Hydraulics 101

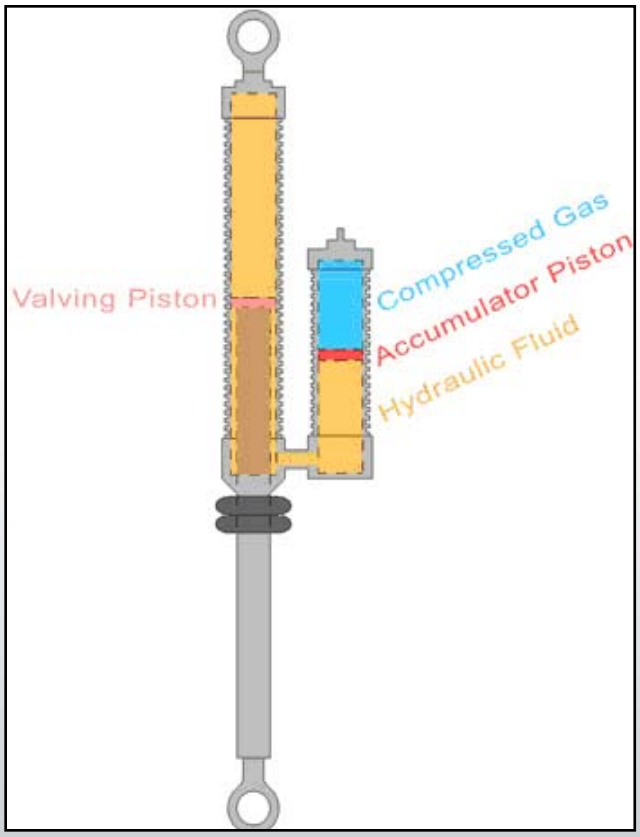
Hydraulic pressure enables the shock absorber to do its work in the following way:

- All forces on the walls of the shock are equal.
- When the shaft of the shock is compressed, the displacement of the shaft causes pressure or force to increase.
- That pressure causes the shaft to extend until the displacement is corrected.

RaceSource Shock Absorber (Side View)

A RaceSource, Inc. shock for a monster truck consists of two main components: the main body and the accumulator. The main body includes the upper and lower mounting points (typically rod ends), the shaft, and the valving piston. The accumulator, which can be either hose-mounted or piggybacked to the main body, has a gas fill valve on one end and the hose or piggyback mount on the other. Within the accumulator is a piston that separates the oil from the gas.

The main body and one side of the accumulator are filled with oil. The other side of the accumulator is charged with gas pressure (typically nitrogen). When the shaft is compressed, the displaced oil goes into the accumulator, which moves the accumulator piston, compressing the nitrogen gas on the other side of the piston. As the shock is compressed, the gas pressure increases exponentially. It is this gas pressure that creates the lift force that holds up the truck.



Valving Assembly

Dampening control is achieved with a valving piston that is mounted to the end of the shock shaft. As the shock is compressed, the piston must pass through the oil. The oil must deflect valving washers as it passes through or around the valving piston. The ports are arranged to allow oil to be controlled separately for both compression and rebound. The valving washers are stacked to increase the force needed to deflect them.

RaceSource shock absorbers are externally adjustable with bypass tubes on the outside of the main body to allow oil to bypass the valving piston through adjustable metering valves in conjunction with the valving piston. These valves allow the dampening force to be increased or decreased without having to open the shock and change the valving washer arrangement.

Additional Resources

To learn more about how shock absorbers work, check out the following links.

- Monroe Web site - http://www.monroe.com/
- Bilstein Web site - http://www.bilstein.com/
- KYB Web site - http://www.kyb.com/
- Tokico Web site - http://www.tokicogasshocks.com/
- Gabriel Web site - http://www.gabriel.com/