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Electrically propelled road vehicles — Vocabulary

Véhicules routiers électriques — Vocabulaire

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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ISO/TR 8713 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 21, *Electrically propelled road vehicles*.

This first edition cancels and replaces the second edition (ISO 8713:2005) which has been revised as a Technical Report.

Electrically propelled road vehicles — Vocabulary

1 Scope

This Technical Report establishes a vocabulary of terms and the related definitions used in ISO/TC 22/SC 21 standards. These terms are specific to the electric propulsion systems of electrically propelled road vehicles, i.e. battery-electric vehicles (BEV), hybrid-electric vehicles (HEV, PHEV), and (pure and hybrid-electric) fuel cell vehicles (FCV, FCHEV).

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
air processing system
system that processes the incoming air for the fuel cell system

EXAMPLE Filters, meters, conditions, and pressurizes.

2.2
auxiliary electric system
on-board vehicle system, other than the propulsion system, which operates on electric energy

2.3
balance of electric power system
remaining portion of a voltage class B (2.72) electric circuit when all RESS (2.61) and fuel cell stacks are disconnected

2.4
barrier
part providing protection against direct contact from any usual direction of access

2.5
basic insulation
insulation applied to live parts for protection against direct contact under fault-free conditions

NOTE Basic insulation does not include insulation used exclusively for functional purposes.

2.6
basic protection
protection against direct contact with live parts under fault-free conditions

2.7
battery cell
basic rechargeable energy storage device, consisting of electrodes, electrolyte, container, terminals and usually separators, that is a source of electric energy obtained by direct conversion of chemical energy

2.8
battery control unit
BCU
electronic device that controls or manages or detects or calculates electric and thermal functions of the battery system and that provides communication between the battery system and other vehicle controllers

2.9
battery-electric vehicle
BEV
electrically propelled vehicle with only a traction battery as power source for vehicle propulsion

NOTE The abbreviation BEV is often shortened to EV.

2.10
battery pack
mechanical assembly comprising battery cells and retaining frames or trays, and possibly components for battery management

2.11
battery system
energy storage device that includes cells or cell assemblies or battery pack(s) as well as electrical circuits and electronics, e.g. BCU (2.8), contactors

NOTE Battery system components can also be distributed in different devices within the vehicle.

2.12
capacity
total number of ampere-hours that can be withdrawn from a battery under specified conditions

2.13
cell electronics
electronic device that collects and possibly monitors thermal and electric data of cells or cell assemblies and contains electronics for cell balancing, if necessary

NOTE The cell electronics may include a cell controller. The functionality of cell balancing may be controlled by the cell electronics or it may be controlled by the BCU (2.8).

2.14
charge balance of battery
change of charge in battery during fuel consumption measurement

NOTE Normally expressed in Ah.

2.15
charger
set of equipment to condition the power of the external electric energy source for charging the RESS (2.61)

2.16
clearance
shortest distance in air between conductive parts (2.17)

2.17
conductive part
part capable of conducting electric current

2.18
coulomb efficiency
Ah efficiency
efficiency of the battery based on electricity (Coulomb) for a specified charge/discharge procedure, which is expressed by output electricity divided by input electricity

2.19
creepage distance
shortest distance along the surface of a solid insulating material between two conductive parts (2.17)

2.20
direct contact
contact of persons with live parts

2.21
double insulation
insulation comprising both basic insulation and supplementary insulation

2.22
driving enabled mode
the only mode in which the vehicle can be moved by its own propulsion system(s)

2.23
electric chassis
conductive mechanical structure of the vehicle whose potential is taken as reference

2.24
electric drive
combination of traction motor, power electronics and their associated controls for the conversion of electric to mechanical power and vice versa

2.25
electric power train
power train, consisting of electric drive (2.24) and drive train

2.26
electric shock
physiological effect resulting from an electric current passing through a human body

2.27
electrically propelled vehicle
vehicle with at least one electric drive (2.24) for vehicle propulsion

2.28
enclosure
part providing protection of equipment against direct contact from any direction

2.29
energy balance of battery
change of energy in battery during fuel consumption measurement

NOTE 1 Normally expressed in Wh.

NOTE 2 For practical use, the following is an approximate definition: charge balance of battery multiplied by the nominal voltage, normally expressed in Wh.

2.30
energy density
amount of stored energy related to the battery pack (2.10) or system volume

NOTE 3 Expressed in Wh/l.

NOTE 4 The battery pack or system includes the cooling system, if any, to the point of a reversible attachment of the coolant lines or air ducts, respectively.

2.31
energy efficiency
Wh efficiency
efficiency of the battery based on energy, for a specified charge/discharge procedure, which is expressed by output energy divided by input energy

2.32
exposed conductive part
conductive part (2.17) of the electric equipment that can be touched by an IPXXB test finger after removing barriers/enclosures which can be removed without using tools and which is not normally live, but which may become live under fault conditions

NOTE For the specification of the IPXXB test finger, see ISO 20653.

