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.

<table>
<thead>
<tr>
<th>Technical characteristic</th>
<th>18-9810</th>
<th>18-9855</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogie weight, kg</td>
<td>4800</td>
<td>5000</td>
</tr>
<tr>
<td>Maximum estimated static load from the wheel set on rails, tf (kN)</td>
<td>23,5 (230,5)</td>
<td>25 (245,2)</td>
</tr>
<tr>
<td>Bogie base (standard), mm</td>
<td>1850</td>
<td>1850</td>
</tr>
<tr>
<td>Design speed , km/h</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Distance between the load application lines to necks of axles of wheel sets and the spring set longitudinal axis, mm</td>
<td>2036</td>
<td>2036</td>
</tr>
<tr>
<td>Distance between side bearing longitudinal axes, mm</td>
<td>1524</td>
<td>1524</td>
</tr>
<tr>
<td>Wheel tread diameter</td>
<td>957</td>
<td>957</td>
</tr>
<tr>
<td>Distance from the rail top level to the center plate supporting surface, mm - in free state</td>
<td>830</td>
<td>830</td>
</tr>
<tr>
<td></td>
<td>795</td>
<td>795</td>
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<tr>
<td></td>
<td>830</td>
<td>830</td>
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<tr>
<td></td>
<td>795</td>
<td>795</td>
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<tr>
<td>Difference between deflections when the car is loaded and empty, mm</td>
<td>51</td>
<td>55</td>
</tr>
<tr>
<td>Estimated static suspension deflection, mm - when a car is empty (tare weight 21 t)</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Estimated static suspension deflection, mm - when a car is loaded (gross weight 100 t)</td>
<td>spring elastic</td>
<td>spring elastic</td>
</tr>
<tr>
<td>Side bearings</td>
<td>spring elastic</td>
<td>spring elastic</td>
</tr>
<tr>
<td>Service life, years</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Distance run between overhauls, thousand (s) km</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>
DESIGN FEATURES

1. Side frame:
   - a reinforced structure provides increased reliability and service life index-
     es, 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 reduc-
     tion 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 fric-
     tion 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.
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.