Status of EV Standards in China

Part Ⅰ Brief Introduction of

EV Standardization Sub-Committee

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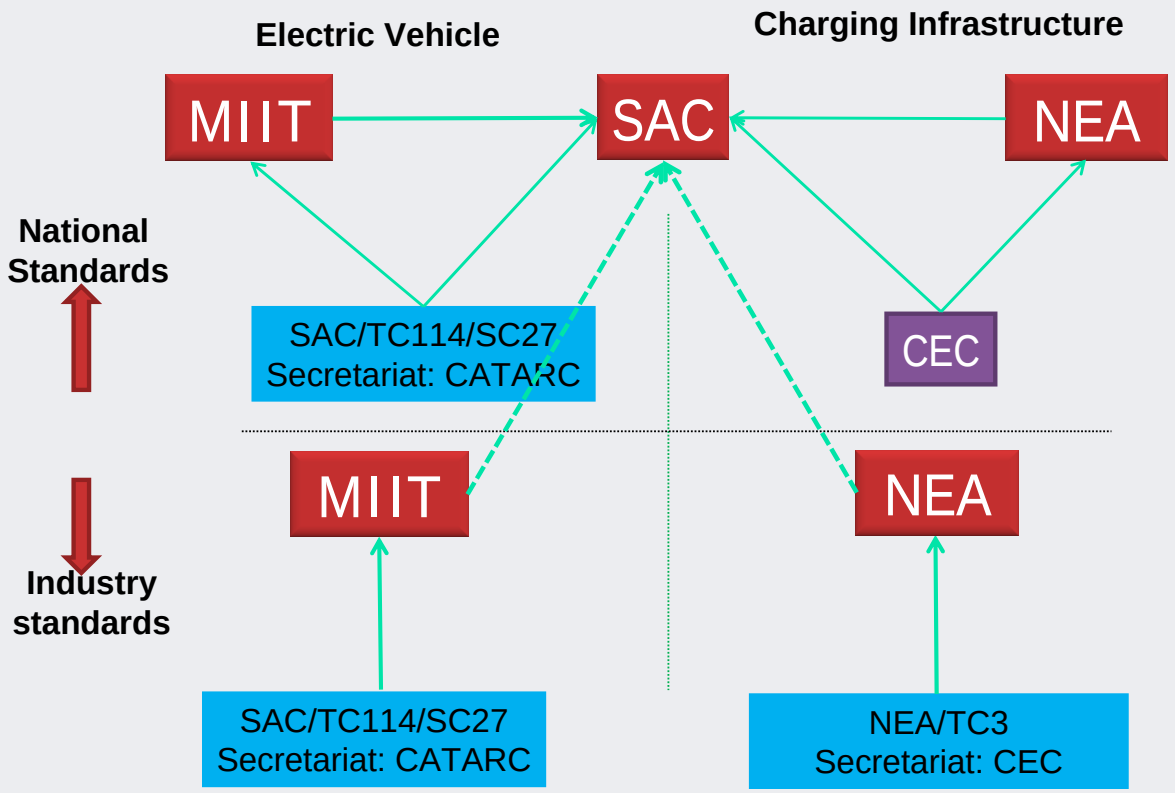
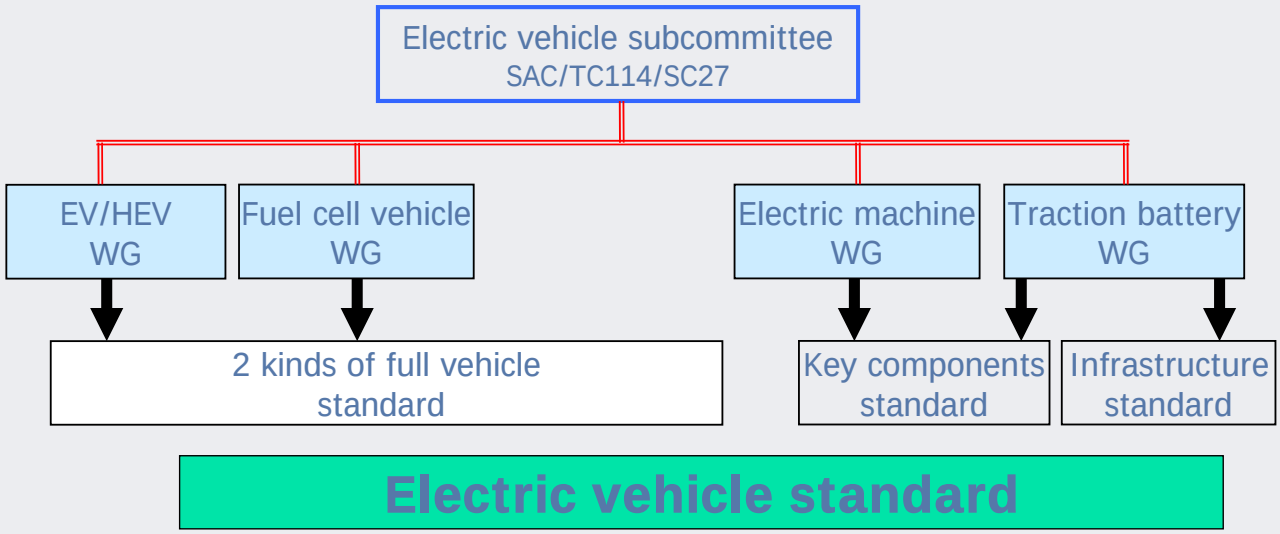


