

# NATIONAL MOBILITY EQUIPMENT DEALERS ASSOCIATION

## GUIDELINES



NATIONAL MOBILITY  
EQUIPMENT DEALERS  
ASSOCIATION

QAP-103

**2023 EDITION**

[Effective January 01, 2023]

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## NMEDA Guidelines

Section:	i
Description:	Terms and Conditions
Revised Date:	September 28, 2004

### TERMS AND CONDITIONS

National Mobility Equipment Dealers Association (NMEDA) will license to you the contents of this publication only if you read carefully the entire publication and accept the terms and conditions contained in this non-exclusive, non-transferable, limited license agreement. By opening this publication, you thereby accept and agree to be bound by the following terms and conditions:

- This publication shall be for the use of the NMEDA members, and may be used only pursuant to the terms of this license.
- This publication and the contents hereof are proprietary products of NMEDA.
- The contents of this publication may not, in whole or in part, be reproduced, copied, disseminated entered into a computer database or otherwise utilized, in any form or manner or by any means, except for the member's individual, personal and confidential reference with prior written consent of NMEDA.

## NMEDA Guidelines

Section:	ii
Description:	Warning and Disclaimers
Revised Date:	September 28, 2004

### WARNING AND DISCLAIMERS

National Mobility Equipment Dealers Association expressly disclaims any liability for damages of any kind arising out of the use of this publication and with respect to damages of any kind arising out of the use of this publication and with respect to any errors that may inadvertently be contained in this publication.

These Guidelines do not provide “how to” instruction for vehicle modifications or equipment installations. Rather the Guidelines set forth general information that should be used as one among numerous sources by the Mobility Industry dealer. Use of these Guidelines requires an appropriate level of knowledge in the field of automotive installations and modifications, knowledge of current and recognized industry guidelines, as well as knowledge of applicable regulations and best practices. Proper work cannot be performed by relying on these Guidelines alone.

These Guidelines are not a modification or installation training manual; proper training by product manufacturers is a prerequisite to use of these Guidelines, and these Guidelines should not be used in lieu of proper training.

These Guidelines do not provide safety training information as regard to specific tasks, work area, or tools used in performing any stated operation. The user of these Guidelines is solely responsible for ensuring that all safety issues are adequately addressed so as to avoid injuries and material damages.

**WARNING:** Failure to specifically and carefully follow manufacturers’ instructions and industry best practices or failure to have proper training can result in an accident, personal injury or death.

As part of the consideration for the use of these Guidelines, the NMEDA member agrees to defend, indemnify, and hold National Mobility Equipment Dealers Association (NMEDA), its agents, employees, officers, directors and contractors (indemnities) harmless, to the fullest extent permitted by law, from and against any claim, suit, action, or proceeding asserted by any person or entity, including attorneys’ fees, arising out of member’s use of these Guidelines or its contents.

## NMEDA Guidelines

Section:	iii
Description:	Guidelines Preamble
Revised Date:	January 18, 2012

### GUIDELINES PREAMBLE

#### BACKGROUND

The National Mobility Equipment Dealer's Association (NMEDA) was formed by mobility dealers to promote and support members who are engaged in providing vehicle modifications for people with disabilities. NMEDA, in supporting their membership, established these Guidelines to direct the mobility equipment industry toward consistency, quality and compliance. In keeping with NMEDA's Bylaws and Mission, to ensure that vehicle adaptive equipment installed is always of high quality and that ethical business practices are followed, an industry Quality Assurance Program (QAP) was created. The NMEDA Guidelines are an integral part of this accreditation program, providing the best-known installation practices for the mobility equipment dealer.

#### PURPOSE

The National Mobility Equipment Dealers Association's Guidelines are intended to guide and assist mobility equipment dealers in the completion of vehicle modifications for people with disabilities. The Guidelines are established to ensure that adaptive vehicle equipment is installed, and vehicle modifications are completed according to the highest level of industry standards and business practices. A mobility equipment dealer and installer shall use the Guidelines in conjunction with the equipment manufacturer installation instructions, Society of Automotive Engineers (SAE) recommended practices, the National Highway Traffic Safety Administration (NHTSA) safety standards and/or Transport Canada safety standards and practices and/or other applicable documents.

#### SCOPE

Consumers, installers, allied professionals, manufacturers, employers, researchers, policy makers and the public are urged to expect that vehicle modifications be completed in accordance with NMEDA Guidelines, manufacturer installation instructions, SAE recommended practices and applicable NHTSA/Transport Canada safety standards and practices. Application of these Guidelines requires judgment and an awareness of other applicable guidelines or regulations. The NMEDA Guidelines may conflict with other laws, funding source guidelines or equipment manufacturer installation procedures. To ensure the best outcome for the consumer, in any situation, the more stringent requirement shall guide the modification process.

The NMEDA Guidelines are intended for use by the mobility equipment industry. NMEDA Guidelines do not supersede Federal, State or Provincial laws and guidelines or mobility equipment manufacturers' installation procedures; the more stringent will prevail.

#### Important Note

This document has been developed based upon the most current information available at the time of this publication. Information may change based on the latest vehicle models and mobility equipment available. Please see the NMEDA website at [www.nmeda.org](http://www.nmeda.org) for the most current updates. Address any questions to the NMEDA office at 1-800- 833-0427.

## NMEDA Guidelines

Section:	1
Description:	NHTSA and Exemptions to the Make Inoperative Prohibition
Revised Date:	July 27, 2022

# 1 NHTSA AND EXEMPTIONS TO THE MAKE INOPERATIVE PROHIBITION

## PURPOSE

To present to NMEDA members information they may use to prepare the documentation needed to demonstrate compliance with U.S. government regulations when modifying vehicles for people with disabilities. This includes appropriate use of the exemptions to the Make Inoperative Prohibition, reference 49 CFR 595.7.

NHTSA prohibits companies from rendering inoperative vehicle features that affect the compliance of the vehicle to motor vehicle safety standards. Due to the nature of our business, the make inoperative prohibition has been amended to allow modifications of some vehicle components/systems covered by Federal Motor Vehicle Safety Standard (FMVSS). The exemptions are very specific and are not to be considered all-encompassing and they usually apply only to certain portions of the respective FMVSS. Penalties for failing to adhere to exemption are severe, up to and including civil liabilities.

**Most modifications will require that a Make Inoperative Disclosure form be filled out and a label is affixed to the vehicle. There will be very few instances when a form is not required. REQUIREMENTS**

- 1.1 Any motor vehicle repair business governed by U.S. law, that modifies motor vehicles to enable people with disabilities to operate, or ride in as a passenger and that intends to consider itself for the make inoperative exemption provided in 49 CFR 595.7 must provide the following information to:  
  
National Highway Traffic Safety Administration 1200 New Jersey Ave., SE Washington, D.C. 20590 (note that all submissions can be done on the NHTSA website: (<https://vpic.nhtsa.dot.gov/mfrportal/>)
  - Full individual, partnership, or corporate name of the motor vehicle repair business (modifier).
  - Residence address of the motor vehicle repair business and State of incorporation, if applicable.
  - A statement that the motor vehicle repair business modifies a motor vehicle to enable a person with a disability to operate, or ride as a passenger in, the motor vehicle and intends to take advantage of the exemption provided in 49 CFR 595.7.
- 1.2 Each motor vehicle repair business is required to submit the information under requirement (1.1) above shall submit the information not later than 30 days after it first modifies a motor vehicle to enable a person with a disability to operate, or ride as a passenger in, the motor vehicle. Each motor vehicle repair business who has submitted the required information shall keep its entry current, accurate and complete, by submitting revised information no later than 30 days after the relevant changes in the business occur.
- 1.3 In all cases where a company has modified a federal safety system, that could make the system inoperative, the Make Inoperative Disclosure form shall be filled out and one copy shall be given to the customer, and one retained in the vehicle file for 7 years, as stipulated by federal regulations.
- 1.4 All vehicles for which the make inoperative exemption is used as a basis for compliance shall have a permanent label (see Appendix D) affixed to the driver's doorjamb that states: **"This vehicle has been modified in accordance with 49 CFR 595.6 and may no longer comply with all Federal Motor Vehicle Safety Standards in effect at the time of its manufacture."** The label shall also include the Modifiers name and street address.
- 1.5 If the net result of the modifier or adaptive equipment company removing and installing equipment adds more than 220 lbs. (100 kg) to a vehicle, they shall notify the customer of the reduction in load carrying capacity of the vehicle after modifications are finalized. This notice shall also include whether or not the weight of the wheelchair is or is not included in calculating the new load carrying capacity.

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- 1.6 If there is any uncertainty about whether a modification makes a federal safety standard inoperative, the modifier shall proceed with completion of the Make Inoperative Disclosure form and weight calculations.
- 1.7 **REFERENCE:** The Federal Motor Vehicle Safety Standards (FMVSS) and the specific exemptions NHTSA has permitted are detailed herein. Additionally, examples of those specific modifications or product installations that affect the specific safety standard may be provided.

**FMVSS 101 – CONTROLS AND DISPLAYS** – This exemption permits controls to be operated by other means than the hand and/or foot. Products affecting this standard are any secondary control(s) no longer operated by the hand or foot. Ex: Power Headrests, Elbow Pads, Voice Activated Products. Controls that are added / relocated must, if possible and relevant, be identified as per FMVSS 101 and, if a new symbol is identified, it must be the color required and illuminated if required.

**FMVSS 108 – LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT** - If it is not feasible to retain a vehicle's turn signal self-cancelling device, it may be rendered inoperative by this exemption from S9.1.1 of 49 CFR 571.108 if the vehicle's turn signal control must be modified or if the vehicle is modified so as to be driven without a steering wheel.

**FMVSS 111 – REAR VISIBILITY** - This part exempts the modifier from S5.5.1, S5.5.2, S6.2.1, and S6.2.2 of standard 111 in any case in which a personal mobility device transporter is temporarily installed on a vehicle by way of a trailer hitch to carry a personal mobility device (e.g., a wheelchair, powered wheelchair, or powered scooter) used by a driver or a passenger with a disability.

**FMVSS 114 – KEY LOCKING SYSTEM** – This part exempts a modifier from S5.1.2 and S5.1.3 of 49 CFR 571.114, in any case where the original key locking system must be modified. This Standard was originally designed to prevent accidents due to theft and vehicle movement. Therefore, when modification to the ignition allows vehicle operation without physically inserting a key, it is strongly suggested to maintain the transmission interlock whenever feasible. Under this exemption, modifications to the vehicle's key locking system do not require that the number of different combinations of the key locking system meet the requirements of the standard. The requirement that a warning device be activated when the key is left in the locking device and the driver's door is opened is also exempted.

**FMVSS 118 – POWER OPERATED WINDOWS** – In this part, any modifications to a vehicle where the power windows could be operated without a key in the ignition is exempt from S4 (a) of 49 CFR 571.118, in any case in which the medical condition of the person for whom the vehicle is modified necessitates the installation of a remote ignition switch to start the vehicle. A key is not required in the ON, Start or Accessory position for the power windows or roof panels to operate. The modifier shall, however, ensure that the vehicle electrical system is in the ON or Accessory position for the windows to operate.

**FMVSS 123 – MOTORCYCLE CONTROLS AND DISPLAYS** – In this part, any modifications to the primary or secondary controls of a motorcycle as well as the required supplemental engine stop control is exempt from S5.1 and S5.2.1 of 49 CFR 571.123, in any case in which the modification necessitates the relocation of original equipment manufacturers controls. For further details, the vehicle is exempt from the following requirements: S5.1. Each motorcycle shall be equipped with a supplemental engine stop control, located and operable as specified in Table 1. S5.2 Each motorcycle to which this standard applies shall meet the following requirements: S5.2.1 Control location and operation. If any item of equipment listed in Table 1, Column 1, is provided, the control for such item shall be located as specified in Column 2, and operable as specified in Column 3. Each control located on a right handlebar shall be operable by the operator's right hand throughout its full range without removal of the operator's right hand from the throttle. Each control located on a left handlebar shall be operable by the operator's left hand throughout its full range without removal of the operator's left hand from the handgrip. If a motorcycle with an automatic clutch is equipped utilizing a single control for front and rear brakes, the control shall be located and operable in the same manner as a rear brake control. With a supplemental rear brake control, the control shall be located on the left handlebar. If a motorcycle is equipped with self-proportioning or antilock braking devices.



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**FMVSS 135 – PASSENGER CAR BRAKE SYSTEMS** – The vehicle is exempt from the requirement of S5.3.1 of 49 CFR 571.135 if the modification requires the removal of the original foot control. Also, the control of the parking brake is not required to be independent of the service brake control. The modifier may remove the brake pedal only if the situation requires it and all other options have been exhausted. For further details, S5.3.1. states that the service brakes shall be activated by means of a foot control. The control of the parking brake shall be independent of the service brake control, and may be either a hand or foot control.

**FMVSS 201 – OCCUPANT PROTECTION IN INTERIOR IMPACT** – In this part the vehicle pillars on either side of a vertically stowed lift or ramp, as well as the side rail between these pillars are exempt from 49 CFR 571.201 in the case of a vehicle that does not have a lowered floor or raised roof. If the vehicle has a lowered floor or raised roof, all FMVSS 201U targets are exempt. All hand grips and vertical stanchion bars are exempt in all vehicles. Whenever possible energy absorbing materials should still be used to minimize the potential for injury. With respect to: (i) targets located on the right-side rail, the right B-pillar and the first right side “other” pillar adjacent to the stowed platform of a lift or ramp that stows vertically, inside the vehicle, (ii) targets located on the left side rail, the left B-pillar and the first left side “other” pillar adjacent to the stowed platform of a lift or ramp that stows vertically, inside the vehicle, (iii) targets located on the rear header and the rearmost pillars adjacent to the stowed platform of a lift or ramp that stows vertically, inside the vehicle, (iv) targets located on any hand grip or vertical stanchion bar, (v) all of S6 of 571.201 in any case in which the disability necessitates raising the roof or door, or lowering the floor of the vehicle, are exempt.

**FMVSS 202, 202(a) – HEAD RESTRAINTS** – This part permits vehicles to be modified to allow wheelchair bound occupants to ride in or operate a vehicle without having headrests. This part also exempts the front driver’s headrest from the height and width requirements, and it exempts the front passenger headrest from the height requirements. The provision further allows the modifier to install alternative headrests or alter original headrests to accommodate the disabled user in the front passenger seat.

**FMVSS 203 – IMPACT PROTECTION FOR THE DRIVER FROM THE STEERING CONTROL SYSTEM** – This exemption from S5.1 of 49 CFR 571.203 permits driving aids to be attached to the steering wheel despite the fact that there may be a problem with entanglement of loose clothing. The exemption includes any driving or steering aids, any modifications to the steering column, column extension, air bag removal, etc. The exemption also applies to the steering wheel impact requirements allowing the replacement or relocation of a steering wheel in any case in which the modification necessitates a structural change to, or removal of, the original equipment manufacturer steering shaft. Except as provided in the exemption the steering control system of any vehicle to which this standard applies shall be impacted in accordance with S5.1 (a).

**FMVSS 204 – STEERING CONTROL REARWARD DISPLACEMENT**- This exemption from 49 CFR 571.204 steering wheel displacement loads is for a vehicle steering shaft that is modified for steering wheel extensions or specialized steering systems or in any case where the modification necessitates a structural change to, or removal of, the original equipment manufacturer steering shaft.

**FMVSS 208 – OCCUPANT CRASH PROTECTION**- This exemption permits modifiers to remove and/or deactivate all airbags for the front row designated seating position modifications, provided Type 2 or Type 2A seat belts meeting the requirements of 49 CFR 571.209 and 571.210 are installed at that position. Modifications include any hand controls and any position for people riding in a wheelchair.

**FMVSS 207 and 214 – HEAD RESTRAINTS, SEATING SYSTEMS, AND SIDE-IMPACT PROTECTION** – These exemptions are for wheelchairs and wheelchair securement systems (tie downs), allowing the removal of the driver’s seat. Vehicles designed for individuals who drive from their wheelchair do not require a driver’s seat or a headrest (see exemption for 202) and vehicles modified for those who ride in a wheelchair do not require a headrest. These standards address certified seating and side impact protection. It is imperative that the modifier make every effort to create a safe environment for the securement of the wheelchair and the customer.

**FMVSS 216 – ROOF CRUSH RESISTANCE** - This part exempts the vehicle in any case in which: (i) The disability necessitates raising the roof; and, (ii) The vehicle, after modification, meets 49 CFR 571.220.

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**FMVSS 225 – CHILD RESTRAINT ANCHORAGE SYSTEMS** – This exemption allows the removal of a child restraint system if necessary, to accommodate a person with a disability, as long as there is at least one compliant tether anchor in a rear row seating position of the vehicle. If there are no rear row seats the child restraint anchorage system must be installed in the front row passenger seat. Note: If there are airbags in the front row passenger side that are not automatically deactivated by the vehicle, the air bag should be deactivated if possible.

**FMVSS 226 – EJECTION MITIGATION** - This exemption from S4.2 and S5 of 49 CFR 571.226, Ejection mitigation, is for the side of the vehicle where a seat on that side of the vehicle must be changed to accommodate a person with a disability.

### 1.8 Other Points to Consider:

- **Air Bags and Supplemental Restraint Systems:** In any instance where a retrofit air bag ON-OFF switch is available and the individual with a disability can operate the switch, the company shall install this system instead of simply disconnecting the airbag. In all instances, a compliant lap AND shoulder belt shall be provided. If no switch is available, a permanent disconnect of the airbag is permissible for clients who have a recognized disability.
- People of short stature having no other disability shall continue to submit written requests to NHTSA under the same format as previously required.
- **Safety standards not exempt:** Some safety standards could be affected by mobility products or modifications when NO Exemptions have been given. If a vehicle modification affects one of the following standards, proper documentation for demonstrating compliance shall be completed.
- **FMVSS/CMVSS 102 – TRANSMISSION LEVER SEQUENCE, STARTER INTERLOCK, TRANSMISSION BRAKING EFFECT** – No exemption given. The operation of the transmission into Park, Reverse, Drive, shall remain in the OEM sequence.
- **FMVSS/CMVSS 103 & 104 – WINDSHIELD DEFROSTING AND DEFOGGING, WINDSHIELD WIPING AND WASHING** – No exemption given. Vehicle modifications shall not prevent the driver from operating the necessary controls for function of the front and rear windshield defrosting or operation of windshield wipers.
- **FMVSS/CMVSS 105 – HYDRAULIC BRAKE SYSTEMS** – No exemption given.
- **FMVSS/CMVSS 113 – HOOD LATCH SYSTEM** – No exemption given.
- **FMVSS/CMVSS 124 – ACCELERATOR CONTROL SYSTEMS** — No exemption given. Requires that throttle returns to idle position under stipulated conditions when all force is withdrawn. All electronic (Drive by Wire) throttle control products shall have a monitoring system to prevent unwanted acceleration in the event of an electronic malfunction or in the event of a severance or disconnection in the accelerator control system. This includes all servo gas and brake products.
- **FMVSS/CMVSS 206 – DOOR LOCKS AND DOOR RETENTION COMPONENTS** – No exemption given. Modifications are required to maintain all OEM latching mechanisms or other compliant mechanisms. This standard includes power doors and rear folding ramp systems.
- **FMVSS/CMVSS 209 – SEAT BELT ASSEMBLIES** – No exemption given. All seatbelt assemblies shall be tested, certified and labeled to this standard. Sewing belts together at the dealer level is not allowed.
- **FMVSS/CMVSS 210 – SEAT BELT ANCHORAGES** – No exemption given. Modified seat belt anchorages shall be installed and tested according to the standard and installed according to the manufacturer of the component.

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- **FMVSS/CMVSS 301 – FUEL SYSTEM INTEGRITY** – No exemption given. All modified vehicles shall be tested and certified by the alterer to meet this standard. Only lowered floor/fuel systems that have been tested and certified can be used as kits by the alterer. Documentation shall be on file.
- **FMVSS/CMVSS 302 – FLAMMABILITY OF INTERIOR MATERIALS** – No exemption given. All materials used in completing a vehicle modification including carpet, wall material, and headliner material shall meet this standard. Information shall be on file showing certification.

**These are only examples; there are other standards that could be affected.**

## NMEDA Guidelines

Section:	2
Description:	Client/Vehicle Assessment Documentation
Revised Date:	November 3, 2021

## 2 CLIENT/VEHICLE ASSESSEMENT DOCUMENTATION

### Purpose

To outline the client/vehicle assessment process and define the documentation that is required to be collected prior to the installation of automotive adaptive equipment or vehicle modifications for drivers and occupants with disabilities.

### Scope

The NMEDA Guidelines are intended for use by the mobility equipment industry. NMEDA Guidelines do not supersede Federal, State or Provincial laws and guidelines or mobility equipment manufacturers' installation procedures. In cases where there are conflicting guidelines or procedures, the more stringent will prevail.

### Requirements

General:

- 2.1 The client shall be seen in person by the installing dealer for a client/vehicle assessment.
  - 2.2 The client/vehicle assessment should consider the following (as applicable):
    - How the vehicle will be used and who will routinely be traveling in the vehicle
    - The combined weight of all portable mobility equipment or other objects that will routinely be loaded into or placed on the vehicle (this is the anticipated cargo weight)
    - The size of the client and overall combined weight of all occupants that will routinely be traveling in the vehicle (this is the anticipated occupant weight)
    - The placement/location of each occupant and any portable cargo
    - Make/model and dimensions/weight of any wheelchair(s)/scooter(s) that will routinely be transported,
    - Seated heights of any wheelchair/scooter user(s) routinely traveling in the vehicle
  - 2.3 Using all the information gathered during the assessment, the dealer shall make determinations on the adequacy of the equipment to be installed and whether or not it is appropriate for the vehicle and the client. The determinations should also include:
    - if the modification will allow the client (and his/her family) safe entry/egress from the vehicle
    - if the combined post-modification curb weight and the anticipated payload weight (the anticipated cargo weight plus the anticipated occupant weight) would cause any of the GVWR, GAWR (front or rear), or the TWR ratings to routinely be exceeded.
- If the proposed modifications are not appropriate for the client, or will not allow safe client access, or will routinely overload the vehicle or exceed any of the weight ratings, the vehicle should not be modified.
- 2.4 If the modifications are being made to a client supplied vehicle. The client's vehicle shall be inspected by a mobility equipment dealer or professional evaluator prior to the installation of any adaptive equipment or vehicle modifications. The inspection and approval for the modifications to be made should be conducted with the knowledge of the type and level of modifications being considered for the client. Equipment shall not be installed by anyone other than a qualified mobility equipment dealer.

## NMEDA Guidelines

Section:	2
Description:	Client/Vehicle Assessment Documentation
Revised Date:	November 3, 2021

- 2.5 If the adaptive equipment being installed requires adjustments to custom fit to the client, the client shall be present for a final fitting to ensure that the equipment is properly installed and operable by the client. This is often done, and sometimes required to be done by, or in the presence of the driver rehabilitation specialist (DRS).
- 2.6 In addition, for clients using primary driving equipment, there are two documents that are required to be retained and kept on file:
- 2.6.1 A driver's license - the dealer shall ensure that the client has a current and valid driver license.
- 2.6.2 And one of the following:
- An assessment report from a qualified driver rehabilitation specialist that includes specifications for equipment, modifications, and training; or,
  - A statement of current experience in operating the equipment to be installed. NMEDA standard form QAP-F04 "Statement of Customer Experience" can be used for this requirement.

NOTE: Driver license systems and restrictions codes vary widely from jurisdiction to jurisdiction. The mobility equipment dealer shall obtain and become familiar with the driver license requirements and restriction for their clients.

- 2.7 If a client is considering changing or replacing their primary driving equipment with a type that has different functional characteristics (i.e. changing from a push/right-angle hand control to a push/twist control), an updated assessment report shall be obtained from a qualified driver rehabilitation specialist.

