

# WINGNUT WINGS



## Felixstowe F.2a Late

1/32 Scale

The Felixstowe F.2a was probably the most successful flying boat of the First World War. With a crew of 5 it was capable of carrying out long range reconnaissance, anti-submarine and anti-shipping patrols of up to 10 hours duration. The development of the Felixstowe F.2a is staggeringly convoluted but it was essentially an Anglo-American design which can trace its roots to the pre war Glenn Curtiss & Cyril Porte designed 180hp twin engine 'America' flying boat design. This basic design was improved, enlarged, strengthened and repowered successively by both Curtiss and Porte (having now returned to service in the RNAS after the outbreak of war despite suffering from Tuberculosis) over the next few years until July 1917 when Porte arrived at the characteristic deep 'V' hull with full side fins. Although technically now a wholly Porte design these Felixstowe flying boats, so named because they were developed at the RNAS Seaplane Experimental Station at Felixstowe in Suffolk, were referred to as 'Large Americas' by the British and as 'Curtiss' types by the Germans.

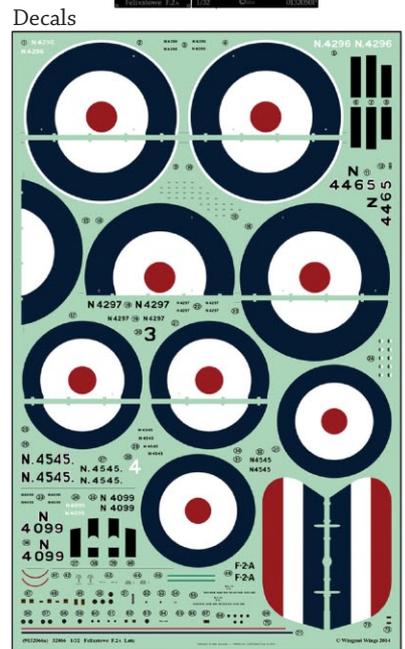
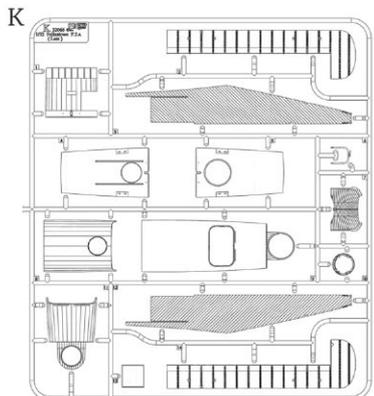
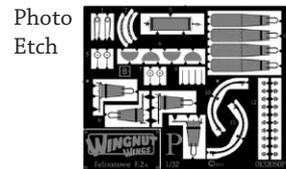
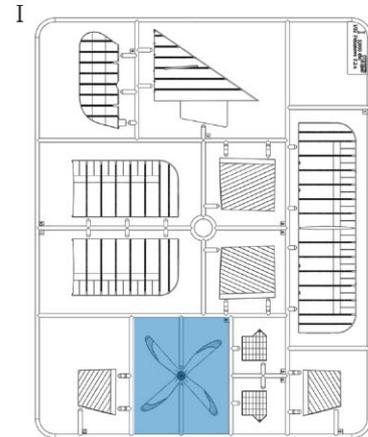
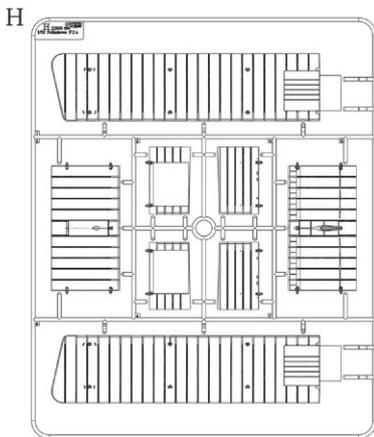
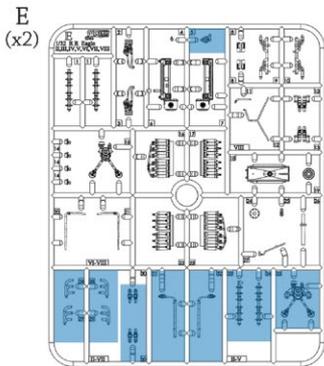
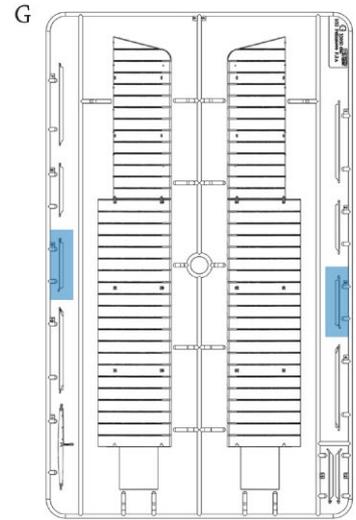
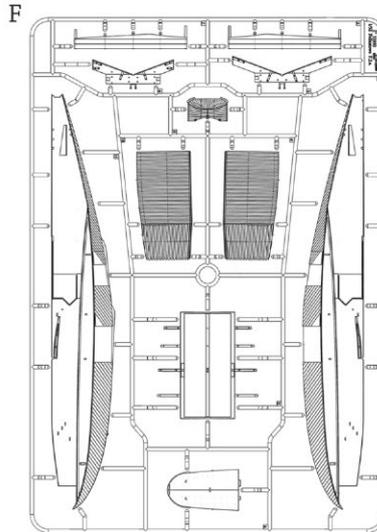
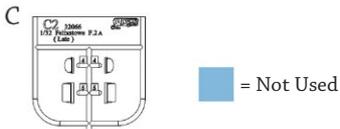
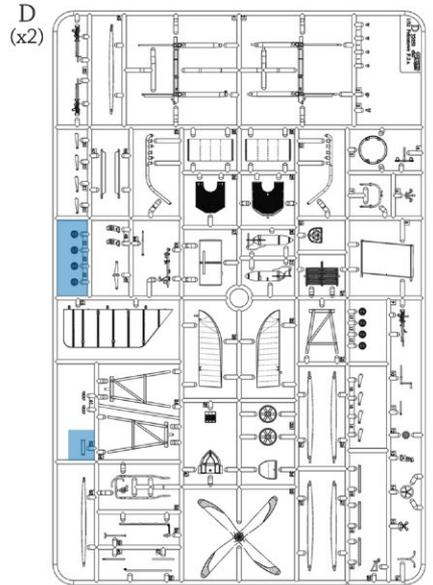
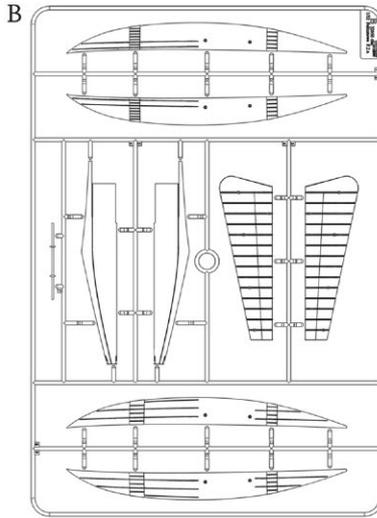
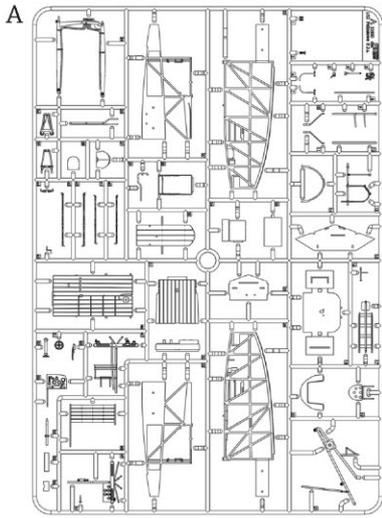
The twin 375hp Rolls Royce Eagle VIII powered Felixstowe F.2a featured a deep 'V' hull constructed using boat building techniques with diagonal planking on the bottom while the tops of the fins were plywood and doped fabric. The sides of the forward superstructure were also plywood and the top coamings were covered with linen, as were the wings and tailplane. Ply walkways were positioned on the top coaming near the engineer's hatch and on the bottom wings below the engines. Early production F.2a were delivered with a glazed cabin, fabric covered sides of the rear hull and large unbalanced ailerons. Later developments included replacing the cabin with an open cockpit, balanced ailerons and strengthening the rear hull sides with ply or diagonally applied 'Consuta' planks. Late production boats as depicted in this kitset had an open cockpit with strengthened rear hull with wooden sides and many had balanced ailerons fitted. Some early boats delivered with glazed cabins were later converted to open top configuration. A modified V12 Liberty engine powered version was manufactured by Curtiss in America as the H.16. The Felixstowe F.3, superficially similar in appearance to the F.2a but slightly larger and capable of carrying twice the bomb load, was put into production despite being considered inferior to the F.2a. The larger still Felixstowe F.5 similarly featured poorer performance but arrived too late to see operational service before the Armistice and a modified V12 Liberty engine powered version was manufactured by Curtiss in America as the F.5L. Any history of these aircraft here is of necessity very brief, therefore we encourage you to seek out the references listed below for a more thorough understanding of these significant aircraft.

