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INTERNATIONAL
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SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J800

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(R) MOTOR VEHICLE SEAT BELT ASSEMBLY INSTALLATION

1. ***Scope—***This SAE Recommended Practice provides general installation instructions for aftermarket, universal type seat belt assemblies for installation in passenger cars, trucks, buses, and multipurpose passenger vehicles. It applies only to seat belt assemblies which are not identified by a vehicle manufacturer part number or which are not designed for a specific vehicle application.

1.1 **Purpose—**This SAE document is intended to provide guidance in the installation of seat belt assemblies meeting the requirements of Part 571.209 of Title 49 of the Code of Federal Regulations as established by the National Highway Traffic Safety Administration.

1.2 **Field of Application—**Passenger cars, trucks, buses, and multipurpose passenger vehicles (MPVs) of all gross vehicle weight classifications.

2. ***References***

2.1 **Applicable Publications—**The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the lastest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE HS 13—Vehicle Occupant Restraint Systems and Components. This reference includes copies of applicable Federal Motor Vehicle Safety Standards (FMVSS) and SAE Recommended Practices.
SAE J833—Human Physical Dimensions

2.1.2 FMVSS PUBLICATIONS—Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9371.

FMVSS 207—Federal Motor Vehicle Safety Standard 207, "Seating Systems" (49 CFR 571.207)
FMVSS 209—Federal Motor Vehicle Safety Standard 209, "Seat Belt Assemblies" (49 CFR 571.209)
FMVSS 210—Federal Motor Vehicle Safety Standard 219, "Seat Belt Assembly Anchorages" (49 CFR 571.210)

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3. *Definitions*

3.1 **Attachment Point (Anchorage)—**The point where the seat belt assembly is mechanically attached to the seat system or vehicle structure.

3.2 **Attachment Hardware—**Hardware for securing a seat belt assembly to an attachment point on a seat system or on a vehicle.

3.3 **Hardware—**Any metal or rigid plastic part of the restraint system.

3.4 **Highway Vehicle—**Self-propelled motor vehicles having more than two wheels and designed for use on public roads. Included are passenger cars, trucks, buses, and multipurpose passenger vehicles (MPVs).

3.5 **Seat Belt Assembly—**A strap or belt device conforming to FMVSS 209 fastened across the lap or pelvic area, upper torso, or combination of the two to provide occupant restraint in a highway vehicle. It includes buckles or other features, and may include the attachment hardware designed for installing the seat belt assembly to an anchorage.

3.6 **Seat System—**The total support mechanisms between the vehicle and the occupant interface. This could include the seat assembly, fixed seat support, or seat suspension (flexible seat support).

4. *Procedures*

4.1 The presence of any vehicle manufacturer-provided anchorages or attachment points for installation of the desired seat belt assembly in the vehicle should be verified by inspection of the vehicle or consultation with the vehicle manufacturer or an authorized vehicle dealer. If the attachment point exists, the compatibility of the desired seat belt assembly with the vehicle and its attachment points and the availability of any specific vehicle manufacturer-provided seat belt assembly installation instructions and fastener specifications should be determined from the vehicle manufacturer or an authorized vehicle dealer. The vehicle manufacturer's instructions should be followed in the installation.

4.2 Anchorages provided by a vehicle manufacturer may require different types of fasteners (threaded holes or studs) with different threads (7/16 - 20 UNF 2A, 1/2 - 13 UNC 2A, or metric (ISO) equivalent), and it is critical that the proper fasteners be used.

4.3 If the vehicle manufacturer cannot be contacted or has no applicable seat belt assembly installation instructions available, the installation should be done in accordance with Section 5.

5. *Technical Requirements*

5.1 Vehicles Equipped With Threaded Anchorages and Factory-Installed Seats, But No Vehicle Manufacturer Seat Belt Installation Instructions Available

5.1.1 Use the available factory-provided anchorages and compatible fasteners provided with the seat belt in lieu of other methods. Threaded anchorages provided at the factory in highway vehicles are located in suitable structure and use 7/16 - 20 UNF 2A, 1/2 - 13 UNC 2A, or metric (ISO) equivalent threads. Determine the correct thread by fastener match if no manufacturer specifications are available. It is important that all full threads be engaged to obtain the ultimate strength of the anchorages. If bolts must be purchased separately, they should be SAE or ASTM grade 5 or higher (if metric (ISO), grade 8.8 or higher).

