



PRECISION PERFORMANCE
SINCE 2003



Type 4 Store

**LN Engineering VW Type 4
Porsche 914/912E Program**



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Mission

LN Engineering seeks to provide innovative “no-compromise” solutions to the automotive aftermarket to exceed OEM requirements. We strive to deliver the highest level of precision performance for our products using improved material, manufacturing, and finishing technologies, all backed up by industry leading educational resources and support.



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Facility

We do all our machining and manufacturing in the USA in our 18,000 sq/ft facility, located one hour south of Chicago, IL.





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Process

Nickies billet cylinders are proudly machined on U.S. - made HAAS CNC equipment using custom AL extrusions from Hydro in Cressona, PA.





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Bore Coating and Plating

LN Engineering has extensive experience with Nikasil type plating as well as the latest in bore coating technologies, APS and PTWA, used by Porsche since 2017.

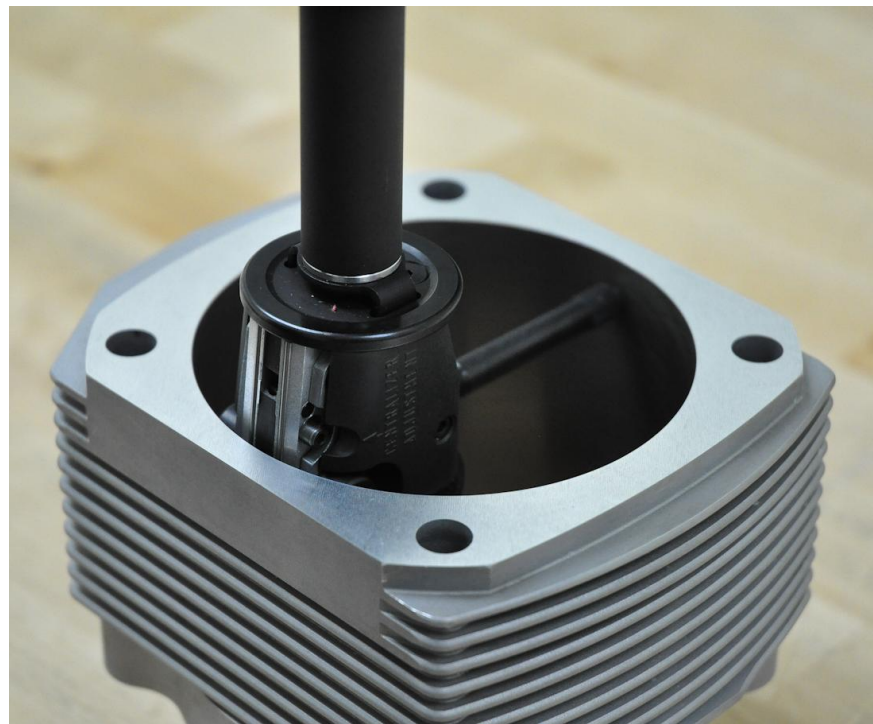




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Quality

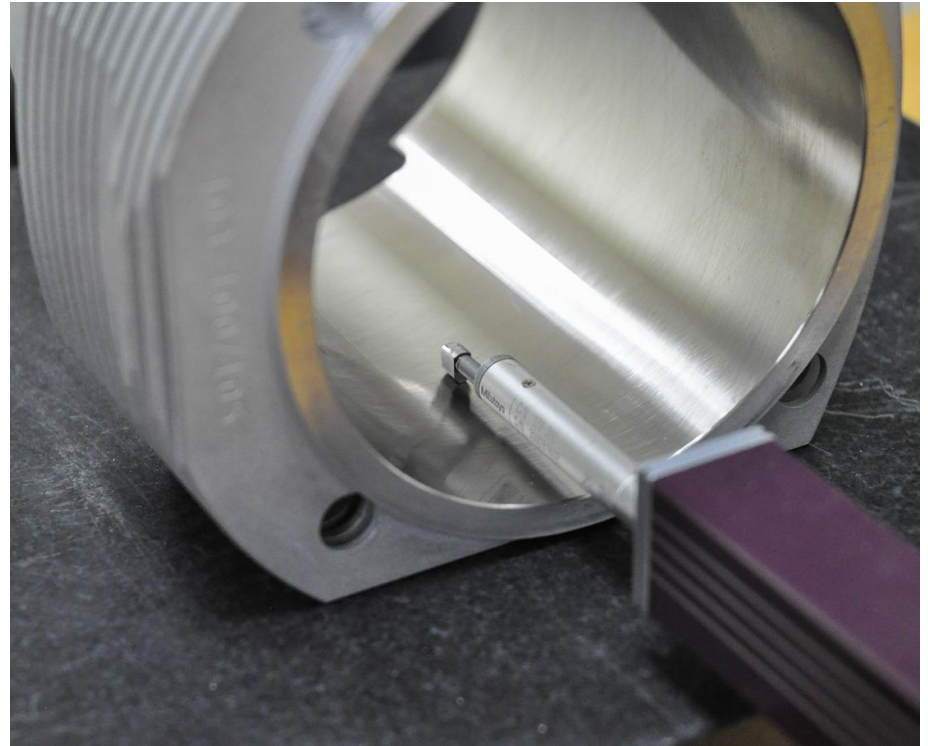
Every part made by LN Engineering undergoes stringent quality control inspections at multiple points during the manufacturing or reconditioning process to ensure the best possible outcome for our customer.





