REGARDING THE QUALITY OF THE VEHICLE BACKSEAT FRAME ARMATURE RS 60%

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***Abstract**: This paperwork identifies the unconformity from the backseat frame armature RS60% welding of a vehicle, respective the seatbelt bracket position. Causes and fixing that the seatbelt bracket not to be able to rotate around its axis.*
Keywords: Device, welding, armature, bracket, seatbelt, quality.

1. Introduction

The paperwork objective consists of the backseats of a automobile and particularly the backseat frame armature RS60%. Regarding this armature some unconformity and claims appeared from clients' area.

The backseats row is made up of 3 components, suc as:

- Rear seat 40%- RS 40%
- Rear seat 60%- RS 60%
- platform

In the figure 1 the whole structure of vehicle backseats is represented. The backseat armature is made up of 2 elements: backseat and backrest.

Fig.1 The whole structure of vehicle backseats

In the figure 2 the backseat armature 60% with all its components is presented : 1 – sidemember left ; 2- sidemember right ; 3 – backseat tube ; 4 – hardened seatbelt bracket ; 5 – backseat wire ; 6 – front tube ; 7 – isofix wire ; 8 – tether wire ; 9 – right isofix wire ; 10 – interior isofix wire ; 11 – foam support wire ; 12 – exterior seat wire ; 15 – welded net ; 16 – central welded net ; 17 – carpet wire ; 18 – foam support wire.

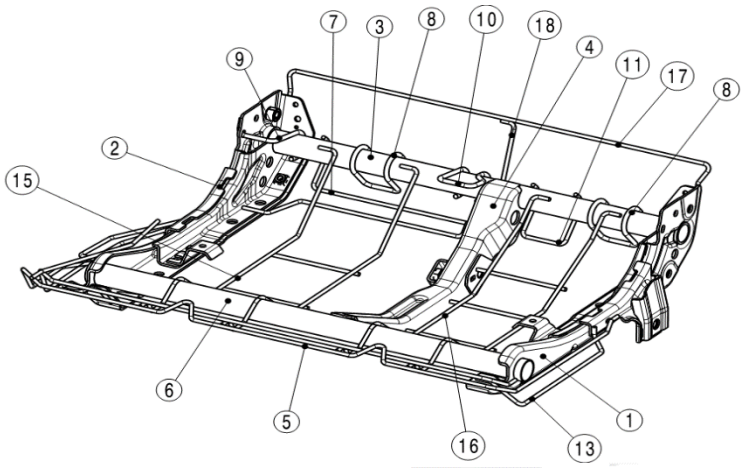

Fig.2 Backseat armature 60%

2. The verifing process presentation

The backseat armature 60% is welded into a robotic area where the operator set the pieces on the welding device and the robot executes the welding straps having the welding straps trajectories already established. The operator from the welding position has a visual aid through which he executes the operations on a well-established order. In the figure 3 the backseat armature on the welding device is presented, the armature has all the components, could be observed also the fixing elements and the areas where the armature is seated.

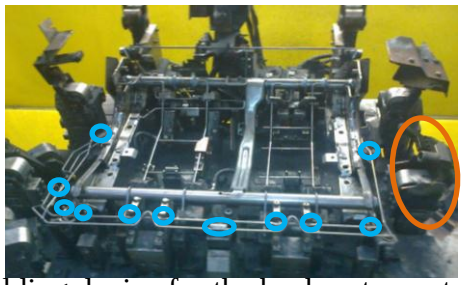

Fig.3 The welding device for the backseat armature 60%

In the figure 4 is presented the place from the robotic area for the backseat armature 60%.

Fig.4 The place from the robotic area for the backseat armature 60%.

There are more types of checkings during the welding process for these kind of armatures:

- the final control for checking the welding straps. On each duty a 100% checking is done for all the armatures in order to verify the welding straps length and to verify the welding straps for porosity, also not to have any irregular forms, to lack some welding points or to present some molten materiel.
- the intermediary control – at the beginning of each duty the initiating of the welding process is done through the 3D measurements of two pieces. The 3D measurements check all the parameters from the component drawing. The measuring s are done with the FARO software.
- the intermediary control is done on the special control layout for this type of armature. Three measurements are done during a shift on the control layout, as seen on the figure 5: at the beginning, in the middle and at the end of the shift. In the case that the piece is unconfirmed, the production is stopped and more adjusters on the welding device are done.

