Automatic resurfacing system for welding gun detachable nozzle end pieces

EM34.SO.730 /D

Standard

Status Applicable

IMPORTANT NOTE: This document has been translated from French. In the event of any dispute, only the French version is referred to as the reference text and is binding on the parties.

Purpose

— Specify the recommended automatic resurfacing systems for welding-gun detachable-nozzle end-pieces and their integration parameters.
— Define the distribution of tasks between partners (equipment manufacturer, integrator, etc.)

Scope of application

Renault Group

Issued by

65304 - Standard Process Engineering

Confidentiality

Not confidential

Approved by

<table>
<thead>
<tr>
<th>Position</th>
<th>Signature</th>
<th>Application date</th>
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<tbody>
<tr>
<td>J. COANT Head of department 65304</td>
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<td>06/2007</td>
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Foreword

All technical characteristics not specified in this standard must comply with Specifications EP34.SO.730.

A honing system is an electro-mechanical assembly installed in a robotized unit, allowing the working parts of the electrodes used on the robotized welding guns to be shaped by machining (detachable nozzles in accordance with standard EM34.SO.122).

The equipment takes the gun’s operating modes into account:

- Robot-mounted gun: Honing machine fixed on a base,
- Floor-mounted gun: Mobile honing machine with flap.

INIT: Process operation used to determine the geometric reference of the gun (calculates the real wear of the electrodes).
1 Definition and composition of the resurfacing site

1.1 General overall dimensions

The resurfacing system dimensions are specified in a Renault standard CAD (ROBCAD) of the equipment recommended by Renault. The library references are communicated by the Renault DICAP technical expert.

The resurfacing system is installed in such a way as to minimize time losses and hide the cycle time linked to machining or honing.

The execution of the honing cycle determines a volume to be left free around the tool and, as with the system dimensions, affects its installation in the robotized unit.

For balanced guns, the honing head orientation must be chosen according to the average working position of the gun (in order to guarantee the correct balance adjustment during resurfacing).

For unbalanced guns, the installation of the equipment must take the specific trajectory linked to the INIT block into account. This block must be integrated in the resurfacing system.

1.2 Integration of equipment

The robot bay manages the resurfacing system actuators.

The control connections, wiring and automations comply with the standard EM34.EA.130 (see paragraph 4.7).

2 Definition of trajectories

2.1 General rules

The specification EP34.SO.075 specifies the “honing” function incorporated in the resistance welding application.

The creation of the trajectory takes the honing cycle and recommendations defined in the manufacturer’s documentation for the resurfacing system into account. Trajectories must be created with new end pieces. The use of a standard cutter is recommended in order to centre the detachable end pieces as best as possible.

At each change of the detachable end piece, it is essential to perform:

- a resurfacing, before the change, to observe the honing quality,
- a machining operation, after the change, to give the shape of the nozzle (active surface and radius) according to the welding process, the assembly type and the feasibility.

The system is capable of accepting a positioning fault for the end pieces of ± 2.5mm along the X, Y and Z axes.
2.2 Use of balanced guns

Machining and resurfacing must be carried out with the gun in the balanced position.
In order to optimize the service life for electrodes by minimum material removal, in the execution of a resurfacing trajectory, it is necessary to take into account the position of the fixed arm electrode in the indexed position and the mobile arm in accordance with an approach point.

2.3 Use of unbalanced guns

The definition of trajectories must take the resurfacing equipment and robot supplier’s recommendations into account.

In order to optimize the service life for electrodes by minimum material removal, it is possible to start the cutter rotation before and after gun closure (according to equipment configurations).

The trajectory linked to honing must take the additional “INIT” function on the geometric referencing block into account.
### Distribution of tasks

<table>
<thead>
<tr>
<th>WHEN?</th>
<th>WHO DOES WHAT</th>
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</thead>
<tbody>
<tr>
<td>Integration studies</td>
<td>Dept. 65304 Technical Expert</td>
</tr>
<tr>
<td>Assembly</td>
<td>Equipment supplier</td>
</tr>
<tr>
<td>Production Start-Up</td>
<td>Integrator</td>
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</tbody>
</table>

**WHAT**

- **Integration studies**
  - **WHAT**
    - Adjustment and mounting of the resurfacing system on the floor or on a floor-mounted gun support
    - Wiring to the robot bay
    - Wiring to the PLC
    - *Robot-mounted guns*
      - Programming the robot trajectory (according to manufacturer recommendations)
      - *Floor-mounted gun*
        - Flap adjustments (length, stops, etc.)
    - Adjustments - Try-out
  - **WHO**
    - Integrator

- **Assembly**
  - **WHAT**
    - Monitoring the integration (Checking, Testing and Acceptance sheet)
  - **WHO**
    - Integrator

- **Production Start-Up**
  - **WHAT**
    - Shared integrator–supplier monitoring for the Study, Static Assembly and Dynamic assembly (TMP) phases according to the Technical Schedule for Trouble-Free Integration
  - **WHO**
    - Integrator

- **Equipment supplier**
  - **WHAT**
    - Drafting the instruction manual according to EB00.20.600
  - **WHO**
    - Integrator

- **Integrator**
  - **WHAT**
    - Drawing up the list of spare parts defined according to EB15.14.000
  - **WHO**
    - Integrator

- **Integrator**
  - **WHAT**
    - Instruction manual distributed to the plant according to EB00.20.600
  - **WHO**
    - Integrator

- **Integrator**
  - **WHAT**
    - The list of spare parts distributed to the plant defined according to EB15.14.000
  - **WHO**
    - Integrator
4 List of reference documents

NOTE : For undated documents, the latest version shall apply

EB00.20.600 : Industrial machines, facilities and tools. Technical documentation. Structure, content and transmission

EB15.14.000 : TDI: Facilities Breakdown Table. Introductions, Processes and Contents

EM34.EA.130 : Robot bay: Integration of robots in bodywork workshops

EM34.SO.122 : Detachable nozzle end pieces and adaptors for robotized guns


EP34.SO.730 : Functional specifications for automatic resurfacing systems for welding-gun detachable-nozzle end-pieces