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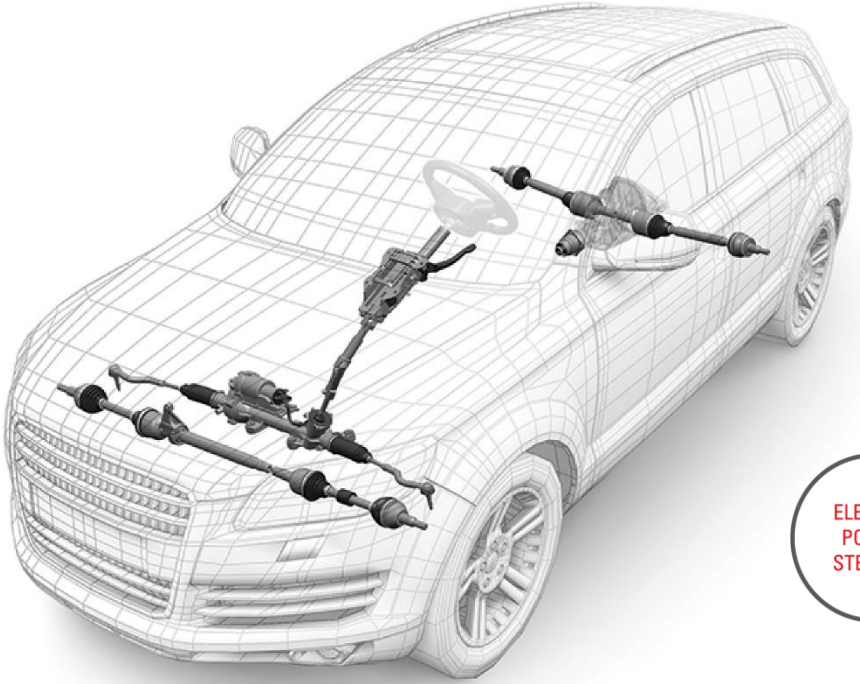

Global Capabilities Presentation

May 2020

- ELECTRIC POWER STEERING
- COLUMNS & INTERMEDIATE SHAFTS
- DRIVELINE SYSTEMS
- HYDRAULIC POWER STEERING
- ASSISTED & AUTOMATED DRIVING ENABLERS

Company Profile

World Headquarters:
Auburn Hills, Michigan, USA

2019 Revenue: $3.58 billion

Global Workforce:
13,000+

Global Customers:
60+, including BMW, FCA, Ford, GM, Groupe PSA, Renault-Nissan-Mitsubishi and VW, as well as automakers in India, China and South America

WHAT We Do:

- ELECTRIC POWER STEERING
- COLUMNS & INTERMEDIATE SHAFTS
- DRIVELINE SYSTEMS
- HYDRAULIC POWER STEERING
- ASSISTED & AUTOMATED DRIVING ENABLERS

2019 Revenue Distribution

NORTH AMERICA

$2.45B

EUROPE, MIDDLE EAST, AFRICA & SOUTH AMERICA

$484M

ASIA PACIFIC

$643M

A Balanced and Diverse Customer Base

Serving More Than 60+ Customers Including…

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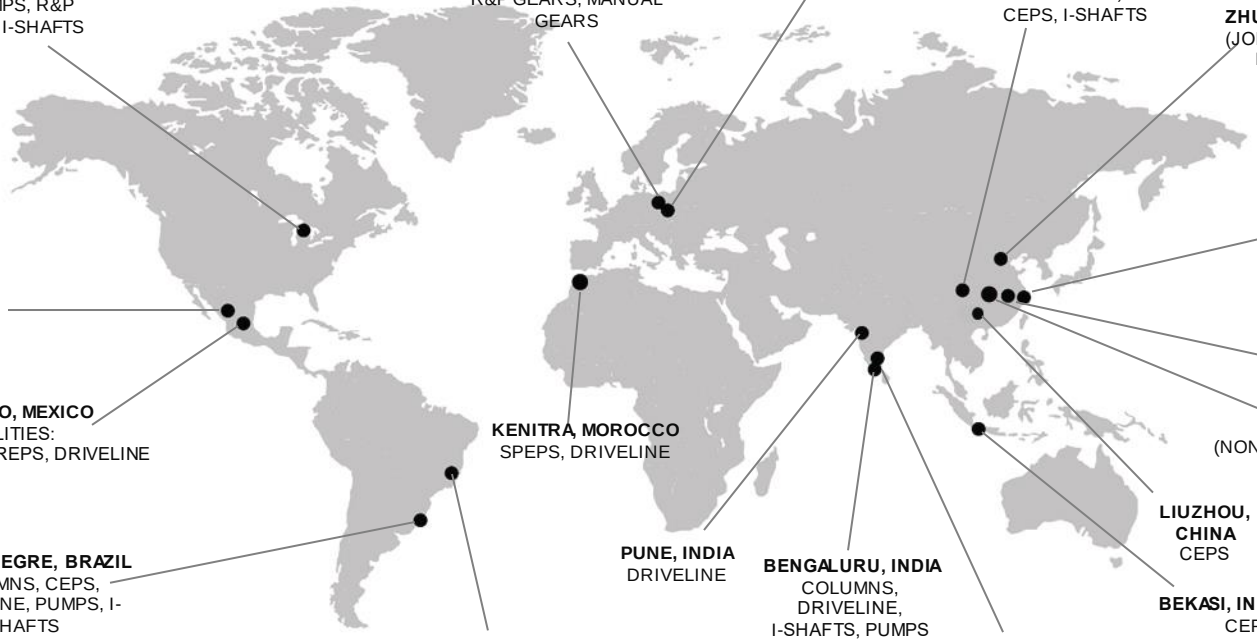
A Global Balanced Manufacturing Footprint



