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CQI-15

Special Processes: Welding System Assessment

1st Edition

»» Insight

»» Expertise

»» Results



The **Catalyst** for Peak Performance



ABOUT AIAG

Purpose Statement

Founded in 1982, AIAG is a globally recognized organization where OEMs and suppliers unite to address and resolve issues affecting the worldwide automotive supply chain. AIAG's goals are to reduce cost and complexity through collaboration; improve product quality, health, safety and the environment; and optimize speed to market throughout the supply chain.

AIAG Organization

AIAG is made up of a board of directors, an executive director, executives on loan from member companies, associate directors, a full-time staff, and volunteers serving on project teams. Directors, department managers, and program managers plan, direct and coordinate the association's activities under the direction of the executive director.

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Volunteer committees focus on business processes or supporting technologies and methodologies. They conduct research and develop, publish, and provide training on standards, conventions, standard business practices, white papers, and guidelines in the areas of automatic identification, CAD/CAM, EDI/electronic commerce, continuous quality improvement, health focus, materials and project management, occupational health & safety, returnable containers and packaging systems, transportation/customs and truck & heavy equipment.

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CQI-15

Special Process: Welding System Assessment

Version 1 Issued 3/10



FOREWORD

Automotive Industry Action Group (AIAG) committees are made up of volunteers from member companies in the automotive industry. The work of preparing process audits is done by AIAG technical committees.

The main task of technical committees is to prepare Automotive Standards and System Requirements. Draft documents adopted by the technical committees are circulated to the Steering Committee for review and consensus approval. Publication of the documents requires approval by the Quality Steering Committee.

The Quality Steering Committee would like to acknowledge and thank the following individuals and their companies who have contributed time and effort to the development of this document.

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TABLE OF CONTENTS

ABOUT AIAG	1
FOREWORD	3
ACKNOWLEDGEMENTS	3
TABLE OF CONTENTS	4
INTRODUCTION	5
GENERAL	5
PROCESS APPROACH	5
WELDING SYSTEM ASSESSMENT GOALS	5
ASSESSMENT PROCESS	5
ASSESSOR QUALIFICATIONS	6
OTHER REQUIREMENTS	6
1 SCOPE	7
1.1 GENERAL	7
1.2 APPLICATION	7
1.3 REFERENCE	8
2 THE WELDING SYSTEM ASSESSMENT PROCEDURE	9
3 SPECIAL PROCESS: WELDING ASSESSMENT	10
APPENDIX A – PROCESS TABLES	31
GLOSSARY	47

INTRODUCTION

General

The work of preparing *CQI-15: Special Process: Welding System Assessment (WSA)* was carried out through the AIAG Welding Work Group. These welding requirements are complementary to customer and product standards.

The WSA can be used to assess an organization's ability to meet the requirements in this assessment, as well as customer, regulatory, and the organization's own requirements. The WSA can also be used between an organization and its suppliers.

In the WSA, the word "shall" indicates a requirement for purposes of the self assessment. Failure to meet the requirements results in an assessment that is either "Not Satisfactory" or "Needs Immediate Action." The word "should" indicates a recommendation. Where the term "such as" is used, any suggestions given are for guidance only.

Process Approach

The WSA supports the automotive process approach as described in ISO/TS 16949.

Welding System Assessment Goals

The goal of the WSA is the development of a welding management system that provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the supply chain.

The WSA, coupled with an internationally recognized quality management system and applicable customer-specific requirements, defines the fundamental requirements for welding management systems.

The WSA is intended to provide a common approach to a welding management system for automotive production and service part organizations.

Assessment Process

Ongoing assessments shall be conducted annually, unless otherwise specified by the customer, to re-examine the continuing compliance with the WSA. Each assessment shall include a review of the organization's systems using the WSA. Successive Job Audits (Section 6.0 of this document) shall sample parts from different automotive component manufacturers that require compliance to the WSA document.

The assessment shall use the process approach to auditing as identified by the requirements of ISO/TS 16949.

Assessor Qualifications

Assessor(s) shall have the following specific experience to conduct the WELDING SYSTEM ASSESSMENT:

1. Be an experienced quality management system (QMS) internal auditor (for example, latest edition of ISO/TS 16949, ISO 9001)
2. Assessor shall possess welding knowledge. Evidence shall include a minimum of 5 years experience in welding or a combination of formal education in welding and welding experience totaling a minimum of 5 years
3. Assessor shall possess knowledge of and be familiar with the application of automotive quality core tools including statistical process control, measurement systems analysis, part approval, failure mode and effects analysis, and advanced quality planning.

