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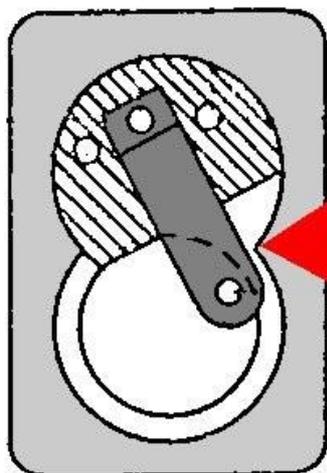
BULLET OIL PUMP SPINDLE

A common problem with Bullets is rapid oil pump spindle wear. This can be seen on both Redditch and Indian built Bullets but is more common place on the Indian variety. There is not a single cause for this problem and we have spent considerable time in the workshop and on the road trying to understand and rectify the problem areas. One of the problems is alignment of the worm and spindle. This is dictated by the crankcases and timing cover so it is not straight forward to do much about this, but what can be done is to make sure that the spindle and worm have as easy a life as possible. This article attempts to explain the more common problems.



Bullets give very low pressure when warm and most owners who have fitted an oil pressure gauge (also known as a worry gauge), will confirm that it is normal to see less than 10psi at any of the measurable places. This is not generally a problem as long as plenty of oil is moving around the engine. The amount of oil that the standard pumps deliver is not over-whelming, so by fitting high capacity oil pumps more oil will circulate. If this is achieved without creating high pressure, then this is good news for the engines longevity. What owners must be careful of is running the engine too hard when cold. "Blipping" the throttle or revving hard can create intermittent pressure of up to 100psi which can have devastating results. This can be further increased by using straight oils like 40 and 50, these are simply too thick when cold and do not suit the small oil ways of the Bullet. It is may not be so bad on Redditch Bullets which have the luxury of two pressure relief valves. At Hitchcocks we use multigrade oil like 20/50 or 15/40 for very good reason!

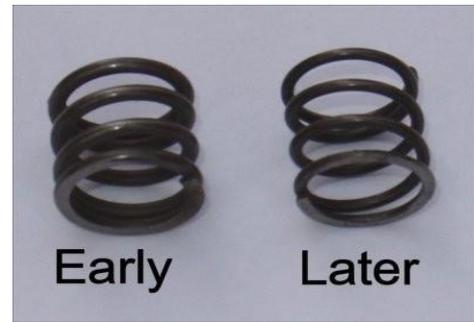
OIL PUMP SPINDLE: One place to start is to check the ease of rotation of the oil pump spindle in the timing cover. Sometimes this can be difficult to turn which puts excess load on the worm and spindle causing premature wear. To eliminate this, careful assembly of the timing cover is required and make certain that all internals are coated liberally with engine oil. Firstly, fit the spindle into the cover without any pumps and check that the spindle is free to turn without any



**Check for
clearance
between
plunger
and cover**

resistance. Follow this by fitting the return pump and plunger, (this is the bigger of the two pumps in the front of the timing cover). Without fitting the oil pump cover rotate the spindle and make sure that the oil pump plunger does not foul on the pump housing as shown in the diagram. Once this has been checked assemble the complete pump assy with spring, end pad, gasket and cover, tighten the 4 screws and then check the oil pump spindle rotates the full 360 degree with light thumb pressure. (At this stage you would expect a bit more resistance, but still light thumb pressure). If the spindle is hard to turn, the most likely cause is too much end pressure from the oil pump spring. Since 2001, Enfields

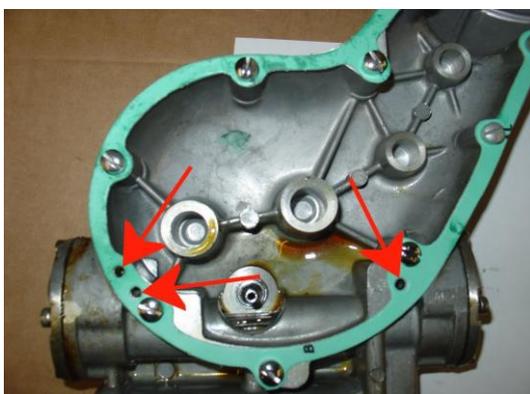
have fitted a lighter spring, part number 144134, if you have an earlier model replace the spring with this new part. Alternatively re-fit the pump cover with two gaskets and check the rotation of the spindle again which should now be ok. Now repeat the same steps with the feed pump, expect a bit more resistance with both pumps fitted, but this should still be able to rotate with reasonably light thumb pressure.



