

Translated English of Chinese Standard: QC/T926-2013

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

QC

AUTOMOBILE INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 43.040

T 47

QC/T 926-2013

**The Reliability Test Methods for Powertrain Unit of
Light-Duty Hybrid Electric Vehicle (ISG Type)**

轻型混合动力电动汽车（ISG 型）用动力单元可靠性试验方法

Issued on: April 25, 2013

Implemented on: September 01, 2013

Issued by: Ministry of Industry and Information Technology of PRC

Schedule:

Numbers, Names and Implementation Dates of 71 Automotive Industry Standards

S/N	Standard No.	Standard name	No. of replaced standard	Implemented from
476	QC/T 427-2013	Automobile use battery main switch technical requirement	QC/T 427-1999	2013-09-01
477	QC/T 431-2013	Spark plug ceramic insulator specifications	QC/T 431-1999 QC/T 432-1999 QC/T 433-1999 QC/T 434-1999 QC/T 435-1999 QC/T 436-1999 QC/T 437-1999	2013-09-01
478	QC/T 29032-2013	Alarms sensor for automobile air filters	QC/T 29032-1991	2013-09-01
479	QC/T 526-2013	Automobile engine - Engineering approval evaluation program	QC/T 526-1999	2013-09-01
480	QC/T 68-2013	Technical specification of magneto for motorcycles and mopeds	QC/T 68-1993 QC/T 69-1993	2013-09-01
481	QC/T 898-2013	Wire spoke of motorcycles and mopeds		2013-09-01
482	QC/T 899-2013	Spoke nipple of motorcycles and mopeds		2013-09-01
483	QC/T 684-2013	Specifications of sealing gaskets for engines of motorcycles and mopeds	QC/T 684-2002	2013-09-01
484	QC/T 225-2013	Technical specification of starting motor for motorcycles and mopeds	QC/T 225-1997	2013-09-01
485	QC/T 64-2013	Carburetor of motorcycle and moped	QC/T 64-1993 QC/T 65-1993	2013-09-01
486	QC/T 902-2013	Technical specifications of motorcycle electronic control fuel-injection system		2013-09-01
487	QC/T 29117-2013	Test regulations for the engine of motorcycle and moped production quality	QC/T 29117.10-1993	2013-09-01
488	QC/T 29115-2013	Test regulations for motorcycle and moped productions quality	QC/T 29115-1993 QC/T 29117.2-1993 QC/T 29117.3-1993	2013-09-01
489	QC/T 903-2013	Fault-types for motorcycles and mopeds		2013-09-01
490	QC/T 904-2013	Wheels hub of motorcycles and mopeds		2013-09-01
491	QC/T 305-2013	Motor vehicles - hydraulic power steering control valve - performance requirements and	QC/T 305-1999 QC/T 306-1999	2013-09-01

QC/T 926-2013

		centrifugal lubeoil filters for automobiles		
515	QC/T 922-2013	Specifications of paper element for automobile air filters		2013-09-01
516	QC/T 923-2013	Specifications of fuel prefilter assembly for automotive diesels		2013-09-01
517	QC/T 287-2013	Dimensions of fuel filter paper element for vehicles	QC/T 287-1999	2013-09-01
518	QC/T 625-2013	Metallic coatings and conversion coatings for automobiles	QC/T 625-1999	2013-09-01
519	QC/T 721-2013	Non-electrolytically applied zinc flake coatings for automobile	QC/T 721-2004	2013-09-01

S/N	Standard No.	Standard name	No. of replaced standard	Implemented from
520	QC/T 927-2013	Flange coupling connectors		2013-09-01
521	QC/T 518-2013	Tightening torque for automotive threaded fasteners	QC/T 518-2007	2013-09-01
522	QC/T 401-2013	24° cone connectors - male elbow - body	QC/T 401-1999	2013-09-01
523	QC/T 369-2013	Pipe clips - fasten multipipe	QC/T 369-1999	2013-09-01
524	QC/T 370-2013	Pipe clips - fasten one pipe	QC/T 370-1999	2013-09-01
525	QC/T 621.1-2013	Spring band hose clamps – Part 1: types, dimensions, materials	QC/T 621-1999	2013-09-01
526	QC/T 621.2-2013	Spring band hose clamps – Part 2: Technical conditions		2013-09-01
527	QC/T 621.3-2013	Spring band hose clamps – Part 3: hose and spigot for clamps		2013-09-01
528	QC/T 624-2013	Rubber plugs	QC/T 624-1999	2013-09-01
529	QC/T 378-2013	Hexagon countersunk headless cone plugs	QC/T 378-1999	2013-09-01
530	QC/T 400-2013	24° cone connectors - male run tee - body	QC/T 400-1999	2013-09-01
531	QC/T 405-2013	Flared couplings - male branch tee - body	QC/T 405-1999	2013-09-01
532	QC/T 928-2013	Plastic cable and tubing clips with interfix hole		2013-09-01
533	QC/T 929-2013	Plastic cable and tubing clips with side-fix hole		2013-09-01
534	QC/T 930-2013	Corrugated pipe protectors		2013-09-01
535	QC/T 931-2013	Heavy duty hose clamps		2013-09-01
536	QC/T 599-2013	Overhead projection weld bolts	QC/T 599-1999	2013-09-01
537	QC/T 403-2013	Flared couplings – male - body	QC/T 403-1999	2013-09-01
538	QC/T 379-2013	Square head cone plugs	QC/T 379-1999	2013-09-01
539	QC/T 404-2013	Flared couplings - male elbow - body	QC/T 404-1999	2013-09-01
540	QC/T 381-2013	Hexagon outside head cone plugs	QC/T 381-1999	2013-09-01
541	QC/T 618-2013	Specification for plastic expansion nut	QC/T 618-1999	2013-09-01
542	QC/T 383-2013	Hexagon outside head cone plugs with magnetic core	QC/T 383-1999	2013-09-01

