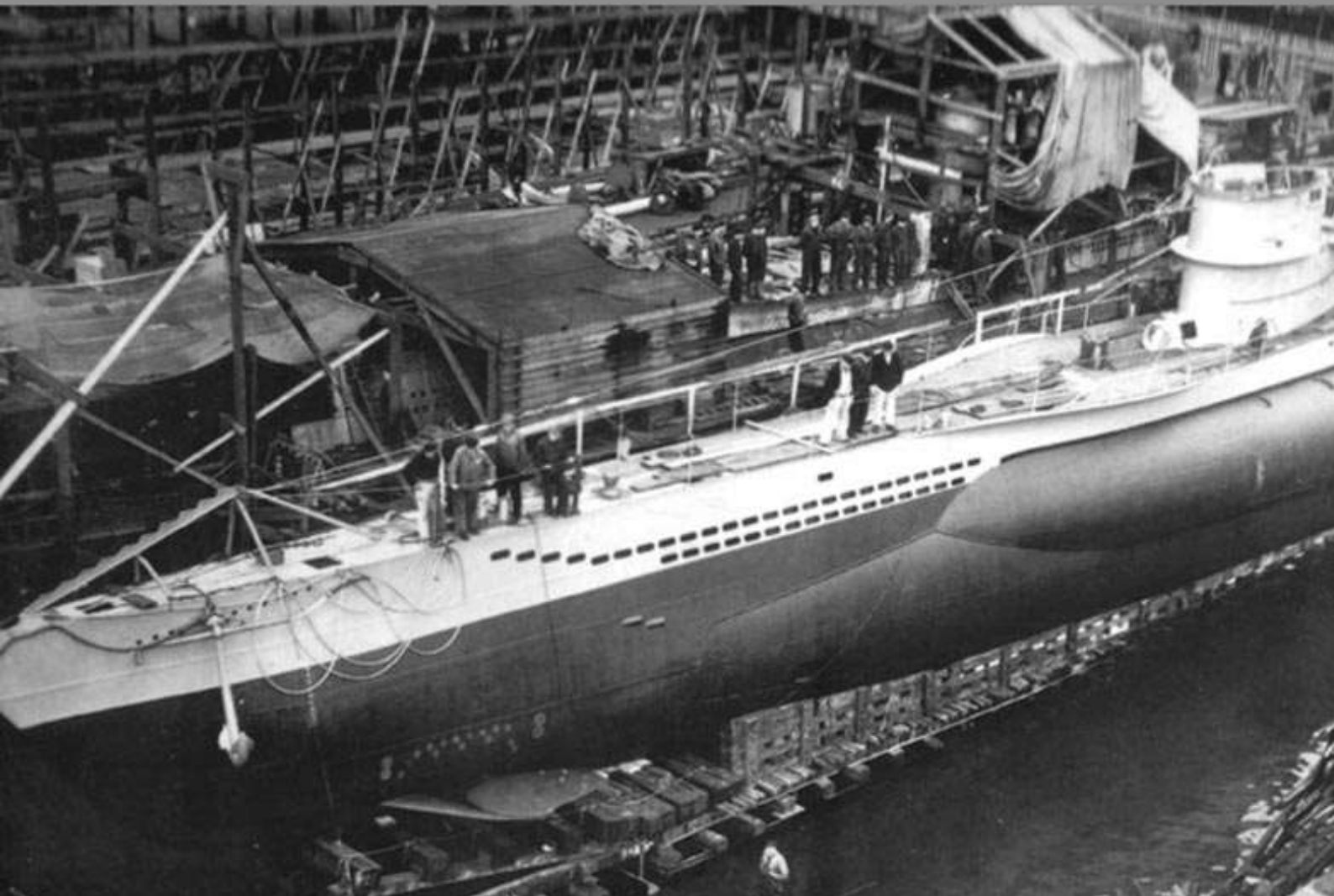




Type VIIC Free-Flooding Vent Patterns

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Accurate Model Parts



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Part I - Introduction

Revell's 1/72nd Type VIIC U-boat model kit has become a very popular choice in the modelling community. Many modellers have spent numerous dollars forking out for some of the after-market upgrade kits that increase the accuracy of this kit. While valuable time and money is spent on buying and fitting these upgrade kits, modifying the inaccuracies in the free-flooding vents in the Revell kit is very often overlooked. Some of the vents on the kit are missing, some are too large, while others are rectangular when they should be oval.

The purpose of this article is to provide details of all the free-flooding vents that were present in the hull casing of Type VIIC U-boats so that super-detailers of the Revell kit may modify their kits accordingly. The article may also be useful for modellers building OTW's 1/32nd Type VIIC, since all of the vents have to be drilled out of the GRP hull when constructing this kit. Details of the vent patterns of VIIBs are also included for modellers building the older Revell 1/125th U 47 or U 99 kits.

Included towards the end are details of the U-Brass photo-etch upgrade set. The set was designed to be used along with the original version of this article to allow modellers to correct the free-flooding inaccuracies in the Revell kit.

This version of the article is updated from the original. The original was published in the September 2005 (#62) issue of the SubCommittee Report.

Part II - Free-Flooding Vents

Variations in vent patterns

Type VII U-boats had a watertight pressure hull which was visible along the central areas of the hull. Forward and aft of this pressure hull were non-watertight structures built of thinner steel. Known as the hull casing, these structures were flat on top to permit movement by the crew, and suitably shaped along the sides to allow for hydrodynamic streamlining. To make the hull casing free-flooding, the thin steel was punctured with numerous free-flooding vents (also called drainage holes) that allowed water to drain in and out of the spaces between the pressure hull and the inside of the hull casing. Since the water on the inside of the casing was at the same pressure as the water on the outside of the casing, the thin steel of the casing would not cave in no matter what depth the boat was at.

The free-flooding vents on the hull casing of the original VIIIs (VIIAs) and VIIFs were markedly different from the VIIBs and VIICs. As VIIAs and VIIFs are rarely modelled, their patterns are not covered in this article. The vent patterns on the 24 VIIBs, 574 VIICs and 88 VIIC/41s were reasonably similar. But a number of variations did exist, primarily between boats that were built in different shipyards. There were also differences between boats that originated from different batches within each shipyard. Though much less common, there were even minor differences between boats from the same batch. Differences were also present between early and

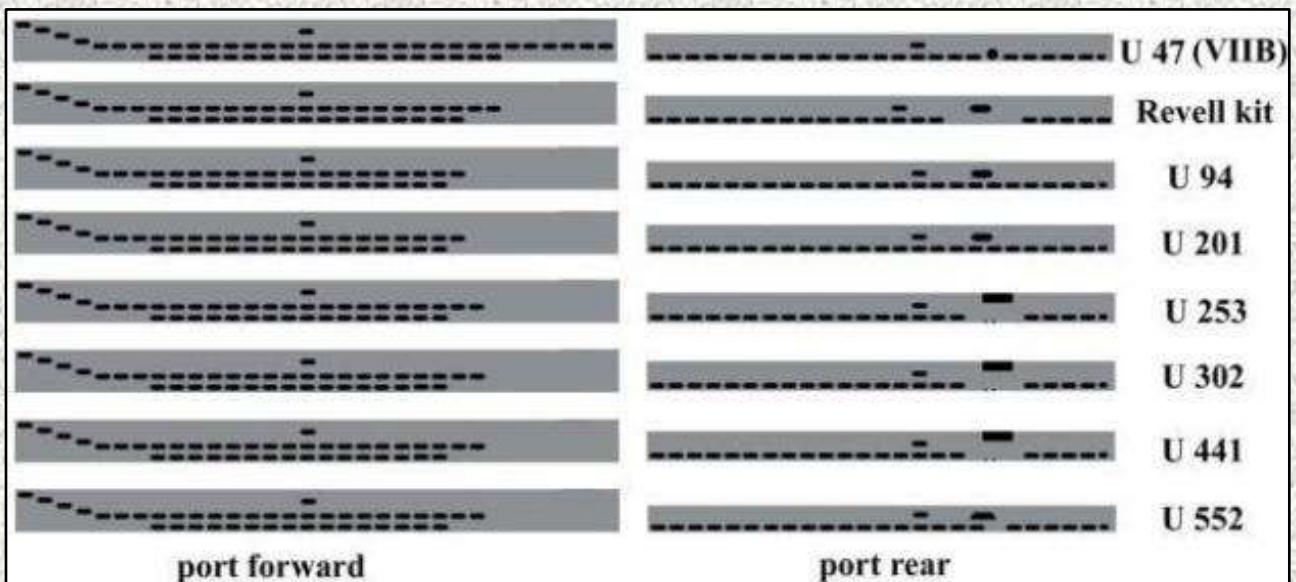
late boats, particularly with regard to the diesel exhaust outlet. These small but distinctive variations in the free-flooding vents act as footprints that can sometimes help us establish the rough time period in which a photo of a U-boat was taken. Occasionally the patterns can identify the shipyard from which the boat originated.

