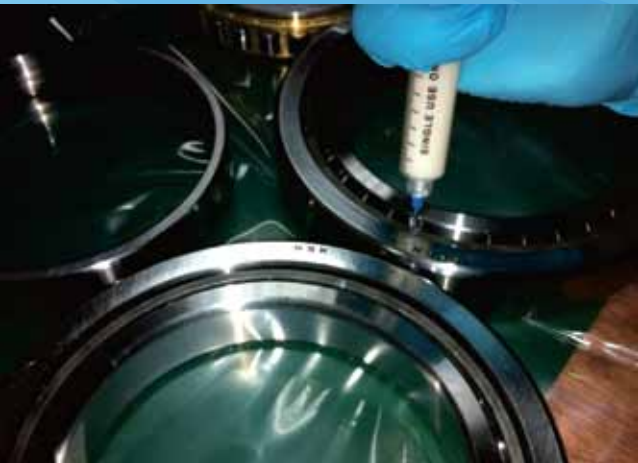




**CNC MACHINE TOOL
SPINDLE REPAIR
SERVICE CENTRE**



ABOUT US



- **Experience**
- **Quality**
- **Workmanship**
- **Precision**
- **Quick Service**

Spintec Engineering Pte Ltd is a dedicated facility with focus on machine tools spindle repair. Serving as the "heart" of a machine tool, spindles are engineered to deliver high levels of speed, accuracy, precision, repeatability and cutting performance. If spindle fails, it need to be repaired in shortest possible time. Our 25 years of experience in this industry keeps us on toes to provide the right repair solution with best quality and quickness. Expected spindle performance is guaranteed after repair, thanks to the effective use of our state of art equipments and facilities

ADVANTAGE

- Have a track record of assembling 800 plus spindles, 70 different brands
- Short lead time for repair
- Stocked P3/ P4 class precision bearings for most of the leading brands of machine tools, which translates to faster recovery of down machines.
- Provide 6 months warranty to all serviced spindles.
- A-Z spindle service. For the customers who wish, Spintec provide service on disassembling and assembling the spindle units from / on their machine tools.

TYPES OF SPINDLES

- Turning/ Lathe spindles – single and multiaxis spindles with cylindrical or A1/A2 taper connection, turn- mill spindles
- High speed milling spindles- part production, die-mold milling spindles with BT/SK/ISO/CAT taper connections, HSK/ Capto/ KM taper connections
- High speed grinding spindles- for cylindrical, centreless, surface and rotary grinding
- Live tools- straight and radial, angular head and speed reducers
- Bi-rotational universal spindles

PROCESS

- **Breakdown of spindle-** Disassembly of faulty spindle at Spintec facility and collect evidences of failed areas
- **Inspection-** Critical parts measurement and identify root cause for failure. Prepare Failure Analysis Report
- **Part preparation-** Degrease, deburr for sharp free edges and ultrasonic cleaning

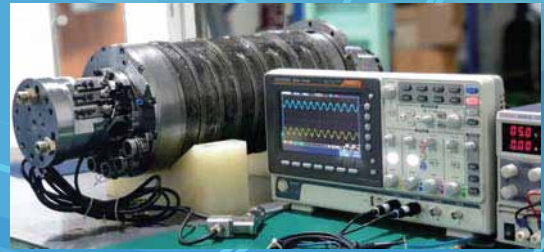




Spindle (before and after grinding with hard chrome)



- **Taper bore correction-** Grinding of tool seating bore to match with the gage (BT/SK/ISO taper connections, HSK/ Capto/ KM taper connections). For badly damaged taper bores, either new taper sleeve will be fitted or material added by hard chroming and ground
- **Bearing Assembly with proper pre-load-** This is a critical step in spindle assembly and Spintec technicians have learnt over years mastering the technique. Bearings must have the proper amount of pre-load for maximum life and optimum machine performance.
- **Dynamic Balancing-** Spintec does balancing of all high speed spindles using Schenck precision balancer and ensure conformity to ISO 1940-1 standard.
- **Encoder Testing-** By oscilloscope and test rigs, spindle orientation and speed measurement confirmation is done.
- **Accuracy check and Test Run-** After completion of assembly, clamping force check, run-out of spindle shaft using a calibrated spindle test bar are checked and conforms the data are as per ISO10791-2 standard. Finally all spindles are test run to maximum speed to ensure assembled bearings are thermally saturated.
- **Stator Rewinding** - Spintec does full electrical integrity checks for the spindle motor winding for resistance, impedance and insulation check. Rewind of damaged stator to OEM specification is done if found failed
- **Leak tests-** As a part of repair process, Spintec does full pressure testing of cooling jackets for stator sets and bearings where applicable. Further, full pressure testing of drawbar actuation cylinders using hydraulic test rigs are done.



