

# The Truck-Trailer Combination Vehicle

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Atlanta, Georgia



**Making Sure the Numbers Add Up**





A truck has to be designed to carry its trailer and payload; a trailer has to be designed to carry the weight; and the parts that connect the trailer and truck have to be strong enough to keep them connected.



**BALL**  
**3,500**



**INSERT**  
**5,000**



**RECEIVER**  
**7,500**



**TRUCK**  
**12,400**



20984346 Hitch Ratings/Capacités de remorquage V-5 GM

Hitch Type Type d'attelage	Maximum Trailer Weight Poids maximal de remorque	Maximum Tongue Weight Poids maximal au timon
Weight Carrying Porteur de charge	17 000 lb (7 711 kg)	1 800 lb (816 kg)
Weight Distributing Répartiteur de charge	17 000 lb (7 711 kg)	1 800 lb (816 kg)

20984344

Using Just Your  
Eyes Leaves You  
Blind to the Facts





# A Lot Rides on the Ratings





only. To move or dispose of  
property call 859-254-1434x243  
**DO NOT RETURN TO UK SURPLUS**

D BY/FABRIQUE PAR: P1 TRAILER MANUFACTURING

NR/PN 9034 (W11000LD)

GAWR

RIM/JANT

COLD INFL PRESS. PRESS

DE CONF A FROID

KPA (PSI/LPC)

551 KPA (80 PSI)

LE

16x5k

551 KPA (80 PSI)

SINGLE

(E) STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE

MANUFACTURE. / CE VEHICULE EST CONFORME A TOUTES LES

DU REGLEMENT SUR LA SECURITE DES VEHICULES

UEUR A LA DATE DE SA FABRICATION.

APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY

STANDARDS (FMVSS) IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

TYPE/TYPE DE VEHICULE: TRA/REM CARHAULER TILT T6202

32 KG (7000 L)

E CONFORMS TO  
ULATIONS IN EFFECT

MES QUI LUI SONT AP  
AUTOMOBILES L

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY  
STANDARDS (FMVSS) IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

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A Lot Rides  
on the Ratings





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A Lot Rides  
on the Ratings





**It's difficult enough to keep a single vehicle operating safely. If you add a trailer to a truck without understanding how they work together, you can create serious public safety issues.**

