

BALANCED BY: DG MACHINE

JOB NO.: 4359

DATE: 10-28-18

CUSTOMER NAME: ROGER YOUNG PHONE: _____

ADDRESS: _____

CITY: _____ STATE: _____ ENGINE TYPE: 372 5B CHEV

CRANKSHAFT TYPE: 4340 SCAT STROKE: 3.48"

NOTES: INTERNAL

- BOB WEIGHT INFORMATION -

PISTON 524.0

PIN + 107.0

LOCKS + 3.5

RINGS + 29.5

ROD(SMALL END) + 140.0

TOTAL = 804.0

PISTONS/THROW x 2

RECIPROCATING WEIGHT = 1608.0

BALANCE FACTOR x 50.0

RECIPROCATING WEIGHT = 804.0

INSERT 42.5

ROD(BIG END) + 349.0

RODS/THROW x 2

OIL + 12.0

ROTATING WEIGHT = 795.0

BOB WEIGHT = 1599.0

SUNNEN DCB-750 CRANKSHAFT BALANCER

DG MACHINE

3240 B STREET NW SUITE B
AUBURN, WA. 98001
253-735-1373

INVOICE #	A34641	11/05/18
ENGINE	372 SB CHEV	
BORE	4.125"	
RODS GRP 80668	6.000"	
CRANK 7-350-3480-5700R SCAT	3.480"	
MAIN BEARINGS MS909H	.0028"	
ROD BEARINGS CB663HXND	.003"	
THRUST CLEARANCE	.005"	
ROD SIDE CLEARANCE	.014"/.017"	
PISTONS WISECO CUSTOM	WD 07735 .004"	
RINGS JE	JG7708-4125-5	
TOP	.022"	
2ND	.023"	
CAMSHAFT		
INTAKE		
EXHAUST		
CAM INSTALL @		
VALVE LASH HOT		
MAIN TORQUE	70LBS	
ROD TORQUE	46LBS	
BALANCE #	#4359	
PUSHRODS		
HEAD TORQUE		

DECK - .011"



RING INSTALLATION GUIDELINES



IMPORTANT: BEFORE FILING RINGS – Check each individual ring in its corresponding piston ring groove, to ensure proper ring groove depth (radial back clearance) and side clearance (thickness)(fig. 2). Proper cylinder finish (honing), ring end-gap, and lubrication are critical to achieving optimum ring seal.

Radial Thickness

The domestic industry standard for piston ring radial width is referred to as “D-Wall”. The Society of Automotive Engineers (SAE) has established this standard as bore size divided by 22. (fig. 1) For example, a D-Wall piston ring for a 4.00” bore would have a radial thickness of $4.00/22 = .182$ ”. In other applications, such as import and racing, reduced radial thickness (back cut) rings, Dykes, and gas ported pistons can provide greater radial pressures and better sealing characteristics under high cylinder pressures. However, these ring types have lower radial tension in the unloaded position, which reduces friction and drag.

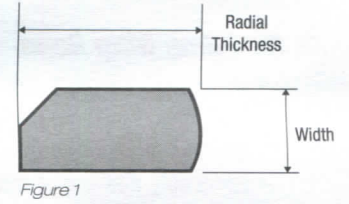


Figure 1

Side (Lateral) Clearance

Side (Lateral) Clearance – Side, or lateral, clearance is the difference between the width of the ring groove and the width of the ring itself. SAE standards recommend .002”-.004”, however many engine builders in the racing and high performance industries use clearances tighter than this. (fig. 2) Piston ring side clearances less than .001” will result in damage to pistons and rings as well as loss of compression and performance.

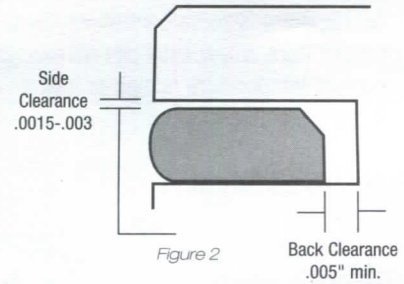


Figure 2

Back Clearance

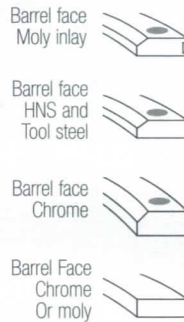
Back clearance is the difference between the depth of the ring groove and the radial thickness of the ring. Ring groove depths are typically made greater than the radial widths of the rings themselves in order to compensate for varying coefficients of thermal expansion. Theoretical optimum back clearance is zero, however this is not practical under actual operating conditions as the rings would likely bottom-out within the grooves and result in engine damage. (fig. 2)

