

TECHNICAL EXPERTISE FOR THE ARM ASSEMBLY OF THE CUPS- HOLDER WHEEL FROM COAL EXTRACTION MACHINE

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ABSTRACT: In this paper we present the technical state in which the first section of the cups-holder wheel arm assembly (elinda) of a coal suction machine, is found following the technical expertise. The rehabilitation to which the whole mechanism will be subjected will be done by carrying out the intervention works that will restore to the normal operating parameters both the structural and the functional part. The paper presents: the modalities of verification of section I as well as the proposed technical solutions for its rehabilitation.

KEYWORDS: equipment, coal, modernization, interventions.

1.INTRODUCTION.

The arm of the cups-holder wheel is part of the large components of the coal extraction machine from the deposits of coal. The machine is part of the machinery family in the coal households at the Turceni power plant. The machine is intended for the unloading of solid fuel deposits, having the technological role of taking the solid fuel from the stacks and depositing it on a conveyor belt for transfer to the bunkers that feed the coal mills with fan. The coal mills with fan spray the crushed coal in the boiler furnace in the thermoelectric power plant. The arm of the cup-bearing wheel is moved through the lifting-lowering mechanism.

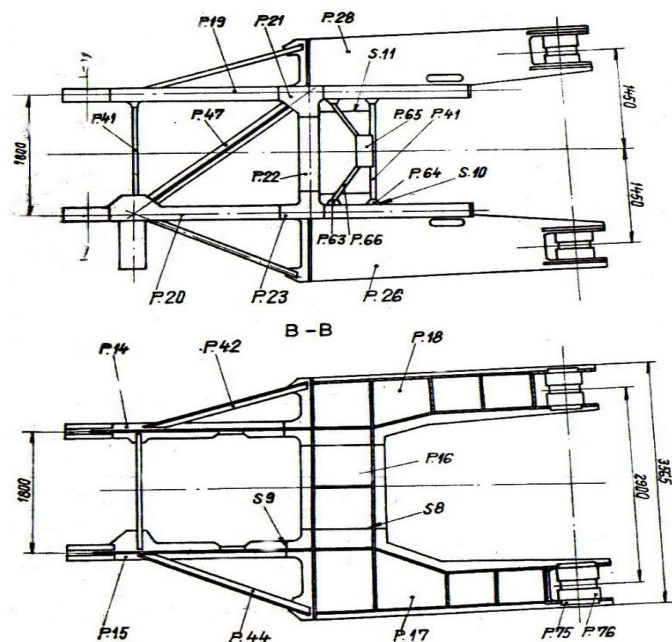


Fig.1. The arm of the cups-holder wheel

The lifting-lowering mechanism has the role of raising or lowering the arm of the cup-bearing wheel with the help of the cable that wraps respectively unfolds on two reels [1]. The arm of the cups-bearing wheel contains: the metal construction of the arm; guide parts for the conveyor belt; cable suspension system, arm extension.

The arm assembly of the cups-holder wheel is composed of section I which is attached to the rotating platform of the coal extraction machine, fig. 2, side view, which is assembled with section II by means of IP (IR) screws and eclipses and the wheel support console. The unitary presentation of the 3 subassemblies is imposed by their functional role as well as by the unitary mode as they are placed on the machine.

