ALTAIVAGON
JOINT STOCK COMPANY

Innovative products
for Russian Railways

Altaivagon JSC is one of the leaders in the production of 1,520 mm gauge railroad freight rolling stock. In 2022, the plant produced about 10 thousand units of rolling stock, which is 15% of the total output of freight cars.

The company includes three facilities specializing in the production of: boxcars, gondola cars, refrigerators and different flat cars (parent facility in Novoaltaisk city); tanks for transportation of light and dark oil products, LPG, fire and food tanks (branch in Kemerovo city) and large, medium and small castings (branch in Rubtsovsk city).

One of the current priority activities of Altaivagon JSC is the development of in-demand, commercially successful railcars for transportation of various types of cargo with high performance characteristics throughout the entire life cycle. To solve this problem, new models of rolling stock are being developed, production is being modernized, and technologies are being improved.

The team of experts and the existing business management system at Altaivagon JSC allows for continuous improvement of production processes that ensure higher quality of products.

Presence of process doors in the end wall:

- maintenance of equipment of the railcar's autonomous power plant;
- refueling (replacement) of process fluids without direct access inside the cargo compartment.

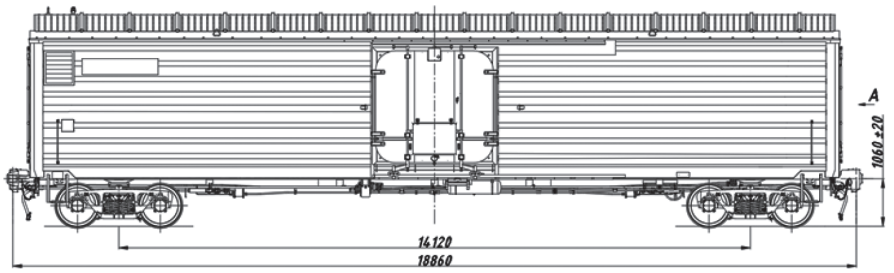
AUTONOMOUS REFRIGERATED RAILCAR | MODEL 16–2155

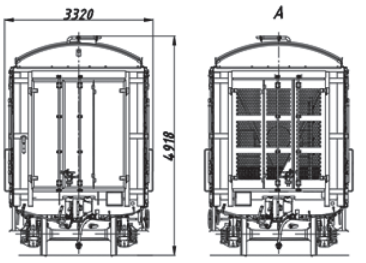
From **–20** °C up to +16 °C – temperature in the railcar's cargo compartment at the entire range of outdoor temperatures

25 years – railcar service life

Purpose: for transportation of perishable and non-perishable food and non-food cargoes (piece, unitized, packaged, in crates, on pallets) requiring weather protection and automatic maintenance of temperature in the cargo compartment.

Payload, tons	54.5
Empty weight of unequipped car, t	37.5
Empty weight of equipped car, t	39.5
Number of axles, ea.	4
Maximum static axial load from wheelset on rails, kN (tf)	230.5 (23.5)
Railcar body volume, m^3	108
Length along the coupler pulling faces, mm	18,860
Floor area, m^2	40.75
Railcar wheelbase, mm	14,120
Rated dimensions of the cargo compartment forming the internal volume, mm:	
– height in the longitudinal axial cross-section	2,985
– side wall height	2,660
– length	16,000
– width	2,547
Doorway clear dimension (width/height), mm	2,454/2,269
Overall dimensions as per GOST 9238–2013	1-T
Design speed, km/h	120
Bogie model, type 2 as per GOST 9246	18–2129
Heat transfer coefficient of railcar body enclosing structures, max., $W/m^2 \cdot K$	0.3
Operating temperature range in the cargo compartment, °C	–20...+ 16
Autonomous operation time of the power unit, not less than, days	30





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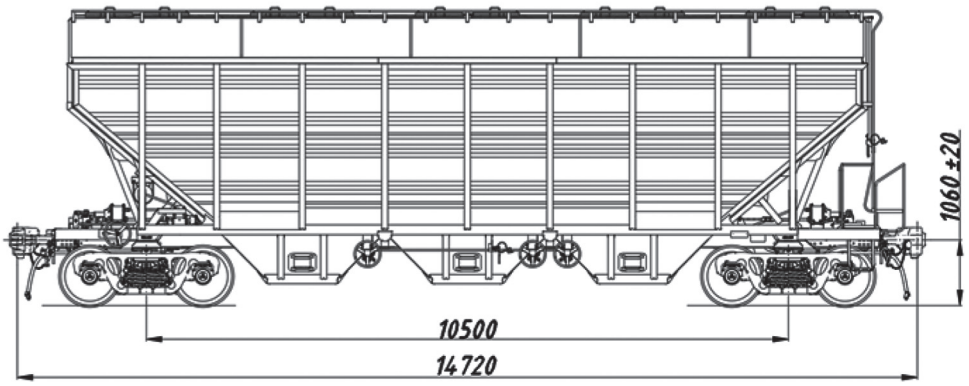
HOPPER CAR | MODEL 19–2165/19–2168

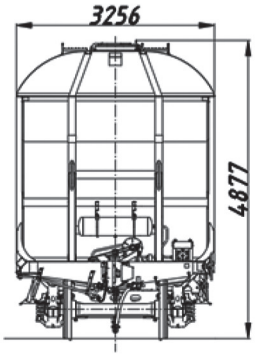
Purpose: for bulk transportation of grains and other food products requiring weather protection.

Railcar body volume, m^3 120
Length along the coupler pulling faces, mm 14,720
Railcar wheelbase, mm 10,500
Maximum railcar width, mm 3220
Maximum height from rail level, mm 4,800
Body overall dimensions as per GOST 9238–2013 ..... 1-T
Bogie overall dimensions as per GOST 9238–2013 .... 0–2VM

Number of loading hatches with a centralized sealing device, ea. 5
Clear dimensions of loading hatches, mm ..... 1,592×562
Number of unloading hatches with a centralized sealing device, ea. 6
Clear dimensions of unloading hatches, mm ..... 823×570
Unloading mechanism drive ..... Lever-screw type

	MODEL 19–2165	MODEL 19–2168
Payload, tons	76	70.5
Empty weight, t	24	23.5
Design static load from wheelset on rails, kN (tf)	245.25 (25)	230.5 (23.5)
Bogie model, type 3 according to GOST 9246–2013	18–9800	18–2128





TANK CAR | MODEL 15–2167 / 15–2167–01/15–2169

86,46 m^3
boiler capacity

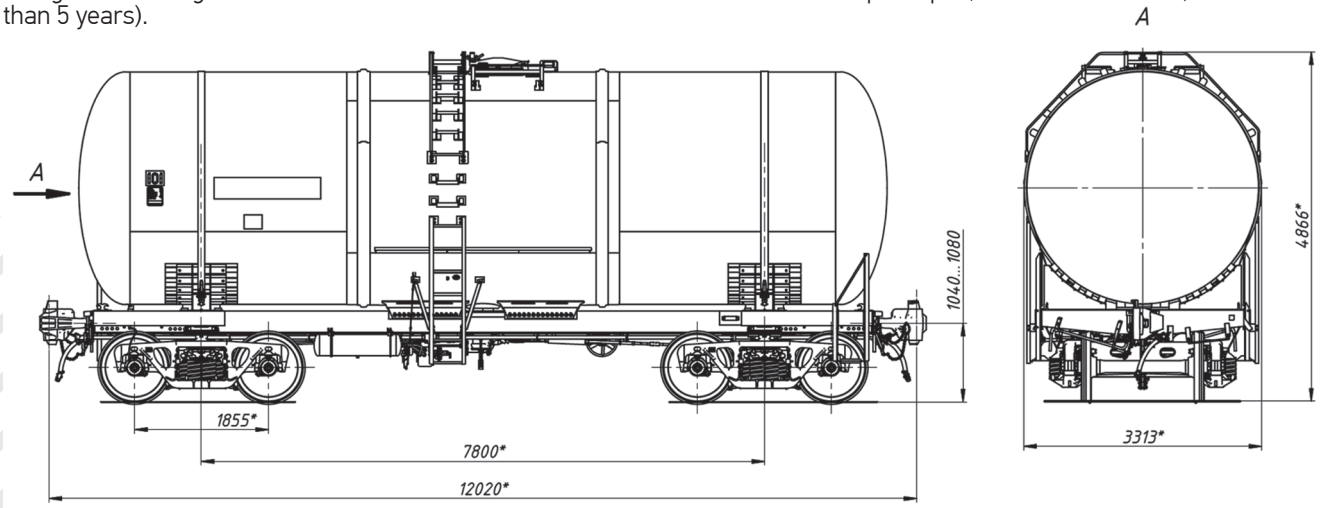
69.0 t
payload

24,0 t empty
weight (minimum)

Purpose: tank car for petroleum products is designed for transportation of cargoes with density not exceeding 0.99 t/m^3 and vapor pressure not exceeding 0.07 MPa.

Empty weight, t
– minimum 24.0
– maximum 25.0
– minimum in operation 22.7
Maximum design static load, kN (tf) 230.5 (23.5)
Boiler capacity, m^3:
– full 86.46
– effective 84.73
Length, mm
– of the car along the coupler pulling faces 12,020
– of the car along the frontal frame beams 10,800
Rated boiler length, mm 11,195
Rated boiler inner diameter, mm 3,200
Car height from the rail level, mm
– maximum 4,866
– to the coupler pulling face 1040–1080
Overall dimensions as per GOST 9238
– car body 1-T
– bogie 02–VM
Internal overpressure, MPa (kgf/cm^2)
– operating 0.070 (07)
– design 0.39 (3.9)
– hydraulic test 0.51 (5.1)
– to adjust the safety relief valve ..... 0.15 ±0.005 (1.5±0.05)

Designated mileage of tank car model 15–2167 from construction to the first depot repair, 500 thousand km (but not more than 5 years).



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Opening roof:
- maximum railcar volume utilization rate;
- reducing the labor intensity of loading/unloading;
- container transportation.

