

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية
GCC STANDARDIZATION ORGANIZATION (GSO)

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السيارات - المتطلبات العامة

GENERAL REQUIREMENTS-MOTOR VEHICLES

Preparation

GSO Technical Subcommittee for Road Vehicles and Tires

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IT IS, THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS
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تقديم

هيئة التقييس لدول مجلس التعاون لدول الخليج العربية هيئة إقليمية تضم في عضويتها الأجهزة الوطنية للمواصفات والمقاييس في دول الخليج العربية ، ومن مهام الهيئة إعداد المواصفات القياسية الخليجية بواسطة لجان فنية متخصصة .

وقد قامت هيئة التقييس لدول مجلس التعاون لدول الخليج العربية ضمن برنامج عمل اللجنة الفنية رقم 01/02 " اللجنة الفنية الفرعية الخليجية لمواصفات المركبات والإطارات " بتحديث اللائحة الفنية الخليجية رقم GSO 42:2003 " السيارات - المتطلبات العامة " . وقامت المملكة العربية السعودية بإعداد مشروع هذه المواصفة .

وقد اعتمدت هذه المواصفة كمواصفة قياسية خليجية في اجتماع مجلس إدارة الهيئة رقم () ، الذي عقد بتاريخ / / هـ ، الموافق / / م .
على أن تلغى المواصفة رقم (GSO 42: 2003) وتحل محلها .

Foreword

GCC Standardization Organization (GSO) is a regional organization, which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards through specialized technical committees (TCs).

GSO through the technical program of committee TC No.: 02/01 " GSO Technical Subcommittee for Road Vehicles and Tires " has updated the GSO technical regulation No.: GSO 42:2003" Motor vehicles – General requirements " . The draft standard has been prepared by Kingdom of Saudi Arabia.

This standard has been approved as Gulf Standard by GSO Board of Directors in its meeting No.../.....held on / / H, / / G.
The approved standard will replace and supersede the standard No.: (GSO 42:2003).

Foreword

Standardization Organization for GCC (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulation through specialized technical committees (TCs).

GSO through the technical program of committee TC No .2 "Technical Committee of Mechanical standards" has Revised the GSO Standard No. GSO 42/2003 "Motor Vehicles – General Requirements". The revision has been prepared by Gulf Standard Organization (GSO).

This general safety regulation is prepared ensuring high levels of safety, environmental protection, energy efficiency and antitheft performance for motor vehicles or items of motor vehicle equipment. These requirements are specified in such a manner that the public is protected against unreasonable risk of accidents occurring as a result of the design, construction or performance of motor vehicles and is also protected against unreasonable risk of serious injury in the event crashes do occur.

In the case of technical requirements if there are no GSO Regulations and Standards, then the vehicle shall comply with the regulations/standards in the country of origin or international standards accepted by GSO (UN/ECE or FMVSS) until the relevant regulations are approved by GSO.

All GSO exhaust emission regulations are under revision based on ECE 83/2005 Euro IV and ECE R 49 Euro IV limits. These regulations will be enforced starting from 2017 model year vehicles.

Note: For UAE, exhaust emission regulations are under revision based on ECE R 49 Euro V limits

This regulation is complementary to all other GSO technical regulations and standards for Motor Vehicles.

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MOTOR VEHICLES GENERAL REQUIREMENTS

1- SCOPE AND FIELD OF APPLICATION

- 1.1 This standard is concerned with the general requirements for motor vehicles ensuring high levels of safety, environmental protection, energy efficiency and antitheft performance. For detailed requirements refer to GSO Technical Regulations on the subject concerned.

- 1.2 GSO technical regulations related to Motor Vehicles will be formulated based on UN/ECE regulations; In the case of motor vehicles manufactured in compliance with FMVSS regulations, will be accepted as an alternative.

2- DEFINITIONS

For definitions see the relevant GSO Technical Regulations and Standards.

3- COMPLEMENTARY REFERENCES

The following Gulf standards:

- 3.1 GS 34 "Lead-Acid Starter Batteries Used for Motor Cars and Internal Combustion Engines".
- 3.2 GS 35 "Methods of Test for Lead-Acid Starter Batteries Used for Motor Cars and Internal Combustion Engines".
- 3.3 GS 36 "Motor Vehicles – Methods of Test for Impact Strength - Part 1: Frontal Impact".
- 3.4 GS 37 "Motor Vehicles - Methods of Test for Impact Strength - Part 2: Rear Impact".
- 3.5 GS 38 "Motor Vehicles - Methods of Test for Impact Strength - Part 3A: Side Impact".
- 3.6 GS 39 "Motor Vehicles - Methods of Test for Impact Strength - Part 4: Roof Strength".
- 3.7 GS 40 "Motor Vehicles - Impact Strength".
- 3.8 GS 41 "Motor Vehicles - Front and Rear Exterior Protection Devices for Passenger Cars (Bumpers, etc.) and its Methods of Test".

- 3.9 GS 48 “Motor Vehicles - Conformity Certificates”.
- 3.10 GS 51 “Passenger Car Tyres - Part 1: Nomenclature, Designation, Marking, Dimensions, Load Capacities and Inflation Pressures”.
- 3.11 GS 52 “Passenger Car Tyres - Part 2: General Requirements”.
- 3.12 GS 53 “Passenger Car Tyres - Part 3: Methods of Test”.
- 3.13 GS 96 “Motor Vehicles - Methods of Testing of Safety Belts ”.
- 3.14 GS 97 “Motor Vehicles - Safety Belts”.
- 3.15 GS 98 “Motor Vehicles - Flammability of Interior Materials and Their Testing Methods”.
- 3.16 GS 99 “Road Vehicles - Sound Signaling Devices - Technical Specifications”.
- 3.17 GS 135 “Methods of Test for Engine Radiators”.
- 3.18 GS 136 “ Motor Vehicles Engine Radiator”.
- 3.19 GS 144 “Motor Vehicles - Allowable Limits of Gaseous Pollutants Emitted to the Atmosphere from Heavy Duty Diesel Engined Vehicles”.
- 3.20 GS 145 “Motor Vehicles - Methods of Testing Gaseous Pollutants Emitted from Heavy Duty Diesel Engined Vehicles - Part 1: Determination of Exhaust Gaseous Pollutants”.
- 3.21 GS 146 “Motor Vehicles - Methods of Testing Gaseous Pollutants Emitted to the atmosphere from Heavy Duty Diesel Engined Vehicles - Part 2: Determination of Smoke Density”.
- 3.22 GS 153 " Motor Vehicles – Conformity Certificates for Vehicles Manufactured in Multi stages"
- 3.23 GS 159 “Motor Vehicles – Dimensions and Weights ”.
- 3.24 GS 289 “Motor Vehicles - Retro-Reflective Number Plates and its Methods of Test”.
- 3.25 GS 419 “Motor Vehicles - Methods of Test for Door Locks and Door Hinges”.
- 3.26 GS 420 “Motor Vehicles - Door Locks and Door Hinges”.
- 3.27 GS 421 “Motor Vehicles - Methods of Testing of Rear-View Mirrors”.
- 3.28 GS 422 “Motor Vehicles - Rear-View Mirrors”.
- 3.29 GS 645 “Multi-Purpose Vehicles Trucks, Buses, and Trailers Tyres - Part 1: Nomenclature, Designation, Marking, Dimensions, Load Capacities and Inflation Pressure”.
- 3.30 GS 646 “Multi-Purpose Vehicles Trucks, Buses, and Trailers Tyres - Part 2: Methods of Test”.
- 3.31 GS 647 “Multi-Purpose Vehicles Trucks, Buses, and Trailers Tyres - Part 3: General Requirements”.
- 3.32 GS 963 “Motor Vehicles – General Requirements for Ambulances”.
- 3.33 GS 967 “Motor Vehicles - Safety Requirements for Pilgrim Buses”.

- 3.34 GS 972 "Transportation of Dangerous Substances by Road - Part 1: General Safety Requirements".
- 3.35 GS 1040 – "Motor Vehicles – Allowable Limits of Pollutants Emitted to the Atmosphere from Light Duty Diesel Engined Vehicles"
- 3.36 GSO 1041 - Motor Vehicles - Methods of Testing for Pollutants Emitted from Light Duty Diesel Engined Vehicles - Part 1: Determination of Exhaust Gaseous Pollutants".
- 3.37 GSO 1042/2000 Motor Vehicles - Methods of Testing for Pollutants Emitted from Light Duty Diesel Engined Vehicles - Part 2: Determination of Smoke".
- 3.38 GS 1052 "Motor Vehicles Tyres - Temporary Use Spare Wheels/Tyres and Their Methods of Test"
- 3.39 GS 1053 "Motor Vehicles – Protection Against Theft".
- 3.40 GS 1503 "Motor Vehicles – Head Lamps Safety Requirements".
- 3.41 GS1598 "Motor Vehicles – Head Restraints and Their Methods of Test".
- 4.42 GS 1624 "Motor Vehicles – Noise Emissions"
- 4.43 GS 1625 "Motor Vehicles – Speed Limiters – Part 2 : Technical Requirements" Equipment Inspection, Certification and type approval"
- 3.44 GS 1626 "Motor Vehicles – Speed Limiters – Part 3 : Methods of Test"
- 3.45 GS 1677 "Motor Vehicles – Laminated Safety Glass"
- 3.46 GS 1680 "Motor Vehicles - Allowable Limits of Gaseous Pollutants Emitted to the Atmosphere from Unleaded Gasoline Engined Vehicles".
- 3.47 GS 1681 "Motor Vehicles - Methods of Test for Gaseous Pollutants Emitted from Unleaded Gasoline Engined Vehicles - Part 1: Determination of Exhaust Gaseous Pollutants After Cold Start".
- 3.48 GS 1682 "Motor Vehicles - Methods of Test for Gaseous Pollutants Emitted from Unleaded Gasoline Engined Vehicles - Part 2: Determination of Exhaust Carbon Monoxide at Idle Speed".
- 3.49 GS 1683 "Motor Vehicles - Methods of Test for Gaseous Pollutants Emitted from Unleaded Gasoline Engined Vehicles - Part 3: Determination of Evaporative Emissions (Hydrocarbons) from the Fuel System Using the Enclosure Method".
- 3.50 GS 1684 "Motor Vehicles - Methods of Test for Gaseous Pollutants Emitted from Unleaded Gasoline Engined Vehicles - Part 4: Determination of Gaseous Pollutants Emitted from Engine Crankcase
- 3.51 GS 1685 "Motor Vehicles - Methods of Test for Gaseous Pollutants Emitted from Unleaded Gasoline Engined Vehicles - Part 5: Determination of Durability of Pollution Control Equipment".
- 3.52 GS 1707 "Motor Vehicles - Methods of Test for Impact Strength - Part 3B: Moving Barrier Side Impact".
- 3.53 GS 1708 "Motor Vehicles - Methods of Test for Impact Strength - Part 3C: Moving Barrier Side Impact".

- 3.54 GS 1711 "Motor Vehicles – Speed Limiters – Part 1 : General requirements, Equipment Inspection, Certification and type approval"
- 3.55 GS 1780 "Motor vehicles – Vehicle Identification Number (VIN) – Requirements.
- 3.56 GS 1782 " Motor Vehicles – Vehicles Identification Number (VIN) – Location and Attachment.
- 3.57 GS 1783 " Passenger car Tyres – Tread wear, Traction and Temperature Resistance Grading".
- 3.58 GS 1784 " Passenger Car Tyres – Method of Testing of Tyre Temperature Resistance Grading"
- 3.59 GSO ISO 3537 " Motor Vehicles – Safety Glazing Materials – Mechanical Tests"
- 3.60 GSO ISO 3538 "Road Vehicles – Safety Glasses – Test methods for optical properties"
- 3.61 GSO ECE 13H "Motor Vehicles – Braking System of Passenger Cars and Multi Purpose Vehicles".
- 3.62 GSO ECE 13H-1"Motor Vehicles – Methods of Test for Braking System – Part 1 : Braking Performance"
- 3.63 GSO ECE 13H-2"Motor Vehicles – Methods of Test for Braking System- Part 2 : Determination of Capacity of Energy Storage Devices"
- 3.64 GSO ECE 13H-3"Motor Vehicles – Methods of Test for Braking System- Part 3 : Determination of Distribution Braking among the Axles of Vehicles"
- 3.65 GSO ECE 13H-4"Motor Vehicles – Methods of Test for Braking System- Part 4 : Determination of Function of Anti-Lock System"
- 3.66 GSO ECE 13H-5"Motor Vehicles – Methods of Test for Braking System- Part 5 : Determination of Performance of Brake Lining Using Inertia Dynamometer"
- 3.67 GSO ECE 13H-6"Motor Vehicles – Methods of Test for Braking System- Part 6 : Determination of Coefficient of Adhesion"

4- DIMENSIONS

- 4.1 All dimensions shall be determined with the vehicle at its unladen mass.
- 4.2 The vehicle length shall be the distance between two vertical planes perpendicular to the longitudinal median plane and touching the front and rear of the vehicle respectively and it shall not exceed 12.5m for trucks and buses, 18m for trailers, 20m for articulated vehicles.

