

BHJ Products, Inc.

Parts List & Instructions

Product Name: **O-Ring Groove Cutter**
BHJ Part#: **ORG-2**

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Kit Contents:

1x Cutter Head	1x 5/32" Hex Wrench
1x Big-Bore Adapter Ring	4x Cutter Head Hold-down Knobs
3x Allen-head Adapter Ring Screws	2x Dowel Pins (Block Specific)
1x Insert Tool Holder with One (1) Carbide Insert	1x $\frac{1}{8}$ " Travel Dial Indicator with Special Tip & Lock Nut
1x Carbide Insert Torx Wrench	1x Zeroing Pin
1x 3/32" Hex Wrench	1x Register Plate (Block Specific)

Recommended Accessory:

O-Ring Groove Depth Gauge BHJ P/N: ORG-DG

Description

This tool can be used to cut grooves for conventional stainless steel O-ring wire for copper head gaskets, copper O-ring wire for "M.L.S." gaskets, FEL-PRO LOC WIRE™ gaskets, as well as "Fire Ring" installation in diesel and Top Fuel drag racing applications.

The Cutter Head can be used on all BHJ big-bore Register Plates (most 8 & 6 cylinder engines), as well as all BHJ small-bore Register Plates (most 4 & smaller 6 cylinder engines). The Big-Bore Adapter Ring should either be installed or removed as necessary per application.

By using the BHJ O-Ring Groove Cutter system, absolute concentricity of the wire groove to the receiver groove is insured, when both a wire groove and receiver groove are necessary. When used correctly, this O-Ring Groove Cutter Kit will produce grooves that are well within the dimensional tolerances of any given head gasket and/or ring manufacturer. BHJ recommends referring to the head gasket manufacturer for O-ring groove dimension starting points.

Call BHJ for replacement cutting Inserts, Wire and other service parts for your application. BHJ also offers a wide variety of Register Plates for any application where an O-ring groove is necessary.

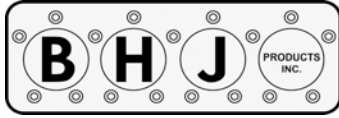
O-Ring Groove Cutting Procedure

*** IT IS STRONGLY RECOMMEND THAT YOU PRACTICE ON A JUNK CYLINDER HEAD OR BLOCK, TO FAMILIARIZE YOURSELF WITH THE TECHNIQUE INVOLVED.**

SET-UP

1. Measure counterbore diameter of the end cylinder bore in the O-Ring Register Plate, which is drilled with a 3/8" hole to accept the Dial Indicator. The counterbore is on the underside of the plate, where the drilled hole enters the bore. Record that counterbore dimension.

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- Slide the Tool Holder, with Insert attached, into the Tool Block on the underside of the Cutter Head.
- Install the Cutter Head into the Register Plate bore on the end with the Dial Indicator plug-in hole, which was measured in step 1.
- Insert the Dial Indicator into the 3/8" Indicator hole, using a slight twisting motion.
- Roll the Zeroing Pin around the inside of the plate counterbore, and over the Dial Indicator tip. Zero the Dial Indicator at the highest reading.
- Set the cutting diameter as per the following example:
(THIS IS ONLY AN EXAMPLE)

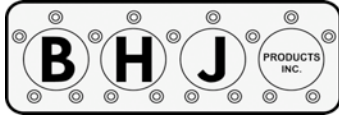
Register Plate Bore	4.403
Subtract the Desired O-Ring O.D.	<u>- 4.299</u>
	.104

Divide the difference by 2 = .052

- Push the center shaft of the Cutter Head until the Tool Block contacts the underside of the Cutter Head. Next, carefully rotate the Insert cutting edge onto the Dial Indicator tip. Rotate the Insert cutting edge slightly to find the high point. Adjust the Tool Holder protrusion, so that it is .052" (as per the example above) from the Dial Indicator zero point. Tighten the Tool Block clamping screws to secure the Tool Holder.
- It is safest at this point to double-check the Dial Indicator zero setting, as well as the Tool Holder protrusion setting.

CUTTING THE GROOVES

- Install the supplied Dowel Pins into the locating holes on the underside of the Register Plate.
- Install the Register Plate onto the cylinder head or block. Install and tighten the Plate Clamping Bolts. Be sure that the cylinder head, or block deck surface, is absolutely clean and free of high spots.



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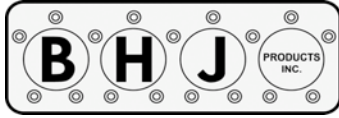
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11. Set the cutting depth by gently allowing the Insert cutting tip to contact the cylinder head or block deck. Adjust the lower Depth-Adjustment Ring below the Handle, until the Cutter can be rotated and just barely contacts the deck surface when turning the Handle with a gentle downward pressure.

12. Rotate the lower Depth-Adjustment Ring one-half turn or more counter-clockwise to set the starting groove depth – Each mark on the Depth-Adjustment Ring equals .001", thus one full turn equals .020". Tighten the top Depth-Locking Knob to lock the setting at the desired depth.
* It is highly recommended that the desired final depth not be dialed-in at the start, to avoid accidentally over-cutting the groove depth for the application.

13. Rotate the Handle rapidly and smoothly, using steady, downward palm pressure to cut the groove. When pressing downward as described above and the cutting resistance fades, the groove is finished.
*** CAUTION! INSERTS MAY BREAK AND GROOVE DAMAGE CAN OCCUR IF EXCESSIVE DOWNWARD FORCE IS APPLIED WHILE TURNING THE CUTTER.**

14. When using the optional O-Ring Groove Depth Gauge, verify the new groove depth and evenness as follows:
 - A. Leaving the Register Plate attached, remove the Cutter Head from the Register Plate after making the initial groove cut.
 - B. Position the O-Ring Groove Depth Gauge on the Register Plate top-surface, with the Indicator Stem passing through one of the four slots in the O.D. of the cylinder bore.
 - C. Zero the Indicator Tip on the deck surface at least 1/8" from the edge of the groove.
 - D. Reposition the Indicator to allow the Tip to settle inside the newly cut groove and check the groove-depth measurement. Record the groove depth and verify, based on the initial depth dialed-into the Depth-Adjustment Ring.
 - E. Repeat the depth check at the remaining three slots to verify the groove depth is even all the way around the bore.
* Uneven groove depth may be an indication that the deck surface is not even, or was not properly cleaned before installing the Register Plate. An uneven groove depth may also result if the Cutter Head is not installed securely on the Register Plate.



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15. Replace the Cutter Head onto the Register Plate and make any groove-depth adjustments necessary, using the Depth-Adjustment Ring, to achieve the final groove depth.
*** IT IS ADVISABLE TO DOUBLE-CHECK THE DIAMETER AND DEPTH SETTINGS OF THE CUTTER, AND ENSURE THE DEPTH-LOCKING KNOB IS SECURELY TIGHTENED BEFORE PROCEEDING WITH FURTHER CUTS.**
16. Once the final groove depth is achieved, repeat the groove-cutting process for the remaining cylinders.
17. When cutting is complete, it may be necessary to gently flat-file the head/deck surfaces to remove any burrs or raised edges.

Call BHJ at (510) 797-6780 with any questions regarding the part, its setup, or operation.