

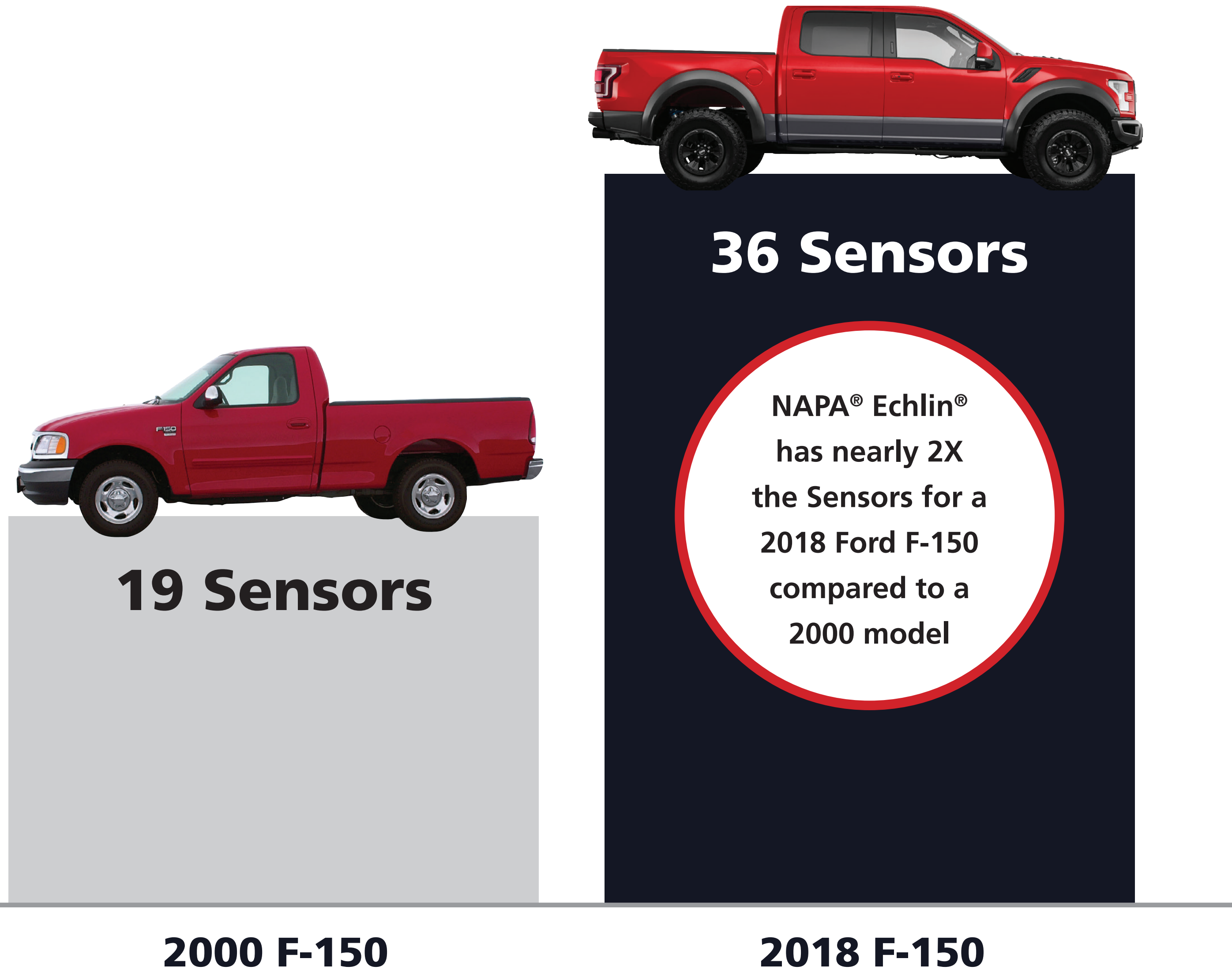
Growing Market

Modern vehicles are equipped with more sensors than ever. Electronic safety systems and a focus on reducing emissions has created entirely new categories of sensors that were unimaginable 20 years ago.

The number of sensors on modern vehicles will continue to grow regardless of powertrain, resulting in more and more service opportunities.

Sources: SMP Internal Data

NAPA® Echlin® Ford F-150 Sensor Coverage



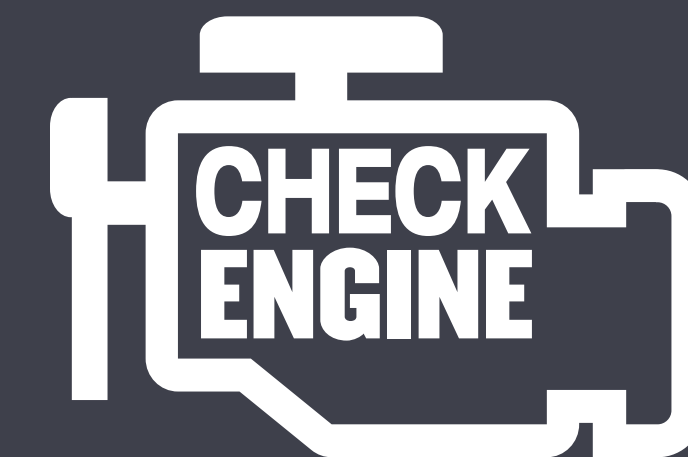
Impact on Engine Systems



An inaccurate wheel speed sensor will make the control module think that a wheel is slipping, and reduce engine torque by limiting the throttle opening — Replacing the throttle body will not fix this problem



Many sensors share the same supply voltage source, and in many cases, a shorted sensor will make all the sensors on that power supply shut down — Typically the quickest solution is to unplug one sensor at a time and cycle the ignition key to see if the reference voltage returns



A faulty cam sensor can cause an extended crank situation — When the vehicle is being started, the engine may just continue rotating as the computer is looking for enough information

A Complete Sensor Program

NAPA® Echlin® offers more than 85 different types of Sensors across multiple categories. The NAPA® Echlin® Sensors Program includes Chassis and Drivetrain Sensors, Fluid Level Sensors, Fuel Sensors, Position Sensors, Temperature Sensors, Pressure Sensors, ADAS Sensors and more.

