1873

140 YEARS

2013

ZMZ

ZAPOROZHYE
MECHANICAL
PLANT

HISTORY

THE PLANT WAS FOUNDED IN OCTOBER 1873, WHEN THE WORKSHOPS FOR THE REPAIR OF LOCOMOTIVES AND CARRIAGES OF THE ALEKSANDROVSK RAILWAY STATION WERE TAKEN INTO OPERATION BY THE COMMISSION OF RAILWAY MINISTRY.
THE CAPACITIES OF ALEKSANDROVSK WORKSHOPS ALLOWED TO REPAIR 20 LOCOMOTIVES AND 40 WAGONS A YEAR.

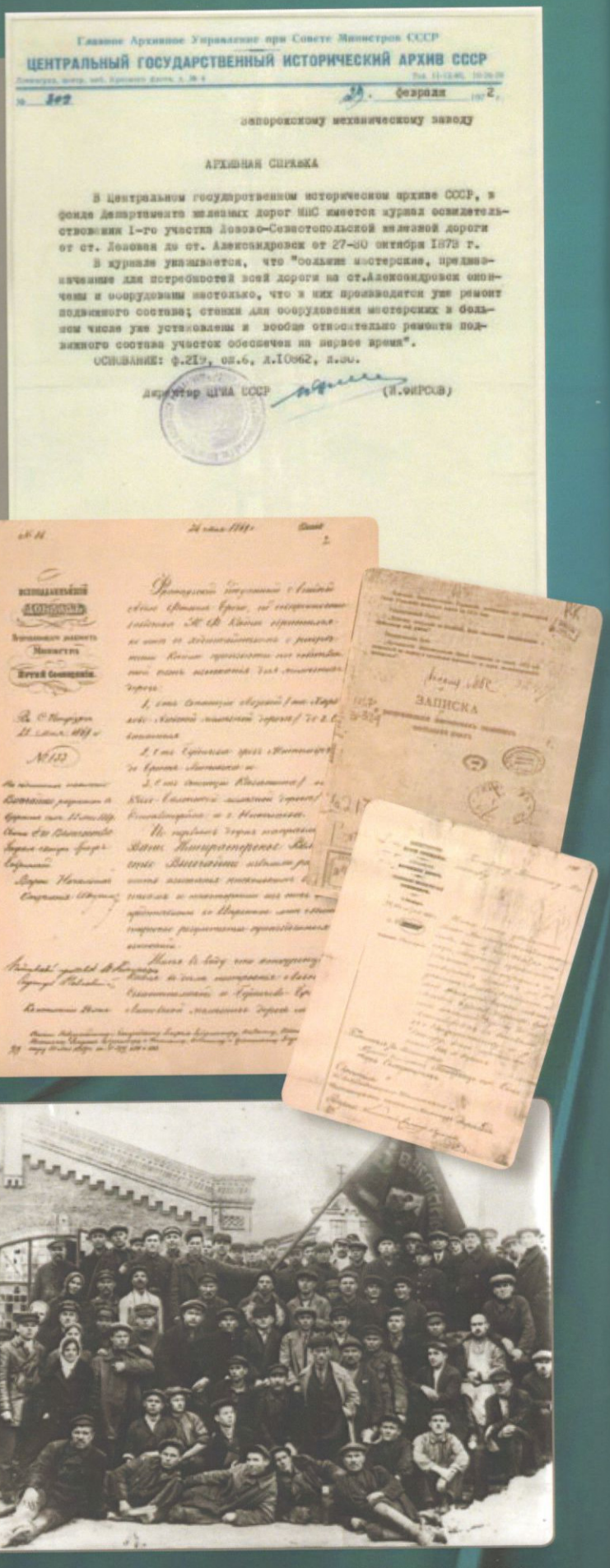
Since January 1, 1907 in connection with the merger Kharkiv and Mykolaiv and Kursk–Kharkov SKO–Lozovo–Sevastopol road to South railway workshops were named Southern. At the end of the 20s the profile of production of workshops changed, instead of repairing rolling stock they began to produce spare parts for railway transport.
In 1932, workshops were fully re–equipped for the manufacture of spare parts and railway equipment.

