



iTC - Intelligent Throttle Control



System description

- Electronic throttle control system
- Comprised of:
 - Throttle Accelerator Sensor (TAS) – Throttle pedal
 - Electric Throttle Actuator (ETA) – Throttle body
 - Throttle Position Sensor (TPS) – Throttle body
- Referred to as throttle by wire – no throttle cable
- ECM controls ETA according to TAS and other sensors
- ECM can change ETA independent of TAS to limit torque or speed



System main features

■ Key modes

- Normal key: 70% of accelerator demand, max 70km/h
- Performance key: 100% of accelerator demand, max 120km/h
- Work key (option): 50% of accelerator demand, max 40km/h

■ Normal/Sport modes

- Sport mode: full potential of specific key is deployed, except in low or reverse gear
- Normal mode: full potential of specific key is not reached, TAS response is smoother



Engine Torque Output
Percentage

Normal Key

100%

70%

50%

Approx. 70 km/h (44 mph)

Sport Mode
Switch Activated

Linear
Acceleration

Switch Not
Activated

Progressive
Acceleration

0%

0%

Pedal Position Sensor (PPS) %

100%



Engine Torque Output
Percentage

Performance Key

Full Power/ Full Speed

100%

80%

Full Speed

Sport Mode
Switch Activated

Linear
Acceleration

Switch Not
Activated

Progressive
Acceleration

0%

0%

Pedal Position Sensor (PPS) %

100%



Engine Torque Output
Percentage

Work Key

Sport Mode
Switch Activated
Linear
Acceleration

Switch Not
Activated
Progressive
Acceleration

50%

30%

Approx. 40 km/h (25 mph)

0%

0%

Pedal Position Sensor (PPS) %

100%



System main features

■ Key modes

- Normal key: 70% of accelerator demand, max 70km/h
- Performance key: 100% of accelerator demand, max 120km/h
- Work key (option): 50% of accelerator demand, max 40km/h

■ Normal/Sport modes

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■ Reverse override function

- In reverse gear, speed is limited to 20km/h and TAS response is smoother
- While depressing OVR, speed and acceleration increase but not 100%



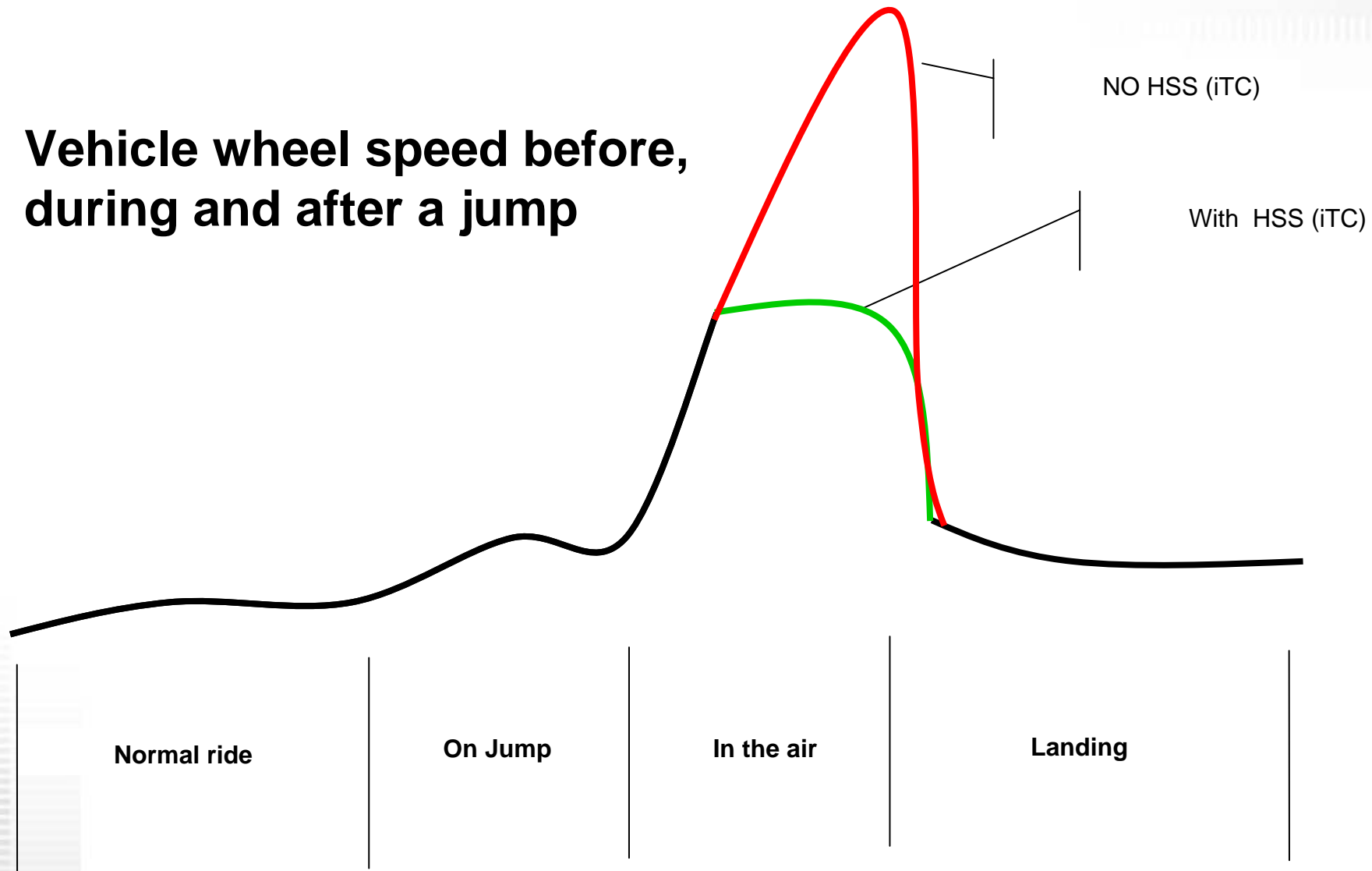
System other features (1)

