East Bedfordshire Model Railway Society **Oil trains and tanks, 3 parts**

Oil Train - Yeehaw!

I thought it would be interesting to have a brief overview of the movement of oil by train, as we'll have at least one block train on Finchley. This information has been garnered from the HMRSpublished book by Alan Coppin, 'Oil on the Rails', an interesting read.

Here's 9F 92136 slogging up Lickey Bank, banked by an unknown loco(s). 9Fs and 8Fs seem to feature regularly on the block trains.

The first recorded imports of oil date back to 1860, and the RCH first considered the construction of rail oil tanks in 1868.

The oldest refinery in the UK was Pumpherston, adjacent to the new town of Livingstone. It was built in 1884 (but closed in 1914) and was the first of 25 refineries to have been built in the UK. As of 1999 only 12 remained. Shell and BP owned 5 each, Esso, Burmah and Wiggins 2 each, and one each for Mobil, Briggs, Philmac, Fina/Total, Gulf, Amoco, Philips, Texaco and Conoco.

There were a number of important rail distribution centres. Purfleet and Ardrossan could accommodate 100 wagons, Bowling 150, Hull 200, Thames Haven, Llandarcy and Manchester 300 each, Avonmouth 350 and Stanlow an enormous 750 wagons. Apparently a train could leave Stanlow every 30 minutes!

Oil trains were, unsurprisingly, subject to some route restrictions. Block trains were normally between 20 and a maximum of 56 wagons, though limited to 20 in Scotland and only 16 on the far north line. Class A trains required 2 barrier wagons at each end.

The motor industry really started to expand after the First World War and by 1940 there were 6,905 oil tanks in service; by the end of WW2 it have grown to 9,136, and by 1960 about 12,000.

In 1954 there were around 80 block trains daily, but most oil tanks were moved in general goods trains. By this time there had been 120 oil companies recorded in the RCH handbook, with 245 depots at 195

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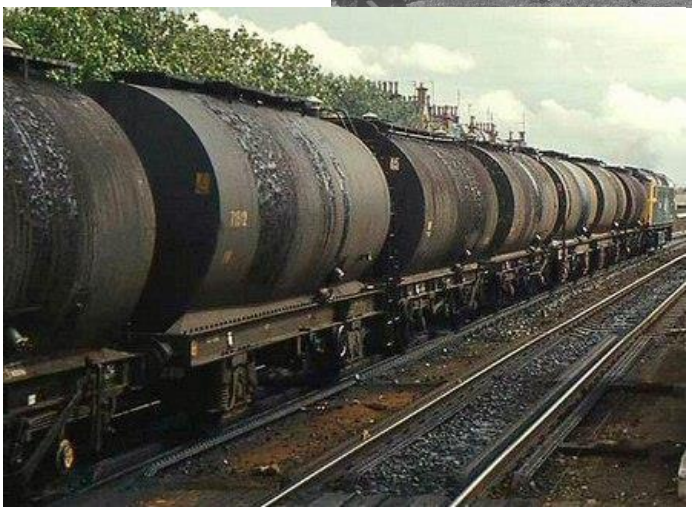
locations. The highlights were Trafford Park, Manchester, with no less than 17 separate rail depots, 11 depots at Netherfield and Colwick and 9 at Stanlow. The trains through Finchley seemed to be principally between the Thames estuary and Avonmouth.

The book has around a dozen drawings of RCH wagons from 1907 onwards, covering 10T to 35T. The most common we'd have seen in the '50s would have been 14T tanks, though there were some 20T tanks around. The 14T tanks barrels were originally held in place by ropes and stays, but from 1942



an anchor mount was developed. The photo of the Shell wagons shows the pre-war arrangement

35T tanks were introduced from 1957 for class A and class B fuels, plus a creosote tank for BR and a bitumen tank in 1959, but the 14T anchor mount design was still being built into the 1960s. 100T bogie wagons didn't appear until 1966. The photo left appears to show bitumen tanks (though I'm not certain) and the final picture shows two Esso 35T tanks in different liveries. The black tank is a Class B (it has a hand-wheel on the roof) and would be heated for more viscous payloads. The other is silver and is a Class A for the more readily flammable liquids.

Pictures from Creative Commons sources.

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PART 2: FOLLOW-UP NOTES

Bern writes: I was re-reading your article on tank wagons in the last Newsletter and wondered how many different styles of tank wagon there were in the 1950s. I had a look through my wagon books and quite quickly found 10 different examples, all of which were running post-WW2. Some of the differences are quite subtle and several different variations can be made from the standard Mainline and Airfix models and help to add variation to a train.