Part Ⅰ Brief Introduction of EV Standardization Sub-Committee

Introduction of electric vehicle subcommittee



Part Ⅰ Brief Introduction of EV Standardization Sub-Committee

Summary

- Founded by NTCAS at 1998, secretariat is located at CATARC.
- Guided by SAC and MIIT; Interface with ISO/TC22/SC21 and IEC/TC69.
- Responsible for national electric vehicle standardization.
- 37 committee members and 6 observers from electric vehicle manufacture, traction battery company, electric machine company, electric motorcycle company, inspection institute, university and research institute, etc.
- 4 work groups.

Part Ⅱ EV Standards System

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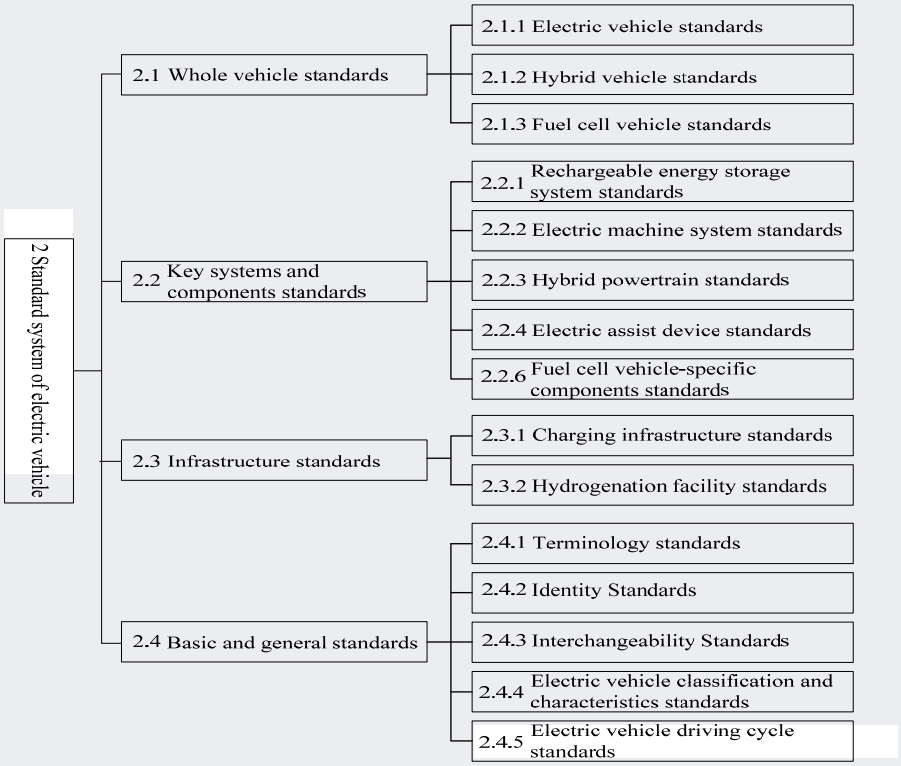

Part Ⅱ EV Standards System

EV Standards in Use

No.		SN	Name	Status
1	BEV and key parts	GB/T18384.1-2001	EV Safety Requirement Part1: Energy Storage	Active
2		GB/T18384.2-2001	EV Safety Requirement Part2: Function and protection	Active
3		GB/T18384.3-2001	EV Safety Requirement Part3: electric shock protection	Active
4		GB/T 4094.2-2005	Symbol of operator, indicator and signal of EV	Active
5		GB/T 19596-2004	Electric vehicle Terminology	Active
6		GB/T 18385-2005	Electric vehicle Power performance Test Procedure	Active
7		GB/T 18386-2005	Electric vehicle Energy consumption and Range Test procedure	Active
8		GB/T 18387-2008	30MHz EV EMC Limit and Test Procedure Broad band ,9kHz~30MHz	Active
9		GB/T 18388-2005	Electric vehicle Type Approval Test Procedure	Active
10		GB/T 24552-2009	EV Windshield defrost and defog requirement and Test procedure	Active
11		GB/T 19836-2005	Electric vehicle Instrument panel	Active
12		QC/T 838-2010	Electric Bus with Ultra-Capacitor	Active

