EPC Exhibit 137-17.1

April 18, 2014

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Dewey Section

To: Jonathan Furner, Chair

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Cc: Members of the Decimal Classification Editorial Policy Committee

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Dewey Decimal Classification

OCLC Online Computer Library Center, Inc.

Via: Michael Panzer, Editor in Chief

Dewey Decimal Classification

OCLC Online Computer Library Center, Inc

Re: Land vehicles

**Relocations**

|  |  |  |
| --- | --- | --- |
| **From** | **To** | **Topic** |
| 625.66 | 629.2293 | Trolleybuses |
| 629.220 4 | 629.222–629.228 | Special topics of types of vehicles |
| 629.220 42 | 629.228 2 | Off-road vehicles |

**Expansions**

|  |  |
| --- | --- |
| **New number** | **Topic** |
| 388.349 | Vehicles powered by other sources |
| 388.349 3 | Electric-powered vehicles |
| 629.227 4 | Quadracycles |
| 629.228 5 | Racing cars |
| 629.229 7 | Hydrogen-powered vehicles and diesel fuel-powered vehicles |
| 629.229 72 | Hydrogen-powered vehicles |
| 629.229 73 | Diesel fuel-powered vehicles |

Some months ago Libbie Crawford raised the question whether we shouldn’t add a Relative Index heading for e-bikes. This led naturally to the question where e-bikes should be classed, which led in turn to discussions of the essential differences among e-bikes, minibikes, motor bicycles, mopeds, etc. These questions have led still further to the question of how to deal generally with electric versions of vehicles that are normally human-powered and on up to the larger questions of what is meant by an “electric vehicle” and what constitutes the best overall organization for land vehicles. These questions will be approached roughly in reverse order.

**Overall organization of land vehicles**

It is non-controversial to start the organization of vehicles with the medium in/on/through which they travel, thus differentiating among land vehicles (distinguished in turn by whether the vehicle travels on rails or not), watercraft, aircraft, and spacecraft. Our concern here is limited to non-rail land vehicles, found in the DDC under 388.34 in the context of transportation and under 629.22 in the context of engineering.[[1]](#footnote-1) The majority of both developments is given over to gasoline-powered, oil-powered, and (hu)man-powered vehicles. An add instruction at 388.342–388.348 adds notation from the numbers following 629.22 in 629.222–629.228; thus the majority of the developments are the same.

Table 1 displays other types of land vehicles accounted for in the two developments:

|  |  |  |
| --- | --- | --- |
| **Vehicle type** | **Treatment under 388.34–388.35** | **Treatment under 629.22** |
| Electric-powered vehicles (except trolleybuses) | 388.34 standing room | 629.2293 |
| Natural gas vehicles | 388.34 standing room | 629.22043 |
| Snowmobiles | 388.34 standing room | 629.22042 |
| Trolleybuses | 388.34 standing room | 625.66 |
| Nonmotor land vehicles (carts, wagons, carriages, stagecoaches; rickshaws, animal-drawn omnibuses; sleds, sleighs) | 388.341 | [688.6 (see reference from 629.049 Land transportation engineering)] |
| Three-wheel vehicles | 388.34 standing room (by default) | 629.2204 |
| Off-road vehicles, all-terrain vehicles | 388.34 standing room (per indexing) | 629.22042 |
| Steam-powered vehicles (steam plows, steam tractors, steamrollers | 388.34 standing room (by default) | 629.2292 |
| Air-compression-powered vehicles | 388.34 standing room (by default) | 629.2294 |
| Solar energy-powered vehicles | 388.34 standing room (by default) | 629.2295 |
| Nuclear-powered vehicles | 388.34 standing room (by default) | 629.2296 |

**Table 1. Treatment of land vehicles other than gasoline-, oil-, (hu)man-powered vehicles**

Several anomalies can be seen:

