

Toyota Lotus 2ZZ

Performance Parts





Engine Assemblies

The Cosworth 2ZZ short and long block engine assemblies have gone through countless hours of engineering and evaluation to determine the best combination of parts and build specifications, ensuring maximum reliable performance. Each high performance engine assembly starts with all new select components as the foundation of the performance build. Every block is thoroughly inspected before the cylinders rotation assembly is balanced. The motorsport grade parts are then professionally assembled by expert engine builders in the Cosworth engine assembly facility. Each high performance engine assembly includes a complete specification sheet along with a serialized plaque.

Engine Assembly Features:

- ✔ Balanced within .5 grams
- ✔ Complete blue-print assembly
- ✔ Ring gap verification
- ✔ Bearing clearance confirmation
- ✔ Deck height certification
- ✔ Connecting rod side clearance verification
- ✔ Crankshaft end float confirmation
- ✔ Shipped in case with protective covers

Additional Long Block Assembly Features:

Coming Soon...

- ✔ Enlarged intake and exhaust ports
- ✔ Enlarged intake and exhaust valves
- ✔ Titanium retainers
- ✔ Multi angle valve job
- ✔ CNC machined port finish
- ✔ Knife edge port divider





SHORT BLOCK

Engine Build Kit

Cosworth is a premier supplier of high-quality components for the performance aftermarket. We specialize in providing engine build and tuner shops worldwide with Cosworth engineered precision products designed to maximize vehicle performance without compromising reliability. These precision parts can be easily purchased utilizing our custom short and long build engine assembly kits.

Block Kit Includes:

- Balanced & blue-printed genuine Toyota 2ZZ crankshaft inspected to Cosworth specifications
- Cosworth forged H-beam connecting rods
- Cosworth forged high compression pistons and rings
- Cosworth treated bearings



Now Available



PISTONS



PISTON RINGS



CONNECTING RODS

Performance Parts

Cosworth's extensive 2ZZ performance portfolio allows you to easily integrate the right part for your performance needs. Allow us to give you our racing edge within this extensive line of precision manufactured parts.

Pistons:

Our 2ZZ pistons can be subjected to directional change up to 285 times every second and can withstand acceleration forces of 8500g. These one-of-a-kind high performance forged pistons have been designed and manufactured using the same methods as our winning Formula 1 pistons.

Piston Features:

- ✔ Skirt profile & oval technology reduces engine noise while increasing life & performance
- ✔ Oil and combustion gas control features reduce blow-by and oil consumption
- ✔ Polished tops reduces carbon build up and relieves stress
- ✔ Patented anti-detonation bands
- ✔ Specially designed under-crown milling that reduces weight while maintaining strength and durability

Piston Rings:

Cosworth performance ring sets are designed to meet the demands of modern high performance engines.

Piston Ring Features:

- ✔ - Higher power output
- ✔ - Improved sealing
- ✔ - Lower friction
- ✔ - Longer life

Specification:

- Chrome top ring, iron second ring and three-piece oil ring
- Gas nitride treated for quicker break-in and improved sealing
- Axial tolerance is +/- 0.0002" and radial tolerance is +/- 0.0005"

Connecting Rods:

This vital link between the piston and power can make all the difference when it comes to ensuring engine reliability in all conditions. Trust the Cosworth forged connecting rods that utilize high strength steel and precision machining to exact tolerances.

Connecting Rod Features:

- ✔ Detailed machine work to maintain optimum weight and strength
- ✔ H-beam design for high power applications
- ✔ Designed for high RPM (revving) with reduced reciprocating mass

Cylinder Heads:

For over 40 years, Cosworth's fully assembled multi-valve cylinder head has been the proven leader in the industry for both racing and high performance production cars. Each original cylinder head design is carefully evaluated, dynamometer tested and flow bench proven.

