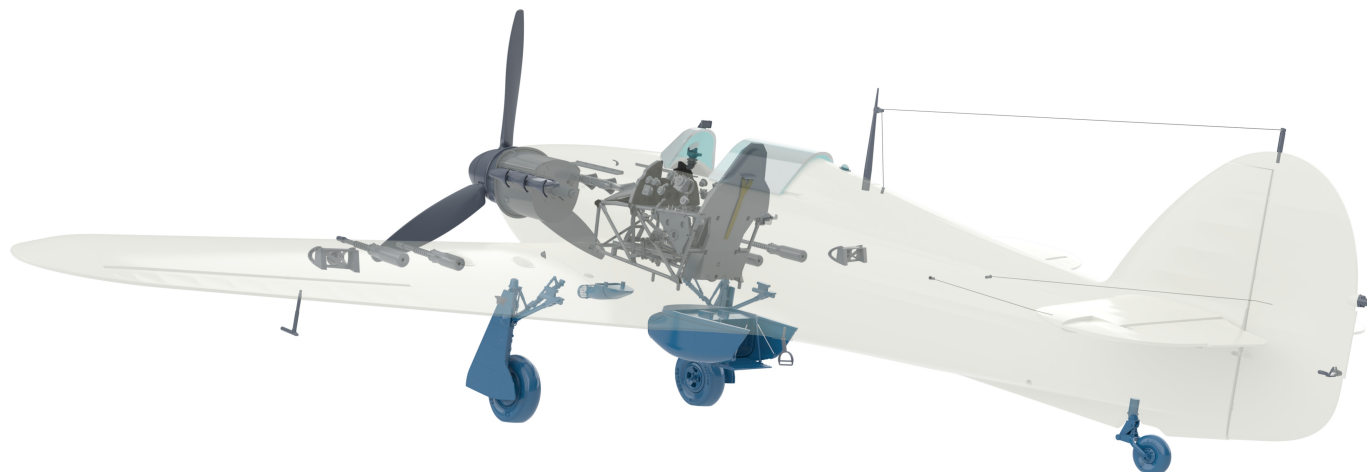


Introduction



This guide is intended for those who wish to upgrade their Hurricane Mk.II model using 3D-printed parts. Many of these parts are also compatible with Hurricane Mk.I and Mk.IV models, as well as various versions of the Sea Hurricane. A list of 3D parts, along with notes on their compatibility, can be found in the Google Sheets spreadsheet available here:

https://docs.google.com/spreadsheets/d/1Q7tAWAIT60jpPy1jU_7EKsZISYckYb5a6ieTrw43BP4/edit?usp=sharing

Some of the 3D parts are available for free at www.pme.org.pl. A link to download them is provided at the end of each build report for my Hurricane Mk. IIm models. For example, see the link in Karel Kuttelwascher's build article for the Hurricane Mk. IIc. These elements are shown in grey in this document.

<https://pme.org.pl/2023/12/30/hawker-hurricane-mk-iic-1-squadron-raf-tangmere-karel-kuttelwascher-arma-hobby-1-48/>

The blue coloured parts are 3D-printable digital models, which are sold on the official Arma Hobby online store.

<https://www.armahobby.pl/category/pliki-3d>

The 3D models of the cockpit interior have been designed so that you can use the instrument panel and other components from Yahu's excellent photo-etched set (YMA4917):

<https://www.yahumodels.com/produkt/hurricane-mk-ii-3/>

If you have photo-etched parts from another manufacturer's model kit, there's a good chance they'll also fit the 3D-printed base from the PME set.

The 3D-printed seat with moulded-in seat belts included in certain Arma Hobby Hurricane Mk.II kits will also fit the PME 3D-printed cockpit. However, you may prefer to use photo-etched Sutton Harness parts from another manufacturer, such as the excellent HGW set numbered HGW148544. In this case use the printable seat without the seatbelts moulded in.

The kit also requires various types of rods, transparent film and elastic rigging wires which cannot currently be produced by current 3D printing technologies. These are described in detail in subsequent steps of the instructions.

Most of the parts included in the PME and Arma Hobby kits are very delicate. Don't skimp on printing several copies of the fuselage truss and the main landing gear. They are very easy to damage when removing the support structures and during painting. Very small parts are usually designed in sets of four on a single base.

When printing, it is best to use shorter exposure times rather than longer ones. To

minimise 'step marks' on the print, flat vertical elements — such as the landing gear with doors — should be rotated at a 45° angle so that, when viewed from above, these flat surfaces are at an angle to the build plate's axis. For parts that are meant to fit inside one another, such as the undercarriage legs, tyres and wheel hubs, it's a good idea to use a resin that maintains its geometry well and has low light transmittance to minimise resin buildup on the lower surfaces around the supports. An example of such a resin is Phrozen Aqua 8K. This increases the likelihood that the hubs will snap into the tyres without requiring extensive sanding.

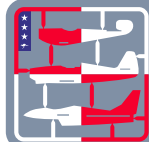
Conversely, thin, long parts such as antenna masts, propeller blades and anti-glare panels (the characteristic trapezoidal shields on the sides of the fuselage) should be treated in the opposite way. It is better to print these parts using a slightly flexible resin with high light transmittance, and to use longer exposure times. Heygears PAP10 is an example of such a resin. The advantage of low light transmission, which was described above, actually works against the modeller here because, after printing and during the final curing process, the outer layers cure more than the interior of the part and undergo different shrinkage rates. This usually results in the part warping.

Pages 2 to 5 show diagrams explaining the differences between the various production series of the Hurricane Mk. II where alternative 3D-printed parts are required. The instructions for using the printed parts begin on page 6. Before you start gluing, it's a good idea to review the entire manual to understand which model parts are being replaced and by which ones. The order of the assembly steps is based on personal experience of the build process. For example, it is best to paint the entire airframe after reaching step 64. Attaching additional 3D-printed parts to the model complicates the painting process and may cause them to break off during intensive masking and handling of the model while painting. Of course, you are under no obligation to use all the 3D parts. However, it's worth noting that the propeller from the PME set, for example, can only be installed without modification in the printed nose section featuring the imitation engine also from the PME set.

For gluing, use cyanoacrylate (CA) adhesive; in areas exposed to light, use UV-curing adhesive. In some cases, it is recommended to use a white adhesive, such as AK Ultra Glue. However, this latter option is always specified in the description of the relevant assembly stage.

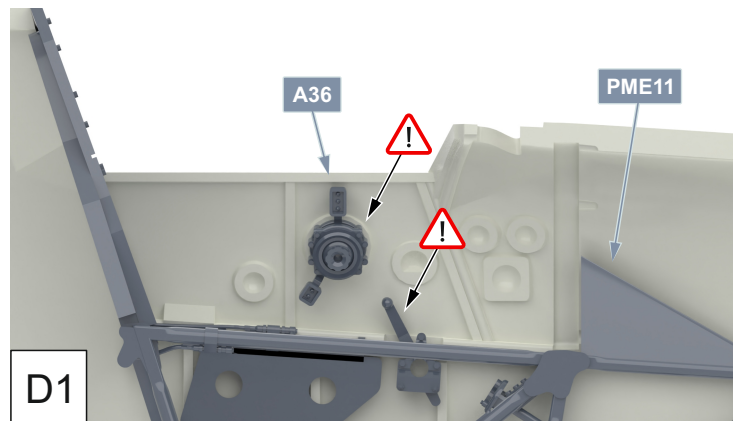
If you have any doubts about specific parts, take a look at my build reports for the Arma Hobby Hurricane Mk.II on pme.org.pl. I've posted many photos of the build process there, along with practical insights on assembling models using these parts.

Good luck!
Tomasz Gronczewski

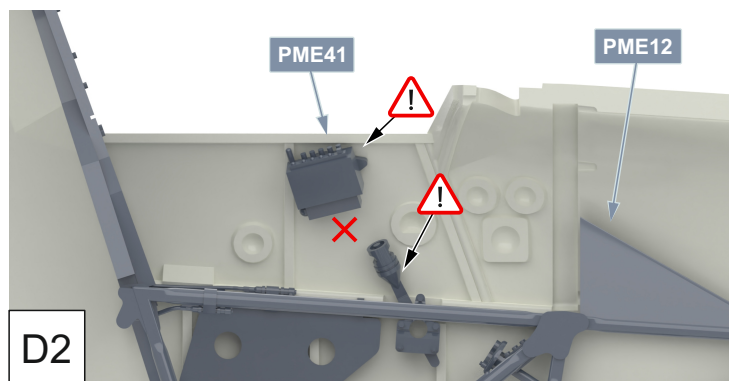


Diagrams illustrating the features of production series

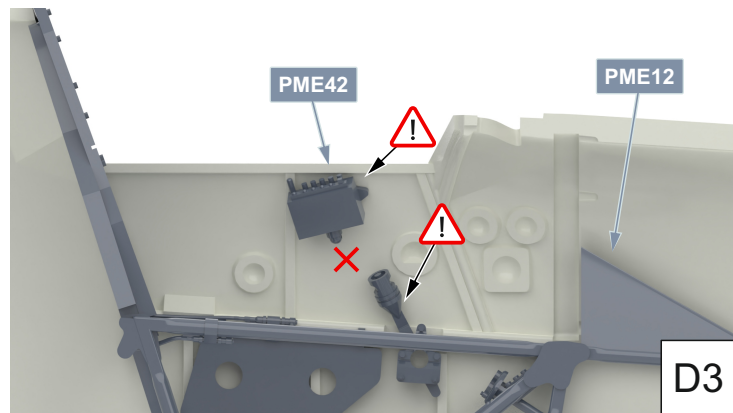
Initially, the radio sets in the Hurricanes were controlled by a mechanical Teleflex controller (part A36). The factory documentation indicates that controllers of this type were used to operate both the TR9D high frequency radio and the later TR1133 ultra-high frequency radios. In this case, a simple throttle quadrant was used, which is modelled in the PME11 fuselage truss.



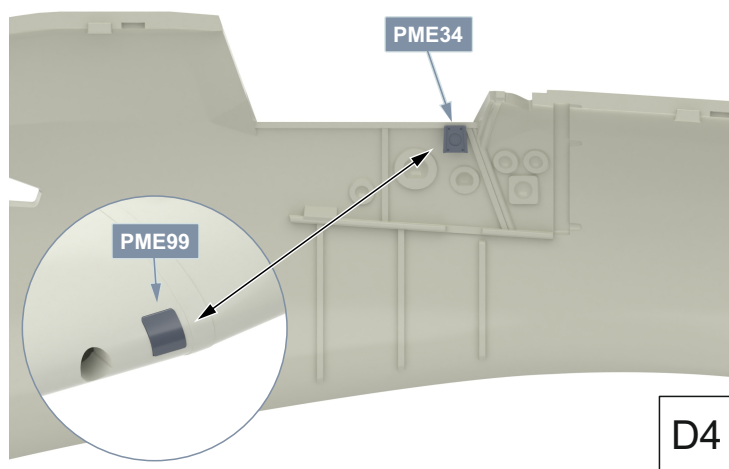
A little later, probably in 1941, an electric key-operated channel selector (part PME41) was introduced, which was compatible with both high frequency and ultra-high frequency radio sets. It is shown in the factory documentation in the wiring diagram for the TR1133D radio set. The early version had a side socket for connecting cables. Its installation required the removal of the socket for the A36 controller on the port fuselage half. In this case, a throttle quadrant with a button for changing the operating mode was used, which is modelled in the PME12 fuselage truss.



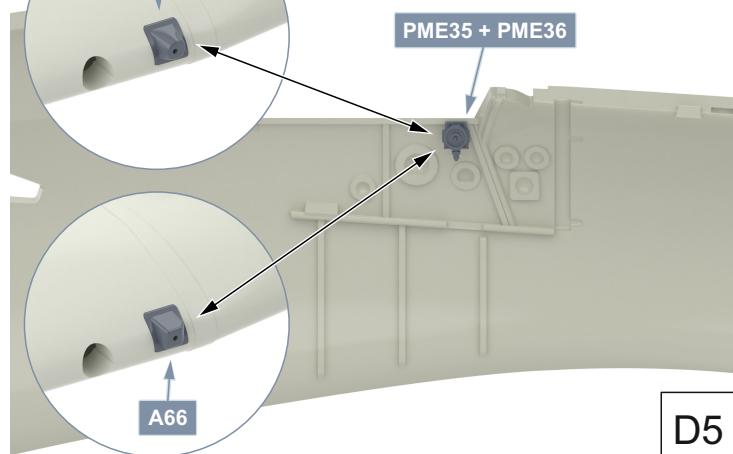
Ultimately, the Hurricanes were fitted with late electric channel selector switch with a socket at the bottom (part number PME42). It is shown in the factory documentation on the wiring diagram for the TR1143 UHF radio, which began to be introduced in mid-1941, but it was used with HV radios too, such as the TR1147 radio used by the Royal Navy. In this case too, a throttle quadrant with a button for changing the operating mode was used, which is modelled in the PME12 fuselage truss.



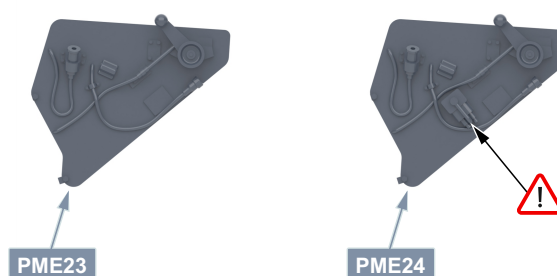
If there is no gun camera in the wing, fit a PME42 blanking plug, and on the port side of the cockpit, fit the gun camera indicator mounting plate (part PME 34) without the indicator itself.



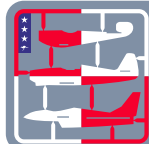
If you are fitting a gun camera (A67 or A66) into the wing, fit the mounting plate (part PME35) and the gun camera indicator (part PME36) on the port side of the cockpit.



The electrical panel is mounted on the port side of the truss. On the left is the panel found on Hurricane Mk.IIa and Mk.IIb aircraft (PME23). On the right is the panel found on Hurricane aircraft fitted with cannons, namely the Mk.IIc (PME24). Hurricane Mk.IIc aircraft had an additional cannon reloading lever fitted to this panel (see highlighted component).

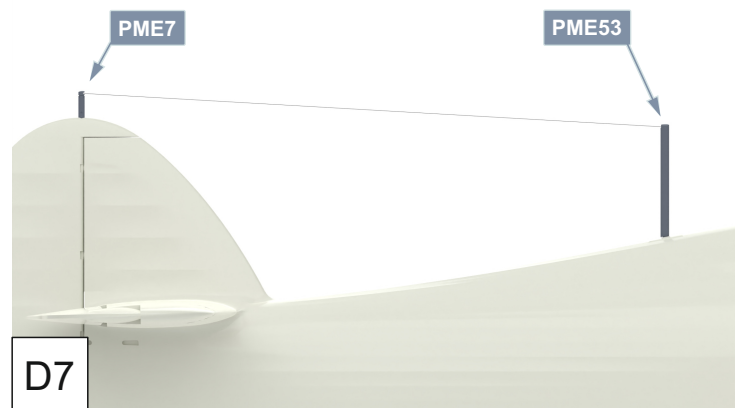


D6

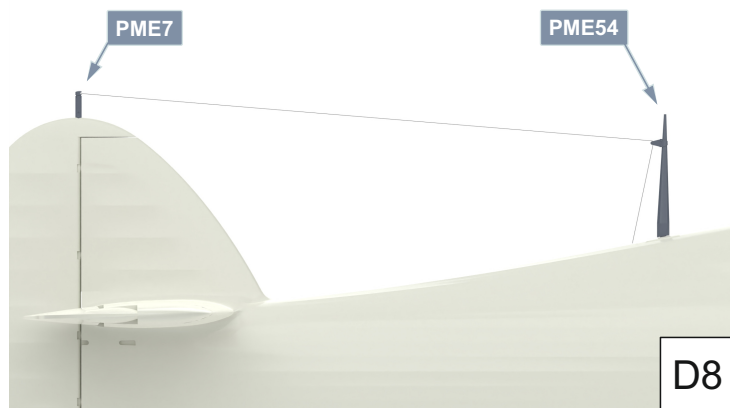


Diagrams illustrating the features of production series

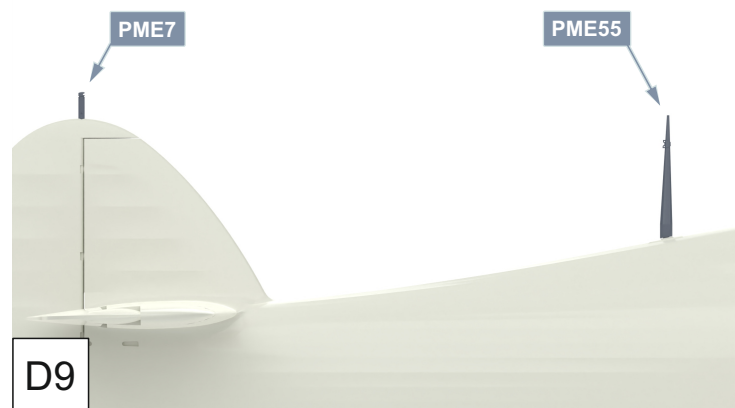
The pole antenna mast (PME53) was fitted to Hurricane Mk.I aircraft of the Lxxxx, Nxxxx and Pxxxx series, up to P2699. An aerial wire for the TR9D HF radio was stretched between this mast and the mast on the rudder (PME7). Occasionally, in combat units and Maintenance Units, these masts were replaced with later tapered masts (PME54). The PME53 is a redundant component not found on Hurricane Mk.IIs.



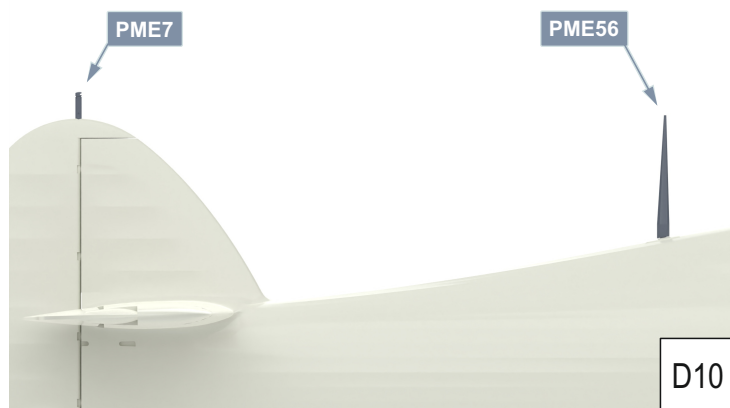
The tapered aerial mast (PME54) was fitted to Hurricane Mk.I P2700 aircraft and later models, including the Mk.II and Mk.IV variants, which were equipped with HF radio sets (TR9D in the RAF or TR1147 in the FAA). These HF radio sets required the use of an aerial wire.



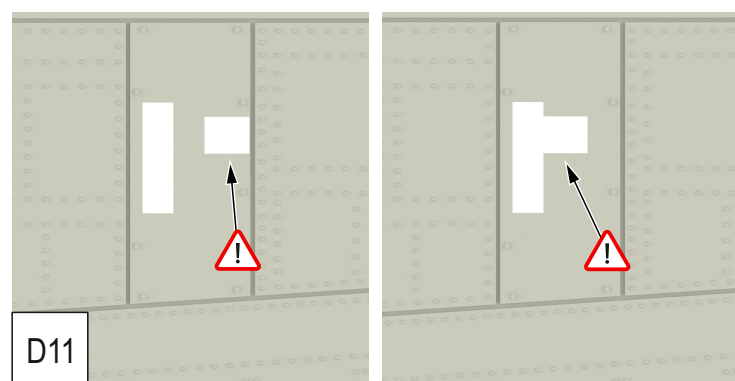
A tapered aerial mast without an aerial wire was fitted to Hurricanes equipped with TR1133 and TR1143 UHF radio sets. When old HF radio sets were replaced with UHF ones, the mounting for the aerial wire tensioning triangle (part PME55) was sometimes left on the mast. The mast on the stabiliser (PME7) was sometimes left in place, sometimes trimmed, and sometimes removed entirely.



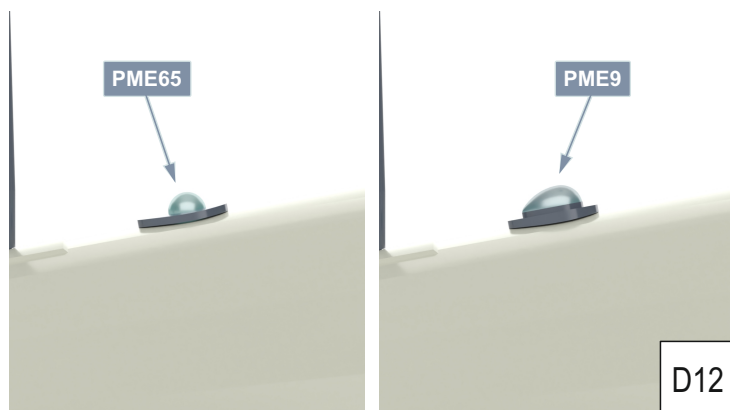
A tapered aerial mast without an aerial wire was fitted to Hurricanes equipped with TR1133 and TR1143 UHF radio sets. In most cases, any remnants of the aerial wire tensioning triangle (part PME56) were removed from the mast. The mast on the stabiliser (PME7) was sometimes left in place, sometimes trimmed, and sometimes removed entirely.

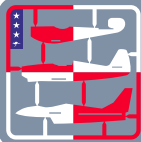


There were two versions of the outer cannon access panels on the underside of the Hurricane Mk.IIc's wings. On the left, the original panel with separate outlets for cartridge cases and ammunition belt links. On the right is a modified panel with a combined outlet for both types of waste. The panel on the right was introduced as modification No. 317 in the autumn of 1941. This modification was necessitated by the introduction of fuel tank and bomb pylons, which would otherwise have obscured the ammunition link outlets.



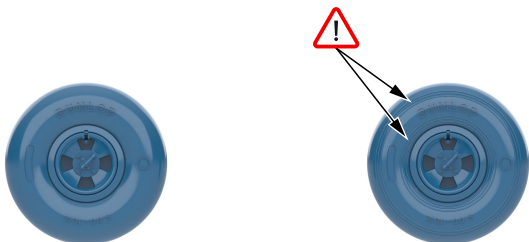
All production Hurricanes had a signal lamp fitted on the fuselage spine for transmitting in Morse code, which was activated from the cockpit using a transmitter (part A33). Hurricane Mk.I and early Hurricane Mk.II aircraft were fitted with a lamp with a spherical shade (on the PME65 base in the illustration on the left), whilst late Hurricane Mk.II aircraft had a teardrop-shaped shade (on the PME9 base in the illustration on the right).





Diagrams illustrating the features of production series

The digital set for 3D printing offered by Arma Hobby includes a range of tyre models. Half of them are older-style tyres with smooth sidewalls. See the tyre rendering on the left. The other half are newer-style tyres with reinforcing concentric rings on the sidewalls. See the tyre rendering on the right, with the rings marked by arrows. The tyre models are flattened a bit, so you need to pay attention to which tyre is the left and which is the right. Each of these versions is available in five variants with different arrangements of the engravings relative to the flattening..



