

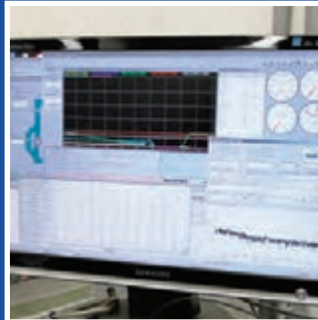
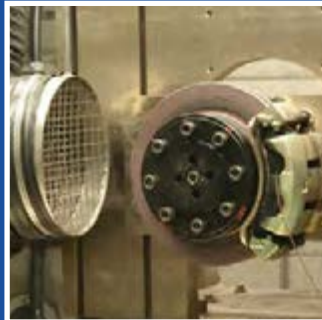


FROM LAB TO LIFT.

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# THE FACTS BEHIND TESTING PARTS THAT PERFORM

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# WHY WE TEST

At Centric Parts, testing is a way of life. It's in our DNA. We've invested millions of dollars over the past decade to ensure all our products (brakes, calipers, rotors and chassis) pass all industry standards while also exceeding our own self-defined and rigid testing protocols as well. We do this to:

- ⊕ Deliver on the quality expectations of our customers,
- ⊕ Ensure safety and reliability within the vehicle application where lives are on the line, and
- ⊕ Differentiate our products from our competition. We've proven this by testing our competitors' products alongside our own to the same, unbiased testing standards.

# HOW WE TEST

- ⊕ Our industry-leading, **in-house engineering** department analyzes each part to ensure proper fitment and safe performance for every vehicle application, import and domestic.
- ⊕ In-house **Friction Lab** allows our engineers to create and test friction material compounds more rapidly than others.
- ⊕ Four in-house **Link Brake Dynamometers** give us the ability to test each brake component in the most demanding conditions and react to real time data.
- ⊕ **Real-world, on-road testing** using our fleet of vehicles equipped with data acquisition systems in city, highway and track conditions.
- ⊕ When comparing our products to competitors, we utilize independent, **third-party test facilities** to provide the testing, results and analysis so as to remain unbiased.





## COMPETITIVE PRODUCT TESTING

We test hundreds of thousands of parts each year, which includes both Centric-manufactured parts as well as competitor parts. We benchmark our products to ensure our product positioning, marketing and customer-facing collateral are all supported by proven test data. The test protocols we use align with industry standards for testing including **Society of Automotive Engineers (SAE)** and others. This ensures the same test is performed and the results are based on product performance and not changing or biased test conditions.

## AN EXPERT VIEW

“Industry test standards are in place to ensure products perform as designed in specific applications. It is dangerous and misleading when manufacturers make claims based on test parameters that are adjusted to favor their products. We go above-and-beyond in terms of testing throughout all phases of design, development and production to ensure all our products not only meet our rigid internal standards, but also industry standards. We also re-test even further when false claims are made against our products. ***Our customers should not be misled in any way when it comes to the reliability of our products.***” Steve Ruiz, Centric VP of Engineering, Research & Development.

# TODAY'S FACT VS. FICTION TEST: BALL JOINTS

**Current State:** Competitor advertisements have made disparaging and false claims of durability, composition and match-to-the-OEM-design part against three (3) Centric Ball Joint products that have been proven completely untrue. We thoroughly re-tested these parts to extreme operating conditions to more than disprove their inaccurate claims.

**Centric Re-Test:** We thoroughly test all our parts throughout the design phase and prior to production. In this case, we re-tested to extreme condition levels to more than disprove the competitor's false claims. These tests were performed in June 2017 and conducted at independent test facilities in Warren, MI and Northridge, CA. The complete test setup, process, test data and final analysis is available upon request for public consumption.

Centric Part	Application
610.44030	2007 Toyota® Camry
610.66029	2007 Chevrolet® Silverado
610.65006	2013 Ford® F-150



2007 Toyota® Camry



2013 Ford® F-150



2007 Chevrolet® Silverado

### Dynamic Testing of Durability:

- ⊕ Sample testing was performed according to *SAE J193-201210 Ball Stud and Socket-Test Procedures (Section 5.2.4.2.2 Endurance Load)*. These are the same test standards that OEM vehicle manufacturers use prior to production parts being installed.
- ⊕ To disprove the false claims, the product samples were tested to five times (“5X” claim) the SAE standard of 250,000 operating cycles (1.25 million cycles in total for each part).
- ⊕ The test conditions were set to match the most extreme, harsh conditions the ball stud might see in use.

