KL50000
Counter Bore
Re-Condtioning Tool Kit

K-Line Special Service Tools

OPERATING INSTRUCTIONS

U.S. Patent No. 8.308.401
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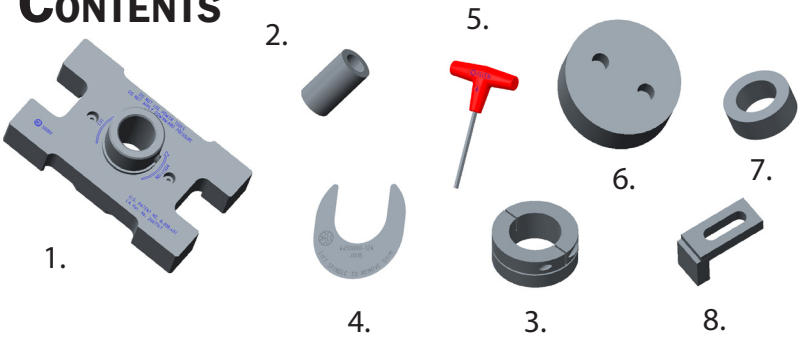
Kit Contents



#	Part #	Description	Qty
1	KL50002	Base Assembly	1
2	KL50008	Bolt Standoffs	2
3	KL50000-2	Stop Collar	1
4	KL50000-12	Set of 4 Shims	1
5	KL50000-6	T-Handle Allen Wrench	1
6	4450007	Foam Plugs for Cutter	3
7	KL50009	Spacer	8
8	KL50010	Clamp Block	2

Cutter Assemblies

Part #	Description	Qty
KL50001	International/Navistar DT466, DT530, DT570, & HT570	1
KL50003	Detroit Diesel Series 60	1
KL50004	CAT 3400 Series, C-15, C-16, C-18, C-27,C-32, International/Navistar 15L	1
KL50005	Cummins ISX 150mm	1
KL50006	Cummins NT/NH, N14	1
KL50007	International/Navistar Maxxforce 11L/13L (Big Bore)	1
KL50011	CAT C-10, C-11, C-12, C-13	1
KL50012	CAT 3306	1

Replacement Carbide Inserts (AT50001A-6) & Screws (AT50001A-7) Available

Overview

The K-Line® 50000 Counter Bore Cutting Tool is a precision instrument designed to re-surface the counter bore ledge for the engine cylinder liner. The Counter Bore Cutting Tool leaves a clean and even counter bore ledge, and with shims, provides the correct cylinder liner protrusion.

NOTE: *K-Line® 50000 Counter Bore Cutting Tool will, during its normal function, remove material in order to achieve a clean and even surface. Thus, it will be required to use a shim or combination of shims of the correct diameter and thickness in order to maintain the factory specified amount of cylinder liner protrusion. The factory engine specifications must be referenced for proper liner protrusion dimensions.*

NOTE: *Always begin by inspecting all of the counter bore ledges, and start with the ledge in the worst condition. Use the tool to cut the counter bore ledge of this cylinder housing first until satisfied with its clean up. Proceed on to the remaining counter bore ledges without making additional adjustments to the tool and its stop collar. This will assure that every counter bore is cut to the same depth.*

CAUTION: *Always inspect the cutter head before proceeding with the set up. Inspect the cutter head locating surface for sharp edges, grooves and burrs. This surface must be smooth and clean for the tool to work properly. The carbide cutting insert must be sharp and without chipped edges.*

NOTE: *The carbide cutting insert is a precision tool and subject to damage if not handled carefully.*

Block Preparation

Remove the cylinder head, pistons, and all of the cylinder liners that are to have the counter bore ledge machined.

NOTE: *This procedure can be performed with the engine in or out of the chassis. The included foam plugs (4450007) should be used in the cylinder housing being machined as well as the cylinder housings directly adjacent to it. In addition, any exposed oil gallery holes should be blocked. This will help prevent machining chips from entering the oil system.*

Make sure the top deck of the engine block is very clean. It must be free of gasket material and without knicks, dings, and burrs for the tool to work properly.

WARNING: The deck of the engine block MUST BE FLAT.

