

TSUDAKOMA

TECHNICAL FEATURES

THE TSUDAKOMA DUAL LEAD GEARING SYSTEM

THE TSUDAKOMA DUAL LEAD GEARING SYSTEM DELIVERS THE OPTIMUM BALANCE BETWEEN POWER, DURABILITY, AND SMOOTH CUTTING PERFORMANCE.

Tsudakoma's
Proprietary
Dual Lead
Worm Gearing
System with Full
Depth Gear Tooth
Engagement



TORQUE TRANSFER EFFICIENCY

The Tsudakoma dual lead gearing system features the largest tooth engagement of any rotary table manufacturer. **This system generates up to 85% torque transfer efficiency.**

GEARING MATERIALS

PROPRIETARY HIGH TENSILE STRENGTH

Worm Wheel Material	Tensile Strength (N/mm ²)	Elongation (%)	Hardness (HB)
Bronze	245	15	70
Phosphor Bronze	295	5	80
Aluminum Bronze	490	20	120
Tsudakoma Proprietary Brass	650	15	170
Worm Spindle	Case hardened alloy steel		

Tsudakoma's dual lead gearing system features exceptionally smooth cutting due to the inherent lubricating properties of the gear materials.



TOOTH PROFILE

Tsudakoma utilizes full tooth depth engagement along with a larger gear module. The results are a larger surface contact area yielding a substantially stronger worm gear system.

Conventional tooth profile



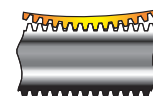
Tsudakoma tooth profile



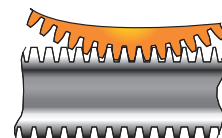
OVERSIZE WORM WHEEL

The Tsudakoma worm wheel uses an oversize diameter pitch circle resulting in reduced pressure on the contact surface compared to a conventional gearing system.

Conventional gearing



Tsudakoma gearing



TSUDAKOMA:

- ▶ PRECISION
- ▶ PERFORMANCE
- ▶ PRODUCTIVITY INNOVATION



TSUDAKOMA CROSS ROLLER BEARINGS

TSUDAKOMA ULTRA PRECISION

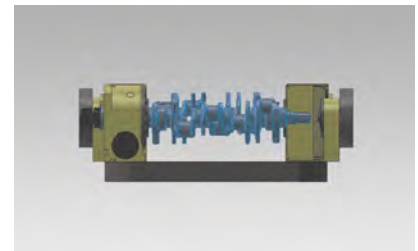
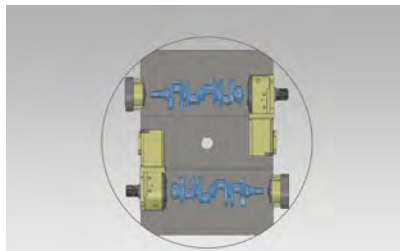
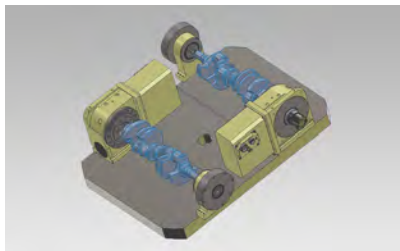
Ultra precision cross roller bearings support radial, axial, and moment loads providing four times the level of stiffness as angular contact bearings. Cross roller bearings are constructed with a sequence of cylindrical rollers arranged at right angles to each other within a sealed 90° V-groove. All Tsudakoma rotary tables and indexers use ultra precision cross roller bearings.



KOMA APPLICATION ENGINEERING

ROTARY TABLE SELECTION ASSISTANCE

KOMA application engineers - with AutoCAD® and SolidWorks® 3D CAD support - ensure Tsudakoma rotary tables purchased from KOMA will be the best available for the required machining operations. Torque calculations, interference drawings, and 3D models are standard no-charge, value added services offered by KOMA Precision.

