



**MOTORCYCLE PISTONS**

# KB Performance Motorcycle Piston Tech Tips

**HYPEREUTECTIC PISTONS:** *The low thermal conductivity of this alloy requires engines running hypereutectic pistons to reduce total ignition timing 2 to 4 degrees. Final timing may vary with your application (example - nitrous).*

The spreadsheet below is for general clearance guidelines for KB pistons, but final sizing needs to be based on your application and conditions.

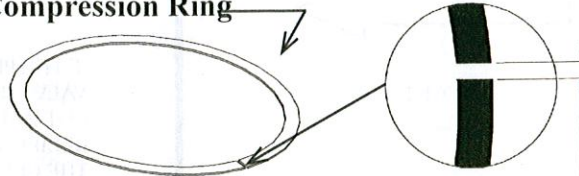
## HYPEREUTECTIC MOTORCYCLE APPLICATION

Your KB Hypereutectic motorcycle pistons are made from a high silicon aluminum alloy. Hypereutectic alloys have less thermal expansion and lower thermal conductivity than a typical cast or forged piston alloy. In addition to greater thermal properties, Hypereutectic alloys have 16% silicon which gives superior wear properties. *The low thermal conductivity of this alloy requires engines running hypereutectic pistons to reduce total ignition timing 2 to 4 degrees.*

## KB FORGED MOTORCYCLE APPLICATION

KB's Forged motorcycle line is supplied in 4032 alloy in new lightweight designs. It is important to remember that specifications for hypereutectic and forged applications be kept separate.

## Top Compression Ring



**IMPORTANT!!!** ring end gap

**IMPORTANT!!!** Calculating your top ring end gap.

To find proper ring end gap, multiply your bore size by the ring end gap factor listed on the chart (i.e. hypereutectic, Light duty 3.498" bore x .0065" gap factor =.022" total top ring end gap).

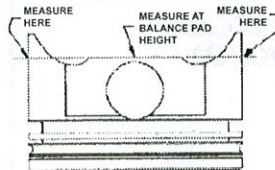
**Second Ring: Multiply the bore size by .004" factor minimum.**

Material Type	Minimum Piston Clearance				Ring End Gap Factor	
	Hypereutectic		Forged		Duty Type	
Bore Size	4.100 under	4.100 above	under 3.875f	3.875 above	Light duty	.0065
Clearance built into the piston all oversizes except STD	0.0015	0.0020	0.0025	0.0030	Medium Duty	.0008
Clearance built into the piston for STD only .005"	0.0015	0.0020	0.0025	0.0030	Heavy Duty	0.01

Standard pistons are given .001 less clearance. A 3.500 STD piston would be supplied at 3.4995. This is done so standard size engines can be honed .001 over, thus giving the clearance of .0015.

Note: Hypereutectic alloy used in KB motorcycle applications has a low rate of thermal expansion so care must be taken not to over clearance your engine. Street motors rarely need more than .0015 piston to wall clearance. For extreme applications, pistons rarely need more than .002 piston to wall clearance. Your clearance must be based on your application and variables.

## KB Hypereutectic and Premium Forged Motorcycle Pistons nominal clearances



The following standards are used on all KB Hypereutectic and Premium forged motorcycle coated and non-coated pistons. All KB motorcycle pistons come with clearance built into the piston. An example is a 3.500 hypereutectic piston at .030 over would have the cylinder bored to 3.530 and we would supply the piston at 3.5285 for a clearance of .0015. *Final piston clearance should be based solely on the demands of your application. Consideration should be given to such things as components being used, demands of the application, climatic conditions, fuel, desired compression ratio, just to mention a few. Typically, additional clearance is honed into the cylinder if more demanding applications are intended, and there may be cases where reduced clearance is acceptable. The chart above is for general clearance guidelines, but final sizing needs to be made based on your conditions. Hypereutectic and forged applications have different minimum clearance requirements.*

