

## REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" \_\_\_\_\_

XC: A. R. Baszczuk  
T. L. Capeletti  
C. F. Cieccko  
W. W. Cook  
G. E. Fletcher  
W. R. Globig  
J. A. Harter  
G. J. Hill  
P. G. Johnson  
T. J. McCormack  
R. L. Stafford  
C. B. Workman  
File

October 26, 1981

J. P. LINDE

SUMMARY OF CENTERFIRE BARREL  
GFM HAMMER MARKS (H.M.)

This summary includes all current knowledge about "hammer marks" cause and conditions.

KNOWN WITH A HIGH DEGREE OF CONFIDENCE:

1. H.M. appear primarily on breach taper section.
2. H.M. are only detectable after color.
3. A higher finish makes H.M. more visible (Harper Buff, Roller Finish).
4. H.M. have been seen on all "no finish turn" models and calibers.
5. H.M. have never been seen on finish turned Barrels, i.e. magnums.
6. H.M. have appeared from all four C.<sup>F</sup>. GFM machines.
7. H.M. patterns are not always alike.

OTHER OBSERVATIONS:

1. H.M. usually appear in groups rather than individually at random.
2. Variation of GFM feed rate from 8 to 12 inches per minute will not produce H.M. or affect target, ~~pr-~~
3. Our Chem. Lab has not been able to detect differences in micro-structure or hardness on H.M. surface.

-2-

SUMMARY OF CENTERFIRE BARREL - Contd.

4. H.M. appear even when steel chemistry is particularly good.
5. H.M. have appeared on muzzle end of M/700 Barrels.
6. M/700, 17 cal. stainless steel turned Barrels did not have H.M. while "no finish turn" Barrels did.
7. H.M. are not new.

FROM NORM NIELSEN'S SCANNING ELECTRON MICROSCOPE PHOTOGRAPHS:

8. H.M. are a variation in surface roughness causing bright and dull areas.
9. Spectrograph analysis shows no difference in material composition between bright and dull areas.
10. The whole circumference of the Barrel has a layer of heavily worked material near the surface.

RECOMMENDATIONS TO ELIMINATE H.M.:

- o Improve uniformity of surface before Harper Buff by controlling rough polish for more consistent amount of material removed.
- o Insure that the amount of material removal is enough to always get below the scalloped surface of the GFM form.

W. R. Globig

WRG:hf

700 - 100 grit - rough

700 - 100 grit rough -  
- 100 grit broken down -  
- 220 spin -