Felixstowe flying boat wings and tailplane upper surfaces usually appear very dark in photographs and have been recorded simply as 'green' with the bottom surfaces remaining heavily varnished Clear Doped Linen (CDL). The bottom of the hull, bow, tops of the fins, and rear hull washboards were finished with gloss black bituminous tar based paint inside and out for waterproofing, as were the fabric wrapped side struts and tailplane struts. The plywood panels of the superstructure were heavily varnished with their joints often being sealed with the same bituminous tar based paint while the top coamings frequently remained CDL. In some instances the coamings were finished with the same dark protective dope as the wings and tailplane. All metal fittings were painted gloss black although those on the engine bearers and interplane struts appear to have frequently been overpainted with Battleship Grey (BSG) along with the wood. Most surfaces featured a gloss finish when new which quickly weathered to a dull matt appearance after short periods exposed to the harsh saltwater environment. Many British flying boats featured brightly coloured dazzle paint finishes for identification purposes from the middle of 1918 onwards.

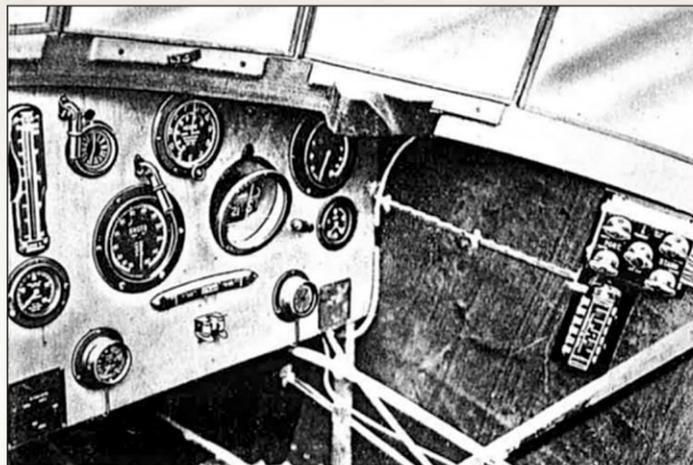
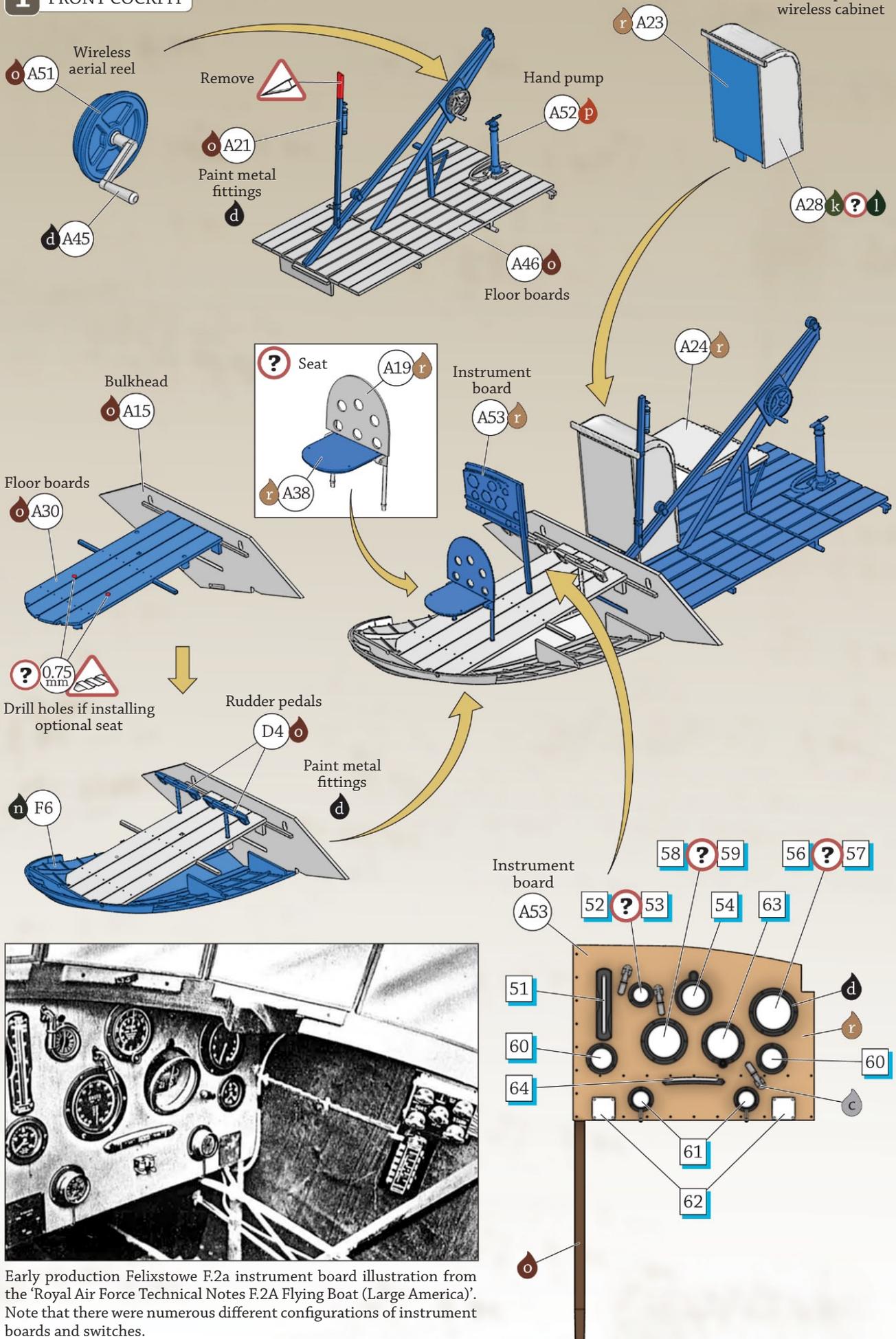
Richard Alexander 2014

<b>Wingspan:</b>	<b>Length:</b>	<b>Max Weight:</b>	<b>Max Speed:</b>
95' 7" & 96' 10" (29.13m & 29.51m)	46' 3" (14.1m)	11500 lb (5216kg)	85kn (156kph)
<b>No. Manufactured:</b>	<b>Production:</b>	<b>Engine:</b>	<b>Ceiling:</b>
(F.2a) approx 100	Mid 1917 to Late 1918	2x 375hp Rolls Royce Eagle VIII	10000' (3048m)
<b>Armament:</b>			
5 .303" (7.7mm) Lewis machine guns and 460lb (208kg) bombs			
<b>References:</b>			
Windsock Datafile 82, Felixstowe F.2a, JM Bruce 2000 - Technical Notes, F.2A Flying Boat (Large America), RAF 1918			
Windsock International, volume 17 #2 & #3, 2001 - Flight, 2, 16 & 23 December 1955 and 20 January 1956			
The Vintage Aviator Ltd - 1914-18 Aviation Heritage Trust - Colin Owers - Private Collections			