NAPA® Echlin® Sensors are engineered and tested for precision and will integrate correctly with the complex systems on today's vehicles.

NAPA® Echlin® Sensor Program

Chassis & Drivetrain Sensors

- ABS Speed Sensors
- Vehicle Speed Sensors
- Transmission Input and Output Sensors
- Turbocharger Speed Sensors
- Accelerator Pedal Sensors
- Brake Pedal Position Sensors
- Ride Height Sensors

Position Sensors

- Crankshaft Position Sensors
- Camshaft Position Sensors
- Throttle Position Sensors
- Fuel Vapor / Vent Pressure Sensors
- Accelerator Pedal Position Sensors
- EGR Valve Position Sensors

Fluid Level Sensors

- Engine Oil Level Sensors
- Coolant Level Sensors
- Windshield Washer Level Sensors
- Brake Fluid Level Sensors
- Fuel Level Sensors

ADAS Sensors

- Park Assist Sensors
- Blind Spot Detection Sensors
- Steering Angle Sensors
- Cruise Control Distance Sensors

Fuel Sensors

- Knock Sensors
- Mass Air Flow Sensors
- Diesel Injection Control Pressure Sensors
- Diesel Nitrogen Oxide (NOx) Sensors
- Fuel / Water Separator Sensors
- Flex Fuel Sensors

Temperature Sensors

- Coolant Temperature Sensors
- Air Charge Temperature Sensors
- Ambient Air Temperature Sensors
- Cabin Air Temperature Sensors
- Intake Air Temperature Sensors
- Cylinder Head Temperature Sensors
- Exhaust Gas Temperature Sensors
- Ambient Air Temperature Sensors
- Cabin Air Temperature Sensors

Pressure Sensors

- TPMS Sensors
- MAP Sensors
- Fuel Pressure Sensors
- EGR Valve Pressure Feedback Sensors
- Exhaust Back Pressure Sensors
- Diesel Particulate Filter Pressure Sensors
- ...and others

What's New

ABS Speed Sensors

Complex safety systems featured in new vehicles depend on real-time data from ABS sensors. NAPA® Echlin® is regularly delivering new numbers to make sure technicians have the coverage needed to get their customers back on the road.

For the most recent applications, check the online catalog at NAPAEchlin.com.



533835
Hyundai / Kia
Cars & SUVs
(2022-14)
VIO: 2M



533903
Toyota
SUVs
(2023-19)
VIO: 1.7M



533794
Ford
Trucks
(2023-16)
VIO: 325K



What's New

Cam and Crank Sensors

NAPA® Echlin® offers more than 1,100 Cam and Crank Sensors, representing 698 million repair opportunities. New Sensors are introduced regularly to make sure technicians have the late-model coverage they need.

For the most recent applications, check the online catalog at NAPAEchlin.com.



CSS2020
Crankshaft Sensor
Nissan Altima / Rogue
(2023-19)
VIO: 1M



CSS2033
Camshaft Sensor
Hyundai / Kia
Cars & SUVs
(2023-19)
VIO: 496K



CSS2032
Crankshaft Sensor
Toyota
Cars & SUVs
(2021-18)
VIO: 1M



What's New

MAP Sensors

NAPA® Echlin® offers more than 370 MAP (Manifold Absolute Pressure) Sensors, covering 200 million vehicles on the road. NAPA® Echlin® is committed to regularly introducing new MAP sensors to cover late-model import and domestic vehicles.

For the most recent applications, check the online catalog at NAPAEchlin.com.



2-27466
Hyundai / Kia
Cars & SUVs
(2023-19)
VIO: 1M



2-27474
Subaru
Cars & SUVs
(2023-19)
VIO: 481K



2-27449
Ford F-150
(2020-18)
VIO: 17K



Top Movers: ABS Speed Sensors

**IMPORT
APPLICATIONS**



531340
Toyota / Lexus
Trucks & SUVs
(2022-03)



531905
Nissan
Cars
(2014-07)



532011
Honda / Acura
Cars
(2012-08)



532022
Honda / Acura
Cars
(2012-08)



532248
Toyota
Sequoia / Tundra
(2017-07)

**DOMESTIC
APPLICATIONS**



532391
Dodge / Jeep
SUVs
(2017-07)



532377
Jeep
Wrangler
(2018-07)



531924
GM
Trucks & SUVs
(2014-07)



532701
Ford / Lincoln / Volvo
Cars, Vans & SUVs
(2020-04)



531158
GM
Trucks, Vans & SUVs
(2014-99)



ECHLIN

ABS Speed Sensors

NAPAEchlin.com

Engineering & Performance

The ABS speed sensors on some newer vehicles measure more than just the speed of each wheel. They also monitor the direction in which the wheel is rotating. A wheel that is rotating backwards will send a unique signal to the ECU that lets the vehicle know the speed and direction of that wheel. This data is used by the electronic safety systems to help keep everyone in the vehicle safe.



