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TRAILER - GENERAL REQUIREMENTS

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TRAILER - GENERAL REQUIREMENTS

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TRAILER - GENERAL REQUIREMENTS

1. SCOPE AND FIELD OF APPLICATION

1.1 This standard is concerned with general requirements for trailers and semi-trailers ensuring high levels of safety, Environmental protection, energy efficiency and antitheft performance for detailed requirements refer to **SAUDI STANDARDS METROLOGY QUALITY ORGANIZATION (SASO)** Technical Regulations on the subject concerned.

1.2 SASO technical regulation related to vehicles will be formulated based on **UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE UN/ECE** regulation in the case of vehicles manufactured in compliance with **FEDERAL MOTOR VEHICLE SAFETY STANDARDS FMVSS** regulations, will be accepted as an alternative.

1.3 The provisions of this standard apply to all trailers and semi-trailers industry designed for road circulation.

1.4 This standard does not cover the armed services trailers.

2. COMPLEMENTARY REFERENCES

2.1 The following codes, standards and regulations are used as reference documents in the compilation of this standard.

	STANDARD	STANDARD TITLE
2.1.1	SASO GSO 42	Motor Vehicles - General Requirements
2.1.2	SASO GSO ECE 48	Uniform provisions concerning the approval of vehicles with regard to the installation of lighting and light-signaling devices
2.1.3	SASO GSO ECE 117	Uniform provisions concerning the approval of tires with regard to rolling sound emissions and/or to adhesion on wet surfaces and/or to rolling resistance
2.1.4	SASO ISO 303	Road vehicles -- Installation of lighting and light signaling devices for motor vehicles and their trailers
2.1.5	SASO ISO 337	Road vehicles -- 50 semi-trailer fifth wheel coupling pin -- Basic and mounting/interchangeability dimensions
2.1.6	SASO 400	Motor Vehicles Conformity Certificates
2.1.7	SASO 469	Motor Vehicles – Dimensions and Weights
2.1.8	SASO 572	Road Vehicles - Retro-Reflective Number Plates and Its Methods of Test
2.1.9	SASO ISO 612	Road vehicles -- Dimensions of motor vehicles and towed vehicles -- Terms and definitions
2.1.10	SASO 703	Motor Vehicle - Conformity Certificates for Vehicle Manufactured in Multi-Stages
2.1.11	SASO 1071	Road Vehicles - Types — Terms and Definitions

2.1.12	SASO ISO 1103	Road vehicles -- Coupling balls for caravans and light trailers - Dimensions
2.1.13	SASO 1134	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tires Part 1: Nomenclature, Designation, Marking, Dimensions, Load Capacities and Inflation Pressures
2.1.14	SASO 1135	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tires - PART 2: Methods of Test
2.1.15	SASO 1136	Multi-Purpose Vehicles, Trucks, Buses and Trailers Tires Part 3: General Requirements
2.1.16	SASO ISO 1185	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- 7-pole connector type 24 N (normal) for vehicles with 24 V nominal supply voltage
2.1.17	SASO 1275	Retreaded pneumatic tires for trucks and their trailers
2.1.18	SASO 1285	Transportation of Dangerous Substances by Road - Part 1: General Safety Requirements
2.1.19	SASO 1286	Transportation of Dangerous Substances by Road - Part 2: Transportation of Radioactive Materials
2.1.20	SASO 1287	Transportation of Dangerous Substances by Road - Part 3: Transportation of Petroleum Liquid
2.1.21	SASO 1288	Transportation of Dangerous Substances by Road Part 4: Transportation of Explosive Materials
2.1.22	SASO-ISO-1724	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- 7-pole connector type 12 N (normal) for vehicles with 12 V nominal supply voltage
2.1.23	SASO ISO 1726-1	Road vehicles -- Mechanical coupling between tractors and semitrailers -- Part 1: Interchangeability between tractors and semi-trailers for general cargo
2.1.24	SASO ISO 1726-2	Road vehicles -- Mechanical couplings between tractors and semitrailers -- Part 2: Interchangeability between low-coupling tractors and high-volume semi-trailers
2.1.25	SASO ISO 1726-3	Road vehicles -- Mechanical couplings between tractors and semitrailers -- Part 3: Requirements for semi-trailer contact area to fifth wheel
2.1.26	SASO 1771	Motor Vehicles Tires -- Temporary Use Spare Wheels/Tires and Their Methods of Test
2.1.27	SASO GSO 2113	Motor vehicles-lateral protection of truck and trailer and its methods of test
2.1.28	SASO GSO 2114	Motor vehicles-rear under run protective devices for truck and trailer and its methods of test
2.1.29	SASO 2249	Motor Vehicle - Vehicle Identification Number (VIN) Requirements
2.1.30	SASO 2250	Motor vehicles - world manufacturer identifier code
2.1.31	SASO 2251	Motor vehicle - VIN-location and attachment
2.1.32	SASO 2288	Road Vehicles - Bottom Loading Tank Truck & trailer

