

VARIABLE VALVE TIMING & RELATED PARTS

Highlights

1

The most comprehensive VVT line in the aftermarket now features more than 530 VVT Solenoids, Sprockets and Kits

2

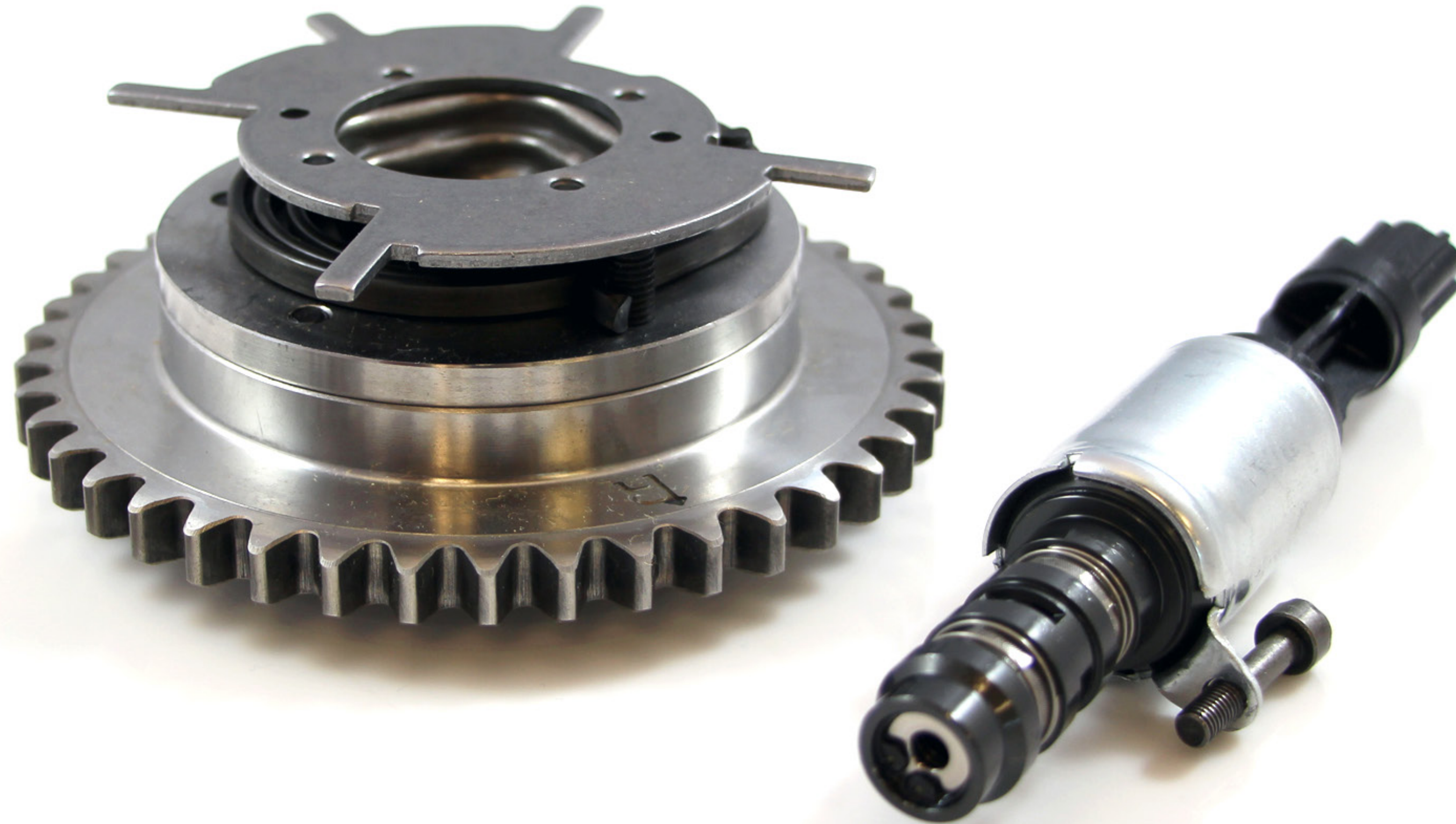
Advanced engineering and manufacturing deliver premium quality VVT components

3

Many NAPA® Echlin® VVTs and Tech Expert® VVT Kits include gaskets for an easier installation



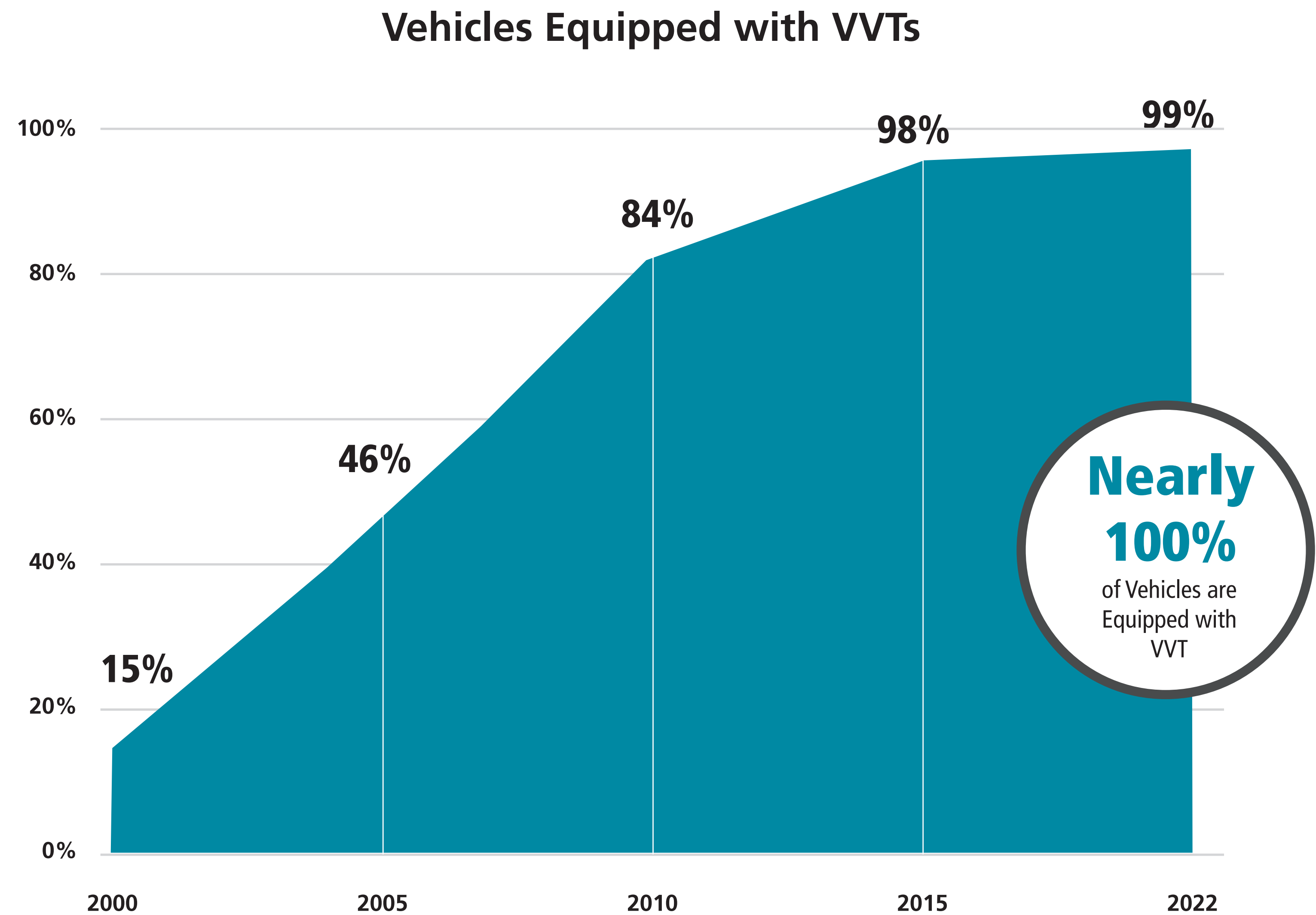
What's in your box?



