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Article 12: Stock Classification – Wagons

Summary: Details of the classification schemes used for wagons from 1948 to the present

Introduction

This article has been divided into five main sections, as shown below. The distinction between operational classifications (eg type and TOPS codes) and technical classifications (eg Diagrams and Design Codes) is my own.

- Pre-TOPS Operational Classifications
- Pre-TOPS Technical Classifications
- TOPS Operational Classifications
- UIC Type Codes
- TOPS Technical Classifications

Pre-TOPS Operational Classifications

Prior to the advent of TOPS there was not much standardisation in the way wagons were classified. BR (and its predecessors) used a mixture of descriptive, abbreviated and coded names to refer to different types of wagons. For general-purpose wagons, descriptive classifications were the most common, often in combination with reference to the carrying capacity. Typical examples would be '16t Mineral', '12t Van' and '21t Hopper'. Open wagons were generally referred to as 'Low' (1-plank or equivalent), 'Medium' (3-plank) or 'High' (5-plank). Abbreviated forms were self-explanatory (such as '12t Min') but were more commonly used where references to other features were added. Some of these are outlined below:

- Wagons that were 'fitted' (i.e. those with vacuum brakes) had 'fit' added, as in 'Vanfit' and 'Medfit'.
- Some wagons had shock-absorbing underframes, these being prefixed 'Shoc', as in 'Shocvan'.
- Open wagons with a hinged bar to support a sheet to cover the load had 'bar' added, as in 'Hybar' for a High open with bar.
- Wagons designed for use with pallets were prefixed 'Pal', as in 'Palvan' and 'Palbrick'.
- Some wagon types had 'Bo' added as a prefix to distinguish bogie variants from 4-wheeled ones, examples being 'Boplate' and 'Borail'.

Many common wagon types did not carry any form of classification. The only markings on this 16t Mineral wagon (seen in preservation at the National Railway Museum in York) are the carrying capacity, the number and (at the right-hand end) the tare weight.

Where the exact type of wagon may not be externally obvious, codes were applied. This van (also seen at the NRM in York) is marked 'Banana'.

With slightly more specialised wagons, there was a need to be able to easily identify particular variants, so that wagons with the correct length, capacity or fittings could be allocated. This was usually achieved by adding a letter suffix to the code name. A good example of this is the Bogie Bolster wagon. Letters A to D were added to distinguish variants of increasing length. The sequence was spoiled somewhat in the early 1960s when some 32ft long wagons were built. These were shorter than the 'Bogie Bolster A' type, but had to be dubbed 'Bogie Bolster E'.

Another type that needed lots of suffixes was Coil wagons. These wagons were fitted with cradles to carry coils of sheet or rod steel, and comprised a mixture of new-builds and conversions. There were numerous variants and it was important to ensure that the wagons had the correct number, size and orientation of cradles for a particular traffic. To achieve this, suffixed variant codes such as 'Coil Q' were used. Some codes were more specific about the type of coil to be carried (as in 'Strip Coil D' and 'Rod Coil R'), while others made reference to the type of wagon they had been converted from (as in 'Mincoil' and 'Hybarcoil').

The most-specialised wagon types were those which BR described as 'Specially Constructed Vehicles'. The movements and usage of these wagons was closely controlled, since the wagons were few in number but certain traffics might require a very particular type. The wagons generally had classifications based on their design, often combined and abbreviated (as in 'Lowmac' for 'Low Machinery Carrier' and 'Weltrol' for a 'Well Trolley Wagon'). These would be followed by a letter to indicate the region the wagon was allocated to, then further letter/s to distinguish variants of each type. For example, an 'Arm ET' was an Armour Plate Truck allocated to the Eastern region, while a 'Flatrol MVV' was a Flat Trolley Wagon assigned to the Midland. The significance of the variant letters does not seem to follow any particular pattern, and indeed seemed to vary from one region to another. For example, an 'Arm WF' was essentially identical to an 'Arm MD', and an 'Arm ET'.

This wagon would have been marked as a 'Flatrol SB' when new. Special wagons allocated to the Southern Region were rare, but included types able to work to the continent. Note the shackles to allow it to be chained-down whilst on the train ferry.

Departmental wagons allocated to the Civil Engineer used a different method of classification, with names based on different types of fish. This seems to have derived from earlier practices on the GWR, where some wagon types were identified by animal names (as in 'Toad' brakevans). Under BR, 'fishkind' names were allocated to various wagons intended for the carriage of ballast, rail or sleepers, and for wagons that were to be used in conjunction with these (such as the 'Cockle', 'Oyster' and 'Shark' ballast plough brake vans). The names were normally carried on the wagons themselves, either painted-on or in the form of a cast plate (as on 'Grampus' wagons). The practice outlived the introduction of TOPS in the 1970s and is still in use today, though the names used became more varied (including other animal types such as 'Heron' and 'Osprey') while some of the more recent types do not actually carry their assigned code. For a list of all known Fishkind names, see LTSV-RD website.

Subject: DB 983860 | TOPS: ZEV-A | Photo: Thomas Young
Location: Willesden Jct (South West Sidings) | Design: ZE500B | Date: 29/03/1987

This ballast hopper had somehow managed to avoid having a TOPS code applied when seen in 1987, though it does display the 'Catfish' fishkind code.

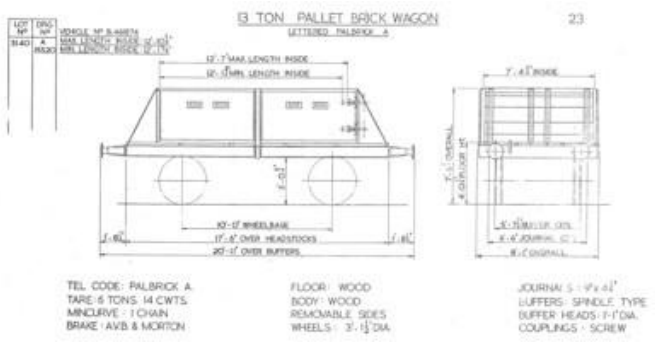
Subject: DB 983913 | TOPS: ZFV-A | Photo: Thomas Young
Location: Willesden Jct (South West Sidings) | Design: ZF501C | Date: 29/03/1987

Also seen in 1987, this wagon shows the post-1964 boxed data panel. The 'Dogfish' code would originally have appeared in the top line of this box, but following the introduction of TOPS codes, the fishkind names had to be shown in a separate box.