Even with tanks that look the same at first sight one can find different tank supports, underframe bracing, filler arrangements, tank length, wheelbase length, tank bracing, tank diameter, with or without ladders and with or without walkways, etc.

Can you spot the variations in each picture? The answers are on a following page so you can't cheat too easily!

Photo 1

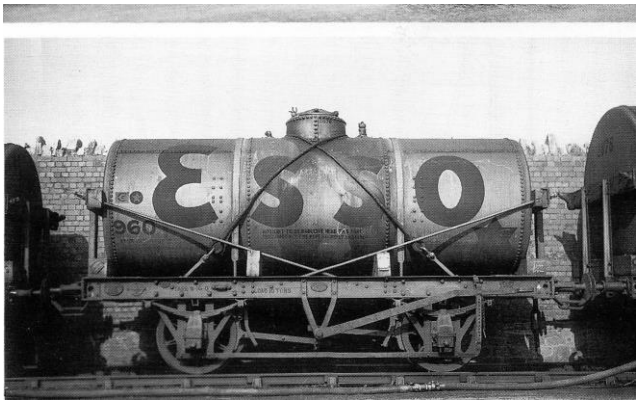


Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

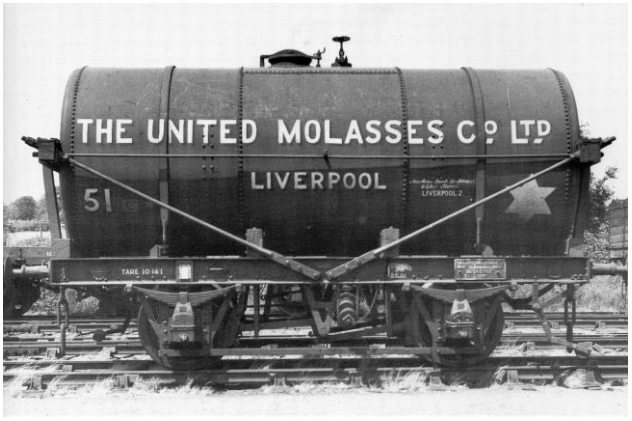
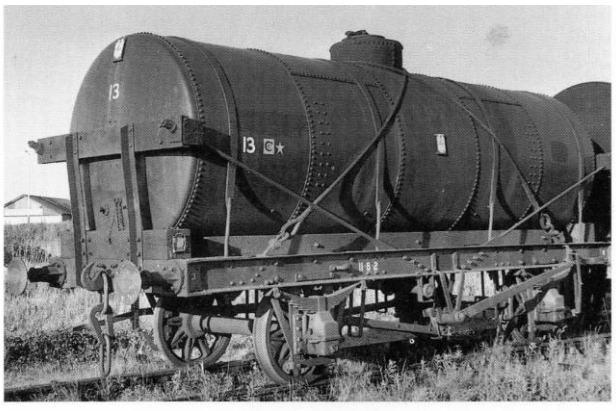


Photo 8

Photo 9

Photo 10



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Just as a spacer from the answers, I found this great image of ex-GW 2-8-0 tank 7209 on a train of Esso-branded tanks. They look to be painted silver, and therefore are Type A tanks. As there's no barrier vehicle between the loco and the train I'm presuming they're empty and are being shunted.

The answers

1. Pre 1927, narrow tank, tall filler, tank ventilator, no ladder, diagonal strapping only.
2. Cradle mounted, bargeboards, horizontal tie rod, low filler, no ladder.
3. Transverse delivery pipe below solebar, ladder, full catwalk, mid height filler and valvewheel.
4. Long wheelbase, deep solebars, ladder, full catwalk, tall filler and valvewheel, vac fitted.
5. Similar to 4 but with a spillway.
6. Transverse delivery pipe, tall filler and valvewheel, horizontal tie rod, short catwalks, no ladder.
7. Similar to 2 but no bargeboards and tall valvewheel.
8. Similar to 1 but different axleboxes (sneaky one, that).
9. Anchor mounted, tall filler and valvewheel, full catwalk, ladder, vac fitted.
10. Similar to 1 but four vertical straps, transverse delivery pipe below solebar, no visible tank ventilator.

