



# RACE SERIES

**PERFORMANCE ENGINE BEARINGS**

## **RACE SERIES APPLICATION GUIDE 2018**





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## PERFORMANCE ENGINE BEARINGS

### If you place demands on your engine... demand the best!

ACL has a proud & rich history in Motorsport – it is in our DNA. There is no better proving ground than the racetrack whatever it's configuration. In the heat of competition proven technology always comes through.

The ACL RACE Series performance engine bearing range of today has a strong pedigree in motorsport & traces its roots back to the 1960's with the manufacture of engine bearings for use in the world conquering Brabham Formula 1. Further experience in the Australian Supercars Championship & numerous other race codes has culminated in the current ACL RACE Series technology platform. The unique combination of design, metallurgy, engineering & precision quality control come together to deliver what engine builders expect from performance engine bearings.

Whatever your application we have you covered – if you are looking for the best – demand the best.

### NO RISK NO COMPROMISE TOTAL PERFORMANCE

## FEATURES OF ACL RACE SERIES PERFORMANCE ENGINE BEARINGS

### Precision Manufacturing

ACL Race Series performance engine bearings are manufactured to exacting tolerances. Micron tolerance machining supported by precision measurement systems delivers consistent accuracy to key characteristics like wall thickness and crush. This ensures reliable fit and helps maintain consistent clearances.

### Bearing Material Enhancements

A blend of characteristics to provide high strength and excellent seizure resistance.

No flash plating is applied to further improve bearing retention and maximise heat transfer.

ACL Race Series performance engine bearings are identified from the standard range by the following suffixes:

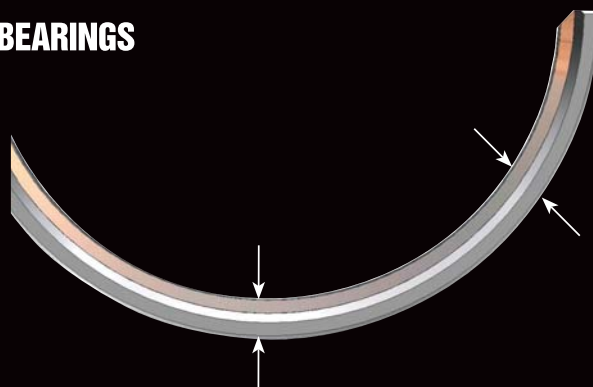
**H** = ACL Race Series.

**HX** = ACL Race Series with 0.025mm (0.001") extra clearance.

**HD** = ACL Race Series with location dowel holes.\*

**HXD** = ACL Race Series with 0.025mm (0.001") extra clearance and location dowel holes.\*

*\*Connecting rod bearing applications only.*



LAYER	ALLOY
Overlay	Lead-Tin-Copper
THICKNESS (Typical)	0.013mm* 0.018mm
*Connecting Rod Bearings Only - Reduced for increased fatigue resistance	
Seizure resistant - Low friction and deformable	
Barrier	Nickel
THICKNESS (Typical)	0.0001mm
Separation Layer	
Lining	Copper-Lead-Tin
THICKNESS (Typical)	0.3mm
Fatigue Strength - Strong yet deformable	
Steel	SAE1010 (High tensile)
THICKNESS (Typical)	Rem
High Strength - supports bearing lining	



## Bearing Design Enhancements

### Crush increased for:

Improved bearing retention from higher radial contact pressure. Locks the bearing into the housing.

More effective heat dissipation through improved thermal transfer.

### Bearing Eccentricity

Definition: Gradual reduction in wall thickness between the crown and parting line.

ACL Race Series performance engine bearings feature increased eccentricity to increase improve shape adaptation to compensate for bore distortion at high speed operation.

Assists in the formation of hydrodynamic oil film.

### Main Bearings with Extended Grooves

Full (180°) grooved uppers with matching partial groove in lowers.

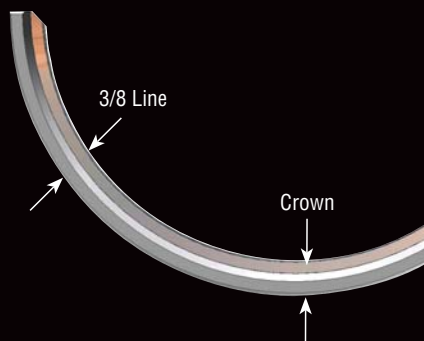
- Reduces interruption to big end oil supply.

Tapered groove run-out.

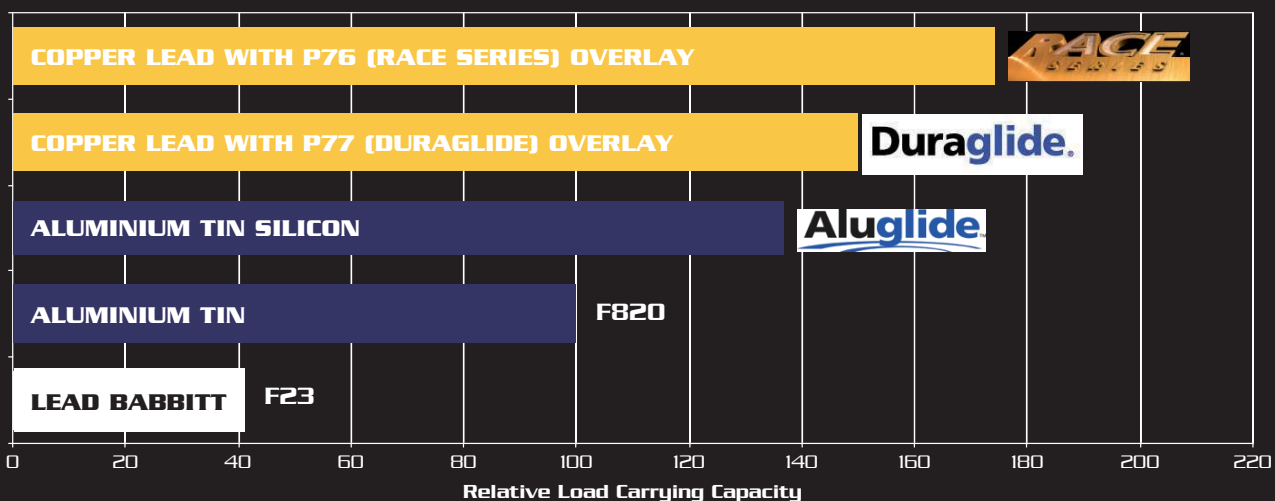
- Smooths big end supply cut-off avoiding pressure pulsing and cavitation.

### Enlarged ID Chamfers

Accommodate larger fillet radii on performance crankshafts.



## Comparison of ACL Materials



## Set Numbering

ACL RACE Series performance engine bearing sets are identified by the 'H' after the set number e.g. 8B663H-Std.

Most ACL RACE Series performance engine bearings are also produced in a 'HX' version e.g. 8B663HX-Std. The 'X' signifies the set will give an extra .001" (.025mm) oil clearance on a standard size shaft when compared to the H-STD set. The wall size of these HX-STD bearings is .0005" (.013mm) thinner than the H-STD Bearings, in all other respects the HX set is identical to the H-STD set.

