TEST SYSTEMS
Motor Testing

<table>
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<tr>
<th>Description</th>
<th>Capabilities</th>
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| Motor testers measure motor performance at no load and at pre-defined load(s). Setting parameters for motor voltage, applied torque, and measure resulting motor current and speed while ramping applied motor torque to develop the complete motor performance characteristic graphs. | - Torque up to 500 Nm  
- Speed up to 20,000 RPM  
- Voltage applied up to 650 VDC  
- Max current draw up to 1000A |
| All tests can be performed for motor rotation in both clockwise and counter-clockwise directions. | Configurable test ranges for the following parameters or motor features (system instrumentation is selected to match product specifications):  
- Full Parametric Performance Test  
- Torque vs. Speed Curve  
- Current vs. Speed Curve  
- Load-Point Test  
- Noise, Vibration, & Harshness (NVH) Analysis  
- Diagnostic Communications Program & Test  
- Dynamic Park Angle Test  
- Motor Commutations  
- Capacitor / Noise Suppressor Test  
- Travel Direction  
- Hall Effect Sensor Test & Calibration |
| Software shall monitor for fail conditions such as, but not limited to:  
- Power supply current foldback  
- Power supply voltage out of expected range  
- Torque load out of expected range  
- Excessive time to complete test | Typical drivetrain for dyno testing of motors  
- Torque transducer to monitor loading  
- Encoder to monitor angular position  
- Hysteresis, eddy current or particle brakes to apply resistive loading  
- Clutch to couple / decouple drivetrain  
- Servomotor to apply backdrive / engage spring coupling with DUT |
| Product tested include:  
- Door lock actuators  
- Reclining mechanisms  
- Actuator motors in consumer and medical products  
- Front Wiper Motors  
- Rear Wiper Motors  
- Wiper Module Systems  
- Window Lift Motors  
- Power Steering Motors  
- Sunroof Motors  
- Power Seat Motors & Actuators  
- Power Door & Door Lock Actuators  
- Instrument Cluster Stepper Motors  
- Deployable Running Boards  
- Starter Motors | Contact ATS directly for application review or for product specific applications beyond the scope of this document. |