BRAKE EQUIPMENT FOR RAILWAY ROLLING STOCK AND UNDEGROUND

Dear friends!

I'm glad to have a chance to address you in this newly published catalogue of MTZ TRANSMASH. For more than 90 years our company has been developing and producing breaking systems and equipment for railway and subway rolling stock. It is no wonder that MTZ TRANSMASH is often identified as a flagship of the national break system manufacturers, because its activity is closely associated with the names of outstanding national inventors of breaking gear – F.P. Kazantsev and I.K. Matrosov.

The inventor's school built up at the plant facilities and the targeted brake system design bureau formed on its basis in 1951 has been always ensuring the high quality of manufactured equipment. It currently allows us to proudly say that almost all of our basic products have been developed at the level of inventions licensed in the RF and some other countries.

The braking systems under MTZ TRANSMASH trademark have been demonstrating reliability and defect-free performance on the national railways for a long time, but there are new demands in the reality of modern development of the railway transport and right now our company faces great challenges. For advanced railway transport we need breaking systems comprising all control components with capability for diagnostics of the brake equipment, both operating and required for maintenance of the rolling stock. Furthermore, nowadays the customer pays more attention to the aesthetic and ergonomic aspects of equipment. It is especially relevant to the devices and instruments installed in the engine-driver cab.

In particular, I would like to note that quality and reliability of breaking equipment, starting from an individual instrument and to the breaking system of the railway or subway train is a security safeguard of the traffic. Building up our policy of quality assurance and competitive development of its products, MTZ TRANSMASH is guided by requirements of the International Railway Industry Standard (IRIS).

It is worth noting that basically any industrial production brings a potential threat to environment; that is why our company is permanently working on the issues of ecologically safe production process.

Keeping up with the times we are constantly upgrading both technological and management processes, paying great attention to the innovative approach for implementation of our strategic plans.

Today all creative potential of our team is focused on implementation of such plans.

Yours sincerely, N.A. Egorenkov
Director General
JSC MTZ TRANSMASH

BRIEF HISTORY

Open Joint-Stock Company MTZ TRANSMASH develops and produces brake equipment for all types of freight and passenger cars, locomotives, electric multiple-unit rolling stock, high-speed trains and underground rolling stock.

The company has accumulated vast production experience, formed a profound research base and improved close business relations with both, Russian manufacturers and foreign partners. Owing to a high technical level, quality and operating reliability of its products, MTZ TRANSMASH is a recognized leader in the field of braking gear manufacture.

History of the Moscow Brake Plant is the history of development of the national brake system manufacture. It starts in 1915, when a military artillery plant was evacuated from Riga to Moscow in the first days of the World War I.

In the early 1920-s railroad experts started to develop the brake systems with regard to the national specifics of the country's railways. At that time it was decided to establish a plant for producing domestic brake systems

On November 17, 1921, the electric power plant «Electrosila» (former name of the Moscow Brake Plant) launched production of the first braking equipment for the railroad transport.

The unique expertise of national engineers made the Moscow Brake Plant highly competitive with such well-known enterprises as the American «Westinghouse» and German «Kunze-Knorr».

The railway guide published in honor of the 100-th anniversary of the steam locomotive invention says: «George Stephenson has gifted to the mankind a steel horse, and Russian locomotive driver Florenty Kazantsev found the way how to bridle it».

Design engineers, headed by Kazantsev created a wide range of products – air-distributors, driver's brake

valves and other elements of brake systems.

A new phase of the in-house brake equipment manufacture is connected with the name of another gifted Russian inventor, Ivan Matrosov, who developed a classical brake scheme and created several types of freight and passenger air-distributors for the railway and underground rolling stock.

Successful operation of the plant made it possible to equip all domestic freight trains with the automated brake system by 1935.

By the beginning of the – Second World War, the plant already had a vast production experience, which enabled to redirect it to the military production in a short period.

In particular, there were designed and produced antiaircraft mountings, manufactured components for the legendary «Katyusha» weapon.

In the postwar period, Russian railroad experts had to solve new tasks: they developed and introduced into mass production air-distributors for the underground and dump cars, emergency braking accelerators and many other devices.