Instructions

Step 1 - Tool Installation

NOTE: *The foam plugs (4450007) should be used in all circumstances. Insert a foam plug into the cylinder housing to be cut, as well as any adjacent cylinder housings, at an approximate depth of ½" below the counter bore ledge. This will help to prevent chips from falling into the engine oil system.*

CAUTION: Assure that the stop collar (KL50000-2) has been loosened before proceeding.

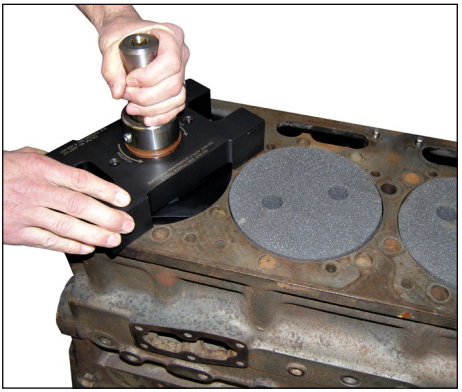


Image 1: Mate the Counter Bore Cutting Tool

1. Mate the counter bore cutting tool assembly to the cylinder housing to be machined. The tool must not bind. (Image 1)

2. Align the holes of the counter bore cutter base to the corresponding holes used for the engine head bolts. (Image 2)

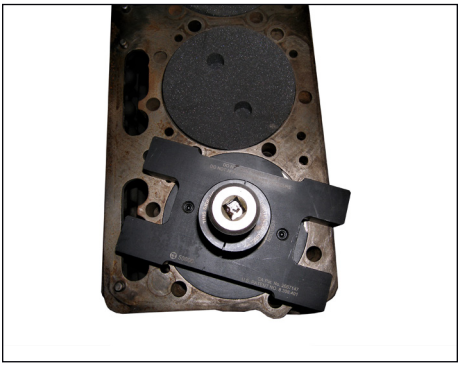


Image 2: Align the Counter Bore Cutter Base

3. Position and align the clamp blocks (KL50010) with the head bolt holes to hold down the base assembly. Place a bolt standoff and spacer (KL50008 & KL50009) if necessary onto each of the two (2) head bolts that will be used to secure the base assembly to the block. Insert both head bolts into the corresponding holes on the counter bore cutter base and finger tighten both bolts. (Image 3)

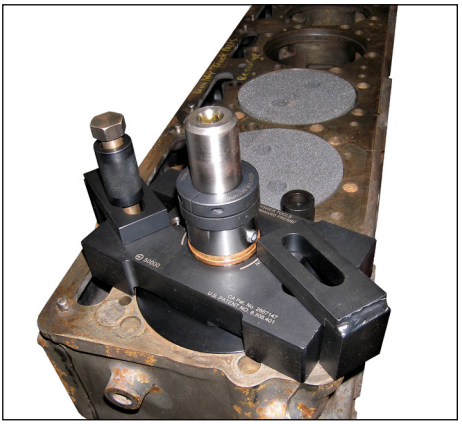


Image 3: Insert Bolt Standoffs/Washers and Head Bolts

4. Turn the cutter head counter clockwise (CCW), as indicated by the "POSITION" arrow on the base block, 1-2 revolutions in order to center the cutter head. (Image 4)

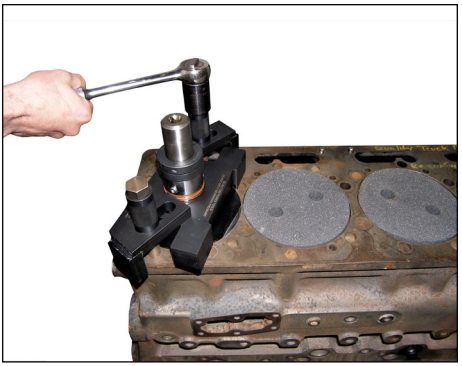


Image 4: Rotate CCW to Center Cutter Head

5. Using a torque wrench and appropriate socket for the bolt head, tighten both bolts using a step method to progressively reach 30 ft. lbs. (Image 5)

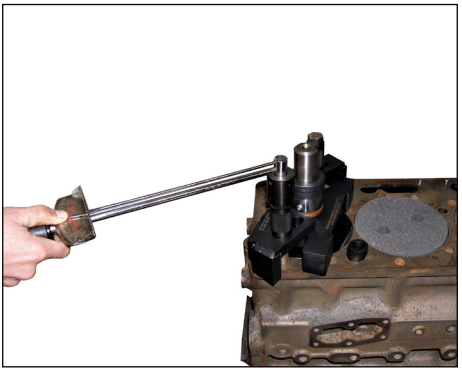


Image 5: Tighten Head Bolts

Step 2 - Settings

6. Loosen the shaft collar and place a shim from the shim set (KL50000-12) of the desired cut depth under the Stop Collar (KL50000-2). (Image 6)