ON-SITE DIS ASSEMBLY & ASSEMBLY



On-Site Disassembly & Assembly is one of the key expertise of Spintec team. Our experienced assembly engineers could disassemble the spindles from the machine and assemble back after repair to reinstate to original condition.

Further, on-site balancing of spindle and related geometric tests are done on the machine ensuring good cutting performance.



BRANDS SERVED



Note: Contact Spintec Engineering for other brands not appeared above

TESTIMONIALS

Spintec Engineering have demonstrated a high level of professionalism in supporting customer request. We appreciate the support received from Spintec during this difficult situation with our machine

JARED TAN

Manufacturing Services Leader, Rolls -Royce Singapore Pte Ltd, Singapore

Spintec Engineering reconditioned few spindles for our company and the quality of work and accuracy is as good as new

RICHARD

Production Manager, Eratech Pte Ltd, Singapore

Spintec team has capability to troubleshoot spindle related issues and could provide solution quickly. We have engaged their service since Y2012 and are satisfied with their prompt response and support.

MUTHUVANAN RAMASAMY

Sr. Engineer- Maintenance, Alliance Contract Manufacturing Sdn Bhd, Malaysia

Experience with Spintec's spindle repair service has been above satisfactory

FOO SIANG FATT

Technical Professional, Sr., Halliburton Completions Mfg Pte Ltd, Singapore

Almost all UMS spindles are serviced by Spintec. The service and reliability are excellent. I sincerely recommend their service

GOBINATH GUNASELAN

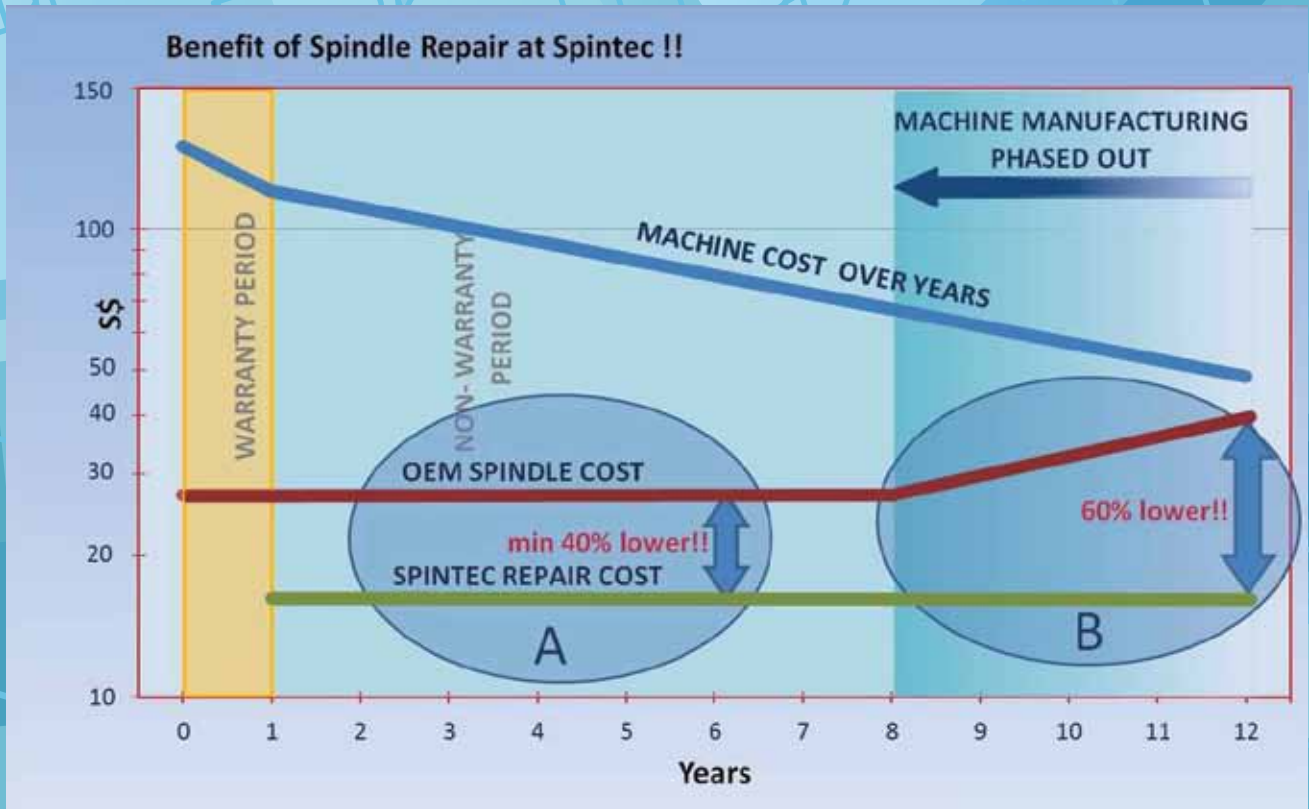
Asst Operations Director, UMS Holdings, Singapore