The material specification and tolerances of the oil pump spindle were changed in approximately 2000. This has helped the problems but not cured them. However, we have produced a kit (Part Number: 90151) which consists of special English made, high precision, high quality spindles and worms (and a replaceable cork seal for use with the worm). This kit has proven to be highly effective in reducing oil spindle wear particularly when the other checks/modifications mentioned in this article have been carried out.

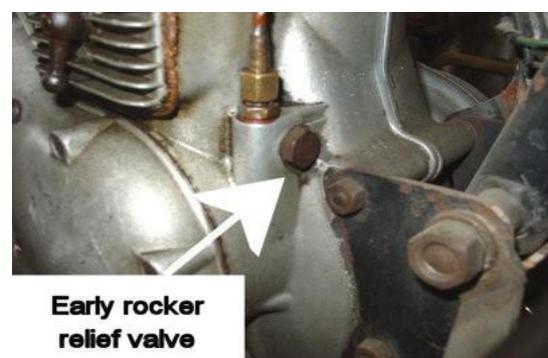
FLOATING BUSH BIGEND: If the bigend is new or recently fitted the clearance between the crankpin, floating bush and fixed bush may be too small. This results in excess pressure and harder work for the oil pump worm and spindle, most of the Redditch Bullets have a pressure relief valve in the flywheel end of timing shaft to help combat this. The Indian Bullets, with few exceptions, rely purely on the oil pumps lifting off their seat as a crude pressure relief valve, but we would rather see a constant high flow without high pressure, therefore the tolerances of the big end are very important. This is not easy to check, but can be roughly checked by using engine oil in a general purpose oil can with its nozzle inserted into the big end oil feed seal, you would expect to be able to force oil through the big end.

DRAIN PLUG/FILTER: Oil is taken, by means of the return pump, from the sump (where the crankshaft lives) through internal oil drilling's in the crankcase to the front drain plug/filter. Sometimes the threaded part of this plug can restrict the oil drilling by screwing in too far. This can be down to machining tolerances or a washer fitted that is too thin. By careful measurements this can be checked and a thicker or extra washer fitted if required.



TIMING COVER OIL WAYS: Another common restriction causing excess pressure is the oil ways between the crankcase and timing cover, these can be misaligned. To check this, offer the timing cover gasket to the crankcase using the timing cover screws to hold in place whilst checking that the gasket does not partially cover any of the oil holes. Repeat this on the timing cover and modify the gasket by opening out the holes if required.

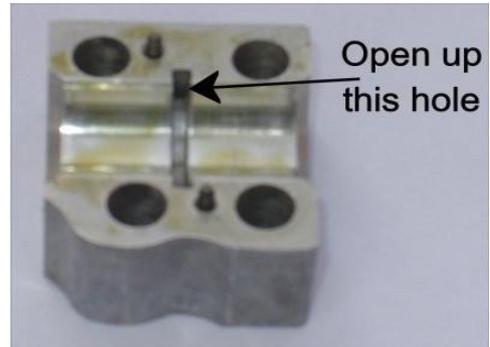
ROCKER FEED PIPE AND ROCKERS: Check that the oil flow through the rocker pipe is good. These can be partially blocked by excess solder during manufacture and damage from the outside. Again this can restrict the flow causing extra work for the whole oil pump assembly. On the Redditch models, for most years, there was a relief valve in the crankcase just below the rocker feed pipe. This continued on the



Indian made Bullets until the 70's before it was

removed and has not been fitted since. A mistake in my opinion! This valve should relieve at approximately 30psi but were never very accurate. If you are one of the lucky ones and have this relief valve fitted, then check that it is working correctly. An airline with pressure gauge can be used for this. Also check that the rocker feed pipe banjo bolts are clear and in good condition.

Early models used a 5/16" banjo bolt and these are often over-tightened which distorts the small oil drillings. If this has happened, replace. Now check that the oil ways between the head and the rockers bearings line up. For owners with Samrat rockers fitted, it is worth checking the size of the oil hole through the alloy block. Since 2006 as a matter of course we open up the standard hole to approximately 2.5mm on every set we supply. This allows more flow with lower pressure.



BAD TIMING: Another cause that we have seen a few times is a badly timed engine that back fires or kicks back when starting. In fact this happened on one of our new built competition engines whilst testing a new ignition system. On the first start up we had a fairly large back fire which resulted in stripping a brand new spindle instantaneously. Be warned! Other causes for backfiring are air-leaks, weak mixture, starting technique etc. - sort the problem sooner rather than later.

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