

# INTERNAL RECESSING UNIT

IRU

**The most efficient method of machining internal grooves in one operation.**



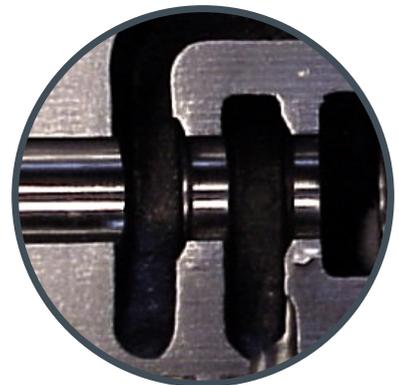
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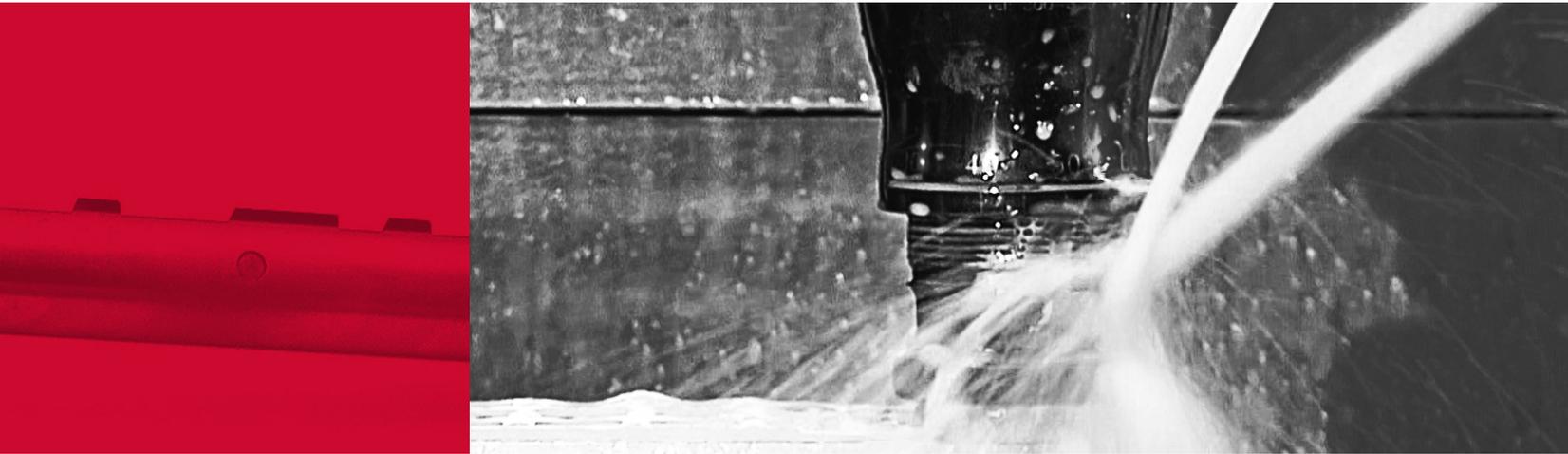
**USE THE INTERNAL RECESSING UNIT FOR FAST, EFFICIENT, AND CONSISTENT MACHINING OF INTERNAL GROOVES CONCENTRIC TO BORES. MINIMIZE YOUR CYCLE TIME WHILE ELIMINATING DEFLECTION AND GUARANTEEING REPEATABILITY.**

## **REPEATABLE & ACCURATE**

**Most efficient method of machining grooves in one operation where close tolerances and finish are critical.**

Repeatable and accurate for diameter and axial position of grooves and lands (+/- 0.002")





## ELIMINATES DEFLECTION & CHATTER

The IRU is designed to support the cutter along its entire length, eliminating deflection and creating precisely machined features.

The IRU system pilots in the bore, providing perfect concentricity.

Rigidity and accuracy is assured by strategic location of the cams to support the cutting teeth.

## FEEDS AND SPEEDS

Feed rates of 0.002 to 0.005 IPR are typical starting points for most applications. For smaller bore diameters (less than 0.500"), decrease the feed rate below 0.002 IPR.

Surface feet per minute are equal to those recommended for multi-fluted reamers (the speeds below can be increased up to 3x).

Material Machined	Surface ft. per minute
Cast Iron - Gray	100 to 110
Cast Iron - Nodular	30 to 70
Steel/Forgings	35 to 70
Aluminum and Brass	150 to 160

## ECONOMICAL & EFFICIENT

Machine internal grooves in one operation.

Quick cycle time – typical cycle time is less than 15 seconds!

Carbide cutters can be resharpened 2-5 times and can also be replaced.

## EASY-TO-USE

**Simple to set up and use! There are only two settings required on the Elliott IRU:**

1) *Positional location*  
(using the tool's adjustable stop collar)

2) *Groove diameter*  
Manual machine – adjust limiting nut;  
CNC/power fed machine – programmed.