ARTICULATED BOXCAR WITH AN OPENING ROOF | MODEL 11–2151

26 t
up to 93 tons payload was increased compared to a standard boxcar of model 11–2135–01

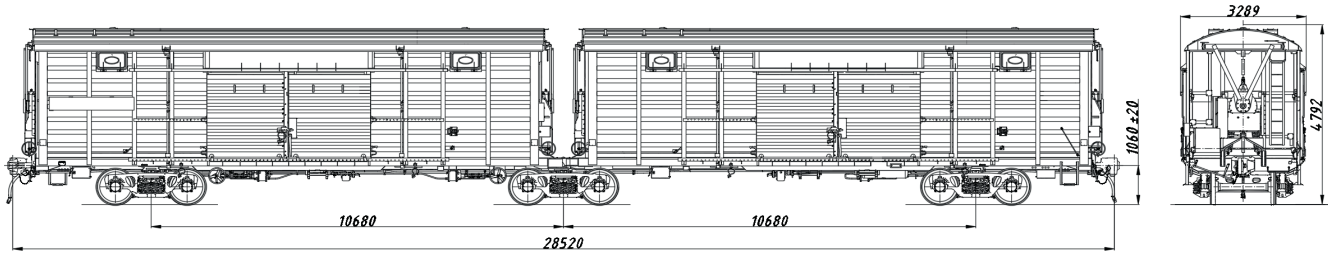
69 m^3
up to 230 m^3, body volume was increased compared to a boxcar of model 11–2135–01

500
thousand km or 5 years — service life from construction to the first depot repair

Purpose: transportation of piece, unitized, packaged cargoes, unpackaged bulk cargoes and loose cargoes requiring weather protection, and containers.

Technical specifications

Number of sections, ea.	2
Railcar payload, t	93
Railcar section payload, t	46.5
Railcar empty weight, t	48
Railcar body volume, m^3	230
Railcar section volume, m^3	115
Number of axles, ea.	6
Maximum design static axial load for the bogie under the end section frame, kN (tf)	230.5 (23.5)
Maximum design static axial load for the bogie under the hinged coupling device, kN (tf)	230.5 (23.5)
Length along the coupler pulling faces, mm	28,520
Railcar wheelbase, mm	21,360
Railcar section base, mm	10,680
Distance between the vertical coupler pulling face and the vertical axis of the hinged coupling device, mm	14,260
Internal dimensions of sections, mm:	
– side wall height	2,976
– length	12,720
– width	2,740
Railcar floor area, m^2	68.6
Railcar section floor area, m^2	34.3
Doorway clear dimension (width/height), mm:	3,802/2,334
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013:	
– with the roof closed	1-T
– with the roof open	Sp (limited by the line 1–2a–4b–5–6–7–8)
Bogie model, type 2 as per GOST 9246–2013	18–2129
Number of containers transported, sizes as per GOST R 53350:	
– 1AAA, 1AA, 1A, 1AX	2
– 1CC, 1C, 1 CX	4

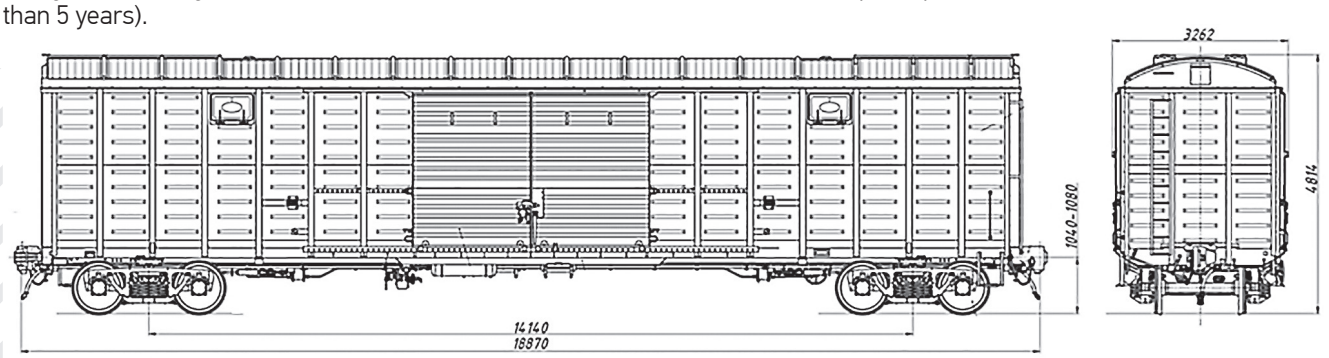


BOX CAR | MODEL 11–2163/11–2164

Purpose: for transportation of piece, unitized and packaged cargoes requiring weather protection.

Railcar model ..... 11–2163 / 11–2164
Payload, tons 68
Railcar empty weight min/max, t 25.5/26
Maximum static design load
from wheelset on rails, kN (tf) 230.5 (23.5)
Railcar body volume, m^3 161
Design speed, km/h 120
Overall dimensions 1-T
Bogie model ..... 18–2129/18–2128 type 2 as per GOST 9246
Number of axles, ea. 4
Length, mm:
– along the coupler pulling faces 18,870
– along frame end beams 17,700
Height from rail level, mm:
– maximum 4,814
– to the coupler pulling face ..... 1,040...1,080
– to the floor level 1,260
Railcar wheelbase, mm 14,140
Internal body dimensions, mm:
– length 17,694
– width 2,786
– side wall height 2,935
Floor area, m^2 ..... 49.3
Clear dimensions, mm
– door opening 4,118x2,748
– side wall hatch 614x365
– flue socket (diameter) 130
Number of flue sockets in the roof (if available), ea. 2
Number of hatches in side walls
(if available), ea. 4
Number and type of doors — non self-sealing, sliding,
two on each side

Designated mileage of boxcar model 11–2163 from construction to the first depot repair, 500 thousand km (but not more than 5 years).



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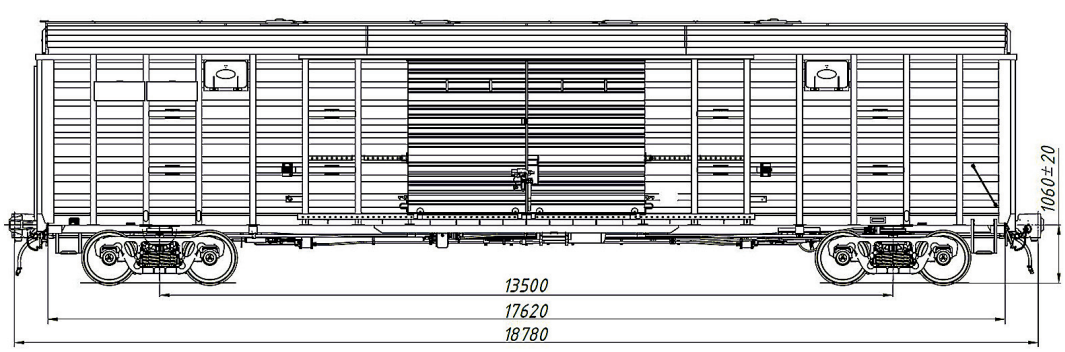
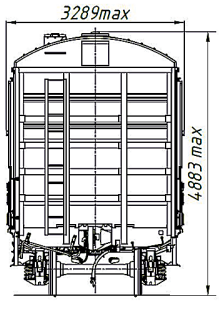
BOX CAR | MODEL 11–2158

Purpose: for transportation of piece, unitized, packaged and bulk cargoes requiring weather protection.

Project No. 2158.00.000
Technical Specifications ..... 2158.00.000 TU
Railcar model 11–2158
Payload, tons 71.5
Railcar empty weight min/max, t 28/28.5
Maximum static design load
from wheelset on rails, kN (tf) 245 (25)
Railcar body volume, m^3 161
Design speed, km/h 120
Overall dimensions 1-T
Bogie model ..... 18–9800 type 3 as per GOST 9246
Number of axles, ea. 4
Length, mm:
– along the coupler pulling faces 18,870
– along frame end beams 17,620
Height from rail level, mm:
– maximum 4,883
– to the coupler pulling face ..... 1,040...1,080
– to the floor level 1,263
Railcar wheelbase, mm 13,500
Internal body dimensions, mm:
– length 17,608
– width 2,740
– side wall height 2,934
Floor area, m^2 ..... 49.1
Clear dimensions, mm
– door opening 4,150x2,820
– side wall hatch 614x365
– roof loading hatch (diameter) 400
– flue socket (diameter) 130
Number of roof loading
hatches (if available), ea. 4
Number of hatches in side walls
(if available), ea. 4
Number and type of doors — non self-sealing, sliding, two on each side



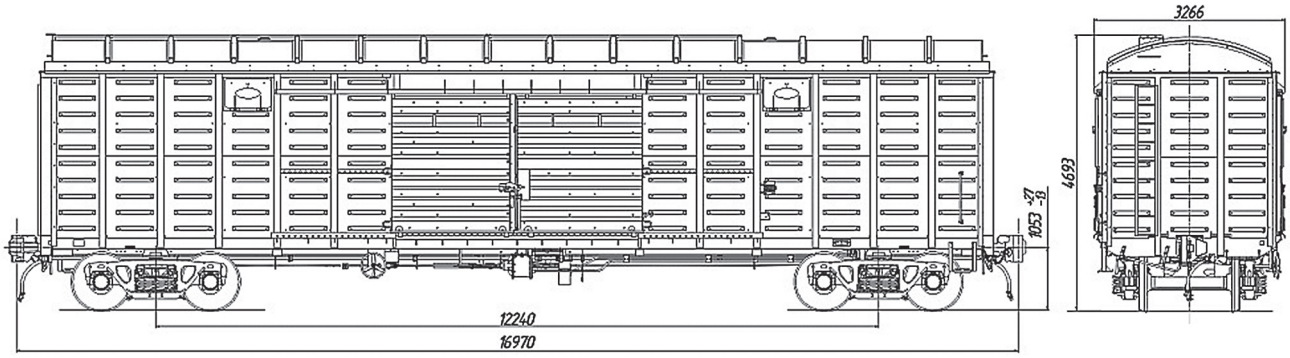


BOX CAR | MODEL 11–280

Purpose: for transportation of piece, unitized, packaged and bulk cargoes requiring weather protection.