- 4.3 When measuring the vehicle structural length the following devices shall not be taken into account:
- wiper and washer devices,
 - front or rear marker-plates,
 - devices for securing the load restraint(s)/cover(s) and their protection,
 - lighting and light signaling devices,
 - mirrors or other devices for indirect vision,
 - reversing aids,
 - air-intake pipes,
 - length stops for demountable bodies,
 - access steps and hand-holds,
 - lifting platforms, access ramps and similar equipment in running order, not exceeding 300 mm,
 - coupling and recovery towing devices for power driven vehicles,
 - external sun visors,
 - exhaust pipes.
- 4.4 The vehicle width shall be the distance between two planes parallel to the longitudinal median plane and touching the vehicle on either side of the said plane and it shall not exceed 2.6m.
- 4.5 When measuring the vehicle structural width the following devices shall not be taken into account:
- Devices for securing the tarpaulin and their protection,
 - Tyre failure tell-tale devices,
 - Lighting and light signaling devices,
 - Rear view mirrors.
 - Tyre pressure indicators
 - Retractable steps
 - Running boards
- 4.6 The height of the vehicle shall be the distance between the supporting surfaces and the horizontal plane touching the topmost part of the vehicle and it shall not exceed 4.2 m.
- 4.7 When measuring the vehicle structural height the following devices shall not be taken into account:
- aerials,
 - current collection devices in their elevated position.
- 4.8 Wheel base of a vehicle shall be measured between the perpendicular lines constructed to the longitudinal median plane between two consecutive wheels situated on the same side of the vehicle.
- 4.9 Vehicle front overhang shall be the distance between the vertical plane passing through the centres of the foremost wheels and the foremost point of the vehicle, taking into consideration lashing hooks, registration number plate, etc., and any parts rigidly attached to the vehicle.
- 4.10 Vehicle rear overhang shall be the distance between the vertical plane passing through the centres of the rearmost wheels and the rearmost point of the vehicle,

taking into consideration the towing attachment, if fitted, registration number plate, etc., and any parts rigidly attached to the vehicle.

FOR DETAILED REQUIREMENTS FOR WEIGHTS REFER GSO 159.

5- MINIMUM ROAD CLEARANCE

- 5.1 Any part other than the earth-touching parts of a motor vehicle shall have adequate clearance above the ground so as to ensure safe driving.
- 5.2 The clearance shall be such that any rigid parts of the vehicle should not touch the level ground and get damaged due to impact.
- 5.3 Due to design constriction any projecting parts should be provided with guards to avoid the rigid part being affected for safety reasons.

6- GROSS VEHICLE AND AXLE WEIGHT

- 6.1 The Gross Vehicle Weight is the maximum weight of the fully laden vehicle, based on its construction and design performances, as declared by the manufacturer. This shall be less than or equal to the sum of the maximum axles capacity. The gross vehicle weight shall not exceed 45 tones.
- 6.2 The Unladen Vehicle weight shall be determined by the following criteria:
Weight of the vehicle with bodywork and all factory fitted equipment, electrical and auxiliary equipment for normal operation of vehicle, including liquids, tools, fire extinguisher, standard spare parts, chocks and spare wheel, if fitted.
- 6.3 The pay load of a truck shall be obtained by subtracting the unladen vehicle weight and the driver and passenger weight from the gross vehicle weight.
- 6.4 Maximum axle weights
 - 6.4.1 Maximum axle (s) capacity of a vehicle is the permissible weight corresponding to the maximum weight to be carried by the axle (s) as defined by the vehicle manufacturer, not exceeding the axle manufacturer's specifications. The maximum axle(s) capacity shall be less than or equal to the sum of the maximum capacities of the tyres.
 - 6.4.2 In the case of tandem axles the total weight on the tandem axles shall be depend On the distance between the two rear axles or the distance between the first and the third rear axles.

FOR DETAILED REQUIREMENTS FOR WEIGHTS REFER GSO 159.

7- STABILITY

- 7.1 The vehicle should not pull to left or right during driving.
- 7.2 It should not have too much steering lash at the steering wheel.
- 7.3 When the turning radius is too high the vehicle can overturn when negotiating

a dangerous bend or curve. It should be limited and shall not exceed 12 meters.

- 7.4 Any motor vehicle in the unladen state shall not overturn when tilted to the left or right side at an angle specified in the regulation (35°) or the rollover stability of the vehicle shall be such the point at which overturning occurs should be limited to the lateral acceleration .
- 7.5 The vehicle shall travel along a straight section of road without unusual steering correction by the driver and without unusual vibration in the steering system at the maximum design speed of the vehicle.

8- ENGINE

- 8.1 The engine shall be suitable for either domestic fuel as unleaded gasoline or diesel oil specially with respect to sulphur contents and the deterioration effect on the accessories provided for exhaust emission controls.
- 8.2 Considering the environmental conditions and the health effect of exhaust emissions gases the engine shall comply with at least Euro IV (ECE R 83 and ECE R 49) exhaust emissions pollution limits once the fuel available is suitable.
- 8.3 The engine and its accessories shall be suitable for use in dusty atmospheric conditions and high ambient temperatures especially as concerns the radiator (type and size), air filter, engine block cooling system, thermostat and battery in accordance with the relevant Gulf standards.
- 8.4 The on board diagnostic (OBD) system provided, shall be suitable to enable it to identify the types of deterioration or malfunction over the entire life of the vehicle considering the climatic conditions prevailing in GCC countries .
- 8.5 The components liable to affect the emission of pollutants shall be so designed, constructed and assembled as to enable the engine in normal use, despite the vibration to which it may be subjected, to comply with the provisions of relevant GSO Regulations.

Note : For UAE , Considering the environmental conditions and the health effect of exhaust emissions gases the engine shall comply with Euro V (ECE R 49) exhaust emissions pollution limits once the fuel available is suitable.

9- FUEL SYSTEM

- 9.1 The fuel tank and its connections shall be secure and fixed in such a manner that they will become resistant to damage by vibration, impact, and flammability.
- 9.2 Each fill pipe shall be fitted with a cap that can be fastened securely.
- 9.3 In order to avoid spilling of fuel during sudden brake or negotiating bends it shall not be possible to fill into the fuel tank a quantity of fuel exceeding 97.5% of its capacity.

- 9.4 The structure of the fuel tank and its connections shall be such that it will not leak fuel in case of collision impact that may cause deaths and injuries occurring from fires that result from fuel spillage during and after vehicle crashes.
- 9.5 The filling entry and air vent on the fuel tank shall not be located in the path of discharge of the exhaust pipe and besides, additionally, shall be located not less than 300 mm from the open end of the exhaust pipe.
- 9.6 The filling entry and air vent on the fuel tank shall be located not less than 200 mm from any exposed electric terminal or switch or be separated by body panels.
- 9.7 The tank(s) shall not be situated in, or from, a surface (floor, wall, bulkhead) of the passenger compartment or other compartment integral with it.
- 9.8 A partition shall be provided to separate the occupant compartment from the tank(s).
- 9.9 Every tank shall be securely fixed and so placed as to ensure that any fuel leaking from the tank or its accessories will escape to the ground and not into the occupant compartment during normal conditions of use.
- 9.10 The fuel tank shall be provided with additional guard to prevent exhaust system come in contact with the fuel tank in case if the distance between them are too close and may cause fire in an accident.

FOR DETAILED REQUIREMENTS ON FUEL LEAKAGE REFER GSO 40.

10- COOLING SYSTEM

- 10.1 Every motor vehicle shall be equipped with a cooling system suitable for the climate of GCC countries to keep the engine at its most efficient operating temperature at all engine speeds and under all driving conditions.
- 10.2 Cooling system, using a liquid coolant, shall be provided with a device (thermostat) to shorten the inefficient or cold-operating time.
- 10.3 The radiator and the cooling fans shall be large enough to reduce the operating temperature of the engine to be below the maximum allowable temperature of the coolant and to safeguard the engine without getting damage.

FOR DETAILED REQUIREMENTS ON COOLING SYSTEM REFER GSO REGULATION 136 ENGINE RADIATOR.

11- ELECTRIC SYSTEM

- 11.1 The electric supply system shall be such that it is suitable (Ah) to the engine capacity, fixed firmly, provided with suitable fuses, the current supply without any overheating, which may result in fire.
- 11.2 The components liable to affect the electric energy consumption shall be so designed, constructed and assembled as to enable the vehicle, in normal use, despite the vibrations to which it may be subjected, to comply with the relevant GSO regulation.
- 11.3 The resistance between all exposed conductive parts and the electrical chassis shall be lower than 0.1ohms when there is current flow of at least 0.2amps in the case of hybrid vehicles.

- 11.4 All conductive parts of hybrid vehicles shall be provided with barriers or enclosures and shall be grounded to avoid electrical shock.
- 11.5 The electrical cables provided shall be suitable for the current carrying capacity and additionally protected to avoid any leak of current.
- 11.6 The vehicles with batteries at the rear shall be provided with additional safety cut off devices near the battery to cutoff the supply in case of an impact and the current supply cable severed.
- 11.7 The electrical equipments provided shall not radiate and conduct unwanted disturbances for the functions for the direct control of the vehicle or the vehicle data functionality. Also it should not create disturbances for the use of electrical or electronic equipment at own or adjacent vehicles.

FOR DETAILED REQUIREMENTS ON ELECTRIC SYSTEM REFER GSO 35 AND GSO 40 (Revised).

12- EXHAUST SYSTEM

- 12.1 The exhaust gases shall not be allowed to enter in to the passenger or goods compartment which will affect the health of the passengers.
- 12.2 The exhaust system shall be designed, constructed and capable of being mounted so as to ensure that the vehicle complied with the provisions of this regulation withstanding the vibration to which it may be subjected.
- 12.3 The exhaust system shall have reasonable resistance to the corrosion phenomenon to which it is exposed having regard to the conditions of use of the vehicle. It shall comply with the relevant GSO requirements to be approved.
- 12.4 Exhaust system incorporated with pollution control equipment such as catalytic converters, shall function correctly when using fuel appropriate to the vehicle.
- 12.5 No part of the exhaust system of any motor vehicle shall be so located as would be likely to result in burning, charring or damaging the electrical wiring, the fuel supply, or any combustible part of the motor vehicle. If necessary it shall be provided with additional guard to prevent any damage to electrical or fuel system.
- 12.6 No part of the exhaust system of bus shall cause any entry of exhaust gases into the passenger compartment. It shall be so designed and directed to the side or rear of the vehicle.
- 12.7 The position and location of the exhaust pipe for trucks may be vertical or horizontal and it depends on the material transported by the truck.
- 12.8 The exhaust system of every truck and truck tractor shall discharge to the atmosphere at a location to the rear of the cab or, if the exhaust projects above the cab, at a location near the rear of the cab.

13- BRAKING SYSTEM

- 13.1 The braking system provided to vehicle shall be suitable to the vehicle concern

and ensure safe braking performance under normal and emergency conditions.

- 13.2 The effectiveness of the brake system shall be checked by measuring the stopping distance.
- 13.3 Every motor vehicle shall be equipped with service brake system adequate to control the movement of, and to halt it safely, speedily and effectively whatever its speed and load, on any up or down gradient.
- 13.4 The secondary braking system shall make it possible to halt the vehicle within a reasonable distance in the event of failure of the service braking system.
- 13.5 No material affecting the public health, directly or after reaction with other components such as asbestos and cadmium, shall be used in the brake system.
- 13.6 The control of the service braking device shall be independent of the control of the parking braking device.
- 13.7 The service brake shall be so constructed as to be operated by the driver's right foot.
- 13.8 Brake pipes shall be so attached to the chassis or equivalent that they are not unnecessarily subjected to damage through vibration or abrasion and shall be made of materials resistant to corrosion or treated by any process which ensures such resistance.
- 13.9 An optical, and/or acoustic, signal shall activate when the ignition (start) switch is in the "on" ("run") position and one of the following conditions occurs:
 - 13.9.1 A fall in the supply pressure in a brake power unit to a level less than half of the normal system pressure.
 - 13.9.2 A drop in the level of brake fluid in any master cylinder reservoir compartment to less than the recommended safe level specified by the manufacturer.
- 13.10 The parking braking system shall make it possible to hold the vehicle stationary on an up or down gradient of 18% even in the absence of the driver, the working parts being then held in locked position by a purely mechanical device. In the case of vehicles with trailers, the gradient will be 12%.
- 13.11 All motor vehicles GVW less than 3500kg(passenger cars , Multipurpose vehicles, Buses, Trucks, and dangerous goods vehicles), shall be provided with Anti lock braking systems (ABS).
 - 13.12 All passenger cars and multipurpose vehicles, buses, and trucks with less than 3500 Kg (light duty vehicles), shall be provided with Electronic StabilityControl Systems (ESC).

FOR DETAILED REQUIREMENTS ON BRAKING SYSTEM REFER GSO/ ECE 13H (Light duty vehicles) .

14- SUSPENSION SYSTEM

- 14.1 Depending on the category of vehicle the suspension provided shall be suitable to give a comfortable ride to the passengers, to reduce the shocks to the vehicle from the uneven level of the road, to reduce the load transmitted from the vehicle to road surface and damage the road surface and to drive the vehicle safely without strain to the driver.
- 14.2 Every motor vehicle shall be equipped with springs and shock absorber or any other shock absorbing system which has adequate capacity depending on the GVW of the vehicle, against the impact from the ground and can ensure safe driving on uneven and rough road.
- 14.3 The suspension system provided for trucks used in construction sites shall be suitable to carry the maximum load applied and the rough terrain in which they are used in GCC countries.
- 14.4 The durability of the suspension system should be tested by carrying out durability tests in accordance with the relevant international and manufacturer's specifications.

15- STEERING SYSTEM

- 15.1 The steering system shall be such as to be easily and securely handled by the driver in his normal driving position.
- 15.2 The steering wheel shall be on the left side.
- 15.3 The steering system shall ensure easy and safe handling of the vehicle up to its maximum design speed or in case of a trailer up to its technically permitted maximum speed.
- 15.4 It must be possible to travel along a straight section of the road without unusual steering correction by the driver and without unusual vibration in the steering system at the maximum designed speed of the vehicle.
- 15.5 The steering equipment shall be designed, constructed and fitted in such a way that it is capable of withstanding the stresses arising during normal operation of the vehicle, or combination of vehicles.
- 15.6 The maximum steering angle shall not be limited by any part of the steering transmission unless specifically designed for this purpose.
- 15.7 There shall be no considerable difference between the left and right steering force.
- 15.8 For motor vehicles excluding heavy duty trucks and buses any steering column placed at an angle of not more than 35°, with the line parallel to the vehicle centerline, shall be shock absorbing and shall collapse away from the driver's chest upon impact or sudden deceleration.