Quality

Cylinders are precision honed to our exacting specifications and are measured using Sunnen bore gauges and Mitutoyo profilometers to ensure proper cylinder geometry and surface finish.





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History

LN Engineering's first product in 2002 was its Nickies cylinders for the VW Type 4 Engine.

Nickies deliver six cylinder performance and reliability to aircooled VW and Porsche vehicles with the VW Type 4 Engine.





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History

The Type 4 Store was founded by Aircooled Technology's Jake Raby in the early 2000s.

In 2014, LN Engineering took over the Type 4 Store and continues to supply the same proven products still used by Aircooled Technology to this day.





Why LN Engineering?

- **LN Engineering has been manufacturing Nickies cylinders in the USA since 2002 with tens of thousands sold.**
- **LN Engineering is one of the most trusted names in the Porsche aftermarket and the leading authority on cylinders and pistons for Porsche engines in the USA.**



Aircooled Precision Performance



History

- **Porsche 2.0, 2.2, and 2.4 engines came with cast iron or biral cylinders that limit cooling and performance.**
- **Porsche used aluminum cylinders to make engines run cooler with Ferral, Chromal, and eventually Nikasil coatings to provide optimal cooling and durability.**
- **Nickies are superior to Limbach and Oettinger cast aluminum Nikasil Type 4 cylinders originally made by Mahle due to Nickies billet construction.**



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Nickies Benefits

- **Billet aluminum Nickies are better than cast iron or biral cylinders:**
- **Increased thermal conductivity for better cooling**
- **Reduced friction and less wear**
- **Increased displacement for more torque and horsepower without more heat**





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Displacement Increases

- **Replace factory cast iron 90-94mm cylinders with Nickies up to 96mm.**
- **Machine-in Nickies available in 100-105mm bore sizes.**





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Our Partners

LN Engineering offers premium performance parts designed to meet or exceed OEM requirements from industry leaders CP Carrillo, Mahle Motorsport, UEM and Wossner.





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Pistons

Our modern forged 2618 pistons features lightweight design with performance features including friction reducing skirt coatings, modern rings, and lightweight wrist pins.