Payload, tons 68
Railcar empty weight min/max, t 24.7/26
Maximum static design load
from wheelset on rails, kN (tf) 230.5 (23.5)
Railcar body volume, m^3 138
Design speed, km/h 120
Overall dimensions 1-VM (0-T)
Bogie model ..... 18–2128 type 2 as per GOST 9246
Number of axles, ea. 4
Length, mm:
– along the coupler pulling faces 16,970
Height from rail level, mm:
– maximum 4,693
– to the coupler pulling face ..... 1,040...1,080
– to the floor level 1,286
Railcar wheelbase, mm 12,240

Internal body dimensions, mm:
– length 15724
– width 2,764
– side wall height 2,860
Floor area, m^2 ..... 43.5
Clear dimensions, mm
– door opening 3,802x2,334
– side wall hatch 614x365
– roof loading hatch (diameter) 400
– flue socket (diameter) 130
Number of roof loading
hatches (if available), ea. 4
Number of hatches in side walls
(if available), ea. 4
Number and type of doors — non self-sealing, sliding,
two on each side



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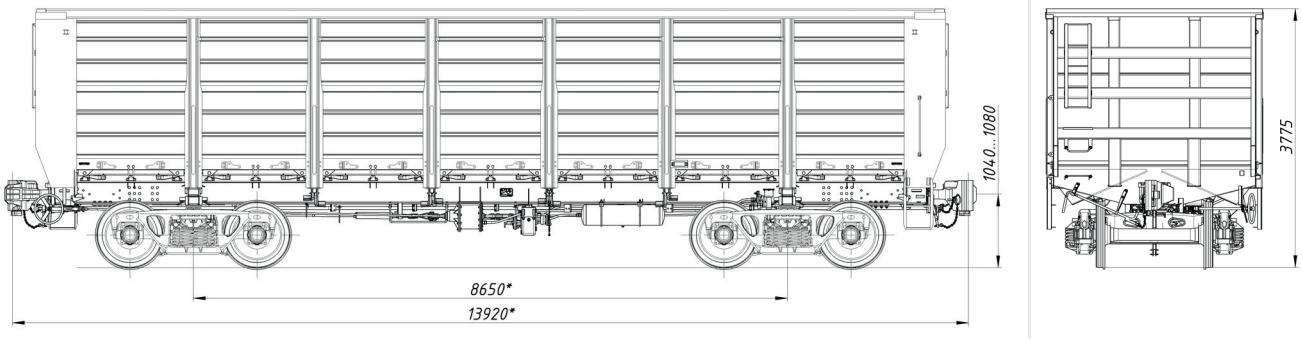
GONDOLA CAR | MODEL 12–2153 / 12–2153–01

Purpose: for transportation of cargoes that do not require weather protection, including bulk non-dusty, bulky (except for hot, with temperatures over 100°C) and other cargoes intended for transportation in open railcars.

Payload, tons	70
Tare weight, t	
– minimum	23
– maximum	24
Number of axles, ea.	4
Maximum static design load from wheelset on rails, kN (tf)	230.5 (23.5)
Railcar body volume, m^3	88
Length along the coupler pulling faces, mm	13,920
Maximum width, mm	3,170
Railcar wheelbase, mm	8,650
Internal body dimensions, mm	
– height	2,335
– length (lower part/upper part)	12,690/12,930
– width	2,922
Overall dimensions as per GOST 9238–2013	1-T
Design speed, km/h	120
Bogie model, type 2 as per GOST 9246–2013	18–2128 / 18–2129
Number of unloading hatches, ea.	14

Designated mileage of gondola car model 12–2153–01 from construction to the first depot repair, 500 thousand km (but not more than 5 years).

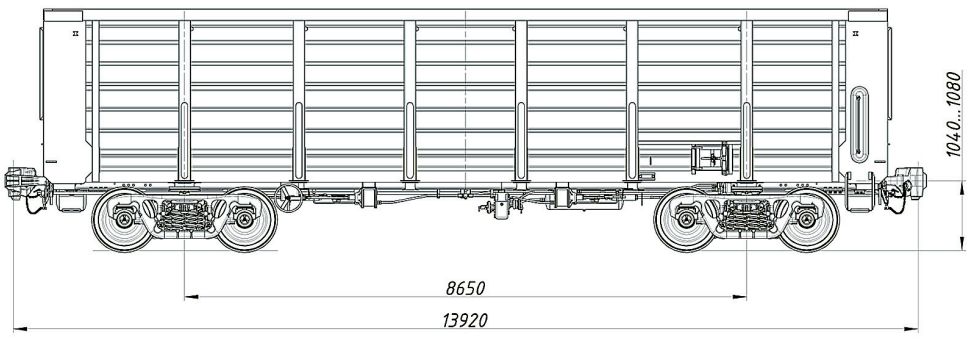


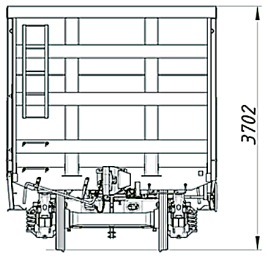
SOLID-BOTTOM GONDOLA CAR | MODEL 12–2156

Purpose: for transportation of cargoes that do not require weather protection, including bulk non-dusty, bulky and other cargoes intended for transportation in open railcars.

Payload, tons 76
Railcar empty weight min/max, t 23.5/24
Load:
static axial, kN (tf) 245 (25)
per meter, kN/m (tf/m) 70.4 (7.18)
Railcar body volume, m^3 94
Design speed, km/h 120
Overall dimensions 1-VM
Length, mm:
– along the coupler pulling faces 13,920
– along frame end beams 12,700

Height from rail level, mm:
maximum 3,702
to the coupler pulling face 1,040–1,080
Number of axles, ea. 4
Bogie ..... 18–9800, type 3 as per GOST 9246
Railcar wheelbase, mm 8,650
Internal body dimensions, mm
– length 12,700
– width 3,006
– height 2,460
Number of cleaning hatches, ea. 2





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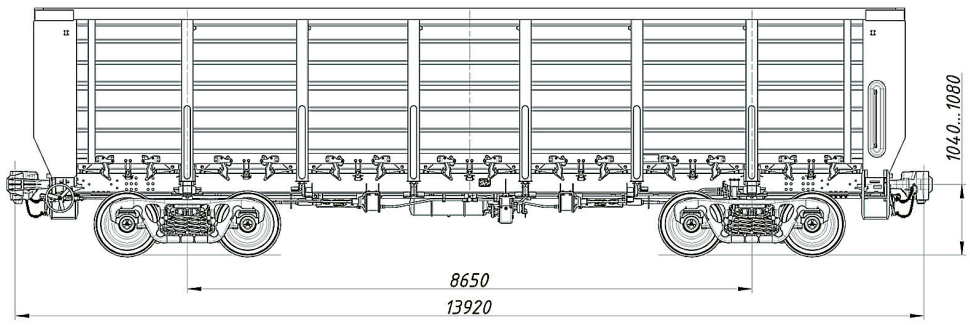
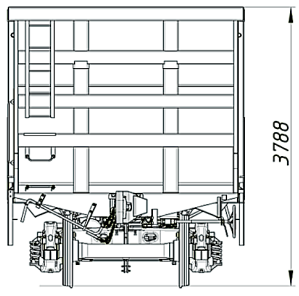
GONDOLA CAR WITH SOLID END WALLS AND FLOOR UNLOADING HATCHES | MODEL 12–2159

Purpose: for transportation of cargoes that do not require weather protection, including bulk non-dusty, bulky and other cargoes intended for transportation in open railcars.

Payload, tons 75
Railcar empty weight min/max, t 24.5/25
Number of axles, ea. 4
Load:
– static axial, kN (tf) 245 (25)
– per meter, kN/m (tf/m) 70.4 (7.18)
Railcar body volume, m^3 94
Design speed, km/h 120
Overall dimensions 1-VM
Length, mm:
– along the coupler pulling face 13,920
– along frame end beams 12,700
Height from the rail level :
– to the coupler pulling face, mm ..... 1,040...1,080
– maximum 3,788
Bogie ..... 18–9800, type 3 as per GOST 9246
Railcar wheelbase, mm 8,650
Internal dimensions of the body, mm:
– length (lower part/upper part) 12,690/13,050
– width 3,014
– height 2,385
Number of unloading hatches ..... ea. 14

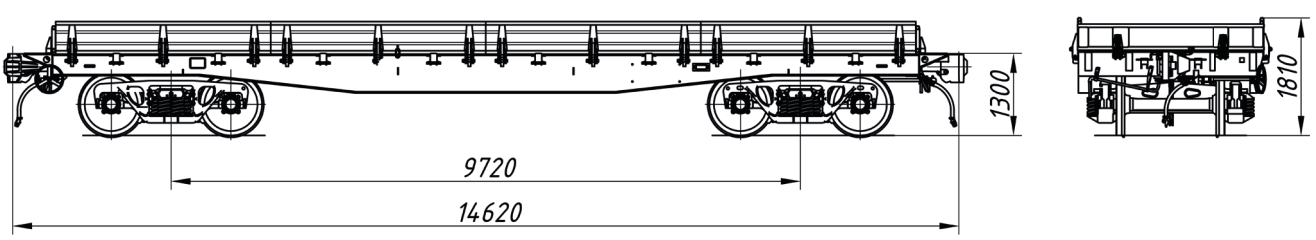




FLAT CAR | MODEL 13–2114

Purpose: for transportation of containers, wheeled and tracked vehicles; timber; long, piece, bulk and other cargoes.

Payload, t	72
Maximum empty weight, t	22
Maximum static design load from wheelset on rails, kN (tf)	230.5 (23.5)
Flat car wheelbase, mm	9,720
Length along the coupler pulling faces, mm	14,620
Car length along the frame, mm	13,400
Car width along the frame, mm	2,870
Height from rail level to floor level, mm	1,300
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	0-VM
Number of containers transported, standard sizes, ea:	
– 1AAA, 1AA, 1A, 1AX	1
– 1CC, 1C, 1CX	2



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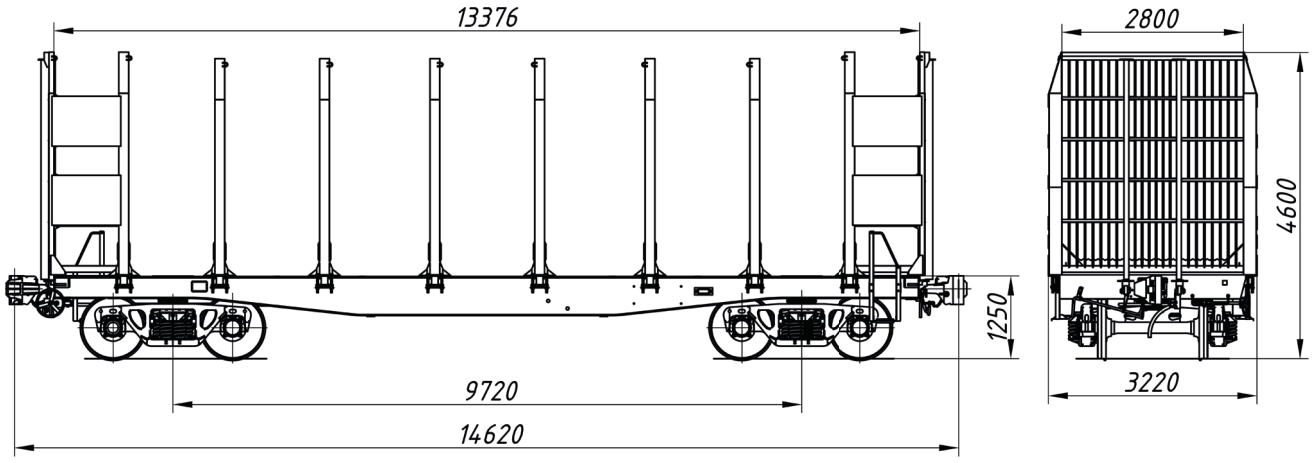
FLAT CAR | MODEL 13–2114–07

Purpose: for transportation of round timber and sawn timber.

