A Study of Analysis Method for the Surface Roughness on the Inner Bore of Diesel Engines Before and After Running-in Operations.

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Background

The running-in of engines improves lubrication
by eliminating microscopic irregularities on the surfaces of engine parts

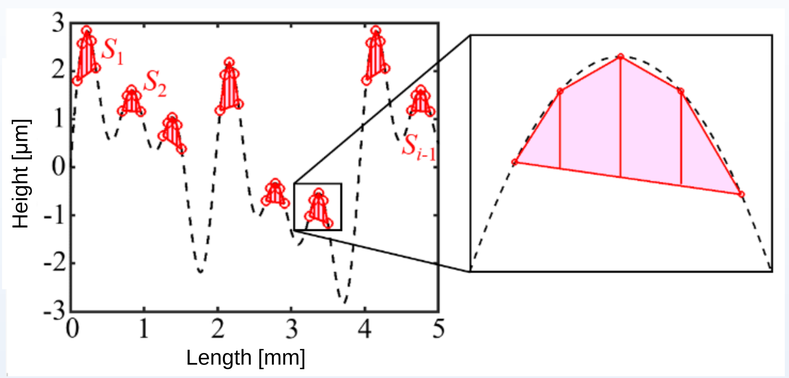
On the other hand, running-in is a complicated procedure,
and some procedures should be performed by consumers themselves.

One solution to this problem is to machine the surfaces
of the engine parts before running-in such that
they have the same surface condition as that after running-in.

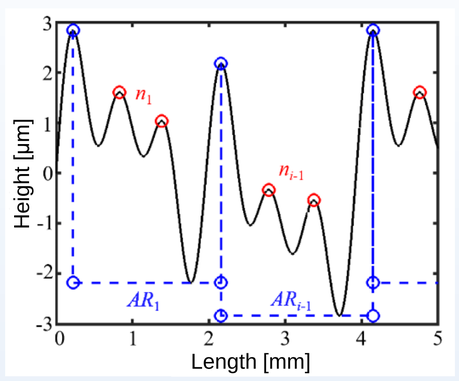
Realizing this solution requires an appropriate evaluation and
quantification of the surface roughness by understanding the changes
in the surface topography of the engine parts before and after running-in.

This study develops new parameters to quantify the difference
in the surface topography of the cylinder liner before and after running-in.

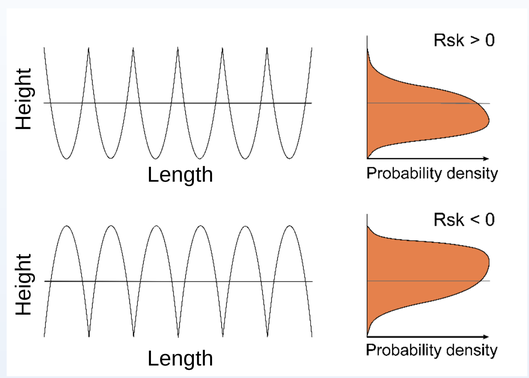
Details of Developed Parameters, Rsk, and Rku



