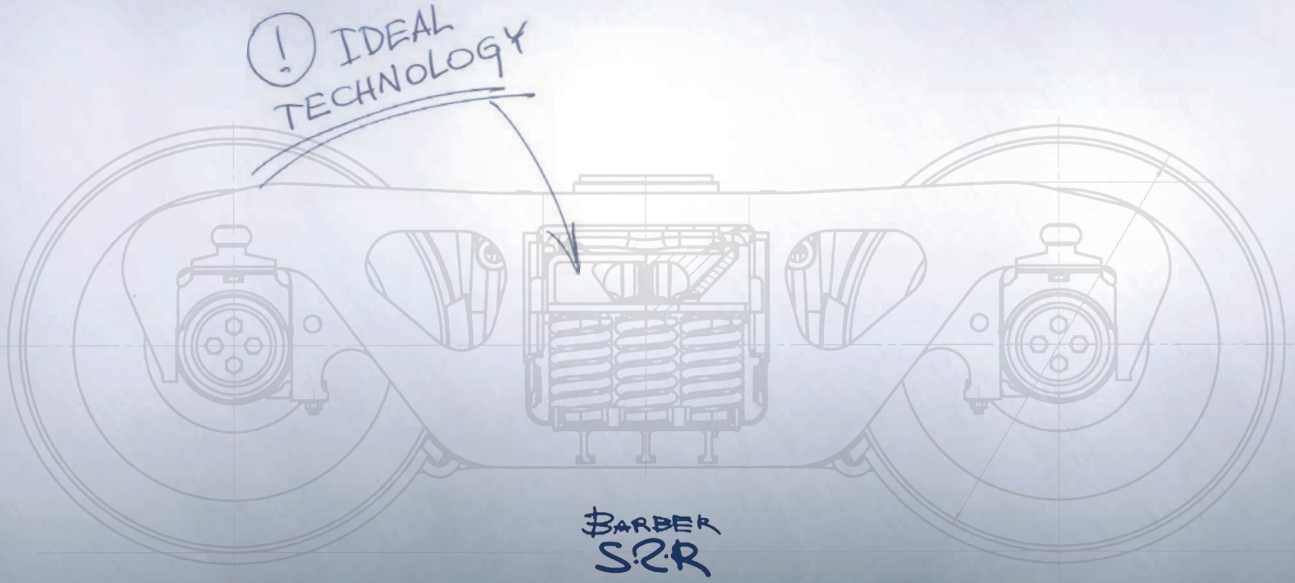
TIKHVIN
FREIGHT CAR BUILDING
PLANT

HIGH-TECH INNOVATIONS FOR RAILWAYS



ENTERPRISE

Tikhvin Freight Car Building Plant is a full technological cycle present-day production of the new generation freight cars with enhanced operational characteristics.

KEY ELEMENTS OF OUR STRATEGY

- Manufacturing of the up-to-date transport machine building products with high efficiency consumer features at the competitive price
- Low cost production
- Development of novelties

FACTORS OF SUCCESS

- Conformity of products to the industrial sector development strategy
- Cooperation with the market and Russian Railways at all stages of engineering and implementation
- Conceptually new level of technology
- High economic efficiency for car owner, shipper and infrastructure owner
- Comprehensive introduction of new freight cars to railway system

PACKAGE PROPOSAL

- Innovative products
- Extended warranty
- Maintenance and repair
- Supply with OEM parts
- Operating leasing contracts with Rail1520 LLC

TOTAL ANNUAL PRODUCTION CAPACITY

13,000 FREIGHT CARS

90,000 TON OF HEAVY AND MEDIUM-SIZE STEEL CASTINGS

65,000 WHEELSETS

Vladimir Putin
President of the Russian Federation

"IT IS PRECISELY SUCH HIGH-TECH PROJECTS THAT REVIVE RUSSIAN INDUSTRY AND FORM EMPLOYMENT OF EXTRA QUALITY."