Cross–planing stations machines, sleeperdrilling and sleeper reparement machines were produced on the basis of bulldozers ChTZ tractors and various parts for locomotives and wagons.

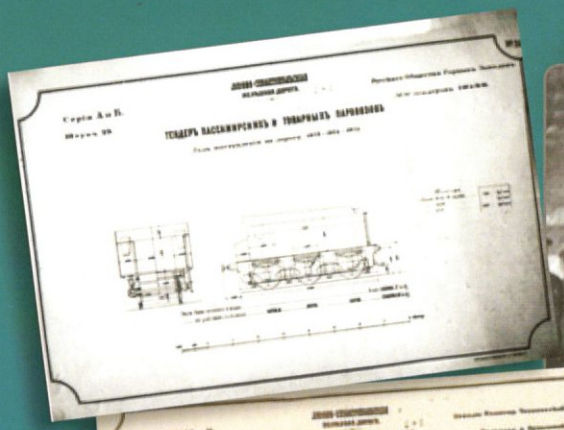
Since April 1932 the South workshops were renamed to Mechanical Plant with Central management of Railways Ministry communication.

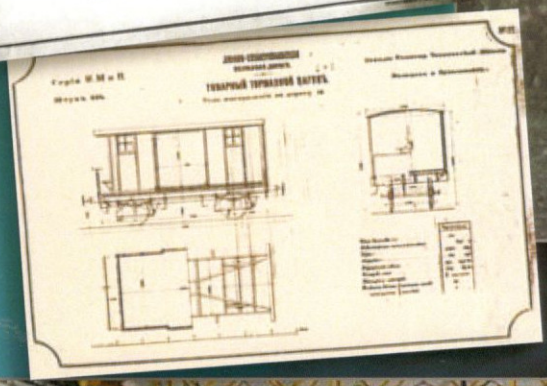
August 11, 1941 the plant was evacuated in Tashkent, where it began to produce products for military purposes. On the 18 th day of its being the first batch of products was released: mine for field mortars, and high pressure compressors for army needs.

After the liberation of Zaporozhye in December 1943 the restoring of a destroyed enterprise by war had began.
In 1944, the plant started to produce non–military products: pneumatic hammers, Hack–cutting machines, files, etc.


ЦЕНТРАЛЬНЫЙ ГОСУДАРСТВЕННЫЙ ИСТОРИЧЕСКИЙ АРХИВ СССР

Factory workers, 1930





Factory workers, 1930

During restoring plant shops were frequently directed to the production of lathe chucks, drills, grease nipples, saws for cutting sleepers, machines for spool bores and bushings, presses, spare parts for locomotives and wagons, special tools to check the automatic coupler devices and profile wheelsets. The administrative building and boiler room were reconstructed.
From a simple issue of factory production, Mechanical Plant moved on to more complex: pneumatic, mold and so on.

Since 1958, the plant, on the instructions of the Ministry, has started the development of production and issue of spare parts for diesel locomotives and electric locomotives.

There were carried out the activities for mechanization of production, the new casting department was arranged. In the mechanical assembly shop was built locksmith lot where the assembly of avtostrop, fuel pumps, Stands for testing pumps, speedometers drives, gearboxes moat and so on took place.

In 1976, Zaporozhye mechanical plant developed new products: patterns, counter–templates, drill dowel.

After the collapse of the USSR and the end of the period the stagnation of the economy a gradual increase in production volumes takes place economic situation stabilizes. High technical equipment, qualified personnel allow the plant to remain reliable enterprise and business partner not only for Ukrainian companies, but also for enterprises of Russia, CIS and States.

WITH THE CREATIVE THINKING PROFESSIONALS, THEIR HIGH QUALIFICATION, KNOWLEDGE OF ADVANCED DOMESTIC AND FOREIGN EXPERIENCE, MECHANICAL PLANT CAN SUCCESSFULLY IMPLEMENT TO THE PRODUCTION OF THE LATEST ACHIEVEMENTS OF SCIENCE AND TECHNOLOGY.

