

VEHICLE EQUIPMENT SAFETY COMMISSION

Regulation VESC-11

MINIMUM REQUIREMENTS FOR CONSTRUCTION AND EQUIPMENT OF MOTORCYCLES

Approved August 1974

Amended August 1975

Suite 802
4660 Kenmore Avenue
Alexandria, Virginia 22304

TABLE OF CONTENTS

	Page
General	
Purpose	1
Scope	1
Definitions	1
Manufacturer's Certification	2
Chassis Requirements	
Frame/Chassis	2
Brakes	2
Tires, Wheels and Rims	3
Steering and Suspension Systems	3
Fuel System	5
Exhaust System	5
Body Requirements	
Mirrors	5
Fenders	5
Seat or Saddle	6
Chain Guard	6
Vehicle Stand	6
Glazing	6
Horn	6
Speedometer and Odometer	7
Electrical System Requirements	
Lighting Equipment	7
Passenger Safety Items	
Passenger Seat	7
Handhold	7
Footrest	8
Highway Bars	8
Equipment Approval	8

MINIMUM REQUIREMENTS FOR CONSTRUCTION AND EQUIPMENT OF MOTORCYCLES

GENERAL

1. PURPOSE

- 1.1 To establish performance and equipment requirements for the manufacture, sale and safe operation of a motorcycle upon public highways, and to furnish administrators with a guide for registration eligibility and continued conformity as related to motorcycles.

2. SCOPE

- 2.1 This standard sets forth performance and equipment requirements for safe operation of a motorcycle upon the public highways applicable to those motorcycles manufactured on and after the effective date of this standard.
- 2.2 A jurisdiction may grant exceptions from the requirements of this standard or permit the use of other equipment or devices by administrative rule and regulation.

3. DEFINITIONS

- 3.1 Motorcycle – means a two-wheel or three-wheel vehicle with motive power which propels the vehicle forward on a level roadway surface at a minimum speed of 40 MPH when operated at its Maximum Gross Vehicle Weight Rating (MGVWR) and having a singular front steering road wheel mounted in a fork assembly which passes through a frame steering bearing, and to which is attached a handlebar assembly or other directly operated turning device; and which has no enclosure for driver or passenger(s) with the exception of a forward mounted windshield if so equipped. A motorcycle equipped with detachable side-car is not considered to be a three-wheel motorcycle.
- 3.2 Manufacturer – means any person engaged in the manufacturing or assembling of motorcycles or motorcycle equipment, including any person importing motorcycles or motorcycle equipment for resale.
- 3.3 Motorcycle Equipment – means any system, part, or component of a motor vehicle as originally manufactured or any

similar part or component manufactured or sold for replacement or improvement of such system, part, or component or as an accessory, or addition to the motor *cycle*.

- 3.4 Gross Axle Weight Rating (GAWR) – means the vehicle manufacturer's prescribed maximum weight to be supported by a single transverse axle measured *on a level surface at the tire-surface interfaces*.
- 3.5 Gross Vehicle Weight Rating (GVWR) – means the vehicle manufacturer's prescribed maximum loaded vehicle weight, including all accessories, occupants, cargo and extra equipment measured at ground level.
- 3.6 FMVSS – means Federal Motor Vehicle Safety Standard
- 3.7 SAE – means Society of Automotive Engineers

4. MANUFACTURER'S CERTIFICATION

- 4.1 The manufacturer shall provide a certification of fact that a motorcycle or class of motorcycles is designed and manufactured for use upon public highways and complies with the performance and equipment requirements of this standard.
- 4.2 The certificate shall be incorporated on the Manufacturer's Statement of Origin (MSO) *or* other ownership document upon transfer of vehicle ownership.

CHASSIS REQUIREMENTS

5. FRAME/CHASSIS

- 5.1 The motorcycle frame/chassis including the suspension components and engine mountings, shall be of *sufficient strength*, capable of supporting the combined weight of all vehicle components and riders for which the vehicle is designed.
- 5.2 The wheel base shall not be less than forty inches.

6. BRAKES

- 6.1 Every motorcycle shall have either a split service brake system or two independently actuated service brake systems in accordance with FMVSS -122. Brakes must act on the front and rear wheel(s).
- 6.2 Every motorcycle shall meet the requirements for system effectiveness, fade and partial systems as specified in FMVSS-122. Brake linings, pads, hoses, drums, rotors and master cylinders shall meet VESC, FMVSS and SAE standards.