Payload, tons	66
Maximum empty weight, t	27
Maximum static design load from wheelset on rails, kN (tf)	227.85 (23.25)
Flat car wheelbase, mm	9,720
Length along the coupler pulling faces, mm	14,620
Car length along the frame, mm	13,400
Car width along the frame, mm	2,870
Height from rail level to floor level, mm	1,250
Number of end walls, ea.	2
Number of side rack pairs, ea.	8
Overall dimensions as per GOST 9238–2013	1-T



FLAT CAR | MODEL 13–2114–08

Purpose: for transportation of containers, wheeled and tracked vehicles; timber; long, piece and other cargoes.

Payload, t 72

Maximum empty weight, t 21.3

Maximum static design load
from wheelset on rails, kN (tf) 228.82 (23.325)

Flat car wheelbase, mm 9,720

Length along the coupler pulling faces, mm 14,620

Car length along the frame, mm 13,400

Car width along the frame, mm 2,870

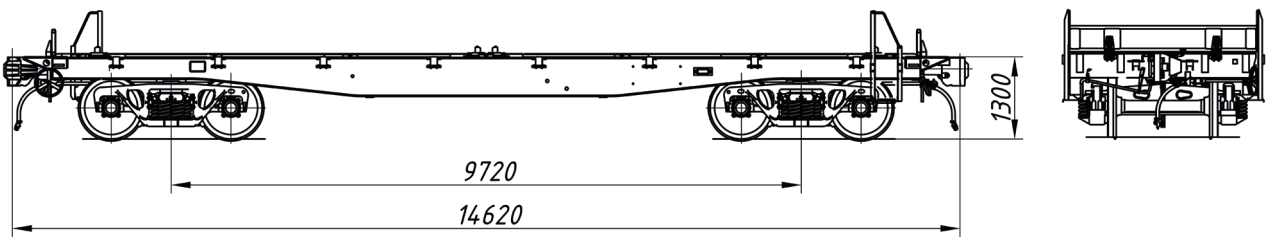
Height from rail level
to floor level, mm 1,300

Number of fitting stops
(as per customer's request), ea. 8 (16)

Number of transported containers of standard sizes, ea.:
– 1AAA, 1AA, 1A, 1AX 1
– 1CC, 1C, 1CX 2
– 1D, 1DX (equipped with 16-fitting
stops as per customer's request) 4

Design speed, km/h 120

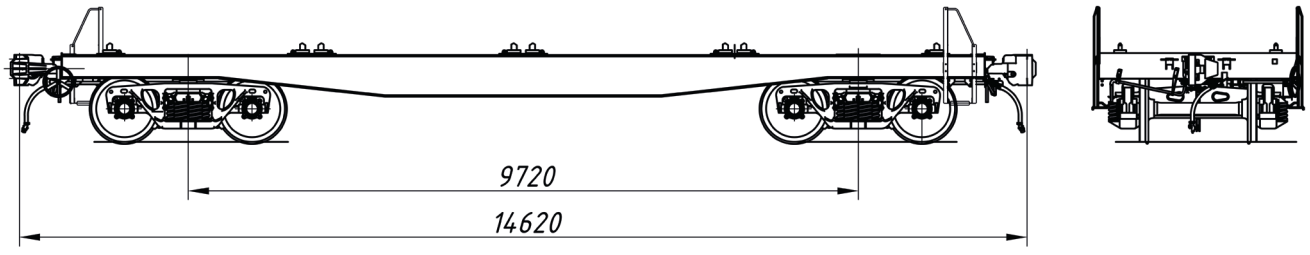
Overall dimensions as per GOST 9238–2013 ..... 0-VM



FLAT CAR | MODEL 13–2114K

Purpose: for transportation of containers, refrigerated containers, tank containers.

Payload, t	73
Maximum empty weight, t	20.6
Maximum static design load from wheelset on rails, kN (tf)	229.6 (23.4)
Flat car wheelbase, mm	9,720
Length along the coupler pulling faces, mm	14,620
Car length along the frame, mm	13,400
Car frame width, mm	2,870
Number of fitting stops, ea.	16
Number of standard containers to be installed, ea.:	
– 1EEE, 1EE	1
– 1AAA, 1AA, 1A, 1AX	1
– 1CC, 1C, 1CX	2
– 1D, 1DX	4
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	0-VM

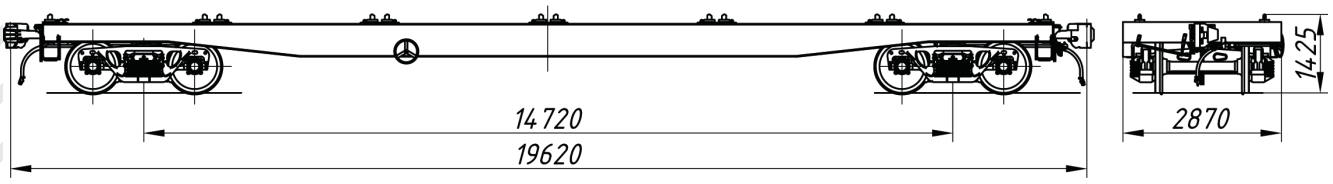


FLAT CAR | MODEL 13–2116

Purpose: for transportation of multi-purpose and specialized large-capacity containers, tank containers

Payload, tons	72
Maximum empty weight, t	22
Maximum static design load from wheelset on rails, kN (tf)	230.5 (23.5)
Flat car wheelbase, mm	14,720
Length along the coupler pulling faces, mm	19,620
Car length along the frame, mm	18,400
Car width along the frame, mm	2,870
Number of containers to be transported:	
– 1EEE, 1EE	1
– 1AAA, 1AA, 1A, 1AX	1
– 1BBB, 1BB, 1B, 1BX	2
– 1CC, 1C, 1CX	3
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	0-VM

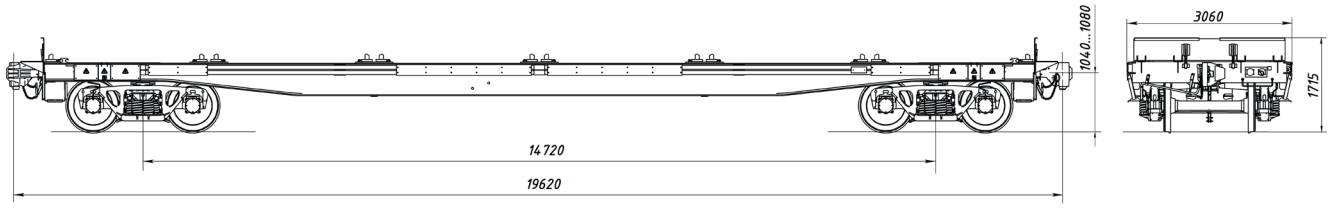
13–2116

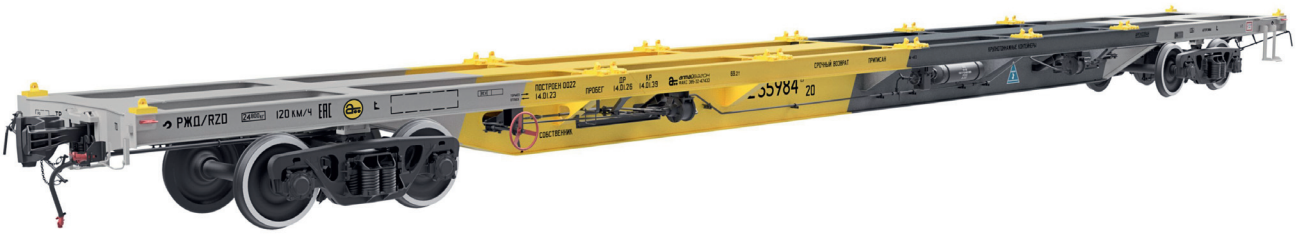


FLAT CAR FOR TRANSPORTATION OF LARGE-CAPACITY CONTAINERS | MODEL 13–2116–01

Purpose: for transportation of multi-purpose and specialized large-capacity containers, including tank containers and refrigerated containers with and without power supply from an external power source, as well as refrigerated containers as part of a 13-car container train in accordance with the project PKB TsV M 1782.

Payload, t	71.5
Maximum empty weight, t	22.5
Maximum static design load from wheelset on rails, kN (tf)	230.5 (23.5)
Flat car wheelbase, mm	14,720
Length along the coupler pulling faces, mm	19,620
Length along the frame, mm	18,400
Width along the frame, mm	2,870
Number of standard containers to be installed, ea.:	
– 1EEE, 1EE	1
– 1AAA, 1AA, 1A, 1AX	1
– 1BBB, 1BB, 1B, 1BX	2
– 1CC, 1C, 1CX	3
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	1-T





FLAT CAR FOR TRANSPORTATION OF LARGE-CAPACITY CONTAINERS | MODEL 13–2162 / 13–2162–01

Purpose: for transportation of multi-purpose and specialized large-capacity containers, including tank containers and refrigerator containers of the following sizes: 1EE, 1EEE, 1A, 1AA, 1AAA, 1AX, 1B, 1BB, 1BBB, 1BBX, 1C, 1CC, 1CX, both loaded, including with dangerous goods, and empty in various combinations.

Payload, tons 69.2

Railcar empty weight min/max, t 24.2/24.8

Maximum static design load from wheelset on rails, kN (tf) 230.5 (23.5)

Length along the coupler pulling faces, mm 25,460

Length along frame end beams, mm 24,530

Railcar wheelbase, mm 19,000

Car width, mm 2,935

Number of container stops, ea. 24

including:
– stationary 4
– hinged 20

Bogie model .....18–2128/18-2129 type 2 as per GOST 9246

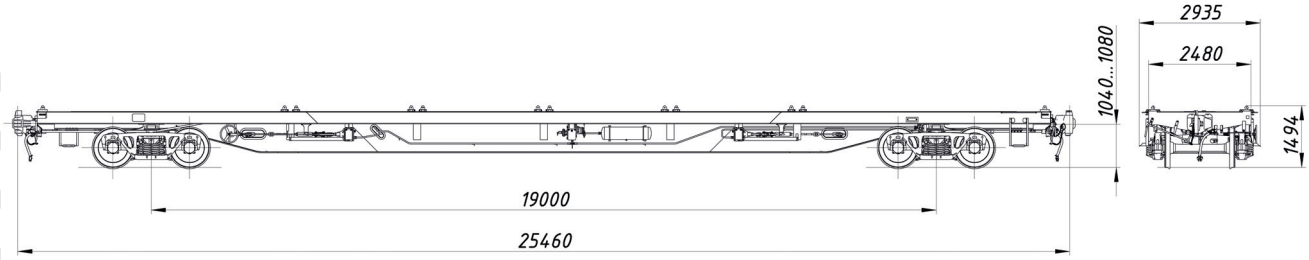
Number of standard containers to be installed, ea.:
– 1EEE, 1EE 1
– 1AAA, 1AA, 1A, 1AX 2
– 1BBB, 1BB, 1B, 1BX 2
– 1CC, 1C, 1CX 4

Gross weight of transported containers as per GOST R 53350, kg, max. 36,000

Design speed, km/h 120

Overall dimensions 1-T

Designated mileage of flat car model 13-2162-01 from construction to the first depot repair, 500 thousand km (but not more than 5 years).



