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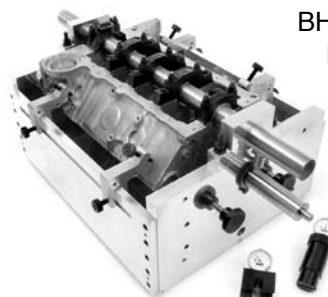
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An Introduction To Engine Blueprinting Using BHJ Fixtures

Blueprinting has become an industry standard for optimum performance and longevity in high performance building of both factory and aftermarket engine blocks. BHJ's world-renowned engine Blueprinting Fixtures introduced an entirely new level of precision and performance for engine builders and race teams of all sizes. Today, BHJ's Blueprinting Fixtures continue to provide machine shops using commonly-found machinery with the accuracy normally associated with much more costly CNC engine machining centers. The examples shown below illustrate the process of blueprinting a performance engine in the correct order, using BHJ Fixtures.

Line Boring The Mains & Cam Tunnel



BHJ's Line Boring Fixture bores main bearing or cam bearing bores in a wide variety of blocks. Using a common vertical mill, this fixture corrects the cam tunnel relationship to the crankshaft, thus eliminating timing inconsistencies and increasing valvetrain performance and longevity. Aftermarket caps are easily sized as well, using the main boring setup. (Page 4)

Indexing The Cam Tunnel



For shops equipped with an align-boring machine, the Cam Tunnel Alignment Fixture properly indexes the cam tunnel parallel to, and in line with, the crank centerline. A "cam-tunnel-only" alternative to the Line Boring Fixture. (Page 5)

Trueing The Deck Surfaces



BHJ's Blok-Tru corrects improperly-machined deck surfaces, by re-establishing crank-centerline parallelism and a true 45-degree angle to the cam-crank centerline. (Page 6)

Trueing Bore & Head Dowel Locations



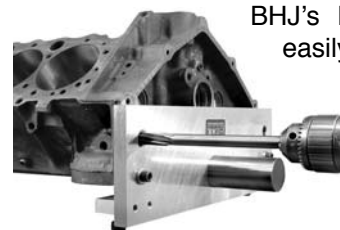
The Bor-Tru establishes proper cylinder bore location over the correct crankshaft centerline, as well as at the blueprint-correct center-to-center distance from one another. Cylinder head dowel locations can also be re-positioned for proper chamber-to cylinder alignment. (Page 9)

Indexing The Lifter Bores



The Lifter-Tru Kit allows lifter bore positions to be corrected in an engine block in front-to-rear and up-and-down orientations. The Kit also restores the correct lifter bore angle as referenced from the cam-crank centerline. Also popular for installation of Lifter Bore Sleeves. (Page 10)

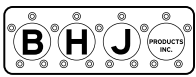
Aligning The Bellhousing



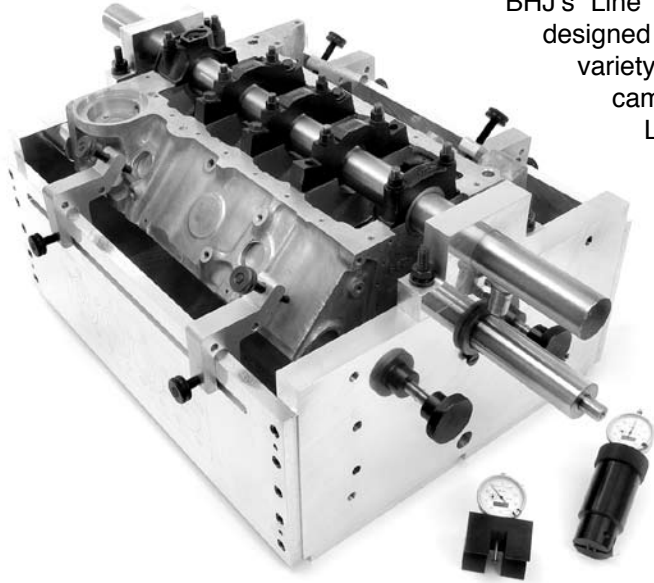
BHJ's Dowel-Tru Kit quickly and easily corrects bellhousing dowel-hole locations by placing them in the correct relationship to the crankshaft centerline. The Dowel-Tru eliminates guesswork and renders offset dowels obsolete. (Page 11)

Blueprinting Support Parts

All BHJ engine block Blueprinting Fixtures shown above utilize our 2" Precision Support Bar and Main Bearing Bore Adapter Rings. The Adapter Rings mount into the front and rear Mains to position the 2" Bar, which establishes the crank shaft centerline as the zero-datum point for setup and operation of these Fixtures. The Bar and Rings are sold separately. (Page 5)



Line Boring Fixture (LBF-1)



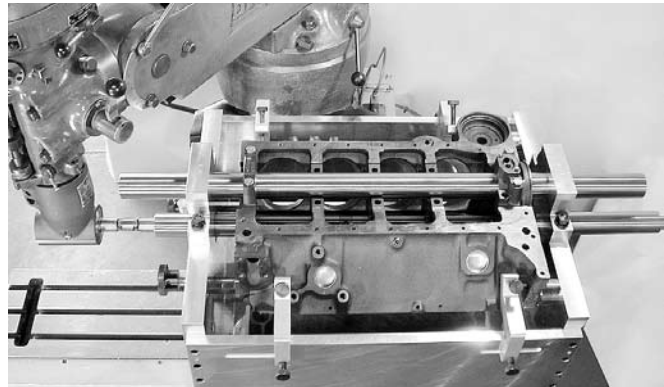
BHJ's Line Boring Fixture is an engine block Blueprinting Device designed to line bore main-bearing or cam-bearing bores in a wide variety of blocks. Whether roughing-in steel main caps or boring cam tunnels to install roller cam bearings, the heavy duty Line Boring Fixture provides the precise, accurate results demanded by high performance engine builders.

When boring cam tunnels for oversize Babbit or roller bearings, the Line Boring Fixture is the only system of its kind on the market that will correct the cam location in all three relationships to the crankshaft, making the cam tunnel absolutely parallel to the mains, straight in line with the mains and on the correct height through the block in relation to the mains. Any skew or twist in the cam tunnel is completely corrected as a result.

The function of machining the cam tunnel parallel to, and at the correct center-to-center distance from the mains is built into the fixture. The ability to index the block into

place, using the mains as the reference point, is left to the discretion of the operator. This method of set-up gives the operator the ability to position the block in the fixture for the best possible clean-up, based on the existing cam tunnel location, thus compensating for core shift and inaccurate factory machining. The amount of material to be removed from the deck surfaces will be minimized when the cam tunnel is located in this manner.

The large-diameter Boring Bar is supported by the fixture close to the block faces, thus reducing flex—normally experienced with smaller diameter boring bars on conventional line boring machines—to an absolute minimum. The resulting rigidity allows a greater cutting depth and reduces machining time while increasing accuracy and surface finish quality. The fixture enables the machinist to bore to the finished desired diameter, thus eliminating the need for line honing.



When used in the Main-boring configuration, the fixture is universal and will accommodate any block, up to a maximum length of 25". Cam-boring configurations are application-specific. Once an initial Line Boring Fixture has been purchased, Step-Up Kits provide greater flexibility of the fixture. Step-Up Kits allow Mains-to-Cam expansion, Cam-to-Mains expansion and the addition of engine families within the Cam-boring configuration. Only the minimum number of parts is included in any given Step-Up Kit to avoid duplicating parts supplied in the original Kit.



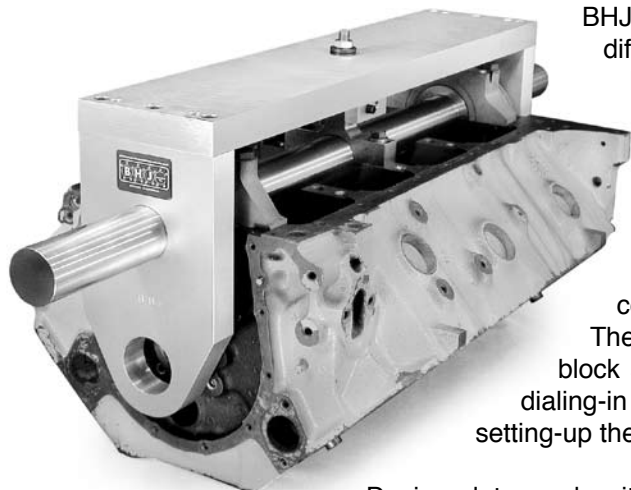
The Kit contents include all of the necessary Positioning and Clamping Hardware for set-up, one Boring Bar (for cam or mains), set-up Dial Indicators and a 90-degree Drive Head, which mounts to an existing vertical mill. An instructional DVD is included with each initial kit and is also available separately by calling BHJ. Also available is the Small Block Chevy Distributor Alignment Fixture, which indexes the cam tunnel boring location to the blueprint-correct distributor gear "sweet spot".

Use of the Line Boring Fixture requires the 2" Precision Support Bar and Main Bearing Bore Adapter Rings, which are sold separately and shown on page 5.

...Blueprinting Basics

Like the Line Boring Fixture, all of BHJ's Blueprinting Fixtures continue to provide machine shops using commonly-found machinery with the level of accuracy normally associated with much more costly CNC engine machining centers. Review the entire range of BHJ Fixtures in the Introduction To Engine Blueprinting section on page 3.

Cam Tunnel Alignment Fixture (CTA-1)



BHJ's Cam Tunnel Alignment blueprinting fixture solves the difficulties associated with setting-up blocks for cam tunnel align-boring, while adding a level of accuracy not before available on a conventional align boring machine.

Many shops have the necessary equipment to perform the cam tunnel align-boring operation. In most cases, zeroing on the existing cam bores sets the cam tunnel alignment relative to the front and rear cam bores only and does not correct the critical relationship between the cam and crankshaft.

The Line Boring Fixture aligns itself in the proper location on the block and the Fixture is then dialed-in on the machine, instead of dialing-in from the block. Machinists reportedly spend up to an entire day setting-up the block in "true" position and achieve only marginal results.

Designed to work with all align-boring machines, the Fixture corrects improper factory geometry, eliminates guesswork and reduces set-up time. The Fixture enables accurate set-up for boring the cam tunnel to ensure parallelism to the main bearing bores, correct cam-crank center-to-center distance and the correct vertical plane in relation to the mains, thus correcting any skew or twist in the block.

The Cam Tunnel Alignment Fixture is supplied complete for one engine family and contains one Tie Plate, one pair of engine-family specific End Plates, one Dial Indicator Mandrel, one pair of Alignment Sleeves specific to the machine's boring bar (specify boring bar size when ordering), an Adjusting Yoke and Hardware Kit.



Step-Up kits may be purchased to upgrade to different engine families and are supplied with one pair of End Plates. Also available is the Small Block Chevy Distributor Alignment Fixture, which indexes the cam tunnel honing location to the blueprint-correct distributor gear "sweet spot".

Use of the Cam Tunnel Alignment Fixture requires BHJ's 2" Precision Support Bar and Main Bearing Bore Adapter Rings, which are sold separately and shown below.

2" Precision Support Bars (BAR)

BHJ's 2" Precision Support Bar is the heart of the set-up for all BHJ Blueprinting Fixtures. Use of this 38-pound, specially-turned, ground and polished precision Shafting provides the rigidity necessary for this critical zero datum starting point.



