

KES

The Standard of Design for
the Rear Clearance of Piston
and the Inner Diameter of
Piston Ring's Groove

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1. Scope of application

This standard shall be applied all vehicle grade with gasoline and diesel engine.

2. Purpose

The purpose of this standard shall be to decide the standard of design for the rear clearance of piston and the inner diameter of piston ring's groove.

3. Meaning of vocabularies

The rear clearance:

It is the clearance between the inside surface of the piston ring and the inner diameter of ring's groove. It is affected by ring's pressure and thermal expansion.

4. The standard of design

4.1 SAE standard

$$\begin{aligned} \text{Compressive Ring } D_n &= [D - (2T + X \cdot D + 0.5)] - \begin{matrix} 0 \\ 0.25 \end{matrix} \\ \text{Oil Ring } D_n &= [D - (2T + X \cdot D + 1.5)] - \begin{matrix} 0 \\ 1.25 \end{matrix} \end{aligned}$$

D_n : Inner diameter of piston ring's groove mm

D : Calling diameter mm

T : Thickness of ring mm

X : Cast iron piston = 0.004

Aluminum piston = 0.006

Ex 1 : U-XA(X-1)Kia 2.7 ℓ calculation the inner diameter of piston ring's groove with compressive ring in the diesel engine

Piston calling diameter : 96mm thickness of ring : 4.1mm aluminum piston

$$D_n = [96 - (2 \times 4.1 + 0.006 \times 96 + 1.5)] = 85.724\text{mm}$$

Reflected value in the design : 85.8 ~ 86mm