Cleaner Locomotive Fleet Powers Up

22 New Units Ordered for State-Supported Amtrak Corridors

Caltrans photos by Scott Lorenzo

This is one of 22 Charger diesel-electric passenger locomotives ordered by Caltrans and being built by Siemens Mobility in Sacramento. The Chargers are the first locomotives to comply with new federal emissions standards, producing 85 percent fewer emissions than existing engines serving California's Amtrak corridors.

Caltrans has ordered 22 higher-speed diesel-electric passenger locomotives that will be among the first in the nation to meet strict new federal emissions guidelines.

The first six of those Charger locomotives, built by Siemens Mobility in Sacramento, are expected to be released from the factory in early December and will undergo testing and commissioning prior to being put into daily service this spring.

The Chargers will replace part of California's aging Amtrak fleet and are expected to improve reliability, reduce greenhouse gas emissions and help efforts to double current ridership of 5.4 million passengers by 2040.

California's 16 remaining Chargers are expected to start coming off the assembly line in 2018. Each locomotive costs about $5.9 million.

In 2012, Caltrans joined its Department of Transportation counterparts in Illinois, Michigan, Missouri and Washington to purchase locomotives for corridor service operated by Amtrak. Caltrans' joint procurement of these locomotives has helped to establish a national emissions standard, and maximized the state's purchase power of the funds provided through the American Recovery and Reinvestment Act and High-Speed Intercity Passenger Rail Investment grants.

The Chargers themselves are powered by 4,400 horsepower-rated diesel engines and are the first to comply with the U.S. Environmental Protection Agency's strict Tier 4 emissions standards, which reduce emissions by approximately 85 percent, compared with most existing locomotives in service on the Pacific Surfliner corridor from San Diego to San

Luis Obispo County. Much of the emission reduction is achieved through an exhaust after-treatment system that converts toxic nitrogen oxide (NOx) emissions into a harmless dinitrogen gas and water. The locomotives are rated to safely reach speeds up to 125 mph.

On normal weekdays, statewide service across the three state-supported corridors (Capitol, San Joaquin, Surfliner) requires 26 locomotives, but maintenance, periodic unscheduled repairs and inspection cycles for locomotives often strains the existing capacity for the Caltrans and Amtrak fleet's ability to meet daily service demands. By procuring additional locomotives, the state will be able to provide the current level of service without interruption.

The Chargers, with Cummins QSK95 diesel engines installed, also boast new safety technology throughout, and a diagnostics system that provides messages on the engineer's display panel that distinguish between minor and severe faults to determine whether the train needs to stop immediately or can continue safely until its next scheduled maintenance. MM

***Source:** Caltrans Division of Rail and Mass Transportation, Siemens Mobility*

Siemens SC-44 Charger			
Power type	Diesel-electric	Fuel type	Diesel
Builder	Siemens Mobility	Fuel Capacity	1,800 U.S. gallons
Length	71 feet, 5 inches	Aspiration	Turbocharged
Width	10 feet	Cylinders	16
Height	12 feet, 6 inches (roof); 14 feet, 4 inches (roof shroud)	Brakes	Dynamic/regenerative/electropneumatic
Axle Load	67,500 pounds	Maximum speed	125 mph
Locomotive weight	264,556 pounds	Power output (at alternator)	4,400 hp

***Source:** Siemens Mobility*

A Siemens employee works on a Charger display panel equipped with a diagnostics system designed to show the severity of faults detected within the locomotive.

The front of this locomotive is closer to completion as lights and electrical hookups are added.