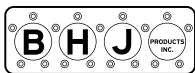
Specially-machined versions of the 2" Precision Support Bar are available when the ends must be re-sized in order to fit equipment applications that originally came with support bars of less than 2" diameter at their ends. Examples include models by Berco, DCM, Kansas Instruments, as well as some Kwik-Way, Peterson and Storm Vulcan equipment. Due to design changes and production variations among machines, the following dimensions must be provided when ordering Special Support Bars: Over-all Length of Bar, Diameter of each end of Bar and Length of turned diameter on each end of Bar.



Main Bearing Bore Adapter Rings (AR)

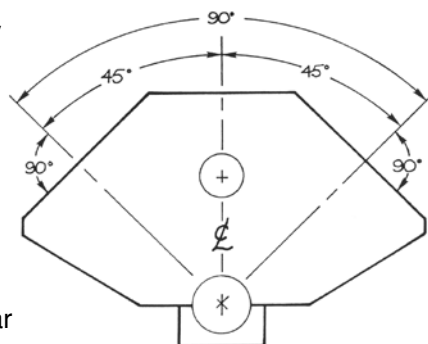


BHJ's Main Bearing Bore Adapter Rings are used to mount BHJ's 2" Precision Support Bar in an engine block. The combination of the Support Bar with these Adapter Rings is required for use of all BHJ engine block Blueprinting Fixtures. The Adapter Rings mount in the front and rear mains and precisely center the 2" Bar to the main bearing bores, once the main caps are torqued to spec. Rings are application-specific and are available for all engines. Most popular sizes are kept in stock for immediate delivery and special O.D.s are available by request.



Blok-Tru (BT1)

BHJ's Blok-Tru engine block Blueprinting Fixture corrects improperly machined deck surfaces, commonly caused by factory machine tolerances and production line inaccuracies. This precision-machined Fixture has a true 45-degree angle machined at each side of its own centerline. The Blok-Tru Index Plate, when installed on the cam-crank centerline of the block, is then referenced to roll over and correctly index the block into position for the resurfacing operation. An optional upgrade allows the Blok-Tru to also work with Ford's Triton/Modular blocks, which lack a cam tunnel by design.



When the Blok-Tru is set-up and used in the prescribed manner, all angular dimensions shown in the illustration can be held within five minutes of one degree.

Top engine builders across the country rely on the Blok-Tru to provide the level of accuracy necessary for today's performance requirements.

Common issues improved after using the Blok-Tru include:

Twisted Blocks: On a twisted block, it is necessary to choose a point on the deck surface to use as a reference point for set-up. As a result, you may be compounding the out-of-square condition.

Uneven Deck Clearance: Deck clearance often varies between the top and bottom edges of the piston due to the deck surface not being at 90 degrees to the bore. On race engines where deck clearances are held on the verge of piston to head contact, any discrepancy in deck angle means lost compression.

Bores Not At 90 Degrees: Since most production lines use the pan rails as the reference point, it is common to find the bores at angles other than the intended 45 degrees when referenced from the cam-crank centerline.

Cam and Ignition Timing Variations: If you have run into cam timing variations between cylinders on opposite banks, it may not be the fault of the camshaft. Again, since most blocks are machined from the pan rails, the cylinder "V" may not be at 45 degrees when referenced from each side of the cam-crank centerline.

O-Ring Groove Variations: If you are cutting O-Ring grooves on a boring stand which references from the pan rails, it is not uncommon to have drastic depth variations.

Poor Intake Manifold Fit: This condition is usually blamed on the intake manifold. However, if the included angle of the deck surfaces is not 90 degrees or if the top of the block has the incorrect angle, the manifold may not be at fault.

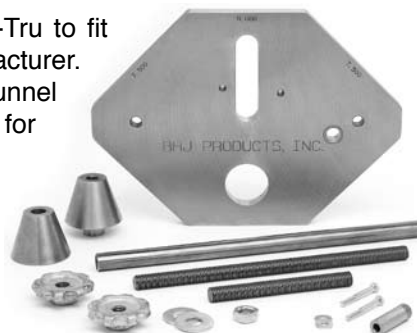
Block Deck-Height Measurements: The Blok-Tru is marked with the height from the crankshaft centerline to index surface. A simple measurement from the block deck surface to the index surface of the Blok-Tru plate, added to the Plate's marked dimension gives you the deck height. This measurement can be easily made using our Deck Height Micrometer, shown on page 8.

The Blok-Tru can be tailored to fit virtually all automotive resurfacing machines, as well as conventional vertical and horizontal milling machines. The Blok-Tru is offered in Kit form to fit several of the more popular resurfacers, or can be put together with the individual components necessary to suit your application.

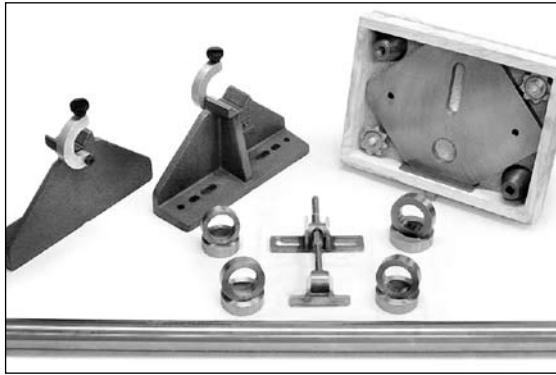
Blok-Tru Basic Kit (BT1-B)

The Blok-Tru Basic Kit is the necessary starting point for tailoring the Blok-Tru to fit resurfacing machines supplied with a 2" diameter support bar from the manufacturer. The Blok-Tru Basic Kit consists of a precision-machined Index Plate, Cam Tunnel Alignment Cones, Cam Tunnel Clamping Hardware and accommodations for optional hardware to allow machining the Ford Triton/Modular O.H.C. blocks.

Use of the Blok-Tru Basic Kit requires the 2" Precision Support Bar and Main Bearing Bore Adapter Rings, which are sold separately and shown on page 5. Existing Blok-Tru Index Plates may also be upgraded to work with the Ford Triton/Modular, by sending the plate to BHJ for machining and parts.



Blok-Tru Fixed Stand Kit (BT1-SK)



BHJ's Blok-Tru Stand Kit fits a broad range of overhead resurfacing machines with a traversing table or head. All necessary parts are supplied for block set-up and indexing from the table-up. The Blok-Tru Stand Kit includes all parts in the Blok-Tru Basic Kit, with the addition of our 2" Precision Support Bar, four pairs of Main Bearing Bore Adapter Rings to fit the customer's choice of engine applications, one pair of heavy duty, cast iron Fixed Support Stands for block support, a Roll Over Lock to control block indexing and, when necessary, a machine-specific Table Extension Bar (specify machine when ordering).

The Support Stands are machined to accommodate T-slots in overhead resurfacing machine tables, as well as conventional vertical milling machines with tables measuring 9" x 42" or larger. Each Stand includes a hinged Latch which, when rotated over the 2" Precision Support Bar, holds the Bar firmly in place with a Clamping Knob during the set-up operation.

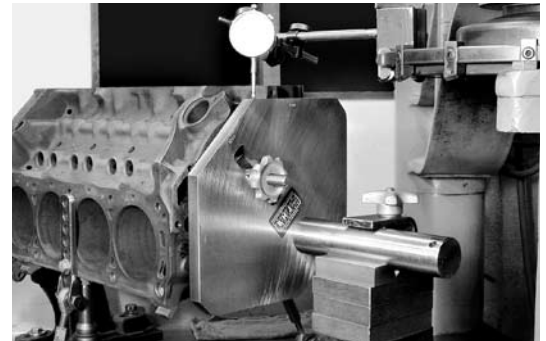
This Kit may also be ordered with optional hardware to allow machining Ford Triton/Modular O.H.C. blocks.

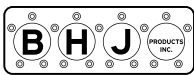
Blok-Tru SV Kit (BT1-SV)

The Blok-Tru SV Kit contains all of the parts necessary to install the Blok-Tru on a Storm Vulcan Blockmaster 85B, 85C, 85EL and 85N.

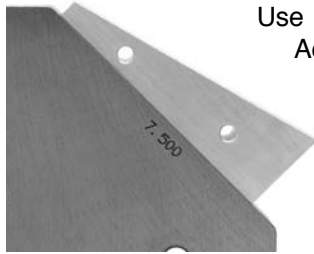
The Blok-Tru SV Kit includes all parts in the Blok-Tru Basic Kit, with the addition of BHJ's 2" Precision Support Bar, four pairs of Main Bearing Bore Adapter Rings to fit the customer's choice of engine applications and a pair of V-Blocks which mount on top of the existing Storm Vulcan stacking blocks to cradle the 2" Bar.

This Kit may also be ordered with optional hardware to allow machining Ford Triton/Modular O.H.C. blocks.





Blok-Tru Deck Angle Adapters (BT1-A)

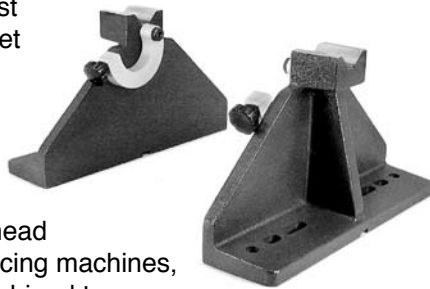


Use of Blok-Tru Deck Angle Adapters in conjunction with the Blok-Tru plate will allow the machinist to accurately correct the deck surfaces of blocks which do not have 90-degree deck surfaces, to their proper angles. The adapters magnetically adhere to the index surface of the Blok-Tru plate, allowing the block to be indicated in flat or parallel from the top surface of the adapter.

Blok-Tru Fixed Stand Set (BT1-FSS)

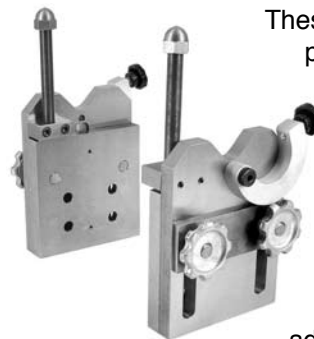
BHJ's massive, cast iron Fixed Stand Set provides level, rigid support of the 2" Precision Support Bar.

Ideal on all conventional overhead automotive resurfacing machines, the Stands are machined to accommodate T-slots in overhead resurfacing machine tables, as well as conventional vertical milling machines with tables measuring 9" x 42" or larger. A column riser will be necessary in most Bridgeport-type applications.



Sold in pairs, each Stand has a hinged latch which, when rotated over the 2" Precision Support Bar, holds the Bar firmly in place with a clamping knob during the set-up operation.

Blok-Tru Adjustable Stand Set (BT1-ASS)



These adjustable Stands are precision-machined to bolt directly onto the bolster plates of the Winona Van Norman 570 and 530 Rotary Broach resurfacers. Sold in pairs, the stands cradle and firmly clamp the 2" Precision Support Bar in place and have independent height adjustment so the main bearing centerline of the block can be adjusted absolutely parallel to the cutter head of the machine.

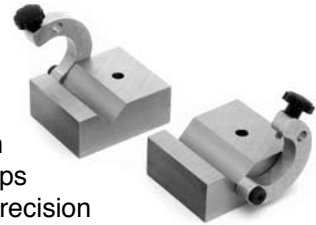
Blok-Tru V-Blocks (BT1-V, BT1-V2)

Precision-machined V-Blocks are supplied as standard equipment with the Blok-Tru SV Kit, but will also work in a number of other applications. Precision-ground and machined in pairs,



they measure 4" x 5" x 1" thick and have a through-hole drilled to accept a 1/2" stud or bolt for clamping. These dimensions are the same as the stacking blocks used on the Storm Vulcan Block Master. The V-Blocks are installed on top of the stacking blocks and cradle the 2" Precision Support Bar.

