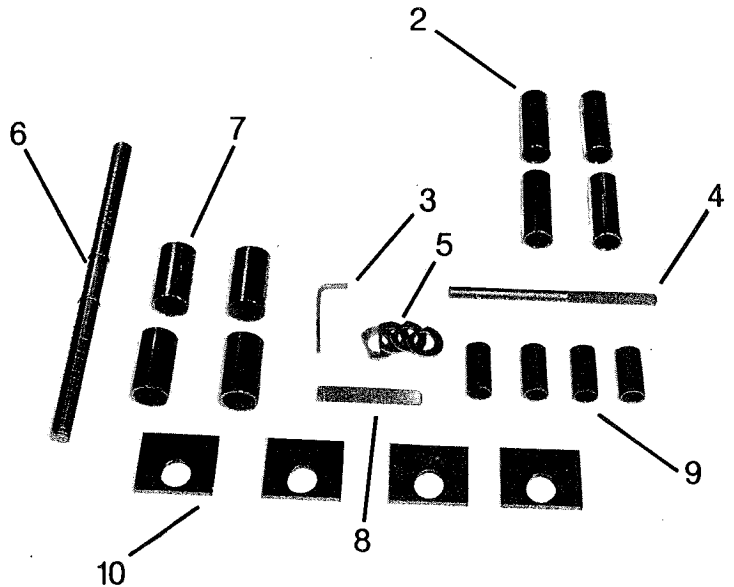
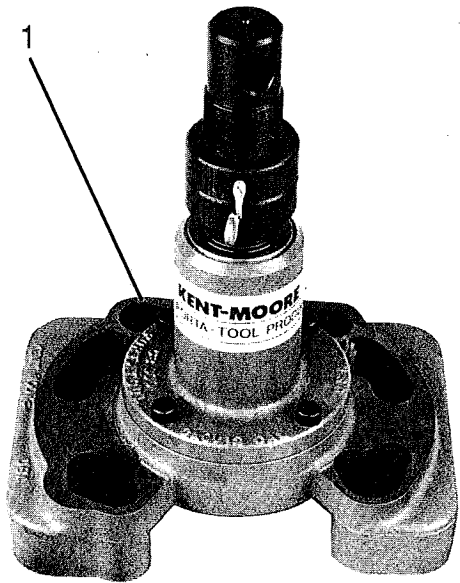


# KENT-MOORE

(CANADA, USA)

## Heavy Duty Group

# PT 2200-B/PT 2250-B UNIVERSAL COUNTERBORE BASIC TOOL KIT



### PT 2250-B Basic Kit and Service Parts Listing

DET. NO.	PART NO.	DESCRIPTION
1.	PT 2200-112A	BASIC MACHINE ASSY.
2.	PT 2000-21	STUD ADAPTER (4 QTY.)
3.	RS 15100-225	5/32 HEX KEY
4.	PT 2200-14A	CUTTER PLATE REMOVING PIN
5.	PT 3000-10	OFFSET WASHERS (4 QTY.)
6.	PT 2200-17	T-HANDLE
7.	PT 2000-16	STUD ADAPTER (4 QTY.)
8.	PT 2200-20	CUTTER SET STRAP
9.	PT 3000-11	STUD ADAPTER (4 QTY.)
10.	PT 2000-62	OFFSET WASHERS (4 QTY.)
N/I	PT 2400-10	STEEL BOX

*PT-2460-18 oil GT*

**NOTE:** PT 2000-B Counterbore Tool includes PT 2250-B Basic Tool Kit and five cutter plates denoted by \* below. Each cutter plate comes complete with a carbide cutter.

### Cutter Plates

(Available for use with PT 2200-B or PT 2250-B)

PART NO.	APPLICATION
*PT 2200-21	CUM V 6/8 VAL-VALE + .010" O.S.
*PT 2200-72A	CUM 5-1/2 - NH, 903
*PT 2200-23	CUM 5-1/8 NH
*PT 2200-24	CUM C & J ENG
*PT 2200-25	CUM 4-5/8 V 6/8 VAL-VALE
PT 2200-30	DD 71
PT 2200-31	DD 92
PT 2200-40	MACK 673/675
PT 2200-42	MACK 865/866
PT 2200-37	IHC DT-466
PT 2200-46	MACK EM 9-400
PT 2400-12	CAT 4.50
PT 2400-13	CAT 4.75 3306
PT 2400-15A	CAT 5.40 3406/3408
PT 2000-207	CUM 5 1/2 NH WITH LPF

## TOOL FUNCTION

To resurface cylinder liner counterbore areas of the engine block. The counterbore tool cuts an even counterbore ledge for correct liner protrusion. This tool is necessary to finish cut counterbore repair sleeves and is recommended for use when installing shims and seal rings.

