Manitoba Public Insurance

Department of Motor Vehicle Licensing and Inspections

MOTOR VEHICLE ALTERATIONS AND MODIFICATIONS

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G E N E R A L

OBJECTIVE

1.1 To establish standards for the alteration and modification of vehicles from new or used parts, or kits to ensure that the vehicle meets standards described in the Highway Traffic Act and it's regulations and the Canadian Motor Vehicle Safety Standards.

DEFINITIONS

2.1 Special Motor Vehicles ***** -passenger vehicles, trucks and buses which are intended for the use on public highways, the term "Special Motor Vehicle" shall include the following types:

TYPE I Vehicles which retain their original body configuration with changes made to the steering, brakes, power train or suspension systems.

TYPE II Vehicles changed from the recognized vehicle manufacturer's original body configuration or a reproduction thereof but which retains the general appearance, including changes to the body, chassis or engine of the original vehicle. This type may also include changes and modifications to engine, chassis, brake system, power train, steering and suspension systems.

TYPE III All special vehicles which are custom built with fabricated parts, or parts taken from existing vehicles excluding Type I and Type II vehicles.

2.2 Recognized Manufacturer - Manufacturer means a person engaged in the manufacturing, assembly or importation of a Special Motor Vehicle intended for use on the Public Highways, or for distribution and sale in the Province.

2.3 S.A.E.-Society of Automotive Engineers.

2.4 C.M.V.S.S.-Canada Motor Vehicle Safety Standards.

2.5 Certification of Compliance - The alterations and modifications done to a motor vehicle shall be certified for compliance by a Qualified Mechanic (Automotive).

***** An antique vehicle registered as an antique vehicle is not considered to be a "Special Vehicle" and is not covered by this standard.

Body Requirements

DEFROSTER AND DEFOGGING DEVICE

3.1 Every closed Special Motor Vehicle shall be equipped with a defrosting or defogging system capable of maintaining clear windshield area.

DOOR LATCHES

4.1 The doors on a Special Motor Vehicle leading directly into a compartment that contains one or more seating accommodations shall be equipped with mechanically actuated door latches which firmly and automatically secure the door when pushed closed and which allow each door to be opened from the inside by the actuation on a convenient lever, handle or other suitable device.

FLOOR PAN

5.1 Every special vehicle shall be equipped with a floor pan under the entire passenger carrying compartment. The floor pan shall support the weight of the number of occupants that the vehicle is designed to carry. The floor pan shall be so constructed that it prevents the entry of exhaust fumes.

GLAZING

6.1 Windshields - every special vehicle shall be equipped with a laminated safety glass windshield that complies with the provisions appearing in the **ANSI Z 26.1** standard *. The vertical height of the unobstructed windshield glass shall be not less than 2540 mm. (10in.) or as originally equipped by a recognized manufacturer.

6.2 Side and Rear Glass - these items are not required, but if they are present they must comply with the provisions of the **ANSI Z 26.1** standard*.

* American National Standards Institute **Z 26.1** for Safety Glazing Materials for Motor Vehicles.

Driver Visibility

7.1 The vehicle shall be provided with a windshield, and side windows or openings which allow the driver a clear unobstructed forward view 180 degrees measured from the line of the back of the driver's seat. This range of vision may be interrupted by window framing not exceeding two inches in width each, and windshield door post support areas not exceeding four inches in width at each side location, or as originally equipped by a recognized manufacturer.

7.2 A special motor vehicle shall have no obstruction forward of the windshield which extends more than two inches upward into the horizontally forward projected vision area of the windshield as measured from the rearmost part of the hood or bottom edge of the windshield glass whichever is the highest with the exception of windshield wiper components.

HOOD LATCHES

8.1 A front opening hood shall be equipped with a primary and secondary latching system to hold the hood in a closed position.

INSTRUMENTATION AND CONTROLS

9.1 Speedometer - every special vehicle shall be equipped with an operating speedometer calibrated to indicate as accurately as possible the speed being travelled.

