KES

Locus Calculation of Connecting Rod Assembly According to Rotation of Crank Axis

KES M – F001

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Contents

1. Scope of Application

2. Purpose

3. Meaning of Vocabularies

4. Contents

Additional rules

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1. Scope of application

This regulation shall be applied to the case that position of connecting rod about crank angle need to be known when operation of locus of connecting rod assy. in a engine of IN-LINE and V type is performed.

2. Purpose

The purpose of this regulation shall be in order to recognize interference or the minimum distance of connecting rod and cylinder block for cad or operation by hand and in order to make program that obtain position of connecting rod according to rotation of crank axis and to use the program for a design.

3. Meaning of vocabularies

Program language : VS FORTRAN

Used computer : IBM PC 5550

Source file name : PISTONSK. FOR

Input file name : PISTONSK .DAT

Output file name : PISTONSK .OUT

Input data variables

ENG : Name of engine
(The maximum 3 characters)

r : Crank radius (mm)

ST : Stroke (mm) = 2 × r

CONL : Length of connecting rod (mm)

CH : Height of piston compression (mm)

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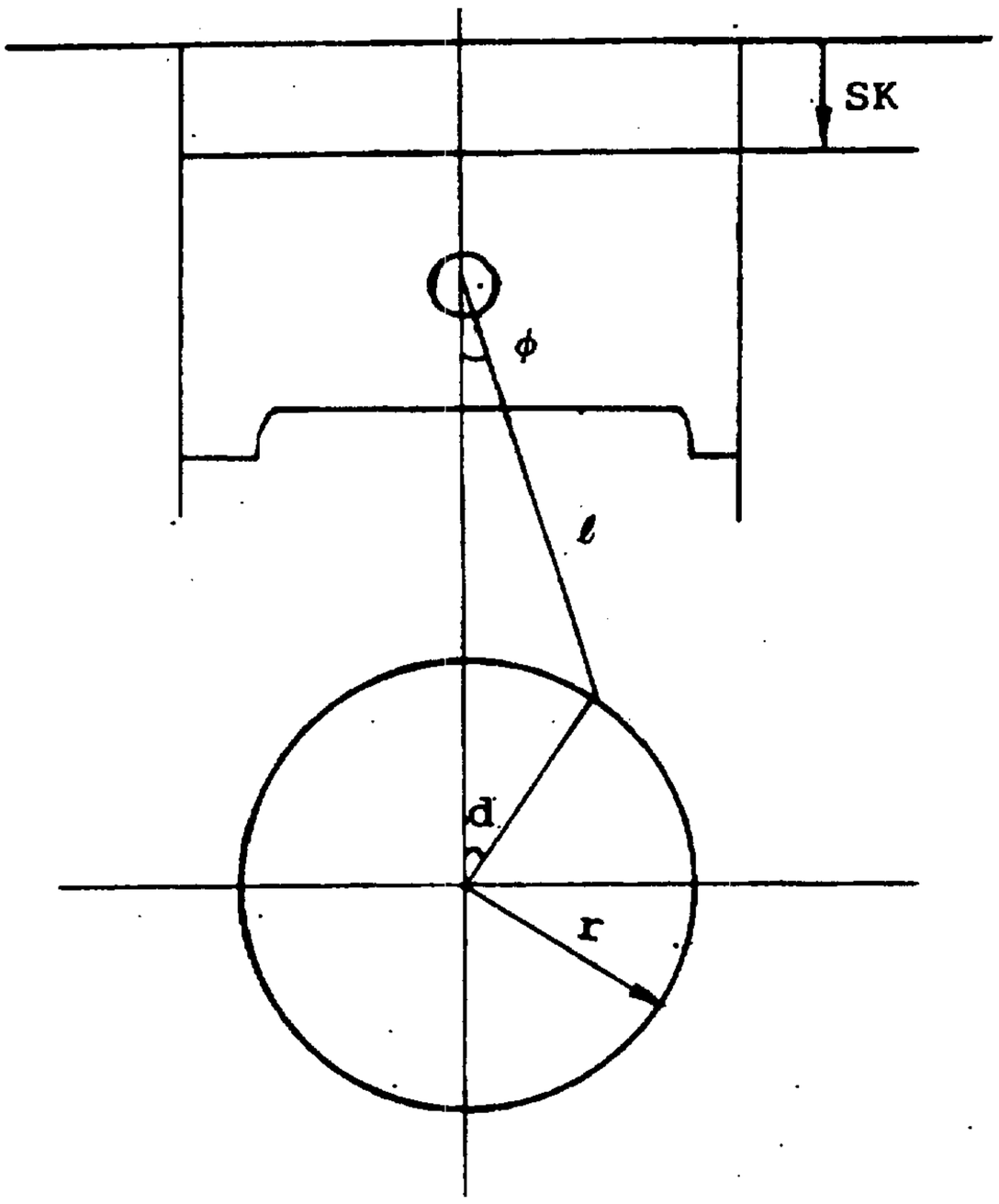
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ISTEP : Step of crank angle that calculation is acquired

(1 to 179)

r, ST, CONL, CH must be real numbers.

