

CJ750 OHV lubrication system

Oil pump

Oil is circulated by a gear pump at the bottom of the crankcase sump, and is driven by a set of gears at the end of the camshaft. The pump's speed and direction of rotation vary according to engine type.

Engine model	CJ750, CJ750D	CJ750F1	CJ750D1, CJ750F1a, CJ650
Camshaft gear teeth	12	19	10
Oil pump gear teeth	24	19	25
Pump / crankshaft speed reduction	4:1	2:1	5:1
Rotation (from above)	CCW	CCW	CW

¹



Figure 1 - oil pump gears

The camshaft and oil pump gears on the right are from a CJ750F1a engine, and require a CW rotation pump, preferably a high volume model due to its slower shaft speed. The oil pump gear on the left is from a CJ750F1 engine, and requires a CCW rotation pump.

The nominal output of the standard pump is 720 cm³/min at 1000 rpm pump speed.²

¹ Table 2-13, page 71, Xiang Jiang 750 Sidecar Motorcycle - Use, Maintenance and Repair (湘江 750 边三轮摩托车构造 • 使用 • 保养 • 维修)

² Page 42, CJ750 Motorcycle Use and Maintenance (长江 750 型摩托车构造使用和维修)

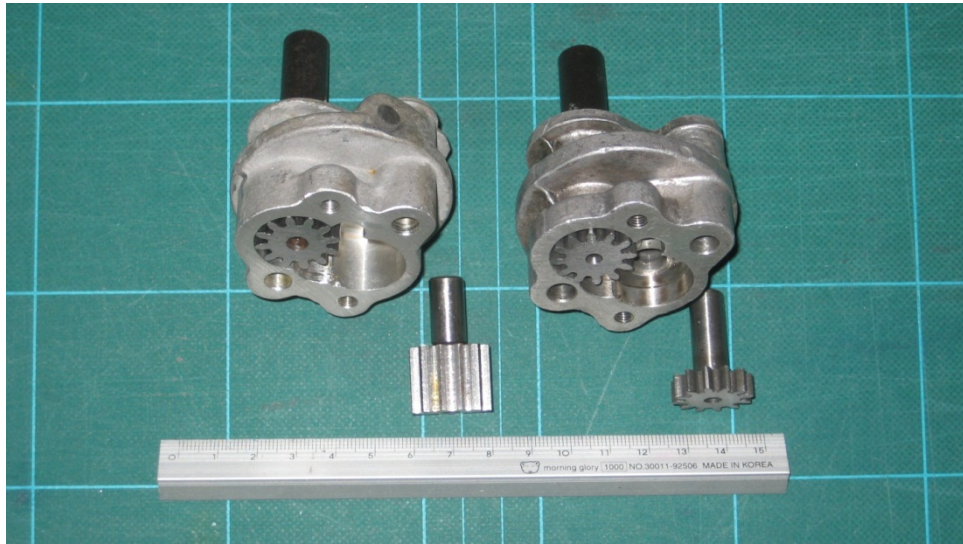


Figure 2 - High volume and standard oil pumps

An aftermarket high volume pump is shown on the left. It was originally designed for CJ750D1, CJ750F1a and CJ650 engines fitted with tachometers. These models have different camshaft/pump gearing resulting in slower pump speed and opposite rotation (CW instead of the usual CCW) to accommodate the tachometer whose cable attaches to the top of the pump drive shaft. Both pumps shown are CCW models.

The high volume pump has 15mm impeller gears instead of 6mm, giving it about 2.5 times the flow rate of the standard pump.