Table of Contents

Foreword 8

1 Scope 9

2 Normative References..... 9

3 Terms and Definitions 9

4 Test Subjects and Conditions 10

5 Test Procedures 11

6 Fault Treatment 13

7 Assessment Criteria 13

Appendix A (Normative) Test Procedures..... 14

Appendix B (Normative) Reliability Test Program of Powertrain Unit..... 15

The Reliability Test Methods for Powertrain Unit of Light-Duty Hybrid Electric Vehicle (ISG Type)

1 Scope

This Standard specifies the reliability test methods for powertrain unit of light-duty hybrid electric vehicle (ISG type).

This Standard is applicable to the powertrain unit for Type-M₁, Type-N₁ and Type-M₂ hybrid electric vehicle (ISG type) with maximum design total mass no greater than 3.5t.

This Standard is not applicable to the idle start-stop function.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 18297-2001 Performance Test Code for Road Vehicle Engines

GB/T 18488.2 Drive Motor System for Electric Vehicles - Part 2: Test Methods

GB/T 19055-2003 Reliability Test Methods for Motor Vehicle Engines

GB/T 19596 Terminology of Electric Vehicles

QC/T 893-2011 Failure Classification and Assessment of Electrical Machine System for Electric Vehicle

3 Terms and Definitions

For the purposes of this document, the terms and definitions given in GB/T 19596 and the following apply.

3.1 Hybrid control unit (HCU)

5.3.3 Initial test data for performance of engine and motor shall adopt the performance test data provided by the manufacturer.

5.4 Reliability test

The reliability test shall be performed as per the Appendix B.

5.5 Inspection and maintenance

5.5.1 General

Inspection and maintenance shall be carried out according to the following requirements; but the contents and cycle may be appropriately increased and decreased. The inspection results and maintenance situations shall be recorded in detail.

5.5.2 Inspection at any time

Use the fault diagnosis device, instrument and computer to check the operation data at any time. If the limit range is exceeded, according to the severity of the fault, issue an alarm or emergency stop for processing and maintenance. If it is the failure of the powertrain unit, it shall be counted as a failure stop. Then record the running time for shutdown, causes and treatment situations.

5.5.3 Inspection records per 1h

5.5.3.1 Record per hour the reliability accumulative running time, powertrain unit output torque, engine speed, engine coolant outlet temperature, engine oil temperature, input DC bus voltage and current of the motor controller, voltage and current of each output phase of the motor controller, motor coolant outlet temperature (if the system contains the cooling device of the motor coolant); if the motor winding is equipped with a thermistor temperature sensor, then the operating temperature of the motor winding shall checked together.

5.5.3.2 After the cold start, the pre-heating time of the powertrain unit shall not be included int the reliability accumulative time.

5.5.4 Inspection and maintenance every 24h

5.5.4.1 The engine part shall be performed as per the 10.3 in GB/T 19055-2003.

5.5.4.2 Check the oil, water and gas leakage of the powertrain unit. Keep the powertrain unit and its surrounding area clean; so that detect the leaks in a timely manner.

5.5.4.3 Check whether the motor bearing and the motor body rotate smoothly, and have abnormal noise.

Appendix B

(Normative)

Reliability Test Program of Powertrain Unit

B.1 The engine throttle is fully open; speed is uniformly raised from n_M to n_P for 90s; during this period, the motor runs for 30s at the peak electric power; then runs for 60s at the rated electric power.

B.2 The engine runs stably at the speed n_P for 210s; during this period, the motor runs at the rated power generation for 10s, runs for 10s at the rated electric power, then runs for 10s at the rated power generation; cycles repeatedly.

B.3 The engine speed is uniformly reduced to the speed n_M for 90s; during this period, the motor runs at the rated power generation.

B.4 The engine runs stably at the speed n_M for 210s; during this period, the motor runs for 10s at the rated power generation, runs for 10s at the rated electric power, then runs for 10s at the rated power generation; cycles repeatedly.

B.5 Repeat the Procedures B.1 ~ B.4 once; then perform Procedures B.1 and B.2 once. Engine throttle is closed; engine speed drops to idle speed (n_i), runs to 1770s; engine throttle is set to 40%, the engine speed is uniformly raised to 105% rated speed (n_i) or raised to the maximum speed specified by the engine manufacturer for $15s \pm 6s$; then close the throttle evenly, the speed is reduced to n_M for $15s \pm 6s$; during this period, the motor has no power output.

B.6 At this time, a working condition cycle for the reliability test is finished for 1800s, see Figure B.1. The operating schedule of the working conditions is shown in Table B.1. The reliability test of the entire powertrain unit is continuously operated for 800 cycles, and accumulative running time of 400h.

B.7 The transition time for the change of motor working conditions is less than or equal to 1s. In the test, if the motor system has insufficient output power due to the protection, then it shall be operated at the maximum output capacity of the motor at this time.

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----