

Regulations Governing the Issuance, Revocation and Abolition of Compliance Certification for Motorcycle Configuration Exhaust Emission

Article 1 This measure is set based on Article 42, Paragraph 2 of Air Pollution Control Act (hereinafter referred to as the Act).

Article 2 The terms of this measure are defined as follows:

1. Motorcycle model composition patterns (hereinafter referred as Motorcycle configuration): refers to power system of the motorcycle (such as internal combustion engine or hybrid power system with electric motor, etc.), basic engine, fuel supply system, emission control system, transmission and inertial mass are the same as the same models.
2. Engine family: motorcycles have similar power system, combustion cycle (number of trips), type of cooling system (air, sea water), cylinder block structure (ie parallel, V-type, opposite type, cylinder aperture center spacing distance, etc.), number of cylinders, air supply method, fuel supply (method, numbers and measuring systems, etc.), evaporated gas storage device, catalytic converters (oxidation catalyst, reduction catalyst or three-way catalytic), secondary air system, electronic control module vehicle can be summarized as the same engine family.
3. Used motorcycles in foreign countries: motorcycles have registered in local Transportation Supervision and have licenses, should obtain certificate and import duties (exemption) issued by customs when import.
4. On Board Diagnostics (OBD): refers to motorcycles with system capability to monitor air pollution prevention equipment and detection fault conditions via on board computer, and can store fault codes and display fault signal capabilities.
5. Hybrid motorcycle: refers to motorcycles with both combustion engine and electric motor-generator system, two sources of power.
6. Idle-stop or stop-start devices: refers to a moving motorcycle stops temporarily or stops for traffic lights, etc., and maintains in idle state for a while, the apparatus can have engine enter into off state automatically, and able to start engine again with opening the throttle.
7. Defeat devices: means through the measured or sensed vehicle's influential operating parameters (such as: vehicle speed, engine rpm, transmission gear position, temperature, altitude, intake manifold vacuum, or other parameters) to trigger, adjust, delay or stop the emissions control functionality of certain devices when the vehicle is in normal operating conditions and hence reduce or with no effect on the emissions control.

Article 3 Motorcycle shall comply with the Article 6 and Article 7 of the Air Emission Standards of Mobile Source (hereinafter referred to as emission standards) and

related provisions of this measure, The central competent authority may only issue motorcycle exhaust emission compliance certificate (hereinafter referred to as compliance certificate).

Article 4 Qualified applicants should apply following provisions for proof:

1. Domestic motorcycles applied by motorcycle manufacturers.
2. Imported motorcycles applied by motorcycle manufacturers designated agents, importers, Importer coalition of nonprofit association or guild.
3. Import purchasing motorcycles of all levels of administrative organizations, organizations apply or commission by winning vendors to apply.
4. Individual motorcycle importation is applied by owners.

Electric motorcycles without internal combustion engines are free of conformity application under the preceding paragraphs. But it shall submit proof of vehicle type safety testing compliance, data models and specifications with complete vehicle photo filing to central authorities, and comply electron transport operations with verification of the central competent authority.

Article 5 The central competent authority may specify authorized testing organization to measure as proof of eligibility to apply for engine family that meets the emission standards as determined basis.

Selection and testing of tested vehicle in the preceding paragraph, in accordance with the provisions of Appendix 1.

Article 6 When applicants apply for compliance certification is based on model and year of engine family as the basic unit, applicants should submit documents and relevant provisions, follow provisions of Appendix 2 and Appendix 3.

Preceding documents have completed reported and transmitted in electronic file information in accordance with the central competent authority may exempt from examination.

Article 7 Eligible approved and issued certifications by engine family and model year by central authorities, central competent authority may revoke or void the compliance certification in following circumstances, and may require applicants to handle in accordance with the provisions of Appendix 4 for recall and correction:

1. False application documents or instruments, or false records.
2. Violation of Article 12.
3. Others are considered by the central authorities that violate the provisions of this Act or provisions in serious circumstances.

Article 8 When applicants want to continue to manufacture or import motorcycles that have been certified already next year, applicants should apply prolong this year

to the central competent authority for compliance certification. At the same time to meet the following requirements, the central competent authority may grant clearances of the same engine family:

1. Same motorcycle models as previous year.
2. Same affect emissions pollution items compare with the models of last year.

Article 9 When applicants change engine components or materials and continues to use the original engine family, should apply to the central competent authority for proof of eligibility to modify, and attach modification comparative information of previous and after to demonstrate the impact of emissions from pollution items are the same and have the same emission characteristics, after approval by the central competent authorities to allow the modification of the engine family.

Article 10 Before applicants want to add new models to the same engine family, should apply to the central competent authority for proof of eligibility extension. Applicant should submit new model data to prove that the original engine family with all implications of emissions pollution is the same and has the same characteristics of emission, after granted by central competent authorities, extension of the engine family is approved.

Article 11 Applicants should report carbon monoxide, hydrocarbons, non-methane hydrocarbons, nitrogen oxides, particulate pollutants degradation coefficient of each engine family escalation; the deterioration factors should follow provisions of appendix 5.

Article 12 Motorcycles with production permission shall comply with the following provisions:

1. Each production motorcycle model should be qualified to prove that all of the emission of air pollutants items and emission control systems, components, must be consistent with the information contained in the application of conformity.
2. Applicants provide distributors, resellers, service units (including maintenance, service, repair plants, stations), and any manuals and instructions related to application, repair, adjustment of emission control system to use, maintenance or testing, should match the information when applied for eligibility.
3. The applicant shall conduct new vehicle's Conformity of Production (COP) and in-use vehicle's OBD In-Use Performance Ratio (IUPR) tests in accordance with Appendix 5.1. If any motorcycles failed to meet the Emission Standards for the Conformity of Production tests or failed to comply with the OBD IUPR relevant requirements, the causes for the fail to meet the Emission Standards or fail to comply with the OBD IUPR requirements should be explained within 30 days along with appropriate corrective measures and a copy of in conformity validation test report. The schedule for submitting the statistical analysis for COP tests and the OBD IUPR information shall be handled according to the following provisions:

- 3.1. New vehicle: The applicant shall send the vehicle model's production number and sales information and the statistical analysis data of previous month conducted Conformity of Production tests to the central competent authority before 20th of each month for future reference.
- 3.2. In-use vehicle: The applicant shall send the information in accordance with the following provisions to the central competent authority for future reference and the central competent authority may conduct random selective validations:
 - 3.2.1. The applicant shall submit all vehicles' in-use maintenance and repair information for previous year before June 30th of each year.
 - 3.2.2. For an engine family with annual sales over 1,000 units and its OBD system is classified as OBD Stage II-A or OBD Stage II-B, the applicant shall submit its all sold vehicles' OBD IUPR information for each calendar year within 18 months after the end of that calendar year.
4. Applicants shall cooperate with and assist in the conduct of competent authorities to check, test, and provide relevant information on sales of motorcycles, including engine family, model name, model year, license plate number, vehicle number, engine number, owners name, phone, address and other documents.

Applicants who violate the provisions of the preceding paragraph, central competent authority may increase the number of sample testing of new motorcycles, suspend the applicant's verification and authorization process, Certificate of Conformity application or in accordance with Article 7 to cancel or revoke the applicant's Certificate of Conformity.

Article 13 Central Competent Authority sample tests new motorcycles that have been certified; sample testing follows Annex 6 regulations, fails to meet central competent authority to complete new motorcycle sample testing, central competent authority may suspend verification. New motorcycle sampling test results fail central authorities, should be repealed qualified proof of the engine family, applicants shall recall and correct follow provisions of Appendix 4.

Article 14 Motorcycles not taken model year and engine family as the basic unit apply for compliance certification by applicants, each motorcycle should submit following documents to the central competent authority for compliance certification:

1. Application forms
2. Motorcycle import and duty (exemption) certificate issued by customs.
3. Motorcycles tested by organizations designated by central competent authority, test reports meet emission standards of Article 6 (deterioration coefficients of carbon monoxide, hydrocarbons, non-methane hydrocarbons, nitrogen oxides, particulate pollutants are deterioration coefficients specified, according to the provisions of Appendix 5).

4. Motorcycles inspected by organizations designated by central competent authority, if motorcycles do not install evaporative emission control system or components, or evaporative emission control system or components cannot function effectively, with the danger of pollution, should attach emissions compliance test reports Article 7 by organizations designated by the central competent authority.

All the documents in this paragraph, applicants submitted through electronic file information reporting system and documents have been completed and complied electron transport operations with verification of central competent authority are exempt from inspection.

Article 15 Used motorcycles from foreign countries, each motorcycle should submit following documents to the central competent authority for compliance certification:

1. Application forms.
2. Motorcycle import and duty (exemption) certificate issued by customs.
3. Motorcycles tested by organizations designated by central competent authority, test reports meet emission standards of Article 6 (deterioration coefficient of carbon monoxide, hydrocarbons, non-methane hydrocarbons, nitrogen oxides, particulate pollutants are deterioration coefficients specified, according to provisions of Appendix 5).
4. Motorcycles inspected by organizations designated by central competent authority, if motorcycles do not install evaporative emission control system or components, or evaporative emission control system or components cannot function effectively, with danger of pollution, should attach emissions compliance test reports Article 7 by organizations designated by central competent authority.

All the documents in this paragraph, submitted through electronic file information reporting system said documents have been completed and complies the electron transport operations with verification of central competent authority are exempt from inspection.

Article 16 Applicants with annual internal combustion engine new motorcycle sales amount more than ten thousands, since 2017 shall be in accordance with the ratio prescribed in Article 6 of emission standards, must manufacture or import motorcycles with idle-stop function, hybrid motors or electrical motors; calculation of ratio to the nearest whole number.

