

# Emirates Authority for Standardization & Metrology (ESMA)



المواصفة القياسية الإماراتية

المتطلبات الفنية للمركبات ذات الإنتاج المحدود

**Technical Requirements for  
Low Small Series Production Vehicles**

دولة الإمارات العربية المتحدة

**UNITED ARAB EMIRATES**

ICS:

جميع حقوق الطبع محفوظة لهيئة الإمارات للمواصفات والمقاييس

**المتطلبات الفنية للمركبات ذات الإنتاج المحدود**  
**Technical Requirements for**  
**Low Small Series Production Vehicles**

**المواصفات القياسية لدولة الإمارات العربية المتحدة**  
**Standards of United Arab Emirates**

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## 1- Scope

This technical regulation specifies the requirements Small Series Production Vehicles (SSPV's). This is applicable to UAE built and/or Imported vehicles, new or used. Excluded are motorcycles, trailers and semi-trailers, caravans and tractors.

### 1.1- Category 01. Small Series Production Vehicles – Replica

SSPV Replica Vehicles are defined as Commercial or Private Vehicles which utilize an OEM Chassis, Steering, Suspension and Brakes, (re-body) either imported or manufactured in the United Arab Emirates (Design and constructed based on produced vehicles)

### 1.2- Category 02. Low Volume Production Vehicles—Commercial Production

SSPV Commercial vehicles are defined as a vehicle manufactured by a commercial entity for the purposes of sale to the general public, either imported, or manufactured in the United Arab Emirates for new design vehicles (Design and constructed not based on produced vehicles).

### 1.3- Category 03. Small Series Production Vehicles- Kit Cars

Kit cars are defined as a set of parts that a manufacturer sells and the buyer himself then assembles into a functioning car. Usually, many of the major mechanical systems such as the engine and transmission are sourced from donor vehicles or purchased new from other vendors.

### 1.4- Category 4. Low Volume Production Vehicles – Racing Cars

SSPV Motorsport vehicles are defined as any vehicle manufactured specifically for the purposes of Motorsport. For purpose of racing according to FIA guild lines

## 2- Terms and Definitions

For the purpose of these technical standards, the following terms and definitions shall apply:

- **Authority:** Emirates Authority for Standardization & Metrology (ESMA).
- **Competent Authorities:** Any federal, local governmental or affiliated authority of the UAE who have been authorized by ESMA to inspect and implement the technical regulation.

- **Country:** United Arab Emirates (UAE).
- **Standard:** A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.-
- **Approved Standard:** A standard that is adopted by ESMA as a UAE standard, and It symbolize by (UAE.S) or (م ق / أ ع م)
- **Small Series Production Vehicles (SSPV's):** Vehicles that do not exceed the production 75 cars annually
- **Emissions:** Substances airborne to the atmosphere, which arise in the running of the vehicle, due to exhaust gases, evaporative fuel and crankcase emissions. They include carbon monoxide, hydrocarbons
- **Passenger's motor vehicle:** A vehicle powered by an internal combustion engine used on public roads.to be modified
- **Drive train:** Consists of the engine, transmission, universal, control arms, drive shaft, axles and wheels.
- **Adaptor (Spacer):** Component placed between two mechanical parts to adjust the distance between them.
- **Licensing Authority:** Authority that is responsible for the registration of Small Series Production Vehicles.
- **Body floor height:** The vertical distance between the ground and the top of the passenger compartment (cab) floor, measured directly below the center of the steering wheel.
- **Frame:** The main longitudinal structural members of the chassis of the vehicle (for vehicles with unitized body construction) or the lower main longitudinal structural members of the body of the vehicle.
- **Frame Height:** means the vertical distance between the ground and the lowest point on the frame, measured when the vehicle is unladed on a level surface at the lowest point on the frame midway between the front axle and the second axle on the vehicle.
- **Multipurpose passenger vehicle (MPV):** A motor vehicle designed to carry a maximum of nine persons or goods equivalent by weight, which has special features for occasional off-road operation
- **Auxiliary Liquid Fuel Tank:** An additional fuel tank and any other components attached directly there to and designed to supplement the vehicle's liquid fuel carrying capability beyond that provided by the vehicle manufacturer.
- **Liquid fuel:** Fuel that is liquid at normal atmospheric pressures and temperatures.
- **Vehicle Control Module:** A term for any embedded system that controls one or more of the electrical systems or subsystems in a motor vehicle.

- **Engine Management System:** An electronic control device primarily for the purpose of controlling fuel injection, Ignition and engine support systems.