SAGINAW, USA
6 FACILITIES
COLUMNS, INTEGRAL GEARS, REPS, PUMPS, R&P GEARS, DRIVELINE, I-SHAFTS

GLIWICE, POLAND
COLUMNS, CEPS, HPS, R&P GEARS, MANUAL GEARS

TYCHY, POLAND
CEPS, I-SHAFTS, SPEPS

CHONGQING, CHINA
(NON-CONSOLIDATED JOINT VENTURE)
CEPS, I-SHAFTS

ZHUZHOU, CHINA
(JOINT VENTURE)
DRIVELINE

SUZHOU, CHINA
3 FACILITIES
CEPS, COLUMNS, I-SHAFTS, MPP, REPS, SPEPS, MANUAL GEARS, HPS

JUAREZ, MEXICO
2 FACILITIES
COLUMNS, I-SHAFTS

QUERETARO, MEXICO
3 FACILITIES:
CEPS, I-SHAFTS, REPS, DRIVELINE

KENITRA, MOROCCO
SPEPS, DRIVELINE

WUHU, CHINA
(JOINT VENTURE)
DRIVELINE

WUHAN, CHINA
(NON-CONSOLIDATED JOINT VENTURE)
SPEPS

LIUZHOU, CHINA
CEPS

PORTO ALEGRE, BRAZIL
COLUMNS, CEPS, DRIVELINE, PUMPS, I-SHAFTS

PUNE, INDIA
DRIVELINE

BENGALURU, INDIA
COLUMNS, DRIVELINE, I-SHAFTS, PUMPS

BEKASI, INDONESIA
CEPS

PORTO REAL, BRAZIL
SPEPS

CHENNAI, INDIA
EPS, DRIVELINE

As of April 2020

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2019 Strategic Expansion of Global Footprint

KENITRA, MOROCCO
EPS and Driveline manufacturing

BANGALORE, INDIA
Software center

WUHAN, CHINA
EPS manufacturing JV with Dongfeng

CHENNAI, INDIA
EPS and Driveline manufacturing

SUZHOU, CHINA
APAC regional technical center

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Expansive Global Engineering & Customer Support

TECH CENTER | CUSTOMER SERVICE CENTER | PROTOTYPE | NOISE & VIBRATION | LAB | TEST TRACK | SOFTWARE CENTER

Global Technical Center (GTC)

- Portfolio Vision
- Product and Process Architecture Strategy
- Advance Core Product Technology
- Software Development
- R&D Innovation

Technical Center (TC)

- Product and Process Engineering
- Product Validation
- Prototype Manufacturing
- Vehicle Integration and Testing
- Software Development
- R&D Innovation

Software Service Center (SCS)

- Software Production and Validation

Customer Service Center (CSC)

- In-region Customer Interface - Sales, Engineering, Quality, Program Management

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Expansive Global Engineering & Customer Support

Global Technical Center (GTC)

- Portfolio Vision
- Product and Process Architecture Strategy
- Advance Core Product Technology
- Software Development and R&D Innovation

Technical Center (TC)

- Product and Process Engineering
- Product Validation
- Prototype Manufacturing
- Vehicle Integration and Testing
- Software Development and R&D Innovation

India Software Center (ISC)

- Software Production and Validation

Customer Service Center (CSC)

- In-region Customer Interface - Sales, Engineering, Quality, Program Management

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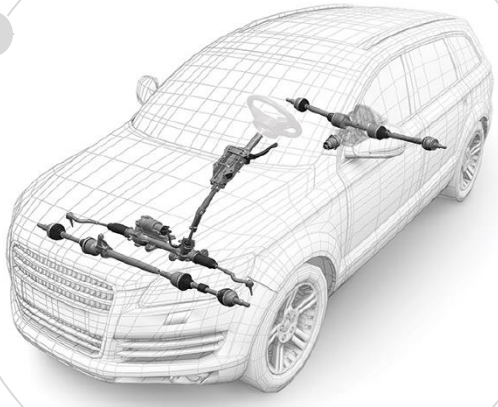
5 Things to Know About Nexteer *& What it Means to You*

DEPTH & BREADTH OF PRODUCTS	**Steering, Driveline & ADAS/AD Enabling Technologies** from cars to commercial vehicles around the globe.
EXPERIENCED SYSTEMS INTEGRATORS	**Seamless integration:** "Vehicle-level thinking" is in our DNA
IN-HOUSE OWNERSHIP OF R&D, DESIGN, TESTING & MANUFACTURING	**Agility, responsiveness, quality & value**
RELENTLESS INNOVATION	**Faster-to-market product development cycles** via quick, iterative design approach **Access to a cross-functional, advanced technology team** **Time & cost-efficiencies** via smart capitalization on Nexteer's in-house technologies, ADAS & autonomous building blocks
GLOBAL MANUFACTURING FOOTPRINT & PROWESS	**A high-quality, proven manufacturing partner for safety-critical systems...** in every market where you need to be

Depth & Breadth of Products

Steering, Driveline & ADAS/AD Enabling Technologies
from cars to commercial vehicles around the globe

Product Overview



Electric Power Steering (EPS)

High Availability

Column Assist

Dual Pinion Assist

Rack Assist

Single Pinion Assist

ADAS & Automated Driving Enabling Technologies

Steer-by-Wire

- Steer-by-Wire
- Quiet Wheel™ Steering
- Steering on Demand™ System
- Stowable Steering Column
- High Availability EPS
- Cyber Security

Steering Columns & I-Shafts

Stowable Steering Column
(Ideal with Steer-by-Wire Applications)

Steering Column

Intermediate Shaft

Driveline

Halfshaft

Propeller Shaft CV Joint

Intermediate Driveshaft

Hydraulic Power Steering (HPS)

