HOW QUIET IS QUIET?

A look at PTO noise and the technology behind the new, quiet FR6Q Series power take-off for Ford

MUNCIE®

THE CALL FOR A QUIET PTO

In the past, power take-off noise was not an issue or concern for work truck operators. Everyone used to accept that a work truck was a work truck, and work trucks were noisy. The truth – operators couldn't hear the noise coming from the power take-off over the engine.

Today, engines and transmissions developed by manufacturers are more sophisticated and quiet. In fact, a diesel engine is now as quiet as a gas engine. For this reason, when the truck is idling, the gear rattle from the PTO generated by the engine's torsional vibrations is audible.

As engines and transmissions have gotten quieter, the gear rattle has been compounded to a PTO issue. This has resulted in a call for power take-off manufacturers to find a solution for the gear rattle and a quiet PTO.

WHY POWER TAKE-OFFS ARE NOISY

The components included within a truck's auxiliary power system all contribute to the audible noise heard while the truck is idling. One of these components is the power take-off. While there are many factors that contribute to the noise of the power take-off itself, it's the engine's torsional vibrations that cause the PTO's gear rattle. Historically, power take-offs have always been noisy and the gear rattle, nothing new.

The Effects of Torsional Vibrations: When the engine fires and subsequent torsional vibrations go throughout the hydraulic system and drivetrain, it causes the input gear to bounce against the transmission's gear where the two mesh. This bouncing can occur unless adequate pressure is applied to the input gear. In which case, the bouncing results in a gear rattle noise and a noisy PTO. Depending on the type of input gear used, which the transmission dictates, the noise can be amplified or decreased.

Multiplying Torsional Vibrations: The sound of the truck can be quieted by firing the engine repeatedly to multiply torsional vibrations. But for a diesel engine that has a lot of torsional vibrations, when the engine fires this can be violent. In these instances, the violent torsional vibrations cause things to flex and bounce – which the operator hears through the PTO.

Gear Rattle with the Ford 6R140 Transmission: For operators with the Ford 6R140 transmission, the PTO gear rattle has been a concern when the truck is idling. With this type of transmission, the engine connects to the transmission through a fluid connection as opposed to a clutch. While this type of drive is very beneficial for many vocational applications, conditions on the power take-off are demanding when it's not in operation. This is because the power take-off does not go through the fluid connection at all. In this case, the PTO's input gear connects to this type of transmission in front of where the engine and transmission connect.

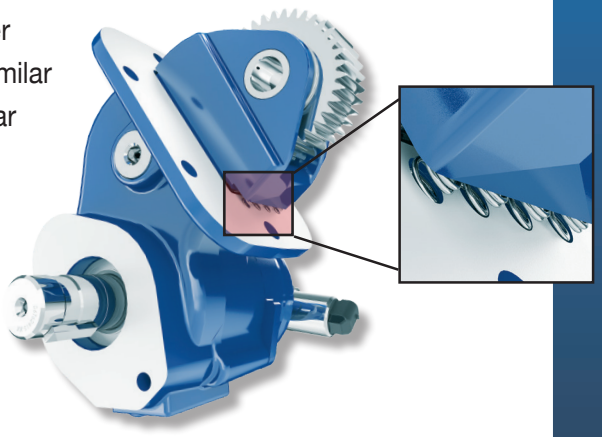
Continued Evolution to Meet Customer Needs: Ford and other manufacturers' products continue to evolve to best meet customer needs. As a result, PTO manufacturers must then adapt to these changes and develop compatible products to best serve customers as well – hence the FR6Q.

ANSWERING THE CALL FOR A QUIET PTO

To address the call for a quiet PTO solution, Muncie Power Products developed the FR6Q Series to fit the Ford 6R140 transmission. The FR6Q encompasses the latest in noise abatement technology and meets the needs of its predecessor – the FR66.