**NOTE: Certified driver rehabilitation specialists (CDRS) are NMEDA's strongly recommended first choice to meet the above minimum requirements. NMEDA recommends behind the wheel driver instruction and training. NMEDA requires that the client be given operational orientation of the installed equipment. NMEDA recommends behind the wheel instruction if the client is new to adaptive driving controls or their skills or equipment have changed.**

**For more information about a CDRS, visit ADED, the Association for Driver Rehabilitation Specialists at [www.aded.net](http://www.aded.net).**

## NMEDA Guidelines

Section:	3
Description:	General Best Practices
Revised Date:	July 28, 2021

### 3 GENERAL BEST PRACTICES

#### PURPOSE

To outline the General “Best Practices” that applies throughout NMEDA Guidelines.

#### REQUIREMENTS

- 3.1 All mobility equipment shall be installed according to the manufacturer’s requirements and instructions. All equipment shall be installed by, or the installation supervised in person by, a qualified individual trained on that specific equipment. When supervised, the supervisor’s name shall be included on the acceptance document along with the installing technician’s name, and the supervisor assumes responsibility for the work performed. A current certification (or letter of authorization) from the equipment manufacturer shall be on file in the name of the installing technician and/or supervisor (or in the name of the dealer for an authorization letter).
- 3.2 Manufacturer training certificates (or letters of authorization) that bear no expiration date do not expire unless notification of expiration is received by the dealer in writing from the issuing manufacturer.
- 3.3 Manufacturer’s instruction and/or installation manuals shall be readily available for use by dealer service and installation technicians.
- 3.4 No fasteners or other dealer-installed components shall damage, unless allowed by the Make Inoperative exemptions as described in Section 1.7 or otherwise reduce the performance of the original equipment. This includes but is not limited to fuel, brake, and electrical performance.
- 3.5 All Wiring:
  - Shall be color-coded.
  - Shall be protected with the appropriately rated protective device (circuit breaker / fuse).
  - Shall be properly routed away from heat, moving parts and sharp edges.
  - Circuits shall be shown on wire routing diagrams and schematics, which describe wiring circuit breakers, fuse sizes, other electrical devices and locations.
  - Diagrams shall be maintained in the dealer’s customer permanent file.
  - Shall be properly loomed.
  - Shall be approved for automotive use.
- 3.6 All Switches:
  - Shall be labeled for function, direction and be illuminated as required by FMVSS 101.
  - Shall be spaced to prevent inadvertent operation.
  - Shall be weather resistant.
  - Shall meet or exceed current automotive standards.
- 3.7 Wire Connections:

## NMEDA Guidelines

Section:	3
Description:	General Best Practices
Revised Date:	July 28, 2021

- Shall meet or exceed OEM specification or applicable SAE standards for electrical requirements, and best practice recommendations. Refer to Section 6, General Electrical Specifications.
- 3.8 For electrical requirements and Best Practice electrical recommendations refer to Section 6, General Electrical Specifications.
- 3.9 Plasma cutter and welding equipment shall only be used after disconnecting the vehicle battery; properly grounding the vehicle and following any prescribed OEM procedures.
- 3.10 All openings created during the conversion process shall be properly sealed using an OEM approved sealant or appropriate grade sealant.
- 3.11 All exposed components and vehicle modifications shall be free of burrs and sharp edges.
- 3.12 Threaded-plumbing fittings that require a sealant shall be sealed per the equipment manufacturer's specifications.
- 3.13 The customer shall always be provided with owner's manual(s) that provide service information, maintenance requirements, and operating instructions for equipment installed by the mobility equipment dealer, for every device not included in the OEM vehicle's operators manual. Any potential consequences to OEM warranty shall be discussed and documented with the consumer.
- 3.14 Certified welders shall perform all welding. These welders are to be licensed, certified or otherwise accredited for the type of weld being performed; by their state, and/or in possession of their applicable American Welding Society certification qualifications or comply with NMEDA Canada welding requirements. The certified welder need not be a direct employee of the dealer but documentation needs to be maintained.
- 3.15 Only the crimping tool specified by the terminal or connector manufacturer shall be used.
- 3.16 The vehicle's Gross Vehicle Weight Rating (GVWR) shall not be exceeded. The vehicle load carrying capacity must be adequate for its intended use. Refer to definition of Vehicle Weight Rating in Appendix C.
- Failure to abide by OEM maximum GAWR and/or GVWR may lead to premature failure of vehicle systems or individual components.
  - An overweight vehicle's stability and driving characteristics may be adversely affected. An overweight vehicle's OEM warranty may also be voided.
  - If a modification adds the lesser of 100 lbs. or 1.5% of the vehicles GVWR in additional weight, a "Warning: Reduction in Load Carrying Capacity" label stating the amount that the load carrying capacity was reduced shall be affixed to the vehicle within 1" of the existing Tire Placard (label). The purpose of this is to record the cumulative effects of adding numerous pieces of equipment to a vehicle.
- 3.17 Neither the vehicle's front nor rear Gross Axle Weight Ratings (GAWR) shall be exceeded.
- 3.18 All mobility dealer installed lap belts will cross the occupant at the "H-Point".
- 3.19 When a mobility equipment manufacturer does not supply a designated ground wire but relies on using mounting bolts for a ground source, the installer shall be sure that proper care has been taken to remove any undercoating, paint, padding or carpet that could limit the conductive ground (negative) path. Installing an independent ground strap from unit's motor to closest vehicle body panel will ensure continuous ground source. Note: Be sure the movement or motion of mobility equipment does not interfere with either power or ground cables. An added ground strap, installed from the negative terminal of the battery to the body of the vehicle or from the starter to the chassis of the vehicle will be installed when any type of electrically powered mobility equipment is installed. The gauge of the ground cable shall be the same or larger than the power cable supplied by the mobility equipment manufacturer. The cable will be a multi-strand copper automotive type product. Please consult OEM procedures. Refer to Section 6 for details on an additional ground strap.

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3.20 NMEDA QAP dealers shall have all the equipment and tools necessary to comply with the manufacturer's installation instructions. The equipment type/model used shall be capable (appropriate range, precision, and unit of measure) for the readings and/or specification given in the instructions or standard. As a minimum, the dealer shall have the following equipment at each location:

- Calibrated Four-Corner scales
- Multi-meter<sup>1</sup> (used for continuity and electrical measurements, ohms and volts)
- Floor jack and jack stands, or vehicle hoist
- Crimping tools of appropriate type for connectors used in the shop
- Air compressor and air tools or appropriate corded/cordless tools
- Calibrated Torque wrench(s)

<sup>1</sup> – if the multi-meter is used for any quantitative acceptance data, it must be calibrated\*\*

### 3.21 Labeling Requirements:

Manufacturers (includes final stage manufacturers) – must label their vehicle production in accordance with applicable regulations, including the Code of Federal Regulations (CFR), Motor Vehicle Safety Act (Canada), Federal Motor Vehicle Safety Standards (FMVSS) and Canada Motor Vehicle Safety Standards (CMVSS), in the required locations on the vehicle. For example, Certification label, Tire label/Vehicle placard, airbag labels, emissions labels, and various other labels as applicable.

Alterers – must label their vehicle production in accordance with applicable regulations including the Code of Federal Regulations (CFR), Motor Vehicle Safety Act (Canada), Federal Motor Vehicle Safety Standards (FMVSS) and Canada Motor Vehicle Safety Standards (CMVSS), in the required locations on the vehicle. For example, Alterer label and Tire label/Vehicle placard, and reduction in load carrying capacity label as applicable.

Modifiers (dealers) – must label their modified vehicles in accordance with 49 CFR Part 595.7 and the NMEDA Guidelines. For example, the QAP label, Make Inoperative label, and the reduction in load carrying capacity label.

### 3.22 Shipping Loose Equipment

NMEDA dealers are required to install all adaptive equipment that they sell or must meet the following requirements if they are shipping uninstalled (loose shipped) adaptive equipment for a consumer.

- The customer must be made aware that some adaptive equipment is being shipped loose and that someone other than the selling dealer will be installing the adaptive equipment
- The selling dealer must make arrangements with another properly accredited NMEDA dealer to install the loose shipped equipment. Such arrangements must be on file.
- The selling dealer must verify that the requirements of 3.1 and 3.2 are being met.
- The installing technician has the proper current certification from the manufacturer of the loose shipped equipment.
- Documentation must be maintained in the customer file indicating who installed the loose shipped equipment.
- Loose shipped equipment must be shipped directly to the installing dealer.

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<sup>1</sup> If the multi-meter is used for any quantitative acceptance data, it must be calibrated.



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- The vehicle must be labeled when the equipment is installed.

### 3.23 Installing Used Equipment

There is no prohibition to install used equipment. However, extreme caution should be exercised. The installer should be able to verify the product history for that equipment and be certain the equipment was properly maintained and is not damaged in any way. When the product history cannot be verified or when there is any uncertainty in the quality or functional status of the equipment, the equipment should be declared suitable for reinstallation by the equipment manufacturer prior to installation. In all cases, the equipment shall be verified by a certified technician to meet original functionality. Used equipment must be in good working order and free of any defects. Used equipment shall not be used if prohibited by the manufacturer, third-party payer, or DRS prescription. Many manufacturers prohibit equipment from being reused if it has been in an accident or under certain other conditions. Always consult with the equipment manufacturer prior to installing used equipment if there is any question about warranty or reuse. The customer shall be made aware and approve all cases where used equipment is installed. A used equipment inspection is required for all used equipment installations. The installer should consult with the equipment manufacturer to help determine appropriate inspection steps if the inspections will be performed by the installer. Objective evidence that a used equipment inspection was completed is required. Anytime used equipment is installed it shall be noted on the work order and label reporting form.

Installing used equipment that was manufactured prior to a new or amended safety standard effective date, into a newer vehicle, could make inoperative a federal standard, especially where the modifier is not aware of changes to a federal standard since the used equipment was manufactured. The equipment shall be in compliance with the F/CMVSS standards in effect at the time of manufacture.

#### **Example:**

A used lift that was manufactured before the FMVSS 403/404 amendment was enacted in 2005 can be installed in a newer vehicle without making inoperative a federal standard. However, a used lift that was manufactured after 2005 must be in compliance with FMVSS 403/404.

## NMEDA Guidelines

Section:	4
Description:	Service Practices
Revised Date:	February 23, 2022

### 4 SERVICE PRACTICES

#### PURPOSE

To outline the expected minimum service practices of all NMEDA dealers selling or servicing modified vehicles or adaptive equipment to / for customers or end-users. These service practices apply to all NMEDA dealers selling or servicing modified vehicles or adaptive equipment to / for customers or end-users.

#### REQUIREMENTS

##### 4.1 Service Responsiveness:

It is a required practice for all NMEDA dealers to provide customers with 24 hour, seven-day-a-week service response. NMEDA dealers are expected to have a system in place which allows customers easy access to an after-hours answering service, or service telephone number, or service beeper number. Subsequently, NMEDA dealers are expected to respond to a service call promptly, and provide emergency assistance as warranted. It is highly recommended for the dealer to outline their response system in writing, maintained with the dealers other standard operating procedures.

**The after-hours service person responding is expected to:**

1. Respond within 30 minutes to a service call.
2. Verify that the situation is not life threatening.
3. Confirm whether or not the problem is related to the conversion.
4. Attempt to talk the customer through a corrective action/emergency backup procedure.
5. Confirm that the customer has completed the necessary corrective action and can safely get to his/her destination, and advise the customer to call again with any other problems.

NOTE: If the customer cannot complete the corrective action, the dealer is expected to advise the customer that a service person will be dispatched.

**If an after-hours service person must be dispatched for a road call:**

1. The service person is to confirm that the customer is in a safe location, and confirm any directions needed to find the customer.
2. The service person is to inform the customer that the emergency service will likely be a temporary repair, intended only to get the customer safely to their destination. Therefore, a subsequent service appointment must be scheduled during normal service hours.
3. The service person shall confirm the approximate arrival time.
4. The service person shall confirm the approximate cost of the service call (if the service is not covered under warranty).

##### 4.2 Service Personnel Qualifications:

Personnel designated by a NMEDA dealer to service and repair mobility equipment are to be knowledgeable of and certified by the manufacturer on the particular equipment to be installed, serviced, or repaired. The servicing NMEDA dealer shall have service personnel certified to repair the level of equipment the dealer sells to the customer. Exceptions such as temporary repairs intended to get the customer to safety until permanent repairs can be made as described in 4.1 are allowable when not avoidable.

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### 4.3 Practices for Providing Before-Sales Services:

The purchase of a vehicle adapted for use by an individual with a disability without the individual first familiarizing themselves in-person with the vehicle and its equipment introduces many potential issues and risks. Since these modified vehicles usually have a level of custom components for safe and optimum usability, it is vital that the customer/end user familiarize and interact with these components and equipment prior to committing to purchasing them.

Early in the sales process the NMEDA dealer should provide all customers with a copy of the most current NMEDA-endorsed consumer reference guide or website for selecting and purchasing adaptive vehicles and equipment so that they can become informed about the process and factors involved in selecting and purchasing adaptive vehicles and equipment and selecting the dealer to provide the equipment and service.

**Note:** Reference Section 2: Consumer Documentation Sub-Sections 2.1 and 2.3 for relevant Before-Sale recommendations, also reference section 4.5.2.

### 4.4 Practices for Providing Pre-Delivery Services:

Once adaptive equipment prescription, specifications, and sales terms between the NMEDA dealer and customer and/or funding party are agreed upon, the adaptive modification process can begin. Prior to delivery of the adapted vehicle, and depending on the complexity of the modifications package, “mid-conversion” and “final” fittings are an expected service component of the successful sale. Of special note for drivers using adaptive equipment, a mid-conversion and final fitting with the end user or client present is expected to occur at the dealer location to fine tune equipment adjustments, determine tie-down locations, torso belt dimensions, etc. (refer to section 2.2). Furthermore, in such situations it is strongly recommended for a Driver Rehabilitation Specialist, whenever available, to be actively involved on site in the fitting process to assure the end user can safely and effectively use the equipment.

**Note:** The dealer shall provide as much notice as possible when scheduling these fittings.

### 4.5 Practices for Providing After-Delivery Services:

#### 4.5.1 After-Sale Service Dealer Agreements:

Out of NMEDA's commitment to the overall high quality experience and outcome of the customer with a disability, NMEDA requires that all dealers who sell vehicles equipped with mobility products ensure that the customer is provided service after the sale.

A service area is defined as an area within 100 miles (160 km) or 2 hours drive time (whichever is shorter in the best judgment of the selling accredited location) from which a location can reasonably service customers to the level of service expected of a QAP compliant location. The definition of this proximity is for the purpose of providing customers who purchase a vehicle, adaptive equipment, or both, with a reasonable distance to travel for repairs. The servicing QAP accredited location is required to have technicians certified to service the mobility products installed by the selling accredited location. Refer to the QAP Rules for exceptions.

#### 4.5.2 Misrepresentation of After-Sale Service Availability:

Without first establishing written service agreements between dealers, no NMEDA member shall state or imply to a client or potential customer that following a sale, ANY NMEDA MEMBER can or will provide service to the vehicle or adaptive equipment package.

#### 4.5.3 After-Sale Equipment Use Training and Demonstration:

It is required that the NMEDA dealer will demonstrate the proper use and maintenance of the equipment to the end user/operator of the mobility equipment. This demonstration and training shall include the proper fit and use of any included wheelchair tie-down systems and wheelchair passenger restraint systems (refer to

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www.travelsafer.org). Furthermore, it is highly recommended to allow the end user/operator to demonstrate their competency in the use of all systems sold or provided by the dealer.

### 4.5.4 After-Sale Documentation:

#### 4.5.4.1 Vehicle Acceptance Documentation:

A modified vehicle is required to have a set of delivery documents completed and a vehicle delivery or acceptance document signed by the client and mobility equipment dealer prior to the vehicle being released to the client. Components of the vehicle acceptance documentation:

- Customer contact information;
- Final vehicle and adaptive equipment inspection;
- Final client fitting;
- Vehicle test drive;
- Customer and other users' in-service training;
- Customer acceptance;
- Conditions of vehicle release;
- Customer has been informed that additional insurance covering adaptive equipment is generally recommended and may be required

#### 4.5.4.2 Other Documentation:

Additionally, it is required for the NMEDA dealer to provide at a minimum the following documentation to the customer or end user no later than the final delivery of the modified vehicle or installed mobility equipment:

- The original operation/owner's/warranty manuals for each item of installed equipment that is not included in the vehicle operator's manual.
- Dealer is to retain an electrical circuit diagram and wire routing; in schematic format. Can be supplied to customer if requested.
- A preventative maintenance schedule detailing required maintenance for all installed equipment.
- The selling, installing, or repairing NMEDA dealer's written warranty detailing all items covered with parts and labor components separately addressed as applicable for the customer to clearly understand what is and is not included.
- Original copies of any manufacturer's warranties. The NMEDA dealer is required to register all warranties with equipment manufacturers. A signed privacy statement may be required.
- Per 49 CFR 595, a list of the FMVSS or portions thereof with which the vehicle may no longer be in compliance and the vehicle's new load carrying capacity if modifications have reduced the load carrying capacity by more than 220 pounds (100 kg). Dealer must state whether the weight of the user's wheelchair is included in the available load carrying capacity. NMEDA dealer must retain a copy for 7 years. Applies to members governed by US law.

## NMEDA Guidelines

Section:	5
Description:	Vehicle Weight Analysis
Revised Date:	October 12, 2022

## 5 VEHICLE WEIGHT ANALYSIS

### PURPOSE

When modifying vehicles for people with disabilities, special care shall be given to the weight of the added equipment and the effect it could have on the vehicle's driving characteristics. Adding equipment can cause the available load carrying capacity to be compromised, or the GVWR (Gross Vehicle Weight Rating), either of the GAWR (Gross Axle Weight Rating) or the TWR (Tongue Weight Rating) to be exceeded. If any of these weight ratings are compromised, the vehicle's safe driving characteristics can be adversely affected causing premature system failures as well as braking and steering functionality that could result in catastrophic failure. Applies to all vehicles sold that contain mobility equipment or that are modified with mobility equipment or components.

**Definition: (See Appendix C)**

### REQUIREMENTS

- 5.1 All vehicles shall be assessed prior to any modifications to determine if the vehicle's GVWR, GAWR, and TWR (as applicable) will not be exceeded and the available load carrying capacity is sufficient to accommodate the anticipated payload when in normal use.  
  
Note: Reference the Weight Analysis Process Flowchart document ([QAP-F30](#)) and the Weight Analysis best practice instruction sheet ([QAP-117](#)) for more detailed information and assistance. These documents can be found on the NMEDA website [document center](#).
- 5.2 A four-corner weight analysis shall be performed and documented when the lesser of 1.5% of GVWR or 100 lbs. (45 kg) or more of net weight is added to a vehicle after modification.
- 5.3 Exceeding a vehicle's GVWR, GAWR, or TWR is prohibited by Federal Law.
- 5.4 Upon completion of modification, a vehicle's available load carrying capacity must not be less than Designated Seating Positions (DSP) times 150 lbs. (68 kg). For the purpose of determining load carrying capacity, occupied wheelchair tie down positions are counted as DSPs and 150 lbs. must be allotted for the wheelchair occupant and the weight of the wheelchair is considered as cargo\*\*. A modified vehicle with insufficient load carrying capacity shall not be delivered. (\*\*Not applicable to define the Seating Capacity on Tire placard in Canada.)
- 5.5 The Remaining Cargo Capacity is measured by taking the Load Carrying Capacity after modification and deducting the required occupant weight capacity (DSP times 150 lbs). The Remaining Cargo Capacity can never be less than zero.
- 5.6 It is the customer's responsibility to safely load the vehicle. In circumstances where the customer has additional cargo (including mobility devices) that could overload the vehicle when all designated seating positions are occupied the dealer shall provide guidance on how to safely load the vehicle. (reference NMEDA publication document PUB-102 "Consumer Safe Loading Guide") The combined weight of occupants and cargo should never exceed the load carrying capacity of the vehicle.
- 5.7 According to 49 CFR Part 595: If the load carrying capacity of the vehicle after modification is reduced by 220 lbs (100 kg) or more, the reduction in load carrying capacity shall be disclosed to the customer. When providing this information, the dealer must state whether the weight of the user's wheelchair is or is not included in the available load capacity. The Make Inoperative disclosure form may be used for this purpose. Refer to section 1 for more information. Applies only to members governed by US Law.
- 5.8 When installing rear mounted scooter and wheelchair lifting or carrying devices, the tongue weight rating (TWR) shall not be exceeded. Modifying or adding a hitch receiver is prohibited unless endorsed by

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information found in sources such as the owner's manual, incomplete vehicle document, dealer bulletin, or, if the vehicle is obviously equipped with an OEM trailer towing package. In most cases the vehicle manufacturer specifies the towing capacity, which determines the tongue weight rating. Manufacturer warranties and/or compliance with F/CMVSS 301 "fuel system integrity" rear impact crash test can be voided if OEM hitch receivers are modified or aftermarket hitch receivers are added.

- 5.9 If a modification adds the lesser of one and one half percent (1.5%) of the vehicle's GVWR or 100 pounds (45 kg) in additional weight, the reduction in load carrying capacity must be determined and a Load Carrying Capacity Reduced label stating the amount of weight the load capacity has been reduced from the original is to be affixed to the vehicle within 1" of the existing Tire Placard (label). The purpose of this is to record the cumulative effects of adding numerous pieces of equipment to a vehicle over time.
- 5.10 It is strongly recommended that the consumer be advised of the load carrying capacity of the vehicle after modification to assure the consumer's safety.

## NMEDA Guidelines

Section:	6
Description:	General Electrical Specifications
Revised Date:	October 12, 2022

## 6 GENERAL ELECTRICAL SPECIFICATIONS

### PURPOSE

To outline the intended use and required function of General Electrical Specifications.

**Definition: (See Appendix C)**

### REQUIREMENTS

#### 6.1 Switches:

All switching devices, in the driver's compartment, shall comply with applicable federal motor vehicle safety standards (FMVSS/CMVSS). Switches installed outside the vehicle shall be weatherproof.

#### 6.2 Connectors:

For all connections, follow manufacturer's instructions using proper technique and materials. If crimped connections are used, only OEM type or equivalent will be permitted. No self-stripping style electrical connectors shall be used in any adaptive equipment installation. All exterior electrical connections shall be weatherproof. Connectors shall be properly sized / rated for the corresponding wire gauge and load.

#### 6.3 Wire Sizes and Types:

All added wiring shall be sized to meet the aftermarket manufacturer's specification. If it is necessary to lengthen an original equipment wire, extreme care shall be taken to ensure that the lengthened wire will handle the required operating electrical loads with enough reserve to prevent overheating. Only then shall wire of the same type, color and gauge size to be used. Additionally, if the wire to be lengthened is identified as part of a multiplexed circuit, the newly lengthened wire shall be tested to ensure that no significant resistance is added to the circuit. All added wiring shall be SAE automotive approved.

#### 6.4 Wire / Cable Routing:

Wiring shall be SAE approved for automotive use and shall be colored or labeled to aid in service identification. Wire harness protection coverings shall be used to avoid abrasions and wear conditions commonly found in or under vehicles. Wiring harnesses shall be properly routed, retained, be of sufficient length and be supported to accommodate any motion resulting from the use of the mobility equipment. Attachments shall be used to retain (carry the weight of) the harness and placed at a maximum distance of 18". Note: Be sure not to compromise the load carrying or volume capacity of the OEM harness clamps if they are used as securement points. Added wiring shall not be attached to the OEM vehicle fuel, hydraulic or evaporative systems. Shielding/insulating from high temperature components (mufflers, exhaust pipes, manifolds, catalytic converters, etc.) shall be maintained at all times. Grommets or feed through style connectors shall be used any time wires pass through metal panels (firewalls/dash panel, floors, door jams). All wire entries into passenger compartment shall be sealed to prevent weather element or noxious fume intrusions.

#### 6.5 Battery Installations:

All batteries shall be installed in compliance with all manufacturers' recommendations and shall be installed in a way that readily allows maintenance access. The manufacturer's installation instructions and battery recommendation take precedence over the guidelines.