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VW Type 4 Nickies

101-94	VW Type 4 Porsche 914 912E 94mm Nickies, inc. Custom CP Piston set [special order]
101-94.1	VW Type 4 Porsche 914 912E 94mm Nickies, inc. CP Piston set for 71mm stroke, 24mm pins [special order]
101-95	VW Type 4 Porsche 914 912E 95mm Slip-Fit Nickies, inc. Custom CP Piston set [special order]
101-96	VW Type 4 Porsche 914 912E 96mm Slip-Fit Nickies, inc. Custom CP Piston set
101-96.1	VW Type 4 Porsche 914 912E 96mm Slip-Fit Nickies, inc. CP Piston set for 71mm stroke, 24mm pins
101-96.2	VW Type 4 Porsche 914 912E 96mm Slip-Fit Nickies, inc. CP Piston set for 78mm stroke, 22mm pins
101-98	VW Type 4 Porsche 914 912E 98mm, Machine-In Nickies, inc. Custom CP Piston set [special order]
101-100	VW Type 4 Porsche 914 912E 100mm Machine-In Nickies, inc. Custom CP Piston set [special order]
101-102	VW Type 4 Porsche 914 912E 102mm Machine-In Nickies, inc. Custom CP Piston set
101-102.1	VW Type 4 Porsche 914 912E 102mm Machine-In Nickies, inc. CP Piston set ofr 78mm stroke, 22mm pins
101-102.2	VW Type 4 Porsche 914 912E 102mm Machine-In Nickies, inc. CP Piston set for 71mm stroke, 24mm pins
101-103	VW Type 4 Porsche 914 912E 103mm (4.060") Machine-In Nickies, inc. Custom CP Piston set [special order]
101-104	VW Type 4 Porsche 914 912E 104mm Machine-In Nickies, inc. Custom CP Piston set [special order]
101-105	VW Type 4 Porsche 914 912E 105mm (4.135") Machine-In Nickies, inc. Custom CP Piston set





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Engine Kits



Complete engine kits with proven combinations from Aircooled Technology's Camper Special to the 190 HP 2563 deliver power and reliability for all VW and Porsche vehicles powered by the Type 4 engine. Most kits include 100% new components including performance cylinder heads and Nickies cylinders.



Engine Kits

44800	2230-120 Camper Special Mountain Climber Engine Kit
44CS	Camper Special 1971 Engine Kit (No cylinders included, pistons only)
44CSP	Camper Special Plus 2056 Engine Kit
45100	2056-120 VW Type 4 Conversion Engine Kit
45200	2270-145 VW Type 4 Conversion Engine Kit
45500	2563-190 VW Type 4 Conversion Engine Kit
46100	2056-120 Porsche 914 912E Engine Kit
46400	2270-175 Porsche 914 912E Engine Kit
46600	2563-190 Porsche 914 912E Engine Kit





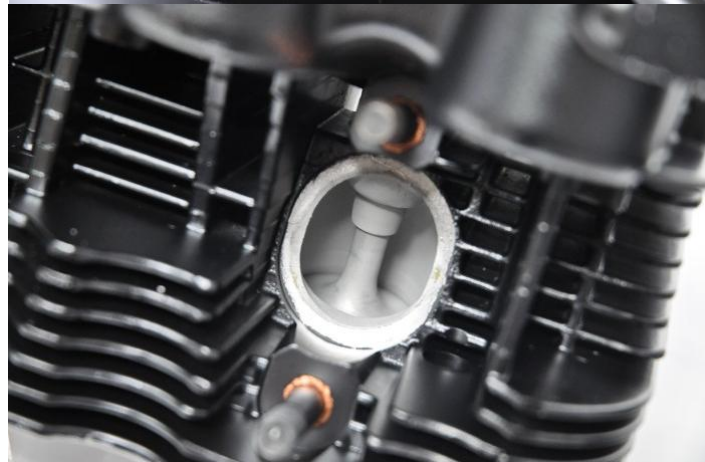
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Cylinder Heads

We use 100% new castings that are completely reworked including all new upgraded components.

Options include:

Thermal barrier and dispersant coatings, Dual Crower springs, REM, and cryogenic treatment.





Cylinder Heads

7600	Camper Special CS Oval Port Type 4 Cylinder Heads
7601	Camper Special CS Square Port Type 4 Cylinder Heads
7607	RS+ Type 4 Cylinder Heads
7608	LE200 Type 4 Cylinder Heads

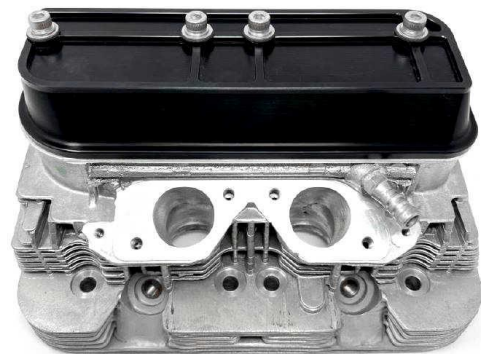




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Billet Accessories

Stop oil leaks with our billet aluminum pushrod tubes and valve covers, designed by Raby's Aircooled Technology and manufactured by LN Engineering.





