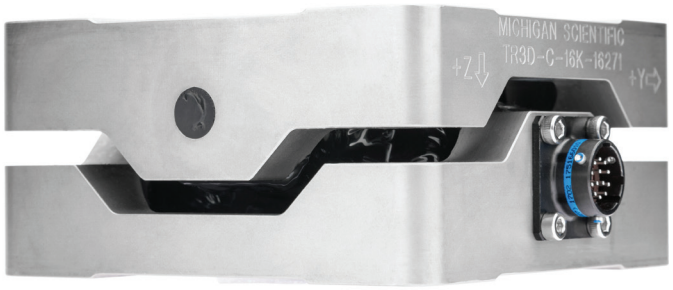
Michigan Scientific Corporation

Multi-Axis Load Cells

LOAD CELL SPECIFICATIONS

Model	Maximum Load Capacity (per channel)	Maximum Moment Capacity (per channel)	Fatigue Rated Load Capacity for Single Axis	Nonlinearity
TR3D-A-1K	1,000 lbf (4.4 kN)	30 lbf·ft (40 N·m)	380 lbf (1.6 kN)	<0.5% of full scale output
TR3D-A-3K	3,000 lbf (13.3 kN)	160 lbf·ft (215 N·m)	2,500 lbf (11.1 kN)	<0.5% of full scale output
TR3D-A-5K	5,000 lbf (22 kN)	210 lbf·ft (280 N·m)	3,750 lbf (16.6 kN)	<0.5% of full scale output
TR3D-A-5/5/10K	X, Y axes 5,000 lbf (22 kN) Z axis 10,000 lbf (44 kN)	270 lbf·ft (365 N·m)	4,200 lbf (18.6 kN)	<0.5% of full scale output
TR3D-A-10K	10,000 lbf (44 kN)	340 lbf·ft (461 N·m)	7,600 lbf (33.8 kN)	≤1% of full scale output
TR3D-B-250	250 lbf (1.1 kN)	12 lbf·ft (16 N·m)	200 lbf (900 N)	<0.5% of full scale output
TR3D-B-1K	1,000 lbf (4.4 kN)	48 lbf·ft (65 N·m)	615 lbf (2.7 kN)	<0.5% of full scale output
TR3D-B-4K	4,000 lbf (17.7 kN)	165 lbf·ft (220 N·m)	3,100 lbf (13.8 kN)	<0.5% of full scale output
TR3D-B-4500	4,500 lbf (20 kN)	165 lbf·ft (220 N·m)	3,100 lbf (13.8 kN)	<0.5% of full scale output
TR3D-B-5/5/10K	X, Y axes 5,000 lbf (22 kN) Z axis 10,000 lbf (44 kN)	385 lbf·ft (520 N·m)	X, Y axes 5,000 lbf (22 kN) Z axis 6,000 lbf (26.6 kN)	<0.5% of full scale output
TR3D-B-16K	16,000 lbf (71 kN)	1,300 lbf·ft (1.7 k N·m)	12,350 lbf (54 kN)	<0.5% of full scale output
TR3D-C-10K	10,000 lbf (44 kN)	900 lbf·ft (1.2 kN·m)	8,000 lbf (35 kN)	<1% of full scale for X, Y axes <2% of full scale for Z axis
TR3D-C-16K	16,000 lbf (71 kN)	1,000 lbf·ft (1.4 kN·m)	12,000 lbf (53 kN)	<1% of full scale for X, Y axes <2% of full scale for Z axis
TR3D-C-40K	40,000 lbf (177 kN)	7,000 lbf·ft (9.5 kN·m)	24,000 lbf (106 kN)	<1% of full scale for X, Y axes <2% of full scale for Z axis
TR3D-D-100K	100,000 lbf (444 kN)	15,000 lbf·ft (20.3 kN·m)	70,000 lbf (311 kN)	<1% of full scale for X, Y axes <2% of full scale for Z axis
TR5D-B-5K	5,000 lbf (22 kN)	600 lbf·ft (815 N·m)	5,000 lbf (22 kN)	<0.5% of full scale output
TR6D-C-16K	16,000 lbf (71 kN)	1,250 lbf·ft (1.7 kN·m)	12,000 lbf (53 kN)	≤1.0% of full scale for X, Y axes; ≤2.0% of full scale for Z axis; Moments ≤0.5% of full scale for all channels
TR6D-C-20K	20,000 lbf (89 kN)	3,350 lbf·ft (4.5 kN·m)	14,000 lbf (62 kN)	≤0.5% of full scale for X, Y axes; ≤1.5% of full scale for Z axis; Moments ≤0.5% of full scale for all channels
TR6D-C-40K	40,000 lbf (178 kN)	7,000 lbf·ft (9.5 kN·m)	24,000 lbf (106 kN)	≤0.5% of full scale for X, Y axes; ≤1.5% of full scale for Z axis; Moments ≤0.5% of full scale for all channels