"Russia" TV Channel

Vladimir Yakunin

President of Russian Railways

"IN TIKHVIN AREA A PLANT HAS ORIGINATED, WHICH WILL PRODUCE INNOVATIVE FREIGHT CARS, AND THIS FACT IS OF UTMOST IMPORTANCE"

"Business FM" Radio station

INNOVATIVE PRODUCT

Tikhvin Freight Car Building Plant manufactures 4 types of innovative freight cars designed by leading American and local engineering companies. The differential peculiarity of the rolling stock manufactured by Tikhvin Freight Car Building Plant is expressed in an innovative Barber S-2-R bogie with the axle load of up to 23.5 tf and 25 tf. The cars are as well characterized by improved economic efficiency and reliability:

- reduction of costs for the rolling stock owner and infrastructure;
- axle load enhancement, improvement of efficiency and speed;
- reduction of the impact on the rail track, higher operation safety and train-handling capacity of the network.

Upon the decision of Railway Transport Board consisting of rolling stock authorized specialists of the CIS and the Baltics railway administration the cars produced by Tikhvin Freight Car Building Plant and equipped with Barber bogies are released for interstate transportation.

For freight railcars equipped with innovative Barber bogies tariff allowance for empty run fixed by Russian Federal Tariff Service is in force.

PRODUCT ADVANCED DEVELOPMENT

In order to meet the growing requirements of the industrial sector to increase the efficiency of transportation Tikhvin Freight Car Building Plant works on engineering of advanced types of cars with uprated specifications: gondola cars with enlarged car body space, hopper cars for transportation of cement and grain, and platform series (multi-purpose and special-purpose cars).

Joint venture company was established with one of the largest European rolling stock manufacturer – JSC Tatravagonka (Slovakia) - for production of car casting for Barber bogies.

PRODUCTION TECHNOLOGY AND QUALITY

Tikhvin Freight Car Building Plant has been designed consistent with the use of modern equipment and complex implementation of innovative engineering and technical solutions and process concepts of the world market leaders.

HIGHEST LABOR EFFICIENCY

Over 20 automated lines, 84 industrial robots, 3 automatic warehouses.

HIGHEST QUALITY OF THE PRODUCT

Modern approach to products quality control beginning from supply chain management and input control till handing-over of the product to the customer, and customer satisfaction monitoring. State-of-the-art welding, steel melting, molding, machining, painting technologies bring up the quality to a new level and minimize the influence of “the human factor”.

COST-EFFICIENCY

Advanced engineering solutions, combined application of energy efficient technologies and high-efficiency equipment.

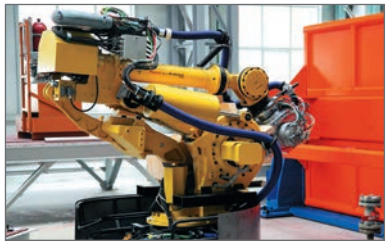
BEST BUSINESS PRACTICES

In order to enhance productivity and competitiveness of the products Tikhvin Freight Car Building Plant introduces the integrated enterprise management system based on the Business Management System and production system.

Tikhvin Freight Car Building Plant ranks among the transport engineering companies where Business Management System complies with the requirements of International Railway Industry Standard, IRIS.

The production system of the plant is based on the philosophy and experience of lean production with the use of advanced information technologies (ERP, PLM, etc.).

Requirements of international Eco-management and Occupational Health and Safety standards ISO 14001:2004 and OHSAS 18001:2007 are being introduced on the plant.