The constant modifications that were being made to VIICs, plus the differences in vent patterns between boats, mean that the modeller who is building a detailed model of a Type VIIC U-boat to a highly accurate standard should select a particular boat at a particular time in its career. To facilitate this accuracy, a number of photos of the chosen U-boat should be sought by the modeller.

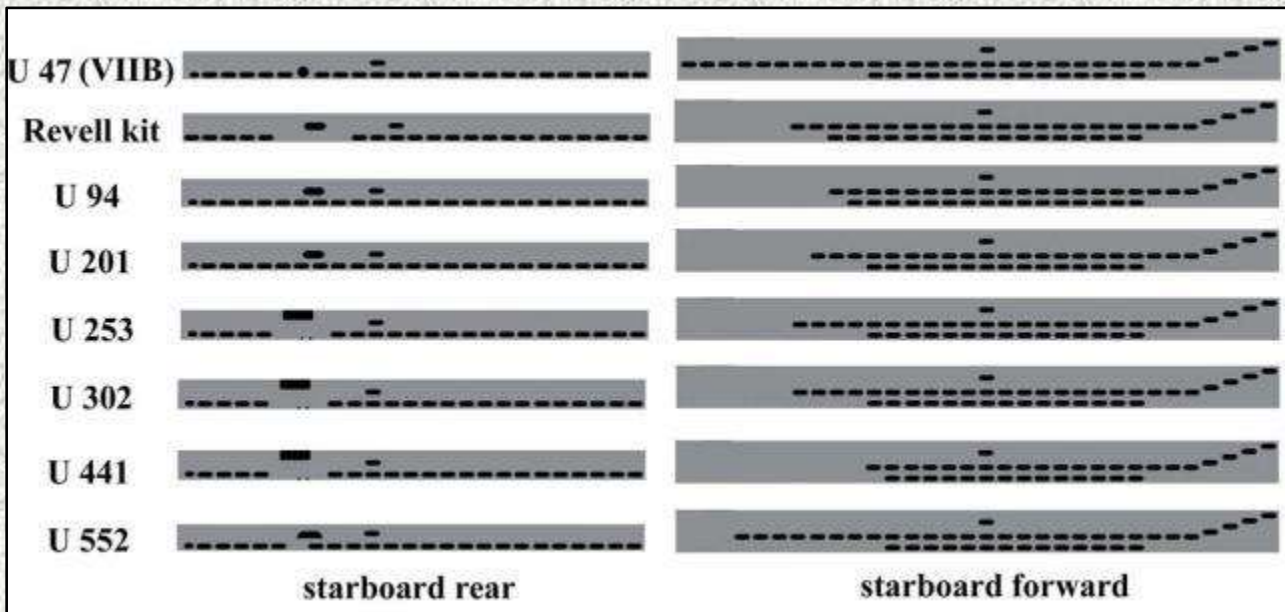
Main free-flooding vent patterns

The two main groups of vents ran along much of the length of the boat, just below the top of the hull casing. One group of large-sized vents was located forward of the central drainage area (the area directly above the saddle tanks) and the other was located aft of the central drainage area. When a U-boat surfaced, water would pour out of these vents.

In the drawings below I have replicated the vent patterns of these main groups for several U-boats. My primary reason for selecting these boats was that I had enough photos of them to identify all the vents. As several photos from different angles are required, it can often be difficult to ascertain the vent patterns on a particular boat.



Above: The port side of the main groups of free-flooding vents for six VIICs, one VIIB and the Revell kit.



Note that even although U 94 and U 201 were both built at the *Friedrich Krupp Germaniawerft A.G.* shipyards in Kiel, there were still small differences in their vent patterns.

Above: The starboard side of the main groups of free-flooding vents. Wohlfarth's U 556 and Suhren's U 564 both had the same vent patterns as U 552.

In the image above, the vents located forward of the central drainage area on the starboard side of U 552 can be seen. The 25 vents on the top row of the starboard side extended farther aft towards the central drainage area than on many other VIICs. I have also seen these extra vents on the starboard side of U 132, U 331, U 564, U 565, U 566, U 570 and U 751. All these boats had the same number of vents on the lower row as U 552 (14 vents), except for U 373 (12 vents) and U 751 (16 vents). I have also seen these extra vents on the starboard side on two unidentified boats built at the *Kieler Howaltswerken* shipyards in Kiel. As U 392 did not have them, these extra vents were not present on all *Kieler Howaltswerken* boats. Since these extra vents featured on boats from several different shipyards, and these shipyards produced boats without the extra vents, we cannot, unfortunately, specify that they were particular to one shipyard.

It can be seen from the drawings that the VIIB U 47 had even more vents directly ahead of the central drainage area (28 vents on the top row). These extra vents, present on both starboard and port sides of all VIIBs, are a characteristic of the VIIB that can be used to identify a VIIB from a VIIC.

By comparing the Revell vent patterns with the VIIC vent patterns, it becomes obvious that alterations should be made to the kit. In fact, the main groups on the Revell kit are not accurate for **any** VIIC. In the main four vent groups alone, 11 vents need to be drilled, 7 filled and 2 altered if U 552 is being depicted. A similar number is required for U 94: 10 drilled, 8 filled and 2 altered. In my opinion, Revell should have included the maximum number of vents for each group so that no drilling would have been required. Although this pattern would not have been accurate for any particular boat, it would have been a simple matter to fill in the necessary vents for the chosen boat.

The earliest VIICs had an unbroken line of 25 vents in the rear groups. When modelling these boats, four extra vents per side should be drilled out beneath the diesel exhaust outlets. Also in the rear groups is a vent located above the line of vents, just forward of the exhaust outlet. In the Revell kit this vent has been positioned above the wrong vent; it should be located one vent farther towards the stern. The vent at the rear of the rear group in the Revell kit is an oval hole that is the same as the rest of the vents. However, this rearmost vent was actually different in shape to the rest. It was the same height, but far narrower in width. In fact, it was almost circular in shape.

Except for the boats which had the extra vents on the starboard side, no drilling of the forward groups of the Revell kit is necessary. The vent patterns for the rest of the boats can easily be replicated by filling in the necessary vents.

The following is a partial listing of which boats had which patterns on the forward hull casing. This information has been derived from assessment of period photos. T designates the number of vents on the top row, B the bottom row.