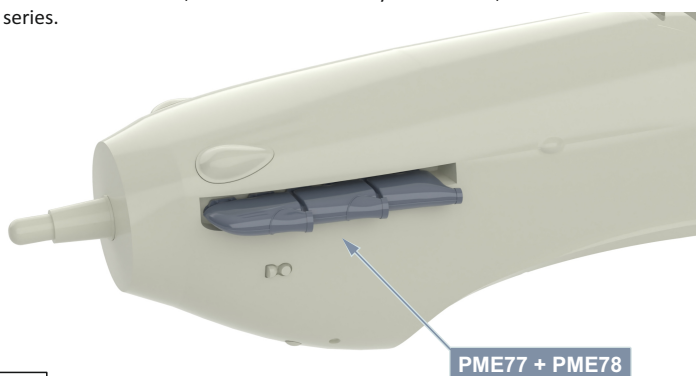
D13

The 3D printing kit from Arma Hobby includes tail wheels with old and new-style spindles. The older ones, with a straight strut, were used on early Hurricane Mk.IIs, mainly from the 5th series by Hawker, the 3rd series by Gloster and early batches from the 2nd series by Canadian Foundry (serial numbers Zxxxx, AFxxx, AGxxx). See the rendering of the wheel on the left. Later Hurricanes had a strut with a scissor-type shock absorber. See the rendering on the right.



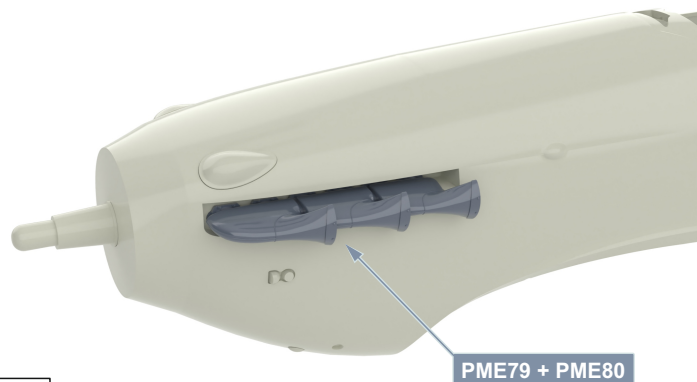
D14

Kidney-shaped exhaust manifolds began to be fitted to the second batch of Hurricane Mk.I aircraft (with serial numbers Nxxxx and later). They were also used on early Hurricane Mk.IIs from Gloster's 3rd series and Hawker's 4th series (serial numbers Zxxxx). They also appeared sporadically on later Hurricanes, for example from Gloster's 4th series, the Canadian Foundry's 2nd series, and Hawker's 5th and 6th series.



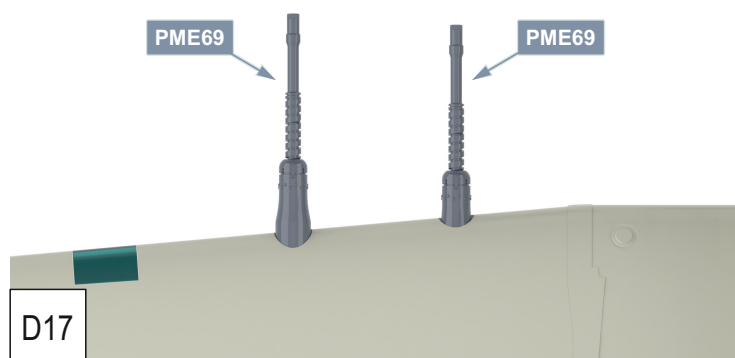
D15

Fishtail exhaust manifolds first appeared in mid-1941 on some Hurricanes from Gloster's 3rd series and Hawker's 4th series. Over time, they completely replaced the earlier kidney-shaped exhaust manifolds.



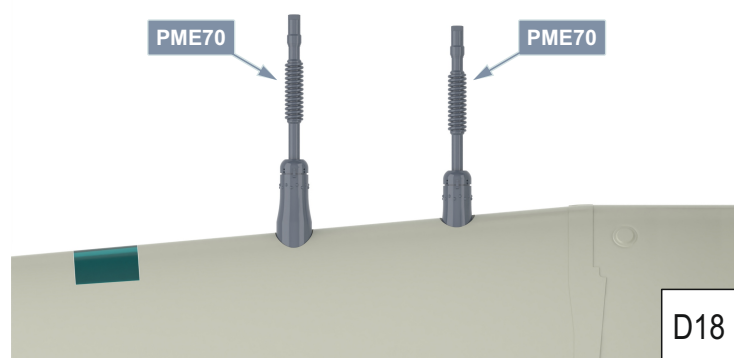
D16

Early Hurricane Mk.IIc aircraft were fitted with Hispano cannons featuring flat recoil springs (known as 'No.1 Springs'). Springs of this type were still common in the 6th production series of the Hawker Hurricane (BDxxx, BExxx, BNxxx, BNxxx) and the 4th production series of the Gloster Hurricane (BGxxx, BHxxx). It appears that Hurricanes with BPxxx serial numbers also had cannons with flat springs. However, sources do not agree on whether the BPxxx batch was the last batch of Hawker's 6th series or the first batch of Hawker's 7th series.

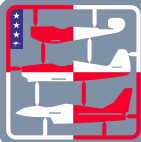


D17

Late-production Hurricane Mk.IIc aircraft were fitted with Hispano cannons featuring circular recoil springs positioned closer to the muzzle (known as 'No. 2 Springs'). These new springs appeared on a large scale in the 7th series of Hawker Hurricanes, with serial numbers HLxxx and later.



D18

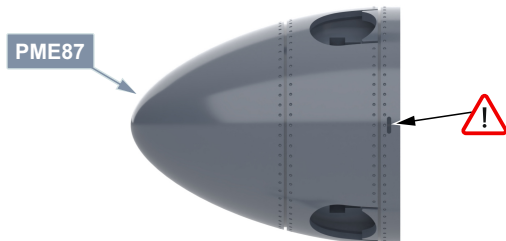


Assembly instructions for 3D-printable parts designed for Arma Hobby's 1/48-scale Hawker Hurricane Mk.II models. www.pme.org.pl



Diagrams illustrating the features of production series

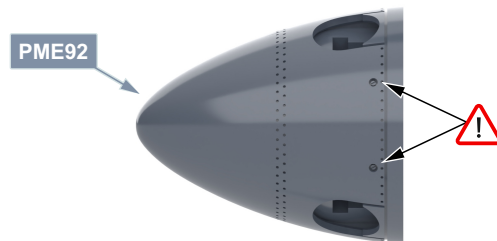
The late production batches of the Hurricane Mk.I and all Hurricane Mk.IIs were powered by Rotol propellers with wooden blades. Initially, these propellers were fitted with ES/6 spinners from Spitfires. These were too large in diameter, and in late autumn 1940 they began to be replaced with a new, longer spinner of smaller diameter, the CM/1 type (the so-called 'bullet spinner'). These spinners were already fitted as standard on early Hurricane Mk.IIs. In the 3D parts set, CM/1 spinner is represented as PME87.



D19

Note: The CM/1 spinner can be identified by the narrow slit at the base of the spinner. If this slit is visible in the photograph, then it is definitely a CM/1 spinner.

On later Hurricane Mk.IIs, a slightly different ES/9-type spinner began to be fitted. This was already the standard spinner for Rotol propellers. It appears that such spinners began to appear during the production of the 7th series of the Hawker, around the HWxxx series, but this is not certain.

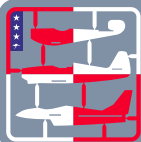


D20

Note: The ES/9 spinner can be identified by the six holes with fixing screws around the base of the front part of the spinner.

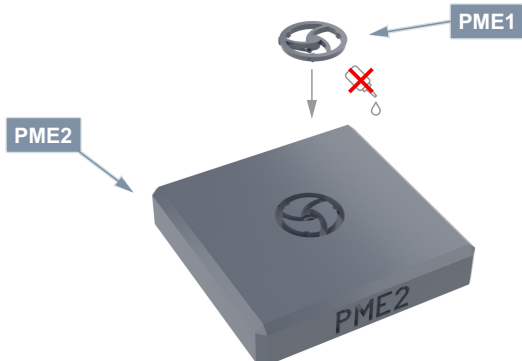
Assembly icon instructions

	3D-printable parts are available free of charge on the www.pme.org.pl website.		Parts made from other materials. See the assembly step description for details.		File or cut the piece along the dotted line.
	3D-printing parts available to buy from the Arma Hobby online shop.		The component prepared in the specified assembly step.		Drill a hole.
	Original plastic parts for the Hurricane Mk.II model produced by Arma Hobby.		Glue in place using cyano-acrylate (CA) or light-curing (UV) adhesive. Occasionally, if specified in the instructions, use white wood glue (or AK Ultra Glue).		Draw a new line to mark the division between the metal sheets.
	The photo-etched parts from the YAHU YMA4917 set are available in many model shops.		Apply a drop of cyano-acrylate (CA) or light-curing (UV) adhesive. Occasionally, if specified in the instructions, use white wood glue (or AK Ultra Glue).		Please note the detail shown.
	HGW seat belts from set 148544 are available in many model shops.		Insert, but do not glue!		Choose one of the alternative options.
	Pieces to be cut out of thin, transparent foil.		Delete the specified item.		Installation step for one of the options described.



Assembly stages

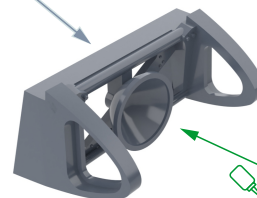
1



Part PME2 is a sanding mould for the PME1 landing light frames. The PME1 parts should be inserted upside down into the PME2 mould (without glue) and sanded down from the top using a piece of sandpaper to remove any remaining printing supports.

Left landing light

PME43

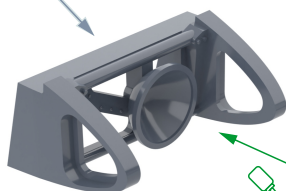


PME1

2

Right landing light

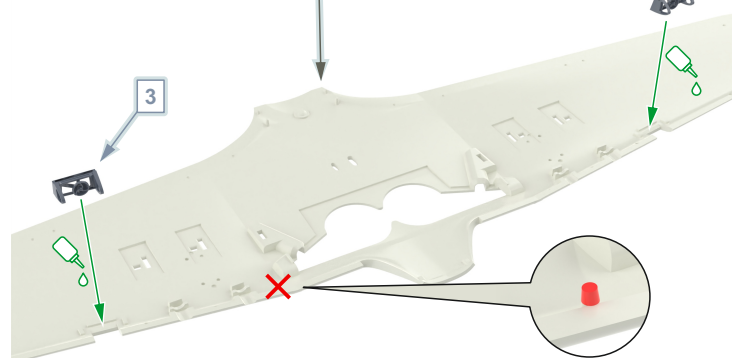
PME44



PME1

4

Arma C1? E1

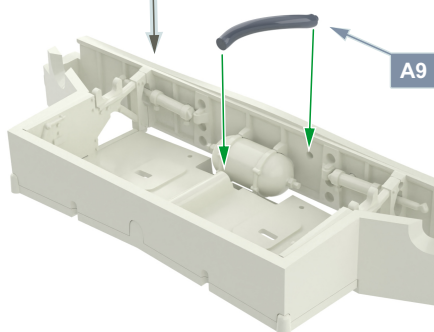


For the Hurricane Mk.IIc/IId Trop, use the lower half of wing C1; for the Hurricane Mk.IIb/IId Trop, use the lower half of wing E1. When gluing in the camera gun or the camera gun patch, remove the mounting pin marked in red.

3

The printed A9 part has a slightly longer mounting pin than the original plastic A9 part, which makes it a little easier to stick it in place.

Arma A1 + A2 + A3 + A4 + A5 + A6 + A7 + A8



A9

5

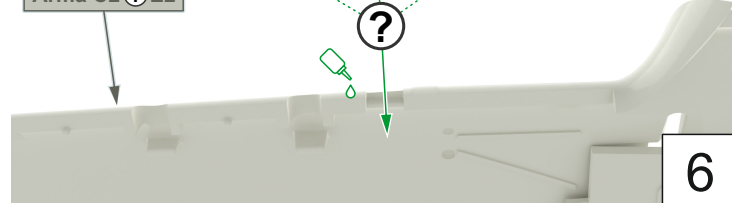
For the Hurricane Mk.IIc/IId Trop, use the upper half of wing C2; for the Hurricane Mk.IIb/IId Trop, use the upper half of wing E2. If there is no gun camera, use the PME41 plug. Note: **attach this BEFORE gluing the upper and lower halves of the wing together.**

PME99

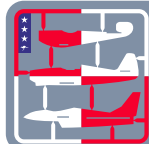
A67

A66

Arma C2? E2



6

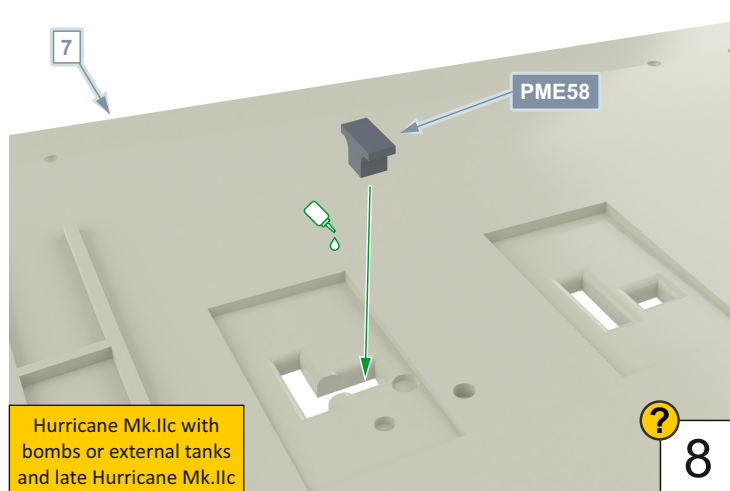


Assembly stages

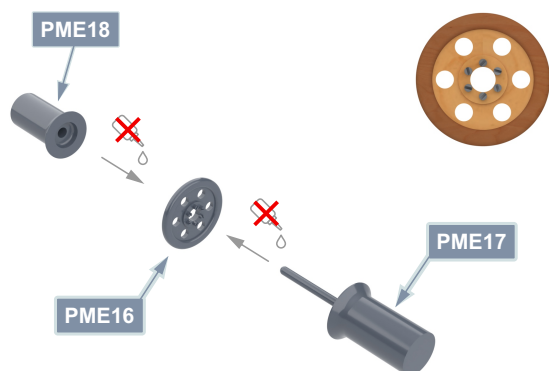
In the case of Hurricane Mk.IIc fitted with fuel tanks or bombs, or later Hurricane Mk.IIc, as shown in diagram D11, the section between the cartridge case ejection port and the ammunition belt link ejection port in the internal gun panels must be cut out.



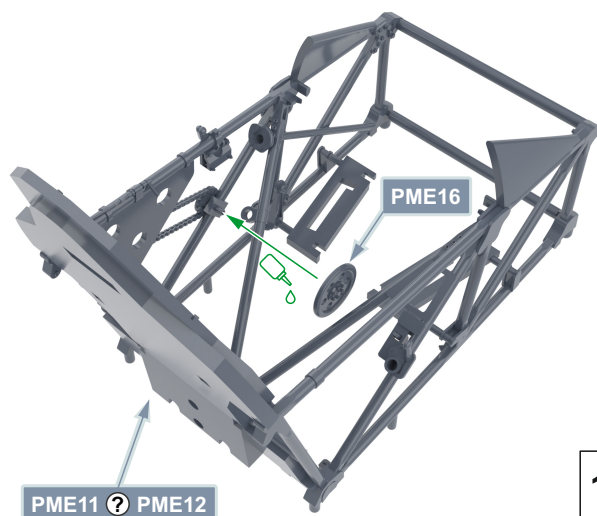
In the case of Hurricane Mk.IIcs fitted with fuel tanks or bombs, or later Hurricane Mk.IIcs, as shown in diagram D11, the outlet hole in the inner gun panels should be reduced by inserting a PME plug into its outer end.



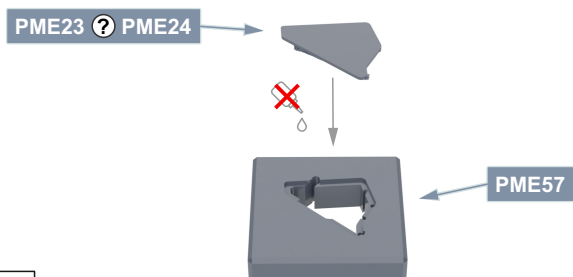
The elevator trim wheel (PME16) was in the natural colour of plywood with a darker wooden rim. First, paint the wheel in a light plywood colour, then use parts PME17 and PME18 as 3D masks to paint the rim a darker colour. Finally, paint the whole thing with a thin layer of yellow-orange transparent paint.



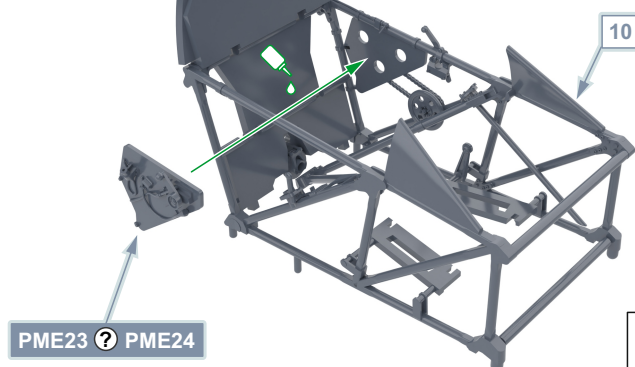
An explanation of which truss to use (PME11 or PME12) can be found in diagrams D1, D2 and D3.

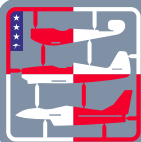


The back surface of the electrical panel for Hurricanes with machine guns (PME23) and the panel for Hurricanes with cannons (PME24) should be smoothed down, removing any remaining printing supports. To make this easier, you can use the PME57 sanding mould. Once the panel has been inserted into it, you can sand the back wall with sandpaper without risking uneven thinning of the panel itself.

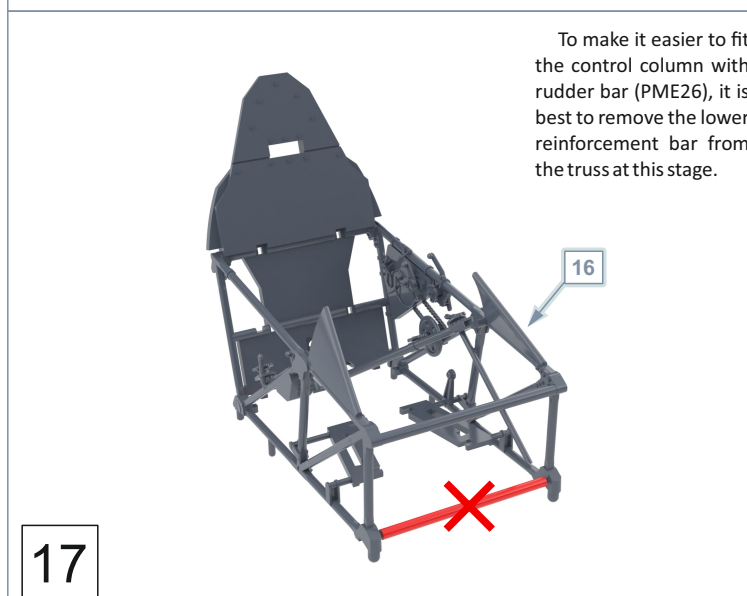
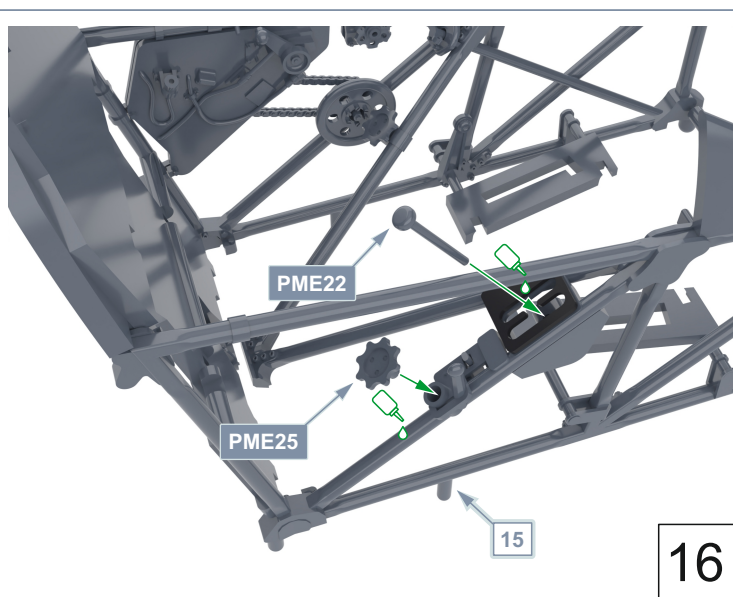
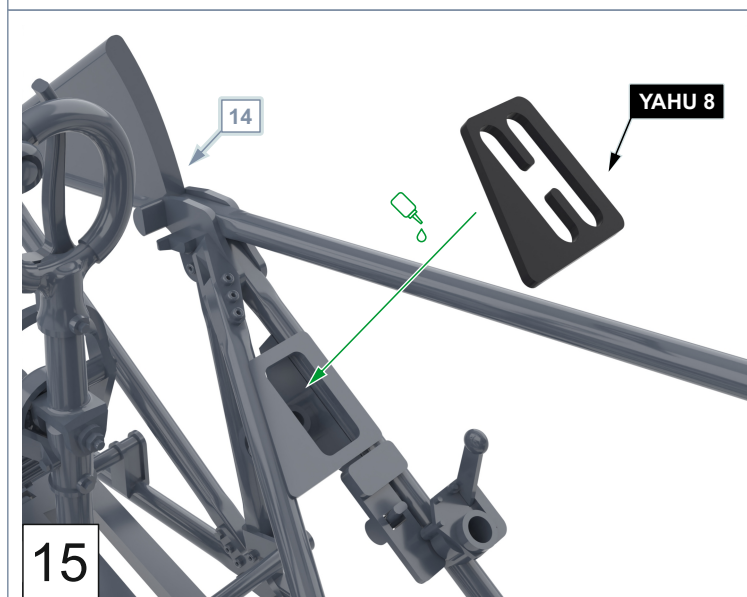
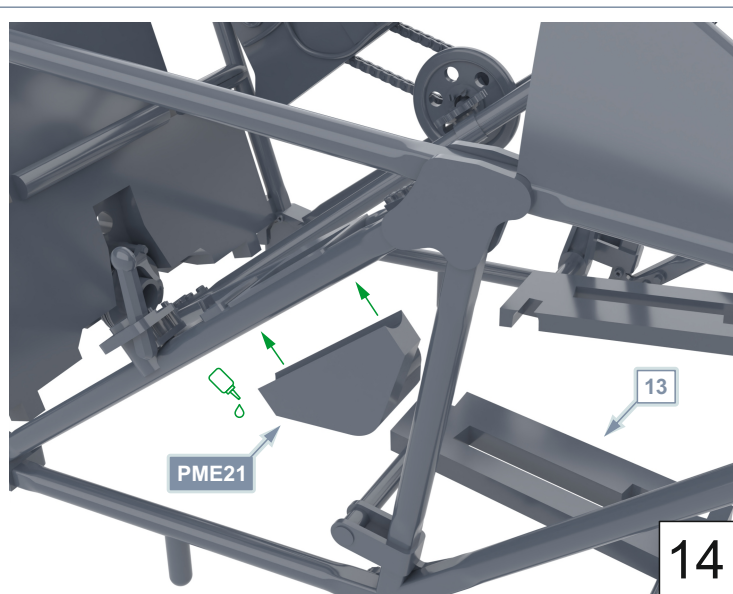
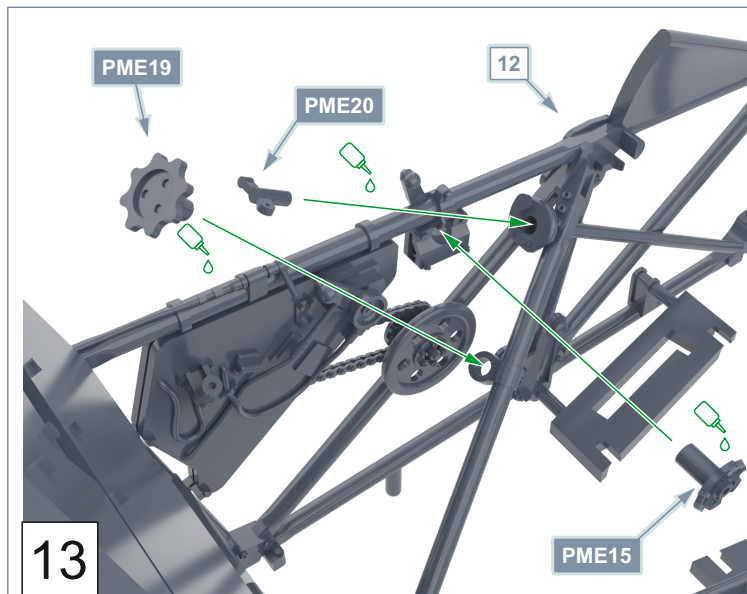


Hurricanes fitted with machine guns had different electrical panels to those fitted with cannons (PME23 or PME24 parts). An explanation can be found in diagram D5.

