

# Reducing Vehicle Chassis Weight

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George Mayhew

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# *Why Reduce Vehicle Weight?*

- Enable use of a smaller, more fuel efficient vehicle
- Enable greater payload capacity for a given chassis size / GVWR
- Provide vehicle capacity to perform a task within given weight restrictions (Non-CDL, Non-FET, etc.)
- Accommodate **Green** weight-adders such as CNG tanks or Hybrid systems

# Chassis Weight Reduction: Frame and Components

- Consult your upfitter for recommended frame material tensile strength, RBM and Section Modulus
  - Does upfitted equipment include a subframe?
- Select lightest frame meeting requirements – a single rail can save hundreds of pounds over a double rail and corrosion problems are reduced
- Higher tensile strength material = less weight for a given RBM
- Rail reinforcements add weight
- Cross members add weight
- Multiple drive shafts add weight
- Length adds weight
- Consult chassis dealer / manufacturer

# Chassis Weight Reduction: Suspension

- Right-Size
  - Adding capacity adds weight
  - Do you really need the overload springs?
- Review state weight laws – Are you running 21,000 or 23,000 axles in states with a 20,000 limit?
- Review weight distribution – can you shift weight forward or rearward to better utilize axle capacities?
- Air suspensions can save 100 pounds vs. conventional steel springs
- Light weight axles, hubs and brake components – 150+ lbs potential savings
- Keep in mind any stability requirements

# Chassis Weight Reduction: Wheels & Tires

- Aluminum wheels
  - Saves roughly 25 pounds per wheel for common 19.5 and 22.5 sizes
- Super singles
  - Aluminum SS saves 165 pounds per wheel position vs. steel duals
- Review tire ratings, load capacities and weight
  - 11R22.5 G rated tires can save 2 - 3 pounds each over H rated tires
  - Considerable weight difference between tire brands and tread designs for a given tire size (15 lbs.)

# Chassis Weight Reduction: Other Chassis Components

- Fuel tanks
  - Capacity - Fuel @ 6.0 (gas) to 7.3 (diesel) pounds per gallon
  - Aluminum tanks save weight + corrosion resistant
  - Single vs. dual tanks
- Aluminum air tanks – 15 to 20 pounds lighter
- Horizontal exhaust can save 50 to 100 lbs. versus vertical exhaust
- One Group 31 battery = 63 pounds – How many do you really need? Consider dual high capacity batteries
- Starter over-crank protection adds 5 pounds
- Tow hooks add 5 to 8 pounds

# Chassis Weight Reduction: Cab & Other Components

- Sound abatement packages add 10 to 30 pounds
- Fog lights and other added lights can add 5 pounds or more each
- Each additional guage is two to ten pounds
- Cloth seats can be 5 to 10 pounds lighter than vinyl
- Selecting a different air drier can save 12-15 pounds
- A two speed engine fan can add 25 pounds
- Deluxe interior, power windows and other features all add a few pounds each

# Conclusion

- If you find one item where you can reduce hundreds of pounds, you've hit the jackpot!
- Most weight reduction on trucks is like a person on a diet:  
“It happens just a few pounds at a time”