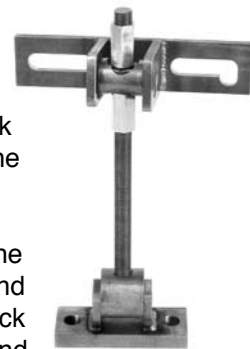
V-Block sets are also available with Hinged C-Clamps (BT1-V2) with Tightening Knobs. The Clamps are rotated over the 2" Precision Support Bar and tightened, to hold it securely in place during setup. Block thickness is increased to 2", with all other dimensions remaining the same.



Rollover Lock (BT1-RL)

BHJ's Rollover Lock, normally included in the Blok-Tru WV570 and Stand Kits, is also available separately to control block indexing on many other machine applications.

One end bolts to the block at the motor mount and the opposite end bolts to the machine table. The Jack Screw allows precise adjustment and locks to prevent movement during machining.



Deck Height Micrometer (DHM-1)

BHJ's Deck Height Micrometer incorporates an oversize, heavy-duty base, which allows the attached measuring spindle to easily reach from the edge of the deck surface out and down to the Blok-Tru Plate. Actual deck height is determined by adding the measured distance to the Blok-Tru center distance, which is machined on the face of the Blok-Tru Plate.



2" Bar Adapter Sleeves (BAR-AS)

This pair of precision-machined, bronze Sleeves is installed over each end of BHJ's standard 2" Precision Support Bar to accurately up-size the ends for use in equipment using pre-existing supports which are larger than 2" from the factory. Available in various sizes. 2" Support Bar available separately.



Bor-Tru Kit (BTK)



The Bor-Tru is a specially designed Blueprinting Fixture for establishing correct cylinder bore and dowel locations on semi-finished cylinder blocks, as well as any stock factory block, when a sufficient overbore will allow correction of out-of-position cylinders.

The Bor-Tru Kit is the only commercially available Fixture that enables the machinist to quickly and accurately locate the cylinder bores over the correct crankshaft journal location. When properly installed, the Bor-Tru references from the rear main surface or rear main thrust surface (depending on block configuration) as a zero datum for front-to-rear positioning of the fixture on the deck surface. Other applications, such as the Chevrolet LS-Series (shown above left) may align at different locations in the block. In addition, the Bor-Tru spaces the bores at the correct center-to-center distance from one another.

Provisions have also been made for correction of cylinder head dowel-hole locations for both solid and ring/split dowel applications. This is accomplished by installation of drill bushings in the dowel-hole locations of the Deck Plate, at the correct dowel hole locations. In the standard configuration, the I.D. of the Drill Bushings used is on size to the dowel O.D. Special, oversized-I.D. Drill Bushings are also available to facilitate the use of a specially ground Cutter to oversize the existing hole for installation of a stepped dowel pin.



The Bor-Tru Kit consists of one Deck Plate, which is engine family specific, one pair of universal Alignment Bars, which fit any V-8 or V-6 engine application, one Set-Up Spacer, plus all fasteners necessary for assembly. Optional Counterboring of the Plate Bolt Holes is available for use with a deck-mounted or portable boring bar, or any type of boring equipment that must contact the deck surface of the block while boring.

Once the initial Bor-Tru Kit has been purchased, subsequent upgrades can be made for other engine families by purchasing Bor-Tru Step-Up Kits. Step-Up Kits include one Deck Plate and one Set-Up Spacer.

Use of the Bor-Tru Kit requires the 2" Precision Support Bar and Main Bearing Bore Adapter Rings, which are sold separately and shown on page 5. A prerequisite to use of the Bor-Tru is a perfectly square deck surface, which can be achieved by use of the Blok-Tru, which is shown on page 6.

Bor-Tru Stepped Dowel Cutter (BTD-CUT)

The dowel-hole location in the deck surfaces of the block can be corrected with this specially-ground Cutter and the Bor-Tru Kit.

With the installation of special I.D. drill bushings in the Bor-Tru Plate, this cutter will precisely machine the dowel holes to accept a stepped dowel on the correct centerline.



Putting the dowel holes in the proper relationship to the corrected cylinder bores ensures proper combustion chamber alignment over the cylinder bores.

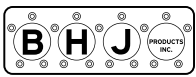
Bor-Tru Stepped Dowels (BTSD)

Bor-Tru Stepped Dowels press fit into the oversized holes created by the Bor-Tru Dowel Cutter (shown left) as part of the dowel-hole blueprinting process.

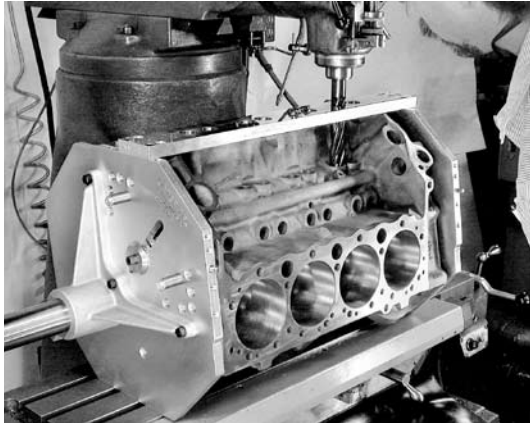
The large diameter end of the dowel inserts into the block, leaving the stepped-down end above the deck surface, to properly fit the O.E.M. ring/split-dowel diameter in the head. This ensures correct alignment of the cylinder head chambers over the bore in the block.



Sizes are available for big block Chevrolet, big block Ford and small block Ford.



Lifter-Tru Kit (LTK)



BHJ's Lifter-Tru Kit blueprinting fixture allows machinists to re-machine the lifter bores and correct their position in an engine block front-to-rear and up-and-down, as well as to restore the correct lifter bore angle as referenced from the cam-crank centerline. In addition, blocks without finished lifter bosses may also be machined with new lifter bores, with the addition of optional cutters in the process.

The cylinder block is fixtured at the prescribed angle while a Piloted Cutter is precisely guided from both above and below the lifter bore. Typically this operation is performed in a vertical milling machine, but a valve seat and guide machine, or even a large drill press can be used. Minimum working height required from table to drive source for S.B. Chevrolet is 18.375". All other applications require 20.5" of clearance from the table to the collet. The machine used must have

the ability to run between 40 and 60 RPM and a coolant mixture of water-soluble cutting oil, mixed with water and applied in either a flood or high-pressure spray mist is required.

Kit contents include one pair of End Plates with Support Bracket, one Cam Tunnel Mandrel, one Upper Guide Plate, one Piloted Cutter, a pair of Angle Adapter Blocks (when necessary) and a Hardware Kit containing all of the necessary Positioning and Clamping Hardware for set-up.



Once an initial Lifter-Tru Kit has been purchased, a Lifter-Tru Step-Up Kit will provide the minimum number of parts necessary to machine a different family of engine without duplicating parts supplied in the initially-purchased Kit.

The Piloted Cutter supplied with the kit is available in .843", .875", or .906" diameter for enlarging existing lifter bores as well as 1" diameter for installation of lifter bore sleeves. The .843", .875" and .906" cutters are also used to rough-finish lifter bore sleeves prior to final honing with the BHJ's Lifter Bore Hone, which is sold separately and shown on page 11.



Additional Piloted Cutters may be purchased separately and include a variety of sizes and configurations, including .937" and 1.062" diameters, as well as Long-Pilot Cutters (2.200" pilot length, vs. 2.00" standard) for blocks with tall lifter bosses.

Special Cutters are also available to add lifter bores to roughed-in blocks, which commonly do not have finished lifter bores (right). These three Cutters include a Piloted End Mill (bottom) to spotface the top of the boss, a self-starting Center Drill (center) and a Roughing Drill (top), which prepare the block for the final lifter-bore cutting process.



Lifter Bore Sleeves are available in both SAE 660 bronze and A-48 cast iron in a variety of sizes to suit Chevrolet, Ford and Chrysler. All sizes are available in standard 1" O.D. as well as 1.062" O.D. Special sizes and configurations are available and can be quoted upon request. See Page 11.

Use of the Lifter-Tru Kit requires the 2" Precision Support Bar and Main Bearing Bore Adapter Rings for installation, which are sold separately and shown on page 5.

Accessories available to compliment the Lifter-Tru include:

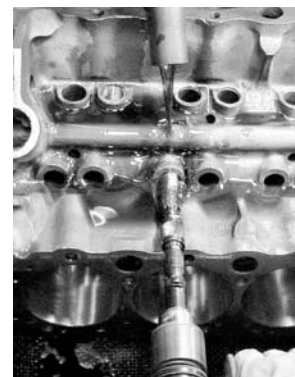
- Bushing Drivers** for Lifter Bore Sleeve installation
- Oil Galley Drills** for cross-drilling Lifter Bore Sleeves after installation
- Alignment Pilot** for gauging clean up at the next larger lifter bore diameter before machining
- Angle Adapter Feet** for operating on the table of a fixed-head type machine
- Special Angle Adapter Blocks** for motors with raised cam tunnels
- Cam Tunnel Mandrel Adapter Sleeves** mount Cam Tunnel Mandrel in blocks with oversize cam bearing bores
- Lifter Bore Honing Kit** for finish-honing the I.D. of lifter bores or Lifter Bore Sleeves
- 1.062" Step-Up Kits** allow installation of 1.062" Lifter Bore Sleeves for all applications

Lifter Bore Honing Kit (LBH-1)



BHJ's Lifter Bore Honing Kit contains everything needed to make fast work of final-sizing lifter bores. The rigid style Hone utilizes a friction Thimble and feed Wedge for increasing diameter and is operated with a 1/2" drill motor. With a diameter range from .843" through .937", this one Kit will accommodate Chevrolet, Ford, Mopar and Jesel lifter bores.

The Lifter Bore Honing Kit consists of one Hone Assembly, two Honing Stones (one coarse, one fine), one Stone Shim, four Spacer Shoes (one each of .843, .875, .906, and .937) and is supplied in a foam-padded, plastic Storage Case. Replacement Stones, Shoes and all other Service Parts are always available.



Block

Lifter Bore Sleeves (LBS)



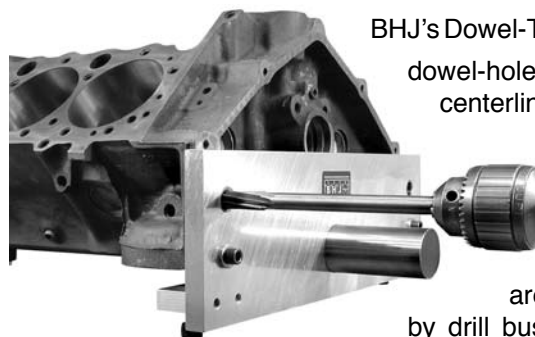
BHJ's Lifter Bore Sleeves are available in both SAE 660 Bronze and A-48 Cast Iron in a variety of sizes to suit standard Chevrolet, Ford and Chrysler I.D. applications. Standard Lifter Bore Sleeve (Lifter Bushing) sizes are nominal 1" O.D., by 1.500" long and are of a standard "Barrel Bushing" design.

All Sleeves are made-to-order and sized per the application. Press-fit O.D. sizes are dependent upon the size lifter being used, as well as the hole in the block into which the Sleeves will be installed. This hole-size must be specified when ordering to ensure proper press fit during installation. Longer Sleeve lengths are also available for applications with tall lifter bosses or other performance applications. Lengths of 1.600" through 2.00" are available for most I.D./O.D. combinations and must be specified when ordering. Shouldered, or other custom Sleeve design configurations can be accommodated on a special order basis.

