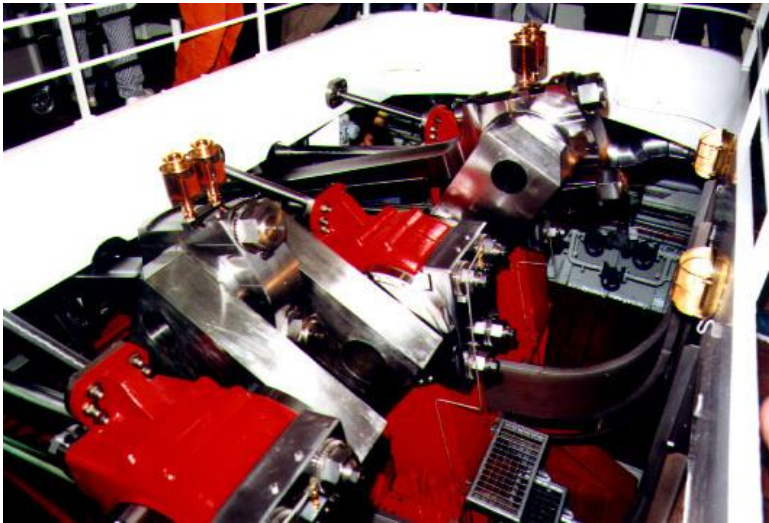


# ***MODERN STEAM TRACTION***



***Clean, efficient and economical***

# Smoke, Soot and flying Sparks gave the **old** Steam Locomotives a bad