If applicants sell domestic and imported motorcycles simultaneously, domestic and imported motorcycle quantity can be merged or separated to calculate the ratio.

If applicant is less than the ratio of the first paragraph, in addition to idle-stop function and hybrid electric motor motorcycles compliance

certification, central competent authority may suspend the issuance of other motorcycle certifications.

- Article 17 Motorcycle emission test methods and procedures, motorcycle evaporative emission testing methods and procedures, motorcycle endurance test methods and procedures qualification certification are defined by central competent authority separately.
- Article 18 Central competent authority may delegate authority (organization) to handle the examination and certification of new motorcycles and sample testing related matters.
- Article 19 These measures start on date of promulgation.

Appendix 1 Selection of Test Vehicle and Comparable Table between Relevant Vehicle Testing Regulations and their Revisions

1. The vehicles that being selected for vehicle testing shall be representative of the said engine family; the principles of test vehicle selection are as follows:
 - 1.1. From the said engine family, the vehicle models expected to have the greatest quantity of emissions shall be selected for the exhaust emissions test; the vehicle with the greatest loaded vehicle weight (including optional devices) shall be selected; when different vehicle models have the same loading weight, through their dynamometer setting data, the vehicle model with the greatest road resistance shall be selected; if their road resistances are the same, the largest engine capacity size shall be selected; if their engine capacity sizes are identical, the vehicle with greatest total gear ratio numbers (including overdrive device [OD]) shall be selected.
 - 1.2. If the central competent authority thinks the test vehicle selected by the applicant is no longer emissions representative for the said engine family, the central competent authority may add other designate vehicle model in the said engine family as the test vehicle.
 - 1.3. From the said engine family, select one vehicle of the vehicle model expected to have the highest evaporative emission value; if unable to ascertain which vehicle model would be expected to have the highest evaporative emission value, select the representative vehicle model by considering the set up conditions and materials used for the fueling system.
 - 1.4. The selected vehicles for the testing shall be complete assembled and in ready condition for normal operation.
 - 1.5. Vehicles of the same engine family but were being manufactured in or imported from different countries shall be individually selected for testing.
2. Emissions testing:
 - 2.1. The applicant shall provide information of the test vehicle such as: its specifications, maximum speed (with the original official documentation), basic engine information, power system, fuel supply system, transmission system, description and schematic diagram of the exhaust emissions control system and its location, emissions related adjustable parameters and their suggested setting values, photos of the test vehicle and its emissions control system etc..
 - 2.2. The vehicle shall be in normal condition when performing the emission tests and shall be conducted in accordance with Article 6 and Article 7 of the Vehicular Air Pollutant Emission Standards and the evaporative emission test methods and procedures for motorcycles.
 - 2.3. Motorcycle with manual on-off switch for Idling Stop function, when conducting its emission tests, the Idling Stop switch shall be in on position; hybrid electric

motorcycle with manual switch for different power operation modes, its emission tests shall be conducted under hybrid operation mode.

- 2.4. The deterioration factors of the said engine family shall be multiplied to the results of all the new vehicle tests which include new vehicle type approval certification test; conformity of production test; and confirmatory selective test; but exclude evaporative test. The being multiplied values shall be provided as basis for determining whether or not the engine family complies with the emission standards.
- 2.5. The applicant shall specify the minimum break-in mileage for each engine family to reach a stable condition for the emission test. But for the new vehicle emission test, the break-in accumulation mileage shall not exceed 1,500 kilometers.
- 2.6. With consent of the central competent authority, the imported motorcycle manufacturer authorized representative may commission foreign inspection and testing laboratory that owned by the manufacturer to perform OBD tests, and the applicant is responsible for all the relevant fees.

Appendix 2 Required documents and stipulations when applying for the Certificate of Conformity

1. When applying for the Certificate of Conformity, the following documents shall be provided:
 - 1.1. Application letter (to be completed in standard format).
 - 1.2. Draft of motorcycle model emissions Certificate of Conformity (to be completed in standard format).
 - 1.3. Authorization documents provided by foreign vehicle manufacturer to the designated representative. The authorization documents shall endow the domestic representative with full authority to represent the said motorcycle manufacturer, and bear the same responsibilities.
 - 1.4. A letter of guarantee for compliance with emissions standards, durability requirements and not installed with any defeat devices. If the defeat device is being used under any of the following conditions shall be excluded:
 - 1.4.1. The device has necessary functions to protecting the motorcycle against damages or accidents.
 - 1.4.2. The device does not function beyond the requirements of engine start and warm up duration.
 - 1.4.3. The operation conditions with this device installed during regulatory testing procedures and being validated and determined as in compliance.
 - 1.5. Quality control plan for mass-production motorcycle's emissions control; the plan shall comply with the following provisions:
 - 1.5.1. The Conformity of Production tests shall be conducted by the central competent authority accredited inspection and testing organization;
 - 1.5.2. The quality control plan shall include the following contents:
 - 1.5.2.1. Self-conducted random selection COP testing method.
 - 1.5.2.2. Ratio of test vehicles to be selected.
 - 1.5.2.3. Test items: the minimum test items shall include driving cycle testing, idle testing, and On Board Diagnostic (OBD) system circuit continuity testing.
 - 1.5.2.4. Identification code inspection for emissions control devices.
 - 1.5.2.5. OBD IUPR monitor (for OBD family being categorized as OBD Stage II-A or OBD Stage II-B).
 - 1.5.2.6. Name of organization to perform the tests.

- 1.5.2.7. Instruments and equipment (instruments and equipment are not belong to the central competent authority accredited inspection and testing organization, shall be provided with copies of their periodic calibration reports).
- 1.5.2.8. Test results and a complete record of the test.
- 1.5.2.9. Allocation information of personnel to implementing the quality control plan;
- 1.5.2.10. Plan implementation flowchart;
- 1.5.2.11. Proposals for issues improvements;
- 1.5.2.12. Other supplemental explanations.
- 1.6. General information of applicant and engine family (see Table A).
- 1.7. All motorcycle models covered by the engine family and their estimated annual sales (see Table B).
- 1.8. Specifications and identification methods for all motorcycle models in the engine family (see Table C), for idling stop, hybrid electric and pure electric motorcycles the previously mentioned information shall be indicated with the model name.
- 1.9. Basic engine information include combustion cycle, cylinder configuration, cylinder numbers, engine capacity, cooling method, air supply method, fuel supply method etc. (see Table D).
- 1.10. Transmission and gear shifting system information (see Table E).
- 1.11. Emissions control system description and schematic diagram (see Table F).
- 1.12. Location of emissions control system in vehicle, and a list of identification code part numbers for its related components (see Table G)
- 1.13. Emissions related adjustable parameters and their suggested setting values (see Table H).
- 1.14. Documents that being provided for owners such as Chinese version of owner's manual, warranty certificate and emissions label to be affixed to the motorcycle (see Table I). The stipulations for owner's manual and emissions label to be affixed are as follows:
 - 1.14.1. Owner's manual:
 - 1.14.1.1. The applicant shall provide owner a Chinese version of owner's manual as maintenance guide for normal operation and to ensure the emissions control system can function normally, and state the expiration date of warranty for the emissions control system. The contents of owner's manual shall include the following information:
 - a. Specifications of motorcycle;
 - b. Operation method;

- c. Fuel to be used and its Octane number;
 - d. Warranty coverage items, period/ mileage;
 - e. Maintenance and repair items, schedule/mileage;
 - f. Address and telephone number of maintenance workshop and stations;
 - g. Inform owner to cooperate with the competent authority to conduct necessary investigation tests.
- 1.14.1.2. The stipulations on the maintenance items related to the emissions control system and its components being listed in the owner's manual is detail described in the remark of Table I.
- 1.14.2. Emissions label to be affixed:
- 1.14.2.1. The applicant shall produce at least one long-lasting and easily identifiable label and affix it to the vehicle in a readily visible place (illustrated the affix location).
 - 1.14.2.2. Be attached in such a manner that it cannot be removed without destroying or defacing the label.
 - 1.14.2.3. For the applicant already has obtained the emissions Certificate of Conformity must affix a Chinese version emissions label to the motorcycle before sell. The emissions label must contain the following information:
 - a. The heading is Vehicle Emission Control Information:
 - b. The full company name, make and trademark of the manufacturer;
 - c. Engine family, engine capacity, onboard diagnostic system (OBD I, OBD Stage II -A or OBD Stage II-B);
 - d. Engine optimal tune up specifications and adjustments, within which shall include idle speed and other necessary parameters suggested by the manufacturer;
 - e. Identification codes for the emissions control devices (refer to stipulations in Article 2 of the Management Regulations for Mobile Source Air Pollution Control Devices);
 - f. Shall state that this engine family comply with the emissions standards effective on ROC calendar ○○ month, ○○ date, ○○ year (to be filled according to the engine family applicable emission standards' implementation date), and the user or owner is not allowed to remove or to replace with the air pollutant control devices not being accredited by the central competent authority.
- 1.15. Summary of the emissions test record for new vehicle model certification testing and the individual deterioration factor for hydrocarbons, carbon monoxide and nitrogen oxides (see Table J).
- 1.16. New vehicle model certification test report and approval information for the durability test (see Table K).
- 1.17. When applying for carry forward the model year's Certificate of Conformity, vehicle configuration modification or the extension of Certificate of Conformity to new vehicle types, in addition to providing relevant information in accordance with this

Regulation (if the application information is identical to the previous one, the central competent authority filed information may be referenced), a listing of each amendment amended items, date of amendment, and summary of amendment contents also must be reported (see Table L).