VARIABLE VALVE TIMING

Growing Market

In an effort to increase fuel efficiency and elevate performance across today's vehicles, nearly every manufacturer has equipped new vehicles with Variable Valve Timing (VVT) technology.



Source: SMP Internal Data

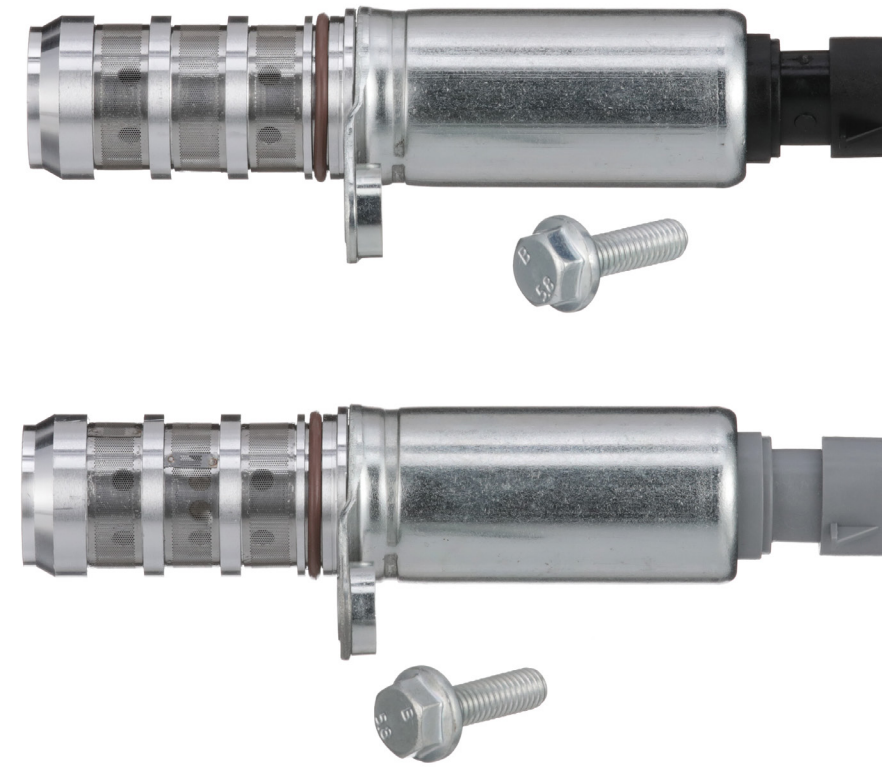
VVT SYSTEMS

Sales Opportunities

The GM 2.4L and Toyota 3.0L / 3.3L applications are known to have high failure rates for VVT solenoids. We have these covered with kits that include improvements over the OE design.

NAPA® Echlin® offers a complete VVT line to solve the OE problems.

Rattling Noises and Unstable Idle on GM 2.4L



Years: 2017-06

Make: GM

Engine: 2.4L

Common DTCs: P0011, P0014, P0016, and P0017

Symptoms: Rattling noise at startup, unstable idle

Solution: Change the engine oil and filter during maintenance intervals and following VVT solenoid replacement

Parts for the job: VVS2000K

Rough Idle on Toyota 3.0L and 3.3L



Years: 2008-00

Make: Toyota

Engines: 3.0L and 3.3L

Common DTC: P1354

Symptoms: Rough idle

Solution: Maintain regular engine oil change intervals. When replacing the solenoids, replace the engine oil and filter.

Parts for the job: VVS2001K

VVT SYSTEMS

Sales Opportunities

Ford 5.4L engines feature highly technical VVT systems which are susceptible to failure. They typically fail due to low engine oil levels, poor oil circulation, or oil and filter change irregularities.

Tech Expert® offers a Complete Timing Repair Kit to solve this OE problem.

VVK1000 Complete VVT Repair Kit Ford / Lincoln (2014-02) VIO: 2.6M

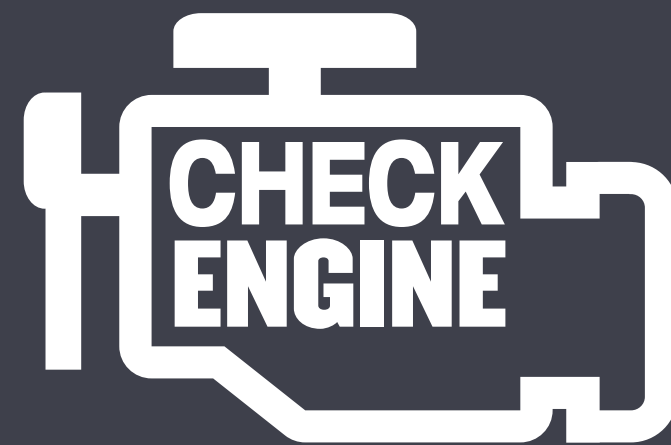


VVT Kit Components

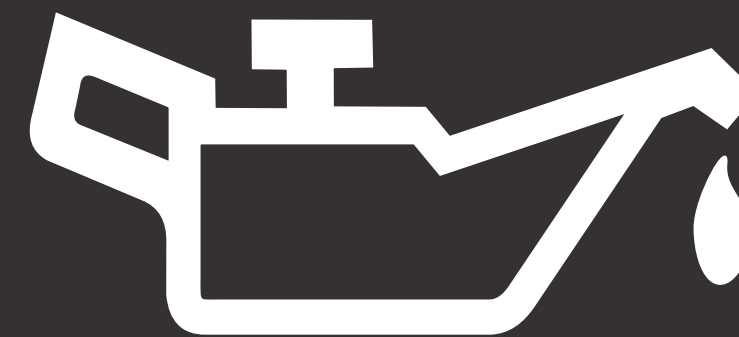
- | | |
|--|-------------------------------|
| 1 – VVT Sprocket | 6 – Drive Gear Sprocket |
| 2 – VVT Solenoids | 7 – Crankshaft Position Wheel |
| 3 – Timing Chain Tensioner | 8 – Crankshaft Seal |
| 4 – Timing Chains | 9 – Gaskets |
| 5 – Timing Chain Guide & Tensioner Arm | |

