TIKHVIN
FREIGHT CAR BUILDING
PLANT
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BARBER S-2-R

The bogie of Barber S-2-R type design embedded advanced technologies, which made it possible to design an undercarriage of freight cars with safety indexes, operational reliability and operational costs are unique for the Russian Federation and CIS countries.

Technical characteristic	18-9810	18-9855
Bogie weight, kg	4800	5000
Maximum estimated static load from the wheel set on rails, tf (kN)	23,5 (230,5)	25 (245,2)
Bogie base (standard), mm	1850	1850
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	2036	2036
Distance between side bearing longitudinal axes, mm	1524	1524
Wheel tread diameter	957	957
Distance from the rail top level to the center plate supporting surface, mm - in free state - when a car is empty (tare weight 21 t)	 830 795	 830 795
Difference between deflections when the car is loaded and empty, mm	51	55
Estimated static suspension deflection, mm - when a car is empty (tare weight 21 t) - when a car is loaded (gross weight 100 t)	 25 48	 25 51
Side bearings	spring elastic	spring elastic
Service life, years	32	32
Distance run between overhauls, thousand (s) km	500	500

DESIGN FEATURES

1. Side frame:

- a reinforced structure provides increased reliability and service life indexes, improves the operational safety
- wearing faces are fitted with a removable protection part, which provides the wearing service life up to 1 mln km

2. Coupler

- the bolster's geometry provides availability of a stress-ration condition when loaded;
- enables to install different types of removable bearings on the mounting surface;
- center plate's sizes enable to roll a bogie to all existing types of freight cars;
- removable wear-resistant parts of the central plate enable to protect the central plate against deterioration and their service life is 500 000 km of the bogie run ;
- removable wear-resistant parts of bolster pockets enable to protect the bolster against deterioration and their service life is 1 000 000 km of the bogie run .

3. Cartridge tapered roller bearing fitted with support of the side frame via an adapter:

- provides the reduction of unsprung bogie weight and improvement of ride performances;
- the adapter design enables to improve the testability and safety during repair because of the availability of wear indicators and safety lug-bosses;
- the adapter is characterized by a high wear resistance due to reinforced high-duty cast iron used and the service life when the run of the bogie is reached 1 500 000 km;
- the bearing provides the warranty lifetime 800 000 km;
- use of a case bearing and an adapter enables to provide significant reduction of service costs for a wheel set.

4. Piecewise spring suspension comprises nine double-row spring assemblies

- enhances the car dynamic qualities both in a loaded and empty condition.

5. Friction shock absorber

- friction wedges are made of high duty cast iron, that provides stable friction characteristics, as well as increases its service life;
- a fundamentally new 3-D geometry raises the bogie stiffness;
- provides the testability of the bogie when operated due to use of visual wedge wear indicators;
- has a wear life time when a bogie run reaches 1 500 000 km.

DESIGN FEATURES

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6. Fixed contact side bearings

- improve the dynamic quality of freight cars;
- have high wear resistance of the friction couple when a bogie run reaches 1 000 000 km;
- provides the testability of the bogie when operated due to use of visual wear indicators;
- use of springs as spring units enables to keep consistent power characteristics of bearings at a low temperature.