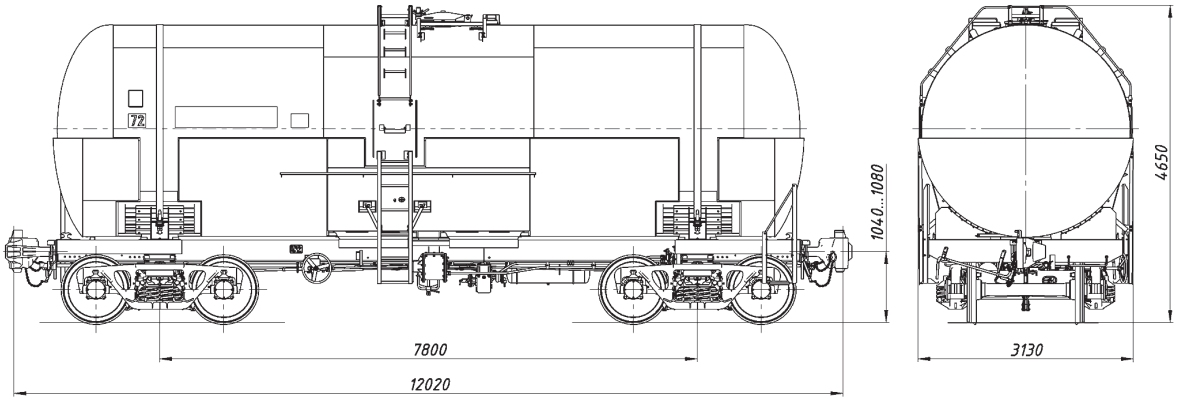
ALTAIVAGON JOINT STOCK COMPANY

TANK CAR | MODEL 15–289–04

Purpose: tank car model 15-289-04 – for transportation of crude oil and petroleum products.
Filling is carried out through the hatch with the lid open, draining — by gravity with the drainage device open and the hatch lid open.

Payload, tons 67*
Empty weight, t:
– maximum 27*
Calibration boiler type, m^3 72
Total boiler capacity, m^3 ..... 72.44
Inner boiler diameter, mm 3,000
Number of axles, ea. 4
Length, mm:
– along the coupler pulling faces 12,020
– along frame end beams 10,800
– along boiler steam heating jacket 10,880*
Tank wheelbase, mm 7,800
Height to the rail level, mm:
– to the coupler pulling face ..... 1,040 ...1,080
– maximum 4,650*
Maximum railcar width, mm 3,130
Design load from the wheelset on the rails, kN (tf) 230.5 (23.5)

Design speed, km/h 120
Overall dimensions as per GOST 9238 ..... 0-VM
Bogies ..... model 18–2129, type 2 as per GOST 9246
Availability of safety inlet valve ..... available
Overpressure in the boiler by adjustment of the safety relief valve, MPa (kgf/cm^2) ..... 0.15±0.005 (1.5±0.05)
External overpressure by adjustment of the safety relief valve, MPa (kgf/cm^2) ..... 0.015–0.005(0.15–0.05)
Test pressure in the boiler during hydraulic testing, MPa (kgf/cm^2) 0.50 (5.0)
Test pressure in the boiler during hatch lid leakage testing, MPa (kgf/cm^2) 0.25 (2.5)
Internal overpressure, MPa (kgf/cm^2):
– operating (vapor pressure) 0.070 (0.7)
– design 0.25 (2.5) 0.325 (3.25)
Code as per Agreement on International Goods Transportation by Rail L4BN

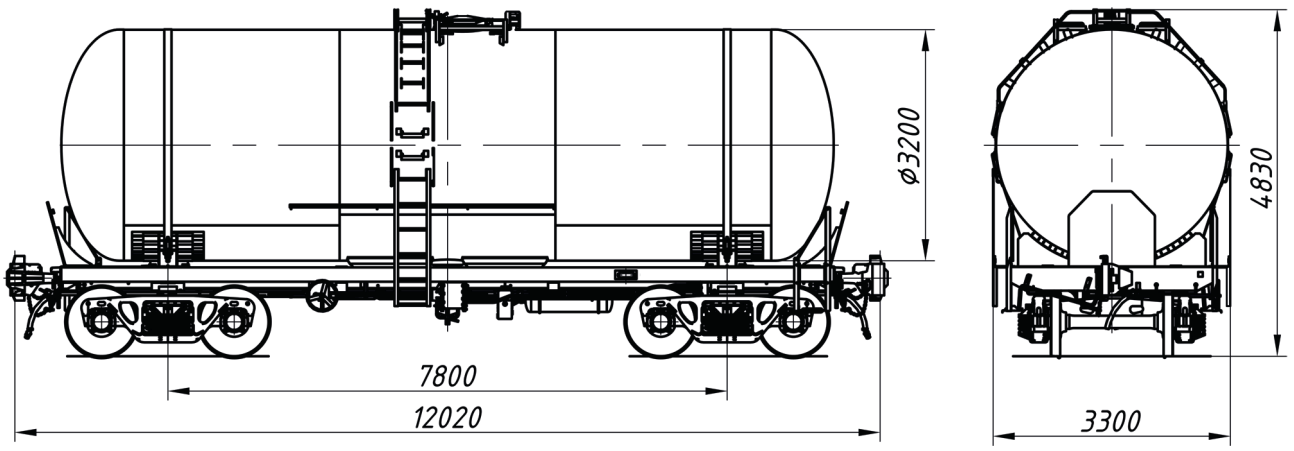


* The final parameter value shall be determined and validated by calculations and tests at the development stage.

TANK CAR | MODEL 15–2132/15–2132P

Purpose: tank car model 15–2132 – for transportation of crude oil and petroleum products; tank car model 15–2132P – for transportation of vegetable oils to be further processed.
Filling is carried out through the hatch with the lid open, draining — by gravity with the drainage device open and the hatch lid open.

Boiler capacity, m^3	85.5
Payload, tons	66
Empty weight, t:	
– minimum	27
– maximum	28
Maximum static design load from wheelset on rails, kN (tf)	230.5 (23.5)
Wheelbase, mm	7,800
Length along the coupler pulling faces, mm	12,020
Maximum railcar width, mm	3,338
Maximum railcar height, mm	4,830
Inner boiler diameter, mm	3,200
Boiler length, mm	11,194
Design pressure in the boiler, MPa (kgf/cm^2)	0.38 (3.8)
Density of transported cargo, not more than, t/m^3	0.96
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	1-T



ALTAIVAGON JOINT STOCK COMPANY

WATER TANK CAR FOR FIRE TRAIN | MODEL 15–289–03

Purpose: storage and transportation of water via 1,520 mm gauge railroads as a part of a fire train by furnishing the tank car with special equipment and covering the boiler with external thermal insulation.

Boiler capacity, m^3:
– full 72.2
– effective 61.0

Payload, t 61

Empty weight, t:
– minimum 31
– maximum 33

Maximum static design load
from wheelset on rails, kN (tf) 230.5 (23.5)

Railcar wheelbase, mm 7,800

Length along the coupler pulling faces, mm 12,020

Maximum railcar width, mm 3,245

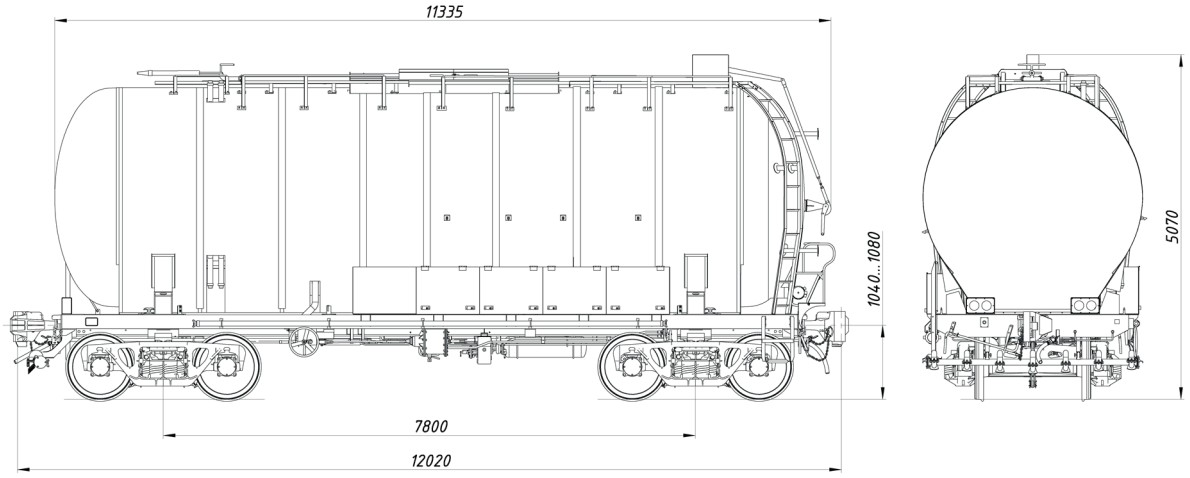
Maximum railcar height, mm 5,070

Design pressure in the boiler, MPa (kgf/cm^2) 0.34 (3.4)

Pressure in the coil, MPa (kgf/cm^2), max. 0.5 (5.0)

Temperature in the coil, °C, max. 100

Heat transfer medium in the coil ..... hot water



TANK CAR | MODEL 15–2148

Purpose: for transportation of ammonia.