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Any time a battery is installed in the interior occupant compartment or cargo area of a vehicle, the following shall apply:

1. **ONLY** a sealed non-spillable type batteries shall be used and shall be installed in a box that is clearly marked **“CAUTION! REPLACE ONLY WITH SEALED NON-SPILLABLE BATTERY”**
2. The battery shall be securely mounted in a manner that will prevent shorting out and can remain in place during a vehicular impact;
3. All battery enclosures shall be compliant to FMVSS 302 or USCG DHS 111.15-10.
4. Separate battery installation should not put any load requirements on vehicle charging system that will compromise appropriate charging of the vehicle main battery. These separate battery charging systems should be appropriate for the type, chemistry, and size of the battery they are charging. Labeling for the type of battery that the charger can charge should be visible when inspecting the battery or an additional decal provided and installed visible in the battery case to prevent mismatch of charging system and battery. When installed the charger shall be securely mounted in a manner that will prevent shorting out and can remain in place during a vehicle impact.
5. The battery shall be installed in a location that does not obstruct wheelchair access or passenger ingress or egress.
6. Battery cabling shall be in compliance with current applicable SAE standards.

### 6.6 Battery Considerations:

When installing electrically powered mobility equipment that draws power from the vehicle battery it is important to balance the load on both sides of the battery. Newer model vehicles may be equipped with intelligent battery monitoring systems which require special caution when connecting to the vehicle power system. These Battery monitoring systems can be identified by an additional enclosure that is typically part of negative terminal. The vehicle Owners' manual will also identify with an illustration. The Mobility equipment manufacturer's instructions on installation should be followed with the following cautions:

- 6.6.1 If a vehicle battery does NOT have an OEM battery Sensor, an additional ground strap shall be installed from the negative terminal of the battery to the body on the vehicle. The gauge of the ground cable shall be the same or larger than the power cable supplied by the manufacturer. The cable shall be a black insulated multi-strand copper automotive type product.
- 6.6.2 If a vehicle battery DOES have an OEM battery Sensor, the mobility device ground strap shall be installed directly to an OEM specified ground point body on the vehicle. The gauge of the ground cable shall be the same or larger than the power cable supplied by the manufacturer. The cable shall be a black insulated multi-strand copper automotive type product.
- 6.6.3 If a vehicle battery does NOT have an OEM battery Sensor, and the Mobility Equipment manufacturer has both a positive and negative lead harness to the battery no additional ground strap needs to be installed from the negative terminal of the battery to the ground point.
- 6.6.4 If a vehicle battery DOES have an OEM battery Sensor, and the Mobility Equipment manufacturer has both a positive and negative lead harness to the battery, the negative is attached to the vehicle ground point by the battery but NOT to the battery terminal.
- 6.6.5 If a vehicle battery does not have sufficient capacity to operate the Mobility Equipment being installed without compromising the OEM installed functions, an additional power supply for the mobility equipment shall be installed. If this power supply is a battery, it shall follow the guidelines in 6.8. The operator shall be informed of the location and battery charging requirements if not automatic.



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### 6.7 Back Up Power Systems

Commonly referred to as Back Up Battery Systems. A vehicle modification that modifies the OEM primary control system with one defined as a “High Tech Primary Controls” shall be equipped with a Back Up Power System that will allow the operator to effectively control the vehicle in the event of a loss of primary power to the high tech primary control system. This Back Up Power System shall be installed according to the equipment manufacturer’s instructions. The installer shall confirm that vehicle control with back up power system engaged in operation is obtainable at the primary driver’s level of ability and convey how to recognize that the back up power system has been engaged so that the need for this engagement can be addressed.

- 6.7.1 If the Vehicle Modification is Electric, the Back Up Power System needs to engage to handle situations including loss of Power, Ground or a short circuit in the primary power source.
- 6.7.2 The equipment manufacturer’s maintenance/service schedule should be conveyed to the primary driver of the vehicle so that the Back Up Power System can be maintained correctly.
- 6.7.3 The vehicle shall be labeled that it has a Back Up Power System installed so that any vehicle maintenance can be done safely for the vehicle technician(s) performing work and without damage or parameter changes occurring to the Back Up Power System.

### 6.8 Circuit Protection:

Unless otherwise specified by the equipment manufacturer each electrical circuit shall have a circuit protection device within 18” of the power supply. The circuit protection device size will be in accordance with the product manufacturer’s specifications. All circuit protection devices located in the engine compartment of the vehicle shall be positioned in a manner to protect against the effects of heat, water and other environmental elements. All exposed terminals shall be protected to prevent corrosion.

### 6.9 Ground Junction Point:

Insulated ground return wires shall be of sufficient gauge, size and length to carry the sum of the currents provided by the supply side(s) wiring. After securing a proper ground connection, continuity to ground should be tested for proper function. The use of serrated paint cutting ground terminals or washer may be used on painted surfaces as long as proper installation techniques are used. A proper tool shall be used, allowing sufficient torque to force the cutting edge of the terminal or washer through the layer(s) of paint and must provide and verify an adequate ground path has been established. Ground junction points shall be accessible for servicing and protected from water, salt spray and other adverse environmental conditions.

### 6.10 Documentation:

Electrical circuit diagrams, wire routings and service manuals, for all electrical components and systems installed by the mobility equipment dealer, shall be available to the client upon request. The mobility equipment dealer shall retain a copy of these diagrams and manuals.

### 6.11 Labeling:

All circuit breakers and solenoids shall be labeled. The label should clearly identify the specific function of the product. All labels shall be weather resistant and be designed to stay affixed and be legible for the duration of the product’s serviceable life.

#### Note:

Detailed information regarding the aforementioned section 6 may be obtained by referring to the following current SAE documents.

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SAEJ156	Fusible Links
SAEJ163	Low Tension Wiring and Cable Terminals and Splice Clips
SAEJ378	Marine Engine Wiring
SAEJ541	Voltage Drop for Starting Motor Circuits
SAEJ553	Circuit Breakers
SAEJ554	Electric Fuses (Cartridge Type)
SAEJ561	Electrical Terminals-Eyelet and Spade Type
SAEJ858	Electrical Terminals Blade Type
SAEJ928	Electrical Terminal-Pin and Receptacle Type
SAEJ1127	Battery Cable
SAEJ1128	Low-Tension Primary Cable
SAEJ1284	Blade Type Electric Fuses
SAEJ1291	Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring
SAEJ1725	Structural Modifications for Personally Licensed Vehicles to Meet the Transportation Needs of Persons with Disabilities
SAEJ1903	Automotive Adaptive Driver Controls, Manual
SAEJ2092	Testing of Wheelchair Lifts for Entry to or Exit from a Personally Licensed Vehicle
SAEJ2093	Design Considerations for Wheelchair Lifts for Entry to or Exit from a Personally Licensed Vehicle
SAEJ2094	Vehicle and Control Modifications for Drivers with Physical Disabilities Terminology

Any or all of the above documents are available at a nominal fee from the Society of Automotive Engineers at the following address:

Society of Automotive Engineers  
400 Commonwealth Drive  
Warrendale, PA 15096-0001  
Phone Number: (412) 776-4841  
[www.sae.org](http://www.sae.org)

## NMEDA Guidelines

Section:	7
Description:	Definition of High Tech and Low Tech Devices
Revised Date:	December 19, 2013

## 7 DEFINITION OF HIGH TECH AND LOW TECH DEVICES

### PURPOSE

To define for purposes of NMEDA dealers, High Tech and Low Tech adaptive equipment installations.

#### 7.1 High Technology Definition:

High Technology ("High Tech") devices are those that meet the following conditions:

1. Devices capable of controlling vehicle functions or driving controls, **and**
2. Operate with a designed logic system, or interface ~~or~~ /integrate with an electronic system of the vehicle.

##### 7.1.1 High Tech Examples:

###### 7.1.1.1 Primary Driving Control Examples:

- a. Powered gas / brake systems;
- b. Power park brake integrated with a powered gas / brake system;
- c. Reduced effort steering systems;
- d. Horizontal steering system;
- e. Reduced effort brake systems;
- f. Backups for primary controls.

###### 7.1.1.2 Secondary Driving Control Examples:

- a. Remote panel or switch array interfacing with OEM electronics;
- b. Wiring extension for OEM electronics;
- c. Powered transmission shifter.

#### 7.2 Low Technology Definition:

Low Technology ("Low Tech") all other devices or modifications that do not meet the definition of High Technology devices or modifications.

##### 7.2.1 Low Tech Examples:

###### 7.2.1.1 Primary Driving Control Examples:

- a. Manual or Hybrid gas / brake hand controls;
- b. Left foot accelerator pedal;
- c. Park brake lever or stand-alone powered park brake;
- d. Steering terminal device;
- e. Driver training brake.

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### 7.2.1.2 Secondary Driving Control Examples:

- a. Remote horn button (grounding system);
- b. Turn signal crossover lever;
- c. Switch extension on OEM controls;
- d. Transmission shifter lever;
- e. Transfer seat base.

## NMEDA Guidelines

Section:	8
Description:	Accelerator, Brake and Clutch Pedal Modifications
Revised Date:	December 19, 2013

### 8 ACCELERATOR, BRAKE AND CLUTCH PEDAL MODIFICATIONS

#### PURPOSE

To outline the intended use, required function and requirements of Pedal Modifications.

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 8.1 Pedal modifications, such as extensions, foot supports, or enlarged surface areas, shall be securely attached to the OEM vehicle pedal. Attaching fasteners shall be OEM or their equivalent with respect to grade, size, type and finish. Each pedal modification shall be prescribed by the Driver Rehabilitation Specialist in conjunction with the mobility equipment dealer.
- 8.2 Foot pedal surfaces shall be an automotive grade non-skid material.
- 8.3 Whenever possible, modifications to the gas and/or brake pedal will not alter the OEM geometric relationship of the pedals to one another.
- 8.4 Accelerator pedal modification shall not interfere with the OEM return to idle when the actuating force is removed.
- 8.5 Pedal modifications shall not cause any inadvertent action during any dynamic driving situation.

## NMEDA Guidelines

Section:	9
Description:	Automotive Wheelchair Roof Carriers / Loaders
Revised Date:	November 19, 2014

### 9 AUTOMOTIVE WHEELCHAIR ROOF CARRIERS / LOADERS

#### PURPOSE

To outline the intended use and required function of Automotive Wheelchair Roof Carriers/Loaders.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 9.1 Fastening plates shall be mounted with fasteners that provide a secure durable attachment. Any attachment to the roof shall be constructed and reinforced to provide secure attachment without causing roof panel distortion.
- 9.2 All roof-mounting points shall be water resistant.
- 9.3 Switch location shall not interfere with the operator's entry or exit (transfer) from the wheelchair to the driver's seat or vice versa.
- 9.4 Control switches shall be placed in a convenient position to assure the operator is able to use them independently.
- 9.5 Windshield and rear glass shall be free of obstructions that interfere with the driver's field of vision.
- 9.6 In the event that the carrier is mounted to a roof rack, the roof rack shall be specifically designed for the vehicle application and the lesser of the performance/capacity rated by the rack manufacturer and/or the OEM to handle the weight of the carriers, wheelchair and the operating load.

## NMEDA Guidelines

Section:	10
Description:	Driver Training Brake
Revised Date:	November 19, 2014

### 10 DRIVER TRAINING BRAKE

#### PURPOSE

To outline the intended use and required function of Driver Training Brakes.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 10.1 It is recommended that the vehicle modifier and/or driver rehabilitation specialist be proactive in the recommendation of a driver training brake for all vehicles in which drivers need training beyond dealer orientation.
- 10.2 The driver training brake shall not apply any brake pedal pressure until activated by the driver trainer; shall not cause inadvertent action during any driving situation.
- 10.3 All mounting holes shall be filled and sealed when driver training brake pedal is removed.
- 10.4 Test drive required and documented.

## NMEDA Guidelines

Section:	11
Description:	Electrically Powered Seat Bases
Revised Date:	November 19, 2014

### 11 ELECTRICALLY POWERED SEAT BASES

#### PURPOSE

To outline the intended use and required function of Electrically Powered Seat Bases.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 11.1 An electrically powered driver or passenger seat base may have one or more of the following power travel features:
  - 1. Up/Down
  - 2. Back/Forward
  - 3. Rotate Left/Right
- 11.2 Wiring shall be routed and protected from entanglement, inadvertent disengagement, abrasion, pinching, stretching, and chaffing when the seat travels throughout its entire operating cycle/travel range. Wiring shall be protected by a circuit breaker/fuse at the power source.
- 11.3 Powered seat bases shall be installed to the vehicle as specified by the seat base manufacturer to be compliant with FMVSS/CMVSS 208, 209 and 210.
- 11.4 Occupant restraint systems shall be installed per the seat base manufacturer's instructions.
- 11.5 When a power seat base is used in conjunction with a transfer seat inside a vehicle, a wheelchair securement system shall be used in the transfer position. The securement shall restrain the wheelchair during the transfer process and while the vehicle is in motion. This securement shall be independently operable by the client and should be labeled "For Unoccupied Wheelchair Only. MUST BE USED WHEN VEHICLE IS IN MOTION", unless securement has been designed and installed for occupied use.
- 11.6 The type of driver's seat shall be determined by the client, mobility equipment dealer and if necessary, the Driver Rehabilitation Specialist.
- 11.7 Controls for the added power seat base shall be placed to permit convenient, efficient and safe operation by the client. All switches shall be clearly identified. Care should be taken to locate the switches as to avoid equipment damage during the transfer process. Additionally, the location of the switches should be chosen to minimize the potential for abrasions, bruising or injury to the client during the transfer process.



## NMEDA Guidelines

Section:	12
Description:	Extended Doors
Revised Date:	November 19, 2014

### 12 EXTENDED DOORS

For all “E” series, up to model year 2007, standard length chassis Ford vans see the applicable revision of the NMEDA “Raised Roof and Doors Manual”. For 2008-2011 E series 150, 250, 350 Ford vans, GM Savana 1500, 2500, 3500 and Chevrolet Express 1500, 2500, 3500 see the Raised Roof and Door Assembly and Installation Guidelines applicable version. This manual is available for purchase from NMEDA. For further information contact NMEDA at 1-800-833-0427. All structural modifications that are covered in this manual will be constructed to adhere to the manual’s design specifications. For any modification not covered in the manual the following minimum guideline specifications shall be met. NMEDA guidelines compliance does not insure compliance with FMVSS/CMVSS. All modifications shall comply with FMVSS/CMVSS when applicable.

#### PURPOSE

To outline the intended use and required function of Extended Doors.

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 12.1 If a NMEDA extended door manual exists for the vehicle to be modified, the manufacturing instructions must be followed **or the upfitter must document their pathway to compliance.**
- 12.2 Extended door systems (doors, hinges, closure components, frames and sliding door tracks) shall be similar in appearance, constructed in a manner equivalent in strength, and other performance requirements to the original door system.
- 12.3 Refinishing shall be consistent with OEM automotive finish. The entire refinishing process shall follow methods described in body shop repair manuals.
- 12.4 The extended door lintel shall incorporate a drip rail. This will ensure that water is channeled away from the van entry system.
- 12.5 A structural support shall be attached to the topside of the lintel to prevent movement of the raised door frame. There shall be a weatherproof seal where the raised door meets the lintel.
- 12.6 The inside perimeter of the extended door shall be sealed with weather-strip material equivalent to OEM. Doors shall close flush and seal against water, air, wind, dust and noxious fumes.
- 12.7 Raised doors shall be constructed to close securely and comply with FMVSS/CMVSS 206.

## NMEDA Guidelines

Section:	13
Description:	Exterior Door and Lift Controls
Revised Date:	November 19, 2014

### 13 EXTERIOR DOOR AND LIFT CONTROLS

#### PURPOSE

To outline the intended use and required function of Exterior Door and Lift Controls.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 13.1 All switches receiving their power from the lift solenoid shall have an additional circuit breaker within 18 inches of the power source. The circuit breaker shall be appropriate to the load demand.
- 13.2 Switches or controls shall be appropriately located as determined by the client, Driver Rehabilitation Specialist, and the mobility equipment dealer and shall not interfere with any OEM controls.
- 13.3 If a remote entry system is utilized, two remote transmitters are to be provided.

## NMEDA Guidelines

Section:	14
Description:	Structural Modifications
Revised Date:	July 28, 2021

### 14 STRUCTURAL MODIFICATIONS

#### PURPOSE

To outline the requirements for structural modifications.

**NMEDA CLASSIFICATION:** Low Tech

**Definitions** (Also see Appendix C for definitions of non-structural modifications and structural alterations)

**Structural modification** – modifications to a used vehicle, such as the body, frame, drive configuration and fuel tank, for the purpose of adapting it for persons with disabilities in such a way that may render inoperative federal motor vehicle safety standards, usually includes cutting and welding.

#### REQUIREMENTS

- 14.1 Structural modifications shall not make inoperative any federal safety standard except as provided in 49 CFR Part 595.7 Make Inoperative exemptions.
- 14.2 Structural modifiers or modifiers installing pre-engineered vehicle conversion kits shall assure that the manufacturer and the vehicle specific kit conversion is accepted and posted on the NMEDA website. If the kit is not accepted and posted, the modifier shall request approval from NMEDA CRP or one of NMEDA's approved third-party test labs prior to installation.
- 14.3 Objective evidence of F/CMVSS compliance shall be the responsibility of the modifier and made available upon request from NMEDA or NMEDA's third-party audit firm.
- 14.4 Cutting and/or welding of the vehicle frame or structure shall be performed by a certified welder. The methods used shall meet or exceed OEM recommendations and methods and shall conform to AWS/SAE Welding Standards and good engineering practices.

## NMEDA Guidelines

Section:	15A
Description:	Mechanical Left Foot Accelerator
Revised Date:	November 08, 2017

### 15A MECHANICAL LEFT FOOT ACCELERATOR

#### PURPOSE

To outline the intended use and required function of Mechanical Left Foot Accelerators.

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

Note: For Electronic Left Foot Accelerator, see Section 15B.

- 15A.1 A left foot accelerator shall only be installed in vehicles with an automatic transmission and only if prescribed by a Certified Driver Rehabilitation Specialist (CDRS) or Driver Rehabilitation Specialist. If there is no CDRS available in the service area then training must be provided by a certified/licensed driver trainer unless the client is licensed or provides documented proof of training on the use of the left foot accelerator. Utilization of a driver rehabilitation specialist is strongly recommended, if available.
- 15A.2 The left foot accelerator assembly shall allow only one active accelerator pedal to be accessed at a time.
- 15A.3 If the left foot accelerator assembly requires a pedal guard to be compliant with section 15.2, the left foot accelerator pedal shall be able to be removed and re-installed without the use of tools. All left foot accelerator assemblies shall have a permanently mounted base.
- 15A.4 The vehicle OEM accelerator pedal shall be functional and useable by a non-disabled driver when the left foot accelerator pedal device is removed and shall continue to meet FMVSS/CMVSS 124.
- 15A.5 The installed left foot accelerator pedal shall be road tested by the mobility dealer to provide acceleration and performance equivalent to the OEM accelerator pedal.
- 15A.6 Installation of a left foot accelerator shall include a thorough inspection of the vehicle underside prior to drilling and/or fastening the device. The inspection shall ensure the device and its fasteners do not rub, chafe or otherwise compromise the vehicle brake lines, fuel lines and any under-vehicle wiring or hoses.
- 15A.7 The left foot accelerator pedal shall be installed such that operation of the left foot accelerator pedal does not allow inadvertent brake pedal use. This item shall be determined by a certified/licensed driver trainer during final fitting and training with the client.
- 15A.8 When installing the left foot accelerator pedal in a vehicle with adjustable OEM accelerator and brake pedals, the pedal shall be rendered non-adjustable and the electrical connection shall be labeled "Do not reconnect while this device is installed". The mobility equipment dealer and/or driver rehabilitation specialist, and client shall determine the location of the OEM pedals prior to disconnection. A label shall be placed in the vehicle informing the vehicle user that the adjustable pedal feature is deactivated.
- 15A.9 All warning and instructional labels supplied by the device manufacturer shall be placed as instructed by the manufacturer.
- 15A.10 During installation of the left foot accelerator pedal the mobility equipment dealer and/or driver rehabilitation specialist, and client shall determine specific accelerator pedal adjustments required.

## NMEDA Guidelines

Section:	15A
Description:	Mechanical Left Foot Accelerator
Revised Date:	November 08, 2017

15A.11 Fitting and training by the certified driver rehabilitation specialist or licensed trainer is required for all left foot accelerator applications.

15A.12 Both the client and the other known users of the vehicle shall be instructed and informed about the dangers of a non-trained individual attempting to drive with the adaptive controls.

15A.13 Test drive required.

## NMEDA Guidelines

Section:	15 B
Description:	Electronic Left Foot Accelerator
Revised Date:	October 12, 2022

### 15B ELECTRONIC LEFT FOOT ACCELARATOR

#### PURPOSE

To outline the intended use and required function of Electronic Left Foot Accelerators.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

Note: For Mechanical Left Foot Accelerator – see section 15A.

- 15B.1 A left foot accelerator shall only be installed in vehicles with an automatic transmission and only if prescribed by a Certified Driver Rehabilitation Specialist (CDRS) or Driver Rehabilitation Specialist. If there is no CDRS available in the service area then training must be provided by a certified/licensed driver trainer unless the client is licensed or provides documented proof of training on the use of the left foot accelerator. Utilization of a driver rehabilitation specialist is strongly recommended, if available.
- 15B.2 The left foot accelerator assembly shall allow only one active accelerator pedal to be accessed at a time.
- 15B.3 The electronic left foot accelerator assembly may or may not require a pedal guard to be compliant with Section 15B.2, if so, the left foot pedal shall be able to be removed and re-installed without the use of tools; otherwise the OEM pedal shall be electronically disabled during the use of the left foot accelerator pedal. All left foot accelerator assemblies shall have a permanently mounted base.
- 15B.4 The vehicle OEM accelerator pedal shall be functional and useable by an ambulatory driver when the electronic left foot accelerator pedal device is deactivated, disabled, or removed and shall continue to meet F/CMVSS 124, Accelerator Control Systems requirements.
- 15B.5 The electronic left foot accelerator pedal shall be accompanied by installation instructions from the manufacturer stating that the device, as installed, will meet the performance requirements of F/CMVSS 124.
- 15B.6 The installed electronic left foot accelerator pedal shall be road tested by the mobility dealer to provide acceleration and performance equivalent to the OEM accelerator pedal.
- 15B.7 Installation of a left foot accelerator shall include a thorough inspection of the vehicle underside prior to drilling and/or fastening the device. The inspection shall ensure the device and its fasteners do not rub, chafe or otherwise compromise the vehicle brake lines, fuel lines and any under-vehicle wiring or hoses.
- 15B.8 All warning and instructional labels supplied by the device manufacturer shall be placed as instructed by the manufacturer.
- 15B.9 During installation of the left foot accelerator pedal the mobility equipment dealer and/or driver rehabilitation specialist, and client shall determine specific accelerator pedal adjustments required and whether the OEM power adjustable pedal should be disabled. The reasons for which the OEM power adjustable pedals would be disabled may include; drivability, relationship to gas and brake pedal, or mechanical constraints, to name a few.
- 15B.10 Both the client and the other known users of the vehicle shall be instructed and informed about the dangers of a non-trained individual attempting to drive with the adaptive controls.

#### **! WARNING !**

**Some vehicles may not allow disconnection of the power adjustable pedal.  
It is strongly urged that this be evaluated prior to installation**

## NMEDA Guidelines

Section:	16
Description:	Hand Controls
Revised Date:	July 22, 2020

### 16 HAND CONTROLS

#### PURPOSE

To provide installation guidelines for a variety of hand control styles including manual/mechanical and hybrid (electronic accelerator, mechanical brake).

