

UKRAINIAN RAILWAY NETWORK REHABILITATION

Feb 2023



SUPPORT OF RAILWAY RECONSTRUCTION TEAMS (1)

Providing recovery teams with earthmoving machinery (loaders, excavators etc)



Current situation: The ongoing damage to the railway network due to constant attacks has created a greater need for restoration and repair works. Due to that, there is a shortage of earthmoving machinery and other equipment for the dismantling of the damaged track, the preparation of the ground surface, and the repair of individual areas.

In addition, the existing fleet of earthmoving equipment is partially outdated and requires constant repairs. Also, there is not enough power of the available equipment to perform works of increased complexity.

Examples of machinery needed	est. q-ty needed
Front loader, 3-3.5 m3 (JCB or similar)	3
Pneumatic excavator with additional attachments (hydraulic hammer, bucket, grab) 1.0 to 1.3 m3 (JCB or similar)	4
Bulldozer (220-320 hp) (CAT or similar)	4
Walking excavator SCHREIT-BOHR-BAGGER (M545x/SA2500-1FS Gen.II)	1
Excavator-loader on a combined drive with attached equipment	92
CAT 950 GC front loader (manufacturer ZEPPELIN CAT)	27
Backhoe loader CAT 444 (manufacturer ZEPPELIN CAT)	40
Bulldozer CAT D4 (manufacturer ZEPPELIN CAT)	54
Motor grader CAT 150 (manufacturer ZEPPELIN CAT)	27



SUPPORT OF RAILWAY RECONSTRUCTION TEAMS (2)

Providing recovery teams with heavy railway machinery



Current situation: Since the beginning of the war, 36 942 km of track is subject to restoration. Special railway machines will help to significantly speed up the high-quality repair of damaged sections.

This machines not only speed up the process of removal, re-profiling of rails, cleaning and arrangement of ballast and track laying, but also significantly increases the safety of workers.



Examples of machinery needed	est. q-ty needed
Multipurpose Stoneblower or similar	6
Ballast levelling and profiling machine SSP 110 SW or similar	4
Plasser & Theurer duomatic 09-32 csm or similar	12
Tamping machine Unimat 08-475/S or similar	12
Ballast cleaning machine (Plasser & Theurer RM-80 or similar)	6
Draisine for a railway track with a manipulator and attachments (for 1520mm/1435mm gauge track)	92

SUPPORT OF RAILWAY RECONSTRUCTION TEAMS (3)



Providing recovery teams with tools and other equipment

Current situation: Since the beginning of war Ukrainian railway workers restored 25 out of 69 bridges damaged by the enemy, as well as 19,838 km out of 36,942 km of damaged tracks. Damage to the railway infrastructure continues and the volume of work is increasing.

A lot of hand tools, power tools, and other equipment are needed to quickly complete such a large amount of work.

Examples of equipment needed	est. q-ty needed
Air compressor (15 kW, 2.4 m3/min.)	10
Shotcrete installation TORNADO AS-3, or similar for 7.5kW, 1.8m3/h	5
Device for laser cleaning of metal (RayMark 7C-0200 or similar for power 1.5 kW, productivity from 20m2/h)	155
Scaffolding PERI or similar	10
Drilling machine on a magnetic stand (MAB 845 or similar for 1.6-1.8 kW maximum cutting depth 110 mm)	170
Rail cutter	200
Rail grinding machines	200
Rail drilling machines	200
Rail grinding machines for turnouts	92
Hand tools (impact drivers, angle grinder, jackhammers, sandblasters, chainsaws, perforators etc.)	endless



RAPID RECONSTRUCTION OF REINFORCED CONCRETE STRUCTURES

Providing recovery teams with concreting equipment



Current situation: In 2022 a lot of railway engineering structures, including 69 bridges, were damaged by russian attacks. The rest is still subject to restoration, which requires time and resources, materials, equipment and machinery.

Reinforced concrete structures are usually used in construction. For their restoration, mobile specialized equipment is now very much needed to make it possible to repair bridges and other structures as quickly and efficiently as possible.

Examples of equipment needed	est. q-ty needed
Formwork for concreting (PERI or similar)	3
Mobile concrete unit (plant) 20m3/hour	2
Truck-mounted concrete pump (60-90 m3/h)	3
Concrete Mixer Truck 7-10m3	4
Concrete mixers	170



RAILWAY OPERATION IN CONDITIONS OF POWER OUTAGES AND BLACKOUTS



Providing backup sources of power supply to ensure railway safety

Current situation: As a result of the war, significant damage was caused to the energy infrastructure of Ukraine. Due to the shortage of electricity, periodic power outages are implemented. Moreover, new strikes on the energy infrastructure cause blackouts.

The operation of control and signaling devices on the railways is highly dependent on the power supply. In order to ensure safety and continuity of transportation, it is necessary to compensate for the lack of centralized power supply by means of batteries, accumulators and generators.

Examples of equipment needed	est. q-ty needed
Battery OPzS 100 A*h, 2 V	20 000
Battery OPzS 350 A*h, 2 V	2 500
Battery OPzS 490 A*h, 2 V	1 500
Sealed battery for telecommunications equipment (12V 125 A*h)	1 800
Sealed battery for telecommunications equipment (12V 155 A*h)	600
Diesel generator units (8kW, 12kW, 16kW, 24kW, 48kW, 100kW)	6, 16, 23, 72, 65, 2



RESTORATION OF CATENARY NETWORK AND ELECTRIFICATION LINES



Provision of means for the repair of the railway power network

Current situation: Along with the energy infrastructure as a whole, the railway power grid was also damaged. Separate sections of the track were de-energized as a result of damage to the electrification lines, which limits the movement of trains.

Specialized equipment and materials are needed to repair the network and restore normal rail traffic.

Examples of equipment needed	est. q-ty needed
Multimeters (eg "APPA 99")	1200
RRV Unimog (vehicle of combined drive for 1520 mm track for the construction and maintenance of catenary network)	15
Contact network disconnector sectional two-pole U=25,000 V, frequency 50 Hz, I=1600A	50
Catenary sectional insulators for a voltage of 25,000 V, a frequency of 50 Hz for speeds of up to 160 km/h	50
Single-pole vacuum switches of the external installation U=25,000 V; frequency 50 Hz at rated current I-1600A, I-1000A	20; 20
Copper control cable (KBBГ 14x2,5; KBBГ 7x2,5)	20000m
Insulating removable towers (gratings) for 1520 mm track	50