With its innovative technology, the FR6Q eliminates virtually all gear rattle noise while the truck is idling. This is possible via its patent-pending spring-loaded rocker design.

Spring-loaded Rocker Design: The spring-loaded rocker design is very different from that of the FR66 and other similar PTO models. As you may recall, the FR66 and other similar power take-offs have a stationary input gear adapter. With the inability to self-adjust and pivot on the idler shaft, the stationary adapter may not be able to control the internal backlash and adapt to the engine's torsional vibrations. Thus, maintaining adequate pressure on the input gear may be difficult. This can result in the input gear bouncing against the transmission gear, causing the gear rattle noise.



Muncie Power's FR6Q's spring-loaded rocker mechanism contains the input gear. This design allows the entire assembly to self-adjust and pivot on the idler shaft to control the internal backlash. With this ability, the assembly is able to adapt to the flexing and bouncing of the PTO from the engine's torsional vibrations.

This design takes up any space that would allow the input gear to bounce from these vibrations. The spring-loaded rocker mechanism maintains adequate pressure on the input gear and acts as a shock absorber as the PTO flexes and bounces. This ability to maintain adequate pressure on the input gear is critical, as the bouncing of the input gear causes the gear rattle noise.

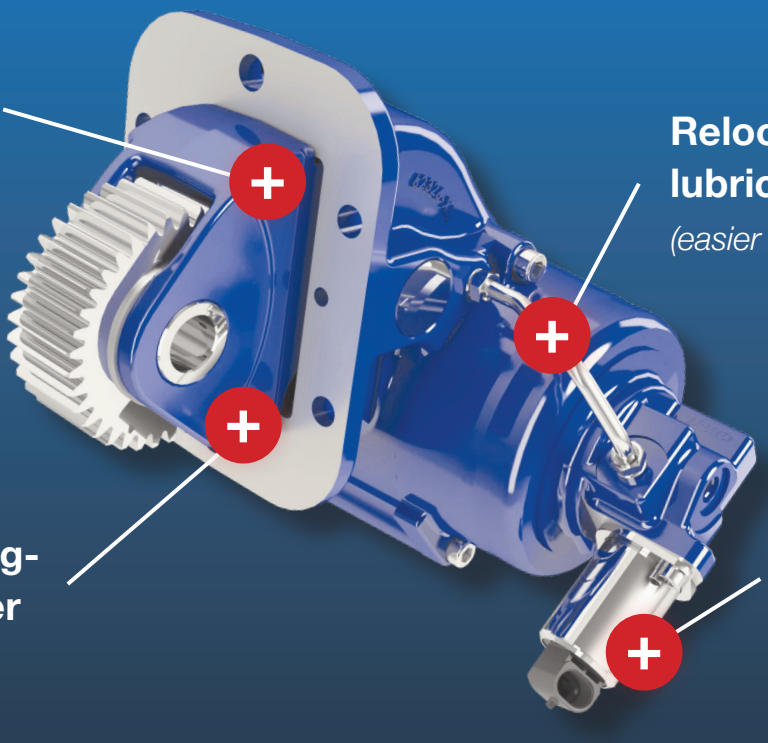
These conditions are demanding on the PTO when it's not in operation on the Ford 6R140 transmission. This innovative technology, as explained, is able to overcome these demanding conditions – which allows for the PTO to adapt to these conditions and maintain pressure on the input gear.

After many internal lab and field tests, the FR6Q has proven itself as the quietest PTO solution currently on the market for the Ford 6R140 transmission.