Image



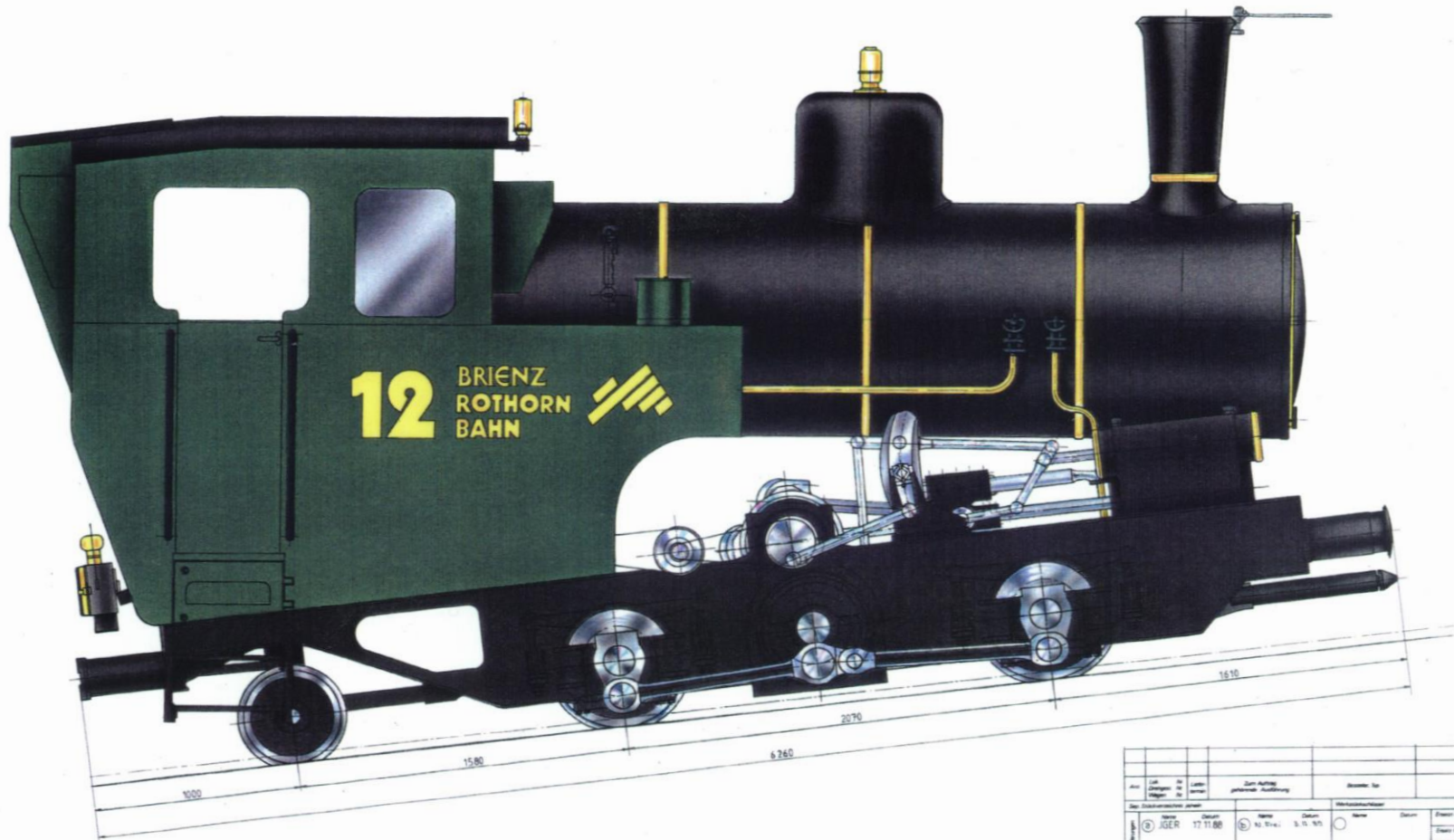
The disadvantages of traditional steam locomotives are **age-related**, not system-related and can be eliminated with modern technology.