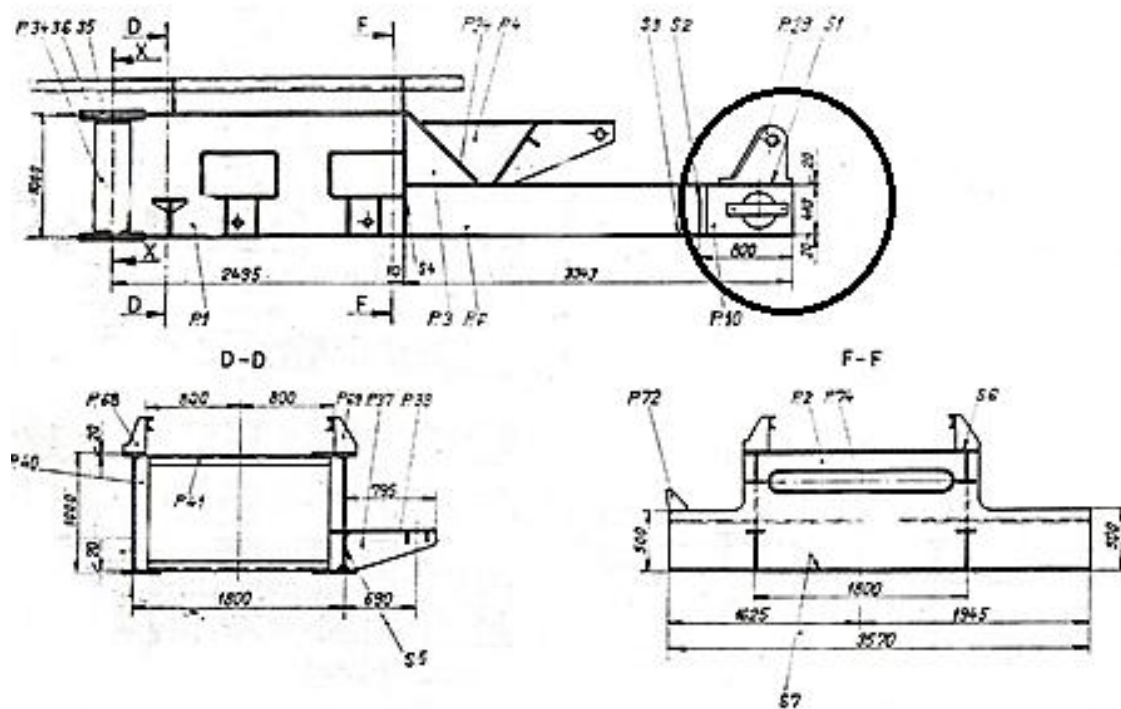


Fig. 2. The arm of the cups-holder wheel, lateral view

The expertise and controls were aimed at the entire metal construction, the joints between these subassemblies through pretensioned IP (IR) screws and the welds end to end from the soles of the "I" shaped construction, "strap - sole - strap" joints on the sole and heart of these joints.

In this paper presents the non-conformities that were found in the first section of the arm of the cup-holder wheel as well as the technical proposals for rehabilitation.

2. NON-CONFORMITIES OF SECTION I

Before starting the repair, the checks for the "M5A coal extraction machine" are performed - whose capacity is 1200 t / h, in an area adjacent to the place of operation, at the end of the line with the belt conveyor, machine is removed from voltage, and the area must be surrounded and signaled.

The arm of the cup-holder wheel shall be positioned at an angle of 90° or 45° to the axis of the

conveyor, and the balance arm to the access path from the outside of the conveyor or to the interior between the unloading path and the conveyor. On the metal construction (the part circled on the overall drawing, fig.2), fig 3.a, with detail in fig.3.b, a profile was welded to fix an auxiliary construction.

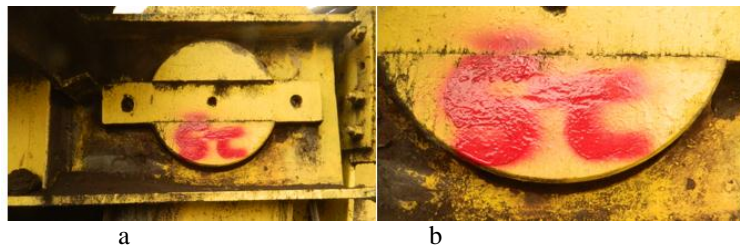


Fig.3. Check the section on the left side, the area of the bolt and the clamping ears.

For this area of section I, the necessary rehabilitation work will have to include: ear removal; welding polishing; control with penetrating liquids. It is necessary for the replacement of the 4 clamping ears to be made following a new project, as soon as possible. It is worth mentioning that in this area the wear is between 16-19mm.