Spintec team was very professional, quick to perform the scheduled repair

JARYL TEO

Account Manager, Focal Oilfield Solutions, Singapore

COST SAVINGS



\$S shown are in '000's

Above chart gives a snapshot on benefit of spindle repair at Spintec Engineering. Assuming a CNC machine is bought for \$S 150,000, and in any event if the spindle on the machine is failed due to end of atigue life of spindle bearings or end of grease life or crash, it is in-entivable to repair the spindle. Estimated spindle replacement cost over the years of machine usage is shown in the chart.

Chart is made assuming

- Depreciation rate of 20% in first year and 7.5% in subsequent years on machine cost
- Spindle replacement cost from OEM is (new spindle or repaired spindle) 15% of machine cost.
- Machine under active manufacturing phase for 8 years, and in support phase later.

Case A: Spindle required to be replaced after warranty period.

Spintec repair cost will provide savings of minimum 40% compared to OEM spindle cost.

Case B: Spindle required to be replaced after 8 years.

It is expected there will be waiting time at OEM due to lead time required for building/ repairing spindle. Factoring in the waiting time cost of OEM spindle, Spintec repair cost will provide savings of around 60% compared to OEM spindle cost.

Target- Cost Saving!!

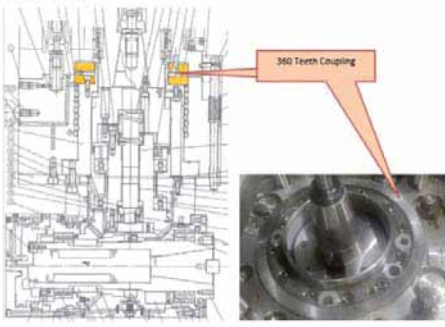
FAILURE ANALYSIS & TEST REPORTS

SPINTEC **SPINDLE ANALYSE REPORT**
SAR- MVR30-00

Customer and Machine Data			
Customer name		Reference ID	MVR-30
Machine make & model	Mitsubishi, MVR-30	Prepared by:	Prakash
Machine number	-	Checked by:	Ramesh
Week of Repair		Date:	12/May/2018

Issue:
ABM complained that on their Mitsubishi Double Column Machining Centre, there is noise and accuracy issue on Right Angle Head attachment. There was an accident reported on this machine and from the date of accident this issue is present.
 It is understood spindle noise is louder at higher speeds and misalignment of test bar upto 0.16 mm present with respect to X axis and Y axis movements.
 Spintec team visited on 18/Apr to confirm the issue and advice on next step.

