

The manufacturer's limited warranty states that its spindles are to be free from defects in material, design and workmanship under normal and proper use.

- ✓ Following these guidelines will ensure proper functionality of the Spindle and should yield optimum machining results. See Spindle Warranty at: www.colibrispindles.com/downloads/
- ✓ **The Jet Spindle is designed for Finishing and Semi-finishing operations using a max. cutting tool diameter of 4.0mm (5/32").**
- ✓ **CNC MACHINE PREREQUISITES**
 1. Coolant flow through the main CNC machine spindle.
 2. Min. coolant pressure, at main spindle outlet: 20 bar (290 psi).
 3. Max. coolant pressure, at main spindle outlet: 40 bar (580 psi).
 4. Minimum flow rate: 12 L/min (3.17 Gal/min.).
 5. Coolant filtration level: Max. 100 µm.
- ✗ Subjecting the Jet Spindle to incorrect cutting conditions, may result in damage to the Spindle, the tool, the work-piece or the machine.
- ✗ **The Jet Spindle is an auxiliary spindle speed increaser and is not to be used as a replacement for the CNC main machine spindle.**
- ✗ **Do not allow main spindle to rotate during Jet Spindle operation.**
 1. When the Jet Spindle is mounted on the machine, the CNC machine spindle must be locked in a stationary position.
 2. Use the correct software M-code to lock: M19 code locks spindle at a defined angle.

NOTE: Some CNC machines do not enable main spindle locking. Check with the manufacturer.

Follow the 10% Rule:

As the cutting tool enters the workpiece, RPMs will be reduced due to load.
The Jet Spindle RPM value when working should not drop more than 10% of the RPM value registered at 'idle speed'.



TO REGISTER IDLE SPEED:

1. Mount the Jet Spindle on the machine with cutting tool installed.
2. Turn on fluid pressure and note RPMs on the display monitor.

EXAMPLE: Improper conditions

Jet Spindle: TJS GJET ER32

Application: Milling/Slotting

Material: DIN ST 52-3

Cutting tool: End Mill Ø2.0 mm (Ø.079")

No. of teeth: Z = 2

Cutting conditions: **Ae** – cutting width = 2.0mm (.079"), **Ap** – depth of cut = 0.5mm (.02"), **fz** = 0.012mm/tooth (.0005"/tooth), **Vc** = 250m/min (820 SFM)

N – Idle: 40,000 RPM

RPM during machining: 30,000 RPM spindle overload!

In the EXAMPLE, following the 10% rule would mean that RPMs during machining should be a minimum of 36,000 RPM, however RPMs are only 30,000. Therefore load on the tool should be reduced by decreasing the cutting parameters; depth of cut (ap) and feed (Fz) should be lessened.

CUTTING CONDITIONS:

1. Monitoring RPMs during Jet Spindle operation is critical, to ensure optimum machining conditions and to avoid damage.
2. Cutting speed may be influenced by material hardness, workpiece topography and/or cutting tool geometry. Refer to cutting tool manufacturer's documentation.
3. Dramatic fluctuations of RPMS during Jet Spindle operation can indicate problems such as inadequate coolant pressure or a broken cutting tool.

Jet Spindle Operating Guidelines

Application	Material	Cutting Tool Dia.		Z (Teeth)	Ap - Depth of Cut		Ae - Width of Cut		Coolant Pressure (bar)	RPM	Fz per tooth	
		mm	inch		mm	inch	mm	inch			mm	inch
Milling Full Slot	SAE 4340 (24-25HRC)	End Mill Ø 1.0	End Mill Ø .040	2	0.1	.004	1.0	0.040	40	47,000	0.04	.0015
	SAE 4340 (42-45HRC)	End Mill Ø 2.0	End Mill Ø .080	2	0.1	.004	2.0	0.080	40	47,000	0.007	.0003
	SAE 4340 (24-25HRC)	End Mill Ø 2.0	End Mill Ø .080	2	0.1	.004	2.0	0.080	40	47,000	0.02	.0008
	SAE 4340 (24-25HRC)	End Mill Ø 2.0	End Mill Ø .080	2	0.1	.004	2.0	0.080	40	47,000	0.02	.0008
	SAE 4340 (24-25HRC)	End Mill Ø 3.0	End Mill Ø .120	4	0.1	.004	3.0	0.120	40	47,000	0.002	.00008
	SAE 316L 130-136 HB	End Mill Ø 1.0	End Mill Ø .040	2	0.1	.004	1.0	0.040	40	47,000	0.03	.0001
	SAE 316L 130-136 HB	End Mill Ø 2.0	End Mill Ø .080	2	0.1	.004	2.0	0.080	40	47,000	0.02	.0008
	SAE 316L 130-136 HB	End Mill Ø 3.0	End Mill Ø .120	4	0.1	.004	3.0	0.120	40	47,000	0.005	.0002
	Aluminum SI 9% 30 HB	End Mill Ø 1.0	End Mill Ø .040	3	0.1	.004	1.0	0.040	40	47,000	0.015	.0006
	Aluminum SI 9% 30 HB	End Mill Ø 2.0	End Mill Ø .080	2	0.3	.012	2.0	0.080	40	47,000	0.02	.0008
Aluminum SI 9% 30 HB	End Mill Ø 3.0	End Mill Ø .120	3	0.2	.008	3.0	0.120	40	47,000	0.025	.0010	
Milling Shoulder	SAE H13 (40-42Hrc)	End mill Ø 1.5	End mill Ø .059	2	0.3	.012	0.3	.012	40	47,000	0.008	.0003
	St 52-3 (A 36)	End mill Ø 1.0	End mill Ø .040	2	0.5	.020	0.1	.004	40	47,000	0.005	.0002
	SAE 4340 (24-25HRC)	Ball nose Ø 1.0	Ball nose Ø .040	2	0.5	.020	0.03	.0012	40	47,000	0.03	.0012
	SAE 4340 (24-25HRC)	Ball nose Ø 3.0	Ball nose Ø .120	2	0.5	.020	0.05	.002	40	47,000	0.07	.0027
	SAE 316L 130-136 HB	Ball nose Ø 3.0	Ball nose Ø .120	2	0.5	.020	0.05	.002	40	47,000	0.04	.0015
	Aluminum SI 9% 30 HB	Ball nose Ø 1.0	Ball nose Ø .040	3	0.5	.020	0.06	.0024	40	47,000	0.03	.012
	Aluminum SI 9% 30 HB	Ball nose Ø 3.0	Ball nose Ø .120	3	1.5	.060	0.05	.002	40	47,000	0.03	.012

JET SPINDLE STORAGE:

The HSM Jet Spindle is free from periodic maintenance, however before storage it is recommended to:

1. Clean the HSM Jet Spindle by air blowing for 10-15 seconds.
2. Max. air pressure for cleaning (2 bar / 30 psi) – DO NOT EXCEED 50,000 RPM.
3. Disconnect the HSM Jet Spindle from the display device.
4. Place the HSM Jet Spindle back in its case.