Ring Types

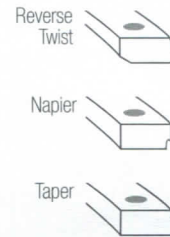
Table 1

	Top Ring	2nd Ring	Oil Ring Rail
Application	Min. Gap Per Inch of Bore		Minimum Gap
High-Perf. Street-Strip	Bore x .0045"	Bore x .0050"	min .015"
Street Moderate Turbo/Nitrous	Bore x .0050"	Bore x .0055"	min .015"
Late Model Stock	Bore x .0050"	Bore x .0053"	min .015"
Circle Track / Drag Race	Bore x .0055"	Bore x .0057"	min .015"
Nitrous Race Only	Bore x .0070"	Bore x .0065"	min .015"
Blown Race Only	Bore x .0060"	Bore x .0060"	min .015"

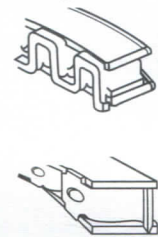
Top Rings



2nd rings



Oil Rings



Additional Ring Installation Guidelines

- Rings with a marking - Install with marking facing up.
- Rings with no marking and bevel - Install with bevel facing up.
- Rings with no marking and no bevel - Install either side up.
- **CAUTION! Chrome Rings must not be used on chrome cylinders.**



End Gap

End gap is the clearance between the two ends of a piston ring as it is installed in a cylinder. Most high performance and racing engine builders purchase piston rings slightly oversized in order to file fit them to very precise end gaps. Testing has shown measurable increases in horsepower and decreases in blow-by as a result of properly fitting the ring end gap to the operating conditions. Factors such as supercharging, turbocharging, nitrous oxide, endurance racing and different fuels determine proper ring end gap. Proper ring end gap can be more than double from one engine to the next depending upon the above factors.

At operating temperature, the top ring end gap should be as small as possible. Precise machining of the cylinder bores is critical, and is the reason why rings should be fitted to the cylinder in which they are to be installed. A diameter variance from one cylinder to the next changes the end gap of the rings in that cylinder by a factor of pi (3.1416). For example, a cylinder .001” larger in diameter will increase the ring end gap by $.001 \times 3.1416 = .003$ ”, rounding off, which could increase cylinder leakage in that cylinder and decrease performance.

Installation Guidelines

- Always Install Pro Seal rings with marks (top of ring indicators) toward the top of the piston.
- Always stagger end gaps on each of the ring grooves, oil rails and expander (See ring orientation diagram below).
- Always use a ring expander when installing rings.
- Always lubricate new rings with clean engine oil - no dry starts!
- Do not "spiral" the rings into the pistons. This will result in ring deformation after installation, causing poor sealing.
- Do not over-expand the rings. Over-expansion can lead to ring breakage opposite the gap or ring distortion.

Hints for Filing Ring Gaps

- JE strongly recommends using a professional quality ring grinder
 - If a ring grinder is not available, file from outside face toward inside diameter to avoid chipping the face coating (fig. 3)
 - Filing only one end of the ring allows you to use the other end as a reference - to verify that the gap remains straight and parallel.
 - Remove sharp corners by hand stoning / deburring all gapped edges.
- * NOTE: There is some controversy as to the effect of coolant temperatures on ring end gaps. Some engine builders feel that if coolant temperature is low, they can narrow up on ring gaps - Not true! Piston and ring temperatures remain approximately the same whether the coolant temperature is high or low. If you consider thermal growth or expansion, the engine with a higher coolant temperature would have larger bores than the engine with lower temperature.