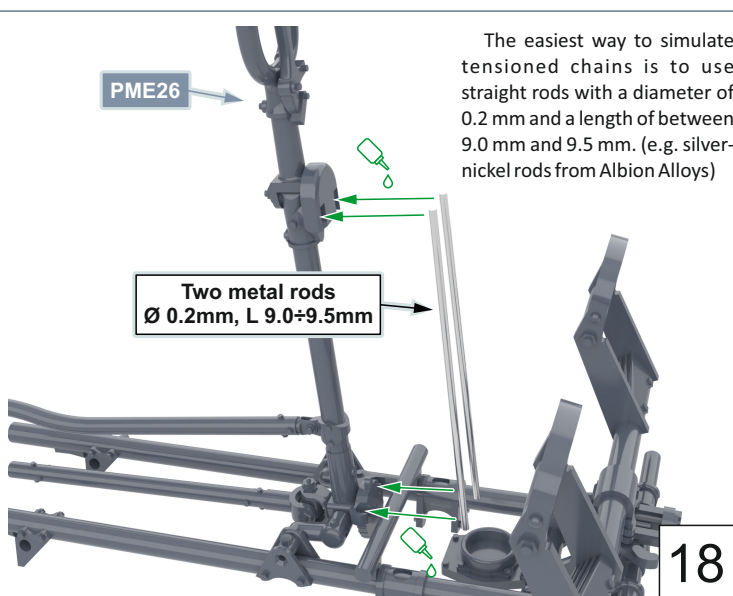




Assembly stages



To make it easier to fit the control column with rudder bar (PME26), it is best to remove the lower reinforcement bar from the truss at this stage.

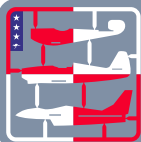


The easiest way to simulate tensioned chains is to use straight rods with a diameter of 0.2 mm and a length of between 9.0 mm and 9.5 mm. (e.g. silver-nickel rods from Albion Alloys)

PME26

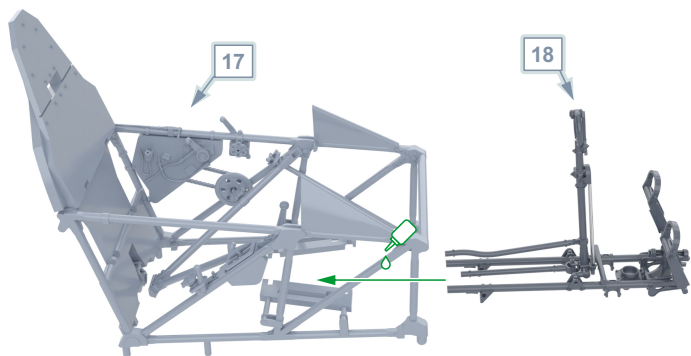
Two metal rods
Ø 0.2mm, L 9.0÷9.5mm

18



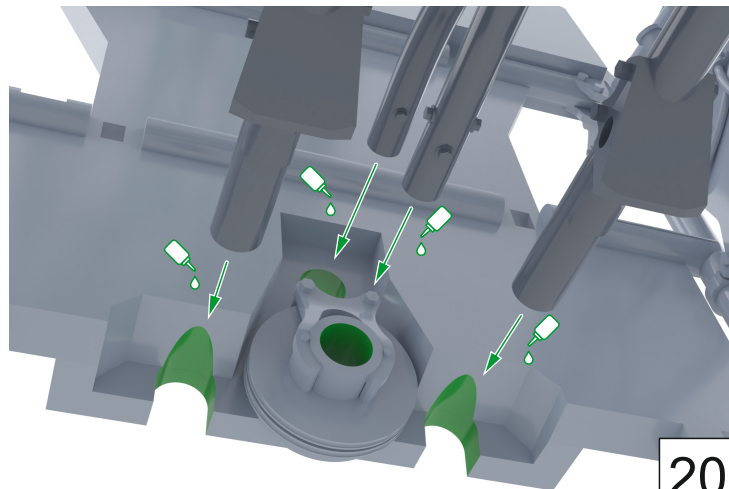
Assembly stages

The control column (component 18) must first be inserted into the holes in the armour plate, as shown in Figure [20], and then positioned in the recesses in the floor panel base, as shown in Figure [21].



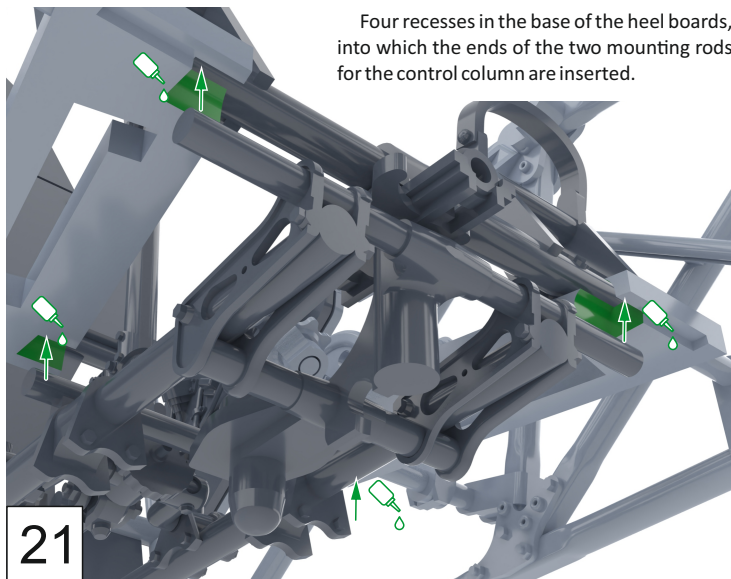
19

The four holes in the armour plate into which the steering column struts are inserted are marked in green.

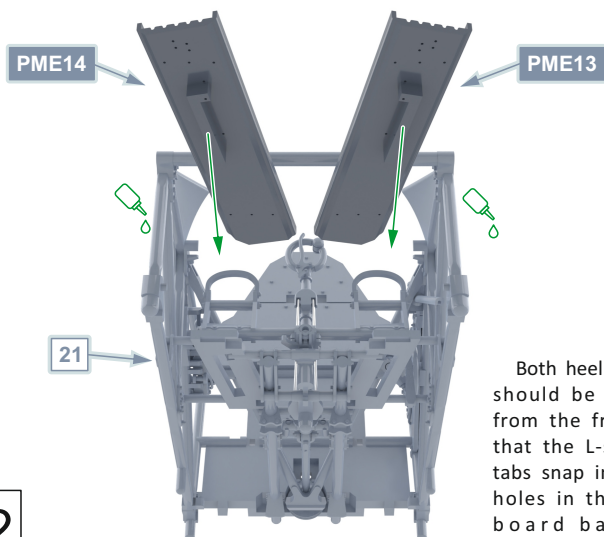


20

Four recesses in the base of the heel boards, into which the ends of the two mounting rods for the control column are inserted.

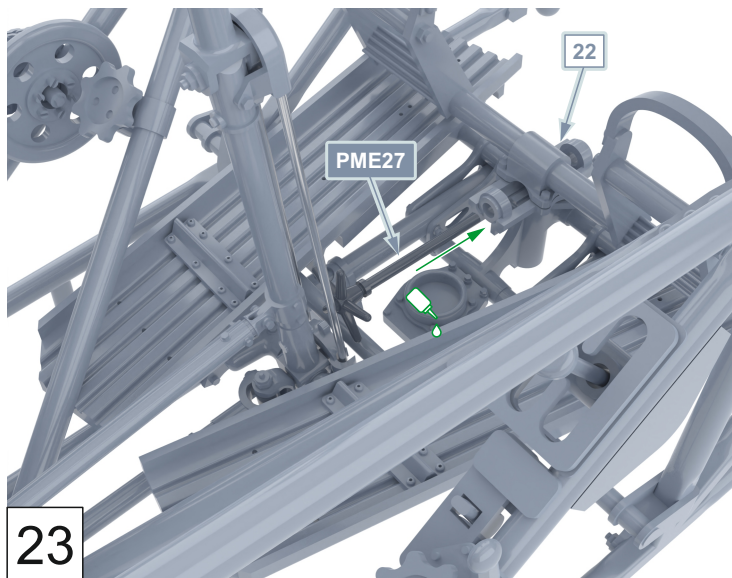


21

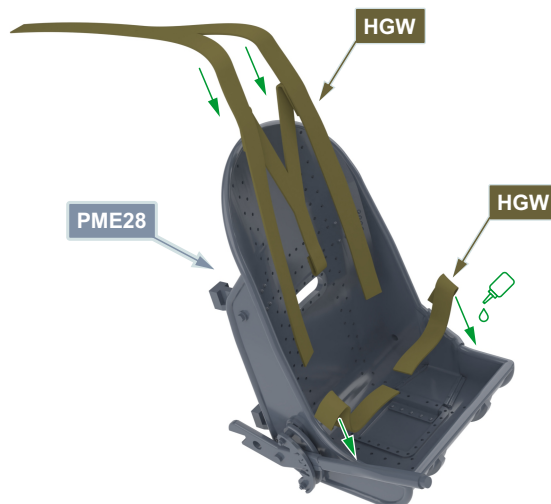


22

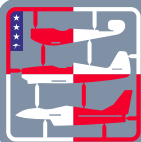
Both heel boards should be slid in from the front so that the L-shaped tabs snap into the holes in the heel board base in component 21.



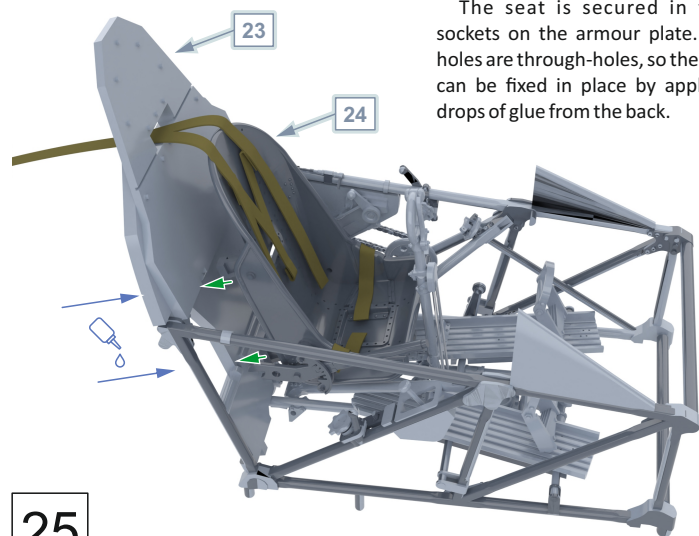
23



24

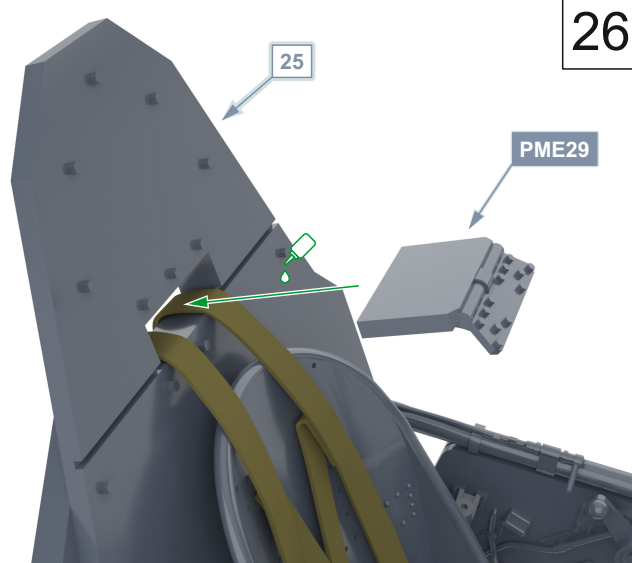


Assembly stages



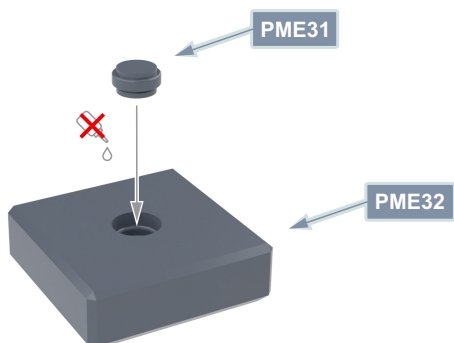
25

The seat is secured in four sockets on the armour plate. The holes are through-holes, so the seat can be fixed in place by applying drops of glue from the back.

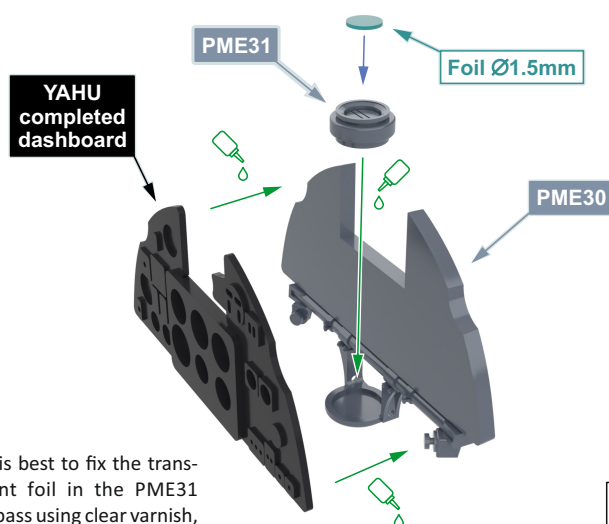


26

To sand the bottom surface of the compass (PME31) evenly, it is worth using the PME32 mould.

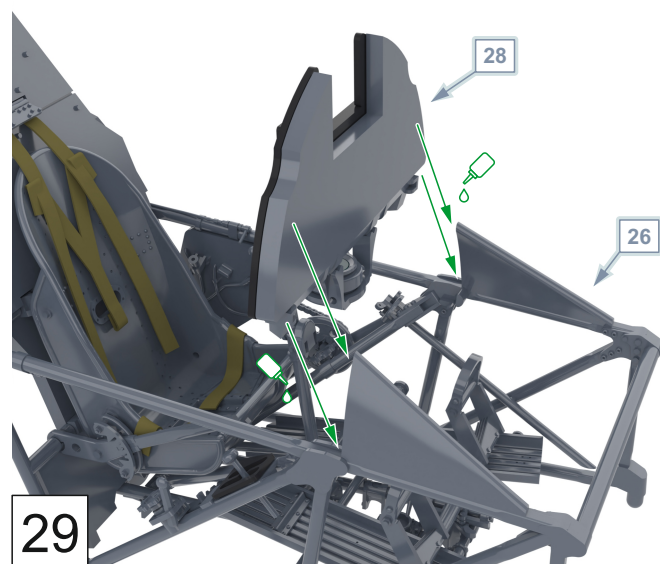


27

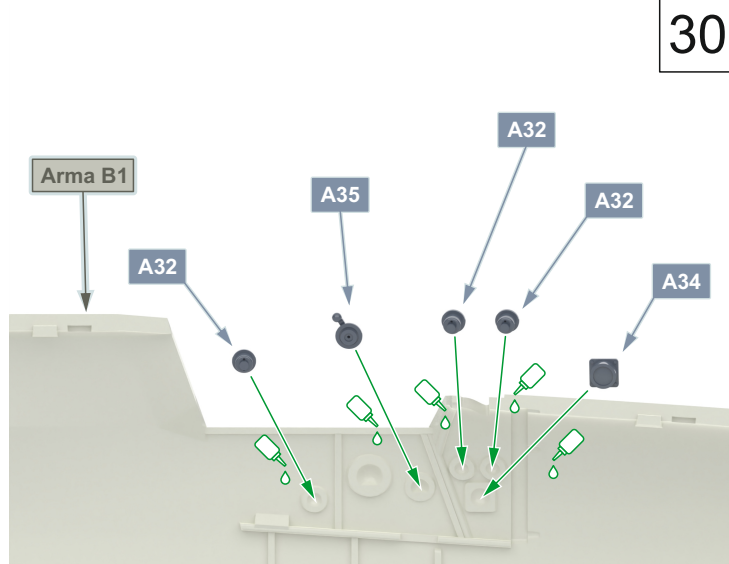


28

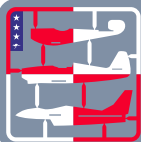
It is best to fix the transparent foil in the PME31 compass using clear varnish, or Future Floor equivalent.



29



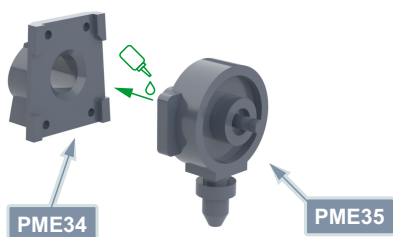
30



Assembly stages

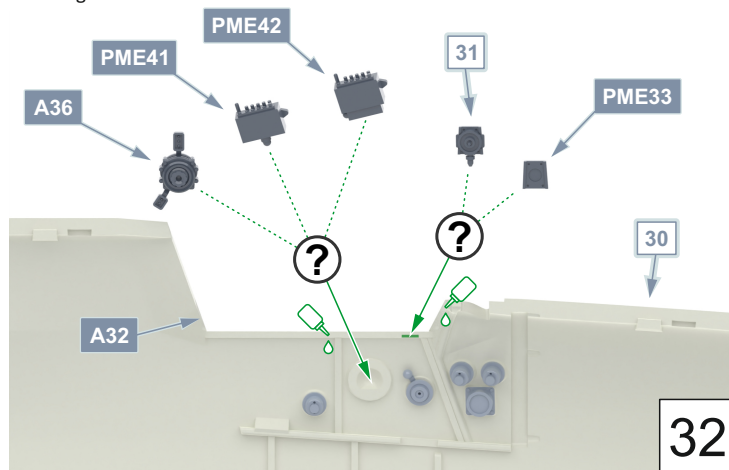
Hurricane with wing camera gun installed

31

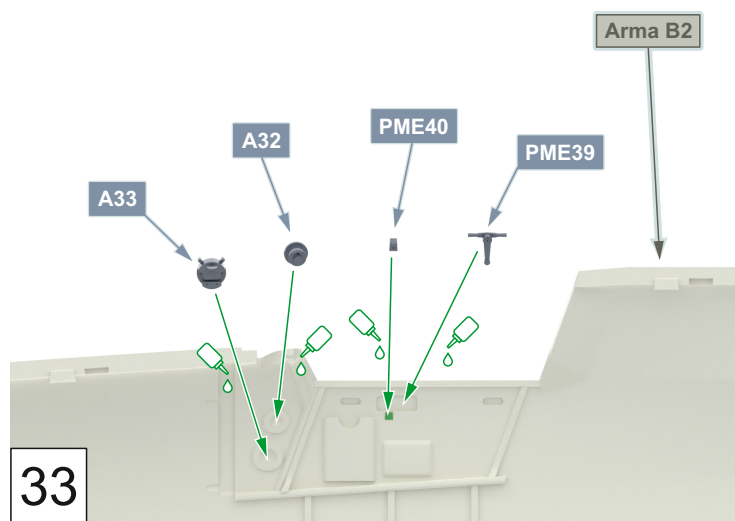


Fitting the camera gun indicator (PME34) to the camera gun mounting plate (PME35). Its use is illustrated in diagram D5.

Diagrams D1, D2 and D3 explain when to use the A36 Teleflex radio controller, or when to use PME41, or PME42 radio channel selectors. Diagrams D3 and D4 explain when to use the PME34 + PME35 camera gun indicator, and when to use the PME33 camera gun mount alone.

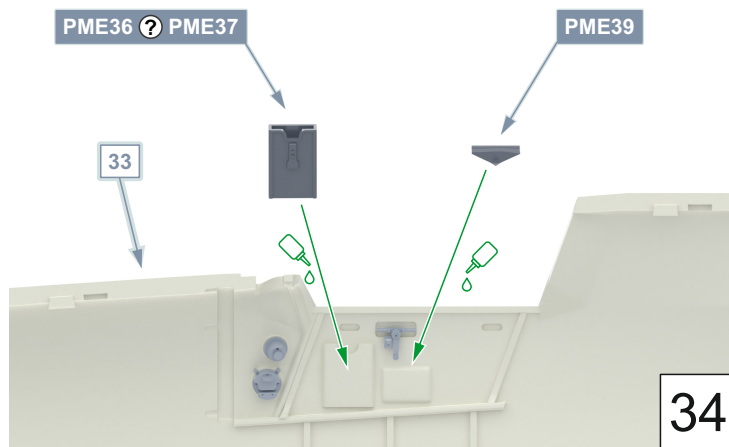


32

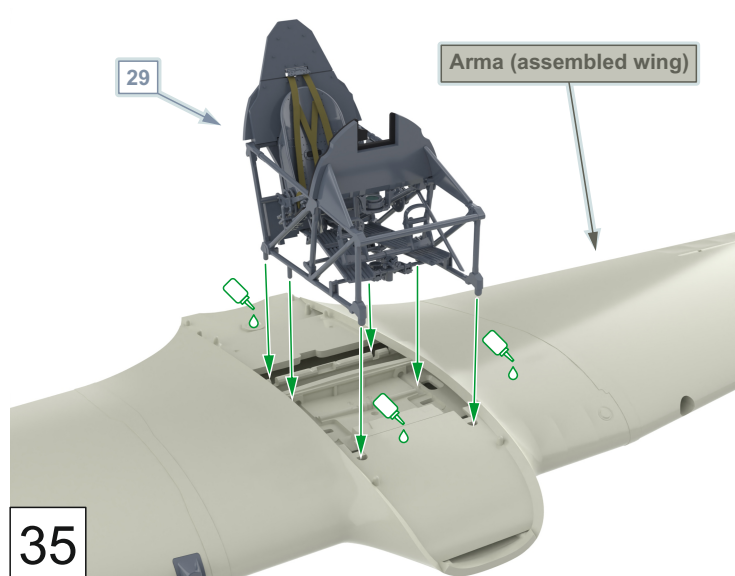


33

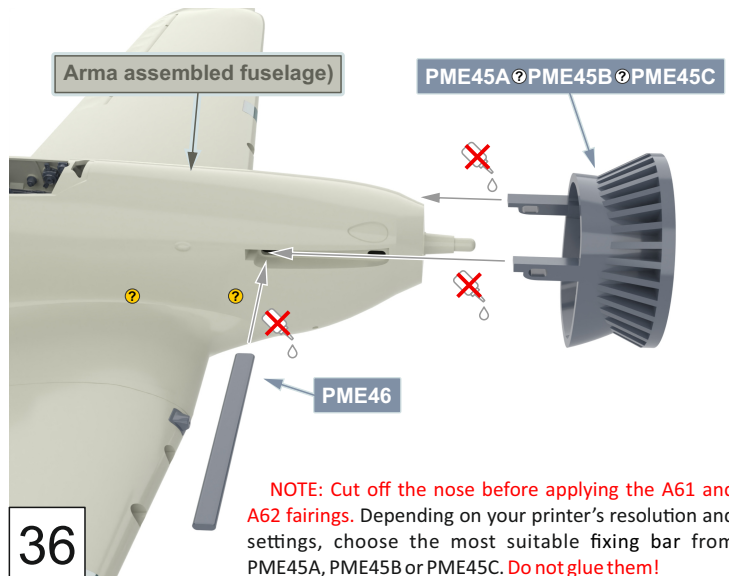
The map pocket is available in two versions. As part of PME36, it can be stuck onto the protruding imitation pocket on the cockpit starboard wall. Part PME37 is a full-size pocket, the fitting of which requires the removal of the imitation pocket from the cockpit wall.