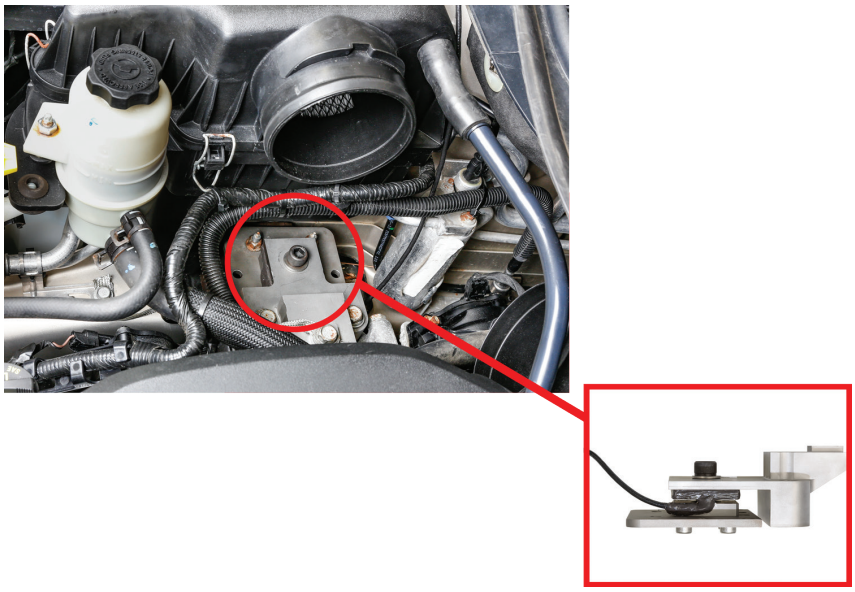
Michigan Scientific Corporation (MSC) has decades of experience designing and manufacturing multi-axis load cells. These strain gauge-based transducers are ideal for simultaneously measuring forces in multiple axes in a variety of scenarios. Designed for easy mounting, these load cells provide accurate, reliable results in applications with limited space.

Each load cell is machined from a solid block of stainless steel or aluminum, which ensures excellent linearity throughout the entire force range, as well as minimal hysteresis. Weatherproof coatings are applied to all strain-gauged surfaces to ensure the load cell will survive in almost any environmental condition experienced in industrial or automotive applications.

Careful consideration of the load paths through the transducer and its strain gauge elements minimize sensitivity to erroneous off-axis loading, otherwise known as “crosstalk.” As a result, each measurement axis maintains immunity to interference caused by loading the other axes.

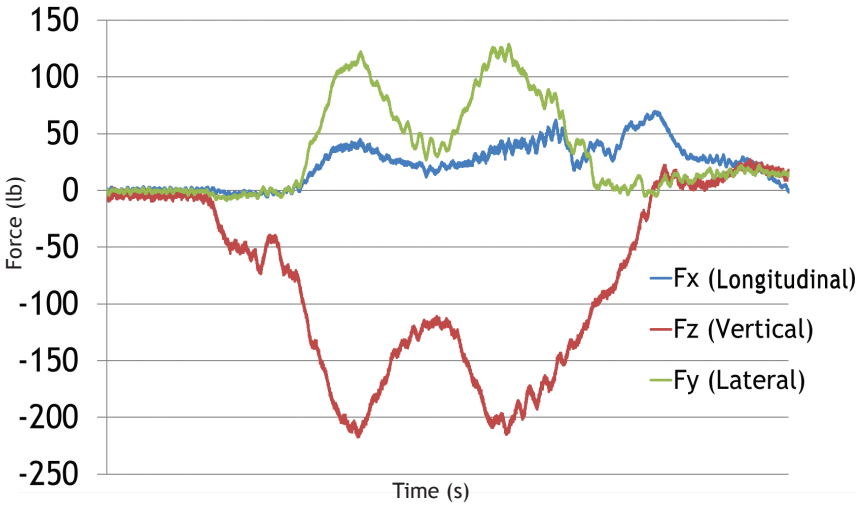
Michigan Scientific load cells have been used extensively across an array of industries. MSC load cells consistently provide innovative and reliable solutions to any testing application: automotive testing, motorcycle measurements, robotic development, and production industries.