# ***MODERN STEAM* MEANS REAL PROGRESS**

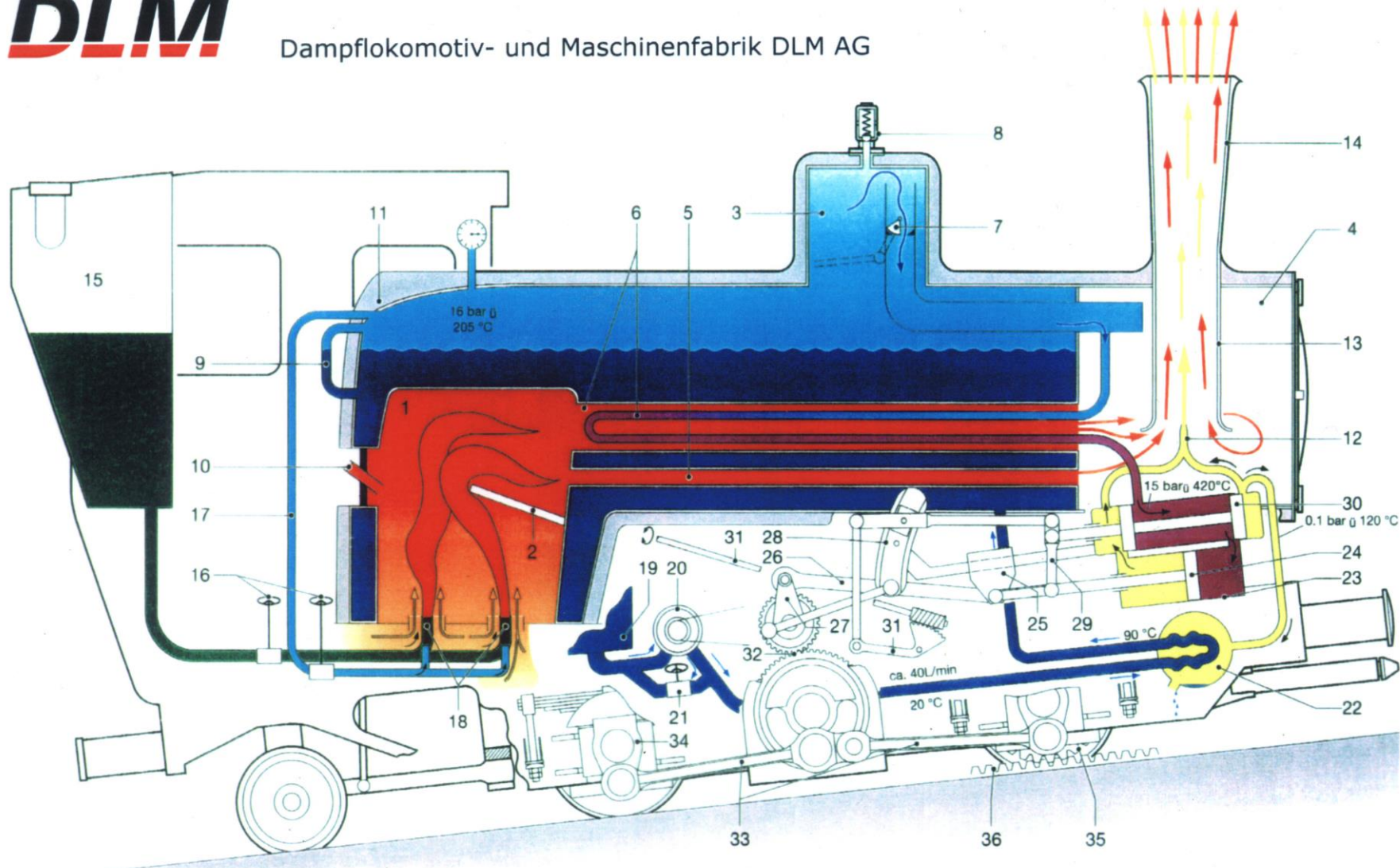
- One man operation (no fireman required)
- Oil firing (extra-light fuel oil, equal to diesel fuel)
- Smoke free combustion, excellent emissions
- Efficient insulation of boiler and cylinders
- Short preparation and shut down times
- Much better thermal efficiency
- Low operating and maintenance costs
- Modern sealed roller bearings, no oil leakage
- Electric preheating device (raising steam unattended)
- Light-weight construction (essential on 1 in 4)