- 6.3 The front wheel brake control cables, lines and hoses shall be so located and secured as not to become pinched between the fork and frame members when the wheel is turned completely to the right or left.
- 6.4 Brake actuating devices shall be in a *readily* accessible location, unencumbered by vehicle components. Service brake system controls and operation requirements shall be in accordance with FMVSS-123. A suitable mechanism shall be provided for the purpose of automatically returning the actuating devices to normal position upon release.
- 6.5 Motorcycle brakes must be capable of being adjusted automatically or manually with means provided to prevent unintentional adjustment.
- 6.6 Each three-wheel motorcycle shall be equipped with a parking brake of a friction type with a solely mechanical means to retain engagement.

7. TIRES, WHEELS AND RIMS

- 7.1 Motorcycle tires shall be of pneumatic design with a minimum width of two and twenty-five hundredths (2.25) inches designed for highway use and meeting current FMVSS-119.
- 7.2 Tires on two-wheel motorcycles and the front tire on a three-wheel motorcycle must have a load capacity rating at least equal to their respective gross axle weight ratings (GAWR). Each tire on the rear axle of a three-wheel motorcycle must have a load capacity rating at least equal to one-half the rear axle gross axle weight rating (GAWR).
- 7.3 Wheel rim diameters shall not be less than ten inches and *rims* shall otherwise comply with applicable Federal standards.

8. STEERING AND SUSPENSION SYSTEMS

- 8.1 Stability – motorcycle steering and suspension systems shall provide the operator with the means of safely controlling vehicle direction.
- 8.2 Wheel Alignment – the rear wheel of a two-wheel motorcycle shall track behind the front wheel within one inch with both

wheels in a vertical plane when the vehicle is operating on a straight course. On a three-wheel motorcycle, the two wheels mounted on the rear axle shall have a wheel track distance no less than thirty (30) inches and the mid point of the rear wheel track distance shall be within one inch of the front wheel track when the vehicle is proceeding on a straight course. The vehicle shall be equipped with an adjustment feature that will provide proper wheel tracking.

8.3 Steering Head – the steering head shall be provided with a bearing or similar device that will allow the steering shaft to turn freely in rotational motion only. All handlebar mounted control cables, wires, lines and hoses shall be so located and secured as not to become pinched between the fork and frame members when the wheel is turned completely to the right or left.

8.4 Front Wheel Geometry – all motorcycles shall meet the following specifications in relationship to front wheel geometry:

MAXIMUM: Rake: 45 degrees – Trail: 14 inches positive

MINIMUM: Rake: 20 degrees – Trail: 2 inches positive*

Manufacturer's specifications shall include the specific *rake* and *trail* for each motorcycle or class of motorcycles.

8.5 Handlebars – handlebars shall be of sturdy construction, adequate in size (length) to provide proper leverage for steering, and capable of withstanding a minimum force of one hundred (100) pounds applied to each handgrip in any direction. Handlebar grips shall be located no more than fifteen (15) inches above the occupied seat with the handlebars located in a straight ahead position and shall be capable of vertical adjustment. The handlebars shall provide a minimum of eighteen (18) inches between *grips* after final assembly.

8.6 Handgrips – handlebars shall be equipped with handgrips of non-slip design or material.

8.7 Suspension – motorcycles shall be equipped with a suspension system and such suspension system shall be applicable to at least the front wheel. The suspension system(s) shall be designed for the purpose of maximizing vehicle stability.

*NOTE: not applicable to three-wheel motorcycles. Reference Front End Geometry Diagram – Appendix A.

9. FUEL SYSTEM

- 9.1 All fuel system components, including the tank, pump, tubing, hoses, clamps, etc., shall be securely fastened to the motorcycle so as not to interfere with vehicle operation and be leak proof when the vehicle is in its normal operating attitude.
- 9.2 Fuel lines shall be positioned in a manner to prevent their contact with the engine head, manifold, exhaust system, or other high temperature surfaces, or moving components. The fuel system shall be adequately vented and provided with a fuel shut-off valve located between the fuel supply and the engine.