There are selected con rod bearing sets that are manufactured with a dowel hole in the lower shell, to suit a dowel location in the con rod cap. These are designated with a 'D' in the set numbering e.g. 8B663HD-Std or 8B663HXD-Std etc.

## Appearance

Questions about the appearance of the ACL RACE Series performance engine bearings are quite common, as this series of trimetal copper lead bearings have a very different appearance to regular aftermarket "ACL Duraglide" trimetal bearings, which have a light silver /grey appearance.

The ACL RACE Series performance engine bearing as manufactured have an appearance that is a dark tarnished colouration, which can vary from dark black/brown/blue colours. This colour comes from the electroplating which is the last manufacturing process. The electroplated overlay has copper as one part of its composition, which tarnishes to the dark colours described above. This tarnish colouration has negligible thickness, so once installed in the engine, the crankshaft journal contacting the bearing, will polish the bearing surface, removing the surface colour and leaving the bearings with a polished silver appearance.

ACL RACE Series performance engine bearings do not start out with the silver grey appearance of regular aftermarket bearings, as there is no final silvery tin flash applied to these bearings. Not applying a silvery tin flash to these high performance bearings is a specific design feature. A silvery tin flash for appearance and long term corrosion protection, as applied to the regular aftermarket bearings, can under high loading and heat, move, with the plate migrating and causing high spots on the back of the shells, and distorting the bearing. For this reason the ACL RACE Series performance engine bearings do not have a cosmetic silvery tin flash applied, so there is no risk of any overlay plate movement on the backs of the shells, giving better bearing to housing contact and better bearing performance and function.

## Installation of ACL RACE Series performance engine bearings - Oil Clearances

Oil clearances are most accurately measured using micrometres and bore gauges. Bearing wall thickness measurements are taken at 90 degrees to the parting line (i.e. at the crown of the bearing) using a micrometre with a ball anvil, for use on the curved ID of the bearing.

Vertical oil clearance is best measured by assembling the bearing in its housing, with bolts torqued to specification, then using a bore gauge measure the assembled ID of the bearings at 90 degrees to the parting faces. The mating crankshaft journal size is measured, and subtracting this measurement from the bearing ID bore size, gives the assembled oil clearance.

ACL RACE Series performance engine bearings can be assembled with .00075-.001" per 1" of journal diameter (0.020-0.025mm per 25mm of journal diameter) plus .0005" (0.013mm).

As an example for a 2.000" (50mm) journal diameter,  $2.000 \times .001 = .002 + .0005 = .0025$  ( $50/25 \times 0.025 = 0.050 + .013 = 0.063$  mm)

Bearings should not be polished with abrasive pads or paper, on the bearing surface, to change the oil clearance.

## Select Fitting of ACL RACE Series performance engine bearings

It is common practise to adjust oil clearances by mixing bearings of adjacent grades i.e. HX-STD with H-STD or H-STD with H-.001 or H-.025, to obtain desired oil clearance. Using the HX-STD with H-STD will give .0005" (0.013mm) additional clearance than using two H-STD shells, and similarly using H-STD and H-.001 will reduce clearance .0005" (0.013mm). The table below demonstrates this in more detail.

Bearing shells with wall size .0005" (0.013mm) or less can be assembled on one journal. The thicker wall size bearing is fitted to the most heavily loaded position i.e. the upper half con rod shell and the lower half or cap position main bearing.

When using a crankshaft that is to be reground to an undersize, first measure the assembled bearing ID's, then have the required journal sizes ground to match the bearing measurements, with the desired oil clearance.

### Selecting Bearings for the Optimized Fit (For 'STD' sized crankshaft)

Bearing Size	Effects on Clearance			
	Per Bearing	Bearing Combinations		
		Matched Pairs		Mixed Pairs
H-001	-0.0125mm	H-001	-0.0250mm	
		H-001		H-001
H-STD	0.0	H-STD	0.0	-0.0125mm
		H-STD		H-STD
HX-STD	+0.0125	HX-STD	+0.0250mm	+0.0125mm
		HX-STD		



Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Alfa Romeo 1570cc, 1779cc, 1962cc, 1995cc Alfetta, Giulia, Giulietta, Spider, GT, 155,164	4B1110H	Std, .25	5M1112H	Std, .25		
Alfa Romeo 1290cc 1300			5M1112H	Std, .25		
Alfa Romeo JTS V6 3195cc 159, Brera, Spider	6B2270H	Std,.025,.25	4M2273H	Std,.025,.25		
	6B2270HX	Std	4M2273HX	Std		
Audi 1595cc, 1781cc (incl. Turbo), 1984cc A3, A4, A6, TT, 80, 90, 100 (1983-2001)	4B1606H	Std, .025, .25, .50	5M1644H	Std, .25, .50	2T1644	Std
	4B1606HX	Std	5M1644HX	Std		
Audi 1781cc Turbo, 1984cc DOHC (incl Turbo) A3, A4, A6, TT (2000 on)	4B1609H	Std, .025, .25				
	4B1609HX	Std				
Audi TFSI 1984cc 4 cyl. (EA888) S3, TTS	4B5562H	Std, .025, .25				
	4B5562HX	Std				
Audi TFSI 2480cc 5 cyl. (CEPA/CEPB) TTRS, RS3, RS Q3	1B5562H	Std, .025, .25				
	1B5562HX	Std				
	4B5562H	Std, .025, .25				
	4B5562HX	Std				
Audi VR6 3189cc, 3597cc	6B5530H	Std, .025, .25	7M5532H	Std, .025, .25	2T5532	Std
	6B5530HX	Std	7M5532HX	Std		
BMC Mini 997cc, 998cc Inline 4	4B2201H	Std, 001, 010	3M2203H	Std, 001, 010	2T2203	Std
	4B2201HX	Std	3M2203HX	Std	RB843	Semi
BMC Mini (up to 1983) 1275cc Inline 4	4B2206H	Std, 001, 010	3M2204H	Std, 001, 010	2T2204	Std
	4B2206HX	Std	3M2204HX	Std		
BMC Mini (from 1983 on) 1275cc Inline 4	4B2206H	Std, 001, 010	3M2205H	Std,.025,.25	2T2204	Std
	4B2206HX	Std	3M2205HX	Std		
BMW M40B16, M40B18, M42B18, M43B16, M43B18, M43B19, M44B19 (1.6,1.8,1.9L) 316, 318, Z3	4B1490H	Std, .025, .25, .50	5M1538H	Std, .025, .25, .50		
	4B1490HX	Std	5M1538HX	Std		
BMW M20B20, M20B25, M20B27, M50B20, M50B25, M50B27, M52B20, M52B25, M52B28, M54B25 (2.0,2.5,2.7,2.8L)	6B1490H	Std, .025, .25, .50	7M1532H (03/1988 on)	Std, .025, .25, .50		
	6B1490HX	Std	7M1532HX (03/1988 on)	Std		
BMW M54B22, M54B30 (2.2,3.0L)	6B1490H	Std, .025, .25, .50				
	6B1490HX	Std				
BMW N13B16A 1598cc Inline 4 (Prince)	4B7787H	Std, .025, .25	5M7788H	Std, .025, .25		
	4B7787HX	Std	5M7788HX	Std		
BMW N54B30/N55B30 (3.0L)	6B1584H	Std, .025, .25				
	6B1584HX	Std				
BMW S14/7 (2.0L) Suites BMW motorsport race engines only	4B1489H	Std, .025, .25				
	4B1489HX	Std				
BMW S14B20, S14B23, S14B25 (2.0, 2.3, 2.5L) M3 E30	4B1568H	Std, .025, .25				
	4B1568HX	Std				
BMW S50B30 (3.0L) M3 E36 Inline 6	6B1515H	Std, .025, .25	7M1532H	Std, .025, .25, .50		
	6B1515HX	Std	7M1532HX	Std		
BMW S50B32 (3.2L) M3 E36 Inline 6	6B1497H	Std, .025, .25	7M1532H	Std, .025, .25, .50		
	6B1497HX	Std	7M1532HX	Std		
BMW S54B32 (3.2L) M3 E46 Inline 6	6B1569H	Std, .025, .25	7M1532H	Std, .025, .25, .50		
	6B1569HX	Std	7M1532HX	Std		
BMW S55B30 (3.0L) M3 F80/M4 Inline 6 M3 F80 / M4 F82/F83	6B1584H	Std, .025, .25				
	6B1584HX	Std				
BMW S65B40 (4.0L) M3 E90 3999cc V8	8B1580H	Std, .025, .25				
	8B1580HX	Std				
BMW S85B50 (5.0L) M5 E60 4999cc V10	10B1580H	Std, .025, .25				
	10B1580HX	Std				