9.2 Odometer - every special vehicle shall be equipped with an operating odometer calibrated to indicate total distance travelled.

9.3 Steering Wheel - every special vehicle shall be equipped with a steering wheel with an outside diameter of not less than 330 mm. (13in.).

REAR VIEW MIRROR

10.1 Every special motor vehicle shall be equipped with a rear view mirror. It shall be mounted in such a way that it affords the driver a clear view of the roadway and of any vehicle approaching from the rear. The mirror mounting shall provide for minor adjustment by tilting in both horizontal and vertical directions. Each mirror shall have a minimum of 645 mm² (10 in.²) of mirror glass and any one of it diameters cannot be less than two inches.

SEAT BELTS

11.1 Seat belt requirements for the three type of special motor vehicles defined under section 3.1 are as follows:

All Special Motor Vehicles - shall be equipped with at least a Type 1 (lap belt) seat belt, in compliance with the Canadian Motor Vehicle Safety Standard number 209, for the driver and each passenger seating position for trucks and buses.

11.2 All seat belts shall be securely anchored.

SEAT SECUREMENT

Seat securement for the three types of special motor vehicle defined under section 2.1 are as follows:

12.1 An adequate seat shall be provided for the driver. The driver's seat shall be positioned to allow easy access to switches, and controls when the driver is seated in the normal driving position and restrained by a **Type 1 seat belt**.

12.2 The driver's seat shall be adequately secured.

12.3 Provision for the driver's seat adjustment is required if originally equipped. The seat adjusting device shall be securely locked into the desired driving position when the driver is seated.

12.4 An adequate seat shall be provided for each allowable passenger and it must be securely attached to the vehicle. (See Appendix for Minimum safety standards.)

WINDSHIELD WIPERS

13.1 Every windshield on a motor vehicle being driven on a highway shall be equipped with a windshield wiper in good working order for clearing rain, snow or other moisture therefrom; and the device shall be such so that its operation shall not require any manual effort on the part of the driver for its control operation other than to activate the controls of the unit. The controls shall be in easy reach of the driver when in the driver's normal seating position and restrained by a Type 1 seat belt.

13.2 Special Motor Vehicle originally equipped with two windshield wipers, must retain two wipers. Type III Special Motor Vehicle shall have two windshield wipers.

Chassis Requirements

ACCELERATOR CONTROL SYSTEM

14.1 Every special motor vehicle shall be equipped with an accelerator control system that returns the engine throttle to an idle position when the driver removes the actuating force from the accelerator control and the geometry of the throttle linkage shall be so designed that the throttle will not lock in an open position.

BRAKES

15.1 Service Brakes - every special motor vehicle shall be equipped with brakes acting on all wheels and shall be at all times in compliance with Section 41(8) of the Highway Traffic Act Manitoba, Power of Brakes.

15.2 Parking Brake - every special motor vehicle shall be equipped with parking brakes capable of effectively applying the brakes to wheels on the same axle.

BUMPERS

16.1 Every special motor vehicle of the passenger type shall be equipped with a bumper both on the front and rear of the vehicle.

16.2 The bumper width must cover the full track width of the vehicle.

16.3 The horizontal bumper of customized bumper or grill bar structure shall be at least 76mm.(3in.) in vertical height and centered on the vehicles centre line and securely fixed to the vehicle and designed to minimize damage.

16.4 The bumper shall have no sharp ends and the ends shall angle towards the body.

16.5 The bumper shall be constructed of non-splintering material.

16.6 Original Car Manufacturers designs are acceptable.

16.7 **Bumper Height Measurement Procedure** measure on a level surface the height of both front and rear bumpers to both the top and bottom of the horizontal bumper bars.

16.8 **Bumper Height Requirement** some part of the horizontal bumper must fall within 350mm.(13.7in.) and 560mm.(22in.) above the ground level surface.

