

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

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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

As presented in the first part, the supporting tripod is the 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.

### 2. EXPERTISE OF THE SUPPORTING TRIPOD FROM A COAL REMOVAL MACHINE

On the lower plate of the tripod, the water drainage holes in the tank were executed with insufficient care, which led to the deformation of the limiting support of the oscillation. For this reason, it is necessary to design in the best areas some boreholes for drainage of the rainwater with extension from the pipe and the remediation of the existing ones, fig. 1- position 1.

For the support for limiting the oscillation of the beam from the support "C", picture 1- position 2, it is necessary to bring the initial form by straightening. It is also necessary to clean the interior of the carbon and metal oxide residues and

to protect against corrosion. Where cleaning cannot be performed with metallic luster, it will be cleaned by hammering and removing the oxide layer and then it will be protected by paint with the role of inhibitor and subsequent protection.



**Fig. 1. Leak holes on the bottom plate:  
1-drainage holes; 2- limitation bearing ;3-ray  
connection**

For the parts of the parts whose connection radii have not been adjusted, picture D-position 3, after welding these

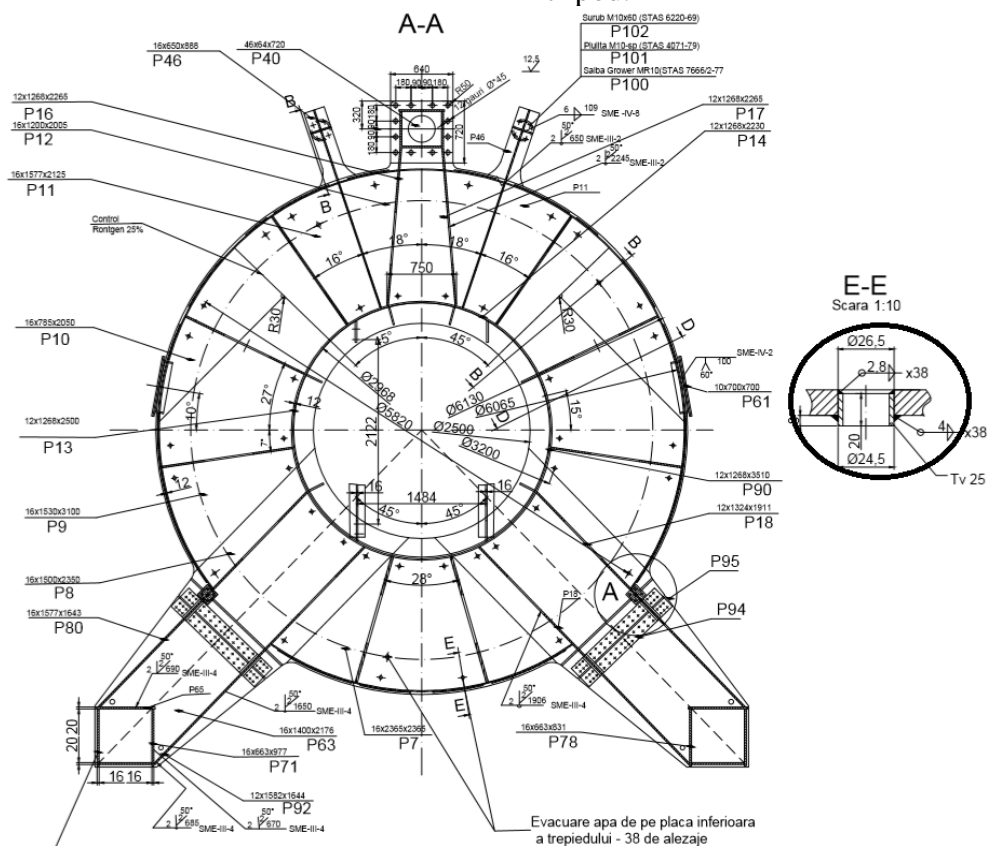
areas will be required. In some places, the pluvial water drainage holes were made very close to the resistance welds, which negatively affected the metal construction, and some welds for various needs were not executed correctly on lower plate and near the butt welds, all of which negatively affect the basic structure of the machine.

It is necessary to design and restore the affected areas followed by the control with penetrating liquids and ultrasound of the areas adjacent to the old and new welds.



Picture 2. the wrong workmanship of the rainwater drainage holes.

The arrangement of the drain holes is shown in picture 3, 38 bores are carried out on the lower plate of the tripod.



Picture 3. The correct arrangement of the 38 rainwater drainage holes.

The project will also include the area with the hardening plate and connection beams mechanically processed, with welds controlled with penetrating liquids (ultrasound), fig. 4.

The radii of connection of the reinforcement attachments shall be at a distance of at least 35 mm from any point of the current cutting.



Picture 4. Cuts in the lower plate.

The holes previously carried, depending on the location, will be reinforced by circular plating and mechanically chosen until the disappearance of the

concentrating points given by the oxygen-gas flow. Another flaw was that the tripod support on the welded "A" rolling mechanism deviated to the mounting.



Fig. 5. Tripod support on the rolling mechanism „A”

In this case, what requires the design of a straightening solution so that the soles are collinear by providing additions over a length of minimum 150 mm to correctly take the efforts in soles and welds.

Prior to the intervention a cleaning of the area with metallic gloss is required with the polishing to clean the welds so that the equalization plates can be correctly placed.

The area that cannot be cleaned will be protected with paint, and before the intervention will be carried out a control with penetrating liquids of the area. Also serious defects of the welds were also found on the lower and upper plates of the tripod, fig.6. For these failures, the polishing and control with penetrating liquids of the welding areas and the restoration of the welds will be required, and the cuts to be executed will be controlled by concentrating parts and possible exfoliation of the plates after which they will be protected against corrosion against oxidation. The joints with slabs on the cutting area and on the grinding wheel with the thickness slab will also be checked because during polishing the vibrations can remove the paint and oxides and additional information can be obtained during the repairs in order to complete a quality repair of the areas.