HX - 0.001" extra clearance on Standard Journal. HD - Bearing has dowel hole location.

PRIOR TO GRINDING YOUR CRANKSHAFT, WE STRONGLY RECOMMEND YOU CHECK THE AVAILABILITY OF THE REQUIRED UNDERSIZE WITH YOUR LOCAL DISTRIBUTOR.



# PERFORMANCE ENGINE BEARINGS

Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Custom Performance (1.889" journal, 0.792" wide)	8B1663H	Std,001,010				
	8B1663HX	Std				
Custom Performance (1.889" journal, 0.896" wide w/ dowel)	8B1665HD	Std,001				
	8B1665HDX	Std				
Custom Performance - Nascar V8 (Rods - 1.85" journal, .748" wide) (Mains - 2" journal, .866" wide)	8B1798H	Std,001	5M1799HU / 5M1799HL	Std,001		
	8B1798HX	Std	5MBG1799HU (120° groove)	Std,001		
			5M1799HXU / 5M1799HXL	Std		
			5MBG1799HXU (120° groove)	Std		
Chev 262, 267, 302, 305, 307, 327, 350 ci V8	8B663H	Std,001,009,010,011,020	5M909H	Std,001,009,010,011,020	5C3349C	Std
	8B663HX	Std	5M909HX	Std	5C3346C {housing bores constant at 1.999/2.001" (50.775/50.825mm)}	Std
	8B663HD	Std,001,010			5C004AS {+0.010" OD, hsg bore 2.029/2.031" (51.537/51.587mm), customer to drill oil holes}	Std
	8B663HDX	Std			5C004BS {+0.020" OD, hsg bore 2.039/2.041" (51.791/51.841mm), customer to drill oil holes}	Std
	8B1227H (18mm/.708" wide)	Std,001,010				
	8B1227HX	Std				
Chev 265, 283, 302, 327 ci V8	8B745H	Std,001,010	5M429H	Std,001,010	5C3349C	Std
	8B745HX	Std	5M429HX	Std	5C3346C {housing bores constant at 1.999/2.001" (50.775/50.825mm)}	Std
	8B745HD	Std,001,010			5C004AS {+0.010" OD, hsg bore 2.029/2.031" (51.537/51.587mm), customer to drill oil holes}	Std
	8B745HDX	Std			5C004BS {+0.020" OD, hsg bore 2.039/2.041" (51.791/51.841mm), customer to drill oil holes}	Std

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Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Chev 4.8L & 5.3 L (Gen III & IV), 5.7L LS1, LS6 Gen III, 6.0L LS2, Vortec (Gen III & IV), 6.2L LS3, Vortec (Gen IV)	8B663H	Std,001,009,010,011,020	5M7298H	Std,001,010,020	5C1000S (1st design 1997-2003)	Std
	8B663HX	Std	5M7298HX	Std	5C1001S (2nd design 2003-on)	Std
	8B663HD	Std,001,010				
	8B663HDX	Std				
Chev 6.2 L (Gen V) LT1, LT4, L86			5M7292H	Std,001,010,020		
			5M7292HX	Std		
Chev 400 ci V8	8B663H	Std,001,009,010,011,020	5M1038H	Std,001,010	5C3349C	Std
	8B663HX	Std	5M1038HX	Std	5C3346C {housing bores constant at 1.999/2.001" (50.775/50.825mm)}	Std
	8B663HD	Std,001,010			5C004AS {+0.010" OD, hsg bore 2.029/2.031" (51.537/51.587mm), customer to drill oil holes}	Std
	8B663HDX	Std			5C004BS {+0.020" OD, hsg bore 2.039/2.041" (51.791/51.841mm), customer to drill oil holes}	Std
Chev 366, 396, 402, 427 454 ci V8	8B743H	Std,001,009,010,011,020	5M829H	Std,001,009,010,011,020	5C615S (1965-66)	Std
	8B743HX	Std	5M829HX	Std	5C616S (1967 on)	Std
	8B743HD	Std,001,010				
	8B743HDX	Std				
Chrysler 273, 318, 326, 340 ci V8	8B481H	Std,001,010	5M540P**	Std,10,20,30,40	5C875S (was part # 5C4636)	Std
	8B481HX	Std				
Chrysler 318 ci LA / Magnum V8	8B481H	Std,001,010	5M1344P**	Std,01,10,20,30,40	5C875S (1974-79)	Std
	8B481HX	Std			5C1112S (1980 on)	Std
Chrysler 345, 370 ci (5.7, 6.1L) Hemi	8B1808H	Std,.025,.25	5M2220H	Std,.025,.25	1T611S	Std
	8B1808HX	Std	5M2220HX	Std		
Chrysler 360 ci V8	8B481H	Std,001,010	5M1051P** (1971-73)	Std,10,20,30,40	5C875S (1971-79)	Std
	8B481HX	Std	5M1266P** (1974 on)	Std,01,10,20,30	5C1112S (1980 on)	Std
Chrysler 350, 361, 383, 400, 413, 426, 440 ci V8	8B527HD	Std,010			5C876S	Std
	8B527HDX	Std				
Chrysler 488 ci (8.0L) V10 Viper	1B481H	Std,001,010				
	1B481HX	Std				
Fontana Midgets/Speedcars			5M1733H	Std, .001		
			5M1733HX	Std		
Ford BDA, BDB, BDC, BDD etc. Cosworth	4B1060H	Std,001,010,020	5M2152H	Std,001,010,020	1T2152	Std, +005
	4B1060HX	Std	5M2152HX	Std		
Ford Cosworth 2.0L	4B2166H	Std, .25, .50	5M2167H	Std, .25, .50	2T2167	Std, +005
	4B2166HX	Std	5M2167HX	Std		
Ford Duratec 1.6L 4 Cyl. (Fiesta, Focus)	4B7267H	Std,.025,.25				
	4B7267HX	Std				
Ford 2300 Stroker (Ford USA)	1B2280H	Std,01,10,20	5M1117H	Std,01,10,20	4C777S	Std
	1B2280HX	Std	5M1117HX	Std	4C777BS	Std
			5M1743H	Std,01,10,20	2C1095S (Aux.)	Std
			5M1743HX	Std		
Ford Ecoboost Turbo 1.0L, Turbo 3 Cyl. (Fiesta, Focus)	3B7328H	Std,.025,.25	4M7330H	Std,.025,.25		
	3B7328HX	Std	4M7330HX	Std		
Ford Ecoboost Turbo 1.6L, Turbo 4 Cyl. (Fiesta ST, Focus)	4B7267H	Std,.025,.25				
	4B7267HX	Std				