INNOVATIVE PTO DESIGN

One-piece installation with rocker

Relocation of the lubrication tube
(easier mounting access)



Unique spring-loaded rocker

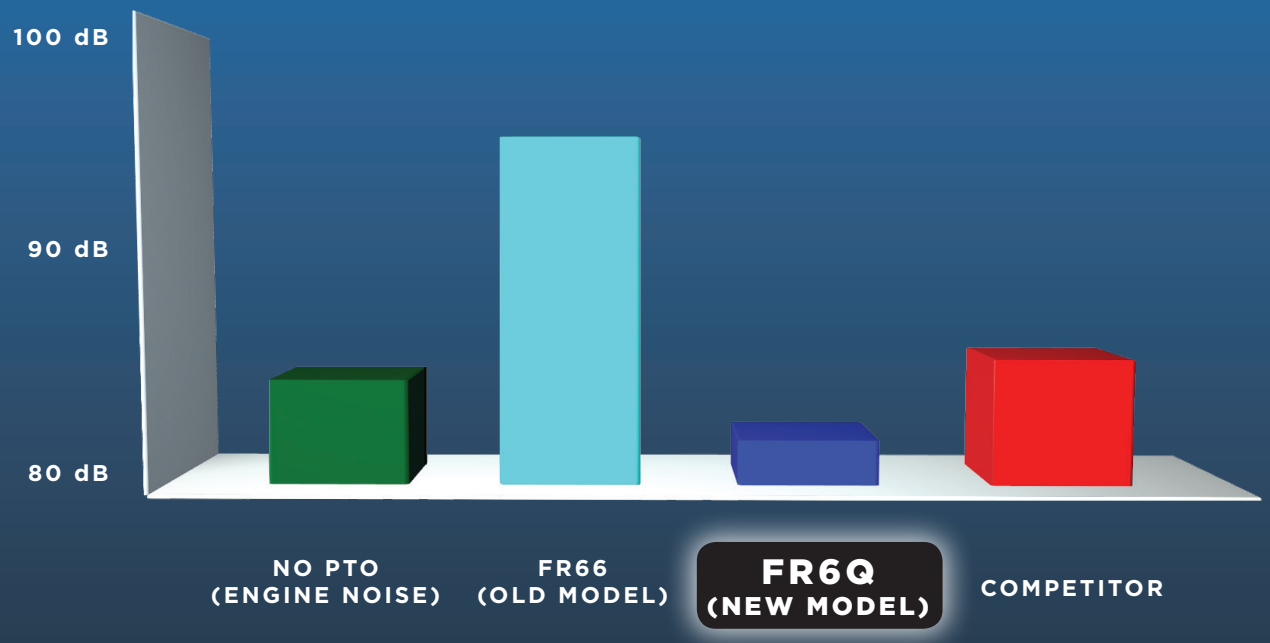
Unique solenoid
(360-degree rotation)

Fits 4X2 and 4X4 Ford Super Duty trucks, F-350 to F-550, with the Ford 6R140 transmission (may also be used on F-650 and F-750 trucks)

A QUIET COMPARISON

PTO NOISE MEASUREMENT

Decibel level at idle, taken five inches from the PTO in an internal testing lab.



When no PTO is attached, the cover plate acts as a drum increasing the engine noise. Once Muncie Power Products' FR6Q is installed, the overall noise is lower than the engine noise without a PTO.

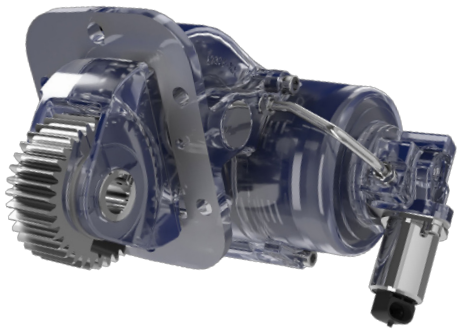
RESOURCES

Additional resources are available for the new, quiet FR6Q power take-off and can be accessed on Muncie Power Products' website via the hyperlinks below.

- *Muncie Power Quarterly*, Issue 1, 2017: Revealing the Quiet PTO Solution for Ford
- *FR6Q Product Page*

Watch this video and hear the difference!

Video may not display or play in some browsers. Please click here to watch the video.



FR6Q
SERIES

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