STRATEGY SUSTAINABLE DEVELOPMENT

During the global financial–economic crisis PJSC "Zaporozhye mechanical Plant "faced with a significant downturn in economic activity of consumers markets of spare parts for railway rolling. This decline is not due to only the consequences of weakening global financial and economic system, and also by cyclicreccurens of most railway engineering industry.

IN ORDER TO OVERCOME THE NEGATIVE MARKET FACTORS, THE STRATEGY OF SUSTAINABLE DEVELOPMENT HAS BEEN FORMULATED ON THE ENTERPRISE. THE MAIN OBJECTIVES ARE:

1. Optimization of the companys activity:

- rationalization of production and other internal processes;
- reducing of the cost of finished products;
- reduction in energy consumption and fuel and energy resources (FER);
- minimization of negative impact on environment.

2. Strengthening the market position at the expense of stability but high quality and expansion nomenclature of manufactured products.

3. The introduction and use of modern and innovative technologies at the enterprise.

Within the framework of sustainable development strategies have been defined and partially have been implemented following areas:

- lean production;
- management of energy consumption;
- quality control;
- environmental Management.

QUALITY CONTROL

IN THE CONDITIONS OF A HIGHLY COMPETITIVE MARKET ECONOMY A KEY ELEMENT OF THE SUCCESS OF THE ENTERPRISE, ITS RECOGNITION BY CONSUMERS, IS THE QUALITY OF MANUFACTURED PRODUCTS.

In order to optimize the production pro-processes and output to a qualitatively new level, the company has implemented a system of quality corresponding to the requirements of State Standard ISO 9001-2009, which is confirmed by certificates including on the quality management system obtained in 2010.

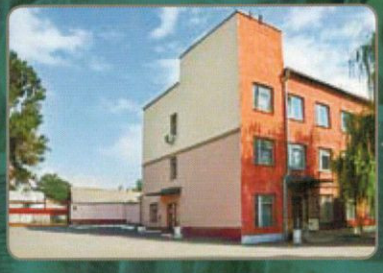
The products of PJSC "Zaporozhye mechanical Plant "is certified by FBU" register at the federal railway of the Russian Federation and the Ukrainian national certification system UkrSEPRO, namely:

- bearing crank shafts TE for diesel locomotives 6S310DR, K6S310DR, 5D49, D50, 2D50, 2D100, 10D100, 11D45, 14D40;
- motor-axial bearings for traction electric locomotives CME-3;
- upper bushing heads of rods diesel 6S310DR, K6S310DR, 11D45, 14D40, 5D49;
- valve intake and exhaust of diesel engines 14D40, K6S310DR, 5D49;
- 6S310DR fingers for diesel engines, K6S310DR, 2D100, 10D100, 11D45, 14D40, 5D49.

The quality of products of PJSC "Zaporozhye mechanical plant" guaranteed by high qualitication, initiative and responsibility of our experts and performers, optimization process and production processes, design improvement instruments, equipment and tooling.

MANUFACTURING CAPACITIES

ZAPOROZHYE MECHANICAL PLANT HAS ALL NECESSARY MEANS (TECHNICAL, MATERIAL AND FINANCIAL) FOR THE MANUFACTURE, SALE AND EXPORT OF SPARE PARTS TO RAILWAY ROLLING STOCK.