VVT SYSTEMS

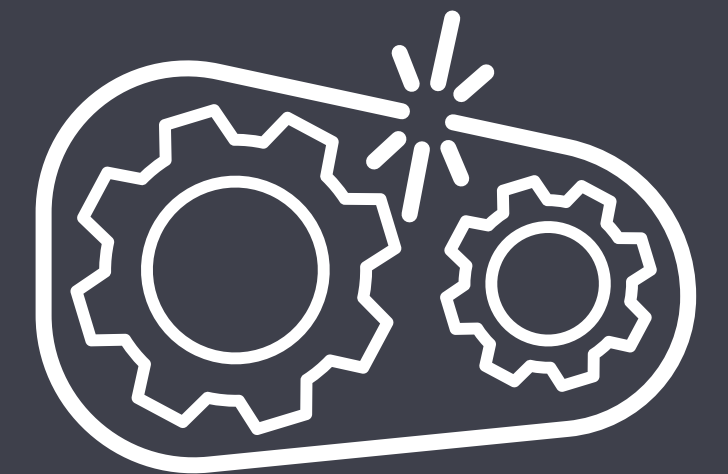
Impact on Engine Systems



Rough idle, stalling, lack of power, decreased fuel economy, engine noise, and a Check Engine light may be signs of an issue with a VVT system



Using the correct oil weight is critical to the health and operation any variable valve timing system



When a VVT solenoid fails or is blocked, the lack of proper lubrication can cause the timing chain and gear to prematurely wear or break entirely

What's New

VVT Solenoids, also known as control valves or spool valves, come in a variety of shapes and sizes to fit a multitude of applications.

NAPA® Echlin® is committed to regularly introducing new VVT Solenoids, adding to our industry-leading coverage.

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



VVS2028
Honda Accord/CR-V
1.5L/2.0L
(2021-18)
VIO: 1.1M



VVS2030
Toyota Cars & Trucks
3.5L
(2021-15)
VIO: 2.8M



VVS2000K
GM Cars & SUVs
2.4L
(2017-06)
VIO: 3.7M



NAPA® ECHLIN® VVT SPROCKETS

What's New

VVT Sprockets, also known as cam phasers, account for nearly 250 SKUs in NAPA® Echlin's ever-expanding line of VVT component coverage.

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



ECP1949
Toyota Cars & SUVs
2.5L
(2022-18)
VIO: 2.6M



ECP1940
GM Cars & SUVs
1.6L/1.8L
(2020-08)
VIO: 660K



ECP1939
GM Cars & SUVs
1.6L/1.8L
(2020-10)
VIO: 613K



Top Movers

**IMPORT
APPLICATIONS**



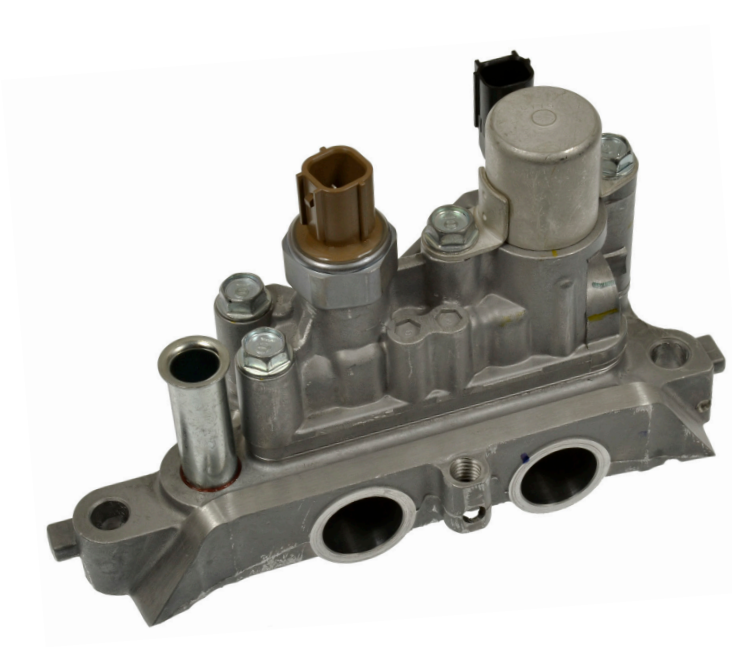
VVS1512

Honda Accord, CR-V, Element
(2011-02)



VVS1542

Nissan Altima, Rogue
(2018-13)



VVT282

Honda/Acura SUVs
(2016-08)



ECP1871

Acura/Honda Cars & SUVs
(2015-09)



ECP1865

Hyundai/Kia Cars & SUVs
(2019-11)

**DOMESTIC
APPLICATIONS**



VVS1754

GM Cars
(2017-06)



VVS1755

GM Cars
(2017-06)



VVS1100

Ford/Lincoln Cars & Trucks
(2014-04)



ECP1757

Ford/Lincoln Cars & Trucks
(2019-11)



ECP1725

GM Cars & SUVs
(2018-07)

Related Parts

In addition to the highest quality sprockets and solenoids, NAPA® Echlin® and Tech Expert® offer the complementary parts necessary to maintain and repair today's VVT systems.

