ASPECTS REGARDING THE METHOD OF REALIZING THE TECHNICAL EXPERTISE FOR REPAIRING THE TRANSLATION MECHANISM OF A M4A COAL-MINING MACHINE

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Abstract: *This paper presents the technical state of the mechanism of translation of the coal-mining machine after the technical expertise. The rehabilitation to which the translation mechanism will be subjected will be carried out by performing the intervention works that will bring back into the normal operating parameters both the structural part and the functional part. The paper presents: the proposed solutions for repair after verification of the translation mechanism and the way of repairing the mechanism.*
Keyword: translation mechanism, rehabilitation, interventions

1. Introduction

The metal construction of the coal-mining machine and its main sub-assemblies are shown in Figure 1. It is worth mentioning that the entire metal construction, although it is the first one manufactured and assembled with Romanian fabrication, is in a good working condition. The main components of the carbon-extraction machine are: 1- elinda section I; 2- elinda section II; 3- rotating platform; 4-sided arm (counter-arm); 5 support cradle of the lifting mechanism; 6-mast (pillar); 7- guy I; 8-guy II; 9- elastic cat-walk; 10- ladder and cat-walk inclined; 11 - cabin horizontally adjustable; 12, 13 - Spill funnels (primary and secondary); 14 - the control cabin; 15 electric cabinets; 16 fixed wheel (stator); 17- guide wire-line; 18- riveted tripod; 19 - cat-walk stairs to support tripod; 20 - wheel gear protection; 21 - support tripod - welded version; 22 - connecting bridge (walkway); 23- Stair and bridge at the mast; 24 - a lifting cable change device; 25- console for wheel.

The rehabilitation of the machine must be carried out following checks by calculation of resistance and stability of the structural system and by non-destructive control of metal elements and joints state [1]. From a technical point of view, intervention measures (consolidation solutions) need to be implemented to ensure that the required functional performance is achieved.

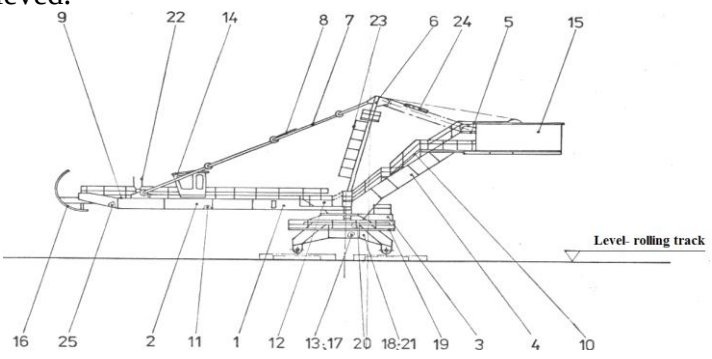

Fig.1. The metal construction of the coal mining machine

Conclusions have been made as a result of checks carried out on several important subassemblies of the coal-mining machine: the wheel with cups; track travel mechanism; infrastructure; superstructure with swivel mechanism; wheel arm with cups; counter-arm with lifting mechanism; lowering the rotor arm.

2. The translation mechanism. Characteristics

The translation mechanism (march), being one of the most demanded and complex parts of the coal-fired machine, on which the excavation, translation and spinning efforts work, was the most used, especially the essential mechanisms, but also on the construction of beams and bogies in places where there is a relative movement of the spindle-bore, bolt-bore, screw-nuts (fillet) and even where there are rolling on the wheel-rail couplings, wheels toothed in open gears and locked gears in carcasses etc. Characteristics of the translation mechanism are presented in Table 1.

Table.1- Characteristics of the translation mechanism

Gauge	7 m
Number of support wheels	16
Wheel diameter	800 mm
Type of running track	Tip 49 STAS 2953-70
Maximum wheel pressure	223 KN
Translation speed (maximum theoretical)	18,43 m/min
Nominal power of electric motors DA 25%	6x7,5=45 kW
The rated speed of the electric motors (engine)	720 rot/min
Gear transmission ratio	46,07
Total transmission ratio	99,51
Brake: Brake Washer Diameter x Brake Number The braking torque of a brake Type of electro-hydraulic lift Active lift time	250 mm x 6 buc 23 daNm REH 32/50 N5CA DA 25%

2.Verification of the translation mechanism. Solutions proposed

The translation mechanism is also called the rail tracking mechanism. It consists of 6 driven (motor) bogies and 2 free bogies. The 6 driven bogies are located at the ends of the claw beams are also provided with rail locking pliers, as well as with scraping-cleaning plows on the tread for the cleaning of coal. The assembly is done by means of simple beams, on the side to the access stack, and on the side of the access road is completed with the main beam (oscillating beam).

As a result of the checks carried out, at the translation mechanism of the coal-mining machine the following were found: the repair has to be done by dismantling and the mechanism will be sent to a specialized company for repairs and bringing to the initial parameters of all the couplings; the execution of all necessary rigging must be done after projects approved by designers specializing in such solutions and verified by authorized verifiers. Regarding the way of solving the necessary repairs for the machine translation mechanism, the following were proposed: repairing the translation mechanism is more economic than replacing it with a new one because the costs are under 30-35% of the value of new parts; non-repairable mechanisms will be ordered in advance to shorten the timeframe for intervention on the machine; at the beginning of the repair, the new electric cable traces will be established and

also their re-location; arranging the place for repair is very important, as the car is immobilized on a long-term, at least 5 months, for this a 50 kW distribution point from a separate supply source will be provided, the machine being disconnected from the 6 kV source; the support and lifting points must be agreed between the beneficiary and the firm which carries out the repair of the car, as well as the works that will be carried out during the repair and their order; will necessarily be executed: the triangle supports and the simple beams after the checked projects, blocking the translation system; site stiffness with previous interventions; cuts in motor bogies and strengthen areas; the drainage holes in the oscillating beam and the fixed supports.