16- CONTROL DEVICES

- 16.1 Every motor vehicle shall be provided with suitable controls, tell tales and indicators for the safe operation of the vehicle.

- 16.2 The controls shall be located to left and right of the centre of the steering wheel and so as to be easily identified and operated by the driver in a normal driving position.
- 16.3 The controls to be used by a driver while driving the vehicle shall be located so that they are operable by the driver restrained by the crash protection system, adjusted to be free to move within constraints of that system.
- 16.4 The tell-tales and indicators, shall be located so that they are visible and recognizable to a driver during night and day when activated.
- 16.5 The identifications of tell-tales, indicators and controls shall be placed on or adjacent to the tell-tales, indicators and controls that they identify.
- 16.6 The controls may be identified by symbols/or words.
- 16.7 The location, identification, colour and illumination of the controls, telltales and indicators shall be in accordance with the relevant GSO regulation.

17- FRAME AND BODY

- 17.1 The frame and body shall be so secure and strong enough as to fully withstand the operation of the vehicle.
- 17.2 The chassy shall be strong enough to carry the maximum load applied to the vehicle in use.
- 17.3 The whole design and construction of vehicles, shall withstand the impact forces to the front, rear, side and roof to reduce the likelihood of injuries to the driver and passengers.
- 17.4 The external shape of a motor vehicle shall be free from any sharp or protruding rotating part likely to endanger other traffic.
- 17.5 The flooring in all motor vehicles shall be substantially constructed free of unnecessary holes and openings and shall be maintained so as to minimize the entrance of exhaust gases.
- 17.6 In case of passenger cars and multipurpose vehicles the surfaces of metal bumpers which are most likely to come into contact with other objects shall be provided with rubber (or any equivalent material) of suitable hardness.
- 17.7 Heavy duty trucks and trailers shall be mounted with front, rear and side shields (front, rear and side under- run protections) to protect against under running of vehicles in the event of front, rear or side collision.
- 17.8 The side protection devices shall be designed to offer effective protection to unprotected road users against the risk of falling under the sides of the vehicle and being caught under the wheels.

- 17.9 Heavy duty trucks of GVW more than 7 tons and slow moving vehicles shall be equipped with suitable rear reflective plates to avoid accidents.
- 17.10 The front and rear of the vehicles shall be provided with designated location sufficient in size to fix the number plates made in accordance with the GSO technical regulation No. GSO 289.

FOR DETAILED REQUIREMENTS ON FRAME AND BODY REFER GSO 36, 37, 38, 39, 1707, 1708, 40, 289 AND 572.

18- COUPLING DEVICES AND TOWING METHODS

- 18.1 When two or more vehicles are operated in combination, the coupling devices connecting the vehicles shall be designed, constructed and installed, and the vehicles shall be designed and constructed so that when the combination is operated in a straight line on a level, smooth, paved surface, the path of the towed vehicle will not deviate more than 76 mm to either side of the path of the towing vehicle.
- 18.2 Fifth wheel
- Every fifth wheel assembly shall have a locking mechanism. The locking mechanism and any adapter used in conjunction with it shall prevent separation of the upper and lower halves of the fifth wheel assembly unless a positive manual release is activated.
- 18.3 Towing of full trailers
- The full trailer shall be equipped with a tow-bar and a means of attaching the tow-bar to the towing and towed vehicles. The tow-bar and the means of attaching it shall meet the following:
- 18.3.1 They shall be of structure adequate to withstand the weight being drawn.
- 18.3.2 They shall be properly and securely mounted.
- 18.3.3 They shall be provided with a locking device that prevents accidental separation of the towed and towing vehicles.

19- WHEELS (TYRES AND RIMS)

- 19.1 The tyres shall withstand endurance test, high speed performance test, Bead unseating tests, Strength tests, Temperature resistance tests, Rolling resistance and wet grip tests specified in the relevant GSO technical regulations.
- 19.2 Considering the environmental conditions prevailing in GCC countries Passenger car tyres shall be of “A” or “B”, temperature rating and provided with a minimum speed symbol “S” (180 km/h) and higher rating tyres.
- 19.3 Multi-purpose passenger vehicles equipped with passenger car tyres, shall have tyres of “A” or “B” temperature rating and provided with speed symbol “S” (180 km/h) and higher rating tyres.
- 19.4 Multi-purpose passenger vehicles, equipped with light truck (LT) tyres, shall be provided with speed symbol “S” (180 km/h) and higher rating tyres.

- 19.5 No bus shall be operated with a regrooved, recapped or retreaded tyre on a front wheel.
- 19.6 No truck or truck tractor shall be operated with regrooved or retreaded tyres on front wheels which have a load carrying capacity equal to or greater than 4000 kg.
- 19.7 The vehicles shall be provided with a spare tyre. The vehicles provided with a run flat tyre may be exempted from this requirement.
- 19.8 All light duty vehicles shall be provided with a Tyre Pressure Monitoring system which informs the driver when a tyre is below the vehicle manufacturers recommended running pressure except those vehicles with dual wheels on an axle.

FOR DETAILED REQUIREMENTS ON TYRES REFER GSO REGULATIONS 51, 52, 53, 645, 646, 647, 1052, 1783, AND 1784.

20- SEATS

- 20.1 Every adjustment and displacement system provided to the seats shall incorporate a locking system, which shall operate automatically. Locking systems for armrests or other comfort devices are not necessary unless the presence of such devices will cause additional risk of injury to the occupants of a vehicle in the event of a collision.
- 20.2 The surface of the rear parts of seats shall exhibit no Dangerous roughness or sharp edges likely to increase the risk of severity of injury to the occupants.
- 20.3 No failure shall occur in the seat frame or in the seat anchorage, the adjustment and displacement systems or their locking devices as a result of collision such as permanent deformations, including ruptures, that may increase the risk of injury.
- 20.4 Seats and bench seats shall be firmly attached to the vehicle.
- 20.5 Sliding seats and bench seats shall be automatically lockable in all the positions provided.
- 20.6 Adjustable seat-backs must be lockable in all the Positions provided.
- 20.7 All seats which can be tipped forward or have fold-on backs must lock automatically in the normal position.
- 20.8 In the case of seats provided with head restraints, the strength of the seat-back and of its locking devices shall be strong enough to meet the required force without any breakage.
- 20.9 Driver's seat

The driver's seat on a motor vehicle in the left side shall be so constructed and located that the driver can at all times have full view necessary for driving and that the driver can control the motor vehicle without being obstructed by the passengers or loaded goods, etc.
- 20.10 Passenger's seats
 - 20.10.1 Except in the case of seats located facing one another, where the minimal distance between them should be double those specified for the ordinary located seats, the space between the foremost edge of a seat cushion and the back of a seat, partition, etc., located ahead shall be sufficient for the passenger to move out from the seat easily without any obstruction or difficulty.

- 20.10.2 The distance between the seats at the aisles shall be sufficient for the passengers to exit in an emergency without any obstruction or difficulty and be not less than 300mm, and 270mm for buses with not more than 15 seats.
- 20.10.3 Vehicles carrying children shall not be equipped with spare seats.

21- SAFETY BELTS

- 21.1 The hardware of seat belt assemblies shall be designed to prevent attachment bolts, and other parts from becoming disengaged from the vehicle while in service.
- 21.2 The seat belt assembly anchorages shall ensure proper location for effective occupant restraint and to reduce the likelihood of their failure during impact.
- 21.3 Motor vehicles shall be equipped with safety belt assemblies and safety belt anchorages in order to restrain the passengers on the seats from moving forward or inclining their upper torso forward excessively in case of collision.
- 21.4 The front and rear outboard seats of passenger cars and multipurpose vehicles shall be provided with three-point safety belts, the other seats and seats of all other vehicles shall be provided with either two point or three-point safety belts except side facing seats.
- 21.5 All three-point belts shall be provided with retractor, and in the two-point belts shall be optional.
- 21.6 The belt assembly shall be so designed and constructed that when correctly installed and properly used by an occupant its satisfactory operation is assured and it reduces the risk of bodily injury in the event of an accident.
- 21.7 Straps and other hard ware shall be free from burrs and sharp edges, and located in the assembly in such a manner that the possibility of injury to the wearer is minimized and liable to cause wear or breakage.

FOR DETAILED REQUIREMENTS ON SAFETY BELTS REFER GSO 96 AND 97.

22- AIR BAGS

- 22.1 The air bag shall be located in suitable position to assist in preventing the driver's head and chest from impacting the steering wheel or windshield.
- 22.2 The material used to inflate the bag shall not be toxic and cause any irritation.
- 22.3 Passenger cars, Multipurpose Passenger vehicles, buses and trucks carrying twenty two (22) passengers and less shall be provided with air bags to the driver side and the front passenger side.

- 22.4 The curtain air bags if provided to the side of the vehicle shall comply with the above requirement and shall activate in a side impact situation.

23- WINDSHIELD AND WINDOW

- 23.1 The windshield shall retain in its position during and impact to keep the vehicle occupants within the confines of the passenger compartment and to reduce crash injuries and fatalities.
- 23.2 The glass of a windshield shall be laminated and all windows on every motor vehicle shall be of safety glass or laminated.
- 23.3 The glass shall be free from faults such as blisters, bubbles, cracks, crazing, scratch, separation, wedge and shall not have any colour/tint, which shall interfere with the appearance, service or vision.
- 23.4 The windshield shall have surfaces sufficiently resistant to abrasion, likely to be encountered in normal traffic such as spot crack and possibility of propagation of this crack to be minimum.
- 23.5 The glass provided shall not be affected by the atmospheric conditions, chemicals and heat.
- 23.6 The glass provided shall be such that in the event of shattering, due to an accident or otherwise, the danger of injuries to persons around, is reduced to minimum.
- 23.7 The glass of a windshield shall be such that even if the glass is broken, the driver can still have a view of near the front of the vehicle through the broken glass.
- 23.8 The allowable minimum light transmissibility for the windshield glasses, Rear glass, and all side Windows of motor vehicles shall not be less than 70%. It shall not obstruct any visibility from outside to inside.
- 23.9 The rear window shall be provided with suitable anti fog system where necessary.

FOR DETAILED REQUIREMENTS ON WINDSHIELD REFER GSO 1677. GSOISO 3537 AND GSOISO 3538)

24- HEAD RESTRAINT

- 24.1 Front outboard seats of passenger vehicles with GVW not exceeding 3500kg shall be tower back type or equipped with adjustable head restraints. For the other seats the head restraints may be optional.
- 24.2 It shall be designed and constructed to be of a suitable size so as not to cause the occupant's head or neck injury as a result of impact in rear - end.
- 24.3 Adjustable type restraint shall be so mounted as not to become dislodged as a consequence of vibration, impact, and it shall not be possible to exceed the maximum prescribed height for use without voluntary action by the user in addition to adjusting operation.
- 24.4 The presence of the head restraint must not be an additional cause of danger to

occupants of the vehicle. In particular, it shall not in any position of use exhibit any dangerous roughness or sharp edge liable to increase the risk or seriousness of injury to the occupants.

- 24.5 The head restraint shall be secured to the seat or to the vehicle structure in such a way that no rigid and dangerous parts project from the padding of the head restraint or from its attachment to the seat-back as a result of the pressure exerted by the head.
- 24.6 The dimensions and the performance of head restraints shall be as specified in GSO regulation.
- 24.7 The height of the seat back shall be less than 70cm from the seating reference point, if the seats are not provided with head restraints.

FOR DETAILED REQUIREMENTS ON HEAD RESTRAINT REFER GSO 1598.

25- REAR-VIEW MIRRORS

- 25.1 The vehicles shall be provided with devices for indirect vision to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. These can be conventional mirrors, camera-monitors or other devices able to present information about the indirect field of vision to the driver.
- 25.2 The rear-view mirrors shall be of adjustable type and mounted in such a manner that by means of them, the driver in his seat can clearly observe the traffic conditions of other vehicles on both sides, right and left of the vehicle, and directly behind and is also able clearly to observe traffic conditions near the right side of the vehicle, other than in the area he in his seat can view directly.
- 25.3 The mirror and mounting shall be free from sharp projecting edges or points which may cause injury and the external mirror holder shall be of breakaway or folding type.
- 25.4 The mirrors shall be firmly fixed in such a way that, they will not move so as significantly to change the field of vision and thus cause the driver to misinterpret the nature of the image perceived when the vehicle is moving at high speed.
- 25.5 The internal mirror shall be adjustable by tilting in both the horizontal and vertical directions from the driver's seated position and shall not cause any injury to the driver in an impact.
- 25.6 The external mirrors shall be directly visible from the normal driving position, through the side windows or through the windscreen.
- 25.7 The external mirrors and the mounting shall not protrude beyond the widest part of the body of the vehicle, except to the extent necessary to produce a field of vision necessary.

FOR DETAILED REQUIREMENTS ON DEVICES FOR INDIRECT VISION REFER GSO 422.

26- SOUND SIGNALLING DEVICE (HORN)

- 26.1 Every motor vehicle other than a trailer and semi-trailers shall be equipped with a horn.
- 26.2 The horn shall emit a continuous and uniform sound and its acoustic spectrum shall not vary during its operation.
- 26.3 The sound level shall not be a nuisance to the public and the other vehicle users.
- 26.4 Except for priority vehicles, no horn shall produce a sequence of sounds of varying frequencies.

FOR DETAILED REQUIREMENTS ON SOUND SIGNALLING DEVICES REFER GSO 99 AND GSOISO 6969/2007.

27- POLLUTION

General: The GSO motor vehicles exhaust emissions regulations are under revision, based on ECE 83/2005 Euro IV limits and ECE R 49 ECE Euro IV, and the revised regulation will be enforced starting from 2017 model year vehicles.

