



Biogas train

Environmentally friendly and cost effective

A unique train

This train is truly one of a kind. It is the first biogas-fuelled train in Sweden, maybe in the world. Modern gas engines with catalysers have replaced both of the diesel engines. In one fell swoop, the train's environmental performance has changed dramatically for the better. The train adds no carbon dioxide to the atmosphere, because biogas is a renewable fuel source. One other advantage is the fact that biogas is produced locally.

In short – low emissions, renewable fuel source and locally produced. It is a cost effective, environmental alternative to electrifying lower volume rail services.

History of this train

Our train (No.1334) was built in 1981 by Fiat in Italy. It was one of 100 railcar trains delivered to SJ and was one of 12 railcar trains with special cargo compartments (littra YF1). It has been used on unelectrified rail services from the north to the south of Sweden. Until recently, it has been in service on the Jönköpings Läns- trafik rail network, on the Nässjö - Halmstad line. The train had a major refit in 1994, when the engines and gearboxes were replaced and the rail cargo compartment was rebuilt.

Rail service

Our train will be in service on the Tjustbanan (Linköping - Västervik); one of Sweden's most beautiful

stretches of rail track. The plans are that the train will be refuelled in Västervik and it will form the base of a local biogas market. Biogas production will be located at Västervik's sewage treatment plant, Lucernaverket.

Total makeover

Besides the engine switch, the train has been completely made over. We have equipped the railcar with a large flat screen, mobile phone signal amplifier, power points for laptop computers, a hot drinks vending machine, and improved ventilation – everything to make the train journey more enjoyable.

Data

Owner	Svensk Biogas AB
Operator	SJ
Littra	Y1G
Train number	1334
Length	24,4 m
Service weight	47 tons
No. of seats	54 st
Engines	2 Volvo GH 10 B
Engine data	210 kW / 1200 Nm
Max speed	130 km/h
Gas tank volume	530 Nm ³
Range	600 km



SvenskBiogas
www.svenskbiogas.se

Main contractors

Refitting	EuroMaint AB
- construction and project management	TravelDesign AB
Engines	Volvo Bussar AB
Fuel system	Gaveco AB
Installation	ProcessKontroll AB

Joint partners

Svensk Biogas AB
 Tekniska Verken i Linköping AB (publ)
 EuroMaint AB
 Linköping municipality
 Västervik municipality
 Åtvidaberg municipality
 Banverket
 Kalmar Länstrafik AB
 AB Östgötatrafiken

Emissions

G/kWh	New bio-gas engines	Old diesel engines
CO carbon monoxide	0.01	0.60
NOx nitrogen oxides	2.00	6.15
NMHC hydrocarbons	0.10	0.35
Particles	0.01	0.16
Complying with	Euro 5	Euro I



Before reconstruction, Åmål March 2005



New gas engine (above) and gas cylinders (below)



About biogas

Biogas is formed by the decomposition of micro-bacteria in organic material in an oxygen-free environment, a natural process that occurs in swamps, and marshes, for example. In biogas plants, this takes place under controlled conditions in a digestion chamber. The gases formed in this process, mostly methane and carbon dioxide are collected. For use as an engine fuel, the methane content has to be boosted to around 97 %, which is done by removing most of the carbon dioxide.

Svensk Biogas is a 100 % owned subsidiary of Tekniska Verken i Linköping AB (publ). Our mission is to promote the development of biogas. We are working in this direction regionally by promoting and marketing our production of vehicle fuel gas and bio-fertiliser as well as the process development and biogas production concepts based on both farm produce and organic waste as raw materials.