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

**Note: Requirements apply to all types of hand controls unless otherwise stated**

- 16.1 Hand controls for accelerator and brake operations shall only be installed in vehicles with power brakes, power steering, and automatic transmission. Hand controls that are installed in vehicles without the above shall be authorized by the certified/licensed driver trainer.
- 16.2 Hand controls shall be road tested by the mobility equipment dealer to not interfere with any other driving control system through the full range of operating motion of all controls. Hand controls shall not interfere with or restrict visibility to any other vehicle operating systems (i.e. headlight switch, steering wheel, etc.).
- 16.3 Hand controls shall not interfere with the normal operation of any vehicle control system, when used by the non-disabled.
- 16.4 Hand controls for accelerator and brake shall automatically return to neutral/idle position after acceleration or braking when released by the operator.
- 16.5 **[Applies to mechanical style only]** When installing mechanical/manual hand controls in a vehicle with adjustable OEM accelerator and brake pedals or steering wheel/column, the pedal or steering wheel/column shall be rendered non-adjustable and the electrical connection shall be labeled "Do not reconnect while this device is installed." The mobility equipment dealer, driver rehabilitation specialist and client shall determine the location of the OEM pedals or steering wheel/column prior to disconnection. A label shall be placed in a conspicuous location in the vehicle informing the vehicle user and anyone performing vehicle maintenance that the adjustable pedal or steering wheel/column feature is deactivated.
- 16.6 Pedal blocks are recommended and shall be available for installation during the final fitting process. The mobility equipment dealer shall be prepared to install pedal blocks if required by the certified/licensed driver trainer/client and mobility dealers fitting results.
- 16.7 The client and other known users of the vehicle shall be instructed and informed and given manufacturer notes about any special features related to the adaptive equipment. For example, removable pedal blocks and mechanical hand control lock-out feature shall be thoroughly explained.
- 16.8 The specific type of hand control (i.e. - push-pull, twist-push, push-rock, right angle) may be specified by the certified/licensed driver trainer. If specified by the certified/licensed driver trainer, the equipment cannot be changed without discussing with and obtaining an amended equipment recommendation from the certified/licensed driver trainer.
- 16.9 If training is specified in the driver rehabilitation report, it shall be provided before the equipment is released to the client or the client agrees in writing to not use the equipment until training is completed.
- 16.10 It is recommended that a throttle lock-out be considered by the certified/licensed driver rehabilitation specialist and mobility equipment dealer at the time of installation.

## NMEDA Guidelines

Section:	16
Description:	Hand Controls
Revised Date:	July 22, 2020

- 16.11 If hand control placement interferes with knee bolster airbag deployment path, the airbag shall be removed and the circuit shunted and the appropriate labeling placed.
- 16.12 Test drive required for all hand control installations prior to delivery to the client.
- 16.13 **The following requirements apply only to Mechanical/Manual style hand controls:**
- 16.13.1 Mechanical hand controls must be tested in vehicle by the hand control manufacturer to meet F/CMVSS 124 "Accelerator control systems" for each specific vehicle make and model that the hand controls are intended to be installed in.
- 16.13.2 Mechanical hand controls shall meet all requirements of the NMEDA CRP-503 "Driver mechanical hand control standard".
- 16.14 **The following requirements apply only to Hybrid style hand controls:**
- 16.14.1 Hybrid hand controls that incorporate the OEM motion sensor in the hand control, thereby rendering inoperative the OEM pedal, do not need an accelerator pedal guard.
- 16.14.2 Hybrid hand controls that incorporate a motion sensor separate from the existing OEM system shall be equipped with a pedal guard or a means to inactivate one system from the other.
- 16.14.3 Hybrid hand controls that interfere with the existing OEM system must be tested by the hand control manufacturer to meet F/CMVSS 124 "Accelerator control systems".



## NMEDA Guidelines

Section:	17
Description:	Parking Brake
Revised Date:	November 19, 2014

### 17 PARKING BRAKE

#### PURPOSE

To outline the intended use and required function of Parking Brakes.

**NMEDA CLASSIFICATION:** Low Tech\*

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 17.1 If an individual is unable to operate an OEM foot or hand controlled parking brake, an alternate method of applying the brake must be used. The type of parking brake modification needed will be determined by the certified/licensed driver trainer, client, and mobility equipment dealer.
  - 17.2 The parking brake shall be held in the applied position by mechanical means and not hydraulic, pneumatic, or vacuum where loss of pressure, over time, would negatively affect the performance of the parking brake.
  - 17.3 An indicator light shall be visible from the driver's position when the parking brake is engaged and the ignition switch is on. An indicator light is preferable; if an aftermarket light is used, it shall be visible and must comply with FMVSS/CMVSS 101.
  - 17.4 The two acceptable parking brake modification types are:
    - a. **Manual Parking Brake Extension:**

This non-powered brake extension shall be positioned so the driver can operate the parking brake safely and easily. Extension shall not interfere with the driver's transfer in and out of the vehicle.
    - b. **Electric Parking Brake:**

The electric parking brake shall be installed in such a manner that the cables will be free from all mechanical interference, the remote switch for the power parking brake shall be clearly marked as to the engaged and disengaged positions, the location of the switch shall be determined by the Driver Rehabilitation Specialist, client and mobility equipment dealer. The electric parking brake system shall be installed and tested to the electric parking brake manufacturers instructions.
- \*NOTE:** NMEDA High Tech/Low Tech classifications: Manual parking brake and stand-alone powered electric parking brake systems that are not associated or directly integrated with powered gas and brake systems are classified as NMEDA low tech devices. Electric parking brake systems that are associated or directly integrated with powered gas and brake systems in a modification are classified as NMEDA high tech devices. Reference Section 7 for the NMEDA definitions for High Tech and Low Tech devices.

## NMEDA Guidelines

Section:	18
Description:	Power Door Openers
Revised Date:	January 19, 2012

### 18 POWER DOOR OPENERS

#### PURPOSE

To outline the intended use and required function of Power Door Openers.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 18.1 All power door openers shall have a mechanical quick release, in the event of mechanical or power failure. The emergency release shall be clearly identified.
- 18.2 Power door(s) shall close flush, and seal against water, air, dust and noxious fumes.
- 18.3 Interior lighting circuits, as provided to the mobility equipment dealer, within the client's vehicle will continue to operate as designed by the OEM when lift door(s) is/are opened and closed. In any other circumstance, the certified/licensed driver trainer will specifically prescribe client required lighting needs.
- 18.4 Automatic lighting shall be installed in conjunction with power door openers to illuminate the lift platform at its lowest position with the doors open.
- 18.5 In a swing door or a slide door application, none of the moving parts that operate the doors(s) should come into direct contact with the finished appearance surface on the vans interior or exterior. In all cases where this is unavoidable, a stainless steel, Delran, UHMW or other suitable material will be used to protect the vehicle finish.
- 18.6 The addition of power door operators shall not compromise compliance with FMVSS/CMVSS including latch system requirements.

## NMEDA Guidelines

Section:	19
Description:	Raised Roof
Revised Date:	December 16, 2015

### 19 RAISED ROOF

All modifications shall comply with F/CMVSS where applicable.

#### PURPOSE

To outline intended use and required function of a Raised Roof for all vehicles.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 19.1 If a NMEDA raised roof F/CMVSS 210 manual exists for the vehicle make and model year to be modified, the manufacturing instructions must be followed, or the modifier must document their pathway to F/CMVSS compliance with a prototype vehicle test report for the upper seat belt anchorages under F/CMVSS 210.
- 19.2 After a raised roof has been installed, the inside perimeter shall be covered with F/CMVSS 302 compliant material and installer must assure that there are no sharp edges.
- 19.3 All raised roofs shall be permanently sealed with automotive grade sealant to prevent dust, air, water and wind noise intrusion.
- 19.4 All raised roofs shall be finished so that the vehicle's aesthetic appearance is maintained consistent with the OEM finish.
- 19.5 All raised roofs shall be attached to the vehicle as securely as an OEM roof so that they will not become detached from the vehicle in the event of a collision and shall not compromise the structural integrity of the vehicle.
- 19.6 When a support structure is required to comply with F/CMVSS 220 in lieu of F/CMVSS 216, (after 2016 for vehicles with a GVWR of more than 6000 lbs.) it shall maintain a minimum ½" clearance to the raised roof and the modifier must document and label the vehicle according to the exemption under 49 CFR Part 595.7.

## NMEDA Guidelines

Section:	20
Description:	Seats
Revised Date:	January 19, 2012

### 20 SEATS

#### PURPOSE

To outline the intended use and required function of Seats.

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 20.1 Seating systems installed in any vehicle shall be in compliance with applicable FMVSS/CMVSS or Make Inoperative for agencies governed by U.S. law.
- 20.2 Seats and seat bases are limited to those specifically designed for automotive installation.
- 20.3 Seat belt geometry must be maintained within OEM specifications.
- 20.4 Wiring shall conform to Section 6: General Electrical Specifications.
- 20.5 Child Restraint Anchorage Systems: Child restraint anchorage systems shall comply with FMVSS 225 / CMVSS 210.2. For additional information pertaining to proper use and installation methods, refer to the most current edition of "The Latch Manual" available through Safe Ride News Publication, P.O. Box 77327, Seattle WA 98177-0327 Phone: 425 640-5710 / 800 403-1424 Fax: 425 640-5417 [www.saferidenews.com](http://www.saferidenews.com)

## NMEDA Guidelines

Section:	21
Description:	Steering Column Extension
Revised Date:	January 19, 2012

### 21 STEERING COLUMN EXTENSION

#### PURPOSE

To outline the intended use and required function of Steering Column Extensions.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

21.1 The following steering column extension methods are acceptable:

**a. Add-on Post Extension:**

- The use of a spacer made of aluminum or composite material shall have a non-reflective surface to prevent glare. This spacer shall be attached to the original steering column, using specified bolts. Additional distance will be added relative to the distance between the original location of the ignition switch, shift lever and turn signal lever and the steering wheel. Caution: Column extensions add weight. The added weight and leverage applied by a driver can affect the integrity of the OEM column mounting systems.
- All bolts attaching the spacer to the column and the steering wheel shall be tightened to the proper torque specified by the manufacturer and use a fastener locking device such as an automotive grade thread-locking fluid to prevent any loosening of the fastener securing the steering wheel or column.
- The maximum recommended steering wheel extension length is 6".

**b. Integral Column Extension:**

- The integral extension retains the ignition switch, shift lever, and turn signal lever in their original positions relative to the steering wheel.
- The maximum recommended steering column extension is 6".

21.2 The type of steering column extension (i.e. integral column or add-on post extension), as well as the length of such extension shall be specified by the Driver Rehabilitation Specialist, the client and/or the mobility equipment dealer.

21.3 Completed column extensions shall be equivalent to the original equipment steering column for performance, and function. The appearance shall be of acceptable quality. The steering column extension shall not interfere with the normal collapsibility of the steering column as designed by the OEM.

## NMEDA Guidelines

Section:	22
Description:	Steering Wheel Devices
Revised Date:	November 19, 2014

## 22 STEERING WHEEL DEVICES

### PURPOSE

To outline the intended use and required function of Steering Wheel Devices.

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

### REQUIREMENTS

- 22.1 The type of counterbalances and steering device shall be determined by the Driver Rehabilitation Specialist. The location of the steering device will be determined by the Driver Rehabilitation Specialist, client and mobility equipment dealer.
- 22.2 The steering device or attachments and any installed counterbalances shall not interfere with client's ability to view any instrument panel gauge such as speedometer, fuel, etc.as practicable.
- 22.3 The steering device, when installed, shall not interfere with the operation of the air bag system. If interference with operation of the airbag cannot be avoided the airbag should be deactivated while the steering device is in use.
- 22.4 Modifications to steering devices shall be authorized by the Driver Rehabilitation Specialist.
- 22.5 Steering devices shall be quick-release and easily removable by a non-disabled person.

**\*NOTE: For purposes of NMEDA High Tech / Low Tech classifications, a low tech steering device is one that is a mechanical device only with no integrated control of a secondary vehicle control function. High Tech steering devices are any steering devices that meet the requirements of a high tech device as defined in Section 7.1.**

## NMEDA Guidelines

Section:	23
Description:	Transfer Aids
Revised Date:	January 19, 2012

### 23 TRANSFER AIDS

#### PURPOSE

To outline the intended use and required function of Transfer Aids (bars, handles, straps, etc.).

**NMEDA CLASSIFICATION:** Low Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 23.1 Transfer aids shall be attached to a part of the vehicle designed, or reinforced to handle the transfer aid and client load.
- 23.2 Location and size of transfer aids to be determined by Driver Rehabilitation Specialist, client or mobility equipment dealer.
- 23.3 Transfer aids shall be constructed of a durable material designed to handle a minimum weight of 250 lbs or the weight of the individual, whichever is higher.
- 23.4 Transfer aids shall be positioned in a manner as to avoid potential bodily harm.
- 23.5 Transfer aids shall not be installed to interfere with the function of the vehicle's airbag systems.

## NMEDA Guidelines

Section:	24
Description:	Vehicle Steering Column Mounted Accessory Controls
Revised Date:	January 19, 2012

### 24 VEHICLE STEERING COLUMN MOUNTED ACCESSORY CONTROLS

#### PURPOSE

To outline the intended use and required function of Vehicle Column Mounted Accessory Controls.

**NMEDA CLASSIFICATION:** Low Tech\*

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 24.1 Controls, turn signals, horn, headlight dimmer switch, and windshield washer/wiper, shall be independently operable by the driver.
- 24.2 The types and locations of accessory controls and modifications shall be determined by the Driver Rehabilitation Specialist, client and mobility equipment dealer.
- 24.3 The relocation of OEM controls shall not cause interference with any existing controls.

**\*NOTE:** NMEDA high tech / low tech classification: Devices and modifications commonly addressed in this section are, based on the definition presented in Section 7, primarily, low tech, but higher tech devices are sometimes employed to fulfill the functional requirements in this section.



## NMEDA Guidelines

Section:	25
Description:	Unoccupied Lifts
Revised Date:	August 14, 2019

### 25 UNOCCUPIED LIFTS

#### PURPOSE

To outline the intended use and required function of Wheelchair and Scooter Lifting Devices.

**NMEDA CLASSIFICATION:** Low Tech

#### Other Considerations

Vehicle shall meet FMVSS/CMVSS, NHTSA, Transport Canada and all OEM's specifications.

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 25.1 An additional ground shall be added to the appropriate ground point on a vehicle when any type of electrical powered hoist is installed. Refer to General Electrical Specifications, section 6 when contemplating the installation of an additional ground strap.
- 25.2 Receiver hitches and vehicles shall be properly weight-rated to carry an unoccupied hoist and mobility device **and hitches must not be modified to exceed the OEM vehicle rated load capacity.**
- 25.3 The installation of a wheelchair hoist and the mobility device shall not cause the GVWR or GAWR to be exceeded. Please refer to Section 5 for information about hitch receivers and Rear Axle Weight Ratings (RAWR).
- 25.4 Hoists shall be installed as per manufacturer's instructions.
- 25.5 The installation of a wheelchair hoist and the mobility device shall NOT interfere with the essential lighting described in FMVSS/CMVSS 108 such as brake lights, turn signals or running lights. After installation, if the hoist or mobility device does obscure the vehicle lighting, appropriate replacement shall be installed. This is normally available from the hoist OEM.
- 25.6 If after installation, the license plate no longer meets State or Provincial requirements for visibility, it shall be brought into compliance. This may include revisions to the license plate lighting to keep it within FMVSS/CMVSS 108 compliance. The user should be informed that other states/provinces might have differing requirements.
- 25.7 The installation of the wheelchair hoist and the mobility device will cause a vehicle equipped with OEM rear safety sensors to emit an audible "alarm" when the vehicle drive is placed in reverse. The vehicle owner's manual may have methods to turn this off under the "trailer" section instructions. Depending on the OEM, this may need to be performed every time preceding placing the drive into reverse. Others have a vehicle dealership programming tool that lets them disable the audible alarm. The vehicle owner may need to request this.
- 25.8 Vehicles equipped with a rear backup camera to meet FMVSS 111 may find that the camera image is partially blocked by the wheelchair hoist. This is the same situation that occurs with bicycle carriers and when trailering. Appropriate orientation/training is needed for the vehicle driver(s) both when the mobility device is being carried and when the unit is unloaded (usually the platform is folded vertically).

## NMEDA Guidelines

Section:	26
Description:	Wheelchair and Scooter Securement
Revised Date:	November 19, 2014

## 26 WHEELCHAIR AND SCOOTER SECUREMENT

### PURPOSE

To outline the intended use and required function of Wheelchair and Scooter Securements.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

### REQUIREMENTS

- 26.1 Any unoccupied wheelchair securement shall be stable in all manners of normal (lawful, within speed limits, etc.) driving, and if constructed in the shop; be of parts rated at 6000 lb. minimum and any strap components must not lay over the wheelchair arms or traverse sharp edges.
- 26.2 Occupied wheelchair securement systems shall comply with all applicable FMVSS/CMVSS 209 and SAE J2249. Installation shall comply with manufacturer's instructions and shall use all backing plates, fasteners, etc. as indicated and/or supplied by the system manufacturer.
- 26.3 After installing the occupied driver securement position, the wheelchair shall be properly positioned and restrained in the vehicle with minimal motion.
- 26.4 After installing the occupied passenger securement position, the wheelchair should be properly positioned and restrained in the vehicle and tested for motion. The wheelchair should not be able to move more than ½" fore, aft or side to side after applying tension to the system.
- 26.5 Wheelchair securements shall not be attached to any part of the wheelchair designed for easy removal (i.e., foot rest or arm rest), or in the case of a non-rigid frame wheelchair to the cross member of the wheelchair.
- 26.6 Wheelchair securement for use by a wheelchair driver of a motor vehicle shall be operable (into and out of the securement) solely by the driver, without the need of assistance. When the wheelchair is secured in the driver's position, there shall be an audible or visual signal to the driver that assures that the wheelchair is fully secured.
- 26.7 Vehicles equipped with a power transfer seat base shall have a securement for the unoccupied mobility device and be placed in such a position as to allow safe and adequate client transfer. The securement shall be independently operable by the client without the need of assistance and shall be clearly labeled, "For unoccupied use, MUST BE USED WHEN VEHICLE IS IN MOTION". The mobility device shall be adequately secured.
- 26.8 A wheelchair occupant may be secured facing forward or rearward if in compliance with FMVSS 49CFR Subtitle B, paragraph 38.23 for dealers governed by US law. Securement for the passenger(s) shall conform to all other wheelchair securement requirements.
- 26.9 The mobility equipment installer, Driver Rehabilitation Specialist and/or client may add an additional upper torso positioning belt and/or other equipment where necessary to assist in a client's balance and stabilization.
- 26.10 Unless supporting documentation can be obtained and supplied to the end-user to verify scooter has designated securement attachment points and crashworthy seating framework, no installation shall allow an occupant to be transported in, and/or drive from an undocumented three or four-wheel scooter.
- 26.11 All wheelchair seating positions shall be equipped with a lap belt. Shoulder and lap belt systems shall be provided for wheelchair seating position when:

## NMEDA Guidelines

Section:	26
Description:	Wheelchair and Scooter Securement
Revised Date:	November 19, 2014

1. The seating position is adjacent to an exterior vehicle wall.
2. The securement manufacturer's installation instructions require its use.
3. 2011 and newer vehicles require shoulder and lap belt systems in all seating positions.

## NMEDA Guidelines

Section:	27
Description:	Wheelchair Flooring
Revised Date:	November 19, 2014

### 27 WHEELCHAIR FLOORING

#### PURPOSE

To outline the intended use and required function of Wheelchair Flooring.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 27.1 Wheelchair sub-flooring shall provide a smooth surface for attachment of the floor covering.
- 27.2 Sub-floor, adhesive and floor covering material shall comply with FMVSS/CMVSS 302.
- 27.3 Flat steel plates, when used, shall have all edges and surfaces coated with an automotive grade primer, sealer, or paint to prevent corrosion.
- 27.4 All sub-floor material (e.g. plywood or steel) shall be securely fastened to the vehicle ensuring no movement and/or rattles.
- 27.5 The style and type of flooring material will be determined by the client, mobility equipment installer, and Driver Rehabilitation Specialist.
- 27.6 All floor covering shall be securely attached to flooring. All exposed edges shall be secured.
- 27.7 Filling in of any step well, (e.g., drivers, passengers, or side door) should be done in such a way as to maintain the original manufactured intent, including structure, function and appearance. This includes sealing, painting and covering the filled area.

## NMEDA Guidelines

Section:	28
Description:	Power Elevating Platform for Wheelchair Driver
Revised Date:	November 19, 2014

### 28 POWER ELEVATING PLATFORM FOR WHEELCHAIR DRIVER

#### PURPOSE

To outline the intended use and required function of Wheelchair Power Elevating Platform in Driver's Position.

**NMEDA CLASSIFICATION:** Low Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 28.1 The size (i.e., depth, length, width and elevation) of the elevating platform shall be determined by the elevating platform manufacturer in conjunction with the Driver Rehabilitation Specialist and the mobility equipment dealer.
- 28.2 The location of the elevating platform control switch shall be determined by the Driver Rehabilitation Specialist, the client and the mobility equipment dealer. This switch shall be plainly marked as to its function and located to avoid inadvertent use.
- 28.3 The entry and top surface of the elevating platform shall be non-skid material.
- 28.4 The finishing of the complete elevating platform shall be corrosion resistant and consistent with the original automotive finishing.
- 28.5 A quick release removable seat base shall be provided for the elevating platform seating position.
- 28.6 If no compliance statements are available from the elevating platform manufacturer, the mobility dealer must certify the installation in accordance with sections 28.7 or 28.8.
- 28.7 The elevating platform shall be capable of withstanding a load test of at least 20 times the weight of the wheelchair that will be anchored to it when tested as per NMEDA's standard C10, dated August 2011.
- 28.8 There shall be a three point seat belt provided for the wheelchair occupant. If the seat belt is anchored to the elevating platform, it shall be tested as per F/CMVSS 210 in conjunction with the requirements of section 28.7. If the seat belt is anchored to the vehicle floor, it shall be tested as per F/CMVSS 210 independently of the load requirements of section 28.7.

## NMEDA Guidelines

Section:	29
Description:	Back-Up Braking System
Revised Date:	December 16, 2015

### 29 BACK-UP BRAKING SYSTEM

#### PURPOSE

To outline the intended use and required function of Back-Up Braking System.

**NMEDA CLASSIFICATION:** High Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 29.1 Modifications that affect brake application shall have a back-up system. In the case where the driver has physical limitations that do not require modifications to the steering system but that could be the cause of a loss of control in the event of the failure of the OEM power assistance, an assessment shall be made to evaluate the need of a back-up system. An assessment from the CDRS is strongly encouraged.
- 29.2 The back-up braking system shall activate automatically to provide power braking assistance in the event that the vehicle engine stalls or that the OEM power assistance fails. The back-up braking system shall provide the same level of power assistance as designed for the client.
- 29.3 Upon activation, the back-up system shall notify the driver that the system has been activated by giving an audible and visual indication. The notifications shall be located so that the driver can view/hear the indicator while driving.
- 29.4 The back-up braking system shall have the capability to be pre-tested by the client (prior to need) so that they can verify proper operation of the system.
- 29.5 The back-up system shall allow continuous operation when activated.
- 29.6 All hoses, lines and fittings shall be equivalent to OEM specifications and meet or exceed all FMVSS/CMVSS or SAE standards. The dealer shall obtain documentation demonstrating compliance with SAE J2671.
- 29.7 The back-up braking system shall be designed in a manner that in the event that any one component of the back-up braking system fails, the OEM power assistance will not be compromised.
- 29.8 The dealer shall install a highly visible label in the driver's area visible to the vehicle operator that cautions the operator that the vehicle is equipped with a back-up braking system for emergency use only and is not to be used continuously or damage will result.
- 29.9 The installer shall provide a detailed owner's manual to the end-user. The manual should outline how to test the system, any warnings about its operation, maintenance requirements that the systems needs and what to do in the event of a system failure.

## NMEDA Guidelines

Section:	30
Description:	Reduced Effort Hydraulic Steering System & Back-Up Hydraulic Steering System
Revised Date:	December 16, 2015

### 30 REDUCED EFFORT HYDRAULIC STEERING SYSTEM & BACK-UP HYDRAULIC STEERING SYSTEM

#### PURPOSE

To outline the intended use and required function of Reduced Effort Hydraulic Steering System and the Back-Up Hydraulic Steering System.

