

bcc: S.C. Toulson

September 22, 1964

Mr. Henry Tyler,
Design Engineer
Burris Company
P.O. Box 965
3865 East Walnut
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Dear Mr. Tyler:

Most of the ballistics information you requested will have to be obtained from our Bridgeport laboratory. Therefore, am forwarding your letter and the data I have accumulated to our Mr. S. C. Toulson, who will in turn supply you with information available as far as ballistics are concerned.

With regard to the gun design effect on barrels and receivers as pertain to mounting scopes and sights, our experience has been that little or no additional stress is incurred in tapping barrels with the small 6-48 screws. However, the problem involved is when the wall thickness at the bottom of the screw hole does not support the pressure of the expanding gasses and the screw becomes a piston or projectile itself. But a wall thickness of approximately .090/.100 is adequate for all center fire cartridges. As to receiver area I refer specifically to the front bridge of these same type of screw holes for mounting scopes and receiver sights. These are drilled all the way through the receiver and are only dangerous should the barrel split and fail in that particular area. Then, of course, the cracks usually occur through the bridge of the receiver starting at the screw holes. Generally speaking, this takes a tremendous amount of pressure up to 2,000/3,000 ppsi to cause this type of failure. Pressures of this kind are obtained only when the wrong powder or overloads are used, in addition to plugged barrels.

However, in our particular design of the Model 700 the forward section of the bolt supports the cartridge case, preventing it from expanding to the point of failure. Therefore the stress levels are reduced on the bolt, barrel and receiver.

Dovetail slots are seldom located in the muzzle of any of the rifles with the exception of the rim fire where no stresses occur. However, on occasion these slots are used for mounting rear sights, and in our particular designs extra

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material is provided to compensate for the reduced loss of strength in that area. I refer specifically to the older Model 721 Rifle which contained a swelled large portion on the barrel for just this purpose.

Generally speaking, the more modern designs use screws to support mounts and sights instead of dovetail slots. In test analysis of these areas which are subjected to high stress we have noted more concentration of stresses with the use of dovetail slots than with the screw holes themselves, so favor the latter. Of all the cartridges listed in your letter, the 30-06 is the one of most concern as far as stress on a gun. This is because the cartridge case is the weaker of the group when loaded to its ultimate capacity.

Higher thrust loads on the bolt lugs may occur as the bore sizes increase. For example, the 375 Magnum.

I hope this information will be useful to you, and you should be hearing from Mr. Toulson shortly with the additional ballistics information required.

Very truly yours,

W. E. Leek
Firearms Design & Development
Illion Research Division

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