MOTION & CONTROL NSK

TECHNICAL INSIGHT

A PUBLICATION OF NSK EUROPE

Thin Thrust Needle Roller Bearing for Planetary Gear Mechanism for use in Automobile Step AT

Development Objectives

The washers are changed to Thin Thrust Needle Roller Bearings

- Reduced friction loss to washers
- Changes to dimension of peripheral parts are kept to an absolute minimum

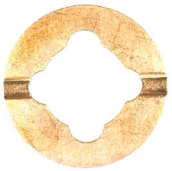
General Description and Product Features (Structure and Operating Principles)

Reduction in friction loss

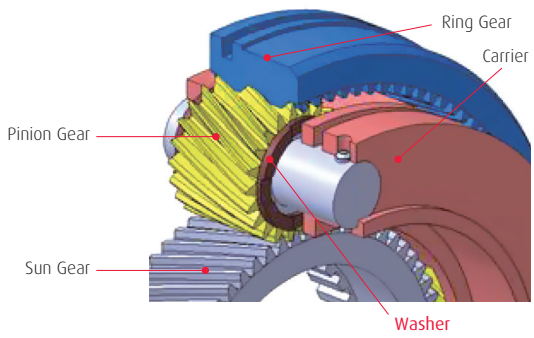
Friction loss (driving shaft torque) is reduced by up to 0.2 N·m compared to washer.

Minimization of size changes of peripheral components

The combined use of the roller of world's smallest level having φ1mm in diameter (1.8 mm in length) and the race having plate thickness of 0.2 mm enabled "replacement of the washer with NSK race in size equivalent to that of a washer"

		Washer	Development Product		
External View			 Lubrication Hole Cage & Roller Flat Plate Race	Usable with various types  Cage & Roller Race with Inner Diameter Lip	 Cage & Roller Race with Inner Diameter Lip Race with Outer Diameter Lip
Dimensions	Width	~1.4 mm	1.2 mm	1.2 mm	1.4 mm
	Roller	- - -	Diameter φ1 mm × Length 1.8   5 mm		
	Race thickness	- - -	0.2 mm		
Friction Loss		Large	Small		
Rate of Mass*		1	0.4 (Reduction by 60%)	0.6 (Reduction by 40%)	0.6 (Reduction by 40%)
		Made of copper, iron, etc.	Cage: Retainer: Resin; Race: Iron		

* Comparison with washer having plate thickness t=1.2 mm made of copper



Measurement Result of Friction Loss (Shaft Driving Torque)