Forward vents, port side	
Pattern	Boats
T18/B14	U 719, U754
T20/B10	U 929
T20/B14	U 617
T20/B16	U 69, U 94, U 95, U 96, U 97, U 201, U 205, U 357, U 673, U 1305
T20/B16*	U 373 (vent 13 on the bottom row – counting from the farthest forward vent – had two circles rather than an oval vent)
T21/B14	U 617, U 752
T21/B16	U 81, U 89, U 251, U 253, U 254, U 302, U 313, U 334, U 354, U 373, U 405, U 407, U 410, U 437, U 441, U 443, U 551, U 553, U 559, U 573, U 582, U 593, U 596, U 617, U 821, U 1058, U 1109, U 1192, U 1197
T21/B17	U 213 (VIID)
T28/B15	U 99 (VIIB)
T28/B19	U 45, U 46, U 47, U 48, U 51, U 100 (all VIIBs)

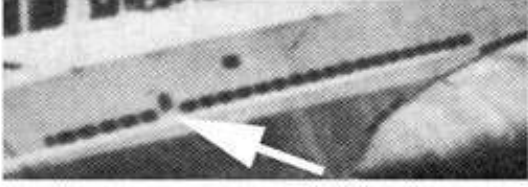

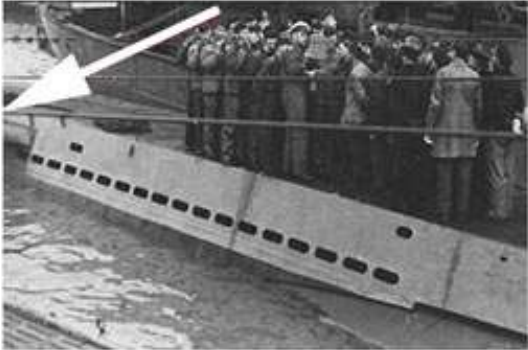

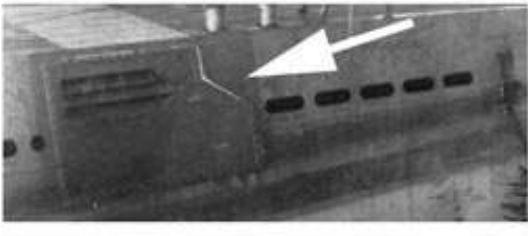
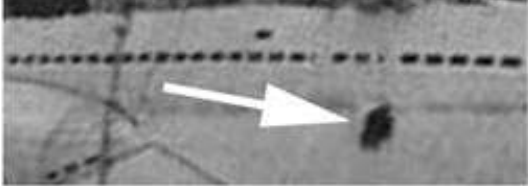
Forward vents, starboard side	
Pattern	Boats
T18/B13	U 1171 (vent missing on bottom row beneath the 4 th vent)
T18/B14	U 352, U 412, U 441, U 471, U 977, U 1165
T19/B14	U 270 (missing 1 st two vents on top row)
T20/B14	U 377
T20/B16	U 94
T21/B12+1	U 930 (extra vent above bottom row, in line with the 2 nd vent on the top row)
T21/B14	U 70, U 96, U 98, U 250, U 315, U 351, U 364, U 402, U 404, U 415, U 427, U 617, U 739, U 744, U 752
T21/B15	U 93, U 201, U 207, U 211
T22/B12	U 373 (the 22 vents were in the positions for 25 vent. Counting back from the farthest forward vent, the 19 th , 21 st and 22 nd vents are missing)
T22/B15	U 253, U 302
T22/B16	U 218 (VIID)
T24/B14	U 372 (vent 13 on the bottom row – counting back from the farthest forward vent – had two circles rather than an oval vent)
T25/B14	U 132, U 331, U 451, U 552, U 556, U 570
T25/B16	U 81
T28/B15	U 45, U 47, U 48, U 49, U 51, U 73, U 74, U 75, U 83, U 99 (all VIIBs)

When modelling a boat not listed above, refer to the VIIC batches at the end of the article. Then choose the closest U-number that was built in the same batch, or failing that the closest U-number in the same shipyard. The pattern may be similar or even identical.

Diesel exhaust outlets

Type VIIIs had two diesel exhaust outlets, located on either side of the hull casing, usually above the line of vents in the rear main group. As the war progressed, the design of these outlets changed. New boats were fitted with the latest style, while boats that were in service were modified with the latest style during refits.

The earliest style (which I have called style 1) was a circular outlet located along the line of vents in the main rear group. This style featured on the early VIIBs in the batches U 45 to U 55 and U 99 to U 102, but not on the VIIBs from other batches or any VIICs. These round outlets were modified on famous VIIBs such as U 47, U 48, U 99 and U 100 to the original VIIC oval outlet (style 2). Style 2, the style in the Revell kit, has a large oval hole above the line of vents.

	STYLE 1 VIIB only U 99 12th March 1940
	STYLE 2 U 93 8th June 1940
	STYLE 3 U 552 (shrouded)
	STYLE 4 U 442 12th January 1942
	STYLE 5 U 1003 December 1943
	STYLE 6 Late war

Above (1a-1f): The holes pointed to with arrows are not free-flooding vents but one of the two diesel exhaust outlets. At least four styles of exhaust outlet can be seen in photos of VIICs.

Other VIIBs such as U 73 were launched with style 2, and never had the round outlet (style 1) that was standard on the earliest VIIBs. All early VIICs such as U 69, U 94, U 96, U 201, U 332, U 352, U 402, U 552, U 556, U 564, U 581, U 617 and U 651 had style 2.

On some U-boats, such as U 87, U 96 and U 552, a shroud (style 3) was added over style 2 at some stage in their careers. The shroud directed the exhaust gases downward so that the boat would be rendered less visually detectable. There were differences in the shroud designs. In 1942, U 751 had a shroud over the outlet, plus two holes beneath the shroud.

Then, at some stage beginning in late 1941 or so, boats coming down the slipways sported a new style of exhaust outlet. This outlet (style 4), which featured upon U 209, U 227, U 253, U 302, U 441 and U 704, had an almost rectangular shape with two squares below. This style was ordered on the 6th December 1940 but it would be a number of months until it was implemented. The late VIIBs U 83 and U 86 also sported style 4. A lip was added at the top of some style 4 outlets to keep the exhaust smoke from rising up.

In 1942 another exhaust outlet (style 5) was introduced. This style had two horizontal bars positioned at an angle that directed the exhaust gases downwards. Style 5 featured on U 226 when it was launched on the 18th June 1942. It is likely that by the autumn of 1942 all new U-boats launched had style 5. Subsequent U-boats, including U 241, U 995, U 1003 and U 1305 sported this last style of outlet.

By the late stages of the war, Allied aircraft were forcing U-boats to spend most of the time underwater. This was the opposite to the start of the war, when they had spent most of the time on the surface. Since so much time was spent underwater, it was no longer necessary to keep the exhaust outlet above the waterline. The last style of outlet (style 6) was introduced below the waterline. Now that the outlet was lower down, well below the line of free-flooding vents, more vents could be added. There was now an almost a complete line of vents on the aft casing.

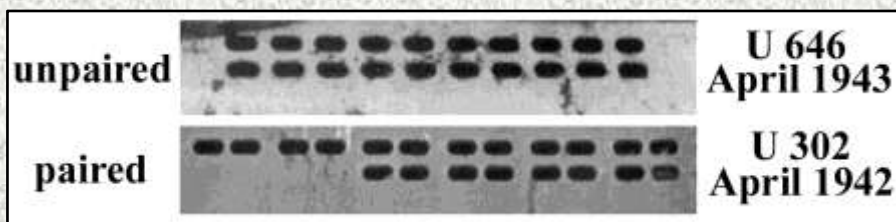
It is important to remember that some boats had different styles of outlet at different times. For example, U 203 was retrofitted with style 4 at some stage prior to April 1943, having originally had style 2 when launched.

Medium-sized vents above central drainage area

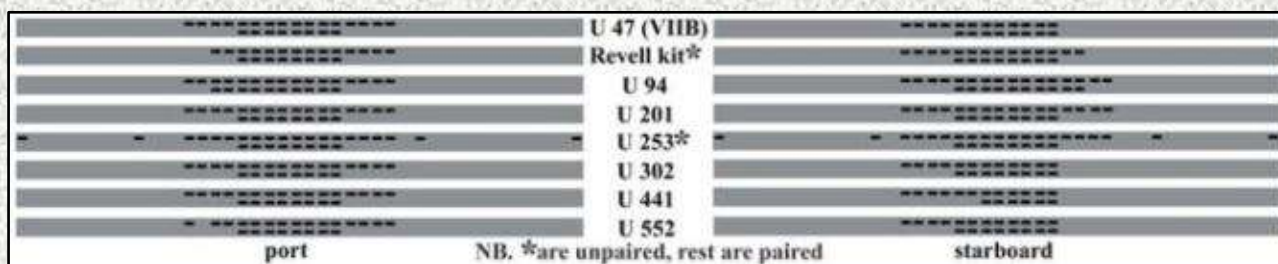
It was commonplace for the medium-sized vents located above the large central drainage area (above the saddle tanks) in the early boats to have been arranged in pairs. The early VIIC style of paired vents was changed at some stage to a later style in which these medium-sized vents were evenly spaced apart (unpaired).



