Aus der Dieselgeschichten-Sammlung der Dieselpensionierten Winterthur

Visit of HMQ Elisabeth II. to the Naval Construction Works, Barrow in Furness, UK and their Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works in 1965 and Sulzer Rail Traction

Eine Dieselgeschichte geschrieben von Bruno Eckert von 2019 bis 2020

Content

1. Introduction

This introduction is taken from the Diesel Story #70 „Sulzer on British Rail“ by Chris Brooks, 2013 of the Diesel Pensioners Winterthur (Dieselpensionierten Winterthur).

“In 1954, B.R. had about 6,000 steam locomotives falling apart at the rivets so embarked on a programme to replace these with 4 classes of main-line locomotives together with some smaller classes of shunting locomotives. Vrious manufacturers put forward different types of prototypes and very quickly Sulzer won orders for Types 2, 3, and 4 power units: these being 6, 8 and 12 cylinder LDA28 engines respectively.

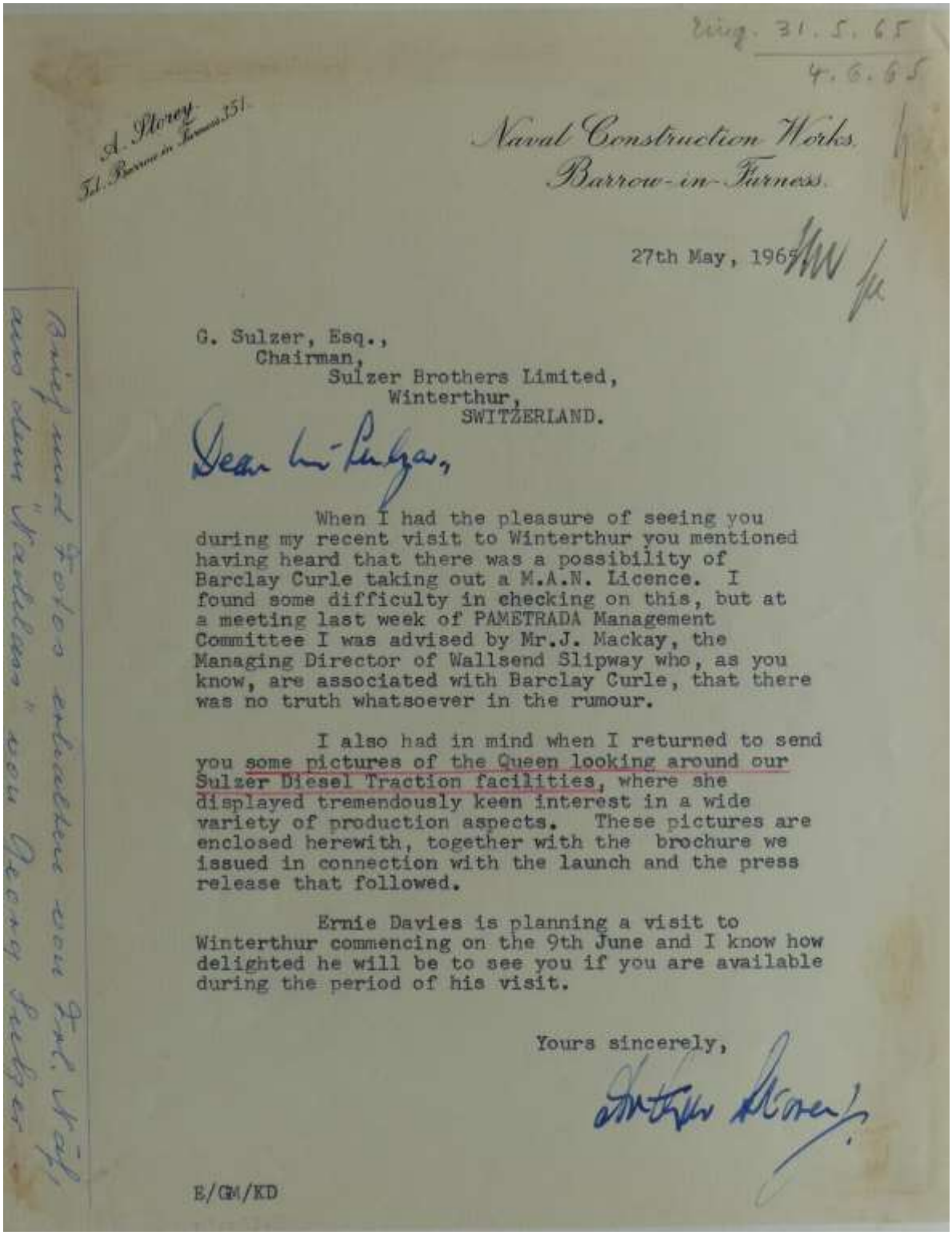
Vickers at Barrow in Furness had geared up in the early 50s to produce submarine engines in large quantities in anticipation of an escalation of the war in Korea. This never happened but Vickers had a large works ready to make LDA size engines in great quantity with very quick deliveries, a situation that was recognised by certain people on BR and Sulzers 'father' of Traction Tom Schur who was head of Dept. 8 in Switzerland where various sizes of LDA engine were already being built for other railway companies.

Sulzer (London) took a license from Winterthur and apart from the first 10 engines built in Switzerland, Vickers built 1,500 engines over a period of 5 years-an engine every working day. This Sulzer order represents the largest single customer contract in the history of Sulzer and will probably stand for all time, a fact stated by Peter Sulzer at the funeral of Tom Schur.

In the late 60s/early 70s, as Sulzer had discontinued development of the LDA28 engine used in various configurations in Classes 24, 25, 26&27 locos (6LDA28),and in Class 33 locos (8LDA 28), and finally Classes 44, 45, 46 & 47 locos (12LDA28), it was decided to see what was in the pipeline for future classes of high powered locomotives.”

2. Visit in 1965 of HMQ Elisabeth II. to the Naval Construction Works, Barrow in Furness and their Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works

2.1 Letter of May 1965 from Arthur Storey, Chairman of Naval Construction Works, Barrow in Furness, UK to George Sulzer, Chairman of Sulzer Brothers Ltd, Winterthur, Switzerland with Pictures of HMQ Elisabeth II. taken during above Visit



Eing. 31.5.65
4.6.65

A. Storey
Tel. Barrow-in-Furness 151

Naval Construction Works,
Barrow-in-Furness.

27th May, 1965

G. Sulzer, Esq.,
Chairman,
Sulzer Brothers Limited,
Winterthur,
SWITZERLAND.

Dear Mr. Sulzer,

When I had the pleasure of seeing you during my recent visit to Winterthur you mentioned having heard that there was a possibility of Barclay Curle taking out a M.A.N. Licence. I found some difficulty in checking on this, but at a meeting last week of PAMETRADA Management Committee I was advised by Mr.J. Mackay, the Managing Director of Wallsend Slipway who, as you know, are associated with Barclay Curle, that there was no truth whatsoever in the rumour.

I also had in mind when I returned to send you some pictures of the Queen looking around our Sulzer Diesel Traction facilities, where she displayed tremendously keen interest in a wide variety of production aspects. These pictures are enclosed herewith, together with the brochure we issued in connection with the launch and the press release that followed.

Ernie Davies is planning a visit to Winterthur commencing on the 9th June and I know how delighted he will be to see you if you are available during the period of his visit.

Yours sincerely,

Arthur Storey

E/GM/KD

Brief und Fotos erhalten von Sir Arthur Storey

2.2 Letter of Jan 2019 from the Author to the Buckingham Palace regarding the Publication of above Pictures of HMQ Elisabeth II of 1965

HM Queen Elisabeth II.
Buckingham Palace
London SW1A 1AA

“Dear HM Queen Elisabeth II.