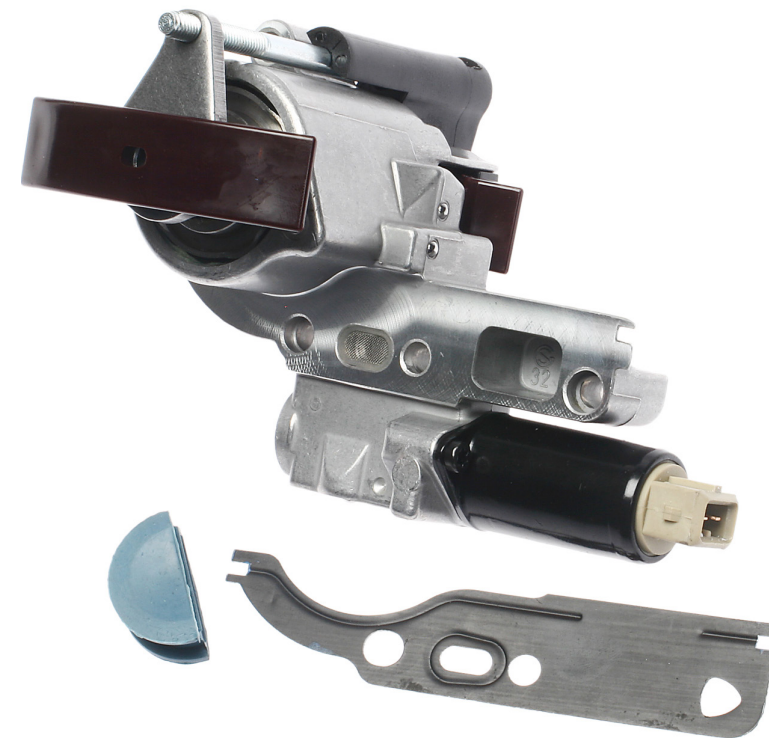


VVT Spool Filters

Spool filters can become clogged over time, hurting performance and potentially causing damage to the solenoids

NAPA® Echlin's replacement VVT Spool Filters allow technicians to service the filter and gaskets without replacing solenoids

Available for popular Honda and Acura applications through 2019



VVT Chain Tensioner Kits

Worn chain tensioners can cause a vehicle to run poorly and can even lead to a catastrophic engine failure

NAPA® Echlin's VVT Chain Tensioner Kits include a new chain tensioner, gasket and seal for a complete repair

Available for popular Audi and VW vehicles with a high failure rate



VVT Adjuster Magnets

Newer VVT Systems may also incorporate adjuster magnets

NAPA® Echlin's VVT Adjuster Magnets are a drop-in replacement part and include new seals to help prevent oil contamination

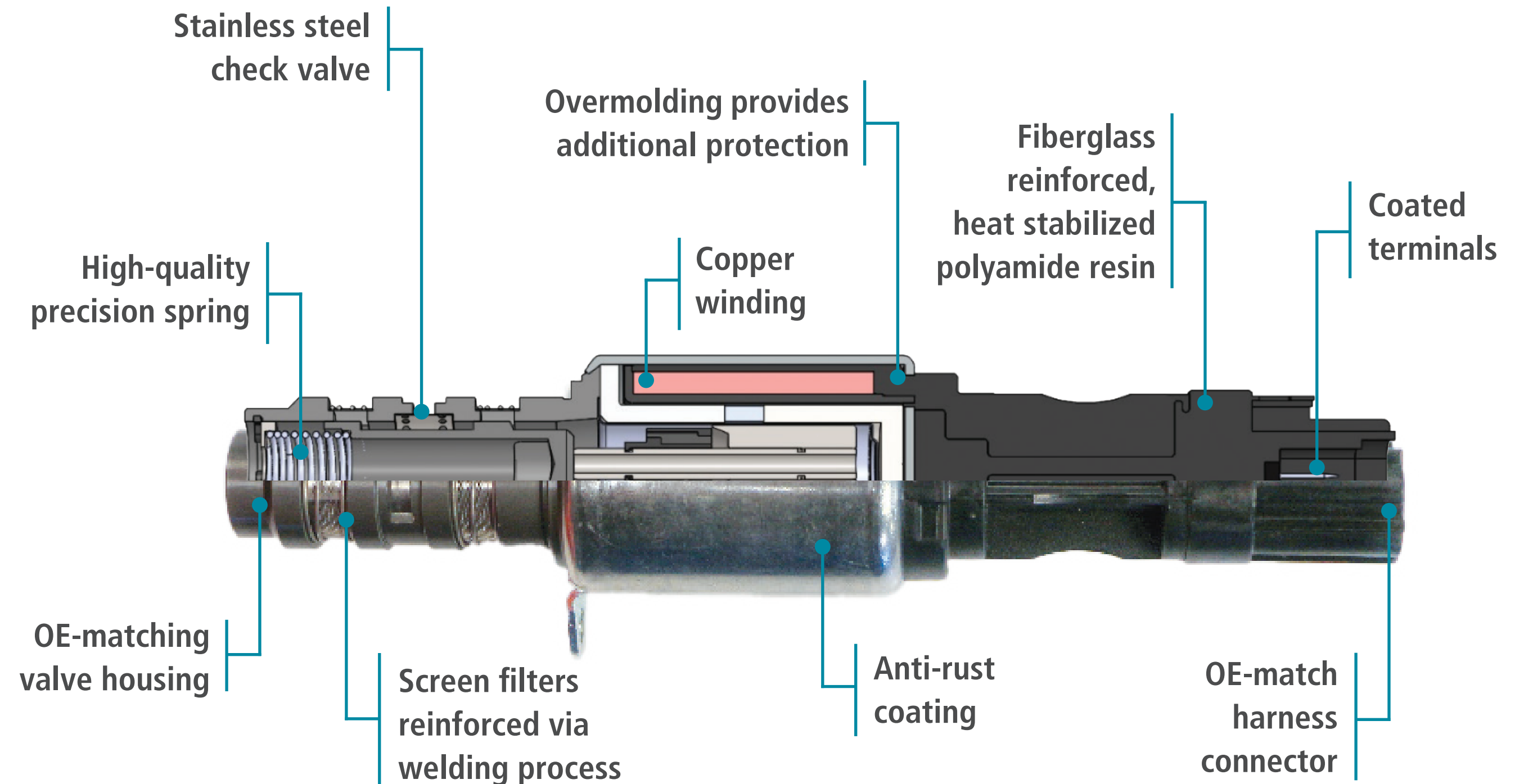
27 SKUs available with coverage through 2021

NAPA® ECHLIN® VVT SOLENOIDS

Engineering Improvements

NAPA® Echlin® VVT Solenoids are direct-fit OE replacements designed to restore engine horsepower and torque curves, reduce emissions, and improve efficiency.

Premium parts start with premium components. Each NAPA® Echlin® solenoid is engineered with features to ensure that our VVT Solenoids will perform under the most extreme conditions.



