



Overloading Your Motorcycle- Steve Warmath, Safety Officer

After last month's meeting, a fellow HOG member approached me to tell me about a friend of his who had a serious accident due to a heavily loaded motorcycle that experienced a load shift while riding down a divided highway. The sudden change in center of gravity caused the rider to try and regain balance and ultimately ran into a guard rail causing rather serious injuries. I think this is one of those things we don't always think about and was a good idea for a safety article.

Aside from overloading the tires, carrying a large load on a motorcycle changes the way it feels and behaves. The added weight will shift the center of gravity on a bike toward the rear, where most of the load will be. Some bikes will require that you adjust the suspension settings to compensate for more weight over the rear tire. A lower rear may also require you to adjust your headlights. Always refer to your owner's manual for load adjustments.

Packing the Right Way

When packing up your bike, put heavier, more solid items on the bottom and sides closer to the bike (to centralize weight.) Lighter items can go on top. If you don't have saddlebags or a tour pack, consider using a small duffel bag to pack and secure smaller loose items. If you must travel with items secured by a bungee net, ensure that they are snug and will not get loosened by winds or g-forces. Again, placing heavier, wider, and more stable items at the bottom will provide an anchor for looser, floppier pieces (like sleeping pads or pillows.)

There is a simple way to tell the maximum weight that your bike is rated to carry by the manufacturer's owner's manual. Just subtract the wet weight (that is, the bike's weight with the tank full of fuel and the other fluids topped up) from the gross vehicle weight rating (GVWR). The GVWR is the maximum allowable total weight of motorcycle and its load, including riders, luggage and other debris. Let's do a hypothetical calculation. Say your bike's wet weight is 850 lbs. and the GVWR is 1,200 lbs. This means you can load up to 350 lbs. on it. Your weight is 190 lbs. and you passenger is 120 lbs. all leathered up. This means you have 40 lbs. left for the packing.

The GAWR (Gross Axle Weight Rating) is usually listed as applicable to a certain size wheel and tire at a certain air pressure. This is critical, since a reduction in tire pressure reduces the load that a tire can carry, and it reduces it pretty rapidly. A 10 percent reduction in pressure probably reduces the tire's carrying capacity by more than that. When you consider that about half the bikes on the street are rolling around on underinflated tires, this is not an insignificant issue. It is the air that supports your bike and its load. Without air, the tire simply ceases to hold the bike up. Reduce the volume of air and you reduce the load capacity of the tire. Keep that maximum pressure in your tires when you add a load. One more thing: Note that the pressures are specified as *cold* pressures. So check your tires when they are cold, and use a dependable gauge -- not the notoriously unreliable gauges still found on some gas station air hoses. You may be tempted to consider a different size tire as a ploy to handle more weight. That might work, especially if you are also going to install a wider rim to go with a bigger tire. But consult the tire manufacturer first. Mixing and matching tires and rims can create additional problems that might actually worsen the tire's lot rather than improving it.

So now you know what the maximum weight limit is that you are supposed to observe. How precise is it? What happens if you go just a teensy-weensy bit over? How about a lot over?



As you might suspect, the GVWR/GAWR numbers are somewhat conservative. Manufacturers don't seem to take a lot of effort to make it easy to adhere to them either, since they never supply wet weights and don't give you any idea of how much of the weight of the rider, passenger or luggage goes on each axle.

But you still pay a price for overloading. Additional load causes additional tire wear. Weight also puts strain on many other components, including suspension, brakes, drive train, etc. That extra bag that your passenger unexpectedly brought along probably won't show up as anything more than a slight deterioration in handling and tires that you have to replace a few miles earlier. However, when you combine extra load with other factors that gang up on your tires -- a long, hot day at high speeds, a road strewn with lots of potholes, lots of braking and accelerating, and somewhat low inflation pressures -- you have a situation that does put a lot of stress on your tires. This sort of scenario could cause a catastrophic tire failure, which is what the bike and tire manufacturers are worried about.

The most immediate effect of overloading is deteriorating handling. If you have added that much weight to your bike, it's probably above the usual center of mass. It's also likely that much of it is over the rear axle, or maybe even behind it. Your normally mild-mannered scooter is going to start handling like a three-legged camel in deep sand. The compressed tires have adopted a different profile. The suspension has little available travel to handle bumps you encounter and insufficient damping to stem the pitching of all that mass. The brakes will also be less effective, and acceleration will be diminished as well. The best solution is to leave something at home, or alternatively, get your passenger a bike of his or her own.



Jack Deremer sent the above photo of a luggage piece he acquired for the Rolling Thunder trip to DC that attaches to the top of a hard saddle bag. The good thing about this rig is it keeps the weight down low, close to the center of gravity and slightly forward of the rear wheel.

These tips for carrying cargo are included in the Motorcycle Safety Foundation Handbook:

- Do not exceed the motorcycle's load limit as specified in the owner's manual.
- Keep items low and close to the center of the motorcycle.
- Keep items evenly balanced from side-to-side.
- If you use a tank bag, be sure it does not interfere with handlebar movement.
- Do not overload saddlebags or tank bag.
- Carrying weight on the rear will lighten the front end and may affect handling.
- Never strap items to the handlebars, front forks, or front fender. Even if handlebar and suspension movement are not limited, the extra weight can affect steering.
- Do not block lights or moving parts and keep items away from mufflers.
- Be sure the cargo is secure. Use accessory racks and luggage designed for your motorcycle. Be sure there are no loose items to blow around or get caught in the wheels. Use web straps, bungee cords, or elastic nets, or similar fasteners. If you use bungee cords or elastic nets, be sure the ends are secure and that a stretched cord does not snap back and injure you or your passenger.

“Be careful out there....it’s a jungle.” *Steve*