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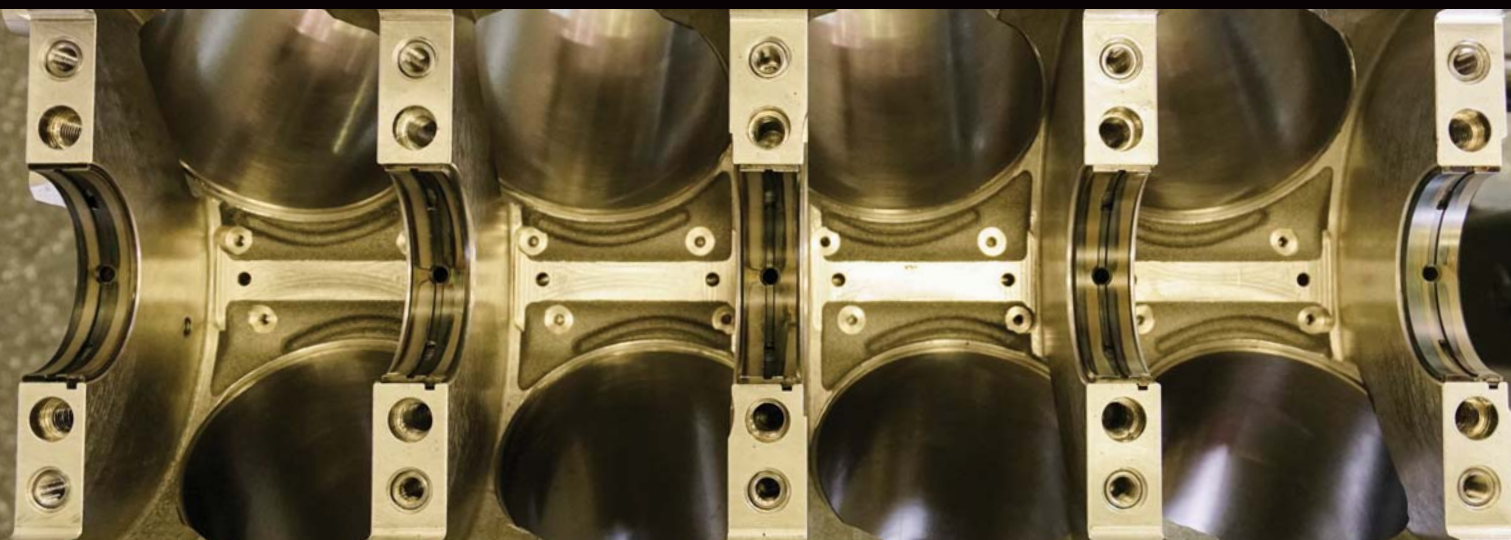
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Ford Ecoboost Turbo 2.0L, 2.3L Turbo (Mustang, Focus RS)	4B8172H	Std, .25, .50				
	4B8172HX	Std				
Ford 144, 170, 188 ci Inline 6	6B2150H	Std,001,010,020				
	6B2150HX					
Ford 200ci, 250ci Non X Flow 3.2L, 3.3L, 3.9L, 4.0L, 4.1L X Flow Inline 6 (Ford Australia)	6B2150H	Std,001,010,020	7M2158H	Std,001,010,020	4C5826	Std
	6B2150HX	Std	7M2158HX	Std		
Ford 4.0L & 4.0L Turbo Inline 6 (AU, BA, BF, FG) (Ford Australia)	6B2150H	Std,001,010,020	7M2092H	Std,001,010,020		
	6B2150HX	Std	7M2092HX	Std		
Ford 221, 255, 260, 289, 302 ci Windsor V8	8B634H	Std,001,009,010,011,020	5M590H	Std,001,009,010,011,020	5C1321S	Std
	8B634HX	Std	5M590HX	Std	5C1763S {constant hsg bores at 2.2041"/2.2051" - SVO engines}	Std
	8B634HD	Std,001,010				
	8B634HDX	Std				
Ford 4.6L VIN 6,W,X Windsor SOHC, 5.4L SOHC V8	8B1442H	Std,.025,.25	5M7296H	Std,.025,.25	6C1100A	Std
	8B1442HX	Std	5M7296HX	Std	RB4113	Semi
Ford 4.6L DOHC, 4.6L SOHC 24V V8	8B1442H	Std,.025,.25	5M5647H	Std,.025,.25	6C1201A (late '96 on)	Std
	8B1442HX	Std	5M5647HX	Std	RB4113	Semi
Ford 5.4L DOHC 24V V8 (Supercharged) Aluminium Block (2011 on)	8B1442H	Std,.025,.25	5M5645H	Std,.025,.25	RB4113	Semi
	8B1442HX	Std	5M5645HX	Std		
Ford 351 Windsor V8	8B831P**	Std,01,10,20,30,40	5M1432H	Std,001,010	5C1321S	Std
			5M1432HX	Std		
Ford 302/351ci Cleveland V8	8B927H	Std,001,010,020	5M1010H	Std,001,010,020	5C710C (was part # 5C5696)	Std
			5M1010HX	Std	5C1763S {constant hsg bores at 2.2041"/2.2051" - SVO engines}	Std
Ford 377ci Cleveland stroker (using Chev conrods)	8B1227H	Std,01,10	5M1010H	Std,001,010,020	5C710C (was part # 5C5696)	Std
	8B1227HX	Std	5M1010HX	Std	5C1763S {constant hsg bores at 2.2041"/2.2051" - SVO engines}	Std
Ford 370, 429, 460 ci V8	8B818H	Std,001,010	5M1039H	Std,001,010	5C1111S	Std, 010
			5M1039HX	Std		
Ford/Lotus 1500cc-1600cc Inline 4 OHV & Twin Cam (Elan/Escort/ Cortina)	4B603H	Std,001,010,020	5M2152H	Std,001,010,020	10C5808 (Twin Cam)	Std
	4B603HX	Std	5M2152HX	Std	1T2152	Std, +005