Forced oil circulation

The output of the oil pump output branches into four 4mm tubes cast in the crankcase, as shown in red below:

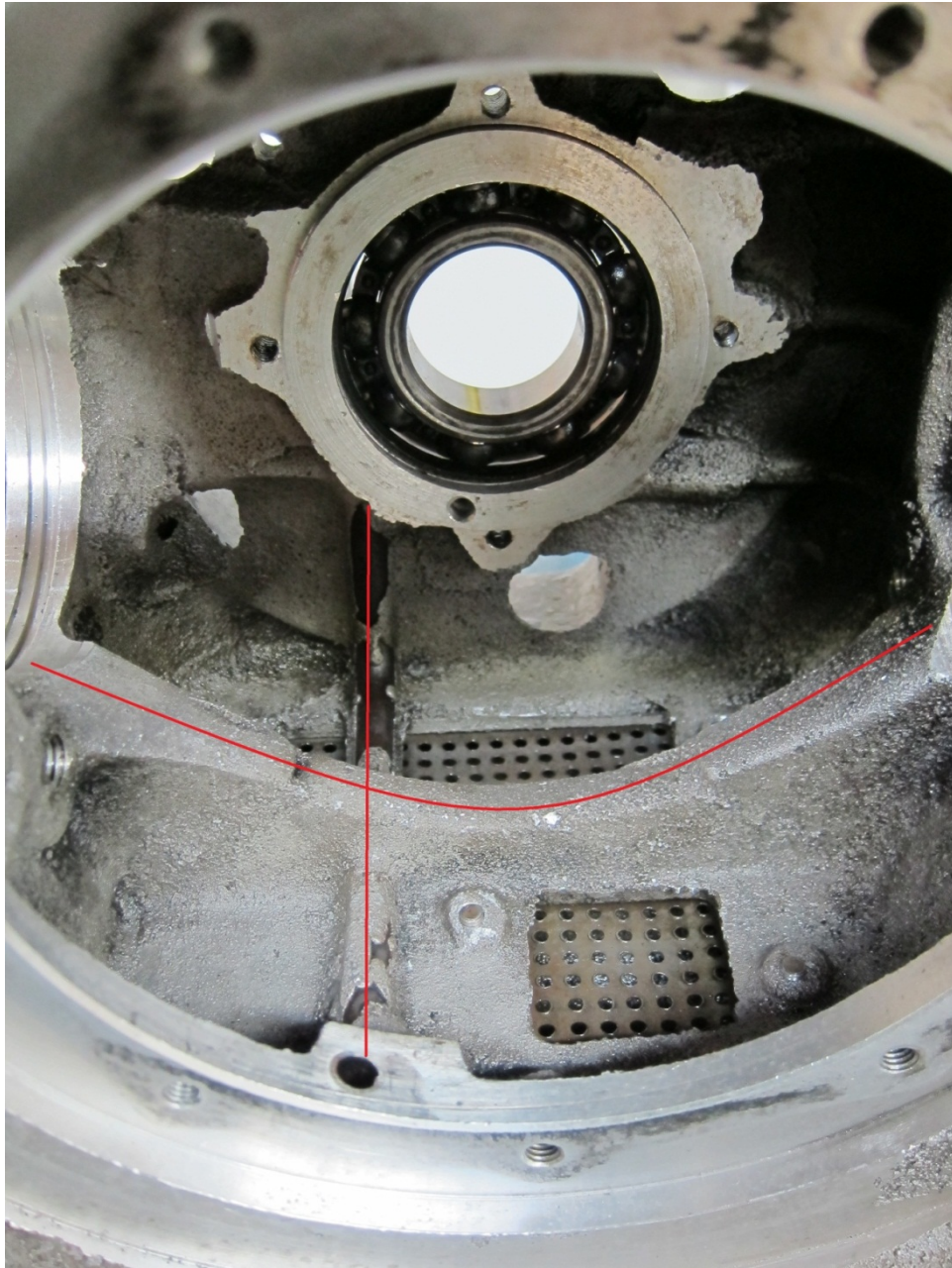


Figure 3 - Main oil conduits

(1) One of the 4mm tubes carries oil to the bottom of the rear crankshaft bearing housing.



