



ENGINEERED SOLUTIONS FOR INDUSTRIES WORLDWIDE

SOLON® BELLEVILLE SPRINGS | SOLON® PRESSURE SWITCHES

TECHNICAL SERVICE BULLETIN

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Subject: H-13 Flange Washer Min Hardness Change

Part Numbers Affected: Multiple

Condition: Multiple heat treat vendors have expressed and demonstrated an inability to consistently achieve our 42-46 RC range. They have requested a 5 RC range to accommodate their process control capabilities.

Cause: We changed our heat treat verification procedure, decreasing the number of hardness measurements per sample but increasing the number of samples measured. After operating under this change for a few months, we learned that the variance within a batch is slightly higher than previously understood for both internal and external commercially available heat treat processes.

Diagnosis: The geometry and material condition of our washers date back many years, and work together to optimize the balance between performance and risk of failure. When the hardness is too low, the flat load and available deflection of the washer are decreased. However, when the hardness is too high, there is an increased risk of failure (stress corrosion cracking, embrittlement, etc).

Correction: As of 1/30/2020, Solon Manufacturing changed our H-13 hardness range from 42-46 RC to 41-46 RC. Rather than increasing a difficult-to-quantify risk by raising the maximum, we opted to decrease the minimum hardness. The difference between 41 RC and 42 RC is a 2-3% drop in flat load in most Solon designs. The overall spring rate and load performance for nearly the entire deflection-range of the washer (0-95% flat) are virtually unchanged. Finally, the design load can be validated and tested when necessary.

Approved By: G. Davet

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