Some standardisation was introduced in the early 1960s, with the '1964' scheme bringing in the use of boxed lettering. Where the wagon body design allowed it, this featured a three line box in which key information would be displayed. The bottom line was for the number, the middle line for the weights, and the top line was for the type code. Technically this meant that all wagons should now display their classification, although implementation was never completed. The scheme also brought in some new codes, such as 'COAL 16 VB' for 16t Mineral wagons with vacuum brakes and 'HOP 32 AB' for the newly-introduced 'Merry-go-round' coal hoppers.

Pre-TOPS Technical Classifications

BR assigned technical classifications to wagons derived from their page number in the diagram books, in a similar manner to the practices of the preceding 'big-four' companies. Diagram books were collections of drawings of each major type, and there were three BR books covering freight stock. Book 1 was for ordinary wagons, book 2 for specially-constructed wagons and book 3 for containers. Within each book, every diagram had a page number, and a wagon could be referenced by this, for example a 'Diagram 101 16ton End Door Wagon'. A given diagram (page) number could appear in more than one book, which could potentially lead to confusion. For example Diagram 250 in book 1 was a Ventilated Meat Van, diagram 250 in book 2 was a Lowmac MU and diagram 250 in book 3 was an AF-type container. To avoid this problem, references to diagram numbers later included the book number as a prefix, separated from the page number by a slash. The three diagrams mentioned would thus be shown as 1/250, 2/250 and 3/250 respectively. Most books and published references to BR wagon diagram numbers add leading zeroes to diagram numbers below 100, such that (for example) diagram 69 in book 1 would be shown as 1/069. This does not appear to have been an official BR policy, as shown by the fact that the BR TOPS diagram for Freightliner wagons to FF001B refers to this being 'EX BR DIAGRAM 1/86'.



A typical BR diagram book page, in this instance page 23 from book 1. Note that no underframe detail is shown.

Rather than just issuing diagram (page) numbers sequentially, the diagram books were broken down into groups of types. The following lists show the original groupings as taken from the index pages of diagram books available to view on the Barrowmore Model Railway Group website.

Diagrams in book 1
1 to 99 Open - Low, Medium, High, Container Chassis
100 to 199 Mineral - End Door, Coke, Hopper Coal, Hopper Coke, Hopper Ironstone
200 to 299 Covered - Good Vans, Fruit, Banana, Meat, Gunpowder
300 to 349 Tank Wagons - Fixed Tanks, Demountable Tanks
350 to 399 Cattle Wagons
400 to 499 Rail and Timber - Single Bolster, Double Bolster, Plate 4 Wheel, Tube, Pipe, Bogie Bolster, Bogie Plate, Special Bogie Bolster
500 to 549 Goods Brake Vans
550 to 649 Service Vehicles - Loco Coal, Ballast, Hopper Ballast, Ballast Brakes, Sleeper, Engineers Bogie Rail

Diagrams in book 2
1 to 29 Armour Plate
39 to 49 Boiler
50 to 69 Case
70 to 149 Flat
150 to 169 Girder
170 to 219 Glass
220 to 239 Gun
240 to 389 Lowmac
390 to 439 Hymac
440 to 449 Rectank
450 to 469 Roll
470 to 489 Transformer
490 to 509 Trestle Plate
510 to 659 Trolleys - Flat
660 to 679 Trolleys - Propellor
680 to 729 Trolleys - Trestle
730 to 879 Trolleys - Well
880 to 899 Wheel
900 to 999 Special Wagons for Departmental Use

These blocks were further broken down in some cases. For example, the first BR Goods Vans were to diagram 1/200, while Fruit vans started at 1/230, Banana vans at 1/240, Meat vans at 1/250 and Gunpowder vans at 1/260. With hindsight it can be seen that the sizes of some of the blocks were misjudged. Fifty numbers were set aside for cattle wagons, though only four were ever used for new builds. Similarly the allocation of 50 numbers to brake vans seems excessive, with only eight seeing use. Conversely there were cases where the number of variants of a basic type overfilled the block allocated. Hopper Coal wagons had started at 1/140, while Hopper Coke wagons began with 1/150. Development of the coal wagons saw all the diagrams up to 1/149 being used, after which they leap-frogged over the coke wagons to carry on from 1/153. The introduction of new types caused similar problems, and the whole block allocation system was becoming a bit muddled by the mid-1960s. For example, the early Freightliner wagons were assigned diagrams 1/081 to 1/086 (except 1/085, which had already been used for salt wagons). With all the other adjacent page numbers already having been used, later Freightliner wagons had to be given diagrams 1/122 to 1/126, in the range latterly reserved for mineral wagons.

Diagram numbers were only very rarely re-used. I have a couple in my database (such as 1/079, 1/080 and 1/147) but further digging suggests that these are incorrect. Diagram 1/140 had been allocated to 13ton coal hopper wagons in 1949. The TOPS diagrams for the HBA hoppers built from 1975 onwards states that they were 'Ex BR Diagram 140 (allocated)', which I suppose means that the number was planned to be re-used but the introduction of TOPS overtook events. That leaves perhaps just diagram 1/401. This has been assigned to a batch of strip coil wagons built in 1951, though these were all soon modified to carry hot coil under new diagram 1/407. This meant that diagram 1/401 was free to be re-used for a design of single bolster wagon first built in 1956.

Mention of diagram 1/407 brings me neatly to the subject of diagram numbers that were issued for conversions as opposed to new builds. During the pre-TOPS years, minor modifications to wagons were common, such as the fitting of vacuum brakes (or through pipes), the replacement of plain bearings with roller ones, and upgrades to buffers. These sorts of changes did not usually result in new diagrams being issued. However, more fundamental changes, such as a rebuild for a new use, would have new diagrams. To give a couple of examples, 1/027 was for Palbrick B wagons rebuilt as Shellcase wagons (for army traffic), 1/028 was for Tube wagons rebuilt as Ale Pallet wagons and diagrams 1/410, 1/437 and 1/438 were for Twin Bolster wagons converted from (respectively) Lowfits, Conflats and Single Bolsters.

Diagrams did not generally cover changes in underframe details. Both of these wagons were built to diagram 1/019, but were to different lots and had different underframe types.

It appears that there was a plan to expand the scope of the diagram book scheme in the 1960s, with a book 6 being proposed. This was for private owner wagons and reference to it appears on many of the pages in the TOPS diagram books available on the Barrowmore MRG website. For example, the page for TOPS design code PB001A (Bogie Potash Covered Hopper) states that the design was 'ex PO diagram 6/488 (allocated)'. The advent of TOPS design codes (q.v.) as replacements for diagrams perhaps killed this scheme before it was fully implemented. Just one diagram from book 6 has actually been seen (6/309 for a bogie tank wagon) and further details of this plan would be welcomed. It would also be interesting to know what books 4 and 5 had been proposed to cover.