5.2 Vehicles Without Threaded Anchorages or Vehicle Manufacturer Instructions

5.2.1 Seat belts shall be anchored to adequate structures such as the body or floor pan.

5.2.2 Seat belts shall not be attached to seats unless the vehicle manufacturer indicates that the seats and seat mounting systems have been specifically designed to withstand the forces applied to the seat belt anchorages as specified in FMVSS 210, Section 4.2, and to the seat as specified in FMVSS 207, Section S4.2.

5.2.3 ANCHORAGE LOCATION AND SEAT BELT INSTALLATION PROCEDURE

5.2.3.1 Consult vehicle manufacturer to determine the recommended seat belt anchorage locations.

5.2.3.2 Adjust the seat to its rearmost position.

5.2.3.3 Mark the floor pan or structure so that the front seat lap belts slope to the rear on the way down to the attachment points. After the seat belt leaves the seat, it may go vertically down to the attachment point, but must not in any case go forward.

5.2.3.4 When restraining the occupant, the lap belt portion of any seat belt assembly shall bear across his hip bones and pull downward and rearward at an angle no less than 30 degrees and not more than 75 degrees from the horizontal.

5.2.3.5 Attachment points should be spaced laterally equidistant from the centerline of the seat (adequate structure permitting) so that the lap belt portion of the seat belt assembly forms a "U"-shaped loop when in use. In no case shall both ends of one assembly be attached to the same anchorage point.

5.2.3.6 Drill holes so as to avoid damaging components such as exhaust system, brake lines, fuel tank and lines, and electrical harnesses. Locate anchorage holes away from other holes which might weaken the floor pan. The fasteners shall be located so that their projection under the vehicle floor cannot be impacted by the fuel tank or a fuel line in the case of a vehicle accident.

5.2.3.7 Carefully examine any corrosion of the floor pan in the area of the seat belt anchorage holes. If necessary, reinforcement in excess of that furnished with the seat belt assembly should be added before attachment hardware is installed.

5.2.3.8 Reinforcing plates shall be of steel and free from burrs and be rounded on the peripheral edges adjacent to the vehicle. The reinforcing plates shall be at least 1.5 mm (0.06 in) in thickness and at least 2580 mm^2 (4.0 in^2) in area. The distance between any edge of the plate and the edge of the anchorage bolt hole shall be at least 15.2 mm (0.6 in). Corners shall be rounded to a radius of not less than 6.4 mm (0.25 in) or cut so that no corner angle is less than 135 degrees and no side is less than 6.4 mm (0.25 in) in length.

5.2.3.9 Install the attachment hardware using the nuts, bolts, washers, or reinforcing plates furnished with the seat belt. Dished reinforcing plates shall be installed with the outer edges away from the body structure; the plate shall contact the body structure at the anchorage hole. Attachment hardware shall be installed so that movement for self-alignment is possible. If the length of the bolt is inadequate, use the size and grade of bolt specified by the vehicle manufacturer.

5.3 Install the buckle side of the seat belt assembly at the inboard side of the seating position; that is, away from the door. Pass the belts through or around the seat toward the rear. Choose a belt path that avoids rough or sharp edges.

5.4 Threadable Attachment Hardware

5.4.1 If the webbing is not sewn or otherwise permanently secured to the attachment hardware, thread the webbing through the hardware as instructed by the seat belt manufacturer. Figures 1, 2, 3, 4, and 5 show typical acceptable methods of threading nonsewn webbing through attachment hardware.

5.4.1.1 Figure 1 depicts a single slot anchor bracket with a single slot keeper plate. The same threading may also be used with two-piece single slot anchor hooks (sister or twin hooks).

NOTE—If single slot anchor hooks are used, after the webbing has been threaded and the hooks have been assembled to the eyebolt, the two hooks must be fastened together with a cotter key or other device (as shown in Figure 3).