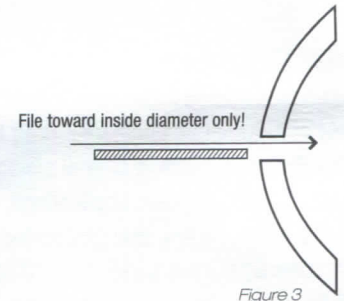


Figure 3

Oil Ring and Rail Support



Figure 4 ▲ No Overlap

Oil Ring Diagrams/Installation

1. Make sure oil ring expander ends are butted properly and do not overlap. (fig. 4)
2. Install top oil ring rail in a counter-clockwise direction and the bottom rail in a clockwise direction with gaps positioned as in the ring installation diagram. (fig. 5)

Ring Orientation Diagram

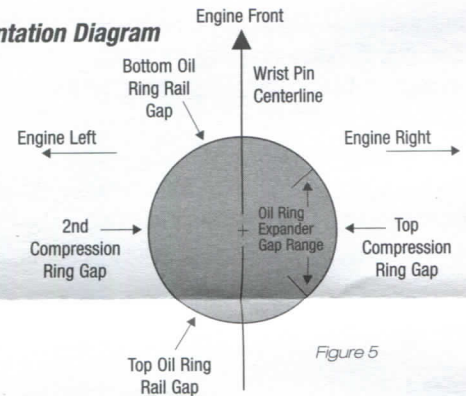


Figure 5

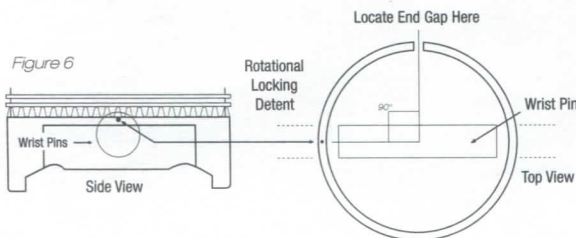


Figure 6

Oil Ring Support Rails Installation

1. Install oil ring support rails on the bottom of the oil ring groove with the antirotational locking detent facing downward.
2. Rotate the oil ring support rail until antirotational locking detent falls between opening at intersection of ring groove and wrist pin hole. (fig. 6)
3. Install oil ring assembly as usual.

Sets Containing Rail with a Tab

For sets containing one regular rail and one tab rail per cylinder. Tab rail can be installed above or below oil ring expander with tab pointing toward expander (fig. 7). If installed in horizontally opposed engine, rail gaps should be installed as shown at right.

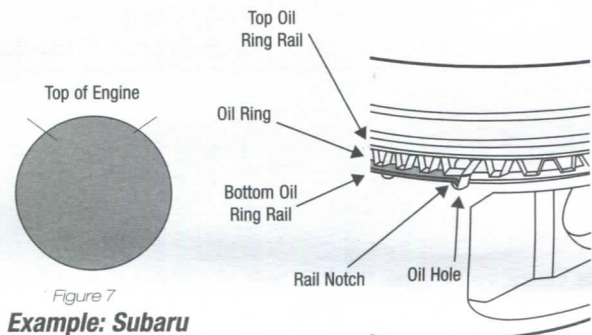


Figure 7

Example: Subaru

Boring and Honing

Boring and honing is becoming a very complicated subject as cylinder finishes become more refined and oils become more slippery. There are a number of different honing procedures depending upon ring material, ring tension, block material and application. If you have any questions about how your cylinder should be honed, please contact your honing representative or professional engine building machine shop.

Custom Order Piston Kit Specifications

Date: 09/26/2018

Made exclusively for:

Auto-Aero Consulting
18620 132nd Ave N.E.
DG/C&D only authorized users*****
Woodenville, WA 98072

Part #: WD-07735
Cust #: 1796E

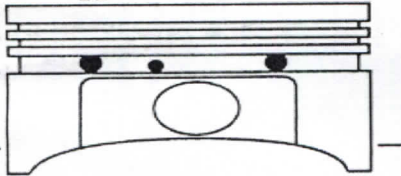
General Information

Forging #: F60017X
Comp Height: 1.260
Bore Size: 4.1250

(Measured at lowest point of piston skirt, or 1.300" from bottom of oil ring, as shown in sketch.)