Separate diagram books were maintained for wagons that could operate to (or from) the continent. The BR 'C' book originated with the Southern Railway. Details are sketchy but known individual pages were numbered in the range C.5044 to C.5213. BR also started an 'SFV' book, for Special Ferry Vehicles that were fully RIV compliant, but again details are limited. It is worth noting that these books differed from other BR diagram books in that they included privately-owned UK wagons, and also wagons registered abroad. The latter included some other rolling stock, such as the French passenger coaches used on the Golden Arrow service.

<u>TOPS Operational Classifications</u>

The introduction of the computerised TOPS (Total Operations Processing System) by BR in the late-1960s and early-1970s resulted in a complete revamp of the classification systems for rolling stock. Privately-owned wagons were included in the scope, bringing them into a standardised system for the first time. The basis of the new system (at least in terms of wagons) was a four-letter operational classification, referred to as the TOPS Class Code or simply TOPS Code, and a six-character technical classification, referred to as the TOPS Design Code. Only the first three letters of the TOPS code were marked on the wagons themselves, so it became common to refer to the 3-letter codes as TOPS codes, although the abbreviated form was officially known as the CARKND! On the TOPS computer, the 4-letter codes are shown as being continuous (e.g. BBAF), whereas on this site I have adopted the convention of separating the final letter with a hyphen (as in BBA-F). This method is commonly used in books and magazine articles on the subject but it is not official. To illustrate, when a few wagon types started displaying full 4-letter codes in the 2000s, they were either shown as continuous (as on FEAB container wagons) or with the last letter in brackets (as seen on MRA(A) side tippers).

Subject: 200000 TOPS: VAA-N Photo: Merfyn Jones
Location: Llandudno Junction Design: VA001C Date: 17/01/1986

Like most wagons, this VAA only displays the first three letters of its full TOPS code of VAA-N.

Subject: 501342 TOPS: MRA-F Photo: Thomas Young
Location: Tonbridge West Yard Design: MR006C Date: 01/10/2013

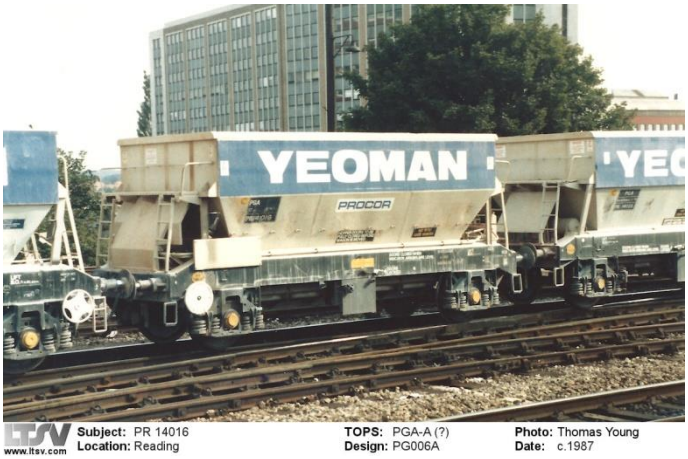
MRAs are one of a few types to display full codes, in their case the fourth letter being in brackets as seen on this MRA(F).

The first letter (known as the GENKOC) of a TOPS code was dictated by the general type, usage or ownership of the vehicle, and the initial letter assignments were as follows:

A - Loco-Hauled Passenger-Carrying Coaches
B - Steel Carrying - Bogie (Excluding Coil)
C - Traffic Brake Vans (CAx) or Covered Bulk Carriers (CBx-CZx)
D - Diesel Multiple Unit Coaches
E - Electric Multiple Unit Coaches
F - Flat Wagons
G - HST Power Cars and Coaches
H - Hopper Wagons
I - International Ferry Wagons
J - Steel Carrying - Bogie Coil
K - Steel Carrying - 2-Axle Coil
L - APT Power Cars and Coaches
M - Mineral Wagons (Not Hopper Fitted)
N - Loco-Hauled Non-Passenger-Carrying Coaches
O - Open Wagons
P - Privately Owned Wagons (Excluding Tanks)
Q - Departmental Coaching Stock
R - Railway Operating Vehicles
S - Steel Carrying - 2-Axle (Excluding Coil)
T - Privately Owned Tank Wagons
U - Uncovered Open Bulk Carriers
V - Vans
W - Containers (Believed to have been proposed but not implemented)
X - Exceptional Vehicles and Special Purpose Vehicles
Y - Departmental Bogie Freight Vehicles
Z - Departmental 2-axle Freight Vehicles

The second letter allowed for a breakdown of types within each of these groups. The letters used were sometimes sequential, and sometimes derived from the type of vehicle covered. For example, the first new open wagon type added after the introduction of TOPS was the OAA and this was followed by the OBA, OCA and ODA, a similar pattern also applying to vans. New bogie steel-carrying wagons also followed this pattern (BAA and BBA), but older types used 'derived' codes, such as BCV, BDV and BEV for Bogie Bolster C, D and E wagons respectively, BPV for Boplates and BRV for Borails.

The F in PFA was derived from the type of wagon it was allocated to, namely flats.



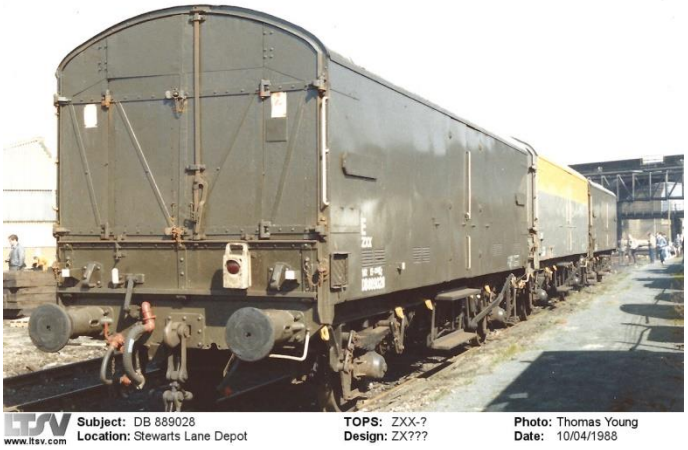
By contrast, the G in PGA hoppers was not derived and seems to have just been the use of a 'spare' letter, though bogie hoppers became PHA.