Cylinder Head Features:

- ✔ All new OE castings for improved gas flow
- ✔ Special multi-angle valve job with state-of-the-art valve seating cutter
- ✔ CNC machined port bore finish with knife edge port divider

Now Available

Performance Parts continued



HEAD GASKET

Head Gaskets:

Constructed from stainless steel with a folded stopper layer to withstand superior sealing under the most demanding conditions. The Cosworth high performance head gaskets are manufactured from pre-coated die cut stainless steel resulting in uniform coating distribution while maintaining a consistent shape.

Head Gasket Features:

- Pre-coated stainless steel with a 0.25 micron layer of nitrile rubber ensures consistent distribution of coating with no high or low areas
- Manufacturing dimensional tolerance of +/-0.001
- Die cut manufacturing process ensures smooth edges
- Folded stopper layer



ENGINE BEARINGS

Engine Bearings:

These are one of the most vital components within an engine and are often overlooked when considering high performance upgrades. Cosworth's performance engineered bearings generate less heat than normal bearings by reducing friction.

Engine Bearing Features

- Specially treated bearing surface for better oil control and less friction
- Hardened steel backing on all connecting rod bearings
- Tight consistent wall tolerances

Camshaft:

Cosworth has been engineering camshafts for nearly 50 years. That coupled with years of innovative multi valve cylinder head design ensures our camshaft designs are the most efficient in providing maximum usable power across the widest power band.

Camshaft Features:

- Ground from new blanks
- Engineered and tested profiles
- Excellent torque and boost response
- Works well with modified cylinder head

Thermal Composite Gaskets:

The Cosworth Thermal Guard Composite Intake Gasket is designed to aid in the reduction of inlet air temperature by isolating the intake manifold from the heat generated by the engine's cylinder head.

Thermal Composite Gasket Features:

- Reusable with no deformation
- Precision CNC manufactured
- Safe with all fuel types

Specification:

- Higher temperature resistance than plastic gaskets (+500° F)
- Includes Hylomar Universal Blue Racing Formula sealant



THERMAL COMPOSITE GASKET



Specifications

Short Block Specifications

Performance Parts Included:

- Balanced & blue-printed genuine Toyota 2ZZ crankshaft inspected to Cosworth specifications
- Cosworth forged H-beam connecting Rods
- Cosworth forged high compression pistons and rings
- Cosworth treated bearings

Long Block Specifications

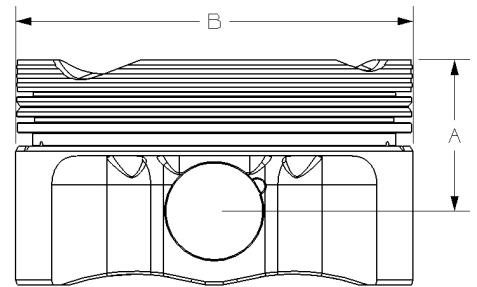
Performance Parts Included:

- Above short block parts
- Cosworth stopper layer steel head gasket
- Cosworth fully assembled cylinder head
- Titanium retainers

Piston Specifications

- 'Xylan' anti scuff skirt coating

Part #	<u>20032761</u>	<u>20035008</u>	<u>20035009</u>
Compression Ratio	10.0:1	12.5:1	14.0:1
A (mm)	31.25	31.25	31.25
B (mm)	82.00	82.00	82.00
Mass (g)	278.7	273.0	282.3
Dome Volume.* (cc)	-8.5	4.86	9.37



Notes:

A - Compression Height

B - Bore Diameter

*Negative value indicated a dished volume. Positive value indicates a dome.