PART 3 FURTHER NOTES ON TANK WAGONS

Tank wagons have been, and still are, used to carry all manner of gases, liquids and powders, and I'll want to review all these for my layout at some point. But this piece is primarily about fuel tanks, whilst noting that the same basic designs were also used for other liquids. In a previous Newsletter I'd covered some aspects of the oil industry and its involvement with the railways, but I wanted to explore this further to see what there is to help create a more accurate train of tanks (I have some, and need more for my layout). What liveries are correct for 1959? Can I detail them easily? and so on. It may be a never-ending task…

I have to draw a line somewhere, so my principal focus is post-Grouping up to the end of steam, and in particular for 1959.

Background to potential traffics

Shell Haven was the location of a Shell refinery near Thurrock in Essex (until 1999) which would provide significant traffic through London, and a further refinery – Coryton – was built nearby in 1953 for Mobil and BP. Block trains were known to work the North London Line (to and from Avonmouth, an Esso refinery), but most fuel traffic in the 1950s was still wagon loads in ordinary goods trains and this would have been in a range of wagons, for a variety of producers and fuels and their derivatives.

In 1938 a census elicited there were 3,600 road vehicles for conveying fuels, mostly 2,000 gallons capacity or less (today's tankers are near to 10,000 gallons). There were 7,600 rail tanks, just over half of which were for the likes of motor spirit and kerosene – "white oils" – but with the war, a further 2,730 tanks were added by 1944, mostly for spirit.

Post-war there was a big review of requirements alongside the growing domestic use of motor fuels and the recognition that fuels needed to be moved more effectively, with much growth in pipeline movements. Shell-BP operated 440 distribution depots in the UK in 1950, mostly small concerns. This was quickly reduced by 75% by 1957, with the road delivery fleet reduced by 20% but doubled in capacity. Competitive road charges had more than halved rail traffic by 1962.

There were a good number of distribution depots and private sidings around London, served by a good number of producers. The Railway Clearing House produced occasional registers of companies and their rail facilities, and here's an overview for the London area, by RCH book year:

Company	Location	1904	1912	1925	1938	1956
Shell-Mex	Shenfield			✓		
BP	Victoria Docks		✓	✓		
	Epping			✓		
	Stratford			✓	✓	
	Purfleet			✓	✓	✓
	Woolwich			✓	✓	
	Wandsworth		✓	✓	✓	
Consolidated Petroleum (became BP)	Victoria Docks	✓				
Consolidated Oil (became BP)	Deptford	✓	✓			
Shell-Mex BP (Companies merged 1932)	Plumstead					✓
	Thames Haven				✓	✓

London & Thames Haven (Shell-Mex BP from 1925)	Thames Haven	✓	✓	✓	✓	✓
	Bromley	✓	✓	✓	✓	
Company	Location	1904	1912	1925	1938	1956
National Benzole (owned by Shell-Mex BP from 1957)	Barking					✓
	Chelsea			✓	✓	
	Fulham				✓	
Anglo Saxon Petroleum (Shell-BP from 1955)	Thames Haven			✓		
Esso	Devons Road					✓
	Plumstead					✓
	Bromley					✓
Anglo American (Esso from 1956)	Purfleet	✓	✓	✓	✓	✓
	Woolwich	✓	✓	✓	✓	
	Angerstein	✓	✓	✓	✓	
	South Lambeth			✓		
Redline Motor Spirit (Esso from 1956)	Bromley			✓	✓	✓
Texas	Dagenham				✓	✓
London & Coastal Oil Wharves (became Regent in the 1960s then Texaco 1970s)	Low Street (Essex)					✓
Gulf	Silvertown					✓
Silvertown Lubricants (Gulf from 1928)	SIlvertown		✓	✓	✓	
Silvertown Oil (Gulf from 1928)	Silvertown	✓	✓	✓	✓	
Lubricant Producers	London				✓	
Trent Oil Products	London				✓	
Caucasian Petroleum Export (Homelight Oil from 1904)	Wandsworth	✓	✓	✓		

So, I can see from this that if I model 1956/1957, there's 14 depots around London for vehicles in ordinary goods trains and the most likely company vehicles seen would seem to be BP, Shell-Mex BP, Esso, Texas, London & Coastal, National Benzole and Gulf – but also with one eye on the fact Mobil built a refinery, which may account for some through traffic. Petrofina (Fina) was another good-sized operator for which I can't see depots listed, but they're a possibility, too. A block train seems most likely to be of Shell-BP or Mobil vehicles, or Esso from and to their Avonmouth refinery as noted earlier.

