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Automobile production is still on the increase, and the main factors deciding choice of transport mode are quality, speed and reliability. ČD Cargo provides more than 90% of the transport of automotive components and vehicles in the Czech Republic, thus confirming the operator's high standards of reliability and professionalism. The automotive industry thus demonstrates that rail transport can form part of modern, progressive logistics and production chains in the 21st century.

The cover photo was taken on 30 April 2015 between Mladá Boleslav and Nymburk, and shows ČD Cargo's modernised 753.777, hauling a trainload of new Škodas bound for sale in Germany.

Photo: Michal Roh jr.

On pp. 54 - 55 we examine the Type ZRR 10000 M snow-blower built by Zaugg of Switzerland for use on the Luleå to Narvik Malmbanan, where winters are severe.

This snow-blower can rotate on its underframe to change its working direction, as shown here on 13 October 2015 at the Matisa factory at Crissier.

Photo: Jürg D. Lüthard

Railmix

5

Latest News

Train-Building Returns
To Northeast England

10

RailWorld

Latest Standard
CRH High Speed Trains

12

Armacell Provides Extensive Range
Of EN 45545 Compliant Insulation
Materials For Railway Vehicles

13

Panorama

RegioJet Expands Carriage Fleet

14

RailScript

AMIT Technology In ČD's
InterPanter EMUs

16

RailStrategy

Liebherr's Air Cycle Air Conditioning
Units In Use In France

18

RailReport

EXPO 1520

22

RailScript

Long-Term Maintenance Strategy
For Croatian Network

50

Horizon

The ZAUGG-MATISA ZRR 10000 M
Snow Clearing Vehicle

54

Report

TRAKO 2015

56

TramScripts

Tram News Round-Up

70



On pp. 12 - 13 we look at the latest developments in the CRH high speed train fleet, the new China Standard High Speed EMUs, built by the China Railway Rolling Stock Corporation.

This photo shows both trains, CRH-0503 (in the foreground) and CRH-0207, during a media presentation event at the CARS test centre in Beijing on 30 June 2015.

Photo: Luo Chunxiao



This number of Railvolution is dedicated to the fifth EXPO 1520, held at the Shcherbinka test circuit in early September. The mega-feature on pp. 22 - 49 looks at many of the rail and state-of-the-art rail technology exhibits from Russia and other CIS countries.

Here we see two of the latest Russian electrics, the 3 kVDC Granit 2ES10-120 (left) and the prototype 25 kV 50 Hz 2ES7-001, both built by Uralskie lokomotivy, forming part of the cavalcade on the test circuit.

Photo: Jaromír Pernička



Shortly after EXPO 1520 came the 11th TRAKO 2015 International Railway Fair in Gdańsk. The event, Poland's largest rail industry exhibition, is covered in the report on pp. 56 - 69.

This photo shows Poland's, and PKP Intercity's two longest EMUs, the Class ED160 FLIRT 3 (left) and Class ED161 PesaDART, exhibited at Gdańsk - Stadion EXPO station on 22 September 2015.

Photo: Tomáš Kuchta



The ZAUGG-MATISA ZRR 10000 M Snow Clearing Vehicle

Annually 27 million tonnes of iron ore are transported on the Malmbanan, which links Luleå in Sweden and Narvik in Norway, part of this railway lying north of the Arctic Circle. Traffic is on the increase. To cope with this it is necessary to keep the line open during the most severe wintertime weather experienced, and here winter lasts from November until April. The snow blowers used for this purpose are now ageing, and their replacement is due.

The Swiss-based firm Zaugg, located in Eggiwil (near Berne), was awarded the **contract** for a suitably powerful snow-clearing vehicle following an invitation to tender issued by Sweden's Trafikverket. Delivery is to take place in March 2016. The snow blower will be used, above all, on the northernmost and highest stretch of line between Kiruna and the Norwegian border.

Zaugg is one of the world's leading manufacturers of snow blowers, and has produced a large number of them. Since a self-propelled vehicle was specified, MATISA Matériel Industriel was chosen as a sub-supplier for the underframe and running gear. The company is a specialist in the construction of rail infrastructure vehicles, and is able to provide a hydrostatic driveline from its range. MATISA will also be responsible for the drive system and drive controls, and for authorisation in Sweden. The snow blower is priced at around 9.5 million CHF (8.8 million EUR).

Trafikverket chose the Type **ZRR 10000 M** snow-blower. „ZRR“ and „M“ stand for „Zaugg Rolba Railway“ and „MATISA“, while „10000“ characterises the highest level in the Zaugg-Rolba range (a theoretical hourly output of snow blowers). It is a four-axle self-powered snow blower, the prime movers being two 470 kW Caterpillar C18 Stage IIIB engines. The hydrostatic drive enables the optimal power distribution between running and snow blower drives, and three of the four wheelsets are powered.

The vehicle can travel and work in either direction, and to enable this, its bodywork, including the blowers, can be **rotated** through 180°, this taking just two minutes to perform. The rotation is realised using a turntable ring mounted on the underframe. Once rotation has been completed the bodywork is, at both ends, automatically bolted into position to secure it.



The upper view shows snow-blowers in the retracted position, and raised for running on lines where snow clearance is not required. This position also ensures that the discharge chutes do not exceed the loading gauge. This photo was taken on 13 October 2015 at the Matisa factory at Crissier. The machine EVN is 99 74 9491 001-8.