- 27.1 Light duty unleaded gasoline engined vehicles regulations are applicable to the following:
 - 27.1.1 Exhaust emissions at normal ambient temperature, evaporative emissions, emissions of crankcase gases, durability of pollution control devices and on board diagnostic systems of motor vehicles with maximum mass not exceeding 3500kg.
 - 27.1.2 Exhaust emissions at normal ambient temperature, evaporative emissions, emissions of crankcase gases, durability of pollution control exhaust devices and on board diagnostic systems of hybrid electric vehicles with maximum mass not exceeding 3500kg.
 - 27.1.3 The components liable to affect the emission of gaseous pollutants from gasoline engines shall be so designed, constructed and assembled as to enable the engine, in normal use to comply with GSO regulations.
 - 27.1.4 There shall be no emission from the crankcase of the vehicle to the atmosphere.
 - 27.1.5 The evaporative emission emitted from the fuel system shall not exceed 2.0 grams/test.
 - 27.1.6 The tests shall be carried out in accordance with GSO regulations Nos. 1681, 1682, 1683, 1684, 1685 and the limits of pollutants to be complied shall be in accordance with GSO regulation No.1680.

FOR DETAILED REQUIREMENTS ON EXHAUST EMISSIONS FOR UNLEADED GASOLINE ENGINED VEHICLES REFER GSO 1680, 1681, 1682, 1683, 1684 AND 1685.

- 27.2 **Light duty diesel engined vehicles regulations are applicable to the following:**

- 27.2.1 Exhaust emissions, the durability of anti pollution devices and on board diagnostic systems of motor vehicles with the maximum mass not exceeding 3500kg.
- 27.2.2 Exhaust emissions, durability of anti pollution devices and on board diagnostic systems of hybrid electric vehicles with the maximum mass not exceeding 3500kg.
- 27.2.3 The components liable to affect the emission of gaseous and particulate pollutants from diesel engines shall be so designed, constructed and assembled as to enable the engine, in normal use to comply with GSO regulations.
- 27.2.4 There shall be no emission from the crank case of the vehicle to the atmosphere.
- 27.2.5 The tests shall be carried out in accordance with GSO regulations Nos. 1041, 1042 and the limits shall be in accordance with GSO regulation No.1040.

27.3 **Heavy duty gasoline engined vehicles**

- 27.3.1 The heavy duty gasoline engine vehicles shall comply with the exhaust emission requirements based on the ECE regulations and/or FMVSS regulations and other country of origin standards, until the GSO regulation for heavy duty Gasoline Engine Vehicles on exhaust emissions are formulated.
- 27.3.2 The components liable to affect the emission of gaseous pollutants from gasoline engines shall be so designed, constructed and assembled as to enable the engine, in normal use to comply with GSO regulations.
- 27.3.3 The carbon monoxide in the exhaust gases at idle speed shall not exceed 3.5% by volume when testing the vehicle in accordance with Gulf standard to be formulated No. "Motor Vehicles - Methods of Test for Pollutants Emitted from Heavy Duty Gasoline Vehicles".
- 27.3.4 There shall be no emission from the crankcase of the vehicle to the atmosphere.

27.4 **Heavy duty diesel engined vehicles**

- 27.4.1 The components liable to affect the emission of gaseous and particulate pollutants from diesel engines shall be so designed, constructed and assembled as to enable the engine, in normal use to comply with GSO regulations.
- 27.4.2 The use of defeat device and irrational emissions control strategy is not allowed.
- 27.4.3 The heavy duty diesel engine vehicles exhaust emissions shall comply with GSO regulation No 144, and the tests shall be carried out in accordance with GSO regulations No.145 and 146.

FOR DETAILED REQUIREMENTS ON EXHAUST EMISSIONS FOR DIESEL ENGINED VEHICLES REFER GSO 144, 145 AND 146.

Note: For UAE, exhaust emission regulations are under revision based on ECE R 49 Euro V limits

28- VEHICLE EXTERIOR NOISE LEVELS

- 28.1 The vehicle, its engine and its noise reduction system shall be so designed, constructed and assembled as to enable the vehicle, in normal use, despite the vibration to which it may be subjected, to comply with the provisions of this requirements.
- 28.2 The noise reduction system shall be so designed, constructed and assembled as to be able to reasonably resist the corrosive action to which it is exposed having regard to the conditions of use of the vehicle and the environmental conditions prevailing..
- 28.3 The noise made by the vehicle shall be measured by the two methods described in GSO technical regulation the vehicle in motion and the vehicle in stationary.
- 28.4 In the case of a vehicle where an internal combustion engine does not operate when the vehicle is stationary , the emitted noise shall only be measured during motion.

FOR DETAILED REQUIREMENTS ON NOISE EMISSIONS REFER GSO 1624.

29- FLAMMABILITY OF INTERIOR MATERIALS

- 29.1 The materials used in the occupant compartments of motor vehicles shall reduce deaths and injuries to motor vehicle occupants caused by vehicle fires, especially those originating in the interior of the vehicle from sources such as matches, cigarettes or electrical short circuits.
- 29.2 The materials used in the interior compartment, engine compartment, any other heating compartment of the vehicles shall comply with this regulation with respect to burning rate of 100mm/min when tested in accordance with GSO technical regulation.
- 29.3 The material used for the interior compartment shall be bounded by Roof, Floor, Side walls, Doors, Outside glazing, Rear compartment bulkhead, Back support, Head restraints, Seats and Curtains.
- 29.4 The materials and/or equipment used in the interior compartment, the engine compartment and any separate heating compartment shall be so installed as to minimize the risk of flame development and flame propagation.
- 29.5 Any adhesive agent used to affix the interior material to its supporting structure shall not, as far as possible, exacerbate the burning behaviour of the material.
- 29.6 Electric cables inside the passenger compartment shall undergo the resistance to flame propagation test and comply with the GSO technical regulation.

FOR DETAILED REQUIREMENTS ON FLAMABILITY OF INTERIOR MATERIALS REFER GSO 98.

30- LIGHTING EQUIPMENT

- 30.1 General

- 30.1.1 Only the approved lighting equipment shall be fitted to motor vehicle and trailers.
- 30.1.2 The lighting equipment shall be so fitted that under normal conditions of use and notwithstanding any vibrations to which they may be subjected in such use their satisfactory operation remains assured and they retain the photometric characteristics prescribed in GSO regulations
- 30.1.3 It shall be possible for the lamps to be correctly adjusted , if not misalignment will affect the visibility and cause disturbance to on coming vehicles.
- 30.1.4 Lighting equipment mounted in pairs shall be of the same colorimetric requirements and symmetrically appropriate photometric characteristics.
- 30.1.5 No motor vehicle shall be equipped with a head lamp, which cause discomfort to the driver either directly or indirectly through the devices for indirect vision and/or other reflecting surfaces of the vehicle or other motor vehicles.
- 30.2 Head lamp
 - 30.2.1 Every motor vehicle shall be equipped with head lamps one or two on each side, at the front, for vehicles with width more than 0.8m and maximum designed speed more than 20km/h.
 - 30.2.2 The intensity of the main beam head lamp or head lamps on the motor vehicle when on main beam setting, shall be capable of allowing any obstacle on the road at night at a distance of 100 meters to be seen clearly.
 - 30.2.3 The head lamps shall be of such construction that the intensity can be dimmed (low beam) or the direction of the beam can be dipped in order that other traffic may not be dazzled.
 - 30.2.4 The head lamps shall emit white light.
 - 30.2.5 A tell-tale device should be provided to indicate the driver whenever the high beam is on.
- 30.3 Stop lamp (brake lamp)
 - 30.3.1 Every motor vehicle shall be equipped with a stop lamp on each side at the rear. Passenger cars and multi-purpose passenger vehicles shall be provided with a high mounted stop lamp at the rear.
 - 30.3.2 Stop lamps shall be clearly visible even in day time from a distance to be clearly identified by the vehicles coming behind to avoid any rear impact.
 - 30.3.3 Stop lamps shall be actuated upon application of the service brake of the motor vehicle or advanced braking features such as cruise control.
 - 30.3.4 Stop lamps shall display a red color.
- 30.4 Rear position lamp
 - 30.4.1 Every motor vehicle shall be equipped with at least one rear position lamp on each side, at the rear.
 - 30.4.2 The intensity of rear position lamps shall be such that it will be clearly visible at night at a suitable distance to the rear to avoid any rear impact.
 - 30.4.3 The lamps shall display a red colour.

- 30.4.5 Rear position lamps to motor vehicles shall be wired so that it will light simultaneously on both sides with the front position lamps.
- 30.5 Front position lamp
 - 30.5.1 Every motor vehicle shall be equipped with a front position lamp on each side at the front.
 - 30.5.2 The intensity of the front position lamps shall be such it will be clearly visible at night at a safe distance from the front of the vehicle.
 - 30.5.4 Front position lamps shall be so designed and constructed that they can be turned on with or without running the engine.
 - 30.5.5 Front position lamps are required to be white/amber in colour and shall be wired to light simultaneously.
- 30.6 Reversing lamp.
 - 30.6.1 Every motor vehicle shall be equipped with not more than two reversing lamps.
 - 30.6.2 The intensity of the reversing lamp shall be not greater than 5000 candela, and it should give a clear vision to the rear when reversing. It shall be white in colour.
- 30.7 Direction Indicator Lamp
 - 30.7.1 Every motor vehicle shall be equipped with direction indicator lamps, two mounted on the front end and two mounted on the rear, direction indicator light mounted on the side of the vehicle is optional.
 - 30.7.2 The intensity of the direction indicator lamps shall be such that it will be visible from any height not more than 2.5 meters above the ground at a safe distance to the rear.
 - 30.7.5 Front and rear direction indicator lamps shall, when in operation, be visible, even in daytime, and shall be amber/red in colour.
 - 30.7.8 A tell-tale device shall be provided to inform the driver of correct operation.
 - 30.7.9 The direction indicator lamps may be so designed and constructed that they also act as the hazard warning flashing lamps.
- 30.8 Hazard warning flashing lamp
 - 30.8.1 Every motor vehicle shall be equipped with hazard warning flashing lamps. The signal shall be given by simultaneous operation of the direction indicator lamps.
 - 30.8.2 Hazard warning flashing lamps shall comply with the requirements of direction indicator lamps specified in (item 30.7).
- 30.9 Clearance lamp
 - 30.9.1 Tractors, trailers, semi-trailers and buses whose width exceeding 2.1 m shall be equipped with clearance lamps, with at least one on each side, at the front and at the rear.
 - 30.9.2 The clearance lamp shall be mounted so as to indicate the extreme width of the motor vehicle.

- 30.9.3 The intensity of the clearance lamps (front and rear) shall be clearly visible from night at a sufficient distance to avoid any accident by other vehicles.
- 30.9.4 Front clearance lamps shall display an amber or white colour and the rear shall be amber or red colour.
- 30.10 Auxiliary head lamp
Auxiliary head lamps, if mounted, shall comply with the following requirements:
 - 30.10.1 No more than two auxiliary head lamps can be lighted at any time.
 - 30.10.2 The main beam of any auxiliary head lamp shall be directed downward.
 - 30.10.3 The light colour of auxiliary head lamps shall be white or light yellow.
- 30.11 Side marker lamps and side reflector
 - 30.11.1 Any motor vehicle exceeding 6m in length shall be equipped with front and rear side marker lamps or side reflectors on both sides of motor vehicles.
 - 30.11.2 The side marker lamps shall be clearly visible at night at a suitable distance from the side of the vehicle to avoid any accidents.
 - 30.11.3 Shall display amber colour for those equipped on the front and the center, and red or amber colour for those on the rear.
 - 30.11.4 The side reflectors shall be clearly visible at night at a sufficient distance from the side of the vehicle to avoid any accident when illuminated by head lamp beams.
 - 30.11.5 Shall reflect amber colour for the front and center side reflectors, and red or amber colour for the rear.
- 30.12 Rear registration plate lamp
 - 30.12.1 Every motor vehicle shall be equipped with a registration plate lamp of such construction as to illuminate, with a white light, the rear registration number plate, making it clearly visible from a distance of 20 meters to the rear.
 - 30.12.2 The registration plate lamp shall be wired so that it is on when the head lamps and front and rear position lamps are on .
- 30.13 Courtesy lamps (room lamp)
Every vehicle shall be equipped with suitable courtesy lamp(s) inside the passenger compartment .
- 30.14 All motor vehicles shall be provided with a minimum of one rear fog lamp. The rear fog lamp shall be red in colour.

FOR DETAILED REQUIREMENTS ON LIGHTING EQUIPMENT REFER GSO 1503.

31- DOOR LOCKS AND DOOR RETENTION COMPONENTS (LIGHT DUTY VEHICLES)

- 31.1 The door locks and side door retention components including latches, hinges, and other supporting means, fitted to the light duty vehicles shall be such to minimize the likelihood of occupants being thrown out from the vehicle as a result of

impact.

- 31.2 Latches and door retention components on any side door leading directly into a compartment that contains one or more seating positions shall be so designed, constructed and fitted as to comply with the provisions of this Regulation.
- 31.3 Each latch shall have both an intermediate latched position and a fully latched position.
- 31.4 Latches shall be designed in such a way as to prevent the doors opening accidentally.
- 31.5 The driver's door lock shall be locked from outside by the help of a key or by the help of a remote system for light duty vehicles.
- 31.6 In passenger cars and multi-purpose vehicles, when the locking mechanism of the side rear door is engaged both the outside and inside door handles or other latch release controls shall be inoperative.
- 31.7 In passenger cars and multipurpose vehicles, when the locking mechanism of the doors are not engaged, a telltale indicator lamp shall function to indicate the driver the one of the doors are not fully latched.