34

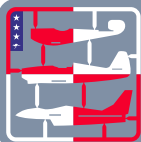


35

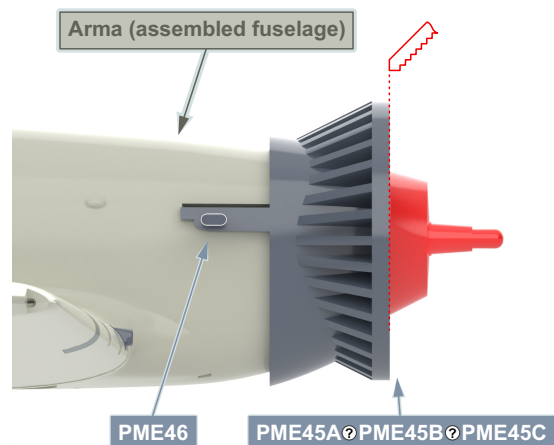


36

NOTE: Cut off the nose before applying the A61 and A62 fairings. Depending on your printer's resolution and settings, choose the most suitable fixing bar from PME45A, PME45B or PME45C. Do not glue them!



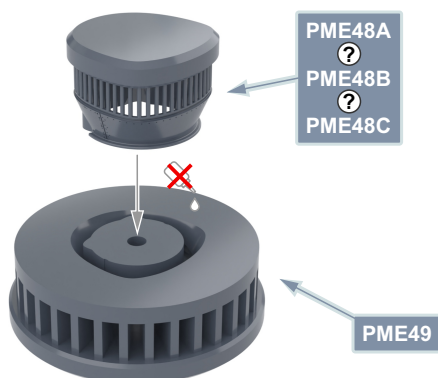
Assembly stages



37

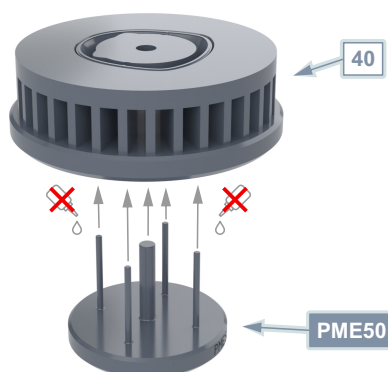
Cut off the nose with a 'Czech modelling saw' and smooth it down with sandpaper.

Once the plastic halves of the Hurricane fuselage have been glued together, the leading edge of the nose may warp in various ways. The front section of the PME48 nose comes in three geometric variants: A, B and C. Choose the one that best suits your model. The print supports for the PME48 section are designed to ensure a clean, unjagged edge. Use PME49 sanding mould to remove them safely.

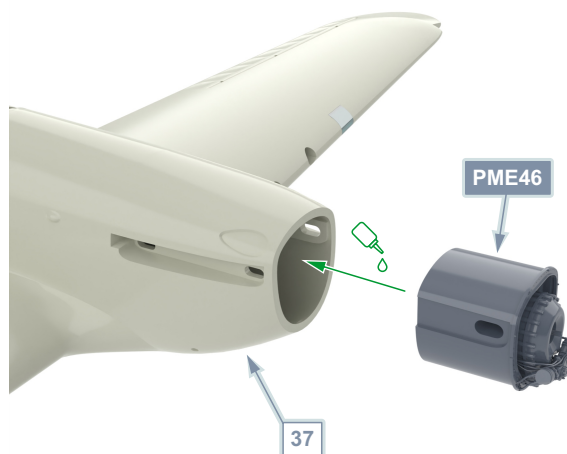


39

After machining the front section of the PME48A, PME48B or PME48C in the PME49 sanding mould, use the PME50 set of pins to push the front section out of the mould.

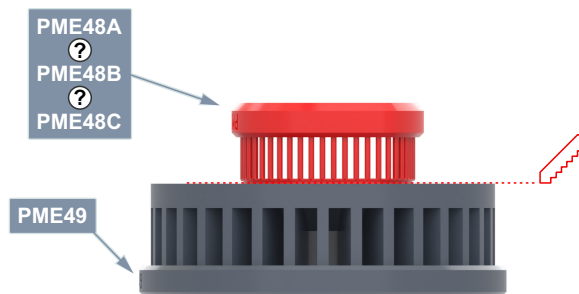


41

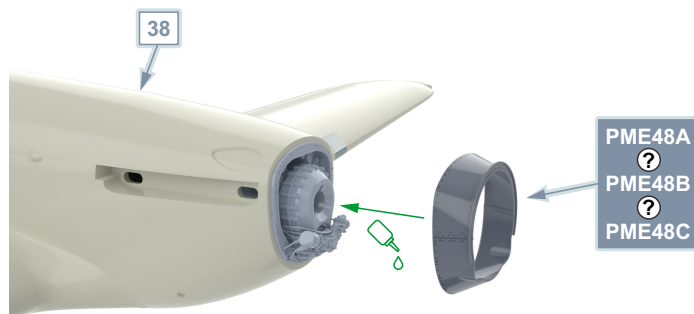


38

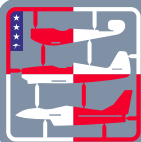
Once you have inserted the front section of the PME48A, PME48B or PME48C into PME49 sanding mould, cut off the supports using a 'Czech modelling saw' and then sand down the cut area with sandpaper.



40

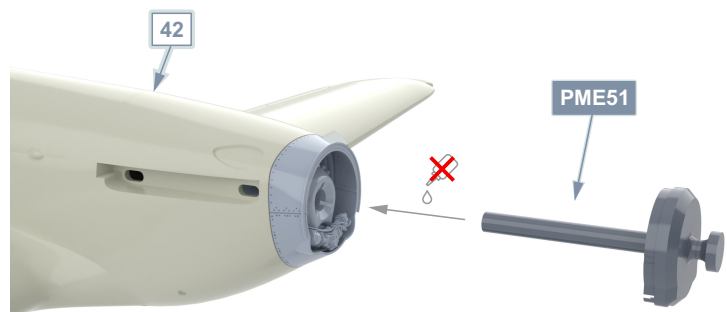


42



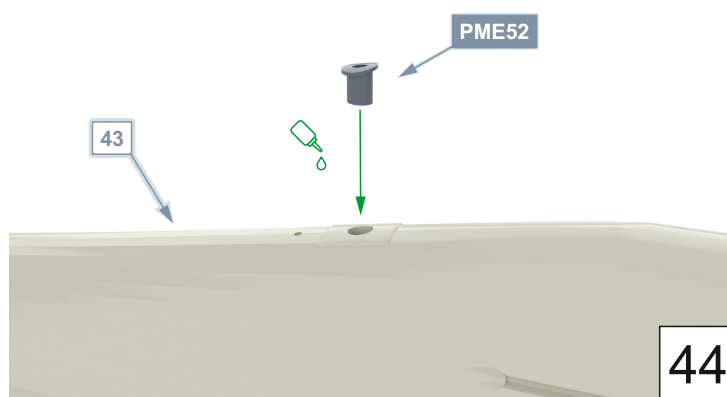
Assembly stages

The PME50 part is a 3D mask that can be used to cover the mock-up engine whilst applying camouflage paint.



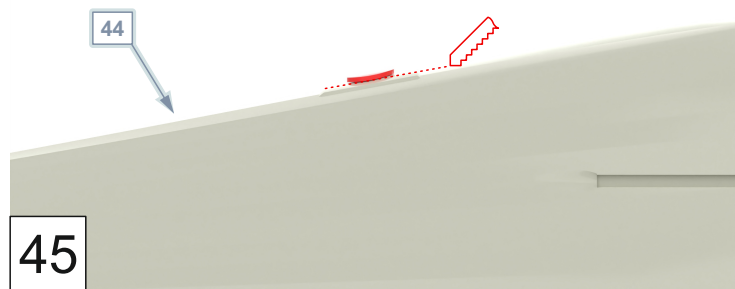
43

The printed antenna masts are much thinner than the hole in the model for the kit's antenna. For this reason, you should insert a PME52 adapter socket into the hole, into which the printed mast will later be fitted.



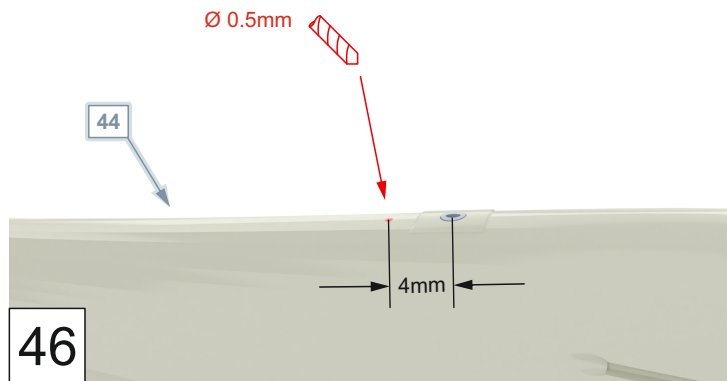
44

Once the PME52 mast socket has been glued in place, cut off the protruding flange and smooth the surface with sandpaper.

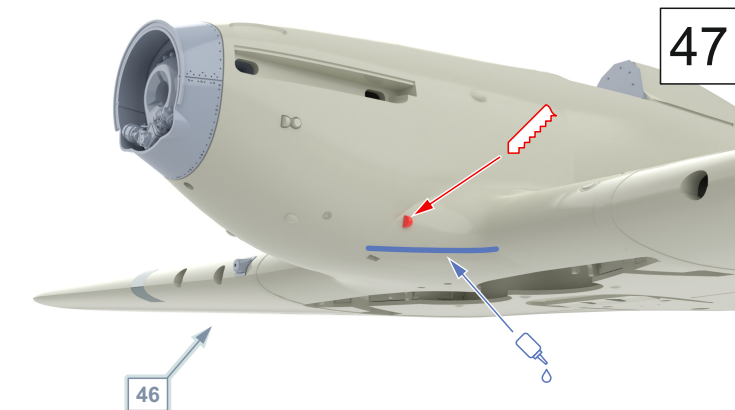


45

If a trapezoidal antenna mast (PME54) with an antenna wire for HF radio (Diagram D8) is used, a hole for the cable must be drilled in the spine of the fuselage. If the antenna wire is to be secured using an 'anchor' inserted into the fuselage, the hole should have a diameter of 0.5 mm. The centre of the hole should be 4 mm behind the centre of the aerial mast. If other variants of antenna masts are used (diagrams D7, D9 and D10), no hole should be drilled.

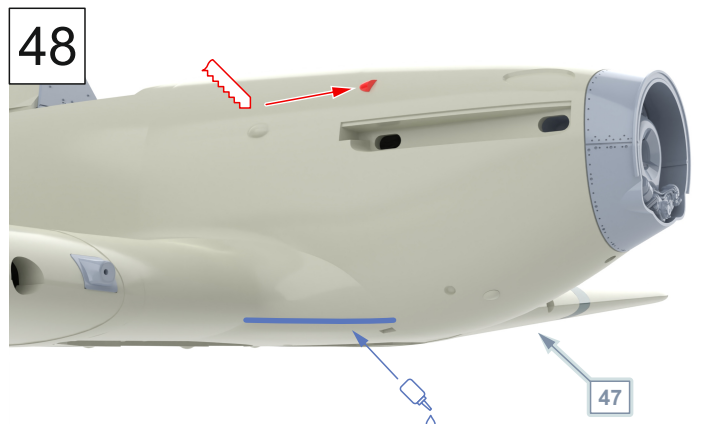


46



47

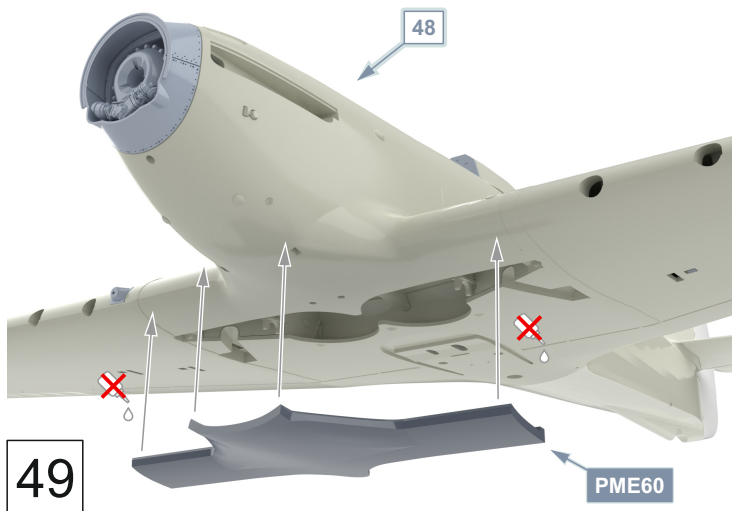
Remove the imitation of an air scoop from the port side of the fuselage, fill the seam between the fuselage and the lower wing with CA glue, and sand the joint until smooth.



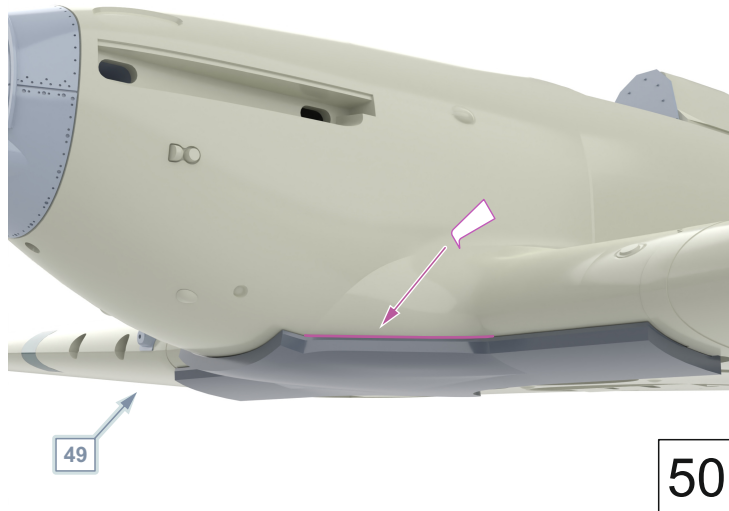
48

Remove the imitation of the compressor air scoop from the starboard fuselage side, fill the seam between the fuselage and the lower wing with CA glue, and sand the joint until smooth.

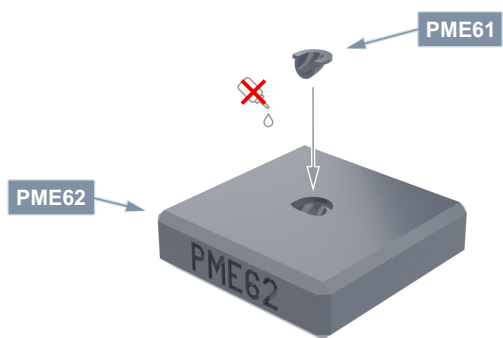
The removed and filled-in seam line between the wing and the fuselage can be recreated using a 3D mask (PME60).



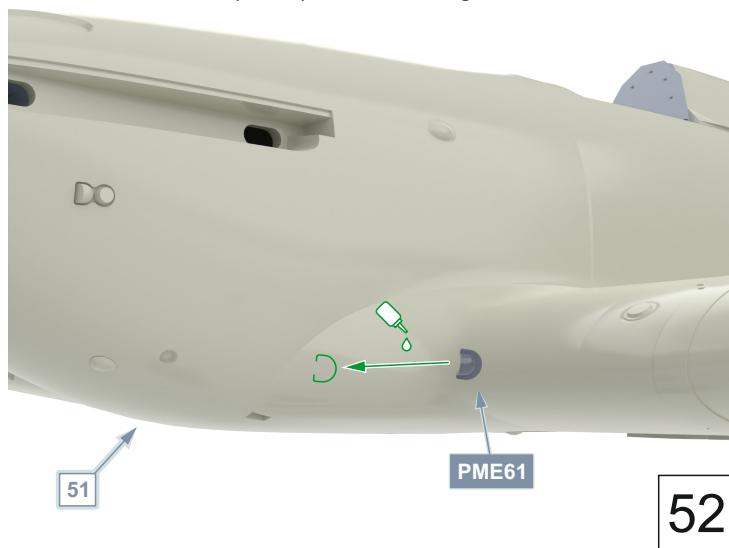
Use the 3D mask (PME60) to scribe new panel lines on the port and starboard sides of the model.



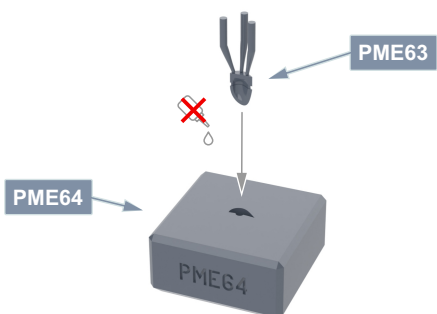
Use PME61 sanding mould to sand off the bonding surface of the air scoop to the cooling duct on the starboard side of the wing-fuselage junction.



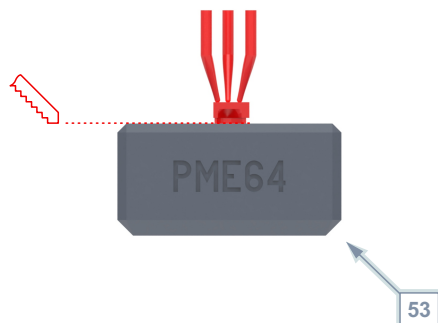
Glue the PME61 air scoop in the position marked in green.

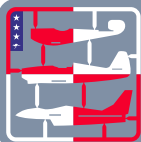


The air scoop to the compressor on the starboard side of the engine cowling (PME63) is moulded in such a way that the supports are located the front edge of the scoop. To ensure a uniform edge of consistent width, an excess section is inserted between the supports and the scoop, which must be removed. To make this task easier, a sanding mould (PME64) has been designed, into which the printed PME63 part should be inserted.



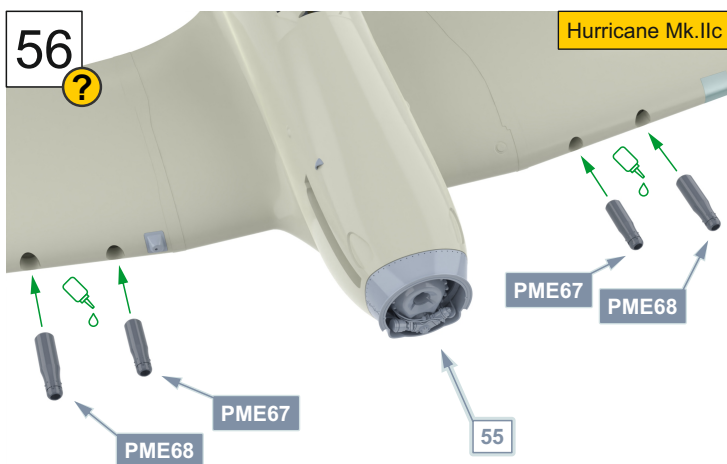
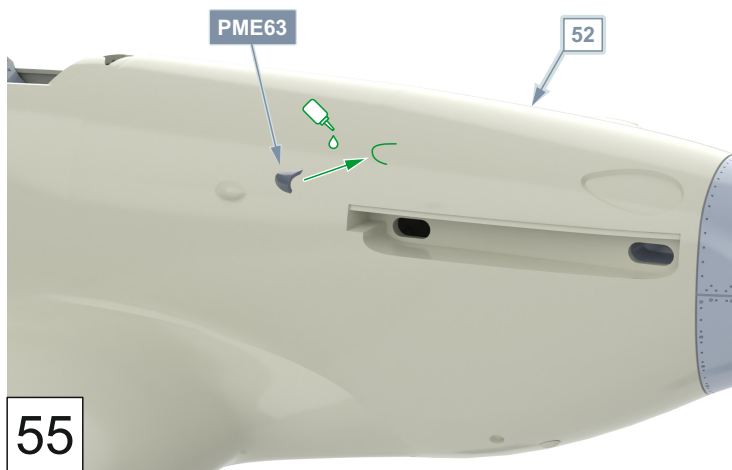
Once the air scoop for the compressor (PME63) has been fitted in PME64 sanding mould, cut off the supports along with the excess section and sand down the front edge of the PME63 scoop.





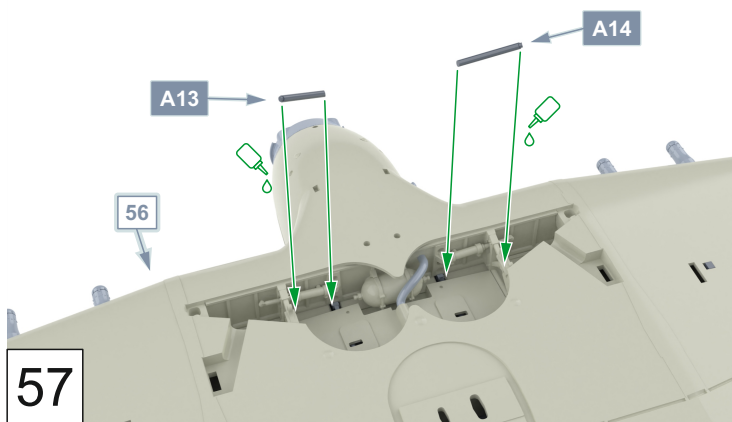
Assembly stages

Glue the air scoop to the compressor (PME63) at the place marked in green.

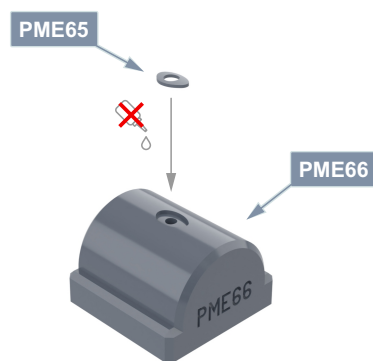


In the case of the Hurricane Mk.IIc, the housings for the internal (PME67) and external (PME68) cannons should be glued in place before painting the airframe. It is best to glue the corresponding cannon barrels in place right at the end of the model's construction.

It is worth replacing the plastic A13 and A14 struts with their printed equivalents, as the printed ones are perfectly round and require only minimal preparation before painting. They should only be glued into the wheel well once the entire airframe has been glued together, as their inner ends of the struts rest against the truss members in the cockpit.