- 1.18. Photo of the test vehicle.
- 1.19. For motorcycles not only powered by an internal combustion engine (such as hybrid electric motorcycle), need to provide the following descriptions:
 - 1.19.1. Verification and description of vehicle type;
 - 1.19.2. Function of power operation mode switch;
 - 1.19.3. Energy storage device description and warranty duration or mileage;
 - 1.19.4. Power mechanic system;
 - 1.19.5. Control unit;
 - 1.19.6. Power control device;
 - 1.19.7. Pure electric vehicle maximum driving range;
 - 1.19.8. Suggestion items from vehicle manufacturer.
- 1.20. The Engine Control Units must be remarked with name of its software, version, identification method and software recognition screen displayed on the OBD scanner.
- 1.21. For motorcycle with manual switchable idling stop device, must conduct additional test with idling stop function switched off, the test report can be provided as evidence to prove its compliance with the emissions standards; for hybrid electric motorcycle with manual switchable power operation mode, if it contains pure internal combustion engine mode, it must conduct additional test under pure internal combustion engine mode and the test report can be provided as evidence to prove its compliance with the emissions standards.
- 1.22. For motorcycle with Onboard Diagnostic System (OBD), must provide relevant documents to prove its compliance with provisions stipulated in this Regulation, the contents of the document are as follows:
 - 1.22.1. Name of OBD family;
 - 1.22.2. Description of OBD system;
 - 1.22.3. Description or annotated drawing of the Malfunction Indication Light (MIL) used in the OBD system;
 - 1.22.4. Description of all emissions control devices and related components / systems monitored by OBD, as well as a list of malfunction codes and related computer code format and contents;

- 1.22.5 Description or flowchart of the actuation principle for the OBD monitoring devices (including monitoring strategy, malfunction indicator standards and MIL light on timing etc.);
- 1.22.6. OBD test report;
- 1.22.7. Description of adopted solutions or strategies to prevent arbitrary adjustment or modification of the Engine Control Units (ECU);
- 1.22.8. Location description of the OBD connector (DLC);
- 1.22.9. Other designated documents by the central competent authority.
2. Other binding matters:
 - 2.1. The name of vehicle model recorded in the Certificate of Conformity shall include sale name, imported vehicle model name; the sale name shall be identical to the name being used in overseas; the same vehicle model with identical model year, manufactured and imported from the same area, only one emissions Certificate of Conformity is allowed for application. If the applicant is not a domestic vehicle manufacturer, nor a local representative authorized by foreign vehicle manufacturer, the application documents shall be filled out based on owner's manual, technical manual, or product catalog of the original manufacturer and the original owner's manual or product catalog shall be attached to the application. If the previously mentioned manual or catalog cannot be obtained the attachment shall be remarked as N/A. However, the application engine family is limited to a single vehicle model. Relevant emissions tests shall be performed by the accredited inspection and testing organization designated by the central competent authority; the provision of certification extension of this Regulation is not applicable in this case.
 - 2.2. To cooperate with electronic application process requirements, the application information being filled out and documents provided by the applicant shall be in the form of electronic files.
3. Forms to be filled out:

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table A
			Page	Date
			Revision No.	Revision Date

GENERAL INFORMATION

1. Manufacturer : _____
Authorized Representative
2. Make : _____
3. Engine family : _____
4. Model year : _____
5. Origin of Manufacture/Importation Country : _____
(According to the Customs issued Import Certificate)
6. The Certificate of Conformity shall be issued to the : _____
following company
(full address)
7. Contact Name, Address and Phone number for all : _____
contacts
(Include domestic and foreign contacts)
8. In accordance with this regulation, the following : _____
items shall be described individually (and with
signature of the authorized representative)
- 8.1. This vehicle conforms to this regulation
- 8.2. Commitment to Owners See Warranty
- 8.3. EPA may inspect the testing equipment Plan See Quality Control
- 8.4. Authorized Representative in Taiwan See
- 8.5. Tests already being conducted in accordance with this regulation See Table J

Remarks :

The engine family name designation shall include engine displacement (take integer number and the discrepancy shall not exceed 10 cm³ from real value) and must end with model year (e.g. G125...-15). No more than 12 characters shall be used for the identification code. The first position shall indicate type of fuel G=gasoline, D=diesel, L=LPG.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table B
			Page	Date
			Revision No.	Revision Date

Additional Information

1. The applicant hereby states that the motorcycles included in this engine family are stabilized and representative for emission data testing at a minimum mileage of _____ kilometers.
2. Contact name and address to whom the EPA can send information regarding the Random Selective Confirmatory Test.

Motorcycle model configuration	Estimated sales(units) in Taiwan R.O.C.	Maximum engine power		
		kW	rpm	Test method
Total units				

3. Attached vehicle configuration information:

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table C
			Page	Date
			Revision No.	Revision Date

Motorcycle model sale designation	Basic engine designation	Emission control system designation	Transmission system designation	Reference mass(kg)	Motorcycle Model configuration

Remarks :

Use the following abbreviated names for the related emission control devices:

PMP = Air pump for air injection

PLS = Pulsating air injection system

EGR = Exhaust Gas Recirculation

THM = Thermal Reactor

OXD = Oxidation Catalyst

RED = Reduction Catalyst

3CL = Three-Way Catalyst, Closed Loop

3WY = Three-Way Catalyst

CAN = Charcoal Canister

RET = Retardation system (such as dashpot, throttle opener etc.)

OTR = Other devices

For example, OXD EGR PMP 3CL CAN-1, and OXD EGR PMP 3CL CAN-2

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table D
			Page	Date
			Revision No.	Revision Date

Basic Engine Information

1. Basic engine designation _____
2. Combustion cycle (two-stroke or four-stroke) _____
3. Cylinder block configuration (V type, Vertical, Horizontal) _____
4. Number of cylinders _____
5. Cooling system type (air-cooled or water-cooled) _____
6. Locations of intake valves and exhaust valves (4-stroke) _____
- 6.1. Number of valves per cylinder, intake/exhaust _____
7. Locations of scavenge ports and exhaust ports (2-stroke) _____
- 7.1. Number of valves per cylinder, intake/exhaust _____
8. Method of air aspiration (natural/supercharged) _____
9. Fuel supply method (carburetor, indirect injection, direct injection) _____
10. Bore size (mm) _____
11. Stroke (mm) _____
12. Displacement (cm³) _____
13. Compression ratio (normal value) _____
14. Valve timing (crankshaft degrees) or scavenge exhaust timing _____
- 14.1. Open: Scavenge/Exhaust _____
- 14.2. Close: Scavenge /Exhaust _____
- 14.3. Maximum lift (mm) _____
15. Ignition timing _____
16. Intercooler ☐Yes ☐No

Remark:

Separate information shall be filled out for each basic engine in the engine family. If the information is identical, reference can be made to the assigned one.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table E
			Page	Date
			Revision No.	Revision Date

Transmission System Information

1. Transmission system designation _____
2. Type of gearbox (manual/automatic) _____
3. Number of gears _____
4. Gear shift pattern (e.g. sequential, international···) _____
5. Driving method _____
6. Tire sizes
- 6.1. Standard Front Rear
- 6.2. Optional Front Rear
7. Final drive ratio
- 7.1. First speed reduction ratio _____
- 7.2. Second speed reduction ratio _____
- 7.3. Overall speed reduction ratio (Top gear) _____
8. Gear ratios
- 8.1. Gear No. 1 _____
- 8.2. Gear No. 2 _____
- 8.3. Gear No. 3 _____
- 8.4. Gear No. 4 _____
- 8.5. Gear No. 5 _____
- 8.6. Gear No. 6 _____

Remark:

Separate forms are required for each transmission system.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table F
			Page	Date
			Revision No.	Revision Date

Description of emission control system

1. Emission control system designation _____
2. Exhaust emissions control system
 - 2.1. Fuel and air supply system
 - 2.1.1. Make and Type designation _____
 - 2.1.2. Configuration and operation method
 - 2.1.2.1. Fuel tank filler port location limitation See Table F Page ____
 - 2.1.2.2. Fuel measuring system, instantaneous rich fueling system, idling stop device configuration, start and warm up rich fueling and hot vehicle idling compensation system, intake manifold and intake air temperature control system. See Table F Page ____
 - 2.2. Ignition system
 - 2.2.1. Make and type designation, Configuration _____
 - 2.2.2. Configuration and operation method See Table F Page ____

Remark:

Separate forms are required for each emission control system.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table F
			Page	Date
			Revision No.	Revision Date

Description of emission control system (continue)

2.3. Indicate parts that are included in the exhaust emission control system

- ☐ Evaporative
Charcoal Canister
- ☐ Evaporative
Emission Control
Valve
- ☐ Deceleration
Control Device
- ☐ Oxygen Sensor
- ☐ Oxidation Catalytic
Converter
- ☐ Reduction Catalytic
Converter
- ☐ Three-Way
Catalytic
Converter
- ☐ Secondary Air
Injection Pump
- ☐ Secondary Air
Injection Control
Valve
- ☐ Secondary Air
Injection Check
Valve
- ☐ Exhaust Gas
Recirculation
- ☐ Electronic Control
Unit
- ☐ Others

2.4. Configuration and operation method

2.4.1. Emissions related Data for each part

3. Crankcase Emissions Control System

3.1. Configuration and operation method

4. Evaporative Emissions Control System

4.1. Name of Evaporative Emissions Control System

4.2. Configuration and operation method

See Table F Page _____

See Table F Page _____

See Table F Page _____

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table G
			Page	Date
			Revision No.	Revision Date

Location of Emissions Control System in Vehicle

1. Emission Control System Designation _____

2. Configuration of Motorcycle Model _____

3. Using photograph or other methods to show the locations of emissions control parts in the vehicle

The photograph shall have a description in a readily visible location to describe the names of motorcycle configuration and emissions control system. Parts shall be labeled by using numbers or letters consistent with the record in the part identification list.

