

48773P2

- (6) Dimension (new) from centerline of crankshaft bearing bore to bottom of block (pan rails) ... 95.250 ± 0.038 mm ($3.7500 \pm .0015$ in)
- (7) Dimension (new) from centerline of crankshaft bearing bore to top of block (top deck) 322.66 ± 0.13 mm ($12.703 \pm .005$ in)

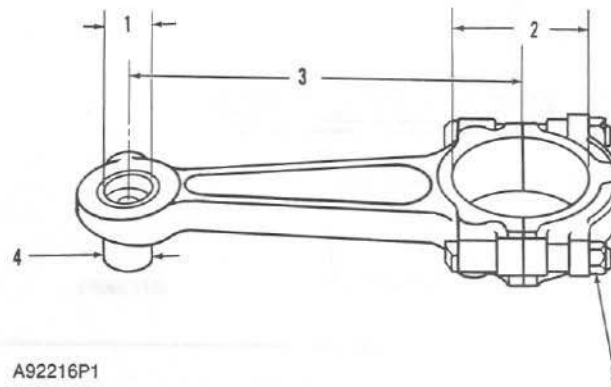
NOTICE

There are holes in the bores for the main bearings, between the cylinders for piston cooling orifices. These holes must have orifices or plugs installed or low oil pressure will be the result.

If the base for the oil cooler is 357.2 mm (14.06 in) long the engine has piston cooling orifices installed. If the base for the oil cooler is 268.2 mm (10.56 in) long the engine has plugs installed.

Piston cooling orifices were eliminated from 3208 truck engines effective with truck engine 2Z30692 with a rating of 150 KW (200 hp) @ 2000 rpm or 160 KW (215 hp) @ 2200 rpm. On earlier engines with these ratings the piston cooling orifices may continue to be used or replaced with 7N4953 Plugs.

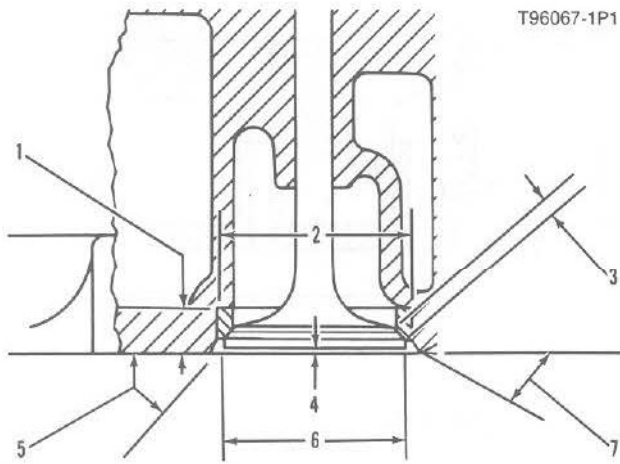
c Connecting Rod



A92216P1

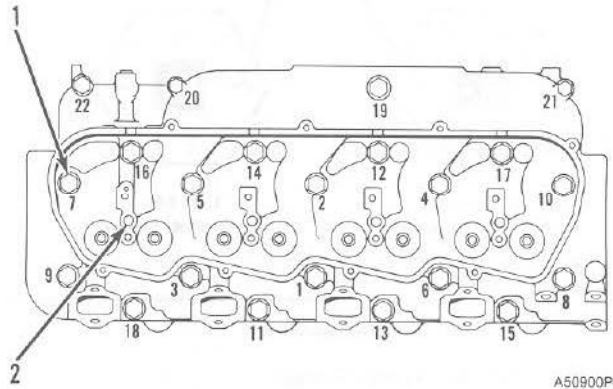
- (1) Bore in bearing for piston pin 38.135 ± 0.008 mm ($1.5014 \pm .0003$ in)
- (2) Bore in connecting rod for bearing [when tightened according to procedure shown in (5)] 74.721 ± 0.013 mm ($2.9418 \pm .0005$ in)
- (3) Distance between center of bearing for piston pin and center of bearing for crankshaft journal 200.66 ± 0.03 mm ($7.900 \pm .001$ in)
- (4) Diameter of piston pin 38.097 ± 0.005 mm ($1.4999 \pm .0002$ in)
- Maximum permissible clearance between bearing and piston pin 0.08 mm (.003 in)
- (5) Torque for nuts:
- Put 2P2506 Thread Lubricant on bolt threads and seating faces of cap and nut.
 - Tighten both nuts to 40 ± 4 N•m (30 ± 3 lb ft)
 - Put a mark on each nut and cap.
 - Tighten each nut from mark $60 \pm 5^\circ$

