

# Clippard

## CASE STUDY

### *safe braking systems*

A system responsible for applying the brakes in a vehicle being towed must be able to apply the brakes safely and reliably, exactly as if the vehicle were being driven.

Clippard Instrument Laboratory, Inc., Cincinnati, Ohio and Isaccs Fluid Power, Indianapolis, Indiana, have been working in concert with SMI Brake, Newburg, Indiana, to provide solutions for braking a towed vehicle.

SMI now offers three solutions that enable the safe breaking of a vehicle being towed by a motor home; Air Force One, Stay-In-Play Duo and Delta Force. All three systems are not only safe and reliable, but according to SMI, they are economical and offer the best warranty in the business.

Air Force One operates by using a small amount of air from the motor homes' air supply to create the necessary vacuum to operate the towed vehicle's power brake system and drive the brake actuator. True proportionate braking is achieved as a result of the direct connection. This supplemental system is also touted as one that provides true coach protection with a patent pending breakaway system which seals the coach's air supply in the event of a separation. According to SMI, this



protection kit is the only DOT compliant and chassis approved air-based system.

Clippard designed and manufactures the special stainless steel actuator that is mounted directly to the braking arm, as well as the mounting brackets and necessary hardware, in order to meet SMI's stringent quality standards. According to Brent Schuck, General Manager at SMI, Clippard's standard for high quality was one of the

determining factors in selecting them as a partner.

The Stay-In-Play Duo system utilizes both air pressure and vacuum. Vacuum is used to operate the towed vehicle's power brakes and air pressure to apply the brakes. The Duo's small operating unit is located under the hood and provides a streamlined approach to the braking operation. As with the Air Force One system, Clippard manufactures the stainless steel actuator, mounting

brackets and hardware. According to Schuck, these actuators have been used thousands of times without any problems. Here again is the correlation between quality products and safety. The Duo requires deceleration and brake lights from the coach in order for the brakes on the towed vehicle to be applied. The approach of combining two separate signals, according to SMI, eliminates the need for complicated electronics.

The newest control system offered by SMI is called Delta Force. Unlike the Air Force One and Stay-In-Play systems, which has their control unit mounted under the hood, the Delta Force control is portable and positioned on the floor of the towed vehicle. Although portable units have not been popular for a number of years, Schuck said SMI got into the market simply because of demand from existing customers and their reputation for manufacturing a quality product. The partnership with Clippard and Isaccs on the other units made for a

smooth partnership on the new system.

Delta Force's control unit is positioned on the towed vehicle's floor in front of the brake pedal. The unit houses its own compressor therefore eliminating the need for an air supply from an external source. Housed inside the unit are two Clippard EV series electronic valves mounted on a special manifold with fittings. This value-added unit functions as a fill and bleed operation, normally open circuit that requires the solenoid to be tripped in order to hold in the air as part of the safety system.

Attached to the control unit is a custom stainless steel actuator Clippard designed specifically for this application. One end of the actuator has a ball and socket that is attached to the front of the Delta unit. The other end utilizes a Clippard clevis bracket and it is attached to SMI's



Air Force One



Stay-In-Play Duo



Delta Force

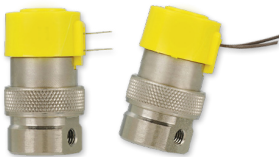
patent-pending pedal clamp. The tether is secured to the firewall and to the back of the cylinder by the tether bracket and carabiner clip.

According to Schuck, customers love the simplicity, quality and ease of installation of the new system, and they have the orders to prove it. He also noted that a great portion of the success of their program has been the harmonious partnership of SMI, Isaacs and Clippard working together to create a fantastic product.

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## Related Products



### EV Series Electronic Valves

Clippard's EV Series valves convert low voltage, low current signals into high pressure (100 psig) pneumatic outputs. EV valves are precision-built 2-way and 3-way control valves utilizing Clippard's unique, patented valving principle with no sliding parts. Complete poppet travel is a mere 0.007", resulting in low power consumption and exceptionally long life.



### Custom Solutions

Clippard's Engineering Department has designed tens of thousands of special variations, modifications and completely customized valves, cylinders, fittings and assemblies. From simple tweaks to complex challenges, partner with Clippard to find the perfect solution for your needs.



### Value-Added Services

The goal of Clippard's Value-Added Services Team is to optimize systems design, increase performance, reduce cost and allow customers to focus on their core competencies. Services include pneumatic assemblies, special manifold designs, manifold assemblies, pneumatic circuit design, control boxes, fitting & tubing harnesses, component kitting, specialized testing, KanBan services and more.