FOR DETAILED REQUIREMENTS ON DOOR LOCKS AND DOOR RETENSION COMPONENTS REFER GSO 420.

32- SPEEDOMETER

- 32.1 Every motor vehicle shall be equipped with a speedometer located in the driver's direct field of vision and is clearly legible by night and by day.
- 32.2 The speed indicated by the speedometer fitted to the vehicle shall not be less than the true speed of the vehicle.
- 32.3 The speedometer shall be graduated in kilometers per hour.
- 32.4 The range of speeds shown on the speedometer shall include the maximum speed indicated by the manufacturer and the actual running speed of the vehicle.
- 32.5 Graduation shall be of 1, 2, 5 or 10 km/h.
- 32.6 The numerical values shall be spaced at intervals not exceeding 20 km/h intervals when the highest value on the dial does not exceed 200km/h and at intervals not exceeding 30km/h when the highest value on the dial exceed 200km.

33- ODOMETER

- 33.1 The odometer should be located in front of the driver's direct field of vision and to be clearly legible.
- 33.2 Every motor vehicle shall be equipped with an odometer in a suitable place in the dashboard.
- 33.3 Every mechanical type odometer shall be capable of indicating distance traveled from 0 to not less than 999,999 kilometers in one kilometer units. Electronic odometers shall be capable of indicating distance traveled from 0 to not less than 600,000 kilometers in one kilometer units.

33.4 The odometer shall be of tamper proof and difficult to modify by design.

34- SPEED WARNING DEVICE AND SPEED LIMITING DEVICE

34.1 The speed warning device shall alert the driver at the set speed that the speed is too high and should reduce the vehicle speed in order to avoid accidents, injury and death.

34.2 The speed limitation devices shall be fitted to the vehicle to control the speed of the vehicles within the safe limit and to comply with the speed limits enforced by the authority for the Pilgrim buses and the dangerous good vehicles.

34.3 Every motor vehicle shall be equipped with light and /or sound emitting devices which automatically give warning to the driver when the speedometer indicates a speed exceeding (120 ± 5) km/h. The light shall be continuous and the sound shall be as a minimum once until the speed is reduced to below 120 km/h.

As a minimum the visual light warning shall remain constantly on or flashing as long as vehicle speed continues to exceed 120 ± 5 km/h. As a minimum the audible warning should active once when the vehicle speed first exceeds 120 ± 5 km/h. Unlike the visual warning this audible warning does not need to operate continuously, but if the vehicle speed drops below 120 ± 5 km/h and then increases again to exceeds 120 ± 5 km/h it must sound operate again.

34.4 The speed warning device shall be of such a structure that the warning signal cannot be stopped by means other than control of the speed by the driver.

34.5 The speed limiting device shall function by controlling the fuel feed to the engine.

34.6 The speed limiting device of the vehicle shall be so designed, constructed and assembled as to resist corrosion and ageing.

34.7 The speed limiting device shall be of a failsafe type and shall not affect the vehicle performance.

34.8 Every heavy duty truck transporting dangerous substances (e.g. explosives ...) and pilgrim buses shall be equipped with speed limiting device in accordance with the GSO technical regulation to limit the maximum speed as specified by the concerned authority.

FOR DETAILED REQUIREMENTS ON SPEEDWARNING AND SPEED LIMITING DEVICES REFER GSO REGULATION NO.1711.

35- WINDSHIELD WIPING AND WASHING SYSTEMS

35.1 Every motor vehicle shall have a power-driven windshield wiping system with at least two speeds; one shall be at least 45 cycles per minute and the other at least 20 cycles per minute, regardless of engine speed and engine load.

35.2 Every motor vehicle shall be equipped with a windshield washing system that meets the requirements of the relevant Gulf standard.

36- **UNDERRUN PROTECTION**

36.1 **Front under run Protection**

36.1.1 All vehicles carrying goods, including tankers, mobile cranes, mobile Workshops of maximum mass exceeding 3.5 tones, shall be equipped with front under run protective devices to offer effective protection for passenger cars or vehicles carrying goods having maximum mass not exceeding 3.5 tones against under running in the event of a frontal collision.

36.1.2 If the vehicle is so designed and equipped at the front that by virtue of their Shape and characteristics, its component parts comply with the requirements Specified in GSO regulation, then the vehicle may not be necessary to be provided with front under run protective device.

36.2 **Rear under run Protection**

36.2.1 All vehicles carrying goods, including tankers, mobile cranes, mobile workshops, trailers and semi-trailers of maximum mass exceeding 3.5 tones shall be equipped with rear under run protective devices to protect against under running of vehicles in the event of rear collision with passenger cars, multi-purpose vehicles and light duty trucks having a maximum mass not exceeding 3.5 tones.

36.2.2 If the vehicle is so designed and equipped at the rear that by virtue of their Shape and characteristics, its component parts comply with the requirements specified in GSO regulation, then the vehicle may not be necessary to be provided with rear under run protective device.

36.2.3 The rear under run protective device to be installed to the vehicle shall be suitable to the vehicle to prevent under running of light duty vehicles.

36.3 **Lateral Protection**

36.3.1 All vehicles carrying goods, including tankers, mobile cranes, mobile workshops, trailers and semi-trailers of maximum mass exceeding 3.5 tones shall be constructed and equipped in such a way as to offer, throughout their length, at both sides effective protection to unprotected road users against the risk of falling under the sides of the vehicle and being caught under the wheels.

36.3.2 If the vehicle is so designed and/or equipped at the side that by virtue of their shape and characteristics, its component parts can be incorporated and/or regarded as replacing the lateral protective device and comply with the requirements specified in GSO regulation then the vehicle may not be necessary to be provided with lateral protective device.

36.3.3 The outer surface of the LPD shall be smooth, and so far as possible continuous from front to rear.

36.3.4 LPD shall be essentially rigid and shall be mounted securely without any vibration in normal use of the vehicle. It shall be made of metal or any other suitable material.

37- **Protection Against Theft**

37.1 All passenger cars and multipurpose vehicles with GVW less than 3500kg (light duty vehicles) shall be provided with an electronically coded immobilizer to prevent unauthorized use of vehicles.

37.2 The immobilizer shall be so designed as to prevent the operation of the vehicle under its own power by at least one of the following means:- Disable at least two separate vehicle circuits that are needed for vehicle operation under its own power such as starter motor, ignition system ,fuel supply, transmission, gear shift control or steering.

37.3 The key and the lock shall not be visibly coded.

37.4 In the case of automatic transmission the transmission shift mechanism shall become locked in park position when the key is removed.

FOR DETAILED REQUIREMENTS ON PROTECTION AGAINST THEFT REFER GSO REGULATION 1053.

38- **Fuel consumption (Economy) measurement and Label**

38.1 All light duty vehicles with maximum weight equal or less than 3500 kg shall be provide with a label on fuel consumption efficiency.

38.2 The label shall be displayed on to the inner side of the vehicle on to the rear left hand side window by the manufacturer of the vehicle. In case where it cannot be installed on the rear left hand window, the label shall be displayed on the front left hand side window.

38.3 The measurement of fuel consumption for motor vehicles shall be carried out in accordance with the New European Driving Cycle (NEDC) or Corporate Average Fuel Economy (CAFÉ) and shall be converted by the method adopted by the International Energy Agency (IEA) and indicated on the label.

38.4 The fuel economy (consumption) of vehicles shall be graded as shown below:

a) Passenger Cars

Level	Grade	Lower Limit(km/l)	Upper limit(km/l)
1	Excellent	14.7	+
2	Very Good	14.2	14.69
3	Good	13.6	14.19
4	Average	13.0	13.59
5	Poor	12.5	12.99
6	Very poor	-	12.49

b) Light Duty Trucks and Commercial vehicles

Level	Grade	Lower Limit(km/l)	Upper limit(km/l)
1	Excellent	12.1	+
2	Very Good	11.6	12.09
3	Good	11.1	11.59
4	Average	10.5	11.09
5	Poor	10.0	10.49
6	Very poor	-	9.99

38.5 The label shall be in accordance with the GSO regulation to be prepared on Motor Vehicle Fuel consumption measurement. The format of the label shall be as shown in Figure 1.

38.6 The label shall be in Arabic and English, and the font sizes shall be as follows:

Details in Label	Arabic Font size (Arial bold)	English Font size (Helvetica)
Auto manufacturers name and Vehicle Name	12	11
Model Year	12	11
Engine Size (displacement)	12	11
Vehicle Type	12	11
Fuel Economy (Km/L)	20	16
Fuel Types	25	17
Fuel Economy value (Km/L)	25	17
Fuel Economy rating (grade)	12	11

As a minimum the label shall have the following details:

38.6.1 Type/model of the vehicle:

38.6.2 Model Year of the Vehicles:

38.6.3 Category of the Vehicle:

38.6.4 Fuel Type of the Engine:

38.6.5 Engine displacement:

38.6.6 Fuel Consumption measurement test Cycle : (NEDC/CAFÉ)

- 38.6.7 Fuel Consumption results in CAFÉ (Km/liter):
- 38.6.8 The label shall be printed in black and white.
- 38.7 When carrying out the fuel consumption measurement the rolling resistance and wet grip of the tyres shall be documented in accordance with GSO/ISO standards 28580, 23671 and 15222.
- 38.8 The components liable to affect the fuel consumption, electric energy consumption shall be so designed, constructed and assembled as to enable the vehicle, in normal use, despite the vibrations to which it may be subjected, to comply with the provisions of the GSO regulations to be prepared.
- 38.9 The fuel consumption shall be expressed in km/litre.
- 38.10 The electric energy consumption shall be expressed in Watt hours per kilometer (Wh/km) and the range in km, both rounded to the nearest whole number.
- 38.11 A guide on fuel economy shall be provided advising the motorists that correct use and regular maintenance of the vehicle and driving behavior, such as avoiding aggressive driving, travelling at lower speeds, anticipation braking, correctly inflating tyres, reducing periods of idling, not carrying excessive weight, will improve the fuel consumption and reduce the CO₂ emissions of their vehicle.

39- **Impact Strength**

These requirements are applicable to passenger cars, multipurpose passenger vehicles, trucks and buses with maximum GVW less than 4500Kg, depending on applicable GVWs as indicated in each regulation.

39.1 **FRONTAL IMPACT.**

This requirement specifies the limit of the rearward displacement of the steering to reduce the likelihood of chest, neck or head injuries. The body injuries are measured by using dummies with electrical impulse connections and measuring instruments. In the case of hybrid electric vehicles the electrical protection and electrolyte spillage are also measured.

39.1.2 After the frontal impact the part of the steering control surface directed towards the driver shall not present any rough edges likely to increase the danger or severity of injuries to the driver. The steering displacement shall be less than 127mm.

39.1.3 At the end of frontal impact no rigid component in the passenger compartment shall constitute a risk of serious injury to the occupants.

39.1.4 The side doors of the vehicle shall not open under the effect of the impact to prevent occupant thrown out during an impact..

39.1.5 As a result of impact the opening of doors to enable all the passengers to emerge shall be possible without the use of tools.

39.1.6 The dummy performance criteria shall be complied to indicate that the occupants will not receive any serious injuries.

39.1.7 Fuel Leakage:

As a result of impact there shall no fuel leakage or should be a maximum amount specified (28g) to avoid fire and to reduce deaths and injuries.

39.1.8 Protection against Electrical Shock

As a result of impact in the case of hybrid vehicles one of the four conditions

indicated in items 39.1.8.1 to 39.1.8.4 below shall be complied to avoid any electric shock.

- 39.1.8.1 The voltages between high voltage buses shall be low as possible. The voltages V_b, V_1 and V_2 of the high voltage buses shall be equal or less than 30VAC or 60 VDC as specified in GSO regulation for highbred vehicles.
- 39.1.8.2 The total energy on the high voltage buses shall be low as possible. The total energy (TE) on the high voltage buses shall be less than 2.0 Joules when measured according to the test procedure specified in GSO regulation for hybrid vehicles.
- 39.1.8.3 Physical protection
The resistance between all exposed conductive parts and the electrical chassis shall be low as possible, lower than 0.1ohm when there is a current flow of at least 0.2ampere. For protection against direct contact with high voltage live parts the protection IPXXB shall be provided.
- 39.1.8.4 Isolation resistance
The isolation resistance between the high voltage bus and the electrical chassis shall have a minimum value of 100 Ω /volt of the working voltage for DC buses, and a minimum value of 500 Ω /volt of the working voltage for AC buses.
For details of electric power train consisting of separate DC or AC buses and electrical power train consisting of combined DC and AC buses refer GSO regulations on hybrid vehicles.
- 39.1.8.5 Electrolyte spillage
As a result of impact there shall no electrolyte leakage or should be a minimum amount specified (less than 7%) to avoid fire or electric shock and to reduce deaths and injuries. In the period from the impact until 30 minutes after no electrolyte from the REES shall spill into the passenger compartment and no more than 7% of electrolyte shall spill from the REESS except open type traction batteries outside the passenger compartment.
For details test refer GSO regulation on hybrid vehicles.
- 39.1.8.6 RESS retention
As a result of impact the REESS (Electrical Power Train) shall not enter the passenger compartment during or after the impact .

**FOR DETAILED REQUIREMENTS ON FRONTAL IMPACT
REFER REVISED GSO REGULATION 36 AND 40.**

39.2 REAR IMPACT

This requirement specifies the limit of the inward displacement of the passenger compartment to reduce the likelihood of death and injuries. It also specifies requirements for the integrity of motor vehicle fuel systems. Its purpose is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes.

- 39.2.1 After a rear impact specified the amount of longitudinal displacement of the vertical projection of the floor shall be such that it will not cause any injury to

the occupant. The rear displacement should be less than 75mm.

39.2.2 After the impact on the vehicle the following shall be met:

39.2.2.1 There shall be no rigid component project out to cause Injury.

39.2.2.2 The side doors of the vehicle shall not open under the effect of the impact to prevent occupant thrown out during any impact.

