INDUSTRY STANDARDS

1 Introduction

ISO/TC22 (Road vehicles) has been experiencing serious operational problems in recent years due to disparities in the level of activity of its subcommittees (SC) and the size of its organizational structure. In addition, other issues, such as the large burdens imposed on the secretariat nations, have been raised, leading, in 2014 to a first reorganization since its founding in 1947. Until now Japan has worked hard as the SC secretariat in the field of motorcycles within TC22. However, other participants, Europe in particular, have expressed the opinion that Japan and other Asian countries should be making contributions commensurate with their economic power, a situation that Japan has viewed as an opportunity to enhance its presence there. Consequently, focusing on its inevitable growing necessity as the electrification of vehicles progresses, Japan submitted its candidacy for, and won, the office of secretariat nation for ISO/TC22/SC32 (Electrical and electronic components and general system aspects) and, for the first time will work on issues related to four-wheeled vehicles to further enhance international standardization activities. The following sections outline the achievements of the past three years since Japan has become the secretariat nation for SC 32.

2 Launching the New SC 32

Figure 1 shows the relationship between the newly established SC 32 formed during the reorganization and the former SC 3 (E/E equipment).

The newly formed SC 32 inherits the former SC 3 working groups, including WG 3 (EMC), WG 4 (Electrical cables), WG 5 (Overcurrent protection devices), WG 6 (Onboard electrical connections), WG 9 (Electrical Connections between towing and towed vehicles), WG 13 (Environmental conditions), and WG 16 (Functional safety), but excluding WG 1 (Data communication) which was made into the independent SC 31. In addition, the formerly independent SC 1 (Ignition equipment) subcommittee was integrated into SC 32.

The scope of SC 32 was defined as "E/E components and cross-sectional specifications for E/E systems and components" during the process of the TC 22 reorganization, with the responsibility for making decisions about the structure of the SC 32 WGs, management policy, operational procedures, liaisons and WG conveners, as well as project assignment falling entirely on the shoulders of the secretariat nation. First, Mr. Wern of the VDA (German Association of the Automotive Industry), international secretary of the former SC 3 and the newly established SC 31, who is fully aware of the circumstances, was asked to draw up an allocation plan for the (about 280) projects assigned to the former SC 3. Next, based on this plan, the chairs of SC 31, SC 32, and the former SC 3, as well as the international secretary, gathered for consultations and made decisions about the projects on the basis of their background and scope. Although initial proposals focused mainly on the background behind their establishment, a proposal by Japan putting greater emphasis on areas now falling under the scope of SC 32, such as intelligent power switches (IPS) and technical documentation, was ultimately accepted. Coincidentally, this resulted in the same number of projects-138-being assigned to SC 31 and SC 32. The total number of projects supervised by SC 32 ultimately rose to approximately 200 with the addition of those from the former SC 1 and from WG 5, which was directly under TC 22.

Figure 2 shows the proposed organizational structure for SC 32. The original names of the WGs established under the former SC 3 were kept the same as much as possible after their reassignment to SC 32, and a numbering system designating the WG with the longest history under the former SC 1 as WG 1 was devised.

Although it was logical to have the conveners of the individual WGs continue their duties from the former SC 3 where appropriate, there were indications that several

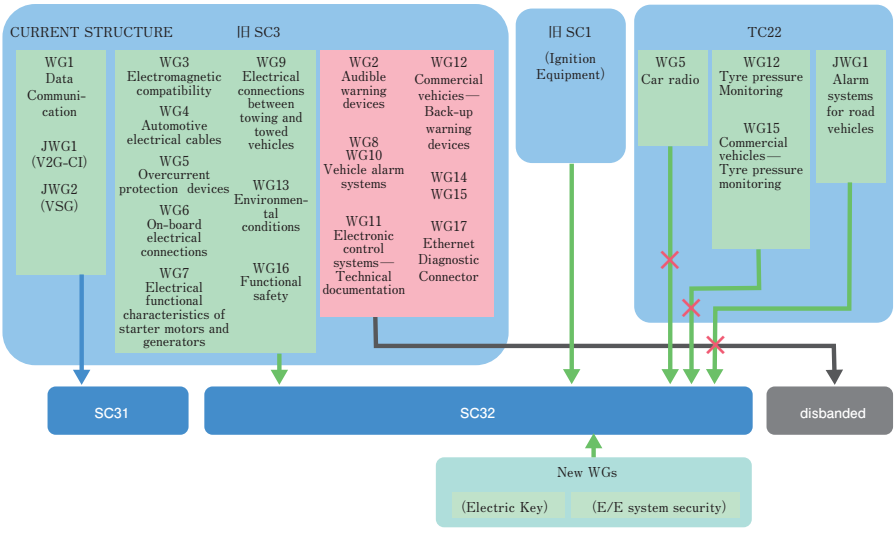


Fig. 1 Diagram Showing Change in Organizational Structure between the Former and New SC