Magnetic Torque Overlay

Smart Flow Pump

Cartridge Valve

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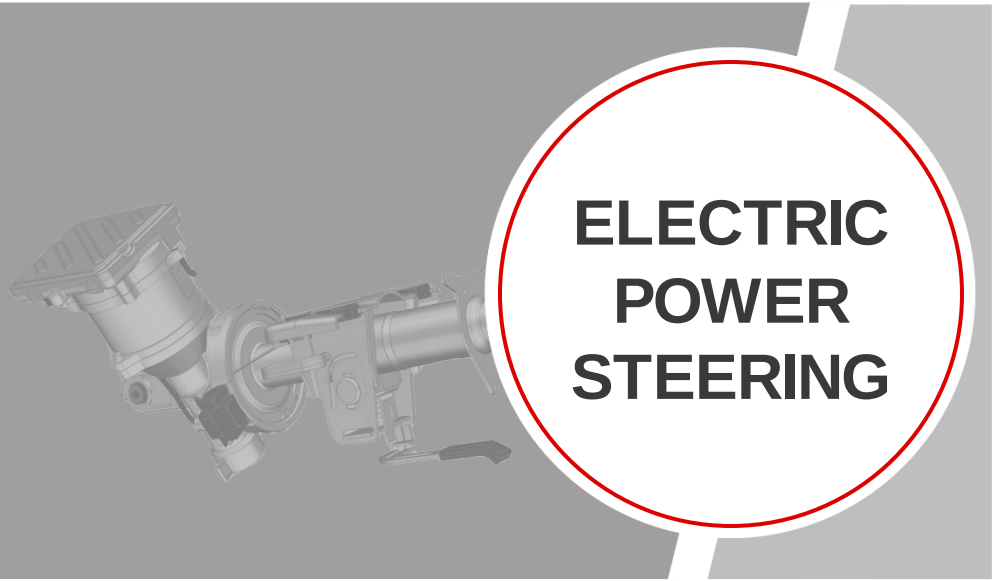


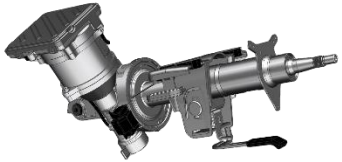
ELECTRIC POWER STEERING

EPS uses an electric motor to assist driver steering. It's the heart of your vehicle's personality and performance, giving the driver control and feel of the road.

High Availability

Rack Assist

Single Pinion Assist



Column Assist

Dual Pinion Assist

PRODUCT PORTFOLIO:

- Column Assist (CEPS) – Brushless / Brush Motors
- Single Pinion Assist (SPEPS)
- Dual Pinion Assist (DPEPS)
- Rack Assist (REPS)
- High Output Rack Assist EPS
- High Availability EPS
- EPS Intermediate Shafts – Fixed / Slider
- Premium EPS Rack & Pinion Gears
- Modular Powerpacks (MPPs)

High Output EPS

Opens New Hydraulic-to-Electric Conversion Wave

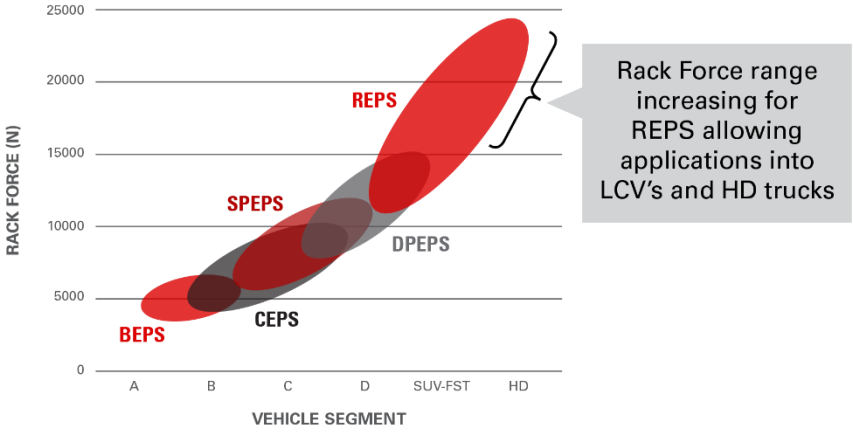
Capable of Higher Rack Forces

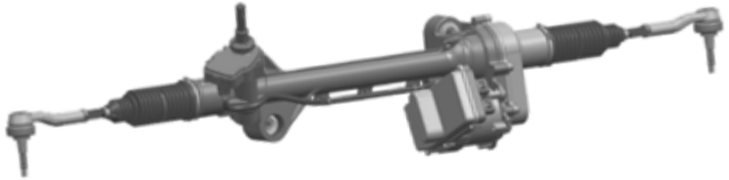
- H.O. REPS increases load capacity up to 24kN (vs. standard REPS in production 10kN – 15kN)

Advantages: Safety, Comfort & Fuel Economy

- **Enhanced fuel economy** via mass reduction & on-demand engine auto start/stop
- **Better steering feel** via reduced friction
- **Enhanced Safety** via High Availability electrical architecture & advanced driver assist features
- **Better Consumer Value**: Helps OEMs close the "Price-to-Feature Gap" between LD & HD Trucks

EPS Architectures vs Vehicle Segments





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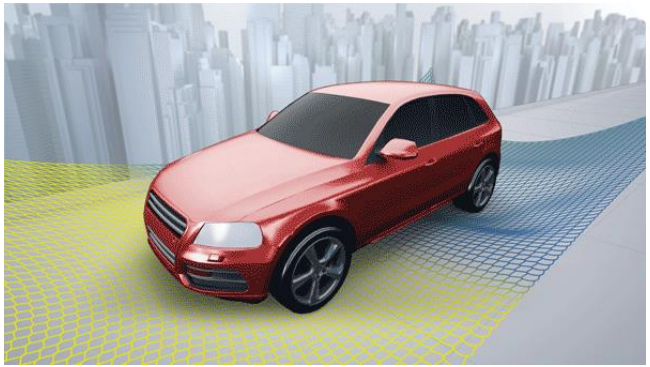
High Availability EPS

