

Single Cylinder Crankshaft BEARING Service Kit 4089213

for All Cummins Engines

Kit contains a Ball Bearing and a Journal Bearing. Also included, for field service, sump access plug, head bolts, cover screws and head and cover gaskets since **the head, piston and rod must be removed and replaced to service the bearings. You must provide Loctite 648 or Euro-Lock A 64.80 to seal the sump plug.**

Disassembly

1. **First**, remove the head assembly, connecting rod and piston assembly, referring to the attached instructions.
2. Position the crankshaft in the TDC position (the gear alignment pin will also be in the TDC position) and press the crankshaft with ball bearing out of the **rear** of the crankcase. This requires approximately 3,000 pounds of force.



3. Using a cylindrical piece of steel that is a loose fit to the bore of the crankcase, press the journal bearing out toward the front.



4. Clamp the crankshaft by the counter weight and remove the bearing retaining nut. It will require a high removal torque in the CCW direction. A section of splined shaft can be used as a tool for some models..



5. Remove the ball bearing from the crankshaft.

Reassembly

1. Press the new ball bearing onto the rear crankshaft journal and assemble the retainer. Insure the force is applied to the inner race. Depending on the model, this retainer may have a spline in the center, or a 3-jaw driver. **Torque on either version is 600 +/- 25 Nm.**
2. Press a front bushing into the crankcase to a depth of 18 +.00/-0.50 mm below the machined mounting flange. **Insure the oil hole is aligned to the crankcase oil supply hole.**



3. Assemble the crankshaft with ball bearing into the crankcase, insuring that the rod throw is in the TDC position and will enter through the cast clearance slot.



4. Press the assembly in until it securely bottoms on the shoulder. **Insure the load is applied to the outer race only ... to avoid bearing damage.**
5. Continue with the remainder of the compressor assembly following the attached piston, rod, and head assembly procedures



The information on the following pages is provided for rereference to facilitate proper removal and replacement of the head and cover, rod and piston assemblies.

Head removal and reassembly for models with **75mm** diameter piston:

Disassembly

1. Remove the four head bolts and two cover screws.
Find the new head bolts and cover screws in the kit, then discard the originals.
2. Remove and **discard the original upper and lower gaskets**. Note the position of the ports with respect to the crankcase for reassembly. **Save** coolant and air fittings for reuse. There is no need to remove fittings from the cover.
3. Cleaning

Rotate crankshaft until piston is at the top of cylinder bore. Remove any accumulated carbon and varnish by carefully scraping and light application of solvents. **Avoid** getting debris and solvents into the clearance between the piston and bore. **Avoid** the use of abrasive products similar to "Scotch Brite" because any abrasive grit left after cleaning will shorten the life of **your** air compressor.

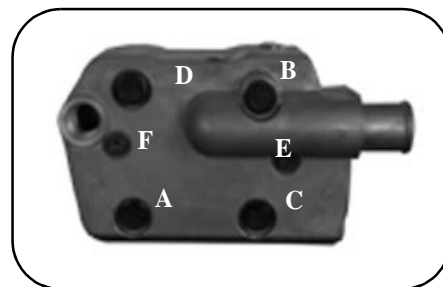
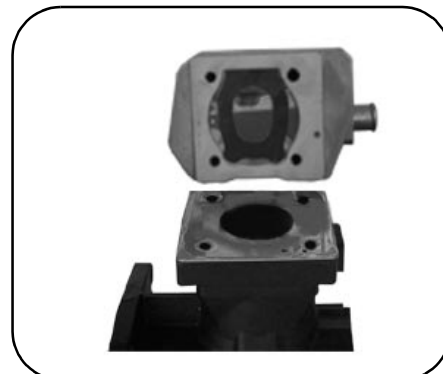
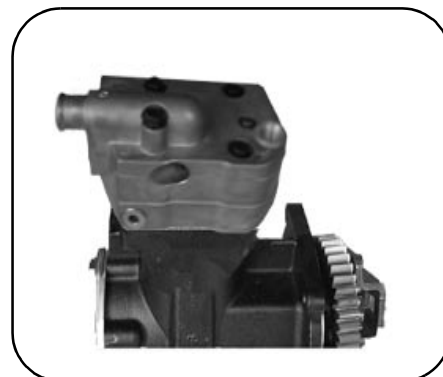
Reassembly

insert new upper gasket. Insure that sliding valve is in place and that guide pins are in the correct direction to enter the larger diameters in the valve body and crankcase. Position mounting gasket and Head Assembly. Insert the four head bolts in locations A, B, C, and D in the picture. Insert the two cover bolts in E and F locations. Tighten all screws and bolts finger tight. Follow the final tightening sequence below:

