



PRECISION PERFORMANCE  
SINCE 2008



# Type 4 Store

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



# 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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# 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.





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# 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- **Nickies are superior to Limbach and Oettinger cast aluminum Nikasil Type 4 cylinders originally made by Mahle due to Nickies billet construction.**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**







# Displacement Increases

- **Replace factory cast iron 90-94mm cylinders with Nickies up to 96mm.**
- **Machine-in Nickies available in 100-105mm bore sizes.**
- **Nickies have been successfully used in turbo and experimental aircraft applications.**







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# Facility

**We do our manufacturing in the USA at our 17,000 sq/ft facility, located one hour south of Chicago in Momence, 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.**

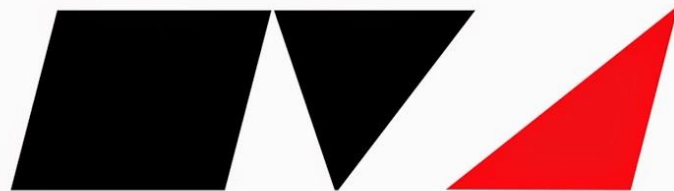




# NSC-Plating

LN Engineering has utilized Millennium Technologies proven NSC-plating since 2002.

Similar to Nikasil, the NSC cylinder bore plating is made up of nickel, silicon, and carbide applied .004-.005" thick.



**MILLENNIUM  
TECHNOLOGIES**

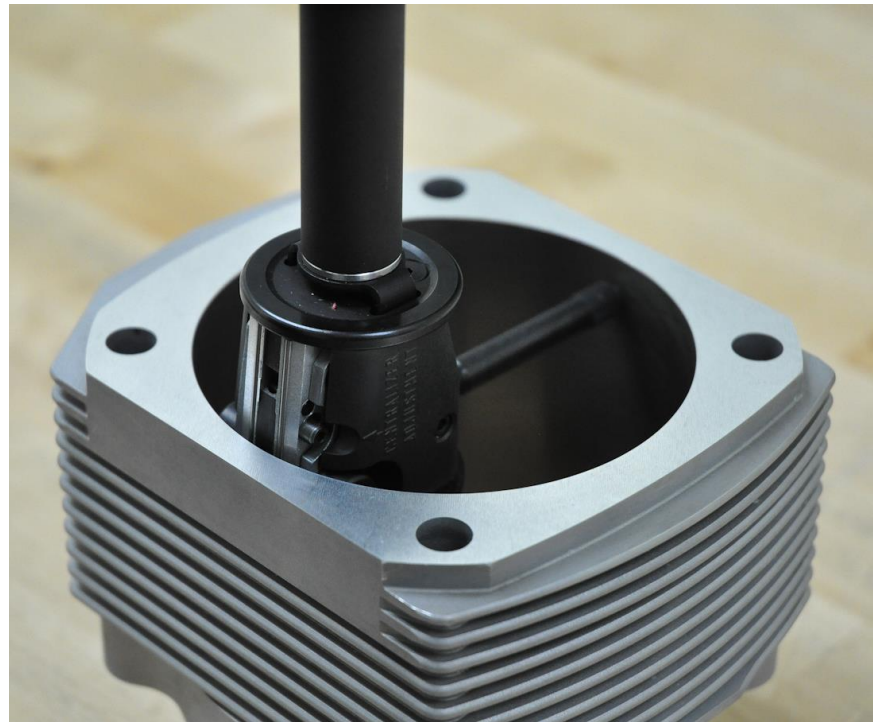
Advanced Engine Solutions



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# Quality

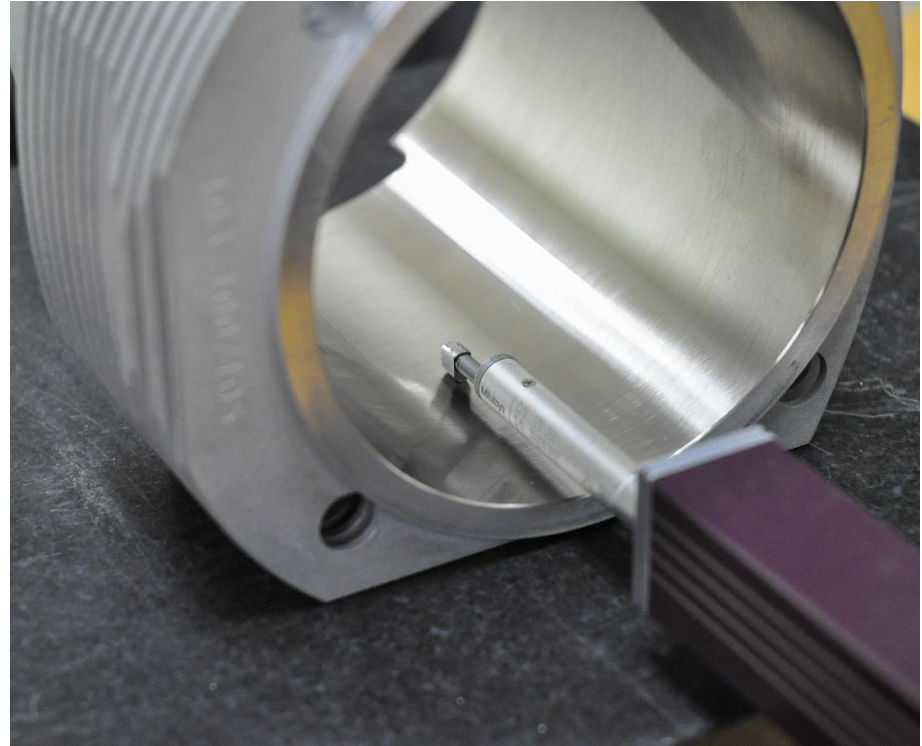
**Every part made by LN Engineering undergoes stringent quality control inspections at multiple points during the manufacturing or reconditioning process to ensure the best possible outcome for our customer.**