As an introduction, this letter is sent to you on behalf of the group of the „Diesel Pensionierten Winterthur“, Switzerland, pensioners of the former Sulzer Bros Ltd, Winterthur or Sulzer Bros (UK) Ltd, London. We regularly publish stories under www.vdmw.ch > Dieselgeschichten. The so called “Dieselgeschichten“ are not stories about the diesel engines, but stories *around* the diesel engines”, stories experienced *because* of the diesel engines build by Sulzer and their licencees and installed in vessels, power stations and locomotives all over the world. Additionally, we frequently issue Dieselpensionierten-Informationen „s Siebni d Diesel®“ under www.vdmw.ch > Dieselpensionierten-Informationen.

Turning now to the reason for this letter, on looking through a foto album kept by the retired secretary of a former technical director of the former Sulzer Diesel Engine Departement in Winterthur, the writer found the three below pictures of her HM Queen’s visit in May 1965 to the Sulzer Diesel Traction Facilities in the Naval Construction Works, Barrow on Furness. These photos were sent by the Chairman of the Naval Construction Works, Barrow on Furness in a letter in 1965 to the Chairman of Sulzer Bros Ltd, Winterthur.

As some background information, in 1954, BR having about 6’000 steam locomotives in service, embarked on a programme to replace these with 4 classes of main-line locomotives together with some smaller classes of shunting locomotives. Various manufacturers put forward different types of prototypes. Sulzer won orders for Types 2, 3, and 4 power units: these being 6, 8 and 12 cylinder LDA28 engines respectively. Sulzer Bros (UK) Ltd took a license from Sulzer Bros Ltd, Winterthur and apart from the first ten engines built in Switzerland, Vickers built 1’500 engines over a period of 5 years.

Coming now to the purpose of this letter, we would now kindly ask you for your permission to include those three photos in either of one of the next Dieselpensionierten-Informationen „s Siebni d Diesel®“ and in a Diesel Story about Sulzer Traction in UK.

Meanwhile we remain with kind regards and would thank you for your consideration,

sig Bruno Eckert

Member of the Organisation Team of the Diesel Pensionierten Winterthur“

2.3 Answer of June 2019 from the Buckinham Palace regarding the Publication of above Pictures of HMQ Elisabeth II. of 1965

BUCKINGHAM PALACE

7th June, 2019

Dear Mr Eckert,

I have been asked to write in response to your letter to The Queen, and I am sorry that it has not been possible to reply to you before now.

While careful note has been taken of your enquiry regarding photographs taken of Her Majesty apparently during a visit to Barrow in Furness, I must explain that this is not a matter with which The Queen's Private Office can assist you. Permission to publish photographs would need to be sought from the holder of the copyright (usually the photographer) and this office holds no records which could be of assistance to you.

Whilst writing I should perhaps mention that the only information we have that could relate to the occasion to which you refer, concerns a visit made by Her Majesty to Barrow-in-Furness on 16th March, 1965 and gives the following details:

Launched the S.S. 'British Admiral' the British Petroleum Tanker at Vicker-Armstrong (Shipbuilding) Yard Limited, Barrow-in-Furness, 16.3.65. Inspected the works and the construction of Nuclear Submarines.

I am sorry to have to send you a disappointing reply.

Yours sincerely,

Miss Jennie Vine, MVO
Deputy Correspondence Coordinator

Mr Bruno Eckert.

4. Pictures of March 1965 of HMQ Elisabeth II. visiting the Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works, Barrow in Furness

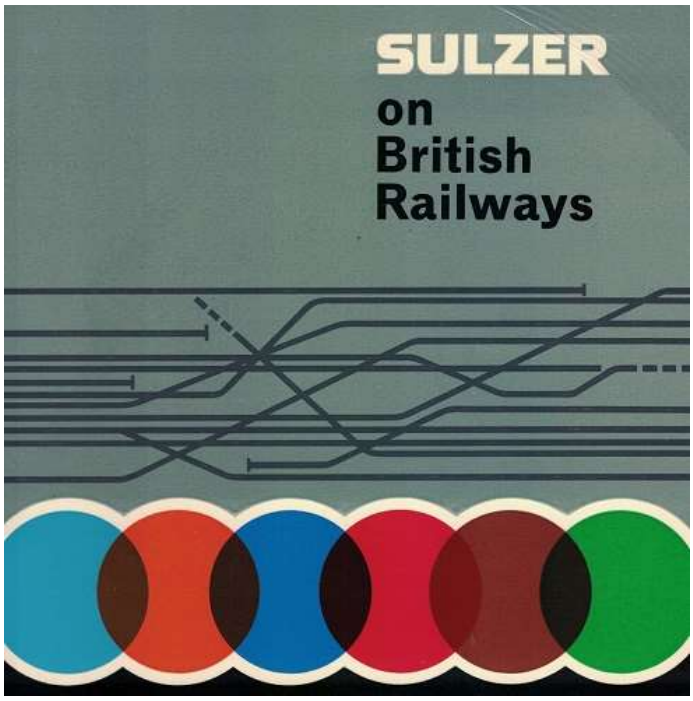
HMQ Elisabeth II., Messrs Storey and Opher in the Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works, Barrow in Furness (North of Liverpool).

HMQ Elisabeth II. in the Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works, Barrow in Furness

HMQ Elisabeth II. at the Component Display of Sulzer Rail Traction Engines in the Sulzer Diesel Traction Facilities at Vickers-Armstrong Shipyard and Engineering Works, Barrow in Furness

4. Sulzer on British Railways

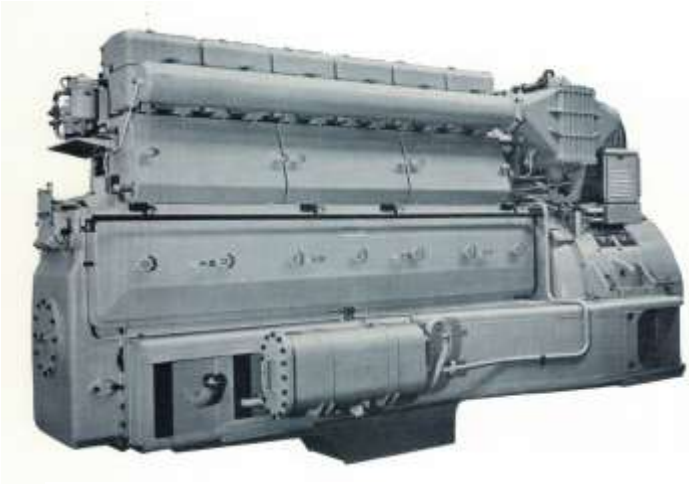
4.1 Sulzer Brochure on BR



The following information was taken from the above Brochure “Sulzer on British Railways” published by the former Sulzer Bros (London) Ltd., Bainbridge House, Bainbridge Street, London W.C.1, an address we all remember well.

This brochure was received in Dec 2019 via Chris Brooks from David Houseman, a retired manager in the former Traction Dept of Sulzer Bros (London) Ltd at Farnborough.

4.2 Sulzer LDA 28 Engines



6LDA28 Engine

A six cylinder 6LDA28B engine, of 1,250 H.P. with A.E.I. generator, as fitted to British Railways Type '2' locomotives.

8LDA28 Engine

An eight cylinder 8LDA28 engine, of 1,550 H.P. with Crompton Parkinson generator, as fitted to British Railways Type '3' locomotives.

12LDA28 Engine

A twin bank twelve cylinder 12LDA28C engine, of 2,750 H.P. with Brush generator, as fitted to British Railways Type '4' locomotives.

4.3 Locomotives of BR with LDA 28 Engines

SCOTTISH REGION

Two B.R.C. & W. built Type 2 locomotives
double head a passenger train in the highlands
of Scotland, near Inverness. Power for each is provided
by a Sulzer 6LDA28 diesel engine
developing 1,160 b.h.p. at 750 r.p.m.

NORTH EASTERN REGION

One of the British Railways built Type 2
locomotives is pictured leaving Berwick on Tweed
with a southbound passenger train.
Power is provided by a Sulzer 6LDA28 diesel engine
which develops 1,160 b.h.p. at 750 r.p.m.

