Towability Design Criteria —Passenger Cars and Light Duty Trucks —SAE J1142a

SAE Recommended Practice
Completely Revised June 1978

THIS IS A PREPRINT WHICH IS SUBJECT TO REVISIONS AND CORRECTIONS. THE FINAL VERSION WILL APPEAR IN THE 1980 EDITION OF THE SAE HANDBOOK.

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LAND SEA AIR SPACE

PREPRINT

TOWABILITY DESIGN CRITERIA—PASSENGER CARS AND LIGHT DUTY TRUCKS—SAE J1142a

SAE Recommended Practice

Report of Automotive Safety Committee approved July 1976 and completely revised by Motor Vehicle Safety Systems Testing Committee June 1978.

1. Purpose—The purpose of this recommended practice is to provide guidelines for the design of vehicles and procedures to minimize damage in the towing of the vehicle with conventional towing equipment in the event of disablement.

2. Conventional Towing Equipment

2.1 Towing Sling and Hitches

2.1.1 Passenger Cars—Towing sling, as shown in Fig. 1 or equivalent, for static lifted loads up to 3000 lb (1361 kg).

2.1.2 Light Duty Trucks—Up to 10 000 lb (4530 kg) GVW.

2.1.2.1 Towing sling, as shown in Fig. 1, or equivalent, for static lifted loads up to 3000 lb (1361 kg).

2.1.2.2 Towing hitch, as shown in Fig. 2, or equivalent, for static lifted loads over 3000 lb (1361 kg) and up to 6000 lb (2722 kg).

2.2 Chains and hooks for use with towing sling and hitch.

2.2.1 Chains with J-Hooks, and Grab-Hooks—For use with towing sling (two required), see Fig. 3.

2.2.2 Chains with Grab-Hooks Only—For use with towing hitch (two required), see Fig. 4.

2.2.3 T-hooks (two required), see Fig. 5, to be added as needed to the above chain assemblies.

2.2.4 U-hooks (two required), see Fig. 6, to be added as needed to the above chain assemblies.

Note: The use of T-hooks or U-hooks is available to vehicle manufacturers at their option in place of J-hooks.

2.3 Cross Beam—See Fig. 7.

2.4 Spacer Blocks—See Fig. 7.

Note: While the use of the crossbeam and/or spacer blocks is not encouraged, they are, nevertheless, included as conventional towing equipment. Because of the limited availability of the conventional crossbeam and spacer blocks in the field and the difficulty of application in using them, vehicles should be designed to eliminate their need, whenever possible.

3. Vehicle Requirements

3.1 Suspension

3.1.1 Front Suspension

3.1.1.1 Attachments for towing equipment shall be designed to withstand the forward extension force exerted by the J-hook, T-hook, or U-hook chain assemblies specified by the vehicle manufacturer.

3.1.1.2 Components shall be designed to withstand the forward extension forces caused by the wheels hitting roadway obstacles when towing from the rear.

3.1.1.3 Attachments for towing equipment shall be provided to avoid interference with components vulnerable to damage.

3.1.2 Rear Suspension

3.1.2.1 Attachments for towing equipment shall be designed to withstand the rearward extension force exerted by the J-hook, T-hook, or U-hook chain assemblies specified by the vehicle manufacturer.

3.1.2.2 Attachments for towing equipment shall be provided to avoid interference with components vulnerable to damage.

3.2 Chassis/Frame

3.2.1 Attachments for towing equipment shall be designed to withstand the extension forces exerted by the J-hook, T-hook, or U-hook chain assemblies specified by the vehicle manufacturer.

3.2.2 Attachments for towing equipment shall avoid interference with components vulnerable to damage.

3.3 Bumpers

3.3.1 Bumpers, bumper guards, bumper attaching assemblies shall be designed to withstand loads imposed by the towing equipment.

3.3.2 License plate mounting locations shall be designed to avoid interference with the towing equipment, whenever possible.

3.4 Body Panels

3.4.1 Body panel design including, but not limited to, valance panels and air deflectors, shall consider the loads and position of the towing equipment.