# Design Proposal for the new Rack Steam Locomotives



# Form follows Function

[illegible]



Öl (Brennstoff) Mazout Fuel oil	Luft Air Air	Verbrennungsgas Gaz de combustion Combustion gas	Wasser Eau Water	Nassdampf Vapeur saturée Saturated steam	Überhitzter Dampf Vapeur surchauffée Superheated steam	Abdampf Vapeur détendue Exhaust steam
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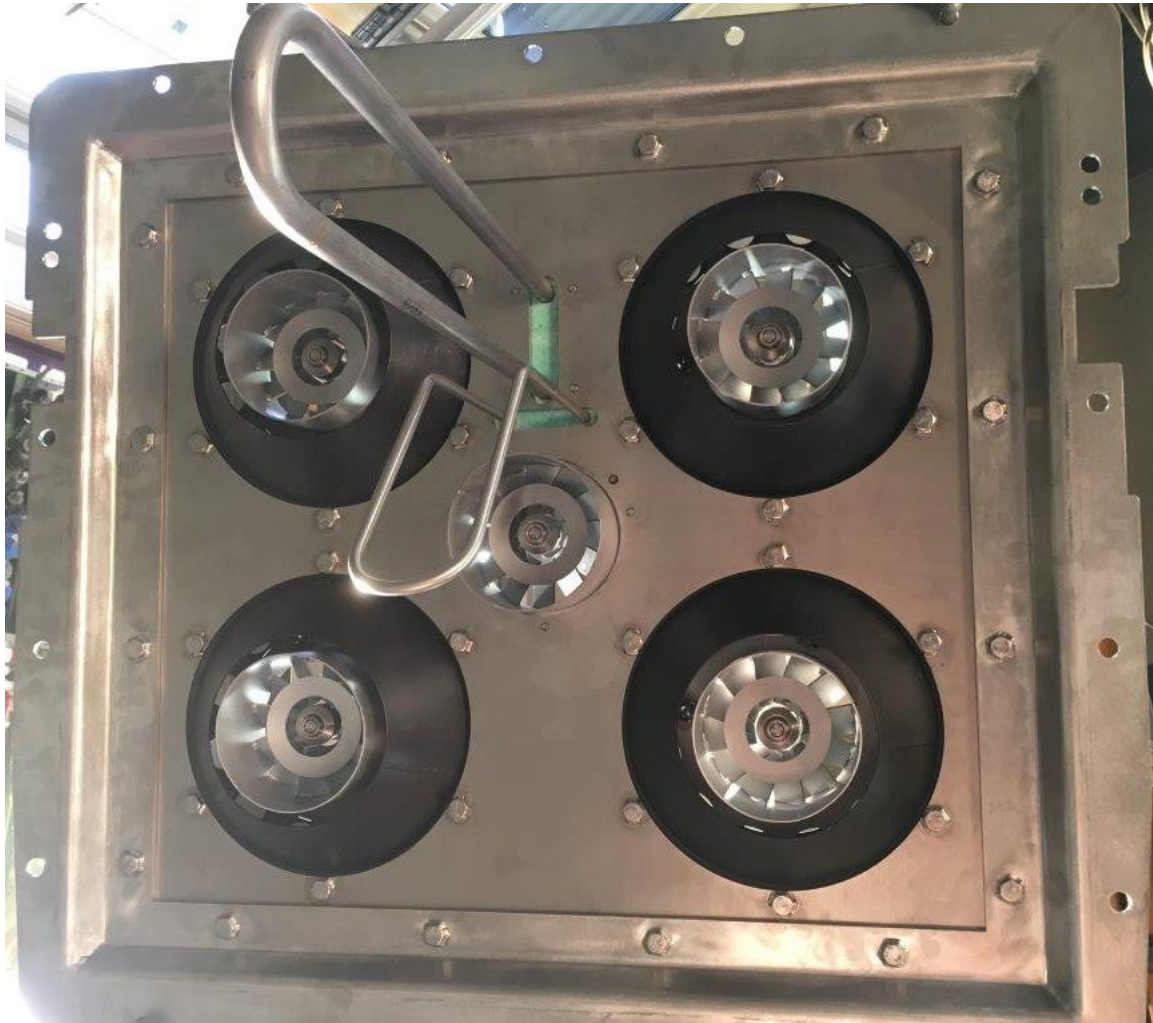
# Light oil firing system DLM

The light oil firing systems developed in 1990-92 for the new rack steam locomotives and further improvements implemented over time have the following advantages:

- One-man operation possible (no fireman necessary)
- Clean, smoke- and spark-free combustion
- Excellent exhaust gas values, no soot filter/catalyst
- Control range of the oil firing power from 1 to 10
- Easy adjustable, no coal stoking, no physical labor
- Can be shut off quickly in an emergency
- No cleaning of fire, ashpan and smokebox
- Guaranteed, consistent fuel quality
- Significantly better combustion efficiency



# Light oil firing system DLM





# New Rack Steam Locomotives No.12 of the Brienz-Rothorn-Bahn





# **New Rack Steam Locomotive 999.201 of the Schafberg Railway**





# New Rack Steam Locomotive 999.204 on the Schafberg





52 8055 was modernized in 1998/99 according to the principles of modern steam. The aim was to pull the NIOE Nostalgie-Istanbul-Orient-Express trains cleanly and economically.