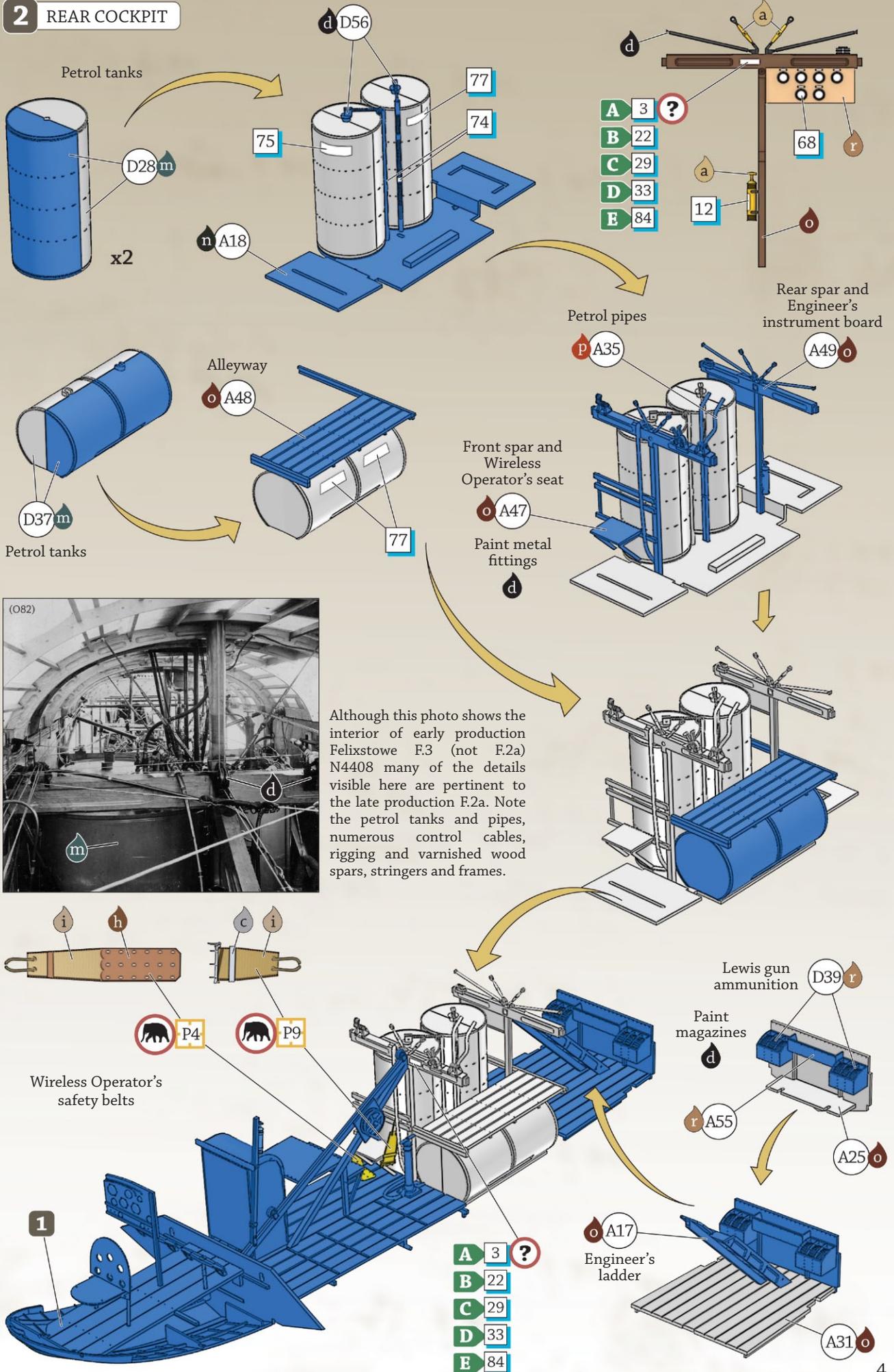


# 1 FRONT COCKPIT

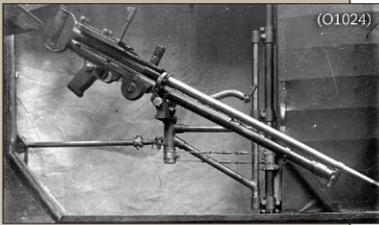


Early production Felixstowe F.2a instrument board illustration from the 'Royal Air Force Technical Notes F.2A Flying Boat (Large America)'. Note that there were numerous different configurations of instrument boards and switches.

## 2 REAR COCKPIT

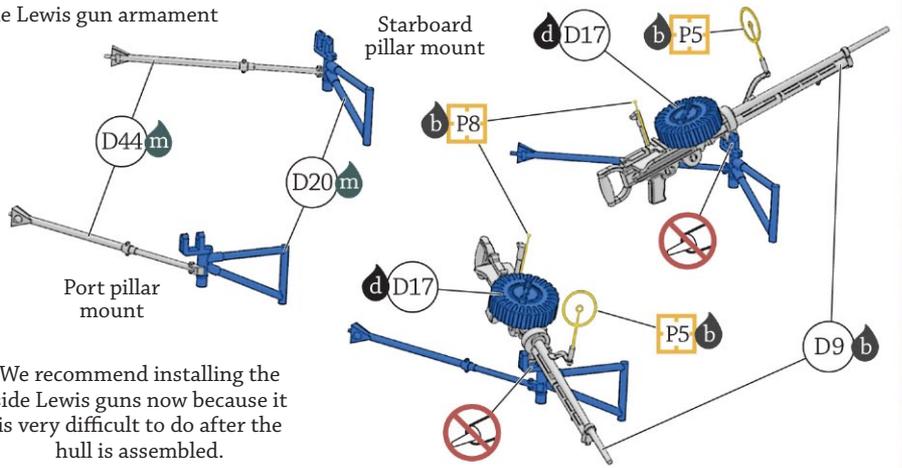


### 3 HULL FRAMES

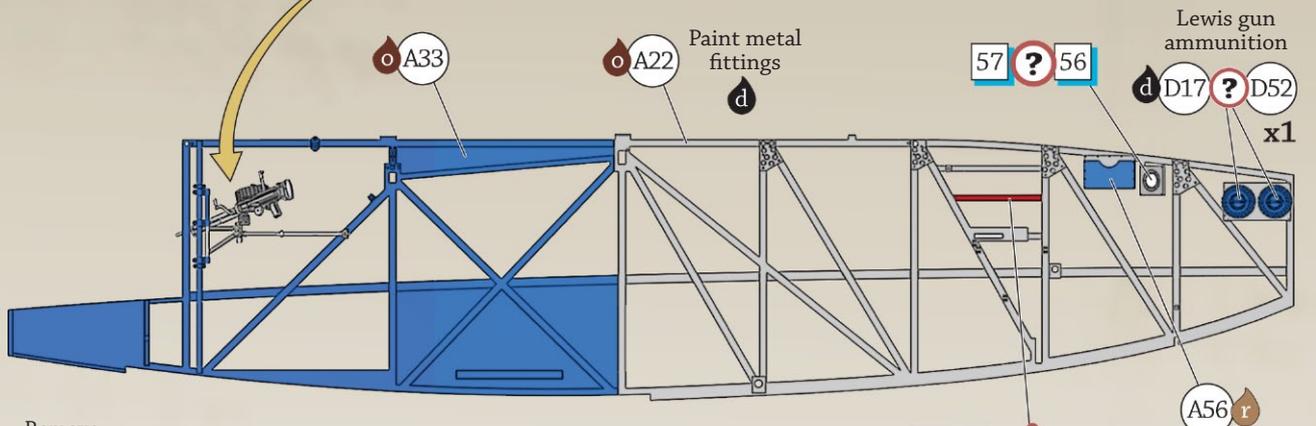


Starboard hull Lewis gun and mount from an unidentified F.3 (not F.2a). Note that the ring **P5** and bead **P8** sights are not fitted. The pillar mounts allowed the guns to be stowed internally until they were required.