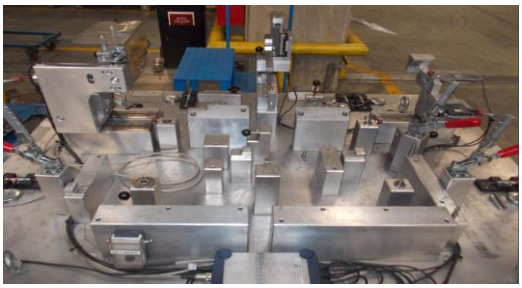

Fig. 5 The control device for the backseat armature 60%

2.1. The identification of the unconformity

One of our client claim is the unconfirmed position of the seatbelt bracket, the client is accusing a bigger angle for the seatbelt bracket fixing. It was found a structure with a seatbelt bracket angle of 37° instead of 34° as seen in figure 6. After the 3D measurements the client claim was confirmed.

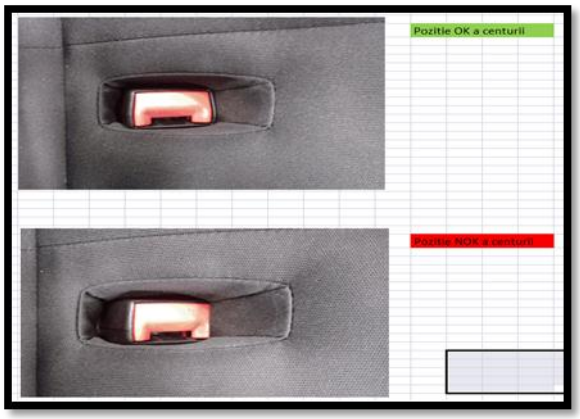

Fig.6 The OK and NOK of a seatbelt

In the figure 7 the execution drawing of the seatbelt bracket hardened subsystem is presented. It is observed that the angle for the seatbelt bracket fixing is 34°. Through this study the root of this unconformity is determined.

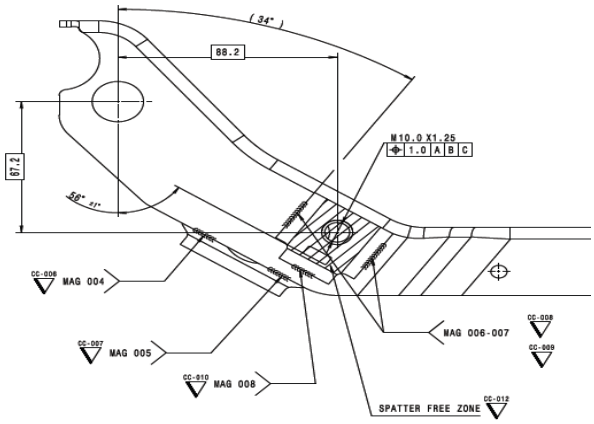

Fig.7 The execution drawing of the seatbelt bracket hardened subsystem

2.2. The quality checking of the client flaw claim

The control devices with which the armatures checking are done are fitted with some visual helpers named ODS (Operation Description Sheet). These visual helpers have a register number and contain the detailed description of each operation.

- **The operation – getting ready for the control device**

All seals must be opened and the devise surfaces where the piece is laid on must be clean.

- **The operation – the 60% seat armature set and lock on the control device.**

The piece must be in contact with those 3 device control surfaces. The piece is sealed with those 3 seals.

