



**Rapid Ball Joint Redesign**  
Keeps Snowmobile Production  
on Track





## EXECUTIVE SUMMARY

A snowmobile manufacturer faced a critical challenge: the ball joint in its new sled design wasn't strong enough to meet performance demands. The part had already been approved and ordered, but field testing revealed that the stud needed to be enlarged—without increasing the housing.

CCTY's engineering team quickly designed a solution that met the original part specifications within just one week. Their rapid response allowed the OEM to reorder without disrupting production and continue sled testing without delays—ensuring a seamless path to market.



Thanks for your help.  
It has never been so easy  
to get a new part!

– OEM Off-Road  
Design Engineer

## THE CHALLENGE

As an OEM's off-road team neared the final stages of testing a newly designed snowmobile, an unexpected issue arose. Additional laboratory and field tests revealed that the ball joint stud lacked the strength needed to withstand the extreme shock loads and stresses of high-performance racing sleds. With production timelines looming, the OEM needed a stronger solution—without altering the existing design parameters.

## THE SOLUTION

With production timelines at stake, CCTY's engineering team moved quickly, using a client-provided sketch as the foundation for a stronger ball joint design. The challenge was clear: reinforce the stud without increasing the housing—all within an accelerated timeline.

Within just a week, CCTY developed and presented an optimized design that incorporated additional heat forging and precision machining for enhanced durability. The engineers also explored new boot options and injection boot molds to ensure long-term performance in extreme conditions.

Leveraging in-house engineering expertise and full-scale manufacturing capabilities, CCTY produced and shipped new part samples to the customer in just 70 days—keeping the project on track.

## THE RESULTS

CCTY's design and manufacturing capabilities provided the customer with a seamless solution, allowing sled testing to continue without interruption. The redesigned ball joint not only met but exceeded expectations, passing all life cycle and durability tests required for high-performance racing sleds.

CCTY's solution delivered three key benefits:

- **Rapid Turnaround:** A time-sensitive response ensured the customer stayed on schedule.
- **Proven Durability:** The new design withstood rigorous testing, confirming its strength and reliability.
- **Streamlined Production:** The customer could use a single ball joint across its entire snowmobile lineup, eliminating the need for multiple parts.

By partnering with CCTY, the OEM maintained its production timeline without compromise—keeping its competitive edge in the high-stakes world of performance snowmobiles.

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With more than 100 engineers on staff, we can quickly provide solutions for our customer's biggest challenges.

– Dave Olson  
CCTY Strategic Sales Manager





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