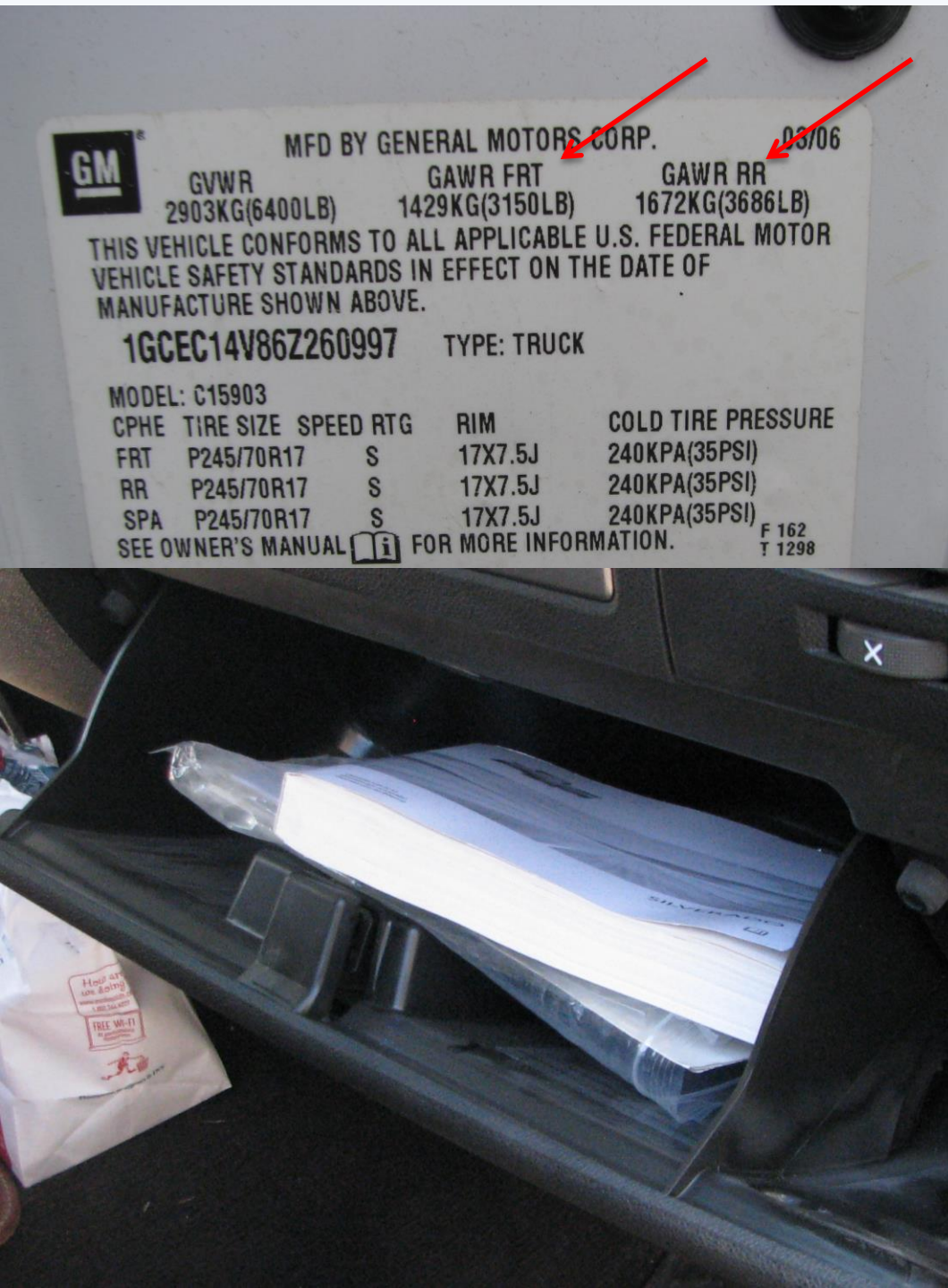




A truck has to be designed to safely pull, stop, and control the trailer attached to it. If a truck is too small, you will be unable to control the trailer and its load.




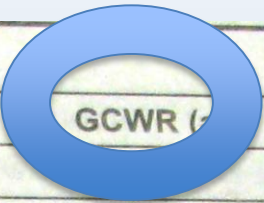
# Finding The Ratings of the Super Vehicle—Truck, Trailer, and Connectors



- Combined gross vehicle weight
- Curb weight
- Gross axle weight rating
- Gross vehicle weight rating
- Receiver rating
- Insert rating
- Ball hitch rating
- Coupler rating
- Tire ratings



## Finding The Ratings of the Super Vehicle—Truck, Trailer, and Connectors



Axle Ratio	Maximum Trailer Weight	GCWR (kg)
d Box HD (d)		
3.73	4 309 kg (9,500 lbs)	7 257 kg (16,000 lbs)
4.10	5 897 kg (13,000 lbs)	9 299 kg (20,500 lbs)
4.10	6 350 kg (14,000 lbs)	9 299 kg (20,500 lbs)
x HD (d)		
3.73	4 264 kg (9,400 lbs)	7 257 kg (16,000 lbs)
4.10	5 897 kg (13,000 lbs)	9 299 kg (20,500 lbs)
4.10	6 305 kg (13,900 lbs)	9 299 kg (20,500 lbs)
HD (d)		
3.73	4 491 kg (9,900 lbs)	7 257 kg (16,000 lbs)
4.10	5 897 kg (13,000 lbs)	9 299 kg (20,500 lbs)
4.10	6 532 kg (14,400 lbs)	9 299 kg (20,500 lbs)
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- Combined gross vehicle weight
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# Analyzing Your Trucks, Trailers, and Connectors



## 25843936 Hitch Ratings/Capacités de remorquage V-5 GM

Hitch Type Type d'attelage	Maximum Trailer Weight Poids maximal de remorque	Maximum Tongue Weight Poids maximal au timon
Weight Carrying Porteur de charge	13 000 lb (5 897 kg)	1 500 lb (680 kg)
Weight Distributing Répartiteur de charge	13 000 lb (5 897 kg)	1 500 lb (680 kg)

Low vehicle maximum trailer rating may be less.