Bolt Tightening Sequence

Step	Bolt	Torque Nm	Rotation Degrees
1	A	15 ± 1.5	
2	B	15 ± 1.5	
3	C	15 ± 1.5	
4	D	15 ± 1.5	
5	A	25 ± 2	
6	B	25 ± 2	
7	C	25 ± 2	
8	D	25 ± 2	
5	A		180° ± 10
6	B		270° ± 10
7	C		180° ± 10
8	D		180° ± 10
9	E	6 ± 0.6	
10	F	6 ± 0.6	
11	E		90° +15 ₋₅
12	F		90° +15 ₋₅

Bolt Identification Letters Refer To Table and Picture

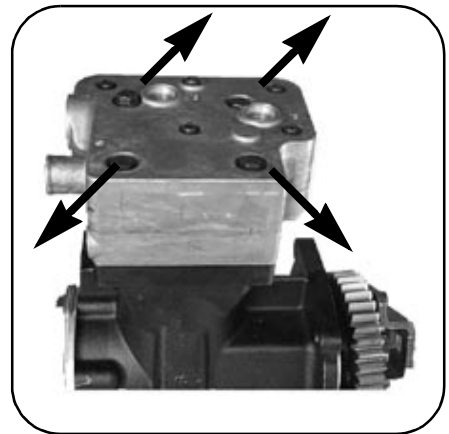


Use the proper tools to perform this torque-turn bolt tightening sequence **EXACTLY**. Accuracy will be **CRITICAL** to your field service **SUCCESS** !

Head removal and reassembly for models with 85mm diameter piston:

Disassembly

1. Remove the four head bolts and five cover screws. **Find the new head bolts and cover screws in the kit, then discard the originals.**
2. Remove and **discard original upper and lower gaskets.** Note the position of the ports with respect to the crankcase for reassembly. **Save** coolant and air fittings for reuse. there is no need to remove fittings from the cover.



Cleaning

Rotate crankshaft until piston is at the top of cylinder bore. Remove any accumulated carbon and varnish by carefully scraping and with light application of solvents. **Avoid** getting debris and solvents into the clearance between the piston and bore. **Avoid** the use of abrasive products similar to "Scotch Brite" because any abrasive grit left after cleaning will shorten the life of **your** air compressor.

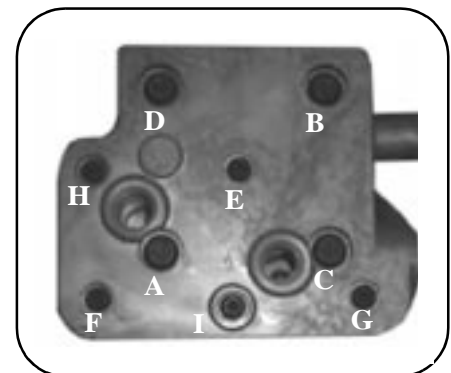


Reassembly

Insure that sliding valve is in place and that guide pins are in the correct direction to enter the larger diameters in the valve body and crankcase. Position mounting gasket and Head Assembly. Insert the four head bolts in locations A, B, C, and D in the picture. Insert the five cover screws in E, F, G, H and I locations. Tighten all screws and bolts finger tight. Follow the final tightening sequence below:.

Step	Bolt	Torque Nm	Rotation Degrees
1	A	25 ⁺⁰ _{-.5}	
2	B	25 ⁺⁰ _{-.5}	
3	C	25 ⁺⁰ _{-.5}	
4	D	25 ⁺⁰ _{-.5}	
5	A		90° ⁺¹⁵ _{-.5}
6	B		90° ⁺¹⁵ _{-.5}
7	C		90° ⁺¹⁵ _{-.5}
8	D		60 ° ⁺¹⁵ _{-.5}
9	E	6 ^{+0.6} _{-.0.6}	
10	F	6 ^{+0.6} _{-.0.6}	
11	G	6 ^{+0.6} _{-.0.6}	
12	H	6 ^{+0.6} _{-.0.6}	
13	I	6 ^{+0.6} _{-.0.6}	
14	E		90° ⁺¹⁵ _{-.5}
15	F		90° ⁺¹⁵ _{-.5}
16	G		90° ⁺¹⁵ _{-.5}
17	H		90° ⁺¹⁵ _{-.5}
18	I		90° ⁺¹⁵ _{-.5}