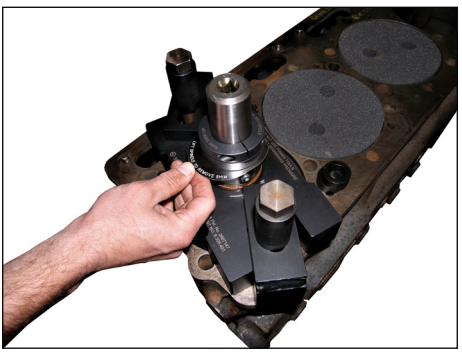


Image 6: Using the Shim Set

7. Apply downward pressure to the stop collar on top of the shim and lock the collar securely. The shim must be removed before proceeding. Note: The spring loaded cutter head will need to be lifted slightly in order to remove the shim. (Image 7)

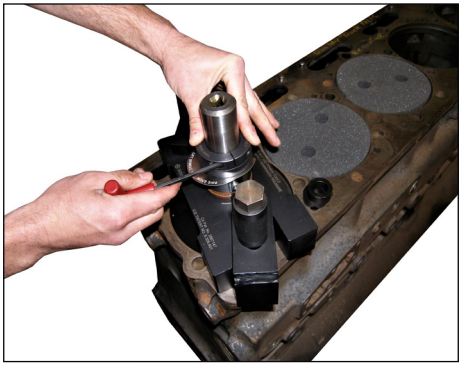


Image 7: Lock the Stop Collar

NOTE: *The counter bore ledge can be inspected past the flat on the edge of the cutter head, also called the "sight window", during cutting. If the desired cut it not obtained after performing Step 3, the depth of the cut can be reset using the shim set (KL50000-12) and adjusted until the desired cut is complete. This final setting should be kept intact while cutting the remainder of the cylinder housing counter bore ledges to maintain uniformity.*

Step 3 - Cutting

8. Once the counter bore cutting tool is positioned and secured, rotate the cutter clockwise (CW), as indicated by the "CUT" arrow on the base block, **by hand only**; the tool will begin cutting. Continue clockwise rotation (CW) until the cutter turns freely. (Image 8)

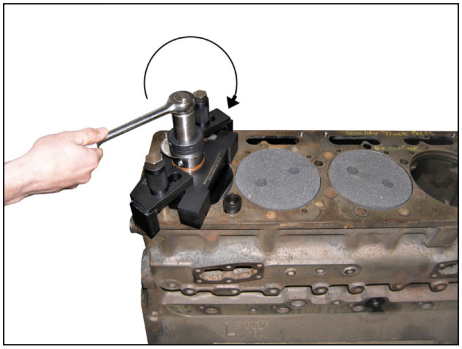


Image 8: Performing the Cut

NOTE: ***DO NOT*** *apply any downward pressure while rotating the cutting tool. Spring Plungers located in the Base Assembly apply all the downward pressure that the tool requires.*

9. Remove the Counter Bore Cutting Tool and move on to the remaining cylinder housing counter bore ledges and repeat steps 1 and 3. Step 2 need not be repeated. The depth of the cut was set during the completion of step 2 for the first counter bore ledge and should remain the same for all of the counter bore ledges.

NOTE: *Clean the Counter Bore Cutting Tool thoroughly between every cut, clearing chips and dust from* ***all*** *surfaces. This tool is a highly precise instrument. Even the slightest debris can cause binding, an inconsistent cut or damage to the tool.*

CAUTION: *For the safety of the technician and to prevent damage to the tool,* ***DO NOT USE POWER TOOLS!*** *Rotation of the tool should be done by hand only!*

Care and Maintenance

Clean all debris and dust off of the tool and its components prior to storage.

Periodically lubricate the spindle that is part of the base assembly using light spindle/machine oil. To lubricate spindle, remove the access screw located on the side of the bushing just above the deck of the base assembly. (Image 9)

Image 9: Lubrication

This completes the operation procedure

For product information or replacement parts

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