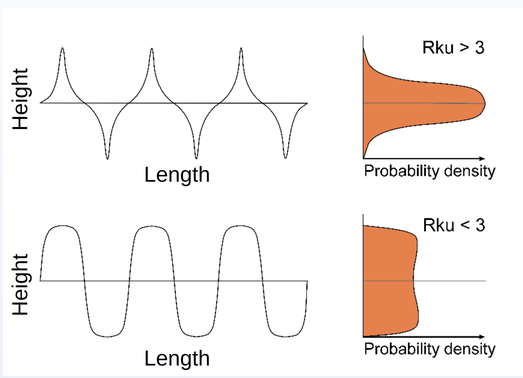
pPsm



pPmotif



Rsk



Rku

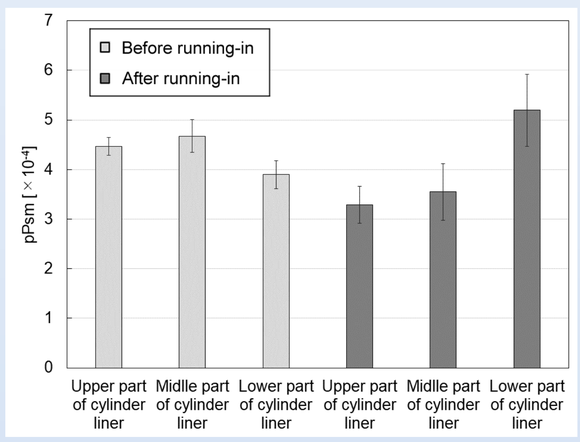
$$pPsm = \frac{1}{n_m}\sum_{i=1}^{n_m} S_i$$

$$pPmotif = \frac{1}{n}\sum_{i=1}^{n} \frac{n_i}{AR_i}$$

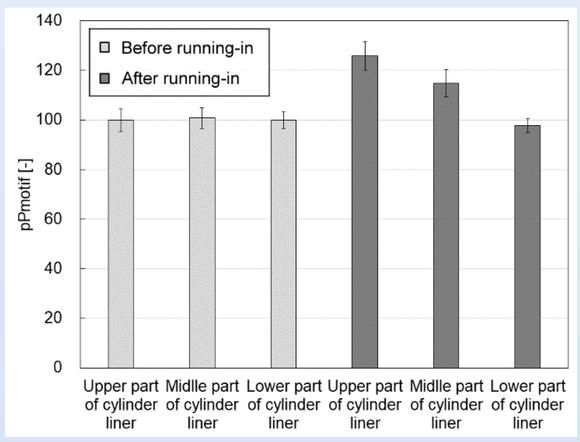
$$Rsk = \frac{1}{Rq^3}\left[\frac{1}{lr}\int_0^{lr} Z^3(x)dx\right]$$

$$Rku = \frac{1}{Rq^4}\left[\frac{1}{lr}\int_0^{lr} Z^4(x)dx\right]$$

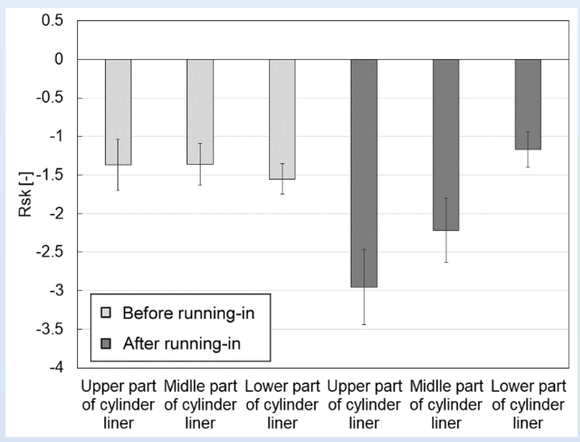
Results of Parameters



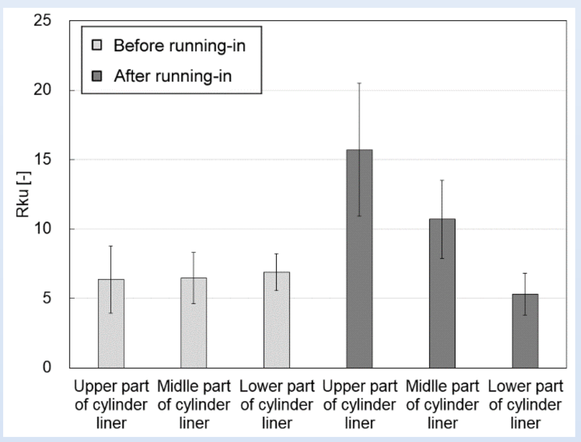
pPsm



pPmotif



Rsk



Rku

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