* The engineering development has specific classes (629.2293–629.2296) for vehicles powered by means other than gasoline, oil, and humans. Of these classes, only electric-powered vehicles are specifically mentioned in the transportation development. All such classes are currently in standing room at 388.34.
* The special development for special topics of types of vehicles at 629.2204 (“Including three-wheel vehicles”) has subdivisions for 629.22042 Off-road vehicles (“Including all-terrain vehicles, snowmobiles”) and 629.22043 Natural gas vehicles. (None of these is mentioned in the transportation development.) Division of vehicles by number of wheels and by where driven is irregular with respect to the development; treatment as special topics thus makes sense. But natural gas vehicles recognize division by fuel used or, more broadly, by source of power, which is the primary characteristic of division governing 629.22.
* Three-wheel vehicles and tricycles are in different in the engineering development numbers (629.2204 and 629.2273, respectively), but lack any notes to indicate how they are related.
* In the engineering development, trolleybuses are classed with the rolling stock of light-rail transit systems. In the transportation development, even though a class for rolling stock exists under 385 Railroad transportation and even though a number for light rail transit systems exists within a local transportation development at 388.4, trolleybuses are classed with other non-rail land vehicles, in standing room at 388.34.

The first two bullets above note a significant difference between the transportation and engineering developments in how they treat vehicles powered by means other than gasoline, oil, and humans. Table 2 explores whether further development of such vehicles is needed, based on literary warrant counts in WorldCat.

In interpreting the data in Table 2, it should be remembered that, except for nonmotor land vehicles, the vehicle types listed in the first column are in standing room in 388.34, but have a dedicated class in 629.2. With nonmotor land vehicles, the case is essentially reversed: 388.34 has a dedicated class for them, but the see reference at 629.049 draws off nonmotor land vehicles to a manufacturing number. Given that background, the counts in Table 2 reveal the following:

* Literary warrant is sufficient to justify expansions under 388.3 for electric-powered vehicles and trolleybuses. (But see below on trolleybuses.)
* Although the literary warrant count expansion threshold is met by snowmobiles, the literature here is stagnant.
* The raw literary warrant count might also be seen as sufficient to justify expansions under 388.3 for carriages and carts, horse/animal-drawn vehicles, stagecoaches, and wagons. The various nonmotor land vehicles, however, are probably not distinctive enough to support separate classes. Indeed, we note that no standard-subdivisions-are-added note is present at 388.341, despite the multitopic caption. Is this an oversight, or are all the topics in the caption deemed to be in standing room? Would the situation be improved by making “Nonmotor land vehicles,” which is known to approximate the whole of the class, into the caption? But if so, should the list of vehicle types become a class-here note or an including note? Ca. 40% of the literature classed under 388.341 specifies geographic treatment. Perhaps this is a place to follow the pattern used with popular music styles by giving “Class here specific types of nonmotor land vehicles” and indexing generously.
* The literary warrant counts also appear to justify expansion under 629.2 for nonmotor land vehicles (as a single class). However, a closer look at the works given the LCSHs “Carriages and carts,” “Scooters,” and “Wagons” reveals that most of them are about motorized or steam-powered vehicles.

|  |  |  |  |
| --- | --- | --- | --- |
| **Vehicle type** | **LCSH** | **Literary warrant in 388.3** | **Literary warrant in 629.2** |
| Electric-powered vehicles | Electric vehicles | 36 | 873 |
| Natural gas vehicles | Natural gas vehicles | 8 | 55 |
| Snowmobiles | Snowmobiles | 20 | 175 |
| Trolleybuses | Buses, Electric  Trolley buses | 5  25 | 11  16 |
| Nonmotor land vehicles (carts, wagons, carriages, stagecoaches; rickshaws, animal-drawn omnibuses; sleds, sleighs) | Carriages and carts  Chariots  Horse-drawn omnibuses  Horse-drawn vehicles  Litters  Pedicabs  Rickshaws  Scooters[[2]](#footnote-2)  Sleds  Sleighs  Stagecoaches  Wagons | 135  16  9  45  0  3  2  8  2  7  25  62 | 15  2  3  11  0  3  0  39  1  0  0  11 |
| Three-wheel vehicles | -- |  |  |
| Off-road vehicles, all-terrain vehicles | Off-road vehicles  All terrain vehicles  Dune buggies  Tundra vehicles | 9  13  0  0 | 188  481  35  1 |
| Steam-powered vehicles (steam plows, steam tractors, steamrollers | Road rollers  Steam plows | 0  0 | 16  0 |
| Air-compression-powered vehicles | Motor vehicles—Pneumatic equipment (629.2294 has been used [and misused] only once in WorldCat) | 0 | 1 |
| Solar energy-powered vehicles | Solar vehicles | 0 | 16 |
| Nuclear-powered vehicles | Nuclear propulsion | 0 | 1 |

