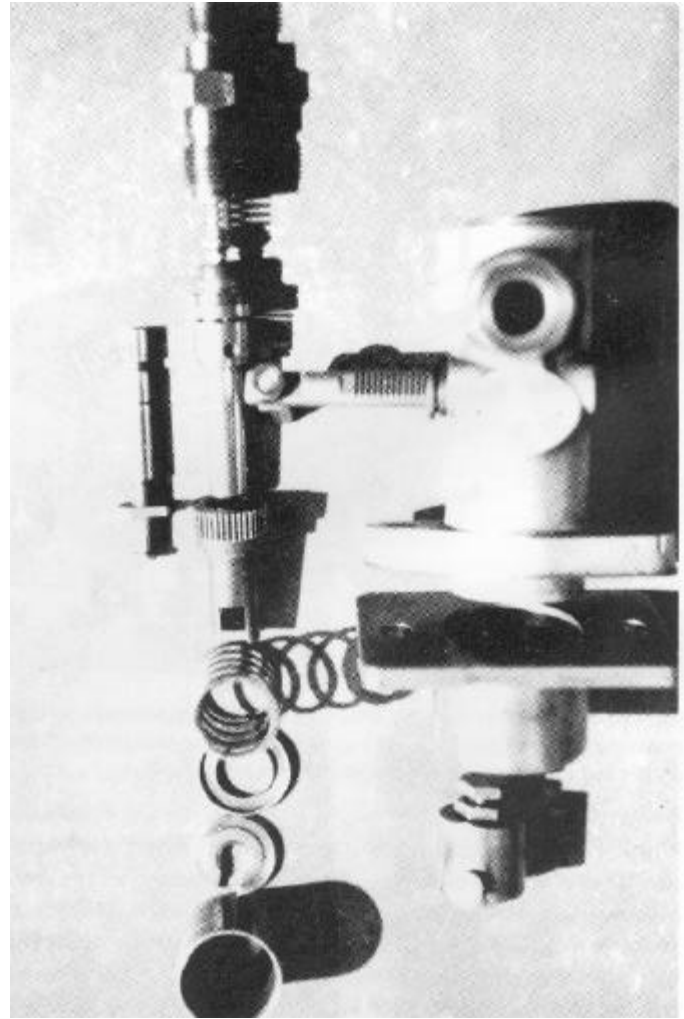


A three lobe cam drives this Bosch diesel pump to supply heavy oil to the burner. A lighter lower case would be adequate when pumping only light oil.



The rack for varying output is clearly visible. A 6 to 7.5mm plunger can be used to burn up to 6 gph at 200 rpm. A light return spring is fitted.

the injector will open and shut 600 times per minute—about the correct speed for perfect combustion.

To make the ti-ree-lobe cam, cut a bearing from old IC camshaft, turn it to 40mm diameter and 12mm width. Drill a 1/2 in. hole for a through shaft. Mark off as per drawing to give 7mm lift. Grind three flats, on a true grinding wheel, weld the shaft both sides, then turn down to 34mm diameter (this will give 7mm lift) and round off tops of cams. Use stainless rod for the weld.

The cam lift should not exceed 7mm, as over 7mm will move the plunger too high and let it strike the delivery valve. Exact cam shape and phasing are not important, and the cam can be hand ground after marking out.

To bum heavy oil, fit a two way valve, connect one outlet for light diesel fuel and the other for heavy oil. Starting from cold use light diesel oil, run for 5 minutes and then change the valve to heavy oil. When stopping the bumer, change back to light oil for the next cold start up.

To burn the heavy oil, an injector pipe (a 6mm or 1/4 in. steel pipe) must be made having two coils to heat the oil up to 180°F before going to the injector. If the oil boils, the injector nozzle will not open, and pipe has to be made shorter. This steel pipe must not be in the flame, but its coil should be positioned to pick up radiant heat. Before burning sump oil, let the oil settle in the drum for a long period and take it from the top. The pump must use the CAV paper filter with built in water trap.

Now we must locate the injector to spray into the combustion fire space; this is easy to do. First, I must describe the correct type of nozzle to use. I have used nozzles with a spray angle up to 40 degrees, but I find the bfst results with a spray angle of 15 degrees. This nozzle is available from Bosch or CAV. The standard Caterpillar sealed nozzle will work, and the IHC poppet nozzle is fine as each have a low pressure setting of 50 atmospheres. This is the perfect pressure setting for burner use. Most diesel injectors work at a high setting from 100-175 atmospheres.