

Dependable Cummins ISX

BY **STEVE SCOTT**

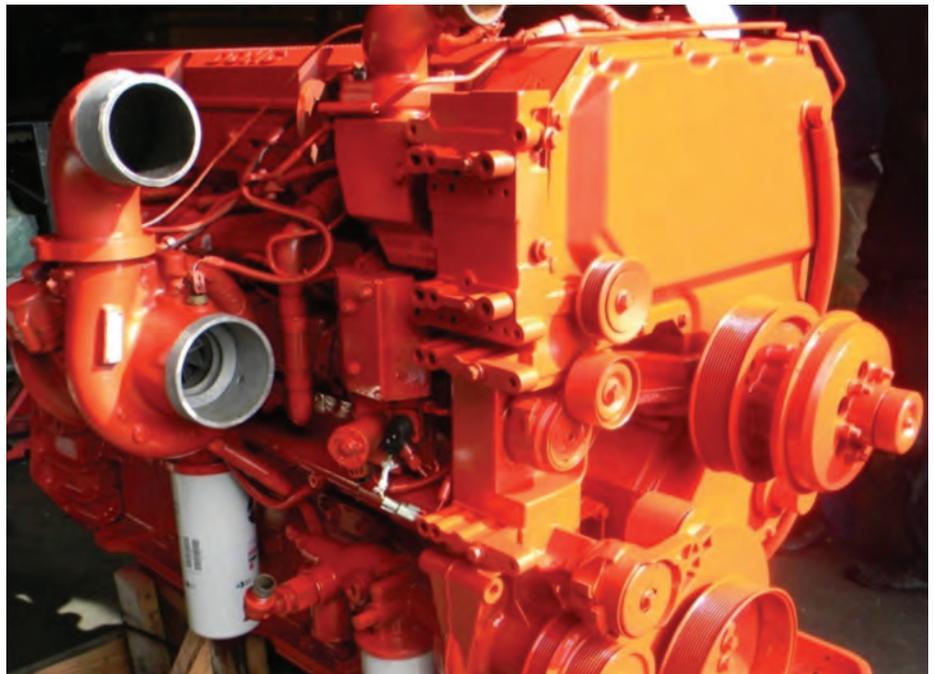
The Cummins ISX and QSX (15.0 liter) engines have been around for a while (1997) and have experienced numerous changes and updates. This engine has had many marketing names and was first known as the Signature 600. A few notable areas of concern that you should be aware of that are showing up during aftermarket overhauls are regarding the types of connecting rods and also the different bore diameter cylinder blocks and liners.

More commonly known currently are the issues surrounding the “drilled” vs. “non-drilled” type connecting rods. There is, however, a third design connecting rod to consider, a “fractured” type, which seems to be the trend in connecting rods. The earlier rods have machined surfaces between the rod and rod cap mating surfaces, whereas fractured rods have rough surfaces on both the rod and cap. The rough surfaces resulting from the rod being fractured during the manufacturing process as shown in the photo at the right.

All three rod types use different connecting rod bearings. Each bearing is designed differently to ensure they cannot be installed into the wrong connecting rod. Historically, drilled connecting rods could be used in place of the older “non-drilled” rods; however, “non-drilled” rods cannot replace “drilled” rods. A “drilled” rod has an oil passage through the strut of the rod that



RIGHT: Fractured Rod Cap Surface



allows oil to travel from the connecting rod bearing up to the piston pin. If a “non-drilled” rod is used in a drilled rod application, there would not be sufficient lubrication reaching the piston pin and the cylinder will most likely seize. The fractured rods are also drilled, and can be used in place of (or mixed with) the earlier machined rods if the weights are similar.

Special care must be used when handling fractured connecting rods. The rod cap should be kept completely separated from the rod, or tightened correctly to the rod whenever the parts

are handled. If they are assembled and the bolts are not tightened, the surfaces will scrub together and the rod will not torque correctly when reassembled. Something as simple as dropping the cap or temporarily putting it on backwards will damage the surfaces. These rods must be replaced if there is any damage to the mating surfaces of the rod or cap.

Each time the fractured joint is separated; small amounts of debris may be produced. The surfaces should be carefully cleaned with solvent and a soft nylon brush; do not use a wire brush or coarse method when cleaning these surfaces. If the parting line between the rod and cap is not visible, you do not have to remove the cap to identify the rod type. A fractured rod has a small hole on the bottom for the rod cap and a machined rod does not have a hole in the cap.