Valentin Gapanovich
Senior Vice-President of Russian Railways

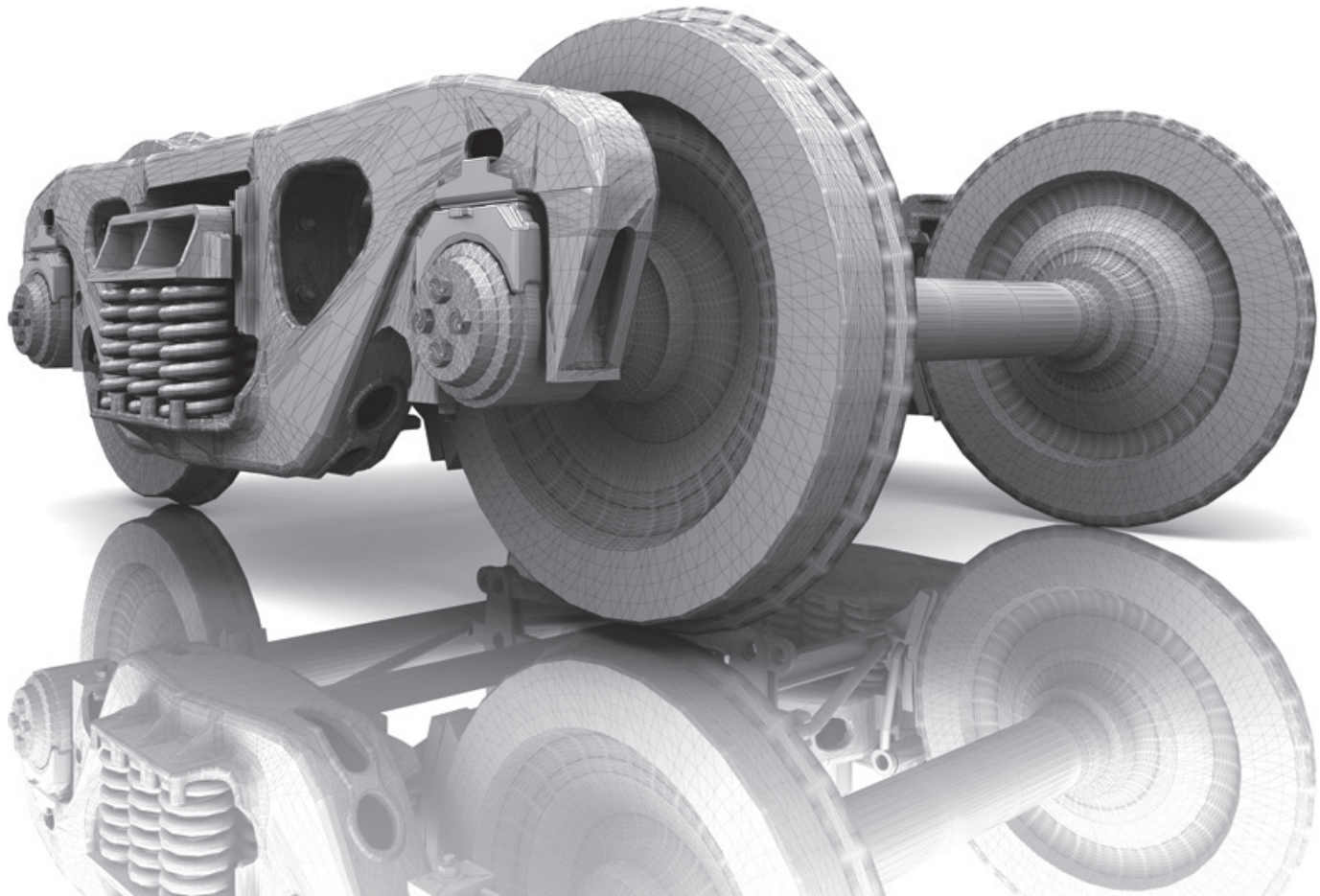
"THE INNOVATIVE PRODUCTS OF TIKHVIN PLANT ARE ABLE TO COMPETE WITH THE UP-TO-DATE MODELS OF THE FOREIGN ROLLING STOCK. THIS APPLIES FIRST OF ALL TO THE BOGIE, WHICH IS ABLE TO GUARANTEE HALF A MILLION KILOMETERS RUN BETWEEN REPAIRS, AND ALSO CAPACIOUS BODIES THAT DIFFER SO FAVOURABLY FROM MOST OF THE OTHERS."