Figure 4 - Rear bearing lubrication

A semi-circular groove under the rear crankshaft bearing (see photo) directs the oil into the oil slinger. From there some of the oil passes through a 15mm hole to inside the right cylinder wrist pin. The wrist pin has two radial holes leading to the roller bearings. The oil then flows out of a small groove in the connecting rod, splash lubricating the inside of the crankcase. The overflow from the oil slinger creates an oil spray inside the crankcase.

Oil also lubricates the bearing, then drains back to the crankcase sump.

(2) One of the 4mm tube enters at the bottom of an annular groove surrounding the front crankshaft bearing [A].

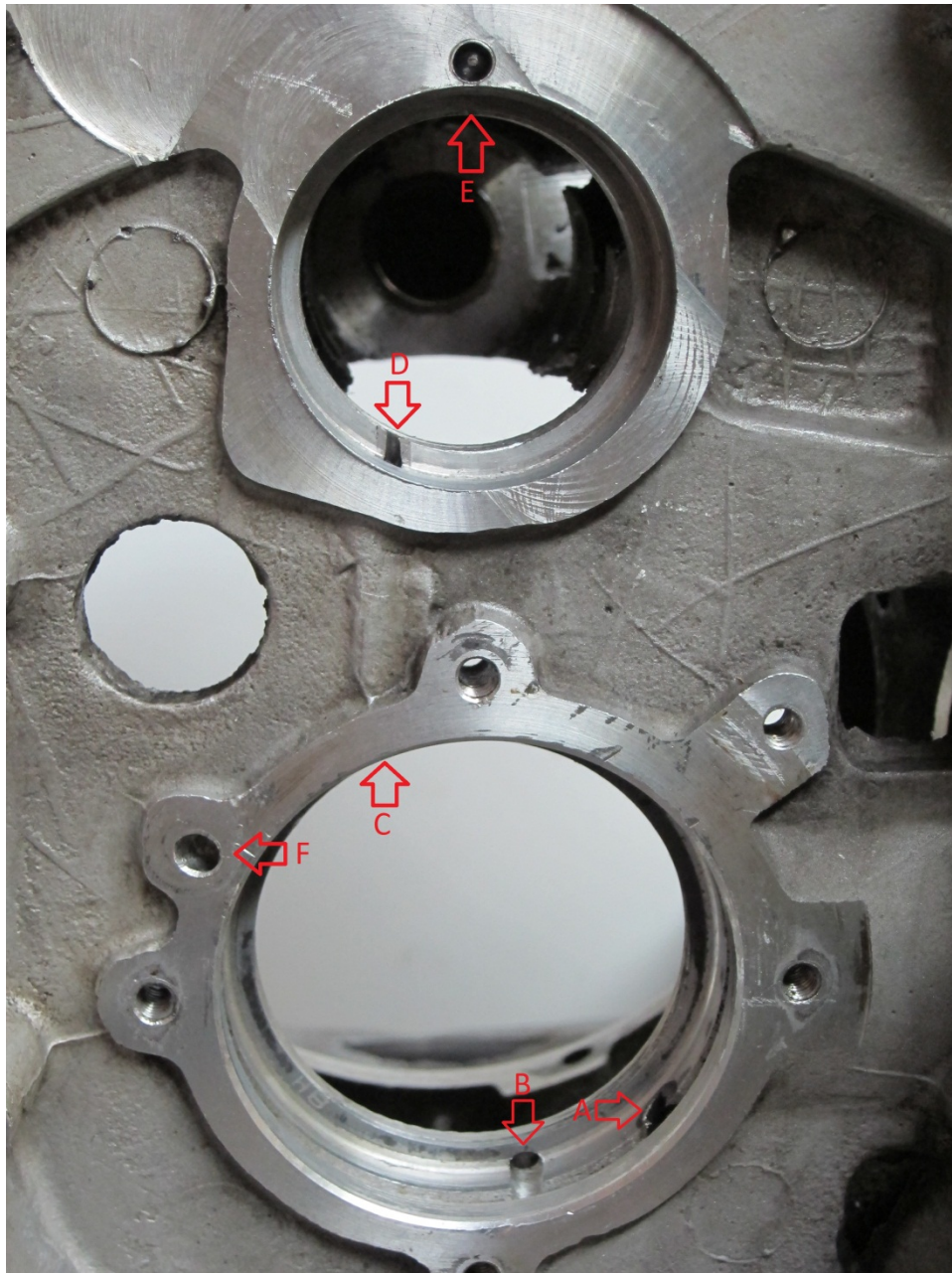


Figure 5 - Front crankshaft and camshaft lubrication

A channel [B] directs the flow to the oil slinger, where some of the oil passes through a 15mm hole to inside the left cylinder wrist pin. The wrist pin has two radial holes leading to the roller bearings. The oil then flows out of a small groove in the connecting rod, splash lubricating the inside of the crankcase. The overflow from the oil slinger creates an oil spray inside the crankcase.