LONDON MIDLAND REGION

One of the Peak class of British Railways built
Type 4 locomotives hauls the Ulster Express through
Kings Langley, Bucks. Power is provided by
a Sulzer 12LDA28 diesel engine
which develops 2,300 b.h.p. at 750 r.p.m.

WESTERN REGION

A British Railways built Type 4 locomotive heads
the southbound 'Devonian' express passenger train
through Cheltenham Spa. Power is provided by
a Sulzer 12LDA28B diesel engine
which develops 2,500 b.h.p. at 750 r.p.m.

SOUTHERN REGION

One of the B.R.C. & W. built Type 3 locomotives is shown working a goods train on the Hastings line near Battle, Sussex. Power is provided by a Sulzer 8LDA28 diesel engine which develops 1,550 b.h.p. at 750 r.p.m.

4.4 Brush Prototype Locomotive “Kestrel” with a Sulzer 16LVA24 Engine

In the 1960ies, a L-engine of V-type and advanced design with considerable higher output concentration was introduced by Sulzer for rail traction, having the particulars, 240mm bore, 280mm stroke, 1000rpm, mps 10.27m/s, bmep 15.84bar with 165g/bhph fuel consumption.

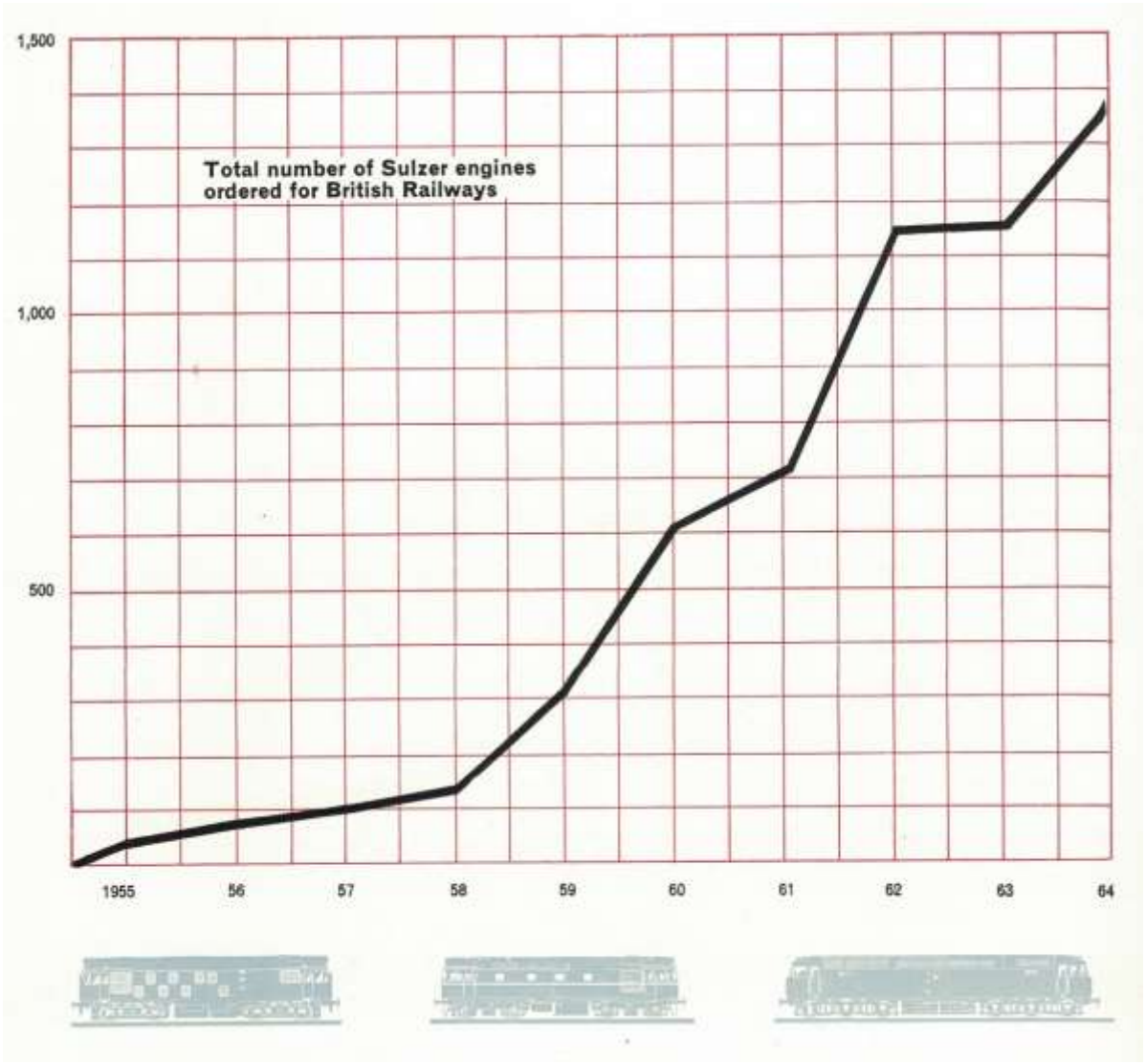
And Brush choose for their private enterprise prototype loco “Kestrel” the Sulzer 16LVA24, the at that time most powerful rail traction engine on the market.

The Brush prototype locomotive HS4000 “Kestrel” started service trials on BR routes in 1968, also at that time the worlds most powerful single-engined loco for a maximum speed of 200km/h with the 4000BHP of the Sulzer 16LVA24 engine. Although “Kestrel” fully proved its capabilities in hauling passenger and freight trains, BR did not or could not exploit its high speed nor its freight train potential in their routine service.

As BR apparently had no requirement for such a single locomotive of such power, it was withdrawn from service in 1971 after covering around 200’000km. Still in the same year, “Kestrel” was sold and shipped to the UdSSR on MV “Krasnokansk”, incidentally having a Sulzer type prime mover as well, a RD76 main engine. By this deal, the UdSSR industry received a full state of the art loco as well as prime mover.

Brush as well as Sulzer eventually lost track of the “Kestrel”. However, a former Sulzer service engineer together with a former Brush test bed foreman tried in 1995, through Sulzer Moscow, to see if the loco still exists, with the intent to try to bring it back to the UK. Unfortunately, by this time the loco had been scrapped, assumingly in 1993, with the engine already dismantled between 1973 and 1974.

4.5 Statistic of LDA 28 in BR Locomotives



The following British Railways Locomotives are

POWERED by SULZER ENGINES

	Number of Engines	Locomotive Builders	Electrical Equipment
TYPE '2' 6LDA28 Engines			
1160 H.P.	47	B.R.C.W.	C.P.
1250 H.P.	69	B.R.C.W.	G.E.C.
1160/1250 H.P.	478	B.R.	A.E.I.
Total of Type '2'	594		

TYPE '3' 8LDA28 Engines			
1,550 H.P.	98	B.R.C.W.	C.P.
Total of Type '3'	98		

TYPE '4' 12LDA28 Engines			
2,300/2,500 H.P./Co-Co/	137	B.R.	C.P.
2,500 H.P./Co-Co/	56	B.R.	Brush
2,750 H.P./Co-Co/	512	B.R. & Brush	Brush
Total of Type '4'	705		
TOTAL OF ENGINES (ALL TYPES)	1397		

Abbreviations used on this page

A.E.I. ASSOCIATED ELECTRICAL INDUSTRIES LIMITED
B.R.C. & W. THE BIRMINGHAM RAILWAY CARRIAGE & WAGON CO. LTD.
B.R. BRITISH RAILWAYS WORKSHOPS
BRUSH BRUSH ELECTRICAL ENGINEERING CO. LTD.
C.P. CROMPTON PARKINSON LIMITED
G.E.C. THE GENERAL ELECTRIC CO. LTD.

