жимают стяжные болты с целью обеспечения неподвижного закрепления этих соединений с незначительным предварительным натягом. В таком положении при помощи тензодатчиков фиксируют нормальные растягивающие напряжения на цилиндрических поверхностях клеммовых соединений (установка относительно нуля, т.е. балансировка каналов тензоаппаратуры при температуре производственного помещения до сборки прессового соединения). Формируется соединение с натягом. После напрессовки замеряют упомянутые выше напряжения и по разности величин последних определяют контактное давление и натяг. Сравнивают полученные результаты с эталонными допустимыми значениями. При отклонениях, превышающих установленные нормативные значения, полученное соединение с гарантированным натягом подлежит расформированию.

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USAGE OF HIGH-STRENGTH STEEL ALLOYS ON FREIGHT CARS, PRODUCED IN THE REPUBLIC OF UZBEKISTAN

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Uzbekistan Railways Joint Stock is one of a few companies on the territory of CIS, which is authorized to produce and manufacture machinery. Several types of tank-wagons, closed and semi-closed carriages are being produced for several years.

Foundry manufacture is the leader branch of a major machinery. Uzbekistan had taken this direction of manufacturing successfully as an independent country. Constant integration of modern requirements into the railway system, can be seen on the example of AIP branch company.

Also, a wide amount of work is being done nowadays in a sphere of closed, semi-closed, flatcar carriages and the between-service period of the carpark is being delayed as long, as it may be possible. Elements and details for serving and repairing the rolling stock, that were imported before, are being manufactured here nowadays. The localization level of the ready product is also growing up.

Shortening natural resources` expenses on different spheres is a very serious problem of the humanity of XXI century. Natural products are been interchanged with synthesized materials, newer hi-strength steels, nanotechnologies and energy saving technologies are being introduced day-by-day.

Such strategical spheres of economy like machinery and transportation are the key consumers and contributors of new technologies. Regular speed increases, carrying constructions` weight decrease, max load increases and service expense economies are characterful for road-building, rural, auto industry, railway manufacturing. An intense usage of main scientifical achievemnts and technical progress products, makes it a great profit for the owner [1].

Aviation and sea transport consider using light but strong materials in the manufacturing processes. High metal capability of these transport means, require innovative solutions from engineers, i.e. optimizing constructions and so on. Elements with the second class of responsibility are interchanged with materials, based on carbon, polyurethane, ceramics and etc.

Car bodies take new and light frames. Suspensions and their upper and lower bridges are changed with space levers per each wheel. Hanged elements (car roof, yaws and etc.) are made of lightened colored castings. Steel in the weel discs is changed on aluminum and titanium. Traditional fuel is changed with gas,

hydrogenium and electric traction. These innovations give advantages, causing weigh losses and environment pollution decrease.

As all huge cities are overloaded today with passenger transport, transport types like tram, trolley-busses, and etc. is really important. Main requirements here are maintaining soft movement, lesser fuel consumption and passengers` comfortability. All these kinds of stuff, require extra systems: filtering systems, cruise-control and fire safety.

That's why, constructors and technicians should decrease the constructions` weight without safety losses. For example, city tramcars are made of hi-strength steel casts, based on aluminum. Foam plastic is used as a sound repressor material. Floor cover in buses is doe from wood sheets, covered with anti-fire shield.

Wide usage of lightened materials with hi-strength steels in manufacturing process of hi-speed passenger rolling stock, and magnetic-levitated rolling-stock can be seen nowadays. Car bodies, running elements of carriages are made exclusively of hi-strength modern materials.

Freight carriages on railway transport are being used with a high intensity on the territory of CIS. Main parameters, that affect the carriages` exploitation, are temperatures within amount of +50…–60 °C, high humidity, excessive loadings on carrying elements, mechanical damages during the loading and unloading operations, curves on rails, wear of the inner surface of the car-body and wear of carrying elements [2].

