

Technical specifications of the BMP-3 after upgrading to the electro-mechanical transmission



Specification after the modernization of the chassis and the engine-transmission compartment

weight, tons	18.7 (+4 tons ERA system)
Length, m	7.14 (body), 7.2 (gun FWD)
width, m	3.3
Height, m	2.3
Clearance, m	0.4
Type of armor	Aluminum / Aluminum oxide / Titanium boride / Steel
Suspension type	Individual torsion bar
Gradeability, degree	30
Overlapping wall, m	0.7
Overcoming ditch, m	2.7
Ford, m	2.2
Speed along the highway, km /h	70
Cruising range on the highway, km	750-900
Fuel tank, L	700

MODERNIZATION

GENERAL INFORMATION ON RUBBER-ARMED CATERPILLARS

RAGs are integral closed or sectional structures consisting of several polymer layers joined together by high-temperature adhesion of vulcanization and reinforced in the longitudinal direction by a metal, composite or fabric cord, and in the transverse direction by metal or composite insert elements.

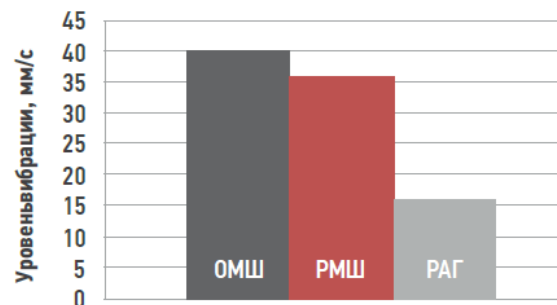
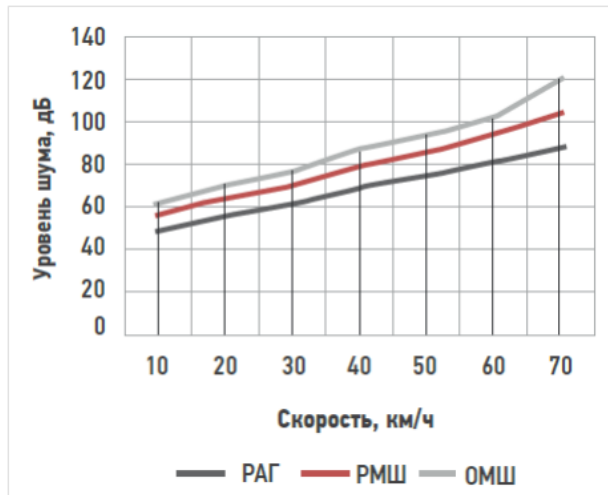
Sectional RAGs can be joined together by fingers with a single hinge, rubber-metal hinge or a polymeric sliding hinge. These caterpillars are analogous to the RAG for the Kurganets chassis



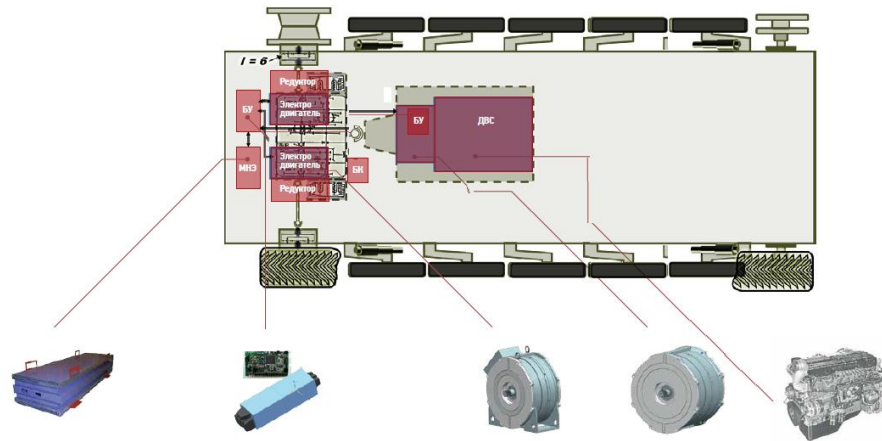
RAG of the clutch

THE ADVANTAGES OF THE STEERING SYSTEMS WITH THE RAG FOR BMP-3

- High service life and reliability (3000-5000 motorized hours)
- Low sealing effect on the soil (maximum The pressure on the soil is, on the average, 2 times less than in the case of a standard track) - increased permeability
- Ability to install instead of riveted metal tracks without changing the design of the running systems
- Reduce weight of machines by more than a ton
- Reduction of noise level by 10 dB - improvement of sound masking M80
- Reduction of vibration level by 65-70%
- Reducing fuel consumption by 30% - reducing the cost of operating machinery
- Increasing the survivability of electronics, optics and fire detection systems
- Ability to traffic on roads with improved Coating at speeds up to 110 km / h without destruction
- Reduced fatigue of the crew



