COGSDILL TOOL
products, inc.

OPERATING INSTRUCTIONS FOR

Cogsdill NOBUR® JA Automatic Recessing Tools

TOOL OPERATION

Cogsdill NOBUR® JA recessing tools operate automatically as axial spindle travel is converted into radial cutter travel within the head. The pilot enters the bore and the stop collar contacts the front of the part. Continued spindle travel results in corresponding cutter travel which is rigidly supported within the part for extreme accuracy. A sealed bearing between the tool body and the stop collar prevents marking of the workpiece.

Radial cutter advancement is approximately 1/2 of spindle travel. Depth of cut is precisely controlled by an adjustable diameter stop nut located on the back end of the tool. A feed rate of .003-.005 IPR (.08–.13mm) is generally used.

Upon completion of the cut, tool withdrawal feed should be at the cutting feed rate until the stop collar no longer contacts the part. This will ensure that the cutter has fully retracted into the pilot before the tool is withdrawn from the part.

TOOL COMPONENTS

NOBUR® JA tools utilize a standard recessing head, with pilot, cutter, and nosepiece designed to suit a specific application (see **Illustration "A"**). These items are quickly and easily replaceable on the head, which allows for swift conversion between applications, as well as fast and easy replacement of cutters.

The Nobur® JA Automatic Recessing Tool consists of a standard recessing head with pilot, cutter, and nosepiece designed to suit the application.

(A) Typical pilot and integral one-piece cutter, for bore sizes up to 9/16 in. (14.29mm).

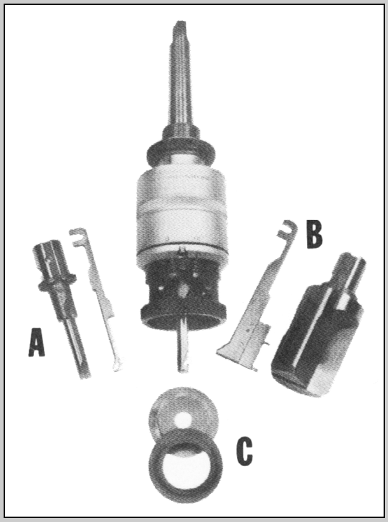


Illustration "A"

(B) Typical pilot, cutter arm, and cutter, for bore sizes 9/16 in. (14.29mm) or greater.

(C) A nosepiece is required wherever the workpiece configuration does not provide sufficient area for seating the adjustable stop collar. The nosepiece is inserted into the face of the stop collar.

The **pilot** locates the tool within the bore and contains the cutter, which feeds radially outward from within the pilot. Each pilot is hardened and ground to .002 in. (.05mm) below the minimum bore diameter. The pilot also rigidly supports the cutting action, thereby eliminating tool deflection and ensuring accuracy, concentricity, and fine finishes. An extended chip clearance area in front of the blade contributes to good lubrication at the cutting edge and provides for chip clearance.

The **cutter** is of a flat form type. It is protected within the pilot when the tool is in the retracted position. Cutters of a one-piece design are used for bore diameters less than 9/16 in. (14.29mm). A two-piece cutter construction is used for bore diameters 9/16 in. (14.29mm) and larger, which permits the use of a less expensive insert-type cutter. The two-piece cutter is normally made from HSS or carbide (depending on the material being cut), and is attached to the cutter arm by screws.

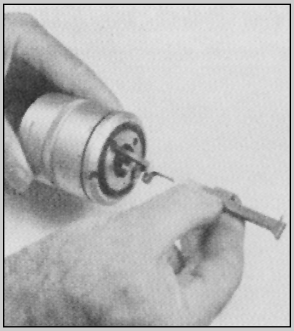
The **cutter arm** supports the cutter in the two-piece design; in the one-piece cutter design the arm is integral with the cutter. The arm is located in the slot within the pilot. Two or more elevating cams actuate and support the cutter. The arm engages the head via an integral yoke.

A **nosepiece** is required wherever the configuration of the workpiece surface does not provide sufficient area for seating the adjustable stop collar. It is simply inserted into the face of the stop collar, and retained by a locking ring.

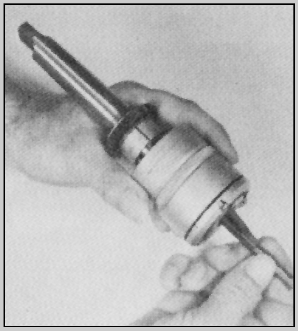
Please see **Illustration "B"** for sequence of steps for installing the above components into the head.

Illustration "B"

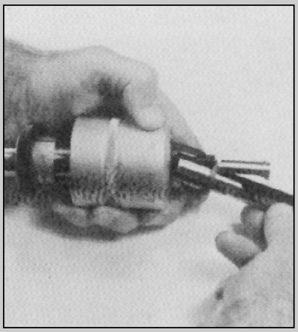
Sequence of Steps for Installing Components



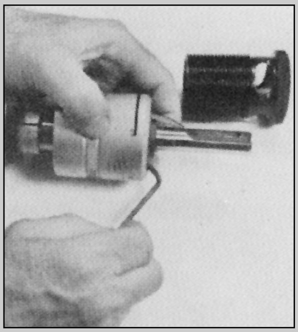
(1) Insert cutter (or cutter arm with cutter) into head as shown. (Shown here with stop collar removed for visual clarity.)



(2) Rotate cutter arm 90° so that the open yoke of the cutter arm straddles the inner pull-pin and the leaf springs rest on the pad.