2.33
excess flow valve
valve which automatically shuts off, or limits, the gas flow when the flow exceeds a set design value

2.34
externally chargeable HEV
HEV (2.42) with RESS (2.61) that is intended to be charged from an external electric energy source

NOTE Externally chargeable HEVs are widely known as plug-in HEVs (PHEVs).

2.35
fuel cell
FC
electrochemical device that generates electricity by the conversion of fuel and an oxidant without any physical or chemical consumption of the electrodes or electrolyte

2.36
fuel cell hybrid-electric vehicle
FCHEV
electrically propelled vehicle (2.27) with an RESS (2.61) and a fuel cell (2.35) system as power source for vehicle propulsion

2.37
fuel cell stack
assembly of two or more fuel cells (2.35)

2.38
fuel cell system
system containing the fuel cell stack (2.37), air processing system (2.1), fuel processing system (2.40), thermal management, water management, and their control system

2.39
fuel cell vehicle
FCV
electrically propelled vehicle (2.27) with a fuel cell system (2.38) as power source for vehicle propulsion

NOTE An FCV can additionally have an RESS (2.61) or another power source for vehicle propulsion [FCHEV (2.36)].

2.40
fuel processing system
system that converts (if necessary) and/or conditions the fuel, as stored in the on-board fuel storage, into fuel suitable for operation in the fuel cell stack (2.37)

2.41
fuel system
combination of the on-board fuel storage and the fuel processing system (2.41)

2.42
hybrid-electric vehicle
HEV
vehicle with both a rechargeable energy storage system and a fuelled power source for propulsion

EXAMPLE Internal combustion engine or fuel cell systems are typical types of fuelled power sources.

2.43
hybrid power train
power train of an HEV (2.42), consisting of a fuelled power source and an electric power train (2.25)

2.44
hybrid vehicle
vehicle with two (or more) different power sources for vehicle propulsion

NOTE Examples of power sources for vehicle propulsion are RESS (2.61), FC systems (2.38), internal combustion engine etc.

2.45
isolation resistance
resistance between live parts of the voltage class B (2.72) electric circuit and the electric chassis as well as the voltage class A (2.71) system

2.46
isolation resistance monitoring system
system which periodically or continuously monitors the isolation resistance between live parts and the electric chassis

2.47
live part
conductor or conductive part (2.17) intended to be electrically energized in normal use

2.48
main hydrogen shut-off valve
valve designed to automatically isolate the high pressure hydrogen source

2.49
maximum allowable working pressure
MAWP
maximum working pressure at which a component or system may be normally operated without damage including leakage and deformation

NOTE The maximum allowable working pressure is used in determining the setting of pressure-limiting/relieving devices installed to protect the part or system from accidental over-pressurizing.

2.50
maximum working voltage
highest value of a.c. voltage rms or of d.c. voltage which may occur in an electric system under any normal operating conditions according to manufacturer's specifications, disregarding transients

2.51
nominal voltage
suitable approximate value of a voltage used to designate or identify a component or a system

2.52
nominal working pressure
service pressure
NWP
pressure level at which a component or system typically operates

2.53
non-externally chargeable HEV
HEV (2.42) with RESS (2.61) that is not intended to be charged from an external electric energy source

2.54
potential equalization
electric connection of exposed conductive parts (2.17) of the electric equipment to minimize differences in potential between these parts

2.55
power management module
control module in FCHEV (2.36) that manages the flow of power/energy from the FC system, from/to the RESS (2.61), and to/from the electric drive according to the driver's commands and the vehicle's propulsion strategy in FCHEV operating mode

2.56
propulsion system
combination of on-board power source for vehicle propulsion and power train

2.57
protection degree
protection provided by a barrier/enclosure related to the contact with live parts by a test probe

EXAMPLE A test finger (IPXXB), a test rod (IPXXC), or a test wire (IPXXD), as defined in ISO 20653.

2.58
pure fuel cell vehicle
pure FCV
FCV with only a fuel cell system as power source for vehicle propulsion

2.59
purge
process of eliminating unwanted gas constituents from a system

2.60
rated capacity
supplier`s specification of the total number of ampere-hours that can be withdrawn from a fully charged battery pack or system for a specified set of test conditions such as discharge rate, temperature, discharge cut-off voltage, etc.

2.61
rechargeable energy storage system
RESS
system that stores energy for delivery of electric power and which is rechargeable

EXAMPLE Batteries, capacitors etc.

2.62
reference energy consumption
quantity of electric energy from the mains needed to charge the traction battery, divided by the distance covered after the vehicle has been driven through the specified test sequence

NOTE The reference energy consumption is usually expressed in watt-hours per kilometre (Wh/km).

