

# KickStart

STARTING ASSIST

Facing repeated demands on locomotive batteries?

Extend battery life, avoid costly repairs, and spend less time dealing with failed starts. With ZTR Kickstart, you can improve starting reliability while also reducing emissions.<sup>1</sup> Kickstart gets your locomotives going, green.



<sup>1</sup>For locomotives equipped with ZTR SmartStart® or similar AESS systems.

## IMPROVE STARTING RELIABILITY

Locomotive batteries can be expensive to replace and the cost of a failed start can be considerable. Kickstart uses supercapacitor technology to bolster locomotive batteries during the engine start, reducing battery strain. That means less energy drain from batteries, longer battery life, less time to recharge batteries, quicker cranking and outstanding locomotive reliability.



### Charge Maintenance

If the battery drains, Kickstart will maintain a charge and be ready to assist locomotive starting after extended shut-down intervals.



### Extended Locomotive Battery Life

Kickstart reduces battery drain during starting to improve longevity by up to 50%.



### Minimized Battery Voltage Drop

Kickstart augments the power required during engine start, reducing the drop in battery voltage.



### Easy Installation and Zero Maintenance

Kickstart can be easily installed and requires no regular maintenance.



### Increased Locomotive Availability

Kickstart significantly enhances starting reliability in all weather conditions.



### Reliable Cold Weather Performance

Kickstart supercapacitor technology is not affected by cold weather extremes.

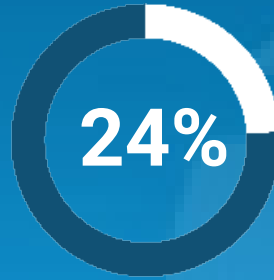
# KICKSTART PERFORMANCE DATA

## Improvements



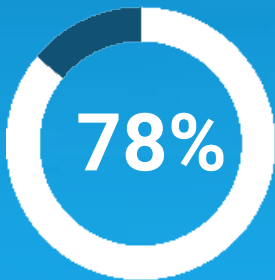
**Idle time reduction**

Less time is spent charging batteries before shutdown.



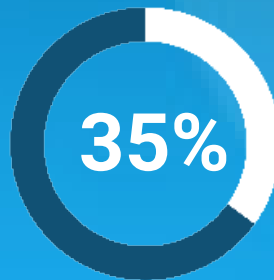
**Shorter engine crank time**

Less is better for lower wear and tear on starting equipment.



**Fewer AESS<sup>2</sup> restarts due to low battery voltage**

Less is better as it indicates a healthier battery state of charge.



**Lower current draw from batteries during locomotive starts**

Less deep-cycling of batteries leads to greater state of charge and longer life.

<sup>2</sup>Field tests conducted on locomotives also equipped with ZTR SmartStart® AESS.



**Yearly savings**



**10 Year ROI**

Whether it's cold weather starting, battery life extension or just overall starting reliability, Kickstart offers proven results. And if you're also using an AESS system, Kickstart has you covered. With less time to crank, you can offset the impact of frequent starts; cutting emissions, saving fuel, and helping the environment.

Data illustrations were created from verified KickStart installation field data.

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