

## TECHNICAL EXPERTISE OF THE ROTARY PLATFORM - ASSEMBLY OF THE COAL EXTRACTION MACHINE - T2052

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**ABSTRACT:** In this paper presents the technical condition of the rotating platform for coal extraction machine- T2052 , following the technical expertise. The rehabilitation to which the “rotating platform” assembly will be subjected will be done by executing the intervention works that will bring back to the normal operating parameters both the structural part and the functional part. The paper presents the verification methods of the assembly as well as the proposed technical solutions for its repair.

**KEY WORDS:** expertise, coal extraction machine, rehabilitation

### 1. INTRODUCTION

The coal extraction machine - T2052, is part of the family of equipment from the coal households thermal power plant the Turceni, this being intended for the discharge of solid fuel deposits.

The largest component parts that are part of the analyzed equipment are: cups wheel; rail travel mechanism; the infrastructure; the superstructure with pivot mechanism; the arm of the wheel with cups and the forearm with lifting-lowering mechanism.

In this paper presents the technical expertise on the element of the component element called the rotating platform. Here are presented the technical non-conformities found, but also a series of indications and solutions for solving them.

### 2. EXPERTISE „ROTARY PLATFORM „

The rotating platform is part of the

superstructure with pivoting mechanism of the machine.

The upper part of the machine construction is padded by the lower part by means of the pressure and rotation bearing, so that it can pivot, being provided with a pivoting mechanism with electric drive which is in turn provided with an overload limiter.

The superstructure is composed of: metal beam, rotating platform, inclined arm, support pole, tie rod, ballast box and platform for lifting mechanism.

The rotating platform is the subassembly that supports and is part of the superstructure, being of the welded caisson type, fig.1.

On the platform will mount the metal beam, the tilted arm and

the balance system which consists of the pole, tie rod, ballast box and the platform for the lifting mechanism of the metal beam, which together with the lifting cable and the safety leash ensure the balance of the machine.

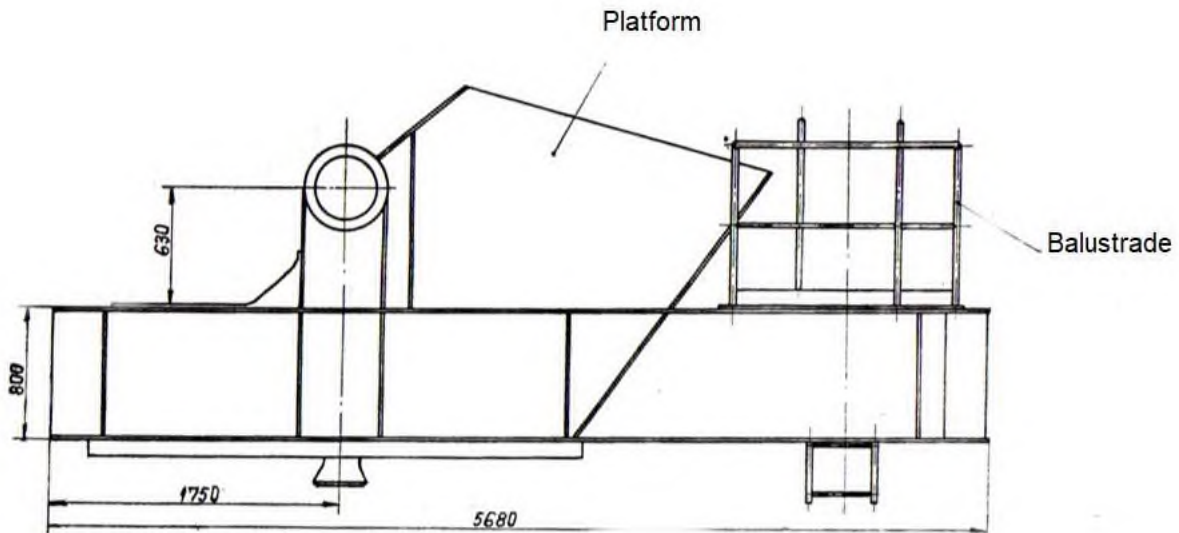


Figure 1. The structure of the rotating platform

On the turning platform is mounted the rotation mechanism but also the mast with the two tie rods I and II that form the skeleton of the metal beam and the inclined arm.

