

Lecture 4. The importance of loading and unloading machines.

Purpose of the lecture: substantiate the basic conditions for the preparation, transshipment, storage and transportation of various goods by rail, road and water transport

Keywords: loading and unloading machines, bulk construction, Floor rail vehicles, Self-propelled loaders

Types of lectures: Lecture-research.

4.1. Assignment and classification of loading and unloading machines

4.2. Floor-mounted trackless loaders and stackers

4.3. Self-propelled loaders of continuous action

4.4. Wagon-unloading machines and devices

4.1. Assignment and classification of loading and unloading machines

Loading and unloading machines (PRM) are designed for loading goods into vehicles and unloading them from vehicles. The principles of classification of loading and unloading machines and devices provide for their attribution to a particular group, depending on several basic characteristics:

- type of cargo handled;
- type of vehicles for the processing of which the PFP is intended;
- degree of mobility used during loading or unloading of PFP;
- the principle of operation of the main working body of the machine.

Along with the main classification features, as necessary, some additional ones can be used: lifting capacity, capacity of the working body, engine type and power, type of running equipment, etc.

At the first sign distinguish PFP intended for cargo handling:

- bulk construction and industrial;
- heavy, bulky and long;
- piece (mainly transported in containers and packaging);
- mass agricultural.

Classification by type of vehicles allows you to allocate PFP, designed for the processing of wagons, cars, ships.

4.2. Floor-mounted trackless loaders and stackers

Floor rail vehicles (MNBTs) are used in freight operations with covered wagons, large containers, automobiles, ships, and in warehousing processes due to good maneuverability and high performance. They require a relatively small investment with a short payback period.

Loaders can move with cargo over considerable distances and serve large storage and production areas. The ability to use a wide range of interchangeable load-gripping devices in combination with high mobility, autonomy of the drive (in most cases) and lack of attachment to a limited place, gives the MNBT the universality property.

In domestic and foreign practice, solid experience has been gained in the effective use of a wide range of MNBTs. Universal auto-loaders driven by internal combustion engines are used for operation on open areas or in well-ventilated rooms with a transportation distance of up to 200 m. Universal electric loaders powered by rechargeable batteries are mainly used for reloading operations in indoor rooms with a transportation distance of up to 100— 120 m.

4.3. Self-propelled loaders of continuous action

Continuous loaders include several hoisting devices. Each loader has a scooping organ (feeder), a main conveyor or elevator, an unloading conveyor, a power plant, a transmission and a running gear. The feeder is an important organ of the loader, determining its performance, operability and reliability.

4.4. Wagon-unloading machines and devices

Wagon tippers are designed for unloading bulk cargo from wagons. As a rule, open wagons are unloaded by turning them relative to the longitudinal axis by 170 ... 175 °, and covered wagons by tilting relative to the transverse and longitudinal axis by an angle of up to 50 °. From an economic point of view, the use of car dumpers is advisable at mass unloading points if the cargo flow is at least 1 million tons of cargo per year.

The existing car dumper, depending on the method of turning the car, it is customary to divide into end, rotor, side and combined.

Face tippers provide a turn of the car relative to the transverse axis by 50-70 °. In this case, the cargo is poured out through the folding end wall of the car. Their productivity is 12 ... 15 vag./h. The advantage of the face tipper car is the simplicity of design and high reliability.

Questions:

1. Tell us about the classification of material handling machines.
2. Compare diesel loaders with electric, indicate the scope of their rational use.
3. How is a universal electric screwdriver arranged?
4. How to determine the performance of a continuous loader feeder?

Literature and resources

1. Zhuravlev N.P., Malikov O.B. Transport and cargo complexes: Textbook. allowance. - M.: Route, 2016.-- 232 p.
2. Boyko N.I., Cherednichenko S.P. Transport and cargo systems and warehouses: textbook / N.I. Boyko, S.P. Cherednichenko. - Rostov n / a.: Phoenix, 2007.-- 400 p.
3. Transport and cargo systems. Textbook / A.S. Balalaev, I.A. Baburova, A. Yu. Kostenko. - Khabarovsk: Publishing house of FVGUPS, 2015.-- 101 p.

4. 4. Complex mechanization and automation of loading and unloading operations: Textbook / Ed. Timoshina A.A. and Machulsky I.I.-M .: Route, 2013.- 400 p.

Internet resources:

1. Abdikerimov, G.S. Logistic management of cargo transportation and terminal and warehouse activities [Text]: A textbook for specialists / G.S. Abdikerimov, S.Yu. Eliseev, V.M. Nikolashin, A.S. Sinitsyna, O.B. Malikov // M: FGBOU "Educational-methodical / center for education in railway transport". - 2013 .-- 428 p. <https://e.lanbook.com/reader/book/59016/#1>
2. Balalaev A.S., Leontiev R.G. Transport and logistics interaction in multimodal transportation: monograph. - M .: FGBOU "Educational-methodical center for education in railway transport", 2012. - 268 p. - <http://e.lanbook.com/view/book/58896/page58/>
3. Design of loading and unloading devices and warehouses: Method. instructions / compiled by V.A. Bolotin, E.K. Korovyakovsky, N.G. Yankovskaya.- SPb.: FSBEI HPE PGUPS, 2015.- 38 p.

Available online: Additional educational material and Internet sources used to complete the assignments of lectures, seminars, CDS, will be available on your page in the Univer.kaznu system.