**Aftermarket
Competitor**

Uses one simple sensor to measure wheel speed

Generates the same signal for forward and reverse

Doesn't give the ECU enough information, especially in emergency situations



**NAPA® Echlin®
531339**

Uses multiple micro sensors to measure wheel speed and wheel rotation

Generates separate signals for forward and reverse

Provide the ECU with accurate and complete information to keep crash avoidance systems operating as designed

Top Movers: Cam and Crank Sensors

IMPORT APPLICATIONS



CSS1095

Nissan / Infiniti
Cars, Trucks & SUVs
(2020-02)



CSS1096

Nissan / Infiniti
Cars, Trucks & SUVs
(2017-00)



CSS1451

Hyundai / Kia
Cars & SUVs
(2023-11)



CSS1004

Nissan
Cars, Trucks & SUVs
(2018-01)



CSS1094K

Nissan / Infiniti
Cars & SUVs
(2018-02)

DOMESTIC APPLICATIONS



CSS1440

Chrysler / Dodge / Jeep / RAM
Cars, Trucks & SUVs
(2021-11)



CSS1394

Chrysler / Dodge / Jeep / RAM
Cars, Trucks & SUVs
(2021-11)



CSS1416

Ford / Lincoln
Cars, Trucks & SUVs
(2020-11)



CSS9290

Dodge / RAM
Trucks
(2020-02)



CSS634

Chrysler / Dodge / Jeep
Cars & SUVs
(2011-00)



ECHLIN

Cam and Crank Sensors

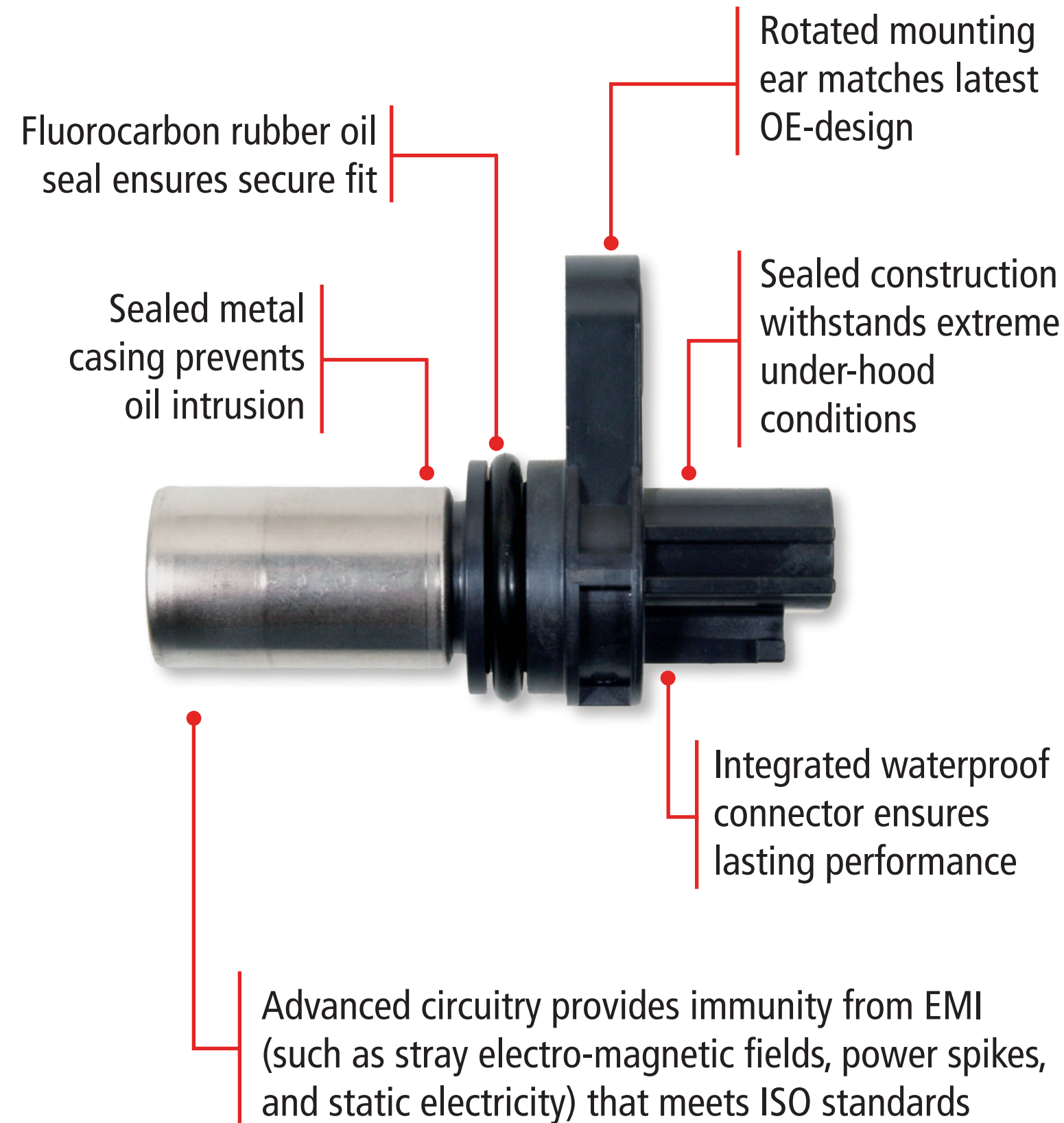
NAPAEchlin.com

Cam and Crank Sensors

Today's advanced engines depend on information from cam and crank sensors to make thousands of decisions per mile about fuel and ignition. Failing or low-quality sensors can affect fuel economy and vehicle performance.

