

JTEKT

AUTOMOTIVE PUMP CAPABILITIES

تقنية



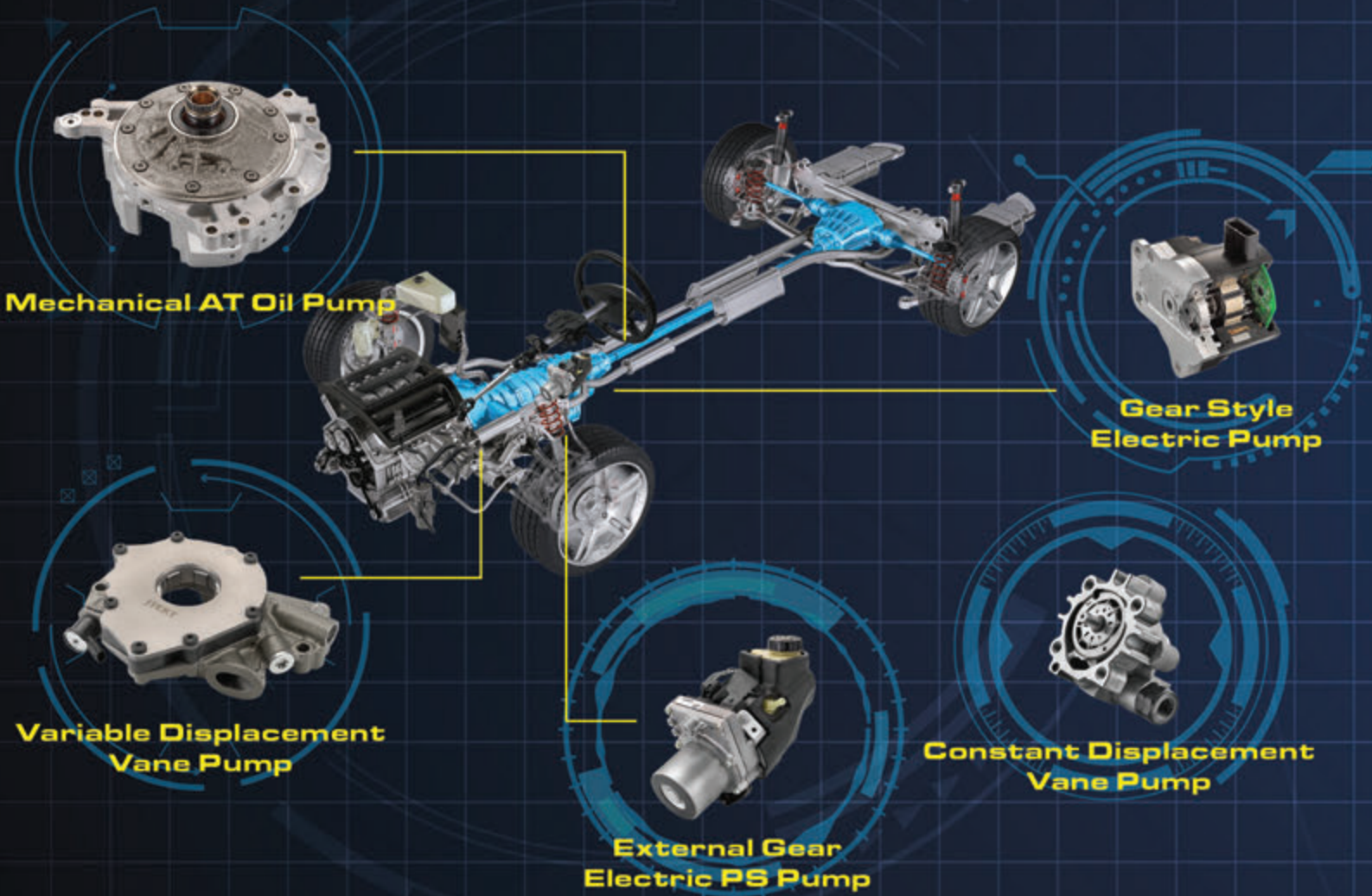
JTEKT

Koyo

TOYOTA

JTEKT is Versatility in Motion

JTEKT design engineers provide versatile solutions for all types of automotive pumps:



JTEKT Value Proposition

-  Experienced Global OEM Pump Manufacturer
-  ISO & IATF 16949 Certified
-  Applications for Engines, Transmissions, CVT, Steering & Others
-  Proficient in Mechanical & Electronic Designs
-  Integrated Die & Squeeze Casting
-  Integrated Variable Vane Manufacturing
-  Integrated Bearing Technology & Manufacturing (KOYO Ball, Needle & Roller)
-  Global Manufacturing Footprint

JTEKT is Innovation in Motion

JTEKT Corporation was established in January 2006 through the merger of Koyo Seiko Co., Ltd., a world-class bearing manufacturer founded in 1921, and Toyoda Machine Works, Ltd., a leading machine tool manufacturer excelling in cutting-edge machining technologies that was founded in 1941. Combining the most advanced technologies and the manufacturing expertise of both companies, JTEKT delivers innovative products that satisfy the most demanding customers all over the world.

