

The M&G

CAR BRAKING SYSTEM

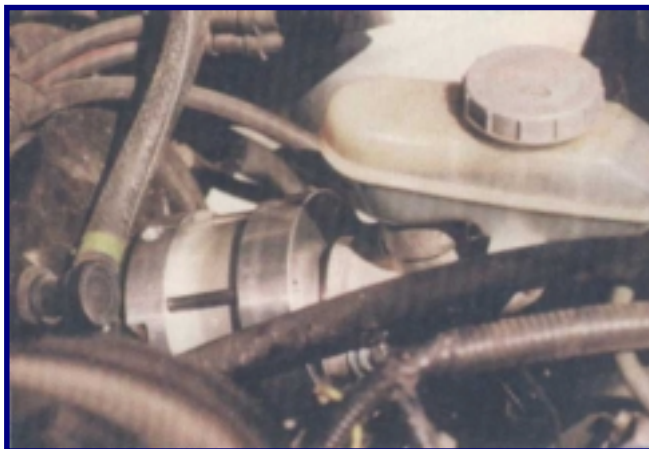
By **CAROL S. MAXWELL**
& **EDWIN S. GURDJIAN.**
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Until retirement, Leon Meadows had been involved in some part of the airline industry nearly all of his adult life. As an airline pilot, he logged more than 20,000 hours, and on two occasions he served as a project engineer on research and development programs. In 1969 he and a partner owned the world's largest commuter airline. They employed

more than 500 people and offered 331 flights per day. The business was sold, but Meadows remained with the new owners until he retired in 1973. After his retirement, he and his wife lived in their motorhome full-time for six months and then settled in Athens, Texas.

During the period of motorhoming, Meadows saw a need to improve braking ability when towing a car. Initially he designed and built an auxiliary car brake for his

own use. Several years later, he established M&G Engineering to produce the pneumatically operated auxiliary braking system for towed vehicles. Hood Production Systems Inc., also in Athens, manufactures the air-over-hydraulic cylinders that are part of the system. At the time



The M&G air-over-hydraulic cylinder is installed between the towed car's brake vacuum booster and the master cylinder.

A test of this pneumatically controlled auxiliary braking system for vehicles towed behind a motorhome.

of our visit, we had the opportunity to meet Jeff Hood and tour his facility, where we observed as his state-of-the-art, computerized machines turned out the precision parts.

The M&G Car Braking System is available to fit various vehicle models manufactured by Chrysler, Ford, Honda, General Motors, Isuzu, Mazda, Mitsubishi, Nissan, Toyota, and Volkswagen. The towed vehicle must have power brakes, and some vehicles with antilock brakes cannot be fitted with this system. M&G literature notes that both Chrysler and General Motors have two types of antilock braking systems (ABS). One type has a "normal" master cylinder and remote ABS. The M&G system will fit in this case. However, the other type is a modular unit with the master cylinder and ABS in one assembly. Vehicles equipped with such a modular unit cannot be fitted. Our towed vehicle is a Ford

Escort, and initially M&G did not have a cylinder available, but they designed a special version for us when we were selected to test the system. This model is now on the M&G Fit List.

The installation instructions supplied with the kit are clear, and mechanically inclined, do-it-yourself FMCA members should have no difficulty with this project. The basic component for the towed car is the air-over-hydraulic cylinder. This cylinder is installed between the towed car's brake vacuum booster and the master cylinder. The M&G cylinder has screw adjustments to provide proper clearance between the power brake booster and the master cylinder. A 1/4 inch air line is installed in the inlet port of the M&G cylinder and then routed to the front end of the car. This line terminates with the male end of a quick disconnect that is used to connect the towed vehicle to the coach. The female end of the quick disconnect attaches to an air line at the rear of the coach.