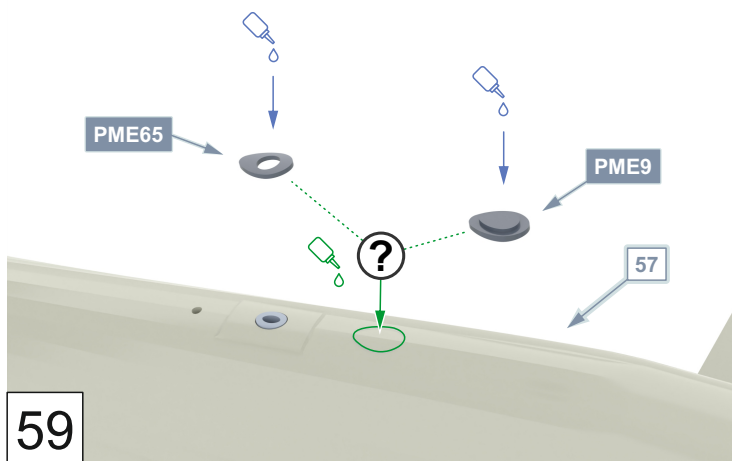


If the early Morse signal lamp (part PME65) is used, the sanding box PME66 can be used to machine its upper surface.

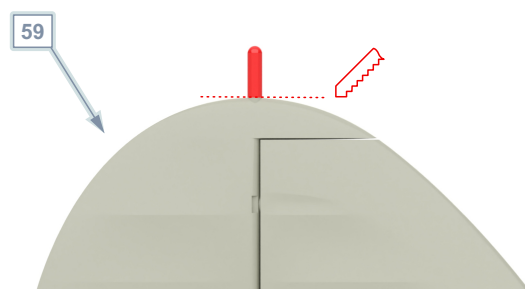


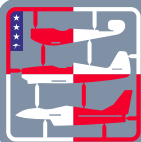
Hurricane with early Morse signal lamp

Early Hurricanes were fitted with Morse signal lamps with a spherical shade (part PME65), whilst later Hurricanes had lamps with a teardrop-shaped shade (part PME9). See diagram D12. Once the base has been glued in place, the shade is best simulated using a drop of UV glue or UV resin.



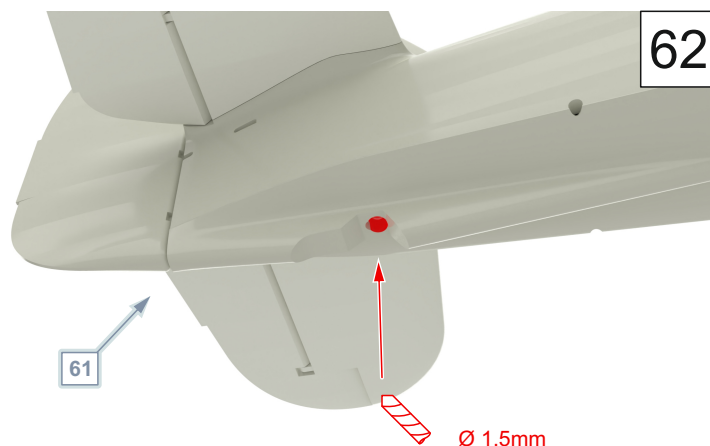
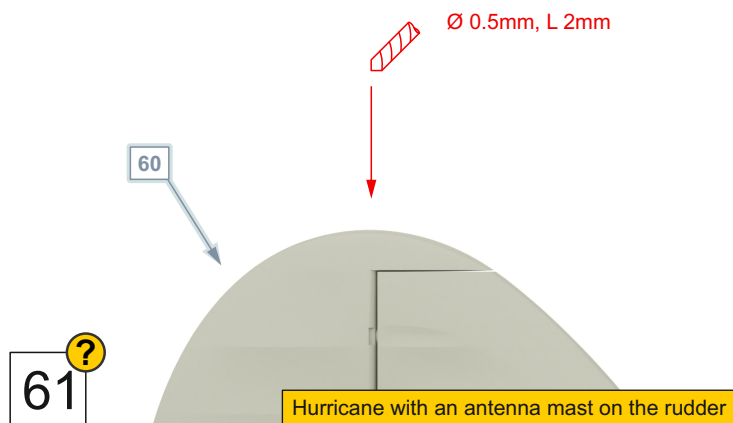
Remove the antenna mast from the rudder. If a particular model is supposed to have this mast, it will be replaced with a printed part.





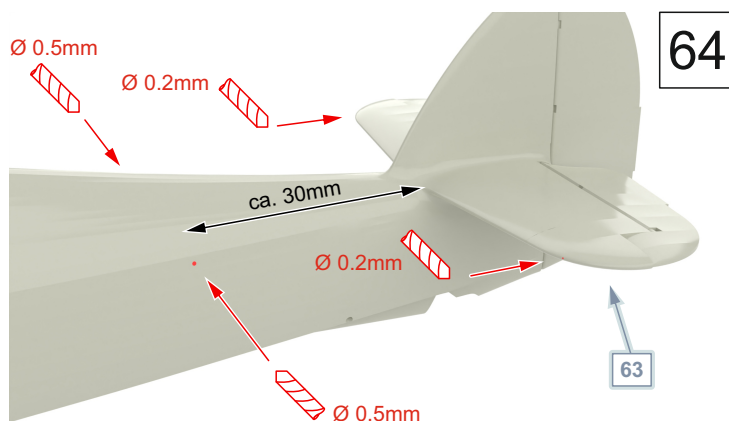
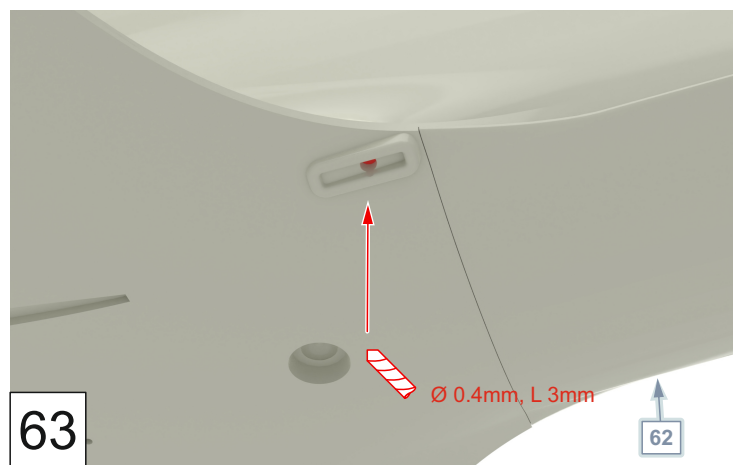
Assembly stages

If the model is to have an antenna mast, as shown in diagrams D7, D8, D9 and D10, drill a vertical hole with a diameter of 0.5 mm and a length of approximately 2 mm. It is best to attach the mast itself towards the end of the model's construction to avoid accidentally breaking it.



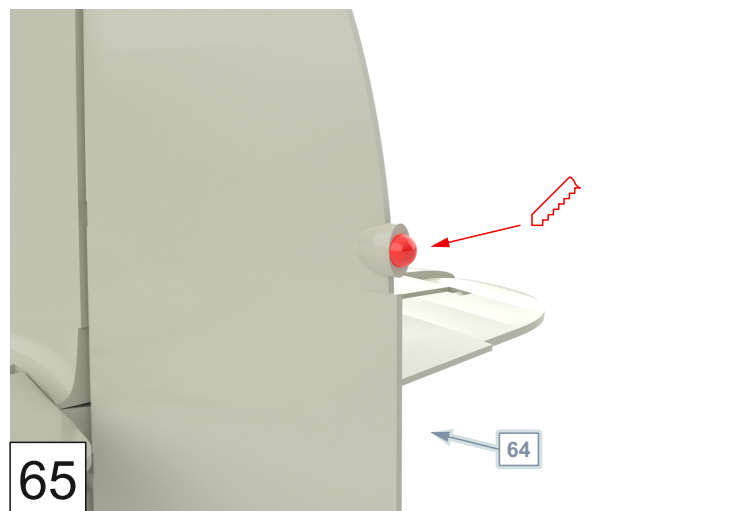
The 3D-printed tail wheel strut has a longer mounting pin than its plastic counterpart. This makes it easier to maintain its correct geometry. However, to fit this 3D-printed strut, you need to drill through the existing socket in the model using a 1.5 mm drill bit.

The 3D-printed cockpit step (A50) has a longer mounting pin than its plastic counterpart. This makes it easier to maintain its correct geometry. To fit the 3D-printed step, you will need to enlarge the existing hole using a 0.4 mm drill bit to a length of approximately 3 mm.

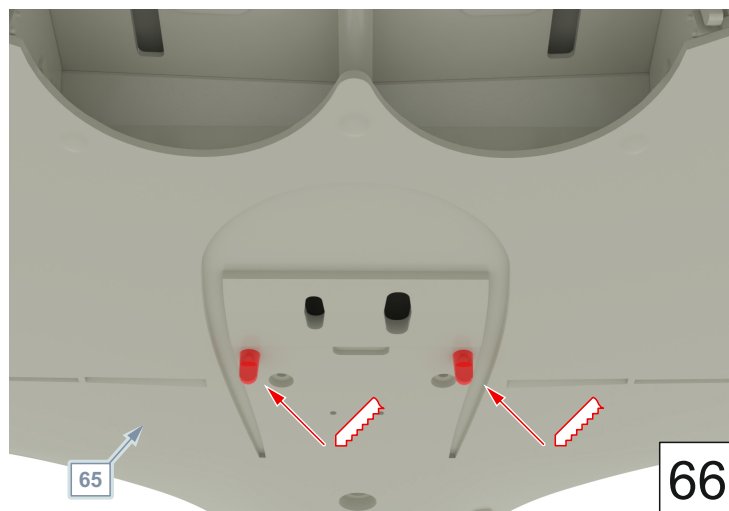


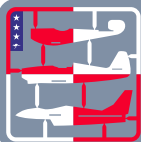
In cases where the Hurricane was fitted with the Mk.II Friend-Or-Foe (IFF) system, antenna cables – known to pilots as 'cheese cutters' – were stretched between the horizontal stabilisers and the fuselage. To fit these to the model, drill 0.5 mm diameter holes in the fuselage and pre-drill holes of approximately 0.2 mm in the stabilisers.

The replica of the navigation light shade on the rudder should be cut off. It will be replaced with a 3D-printed part.



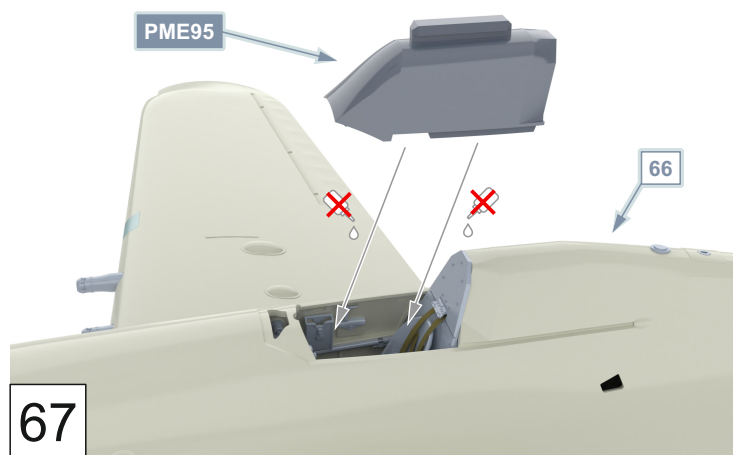
If a 3D-printed radiator is used, the imitations of cooling pipes must be removed from the underside of the centre wing.



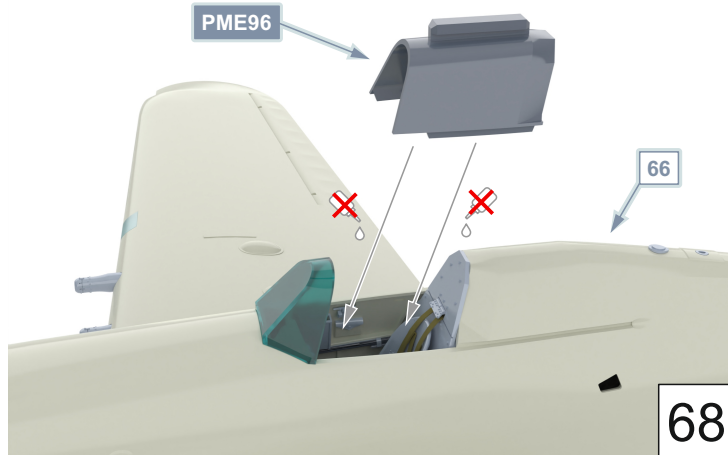


Assembly stages

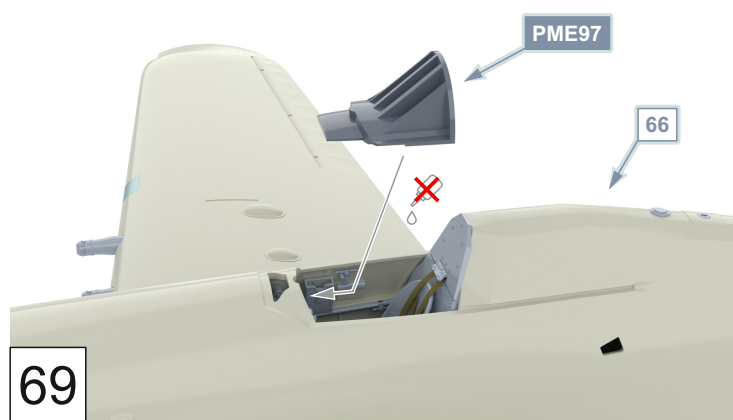
At this stage of construction, it is best to start painting the entire airframe. Once the radiator and the carburettor air intake have been glued in place, this would be very difficult to do. When painting, you can use one of the four 3D masks to cover the cockpit. The first of these covers the entire cockpit like a windscreen and sliding hood.



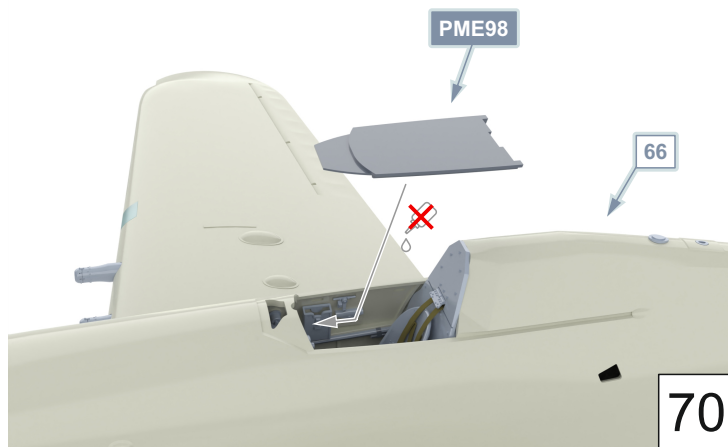
If you need to mask the cockpit after the windscreen installation, you can use a mask that covers the cockpit only beneath the windscreen.



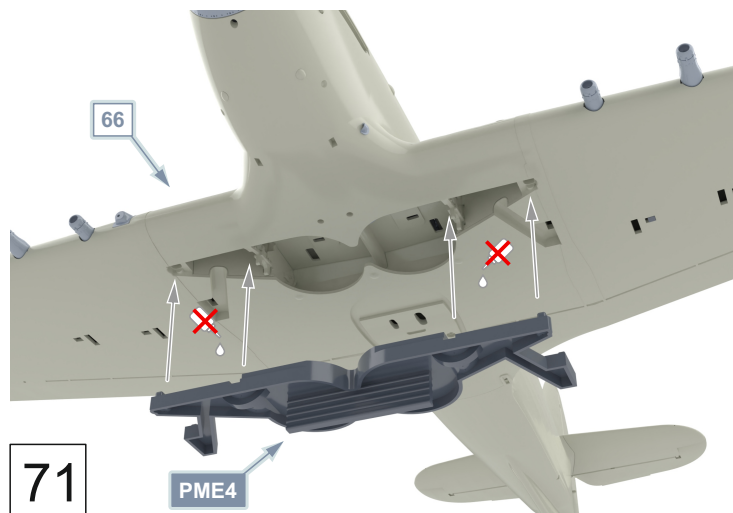
If you want to paint the shelf above the instrument panel, you can use a 3D mask to cover the area beneath the shelf and the rear of the cockpit.



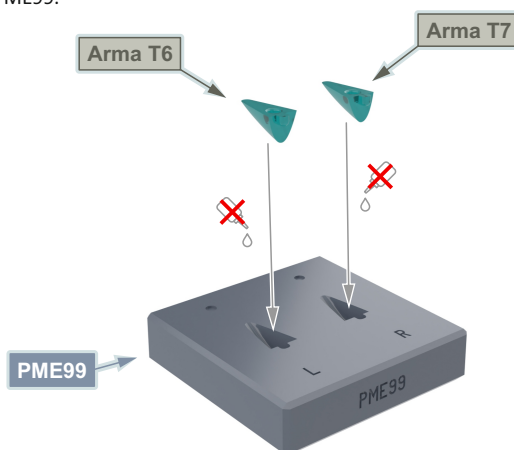
Alternatively, you can use a flat 3D mask to cover the cockpit.

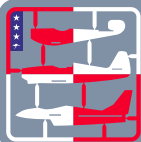


The 3D mask PME4 can be used to protect the wheel well. To hold the mask in place within the well, it is best to use balls of blu-tack.

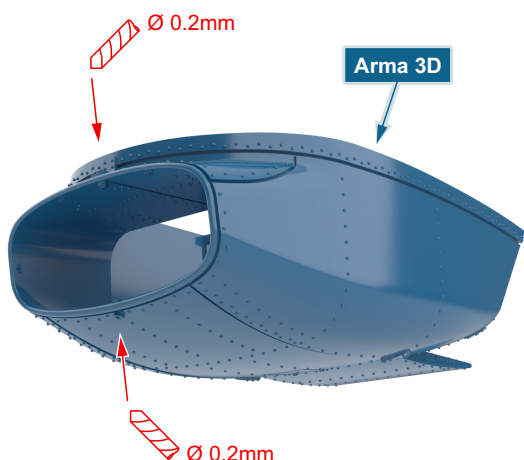


The navigation lights at the wing tips (parts T6 and T7 in the transparent frame of the Arma Hobby model) are quite difficult to work on whilst holding them in your fingers. It is much easier to sand down their rear surfaces whilst they are in the sanding mould PME99.





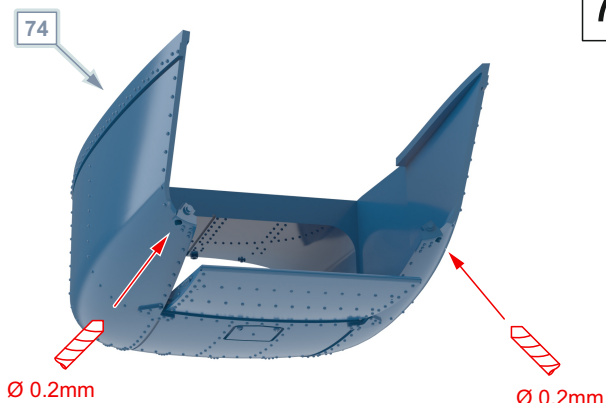
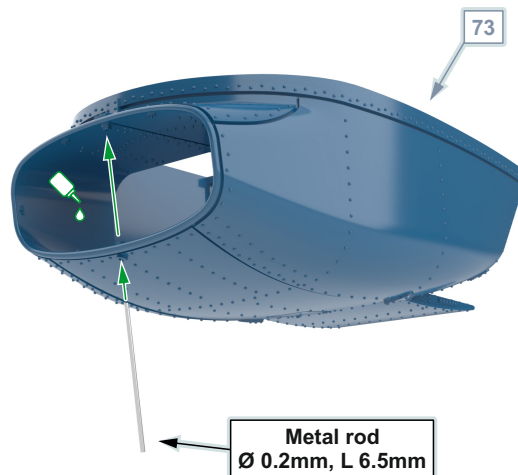
Assembly stages



73

74

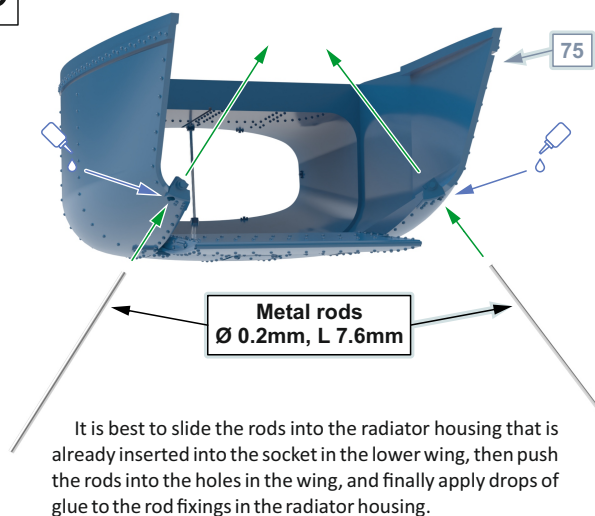
When using a radiator printed from the 3D files sold by Arma Hobby, you will need to drill holes in the front panels of the radiator housing. These holes are included in the design, but in most cases such thin holes cannot be printed without filling in.



75

76

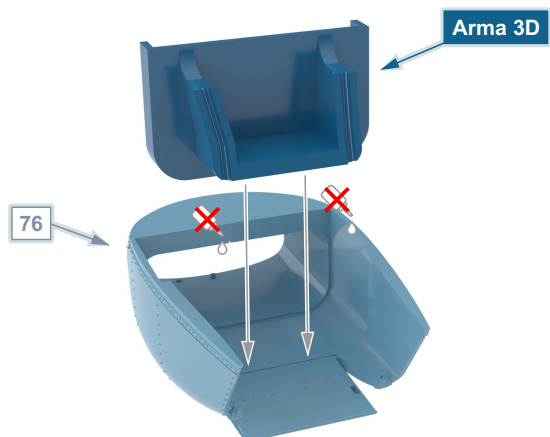
When using a radiator printed from Arma Hobby 3D files, you will need to re-drill the holes in the housing brackets. These holes are included in the design, but in most cases such thin holes cannot be printed without filling in.



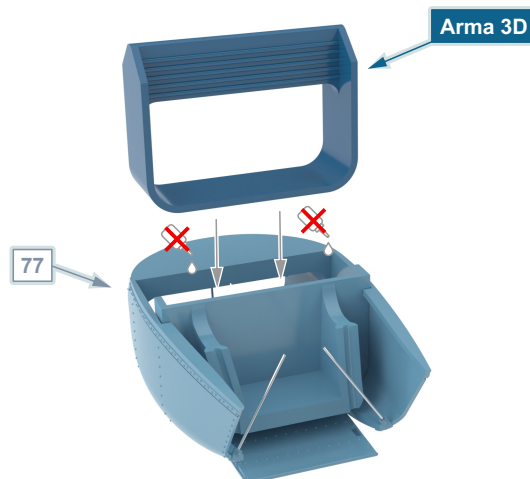
It is best to slide the rods into the radiator housing that is already inserted into the socket in the lower wing, then push the rods into the holes in the wing, and finally apply drops of glue to the rod fixings in the radiator housing.

To ensure the correct geometry of the rear flap push rods, a 3D-printed template should be used. The template, which includes the push rod guides, should be inserted into the recess for the radiator block and moved back to the rear.

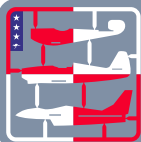
To fix the position of the 3D template for the push rods, insert a spacer into the recess on the radiator block in front of the template.