39.2.2.3 The opening of doors to enable all the passengers to emerge shall be possible without the use of tools.

39.2.3 Fuel Spillage

As a result of impact there shall no fuel leakage or should be a maximum amount specified (28g) to avoid any fire and to reduce deaths and injuries.

**FOR DETAILED REQUIREMENTS ON REAR IMPACT
REFER GSO REGULATION 37 AND 40.**

39.3 **SIDE IMPACT**

This requirements is to protect the occupants in side impact crashes. The purpose of this regulation is to reduce the risk of serious and fatal injury to occupants of the vehicles in case of serious accidents. It also covers the requirements to avoid electrical shock and fatal accidents if the vehicle is hybrid electric vehicle.

39.3.1 Static side Impact

39.3.1.1 The side doors shall be reinforced to reduce the impact forces from the side and to reduce the injuries or deaths due to side impact.

39.3.1.1 The strength of the body structure and doors shall be such when tested the vehicle in accordance with Gulf standard the vehicle shall meet the following requirement to indicate the structure is strong enough to absorb the forces applied on them:

- The initial crush resistance be more than 1020 kg.
- The intermediate crush resistance be more than 1590 kg.
- The peak crush resistance be more than twice the curb weight of the vehicle or 3175 kg whichever is less.

39.3.2 Dynamic side Impact

39.3.2.1 The body injuries are measured by using dummies with electrical impulse connections and measuring instruments.

After the impact, the head performance criteria, Rib performance criteria, Viscous criterion, pubic symphysis peak force and abdominal peak force shall be complied with the requirements indicating the side doors are strong enough that the occupants will not receive any serious injuries in a side impact with other vehicles or rollover accidents.

39.3.2.2 At the end of specified impact no rigid component in the passenger compartment shall constitute a risk of serious injury to the occupants.

39.3.2.3 The side doors of the vehicle which are not impacted shall not open under the effect of the impact, and the latches shall not separate from the striker to prevent occupant thrown out during an accident..

39.3.2.4 As a result of impact the opening of sufficient number of doors to enable all the passengers to emerge shall be possible without the use of tools.

39.3.2.5 Fuel Leakage:

As a result of impact there shall no fuel leakage or should be a minimum amount specified (28g) to avoid fire and to reduce deaths and injuries.

39.3.2.6 Protection Against Electric Shock.

After the side impact on hybrid vehicles the conditions indicated in item 39.1.8 shall be complied to avoid electric shock and safety for the following:

Absence of high voltage.

Low electrical energy

Physical protection

Isolation resistance

Electrolyte spillage

RESS retention.

**FOR DETAILED REQUIREMENTS ON SIDE IMPACT
REFER GSO REGULATION 38, 1707, 1708 AND 40.**

39.4 Roof Strength

This requirement establishes strength requirement for the passenger compartment roof to reduce deaths and injuries due to crushing of the roof into the occupant compartment in rollover crashes.

39.4.1 The maximum displacement of any vehicle less than 2722kg after the impact the roof of vehicle shall not exceed 127 mm when tested according to GSO regulation.

**FOR DETAILED REQUIREMENTS ON ROOF STRENGTH
REFER GSO REGULATION 39 AND 40.**

40- **EXTERIOR PROTECTION**

40.1 This requirement is applicable to passenger cars

40.2 The exterior devices provided to the vehicles shall reduce damage to this vehicle in an accident situation.

40.3 Surfaces of protective devices at the front and rear end of the vehicle which are most likely to come into contact with other objects shall be covered by, or made of rubber, or equivalent material, of suitable hardness.

**FOR DETAILED REQUIREMENTS ON EXTERIOR PROTECTION
REFER GSO REGULATION 41.**

41. HYBRID ELECTRIC VEHICLE

- 41.1 The requirements specified in this technical regulation shall reduce deaths and injuries during a crash, during electric shock, which occur because of electrolyte spillage from propulsion batteries, intrusion of propulsion battery system components into the occupant compartment and electric shock.
- 41.2 This requirement is applicable to hybrid/electric passenger cars, multi-Purpose passenger vehicles, trucks and buses with maximum designed speed exceeding 25km/h.

41.3 Protection against electrical shock

- 41.3.1 Protection against direct contact
- 41.3.1.1 The protections against direct contact with live parts, such as solid insulator, barrier, enclosure, etc. shall not be able to be opened, disassembled or removed without the use of tools which can be done only by a competent person.
- 41.3.1.2 Connectors
Connectors shall meet the following:
Located underneath the floor and are provided with a locking mechanism. Or
Provided with a locking mechanism and other components shall be removed with the use of tools in order to separate the connector. Or
The voltage of the live parts becomes equal or below DC 60V or below AC 30V(rms) within 1 second after the connector is separated.
- 41.3.2. Protection against indirect contact
- 41.3.2.1 The exposed conductive parts, such as the conductive barrier and enclosure, shall be galvanically connected securely to the electrical chassis by connection with electrical wire or ground cable, or by welding, or by connection using bolts, etc. so that no dangerous potentials are produced.
- 41.3.2.2 The resistance between all exposed conductive parts and the electrical chassis shall be less than 0.1ohm when there is current flow of at least 0.2amperes.
- 41.3.3. Isolation resistance
- 41.3.3.1 Mechanically robust protections that have sufficient durability over vehicle service life such as motor housings, electronic converter cases or connectors shall be provided.

41.4 Rechargeable energy storage system (REESS)

- 41.4.1 Protection against excessive current
- 41.4.1.1 The REESS shall not overheat.
- 41.4.1.2 It shall be equipped with a protective device such as fuses, circuit breakers or main contactors.
- 41.4.2. Accumulation of gas
Places for containing open type traction battery that may produce hydrogen gas shall be provided with a ventilation fan or a ventilation duct to prevent the accumulation of hydrogen gas.

42- ADDITIONAL REQUIREMENTS FOR PARTICULAR VEHICLES

In addition to the foregoing requirements in items 1 to 41, the following shall be met:

42.1 Buses

General: The safety requirement for buses covers requirements for the retention of windows, the operating forces, opening dimensions, and marking for bus emergency exits. It also covers rollover protections. In order to avoid over loading the bus above the maximum weight allowed, number of seats allowed, and stability of the bus are covered. The safety requirements such as protection against fire, Electrical wiring, Exits, Interior arrangements, and Interior lighting are also covered.

The following classes (I,II,III) are applicable for vehicles having a capacity exceeding 22 passengers in addition to the driver.

Class I : Vehicles constructed with areas for standing passengers, to allow frequent passenger movement.

Class II : Vehicles constructed principally for the carriage of seated passengers, and designed to allow the carriage of standing m passengers in the gangway and/or in an area which does not exceed the space provided for two double seats.

Class III : Vehicles constructed exclusively for the carriage of seated passengers.

The following classes (A, B) are applicable for vehicles having a capacity not exceeding 22 passengers in addition to the driver.

Class A : Vehicles designed to carry standing passengers; a vehicle of this class has seats and shall have provision for standing passengers.

Class B : Vehicles not designed to carry standing passengers; a vehicle of this class has no provision for standing passengers.

42.1.1 Load Distribution

The load distribution shall be determined under laden and unladen conditions and on consideration for standing passengers of vehicle.

42.1.2 Area available to passengers

The surface area for passengers shall be calculated by deducting from the total area of the vehicle, the area of the driver's compartment, the area of steps at doors and the area of any other step with a depth of less than 300 mm and the area swept by the door and its mechanism when it is operated, the area of any part over which the vertical clearance is less than 1,350 mm measured from the floor, and the area of any space reserved solely for the carriage of goods or baggage.

42.1.3 Passenger capacity

42.1.3.1 When calculating the total number of seating or seating and standing passengers the mass on each axle of the vehicle shall not exceed the values of their respective technically permissible maximum values.

42.1.3.2 The vehicle shall be clearly marked in a manner visible on the inside in the vicinity of the front door in letters or pictograms the number of seating places for which the vehicle is designed, the maximum number of standing places if any the

vehicle is designed to carry, the maximum number of wheelchairs which the vehicle is designed to carry and the total number of passengers for which the vehicles designed.

- 42.1.4 Protection against fire risk.
 - 42.1.4.1 No flammable sound-proofing material or material liable to become impregnated with fuel, lubricant or other combustible material shall be used in the engine compartment unless the material is covered by an impermeable sheet.
 - 42.1.4.2 Precautions shall be taken, either by a suitable layout of the engine compartment or by the provision of drainage orifices, to avoid, so far as possible, the accumulation of fuel, lubricating oil or any other combustible material in any part of the engine compartment.
 - 42.1.4.3 A partition of heat-resisting material shall be fitted between the engine compartment or any other source of heat and the rest of the vehicle.
 - 42.1.4.4 The fuel filler hole caps shall be so designed and constructed that they cannot be opened accidentally.
 - 42.1.4.5 The fuel tank shall be made so as to be corrosion resistant.
 - 42.1.4.6 All cables shall be well insulated and all cables and electrical equipment shall be able to withstand the temperature and humidity conditions to which they are exposed. In the engine compartment, particular attention shall be paid to their suitability to withstand the environmental temperature and the effects of all likely contaminants.
 - 42.1.4.7 No cable used in an electrical circuit shall carry a current in excess of that acceptable for such a cable in the light of its mode of installation and the maximum ambient temperature.
 - 42.1.4.8 Every electrical circuit feeding an item of equipment other than the starter, the ignition circuit (positive ignition), the glow-plugs, the engine-stopping device, the charging circuit and the battery earth connection shall include a fuse or a circuit breaker.
 - 42.1.4.9 All cables shall be well protected and shall be held securely in position in such a way that they cannot be damaged by cutting, abrasion or chafing.
 - 42.1.4.10 All batteries shall be well secured and easily accessible.
 - 42.1.4.11 The battery compartment shall be separated from the passenger compartment and driver's compartment and ventilated to outside air.
 - 42.1.4.12 The battery terminals shall be protected against the risk of short circuit.
 - 42.1.4.13 Space shall be provided for the fitting of one or more fire extinguishers, one being near the driver's seat.
 - 42.1.4.14 Space shall be provided for the fitting of one or more first-aid kits.
- 42.1.5 Siting of exits
 - 42.1.5.1 The service door(s) shall be situated on the right side of the vehicle that is nearer to the side of the road corresponding to the direction of the traffic.
 - 42.1.5.2 The exits shall be placed in such a way that there is at least one exit on each side of the vehicle.
 - 42.1.5.3 The forward half and the rearward half of the passenger space shall each contain at least one exit.
 - 42.1.5.4 At least one exit shall be situated either in the rear face or in the front face of the vehicle unless an escape hatch is fitted.
- 42.1.6 Exits

For security reasons the door should only be open from the inside, or at least when not locked also the emergency doors sometimes a once opening, break glass for instance. The power door should be permitted providing they have a manual override.

42.1.6.1 The minimum number of exits shall be dependent on the total number of passengers the vehicle is designed for and to be in accordance with the GSO regulation for buses.

42.1.6.2 The minimum number of emergency exits shall be such that the total number of exits in a separate compartment is as follows:

Number of passengers and driver	Minimum total number of Exits
1 - 8	2
9 - 16	3
17 - 30	4
31 - 45	5
46 - 60	6
61 - 75	7

42.1.7 Every motor vehicle having more than 9 (8 passengers + driver) passenger seating capacity shall be equipped with either two service doors or one service door and one emergency door. The emergency exit shall meet the following requirements:

42.1.7.1 The emergency exit shall be located on the left side at the rear or in the rear of the passenger compartment. The aisle leading to the emergency exit shall be free from any obstacles.

42.1.7.2 The width and height of the emergency exit shall not be less than 550mm and 1,250mm for buses having capacity exceeding 22 passenger seats. This is applicable for class I, II or III vehicles.

The width and height of the emergency exit shall not be less than 550mm and 1,100mm for buses having capacity not exceeding 22 passenger seats.

42.1.7.3 The emergency exit shall be equipped with an outward opening door that can be securely closed under normal conditions.

42.1.7.4 The position and method of opening of the emergency exit shall be indicated in an easily legible way, at or near the emergency door.

42.1.7.5 Emergency doors shall not be of the power operated or of the sliding type unless it is capable to manually override the system and open the door without power.

42.1.7.6 All emergency doors on class I, II and III shall be provided with an audible device to warn the driver when they are not securely closed. The warning device shall be operated by movement of the door catch or handle and not by movement of the door itself.

42.1.7.7 Service doors shall be capable of being easily opened from inside and from outside when the vehicle is stationary.

- 42.1.7.8 The width and height of the service door shall be 650mm (single) 1200mm (double) and 1650mm (classA), 1400 (classB).
- 42.1.7.9 An emergency window (provided) shall have a minimum area of 400,000 mm². It shall be possible to inscribe in this area a rectangle measuring 500 mm x 700 mm.
- 42.1.7.10 An escape hatch (if provided) shall have a hatch aperture with a minimum area of 400,000 mm². It shall be possible to inscribe in this area a rectangle measuring 500 mm x 700 mm.
- 42.1.8 Interior arrangement for buses having capacity more than 22 passengers.
The entrance door shall be constructed that passengers shall be unable open it easily. The door shall be equipped with the following items:
- 42.1.8.1 The automatic lighting system which is lighted when the door opens.
- 42.1.8.2 Support handles to provide comfort to passengers while boarding or alighting. handrails and stanchions of adequate strength, present no risk of injury to passengers.
- 42.1.8.3 A mechanism used to open it during the emergency from outside.
- 42.1.8.4 Mirrors shall be provided to enable the driver to observe the condition near the entrance doors and inside the compartment from the driver's seat.
- 42.1.8.5 The step edges shall have slip-resistant surfaces.
- 42.1.8.6 The height of aisle and standing space shall be suitable for standing passengers in case the bus (Class I and Class II) is provided with standing space.
No provision for standing space shall be made in buses carrying children.
- 42.1.8.7 Every bus shall have an aisle easy and safe for access through and of width not less than 300 mm. The aisle floor shall be covered with slip resistance material.
- 42.1.8.8 Every bus shall be provided with a three-point safety belt for the driver seat and two point safety belt for the other seats.
- 42.1.9 Access to service doors
For vehicles having capacity more than 22 passengers.
- 42.1.9.1 The free space extending inwards into the vehicle from the side wall in which the door is mounted shall permit the free space having the width and height given below in the table below:
The measurement shall be taken parallel with the door aperture as it is from the starting position, to the position where the first step, after which it shall be taken at right angles to the probable direction of motion of a person using the entrance.