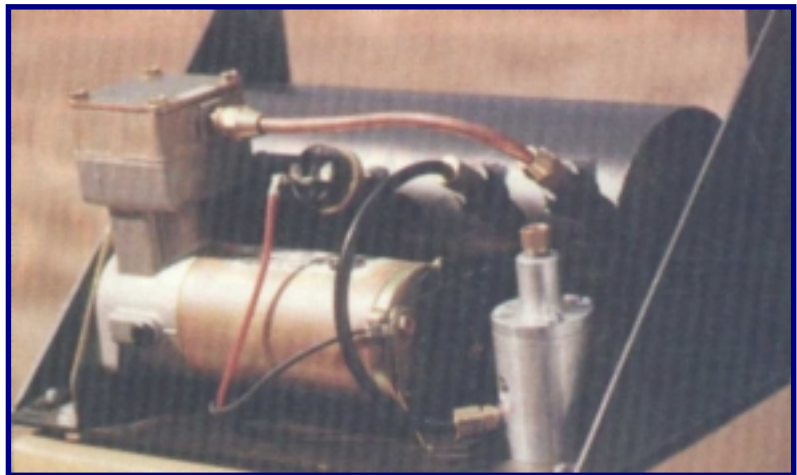
The M&G Car Braking System can be used with coaches that have hydraulic or air braking systems. On coaches with air brakes, a 1/4-inch air supply line is routed from the rear brake relay valve, which usually has four ports. Our installation required removing the air hose from the relay valve to the brake canister and then installing a "T" fitting next to the relay valve. A coach with hydraulic brakes requires installation of a 12-volt air compressor, an air storage tank, a pressure switch, and a proportioning valve. M&G has combined these items into a compact tray that the installer secures to the motorhome frame or crossmember via a mounting bracket and four bolts. The coach hydraulic system is connected to the proportioning valve by inserting a "T" between the flexible brake line (where it goes to the rear axle) and

the steel line. A 1/4-inch air line is attached to the proportioning valve and routed to the rear of the coach as previously described. Hydraulic pressure at the proportioning valve transmits air pressure to the towed car through the air hose.

It took approximately three hours to complete the installation on our coach and car. We were cautioned by Meadows not to expect too much benefit from any braking system, because of the disproportionate weight of our Prevost coach versus the towed car. He noted that an auxiliary braking system provides a more noticeable benefit in lighter weight motorhomes. That afternoon

better on cloverleaf interchanges and tight curves. This was an unexpected benefit that we had not noted when previously towing a trailer equipped with surge brakes.

A return to high school physics explained this phenomenon. When towing in a straight line without auxiliary brakes, the trailer rides up the hitch during braking, because of inertial forces. Surge brakes capitalize on this feature, applying the brakes whenever the tow bar is compressed. In a curve, the trailer inertia wants to go straight and thus tends to ride out of the curve. This can be exaggerated with braking. Because an angle is created between



This compact tray, consisting of an air compressor, air storage tank, pressure switch, and proportioning valve, is installed in the coach's hydraulic system.

we were on our way out of Athens to our next stop — Dallas.

We both believed that our coach had always towed the Escort in an effortless manner without any braking difficulty. Over the next few weeks we drove approximately 2,000 miles and were surprised by the changes in handling. Both as driver and copilot, we independently concluded that there was a notable improvement. The coach was not only more "surefooted" in sudden stops, but it also tracked

the coach and the towed vehicle when turning, the surge brake hitch cannot compress with the same effectiveness as it would in a straight line. The M&G cylinder actively responds to the coach brakes without regard to any other factors. Since the brakes on both vehicles are applied simultaneously, the result is a smoother, more controlled stop.

M&G Engineering has an impressive videotape that shows panic stops with and without the cylinder

installed. Without the cylinder, the towed vehicle had a definite tendency to "run under" the coach. With the M&G cylinder employed, the towed vehicle maintained its orientation to the coach with no exaggerated reaction to the panic stop. A more significant finding was that the stopping distance was reduced by one-third. This is an important safety feature.

All components made by M&G are warranted for three years. The

Thomas air compressor used on coaches with hydraulic brakes has a one-year warranty.

The M&G Car Braking System is available directly from any of the following sources:

M&G Engineering
P.O. Box 1107
Athens, TX 75751
(800) 817-7698
(903) 675-2812

Remco
4138 S. 89th St.
Omaha, NE 68127
(800) 228-2481
(402) 339- 3398.

Henderson's Line-Up, Brake, &
RV Service
417 S.W. Marion Lane
Grants Pass, OR 97527
(800) 245-8309
(503)479-2882