Billet Accessories

021101471LN	LN Engineering Billet VW Type 4 Porsche 914 912E Valve Covers
021.109.335C.LN	LN Engineering Billet Aluminum VW Type 4 Pushrod Tubes





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Camshaft Kits



The Type 4 Store features custom camshaft grinds available no where else, designed by Jake Raby exclusively for his engine builds and our engine kits for engine displacements from 1971cc to 2563cc.

Basic, Deluxe, and Deluxe Plus kits available.



Camshaft Profiles

9590 – Camper special kits and the Porsche 2056-120 kit. This is the only camshaft that works with stock FI, but it will also work with carbs. Recommended compression ratio 8.0:1.

9520 – Porsche 2270-175, Porsche 2563-190, and VW conversion 2563-190. Optimized to work with carbs but can be used with aftermarket EFI with independent runner throttle bodies. Best paired with the LE200 cylinder heads. Recommended compression ratio 9.5:1.



Camshaft Profiles

9530 – VW Conversion 2056-120. Optimized to work with carbs but can be used with aftermarket EFI with independent runner throttle bodies. Recommended compression ratio 8.5:1.

Alternatively, the 9130 grind can be used for a slightly higher revving 2056 and allows for a bit more top end HP when paired with upgraded RS+ cylinder heads.



Camshaft Profiles

9500 – VW Conversion 2270-145. Optimized to work with carbs but can be used with aftermarket EFI with independent runner throttle bodies. Best paired with the RS+ cylinder heads. Recommended compression ratio 9.5:1.



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Camshaft Kits

Basic camshaft kits includes the camshaft, set lifters (8), cam gear, and cam gear bolts.

The Deluxe camshaft kit includes everything from the basic plus: pushrods (8), rocker spacer kit (4 spacers and 8 shims), 8mm valve adjuster nuts (8), OEM Porsche 911 swivel foot adjusters (8), Rocker studs (8), and Rocker stud nuts (8).

The Deluxe Plus camshaft kit adds rocker shafts and Crower Springs (single springs with 9530, 9590; dual with 9130, 9500, and 9520)



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Camshaft Kits

9130C	VW Type 4 Porsche 914 912E Basic 9130 Cam Kit
9500C	VW Type 4 Porsche 914 912E Basic 9500 Cam Kit
9520C	VW Type 4 Porsche 914 912E Basic 9520 Cam Kit
9530C	VW Type 4 Porsche 914 912E Basic 9530 Cam Kit
9590C	VW Type 4 Porsche 914 912E Basic 9530 Cam Kit
9100	VW Type 4 Porsche 914 912E Deluxe 9130 Cam Kit
9101	VW Type 4 Porsche 914 912E Deluxe Plus 9130 Cam Kit
9102	VW Type 4 Porsche 914 912E Deluxe 9500 Cam Kit
9103	VW Type 4 Porsche 914 912E Deluxe Plus 9500 Cam Kit
9104	VW Type 4 Porsche 914 912E Deluxe 9520 Cam Kit
9105	VW Type 4 Porsche 914 912E Deluxe Plus 9520 Cam Kit
9106	VW Type 4 Porsche 914 912E Deluxe 9530 Cam Kit
9107	VW Type 4 Porsche 914 912E Deluxe Plus 9530 Cam Kit
9110	VW Type 4 Porsche 914 912E Deluxe 9590 Cam Kit
9111	VW Type 4 Porsche 914 912E Deluxe Plus 9590 Cam Kit



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DTM Cooling Systems

DTM cooling
systems



Jake Raby's "Down The Middle" cooling upright conversion systems for the VW Type 4 engine provide superior cooling to all other cooling systems by balancing cooling air evenly between all cylinders.

The DTM Cooling System is also available for upright VW Type 1 Engines to replace the doghouse fan shroud.