STRUCTURAL SCHEME AND PLACEMENT OF ELEMENTS OF HYBRID ENERGY INSTALLATION AND ELECTROMECHANICAL TRANSMISSION



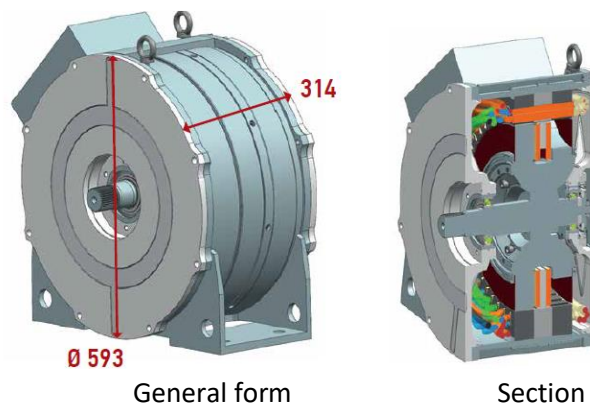
ELECTRIC MOTOR VENTYL INDUCTOR DRIVE WITH INCINERY EXCITATION AND BUILT-IN SENSOR POSITION OF ROTOR

New technology - for the first time in the practice of traction electric drive the structure of the "software-implemented sequential excitation motor" is proposed on the basis of a valve inductor motor with an independent field winding

NEW OPPORTUNITIES:

In combination with a microprocessor control system, implements characteristics similar to those of a sequential excitation collector motor (one of the best electric motors for traction applications); The presence of an excitation winding provides an additional control channel, and provides the widest range of speed control in constant power mode (today: 17), required for a traction electric drive.

MOTOR VENTYLE INDUCTOR TRACTOR INDEPENDENT EXCITATION DVIT-200



CHARACTERISTICS OF DVIT - 200

The motor valve inductor traction DVIT-200 is designed to drive the leading sprocket BMP-3.

MAIN TECHNICAL CHARACTERISTICS

Rated output power (P _d), kW	200
Nominal speed of rotation (n _{nom}), rev / min	3000
Max. The effective value of the phase current (I _φ .max)	873
Max. Effective value of phase voltage, V	320
Max. Rotational speed (n _{max}), rpm	6000
Rated torque, N · M	352
Coefficient of efficiency,% not less than	94.7
Max. Twisting moment, N · M, not less than	800
The maximum torque for a coolant temperature of 30 °C	90
The torque at the rotation of the rotor at a speed of 6000 rpm in a continuous mode, N · m	175
Weight, kg	375

ADVANTAGES OF THE VIEW OF THE NV IN A TRACTION ELECTRIC

- No sliding contact in BMP;
- High processability - less cost compared to HP with PM;
- high reliability. Resistance to shock and vibration;
- possibility of field weakening - two zone speed regulation;
- minimization of losses in the passive rotor (no reversal of the rotor). All heat is released on the stator;
- Full vector control of torque and speed. It is possible to create an AP with sensorless control;
- Use of a standard three-phase inverter in the control converter. Substantial reduction of the converter's overall power as compared to the VD with PM and SR with SR (SRD);
- the possibility of constructive integration of the section of the traction motor with a converter, control system and a liquid cooling system (mechatronic module);
- the possibility of sectioning the motor and the converter to improve reliability.

MICROPROCESSOR DISTRIBUTION TRAILER CONTROL SYSTEM

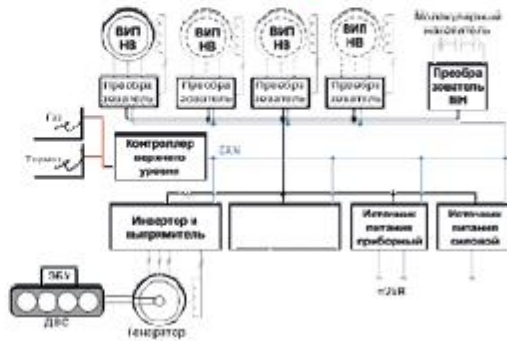
NEW OPPORTUNITIES:

- Realizes the most modern circuit solutions and the laws governing the traction motors, in this case vector - direct torque control;
- It allows to implement all active safety systems programmatically (hardware has already been installed);
- Anti-lock braking system (ABS)
- Traction control system (PBS);
- the system of exchange rate stability. Individual assignment
- The moment for each wheel, depending on the driving conditions;
- Cruise control;
- Implements modern interfaces and communication protocols, has the ability to remote control.