It should be clarified that the meaning of the second letter was dependent on the first letter, such that (for example) the R in BRV would not have the same meaning as the R in JRV or KRV. An exception to this was the letter I, which was used as the second letter for all UK-based freight stock that was capable of operating on train ferries to the continent. Despite this, codes HIO, HIP and HIV were initially assigned to Ironstone Hopper wagons, these soon being changed to HJx codes. Within the three departmental GENKOCS (Q, Y and Z), the second letter often had the same meaning. For example, QRV, YRV and ZRO would all be stores vehicles. Other shared letters included S (for operating vehicles), T (for brake vans), V (for general equipment/material carriers), X (for specialist vehicles) and Y (for vehicles used by the Electrification section).

The third letter (known as the BRAKTY) showed the type of brake equipment fitted to the vehicle, and was intended to assist operating staff ensure that trains were correctly marshalled with wagons with compatible braking systems.

The codes used were as follows:

A - Air brakes
B - Air brakes with through vacuum pipe
F - Vacuum brakes with Accelerated Freight Inshot (AFI)
G - Vacuum brakes with AFI and through air pipe
H - Dual (air and vacuum) brakes with vacuum AFI
O - No continuous brake (unfitted)
P - No continuous brake, through vacuum pipe
Q - No continuous brake, through air pipe
R - No continuous brake, through air and vacuum pipes
V - Vacuum brakes
W - Vacuum brakes with through air pipe
X - Dual (air and vacuum) brakes
Y - No continuous brake (for track machines)



'Ferry' wagons were often dual-braked to maximise compatibility. Though now in departmental use, this van retains the dual brakes (both pipes are visible on the bufferbeam) and it thus carries a TOPS code ending in X.

When TOPS was being introduced, the air brake had already been chosen as the standard for new wagons. As such, many of the other BRAKTYs have fallen out of use and today, virtually all wagons have the letter A.

The fourth letter (known as the AARKND) provides an additional breakdown between different types. As mentioned, it was not normally marked on the wagons themselves, and its usefulness depended to some extent on how the first two letters had been assigned. To illustrate, TOPS code PFA was assigned to all privately-owned flat wagons with air brakes, but this could cover a variety of types from 4-wheel zinc block carriers to bogie container flats or car carriers. Hence the AARKND was useful for distinguishing between these. On the other hand, TOPS code OAA and OBA were essentially similar open wagons with no

significant variants, so the AARKND was of less use. In these cases, AARKND variations were later introduced but they covered fairly minor differences such as the fitting of high ends and/or cargo strap winches.

The AARKND was dependent on the first two letters of the TOPS code but not the BRAKTY. For instance, the F in YVO-F would indicate the wagon was a cripple carrier, and this would also apply to wagons with other brake types (YVP-F, YVR-F, YVV-F and YVW-F).

As with the second letters, the AARKNDs were sometimes assigned sequentially, sometimes derived. The first OTA timber wagons were given code OTA-A, and were followed by variants OTA-B, OTA-C, OTA-D and OTA-E. The first HAA coal hoppers appear to be have been HAA-M (the M perhaps being derived from 'Merry-go-round'), with later variants more-or-less following on as HAA-N, HAA-R and HAA-S. New Freightliner wagons from 1991 were coded as FSA-O and FTA-I, where the O and I indicated Inner and Outer respectively, even though that information was already implied by the 3-letter code. By contrast, the same letters had the same meaning in FLA-I and FLA-O, where the distinction was not otherwise made. A twist with the FLA example is that, when a variant of the two types was introduced, they were given sequential AARKNDs of FLA-J and FLA-P respectively. Then, when twin-sets were introduced in 2004 (formed of only outer wagons), they were allocated FLA-B.

TOPS codes were applied to wagons from the mid-1970s, specific details not being known. The revenue-earning fleet alone amounted to 182,443 wagons in 1977, to which must be added the departmental stock and also private-owner wagons (the latter also needing new TOPS numbers to be applied). As such, the process must have taken some time, and it is hardly surprising that a few wagons were still lacking codes in the mid-1980s (see Catfish photo above).

Changes in the 1980s and 1990s

TOPS was largely successful, particularly in terms of improving efficiency by being able to monitor the movement and usage of rolling stock. However, the system did require some tweaks. By the early 1980s it was considered that the allocation of codes to types could be improved. Some groups were under-utilised (such as the Uxx block for uncovered bulk carriers), while the private-owner block Pxx did not provide sufficient codes to cover the growing variety of such wagons in use. Changes in the fleet also meant that the separation out of coil-carrying and exceptional wagons was now of less relevance. Revisions to the code blocks were planned, the first stage being implemented in October 1983 as outlined below.

Codes in GENKOC J would be moved into GENKOC B
Codes in GENKOC K would be moved into GENKOC S
Codes in GENKOC U would be moved into GENKOC O
Codes in GENKOC X would be moved into GENKOCs B or F

Some of the changed codes retained their last two letters (as in strip coil wagons JGV becoming BGV and KEV becoming SEV), while others were changed (as in UCV clay wagons becoming OOV and XVA Trestle Plate wagons becoming BXA). The scheme also meant that the designations of some GENKOCs was changed, primarily that B and S were now for bogie and 4-wheel steel wagons respectively, no longer excluding coil-carrying variants.

The next set of changes did not take place until the beginning of 1990. Despite the almost 7-year gap, it is possible that this was part of the same 'master-plan', with time allowed for the first set of changes to be fully implemented before further changes were applied (for example, a wagon that should have been recoded from JRV to SRV in 1983 could conceivably have still been showing JRV several years afterwards). Equally it could be that the 1983 changes were simply a tidying-up exercise, and the 1990 changes were un-related but taking advantages of the opportunities that the 1983 changes had offered. If anyone knows for certain, I would be interested to hear from them.

Although four GENKOCs had been freed-up by the 1983 changes, only two were chosen to be re-assigned in 1990, as shown below.

J - Private-owner bogie wagons other than tanks and special-purpose vehicles
K - Private-owner special-purpose wagons

The designation of GENKOC P was thus revised to be 'Private-owner 2/3-axle wagons other than tanks and special-purpose vehicles', although it was also still used for some bogied wagons such as the Cartic-4 articulated car carriers (PJA) and the drain-cleaning train rebuilt from Freightliner flats (PFA-C). Although both types were bogied, they could not be operated singly, which may explain the anomaly.

The distinction between 'special-purpose' and other wagons for GENKOCs J and K seems to have been a bit vague. For example, old code PXA-Z was for 'Bogie Open, Concrete Sections' wagons, and these became KEA-Z. However, the only 'special' feature of these wagons was the non-standard couplings used within sets. But such couplings were also used on other wagons like the PXA-N aggregates wagons and PTA former tipplers, yet these were recoded as 'non-special-purpose' JRA-N (soon changed to JNA-N) and JTA/JUA respectively. Likewise, most bogie container wagons were recoded from PFA to KFA, yet the seemingly more specialised Lowliner container wagons became non-specialised JKA (although in the latter case they were soon sold to BR and further recoded as FLA).