Cylinder Heads Specifications

- CNC ported
- Flow bench tested
- Big exhaust and intake valves

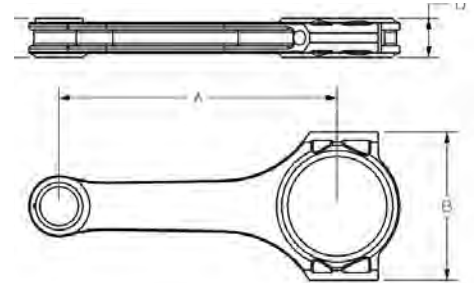


Specifications continued

Connecting Rod Specifications

— Proprietary forging made in the USA - Manufactured from 4340 (EN24) steel

Part #	20029423
A (mm)	138.0
B (mm)	76.2
C (mm)	18.0
D (mm)	19.8
Mass (g)	477.0
Recip. Mass (g)	133.0
Rot. Mass (g)	344.0



Notes:

A - Center to Center Distance
B - Big End Overall Width
C - Small End Thickness
D - Big End Thickness

Engine Bearing Specifications

Main Bearings

- Size 1 is the standard size bearing
- Size 0 provides 0.0127mm or 0.0005" less oil clearance than a size 1
- Size 2 provides 0.0127mm or 0.0005" more oil clearance than a size 1

Rod Bearings

- Size 1 is the standard size bearing
- Size 0 provides 0.008mm or 0.0003" less oil clearance than a size 1
- Size 2 provides 0.008mm or 0.0003" more oil clearance than a size 1

Head Gasket Specifications

Head Gasket Sizes

- T ~ 0.38mm
- T ~ 0.8mm
- T ~ 1.2mm

Please note head gaskets are intended for stock bore applications.

Disclaimer:

The products in this catalogue require professional installation to ensure correct operation. Cosworth will not accept responsibility for damage to vehicles as a result of improper installation of our products. The performance and power gained from installing products from this catalogue may place vehicles within an "off road use only" category in certain counties and states around the world. Cosworth will not accept responsibility for any restrictions placed on vehicles.

Product Disclaimer: A vehicle modified with Cosworth competition and/or racing performance products may not meet the legal requirements for operation on public roads and highways. It is the purchaser's responsibility to check and comply with all local, state and federal laws prior to operating vehicle. Installation and use of performance products may also affect/void vehicle warranty and insurance policy.

Warranty: In general, Cosworth Performance Parts carry no warranty. Cosworth Ltd and Cosworth LLC shall not be liable for direct, indirect, incidental or consequential damage or injury to persons or property that might be claimed as a result from the installation, improper installation and failure of part including claims for delay, loss of profits or labor. There are no warranties expressed or implied.



A History of Excellence

Cosworth has a legendary reputation for high performance racing engines and vehicle electronics systems in Formula One, the IndyCar Series, NASCAR, WRC and many more.

In 40 years of F1 competition (through the 2006 season), Cosworth engines delivered 176 F1 wins, 13 Constructors' Championships and 10 Drivers' Championships. Its results in American open-wheel racing, United States Auto Club (USAC), Championship Auto Racing Teams (CART) and the Indy Racing League (IRL), are equally impressive. From 1976 through 2002, Cosworth, sometimes in association with Ford, powered drivers to 305 race wins including 12 Indy 500 victories and 14 Series Championships. As the exclusive engine supplier to the Champ Car World Series (CCWS) from 2003 through 2007, it was the winning engine in 73 more races and claimed five more series championships.

Cosworth has supplied the power to a significant cohort of respected F1 teams (Lotus, Tyrrell, Williams, McLaren), and drivers (Jim Clark, Graham Hill, Jackie Steward, Mario Andretti and Michael Schumacher), as well as providing engines for champions and Indy 500 winners in the United States (Andretti, Sebastien Bourdais, Nigel Mansell, Rick Mears, Bobby Rahal, Danny Sullivan, Paul Tracy, Al and Bobby Unser, and Jacques Villeneuve).

Now Cosworth's unique combination of advanced powertrain experience and state of the art electronics technologies has been employed to create a race-proven range of high performance components for some of the most popular performance production vehicles. The Cosworth range of high performance aftermarket components includes everything the serious enthusiast needs, designed to Cosworth's superlative standards and manufactured to precise tolerances using high quality materials.



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