In 1951, Joseph Stalin has signed a decree on the establishment of the Special Design Bureau at the Moscow Brake Plant, after which it became a unique complete-cycle production enterprise – from design to manufacture of finished products.

In view of electrification of the national railways, the plant mastered the production technology of pneumatic brakes for electric trains that ensured high safety level, especially in the passenger transportation. From the late 1950-s, there was launched production of electro-pneumatic brakes for passenger trains hauled by locomotives that significantly enhanced traffic safety. In the 1970-s, a series of new devices were designed at the plant, including air-distributor 483 for freight cars that made it possible to increase tonnage of freight trains.

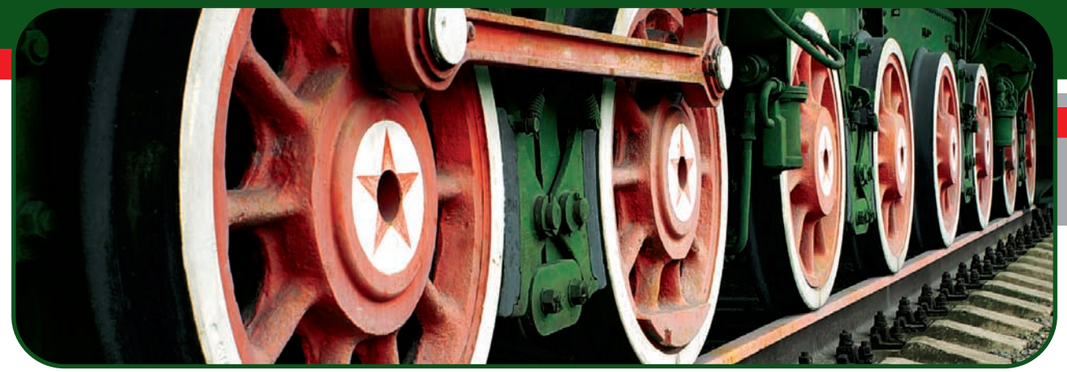
The years from 1951 to 1960 one can fairly regard as the most fruitful period for the national brake

equipment manufacture.

More than 20 devices were designed in those years. Starting from 1959, the total passenger rolling stock was equipped with the electro-pneumatic brakes, developed and produced at MTZ TRANSMASH.

Another important stage of brake system development falls on the late 1990-s, when the railroad transport became more sophisticated, while travel speed and tonnage of trains was increased.

The technological progress brings higher requirements to the automatic brakes. Designers develop and put into operation enhanced electro-pneumatic microprocessor equipment, aimed to increase the speed and safety of transportation and ensure comfort to passengers and increase tonnage of freight trains.



New brake systems for high-speed trains, modern «Yauza» underground trains and other types of the rolling stock are designed.

Совет Министров СССР
постановление

от 11 января 1951 г. № 93
МОСКВА, КРЕМЛЬ

ОБ ИЗГОТОВЛЕНИИ И ИСПЫТАНИИ ОПЫТНЫХ КОНСТРУКЦИЙ НОВЫХ ТИПОВ АВТОТОРМОЗНОГО ОБОРУДОВАНИЯ ПОДВИЖНОГО СОСТАВА ЖЕЛЕЗНОДОРОЖНОГО ТРАНСПОРТА.

В целях улучшения организации работ по созданию новых типов тормозного оборудования, осуществляемых в настоящее время разрозненными конструкторскими бюро Министерства транспортногомашиностроения и Министерства путей сообщения, обязать:

а) Министерство транспортного машиностроения организовать на базе существующего конструкторского бюро Московского тормозного завода Министерства специальное конструкторское бюро по тормозостроению Министерства транспортного машиностроения;

б) Министерство путей сообщения передать Министерству транспортного машиностроения конструкторские бюро по автотормозам тт. Матросова и Шавгулидзе и бюро по разработке электропневматических тормозов, для включения их в состав указанного специального конструкторского бюро.

Председатель Совета Министров
Союза ССР И. СТАЛИН

Управляющий Делами Совета
Министров СССР М. ПОМАЗНЕВ

TODAY ...

JSC MTZ TRANSMASH is pursuing with dignity its history by developing new and improving the existing brake systems of railroad and underground rolling stock and combining research, test and production bases.

