



# SIEMENS CHARGER

## Clean Diesel-Electric Locomotives for Better Reliability and Efficiency

States across the U.S. to rely on the new Charger locomotives to power the next generation of clean, efficient and high-performance rail travel

90% emissions reduction compared to Tier 0 locomotives

16% improvement in fuel efficiency over existing fleet in California and Washington

>3x less fuel consumption

Manufactured at Siemens U.S. plant, powered by up to 80% renewable energy

### STATE-OF-THE-ART FEATURES

#### Power

The Charger locomotive is powered by a **high-performance**, environmentally friendly, 4,400 horsepower-rated Cummins QSK95 diesel engine. Designed to operate at **speeds up to 125 miles per hour**, the locomotives are the **first high-speed passenger locomotive to receive Tier 4 emissions certification** from the Environmental Protection Agency (EPA).

#### Smart Technology

A state-of-the-art microprocessor control system installed in the locomotive performs **continued monitoring**, takes self-corrective action and provides clear operating instructions to the locomotive engineer to ensure the most efficient on-time performance.

#### Rider Experience

The powerful diesel-electric operation allows for better acceleration, cleaner emissions, and low noise levels while on-board and waiting at the platform. The Chargers also feature an attractive streamlined design and smoother traction control which results in **better ride quality** for passengers.

#### Maintenance

The lighter weight of these locomotives ensures the ability to safely operate the locomotives at speeds of up to 125 mph more efficiently, **requiring less maintenance** for both the locomotive and the infrastructure. All wiring, cabling and piping is located under the middle aisle within the locomotive machine room for easy maintenance access and protection from external elements.

#### Safety

The locomotives meet the latest federal rail safety regulations, including enhanced carbody structure safety with **crash energy management** components like a locomotive cab safety cage and push-back couplers.

#### Redundancy

Siemens Charger diesel-electric locomotives are specifically designed for North America relying on the experience of its proven Vectron platform, currently pulling some 1,600 passenger and freight cars throughout Europe. The locomotive includes **redundant systems** to keep primary systems such as traction, communications, heating and cooling systems working. The electric version of this locomotive was rolled out by Amtrak and is currently in service along its highly-traveled Northeast Corridor.



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### CLEANER RAIL TRAVEL

#### Fuel and Energy Efficiency

The Charger locomotives are equipped with electronically-controlled regenerative braking systems that use energy from the traction motors during braking to feed the auxiliary and head-end power systems to minimize fuel consumption. With a fuel capacity of 2,200 gallons, the locomotive consumes **more than three times less fuel** than comparable gallons per passenger for two-person car travel.

Also, the new Charger locomotives, using the QSK95 Cummins engine, provide a **16% improvement in fuel efficiency** over the non-Tier 4 certified locomotives that the Charger will replace in Washington and California.

#### Emission Reduction

The new locomotives are among the cleanest in the nation and will result in dramatic **emission reduction of approximately 90 percent** compared to trains powered by currently operating Tier 0 locomotives.

#### Reliability

The new locomotives are equipped with single-axle control located in the drive system which allows the train to better adhere to the rails in difficult conditions like rain and snow.

**The locomotive consumes more than three times less fuel than comparable gallons per passenger for two-person car travel.**

### CUSTOMERS

Siemens is building the Charger locomotives for transportation agencies across the U.S. as part of a multi-state procurement project. The states include California (Caltrans), Illinois (IDOT), Washington (WSDOT) and Maryland (MTA). Additional states served by the procurement are Oregon, Wisconsin, Missouri, Michigan and Iowa. The Charger locomotives will also power new trainsets for Brightline, a passenger rail service that will connect South and Central Florida.

### SUPPLY CHAIN

The Buy America-compliant Charger locomotives are being and built at **Siemens nearly 1,000-person Sacramento, Calif. rail manufacturing plant** which is powered by up to 80 percent renewable energy. All main components of the new locomotive are produced in Siemens plants in the United States – including traction motors and gearboxes in Norwood, Ohio and propulsion containers in Alpharetta, GA. The diesel engines are manufactured by Cummins in its Seymour, Indiana plant.

Siemens has established a robust and diverse base of U.S. suppliers across the country to support production of the Charger locomotives. Transformers and alternators are supplied out of Florida, brake components out of Maryland, diesel engines from Indiana, HVAC systems out of Nebraska, and steel and fabrication parts out of California and Oregon.

### TESTING

The locomotives are undergoing a comprehensive and rigorous testing program and the U.S. Department of Transportation's (DOT) Transportation Technology Center (TTC). This includes testing maximum speed runs, acceleration and braking, and the overall performance capabilities of the locomotive.

### PRODUCTION SCHEDULE

Siemens will complete and ship a Charger locomotive as part of the first trainset for Brightline this fall. The Illinois Department of Transportation will receive their first Charger locomotive later this year, with additional customers to follow throughout 2017.

### CONTRACT DETAILS

In March 2014, Siemens was awarded a \$225 million contract to build 32 diesel-electric Charger locomotives for a multi-state passenger rail locomotive procurement led by the Illinois Department of Transportation. The procurement was done on behalf of transportation agencies from five states including Illinois, California, Michigan, Washington and Missouri. Siemens received an order for 34 additional Charger locomotives under this procurement to now include the Maryland Transit Administration (MTA). Siemens was awarded the Brightline trainset contract in September 2014.