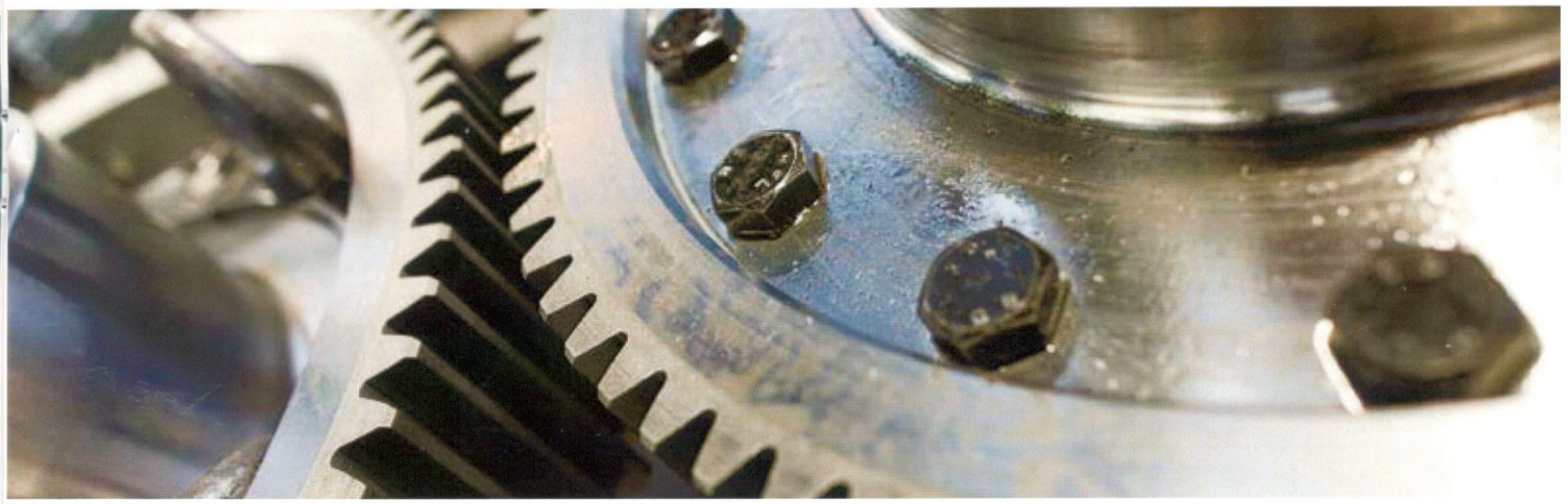


The factory covers an area of 5.4 hectares, which has the following production power:

- section 101 of the mechanical assembly production – production of valves, motor-axial bearings, piston pins and bolts, adapters, cranes indicator;
- section 102 of the mechanical assembly production – production of steel-bronze bushings, sleeves, gear unit moat priming pumps, gears. This production is equipped with pneumatic hammers and chambered furnaces;
- a section for the production of bronze-babbitt liners;
- non-ferrous casting;
- tool production – manufacturing of tools and equipment. It includes thermal lot that is running all the main types of heat treatment – hardening, annealing, carburizing, nitrogen and electroplating section and Oak seeding;
- chemical and measuring laboratory. Storage facilities are also available for storing pro-induction of the plant and property.

The machinery is provided by 400 units of equipment, including lathes, milling machines, grinding, drilling, press, saws and much more.

MANUFACTURING CAPABILITIES



TURNER GROUP

Maximum diameter workpiece	1000 mm
Maximum length workpiece	2800 mm

GRINDING GROUP

The maximum diameter grinding	320 mm
The maximum length of	800 mm
Hole diameter	40–250 mm
Height flat grinding	0,5–350 mm
Maximum length of grinding	800 mm
Maximum width of grinding	350 mm
Diameter centerless grinding	0.8 mm–75 mm
Maximum length of centerless grinding	20–200 mm

MILLING GROUP

Milling group consists of:
horizontal milling, vertical milling, universal milling machine and CNC milling machines that perform various types of milling operations.

The maximum product dimensions	1000x280x100 mm

BORING GROUP

Bore diameter	27–200 mm

GEAR GROUP

HOBBING

Cut the module	1–10 mm
The largest diameter of the pitch circumference of the wheel being cut	500 mm

CUTTING SLOTS

Maximum module being cut products	6 mm
Minimum module being cut products	1 mm
The maximum diameter installed products	300 mm
Maximum cutting length	100 mm

PERFORMS THE FOLLOWING TYPES OF GALVANIC COATINGS:

chromium–plating
oxidation
alloy coating «tin–lead»
alloy coating «tin–copper–lead»