During repair, the warehouse will be serviced by the other existing machines.

4. The translation mechanism repair method

The way of repairing the translation mechanism must comply with the following:

a. Removing the straight or left simple beams from the main oscillating beam and mounting the new one with the two driven and unused bogies.

b. Dismantling the single beams with the two driven bogies and sending to repairs the positions 14 and 15 of the support "B" of the triangle support (figure 1).

c. Mounting of the single beam with the two bogies operating separately from the support "B" of the triangle support.

d. Dismantling the single beams with the two driven bogies and sending to repair positions 14 and 15 of the support "A" of the triangle support.

e) Mounting the single beams with the two bogies operating separately from the support "A" of the triangle support.

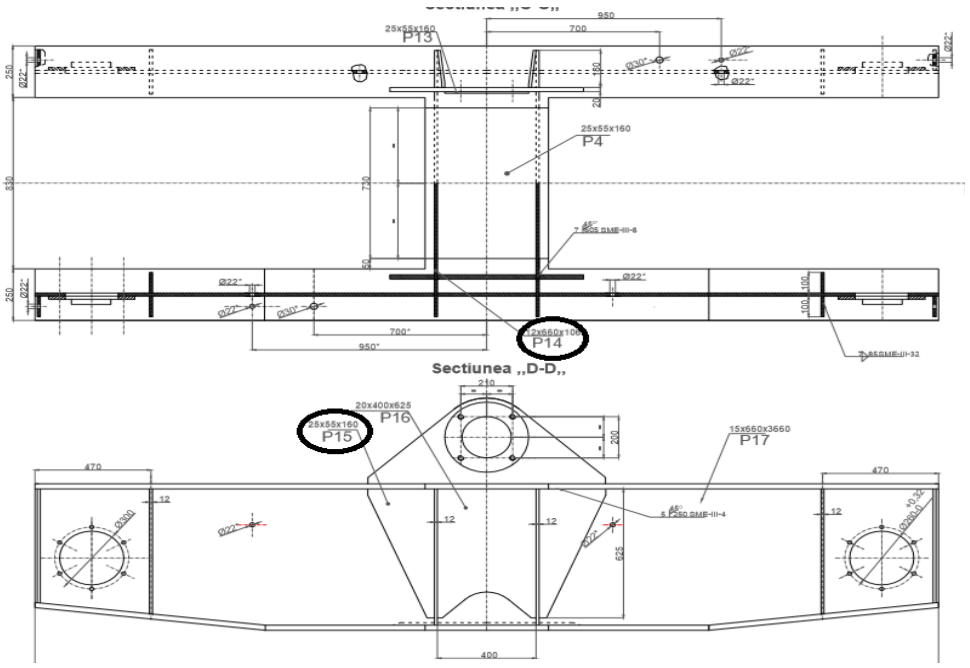

Fig.1. Sections of the main beam

The assembly of the mechanism consists of: the bogie, the free bogie (the bogies on both sides are assembled two by two by means of the assembly), the single beam, figure 2. On the side of the coal stack, the simple beams will be repaired with the independent support of a

support triangle (Claw Beam), and on the side of the access road in the main oscillating beam, the spherical support will be repaired.

5. Conclusions

Before starting the assembly after the repair of each subassembly, measurements must be made. After repairs to the subassemblies of the mechanism, carried out at the repairing company, the mechanism will be installed in the presence of the site engineer or the Technical Execution Officer (RTE) and will be concretized by documents signed by the site engineer. For shafts, boreholes, sliding and rolling bearings of moving parts, but also for those with low value, the measurement sheets will be completed, except for shafts and boreholes that are to be repaired. For boreholes, free bogies, single beam, main beam, spherical support and spherical bushing, the measurement files must be complete (check for bogie bursts, dimensional chain dimensions, mounting wheel bore and free wheel bogie checks).

Assembly of the gearbox will be done by assembling the bogie shaft of the bogie and bearing in the mounting plate (torque support). Also, mounting and checking: brake couplings and actuator motor - check boreholes, shafts and bearings; brakes Φ250 (FC250) - checking boreholes and axes (gaming measurements); shafts - Verification of electrohydraulic lifter boreholes (REH); motor-reducer couplings: bore and shaft verification; bogies (BM and BL) - for metal construction: checking of trees and boreholes; rolling wheels: verification of boreholes, allowances, gauge ratios, over-tooth gears at outer gears on toothed wheels on drive wheels of motor bogies and gears on intermediate axles; Simple beams: Verification of boreholes - fastening of bogies, gripping of the supporting tripod. We will repair: free bogie pairs and single-beam motor bogie; free bogie pairs and simple bogie motor bogie and then with main beam and spherical support. Measurement datasheets will be made for: Mounting axles between free bogie and plain beam (BL - GS) and motor bogie and single beam (BM - GS if necessary) will be made. On the main beam (oscillating), the spherical pivot will be used to drain rainwater because it can penetrate the support. Measurement sheets will also be made for: sphere, spherical shirts, safety bolts required to secure the spherical pivot.

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