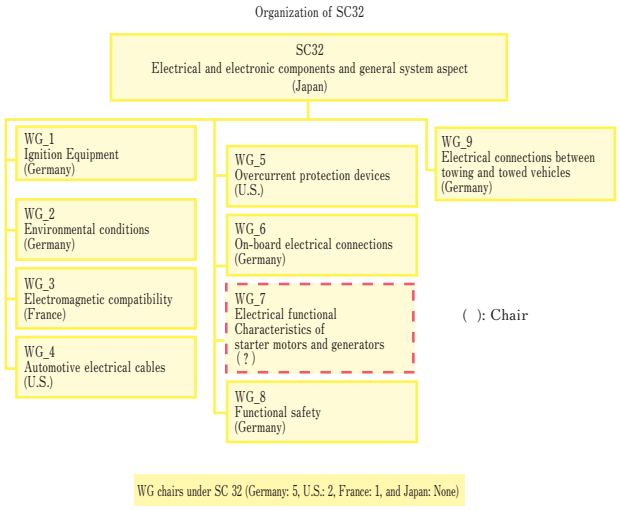


Fig. 2 Composition of SC 32 upon Its Initial Establishment

of the conveners would take the opportunity provided by the reorganization to retire, and following up revealed that this was the case for WG 1, WG 2, WG 6, and WG 7.

This was perceived as a chance to nominate candidates from Japan, but a public appeal put out via the Society of Automotive Engineers of Japan (JSAE) resulted in only one application to serve as convener for WG 7 (Electrical functional characteristics of starter motors and generators). Further examination revealed that WG 7, which was initially thought to be dormant, had been disbanded and restoring it would require assigning it a new topic to supervise. The idle stop system (ISS) starter endurance evaluation method the JSAE was working on at the time as a potential international standard topic from Japan was therefore presented as a new activity theme at the ISS SWG of the Power Supply System Working Group of the Electric Propulsion Vehicle Subcommittee in the form of a new work item proposal (NWIP).

As a result, activities got underway with five of the eight WGs comprising SC 32 chaired by Germany, two by the U.S., one by France, and none by Japan. At the first plenary meeting of SC 32 held in June 2015, WG 7 was revived with the applicant from Japan appointed as its convener, and charged with the ISS topic.

The management policy below was agreed for SC 32, and has guided its operations until now.

(Management Policy)

I. We will lead standardization of Electrical and electronic components and general system aspects.

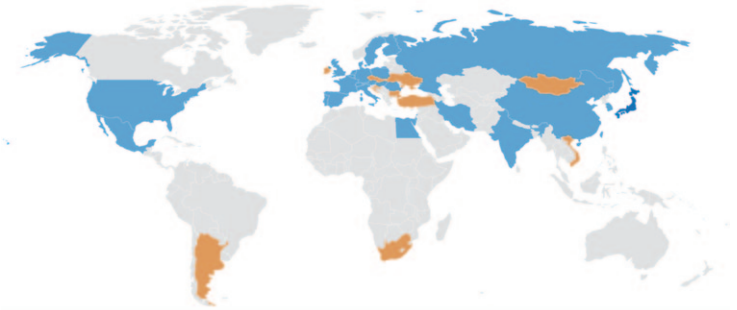
II. We intend to standardize and maintain our projects in a timely manner in accordance with the rapid progress of E/E technologies.