TABLE

TYPES OF GALVANIC COATINGS AND MAXIMUM DIMENSIONS OF PROCESSED PARTS

Coating type	Dimensions, mm
Chrome	200x200x200
oxidation	200x200x200
tin–Lead	200x200x200

PROCESSING ON PNEUMATIC FORGING HAMMERS

mass of falling parts of	160–1000 kg
maximum weight forging	90 kg

PROCESSING ON HYDRAULIC PRESSES

The force developed by the press	10–200 tons

ON SAID FORGING AND STAMPING EQUIPMENT POSSIBLE TO PRODUCE FREE FORGING, STAMPING, CUTTING, BENDING, PIERCING, EMBOSSING

THE BILLETS ARE HEATED IN GAS OVENS

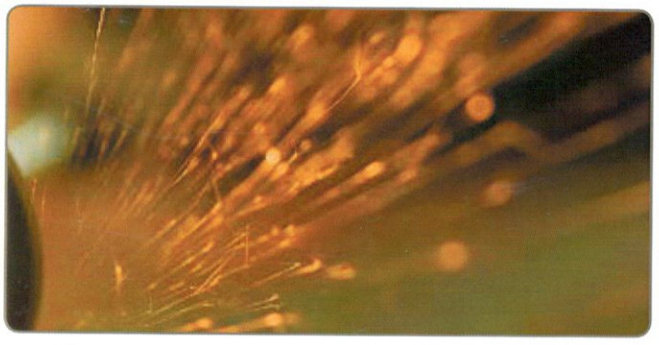
THE LOT OF BLANKS

It provides a variety of cutting of rolled profiles ferrous and non-ferrous metals maximum diameter to 330 mm and a length of 12 000 mm.

HOUSE SPRINGS MANUFACTURING

It is made of wire and spring rentals:
- screw;
- cylindrical;
- compression and tension.

The maximum diameter of material	7 mm
Maximum spring length	600 mm
The maximum diameter of the spring	80 mm



FILLING STATION BEARING

Produced pouring babbitt liner type BK2, BK2SH, B16, as well as bronze OS 1-22 centrifugal way and sprayers.

The maximum diameter of flooded bushings (bearings)	300 mm
The maximum length of	250 mm

THE FACTORY MANUFACTURES VARIOUS KINDS OF THERMAL AND CHEMICAL-THERMAL TREATMENT OF FERROUS AND NON-FERROUS METALS AND ALLOYS.

TABLE

KINDS AND MAXIMUM HEAT TREATMENT DIMENSIONS OF WORKPIECES

Type of heat treatment	Dimensions in mm
tempering	1200x700x400
vacation	1000x1400
annealing	600x1000
normalization	1200x700x400
cementation	400x700
nitriding	400x600

ELECTROMOTIVE OVEN ITPE 0.65 / 0.5 HS1

Bronze smelting.

ELECTROMOTIVE OVEN ITP

For the smelting of non-ferrous alloys.
Molten metal weight - 20 kg.

ELECTRIC RESISTANCE FURNACES

For melting babbitt BK2SH, B16.
Molten metal weight - up to 650 kg.

METAL CASTING

The company produces the casting in centrifugal machine for non-ferrous alloys in various kinds of molds.

SPARE PARTS LIST

FOR RAILWAY ROLLING STOCK
PRODUCTION OF PJSC «ZAPOROZHYE MECHANICAL PLANT»