## CARE AND MAINTENANCE OF COUNTERBORE TOOL

Your Counterbore Tool has been manufactured to very precise specifications. A great deal of care and craftsmanship went into the manufacturing of this tool so that you may enjoy years of trouble-free service. Each and every Counterbore Tool is tried and tested before it leaves our factory. Your Counterbore Tool is a precision piece of machinery which requires all the care you would provide for any type of precision equipment. Care and maintenance is simple and need only be done periodically to insure complete satisfaction from this tool.

Please adhere to the following guidelines for years and years of trouble-free machining:

Prior to using always inspect bottom of base plate for nicks and debris. Main Shaft must turn freely in housing. Fill oil cup on Main Housing with 30 W non-detergent oil. Tool and engine block must be at room temperature.

Periodically, replace the PT 16001 brass stop, which is located in the depth set collar between the thumb screw and threaded shaft. It is a dispensable item which protects the main shaft threads.

## CUTTER PLATE INSPECTION

Always inspect your cutter plate before proceeding. Make sure you have the correct plate for your application. Inspect the cutter plate locating surface for burrs, sharp edges or grooves (it must be smooth).

## SPRING LOADED LOCK-PIN

The drive shaft of your Counterbore tool has two groove positions for the spring loaded lock-pin to engage into.

This feature will hold the cutter plate in its upward position when not in use.

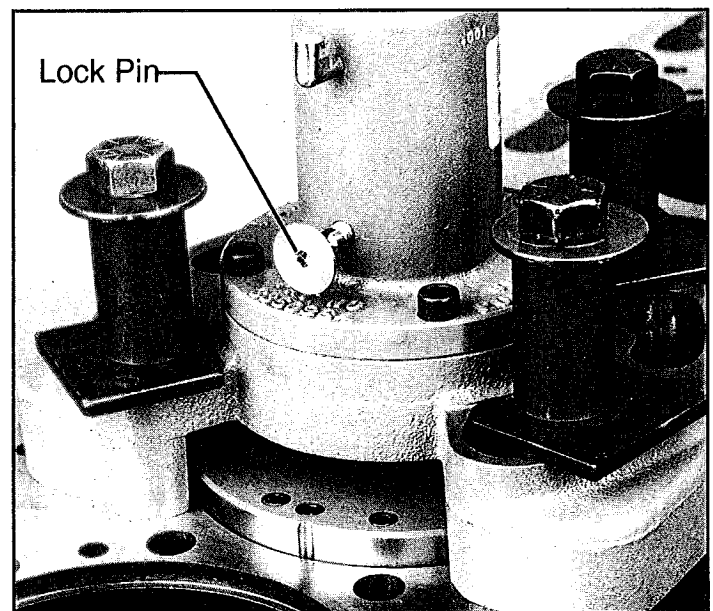
The bottom drive shaft groove is used for tapered cutter plates and the top groove for straight cutter plates.

**To unlock:** Pull button outward and rotate 90°. The Counterbore tool drive shaft is now free to move up and down.

**To lock:** Rotate button until button tangs align with slots in screw body. Then pull drive shaft upward until spring plunger engages into groove in drive shaft.

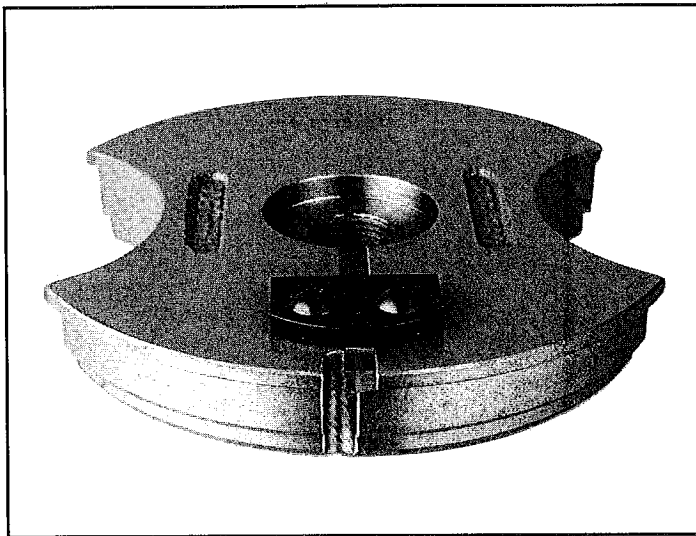
The above procedure is recommended when locating tool on engine block or during storage

