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IH: Engine Mechanicals - Sub-07L

Dr Dick on the slinger and oil loss

Article by Dr Dick of the XLFORUM [1)]

1952-1962 used the old 'daisy wheel' gear that physically sealed to a spring loaded top hat in the cover. These had great oil control but are pretty restrictive to air flow. Bad air flow can rob hi RPM horsepower. Race bikes used big breather passages, fittings, hoses and pass lots more oil.

Bikes 1952-1976 work different than 1977>.
1977> don't have as much oil flying around in cam chest and the 1977-1978 one way foo foo keeps air flow volume to atmosphere low.
These bikes tend to drip from the tube after a ride. Oil gets trapped in the nook and crannys of the foo foo, then leaks out.

1976< is a totally different dynamic.
The crankcase volume under pistons is much smaller than 1977> and air flow to the cam chest is much more restricted.
The 1977> cam chest can act as a air reservoir for crankcase volume and the foo keeps the amount air in the cases low.
Less air equals less pumping losses. Used oil gets picked up in the crankcase itself (not in the camchest). So the slinger has an easier task in 1977>.

Not so for 1976<.
Oil collecting in the crankcase needs to be blown into the camchest to be picked up by the return pump.
High air flow from the crankcase thru the timed breather to the camchest evacuates the crankcase oil good.
That same high flow 'opens' the crankcase volume to the camchest.
Opening the camchest vent size to atmosphere adds another level of free breathing. All this is good for power.
As you allow free air flow thru the motor, you also allow free oil flow too. So far, so good, right?

The down side: As air flows in and out of the camchest vent (puke tube), so does the well suspended oil.
Race bikes can pass a lot of oil to atmosphere way more than acceptable for a street ride.
So to separate oil from air, a slinger is used. It functions by forcing air thru a small passage that has a spinning disc.
The disc sets up centripetal force in air passing thru passage.
The smaller the passage, the better the oil control and the smaller amount of air that can freely pass.
Bad for power-good for oil control.
Reducing the slinger clearance (to a degree) is like putting mufflers on a race bike.
The MoCo is more interested in happy customers than the efficiency of a single sub-system.

Everyone seems concerned about oil loss. Not a word about the other side of the coin - the cost in performance of good oil control.
The factory knew their customers wants and it will cater to that market. Good business sense.
In the boardroom, the question was:
How do we free up more power while keeping oil loss at a level that the customers are accustomed to?
From past experience, they knew that oil evacuation was more important than air evacuation.
And they learned that keeping air speed in the camchest low allowed oil in the cam chest to 'rain down' to the return pump.
(instead of staying in suspension and relying on a restrictive slinger to keep flow thru puke tube and to the underside of bike acceptable.

So if they could concentrate the crankcase oil in a trap, then blow that oil into the camchest with a small amount of air;
They get the most power with the least chance of oil loss.
A look at the shape of the transfer passage between the crankcase and the breather valve shows the result of that line of thinking.
So in mid 1962, they reduced oil pump capacity but increased the return to feed ratio. Less oil in means less oil to move and less drag.
More return over pump helped more yet.
The small pump dried the camchest well enough that the slinger could be opened up = more air flow.
Good-bye power robbing daisy wheel - hello fender washer.

The 1962-1971 oil pump has a smaller feed side than the 1961<. Compared to the 1961<, the return is bigger in the -62 pump. Less feed, more return. [2)]
The 1972 pump feeds and returns more than any of the previous.

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1)
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