

COSBER

Smart Integration · Global Innovation



The 13th CITA RAG AA Meeting in Shenzhen

Technical Requirement for Electric Vehicle Inspection in China

Ken WANG - Intl. Sale Director of Cosber China



Member of International
Motor Vehicle Inspection
Committee

Nov. 2019. Shenzhen

**Electric Vehicle is in full acceleration,
Are we ready ?**



Attention to:

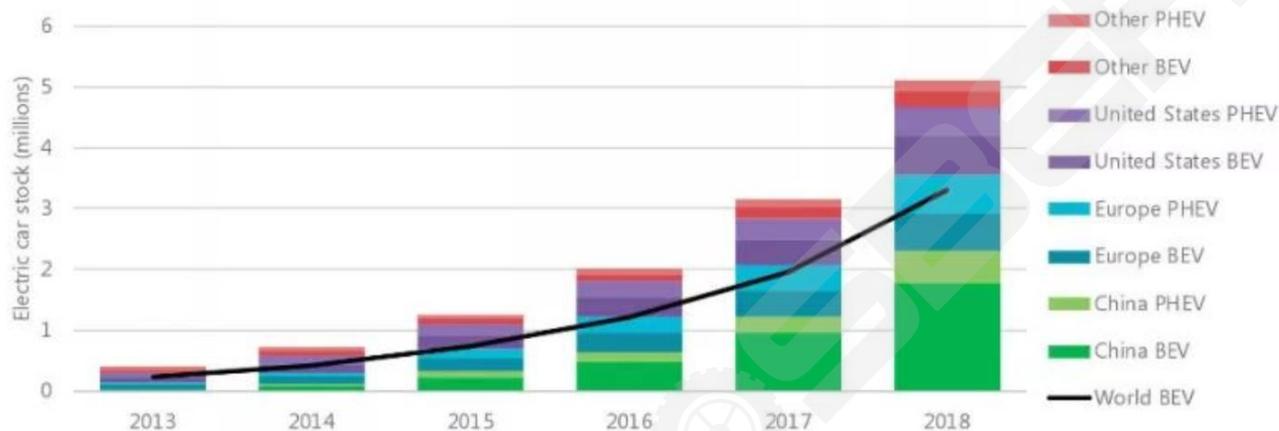
1. Development of the Electric Vehicle in the World.

Market Data 2018, National Policy, Charger System.

2. China GB/T- Tech.Requirment for E.V. Inspection

*Electric Safe, BMS, Bench Test, Battery capacity, Driving Efficiency,
Electromagnetic Safety*

Figure 1.1. Passenger electric car stock in main markets and the top-ten EVI countries



Notes: BEV = battery electric vehicle; PHEV = plug-in electric vehicle. Other includes Australia, Brazil, Chile, India, Japan, Korea, Malaysia, Mexico, New Zealand, South Africa and Thailand.

Sources: IEA analysis based on country submissions, complemented by ACEA (2019); EAFO (2019); EV Volumes (2019); Marklines (2019); OICA (2019); CAAM (2019).