## Modernising of 52 8055



**DLM**

Dampflokotiv- und  
Maschinenfabrik DLM AG



# 52 7596 (Coal) and 52 8055 (Light Oil)



**The significant improvement of the combustion quality is obvious!**



# 52 8055 pulling an Orient-Express Train





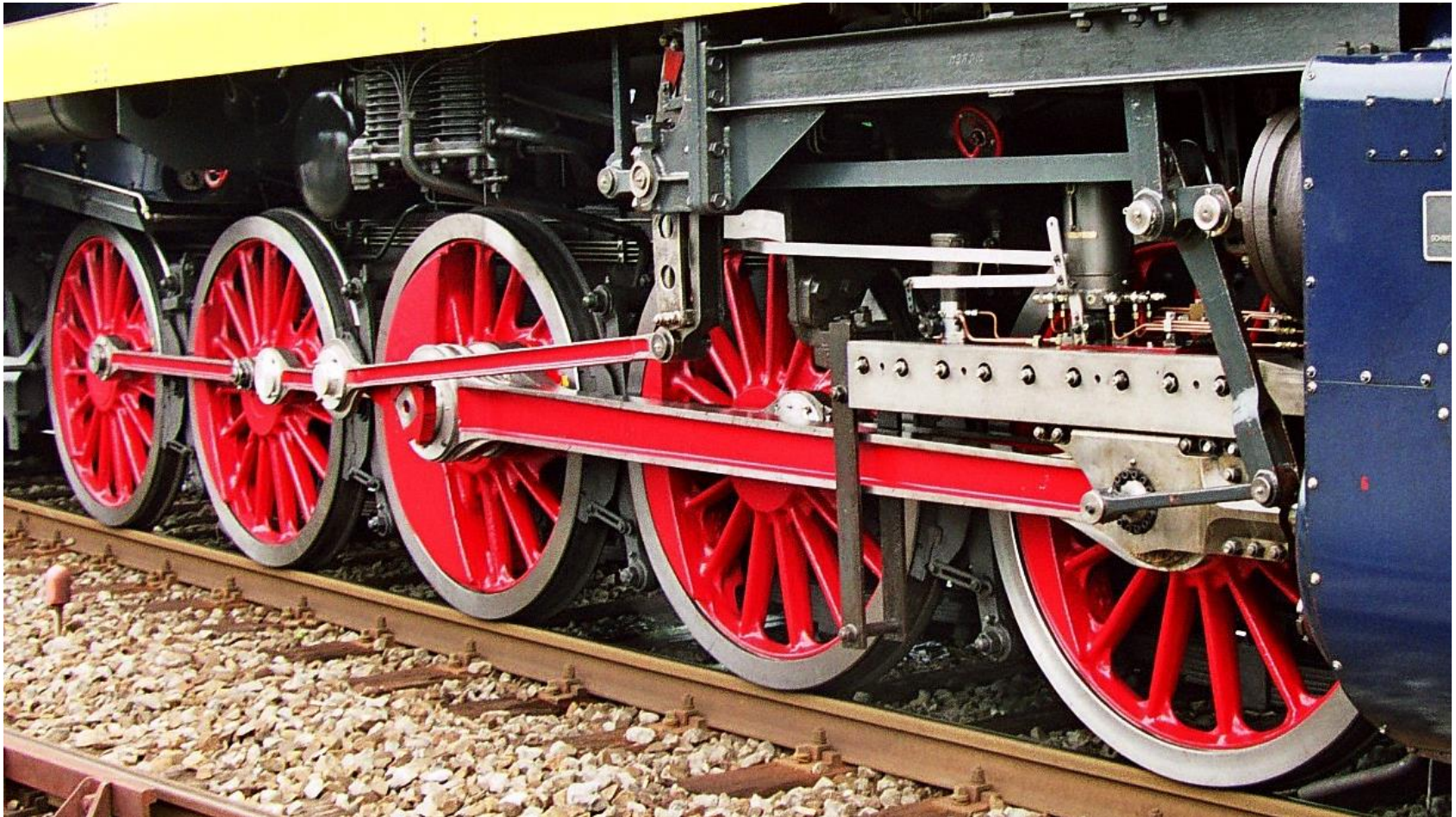
# **52 8055, owned by DLM since 2003**

**Unfortunately 52 8055 couldn't do many journeys with the NIOE trains as the carriages were soon sold abroad. Subsequently, 52 8055 become redundant and DLM bought it in 2003, using it for special passenger services and occasionally even for goods trains.**





# 52 8055 Roller Bearing Drive



Replacing the old plain bearings with modern roller bearings improved adhesion, reduced maintenance and eliminated oil losses.



