VAN'S AIRCRAFT
TOTAL PERFORMANCE

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Van's Aircraft has recently received questions from several builders about variances in the depth of stiffening rings and beads in formed aluminum ribs. Variances in the depth of stiffening rings and beads for these parts have existed for years. We understand why people have questions about these variations, especially in light of last year's laser-cut parts issue. The primary cause is that, several years ago, Van's transitioned parts from T0 to T3 temper. Van's also acquired and began forming parts a using very large hydraulic press, which permitted us to manufacture wing ribs and similar parts in-house. This greatly increased our production volume and reduced manufacturing time. From time to time, the pressure applied by our press while forming parts has varied, resulting in differing depths of the stiffening rings and beads. Although a mix of ring/bead depths may be observed when looking at the parts in your kit, this variance does not a represent a safety or quality issue. However, in light of the concerns expressed by customers on this issue, moving forward Van's will tighten our specifications related to the depth and appearance of the stiffening beads, to reduce the visual differences observed over the past few years.

For those interested in more background on this topic, here is a brief history of formed RV parts and testing:

- In the earlier days of aluminum homebuilt airplanes, builders fabricated their own wing ribs and other parts, which were generally hand-formed over hardwood form blocks using a soft hammer-bending processes to form the flanges. There were often no stiffening ribs or beads in these ribs.
- Most ribs at that time were made from tempered aluminum, usually 2024-T3. This was true for most early aluminum homebuilts, including the Thorp T-18, Bushby Mustang, Davis DA-2A, etc. These planes flew safely, and many are still flying today. The RV-1 wing ribs were also formed in this manner.
- As Van's started kit production in volume in the 1970s, ribs and parts were made of formed soft aluminum (T0), to enable the fabrication of more compound curved parts. The use of T0 aluminum required heat treating of the formed aluminum parts to achieve the stiffness and strength needed.
- When we developed the tooling for the RV-3, we decided to add stiffener rings and beads to the webs to produce ribs that emulated those used on major production light aircraft. Although testing never indicated that these features were necessary, since that time, all of our rib tooling includes cutouts for stiffener rings and beads.

- As Van's grew over time, we realized that with proper tooling design we could produce most of our formed aluminum parts from T3 alclad aluminum, eliminating the need for the costly and time-consuming heat-treat process manufacturing and reducing the amount of work for the aircraft builder.
- As we transitioned from T0 to T3 ribs we analyzed and tested T3 ribs with minimum depth stiffening beads in the most critical aircraft structure. Further tests conducted during research on laser cut parts showed that ribs maintained sufficient strength when cuts were introduced across the rib. In this test all ribs in the wing were cut in multiple locations. In many cases these cuts passed through the stiffening bead negating the beads strength. The results of this testing and analysis showed the stiffening rings and beads were not required. However, because these features are already built into all of our manufacturing tooling, we have decided not to create new tooling to remove these features.

Thank you.

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