Bronze Sleeves are also available in .937" I.D. for Jesel and other aftermarket lifter applications. Standard 1" O.D. as well as special 1.062" O.D. are also available for all I.D. sizes, though it is recommended that .937" Bushings use the 1.062" O.D. to maintain greater wall thickness. Cast iron Sleeves are available in longer lengths and special configurations mentioned above, but are not available in .937" I.D. or 1.062" O.D.

Quantity price breaks are available on all sizes at 25, 50, 100 and 200+ units, per size.

Dowel-Tru Kit (DTK)



BHJ's Dowel-Tru Kit is a blueprinting fixture that quickly and easily corrects bellhousing dowel-hole locations by placing them in the correct relationship to the crankshaft centerline. As a result, the Dowel-Tru eliminates the time-consuming operation of "dialing-in" bell housings using troublesome offset dowels.

Once the Fixture is installed on the block, the Dowel-Tru Plate is adjusted into position using a pair of jackscrews and then secured to the block in preparation for machining. The dowel-hole locations are then re-machined with a supplied, special size Reamer, guided

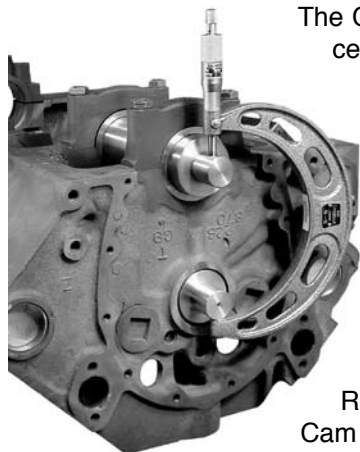
by drill bushings in the fixture plate. Special Stepped Dowels are installed into the engine block after machining is complete.



The Dowel-Tru Kit is available to fit most popular GM, Ford and Mopar blocks and includes an application-specific Alignment Plate, six Stepped Dowels and one special Reamer.

Additional Stepped Dowels are available in Six Packs, in Standard Length, or Extra-Long when a motor plate will be used in the chassis. Use of the Dowel-Tru Kit requires the 2" Precision Support Bar and Main Bearing Bore Adapter Rings, which are sold separately and shown on page 5.

Cam-Crank Center Distance Gauge (CCG-1)



The Cam-Crank Center Distance Gauge provides an accurate method for measuring the center-to-center distance of the cam and crankshaft. This process is imperative with the availability of custom-length timing sets from various manufacturers. The Gauge Kit is available to fit all popular engines.

The initial Kit includes one Crankshaft Bore Mandrel, one pair of Main Bearing Bore Adapter Rings and one Cam Tunnel Mandrel. Step-up Kits are also available and are supplied with one Cam Tunnel Mandrel and one pair of Main Bearing Bore Adapter Rings.



The Crankshaft Bore Mandrel is universal to all applications, using the Main Bearing Bore Adapter Rings to center it in the mains of any given block. The Cam Tunnel Mandrel is machined to fit the two front cam-bearing bores. The Measuring Pin on both the Cam and Crank Mandrels is 1" diameter. A

simple micrometer measurement across the two Measuring Pins, with the subtraction of 1" gives a precise center-to-center distance measurement.

Micrometers of the appropriate size for all applications are available on page 29. The Timing Set Length Gauge is also available for quick and accurate measurement of timing sets and is shown on page 22.

Oil Groove Cutter (OGC)



BHJ's Oil Groove Cutters provide quick and accurate groove cutting in cam tunnels and main bearing saddles. As engine horsepower continues to climb, engine builders are finding it necessary to improve bearing oiling. The Oil Groove Cutter makes a seemingly impossible task fast and repeatable.

After the cylinder block is mounted in a line-boring machine, the Oil Groove Cutter is installed in the cam tunnel or mains. The drive yoke for the honing mandrel is then attached to the Oil Groove Cutter. All five grooves in a cam tunnel (OGC-1) or main saddles (OGC-2) can typically be enlarged in 30 to 40 minutes. The modified groove will be deepened

to full factory depth (or to specification) and widened to give a minimum 25% increase in cross-sectional area over a full-size factory-cut groove. This operation is typically necessary after line boring the cam tunnel.

The Oil Groove Cutter is available in a variety of sizes to meet different engine requirements. Setups are available for small block Chevrolets with stock cam bearings, oversize stock bearings, big block bearings, and various roller bearings, as well as numerous other applications. Different size cam tunnels can be accommodated simply by adding Cutter Step-Up Kits, which include only the necessary hardware to adapt a current Kit to a new size application. The OGC-2 model Cutter, sized specifically for main saddles is available for all engines.



Cam Bearing Installer (CBT-1)



The Cam Bearing Installer smoothly draws both Babbit and roller bearings into position using a heavy duty sealed-bearing Drive Hub. Precise-fitting Guide Plugs supplied in 23 common sizes (up to 55mm roller), hold the bearing square to the housing bore, ensuring straight installation.

Distortion-free installation, elimination of incorrect positioning of the bearings and easy oil-hole positioning make BHJ's Cam Bearing Installer superior to any other method of bearing installation. Bearings may also be removed from the block in the same manner.

Conventional cam bearing installation tools use an expanding rubber-covered mandrel and a large hammer. This method allows the bearing to shift and potentially be driven in crooked. This can cause the camshaft to bind, leading to instant bearing failure. When installing needle type roller bearings, this method is absolutely prohibited by the bearing manufacturer, as it causes sidewall distortion, which locks the needles to the cage and prevents proper rotation.



The Cam Bearing Installation Tool is supplied in a sturdy, foam padded plastic case for storage and includes an application size chart for easy Guide Plug selection. For projects using only one size cam bearing, the Cam Bearing Installation Tool is also available in a one-size-only Kit, which is supplied with one Guide Plug (specify when ordering). Replacement and larger-size Guide Plugs (including 60mm roller) are also available.

S.B. Chevrolet Fuel Pump Pushrod Fixture (FPPR-CHS)

BHJ's Fuel Pump Pushrod Fixture Kit is designed to accurately locate and install a finished fuel-pump boss in late-model, fuel-injected small block Chevrolet engines. These blocks typically do not have a completed boss and must be modified to allow use of a mechanical fuel pump. The ability to conduct this process becomes more and more valuable as older cores become less available for performance applications requiring a mechanical fuel pump.



The Kit is installed via a Registration Plate, which precisely aligns from the timing cover locating dowels using hardened bushings, and bolts securely into place. Three Fixture Blocks are attached to the unfinished boss to execute each part of the three-stage process. The Kit includes all the necessary Fixture Blocks, Fixture-mounting Hardware, Drill Bushing Guides, Drills, Taps and Reamers to do a clean, precise job every time.

Cummins B Series 14mm Head Bolt Fixture (HBF-CMN-14)

BHJ's Cummins Head Bolt Fixture allows precise up-sizing of Cummins 6B diesel head-bolt holes from the stock 12mm configuration, to 14mm. The precision design and heavy-duty construction allows for countless accurate installations either on the bench top or with the engine in the chassis. The Registration Plate aligns from the stock dowel holes and bolts to the deck surface using the supplied 12mm Bolts. Switching to the 14mm Bolts, also included in the Kit, allows the remaining holes to be drilled and tapped, once the initial holes have been machined to 14mm, thus completing the process.

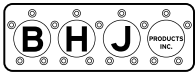
The Head Bolt Fixture Registration Plate is constructed of aluminum tooling plate and includes all Drills, Taps, Drill Bushing Guides and Mounting Hardware necessary to complete the process.

An optional Dowel Hole cutter and Oversize Dowels are also available which together provide a larger O.D. Dowel, thus providing adequate wall thickness. Machining the block for 14mm bolt-holes and re-installing the stock O.D. dowels significantly reduces the dowel wall thickness, as the I.D. of the dowel is machined to accept the 14mm bolt. Up-sizing the dowels in this manner ensures adequate strength for heavy duty applications.



...More Diesel Products

BHJ also manufactures Honing Plates and O-Ring Groove Cutters specifically tailored to Cummins, Ford, General Motors, International and many other Diesel applications. Virtually all BHJ Tooling and Fixtures can be used in one form or another for building high performance Diesel engines. Email sales@bhjproducts.com or call for more information on BHJ Diesel applications.



O-Ring Groove Cutter (ORG-3)

BHJ's O-Ring Groove Cutter is the solution for eliminating misalignment when cutting O-ring and receiver grooves. By using this specially designed cutter in conjunction with application-specific Register Plates (sold separately), absolute concentricity of the top and bottom grooves is insured.

Use of the Cutter and O-Ring Register Plate gives excellent results when cutting grooves in the block and/or heads. This operation is typically necessary when using copper head gaskets with stainless steel wire, copper wire with an MLS gasket, diesel or Top Fuel "fire rings" and the Fel-Pro Loc-Wire™ head gasket.



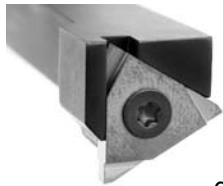
Cutting Inserts are available in a variety of sizes to accommodate current, popular groove widths for gas and diesel applications. Inserts are custom-ground on centerline, which eliminates the need to reset groove diameter when grooves of different widths are required between the block and head.

Applications range from small-bore import engines to diesels, by installing or removing the large-bore Register Ring for most V6 and larger engines, or removing it to accommodate the close bore-centers found in many import motors. This new feature is available standard with all new O-Ring Groove Cutters. Conversion of older model O-Ring Groove Cutters to work with small-bore Register Plates is also available.



Groove diameter is precisely set using a special Dial Indicator, which is included with the Cutter. Accuracy of the groove diameter is within .002" and groove depth is easily adjusted with the built-in micro stops, with accuracy within .001". Diameters range from 2.400" to over 5.125", based on application.

Using the O-Ring Groove Cutter with the appropriate Register Plate, an automotive machinist can accurately groove a pair of V-8 heads in just over one-hour, or a block and heads in approximately two and a half hours. Cylinder heads may be cut without first being stripped, as the chips are fully contained in the register plate bores during cutting.



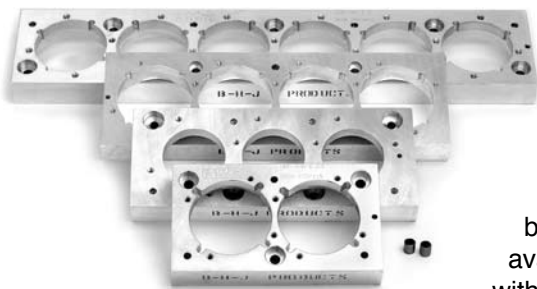
Each Kit includes one Cutter Unit, four Hold Down Knobs, a 1"-travel Dial Indicator with Tip, one Carbide Insert (choose size when ordering), a Torx Wrench, two Hex Key Wrenches and a Zeroing Pin.

BHJ's O-Ring Groove Depth Gauge is available separately and is used to verify groove depths during the cutting process. After cutting the groove and removing the Cutter Head, the Gauge rests on the Register Plate surface and zero is set on the deck surface. The tip is then set into the groove in any of four locations around each bore and the groove depth is easily verified.



A 4" Short Handle option is available for engine builders wishing to groove inline-6 cylinder engines while still in the vehicle. The Short Handle provides clearance from the firewall when cutting the rear cylinder in the block and is commonly used for Cummins diesel applications.