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GM HFV6 2.8/2.8 Turbo/3.0/3.2/3.6L LAU, LP1, LP9, LF1, LFX, LLT, LY7, 10HMA Cadillac, Buick, Pontiac, Chev, GMC, Holden	6B2270H	Std.,.025,.25	4M2273H	Std.,.025,.25		
	6B2270HX	Std	4M2273HX	Std		
Holden Grey Motor 132ci, 138ci Inline 6	6B5001H	Std,001,010,020			4C3088	Std
	6B5001HX	Std			RB808/RB876	Semi
Holden 202ci Inline 6 (Red, Blue, Black) 173 ci (2850cc) Inline 6 (Blue)	6B2380H	Std,001,010,020	7M2398H	Std,001,010,020	4C5116	Std,001
	6B2380HX	Std	7M2398HX	Std		005, 010
Holden 138, 149, 161, 173, 179, 186 ci Inline 6	6B2380H	Std,001,010,020	7M2384H	Std,001,010,020	4C5116	Std,001
	6B2380HX	Std	7M2384HX	Std		005, 010
Holden/Buick 231 ci (3.8L V6) (Universal Main Set to suit all)	6B2306H (1990 on)	Std,001,010,020	4SM2222H	Std,001,010,020	4C5106 (1988-5/95)	Std,010
	6B2306HX (1990 on)	Std	4SM2222HX	Std	4C5108 (5/95 on)	Std,010
Holden Alloytec HFV6 LF1, 10HMA, LLT, LY7 (3.0, 3.2, 3.6L)	6B2270H	Std.,.025,.25	4M2273H	Std.,.025,.25		
	6B2270HX	Std	4M2273HX	Std		
Holden 253ci, 4.9L, 308ci, 5.7L V8 Red, Blue, Black	8B2356H	Std,001,010,020	5M2357H	Std,001,010,020	5C5146C	Std,002,010
	8B2356HX	Std	5M2357HX	Std		
Holden Gen III & Gen IV V8 LS1 (5.7L), LS2, L76, L98 (6.0L), LS3 (6.2L)	8B663H	Std,001,009,010,011,020	5M7298H	Std,001,010,020	5C1000S (1st design 1997-2003)	Std
	8B663HX	Std	5M7298HX	Std	5C1001S (2nd design 2003-on)	Std
	8B663HD	Std,001,010				
	8B663HDX	Std				
Honda D15B, D15Z 1493cc Inline 4 (engines from 09/1991 on)	4B1956H	Std.,.025,.25				
	4B1956HX	Std				
Honda/Acura D16A, D16B, D16W, D16Y, D16Z 1590cc Inline 4	4B1956H	Std.,.025,.25	5M1957H	Std.,.025,.25	1T1957	Std
	4B1956HX	Std	5M1957HX	Std		
Honda/Acura A18A, ES, ET, A20A 1829cc, 1955cc Inline 4	4B1946H	Std.,.025,.25				
	4B1946HX	Std				
Honda/Acura B16A 1595cc Inline 4	4B1946H	Std.,.025,.25	5M1959H	Std.,.025,.25	1T1957	Std
	4B1946HX	Std	5M1959HX	Std		
Honda/Acura B17A1/B18A1/B18B1/ B18B2 1678cc/1834cc Inline 4	4B1946H	Std.,.025,.25	5M1959H	Std.,.025,.25	1T1957	Std
	4B1946HX	Std	5M1959HX	Std		
Honda B18A/B20A SOHC only 1834cc/1958cc Inline 4	4B1946H	Std.,.025,.25	5M1957H	Std.,.025,.25	1T1957	Std
	4B1946HX	Std	5M1957HX	Std		
Honda/Acura B18C1 /B18C2/B18C5/ B18C7 1797cc Inline 4 VTEC	4B1925H	Std.,.025,.25	5M1959H	Std.,.025,.25	1T1957	Std
	4B1925HX	Std	5M1959HX	Std		
Honda/Acura B20A/B21A/B21A1 DOHC only 1958cc/2056cc Inline 4	4B1936H	Std.,.025,.25	5M1957H	Std.,.025,.25	1T1957	Std
	4B1936HX	Std	5M1957HX	Std		
Honda B20B/B20Z 1972cc Inline 4	4B1946H	Std.,.025,.25	5M1959H	Std.,.025,.25	1T1957	Std
	4B1946HX	Std	5M1959HX	Std		
Honda/Acura D17A / D17Z 1668cc Inline 4	4B1980**	Std.,.25,.50,.75	5M1957H	Std.,.025,.25	1T1957	Std
			5M1957HX	Std		
Honda/Acura K20A3 1998cc Inline 4	4B1906H	Std.,.025,.25, .50	5M1959H	Std.,.025,.25	1T1957	Std
	4B1906HX	Std	5M1959HX	Std		
Honda/Acura K20A2 / K20Z1 / K24A / K24Z1 1998cc/2354cc Inline 4	4B1972H	Std.,.025,.25	5M1959H	Std.,.025,.25	1T1957	Std
	4B1972HX	Std	5M1959HX	Std		
Honda F20A, F22A, F22B 1997cc/2156cc Inline 4	4B1936H	Std.,.025,.25				
	4B1936HX	Std				
Honda F18B / F20B 1850cc, 1997cc Inline 4	4B1946H	Std.,.025,.25				
	4B1946HX	Std				