Our Safety Net is ALWAYS ON

- **Safety-critical** for varying levels of automated driving
- **Integrated** back-up hardware & software designs
- **Simultaneous**, multi-path processing software <u>AND</u> dual hardware components
  - Torque and position sensor
  - Electronic control units
  - Motor windings
  - Vehicle power and communication connectors

GM's Innovation Award Winner

Int'l Automotive Congress in Shanghai's Automotive Technology Innovation Award Winner



Choose Nexteer EPS for…

- **Superior Systems Integration:** Software, Electro-Mechanical *(AUTOSAR & FlexRay Capable)*
- **In-house Ownership:** Electro-Mechanical Design, Testing & Manufacturing
- **Product Range:** Steering Small Cars to Full Size Trucks
- **Industry Leading Safety** With High Availability Systems
- **Advanced** Steering System Development
- **Proven Experience & Product Reliability:** All Segments & Product Technologies
- **Fast, Flexible** Product Development & Customized Solutions

DID YOU KNOW?

Nexteer produced its **70 millionth EPS unit** in 2020.

Nexteer EPS is on...

9/10

Full Size Trucks in North America

&

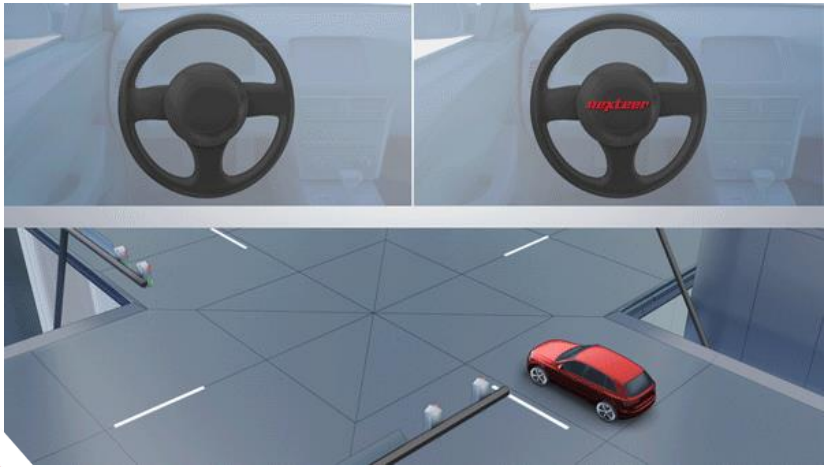
1/4

Small Cars that use EPS in Europe

Quiet Wheel™ Steering

Redefines the "Behind the Wheel" Experience

- **Enabled by Steer-by-Wire**
- **Allows the Steering Wheel to Remain Still**
  - Even while the vehicle is in the process of turning during autonomous driving mode
- **Eliminates Potential Hazard**
  - Of a fast-rotating steering wheel in front of the driver during hands-off driving
- **Enhances Safety and Sense of Peace in the Cabin**
- **Awarded the 2019 Automotive Innovation Technology Award at the 2019 International Automotive Congress**



Steering on Demand™ System (SoD) & Stowable Steering Column

- **SoD** – Provides safe, intuitive transitions of steering control between manual driving and automated driving
- **Stowable Steering Column –** Allows steering wheel to retract during hands-off driving
- **Enabled by Steer-by-Wire**
- **Enhances safety, comfort** and **control**

Click here to experience SbW, SoD and Quiet Wheel.

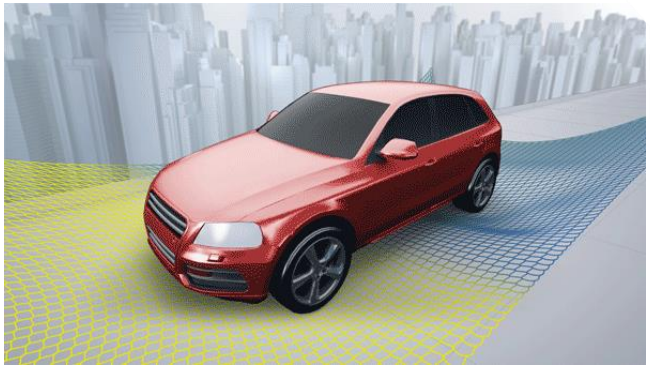
High Availability EPS

Our Safety Net is ALWAYS ON

- **<10 FIT Systems are Safety-critical** for varying levels of automation
- **Integrated** back-up hardware & software designs
- **Simultaneous**, multi-path processing software AND dual hardware components
  - Torque and position sensor
  - Electronic control units
  - Motor windings
  - Vehicle power and communication connectors

GM's Innovation Award Winner

Int'l Automotive Congress in Shanghai's Automotive Technology Innovation Award Winner



Cyber-Secure Steering

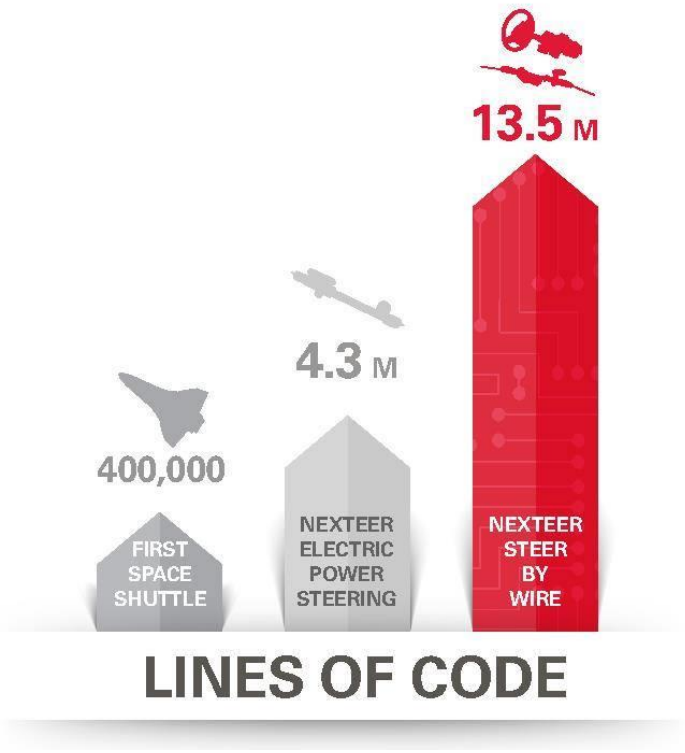
Validates Steering Commands

- **Safety-critical** as vehicles adopt advanced electronics, V2X communication & Internet connectivity
- **Integrates multi-layer hardware & software**
  - **Hardware:** Specifically designed semi-conductor modules
  - **Software:** Multiple layered structure authorizes data and command flow between the steering system and other controllers