Boiler capacity, m^3 ..... 86.5

Payload (design), t, max. 50.14

Empty weight, t:
– minimum 36.6
– maximum 39

Maximum design load from wheelset on rails, kN (tf) 218.63 (22.29)

Railcar wheelbase, mm 7,800

Railcar length along the coupler pulling faces, mm 12,020

Maximum railcar width, mm 3,289

Maximum railcar height, mm 5,090

Inner boiler diameter, mm 3220

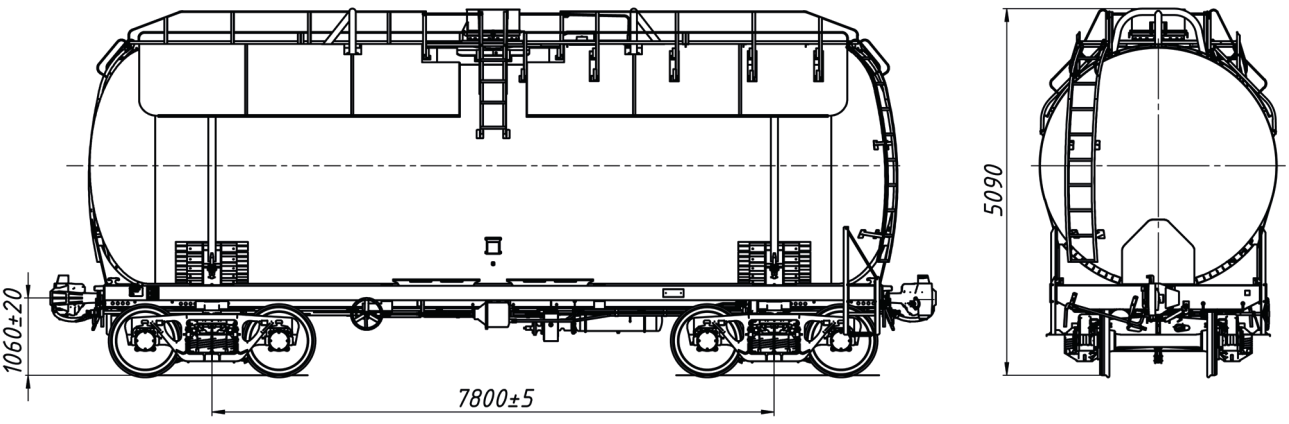
Outer boiler length, mm 11,200

Design pressure in the boiler, MPa (kgf/cm^2) 2.14 (21.8)

Safety relief valve actuation pressure, MPa (kgf/cm^2) ..... 2.2+0.17 (22.4+1, 7)

Design speed, km/h 120

Overall dimensions as per GOST 9238–2013 ..... 1-T

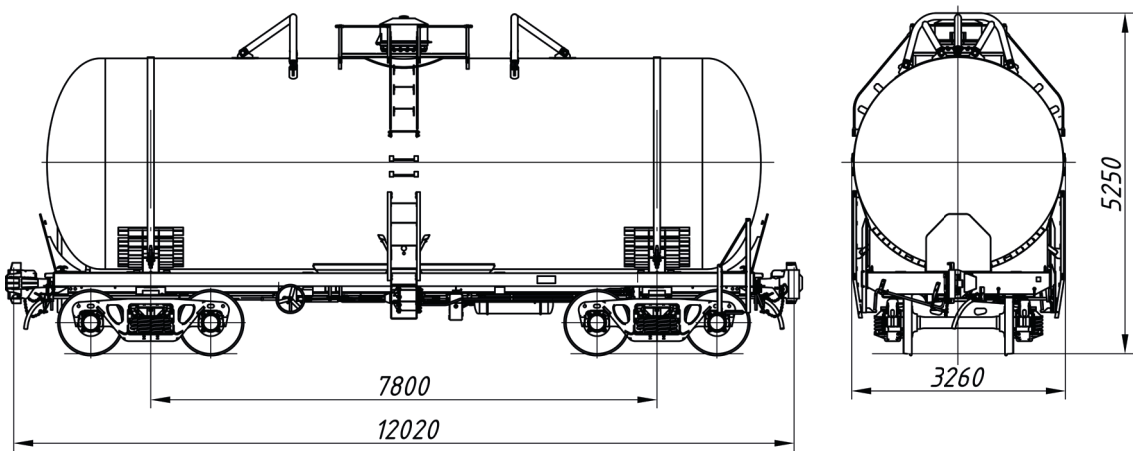


ALTAIVAGON JOINT STOCK COMPANY

TANK CAR | MODEL 15–9872

Purpose: for transportation of liquefied hydrocarbon gases (propane, butane and their mixtures).
Filling and draining are performed through the drain and fill fittings located in the upper part of the boiler under the valve cover.

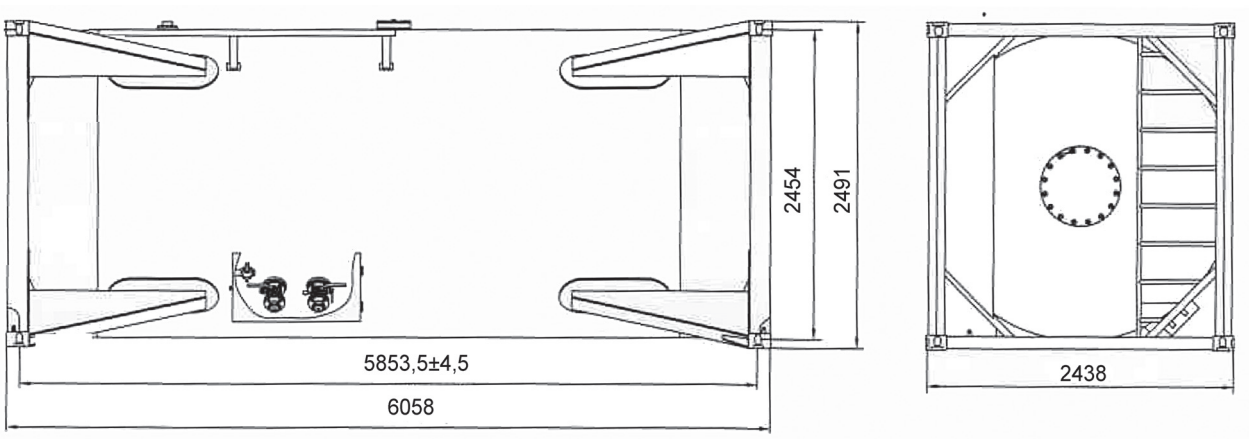
Boiler capacity, m³	83.9
Payload, t	52
Empty weight, t:	
– minimum	35.8
– maximum	37.5
Maximum static design load from wheelset on rails, kN (tf)	230.5 (22.5)
Tank wheelbase, mm	7,800
Length along the coupler pulling faces, mm	12,020
Maximum railcar width, mm	3,260
Maximum railcar height, mm	5,250
Inner boiler diameter, mm	3,200
Outer boiler length, mm	11,000
Operating pressure in the boiler, MPa	2.0
Design speed, km/h	120
Overall dimensions as per GOST 9238–2013	1-T



TANK CONTAINER | MODEL KTS–25

Purpose: for safe transportation of liquefied hydrocarbon gases of hazard class 2 according to GOST 19433-88 by road, rail, river and sea transport in domestic and international traffic, as well as their temporary storage at the consignee's premises. May be fitted with Russian-made shutoff and safety valves, as well as valves produced by Fort Vale.

Container type and size	UN T50, ICC
Payload, kg	16,000
Empty weight, kg	8,000
Total tank capacity (rated), m^3	25
Maximum gross weight, kg	24,000
Vessel inner diameter, mm	2,400
Maximum allowable working pressure, MPa	2.04
Test pressure, MPa	2.8
Operating temperature range, °C	from –50 to +50
Design temperature of the medium, °C	+60
Permissible weight when stacked, kg	192,000



CONTAINER WITH REMOVABLE ROOF FOR TRANSPORTATION OF DRY GOODS | MODEL KSK-24

It is a transport equipment designed for safe transportation of dry cargoes by road, rail (along the entire network of 1,520 mm and 1,435 mm gauge railroads), river and sea transport (in domestic and international traffic); for transfer from one mode of transport to another (without intermediate reloading of cargo), as well as temporary storage at the consignee's premises.

20-FOOT SPECIALIZED CONTAINER

20-foot specialized container for transportation of dry bulk goods, including grains. Container for transportation of dry bulk cargoes with side discharge is a transport equipment designed for safe transportation of dry bulk cargoes by road, rail, river and sea transport in domestic and international traffic, as well as temporary storage at the consignee's premises.

BIAXIAL RAILCAR BOGIE
MODEL 18–9800

Maximum design static load from wheelset on rails, kN(tf) — 245 (25)

Bogie wheelbase, mm 1,850

Free distance from the rail level to the center plate support surface level, mm ..... 1,524 ±6

Distance between longitudinal axes of spring sets, mm 2,036

Static deflection of spring suspension under maximum permissible gross load, mm, max. 65

Static deflection of spring suspension in the car with minimum design weight, mm, ... no less than 8

Clearance limits as per GOST 9238, lower outline — 02-VM

32 years
service life of the bogie, side frame and bolster

15 years
Service life in terms of strength of press connections of wheels with wheelset axle

6 years or **500** thousand km
mileage before first depot repair*

BIAXIAL RAILCAR BOGIE | MODEL 18–2129/18–2128

Purpose: for rolling under freight cars with maximum design static axial load not exceeding 230.5 kN (23.5 tf), operated on 1,520 mm gauge mainline railroads.

Weight, kg, maximum 5,000

Wheelbase, mm 1,850

Rail gauge, mm 1,520

Maximum design static load, kN (tf) 230.5 (23.5)

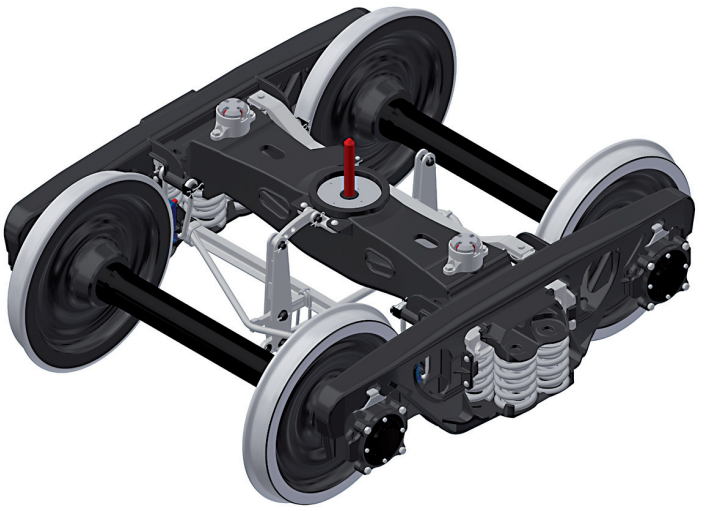
Free height from the rail level to the central plate supporting surface, mm 806

Distance between the longitudinal axes of side bearings, mm 1,524

Design speed, km/h 120

Designated mileage from construction to the first depot repair, thousand km ..... 500 (no more than 5 years)

..... 210 (no more than 3 years)



*Biaxial bogie, model 18–2129, type 2, GOST 9246–2013

AXLE | RU1SH–OS–V–2 AS PER GOST 33200–2014

The axles are manufactured on an automated production line. All manufacturing, marking and identification, geometric and nondestructive testing operations are performed via a central computer

Bogie model	18–2128, 18–2145
Axle weight, kg	402
Maximum static load, t	23.5
Neck diameter, mm	130
Axle set diameter, mm	195
Length, mm	2,216
Material	OS steel as per GOST 4728–2010
End fastening	4 x M20 holes

BRAKE BEAM ASSEMBLY FOR THE BOGIE MODEL 18–2128

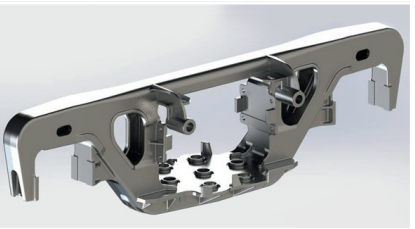
Element of the brake lever transmission of the freight car bogie designed to transfer the force developed by the brake cylinder piston or handbrake drive to the friction elements (brake shoes) for their uniform pressing to the rolling surface.