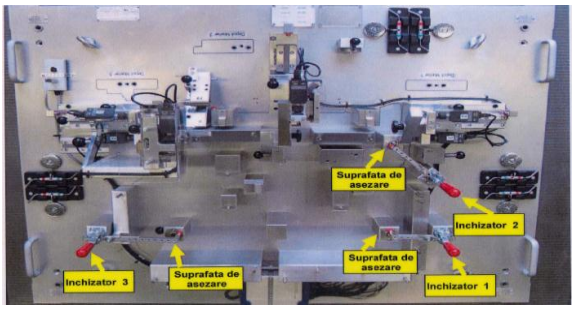

Fig. 8 Visual helper for the set and lock of the 60% backseat armature

- **The operation – the control aids presentation**
  - Control pin P
  - Control pin P2
  - Control pin P11
  - Control pin P14
  - Control calibre P7 T/NT (Ø3 Trece/ Ø7 Nu Trece)
  - Control calibre P12 T/NT (Ø3 Trece/ Ø5 Nu Trece)
  - Control calibre P13 T/NT (Ø3 Trece/ Ø6 Nu Trece)
  - Mitutoyo Sensors

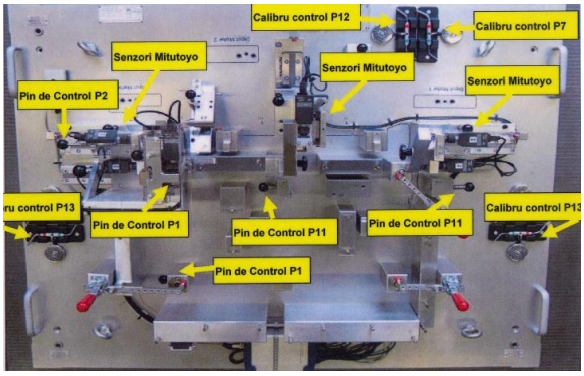

Fig.9 Visual helper with control aids

The operation – the M10 x 1.25 screw nut position verification

The P11 T/NT control pin will be used. In the figure 10 the visual helper for the M10 x 1.25 screw nut position verification is represented.

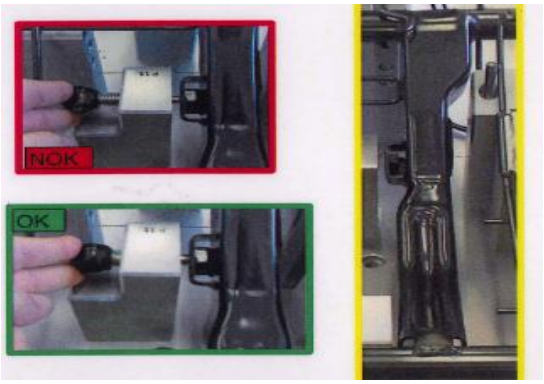

Fig. 10 Visual helper for the M10 x 1.25 screw nut position verification

3. Conclusions

After this study it was found out that the welding device was the main cause for the unconformity. Through a detailed analysis it was concluded that the welding device allowed the seatbelt bracket to rotate around its screw nut during its laying down on the welding device ,figure 11.

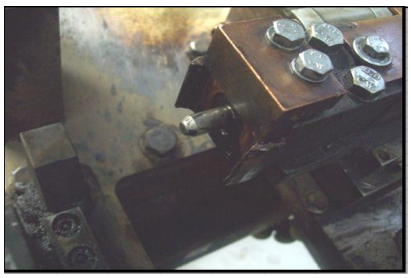

Fig.11 The alignment device for the seatbelt bracket.

After the analysis, an improvement for the bracket fixing on the welding device was proposed, in this way the seatbelt bracket won't be able to rotate around its axis. This was replaced with a new fixing element which doesn't allow the seatbelt bracket to rotate,figure 12.

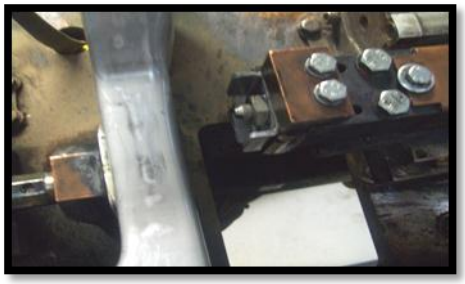

Fig. 12 The improved welding device

For this client claim, it was reached the conclusion of the upgrading with a new control layout which verifies only the seatbelt bracket stiffening and its out of shape.

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