

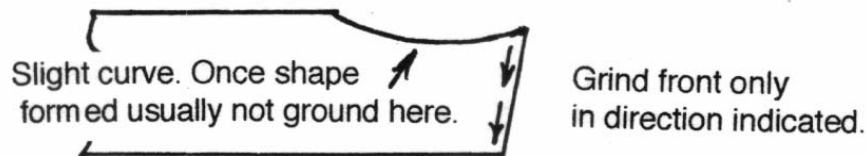
Parting Off in the Lathe

Do you know anybody who has not had problems learning to “part off”?

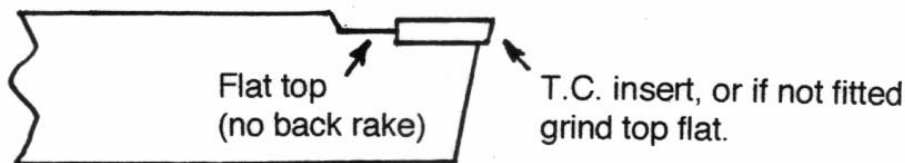
We get more requests from amateurs for parting off information than any other lathe operation, except perhaps screw cutting.

TOOL SHAPE AND SHARPENING.

Sharpening of the most commonly used type of HSS bevelled blades is usually done as indicated in the following diagram. Once the shape of the tool is decided, it needs only to be ground on the front.



The practice of grinding the top of the parting tool into a long sweeping curve leads the swarf out in a loose coil or long uncurled strip. Tools without curved backrake tend to produce tightly wound coils of swarf which can cause jamming in the cut. Mild steel, brass, aluminium and stainless steel are usually cut with HSS steel blades having some top rake as described above. Cast Iron and gun metal are best cut with tungsten carbide tipped tools without back rake.



Parting off blades must have clearance. If the tool does not have bevelled sides, a slight clearance on both sides must be provided to prevent rubbing. If tool is hand ground from scratch, a slight back clearance (wider at the front) is also recommended. It is not necessary to grind clearance onto HSS bevelled blades.

CUTTING SPEEDS.

Basically soft materials can be cut much faster than hard or high tensile materials. With HSS blades, the following cutting speeds are suggested:

Silver Steel (and Cast Iron)	5 metres / minute	17 feet / minute
Mild Steel	11 m/min	37 ft./min
Brass	17 m/min	57 ft./min
Aluminium alloy	25 m/min	83 ft./min

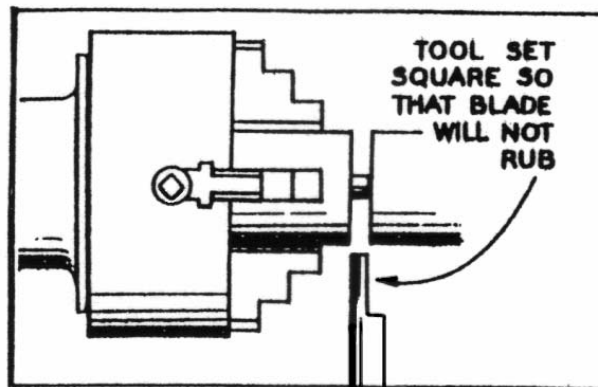
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Parting Off in the Lathe (continued)

This translates to about 200 RPM for 20mm (.3/4") mild steel rod with an increase in speed recommended for smaller diameters. Try to avoid back gear as this puts undue pressure on the tool.

GETTING ON WITH THE JOB.

1. Ensure job is held securely in chuck jaws with a minimum of overhang.
2. Ensure tool is sharp, square to work and is at centre height (or very slightly below). With cutting edge slightly below, there is a tendency for the tool to flex away from the work reducing damage of "dig in" if it occurs.



3. Ensure top slide is retracted so there is a minimum of overhang.
4. Move tool into position with saddle and then lock to bed.
5. Set speed. If chatter is experienced, feed rate should be slightly increased and not a slower speed selected.
6. Lubrication. If fitted, coolant is set to flow in order to float the swarf away from the cut but if not available, use a small brush (or old toothbrush) and plenty of lathe cutting oil.
7. When parting off large diameters, take side by side cuts in initial stages to increase clearance and reduce possibility of swarf jamming in the cut and causing damage to the job or tool.

IF YOU ARE STILL HAVING PROBLEMS.

If the correct "parting off" procedure is adopted and trouble is still being experienced, some of the common faults are:-

- Loose headstock spindle
- Loose top slide (adjust gib)
- Loose cross slide (adjust gib)
- Saddle not clamped (clamp)
- Old chuck belled towards mouth and not gripping job effectively (replace chuck).

FINALLY.

A particularly good design of parting off tool holder is the Interchangeable Tooling Set (Part Number THQC-DXS).

We stock an indexable or replaceable carbide parting off system that is superior to other systems but cost is more than \$300. Please call us if you require additional information.

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