Контроллер МК17.3



Структура мультипроцессорного тягового электропривода



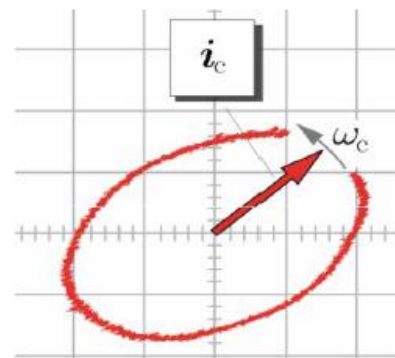
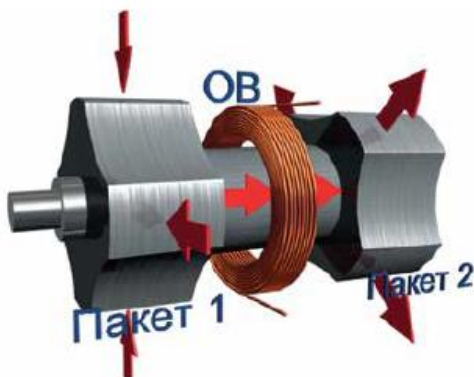
NEW MICROCONTROLLER NT32M4F1 FOR CONTROLLING POWER CONVERTERS AND ELECTRIC MOTORS

On the basis of the microcontroller NT32M4F1, controllers for controlling power converters and electric motors have been developed entirely on the domestic element base, a set of debugging facilities and libraries of mathematical and applied functions have been developed, and vector control systems for traction electric drives have been implemented.



NT32M4F1 ARM 100MГц

VECTORAL PUNCTURAL CONTROL



- Sensorless vector control systems of conventional electric machines do not work if the speed is zero (no EMF for evaluation).
- The inductive electric machine is clearly a pole. Because of this, it is possible to apply the principle of

sensorless control, based on the analysis of the magnetic anisotropy of the electric motor, which varies with the position of the rotor. For example, the injection of a high-frequency signal into the stator voltage leads to the appearance of a high-frequency component of the current, the travel time of which uniquely determines the position of the motor rotor.

- The response to high-frequency signal injection allows to determine the position of the rotor at any speed (shown in the figure).

ADVANTAGES:

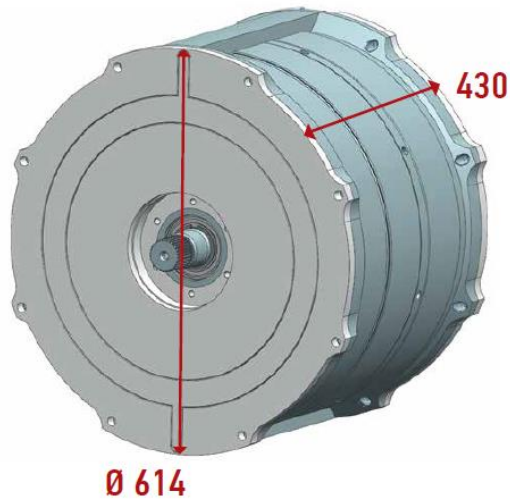
- There is no need to use the rotor position sensor. The sensor is an electric motor. This significantly increases the reliability of the system.
- Direct torque and speed control possible from zero speeds

VARIANTS DIESEL ENGINE

Engine version	DV8
Bore/stroke mm (in)	86/76 (3.39/3)
Displacement, total l (cu in)	4.5 (244)
Intercooling Air/coolant	charge air cooler
Number of cylinders	8V 90° cylinders, inline Dry sump Diesel Electric Drive
Max. torque Nm (ft lbs)	1056 at 5800 rpm
Rated power kW (hp)	450 (610)
Dimensions (LxWxH; H1) mm (in)	738x680x740;
Mass, dry kg (lbs)	520 (1146)

