

McLaren steam traction engine No 815

The Museum of Applied Arts and Sciences (MAAS) acquired the McLaren steam traction engine No 815 in the 1960s. It was donated by a farmer from Kelso, near Bathurst. It had been stored in a shed for many years and was still in working order. The engine was bought from George Fish Pty Ltd, corner Bentick and Russell streets, Bathurst.



The McLaren steam traction engine No 815 in the Display Store at the Powerhouse Discovery Centre.

Background

Traction engines originated in England in the 1860s. They can be defined as mobile (wheeled) steam engines. McLaren traction engines had a good reputation. They were known for their high standard of workmanship, ease of operation, longevity and reliability. Of the 1860 McLaren's traction engines that were made, about 300 were sold in Australia and New Zealand. They were used for road clearing, building and agriculture. They were also used for threshing, carting wool, wheat and timber, land clearing, direct ploughing, driving chaff cutters, operating pumps and sawmills. The engines were used in pairs with a chain between them for land clearing. McLaren offered an array of choices to its customers — the wheels of the Australian engines were wider than those used in Britain to cope with poorer road and ground conditions. They also offered 2- or 3-speed,

sprung or unsprung, coke, straw or coal-fired. The traction engine was the precursor to the internal combustion tractors that were developed during World War I. The production of the traction engines phased out in the 1930s.



Detail of the McLaren label, cylinder block and governor (speed controller).

The McLaren steam traction engine No 815 is a general-purpose steam engine with a double crank compound (2-speed). It is unsprung, fitted with a belly tank, outside valve gears and side valves. It has a Stephenson link motion, a spoked flywheel, roof and straked road wheels. The handpainted line work is black, brown, yellow and red. The original McLaren records show that it was called a 'strawburner' engine, meaning straw was used as a source of fuel. The engine was manufactured in Leeds, England. Faint annotations on one of the front wheels indicate the engine came to Australia on the 'Africa No 72' cargo ship.



Original paint and line work is still visible on the gear cover and horn plates.

Significance

The McLaren Burrell steam traction engine No 815 is highly significant because it is one of the few remaining examples in the world in its original and complete condition. It is now used as an important reference point in steam engineering history. It is an outstanding example of how the original engines would have looked and it has not been altered since it last did useful work. It is possibly the best surviving McLaren traction engine in existence. This type of machinery is often found in degraded or incomplete condition due to age and being stored outside.



The belly water tank shows skilful, original, handpainted line work.

Restoration is often undertaken on old steam engines. This unfortunately means that along with the loss of the original fabric, knowledge of the engine's history and working life is also lost.

By storing this McLaren steam traction engine in a shed for many years, it has survived, is in reasonable condition and has not been restored. This is what makes it so significant.



Spare nuts and washers located on the engine for reuse during its working days.



Important shipping details on the front wheel would have been lost if this engine had been restored.

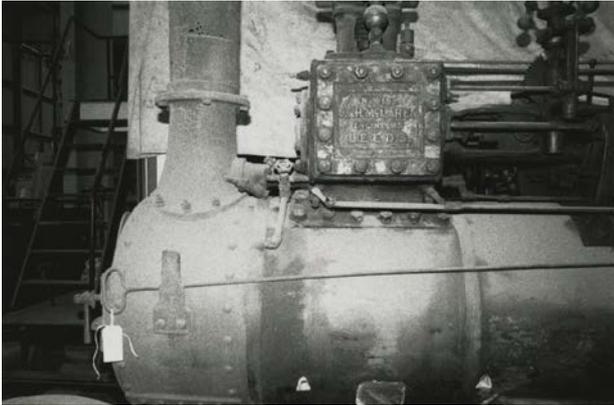
Treatment philosophy

The conservation policy for the traction engine is to simply maintain its original condition and keep it stored in a stable, clean environment. Given its world significance status, the conservation treatment has been kept to a minimum, with only some small preservation measures taken to stabilise the engine for long-term display/storage. The McLaren was conserved in the 1990s at the Powerhouse Museum in Sydney.