# 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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# Our Partners

**LN Engineering  
offers premium  
performance parts  
designed to meet or  
exceed OEM  
requirements from  
industry leaders JE  
Pistons, CP Carrillo,  
Mahle Motorsport,  
and Total Seal.**



**NICKIES**<sup>TM</sup>  
PERFORMANCE AIR-COOLED CYLINDERS

WITH MATCHING PISTON SETS BY





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# 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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# Pistons

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





# VW Type 4 Nickies

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

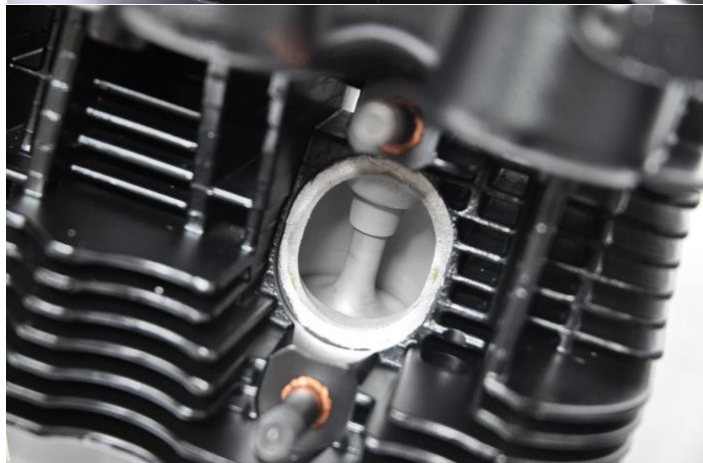


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# Cylinder Heads

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

**All heads feature thermal barrier coatings on exhaust ports and chambers. Springs are cryo treated and REM super finished for added life. Dual Crower springs optional.**





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# Cylinder Heads

**Camper Special Heads are available in square or oval port.**

**Performance RS+ heads flow 190cfm w/ 44x38 valves and LE200 flow 210cfm at .500" lift w/ 46x38 stainless valves.**

**RS+ and LE200 include ext. thermal dispersant coating.**





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# Chambers

**Camper Special heads feature 49-50cc chambers and a 0.5mm step cut.**

**RS+ and LE200 heads have 59-60cc chambers and are available with standard registers for bore sizes up to 96mm or for machine-in 100-105mm cylinders.**





# 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
021101471LN	LN Engineering Billet VW Type 4 Porsche 914 912E Valve Covers





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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.**



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# 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.**



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# 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.**



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# 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.**



# 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.**



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# 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.**



**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.**





# 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.**





# 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.





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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.**





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# 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.**





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# Piston and Rod Balancing Service

**Our balancing service provides piston assemblies and connecting rods balanced within  $\pm 0.5$  grams.**



# Additional Products & Services

107-01	Cylinder Reconditioning, per cyl.
107-02	Surface grind cylinder deck, per cyl.
107-07	Custom cylinder fee for new cylinder not based off existing part. One time charge.
107-07.1	Change bore size to non-stocking diameter on existing cylinder design. Price per set.
107-07.2	Custom cylinder based off existing cylinder. One time charge.
107-09	Modify machine-in cylinders to slip-fit, per set of cylinders.
107-13	Replacement Cylinder Fee <i>(for quantities less than a complete set of cylinders)</i>
107-15.1	4 Cylinder Piston Ring End Gapping Service
107-16.1	4 Cylinder Porsche Engine Static Balancing Service
304-00	Custom four cylinder set of JE Pistons, inc. coated skirts, rings, pins, and clips.



# 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 magnetic drain plugs are available for additional makes and models.*



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# Free Technical Resources

Click on education on the LN Engineering home page for [free technical information](#).

Be sure to check out and subscribe to the [LN Engineering YouTube channel](#).



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TECHNICAL  
LIBRARY



**AIRCOOLED ENGINE  
WITH NICKIES™ CYLINDERS**  
BASIC ASSEMBLY AND BREAK-IN INSTRUCTIONS



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# Contact Details



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SINCE 2002

## Headquarters

LN Engineering  
125 Gladiolus St.  
Momence, IL 60954  
USA  
+1 (815) 472-2939  
[support@lnengineering.com](mailto:support@lnengineering.com)  
<https://www.LNEngineering.com>

## Europe



CUSTOM CONCEPTS  
Oude Baan 6  
4825 BL Breda  
The Netherlands  
+31(0)6 2275 6519  
[info@custom-concepts.nl](mailto:info@custom-concepts.nl)  
<https://LNEngineering.eu/>