GOST	4686–2012
Weight, kg	66.4

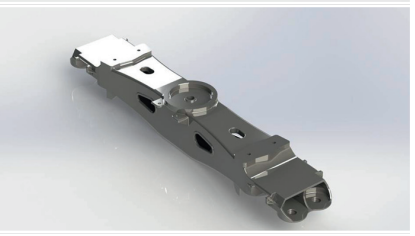
PARTS AND COMPONENTS

Side frame 2128–07.20.00.001–01
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2414x554x654 mm
Part weight: 430.0 kg

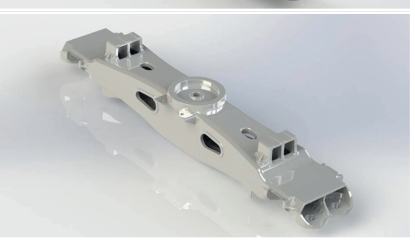
Side frame 2128–07.20.00.006
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2414x554x654 mm
Part weight: 479.0 kg



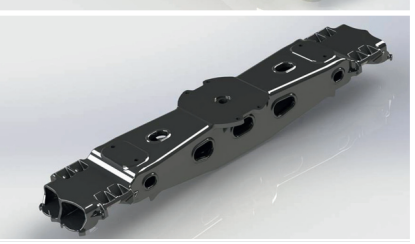
Bolster 2128–07.10.00.00.003
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2590x480x403 mm
Part weight: 520.0 kg



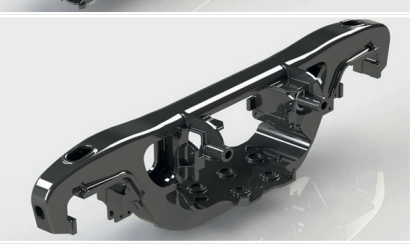
Bolster 2128–07.10.00.001
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2590x480x449 mm
Part weight: 540.0 kg



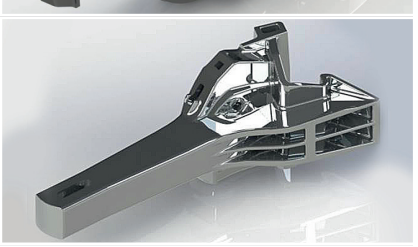
Bolster 9800.01.00.001
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2592x520x356 mm
Part weight: 636.0 kg



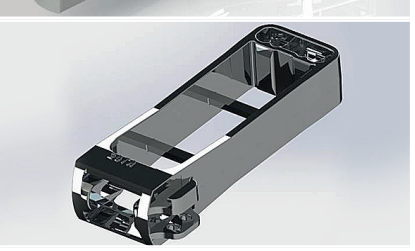
Side frame 9800.02.00.001
Material: 20GFL Steel, GOST 32400–2013
Overall dimensions: 2415x691x554 mm
Part weight: 465.0 kg



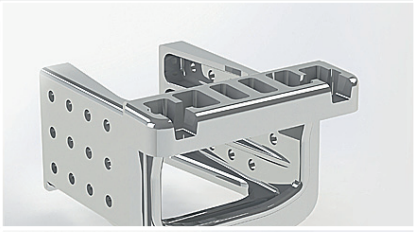
Coupler body 2150.10.001–2
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 1130x440x421 mm
Part weight: 182 kg



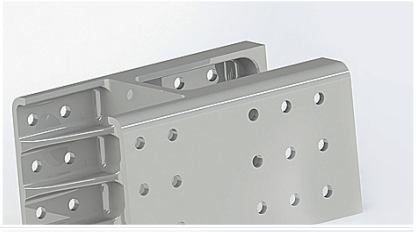
Pulling clamp 2150.00.001–2
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 955x202x363 mm
Part weight: 113.8 kg



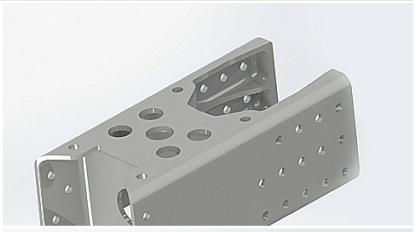
Front stop 066.02.243–04
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 523x460x355 mm
Part weight: 113.8 kg



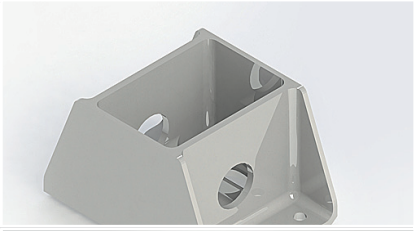
Rear stop 276.02.124–00
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 525x356x280 mm
Part weight: 116.2 kg



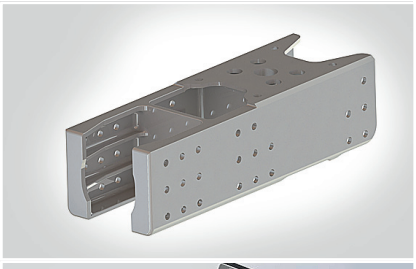
Stop UZO1K GOST 52916–2008 289.02.148–01
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 748x360x290 mm
Part weight: 107.5 kg



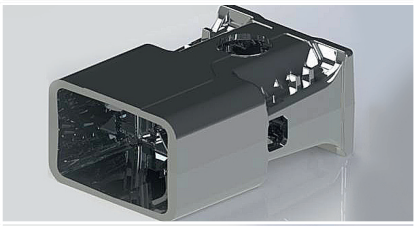
Upper center plate 276.02.108–01
Material: 20GL Steel GOST 22703–91
Overall dimensions: 470x375x285 mm
Part weight: 88.83 kg



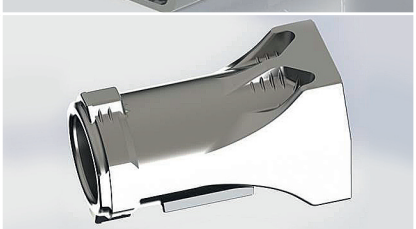
Stop with upper center plate 066.02.304–01
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 1053x360x295 mm
Part weight: 207.3 kg



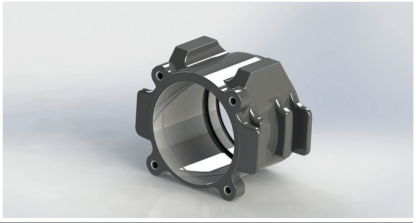
Body of cushioning device PMKP – 110.00.00.00.002
Material: 30GSL-B Steel GOST 22253–76
Overall dimensions: 460x327x230 mm
Part weight: 113.8 kg



Cushioning device body 73ZW110102–5–01U2
Material: 30GSL-B Steel GOST 22253–76
Overall dimensions: 505x318x230 mm
Part weight: 113.7 kg

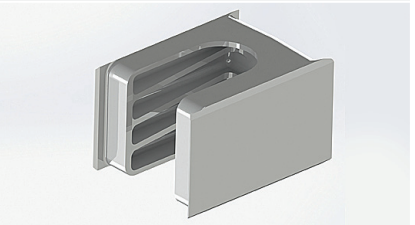


Axle-box body 2128–07.40.00.301
Material: 20L Steel GOST 977–88
Overall dimensions: 382x342x255 mm
Part weight: 70.6 kg

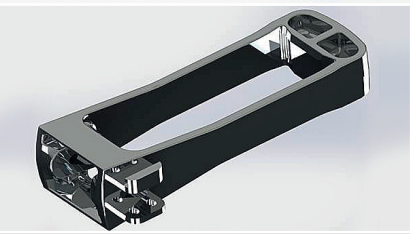


PARTS AND COMPONENTS

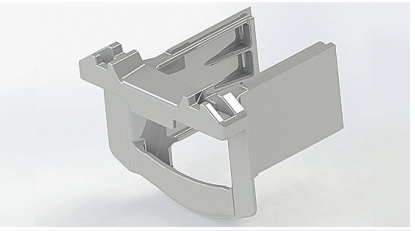
Rear stop UZ2 287.02.138–00
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 487x368x293 mm
Part weight: 106.0 kg



Pulling clamp ChU5.15.0808–01
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 967x369x242 mm
Part weight: 131 kg

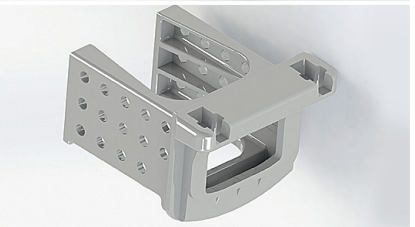


Front stop UP3–2 287.02.152–00
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 563x605x475 mm
Part weight: 112.6 kg

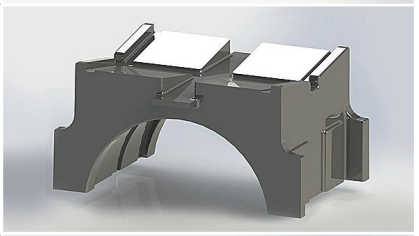


Rear stop UZ1K GOST R 52916–2008 296.02.175–00
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 434x350x260 mm
Part weight: 52.0 kg

Front stop UP1K–1 GOST R 52916–2008 296.02.176–00
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 520x350x355 mm
Part weight: 79.4 kg

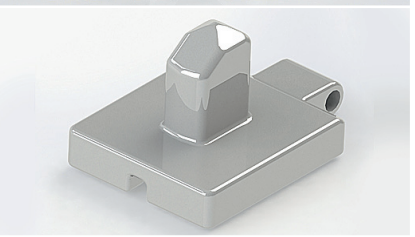


Adapter 9800.00.00.001
Material: 20GL Steel GOST 977–88
Overall dimensions: 324x248x160 mm
Part weight: 31.2 kg

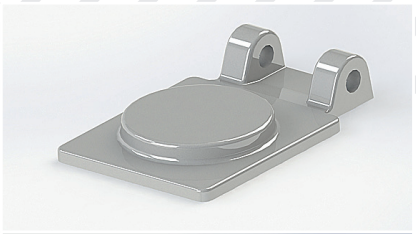


Fixing cover 2128–07.40.00.002
Material: 20L Steel GOST 977–88
Overall dimensions: 372x372x64.5 mm
Part weight: 16.14 kg