Vehicle Class	Width of test Gauge (mm)	Height of test Gauge (mm)
Class A	550	1650
Class B	550	1400
Class I	550	1800
Class II	550	1650
Class III	550	1550

- 42.1.9.2 For vehicle having a capacity not exceeding 22 passengers:
When measured parallel with the longitudinal axis of the vehicle, the clearance is not less than 220mm at any point and 550mm at any point being more than 500mm above the floor or steps.
- 42.1.9.3 Measured perpendicular to the longitudinal axis of the vehicle, there is a clearance of not less than 300 mm at any point and 550 mm at any point being more than 1,200 mm above the floor or steps or less than 300 mm below the ceiling .
- 42.1.10 Access to emergency doors:
- 42.1.10.1 The free space between the gangway and the emergency door aperture shall permit the free passage of a vertical cylinder 300 mm in diameter and 700 mm high from the floor and supporting a second vertical cylinder 550 mm in diameter, the aggregate height of the assembly being 1,400 mm.
- 42.1.11 Gangways
- 42.1.11.1 The gangway(s) of a vehicle shall be so designed and constructed as to permit the free passage of passengers. The gangway shall have the following dimensions:

Class of Bus	Space between seats above 1400mm from the floor (B)	Distance between seats from floor to 900(mm) up (C)	Ht above 1400mm (D)	Total free space ht of the gangway from the floor (E)	Ht above the floor where the free space is 350mm (F)
A	550	350	500	1900	900
B	450	300	300	1500	900
I	550	450	500	1900	900
II	550	350	500	1900	900
III	450	300	500	1900	900

- 42.1.12 Steps
- 42.1.12.1 The maximum and minimum height and minimum depth of steps for service and emergency doors are given below:

Classes		I and A	II, III and B
First Step from Ground Level	Max ht	340 ¹	380 ^{1, 2, 5}
	Min depth		300*
Other steps inside	Max. height	250 ³	350 4
	Min. height		120
	Min depth		200

* 230 mm for vehicles having a capacity not exceeding 22 passengers.

1 700 mm in the case of an emergency door.

2 430 mm in the case of a vehicle with solely mechanical suspension.

3 300 mm in the case of steps at a door behind the rearmost axle.

4 250 mm in gangways for vehicles having a capacity not exceeding 22 passengers.

5 For at least one service door; 400 mm for other service doors.

42.1.12.2 The height of a step shall be measured at the centre of its width at the outer edge.

42.1.12.3 The width and shape of every step shall be such that a rectangle as indicated in the table below can be placed on that step with not more than 5 percent of the area of the appropriate rectangle overhanging the step.

Number of passengers		More than 22	Less than or equal to 22
Area	First step(mm)	400x300	400x100
	Other steps(mm)	400x200	400x100

42.1.13 Passenger seats

42.1.13.1 Minimum seat width

42.1.13.1.1 The minimum width of the seat cushion, measured from a vertical plane passing through the centre of that seating position, shall be:

- 200 mm in the case of Class I, II, A or B; or
- 225 mm in the case of Class III.

The minimum width of the available space for each seating position, measured from a vertical plane passing through the centre of that seating position at height between 270 mm and 650 mm above the uncompressed seat cushion, shall be not less than:

- 250 mm in the case of individual seats; or
- 225 mm in the case of continuous rows of seats for two or more passengers.

42.1.13.2 Minimum depth of seat cushion

The minimum depth of a seat cushion shall be:

- 350 mm in vehicles of Classes I, A or B, and
- 400 mm in vehicles of Class II or Class III.

42.1.13.3 Height of seat cushion

The height of the uncompressed seat cushion relative to the floor shall be such that the distance from the floor to a horizontal plane tangential to the front upper surface of the seat cushion is between 350 mm and 500 mm.

42.1.13.4 Seat Spacing

In the case of seats facing in the same direction, the distance between the front of a seat squab and the back of the squab of the seat preceding it shall, when measured horizontally and at all heights above the floor between the level of the top surface of the seat cushion and a point 620 mm above the floor, shall not be less than:

Class of bus	Seat spacing (mm)
Class I, A and B	650
Class II and III	680

In the case of seats face one another the minimum distance between the front faces of the seat squabs of facing seats, as measured across the highest points of the seat cushions, shall be not less than 1,300 mm.

42.1.13.5 Free height over seating position

In the case of single deck vehicles, over each seating position and, except in the case of the seat(s) alongside the driver in a vehicle of Class A or B, its associated foot space, there shall be measured a free space with a height of not less than 900 mm measured from the highest point of the uncompressed seat cushion and at least 1,350 mm from the mean level of the floor in the foot space.

In the case of vehicles for the seat(s) alongside the driver in a vehicle of Class A or B, these dimensions may be reduced to 1,200 mm measured from the floor and 800 mm measured from the highest point of the uncompressed seatcushion.

- 42.1.14 Communication with the driver
 - 42.1.14.1 On vehicles of Classes I, II and A, a means shall be provided to enable passengers to signal that the driver should stop the vehicle.
 - 42.1.14.2 The controls for all such communication devices shall be capable of being operated with the palm of the hand.
 - 42.1.14.3 Activation of the control shall also be indicated to the passengers by means of one or more illuminated signs. The sign shall display the words "bus stopping" or equivalent, and/or a suitable pictogram and shall remain illuminated until the service door(s) open.
- 42.1.15 Driver's compartment
 - 42.1.15.1 The driver shall be protected from standing passengers and from passengers seated immediately behind the driver's compartment who may be projected into the driver's compartment in the event of braking or cornering.
 - 42.1.15.2 The rear of the driver's compartment may be enclosed by a partition; or a guard be fitted
- 42.1.16 Driver's seat
 - 42.1.16.1 The driver's seat shall be independent of other seats.
 - 42.1.16.2 The minimum width of the seat cushion, measured from a vertical plane passing through the centre of the seat, shall be:
 - 200 mm in the case of Class A or B;
 - 225 mm in the case of Class I, II or III.
 - 42.1.16.3 The minimum depth of the seat cushion, measured from a vertical plane passing through the centre of the seat, shall be:
 - 350 mm in the case of Class A or B;
 - 400 mm in the case of Class I, II or III.
 - 42.1.16.4 The minimum overall width of the seat back measured up to a height of 250 mm above the horizontal plane tangential to the uppermost surface of the uncompressed seat cushion shall be 450 mm.
 - 42.1.16.5 The seat shall be adjustable in its longitudinal and vertical positions and in its seat back inclination. It shall lock automatically in the selected position and, if fitted with a swiveling mechanism, it shall lock automatically when in the driving position.
- 42.1.17 Interior Lighting

Internal electrical lighting shall be provided for the illumination of passenger compartment, crew compartments, any steps, access to exits, service doors and places where there are obstacles.

- 42.1.18 Every pilgrim bus carrying more than ten persons shall be provided with the safety items namely, suitable engine (10kW/ton of the GVW), emergency exits, sufficient luggage compartment under the seating floor, heavy duty air conditioning, electrically operated refrigerator, water storage tank for ablution purposes, spare tyre and tools for changing wheels, fire extinguisher, first aid kit, intercom system to address the passengers, and special safe box.

**FOR DETAILED REQUIREMENTS ON PILGRIM BUSES
REFER GSO REGULATION GSO 967.**

42.2 Trucks and trailers

The trucks and its body shall be suitable with respect to the GCC terrain, operating conditions and climatic conditions prevailing in GCC counties.

- 42.2.1 The design and weight carrying capacity of the axles shall be suitable to the gross axle weights allowed by the manufacturer.

- 42.2.2 Torque capacity of the clutch shall exceed the maximum delivered engine torque with at least 10%.

- 42.2.3 The trucks/tractor with trailer fully loaded shall be capable of ascending not less than 15% grade ability.

- 42.2.4 The trailers shall be provided with at least two spare wheels.

- 42.2.5 Front supports of semi-trailers (standing legs) and lifting gears shall be capable of supporting the semi-trailers fully loaded plus 10% in excess of load.

- 42.2.6 Tipper truck fully loaded shall not overturn during discharging when the tipper body reach the highest position.

42.3 Motor vehicles carrying dangerous materials

- 42.3.1 The electric wiring on the outside of the body, or in any part of the vehicle containing dangerous materials, shall be protected by an electrically insulated cover resistant to fire and firmly fixed to the vehicle body. The size of conductors shall be large enough to avoid overheating. Circuits shall be protected by fuses or automatic circuit breakers.

- 42.3.2 The battery terminals shall be electrically insulated or covered by the insulating battery box cover. If the batteries are not located under the engine bonnet, they shall be fitted in a vented box.

- 42.3.3 Lamp bulbs with screw cap shall not be used.

- 42.3.4 A switch for breaking the electrical circuits shall be placed as close to the battery as practicable.

- 42.3.5 There shall be a clear space between the tank carrying dangerous goods and the driver's cab or the shield.

- 42.3.6 The exhaust system (including the exhaust pipes) shall be so directed or protected to avoid any danger to the load through heating or ignition. Parts of the exhaust system situated directly below the fuel tank (diesel) shall have a clearance of at least 100 mm or be protected by a thermal shield.

42.3.7 Every motor vehicle used for transporting dangerous materials shall carry markings indicating the nature of the load and the class of hazard in accordance with the relevant Gulf standard .

FOR DETAILED REQUIREMENTS ON VEHICLES CARRYING DANGEROUS GOODS REFER GSO REGULATIONS GSO 972, GSO 973, GSO 974 AND GSO 975

42.4 Emergency motor vehicles

42.4.1 Every emergency motor vehicle shall be equipped with a warning lamp and a siren and shall be painted with the identification colour(s) specified by the concerned authority.

42.4.2 The warning light shall be of specified identifying colour and shall be clearly visible from a minimum distance of 20 meters to the front and to the rear.

42.4.3 The sound level of the siren shall be, when measured at a distance of 3 meters ahead, within 90 to 120 dB(A).

42.4.4 The vehicle shall be equipped with sufficient medical equipment to treat emergency cases while transporting the patients.

42.4.5 The speed, acceleration and grade ability of the vehicle shall be sufficient to the vehicle depending on the geographical condition of the area.

FOR DETAILED REQUIREMENTS ON EMERGENCY VEHICLES REFER GSO REGULATION GSO 963.

42.5 Handicapped vehicles

The vehicle shall have particular features, purpose-designed for facilitating its use by the disabled and handicapped persons, such features shall be suited to the various kinds of disability or handicap for the people using the vehicle.

42.6 **School Buses**

42.6.1 Dimensions .

42.6.1.1 When calculating the total number of seating or seating and standing passengers the mass on each axle of the vehicle shall not exceed the values of their respective technically permissible maximum values.

42.6.1.2 The vehicle shall be clearly marked in a manner visible on the inside in the vicinity of the front door in letters or pictograms the number of seating places for which the vehicle is designed, the maximum number of standing places if any the vehicle is designed to carry, the maximum number of wheelchairs which the vehicle is designed to carry and the total number of passengers for which the vehicles designed.

42.6.1.3 The height of the bus shall not exceed 4.7m.

42.6.2 The buses shall be classified as follows:

Type of Bus	Length of Bus (m)	Number of seats
Mini Bus	Between 5 – 6	22 or less

Medium Bus	Between 7 – 9	23 - 50
Large Bus (Heavy duty)	Between 10 – 12.5	51 or more.

42.6.3 Body Structure.

- 42.6.3.1 The structure of the body shall be strong with a close ring.
- 42.6.3.2 The front and rear bumpers shall be installed to the body structure of the vehicle.
- 42.6.3.3 The floor of the gangway shall be of slip and wear resistant.
- 42.6.3.4 The engine compartment shall be provided with heat and fire resistant material.
- 42.6.3.5 There shall be no holes, spikes, sharp edges or flaws that may lead injuries to the children when using the bus.

42.6.4 Engine

- 42.6.4.1 The engine shall be suitable for either domestic fuel as unleaded gasoline or diesel oil specially with respect to sulphur contents and the deterioration effect on the accessories provided for exhaust emission controls.
- 42.6.4.2 Considering the environmental conditions and the health effect of exhaust emissions gases the engine shall comply with at least Euro IV exhaust emissions pollution limits once the fuel available is suitable.
- 42.6.4.3 The engine and its accessories shall be suitable for use in dusty atmospheric conditions and high ambient temperatures especially as concerns the radiator (type and size), air filter, engine block cooling system, thermostat and battery in accordance with the relevant Gulf standards.
- 42.6.4.3 The engine shall be powerful enough to the bus depending on the GVW and the terrain of the GCC countries.

Note : For, UAE Considering the environmental conditions and the health effect of exhaust emissions gases the engine shall comply with at least Euro IV (ECE R 83) and Euro V (ECE R 49) exhaust emissions pollution limits once the fuel available is suitable

42.7 Brakes

- 42.7.1 The front and rear wheels shall be provided with brake system depending on the GVW of the vehicle and the front wheel shall be of disc brakes and the drum brakes be provided with calipers.
- 42.7.2 The buses shall be equipped with ABS system and brake retarder for drum brake system.
- 42.7.3 The large size buses with heavy duty engines shall be provided with brake retarders to control the braking system when travelling on down the slope or sudden braking.
- 42.7.4 The heavy duty buses depending on the design requirement, the rear axles shall be equipped with dual wheels for each side.