Exhaust Valve



- (1) Depth of bore in head for valve seat insert 11.23 ± 0.13 mm (.442 \pm .005 in)
- (2) Diameter of valve seat insert 48.565 ± 0.013 mm (1.9120 \pm .0005 in)
Bore in head for valve seat insert 48.489 ± 0.013 mm (1.9090 \pm .0005 in)
- (3) Maximum permissible width of the face of the valve seat insert 2.67 mm (.105 in)
- (4) Distance from head of valve to cylinder head face:
Maximum permissible (valve closed) ... 2.16 mm (.085 in)
Minimum permissible (valve closed) 1.27 mm (.050 in)
- (5) Angle of the face of the valve seat insert $45 \frac{1}{2} \pm \frac{1}{2}^\circ$
- (6) Outside diameter of the face of the valve seat insert 44.07 ± 0.13 mm (1.735 \pm .005 in)
Maximum permissible 44.70 mm (1.760 in)
- (7) Angle to grind face of seat insert (to get a reduction of maximum seat diameter) 15°

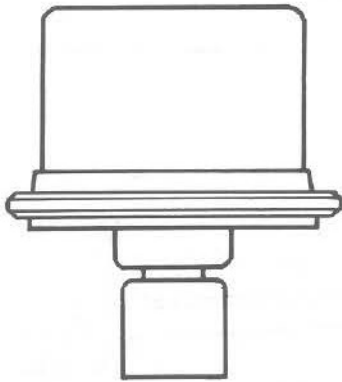
Cylinder Head



- (1) Put 6V4876 Molykote Lubricant on bolt threads and tighten bolts according to the Head Bolt Torque Chart that follows:

Head Bolt Torque Chart		
Tightening Procedure	Earlier Bolts (With Six Dash Marks) ¹	Later Bolts (With Seven Dash Marks) ¹
Step 1. Tighten bolts 1 through 18 in number sequence to:	130 ± 7 N·m (95 \pm 5 lb ft)	150 ± 7 N·m (110 \pm 5 lb ft)
Step 2. Loosen bolts 1 through 18 until the washers can be turned freely.		
Step 3. Tighten bolts 1 through 18 in number sequence to:	80 ± 14 N·m (60 \pm 10 lb ft)	80 ± 14 N·m (60 \pm 10 lb ft)
Step 4. Tighten bolts 1 through 18 in number sequence to:	130 ± 7 N·m (95 \pm 5 lb ft)	150 ± 7 N·m (110 \pm 5 lb ft)
Step 5. Again tighten bolts 1 through 10 in number sequence to:	130 ± 7 N·m (95 \pm 5 lb ft)	165 ± 7 N·m (120 \pm 5 lb ft)
Step 6. Tighten bolts 19 through 22 in number sequence to:	43 ± 7 N·m (32 \pm 5 lb ft)	43 ± 7 N·m (32 \pm 5 lb ft)

