

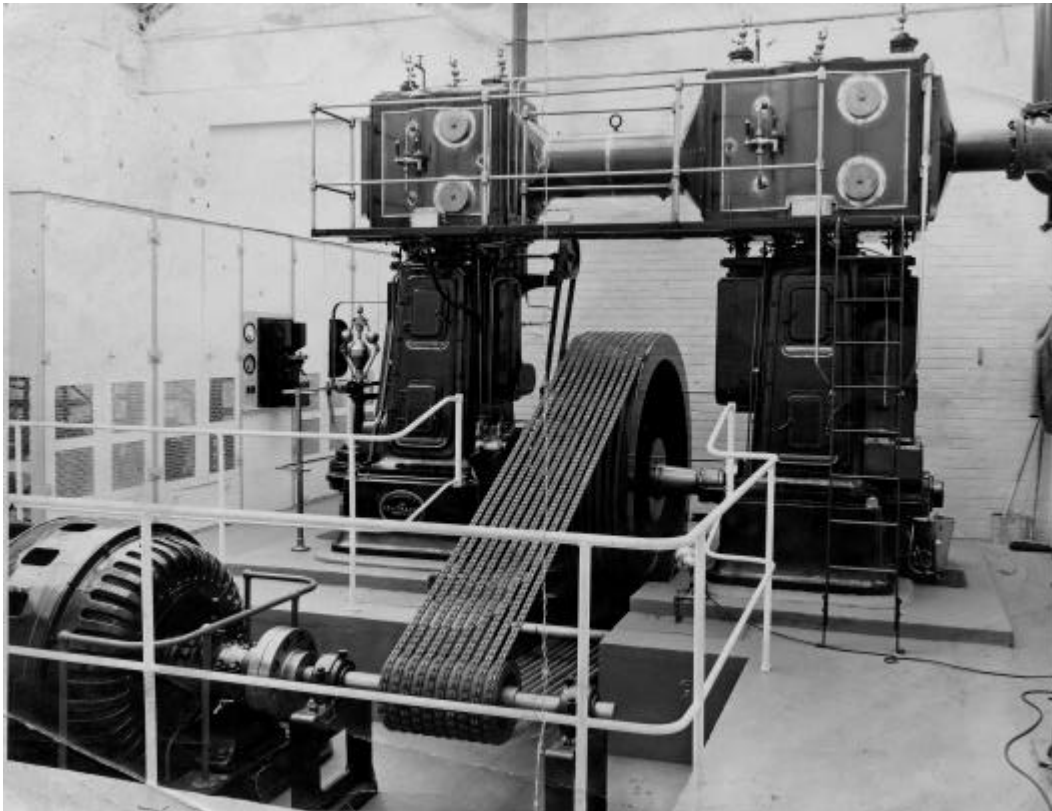
## Ferranti Inverted Vertical Cross-Compound Engine

This steam engine was built by S. Z. de Ferranti Ltd of Hollinwood, Oldham, in 1900. It is an inverted vertical cross-compound engine with two vertical cylinders, one high-pressure and one low-pressure, on either side of the flywheel. This engine originally generated electricity at Lambeth Power Station in London, but was later sold to J. H. Gillet & Sons Ltd for use as a mill engine at Brunswick Mill in Chorley. As the engine was no longer required to generate electricity, the original alternator was removed and replaced by a flywheel of 6-ft diameter.



This engine was a very advanced design for 1900. It had pressurised lubrication to all main bearings and balance weights fitted on the crankshaft. These features ensured that it would run smoothly at the (then) very high speed of 300 rpm required to generate alternating current at the standard rate of 50 cycles per second. Ferranti Ltd stopped making steam engines in 1903, as part of a reorganisation resulting from heavy trading losses. Although its steam engines were of a high quality, the company could not compete on price with larger manufacturers, even in the more specialist steam-alternator market.

The compound mill engine was introduced in the late 1890s in order to improve on the efficiency of the single-cylinder horizontal mill engine. The idea of the compound engine was to let the steam expand in two or more successive stages. Firstly, the steam worked the piston in the high-pressure cylinder and then it was exhausted to the low-pressure cylinder to work that piston. In the Ferranti engine, the high- and low-pressure cylinders are positioned on opposite sides of the flywheel. The cylinder, piston rods and crankshaft are totally enclosed within the engine casing and accessible only via small inspection doors. This vertical type of compound steam engine was widely adopted because it took up much less floor space than the horizontal compound mill engines (such the Firgrove Mill Engine, displayed in the Power Hall).



When the Ferranti engine went out of service in 1960, Ferranti Ltd reacquired it as part of its collection of company products. The photograph above shows the engine at the company's Avenue Works in Oldham. It was loaned to the Museum in 1982 for display in the Power Hall, the first of the Museum's galleries at Liverpool Road Station. A Siemens flywheel alternator was fitted to recreate the only surviving reciprocating steam engine flywheel alternator set in the world.

*Technical Data*

Engine type	Inverted vertical cross-compound engine
Manufacturer	S. Z. de Ferranti Ltd, Hollinwood, Lancs.
Date of manufacture	1900
Operators	Lambeth Power Station, London; then J. H. Gillet & Sons, Brunswick Mill, Chorley, Lancs.
Rating	600 horsepower
Speed	300 rpm as an alternator, 150 rpm as a mill engine
Cylinder	High-pressure: 15-inch (380-mm) diameter Low-pressure: 30-inch (760 mm) diameter
Steam pressure	160 p.s.i.
Valve type	Two slide valves
Flywheel	Siemens flywheel alternator.

*For more information:*

*Read* Hayes, G. *Stationary Steam Engines*. Princes Risborough, UK: Shire Publications, 2003.

*Visit* The Museum's Collection Centre  
Northern Mill Engine Society, Chorley Old Rd, Bolton.