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PRODUCT INFORMATION

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LIFTERS, ROLLERS, CONTROL LEVERS, AND CALIBRATION TOOL FOR CATERPILLAR SLEEVE METERING FUEL PUMPS

LIFTERS

Caterpillar 3208 fuel pumps as well as certain 3304 and 3306 fuel pumps use a sleeve metering plunger and barrel instead of a scroll type. This bulletin will cover the lifters, rollers, and control levers used with the sleeve metering plunger and barrel. It will also cover a tool used to simplify the calibration of the plunger and barrel and the control lever. When referring to 3304 and 3306 pumps in this bulletin, we are only talking about the pumps which used the sleeve metering system.

Caterpillar has produced four different lifters. All four of them have been used in 3208 fuel pumps, while only two have been used in 3304/3306 pumps. There has been an evolution in the size of the lifters, as the chart below shows. The 4N1750 lifter was originally used in all of the sleeve metering pumps. It was replaced by the 8N1317 lifter. The difference between the two is the size of the guide pin slot. The pumps originally used a .094" diameter guide pin. However, guide pins can break, causing pump failure. To reduce the potential for guide pin breakage and subsequent pump damage, the guide pin diameter was increased to .125". The 8N1317 lifter is now used in all 3304 and 3306 pumps. It is also still used in 3208 NA-1 fuel pumps using a 9L6078 or 9L6542 camshaft.

In 1979 Caterpillar made several changes to the 3208 resulting in the NA-2 designation fuel pump. Later changes brought the NA-3 and NA-4 designations. One of the changes between the NA-1 and subsequent pumps was the camshaft. The profile was changed to provide faster injection. To accommodate this, the length of the lifter was reduced. This resulted in the 6N6794 lifter. The diameter of the crown was also increased to provide a larger wear area. The 6N6794 has the same outside diameter as the 4N1750 and the 8N1317. It also has the same size guide pin slot as the 8N1317.

As a note, most NA-1 pumps can be upgraded by using a NA-2, 3, 4 camshaft, 6N6794 lifter, and updating the guide pins. Caterpillar recommends upgrading the pumps. Some early NA-1 housings cannot accept newer camshafts due to casting tolerances.

Part	Outside Diameter	Crown Diameter	Guide Width
4N1750	.6875"	.36"	.135"
8N1317	.6875"	.36"	.156"
6N6794	.6875"	.39"	.156"
9N5817	.7669"	.39"	.156"

Turbo charged 3208 pumps required another lifter, 9N5817. The 9N5817 has a larger outside diameter than the 6N6794.

Lifters must be replaced if any of the following occur: spalling/chipping/scaling on the skirt area; heavy wear and/or a small wear step on the crown or guide pin area; metal smearing where the roller contacts the lifter; rust deposits. DIPACO has available the D8N1317, D6N6794, and D9N5817 lifters.

ROLLERS

Caterpillar uses two different rollers with their lifters, 4N2685 and 9N5827. The 4N2685 is used in all 3304, 3306, and 3208 naturally aspirated fuel systems. The 9N5827 roller is used only with the 9N5817 lifter in turbocharged 3208 applications.

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Rollers must be replaced whenever there is evidence of scoring or pitting.

SLEEVE CONTROL LEVERS

The sleeve control lever controls the position of the sleeve on the P&B, controlling fuel flow through the P&B. Caterpillar originally used a 4N1763 control lever. This lever is used in all 3304 and 3306 pumps. It is also used in all naturally aspirated 3208 pumps. These pumps use the 8.0mm 6N7527 plunger and bushing.

When Caterpillar came out with the turbocharged 3208, they increased the diameter of the plunger in the plunger and bushing to 8.5mm. This is the 1W3010 P&B. Because of the larger diameter, the 4N1763 control lever could not be used because it could interfere with the sleeve movement and result in sticking, binding, or even breakage. The 9N5820 control lever was introduced. The arm of the control lever is 0.10mm shorter than on the 4N1763, and it is machined to tighter tolerances. The 9N5820 control lever can be used with **either** the 6N7527 or 1W3010 plunger and bushing. You can tell the 9N5820 lever because it has a distinctive machined chamfer on one side of the arm while the 4N1763 does not.

SLEEVE METERING CALIBRATION TOOL

One of the difficulties with sleeve metering fuel pumps has been setting the position of the sleeve control lever. As we said earlier, the control lever controls the position of the sleeve on the P&B which regulates how much and when fuel is delivered by the P&B. The difficulty occurred because in order to set the lever you had to use a dial indicator and the slightest movement of the control lever would change your setting. Caterpillar now has a new tool for setting the control sleeve for sleeve metering P&Bs. The part number for the tool is 6V4141. This tool replaces the previous method using dial indicators. It is significantly faster and just as accurate as long as the cam lobe, roller, and lifter are with specifications.

After the cam and rack(s) have been set and before the P&Bs are inserted, the sleeve control levers need to be set using the following instructions.



D6V4141 Calibration Tool

1. Insert the notched end of the tool into the bore. The bottom of the tool has a cut-out and a rubber washer. The middle part of the tool will bottom out. The flat side should be facing the control lever arm.
2. Turn the tool, wedging the control lever arm between the rubber washer and the base of the tool. Place slight downward pressure on the lever, so the arm is bottoming out against the bottom of the tool.
3. Use a torque screwdriver to tighten the screw on the control lever. Tighten it to 24 ± 2 lb. in. **You must use a D6V6069 torque screwdriver along with a D6V6072 ball head bit.**

It is much faster, less than a minute per sleeve, than using a dial indicator. Remember, this tool is used to set the control levers for all sleeve metering pumps. DIPACO has available their own version of this tool, part number D6V4141. The tool includes instructions on its use. Also, replacement rubber washers for the tool, part number D8T0888 are also available.