By delivering our products and system solutions throughout the world, we can realize an affluent society by creating new value for people, vehicles and society.

Future automotive technology will require substantial progress in order to preserve the global environment, eliminate accidents and decrease accident damage, and improve convenience through information technology. Vehicle electrification and increasing application of electronics will be the keys to realize a smart mobility society.

Hitachi Automotive Systems has strengths in electronics technology which will serve as a base to refine our product and system technologies in the fields of environment and safety. We are also pushing forward with our Advanced Vehicle Control System that is integrated with Hitachi’s social infrastructure and services. In this way, Hitachi Automotive Systems will contribute to a connected future for people, vehicles, and society.

Moving Forward
Engine Powertrain Systems

In order to meet increasingly stringent environmental regulations around the world, there is a need to efficiently convert fuel into kinetic energy, and reduce emissions of gases such as CO2. We have developed engine technologies such as direct injection and valve timing control that greatly increase the efficiency of internal combustion engines. In addition, we use simulation and analysis technologies to continually refine our components, improve engine thermal efficiency, and produce clean engines with a reduced environmental burden.

### Control Systems
- Control Unit for DIG
- Control Unit for MPI
- Control Unit for CVT
- On Mission Control Unit for CVT
- Control Unit for Four-speed Automatic Transmission
- In-pan Transmission Control Module

### Exhaust Systems
- Multi Function Mass
- Air Flow Sensor
- Differential Pressure Sensor
- Hall Effect Type Revolution Sensor
- Pressure Sensor
- Electronic Throttle Body
- Electronic Throttle Body for Diesel

### Fuel Systems
- High-Pressure Fuel Pump
- High Voltage DIG Injector
- Atomization MPI Injector

### Engine Components and Subsystems
- Piston for DIG
- Piston for MPI
- Cooling Channel Piston
- Valve Timing Control System (VTC)
- VTC Solenoid Valve
- Electromotive VTC
- Variable Valve Event and Lift (VEL)
- Variable Displacement Vane Pump (Front Cover Integrated Type)
- Water Pump (Single Bearing Type)
- Water Pump (Oil Pan & Oil Pump Integrated Type)
- Balancer (Oil Pan & Oil Pump Integrated Type)
- Balancer (VDVP Integrated Type)

### Electrical Equipment Systems
- Chain Case Module (Oil Pump & Water Pump Integrated Type)
- Water Pump (with Housing Type)
- Planetary Gear Reduction Starter
- Twin Axial Gear Reduction Starter

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Electric Powertrain Systems

In recent years, vehicle electrification has seen remarkable progress, due in part to environmental regulations on zero-emission vehicles. In addition to Hybrid Electric Vehicles (HEV), Plug-in Hybrid Electric Vehicles (PHEV), and Electric Vehicles (EV), Mild Hybrid Vehicle systems using 48 Volt electricity are starting to appear. Vehicle electrification systems will prove essential for meeting environmental regulations. In addition to the main electric powertrain components of electric motors and inverters, we are developing other technologies to maximize eco-friendliness and driving performance.

Intelligent Vehicles / 360 Degree Sensing Systems

Expectations are increasing for safe, comfortable, and highly efficient autonomous driving systems that can eliminate accidents, reduce driver workload, and resolve traffic congestion, thereby helping to achieve a smart mobility society.

In order to realize a safe and secure autonomous driving system, we are developing a sensor fusion system that can detect the surrounding situation by integrating sensor data from sources such as stereo cameras and radars. Data from this system is used by our autonomous driving ECU to make instantaneous decisions on acceleration, deceleration, and lane-changing.