Some oil is channeled upwards [C] following an annular ring under the bearing, then through a 2mm hole to the top of the camshaft bearing housing [D] where the oil follows a similar annular groove to the top of the bearing. There it exits the groove [E], connecting to a 4mm tube located just above the camshaft. Four holes in the tube spray oil on the camshaft/tappet contact surface.

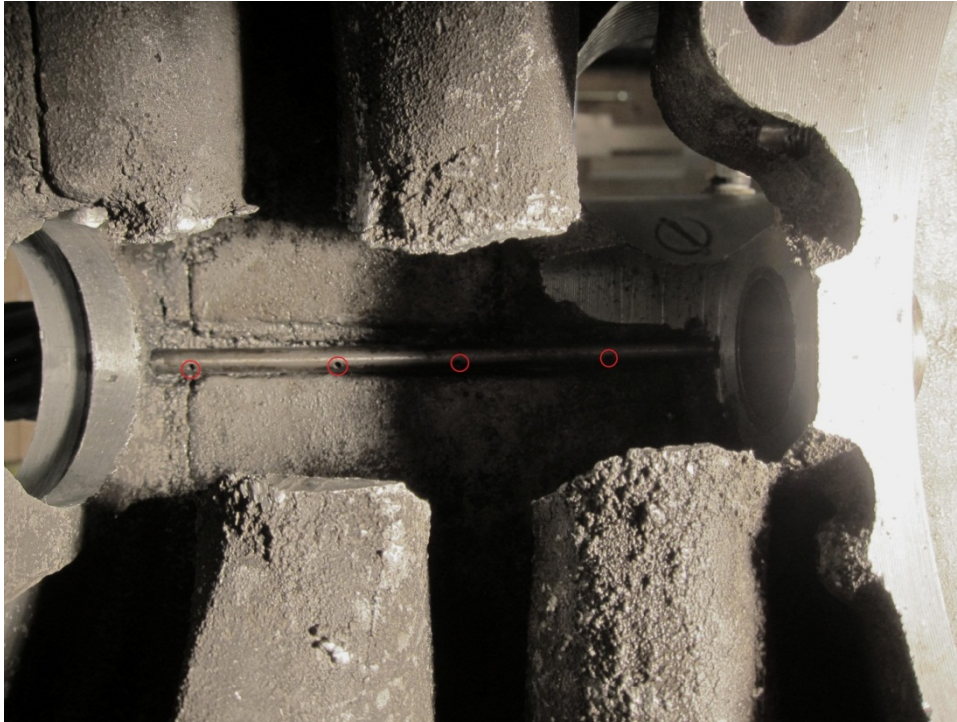


Figure 6 - Camshaft lubrication

Oil also flows through a passage on the left side of the bearing housing [F], where it connects via a rubber seal to a tube connected to an oil channel in the front engine cover. This channel leads to the camshaft end, where the oil flows through an axial hole in the camshaft leading to the starter freewheel clutch needle bearings. An O-ring on the end of the camshaft acts as a seal. The oil then flows out to lubricate the timing gear and the distributor gears.