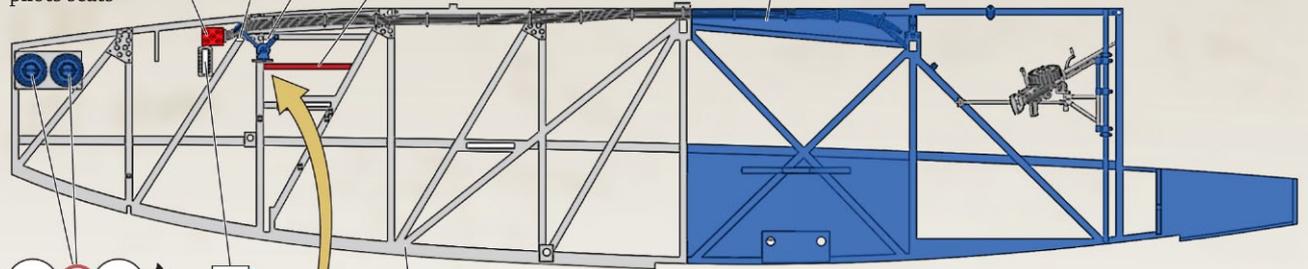
#### Side Lewis gun armament



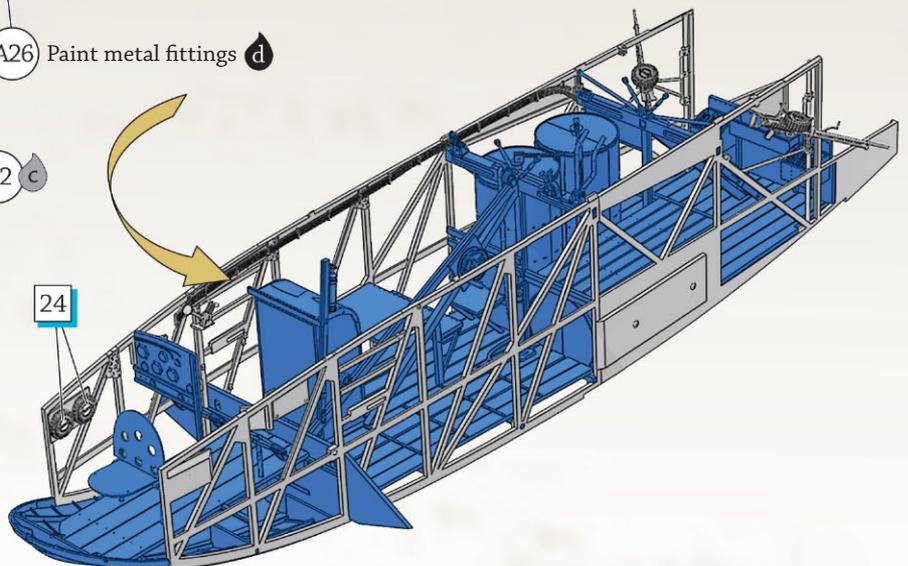
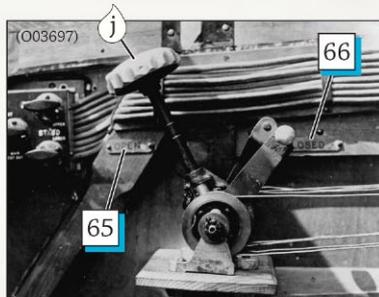
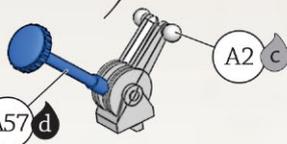
We recommend installing the side Lewis guns now because it is very difficult to do after the hull is assembled.



Remove switches if installing **A1** between pilots seats

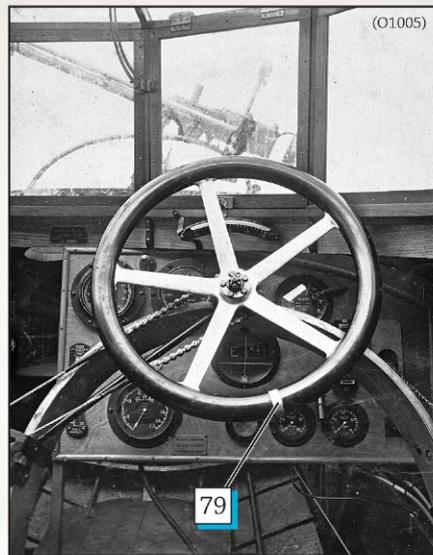
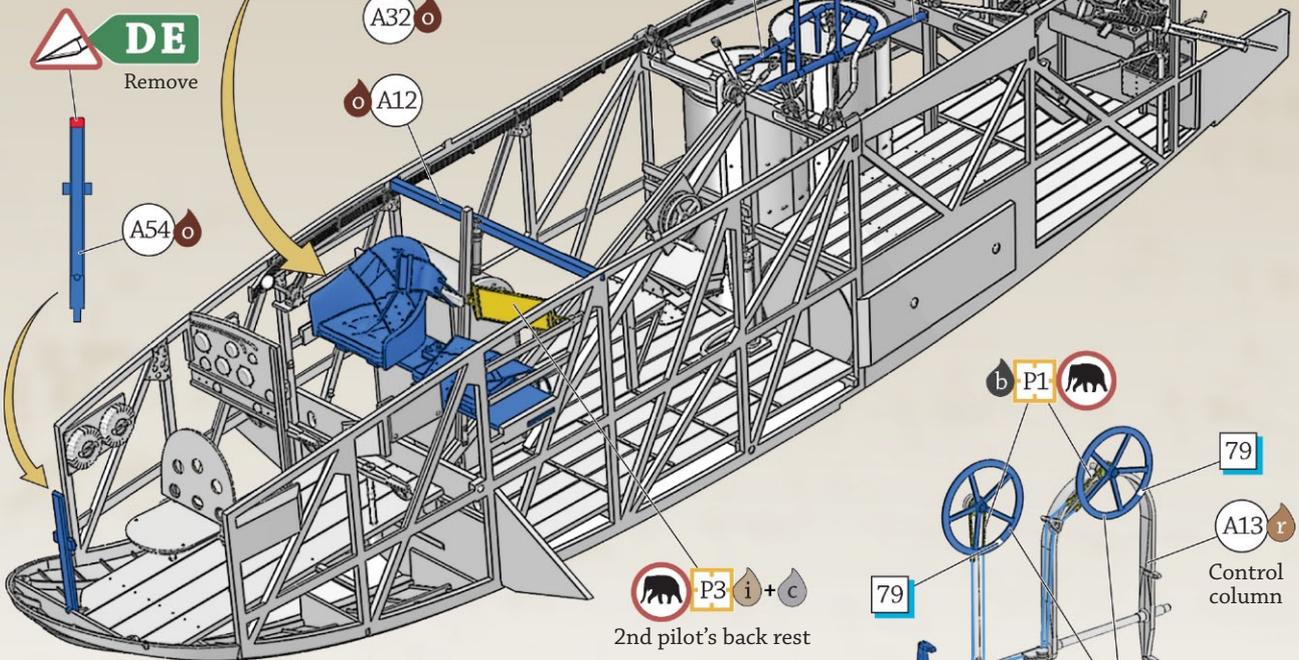
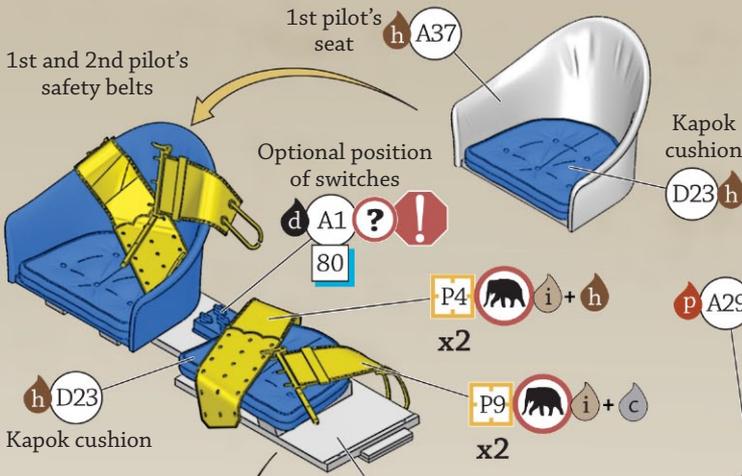
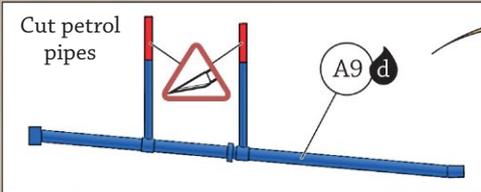