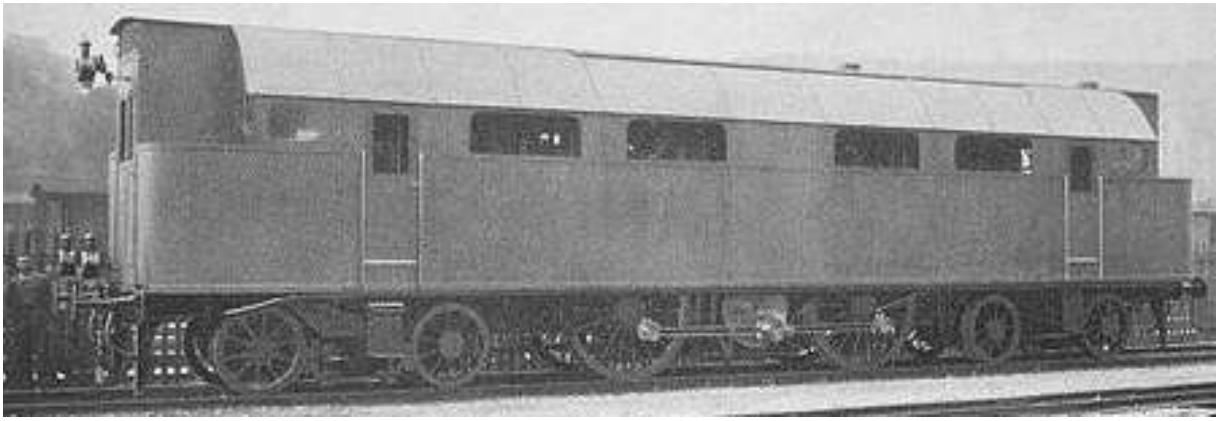
5. Beginning of the Sulzer Rail Traction

5.1 The „Thermolokomotive“ for the Preussisch-Hessische Eisenbahngemeinschaft with a Sulzer Two Stroke Diesel Engine in 1912

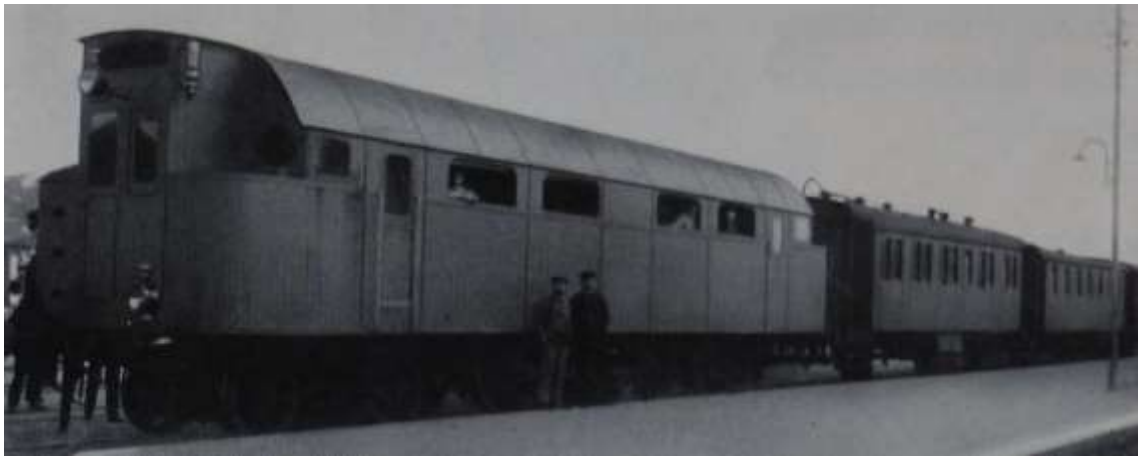
In 1906, Rudolf Diesel, Oberbaurat Adolf Klose, München and Gebrüder Sulzer, Winterthur jointly founded the company “Gesellschaft für Thermolokomotiven, Diesel-Klose-Sulzer GmbH” for the application of the diesel engine in rail traction. And a 1‘000BHP „Thermolokomotive“ was designed, having a Sulzer two stroke blast injection 4LV38 V-engine, valveless and reversible.

In 1909, an agreement from the Preussisch-Hessischen Eisenbahngemeinschaft was received for a diesel locomotive, resp for the 1‘000BHP „Thermolokomotive“, provided it operates satisfactory for one year.

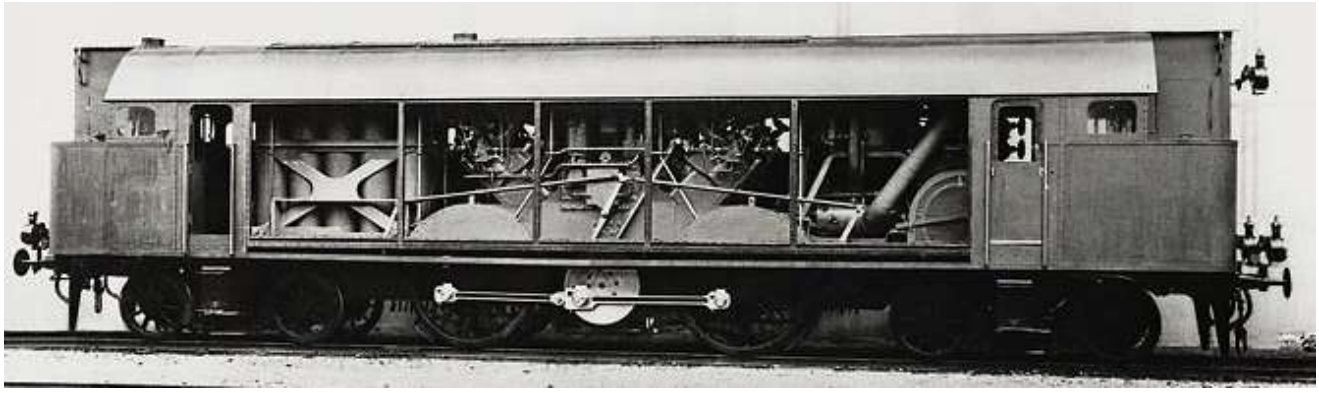
Thus in 1912, the world first diesel locomotive of considerable size and power, the direct-drive 95 t 1‘000 BHP „Thermolokomotive“ built by Borsig, Berlin and provided with a Sulzer two stroke reversible 4LV38 V-engine was ready. Following tests in Switzerland on the SBB line Winterthur-Romanshorn with 120t trains and after a four-day journey to Berlin-Grunewald in 1913, tests begun at site with 200-238t trains up to 100 km/h.



Thermolokomotive built by Borsig, Berlin in 1912 (16.6 m; 95.0 t, 100 km/h, Westinghouse air brake) with direct drive provided by a Sulzer two stroke 4LV38 V-engine



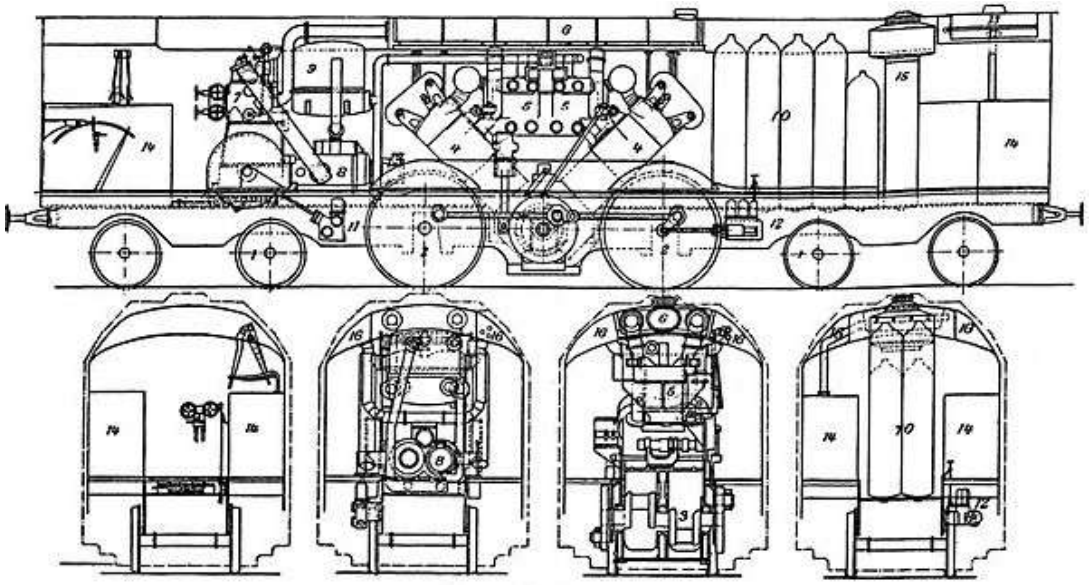
Train with the Thermolocomotive en route



Above and below: Arrangement of the direct drive Sulzer two stroke blast injection reversible 4LV38 V-type engine, valveless (bore 380mm, stroke 550mm) in the Thermolokomotive.