**NOTE:** **DO NOT** allow plunger to ride on drive shaft when machining engine block. **ALWAYS** keep in unlock position.

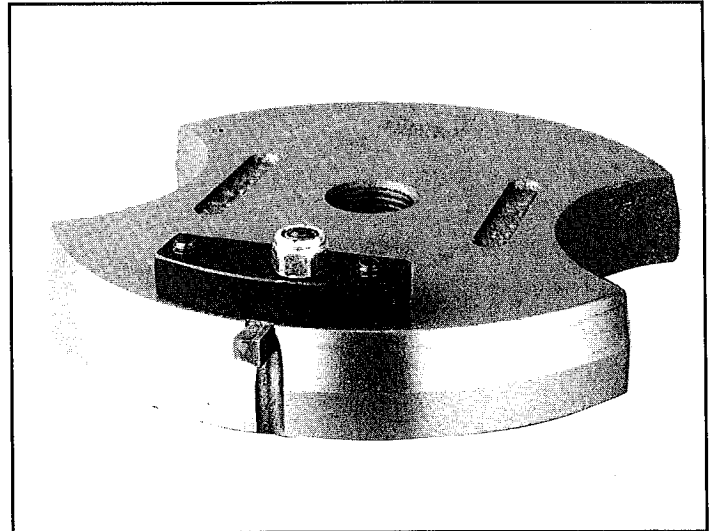


## **COUNTERBORE TOOL INSTRUCTIONS**

The following instructions cover the use of Counterbore Tool using two different style cutter plates, tapered with adjustable cutter bit and straight with fixed cutter bit. When exception to the procedure is required, follow the appropriate instructions.



Typical Straight Cutter Plate (Top Side)



Typical Tapered Cutter Plate (Bottom Side)

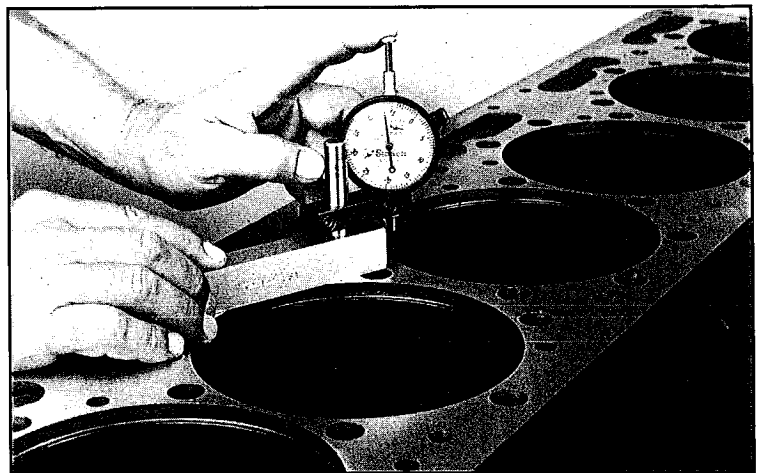
### ***STEP 1***

#### **PREPARE BLOCK**

- A. Remove the cylinder head, piston and liner of the cylinder to have the counterbore ledge machined. This procedure can be performed either in or out of the chassis. If in chassis, cover the crank shaft and any oil hole gallery to prevent machining chips from entering.
- B. Make sure the top deck of the block is clean and free of burrs. Use a finish mill file (PT 2000-400 or equivalent) and fibrous abrasive pad PT 2901.
- C. Measure and record the ledge depth in four places 90° apart with PT 5025 Dial Depth Gauge.

Mark the shallowest point

Subtract the lowest number from the highest number. This is the minimum amount to be machined for clean-up.