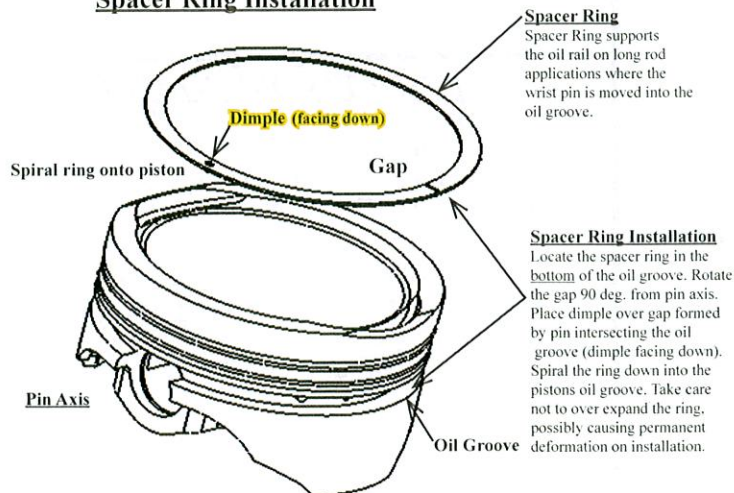
## Pin Lubrication and Installation

1. It's suggested a high quality engine assembly lube be used between pin and pin bore. Failure to properly lubricate may result in pin seizure. TORCO assembly lube supplied.
2. You should never use grease when lubricating the pin and pin bore. Grease acts as a dam and prevents oil from getting to the pin.

## Calculating Compression Ratios

When calculating compression ratios, KB treats a *dish* designed piston as a positive number. This is because a dish adds volume to the cylinder head. All KB *dish* pistons receive a positive cc volume. The reverse is true for all *dome* style pistons. Since the *dome* removes volume from the cylinder head we give all *domes* a negative cc volume. Remember this when calculating compression using your KB calculators.

## Spacer Ring Installation



## Spiral Retaining Ring Installation and Use



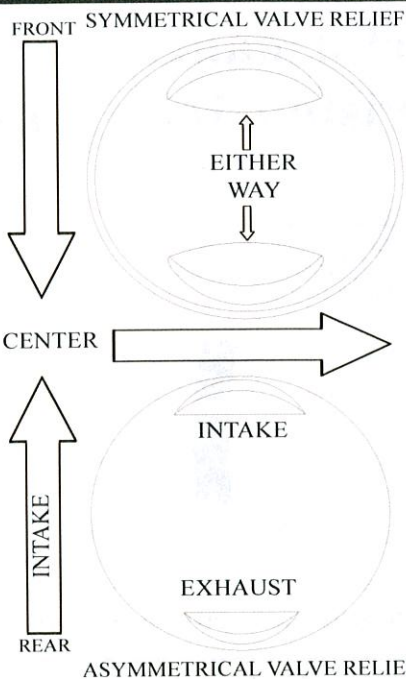
### Retaining Ring Installation:

1. The spiral retainer comes unsprung. KB suggests that you slightly spring the retainer about 1/2"-3/4" by grasping both ends and stretching it. This will help with installation.
2. Installation of the retaining ring. Place the end of the retaining ring into the retaining ring groove in the piston. Using a small screwdriver press the retaining ring in place. Move around the pinhole in a circular pattern to spiral the complete retainer into the groove. Make sure the retainer is completely in the groove as it will unwind and lead to failure.

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### INSTALLATION OF MOTORCYCLE PISTON WITH SYMMETRICAL AND ASYMMETRICAL VALVE RELIEFS

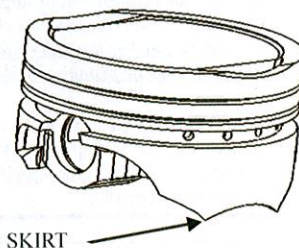
WHEN INSTALLING KB MOTORCYCLE PISTONS THAT HAVE SYMMETRICAL VALVE RELIEFS, THE PISTON CAN BE TURNED SO EITHER VALVE IS POINTING TOWARD THE CENTER OF THE ENGINE. THE PISTON CAN BE FIT IN EITHER THE FRONT OR REAR CYLINDER.

WHEN INSTALLING KB MOTORCYCLE PISTONS THAT HAVE ASYMMETRICAL VALVE RELIEFS (INTAKE LARGER THAN EXHAUST), THE INTAKE SHOULD ALWAYS BE ORIENTED TOWARD THE CENTER OF THE ENGINE. THE PISTON CAN BE IN EITHER THE FRONT OR REAR CYLINDER.

IF THE PISTON HAS SYMMETRICAL VALVE RELIEFS BUT HAS A RELIEF CUT IN THE SKIRT TIP, THE CUT RELIEF MUST BE ORIENTED TOWARD THE CENTER OF THE ENGINE. THE PISTON CAN BE FIT IN EITHER THE FRONT OR REAR CYLINDER.