4. **Contents**



l : Connecting rod length

r : Crank radius

α : Crank rotation angle from TDC

(Deg)

ϕ : Angle between bore center line

and conrod

SK : Length that piston descend

from TDC

λ : Ratio of conrod(ℓ / r)

SK, the length that piston descend from TDC, can be expressed by following formula.

$$SK = \ell + r - \ell \cos\phi - r \cos\alpha$$

$$= r (\ell + 1 - \cos\alpha) - \ell \cos\phi \quad \cdots\cdots (1)$$

Here, the relation of conrod length ℓ and crank ℓ, radius r is

because of lsinα

In the formula (1) $\ell \cos\phi = 1 \sqrt{(1^2 - \sin^2 \alpha)}$

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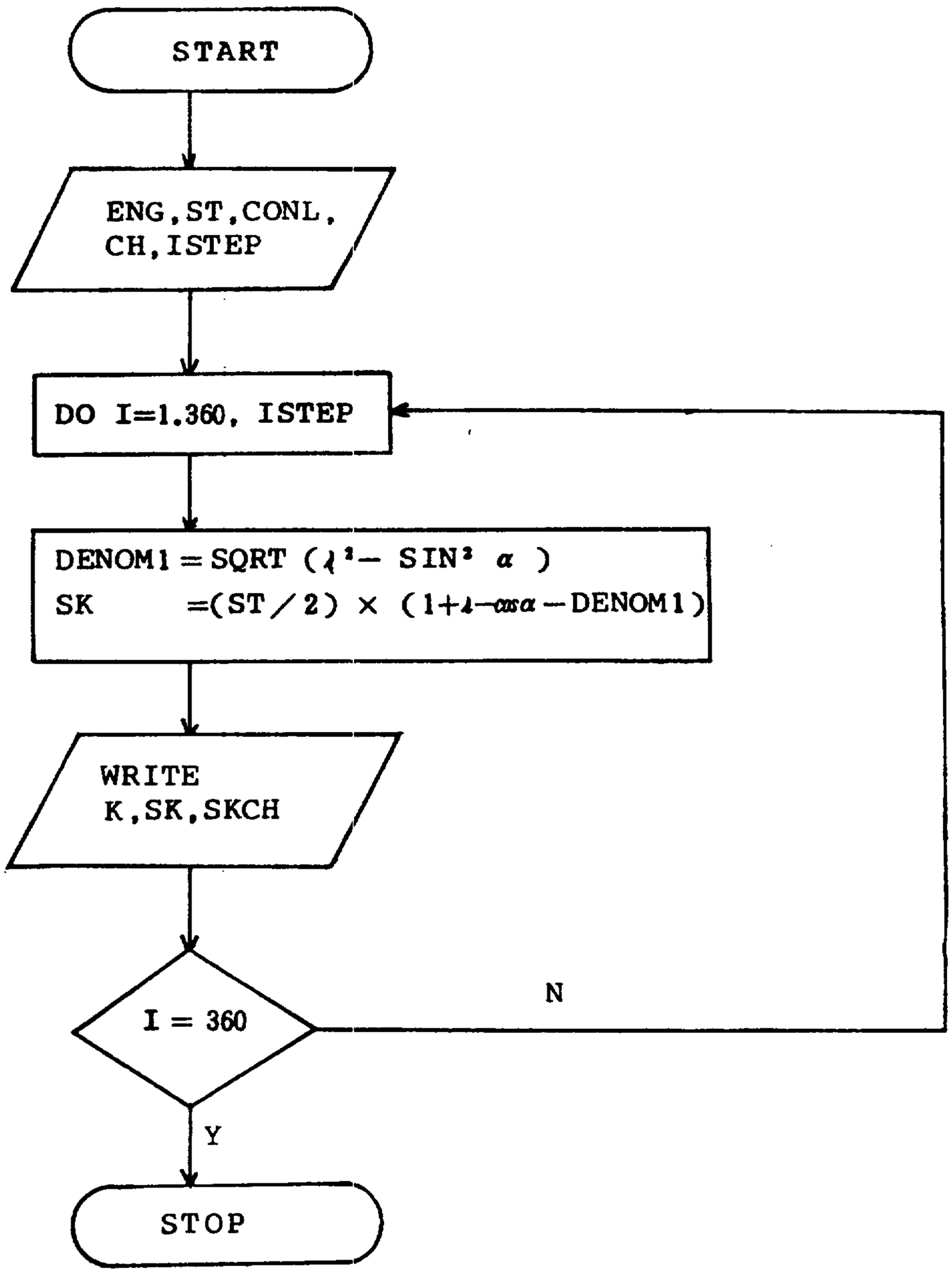
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Indicate this as a DENOM1 and substitute this for (1).

$$\text{DEMOM1} = \ell \sqrt{(\ell^2 - \sin^2 \alpha)}$$

Then (1) is expressed as a SK = r × (ℓ + λ – cos α – DENOM1)

(1) Flow chart



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