**PT 5025 Dial Depth Gauge**

## STEP 2A

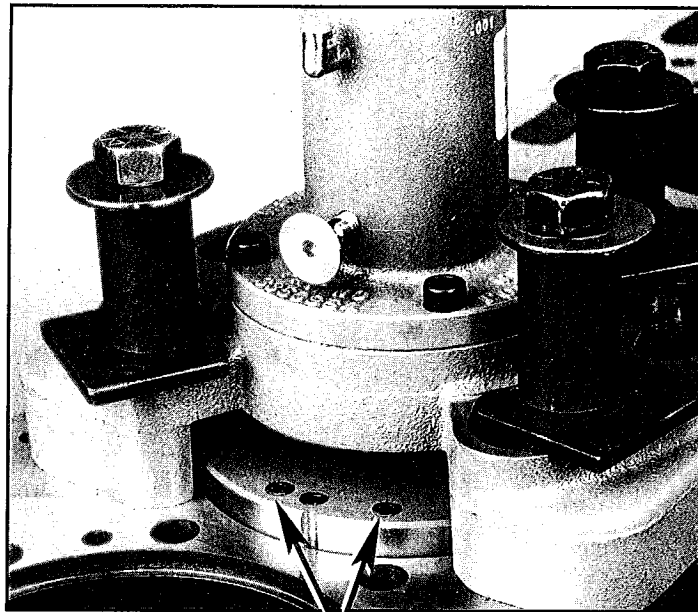
### SET THE CUTTER, TAPER CUTTER PLATE

Loosen the two cutter bit hold down cap screws. Install the tool bit into cutter plate by turning the cutter bit adjuster bolt counterclockwise. Cutter bit face must be facing towards a clockwise rotation cut.

NOTE: The point of cutter should not extend beyond the outer diameter of the cutter plate. If the cutter bit does stick out, damage to the tool bit will occur when locating the counterbore tool onto engine block.

**Do not tighten cutter bit hold down cap screws at this time.**

IMPORTANT: Hold down cap screws MUST BE loose whenever adjustment is being made to cutter bit, in or out movement.

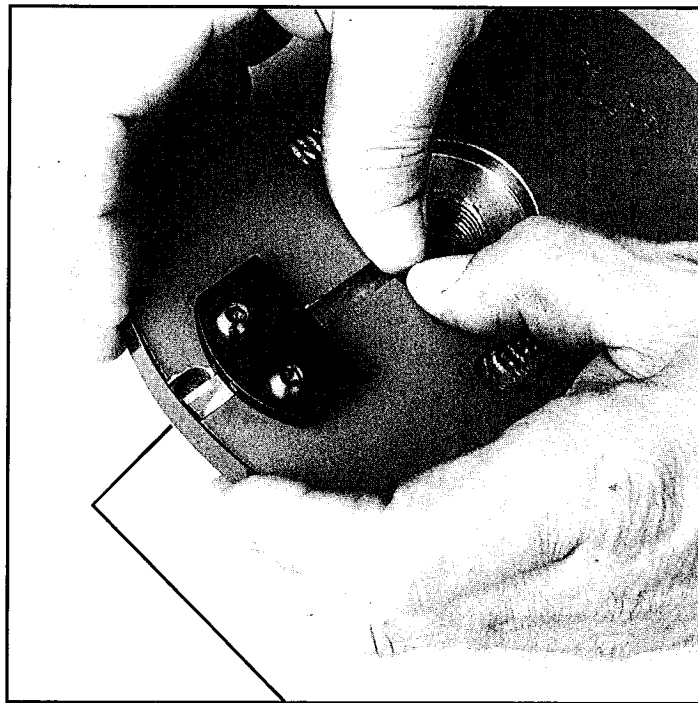


**FIG. 2A Cutter Bit Hold Down Cap Screws**

## STEP 2B

### SET THE CUTTER, STRAIGHT CUTTER PLATE

Preset the cutter by using the cutter set strap (included). Wrap it around the area of the cutter slot (Figure 2B). Push the cutter out to touch the sheet stock and tighten the button head socket set screws. Recheck the cutter, making sure it contacts the sheet stock but does not protrude beyond the edge of the plate. Properly installed, the cutter carbide faces the open space in the cutter plate. Light should not pass between the sheet stock and cutter plate.



