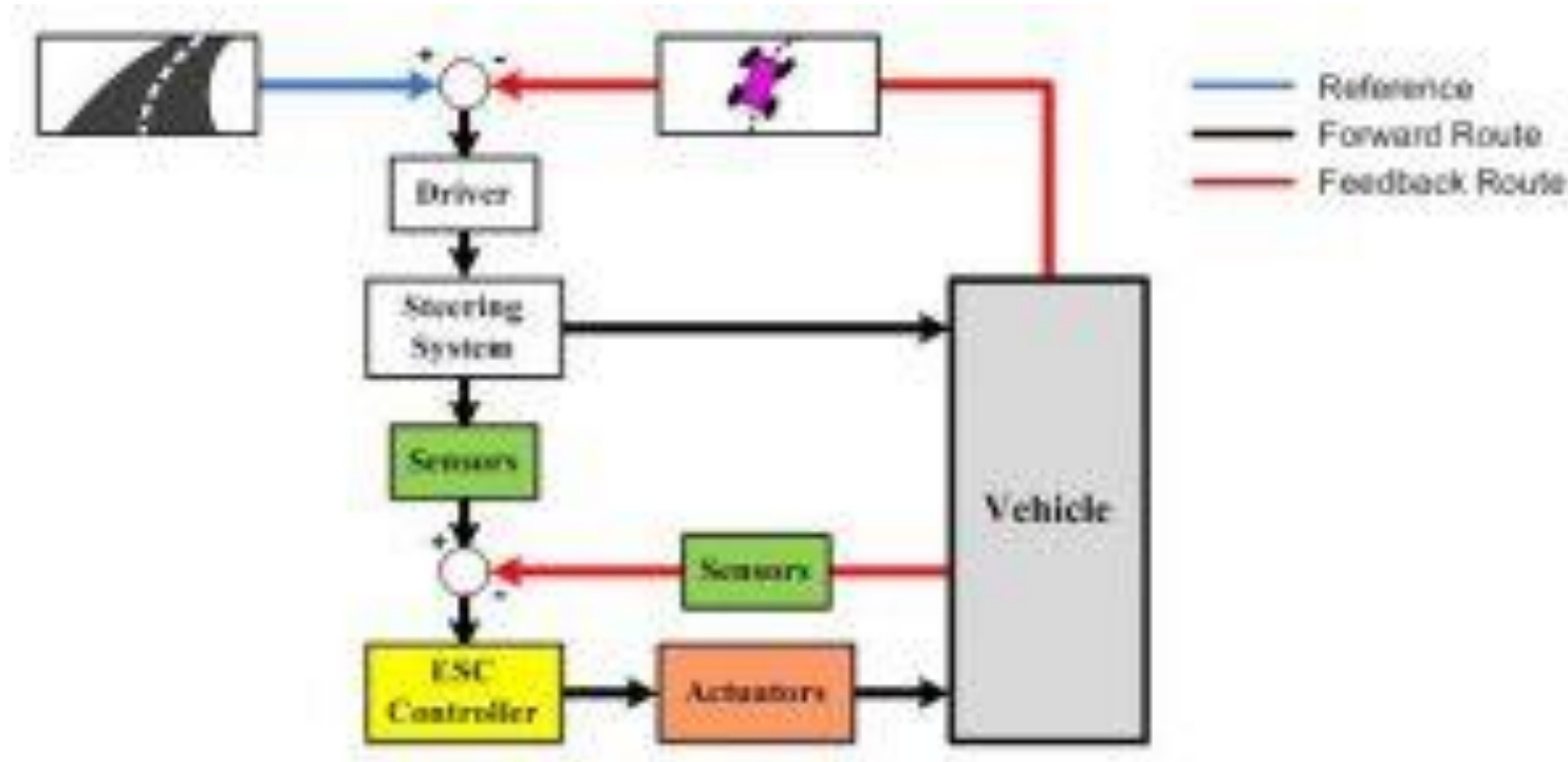
❖ Throttle Control

❖ Indicator Light.





WORKING





REFERENCE



- ❖ <https://www.youtube.com/watch?v=iBU2n-HI2oM>
- ❖ <https://www.youtube.com/watch?v=5IP-pgKrNV8>
- ❖ <https://www.youtube.com/watch?v=m6752nIYbos>



THANK YOU !!!