DTM Specifications

- **Shroud Material - Hand laid fiberglass (raw gel coat)**
- **Accepts 1971 & up VW Type 1 (Doghouse style) cooling fan and stock Type 4 oil cooler (10% larger than a stock Type 1 oil cooler – not included)**
- **Designed for dual carbs or independent runner EFI only.**
- **Utilizes stock VW Type 1 alternator.**
- **V2 Type 4 DTM eliminates the oil cooler provision and requires external oil cooling.**



DTM Specifications

- **Offset design on left side allows air to blow directly between cylinder #3 and #4.**
- **Internal air deflectors provide balanced flow to all cylinders with 80% of air to the cylinders and 20% to the oil cooler (except V2 DTM)**
- **Type 4 oil cooler used on Type 1 and Type 4 DTM provides adequate oil cooling without the need for external cooling for most applications.**
- **No cutting of engine bay required.**



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Type 4 DTM

Basic Kit includes: DTM shroud, air hose, clamps, alternator stand and mount bar, crank pulley, fan belt, oil cooler adapter, hex linkage adapter, and Bug Me Video Type 4 Conversion DVD.





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Type 4 V2 DTM

Basic Kit includes: V2 DTM shroud, alternator stand and mount bar, crank pulley, fan belt, oil cooler adapter, hex linkage adapter, and Bug Me Video Type 4 Conversion DVD.





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Type 4 DTM Options

Stage 2 kit adds DTM surround tin and air sealing kit (tin available for 356, 914, or for vehicles originally fitted with type 1 engine)

Stage 3 kit adds cooling fan and hub, alternator with pulley, nut, woodruff key, and strap with cast aluminum backing plate.

Deluxe adds 200mm conversion flywheel, clutch, and stage 1 pressure plate, under cylinder air deflector tin, and flywheel and pressure plate bolts.



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DTM Surround Tin

Optional surround tin available for Type I, Type II, Replicar, 914, and 356/912 installations. Seals road air from engine for proper cooling. Aluminum Tin is “water-jet” cut and may require slight hand trimming.





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Type 1 DTM

Includes the shroud, air hose, and 2 clamps as shown.

Utilizes the stock VW Type 1 generator or alternator stand and factory engine bay sealing tin.





DTM Upright Cooling Systems

11001	Type 1 DTM
11002	Type 4 Basic DTM Kit
11004	Type 4 Stage 2 DTM Kit
11005	Type 4 Stage 3 DTM Kit
11006	Type 4 Deluxe DTM Kit
11024	Type 4 V2 Basic DTM Kit
11026	Type 4 V2 Stage 2 DTM Kit
11027	Type 4 V2 Stage 3 DTM Kit
11028	Type 4 V2 Deluxe DTM Kit
11528LN	LN Engineering Billet Alternator Fan Mount Backing Plate
TDS-912	Porsche 912 Engine Support Package for Type 4 Conversion





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ARP Engine Hardware

New ARP head studs should be fitted when installing Nickies cylinders.

LN Engineering also offers ARP connecting rod and case through bolt kits.





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ARP Engine Hardware

104-6006	ARP Porsche 914, 912E, VW Type 4 1.7, 1.8, 2.0 Rod Bolt Kit. [special order]
201-02	ARP Porsche 914, 912E, VW Type 4 1.7, 1.8, 2.0 Head Stud Kit. Direct fit - no case inserts required.
204-01	ARP Porsche 914, 912E, VW Type 4 1.7, 1.8, 2.0 Case Thru-Bolt Kit.

ARP
automotive Racing products



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Pauter Connecting Rods

Pauter X-Beam 4340 chromoly rods balance strength and weight reduction while reducing horsepower losses due to crankcase windage.

Features ARP 2000 rod bolts.





Pauter Connecting Rods

VW4-240-578-1270F	VW Type 4 Porsche 914 1.7/1.8 Pauter X-Beam Connecting Rods
914-240-578-1270FL	VW Type 4 Porsche 914 1.7/1.8 Lightweight Pauter X-Beam Connecting Rods
914-240-528-1310F	VW Type 4 Porsche 914 912E 2.0 Pauter X-Beam Connecting Rods
914-240-528-1310FL	VW Type 4 Porsche 914 912E 2.0 Lightweight Pauter X-Beam Connecting Rods





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Base Shims

Base shims are available to adjust deck height in thicknesses of .25mm, .5mm, .75mm, and 1.0mm.

Custom thicknesses can be special ordered.