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Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Honda F20C / F22C 1997cc/2157cc Inline 4	4B1912HX	Std,.025,.25	5M1913HX	Std,.025,.25		
	4B1912HX	Std	5M1913HX	Std		
Honda H22A / H22Z 2157cc Inline 4	4B1912H	Std,.025,.25	5M1957H (1998 on)	Std,.025,.25	1T1957 (1998 on)	Std
	4B1912HX	Std	5M1957HX (1998 on)	Std		
Honda F23A / F23Z (1998 on) 2254cc Inline 4	4B1906H	Std,.025,.25, .50	5M1957H	Std,.025,.25	1T1957	Std
	4B1906HX	Std	5M1957HX	Std		
Honda J32, J35 3.2L, 3.5L V6	6B1995H	Std,.025,.25	4M1996H	Std,.025,.25		
	6B1995HX	Std	4M1996HX	Std		
Hyundai G4KF 2.0T (Theta II, 2010 on) 1998cc Inline 4 Turbo - Genesis, Sonata	4B1293H	Std,.025,.25	5M1295H	Std,.025,.25		
	4B1293HX	Std	5M1295HX	Std		
Hyundai G6DA/DB/DC/DH (Lambda) 3.3/3.5/3.8L V6 (inc Turbo) - Genesis	6B8598H	Std,.025,.25	4M8599H	Std,.025,.25		
	6B8598HX	Std	4M8599HX	Std		
Kia G6DA/DB/DC/DH (Lambda) 3.3/3.5/3.8L V6 (inc Turbo) - Stinger	6B8598H	Std,.025,.25	4M8599H	Std,.025,.25		
	6B8598HX	Std	4M8599HX	Std		
Lancia Delta HF Integrale 1995cc Inline 4 Turbo	4B2904H	Std,.025,.25	5M2908H	Std,.025,.25		
	4B2904HX	Std	5M2908HX	Std		
Mazda 2.0L LF MZR (Duratec) Mazda 3, MX-5	4B4390H	Std,.025,.25				
	4B4390HX	Std				
Mazda 2.3L L3 MZR (Duratec) Mazda 3, 6, Tribute	4B8170H	Std, .025, .25				
	4B8170HX	Std				
Mazda 2.3L L3-VDT DISI Turbo (Duratec) Mazda 3 MPS, 6 MPS, CX-7	4B8172H	Std,.025,.25				
	4B8172HX	Std				
Mazda B1 , B3, B5, Z5-DE 1.1L, 1.3L, 1.5L Inline 4	4B8331**	Std,.25,.50,.75,1.0,1.25,1.5	5M8353H	Std,.025,.25,.50	1T8353	Std
			5M8353HX	Std		
Mazda B6/B6-T, BP/BP-T, ZL-VE, ZM-DE 1.5L, 1.6L, 1.8L Inline 4	4B8351H	Std,.025,.25,.50	5M8353H	Std,.025,.25,.50	1T8353	Std
	4B8351HX	Std	5M8353HX	Std		
Mini N12/N14/N16/N18B16 1598cc Inline4 (Prince) 2006 - 2015	4B7787H	Std, .025, .25	5M7788H	Std, .025, .25		
	4B7787HX	Std	5M7788HX	Std		
Mini (BMW) W10B16 1598cc Inline 4 One/Cooper	4B2903H	Std,.025,.25				
	4B2903HX	Std				
Mini (BMW) W11B16 Supercharged 1598cc Inline 4 Cooper S	4B2902H	Std,.025,.25				
	4B2902HX	Std				
Mitsubishi 4G30/31/32/33/35/36/37 1.2L,1.3L,1.4L,1.5L,1.6L,1.7L,1.8L Inline 4	4B1146H	Std,.025,.25	5M1144H	Std,.025,.25		
	4B1146HX	Std	5M1144HX	Std		

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**PERFORMANCE ENGINE BEARINGS**

Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Mitsubishi 4G61/4G61T/4G62/G62BT 1.6L, 1.8L Inline 4	4B1146H	Std.,.025,.25	5M1144H	Std.,.025,.25		
	4B1146HX	Std	5M1144HX	Std		
Mitsubishi 4G63/4G63T/4G64 (1983-1992)	4B1146H	Std.,.025,.25	5M1144H	Std.,.025,.25		
	4B1146HX	Std	5M1144HX	Std		
Mitsubishi 4G63/4G63T/4G64 (1992-97 with flange main)	4B1185H	Std.,.025,.25	5M1186H	Std.,.025,.25		
	4B1185HX	Std	5M1186HX	Std		
Mitsubishi 4G63/4G63T/4G64 (1997 on with T/W)	4B1185H	Std.,.025,.25	5M1219H	Std.,.025,.25	1T1219	Std
	4B1185HX	Std	5M1219HX	Std		
Mitsubishi 4G91/4G92/4G93/4G93-T 1.5L/1.6L/1.8L Inline 4	4B8036H	Std, .25	5M8037H	Std, .25	1T8037	Std
Mitsubishi 4G94 2.0L Inline 4	4B8050H	Std.,.025,.25	5M8037H	Std, .25	1T8037	Std
	4B8050HX	Std				
Mitsubishi 4B11T (EVO X) Lancer Evolution 2.0L Inline 4	4B1236H	Std.,.025,.25	5M1237H	Std.,.025,.25	1T1237	Std
	4B1236HX	Std	5M1237HX	Std		
Mitsubishi 4M41 Turbo Diesel 3.2L Inline 4	4B1800H	Std				Std
Mitsubishi 6G72, 6G72T, 6G73 3.0L/2.5L V6	6B1140H	Std.,.025,.25	4M1149H	Std.,.025,.25	2T1149	Std
	6B1140HX	Std	4M1149HX	Std		
Nissan CA16, CA18, CA18DET, CA20, CD17 1.6L/1.7L/1.8L/2.0L Inline 4	4B1630H	Std.,.025,.25,.50	5M1633H	Std.,.025,.25,.50		
	4B1630HX	Std	5M1633HX	Std		
Nissan CD20, CD20-T Diesel/Turbo Diesel 2.0L Inline 4			5M1633H	Std.,.025,.25,.50		
			5M1633HX	Std		
Nissan KA24DE 2389cc Inline 4 (240SX)	4B2746H	Std.,.025,.25	5M2747H	Std.,.025,.25	RB4105	
	4B2746HX	Std	5M2747HX	Std		
Nissan MR16DDT 1.6L Inline 4 Turbo			5M2905H	Std.,.025,.25		
			5M2905HX	Std		
Nissan RB20E, RB20S (SOHC) 2.0L Inline 6	6B2389**	Std.,.25,.50,.75,1.0	7M2394H	Std.,.025,.25,.50	RB4107	
			7M2394HX	Std		
Nissan RB20DE, RB20DET (DOHC) 2.0L Inline 6	6B2630H	Std.,.025,.25	7M2394H	Std.,.025,.25,.50	RB4074	
	6B2630HX	Std	7M2394HX	Std		
Nissan RB25DE, RB25DETT 2.5L Inline 6	6B2960H	Std.,.025,.25,.50	7M2394H	Std.,.025,.25,.50	RB4074	
	6B2960HX	Std	7M2394HX	Std		
Nissan RB26DETT 2.6L Inline 6	6B2960H	Std.,.025,.25,.50	7M2428H	Std.,.025,.25,.50	RB4074	
	6B2960HX	Std	7M2428HX	Std		
Nissan RB30/RB30ET 3.0L Inline 6	6B2390H	Std.,.025,.25,.50	7M2394H	Std.,.025,.25,.50	RB4074	
	6B2390HX	Std	7M2394HX	Std		
Nissan RD28/RD28E/RD28T 3.0L Inline 6 Diesel / Turbo Diesel	6B2930**	Std.,.25,.50,.75,1.0	7M2394H	Std.,.025,.25,.50		
			7M2394HX	Std		
Nissan SR20DE/DET (non GTiR) 2.0L Inline 4	4B2960H (17mm wide)	Std.,.025,.25,.50	5M2964H	Std.,.025,.25,.50	1T2964	Std
	4B2960HX	Std	5M2964HX	Std		
Nissan SR20DET (GTiR) 2.0L Inline 4	4B2976H (19mm wide)	Std.,.025,.25	5M2975H (5 oil holes in upper)	Std.,.025,.25	1T2964	Std
	4B2976HX	Std	5M2975HX	Std		
Nissan TB42/TB45/TB48 L6 4.2L/4.5L/4.8L Inline 6	6B2955H	Std.,.025,.25				
	6B2955HX	Std				
Nissan TD25, TD27 (Navara) 2494cc, 2663cc Inline 4 Diesel	4B2966H	Std.,.025,.25	5M2965H	Std.,.025,.25	2T1367	Std
	4B2966HX	Std	5M2965HX	Std		
Nissan TD42 (Patrol) 4169cc Inline 6 Diesel	6B2966H	Std.,.025,.25	7M2965H	Std.,.025,.25	2T1367	Std
	6B2966HX	Std	7M2965HX	Std		
Nissan VG20E/VG20ET/VG20DET 2.0L V6			4M2737H	Std, .025, .25		
			4M2737HX	Std		