DIESEL TEK: DIESEL 2D100. DIESEL 2TE10, 2TE10L, TE10, 2TE10M: DIESEL 10D100

Name	Drawing	Name	Drawing	Name	Drawing
Adapter for indicative crane	D128.00.00sb	Liner	D100.02.138	Laying	D100.17.013
Nozzle adapter	D127.00.00sb	Liner	D100.02.139	Reducer worm	TE2.62.1sb
Bolt with nut	D100.24.005 / 006	Liner	D100.24.007	Reducer worm	TE2.62.020sb
Bolt with nut	D100.02.008–2 / 009–1	Liner	D100.24.017	Reducer worm	2TE10L.00.20.012
Shaft	TE12.00.020.115	Worm wheel	TE2.62.006	Pusher	D100–17–006
Shaft	TE12.00.020.108	Worm wheel	2TE10L–00–020	Worm	TE2.62.007
Worm	TEZ.62.081	Crane indicator	2D100.06SB	Gear	361–50
Weel shaft	TE2.62.006	Finger piston	D100.04.004–5	Gear	2TE10L.30.58.123
Shaft drive	D100.29.004	Fuelpumping	2D100.32.010sb	Hairpin of main bearing with 2 nuts	D100.02.007–2 / D100.02.009–1
Liner	D100.02.136	Driving speedometers	2TE10L.00.20.007		
Liner	Д100.02.137	Laying	D100.17.018	Spindle	D100.06.003–2

M62 DIESEL: DIESEL 14D40. DIESEL TEP60, 2TEP60: DIESEL 11D45

Bolt with nut	40D.17.05/30D17.06.3A	Bushing	D45.17.5 SB–1	Piston	30D.22.05–8
Liner	11D45.35.11 Security	Bushing	D45.22.2 Security	Finger rod	D45.17.04.1A
Liner	11D45.35.12 Security	Bushing	D45.35.13sb	Pin	30D.78.16–7
Liner	D45.17.2SB–1	Bushing	30Д.35.16сб–4	Pin	30D.78.07–7
Bushing	40Д17.6СБ	Bushing	30D.35.16sb–4	Pin	D45.17.36

DIESEL 2TE116, TE109, TEP70: 5D49 DIESEL. DIESEL TGM6: 6D49 DIESEL

Liner	D49.2.1 / 2SB–1	Valve	D49.78.05	Piston	5D49.22.05–3
Liner	D49.2.1 / 2SB	Valve inlet	D246.01.00sb (5D49.78.2sb)	Intermediate gearbox	TE2.62.2sb
Liner	5D49.17.8 / 9SB–3			Worm gear reduce	TE3.62.020sb
Liner	5D49.17.8 / 9SB–4	Valve inlet	D243.16.01.00sb (11D40.84.1sb)	Gear	TEP70.31.16.101
Liner	2–5D49.2.1 / 2SB			Pin	5D49.35.15
Bushing	5D49.17.4SB–W	Piston	5D49.12.33	Pin	5D42.8.06
Bushing	5D49.17.6SB–2	Piston	5D49.17.06–3	Pin	5D49.12.38

DIESEL LOCOMOTIVES TE1, TE2: DIESEL D50. DIESEL TEM1: 2D50 DIESEL. DIESEL TEM2: DIESEL PDG-1M

Shaft	TE12.00.20.108	Liner	D50.27.047–A	Worm reducer	TE2.62.1sb
Worm	TEZ.62.081	Liner	D50.27.048–A	Worm reducer	TEZ.62.020sb
Weel shaft	TE2.62.008	Bush	D50–32–005–1	Worm reducer	2TE10L.00.20.012
Liner	D50.24.004–1A	Valve inlet	D50.09.009	Worm	TE3.62.082
Liner	D50.02.005–1AR	The valve outlet	D50.09.010	Gear leading	D50–27–271
Liner	D50.02.006–1AR	Worm wheel	TE2.62.006	Gear drive	D50–27–272
Liner	D50.02.007–1AR	Intermediate Gearbox	ТЭ2.62.2сб	Gear	TE2.62.034

DIESEL CHMEZ, CHME2 (CZECHOSLOVAKIA): DIESEL K6S310DR, 6S310DR

The connecting rod bolt and nut	D27.08.02.06 / 07–1	Liner	D67.02.13 / 14.00	Piston pin	D67.08.43.00SB
Motor Axial bearing	T463.62.77.00	Liner	D67.08.21 / 22.00	Gear	T328.37.10.01
Liner	D27.02.00.01 / 02	Liner	D67.02.11 / 12.00	Drive Gear pumps	D67.24.01.02
Liner	D27.08.02.02 / 03	Bushing	D67.08.23.00–1SB		
Liner	D27.02.00.03 / 04	Valve	D27.16.00.06		