The Special Design Bureau of Brake Systems, which employs highly skilled specialists in the field of brakes of cars and locomotives, electronics and microprocessors, as well as the test engineers of I. K. Matrosov Experimental Brake Laboratory, continuing the work of a constellation of distinguished domestic brake designers, create the up-to-date brake systems.

All the developments of JSC MTZ TRANSMASH are protected by the licenses of the Russian Federation and many other countries.
Brake equipment is developed with regard to the specifics of the operation of lengthy Russian railroads, the circulation of rolling stock in the sparsely populated regions of the country, climatic conditions and great temperature range from -60°C to +60°C.

In particular, taking into consideration the Russian landscapes, a combination of stepless and stepwise brake release modes is created to provide the best conditions of braking for heavy long trains on plain lands and the inexhaustibility of brakes operation at steep descents.

Brakes produced by JSC MTZ TRANSMASH were used to equip over 1.5 mln units of railroad and subway rolling stock in CIS countries, Latvia, Lithuania, Estonia, and a number of countries of Asia, Africa and Latin America.

In accordance with the plan of development of advanced technology, the Company is carrying on research and development work to produce new promising devices and complete brake systems meeting the up-to-date requirements.

Our design engineers have lately carried on many tests and developed new brake mechanisms:

• Series of 483A-05, 483A-08, 483A-09 и 483A-10

air distributors was approved by the Acceptance Committee. Brake equipment, and in particular, Series 483A air distributors subjected to life tests in the tough conditions of the North and Far East have proved their reliability.

483A-05 air distributor is mounted and being tested:

– on a car under axial load of 27 t/axle;

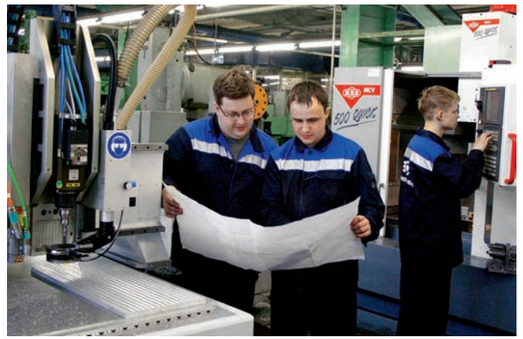
– on an articulated flatcar made by «Tatravagonka» Company;

483A-05 air distributor is mounted on a «Tatravagonka» gondola car for testing.

• One of the recent large-scale developments in the brake systems of mainline locomotives is the brake system for ЭП20 locomotive, which is to be manufactured at the Novocherkassk Electric-Locomotive Building Plant. The brake system is of modular design and includes all components of brake system: E.300T brake equipment module, E.300F compressor module, disk brakes and BARS WSP (wheel slide protection) system.

• Another recent large-scale work is the development of the module of E.311 brake equipment for 2ТЭ25А diesel locomotive with induction motor drive made by the Bryansk Machine-Building Plant. The same module is intended to be used on 2ТЭ25К mainline diesel locomotive with commutator motor drive. The E.311 brake equipment module has undergone the entire cycle of factory tests and been approved by the Acceptance Committee and the startup and adjusting operations are under way on the locomotive for testing.

It is necessary to emphasize that E.300T and E.311 modules of brake equipment have been developed in Russia for the first time. To the date the brake equipment was delivered to the customer in the form of the units of electro-pneumatic devices or separate brakes parts



which were then mounted on a locomotive.

• LK.242 brake unit for serial-production passenger cars made by JSC TVZ was developed, manufactured and approved by the Acceptance Committee.

• LK.242Д brake unit for double-deck stock made by JSC TVZ is under deployment.

Recently the Special Design Bureau of Brake Systems has developed new locomotive devices – remote-controlled EPK 151D electro-pneumatic valve of automatic braking gear, remote-controlled 224D auxiliary braking valve of locomotive, 025M-1 pneumatic standby module, 025 A standby control valve of automatic brake and 025Л standby control valve of locomotive brake.