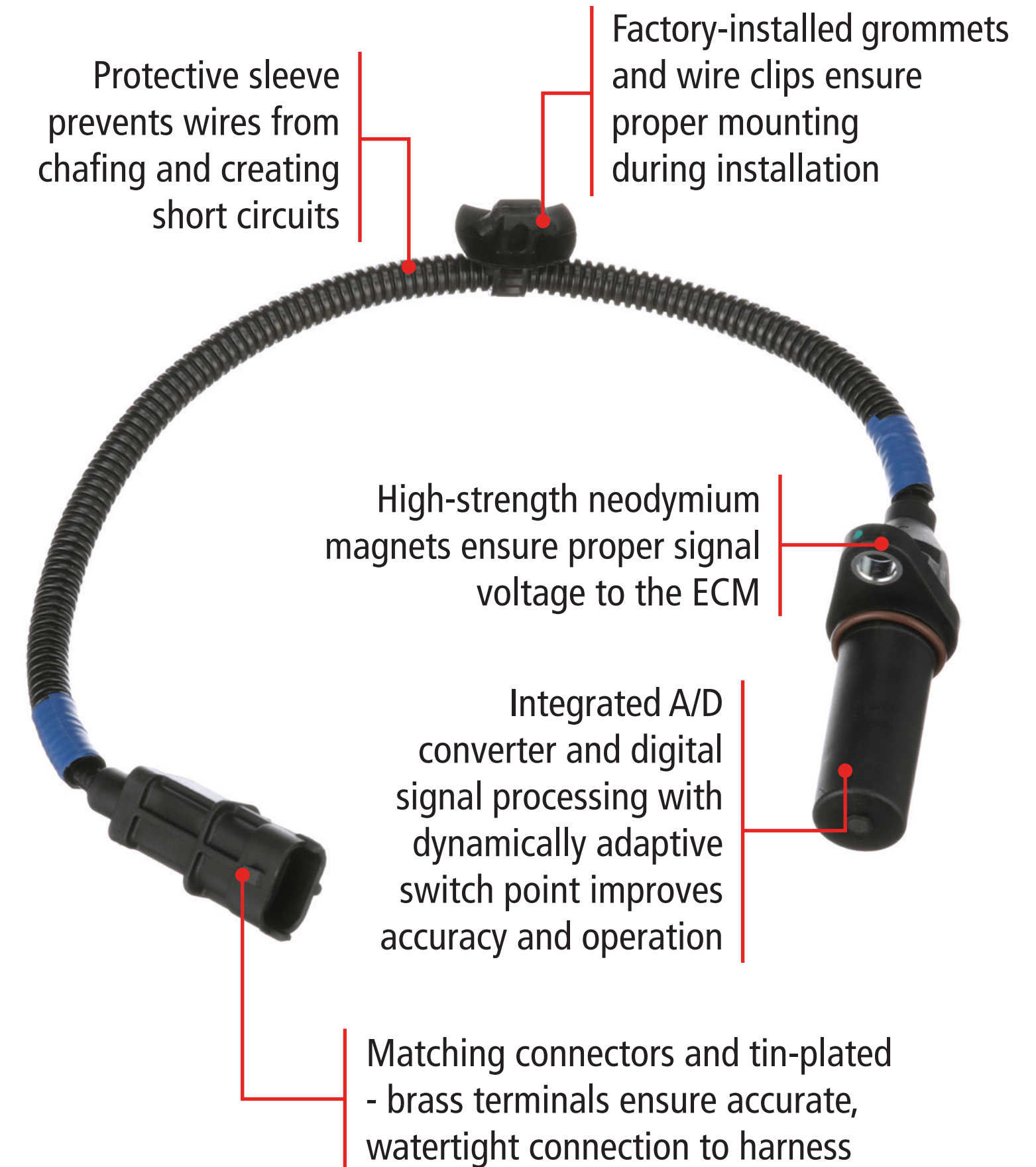
NAPA® Echlin® considers every detail to deliver a Sensor that operates correctly in all conditions.

NAPA® Echlin® Camshaft Position Sensors



CSS1004
Nissan
(2018-01)

NAPA® Echlin® Crankshaft Position Sensors



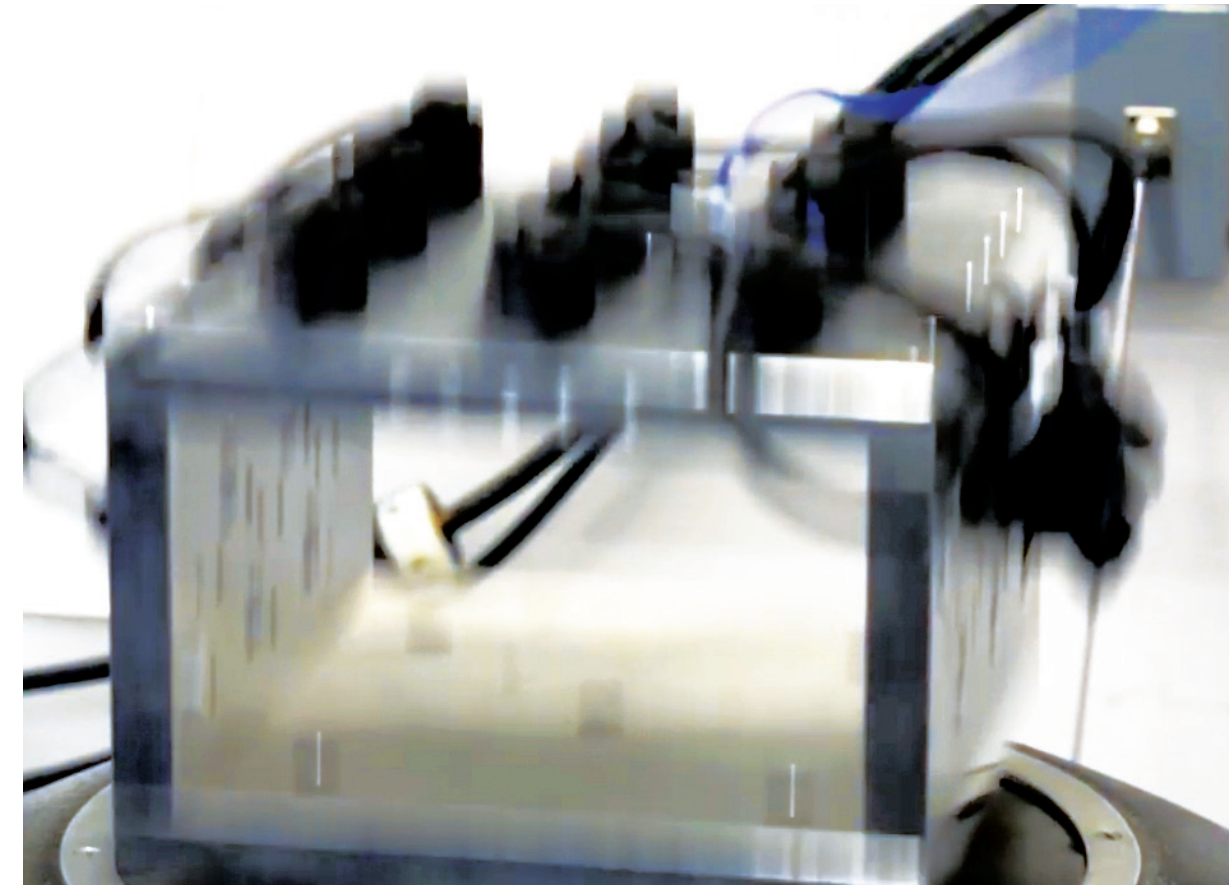
CSS1521
Hyundai / Kia
(2021-13)

