The Vehicle Inertia Measurement Facility (VIMF) is the premier, state-of-the-art system for measuring vehicle mass, center-of-gravity (CG) position and moments of inertia (MOI). Originally designed and built by S-E-A in 1994, the VIMF has remained the gold standard in the automotive industry since its inception. Over its nearly 25 years in production, the VIMF has been used to conduct over 30,000 tests for automobile manufacturers, race teams and design consultants worldwide. The U.S. National Highway Traffic Safety Administration (NHTSA) uses the measurements taken on S-E-A’s VIMF to provide Static Stability Factor (SSF) data to rank vehicle rollover propensity as part of its New Car Assessment Program (NCAP).

The VIMF is available in various sizes, each utilizing a single platform for all measurements, thus minimizing test time and space requirements. The VIMF uses a combination of stable and inverted pendulum methods to determine CG height, moments of inertia and various yaw cross products of inertia. Test operation is computer guided, user friendly and highly accurate.

The VIMF technology has multiple configurations to accommodate small vehicle components, engines, passenger vehicles, large commercial and military vehicles and anything in between. VIMF test facilities range from 450 to 45,000 kg capacities and can be installed at an automotive R&D campus, or testing can be performed by S-E-A at our facility.

<table>
<thead>
<tr>
<th></th>
<th>C1000</th>
<th>C3000</th>
<th>V4500</th>
<th>V10K</th>
<th>V100K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>1000 lb (450 kg)</td>
<td>3000 lb (1350 kg)</td>
<td>4500 lb (2000 kg)</td>
<td>10,000 lb (4500 kg)</td>
<td>100,000 lb (45,000 kg)</td>
</tr>
<tr>
<td>Platform Dimensions (mm)</td>
<td>1200 x 1200</td>
<td>2500 x 2500</td>
<td>1800 x 3600</td>
<td>2100 x 5500</td>
<td>3600 x 12,000</td>
</tr>
<tr>
<td>CG Height</td>
<td>1%</td>
<td>1%</td>
<td>0.5%</td>
<td>0.5%</td>
<td>1%</td>
</tr>
<tr>
<td>Moment of Inertia (MOI)</td>
<td>1-2%</td>
<td>1-2%</td>
<td>1-2%</td>
<td>1-2%</td>
<td>3%</td>
</tr>
<tr>
<td>Product of Inertia (POI)</td>
<td>1% of smallest MOI</td>
<td>1% of smallest MOI</td>
<td>2% of smallest MOI</td>
<td>2% of smallest MOI</td>
<td>5% of of smallest MOI</td>
</tr>
<tr>
<td>Test Duration (includes setup)</td>
<td>3 hours</td>
<td>3 hours</td>
<td>3 hours</td>
<td>3 hours</td>
<td>4 hours</td>
</tr>
</tbody>
</table>
Data sheet containing the complete results from a C1000 test.

**S-E-A C1000**
Inertia Measurement Facility

**C1000 Test #** 110  
**Test Date:** 10/24/2017  
**Date Printed:** 10/24/2017

**Year:** 2016  
**Make:** Ford  
**Model:** Fusion Engine  
**Engine Weight (kg):** 113.2

**Description:** 2016 Ford Fusion Engine

**Engine X CG from Y-Axis (mm):** 0.76  
**Engine X Reference from Y-Axis (mm):** 6.35  
**Engine X CG from Engine Reference (mm):** -5.59

**Engine Y CG from X-Axis (mm):** 1.52  
**Engine Y Reference from X-Axis (mm):** -266.45  
**Engine Y CG from Engine Reference (mm):** 287.97

**Engine Z CG from Platform (mm):** 332.23  
**Engine Z Reference from Platform (mm):** -215.90  
**Engine Z CG from Engine Reference (mm):** -116.33

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**Amplitude**  
**Period**  
**Relative Motion**

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Data sheet containing the complete results from a V10K test.

**S-E-A VIMF**
Vehicle Inertia Measurement Facility

**VIMF Test #:** 6024  
**Test Date:** 2/3/2016  
**Date Printed:** 2/3/2016

**Year:** 2016  
**Project:** SEA Research  
**Make:** Lexus  
**VIN:** 2T2ZKCAJXCG09201  
**Model:** RX350  
**Mileage:** 44

**Description:** Driver, Full Fuel, 3.5L V6, 8AT, FWD, 4 Door, SUV  
**Load:** Driver

**Front Tire:** Bridgestone Ecopia HL422 Plus  
**Front Tire Size:** 235/65R18 106V  
**Front Weight (kg):** 609.1

**Rear Tire:** Bridgestone Ecopia HL422 Plus  
**Rear Tire Size:** 235/65R18 106V  
**Rear Weight (kg):** 426.3  
**Total Weight (kg):** 1035.4

**Front Track (mm):** 1695.45  
**Right Front:** 557.6  
**Left Front:** -26.3  
**Lateral CG (mm):** 1168.0

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**Engine Y CG from Engine Reference (mm):** 287.97

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**Engine Z Reference from Platform (mm):** 332.23  
**Engine Z CG from Platform (mm):** -215.90  
**Engine Z CG from Engine Reference (mm):** -116.33

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**Inertia Measurement Facility**

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