2.1.33	SASO ISO 3536	Road vehicles -- Safety glazing materials -- Vocabulary
2.1.34	SASO ISO 3584	Road vehicles -- Drawbar couplings -- Interchangeability
2.1.35	SASO ISO 3731	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- 7-pole connector type 24 S (supplementary) for vehicles with 24 V nominal supply voltage
2.1.36	SASO ISO 3833	Road vehicles -- Types -- Terms and definitions
2.1.37	SASO ISO 3842	Road vehicles -- Fifth wheels -- Interchangeability
2.1.38	SASO GSO ISO 3894	Road vehicles: Wheels/rims for commercial vehicles - Test methods
2.1.39	SASO ISO 4086	Road vehicles -- 90 semi-trailer fifth wheel kingpin -- Interchangeability
2.1.40	SASO ISO 4091	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- Definitions, tests and requirements
2.1.41	SASO ISO 4107	Commercial vehicles -- Wheel-hub attachment dimensions
2.1.42	SASO ISO 7638-1	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- Part 1: Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage
2.1.43	SASO ISO 7638-2	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- Part 2: Connectors for braking systems and running gear of vehicles with 12 V nominal supply voltage
2.1.44	SASO-ISO-8716	Road vehicles -- Fifth wheel kingpins -- Strength test
2.1.45	SASO ISO 8855	Road vehicles -- Vehicle dynamics and road-holding ability - Vocabulary
2.1.46	SASO ISO 10392	Road vehicles -- Determination of center of gravity
2.1.47	SASO ISO 11446	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- 13-pole connectors for vehicles with 12 V nominal supply voltage
2.1.48	SASO-ISO-12098	Road vehicles -- Connectors for the electrical connection of towing and towed vehicles -- 15-pole connector for vehicles with 24 V nominal supply voltage
2.1.49	SASO GSO ISO 13207-1	Road vehicles — LED lamp characteristics for bulb compatible failure detection — Part 1: LED lamps used as direction indicators
2.1.50	SASO ISO 15082	Road vehicles -- Tests for rigid plastic safety glazing materials
2.1.51	SASO ISO 20653	Road vehicles -- Degrees of protection (IP code) -- Protection of electrical equipment against foreign objects, water and access
2.1.52	SASO GSO ISO/TS 20825	Road vehicles — Drawbar couplings, drawbar eyes, fifth wheel kingpins, hook couplings and toroidal eyes — Wear limits for in-use mechanical couplings

3. DEFINITIONS

For the purposes of this regulation, the following definitions shall apply in addition to the definitions set out in list of standards paragraph (2).

3.1 Automotive Trailers (O Category):

A non-self-propelled vehicle having at least two wheels which on account of its design and technical features is used to transport goods and is intended to be towed by a motor vehicle; Semi-trailer is included in this category.

3.1.1 Category O₁:

Trailers with a maximum mass not exceeding 0.75 tons.

3.1.2 Category O₂:

Trailers with a maximum mass exceeding 0.75 tons but not exceeding 3.5 tons.

3.1.3 Category O₃:

Trailers with a maximum mass exceeding 3.5 tons but not exceeding 10 tons.

3.1.4 Category O₄:

Trailers with a maximum mass exceeding 10 tons.

3.2 Tractor:

A truck (provided with fifth wheel) designed primarily for drawing a semitrailer and not so constructed as to carry a load other than a part of the weight of the semitrailer.

3.3 Truck:

A motor vehicle intended for carrying goods, or towing a trailer.

3.4 Vehicle:

Any motor vehicle or its trailer.

3.5 Semi-trailer:

A trailer, which is intended to be connected to a motor vehicle and which is so constructed that a portion of it is superimposed on and apart of whose weight is borne by the haulage tractor.

3.6 Drawbar trailer:

A towed vehicle with at least two axles, of which at least one is a steered axle, and:
— Equipped with a towing device which can move vertically (in relation to the trailer),
— Which transmits no significant static vertical load to the towing 2 vehicle (less than 100 daN).

When a semi-trailer is coupled to a dolly axle it is considered to be a drawbar trailer.

3.7 Maximum (gross) vehicles weight (GVW):

Weight of the vehicle loaded with the maximum load specified by the manufacturer.

3.8 Maximum (gross) axle weight (GAW):

The maximum load carrying capacity, specified by the manufacturer, of a single axle measured at the tyre-ground interfaces.

3.9 Overhang:

The horizontal distance (a bus, truck, trailer or semi-trailer) between the centers of the rear most axle and the rear most part of the body, or between the center of the front most axle and the front most part of the body.

3.10 Drawbar:

Strut or column like device temporarily attached between the rear of a towing vehicle and the front of the vehicle being towed. Its purpose is to maintain the interval or distance between the two.

3.11 Fifth Wheel Coupling:

A device used to connect a tractor to a semi-trailer and to permit articulation between the units. It is generally composed of a lower half, mounted on the tractor, consisting of a trunnion, plate and latching mechanism, for connection with a king pin mounted on the semi-trailer.

3.12 King pin:

The trailer part of the mechanical coupling of a transport trailer normally attached to fifth wheel of the tractor.

3.13 Group of axles:

Axles being part of a bogie. A two axle group is called a tandem and a tri-axle group a tri-axle bogie. By convention, a solo axle is considered as a group of one axle.

3.14 Axle end:

Group of tyres on one of the axle ends bearing half the load lying on the axle end.

3.15 Air suspension:

A suspension system on which at least 75% of the spring effect is caused by the air spring.

3.16 Spray-suppression system:

A system intended to reduce the pulverization of water thrown upwards by the tyres of a vehicle in motion. The spray-suppression system is variously made up of a mudguard, rain flaps and valances equipped with a spray-suppression device.

3.17 Vehicle identification number VIN:

Structured combination of characters assigned to a vehicle by the manufacturer for identification purposes.

3.18 World manufacturer identifier WMI:

First section of the vehicle identification number, which designates the manufacturer of the vehicle and is assigned to a vehicle manufacturer in order to allow identification of that manufacturer.