## 2. NON-CONFORMITIES AND REHABILITATION PROPOSALS

Following the technical expertise, a

series of non-conformities were found concerning the rotating platform.

The supports for lifting the superstructure in order to replace or check the bearing were welded on the platform's mantle and it was debited impermissibly from the platform sole in all four corners of the platform, this being highlighted in the photos in fig.1.



Figure 2. Nonconformities in marked areas.

After an operation of the machinery for approximately 33 years, the thickness of the rotating platform material was analyzed, which was being subjected to an ultrasonic

control. At this type of control it was used an ultrasonic apparatus of measuring Sonatest thickness.



Figure 3. Wear of the screws in the joint area of section II with section III.

Following the measurements performed at the metal construction where the thickness of the material was according to the documentation of 20mm, there was found an uneven degradation up to 18.6 mm, of 7% by oxidation, which is above the limit of 5% appreciated as admitted at mining equipment for taking over coal warehouses (the influence being due to the presence of sulfur), figure 2.

As a rehabilitation proposal, it is imposed to cladding to hardening the metal

construction in degraded areas. An ultrasound control was also done on the jointing heart between the platform and the balancing arm. Here was found non-uniform a degradation from 16 mm to 14.83 mm, which means a process of oxidation of the material of 7.32% by oxidation, this percentage being above the allowed limit of 5%, figure 3.

And here, as in the previous case, the cladding was imposed to strengthening the metal construction in the degraded areas.



Figure 3. Material thickness control at the joint core between the platform and the balancing arm.

The measurement included only the strongly affected area in the accumulation area of coal dust which is containing sulfur and in dampness conditions, ensue a weak mixture of hydrogen sulfide, a strong oxidizer of steel. Another non-conformity was found following the control of the prestressed screws in gr. 8.8 and 10.9. This shows that a part of the screws no longer ensures a tightening to ensure the correct joining of the eclipse between the platform and the balancing arm, fig.4. Here it is recommended to tighten and / or them replacement as urgent.



Figure 4. Screw control on the platform sole

The control of the pretensioned screws it was also extended when gripping the balancing arm on the rotating platform, figure 5, where it was found that 5% of the screws showed weakening and vibration during the test. For this reason it is recommended to replace them 100%.Fig.5. Screw control when balancing arm on the rotating platform

Welds were performed on the upper sole - this being strongly corroded. Adjustment and plating for stiffening are recommended.



Figure 6. Nonconformities - lower sole

Strong corrosion of the platform inside, in the area of the right bearing-fig.7. The presence of water is observed,

It is recommended to clean and remaking the anticorrosive protection. It will be practiced stiffened drain bores and drain nipples.



Figure 7. Corrosion inside the platform  
Crack in the resistance metal construction, fig.8. Urgent remediation by specific technologies is needed. Here a great care must be to the welding temperature, the admixture materials and the qualification of the welders.



Figure 8. Nonconformities - strength metal construction

Oxy-gas adjustment of the eclipses in the joint with IR screws and strong corrosion of the joint.



Fig. 9. Ecclesiastical nonconformities

Urgent remediation through specific technologies is needed.

#### CONCLUSIONS:

Obligatory the joint with the spindle will be dismantled, lubrication channels will be made in the bronze bushes, they will be secured and lubricant will be introduced.

The oxygen flow in the lower sole is urgently adjusted

The expert will re-examine the works and will issue a new report, after the repair. Only then will it be possible to guarantee the safe operation of the machine for 10 years.

It is recommended that a technical inspection be carried out annually, this being the guarantee of a safe operation considering the age of the equipment and the difficult operating conditions.

#### 4. REFERENCES

1. Constantin, M , ș.a. – Asamblarea întreținerea și repararea mașinilor și instalațiilor, Editura All, București, 2002
2. Cîrîină 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. Cîrîină 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., Cîrîină 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., Cîrîină 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., Cîrîină 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., Cîrîină L.M., Rădulescu C. Aspects relating to expertise of the mast coal mining machines – second 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).