VVS1100

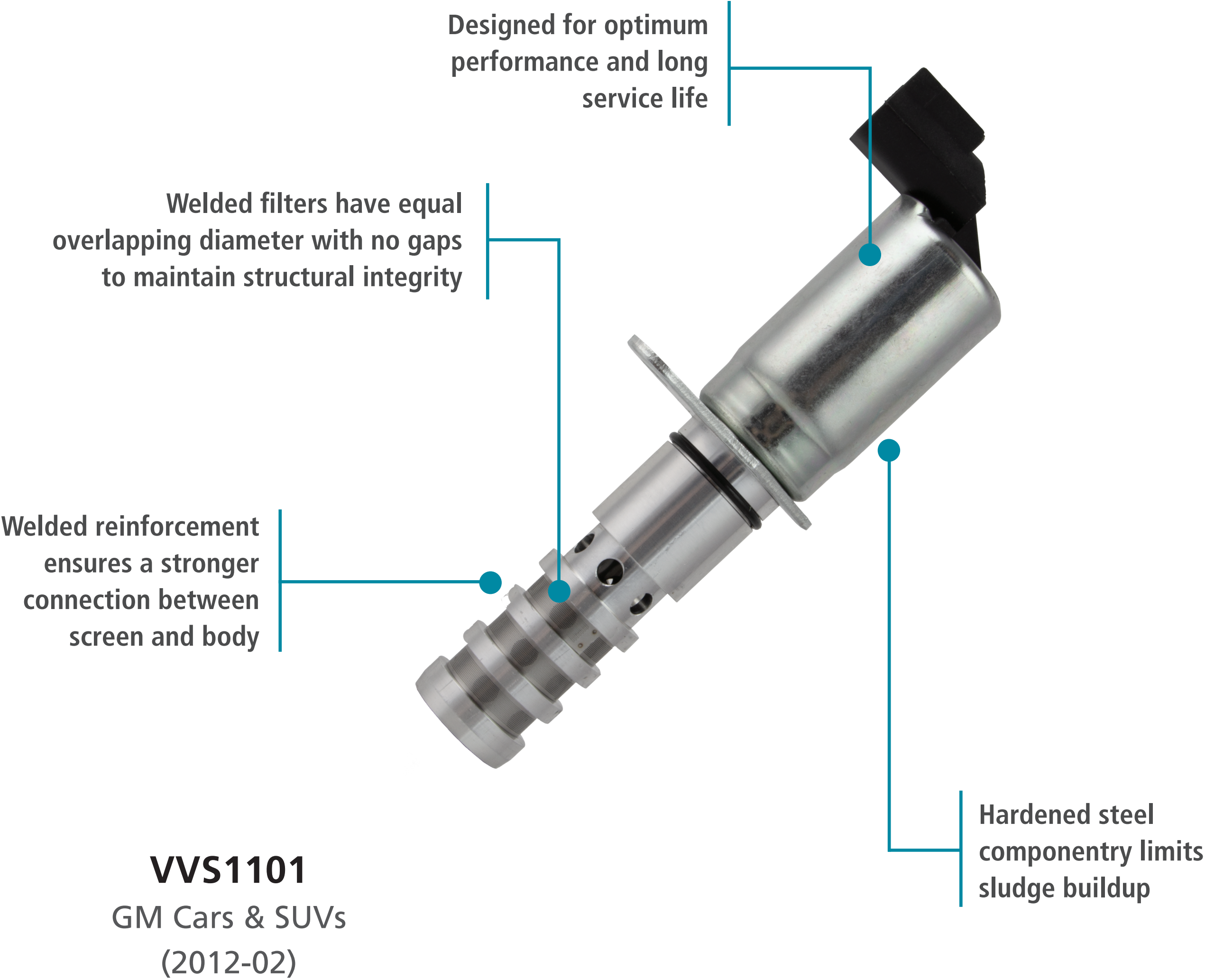
Ford / Lincoln
(2014-01)

NAPA® ECHLIN® VVT SOLENOIDS

Engineering Improvements

Generally located on and/or around the cylinder head block, VVT solenoids meter the oil flow to control the actuation of the VVT sprocket.

Each VVT solenoid features anodized steel componentry, which limits sludge buildup and protects against sticking. NAPA® Echlin® Solenoids also feature premium O-rings and gaskets to prevent oil leaks, as well as an OE-matching harness connector.



Engineering Improvements

NAPA® Echlin® VVT Solenoids feature design improvements over the original and the competition.

Our improved screen stamp and welded reinforcement along with a reinforced plunger and spring are the result of NAPA® Echlin's commitment to high-quality design and rigorous testing.

OE



Uses Plastic

OE uses plastic which often fails to hold the screen to the body

NAPA® Echlin®



OE and NAPA® Echlin® feature a reinforced plunger and spring



Reinforced

NAPA® Echlin® has improved screen stamp plus welded reinforcement

Aftermarket Competitor D



Competitor design has no reinforcement



Doesn't Match

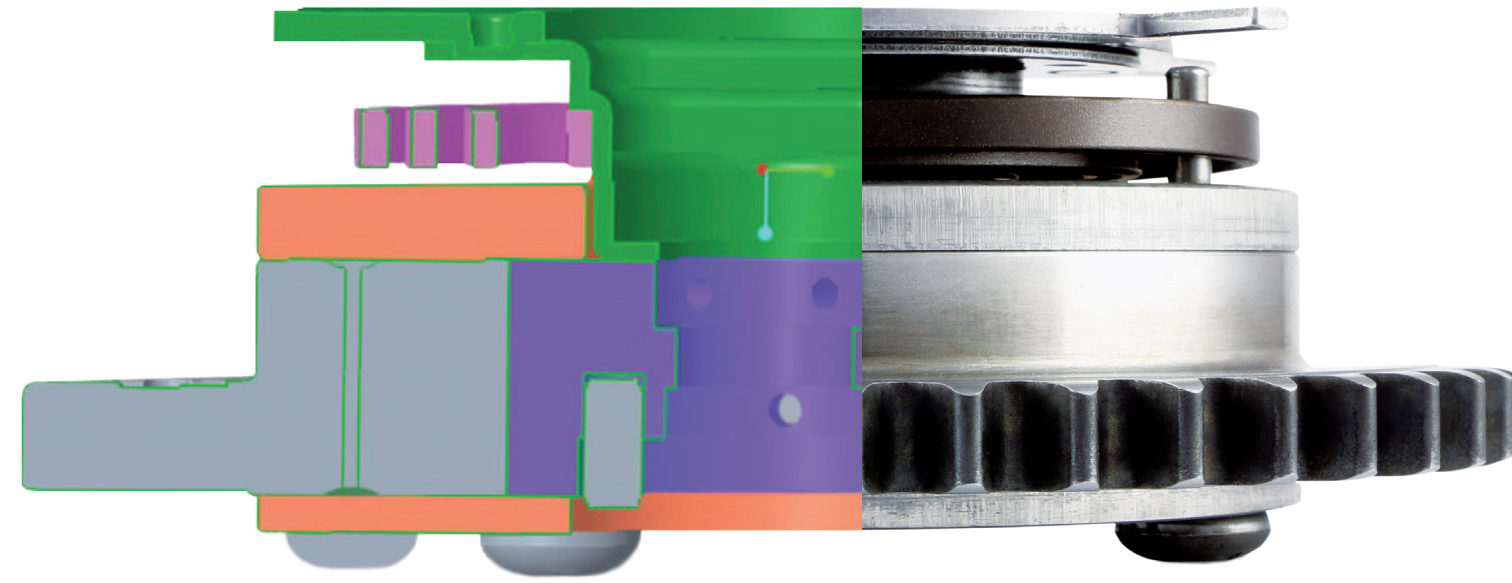
Competitor has shorter solenoid length & minimal screen reinforcement

NAPA® ECHLIN® VVT SPROCKETS

Engineering Improvements

NAPA® Echlin® engineers have designed numerous improvements into our most popular VVT Sprocket for enhanced performance and long-lasting durability.

