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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J689

REV. JUN96

Issued 1960-03
Revised 1996-06

Superseding J689 DEC89

Submitted for recognition as an American National Standard

(R) CURBSTONE CLEARANCE, APPROACH, DEPARTURE, AND RAMP BREAKOVER ANGLES— PASSENGER CAR AND LIGHT TRUCK

1. ***Scope—***This SAE Recommended Practice applies to rigid bumper or rigid structure points and flexible components of passenger cars, multipurpose passenger vehicles, and light trucks. This document is intended as a guide toward standard practice and is subject to change to keep pace with experience and technical advances.

1.1 **Purpose—**The purpose of this document is to provide minimum static design guidelines for curbstone clearance, approach, departure, and ramp breakover angles. This is to minimize damage, if any, in normal vehicle use conditions. This document also encompasses all current worldwide regulations and requirements.

1.2 **Field of Application**

1.2.1 PASSENGER CAR, MULTIPURPOSE PASSENGER VEHICLE (MPV), AND LIGHT TRUCK

1.2.2 MINIMUM ANGLES AND CLEARANCES—Under the manufacturer's most severe vehicle design load for each particular load condition, the minimum approach, departure, ramp breakover angles, and bumper-to-ground height, as indicated in Figure 1, shall be as follows:

When measuring these dimensions, flexible bumper components such as air dams, lower valance panels, and fascias should be considered. The allowable approach angle to flexible components that are allowed nonstructural damage should be 13 degrees.

2. ***References—***There are no referenced publications specified herein.

3. ***Definitions***

3.1 **Passenger Car—**Vehicles with motive power, except multipurpose passenger vehicles, motorcycles, or trailers, designed for carrying 10 persons or less.

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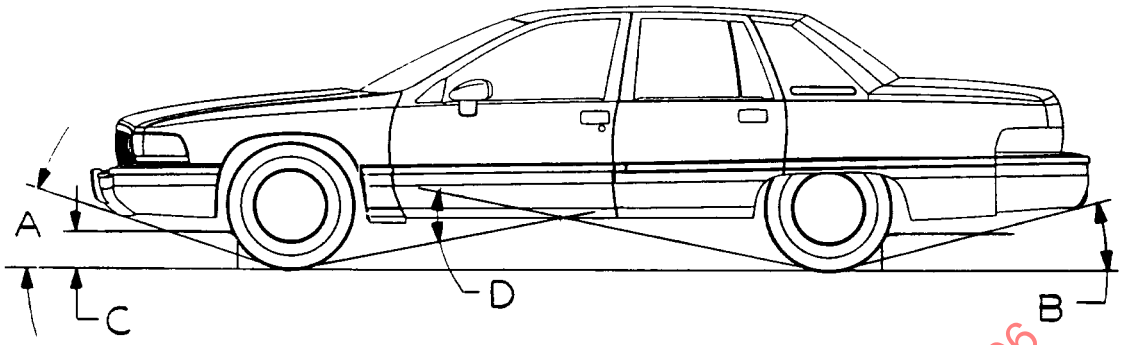

A.	Approach Angle (H106)	16 degrees
B.	Departure Angle (H107)	13 degrees
C.	Curbstone Height Clearance	203 mm (8 in)
D.	Ramp Breakover Angle (H147)	12 degrees

FIGURE 1—MINIMUM ANGLES AND CLEARANCES

3.2 Multipurpose Passenger Vehicle (MPV)—Vehicles with motive power, except trailers, designed to carry 10 persons or less, which are constructed either on a truck chassis or with special features for occasional off-road operation.

3.3 Truck—Vehicles with motive power, except a trailer, designed primarily for the transportation of property or special-purpose equipment.

3.3.1 LIGHT TRUCK—Classification of self-propelled vehicles which are designed primarily to transport property or special-purpose equipment, and have a maximum gross weight rating (GVWR) of 4536 kg (10 000 lb) or less. GVWR is the value specified by the manufacturers as the loaded weight of a single vehicle.

3.4 Bumper to Ground

3.4.1 H102—FRONT BUMPER TO GROUND—The minimum dimension measured vertically from the lowest point on the front bumper to ground, including bumper guards if standard.

3.4.2 H103—FRONT BUMPER TO GROUND—CURB WEIGHT—Measured in the same manner as H102.

3.4.3 H104—REAR BUMPER TO GROUND—The minimum dimension measured vertically from the lowest point on the rear bumper to ground, including bumper guards if standard equipment.

3.4.4 H105—REAR BUMPER TO GROUND—CURB WEIGHT—Measured in the same manner as H104.

3.5 Angle of Approach (H106)—The angle measured between a line tangent to the front tire static-loaded radius arc and the initial point of structural interference forward of the front tire to ground. The limiting structural component shall be designated.

3.6 Angle of Departure (H107)—The angle measured between a line tangent of the rear tire static-loaded radius and the initial point of structural interference rearward of the rear tire to the ground. The limiting component shall be designated.

3.7 Ramp Breakover Angle (H147)—The angle measured between two lines tangent to the front and rear tire static-loaded radius and intersecting at a point on the underside of the vehicle which defines the largest ramp over which the vehicle can roll.

3.8 Parking Curbstone Height Clearance—The minimum curbstone clearance to any structure, mechanical, fuel tank, exhaust system, or any limiting component. The limiting components for this document are located forward of the front tires or rearward of the rear tires.

4. Notes

4.1 Marginal Indicia—The (R) is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

PREPARED BY THE SAE BUMPER STANDARDS COMMITTEE