Software for Advanced Steering

Critical Role in Safety & Performance

- **Smart software solutions continue to grow exponentially**
- **Plays a significant role in cyber security, SbW and other advanced EPS systems**
  - Built for simultaneous, multi-path processing to further enhance the safety net
- **Proven, award-winning <10 FIT solutions**
  - FIT: A statistical measurement of product reliability
  - The lower the FIT score, the higher the product reliability



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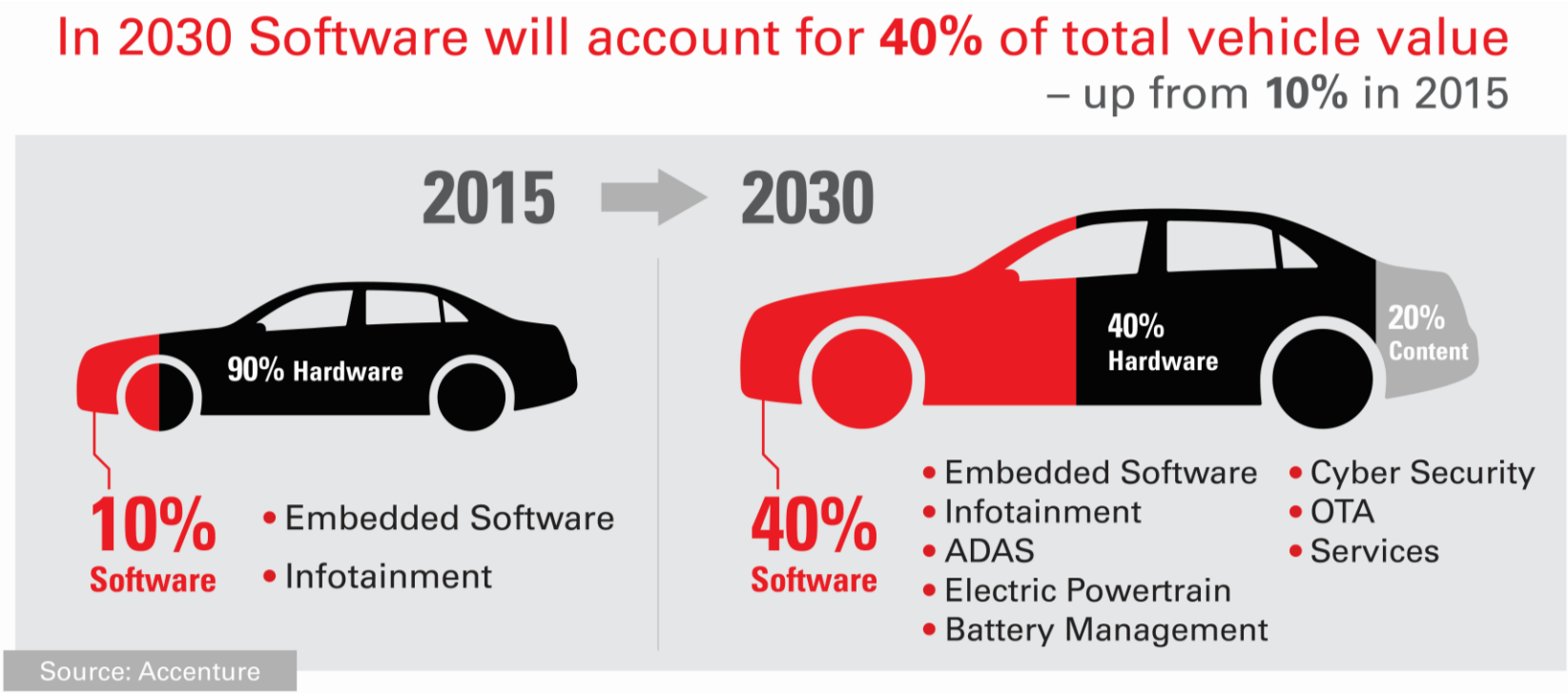
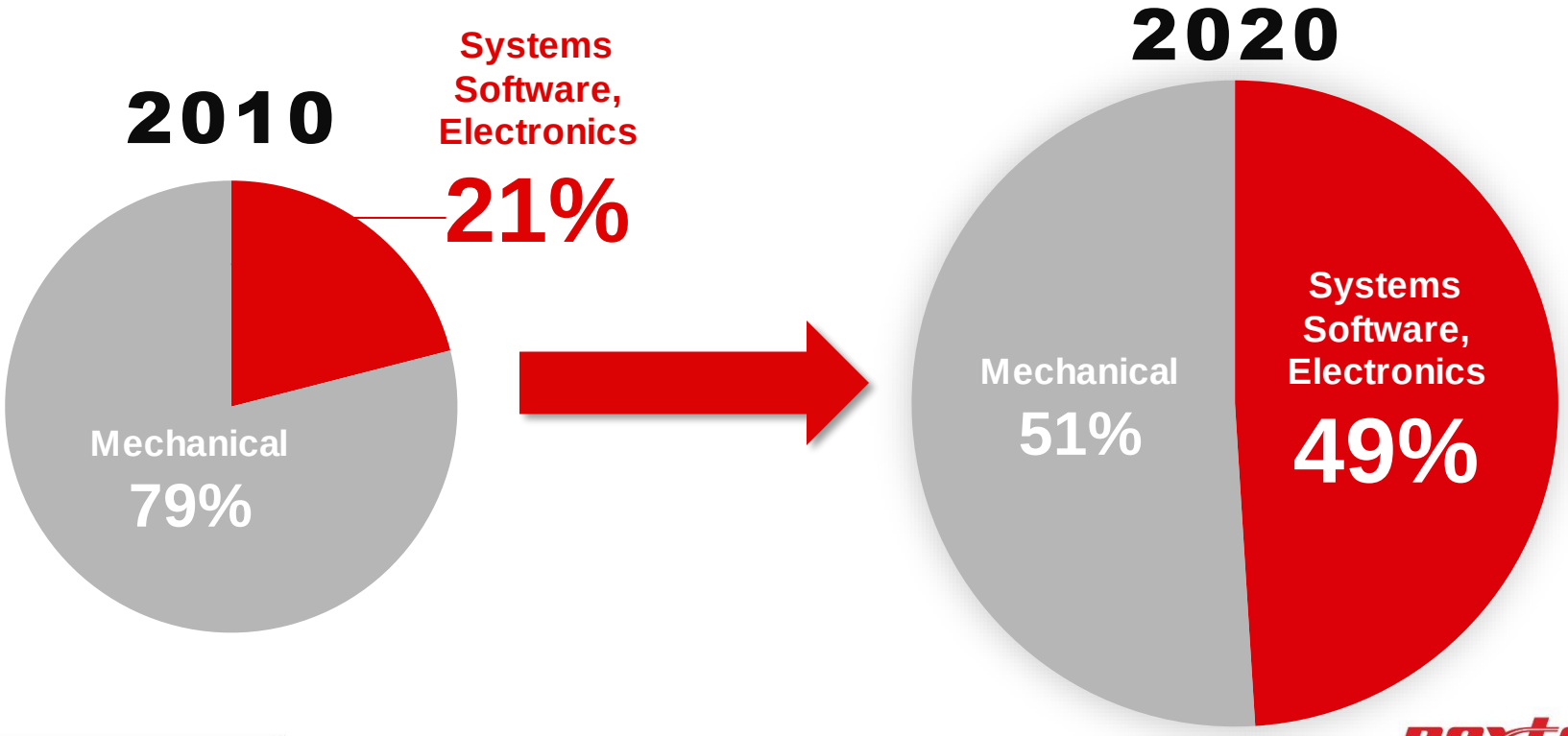
Software for Advanced Steering

