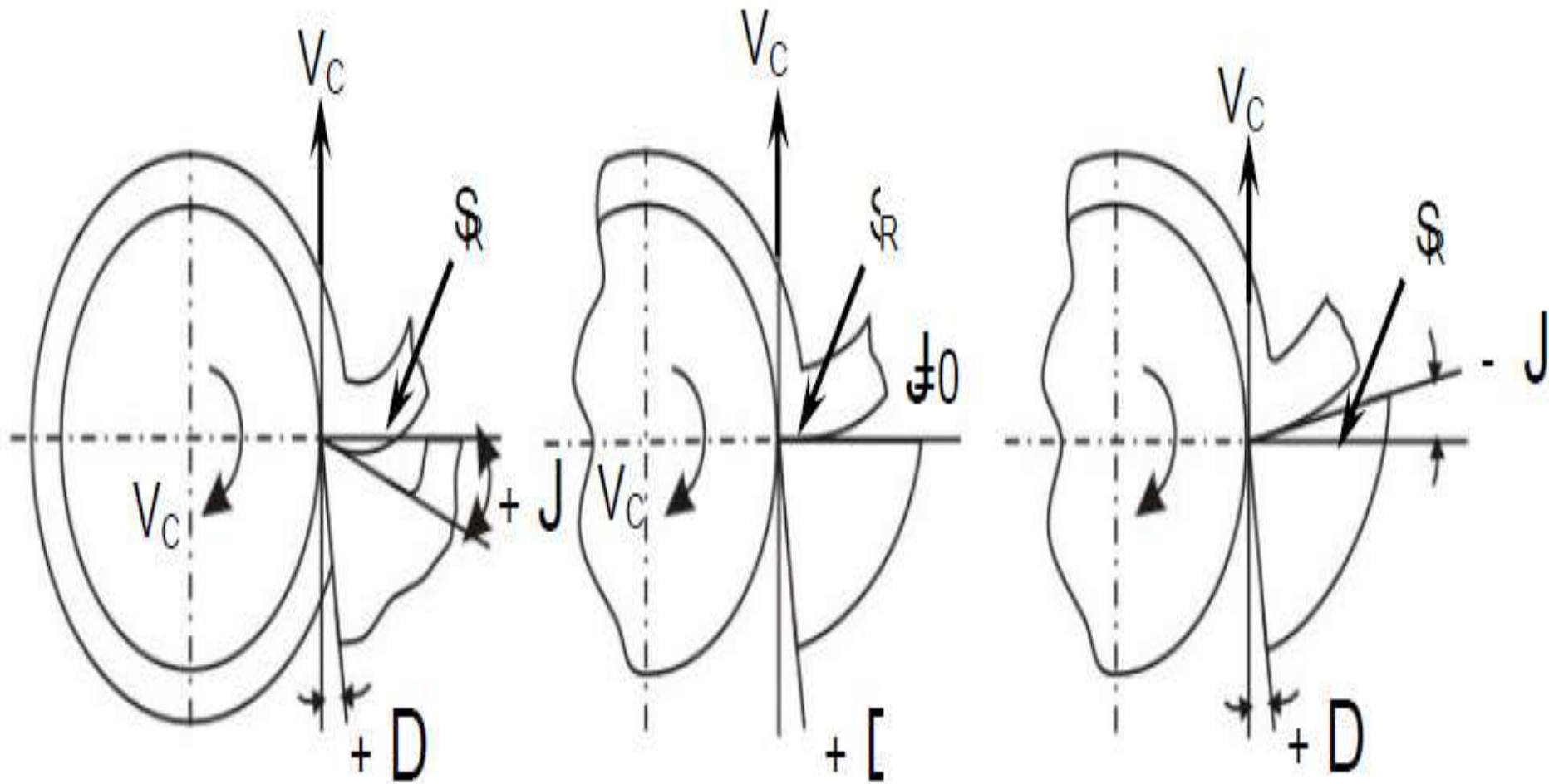


Concept of rake angles of cutting tools

- Angle of inclination of rake surface from reference plane.
 - Rake angle is provided for ease of chip flow and overall machining.
 - Rake angle may be positive, or negative or even zero.



(a) positive rake

(b) zero rake

(c) negative rake

Fig. 3.2 Three possible types of rake angles

Concept of clearance angles of cutting tools.