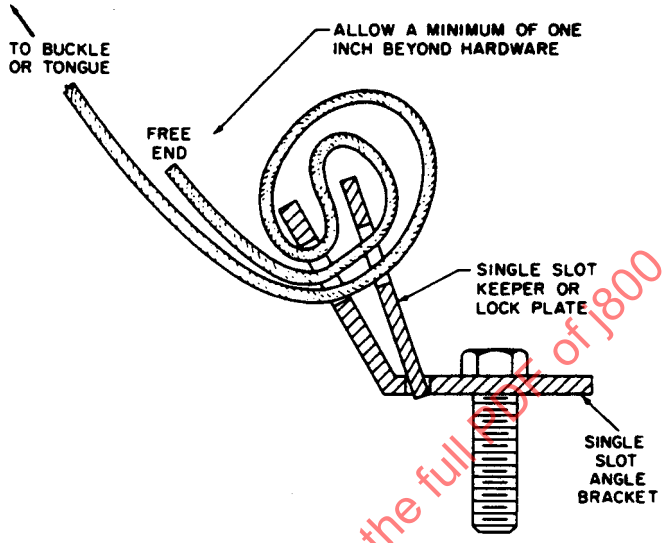

FIGURE 1—SINGLE SLOT ANCHOR BRACKET WITH SINGLE SLOT KEEPER PLATE

5.4.1.2 Figure 2 shows a dual slot anchor bracket without a keeper plate. The same threading is used for two slot sister or twin hooks. The two parts are held together by webbing as though they are a single unit.

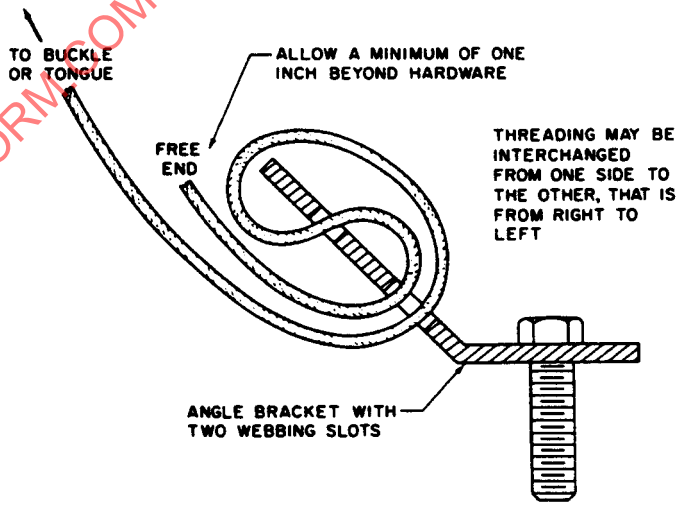

FIGURE 2—DUAL SLOT ANCHOR BRACKET (NO KEEPER PLATE)

5.4.1.3 Figure 3 shows sister or twin hooks in the case where one hook has two webbing slots while the other one has one web slot. After threading, the hooks must be keyed or otherwise secured together.