Description of issue:



Right Angle Head touching slings

360 Teeth Coupling

VS, April 06, 2012 Spintec Engineering Pte Ltd, Singapore Page 1

VS, April 06, 2012 Spintec Engineering Pte Ltd, Singapore Page 2

SPINTEC **SPINDLE TEST REPORT**
STR- WJ 1930

Customer and Machine Data			
Customer name	WMS Paving	Prepared by:	Alvin
Machine make & model	EMVI SCX1.0L STD	Checked by:	Alvin
Machine number		Date:	2/12/2014
Week of Repair		Return by Request	EMVI Pte. Request

Spindle Data

Drive type Belt Direct coupling Motor Spindle Pneumatic Others

Type of spindle Milling Turning Grinding Others

Spindle body Cartridge type Non Cartridge type

Drive system Frequency converter Air pressure Other:

Spindle range From _____ to _____ min-1

Spindle Motor Make: Fanuc Model: KB12L-17.5 (P=17.5kW)
 if Built in motor, make parameters: 1.5 (inverter)
 Rated speed: 2300 (R/min) Rated current: 112A No of Poles: 4
 Rated voltage: 220V Power factor: 0.75

Lubrication Grease Oil-mist Mist-air Dry

Spindle cooling Stator Jacket cooling Front Bearing cooling Rear bearing cooling
 Water/Oil Oil type _____ bar
 Air cooling (Pressure _____ bar)
 Fan No cooling

Pulley (when belt drive) Flat belt V-belt Synchronous (toothed) belt N/A

Additional Features TSC TSA Oil mist cooling

Spindle Taper ISO 30 / MAS-6T / JIS D / DIN / CAT
 HSK-63 / 63 / 63 / 63
 Custom PTC

Probable Cause of Failure

<input checked="" type="checkbox"/> Symptoms of Crash	<input type="checkbox"/> Coolant penetration	<input type="checkbox"/> Mech damage/ wear	<input type="checkbox"/> Assembly Errors
<input type="checkbox"/> End of Fatigue Life	<input type="checkbox"/> Dirt/ contamination	<input type="checkbox"/> Inadequate lubrication	<input type="checkbox"/> Drivebar Failure
<input type="checkbox"/> Stator Failure	<input type="checkbox"/> Oil Leak	<input type="checkbox"/> Accuracy issues	<input type="checkbox"/> Unknown

V7, Jan 04, 2009 Spintec Engineering Pte Ltd, Singapore Page 1

STORAGE OF SPINDLES



- Every spindle received from customer is stored properly in a modular storage system.
- Once service is done, Spindles will be shipped immediately to the customer. However, upon customer request, if it is a spare spindle at customer end, Spintec takes responsibility of storing spindles.
- Spindles that are stored for long period are applied with protective coating and always checked again with a warm up run before shipping to customer
- 6 months warranty is applicable for all stored spindles from the date of installation on-site
- Spintec do keep stock of some of the OEM spindles, and contact for more information

SPARE PARTS



NSK GMN
SKF FAG



RÖHM OTT
ROHM ON BARRIKET Spantechnik JAVOR



DEUBLIN RIX

SPINTEC



SPIROIDE KHK
ENGRANAJES ESPECIALES, S.A. STOCK GEARS



PISCO SMC
PNEUMATIC EQUIPMENT



TRELLEBORG NOK
elringklinger GAPI

CERTIFICATIONS



spindle healthcheck



Q: HOW TO MAKE MY MACHINE TOOL HIGHLY PRODUCTIVE?

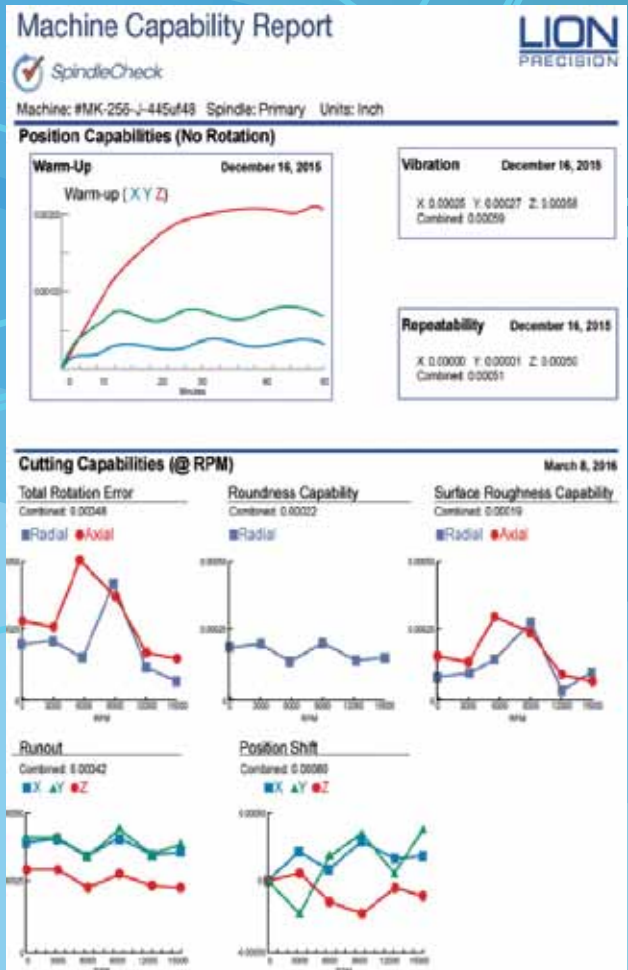
A: KEEPING SPINDLE HEALTHY!