Note: If more than one assessor is required to meet the above qualifications, the lead assessor shall be the person meeting the requirements in item #1.

Other Requirements

The organization shall keep records as evidence of compliance to the requirements identified in the WSA, as well as all appropriate action plans to address any unsatisfactory ratings. These records shall be readily available for review by any customer requiring compliance to the requirements within this document.

1 SCOPE

1.1 General

This document specifies process requirements for an organization or its suppliers performing applicable welding, who need to:

- demonstrate ability to consistently provide product that meets customer and applicable regulatory requirements, and
- enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system.

The Welding System Assessment is applicable to sites where customer-specified parts for production and/or service are processed throughout the automotive supply chain.

1.2 Application

All requirements of the WSA are generic and are intended to be applicable to all organizations performing the welding operations addressed in this document, regardless of type, size, and product.

Note: Four Process Tables have been developed and the appropriate table(s) is to be referenced during the assessment. The Process Tables are specific to welding processes as noted below:

Process Table A - Arc Welding

Arc Stud/Fastener Welding
Flux-Cored Arc Welding
Gas Metal Arc welding
Submerged Arc Welding
Shielded Metal Arc Welding
Plasma Arc Welding
Gas Tungsten Arc Welding
Gas Metal Arc Braze Welding

Process Table B - Resistance Welding

Resistance Spot Welding
Projection Welding
Resistance Seam Welding
High-Frequency Seam Welding
Induction Seam Welding
Mash Seam Welding
Flash Welding

Process Table C - Laser Welding

Nd YAG
CO2
DIODE
Wire Fed

Process Table D - Solid State Welding

Inertia Friction Welding
Direct Drive Friction Welding
Friction Stir Welding
Flash Butt Welding
Resistance Butt Welding
Ultrasonic Welding

These Process Tables contain requirements for:

1. Management Responsibility & Quality Planning
2. Floor and Material Handling Responsibility
3. Equipment / Facilities/Controls
4. Tooling/Fixturing
5. Process Controls and Confirmation
6. Essential Variables

The Process Tables specify the tolerances of process parameters and the frequencies for checking process control parameters and parts. The Requirements and Guidance in the WSA form will notify the assessor when to refer to the Process Tables.

1.3 Reference

The following standards are used as reference material. There are other reference materials that contain more information, however, the list is not meant to be inclusive. The applicability is limited to the subject matter referenced.

Standard Number	Title	Standard's Organization
ANSI Z 49.1	Safety in Welding and Cutting	ANSI - www.ansi.org
AWS A3.0	Standard Welding Terms and Definitions	www.aws.org
AWS C7.2	Recommended Practices for Laser Beam and Welding	www.aws.org

2 THE WELDING SYSTEM ASSESSMENT PROCEDURE

1. Obtain current copy of *CQI-15 Special Process: Welding System Assessment*, from AIAG.
2. Identify all welding processes to which *CQI-15 Special Process: Welding System Assessment*, applies (see *CQI-15, 1.2*). Record these processes on the WSA.
3. Complete the WSA, determining the level of compliance. A minimum of one job audit (Section 6) shall be performed during each assessment.
4. Address each “Not Satisfactory” item and determine corrective action, including root cause analysis and implementation of the corresponding corrective action(s). The corrective action(s) shall be completed within 90 days. Records of the corrective action, including verification, shall be maintained.
5. “Needs Immediate Action” requires immediate containment of suspect product. Address each “Needs Immediate Action” item and determine corrective action(s), including root cause analysis and implementation of the corresponding corrective action(s). The corrective action(s) shall be completed within 90 days. Records of the corrective action, including verification, shall be maintained.
6. Assessments shall be conducted annually unless otherwise specified by the customer.