**Table 2. Literary warrants counts for vehicles powered by means other than gasoline, oil, and humans**

At the same time, the gasoline-powered, oil-powered, human-powered vehicles group has its own anomalies. This group includes passenger automobiles, light trucks, trucks (lorries), work vehicles, campers / motor homes / trailers, cycles, and racing cars. The presence of bicycles, tricycles, and tandem bicycles under 629.227 Cycles accounts for the inclusion of human-powered vehicles with gasoline- and oil-powered vehicles (which otherwise seem oddly juxtaposed). The pairing of gasoline-powered vehicles and oil-powered vehicles arises from the existence of passenger automobiles, trucks, racing cars, etc., some of which consume gasoline and some of which consume petroleum diesel (at least, that’s my assumption of what the “oil” in oil-powered vehicles refers to); however, the caption does not apply to other types of diesel fuel, which also include biodiesel and biomass to liquid [BTL] diesel. Perhaps instead of speaking of gasoline-powered and oil-powered vehicles, the caption at 388.342–388.348 and 629.222–629.228 should speak of vehicles powered by fossil fuels, which would include petrodiesel and gas to liquid [GTL] diesel, but not biodiesel and biomass to liquid (BTL) diesel.

Missing from the current set of types of vehicles is hydrogen-powered vehicles. (The search *(:su="hydrogen buses" or :su="hydrogen as fuel") and :dd=629.2\** retrieves 69 hits in WorldCat.) We propose to expand under 629.229.

The existence of 629.2204 Special topics of types of vehicles is somewhat troubling, on several counts. For example, three-wheel vehicles are mentioned in the including note at 629.2204; how do they differ from 629.2273 Tricycles? Why is there a subdivision for natural gas vehicles here when 629.222–629.229 is organized around how vehicles are powered[[3]](#footnote-3)? Which types of vehicles are in standing room at 629.2204 vs. which are in standing room at 629.22 or at 629.229? Given that the only two classes in the DDC where special topics T1—04 is applied to “types of” something are 629.2204 and the derivative 629.28704, does it make any sense at all to have 629.2204 Special topics of types of vehicles?

Our consideration of these issues leads us to several proposed actions:

* Relocation of all topics under 629.2204 to 629.222–629.228: Natural gas is a type of fossil fuel and is easily included under 629.222–629.228; inclusion of an example for natural gas buses at 388.342–388.348, plus indexing, should help to make this clear. Off-road vehicles make good neighbors for racing cars at a re-envisioned 629.228 Off-road vehicles and racing cars.
* Differentiation between kinds of three- (and two-)wheeled vehicles, depending on whether they are human-powered or completely motorized: The need to define the difference between three-wheel vehicles and tricycles is based in part on a general lack of clarity at 629.2271 Monocycles, 629.2272 Bicycles, and 629.2273 Tricycles. Are these merely vehicles with 1, 2, or 3 wheels, or are they expressly non-motorized vehicles with 1, 2, or 3 wheels? Internal discussion led us to conclude that the vehicles at these numbers should be characterized as vehicles propelled by pedaling; definition notes are proposed to make this clear. Further discussion led us to realize the need to expand for quadracycles, a topic with literary warrant.
* Reworking of the caption at 629.229: With the caption at 629.222–629.228 recast as “Vehicles powered by fossil fuels and human-powered vehicles,” the caption at 629.229 is perhaps better cast as “Vehicles powered by other sources.” (But this also leads to the need to provide for vehicles powered by more than one type of source; see section entitled Hybrid vehicles.)

