



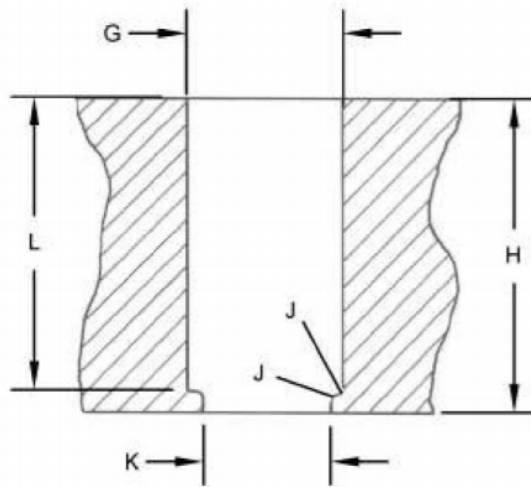
## Lifter Bore Repair on Caterpillar 3400 Series Engines

The AERA Technical Committee offers the following information on a lifter bore repair option for Caterpillar 3400 series engines. These engines are made in an inline (L) and V configurations. This repair involves boring and then installing a sleeve insert Part # 4W4588.

The repair of an individual bore is acceptable and as a general rule the bore must have a normal wear pattern and the diameter of the bore must be 1.1017" (27.983 MM) or less to be used again.

As a reference, the centerline of the lifter bore on the 3406 engines is 84° 30' from the top deck of the block. On the 3408 and 3412 engines, the centerlines are 80° 30' from the top of the deck of the block.

Install the block on a boring machine. Use a lifter bore that is in good condition to adjust the centerlines correctly. Use a dial indicator to make sure that the centerline of the bore is in alignment with the centerline of the spindle. Move the dial indicator along a horizontal and a vertical axis to center the boring machine.



The dimensions of the lifter bores for machining the 3400 engines

- (G) 1.3470"  $\pm$  .001" (34.226  $\pm$  .025 MM)
- (H) 2.560"  $\pm$  .020" (71.0  $\pm$  .5 MM)
- (J) .010" (.25 MM) Max Chamfer and Radius
- (K) 1.228"  $\pm$  .001" (31.191  $\pm$  .025 MM)
- (L) 2.560"  $\pm$  .020" (65.0  $\pm$  .5 MM)

Before machining measure the outside diameter of the sleeve to determine which diameter to bore to be sure that the press fit of .0020-.0030" (.064  $\pm$  .013 MM) is obtained. **NOTE:** the block and repair sleeve should be of equal temperature during all measurements and machining.



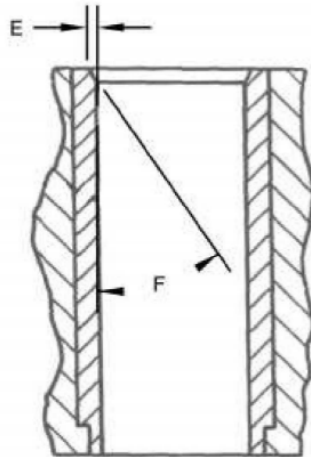
Before installation, freeze the 4W-4588 sleeve with liquid nitrogen to minus 120° F (-84 °C). Apply Loctite 620 to the lifter bore. Install the 4W-4588 sleeve with a 25° internal chamfer toward the top of the block.

Use the 1P-0510 Driver Group to install the sleeve flush with the block. Make sure that the lubrication holes in the sleeves are in alignment with the lubrication holes in the block. There is an oil hole for the late produced 3406A engines and all 3406B engines that must be drilled out after the sleeve is installed. The oil hole is located 23.285" (591.44 MM) from the end of the engine block. Use the existing hole of .3390" (8.61 MM) in diameter as a guide and the same size drill to drill all the way through the sleeve and open the oil passage to the lifter bore.

**Note:** Inspect the alignment of the oil hole between all sleeves and the block after installation. If the opening is less than 50%, run a 9.5 mm (3/8 in) drill through the oil passages of the engine block.

Use a spot face tool to make the sleeve even with the surface of the block. Machine the lifter bore to 1.1005" ± .0007" (27.953 ± .019 MM). The surface of the bore must be smoother than 126 micro inch (3.200 micrometer).

Machine a chamfer on the sleeve top as shown below.



**Chamfer dimensions on the sleeve.**  
(E) .020-.040" (.510-1.010 MM)  
(F) 30°