Lewis gun ammunition **x1**



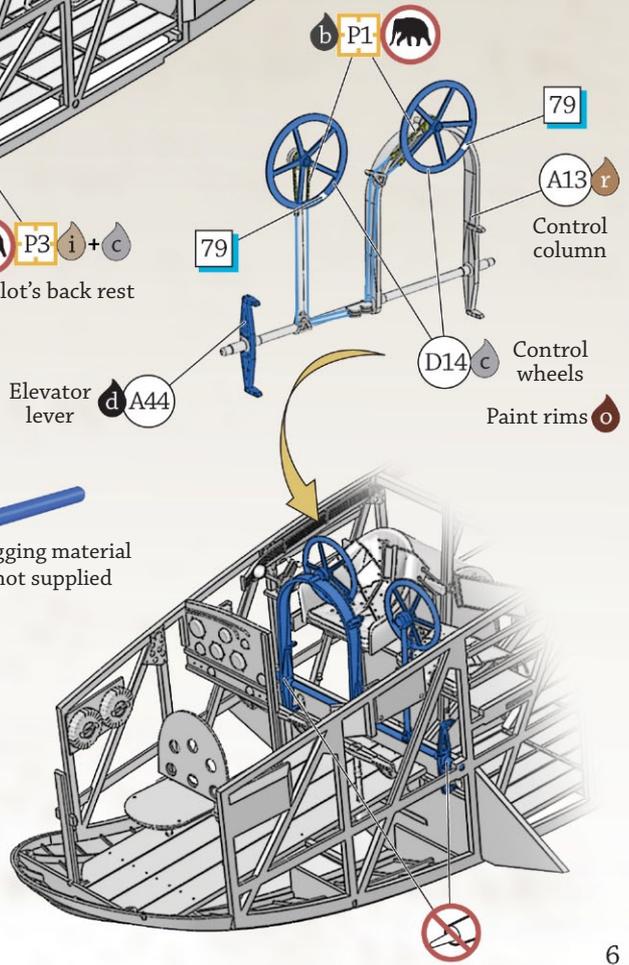
^ Engine control and switch detail on the starboard side of an unidentified F.2a hull. There was a remarkable lack of conformity amongst the various F.2a constructors as well as modifications done at unit level so while we have done our best to provide accurate interior details they will not be correct for every boat.