Growing Role of Software in Vehicles



Software / Connectivity & Nexteer

Investment in Global Engineering Technical Talent & Competencies



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Thoughtful Alignment with Megatrends

	ADAS L2/3 *Advanced Safety, Driver Assist*	Electrification	Software	ADAS L4/5 *Advanced Safety, High/Full Automation*	MaaS	Connectivity
DL		✓			✓	
CIS	✓	✓	✓	✓		
EPS	✓	✓	✓	✓	✓	✓
SbW	✓	✓	✓	✓	✓	✓
R&D	✓	✓	✓	✓	✓	✓
CNXMotion JV	✓	✓	✓	✓	✓	✓

Advanced Safety & Performance

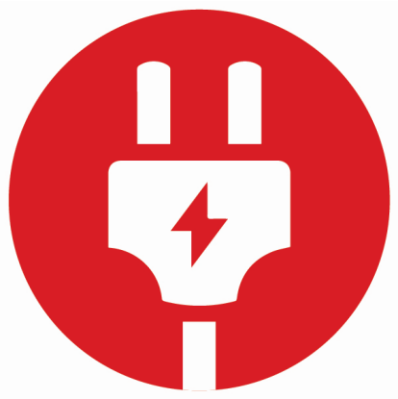
Supporting ADAS Levels 2 - 5

- Enhancing the future of mobility through intuitive motion control solutions that enable a new era of safety and performance:
  - High Availability EPS (10 FIT)
  - Steer-by-Wire
  - Stowable Columns
  - Quiet Wheel™ Steering
  - Steering on Demand™ Systems

One of the advanced safety features enabled by SbW technology is collision avoidance through AES
(Automatic Emergency Steering)

Electrification & New Energy Vehicles

Growing on a Global Scale

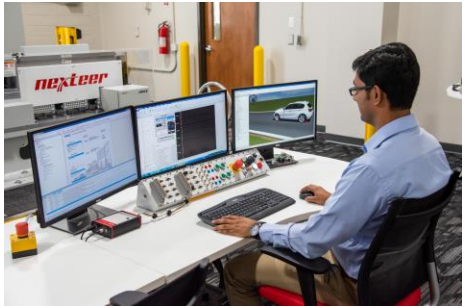


- **REPS & Pinion EPS:** Underhood EPS for Heavy EV Loads
- **High Output EPS:** Converts Heavy Duty Trucks & SUVs from Hydraulic to Electric Powered Steering
- **Columns:** Reduced Mass & Packaging Flexibility
- **Driveline:** Quiet EVs Need Premium, Low Mass Axles & Joints
- **Steer-by-Wire:** Packaging Flexibility, Component Reuse & Standardization

Software

Serving as a key differentiator

- **Global Business Model:** Feature Development, Production-Intent Software & Validation
- **Growing Demand for Advanced Safety & Performance Steering Features: Levels 2-5**
- **SbW & High Availability EPS (10 FIT):** More Advanced Steering Features Mean More Complex Code
- **Cyber Security:** Protects against Cyber Threats by Validating Steering Commands
  - Also provides secure links during design & manufacturing



Vehicle Autonomy & Mobility as a Service

Leveraging our core competencies to align with advanced work

- Partnerships in Autonomous People Moving & Last Mile Delivery of Goods
- Steer-by-Wire & High Availability EPS (10 FIT) are Key Enabling Technologies
- Increased Durability Requirements for Shared Fleets
- CNXMotion JV: Integrating Steering & Braking for Full Motion Control in Advanced Applications; Accelerating R&D for Parent Companies