Hybrid Vehicles / Electric Vehicle Systems

- Motor for HEV
- Inverter for HEV / PHEV / EV
- Inverter for HEV / PHEV / EV

EV: Electric Vehicle
HEV: Hybrid Electric Vehicle
PHEV: Plug-in Hybrid Electric Vehicle

Integrated Vehicle Control Systems
(Recognition & Judgment)

- Stere Camera
- Millimeter-wave Radar (Mid-range)
- Millimeter-wave Radar (Long-range)
- Advanced Driver Assistance System (ADAS) Control Unit
- AD ECU (Prototype)
- Central Gateway
- Map Positioning Unit (Prototype)

AD: Autonomous Driving
ADAS: Advanced Driver Assistance System
ECU: Electronic Control Unit
Integrated Vehicle Control Systems (Control [Chassis])

Chassis products determine the basic functions of automobiles - moving, turning and stopping. By coordinating and harmonizing the chassis with various control technologies, we can count on improved safety and comfort. In order to aim for an even higher level of safety, the core elements of brakes, steering, and suspension have been electrified and subjected to electronic control. We created a system that completely integrates all aspects of vehicle motion. The aim of this system is to improve motion performance by responding in real-time to changes in the state of tires, road surface and the vehicle itself, as well as to achieve autonomous driving, which requires coordinated driving control.

**Steering Systems**

- Electric Power Steering System (Belt Drive Rack Assist Type)
- Electric Power Steering System (Pinion Assist Type)
- Manual Steering Gear (for Column Assist EPS)
- Rack & Pinion Power Steering Gear (Speed Sensitive Type)
- Electric Power Steering Control Unit (Column Assist Type)
- Power Steering Pump (Variable Displacement Type)
- Variable Displacement Power Steering Pump for Heavy-duty Truck

**Drive Power Transmission Systems (Propeller Shaft)**

- Impact Absorbable CVJ Type
- Direct Connection Interface (DCI) Joint Type
- CFPR Tube Type
- Rubber Coupling Type (with Lobro Joint)
- Aluminum Tube Type

**Suspension Systems**

- Shock Absorber
- Suspension Strut
- Suspension Unit
- Mono Tube Shock Absorber
- Frequency Reactive Damper
- Hydraulic Type Height Adjustment Suspension System
- Air Suspension Strut
- Semi-Active Suspension System
- Hydraulic Cylinder for Roll Control
- Self Levelizer
- Air Levelizer
- Air Compressor for Height Adjustment
- Control Unit for Height Adjustment

**Brake Systems**

- Disc Brake Caliper
- Disc Brake Caliper for Motorcycle
- Electric Parking Brake
- Brake Master Cylinder
- Vacuum Booster
- Electrically-Driven Intelligent Brake

**Control Unit for Other Purposes**

- Anti-Lock Brake System
- Electronic Stability Control (ESC)
- Electric 4WD Control Unit
Aftermarket Products / Applied Technology & Industrial Equipment

Over many years, Hitachi Automotive Systems has developed and cultivated advanced automotive technologies that have extensive secondary applications in the world around us. For instance, from our manufacturing technologies, we have derived anti-vibration and hydraulic components, home appliance technologies that support modern lifestyles, and industrial equipment and social infrastructure including railcar components, anti-seismic products, and many other useful technologies. Moving forward, we will continue to pursue secondary applications for our technologies in order to realize a more comfortable society.

Aftermarket Products & Maintenance Accessories

- Brake Pads
- Brake Rotor
- Shock Absorber
- Power Steering Gear
- Power Steering Pump
- Water Pump
- Fuel Pump
- Injector
- Electronic Throttle Body
- Air Flow Sensor
- Ignition Coil
- Hitachi Diagnostic Monitors
- Ignition Coil Checker
- Tire Pressure Monitoring System

Applied Technology & Industrial Machinery

Railcar Components

- Vertical Damper
- Horizontal Damper
- Yaw Damper
- Yaw Damper between the Car

Gas Springs

- Variable Damper System
- Leveling Valve
- Gas Springs / Gas Springs for Laundry Machine
- Gas Springs for Industrial Equipment

Anti-seismic Products

- Seismic Isolation Oil Dampers
- Anti-vibration Oil Dampers

ATSUGI Hydraulic Press

- Toggle Type Vibration-proof Damper
- Vibration-proof Damper for Housing