Above (2): There are always exceptions and peculiarities in regard to the Type VII. As pointed out by Bill Gordon, the Type VIIB U 73 had a different outlet when the boat served in La Spezia. This consisted of a shroud over the style 4 outlet.



Left (3a & 3b): A comparison between paired and unpaired vent patterns.



Above: The medium-sized vents above the central drainage area were rarely the same on port and starboard sides. There were usually fewer on the starboard side.

There were some boats which had 4 extra single medium-sized vents on the port side and 4 extra single medium-sized vents on the starboard side. The U-boats which sported this pattern include U-numbers 74, 80, 81, 82, 83, 132, 136, 202, 251, 253, 267, 269, 275 and 278. As all these boats were built in the *Bremer Vulkan-Vegesacker Werft* shipyard in Vegesack, this pattern appears to be particular to boats built in this shipyard. The medium-sized vents on the U-boats from Vegesack were evenly spaced apart (unpaired). This was unusual for U-boats built at the start of the war, since all the boats from other shipyards had these vents arranged in pairs.

There are always exceptions in relation to the vent patterns. For example, on the top row of the forward pattern on U 390 the 11th vent back was missing. Similarly, on the top row of the forward pattern on U 442 the 14th vent back was missing.

There are a few vents missing in this area of the Revell kit. Should U 94 be chosen as a subject, 8 vents have to be drilled. As with the main groups, it would have been more prudent of Revell to have chosen a pattern which had the maximum number of vents, for it is always easier to fill than drill.

The Revell model has the medium-sized vents evenly spaced apart, as was the norm on the mid-to-late war VIICs. This is good news for those modellers who are converting their Revell kit into a mid-to-late war boat, or building a U-boat that originated from the *Bremer Vulkan-Vegesacker Werft* shipyards. However, it is not such good news for those of us who wish to make an early VIIC, which the kit is meant to depict. To accurately model an early VIIC, the unpaired (evenly spaced apart) pattern on the kit should be altered to the pattern in which the vents are arranged in pairs. This is not the easiest of tasks, and one which many modellers would prefer not to have to undertake.

The following is a partial listing of which boats had which patterns above the saddle tanks. This information has been derived from assessment of period photos. T designates the number of vents on the top row, B the bottom row. Type VIIBs and VIIDs are included in the list.

Medium vents above saddle tanks, port side	
Pattern	Boats
T13/B8	U 239
T13/B10	U 249, U 978, U 1064
T14/B10*	U 673 (*evenly spaced)
T15/B8	U 432, U 552, U 559, U 571, U 575, U 595, U 596, U 612, U 617, U 628
T16/T8*	U 97, U 707 (*evenly spaced)
T16/T8	U 47, U 52, U 69, U 71, U 74, U 86, U 87, U 101, U 201, U 202, U 203, U204, U212, U 213, U 226, U 227, U 302, U 332, U 333, U 354, U 357, U 437, U 654, U 659, U 755 (all paired. Note that the vents on U 69 were unevenly distributed)

T16/B10	U 93, U 94
T17/B8*	U 81, U 83, U 132, U 202, U 251, U 252, U 402 (*evenly spaced. These are the <i>BremerVulkan-Vegesacker</i> boats with the extra 4 vents)

Medium vents above saddle tanks, starboard side	
Pattern	Boats
T9/B9*	U 427 (*evenly spaced)
T10/B10*	U 249, U 646, U 977, U 995 (*evenly spaced)
T12/B6	U 441
T12/B8	U 46, U 47, U 48, U 52, U 53, U 73, U 302, U 331, U 352, U 353, U 354, U 392, U 404, U 408, U 552, U 566, U 651, U 701, U 739
T16/B8	U 71, U 203, U 213, U 375, U 208
T16/B10	U 93, U 94, U 201
T17/B8	U 302
T20/B8*	U 74, U 81, U 132, U 136, U 253 (*evenly spaced. These are the <i>Bremer Vulkan-Vegesacker</i> boats with the extra 4 vents)

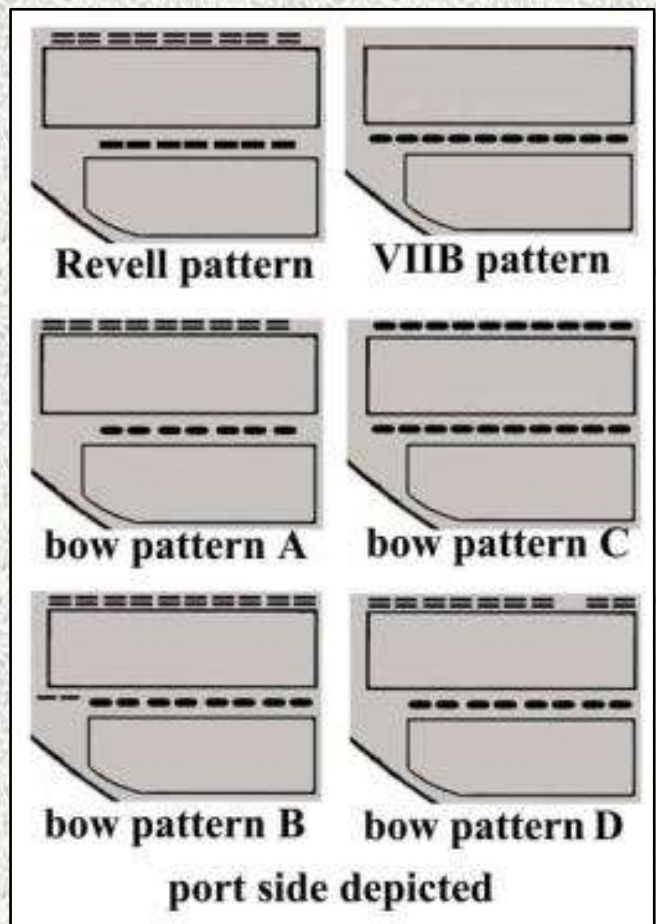
Vents near torpedo doors

Type VIICs had a row of vents between the torpedo doors, plus a double row of smaller elongated vents above the upper doors. Since most photos of VIICs were taken of the U-boats in the water, this area is most often hidden from view. As such, it often proves difficult to ascertain which bow vent pattern featured on a particular boat.

U 228 and U 1064 had the arrangement that I have called “bow pattern A.” This pattern had seven paired medium-sized vents between the doors and nine double rows of paired elongated vents above the upper doors. It is likely that all the boats which were built in the same batches as U 228 and U 1064 also had pattern A. Both of these boats were built at the *Friedrich Krupp Germaniawerft A.G.* shipyards in Kiel.

A higher percentage of U-boats had the arrangement that I have called “bow pattern B,” with eight paired medium-sized vents between the doors and ten double rows of paired elongated vents above the upper doors. The boats included U-numbers 69, 94, 333, 407, 441, 451, 458, 471, 551, 559 and 703. Some had the additional two elongated vents towards the stem, whereas some did not.

A much rarer pattern, bow pattern C, consisted of ten unpaired medium-sized vents between the doors and ten unpaired medium-sized vents above the upper doors. I have seen this pattern only once, in a photo of a VIIC dry-docked in Samalis in 1942.



Above: This drawing illustrates the differences in the vent patterns near the port torpedo doors. The starboard vent patterns were the mirror image of the port vent patterns.

Bow pattern D is also a rare pattern, which was found on U 929.

The early Type VIIBs had ten unpaired medium-sized vents between the doors (as in bow pattern C) but none above the upper doors. I have not seen any photos of late VIIBs in which this area of the hull casing is exposed, so I cannot say which pattern was present on the late VIIBs.