Connectivity

Real-Time Safety

- **Product Impact**
  - New Frontier of Safety & Performance
  - Real-Time Safety via “Well-Informed” V2X Motion Control Systems
  - Cyber Security Validates True Steering Commands
- **Manufacturing Impact**
  - Nexteer’s Digital Trace™ Manufacturing

Experienced Systems Integrators

Seamless integration:
“Vehicle-level thinking” is in our DNA

110-Year Heritage

Vehicle-Level Thinking & Systems Integration: It's In Our DNA

1900

- 1906 – **Jackson, Church & Wilcox Co.** is established in Saginaw, MI.
- 1909 – Buick Motor Car Co. purchases Jackson, Church & Wilcox Co. Buick then **joins the new General Motors Co.**
- 1917 – General Motors realigns the Saginaw plants to become **Jackson, Church & Wilcox Division of General Motors Corp.**
- 1919 **–** The company name is changed to the **Saginaw Products Company, a Division of General Motors Corporation.**
- 1928 – GM divides the Saginaw Products Company into 4 self-sustaining divisions. Steering systems are designed & manufactured at the new **Saginaw Steering Gear Division of GM.**

1950

- 1952 – The new **Saginaw Safety Power Steering System,** comprised of a gear, hydraulic pump, valve mechanism & various hoses, is developed & produced as vehicles become larger & more difficult to steer manually.
- 1985 – Saginaw Steering Gear Division is changed to **Saginaw Division** to better reflect our broad range of products offered to the automotive industry.
- 1995 – Saginaw Division becomes a separate business unit of GM, referred to as **Delphi Automotive Systems – A Division of GM.**
- 1999 **– Delphi** becomes an independent company.

2000

- 2010 – GM announces agreement on the **sale of Nexteer Automotive to Pacific Century Motors (PCM)**. PCM transitions to AVIC.
- 2013 – Nexteer Automotive completes **Initial Public Offerings** in Hong Kong (HK:1316).
- 2014 – Nexteer Automotive completes **$250M bond offering**.
- 2016 – The stand-alone **World Headquarters opens in Auburn Hills, MI.**
- 2017 – Nexteer Automotive & Continental AG announce **CNXMotion, a joint venture advancement of motion control systems** and actuator components for automated driving.
- 2018 **–** Nexteer Automotive launches **Digital Trace™ Manufacturing** (DTM) – a holistic approach to integrating manufacturing and design. Nexteer earns **Frost & Sullivan's Manufacturing Leadership Award** for DTM.
- 2020- Nexteer Automotive celebrates **10 year anniversary**.

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Global Manufacturing Footprint & Prowess

A high-quality, proven manufacturing partner for safety-critical systems…

in every market where you need to be

HOW We Do It: Digital Trace™ Manufacturing

Connects all Global Data Points into 1 Smart System

Click here to learn more about the benefits of Digital Trace™ Manufacturing.

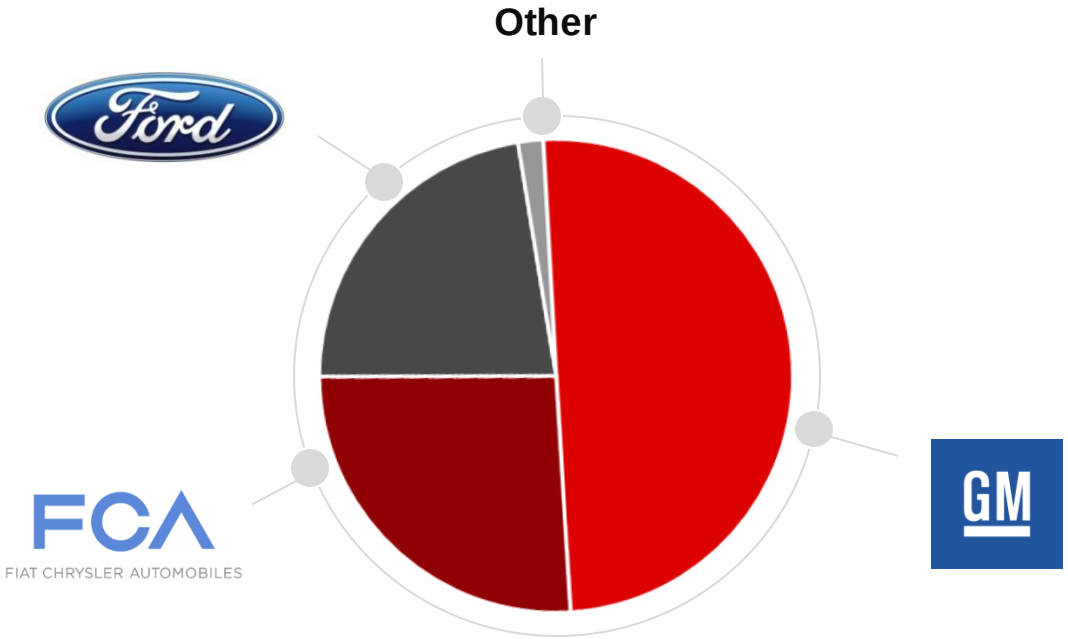
North America Overview

Nexteer North America Overview

- **2019 N.A. Revenue:** $2.45B
- **World Headquarters in Auburn Hills, MI, USA**
- **11 Manufacturing Facilities:**
  - Saginaw, Michigan (6)
  - Juarez, Mexico (2)
  - Queretaro, Mexico (3)
- **Customer Service Center:**
  - Auburn Hills, MI
- **Global Technical Center:**
  - Saginaw, MI
    - NVH Engineering
    - Prototype Center
    - Vehicle Testing / Test Track
    - Software Development
    - R&D
    - Laboratory