NOTE: When used in conjunction with the remaining sections of the VIN, the WMI ensures the uniqueness of the VIN for all vehicles manufactured in the world for a period of 30 years.

3.19 Vehicle descriptor section VDS:

Second section of the vehicle identification number, which provides information describing the general attributes of the vehicle.

3.20 Vehicle indicator section VIS:

Third and final section of the vehicle identification number, which constitutes a combination of characters assigned by the manufacturer to distinguish one vehicle from another.

3.21 Incomplete trailer:

Any trailer which must undergo at least one further stage of completion in order to meet the relevant technical requirements of this Directive.

3.22 Complete trailer:

Any trailer which need not be completed in order to meet the relevant technical requirements of this Directive.

3.23 System:

An assembly of devices combined to perform one or more specific functions in a trailer and which is subject to the requirements of any of the regulatory acts.

3.24 Separate technical unit:

A device subject to the requirements of a regulatory act and intended to be part of a trailer, which may be type-approved separately, but only in relation to one or more specified types of trailer where the regulatory act makes express provisions for so doing.

3.25 Information document:

The document set in the corresponding Annex to a separate directive, or regulation that prescribes the information to be supplied by an applicant, it being permissible to supply the information document in the form of an electronic file.

3.26 Manufacturer:

The person or body who is responsible to the approval authority for all aspects of the type approval or authorization process and for ensuring conformity of production. It is not essential that the person or body be directly involved in all stages of the construction of the vehicle, system, component or separate technical unit which is the subject of the approval process.

3.27 Registered Laboratory:

A laboratory accredited based on ISO 17025 by an approved body in the field of industry testing for trailers and semi-trailers. This lab is registered by SASO in order to approve the reports issued by it in the procedures of licensing a Logo usage.

3.28 Test Report:

A test report issued by a registered laboratory, provided that the date of issuance does not exceed one year at the time of applying for the license.

3.29 B-train:

two semi-trailers linked together by a fifth wheel.

3.1.30 Double trailer truck:

An articulated transport vehicles as specified in SASO 469, which used to transport goods on specified routes after obtaining a permit to run on roads from the concerned authorities in the KSA.

All axles in double trailer truck should have double tyres except the steering motor axle, and the tractor or truck used shall have at least two rear axles.

The components in the Double trailer truck (trailers, semitrailers, dolly, B-train) should be manufacture by an authorized Manufacturer and approved by the Registered Laboratory in according to the requirements set by SASO.

3.1.31 long vehicle sign:

Plate fixed on front and back of the double trailer truck with a phrase "long vehicle" in Arabic and English with a minimum length (102) cm and minimum height (50) cm and in letters of 18 cm in height, so that the floor of the plate is in reflective yellow and the writing is in black color.

4. DIMENSIONS

4.1 All dimensions shall be determined with the trailer at its unladen mass.

4.2 None of the outward-opening windows or ventilators and wing mirrors shall protrude by more than 300 mm outward from the outermost point on both sides, of the vehicle, and by more than 300 mm upward from the highest top point of the vehicle. In the case of rear-wing mirrors attached to a tractor towing a trailer with a width exceeding that of the tractor, a protrusion of these mirrors not exceeding 300 mm form the outer most point on both sides of the trailer may be allowed.

4.3 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 20m for trucks and trailers, 23m for tractor and semi-trailers, 25.25m for Double Trailer Truck provided that the maximum parts lengths as specified in SASO 469.

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.

4.4.1 All part of the vehicle including any lateral projecting of fixed parts (wheel hubs, door handles, bumpers, etc.) are contained between these two planes.

4.5 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 4.5 m.

4.5.1 When measuring the vehicle structural height all fixed parts of the vehicle is contained between these two planes.

4.6 For vehicles with dimensions exceeding the limits given in standard and which are necessarily needed for use, an approval from the authorities responsible for transportation shall be attained prior to their clearance and use on roads.

FOR DETAILED REQUIREMENTS FOR DIMENSION REFER TO SASO 469, SASO GSO 42 AND SASO ISO 612.

5. MINIMUM ROAD CLEARANCE

5.1 Any part other than the earth-touching parts of a 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 the limits as specified in SASO 469.

6.1.1 Subject to Article (6.1), the maximum vehicle weight of a double trailer truck shall not exceed the limits as specified in SASO 469.

6.2 The Unladen Vehicle weight shall be determined by the following criteria:

6.2.1 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.

6.2.2 The fuel tank shall be filled to at least 90% of rated capacity and the other liquid containing systems to 100% of the capacity specified by the manufacturer.

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

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

6.5 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.

6.6 For vehicles with weight exceeding the limits given in standard and which are necessarily needed for use, an approval from the authorities responsible for transportation shall be attained prior to their clearance and use on roads.

6.7 Maximum axle weights

6.7.1 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.

6.7.2 In the case of tandem axles the total weight on the tandem axles shall be in depend on the distance between the two rears axles or the distance between the first and the third rear axles.

FOR DETAILED REQUIREMENTS FOR WEIGHTS REFER TO SASO 469 AND SASO GSO 42.

7. STABILITY

7.1 The trailer should not pull to left or right during driving.

7.2 Any vehicle in the unladen and laden 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 shall be such the point at which overturning occurs should be limited to the lateral acceleration.