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# PERFORMANCE ENGINE BEARINGS

Application	Rod Bearing Set	Sizes	Main Bearing Set	Sizes	Cam Bearing Set / Thrustwasher Set / Piston Pin Bush	Size
Nissan VG30E/VG30ET/VG30I/VG33E 3.0L/3.3L V6	6B2390H	Std.,.025,.25,.50	4M2737H	Std.,.025,.25,.50		
	6B2390HX	Std	4M2737HX	Std		
Nissan VG30DE/VG30DETT 3.0L V6	6B2390H	Std.,.025,.25,.50	4M2737H	Std.,.025,.25,.50		
	6B2390HX	Std	4M2737HX	Std		
Nissan VQ20DE/VQ25DE/VQ25DET VQ30DE/VQ30DET 2.0L/2.5L/3.0L V6	6B2630H	Std.,.025,.25	4M2633H	Std.,.025,.25	2T2633	Std
	6B2630HX	Std	4M2633HX	Std		
Nissan VQ35DE 3.5L V6	6B2640H	Std.,.025,.25	4M2633H	Std.,.025,.25	2T2633	Std
	6B2640HX	Std	4M2633HX	Std	6RB4128 (set of 6)	
Nissan VR38DETT (GT-R R35) 3.8L V6 Twin Turbo	1B2500H	Std-0/1/2 (Graded)*	1M2505H	Std-0/1/2/3/4 (Graded)*	1T2505	Std
	6B2500H	Std.,.25	4M2505H	Std.,.25		
Nissan VK45, VK50, VK56 4.5L, 5.0L, 5.6L V8	8B2990H	Std.,.025,.25	5M2995H	Std.,.025,.25	2T2995	Std
	8B2990HX	Std	5M2995HX	Std		
Nissan ZD30, QD32 2953cc, 3153cc Inline 4 Diesel	4B2966H	Std.,.025,.25	5M2965H	Std.,.025,.25	2T1367	Std
	4B2966HX	Std	5M2965HX	Std		
Opel 1.6/1.8/2.0/2.4L Family II	4B2322H	Std.,.025,.25,.50	5M2327H	Std.,.025,.25,.50		
	4B2322HX	Std	5M2327HX	Std		
Opel Z28NEL, Z28NET, Z32SE 2.8L Turbo, 3.2L V6	6B2270H	Std.,.025,.25	4M2273H	Std.,.025,.25		
	6B2270HX	Std	4M2273HX	Std		
Peugeot/Citroen EP6/EP6DT 1598cc Inline4 (Prince)	4B7787H	Std.,.025,.25	5M7788H	Std.,.025,.25		
	4B7787HX	Std	5M7788HX	Std		
Peugeot XU9/XU10/XU10J2/XU10J4/XU10M 1905cc, 1998cc Inline 4	4B7700H	Std, .25				
Peugeot TU9/XV3/XV5/XV8 954cc Inline 4	4B7712H	Std, .30, .50			1T7707	Std, +.15
	4B7712HX	Std				
Peugeot TU3.2/TU3J2/TU5JP/TU5JP4 1360cc/1587cc Inline 4	4B7712H	Std, .30, .50	5M2797H	Std, .30, .50	1T7707	Std, +.15
	4B7712HX	Std	5M2797HX	Std		
Peugeot TU1/TU2.4/TU2J2/XW3/XW7 1124cc/1294cc Inline 4	4B7712H	Std, .30, .50			1T7709	Std, +.10
	4B7712HX	Std				
Peugeot TU3A/TU3CP/TU3M/TU3S XY6/XY7/XY8 1360cc Inline 4	4B7712H	Std, .30, .50			1T7709	Std, +.10
	4B7712HX	Std				
Peugeot TU1JP/TU3JP/TU5J2/TU5J4 XU5J/XU5JP 1124/1360/1580/1587cc Inline 4	4B7712H	Std, .30, .50	5M2797H	Std, .30, .50	1T7709	Std, +.10
	4B7712HX	Std	5M2797HX	Std		
Peugeot TU3JP (2005 on), TUD5 (Diesel) 1360cc/1587cc Inline 4			5M2797H	Std, .30, .50	1T7709	Std, +.10
			5M2797HX	Std		
Peugeot EW7/EW10/EW12 1749cc, 1997cc, 2230cc Inline 4	4B7736H	Std, .30				