2.63
reference range
distance covered by an electrically propelled vehicle (2.27) over a designated test sequence on a fully charged traction battery, to the end of the test sequence as defined by the end of test sequence criteria

NOTE The reference range is usually expressed in kilometres (km).

2.64
regenerative braking
braking with conversion of kinetic energy into electric energy for charging the RESS (2.61)

2.65
reinforced insulation
insulation of live parts for protection against electric shock equivalent to double insulation

NOTE Reinforced insulation does not imply that the insulation shall be a homogeneous piece. The reinforced insulation may comprise several layers which cannot be tested individually as supplementary or basic insulation.

2.66
specific energy
amount of stored energy related to the battery pack (2.10) or system mass

NOTE Expressed in Wh/kg.

NOTE The battery pack or system shall include the cooling system, if any, to the point of a reversible attachment of the coolant lines or air ducts, respectively. For liquid cooled systems, the coolant mass inside the battery pack or system shall be included.

2.67
state of charge
SOC
available capacity in a battery pack (2.10) or system expressed as a percentage of rated capacity (2.60)

2.68
supplementary insulation
independent insulation, applied in addition to basic insulation for protection against electric shock in the event of a failure of the basic insulation

2.69
temperature triggered pressure relief device
TPRD
non-reclosing device triggered by excessive temperature that opens to vent gas to protect the fuel container from rupture

2.70
traction battery / propulsion battery / battery
collection of all battery packs which are electrically connected for the supply of electric power to the electric drive and possibly auxiliary electric systems

2.71
voltage class A
classification of an electric component or circuit with a maximum working voltage of less than a.c. 30 V rms or d.c. 60 V rms

2.72
voltage class B
classification of an electric component or circuit with a maximum working voltage between a.c. 30 V rms and a.c. 1 000 V rms or between d.c. 60 V and d.c. 1 500 V

Annex A
(informative)

