

**Towed Vehicle/Wrecker
Attachment Test Procedure—
Passenger Cars and Light Duty Trucks
—SAE J1143a**

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.

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096



PREPRINT
S. A. E.
LIBRARY

SAENORM.COM : Click to view the full PDF of J1143a-197806

φ **TOWED VEHICLE/WRECKER ATTACHMENT
TEST PROCEDURE—PASSENGER CARS AND
LIGHT DUTY TRUCKS—SAE J1143a**

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 test procedure is to subject a vehicle to wrecker towing attachment under a variety of road conditions, and to observe and evaluate its behavior. The powertrain should be evaluated by conducting SAE J1144a, Towed Vehicle Drivetrain Test Procedure—Passenger Cars and Light Duty Trucks (June, 1978).

2. Test Equipment

2.1 Tow Truck

2.1.1 Passenger Cars and Light-Duty Trucks Using the Towing Sling—Tow vehicle should be a 10 000 lb (4536 kg) GVW, 60 in (1524 mm) Cab-to-Axle (CA), dual-wheel tow truck.

2.1.2 Light-Duty Trucks Using the Towing Hitch—Tow vehicle should be a 20 000 lb (9072 kg) GVW, 60 in (1524 mm) Cab-to-Axle (CA), dual-wheel tow truck.

2.2 Testing Equipment

2.2.1 Tow sling, or hitch, as required by vehicle to be tested.

2.2.2 Other conventional towing equipment as required by towing procedure instruction sheets.

2.3 Vehicle ballast.

2.4 Wheel alignment checking device.

2.5 SAE J1143a, Towed Vehicle/Wrecker Attachment Test Procedure—Passenger Cars and Light Duty Trucks (June, 1978).

2.6 Manufacturer's recommended towing procedure instruction sheets.

3. Test Procedure

3.1 Towed Vehicle Preparation

3.1.1 Vehicle shall be selected model at the heaviest curb weight. Ballast may be used, if required.

3.1.2 Tires shall be those with the smallest static loaded radius available for the vehicle at the heaviest curb weight in paragraph 3.3.1.

3.1.3 Tire pressures shall be to manufacturer's lowest recommended pressure.

3.1.4 Optional released equipment including, but not limited to, bumper guards, trailer hitches, automatic level control systems, which may affect towing sling attachment and/or reduce towed vehicle ground clearance during towing shall be installed.

3.1.5 Trim height shall be within manufacturer's specifications prior to test.

3.1.6 Check front and rear wheel alignments and record on data sheet. Reset to manufacturer's specifications, if required.

3.1.7 Sheet metal, doors, deck lid, or tailgate clearance shall be within manufacturer's tolerances. For trucks, cab-to-body clearance shall be set to minimum dimensions, if applicable.

3.1.8 Check bumpers for clearances to sheet metal, grilles, etc. to manufacturer's tolerances. Realign, if required.

3.1.9 Check bumper system fastener torques to manufacturer's tolerances. Retorque to specifications, if required.

3.1.10 Vehicle Test Loads

3.1.10.1 Passenger cars shall be loaded to manufacturer's recommended cargo capacity.

3.1.10.2 Light duty trucks shall be loaded as specified by the manufacturer.

3.1.11 Record final vehicle weights.

3.1.12 Drive vehicle to determine if vehicle is operating normally.

3.2 Front Towing Test Procedure

3.2.1 With wrecker and vehicle on level ground, attach wrecker sling or hitch to front of vehicle using manufacturer's recommended procedure. Raise front wheels 4 in (102 mm) minimum above ground.

3.2.2 Determine minimum ground clearance at rear of vehicle. Record component closest to the ground and amount of clearance on data sheet.

3.2.3 Set ignition switch and transmission selector to proper positions for towing and release parking brake.

Note: The following sequence is recommended, but not mandatory. Events may be resequenced as long as all tests are performed.

3.2.4 Curb Test—This test is to determine ground clearance. At creep speed, drive off a 4 in (102 mm) curb, with towed vehicle centerline at 45 deg to the curb on the right side. Repeat with towed vehicle centerline at 45 deg to the curb on the left side.

3.2.5 Conduct a visual inspection of the vehicle and sling hitch attachment. Record any irregularities on the data sheet.

3.2.6 High Frequency Vertical Shock Test—This test is to induce vertical shock loads to determine stability of vehicle attachments. (This test is not to determine ground clearance which is evaluated in other portions of this procedure.) Drive one mile (1.6 km) at 15 miles/h (24 km/h) on *Belgian-Block* type road as specified by the manufacturer. If ground contact is encountered during this test, remove lifted wheels from towed vehicle and carry lifted end of vehicle closer to the ground, or place ground wheels on a dolly.

3.2.7 Repeat paragraph 3.2.5 (if applicable, reinstall lifted wheels or remove dolly and reposition vehicle per paragraph 3.2.1).

3.2.8 Roll Test—This test is to induce opposing roll between the towing and the towed vehicles. Drive 0.5 miles (0.8 km) at 35 miles/h (56 km/h) on *Twisted-Plane* type road as specified by the manufacturer.