Base Shims

107-108.5.25	VW Type 4 base shim for 101-98 thru 101-105 Nickies, copper .010", set of 4 pcs
107-108.5.50	VW Type 4 base shim for 101-98 thru 101-105 Nickies, copper .020", set of 4 pcs
107-108.5.75	VW Type 4 base shim for 101-98 thru 101-105 Nickies, copper .030", set of 4 pcs
107-108.5.100	VW Type 4 base shim for 101-98 thru 101-105 Nickies, copper .040", set of 4 pcs



Tapered Sleeve Ring Compressors

Modern piston rings require a modern approach to piston installation.

Tapered sleeve ring compressors reduce the chances of bending or breaking a piston ring during installation.

Available in all bore sizes.

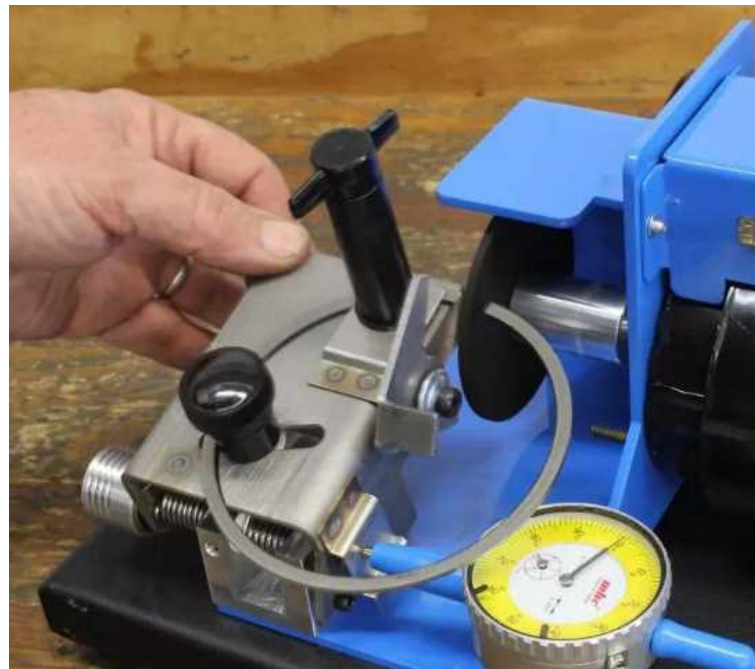




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Ring Gapping Service

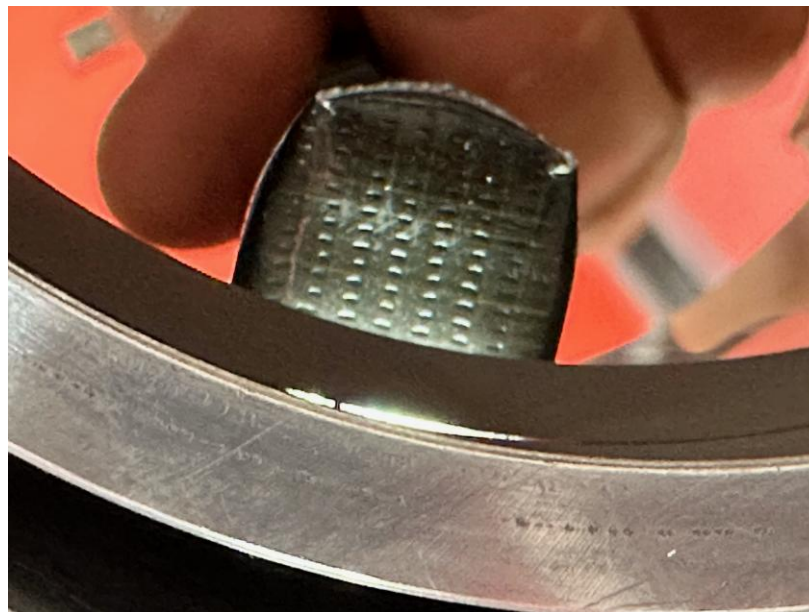
Our piston ring end gapping service provides you with piston rings with pre-set end gaps.





Light Checking

Piston rings should be round. If they are not round, they won't function properly. When gapping rings, we can also light check them for you.





Piston and Rod Balancing Service

Our balancing service provides piston assemblies and connecting rods balanced within +/- 0.5 grams.





