Running-in a new Ural Sidecar rig:

"A properly run-in machine will have just enough clearance between mating surfaces to permit an unbroken oil-film under normal operating conditions"

Forward now, not to Urals, but to Guns! Very recently, I came across an interesting article about a prosperous gunsmith firm specialising in rebuilding NEW handguns for better precision and reliability. This they do by plating/lapping until all the clearances are exactly enough and no more. Their labour-charges were USD500 for a gun costing USD400. And the gun was manufactured by a reputed company whose logo is a frisky horse.

Whatever the technology, the mechanism can always be improved by manual fitting. But the cost more than doubles with hardly a dozen parts to be fitted!

Finally, we come back to familiar terrain: Who has not freed a seized door-hinge by liberal application of penetrating-oil and cycling open/shut with gradually increasing amplitude. If the entire operation was attempted in a single try, something would have bent/broken!

Hmmmm. So here is an alternative! Neither do you have to manufacture to space-shuttle tolerances nor do you have to hand-fit the parts. **Just aim for interference-fit where running-fit was needed, and it will wear itself to a lovely running-fit if progressively run-in like the hinge!**

So that was the run-up to running-in.
Which you have done by "the book":
1000Kms never exceeding 80Kmph, Oil-change on the dot at authorised-dealer's, and all.
Feeling smug?
OK, ride out to the nearest National Highway one Sunday morning (no traffic) and open 'er up! Ten minutes at 120Kmph, and it is even-money that you have a seized engine and misc damage in gearbox.
Oh, really ?!!! But how ? And why didn't anyone ever mention it ?
Well, I just did, and the reason is not difficult to understand!

First we consider the engine construction:

Piston - Al Alloy; Rings - White Iron; Cylinder - Grey Iron; Gudgeon,CrankPins - Steel; ConnectingRod - Al Alloy; Floating Bush ....OK, OK, the point is that there are many different materials, which have different co-efficients of thermal expansion. It stands to reason that the clearance between the components will change as temperature changes. The plot FURTHER thickens, if you believe me (Please do; I am pretty good at Metallurgy) when I say that these materials are non-homogenous! I'm serious!! For example, Grey Cast Iron is particles of graphite embedded in iron. The size & distribution of the graphite is influenced by so many factors, you really don't want me to list them here! You'll just take my word for it when I say that in case of a mass production piece, nobody can predict it's EXACT dimension at a given temperature. Nobody but an insurance salesman :-)

Now consider engine temperature:
It depends mainly on the balance between (a) the heat from the burnt fuel, from friction and (b) the heat removed by the exhaust gases, by air, by oil. Rises with rising engine RPM.
Back to running-in.
You have run-in your bike at 80Kmph. Which means, at the corresponding temperature T(80), the clearances are ideal.
The next step is to make them likewise at T(90) where
T(90) = T(60) + DeltaT
and NOT at T(120) where
T(120) = T(80) + n DeltaT where n>>1 , right ? :-)
Don't like "mathematical" formulae ? , eh ? :-)
OK, try this:
Recall (or visit) a machine shop. Observe how the machinist removes material from the work piece to bring it down to the required dimension. He traverses the length repeatedly, advancing the tool SLIGHTLY each time, removing a LITTLE material each time, obtaining a pretty decent finish too. Try removing the whole lot in one pass, and you'll neither get accuracy nor a good finish! If you were very lucky. If not, screeeeeeeEEEE-KRAK-crrrruNCHH. Overheat, smoke, toolbreakage, system-seizure.
See any connection ? :-)

In other words, even if you have already "run-in" the engine at 80Kmph, you should progressively expose it to higher speeds and gradually form the clearances for best finish and fit. If you directly go to 120Kmph, the clearances might suddenly close-up, scrubbing off the oil-film and creating a rough unstable finish.
Now, should you take your chances on that, or should you take the advice offered here?

Point One:

Even if your bike has been used for YEARS in the city, say at 80Kmph max, DON'T try holding 120Kmph steady on the first interstate trip! **Run-in** the engine to 120Kmph first.

Point Two:

A suggested running-in method. Don't exceed 80Kmph for the first 1000Km. Then with engine warmed at 80Kmph, go to 90 and hold it for not more than half a minute. Do not repeat for at least 10 minutes
(You can guess why, right ?) Repeat this process at least 5 times before proceeding to next step, which is the same but holding time is one minute. Then repeat for 2min, 5min, 10min. This may have taken several days or weeks! Repeat this for 95, 100, 105 etc and then 120 Kmph. NOW you can say your bike is run-in.

This article was originally written on the internet by ***B. R. Gurunandan*** and we edited it to suit our needs…