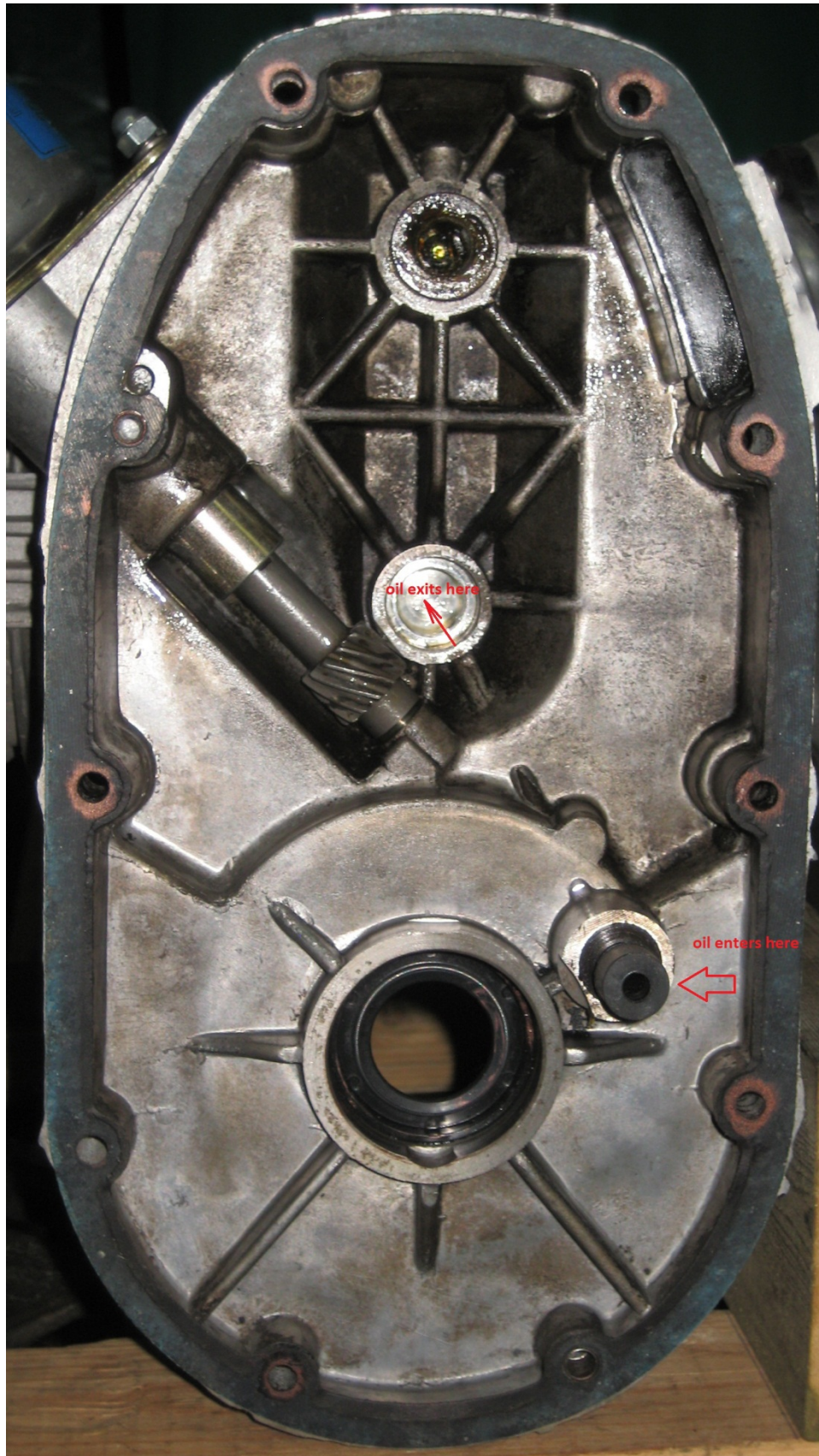


Figure 7 - Front end lubrication



Figure 8 - Starter freewheel clutch lubrication



Figure 9 - Detail of camshaft oil conduit

The front crankshaft bearing is lubricated by overflow from the oil slinger.