7.3 MANEUVERABILITY REQUIREMENTS

7.3.1 Any motor vehicle and any semi-trailer must be able to maneuver on either side for a complete circular trajectory of 360° inside an area defined by two concentric circles, the outer circle having a radius of 12.50 m and the inner circle having a radius of 5.30 m, without any of the vehicle's outermost points (with the exception of the protruding parts prescribed for the vehicle width in a paragraph 4.4) projecting outside the circumferences of the circles.

7.4 Tractor- trailer combination shall comply with the maneuverability requirements, as laid with Figure (3).

7.5 The location of the center of gravity (CG) of a road vehicle, as defined in ISO 3833. A method for determining the coordinates of the CG in the horizontal plane is provided. Two methods for determining the height of the CG above the ground are specified. The axle lift and the stable pendulum methods are the most common methods for determining vehicle CG height.

7.6 Tipper trailer fully loaded shall not overturn during discharging when the tipper body reach the highest position.

FOR MORE DETAILED REQUIREMENTS FOR STABILITY REFER TO SASO GSO 42, SASO ISO 8855 AND, SASO ISO 10392.

8. ELECTRIC SYSTEM

8.1 The electric supply system shall be such that it is suitable (Ah) to the vehicle capacity, fixed firmly, provided with suitable fuses, the current supply without any overheating, which may result in fire.

8.2 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.

8.3 The electrical cables provided shall be suitable for the current carrying capacity and additionally protected to avoid any leak of current.

8.4 The trailer 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.

8.5 Electrical parts should be provided with a protection enclosure against access external influences, foreign objects and/or water.

8.6 The electric wiring on the outside of the body, or in any part of the trailer 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.

8.7 The battery terminals shall be electrically insulated or covered by the insulating battery box cover. They shall be fitted in a vented box.

8.8 Lamp bulbs with screw cap shall not be used.

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

FOR DETAILED REQUIREMENTS ON ELECTRIC SYSTEM REFER TO SASO GSO 42 AND SASO ISO 20653.

9. BRAKING SYSTEM

9.1 The braking system provided to the trailer shall be suitable to the vehicle concern and ensure safe braking performance under normal and emergency conditions.

9.2 Every trailer 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.

9.3 The secondary braking system is required and shall make it possible to halt the vehicle within a reasonable distance in the event of failure of the service braking system.

9.4 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.

9.5 The control of the service braking device shall be independent of the control of the parking braking device.

9.6 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.

9.7 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%.

9.8 The trailers category O3, O4 shall be provided with Anti-lock braking system (ABS).

9.9 The connections of the compressed-air braking systems between power-driven vehicles and trailers shall be provided according to choose one of the follow paragraphs:

9.9.1 One pneumatic supply line and one pneumatic control line.

9.9.2 One pneumatic supply line, one pneumatic control line and one electric control line.

9.9.3 One pneumatic supply line and one electric control line.

The SASO REGULATION ON BRAKE IS UNDER PREPARATION UNTIL SUCH TIME.

VEHICLES SHOULD COMPLY WITH REQUIREMENTS OF BRAKE OF ECE OR FMVSS REGULATIONS.

FOR DETAILED REQUIREMENTS ON BRAKING SYSTEM REFER TO SASO GSO 42 AND ECE 13.

10. SUSPENSION SYSTEM

10.1 Depending on the category of vehicle the suspension provided shall be suitable 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.

10.2 Every trailer 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.

10.3 The suspension system provided for trailer used in construction sites shall be suitable to carry the maximum load applied and the rough terrain in which they are used.

10.4 The durability of the suspension system should be tested by carrying out durability tests in accordance with the relevant international and manufacturer's specifications.

11. FRAME AND BODY

11.1 The frame and body shall be so secure and strong enough as to fully withstand the operation of the trailer.

11.2 The chassis shall be strong enough to carry the maximum load applied to the trailer in use.

11.3 The flooring in all trailers shall be substantially constructed in good conditions according to purpose used.

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

11.5 Trailers shall be mounted with rear and side shields (rear and side under- run protections) to protect against under running of vehicles in the event of rear or side collision.

11.6 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.

11.6.1 The maximum mass of a trailer type for which the rear underrun protective device to be installed shall not exceed the value indicated on the rear underrun protective device for which it is designed for.

11.6.2 The rear under run protective device to be installed to the trailer shall be suitable to the trailer to prevent under running of light duty vehicles. Its surface shall be made of a reflective type.

11.7 Lateral protection fix to 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.

11.7.1 Components permanently fixed to the trailer, e.g. spare wheels, battery box, air tanks, fuel tanks, lamps, reflectors and tool boxes may be incorporated in the guard, provided that they meet the dimensional requirements of this Regulation. The requirements of items from 4.2.5 to 4.2.8 at SASO GSO 2113 shall generally apply as regards gaps between protective devices and permanently fixed components.

11.7.2 The outer surface of the LPD shall be smooth, and so far, as possible continuous from front to rear and its surface shall be made of a reflective type.

11.7.3 Lateral Protection Device (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.

11.8 Spray-suppression devices must be constructed in such a way that they operate properly when used normally on wet roads. Moreover, the automotive trailer manufacturing they must incorporate no structural or defect detrimental to their proper functioning or behavior.

11.9 Every trailer 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 SASO standard.

11.10 for tankers carrying fuel and equipped with auxiliary equipment “e.g. pumps” it should be constructed in compliance with **NFPA 385** chapter 8 (**NATIONAL FIRE PROTECTION ASSOCIATION**).

Note: Tanker shell shall be made from aluminum alloys with shiny bright finish.