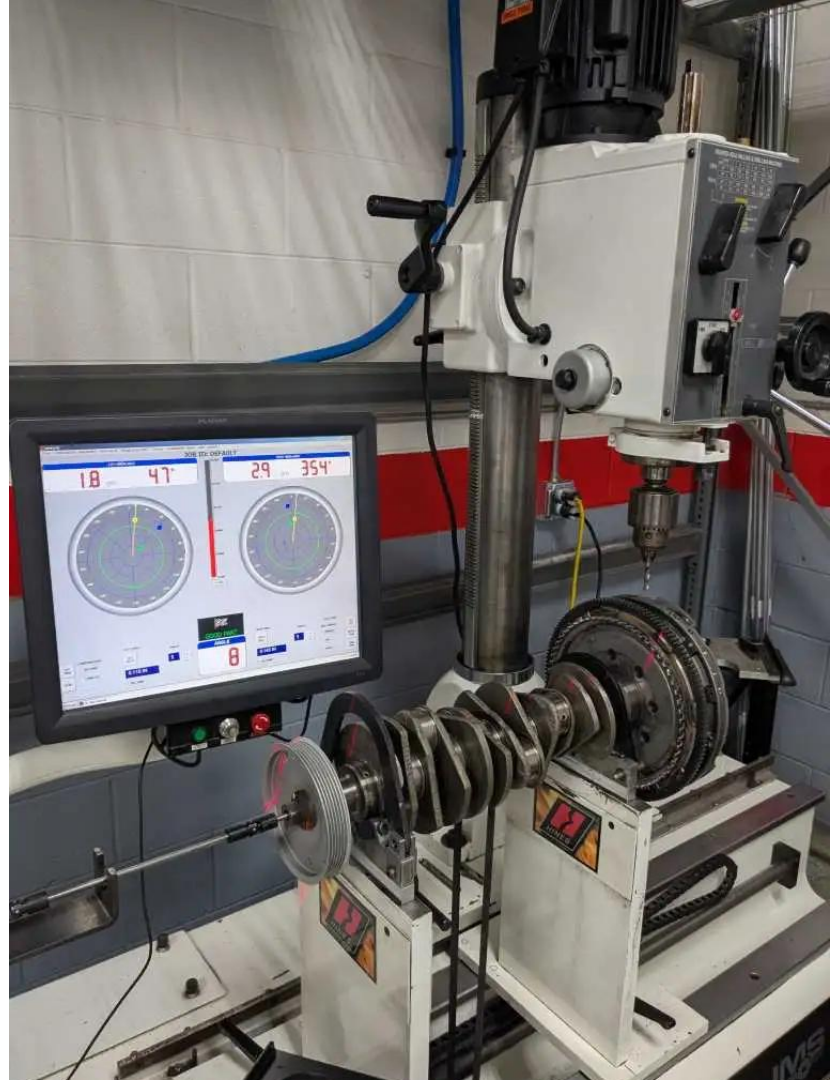
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Dynamic Balancing

**We now offer
Dynamic Engine
Balancing.**

**Standard balance
specification is 0.5
oz/in.**

**Race balance is to
0.2 oz/in.**



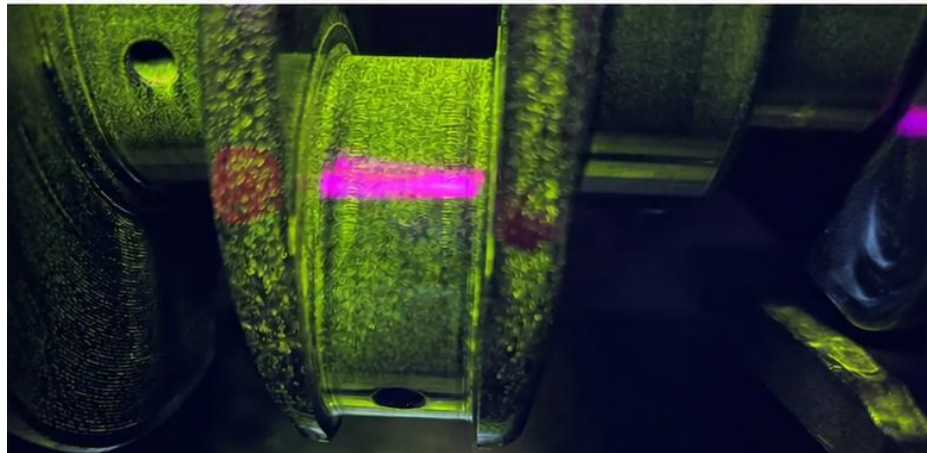


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Crankshaft

Magnetic particle inspection ensures crankshafts are not cracked.