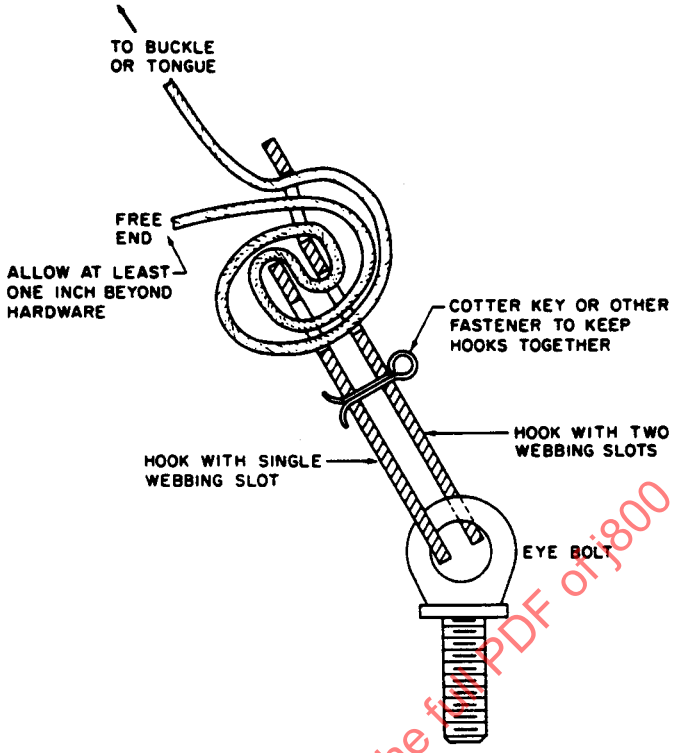

FIGURE 3—SISTER (TWIN) HOOKS

5.4.1.4 Figure 4 depicts single slot sister or twin hooks with a single slot keeper plate.

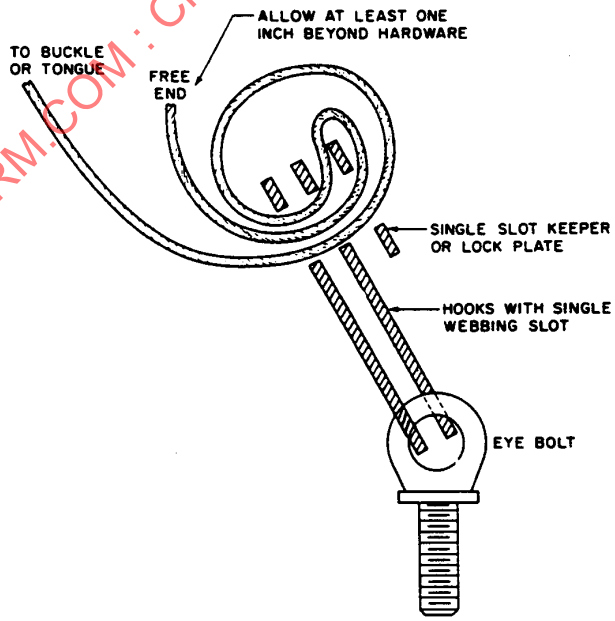

FIGURE 4—SISTER (TWIN) HOOKS WITH KEEPER PLATE (ALL SINGLE SLOT)

5.4.1.5 Figure 5 illustrates a single hook with webbing slots. The retainer latch that secures the hook onto the eyebolt must be keyed or otherwise secured.

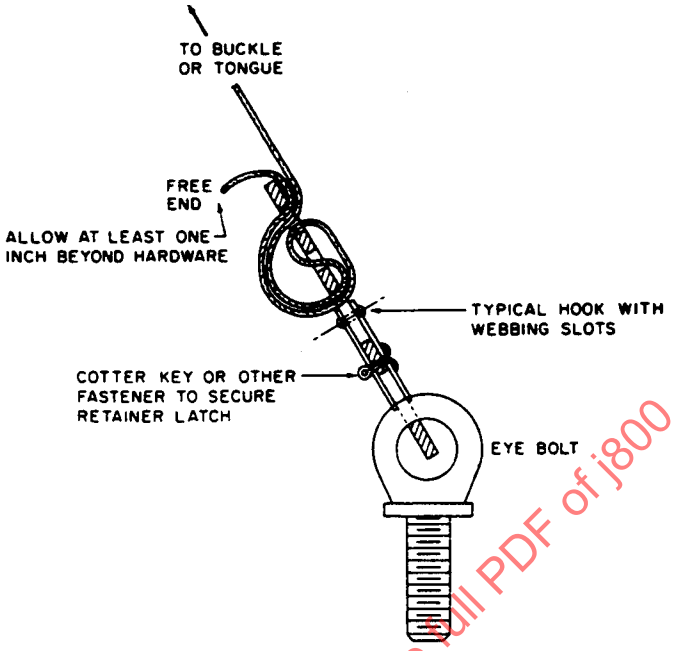

FIGURE 5—SINGLE (SNAP) HOOK WITH WEBBING SLOTS

5.4.2 CAUTION—Proper threading of the webbing through the attachment hardware is extremely important to insure adequate strength of the installation. This part of the installation shall be double checked to see that it follows these instructions.

5.5 Belts whose length can be set at the time of installation by threading the webbing through the attachment hardware shall be installed so that they can later be adjusted at the buckle to fit occupants ranging in size from 5th percentile adult female to 95th percentile adult male (see SAE J833). Typically, either the buckle half or the tongue half of the seat belt assembly will contain a means to adjust the belt length. The half of the assembly containing the adjuster should be left long enough to fit around the hips of a 95th percentile adult male passenger. Paragraph 5.7 has special adjustment instructions for shoulder belts.

5.6 if single attachment hooks, sister hooks, or twin hooks are used, they shall be secured by a fastening device to insure against inadvertent release from the eyebolt to which they are attached.

5.7 If the seat belt includes an upper torso restraint, consult the vehicle manufacturer to establish the recommended position of the upper anchorage point. This point is typically above and behind the shoulder point of the seated occupant. If the vehicle manufacturer's recommendation is not available, consult FMVSS 210 and HS 13 identified in Section 2. Drill the required holes and install the attachment hardware using the washers or reinforcing plates furnished. If the shoulder belt is sewn or hooked to the lap belt, the lap belt must be adjusted so that the point of intersection is at least 152 mm (6 in) from the center of the seated occupant.