77

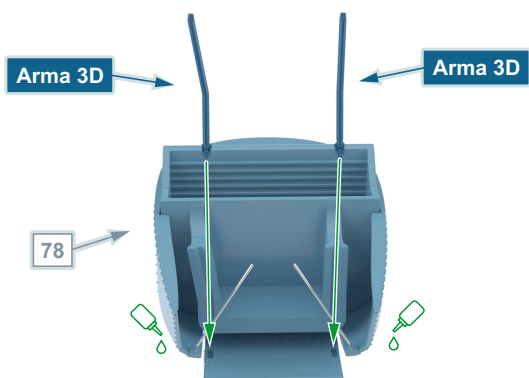


78



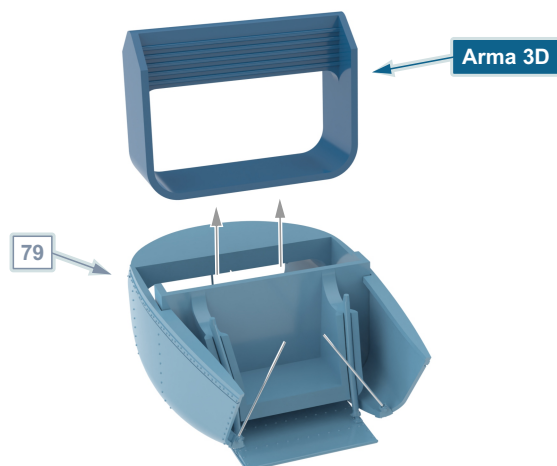
Assembly stages

The push rods should be glued into the recesses in the radiator flap and rested against the guides on the 3D template. Note: the push rods are not symmetrical. The left pusher has a greater bend angle in its upper half than the right one.



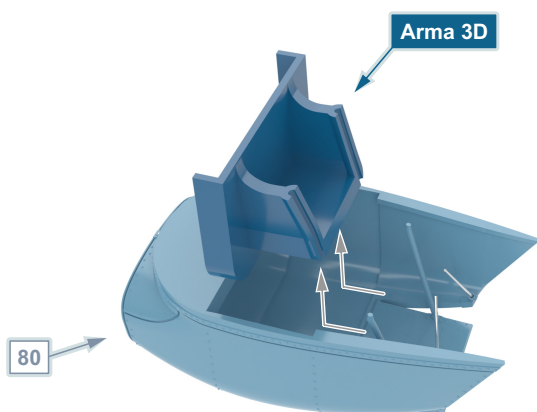
79

The insert with the push rods guides is deliberately divided into two parts. This is because it must be removed in such a way as not to damage the push rods glued to the flap. First, pull the front insert straight upwards.



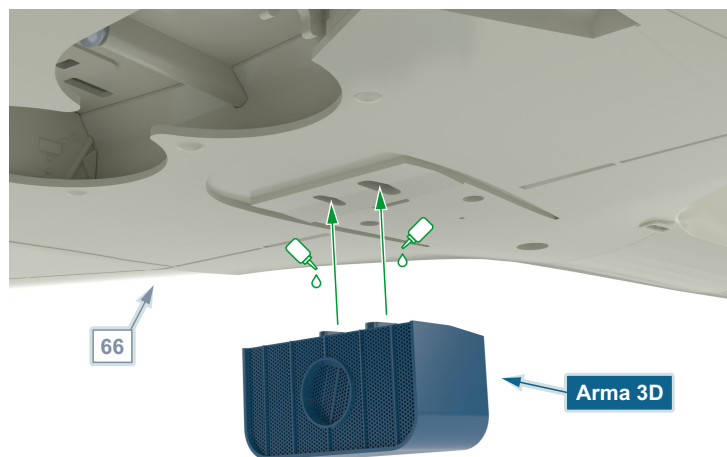
80

Next, slide the rear insert forwards, moving it away from the push rods, and then pull it upwards.



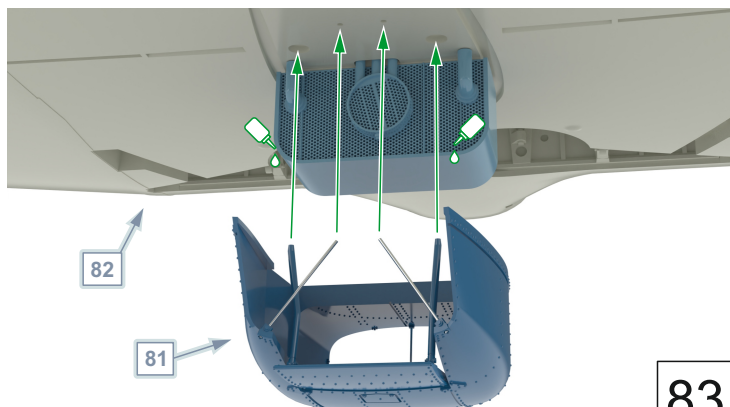
81

The radiator block should be glued directly to the wing.

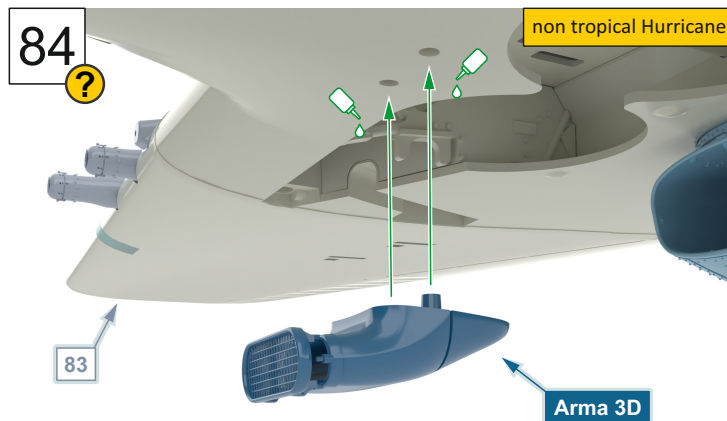


82

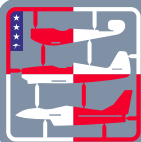
The complete, painted radiator housing should be glued in place so that the ends of the struts at the rear of the housing and the ends of the push rods align with the corresponding holes in the underside of the wing. This allows the radiator housing to be glued in place using spot applications of adhesive in other areas, without the need to get adhesive on the struts and push rods.



83

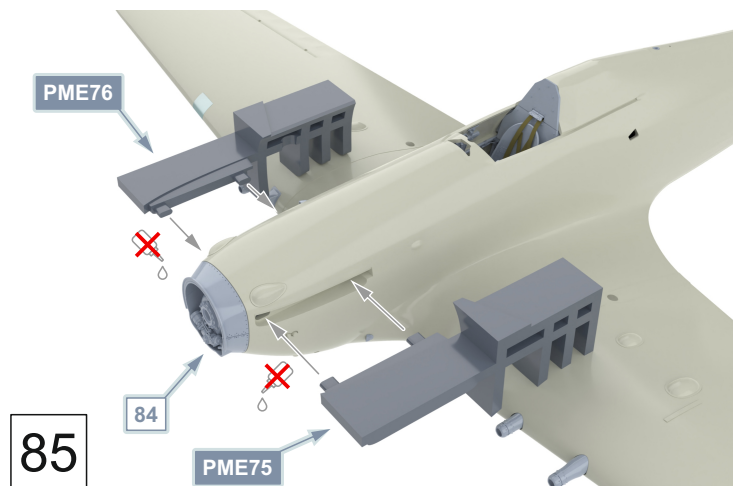


If you are building a Hurricane without the Vokes tropical filter, you should glue the carburettor air intake to the underside of the centre wing. It is best to do this as late as possible in the model-building process. The grille fitted to the front of the intake (the so-called 'snow guard') is very delicate and can easily be snapped off during assembly.

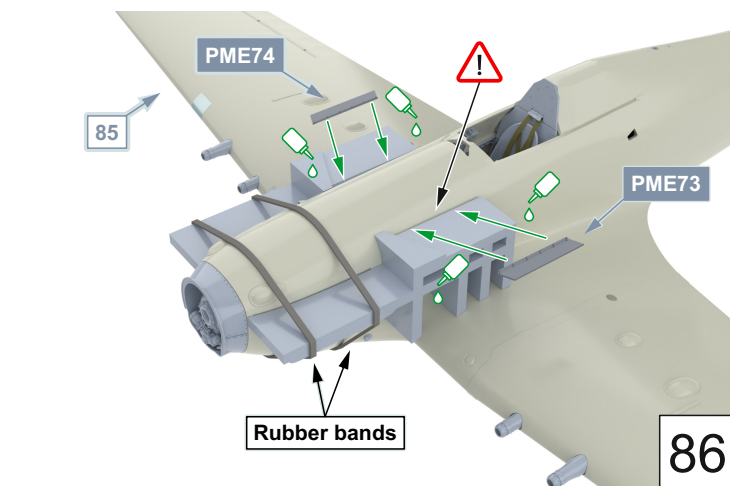


Assembly stages

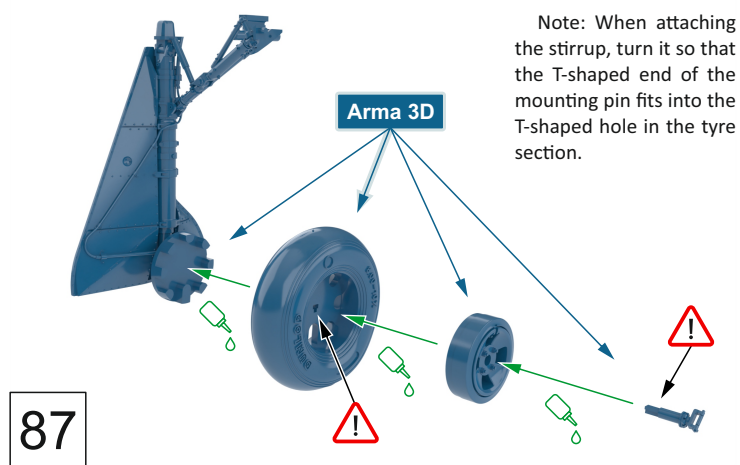
For attaching the anti-glare shields that obscure the view of the flames from the exhaust manifolds, which were fitted to some Hurricanes, it is worth using 3D templates (PME75 and PME76).



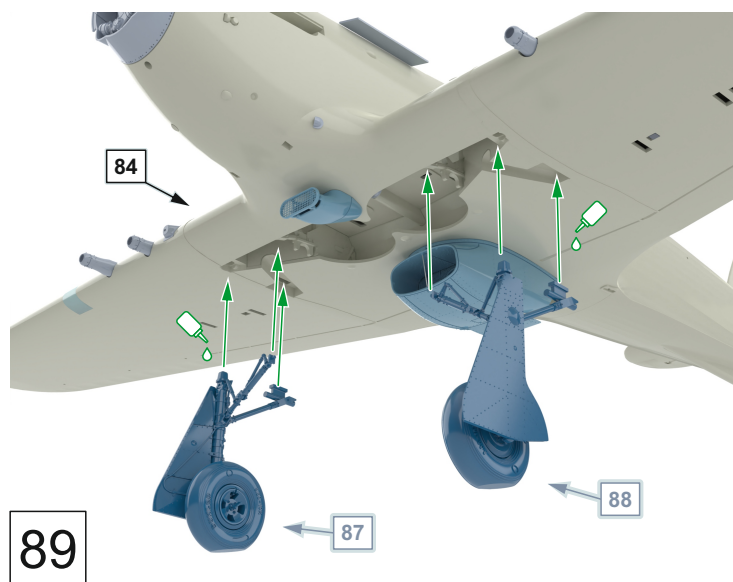
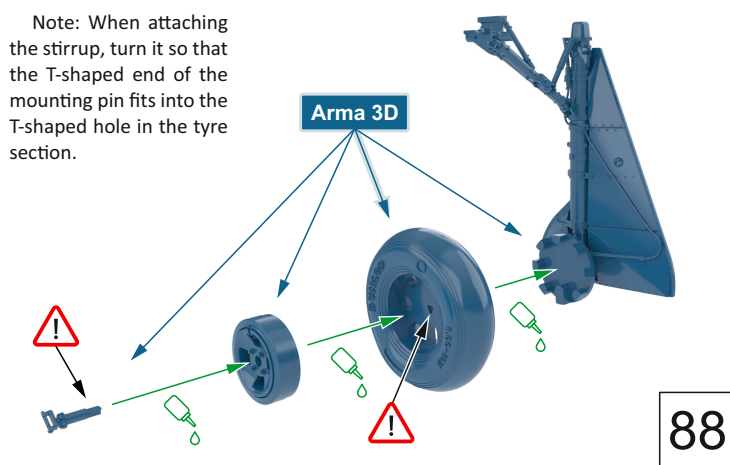
The anti-glare shields are arranged horizontally, as dictated by the 3D template. Apply the glue sparingly to the edges of the shields and use the cut-out in the 3D template (marked with an arrow) to avoid getting glue on the model and the template.



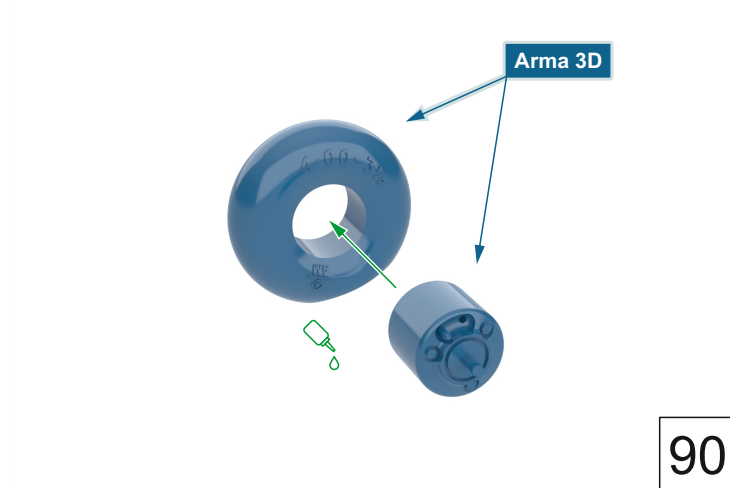
It is best to glue the printed chassis parts together using 'white glue', such as Ammo Ultra Glue. This will allow for any necessary adjustments to the geometry once the chassis has been fitted. Arma supplies both early and late versions of the tyre models (see diagram D13).

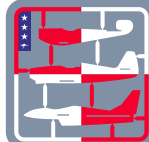


It is best to glue the printed chassis parts together using 'white glue', such as Ammo Ultra Glue. This will allow for any necessary adjustments to the geometry once the chassis has been fitted. Arma supplies both early and late versions of the tyre models (see diagram D13).



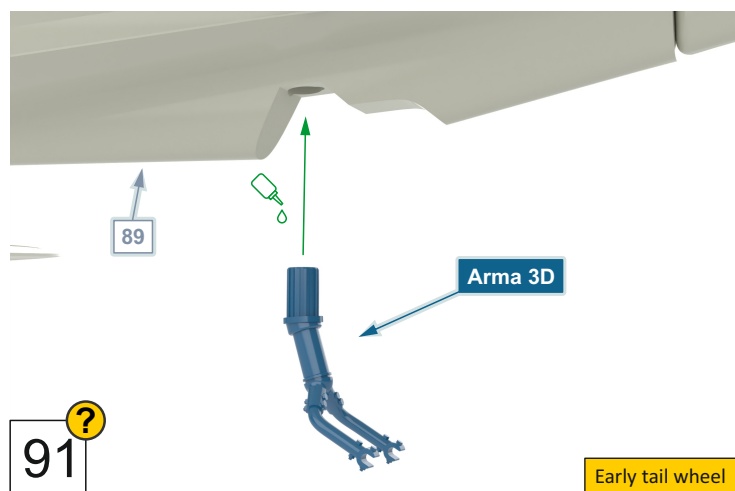
Two types of tail wheel assemblies were fitted to the Hurricane Mk.II. This is illustrated in diagram D14. In both cases, the tail wheel itself was the same. Once painted, the tail wheel should be assembled from two parts.



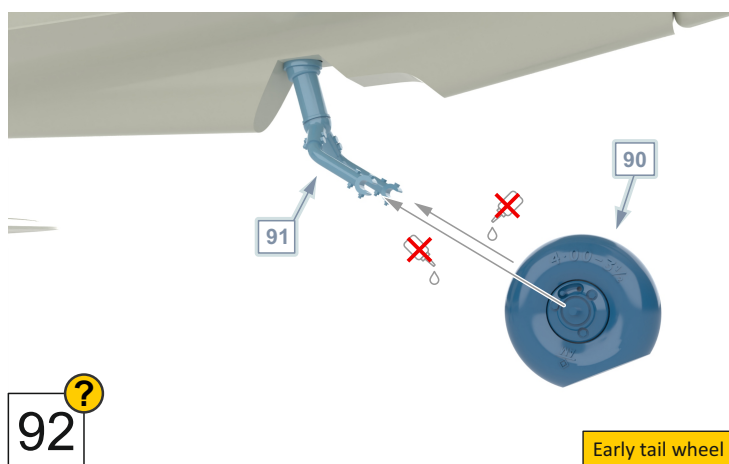


Assembly stages

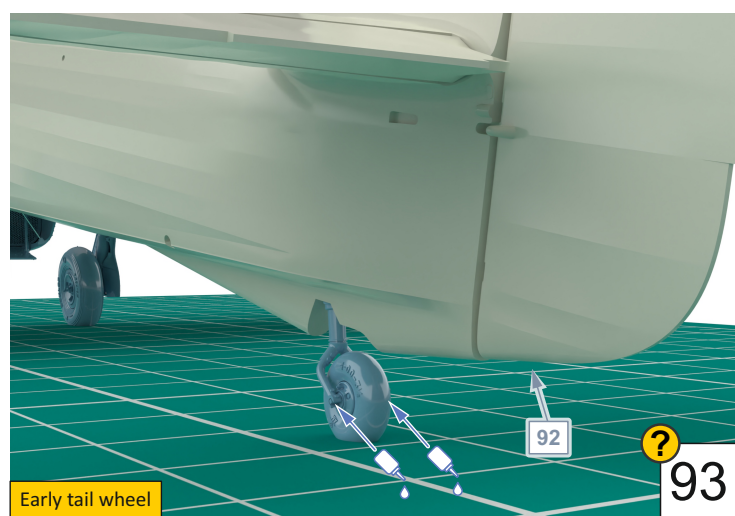
For the early version (see diagram D14), a straight strut must be glued into the fuselage. Remember to drill the hole in the fuselage right through beforehand, as shown in stage 60 of the instructions.



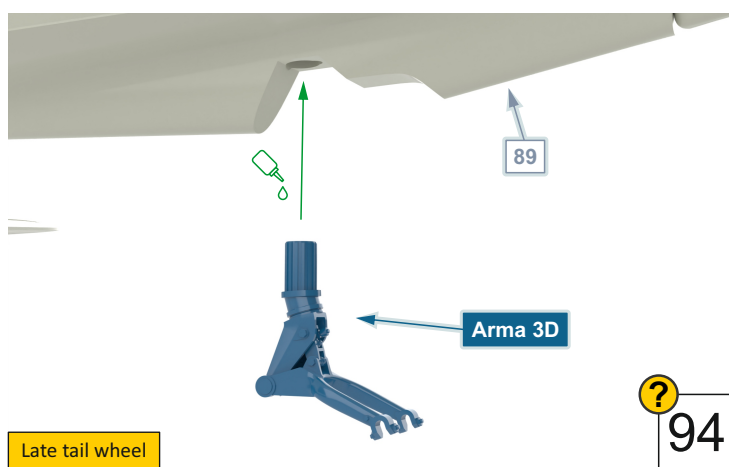
The 3D model depicts the tyre flattening. It is very difficult to position this correctly before applying the glue. Instead, it is recommended that, as a first step, you insert the wheel into the sockets in the lower leg without using any glue, and stand the model on its wheels so that the flattening settles into the correct position.



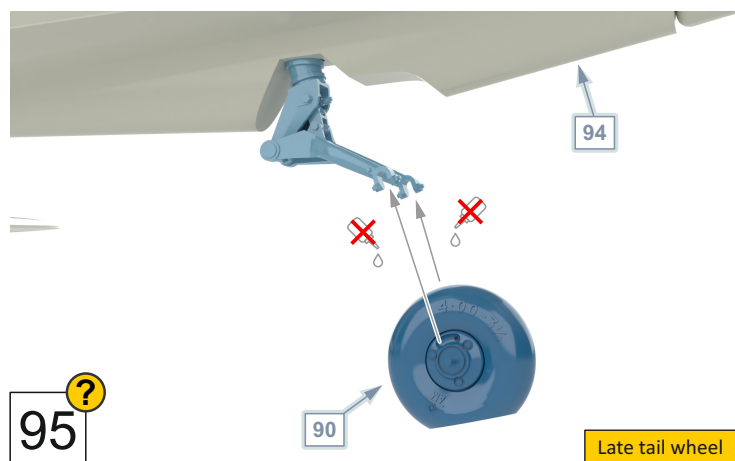
After placing the model on its wheels, position the rear wheel correctly and apply a few drops of glue to the axle to secure the wheel in place.



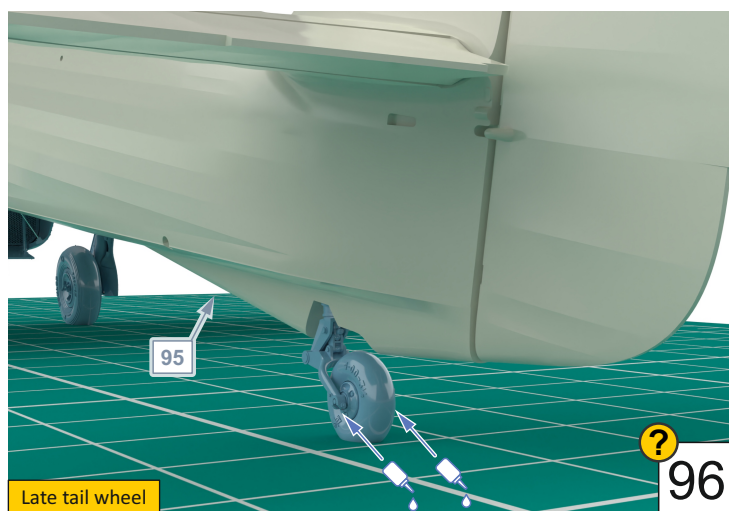
If you are installing the late tail wheel assembly (see diagram D14), you must glue the strut with the scissor-type shock absorber into the fuselage. Be sure to drill the hole in the fuselage all the way through beforehand, as shown in stage 60 of the instructions.

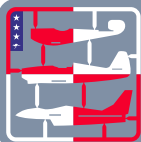


The 3D model depicts the tire flattening. It is very difficult to adjust it properly before applying glue. Instead, we recommend first inserting the wheel into the sockets in the fender without using glue and standing the model on its wheels so that the flattening settles into the correct position.



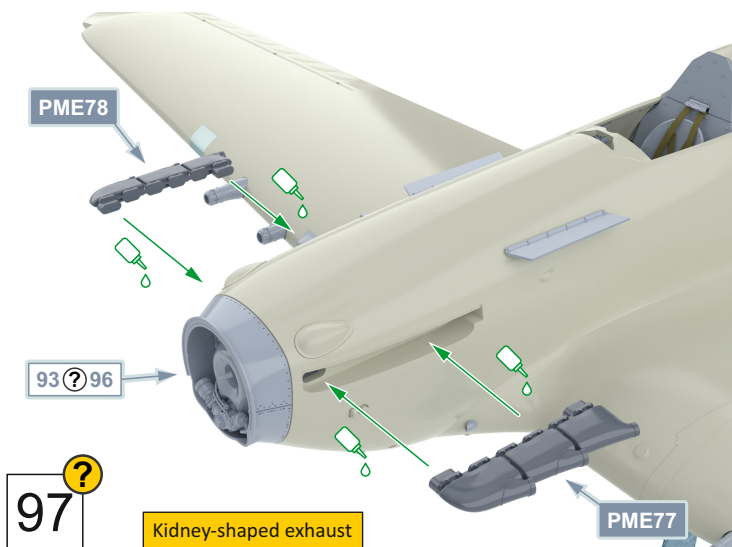
After placing the model on its wheels, position the rear wheel correctly and apply a few drops of glue to the axle to secure the wheel in place.