- **Aftermarket:** The market for replacement parts, accessories, and equipment for the care or enhancement of the original product, especially an automobile, after its sale to the consumer.

- **Engine:** The engine itself in conjunction with related components.

Small Series Production Vehicles (SSPV's): Vehicles that do not exceed the production 75 cars annually

### 3-Technical Requirements for SSPV Categories

#### 3.1 - Category 1: SSPV's – Replica

- a. Inspection process will be required at specific production stages
- b. Welding samples must be submitted and approved prior to commencement
- c. Vehicles will be subject to standard registration emissions (Exhaust & Noise) testing procedures according to UAE Standards

#### 3.2- Category 2: SSPV's – Commercial Production

- a. Design approval will be required prior to commencement. Designs must be submitted to the ESMA Technical committee.
- b. CAD Drawings of all structural areas and fabricated components
- c. FMEA (Failure Mode & Effects Analysis) test report of all structural and fabricated components utilized within the construction of the crash structure must be submitted with the application (This will include glass panel calculations if they form an integral member of the crash structure.
- d. Production facilities will be required to be Approved and Certified by the Competent Authority
- e. Welders will require Certification by a recognized Authority or Institute.
- f. Full traceability of production materials must be available for Quality Assurance purposes
- g. A full Drive Cycle Emissions Compliance report according to UAE standards must be available for each Vehicle Model produced.

**3.3- Category 3: SSPV's – Kit cars**

- a. Design approval will be required prior to commencement. Designs must be submitted to the ESMA Technical committee.
- b. CAD Drawings of all structural areas and fabricated components
- c. FMEA (Failure Mode & Effects Analysis) test report of all structural and fabricated components utilized within the construction of the crash structure must be submitted with the application (This will include glass panel calculations if they form an integral member of the crash structure.
- d. Production facilities will be required to be Approved and Certified by the Competent Authority
- e. Welders will require Certification by a recognized Authority or Institute
- f. Full traceability of production materials must be available for Quality Assurance purposes
- g. A full Drive Cycle Emissions Compliance report according to UAE standards must be available for each Vehicle Model produced.
- h. Emissions Compliance Certificate must be available for each Vehicle Model produced

**3.4- Category 4: SSPV's – Racing Cars**

All requirements for Motorsport vehicles are regulated by the worldwide motorsport sanctioning body, Federation International De L'Automobile (FiA) Materials, design and installation regulations are strictly enforced by the National Sporting Authority (ASN) and vehicle production procedures are available from the ASN.

**4- General Requirements****1. Engine**

- 1.1 Category 1 SSPV's engine capacities are subject to approval on entire vehicle design submissions.
- 1.2 Category 2 and 3 SSPV's engine capacities may not exceed the maximum engine size offered for the specific model by the OEM Manufacturer.
- 1.3 When the engine is larger in power output than the original engine offered by the vehicle manufacturer as standard or optional equipment, the vehicle must be upgraded with the appropriate parts and equipments, e.g. brakes, front and rear suspension, fire extinguisher and appropriate seat belts.

- 1.4 The engine shall be installed in such a way to ensure proper engine mounting. Engines shall be securely fastened to the vehicle frame or unit body with bolts and mounting hardware designed to accommodate the engine. Engine mounting frames or brackets that are cracked, broken, or display improper welding will cause the vehicle to fail in inspection.
- 1.5 Engines shall be located outside the compartment of the vehicle that is intended for use by the driver or passenger (passenger compartment). The engine shall be separated (from the passenger compartment) and shielded by a firewall that is (a) constructed of a metal or comparable insulated fire retarding material acting as protective barrier, (b) capable of withstanding forces normally encountered in collisions and (c) designed to retard the spread of fire from the engine compartment into the passenger compartment.
- 1.6 All the moving parts and components of the engine, that are accessible to inadvertent contact during normal operating conditions and those that may cause personal injury to persons standing outside of the vehicle, shall be effectively screened or shielded.

## 2.0 - Forced Induction Systems

- 2.1 Forced Induction will only be approved on Category 2 and 3 SSPV's on submission of complete vehicle designs.
- 2.2 Category 1 SSPV will only be approved if originally installed on the Donor Chassis (SSPV 2) or OEM option on SSPV 3 vehicles.
- 2.3 Forced Induction will necessitate the upgrading of braking system, rims, tyres and suspension to manufacturer's highest optional standard. Modifications that are not permitted under these Standards are the fitting of turbo/superchargers to an engine that results in the power/torque output of the engine not being compatible with the original vehicle driveline.
- 2.4 If a Manufacturers option Forced Induction Engine is installed, all supporting systems including safety items, emission control systems, Intercooler piping, Blow off valves, etc should be installed in accordance with Manufacturers specifications.
- 2.5 It is accepted to install an aftermarket Forced Induction System (Super charger, turbocharger .etc) as long as the engine is identical in operation to the OEM system it replaces, the system is in compliance with the exhaust/noise emission standards and the system are installed according to Manufacturers instructions.
- 2.6 The engine must be operated exclusively on commercially available unleaded fuel. All Category 1 SSPV vehicles will comply with EURO 4 emissions for Diesel and gasoline engines