To ensure proper performance, NAPA® Echlin® VVT Sprockets are direct-fit OE replacements and meet tight dimensional tolerances to improve internal sealing, minimize oil drain back, and reduce frequency of PCM correction.



NAPA® Echlin® ECP1100

The NAPA® Echlin® Advantage

Larger contact area – no friction between sprocket and rotor

Design improvements virtually eliminate component wear – less oil loss

Advanced coil spring and locking pin

Better performance in timing phase response

Overall a better performing and longer-lasting VVT Sprocket

NAPA® ECHLIN® VVT SPROCKETS

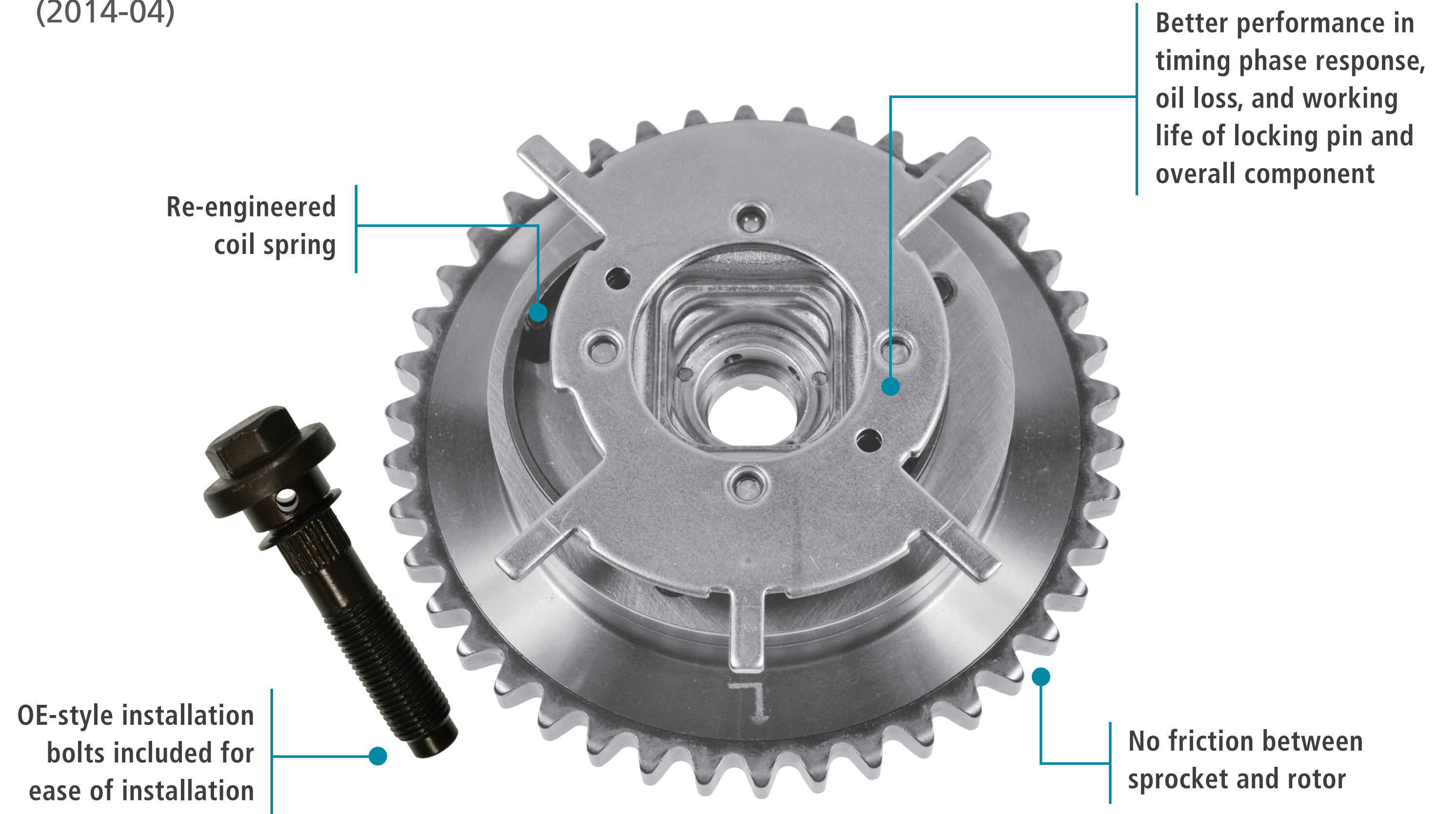
Engineering Improvements

Located on the camshaft, sprockets help maximize horsepower and torque curves, reducing emissions and improving vehicle efficiency.

NAPA® Echlin® VVT Sprockets benefit from design improvements which virtually eliminate component wear resulting in less oil loss. The result is a better-performing longer-lasting sprocket.

ECP1100

Ford / Lincoln / Mercury
(2014-04)



NAPA® ECHLIN® VVT SPROCKETS

Engineering Improvements

NAPA® Echlin® matches the original in all key tolerances and then improves on it with an all-metal integrated machined design – no paddle inserts to wear out, larger contact area, faster response times and longer service life.

The OE metal paddles may produce iron shavings that impede performance and shorten sprocket wear.

Competitor D uses plastic paddle inserts that wear easily and an “R” chamfer which can affect timing signal.