**FIG. 2B Note: Cutter carbide faces slot**

## STEP 3

### INSTALL THE CUTTER PLATE ON THE MAIN SHAFT OF COUNTERBORE TOOL

Install the cutter plate on the main shaft. Use the cutter plate removing/installing pin to tighten securely. (Figs. 3A & 3B) (NOTE: Hole in side of cutter plate accepts the removing/installing pin).

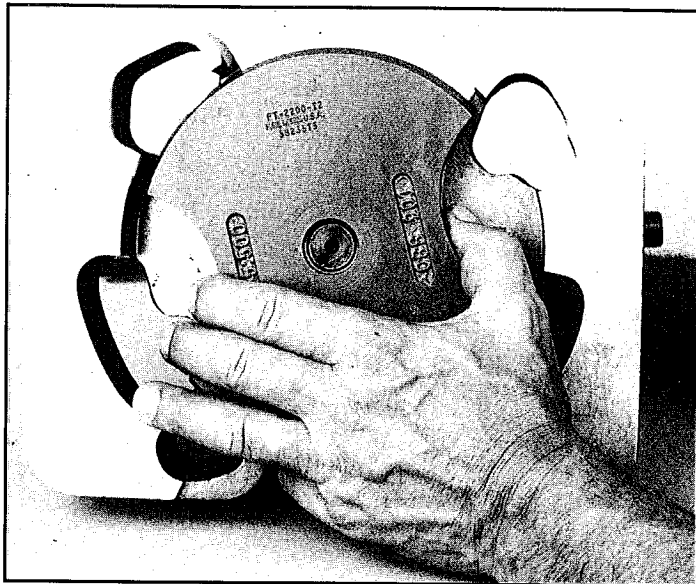


Fig. 3A Installing Cutter Plate

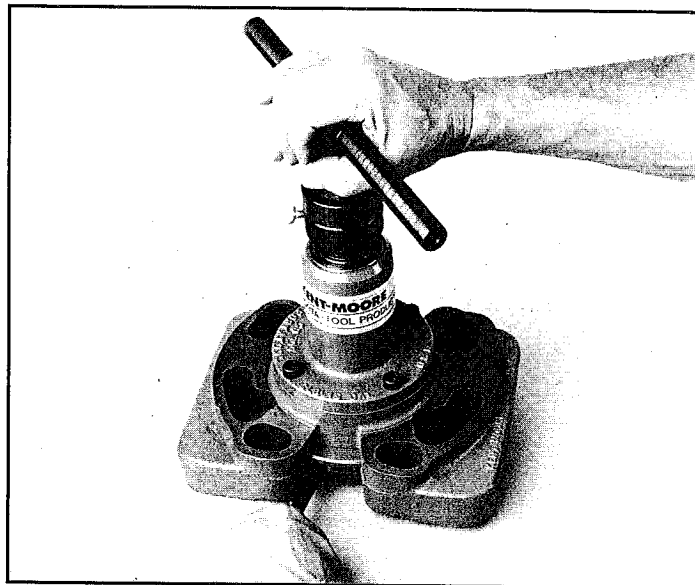


Fig. 3B Tightening Cutter Plate

## STEP 4A

### LOCATE THE TOOL

Position the tool in the cylinder bore by backing off the depth set collars and lowering the cutter plate into the counterbore to center the tool. Secure the base plate to block with cylinder head bolts and special washers and spacers if required. Cross tighten bolts (diagonally) to 30 ft. lbs. torque. (See Fig. 4)

### TAPER CUTTER PLATE

When taper cutter plate is in position in engine block counterbore it will position the machine correctly. There will be No Movement of the machinery when tapping (by hand) the machine base plate from side to side and forward and backward.

Any rotating of the cutter plate, while positioned in the counterbore, will cause premature wear grooves on the taper cutter plate, thus incorrect location of the counterbore tool. The taper cutter plate must be replaced if grooves appear.