III. We will enhance SC member activities, and encourage meeting participation.

IV. We will work together positively with other committees and organizations to standardize complicated items.

V. We will seek to maximize speed and efficiency by utilizing IT resources.

SC 32 is responsible for the field of electrical and electronic components, which is characterized by intense technological progress and will have to take a leading role ahead of the IEC, consortiums, and other related groups, as well as make use of state-of-the-art IT re-



Secretariat
Japan

Participating Members (27)
Austria (ASI)
Belgium (NBN)
China (SAC)
Denmark (DS)
Egypt (EOS)
Finland (SFS)
France (AFNOR)
Germany (DIN)
Hungary (MSZT)
India (BIS)
Iran, Islamic Republic of (ISIRI)
Israel (SII)
Italy (UNI)
Japan (JISC)
Korea, Republic of (KATS)
Luxembourg (ILNAS)
Mexico (DGN)
Netherlands (NEN)
Poland (PKN)
Portugal (IPQ)
Romania (ASRO)
Russian Federation (GOST R)
Spain (UNE)
Sweden (SIS)
Switzerland (SNV)
United Kingdom (BSI)
United States (ANSI)
Observing Members (11)
Argentina (IRAM)
Bulgaria (BDS)
Croatia (HZN)
Czech Republic (UNMZ)
Ireland (NSAI)
Mongolia (MASM)
Slovakia (SOSMT)
South Africa (SABS)
Turkey (TSE)
Ukraine (DSTU)
Viet Nam (STAMEQ)

Fig. 3 List of Member Countries at SC 32 Founding

sources such as web conferencing to carry out work its swiftly and in keeping with the general principles of agreements with various countries.

The activity proposals described above were supplemented by proposals dealing with the scope and liaisons that were submitted via a proposal from the secretariat nation and approved at the plenary meeting of the new SC 32 in Kyoto, marking the start of SC 32 activities.

3 Tour of Asian Nations

Figure 3 shows the list of member nations in SC 32 at the time of its establishment. The list reveals that 17 European nations, including Germany, France, Italy, the UK, and Sweden, represented the majority of the 23 participating members playing a lead role in activities, with just four countries-Japan, China, India, and South Korea-providing a weak presence for Asian nations.

The taking over of the SC 32 secretariat by Japan led to the launch activities that better reflected the economic power of each country in the automotive field rather than being led by Europe, and Germany in particular, as in the past.

First, one month before the plenary meeting in Kyoto, on the first day of the 38th Pacific Area Standards Congress (PASC) General Assembly in Delhi (May 6, 2015), the SC 32 chair and secretary introduced the activity plans of the new SC 32, and asked the delegates from the 22 participating countries to join those activities. The SC 32 Japan delegation then visited the offices for subcommittee located in India, Malaysia, China, and South, calling for participation in SC32 activities, including attending the Kyoto plenary meeting.

In September 2017, the SC 32 chair and the Japanese TC 22 representatives visited the Thai Industrial Standards Institute (TISI) and the Society of Automotive Engineers of Thailand (TSAE) in Bangkok, Thailand to request their cooperation, including joining SC 32 as a participating member.

As a result of the above efforts, China attended the Kyoto plenary meeting despite having never participated in any of the former SC 3 activities before, and South Korea participated in the Kyoto, Berlin (2016), and Stockholm (2017) plenary meetings, while Vietnam joined as a new observing member. As this remained a far cry from the initial expectations, SC 32 representatives attended workshops at the 41st PASC General Assembly in Okayama in May 2018, introducing the latest SC 32 activities and again urging participation, including attending the SC 32 plenary meeting in Busan in June 2018. The Japanese secretariat of SC 32 will continue to work hard to include the Asian member countries in its activities.

4 Taking on the Challenge of New Topics

Figure 4 shows a diagram of the latest organizational structure of SC 32 as of June 2018. The number of WGs has increased to 11 from the 8 at the time it was established, with Germany now chairing seven WGs (+2), the U.S. chairing (-1), France chairing 1 (no change), and Japan chairing two (+2). In addition to the main projects of cybersecurity and in-vehicle Ethernet described in further detail below, SC 32 is also working on a variety of other new topics including, but not limited to, a 48 V

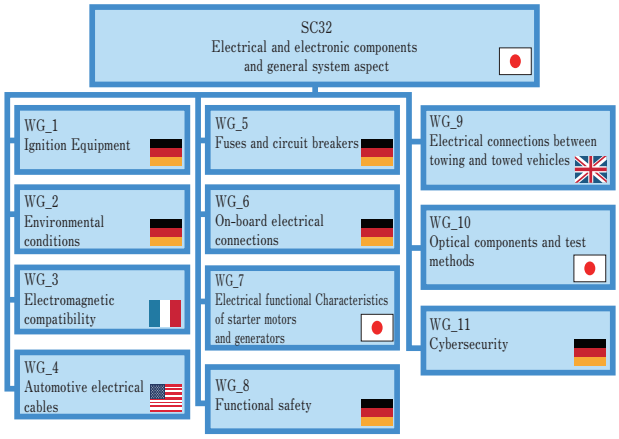


Fig. 4 Diagram of SC 32 Organizational Structure (June 2018)

electric vehicle environmental test method, new types of fuses, integrated plug standards, and electronic Ethernet parts.