OE



Original - Metal Paddles

Produce iron shavings, paddles wear rapidly

NAPA® Echlin®



Best – Integrated Design

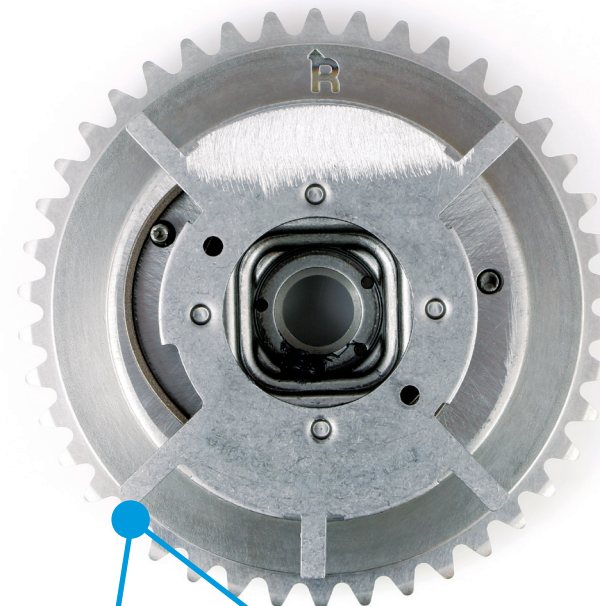
Larger contact area with no paddle to wear out

Aftermarket Competitor D

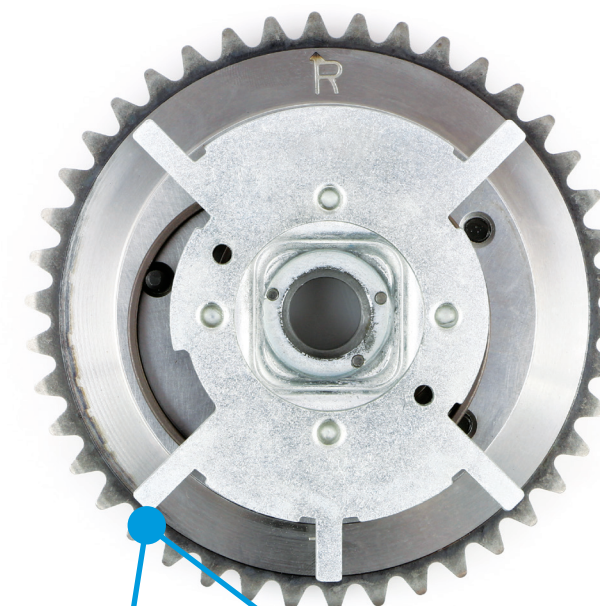


Inferior – Plastic Paddles

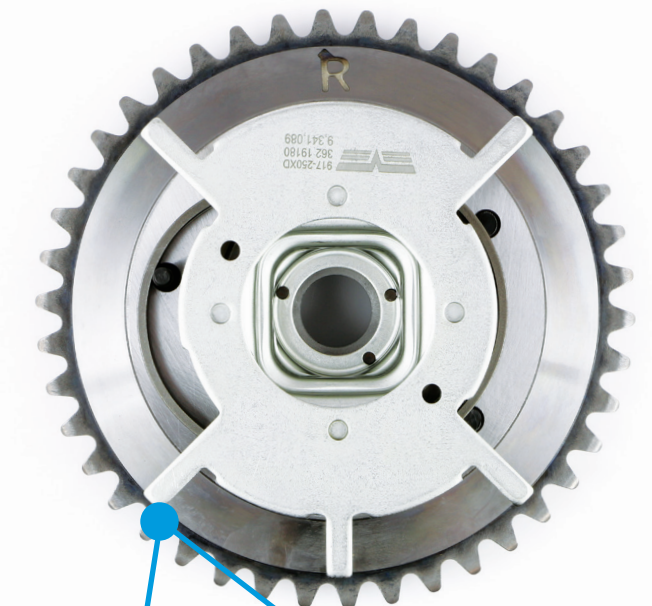
Components wear easily



No R chamfer on signal-driven area



No R chamfer on signal-driven area



R chamfer on signal-driven area

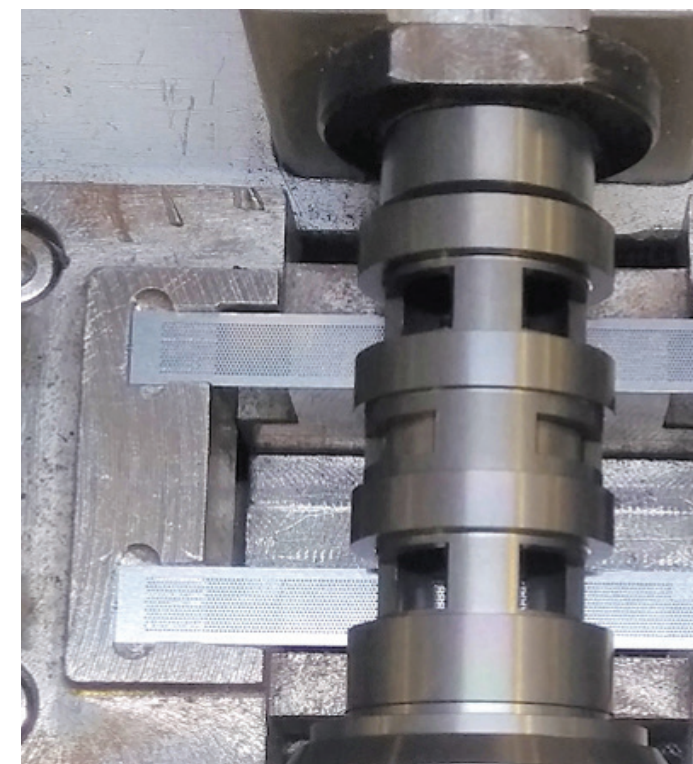
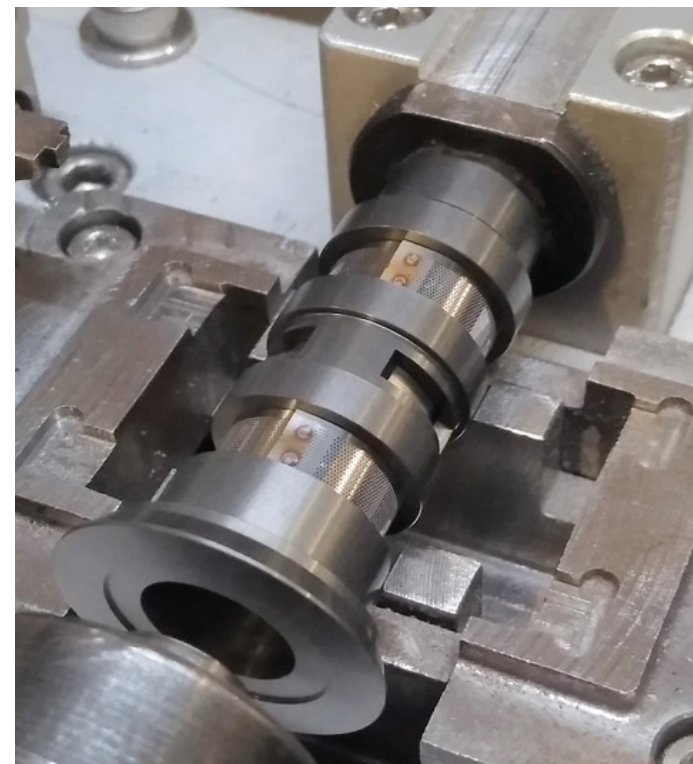
NAPA® ECHLIN® VVT SPROCKETS

Manufacturing

NAPA® Echlin® VVT Solenoids and Sprockets are designed and manufactured at our IATF 16949-certified facility in Bialystok, Poland.