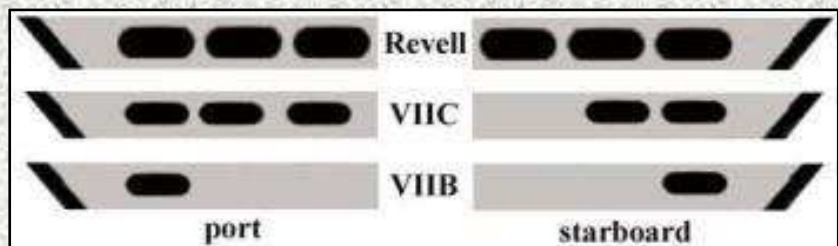
Bow pattern A is the pattern depicted in the Revell kit. As many popular subjects such as U 69, U 96, U 201 and U 552 all had pattern B, an extra six vents need to be drilled for these boats. Accuracy in this area becomes ever more difficult when it is realised that the torpedo doors are too long in the Revell kit. In fact the upper torpedo doors are **a full 7mm** too long in length. By shortening the doors to their correct length, the line of vents then appear too long in length also.

Many modellers will consider these inaccuracies to be of no major concern. What they might be more concerned about in the Revell kit is the basic shape of the vents in this area. The vents were all oval in shape, but for some reason they are rectangular on the Revell kit.

Two/three vents next to stem

The medium-sized vents right next to the stem, above the level of the upper torpedo doors, are too large in size in the Revell kit. On the majority of VIICs there were three vents to port and two to starboard, rather than the three per side which feature on the Revell kit. Note also that the third vent from the stem on the port side was offset slightly from the second vent. Early Type VIIBs had only one vent next to the stem rather than the two/three that were present on VIICs. I have not seen any photos of late VIIBs in which this area of the hull casing is exposed, so I cannot say which pattern was present on the late VIIBs.

Right: The oval vents right next to the stem, above the level of the upper torpedo doors.

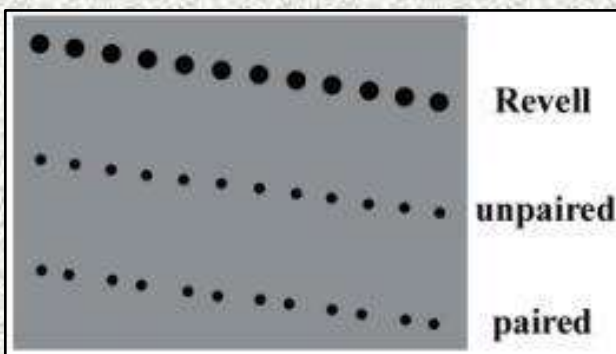


Twelve circular vents above torpedo doors

On each side of the hull, there were a line of twelve small circular vents located well above the upper torpedo door. Most U-boats had these vents arranged with an even space between them (unpaired). This unpaired pattern is the style present in the Revell kit.

A smaller proportion of U-boats had these vents arranged in pairs. The paired arrangement featured in *Blohm & Voss* boats such as U 552, U 556 and U 564. Should any of these boats be chosen as a subject, this line of vents on the Revell kit should be altered to a paired pattern.

One of the most noticeable inaccuracies in the Revell kit is that these twelve vents are **much** too large in the Revell kit. Since the line of vents is also too far forward in the Revell kit, it is easy enough to rectify both these problems: simply fill in the holes in the kit and drill new and smaller ones just aft of each of the filled holes.



Left: The difference in diameter between the circular vents on VIICs and the large vents in the Revell kit is obvious.

Curved line of vents above central drainage area

The VIIBs and the earliest VIICs originally featured breakwaters (Revell parts 115 and 116) on the hull casing above the forward part of the central drainage area. These breakwaters were positioned outboard of the 88mm deck gun to help reduce the interference to the gun crew from waves. An order to remove the breakwaters was issued on the 29th May 1941. However, a few boats such as U 96 had the breakwaters removed earlier than this date.

The breakwaters were replaced by a curved line of small circular vents of varying size. These vents allowed for a marginal improvement in diving times. Sometimes the vents in the curved line were evenly spaced (unpaired), as in the Revell kit, but more often the vents were arranged in pairs.



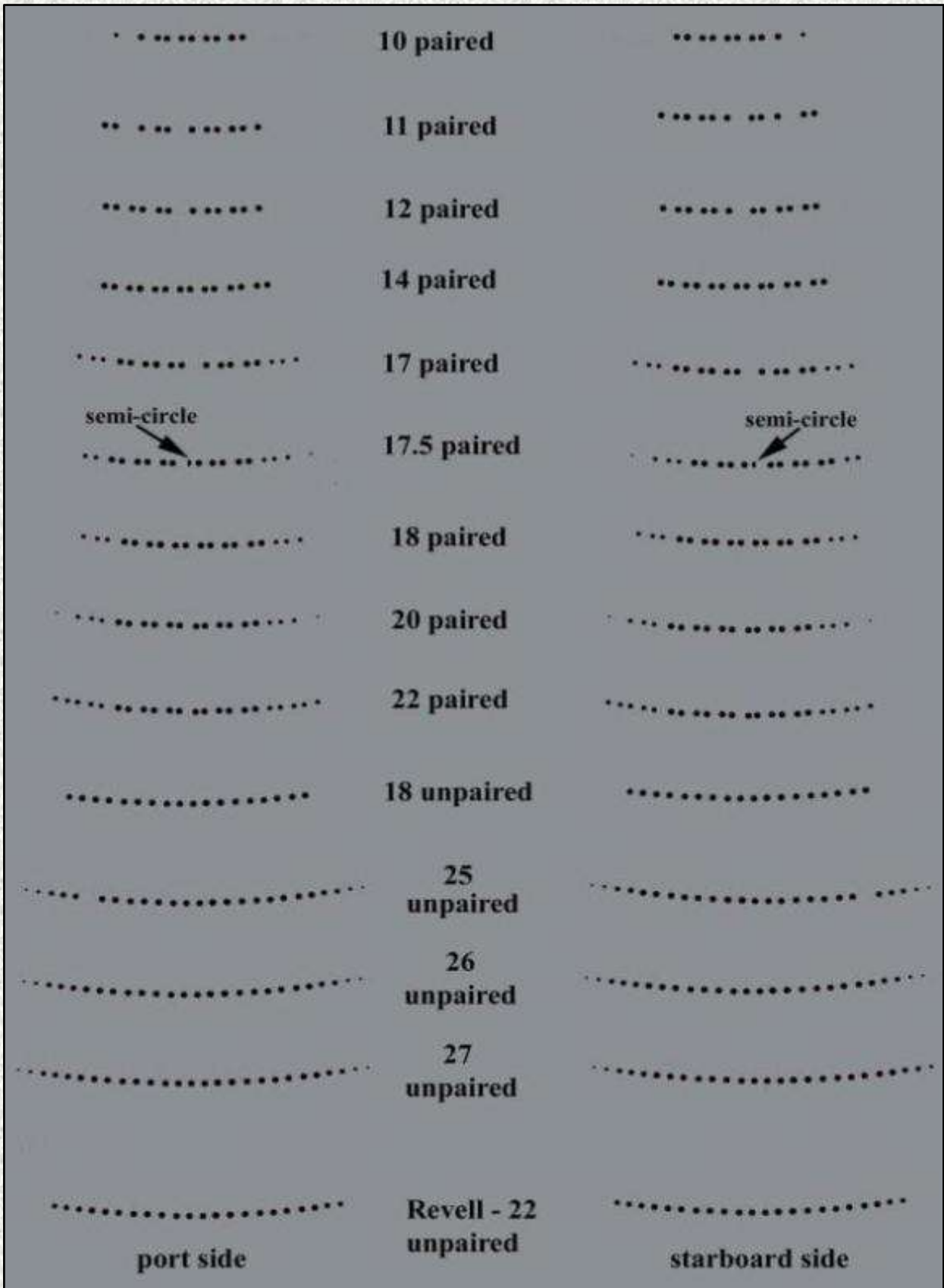
Left (4): The curved line of vents on the port side of U 82. Note that the 17 vents are arranged in pairs.