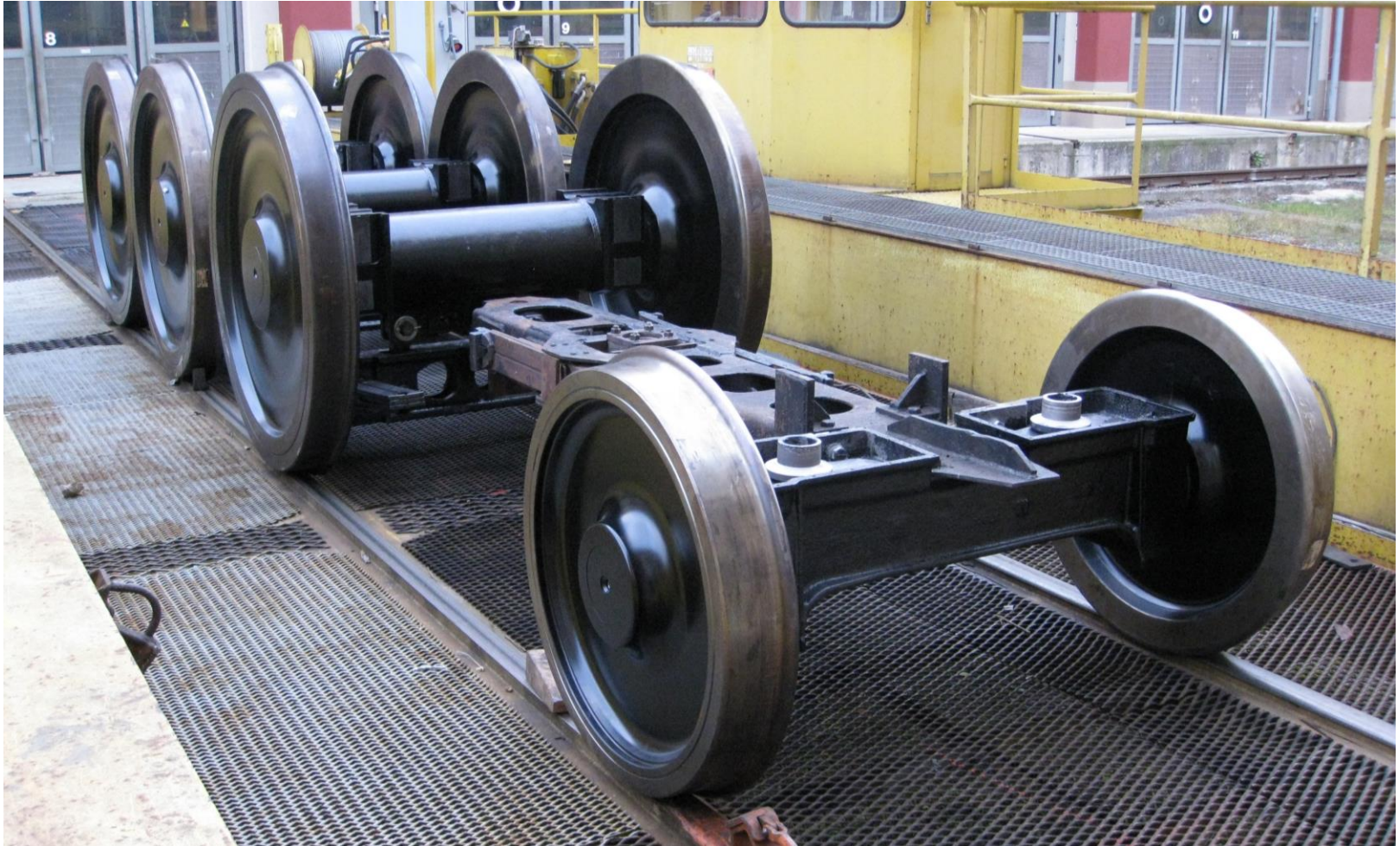
# Snowploughs of the Austrian Federal Railways, built on Frames of Class 52 Steam Locomotives



Because roller bearings require more radial space, expensive modifications to the frame are usually necessary. The innovative solution used in the 52 8055 makes this unnecessary.