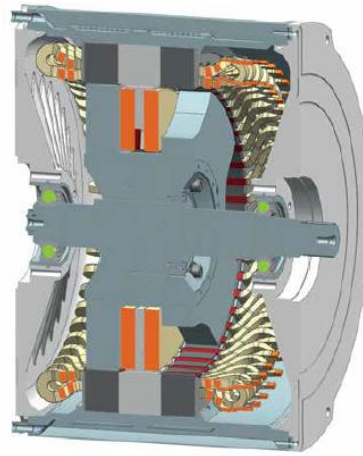


GENERATOR VENTYL INDUCTOR TOWERS WITH INDEPENDENT WINDING OF EXCITATION GVIT - 410



Ø 614

General form



Section

CHARACTERISTICS OF ENERGY DRIVERS

ВАРИАНТ 1

Общие характеристики	Номинальный ток заряда, А	0,5С
	Макс. ток зар./разр., А	3С
	Кол-во циклов зар.-разр.	3000...5000
	Рабочее напряжение, В	2,8-4,0
	Рабочая температура, С0	-45...+85
	Модель: WB-LYR60AXA	60 А·ч
	Емкость, С	2,3 м
	Масса	115х215х61 (мм)
	Габариты	
	Модель: WB-LYR60AXA	90 А·ч
	Емкость, С	3,2 м
	Масса	143х218х61 (мм)
	Габариты	
	Модель: WB-LYR60AXA	100 А·ч
	Емкость, С	3,5 м
	Масса	179х218х68 (мм)
	Габариты	

АНДУМУЛЯТОР ЛИТИЙ-ЖЕЛЕЗО-ФОСФАТНЫЙ (ЛИФЕР04)

Тип накопителя	Батарея 100xWB-LYR90AXA (последовательное соединение)
Диапазон рабочих напряжений, В	420-280
Масса, т	0,32
Объем, м3	0,19
Средний непрерывный ток заряда-разряда при номинальной мощности, А	270 (ограничение по току ЗС)
Запасаемая энергия в диапазоне рабочих напряжений, МДж	≈ 129,6
Номинальная мощность, кВт	36
Максимальная мощность, кВт	108
Время разряда при номинальной мощности, с	1200
Рабочая температура, 0С	-45/+85

ХАРАКТЕРИСТИКИ БЛОКА НАКОПИТЕЛЕЙ

ВАРИАНТ 2

Модуль суперконденсаторов (Модуль 150)		Общие характеристики	
		Номинальное напряжение:	140В
		Максимальное напряжение:	151,2В
		Ток рабочий:	750А
		Ток в импульсе 1 с:	1800А
		Устроенная схема балансировки заряда	
		Работа в любом положении	
		Полнота: прямая и обратная	
		Запас энергии, Вт·час:	170,2
		Срок службы:	до 10 лет
		Габариты:	300x200x90мм
		Вес:	48 кг

МОДУЛЬ СУПЕРКОНДЕНСАТОРОВ (ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ)

Тип накопителя	Батарея 3x150 (последовательное соединение)
Рабочее напряжение В	420
Масса, т	0,164
Объем, м3	0,162
Рабочий ток, А	750
Запасаемая энергия в диапазоне рабочих напряжений, МДж	≈ 0,613
Номинальная мощность, кВт	до 300
Мощность в импульсе, кВт	до 750
Рабочая температура, 0С	-45/+65

ХАРАКТЕРИСТИКИ БЛОКА НАКОПИТЕЛЕЙ

conversions KIT water in fuel for diesel engines DV8



FULL SET!

- COMPLETE WITH DIGITAL PWM and MAF / MAP proofreaders;
- High-end electronics included in the package;
- The union of stainless steel;
- Generator type "dry cell" of the latest generation ;
- Very small dimensions: 240x190x90mm;
- Impressive Square production of hydrogen gas: 2268 cm²;
- Large volume production of hydrogen 3.5 liters per minute (15A);

- Suitable for all models of trucks and buses, the engine power to 480hp.
- Weight 8.2 KG

MULTIPLEXIC INTELLIGENT TWO-WAY NETWORK WITH THE BUILT-IN DIAGNOSTIC SYSTEM

- Non-contact management of the consumers of the facility;
- Automated control of operating modes
- Optimum load distribution;
- Real-time diagnostics of automatic electronic systems;
- Monitoring the technical state of the sample registration, recording Operational parameters of the facility, the removal of information for Testing and analysis of aggregates, forecasting changes in the technical condition of the facility;
- Output of information about the current technical condition;
- Processing and output of navigation information;
- Remote data transmission;
- Integration into the EU;