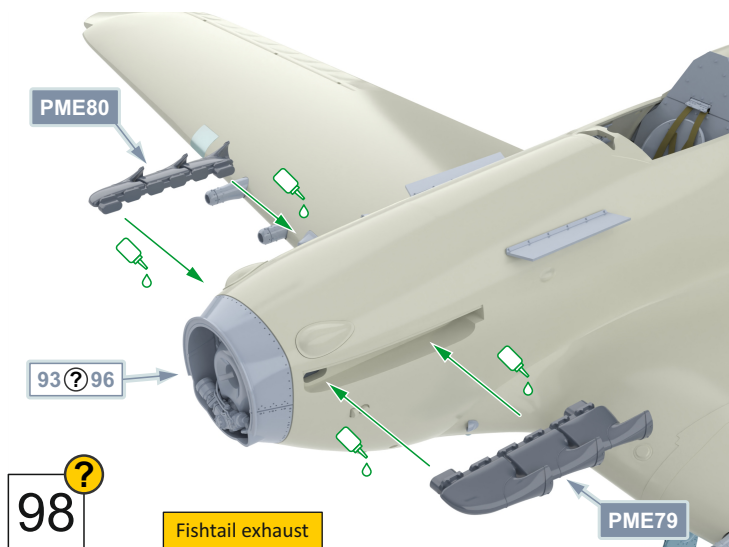


Assembly stages

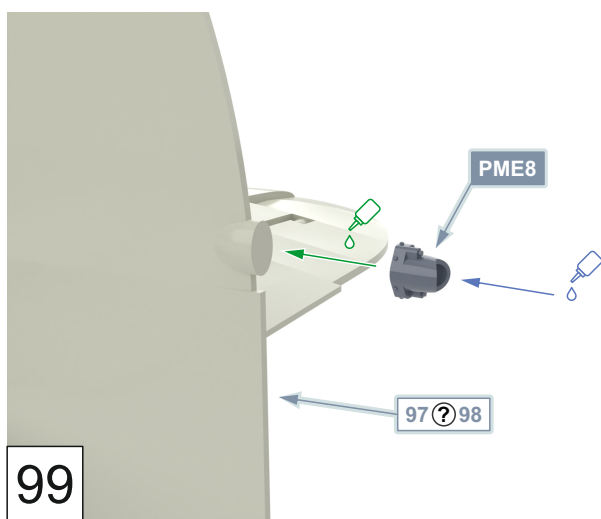
Earlier kidney-shaped exhaust manifolds. See diagram D15.



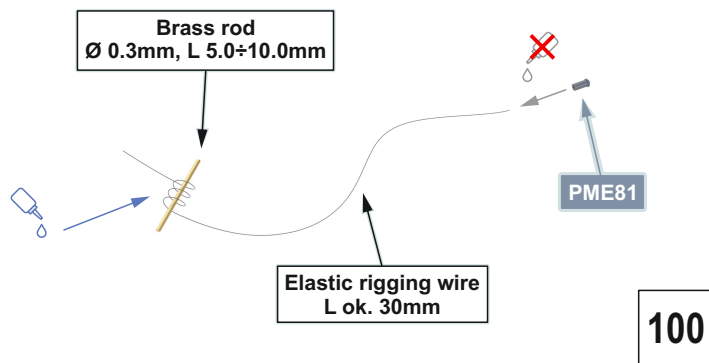
Later fishtail exhaust manifolds. See diagram D16.



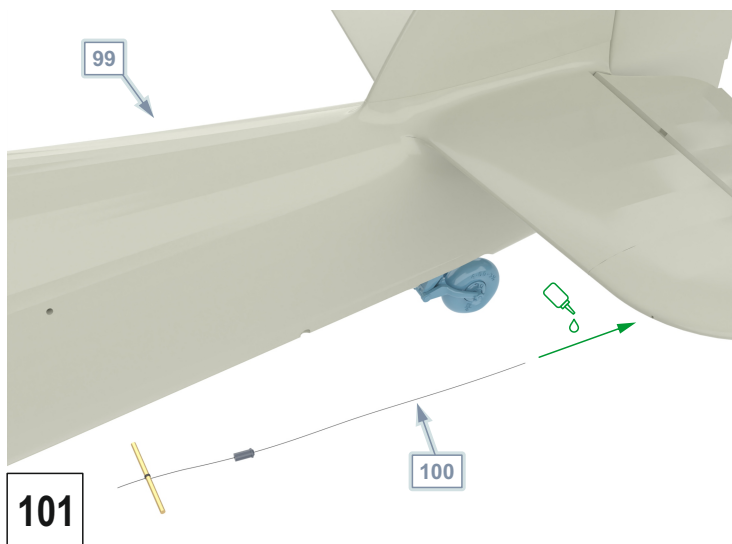
The best way to simulate the shade on the navigation light at the rudder is to use a drop of UV glue or UV resin.



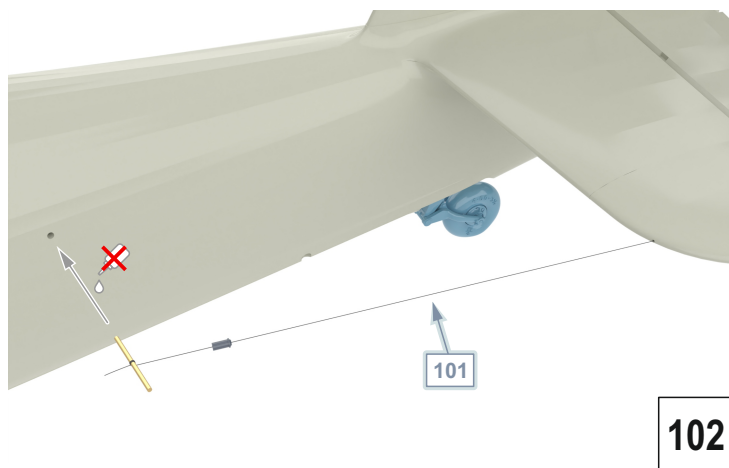
If your Hurricane was equipped with Mk.II IFF antennas (colloquially known as 'cheese cutters'), it's a good idea to prepare two appropriate sets on the side of the model before mounting them to facilitate installation. Use flexible rigging lines as antenna wires such as Uschi van der Rosten's 'Rig That Thing'. Wrap one end of the wire around a 0.3 mm diameter brass rod and seal the knot with CA or UV glue. The rod will act as an 'anchor' in the fuselage. Thread a PME81 socket onto the other end of the cord, but **do not glue it in place!**

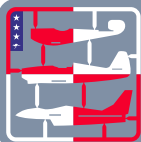


Insert the free end of the wire into the pre-drilled hole in the horizontal stabiliser.



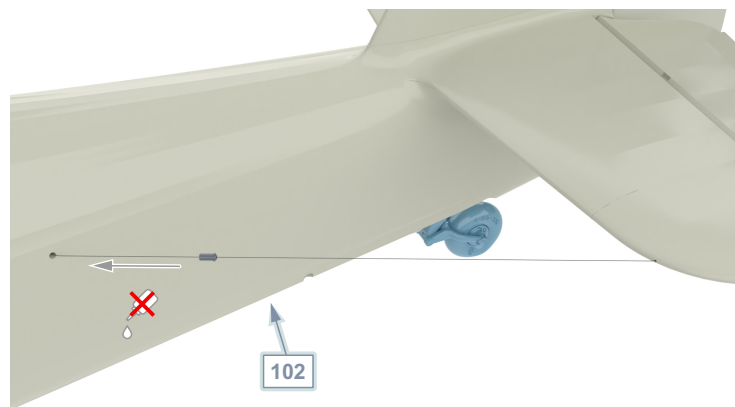
Push the brass rod into the hole you drilled earlier in the fuselage. The easiest way to do this is to push it in with another piece of metal rod. Once pushed in, the 'anchor' will settle into the fuselage on its own so that it holds the end of the stretched wire in place.





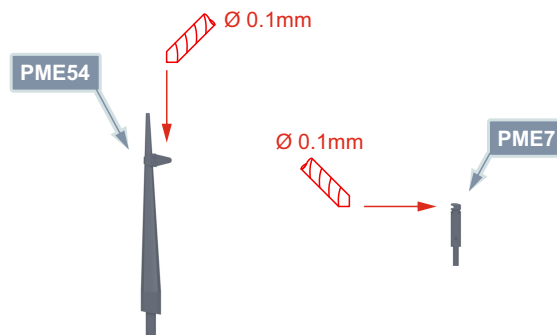
Assembly stages

After securing both ends of the wire, insert the PME81 socket into the hole in the fuselage. If the drilled hole is not too large, there is no need to use glue. Alternatively, you can secure the socket with a drop of clear paint.



103

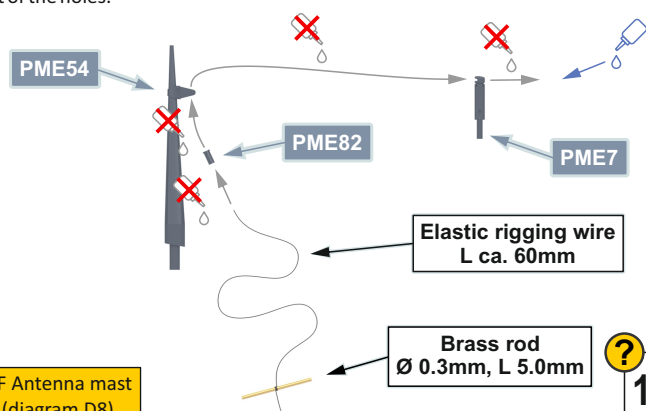
If you are using an antenna mast for HF radio (see diagram D8), you must drill through the tension triangle in PME54 front mast and the upper end of PME7 rear mast. The 3D model includes these holes, but most printers will be able to preserve them during printing.



HF antenna mast (diagram D8)

104

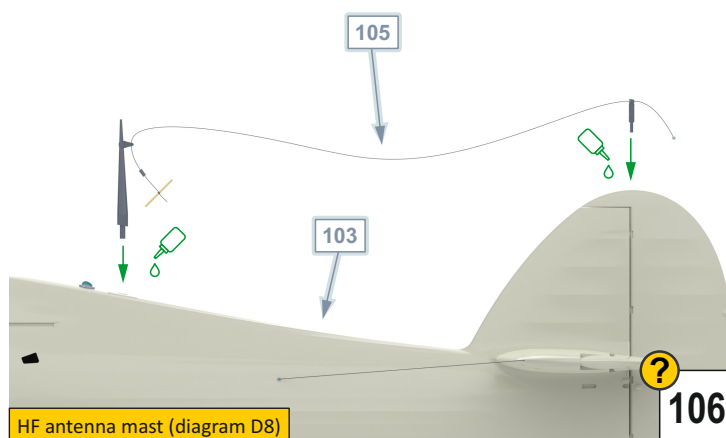
To make it easier to install the antenna assembly, it's best to prepare everything before attaching the antenna masts. Wrap one end of the wire around the brass rod ('anchor'), and thread the other end through the PME82 socket, the PME54 mast, and the PME7 rear mast. After threading the wire through, apply a drop of UV or CA adhesive to the other loose end. The resulting knot will prevent the cable from slipping out of the holes.



HF Antenna mast
(diagram D8)

105

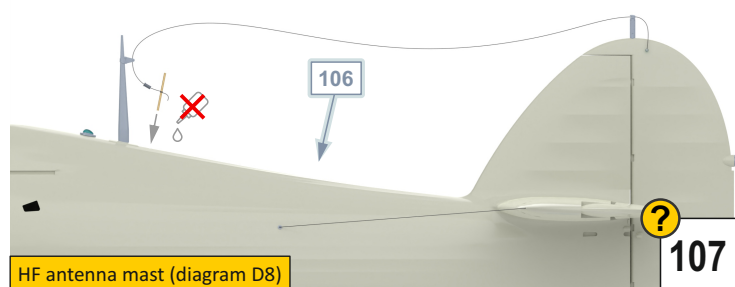
Once the entire antenna assembly has been prepared, attach the front mast (PME54) and the rear mast (PME7) to the rudder.



HF antenna mast (diagram D8)

106

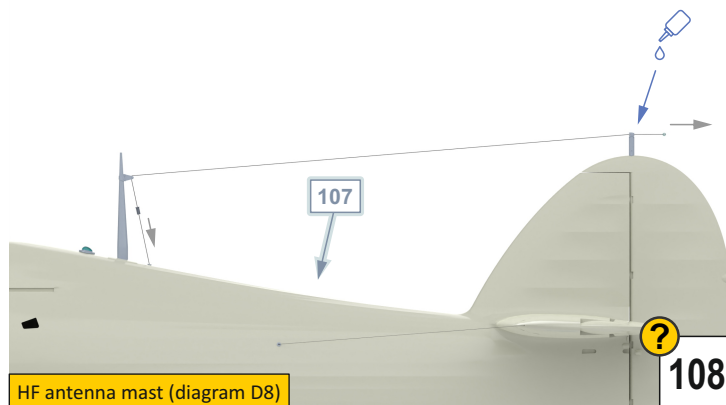
Push the brass rod ('anchor') into the hole you drilled earlier. It's best to use another piece of brass rod for this.



HF antenna mast (diagram D8)

107

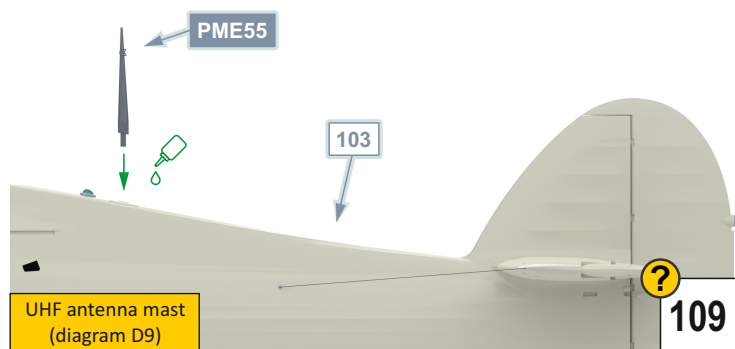
With the front end of the wire secured to the fuselage, tighten the wire by pulling on its rear end and apply a drop of glue to the hole in the rear antenna mast. Once the glue has dried, you can cut off the excess length of cable behind the PME7 mast.



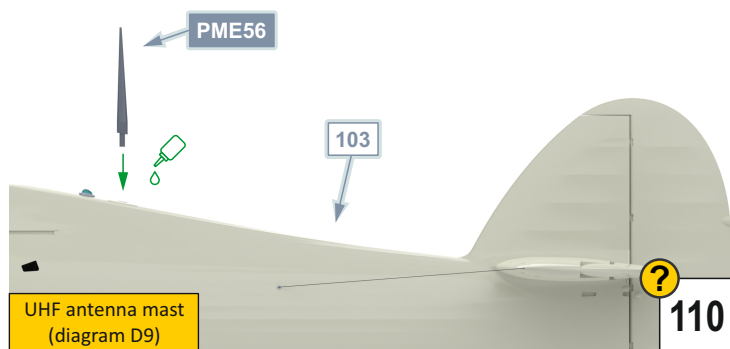
HF antenna mast (diagram D8)

108

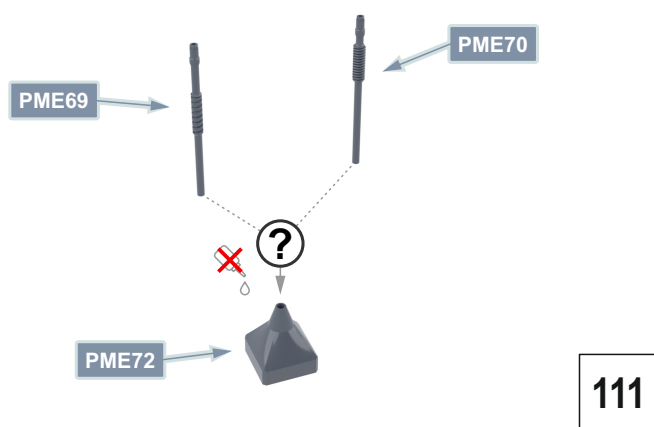
When installing an antenna mast for an ultra-high-frequency radio with the triangular antenna cable tensioner removed, use PME55 mast. See the explanations in diagram D9.



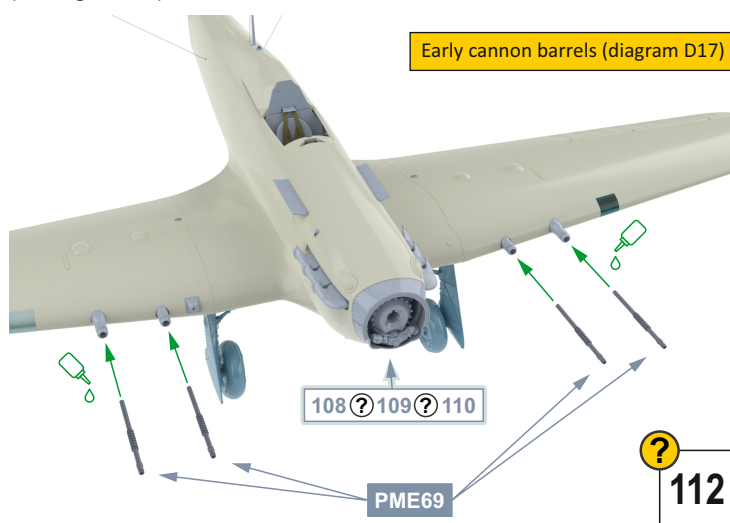
If you are installing an antenna mast that is factory-prepared for an ultra-high-frequency radio and lacks any antenna cable tensioning components, use PME56 mast. See the explanations in diagram D10.



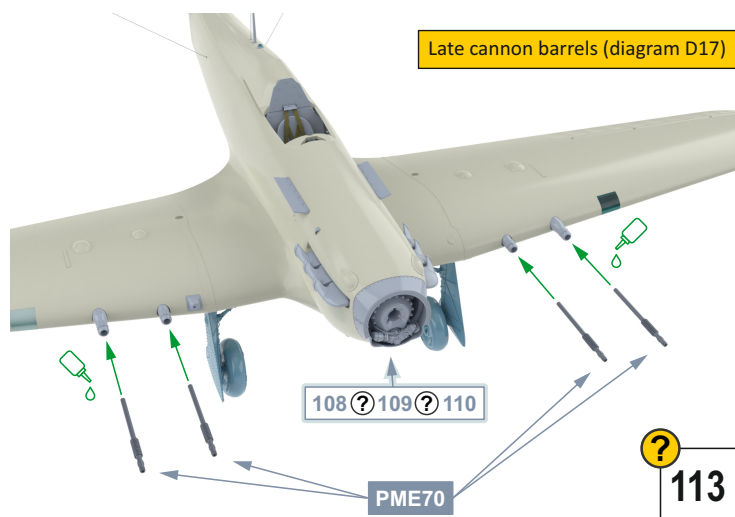
When building the Hurricane Mk.IIc, the gun barrels should be glued in place at the end of the build in order to avoid breaking them. To make painting the barrels easier, you can use PME72 mounts. They fit both the early PME69 barrels and the later PME70 barrels.



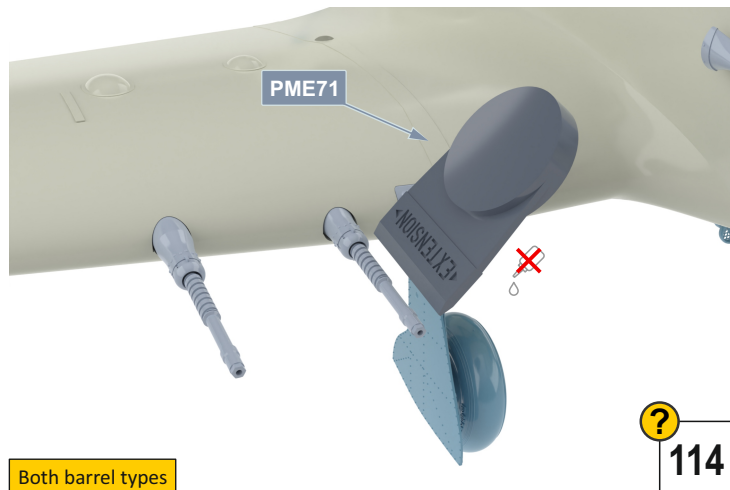
When building an early Hurricane Mk.IIc, use PME69 barrels with flat recoil springs (see diagram D17).

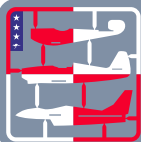


When building a late version of the Hurricane Mk.IIc, use PME70 barrels with round recoil springs (see diagram D17)



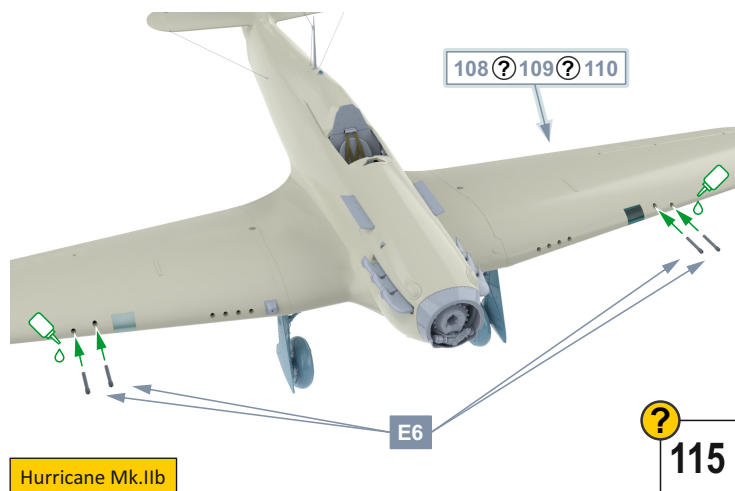
The barrel housings have a guard that prevents the barrels from being inserted too deeply. To check that the barrels are not seated too shallowly, you can use the PME71 extension gauge. Both the early and late barrels were the same length.