Part Ⅱ EV Standards System

EV Standards in Use

No.		SN	Name	Status
13	HEV	GB/T 19751-2005	HEV Safety Requirement	Active
14		GB/T 19750-2005	HEV Type Approval Test Procedure	Active
15		GB/T 19752-2005	HEV Power Performance Test procedure	Active
16		GB/T 19753-2005	Light Duty HEV Energy Consumption Test Procedure	Active
17		GB/T 19754-2005	Heavy Duty HEV Energy Consumption Test procedure	Active
18		GB/T 19755-2005	Light Duty HEV Emission Test Procedure	Active
19		QC/T 837-2010	Classification of HEV	Active
20		QC/T 894-2011	On Board Measurement Methods for Emissions from Heavy-Duty Hybrid Electric Vehicles	Active
21	FCEV	GB/T 24554-2009	Fuel Cell Engine Performance Test Procedure	Active
22		GB/T 24549-2009	Fuel Cell Electric vehicle Safety Requirement	Active
23		GB/T 24548-2009	Fuel Cell Electric Vehicle Terminology	Active
24		QC/T 816-2009	Specification of Hydrogen Refueling Vehicle	Active
25		GB/T 26990-2011	Fuel cell electric vehicles - Onboard hydrogen system - Specifications	Active
26		GB/T 26991-2011	Fuel cell electric vehicles - Maximum speed test method	Active
27		QC/T 816-2009	Specification of mobile hydrogen refueling vehicles	Active

Part Ⅱ EV Standards System

EV Standards in Use

No.		SN	Name	Status
28	Energy Storage	GB/Z18333.1-2001	Li-ion Battery	Active
29		GB/Z18333.2-2001	Zinc-Air Battery	Active
30		QC/T 741-2006	Ultra- Capacitor	Active
31		QC/T 742-2006	Lead Acid Battery	Active
32		QC/T 743-2006	Li-ion Battery	Active
33		QC/T 744-2006	NiMH Battery	Active
34		QC/T 840-2010	Battery Structure and Size	Issued
35		QC/T 897-2011	Technical specification of Battery Management System for Electric vehicles	Issued
36	Motor and Contro-ller	GB/T18488.1-2006	Motor and its Controller Part1: Specification	Active
37		GB/T18488.2-2006	Motor and its Controller Part2: Test Procedure	Active
38		GB/T 24347-2009	DC/DC convertor	Active
39		QC/T 896-2011	Interface of electrical machine system for electric vehicle	Active
40		QC/T 893-2011	Failure classification and assessment of electrical machine system for electric vehicle	Active

Part Ⅱ EV Standards System

EV Standards in Use

No.		SN	Name	Status
41	Charging & Communication	GB/T18487.1-2001	Conduct Charging System General Requirement	Active
42		GB/T18487.2-2001	Connect Requirement of EV and DC Charger	Active
43		GB/T18487.3-2001	AC/DC Charger (and Charger station)	Active
44		GB/T 20234.1-2011	Connection set for conductive charging of electric vehicles Part General requirements	Active
45		GB/T 20234.2-2011	Connection set for conductive charging of electric vehicles Part 2:AC charging coupler	Active
46		GB/T 20234.3-2011	Connection set for conductive charging of electric vehicles Part 3:DC charging coupler	Active
47		QC/T 895-2011	On-board conductive charger for electric vehicles	issued
48		QC/T 839-2010	Electric System of Ultra-Capacitor Bus	Active
49		QC/T 841-2010	Electric vehicle conductive charge coupler	issued
50		QCT/842-2010	Communication Protocol between BMS and off board Charger	issued

Part Ⅱ EV Standards System

EV Standards in Use

No.		SN	Name	Status
51	E-motor cycle	GB/T 24158-2009	Electric motorcycles and electric mopeds—General specifications	Active
52		GB/T 24157-2009	Electric motorcycles and electric mopeds - Energy consumption and range - Test procedures	Active
53		GB/T 24156-2009	Electric motorcycles and electric mopeds—Power performance—Test methods	Active
54		QC/T 791-2007	Electric motorcycles and electric mopeds—Type Approval Test Procedure	Active
55		QC/T 792-2007	Electric motorcycles and electric mopeds—Motor and its Controller Specification	Active
56		GB 24155-2009	Electric motorcycles and electric mopeds - Safety specifications	Active

Part Ⅱ EV Standards System

Released standards of electric vehicle in China

Up to now, national technical committee of auto standardization (NTCAS) have organized and drafted 56 electric vehicle standards (38 national standards and 18 automotive industry standards) which have been approved and released by standardization authorities.