# 4 INTERIOR

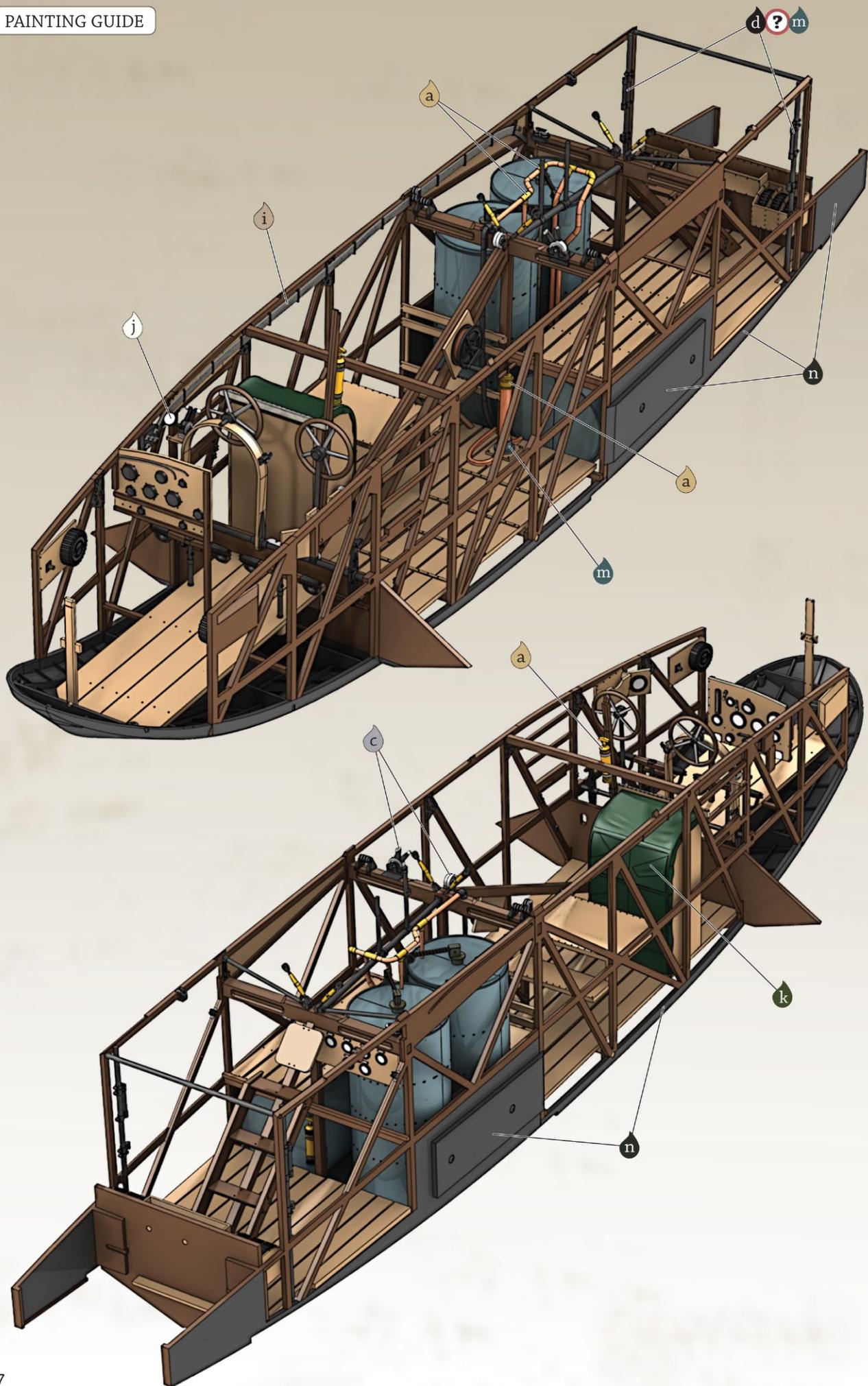


1st Pilot's control column and wheel detail from an unidentified F.3 (not F.2a).