*\*\*Note: Reduced Effort Electronic Power Steering and Electronic Power Steering Back-Up system is found in Guidelines Section 36.*

**NMEDA CLASSIFICATION:** High Tech\*

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 30.1 Torque Required for Steering: The torque required for steering control should be measured at the top of the steering shaft with vehicle engine running at the factory recommended curb idle rpm with engine warm and air conditioning off. SAE J2672 defines that the torque should be within the range of 4.0 – 15.0 in-lb for steering designated as “low effort steering” (Reduced Effort) and 1.5 – 4.0 in-lb for steering designated as “maximum reduced effort steering” (Zero Effort) when tested with OEM wheels and tires on a dry smooth concrete surface. The equipment manufacturer shall be consulted for the torque range achievable for the specific vehicle (SAE J2672 #3.32).
- 30.2 The dealer shall document final inspection that hydraulic and power lines are properly routed and protected from damage or other deterioration caused by sharp edges, weather, etc.
- 30.3 When zero effort power steering is installed on a vehicle and a steering device is attached to the steering wheel, a counterweight equivalent to the weight of the steering device and any attaching fixture should be added to balance the steering wheel. This counterweight should be mounted on the steering wheel directly opposite (180 degrees away from) the steering device and be removable by a non-disabled driver.
- 30.4 Modifications that affect the steering system shall have a back-up system. In the case where the driver has physical limitations that do not require modifications to the braking system but that could be the cause of a loss of control in the event of the failure of the OEM power assistance, an assessment shall be made to evaluate the need of a back-up system. An assessment from the CDRS is strongly encouraged.
- 30.5 The back-up steering system shall activate automatically to provide power steering assistance in the event that the OEM power assistance fails. The back-up system shall provide the same level of power assistance as the OEM system.
- 30.6 Upon activation the system shall notify the driver that the system is in operation by giving an audible and visual indication. The notifications shall be located so that the driver can view/hear the indicator while driving.
- 30.7 The back-up steering system shall have the capability to be pre-tested by the client (prior to need) so that they can verify proper operation of the system.
- 30.8 The back-up system shall allow for a minimum of 180 seconds of operation when activated.
- 30.9 All hoses, lines and fittings shall be equivalent to OEM specifications. The dealer shall obtain documentation demonstrating compliance of all components with SAE J2672.

## NMEDA Guidelines

Section:	30
Description:	Reduced Effort Hydraulic Steering System & Back-Up Hydraulic Steering System
Revised Date:	December 16, 2015

- 30.10 The installer shall place a highly visible label in the driver's area visible to the vehicle operator that cautions the operator that the vehicle is equipped with a backup steering system for emergency use only and is not to be used continuously or damage will result.
- 30.11 The dealer shall deliver a detailed owner's manual with each unit. The instructions should be specific as to the location and installation of all components of the system. The Manual should outline how to test the system, any warnings about its operation, maintenance requirements that the system needs, and what to do in the event of a system failure.

**\*NOTE: NMEDA classifies this type of system as high tech, since a back-up unit is required, and back-up units meet the NMEDA definition of a high tech device.**



## NMEDA Guidelines

Section:	31
Description:	Electronic Vehicle Interface
Revised Date:	November 08, 2017

### 31 ELECTRONIC VEHICLE INTERFACE

#### PURPOSE

To outline the interfacing between vehicle electrical systems and mobility equipment.

**NMEDA CLASSIFICATION:** High Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 31.1 When installing any controls or devices which involve connecting to the OEM vehicle electrical system, the equipment manufacturer's installation manual applicable to the specific vehicle make, model and year must be followed explicitly and with no deviations. Any deviation must be approved by the equipment manufacturer in writing.
- 31.2 Installation requiring interface to the OEM electronic system will be installed by or supervised by a certified technician as required by the equipment manufacturer.
- 31.3 Electronic vehicle interfacing shall be performed in accordance with NMEDA Guidelines, Section 6 – General Electrical Specifications.
- 31.4 An OEM service manual or online service must be available to provide wiring diagrams and support for all installations involving connections to the OEM electrical system. The information must be specific to the Year, Make, and Model of the vehicle.

## NMEDA Guidelines

Section:	32
Description:	Gear Shifter Operation
Revised Date:	December 16, 2015

### 32 GEAR SHIFTER OPERATION

#### PURPOSE

To outline the intended use and required function of Gear Shifter Operation as well as Standard/Manual Transmission Clutch Controls commonly referred to as a “Duck Clutch”.

**NMEDA CLASSIFICATION:** High Tech\*

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 32.1 A client shall be able to safely and efficiently operate the transmission shift lever to each desired gear position. In the case of a standard transmission, this includes the clutch activation motion ability. The driver rehabilitation specialist, client and/or mobility equipment dealer will determine the type and/or modification.
- 32.2 Gear shifter extensions or crossovers and/or clutch activation device shall be securely attached to the OEM shift lever and shall be operable by the client.
- 32.3 All powered gear shifters and clutch activation devices shall meet or exceed FMVSS/CMVSS 101 and 102 relating to illumination of the shifter icons and the layout and relationships of the icons within the shifter console.
- 32.4 Power gear shifter actuators shall be mounted in accordance with equipment manufacturer's installation instructions.
- 32.5 All automatic transmission gearshift devices shall have an interlock that requires the brake be applied before the transmission can be shifted in or out of park.

**\*NOTE: NMEDA High Tech Classification: All electronic gear selector modifications are classified as NMEDA High Tech.**

## NMEDA Guidelines

Section:	33
Description:	Horizontal Steering System
Revised Date:	January 19, 2012

### 33 HORIZONTAL STEERING SYSTEM

#### PURPOSE

To outline the intended use and required function of Horizontal Steering System.

**NMEDA CLASSIFICATION:** High Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 33.1 The steering wheel position shall be established by the Driver Rehabilitation Specialist, client and mobility equipment dealer. If applicable, the control switches for the unit or any actuator for raising and lowering the steering column shall be specifically located so each driver is able to operate the system within the driver's range of motion and strength. The Driver Rehabilitation Specialist and mobility dealer will locate the switch so as to avoid inadvertent operation with the vehicle is in motion.
- 33.2 Horizontal steering columns shall only be installed per manufacturer's specifications.

## NMEDA Guidelines

Section:	34
Description:	Power Gas and Brake System
Revised Date:	December 16, 2015

### 34 POWER GAS AND BRAKE SYSTEM

#### PURPOSE

To outline the intended use and required function of Power Gas and Brake System.

**NMEDA CLASSIFICATION:** High Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 34.1 Power gas and brake systems shall be installed in accordance with equipment manufacturer's instructions.
- 34.2 The installation shall be performed or supervised by a technician trained and certified by the equipment manufacturer.
- 34.3 All equipment installed shall comply with SAE J2603 and applicable FMVSS/CMVSS standards.
- 34.4 A power gas/brake and control system shall only be installed when recommended by a qualified Driver Rehabilitation Specialist.
- 34.5 Proper position of the control interface shall be determined and positioned by the mobility equipment installer, the Driver Rehabilitation Specialist and client. This may require a follow-up fitting and adjustments. Final fittings should be coordinated with the Driver Rehabilitation Specialist.
- 34.6 Power gas and brake hand controls, when prescribed, shall meet the following requirements:
  - The power gas and brake system shall have a backup system, which automatically engages in the event of a power failure in the primary system (i.e. engine failure, belt slippage/breakage, or engine vacuum loss).
  - The power gas and brake backup system shall give an audible and visual warning when activated.
- 34.7 When an accelerator/brake pneumatic system is prescribed:
  - All pneumatic lines shall be routed within the vehicle and protected from damage or other deterioration caused by sharp edges, weather, etc.
- 34.7 All connections must meet General Electrical Specifications as stated in Section 6.

## NMEDA Guidelines

Section:	35
Description:	Reduced Effort Braking System
Revised Date:	January 19, 2012

### 35 REDUCED EFFORT BRAKING SYSTEM

#### PURPOSE

To outline the intended use and required function of Reduced Effort Braking System.

**NMEDA CLASSIFICATION:** High Tech\*

#### REQUIREMENTS

- 35.1 Reduced effort braking is a modification to the OEM power assistance system that decreases the amount of effort required to depress the brake pedal. The amount of reduction is classified as either "Low Effort" or "Zero Effort". Low effort is a modification that reduces the braking effort to 7-11 pounds of force applied on the brake pedal. Modifications shall comply with SAE J2671. A zero effort modification reduces the braking force to below 7 pounds of force applied on the brake pedal. The level of reduced effort braking will be determined and specified by a Driver Rehabilitation Specialist.

**\*NOTE:** NMEDA classifies this type of system as high tech, since a back-up unit is required, and back-up units meet the NMEDA definition of a high tech device.

## NMEDA Guidelines

Section:	36
Description:	Reduced Effort Electronic Power Steering System Electronic Power Steering Back-Up System
Revised Date:	December 16, 2015

### 36 REDUCED EFFORT ELECTRONIC POWER STEERING SYSTEM ELECTRONIC POWER STEERING BACK-UP SYSTEM

#### PURPOSE

To outline the intended use and required function of a Reduced Effort Electronic Power Steering System and the Electronic Power Steering Back-Up System.

*\*\*Note: Reduced Effort Hydraulic Steering and Hydraulic Power Steering Back-Up system is found in Guidelines Section 30.*

**NMEDA CLASSIFICATION:** High Tech

**Definition: (See Appendix C)**

#### REQUIREMENTS

- 36.1 Modifications that affect the steering system shall have a back-up power source.
- 36.2 The backup power source for electronic power steering systems shall remain isolated from the OEM battery until needed and shall activate automatically in the event the OEM power source fails.
- 36.3 Upon activation the system shall notify the driver that the system is in operation by giving an audible and visual indication. The notifications shall be located so that the driver can view/hear the indicator while driving.
- 36.4 The back-up power source shall have the capability to be pre-tested by the client (prior to need) so that they can verify proper operation of the system.
- 36.5 The back-up power source shall allow for a minimum of 180 seconds of operation when activated.
- 36.6 All cables, connectors, electronic components, printed circuit boards (PCB) and fittings shall be equivalent to OEM specifications. The dealer shall obtain documentation demonstrating compliance of all components with SAE J2672, SAE J1113, as well as ISO standards.
- 36.7 The installer shall place a highly visible label in the driver's area visible to the vehicle operator that cautions the operator that the vehicle is equipped with a backup power source for the steering system intended for emergency use only and is not to be used continuously.
- 36.8 The dealer shall deliver a detailed owner's manual with each unit. The instructions should be specific as to the location and installation of all components of the system. The Manual should outline how to test the system, any warnings about its operation, maintenance requirements that the system needs, and what to do in the event of a system failure.

## NMEDA Guidelines

Section:	37
Description:	Remote Steering System (Digital, Electronic and Mechanical / Hydraulic)
Revised Date:	November 19, 2014

### 37 REMOTE STEERING SYSTEM (DIGITAL, ELECTRONIC AND MECHANICAL / HYDRAULIC)

#### PURPOSE

To outline the intended use and required function of Remote Steering Systems.

**NMEDA CLASSIFICATION:** High Tech

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 37.1 All remote steering systems shall be installed in accordance with the equipment manufacturer's instructions.
- 37.2 Installation and service shall be performed or supervised by a technician trained and certified by the equipment manufacturer.
- 37.3 All systems installed shall be in compliance with FMVSS/CMVSS regulations, SAE J2588, and applicable Provincial, state and Federal standards and guidelines.
- 37.4 A remote steering system shall only be installed when recommended by a qualified Driver Rehabilitation Specialist recognized by the equipment manufacture.
- 37.5 The mobility equipment dealer, the driver rehabilitation specialist, and the client shall determine proper mounting location of the input control device. Multiple fittings may be required.
- 37.6 All mounting systems for the input control device shall be designed and installed so that they will remain stable throughout the entire life cycle of the equipment.
- 37.7 All mounting systems for input control devices shall be free of sharp edges, corrosion resistant and coated in an automotive finish.
- 37.8 Mechanical/hydraulic foot steering requires low effort with backup unless further reduction is requested by the evaluator (see Section 36.4).It is recommended that whenever possible a guard should be installed.
- 37.9 Labeling requirement: A label stating "This vehicle is equipped with foot steering and should only be driven by a driver trained in the proper use of the equipment." must be applied to the vehicle.

## NMEDA Guidelines

Section:	38
Description:	Secondary Control / System
Revised Date:	January 19, 2012

### 38 SECONDARY CONTROL / SYSTEM

#### PURPOSE

To outline the intended use and required function of Secondary Control/Systems.

**NMEDA CLASSIFICATION:** High Tech\*

**Definition:** (See Appendix C)

#### REQUIREMENTS

- 38.1 The type of device and switch arrangement location shall be determined by the driver rehabilitation specialist, mobility equipment dealer/manufacturer, and driver.
- 38.2 The installation of the controls shall include an interim and final client fitting. The mobility equipment dealer, driver rehabilitation specialist and driver shall determine the location of the controls and determine specific adjustments as required.
- 38.3 Installation of the controls shall assure the greatest possible retention of OEM driver and occupant protection features including collapsible steering column, knee bolsters and airbags.
- 38.4 The installation shall permit vehicle operation by a non-disabled driver.
- 38.5 The installation shall follow NMEDA General Electrical Specifications (NMEDA Guideline Chapter 6).
- 38.6 Installation of controls shall include a thorough inspection of the vehicle prior to drilling and/or fastening device components. The inspection shall ensure the device fasteners do not rub, chafe or otherwise compromise the vehicle brake lines, fuel lines, vehicle wiring or hoses.
- 38.7 All controls shall be of a type and style so as not protrude and risk injury to a driver and/or passenger.
- 38.8 All switch functions shall be labeled for function and direction of operation.
- 38.9 The installation shall prevent inadvertent operation of controls by the driver and by a non-disabled driver.
- 38.10 All warning and instructional labels supplied by the adaptive equipment manufacturer shall be placed as instructed.

**\*NOTE:** NMEDA High Tech/Low Tech Classification: With the exception of simple mechanical modifications to OEM secondary vehicle control systems, nearly all modifications to secondary vehicle control systems would be classified as NMEDA High Tech according to the NMEDA High Tech / Low Tech definition in section 7.



## NMEDA Guidelines

Section:	39
Description:	Interlocks
Revised Date:	December 19, 2013

### 39 INTERLOCKS

#### PURPOSE

The purpose of the interlock is to activate or deactivate specific vehicle and mobility equipment functions.

**NMEDA CLASSIFICATION:** High Tech / Low Tech

**Definition: (See Appendix C for High Tech and Low Tech definitions)**

#### REQUIREMENTS

- 39.1 Interlocks shall be vehicle specific.
- 39.2 Installation must meet the requirements of Section 6 – General Electrical Specifications if applicable.
- 39.3 The interlock shall meet or exceed specifications set forward by the adaptive equipment manufacturer and/or the Original Equipment Manufacturer.

## NMEDA Guidelines

Section:	40
Description:	Off-Site Installation and Servicing Policy
Revised Date:	June 02, 2016

### 40 OFF-SITE INSTALLATION AND SERVICING POLICY

#### PURPOSE

To provide the tools, equipment, and personnel necessary for safe installations and/or service of mobility equipment that meet all functional requirements of the QAP Rules and NMEDA Guidelines in locations other than the dealer's NMEDA accredited permanent shop facility. This policy applies to all NMEDA dealers in good standing that are accredited as Off-Site Installers. These installations are limited to low-tech category. These installations exclude primary and secondary driving controls, high-tech, and structural modifications.

**Definitions: (See Appendix C)**

#### REQUIREMENTS

##### Policy:

- 40.1 The requirements for the off-site installer are defined herein. If there are any variations, they will be listed as an Addendum.

##### Personnel:

- 40.2 Two people are required for all installations. This is for safety reasons as well as to provide oversight of installs, assist with heavy lifting, and to perform final inspection. At least one of the technicians shall be certified for the product(s) being installed and/or serviced.
- 40.3 One person is sufficient if performing repairs or service only and no heavy lifting is involved. The technician must be certified on the product being serviced.
- 40.4 Personnel must be competent to complete documentation as required and demonstrate equipment use, backup procedures, and safety systems to the client as necessary.

##### Mobile Unit (Vehicle):

- 40.5 There shall be a vehicle used for off-site installations with the capability to safely transport all tools and equipment required with a separate area for tools/equipment and sufficient GVWR to accommodate all necessary payload.
- 40.6 The vehicle must have the ability to heat the area inside the vehicle above freezing where tools are stored to keep them at a workable condition.
- 40.7 The vehicle shall be registered to the dealer and have current insurance and meet all federal, state or provincial laws.

##### Tools/Equipment:

Each mobile unit shall be outfitted with tools and equipment appropriate for the installation or service being provided. The following is a list of tools, equipment, and documents that will be provided.

##### Required:

- 40.8 Reference materials (installation/troubleshooting manuals) in digital or paper form (paper preferred).
- 40.9 MSDS for chemicals carried.
- 40.10 Standard PPE (as required by employer/State/Province).

## NMEDA Guidelines

Section:	40
Description:	Off-Site Installation and Servicing Policy
Revised Date:	June 02, 2016

- 40.11 First Aid Kit.
- 40.12 Wheel Chocks.
- 40.13 Work light(s).
- 40.14 Four-corner scales.
- 40.15 Cell Phone for case of emergency
- 40.16 Full complement standard shop hand tools (wrenches, screwdrivers, socket sets, pliers, cutters, wire strippers, crimping tools, etc.)
- 40.17 Torque wrenches.
- 40.18 Multi-meter.
- 40.19 Shop supplies: wire, connectors, heat shrink, heat gun (torch), tie wraps, fuses, tape, sealant, lubricant.

### **Optional (as necessary for the work to be performed):**

- 40.20 Soldering gun/iron.
- 40.21 Power source (generator) for soldering tools, lights, compressor, etc. as necessary.
- 40.22 Air tools & relevant attachments.
- 40.23 Labeler of some kind (for wiring).
- 40.24 Floor jack & jack stands.
- 40.25 Lifting and/or positioning device (for heavy equipment)
- 40.26 Trim removal tools.

### **Documentation and Labeling:**

- 40.27 Customer/QAP documentation – and ability to complete this (electronically or on paper) in accordance with Guidelines Section 2, and QAP Rules.
- 40.28 Make Inoperative form.
- 40.29 Photographic evidence:  
Photos are required only for new installations. The following minimum photographs are required. Photos can be stored in the customer file or electronically and shall be made available on request.
  - 40.29.1 Work site (shows working conditions)
  - 40.29.2 Vehicle/product before installation (showing area that equipment will be installed).
  - 40.29.3 Vehicle/Product after installation (showing product that has been installed).
  - 40.29.4 Whenever a vehicle is weighed on four-corner scales a photo shall be taken to show the scale pad placement and surface conditions. One angle is acceptable that shows the entire vehicle in the frame with the pads under the tires.
  - 40.29.5 Any special quality control points called out in the mobility equipment manufacturers instructions (as necessary).
- 40.30 Customer file shall be clear that the job was an off-site installation/service.

## NMEDA Guidelines

Section:	40
Description:	Off-Site Installation and Servicing Policy
Revised Date:	June 02, 2016

- 40.31 Customer shall signoff the acceptance document stating that they are satisfied with the installation and/or service provided.

### Environmental Considerations:

- 40.32 The technician shall assess that the ambient and working conditions and that the location is acceptable to perform the installation and/or servicing in accordance with all applicable NMEDA Rules, Guidelines, and tool manufacturer recommendations.
- 40.33 Installation shall not proceed in inclement weather conditions that jeopardize the technician's safety or the technician's ability to complete the installation in a safe manner.
- 40.34 Tents, canopies, or other outdoor provisions that help protect the work area from weather or other safety concerns are recommended when conditions warrant.
- 40.35 When four-corner scales are used to weight the vehicle per the QAP Rules and Guidelines, the scale must be on an appropriate flat surface and in accordance with the scale manufacturers operation instructions.

### Records:

- 40.36 All records are retained by the dealer in the customer file for not less than seven (7) years in accordance with the QAP Rules.

### Addendums:

Addendum 40A – Exterior Hitch Mounted Lifts

## NMEDA Guidelines

Section:	40A
Description:	Off-Site Installation and Servicing Policy Addendum- Exterior Hitch Mounted Lifts
Revised Date:	April 26, 2017

### 40A OFF-SITE INSTALLATION AND SERVICING POLICY ADDENDUM-EXTERIOR HITCH MOUNTED LIFTS

#### PURPOSE

This addendum applies only to exterior, removable, hitch mounted lifts that have been approved for use on the client's vehicle by the lift manufacturer (application tool or similar).

#### USING THIS ADDENDUM

Follow all the requirements of Section 40 with any exceptions noted in Section A. Additional requirements are also defined in Section B of this addendum.

##### A. Exceptions:

Refer to Section 40 and replace with text shown where applicable.

##### Section 40 – Personnel

One person is acceptable to install the lift as long as the manufacturers installation instructions are followed and the person performing the installation has completed training and has been certified by the manufacturer.

##### Section 40 – Required Tools and Equipment

A calibrated Trailer Tongue Scale\*\* may be used in place of the required Four-Corner Scale if no other non-OEM equipment has been installed in the vehicle that could affect the GVWR, GAWR, or available load carrying capacity.

\*\* If Trailer Tongue Scale is used, refer to QAP-110 [NMEDA Tongue Weight Scale Instructions] for instructions on how to use the scale. QAP-110 can be found on the Document Control section of the NMEDA website.

##### B. Additional Requirements:

##### B.1 Section Weight Analysis

- B.1.1 Prior to installation, the technician shall verify the Tongue Weight Rating (TWR) of the client's vehicle is sufficient to accommodate the hitch lift to be installed and that the hitch is the appropriate size, capacity, and class.
- B.1.2 Each installation shall be photographically documented showing that the installation of the lift with the mobility device installed does not exceed the vehicle's Tongue Weight Rating (TWR) which is typically found in the vehicle's owner's manual. If the client's mobility aid is not available, an equivalent weight dunnage is permissible. The preferred method is to use a calibrated four-corner scale to verify that the Gross Vehicle Weight Rating (GVWR) and Front and Rear Gross Axle Weight Ratings (FGAWR and RGAWR) have not been exceeded. Alternative calibrated and traceable scale methods such as Trailer Tongue scale are permissible but then documentation is required that there are no other "non OEM" equipment installed that could change the Gross Axle Weights of the vehicle.
- B.1.3 If any one of the weight ratings are exceeded the lift shall be uninstalled and returned to the dealer for disposition.
- B.1.4 All weight measurements shall be recorded and retained in the customer file.

##### B.2 Photographic Evidence

- B.2.1 Photographs may be stored electronically or printed. All photographs shall be retained in the customer file.

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B.2.2 Photos are taken after installation is complete with the client's mobility aid mounted and secured on the lift.

B.2.3 The following photographs (at a minimum) are required for all installations: \*\*see examples

B.2.3.1 Straight on view.

B.2.3.2 Side view.

B.2.3.3 Forty-five (45°) degree angle view.

B.2.3.4 Positive (+) power source termination.

B.2.3.5 Negative (-) power source termination.

B.2.3.6 Loom and routing.

B.2.3.7 Wiring over rear axle.

B.2.3.8 Scale reading.

### B.3 Inspection Requirements

B.3.1 In addition to the technician self-inspection, a quality inspection shall be accomplished at the dealer's facility using the photographic evidence by no later than the end of the next business day.

B.3.2 If any anomalies are found during inspection, the client shall be notified immediately and rework (as warranted) shall be scheduled.

B.3.3 The quality inspection shall be documented, signed and dated by the inspector (electronic signature and filing methods are acceptable).

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Example photos for exterior hitch lift installations:

Straight on view	Side view
	
Forty-five (45°) degree angle view	Wiring over rear axle
	
Positive (+) power source termination	Negative (-) power source termination
	

## NMEDA Guidelines

Section:	41
Description:	Hybrid / Electric Vehicle
Revised Date:	November 28, 2018

### 41 HYBRID / ELECTRIC VEHICLE

#### PURPOSE

To provide guidelines when modifying or installing mobility equipment in hybrid or all electric vehicles. This section does not include instructions or guidelines for structural modifications.