Actually a 4LV38 engine for marine application had nominal only 1000BHP, but with the “Thermolocomotive” at 100km/h, it reached 1600BHP at 304rpm and bmep 9.31bar.

Note above on the left and below as #10, the bottles for compressed air for engine starting respectively loco acceleration.



However, tests with the „Thermolokomotive“ at side proceeded not very sucessfully, mainly as a result of the direct drive transmission with its starting and acceleration procedure of the loco with compressed air until compression pressure for firing resp firing speed of the prime mover was reached, resp the engine compression end temperature was sufficient for combustion and running on fuel. There were also engine component failures. However, tests were terminated by the outbreak of the First World War. Considering the so far unsatifactory performance, the State Railway, did not take delivery of the locomotive. In 1920, it eventually landed in a scrap yard in Berlin-Tegel.

Following the disappointing service results with the „Thermolokomotive“, Sulzer Bros, Winterthur carried out a further study into the application of diesel engines for rail traction and on conclusion, decided to continue for the time being with smaller diesel engines for dieselelectric drive in railcars and smaller locomotives.

Diesel railcars had already been built in 1910-1912 by AESA in Sweden with a six-cylinder four stroke diesel engine of 75 BHP from AB Diesels Motorer.

5.2 Sulzer Railcars for the Preussische und Sächsische Staatsbahnen with Sulzer Four Stroke Engines in 1914

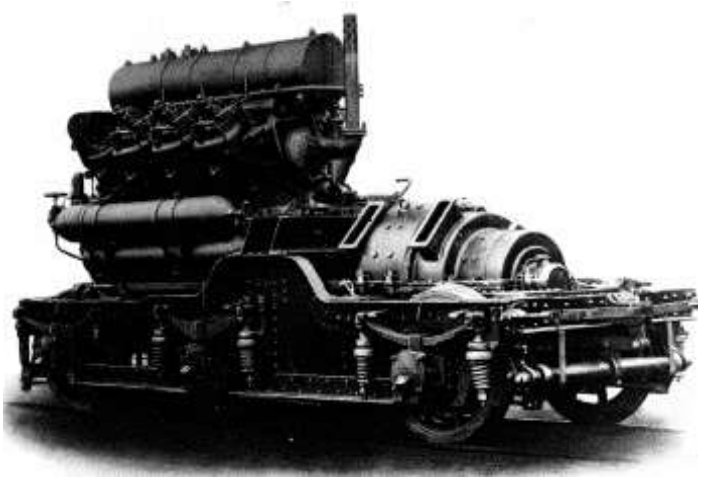
A new type of dieselelectric railcar was developed by Sulzer Brothers together with BBC Brown Boveri Ltd, Baden and the Wagonfabrik Rastatt for the Prussia and Saxony State Railway in 1912.

A feature of the Sulzer traction diesel engines from the beginning, was the control from the drivers cabine, including starting and the services of fuel, cooling and lubricating to the engine were fully automated.

Prussia ordered three and Saxony two of this dieselelectric railcar. They were delivered in 1914, each with a Sulzer four stroke air blast 6LV26 V-engine of 200BHP.

One of the five Sulzer railcars supplied in 1914 to the Prussia or Saxony State Railway with dieselelectric drive, provided each by a Sulzer four stroke air blast 6LV26 V-engine of 200BHP and reaching 70km/h respectively 60km/h with a haul of 30t.

Sulzer four stroke air blast 6LV26 V-engine with 200BHP at 440rpm (bore 260mm, stroke 300mm, mps 4.4m/s, bmep 4.2bar) for the railcars for the Prussia and Saxony State Railways. The electric control systems for the railcars were supplied by BBC Brown Boveri.



Three-axle bogie carrying the diesel engine with the directly coupled generator.

The other bogie, two-axle, carried two en bloc and fast installed electric motors, driving over gear, blind axle and coupling rods the axles.

In 1921, the two Saxony railcars, probably DET 1 and DET 2 were repurchased by Sulzer Bros., Winterthur, the engines rebuilt including to direct pre-chamber injection and replacing the air starting by an electric one. In 1924, the two refurnished railcars were sold to the RVT “Chemin de fer Régional du Val de Travers” in State Neuchâtel (Kanton Neuenburg) in Switzerland. Noteworthy, these engines for RVT became the first direct-injection diesel engines in railway service. After 1939, one of these railcars was used as a spare part source, whilst the other covered the service until the electrification of the line and served thereafter as stand-by vehicle until 1965.

This stand-by railcar, RVT No 9 (ex DET 1 or DET 2) was in 1966 donated to the museum “Verkehrshaus der Schweiz” in Lucern, Switzerland by the “Chemin de fer Régional du Val de Travers”. Such, it survived into preservation as a original, unique and the earliest Sulzer powered diesel electric rail vehicle. By now, it is probably the oldest dieselelectric railcar in the world too. For reason of another exhibition with a different theme, it is temporarily withdrawn from exibition.

5.3 First Railcar with a Sulzer Four Stroke Engine, for the Swiss Federal Railway - SBB Schweizerische Bundesbahnen - in Passenger cum Freight Version in 1924

This first railcar, SBB No 1691 in the passenger cum freight version was built by SIG Schweizerische Industrie-Gesellschaft, Neuhausen, Switzerland and provided with a Sulzer four stroke 8LV21 engine with 250BHP (bore 215mm, stroke 300mm) coupled to a BBC Brown Boveri electric transmission. It was reengined in 1936 with a Sulzer two stroke 4ZG14 opposed piston engine of 400BHP at 1’250rpm and in 1956 (or 1951) with a Saurer V12 engine of 300BHP from Adolph Saurer AG, Arbon, Switzerland.

The particulars of this railcar at original were: gauge: 1435mm, length over buffers: 19m, wheel diameter: 1040mm, maximum speed: 60km/h, gross/unladen weight: 61/57tons and 50 seats (3rd Class).

In 1925, the first railcar, SBB No 1691 in the passenger cum freight version built by SIG Schweizerische Industrie-Gesellschaft, Neuhausen and fitted with a Sulzer four stroke 8LV21 of 250BHP at 550rpm (bore 215mm, stroke 300mm, mps 5.5m/s, bmep 4.60bar; 190g/bhph)

It was first allocated to Brugg for the Brugg-Wohlen route and from 1927-1932 for the Brugg - Wettingen - Otelfingen - Niederglatt route with a daily run of 206 km. By 1938 it was at Winterthur for the Koblenz - Winterthur - Etzwilen - Singen and Effretikon - Hinwil routes. During the Second

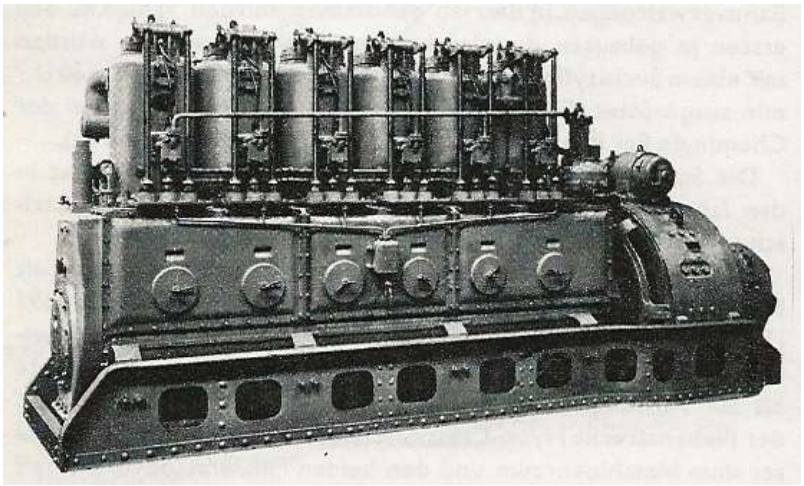
World War, between 1939 and 1945 it was stored for fuel shortage reasons. After 1945, it was allocated to Bellinzona depot, operating over the Luino line to Ranzo with a daily run of 268 km and alongside FM 2/4 18601. Finally it was operated on the Nyon-Cressier-Divonne les Bains route until 1962. In April 1965 the engine and transmission were removed and the vehicle taken over by the Dept Maintenance of Way as a measuring and calibration car and was finally retired in January 1989.

