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DRAFT AMENDMENT NO. 1 TO IS 18606: 2024 ELECTRIC POWER TRAIN OF M AND N CATEGORY VEHICLES — SPECIFIC REQUIREMENTS

ICS: 43.120

Electric and Hybrid Vehicles Sectional Committee,TED 27	Last Date for Comments: **21 October 2025**

DRAFT AMENDMENT NO. 1 TO IS 18606: 2024 ELECTRIC POWER TRAIN OF M AND N CATEGORY VEHICLES — SPECIFIC REQUIREMENTS

(*Page* 1, *Clause* **2**) **—** Insert the following at the end:

IS/Other Standards	*Title*
IS 17017 (Part 2/Sec 2) : 2020	Electric Vehicle Conductive Charging System — Part 2: Plugs, Socket – Outlets, Vehicle Connectors and Vehicle Inlets — Section 2: Dimensional compatibility and interchangeability requirements for A.C. pin and contact-tube accessories
IS 17017 (Part 2/Sec 3) : 2020	Electric Vehicle Conductive Charging System — Part 2: Plugs, Socket — Outlets, Vehicle Connectors and Vehicle Inlets — Section 3: Dimensional compatibility and interchangeability requirements for D.C. and A.C./D.C. pin and contact-tube vehicle couplers
IS 17017 (Part 1):2018	Electric Vehicle Conductive Charging System Part 1 General Requirements
IS 17017 (Part 23):2021	Electric Vehicle Conductive Charging Systems Part 23 dc Electric Vehicle Supply Equipment
IS/IEC 60529: 2001	Degrees of protection provided by enclosures (IP Code)

(*Page* 2, *Clause* **3.11**) **—** Substitute the following for the existing:

3.11 'C Rate' of 'nC' — The constant current of the tested-device, which takes 1/n hours to charge or discharge the tested-device between zero percent of the state of charge and 100 percent of the state of charge.

(*Page* 3, *Clause* **3.34**) **—** Substitute the following for the existing:

3.34 High Voltage Bus — The electrical circuit, including the coupling system for charging the REESS that operates on high voltage. In case of electrical circuits, that are galvanically connected to each other and fulfilling the voltage conditions specified in **3.63,** only the components or parts of the electric circuit that operate on high voltage are classified as a high voltage bus.

[*Page* 19, **Annex C**, *Table* 1, Sl. No. (i), Column (4)] **—** Substitute '(*see* Fig. 3 for Full Dimension)' for '(*see* Fig. 3 or Full Dimension).

(*Page* 24, *Clause* Fig. 7) **—** Substitute the following for the existing:

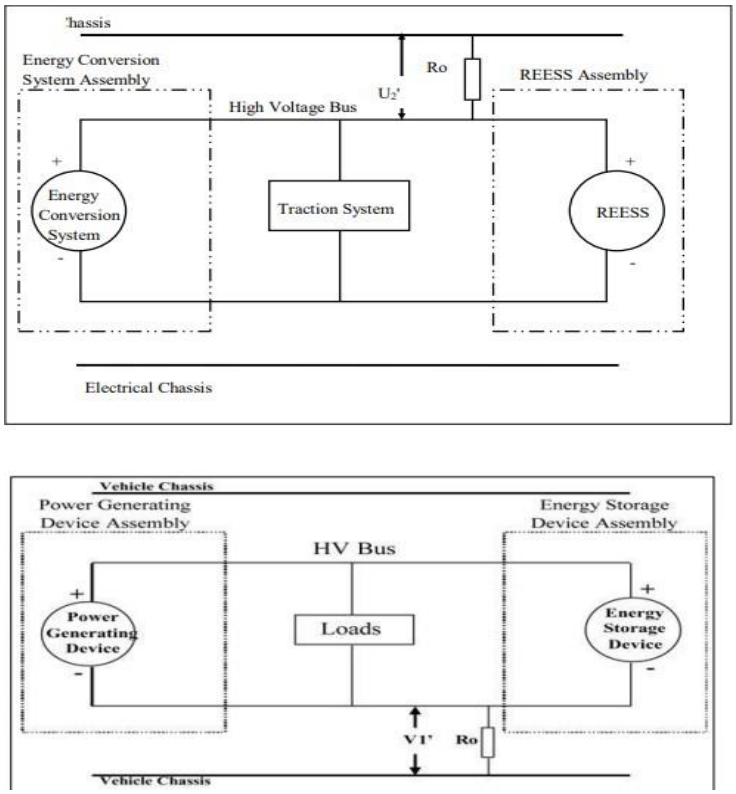

FIG. 7 MEASUREMENT OF U2'