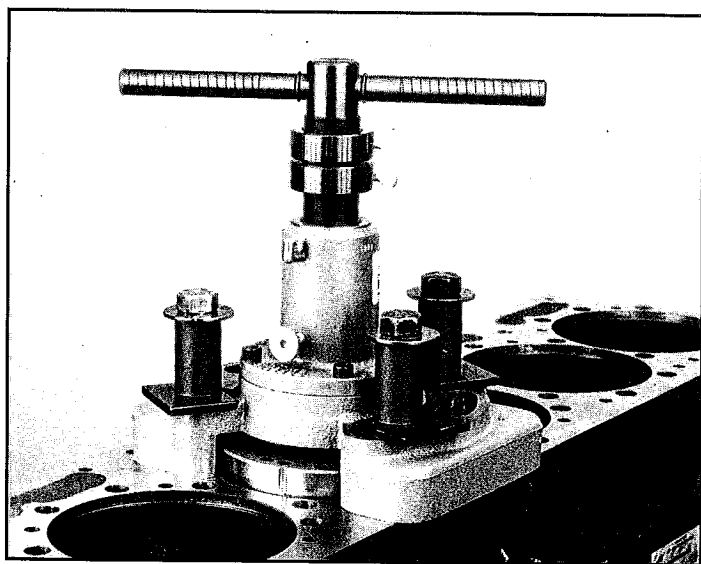


Fig. 4

## STEP 4B

### STRAIGHT CUTTER PLATE

Lift the T-Handle slightly and rotate main shaft clockwise to ensure cutter plate turns freely without binding up. If necessary, loosen cap screws and reposition the tool. (Repeat Step 4A).

## STEP 5

### ADJUST CUTTER BIT, TAPER CUTTER PLATE

Using the counterbore tool handle, raise the cutter plate from the counterbore seat by approximately 1/2". Turn bottom lock collar until it contacts housing, thus holding cutter plate in this position.

Use Hex Key Wrench to turn the tool bit adjusting bolt clockwise until tool bit contacts liner bore wall. Then tighten the two hold down cap screws to secure the tool bit. (See Fig. 5)

Rotate the main shaft clockwise to ensure cutter plate turns freely without binding up or scraping the counterbore wall. If necessary, loosen the two hold down cap screws and reposition the tool bit against the counterbore wall. Retighten screws.

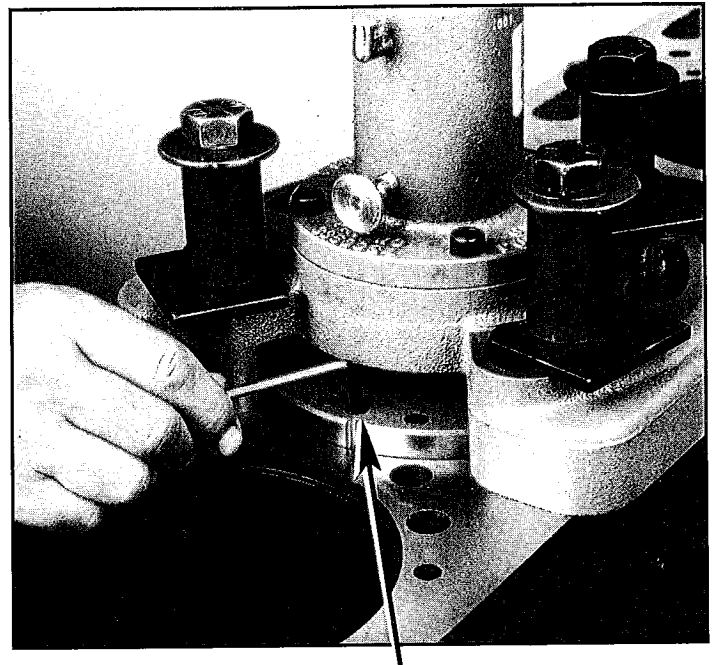


Fig. 5

Cutter Bit Adjusting Bolt

## STEP 6A

### SETTING DEPTH OF CUT

Back off depth set collar and carefully lower the cutter plate into the bore and allow the cutter to rest on the counterbore ledge. Rotate both depth set collars down until the bottom collar contacts the main housing. Do not force the collar beyond this point, as it will lift the cutter plate and prevent an accurate zero reading. (See Fig. 6A).

Determine the final depth of cut and back off the top depth set collar accordingly. Each graduation on the depth set collar increases the depth of cut by one thousandth (.001"). Tighten the thumb screw on the top collar securely.