- Angle of inclination of clearance or flank surface from the finished surface.
- Clearance angle is essentially provided to avoid rubbing of the tool (flank) with the machined surface which causes loss of energy and damages of both the tool and the job surface.
- Hence, clearance angle is a must and must be positive (3° to 15° depending upon tool-work materials and type of the machining operations like turning, drilling, boring etc.)

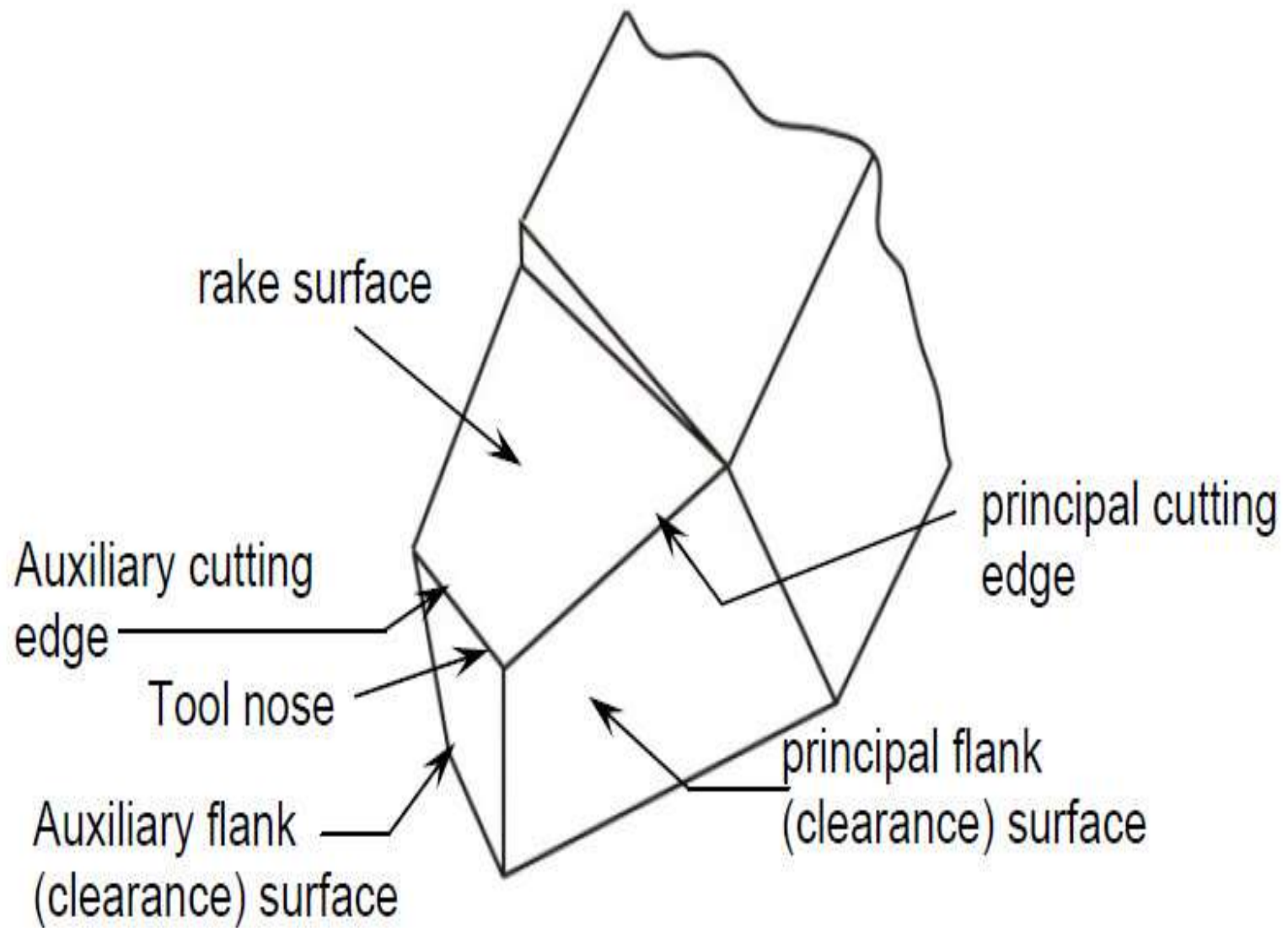
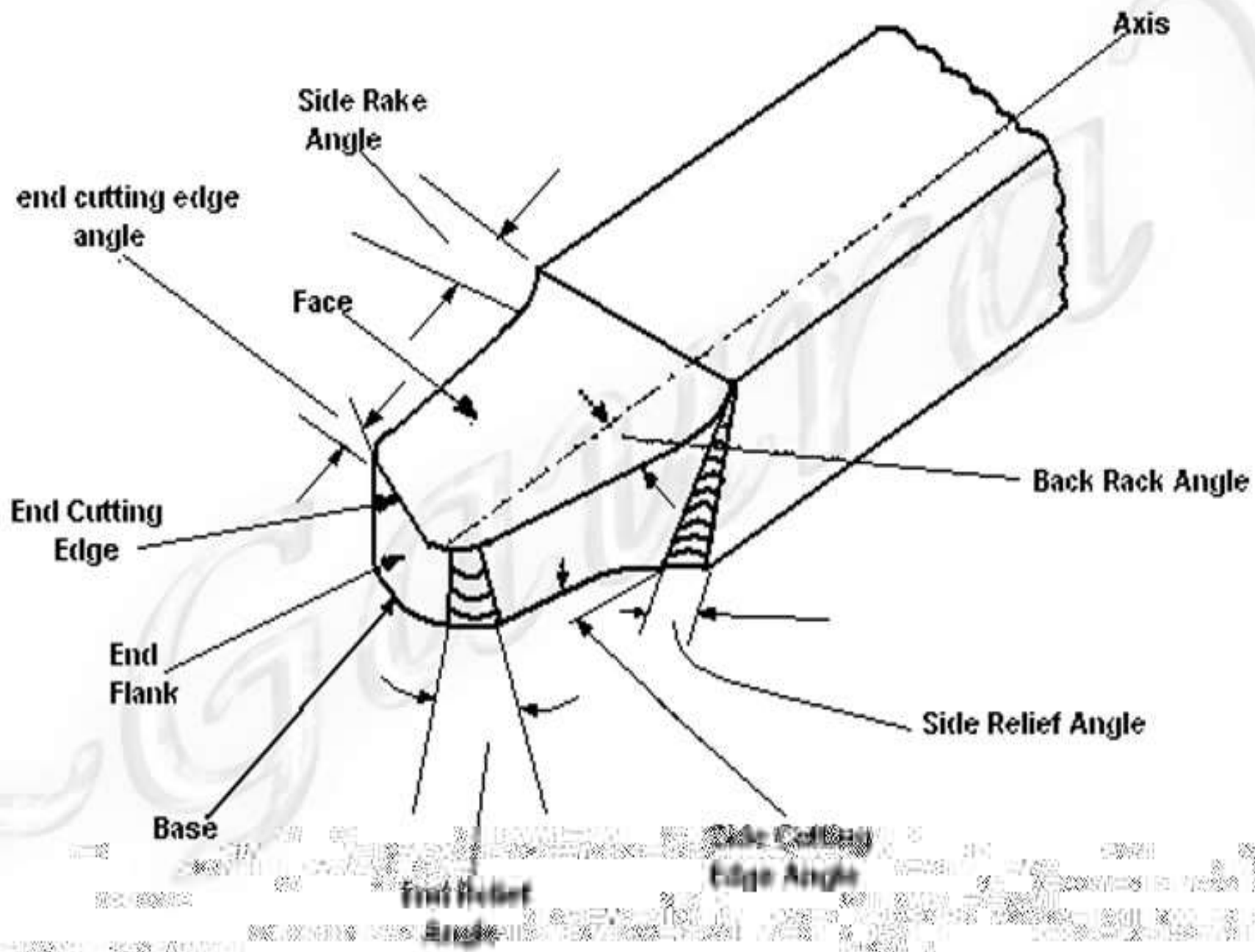


Fig. 3.3 Basic features of single point tool (turning) in Tool-in-hand system



Tool Signature

- The numerical code that describes all the key angles of a given cutting tool. A tool signature may be used for HSS or carbide inserts.
- Convenient way to specify tool angles by use of a standardized abbreviated system is known as tool signature or tool nomenclature.
- It indicates the angles that a tool utilizes during the cut.
- It specifies the active angles of the tool normal to the cutting edge.
- This will always be true as long as the tool shank is mounted at right angles to the work-piece axis.

Tool Signature

- The seven elements that comprise the signature of a single point cutting tool can be stated in the following order:

Example: Tool signature **0-7-6-8-15-16-0.8**

1. Back rake angle (0°)
2. Side rake angle (7°)
3. End relief angle (6°)
4. Side relief angle (8°)
5. End cutting edge angle (15°)
6. Side cutting edge angle (16°)
7. Nose radius (0.8 mm)