(*Page* 26, *Clause* **E-2.1.2.3.4**)— Substitute '*R*i = *R*o × *U*b × (1/*U*2' – 1/*U*2)' for '*R*i = *R*o × *V*b × (1/*U*2' – 1/*U*2)'

(*Page* 29, *Clause* **G-2.1,** key, Sl No. 7) — Substitute the following for the existing:

7. Spray nozzle - brass with 121 holes, Φ 0.5:
1 hole in centre, 2 inner circle of 12 holes at 30° pitch, and 4 outer circle of 24 holes at 15° pitch.

(*Page* 35, *Clause* **H-1.5.1.3**) — Substitute the following for the existing:

H-1.5.1.3 *Soak*

Within 15 min of completing the battery discharge operation specified in **H-1.5.1.2**, the vehicle is parked in the soak area. The vehicle is parked for a minimum of 12 h and a maximum of 36 h, between the end of the traction battery discharge and the start of the hydrogen emission test during a normal charge. For this period, the vehicle shall be soaked at 293 K ± 2 K.

(*Page* 37, *Clause* **H-1.6, line 11**) — Substitute 'MH2 = Hydrogen mass, in gram' for 'MH2 = Hydrogen mass, in'

(*Page* 37, *Clause* **H-1.6, line 12**) — Substitute 'K = 2.42;' for 'g; K = 2.42;'

(*Page* 5, *Clause* **3.77**) **—** Insert the following after **3.77**:

3.78 Swappable Battery Pack - It is REESS with connector for connecting charger/electric powertrain vehicle, battery management system (BMS), electrical protection circuit, enclosure and supporting devices.

3.79 Swapping Station - Equipment facility that provides Electric Power Train Vehicles with a Swappable Battery Pack.

(*Page 10*, *Clause* **5.4.10**) – Insert the following after **5.4.10**:

5.5 Requirements of a vehicle with regards to inlet connector and interoperability for conductive charging

In case of conductive charging, vehicle shall meet inlet connector and interoperability requirements as defined in **Annex M.**

5.6 **Verification of safety functions of Onboard/portable charger.**

5.6.1 Charger shall have Charge voltage cut-off to avoid over charging of REESS.

5.6.2 Charger shall have soft-start function every time REESS is connected for charging.

5.6.3 Charger shall have Pre-charge Function to detect deep discharge condition of battery.

5.6.4 Charger shall have protection for input supply variation of 230 VAC +/- 10%.

5.6.5 Charger shall have earth leakage detection as per Class 1 of IS 12640 Part 1.

5.6.6 On-board/portable charger shall have communication with battery (BMS).

(*Page 16*, *clause* **9.15.2.4.3**) – Insert the following after **9.15.2.4.3**:

9.16 REESS shall comply with additional safety technical requirements as per J-14.

(*Page* 56, *clause* **J-14**) **—** Substitute the following for the existing:

J-14 TECHNICAL REQUIREMENTS FOR SAFETY OF REESS

REESS manufacturer shall comply with design and manufacturing guidelines as specified in this Annexure. Same shall be verified by test certifying agency at the time of type approval and CoP of REESS.

J-14.1 The manufacturing date of battery cells shall be clearly visible on the cells used to build REESS, with clear month and year of manufacture. REESS manufacturer shall print clearly visible manufacturing date on the battery pack. Alternatively, the manufacturing date

is in the form of code on the cells, then REESS manufacturer shall print manufacturing date on the REESS pack (by choice of manufacturer, for example, barcode, QR- code, etc.) and shall maintain record of manufacturing date(s) of cells used in the assembly of pack.