3 SPECIAL PROCESS: WELDING ASSESSMENT

Cover Sheet.....	15
Section 1-5	18
Section 1: Management Responsibility & Quality Planning	18
Section 2: Floor and Material Handling Responsibility.....	24
Section 3: Equipment.....	26
Section 4: Tooling/Fixturing.....	27
Section 5: Process Controls and Confirmation	27

Instructions for completing the Cover Sheet

1. Facility Name: Name of the facility being assessed.
One form shall be used for each facility. The facility may have several buildings or physical locations in the same general area. If there is a separate management team or different management system, then these locations shall be considered as separate facilities.
2. Address: The street address of the facility being assessed; P.O Box numbers may be given as additional information.
3. Phone Number: The phone number of the facility.
If there is no common phone number for the facility, the phone number of the Operations Manager or Quality Manager shall be used.
4. Fax Number: The fax number of the facility.
5. Number of Welding Employees at this Facility: The number of employees, salaried and hourly, associated with the welding operation at this facility.
6. Captive Weld Organization (Y/N): Enter “Y” if this facility welds components for their own company. Enter “N” if the company does not weld any components for their own company.
7. Commercial Weld Organization (Y/N): Enter “Y” if this facility welds components for companies other than their own company. Enter “N” if this facility does not weld any components for other companies.
8. Date of Assessment: Enter the date(s) of the assessment. An alphanumeric format shall be used to avoid confusion with different numeric formats.
Example: May 3 – 4, 2010
9. Date of Previous Assessment: List the date of the previous CQI-15 Special Process: Welding System Assessment of this facility.
10. Type(s) of Welding Processing at this Facility: Place a checkmark to designate all welding process(es) performed at this facility. This information determines the appropriate Process Table that shall be used during the assessment. Processes not listed on the cover sheet are not part of the Welding System Assessment.
11. Current Quality Certification(s): The weld organization shall list their current quality certifications, e.g., ISO/TS 16949, ISO 9001. Certifications may be from 3rd party sources or customer quality certifications. If customer quality certification is given, then the year of the last assessment by the customer shall also be given.

12. Date of Re-assessment (if necessary): If “Not Satisfactory” findings were observed from the original assessment, then the weld organization shall address each item and determine correct action, including root cause analysis and implementation of the corresponding corrective action(s).

The date of the re-assessment shall be given here, and the appropriate Question(s) from Sections 1 – 5, in the original assessment, shall be modified to reflect that the evidence, relating to the implementation of the corrective action(s), has been observed. Also, the “Number of Not Satisfactory Findings” shall be modified as appropriate.

13. Personnel Contacted: List the name(s), title(s), phone number(s), and email address(es), if available, of the principal participants from the weld organization.
14. Auditors/Assessors: List the name(s), Company(ies), phone number(s) and email address(es), if available, of the auditor/assessor(s).
15. Number of “Not Satisfactory” Findings: Enter the number of “Not Satisfactory” findings observed during the assessment.
16. Number of “Needs Immediate Action” Findings: Enter the number of “Needs Immediate Action” findings observed during the assessment.
17. Number of “Fail” Findings in the Job Audit(s): Enter the number of “Fail” findings observed from the job audit.

Special Process: Welding System Assessment			
Facility Name:			
Address:			
Phone Number:		Type(s) of Weld Processing at this Facility:	
Fax Number:		Process Table A - Arc Welding	
		Arc Stud/Fastener Welding	
Number of Welding Employees at this Facility:		Flux Cored Arc Welding	
		Gas Metal Arc Welding	
Captive Weld Organization (Y/N)		Submerged Arc Welding	
Commercial Weld Organization		Shielded Metal Arc Welding	
		Plasma Arc Welding	
		Gas Tungsten Arc Welding	
Date of Assessment:		Gas Metal Arc Braze Welding	
		Process Table B - Resistance Welding	
Date of Previous Assessment:		Resistance Spot Welding	
		Projection Welding	
		Resistance Seam Welding	
		High-frequency Seam Welding	
		Induction Seam Welding	
		Mash Seam Welding	
		Flash Welding	
		Process Table C - Laser Welding	
		Nd YAG Welding	
		CO2 Welding	
		Diode Welding	
		Wire Fed	
		Process Table D - Solid State Welding	
		Inertia Friction Welding	
		Direct Drive Friction Welding	
		Friction Stir Welding	
		Flash Butt Welding	
		Resistance Butt Welding	
		Ultrasonic Welding	
Current Quality Certification(s)			
Date of Re-assessment (if necessary):			
Personnel Contacted:			
Name	Title	Phone	Email
Auditors/Assessors			
Name	Company	Phone	Email
Number of "Not Satisfactory" Findings			
Number of "Needs Immediate Action" Findings			
Number of "Fail" Findings in the Job Audit(s)			