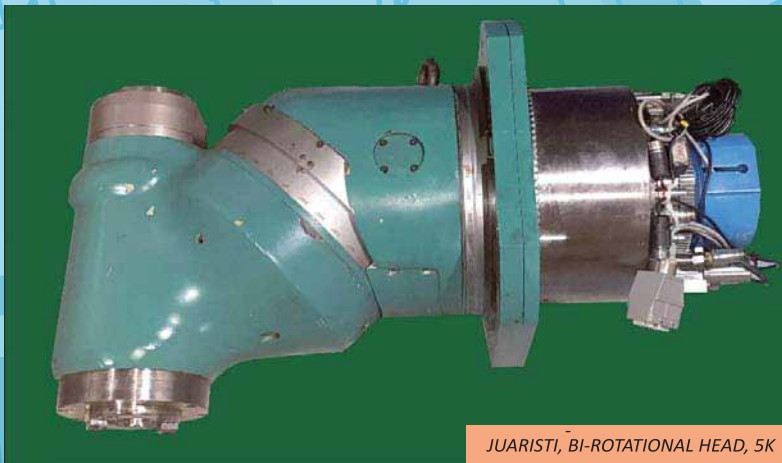
Performing a periodic inspection of the spindle (e.g. annual) is an important step in ascertaining if the Spindle's static and dynamic characteristics are intact, and Spindle HealthCheck program is aimed to achieve this. This is especially true for machine tools equipped with high speed spindle units. Acquiring such data in advance, aids the machine users to plan for all remedial action, in a pro-active manner.

It is a dynamic 6-step test program, that includes the following:

- Spindle taper run-out check
- Test bar run-out check at top & bottom planes of the test bar
- Blue-seat check of the spindle taper
- Spindle balancing check confirming to ISO 1940-1 standard
- Tool pull force check
- Generation of machine capability reports (highlighting what the machine is capable of) utilizing high frequency non-contact sensors



SPINDLE PHOTOS - EXAMPLES



JUARISTI, BI-ROTATIONAL HEAD, 5K



MAZAK, INTEGREGX E420, 12K



MITSUBISHI, MVK30, 5K



OKUMA, LU400, 3K



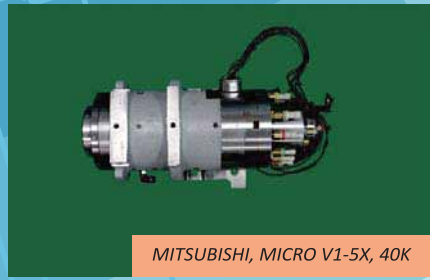
MAKINO, S33/V33/V22, 30K



OKK, VP2200, 30K



MAKINO, V56, 30K



MITSUBISHI, MICRO V1-5X, 40K



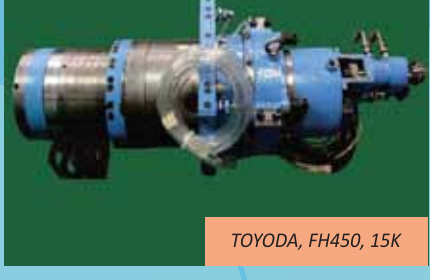
MORI SEIKI, NVD5000, 20K



OKUMA, MA400-H, 45K



NIGATA, HN80D-11, 8K



TOYODA, FH450, 15K



TONGTAI, HA500II, 12K



STEPTEC (MIKRON), HSM600, 36K



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