"Gudok" Newspaper

Vitaly Evdokimenko
CEO of Federal Freight

"THE AGREEMENT WITH TIKHVIN FREIGHT CAR BUILDING PLANT WILL ENABLE THE RENEWAL OF THE ROLLING STOCK OF FEDERAL FREIGHT WITH THE BRAND NEW CARS, THAT FITS IN WITH THE INNOVATIVE DEVELOPMENT TARGETING OF OUR COMPANY."

"Company" Magazine



BARBER S-2-R BOGIE

axle load of up to 23.5 tf and 25 tf

Technical characteristics	Model 18-9810	Model 18-9855
Bogie weight, kg	4,800	5,000
Maximum estimated static load from the wheel set on rails, tf (kN)	23.5 (230.5)	25 (245.2)
Bogie base (standard), mm	1,850	1,850
Design speed, km/h	120	120
Distance between the load application lines to necks of axles of wheel sets and the spring set longitudinal axis, mm	2,036	2,036
Distance between side bearing longitudinal axes, mm	1,524	1,524
Wheel tread diameter, mm	957	957
Distance from the rail top level to the center plate supporting surface in free state / when a car is empty (tare weight 21 t), mm	830/795	830/795
Difference between deflections when the car is loaded and empty, mm	51	55
Estimated static suspension deflection when a car is empty (tare weight 21 t) / when a car is loaded (gross weight 100 t), mm	25/48	25/51
Side bearings	spring elastic	spring elastic
Service life, years	32	32
Distance run between overhauls, ths km	500	500

DESIGN FEATURES

• Side frame and bolster having increased reliability and service life indexes • Cassette tapered bearing supporting the side frame via the adapter • Bogie suspension with piecewise linear performance made of nine double-row spring sets • Friction shock absorber of the conceptually new design • Fixed contact side bearings

COMPETITIVE ADVANTAGES

up to **500** ths km distance run between overhauls

up to **1** mln km service life of wear-resisting parts

by **30** % decreased vertical dynamics coefficient of the empty car

up to **30** % increase of the empty car stability margin against derailment

by **50** % reduced cost of maintenance and repair throughout the life cycle in comparison with common local bogie

up to **15** % reduction of the impact on track

service life of wheel sets increased up to **12** years

by **70** % i.e. from 70 km/h to 120 km/h increase of empty rolling stock maximum speed

Sergey Kaletin

Deputy CEO for Technological Development of Freight One

"DURING THE EXPERIMENTAL SERVICE OF THE TIKHVIN HOPPER ITS DESIGN ADVANTAGES HAVE BEEN CONFIRMED."

"Gudok" Newspaper

HOPPER FOR MINERAL FERTILIZERS

axle load of up to 23.5 tf and 25 tf

Technical characteristics	Model 19-9835/ 19-9835-02	Model 19-9835-01/ 19-9835-03	Model 19-9870/ 19-9870-01
Payload capacity, t	71	71	76.5
Tare weight, maximum t	23	23	23.5
Body space, m^3	101	101	101
Maximum estimated static load from the wheel set on rails, kN (tf)	230.5 (23.5)	230.5 (23.5)	245.2 (25)
Length over coupler pulling faces, mm	14,720	14,720	14,720
Bogie centres, mm	10,500	10,500	10,500
Overall dimensions as per GOST 9238-83			
Body	1-T	1-T	1-T
Bogie	02-BM	02-BM	02-BM
Number of loading hatches	4	4	4
Number of unloading gates	6	6	6
Bogie model	18-100	18-9810 Barber S-2-R	18-9855 Barber S-2-R
Run to the first roundhouse service, ths km	210	500	500

DESIGN FEATURES

• Increased payload capacity with decreased car weight • Lowered car gravity center • Enlarged body space • Increased loading hatches size • Vinyl copolymer coating provides reliable protection of the body against aggressive influence of the transported freight • Modern shock absorbing device of T-1 class decreases the level of axial forces applied • Improved uncoupling arrangement prevents falling of the coupler on a track • Independent bogie braking system provides more advantageous braking conditions and possesses higher efficiency • Modern braking units with run life not less than four years • Threadless joints of brake lines • Run life at least 1 mln km for wear-resistant sleeve joints.