Wagon Designs

Rectangular tanks were constructed in much fewer numbers than the cylindrical versions, but despite their relative rarity on the 1950s railway (going by pictures I've found), they were still occasionally built up to the 1940s, at least by Charles Roberts. These were used for heavier oils and tar, and I'm not expecting to use any for my layout. However, if we want an odd example for Finchley then it could be investigated.

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Wagon engineers had to work out how to secure a cylindrical tank to a chassis. One method was to use either a saddle, or a cradle, which gave better support. The second method was two saddles, but the greater bearing surface caused greater corrosion and issues with repairs. End movement was restricted by crossheads (in line with the centre of the tank) that were pulled taught by stays wound to the middle of the chassis. Holding bands were fixed across the tank near each end, and in older wagons there were further rods or wire ropes wrapped around the manhole. The ropes would stretch in time, and Charles Roberts agreed with the RCH that the ropes could be dispensed with in favour of longitudinal tie rods between the crossheads.

1907 (& thereabouts) RCH Regulations
Original tanks were made from wrought-iron plates rivetted together – 14T wagons with 3 plates (and 2 end plates), 20T wagons with 5 plates.

Early tanks had a rounded or bevelled manhole atop the tank, which changed to a flat top in the 1907 RCH regulations. These were 2'6" diameter, fixings were either wing nuts or a hinged pressure bar. From 1906 class A products had to be pumped out from the top, bottom discharge being banned, though improvements in valve design allowed bottom discharge once more from the 1950s.

Tanks were often painted grey, black or red oxide, but from 1902 Class A tanks were recommended to be painted a light colour, eg light stone, and from 1907 with a horizontal 6" red band at mid-way on the tank.

1911 RCH Regulations
Specifications for 14T wagons were published. These could be saddle or cradle mount, and barrel diameter was 6'7¾".

Tank wagon built 1912, showing white star

Around the time of WW1 all Class B tanks were painted black, as the contents would blacken any paintwork anyway! Lubricating oil tanks were originally yellow, but later also black.

Up until 1913 oil tanks were not permitted to travel above 20 mph. New regulations allowed RCH-standard wagons in travels with a point-to-point average of 35 mph. These wagons required a 2' wide star painted on the tank, white on black tanks, otherwise black.

Welded tanks were first introduced in 1922 by Thompson Bros of Bilston.

1927 RCH Regulations
Tanks were designed in 5 diameters from 5'7½" to 7'2⅛" for 10T, 12T or 14T payloads depending on the density of product. Wagon length is 17'6" using a 9' wheelbase. No more wire ropes, tie rods becoming universal. The manhole reduced in size to 1'4". See Preservation notes for photographs.

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Wagons to these designs continued into the 1950s. Tanks could be welded or rivetted, some with metal saddles, sometimes with a taller manhole with turn screws. Small platforms were added either side of the manhole just before the war, later replaced with longer platforms and a fixed ladder.

From 1935 speed restrictions were amended to 60 mph, provided the wagons were vacuum fitted, had F.T. painted on the tank sides with two stars of 18" width

World War II
The RCH was pushed by Anglo-American to allow Class A tanks to be painted aluminium, which dried faster and was more resistant to spills. This was made compulsory at the end of 1939, with the red band on crossheads and for 18" along the sides. Then the war got in the way and the colour scheme was amended to lead grey. Aluminium was reinstated after the war, with red solebars instead of a red band, this scheme lasting to the 1960s.

In 1942 the anchor mount was developed; two anchors welded to the tank and the tank also supported by two saddles and two small supports at each end. This all rendered wire ropes and tie rods redundant, and this style of wagon continued in production into the 1960s.

Some built by the GWR and SR for the war effort used welded tanks, mounted on steel saddles.

Post-War

In 1957 the British Transport Commission engaged Charles Roberts to build prototype 35T tanks, types A and B for Esso, a creosote tank for BR and then a bitumen tank for Esso in 1959. These tanks were mounted on four outrigger cradle brackets. Class A were fitted with SKF axleboxes and Oleo Pneumatic buffers, the Class B and bitumen tanks with Timken axleboxes and Dowty Hydraulic buffers. The creosote vehicle had Oleo buffers and Isothermos axleboxes.

These designs morphed into 40T, 45T and 50T versions with variations on suspension.

In 1960 there were in the region of 12,000 private rail tanks on the network.

In the mid-60s the new tanks brought about a new colour scheme for Class A, with dove grey tanks and red solebars. Shell-Mex & BP jointly incorporated a white and yellow stripe with names and logos, usually on opposite sides.

