






The Midwest Interstate Passenger Rail Commission AGM

The Charger Locomotive Procurement

September 28 & 29, 2016 in St Louis


Fast Facts

5 Customers, 91 locomotives (Multi States 71, AAF 21)




- **Standardization**
 - A common product across the country
 - 5 customers. IDOT, Caltrans, WSDOT, MARC, AAF
- **High Performance and Efficiency**
 - Speed. 125 mph with good acceleration
 - Emissions. Tier IV with a 90% improvement
 - Fuel efficiency . An improvement of 16 %
- **Maintainability and Reliability**
 - Plug and play concept. High redundancy.
- **Safety**
 - Tier II carbody with crash energy management
- **Local commitment.**
 - Fully buy America compliant. FRA & FTA.


IDOT 33 locos. 21 base and 12 options




CALTRANS 22. 6 base and 16 options



WSDOT 8. 5 base and 3 options



MARC 8 options



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Multi State Project Status



Overview

- Contract awarded in March 2014
- First article and FRA product readiness inspection achieved
- All locomotive safety tests completed.
- Acceptance testing completed at TTCI and on the NEC
- High speed tests completed at TTCI and on the NEC
- Tier IV EPA certification received in April 2016
- Production is progressing well with 16 locos through final assembly and 28 through carshell production

Primary Challenge

- Schedule retention. We have experienced some challenges but are confident of deliveries within the funding deadline.
- This will however require the support of the JPE's

Acceptance Testing at TTCI Pueblo

Achieved speeds in excess of 135 mph with load



Acceptance Testing on the NEC

Well within FRA specified vehicle stability limits

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We Recognize our Customers Needs

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- **Ridership** Intercity passenger rail ridership is at an all time high.
We will get your passengers to their destinations faster and on time
- **Growth.** In the state of Illinois ridership has increased 85% on main routes.
The Chicago to St. Louis route grew over 200% in the past 5 years
- **Environment.** A 90% improvement on emission. Low noise levels, very quiet
- **Safety.** Cab safety cage with push back couplers
- **Efficiency.** Less fuel, regenerative braking, LED lighting
- **Maintenance.** Ease of equipment removal, limited double stacking
- **Reliability.** Proven system and component technology. High redundancy.
- **Monitoring and diagnostics.** Self monitoring with wayside capability
- **Comfort & Ergonomics.** Large free flowing operators cab design
- **Standardization.** Interoperability, interchangeability and supplier flexibility
- **Local commitment.** Manufactured in America using local suppliers

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Together we will Succeed !!!!!



Thank you !

Charger Technical Characteristics



- Loco type High speed with **full** streamlined **carbody**
- Power type **AC** Diesel Electric
- Crashworthiness **CEM and AAR-S-580**
- Configuration: **Bo' Bo' single axle control**
- Compatibility: all Amtrak DE and E Locomotives
- Environment Amtrak environmental spec. 963
- Loco Length Couplers 71'6" (21 655 mm)
- Loco Width 10' (3022 mm)
- Loco Height 14'6" (4385 mm)
- **Clearance Diagram D-05-1355 Amtrak**
- Bogie centers 43' (13 050 mm)
- Axle centers 118"
- Track gauge 4' 8.5" (1435 mm)
- Curve radius track min 250 ft (coupled to 85 ft coach)
- Wheel diameter new 44" worn 41"