COMPETITIVE ADVANTAGES

by **7** m^3 up to **101** m^3 enlarged car body space.

Up to **7** % tariff allowance for empty car run of the models with Barber bogie

by **5.5** ton up to **76.5** ton increased payload capacity*

* Model 19-9870 /19-9835-03

Terminal requirements **COMPATIBLE DESIGN**

Total profit from operation of Hopper Car equipped with Barber bogie with the axle load of 25 tf on the main transport routes will be

up to **350** ths rubles annually

Ilya Yastrebov

Director of the Department of Rail Transportation of "SUEK"

"…DUE TO DESIGN FEATURES AND HIGH QUALITY OF RAILCARS' PRODUCTION, THEY HAVE NOT BEEN UNCOUPLED WHEN UNDERGOING MAINTENANCE REPAIRS OF TECHNICAL AND OPERATIONAL FAILURES SO FAR. INCREASED PAYLOAD ALLOWS SHIPPING OUT APPROXIMATELY BY 8% MORE CARGOS COMPARED TO GONDOLAS OF OTHER MODELS..."

"RZD-Partner" Magazine

MULTIPURPOSE DROP BOTTOM GONDOLA

axle load of up to 23.5 tf and 25 tf

Technical characteristics	Model 12-9761	Model 12-9761-02	Model 12-9853
Payload capacity, t	69.5	69.5	75
Tare weight, maximum t	24.5	24.5	25
Body space, m^3	88	88	88
Maximum estimated static load from the wheel set on rails, kN (tf)	230.5 (23.5)	230.5 (23.5)	250 (25)
Length over coupler pulling faces, mm	13,920	13,920	13,920
Bogie centres, mm	8,650	8,650	8,650
Number of unloading gates	14	14	14
Body internal dimensions, mm			
Length Width Height	12,771 2,922 2,360	12,771 2,922 2,360	12,771 2,922 2,360
Overall dimensions as per GOST 9238-83			
Body	1-BM	1-BM	1-BM
Bogie	02-BM	02-BM	02-BM
Bogie model	18-100	18-9810 Barber S-2-R	18-9855 Barber S-2-R
Run to the first roundhouse service, ths km	210	500	500

DESIGN FEATURES

• Reinforced structure of the top cord reduces body damaging while loading / unloading • Improved design of car lining provides the decrease of friction of the freight on walls • Improved design of the end wall increases body strength • Modern shock absorbing device of T-1 class decreases the level of axial forces applied • Uncoupling arrangement prevents falling of the coupler on a track • Modern braking units with run life not less than four years • Threadless joints of brake lines • Life of durable sleeve joints not less than 1 mln km.

COMPETITIVE ADVANTAGES

by **5.5** ton up to **75** ton increased payload capacity*

* Model 12-9853

Up to **30** % tariff allowance for empty car run of the models with Barber bogie

Service life of the cars on Barber bogies increased up to **32** years

IMPROVED strength and reliability **INDEXES** of the railcar body

Total profit from operation of Multipurpose drop bottom Gondola equipped with Barber bogie with the axle load of 25 tf will be up to **260** ths rubles annually

Sergey Kaletin

Deputy CEO for Technological Development of Freight One

"SOLID BOTTOM GONDOLAS ARE OPTIMAL FOR HANDLING ORE AND BULKY GOODS AND MAY SIGNIFICANTLY BENEFIT THE COMPANIES SPECIALIZED PARTICULARLY IN THESE FREIGHT SERVICES."