Parts that could not be installed in the engine compartment, their locations shall also be indicated.

See Table G Page _____

4. Vacuum line layout schematic drawing

See Table G Page _____

5. Part identification list (production parts). The name and identification code on each emission related parts shall be identical with the list in Table F

The information shall include numbers or letters according to the requirements of paragraph 03, and the location of each part could be identified in the photograph.

See Table G Page _____

Remark:

Separate forms are required for each emission control system

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table H
			Page	Date
			Revision No.	Revision Date

Adjustable parameters and their suggested setting values

1. Configuration of motorcycle model _____
2. Lists the emissions related and practically adjustable parameters (include parameters that is difficult to approach) See Table H Page _____
3. The suggested setting values and their tolerance for easy to approach and adjustable parameters. See Table H Page _____
4. The production tolerance setting ranges for adjustable parameters that difficult to access due to the installation of modification prevention devices. See Table H Page _____
5. Describe measures that were being adopted to limit or prevent arbitrary approach the emissions related adjustable parameters. See Table H Page _____

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table I
			Page	Date
			Revision No.	Revision Date

Provide emissions related vehicle owner's manual

1. Configuration of Motorcycle Model _____
2. Start instruction See Table I Page _____
3. How to use gear shifting device See Table I Page _____
4. Recommended fuel to be used _____
5. Recommended tire pressure _____
6. Other emissions related operation manual to ensure the effective of emissions control system. See Table I Page _____
7. Emissions related maintenance manual (include vehicle delivery preparations and maintenance schedule) to ensure the operation of vehicle comply with applicable emission standards. See Table I Page _____
8. Provides copy of owner's Warranty according to the stipulation of this regulation. See Table I Page _____
9. Provides copy of Emission Control label (in Chinese) to be affixed to a readily visible location of motorcycle according to the stipulations of this regulation. See Table I Page _____
10. Owner's manual in Chinese version. See Table I Page _____

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table J
			Page	Date
			Revision No.	Revision Date

Testing Data and summary of deterioration data

1. Emissions Data

(Form that applicable to emission standards effective before Jan. 1, 2017)

Test report number	Motorcycle Model Configuration	Test results after multiplied or added by deterioration factors				Evaporative test	Idle test		Smoke test
		CO g/km	HC g/km	NOx g/km	HC+NOx g/km	HC g/test	CO %	HC ppm	%
Limits									

Remark : The smoke test will not be implemented before the central competent authority announces its testing procedures.

(Form that applicable to emission standards effective on and after Jan. 1, 2017)

Test report number	Motor-cy cle Model Configu- ration	Exhaust emission test results after being processed with deterioration factors					Evaporative test results after being processed with deterioration factor	Idle test		Smoke test
		CO mg/km	THC mg/km	NMHC mg/km	NOx mg/km	PM mg/km	HC mg/test	CO %	HC ppm	%
Limits										

Remark : The smoke test will not be implemented before the central competent authority announces its testing procedures.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table J
			Page	Date
			Revision No.	Revision Date

Testing Data and summary of deterioration data (continue)

2. Deterioration factors

(Exhaust emission test)

Test vehicle number	Motorcycle Model Configuration	Deterioration Factor				
		CO	HC	NMHC	NOx	PM

Remark :

- ☐ The deterioration factors are calculated from test results in accordance with the “Durability Test Methods and Procedures for Motorcycles”.
- ☐ The deterioration factors are using assigned deterioration factors.
- ☐ The deterioration factors are calculated or converted by using original manufacturer’s durability test results.

(Evaporative emissions test)

Test vehicle number	Motorcycle Model Configuration	Deterioration Factor HC
		(mg/test)

Remark :

- ☐ Using new evaporative emissions control device for the test.
- ☐ Using aged evaporative emissions control device for the test.

3. Onboard Diagnostic System Test Results

Test Vehicle Number	Test Item	Simulated Malfunction Emission Test Results					Mal-function Code (DTC)	Mal-function Indicator light on?	Test results need to be multiplied by DFs?
		CO (mg/km)	THC (mg/km)	NMHC (mg/km)	NOx (mg/km)	PM (mg/km)			
Limits									

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table K
			Page	Date
			Revision No.	Revision Date

Emissions test report and Deterioration Factors Agreement Letter

1. Emissions test data

According to this regulation, the test report for the selected testing motorcycle shall contain the following information:

- 1.1. Test number and test date
- 1.2. Test vehicle identification (motorcycle configuration, test vehicle number, vehicle body number, engine number, mileage)
- 1.3. Settings for emissions related engine parts
- 1.4. Idling test emissions test results
- 1.5. Pre-adjustment method
- 1.6. Operation of gear shifting device
- 1.7. Testing conditions (inertia, road resistance, tire pressure, tire brand)
- 1.8. Test ambient conditions (atmospheric pressure, temperature)
- 1.9. Driving cycle emissions test results
- 1.10. Evaporative test results
- 1.11. Crankcase test results

See Table K Page ____

2. Deterioration Factors Agreement Letter

- 2.1. Central competent authority approved
Deterioration Factors Agreement Letter

See Table K Page ____

Remark:

When the gear shifting pattern being used is different from the one that stipulated in the regulation, must be approved in advance by the central competent authority.

Execution Yuan Environmental Protection Administration	Certificate of Conformity Application Form	Engine Family	Pages	Table L
			Page	Date
			Revision No.	Revision Date

Revision number	Revision date	Attachment/Pages	Description of revision

Revised Items List

Appendix 3 Onboard Diagnostic System (OBD) regulations

1. Terms used in these regulations are defined as follows:
 - 1.1. Malfunction: A situation in which the deterioration or ineffectiveness of a vehicle's air pollution control equipment and related components leads to non-compliance with the OBD control standards.
 - 1.2. Malfunction simulation: The use of air pollution control equipment and related components in a state of deterioration or ineffectiveness, or the use of electronic simulation equipment to simulate a malfunction of the equipment or component for the said testing item.
 - 1.3. Malfunction indicator: Illuminates a warning light to alert the driver that the OBD system has detected a malfunction of related equipment or components.
 - 1.4. Continuous Monitoring: Monitoring the loop circuit's continuity (such as deficiencies in circuit continuity, circuit malfunction, and values exceeding normal operating ranges).
 - 1.5. Driving cycle: The driving procedure needed for the OBD to perform one complete diagnostic on the air pollution control equipment and related components, including starting and operating the engine, turning the engine off after driving for a certain period of time, and allowing sufficient time for the engine to remain inactive before the next startup; the malfunctions that occur during the driving cycle procedure shall be diagnosed.
 - 1.6. Warm-up cycle: The cycle whereby the vehicle is kept operating for a sufficient period of time to allow the cooling water has reached a manufacturer recommended normal operation temperature.
2. According to Article 6 and start from the effective date of the Emission Standards, motorcycles shall be equipped with appropriate OBD system to monitoring and identifying the deterioration, malfunction and malfunction type of emissions related control equipment or components within their useful life.
3. OBE control thresholds are stipulated as follows:

When the deterioration or malfunction of the emissions control equipment and its related components has caused the emissions values exceed the following OBD threshold values (must not exceed more than 20%), the OBD system shall be able to display the deficiency status of the emissions control equipment and its related components.

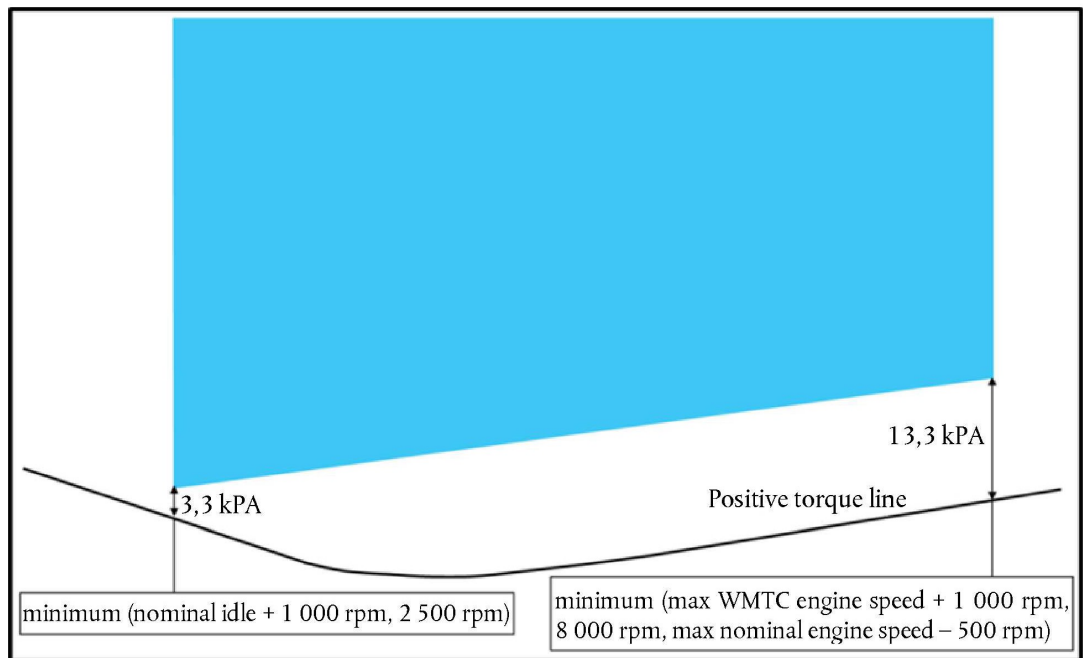
Conduct the Driving Cycle tests in accordance with the regulation of "Exhaust Emissions Test Methods and Procedures for Motorcycles", the OBD control thresholds are as follows:

- 3.1. For motorcycles being classified as OBD Stage I and OBD Stage II-A

- 3.1.1. For motorcycles with maximum speed less than 130 km/h:
 OBD thresholds for Carbon Monoxide (CO): 2170 mg/km; Hydrocarbons (THC): 1400 mg/km; Nitrogen Oxides (NOx): 350 mg/km.
- 3.1.2. For motorcycles with maximum speed equal to or above 130 km/h:
 OBD thresholds for Carbon Monoxide (CO): 2170 mg/km; Hydrocarbons (THC): 630 mg/km; Nitrogen Oxides (NOx): 450 mg/km.
- 3.2. For motorcycles being classified as OBD Stage II-B
 OBD thresholds for Carbon Monoxide (CO): 1900 mg/km; Non-Methane Hydrocarbons (NMHC): 250 mg/km; Nitrogen Oxides (NOx): 300 mg/km; Particulate Matter (PM): 50 mg/km (the PM standards only applicable to vehicles with direct injection engines).
- 3.3. For motorcycles applicable to the Emission Standards effective on Jan. 1, 2017:
 OBD thresholds shall be in accordance with stipulations for OBD Stage I.
- 3.4. For motorcycles applicable to the Emission Standards effective on Jan. 1, 2021:
 OBD thresholds shall be in accordance with stipulations for OBD Stage I, OBD Stage II-A or OBD Stage II-B.
4. The scope and items of the OBD diagnostic shall comply with the following stipulations:
 - 4.1. Catalytic Converter — Before the deterioration or malfunction of catalytic converter is causing THC (or NMHC) and NOx emissions exceed their threshold values, OBD shall be able to diagnose the malfunction status (this item is applicable for the OBD system being classified as OBD Stage II-B).
 - 4.2. Engine Misfire — Before the engine misfire is causing any pollutant's emission value exceeds its OBD threshold; Or causing damages to the catalytic converter, the OBD system shall be able to diagnose the malfunction status (this item is applicable for the OBD system being classified as OBD Stage II-A or OBD Stage II-B)

 The engine operation area for misfire detection shall be enclosed by the following lines:
 - 4.2.1. Low speed limit: 2500 rpm or normal idle speed + 1000 rpm, choose whichever is lower.
 - 4.2.2. High speed limit: 8000 rpm, the highest speed during the driving cycle test + 1000 rpm, or the maximum designed engine speed – 500 rpm, choose whichever is the lowest.
 - 4.2.3. Line connected by the following operation points: the point on the paragraph 4.2.1 defined line of low speed limit and with a 3.3 kPa intake manifold

vacuum lower than the positive torque line of the engine and the point on the paragraph 4.2.2 defined line of high speed limit and with a 13.3 kPa intake manifold vacuum lower than the positive torque line of the engine.



- 4.3. Oxygen Sensor— Before the malfunction of oxygen sensor is causing any pollutant's emission value exceeds its OBD thresholds; The OBD system shall be able to diagnose the malfunction status (this item is applicable for the OBD system being classified as OBD Stage II-A or OBD Stage II-B).
- 4.4. Electronic evaporative emission purge control device shall be monitored at least on its circuit continuity.
- 4.5. Before the deterioration or malfunction of direct injection engine is causing PM pollutant's emission value exceeds its OBD thresholds, the OBD system shall be able to diagnose the malfunction status.
- 4.6. Before the deterioration or malfunction of other emissions control system, components that being connected to ECU, and the emissions related power components or system is causing any pollutant's emission value exceeds its OBD thresholds, the OBD system shall be able to diagnose the malfunction status.
- 4.7. For the emissions related or functional safety related electronic power components that being connected to ECU, including performing monitoring functionality related sensors, the circuit malfunction shall be monitored, especially the continuously malfunction monitoring shall be performed on their circuit continuity, short circuit, power range or performance, and the signal of emission control system.

- 4.8. For the emissions related or functional safety related electronic power components that being connected to ECU that being triggered into the limp-home operation mode and causing significant engine torque reduction, the related malfunction code must be stored.
- 4.9. If the manufacturer can prove to the central competent authority that for some specific component or system, even in malfunction condition or being removed will not cause emission values exceed the OBD thresholds, then that specific component or system need not to be monitored.
- 4.10. Under the consideration of manufacturer and to assist technician to perform repairs on vehicle effectively, the manufacturer may extend its OBD system monitoring and reporting to other on-board systems, the extended diagnostic system is not included in the scope of this appendix.
5. The OBD system shall comply with the following requirements:
 - 5.1. The OBD system must be able to monitoring emission-related equipment and components and must perform periodical monitoring assessments. The diagnostic check must be performed at each engine start. As to the frequency requirement, at least one OBD monitoring assessment must be completed for each drive cycle.
 - 5.2. The vehicle must be equipped with OBD Malfunction Indicator Light (MIL), functionality of diagnostic trouble code (DTC) storage, and access the DTC via a data link connector. The performing of vehicle checking, diagnosis, maintenance, or repairs, must not limit the usage of the OBD system, and the OBD system shall be standardized.
 - 5.3. The OBD must perform assessment monitoring on the emissions related systems or components of the vehicle except under the following conditions: may causing air pollution control equipment and related components damages; with safety concerns; and while the power take-off units are running.
 - 5.4. If the OBD function of monitoring is affected by low fuel level (lower than 20%) or by too low voltage, the manufacturer may temporarily shut down the OBD system.
 - 5.5. If the manufacturer can provides information or engineering assessment as evidence to the central competent authority that when ambient temperature is lower than 266.2 K (- 7 °C) , at an elevations above 2500 meters above sea level or under other ambient temperature, the OBD monitoring function becomes unreliable, may temporarily shut down the OBD system.
 - 5.6. If the manufacturer can provide evidence to the central competent authority that when low percentage of engine misfire detection is causing unreliable for OBD monitoring, the manufacturer may adopt higher misfire percentage as OBD monitoring criteria.

- 5.7. If the manufacturer can provide evidence to the central competent authority that it is impossible to conduct OBD monitoring with higher percentage of engine misfire, or unable to distinguish engine misfire from other causes (such as rugged road condition, gear shifting etc.), may temporarily shut down the function of OBD engine misfire monitoring.
6. Malfunction Indicator Light and Fault Code related Stipulations:
- 6.1. The OBD system must be equipped with malfunction indicator light (MIL) in a location readily visible to the driver, except for engine start-up and limp-home indication, the MIL must not be displayed for other purpose, and it must be with sufficient brightness and easy to identify. When the MIL is on, it must display a symbol in accordance with the stipulation of F.01 of ISO 2575:2010 standard for symbols. Vehicles must not be equipped with more than one general purpose MLI to indicate emissions related problems or obvious torque reduction caused by malfunction of the power system; however, other special purpose warning lights (such as brake system, seat belts, oil pressure, etc.) are not subject to this restriction, and the red light must not be used for MIL.
- 6.2. If more than twice pre-conditioning drive cycles are needed to illuminate the MIL, then the manufacturer must provide information or engineering assessments as evidence to prove that this kind of monitoring system can effectively and immediately detect deterioration of components, but not more than ten pre-conditioning drive cycles is allowed. When the operation of power control device enters into default mode and causing significant reduction of engine torque or the emissions values exceed control thresholds or the OBD system cannot achieve its basic monitoring requirements, then the MIL must be turned on.
- 6.3. When engine misfire occurs and may cause damages on catalytic converter, the MIL must be displayed in an obvious warning mode (such as blinking).
- 6.4. . Before engine cranking, the MLI must flash briefly when the ignition is in "key-on" position and turn off after no malfunctions are detected.
- 6.5. The OBD system must store the diagnostic trouble codes (DTC) to indicate emissions control system related problems or when significant functionality reduction of engine torque and may cause safety issues. If the MIL is illuminated because of the deterioration or malfunction of the emission-related systems, components or the engine enters into default mode and the related DTCs must be stored to confirm the types of malfunction.
- 6.6. When the MIL is illuminated, the mileage information of the vehicle must be accessible through the Serial Port of a standardized Data Link Connector; as to the vehicles equipped with mechanic odometers, the engine operation time may be obtained through the serial port of a standardized Data Link Connector to replace mileage.