Note: It will be stopped working for tankers constructed from steel by the end of 2020 and should be replaced by tanks manufactured from aluminum material.

FOR DETAILED REQUIREMENTS ON VEHICLES CARRYING DANGEROUS GOODS REFER TO SASO REGULATIONS SASO 1285, SASO 1286, SASO 1287, 1288 AND SASO 2288.

11.11 The rear of the trailers shall be provided with designated location sufficient in size to fix the number plates made in accordance with the SASO technical regulation No. SASO 572.

11.12 Requirements for windows and partitions Transparent partitions and windows fitted to any trailer shall be:

- a) of safety glass that complies with the relevant requirements given in SASO ISO 3536 standard or any alternative regulation.
- b) of plastics safety glazing material that complies with the relevant requirements in SASO ISO 15082 standard or any alternative regulation.

FOR DETAILED REQUIREMENTS ON FRAME AND BODY REFER TO SASO 572 AND SASO GSO 42, 2113, 2114 AND SASO ISO 3536, 15082.

12. COUPLING DEVICES AND TOWING METHODS

12.1 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.

12.2 All characteristics necessary for the mounting and interchangeability of drawbar couplings on the frame (cross member, drawbeam or mounting bracket) of towing vehicles for trailers according to the SASO ISO 3584.

12.3 The manufacturer must lay down the dimensions necessary for the compatibility of mechanical coupling devices between light trailers or caravans and towing vehicles, when the latter are fitted with a coupling ball.

12.4 The maximum allowable wear and the limit dimensions of worn components of in-use mechanical couplings, will ensure the safe operation on the road of heavy commercial vehicles fitted with such couplings.

12.5 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.

12.6 The fifth wheel coupling pin which is used for coupling semi-trailers to prime movers, it should be taking into account the limitations of weight generally laid down by official requirements.

12.7 The fifth wheel kingpin shall be equipped with all the fixtures needed to attach it to the vehicle (see SASO ISO 337 and SASO ISO 4086). The method of mounting shall be identical to that subsequently employed on the vehicle itself.

12.8 Electrical connectors that are fitted for the purpose of towing and towed vehicles should be complying with 12 v systems or 24 v systems according to the trailers category applicable. Refer to SASO ISO 1185, 1724, 3731, 4091, 11446, 12098 or alternative connectors.

12.9 The location for the electrical connection of the braking systems and running gear of towing and towed vehicles with 12 v AND 24 v nominal supply voltage and park socket used to receive and store the plug when disconnected according to ISO 4009 standard or any alternative regulation.

12.10 The locations of coupling devices for electrical and pneumatic connections between towing and towed commercial road vehicles. It is applicable to heavy vehicles equipped with pneumatic braking systems and 24 V electrical equipment of the following types: drawbar-trailer combinations whose towing vehicles have rear-mounted couplings or couplings mounted forward and below, and articulated vehicles according to standard.

FOR DETAILED REQUIREMENTS COUPLING DEVICES AND TOWING METHODS REFER TO SASO ISO 337, 1103, 1726, 3584, 3842, 4086, 7638, 8716, AND TS 20825.

13. WHEELS (TYRES AND RIMS)

13.1 Tyre/wheel combination recommended by the manufacturer should suitable and indicate size designation, load-capacity index, speed category symbol, rolling resistance in accordance with accepted SASO standard.

13.2 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 ECE 117.

13.3 Retreaded tyres shall display on both sidewalls in the case of symmetrical tyres and at least on the outer sidewall in the case of asymmetrical tyres.

13.4 The retreaded pneumatic tyre accepted for trailer category O3, O4.

13.5 The trailers shall be provided with spare tyre.

FOR DETAILED REQUIREMENTS ON WHEELS REFER TO SASO REGULATIONS SASO 1134, 1135, 1136, 1275, 1771, AND SASO GSO ECE 117 AND SASO ISO 4107.

14. LIGHTING EQUIPMENT

14.1 General

14.1.2 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 SASO GSO 42 standard.

14.1.3 Lighting equipment mounted in pairs shall be of the same colorimetric requirements and symmetrically appropriate photometric characteristics.

14.2 A summary of the requirements for each type of lamp and reflector is given in the following table.

	Item	Location of emitted light	color	Description
01	Stop lamp (brake lamp)	Each side at the Rear	Red color	<ul style="list-style-type: none"> - Clearly visible even in day time from a distance to be clearly identified by the vehicles coming behind to avoid any rear impact. - should be actuated upon application of the service brake.
02	Rear position lamp	Each side at least one at the rear	Red color	<ul style="list-style-type: none"> - Clearly visible at night at a suitable distance to the rear to avoid any rear impact. - shall be wired so that it will light simultaneously on both sides with the front position lamps.
03	Reversing lamp	Not more than two lamps at the rear	White color	<ul style="list-style-type: none"> - It is optional for category O1. - The intensity of the reversing lamp shall be not greater than 5000 candles. - give a clear vision to rear when reversing. - for the all vehicle with length exceeding 6,000 mm, two devices mandatory and two devices optional.

