

ULTRA-LONG LIFE TOOL CLAMPING MECHANISM
– HAOZHI DRAWBAR SYSTEM



Haozhi Drawbar System

- **Ultra-long tool unclamping life** —Adopts circular springs with more uniform stress distribution, ensuring longer and more stable service life. After 10 million impact cycles, the drawbar force attenuation remains within 10%.
- **Ultra-low overall machine vibration** —The spring undergoes special surface treatment and is transition-fitted with the drawbar, preventing displacement during tool unclamping and long-term vibration, thus avoiding imbalance variation. The ultra-high durability of the Haozhi drawbar system also prevents imbalance caused by fracture or loss of clamping force.
- **Ultra-high repeat clamping accuracy** —Features a simpler and more robust steel ball gripper structure, effectively preventing accuracy degradation caused by wear.
- **Zero failure record** —With over 200,000 spindles delivered in volume, there have been zero abnormal feedback cases from customers regarding the Haozhi drawbar system.



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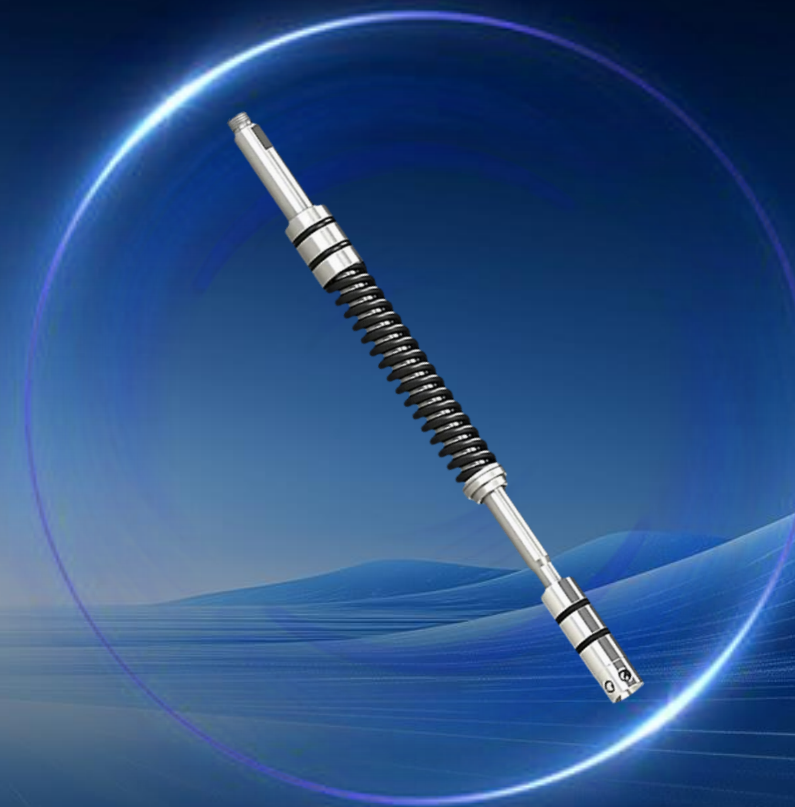
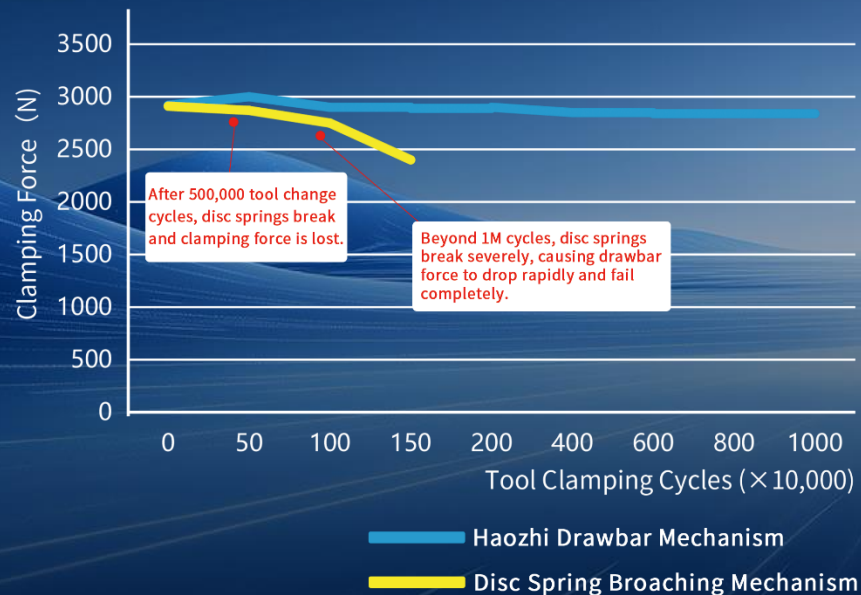
Innovative Broaching Mechanism with 10x Longer Service Life

