

ASCERTAINING THE TECHNICAL STATE OF THE "TRIPOD" ASSEMBLY OF A MINING EQUIPMENT - PART I

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ABSTRACT: In this paper are presented the methods of ascertaining the technical state of a mining machine and their method of application. Taking these methods into account, the technical expertise of the tripod support assembly of a coal extraction machine is presented. After performing the technical expertise, there are presented the found defects. The rehabilitation to which the assembly will be subjected will be done by the workmanship of the intervention work that will bring back to the normal operating parameters both the structural and the functional part.

KEY WORDS: mechanism, expertise, coal extraction machine

1. INTRODUCTION

For repairing the industrial machines and machines, several preliminary repair steps are required. These stages include: expertise of the machine or machine to be repaired; - carrying out the technical project necessary to repair the machine (technical details as well as economic details, deadlines established, etc.).

The preparatory operations that are necessary for the repair of the machinery and mining installations are: receiving the equipment for repair, preliminary washing the machine, disassembling, cleaning and washing the parts after disassembly, finding defects of the disassembled parts and recording, revealing the defective parts and redesigning them.

The preliminary washing the machine is a necessary operation especially for those working in the open air (it is necessary for the removal of coal dust and other deposits), it being executed with cold or hot water at pressures of (5 ... 10) 102Pa [1].

2.METHODS OF ASCERTAINING THE TECHNICAL STATE OF THE TOOLS

The technical state of mining machines and machines is ascertained by several methods, namely:

Method of examinations - through which verifies the technical state of the machines and the machines, observing their operation. This is done by the specialized personnel and the operator working on the machine, without stopping the machine.

- Method of measures - by which

- measurements are made on certain component parts of the machine, the machine that is compared with the data in the technical book, the data of the execution drawings, the data from the standards, establishing their degree of wear. In order to apply this method, it is necessary that some assemblies, sub-assemblies of the machine be dismantled [2], [3] and [4].

Special measurement method - consists of measuring special parameters of the machine, such as: vibration, temperature, noise, working speeds, various pressures, etc. In addition to these methods, in the case of machine tools in the machine building industry, there is also a method of detecting defects, namely the test method. By this method, measurements are made on the part that is executed on it and the deviations presented on the piece are found. The deviations of the part that exceed the deviations prescribed in the execution drawing reflect the high wear of the machine

(for example: the wear of the guides of a lathe, the wear of the work table of a mill, the radial and axial beating of the main shaft of a lathe, etc.).

3. EXPERTISE OF THE SUPPORTING TRIPOD FROM A COAL REMOVAL MACHINE

The support tripod is an assembly that is part of the metal construction of the coal pick-up machine along with the armrest wheel, tie rod I and tie rod II, the horizontal control device, the rotary platform and the balancing arm. The sub-assembly being placed on the running and running mechanism of the car supports the entire upper construction and as a result of its importance, a greater attention was given to the technical expertise on it. The supports A and B are assembled on the tripod with the help of the IR preliminary strained screws from gr. 10.9. The latter presents a series of non-conformity which is why they must be removed in the process of repair that will follow. The sketch of the support tripod is shown in picture 1.

The non-conformity area are presented in the pictures that will follow along with the related observations, but also with the intervention mode for bringing the sub-assembly under normal conditions and for safe operation.

The restoration and completing of the welds, picture 1.a, will be done with the car suspended on the presses at the special lifting

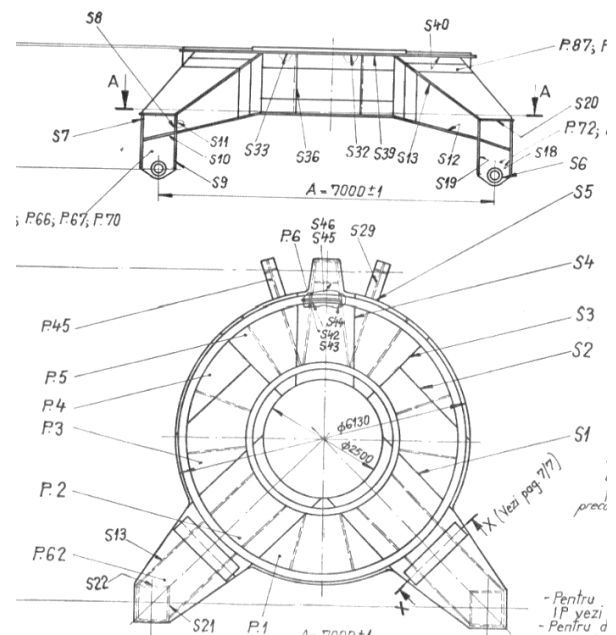


Fig.1. Sketch - support tripod



Fig.2. Bottom plate - welding defects.

points provided in the construction of the car, the polishing with the radius of the corners at the boxes and / or sheet marks, picture 1.b. In order to be able to easily identify defects and / or non-conformity parts of the components of the tripod, they were painted red.

All X-welds on the lower plate were controlled and did not have defects in the weld, the control was performed with ultra sound (US) and fluids. At the welded plate - position 6, S45, S46

(picture 2), serious welding findings were detected, picture 3.

