

KES

**Clearance Design Standard of
Main Part (Cylinder Block, Crank
Axis, Piston, Connecting Rod)
of Diesel Engine**

KES M – F011

(EST.) 1990 – 01 – 30

Contents

- 1. Scope of Application**
- 2. Purpose**
- 3. Regulation Items**
- 4. Clearance Calculation Method**
- 5. Clearance Value of Every Items**
- 6. Relation of Exhaust Amount and
Clearance**

1. Purpose

The purpose of this standard shall be to devise stability and to use application clearance publicly by stipulating the value of clearance, which consists of the each parts of connecting rod that convert reciprocation of cylinder block which consist of main part of diesel engine and piston which perform reciprocation into rotational motion.

2. Scope of application

This standard shall be applied to clearance that is made between cylinder block and piston, between piston and connecting rod, and between piston and piston ring in a diesel engine.

3. Meaning of vocabularies

(1) Clearance

A gap that prevents direct contact for smooth movement of perturbation part such as axis and bearing and allows formation of oilskin at surface of perturbation part to reduce friction and abrasion by keeping state of fluid friction.

(2) End gap

A gap that is made at free-end part of piston ring

(3) Ring lift

A gap that is made by groove and thickness of a piston ring

4. Regulation items

(1) Crank main journal oil clearance

(2) Crank pin oil clearance

(3) Piston pin & con-rod S.E clearance

(4) Piston pin & pin boss clearance

(5) Liner fitting

(6) Piston ring end gap

(7) Piston ring lift

5. Clearance calculation method

- (1) Crank main journal oil clearance
- = Housing inside diameter – { Main journal outer diameter + (Bearing thickness × 2) }
- (2) Crank pin oil clearance
- = Connecting rod L.E inner diameter – { Crank pin outer diameter +
(Bearing thickness × 2) }
- (3) Clearance of piston ring and connecting rod S.E
- = Connecting rod S.E inner diameter – piston outer diameter
- (4) A gap between piston pin and pin boss
- = Piston boss inner diameter – piston pin outer diameter
- (5) Liner fitting
- =Liner outer diameter – cylinder bore inner diameter
- (6) Piston ring lift
- = Piston ring groove – piston ring thickness

6. Clearance value of each item

Table 1

Items		Clearance Min Max	Remark
Crank main journal oil clearance		28 ~ 102	Yielding value with no relation with displacement
Crank pin oil clearance		27 ~ 82	
Piston pin and connecting rod S.E clearance		12 ~ 44	
Clearance of piston ring and pin boss		0 ~ 18	
Liner fitting		21 ~ 100	Fitting forcibly
		12 ~ 43	Loose fitting
Piston ring lift	1st	50 ~ 100	3rd 0.30 ~ 0.45μ
	2nd	40 ~ 80	
	Oil	20 ~ 78	
Piston ring end gap	1st	0.20 ~ 0.60	3rd 40 ~ 80μ
	2nd	0.20 ~ 0.55	
	Oil	0.20 ~ 0.55	