# New Roller Bearing Wheelsets



**DLM supplied the Austrian Federal Railways with a total of 23 such wheelset groups featuring maintenance-free roller bearings.**

# Snow Plough with Roller Bearings



The snow ploughs are pushed by locomotives. The maximum speed allowed for snow ploughing is 60 km/h. However on test runs 100 km/h have been reached without any problems.



# Modernising of RhB G 3/4 No.11 «Heidi»



# **2005-2015: Overhaul and Modernisation**

## **Work done by DLM:**

- New, all-welded boiler with new superheater
- Light oil firing type DLM
- Electric preheating device
- New Lempor-Blastpipe
- New pistons and pistonrods, new slide valves
- Commissioning of the light oil firing system

## **Work done by RhB:**

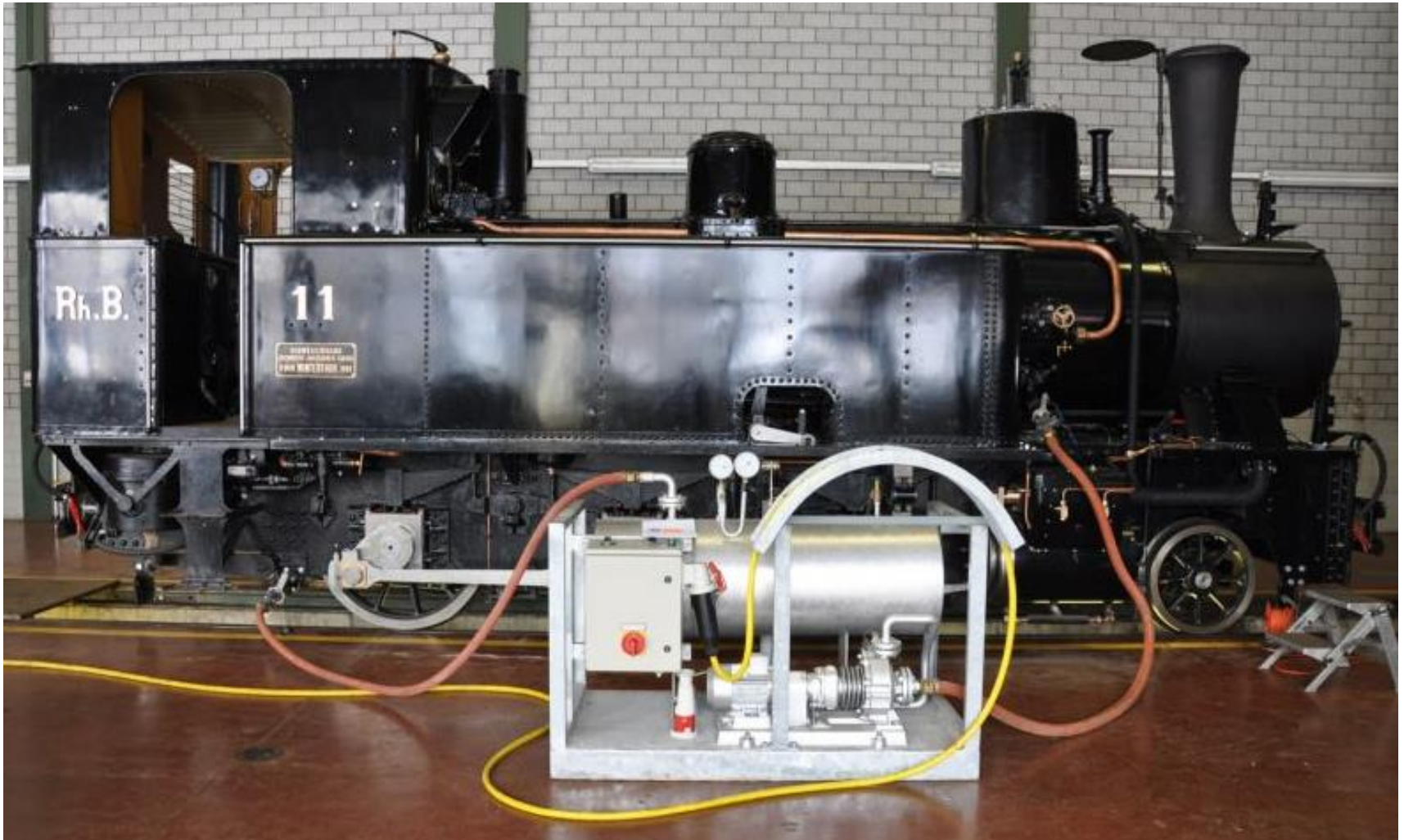
- Overhaul of frame, axles and axle bearings

