Overview

Autonomous systems
Cabin systems
Chassis and body
Complete vehicle systems
Drivetrain
Electrical power systems
Internal combustion
Mobility and connectivity
Safety
Vehicle dynamics

Autonomous systems

ADAS
ADAS components
- Infrared sensors
- Lidar sensors
- Millimetre wave radar (MMW)
- Night vision
- Panoramic and overhead cameras
- Radar sensors
- Rear and parking cameras
- Ultrasonic sensors
Braking and acceleration assistance
- Adaptive cruise control
- Autobraking
- Hill descent control
- Traffic jam assistance

Detection and warning
- Blind spot warning
- Forward anti-collision systems
- Image processing
- Intersection warning
- Lane departure warning
- Lane detection
- Pedestrian detection
- Rear anti-collision systems
- Traffic sign recognition
Driver monitoring
- Active health monitoring
- Driver drowsiness sensors
- Drunk driver monitoring
Parking
- Automatic parking
- Parking assistance
- Parking detection and measurement
Steering assistance
- Advanced trailer assist
- Auto-hitching
- Crosswind stabilisation
- Lane changing assist
- Lane keeping
- Traffic jam assistance
Autonomous modes
- Autonomous activation
- Autonomous de-activation
- Autonomous driving mode
- Autonomous interior change

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Automotive Taxonomy Example (cont.)

**Cabin systems**
- Active Noise Control (ANC)
- Entry systems
  - Biometric vehicle access
  - Keyless entry
  - HMI
- Augmented reality
  - Gesture control
  - Haptic interfaces
  - Head up displays
  - Infotainment
  - Satellite navigation
  - Smartphone integration
  - Speech interfaces
  - Touch interfaces
  - Virtual Reality (VR)
- In-car communications
  - Automotive bus technologies
  - FlexRay
  - In-car wifi
  - Media oriented systems transport (MOST)
  - Optical communications
  - Wiring harnesses
- Seating
  - Power seats
  - Seat structures
- Semiconductors
- Vehicle interior monitoring

**Suspension**
- Active suspension
- Air suspension
- Passive suspension

**Wheels and tyres**
- Chip to tyre
- Pneumatic tyres
- Run flat tyres
- Tyre pressure monitoring

**Complete vehicle systems**
- Complete vehicle lighting
- Forward illumination
  - Halogen lights
  - High intensity discharge (HiD) lights
  - LED lights
  - Laser headlights
  - Lighting control
  - Smart lights
- Manufacturing methods
- Mountings

**Chassis and body**
- Body in white (BIW)
- Body structures
- Doors
  - Door structures
  - Powergate/tailgate actuation

**Drivetrain**
- Automatic transmission
  - Automatic gearbox
  - Continuously variable transmissions (CVT)
  - Dual-clutch transmissions
  - E-clutch
  - Semi-automatic gearbox
  - Torque converters
- Constant velocity joints
- Differentials
- Drive shas

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Hybrid
- Flywheel energy storage (FES)
- Hybrid electric drive assist
- Parallel hybrid
- Plug-in hybrid (PHEV)
- Power split hybrid transmissions (PST)
- Regenerative braking
- Series hybrid/extended range

Manual transmission
- Clutches
- Flywheels
- Manual gearbox

Transaxle
Transfer boxes

Electrical power systems
Charging and charging equipment
- AC charging
- DC charging
- Handsfree (robotic) charging
- Induction charging

Electric traction motor
Energy management
- Battery management systems (BMS)
- Battery thermal management

Energy storage
- Battery separators
- Lead-acid batteries
- Lithium-ion batteries
- Lithium-oxygen batteries
- Lithium-sulfur batteries
- Metal-air batteries
- Nickel-metal hydride batteries
- Solid state batteries
- Supercapacitors

Fuel cell electric vehicles
- Fuel cell stack
- Hydrogen storage
- Proton Exchange Membrane Fuel Cell (PEMFC)

Stop-start systems

Internal combustion
Cooling systems
Crankshas
Engine structure
- Engine gaskets
- Main bearings
Exhaust
- Diesel particulate filters
- Exhaust systems
- Lean NOX traps
- Oxidation catalysts
- Selective catalytic reduction
- Urea injection
Fuel Pumps
ICE electrics
- Engine management systems
- Generators and alternators
- Power and control systems
- Starter motors
Induction
- Superchargers
- Turbochargers
- Wastegates
Oil filters
Pistons and rings
Pre-chamber combustion systems
Valve train
- Camshas
- Connecting rods
- Exhaust valves
- Inlet valves
- Variable valve li and timing
Variable displacement

Mobility and connectivity
Communication
- Brain to vehicle (B2V)

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- Intersection communication
- Vehicle to everything communication (V2X)
- Vehicle to infrastructure communications (V2I)
- Vehicle to pedestrian (V2P)
- Vehicle to vehicle communications (V2V)
- Vehicle to device (V2D)
- Vehicle to grid (V2G)

Cybersecurity

Mobility
- Car sharing
- Fleet management
- Platooning
- Ride sharing
- Usage-based insurance

Remote services
- Live navigation updates
- Over-the-air updates
- Remote diagnostics

Safety

- Airbags
  - Airbag gas generators
  - Bumper airbags
  - Crash sensors
  - Knee and leg airbags
  - Passenger airbags
  - Rear end collision airbags
  - Side impact airbags
  - Steering wheel airbags

Vehicle dynamics

- Braking
  - Anti-lock braking (ABS)
  - Electronic brakeforce distribution (EBD)
  - Electronic brakes