3.2.9 Repeat paragraph 3.2.5.

3.2.10 Pitch Test—This test is to induce pitch between the towing and the towed vehicles. Drive at 15 miles/h (24 km/h) in the normal traffic lane through a 90 deg intersection of two highly crowned roads as specified by the manufacturer.

3.2.11 Repeat paragraph 3.2.5.

3.2.12 Highway Test—This test is to evaluate both the handling characteristics of the combination during highway towing, and the distance capabilities of the combination. Drive 50 miles (80 km) at 50 miles/h (80 km/h). If required by the manufacturer's recommended towing procedure, propeller shaft, or axle shafts as applicable, may be disconnected or removed, for towing on the drive wheels at these speeds and distance.

Note: The equipment or methods employed must be consistent with the manufacturer's recommended towing procedure instruction sheet.

3.2.13 Repeat paragraph 3.2.5 (if applicable, reinstall propeller shaft, or axle shafts removed in Item 3.2.12).

3.2.14 Grade Test—This test is to evaluate, individually, approach, departure, and breakover and stability of the towing attachment on grades. Drive 15% grade (8.5 deg) uphill. Repeat drive in downhill direction. The entrance to the grade, the run of the grade, and the departure from the grade must each exceed the length of the towing/towed vehicles combination.

3.2.15 Repeat paragraph 3.2.5.

3.2.16 Panic Brake Stop—This test is to evaluate the stability of the towing attachment under severe braking conditions. Recognizing that ride-up damage can occur, the recommended attachment method should minimize ride-up damage. Make a panic brake stop from 15 mile/h (25 km/h) with the towing vehicle wheels locked (tires skidding) on dry, level pavement.

3.2.17 Repeat paragraph 3.2.5.

3.2.18 Final Inspection—Detach vehicle and inspect for bumper deformation; paint damage; valence panel damage; body or sheet metal buckles; proper opening and closing of doors, hood, and decklid (or tailgate); and deformation of fuel tank, filler pipe, and exhaust system. Perform a general undercarriage inspection including tow hook attachment points for deformation. Check front and rear wheel alignments after the test vehicle has been driven at least one mile to normalize suspension components. Check brake systems. Note observations and results of all inspections on data sheet.

3.2.19 Drive vehicle to determine if vehicle is operating normally.

3.3 Rear Towing Test Procedure

3.3.1 Set front wheels in straight ahead position and secure steering wheel according to manufacturer's recommended procedure.

3.3.2 With vehicle and wrecker on level ground, attach wrecker sling or hitch to rear of vehicle using manufacturer's recommended procedure. Raise rear wheels a minimum of 4 in (102 mm) above the ground. Determine minimum ground clearance at front of vehicle. Record component closest to the ground and amount of clearance on data sheet.

3.3.3 Set ignition switch and transmission selector to proper positions for towing and release the parking brake.

3.3.4–3.3.17 Repeat paragraphs 3.2.4–3.2.17.

3.3.18 Final Inspection—Conduct the complete inspection listed in paragraph 3.2.18 including the check of front and rear wheel alignments.

3.3.19 Drive vehicle to determine if vehicle is operating normally.

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.

TOWED VEHICLE/WRECKER ATTACHMENT TEST
SAE J1143a
Passenger Cars
DATA SHEET

Test Vehicle: Year _____ Make _____ Model _____ Number _____ Report No. _____
 Year _____ Pretest _____ Prototype _____ Pilotline _____ Production _____
 Test Weight: Left Front _____ lb (kg) Right Front _____ lb (kg) Total _____ lb (kg)
 Left Rear _____ lb (kg) Right Rear _____ lb (kg) Total _____ lb (kg)
 Tow Vehicle: Year _____ Make _____ Model _____ GVW _____
 Wrecker/Body Equipment: Make _____ Model _____
 Sling/Hitch: Make _____ Model _____

WHEEL ALIGNMENT DATA:

Front	Initial (3.1.6)		After Front Tow (3.2.18)		After Rear Tow (3.3.18)	
	RH	LH	RH	LH	RH	LH
Camber-deg	_____	_____	_____	_____	_____	_____
Caster-deg	_____	_____	_____	_____	_____	_____
Toe-in (mm)	_____	_____	_____	_____	_____	_____

Comments: _____

Rear Wheel Alignment Data:

Rear	Initial (3.1.6)		After Front Tow (3.2.18)		After Rear Tow (3.3.18)	
	RH	LH	RH	LH	RH	LH
Camber-deg	_____	_____	_____	_____	_____	_____
Caster-deg	_____	_____	_____	_____	_____	_____
Toe-in (mm)	_____	_____	_____	_____	_____	_____

Comments: _____

FRONT TOW TEST (3.2)

Height of front wheels above ground _____ in (mm)
 Component closest to ground _____ in (mm)
 Record ground clearance to component _____ in (mm)

Results of visual inspection after Curb Test (3.2.4) _____

Results of visual inspection after High Frequency Vertical Shock Test (3.2.6): _____

Note if lifted wheels were removed or if dolly was used _____

SAENORM.COM : Click to view the full PDF of J1143a_197806