## **Work done by Club 1889:**

- financing, other works, commissioning, operation



# Electric Preheating Device



# Modernised Steam Locomotive «Heidi», Inauguration on March 5, 2016





# Puffing Billy Railway, Melbourne, Australia





# **NA-Class, still coal-fired**



**NA 14 A was converted to light oil firing, enabling Puffing Billy to operate steam trains to passengers all year round, even in times of high fire risks.**



# Oil fired NA 14A in Service





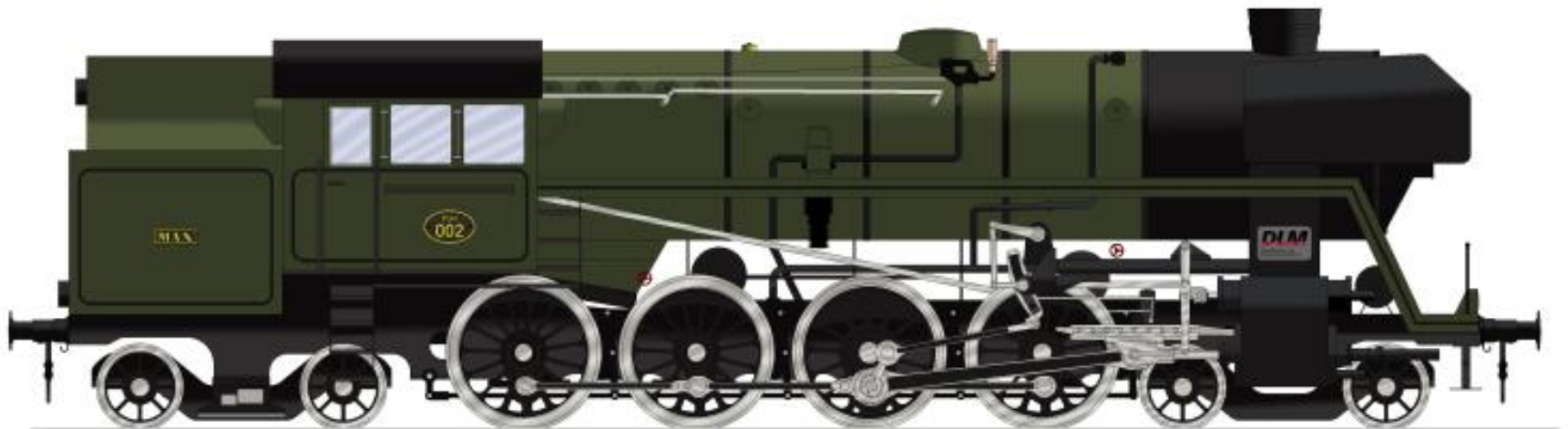
# Train Rides can be great fun!





# ***New Steam Locomotives are:***

- ***Economical: One man operation, remote control***
- ***Ecological: Light oil firing, fireless operation***
- ***Low on maintenance: Roller bearings, welded design***
- ***Powerful, efficient and reliable***



# ***Clean** Steam Traction has a Future!*







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