AGRICULTURAL TRAILER BRAKING SYSTEMS

John Pettit, Teagasc, Kildalton

Farm vehicles like any other vehicle must comply with Road Traffic Regulations, a lot of which have been in Legislation since the 1960's. The increasing number of fatalities on our roads, together with the demand for action on road safety, has resulted in stricter enforcement of these regulations. The Garda Síochana are now more stringent in relation to legislation regarding tractor trailers. Many farmers and contractors are discovering that their trailers do not fulfil the requirements laid down in the Road Traffic Regulations. This article will review the following:

- The Road Traffic Regulations in relation to trailer braking
- The mechanical options available to fulfil these regulations

Within the Road Traffic Regulations, tractor-trailers are divided into different categories. The manner in which the trailers are categorised is complex and leads to misinterpretation into which category a particular trailer belongs. To meet the Road Traffic Regulations one would be best advised to ensure that any tractor trailers over 5 tonnes laden weight should have a service brake, a parking brake and an automatic breakaway brake. The need for such braking systems is even more important with the introduction of 50kph tractors. European Regulations state that tractor trailer travelling in excess of 40kph should be equipped with air brakes. This option should be strongly considered for mechanical reasons and if any Irish Regulations were to be revised most likely they would be updated to that of the European Standards. The service brakes of the tractor and those of the trailer are required to be operated simultaneously by a single control (brake pedal).

The service brakes on trailers are either of the hydraulic or air type. Hydraulic braking systems would be adequate up to 40kph. Above 40kph the air system should be chosen. The hydraulic system is not as responsive as the air system. This results in a lag period between pressing or depressing the brake pedal and the

brakes activating or de-activating respectively. The lag period between pressing the brake and the brake activating can lead to overloading the braking system. Similarly, the lag period between depressing the brakes and de-activating the brakes may cause the trailer's brakes to drag. This would result in excessive tire and brake wear. As the trailer speeds increase the consequences become more apparent hence the need to transfer from the hydraulic system to the air system if trailers exceed 40kph.

An automatic breakaway system is one that will activate the trailer brakes bringing it to a halt if it uncouples from the tractor. The air system by its working nature upon uncoupling will automatically activate the brakes. The hydraulic system however requires an additional mechanism or breakaway brake. An electrical activated system is currently available, and a trailer stand activation system is being developed.

The electrical activated system contains a hydraulic accumulator, which stores pressurised oil. Upon uncoupling, the electrical connection to the tractor or seven-pin plug is broken. This breaks an electrical circuit, which operates a valve at the base of the accumulator releasing the pressurised oil. The oil then pressurises the braking system, activating the brakes to bring the trailer to a halt.

The stand-activated system contains a hydraulic cylinder within the trailer stand. Upon uncoupling from the tractor, the trailer stand will hit the ground compressing the hydraulic cylinder. This will pressurise the braking system, activating the brakes, thus bringing the trailer to a halt.