Replacement cutting Inserts are available in standard widths of .039", .048", .050", .060", .085", .120" and .125" and are also available in custom widths on a special-order basis. One-pound rolls of Stainless Steel or Copper Wire are also available in .041" and .051" diameters.



O-Ring Register Plates are designed to work specifically with BHJ's O-Ring Groove Cutter. Each Plate is engine-specific and locates on the dowel holes in both the block and heads, thus ensuring precise alignment of the grooves when assembled. Through-holes and threaded holes are machined into each Plate for fastening to both the block and head. Plates are available for virtually any currently available block and/or head. Each O-Ring Register Plate is supplied with the appropriate dowel pins for mounting to the block and head.

Block & Heads

Flycutter Head (FCH-2)

BHJ's Flycutter Head makes fast work of surfacing cylinder heads and blocks and adds versatility and value to your existing milling machine for all types of general machining operations. The Flycutter Head is supplied with both a Carbide Cutter for machining aluminum and a CBN Cutter for use on cast iron. The CBN Cutter Insert enables speeds and feeds of more than three times that of carbide inserts when used on cast iron. Tests conducted in our factory indicate a .005" depth of cut on a cast iron Big Block Chevrolet head can be performed in four and a half minutes using the CBN Cutter.

The single-cutter design allows quick changing from carbide to CBN cutting without losing the ability to cut quickly and accurately. The 7" diameter Body can be adjusted to cut from 9" to 12" diameters and the 15-pound weight of the Head acts to dampen the cutting operation, resulting in a smooth, chatter-free cut. Recommended initial settings are 500-RPM Speed, .005" Depth and 5" per minute Feed. Speed and Feed can be varied from that point, based on results.



An R-8 style Arbor is included standard, which allows the Cutter will fit the spindle of most vertical mills. Other Arbor styles are available as well and can be quoted on request.

Precision Straight Edge (PSE-1)

BHJ's Precision Straight Edge is second only to granite in accuracy and durability for precise measurement of straightness.

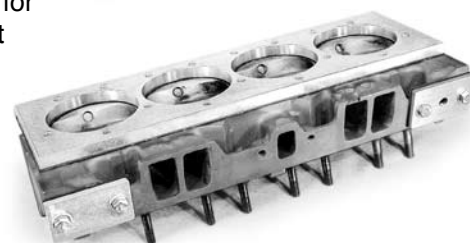


The Straight Edge weighs just-under ten pounds, measures .625" thick by 2.500" wide and has a 29" long measuring edge, which is beveled to .250" wide. After grinding, each unit is finished to .0005" straightness over its full length. Stress-relieved cast iron construction makes it virtually indestructible and a Finger Groove on each side ensures safe handling. A wooden Storage Block is included to prevent damage to the measuring edge.

Pressure Test Kits (PTK)

BHJ's Pressure Test Kits are quick and easy to use. The kit is affordable for the shop that does only a small quantity of cylinder heads. Pressure test kits are available for all cylinder head and block applications. Simply install the Kit, pressurize the water jacket and submerge the head or block to locate the leaks.

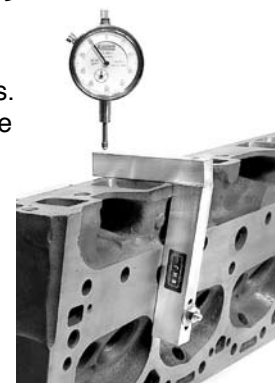
Each Kit contains one aluminum Block-off Plate, all necessary Fasteners and durable, reinforced Rubber Gaskets. "X2" Kits are available for V6, V-8, V-10 and V-12 block configurations and include everything needed to seal the entire block.

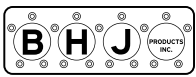


Cylinder Head Intake Angle Levels (VT-4)

BHJ's Cylinder Head Intake Angle Levels provide quick and accurate measurement of the intake surface angle on various cylinder head applications. The Level is an absolute must for shops that angle-mill cylinder heads or just need to clean up the intake surfaces. The Levels guarantee the correct included angle, rather than assuming the existing angle is perfect from the factory. A Level is fastened to the milled deck surface of the head and the head is then indexed by zeroing the Intake Edge of the Level with a dial indicator or micrometer (not included).

Intake Angle Levels are available as follows; VT-4 small block Chevrolet, big block Chrysler and other 80-degree angle applications; VT-4A 18-degree small block Chevrolet; VT-4B small block Chrysler; VT-4C Chevrolet big block, Ford small block, Ford FE, GM B.O.P. and other 90-degree applications.





Precision Engineered Honing Plates



BHJ manufactures Honing Plates to fit more than 400 engine applications in all sizes, from single-cylinder to V-12s and is recognized worldwide as the authority in Honing Plate development and production today. Since the conception of the initial Honing Plate designs that were introduced by BHJ Products in early 1975, continued research and development has brought numerous design improvements that bring us to the models available today.

Head-bolt torque can dramatically distort cylinders and cylinders can not be bored or honed accurately if cylinder dimensions change so significantly after assembly. Rings won't seal well and scuffing is likely to occur if the engine overheats. Use of BHJ Honing Plates rectifies all of these problems, leading to more consistent tolerances, better sealing and more power.

Honing Plate Standard Features:

1-3/4" thick Meehanite Cast Iron or Cast Aluminum give maximum rigidity and resistance to permanent distortion and most closely simulate the stresses induced on the cylinder wall by the cylinder head when it is torqued in place. In addition, these materials have essentially the same coefficient of expansion as cylinder heads, important to those honing at operating temperature.

Cast Iron Plates are Blanchard Ground on both sides flat and parallel within precision commercial tolerances.

Aluminum R Model Plates are supplied with heat-treated Steel Inserts (T-Washers) in all bolt holes standard.

Plates are manufactured with .090"-.095" larger bore size than the largest standard engine bore diameter found in the applicable engine family in most applications, allowing the Plate to accommodate .060" over-bore. This maintains full gasket firing ring compression, thus further enhancing bore distortion. Special bore diameters are available upon request.

Head-bolt holes are precision machined to factory tolerances and special bolt hole sizes are also available.

Clearance holes for locating dowels are machined over-size to allow visual alignment before torquing. Indexed or "Dialed In" dowel holes are also available upon request. (See DID description in Options section on page 19.)

All Honing Plates are shipped in a durable, protective Wooden Case.

R Model High Performance Plates



The R Model Honing Plate is the established standard for duplicating cylinder bore distortion and is a must for any high performance engine application. Used by top machine shops, racing teams and racers alike, the R Model is acknowledged to be the finest, most accurate honing plate on the market today.

The R Model incorporates all of the standard features listed above, plus is specially machined, and in most cases, supplied with D.O.M. steel Spacers and Washers, to duplicate cylinder head height and facilitate the use of the OEM-length head bolts or aftermarket studs during the honing operation. Optional machining is also available for Hot-Hone applications.



In order to maintain the closest possible block distortion, it is necessary to use the same type of cylinder head gasket, as well as the same type of bolt or stud set that will be used during final engine assembly during the honing operation when using the R Model Honing Plate. Some engines require that both cylinder banks be torqued to better simulate final assembly conditions during honing. Additionally, industry tradition dictates that the Honing Plate should be of a similar material as the heads being used in final assembly, thus a cast iron Honing Plate is preferred when using cast iron heads in final assembly and an aluminum Plate used when aluminum heads will be installed.

Cylinder Head Model High Performance Plates



When a cylinder head is installed on the block, substantial valve seat distortion can be measured from the stresses induced upon the head, thus compromising the valve seal. Having the ability to grind or cut the valve seats in this distorted condition is advantageous to proper valve-to-seat sealing.

The Cylinder Head Model (H) plate is drilled and tapped to accept the installation of the cylinder head to the plate using O.E.M. length cylinder head bolts or aftermarket studs and the proper gasket. With the head installed on the plate, valve seat distortion is duplicated during the machining process, producing a substantially more efficient valve seal. Many cylinder heads show a 5-10% improvement in leak down when valve seats are machined in this manner.



Some clearancing of the sidewall of the plate may be necessary to fit large grinding stones or cutters into the combustion chamber on some applications. Optional threaded Steel Inserts can be installed on any Head Plate by request.

Counterbore Model Plates



The Counterbored (CB) Model Honing Plate is popular with machinists who want to bore with the Honing Plate installed, using an existing portable, or deck-mounted type boring bar.

The CB Honing Plate incorporates all of the standard features, plus, has counterbores machined on its top surface at the head-bolt hole locations, providing a flat deck surface when used with the Bolts and Washers provided.



In order to maintain the closest possible block distortion, it is necessary to use the same type of cylinder head gasket that will be used during final engine assembly when conducting the honing operation using the CB Model Honing Plate.

Production Model Plates



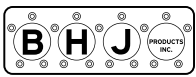
The Production (PM) Model Honing Plate is designed specifically for high-volume engine rebuilding shops, which must use a honing plate on the ever-increasing number of ultra-lightweight cylinder blocks being produced today. On many of these blocks, the factory used a honing plate during machining and mandates the use of a Honing Plate when rebuilding.

The PM Plate incorporates all of the standard features, plus is specially machined to work without a cylinder head gasket installed, thus eliminating additional cost in parts inventory and assembly time during installation.

Heat-treated Steel Inserts (T-Washers) are installed in the top surface of the Plate at the head bolt hole locations for increased durability and longevity when used in a production environment. Also, a set of equal-length O.E.M. style Head Bolts and Washers are included. These special features combine to make the Production Model the easiest, most cost-effective and durable Honing Plate available.



While the Production Model honing plate is not intended for high performance use, it is designed to exceed all O.E.M. honing plate requirements. PM Honing Plates are available in cast iron and billet steel only.



Harley Davidson Honing Plates



Honing Plate Kits are available for the Harley Davidson Shovel Head, Evolution and Twin-Cam engines. Kits are supplied with a Base Plate, which features side clamping of the spigot area on the Jug to address the recurring problem of spigot deflection during honing. This is especially prevalent in large-bore applications and will eliminate additional clearance that would be necessary to achieve correct piston to cylinder wall clearance.

The Plate allows the user to hone straight, round bores through the full length of the Jug. The Plate also has tapped holes in the bottom surface to facilitate clamping onto most honing machines.

The Shovel/Evolution Kit is supplied with the above Base Plate machined with a dual bolt pattern to accept both Shovel Head and Evolution Jugs. Two Honing Plates are included, to accommodate each engine type. A Hardware Kit containing all the fasteners needed to simulate the assembled engine condition for both setups is also included.

The Twin-Cam Kit is supplied with the above Base Plate machined with the bolt pattern to accept the Twin-Cam Jug and one Honing Plate. A Hardware Kit containing all the fasteners needed to simulate the assembled engine condition is also included.

Small Engine Honing Plates



Honing Plates are also available for all small engine applications including Briggs & Stratton, Honda, Kohler, Tecumseh and many others. The cylinders in these engines undergo the same distortions as other applications and require the same degree of accuracy during honing for performance applications such as racing and sled pulling.

Plates are machined from 1" thick, 6061T6 billet aluminum, and fit all specific combustion chambers exactly. Head-bolt spacer tubes are supplied as necessary to allow the use of the OEM head bolts to give proper depth of penetration into the threaded head-bolt holes.

Kits include one precision honing plate per cylinder and the appropriate number of head bolt Spacers for any given application.

Heat Treated Steel Inserts (HTI)



For years B H J has supplied heat-treated alloy Steel Inserts (T-Washers) as an installed option in our honing plates. These high-quality, precision-machined Inserts are also available separately for installation in aluminum cylinder heads to prevent galling and deterioration of the head under the stud or head-bolt washer while increasing longevity of the seating surface.