4. 1. Automotive Cybersecurity Engineering (ISO 21434)

Until now automobiles have been a self-contained space, but advances in internet and communications technologies, are now connecting them to the outside world, and a standardization proposal was presented by the delegation from Germany at the SC 32 plenary meeting in Kyoto. Although Germany was originally of the opinion that security should be the responsibility of SC 31 (Data communication), the issue at hand did not concern security countermeasures for individual types of communication, and it was decided that SC 32, which is responsible for fundamental electronic technologies, would handle the underlying process of cybersecurity aspects concerning automobile development, manufacturing, maintenance, and disposal. Similarly, the opinion that WG 8 of SC 32 should handle the matter since it already deals with the same fundamental process in ISO 26262 (Functional safety) was voiced, but the differences on the technical level led to establishing the new WG 11 instead.

Meanwhile, the SAE has already seized the initiative, working on it SAE J3061 project that covered almost the same scope, which created an unusual situation where both the U.S. and Germany submitted nearly identical NWIPs at essentially the same time. Continued discussions based on the notion of having a single global security process standard in an era when the world is connected led to the first application of the Partnership Standards Development Organization (PSDO) joint development agreement between the ISO and SAE, as well as an agreement to adopt a joint working group (JWG) approach, with both sides appointing the same number of chairmen, secretaries, and members. This agreement put the work on track, with JWG holding regular quarterly meetings starting with its first plenary meeting (kickoff) in Munich in October 2016, enabling the group to make smooth progress toward its goal of issuing ISO 21434 in May 2020.

Building on the knowledge accumulated since the 2010 establishment of a security standardization planning subcommittee in the JSAE, and with the support of the Japan Automobile Manufacturers Association (JAMA) and the Japan Automotive Software Platform and Architecture (JASPAR), Japan has also dispatched a numerous project group leaders, secretaries, and experts to the JWG to contribute to early standardization as a leading nation equal to the U.S. and Germany.

4. 2. In-Vehicle Ethernet (ISO 21111)

This topic represents one of the international standardization proposals been submitted by Japan. The project, jointly conducted by SC 31, which is responsible for systems and SC 32, which is responsible for parts, got underway following the SC 31 and SC 32 plenary meetings respectively held in May and June 2016. While the U.S. and Germany expressed the opinion that this project should be handled by WG 6, which is responsible for connectors, the perception of optical technologies as a new frontier, led to establishing the new, future-oriented WG 10 under the direction of the Japanese convener. Work aimed at issuing ISO 21111-4 (General requirements and test methods of optical gigabit Ethernet components) at the end of 2019 is currently in progress.

At the June 2017 SC 32 plenary meeting in Stockholm, Germany proposed the creation of a new standard for electrical Ethernet with SC 31 responsible for systems, and SC 32 responsible for parts. The organization of the standard was reviewed to make it convenient for users and Japan proposed ISO 21111-8 (Electrical 100-Mbit/s component requirements and test methods) as a NWIP for electronic parts to be assigned to WG 6 (On-board electrical connections) under a Japanese project leader and pursued in collaboration with WG 4 (Automotive electrical cables). A kickoff meeting for this project is scheduled to take place in Busan in June 2018.

5 Future Initiatives

The basic mechanism of ISO standardization work be-

gins with participating member countries submitting a proposal as an NWIP on their own initiative, and there has virtually been no roadmap to follow since TC 22 was founded shortly after World War II. However, a growing number of newer projects have become complex, requiring cooperation between multiple standardization organizations to move forward. To proceed efficiently, these organizations therefore need to have mutually connected roadmaps, and to agree on the division of roles in the project in advance.

One year after the founding of SC 32 Japan, in its capacity as the secretariat nation, initiated activities to increase understanding in that respect. Although there was a stalemate due to the persistent resistance of some major countries, instructions from the TC 22 Chair to create these roadmaps has shifted the momentum, providing the opportunity to create them at once.