Regarding the upper plate of the tripod in the support "A", the upper junction plate will be replaced.

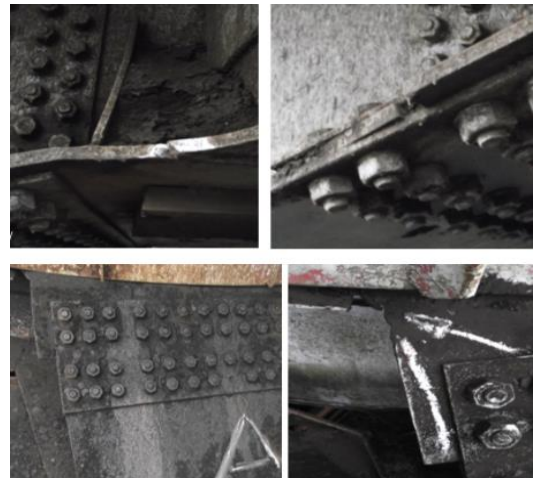


Fig 6. Defects on the lower base plate and upper base plate

On the upper and lower plates of the tripod a thickness check was also made, picture 7, to see if they were degraded, in time, by oxidation.



Picture 7. Thickness control of tripod plates

Detail on the Sonatest ultrasonic thickness gauge screen, Picture I, indicates that the plate thickness is 14.58 mm, which means that it falls within the STAS deviation of 0, 40 mm for the thickness  $g = 15$  mm.

The welding control on the lower and upper plates was performed on 15-20% of the lengths of the butt welds in "X" on all cords, without any welding defects. At the ends of 3 defective welds of incomplete shape and welds appeared, they will be remedied as soon as possible. If the beneficiary has availability of qualified workforce (welder and repairman or machinist), the expert is available to assist in repairing these

welds in a short time, when the weather conditions are favorable.

### 3. CONCLUSIONS

As urgent points of the planned repair are specified:

- Remediation of rainwater drainage holes from the upper plate, but especially those on the lower plate (inside the garment) and providing them with pipe extensions that direct the water without extension on the metal construction of resistance.

- The provision and execution of holes in the same conditions previously mentioned for the support supports noted "A" and "B", but also in the extension of the beam supporting the spherical support.

- Cleaning and applying the corrosion protection of the entire sub-assembly including the lower plate inside the sub-assembly.

Regarding the maintenance of the tripod sub-assembly, we specify:

- It is forbidden to carry out any intervention on the metallic structure regardless of whether it requires or is collateral without a project approved and issued by the welding specialist or an engineer of TCM specialty with the visa of an authorized specialist.

- Dismantling of the visiting covers is allowed only with the follow-up and control of their correct installation by the one who issued such a disposition from times that would be the decision level.

- The **yearly** control by an authorized specialist with an appropriate training through a **technical expertise** of the welded structure, taking into account the year of manufacture, the exceeded service life and the conditions of concrete operation and maintenance.

- The yearly inspection will be completed with an expert report registered and dated at SE Rovinari main office and will be distributed to the compartments; technical, coal storage, repairs and investments.

### 4. REFERENCES

1. Constantin, M , ș.a. – Asamblarea întreținerea și repararea mașinilor și instalațiilor, Editura All, București, 2002
2. Cîrțină Liviu Marius, Stăncioiu A., **Rădulescu C** - Aspects regarding expertise of the orizontalization device of command cabine of the coal mining machine - Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.111-114, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/18\\_LMC~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/18_LMC~1.pdf)
3. Cîrțină Liviu Marius, **Rădulescu C.**, Stăncioiu - Aspects regarding expertise the mechanism of riding of elinde from the coal extraction machine A- Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.115-118, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/19\\_LMC~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/19_LMC~1.pdf)
4. **Rădulescu C.**, Cîrțină L.M., Stăncioiu – Aspects regarding the expertise of lifting-descent mechanism platform of a coal extraction machine – Part I - Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.149-152, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/26\\_CRA~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/26_CRA~1.pdf)
5. **Rădulescu C.**, Cîrțină L.M., Stăncioiu – Aspects regarding the expertise of lifting-descent mechanism platform of a coal extraction machine – Part II - Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.153-156, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/27\\_CRA~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/27_CRA~1.pdf)
6. Stăncioiu A., Cîrțină L.M., **Rădulescu C.** ASPECTS RELATING TO EXPERTISE OF THE MAST COAL MINING MACHINES – THE FIRST PART -- Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.167-170, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/30\\_AST~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/30_AST~1.pdf)
7. Stăncioiu A., Cîrțină L.M., **Rădulescu C.** ASPECTS RELATING TO EXPERTISE OF THE MAST COAL MINING MACHINES – THE FIRST PART -- Confereng 2018, Analele Universitatii „Constantin Brancusi,, din Targu-Jiu, Nr.1/2018, pg.171-174, ISSN 1842 – 4856 - [http://www.utgjiu.ro/rev\\_ing/pdf/2018-2/30\\_AST~1.pdf](http://www.utgjiu.ro/rev_ing/pdf/2018-2/30_AST~1.pdf)
8. Dumitru Sfirloaga, Victor Arad, Rădulescu Constanța - Ways of realization of coal deposits - Fiabilitate si Durabilitate - Fiability & Durability No 1/ 2018, pag. 220-223- Editura “Academica Brâncuși”, Târgu-Jiu, ISSN 1844 – 640.