

Trailer – Truck – Hitch Weight and Rating Survey and Compatibility Analysis

Date: _____

Reviewer: _____

Tow Vehicle: _____

Trailer Load: _____

The following analysis should be conducted by an EPA staff member who has taken the Trailer Towing Safety Course. These worksheets provide a guide to ensuring that the weight distribution of the trailer is compatible with the tow vehicle and hitching system.

In Table B-1, the reviewer determines the 16 individual values as outlined. From this, an analysis of weight distribution and tow vehicle / trailer load compatibility can be conducted in Table B-2. If any of the checklist questions in Table B-2 are answered as “NO”, efforts must be made to redistribute the load or find other equipment capable of handling the loads necessary for the specific trip. If any weight redistributions are done to address a specific issue, the entire analysis will have to be repeated to ensure that none of the redistributions affected other potential compatibility checklist items.

These forms should be completed, and the inspector shall be able to answer all the checklist questions in Table B-2 with a “YES”. This form should be attached to the pre-inspection trailer checklist, and a copy of both forms should be sent to the safety manager. Note: No trip involving the towing of a trailer can take place before both this compatibility analysis and the pre-trip inspection checklist have been satisfactorily completed.

Table B-1. - Trailer-Truck-Hitch Weights and Ratings

Line Item	Trailer / Vehicle Component Weight/Rating	Description	Weight/Rating
Trailer Weights			
1.	Gross Trailer Weight (GTW)	Scale Reading from the trailer and all trailer contents (i.e. boat, lab, ATV, equipment) sitting detached from the vehicle.	
2.	Trailer Tongue Weight (TTW)	Also known as Hitch Weight, this value is obtained by detaching the trailer at full load, placing only the landing gear (trailer jack) on the scale. The trailer should be at the height that it will be towed at, since the attitude affects the scale reading	
Tow Vehicle Weights			
3.	Base Curb Weight (BCW)	This is the weight of the tow vehicle (fuel included) with no passengers or equipment. This value can usually be obtained from the vehicle owner's manual.	
4.	Gross Vehicle Weight (GVW)	The BCW, plus the weight of all passengers and equipment. This value can be obtained by placing the entire tow vehicle on the scale (trailer detached) with all passengers and equipment inside the vehicle.	
5.	Gross Combination Weight (GCW)	This is the combined weight of the towing vehicle, trailer, trailer load, passengers and associated equipment. This value can be obtained by positioning all of the wheels of both the loaded tow vehicle and loaded trailer on the scale, or taking the sum of GTW and GVW.	
6.	Gross Axle Weight - Front (GAW-Front)	This is the total weight placed on the tow vehicle's front axle while the trailer is attached. This value can be obtained by placing only the front wheels of the tow vehicle (trailer attached) on the scale.	
7.	Gross Axle Weight - Rear (GAW - Rear)	This is the total weight placed on the tow vehicle's rear axle while the trailer is attached. This value can be obtained by placing only the rear wheels of the tow vehicle (trailer attached) on the scale.	

Line Item	Trailer / Vehicle Component Weight/Rating	Description	Weight/Rating
Tow Vehicle Weight Limits			
8.	Gross Vehicle Weight Rating (GVWR)	This is the maximum permissible weight of the vehicle while fully loaded. This limit can usually be obtained from the vehicle's owner manual, or inside the driver's side door.	
9.	Gross Combination Weight Rating (GCWR)	This is the maximum permissible weight of the towing vehicle, trailer, trailer load, passengers, and associated equipment. This limit is provided in the vehicle manual, or can be provided by the manufacturer.	
10.	Gross Axle Weight Rating - Front (GAWR - Front)	This is the total weight that the tow vehicle's front axle is capable of carrying. This limit can usually be obtained from the vehicle's owner manual, or inside the driver's side door.	
11.	Gross Axle Weight Rating - Rear (GAWR - Rear)	This is the total weight that the tow vehicle's rear axle is capable of carrying. This limit can usually be obtained from the vehicle's owner manual, or inside the driver's side door.	
12.	Maximum Trailer Towing Rating (MTTR)	This is the maximum load that the vehicle is capable of towing. This limit can usually be obtained from the vehicle's owner manual, or inside the driver's door.	
Hitch Weight Limits			
13.	Hitch Capacity (HC)	This is the maximum load that the hitch can safely tow. This limit is often given right on the hitch frame.	
14.	Tow Ball Rating (TBR)	This is the maximum load that the tow ball can safely support. This limit is often stamped directly onto the tow ball itself.	
15.	Tongue Weight Rating (TWR)	This is the maximum tongue weight that the hitch system can safely carry. This limit is often given right on the hitch frame.	
16.	Draw Bar Tongue Rating (DBTR)	This is the maximum tongue weight that the draw bar can safely support. This limit is often given right on the draw bar itself.	

Table B-2. Trailer-Truck Hitch Compatibility Checklist

Question / Check of Conformance	YES	NO	If no, this issue should be addressed before trip departure. Possible solutions include:
Gross Trailer Weight Checks			
Is Line Item 1 (GTW) less than Line Item 12 (MTTR)?			(1) Select another tow vehicle with a higher MTTR. (2) Reduce the GTW.
Is Line Item 1 (GTW) less than Line Item 13 (HC)?			(1) Select another hitch with a greater HC. (2) Reduce the GTW.
Is Line Item 1 (GTW) less than Line Item 14 (TBR)?			(1) Select another hitch system or tow ball with a greater TBR. (2) Reduce the GTW.
Trailer Tongue Weight Checks			
Is Line Item 2 (TTW) 10-15% of Line Item 1 (GTW)?			(1) Verify that the trailer is properly loaded. (2) Select another trailer appropriate for carrying the desired load.
Is Line Item 2 (TTW) less than Line Item 15 (TWR)			(1) Decrease the TTW (keeping within 10-15% of GTW). (2) Select another hitch system with a higher TWR.
Is Line Item 2 (TTW) less than Line Item 16 (DBTR)?			(1) Decrease the TTW (keeping within 10-15% of GTW). (2) Select another draw bar and/or hitch system capable of handling the load
Tow Vehicle and Trailer Weight and Distribution Checks			
Is Line Item 4 (GVW) less than Line Item 8 (GVWR)?			(1) Decrease the GVW. (2) Select another vehicle with a greater GVWR.
Is Line Item 5 (GCW) less than Line Item 9 (GCWR)?			(1) Decrease the GCW (GVW plus GTW) (2) Select another vehicle with a greater GCWR.
Is Line Item 6 (GAW-Front) less than Line Item 10 (GAWR-Front)?			(1) The distribution of the tow vehicle load needs to be adjusted.
Is Line Item 7 (GAW-Rear) less than Line Item 11 (GAWR-Rear)?			(1) Decrease the TTW (keeping within 10-15% of GTW). (2) The distribution of the trailer load needs to be adjusted.