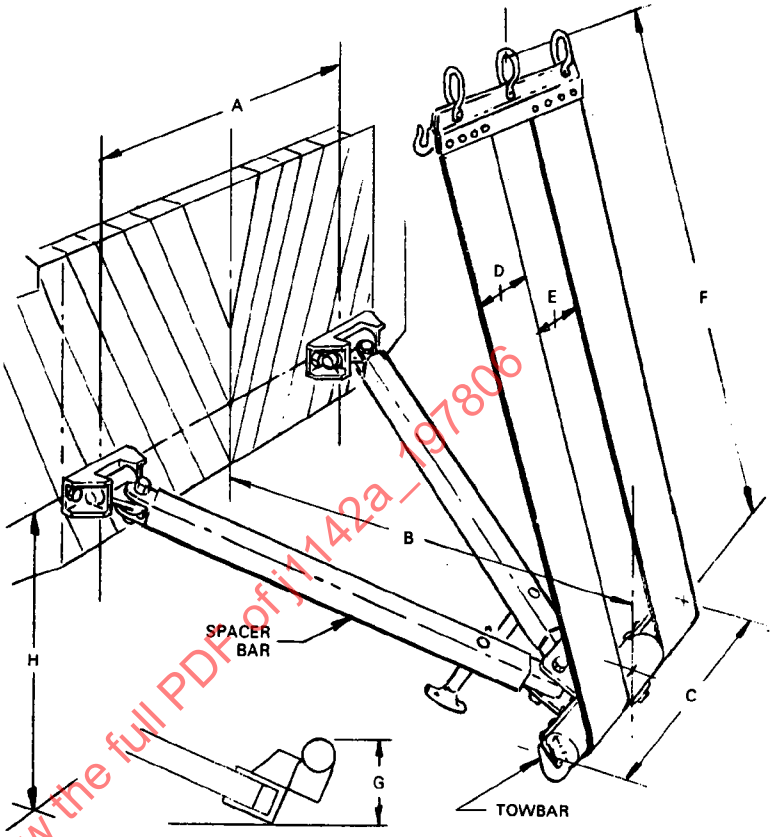
3.4.2 When adequate clearance between towing equipment and body panels cannot be provided, such body panel materials and their attachment shall be specified for elastic flexibility to -20°F (-29°C).

3.4.3 Adjacent body panels shall have sufficient clearance to allow for body/chassis deflections under lifting and towing loads.

3.5 Underbody

3.5.1 Adequate ground clearance (a function of approach angle, departure angle, breakover angle, and standing height) shall be provided to allow damage-free lifting and towing.

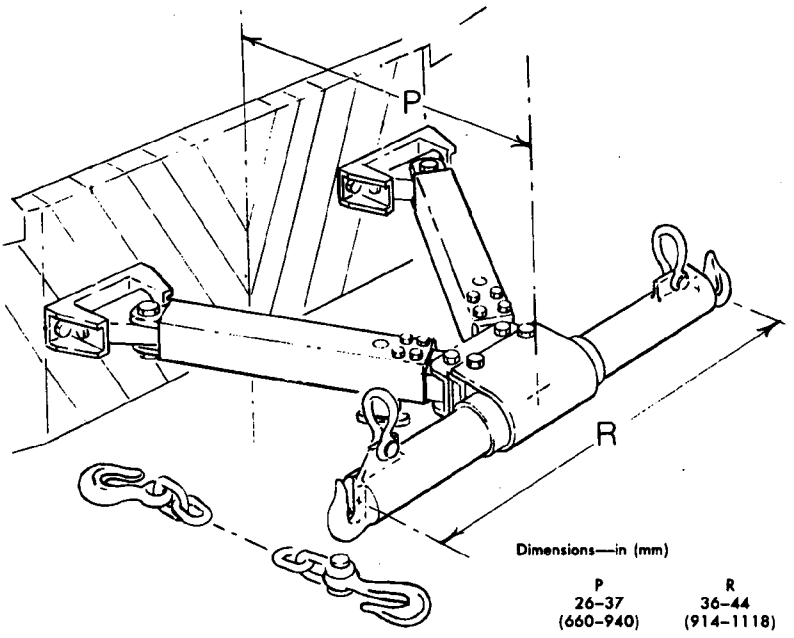
The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.



Dimensions—in (mm)

A:	36–38	(914–965)	E:	13–20	(330–508)
B:	34–36	(864–914)	F:	44–48	(1118–1219)
C:	34–36	(864–914)	G:	4–5.6	(102–142)
D:	8–10	(203–254)	H:	24–32	(610–813)

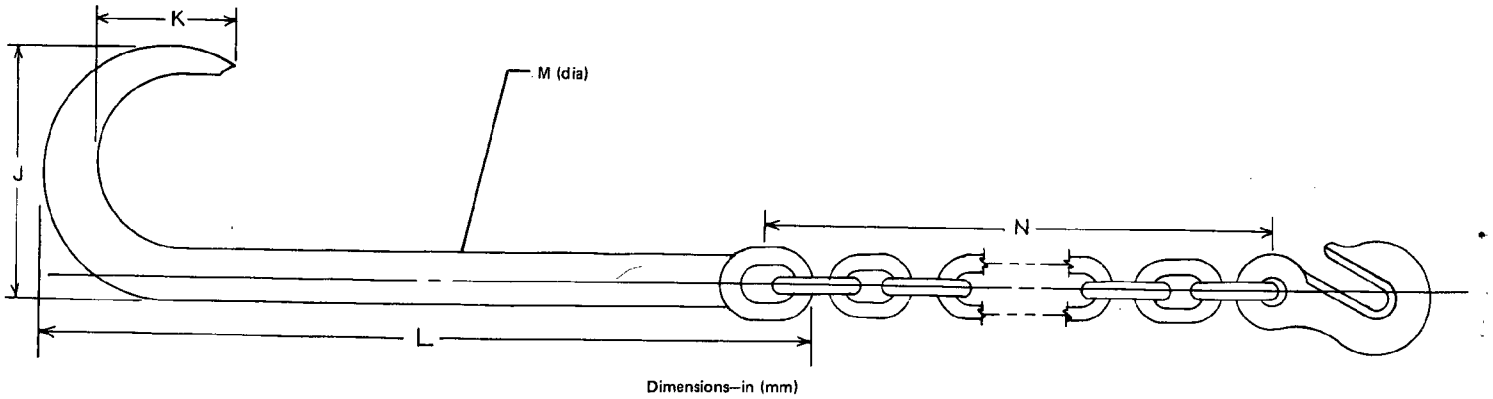
FIG. 1—TOWING SLING UP TO 3000 LB (1361 KG)