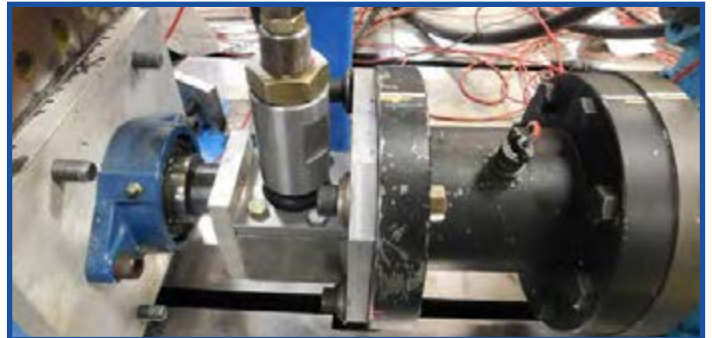
**RE-TEST RESULTS:** All 3 Centric parts successfully completed all 1.25 million operating cycles and were still fully functioning with no signs of failure. **False claim of durability disproved.**

### Metallurgical Chemistry Testing of Composition:

- ⊕ Sample testing was performed according to *ASTM E3, E140, E384, E407, E415, E1019 Test Procedures*. These are the actual industry test standards referenced in the false claim advertising.
- ⊕ The 3 original equipment parts, 3 Centric replacement parts and 3 competitor parts making the false claims were re-tested.

**RE-TEST RESULTS:** Forensic metallurgist expert found no difference in chemistry for use within the intended vehicle applications. Only slight differences in chemical composition were found amongst the three parts which were deemed insignificant. **False claim of composition failure and OE-match disproved.**

- ⊕ In fact, the competitor steel alloy composition (4140) does not match the OEM part. Centric’s parts exactly match the steel alloy composition (4130-4135) used in the OEM part which is important when interacting with supporting Centric polymer cups.
- ⊕ Physical tests (peening and hardness) were also performed and showed only slight variations between the parts as well. The advertising claim of “superiority” in this metric is unprovable through scientific analysis.



# FACT VS. FICTION – THE FINAL RESULTS

Competitor Claim	Centric Parts – Test Results	Accuracy of Competitor Claim
<p>“Outperforms competition by more than 5X.”</p>	<p>Tested to five times the SAE test standard. All 3 Centric parts successful completed 1.25 million cycles and were still functioning as designed with <b>no</b> signs of failing. For competitor claim to be true, they’d need to run their part to 25 times the SAE standard.</p>	<p><b>FALSE</b> CLAIM DEBUNKED.</p>
<p>“Independent metallurgical testing shows other providers parts failed.”</p>	<p>Tested to the ASTM standards for metal composition and physical properties. Nothing to distinguish the 3 samples of having superior metallurgy, treatment or hardness characteristics.</p>	<p><b>FALSE</b> CLAIM DEBUNKED.</p>
<p>“Only their ball studs are proven to be OEM or better” and “meet or exceed the OEM standard.”</p>	<p>Centric has gone to great lengths to follow the OEM design not only in function but also in physical composition. The 4130-4135 alloy steel used in Centric’s design <b>exactly matches</b> the OEM design. Competitor product uses non-OEM design metals.</p>	<p><b>FALSE</b> CLAIM DEBUNKED.</p>

## SEEING IS BELIEVING – AFTER 1.25 MILLION CYCLES







# PROVEN. FROM LAB TO LIFT.

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Centric® Parts is a part of APC Automotive Technologies, a leading automotive aftermarket undercar parts platform. Centric Parts is also North America's leading manufacturer and supplier of aftermarket brake and chassis components for passenger vehicles, light and medium duty trucks, fleet vehicles, high performance vehicles and racecars. Centric products are marketed under the Centric®, C-Tek®, Posi Quiet®, StopTech®, PQ PRO™, TACTICAL™ and Fleet Performance brands.

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