- 2.7 All of the emission control equipment originally fitted to the replacement engine must be fitted and operational. An appropriate catalytic converter must be fitted in the vehicle's exhaust system.
- 2.6 When an OEM standard exhaust system is not used, the sound level emitted must be within the limits specified by these Technical Standards.
- 2.8 All fuel, brake and electrical components that are located in close proximity to the turbocharger/supercharger, must be shielded to prevent excessive heat affecting performance or safety of these components.
- 2.9 All components added must be of a standard suitable for the application. E.g. temporary installations of any component will not be approved

### 3.0 Engine Management Systems

OEM engine management systems may be replaced by aftermarket units provided the following is adhered to:

- 3.1 All electronically controlled emission devices are utilized and functioning as per OEM manufacturers specifications
- 3.2 Aftermarket engine management systems must be issued with a Drive Cycle Emission Test Certificate, which includes drive-ability testing and issued by the Competent Authorities.
- 3.3 The Engine Management System is installed in a professional manner.

### 4.0 Exhaust Systems

- 4.1 Installation or use of aftermarket part is allowed provided there is a reasonable basis that such installation and use will not adversely affect emissions performance mentioned in UAE.S GSO 1680 and UAE.S GSO 144. Reasonable basis can be considered as existing if there is written document by the manufacturer of the part that emissions tests have been conducted and reveal that the part complies the requirements of the above-mentioned standards.
- 4.2 A vehicle shall be equipped with a leak-proof exhaust system that includes the exhaust manifold(s) or headers, the piping leading from the flange of the exhaust manifold(s) or headers, the muffler(s), and the tail piping.
- 4.3 Exhaust systems shall discharge the exhaust fumes at a location to the rear of the vehicle body or direct the exhaust fumes outward from the side of the vehicle body or upward at a location rearward of any operable side windows.

- 4.4 No part of the exhaust system shall pass through the passenger compartment or in close proximity to the fuel system, unless it is effectively shielded.
- 4.5 No part of the exhaust system shall contain a muffler cutout or by-pass.
- 4.6 The modified vehicle shall not emit noise more than 95 decibels when tested as per exhaust noise test.

## 5.0 Fuel System

- 5.1 Every vehicle shall have a fuel system that is securely fastened to the vehicle so as not to interfere with the vehicle's operation. The components, such as the tank, tubing, hoses, and pump, must be of leak proof design and be securely attached with fasteners designed for that purpose. All fuel system vent lines and fuel lines must extend outside of the passenger compartment and be positioned as not to be in contact with the high temperature surfaces or moving components. The fuel pipe should be laid in the original rout of the fuel system. The use of pressed fittings or A/N hose ends in high flow / high-pressure fuel system is mandatory.
- 5.2 Only a flexible hose specifically designed, manufactured and marked for use as a fuel hose, should be used for fuel supply or return in the fuel system. The pressure rating of the fuel hose must not be less than the operating pressure of the fuel system.
- 5.3 The fuel line connection to the engine shall be of a flexible design, and of a length sufficient to accommodate all engine vibrations and movements of the engine with respect to the vehicle frame.
- 5.4 The fuel tank shall not be located in the engine compartment. The fuel tank shall be shielded from passenger compartment by a flameproof barrier, and equipped with a filler cap designed to prevent fuel spillage from the filler opening when the cap is in place.
- 5.5 Fill caps shall be threaded or bayonet type or equivalent and shall be provided with a gasket.
- 5.6 The tank, its fittings, line and all line connections, fill pipe openings, and venting systems must be exterior to the breathable atmosphere of the passenger and luggage compartments. The tank, its fittings, line and line connections shall not pass within 3 inches [7.62 centimeters] of any part of the exhaust system unless a suitable heat shield is used in which case a minimum separation of 2 inches [5.08 centimeters] shall be maintained. No portion of any auxiliary liquid fuel tank shall be installed to extend downward below the lowest portion of the vehicle's axle housing, differential housing,

body or frame, whichever is lowest, with the vehicle sitting on a level plane loaded to its maximum gross vehicle weight rating and tyres inflated to their minimum recommended cold pressure.