It was also found that the safety of fixing the bolt of the hinge joint on the left side is fixed with welding points, which is why the following works are needed for the repair of this subassembly: disassembly of safety; disassembly of the bolt (specific technology), check the bolt, the execution drawing for the manufacture of a new landmark, bolt execution and reassembly according to the documentation.

A detailed technical presentation of the arm of the cup-holder wheel, section I, is shown in Fig. 4. In addition to the execution drawing of the bolt (pos. 1, fig. 4), they are required the execution drawings for: the catching ear (pos.2, fig.4) and the bushing (pos.3, fig.4).

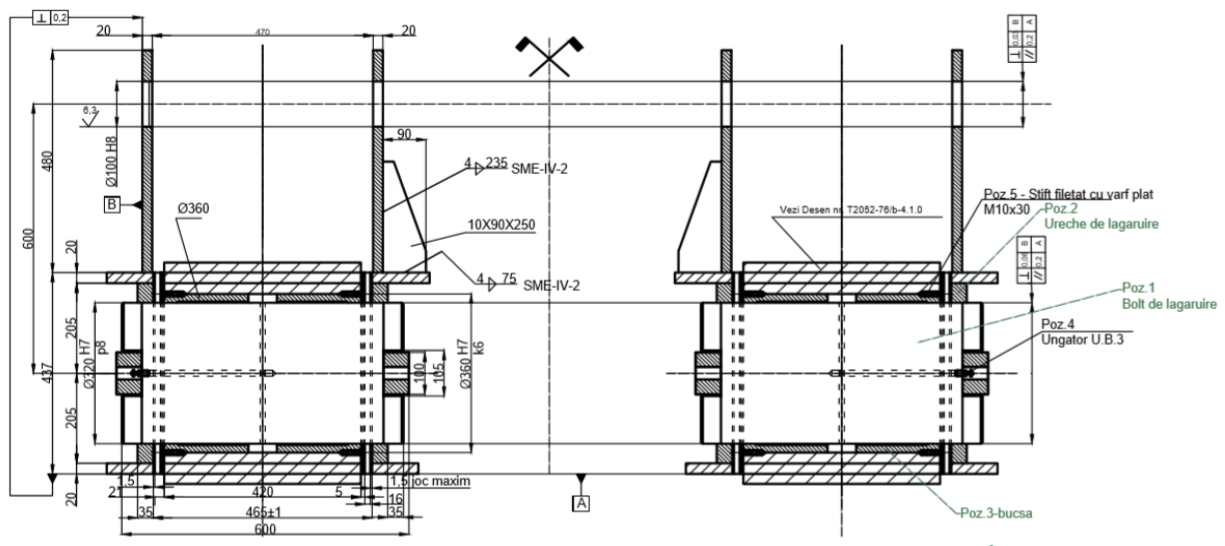


Fig. 4. The subassembly: metal structure-ear-bolt-bush.

On the right side, the locking bolt of the hinge joint is missing, (pos. 75, fig. 1) and the clamping screws are broken into holes, fig. 5, a.

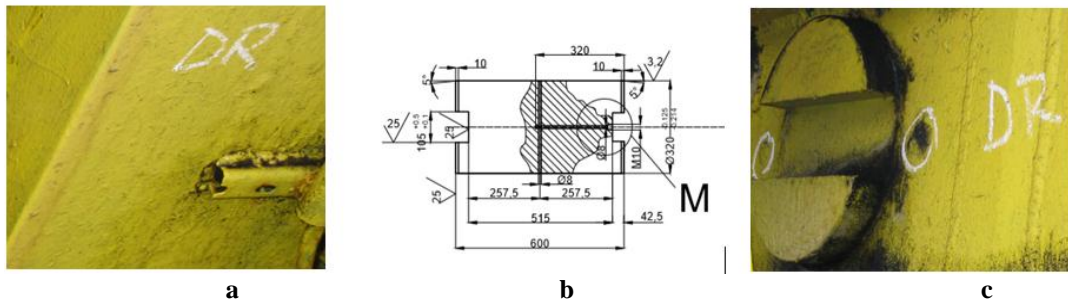


Fig.5. Checking the right area of section I.