Surface finish influences oil film stability, load capacity, and bearing longevity. LN Engineering polishes journals to achieve a consistent, controlled finish that supports long-term reliability.





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WPC Treatment

WPC is an anti-friction micro shot-peening treatment to the surface of the (any) part.

The peaks and valleys scoop up oil and increase the surface hardness of the material.

Due to the fact there is virtually no dimension change, we can add the treatment to already finished parts.

Engine main and rod bearings can be special ordered with WPC.





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Cryogenic Treatment

The advanced process of Deep Cryogenic Processing involves bringing the temperature of materials down to temperatures below -300°F slowly.

Optional Cryogenic Processing alters the crystalline structure, transforming it into a more uniform and durable construct.

These changes become permanent as the temperature of the material is gradually brought back up to room temperature or beyond.





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Additional Services

LN Engineering's automotive machine shop offers services like cylinder reconditioning, honing, aluminum engine block repair and sleeving, connecting rod reconditioning, crankshaft polishing, engine balancing, cylinder head remanufacturing, surface grinding and more.



Scan QR code for the most up to date [list of machine shop services offered](#)





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Magnetic Drain Plug

Our billet magnetic stainless steel and aluminum engine and transmission drain plugs allow for easy inspection to monitor for wear debris.



Magnetic Drain Plugs

N0297014LN	Billet Stainless Magnetic Drain Plug Type 4 & Vanagon (14 x 1.5)
021101195LN	Billet Stainless Magnetic Drain Plug Porsche 914 912E (12 x 1.5)
WHT001937LN	LN Engineering Billet Stainless Steel Porsche/VW/Audi Magnetic Transmission Drain Plug (24 x 1.5)
N91059701LN	LN Engineering Billet Stainless Steel Porsche/VW/Audi Magnetic Transmission Drain Plug (22x1.5)





Our Brands

**Curated Brands.
Proven Performance.**

**LN Engineering's
aircooled Porsche parts
program brings
together trusted
manufacturers,
specialty suppliers, and
precision-engineered
components for serious
Porsche engine builds.**



123ignition.nl

123 Ignition



Performance Products

AA Performance

aasco
motor

AASCO

NICKIES
PERFORMANCE AIR-COOLED CYLINDERS™

Aircooled Nickies
Cylinders

ARP
automotive racing products

ARP



Automobile Associates

AutoVerdi
Racing PUMPS & HOSES

AutoVerdi

SINCE 1958
BAUM TOOLS
SINCE 1958

Baum

bRS
Bike Racing Service

BRS

BURSC
EXHAUST

Bursch

CALLAS

COBB

GT

DRIVEN

DRIVEN



Shipping

Easy and secure shipping with trusted UPS Air Freight minimizes time in transit which means less time waiting for your shipment with discounted rates that save you money.





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KNOWLEDGE

Technical Resources for Porsche Owners

Guides, videos, downloads, AI-powered tools, and **enhanced 24/7 support.**

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lnengineering.com/knowledge/



AI-Powered Tools



ENHANCED 24/7 SUPPORT
Porsche experts, always here.



SOLUTIONS ▾

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SUPPORT 24/7



Knowledge

Technical Resources for Porsche Owners

LN Engineering provides educational resources, training, and guidelines to help you get the most from your aircooled Porsche. Our resources are built by engineers, for enthusiasts—plus, enjoy **enhanced 24/7 support.**



[What is the best oil for my Porsche?](#)



[Porsche Engine Technical Videos](#)



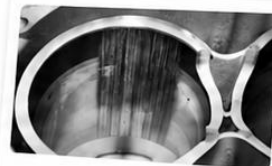
[Technical Downloads for Porsche Owners](#)



[The Definitive Guide to the Porsche IMS Bearing](#)



[The Ultimate Guide to Nikasil and NSC Cylinder Platings](#)



[The Porsche Cylinder Bore Scoring Problem](#)



Contact Details



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