Testing and Validation

Cam and Crank Sensors

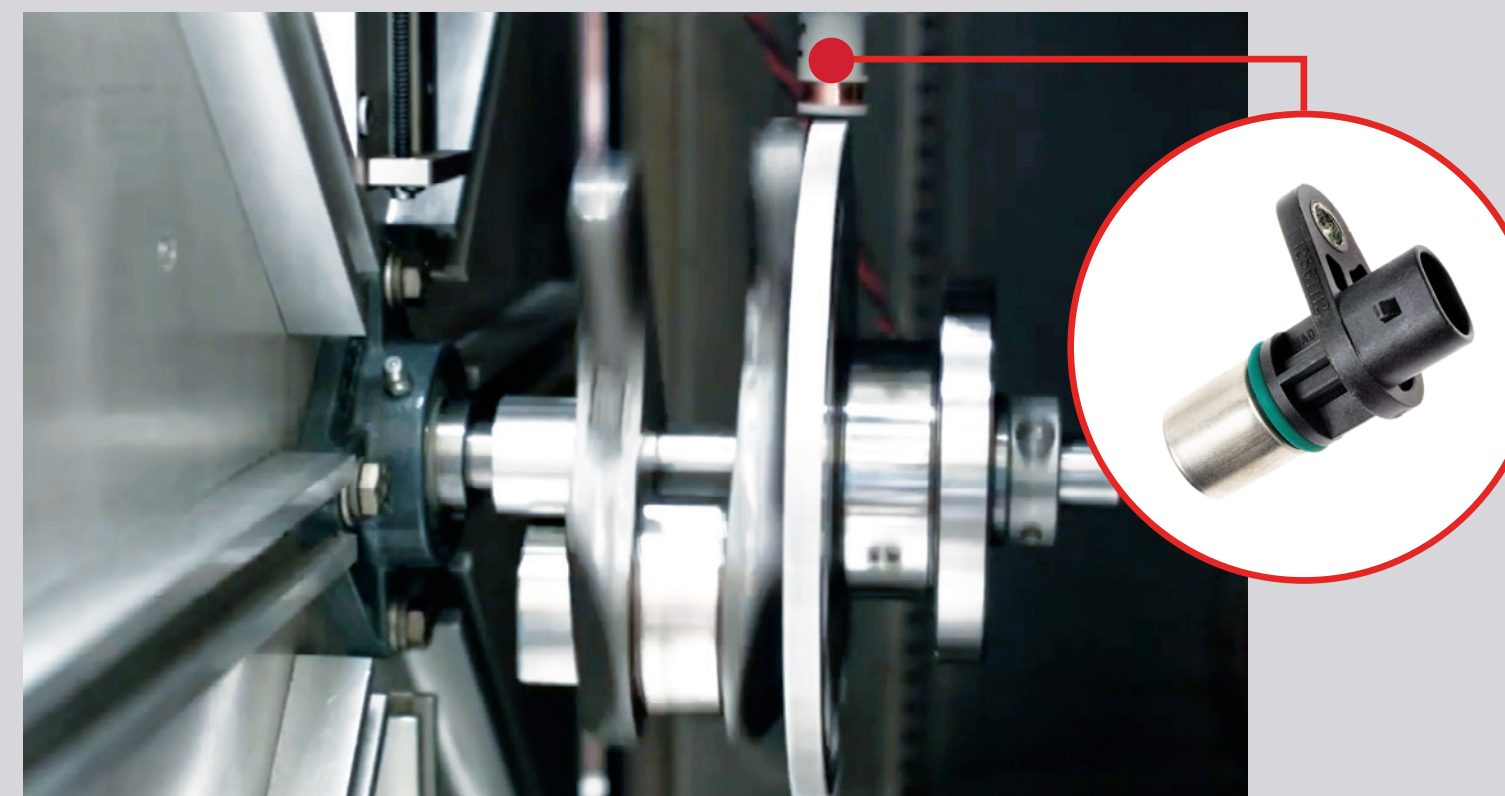
NAPA® Echlin® Cam and Crank Sensors are manufactured in our North American TS16949-certified facility and are rigorously tested for pulse width and signal amplitude.

NAPA® Echlin® Camshaft Position Sensors



NAPA® Echlin® Camshaft Position Sensors are subjected to 48-68 hour vibration tests across multiple planes. This helps to ensure correct and accurate performance in any situation.

NAPA® Echlin® Crankshaft Position Sensors



NAPA® Echlin® Crankshaft Position Sensors undergo intense chamber testing from -40 to 257 degrees. Our extensive testing helps protect against incorrect voltage output and short circuits to maintain accuracy in all conditions.