JSC MTZ TRANSMASH is not only a parent enterprise for commercial production of up-to-date brake systems and devices, but also a powerful testing ground. Work is in progress on the modernization of existing equipment and devices and on the acquisition of new advanced test-bench equipment, devices of

instrumental and visual measurement of registered characteristics, tests monitoring. As a result, a unique experimental complex is established – it includes two group test stations. One of them is involved in the simulation of control under a preset program and the check of the operation of the air distributors of a freight car, the other one is intended for the tests of air distributors for a passenger trains of 30 cars. There are also other test benches, without which now it is impossible not only to create everything that is invented by the scientists and experts of the Plant, but, what is more important – to implement all their scientific and engineering developments and improvements in practice for opening up the ways for commercial production of new products.

Every year the Plant elaborates and implements its Technical Re-equipment Program included in its Business Plan.

The policy of the Plant in terms of quality is aimed at the maximum satisfaction of a consumer over the

complete life cycle of a project. With its strategic objects in mind, JSC MTZ TRANSMASH developed and certified its quality management system for its compliance with the requirements of GOST R ISO 9001-2008.

Moreover, the business management system was implemented in accordance with the requirements of IRIS Standard, as well as the ecological management system.

JSC MTZ TRANSMASH has compliance certificates for all of its products subject to mandatory certification, and also a vast range of certificates of voluntary certification.

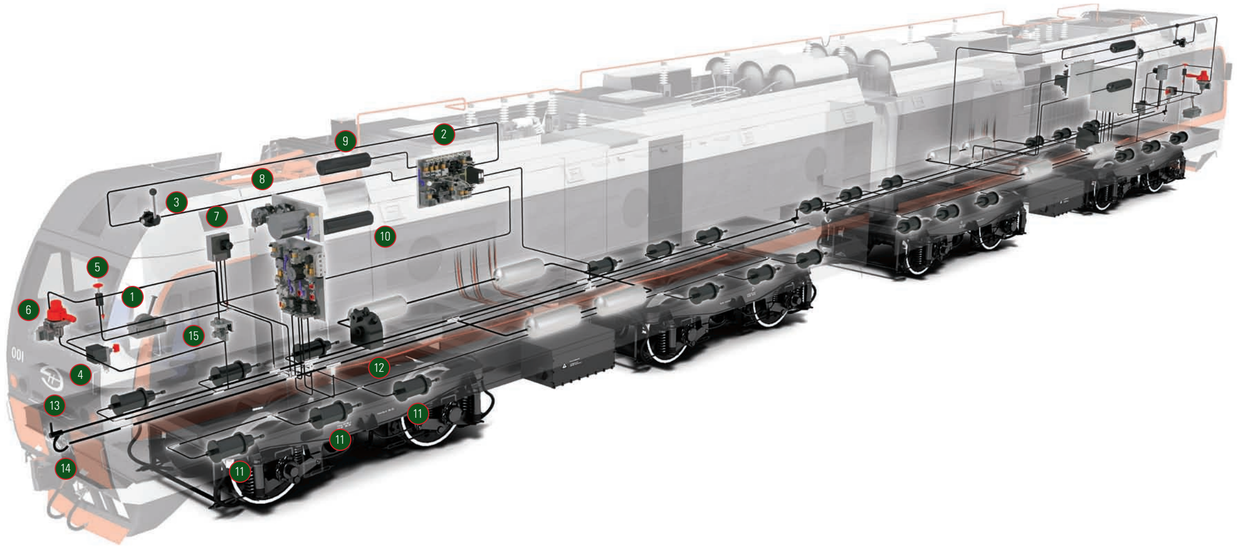
The Brake Equipment Test Center is accredited with JSC MTZ TRANSMASH in accordance with the established procedure for the right to perform certification tests.

The priorities of JSC MTZ TRANSMASH business activities are first of all related to creation of new promising brake equipment, with acceleration of its introduction, quality assurance.

Reliability of brake systems is a warranty of safety at railroads in the age of superhigh-speed, increasing freight turnover, continually growing traffic volume and increasing number of passengers.