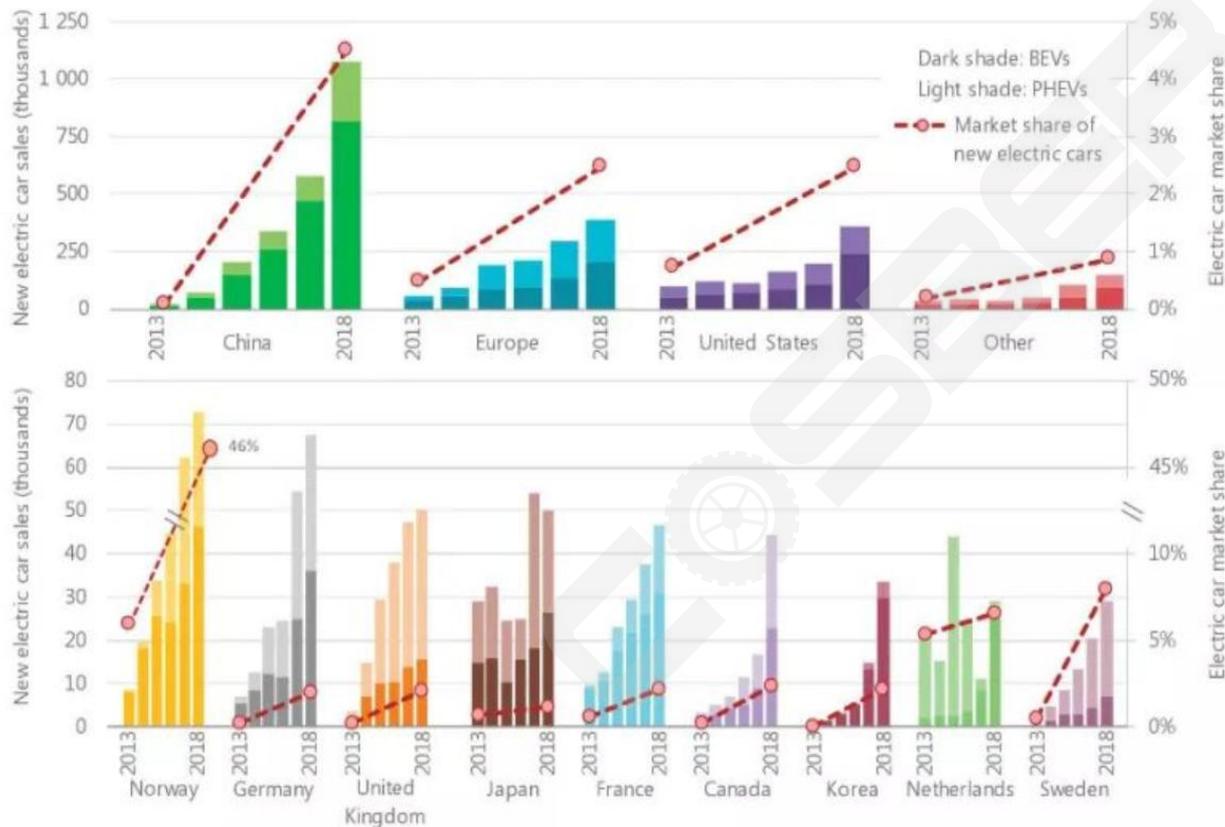
There were 5.1 million electric passenger cars on the road worldwide by the end of 2018, of which 45% were in China.

**Global E.V Stock to
5.1 millions in End.
2018, 40% more**

China	Europe	USA
2.3 M,	1.2 M,	1.1 M,
<i>Represent</i>	<i>Represent</i>	<i>Represent</i>
45 % of	24 % of	22% of
Global	Global	Global

**Data from: [Global EV Outlook 2019](#) of IEA*

Figure 1. Global electric car sales and market share, 2013-18



New EV Sales to **2.0**
Millions in 2018.
Growth of 68%

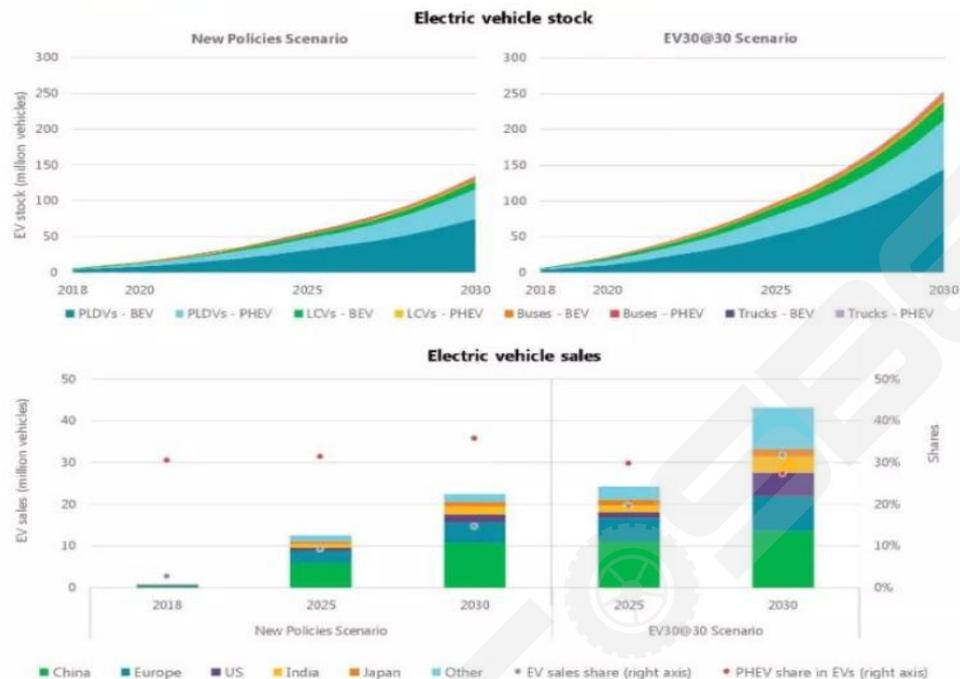
China
sales
1.1 M,
grows of
90%

Europe
Sales
385k,
by:
**Norway,
Germany,
UK...**

USA
sales
361k,
grows of
82%

*Data from: [Global EV Outlook 2019](#) of IEA

Figure 2. Future global EV stock and sales by scenario, 2018-30



Note: PLDVs = passenger light-duty vehicles; LCVs = light-commercial vehicles; BEV = battery electric vehicle; PHEV = plug-in hybrid vehicle.

