



SERVICE BULLETIN

TOPIC: CFR Connecting Rod

Part Number: NA

NUMBER: 07-11-2016

SUPERSEDES:

DATE: November 21, 2016

MODELS APPLICABLE TO:	TEST METHOD:
■ F1/F-2 Combination	D 2699, D 2700 Route To: Distributor/ End-user
■ F4 Supercharge	D909
■ F5 Cetane	D613

This bulletin is to notify Distributors and End-users of important information regarding connecting rod compatibility. There are currently two types of connecting rods currently in use in CFR units today. The older style is a forging and a newer style is a fully machined forging. The changeover from the old style to the new style was done in 1985. Both rods are interchangeable on the 48 style crankcases. (See Bulletin No. 285 dated March 15, 1985).

There has been a recent incident in which the bolts from the current fully machined forged rod were misapplied with the older style connecting rod. The current new rod bolt (part number 105681B) is longer than the older style forge rod bolt (part number 105681A). This created an issue which caused the new longer style bolts to fail in the older style rod.

The left image in figure 1 (**below**) is an example of the old style cast forged rod and the right image, a billet forged rod.

- The old style cast forged rod is no longer produced. Bolt's for these rods are also no longer sold. It is permissible to use the old style rod as the current big end bearing shells and pin bushing are interchangeable. Since the bolts are no longer available and yielding of the bolts can occur after repeated torqueing, CFR highly recommend that old style rods should be eventually replaced with newer billet style rods when needed or possible. Generally, the bolts can sustain about 4-5 torques before they start to become stretched or yielded and should be replaced. This also is the same for the billet style rod.



Figure 1

- The bolts for the old style rod are shorter by approximately $\frac{1}{4}$ inch vs. the newer style forged Billet machined rod bolt. See **Figure 2**.



Figure 2

- The shank (raised diameter) just before the threads on the bolt is used to orientate the rod cap to keep it straight and parallel during installation. If the longer bolt from the newer rod is used, it causes the shank to bind at the bottom of the threads on the rod side due to its extra length. If the bolt is forced or torqued, it will pull the threads out of the rod and damage the bolt threads as well, or worse will not allow the rod and bearing cap to be properly torqued causing rod and crank damage.
- The old style rod is directional in its installation. On the shaft of the old style connecting rod it has cast letters "**FRONT**" meaning that that side of the connecting rod is always installed toward the front gear cover when installed on the crank pin.

- The new style forged billet machined rod is not directional in its orientation (front to back)
- The rod caps and rods on both style rods have a number stamped on them to keep the cap orientated in the same position. (See Figure 3)

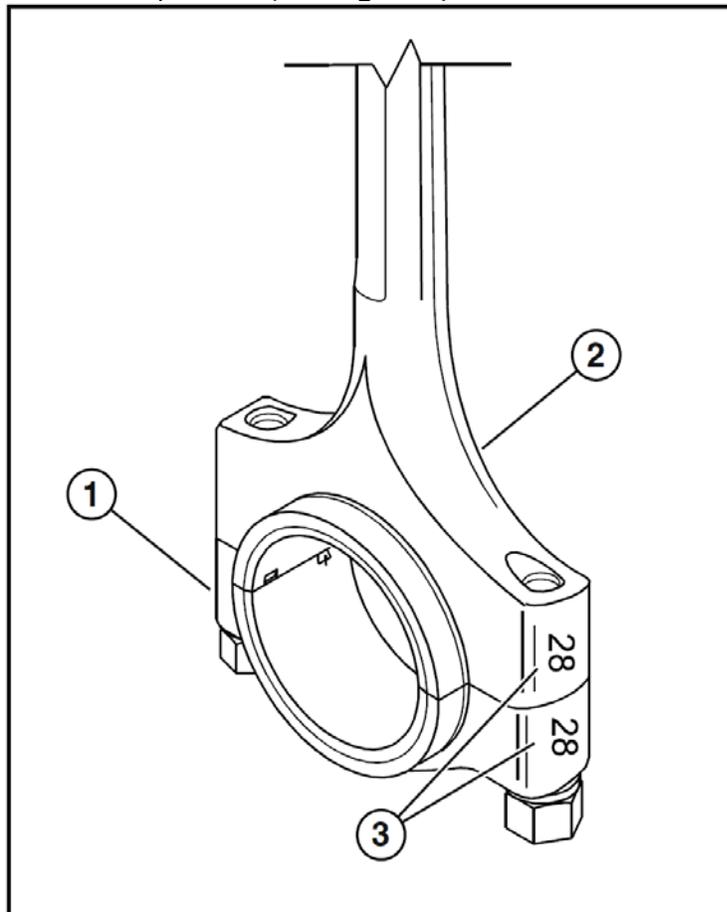


Figure 3.00-9: Connecting Rod and Bearing Cap Orientation Marks

- | | |
|--------------------|----------------------|
| 1 - Bearing Cap | 3 - Matching Numbers |
| 2 - Connecting Rod | on Rod and Cap |

Figure 3

General Maintenance of the Connecting Rod

- 1- The rod should be removed for inspection at every top end overhaul.
- 2- Inspect for straightness of the complete rod assembly when the cap is torqued to 104 ft. lbs. The rod should measure 10.000 +/- 0.003" when measured from the center of the big end bore to the center of the pin bushing. Any dimensions outside of the above range will require complete replacement of the rod. **NOTE: Do not straighten bent rods. This will weaken the rod and can cause further failure.**
- 3- The bearings should be inspected for any grooves or damage indicating debris has passed between the bearing and the crank pin. This is why it is important to change your oil and filter at recommended intervals. Shiny areas are normal and indicates polishing as long as it does not exposing the copper wear burnish.
- 4- Any significant scratches or areas where the copper wear burnish shows through, should result in the inspection of the crank pin. The crank pin should be free of scratching/grooving and should be smooth to touch. A dental pick can be "lightly" moved across the surface to see if it catches on any area of the crank pin. If it does catch or grooves can be felt, the crankshaft will need to be replaced.

- 5- Measure the I.D. of the pin bushing to be sure it meets specifications within the O&M manual.
- 6- Measure the journal diameter where the connecting rod will be installed. It should meet the dimensional features found in the O&M manual. If not the crankshaft will need to be replaced
- 7- Measure the clearance between the bearing and the crank journal by use of Plastigage. Plastigage is available from your local auto parts store. **Note the mfg. clearance / wear range in the O&M manual that it must meet. This will indicate the correct size Plastigage you will need to use.**
- 8- After confirming the clearance of the bearings, remove the connecting rod and clean the Plastigage off the surfaces.
- 9- Oil the journal and the rod bearings and reinstall the rod and cap with numbers side matching. Be sure to torque the rod in place to 104 ft. lbs. Bolts are easiest to access through the side inspection door if the flywheel is set to 52°. Carefully draw the cap up evenly by tightening the bolts a little on each side at a time. **NOTE: Drawing the bolt up all the way on one side will cause the cap to bind and distort.** In addition, step torque each bolt once it is hand tighten to 52 ft. lbs. Make sure it is free to move easily on the journal, then final torque to 104 ft. lbs.
- 10- Once torqued in place check the side clearance (endplay) between the connecting rod and the crankshaft cheek using feeler gauges. Make sure it meets the dimensional limits in the O&M manual. If it does not, install a new rod and validate the endplay again. If it still does not meet the wear limit in the O&M a new crankshaft will need to be installed.

Please refer to the current O&M manual for all tolerances and any additional procedures. Please feel free to contact your local distributor for any questions you may have.

Best regards,
Dan Bemis

CFR Service Manager
CFR Engines Inc.