(3) Align pilot to cutter arm and gently insert as shown, permitting the cam surfaces of the arm and the pilot to engage.



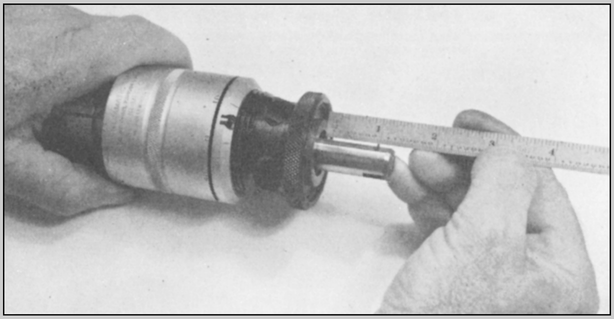
(4) The pilot is keyed, seated against shoulder, and retained with a screw. (If the stop collar was removed, it is now re-inserted.)

TOOL ADJUSTMENT

Cogsdill NOBUR JA tools are easy to set. Since the precision feed motion is built into the head, only two adjustments are required in order to properly set up a tool for operation. Occasionally, compensating adjustments might be required if there is an error in the initial settings, or to compensate for cutter wear. However, by following the steps prescribed below, it will be easy to attain the initial set-up.

1. The first step required is to **set the front stop collar**. This setting determines the position of the groove(s) relative to the face of the part, or other surface from which the tool actuates. Simply adjust the threaded stop collar, measuring from the face of the collar to the top corner of the cutter until the correct distance is established (refer to **Illustration "C"**). Once set, the locking screw on the outer tool body should be tightened.

Illustration "C"

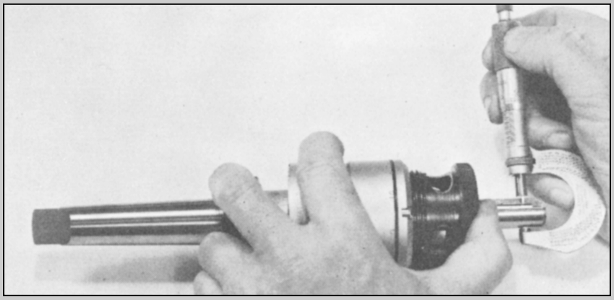


Groove location is easily set by adjusting the stop collar. For critical settings (ie., extremely close groove tolerances) an indicator and height gage, or fixed gages, should be used.

2. The second step is to **set the groove diameter to be cut**. On manually fed machines, this setting is established by adjusting the threaded diameter stop nut at the rear of the tool body (see **Illustration "D"**). Because the cutter motion is radial, the groove cut diameter can be measured by using a micrometer to measure directly across the pilot and cutting edge. Since the pilot is .002 in. (.05mm) under the smallest bore diameter, the cutter should project from the pilot for a distance equal to the required depth of cut. An alternative setting method is to measure the projection of the cutter using a surface plate indicator relative to the centerline of the bore.

Setting the groove diameter for machines with power feed requires that the diameter stop nut be backed away (toward the rear of the tool) so that it becomes non-operative. (Tools with Acme threaded shanks do not have

Illustration "D"



In manual feed applications, the diameter stop nut at the rear of the tool body is adjusted in order to set the groove cut diameter. Light spring pressure allows the actuating assembly to be compressed as shown against the diameter stop nut when measuring for groove diameter.

the diameter stop nut.) The automatic feed on the machine is then set to produce the cutter projection required to cut the desired groove diameter. Preset holders and gages may also be used to establish the spindle travel limits.

Since cutter deflection is eliminated due to the support of the cutter by the arm and pilot, no compensation is required. Once the above settings are verified, the tool is ready to use. However, please remember that variations in bore diameter can cause groove dimensions to vary. A variation of .001 in. (.02mm) in bore diameter can result in a .002 in. (.05mm) variation in groove diameter. Therefore, bore tolerances must be limited to less than 1/2 of the tolerance required for the groove diameter. If this tolerance requirement presents a problem, it might be necessary to pilot the tool in a fixture instead of piloting in the bore. **Diagram 1** shows how to measure a tool to cut a specific diameter.

Diagram "1"

BY MICROMETER

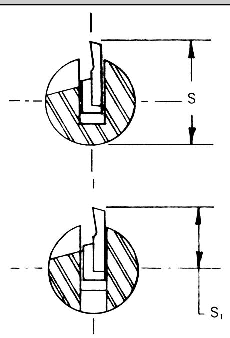
$$S = \frac{\text{Groove Dia.} + \text{Bore Dia.}}{2}$$

or

$$S = \frac{\text{Groove Dia.} + \text{Bore Dia.}}{2} + .002$$

BY INDICATOR

$$S_1 = \frac{\text{Groove Dia.}}{2} + .002$$



In order to measure for a specific groove cut diameter, the tool must be actuated to the limit setting by compressing the actuating assembly against the diameter stop nut. The nominal clearance between the pilot diameter and the minimum bore diameter is .002" (.05mm).

LUBRICATION AND MAINTENANCE

In applications where water soluble or synthetic coolants are used, we recommend that, when the machine and tool are idle, the tool be removed from the spindle and immersed in oil to keep it lubricated and to prevent rusting of the internal mechanism.

Cogsdill Tool Products offers the world's broadest range of solutions for recessing, facing, back-chamfering, and contouring operations (internal or external) and the widest array of standard tooling in the industry. Please refer to our Catalog no. 400 for more information.

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