- 5.7 The manufacturer shall provide the tank with clear and concise printed instructions for its safe installation and use. The tank shall be securely attached to the vehicle by means of suitable hangers or brackets provided by the manufacturer. The fuel line connections from the auxiliary liquid fuel tank to the primary system, including a selection control valve, shall not render the primary system inoperative for any of its functions.

The replacement tank or auxiliary tank shall be certified by any international standards, or shall have declaration and undertaking letter from the supplier.

- 5.8 If a fuel system includes a selection control valve which is operable by the driver to control the flow of fuel from two or more tanks, the valve must be installed so that either: (1) the driver may operate it while watching the roadway and without leaving the driving position; or (2) the driver must stop the vehicle and leave the driving position in order to operate the valve. If no tank selection control valve is used, each tank line must be equipped with a check valve to prevent back feeding from one tank to the other.

## 6.0 Brake System

The vehicle shall be equipped with a parking brake that must operate on at least two wheels on the same axle, and when applied it must be capable of holding the vehicle on any grade on which the vehicle is operated. The parking brake must be separately actuated so that failure of any part of the service brake actuation system will not diminish the vehicle's parking brake holding capability.

The full brake system should be certified in accordance with UAE.S GSO ECE13 or equivalent international standards and pass the brake test

## 7.0 Chassis and Frame

- 7.1 Chassis Cross members for engine and drive train location may be removable if desired. The flange plates and bolts shall be of suitable size and the nuts and threaded bosses shall have thread depth appropriate for the application.

- 7.2 A vehicle shall be equipped with a frame consisting of structural beams or channels, or structural tubing, or unitized construction capable of supporting the vehicle, its load, and the torque produced by the

power source under all conditions of operation. The frame structure shall be essentially rigid, free of cracks and visual indications of weakness, such as bending or buckling.

- 7.3 A vehicle shall be equipped with a floor pan under the entire passenger compartment. The floorpan shall be capable of supporting the weight of the number of occupants that the vehicle is designed to carry in the designated seating positions.

#### 7.4- Minimum Standards for Choice of Nuts and Bolts

Grade	Applicability
Ungraded bolts:	Panel fixing, floor panel fixing, and lightly loaded brackets.
Grade 5 or metric 8.8 bolts:	Seat belts, moderately loaded members, suspension mounts, cross member.
Grade 8 or metric 10.9 bolts:	Brake calipers, master and slave cylinder mounts, steering arms and all suspension assemblies.

- 7.5 The bolt or fastener should be long enough to ensure that at least one clear turn of thread is visible. This applies to all nuts, including the nylon and locking nuts. Locking devices must be fitted to all fasteners. These devices include spring and shake proof washers, nylon nuts, deformed thread locknuts, castellated nuts with split or roll pins, lock wire, split pins, locking tabs, and staking.

## **8.0 Steering & Suspension**

- 8.1 All SSPV vehicles shall be equipped with a circular steering wheel having an outside diameter of not less than 34 cm [13 inches cm].
- 8.2 The steering system shall remain unobstructed from stop to stop.
- 8.3 The range of movement between the axle and the frame of a modified vehicle shall be limited in a manner which, under all normal conditions of suspension, compression and rebound, shall prevent the following: contact between the wheels, including the tyres, and any part of the vehicle frame or

chassis; contact between the suspended and unsuspended portions of the vehicle except at suspension component attachment points and at those points which are designed and suitably cushioned to limit extreme suspension movement; and prevent any brake hose from becoming fully extended.

- 8.4 Welding any component on a steering system is not permitted. All modifications shall be suitably retained by spindle nuts and split pins.
- 8.5 There shall be no heating or welding of coil springs, leaf springs, or torsion bars.
- 8.6 Double shear – All shear style suspension mounts shall be in double shear.
- 8.7 Whenever the suspension system provided by the original recognized vehicle manufacturer has been altered, supplemented, or adjusted in a manner which changes the height of the vehicle frame all suspension components on the same axle shall be changed in an equivalent manner, the lateral (side to side) aspect of the vehicle frame shall be horizontal when the vehicle is at rest on a level surface, and longitudinal (front to rear) slope of the vehicle is permitted so long as all other suspension system and body height requirements within this section are the same.
- 8.8 No person shall operate any motor vehicle with a frame height greater than as specified:

<u>Vehicle Class by GVWR</u>	<u>Maximum Frame Height</u>
Passenger Cars	55.88 centimeters [22 inches]
Trucks and MPVs	
2041 Kg and under	60.96 centimeters [24 inches]
2041- 3402 Kg.	66.04 centimeters [26 inches]
3402- 4536 Kg.	71.12 centimeters [28 inches]

#### **09.0 Exterior Projection Specifications.**

- 9.1 All hard wheel arches must be 'turned inwards', or have a radius of curvature of at least 2.5mm.
- 9.2 Grills, gaps, slots, grooves, channels, recesses and holes that have a width of 10mm or less must be blunted.
- 9.3 Fiberglass reinforced plastic panel edge must be blunted.

