



## IPD TECH BULLETIN

### **Reusability of Cummins® ISX & QSX Connecting Rods**

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#### Background:

There are two types of ISX & QSX connecting rods: "Drilled" and "Non-Drilled". A drilled connecting rod has an oil passage drilled up through the shank of the rod to provide lubrication to the connection at the piston pin. A drilled rod can be used with either two piece articulated or one piece steel pistons. There is no oil passage in a non-drilled rod, and this type of rod can only be used with two piece articulated pistons. Because of the differences in the connecting rods they require different connecting rod bearings, which cannot be interchanged between the two rod types.

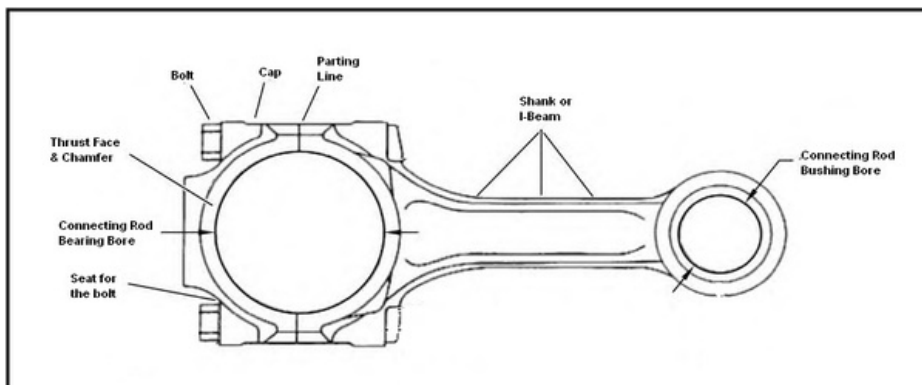
#### Reusability Guidelines:

Thoroughly checking a connecting rod and connecting rod bolts requires sophisticated equipment and fixtures found in engine machine shops. Machine shops have the capabilities to Magnaflux™ the rods and/or bolts to identify cracks, check the rod to see if it is bent or twisted and check the length from center to center.

- o Maximum allowance for bend is  $.0008"$  ( $.021mm$ ).
- o Maximum allowance for twist with the bushing installed is  $.002"$  ( $.05mm$ ).
- o The length specification of the connecting rod from center to center is  $10.293"$  to  $10.297"$  ( $261.45mm$  to  $261.55mm$ ).

Often, connecting rods removed from non-failed running engines are visually inspected and checked dimensionally to assure the bores are within specific tolerances then reused. Once the rod & bolts are cleaned and dried, including the oil passage of drilled rods, the remainder of the tech bulletin outlines the steps commonly performed by the technicians at the repair or rebuild facilities.

#### Nomenclature





- Visually inspect the rods and bolts
  - o There should not be any damage to the shoulder of the rod or to the cap.
  - o There should not be any damage to the thrust face of the rod or cap.
  - o The mating surface of the parting line of the cap and rod must not be fretted or damaged.
  - o The bearing surfaces must be free of nicks and burrs (all imperfections can be removed with emery cloth).
  - o The rod pin bushing must not be damaged or have indications that it has turned in the rod.
  - o Some amount of discoloration is acceptable, but if the rod & cap have a bluish color, the rod assembly should be replaced.
  - o Assure that the alpha code match between the rod & cap.
  - o The bolts cannot be damaged, treated or be pitted from rust or corrosion.
  - o The bolts cannot be bent or galled.
  - o The bolt seat and mating seating area of the cap must not be fretted or damaged.
- Dimensional Specifications
  - o Connecting rod bearing bore (big end) specification is 3.890" to 3.891" (98.801mm to 98.839mm). Note that the torque procedures are different between new rod bolts and used rod bolts.
    - The procedure for used rod bolts is to tighten the bolts in numeric sequence to 52 ± 3 foot pounds, and then in sequence add an additional 60 ± 0 degrees turn.
    - The procedure for new rod bolts is to tighten the bolts in numeric sequence to 29 ± 3 foot pounds, loosen the bolts in numeric sequence, retighten the bolts in numeric sequence and time at 52 ± 3 foot pounds, and then in sequence add an additional 60 ± 0 degrees turn.
  - o Connecting rod bushing (small end) bore specification for inside diameter of the bushing to accept the piston pin is 2.502" to 2.503" (63.50mm to 63.57mm).
    - Note, at the time of this bulletin, replacement bushings and the procedure for replacing them is not available.

The drilled connecting rod was introduced in late 2014 and has since replaced the earlier - non drilled rod. As stated above, the drilled rod can be used with both two piece articulated and one piece steel pistons. It can also be mixed with non-drilled rods in engines with two piece articulated pistons only. Again, drilled rod must be used in all one piece steel piston applications.

More detailed information can be found in the O.E. service bulletins. Always consult the latest O.E. service bulletins and publications for the updates and current information.

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