- 6.7. If it is clear that a single or multiple cylinders' misfires DTCs are stored, then it is not necessary to indicate which specific cylinder with misfire occurred.
- 6.8. As to other malfunctions, after three consecutive driving cycles, if the monitoring system has stopped malfunction detection or no other malfunctions have been detected, then the MIL shall be turned off.
- 6.9. If the same malfunction is not diagnosed for at least another 40 engine warm-up cycles, the OBD system may erase its stored DTCs, mileage and the freeze-frame engine data.
- 6.10. When the ECU is disconnected from the power source or battery or is in malfunction condition, the OBD system stored DTC data must not be erased.
7. OBD diagnostic trouble code (DTC) related requirements:
 - 7.1. The OBD system must capture and store any monitored, confirmed and with MIL illuminated DTCs. The DTC must be capable to identify each individual malfunctioned equipment, system or component. After the DTCs have been stored, the MIL shall be illuminated.
 - 7.2. When the malfunction of any component or system is detected and confirmed at the first time, a "freeze-frame" of the engine status must be stored in the ECU memory. The engine status data to be stored shall include (but not limited): calculated loading value; engine speed; fuel trim value; fuel pressure; vehicle speed; coolant temperature; intake manifold pressure; operation method for open loop, closed-loop and their corresponding DTCs.
 - 7.3. The manufacturer shall select only one set of data that can provide suitable conditions for effective repairs as the "freeze-frame" data. If additional freeze-frame data may be accessible by using scan tools that comply with the original diagnostic specifications, these data may also be stored.
 - 7.4. If the subsequent fuel trim or misfire faults have occurred, the previous stored freeze-frame data shall be replaced by the engine operating conditions when the fuel trim or misfires malfunction has occurred (whichever occurs first).
 - 7.5. In addition to the necessary freeze-frame data, the following signals shall also be accessible through standard Data Link Connectors which include: DTCs; engine coolant temperature; fuel control system conditions (closed-loop, open-loop or others); fuel trim values; ignition timing advance, intake air temperature; manifold pressure; air flow rate; engine speed; throttle position; sensors output values; secondary air conditions (upstream, downstream or ambient); calculated loading values; vehicle speed; anti-brake lock-down system switch position (on/off); engine start default mode and fuel pressure. The signals shall be provided in units that in accordance with the International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE) and the actual signals shall be clearly segmented from default settings or limp-home signals.

- 7.6. The software identification number and calibration verification number shall be in standardized format and accessible through a standardized serial port of Data Link Connector.
- 7.7. When malfunctions have occurred, if the process of component assessment of OBD system may cause functionality safety issues or malfunction of components, the component assessment requirement may be ignored.
- 7.8. The main control systems of OBD, vehicle testing process related OBD requirements and storage and assess of signals shall be accessible through the serial port of standard Data Link Connectors. The access method for the communication linkage between vehicle and external equipment shall be standardized and not specifically limited and comply with the following ISO standards and SAE requirements.
 - 7.8.1. ISO 9141-2:1994/Amd 1:1996: “Road Vehicles — Diagnostic Systems — Part 2: CARB requirements for interchange of digital information”.
 - 7.8.2. SAE J1850: March 1998 Class B Data Communication Network Interface. Emission related messages shall use the cyclic redundancy check and the three-byte header and not use inter byte separation or checksums.
 - 7.8.3. ISO 14229-3:2012: Road vehicles — Unified diagnostic services (UDS) — Part 3: Unified diagnostic services on CAN implementation.
 - 7.8.4. ISO 14229-4:2012: Road vehicles — Unified diagnostic services (UDS) — Part 4: Unified diagnostic services on FlexRay implementation.
 - 7.8.5. ISO 14230-4:2000: Road Vehicles — Keyword protocol 2000 for diagnostic systems — Part 4: Requirements for emission-related systems.
 - 7.8.6. ISO 15765-4:2011: Road vehicles — Diagnostics on Controller Area Network (CAN) — Part 4: Requirements for emission-related systems’ , dated 1 November 2001.
 - 7.8.7. ISO 22901-2:2011: Road vehicles — Open diagnostic data exchange (ODX) — Part 2: Emissions-related diagnostic data.
 - 7.8.8. ISO 15031-4:2005: Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 4: External test equipment.
 - 7.8.9. ISO 15031-5:2011 Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services.
 - 7.8.10. ISO 15031-6:2010 Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 6:

Diagnostic trouble code definitions relating to emission-related system diagnostic trouble codes.

- 7.8.11. ISO DIS 15031-3:2004 Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 3: Diagnostic connector and related electric circuits: specification and use.
- 7.8.12. ISO 19689:2016 Motorcycles and mopeds — Communication between vehicle and external equipment for diagnostics — Diagnostic connector and related electrical circuits, specification and use.
- 7.9. The previously mentioned diagnostic connector shall be located under the driver's seat; intent to be installed at any other locations shall be prior approved by the central competent authority. Upon request by the vehicle manufacturer the central competent authority may agree to use an alternative connector interface. But the manufacturer shall provide the same connector for all users to connect with the original scan tools.
- 7.10. Vehicle manufacturers shall provide its OBD system related information to all the components, scan tools or test equipment manufacturers impartially.
- 7.11. Vehicle manufacturers shall provide the connection method for its diagnostic tool functions, repair and troubleshooting information on the manufacturer's repairing information website and offer the original diagnostic tools to different brand's repairing technicians.
- 7.12. Vehicle manufacturers shall provide full documentations to describe the strategies for sensing elements' malfunction detection and MIL illumination (drive cycle numbers or statistic method) which include secondary sensing parameters for each the OBD monitored components, individual emission related and non-related power components' output codes and formats (include descriptions) etc. the example is as the following:

Component	Catalyst
Diagnostic trouble code	P0420
Monitoring strategy	Oxygen sensor 1 and 2 signals
Fault detection criteria	Difference between sensor 1 and sensor 2 signals
MI activation criteria	3rd cycle
Secondary parameters	Engine speed, engine load, A/F mode, catalyst temperature
Preconditioning	Two WMTC cycles
Demonstration test	WMTC
Default mode	None

8. OBD test relevant stipulations:

- 8.1. If the vehicle models produced by the same vehicle brand have identical engine combustion type, fuel supply method, fuel type, catalytic convertor type, carbon particle trap type, secondary air system, exhaust gas recirculation system, identical OBD monitoring functions and strategies, malfunction detection method, and malfunction indication method etc., may be defined as the same OBD family. The applicant shall select the test results of the vehicle representing the greatest emissions as the test results for all the vehicle models in the OBD family.
- 8.2. The OBD test shall be performed on a test vehicle that has completed the durability test or on test vehicle that being processed to the equivalent durability deterioration. A new vehicle may be used with deterioration factors applied to its OBD measured emissions values as the final OBD test results.
- 8.3. The OBD shall monitor all exhaust emissions related air pollution control equipment and related components or systems. During new vehicle model certification stage, the applicant shall conduct OBD monitoring tests on not more than 4 items and provide proper deteriorated components or systems, or malfunction simulator to the inspection and test organization to conduct the OBD tests. Before conduct the OBD monitoring item tests, the applicant shall verify that the test vehicle is comply with applicable emission standards. The central competent authority may designate specific items and request the applicant to perform tests on the said items.
- 8.4. If the above provision meets one of the following conditions, then at least one OBD circuit continuity test shall be performed according to the requirements stipulated in the regulation of “The Exhaust Emissions Test Methods and Procedures for Motorcycles”.
 - 8.4.1 The annual sales of motorcycle model year for each OBD family were not reach 200 units.
 - 8.4.2. The application is not based on vehicle model year and engine family.
- 8.5. The applicant shall conduct the OBD tests at the testing organization designated by the central competent authority in accordance with the regulation of “The Exhaust Emissions Test Methods and Procedures for Motorcycles”, or the applicant may submit an OBD test plan pursuant to this Appendix, once the plan is approved by the central competent authority the applicant may self-perform the OBD tests.
 - 8.5.1. OBD Family Name
 - 8.5.2. Name and address of organization to perform the OBD test (include capability proof documents).
 - 8.5.3. Test Procedures (include its basis, items, contents, theory of malfunction simulation, operation description of malfunction simulation etc.).
 - 8.5.4. Test Schedule

- 8.5.5. Test Vehicle
 - 8.5.6. Test Equipment
 - 8.5.7. Other supplementary description documents.
9. If the engine family vehicle for certification application by the applicant temporary unable to fully comply with the OBD requirements, the handling principle is as follows:
- 9.1. After take into account the technical feasibility, lead-time for vehicle's introduction and mass production retiring and replacement timing, computer software upgrading or other special conditions that may cause the OBD monitoring function unreliable, the applicant may submit a temporary non-fully-compliance application for the OBD system, after being approved by the central competent authority, the OBD may temporary be exempted to fully comply with the OBD requirements.
 - 9.2. The OBD main monitoring items such as Catalytic Converter, Oxygen Sensor, and Engine Misfire etc. must not under lack of monitoring conditions.
 - 9.3. IF the applicant intends to apply temporary exemption for fully comply with the OBD requirements, before his application for carry forward the engine family Certificate of Conformity the next year, he shall complete all the OBD improvement measures to comply with full OBD requirements. If due to factors such as software modifications or need additional lead time and causing the applicant unable to complete the OBD improvements in that vehicle model year, the applicant shall apply for carry forward with temporary exemption for fully comply with OBD requirements and attached with all relevant documents. After being approved by the central competent authority the carry forward Certificate of Conformity may be extended to the following model year, but the carry forward extension shall not exceed three model years.
10. OBD requirements for in-use vehicles:
- 10.1. For vehicles covered within an OBD family with annual sales over 1000 units and its OBD system is classified in category of OBD Stage II-A or OBD Stage II-B, the vehicle shall be able to monitoring and store the OBD's In-use performance ratio (IUPR) related information and comply with IUPR relevant stipulations as specified in ANNEX XII to the EU Regulation (EU) No. 44/2014. When apply for new engine family Certificate of Conformity, the applicant shall provide functionality statement documents on OBD monitor items, monitor conditions and OBD IUPR descriptions. For OBD family with OBD system being classified in category of OBD Stage II-B, for in-use vehicle major monitoring components or system, the OBD IUPR shall meet the following requirements.
 - 10.1.1. The averaged IUPR value shall be ≥ 0.1

- 10.1.2. At least 50% of the in-use vehicles' IUPR shall be ≥ 0.1 .
- 10.2. The above mentioned major monitor components or system means the following devices:
 - 10.2.1. Catalyst.
 - 10.2.2. Oxygen (O₂)/Exhaust gas sensors, including the secondary O₂ sensor (each one shall report separately).
 - 10.2.3. Evaporative system.
 - 10.2.4. Exhaust gas recirculation (EGR) system.
 - 10.2.5. Variable valve timing (VVT) system.
 - 10.2.6. Secondary air system.
 - 10.2.7. Particulate filter.
 - 10.2.8. NO_x after-treatment system (such as NO_x adsorbent catalyst, NO_x Reagent/Catalyst system).
 - 10.2.9. Turbo/Supercharger Boost System.

