CATERPILLAR®

Product: MARINE ENGINE
Model: 3406E MARINE ENGINE 9WR
Configuration: 3406E Marine Engine 9WR00001-UP

Specifications
3406E Marine Engine

Media Number -SENR1167-05 **Publication Date -01/03/2005** **Date Updated -15/03/2005**

i03922075

Cylinder Head

SMCS - 1100

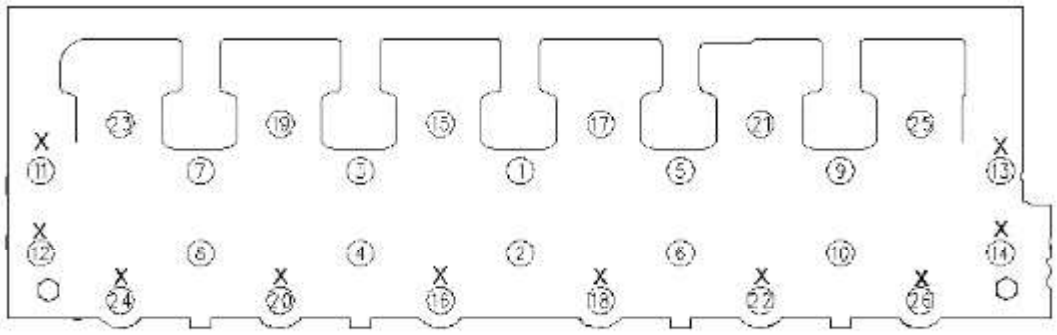

Illustration 1 g01025095

The bolts that are marked "X" are 216 mm (8.5 inch) long. The lengths of the remaining bolts are 194 mm (7.6 inch) long.

Apply **6V-4876** Lubricant to the bolt threads and both sides of the washers. Tighten the bolts in the following step sequence:

1. In a numerical sequence, tighten bolts 1 through 26.

   Torque for bolts ... 270 ± 15 N·m (200 ± 11 lb ft)

2. In a numerical sequence, tighten bolts 1 through 26.

   Torque for bolts ... 450 ± 15 N·m (330 ± 11 lb ft)

3. In a numerical sequence, again tighten bolts 1 through 26.

   Torque for bolts ... 450 ± 15 N·m (330 ± 11 lb ft)

Note: The flatness of the cylinder head should be within a total of 0.13 mm (.005 inch). Also, the

(11) Main bearing cap bolts

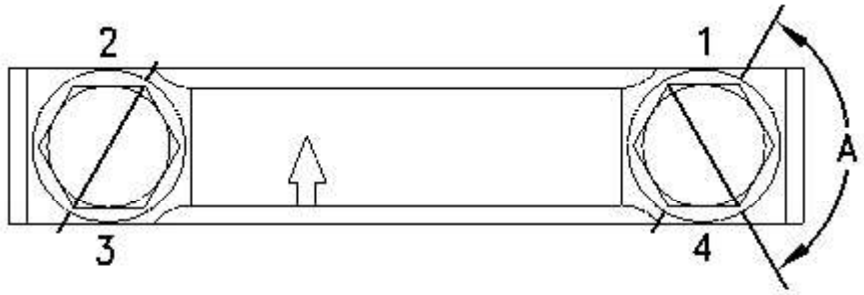

Illustration 5 g00562863
Torque-turn tightening method for main bearing cap bolts

Use the following procedure in order to tighten the main bearing cap bolts:

1. Apply clean engine oil to the threads of the bolts.
2. Tighten the bolts first on the bearing tab side (1) of the cap.

   Torque for bolts ... 260 ± 14 N·m (190 ± 10 lb ft)
3. Tighten the bolts on the opposite side (2) .

   Torque for bolts ... 260 ± 14 N·m (190 ± 10 lb ft)
4. Put a mark on each bolt and each cap.
5. Tighten the bolts on the opposite side (3) from the mark to angle (A) .

   Angle (A) ... 120 ± 5 degrees (2 flats)
6. Tighten the bolts on the bearing tab side (4) of the cap from the mark to the following value.

   Angle (A) ... 120 ± 5 degrees (2 flats)

(12) New dimension from the centerline of the crankshaft bearing bore to the bottom of the cylinder block pan rails ... 165.10 ± 0.10 mm (6.500 ± 0.004 inch)

(2) Etch the cylinder number on the connecting rod and the cap in this location. Mark the connecting rod and the cap with a number 1 through 6. Mark the numbers on the same side of the connecting rod as the bearing tab slots.

(3) Connecting rod bolts

Use the following procedure in order to tighten the connecting rod bolts.

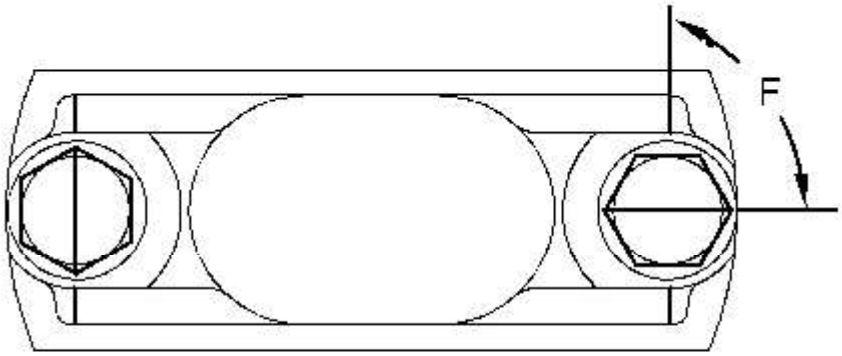

Illustration 2 g01431988
Torque-turn tightening method for connecting rod cap bolts

1. Lubricate the bolt threads and the seating faces of the caps with **4C-5593** Anti-Seize Compound .

2. Tighten the connecting rod bolts.

   Torque for bolts ... 90 ± 8 N·m (65 ± 6 lb ft)

3. Put a mark on each bolt and each cap.

4. Tighten each bolt from the mark to angle (A) .

   Angle (F) ... 90 ± 5 degrees (1/4 turn)

(E) Bore in the connecting rod for the bearing for the crankshaft connecting rod journal ... 96.200 ± 0.013 mm (3.7874 ± 0.0005 inch)