

# Penn Regular and Low-Floor Axles

*Penn Machine Company*

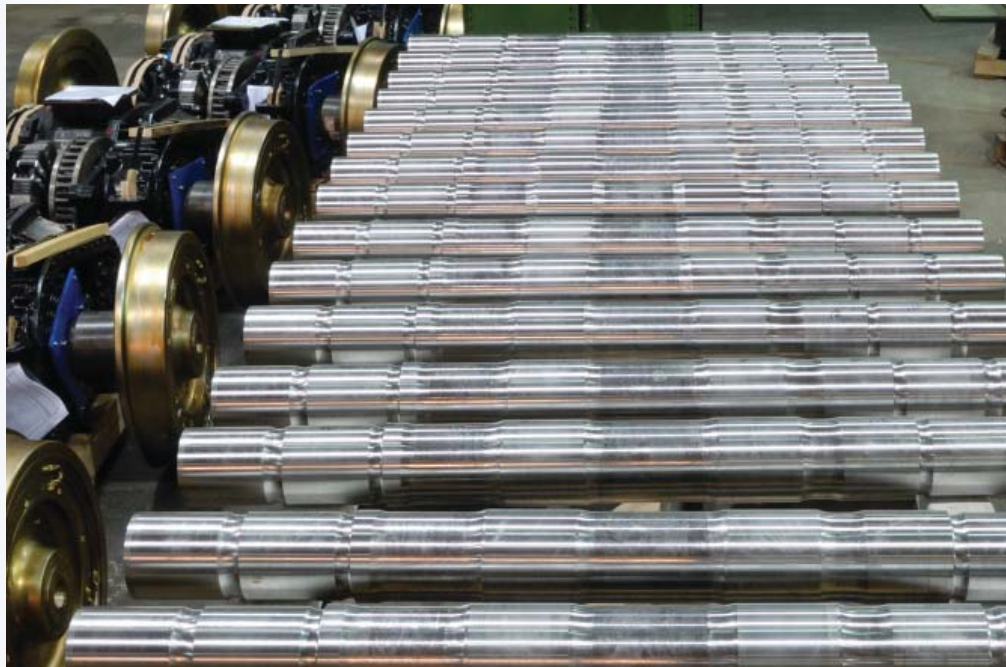
*manufactures rail transit axles  
to exact tolerances in solid, hollow,  
inboard and outboard designs.*

*Subcritically quenched in our heat  
treat facilities, our axles meet AAR  
or UIC standards.*



## Axle Reconditioning Services:

Penn Machine provides services for axle rebuilding and requalification. We supply flexible couplings, replacement brake discs, hubs and track brake components for aftermarket support. Penn Machine develops and makes those hard-to-get components.



*Outboard LRV axles ready for final  
grinding and inspection*



# Penn Regular and Low-Floor Axles (continued)

## Subcritical Quench Process:

After axles are rough machined, they are placed in a vertical position in an electric furnace for the subcritical quenching process. Typically, the axles remain in the furnace for a period of time equal to approximately one hour for every inch of diameter based on the size of the largest fit on the axle. The axles are then removed from the furnace and quenched in water. The axles remain in the water bath until they cool to ambient temperature of approximately 70°F. Finally, the axles are finish machined to customer specifications.



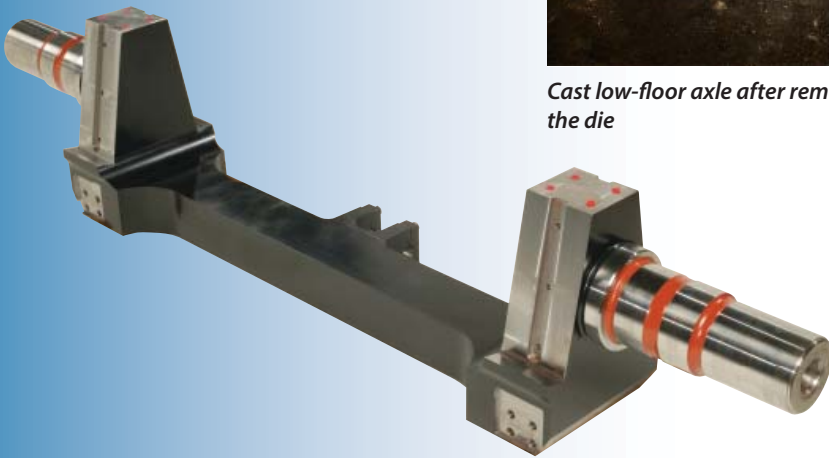
*Axles positioned for the subcritical quenching process in an electric furnace*



*Cast low-floor axle after removal from the die*



*Hollow axles with AAR stamping*



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A Macman Group/Berkshire Hathaway Company