Inserts are available for 3/8" (10mm), 7/16" (11mm), 1/2" (12mm) and 9/16" (14mm) diameter head bolts or studs in bulk quantities.

Honing Plate & Head Bolt Washers (HPW)

The same high quality Washers that are supplied with B H J Honing Plates are also available separately for use as a head bolt or stud washer. The durability of these Washers has been proven by their daily, repeated use on honing plates by some of the largest production engine rebuilders in the country. Washers are manufactured from C1050 high carbon steel and heat-treated to HRC 45-50 making them stronger than competitive brands and an excellent choice for use in your engine assembly.

These Washers are available in sizes to suit 3/8" (10mm), 7/16" (11mm), 1/2" (12mm) and 9/16" (14mm) diameter head bolts or studs in bulk quantities.

Honing Plate Options

The following Options can be ordered with virtually any BHJ Honing Plate:

Special Bore Diameters: Part number suffix – S

Standard bore diameter for most Honing Plates is .090”-.095” over the largest standard engine bore diameter found in the specific engine family. Any special diameter may be machined in the Plate (may void warranty in some extreme big-bore applications).

Heat-Treated Inserts Installed: Part number suffix – T

Heat-treated Steel Inserts (T-washers) can be installed in the top surface of the Plate for each head bolt hole, resulting in increased durability and longevity. Included as standard equipment in aluminum and Production Model plates, Inserts are also beneficial in cast iron R and CB Model plates.

Threaded Steel Inserts: Part number suffix – TI

Threaded Steel Inserts are available for added durability in aluminum or cast iron Plates with threaded holes.

Heat Treated Spacers: Part number suffix – HT

D.O.M. Steel Spacers, as supplied with most R Model plates, may be heat-treated for increased durability.

O-Ring and Receiver Grooves: Part number suffix – O

O-Ring or receiver grooves are available in the deck surface of the Honing Plate, to more closely simulate the bore distortion induced by a cylinder head with similar machining. Customer must supply O-Ring groove outside diameter, width and depth when ordering.

Dialed In Dowels: Part number suffix – DID

All standard honing plates are machined with oversized locator dowel-pin holes to allow for Honing Plate bore-alignment over the typically misaligned bores of any given factory block. The Dialed In Dowel option includes dowel pin locator holes which are on-size to the dowel pin and in the exact relationship to the bores, as per the factory specifications. This option allows the plate to be used for bore layout during the boring operation. It is important to realize that bores located in this manner will only be as correct as the dowel pin location they are referenced from in any given block.

Rocker Stud Extractors (SP-2, SP-3)



BHJ's Rocker Stud Extractors remove press-in rocker arm studs with ease and are designed to meet the most severe demands imposed upon them.

The SP-2 Stud Extractor (right) works with a 1/2” drive air impact wrench (not included) and is manufactured from heat-treated alloy steel for maximum durability. The unit is strong enough for use in a high-performance head shop where 16 studs may be removed in succession, yet economical enough to be in a machinist's toolbox for extracting the occasional worn stud. The threaded Center Stud is reversible for use on either 3/8” or 5/16” rocker studs.



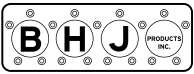
The SP-3 Hydraulic Rocker Stud Extractor (left) further streamlines the stud-removal process. When tied into a hydraulic power unit, such as the piston pin press found in most shops (not included), the SP-3 is capable of removing eight studs in a little over five minutes with no operator effort. A hard-anodized aluminum housing, combined with heat-treated steel for all wear and high-stress parts makes the SP-3 light and incredibly durable. One 3/8” and one 5/16” Collet are supplied, as well as a 36” High-pressure Hose with No-bleed Quick Coupler.

Head Bolt Hole Spotface Cutter (HBS-1)

BHJ's Head Bolt Spotface Cutter helps restore parallelism between head-bolt seating surfaces and the deck surface after cylinder heads are angle milled. Utilizing a top quality high-speed steel Cutter and a specially-machined Pilot, the Tool is guided by the existing bolt hole, to quickly and accurately re-machine the bolt boss surface.



Honing Plates & Heads



Cylinder Head Fixture (CHF-2)



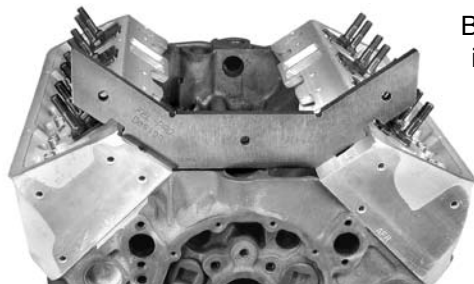
BHJ's Cylinder Head Fixture ensures accurate positioning of any cylinder head from an established reference point, which is necessary to properly perform many cylinder head machining operations. The cylinder head is mounted in the Fixture from the valve cover side for most procedures, which leaves all other surfaces exposed for machining. On most cylinder heads, mounting in this manner leaves the valve guides and spring seats exposed for machining as well. The head can also be mounted from the deck, leaving the top surface fully exposed for additional machining operations.

Precise setup is accomplished by inserting locating dowels into the deck surface, and positioning the head using a pair of supplied adjustable-length Setup Standards. Once the head has been clamped in the Fixture, it can be rolled into position and leveled both across its width as well as end-to-end, using the Height-adjustment Feature located on the Protractor end of the Fixture. Setting-up in this manner ensures that the travel of the cutter head is always parallel to the dowel pin centerline as the head is rolled over in the Fixture. This is critical when correcting the included angle between the deck surface and the intake surface. Use of the large Protractor and Vernier Pointer allows this angle to be held within twelve minutes of one degree.

The Fixture utilizes massive Cast Iron End Supports, which are keyed for accurate alignment on a machine table. Supports are machined to accommodate the T-slot spacing of all common surfacing and milling machines. The infinite pivot point provides 360-degree rollover capability and accepts 4 cylinder, V-6 and V-8 heads up to 23-1/2" in length. Straight-6, V-10 and V-12 heads can be accommodated with the addition of the "XL" Step-Up Kit. Custom-length Bars are also available on a special-order basis.

Heads

Intake Angle Gauges (IAG)



BHJ's Intake Angle Gauges help identify and resolve issues resulting from incorrectly machined engine components. Cylinder heads, blocks and intake manifolds, or any combination thereof, if not properly machined, can lead to intake leaks. These Gauges expose errors in these critical areas before further machining or assembly is conducted.

The precision-machined Gauges are designed to rest on an assembled block and heads (left), or the underside of an intake manifold (below). Checking for an air-gap either visually or

with a feeler gauge verifies the correct angles, leading to a proper seal.

Manufactured from aluminum alloy and hard anodized for durability, these Gauges are available individually or in Kit form for five different head/block applications: small block Chevrolet and big block Chrysler; 18-degree small block Chevrolet; small block Chrysler; Ford FE and GM B.O.P.; big block Chevrolet and small block Ford.

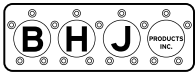


Angle Milling Set-Up Blocks (VT-5)

BHJ's Angle Milling Set-Up Blocks will increase productivity for any machinist who uses a level to set up cylinder heads for angle milling. The four Blocks can be used with a dial indicator or precision level (not included) to simplify and improve accuracy in the set-up process.



The Kit includes four precision-machined, aluminum Set-Up Blocks. Each Block is numbered 1, 2, 3 and 4 to correspond with a stock removal value, which is designated in the Instruction Sheet supplied with the Kit. The Blocks can be used separately or stacked together, giving the ability to rapidly and accurately set-up any cylinder head for practically any desired cutting angle.



Valve Stem-Height Indicator (VT-1, VT-1A)

BHJ's Valve Stem-Height Indicators easily and precisely measure valve stem-height when grinding valves and seats. A precision Dial Indicator assembly is mounted on a transparent Mounting Tube made from bulletproof polycarbonate tubing. When combined with the large-diameter Indicator Foot, this feature increases the accuracy and speed with which the Indicator can read each valve stem.

Each Valve Stem-Height Indicator includes one 2" Calibration Standard and a List of common heads and their corresponding stem-heights.

The VT-1 Indicator has a spring seat range of 1.025" I.D. and 1.200" O.D. The VT-1A Indicator is a smaller unit made specifically for four-valve cylinder heads and has a spring seat range of .775" I.D. and .945" O.D. Additional Mounting Tubes are also available for both the VT-1 and VT-1A.



Timing Set Length Gauge (TSG-1)



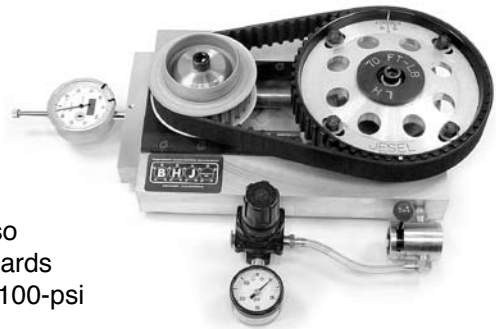
BHJ's Timing Set Length Gauge is a precision measuring fixture that eliminates the need to special order custom-length timing sets, or waste time with tedious trial-and-error methods of obtaining proper timing chain or belt fit.

The Gauge is simple to set-up and easy to operate. It is adjusted to the desired center-to-center distance using a micrometer and the provided Set-Up Pins, or an optional Set-Up Standard. The included Dial Indicator is then zeroed at the desired length.

To check length, timing sets are first installed onto the appropriate Mounting Plugs. Activating the Air Switch applies exactly 100 pounds of tension to the chain or belt, as specified by leading manufacturers. The timing set length is read as a plus or minus dimension from the desired length applied to the Dial Indicator.

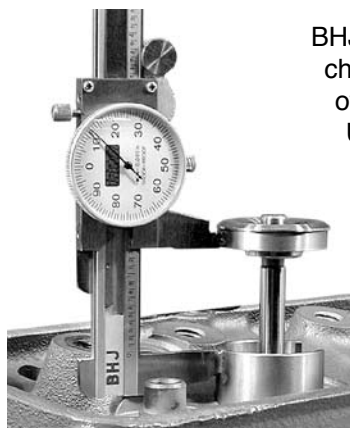
The Gauge currently accepts timing sets with center-to-center distances ranging from 4.125" to 6.125" using the appropriate Mounting Plugs.

The Timing Set Gauge includes a precision Dial Indicator, Set-Up Pins and one pair of Mounting Plugs for a specific engine application. Timing Set Gauges made specifically for engines using Jesel belt drives are also available (right). Additional Mounting Plugs and optional Set-Up Standards are available for all engines. The Timing Set Length Gauge requires 100-psi minimum air pressure for operation.



Valvetrain

Valve Spring Installed Height Caliper (VT-2)



BHJ's Valve Spring Installed Height Calipers provide a quick and accurate method for checking valve spring installed height on both overhead valve and recessed-pocket overhead cam cylinder heads. The Calipers are based on a high quality Dial Caliper. Use of this instrument involves installing the valve spring retainer and measuring the spring space with the specially designed Caliper Feet.

The VT-2 Installed Height Caliper is designed for overhead valve applications and has an outside spring diameter range of 1.250" to 1.550". The VT-2A Caliper is also designed for overhead valve applications but has a larger outside spring diameter range of 1.400" to over 1.625".

The VT-2B Valve Spring Installed Height Caliper is designed to accommodate beehive-style valve spring retainers, starting at .960" diameter.