- Drivers seat belt monitoring
 - If belt is not fastened, speed is limited to apx. 15km/h
- Brake monitoring
 - If ECM receives brake signal when vehicle is in gear and in motion, ETA will decrease throttle opening and so drops to idle
- Low range operation
 - When in low gear, TAS response is limited and smoother
- Half shaft saver
 - When EMC detects excessive wheel acceleration (thru VSS), iTC will reduce engine torque to protect the drive system



HSS Half Shaft Saver

Vehicle wheel speed before, during and after a jump



System other features (2)

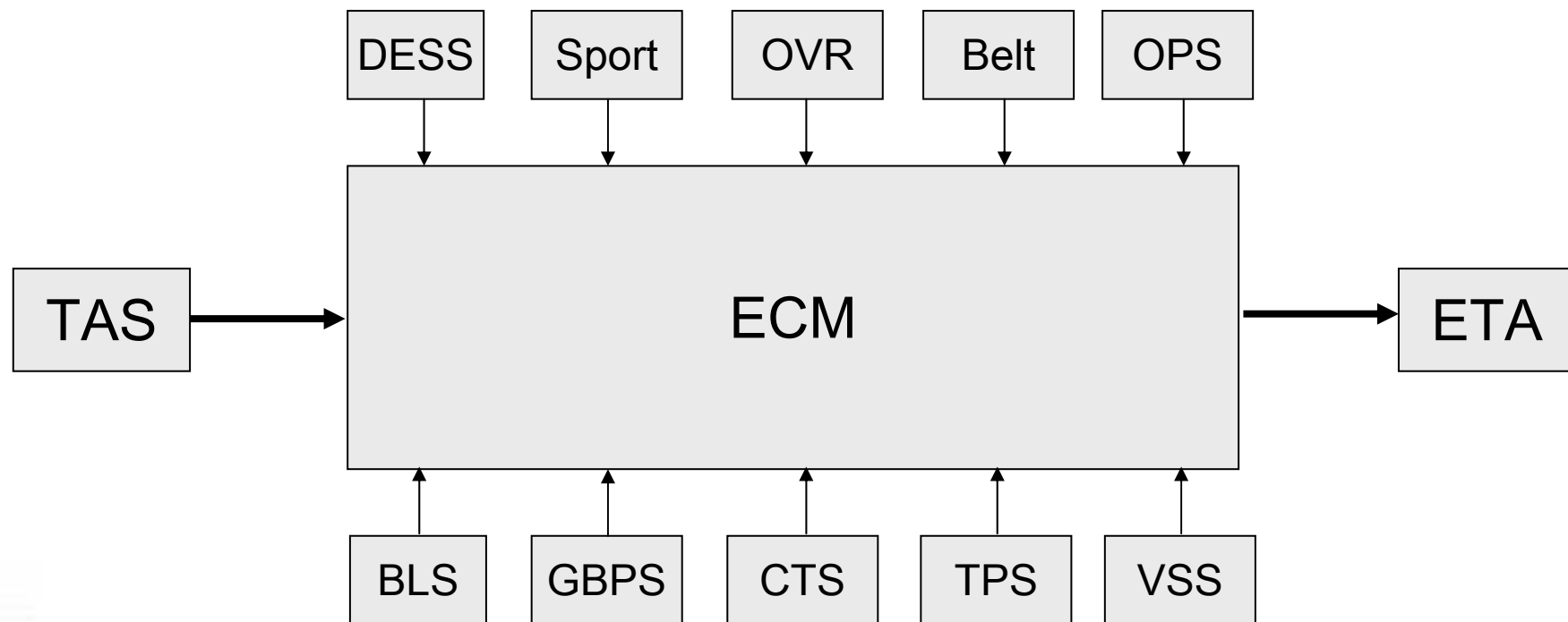
- Engine temperature monitoring
 - If the coolant gets too hot, TAS response is limited proportional to overheat degree
- Battery voltage monitoring
 - If battery voltage gets too low, idle RPM will increase to 1500rpm
- Drowned mode
 - In case of fuel flood, engine can be cranked without fuel injection
 - To enter Drowned mode, depress and hold TAS at least 20% while cranking
- Limp home mode
 - When certain faults occur, ECM will activate limp home mode
 - TAS response is limited



Involved components

- Throttle Accelerator Sensor (TAS)
- Throttle Position Sensor (TPS)
- Digitally Encoded Security System (DESS)
- Sport switch
- Override button (OVR)
- Driver's seat belt sensor
- Brake Light Switch (BLS)
- Gearbox Position Sensor (GBPS)
- Coolant Temperature Sensor (CTS)
- Vehicle Speed Sensor (VSS)
- Oil Pressure Switch (OPS)







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