

# PARTS & SERVICE NEWS

REF NO.	AA03051
DATE	March 25, 2003

**SUBJECT:** M11 ENGINE PISTON CHANGE

**PURPOSE:** Update engine kits

**APPLICATION:** PC400HD-6LC Hydraulic Excavator Serial Number A80001 thru A80500  
 PC400LC-6LC Hydraulic Excavator Serial Number A80001 thru A80500  
 WA450-3L Wheel Loader Serial Number A30001 thru A30370

**FAILURE CODE:** A350Z9

**DESCRIPTION:** The Parts and Service News (PSN) addresses changes to the M11 cylinder kits. Included in this PSN are the following:

1. Bushingless piston description.
2. Single notch piston skirt description.
3. Engine serial number first build and date.
4. Cylinder and piston kit part numbers.
5. Assembly guidelines.
6. Reuse guidelines.

**Publications Affected by This Parts and Service News**

Engine	Operation and Maintenance	Troubleshooting and Repair	Shop	Parts
M11		3666039, 3666074	3666075	PC400HD-6LC BEPB4006C3 PC400LC-6LC BEPB4006C3 WA450-3L BEPB000600

**Warranty Impact**

**None:** The information in this document has no effect on current warranty coverages or repair practices, nor does it authorize TRP or Campaign actions.

**NOTE: This is a product improvement and is not subject to campaign.**

1. Bushingless Piston Description

Bushingless pistons incorporate two features that set their function and appearance apart from bushed pistons.

A. A manganese phosphate coating (dark in color) which is required for break-in:

The porous nature of the coating retains oil to reduce friction during start-up and aids in oil film continuity during engine operation. This coating is softer than the surrounding steel, allowing the pin and pin bore to break-in evenly. The coating will wear off in some regions of the pin bore, but wear of the pin or bore itself is not affected after the break-in period. Engine tests show no significant difference in pin wear between the bushed piston and bushingless piston design.

B. The double profile is machined into the bushingless piston pin bore during production.

This profile accommodates the bending clearance required for pin deflection. The bushed pistons experience significant run-in wear to create a profile in the softer bushing material in the pin compression area. The steel-on-steel design does not experience run-in wear in the bushingless pistons. Both bushingless pistons and bushed pistons can be used in the same engine.

2. Single Notch Piston Skirt

Originally designed as an assembly fail-safe, the double notched piston skirt can be rotated 180 degrees during piston and connecting rod assembly and not contact the oil cooling nozzle during engine installation.

The single notch skirt is designed with a higher strength rating than the double notch skirt. It is highlighted with a blue dykem dot on the oil cooling notch side. The blue dot is an assembly guide to insure proper piston skirt and oil cooling nozzle alignment. The piston must be installed with the blue dot facing the camshaft side of the engine.

3. Engine Serial Number First Build and Date

Single Notch Piston Skirt		
Application	Engine Serial Number First	Build Date
All	35026402	January 2, 2001

4. Cylinder and Piston Kit Part Numbers

L10/M11 Cylinder Kit Changes				
Application	Description	Old Part Number	New Part Number	Old Stock Disposition
M11/ISM Industrial	Kit, Engine Piston	1307 068 H91	1307 068 H92	Use
M11/ISM Industrial	Kit, Cylinder	1310 101 H91	1310 101 H92	Use

## 5. Piston Assembly Guidelines



**WARNING!** The M11 articulated piston skirt must be assembled so the single notch and blue dot is pointed toward the camshaft side of the engine to clear the piston cooling nozzle. Failure to align the skirt notch to the piston oil cooling nozzle will result in engine damage.

Position the piston crown over the skirt. Take note of the skirt cooling notch and blue dot position. They must be on the same side of the connecting rod as the bearing tang.



**WARNING!** The single notch (blue dot side of the piston skirt) must face the camshaft side of the engine to prevent piston cooling nozzle damage.

**NOTE:** The blue dot is to identify new part orientation. It is possible the blue dot will wear away during engine operation, but the repairing technician must be aware of the skirt orientation.