Finally, for those who have been on EPC for a while, trolleybuses should feel like a familiar topic of conversation. Having revisited EPC Exhibit 128A-23.3 Underground and elevated railroads, and trolleybuses, which was approved unanimously without (further) comment (there having been a fair amount of discussion about trolleybuses and trolley systems at Meeting 128), I find that the relocation of trolleybuses to 629.2293 Electric-powered vehicles did not get implemented. They currently sit in 625.66 Rolling stock under 625.6 Light rail transit systems. But trolleybuses do not operate on rails. We will relocate trolleybuses to 629.2293, as approved previously. (Other approved trolleybus-related changes that did not get implemented previously, and which we will take care of now, include [1] the relocation of trolleybus systems from 625.6 to 629.2293 and [2] the addition of a see reference for trolleybuses from 629.22233 Buses to 629.2293.) For now we will keep the treatment of electric-powered vehicles and trolleybuses consistent between 388.3 and 629.2 by treating trolleybuses in an including note at the expansion for electric vehicles under 388.3.

**Electric vehicles**

Vehicles involve several aspects that could conceivably contribute to their qualification as electric vehicles. First, all vehicles depend on an energy source; examples include wind energy, solar energy, fuel, and electricity. Second, on some vehicles energy may be stored for later use; examples of energy storage media include batteries, flywheels, and fuel cells. Third, many vehicles depend on motors to convert their energy into motion; examples of kinds of motors include electric motors, hydraulic motors, pneumatic motors, and rocket engines. So what’s electric in an electric vehicle? It’s the motor, the electric motor being a machine that converts electrical energy into mechanical energy or motion.

The Wikipedia article on electric vehicles notes that “three main types of electric vehicles exist, those that are directly powered from an external power station, those that are powered by stored electricity originally from an external power source, and those that are powered by an on-board electrical generator.” Examples of the first type—those directly powered from an external power station—include trolleybuses powered through overhead lines and railway trains powered through a third rail. The second type—those powered by stored electricity from an external power source—includes vehicles powered by, for example, (a) the chemical energy stored in batteries, (b) the kinetic energy stored in flywheels, or (c) the static energy stored in electric double-layer capacitors. The on-board electrical generator of the third type might use, for example, a diesel engine, a hydrogen fuel cell, nuclear energy, or solar power. We see that while electric vehicles always involve electrical energy being converted into mechanical energy, they can also involve other types of energy. However, in all cases, electric vehicles are spoken of as “being powered” by electricity, whether the electricity comes directly from an external source, is stored, or is generated on-board. This accords with the distinction drawn in the DDC between gasoline-powered, oil-powered, (hu)man-powered[[4]](#footnote-4) vehicles at 388.342–388.348 and 629.222–629.228, on the one hand, and other vehicles, including electric-powered vehicles, at 388.34 (in standing room) and 629.229 (with electric-powered vehicles at 629.2293).

The Wikipedia article on solar vehicles reports that “a solar vehicle is an electric vehicle powered completely or significantly by direct solar energy. Usually, photovoltaic (PV) cells contained in solar panels convert the sun's energy directly into electric energy.” That suggests that a see reference is needed from 629.2293 Electric-powered vehicles to 629.2295 Solar energy-powered vehicles.

Musing: The time may/should come when vehicles powered by fossil fuels are considered old technology much in the same way as print photography. However, because of the infrastructure investment needed for other sources of power, the shift to their use is more gradual than the shift from print to digital photography. Moreover, there is more than one modern/alternative source of power. We can readily assume future changes to 629.229 will be necessary, but cannot reliably predict at this time what will end up working best.

**Hybrid vehicles**

Given we have seen how other types of power may play a role in various types of electric vehicles, division by the type of energy that powers a vehicle is not as simple and clean as it may appear at first glance. How are hybrid vehicles to be classed? Presumably we would want hybrid cars, which are both gas-powered and electric-powered, to class with electric vehicles. A note will be added at 629.22 Types of vehicles instructing the classifier to class hybrid vehicles with the type of vehicle coming later in the schedules.