16.9 Every modified vehicle that is a truck or multi-purpose passenger vehicle having a gross vehicle weight rating of 4500kg or less, the following shall apply:

(a) There shall be a front bumper of at least 100mm.(4in.) in vertical height and extending to the width of the vehicle manufacturer's track width.

(b) The bumper shall be of non-splintering material with no sharp ends.

(c) Bumpers shall be of sufficient strength and so attached to the vehicle frame so as to effectively transfer impact loads to the frame.

(d) Dropped bumpers shall be horizontal, at least 100mm.(4in.) in vertical height and continuous across its normal width or shall consist of separate sections. Separate sections shall be not less than 100mm.(4in.) wide and shall be not more than 300mm.(12in.) apart.

(e) All bumpers shall have a foremost contact point at the bottom of the bumper not to exceed a maximum height 740mm.(29in.) above a flat surface upon which the vehicle stands at curb weight, unless originally equipped.

EXHAUST SYSTEM

17.1 Every special motor vehicle shall be equipped with a complete exhaust system to limit sound. The exhaust system shall not interfere with the operational components of the vehicle.

17.2 Exhaust systems on truck type vehicles may discharge the exhaust fumes to the midpoint but must discharge fumes beyond the rear of the passenger compartment.

17.3 Exhaust systems on passenger type vehicles shall discharge at a location to the rear of the vehicle body or at a car manufacturer's side exit design and it must not exit in a vertical alignment to an operable window unless the exhaust is deflected downward.

17.4 No part of the exhaust system shall pass through any area of the vehicle that is used as a passenger carrying compartment.

17.5 Exhaust piping of a flexible type shall be that type which is approved for use in automotive systems.

FENDERS

18.1 Every special motor vehicle shall be equipped with fenders and/or adequate body coverage designed to cover the entire tread width that comes in contact with the road surface. Coverage of the tire tread circumference shall be from at least 15 degrees in front to at least 90 degrees to the rear of the vertical centre line at each wheel measured from the centre of wheel rotation. At no time shall the fender or adequate body coverage contact the tire.

FRAME

18.2 A special motor vehicle shall be equipped with a frame. If an existing frame from a recognized car manufacturer is not used and a special frame is fabricated, it shall be constructed of wall box tubing, wall channel or unitized construction capable of supporting the vehicle, it's load and the torque produced by the power source under all conditions of operation. Subframes of modular suspension assemblies manufactured by a recognized manufacturer may be attached to dissimilar existing or special frame providing that the subframe was originally designed to accommodate a similar load and that it be attached in a similar manner to which it was originally installed.

FUEL SYSTEM

19.1 Every special motor vehicle shall have all fuel system components such as tank, tubing, hoses clamps, etc., securely fastened with fasteners designed for this purpose, to the vehicle so as to not interfere with the vehicle operation, and shall be leak proof.

19.2 Fuel lines shall be positioned so as not to be in contact with high temperature surfaces or moving components.

19.3 Every fuel tank shall have air vent.

19.4 Every fuel tank shall be installed in a location to afford maximum body protection.

19.5 Every fuel tank shall be constructed of materials which will meet the safety performance requirement as outlined in the Canada Motor Vehicle Safety Standard, Part IV, Section 301.

STEERING AND SUSPENSION

20.1 A special motor vehicle shall have no parts extending below the wheel rims in their lowest position, excepting tires and electric grounding devices designed for that purpose.

20.2 The steering system shall remain unobstructed when turned from lock to lock.

20.3 The steering wheel shall have not less than two turns or more than six turns when turning the road wheels from lock to lock.

20.4 While the vehicle is in a sharp turn at a speed between 8 km.(5mph) and 24 km.(15 mph) release of the steering wheel shall result in a distinct tendency for the vehicle to increase its turning radius.

20.5 No special motor vehicle shall be constructed or loaded so that the weight on the wheels of any axle is less than 30% of the gross weight of the vehicle.