At one end of the bodywork there are two dual-stage **snow blowers** which can both be moved vertically, and only together, or individually, to the left and right. Snow is ejected from the machine via the ejection/discharge chutes, and the distance and direction in which the snow is ejected can be adjusted. When the snow-blower vehicle is being moved, without having to work on snow clearance, both adjustable



A side view, showing how the bodywork can be rotated on the turntable ring mounted on the underframe. The door to the engine compartment is open. The snowplough will be installed at the same end as the engine compartment following delivery to Sweden.



Ready for action! Here the snow-blowers have been extended on either side to the vehicle to their maximum outreach position. A high-powered xenon searchlight is provided in the centre, between the blowers, but all other lights have LEDs. Some of the lights are only intended for use during maintenance.

Principal Technical Data

Track Gauge	1,435 mm
Axle Arrangement	(A1) Bo'
Diesel Engines Power	2 x 470 kW
Maximal Speed - When Moving To Or From Work Sites	70 km/h
- With Snow Blowers Working	20 km/h
- When Being Towed	100 km/h
Snow Blowers' Output	7,500 t/h
Overall Length	16,470 mm
Distance Between Bogie Pivots	7,790 mm
Bogie Wheelbase	1,800 mm
Overall Weight In Working Order	70 t
Weight Of Bodywork	47 t
Weight Of Underframe	20 t
Fuel Tank Capacity	3,000 l
Minimum Curve Radius Negotiable	90 m
Minimum Working Ambient Temperature	-40 °C



A view of the driving console. Both windcreens are fitted with heating wires. At each driving/operating position the air brake lever is on the left and the traction control lever on the right. The snowplough is operated using buttons situated between the brake and traction controls. In front of these buttons there are two joysticks used for the snow blowers.

snow-blowers are grouped close together and vertically, situated several cm above rail top, in order to keep the vehicle within the UIC 505 G1 loading gauge of the line. Unlike snow-blowers with fixed-position equipment, but with deflector plates, the adjustable assembly uses less power when clearing snow off the rails, and can accomplish this much more rapidly.

At the rear end of the vehicle is a hydraulically adjustable **snowplough** for clearing above and between the rails. This can be adjusted remotely from the cab. It can be raised when the snow-blower is moved from one working location to another, or lowered, to clear snow. Moreover it can be moved to left or to right, or configured into a „V” shape, so that snow can be directed to either side of the track.

So that the weight of the snow-blower is balanced, both engines are situated towards the rear of the bodywork, while the fuel tank is located near the centre. An auxiliary engine is installed to power auxiliary drives and the defrosting or pre-heating of the snow blower. Alternatively these functions can be run off an external power source.

The complete **cab** plus the electronics cabinet assembly is mounted on the bodywork using a combination of

suspension and damping systems. The result is that noise levels in the cab are incredibly low, even when the snow blowers are running. The cab has two interchangeable working positions, one for driving and the other for operating the snow blowers. Both positions offer a good unobstructed forward view, and both incorporate an identical range of controls. In practice the snow-blower could therefore be one-man operated, but for safety reasons, it is not recommended by Zaugg. The consoles are provided with a set of push-buttons to adjust the snow-blowing equipment to pre-defined pre-programmed positions.

Although the drive engines can always be started up, driving and operating of the snow-blower involves the operating crew first of all blowing into the alcohol tester. This is a standard piece of equipment in Sweden, found on buses, rail vehicles and other forms of public transport. Should the test prove positive, the drive controls will remain locked.

Among the fittings in the spacious cab are a table with two folding seats, mounted against one of the sidewalls, a fridge, microwave oven and coffee machine. A large empty cabinet is provided for the future installation of ETCS equipment.



Photo: Michal Vaňous

CZ LOKO's Fennia Rail Diesels Arrive In Finland

On 30 August 2015 774.711 (Dr18 101), the first of the three diesels ordered by Fennia Rail, left its birthplace factory in Česká Třebová, bound for Finland. **This photo was taken one month later, on 30 September, showing the locomotive on the Laajakangas test track near Kontiomäki in central Finland.** Coincidentally, on the same date, 774.712 and 713 (Dr18 102 and 103) left Česká Třebová, reaching Finland about four weeks later.

Following arrival 774.711 was fitted with the final set of instrumentation for testing, this comprising track circuit

detectors and an earthing apparatus. A series of short test runs then took place, to fulfil requirements stipulated by the Transport Safety Agency, Liikenteen turvallisuusvirasto Trafi. By the end of October, the results of the tests were being examined and assessed. Examination of the test documentation was expected to take around a month.

Recently completed 774.713 is CZ LOKO's 100th modernised six-axle diesel locomotive. By early autumn 774.714 was being assembled. This one is 1,435 mm gauge machine, and will be incorporated in CZ LOKO's leasing pool once completed in February 2016.

Petr Kadeřávek

In October 2015 Vossloh Locomotives founded its own sales and service company in Sweden, thus offering its clients comprehensive services on-site in Scandinavia. **Vossloh Locomotives Scandinavia AB** is based in Örebro. Currently, nine G 6 three-axle shunters are being built for Swedish clients, and one has been in service in Sweden since mid-2015. At Nordic Rail 2015 fair was signed a rental contract with Rush Rail for a G 6 locomotive. The first DE 18 four-axle diesel-electric locomotive is planned to make its Swedish debut in early 2017.

Vossloh

Test running has now taken place in Switzerland, but not under snowy conditions. The first test run took the complete snow blower vehicle from its Crissier birthplace to Yverdon, the second one to Brig, the third to Berne and the fourth one to the marshalling yard in Denges near Lausanne. Delivery to

Sweden will take place by rail via Basel and Germany to Rostock, and then by ferry to Trelleborg with final destination Kiruna.

Jürg D. Lüthard

Photos by author

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