The factors above negatively affect the reliability of the freight carpark exploitation, As the 2014–2017 yrs. monitoring analysis shows, there is half-carriages` car-body defects, having the biggest occasion frequency, and happens by cross-beam cracks, corner cracks and car-body`s yaw wall cracks. Elements of universal flatcars usually oppose to dysfunctions on the floor and the deck. Tank-cars` weak points are stretching belts, drainage equipment and a tank. All these types of cars have dysfunctions in a cross-bar, internal beams and end-beams.

Taking the upper influent factors into account, the carriages` design should be remastered, integrating in newer manufacturing technologies and maintenance methods, using high-strength steel in manufacturing processes, and maintaining careful exploitation.

Special technical contributions and requirements were formed within this target for the new generation carriages. Main characteristics for them should be: high run speed, axle loading, max load, run between maintenance and low metal usage, obtained by optimizing carrying elements of the carriages.

So that's why, all these technological introductions with using high-strength steels, which are approved by economical calculations are really actual and necessary.

There is a pretty wide variety of ways to increase an efficiency of exploiting current kinds of rolling stock of railways. For example, it can be made out through increasing the max load mass & decreasing the carriage load coefficient. Or, via widening the carriages` volume, and at last, by decreasing the exploitation expenses [3].

Max load mass of a 4-axle half-carriage, which has a 23.5 tons/power unit load, can be increased by decreasing it`s load mass. All leading rolling-stock manufacturers try to integrate new kinds of alloys into the production processes, so that will decrease the carriages` costs, still keeping them reliable. It was figured out, that tare extension of a carriage, will lead to a max traffic density increase on railways, because of net weight increase on carriages with a lesser tare coefficient. By keeping the standard sizes of carriages and decreasing their loads` mass, it can be obtained to shorten carriage & loco parks, which would help to decrease the number of needed personnel to operate. Besides, resources like metal, electricity are also usually been saved, so thus gives fund saves for traffic expenses. All kinds of loco & carriage park and railway track expenses are also decreased. Also, less tare masses are obtained by using special high-strength alloys in carriage manufacturing process.

Volume extensions of carriages leads to railway traffic capacity increase. Proper usage of carriages` spaces gives great haul incomings. For example, closed-cars` sizes are used much more efficiently, than tankers`, hoppers` or dump-cars`.

High reliability, great maintenance characteristics and high run volume between maintenances, decreases all kinds of exploitation expenses. This is reached by throughout projecting, using proper materials in manufacture processes and obeying all rules of exploiting & maintenance of rolling stock.

Nowadays, all parameters, counted above, are objects of interest for all customers. It has to be underlined, that responsible parts of carriages, such as box and frame are made of steel, which has a durability for up to 390 MPa pressure. Durability against pressures for up to 440 MPa has not been reached yet, making it still an objective, that will lead to the full market domination, if it`s achieved. That`s why work over

high-strength alloy production for carriages of 12-9922 model in «AMP» subsidiary company is steel one of the most actual processes for today.

The half- carriages` tare coefficient decreases, should be organized without affecting it`s reliability and strength. The highest percentage of failures is considered to be on spines, or elements with technological spaces, welded edges and cross-beams.

The next part of the carriage, that comes to malfunctions frequently, is a carriage frame. Technological holes, welding zones are really weak during the exploitation. Frame malfunctions are usually met on fitting platforms.

And at last, box-stands and cans of tankers are the details that should be discussed through. Different cracks on stands and cans are caused by corrosion and rips on the can-bottom.

Carriages and their yaw walls have cracks on stands, welding edges, cuts, and mechanical dysfunctions. Due to a high amount of welding edges, they often have cracks on their surface.

Hopper-carriages bunkers` failures happen on the vibrating element`s installation place, and corrosion. Another failures that should be described right over here, are cracks on carriage rooftops and carriage frame ends.

In addition, failures like aggressive influence of heavy loadings and their mechanical coercion can also be added to the list of factors, that cause various malfunction on carriages.

The analysis held out through the past 4 years, shows, that ross-beams, vertical box-stands and yaw walls should be strengthened. Usage of high-durable steel alloys in these details will, probably, decrease the percentage of failures.

So in that case, this article goes through the main parameters of carriage «12-2299»`s analogue model, produced by «AMP» subsidiary.

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