42.8 Tyres

- 42.8.1 The tyres used shall be of approved type from GSO complying with applicable GSO technical regulations.
- 42.8.2 The tyres shall be of tubeless type.
- 42.8.3 Retreaded tyres shall not be used on the buses.
- 42.9 Steering
- 42.9.1 The steering system shall comply with the requirements specified in item 15 above.
- 42.9.2 Auxiliary steering equipment (ASE) and vibration dampeners shall be fitted to axles to avoid any accident in case of main steering system fails.
- 42.10 Electrical
- 42.10.1 The electrical system provided shall be suitably insulated.
- 42.10.2 The circuit breakers provided shall be of sufficient capacity to avoid any fire in case of short circuit and operate when necessary.
- 42.10.3 The lighting provided shall be of sufficient amperage and of damage resistance.
- 42.10.4 The buses shall be provided with Air conditioners with capacity sufficient to the number of seating places, and should be able to be adjustable to a maximum inside temperature not exceeding 24°C.
- 42.10.5 The rear glass shall be provided with antifogging system.
- 42.11 Seats
- 42.11.1 Seats shall be fixed securely and have fire resistance and the burning rate of 100mm/min when tested in accordance with GSO technical regulation.
- 42.11.2 All seats shall be padded from all sides and shall comply with the fire resistant requirement.
- 42.11.2 All seats shall be provided with two point safety belts except the driver seat which must be of three point safety belt..
- 42.11.3 The width of the seat shall be not less than 40cm for a single seat and 90 cm for double seats.
- 42.11.4 The height of the seat back shall be not less than 70cm.
- 42.11.4 The seat back height from the floor shall be not less than 40 cm and the distance between the two adjacent seat back shall be not less than 70cm
- 42.11.5 There shall be no folding seats obstructing the aisle space.
- 42.11.6 The hand rest, arm rest provided shall be able to be removed from the backside of the seats.
- 42.11.5 The gangway between two seats shall be not less than 50cm.
- 42.12 Doors and Emergency Exits.
- 42.12.1 The number number of exits and emergency exits shall comply with the following:

Length of Bus (m)	Number of Exits	Number of Emergency Exits
Less than 6	One door on the right side	One Escape Hatch in the ceiling or one emergency window on the left.
Between 6 - 9	Two doors in the right side, one in the front and one at the rear	Two escape hatches in the ceiling and two emergency exits one on the left and one on the right.
Between 10 – 12.5	Two doors in the right side one in the front and one in the rear.	One Emergency door in the left side + two escape hatches in the ceiling and one emergency exit on the left side and one on the right side.

- 42.12.2 The exit doors opening shall be controlled by the driver. The opening and closing mechanism shall be electrically controlled.
- 42.12.3 The emergency door shall be located at the bottom of the left side, with clear signs indicating the exit and without any obstruction.
- 42.13 Windshield and Windows.
- 42.13.1 The windshield shall be of laminated glass and provided with sun visor.
- 42.13.2 The transmissibility of the glasses shall not be less than 70%.
- 42.13.2 The side window and the rear glasses shall be of laminated or safety glass.
- 42.13.3 The side windows shall fixed with aluminium frames and open able up to 10cm maximum from the top and fixed at the bottom.
- 42.13.4 The emergency windows shall be provided with hammers for breaking the glass in case of an emergency.
- 42.14 Steps
- 42.14.1 The height of the first step from the ground level shall not exceed 340mm.
- 42.14.2 The height of the other steps shall not exceed 250mm.
- 42.14.3 The depth of the steps shall be not less than 230mm in case of small buses and not less than 300mm in case of other buses.
- 42.15 Safety
- 42.15.1 Every motor vehicle shall be provided with suitable changing wheel tools which must be in good condition such as jack; its lever and wheel spanner.
- 42.15.2 The vehicle shall be fitted with speed limiters and the maximum speed of the vehicle shall be set at (80+ 0/-2). The speed limiters provided shall comply with the GSO technical regulation.

- 42.15.3 There shall be a separate compartment for storing the school bags of the students, which must not obstruct the movement space, and shall not falls on students and cause injury during sudden stops or accidents.
- 42.15.4 The entrance and exits opening of medium and large buses shall be fitted with hand rails.
- 42.15.3 Every motor vehicle shall be provided with first aid box without any marking at a suitable location with sufficient “facility” for emergency treatment (e.g. bandage, flavones, cotton wool, etc).
- 42.15.4 The vehicles shall be provided with two dry powder fire extinguishers 4.5 kg for small buses, two dry powder fire extinguishers for medium size buses and three 6kg dry powder extinguishers for large size buses.
- 42.15.5 The fire extinguishers shall be stored in a place that the driver is able to reach it easily (e.g. pillar, or under the seat, etc) with a sign indicating the place.
- 42.15.6 The vehicles shall be provided with spare tyres and reflective triangles.
- 42.15.7 The vehicles shall be provided with red signs indicating "Frequent Stops" at the rear side of the school buses.
- 42.15.8 The buses and coaches shall comply with all the relevant GSO technical regulations specially vehicle safety, seats, safety belts, mirrors, exhaust emissions, emergency exits and other safety requirement.
- 42.16 Exterior Appearance
- 42.16.1 The colour of the bus shall be yellow.(RAL 1018 Zink Gelb GL 841).
Any parts which are made of nonmetallic material such as bumpers etc cannot be painted; those parts shall be in black.
- 42.16.2 The word "School Bus" shall be written in black in Arabic and English, with the font size of of letters not less than 20cm height. It shall be written between the upper hazard lights or at the uppermost part on the front and rear sides of the bus, and in the middle of both sides of the bus.
- 42.16.3 The size of the word "School Bus" together with the name and number of the operator shall not exceed 1500cm².
- 42.16.4 The bus shall be fitted with a stop signal arm at the external directly behind the drivers door so that the word stop is displayed outwards with two red lights flashing when the bus stops.
- 42.16.5 The buses shall be fitted with double red flashing lights at the top of the bus at t
The buses shall be fitted with double red flashing lights at the top of the bus at the front and rear sides.
- 42.16.6 The buses shall be fitted with double yellow flashing lights at the top of the bus at the front and rear sides.
- 42.16.7 The buses shall have a "School Bus" sign in Arabic and English on the right and left sides and at the rear side.
- 42.16.8 The school bus sign shall be of reflective material and measure 25x25cm for large buses and 17x17 for medium and mini buses.

- 42.16.9 The maximum speed of the vehicle shall be displayed in the rear side of the bus.
- 42.16.10 The identity of the School bus shall be as shown in Fig.1.

43- INCOMPLETE VEHICLES

The incomplete vehicles shall be completed in accordance with the technical information and instructions supplied by the incomplete vehicle manufacturer.

- 43.1 The manufacturer shall supply the following information:
 - 43.1.1 The gross vehicle weight rating of the completed vehicle for which the incomplete vehicle is manufactured.
 - 43.1.2 Gross axle weight rating for each axle of the completed vehicle.
 - 43.1.3 A complete manual containing a technical instruction for completing the vehicle for its intended purpose.
- 43.2 The final stage manufacturer shall complete the vehicle in accordance with the instructions supplied by the incomplete vehicle manufacturer.
- 43.3 A label shall be affixed by the final stage manufacture in accordance with the relevant GSO regulation.

**FOR DETAILED REQUIREMENTS ON VEHICLES
MANUFACTURED IN MULTI STAGE REFER GSO REGULATION
GSO 153**

44- SAFETY REQUIREMENTS

- 44.1 Every motor vehicle shall be provided with suitable changing wheel tools which must be in good condition such as jack; its lever and wheel spanner.
- 44.2 It shall be provided with dry powder fire extinguisher suitable for its size (minimum extinguisher medium capacity 1 kg) and type to the vehicle, stored in a place that the driver is able to reach it easily (e.g. pillar, below the dashboard or under the seat).
- 44.3 It shall be provided with emergency equipments such as reflector triangle and special tools to be used in emergency for quick repairs on road.
- 44.4 Every motor vehicle shall be provided with first aid box without any marking at a suitable location with sufficient “facility” for emergency treatment (e.g. bandage, flavones, cotton wool, etc).
- 44.5 Tire pressure gauge.
- 44.6 The safety equipment mentioned in items 44.2, 44.3, 44.4 and 44.5 shall be provided by the vehicle manufacturer or by the dealer under the responsibility of the manufacturer of the vehicle.
- 44.7 Any safety warning or statement provided with any vehicle parts shall be translated into Arabic.

- 44.8 The information given in the Navigation system shall as a minimum be available in Arabic or Arabic and English. All data, maps and the voice guidance systems shall be in Arabic and English
- 44.9 Any safety instructions indicated on the dash board to the driver shall be in Arabic or Arabic and English.
- 44.10 All light duty vehicles shall be provided with brake throttle override system (BTO) so that when applying the brake to reduce the speed of the vehicle.

45- INFORMATION OF VEHICLE

- 45.1 The manufacturer shall affix, on the door edge, door latch post of each vehicle or on the chassis of the trailer, a label meeting the following requirements:
 - 45.1.1 It shall be made of material resistant to deterioration.
 - 45.1.2 The label shall, unless riveted, be permanently affixed in such a manner that it cannot be removed without being destroyed.
 - 45.1.3 The following information shall be written (in Arabic or English language) in letters at least 2.4 mm high and in a clearly legible manner:
 - 45.1.3.1 Name of manufacturer and country of manufacture (or assemble).
 - 45.1.3.2 Year and month of production.
 - 45.1.3.3 Maximum (gross) vehicle weight (GVW) in kilograms (for trucks).
 - 45.1.3.4 Maximum (gross) axle weight (GAW) for each axle, in kilograms (for trucks).
 - 45.1.3.5 The statement “This vehicle complies with all GSO and National Motor Vehicle Technical Regulations in effect up to the date of manufacture”.
- 45.2 Vehicle identification number.
 - 45.2.1 The VIN number shall contain 17 characters and shall comply with the relevant Gulf standard.
 - 45.2.2 The VIN shall be readable through the vehicle glazing from outside the vehicle adjacent to the left windshield pillar of the light duty vehicles and shall comply with the relevant Gulf standard.

FOR DETAILED REQUIREMENTS ON VEHICLES VIN NUMBER AND THEIR LOCATIONS REFER GSO REGULATIONS GSO 1780 AND 1782.

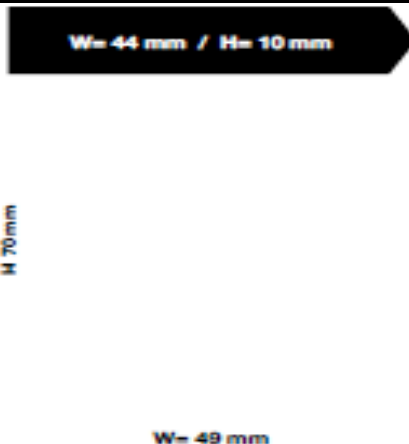



46- OWNER’S MANUAL (Operating Instructions)

Every vehicle shall be accompanied with manual in Arabic and/or English including the following:

- 46.1 The technical specifications of the motor vehicle.
- 46.2 Information relating to the operation of the vehicle.
- 46.3 Information relating to the periodic maintenance.

- 46.4 Technical information about the recommended tyre designation, inflation pressure and changing procedure.
- 46.5 Information for the use and changing the spare wheel/tyre.
- 46.6 The maximum speed limit, maximum torque and maximum power at rpm.
- 46.7 An advice to motorist that correct use and regular maintenance of the vehicle and driving behavior , such as avoiding aggressive driving, travelling at lower speeds, correctly inflating tyres, reducing periods of idling, not carrying excessive weight, will improve the fuel consumption and reduce the CO2 emissions of their vehicles.

Fig 1 :FUEL ECONOMY(Consumption) LABEL

130 mm			
Manufacturer's Name:		اسم الصانع:	
Model Year:	سنة الموديل:	Engine Displacement:	سعة المحرك:
W= 65 mm / H=10 mm		W= 65 mm / H=10 mm	
Vehicle Category:		صنف المركبة:	
Vehicle Type:		نوع المركبة:	
W= 130 mm / H=10 mm			
Fuel Economy		اقتصاد الوقود	
W= 130 mm / H=10 mm			
 <p style="text-align: center;">W= 44 mm / H= 10 mm</p> <p style="text-align: center;">W= 49 mm</p>	 <p style="text-align: center;">W= 75 mm / H= 10 mm</p> <p style="text-align: center;">W= 70 mm / H= 10 mm</p> <p style="text-align: center;">W= 65 mm / H= 10 mm</p> <p style="text-align: center;">W= 60 mm / H= 10 mm</p> <p style="text-align: center;">W= 55 mm / H= 10 mm</p> <p style="text-align: center;">W= 50 mm / H= 10 mm</p> <p style="text-align: center;">W= 80 mm</p>		
 <p style="text-align: center;">هيئة التقييس للدول مجلس التعاون لدول الخليج العربية Standardization Organization For G.C.C. (GSO)</p> <p style="text-align: center;">W= 49 mm</p>	<p style="text-align: center;">نوع الوقود : Fuel Type:</p> <p style="text-align: center;">W= 47 mm</p>	<p style="text-align: center;">اقتصاد الوقود : Fuel Economy :</p> <p style="text-align: center;">كم/ساعة Km/L</p> <p style="text-align: center;">W= 47 mm</p>	175 mm
<p>إزالة أو تغطية أو كشط هذه البطاقة قبل البيع يعرض للملاحقة القانونية</p> <p>Removing, Covering or Damaging of this label before sale is punishable by law</p>			
 <p style="text-align: center;">W= 130 mm / H=10 mm</p>			