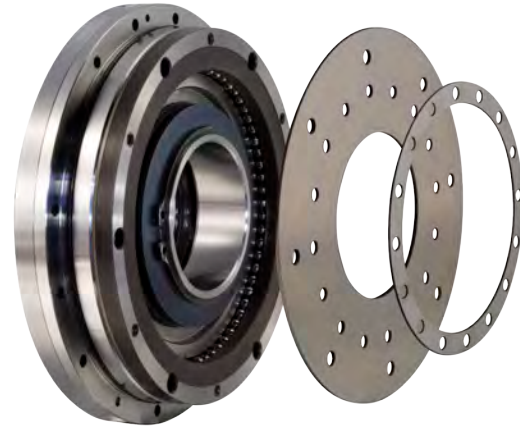
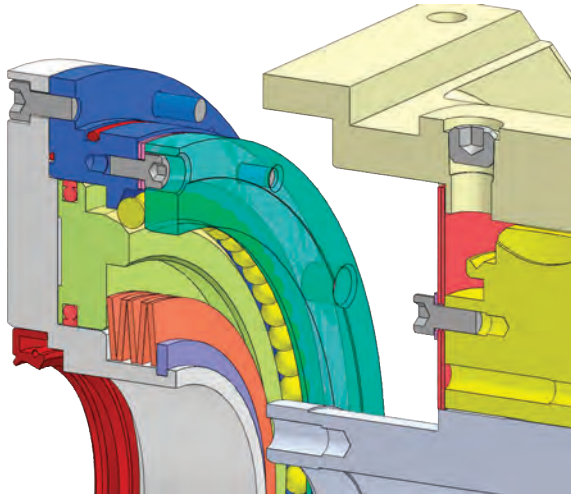


KOMA application engineers supplied the above SolidWorks® 3D interference models integrating two RNA-251R rotary tables and two TS-160P pneumatic tailstocks with customer supplied 3D part models and machine tool work cube models to ensure the success of this V-8 automotive crankshaft project.



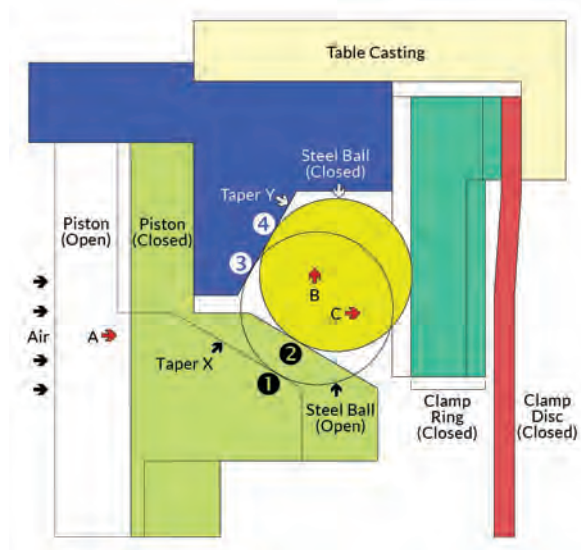
DUAL TAPER PNEUMATIC CLAMPING MECHANISM

APPLIES TO: RWA/RWA,B-SERIES TABLES • TWA-130/160/200 • TWA-160,B/200,B



Tsudakoma Dual Taper Clamping Mechanism

- 1) Air pressure moves Piston in Direction A
- 2) Steel Ball moves in Direction B along Taper X from Position 1 to Position 2. Force is multiplied by a factor of 1.73
- 3) As Steel Ball moves in Direction B, Taper Y forces Steel Ball to move in Direction C from Position 3 to Position 4. Force is multiplied by a factor of 1.73
- 4) Steel Ball moving in Direction C forces Clamp Ring against Clamp Disc. The movement of the Steel Ball along Taper X and Taper Y results in the applied force being multiplied by a factor of $1.73 \times 1.73 = 3.0$