Bogie ferry vans were deemed to be 'special-purpose' and thus got new TOPS codes in the K group, like this KVA-B.

This china-clay covered hopper would appear to be more specialised, and was also ferry-fitted, yet it was recoded in the non-special J group as a JIA-Y.

With many TOPS codes in the P group now freed-up (by the move of bogie vehicles to groups J and K), the opportunity was taken to revise some of the codes used for 2-axle wagons. For example, 2-axle covered hoppers had previously all been coded PAA but could now be spread across PAA and PBA. Likewise, the 'Self-Discharge' hopper wagons could now become PHA to distinguish them from regular hoppers (which remained as PGA). There were also changes to codes in the I GENKOC (for foreign-registered wagons). These mainly eased the congestion of code IPA by allowing privately-owned wagons to have 2nd letters other than P. For example, the Cargowaggon bogie flats were changed from IPA to IGA and the twin vans from IPA to IZA. In almost all cases of recoding, the AARKND (4th letter) remained the same. Thus PHA-K became JGA-K, PIA-X became KPA-X and so on.

One final aspect of the 1990 changes was that wagon types capable of working to the continent no longer had to have the letter I as the second letter of their TOPS code. For example, the Tiphook PIA-H (box) and PIA-X (hopper) wagons became JRA-H and KPA-X respectively.

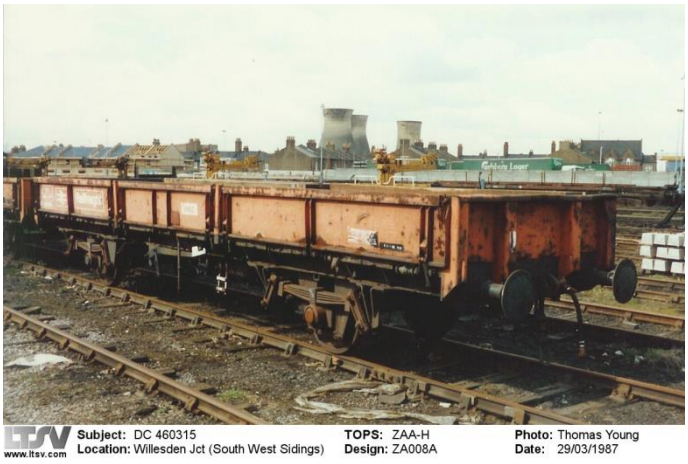
As the 1990s progressed, the number of TOPS code 2-letter combinations that had not already been used was diminishing, and this led to a practice of re-issuing codes. This applied most notably to the GENKOC B (bogie steel-carrying wagons), where many codes were re-used, in some cases more than once. As an example, the 1983 changes had seen the Bogie Trestle wagons changed from XVA to BXA. These wagons were soon modified for other uses, and the BXA code was re-used in 1993 for former BAA wagons fitted with a certain type of coil cradle. All of these BXA wagons were further modified and recoded to BSA in about 1995, but the BXA code then re-appeared for a third outing in 1997/1998, now applied to former BBA wagons fitted with 7 coil cradles and sliding covers. Each of these types had different AARKNDs (the first and third being BXA-T and BXA-A, the second use not known), and different design codes, and of course they were all active at different times. So, the only problems they caused were to people like me who try to document changes to the wagon fleets! On this website, re-used codes are indicated by a number in brackets. The examples shown above would be shown as BXA, BXA (2) and BXA (3) respectively.

There were also attempts to make use of some of the 'spare' GENKOCs, though none were to become common. GENKOC W had originally been intended to be used for containers but this never seems to have taken place, perhaps because of the switch from custom-built to ISO-standard containers. In the 1990s, new TOPS code WIA-A and WIA-B were assigned to articulated double-deck carriers. WIA-A was for the new-build of 5-section, covered wagons, while WIA-B was applied to a number of existing Cartic-4 sets adapted for use through the Channel Tunnel. Then, in about 2003, TOPS code XAA was applied to a single wagon used to carry water for steam locos used on excursions. Neither GENKOC has seen any further additions. GENKOC U meanwhile had been assigned for use by the passenger coaches intended to be used on 'Nightstar' services between the continent and regional UK cities. These services were cancelled before they even started, and most of the coaches were sold to Canada.

Privatisation muddies the water

Two of the distinctions that had previously dictated the allocation of TOPS codes became less relevant as the privatisation of the railways took place in the 1990s. These were the distinctions between railway-owned and privately-owned wagons, and between revenue-earning and departmental wagons. Following privatisation, all rolling-stock was technically privately-owned. Fortunately it was not decided to change all the affected TOPS codes. Instead, wagons used by the freight-operating companies were allowed to continue with 'railway-owned' TOPS codes, even though some of the assets were actually owned by the newly-formed Rolling Stock Companies (ROSCOs). Wagons owned by the established private-owners and leasing companies remained with 'private-owner' TOPS codes. There were some anomalies of course. Network Rail bought 555 bogie open wagons in 2003, and these were numbered and coded in the private-owner series as JNA-Cs. The owner prefix applied was NLU, this being the National Logistics Unit, part of Network Rail.

A 'railway-owned' wagon with 'private-owner' code and number! The Network Rail 'Falcon' box wagons built from 2003 were given PO TOPS codes of JNA-C.



BR had transferred this SPA wagon (without modification) to departmental service as a ZAA. EWS later reversed many such codings, and this wagon returned to being an SPA.

Changes to departmental wagons were more fundamental. Under BR-control, many wagons had been transferred to departmental use without any modification, the distinction presumably being for accounting purposes as much as anything. When EWS took over the freight operating companies in 1995 one of its first actions was to revert these wagons back to their original codings. This reflected the fact that they could be used for either a freight customer or for an infrastructure customer. Batches of new and converted wagons for infrastructure duties were also given TOPS codes in the erstwhile 'revenue' series, whereas they would previously have got 'departmental' codes. A good example is the MHA box wagon conversions from MGR hoppers, these only ever being used for infrastructure work. Most of the existing, purpose-built departmental wagons were left coded as before, with a couple of exceptions. The ZFA 'Gunnel' ballast hoppers were mainly recoded as HGAs, while some of the ZCV 'Clam' box wagons were recoded as MGV. Perhaps most surprisingly, 50 vacuum-braked ZFV 'Dogfish' hoppers saw a short life-extension when they were converted into air-braked HPAs. New-build batches that were dedicated to departmental work by nature of their design (such as the Materials Handling Trains) were given new codes in the existing departmental groups (eg YDA).