Rehabilitation work required on the right side of the wheel arm will be: disassembly of the bolt (specific technologies and execution drawing, fig.5.b); bolt verification and safety execution; replacement according to documentation. On the metal construction of resistance were welded profiles for the metal garments to support the components of the electrical installation, fig.5 c.

The clamping ears (pos. 29, fig.1) on the inside right side, fig.6.a, respectively the inside left, fig.6.b, they have pinches on the outer contour.

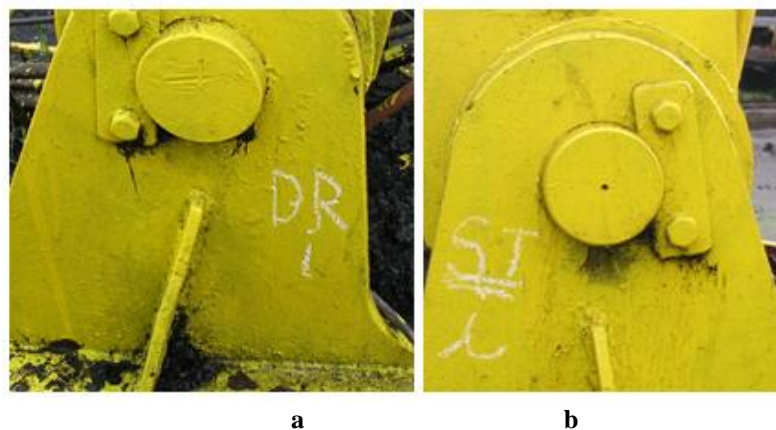


Fig.6. Defects of the clamping ears

It is necessary to grind, on the contour as well as in the welding area on the sole, all four ears after which the welding control is performed.

At the safety on the bolt (pos. 75, fig1) (right inner wall, fig.7.a and left inner wall, fig.7.b) the fixing screws in the threaded holes are broken and the bolts are locked and to rotate together with the arm of the cup-holder wheel.

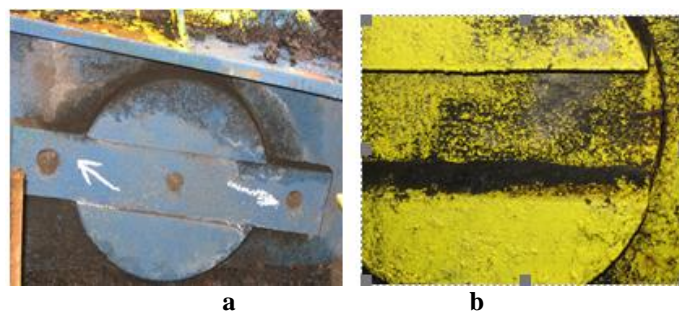


Fig.7. Defects in the safety area of the bolt

Here it is necessary to make a depression of the bolts, machining the bores, enlarging the threaded holes and possibly replacing the bolts if after disassembly it will be found that they are worn. At the heart of the metal construction in the arm of the cup-holder wheel have been practiced holes with oxyacetylene flame, as seen in fig. 8. a, b and c.,in order to be able to draw a conclusion on its state.