The front camshaft bearing is lubricated by the overflow from the starter freewheel clutch, as well as from splashes and mist from the inside of the crankcase.

(3 and 4 - the left and right sides are identical) A 4mm tube carries oil to an opening just behind the cylinder's mounting flange. The cylinder gasket should be trimmed around this opening, as bits of the gasket could break off and plug the oil passages. An annular groove around the cylinder opening directs the oil to the top of the opening where a 2mm hole corresponds to a matching hole in the cylinder wall, lubricating the cylinder. An O-ring (84x89x2.5mm) insures that the oil doesn't simply leak out to the crankcase. Take care to not tear the O-ring when installing the cylinder.

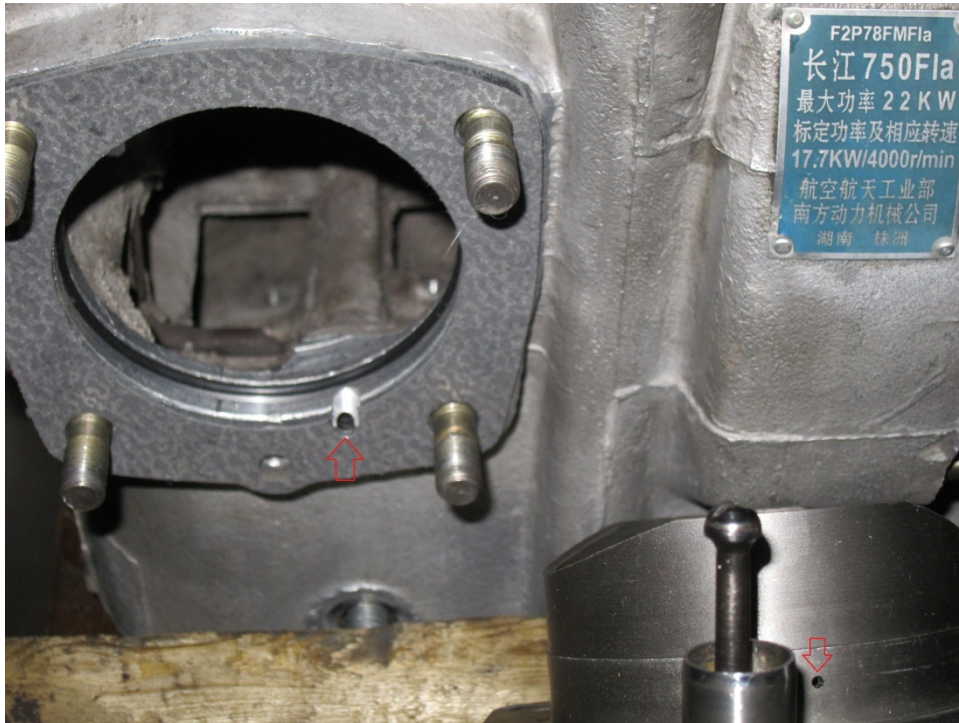


Figure 10 - Cylinder lubrication

Splash lubrication

Oil is splashed to the oil pump drive gears, and then flows along a channel leading to the bronze camshaft end bushing.



Figure 11 - Pump gears and camshaft bushing lubrication

Oil is splashed into 6mm holes near the end of the push-rod tubes. Oil flows down the tubes to lubricate the push-rod ends, rockers, valve stems, etc. The oil then drains through a 6mm tube on the underside of the cylinder, leading to the crankcase sump.

Oil sprayed inside the piston enters two radial holes that lubricate the piston wrist pin bronze bushing.



Figure 12 - Wrist pin lubrication

Due to the CCW rotation of the crankshaft (as seen from the rear of the engine), the bulk of the oil is splashed to the top of the right cylinder wall. The left cylinder receives less oil, and for this reason the left cylinder's temperature is often higher.