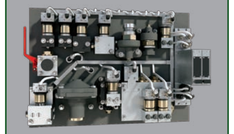
MTZ TRANSMASH

PRINCIPAL MOUNTING ARRANGEMENT OF BRAKE EQUIPMENT FOR LOCOMOTIVE



1. Driver's brake valve controller 130.52
2. Unit (block) of pneumatic devices 130.10
3. Back up control valve 130.20
4. Control circuits switch 130.40
5. Emergency brake valve 130.30
6. Control valve 215
7. Electropneumatic automatic stop valve 153A
8. Arrangement block (unit) of brake equipment for freight type locomotives 010
9. Equalizing reservoir 20l
10. Auxiliary reservoir 20l
11. Brake cylinder
12. Compressor
13. Connecting hose
14. End cock
15. Pressure switch 404

Driver's brake valve controller



130.10

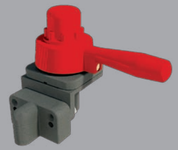
Pressure switch

404

Electropneumatic automatic stop valve

153A

Control valve



215

Back up control valve

130.20

Brake control valve unit

010.10

Emergency brake valve

130.30

Driver's brake valve controller

130.52

Control circuits switch

259.40

PRINCIPAL MOUNTING ARRANGEMENT OF BRAKE EQUIPMENT FOR PASSENGER CAR

1. Electric brake control valve 305
2. Brake control valve 242-1-01
3. Emergency stop valve 138-1
4. End cock
5. Pipe tee fitting 373P
6. Connection hose 369 A
7. Terminal block 317-8
8. Brake linkage regulator (Slack adjuster) RTRP-675 M
9. Auxiliary reservoir
10. Brake cylinder
11. Outlet valve 131
12. Disconnecting valve
13. Terminal block 316-8
14. Temperature sensor 005
15. Monitoring axel box heating unit 004

Brake control valve

242-1-01

Electric brake control valve

305

Terminal block

316-8

Temperature sensor

005

Emergency stop valve

138-1

Outlet valve

131

Monitoring axel box heating unit

004

MTZ TRANSMASH

PRINCIPAL MOUNTING ARRANGEMENT OF BRAKE EQUIPMENT FOR UNDERGROUND MOTOR CAR

1 Control valve 013A
2 Unit (block) of electropneumatic devices 248
3 Pressure regulator 348-2
4 Electro-pneumatic valve 177
5 Disconnecting valve 154
6 Return valve 161
7 Breakaway valve 363-3M
8 Vibrator valve 144
9 Pressure indicator 115
10 Parking brake control unit 149
11 Main air reservoir
12 Compressor
13 Auxiliary reservoir
14 Brake cylinder
15 Car body position regulator 003M
16 Changeover valve 108
17 Switching valve 109
18 Emergency valve 398
19 Exhaust valve 131
20 Three - position discharge valve 131

Vibrator valve

144

DEVELOPMENT FOR NEW UNDERGROUND TRAIN MODEL 760

Friction brake control unit

076

Brake control unit

077

Changeover valve

108

Control valve

013A

Pressure regulator

348-2

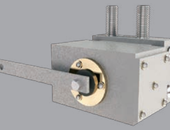
Breakaway valve

363-3M

Unit (block) of electropneumatic devices

248

Car body position regulator



003M

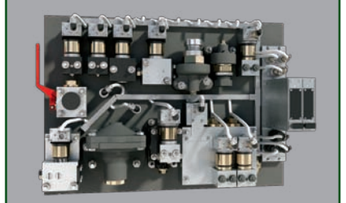
Pressure indicator

115, 115A

MTZ TRANSMASH

PRINCIPAL MOUNTING ARRANGEMENT OF BRAKE EQUIPMENT FOR LOCOMOTIVE TEM31

Electropneumatic brake control unit



130.10

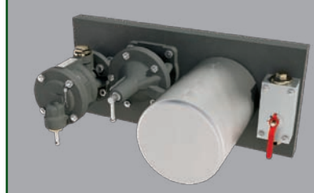
Remotely controlled locomotive auxiliary brake valve controller