Spanning 145,000 square feet, our most advanced facility has more than 750 employees including 60+ resident engineers.

Dedicated to producing the highest quality parts available, this plant produces millions of components annually while introducing more than 110 new products each year.



Commitment to Continuous Improvement

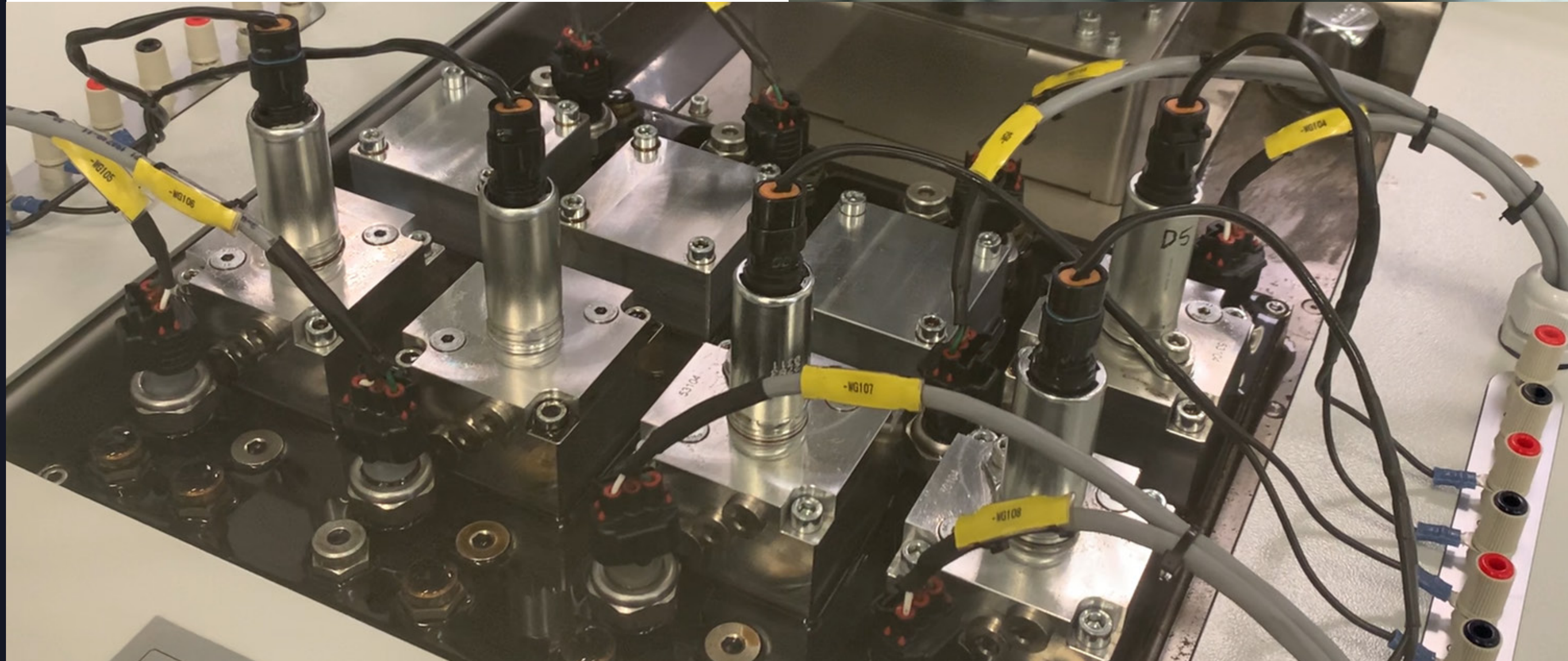
Our dedication to continuous improvement practices in design, engineering and manufacturing allows us to make enhancements to the OE design, while maintaining complete control over each NAPA® Echlin® VVT component.

NAPA® ECHLIN® VVT COMPONENTS

Testing and Validation

NAPA® Echlin®-manufactured VVT Solenoids and Sprockets undergo extensive measurement and life testing, plus a full spectrum of environmental analysis. This regimen includes thermal shock, thermal cycling, salt spray, vibration, storage tests, dirty oil test, and more.

The result is a line of premium VVT components that perform flawlessly and stand up to real-life conditions.



NAPA® ECHLIN® VVT COMPONENTS

NAPA® Echlin® Training Tech Tip

As experienced ASE-certified automotive technicians themselves, NAPA® Echlin® Trainers are experts in VVT system technology.

Here's what they say to look out for during a VVT component install.



**Use a Tech Expert® Cam
Gear Wedge Tool (ECP101)
to lock the sprocket in
place during VVT repairs,
but do not remove the
wedge tool while the cam
gear is out – if the tool
comes out, the timing
cover needs to be removed
and the engine will need
to be re-timed**



**Always change the
engine oil and filter when
replacing a VVT solenoid
or sprocket**



**If one solenoid or sprocket
fails, it's likely the other
VVT components are
nearing the end of their
service life too – it's
suggested to replace both
solenoids and sprockets at
the same time and inspect/
replace all related timing
chain components in the
VVT system**

NAPA® ECHLIN® VVT COMPONENTS

NAPA® Echlin® Professional Training

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

NAPA® Echlin® 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 ADA-compliant YouTube professional video library features more than 500 installation and product videos.



**PRO
TRAINING**
ON-DEMAND

NAPA® Echlin® offers an annual subscription to Pro Training On-Demand. This subscription grants access to more than 200 English, and over 50 Spanish 1-hour courses – and the NAPA® Echlin® on-demand library continues to grow. Topics range from fundamentals to advanced concepts, and include HVAC, diesel, hybrid, ignition, injection, electrical and communication diagnosis.



**PRO
TRAINING**
ON-SITE

Whether in-person at your location or virtually via computer, all NAPA® Echlin® Training classes feature a live instructor and are fully interactive as students work through real-life scenarios. Virtual class “workbooks” include on-demand links to video content and student configurable scan data.

Visit NAPAEchlinTraining.com