Condition

- Overall corrosion and paint loss but a large amount of original paint and line work survives.
- The boiler engine had corked asbestos cladding, used for insulation, sandwiched between the wooden lagging and the metal lagging on top.
- Heavy deposits of oxidised oil and grease, working grime and storage dirt.
- The stencilled shipping details are visible inside the front wheels.
- Severe corrosion in the floor of the smoke-box and on the door closing ring, caused by the acidic combustion products and moisture.
- Moderate corrosion to the front tube-plate and rivets but externally sound.
- The boiler interior, especially the tubes and the firebox crown, have corrosion blisters consistent with storing water, leading to splitting.

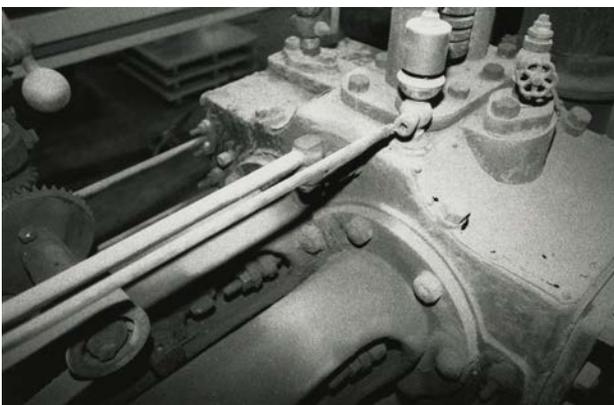
- There are blisters, pitting and perforation of steel in the belly water tank, due to acidic combustion products and moisture.
- The footstep to the man-stand was broken. It has been repaired in service by plating and riveting on the nearside.
- The chimney has corroded in places.
- There is severe corrosion in the ash pan.
- The fire bars contain ash and show moderate corrosion.



The engine before cladding was removed.



Corrosion to the smoke box.



Cylinder block can hold moisture and cause corrosion.

Moving the engine

The engine was moved from the Museum's Alexandria store to the Cooks River Yard, then loaded onto a well wagon and taken to the State Rail Authority (SRA) Asbestos workshops at Chippendale (Carriage Workshops, Eveleigh). In order to prevent any damage during the move, the following precautions were taken:

- rubber was placed over wheels and under chains
- soft nylon webbing was used over the roof for stability and also used to tie down loose objects
- loose bits were wrapped in bubble wrap.



Moving the engine by crane from the Alexandria store.

Asbestos removal

- Thorough black and white photography was undertaken before treatment began.
- The asbestos cladding was visible in some places. It was friable, could be disturbed if touched or tampered with, and was a health hazard, so the asbestos had to be removed. To do this, the metal lagging sheets of the boiler barrel had to be removed by unbolting and unscrewing all attachments. This was potentially dangerous as some of the existing surfaces could be damaged during this process. Some fittings and the chimney had to be removed to protect the paintwork.
- The asbestos was flooded in water first and then removed by the SRA Asbestos Unit.
- The engine was scrubbed down then dried off. It was reloaded and taken to the Museum's Castle Hill stores.

Conservation treatment

- The belly tank, the steering shaft, worm gear and some other fittings were put back in place.
- The exterior engine was sprayed with Rustico DW x30 which is a dewatering agent in oil that gives a protective coating.
- The boiler and the firebox were washed out with water to remove mud and rust.
- The boiler was dried with a dewatering agent (Corroless) to prevent further corrosion. This solution is no longer recommended.
- The fire-bars and the ash pan were removed and all the ash was taken out of the inner firebox, tubes and smoke box.
- All loose bits, pins and plugs have been stored in the tender.
- Thorough colour photography was undertaken.



The smoke box after the ash was removed.

Ongoing care

Preservation of the traction engine is ongoing. It is permanently stored in the Display Store at the Powerhouse Discovery Centre, Castle Hill. In order to minimise further deterioration, it is stored in a stable environment. This means the temperature is maintained between 22–24°C, the relative humidity is kept between 40–55% and it is in a dust free, pest free, pollution free storage area. Providing a stable environment ensures that this very rare engine will survive for many generations to come. Ongoing maintenance will be minimal.

This case study is part of a series developed by Powerhouse Museum Conservation department, May 2014.

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