



Eliminating RPM Limits on Unspooling in a Hydraulic Winch

How GMN helped eliminate winch failures by removing the limiting speed factor and increasing the safety of the winch.

Executive Summary

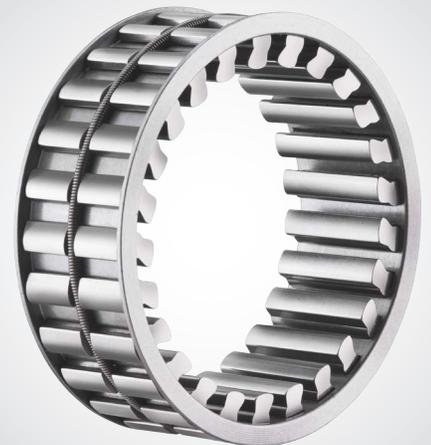
After experiencing product failures from another manufacturer's sprag clutch, a hydraulic winch company came to GMN for help.

Knowing GMN could provide application engineering support and offer a high-quality sprag clutch, the customer asked GMN to provide a solution that would eliminate the recurring product failures they were having when unspooling at high speeds (RPM).

GMN provided a direct "drop-in" replacement sprag clutch, from the GMN FE 8000 sprag clutch product line.

THE FE 8000 SPRAG CLUTCHES:

- ✔ Removed any maximum RPM limits.
- ✔ Increased torque capacity (with the same size clutch), thereby increasing the safety.
- ✔ Eliminated the need for a system redesign.
- ✔ Increased reliability of the winch system by stopping the product failures from occurring.



Overview of a Hydraulic Winch

Hydraulic winches are commonly used for heavy-duty jobs and usually found in cranes to move equipment and heavy machinery.

Compared to an electric winch, a hydraulic winch carries heavier loads and operates at a higher power output. This combination brings a higher potential for serious injury or property damage if winch failure occurs.

A sprag clutch is located inside the braking mechanism in a hydraulic winch. A sprag clutch is a critical safety component that prevents the drum from unspooling.

Winch Failure: Sprag Clutch Hit Max Speed Limits

After analyzing the braking mechanism, the problem was caused by the max RPM limit from the other manufacturer's sprag clutch.

Like most sprag clutches, if speeds get higher than the max RPM limit, the sprags in the clutch will lift off the shaft due to centrifugal force. The "lift-off" prevented the sprags from engaging unless speeds were lowered to a value below the limit.

How GMN Helped

GMN provided a direct "drop-in" replacement sprag clutch, from the GMN FE 8000 sprag clutch product line.

The FE 8000 series has a unique design that prevents the sprags from lifting off the shaft at high RPMs, completely removing a maximum RPM limit.

This key feature eliminated the product failure the customer was experiencing and improved the overall functionality of the system.

Added Benefits of the FE 8000 Sprag Clutch

In addition to finding a solution to their primary problem, this company learned that the GMN FE 8000 sprag clutch also provides a higher torque capacity, increasing the safety of the overall winch system. This higher torque capacity is a result of having more sprags in the GMN clutch compared to other sprag clutches on the market.

The GMN sprag clutch was also a direct “drop-in” replacement, eliminating the need for a redesign of the mating components.

Results

This company came to GMN in need of a product that wouldn't fail when the unspooling RPMs were too high.

Using the technical expertise from GMNs in-house engineers, they delivered a product with no RPM limits that eliminated the product failures, increased safety with the higher torque capacity, and removed the need for a system redesign that saved the company a substantial amount of money.

The GMN FE 8000 series sprag clutch was tested and exceeded the customer's expectations. The switch was seamless, and the customer couldn't be happier.



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