Bolt Identification
Letters Refer To
Table and Picture

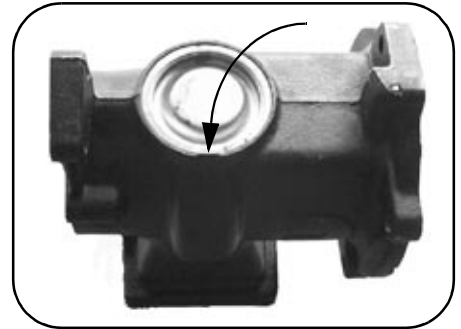


Use the proper tools to perform this torque-turn bolt tightening sequence **EXACTLY**. Accuracy will be **CRITICAL** to your field service **SUCCESS** !

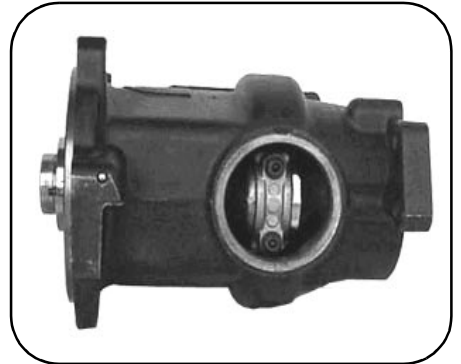
Connecting rod and piston removal and reassembly for reference:

Disassembly (after Head removal)

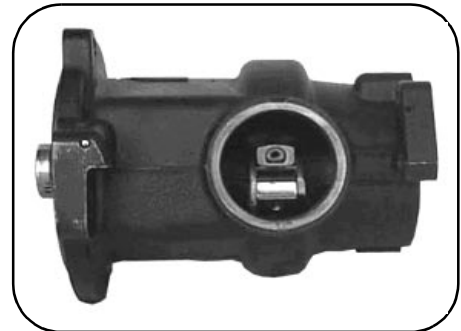
1. Using a large screwdriver or similar device, remove the sump plug using the cast slot in the crankcase.



2. Rotate the crankshaft to position the rod cap in the access hole.
3. Remove the two Torx Socket rod bolts. **Retain the rod bolts for reuse (unless the rod is also being replaced).**



4. Pull the rod cap off of the rod and crankshaft. **Keep the rod cap for reuse (unless the rod is also being replaced).**



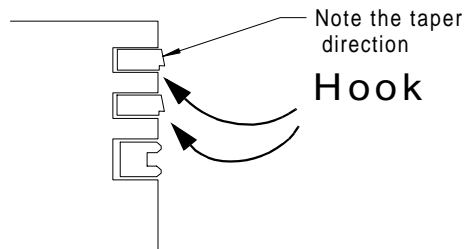
5. Push the piston and rod assembly out of the top of the crankcase with a wooden dowel, or hammer handle; pushing on the bottom of the rod.



6. Remove one pin retaining clip. Push out the pin to separate the connecting rod from the piston assembly. **Keep** the Piston Assembly for reuse (unless the Piston Assembly is also being replaced).

Reassembly

1. Check the piston assembly and, if necessary, stagger ring gaps so that they are about 90° apart. Also check to see that the “hook” of the upper rings is away from the top of the piston as shown.



2. Coat the piston pin, con rod bore and piston pin bores with light oil. Assemble the new rod, piston pin and retainers, insuring that the retainers are secure in their grooves. The rod should move freely.

3. Coat the crankcase cylinder bore with light oil. Using a ring compressor, install the piston into the crankcase. Align the rod to permit it to match up to the crankshaft. Note the orientation features of the cap and rod.

4. Apply light oil to the crankshaft rod journal and assemble rod cap.
Bolt A is the one nearer the “W” of cast word “WABCO”.

Step	Bolt	Torque Nm	Rotation Degrees
1	A	6 ^{+0.6} _{-0.6}	not yet
2	B	6 ^{+0.6} _{-0.6}	not yet
3	A		70° ⁺¹⁵ ₋₅
4	B		70° ⁺¹⁵ ₋₅

5. Check that the crankshaft rotates without binding or excessive torque. The maximum torque is 6 Nm.
6. Apply **Loctite 648** or Euro-Lock A 64.80 sealant to the cylindrical surface of the sump plug and press it evenly into the crankcase until the flange seats.

7. Continue with the remainder of the compressor reassembly.