Examples of propulsion systems for electrically propelled vehicles

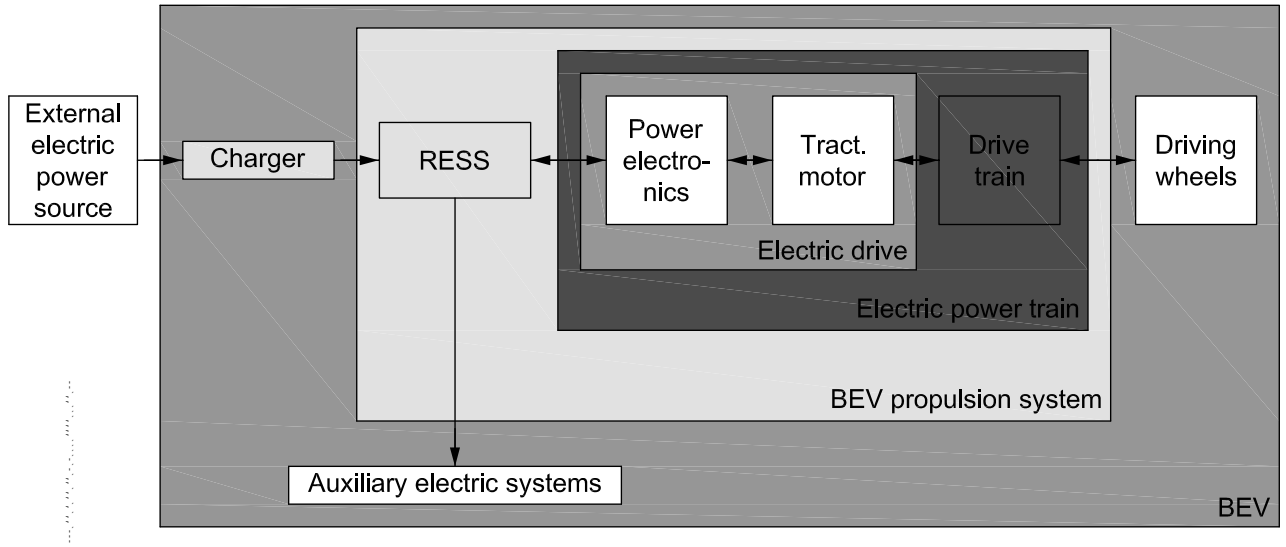

Figure A.1 — Example of BEV

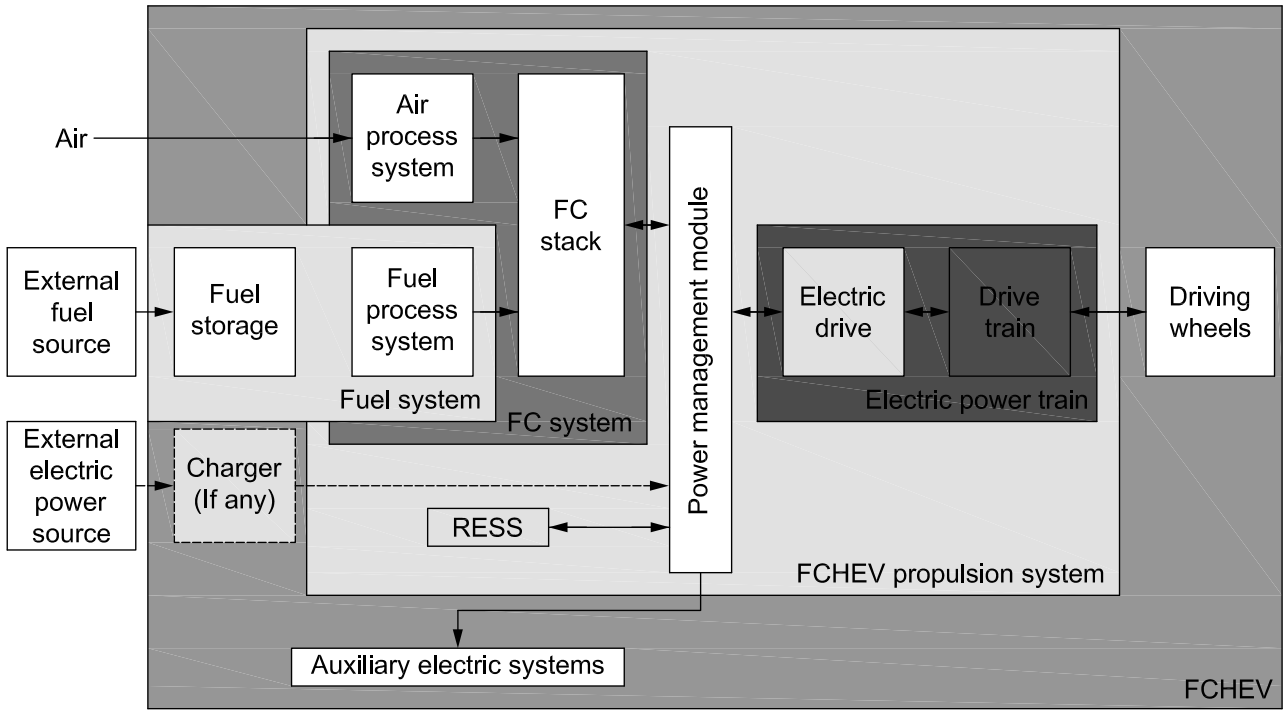

Figure A.2 — Block diagram — Example of FCHEV

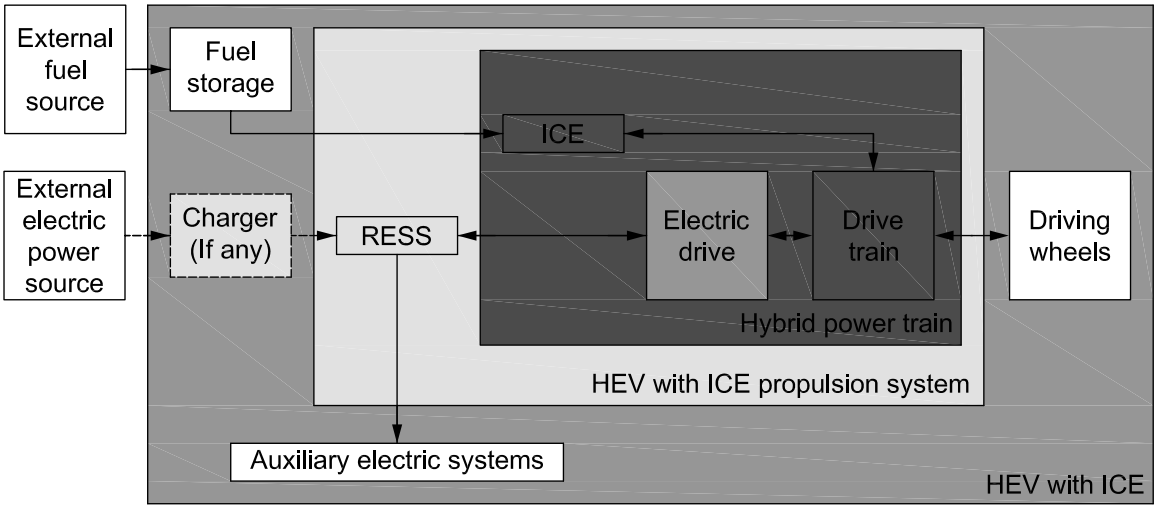

Figure A.3 — Block diagram — Example of HEV with internal combustion engine (ICE)

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1) To be published.

2) Under preparation.

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