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THEORETICAL ANALYSIS OF THE CLASSIFICATION OF TRANSPORT VEHICLES FOR GOODS TRANSPORTATION ACCORDING TO THE COMMODITY NOMENCLATURE FOREIGN ECONOMIC ACTIVITY

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Abstract
This article analyzes commodity position 8704 – Motor Vehicles for the Transportation of Goods according to the 2022 version of the Foreign Economic Activity Commodity Nomenclature (CN FEA). The author examines motor vehicles in the 8704commodity position based on five criteria: functionality, usage period, engine type, engine parameters, and load-carrying capacity. The various types of motor vehicles included in the 8704commodity position are clarified. Additionally, the technical characteristics of the Tesla Semi electric truck and the Mercedes-Benz GenH2 hydrogen fuel truck are analyzed according to the CN FEA. It is scientifically noted that while the production, import, and export of hydrogen fuel vehicles are being encouraged in foreign countries, the 2022 edition of the CN FEA does not provide a classification procedure for hydrogen fuel vehicles.

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Introduction

Classification of goods involves dividing them into different categories based on similar characteristics. The result of this classification is the creation of a classification system or classifier. In other words, a classifier is a grouped list of objects that allows each product to be assigned a specific classification code [1, 2, 3].

Analysis

Analyzing the classification of motor vehicles for the transportation of goods within the 8704commodity position of the CN FEA reveals that motor vehicles are categorized based on five criteria: functionality, usage period, engine type, engine parameters, and load-carrying capacity (Table 1) [4].

Table 1[2]

[2] Author's work

№	Motor vehicles intended for the transport of goods (8704):
	I. According to function performance
1	Dump trucks intended alone use
2	Vehicles specially intended for transporting high radioactive materials
3	Forwarder-type vehicles equipped with loading and unloading devices for transferring wood from cutting sites to logging stations or roads
4	Vehicles equipped with scissors-type lifting mechanisms, ventilation, heating, and lighting systems, multifunctional attachment devices for wheelchairs and stretchers, and more than two seats for accompanying persons, for loading and unloading passengers and accompanying persons onto and from aircrafts who cannot move independently
5	Four-wheeled vehicles with two moving trolleys for transporting large-sized loads over 24 meters in length in marshy or snowy areas
6	Four-wheeled vehicles with two driving trolleys equipped with lifting or digging machine for operation in marshy or snowy areas
7	Forwarder-type vehicles equipped with loading and unloading devices for transferring wood from cutting sites to logging stations or roads
8	Vehicles equipped with a corpus, ventilation, heating, and lighting systems, windows, multifunctional attachment devices, scissors-type lifting mechanisms, seats for gurneys and/or stretchers, handles along both sides of the entire body, and more than two seats for accompanying persons, for transporting wheelchairs and/or stretchers
	II. According to usage period
1	New
2	More than 7 years in usage
3	Previously used (second-hand)
4	More than 5 years in usage but not more than 7 years
	III. According to engine type
1	Compression ignition (diesel or semi-diesel) internal combustion piston engine
2	Spark ignition piston internal combustion engine
3	Others, piston internal combustion engines with spark ignition
4	Others, compression ignition piston internal combustion engines (diesel or semi-diesel) as well as those driven by electric motors
5	Internal combustion engines with a power greater than the maximum 30-minute power of electric motors
6	Others, vehicles driven exclusively by electric motors
	IV. engine parameters
1	Vehicles with a cylinder capacity exceeding 2500 cm^3 for compression ignition piston internal combustion engines (diesel or semi-diesel) or exceeding 2800 cm^3 for spark ignition piston internal combustion engines and a total vehicle weight not exceeding 50 tons
2	Vehicles with a cylinder capacity exceeding 2500 cm^3 for compression ignition piston internal combustion engines (diesel or semi-diesel) or exceeding 2800 cm^3 for spark ignition piston internal combustion engines, others
3	Vehicles with a cylinder capacity not exceeding 2500 cm^3
4	Vehicles with a cylinder capacity not exceeding 2500 cm^3

5	Vehicles with a cylinder capacity exceeding 2800 cm³
	V. load-carrying capacity
1	Vehicles with frames mounted on axles and a total weight exceeding 40 tons but not exceeding 50 tons
2	Vehicles with a total weight not exceeding 5 tons
3	Vehicles with a total weight exceeding 5 tons but not exceeding 20 tons
4	Vehicles with a total weight exceeding 20 tons

We can see how the 8704commodity position of the CN FEA is explained in relation to the Harmonized System commodity subpositions.

8704 motor vehicles designed for the transportation of goods (+):

8704 10 – Dump trucks designed for off-road use – Other vehicles with compression ignition (diesel or semi-diesel) piston internal combustion engines (diesel or semi-diesel):

8704 21 – Total vehicle weight not exceeding 5 tons

8704 22 – Total vehicle weight exceeding 5 tons but not exceeding 20 tons

8704 23 – Total vehicle weight exceeding 20 tons – Other vehicles with spark ignition piston internal combustion engines:

8704 31 – Total vehicle weight not exceeding 5 tons

8704 32 – Total vehicle weight exceeding 5 tons

8704 90 – Others

The following types of motor vehicles are specified to be included in the 8704 commodity position:

Ordinary trucks and vans (open top, tarpaulin-covered, etc.); Delivery vehicles and all types of vans for transporting household items; Trucks with automatic unloading mechanisms (tilting bodies, etc.); Tanker trucks (equipped with pumps or not); Refrigerated trucks or vehicles with isothermal bodies; Multi-stage trucks designed for transporting acid in bottles, butane in cylinders, etc.; Heavy trucks with low frames and loading ladders designed for transporting tanks, lifting machines, or excavators, electric transformers, etc.; Specially manufactured trucks for transporting new concrete except for the concrete mixers of the 8705 commodity position; Garbage collection trucks equipped with loading, ramming, dumping, and other devices, whether equipped or not.

