



MODERNIZATION OF ELECTRIC TRACTION MOTOR SUPPORTS TO THE BOGIE FRAME FOR ELECTRIC ROLLING STOCK

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ABSTRACT

The article presents a new design of modernized electric traction motor support to bogie frame for electric trains.

Our proposed device for vibration protection of traction electric motors refers to electric machine building, and can be used in the railroad transport, namely in mounts (supports) of electric motor to the frame of train bogie at support-axis suspension, used on the railroads of the Republic of Uzbekistan in JSC "Uzbekiston temir yullari".

It is known that traction electric motor is attached to the frame of electric trains bogie VL-80 [1, p. 120÷121], used on the railroads of the Republic of Uzbekistan in operating conditions in "Uzbekiston Temir Yullari" JSC. This mount contains a set of springs placed between the protrusions of the bogie frame, combined with support plates located at their ends, interacting with the

brackets of the traction motor, distinguished by the fact that, in order to improve reliability, between the brackets of the traction motor and support plates installed ball bearings and between the support plates installed lubricant reservoir with shut-off valves in contact with ball bearings

The purpose of our invention in comparison with the existing ones [2,3,4,5] is to improve reliability. The traction motor mounting to the frame of the railway rolling stock bogie with axle suspension is different in that, in order to improve reliability, ball bearings are installed between the brackets of the traction motor and the base plates, and a lubrication reservoir with stop valves in contact with the ball bearings is installed between the base plates.



Figure 1. Appearance of support unit (support) of traction electric motor NB-418K with support-axis suspension for electric rolling stock VL-80s in the form of a system of parallel spiral cylindrical springs

Figure 1 shows the appearance of the support unit (support) of traction electric motor NB-418K with support-axle suspension for electric rolling stock VL-80s; Figure 2 shows the wheel-motor unit of electric train.

The device consists of a traction electric motor 1, which is based on one side on the axle of the wheel set 2, and on the other side on the frame 4 of the bogie through the spring suspension 5, placed in the lugs 6 of the frame and consisting of springs 7 and base plates 8 on the ends of the springs. Between the brackets 3 and 9 of the electric motor and the base plates 8 there are ball bearings 10 and 11. In the hanger 5, between the plates, there is a lubricant reservoir 12, the stop valves 13 and 14 of which at the ends of the reservoir contact with the ball bearings 10 and 11. In

the middle part of the reservoir there is a valve 15 for filling the reservoir 12 with grease.

The unit works as follows.

During the movement of the train dynamic loads from the unevenness of the track (joints, rail wear) and errors in the gear reducer wheel set and the electric motor are transferred through the wheel set 2, the electric motor 1 and ball bearing 10 or 11, depending on the direction of the train on the spring suspension 5, located in the ledges of the frame 4 bogie. Under the influence of these loads the springs 7 of the suspension are deformed and the base plates 8 together with the ball bearings 10 and 11 and the brackets 3 and 9 of the electric motor make a vertical movement with a frequency external perturbation force.

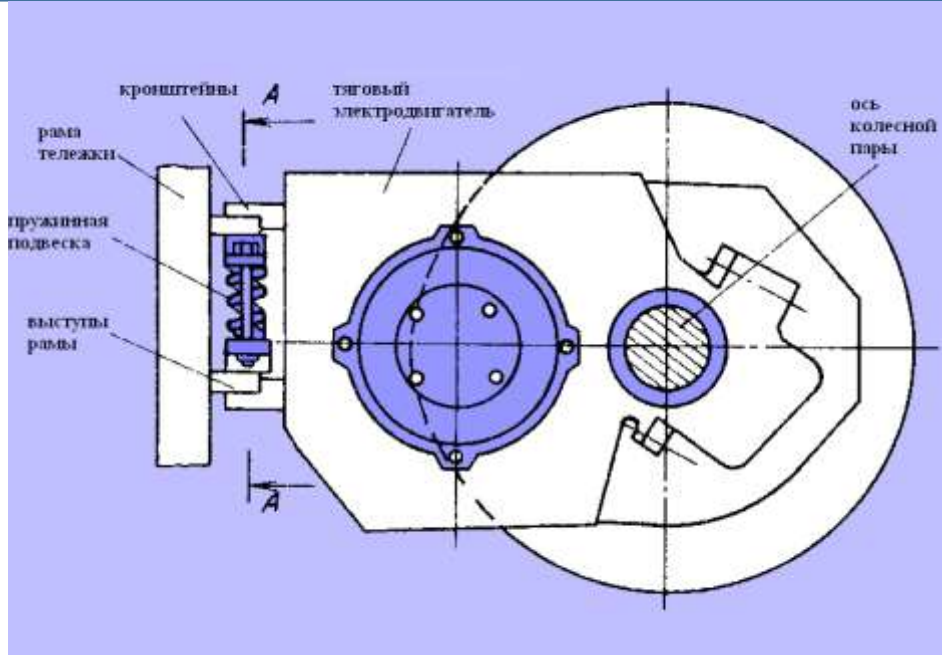


Figure 2: Traction motor attachment to the electric rolling stock bogie frame with axle suspension

When moving the electric motor upwards, the load through its bracket 9 is transferred to the ball bearing 11, the suspension base plate 5 and is taken up by springs 7. At the same time, the load is transferred to the shut-off valve 14 of the oil reservoir 12. The distance between the base plates 8 hanger by moving the lower base plate is reduced by the amount of deformation of springs 7 (the movement of the upper suspension plate is limited to the ledges of the frame 4 bogie). When the load exceeds the value of spring tension valve 14 is pushed away from the seat and the greasing flows to the rubbing surface of the ball bearing 11. When moving the motor downward, the force transfer occurs from the bracket 3 in the same way and the greasing to the ball bearing 10 comes through the valve 13 of the oiling reservoir 12.

When driving a train in curves, the ball bearing provides a connection between the electric motor 1 and the bogie frame 4, limiting its movement in the direction

perpendicular to the track axis, which prevents the motor axle bearings, through which it rests on the wheelset axle, from colliding with the wheel hubs and reduces dynamic loads in the wheel-engine block nodes. The use of these devices for vibration protection of traction electric motors will increase smooth running, reduce high-frequency vibrations transmitted to the electric motor from the wheel set, as well as increase the durability of the electric motor. The main advantages of this development is that this device has improved characteristics compared to its counterparts, in addition, it provides energy saving by increasing the service life of the electric motor and saving electricity, as well as resource saving, since instead of silver solder bolt attachment is used. For production used local materials; this development will completely replace similar devices currently imported from Russia.



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