10. EXHAUST SYSTEM

- 10.1 Motorcycles shall be equipped with an exhaust system incorporating a muffler or other mechanical device for the purpose of reducing engine noise. Cutouts and by-passes in the exhaust system are prohibited. The system shall be leak proof and all components shall be securely attached to the vehicle and located so as not to interfere with the operation of the motorcycle. Shielding shall be provided to prevent inadvertent contact with the exhaust system by the operator and/or passenger during normal operation.

BODY REQUIREMENTS

11. MIRRORS

- 11.1 Every motorcycle shall be equipped with at least one (1) mirror of unit magnification, securely affixed to the handlebar and capable of adjustment within a range that will reflect an image that includes at least the horizon and the road surface to the rear of the motorcycles. Such mirror shall consist of a minimum reflective surface of ten (10) square inches. All mirrors shall be regular in shape (circular, oval, rectangular, or square) and shall not contain sharp edges, projections, or irregular indents capable of producing injury.

12. FENDERS

- 12.1 Each wheel of a motorcycle shall be equipped with a fender or otherwise *be* covered by the body configuration. Fenders shall be securely mounted and of sufficient size and strength to minimize water or other road surface substances from coming in contact with the vehicle riders.

13. SEAT OR SADDLE

- 13.1 Seat and/or Saddle – a seat or saddle securely attached to the vehicle, shall be provided for the use of the operator. The seat or saddle shall not be less than twenty-five (25) inches above a level road surface when measured to the lowest point on top of the seat or saddle cushion with the operator seated in a driving position. The seat or saddle adjustment locking device shall prevent relative movement of the seat from its selected and secured position under all normal vehicle operating conditions.

14. CHAIN GUARD

- 14.1 Chain Guard – any drive chain on a motorcycle shall be equipped with a chain guard or covering device to prevent chain or chain sprocket contact with any rider.

15. VEHICLE STAND

- 15.1 All motorcycles designed with two wheels shall be equipped with a retracting stand. The stand may be of a side or center type, and capable of supporting the motorcycle when left unattended.

16. GLAZING

- 16.1 When equipped, all motorcycle windscreens and windshields shall meet the following standards:
- A. The glazing material shall comply with the provisions of FMVSS-205.
 - B. The metal support shall be of a material which shall bend rather than fragment under impact.
 - C. Covering material, other than glazing, shall be beaded at the edges to prevent fraying.

17. HORN

- 17.1 Every motorcycle shall be equipped with at least one horn. The horn shall be electrically operated and shall operate from a control device located on the left handlebar.

18. SPEEDOMETER AND ODOMETER

- 18.1 Every motorcycle shall be equipped with a properly operating speedometer and odometer calibrated in miles per hour and miles respectively and shall be fully illuminated when the headlamp(s) is activated.

ELECTRICAL SYSTEM REQUIREMENTS

19. LIGHTING EQUIPMENT

- 19.1 Lamps – every motorcycle shall be equipped with lamps, reflective devices and associated equipment as required by and in compliance with FMVSS-108.
- 19.2 A gear selector neutral indicator light shall be located within the operator's field of vision and shall be green in color.
- 19.3 Headlamp Indicator Light – a headlamp beam indicator light shall be located within the operator's field of vision and illuminated automatically when the hi-beam of the headlamp is actuated.
- 19.4 Electrical Energy System – every motorcycle shall be equipped with an electrical energy storage source to provide lighting of a constant intensity.

PASSENGER SAFETY ITEMS

20. PASSENGER SEAT

- 20.1 Passenger Seating – motorcycles designed to carry more than one person must be equipped with a securely mounted seat *or seating space* for the passenger and shall be located to the rear or side of the driver such that the passenger(s) seat does not interfere with the driver's control or operation of the vehicle. In the case of a two wheel vehicle the passenger seat shall be located on the longitudinal centerline of the motorcycle.

21. HANDHOLD

- 21.1 If a motorcycle is designed to carry a passenger, a handhold device shall be provided.

22. FOOTREST

- 22.1 Footrests shall be provided for each designated seating position. Footrests shall be located to provide reasonable accessibility and fold upward if the footrest protrudes beyond the side of the motorcycle's fixed items.