La capacité de remorquage maximale du véhicule remorqueur peut être inférieure.



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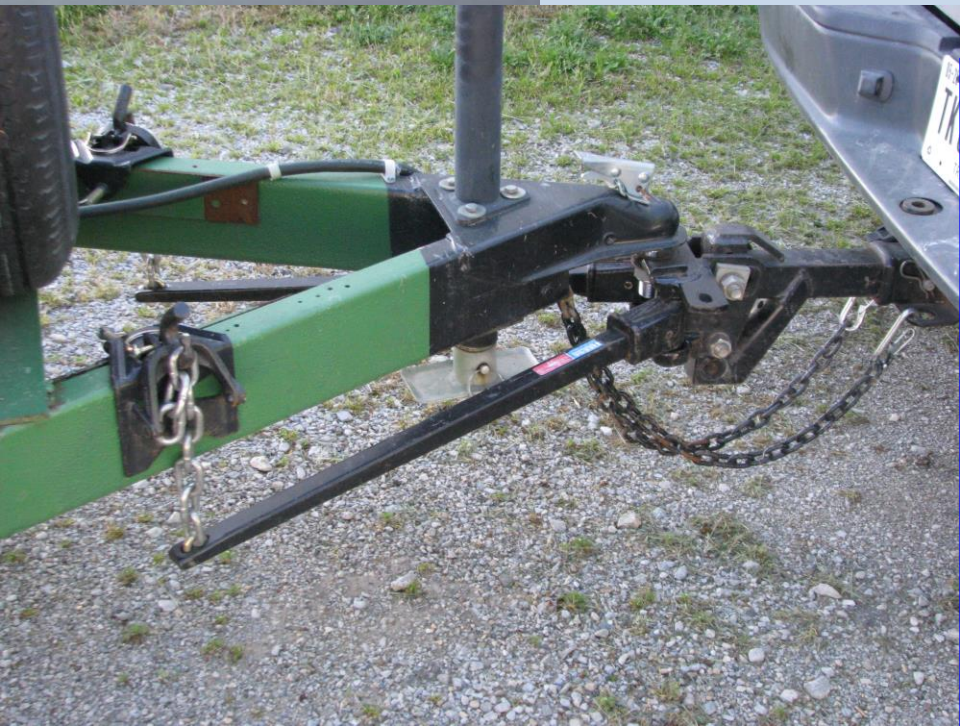


# Analyzing Your Trucks, Trailers, and Connectors





## Weight-Carrying Hitch



**This is a weight-distributing hitch. Crossing chains allow the trailer tongue to be cradled by the chains instead of going into the pavement in the event the trailer detaches.**



## Component 1. Truck System

- Year: 2011
- Make: Ford
- Model: F-150
- Cab: supercab
- Bed: 8 feet
- Wheelbase: 163 inches
- Engine: 5.0 liter
- Fuel: unleaded gasoline
- Transmission: 5-speed automatic
- Gross axle weight rating (rear): 4,200 pounds
- Rear axle ratio: 3.73
- Tire size: LT245/70R17
- Tire loading rating: 3,120 pounds
- Tire pressure: 60 psi
- Gross vehicle weight rating: 8,200 pounds
- Curb/empty weight: 5,780 pounds
- Load capacity: 2,420 pounds
- Towing capacity: 9,600 pounds