1. Dump trucks, i.e., robustly designed vehicles with a tilting body or a bottom that opens downward, intended for transporting soil or other materials.
2. Shuttle cars. These vehicles are used in mines to transport coal or ore from cutting machines to conveyors. They are heavy, low-slung vehicles equipped with tires and powered by internal combustion engines or electric motors; they unload automatically via a conveyor that forms the floor of the vehicle.
3. Self-loading vehicles. Vehicles mainly intended for transportation purposes, equipped with lifting devices and other apparatus for self-loading.
4. Road and rail trucks specially equipped to operate on both roads and railway tracks.

Method: Focusing on the development of electric vehicles, we can observe that hydrogen fuel vehicles for the transportation of goods are being manufactured. Looking at the focus on the fleet of hydrogen vehicles in the member countries of IPHE, we can see that hydrogen fuel vehicles are being produced in China, Japan, Germany, the Netherlands, Canada, and France [5, 6].

The technical characteristics of the Tesla Semi electric truck and the Mercedes-Benz GenH2 hydrogen fuel truck are analyzed according to the CN FEA in Table 2.

Table 2

№	Technical Characteristics	Tesla Semi Electric Truck [7, 8]	Technical Characteristics	Mercedes-Benz Gen H2 Hydrogen Fuel Truck [9]

1	Load capacity (kg) / seats	37,200 / 1 seat	Load capacity (T)	25
2	Gross weight (kg)	11 340	Gross weight (T)	40
3	Full charge or full tank (km)	800	Range (km)	1000
4	Charging time for 640 km range	30 minutes	Rated battery power (kW)	400
5	Fuel/battery consumption per 100 km	124 kVt/ soat	Rated fuel power (kW)	300
6	Maximum speed (km/h)	160	Rated motor power (kW)	2 x 230
7	Acceleration to 100 km/h (seconds)	20 seconds with load / 5 seconds without load	Maximum torque (N·m)	2 x 2071
8	Engine or battery type	Plaid tri-motor powertrain	Hydrogen storage type	Liquid
9	Horsepower	1032	Horsepower	449
10	Number of wheels	6x4	Battery capacity (kWh)	70
11	Number of doors	4	Number of fuel tanks	2
12	Drive axle	Rear	Total hydrogen volume (kg)	80
13	Average price	180 ming dollar	Pressure in hydrogen tank (bar)	700 – 1000

From a technical standpoint, vehicles that operate on fuel elements are classified as electric vehicles. If we pay attention to production trends, we can observe that motor vehicles under commodity positions 8701 to 8705 are producing hydrogen fuel vehicles for each commodity position.

Conclusion: Foreign countries are implementing mechanisms to promote the production, import, and export of hydrogen fuel vehicles. According to the CN FEA 2022 publication, the type of engine of the vehicle is specified, with the characteristics indicating it operates with "a piston internal combustion engine that ignites by compression (diesel or semi-diesel), as well as with an electric motor" (Table 3).

Table 3

Code of CN FEA	Name of position
8704 10	– Designed for off-road use:
8704 10 10	– Vehicles equipped with a piston internal combustion engine that ignites by compression (diesel or semi-diesel) or a spark-ignited piston internal combustion engine:
8704 32 980 1	– Vehicles equipped with loading and unloading devices intended for transporting wood from a logging site to a wood processing station or logging road (forwarder type)– others

8704 32 980 9	– Others powered by a piston internal combustion engine that ignites by compression (diesel or semi-diesel) and an electric motor – – – – – units
8704 43 990 9	– Others powered by a piston internal combustion engine that ignites by compression (diesel or semi-diesel) as well as an electric motor
8704 60 000 0	– Others powered solely by an electric motor

It can be seen from Table 3 that the CN FEA 2022 publication does not provide a classification system for hydrogen fuel vehicles.

Automotive and electric vehicles can be classified according to their engine type as the main technical characteristic in the order presented in Table 4. This indicates a systematic classification of new generation vehicles for customs authorities.

Table 4

No.	Engine Type
1	Diesel or semi-diesel
2	Petrol
3	Hybrid (HEV - Hybrid Electric Vehicle)
4	Plug-in Hybrid (PHEV - Plug-in Hybrid Vehicle)
5	Range Extended Electric Vehicle (REEV)
6	Battery Electric Vehicles (BEV)
7	Fuel Cell Electric Vehicle (FCEV)
8	Full Hybrid Electric Vehicle (FHEV)
9	Mild Hybrid Electric Vehicle (MHEV)

In terms of weight capacity classification, there is an increasing trend in new generation electric and hydrogen vehicles. During their operational life, the type of fuel consumption varies: gasoline, diesel, and hydrogen fuel vehicles differ in their range, while electric vehicles depend on charging cycles for their serviceability.

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