<p>04</p>	<p>Direction Indicator Lamp</p>	<p>Two mounted on the rear</p>	<p>Amber/red color</p>	<ul style="list-style-type: none"> - 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. - Front and rear direction indicator lamps shall, when in operation, be visible, even in daytime. <p>The direction indicator lamps may be so designed and constructed that they also act as the hazard warning flashing lamps.</p> <ul style="list-style-type: none"> - The signal shall be given by simultaneous operation of the direction indicator lamps. - Hazard warning flashing lamps shall comply with the requirements of direction indicator lamps. - if a power-driven vehicle is
<p>05</p>	<p>Hazard warning flashing lamp</p>	<p>Two mounted on the rear</p>	<p>Amber/red color</p>	<p>equipped to draw a trailer the hazard warning signal control shall also be capable of bringing the direction-indicator lamps on the trailer into action.</p> <ul style="list-style-type: none"> - hazard warning signal shall be able to function even if the device which starts or stops the engine is in a position which makes it impossible to start the engine.
<p>06</p>	<p>Clearance lamp</p>	<p>Each side one at the front and rear</p>	<p>Front display an amber or white color. Rear should be amber or red color.</p>	<ul style="list-style-type: none"> - Equipped for trailer, semi trailers if width exceeding 2.1 m. - it should be mounted so as indicate the extreme width on the trailer vehicle. - The intensity of the clearance lamp shall be clearly visible night at a sufficient distance to avoid any accident by other vehicles.

07	Side marker lamps And	front and rear side marker lamps	Front and center amber color and the rear Red or amber color	- Any vehicle exceeding 6m in length shall be equipped with front and rear side marker lamps or side reflectors on both sides of vehicles. - The side marker lamps shall be clearly visible at night at a suitable distance from the side of the vehicle to avoid any accidents.
07.1	side reflector	On both sides of vehicle for side reflectors	Front and center reflect amber color and the rear reflect Red or amber color	- 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.
08	Rear registration plate lamp	In the rear registration number plate	White color	- making it clearly visible from a distance of 20 meters to the rear. - The registration plate lamp shall be wired so that it is on when the head lamps and front and rear position lamps are on.
09	Rear fog lamp	A minimum one in the rear	Red color	- The rear fog lamp is optional provided if the intensity of the rear lamps complies with the SASO regulation.

FOR DETAILED REQUIREMENTS ON LIGHTING EQUIPMENT REFER TO SASO ISO 303, SASO GSO 42, SASO GSO ECE 48 AND SASO ISO 13207.

15. INCOMPLETE VEHICLES

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

15.2 The manufacturer shall supply the following information:

15.2.1 The gross vehicle weight rating of the completed trailer vehicle for which the incomplete vehicle is manufactured.

15.2.2 Gross axle weight rating for each axle of the completed trailer vehicle.

15.2.3 A complete manual containing a technical instruction for completing the trailer vehicle for its intended purpose.

15.3 The final stage manufacturer shall complete the trailer vehicle in accordance with the instructions supplied by the incomplete trailer vehicle manufacturer.

15.4 A label shall be affixed by the final stage manufacture in accordance with the relevant SASO regulation.

FOR DETAILED REQUIREMENTS ON VEHICLES MANUFACTURED IN MULTI STAGE REFER TO SASO REGULATIO (SASO 703).

16. VEHICLE IDENTIFICATION NUMBER (VIN)

16.1 GENERAL REQUIREMENTS

Each manufacturer trailer should have Identification number (VIN) assigned by the manufacturer according to SASO standard SASO-2249.

16.1.2 Each trailer manufactured in one stage shall have a VIN assigned by the manufacturer.

16.1.3 Each trailer manufactured in more than one stage shall have a VIN assigned by the incomplete vehicle manufacturer.

16.1.4 Each VIN shall consist of seventeen (17) characters.

16.1.5 The check digit shall appear in position nine (9) of the VIN.

16.1.6 The VINs of any two vehicles manufactured within a 30-year period shall not be identical.

16.1.7 Only the following Arabic numerals and capital roman letters shall be used in the VIN:

0123456789.

ABCDEFGHIJKLMNPRSTUVWXYZ.

16.1.8 The VIN content shall consist of four (4) sections.

16.1.9 The VIN location shall be readable from outside according to SASO 2251 paragraph **4.1.2.**

16.1.10 Each vehicle must have its own special number engraved or engraved on the internal frame structure or on any other similar body, on the left side of the vehicle, as determined by the manufacturer.

See table 1 & 2 for sample deciphering submission.

FOR DETAILED REQUIREMENTS FOR VEHICLE IDENTIFICATION NUMBER (VIN) REFER TO SASO 2249, SASO 2250, AND SASO 2251.

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TABLE 1

Placement of information in manufacturers vin

Section title	1 st section			2 nd section					3 rd section	4 th section								
	World manufacturing identify (WMI)			Vehicle description (VDS)					Check digit	Model year	Plant	vehicle indicator section (VIS) - Number sequentially assigned In positions 12-17 if a high - vol. min. or In positions 15-17 if a low-vol. - Manufacture.						
CHARACTER OR POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Type (character)	B	B	B	B	B	B	B	B	B	B	B	B	B	N	N	N	N	
A= Alphabetic N= Numerical B= Alphabetic or Numerical	Defined by of SASO 2250 first & second position is an alphabetic or numeric character assigned from international agency (SAE). Third position is assigned by national organization or partner and is consisting of an alphabetic character from A to Z (I, O & Q are excluded) or numeric character from 1-8 (9 is reserved for production of less than 500 vehicles /year)			Describe: Trailer type. Body type. Length. Number of axles. For sample deciphering see table 2.					Check digit Refer to SASO 2249 /4.2.3	Model year H=2017 J=2018 K=2019 L=2020 M=2021	Location of plant that affixes v I n	Sequential production number						
													If manufacture Produces less than 500 vehicles in A year		sequential production number			