Source: IEA analysis developed with the IEA Mobility Model.

In 2030, global EV sales reach 23 million and the stock exceeds 130 million vehicles in the **New Policies Scenario** (excluding two/ three-wheelers). In the **EV30@30 Scenario**, EV sales and stock nearly double by 2030: sales reach 43 million and the stock is larger than 250 million.

EV30@30 Campaign is to get market share of EV Sales up to 30% by Y 2030 (= 43millions).

Benefits:

- Pollution reduction.
- Cost saving policy for end user by Gov.
- Encourage business in EV industry

Challenges for us:

- EV Charging Infrastructure
- Gov. Subsidies Vs Premium cost of EV
- Autonomies mileage anxiety
- Battery Tech. develops Slow...

Charging Infrastructure in China

Unification EV Charger Standard **GB/T 20234** From **1st Jan.2016**



Chinese Technical Standard for In-Use EV Inspection

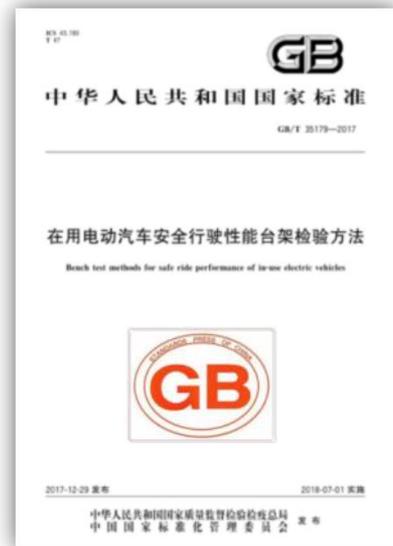
Bench Test Method for safe ride performance of in-use Electric Vehicle

Code of Standard: **GB/T 35179-2017**, Published on 29th –Dec. 2017

Frame: This standard is applicable only to M and N classes of Battery Electric vehicles. *Not for Fuel Cell Vehicle, not for AWD vehicle.*

Provides Recommended Methods for in-use E.V Inspection in:

- General Electric Safety,
- Battery Management Data ,
- Driving Efficiency,
- Electric Consumption,
- Battery Service performance
- Electromagnetic Environment Safety.



E.V GB/T China: **Test Aspects & Equipments**

General Electric Safety:

AC/DC, HV Isolation meter.

Battery Management Data: EV Diagnostic Tool.

Battery Service Performance: Recharging Test Station



OBD for EV,

New Launched on 2019

Driving Efficiency : Nominal power Data.

Electric Consumption : Current meters / BMS data.

Electromagnetic Environment Safety: Electromagnetic Meter.

Chassis Dynamometer - Under-load Mode Test

EV Test 1: General Electric Safety Check

Check list Item	Requirement
<ul style="list-style-type: none"> • Power Battery • Motor • Motor controller • DC-DC converter • Charger and other housing 	External requirements of electric vehicles below should not be significantly deformed, damaged, warning signs should be clear and firm. EV OBD check
<ul style="list-style-type: none"> • Power cables 	Should be undamaged, the connectors securely fastened, and the cables and the moving parts of the vehicle should not interfere.
<ul style="list-style-type: none"> • Battery Type 	Chemical type should be clearly visible.
<ul style="list-style-type: none"> • Insulation resistance of electric Power circuit 	At maximum operating voltage, the minimum insulation resistance of the DC circuit shall be at least 100 Ω / V and the AC circuit at least 500 Ω / V .



EV Test 2: Battery Mgt Data & Charger

Testing condition:

- SOC > 30%, Bat.
- Temperature < 65 ° C



1. Max Different Voltage b/t Bat. Cell .
2. Bat. Assemble **Voltage**.
3. Battery **Current** & Maximum discharge multiple
4. Battery working **Temperature**
5. Battery Aging(times been charged)



EV Test 3: Battery Capacity Test (*EV Autonomies mileage*)

Testing condition:

- Discharged EV battery to 0 %
- Holding time 20-30 mins.

Recharge

- Recharge completely to full by *Bat. Recharge Test station.*

Capacity

- Record the Real Capacity of Battery

Autonomi
es

- Key Autonomies mileage Concerns:
Limit mileage to be acceptable?