Haozhi Innovative Broaching Mechanism Service Life **VS** Service Life of Disc Spring Broaching Mechanism

Haozhi Innovative Broaching Mechanism: 10 Million Cycles Life

Disc Spring Broaching Mechanism: 1 Million Cycles Life

**Tool clamping force decay is within 10%
after over 10 million tool clamping/unclamping cycles.**



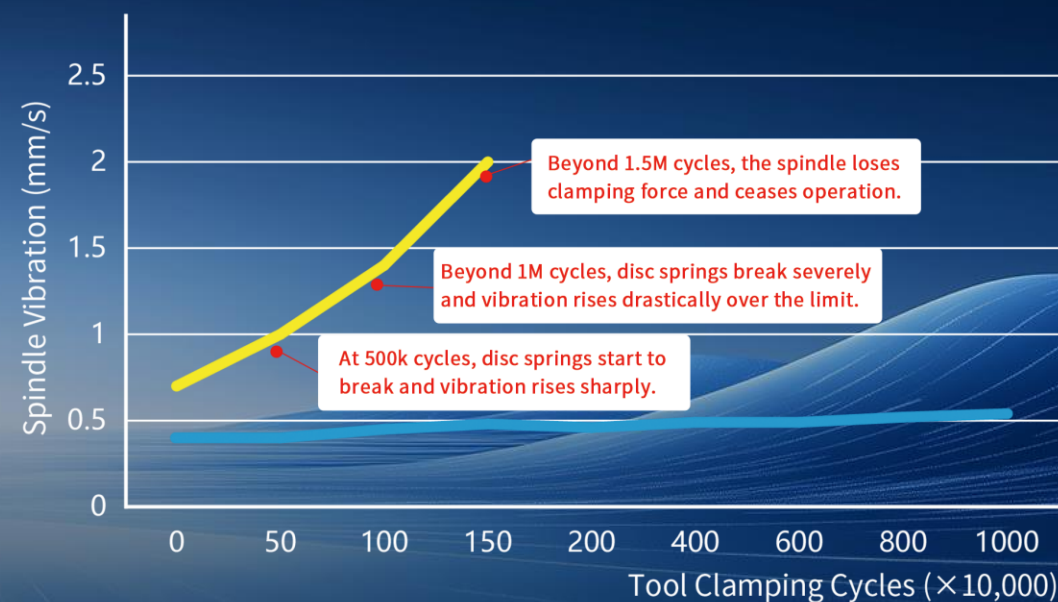
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Innovative Drawbar Mechanism Reduces Spindle Vibration by Approximately 30%



