



Weld Acceptance Criteria and Repair Procedures Laser Beam Braze Welding

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard provides the acceptance criteria and a repair procedure for Laser Beam Braze Welding (LBBW) in Body-in-White applications for which GM is responsible for establishing or approving product design.

1.2 Applicability. The criteria established in this standard become mandatory when referenced on a product design document. Deviations from the acceptance criteria provided in this standard must be identified on a weld design document or an approved Product Quality Standard (PQS).

1.3 Remarks. Welded structures are considered satisfactory when they carry the intended service loads for a required period. Service loads on weldments in a vehicle are varied in both type and magnitude and cannot be addressed by this standard. Therefore, while weld quality criteria of this standard are consistent with service loading requirements, they have been established specifically for use in process and product monitoring. Any attempted application of this document to other uses, such as post-crash weld quality assessment, may lead to an erroneous result or conclusion. Nonconforming welds by retaining a portion of their engineering properties may still contribute to the integrity of the assembly.

1.3.1 Clarification. For clarification of this standard or editorial comments, email the GM Weld Council at weld.council@gm.com.

Proposed changes to this standard must be presented to the Global Weld Council. To suggest a change to this standard, reference the "Procedure for Weld Standard Changes" on the Global Weld Council's webpage.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15563 GMW16939

2.3 Additional References.

- GM Global Customer Audit Procedure
- GM Global Manufacturing Systems (GMS) Operating Guidelines

3 Requirements

3.1 General Acceptance Criteria.

3.1.1 Filler Metal. The designated filler metal used shall be a GM approved filler metal specified in GMW16939 Wire, Filler, Welding and Brazing. Welds not using the designated filler metal cause the product to be nonconforming.

3.1.2 Weld Surface Perceptual Quality. Product and Manufacturing Engineering jointly must identify and approve weld surface cosmetic appearance criteria for those welds deemed necessary to satisfy the GM Global

Customer Audit. Product Quality Standards (PQS) are to be generated to quantify weld surface appearance requirements for these perceptual quality welds.

3.2 Visual Acceptance Criteria.

3.2.1 Spatter. When weld spatter occurs on a surface visible to the customer the weld spatter must be removed. Spatter does not make the product nonconforming. The cause of spatter shall be determined and eliminated. See Figure 1.



Figure 1: Example of Spatter

3.2.2 Surface Porosity. Cavity type discontinuities on the surface of the weld bead. Surface porosity does not cause the product to be nonconforming. However, the welding process should be adjusted to the initial qualified setup to eliminate the porosity. See Figure 2.



Figure 2: Example of Surface Porosity

3.2.3 Holes. A hole is circular in shape and has filler metal surrounding the circumference of the hole. Holes do not cause the product to be nonconforming. However, the welding process should be adjusted to the initial qualified setup to eliminate holes. See Figure 3.

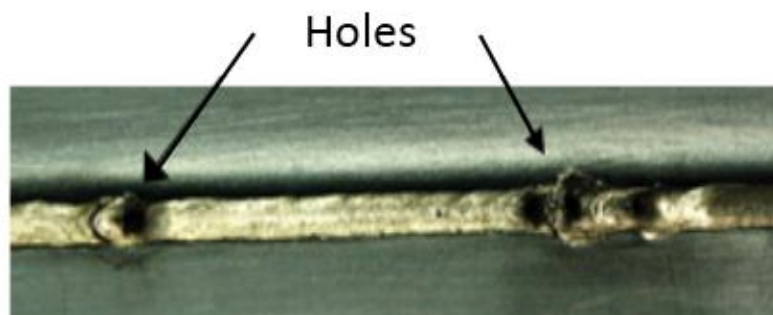


Figure 3: Example of Holes

3.2.4 Saw Tooth Edges. A jagged edge appearance where the braze filler material contacts the base metal. Saw tooth edges do not cause the product to be nonconforming. However, the welding process should be adjusted to the initial qualified setup to eliminate this condition. See Figure 4.



Figure 4: Example of Saw Tooth Edges

3.2.5 Skip. Skips are voids or interruptions in a continuous weld bead. A skip may cause the weld to be discrepant. If the length of an individual skip or interruption is greater than the maximum allowable length specified in 3.3.3, then the weld is nonconforming. Also, if the sum of all skips is greater than the amount specified in 3.3.3, then the weld is nonconforming. See Figure 5.

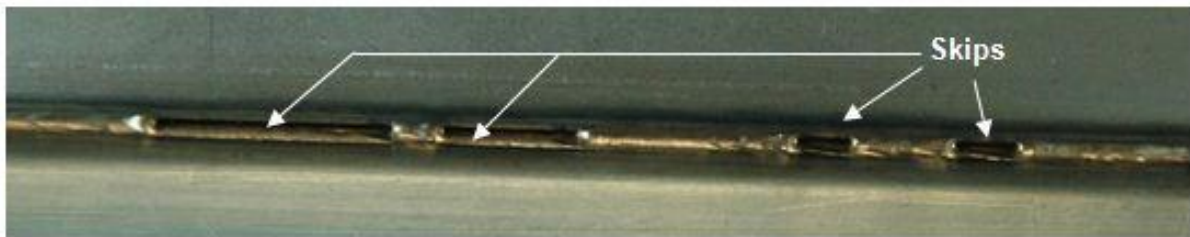


Figure 5: Example of Skips

3.2.6 Missing or Not Installed Weld Bead. A specified weld bead not installed causes the product to be nonconforming.

3.2.7 Rising. An area of the weld bead that abruptly increases in height from the surrounding weld braze bead. Rising does not cause the weld to be nonconforming, however, the process should be adjusted. See Figure 6.



Figure 6: Example of Rising

3.2.8 Sinking. An area of the weld bead that abruptly decreases in height from the surrounding weld bead. Sinking does not cause the weld to be nonconforming, however the process should be adjusted. See Figure 7.