TABLE 2
VIN SAMPLE DECIPHERING SUBMISSION

Vin deciphering

Vin deciphering submission		
1 ST section		
Position 1	WMI	Assigned by international agency SAE
Position 2	WMI	Assigned by international agency SAE
Position 3 *	WMI	Assigned by national organization or partner
2 nd section **		
Position 4	Type of trailer For all trailer type the make is	1= Ball type pull 2= Pintle hitch 3= Gooseneck 4= Straight semi 5= Fifth wheel 6= Kingpin 9= Other
Position 5	Body type	A = Snowmobile trailer B = Boat trailer C = Car hauler trailer D = Dump trailer E = Enclosed trailer F = Flatbed trailer G = Curtain side trailer H = Hydraulic dovetail J = Double drop trailer K = Camper trailer L = Lowboy trailer M = Motorcycle trailer N = Livestock trailer P = Pole trailer R = Reel trailer S = Stacker trailer T = Tank trailer U = Utility trailer V = Straw trailer W = Landscape trailer X = Logging trailer Y = Satellite trailer Z = Converter dolly

Position 6	Length <u>Remark 1</u> the manufacture should specify the actual length in the technical information list.	2= 2 meter long 3= 3 meter long A= 9 meter long			
Position 7	Type of material	A= Aluminum B= Stainless steel C= Carbon steel D= Fiberglass/composite 9= Other			
Position 8	Number of axles	1= Single Axle 2= 2 Axles 3= 3 Axles			
3 rd section					
Position 9	Check digit	Must Calculate for each VIN refer to SASO 2249 4.2.3			
4 th section					
Position 10	Model year	Per regulation:			
		code	Model year	code	Model year
		K	2019	Y	2030
		L	2020	1	2031
		M	2021	2	2032
		N	2022	3	2033
		P	2023	4	2034
		R	2024	5	2035
		S	2025	6	2036
		T	2026	7	2037
		V	2027	8	2038
		W	2028	9	2039
X	2029				
Position 11	Plant location	code	Regain		
		A	ASIR		
		B	AL-BAHAH		
		C	AL-QASSIM		
		D	NORTHERN BORDER		
		E	EASTERN		
		G	JIZAN		
		H	HAIL		
		K	MAKKAH		
		M	AL-MADINAH		

		N	NAJRAN
		R	RIYADH
		T	TABUK
		W	AL-JAWF
Position 12 *	WMI	Assigned by national organization or partner	
Position 13 *	WMI	Assigned by national organization or partner	
Position 14 *	WMI	Assigned by national organization or partner	
Position 15.16. and 17	Sequentially assigned number	001, 002, 003, ETC.... The first vehicle of any model year will be 001.the second will be 002. And so	

* = IF A MANUFACTURE PRODUCES LESS THAN 500 VEHICLES IN A YEAR the WMI is assigned by international agency SAE.

** = The layouts shown in 2nd section as attributes is given as deciphering submission examples only and are not restrictive.

17. COMPLIANCE PLATE

17.1 Every applicable trailer shall bear an Approved Compliance Plate which shall be placed in a conspicuous position on the trailer.

17.2 The manufacturer shall affix, on the chassis of the trailer, a label meeting the following requirements:

17.2.1 It shall be made of material resistant to deterioration.

17.2.2 The label shall, unless riveted, be permanently affixed in such a manner that it cannot be removed without being destroyed.

17.2.3 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:

17.2.3.1 Name of manufacturer and country of manufacture (or assemble).

17.2.3.2 Year and month of production.

17.2.3.3 Maximum (gross) vehicle weight (GVW) in kilograms.

17.2.3.4 Maximum (gross) axle weight (GAW) for each axle, in kilograms.

17.2.3.5 The trailer identification number.

17.2.3.6 The category of trailer.

17.2.3.7 The statement “This trailer conforms to all applicable SASO standard and Technical Regulations in effect up to the date of manufacture” referred to table - 3.

17.2.4 Additional information may be included at the discretion of the Manufacturer.

17.2.5 In the case all of the information required by manufacturer is contained in the ‘Compliance Plate’ a separate vehicle plates need not be fitted.

FOR DETAILED REQUIREMENTS ON COMPLIANCE PLATE REFER TO SASO REGULATIONS SASO 400 AND SASO GSO 42.