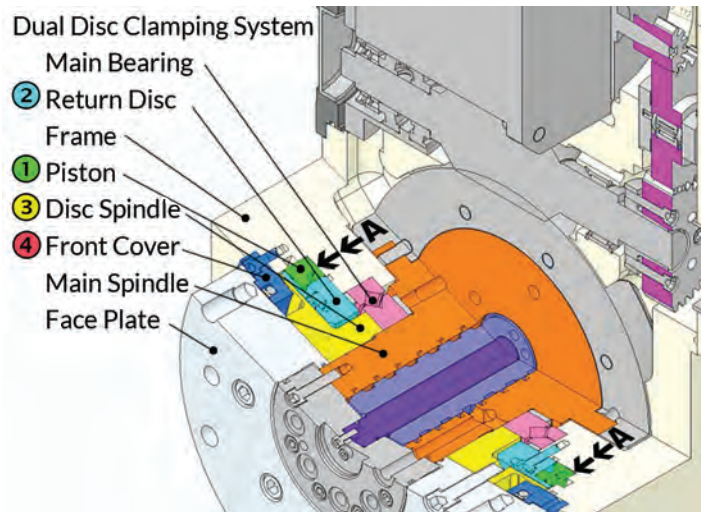
DUAL DISC CLAMPING MECHANISM



Tsudakoma Dual Disc Clamping Mechanism

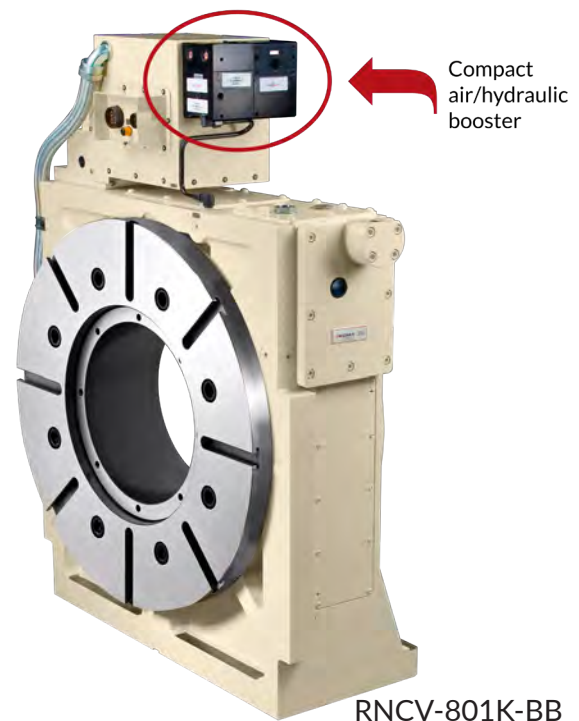
1) Hydraulic pressure* moves Piston ① in Direction A.

2) Piston ① presses Return Disc ② against Disc Spindle ③ which clamps the Disc Spindle against the Front Cover ④.



*If the machine tool does not have a hydraulic source to power the rotary table clamp mechanism, a Tsudakoma air/hydraulic booster is used to power the clamping. An air source is plumbed to the inlet port of the booster, and the outlet port of the booster is plumbed to the rotary table hydraulic inlet port. Air/hydraulic boosters are either built-in internal units (for RBA-Series tables) or compact externally mounted units.