1.300"

Suggested Clearance: 0.0040



Shape:

Weight @ Inspection 524.0-525.1 g

Piston Pins / Retainer Clips

Piston Pin #: S425
Diameter: .927
Length: 2.500
Retainer Clip #: CS24
Width or Wire Dia: .0720

Rings

Oil Rail Support #:
Ring Type:

	Land Thick	Grv Width	Grv Root Dia
Top Ring	.2250	.0435	3.717
Second Ring	.1800	.0435	3.7316
Third Ring	.0800	.1198	3.7760

Dome and Valve Pockets

Dome Rise: .4000 Dome Volume: 13.5
Deck Thickness: .230

	Intake	Exhaust
Valve Dia		
Pocket Dia	2.2250	1.7250
Angle	22.00	22.00
Rotation		
Depth from TE	-.3100	-.2500

Specifications and Installation Instructions for Wiseco Automotive Pistons

Piston to Cylinder Wall Clearance - Wiseco pistons are machined with a special cam and barrel design. When measuring for piston to wall clearance, measure at widest point of piston skirt 1.300" from bottom of oil ring groove, 90 degrees from piston pin hole.

Valve to Piston Clearance - Most Wiseco pistons are machined with valve pockets that are deeper and larger than stock. These pockets provide adequate valve clearance under most conditions. It is very important that valve to piston clearance be checked upon piston installation. This is necessary due to many variations in cams, how much a block has been decked or if the heads have been cut or angle milled.

CAUTION: Use only Wiseco Spiro Lox retainer clips in pistons manufactured for Spiro Lox clips and round wire retainer clips for pistons manufactured for round wire clips. Use only Wiseco part number retainer clips in Wiseco pistons. Substitution can result in severe engine damage. Wiseco also recommends that retainer clips are not reused.

WARRANTY DISCLAIMER *

Due to the nature of performance applications, the parts in this kit are sold without any express warranty or any implied warranty of merchantability or fitness for a particular purpose. Wiseco shall not, under any circumstances, be liable for any special, incidental or consequential damages, including, but not limited to, damage, or loss of profits or revenue, cost of purchased or replacement goods, or claims of customers of the purchaser, which may arise and/or result from sale, installation or use of these parts.

Installation of these parts could adversely affect vehicle manufacturer's



7201 Industrial Park Blvd. Mentor, OH 44060-5396
(440) 951-6600 Fax (440)951-6606



INSTRUCTIONS:

Thank you for purchasing a set of GRP connecting rods. We appreciate your business. You will notice our rod design is quite different from other manufacturers. This is partially due to the stress riser free design and the radial serration feature. Certain precautions must be taken as follows to ensure a long and trouble free service life.

First, remove the cap from the rod body assembly and wash all parts thoroughly. Apply **Motor Oil** to rod bolt and washer assembly. Install washer with the bevel facing the head of the bolt. This eliminates a stress concentration that can cause premature bolt failure. On rods with the pressed in hat washer this is not needed. Re-assemble the connecting rod. We still recommend using feeler gages to take up the side clearance but the radial serrations will locate the cap and body properly. We **strongly recommend** that you verify the torque by checking the rod bolt stretch. Our torque values are as follows.

ROD Serial # 80668

Bolt Size	Socket Size	Torque with oil	Stretch
5/16 Import/Compact	3/8 12 point	_____ ft./lbs.	.0048 - .0052"
3/8 Small Block 8740	3/8 12 point	_____ ft./lbs.	.0050 - .0055"
3/8 Small Block ARP 2000	3/8 12 point	<u>46</u> ft./lbs.	.0055 - .0060"
7/16 Small/Big Block	7/16 12 point	_____ ft./lbs.	.0055 - .006"
7/16 Small/Big Block L-19	7/16 12 point	_____ ft./lbs.	.0060 - .0065"
7/16 Hemi/Blown Alcohol	1/2 12 point	_____ ft./lbs.	.0060 - .0065"
7/16 Hemi/Blown Alcohol L-19	1/2 12 point	_____ ft./lbs.	.0070 - .0075"

Clearances:

Our recommendation for the vertical clearance on rods for drag racing use should be .0025-.0035 and the side clearance should be a minimum of .014 and maximum of .025. Pin fit to .0007-.0012. These specifications are for normally aspirated and nitrous applications. We have seen no advantage to opening up clearances beyond recommendations. For supercharged applications of alcohol or nitro-methane the vertical clearance should be .003-.006 and the side clearance should be .030-.050".

If we may be of assistance, please do not hesitate to contact us at (303) 935-7565.

Sincerely,

Brian Scollon

GRP Connecting Rods
WWW.GRPCONRODS.COM

333 West 48th Avenue Denver, Colorado 80216 303-935-7565 Fax 303-935-8048

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