

# Solutions “D”

## Truck “D” Four Axle (single tire on tridem “lift” axle)

The maximum allowable weight is computed by going to the gross weight chart. Go down the left side to 24 feet (the distance between the first and last axle of the truck), then go across to column 4 (which is the number of axles in the measurement) and you will find 58,000 pounds. This is the maximum allowable weight for this truck if the 58,000 pounds were to be legally distributed within the maximum allowable weights of the axles in the measurement (no overweight axles).

The steering axle weight is noted as “metric”. In order to find the maximum allowable weight, it is necessary to convert metric size to inches. Note the text box on sheet “D”. Since the metric tire size is 295mm, that number must be divided by 25.4 to find the measurement in inches. That number is 11.614 inches. (Rounded to 11.6 inches on the tire weight chart handout). Since the steering axle is allowed 600 pounds of weight per inch of tire size we must multiply the 11.6 by 600 to get the weight per tire. That weight is 6960 pounds per tire. Assuming both tires are the same size, this weight 6960 multiplied by 2 gives the maximum allowable weight (13,920#) on the steering axle unless the rating is less. The tire rating is 3450 kilograms per tire. This also should be computed to “pounds” to determine if it exceeds the allowable 600 pounds per inch weight. To compute the metric to pounds take the 3450kg times 2.2 which converts the metric 3450kg to 7590 pounds per tire. This weight in pounds (7590) multiplied by 2, gives the maximum allowable “rated” weight as 15,180 pounds.

The tire rating allowable weight is 15,180 pounds.

The tire weight per inch allowable weight is 13,920.

13,920 is the lesser thus is the maximum allowable weight of the steering axle on this truck.

## The difference from “C”

The last three axles of this truck are spaced exactly 9 feet apart. This is still defined as a “tridem” as it involves 3 axles spaced 9 feet or less.

Go down the left side of the gross weight table to 9 feet and go across to the 3 axle column (3 axles in the measurement) and you will find the maximum allowable weight in the tridem is 43,000 pounds. This configuration is common where the first axle of the tridem is a lift axle and sometimes is only a single wheel instead of a dual tire axle. In this example it is a single 10 inch tire. This decision will influence both the maximum tridem weight and the gross weight. Since the lift axle is a single tire, the maximum allowable weight will be governed by the tire size and rating. A 10 inch tire, which is non-steering, is allowed 500 pounds of weight per inch of tire. This limits each tire to 5,000 pounds. In this example the rating is 5,000 pounds. The lift axle has a maximum allowable weight of 10,000 pounds. (Two single 10 inch tires multiplied by 500 pounds each = 5000 pounds per tire X 2 tires = 10,000 pounds). The configuration of the last three axles on this truck is risky as the

choice to use the 10 inch tire size on the lift axle will require consistent monitoring to make certain the ratings are not exceeded. Doing so could result not only in a weight violation but also an “out of service” situation if inspected by law enforcement. The configuration of the three axles in the back allows 44,000 pounds (10,000 on the lift axle and 34,000 pounds on the last two “tandem” axles. However, the chart only allows for 43,000 pounds which would be the “legal” weight of this group.

The maximum legal weight of this truck is 13,920 on the steering, and 43,000 pounds on the tridem totaling a actual legal gross weight of 56,920 pounds.

### Restricted Weights

Look at the restricted gross weight table chart “I”.

The steering axle weight on a 5 ton road would be 10,000 pounds. On a 7 ton road it would be 14,000 pounds. Since the maximum legal weight on the steering axle is 13,920 pounds adjustments would have to be made on the 5 ton routes only.

The tridem axle would be restricted to 23,889 on a 5 ton route, and 33,444 on a 7 ton route. Note that the chart addresses the axles in the tridem as a group, not 3 single axles. (3 non-tridem single axles would be allowed 14,000 [@ 7 ton] each equaling 42,000 pounds...this is not a correct way to determine restricted weight in a tridem). 5 ton 10,000 steering added to 23,889 tridem allows 33,889 maximum allowable.

7 ton 13,920 steering added to 33,444 tridem (Note that the first axle of the tridem on a 7 ton route can only weigh 10,000 pounds due to the rating.) This allows 47,364 maximum allowable. Gross weights in excess of these would indicate an overweight somewhere on the vehicle.

### 10% Weight Increases

The maximum weight possible is whatever the weight on the gross weight chart allows plus 10%. This truck is allowed 58,000 pounds by the chart. When a 10% increase is allowed, this truck cannot gross more than 63,800 pounds (58,000 + 5,800) and then only when the axles are within their legal limits. If it's not monitored, there are occasions where the axle weight increases may imply more gross weight than the increased chart limit would allow. Be careful!

The maximum allowable (non 10% increase) steering axle weight is 13,920 pounds. Add to that an additional 10% (1,392 pounds) computes to 15,312 pounds. The rated weight computed to 15,180 pounds. The 10% increase would be allowed up to the rated weight of 15,180. (Only 132 pounds short of the 10% possible).

The maximum allowable (non 10% increase) tridem weight is 43,000 pounds. Add to that an additional 10% (4300 pounds) computes to 47,300 pounds Noting the rating on the single lift tridem axle is 5,000 pounds, that axle will receive no benefit of the 10%. During the increase the lift axle would still only be allowed 10,000 pounds. The remaining two “tandem spaced” axles would be allowed 37,400 pounds

**(34,000 + 3400). Note that 37,400 and the lift axle 10,000 pounds exceed what the chart allows (47,300 pounds) by 100 pounds. So the legal weight of the last three axles with a 10% increase would be the chart weight of 47,300 pounds.**

**The actual legal weight of this truck during a legal 10% increase would be the steering axle 15,180 plus the rear tridem 47,300 for a total gross weight of 62,480 pounds. (Only 1320 pounds less than the chart allows)**

### **Registration Increase & permit?**

**If the registered weight on the cab card is exceeded by more than 1000 pounds, or 4%, (whichever is greater) the registered weight (license plate weight) must be increased to the weight hauled. This is always true.**

**A transportation permit is needed during harvest for any state highway but not valid on an Interstate highway.**

**During the winter weight increase a transportation permit is needed ONLY on an Interstate highway. (I-94, I-35 etc).**

**Always check with local agencies (city, county and township) prior to increasing any weights on their routes.**