2019 North America Revenue

Total Sales $2.45B



Nexteer Plant 1

Saginaw, Michigan, USA

- **Year Established:** 2003
- **Floor Space:** 55,000 ft^2 (5,110 m^2)
- **Employees:** 3 Salaried, 66 Hourly
- **Quality:**
  - ISO/TS 16949
  - ISO 14001
- **Customers:**
  - Ford
- **Products:**
  - REPS

Nexteer Plant 3

Saginaw, Michigan, USA

- **Year Established:** 1953
- **Floor Space:** 591,289 ft^2 (54,933 m^2)
- **Employees:** 115 Salaried, 823 Hourly
- **Quality:**
  - ISO/TS 16949
  - ISO 14001
- **Customers:**
  - FCA
  - GM
- **Products:**
  - REPS

Nexteer Plant 4

Saginaw, Michigan, USA

- **Year Established:** 1956
- **Floor Space:** 677,300 ft^2 (62,923 m^2)
- **Employees:** 76 Salaried, 382 Hourly
- **Quality:**
  - IATF 16949
  - ISO 14001
- **Customers:**
  - FCA
  - GM
  - Dana
- **Products:**
  - Driveline

Nexteer Plant 5

Saginaw, Michigan, USA

- **Year Established:** 1962
- **Floor Space:** 593,000 ft^2 (55,092 m^2)
- **Employees:** 54 Salaried, 367 Hourly
- **Quality:**
  - IATF 16949
- **Customers:**
  - FCA
  - GM
- **Products:**
  - Driveline

Nexteer Plant 6

Saginaw, Michigan, USA

- **Year Established:** 1966
- **Floor Space:** 636,000 ft^2 (59086 m^2)
- **Employees:** 41 Salaried, 399 Hourly
- **Quality:**
  - IATF 16949
  - ISO 9001
  - GM-BIQS
- **Customers:**
  - GM
  - FCA
- **Products:**
  - Columns
  - I-Shafts
  - Distributes:
    - I-Shafts, EPS Rotor & Worm Gears, Reservoirs, Plastic Components

Nexteer Plant 7

Saginaw, Michigan, USA

- **Year Established:** 1979
- **Floor Space:** 577,100 ft^2 (53,614 m^2)
- **Employees:** 40 Salaried, 320 Hourly
- **Quality:**
  - ISO/TS 16949
  - ISO 14001
- **Customers:**
  - FCA
  - GM
  - NASCAR
- **Products:**
  - Integral Gears – MTO
  - Pumps
  - Torsion Bars
  - Rack & Pinion Gears

Nexteer Plant 61

Juarez, Mexico

- **Year Established:** 2017
- **Floor Space:** 124,200 ft^2 (11,539 m^2)
- **Employees:** 30 Salaried, 49 Indirect, 164 Direct
- **Customers:**
  - Ford
  - GM
- **Products:**
  - Columns
  - Shafts

Nexteer Plant 63

Queretaro, Mexico

- **Year Established:** 2018
  - Grand Opening April 2018
- **Floor Space:** 133,380 ft^2 (12,392.24 m^2)
- **Employees:** 27 Salaried, 80 Indirect, 212 Direct
- **Quality:**
  - IATF16949
  - ISO 14001
- **Customers:**
  - GM
  - Ford
- **Products:**
  - Shafts

Nexteer Plant 65

Queretaro, Mexico

- **Year Established:** 1997
- **Floor Space:** 177,389 ft^2 (16,486 m^2)
- **Employees:** 174 Salaried, 516 Indirect, 833 Direct
- **Quality:**
  - ISO/TS 16949
  - ISO 14001
  - Ford Q1
- **Customers:**
  - FCA
  - Ford
- **Products:**
  - REPS

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Nexteer Plant 66

Queretaro, Mexico

- **Year Established:** 1999
- **Floor Space:** 221,434 ft^2 (20,571 m^2)
- **Employees:** 89 Salaried, 235 Indirect, 492 Direct
- **Quality:**
  - ISO/TS 16949
  - ISO 14001
  - QS9000
- **Customers:**
  - Dana
  - GM
  - Rotorion
  - Ford
  - FCA
  - Smart
- **Products:**
  - CEPS
  - REPS
  - Driveline

Nexteer Plant 68

Juarez, Mexico

- **Year Established:** 2002
- **Floor Space:** 113,498 ft^2 (10,544 m^2)
- **Employees:** 56 Salaried, 140 Indirect, 301 Direct
- **Quality:**
  - ISO/TS16949
  - ISO14000
  - Ford Q1
- **Customers:**
  - Ford
  - GM
  - Toyota
  - FCA
- **Products:**
  - Columns
  - I-Shafts
  - Driveline

Presentation Acronyms

- **ADAS:** Advanced Driver Assistance Systems
- **AD:** Autonomous / Automated Driving
- **BCEPS:** Brush Column-Assist Electric Power Steering
- **CAD:** Computer Aided Design
- **CEPS:** Column-Assist Electric Power Steering
- **CSC:** Customer Service Center
- **CV joint:** Constant Velocity Joint
- **EPS:** Electric Power Steering
- **EMC:** Electro Magnetic Compatibility
- **EMI:** Electro Magnetic Interference
- **FEA:** Finite Element Analysis
- **FIT:** Failures In Time
- **HPS:** Hydraulic Power Steering
- **HS:** HalfShaft
- **IDS:** Intermediate Drive Shaft
- **I-shaft** Intermediate Shaft
- **MTO**: Magnetic Torque Overlay
- **NVH:** Noise Vibration Harshness
- **REPS:** Electric Power Steering Rack Assist
- **R&P Gear:** Rack & Pinion Gear
- **SbW:** Steer-by-Wire
- **SPEPS:** Single-Pinion Assist Electric Power Steering
- **SOP:** Start Of Production
- **SOD**: Steering on Demand™ System
- **QW:** Quiet Wheel™ Steering