23. HIGHWAY BARS (Alternate Footrest)

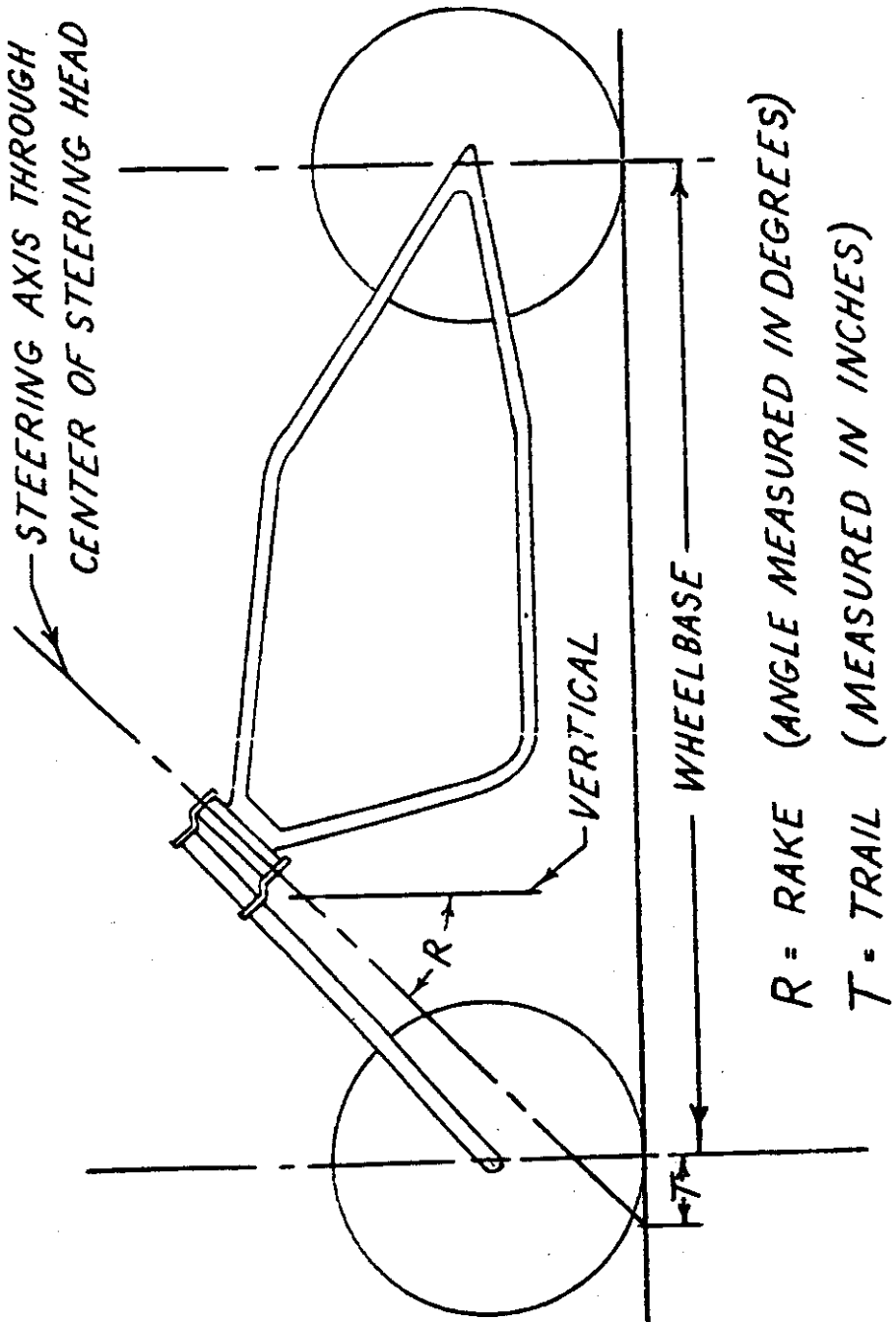
- 23.1 If a motorcycle is so equipped, highway bars (alternate footrest) shall have a maximum width of twenty-six inches; shall be located less than fifteen inches from the foot controls; and shall not interfere with the operation of the foot controls.

24. EQUIPMENT APPROVAL

- 24.1 All motorcycle lighting devices, electrical systems, brake components, glazing materials, required or optional, shall require approval. The head of the designated agency of the state government may issue a certificate of approval to the requesting manufacturer. The term "head of the designated agency" shall mean the state government approval authority, or appointed or designated agent.

MOTORCYCLE FRONT END GEOMETRY

MOTORCYCLE FRONT END GEOMETRY



R = RAKE (ANGLE MEASURED IN DEGREES)
T = TRAIL (MEASURED IN INCHES)

VE
SIC