J-14.2 Cells used to make REESS, shall be certified as per IS 16893 Part 2 and Part 3 as applicable by NABL accredited lab or by test agency notified under CMV Rule 126.

J-14.3 Cells used to make REESS, shall undergo minimum 1 cycle of charge- discharge at minimum C/3 current rate. Data of this cycling shall be analyzed and maintained by REESS pack manufacturer as an incoming quality check.

J-14.4 REESS shall have pressure release vent or equivalent pressure control method to avoid building up of internal pressure and release of gases in case internal single cell short circuit. Joints, in the coolant lines which pass inside the battery, shall be leak proof.

J-14.5 REESS shall include technical solution to prevent circulating current leading to hazardous situations. If REESS meets all safety requirements defined in this standard, the following requirements would be seen as fulfilled.

In all other cases the power semiconductor devices used for interconnecting strings will also act as protection/safety switches which will detect any faulty strings and isolate them. They will allow bidirectional flow of currents to charge and discharge the pack. The parallel strings will get isolated if it is detected to be faulty. Therefore, active paralleling circuits shall be mandatory in the battery packs or circulating current mitigation techniques shall be adopted.

Alternatively, fuses / bond wires or other safety methods can also be used to prevent circulating currents flowing through the strings connected in parallel. Such precautionary devices will help in isolation of faulty strings connected in parallel.

J-14.6 Sufficient cell-to-cell spacing distance or other suitable alternative technologies shall be adapted for effective heat transfer from the cell and also to isolate the cells in case of thermal run away in REESS. The inter cell gap in REESS shall be decided based on the type of cell geometry used viz., cylindrical, prismatic or pouch and capacity of cells.

J-14.7 REESS shall have safety fuse or circuit breaker in addition to the features available in Battery Management System (BMS).

J-14.8 REESS with SOC higher than 95% shall be tested for water ingress protection IP X7 as per procedure defined in IS/IEC 60529. Alternatively, water immersion test shall be performed as per ISO 6469-1:2019. There shall be no fire or explosion during the testing.

J-14.9 BMS shall be microprocessor/microcontroller-based circuit.

J-14.10 BMS shall comply EMC requirements as per AIS 004 Part 3 or AIS 004 Part 3 Rev 1 as applicable at ESA or vehicle level.

J-14.11 BMS of REESS shall be verified for following safety features during REESS testing as per Annexure J of this standard.

a) Over-charge protection

b) Over-discharge protection

c) Over-temperature protection:

d) Overcurrent protection

e) Short circuit protection

J-14.12 Each REESS manufacturer shall have a traceability document in which the details of cells, BMS used along with serial/batch number, charge discharge data values etc. shall be maintained with the REESS manufacturer.

J-14.13 Adequate protection of cells in case of regenerative braking shall be considered in REESS design.

J-14.14 Data of critical parameters of battery pack shall be logged by BMS and latest data for at least one month shall be maintained. Alternatively, latest data also can be stored on cloud (remote server) at least for one month.

(*Page 60*, Annex K) – Insert the following at the end of ANNEX K:

ANNEXURE-M

(clause 5.5)

CONDUCTIVE CHARGING VEHICLE INLET AND INTEROPERABILITY REQUIREMENTS

M-1 Vehicle inlet requirements for conductive charging

a) For AC charging interface, the vehicle inlet shall comply with the requirements as defined in IS 17017-2-2 for configuration Type 2.

b) For DC charging interface, the vehicle inlet shall comply with the requirements for configuration FF as defined in IS 17017-2- 3.

c) For combined AC/DC charging interfaces, the vehicle inlet shall comply with the requirements for Type 2 as defined in IS 17017- 2-2, and configuration FF as defined in IS17017-2-3.

M-2 Interoperability requirements for conductive AC/DC charging

a) For AC Charging, Vehicle manufacturer shall provide declaration that the vehicle complies with the interoperability requirements, as defined in Annex A of IS17017-1.

b) For DC charging, Vehicle manufacturer shall provide declaration that the vehicle complies with the interoperability, as defined in Annex B of IS17017 (Part 23).

(Page 61) – Substitute ‘ANNEX N’ for ‘ANNEX M’.