Paragon Machine Technology
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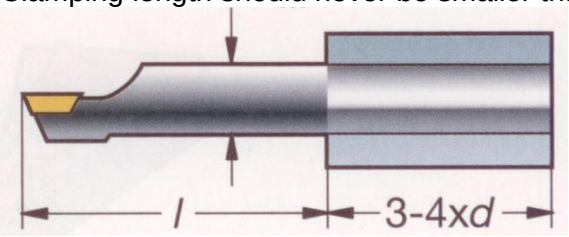
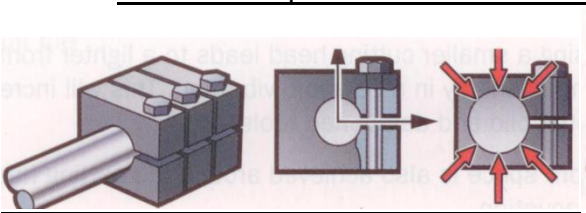
TECHNICAL GUIDE –
PROPER USE OF "DEVIBE" BORING BARS

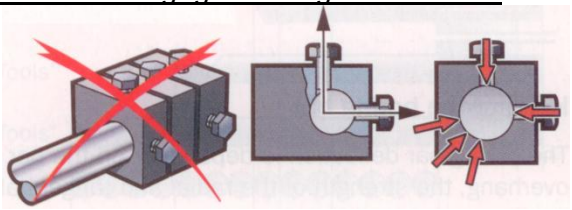
I. RECOMMENDED SETUP PARAMETERS

- Internal machining operations are very sensitive to the tool length : diameter ratio (L:D). Always use the shortest overhang and largest bar diameter permitted by the workpiece geometry.
- For optimal performance, avoid mounting devibe bars less than the recommended L:D overhang.
- Rigid bar clamping is crucial. For optimal stability, bar clamping length should be 3-4X bar diameter. Clamping length should never be smaller than 3X bar diameter.

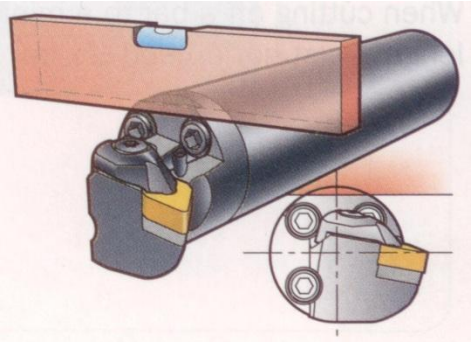


- Whenever possible, use a "split" style boring bar holder or bushing for greater clamping surface around the bar. NEVER clamp a devibe bar with direct screw engagement against the bar!





- Index the bar so the insert cutting edge height is on-center or in some cases, *slightly above* center.



- Select an insert lead angle as close to 0° as possible, and never exceed 15°.

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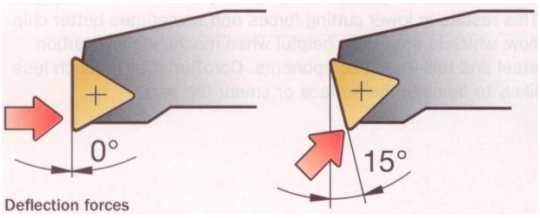
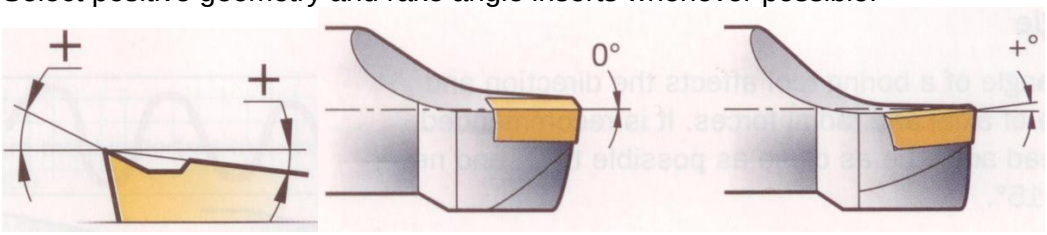
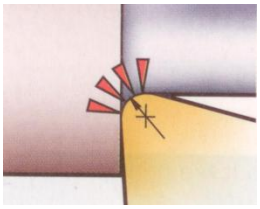


Deflection forces

- Select positive geometry and rake angle inserts whenever possible.



- Use the smallest insert nose radius possible, preferably smaller than cutting depth.



- Ensure sufficient chip evacuation during the cut.
- Both insufficient (friction) and excessive (high forces) depths of cut can cause tool deflection resulting in chatter.
- L:D overhang ratio recommendations for devibe boring bars DO NOT apply for threading and grooving, which generally requires shorter overhang (greater rigidity).
- Use common sense in bar selection. Do not use an excessively long, heavy bar for your machine. Consult machine tool manufacturer for recommendations.

II. OVERVIEW

Dampened or "devibe" boring bars permit cutting at extended overhangs exceeding the capability of conventional solid steel boring bars. However, it is very important to understand the limitations inherent with extended internal operations. While some of the same principles apply to all cutting tools, few tooling systems are as unforgiving of improper setup as extended boring bars. Improper setup frequently causes excessive tool deflection against cutting forces, resulting in vibration (chatter) and/or difficulty in maintaining critical workpiece dimensions.

NOTE: THOUGH SOME DEVIATION FROM THESE RECOMMENDATIONS MAY BE UNAVOIDABLE, OPTIMAL DEVIBE BAR PERFORMANCE IS DEPENDENT ON APPLYING AS MANY OF THESE BASIC PRINCIPLES AS POSSIBLE.