## Component 2. Connector System

### **Truck-Mounted Hitch**

- Hitch rating for weight carrying: 5,000 pounds
- Hitch tongue weight: 500 pounds
- Hitch rating for weight distribution hitch: 10,500 pounds
- Insert size: 2 inches
- Insert rating: 5,000 pounds
- Ball size: 2 inches
- Ball rating: 5,000
- Coupler size: 2 inches
- Coupler rating: 5,000 pounds
- Coupler tongue weight rating: not indicated
- Safety chain grade: 43
- Safety chain size: 0.25
- Safety chain breaking strength: 2,600 pounds
- Safety chain hook grade: unknown
- Safety chain hook: grade 30, 1/4 diameter

### **Gooseneck Hitch System**

- Not available



### Component 3. Trailer System

- Year: 2011
- Make: Featherlite
- Model: 6.7 x 10 feet
- Type: conventional
- Electric emergency brake: none
- Axles: single
- Axle rating: 3,500 pounds
- Single/dual tires: single
- Gross vehicle weight rating: 2,990 pounds
- Curb weight: 1,590 pounds
- Payload weight: 1,400 pounds
- Tire size: ST 205/75R15
- Tire loading rating: 1,820 pounds
- Tire pressure: 50 psi



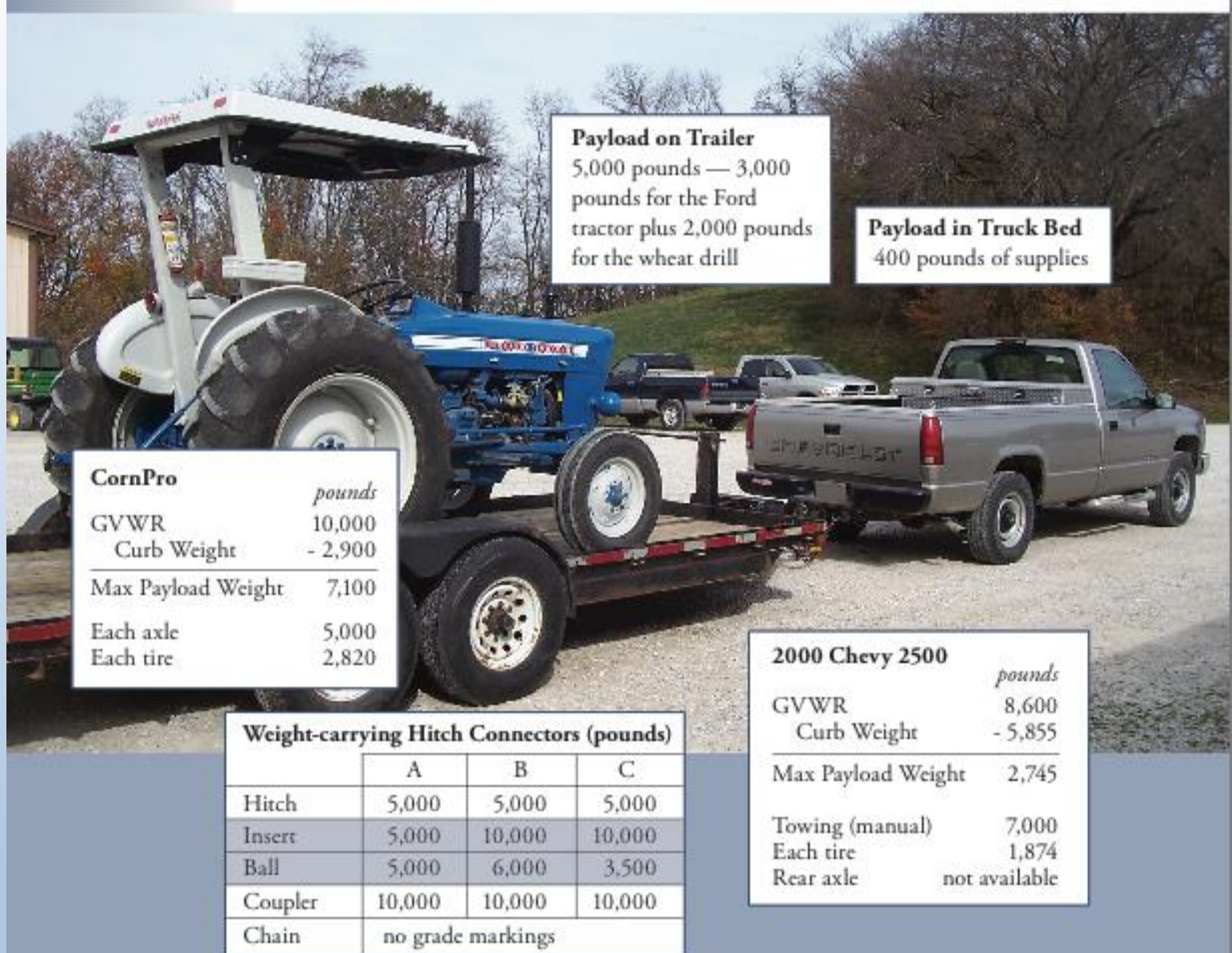
#### Component 4. Combination System

- Combination gross vehicle weight rating:  
15,300 pounds (from owner's truck manual)

#### Component 5. Actual Weights of Payloads

- Payload in truck: one person,  
no load in bed: 180 pounds
- Actual load carried on trailer:  
Polaris ATV: 1,170 pounds





**Payload on Trailer**  
5,000 pounds — 3,000 pounds for the Ford tractor plus 2,000 pounds for the wheat drill

**Payload in Truck Bed**  
400 pounds of supplies

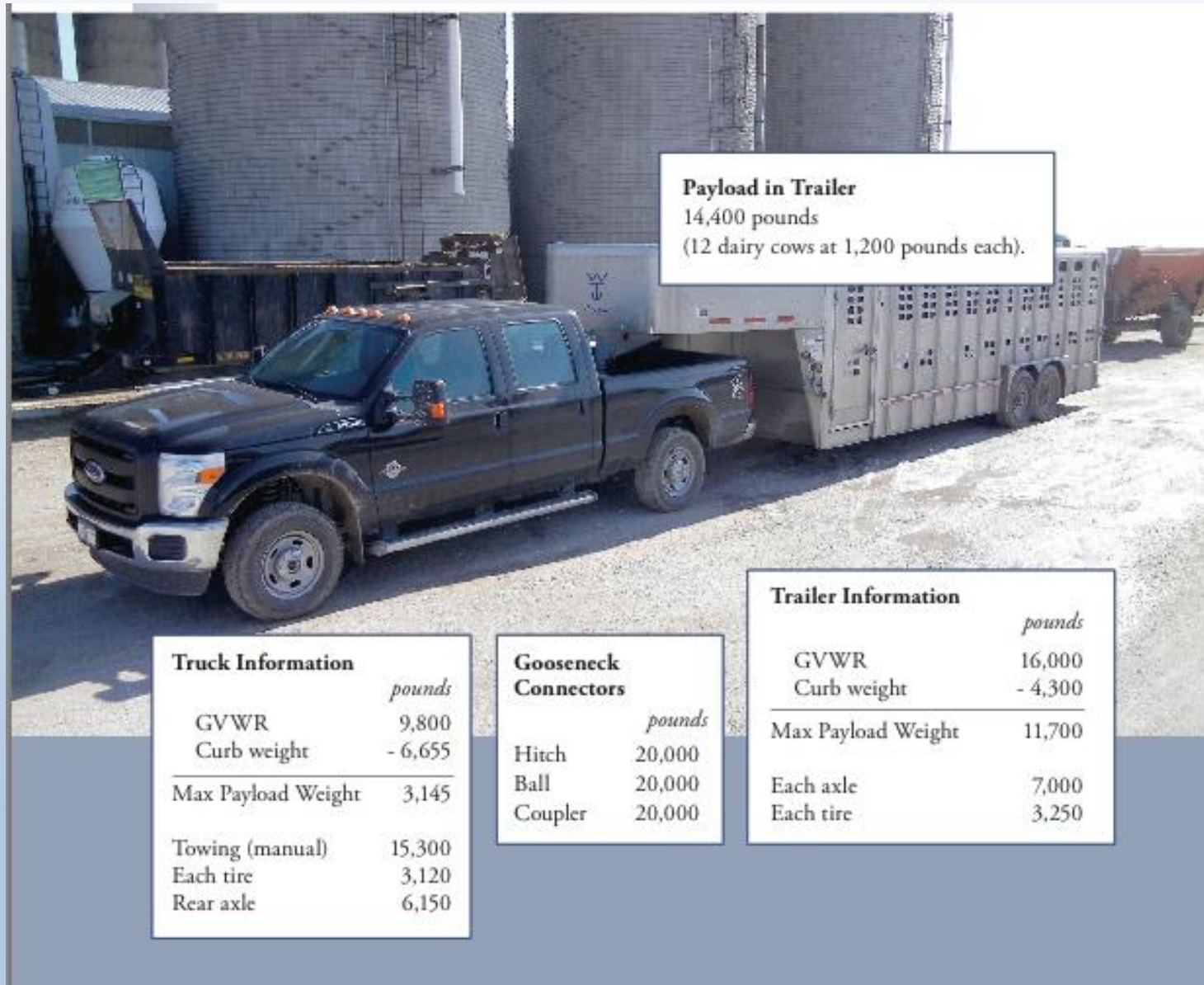
<b>CornPro</b>	
	<i>pounds</i>
GVWR	10,000
Curb Weight	- 2,900
Max Payload Weight	7,100
Each axle	5,000
Each tire	2,820