The JTEKT idea of “monozukuri”, Japanese for craftsmanship, carefully considers such issues as what products are needed in the marketplace, how and where to make them, and how they should be provided to our customers.

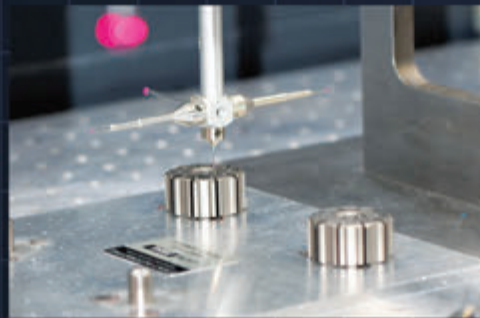
JTEKT makes parts, components, and systems for just about every industry: from bearings, drive-line components, gears, pumps, and steering systems, to high-tech, ultra-precise milling machines and the mechatronic controls that keep them all moving.

JTEKT Corporation and its 136 consolidated subsidiaries employ over 44,000 people world-wide, with JTEKT North America boasting 15 of JTEKT’s 65 global manufacturing plants and over 7,000 employees across plants, tech centers, warehouses, and operations.

JTEKT Corporation consistently ranks in the top 20 (of 100 ranked) automotive suppliers globally.*



Greenville, SC Technology Center



Plymouth, MI Technology Center

JTEKT North America operates two Technology Centers. One is located in Plymouth (Detroit), Michigan, and the second is on the CU-ICAR automotive research campus of Clemson University in Greenville, South Carolina. JTEKT boasts 13 such Technology Centers world-wide, supporting our global “Customer First” commitment to quality, reliability, and innovation in motion.

* “Top Suppliers”, Automotive News supplement, June 2016 (ranked number 15 for 2015)

JTEKT Proving Grounds located in Japan and France

JTEKT Iga Proving Ground (Iga City, Japan shown)

Site Area:	500,000 m ²
Course Area:	170,000 m ²
Combined Circuit Length:	2,200 m
Dynamics Pad Area:	54,000 m ²



A Straight-line Course

B Winding Course

D Forcing Course

E Dynamics Pad

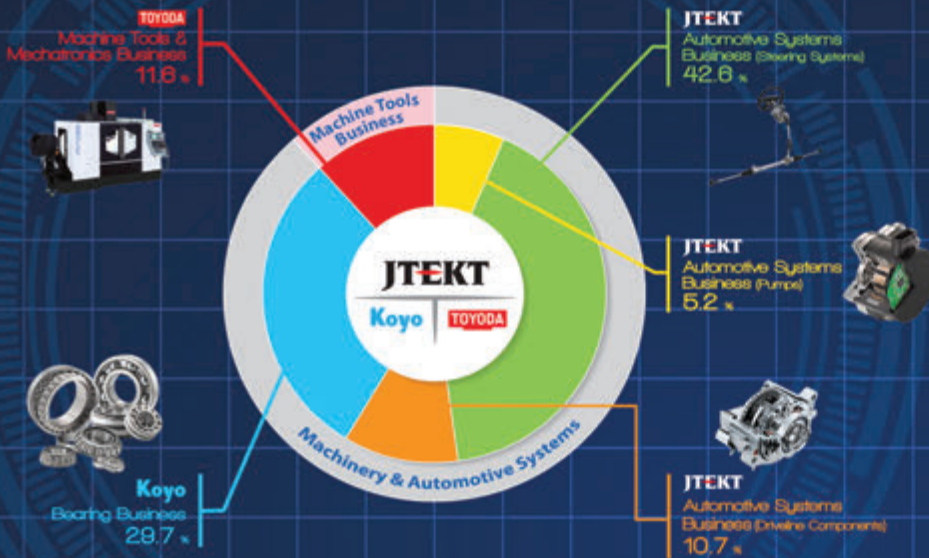
F Noise Evaluation Course

C Administration / Maintenance Building



JTEKT is Engineering in Motion

JTEKT operates in 5 business segments globally, and is a leader in each product category.



One of our fastest growing areas of expertise is in the design, engineering, and manufacture of electro-mechanical pumps.

Whether your need is electro-mechanical, mechanical, fixed, or variable displacement, JTEKT has the capability to engineer and build all types of pumps. We were the first to introduce vane style pumps in the 1970s, and the first electro-hydraulic pump capable of operating an automotive power steering system in 1983. Today our pumps are found in engines, transmissions, CVTs, power steering systems, and AWD couplings.