**Electric versions of normally human-powered vehicles**

Human-powered vehicles include land vehicles (e.g., skateboards, kick scooters, roller skates, bicycles, velomobile / “bicycle” cars, tricycles, cycle rickshaws), watercraft (e.g., [oared] row boats, galleys, gondolas; [paddled] canoes, kayaks, surfboards; [poled] rafts; [pedaled] amphibious bicycles, hydrocycles, pedal kayaks), and aircraft (e.g., hang gliders, paragliders). When the power supplied such vehicles is assisted by, say, an electric motor, does the vehicle become a hybrid vehicle and therefore, if the note for hybrid vehicles just proposed is implemented, should such vehicles be classed with electric vehicles? That note was intended to class hybrid vehicles with the greener technology, but when electric power is combined with human power, it is human power that represents the greener technology. We therefore propose to introduce the hybrid vehicles note with “Unless otherwise indicated.” The addition of the phrase “possibly electric-assisted” in the definition notes under each of the classes in 629.2271–629.2274 provides such indication.

388.34 Vehicles

Including ~~electric-powered vehicles,~~ ~~natural gas vehicles,~~ snowmobiles~~, trolleybuses~~

Class here interdisciplinary works on land vehicles

Class use of vehicles in specific services, vehicle operation in 388.32

*For railroad rolling stock, see 385.37; for air-cushion vehicles, see 388.35; for rolling stock of local rail transit systems, see 388.42. For a specific aspect of vehicles, see the aspect, e.g., engineering of motor land vehicles 629.2*

*See Manual at 629.046 vs. 388*

388.341 ~~Carts, wagons, carriages, stagecoaches~~ Nonmotor land vehicles

~~Including rickshaws, animal-drawn omnibuses~~

Class here specific types of nonmotor land vehicles

Class cycles in 388.347

388.342–.348 Vehicles powered by fossil fuels and ~~Gasoline-powered, oil-powered,~~ human-powered

vehicles

Add to base number 388.34 the numbers following 629.22 in 629.222–629.228, e.g., natural gas buses 388.34233, bicycles 388.3472

*For rickshaws, see 388.341*

388.349 Vehicles powered by other sources

388.349 3 Electric-powered vehicles

Including trolleybuses

\*Add as instructed under 380

625.6 Light rail transit systems

~~Including trolleybus systems~~

Class here interurban railroads (streetcar lines running between urban areas or from urban to rural areas); streetcar systems, tramways, trolley-car systems

Local surface rail systems using conventional (heavy) rail technology relocated to 625.4; trolleybus systems relocated to 629.2293

. . .

625.66 Rolling stock

Including horse-drawn streetcars~~, trolleybuses~~

Class here streetcars, trams, trolley cars

Trolleybuses relocated to 629.2293

629.2 Motor land vehicles, cycles

Standard subdivisions are added for motor land vehicles, cycles together; for motor land vehicles alone

Class here automotive engineering

Class military motor land vehicles in 623.747

*See Manual at 629.046 vs. 388*

. . .

629.22 Types of vehicles

Unless otherwise indicated, class hybrid vehicles with type of vehicle coming later in the schedules, e.g., automobiles using both an internal combustion engine and an electric motor 629.2293

Class design, materials, construction of a specific type of vehicle in 629.23; class parts of a specific type of vehicle in 629.24–629.27; class driving a specific type of vehicle in 629.283; class nonsurface motor land vehicles, vehicles for extraterrestrial surfaces in 629.29

. . .

629[.220 4] Special topics of types of vehicles

~~Including three-wheel vehicles~~

Discontinued because without meaning in context

Three-wheeled vehicles relocated to 629.227

629[.220 42] ~~\*~~Off-road vehicles

~~Including all-terrain vehicles, snowmobiles~~

*~~For dune buggies, see 629.222~~*

Relocated to 629.2282

629[.220 43] ~~\*~~Natural gas vehicles

Relocated to 629.222–629.228

. . .