EVNs muddy the mud!

While the logic of TOPS codings seems to have got through privatisation more-or-less intact, an unrelated change a decade later did see things get a bit silly. The adoption of the European Railway Agency's TSI (Technical Standards of Interoperability) in 2008 meant that all new wagons had to be given RIV numbers, now referred to as European Vehicle Numbers (EVNs). This should not have impacted on the TOPS codes at all. The first wagons delivered after the change were a batch of bogie coal hoppers for Fastline Freight. These had 12-digit EVNs from new, but the wagons were added to TOPS under code IIA-A. This seemed to be completely wrong, as the GENKOC I was meant for wagons registered abroad. In fact the II- codes were intended for use on foreign Interfrigo vans. It was not a one-off mistake though, as the Fastline hoppers were soon followed by hoppers for other operators that were also coded IIA, along with IFA/IDA container flats, IOA/IEA box wagons and ICA bitumen tankers. None of these wagons were registered abroad, indeed none were even intended to work to the continent.

TOPS codes starting in I were for foreign-registered wagons, while codes starting in II were meant for refrigerated vans. The IIA coal hoppers were neither!

Code ICA was correct for a bogie tank, but not for a UK-based one.

This apparent error seems to have gone un-noticed until 2010, when a new batch of bogie hoppers for Marcon gravel traffic was delivered with 'domestic' TOPS code of HLA alongside 12-digit EVNs. There was no attempt to re-code any of the 'wrongly' coded types, but all subsequent additions seem to have been given appropriate codes (including TEA tankers, JGA cement wagons, FWA container flats and JNA bogie boxes).

<u>UIC Type codes</u>

Whilst all wagons running in or to the UK have been allocated TOPS codes, international wagons (and more recently some 'domestic' wagons) will also have UIC type codes. This is a Europe-wide system first introduced in 1965 to convey information about the characteristics of rolling stock. It comprises a variable number of letters, of which the first is always a capital, the remainder being lower case. The code is shown on the relevant diagram/design sheets (q.v.) and is also marked on the wagons themselves in most cases.

Type codes give much more detail than TOPS codes, though they can be harder to decipher since the meaning of any given letter can vary depending on the preceding letters. An example is shown on the right, while some more details can be found in my article about RIV/UIC numbers and codes. Various other websites give a full breakdown of the component parts of UIC type codes, and a Google search should find them.

This HKA hopper wagon displays the UIC code Fabnooss below its number.

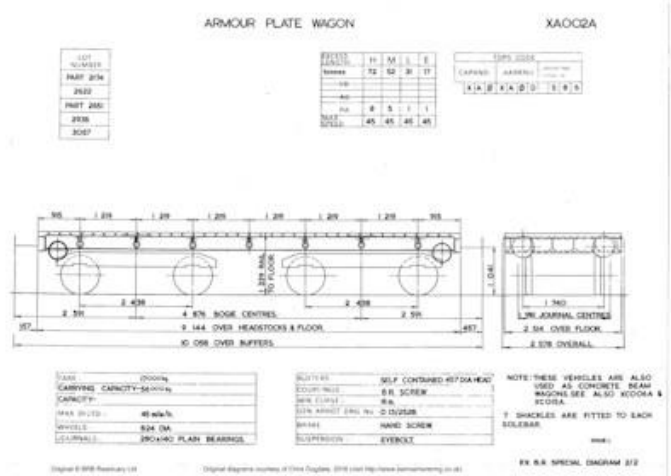
TOPS Technical Classifications

The arrival of TOPS brought with it a new way of detailing technical differences between items of rolling stock, these being design codes. The format for these was two letters (these being the first two letters of the TOPS code), followed by a 3-digit number (usually starting at 001) for each major variant, and a final letter for minor differences within each variant. To give an example, the first type of HAA coal hoppers had top canopies (or 'skips') to increase their capacity. These were given design code HA001A, with variants up to HA001F added to cover minor differences such as changes to operational speed limits. Wagons without the top canopies were also built, and these started a new design code series at HA002A. These wagons were more numerous, and minor changes saw further design codes issued up to at least HA002P.

Purpose-built departmental wagons differed in that the numerical part of the design code usually started at 500 instead of 001. For example, the basic variant of the 'Sturgeon' bogie wagon was YB500A. Other than that, such wagons followed the same practice of sequential letter suffixes for minor variants, and sequential numbers for major variants. While it is believed that the suffixes used each letter in alphabetic order (skipping I and O to avoid confusion with numerical digits), there are some design codes that do not appear in records. This could be because a change was planned but not implemented, or because a change was implemented but was quickly replaced by further changes with a new design code. As an example, I have no record of HA002B or HA002G being issued. More recently there are a few other gaps in the known sequences, but this is most likely due to details rarely being included in published sources. As mentioned, the HA002 series reached HA002P, though no instances of wagons to design codes HA002J or HA002N are known. Design codes that became obsolete (because all the related wagons had been either withdrawn or modified) would be removed from the books, leaving apparent gaps in the sequences.

Design codes were more detailed than the earlier diagrams, in that a new code would be issued for differences that would have been covered within a single diagram. For example, design codes SO001D and SO001E were both for SOV pipe wagons built to diagram 1/462. SO001D referred to wagons with spindle buffers, while SO001E was for wagons with hydraulic buffers. Because of this, it is often not possible to define a one-to-one relationship between a diagram number and a design code that replaced it. Similarly, minor modifications (that in the past would not have resulted in a new diagram being issued) did now get a new design code.

Although created to enable computerisation of the records, hard-copies of the design code books were also kept, in 'books' rather similar to the old diagram books. In fact a TOPS design code page looked essentially the same as a diagram page book. There would be a basic side and end elevation drawing (still not showing underframe details), and various blocks of data about the technical and operational characteristics of the type. Many of the early design code sheets included a reference to the related diagram number (as in 'ex BR diagram 1/462'), but it should be realised that one old diagram number could be referenced on multiple design codes, and that the reference could mean either 'recoded from diagram x' or 'rebuilt from diagram x'.



A typical early Design Code book page. The drawing is clearly derived from the earlier diagram book, though all dimensions are now metric and additional data blocks have been added.