5.4 Second Railcar with a Sulzer Type Four Stroke Engine for the Swiss Federal Railway, in the Freight Version in 1925

This second railcar, SBB No 1692, in the freight version was again built by SIG Schweizerische Industrie-Gesellschaft, Neuhausen, Switzerland and provided with a Sulzer four stroke 6LV28 engine of 420BHP, but coupled to a electric transmission from MFO Maschinenfabrik Oerlikon, Switzerland.

The particulars of this railcar were at original: gauge: 1435mm, length over buffers: 17.6m, driving wheel diameter: 1040mm, maximum speed: 75km/h, gross/unladen weight: 59.8/57.3tons.

In 1929, the second railcar, SBB No 1692 in freight version fitted with a Sulzer four stroke 6LV28.



Dieselgenerator-Set with the Sulzer four stroke 6LV28 of 420BHP at 620rpm (bore 280mm, stroke 360mm) of the SBB Freight-Railcar No 1692.

Reengined in 1936 by a Sulzer turbocharged 6LDA28 engine of 600BHP and of monobloc design, it was allocated to Winterthur, initially operating on the route to Etzwilen und Thalheim. In 1957 the crankshaft broke, it was reengined by a SLM 8YD20 V-engine, turbocharged of 720BHP at 1200rpm (bore 200mm, stroke 240mm) supplied by SLM Schweizerische Lokomotiv- und Maschinenfabrik, Winterthur, Switzerland. After this first reengining, its routes covered Schaffhausen, Konstanz, Basel and Winterthur with a daily and monthly running distance of about 600km and 18'000km respectively. In 1945, the railcar was transferred to Bellinzona and engaged on the Luino route, only to be reallocated in 1947 to Winterthur for the Singen route. In 1961, placed in Geneva for the Nyon-Divonne route, however returned again in 1962 to Winterthur for the branch route Etzwilen-Singen, Germany until 1969. In March 1973 the engineless luggage van was sold to the Emmental-Burgdorf-Thun Railway, Switzerland and became part of its emergency train.

5.5 Dieselelectric Locomotive for the CTF Chemin de Fer Tunisiens with a Sulzer Four Stroke Engine in 1925

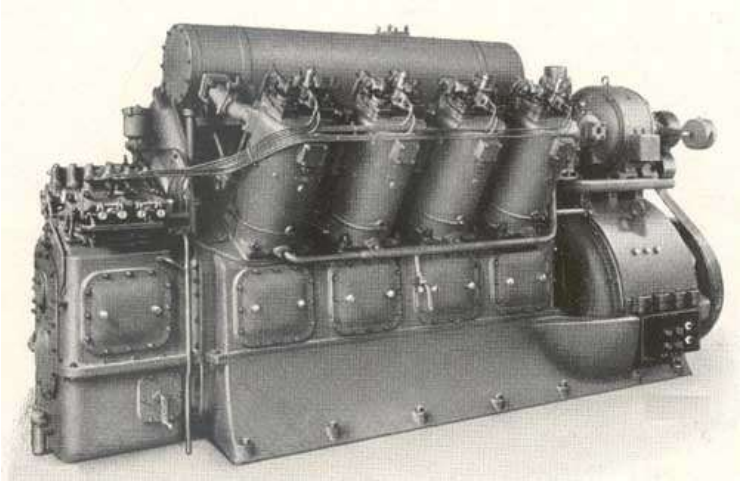
In 1922, a "proper" dieselelectric locomotive, the first in Europe was delivered to Tunesia by the Swedish Diesel Elektriska Vagn AB (AESA and Atlas Diesel). It was a 150 BHP locomotive.

Sulzer Brothers Switzerland followed suit in 1925 by their first dieselelectric locomotive design provided with a Sulzer four stroke 8LV21 engine with 250BHP and supplied to CTF Chemin de Fer Tunisiens in 1926. The metre gauge locomotive was built by CCM Compagnie de Construction Mécanique Procédés Sulzer, St Denis, Paris.

The particulars of this locomotive at original were: gauge 1000mm, length over buffers: 9.4m, maximum speed: 64km/h, gross weight: 39tons, haul: 80tons.

By 1950 it had accumulated 392'000km and after 1955 it was kept as reserve.

CFT Train in Tunesia in 1926 with the Sulzer diesel electric locomotive with a Sulzer four stroke 8LV21 engine of 250BHP driving a direct current dynamo of 145kW with a maximum voltage of 800V.



Generator set with a Sulzer four stroke airless injection 8LV21 V-engine with 250BHP at 550rpm (bore 215mm, stroke 300mm, mps 5.5m/s, bmep 4.60bar; 190g/bhph) for the CFT Tunesia

Further orders from all over the world followed suit in increasing numbers and over decades at Sulzer Brothers in Switzerland and at their licencees for railcars and locomotives with Sulzer rail traction engines of L types.

6. Sulzer Rail Traction in the US in the 1980ties with Sulzer AS25 Engines

In 1978, Sulzer Bros Ltd, Winterthur entered the US locomotive market with their AS25 type engines in cooperation with M&K Morrison & Knudsen, Boise, US. AS25 engines were already applied in numbers in the marine and power station fields. Their nominal particulars were, bore 250mm, stroke 300mm, 1'000rpm, mps 10.0m/s, 270BHP/cyl and bmep 16.18bar. Together with M&K, the AS25 engines were installed in 15 locomotives refurnished by M&K and then operated by various railway companies for comparison tests, as follows:

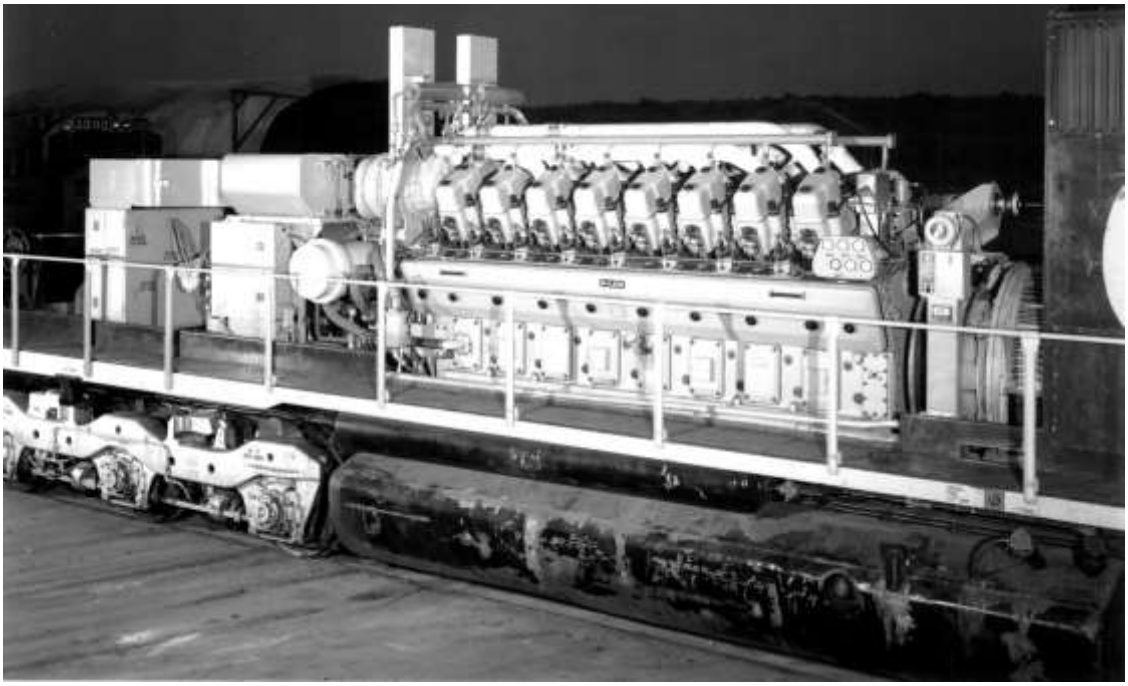
6.1 Southern Pacific Locomotives Nr. 7030-7034, each with one Sulzer 12ASV25 of 3'240BHP (1978-1980, for about 140'000 US miles)