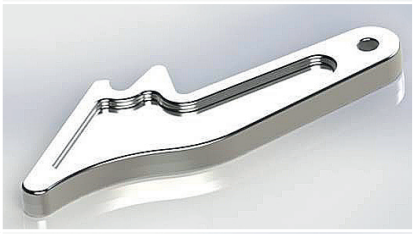
Plate 2116.03.102–00
Material: 20GL Steel GOST 977–88
Overall dimensions: 285x175x144 mm
Part weight: 11.9 kg



Support plate 2116.03.101–00
Material: 20GL Steel GOST 977–88
Overall dimensions: 268x175x50 mm
Part weight: 5.3 kg

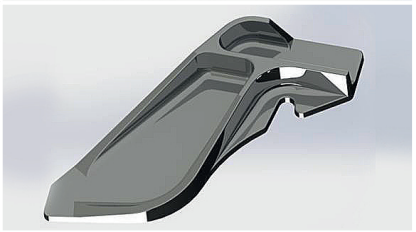


Flap 296.45.102–01
Material: 20L Steel GOST 977–88
Overall dimensions: 371x155x25 mm
Part weight: 4.8 kg

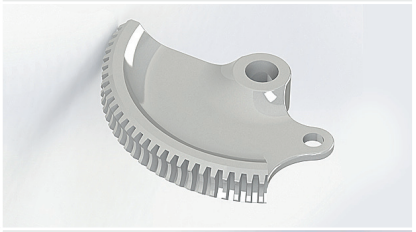


Right/left sector 296.45.182–00/183–00
Material: 20L Steel GOST 977–88
Overall dimensions: 152x121x57 mm
Part weight: 1.9 kg

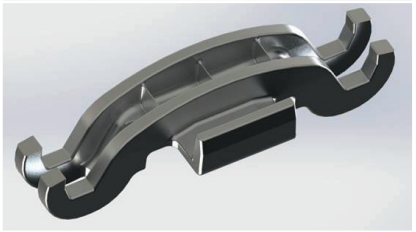
Right/left bracket 296.45.178–01/177–01
Material: 20L Steel GOST 977–88
Overall dimensions: 340x330x82 mm
Part weight: 8.45 kg



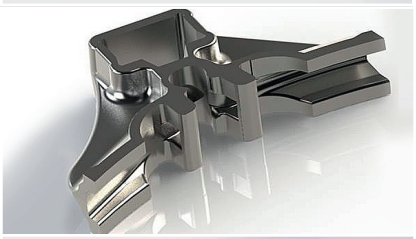
Worm sector 066.40.354–04
Material: 20L Steel GOST 977–88
Overall dimensions: 321x231x62 mm
Part weight: 11.9 kg



Centering beam 2150.00.009–2
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 432x126x118 mm
Part weight: 10.8 kg



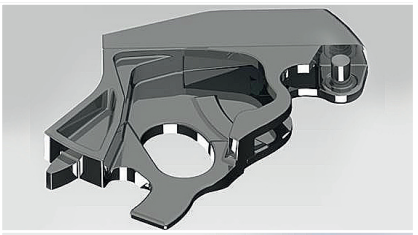
Shoe 1–2 GOST R 34075–2017 2128–07.60.00.309
Material: 20L Steel GOST 977–88
Overall dimensions: 340x80x210 mm
Part weight: 7.6 kg



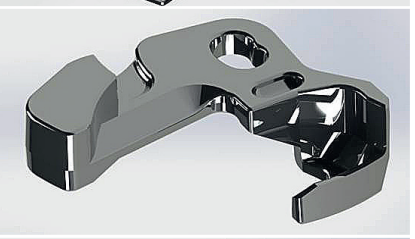
Special bracket 2114.02.262–00
Material: 20L Steel GOST 977–88
Overall dimensions: 210x135x222 mm
Part weight: 11.6 kg

PARTS AND COMPONENTS

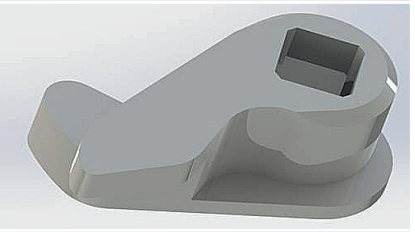
Lock 2150.10.002–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 345x340x48 mm
Part weight: 12.86 kg



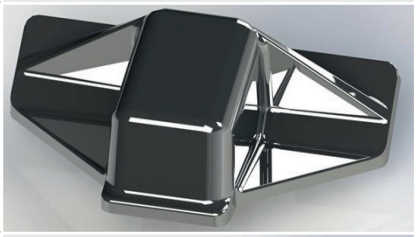
Lock holder 2150.10.003–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 250x185x75 mm
Part weight: 4.6 kg



Lock lifter 2150.10.004–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 157x89x50 mm
Part weight: 1.9 kg

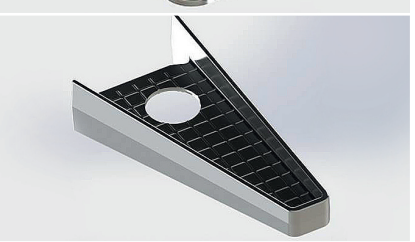


Side bearing 5L 296.02.123–00
Material: 20L Steel GOST 977–88
Overall dimensions: 400x280x154 mm
Part weight: 17.8 kg



Left/right stop 296.02.124–00/125–00
Material: 20L Steel GOST 977–88
Overall dimensions: 230x126x230 mm
Part weight: 8.8 kg

Bracket 2114.02.176–00
Material: 20L Steel GOST 977–88
Overall dimensions: 510x231x120 mm
Part weight: 14.1 kg

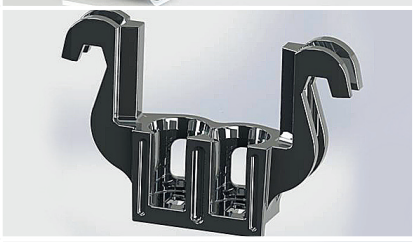


Dead point holder 2128–07.10.00.00.002
Material: 20L Steel GOST 977–88
Overall dimensions: 265x115x86 mm
Part weight: 3.6 kg

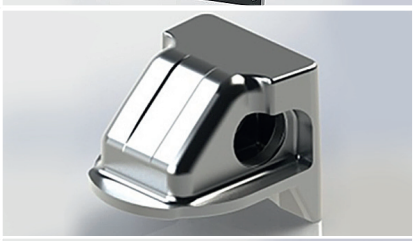
Transversal board hinge 2114.01.114–00
Material: 20L Steel GOST 977–88
Overall dimensions: 350x144x80 mm
Part weight: 5.9 kg

Longitudinal board hinge 2114.01.115–00
Material: 20L Steel GOST 977–88
Overall dimensions: 622x144x85 mm
Part weight: 10.3 kg

Beam body 287.35.101–01
Material: 30GSL-B Steel GOST 22253–76
Overall dimensions: 490x326x112 mm
Part weight: 19.9 kg



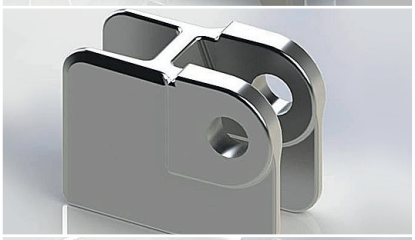
Friction wedge M1698.00.003
Material: SCh35 GOST 1412–85
Overall dimensions: 237x100x186 mm
Part weight: 15.6 kg



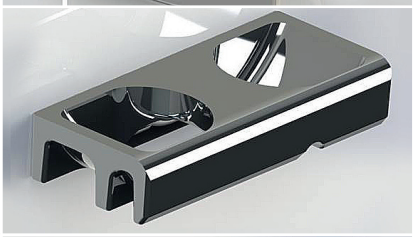
Swivel shoe 2145.60.110.001
Material: 20L Steel GOST 977–88
Overall dimensions: 490x185x85 mm
Part weight: 14.0 kg

Support plate 287.35.102–00
Material: 30GSL-B Steel GOST 22253–76
Overall dimensions: 290x140x146 mm
Part weight: 7.4 kg

Holder 2114.02.581–00
Material: 20L Steel GOST 977–88
Overall dimensions: 177x135x90 mm
Part weight: 7.4 kg

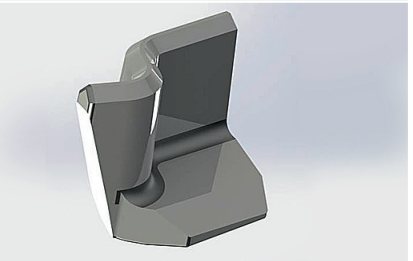


Lug 2114.05.129–00
Material: 20L Steel GOST 977–88
Overall dimensions: 230x100x50 mm
Part weight: 3.43 kg



Wedge 2114.01.113–00
Material: 20L Steel GOST 977–88
Overall dimensions: 360x130x40 mm
Part weight: 5.3 kg

Upper bracket 2150.10.016–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 157x92x106 mm
Part weight: 3.5 kg

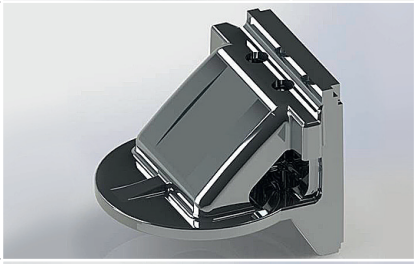


Lift roller 2150.10.014–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 174x171x116 mm
Part weight: 3.4 kg

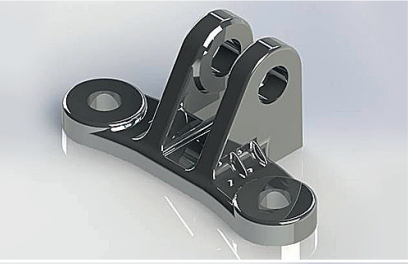
Bottom bracket 2150.10.015–0
Material: 20GL Steel GOST 22703–2012
Overall dimensions: 148x86x57 mm
Part weight: 1.1 kg

Friction wedge 2128–07.50.00.005
Material: 20L Steel GOST 977–88
Overall dimensions: 212x186x190 mm
Part weight: 16.0 kg

Wedge 9800.03.00.001
Material: VCh 120 TU9800.03.00.001
Overall dimensions: 212x190x220 mm
Part weight: 13.15 kg



Dead point holder 26.V.503.01.00.00.004
Material: 20L Steel GOST 977–88
Overall dimensions: 230x110x98 mm
Part weight: 3.3 kg



Bucket tooth EKG-8 3536.01.00.001
Material: 110G13L Steel GOST 977–88
Overall dimensions: 1060x390x184 mm
Part weight: 220 kg

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