Design codes were also allocated to surviving pre-Nationalisation types. Such wagons would not have appeared in the BR diagram books, and it is believed that diagram books of the pre-BR companies would have been referred to instead. The allocation of design codes to these wagons does not seem to follow any particular pattern. They were sometimes assigned design codes after the BR types, as with the brake vans, where design codes in series CA001- to CA006- were assigned to BR types with higher series (including CA010- for ex-LNER and CA015- for ex-LMS) for pre-BR types. However, they sometimes appeared randomly. For example, the OH019- series for OHV High Open Goods wagons included ex-BR diagrams (OH019A, B), ex-LNER diagrams (OH019C, D), ex-LMS diagrams (OH019F, K) and ex-SR diagrams (OH019G, H, J). This is curious as it suggests that all of these types were of very similar design.

Design codes were also allocated to all privately-owned stock that could run on BR tracks. These were included in the design code 'books' and this is believed to be the first time that details of all such types were grouped together in a single place (unless the diagram book 6 mentioned above did actually exist). The design code sheets for private-owner wagons differed slightly in that they included build and numbering details, the latter showing both the TOPS 'registration' numbers, and the pre-TOPS 'owners' numbers. The Barrowmore Model Railway Group website has scanned copies of many TOPS and pre-TOPS diagram books containing several thousand individual pages. Because of the additional information they contained, the books relating to private-owner wagons have proved particularly useful.

The design code scheme clearly allowed a lot of scope for growth, with the potential to allow up to 999 major variants of every TOPS code letter pairing (eg BA001- to BA999-), and up to 24 minor variants of every one of these (eg BA001A to BA001Z, skipping BA001I and BA001O). A very minor problem was when a particular wagon type saw a lot of modifications. The best example of this is the 'Salmon' bogie rail wagon. When TOPS was launched, design codes YM500A through to YM500D covered variations of the BR-built wagons, with YM500E to YM500H for ex-LMS wagons. Over time, further changes were made to the type (such as the fitting of air brakes), and eventually all codes up to YM500Z had been issued. In this case, the YM501- series had not been used so the Salmons were able to continue with YM501A and so on. Indeed, due to the longevity of the type, series YM501- was used up and YM502- codes up to YM502E were also allocated. It is not clear what would have happened if the YM501- series had already been allocated to a different type. It is also slightly confusing that a YM501- wagon would be a development of a YM500- one when this did not apply to most other code series. For example, a YC501- wagon was a completely different type to a YC500- one.

Although it would be normal for all wagons in a new-build batch to be given the same design code, this was not always the case. When Freightliner introduced its HHA bogie coal hopper in 2000, there seem to have been numerous small changes during the production run. Only the first wagon (370001) was to the 'basic' HH001A. The next 17 were to HH001B, while further variants were added such that the final wagons of the batch were coded HH001Q. Perhaps unsurprisingly, many of the intervening codes have since been deleted, as earlier wagons are modified to the standard of later deliveries. The HHA also illustrate the fact that there was some flexibility as to what constituted a 'major' change! Some redundant wagons were modified for use as barrier/adaptor wagons. This should really have resulted in a change of TOPS code into the R GENKOC, but they were left as was, with just the AARKND changed to HHA-D. Perhaps more suprisingly, the change did not even result in a new design code series (for example HH002A) but was issued with the sequential HH001R.

Minor tweaks to the HHA hoppers during delivery saw numerous design codes being issued. 370126 is to HH001K.

This HHA shouldn't even be a HHA, having been modified as a coupling adaptor. Yet it only received minor changes to its TOPS code (now HHA-D) and design code (now HH001R).

Although it would appear that international wagons could quite easily have been assigned design codes using the same conventions as domestic ones, a rather different approach was taken instead. A new 'diagram book' was started, with pages numbered E001 and upwards. Numbers up to about E400 were assigned to existing diagrams transferred from the 'C' and 'SFV' books, with subsequent numbers being allocated as and when required as wagons were built, modified or registered to work to the UK. An exception to this was that diagrams E600 to E656 appear to have been allocated to cover braking variations on existing diagrams. For example, diagram E008 originally covered both unfitted and air-braked variants of the same tank wagon design. The unfitted wagons later had new diagram E600 issued.

As E-series diagrams were assigned sequentially, they bore no relation to the type or origins of the wagons, with UK-registered wagons (mainly privately-owned but including a few BR types) intermingling with wagons from other countries. As an example, E377 was for SNCB (Belgian Railways) open wagons, E378 was for DB (German Railways) tank wagons and E379 was for FS (Italian Railways) covered vans.

I have referred to the E-series diagrams as 'TOPS International Wagon Diagrams', though the scheme may have slightly predated the introduction of TOPS. On the TOPS computers, wagons to international diagrams have a design code. As with 'domestic' wagon design codes, this is a 6-character code where the first two letters are the same as the first two letters of the TOPS code. The remainder of the design code for international wagons differed in that it was based on the E-series diagram number. To give an example, the ferry-fitted Tube wagons built by BR to diagram 1/449 were initially also shown in the 'Special Ferry Vehicles' diagram book as diagram SFV6247. When the E-series was introduced, diagram E247 was assigned, while the wagons had been given TOPS code OIX. Thus the TOPS design code was OIE247.

This PIA-X hopper was to diagram E702. Thus its design code was PIA702. In 1990 the TOPS code changed to KPA-X, the design code becoming KPE702.

One difference with E-diagrams and design codes was that variants could not be shown by a suffix letter. When these diagram E825 (design code IPE825) car carriers were modified with stanchions, a whole new diagram of E932 (design code IPE932) had to be issued.

Most TOPS codes only covered a relatively small amount of different types. As a result, it was fairly unusual for a TOPS design code to have a numerical element higher than the low 000s (or 500s for departmental types). For instance, there were lots of different types of High Open Goods wagons either built or inherited by BR. Those that survived into the 1970s were given design codes in the series OH001- to OH038-, 038 being one of the highest-numbered series among the revenue-earning codes. Departmental wagons were a bit different. Two codes in particular (ZDx and ZRx) included many different types of wagon that had been transferred into departmental use. As each variant was given a separate design code series, the numbers got quite high. By the 1980s, the ZD series had reached ZD148- while the ZR series was up to ZR234-. When track machines were added to TOPS (believed to have taken place in the 1980s), some were given design codes in blocks that did not start at 001 or 500. Various design codes in the range ZW301- to ZW355- were used for some, while others seem to have started at ZW999- and worked downwards.

This OBA had been transferred to departmental use as a ZDA to design code ZD143A. The sheer variety of general materials wagons transferred accounts for the high numerical part of the design code.

On the other hand, the ZW999L design code on this GP-TRAMM does not indicate that it was the 999th type in the ZW-series!

