

# A new concept in PTO safety



**Darren Bailey** recently met brothers Ger and Noel Hickey who have come up with a new concept for safety and PTO shafts

**B**rothers Ger and Noel Hickey are based in a small village outside Waterford city called Kilmacthomas. Ger is a metal fabricator, while Noel works as an agricultural mechanic with the local Case dealership.

A close friend of the brothers was recently involved in an accident with a PTO shaft where unfortunately he lost an arm. Instead of standing back and saying how terrible it was, Ger and Noel decided there had to be a solution to stop another person falling victim to the PTO shaft. They sat down in January 2016 and looked at ways to remove the PTO shaft from machines such as slurry tankers in order to make them safer.

## Concept

Over the course of the next six months, they sourced and made parts, and came up with different ideas. Because Ger owns a metal fabrication business, they were lucky enough to have the facilities to fabricate and tweak their designs quite easily.

Noel was able to apply his hands-on knowledge of agricultural machinery and in June they emerged with a working prototype which was then given to local contractor PJ Mullhearn, who tested it over the summer months to find any issues or flaws with the design.

## Design

The basic design removes the shaft which connects the tractor's PTO to the tanker's pump, which is the most dangerous part of the system due to its speed of rotation and close proximity to people.

In some cases the shaft is fitted with damaged guards or even no guards at all.

A hydraulic motor is fitted in place of the PTO shaft which is powered by the tractor's hydraulic system through a double-acting spool valve. The oil flow is delivered through the spool valve to power the motor and is then returned to the tractor via the bottom spool valve.

The return line is fitted with a non-return valve to stop the pump being run in reverse accidentally. To allow the pump

The Safe Shaft System uses a hydraulically powered motor to replace the PTO shaft making it much safer for the farmer when working in close proximity with the pump.



to start slowly and to prevent shock loading in the system, an anti-cavitation block is fitted which alters the oil flow on start-up and stopping, making it smoother.

The power is transferred from the motor to the pump via a steel coupler with shock absorber that can allow for up to four degrees of misalignment and is fully guarded for safety.

## Fitting

Fitting the unit requires the pump to be moved rearwards in order to allow the lift arms clear the motor for full lock to be achieved while spreading and filling.

Initially the system was welded in place but after attending the National Ploughing Championships and talking to various manufacturers, the brothers decided to redesign the unit as a bolt-on kit which took the problem of correctly aligning the system and welding it in place by a certified welder out of the equation.

A customer can simply order a kit to suit their model of tanker and fit it themselves on site in less than an hour, according to Noel. The existing pump is bolted off and a galvanised 10mm folded steel bracket plate is fitted on to the existing bolt holes and the pump and safe shaft system is then bolted to the plate.

## Functionality

Fitting the Safe Shaft System not only removes the dangers associated with a PTO shaft, but also helps to increase efficiency over the working day. This is because the machine does not need to

be straight when filling or spreading as the drive is now hydraulic.

This allows the tractor to spread while turning sharply on the headlands if required and also fill at any angle in the farmyard.

According to driver Jim Mullhearn, who operated it for six months, "I can turn sharper in yards and on lanes getting in and out of fields as I don't need to worry about the shaft any more. I can fill at any angle and over the course of the day I can get through more tanks than the standard system, I don't need to switch off on headlands and can keep the pressure up, plus I am saving fuel running at 900rpm, whereas the old system needed to be at 1,100rpm."

## Options

The Safe Shaft System is supplied as a kit starting at €1,600 plus VAT delivered anywhere in Ireland. All models and manufacturers are catered for with kits on the shelf ready for immediate despatch.

There are numerous options available to suit individual requirements, such as manual or electric flow control valves, in cab speed display and in-line filters. All Safe Shaft Systems come with a full standard manufacturer's warranty, are CE marked and have a patent pending.