Load Cell Applications

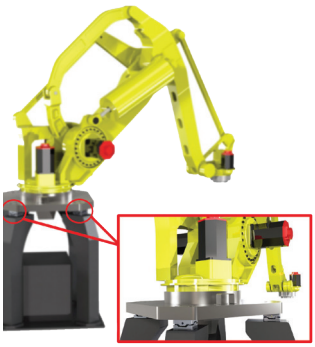


TR3D Transducers are often used in automotive applications, such as measuring engine-to-body mount forces. Here, a TR3D-B-4K is installed to measure forces during engine mount testing.

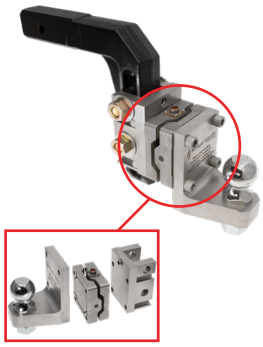
Forces in Engine-to-Body Mount Testing Measured with TR3D-B-4K



The graph above shows data from force measurements using a TR3D-B-4K to measure forces during an engine mount test.



Load Cells are commonly used in industrial applications to measure forces and moments.



Multi-Axis Force Transducers are used in many vehicle applications for testing and validation.

Additional Applications

- **Automotive Applications**
  - Body Mounts
  - Carrier Bearing Mounts
  - Seat Tracks
  - Air Bag Inflation Forces
  - Powertrain Mounts
  - Rear Suspension Mount Forces
  - Trailer Hitch Forces
- **Agriculture & Construction Equipment**
  - Fifth-Wheel Mount Forces
  - Hitch Mount Forces
  - Cab Mounts
  - Suspension/Axle Mounts
  - Implement Forces
  - Bucket and Blade Forces
  - Drawbar Load Measurements
- **Machine Tool Cutting Forces**
- **Rock/Granite Machining Operations**
- **Biomedical Prosthetics**

Related Products

SGA3A THREE CHANNEL STRAIN GAGE AMPLIFIER BOX

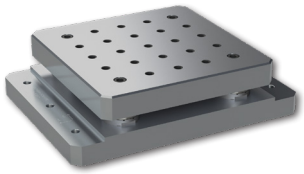
The Michigan Scientific SGA3A Strain Gage Amplifier Box is ideal for use with any of MSC's Three Axis Load Cells. The SGA3A provides highly accurate excitation voltage to the load cell, a stable differential amplifier, and a remotely activated shunt resistor for system span verification. The result is an accurate, high level voltage output signal.

JB3 JUNCTION BOX

The JB3 Junction Box combines the signals from multiple TR3D load cells and outputs the total force acting on a load cell array or a load platform. Up to four of MSC's Three Axis Load Cells can be connected to the JB3. The JB3 has a sensitivity trimming circuit for each input to equalize sensitivity in each load cell.

LP-3030 LOAD PLATFORM

The LP-3030 is a compact load platform designed to have higher force and moment capacity than individual load cells. The 12 individual cell channels can be used to calculate the net forces and moments. The LP-3030 is available in a variety of load capacities and uses a universal mounting pattern.



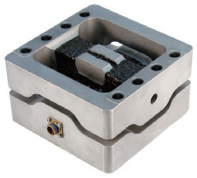
Additional Information

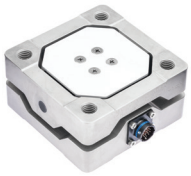
Customization

Alterations and customizations can be made to standard load cells. Michigan Scientific also has extensive experience in the design and manufacturing of custom fixturing. From cable modifications, to capacity alterations, MSC can create a custom solution to any force and moment measurement application.

Repairs and Calibration

All Michigan Scientific load cells are factory calibrated and come with an ISO17025 compliant calibration. It is recommended that load cells are calibrated periodically to monitor any channel unbalances or sensitivity changes throughout the lifetime of the transducer. If the load cell is damaged, it may be repaired following evaluation.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