Valve Angle Comparator (VT-6)

BHJ's Valve Angle Comparator is a simple, yet essential tool that verifies the relationship of the valve head angle to the piston relief. The angles must be compared when assembling engines using angle-milled heads and aftermarket pistons.



The angle relationships are quickly checked by first pressing the Comparator to the valve head to set the angle (Illustration #1), then placing it on the piston to check the piston relief angle (Illustration #2).

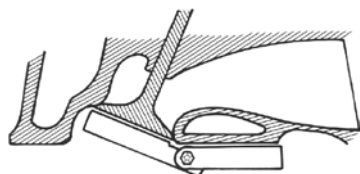


Illustration #1

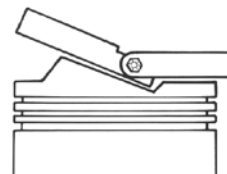


Illustration #2

Valve Margin Comparator (VMC-1)



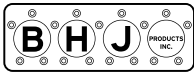
BHJ's Valve Margin Comparator enables quick and easy comparison of valve margin thickness. Detecting margin variations between valves is critical to matching their flow characteristics, as well as assuring equal combustion chamber volumes. Matching the valves before head assembly reduces the possibility of disassembling one or more chambers after cc'ing the head to re-machine the valves or seats.

The Valve Margin Comparator uses a durable, hard-anodized aluminum Base, which is ideal for many years of bench-top use. Interchangeable Slip-fit Bushings positively locate valve stems of various sizes to ensure accurate, perpendicular positioning of the valve for precise measuring. The adjustable Indicator Swing-Arm can be set to consistently read margin thickness at virtually any location across the face of valves up to 3" in diameter.

The Valve Margin Comparator includes the Base, a 1"-travel Dial Indicator with adjustable Swing-Arm, a Positioning Pin and three Slip-fit Bushings to accept 5/16", 11/32" and 3/8" valve stems. Additional Bushings are available in other sizes separately.

...Better Valve Sealing

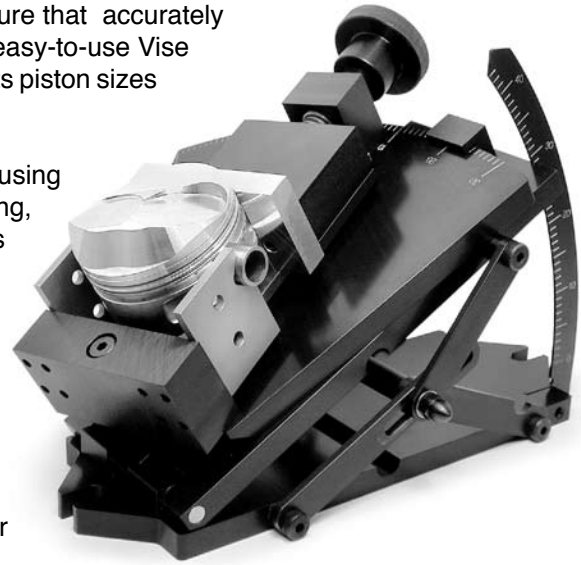
BHJ's High Performance Cylinder Head Plates are similar to Honing Plates, but mount to cylinder heads to duplicate the distortion induced when a cylinder head is installed on the block upon final assembly. With a Cylinder Head Plate and gasket installed on a head, assembled distortion is replicated during the valve-seat machining process. The result is more precise machining and a substantially more effective valve seal. See page 17 for more details.



Compound Angle Piston Vise (PV-1B)

BHJ's Compound Angle Piston Vise is a precision machining fixture that accurately & securely mounts pistons for a wide variety of operations. The easy-to-use Vise holds pistons firmly, yet delicately from the pin centerline & accepts piston sizes ranging from 2.375" to 5" in diameter.

Accurate positioning is ensured both horizontally & vertically using durable heat-treated steel V-Jaws for pin clamping & an opposing, soft aluminum V-Block to ensure skirt protection. This assembly is mounted on a Tilt/Swivel Base that is equipped with large, easy-to-read Protractors and Vertical Fine-Adjust, for angle setup in both planes and is ready to mount on any milling table.



All moving parts that are subject to wear are made from alloy steel. The Tilt/Swivel Base assembly is made from alloy aluminum tooling plate for weight considerations & then hard anodized for maximum durability.



BHJ's Piston Flycutter Set (left) is also available separately and includes three Flycutters in .750", 1.125", and 1.500" sizes.

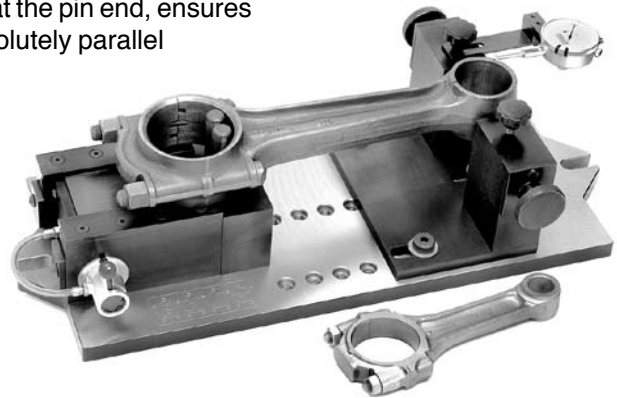
Connecting Rod Fixture (CRF)

BHJ's Connecting Rod Fixtures provide a highly accurate way to bore the small end of connecting rods for pin bushing installation. The rod is held securely while the small end is bored using a common vertical-milling machine.

The Fixtures provide a rigid, quick and repeatable method of holding the connecting rod during the pin boring operation. The unique three-point pneumatic clamping mechanism at the journal end, in conjunction with a two-sided mechanical clamp at the pin end, ensures

the pin bore is machined absolutely parallel to the journal bore.

Manufactured from heat-treated alloy steels, the CRF-1B Connecting Rod Fixture (above-left) is designed to accommodate automotive connecting rods with a center-to-center distance range from 5.500" to 7.750". The CRF-1C handles 3.504" to 6.925" center-to-center distance range and is targeted to powersports applications (not shown). For a wider variety of and larger rod lengths, the CRF-2 (right) incorporates a similar, yet larger and more flexible design. Weighing over 90 pounds, the adjustable CRF-2 securely holds connecting rods with a center-to-center distance range of 3.00" to 14.00". All Connecting Rod Fixtures require 100-psi minimum air pressure for operation.



Available options include application-specific Set-Up Standards (left), which enable accurate set-up at the correct center-to-center distance and a rod-length checking Dial Indicator and Bracket Kit, (shown installed above-left) which allows either Fixture to double as a rod length gauge to make comparative measurements using a qualified connecting rod.



BHJ's adjustable Connecting Rod Pin-End Boring Head (right) is also available separately for accurate boring of the pin-end of connecting rods on typical milling machines.

Rotating Assembly

Connecting Rod Length Gauge (RLG-1)

BHJ's Connecting Rod Length Gauge allows quick and precise measurement of connecting rod length. The Dial Indicator is first set to zero using an application-specific Length Standard or a connecting rod with a qualified length. The connecting rod to be measured is placed on the fixture with its wrist pin installed. The wrist pin is then swept past the dial indicator and the rod is quickly measured as a plus or minus reading from the calibrated zero setting.



The Fixture accommodates automotive connecting rods with an approximate center-to-center distance of 5" to 8" and a big-end I.D. range of 2.100" to 2.750". A precision Dial Indicator and one application-specific Length Standard are included in the Kit (specify application when ordering). Additional Length Standards are also available for most connecting rods.

Optional Undersize Pins are also offered for use with press-fit type connecting rods. The Connecting Rod Length Gauge requires 100-psi minimum air pressure for operation.

Piston Ring Gauge (PRG-1)

BHJ's Piston Ring Gauge improves accuracy and greatly reduces the time required to set or check ring end-gaps. The Gauge is made to any specified bore size and holds the ring squarely and securely in place. The Ring Gauge may be mounted in a vise or used loose on a workbench.

Since bore distortion from a head or honing plate can extend 2" or more down into each cylinder, end gap must be measured at least 2" down the bore, or with a honing plate installed. This issue can be sidestepped by using the Piston Ring Gauge with the added bonus of preventing possible damage of your finished cylinder bore.

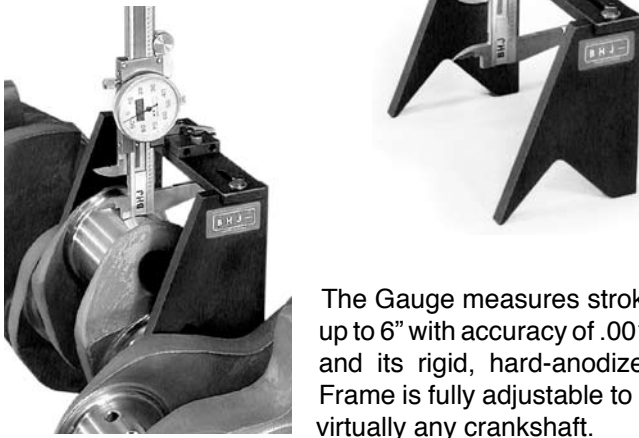


Each Gauge is accurately machined to size with an internal Step to square the piston ring and features a Relief that is added for clearance of a feeler gauge when taking gap measurements. The bore size is machined in the top surface of each Gauge for easy identification.

Crankshaft Stroke Gauge (CS-1)

BHJ's Crankshaft Stroke Gauge allows easy and accurate crankshaft stroke measurements and is engineered to provide a lifetime of dependable service.

This durable Gauge is an essential tool for any engine builder and uses a replaceable, precision Dial Caliper (included with gauge) to measure crank stroke instead of the expensive, fragile dial indicators found in conventional stroke checkers.



The Gauge measures stroke up to 6" with accuracy of .001" and its rigid, hard-anodized Frame is fully adjustable to fit virtually any crankshaft.

Piston Measurement Stand (PM-1)

BHJ's Piston Measurement Stand makes typically difficult piston measurements simple and precise. Piston-head thickness, including under valve reliefs, compression height and ring-groove locations can all be measured with ease. The Stand can also be used for any number of other measuring operations.

This precision-made Measurement Stand is equipped with a quality 2"-travel Dial Indicator. Anvils are supplied to permit easy measurement of all of the dimensions listed above.



The Dial Indicator is mounted in a Sliding Collar and is supported by a Locking Collar that has a radial stop, which allows precise alignment of the Anvil Tip with the Indicator Tip. Set-up and operation procedures are simple and can be performed by any qualified machinist.

Crankshaft Dual-Key Fixture (CKF-2)



BHJ's Crankshaft Keyway Fixture provides a quick and accurate solution for adding a second crankshaft keyway, using a vertical mill or other conventional shop equipment. Using a dial indicator or micrometer (not included) the "Crank Cubes" enable indexing of the crankshaft at 180 degrees from the existing key and register squarely on the crank snout centerline.

The Kit accommodates Chevy, Ford and Mopar applications and includes three anodized, billet aluminum Cubes and a Storage Case. BHJ's Harmonic Damper Keyway Fixture and Crankshaft V-Blocks are recommended companions to this Kit and are both shown on page 27.

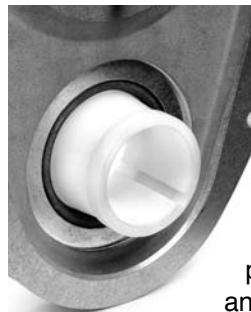
Rod Bolt Stretch Gauge (RBG-1)

BHJ's Rod Bolt Stretch Gauge is an easy to use and highly accurate tool for measuring connecting rod bolt stretch to ensure ultimate bolt strength and proper torque during installation.