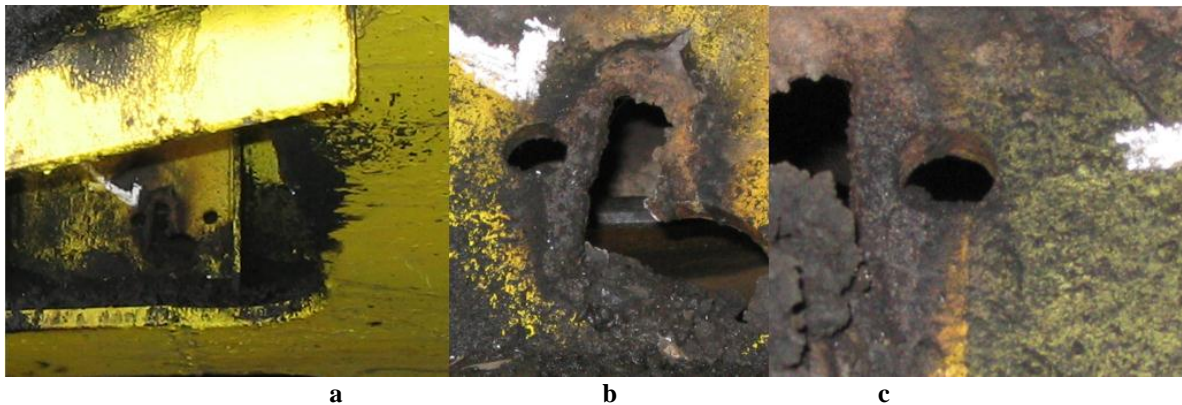


Fig. 8. The welding holes in metal construction.

The rehabilitation works required for the metal construction are complex and will be carried out according to the specific technologies for rehabilitation - repair.

On the lower sole of the arm (pos. 16, fig. 1) they were welded metal profiles, currently removed, fig.9. a, and in the bore area on the right side, also welding cords are observed, fig.9.b.

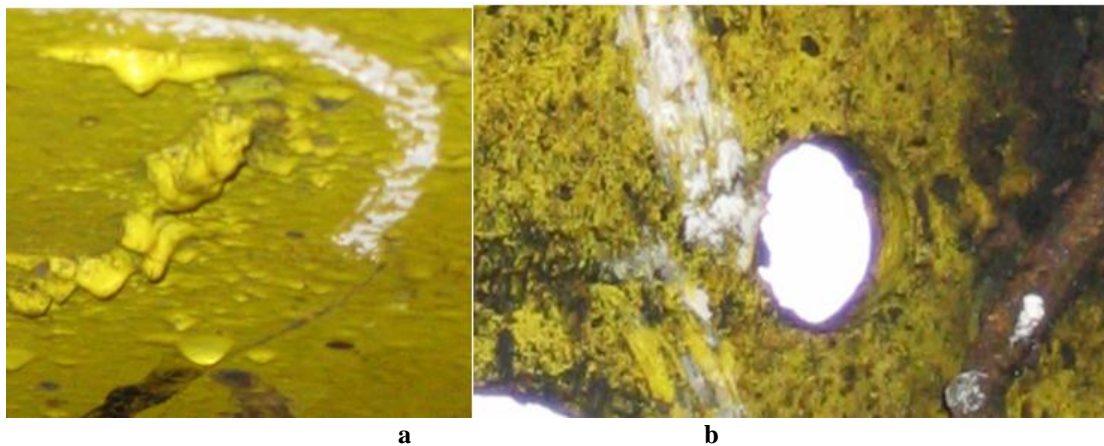


Fig.9. The welding cords made on the lower sole of the arm

The rehabilitation works required in this area are: removal of the welds by grinding and control with penetrating liquids throughout the affected area. It may be necessary after the control to replace significant portions of the metal construction.

3. CONCLUSIONS

After the technical expertise of the wheel arm with cups were registered several defects, all of which will be analyzed technically to perform the repair of the assembly.

In the work were presented together with the registered non-conformities and proposals for

rehabilitation, technical solutions to remove the non-conformities.

During the repair, during the disassembly, if you notice much deeper damage to your ears, pins and bushings, then it will be necessary to perform the following repair steps: urgent disassembly of the bolts (their diameter being Ø320mm, fig.5.b) according to their documentation and control; dismantling the joint as soon as possible and replacing the ears; restoring the lubrication system with the greasers outwards; replacing damaged or missing fuses with new ones to which the welded stops are added and executed.

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