#### Definitions:

Based on the foundation of SAE J1715 "Hybrid Electric Vehicle (HEV) and Electric Vehicle (EV) Terminology"

**Hybrid** – A vehicle equipped with two or more energy storage systems, both of which must provide propulsion power either independently or together. Typically, one of these energy storage systems powers an internal combustion power-plant.

**Electric**– A vehicle whose power-plant is solely powered by an electrochemical energy storage system(s). There are a wide variety of storage systems and charging systems.

#### SAFETY PRECAUTIONS:

Hybrid and Electric vehicle systems are very different from traditional Internal Combustion vehicles and have many variations. Before any accessory is added or service is performed to these systems, an understanding of the vehicle's power-plant and vehicle OEM service guidance is strongly encouraged. Vehicle OEM or recognized service training classes from SAE or ASE are recommended BEFORE attempting any propulsion or controls modifications. Working with hybrid and electric vehicles may require changes in the normal operation of the Dealer Service/Installation in such things as new dangers that shops had not experienced:

- 41.1 Safety training is a key to safely servicing or modifying the vehicle.
- 41.2 Moving a hybrid vehicle or EV around the shop environment is significantly quieter and much more dangerous to those working in the environment. In comparison the standard IC engine currently makes significant noise, so team members may not hear an EV or hybrid being moved. Electric vehicles are silent when operated, so there's a risk that people would be unaware of planned or unexpected movements.
- 41.3 Electric vehicles may also move unexpectedly on their own unless the Power Propulsion Key is removed.
- 41.4 The battery location on the vehicle may require new lifting methods for the batteries and may require communicating with the component/vehicle manufacturer.
- 41.5 High voltage components and cables are capable of delivering a fatal electric shock. Some Hybrid and electric vehicles have energy storage systems in excess of 650 volts, anything over 150 volts can cause serious injury and or death.
- 41.6 Electric vehicles and hybrid vehicles have uniquely stored electrical energy with the potential to cause explosion or fire. Explosive gases and harmful liquids can be released if batteries are damaged, overcharged or incorrectly modified.
- 41.7 Components can hold a dangerous voltage even when vehicles are "off". It is critical to find the Power Propulsion Key on the vehicle and remove this before any work is started.
- 41.8 Caution should be exercised for unexpected movement of electric motors or the vehicle itself, due to stored magnetic forces within the vehicle and its systems.
- 41.9 High-voltage batteries can be heavy, bulky and awkward to handle components, several times heavier than conventional batteries, so lifting aids and devices may be required to prevent musculoskeletal disorders.



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- 41.10 Hybrid vehicles can start their internal combustion engine automatically when the ignition is on and the vehicle detects that the battery has discharged to a level at which recharging is necessary.
- 41.11 High electric currents in batteries and high-voltage systems in electric vehicles can cause magnetic fields, which can induce eddy currents in the human body. Risks arising from electromagnetic fields are, therefore, potentially dangerous for mechanics and others with active implants such as cardiac pacemakers.
- 41.12 Hybrid and electric vehicles often take advantage of low rolling resistant tires and energy efficient systems that have different operational guidance that installers and service technicians trained on more traditional vehicles may not be familiar with.

### REQUIREMENTS

#### 41.13 Charging Systems:

A wide variety of charging systems and energy storage systems are involved with little industry standardization. No modification to these systems should be performed unless at the explicit direction of the manufacture who has supplied all needed parts and guidance.

#### 41.14 Backup and Accessory Power Systems:

Many hybrids and electric vehicles run all the accessory functions and many secondary controls off of a 12 volt or 24 volt auxiliary power system. Many of these auxiliary systems are sized only for these operations. These are often found in non- traditional locations in the vehicle. The equipment manufacture should supply information if drawing power from these systems is appropriate and the installer should follow all the guidelines. Care must be taken to verify that circuit breaker and or fuse protection to the system are appropriately labeled and to train the end users as to location and operation.

### INSTALLATION CONCERNS:

- 41.15 Follow the vehicle and equipment manufacturers explicit installation instructions for the make and model of the vehicle. Due to the large variants in vehicle design, if the manufacturer's instructions do not cover the vehicle type and model, contact the manufacturer for guidance.
- 41.16 Special Care is needed when working around the propulsion systems not to compromise the integrity. Doing so can cause severe property damage, injury or death. This is especially true when drilling into blind areas of the vehicle.

### WEIGHT DISTRIBUTION [INC. LOAD CARRYING CAPACITY]:

- 41.17 Weight distribution is more critical in a hybrid or electric vehicle due to the unique energy reclamation systems using the brakes. Hybrids and electric vehicles often take advantage of regenerative braking to do most of the stopping, which also replenishes the energy storage system. An out of balance vehicle can affect the handling controls and stability of the vehicle as well as have unintended consequences when "braking".
- 41.18 Following the Vehicle OEM listed weight distribution guidelines is critical.
- 41.19 Training the end users about weight distribution requirements when carrying their mobility equipment is very important.

### HIGH VOLTAGE VS. LOW VOLTAGE SYSTEMS:

- 41.20 Any system that is over 60Vdc up to and including 1500 Volts is considered HIGH VOLTAGE. No modification to a high voltage system should be performed.
- 41.21 48-volt vehicle systems are considered "Mild Hybrids".

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41.22 Systems under 40 Volts are considered Low Voltage Systems.

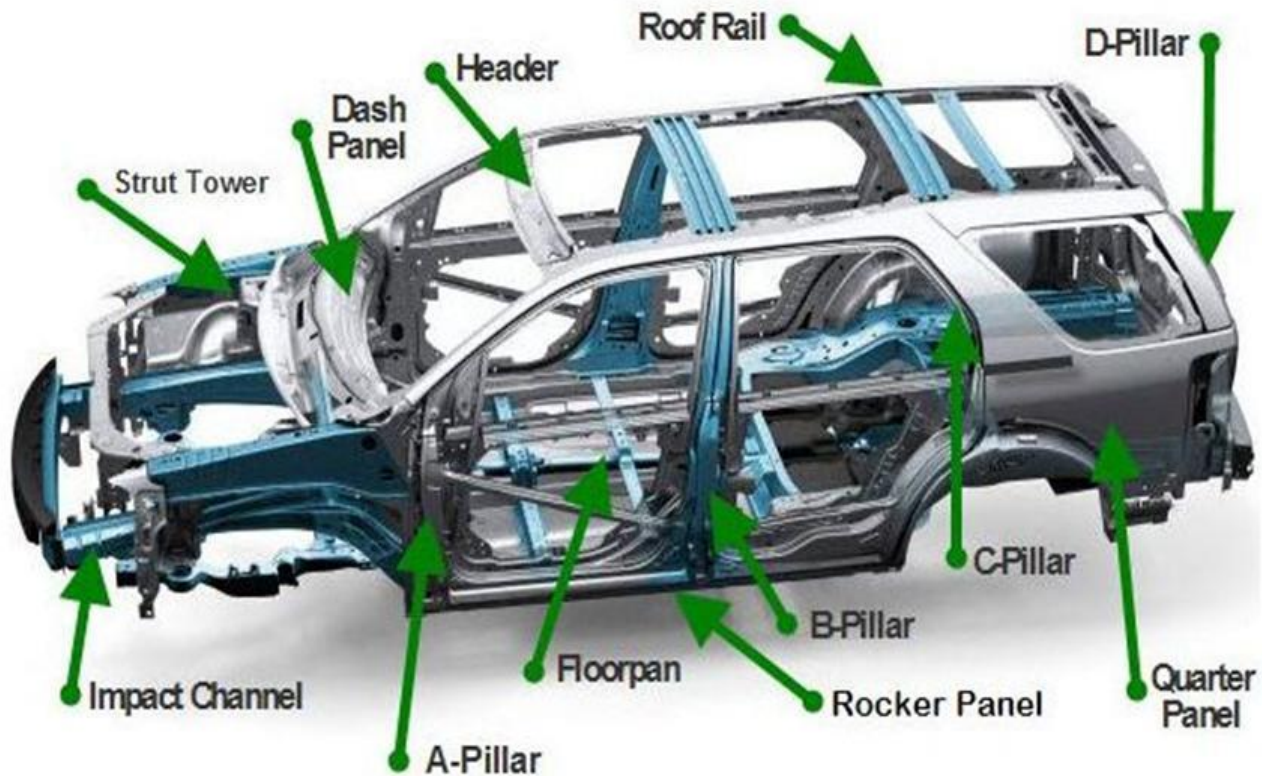
### **F/CMVSS 305 [Electric-powered vehicles: electrolyte spillage and electrical shock protection]:**

41.23 There is no exemption under the 49 CFR Part 595 “Make Inoperative Exemptions” for Federal Motor Vehicle Safety Standard (F/CMVSS) 305, so no installation or service may modify any part of the vehicle safety system specified under F/CMVSS 305.

Illustration Section	
Revised Date:	January 19, 2012

ILLUSTRATION SECTION

## MINI-VAN BODY TERMINOLOGY



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Key References	
Revised Date:	November 19, 2014

### KEY REFERENCES

- 1 ADED -The Association for Driver Rehabilitation Specialists – The professional organization for persons working in the specialized field of driver rehabilitation, driver training and adaptive vehicle equipment evaluation for persons with disabilities.  
  
[www.aded.net](http://www.aded.net)  
  
1-866-672-9466 Toll Free (US/CA)
- 2 AWS - American Welding Society – To advance the science, technology and application of welding and related disciplines.  
  
[www.aws.org](http://www.aws.org)  
  
1-800-443-9353 or 305-443-9353
- 3 FMVSS/CMVSS – Federal Motor Vehicle Safety Standards - Regulations to which manufacturers of motor vehicle and equipment items shall conform and certify compliance.  
  
US Standards: [www.nhtsa.dot.gov/cars/rules/standards](http://www.nhtsa.dot.gov/cars/rules/standards)  
  
1-888-327-4236  
  
Canadian Standards:  
  
[http://www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/regulations/mvsrg/toc\\_mvsg.htm](http://www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/regulations/mvsrg/toc_mvsg.htm)  
  
613-990-2309
- 4 NHTSA – National Highway Traffic Safety Administration – The Federal government agency with the authority to regulate the manufacture of automotive adaptive equipment and modified vehicles used by persons with disabilities.  
  
[www.nhtsa.dot.gov/cars/rules/adaptive](http://www.nhtsa.dot.gov/cars/rules/adaptive)  
  
1-888-327-4236      Auto Safety Hotline
- 5 NMEDA – National Mobility Equipment Dealers Association -Trade association of mobility equipment dealers that provide vehicle modifications and equipment installation, manufacturers of equipment, driver rehabilitation specialists, and other professionals dedicated to broadening the opportunities for people with disabilities to drive or be transported in modified vehicles.  
  
[www.nmeda.com](http://www.nmeda.com)  
  
1-800-833-0427
- 6 QAP – Quality Assurance Program -The Quality Assurance Program is a recognized accreditation program for the mobility equipment industry. The program was developed by NMEDA to promote quality, safety, and reliability within the industry.  
  
[www.nmeda.com/quality-assurance-program/](http://www.nmeda.com/quality-assurance-program/)  
  
1-800-833-0427
- 7 SAE – Society of Automotive Engineers – Professional network of engineers and professionals who share information for advancing the engineering in the automotive industry. The Adaptive Devices Standards Committee develops information reports, recommended practices and standards for automotive adaptive equipment.

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[www.sae.org](http://www.sae.org)

1-724-776-0790 Customer Service

- 8 Transport Canada – The Canadian government agency with the authority to regulate the manufacture of automotive adaptive equipment and modified vehicles used by persons with disabilities.

[www.tc.gc.ca](http://www.tc.gc.ca)

1-800-333-0371 Road Safety Inquiries

## NMEDA Guidelines

Appendix A	Title 49 Code of Federal Regulations Part 571, Summary Description of FMVSS / CMVSS
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### APPENDIX A, TITLE 49 CODE OF FEDERAL REGULATIONS PART 571, DESCRIPTION OF FMVSS / CMVSS

#### PURPOSE

To outline Federal/Canada Motor Vehicle Safety Standards that is more likely to be affected by mobility modification.

#### SCOPE

The NMEDA Guidelines are intended for use by the mobility equipment industry. NMEDA Guidelines do not supersede Federal, State or Provincial Laws and Guidelines or mobility equipment manufacturers' installation procedures; the more stringent will prevail.

#### REQUIREMENTS

##### Crash Avoidance:

**FMVSS/CMVSS No. 101** - Controls and Displays - This standard requires that essential controls be located within reach of the driver when the driver is restrained by a lap belt and upper torso restraint, and that certain controls mounted on the instrument panel be identified.

**FMVSS/CMVSS No. 102** - Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses - This standard specifies the requirements for the transmission shift lever sequence, a starter interlock, and for a braking effect of automatic transmissions, to reduce the likelihood of shifting errors, starter engagement with vehicle in drive position, and to provide supplemental braking at speeds below 40 km/h (25 mph).

**FMVSS/CMVSS No. 103** - Windshield Defrosting and Defogging Systems - This standard specifies requirements for windshield defrosting and defogging systems to ensure that each vehicle shall have a windshield defrosting and defogging system which operates either by applying heat to the windshield or by dehumidifying the air inside the passenger compartment of the vehicle. Application: Passenger cars, multipurpose passenger vehicles, trucks, and buses.

**FMVSS/CMVSS No. 104** - Windshield Wiping and Washing Systems - This standard specifies requirements for the windshield wiping and washing systems. The purpose of this standard is to ensure that the windshield wiping and washing system shall wipe the specified percentage area of the windshield, with at least two frequencies or speeds. Application: Passenger cars, multipurpose passenger vehicles, trucks, and buses.

**FMVSS/CMVSS No. 105** - Hydraulic and Electric Brake Systems - This standard specifies requirements for vehicles equipped with hydraulic and electric service brake systems and associated parking brake systems to ensure safe braking performance under normal conditions and emergency conditions.

**FMVSS/CMVSS No. 106** - Brake Hoses - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles, and Hydraulic, Air, and Vacuum Brake Hose, Brake Hose Assemblies, and Brake Hose End Fittings for use in those vehicles. This standard establishes performance and labeling requirements for hydraulic, air, and vacuum brake hoses, brake hose assemblies, and brake hose fittings for all motor vehicles. The purpose of this standard is to reduce brake system failure from pressure or vacuum loss due to hose or hose assembly rupture.

**FMVSS/CMVSS No. 108** - Lamps, Reflective Devices, and Associated Equipment - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, (except pole trailers and trailer converter dollies), and Motorcycles. This standard specifies requirements for original and replacement lamps, reflective devices, and associated equipment. Its purpose is to reduce traffic crashes and deaths and injuries resulting from traffic crashes, by providing adequate illumination of the roadway, and by enhancing the conspicuity of motor vehicles on the public roads so that their presence is perceived and their signals understood, both in daylight and in darkness or other conditions of reduced visibility.

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**FMVSS/CMVSS No. 110 - Tire Selection and Rims** - This standard specifies requirements for tire selection and vehicle labeling of tire and load carrying capacity information to prevent overloading. Application: Except for motorcycles, this standard applies to motor vehicles with a GVWR of 4,536 kg (10,000 lb) or less, and to non-pneumatic spare tire assemblies for passenger cars.

**FMVSS/CMVSS No. 111 - Rearview Mirrors** - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, School Buses and Motorcycles. This standard specifies requirements for the performance and location of inside and outside rearview mirrors. Its purpose is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

**FMVSS/CMVSS No. 114 – Theft Protection and Rollaway Prevention** – Passenger cars, Multipurpose Passenger Vehicles and Trucks with a GVWR of 4,536 kg (10,000 lbs) or less. This standard specifies vehicle performance requirements intended to reduce the incidence of crashes resulting from theft and accidental rollaway of motor vehicles.

**FMVSS/CMVSS No. 118 - Power Operated Window, Partition and Roof Panel Systems** – Passenger Cars, Multipurpose Passenger Vehicles and Trucks with a GVWR of 4,536 kg (10,000 lb) or less. This standard specifies the requirements for power operated window, partitions and roof panel systems to minimize the likelihood of death or injury from their accidental operation.

**FMVSS/CMVSS No. 119 - New Pneumatic Tires** - Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles. This standard establishes performance and marking requirements for tires for use on multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles. Its purpose is to provide safe operational performance levels for tires used on motor vehicles other than passenger cars, and to place sufficient information on the tires to permit their proper selection and use.

**FMVSS/CMVSS No. 120 - Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars** - Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles, to Rims for use on those vehicles, and to Non-Pneumatic Spare Tire Assemblies for use on those vehicles. This standard specifies tire and rim selection requirements and rim marking requirements. Its purpose is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size, type designation, and manufacturer identification.

**FMVSS/CMVSS No. 123 – Motorcycle Controls and Displays** – Motorcycles with handlebars. The purpose of this standard is to minimize accidents caused by operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

**FMVSS/CMVSS No. 124 - Accelerator Control Systems** - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses. This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes his or her foot from the accelerator control or in the event of a severance or disconnection in the accelerator control system.

**FMVSS/CMVSS No. 135 - Light Vehicle Brake Systems**- This standard specifies equipment and performance requirements for service brakes and for parking brake systems. The purpose of this standard is to ensure safe braking performance under normal and emergency driving conditions. Application: Passenger cars, multipurpose passenger vehicles, trucks, and buses with a GVWR of 3,500 kg (7,716 lb) or less.

**FMVSS/CMVSS No. 201 - Occupant Protection in Interior Impact** - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with a GVWR of 4,536 kg (10,000 lb) or less. This standard specifies performance requirements to provide head impact protection for occupants.

### Crashworthiness:

**FMVSS/CMVSS No. 202 (a) – Head Restraints** This standard specifies performance and other head restraint requirements for purposes of reducing whiplash injuries. For front seats, the expanded rule establishes a higher minimum height requirement, a requirement limiting the distance between the back of an occupant's head and the occupant's head restraint, as well as a limit on the size of gaps and openings within head restraints. The expanded rule also establishes new strength and dynamic compliance requirements, and amends most existing test

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procedures. In addition, the rule establishes requirements for head restraints voluntarily installed in rear outboard designated

seating positions. The upgraded standard becomes mandatory for all vehicles manufactured on or after September 1, 2008. Until that time, the manufacturers may comply with the existing NHTSA standard, the upgraded NHTSA standard or the current European regulations.

**FMVSS/CMVSS No. 203** - Impact Protection for the Driver from the Steering Control System - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with a Gross Vehicle Weight Rating of 4,536 kg (10,000 lbs.) or less. This standard specifies requirements for minimizing chest, neck, and facial injuries by providing steering systems that yield forward, cushioning the impact of the driver's chest by absorbing much of his or her impact energy in front-end crashes. Such systems are highly effective in reducing the likelihood of serious and fatal injuries.

**FMVSS/CMVSS No. 204** - Steering Control Rearward Displacement - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with Unloaded Vehicle Weight (UVW) of 2,495 kg (5,500 lbs.) or less. Walk-in Vans are excluded. This standard specifies requirements limiting the rearward displacement of the steering column into the passenger compartment to reduce the likelihood of chest, neck, or head injuries.

**FMVSS/CMVSS No. 206** - Door Locks and Door Retention Components - Passenger Cars, Multipurpose Passenger Vehicles, and Trucks. This standard specifies requirements for side door locks and side door retention components including latches, hinges, and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.

**FMVSS/CMVSS No. 207** - Seating Systems - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses. This standard establishes requirements for seats, attachment assemblies, and installation, to minimize the possibility of failure as a result of forces acting on the seat in vehicle impact.

**FMVSS/CMVSS No. 208** - Occupant Crash Protection This standard originally specified the type of occupant restraints (i.e., seat belts) required. It was amended to specify performance requirements for anthropomorphic test dummies seated in the front outboard seats of passenger cars and of certain multipurpose passenger vehicles, trucks, and buses, including the active and passive restraint systems identified below. The purpose of the standard is to reduce the number of fatalities and the number and severity of injuries to occupants involved in frontal crashes.

**FMVSS/CMVSS No. 209** - Seat Belt Assemblies - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses. This standard specifies requirements for seat belt assemblies. The requirements apply to straps, webbing, or similar material, as well as to all necessary buckles and other fasteners and all hardware designed for installing the assembly in a motor vehicle, and to the installation, usage, and maintenance instructions for the assembly.

**FMVSS/CMVSS No. 210** - Seat Belt Assembly Anchorages - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses. This standard establishes requirements for seat belt assembly anchorages to ensure proper location for effective occupant restraint and to reduce the likelihood of failure. The requirements apply to any component, other than the webbing or straps, involved in transferring seat belt loads to the vehicle structure.

### **CMVSS No. 210.1 – User-ready Tether Anchorages for Restraint Systems**

This standard was established to improve child restraint and vehicle compatibility by requiring all vehicles manufactured on or after 9-1-02 to provide anchorage systems for child restraint systems that function independently of the vehicle seat belt system. The tether anchor portion of the standard specifies the location of the tether anchor, strength requirements of tether anchorages, test conditions and test procedures to test the anchorage strength requirements. Application: Except for shuttle buses, this standard applies to passenger cars, trucks and multipurpose passenger vehicles with a GVWR of 3,855 kg (8,500 lb) or less, except walk-in van-type vehicles and vehicles manufactured to be sold exclusively to the U.S. Postal Service; and to buses (including school buses) with a GVWR of 4,536 kg (10,000 lb) or less. This standard does not apply to vehicles manufactured prior to the phase-in of this standard. For such situations, reference section 20.4 NMEDA guidelines for additional information source.

### **CMVSS No. 210.2 – Lower Universal Anchorages Systems for Restraint Systems and Booster Cushions**

This standard was established to improve child restraint and vehicle compatibility by requiring all vehicles manufactured on or after 9-1-02 to provide anchorage systems for child restraint systems that function independently



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of the vehicle seat belt system. The tether anchor portion of the standard specifies the location of the tether anchor, strength requirements of tether anchorages, test conditions and test procedures to test the anchorage strength requirements. Application: Except for shuttle buses, this standard applies to passenger cars, trucks and multipurpose passenger vehicles with a GVWR of 3,855 kg (8,500 lb) or less, except walk-in van-type vehicles and vehicles manufactured to be sold exclusively to the U.S. Postal Service; and to buses (including school buses) with a GVWR of 4,536 kg (10,000 lb) or less. This standard does not apply to vehicles manufactured prior to the phase-in of this standard. For such situations, reference section 20.4 NMEDA guidelines for additional information source.

**FMVSS/CMVSS No. 212** - Windshield Mounting - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with a Gross Vehicle Weight Rating of 4,536 kg (10,000 lbs.) or less. This standard requires that, when tested as described, each windshield mounting shall be anchored in place and retain one of two specified percentages of its periphery in a crash situation. The purpose of this standard is to keep vehicle occupants within the confines of the passenger compartment during a crash.

**FMVSS/CMVSS No. 213** – Child Restraint Systems - This standard covers infant carriers, child seats, harnesses and car beds that restrain children under 65 pounds. This regulation requires child restraint systems to be manufactured as compatible with the child restraint anchorage systems required by FMVSS 225 and pass a 30 MPH frontal sled test with the typical crash test parameters. It specifies padding for children weighing less than 22 pounds and contains labeling requirements.

**CMVSS No. 213.4** – Built-in Restraint Systems and Built-in Booster Cushions - This standard covers built-in infant carriers, child seats and harnesses that restrain children. This regulation requires built-in child restraint systems to meet performance and safety requirements.

**FMVSS/CMVSS No. 214** - Side Impact Protection - This standard specifies performance requirements for protection of occupants in side impact crashes. The purpose of this standard is to reduce the risk of serious and fatal injury to occupants of passenger cars, multipurpose passenger vehicles, trucks, and buses.

**CMVSS 215 – Bumpers** Applicable to passenger cars, this standard specifies bumper geometrical requirements and maximum damage to a vehicle's bumper in minor impacts.