224D

Remotely controlled electro-pneumatic automatic train stop valve

151D-1

Brake control valve unit

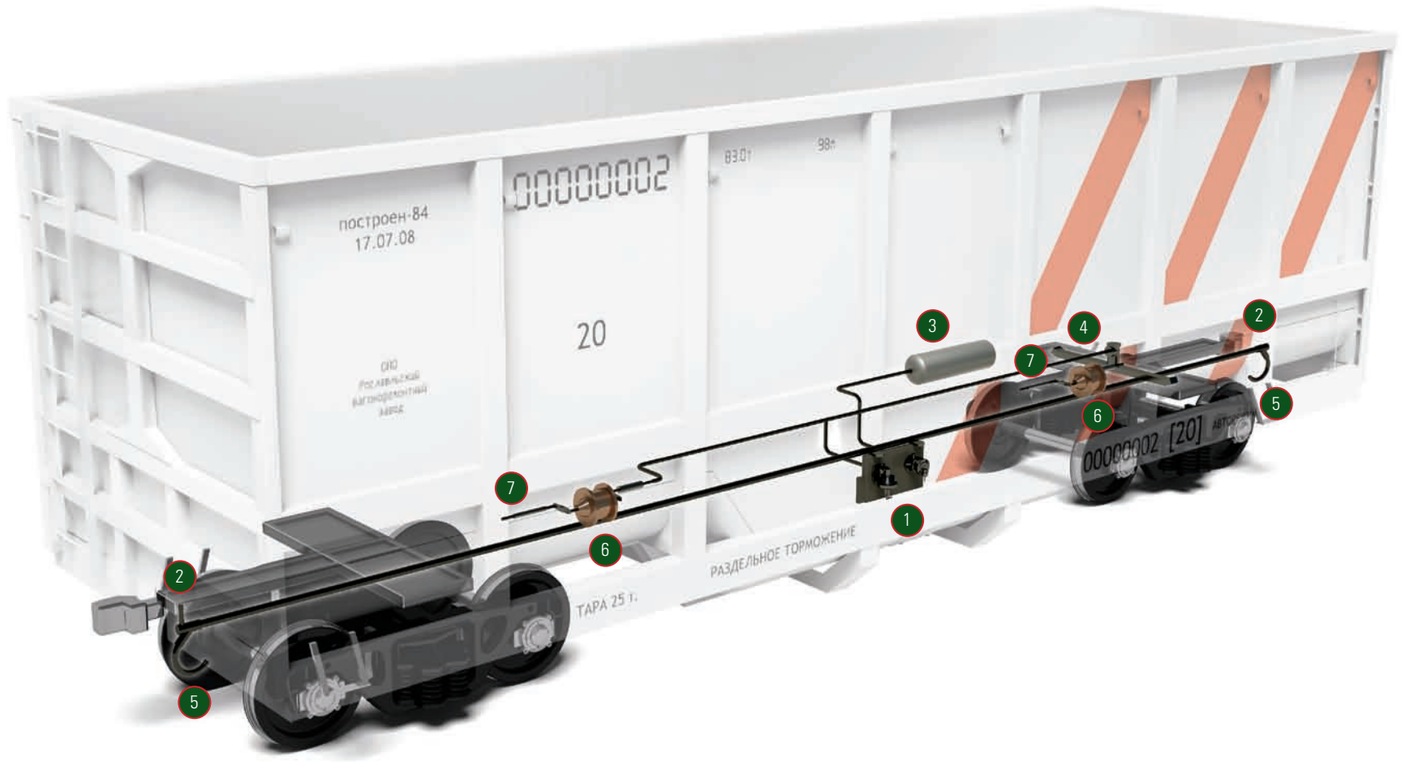


010.10

1. Brake control valve unit 010.10
2. Electropneumatic brake control unit 130.10
3. Remotely controlled electro-pneumatic automatic train stop valve 151D-1
4. Remotely controlled locomotive auxiliary brake valve 224D
5. Driver's brake valve controller 224D.100
6. Driver's brake valve controller 130.52

MTZ TRANSMASH

PRINCIPAL MOUNTING ARRANGEMENT OF BRAKE EQUIPMENT FOR FREIGHT CAR



Воздухораспределитель

1. Brake control valve 483A-05
2. End cock
3. Auxiliary reservoir
4. Automatic proportional empty-and-load device 265 A-1
5. Connecting hose Р17Б
6. Brake cylinder
7. Brake linkage regulator (Slack adjuster) РТРП-675М

CONTACTS

Tel. + 7 495 780-37-60
Fax + 7 499 978-71-09
E-mail: info@mtztransmash.ru
Web: www.mtztransmash.ru

Lesnaya st, 28, Moscow, 125190, Russia