"Gudok" Newspaper

SOLID BOTTOM GONDOLA

axle load of up to 23.5 tf and 25 tf

Technical characteristics	Model 12-9833	Model 12-9833-01	Model 12-9869
Payload capacity, t	71.5	71.5	77
Tare weight, maximum t	22.5	22.5	23
Body space, m^3	92	92	92
Maximum estimated static load from the wheel set on rails, kN (tf)	230.5 (23.5)	230.5 (23.5)	245 (25)
Length over coupler pulling faces, mm	13,920	13,920	13,920
Bogie centres, mm	8,650	8,650	8,650
Body internal dimensions, mm			
Length Width Height	12,780 2,986 2,425	12,780 2,986 2,425	12,780 2,986 2,425
Overall dimensions as per GOST 9238-83			
Body	1-BM	1-BM	1-BM
Bogie	02-BM	02-BM	02-BM
Bogie model	18-100	18-9810 Barber S-2-R	18-9855 Barber S-2-R
Run to the first roundhouse service, ths km	210	500	500

DESIGN FEATURES

• Increased payload capacity with decreased car weight • Enlarged body space • Smooth body lining plates improve the unloading conditions • Improved design in junction of side and end walls increases the operation reliability • Modern shock absorbing device of T-1 class decreases the level of axial forces applied • Modern braking units with run life not less than four years • Threadless joints of brake lines • Life of durable sleeve joints not less than 1 mln km.

COMPETITIVE ADVANTAGES

by **5.5** ton up to **77** ton increased payload capacity*

* Model 12-9869

IMPROVED STRENGTH of the car body against service damage

Up to **30** % tariff allowance for empty car run of the models with Barber bogie.

Service life of the cars on Barber bogies increased up to **32** years

by **4** m^3 up to **92** m^3 enlarged car body space

Total profit from operation of Solid bottom Gondola equipped with Barber bogie with the axle load of 25 tf on the coal export routes will be over **280** ths rubles annually

Salman Babayev
Vice-President of Russian Railways

"THE OPERATORS NOWADAYS NEED THE CARS OF THE MODERN DESIGN HAVING THE INCREASED RUN BETWEEN REPAIRS AND LARGER CAPACITY. AND THE FUTURE BELONGS TO THE MANUFACTURERS WHO WILL BE ABLE TO INTRODUCE SUCH ROLLING STOCK TO THE MARKET. WE CONSIDER THE FREIGHT CARS PRODUCED IN TIKHVIN TO BE POTENTIAL AND ARE GOING TO PUT THIS ROLLING STOCK INTO OUR SERVICE."

"Gudok" Newspaper

PLATFORM CAR FOR THE HIGH-CAPACITY CONTAINERS

axle load of up to 23.5 tf and 25 tf

Technical characteristics	Model 13-9834	Model 13-9834-01
Payload capacity, t	69.5	69.5
Tare weight, maximum t	24.5	24.5
Maximum estimated static load from the wheel set on rails, kN (tf)	230.5 (23,5)	230.5 (23,5)
Length over coupler pulling faces, mm	25,620	25,620
Bogie centres, mm	19,000	19,000
Types of containers transported as per GOST R 51876-2008		
Type 1AAA, 1AA, 1A	1 or 2	1 or 2
Type 1BBB, 1BB, 1B	2	2
Type 1CCC, 1CC, 1C	1*, 2*, 3*, 4*	1*, 2*, 3*, 4*
Overall dimensions as per GOST 9238-83		
Body	1-T	1-T
Bogie	02-BM	02-BM
Bogie model	18-100	18-9810 Barber S-2-R
Run to the first roundhouse service, ths km	210	500

* Containers must be loaded according to its actual gross weight not to exceed the platform payload capacity

DESIGN FEATURES

• Applied design allows to decrease car weight and increase its payload capacity providing the required strength and reliability • Modern shock absorbing device of T-1 class decreases the level of axial forces applied • Modern braking units with run life not less than four years • Threadless joints of brake lines • Life of durable sleeve joints not less than 1 mln km.

COMPETITIVE ADVANTAGES

Modern engineering tools and improved methods of strength analysis resulted in **UP-TO-DATE DESIGN**

Platform design guarantees **CONVENIENT AND EXPEDITE LOADING AND UNLOADING** of the containers

Endurance strength of the platform is ensured over its **32** years service life

Maintenance and repair

Tikhvin Freight Car Building Plant is responsible to the participants of transportation process for the quality and safety of the production. With these view the company provides full warranty and post-warranty service of freight cars, including the cars equipped with the innovative Barber bogies.