Charger Technical Main Data



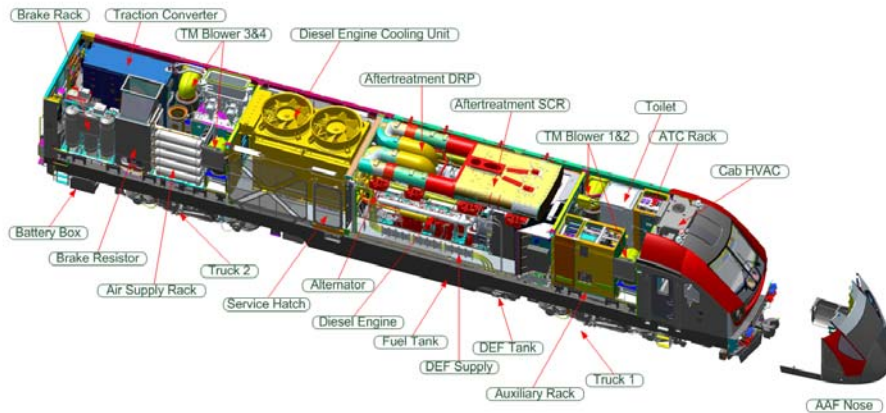
• Rated DE power	max. 4400 hp at engine speed 1800 rpm
• HEP power supply	800 kW (600 kW) (3AC 480 V), Redundant
• Aux power supply	≤ 150 kW (3AC 480 V), Redundant
• Starting tractive effort	65 000 lbs (290 kN)
• Continuous tractive effort	61 800 lbs (275 kN)
• Brake effort	27 000 lbs (120 kN)
• Track super elevation	6" (9" design)
• Weight	271 000 lbs (base)
• Operating speed	max 125 mph
• Design speed	max 135 mph
• Fuel Capacity	max 2,200 gal (8400 liters)
• Engine type	16 cylinder 4 stroke Type Cummins QSK95
• Engine speed range	600 to 1800 rpm
• Emission standard	EPA Tier IV

Design Approach



- **Robust design**, based on service proven equipment
- **Platform logic** allows customizing to accommodate long-distance, cab car and dual mode variants
- **High speed** (125 mph), high performance (4,400 HP max) and light weight (268,000 lbs)
- **Intelligent control system** assuring **improved fuel economy, with lower LCC**
- **Modular plug and play design** with improved maintenance, reliability and availability
- **High speed trucks**. Service proven high speed truck and drive system
- **High performance Cummins QSK 95 engine**, designed from ground up with **EPA Tier IV+** in mind
- **Single axle AC traction control** offering optimum redundancy
- **Advanced monitoring and diagnostics** with onboard and remotely
- **100% HEP and auxiliary load redundancy**. Common inverter with traction
- **Bold appearance** while considering ease of maintenance and collision repair
- **NGEC Spec compliance**. Compliant with the NGEC PR11A 305-005 technical specification
- **Advanced microprocessor control** with various PTC system combinations

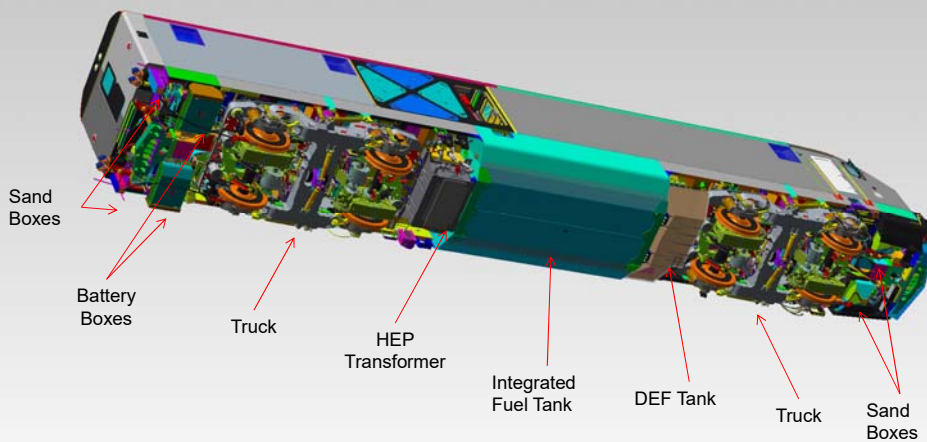
Equipment Layout



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Underfloor Equipment Layout



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Siemens Locomotives in North America



Amtrak

70 locomotives in 2010



ACS-64

SEPTA (Pennsylvania)

13 locomotives in 2015
2 locomotives in 2016



IDOT (Illinois)

21 locomotives in 2014
12 locomotives in 2015



Charger Diesel-Electric

WSDOT (Washington)

8 locomotives in 2014



Caltrans (California)

6 locomotives in 2014
14 locomotives in 2015
2 locomotives in 2016



MARC (Maryland)

8 locomotives in 2015



AAF / Brightline (Florida)

21 locomotives in 2014
50 coaches in 2014



**Σ 177 Locomotives
On Order / Delivered**

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