TGM4 DIESEL: DIESEL 211D-1 (6CHN21 / 21)

Liner	0210.04.100 / 110SB	Valve inlet	0210.05.060	The valve outlet	0210.05.070
Liner	0213.11.040 / 050SB				

ELECTRIC LOCOMOTIVES

Name	Drawing	Name	Drawing	Name	Drawing
Shaft Worm	2-1317-2 (M28-192)	Gear	8TN.240.218	Gear	8TN.240.235
Rolls worm gear	2-1317-8 (8TN-200-268)	Gear	8TN.240.217	Gear	8TS.240.011
Worm wheel	2-1317-7 (M28-195)	Gear	8TN.240.006	Gear	8TS.240.011-1
Reducer worm	6TN.724.006	Gear	8TN.240.007	Gear	8TP.240.037
Reducer worm	6TN.724.008	Gear	8TN.240.178	Gear	8TP.240.037-1
Worm	M28-192	Gear	8TN.240.179	Gear	8TN.240.246
Gear	8TN.242.000	Gear	E96.37.11.00	Gear	8TN.240.247
Gear	8TN.242.001	Gear	E96.37.12.00	Gear	017.35.10.025
Gear	8TN.240.137	Gear	8TN.240.234	Gear	017.35.10.025.01

ELECTRIC TRAIN ER1, ER2, ER9 ELECTRIC TRAINSET

Bolt connecting rod	EK4.03.018	Val	S386.01.01	Gear	S386.06.03
Piston pin	EK4.03.014	Reducer worm	25-62-020sb	Gear assembly	S386.08.00sb (12-30-10-016)
Driving speedometers	S335.01.00	Reducer worm	RD69.01.00SB		
Driving speedometers	C336.01.00	Reducer worm	RD70.01.00SB		

D1 MULTIPLE UNIT (HUNGARY): DIESEL 12VFE 17/24

Piston	D51.08.01.02-1	Liner	D62.08.111 / 112.00SB	Liner	D62.03.133 / 134.00SB
Piston	DP19.40.07.01	Liner	D62.08.121 / 122.00SB	Valve	D62.04.21.00
Piston	DP19.40.06.01	Liner	D62.03.131 / 132.00SB		

LOCOMOTIVE TGM 23: DIESEL D6, D12

Liner	301-82 / 83-5SB	Liner	3304-25 / 26SB	Liner	501-82 / 83-1SB

REFRIGERATED TRAIN

Bushing	21498-H-00 SB	Liner	21501-H-00SB	Bearing	40261-H-00SB
Bushing	40265-H-00SB				

OTHER PRODUCTS

Cold coiling spring from 0.5 to 9 mm	Rollers Rolling

DIESEL 5D49; 6D49

Bushing 5D49.17.6SB-2

Bushing 5D49.17.4SB-3

Piston 5D49.17.06-3

Liner 2-5D49.2.1 / 2SB

Liner 5D49.17.8 / 9SB-3

Liner 5D49.17.8 / 9SB-4

Liner D49.2.1 / 2SB

Liner D49.2.1 / 2SB-1

Liner D49.2.1 / 2SB

Valve D243.16.01.00SB
(11D40.84.1SPCH-4)

valve D246.01.00SB
(5D49.78.2SPCH)