The Gauge is a precision instrument made with a heat-treated aluminum Frame. The high-quality Dial Indicator has a compact size for tight operating environments and is specially modified for sufficient spring tension to hold it firmly on the ends of the rod bolt. The Indicator can be turned for right-hand or left-hand operation, and the Lower Anvil is adjustable to fit various bolt lengths.



Jesel Drive Seal Alignment Tool (SAT-CHS)



BHJ's Jesel Seal Alignment Tool is designed for easy installation of Jesel belt drive plates onto small block Chevrolet engines using a big block crank snout. The unique design and Delrin construction of this simple installation Tool combine to prevent possible damage to both the seal and crank snout while installing the drive plate. Simply slide the Tool onto the crank snout and guide the plate onto the block.

Crankshaft V-Blocks (CVB-1)

BHJ's Crankshaft V-Block Set is designed to securely support crankshafts for keyway cutting, cross drilling and knife-edging, as well as multiple other operations.

The V-Blocks are constructed of anodized aluminum to insure a firm, yet safe hold on journals ranging in size from 2.00" to 3.250". Heat-treated steel inserts at the fastener wear locations provide extended durability.

The Kit includes two V-Blocks with removable .6250" T-Slot Keys to allow bench-top use as well as machine table mounting. Overall height including studs is 7" with the base of the V at 2.875" from the table surface.



Tapered Piston Ring Installers (RC-1)

BHJ's Tapered Piston Ring Installers are custom made to fit any specified bore size and come with a variety of options to increase versatility. Each Installer is machined from steel for durability and is polished inside for smooth ring compression and ease of use.



Options include Notching the O.D. to clear pre-installed studs near the cylinder bores (left), as well as relieving the base for installation in O-ringed blocks. A permanently-attached knurled steel Handle is also available (right) for greater flexibility and reach during installation.

Harmonic Damper Keyway Fixture (DKF-1)

BHJ's Harmonic Damper Keyway Fixture provides an easy and accurate method for adding a second keyway to the hub of a harmonic damper, using a typical hydraulic or arbor press. Addition of a second keyway at 180 degrees is common when a damper hub will drive a screw-type supercharger.

A Registration Plug slides into the damper hub I.D. and indexes the hub at 180 degrees from the existing keyway. A supplied Two-Pass Broach Cutter is then drawn through the passage in the Registration Plug, resulting in a precision second keyway in the damper hub.

The Kit includes six Registration Plugs to accommodate Small and Big Block Chevy, Ford and Mopar applications. A pair of Two-Pass Broach Cutters, one 3/16" and one 1/4" is also included. BHJ's Crankshaft Dual-Key Fixture is a recommended companion to this Kit and is shown on page 26.



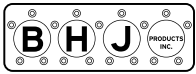
Harmonic Damper Installation Kit (HD-1)

The HD-1 Harmonic Damper Installer is a high quality, precision-machined tool that enables the proper press-fit of all harmonic dampers and is designed for a lifetime of use. Manufactured from alloy steel and fully heat-treated the HD-1 incorporates a Torrington thrust bearing and washers for smooth, effortless damper installation.

Improper installation of any performance harmonic damper may damage the crank snout and damper hub and in most cases will void any warranties for those parts.

The Kit includes two Mounting Bolts and Thread Adapters for use on crankshafts that are tapped for 3/8", 7/16", 1/2", 5/8" and 3/4" SAE threads. Metric Thread Adapters are also available.





Differential Narrowing Kit (DNK-1)



BHJ's Differential Narrowing Kit is designed for precision re-assembly of standard-width and narrowed differentials. The initial Kit includes all parts needed to accommodate Dana 60, Ford 9" (with large style axle bearings) and Chevrolet 12 Bolt rearends using the C-clip eliminator kit.

The Narrowing Kit consists of one 48" long, 1.500" O.D. precision-ground steel Alignment Bar, Carrier Bearing Adapters in pairs and Wheel Bearing Plugs. Additional Carrier Bearing Adapter pairs and Axle Plugs are available separately for virtually all differential applications. Each Set of Carrier Bearing Adapters and Axle Plugs is size-specific and thus may fit multiple rearend applications.

Precision Measuring Instruments



BHJ Products offers a wide selection of high-quality, precision Measuring Tools and Instruments to aid in accurate engine preparation. Many Measuring Instruments not listed below can also be supplied by request.

Outside Micrometers, Inside Micrometers, Depth Micrometers

Most Popular Sizes Available

Dial Bore Gauges

.250"-.400" Dial Bore Gauge Set for valve guides

.750"-1.500" Dial Bore Gauge Set for lifter bores

2"-6" Dial Bore Gauge Set for cylinders

Telescope gauges

Most Popular Sizes Available

Dial Calipers

6" Dial Caliper, .100"/revolution

Dial Indicators

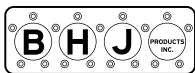
1"-travel Dial Indicator, .100"/revolution, .001" graduations

.200"-travel Dial Indicator, .100"/revolution, .001" graduations

Magnetic Base Set for dial indicator

Specialty Micrometers

Deck Height Micrometer (see page 8)



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Email sales@bhjinc.com
Web <http://www.bhjproducts.com>

Hours of Operation

Monday-Friday, 8:00am-5:00pm Pacific Time

Limited Warranty

If a product has a defect in materials or workmanship BHJ, Products, Inc. ("BHJ") will repair or replace the product. This warranty is for 90 days from the date the product is delivered unless a shorter time is stated for a particular product. Should BHJ determine that a product should be returned to the factory for inspection or repair, the customer must properly pack the product to protect it from further damage and ship it freight prepaid. In no event shall BHJ be liable to the customer for consequential, incidental, economic, or special damages stemming from any breach of express or implied warranty.

THIS IS THE ONLY WARRANTY BHJ GIVES IN CONNECTION WITH ITS PRODUCTS. BHJ GIVES NO OTHER WARRANTY EXPRESS OR IMPLIED AND DISCLAIMS ANY OTHER EXPRESS WARRANTY AND ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY.

Conditions Of Use

BHJ shall have no liability and BHJ's warranty does not apply if the Product is abused or used for a purpose other than the intended purpose or used in other than the intended manner. BHJ shall have no liability and BHJ's warranty does not apply if the Product is not properly maintained. BHJ shall have no liability and BHJ's warranty does not apply if the Product is repaired or modified by anyone not authorized to do so by BHJ.

Limitation Of Liability

BHJ Products shall not be liable for any unforeseeable or any consequential damages arising from the use of the product. BHJ's liability for any damages arising from use of the Product is limited to the purchase price of the Product.

Warnings

BHJ manufactures precision tools, fixtures and gauges for the automotive industry. BHJ Products are used in

conjunction with products of others to repair and modify engines. The installation or use of BHJ Products and the operations in which BHJ Products are used require skill, experience and attention to safety precautions.

BHJ Products are often used in high performance engines in situations where the engines are used in extreme conditions, and at or beyond the level at which sudden and surprising failure of components are to be expected, such as automobile racing. Failure of components, including BHJ Products, can lead to dangerous situations and to damage to other property, and injury or death of the driver or of others.

IF YOU USE BHJ PRODUCTS IN DANGEROUS ACTIVITIES SUCH AS AUTOMOBILE RACING YOU ASSUME THE RISKS INHERENT IN THAT ACTIVITY AND ONE OF THE INHERENT RISKS IS THE FAILURE OF THOSE PRODUCTS.

BHJ Credit Policy

Terms for all sales are Cash, COD-Certified Check/Money Order, or Prepaid by Visa or MasterCard unless a signed credit application is on file and has been approved by BHJ. Credit applications are available for Net 30 Days or COD-Company Check OK terms.

Sales Tax

Sales Tax will be charged for all California and Florida sales unless a Resale Number is on file with us or provided at the time of order.

BHJ Freight Policy

All orders are sent freight pre-paid and billed, F.O.B. Newark, California unless other arrangements have been made in advance. Orders normally ship the next business day for in-stock items when standard UPS Ground shipping is requested. We can typically ship "same-day" as late as 3:30 PM Pacific time for in-stock parts if expedited shipping is requested.

BHJ Return Policy

If a product needs to be returned to us for credit or repair, please call for a RMA number (Return Merchandise Authorization), which can be referenced when the package arrives and will speed the response time for repairs and returns. Most RMA returns will be processed within 7 working days. All returns to the factory must be sent freight prepaid and properly packaged to prevent the product from damage during shipping. Shelf items returned for credit will incur a 15% restocking charge. Custom made parts can only be returned for defects in material or workmanship.

Check All Packages

WE ARE REQUIRED TO FILE ALL FREIGHT CLAIMS WITHIN 72 HOURS. PLEASE INSPECT EACH SHIPMENT FOR MISSING OR DAMAGED PARTS.

BHJ Harmonic Dampers

BHJ Harmonic Dampers offer the most precise and advanced execution of the proven elastomer-style Harmonic Damper (also called Torsional Vibration Damper) design.

Most engine designers prefer elastomer-type Dampers because of their durability, superior high-frequency damping qualities, and ability to dampen all types of vibrations: torsional, axial and radial. Other Damper designs are limited to damping torsional vibrations only.

S.F.I. 18.1 approved Dampers are available for most engines in two versions, all steel and aluminum hub/steel inertia ring “Combo” styles. Both types are typically much lighter than the O.E.M. units they replace and are lighter than many competitive aftermarket Dampers.



All-steel Dampers have been manufactured by BHJ longer than any other company in the industry. They have proven their merit in thousands of applications, including off-shore boats, drag racing, super speedways, short track, road racing and off-road, as well as hot rods and street-driven grocery getters.

Aluminum/steel “Combo” Dampers are a product of BHJ’s long experience in the performance industry. The “Combo” Damper design mates a lightweight aluminum hub with a steel inertia ring and is available for most internal-balance Dampers. Established Damper technology proves that the mass of the non-damping elements in any design actually amplifies harmonic vibrations. Therefore, elimination of non-damping mass greatly improves the effectiveness of any Damper. In many instances this will allow the use of a smaller size Damper. The lighter hub and smaller size provide for appreciably faster potential acceleration.

BHJ’s E-Performance dampers are an economical, nodular iron alternative for use in high-performance street or racing applications where S.F.I. certification is not required. The E-Performance damper series is also very popular in racing classes where a “stock-appearing” (non-S.F.I.) damper is mandated by the sanctioning body. E-Performance Dampers are lighter than their O.E.M. counterparts and equivalent in price.



Both S.F.I. and E-Performance Harmonic Dampers are custom designed to meet each specific application and all critical O.E.M. mounting dimensions are duplicated for accurate alignment of accessory drives. All Harmonic Dampers feature a T.D.C. mark and when necessary, are degreed from 0 to 50 degrees in 2-degree increments for accurate ignition timing. 90-degree marks are also included for easy valve adjustment.



Externally balanced Dampers feature a machined-in-place counterweight that precisely matches the O.E.M. unit it replaces and are available in all-steel only. Internal or neutral-balance Dampers are zero-balanced before shipment.

Custom Design Programs for specialized racing applications, vintage restoration and crate engine programs are also available in nearly unlimited configurations, whether S.F.I. certification is necessary or otherwise. Programs are available for a wide variety of budgets and production quantities. BHJ’s state-of-the-art damper design technology assures precise tuning for outstanding performance and long engine life in any operating environment.

Visit our website at www.BHJDynamics.com or contact us for available applications, technical specifications and custom design inquiries.