A Closer Look

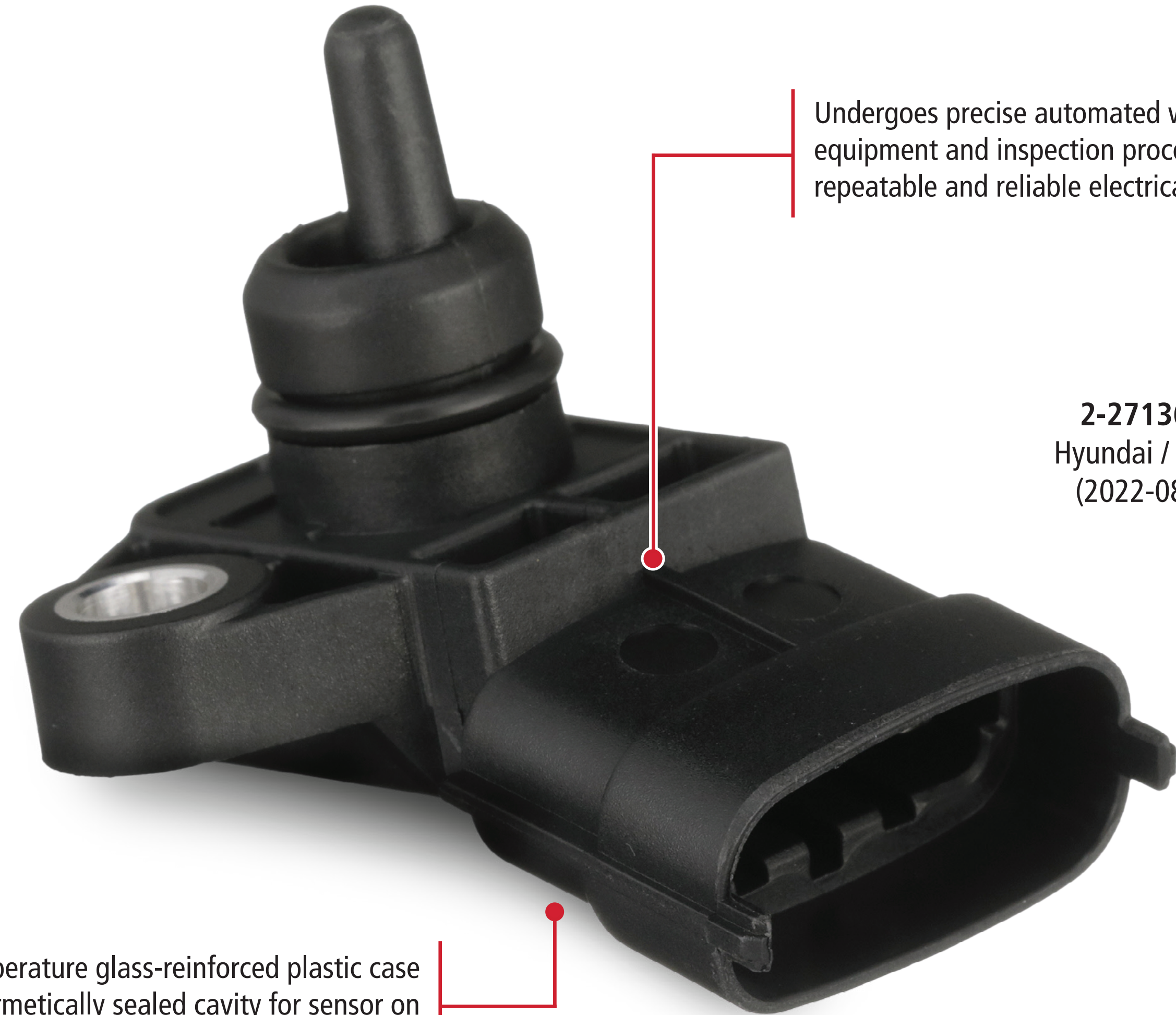
MAP (Manifold Absolute Pressure) sensors convert vacuum/manifold pressure to an electric signal. The real-time information is used for both fuel delivery and ignition.

NAPA® Echlin® MAP Sensors are 100% tested to make sure variations in pressure generate the correct output to match OEM performance in all conditions.

Did you Know

Many modern turbocharged engines utilize both MAP (Manifold Absolute Pressure) and MAF (Mass Air Flow) sensors to provide the vehicle's computer with precise information.

NAPA® Echlin® MAP Sensors



Undergoes precise automated wire bonding equipment and inspection processes to ensure repeatable and reliable electrical connections

2-27136
Hyundai / Kia
(2022-08)

High-temperature glass-reinforced plastic case creates hermetically sealed cavity for sensor on one side with port for pressure on other

Accelerator Pedal Sensors

The performance and accuracy of Accelerator Pedal Sensors is critical to vehicle performance, fuel economy and safety. NAPA® Echlin® has over 400 Accelerator Pedal Sensors covering 250 million vehicles.

NAPA® Echlin® Sensors undergo intense testing to make sure the output matches the slope and linearity of the original in all pedal positions.

Tech Tip

Due to the location of the APS and the amount of moisture or condensation that comes from wet floor mats and/or drivers' wet feet, it is advisable to use dielectric grease on the electrical connector.

NAPA® Echlin® Accelerator Pedal Sensors



Multi-finger wiper design accurately controls sensor contact to within few grams of force

Dual return springs provide redundancy and comfortable, familiar pedal force profile

High-impact ABS plastic provides best solution to pedal support and spring guide components

2-80164
GM
Trucks & SUVs
(2020-07)

ADAS Sensor Program

Advanced Driver Assistance Systems rely on multiple sensors to provide real-time data to both the driver and the vehicle. Sensors that have failed or are not correctly calibrated may put the motorist and the occupants at risk.

NAPAEchlin.com features the most up-to-date information on our latest ADAS components.



Blind Spot Detection Sensors

NAPA® Echlin® BSD Sensors are direct-fit replacements to ensure proper fit and performance. All BSD Sensors undergo extensive quality testing and product validation.

120+ SKUs / 104M Repair Opportunities



Cruise Control Distance Sensors

Designed and manufactured to stringent quality standards to match the original for an easy install and to deliver precise performance.

75+ SKUs / 37M Repair Opportunities



Steering Angle Sensors

NAPA® Echlin® Steering Angle Sensors are rigorously tested for fit, form and precise performance to match the original application they are replacing.

280+ SKUs / 224M Repair Opportunities



Park Assist Sensors

NAPA® Echlin® Park Assist Sensors are direct-fit replacements utilizing advanced ultrasonic technology that exactly matches the detection capabilities of the original sensors.