DIESEL 12VFE 17/24

Liner D62.03.111 / 112.00SB

Liner D62.03.121 / 122.00SB

Liner D62.03.131 / 132.00SB

Liner D62.03.133/134.00SB

Valve D62.04.21.00

DIESEL D50; 2D50; PDG-1M

Liner D50.02.004-1A

Liner D50.02.005-1 AR

Liner D50.02.006-1AR

Liner D50.02.007-1 AR

Valve D50.09.009

Valve D50.09.010

Bushing D50.27.047 / 048-A

DIESEL 2D100; 10D100

Liner D100.02.136

Liner D100.02.137

Liner D100.02.138

Liner D100.02.139

Liner D100.24.007

Crane indicator 2D100.06SB

Pump priming 2D100.32.010sb

Nozzle adapter 127.00.00sb

Indicator tap adapter D 128.00.00sb

Piston D100.04.004-05

ELECTRIC LOCOMOTIVES

Worm gear reducer 6TN.724.006

Worm gear reducer 6TN.724.008

Gear 8TN.240.217 / 218

DIESEL K6S310DR; 6S310DR

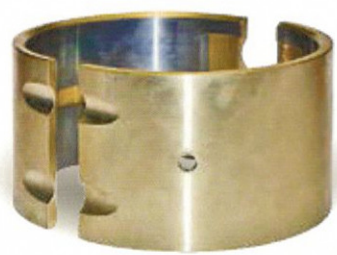
Liner D27.02.00.01 / 02

Liner D27.02.00.03 / 04

Liner D27.08.02.02 / 03

Liner D67.02.11 / 12.00

Liner D67.02.13 / 14.00

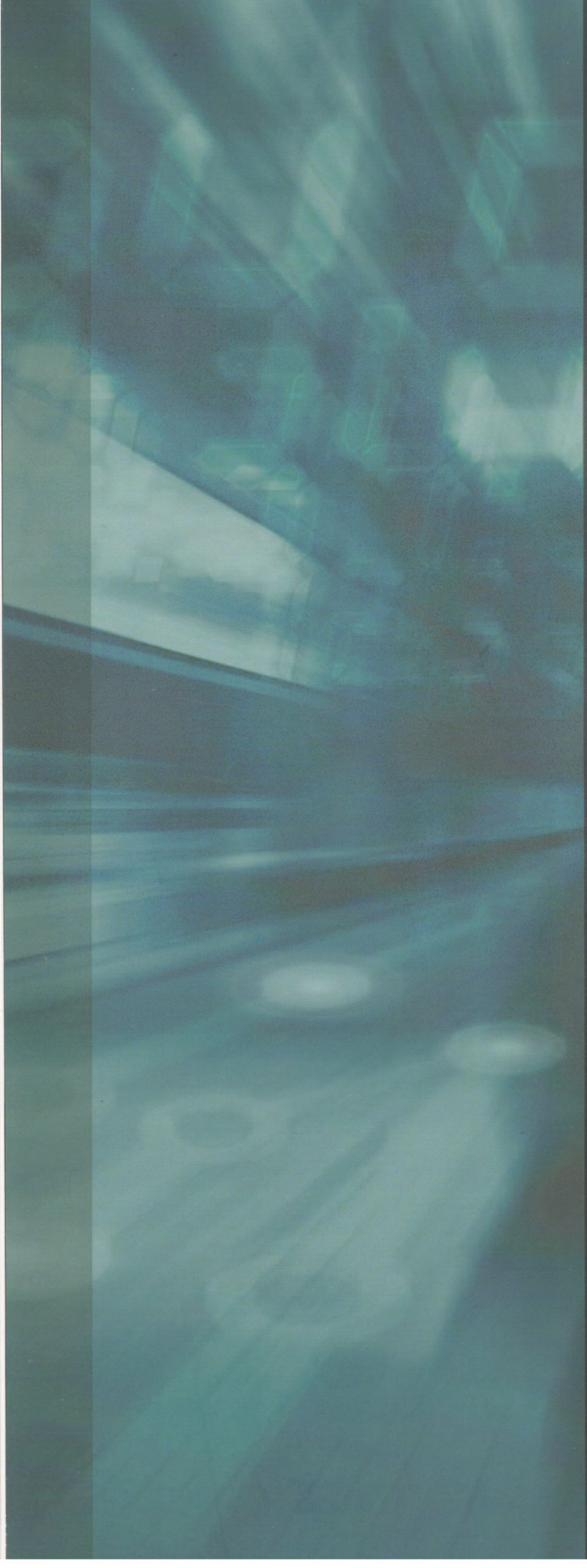


Liner D67.08.21 / 22.00

Liner motor axial bearing T463.62.77.00

Valve D27.16.00.06

Bushing D67.08.23.00-1SB



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