JTEKT makes extensive use of squeeze casting (also known as *liquid metal forging*) to produce highly reliable pump housings. This process combines casting and forging techniques to make very dense structures that produce near net shapes and virtually eliminates the possibility of porosity.

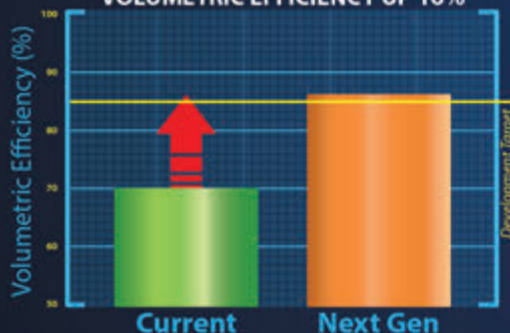


These graphs illustrate improvements achieved by JTEKT during development of our next generation oil pumps for CVT's

Volumetric Efficiency

1000 rpm 5MPa @ 80°C

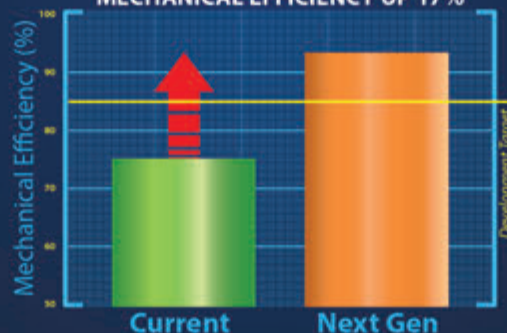
VOLUMETRIC EFFICIENCY UP 16%



Mechanical Efficiency

1000 rpm 5MPa @ 80°C

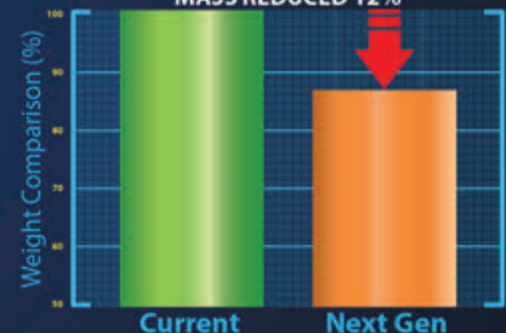
MECHANICAL EFFICIENCY UP 17%



Mass Reduction

Unit Assembly Comparison

MASS REDUCED 12%



JTEKT is Quality in Motion

JTEKT is considered the benchmark for quality manufactured products. Through exhaustive testing utilizing the latest state-of-the-art methods and equipment, we are able to ensure all specifications and standards are clearly met.

Durability testing methods vary by product or application, so JTEKT maintains a complete laboratory filled with the latest equipment to meet the most stringent requirements.



DURABILITY

- Pump Durability Tests
- Engine Pump Durability
- Impulse Testing
- High Speed Durability

ENVIRONMENTAL

- Cold Start
- Thermo Shock
- Impulse
- Heat Resistance
- Vibratory

QUALITY

- Cold Start
- Thermo Shock



The automotive industry is sensitive to noise and vibrations that can emanate from dynamic components such as pumps.

Our customized anechoic testing labs allow our engineers to isolate and understand these phenomena and design them out of our products before they become problematic.

With the addition of X-RAY and CT Scan technology, 3D views of castings can be analyzed for voids, underfills, porosity, stress risers, and cold shut defects.



X-RAY



CT SCANNING



Cold Shuts









High Definition Details



JTEKT is Manufacturing in Motion

JTEKT North America's headquarters for automotive pump design and manufacturing is located just north of Knoxville, Tennessee on our manufacturing campus in Morristown, Tennessee. This 39 acre complex features our in-house Pump Design Department, on-site aluminum casting capabilities, pump assembly as well as validation testing.

JTEKT's Morristown Facility sells and ships pumps to 10 countries.

Pump Design Capabilities	Design Department On-Site
 <p>Mechanical (Engine, Transmission, CVT, Steering, other)</p>	 <p>On-Site / In-House Aluminum Casting Squeeze Casting, Die Casting</p>
 <p>Electro Mechanical CVT, Idle Stop Start, Hybrid, Steering</p>	 <p>In Group Vane Manufacturing Our Bedford, Quebec plant is our worldwide site for Pump Vanes, and has produced over 70 Million vanes to date.</p>
 <p>Fixed & Variable Designs Vane Type, Gear Type, Internal Gear Type</p>	 <p>In Group Bearing Manufacturing Ball, Needle & Roller Bearings</p>

In-House Validation Testing



- NVH Testing
- Performance Testing
- Durability Testing

Pump Quality Level = 5ppm

JTEKT's Morristown Facility



Koyo. Bedford Quebec Facility has produced over **70 Million Vanes**

JTEKT
Morristown Facility
Has Produced & Sold More Than
50 Million Pumps
Since 1989
U.S.A.