Below is a short listing of which boats had which patterns -

Curved line patterns	
Pattern	Boats
10 paired	U 570
11 paired	U 75
12 paired	U 74
14 paired	U 83
17 paired	U 81, U 82, U 202, U 251, U 253, U 254, U 451, U 559 and U 565
17 paired plus semi	U 552 (different to normal 17 paired pattern)
18 paired	U 89, U 132, U 302, U 303, U 331, U 373 and U 404
20 paired	U 564
22 paired	U 377
18 unpaired	U 392 and U 402
25 unpaired	U 204
26 unpaired	U 94, U 96, U 201 and U 202
27 unpaired	U 93

The Revell kit has 22 evenly-spaced (unpaired) vents, so four extra small holes need to be drilled on each side to replicate the 26 unpaired pattern. The paired patterns require more drilling and filling.

By December 1941 the policy of drilling extra vents in this area was discontinued. Every boat launched during December 1941 (and some before this date) did not have the curved lines. U 226, U 239, U 267, U 302, U 357, U 404, U 412, U 441, U 995 and U 1064 are all examples of boats which never had these lines. The curved lines were gradually removed in operational boats over a period of time. There were even some early U-boats such as U 203 and U 571 which didn't have the curved lines, even when other boats did.

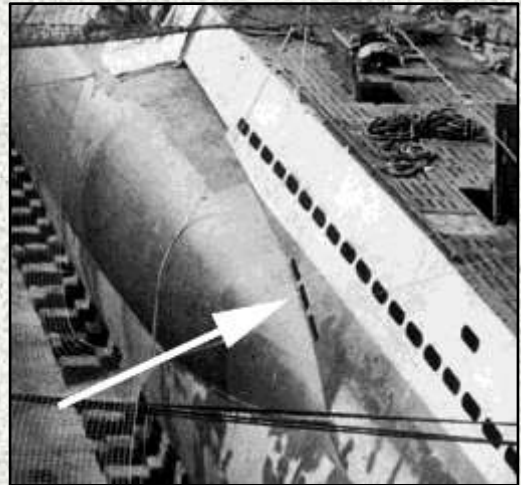


Above: Several different curved line patterns were present above the central drainage area of VIICs.

Three vents at rear of saddle tanks

The three elongated vents on the hull casing next to, and very slightly above, the rear of the saddle tanks are missing from the Revell kit.

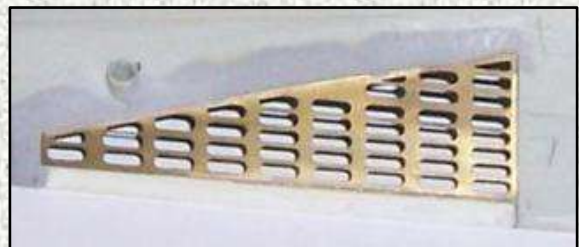
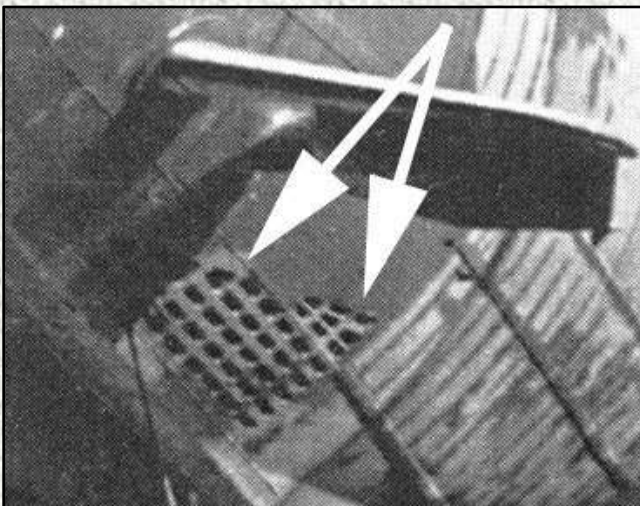
Right (5): The three vents immediately beside the saddle tanks were more elongated in shape than the main vents above.



Vents behind forward hydroplanes

There are very few clear photos in books of the pattern of vents behind the forward hydroplanes, nor are there side profiles or drawings which can be relied upon. What can be established from these few photos is that the pattern is a little too simplified in the Revell kit and, more importantly, the vents in the kit are rectangular when they should be oval in shape.

The photo-etched upgrade set from Modelbrass includes parts to replace this area of the Revell kit. The pattern in the set resembles the shape and pattern found in the museum VIIC/41 U 995. An extra group of 7 vents (slightly offset from the main group) were not a feature of U 995. This extra group needs to be filled in if U 995 were to be modelled. It is possible that all late U-boats did not have this extra group.



Above left (6): The right hand arrow on this photo of the VIIB U 99 points to a small group of vents that were present in some VIICs, but not in others. Above and forward of the vents are the port hydroplane and its guard.

Above right (7): The area behind the forward hydroplanes can be greatly improved with the Modelbrass set, fitted to the author's model in this photo.

Vents near rear hydroplanes

As with many of the vents in the Revell kit, the vents behind the rear hydroplanes are also rectangular when they should be oval in shape. The pattern of vents in the Revell kit is also too basic.

Photos which show the pattern of small vents near the rear hydroplanes are even rarer than the group behind the forward hydroplanes. Due to the scarcity of photographic material, the pattern visible in photos of the museum VIIC/41 U-boat U 995 was used for the Modelbrass set.



Left (8): By comparing this photo with the Revell kit, it becomes apparent that the vents in front of the port propeller were more numerous, and different in shape, to those in the model kit. The perforated plates may be sacrificial anodes (thanks to AMP forum member Pat).

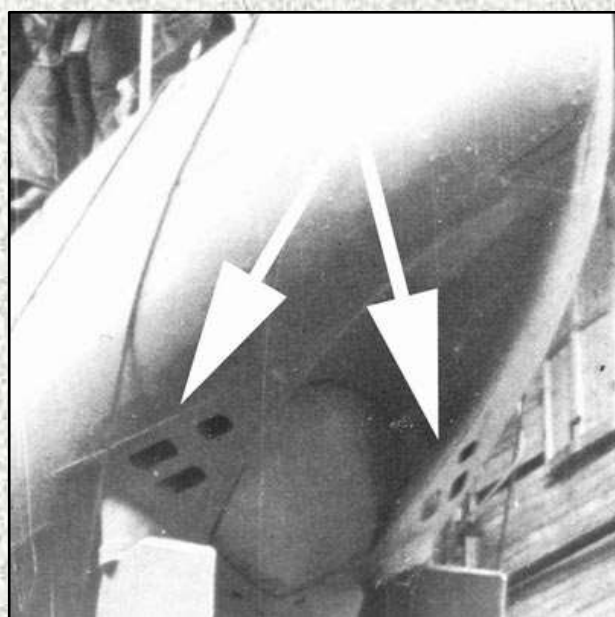
Below left (9): Although tricky to fit, the Modelbrass set greatly improves the pattern of vents behind the rear hydroplanes.



Vents aft of the rudders

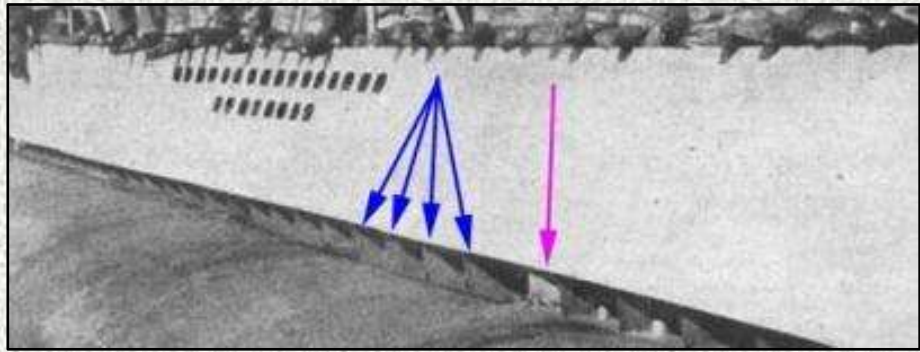
The two sets of three vents immediately aft of the rudders are reasonably accurate in the Revell kit.

