



BUREAU  
VERITAS  
EN ISO 9001:2000



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Production of wheelsets. Wagon  
production and overhaul.

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***Project for recycling of old BDZ sleeping wagons and  
their reconstruction in modern coaches.***



## **Project advantages:**

- Making use of old wagons owned by BDZ which are ineffective for exploitation and turning them into modern wagons responding to the European standards and levels of comfort
- Expiry date of exploitation is 30 years
- The renewal of the BDZ wagon park is imperative. It has an urgent need of new wagons. The newest 52 wagons are manufactured 10 years ago, and are the only ones among the fast and express trains, because of their very weak and ineffective air-conditioning system with power 16.8KW (compared to the air-conditioning system of the present wagons which have power 26KW). Since then there hasn't been any renewal of the wagon park with new wagons for fast trains.
- The strongest advantage of this project is the low price of the recycled and reconstructed wagon, which is practically new (all the systems and parts put into the wagon are new, manufactured in 2009)
- Comparison: by projects for recycling of old wagons and reconstructing them into modern ones; in Yugoslavia such a wagon is recycled for 1 150 000 Euro. The price in Europe for a wagon of this type is 2 500 000 Euro.
- The level of comfort in the wagon's salon is of the highest class
- New model of Powerful Air-conditioning system with 26KW power
- New heating system
- New anti-fire system
- New energy saving system
- New digital system controlling all the systems mentioned above
- Toned anti sun windows with the most modern design
- Ergonomic seats with arms and built-in and collect-in tables with cup and bottle holders, enough space between the passengers as well
- Automatic outside electro-pneumatic doors with button
- Automatic front electro-pneumatic doors with button
- Automatic electro-pneumatic doors with button in the inside salon
- Module toilettes (for maximal non-detention of dirt) with a modern design of fiberglass panels
- The side doors and the ceiling of the salon are made of fiberglass panels on a modular principle, incombustibility class B
- Tables for portable notebooks and laptops with 220V switches
- Modern luggage-racks with built-in LED lights for reading
- Compartment-free type of the salon (used to prevent from vandalism)
- Floor covers, underfloor side and ceiling coatings from module type made of non-removable materials with the highest class of incombustibility "B"
- Constructing a completely new break system Knorr Bremse, a world wide known manufacturer, which guarantees save stops, low level of noise and high speed.

- Cutting out of an old sleeping wagon where the roof's geometry of the frame is preserved by approved technology of the LP16 project. Disassembling and shootblasting on all the joints and details of the wagon.



- reconstruction of bogie from Gorlitz 5A with blocking break system in modernized DVJ disc brake system .



Produced by VRZ-99 AD Ø920mm wheelset with two breaking discs and two symmetrical wheels type BA092 with European number by documentation 2FWp 105.02.002.092 is intended for completion of passenger wagons with 20t axle load and speed  $120 < V < 200$  km / h, with the right to be used in the European railway network of all the countries of Central and Western Europe which have adopted and do apply the European standard EN13260: 2009 (E), developed and implemented by CEN (European Committee for Standardization)

It is applicable to wheelsets, composed of elements that meet the following EU;

- CEN EN13261: 2003 - railway components - wheelsets and bogies - Axles - requirements for the products;
- CEN EN13262: 2004D - - railway components - wheelsets and bogies - Wheels - requirements for the products;
- CEN EN 14535-1 - Brake discs for railway rolling stock.

The manufacture of the product is developed with quality materials through direct import from manufacturers of steel forgings (wheels certified from DB and TSI and axes with certificates from TSI) in Ukraine. The providers of preparations also fulfill all the requirements of the CEN EN13261: 2003 and EN13262: 2004D, as representatives of VRZ-99 AD supervise the quality production of the site and exercise control over the expedition.

Certificates for each wheelset contain the following documents:

- Certificate 3.1 according to EN 10204 for wheels incl. material (chemical-mechanical report);
- Certificate 3.1 according to EN 10204 for the axle incl. material (chemical-mechanical report);

It must be taken into consideration that the primary object of VRZ is related to repairs, according to certificates: from notified authority VUZ-Prague-Czech Republic, authorized by the MT-NIIT Iliyantsi Sofia; TSI; TUV "Reyland" - trained and received a certificate for 17 workers in control in welding (ultrasonic flaw detection, visual and penetrating) also trained and received a Certificate for 6 workers in control in wheelsets (ultrasonic flaw detection, visual and penetrating) and DB on the Directive 984 04.,

- change of wheel sets of an old type with blocking system to a new type of wheels with equipped with breaking discs, new axle and new bearings of SKF type



- Reconstruction of an old type of blocking breaking system in a new of disc breaking system of the highly modern type, manufactured by the most famous company Knorr Bremse-Berlin, Germany



- Constructing of new side walls of the wagon



-Preliminary production of the metal construction with modern and anti-corrosion coatings, primers and pastes. Setting of noise and heat isolation. Constructing of fire isolating coverage with class B of incombustibility Standard. Setting of highly modern floor and underfloor coverage from German and Slovenian manufacturers, each of them with certificate of incombustibility class B according to UIC 842-1



-Painting of the wagons with double component Austrian paint on water basis UIC 842-1 from the famous manufacturer Rembrandtin-Vienna, Austria.



- Assembling of the most modern type of whole windows used in the construction by the famous manufacturers of coaches like Simens, Alstom, Bombardie :



- Constructing of new system of electrically opened and closed electrical-pneumatic doors, provided with sound signal handles for emergency opening. Installed an additional system for mechanical locking and unlocking. Automatic closing at speed higher than 5 km/h.



- New model of cooling system with empowered capacity of 26 KW for negating the summer heat. Heat system with 40 KW capacity (two 20 KW sections). Additional blowing when system is off, new heat isolation for 130°. Completely new energy saving, impulse, non-transforming BGU systems, provided with isolation of blocking. Installed new power board and controlling system.





-Assembling of interior panels- moduled by modern design, great hardness and wear-out protection, made of incombustible materials class B .



- Assembling of new modern toilettes created by module type module type. Used and implemented hardly flammable materials according to the modern class of combustibility B.



-New seats with modern ergonomic design establishing maximal comfort on long distance travels. Made of incombustible materials class B .



-Highly modern (plane) type luggage-rack with glass shelves and built-in individual diode light. Installed conversation and information system.



-Assembling of glass septal walls in wagon's salon between the two automatic doors of the salon .

-Assembling of completely new electric supply system and digital control of all systems like **anti-fire, electric and pneumatic** .