0.15mm Rigging material not supplied



PAINING GUIDE



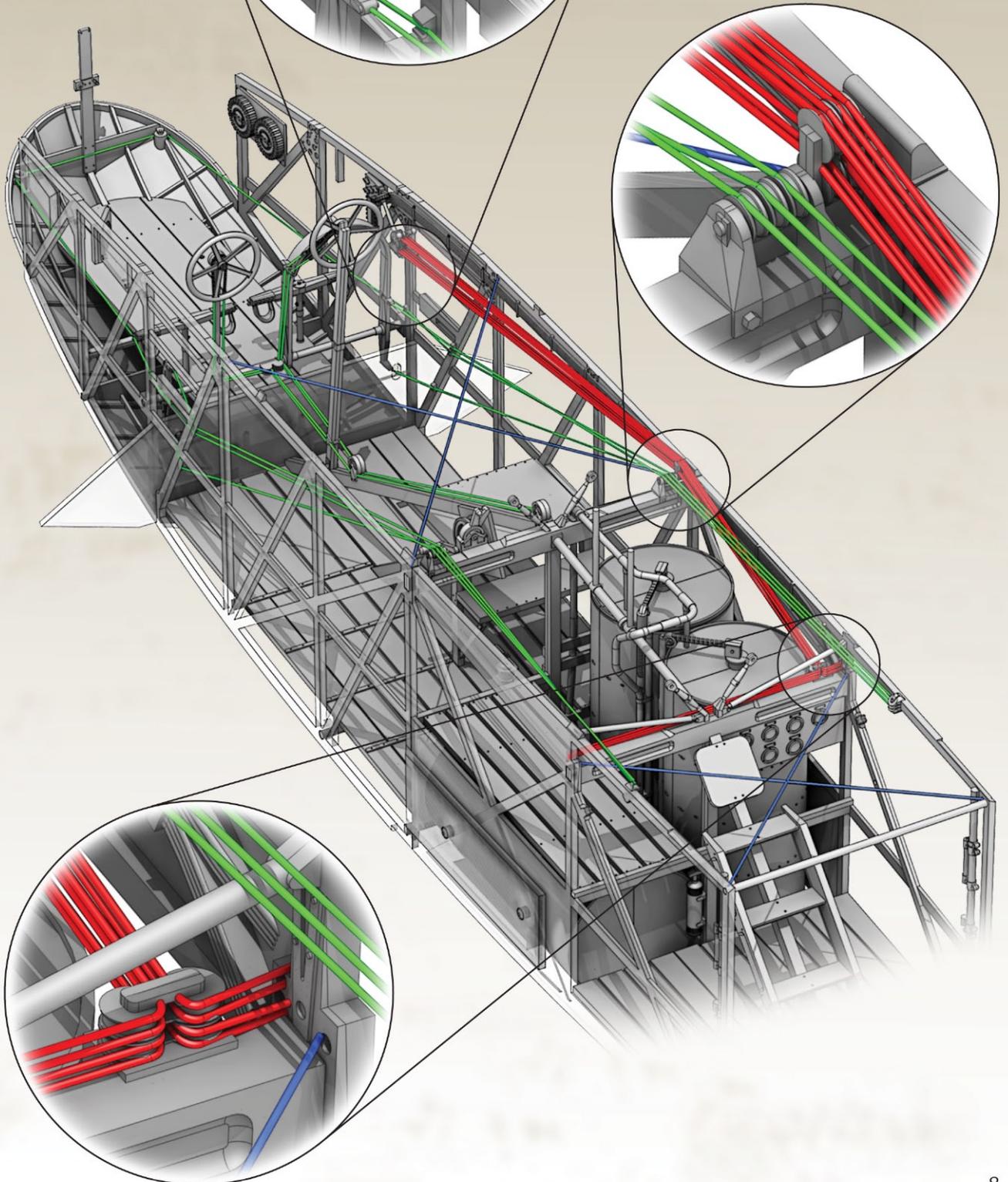
# INTERNAL RIGGING GUIDE

Rigging material not supplied

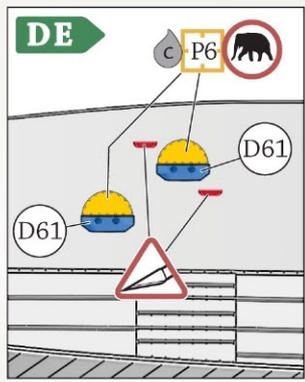
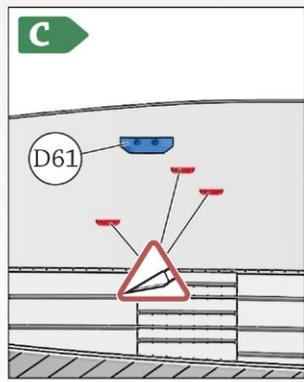
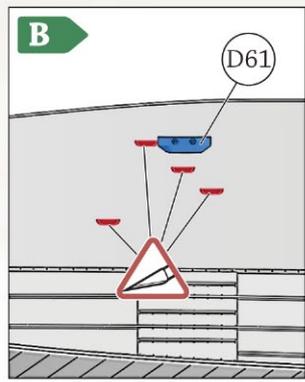