The system can be used with all tractor types including low and high oil flow systems. To run the pump at 450rpm, the system only needs 42 l/min, according to Noel, while to run at 300rpm it only needs 30 l/min. The flow can be adjusted

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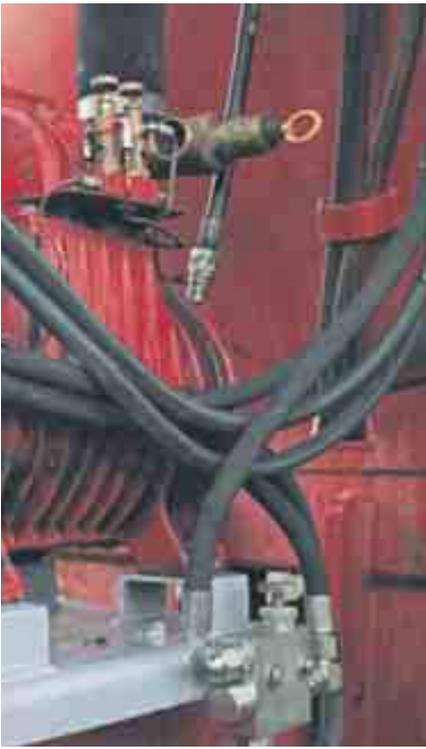
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Hydraulic power is delivered through a double-acting spool valve which has a valve on the return line to stop the motor being accidentally run in reverse.



The kit bolts down to the pump's original bolt holes. The pump is then bolted to the plate, eliminating any need for welding.



Brothers Ger (left) and Noel (right) Hickey developed the Safe Shaft System.



An optional manual or electronic flow controller can be specified to alter the oil flow and speed at which the pump runs when using different tractors.

via an optional flow control valve to set the speed when using various tractors.

**Summary**

Although hydraulically driven pumps are not a new concept, the idea of a retrofit kit which you can order off the shelf and fit in less than an hour is a new

safety idea. It's great to see two brothers taking a tragic event and turning it into a positive in less than a year in order to help make farmers' lives a little bit safer when working near PTO shafts.

For more information, log on to [www.safeshaftsystems.ie](http://www.safeshaftsystems.ie) or call 087-638 0643 / 087-050 8798.

**FTMTA NEWS**



Be a part of a stronger farm machinery industry - join the Farm Tractor and Machinery Trade Association - contact FTMTA at 045 409309 or membership [ftmta.ie](http://ftmta.ie) for details.

**Agricultural mechanisation degree course**

It is that time of the year again when the focus of Leaving Certificate students is drawn to next year and their post-exam options.

FTMTA encourages all 2017 Leaving Certificate students interested in a career as agricultural machinery technicians to consider the Bachelor of Science in Agricultural Mechanisation course at IT Tralee as a higher education option.

This course has been developed in co-operation with the college and industry to deliver a programme tailored to meet the requirements of the modern farm machinery industry for highly skilled service technicians who can deal with the rapidly evolving technical challenges of today's agricultural mechanisation technology.

The first intake of students started the course in September of 2015 and this autumn will see the first year that there will be students at all stages of the degree programme.

The course is a mix of college-based learning and work placement over three years with the student required to carry out a substantial body of online learning when on work placement.

The course is a direct entry programme outside of the CAO process and to apply for a place on the course potential students must have been accepted by a sponsoring farm machinery business who will provide the required work placements.

Successful applicants will also require at least five passes in the Leaving Cer-

tificate and two of those passes must be in maths and English/Irish. In practice, a relatively high level of mathematical ability will be an advantage during the course and candidates entering the course with better maths results are likely to fare better over time.

Applicants may be required to attend for interview as part of the application/admission process and offers of places on the course will be subject to the candidate achieving the required standard in their Leaving Certificate results. Application forms and further information are available from the courses section of the IT Tralee website. The closing date for the prospective first years in 2017 has not yet been finalised but will be during the summer.

FTMTA is encouraging its member firms to support the course and is asking that any firms planning to take on trainees for the service technician role from this year's school leavers consider this route, which is specifically designed to produce the agricultural technicians required by the industry for the future.

The association advises that interested secondary school students should use the member links page of [www.ftmta.ie](http://www.ftmta.ie) to identify FTMTA member farm machinery businesses in their area who may be prepared to offer the required work placements.

The student should send a written request in relation to the required work placement sponsorship to the dealer principal or, in the case of larger businesses, to the service manager. This should be followed up by a request to meet in person with the decision-maker on such matters in the business.



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