

ADY's Sleeping Cars Under Construction

On 12 June 2014 Stadler was awarded a contract by Azerbaijan state operator ADY (Azərbaycan Dəmir Yolları) for a batch of 30 new 160 km/h carriages to be used on international services linking Baku, Tbilisi, Kars, Ankara and Istanbul (see R 3/14, p. 12).

The upgrading of the line between Baku, Tbilisi and Kars was agreed upon in 2007 by the Turkish, Georgian and Azerbaijani governments, the work to include a new stretch of line between Georgia and Turkey, avoiding Armenia. Substantial freight traffic was envisaged, and 2010 was over-optimistically fixed as the completion date. While the various stretches of line in Azerbaijan and Georgia have now been upgraded, problems were encountered during the construction of the high altitude international stretch between Achalkalaki (Georgia) and Kars. Tracklaying is now nearing completion and services on this stretch of line, which is not electrified yet, are expected to start in late 2017.

The batch of 30 new **carriages** consists of:

- three Class **WLA** first class sleepers, which offer de-luxe accommodation, each car having eight two-berth en-suite compartments,
- three Class **WLAB** first/second class composite sleepers. These carriages offer comfortable first class accommodation in four two berth en-suite compartments, which include a toilet. There are also four two-berth second class compartments only with washbasins. Pairs of these first class (A) and second class compartments (B) are provided with intercommunicating doors, so that they can be sold as four-berth family compartments. There is also one second class four berth compartment. For users of the second class compartments there is a WC/shower cubicle at the end of the car.
- 18 Class **WLB** second class sleepers, offering eight four-berth compartments, without washbasins. One shower/WC cubicle and a second WC cubicle (without a shower) are provided at one end of the car.
- three Class **WLBb** wheelchair-accessible second class sleepers. These have four second class four-



*The first three carriages in the batch destined for ADY were completed by early 2017. These were a Class **WR** dining car, a Class **WLB** standard sleeper, and the Class **WLA** de-luxe sleeper AZ-AZ 62 57 44-71 008-02 **WLA**, which was exhibited at InnoTrans 2016. This photo shows them at Stadler's IBS commissioning centre at Erlen.*

- berth compartments, together with a wheelchair-accessible compartment. This has two berths, one for the disabled person's helper. There is one shower/WC cubicle designed for use by handicapped passengers, and also one with standard dimensions and fittings. Both entrance doors are fitted with wheelchair lifts.
- three Class **WR** restaurant cars, each with 28 seats. To cater for the fact that some passengers will be making the full 50-hour journey between Baku and Istanbul, lunch and dinner will be served in several sittings, while passengers will receive their breakfasts in their sleeping cars.

The cars are to be marshalled into three identical **ten-car rakes**, formed of one **WLA**, one **WLAB**, six **WLBs**, one **WLBb** and one **WR**. Each sleeping car will be staffed by two attendants, who have their own two-berth compartment and a small kitchenette for the preparation of hot drinks and breakfasts.

The entrance doors are designed for boarding at platform heights of 200 and 1,100 mm (in Azerbaijan and Georgia, where GOST standards apply), and of 300, 380 and 500 mm (in Turkey,

where UIC standards apply). All the sleeping cars have three 500-litre fresh water tanks, while the restaurant cars have four. These are roof-mounted, at the ends of the vehicles. It is planned to refill them roughly halfway between Baku and Istanbul. The WCs drain into 800 litre „black“ waste tanks, which are emptied during servicing at the end of each run, while the washbasins, showers and kitchen sinks drain into 100-litre „grey“ waste tanks, which empty automatically once the train is travelling at or above 40 km/h.



In early 2017 the next five carriages of the batch were being built at Stadler's Altenrhein works.



The outer ends of the carriages at each end of each rake are to be fitted with combined Type SA3 automatic and UIC screw couplings. This couplings, necessary for use on the 1,520 mm gauge network, are produced by Voith (see R 4/14, p. 52). Voith also produced the high impact absorption buffers fitted to this batch of carriages. The inter-car couplings are only of the UIC screw type.



A WLB sleeper at Stadler's Altenrhein works, shortly after completion of final assembly. Following commissioning at the IBS the carriages are then stored at Weinfeld (just a stone's throw from Bussnang), on sidings belonging to Axpo Holding, a power trading company. Here they await delivery to ADY.

The carriages are designed for receiving power from the locomotive at 3,000 V DC and 1,500 V AC. Turkish lines are electrified at 25 kV AC, and there are projects to convert the Azerbaijani network to 25 kV AC. Each carriage is fitted with a standby **diesel-generator**, situated behind a door at one end of the car (see photo on p. 32 below left, where that door is half open), capable of providing on-board power for up to 24 hours, in the event of the train becoming stranded, or whenever the train is being hauled by a Turkish diesel locomotive.

The fuel tank for the dieselgenerator, the compressed air system, the waste water tanks, the air conditioning system, the cubicle containing the battery and some electrical switchgear, and the converter are all underfloor-mounted. The passenger information system is equipped with infotainment functions, with screens provided in each compartment. WiFi access is possible in all carriages, and is linked up to the infotainment system.

Turkey will grant **authorisation** for the use of the carriages on its network, and some tests will be re-

lised there. However most of the tests on 1,435 mm gauge lines are scheduled to take place later in 2017 in Switzerland and Germany. It is not known yet how long these tests will last for. Testing on 1,520 mm gauge lines is to take place either in Azerbaijan or in Russia. Once the carriages have been granted TR TS 001/2011 authorisation for Russia or Azerbaijan, they will also automatically be cleared for use in Georgia. Stadler expects that the first ten-car rake will be moved to Azerbaijan in early 2018, with the second rake following later in the year, and the third in 2019.

The **bogies** will have to be subjected to the same sort of tests as those for any other ordinary type of bogie. The only design difference between those under the ADY sleepers and those of other carriages is that the sleepers are mounted on gauge-changing wheelsets. These are of a tried-and-tested design, and are supplied by BVW (Bochumer Verein Verkehrstechnik). The gauge-changing facility is currently being installed at Achalkalaki. It is about 20 m long, and is designed for use with vehicles travelling at speeds of between 5 and 10 km/h.

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Photos, unless otherwise cited, by author, taken on 6 February 2017



A first class two-berth en-suite compartment, in the WLA car which was exhibited at InnoTrans 2016.

Photo: Tomáš Kuchta

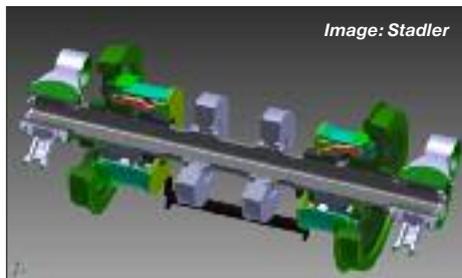


Image: Stadler

This illustration shows how one of the BVW-produced gauge-changing wheelsets works. The drums inside the two wheels house an interlocking mechanism. As the wheelset passes through the gauge changer, from 1,435 mm gauge to 1,520 mm gauge track, the inner faces of these two drums are pushed outwards. The wheels are during this procedure momentarily unlocked from their axles and by the rails within the installation are guided into position for the new track gauge. Then the drums are released, and the wheels are once again locked into position on the axles. The whole system is hermetically sealed, to ensure that the unlocking/locking mechanism is not blocked by frozen snow or ice. The two brake discs are situated in the centre of the axle.

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