20.6 Special vehicles shall be equipped with a shock absorber at each wheel location allowing a minimum relative motion between the unsprung axle and wheel and the chassis body of plus and minus two inches. When each corner of the vehicle is depressed and released the shock absorber shall stop vertical body motion within two cycles.

20.7 The steering wheel shall have an outside diameter of not less than 330mm.(13 in.). Any enlargement of the outer perimeter to gain compliance respecting the required minimal diameter is acceptable only if the enlargement become an integral part of the steering wheel and is easily grasped.

20.8 The steering box shall be securely bolted to the vehicle frame.

20.9 The spring mounts and shackles shall be properly aligned and of sufficient strength so as to support the gross weight of the vehicle and provide free travel in an up and down movement under all condition.

20.10 A special motor vehicle shall have a suspension system that allows movement between the unsprung axles and wheels and the chassis body and shall be equipped with a shock absorber at each wheel location. The suspension system shall provide a minimum relative motion of plus and minus two inches. When any corner of the vehicle is depressed and released the shock absorber shall stop vertical body motion within two cycles.

20.11 There shall be no heating or welding of coil springs, leaf springs or torsion bars.

20.12 A special motor vehicle shall be capable of stable, controlled operation while transversing a slalom-type path passing alternately to the left and right of at least four cones or markers arranged in a straight line and spaced 18m (59ft.) apart at a minimum velocity of 40 km (25mph).

20.13 In the case of any truck or multi-purpose passenger vehicle with a gross vehicle weight of 4500 k. or less, the following shall apply:

(a) **RAISED VEHICLE:** The front tread width divided by the sum of the frame height at its highest point, and any body lift shall not be less than 1.80 for vehicles with wheelbase of 254 cm. (100 in.).

(b) **LOWERED VEHICLES:** No part of the chassis or the steering components shall extend below the rim of the wheel or come in contact with the road surface if all four tires are flat.

TIRES

Tread width is distance between center points of left tire tread and right tire tread. Measurements are taken from frame center line to center of tire in each case to establish correct frame-to-wheels relationship.

21.1 The tires on special motor vehicle shall comply with current Canadian Motor Vehicle Tire Safety Regulations, and Manitoba Highway Traffic Act and Regulations.

21.2 All tires when installed on the rear and at the recommended P.S.I. air pressure shall when the vehicle at maximum loaded weight is jacked up at the rear at one wheel, have a minimum lateral clearance each side of 2.5 cm.(1in.) from the nearest component and a minimum fore and after clearance of 3.5 cm.(1.4 in.). The same shall apply to front tires and that the tires while in full contact with ground and at maximum vehicle weight shall not make contact with any component when the wheels are turning from stop to stop.

21.3 Every special motor vehicle shall have tires that are rated to carry that vehicle weight.

21.4 Front tire to rear tire section width variances if other than car manufacturers allowance shall be not less than 60% of the section width of the rear tires.

21.5 No vehicle shall be equipped with a tire having a section width less than the vehicle manufacturer's recommended specification.

DIMMER SWITCH

22.1 The headlamp circuit shall be equipped with a driver controlled switch used to select the high or low beam.

HEADLAMP SWITCH

23.1 The headlamp switch must activate the headlamps, taillamps, licence plate lamp, parking lamps and the speedometer illumination lamp(s).

HEADLAMP SYSTEM

24.1 The headlamps shall be mounted not less than 560 mm.(22 in.) nor more than 1370 mm.(54 in.) above the road surface when measured to the headlamp centre. Lamp shall be constructed with adequate adjustment to afford proper aiming of the headlamp(s).

HIGHBEAM INDICATOR

25.1 An indicator shall be provided to show the driver when the upper beam of the headlamp system is energized. The indicator shall emit a light without glare and be plainly visible to the driver under normal driving conditions.