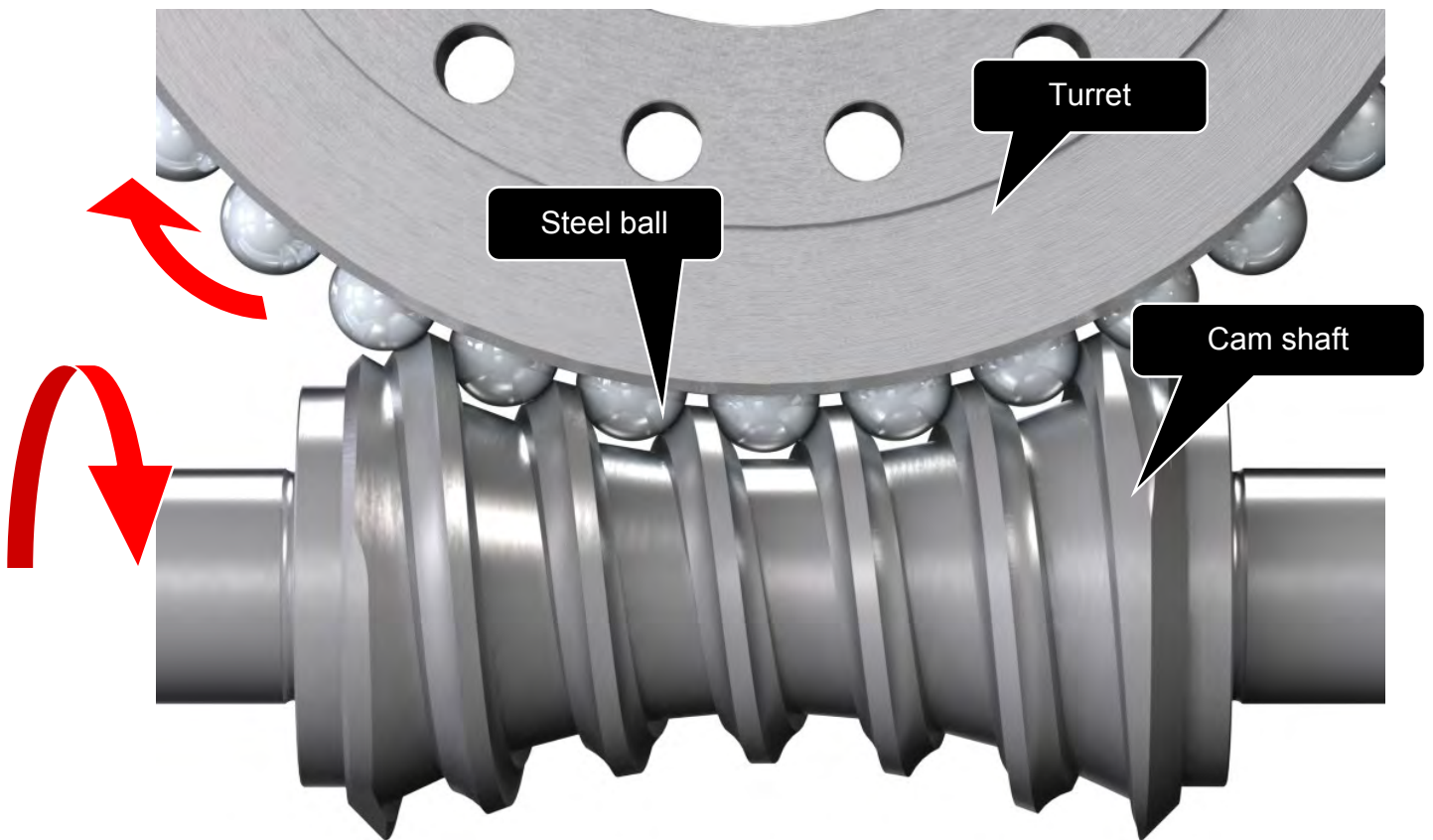
Booster Type	Table models	Booster
Internal	RBA-Series tables only	
External (enclosure size varies)	Rotary table diameter is 300mm or more	



RNCV-801K-BB



BALL DRIVE SYSTEM MECHANISM



BALL DRIVE SYSTEM FEATURES



HIGH SPEED

Index speeds up to 138.9 RPM.

HIGH ACCURACY

Increased accuracy and repeatability specifications.

HIGH RIGIDITY

Increase clamp and holding torque.

ZERO BACKLASH

High accuracy machining with no backlash or reversal error.

ZERO MAINTENANCE

Lifetime adjustment-free

HIGH TORQUE TRANSFER EFFICIENCY

40% more drive torque.



RBS-160



TBS-160



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