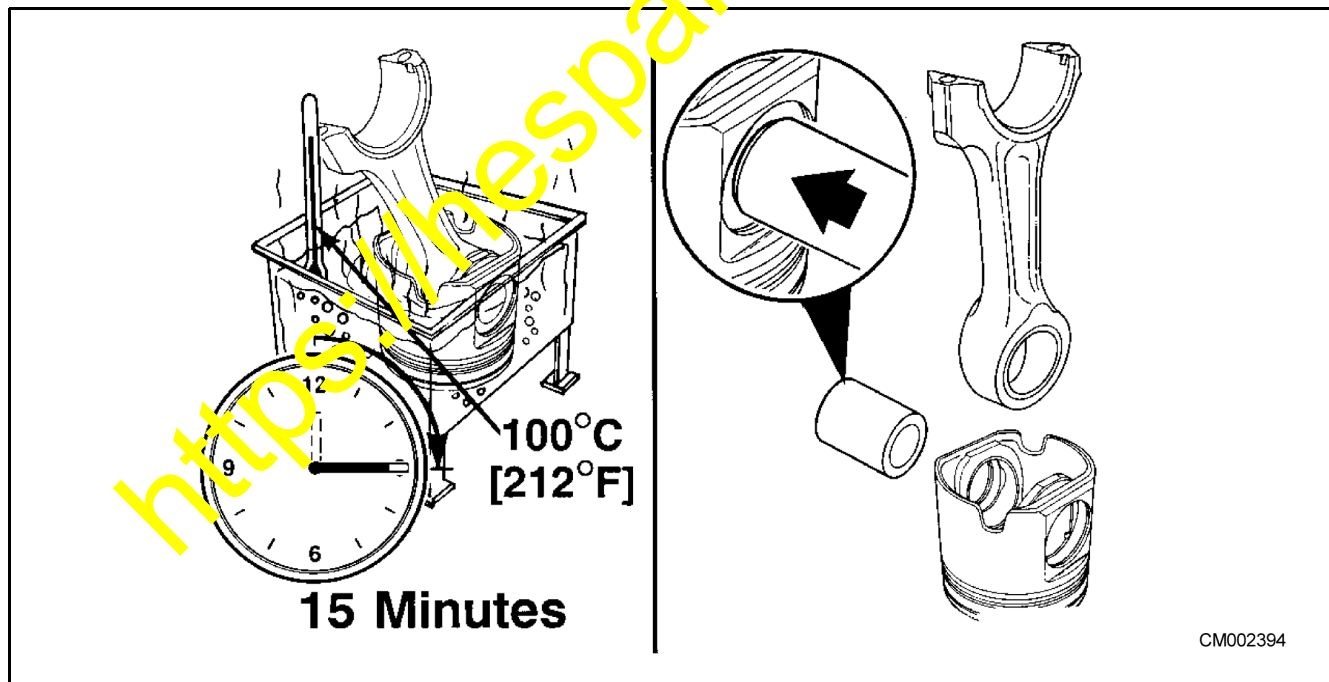
Align the pin bore of the connecting rod with the pin bore of the piston skirt and crown. Insure that the skirt single cooling notch is on the same side as the connecting rod bearing tang before installing the piston pin.

**NOTE:** The piston pin must be lubricated with clean 15W-40 prior to assembly.

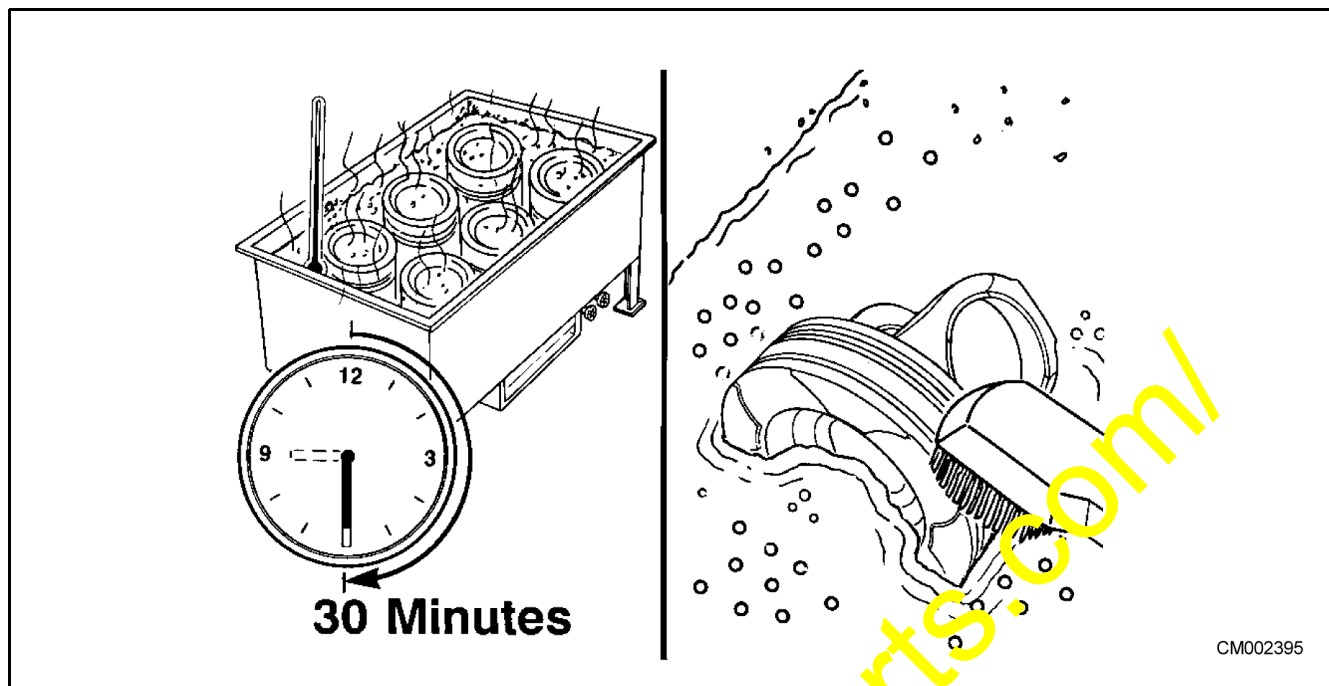
Follow the assembly instructions in Procedure 001-054 of the appropriate Troubleshooting and Repair Manual to install the piston pin and snap rings. When installing the piston and connecting rod assemblies into the cylinder include the following step:

Insert the connecting rod through the cylinder liner with the bearing tang and piston skirt cooling notch toward the camshaft side of the engine.

## 6. Piston Reuse Guidelines



Disassemble the bushingless pistons in the same manner as the bushed pistons. Refer to Procedure 001-054 in the appropriate Troubleshooting and Repair Manual.



Clean the bushingless pistons in the same manner as the bushed pistons. Refer to Procedure 001-054 in the appropriate Troubleshooting and Repair Manual.

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