Under the service maintenance development and repair of freight cars TVSZ has signed long-term relationship agreements with JSC "Car Repair Company – 2" and LLC "Siberian Car Repair Company", LLC "Transvagonmash" and railway administrations of Ukraine, Belarus, Estonia and Kazakhstan. On the territory of Russia and the CIS countries more than 15 maintenance centers were established.

The maintenance centers, provided with technical documentation and original spare parts, are locating along the route of freight cars produced by Tikhvin Freight Car Building Plant.

The establishment of these maintenance and repair centers for the freight cars equipped with Barber bogies renders possible:

- to perform car uncoupling repair;
- to minimize the car repair downtime due to fast delivery of the required original spare parts and repair in place of uncoupling.

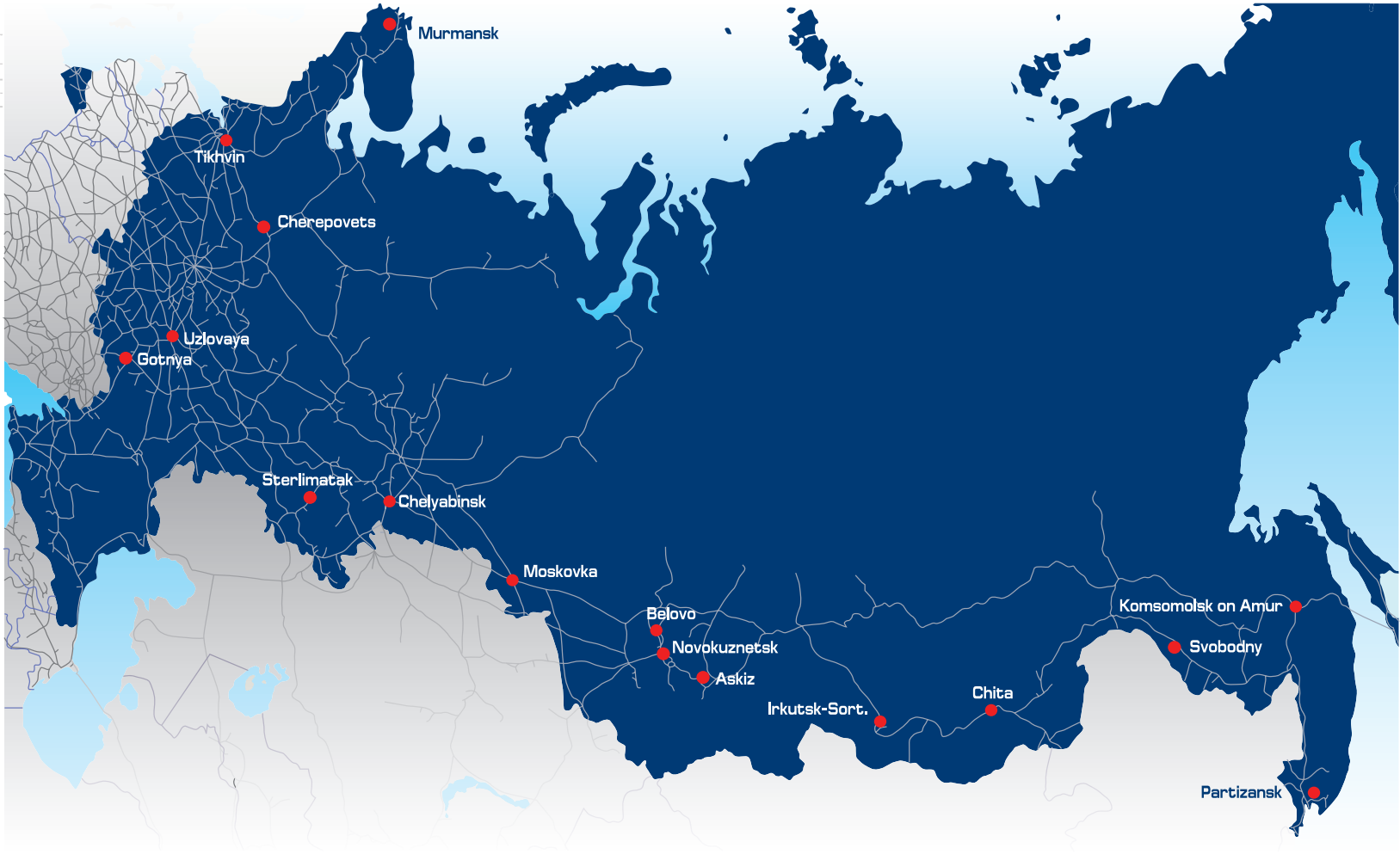
For more details on maintenance and repair please contact us on the following address:
tvsz_product@uniwagon.com