SP Locos 7030-7034 displaying their unique "Popsicle" livery and each installed with one Sulzer 12ASV25 of 3'240BHP at 1'000rp in Aug 1986, stored at Eugene, Oregon.

6.2 Santa Fe Locomotives Nr 5496-5498, each with one Sulzer 16AVS25 and **Loc 5499** with one Sulzer-HCP 16AVS25, each of 3'600BHP at 1'000rpm (1980-1985, for 100'000-120'000 US miles)

6.3 Union Pacific Locomotives Nr 60, 64, 65: each with one Sulzer 16ASV25 and Locos Nr 61-63, each with one Sulzer-HCP 16ASV25, each of 3'600BHP at 1'000rpm (1981-1983, for 140'000-200'000 US miles)

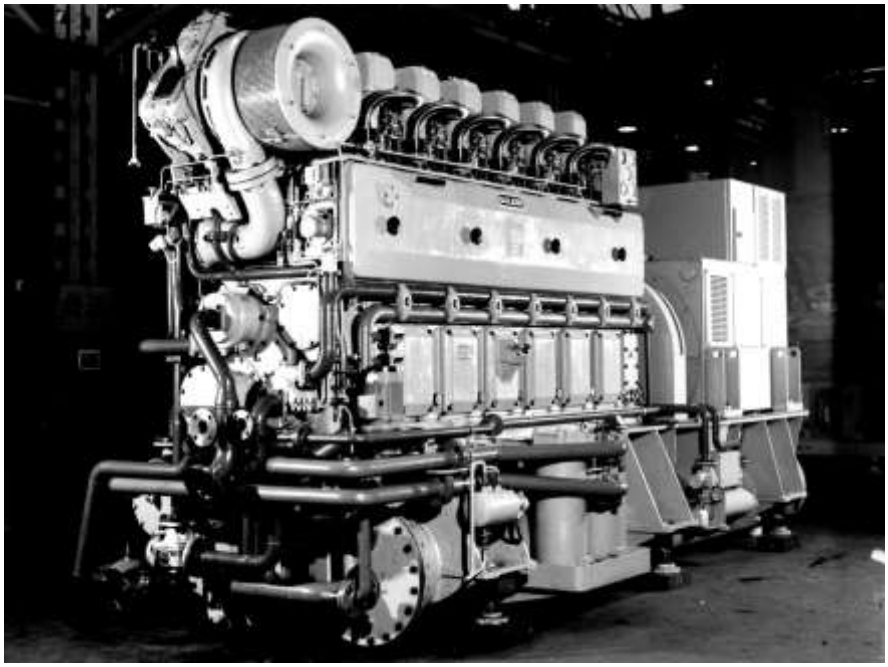
UP Loco 60 installed with one Sulzer 16ASV25 of 3'600BHP at 1'000rpm at Ogden on July 29th 1983. It was the first of the UP "Sulzers" to enter service. Clearly visible here is the two inch step-out to accommodate the wider Sulzer power unit.



Bogies and loco frame with generator set of a UP Loco with Sulzer 16ASV25 of 3'600BHP at 1'000rp. At the end of the test time, the Sulzer engines of UP were bought by a yard cum ship owner and two each were installed in Mississippi pushboats.

6.4 M&K Leasing Locomotive Nr. 5001, with one Sulzer 6ASL25 (1979-2006)

M&K Leasing Loc Nr. 5001 provided with one Sulzer 6ASL25 of 1'500BHP at 1'000rpm.



Generator set with Sulzer 6ASL25 of 1'500BHP at 1'000rpm for the M&K Leasing Loc Nr. 5001 after Shop Test Trial at Oberwinterthur Works of Sulzer Bros Ltd in Switzerland.

Later at Boise, on July 18th, 1979 a successfull "Visual Fuel Demostration and Comparison Test" was held by Morrison & Knudsen between its M&K Leasing Loc Nr. 5001 with Sulzer 6ASL25 and a EMD GP 7 Loc with a 16 cylinder 567 BC engine, also rated at 1'500BHP for traction.

The M&K Leasing Loc Nr. 5001 with the Sulzer 6ASL25 remained in service for 27 years, last with Morristown and Erie Railroad.

Although the AS25 and their successor AT25 type engines would have been suitable for the application of rail traction, Sulzer's Test entry into the US rail locomotive market with considerable personal and capital involvement has finally not materialised into orders. This for several reasons.

7. Statistic of Sulzer Rail Traction

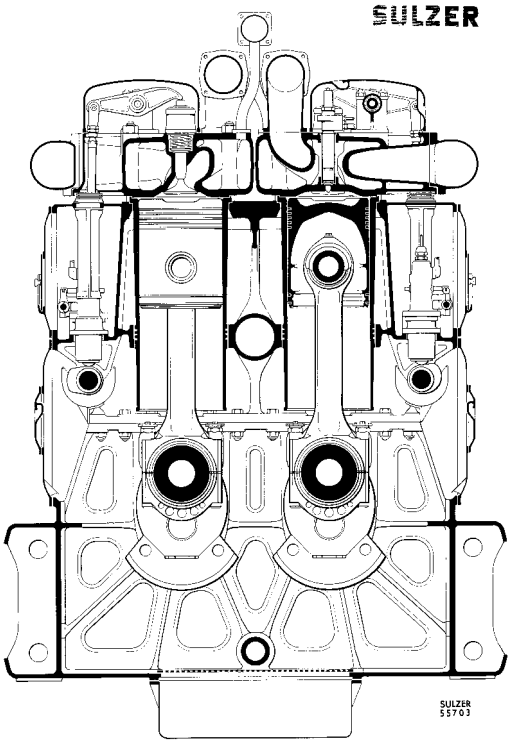
From the Sulzer L-type engine, 7'692 engines were built for rail traction with 13'530'985 BHP as well as additionally 437 engines for non-traction applications with 468'550 BHP.

Thus, the Grand Total of L-type engines built between 1912 and 1993, in L- and V-versions, between bores of 19 to 34cm, comes to at least 8'129 engines with over 13'999'535 BHP, supplied to 40 countries.