HORN

26.1 The horn must be capable of emitting sound audible from a distance of not less than 60 metres(197 ft.). The switch used to activate the horn shall be easily accessible to the driver when seated in the normal driving position and restrained by a Type 1 seat belt.

LICENCE PLATE LAMP

27.1 At least one white lamp shall be provided at the licence plate to illuminate the plate.

PARKING LAMPS

28.1 Two amber or white parking lamps in compliance with SAE Standard J222 may be mounted on the front of the vehicle, one on each side and equidistant from the vertical centre line of the vehicle, at the same height, and as far apart as practicable. The parking lamps shall be mounted not less than 380 mm.(15 in.) nor more than 1830 mm.(72 in.) above the roadway.

STOPLAMPS*

29.1 Two red stop lamps in compliance with SAE Standard J586B shall be mounted on the rear, one on each side equidistant from the vertical centerline of the vehicle, at the same height, and as far apart as practicable Type I vehicles, which were originally equipped with only one stop lamp need not be equipped with two stop lamps providing the original lamp is located in accordance with the original design configuration. The stop lamps shall be mounted no less than 380 mm.(15 in.) nor more than 1830 mm.(72 in.) above the roadway.

TAIL LAMP SYSTEM*

30.1 Two red stop lamps in compliance with SAE Standard J586B shall be mounted on the rear, one on each side equidistant from the vertical centerline of the vehicle, at the same height, and as far apart as practicable. The stop lamps shall be mounted no less than 380 mm.(15 in.) nor more than 1830 mm.(72 in.) above the roadway. Type I vehicles, which were originally equipped with only one tail lamp need not be equipped with two tail lamps providing the original lamp is located in accordance with the original design configuration.

TURN SIGNAL INDICATOR

31.1 If the operation of the signal lights are not visible to the driver there shall be an illuminating indicator to indicate to the driver that the signal lights are operating. The indicator may be of a one lamp or a two lamp design. If of the two lamp design, only the lamp which indicates the signal being made shall flash in unison with the signal.

TURN SIGNAL LAMPS

32.1 Two Class A turn signal lamps in compliance with approved standards shall be mounted as follows:
At the front of the vehicle, one white or amber lamp on each side equidistant from the vertical centerline of the vehicle, at the same height, and as far apart as practicable. At the rear of the vehicle, one red or amber lamp on each side equidistant from the vertical centerline of the vehicle, at the same height, and as far apart as practicable. All turn signal lamps shall be mounted no less than 380 mm.(15 in.) nor more than 1830 mm.(72 in.) above the roadway

TURN SIGNAL SWITCH

33.1 Every special vehicle shall be equipped with a turn signal switch controlled by the operator of the vehicle that shall cause the turn signal lamps to function. All originally manufactured vehicles from 1971 on shall have a self canceling turn signal switch.

POSITION OF THE CONTROLS

34.1 Every switch and control in a special motor vehicle necessary for the safe operation of that motor vehicle, shall be easily accessible to the driver when seated in the normal driving position and restrained by a Type I seat belt.

34.2 **NEUTRAL SAFETY SWITCH** - A special motor vehicle if equipped with an automatic transmission shall be equipped with a neutral safety switch that prevents the starter motor from being actuated except when the gear selector is in the neutral or parked position.

ENGINE REPLACEMENT

Vehicles which have had original engines replaced with engines of greater horsepower or of significant difference respecting physical size and shape shall have the following:

35.1 Power ratio compatibility with the remainder of the drive train (transmission, U-joints, drive shaft, differential, axles).

35.2 Must have adequate engine mounting to frame.

35.3 Must have sufficient space to accept normal engine torque movement without contacting frame or other adjacent components or body structure.

35.4 No part of the motor shall interfere with any steering component.

35.5 No frame shall be cut or notched without being boxed, fish plated, or otherwise modified so as to retain it's original strength.

35.6 No part of the engine shall be at a height which intrudes the forward viewing area of the driver.