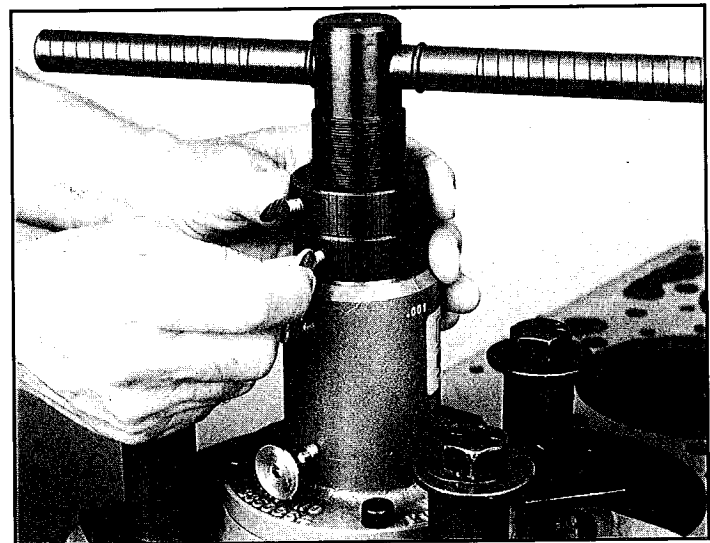


Fig. 6A

## STEP 6B

### OPTIONAL DEPTH SET SPACER FOR USE WITH TAPER CUTTER PLATES ONLY

FUNCTION: PT 2200-83 Spacer Block eliminates the need to reset depth of cut when machining two or more counterbores.

1. Follow counterbore tool installation procedure as outlined with tool and/or taper cutter plate.
2. After adjusting the cutter to counterbore diameter, back off both lock collars and lower the cutter plate into the bore until the cutter bit contacts ledge. Continue to back off collars until PT 2200-83 Spacer Block can be installed between main housing and lower lock collar. See Fig. 6B.
3. Follow procedure for setting depth of cut thru counterbore tool removal.
4. Remove PT 2200-83 Spacer Block and install tool into next bore to be cut. Repeat cutting instructions.

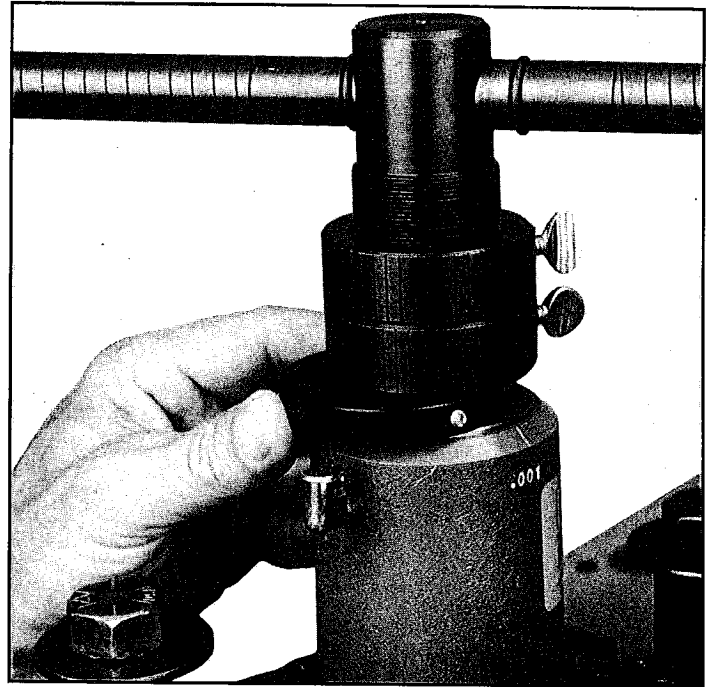


Fig. 6B

## STEP 7

### CUTTING THE COUNTERBORE

Fill oil cup on the main housing with 30W non-detergent oil to maintain lubrication during use. Back off the bottom depth set collar two graduations (or less) and tighten the thumb screw securely. Cut the counterbore by turning the T-Handle clockwise and maintaining constant downward pressure on the tool. Do not stop in the same handle position. Alternate stops to avoid creating a ridge in the counterbore. Continue backing off the lower depth set collar (no more than two graduations per cut) and checking depth measurements between each adjustment. Plan to take a one thousandths (.001") final cut to meet the final predetermined counterbore depth. This ensures a very fine machined finish.