Models

A search for Model Railway Database on the web will bring you to a resource listing Hornby, Bachmann and Heljan products in OO scale, and Farish in N scale. Other manufacturers are gradually being added, apparently, but there's already nearly 500 tank wagon variations listed between these three manufacturers. None of them is a particularly accurate product, seemingly.

Peco
Produce tank wagons kits as part of their Wonderful Wagon series, and these look like they'll be marketed as Parkside. The tank width is the equivalent of a 6'9" tank, but the kit is quite simplistic.

Oxford Rail
Oxford actually specify their older tank wagons are based on RCH diagram 72 of 1907, a 12T wagon. The liveries are therefore almost all pre-war, but it's still possible some would survive into the 1950s – for example, their Mobil Oil version.

Oxford are also bringing out the early modernisation tanks initially used by Esso in 1957, for class A and B and both with early or revised suspension – this is the same tank wagon that Dapol provide as a kit (ex-Airfix)

Dapol
As noted above, a kit is available for the 1957 tank. They also produce a rectangular tank, RTR, but it looks quite basic. If you want to jump to 7mm scale they do produce some nice-looking 14T oil tanks, but I digress…

Heljan
Produce the same 1957 tanks as Dapol and Oxford, but in a much larger array of liveries – which makes me wonder why Oxford are doing so?

Slaters
Manufactures a 4mm model kit for the Charles Roberts rectangular tank.

David Geen
Was producing oil tank (and milk tank) kits until ill health forced his retirement. Regarded as the most accurate model, you may still occasionally get a 2nd-hand model – but beware, a milk tank kit was recently advertised at £60.

Rumney Models
Manufacture underframe kits for oil tanks, and detailing frets too, designed especially for using Bachmann tank bodies.

Cambrian
Providers of underframe kits, including an open-frame version that *may* be suitable for a 10' wheelbase wagon.

Hornby
As you may imagine, Hornby has produced quite a number of tank vehicles over the years, too many to consider listing or providing too many pictures

Bachmann
Much the same as Hornby, with wagons often presented in sets of 3. They're generally nice models but are inaccurate in particular with regard to the mount on the chassis.

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Preservation

The Railway Heritage Register (see references for the link) lists circa 150 tank wagons even though it's not all fuel tanks. It covers wagons built between 1889 and 1984.
Here's views of 5 preserved tanks, all of the 14T 1927 specification variety with ladders and small walkways. The silver-liveried Esso tank is particularly nice!

By Dgkent - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=6028106

By Panhard - Own work, CC BY 2.5, https://commons.wikimedia.org/w/index.php?curid=6805612

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- Historical Model Railway Society – link to tank wagon photographs (1,100+) HMRS Photos
- Railway Heritage Register - a site dedicated to preserved stock Railway Heritage Register Wagon Survey Project (rhrp.org.uk)
- Model Railway Database – link Model Rail Database of Scale Models | Model Rail Database

Appendix 1927 Tank Loading Specifications

10T – 14T 17'6" over headstocks, 9'0" wheelbase, tanks 17'5" long
20T 21'6" over headstocks, 12'0" wheelbase, tanks 21'6" long

Tank diameter & 4mm equivalent	Load	Suitable for:
5'7½" 22.5mm	10T	Mineral & shale lub oils, gas oil, turpentine, turps sub
	12T	Ammoniacal liquor, coal tar creosote
	14T	Coal tar
5'10½" 23.5mm	10T	Paraffin, petroleum etc (class B)
	10T	Light naptha (class A)
	12T	Mineral oil, seed & fish oils
	14T	Coal tar
6'3" 25mm	12T	Petroleum, turpentine
	12T	Benzole, toluol (class A)
	14T	Mineral lubricating oils, resin oil
	14T	Crude coal tar naptha (class A)
6'7¼" 26.42mm	10T	Light motor spirit (class A)
	12T	Motor spirit (class A)
	14T	Mineral & shale lub oils, gas oil, turpentine, turps sub
7'2" 28.67mm	14T	Heavy motor spirit, min naptha, benzine, carburine (class A)
6'3½" 25.17mm	20T	Coal tar
6'8" 26.67mm	20T	Ammoniacal liquor, coal tar creosote
7'3" 29mm	20T	Lubricating oils, crude shale, turpentine, turps sub
	20T	Coal tar naptha (class A)
7'2" 28.67mm	20T	Ammoniacal liquor, coal tar creosote