Dimensions—in (mm)

P	R
26–37 (660–940)	36–44 (914–1118)

FIG. 2—TOWING HITCH



Dimensions—in (mm)

J:	4.5-5.5	(114-140)
K:	3-4	(76-102)
L:	14-15	(356-381)
M:	0.85-0.90	(22-23)
N:	90-96	(2290-2440)
Chain:	5/16 (B) dia	

FIG. 3—J-HOOK CHAIN ASSEMBLY FOR USE WITH TOWING SLING

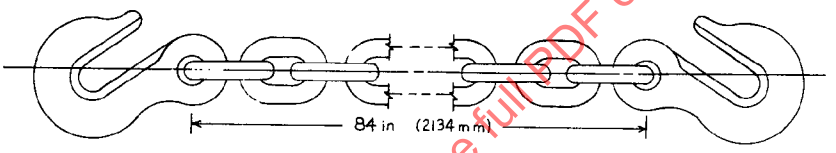


FIG. 4—CHAIN ASSEMBLY FOR USE WITH TOWING HITCH

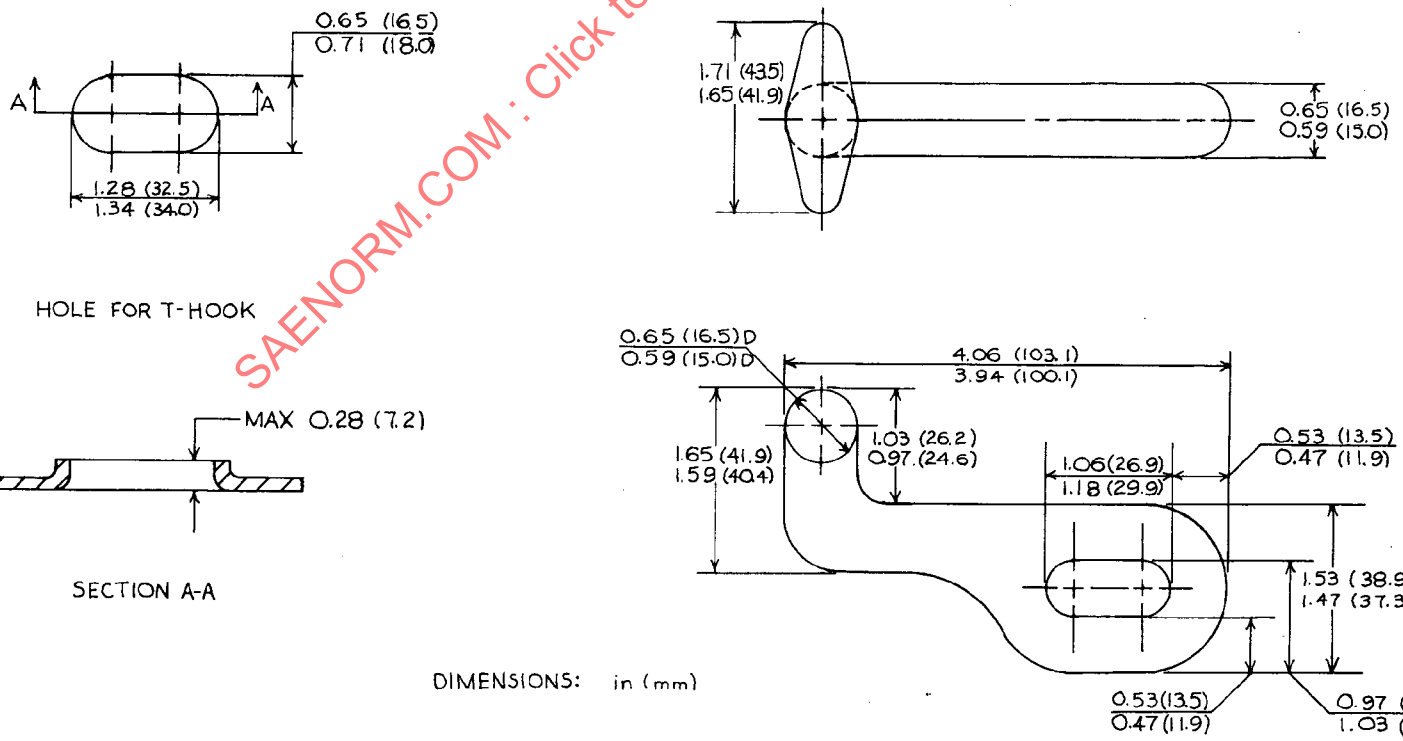


FIG. 5—T-HOOKS