



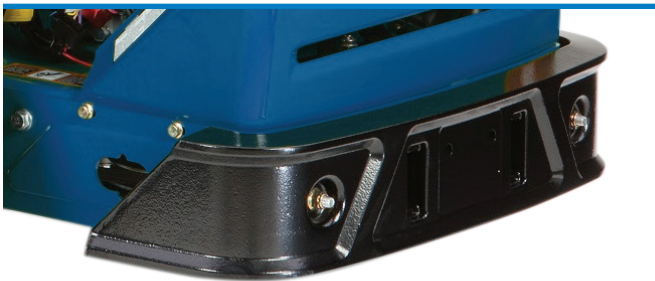
Collaboration That's a Cut Above

Case Study: Commercial Turf/Lawn Care Equipment



Collaborating with a global leader in commercial turf and lawn care equipment, Waupaca Foundry worked to drive out costs from a mower bumper cast in gray iron, and thereby **enhanced the zero-turn commercial mower's performance.**

BEFORE: One-part bumper



AFTER: Two-part bumper



? Situation

The OEM identified three key opportunities:

- The original bumper casting design wrapped around the zero-turn mower, thus displacing the center of gravity. It is essential that the mass of the rear bumper be properly balanced to provide a counterweight when the mower is operated on inclines. Gray iron provides the needed density, but the distribution of the material was a problem.
- The angle of the original bumper caused it to scrape on inclines and steep grades, a significant problem for commercial customers who are trailering the mower to multiple jobsites daily.
- The original bumper casting was designed with a thin section in the center that cracked when/if backed into substantial objects. Customers had to wrestle with removing a broken and costly 67-pound bumper, then order and wait for a replacement part.

Additionally, the one-piece assembly required shipment to a third-party machine shop to drill and tap holes required to mount the bumper to the mower.

Solution

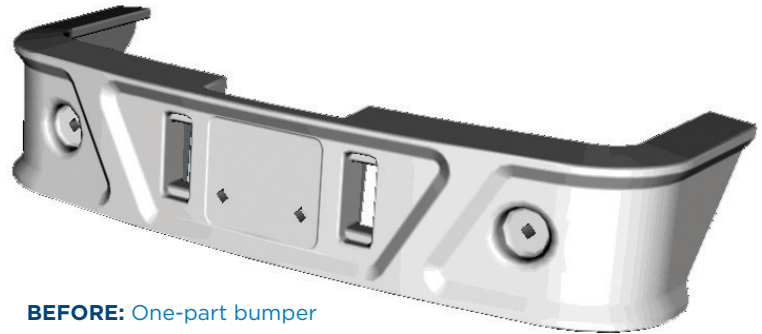
Engineering and manufacturing teams at Waupaca Foundry worked with the customer's product engineering group to review the production process and collaborate on increasing performance on the part. We identified cost drivers and production solutions to produce the part more efficiently.

We then proposed breaking the one-part casting into two parts to better meet the goals and the end user's expectations.

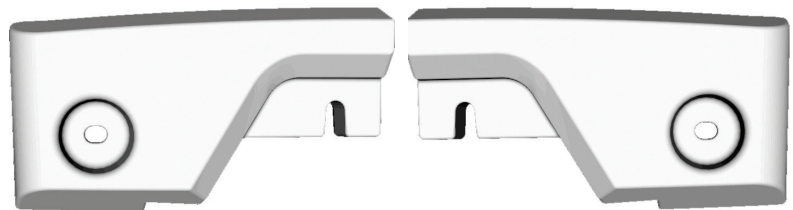
Foundry engineers worked to design a gray iron casting that repositioned the offset parting line to allow three halves of the new 2-piece bumper or 1.5 bumpers in each mold.

Additionally, the mounting holes in the 2-piece bumper were redesigned and are now cast without the use of cores and eliminating the need for machining.

The new, two-piece bumper system is safer and easier (more ergonomic) to handle for assembly and replacement at the factory and the dealership level. By changing the part's geometry, the center of gravity was redistributed and improved the overall center of gravity of the mower.



BEFORE: One-part bumper



AFTER: Two-part bumper

Win Win

- New, two-part bumper decreased weight 3%, from 67 pounds to two 32-pound parts.
- Production efficiency increased due to casting a 2-piece bumper. Casting three parts on a smaller, vertical molding machine allowed for faster production.
- OEM ships more products in a container, reducing transportation costs.
- Eliminated weak point in the center of the one-piece bumper design to improve durability and reduce warranty claims.
- Reduced overall profile and eliminated scraping the bottom of the bumper during trailer loading and unloading.



Looking for casting quality improvement, engineering support, cost reduction or to localize your supply chain? Count on Waupaca Foundry for everything you need to outperform.

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