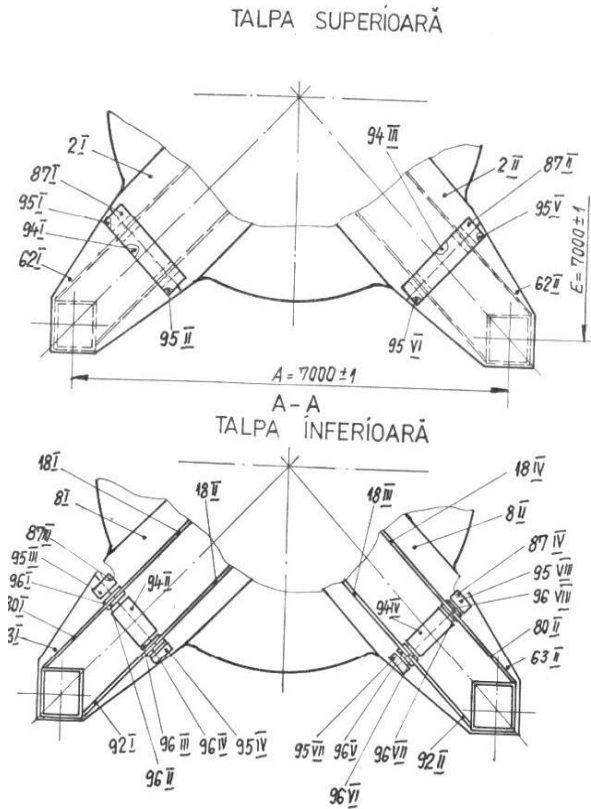


Fig. 3. Upper sole and lower sole – tripod

that the paint may be removed from the coal that falls from the conveyor and rolls over the assembly area until the intervention.

In order to repair these defects, a press fitting will be performed under the bottom plate.

At the side walls and the base plate (fig. 6), the screws have lengths that do not come out of the nut 1.5-2 turns or are weakened, this being determined by testing by transverse impulse on the axis of the screw with the hammer and the answer ball. On each wall are about 25-30 pieces to be replaced.



Picture 5 - face support - upper sole.

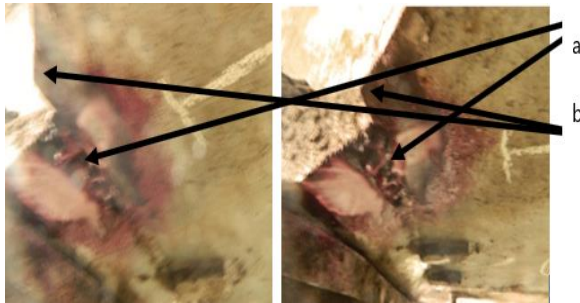
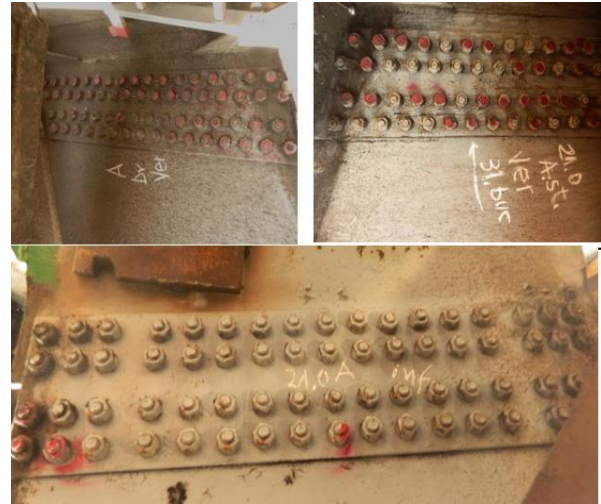


Fig. 4. Defect plate-position 6 (S45 and S46)

At welded plate - position 6, S45, S46 (picture 3) serious weld defects were detected, figure 4. Here you will urgently intervene to restore the weld. After welding, the corners a and b (fig.4) will be polished to the left and right with a certain radius. At the front bearing (A top plate - picture 5) the clamping screws were checked and it was found that all of this and the glazing are severely affected by rust and abrasive wear. The screws and plate were painted red but it is possible



Picture 6. Side walls and base plate

After replacement, all screws will be tested with the torque wrench. Also, it will adjust the corners of the boards that exceed the slabs and will remove the welds and plates on the welded CM without the technical logic and which do much damage to the structure.

The screws used in the connection between the supporting skeleton (claw

beam) and the supports in points "A" and "B" were checked on the coal side of the deposit, the screws being subjected to impulse vibration testing.

After the control it was found that most of the screws are short (the screws have lengths that do not come out of the nut 1.5-2 turns) they have been painted red and need to be replaced.



Picture 7. Checking the screws used in the connection between the support skeleton and the tripod supports

The IP (IR) screws on all the sub-assembly joints were tested according to the procedure. From the last detail photos are observed, more clearly how short they are and do not correspond to the mounting regulation C 133.

The replacement will be carried out step by step, by replacing each screw and tightening up to 100% (with the passage through 70%, the break and then 85%, pause and finally 100%). It will not be passed to the next screw until the primary corrosion protection will be carried out by priming, testing at 1.1 Mtn and final corrosion protection (painting).

CONCLUSIONS

The analyzed sub-assembly, the coal miner tripod needs some urgent

repairs, namely: a - cleaning the interior of the support tripod (beams with claws).

b - making and mounting the closing lids and introducing the electric cables through specially arranged places provided with cable glands.

c - remedy of the 3 welds with defects at the ends on the lower plate, when the temperature weather permits it. d - removal of welds and welded parts on the bottom plate that were incorrectly executed.

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