As electrification, connectivity, automated driving, and diversifying forms of ownership such as car sharing usher a once in a hundred years period of transformation for the automotive world, and the collaborative interplay between standards (compulsory standards) and criteria (optional standards), among other factors, make the role played by standardization increasingly complex, rising expectations will inevitably be placed on SC 32. Moving forward, Japan will take the initiative as a secretariat nation to obtain the cooperation of not only the traditional European powers, especially Germany, but also other Asian nations as it leads the world in the field of standardization.

6 JASO Standards Issued in 2017

This section introduces the standard numbers, names, and applicable scopes of JASO (Japan Automotive Standards Organization) standards and JASO technical papers published (established or revised) in March 2018.

Newly established JASO standards

[D: Electrical equipment]

D 016: Automotive Parts – Test Method and Requirement spec of Relay

Applicable scope: This standard specifies the details for plug-in relays with a rated capacity of 12 V and 24 V featuring mechanical contacts and used in automobile DC electric circuits.

[E: Motors and engines]

E 016: Road vehicles – Requirements and evaluation methods of vehicle restraints on chassis dynamometers for four-wheel-drive vehicles

Applicable scope: This standard specifies the requirements and procedures for attaching vehicle restraints and shows the actual evaluation method for a vehicle in a properly restrained state as well as points of caution in case involving a mode fuel economy test for four-wheel drive vehicles with a mass of 3,500 kg or less carried out using a chassis dynamometer. This information is provided to ensure that a safe and repeatable fuel economy test can be performed.

[F: Machinery elements]

F 127: Automotive parts – Hexagon nuts with flange

Applicable scope: This standard specifies the details of steel hexagon nuts with flanges used for automobiles. However, this JASO standard does not apply to hexagon nuts that require weldability, heat resistance to temperatures above 300 ℃, or cold resistance to temperatures lower than -50℃.

JASO revisions

[C: Chassis and brakes]

C 428: Road vehicles – Parking Brake Test Procedure

Applicable scope: This standard specifies the test method using an actual vehicle for the parking brake that operates normally in the vehicle. However, it does not apply to two-wheeled vehicles, two-wheeled vehicles with sidecars, mini-vehicles with caterpillar tracks and tail skids, and vehicles with a maximum speed of 25 km/h or less.

C 705: Road vehicles – Static steering efforts test procedure

Applicable scope: This standard specifies the test procedure for static steering effort.

[D: Electrical equipment]

D 010: Road vehicles and automotive parts- Test methods for electrical disturbances from electrostatic discharge

Applicable scope: This standard specifies the electrostatic discharge (ESD) test method

required for the evaluation of electronic modules intended for use in automobiles. This test is suitable for the ESD during vehicle assembly, the ESD caused by maintenance service personnel, and the ESD caused by vehicle occupants.

D 507-1: Automotive parts – Glossary of terms relating to car antenna

Applicable scope: This standard specifies the definitions of the terms for automobile antennas and other related terms.

D 612-1: Automotive Parts – Fuses – Part 1: Definitions and General Test Requirements

Applicable scope: This standard specifies the definitions of low-voltage fuses for automobiles with a rated voltage of 32 V or 58 V and breaking capacity of 1000 A or 2000 A, as well as the general conditions, basic test methods, and performance requirements for testing.

[F: Machinery elements]

F 208: Automotive Parts – Plastic Clips for Interior and Exterior

Applicable scope: This standard specifies the details of the plastic push-pull clips used for fastening interior and exterior parts of automobiles. Details about plastic push-turn clips, push clips, and push-screw clips shall be as specified in Annexes A to C (reference).

[M: Material and surface treatment]

M 101: Metal Pipes for Automobile Tubing

Applicable scope: This standard specifies the metal pipes composed of metal tubes combined with fastener shape processing that are used for piping, mainly in automobiles, for the braking, fuel, lubrication, and other systems.

M 321: Automotive Parts – Air Conditioning Hose Assemblies

Applicable scope: This standard specifies the hose and hose assemblies within the automobile air-conditioning system installed for the purpose of using liquid and gaseous refrigerants, Refrigerant 134a or Refrigerant 1234yf.

M 340: Two-stroke-gasoline engine – Engine oils – Lubricity test procedure

M 341: Two-stroke-cycle gasoline engine – Engine oils – Detergency test procedure

M 342: Two-stroke-cycle gasoline engine – Engine oils – Smoke test procedure

M 343: Two-stroke-cycle gasoline engine – Engine oils – Exaust system blocking test procedure

M 345: Two-stroke-cycle gasoline engine – Engine oils – Classifications

Applicable scope: These standards specify the test methods for evaluating the detergency inside the engine and the piston ring adhesiveness at high temperatures for the lubricating engine oils used in engines such as the two-cycle gasoline engines of motorcycles, general-purpose machines, and outboard motors.

