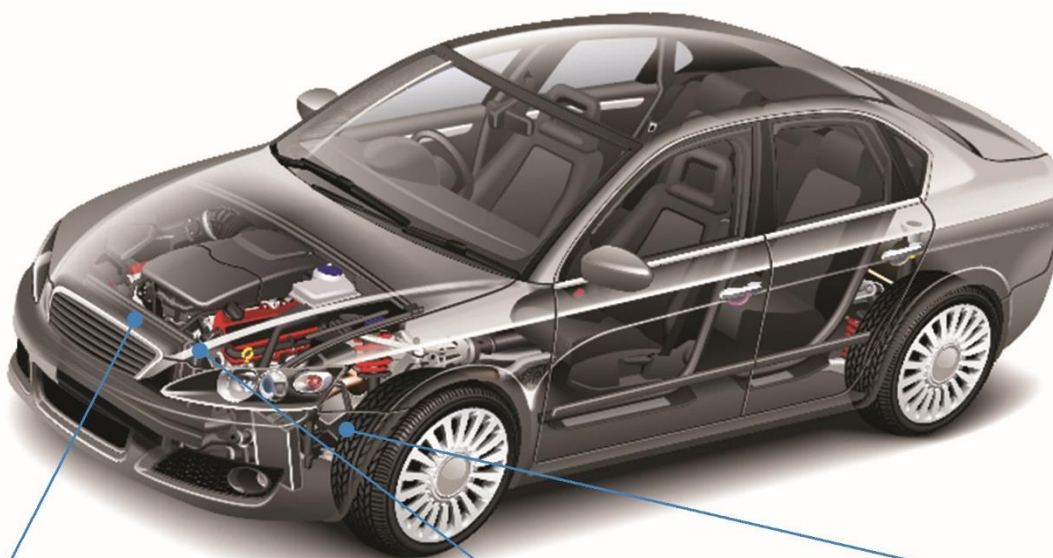


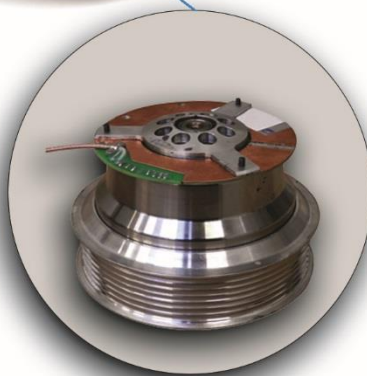
Torque testing solutions

High accuracy in-vehicle torque measurement Designed for vehicle real use applications

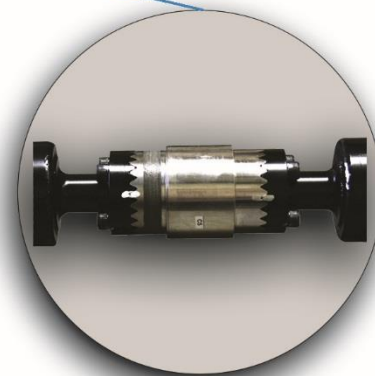
GREENMOT has developed various torque measurement systems providing high dynamic accuracy in the “in-vehicle” real use environment. Sensitive parts of these customized sensors are designed and validated by GREENMOT to be less sensitive to external perturbations like temperature, misalignment, or Coriolis effects in real use.



Engine torquemeter
1 N.m accuracy



Pulley torquemeter
0.3 N.m accuracy



Driveshaft torquemeter
0.1 N.m accuracy

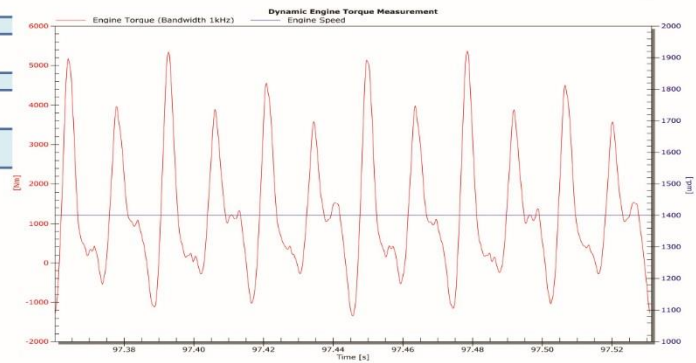
Applications

**Engine mapping / development – Transmission development – Hybrid powertrain development
Traction control – Energy flow mapping – Engine vehicle integration**

Engine torque measurement system

Technical specifications

| | |
|-------------------|--|
| Type of sensor | Strain gauges - HF Telemetry Integrated in the original design |
| Torque capacity | Dependent of maximal engine torque, typically : · 0 - 500 N.m or 0 - 1 000 N.m for passengers car · Up to 0 - 10 000 N.m for industrial engine |
| Maximum speed | Dependent of the engine |
| Accuracy | 0.2 % FS in real use in-vehicle environment |
| Bandwidth | 1 kHz |
| Temperature range | -10°C / +120°C |
| Supply | 10V to 34V |
| Output Type | 0 - 10V |



Driveshaft measurement system



| | |
|-------------------|---|
| Type of sensor | Strain gauges – HF Telemetry Integrated in the original design |
| Torque capacity | 0 - 1 000 N.m |
| Maximum speed | 3 000 rpm |
| Accuracy | < 0.01 % FS |
| Bandwidth | 1 kHz |
| Temperature range | -10°C / +80°C |
| Supply | 10V to 34V |
| Output Type | 0 - 10V |

Technical specifications

Pulley measurement system

A/C Pulley – Power steering pulley – Hydraulic pumps pulley – Remote alternator – Crankshaft main pulley

Technical specifications

| | |
|-------------------|---|
| Type of sensor | Strain gauges – HF Telemetry Integrated in the original design |
| Sensor inertia | 120 kg.mm ² |
| Torque capacity | 0 - 100 N.m |
| Maximum speed | 6 000 rpm |
| Accuracy | 0.3 % FS in vehicle environment |
| Bandwidth | 1 kHz |
| Temperature range | -10°C / +80°C |
| Supply | 10V to 34V |
| Output Type | 0 - 10V |



GREENMOT maintains a policy of continuous research and development and specifications are subject to optimization without notice.