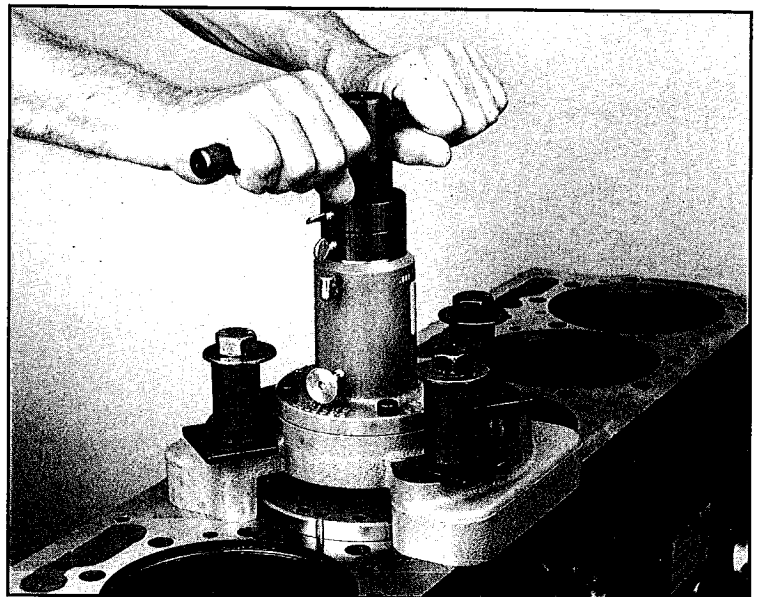


Fig. 7 Fill w/30W non-detergent oil before using

Once the predetermined depth has been reached, adjust the top calibrated depth set collar against the lower collar and tighten the thumb screw securely. This will allow all other counterbores to be cut to the same depth as the first.

# STEP 8

## TOOL REMOVAL

Retract cutter plate by pulling up on tee handle and lock in up position with spring loaded lock-pin. Remove four machine hold down bolts.

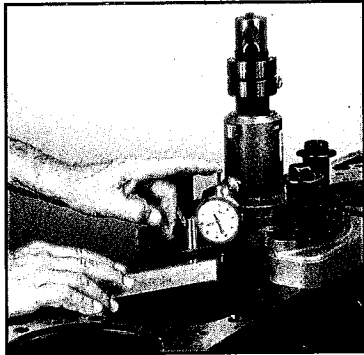
## TAPER CUTTER PLATE

Prior to tool removal loosen the two cutter bit hold down cap screws and rotate cutter bit adjusting screw counterclockwise until cutter bit is retracted into cutter plate. This will protect the cutter bit when not in use and prepare you for the next counterbore.

# FINE QUALITY TOOLS FOR UPPER DECK WORK

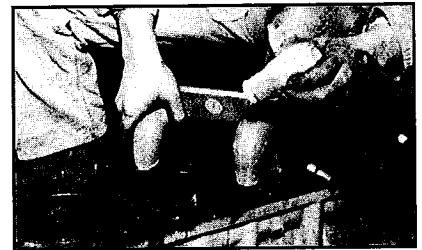
### **PT 5025 DIAL DEPTH/LINER PROTRUSION GAUGE**

Saves time -  
designed for use  
with our  
counterbore tool:



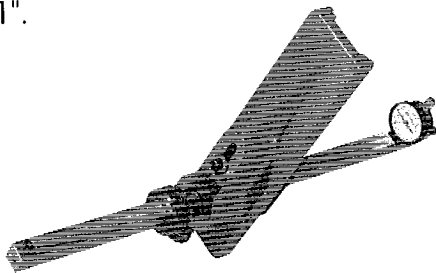
### **PT 7190 PORTA-FLUX**

Powerful  
permanent  
magnet attracts  
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Hundreds of uses.



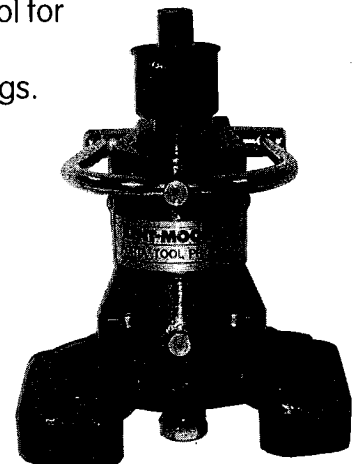
### **PT 5010 CONCENTRICITY GAUGE**

Checks upper to lower bore concentricity  
within .001".



### **PT 2050-D PORTA-MATIC**

The upper deck boring tool for  
installing our exclusive  
prefinished repair bushings.  
Easy to operate  
with precision, machine  
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PT 2250-20B