Haozhi Innovative
Drawbar Mechanism **VS** Disc Spring
Drawbar Mechanism

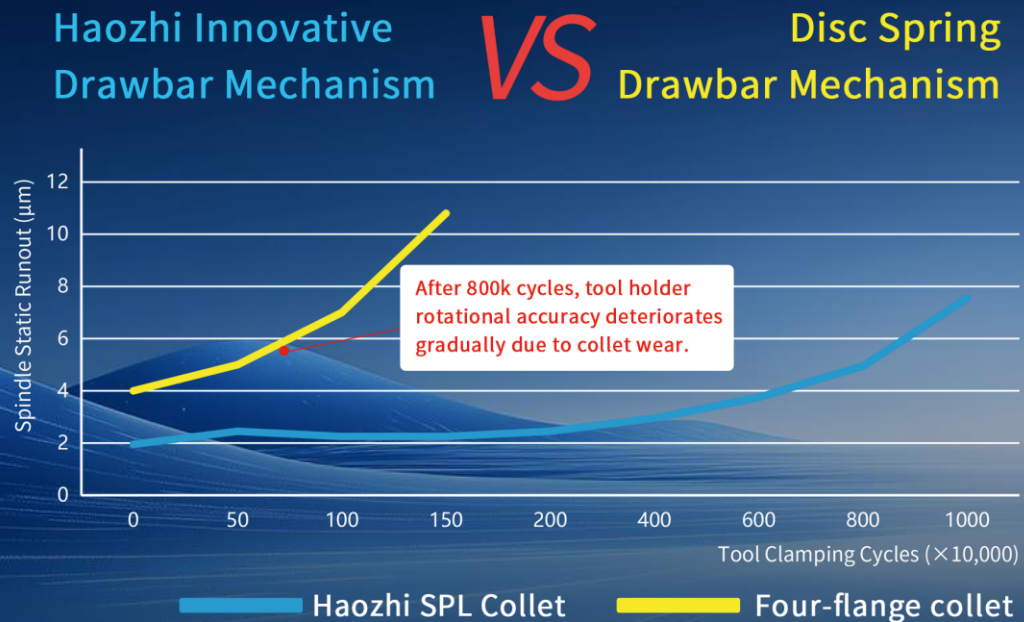


— Haozhi Drawbar Mechanism
— Disc Spring Drawbar Mechanism

ULTRA-LONG LIFE TOOL CLAMPING MECHANISM – HAOZHI DRAWBAR SYSTEM



Innovative Drawbar Mechanism with Ultra-High Repeatable Broaching Precision



Innovative Drawbar Mechanism – **Zero** Failure History

- **Zero** abnormal repair rate for Haozhi drawbar spindles at customer sites.
- **Zero** production line abnormalities since 2016 launch.
- In-house durability tests exceed 10 million clamping cycles with **zero** failures.
- Since 2016, over 200,000 spindles delivered with **zero** customer complaints on Haozhi drawbar mechanisms.



Spring Design & Service Life

- **Haozhi** — Utilizes **dual-strand circular springs**—with uniform and smooth stress distribution, resulting in longer fatigue life. Capable of maintaining drawbar force attenuation within 10% after 10 million impact cycles.
- **OTT** —Standard laboratory life is approximately 9 million cycles, while actual operating life typically ranges from 3 to 6 million cycles.

Structural Stability

- **Haozhi** —The spring is specially surface-treated and transition-fitted with the drawbar, effectively preventing displacement under tool unclamping and long-term vibration, eliminating imbalance variation.
- **OTT** —No special fitting design; clearance fit is used, posing a risk of imbalance variation.



ADVANTAGES OF HAOZHI DRAWBAR SYSTEM VS. OTT DRAWBAR SYSTEM



Repeat Clamping Accuracy

- **Haozhi** —Provides stable clamping force with a simple and reliable steel ball gripper structure. Low wear and excellent accuracy retention ensure high repeatability and stable, reliable long-term operation.
- **OTT** —Features multiple components and complex interfaces, increasing wear and force variation risks. Accuracy retention depends on multiple component conditions, resulting in relatively weaker structural stability and long-term precision maintenance.



Haozhi
Drawbar Mechanism (Left)

OTT
Drawbar Mechanism (Right)



Core Value:Through structural optimization and process upgrades, the Haozhi drawbar system outperforms traditional OTT systems in operational stability, fatigue life, and maintenance cost, ensuring long-term reliable machine performance.