

## CONTROL SYSTEMS

The Telma Retarder control can be based on the following :

### HAND CONTROL

Hand Control is the simplest system and may be found on coaches and commercial vehicles. A 5 position switch mounted on the dash or steering column enables 4 positions of retardation to be selected along with an "off" position.

### FOOT CONTROL

Automatic foot control integrated into the vehicle foot brake system is frequently installed on mini- and midi-buses and on certain commercial vehicles; it generally uses either a four stage microswitch operated via the service brake pedal for hydraulic brakes, or a pressure switch manifold connected into the air brake system for vehicles with air brakes.

There is almost always a Standstill Detection system installed to ensure that the retarder does not operate when the vehicle is stationary to avoid unnecessary current draw.

**NOTE :** Telma Installation Regulations prohibit the use of Foot Control in certain applications where the stability of the vehicle may be affected.

### HAND AND FOOT CONTROL

Hand and Foot Control, sometimes known as "Combined Control," is generally found on coaches, and may also be used on commercial vehicles in hilly terrain for driver convenience and comfort.

The Hand Control may be wired independently of the Standstill Detection System. This ensures that, in the event of any failure in the Standstill Detector system or the vehicle tachograph, the retarder system still functions and provides a high degree of vehicle safety.

The Hand Control may also be wired through the Standstill Detection system so that if the Hand Control is left switched on when the vehicle is stationary, unnecessary current draw is avoided.

If the Hand Control is combined with a microswitch type foot control, there is generally a Diode Box fitted to prevent 'feed-back' from one control to the other.

**NOTE :** Telma Installation Regulations prohibit the use of Foot Control in certain applications where the stability of the vehicle may be affected.

### THROTTLE MICROSWITCH

On certain vehicles, a throttle microswitch may be installed to operate in one of two modes:

- In minibus applications, the function of a throttle microswitch, if fitted, may be used to cut the ignition supply to the foot control. This cuts out the retarder when the throttle is depressed, making it impossible to drive against the retarder.
- In certain commercial vehicles fitted with automatic gearboxes, a throttle microswitch may be used to engage the first stage of the retarder as soon as the throttle is released.