Appendix 4 Requirements for recall and correction plan

1. When the central competent authority cancels the Certificate of Conformity of the applicant, within 30 days after receipt of the cancelation notification, the applicant shall submit a recall and correction plan for his both unsold and sold vehicles of the said engine family. Once the central competent authority has reviewed and approved the plan, he shall deliver an approval letter to the applicant, after receipt of the letter and within 90 days the applicant shall complete the proposed recall and correction plan. If the applicant expects that he would fail to complete the correction plan by the deadline, within 30 days after receipt of the approval letter, he shall submit a specific improvement plan to the central competent authority to apply for an extension of deadline. The central competent authority shall agree to extend the improvement deadline based on actual situations, and the maximum period of deadline extension shall not exceed one year. If the central competent authority finds out that the applicant does not implement the improvement measures according to the approved correction plan, after investigation and being confirmed, the central competent authority may terminate the improvement deadline extension immediately.
2. The contents of the recall and correction plan submitted by the applicant shall include the following items:
 - 2.1. For each vehicle that failed to comply with its applicable emission standards and activates the recall and correction procedures, an engineering analysis and description of the cause shall be included. The attached documents shall include previous years' new vehicle confirmatory selective test data, manufacturer self-conducted COP test data, in-use vehicle recall and correction test result records for vehicles that failed to comply with their applicable emission standards and their cause descriptions and analysis.
 - 2.2. Causes and influence assessment for recall and correction occurrence.
 - 2.3. The brand, engine family, vehicle model, model year, numbers and relevant information of recall and correction vehicles.
 - 2.4. The ratio of estimated number of recall vehicle to its sales.
 - 2.5. The correction measures on the recall and correction vehicles such as components replacement, repairs, inspection, check, calibration, adjustment or other necessary changes in technical information summary to prove that the exhaust emissions of the recall vehicles can be improved and comply with their applicable standards.
 - 2.6. Methods to obtain the lists of name and address of the recall and correction vehicle owners.
 - 2.7. For the recall and correction vehicles, unless being approved by the competent authority, the manufacturer shall not force the vehicle owner to follow any maintenance guidelines or operation conditions; such as: requests the vehicle

owner not to use non-OEM components or not to go for a maintenance or repair service at a station or workshop not being authorized by the applicant.

- 2.8. The recall and correction implementation procedures shall include the start and end date of the recall and correction process for the designated vehicle owner, implementation location, and a reasonable period of time for the implementation of this process etc.
- 2.9. The technical capability evidence documents for the organization or personnel being designated to implement the recall and correction process and necessary equipment he owns, and the personnel assignment and responsibility for each recall and correction work item.
- 2.10. The notification letter issued to owners of vehicles subject to recall and correction.
- 2.11. Appropriate supply system for needed components during recall and correction.
- 2.12. The necessary work manuals for personnel that participate in recall and correction work.
- 2.13. Describe the impact on the fuel consumption, noise or other performance functions of the vehicles that subject to the recall and correction process.
- 2.14. Other data or reports that being provided as evidence for the central competent authority to assess the recall and correction plan submitted by the applicant.
3. The central competent authority may perform validation tests for each correction measure of the recall and correction plan that being implemented by the applicant.
4. After the completion of implementation process in accordance with the recall and correction plan, within 15 days, the applicant shall submit a recall and correction report to the central competent authority for review.
5. When the central competent authority notifies the applicant of cancellation or revocation of his Certificate of Conformity, the central competent authority shall also notify the Ministry of Transportation and Communications concurrently to stop the issuance of registration license of that vehicle model.
6. For unsold or other the same type vehicles with their Certificate of Conformity being canceled or revoked by the central competent authority, once the applicant has completed the implementation process of the recall and correction plan and being reviewed and approved by the central competent authority, the applicant may re-apply for the Certificate of Conformity of the said engine family in accordance with this regulation.

Appendix 5 Rules on the Usage of Deterioration Factors

1. If the annual sales for each vehicle model within an engine family were over 200 units, then the on-road real world durability tests for that vehicle model shall be conducted in accordance with the Durability Test Methods and Procedures for Motorcycles to obtain its deterioration factors. After being reviewed and approved by the central competent authority, these deterioration factors can be used for the calculation of final results.
2. If the annual sales for each vehicle model within an engine family were less than 200 units, the following assigned deterioration factors may be used on the driving cycle test to get the final results.
 - 2.1 Carbon Monoxide (CO): 1.400;
 - 2.2 Hydrocarbons (HC): 1.400;
 - 2.3 Non-Methane Hydrocarbons (NMHC): 1.400;
 - 2.4 Nitrogen Oxides (NO_x): 1.400;
 - 2.5 Particulate Matter (PM): 1.100.
3. For motorcycles applicable to the Emission Standards effective on and after January 1, 2017, when conducting the fuel tank and fuel supply system HC emissions test, may use 300 mg/test as the deterioration factor.
4. If the annual sales for each vehicle model within an engine family were less than 200 units and within which for an imported motorcycle model has already obtained the Certificate of Conformity issued by a foreign government, and the deterioration factor setting methods were recognized by the central competent authority, the deterioration factors applicable in Taiwan shall be set as follows:
 - 4.1. If the emission test method and durability test for that engine family with the Certificate of Conformity issued by a foreign government are the same as the calculation method for the deterioration factors stipulated in the domestic motorcycle durability test methods and procedures. The deterioration factors recognized by the foreign government may be adopted.
 - 4.2. If the durability test method for that engine family with Certificate of Conformity issued by a foreign government is different from the calculation method for the deterioration factors stipulated in domestic motorcycle durability test methods and procedures, but the emission test method is the same as the domestic ones, the applicant shall provide information documents on the accumulation mileage and emission tests data for each durability test point that recognized by the foreign government and calculate the deterioration factors in accordance with the calculation method stipulated in the domestic durability test regulation.

- 4.3. The deterioration factors that obtained in accordance with the US durability test regulation may use the following conversion formula to calculate the corresponding deterioration factors applicable in Taiwan.

$$\text{Deterioration Factor} = \frac{K + (DF - 1)(2D - K)}{K - (DF - 1)(K - 5000)}$$

K: The applicable US durability test mileage for that motorcycle (km).

DF: The deterioration factor for the US durability test for that motorcycle.

D: The applicable Taiwan durability test mileage for that motorcycle (km).

- 4.4. The deterioration factors that obtained in accordance with the Japanese durability test regulation may use the following conversion formula to calculate the corresponding deterioration factors applicable in Taiwan.

$$\text{Deterioration Factor} = \frac{10000 + DA}{10000 + 2500A}$$

D: The applicable Taiwan durability test mileage for that motorcycle (km).

A: The deterioration factor for the Japanese durability test for that motorcycle.

5. If the applicant is a motorcycle manufacturer or a motorcycle manufacturer designated representative, the Regulation of OBD family with its annual sales for each vehicle model were less than 200 units may use the assigned deterioration factors or the foreign government recognized deterioration factors for the calculation of final results as stipulated in this Appendix, the annual sales for each vehicle model may be extended to less than 600 units. In that case, the applicant shall increase the sampling ratio for its self-conducted COP test; the central competent authority may increase the test vehicle number for the new vehicle confirmatory selective test and listed the applicant as a priority object for the in-use vehicle recall and correction investigation test. If that engine family subsequently failed to comply with the new vehicle confirmatory selective test or failed to comply with the in-use vehicle emission standards, a recall and correction plan must be implemented. The applicant must complete the recall and correction plan being reviewed and approved by the central competent authority to be eligible in next year for that engine family with its annual sales for each vehicle model less than 600 units to use the assigned deterioration factors or the foreign government recognized deterioration factors for the calculation of final results as the extended stipulation.
6. If the applicant does not use vehicle model year and engine family as basis to apply for the Certificate of Conformity, the assigned deterioration factors specified in provision 2 of this appendix shall be directly used.
7. If the carry forward of the Certificate of Conformity of that engine family has been approved by the central competent authority, the same as the previous vehicle model year deterioration factors may be used.