M 501: Safety Glass for Automobiles

Applicable scope: This standard specifies the details of the safety glass mainly used for automobile windows.

[Z: General and others]

Z 125: Road vehicles – Interior – Measurement methods of diffused volatile organic compounds (VOC) for trucks and buses

Applicable scope: This standard specifies the methods of measuring the concentration of volatile organic compounds (VOC) and aldehyde compounds within the vehicle interior.

Newly Established JASO Technical Papers

TP 18001: Automotive Parts – Standard Ports for Automobile Connectors

Applicable scope: This technical paper was established in preparation for the revisions being made to JASO D605-96 (Electric Connectors for Automobiles), as well as to unify the shapes of the connector mating ports used for various in-vehicle accessories. This should make it possible for competing automobile manufacturers to create new, yet similar products, reduce the need for re-evaluation when reusing existing

products, increase the efficient use of development resources for both automobile manufacturers and connector suppliers, and help ensure an adequate level of quality.

TP 18002: Automotive parts – Transverse electromagnetic (TEM) cell Supplementation

Applicable scope: The JASO standard for ISO 11452-1 to 11452-10, which specifies the electromagnetic compatibility (EMC) standards for automotive parts, has been stipulated as JASO D 011: 2015, "Automotive Parts – Test Method for Electrical Interference by Narrowband Radiating Electromagnetic Energy". This technical paper was established specifically to describe the background of the revisions, provide commentary on the changes explain its relationship to UN R10 and otherwise expand upon the contents of ISO 11452-3: 2016.

TP 18003: Road vehicles-Glossary for driving automation system

Applicable scope: This technical paper was established for the purpose of unifying the interpretations of the terms related to automated driving systems being used by researchers and developers, to contribute to the advancement and growth of development in this field, and to contribute to promoting the future standardization of automated driving.

TP 18004: Taxonomy and definitions for terms related to driving automation systems for On-Road Motor Vehicles

Applicable scope: This technical paper was established following a Japanese Ministry of Economy, Trade and Industry (METI) for a Japanese translation of SAE J3016 after the Cabinet Office-led Strategic Innovation Promotion Program (SIP) determined that, for automated driving systems, the levels of automated driving and their definitions would be as specified in SAE J3016.

JASO Technical Paper Revisions

TP 14003: Guidelines Concerning the Operational Durability Test Methods for the Starter Relays used in Idling Stop Systems

Applicable scope: This technical paper was revised to reflect the newly verified results regarding the adequacy of the test method that was an issue when this paper was originally established in 2013.

7 JIS Standards Issued in FY 2017

This section introduces the standard numbers, names, and applicable scopes of JIS (Japanese Industrial Standards) standards published (established or revised) up to the end of March 2018.

Newly Established JIS

D 1047-1: Motorcycles – Measurement methods for gaseous exhaust emissions and fuel consumption – Part 1: General test requirements

Applicable scope: This standard specifies the general requirements for the exhaust emissions test methods and fuel consumption rate test methods for motorcycles.

D 1047-2: Motorcycles – Measurement methods for gaseous exhaust emissions and fuel consumption – Part 2: Test cycles and specific test conditions

Applicable scope: This standard specifies the test cycles and test conditions for the exhaust emissions test and fuel consumption rate test for motorcycles.

D 1047-3: Motorcycles – Measurement methods for gaseous exhaust emissions and fuel consumption – Part 3: Test method for fuel consumption measurement at a constant speed

Applicable scope: This standard specifies the test methods for the fuel consumption rate of motorcycles being driven at constant speed on a test road and a chassis dynamometer.

D 8021: Motorcycles - Measurement Methods for Gaseous Exhaust Emissions During Inspection or Maintenance

Applicable scope: This standard specifies the direct

measurement methods for the exhaust emissions concentration of motorcycles (including motorcycles with sidecars) and mopeds during inspection and maintenance service.

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(2) Katsuji Shimasawa: Introduction of Kyoto Meeting for ISO/TC22/SC32, Society of Automotive Engineers of Japan, Vol. 69, No. 10, p. 104-105 (2015) (in Japanese)