125+ SKUs / 500M Repair Opportunities

TPMS Program

NAPA® Echlin® offers both QWIK-SENSOR® Multi-frequency Sensors and pre-programmed OE-Match Sensors. The QWIK-SENSOR® can be quickly programmed to fit almost any vehicle. OE-Match Sensors can be installed right out of the box without any programming.

NAPAEchlin.com features additional information on our TPMS Sensors, Service Kits, and Programming Tools.

QWIK[®]
sensor *MULTI-FREQUENCY*
Programmable TPMS Sensors



Available with rubber or metal valve stems

Can be programmed on or off of the vehicle

Works on both domestic and import vehicles with 314.9 MHz to 434 MHz systems

Military-grade lithium battery for maximum battery life

NAPA **ECHLIN** *OE-Match*
TPMS
SENSORS



More than 230 SKUs for the industry's best coverage

Pre-programmed at the factory with exact OE protocol, so it's ready to install

Direct-fit replacement that matches the fit and performance of the original

Military-grade lithium battery for maximum battery life

Manufacturing and Testing

All NAPA® Echlin® TPMS Sensors are designed and manufactured to meet the latest SAE2657 specifications.

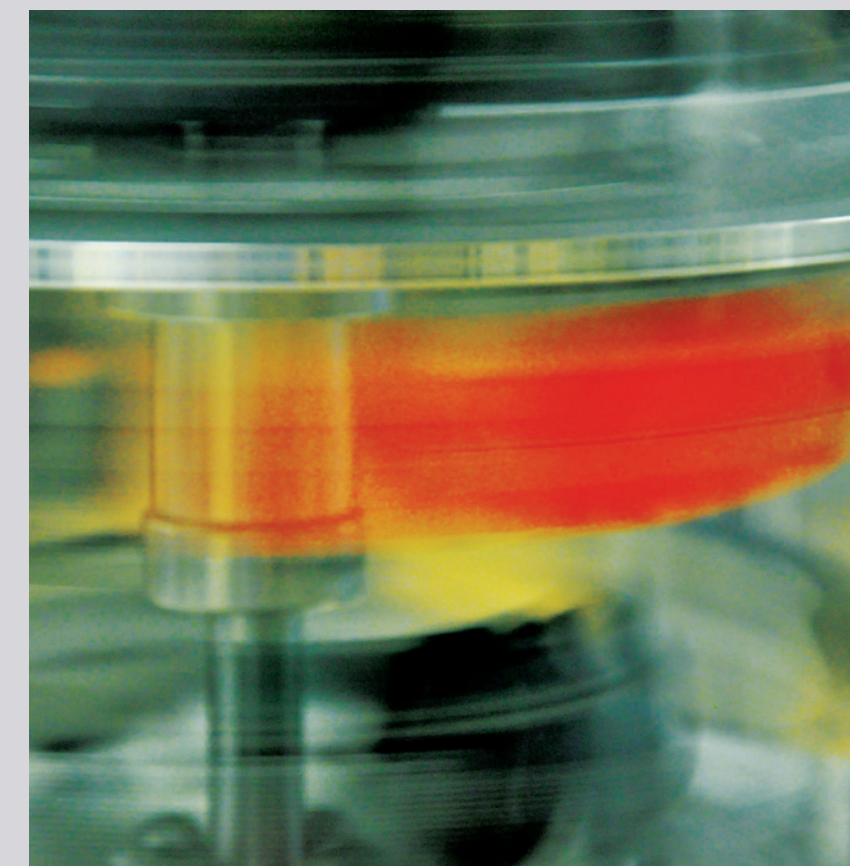
Our TPMS Sensors are subjected to multiple tests for operational temperature, thermal shock, extreme temperatures, humidity, contamination, salt fog, centrifugal force and mechanical testing. The result is a Sensor that works correctly in all conditions, and lasts.

NAPAEchlin.com features additional information on our TPMS Sensors, Service Kits, and Programming Tools.



NAPA® Echlin® TPMS Manufacturing

Our facility produces more than a million Sensors each year and has earned multiple certifications, including US FCC, European E-Mark, and Canada IC while meeting FMVss 138, SAE J2657, ISO 9001 and IATF 16949 quality standards.



NAPA® Echlin® TPMS Testing

To make sure our TPMS Sensors last, we subject them to a high-speed Accelerated Life Test.