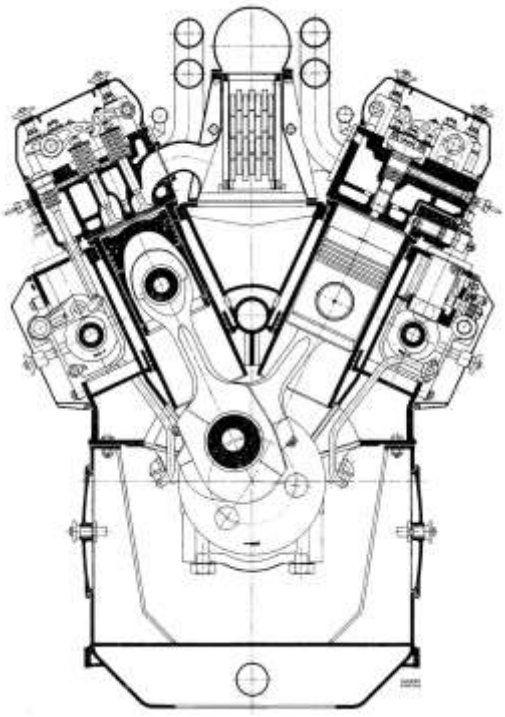
The builders of these L-type engines and its applications have been:

- Sulzer Bros Ltd, Winterthur, Switzerland: Rail, Marine and Power Stations
- Sir W G Armstrong, Whitworth & Co Ltd, New Castle upon Tyne, Great Britain: Rail and Marine (in 1928 partial merger with Vickers Ltd to Vickers-Armstrong Ltd)
- Sociedad Española de Construcciones Babcock & Wilcox CA, Bilbao, Spain: Rail
- Cie de Construction Méchanique Procédés Sulzer (CCM), Paris, St Denis and Mantes, France: Rail, Marine and Power Stations
- Société Anonymes des Forges & Chantiers de la Méditerranée (FGM), Le Havre, Le Sayne and Marseilles, France: Marine
- Henschel & Sohn GmbH, Kassel, Germany: Rail
- Marinens Hovedverft Horten, Horten, Norway: Marine
- Mitsubishi Kobe, Japan: Marine
- La Maquinista Terrestre y Maritima SA (MTM), Barcelona, Spain: Rail and Marine
- Masinimport, State Enterprise for External Trade, Bucarest, Romania for Combinatul Metalurgic Resita: Rail, Marine and Power Stations
- Vickers-Armstrong Shipyard and Engineering Works, Barrow in Furness, Great Britain: Rail and Power Stations

Almost two third of these engines, 5246 with 9'794'800BHP were built by CMR Resita and UCM Resita in Romania and mainly supplied for locos to Romania, Bulgaria, Poland, PRC China, Czechoslovakia, Mozabique, US, Costa Rica and Venezuela.



Cross-Section of a Sulzer twin-bank 12LDA28



Cross.Section of a Sulzer LVA24

8. Sources and Acknowledgements

Rudolf Diesel 1858-1913

- Jubiläumsbuch 100 Jahre Gebrüder Sulzer 1834-1934, Ausgabe 1934 durch Gebrüder Sulzer AG mit Vorwort von Hans Sulzer und Beiträgen ohne Autoren-Angaben, Prof Dr F Heerwangen, Art Institut Orell Füssli Zürich, 1934

- Technische Rundschau Sulzer Nr.2/1947, gewidmet den 50 Jahren Sulzer-Dieselmotoren 1897-1947 mit Beiträgen von H S Kilchenmann, W Bangerter und O Schlaepfer

- Jubiläumsbuch 125 Jahre Sulzer, Herausgeber Gebrüder Sulzer Aktiengesellschaft, Winterthur, Schweiz, 1959

- Dieseltriebfahrzeuge der Schweizerischen Bundesbahnen, O Herrmann, Technica-Reihe Nr 7, 1964

- Aus der Anfangszeit der Eisenbahn-Dieselmotoren, Georg Aue und Jakob Röschli, Industriearchäologie, Zeitschrift für industrielle Kulturgüter, 2/1990

- From th Mountains to the Sea, The Sulzer Diesel Engine, Wärtsilä NSD Switzerland Ltd, 1998

- Jubiläumsschrift 150 Jahre Sulzer, Das Jubiläumsjahr 1984 im Rückblick, 2008, Gebrüder Sulzer AG, Winterthur

- A Tapestry of Diesel Power, The Historical Development of Sulzer Diesel Engines by David T. Brown, A Work in Progress, Draft 2016

- Sulzer Traction in the Internet: such as The Sulzer Engine in Diesel Traction-A potted and incomplete History 1912-1990, Derby Sulzers Site Menu, A Sulzer Engineer's Memories 1965-1979 on British Railways & Elsewhere, US Sulzer Locomotive, Wikipedia etc.

- Archives of Chris Brooks, David Brown, Siegfried Frey, David Housemann, Ernst Jung, Alex Rudin and Bruno Eckert

9. Author and Companies

Bruno Eckert, Dipl Maschineningenieur FH, 1937 born, grown up, educated and living at first in Winterthur, Switzerland, moves in 1980 with his family with two children to the nearby village Seuzach. Regarding the authors longtime involvement with Diesel Engines, he joins in 1961 as a Design Engineer the Two-Stroke Prototype Group of the Diesel Engine Dept (Dept 7) of Sulzer Bros Ltd, Winterthur. Married in 1962, he changes in the same year to Sulzer (UK) Ltd, London into their Diesel Service and Spares Dept. Following his return in 1964 to Sulzer Bros Ltd, Winterthur and Dept 7, he starts as Commissioning and Service Engineer in their Technical Service, mainly two-stroke engines, worldwide remembered as the „famous 0736“. From 1968-1969 and parallel to his employment, he takes a Diploma Course as Teacher for Apprentices given by the State Zürich. Only to be asigned from 1969-1973 as Technical Delegate for the Diesel Engine Dept of Sulzer Bros Ltd, Winterthur for India and Pakistan, again mainly two-stroke engines, living with his wife in Mumbay. On his return in 1973 to Sulzer Bros Ltd, Winterthur, Dept 7, he was appointed as Manager of the Technical Service for Four Stroke Engines, incl the Technical Information to Customers and Technical Sales Promotion. The latter, mainly until the Engine Trading Group has been established. In 1995, the Diesel Training Center is also attached to the authors group, at that time already in New Sulzer Diesel Ltd. Finally he is appointed as Manager of the Customer Assistance for Sulzer Type Engines, keeping all other tasks, now in Wärtsilä NSD Switzerland Ltd. His considerable and interesting business travelling brought him to many countries of the world. Following his retirement in 2000, he continued the travelling mode, now with his wife, beside other interests such as mountain hiking, classical music, operas and theaters. The author became also increasingly engaged in research of ancestor, history of enterprises, their products and individuals associated with. In 2004, he is part of the initiative group for and since a member of the organisation team of the Winterthur Diesel Pensioners. He also issues from time to time Informations to the Diesel Pensioners, called „s Siebni d Sulzer Diesel“ and serves as well as deputy coordinator for the Diesel Stories (Dieselgeschichten). Almost unnecessary to mention, he was a also member of the Sulzer Band, as Clarinettist and acted as their Secretary for many years and still is one of their Revisors.

Not only the Sulzer diesel engines and the employees behind have their history, but also the companies associated with. For the Diesel Department, it was Sulzer from 1893 until 1989, first Sulzer Brothers, Winterthur, than from 1914, Sulzer Brothers Ltd, and from 1993, Sulzer Ltd as Holding Company. However before the latter, the Diesel Department of Sulzer Bros Ltd, Winterhur was for selling in 1989 and outsourced, first with the name MBS Diesel Engines Ltd (may be standing for MAN, B&W, Sulzer) and then Sulzer Diesel Ltd. The latter was in 1990 finally and jointly bought by Bremer Vulkan AG, Germany und Fincantieri, Italy. The new owners renamed it to New Sulzer Diesel Ltd, Winterthur (NSD). Following the unfortunate bankruptcy of Bremer Vulkan AG in 1997, Fincantieri bought the NSD-shares of BV and sold their production plant Grandi Motori, Trieste, the largest in Europe together with NSD to the Metro Holding Finland. The latter merged NSD with Wärtsila Diesel Oy to Wärtsilä NSD Switzerland Ltd and as almost the first act, the prosperous Four-Stroke Engine Division of NSD was dropped. In 2000, a few months after the authors retirement, WNSD was renamed to Wärtsilä Switzerland Ltd. In 2015, a joint venture was founded between Wärtsilä Finland and the Chinese State Shipbuilding Corporation for the Two-Stroke Diesel Engineering, called Winterthur Gas & Diesel Ltd. The Service remained with the now renamed to Wärtsilä Service Switzerland Ltd. Since 2016, the Chinese State Shipbuilding Corporation holds 100% of the shares of WinG&D.

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