EV Test 4 : Under-Load mode E.V Test

1

Drive Efficiency Factor K

2

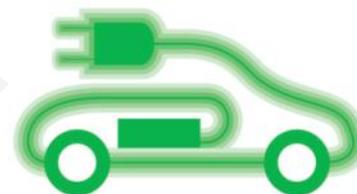
Steady Driving Capacity

3

Energy Consumption Efficiency

4

Electromagnetic Environment



Passenger
Vehicle

M type: Power test on **60km/h**
@ **50%** of Nominal PW on
Chassis Dyno

Goods
Vehicle

N type: Power test no **50km/h**
@ **50%** of Nominal PW on
Chassis Dyno.



EV Test 4: Suggested KPI limit (according to GB/T or Regional directive)

Drive Efficiency Factor K

DB-44 Guangdong

$K \geq 50\%$

Real Wheel PW Vs
Motor Nominal PW

Steady Driving Capacity

GB/T 35179-2017

Run for 1000 m:

Speed Fluctuation :

$< 2\text{km/h}$

@ **50%** of load in Dyno,
@ **60km/h**



Energy Consumption Limit

GB/T 36980 -2018

Depends on Gross Weight from
750kg to 2510kg (passenger Car):

13.1 - 21.9 Kw h/100km

Electromagnetic Environment

GB 8702-2014

3 test points in cabin:

- Electric Field Intensity @100k Hz
 $\leq 4000\text{V/m}$
- Magnetic Induction strength:
 $\leq 100 \mu\text{T}$ @ $< 100\text{k Hz}$

EV Test Report: Special EV report

Comprehensive EV Report:

- Intergrated all test items
- Digital Data management

EV Info

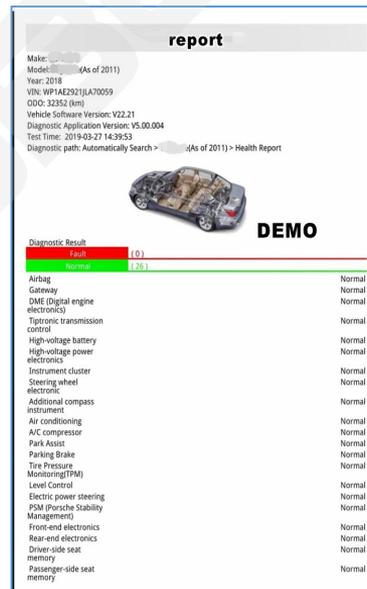
- Classify all the items in one Format

Machine test

- Com. Protocol with Test Equipment

Manual test

- Computerised manual Input Data



在用电动汽车检验报告 Electric Vehicle Test Report

(Sample) Serial NO:

号牌(自编)号 Plate NO	电动机号 Motor NO	检验日期 Test Date
号牌种类 Plate Type	车辆类型 Vehicle Type	品牌/型号 Brand/Model
所有人 Owner	额定功率 Rated Power	VIN码 VIN Code
座位数 Seat Nbr	满载质量 G.M.W	动力电池类型 Battery type
标称续航里程 Rated Range	额定乘员 Rated Passengers	额定最高车速 Rated Max Speed
初次登记日期 Initial Registration	出厂年月 Left Manuf	里程表读数 Mileage in km
Test type	Test item	Inspector
条件 Cond	Nominal Load	kg
Site Temp	°C	Humidity
%	Site pressure	
Drive Speed set	km/h	Resistance
N	Wheel Torque	N
Efficiency	Real Speed	km/h
Wheel Power	kW	Para Torque
N (set speed)		
Judgment		
Speed set	km/h	Res Power
W/h/m	Real Speed	km/h
Test Distance	m	Runtime
s	Fluctuation	km/h
Judgment		
Speed set	设置阻力	N
Distance	m	
Consumption	电耗	电耗率
Wh/kWh	Judgment	
Energy	Drive 1 leg	V/m
Drive 2 leg	V/m	R seat
V/m	Max	
Magnetic	Drive 1 leg	μT
Drive 2 leg	μT	S seat
Max	μT	
Power	Total V before	V
Nominal V	Temp before	°C
Cell V before	V	Amber before
A	Amber after	A
Battery	Total V after	V
Max temp	°C	
Nominal Cell V	Max cell Diff V	ΔU
V/stop ratio	ΔU	Max pulse rate
C	Charge port	Com port
PV battery	EV Visual Check	Waterproof
Waterproof	CCDC	Power Cable
Insulation		
Overall Assessment	(Signature)	Test times
		Stamp
		Applicant (Signature)

Thank you for your time! Further Information and Contact:

- Further Information, Presentations and Video about COSBER in topic of:

Technical Requirement for Electric Vehicle Inspection in China

- Contact:

Ken Wang

Intl. Sales Director of COSBER

10th, F1, TCL Intl. Science E-Park, 1001 Zhongshanyuan Road, Shenzhen, China

Tel.: +86 755 2572 7015

Email: kenwang@cosber.com

WWW: www.cosber.com



Vehicle Inspection Equipments & System