Right (10): Between the two sets of three vents is the aft torpedo door.



Part III - Central Drainage Area

While it is not essential to drill out the central drainage area, some modellers have chosen to do so. The hull casing above the central drainage area becomes much weaker as a result, so great care is needed when handling a hull piece that has had this area drilled out.

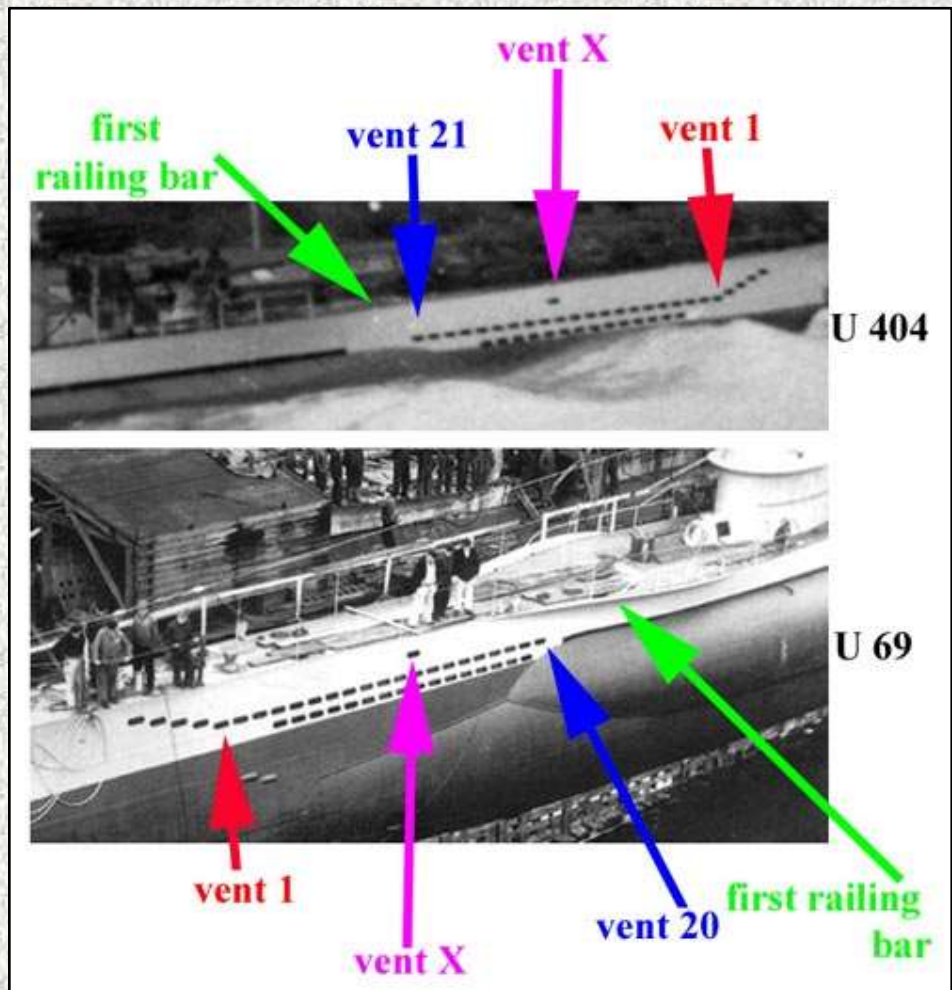


Above (11): The blue arrows point to the thin ribs while the magenta arrow points to one of the two thick round supports on either side.

U-boats had ribs which were spaced at regular 60cm intervals. These ribs could be seen in the central drainage area if viewed from a suitable angle. By adding vertical strips to represent these ribs, the hull casing above the central drainage area becomes much less prone to damage. In addition to the ribs were four thicker supports (two on each side).

Below (12a & 12b): A comparison between the front end of the central drainage area on port and starboard sides.

One aspect of the VIIC that is rarely discussed is the different lengths of the central drainage area on either side. The central drainage area on the port side was actually shorter in length than on the starboard side. While this does seem strange, assessment of period photos show this to be true. Once one has appreciated the different lengths, it then becomes very obvious when looking again at photos.





Above (13): Some VIICs such as U 373 above had 25 vents on the top row on the starboard side.

We will first look at the starboard side in the image below. If we go to the top row, then count back from the farthest forward vent, we count 21 vents. Vent X is the single vent above the top row, and was above the 12th vent from the front. We can plainly see that the central drainage area begins a good distance behind vent 21. The green arrow points to the very front of the deck railings. The front of the railings is located behind vent 21 and **forward** of the front of the central drainage area.

Now we look at the image above, which shows the port side of U 69. There are 20 vents on the top row. The front of the central drainage area starts not far behind vent 20. In fact it starts just behind where vent 21 would have been. The VIICs had a maximum of 21 vents on the top row. The start of the drainage area always started just behind vent 21, or where vent 21 would have been in the case of the boats with 18 or 20 vents. The green arrow

points to the front of the deck railings. We can see it is well behind the start of the central drainage area.

A number of VIICs had 25 vents on the top row on the starboard side. The central drainage area started directly behind vent 25, as can be seen above. In fact, the central area on the starboard side **always started at this same location**, regardless of the number of vents. On boats with 21 vents, if we count back to where the 25th vent would have been, the central area starts directly behind this point.

The four vents that were arranged diagonally were at the same location on the port and starboard sides, as was vent X. So vent 21 on the port side was directly opposite vent 21 on the starboard. The rear of the central area started at the same location on port and starboard sides. The central drainage area **always** started just behind vent 21 on the port side, and just behind vent 25 on the starboard side. Given the above facts, we are faced with an obvious conclusion –

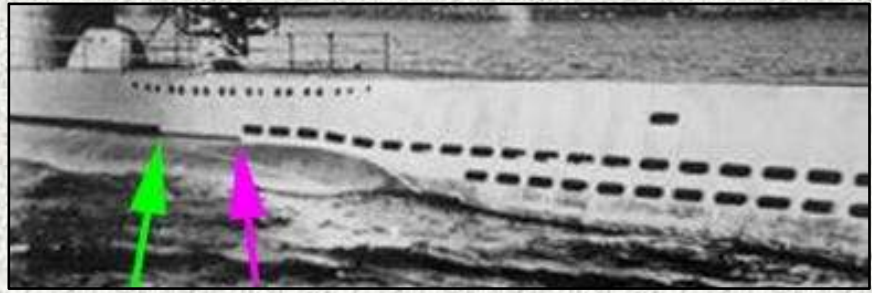
- the central drainage area was shorter on the starboard side
- the front end of the central drainage area began farther back on the starboard side than on the port side

For those who still cannot accept this, look at the position of the front bar of the deck railings. The starboard and port deck railings were positioned at the same position on either side of the deck, giving ideal reference points. On the starboard side the bar is ahead of the central area, while on the port side the bar is well behind the start of the central area.

Once we understand the different central area lengths, it becomes obvious in all photos. Now we can often see the difference without needing to count vents or look at the deck railings.

But how wide was the length difference between either side? The distance equates to four vent widths. On the Revell kit this is 28mm, giving a real difference in length of around 2 metres. The Revell kit is completely wrong in this respect, with the central area starting 5mm behind vent 22 on both sides. To accurately fix the kit, we should drill away an area of 11mm in length at the front end of the port area. And on the starboard side, we should fill in the front 15mm of the central area.

There were, quite naturally some exceptions. This is the Type VIIC we are studying, after all! On some boats the starboard central area did start at the usual location just behind vent 25. But for a distance of around three vent widths the front of



Above (14): This photo of U 331 shows that the main drainage slot on the starboard side started directly behind vent 25 (at the magenta arrow) but was very narrow in height for a distance. Farther back (at the green arrow) it widens out to be the normal height.

