

Passenger safety is king on thrill ride

The Turbo Drop thrill ride lifts 12 passengers, seated on the outside of an octagonal metal cage, straight up to 180 ft above the ground, holds them there for a moment, and then drops them — actually at a negative-gravity speed — until the cage is safely decelerated and stopped at the bottom of the ride.

S & S Sports Power, Logan, Utah, designs and builds this and other rides. Their challenge is to provide passengers with a few moments of wild excitement, while keeping them wrapped in an invisible envelope of complete control and safety. Both pneumatics and hydraulics play important roles in the performance of the Turbo Drop.

Inside the Turbo Drop tower behind the passengers, a cable arrangement is attached to the cage, runs over a sheave at the top of the tower, returns to a second sheave at the bottom, and finally is connected to the piston of a large, vertical pneumatic cylinder. After the cylinder pulls the cage to its topmost position, a mechanical brake holds it while the bottom of the piston is pressurized. When the brake releases, piston force supplements gravity to start the ride down at breathtaking speed. Pressure is quickly exhausted from the cap end of the cylinder, while flow out of the head end is gradually choked down to decel-



Series SCS industrial shock absorbers with self-contained accumulators are available in 38-, 50-, and 63-mm bores.

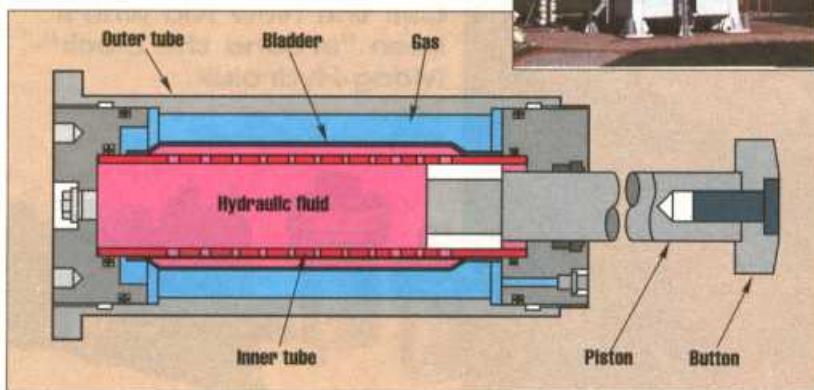
erate the cage. Near the end of the drop, flow is blocked completely to provide a cushion of air to stop the fall with a gentle bounce.

The final, redundant safety devices are four heavy-duty industrial shock absorbers from Ace Controls, Farmington, Mich., mounted vertically at ground level around the base of the tower. These hydraulic devices are located just below the cage's stopping point and normally do not come into play in the Turbo Drop cycle.

Originally developed for high-cycling stacker cranes, the SCS Series shock absorbers were designed to provide only minimal resistance to loads unless the load velocity is greater than normal. Then, the shock absorber responds automatically with controlled, gentle deceleration and minimum reaction force.

As seen in the drawing at left below, in the ready position, the piston rod with button end is extended. When the load impacts the button, the piston displaces hydraulic fluid through the metering orifices in the inner tube, producing soft initial-contact performance. As the piston continues to stroke, the orifices are progressively blocked off, so fluid flow is restricted and the piston decelerates. Internal hydraulic pressure, and in turn the reaction force, remains essentially constant through the stroke length while bringing the impacting load to rest.

The displaced hydraulic fluid passes into the self-contained, gas-pressurized bladder accumulator. Compressed gas on the outside of the accumulator bladder generates the return force, which extends the piston rod to its ready position when the load is removed.



New ultrasonic technology enhances cleaning

Three major variables affect the success of cleaning industrial parts in a media bath: the concentration of the cleaning media (typically an alkaline solution that cuts oil and grease), its temperature, and the time the parts

spend in the bath. Add mechanical agitation and you can significantly reduce one or more of these variables. If ultrasonic energy provides the agitation, there's a performance bonus.

When ultrasonic energy is transmit-

ted to a liquid, it creates high and low pressure areas in the medium, literally pulling it apart. This action produces vacuum cavitation bubbles in every part of the liquid that sound can reach. If the liquid is a cleaning medium in which