<b>Weight-carrying Hitch Connectors (pounds)</b>			
	A	B	C
Hitch	5,000	5,000	5,000
Insert	5,000	10,000	10,000
Ball	5,000	6,000	3,500
Coupler	10,000	10,000	10,000
Chain	no grade markings		

<b>2000 Chevy 2500</b>	
	<i>pounds</i>
GVWR	8,600
Curb Weight	- 5,855
Max Payload Weight	2,745
Towing (manual)	7,000
Each tire	1,874
Rear axle	not available

## Loading a Trailer Beyond Its Gross Vehicle Weight Rating





**Payload in Trailer**  
14,400 pounds  
(12 dairy cows at 1,200 pounds each).

Truck Information	
	<i>pounds</i>
GVWR	9,800
Curb weight	- 6,655
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Max Payload Weight	3,145
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Towing (manual)	15,300
Each tire	3,120
Rear axle	6,150

Gooseneck Connectors	
	<i>pounds</i>
Hitch	20,000
Ball	20,000
Coupler	20,000

Trailer Information	
	<i>pounds</i>
GVWR	16,000
Curb weight	- 4,300
<hr/>	
Max Payload Weight	11,700
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Each axle	7,000
Each tire	3,250

**An Undersized Truck and Overloaded Trailer**



# When You Can't Find the Numbers







Load Weight. Place the heaviest load (including tools, supplies, and other items) on the trailer and reweigh the trailer. Get the load weight by subtracting the trailer curb weight from the total loaded weight.



Pull the truck on the scale with only the tongue of the loaded trailer still on the scale. Take that weight. Subtract the weight of the truck from the reading to get your tongue weight.



