

# Appendix I – Sharpening Steel Lathe Tool Bits

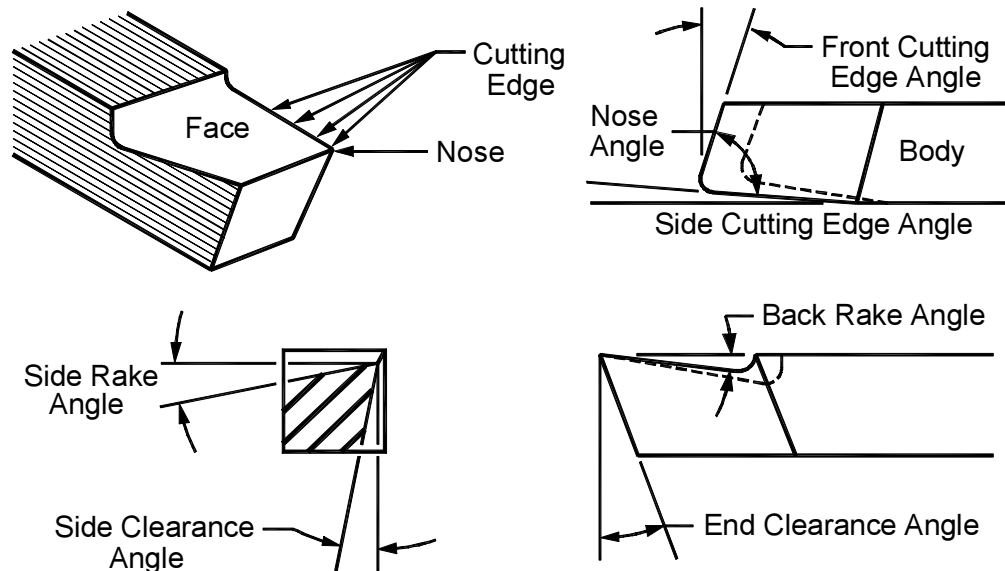


Figure A-I-1. Tool bit nomenclature.

**What are typical rake and clearance (relief) angles for HSS tool bits?**  
See Table A-I-1.

Material	Side Relief	Front Relief	Side Rake	Back Rake
Aluminum	12	8	16	35
Brass	10	8	5 to -4	0
Bronze	10	8	5 to -4	0
Cast Iron	10	8	12	5
Copper	12	10	20	16
Machine Steel	10 to 12	8	12 to 18	8 to 15
Tool Steel (unhardened)	10	8	12	8
Stainless Steel	10	8	15 to 20	8

Table A-I-1. Relief and rake angles in degrees for common metals.

**What is the procedure for grinding HSS general-purpose lathe tools?**

Begin by dressing the grinding wheel. Next, look up the optimum angles for the workpiece material, and then follow the steps in Figure A-I-2. Dip the tool in coolant frequently to keep it from overheating and annealing. Any discoloration on the bit indicates it was drawn and is no longer hardened. Start over again from the beginning. Tool bit angles are not critical and most tools will cut material satisfactorily, just slightly less effectively.

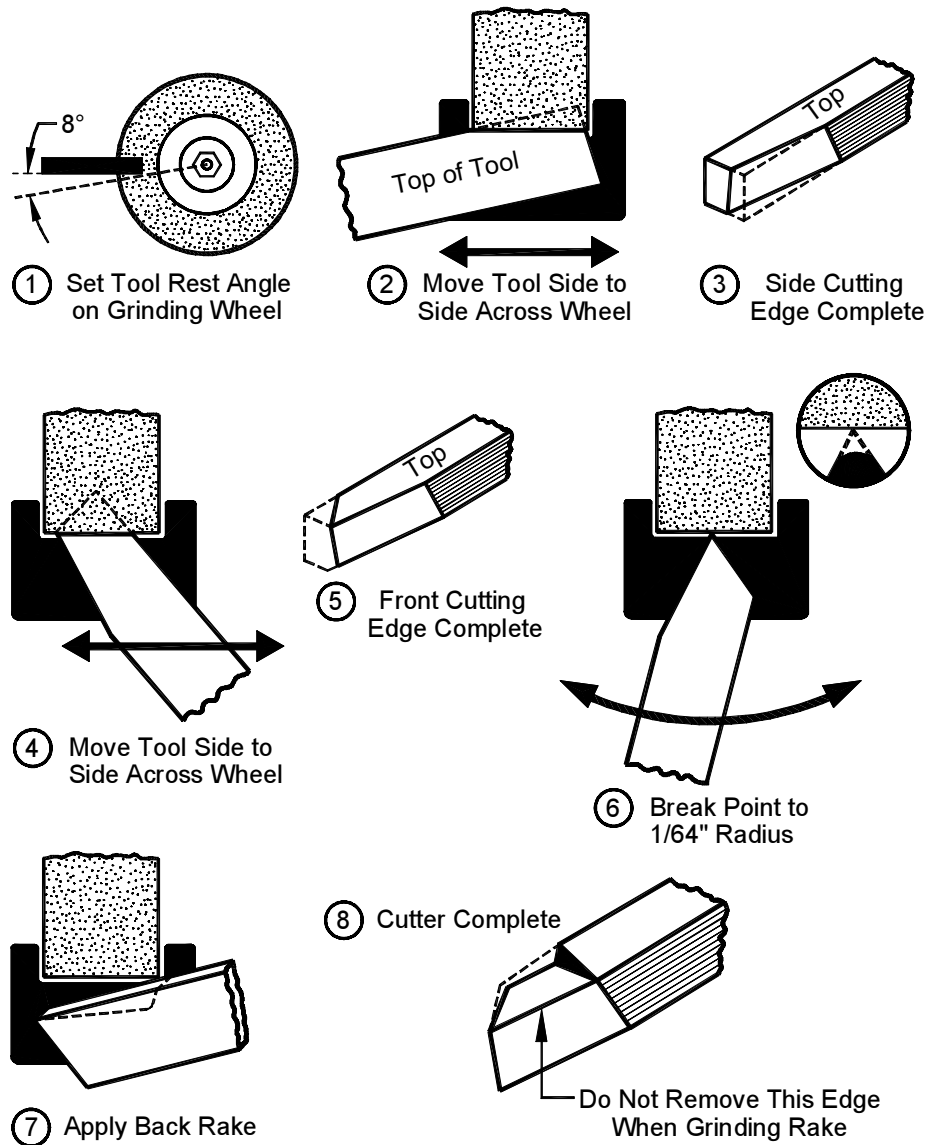


Figure A-I-2. Steps for sharpening HSS tool bits.