While the methods of assigning design codes has not really changed since the implementation of TOPS, the various alterations to TOPS codes from the 1980s onwards have resulted in many changes to the ranges of design codes that are in use. The first such change was the removal of GENKOCs J, K, U and X in 1983. I don't have full details of how the design codes were affected by this, but it would appear that in most cases, only the first two letters were changed. This can be shown by looking (again) at the BXA Bogie Trestle wagons. Originally coded XV- (with the third letter varying depending on the brake type), design codes XV001- to XV003- were used for unfitted or vacuum-braked wagons, all of which had been withdrawn by 1983. XV004A was for the prototype XVA-T air-braked conversion, with XV005A for the production batch of 50 further conversions that followed. In 1983, these wagons were recoded to BXA-T, and the design codes would have been revised to BX004A and BX005A respectively, simply by changing the first two letters. This was fine, except that it left design codes BX001A, BX002A and BX003A unused, thus slightly spoiling the sequential logic. When the BXA code was reused for a different type in 1993, the sequence was continued with new design codes BX006A, BX007A, BX008A and BX009A being used, while the third incarnation of TOPS code BXA in 1997/1998 used design code BX010A.

The major changes in January 1990 had a similar impact, and again, most design codes simply had the first two letters changed. This resulted in many 'gappy' sequences, and also caused a few duplications (or at least re-uses). Considering the gaps first, new TOPS code JNA illustrates this well. Four batches of wagons were to be given this code, all of which had previously been PXA. The PX- series covered a wide variety of 'special' types, and there were consequently numerous design code series. The wagons in these four batches were to design codes PX029E/F, PX029J, PX046A/B/C and PX050A/B/C/D. Logically enough, these became JN029E etc up to JN050D, meaning that design codes such as JN001A, JN028A, JN049A never existed. When further JNA wagons were later built/converted, they continued from JN051A onwards.

Design code PX050A was changed to JN050A in the TOPS code reshuffle of 1990. Though this might give the impression that there was also a JN049A, JN048A etc, there wasn't! Later additions continued the sequence with JN051A etc.

Sometimes skipped design codes were used. In 1990, MOD Warwells to PF041- became KW041-, these being the only wagons in the KW- coding. When new well wagons were built for infrastructure use in 2000, they were given design code KW001A rather than KW042A.

I was going to suggest that it would have been 'neater' if the design codes of the four batches of wagons changed from PXA to JNA had been revised to be JN001E/F, JN001J, JN002A/B/C and JN003A/B/C/D. This would have meant that the JN- design code series had no gaps but, following that logic, surely PX029E would have become JN001A?! I suppose there was at least some benefit in retaining the existing series, such that a JN046C could be seen to be related to a PX046C. Somewhat more annoying were the cases where this policy lead to a duplication of design codes. Up until 1983, design code JU001A had related to a 'Coil U' wagon. In the 1990 changes, PTA tipplers became JTA or JUA (outer and inner wagons being given different codes). Wagons to PT001A were now to JU001A, re-using the design code of the 'Coil U' wagons. More seriously, the related revisions to codes in the P GENKOC meant that some design codes were immediately reused. For example, prior to January 1990, design code PB005A had related to bogie covered hoppers numbered TRL13500-13524. After January 1990 it applied to 4-wheel covered hoppers numbered BRT8050-8099. This has already caused me problems, where I have assigned the latter wagons to 'PB005A', when I should have assigned them to 'PB005A (2)'. Ho hum.

Interestingly, although the major TOPS code changes did result in some design code anomalies, other changes have (mainly) seen a strict avoidance of duplication or re-use. For example, when new container wagons were given TOPS codes of FLA, FSA

and FTA, the design codes used were FL002A, FS002A and FT002A respectively, due to codes FL001A, FS001A and FT001A having been used many years previously for other types. EWS took a slightly different approach with some of its new types. The HTA bogie coal hoppers had design codes starting at HT050A, so as to completely avoid the numerous design codes that had once been applied to HTO and HTV 4-wheel hoppers. Their MCA and MDA bogie open wagons played it even safer by starting at MC100A and MD100A. There were a few odd slip-ups though. New TOPS codes HBA and HCA were introduced in 1991 for MGR coal hoppers fitted with top canopies. HBA was for former HDA wagons newly fitted with canopies, while HCA was for existing HAA wagons that had canopies since new. Design codes for the HBA wagons were HB003A/B, thus avoiding the HB001A and HB002A codes that had already been used for hoppers that were later modified as HEAs. However, the HCA wagons got design codes HC001A/B, later joined by HC002A/B. All four of these design codes had previously been used on HCO/P Coke hoppers. Perhaps the fact that these had all been withdrawn over ten years earlier meant that it was deemed acceptable to re-use the codes? Among other design codes that appear to have been recycled are BC004A, BC007A, BO001A, CG003A, FA001A/B/C etc, FB001A, FC001A, FD001A, HI001A, HS001A, MF001A, OS002A, OS003A, SD001A, VF001A and VX001A.

The FTA container flats delivered in the early 1990s were given design code FT002A, presumably due to FT001A having been used briefly many years previously for FTV Conflat T wagons.

Conversely, the FCA container flats built for EWS in 2000 re-used the FC001A design code that had once applied to FCV-C 'Condor' conflats.

International design codes/diagrams have been less affected by changes to TOPS. Many codes were changed in 1990, but this just saw the first two letters being revised, the remainder of the code still being the diagram number. For example, wagons to diagram E700 were changed from PIA-X to KPA-X, which meant that their design codes changed from PIE700 to KPE700. The changes from 2008 (when new wagons started being allocated 12-digit numbers and many were erroneously given TOPS codes in GENKOC I - see above) caused a surge in the allocation of E-series diagram numbers and the related design codes. For example, the Fastline Freight hoppers (that were the first to be given EVNs) were assigned to diagram E936, and thus had design code IIE936. As already described, various other batches of wagons followed, all of which were wrongly given 'foreign' TOPS codes, and all of these also got E-series codes. Domestic design codes returned in 2010, when the new HLA hopper wagons were allocated to HL003A. Subsequent additions and changes have mainly been to the correct series, with the E-series kept only for wagons that work to (or from) the continent. Having said that, the E-series was getting close to E999 recently, and it is not yet clear what numbers will be used after that. E1000 would probably not be compatible with TOPS, since a design code of IFE1000 (for example) would be 7-digits long. We shall see.

I need to end with a disclaimer of sorts. Design codes are something of a specialist subject, and they are often not referred to in wagon books and magazine articles. What I have written on this page is based on the information that I was able to obtain, but this is almost certainly far from complete. If you have noticed anything wrong in this article, please get in touch and I will ensure it is corrected. Similarly, if you have any information that would help 'complete the picture', I would be very interested to hear from you.