Part Ⅱ EV Standards System

Progress of New Standards（to be issued）

No	Item No	name	status
1	20091183-T-339	Light Duty HEV Energy Consumption Test Procedure	Revised
2	20090040-T-339	General requirements for electric vehicle charging station	completed
3	20090040-T-339	Heavy Duty HEV Energy Consumption Test procedure	Revised
4	20083096-T-339	Specifications for hydrogen fuel cell vehicles in demonstration	completed
5	20083097-T-339	Hydrogen fuel cell vehicles Facilities for demonstration Specifications	completed
6	20090044-T-339	The reliability test methods of electrical motor system for electric vehicles	completed
7	20070544 -T-303	Battery electric passenger cars - Specifications	completed
8	2009-1002T-QC	ultracapacitor Electric City Bus-Engineering Approval Evaluation Program	completed
9	2010-1854T-QC	The reliability test methods for power train unit of light-duty hybrid electric vehicles（ISG type）	completed
10	20110009-T-339	Fuel cell electric vehicles-Onboard hydrogen system-Test methods	completed
11	20090041-T-339	Motor and its Controller Part1: Specification	revised
12	20090042-T-339	Motor and its Controller Part2: Test Procedure	revised

Part Ⅲ Research on Crash Safety Standard of EV

Backgroud

- **To provide safety vehicle product is the responsibility of EV manufacturer**
- **Crash safety is the first challenge of EV manufacturer**
- **Variety differences between EV and conventional vehicle:**
  - **The mass and dimension of electric motor is far less than engine**
  - **RESS and related system is located under seat or in trunk**
- **Potential dangerous of on-board high-energy RESS**
- **Potential injury to occupants from high-voltage circuit**

Status of International EV Crash Std

		Number	Date					
				07	08	09	10	11
Inter-national	R	ECE R12/94/95					Publication expected in 2011	
		HFCV gtr			*under development*			
US	R	FMVSS 305	Published in 2000		★ Proposal of revision		★ Revised rule publication	★ Refine-ment?
	S	SAE J1766	Published in 1996 ★	Revision in 2005				
Japan	R	Attachment 111		Published in 2007				

State of Arts for EV Safety Std in China

No.	title	status
GB/T 18384.1	Safety Requirements for Electric Vehicles — Part 1: RESS	Revising
GB/T 18384.2	Safety Requirements for Electric Vehicles— Part 2: Function Safety and Fault Defending	Revising
GB/T 18384.3	Safety Requirements for Electric Vehicles— Part 3: Protection against Electrical Shock	Revising
GB/T 19751-2005	Safety Requirements for Hybrid Electric Vehicles	Available
GB/T 24549-2009	Safety Requirements for fuel cell Electric Vehicles	Available

State of Arts for EV Safety Std in China

Std No. Item	GB/T 18384.1-2001	GB/T 19751-2005
Occupant Protection	RESS penetrate and electrolyte spillage	same
Protection provided for third party	RESS cannot be thrown away from vehicle	same
Prevention of short circuit	prevent any short cut of the power circuit	same
Over current Breaker of Traction Battery	Over current specified by the vehicle manufacturer; Short cut on the circuit connecting the traction battery	same
Isolation resistance	N/A	>100Ω/V / 500Ω/V

Plan & Development of EV Crash Safety

- **The project was approved by SAC. The project code is 20110008-T-339 and project name is "The safety specification of EV frontal crash test"**
- **In May 2011, the WG on EV Crash Safety was established**
- **In March 2012, the second meeting discussing draft**
- **Analysis the obtained technical data of EV crash test**
- **Further conduct the verification test for EV crash safety**
- **Carry out and enhance the international communication & cooperation**
- **EV Crash Std is scheduled to be finished by end of 2012**

Summary

1、China has established EV Standard system

2、 56 Standards have been used in R&D, Demo and industrialization

3、 In one to two years, the China EV standards will reach more than 70

4、 Close cooperation among ministries and industries speed up the EV standards work

5、 International cooperation , Sino-German, Sino-US and Sino-Japan etc

6、 Participant WP29, ISO, IEC standard and regulation work