Programming your CNC is straight-forward - axial motion translates to radial cutter lift at a 1:1 ratio on diameter.

Can be used on CNC machining centers, special machines, transfer machines and drill presses.



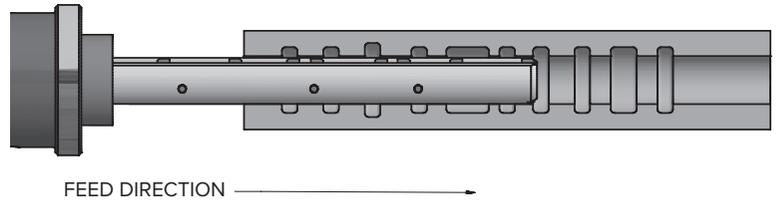
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## OPERATING PROCEDURE

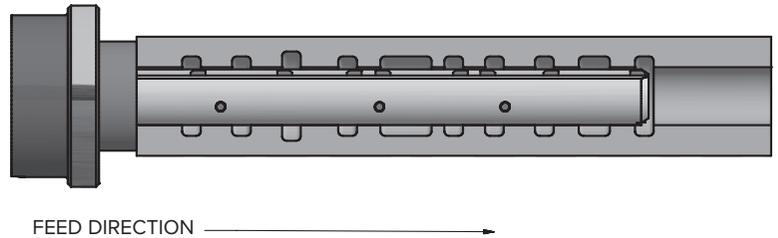
1

The IRU is fed into the work-piece at a fast feed rate with the pilot locating within the bore until the nose piece is approximately .020" (0.5mm) from the face of the work-piece.



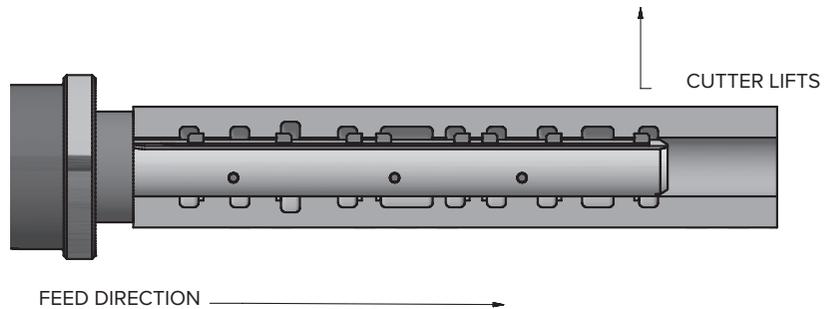
2

Feed into the work-piece at a cutting feed rate and make contact with the face of work-piece. At this point, the operating head and nose piece are engaged and will stop rotating.



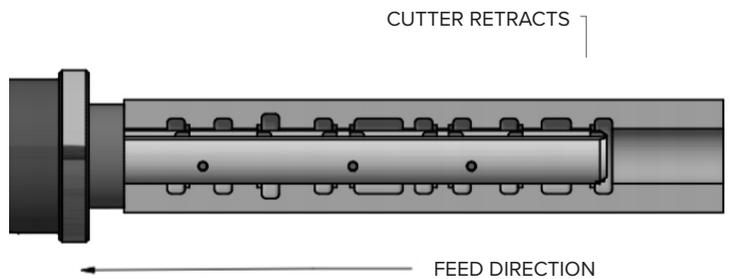
3

Continue feeding forward - causing the system to actuate - lifting the cutter perpendicular to the axis of rotation, machining the internal features in the bore.



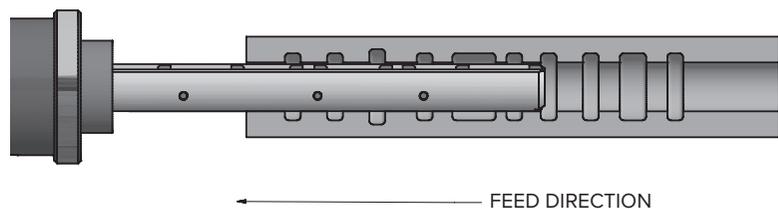
4

Retract the IRU three (3) times faster than the cutting feed rate.



5

Once the nose piece is off of the face of the work piece, the cutter has fully retracted back into the pilot and from this point, the IRU can be rapid fed out of the work-piece.



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# APPLICATION

### THE JOB

**Part Material:**  
Gray iron

**Diameter:**  
0.625" bore

**Job parameters:**  
Machine 2 internal  
grooves simultaneously -  
0.125" wide x 0.060" deep  
per side

### THE SOLUTION

**Tool Used:**  
IRU-0444

**Speed:**  
100 SFM

**Cut Feed:**  
0.003 IPR

**Retract Feed:**  
0.009 IPR

### THE RESULTS

- No deflection, good  
surface finish in grooves

- Groove positions to  
print and achieved  
groove diameter of .745"



**Cycle Time:**

**6.1SEC.**



Simultaneously  
**lose problems**  
and enormous  
amounts  
of **cycle time.**