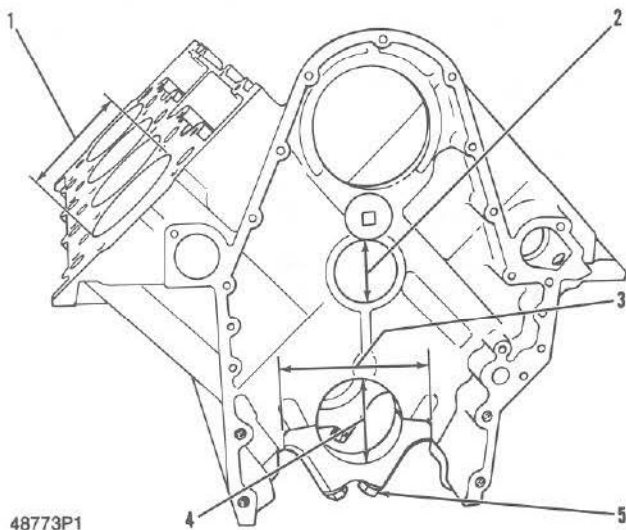
¹ See Illustration 1 for identification of EARLIER and LATER bolts.



B75390P1

Temperature when completely open:
 9N3711 Water Temperature Regulator 92°C (197°F)
 Minimum completely open distance 9.53 mm (.375 in)

Cylinder Block



48773P1

Measure wear of the cylinder bore at the top and bottom of piston ring travel.

- (1) Cylinder bore [standard, original size] 114.300 to 114.338 mm (4.5000 to 4.5015 in)
 The recommendation is made to make the cylinder bore the next size larger when the size of the bore is 114.452 mm (4.5060 in)
 Cylinder bore must be made the next size larger when the size of the bore is 114.529 mm (4.5090 in)
 Cylinder bore [0.51 mm (.020 in) larger than the original size] 114.821 ± 0.013 mm (4.5205 ± .0005 in)
 The recommendation is made to make the cylinder bore the next size larger when the size of the bore is 114.960 mm (4.5260 in)
 Cylinder bore must be made the next size larger when the size of the bore is 115.037 mm (4.5290 in)
 Cylinder bore [1.02 mm (.040 in) larger than the original size] 115.329 ± 0.013 mm (4.5405 ± .0005 in)
 Maximum permissible wear of cylinder bores (replacement of the cylinder block is necessary) 115.545 mm (4.5490 in)

- (2) Bore in block for camshaft bearing .. 67.374 ± 0.013 mm (2.6525 ± .0005 in)

NOTE: Install camshaft bearings with the oil hole toward the top of the cylinder block.

- (3) Width of main bearing cap 166.624 ± 0.018 mm (6.5600 ± .0007 in)

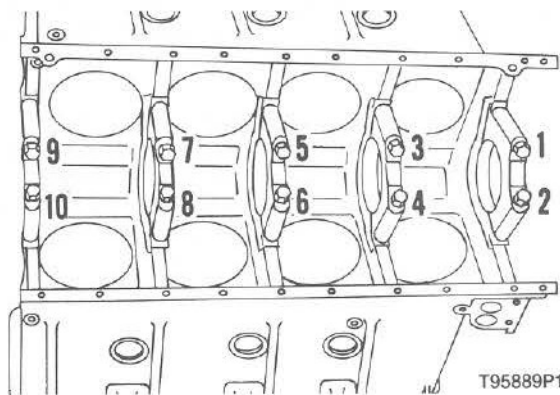
Minimum permissible width of main bearing cap

cap 166.573 mm (6.5580 in)

Width of main bearing cap guide (in cylinder block) 166.599 ± 0.013 mm (6.5590 ± .0005 in)

- (4) Bore in block for main bearing 94.171 ± 0.013 mm (3.7075 ± .0005 in)

Permissible amount of distortion in bore 94.13 to 94.21 mm (3.706 to 3.709 in)



T95889P1

- (5) Torque for bolts holding caps for main bearings:
- Put 2P2506 Thread Lubricant on bolt threads and washer face.
 - Tighten all bolts in number sequence to 40 ± 4 N•m (30 ± 3 lb ft)
 - Put a mark on each bolt and cap.
 - Tighten all bolts in number sequence from mark 120 ± 5°