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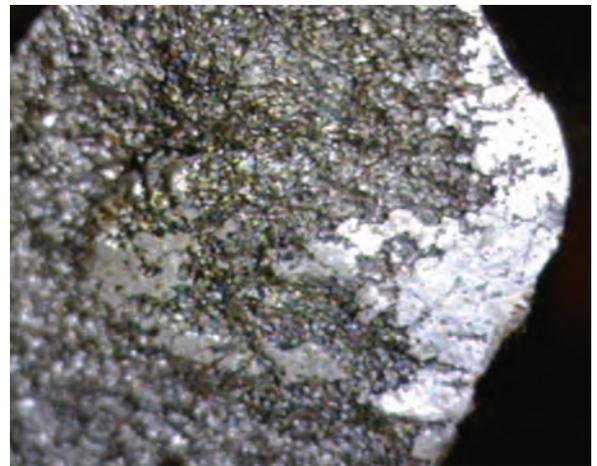
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Correct Rod Cap Mating Surface
(Use again, like new condition)



Damaged Rod Cap Mating Surface
(Do not reuse, damaged condition)

When discussing a large bore liner or cylinder block, one typically thinks of the inside diameter of the cylinder and pistons. However, for the ISX/QSX (15 liter) engines, this is not the case. The diameter being referred to is for the outside diameter of the liner, and the receiving bore size of the cylinder block (this only pertains to the late style “flat top” liners). The difference in diameters is only .078” (2mm), thus the concern is that someone unknowingly might install the smaller OD liner into the larger OD block. This could result in coolant entering to oil system, even something as major as a catastrophic engine failure. These larger bore cylinder blocks are backwards compatible with previous production blocks, but do require some additional parts. The liners are not backwards compatible. Unfortunately, according to a Cummins technical service bulletin (TSB110277), the exact production of engines with the larger bore blocks is not completely clear, and there is a potential that QuickServe (Cummins online program) may list the incorrect block and cylinder liner part numbers. In addition, if an engine has had the cylinder block, short block, long block, or remanufactured

(continued)

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engine replaced, then it could potentially have either the small or large bore cylinder blocks.

The Cummins bulletin states: Any Signature™, QSX, and ISX CM570/CM870/CM871/CM2250 engines that have had a cylinder block kit, ReCon® short-block, ReCon® long-block, or ReCon® engine replaced after January 1st, 2010, could potentially have been built with either a small bore diameter cylinder block and cylinder liner, or a large bore diameter cylinder block and cylinder liner.

As you can see by the dimensions listed by the diagram at the far right, the reference to small/large is really not that much (2mm) and great attention (no eyeballing here) to this area is required during parts ordering and engine assembly.

IMPORTANT NOTE: A small outside diameter cylinder liner will visually appear to have been correctly installed into a large bore cylinder block. However, because of the smaller outside diameter of the cylin-

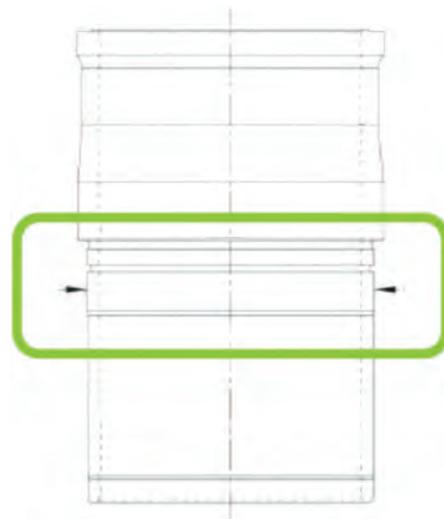
der liner, it will fit loosely into the cylinder block at the cylinder liner O-ring sealing area. This will result in excessive cylinder liner movement in the cylinder block and possible leakage.

These blocks and liners have proven to be long lived and provide millions of miles of service if properly installed and the owner performs the required service maintenance and to be cautious when it comes time for repair. ■



Steve Scott joined the service department at IPD in 1982, working with parts, service and sales for a variety of equipment, diesel, and natural gas engines. Since 2004, he has been the director of product development and technical support for IPD. For more information, email sscott@ipdparts.com.

Large Bore Block O.D. 5.984" (152 MM)
Small Bore Block O.D. 5.906" (150 MM)



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