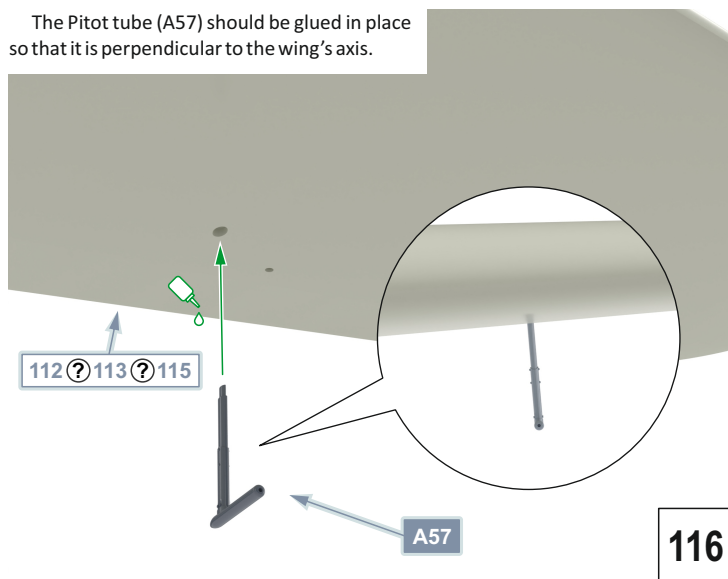


Assembly stages

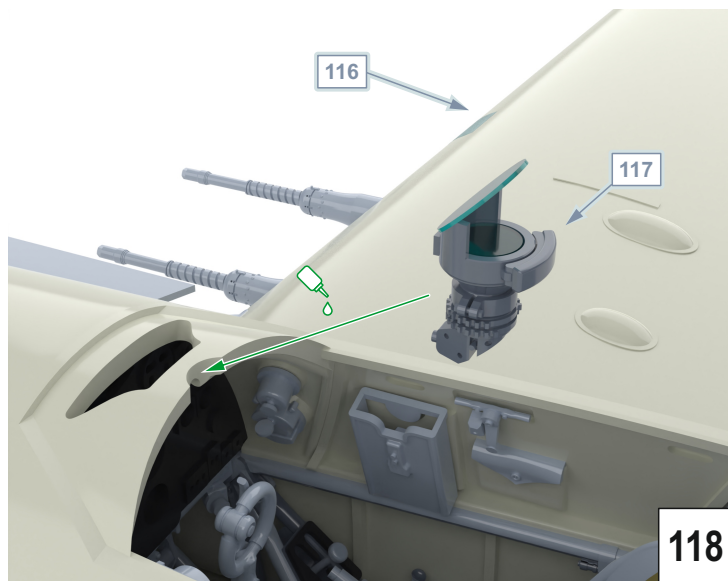
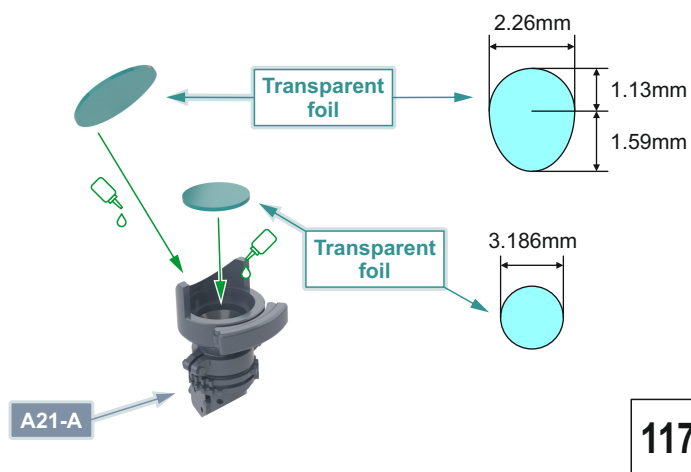
When building the Hurricane Mk.IIb, use four E6 barrels for external guns. Their length is such that they can be inserted all the way into the 'recess' moulded into the upper half of the wing.



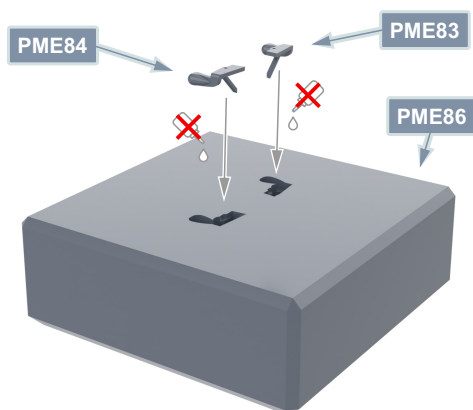
The Pitot tube (A57) should be glued in place so that it is perpendicular to the wing's axis.



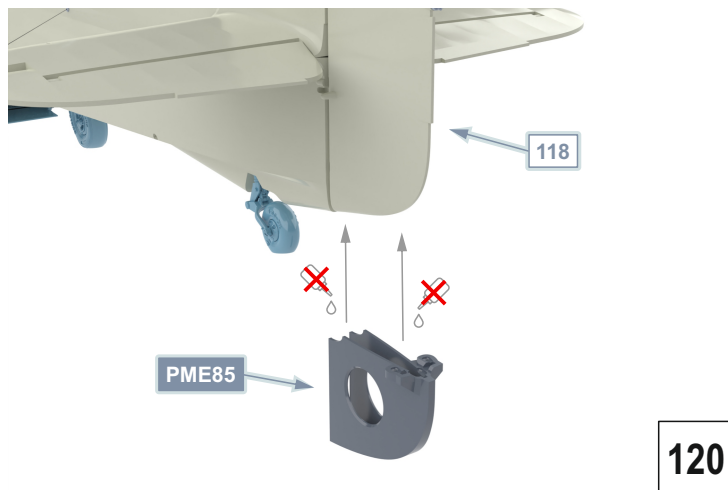
To glue the foil pieces to the gunsight, it is best to use UV glue, white glue (e.g. AK Ultra Glue) or clear paint.

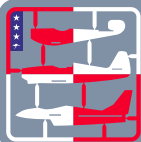


The rudder trim tab horns are very delicate, and to make it easier to remove any remaining support material from their undersides, it is worth using the PME86 sanding mould.



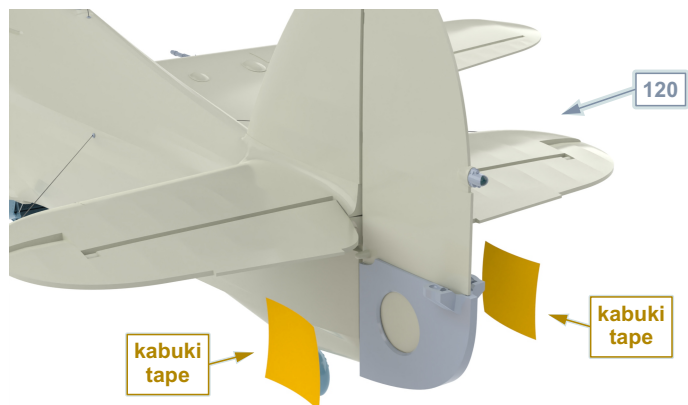
To ensure that the PME83 and PME84 trim tab control horns are attached evenly, it is advisable to use the PME85 template, which should be slid onto the rudder from below.





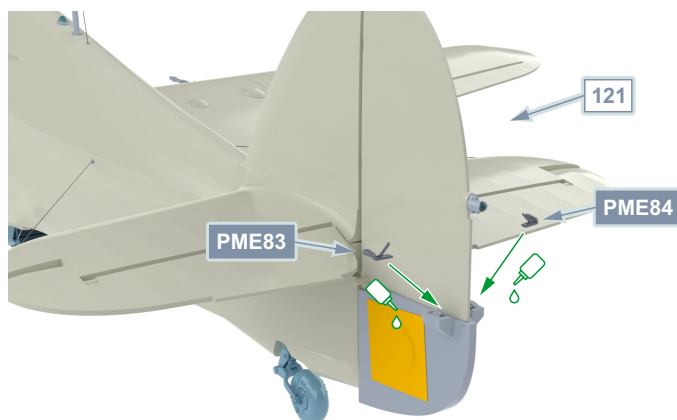
Assembly stages

The PME85 template can be fixed to the rudder using pieces of yellow kabuki tape, making use of the round holes in the mould.



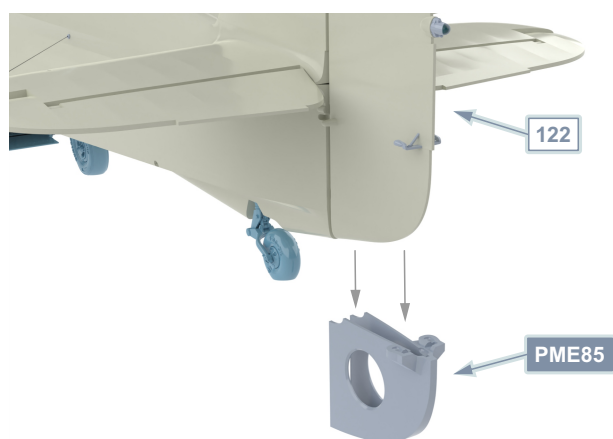
121

Once the mould has been secured, glue trim tab control horns on both sides.



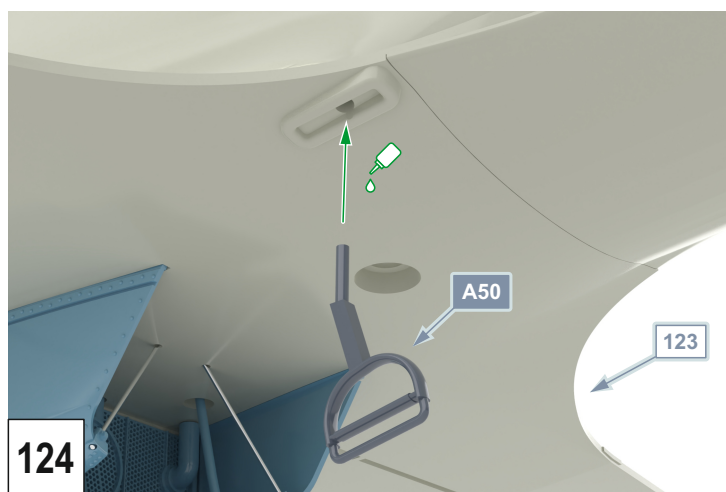
122

Once the PME83 and PME84 trim tab control horns have been glued in place and have dried, carefully slide the PME85 mould downwards.



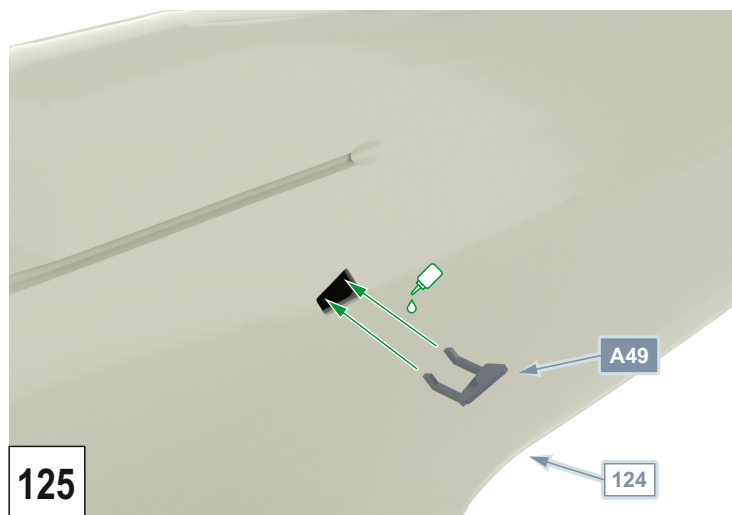
123

The foot step (A50) could be lowered or retracted. If the step is to be installed in the lowered position, drill a through-hole in the door socket (see step 61) and fit part A-50.



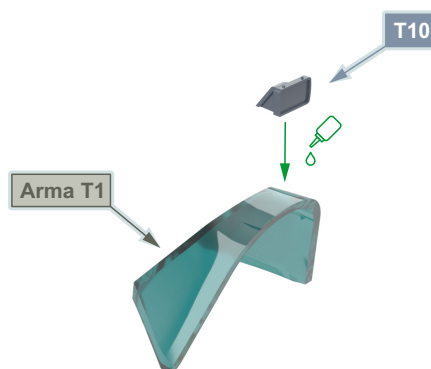
124

When fitting the lowered foot step (A50), the open hand door (A49) must be glued to the fuselage.

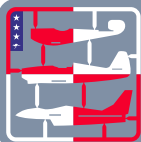


125

It is best to paint the 3D-printed T10 mirror before gluing it in place, and to use UV adhesive to fix it to the windshield.

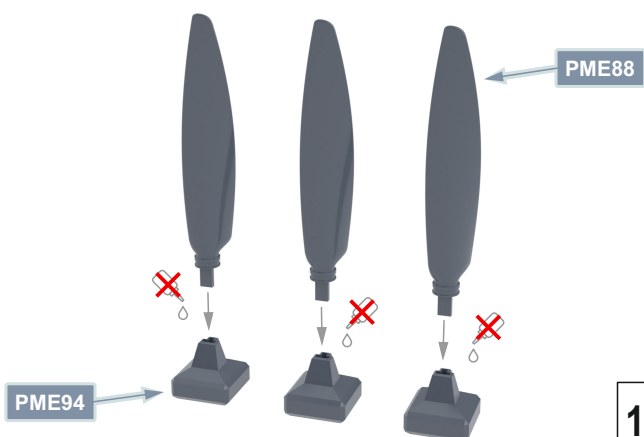


126



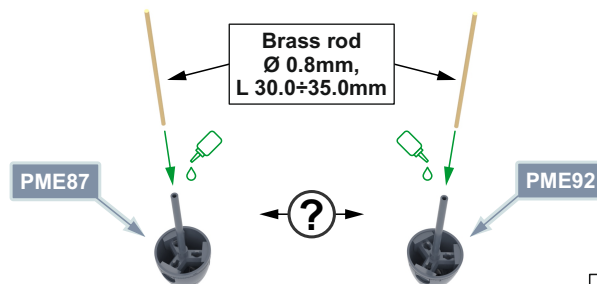
Assembly stages

It is worth painting the Rotol propeller blades (PME88 parts) before gluing them into the spinner. You can use the PME94 holders to paint the blades.



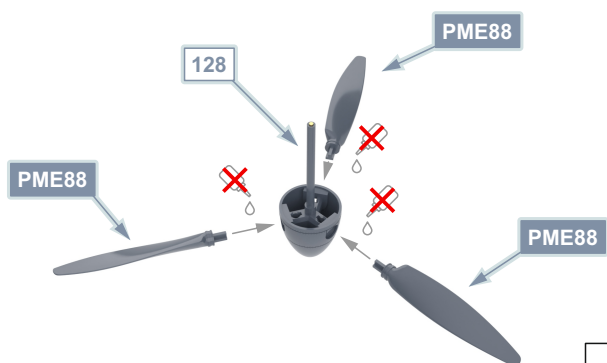
127

Before installing the propeller blades, check which spinner was used on the Hurricane you are building. Is it a CM/1 spinner (PME87) or an ES/9 spinner (PME92)? This is explained in diagrams D19 and D20. In both cases, the shaft printed together with the propeller spinner is hollow inside so that it can be reinforced with a 0.8 mm diameter metal rod. A brass rod, which is readily available at model shops, is sufficient. It should be glued in place with slow-drying glue so that it does not dry too quickly while the rod is being inserted. Alternatively, you can pour glue at the shaft's end after it has been already inserted.



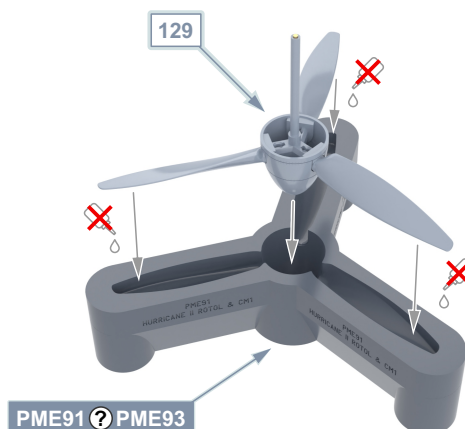
128

The propeller is designed so that the hub and blades can be painted before gluing. Additionally, the propeller's design allows you to attach the blades to the spinner without risking getting glue on the spinner and while ensuring the blades maintain the correct geometry. Therefore, at this stage, insert the blades into the spinner without using glue. The blades will be secured in the following steps.



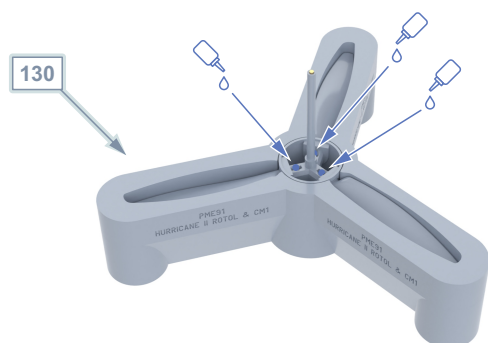
129

The propeller, which has been assembled but not yet glued, should be placed in the PME91 or PME93 template (depending on the spinner variant), which ensures that the correct geometry is maintained during the subsequent gluing process.



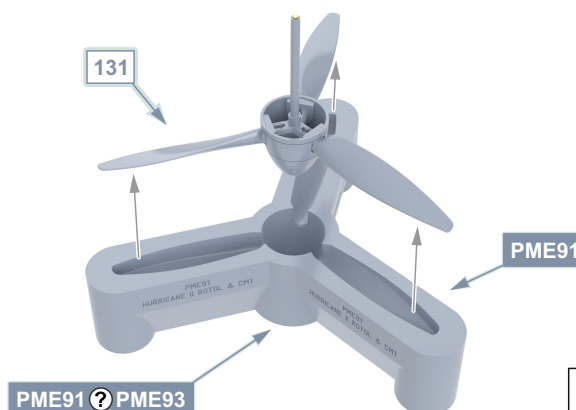
130

At the back of the hub cap, in the blade sockets, there are slots into which you should apply drops of adhesive to secure the blades to the hub cap. It is safest to use UV adhesive for this.

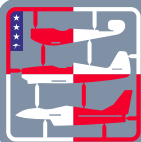


131

Once the propeller has been glued together, it can be safely removed from the mold.

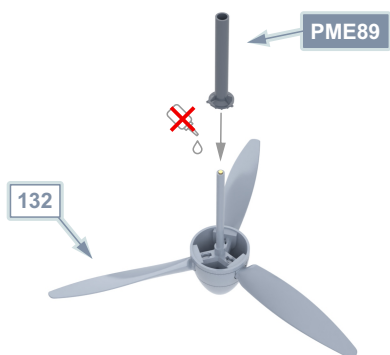


132



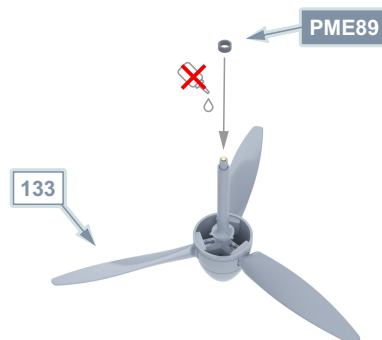
Assembly stages

A PME89 bearing should be installed without using glue on the propeller shaft. During printing, the through-hole in the bearing may shrink due to excessive exposure time or resin shrinkage. If this occurs, ream the hole with a 1.6 mm drill bit.



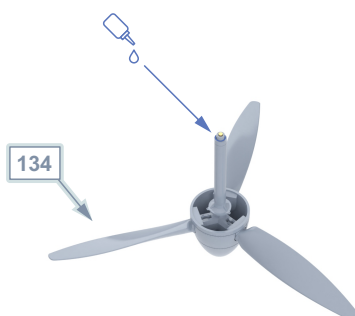
133

Slide a PME90 nut onto the end of the propeller shaft. Be sure to check that the bearing and nut are fitted tightly enough to prevent any longitudinal play on the propeller shaft.



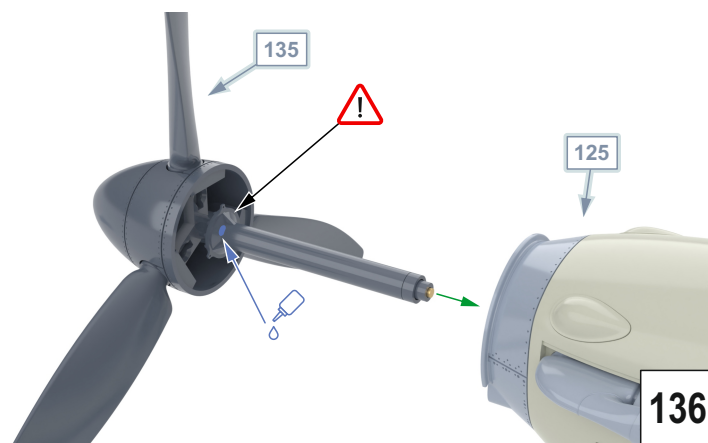
134

Once the PME98 nut has been fitted, secure it with a few drops of adhesive from the rear, taking care to ensure that the adhesive does not seep forwards into the bearing.



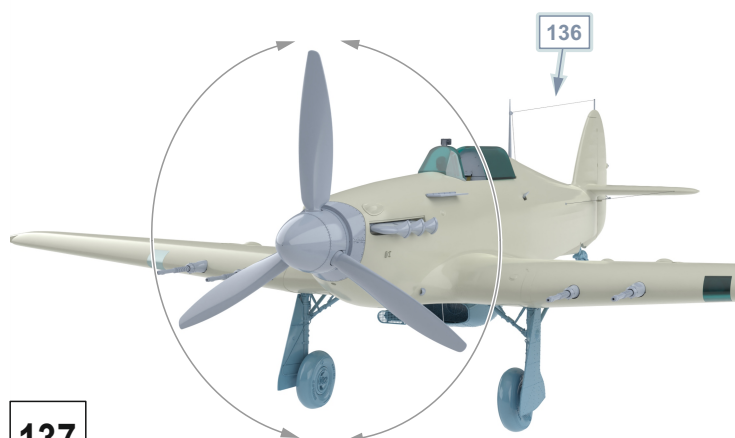
135

When installing the propeller on the model, it's best to use a slow-drying 'white' glue, such as AK Ultra Glue. Apply the glue in several places behind the front bearing shield of the PME89. Note: Be aware that there are three 'ridges' behind the front bearing shield that position the bearing in the mock-up engine. Rotate the bearing so that one of the ridges is facing upward.



136

Once the propeller is inserted, turn it clockwise and anti-clockwise to ensure that the 'ridges' in the bearing have engaged with the notches in the mock-up engine.

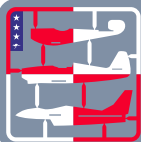


137

If you've made it this far, my heartfelt congratulations. That's a job well done! Now it's time to relax ;).

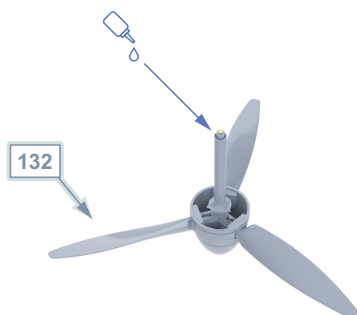


138



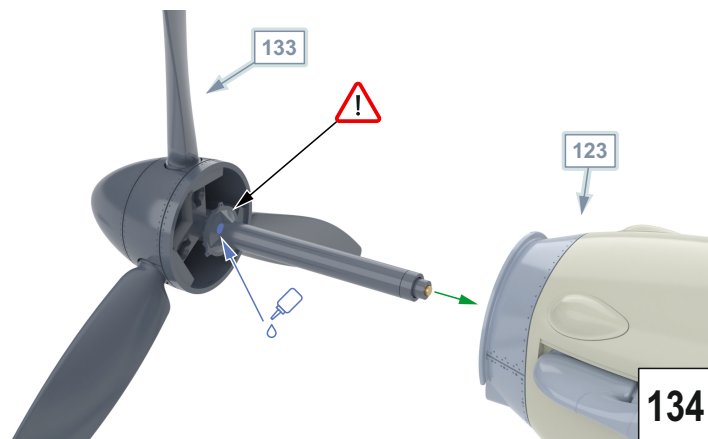
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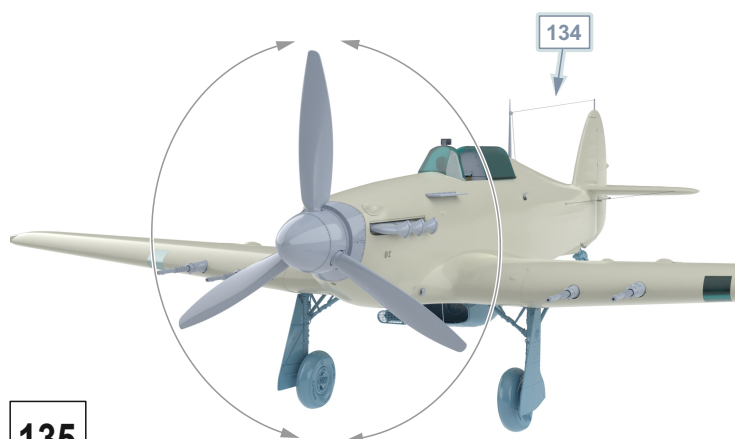
133

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