- 9.4 The body structure of a vehicle shall be free of sharp edges and projections in all interior and exterior locations where they may be in contact with persons under the normal use and care of the vehicle shall also be free from sharp edges. This requirement does not include those locations usually accessible only when the vehicle is hoisted or partially dismantled for the purpose of maintenance or repair.

#### 10.0 Bonnet Scoop

Permitted providing the system (scoop) does not interfere with the driver's visibility

#### 11.0 Car Seats, Seating Arrangements & Seat Belts

Car Seats, Seating Arrangements & Seat Belts should comply with the approved UAE technical regulation in annex no.

#### 12.0 Bull bars

- 12.1 Fiberglass, carbon fiber and other composite material are accepted as long as there is no internally reinforcement with heavy steel that is welded to the main chassis
- 12.2 Steel / Aluminium bull bars are permitted only if originally supplied as a vehicle manufacturer's option with appropriate Quality Assurance Certificates by the Manufacturer.

#### 13.0 Bumpers

Bumpers should comply with approved UAE technical regulation in annex no.1

#### 14.0 Rims & Tyres

- 14.1 Specialty tyres may be used if they comply with the technical specifications in section 19 of UAE.S/GSO 42. Wheels shall not be altered from the wheel manufacturer design and application. This should be further supported by the GSO conformity certificate and comply with the speed and load codes.
- 14.2 The tyres shall not touch any part of the body during the moving and not obstructing it.

- 14.3 The load rating of a wheel as determined by the wheel manufacturer, either by a stamp on the wheel or in the wheel manufacturer's literature, shall not be exceeded. If such a load rating is not available, the wheel shall not be used on the vehicle. Wheel load rating requirements are determined by dividing the vehicle's heaviest gross axle weight rating (G.A.W.R.) by 2. The axle weight rating for most vehicles is shown on the identification label located on the driver's side door jam, gas tank door, trunk lid or glove compartment.
- 14.4 All tyres shall be mounted according to the recommended procedures of the manufacturers of tyre and the tyre machine. The tyre manufacture recommendations of rim width must be followed and the wheel size shall be according to the reference manual for the given country. The Tire and Rim Association (TRA) publish the reference manual for the United States of America, the European Tyre and Rim Technical Organization (ETRTO) publish the reference manual for Europe, the reference manual for Japan is published by Japan Automobile Tyre Manufacturers Association, Inc. (JATMA).
- 14.5 Wheels must be free from damage, cracking, and rust so as to not to contribute or influence the safe operation, mounting, or performance of the wheel in service. Wheels may not be drilled, welded shaved, cut or otherwise altered from the wheel manufacturer's design and application
- 14.6 Any modification on the structure of the wheels are not allowed
- 14.7 Tyre-to-fender clearances and tyre-to-suspension clearances should be installed in a manner that prevents rubbing and scuffing. Wheel balance weights shall not be in contact with suspension components and tires shall not be in contact with fenders.
- 14.8 A wheel shall not use fewer fasteners than the wheel and vehicle was designed for, and must be set at the appropriate retention toque value according to the size of the fastener. See vehicle manufacturer manual handbook for the number of fasteners and recommended torque value.
- 14.9 Slick and racing tyres are not allowed to use on road

Annex No.(1)  
Complementary Standard

S.No.	Standards Number	Standards Title
1	UAE.S GSO 42	Motor Vehicles – General Requirements
2	UAE.S GSO 1680	Motor Vehicles – Allowable Limits Of Gaseous Pollutants Emitted To The Atmosphere From Unleaded Gasoline Engined Vehicles
3	UAE.S GSO 144	Motor Vehicles – Allowable Limits Of Gaseous Pollutants Emitted To The Atmosphere From Heavy Duty Diesel Engined Vehicles
4	UAE.S GSO 13	Motor Vehicles: Braking System of Passenger Cars and Multi-Purpose Vehicles
5	UAE.S GSO 41	Motor Vehicles – Front And Rear Exterior Protection Device For Passenger Cars (Bumpers , ETC....) And its Methods of Test