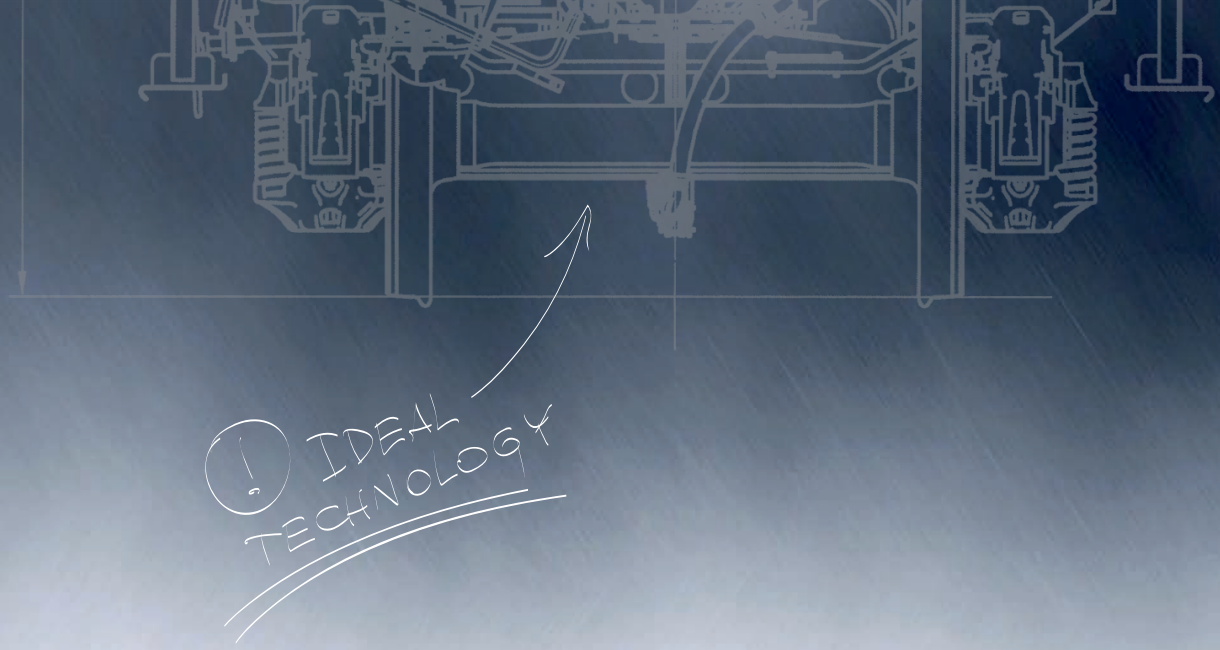
Sergey Maltsev
CEO of Globaltrans

"…IT IS NECESSARY TO PAY MORE ATTENTION TO NEW ROLLING STOCK TYPES, WHICH ARE PRODUCED AT THE PLANT IN TIKHVIN..., BECAUSE IN MY OPINION THESE MODELS WILL BE HIGHLY MARGINAL EVEN IN THE LOW MARKETS."

"Interfax" Newswire

Maintenance centers of CJSC "Tikhvin Freight Car Building plant"





CONTACTS

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