A Possible Means of Measuring a Thread's Pitch Diameter

By R. G. Sparber

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I'm not ready to say that this works but do have some data. The basic idea is to take a hex nut of a given thread size and cut it in half point to point. Deburr the threads and use it to measure pitch diameter. To help get consistent results, I marked one face of the nut so it always goes together the same way.

The nut acts like the thread inserts used on a thread mic.

To test if this idea works, I used the 3 wire method of measuring pitch diameter on a 3" ¼-20 bolt. Data was taken at the end, 1" back from the end, 1.9" back from the end, and 2.8" from the end.

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For a ¼-20 thread, I used 0.029" diameter wires. The constant is 0.0437". To get the pitch diameter, I take the 3 wire mic reading and subtract this constant.

I chose to use the average readings along the bolt to create my adjustment factor. The average pitch diameter is 0.2115" while the average mic read 0.41815". This difference should represent the total thickness of the nut: 0.41815" - 0.21153" = 0.20663". This nut thickness value is subtracted from the mic over split nut value.

Position along bolt	Mic over 3 wires	Pitch dia.	Mic over split nut	Adjusted value	Pitch dia. – adjusted value
At end	0.25405	0.2104	0.41610	0.20948	0.00092
1" back	0.25400	0.2103	0.41775	0.21113	-0.00083
1.9" back	0.25525	0.2116	0.41760	0.21098	0.00062
2.8" back	0.25745	0.2138	0.42115	0.21453	-.00073
average		0.21153	0.41815		

Conclusion

From this rather small sample, there does seem to be a correlation between the pitch diameter and the adjusted value read across the split nut. The error appears to be around +/- 0.001".

I do not claim this to be a proof, just a demonstration of a possible alternate approach to measuring the pitch diameter. It is certainly easier to handle the split nut than the 3 wires.

I welcome your comments and questions.

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