TITAN Powertrain
Advanced Powertrain Testing For Heavy-Duty Applications
The newest generation of the HORIBA TITAN Powertrain test system for heavy-duty vehicles ushers in a new era of transmission testing. Based on the proven HORIBA TITAN engine platform, TITAN Powertrain stands out with its modular and flexible design attributes. It is a significant extension of the test spectrum, allowing powertrain and engine testing on one single test stand.

The wide range of test stand configurations makes HORIBA TITAN Powertrain a powerful tool for steady-state and dynamic powertrain tests for virtually every component and configuration of powertrains.

More than 1,000 powertrain and engine test stands sold worldwide are proof of HORIBA’s leading expertise and proven solutions.

**Applications & Test Stand Configurations**

<table>
<thead>
<tr>
<th>Test Specimen</th>
<th>Manual Transmission</th>
<th>Automatic Transmission</th>
<th>Hybrid Electric Vehicles</th>
<th>Axles, Driveshafts &amp; Transmission Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Durability &amp; wear test</td>
<td>Performance &amp; efficiency test</td>
<td>Noise, Vibration &amp; Harshness (NVH) / altitude &amp; climate simulation</td>
<td>Thermal &amp; lubricant test</td>
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<td></td>
<td>Shell Tests</td>
<td>General functional testing</td>
<td>Shift calibration</td>
<td>Shift calibration</td>
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<td></td>
<td>Durability test</td>
<td></td>
<td>Simulation of cornering</td>
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<tr>
<td></td>
<td>Convert test</td>
<td>Energy &amp; battery management</td>
<td>NVH / altitude &amp; climate simulation</td>
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With years of experience in the fields of engine and powertrain testing, HORIBA developed the TITAN Powertrain as a tool for both, steady-state and dynamic test applications. Thanks to the sophisticated and modular design, complete powertrains as well as components such as axles, power take-offs, torque converters and retarders can be tested in various configurations, thus ensuring tests on virtually every heavy-duty application.

The pictures show possible configurations for rear-wheel driven vehicles. A second driven axle for all-wheel and rear-wheel drive configuration can be simulated by either two DYNAS3 WM wheel output units or one DYNAS3 PT propshaft unit.
Mechanical Elements

To ensure a high degree of testing flexibility, HORIBA offers several input and output propshaft and wheel output DYNAS machines. In addition to the proven DYNAS machines, the new DYNAS products, combinations of a DYNAS machine and a shiftable test stand gearbox, are available as wheel and propshaft units. These units provide for individual test stand configurations, including tests of one or two rear axles and all-wheel-driven vehicles. Furthermore, the input unit can be realized using the original internal combustion engine.

Examples for possible DYNAS Units:

<table>
<thead>
<tr>
<th>DYNAS_products for TITAN Powertrain</th>
<th>Type</th>
<th>Torque [Nm]</th>
<th>Speed [rpm]</th>
<th>Power [kW]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT32000 Propshaft Unit</td>
<td>32,000</td>
<td>3,000</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>WM40000 Wheel Unit</td>
<td>40,000</td>
<td>1,200</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>HD860 Input Unit</td>
<td>5,000</td>
<td>3,000</td>
<td>860</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>DYNAS_Pack products for TITAN Powertrain</th>
<th>Type</th>
<th>Torque [Nm]</th>
<th>Speed [rpm]</th>
<th>Power [kW]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT35000 Propshaft Unit</td>
<td>35,000</td>
<td>3,500</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>WM50000 Wheel Unit</td>
<td>50,000</td>
<td>1,200</td>
<td>500</td>
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</table>

Thanks to an optimized ratio spread, there are no power output gaps with the DYNAS_Pack units.

Platform Highlights:
- Modular frame adjustment for quick realization of various applications
- Optional automatic fixation for frame adjustments
- DYNAS input and output units for increased testing variety
- DYNAS output units with minimized power output gap
- Support for HAUSMANN and GIF shift actuators
- Possible input units: electrical dyno or internal combustion engine

Calibration Highlights
- Rapid calibration with time savings of up to 60% per motor
- Highly accurate HBM torque measuring flanges

The HORIBA TITAN product platform is characterized by its modularity and flexibility attributes. On the mechanical side, there are many options for enhancing the setup of the specimen, for example electrical adjustment, automatic fixation etc. The modular design maximizes the technical availability of the test stand and reduces downtimes during service and installation in comparison with previous HORIBA products.

In standard configuration, TITAN Powertrain is delivered with HAUSMANN shift actuators. However, GIF actuators are also supported on customer’s demand.

A highly accurate calibration device for torques up to 50,000 Nm adjusts the HBM measuring flanges and supports the operator to reach the highest quality of fine-tuning.

Two pneumatic actuators load the calibration lever with a high degree of accuracy and significantly shorten the adjustment process.
Open and Flexible System Architecture

The flexible system architecture realizes easy integration of customer specific functions into the test system. A standardized interface ensures integration into HORIBA STARS world-class Automation or other automation systems via Ethernet User Datagram Protocol (UDP). All reference values and control modes as well as SPARC Powertrain parameters can be preset and read out during testing.

Software Highlights
- Manual control panel for reduced setup times
- Various operating modes for rapid, safe and easy handling
- Easy integration of customer specific functions via Ethernet UDP
- Optimum results with STARS Automation
- Compatible with all automation systems

A large variety of customized options are available. HORIBA offers a wide range of additional testing equipment such as NVH or climate testing facilities. Furthermore, HORIBA provides powerful hardware-in-the-loop simulation. CarSim and TruckSIM allow complete vehicle and track simulation in real time, whereas the Graphical User Interface (GUI) provides 3D visualization of the simulation.

In addition, third-party products, software and simulation tools can easily be integrated into the test system.
HORIBA continues contributing to the preservation of the global environment through analysis and measuring technology.

Please read the operation manual before using this product to assure safe and proper handling of the product.

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