

Troubleshooting

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Trouble condition	Condition	Cause	Countermeasures
Hole diameter becomes smaller (at hole bottom)	<p>A (Entrance side) B (Bottom side) $A > B$</p>	Chip jam (External or Internal edge chip stuck)	Change the cutting conditions <ul style="list-style-type: none"> • Increase the cutting speed • Lower the feed rate See page K34, K40 or K51 for "Recommended Cutting Conditions".
Hole diameter becomes larger (at hole bottom)	<p>A (Entrance side) B' (Bottom side) $A < B'$</p>	Internal edge chip jam.	Change the cutting conditions <ul style="list-style-type: none"> • Increase the cutting speed • Lower the feed rate See page K34, K40 or K51 for "Recommended Cutting Conditions". <ul style="list-style-type: none"> • Check the core height See page K36-K37
Hole diameter is small (from the hole entrance)		Hole diameter is small from entrance. (At turning moment)	Inappropriate adjustment of hole diameter.
		No core at internal edge. (No core remains)	In case of using lathe machine, use X-axis and adjustment hole diameter. See page K36
			Adjust the core height. See page K36-K37

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Drilling

Indication of tool life of MagicDrill

How to judge tool life	Indication of judging tool life
Judgment of tool condition and insert wear	<ul style="list-style-type: none"> • When an insert is new, the holder is slightly bent to the side during cutting (therefore, the cutting diameter is slightly bigger during cutting). Once cutting is finished, the holder will return back to normal size. No tool marks will appear on the finished surface (although this depends on workpiece and cutting condition: during external machining slight tool marks might appear). • When an insert is at the end of its tool life, Gradually the external corner part gets worn out, the holder does not bend slightly outwards - it starts to bend inwards. After the cutting is finished, the holder returns to the normal position. When taking off a holder under this condition the cutting edge of the insert creates external tool marks on the finished surface of the workpiece.
Checking cutting diameter	When cutting diameter is measured, suddenly it shows small diameter. In this case, a worn out insert can be the cause.
Checking the surface on the exit side	If insert wear progresses, the burrs of penetrated hole entrances become bigger. This is a clear indication that the tool must be exchanged.
Variation of cutting noise	DRX / DRZ → Light cutting noise at the beginning turns to brady noise which contains vibration noise. DRS → Light cutting noise at the beginning turns to whirl noise. Although, it is difficult to recognize DRX / DRZ type's smaller cutting diameter or DRS type's variation of cutting noise because of main motor noise or projection of coolant.
Variation of vibration	As the end of tool life is getting closer, there is more vibration and the cutting noise changes. However, when machining smaller diameters these factors are difficult to detect