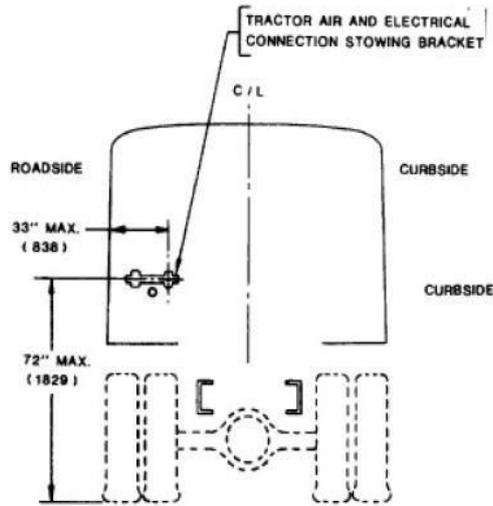


FIGURE 1—

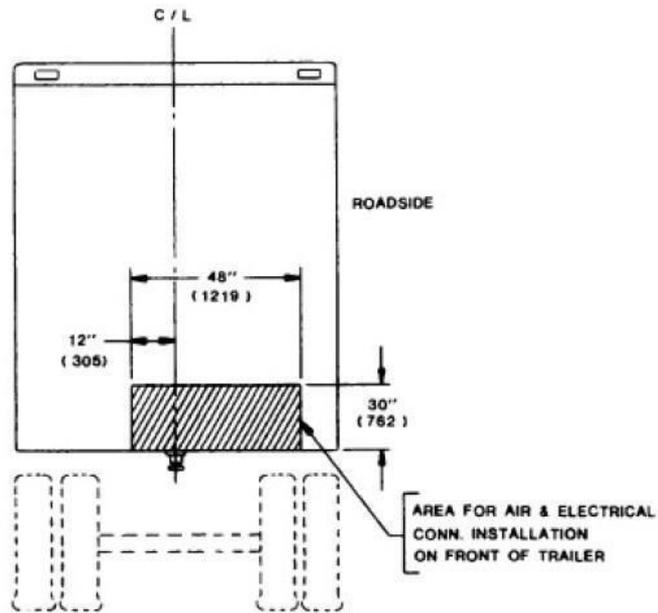


FIGURE 2—

Fig-1 & Fig-2

For brake and electrical connections locations

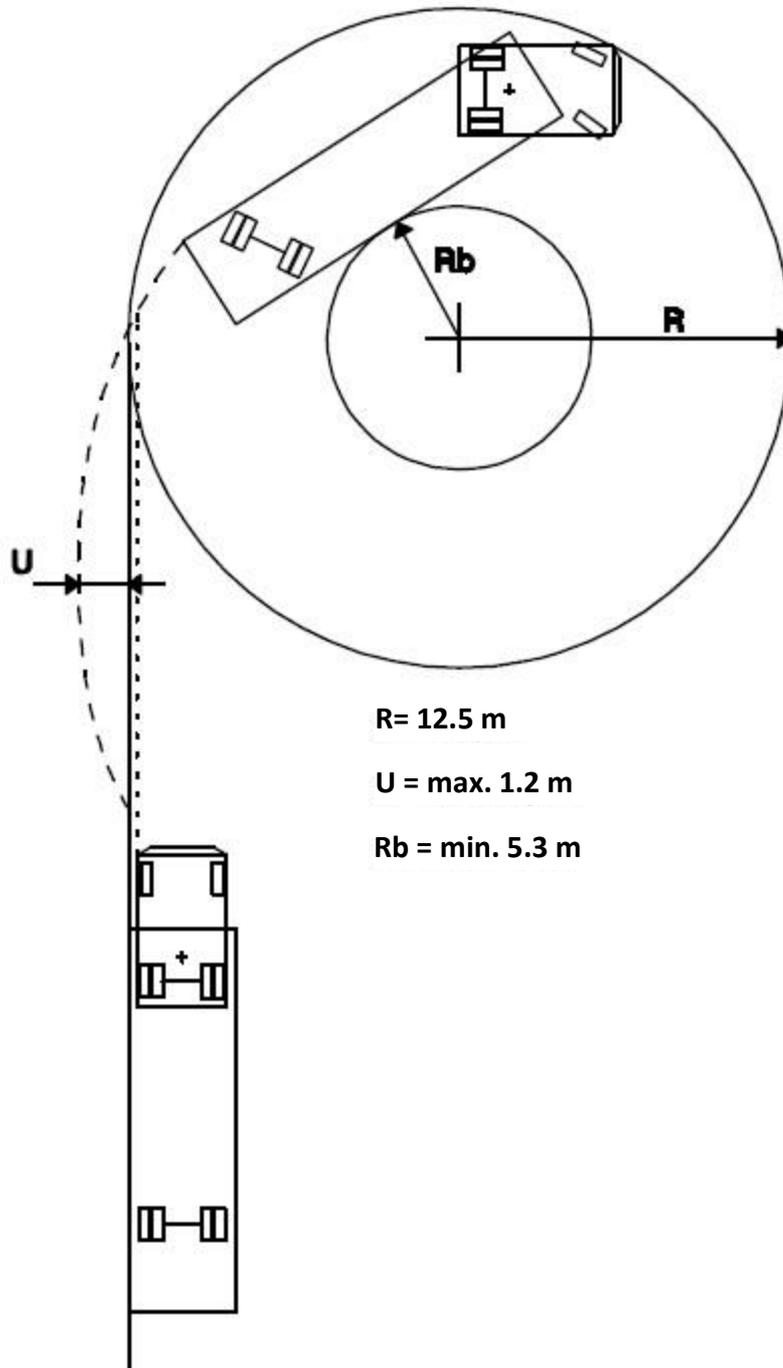


Fig.3 Vehicle maneuverability

COMPLIANCE PLATE

Chassis numbr				رقم الهيكل
Manufacturer				اسم المصنع
Country of manufacturing				بلد الصنع
Model				رمز الطراز (الموديل)
Date of manufacturer				تاريخ التصنيع
	Axle 1 (kg)	Axle 2 (kg)	Axle 3 (kg)	
Max. axle weight				الوزن الأقصى على كل محور
Gross Weight				الوزن الكلي
Width				العرض (بالمتر)
Length				الطول (بالمتر)
Height				الارتفاع (بالمتر)
Comply with Approved standards				مطابقة للمواصفات القياسية المعتمدة
Special notes				ملاحظات

TABLE – 3

REFERENCE

ECE 13	Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking.
ISO 4009	Commercial vehicles — Location of electrical and pneumatic connections between towing vehicles and trailers.
Directive 96/53 /EC, of 25 July 1996 Article 4, § 4 (b)	