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

> 629.222–629.228 Vehicles powered by fossil fuels and ~~Gasoline-powered, oil-powered,~~

human-powered vehicles

Class here natural gas vehicles [*formerly* 629.22043]

Class two-wheeled motor vehicles, three-wheeled motor vehicles in 629.2275; class comprehensive works in 629.22

629.222 \*Passenger automobiles

Including dune buggies, minivans, station wagons

Class passenger automobiles rebuilt or modified for high speed in 629.2286

*See also 629.2234 for vans*

. . .

629.222 33 \*Buses

*For guided-way s~~t~~ystems, see 625.4; for trolleybuses, see ~~625.66~~ 629.2293*

. . .

629.227 \*Cycles

Class here three-wheeled vehicles [*formerly* 629.2204]

629.227 1 \*Monocycles

One-wheeled vehicles with pedals, possibly electric-assisted

629.227 2 \*Bicycles

Two-wheeled vehicles with pedals, possibly electric-assisted

Class two-wheeled motor vehicles in 629.2275

*For mopeds and motor bicycles, see 629.2275; for tandem bicycles, see 629.2276*

629.227 3 \*Tricycles

Three-wheeled vehicles with pedals, possibly electric-assisted

Class three-wheeled motor vehicles in 629.2275

629.227 4 \*Quadracycles

Four-wheeled vehicles with pedals, possibly electric-assisted

Including pedal cars

Class four-wheeled motor vehicles in 629.222–629.226

629.227 5 \*Motorcycles

Including minibikes, mopeds, motor bicycles; two-wheeled motor vehicles, three-wheeled motor vehicles

Class here motorscooters

Class cycles with pedals in 629.2271–629.2274

629.227 6 \*Tandem bicycles

629.228 \*Racing cars and off-road vehicles

~~Conventional and converted~~

~~Including karts~~

629.228 5 \*Racing cars

Conventional and converted

Including karts

*For hot rods, see 629.2286*

629.228 6 \*Hot rods

629.228 8 \*Off-road vehicles [*formerly* 629.22042]

Including all-terrain vehicles, snowmobiles

*For dune buggies, see 629.222*

629.229 \*~~Other types of vehicles~~ Vehicles powered by other sources

. . .

629.229 3 \*Electric-powered vehicles

Including trolleybus systems [*formerly 625.6*], trolleybuses [*formerly 625.66*]

*~~For trolleybuses, see 625.66~~ For solar energy-powered vehicles, see 629.2295*

. . .

629.229 7 Hydrogen-powered vehicles and diesel fuel-powered vehicles

629.229 72 \*Hydrogen-powered vehicles

629.229 73 \*Diesel fuel-powered vehicles

Including vehicles powered by biodiesel, biomass to liquid (BTL) diesel

*See also 629.222–629.228 for petrodiesel-powered vehicles, for vehicles powered by fossil fuels with biofuel additives (e.g., ethanol additives)*

\*Do not use notation 0228 from Table 1 for models and miniatures; class in 629.221. Do not use notation 0287 from Table 1 for testing and measurement; class in 629.282. Do not use notation 0288 from Table 1 for maintenance and repair; class in 629.287

1. The Manual note at 629.046 vs. 388 Transportation equipment vs. Transportation indicates that vehicle numbers in the 600s should be used for description, technology, technical operation, and maintenance and repair of vehicles, while numbers in 385–388 should be used for services provided by vehicles, their general operation, economic and social aspects of vehicles, and interdisciplinary works. [↑](#footnote-ref-1)
2. SN: Here are entered works on vehicles propelled by foot or by small motor and usually ridden by children. Works on larger motorized scooters with seats are entered under [Motor scooters.] [↑](#footnote-ref-2)
3. We should not hesitate to relocate natural gas vehicles to 629.222–629.228: only 28 records in WorldCat are classed in 629.22043. [↑](#footnote-ref-3)
4. The caption at 629.222–629.228 will be updated to read . . . human-powered vehicles. [↑](#footnote-ref-4)