**FMVSS/CMVSS No. 216** - Roof Crush Resistance This standard establishes strength requirements for the passenger compartment roof to reduce deaths and injuries due to the crushing of the roof into the occupant compartment in rollover crashes. Application: Passenger cars (except convertibles) and multipurpose passenger vehicles, trucks and buses (except school buses) with a GVWR of 4,536 kilograms (10,000 pounds) or less.

**FMVSS No. 225** – Child Restraint Anchorage Systems - This standard was established to improve child restraint and vehicle compatibility by requiring all vehicles manufactured on or after 9-1-02 to provide anchorage systems for child restraint systems that function independently of the vehicle seat belt system. The tether anchor portion of the standard specifies the location of the tether anchor, strength requirements of tether anchorages, test conditions and test procedures to test the anchorage strength requirements. Application: Except for shuttle buses, this standard applies to passenger cars, trucks and multipurpose passenger vehicles with a GVWR of 3,855 kg (8,500 lb) or less, except walk-in van-type vehicles and vehicles manufactured to be sold exclusively to the U.S. Postal Service; and to buses (including school buses) with a GVWR of 4,536 kg (10,000 lb) or less. This standard does not apply to vehicles manufactured prior to the phase-in of this standard. For such situations, reference section 20.4 NMEDA guidelines for additional information source.

### Post Crash Standards:

**FMVSS/CMVSS No. 301** - Fuel System Integrity (includes CMVSS 301.1 – LPG Fuel System Integrity, CMVSS 301.2 – CNG Fuel System Integrity/FMVSS 303, CMVSS 3.1.3 – Fuel System Integrity for Three-wheeled Vehicles and Motorcycles) - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses with a Gross Vehicle Weight Rating of 4,536 kg (10,000 lbs.) or less, and School Buses with a Gross Vehicle Weight Rating greater than 4,536 kg (10,000 lbs.) - This standard 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.

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**FMVSS/CMVSS No. 302** - Flammability of Interior Materials - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses - This standard specifies burn resistance requirements for materials used in the occupant compartments of motor vehicles. Its purpose is to 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 or cigarettes.

**FMVSS/CMVSS No. 305** - Electric-Powered Vehicles: Electrolyte Spillage and Electric Shock Protection This standard specifies requirements for limitation of electrolyte spillage, retention of propulsion batteries during a crash, and electrical isolation of the chassis from the high voltage system, to be met by vehicles that use electricity as propulsion power. The purpose of this standard is to reduce deaths and injuries during a crash, which occur because of electrolyte spillage from propulsion batteries, intrusion of propulsion battery system components into the occupant compartment, and electrical shock.

Application: Passenger cars, multipurpose passenger vehicles, trucks and buses with a GVWR of 4,536 kg (10,000 lb) or less, that use more than 48 nominal volts of electricity as propulsion power and whose speed attainable in 1.6 km on a paved level surface is more than 40 km/h.

### Miscellaneous Standards:

**FMVSS/CMVSS No. 401** - Interior Trunk Release - This standard establishes the requirements for providing a trunk release mechanism that makes it possible for a person trapped inside the trunk compartment of a passenger car to escape. Instead of a release latch, this standard also permits the installation of an alternative system such as a passive trunk release system that could detect the presence of a human in the trunk and would automatically unlatch the trunk lid. Application: Passenger cars containing a trunk compartment; This standard does not apply to passenger cars with a back door, a door or door system on the back end of a passenger car through which cargo can be loaded or unloaded, a hatchback or a station wagon.

**FMVSS No. 403** - Platform Lift Systems for Motor Vehicles - This standard specifies requirements and performance tests for platform lifts designed to carry standing passengers, who may be aided by canes or walkers, as well as persons seated in wheelchairs, scooters and other mobility aids, into and out of motor vehicles. The purpose of this standard is to prevent injuries and fatalities to passengers and bystanders during the operation of platform lifts installed in motor vehicles. Application: Platform lifts designed to carry standing passengers who may be aided by canes or walkers, as well as persons seated in wheelchairs, scooters and other mobility aids, into and out of motor vehicles.

**FMVSS No. 404** - Platform Lift Installations in Motor Vehicles - This standard specifies requirements for the installation of platform lifts in motor vehicles. It requires vehicle manufacturers to install platform lifts that are certified to Standard 403 and to install them in accordance with the lift manufacturer's instructions. The purpose of this standard is to prevent injuries and fatalities to passengers and bystanders during the operation of platform lifts installed in motor vehicles. Application: Motor vehicles equipped with a platform lift designed to carry standing passengers, who may be aided by canes or walkers, as well as persons seated in wheelchairs, scooters and other mobility aids, into and out of the vehicle.

**FMVSS/CMVSS No. 500** - Low-Speed Vehicles - This standard specifies basic safety equipment including lights, reflectors, mirrors, windshields, windshield wipers, parking brake, and seat belts on motor vehicles whose maximum speed is between 20 and 25 miles per hour. The purpose of this standard is to ensure that low-speed vehicles operated on the public streets, roads, and highways are equipped with the minimum motor vehicle equipment appropriate for motor vehicle safety. Application: Low-speed vehicles. A low-speed vehicle is a 4-wheeled motor vehicle, other than a truck, whose top speed is more than 32 km/h (20 mph) and not more than 40 km/h (25 mph).

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### APPENDIX B, DEFINITION AND TERMINOLOGY

**Accessory Controls:** Switches regulating the environment of the vehicle (i.e. heater, air conditioning, power windows, radio, etc.).

**Actuator:** A mechanical device used to cause movement.

**Adapted Key Holder:** A device which by design will improve both grip and turning leverage. (Also referred to as a quad key.)

**Adaptive Equipment:** see Automotive Adaptive Equipment (AAE).

**A.D.E.D.:** Association for Driver Rehabilitation Specialists. Previously known as Association of Driver Educators for people with disabilities.

**Aesthetically:** A pleasing appearance or effect.

**Aftermarket:** Components used to modify a motor vehicle after the vehicle is purchased from the OEM.

**Alter:** To add or remove a permanently attached component or change the function of such a component in a vehicle prior to its first purchase for purposes other than resale.

**Alterer:** A company that alters a completed vehicle and recertifies it.

**Amputee Steering Device:** See Steering Devices.

**Anchorage:** A means of securing a component to a vehicle.

**A.N.S.I.:** American National Standards Institute.

**Audible:** To hear; be heard or capable of being heard.

**Automatic Lift:** The raising, lowering, stowing and deploying of the lift is performed by a power source, other than manually.

**Automatic Securement:** A tie down that locks and releases through an automatic electric/mechanical latching device.

**Automatic Tie Down:** See Automatic Securement.

**Automotive Adaptive Equipment (AAE):** Equipment, products, devices, installations, and/or mechanisms designed, equipped, or installed for the purpose of allowing, permitting, or increasing the ability of people with disabilities or people with mobility challenges to: enter, exit, or operate a motor vehicle; enter, exit, or be transported as a passenger in a motor vehicle; or load, unload, or transport a personal mobility device.

**A.W.S.:** American Welding Society ([www.aws.org](http://www.aws.org)) phone number: 800-443-9353

**Base Vehicle:** A completed vehicle or incomplete vehicle on which a company performs manufacturing operations, alterations, or modifications

**Backing Plate:** A reinforcement designed to relieve stress and strengthen a specific area of a modification.

**Backup System:** A reserve or substitute source of energy in the event of a failure in the primary equipment.

**Body Mount:** A device insulating and/or securing the vehicle floor from/to the motor vehicle frame. Body mounts are an integral component of a body on frame vehicle.

**Booster:** An auxiliary device for increasing force, power, pressure or effectiveness.

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**Camber:** A slight convexity or curvature. A setting of the wheels relative to the vertical centerline that describes the distance between the top and bottom of the wheels.

**Car Top Carrier:** An integrated wheelchair lift and storage for a manual wheelchair. The wheelchair is lifted with a system of chains, cables or straps, while folding the wheelchair and storing it in a storage compartment on the roof of the vehicle.

**Cargo Carrying Capacity:** GVWR minus unloaded vehicle weight minus 150 pounds (68 kg) times the number of designated seating positions. (also see Remaining Cargo Capacity)

**Center Lowered Floor:** The original vehicle floor is removed from the rear of the driver and passenger seats to the front of the rear wheel wells and to the side door and is replaced with a lower floor pan;

**Certified Driver Rehabilitation Specialists (CDRS):** An individual who has obtained the necessary knowledge base and experience in the field of driver rehabilitation and who has successfully obtained and maintained certification.

**Certified Welder:** A person qualified to perform welds using welding methods as per established recommended processes by American Welding Society or Canadian Welding Bureau.

**CFR:** Code of Federal Regulations

**Chest Harness:** See Upper Torso Positioning Belt.

**Collapsibility:** The action of collapsing; to fold down into a more compact shape.

**Column Extension:** A spacer added between the steering wheel and steering column. This spacer will bring the steering wheel closer to the driver

**Conversion:** for use in our industry, the term "Conversion" is often applied to vehicle conversions and is defined as a structural modification/alteration to a vehicle to make it accessible for people with disabilities (also see Vehicle Conversion).

**Commercially Licensed Vehicle:** A vehicle licensed and tagged to a company for commercial use.

**Completed Vehicle:** A vehicle that requires no further manufacturing operations to perform its intended function, other than the addition of readily attachable components, such as mirrors, tires, rims, or minor finishing operations such as painting.

**Crossover Gear Shift Extension:** A device that attaches to the OEM column mounted gear selector and crosses over to the left of the steering column. (See also gear shift extension).

**Dash Panel (Previously known as Firewall):** A partition separating the engine compartment from the passenger compartment in a vehicle.

**Deep Dish Steering Wheel:** An aftermarket steering wheel with the rim closer to the driver. Generally cannot accommodate use with an airbag.

**Dexterity:** Skill and ease in using the hands.

**Door Control:** See Remote Switches.

**Double Lowered or Double Dropped Floor:** Refers to a vehicle floor that is lowered in the driver, passenger and center floor area.

**Driver's Lowered Floor:** Lowered vehicle floor in the driver's compartment extending to the front of the rear wheel wells, excluding the front passenger compartment

**Driver Rehabilitation Specialist:** As used in this document is any individual, center, hospital or business that evaluates and/or trains people with disabilities for their transportation requirements as a driver and/or passenger.

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**Dropped Floor:** See Center Lowered Floor or Driver's Lowered Floor, Passenger Lowered Floor or Double Lowered Floor.

**Duck Clutch:** A mechanically actuated electrically controlled clutch for a standard transmission mounted on a center console transmission control stalk.

**Electric Vehicle:** A vehicle whose power-plant is solely powered by an electrochemical energy storage system(s). There are a wide variety of storage systems and charging systems.

**Electrical / Mechanical Lift:** A lift powered by an electrical motor and accompanying components.

**Emergency Release:** A pin, lever, handle or other device to allow for a manual release in the event of a power failure.

**Engineering Practices:** Terminology referring to the process of analyzing and/or evaluating proper technical procedures. Usually refers to an existing process or set of standards.

**Fastener:** Bolt, screw, pin, tie, clamp, or other securing device.

**Final Fitting:** Inspection of equipment to verify installation and appropriate functional fitting and interface with the client.

**Final-Stage Manufacturer (FSM):** A company which performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle.

**First Retail Purchaser:** The first purchaser of a vehicle for purposes other than resale.

**Flat Floor:** A smooth stable surface, replacing or covering the OEM corrugated flooring.

**FMVSS/CMVSS:** Federal Motor Vehicle Safety Standard / Canada Motor Vehicle Safety Standard

(FMVSS: [www.nhtsa.dot.gov/cars/rules/standards/](http://www.nhtsa.dot.gov/cars/rules/standards/))

(CMVSS: <http://www.tc.gc.ca/acts-regulations/regulations/menu.htm>)

**Foot Steering:** A modification of the OEM steering, enabling the steering to be performed with the driver's foot.

**Forward Facing:** The wheelchair and occupant face forward in the vehicle and parallel to the sides of the vehicle.

**Four Point Securement:** A wheelchair securement that attaches the four points of the wheelchair frame to four points on the vehicle.

**Four Point Tie-Down:** See Four Point Securement.

**Framed Vehicle:** A motor vehicle with an independent or separate body on frame.

**Gear Shift Extension:** A device that attaches to the OEM gear selector and offers additional leverage for shifter operation.

**Ground Strap:** A cable connecting the ground terminal of a battery to the vehicle body to maintain a continuous current path equal to the mobility equipment power supply.

**GAWR:** Gross Axle Weight Rating (See Vehicle Weight Rating).

**GVWR:** Gross Vehicle Weight Rating (See Vehicle Weight Rating).

**H-Point:** The mechanically hinged hip point of a manikin, which simulates the actual pivot center of the human torso and thigh.

**Hand Control:** See Manual Hand Control

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**HVAC:** Heating, ventilation and air conditioning.

**Hand Control Lock-Out:** A locking mechanism, either manual or automatically operated, that is a feature incorporated into the design of some hand controls to restrict operation of the hand control.

**Hand Held Pendant:** A control harness which operates adaptive/mobility equipment.

**Hand Held Remote:** A hand held device that emits a signal to a receiver within a motor vehicle for operation of adaptive/mobility equipment.

**Heat Shield:** An insulating shield installed between the exhaust system, catalytic converter, muffler and floor of the motor vehicle to minimize heat transfer to other components and into the vehicle's interior compartment.

**Heavy Lifting:** Any item or group of items that are meant to be lifted at one time and weigh over 50 lbs. (per OSHA standard).

**High Technology ("High Tech") Devices:** are those that meet the following conditions: 1) Devices capable of controlling vehicle functions or driving controls, and 2) operate with a designed logic system or interface or integrate with an electronic system of the vehicle. An interlock that interfaces with a logic system via a splice connection is classified as high tech; plug and play is considered low tech.

High Tech Examples:

Primary driving control examples:

- A. Power accelerator / brake systems;
- B. Power park brake integrated with a power accelerator / brake systems;
- C. Reduced effort steering systems;
- D. Horizontal steering system;
- E. Reduced effort brake systems;
- F. Backups for primary controls.

Secondary driving control examples:

- A. Remote panel or switch array interfacing with OEM electronics;
- B. Wiring extension for OEM electronics;
- C. Power transmission shifter.

**Horizontal Steering:** A modification that enables a steering wheel to be adjusted in a horizontal position.

**Hybrid Vehicle:** A vehicle equipped with two or more energy storage systems, both of which must provide propulsion power either independently or together. Typically, one of these energy storage systems powers an internal combustion power-plant.

**Hydraulic:** Operated by the resistance offered or the pressure transmitted when a quantity of fluid (oil or water) is forced through a comparatively small orifice or through a tube.

**Hydraulic Lift:** A lift using a hydraulic pump as the power source for lifting and lowering the wheelchair platform.

**In Floor Lift:** See under the floor lift.

**Incomplete Vehicle:** means a vehicle that is capable of being driven and that consists, at a minimum, of a chassis structure, power train, steering system, suspension system and braking system in the state in which those systems are to be part of the completed vehicle, but requires further manufacturing operations to become a completed vehicle.

**Incomplete Vehicle Document:** lists all applicable F/CMVSS the vehicle complies with and states under what conditions the final stage manufacturer can certify compliance with certain F/CMVSS requirements by relying on the incomplete vehicle document. This is also referred to as pass-through certification. Some of the applicable F/CMVSS

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requirements on an incomplete Vehicle will be pass through, and the Final Stage Manufacturer is responsible for certifying the balance of the F/CMVSS items. The Incomplete Vehicle Document is a document associated to a specific vehicle and must remain with the vehicle until final certification of the vehicle.

**Incomplete Vehicle Manufacturer:** A company which manufactures an incomplete vehicle by assembling components, none of which taken separately, constitute an incomplete vehicle.

**Integral:** Formed as an essential unit with another part; composed of integral parts.

**Interlock:** A device or arrangement by means of which the functioning of one part is controlled by the functioning of another. An interlock that interfaces with a logic system via a splice connection is classified as high tech; plug and play is considered low tech.

**Intermediate Manufacturer:** Means a company, other than the incomplete vehicle manufacturer or the final-stage manufacturer that performs manufacturing operations on an incomplete vehicle.

**I.S.O.:** International Standards Organization.

**Joystick Control:** A steering input device using a single upright post, completely moveable in up to two axes, to control primary vehicle functions.

**Keyless Entry:** A magnetic or remote switch to open or close a vehicle door without a key.

**Keyless Ignition:** A remote switch that enables the vehicle's engine to start or be turned off without a key.

**Kneeling System:** Commonly found on lowered floor minivans. Allows a lower *floor-to-ground* height, thus decreasing the angle of a ramp entry system.

**Lap Restraint:** See Lap Belt.

**Lap Belt:** The seat belt that restrains the pelvis, also called a 'Type 1 belt' in federal regulations.

**Lateral Support:** A device installed on a wheelchair to allow the user greater stability. Often required for wheelchair drivers. May also reference custom seat modifications. (See also Upper Torso Positioning Belt).

**Left Foot Accelerator:** A device installed in a motor vehicle to the left of the brake pedal to allow the operation of the accelerator pedal by the left foot of the driver. (See also Pedal Guard and Manual Hand Controls).

**Lift Platform:** The area the wheelchair occupies, to be raised and lowered during the operation of the lift.

**Lintel:** Structure carrying the load above the door(s) opening.

**Load Carrying Capacity:** GVWR minus unloaded vehicle weight.

**Low Effort Braking:** A modification to the OEM power brake system that reduces pedal effort approximately 50%.

See Reduced Effort Braking.

**Low Effort Steering:** A modification of an OEM power steering system to lower the amount of effort required to steer a vehicle approximately 50%. See Reduced Effort Steering.

**Low Technology ("Low Tech") Devices:** These are all other devices or modifications that do not meet the definition of High Technology devices or modifications.

Low Tech examples:

Primary driving control examples:

- A. Manual accelerator / brake hand control;
- B. Left foot accelerator pedal;
- C. Park brake lever or stand-alone powered park brake;
- D. Steering terminal device;

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E. Driver training brake.

Secondary driving control examples:

- A. Remote horn button (grounding system);
- B. Turn signal crossover lever;
- C. Switch extension on OEM controls;
- D. Transmission shifter lever;
- E. Transfer seat base.

**Lower Torso Restraint:** See Lap Belt.

**Magnetic Switch:** Switch that is activated with a magnet.

**Malfunction:** To function imperfectly or defectively; fail to operate in the normal or usual manner.

**Mandatory:** Containing or constituting a command. No choice. (SHALL)

**Manual Hand Controls:** A device to operate the accelerator and/or brake on a vehicle manually, using the driver's hand rather than the driver's foot.

**Manual Parking Brake Extension:** A handle, which enables the driver to set the parking brake with their hand.

**Manual Release:** See Emergency Release.

**Manual Securement:** A device that secures the wheelchair. This device requires only a mechanical latch to properly fasten and release the securement.

**Manual Tie-Down:** See Manual Securement.

**Manufacture:** Any process of assembling or altering a vehicle prior to its sale to the first retail purchaser.

**Manufacturer:** The producer of equipment and components to be installed in a vehicle or an entity that produces complete vehicles or that alters vehicles.

**Maximum Reduced Effort Steering:** See "Zero Effort Steering", the minimum effort obtainable based on a specific vehicle chassis.

**Minimal Effort Braking:** A modification that reduces the brake control (e.g. pedal, hand control) force to below 7 foot-pounds.

**Mobile Unit:** A vehicle used for off-site installations per Section 40.

**Mobility Equipment Dealer:** As used in this document is any individual or business that installs, sells, and services equipment or modifies vehicles for use by people with disabilities as a driver and/or passenger.

**Modify:** To add or remove a component or change the function of a component in a vehicle after its first purchase for purposes other than resale. For Example: making modifications to a used vehicle at the end users request.

**Momentary:** Continuing only a moment; operative or recurring at every moment.

**MSDS:** Material Safety Data Sheet

**New Motor Vehicle:** A motor vehicle that has not been sold, except for purposes of resale. (Not yet sold to an end user)

**N.H.T.S.A.:** National Highway Traffic Safety Administration ([www.nhtsa.gov](http://www.nhtsa.gov)) phone number: (800) 424-9393.

**Non-disabled:** A person who does not require adaptive equipment to safely operate a motor vehicle.



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**Non-Structural Alteration:** Alterations to a new vehicle that do not structurally alter the vehicle, typically by adding adaptive equipment or components, in such a way that may affect conformance with federal motor vehicle safety standards.

**Non-Structural Modification:** Modifications to a used vehicle that do not structurally modify the vehicle, typically by adding adaptive equipment or components in such a way that may render inoperative federal motor vehicle safety standards.

**Non-OEM Equipment:** Any equipment installed in a vehicle that is not OEM standard equipment.

**Occupied:** To take up space. To have a person present in the seat of a wheelchair.

**Occupied Restraint:** See Occupied Securement.

**Occupied Securement:** A system to secure the personal mobility device during movement of the vehicle while transporting the wheelchair and occupant.

**Occupied Tie-Down:** See Occupied Securement.

**OEM:** Original Equipment Manufacturer.

**Original Equipment Manufacturer (OEM):** A vehicle manufacturer who performs all manufacturing operations on a motor vehicle up to the point that the vehicle is certified as complying with all applicable Federal Motor Vehicle Standards. (Most commonly referring to Ford, GM, Toyota, Chrysler, etc)

**Outboard Barrier:** A flap to prevent the personal mobility device from rolling off the wheelchair lift platform. See Roll Stop Barrier.

**Outside Control Switch:** Exterior mounted switch to operate adaptive/mobility equipment.

**Palm Grip Steering Device:** See Steering Devices

**Para Hand Controls:** See Manual Hand Controls.

**Para Transit Vehicle:** A motor vehicle modified to transport multiple wheelchair users, generally for commercial use.

**Passenger Lowered Floor:** The lowered vehicle floor that extends from the cowl of the front row passenger compartment to the front of the rear wheel wells, excludes the driver's compartment.

**Payload:** See Load Carrying Capacity

**Pedal Guard:** A device installed in a motor vehicle to prevent access to the accelerator pedal and/or brake pedal. (See also Left Foot Accelerator and Manual Hand Controls).

**Pedal Extensions:** Devices mounted to the brake and/or accelerator for use by a short stature driver. (See also Powered Pedals).

**Pelvic Restraint:** See Lap Belt.

**Personal Mobility Device:** Device used for mobility, such as a wheelchair, scooter or walker, to assist a physically disabled individual.

**PPE:** Personal Protection Equipment.

**Personally Licensed Vehicle:** A vehicle licensed and tagged to an individual for private use.

**Pillar:** Upright member of vehicle structure connecting roof of vehicle to the body. See Illustration section.

**Platform Lift:** A wheelchair lift intended to board an occupied wheelchair that has the area the wheelchair fits onto stored in a vertical position in the vehicle or under the vehicle floor.

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**Plug and Play:** An electronic device specifically designed for the application that does not require any modification to any harness.

**Pneumatic:** Adapted for holding or inflated with compressed air, moved or worked by air pressure.

**Power Door Opener:** A device to open and close the vehicle door electrically by remote switching.

**Power Elevating Platform:** An integrated wheelchair occupant lift device that extends laterally, lowers, elevates and retracts the vehicle floor under the driver or passenger.

**Powered Controls:** Vehicle controls operated by an auxiliary source (i.e. electric, hydraulic, or vacuum diaphragm) reducing the necessary amount of strength needed by the operator.

**Powered Gas and Brake Systems:** A device which uses power from an energy source of the vehicle to supplement the force and motions made by the driver to control acceleration, velocity, and braking of a vehicle.

**Powered Pedals:** A device to vary the fore and aft position of the vehicle pedals.

**Power Seat Base:** An electrically powered base mounted between the floor of the vehicle and the OEM or aftermarket seat. This base may be moved in a combination of needed directions.

**Powered Gearshift Selector:** A control activating the transmission gear selection by a switching device.

**Powered Parking Brake:** A powered device to set and release the OEM parking brake electrically.

**Primary Controls:** (aka Primary Driving Controls) The controls of the vehicle governing movement and direction (i.e. acceleration, braking and steering).