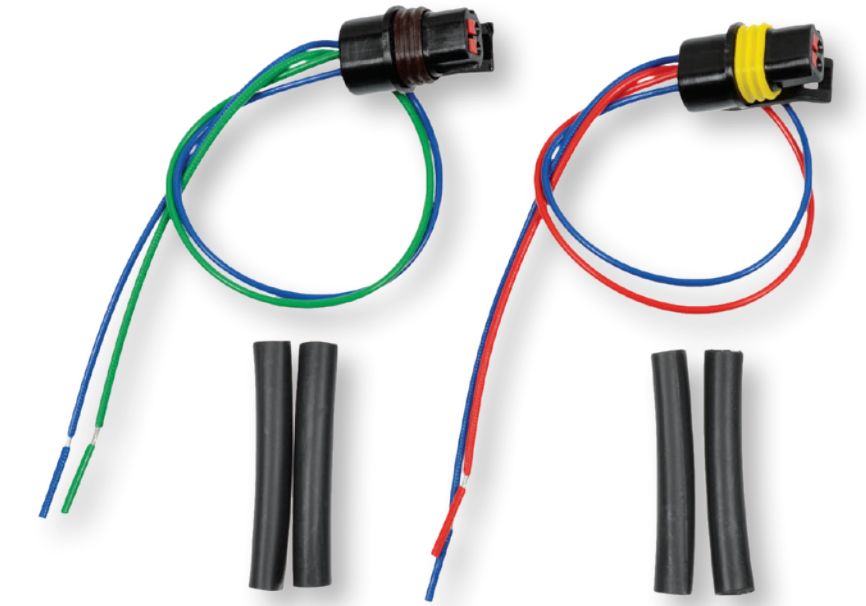
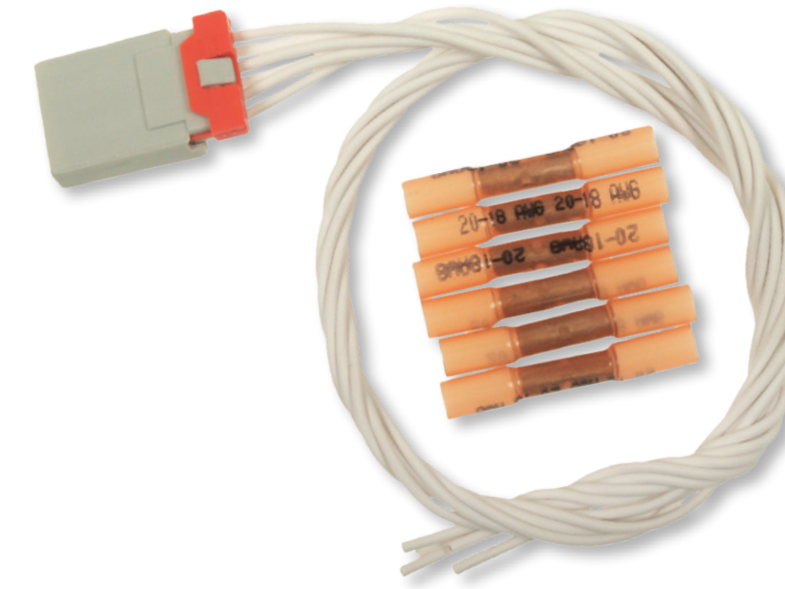
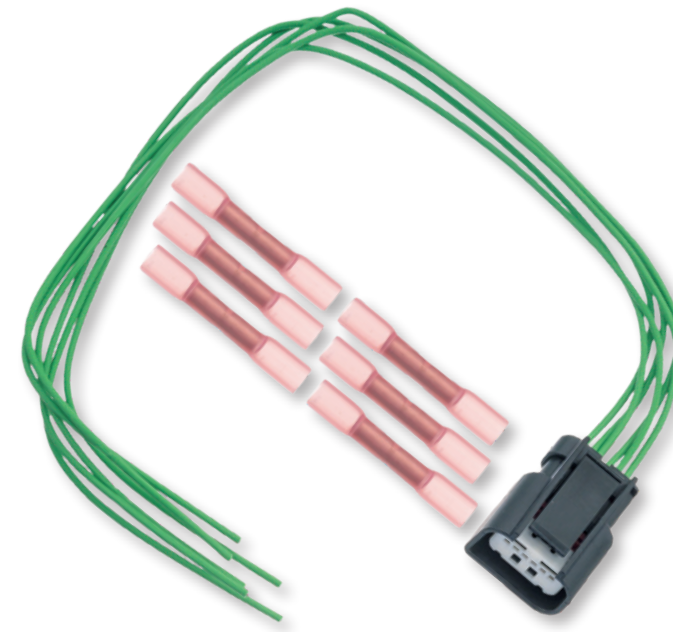
Related Parts

Sensor Connectors

In addition to over 90 different Sensor categories, we also offers thousands of Connectors technicians may need to get their customers back on the road.

For a comprehensive look at available NAPA® Echlin® Connectors, visit NAPAEchlin.com.

NAPA® Echlin® Sensor Connectors



ABS Sensor Connectors

Cruise Control Distance Sensor Connectors

Knock Sensor Connectors

Accelerator Pedal Sensor Connectors

EGR Valve Position Sensor Connectors

Mass Air Flow Sensor Connectors

Air Intake Temperature Sensor Connectors

Engine Oil Level Sensor Connectors

Misfire Sensor Connectors

Ambient Air Temperature Sensor Connectors

Engine Oil Temperature Sensor Connectors

Oxygen Sensor Connectors

Blind Spot Detection Sensor Connectors

Engine Speed Sensor Connectors

Park Assist Sensor Connectors

Camshaft Position Sensor Connectors

Exhaust Gas Temperature Sensor Connectors

Steering Angle Sensor Connectors

Crankshaft Position Sensor Connectors

Fuel Pressure Sensor Connectors

Vehicle Speed Sensor Connectors

...and more

NAPA® Echlin® Pro Training Tech Tip

As experienced ASE-certified automotive technicians themselves, NAPA® Echlin® Pro Trainers are experts in engine and sensor technology.

Here's what they say to look out for when replacing a sensor.



When replacing a crankshaft position sensor, make sure the appropriate relearn is performed — Failing to do this may cause the vehicle to misfire and run poorly



When an engine coolant temp sensor is suspected to be faulty, wait for the vehicle to cool so that the coolant temperature and ambient air temp should match — With the vehicle off, if the temps do not match, then the coolant temp sensor may not be reading correctly

NAPA® Echlin® Professional Training

**Award-Winning In-Person, Live
Virtual, and Online Learning**

NAPA® Echlin® Pro Training delivers accredited classes that educate technicians in the latest automotive repair technologies, and techs can earn CEU credits.

An extension of NAPA® Echlin® training, our extensive YouTube video library has over 500 technical and installation videos.



Available Classes

- GM Electric Powertrain Management
- SENT Sensor Overview
- Rapid Sensor and Circuit Testing
- Vehicle Electronic Fundamentals 1-7
- Brain Teasers
- Labscope
- Modern Cylinder Deactivation Techniques and Tips
- Applied Voltage Drop Testing



Available Classes

- Powertrain Electronics
- Body Control Electronics Diagnosis
- Ignition System and Cam/Crank Synchronization
- Labscope Power User
- Misfire Diagnosis
- Unleash The Power Of Your Scan Tool
- Torque Management and Electronic Throttle Control
- Advanced Driveability Diagnosis
- Unleash the Power of Your Scan Tool