PISTON WITH OFFSET PINS MUST BE ORIENTED AS SHOWN ON THE PISTON (FRONT AND REARS CANNOT BE CHANGED AROUND).

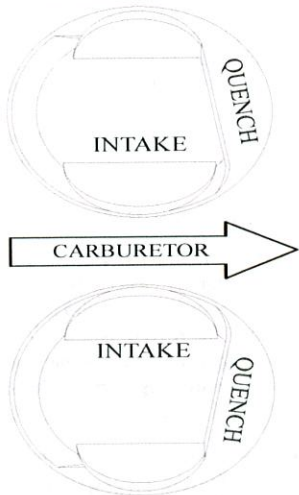
PISTON SKIRT TIP CLEARANCE SHOULD ALWAYS BE CHECKED



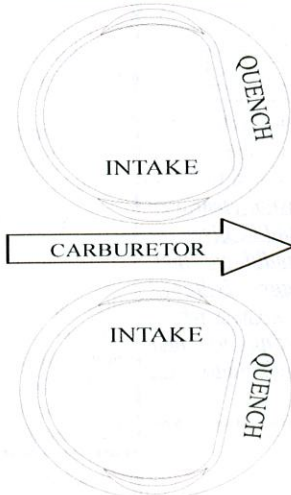
### INSTALLATION OF 883cc TO 1200cc CONVERSION AND 1340cc POP-UP

THESE PISTONS HAVE ASYMMETRICAL VALVE RELIEFS AND HEAD DESIGNS. PUT THE INTAKES TOWARD THE CENTER OF THE ENGINE AND THE QUENCH TOWARD THE CARBURETOR.

#### 1340cc POP-UP

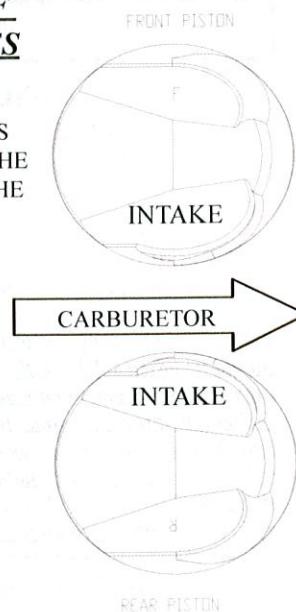
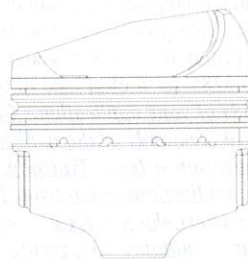


#### 883cc TO 1200cc CONVERSION



### INSTALLATION OF SPORTSTER DOMES

THE PISTONS ARE MARKED FRONT AND REAR. INTAKES TOWARD THE MIDDLE OF THE ENGINE. DOME TOWARD THE CARBURETOR.



### SPECIAL NOTES FOR KB263

OVERSIZES .060, .070, .080, ARE SUPPLIED WITH RING SETS THAT DO NOT MATCH THE OVERSIZES. RING SETS FOR .060 USE A STD. SET, .070 USE A .010 SET, AND .080 USE A .020 SET.

#### Warranty Disclaimer

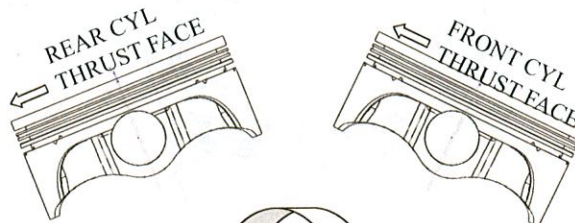
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The information contained in this instruction should not be considered absolute. Final decisions concerning the installation and use of these products are ultimately the responsibility of the customer. UEM makes no guarantee of warranty on emissions.

### OFFSET PIN ORIENTATION

THE FORGED KB MOTORCYCLE LINE IS SUPPLIED WITH OFFSET PINS. OFFSET PINS ARE DESIGNED TO QUIET YOUR ENGINE. THE OFFSET MUST ALWAYS BE TOWARDS THE THRUST FACE SIDE OF THE ENGINE.



CLOCKWISE ENGINE ROTATION FROM RIGHT SIDE OF BIKE