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Peugeot XU7JB, XU7JP, XU7JP4 1761cc Inline 4	4B7736H	Std, .30				
Porsche 911/914 1964 - 1971 1990cc/2193cc H6	6B2452H	Std,.025,.25				
	6B2452HX	Std				
Porsche 911/930 1971-1977 2341cc/2687cc/2994cc H6	6B2455H	Std,.025,.25				
	6B2455HX	Std				
Porsche 911 1978-1989 2993cc/3164cc H6	6B2462H	Std,.025,.25				
	6B2462HX	Std				
Porsche 930 1978-1989 3299cc Turbo H6	6B2463H	Std,.025,.25				
	6B2463HX	Std				
Porsche 911 (964, 993) 1989-1997 3600cc, 3746cc H6	6B2463H	Std,.025,.25				
	6B2463HX	Std				
Renault 129-5/XZ7R, 150-X5J 1219cc/1360cc Inline 4	4B7712H	Std, .30, .50				
	4B7712HX	Std				
Renault F1N, F2N, F2R, F3N, F3P, F3R F7P, F7R 1721cc,1794cc,1763cc,1998cc Inline 4	4B7820H	Std, .25, .50	5M7807H	Std, .25, .50	1T7807	Std, +10
	4B7820HX	Std	5M7807HX	Std	RB4122	Semi
Renault F8M, F8Q 1595cc/1870cc Inline 4 Diesel	4B7820H	Std, .25, .50	5M7807H	Std, .25, .50	1T7807	Std, +10
	4B7820HX	Std	5M7807HX	Std		
Saab B202/4/5/6, B234/5 1985cc, 2290cc inline 4 (inc. turbo)	4B2010H	Std, .25	5M2015H	Std, .25		
Saab LP9 2.8L Turbo V6 9-3, 9-5	6B2270H	Std,.025,.25	4M2273H	Std,.025,.25		
	6B2270HX	Std	4M2273HX	Std		
Subaru EJ15/EJ16 1493cc/1597cc H4	4B8296H (suits 52 mm journal size)	Std,.025,.25,.50	5M8297H (for thrust in #3 position)	Std,.025,.25,.50		
	4B8296HX	Std	5M8297HX	Std		
	4B8320H (suits 48 mm journal size)	Std,.025,.25,.50				
	4B8320HX	Std				
Subaru EJ18/EJ20/EJ22/EJ25 EJ20T/EJ20TT/EJ22T/EJ25T (Turbo/Twin Turbo)1820cc/1994cc/ 2212cc/2457cc H4	4B8296H (suits 52 mm journal size)	Std,.025,.25,.50	5M8309H (for thrust in #5 position)	Std,.025,.25,.50	RB4125	Semi
	4B8296HX	Std	5M8309HX	Std		
	4B8320H (suits 48 mm journal size)	Std,.025,.25,.50	5M8297H (for thrust in #3 position)	Std,.025,.25,.50		
	4B8320HX	Std	5M8297HX	Std		
Subaru EJ25T (Turbo) 2457cc H4	4B8296H (suits 52 mm journal size)	Std,.025,.25,.50	5M8309H (for thrust in #5 position)	Std,.025,.25,.50	RB4125	Semi
	4B8296HX	Std	5M8309HX	Std		
Subaru FA20 (BRZ) 1998cc Flat4	4B8310H	Std,.025,.25	5M8312H	Std,.025,.25		
	4B8310HX	Std	5M8312H	Std		
Suzuki GSX-R1000 988/999cc Inline 4 (Motorcycle)	4B8430H	Std,.025,.25				
	4B8430HX	Std				
Suzuki Hayabusa 1299cc Inline 4 (Motorcycle)	4B8431H	Std,.025,.25	5M8434H	Std,.025,.25		
	4B8431HX	Std	5M8434HX	Std		
Suzuki G13A/G13B/G13BA/G13BB 1298cc/1324cc Inline 4	4B8336H	Std,.25,.50	5M8337H	Std,.25,.50	1T8337	Std
	4B8336HX	Std	5M8337HX	Std		
Suzuki M16A Liana, Grand Vitara, Swift 1586cc Inline 4	4B8440H	Std,.025,.25	5M8443H	Std,.025,.25		
	4B8440HX	Std	5M8443HX	Std		
Toyota 1AZ-FE, 2AZ-FE, 2AZ-FXE 1998cc, 2362cc Inline 4	4B8411H	Std,.025,.25	5M8412H	Std,.025,.25	1T8412	Std
	4B8411HX	Std	5M8412HX	Std		

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Toyota 1FZFE Landcruiser 4476cc Inline 6	6B7990H	Std.,.025,.25	7M7989H	Std.,.025,.25	2T7989	Std
	6B7990HX	Std	7M7989HX	Std		
Toyota 1GR-FE 3456cc V6 (Landcruiser, Tundra)	6B8262H	Std.,.025,.25	4M8263H	Std.,.025,.25	2T8263	Std
	6B8262HX	Std	4M8263HX	Std		
Toyota 1HZ (Landcruiser) 4164cc Inline 6 Diesel	6B8396H	Std.,.025,.25	7M8397H	Std.,.025,.25	2T8397	Std
	6B8396HX	Std	7M8397HX	Std		
Toyota/Lexus 1JZGE/1JZGTE 2492cc 2JZGE/2JZGTE 2997cc Inline 6	6B8100H	Std.,.025,.25	7M8103H	Std.,.025,.25	2T8103	Std
	6B8100HX	Std	7M8103HX	Std		
Toyota 1RZ, 2RZ, 2TZ, 3RZ 1998cc, 2438cc, 2693cc Inline 4	4B8376H	Std.,.025,.25	5M8378H	Std.,.025,.25	2T8377	Std
	4B8376HX	Std	5M8378HX	Std		
Toyota 1S, 2S, 3S, 4S, 5S 1832cc, 1838cc, 1995cc, 1998cc, 2164cc Inline 4			5M8361H	Std.,.025,.25,.50	2T1689	Std
			5M8361HX	Std		
Toyota/Lexus 1UZFE/2UZFE/3UZFE 3969cc/4664cc/4293cc V8	8B8091H	Std.,.025,.25,.50	5M8088H	Std.,.025,.25,.50	2T8092	Std
	8B8091HX	Std	5M8088HX	Std		
Toyota 2A, 3A, 4A, 5A, 6A, 7A 1298cc, 1397cc, 1452cc, 1587cc, 1762cc Inline 4			5M1695H (1983 on)	Std.,.025,.25,.50	2T1695	Std
			5M1695HX	Std		
Toyota 2GR-FE 3456cc V6 (Lotus Evora, Exige)	6B8466H	Std.,.025,.25	4M8468H	Std.,.025,.25	1T8468	Std
	6B8466HX	Std	4M8468HX	Std		
Toyota/Lotus 2ZZ-GE 1796cc Inline 4 (Lotus Elise, Exige)	4B1856H	Std.,.025,.25	5M1857H	Std.,.025,.25	1T1853	Std
	4B1856HX	Std	5M1857HX	Std		
Toyota 3SGE, 3SGTE 1998cc Inline 4	4B8366H	Std.,.025,.25,.50	5M8361H	Std.,.025,.25,.50	2T1689	Std
	4B8366HX	Std	5M8361HX	Std		
Toyota 4AGE, 4AGZE, 4A-GEC, 4A-GELC 1587cc Inline 4	4B1780H	Std.,.025,.25,.50	5M1695H	Std.,.025,.25,.50	2T1695	Std
	4B1780HX	Std	5M1695HX	Std		
Toyota 4U-GSE (86) 1998cc Flat 4	4B8310H	Std.,.025,.25	5M8312H	Std.,.025,.25		
	4B8310HX	Std	5M8312H	Std		
VW 1595cc, 1781cc (incl. Turbo), 1984cc, 1998cc Polo, Caddy, Golf, Jetta, Passat (1983-2003)	4B1606H	Std.,.025,.25,.50	5M1644H	Std.,.25,.50	2T1644	Std
	4B1606HX	Std	5M1644HX	Std		
VW 1781cc Turbo, 1984cc (incl Turbo) Polo, Golf, Jetta, Eos, Passat (2000 on)	4B1609H	Std.,.025,.25				
	4B1609HX	Std				
VW TFSI 1984cc 4 cyl. (EA888) Golf R (Mk7)	4B5562H	Std.,.025,.25				
	4B5562HX	Std				
VW VR6 2792cc, 2861cc, 3189cc, 3597cc	6B5530H	Std.,.025,.25	7M5532H	Std.,.025,.25	2T5532	Std
	6B5530HX	Std	7M5532HX	Std		
Volvo B200, B204, B230, B234 (incl. Turbo) 1986cc, 2316cc Inline 4	4B2726H	Std				

HX - 0.001" extra clearance on Standard journal. HD - Bearing has dowel hole location.

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