Appendix 5.1 Quality Control Provisions for Mass-Production Vehicles

1. For a mass-production vehicle to apply for the Certificate of Conformity based on engine family, the applicant shall implement the quality control measures in accordance with this Appendix to ensure that vehicle is in compliance with the Emission Standards within the useful-life of that vehicle's emissions control system.
2. New-vehicle quality control
 - 2.1. Inspection and test items:

The minimum tests to be conducted including driving cycle test, idle test and OBD circuit continuity test.
 - 2.2. New vehicle quality control Conformity of Production (COP) sampling ratio:
 - 2.2.1. For the entity that is able to conduct the COP test by itself, the sampling ratio shall be at least one per every 500 units of its annually produced or imported vehicles for each vehicle model year within each engine family for the test; for the entity that is unable to conduct the COP test by itself, a central competent authority accredited inspection and testing organization shall be commissioned to conduct the exhaust emission test, the sampling ratio shall be at least one per every 200 units of the annually produced or imported vehicles for each vehicle model year within each engine family for the test.
 - 2.2.2. For the entity that applicable for the regulation of using assigned deterioration factors with its annual sales being limited to less than 600 units for each vehicle model year within each engine family and also is able to conduct the COP test by itself, the sampling ratio shall be at least one per every 250 units of the annually produced or imported vehicles for each vehicle model year within each engine family for the tests; if the above mentioned entity is unable to conduct the COP test by itself, a central competent authority accredited inspection and testing organization shall be commissioned to conduct the exhaust emission tests, the sampling ratio shall be at least one per every 100 units of the annually produced or imported vehicles for each vehicle model year within each engine family for the test.
 - 2.2.3. For the entity with its annually produced or imported vehicles for each vehicle model year within each engine family was unable to reach the previous paragraph regulated 100 units, at least 1 vehicle still shall be sampled for the test.
 - 2.2.4. For the self-conducted COP test, the sampled vehicles shall be never being tested before, and is not allowed to conduct the repeat test.
 - 2.3. In-use quality control
 - 3.1. Maintenance and warranty information:

The applicant shall collect the service information on emission control system related maintenance and warranty custom complaints, repairs, OBD malfunction code records and to be filed and preserved for 5 years for future reference. The statistic analysis information on OBD malfunction codes shall include the names of OBD family, engine family and vehicle model; engine identification number, VIN number, malfunction codes, vehicle travel mileage at freeze frame, occur frequency for individual malfunction codes etc..

3.2. Inspection and test items:

3.2.1. OBD IUPR

- 3.2.1.1. For an engine family with annual sales over 1,000 units and its OBD system is classified in the OBD Stage II-A or OBD Stage II-B category, the applicant shall submit its all sold vehicles' OBD IUPR information (including IUPR statistical analysis report) for each calendar year within 18 months after the end of that calendar year.
- 3.2.1.2. Pursuant to the provisions related to the OBD IUPR as specified in ANNEX XII to the EU Regulation (EU) No. 44/2014, the applicant shall inspect and record its domestic sold vehicles' OBD IUPR, complete the related statistical analysis report and to be filed and preserved for 5 years for future reference.

3.3. Sampling ratio:

3.3.1. OBD IUPR

- 3.3.1.1. For an OBD family with its OBD system is being classified in the OBD Stage II-A or OBD Stage II-B category, if its annual sales is between 1,000 units to 5,000 units, 6 in-use vehicles should be selected; if its annual sales is over 5,000 units and less or equal to 100,000 units, 15 in-use vehicles should be selected; if its annual sales is over 100,000 units and less or equal to 200,000 units, 30 in-use vehicles should be selected; if its annual sales is over 200,000 units, 45 in-use vehicles shall be selected for the IUPR inspection, investigation, and performing statistic analysis. The inspection results shall comply with the requirements as stipulated in Paragraph 10 of Appendix 3.
 - 3.3.1.2. For the above mentioned in-use vehicles selection, the vehicles with large sales or with representative characteristics shall be considered as first priority; the travel mileage for the selected vehicles shall be at least 3,000 kilometers or at least 6 months of driving and its emission control system shall be within the warranty mileage or duration of warranty period.
4. The central competent authority may conduct random selective checks and validations on the applicant submitted quality control related information and reports to ensure its vehicles are in compliance with the related regulations.

Appendix 6 Requirements for Motorcycle Confirmatory Selective Test

1. For the motorcycles that already have obtained their Certificate of Conformity, the central competent authority may conduct the confirmatory selective tests to verify whether or not the mass-production motorcycles comply with the emission standards and the relevant regulations. The test method shall be in accordance with the provisions stipulated in the emission standards; the applicant shall send the confirmatory selective test motorcycles according to the central competent authority scheduled time and designated inspection and testing organization to conduct the tests; only OBD tests are allowed for the applicant to apply for schedule time extension according to the actual needs and the applicant is responsible for all the relevant fees. Being approved by the competent authority, the applicant may designate his own inspection and testing laboratory to conduct the OBD tests.
2. The central competent authority may designate the motorcycle engine family, motorcycle model for the confirmatory selective test, the applicant shall provide untested new mass-production motorcycles for selection by the competent authority and the number of provided motorcycles shall be at least 3 times the number for the tests. The sampling ratios for the preliminary confirmatory selective test are stipulated as follows:
 - 2.1. For the driving cycle test and idle test: if the annual sales of the same engine family exceeds 50,000 units, 10 units shall be selected for the test; If the annual sales of the same engine family is over 10,000 units but less than 50,000 units, 5 units shall be selected for the test; If the annual sales of the same engine family is less than 10,000 units, per each 2,000 units increment, one unit shall be selected for the test; if the annual sales is less than 2,000 units, one unit shall be selected for the test.
 - 2.2. For the fuel tank and fuel supply system Hydrocarbons (HC) evaporative test, one motorcycle per each engine family shall be selected for the test.
 - 2.3. For the Onboard Diagnostic System (OBD) test, one motorcycle per each engine family shall be selected for the test.
 - 2.4. If the central competent authority thinks that the motorcycle model may fail to comply with the emission standards, the number of motorcycles to be selected for the test may be increased in that engine family.
3. The motorcycle selection locations for the confirmatory selective test:
 - 3.1. Storage area owned by the applicant for the motorcycles that have completed and passed the inspection.
 - 3.2. The Customs warehouse of Republic of China (Taiwan).
 - 3.3. Applicant's designated domestic representative, distributor or dealer's motorcycle storage locations.

4. The motorcycles for the confirmatory selective test shall conduct run-in by the applicant to the minimum necessary mileage to stabilizing the emission test results, but the maximum break-in mileage shall not exceed 1,500 km.
 - 4.1. The run-in time period limits are stipulated as follows:
 - 4.1.1. Number of motorcycles between 1 ~ 5 units: 15 working days.
 - 4.1.2. Number of motorcycles between 6 ~ 15 units: 20 working days.
 - 4.1.3. Number of motorcycles between 16 ~ 25 units: 24 working days.
 - 4.1.4. Number of motorcycles more than 26 units: 36 working days.
 - 4.2. The fuel that being used during the run-in duration shall be the test fuel (or gas) listed in the test fuel regulation issued by the central competent authority or the vehicle fuel that being sold in domestic gas stations.
 - 4.3. During run-in period, the confirmatory selective test motorcycles shall not be conducted adjustments, maintenance or inspections by the applicant, unless being reported to and approved by the central competent authority. Under supervision by the competent authority designated personnel and using the instruments, equipment or tools with the same functions used by the service station of the dealer to perform adjustments, maintenance and inspections.
5. If the confirmatory selective test motorcycle is unable to be tested due to accident or the central competent authority thinks the selected confirmatory selective test motorcycle is no longer representative for the said engine family, the central competent authority shall cancel its eligibility and select another motorcycle as replacement, the replacement motorcycle number shall be according to the sampling ratio determined by the central competent authority. The applicant shall not raise any objections to that test motorcycle or test result values.
6. If the confirmatory selective test motorcycle has failed the test, but still inside the inspection and testing organization and without any adjustments, maintenance or inspections that may influence the test results, the applicant may request for one repeat test, the test results shall be deemed as the final results.
7. If all the confirmatory selective test motorcycles comply with the emission standards, the motorcycle model shall be determined as in-compliance with the emission standards. If any motorcycle has failed the test, within 15 days after receipt of the notice from the competent authority, the applicant may send a letter of request to inform the competent authority for a repeat test or the applicant may accept the fail result of the confirmatory selective test. The requirements for the repeat test are stipulated as follows:
 - 7.1. Within 30days after receipt of notification from the competent authority, the applicant shall provide sufficient number of motorcycles for the competent authority to select for the repeat test; if the applicant unable to provide enough motorcycles before the deadline, he shall apply for n deadline extension. Fail

to meet the deadline shall be deemed as forfeit the right to request for repeat test.

- 7.2. The sampling number for the repeat test shall be determined by the applicant, but must not less than twice the number of failed motorcycles during the preliminary test.
- 7.3. The relevant items such as test motorcycles selection, run-in procedures and testing methods are the same as the preliminary test.
- 7.4. For the motorcycles that failed the test, the applicant may request to perform one repeat test in accordance with provision 6 of this Appendix.
8. The determination basis for the repeat test is when all the arithmetic average values of each individual pollutant test results are below the emission standards, the repeat test shall be deemed as in-compliance with the emission standards otherwise being deemed as non-compliance. As to the motorcycles that failed the preliminary or repeat test, the applicant shall explain the causes for non-compliance and propose correction measures to the central competent authority for future reference.
9. As to the motorcycles that failed in the preliminary test and all the motorcycles being selected for the repeat test, if the arithmetic average values of each individual pollutant test results are below the emission standards, then the new motorcycle confirmatory selective test shall be deemed as in-compliance with the emission standards otherwise shall be deemed as non-compliance.

If the previous item is the OBD test, then the sum of the number of motorcycles failed the preliminary test and the number of motorcycles failed the repeat test, divided by the sum of number of motorcycles failed the preliminary test and the total number of motorcycles performed the repeat test shall be calculated. If the calculated value is less than 0.4 and the sum of the number of motorcycles failed the preliminary test and the number of motorcycles failed the repeat test is less than 4, then the confirmatory selective test shall be determined as in-compliance with the emission standards otherwise shall be determined as non-compliance. The compliance determination formulas are as follows:

Formula 1: $(\text{number of motorcycles failed the preliminary test} + \text{number of motorcycles failed the repeat test}) \div (\text{number of motorcycle failed the preliminary test} + \text{total number of motorcycles performed the repeat test}) < 0.4.$

Formula 2: $(\text{number of motorcycles failed the preliminary test} + \text{number of motorcycles failed the repeat test}) < 4.$