Left (15): The photo of U 441 shows that this boat also had a narrow slit at the front of the starboard drainage area. The photo also shows blanking plates behind three vents. This feature was not that common but can be found in some VIIC photos. The area this usually occurred was at the rear of the main set of vents on the starboard side.

the area is very narrow in height. The area here is more of a slit than a wide gap.

Another interesting aspect of the photo above regards vents 20 to 25. The top row from vents 1 to 19 are all in a neat straight line. But the five vents from 20 to 25 curve up slightly, and are slightly higher than the rest. This was likely done to keep an appropriate distance between vents 20 to 25 and the top of the saddle tank below. The crooked top row did occur on some other boats, while many others such as U 552 had a nice straight top row.

Part IV - Type VII U-Boat Batches

Type VII U-boats built and commissioned into Kriegsmarine

Type VIIA batches (10)	
Shipyard	U-numbers
<i>A G Weser, Bremen (6)</i>	27-32
<i>Germaniawerft, Kiel (4)</i>	33-36

Type VII B batches (24)	
Shipyard	U-numbers
<i>Germaniawerft, Kiel (15)</i>	45-51, 52-53, 54-55, 99-102
<i>Flender-Werft, Lübeck (5)</i>	83-87
<i>Vegesacker Werft, Vegesack (4)</i>	73-76

Type VIIC batches (574)	
Shipyard	U-numbers
<i>Danziger Werft, Danzig (32)</i>	401-404, 405-408, 409-412, 413-416, 417-420, 421-424, 425-428, 429-430, 1161-1162

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	(NB. 429-430 & 1161-1162 were in the same batch)
<i>F Schichau, Danzig (62)</i>	431-434, 435-438, 439-442, 443-444, 445-448, 449-450 & 731-734, 735-740, 741-746, 747-750, 825- 826, 1191-1198, 1199-1204, 1205-1210 (NB. 449-450 & 731-734 were in the same batch)
<i>Nordsee-Werke, Emden (26)</i>	331-334, 335-336, 337-338, 339-340, 341-344, 345-348, 349-350, 1101-1102, 1103-1106 (NB. 349-350 & 1101-1102 were in the same batch)
<i>Flensburger SchiffbauGesellschaft, Flensburg (20)</i>	351-354, 355-358, 359-360, 361-362, 363-366, 367-370
<i>Blohm & Voss, Hamburg (144)</i>	551-558, 559-562, 563-574, 575-586, 587-598, 599-610, 611-634, 635-646, 647-650, 951-958, 959-982, 983-994 (NB. 647-650 & 951-958 were in the same batch)
<i>H C Stülcken Sohn, Hamburg (24)</i>	701-706, 707-708, 709-710, 711-714, 715-718, 719-722, 905 & 907
<i>Howaltswerke, Hamburg (33)</i>	651-662, 663-668, 669-674, 675-680, 681-683 (684-686 not finished)
<i>Deutsche Werke, Kiel (30)</i>	451-454, 455-458, 465-468, 469-474, 475-480, 481-486
<i>Germaniawerft, Kiel (58)</i>	69-70, 71-72, 93-98, 201-204, 205-212, 221-226, 227-232, 235-240, 241-246, 247-250, 1051-1058 (NB. 69-70 & 93-98 were in the same batch)
<i>Howaltswerken, Kiel (32)</i>	371-374, 375-382, 383-386, 387-390, 391-394, 395-398, 399-400, 1131-1132 (NB. 399-400 & 1131-1132 were in the same batch)
<i>Flender-Werft, Lübeck (23)</i>	88-92, 301-302, 303-304, 305-308, 309-312, 313-316, 903- 904
<i>Neptun-Werft, Rostock (8)</i>	921-924, 925-928
<i>Stettiner Orderwerke, Stettin (2)</i>	821-822
<i>Stettiner Vulcan Werke, Stettin (1)</i>	901 (902 suffered bomb damage and cancelled – not commissioned)
<i>Veegesacker Werft (Bremen Vulcan), Vegesack (52)</i>	77-82, 132-136, 251-255, 256-261, 262-267, 268-273, 274-279, 280-291
<i>Kaiserliche Marinewerft, Wilhelmshaven (27)</i>	751-762, 763-768, 771-776, 777-779

Type VIIC/41 batches (88)	
Shipyard	U-numbers
<i>Danziger Werft, Danzig (10)</i>	1163-1166, 1167-1170, 1171-1172
<i>F Schichau, Danzig (2)</i>	827-828
<i>Nordsee-Werke, Emden (4)</i>	1107-1110
<i>Flensburger Schiffbau Gesellschaft, Flensburg (8)</i>	1301-1304, 1305-1308
<i>Blohm & Voss, Hamburg (29)</i>	995-1006, 1007-1010 & 1013-1018, 1019-1025
<i>Germaniawerft, Kiel (3)</i>	1063-1065
<i>Flender-Werft, Lübeck (12)</i>	317-322, 323-328
<i>Neptun-Werft, Rostock (2)</i>	929-930
<i>Veegesacker Werft (Bremen Vulcan), Vegesack (18)</i>	292-297, 298-300, 1271-1273, 1274-1279 (NB. 298-300 & 1271-1273 were in the same batch)

Type VIID batches (6)	
Shipyard	U-numbers
Germaniawerft, Kiel (6)	213-218

Type VIIF batches (4)	
Shipyard	U-numbers
Germaniawerft, Kiel (4)	1059-1062

Additional boats not finished

The above tables show all of the VIIs that were commissioned into the Kriegsmarine. However, there were a number of boats which were partially built before they were cancelled. There confusion over these boats can cause discrepancies in the total numbers of VIIs built. The lists below show the partially built VIICs and VIIC/41s that weren't commissioned into the navy -

Boats that had keels laid down and were launched -

VIICs 902, 906 (2 boats)
 VIIC/41s 1026-1030, 1173-1176 (9 boats)

Boats that had keels laid down but were not launched -

VIICs 684-686, 780-781, 823-824 (7 boats)
 VIIC/41s 329-330, 687-689, 723-724, 931-932, 1011-1012, 1031-1032, 1133-1136,
 1177-1179, 1280-1282 (17 boats)

Other boats were ordered but cancelled before the keels were laid down.

Part V - References & Photo Sources

References

Köhl, Fritz and Niestle, Axel. *Vom Original zum Modell: Uboottyp VIIC*. Bernard & Graefe Verlag, 1997.
 Rössler, Eberhard. *Die Deutschen Uboote und ihre Werften*. Bernard & Graefe Verlag, 1990.
 Westwood, David. *Anatomy Of A Ship: The Type VII U-Boat*. Conway Marine Press, 2003.

Photo sources

Breyer, Siegfried and Koop, Gerhard. *The German Navy At War 1935-1945 Volume 2: The U-Boat*. Schiffer Military History.

⊕ 10.

Köhl, Fritz and Niestle, Axel. *Vom Original zum Modell: Uboottyp VIIC*. Bernard & Graefe Verlag, 1997.

⊕ 1b, 1e, 3a.

Martindale, Dougie.

⊕ 7, 9.

Nowarra, Heinz J.. *Grey Wolves of the Sea: German U-Boat Type VII*. Schiffer Military History, 1992.

⊕ 1a.

Rössler, Eberhard. *Die deutschen U-Boote und ihre Werften*. Bernard & Graefe Verlag, 1990.

⊕ Cover (top), 3b, 13, 14.

Showell, Jak P. Mallmann. *U-Boats In Camera*. Sutton Publishing, 1999.

⊕ 1d, 15.

Stern, Robert C.. *U-Boats In Action*. Squadron/Signal Publications, 1977.

⊕ 4.

Westwood, David. *Anatomy Of A Ship: The Type VII U-Boat*. Conway Marine Press, 2003.

⊕ Cover (bottom).

Wiper, Steve. *Warship Pictorial #27: Kriegsmarine Type VII U-Boats*. Classic Warships Publishing, 2004.

⊕ 5, 6, 8.

<http://www.u552.de>

⊕ 1c.

Note: More comprehensive drawings of Type VIIC and VIIC/41 vent patterns can be found in the AMP article “Askania, Side Cushions & Updated Type VII Vent Patterns” written in 2021.

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