# When You Can't Find the Numbers

**Determining Individual Numbers—Truck Curb Weight and Trailer Curb Weight**



**Weighing a trailer in the way shown here will produce a figure that includes tongue weight of trailer.**

# When You Can't Find the Numbers

## Determining Individual Numbers—Truck Curb Weight and Trailer Curb Weight



**Weighing a trailer in the way shown here will produce a figure that excludes the trailer's tongue weight.**



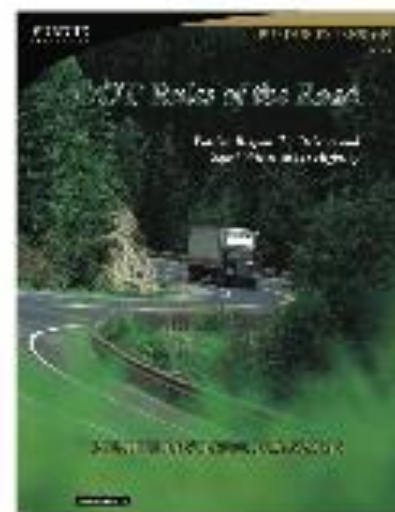
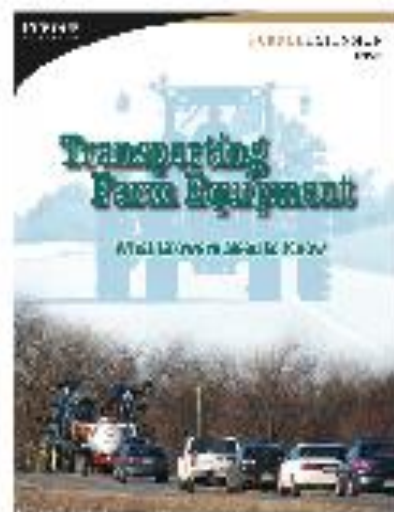
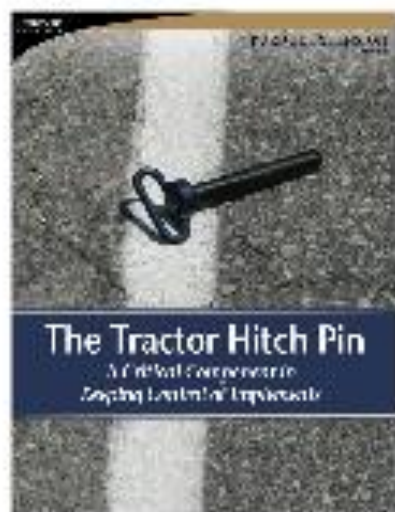
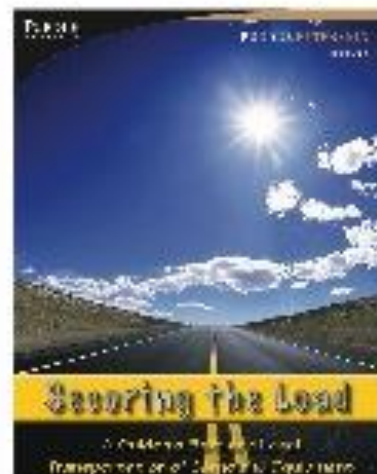
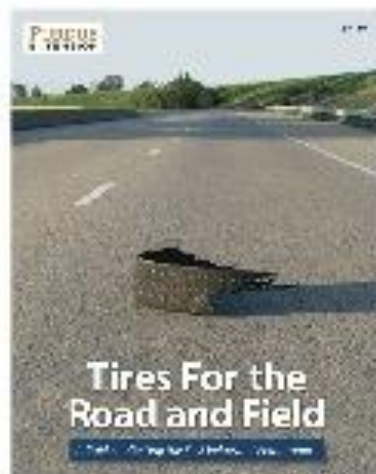
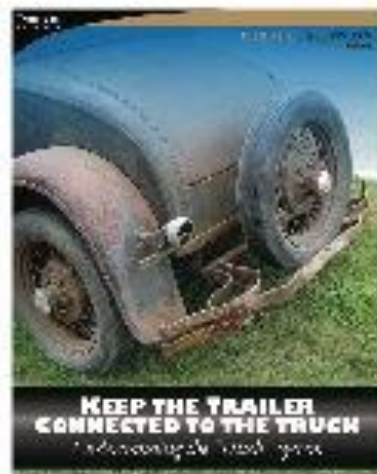
Download the spreadsheets from the Purdue Pesticide Programs Publications page:  
[ppp.purdue.edu](http://ppp.purdue.edu)



**Conventional Hitch**  
Truck-Trailer Calculator

**Gooseneck Hitch**  
Truck-Trailer Calculator

**Fifth Wheel**  
Truck-Trailer Calculator





## Conclusions—It's All About Weights and Ratings

Just because it fits doesn't mean it is correct or legal!