**Proof Load:** See Static Test Load.

**Push/Pull Hand Control:** A device to operate the accelerator and brake pedals by hand. Push/Pull operation is push forward (toward the brake pedal) to brake and pull toward the rear to accelerate.

**Push/Right Angle Hand Control:** A device to operate the accelerator and brake pedals by hand. The Push/ Right Angle operation is push forward (toward brake pedal) to brake and move down toward the lap to accelerate.

**Push/Rock Hand Control:** A device to operate the accelerator and brake pedals by hand. The Push/Rock operation requires a push of the control handle forward (toward brake pedal) to brake and for acceleration, the rocking of an upright handle rearward toward the user.

**Push/Twist Hand Control:** A device to operate the accelerator and brake pedals by hand. The Push/ Twist operation is push of the control handle forward (toward brake pedal) to brake and twist the handle (much like a motorcycle) to accelerate.

**QAP:** The NMEDA Quality Assurance Program.

**Quad Hand Controls:** Hand controls manufactured specifically for use by a driver with limited hand and/or wrist strength, control or dexterity. Generally, these controls offer additional hand and/or wrist support.

**Quick Release:** A method to remove or disengage equipment with minimum use of tools.

**Raised Door(s):** Vehicle door headroom is raised, usually integrated with a raised roof, to accommodate the ingress and egress of a wheelchair occupant.

**Raised Roof:** Some or all of the OEM roof is removed and replaced with an aftermarket raised roof. (See also Roof Support Structure).

**Ramp:** Inclined plane providing access between two levels.

**Rated Load:** The maximum load capacity as designated by the manufacturer.

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**Recommended:** To endorse as competent; acceptable.

**Reduced Effort Braking:** A modification to the OEM power brake system that reduces pedal effort. This term includes both low effort brake systems and zero effort brake systems. See Low Effort Braking. See Zero Effort Braking.

**Reduced Effort Steering:** A modification of an OEM power steering system to lower the amount of effort required to steer a vehicle. This term includes both low effort steering systems and zero effort steering systems. See Low Effort Steering. See Zero Effort Steering.

**Reinforcement Cage:** (See Roof Support Structure).

**Remaining Cargo Capacity:** The cargo capacity that remains from the Load Carrying Capacity after the required occupant capacity (DSP x 150 lbs) is deducted.

**Remote:** Acting, acted on, or controlled indirectly from a distance.

**Remote Switches:** A device acting, acting on or controlling an operation from an alternate location.

**Removable Seat Base:** A device or modification that allows a seat to be removed or repositioned.

**Remote Steering:** A second steering system mounted in an alternate location to the OEM system.

**Roll Stop Barrier:** A device that retains the wheelchair on a wheelchair lift platform. See Outboard Barrier.

**Roof Support Structure:** A structure that prevents or limits the collapse of the motor vehicle roof.

**Rotary Lift:** A wheelchair lift with a platform that rotates into and out of the van and stows in the cargo area (center) of the van.

**S.A.E.:** Society of Automotive Engineers ([www.sae.org](http://www.sae.org)).

**Safety Flap:** See *Outboard Barrier*

**Seat Belt:** Strap or webbing designed to secure a person in a motor vehicle. See Two Point Belt. See Three point Belt.

**Secondary Controls:** All motor vehicle controls with exception of primary controls. (See Primary Controls).

**Semi-Automatic Lift:** The raising and lowering of the lift platform is performed by a power source, The stowing and deploying of the platform to and from a horizontal position is performed manually.

**Servo:** A device used to provide control of a desired operation.

**Shall:** Required or compelled that there be no deviation.

**Should:** Advised. Implies noncompliance with the specific recommendation is permissible, variations acceptable.

**Shoulder Belt:** Strap or webbing designed to restrain an occupant's torso in a motor vehicle by diagonally crossing the torso.

**Splice Connection:** An electrical or electronic connection requiring physical modification to the original harness (es).

**Static Test Load:** The weight of a stationary load for the purpose of testing.

**Steering Device:** An apparatus attached to the vehicle steering wheel to aid in turning the steering wheel. Including but not limited to:

**Knob:** A steering wheel device with a knob type grip.

**Tri-Pin:** A steering wheel device with three upright pins to stabilize the hand and wrist of the driver.

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**U or V Grip:** A steering wheel device with two vertical pins to stabilize the hand of a driver.

**Cuff:** A steering wheel device with a curved oval shape that fits around the hand of a driver.

**Amputee:** A steering wheel device that integrates with a driver's prosthesis.

**Custom:** A steering device designed for a specific application or driver.

**Palm:** A steering device that wraps over the top of the hand.

**Structural Alteration:** Alterations to a new vehicle, such as the body, frame, drive configuration and fuel tank, for the purpose of adapting it for persons with disabilities in such a way that may affect conformance with federal motor vehicle safety standards, usually includes cutting and welding.

**Structural Modification:** Modifications to a used vehicle, such as the body, frame, drive configuration and fuel tank, for the purpose of adapting it for persons with disabilities in such a way that may render inoperative federal motor vehicle safety standards, usually includes cutting and welding.

**Structural Reinforcement for Tops:** See Roof Support Structure.

**Swing Lift:** See Rotary Lift.

**Switch:** A device used to open or close an electrical circuit. (May be momentary or latched).

Some examples of switches:

**Push/Pull:** Controlled with an in/out motion.

**Rocker:** Controlled with a pivoting motion.

**Rotary:** Controlled with a clockwise/counter clockwise motion.

**Toggle Switch:** Controlled by a lever that moves through an arc motion.

**Contact Switch:** Controlled by touching a specific area.

**Three Point Seat Belt:** A seat belt system that incorporates the lap and shoulder belt. (Type 2 belt).

**Tire Label:** also known as 'tire placard' or 'vehicle label' is a placard that is applied to a vehicle that shows the number for seating positions and available load carrying capacity as prescribed by F/CMVSS 110.

**Touch Pad:** A contact switch controlled by touching a specific area. A specific area of contact that acts as pressure sensitive switch.

**Trailer Tongue Scale:** A measurement device that measures the actual weight applied to the tongue of a hitch.

**Transfer Bar:** A bar, handle or strap to assist an individual in movement and/or balance.

**Transfer Handle:** See Transfer Bar.

**Transfer Seat Base:** See Powered Seat Base.

**Transport Van:** Vehicle for transporting a non-driver wheelchair occupant.

**Tri-Pin Spinner Device:** See Steering Devices.

**Turn Signal Extension:** A device that attaches to the OEM turn signal lever to allow a different location for activation.

**Two Point Seat Belt:** A seat belt system using a lap belt. (Type 1 belt).

**UVW:** Unloaded Vehicle Weight (See Vehicle Weight Rating).

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**U-Grip Steering Device:** See Steering Devices.

**Under the Floor Lift:** A wheelchair lift that is stored under the vehicle floor.

**Under the Vehicle Lift:** A wheelchair lift that is stored under the vehicle frame.

**Undercoating:** A protective coating that is applied to exposed areas such as the underside of a vehicle.

**Unibody:** Body and sub-frames that are constructed as an integral unit.

**Unoccupied Restraint:** See Unoccupied Securement.

**Unoccupied Securement:** A system or device to stabilize an empty personal mobility device while the vehicle is in motion.

**Unoccupied Tie-Down:** See Unoccupied Securement.

**Unoccupied Wheelchair Tie-Down:** See Unoccupied Securement.

**Unloaded Vehicle Weight (UVW):** The weight of a vehicle with all fluids necessary for operation of the vehicle (full fuel tank etc.) at maximum capacity, but without any cargo or occupants.

**Upfitter:** Anyone who modifies a vehicle including modifier, alterer and final stage manufacturer.

**Upper Torso Positioning Belt:** A belt system designed to prevent excessive upper torso movement. (See also Lateral Support).

**Used Motor Vehicle:** A motor vehicle that has been sold for purposes other than resale. (Has been sold to an end user)

**Vehicle Conversion:** A structural modification/alteration to a vehicle to make it accessible for people with disabilities.

**Vehicle Placard:** Also known as 'tire placard' or 'tire label' is a placard that is applied to a vehicle that shows the number for seating positions and available load carrying capacity as prescribed by F/CMVSS 110.

### Vehicle Weight Rating:

**Gross Axle Weight Rating (GAWR):** The value specified by the OEM as the maximum weight allowed when a single axle of a fully loaded vehicle (all occupants, all cargo, full fuel tank, etc.) is weighed.

**Gross Vehicle Weight Rating (GVWR):** The value specified by the manufacturer as the maximum weight allowed when a fully loaded vehicle (all occupants, all cargo, full fuel tank, etc.) is weighed.

**V-Grip Steering Device:** See Steering Devices.

**Vacuum:** A space devoid of matter, negative air pressure.

**Vehicle Type:** - The class or type of vehicle as defined in section 571.3 of Title 49 of the Code of Federal Regulations (49 CFR), or as prescribed in section 4 of the Canadian Motor Vehicle Safety Regulations (MVSr) and defined in section 2(1) of the MVSr, e.g., passenger car, multipurpose passenger vehicle (MPV), truck, or bus and in section 568.3, e.g., incomplete vehicle.

**Visual:** Done or executed by sight only.

**Warp:** A twist or curve that has developed in something originally flat or straight.

**WAV:** Wheelchair Accessible Vehicle

## NMEDA Guidelines

Appendix B	Definitions and Terminology
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**WC19:** ANSI/RESNA standard WC19 Wheelchairs Used as Seats in Motor Vehicles is a voluntary industry standard that establishes minimum design and performance requirements for wheelchairs that are occupied by users traveling in motor vehicles.

**Weatherproof:** Capable of withstanding exposure to weather without damage.

**Wheelchair Carrier:** Device to carry an unoccupied personal mobility device in/on a vehicle.

**Wheelchair Hoist:** Device to load unoccupied wheelchair in a vehicle

**Wheelchair Restraints:** See Wheelchair Securement

**Wheelchair Securement:** See Securement.

**Wheelchair Sub Floor:** The material used to make a smooth surface for a wheelchair to roll on.

**Wiring Harness:** A grouping of wires contained and protected by an outer encasement.

**WTORS:** The SAE acronym for Wheelchair Tie-down Occupant Restraint System.

**Zero Effort Braking:** A modification to the OEM power brake system that reduced pedal effort approximately 95%. See Reduced Effort Braking or Low Effort Braking.

**Zero Effort Steering:** A modification of an OEM power steering system to lower the amount of effort required to steer a vehicle approximately 75-95%. See Reduced Effort Steering or Low Effort Steering.

## NMEDA Guidelines

Appendix C	Labels and Descriptions
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### APPENDIX C, LABELS AND DESCRIPTIONS

#### CERTIFICATION LABEL

<http://www.access.gpo.gov/nara/cfr/waisidx 06/49cfr568 06.html>

CFR Title 49 Parts 567 & 568 & 595

**Type of Label:** Manufacturer Label  
**Who Uses this label:** Final Stage Manufacturer  
**Original Vehicle Status:** Incomplete  
**Label Location:** at the driver side B-pillar or door edge.

Requires a (Final Stage) Manufacturer Label. An Incomplete OEM vehicle will have an OEM Incomplete Vehicle Certification Label, 49 CFR 567.5 (d) (v) (A) (1, 2 or 3). Do not cover the incomplete vehicle label.

MFD BY: \_\_\_\_\_

DATE OF MFR: MO \_\_\_\_\_ YR \_\_\_\_\_

GVWR: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

GAWR-FRONT: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

WITH \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA

( \_\_\_\_\_ PSI) COLD

GAWR-INTERMEDIATE (1): \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

WITH \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA

( \_\_\_\_\_ PSI) COLD

GAWR-INTERMEDIATE (2): \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

WITH \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA

( \_\_\_\_\_ PSI) COLD

GAWR-REAR: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

WITH \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA

( \_\_\_\_\_ PSI) COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS, (AND BUMPER AND THEFT PREVENTION STANDARDS, IF APPLICABLE) IN EFFECT IN: MO \_\_\_\_\_ YR \_\_\_\_\_

VEHICLE IDENTIFICATION NUMBER: \_\_\_\_\_

VEHICLE TYPE: \_\_\_\_\_

INCOMPLETE VEHICLE LABEL			
INCOMPLETE VEHICLE MANUFACTURED BY :			
DATE (mm/yy):			
GVWR:            KG. ,            (LB)			
V.I.N./N.I.V:			
GAWR			COLD INFL. PRESS
KG (LB)	TIRE SIZE	RIM	PSI (KPA)
FRT:			
RR:			

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### ALTERER LABEL

Adds an alteration Tag.

Requires an Alterer Label. 49 CFR 567.7

THIS VEHICLE WAS ALTERED BY: \_\_\_\_\_

IN: MO. \_\_\_\_\_ YR. \_\_\_\_\_

AND AS ALTERED IT CONFORMS TO ALL APPLICABLE U.S.A. FEDERAL MOTOR VEHICLE SAFETY, BUMPER AND THEFT PREVENTION STANDARDS AFFECTED BY THE ALTERATION AND IN EFFECT IN:

MO. \_\_\_\_\_ YR. \_\_\_\_\_

COMPLETE BELOW IF GVWR, GAWR OR VEHICLE TYPE IS CHANGED OR ALTERED

GVWR: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

GAWR-FRONT: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

GAWR INTERMEDIATE (1): \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

GAWR INTERMEDIATE (2): \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

GAWR-REAR: \_\_\_\_\_ KG ( \_\_\_\_\_ LB)

VEHICLE TYPE: \_\_\_\_\_

SUITABLE TIRE-RIM CHOICE

FRONT: \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA, ( \_\_\_\_\_ PSI) COLD

INTERMEDIATE (1): \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA, ( \_\_\_\_\_ PSI) COLD

INTERMEDIATE (2): \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA, ( \_\_\_\_\_ PSI) COLD

REAR: \_\_\_\_\_ TIRES, \_\_\_\_\_ RIMS, @ \_\_\_\_\_ KPA, ( \_\_\_\_\_ PSI) COLD

**Type of Label:** Alterer Label

**Who Uses this label:** Alterer

**Original Vehicle Status:** Complete, Certified and Prior to First Retail Sale

**Label Location:** Next to the OEM Certification Label (Must not cover the OEM label).



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### MAKE INOPERATIVE LABEL

[http://www.access.gpo.gov/nara/cfr/waisidx\\_06/49cfr595\\_06.html](http://www.access.gpo.gov/nara/cfr/waisidx_06/49cfr595_06.html)

CFR Title 49 Part 595

**Type of Label:** Make-Inoperative Label  
**Who Uses this label:** NHTSA Registered Modifier  
**Original Vehicle Status:** Complete (Labeled as Certified), Titled (Sold to End User)  
**Label Location:** Applied adjacent to the OEM certification Label. (Must not cover the OEM label).

Requires a Make Inoperative Label if any of the FMVSS standards listed in 49 CFR 595.7 are rendered inoperative after the modification. The label requires a physical address of the facility which modified the vehicle. If the inoperative label is used, there are additional requirements that must be met for documentation, tracking. 49 CFR 595.7D

Reference Guidelines Section 1.

THIS VEHICLE HAS BEEN  
MODIFIED IN ACCORDANCE  
WITH 49 CFR 595.6 AND  
MAY NO LONGER COMPLY  
WITH ALL FEDERAL MOTOR  
VEHICLE SAFETY  
STANDARDS IN EFFECT AT  
THE TIME OF ITS ORIGINAL  
MANUFACTURE.

MODIFIERS NAME, ADDRESS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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### VEHICLE PLACARD (AKA TIRE LABEL)

Reference 49 CFR 571.110 (FMVSS 110)

**Type of Label:** Vehicle Placard

**Who Uses this label:** Final Stage Manufacturer, Alterer, and Modifier

**Original Vehicle Status:** Complete Prior to First Retail Sale and Incomplete

**Label Location:** Replacement placard is placed over the top of the original OEM vehicle placard.

The vehicle placard is originally applied by either the OEM, Final Stage Manufacturer, or Alterer. This label must be updated by the modifier if there is a change in the seating capacity (aka DSP) or if the tire/rim information has changed. Additionally, when there are changes to the load carrying capacity (i.e. "the combined weight of occupants and cargo") the modifier, at their discretion, may replace this placard with the new information or apply the "Load Carrying Capacity Reduction" label shown in Figure 7 of this appendix.

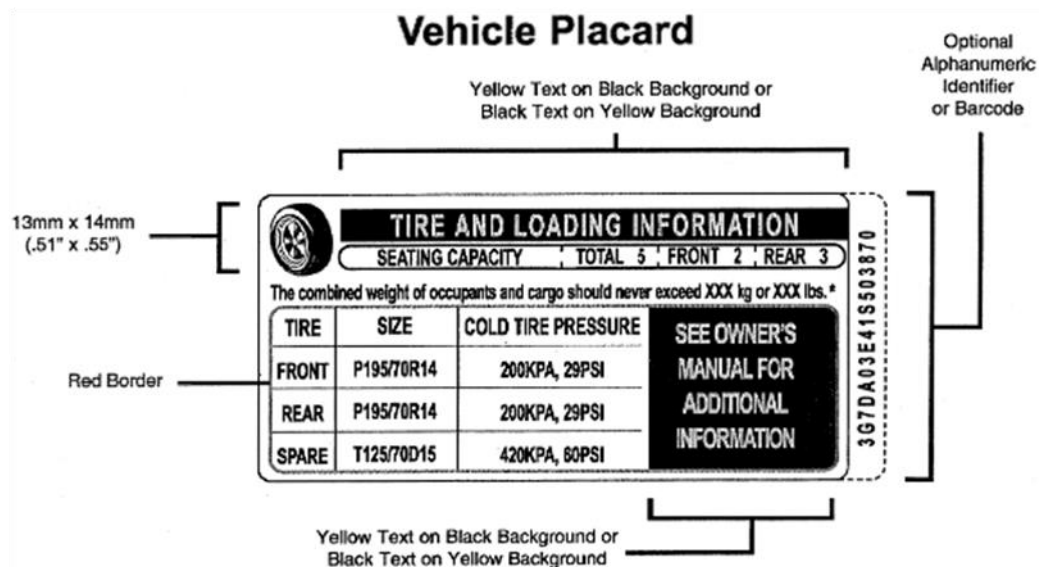


Figure 1

#### NOTICE:

**Modifier:** Whenever servicing a vehicle or assisting a customer with a vehicle accident; if you suspect or notice defects in the tires or wheels, you are required under the TREAD ACT to notify the manufacturer of the issue or incident immediately. Manufacturers must report these incidents as part of the NHTSA early warning system.

**FINAL STAGE MFG or ALTERER:** There may be additional reporting requirements if you replace RIMS or TIRE SIZES from the OE specified. **Additional Info:** [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

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**Type of Label:** Load Carrying Capacity Reduction Label  
**Who Uses this label:** Alterer  
**Original Vehicle Status:** Complete and certified  
**Label Location:** Label is placed beside the existing tire (placard) label.

The Alterer has two options:

1. If a modification adds the lesser of one and one half percent (1.5 %) of the vehicle's GVWR or 100 pounds (45 kg) in additional weight, the reduction in load carrying capacity must be determined and a Load Carrying Capacity Reduced Label stating the amount of weight the load capacity has been reduced from the original be affixed to the vehicle within 1" of the existing Tire Placard (label).
2. Do nothing if the load carrying capacity has not been reduced by the lesser of one and one half percent (1.5 %) of the vehicle's GVWR or 100 pounds (45 kg).

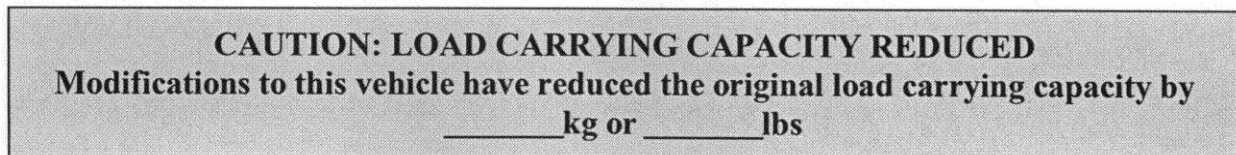



Figure 7 - Load Carrying Capacity Modification Label

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### CANADIAN LABELS Canadian Manufacturer Label

MANUFACTURED BY/FABRIQUÉ PAR: _____			
TYPE: _____ DATE: _____			
GVWR/PNBV _____ KG V.I.N./N.I.V. _____			
GAWR/PNBE KG	TIRE/PNEU - DIMENSION - RIM / JANTE	COLD INFL. PRESS./ PRESS. DE GONFL. À FROID PSI/LPC KPA	

[If manufactured in the U.S. for Canada, add Canadian certification statement to bottom of label: "THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE / CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÈGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION" in lieu of national safety mark];

## NMEDA Guidelines

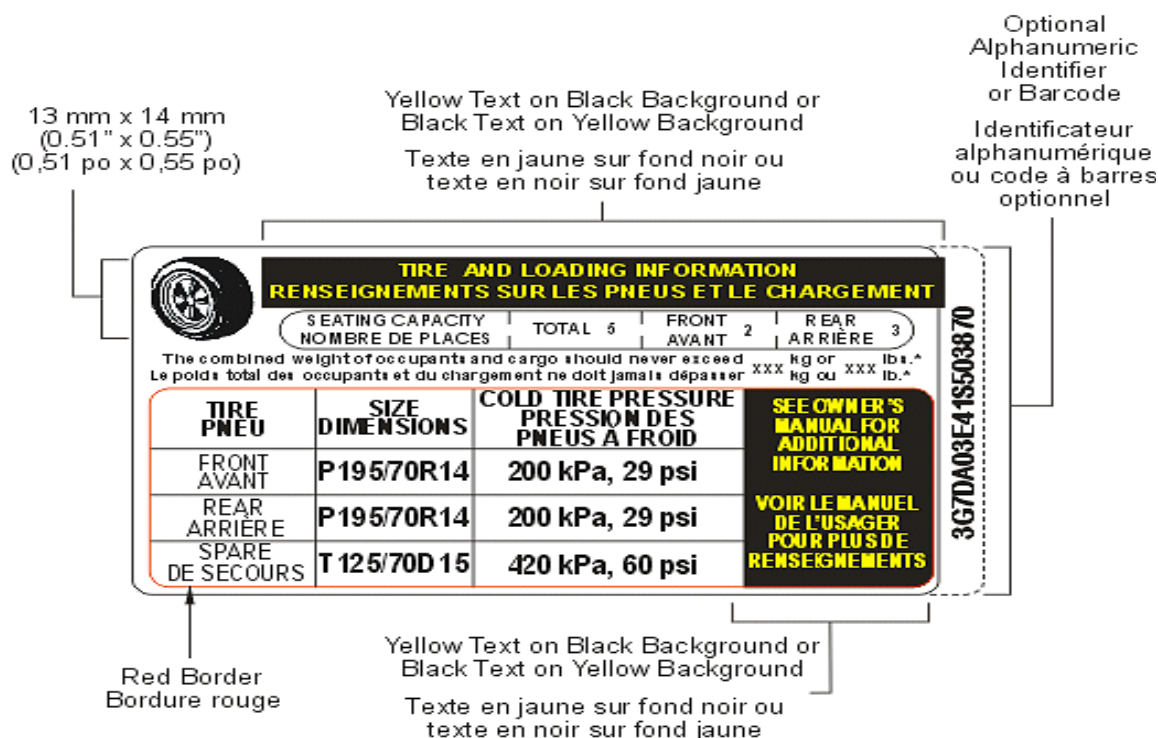
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### Canadian Alterer Label:

[Add Canadian French wording: "THIS VEHICLE WAS ALTERED BY / CE VÉHICULE A ÉTÉ MODIFIÉ PAR"];

[If altered in Canada or in the U.S. for Canada, replace U.S. wording with Canadian wording for certification statement: "THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE / CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÈGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION"];

[Add Canadian bilingual tire placard as follows]:



\* For trailers, this statement should read:  
 "The weight of cargo should never exceed XXX kg or XXX lbs."

\* Sur les remorques, le libellé est le suivant :  
 « Le poids du chargement ne doit jamais dépasser XXX kg ou XXX lb. »