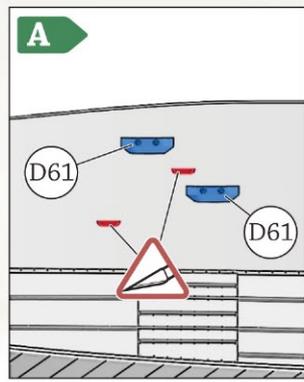
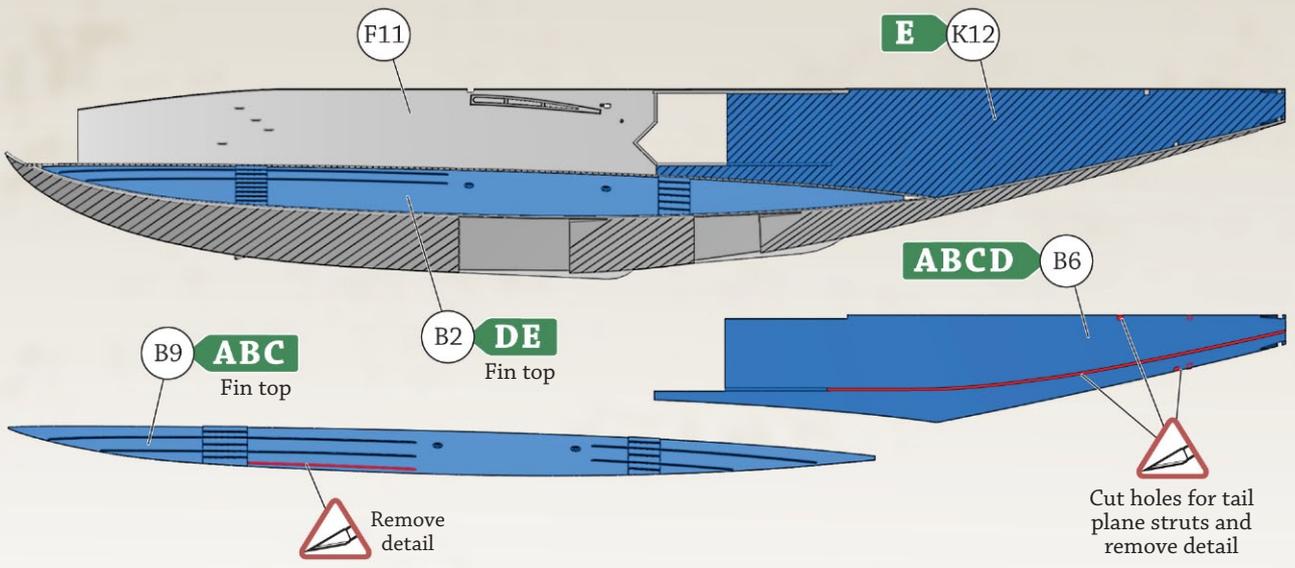
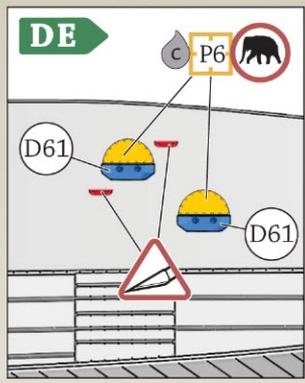
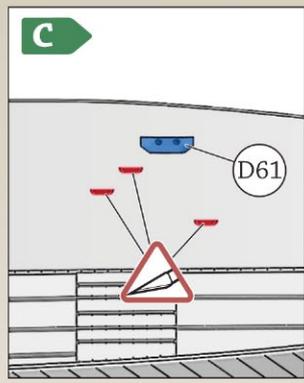
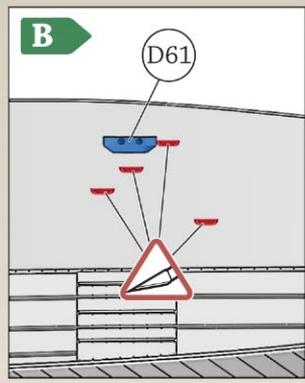
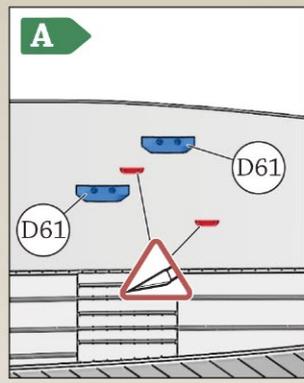
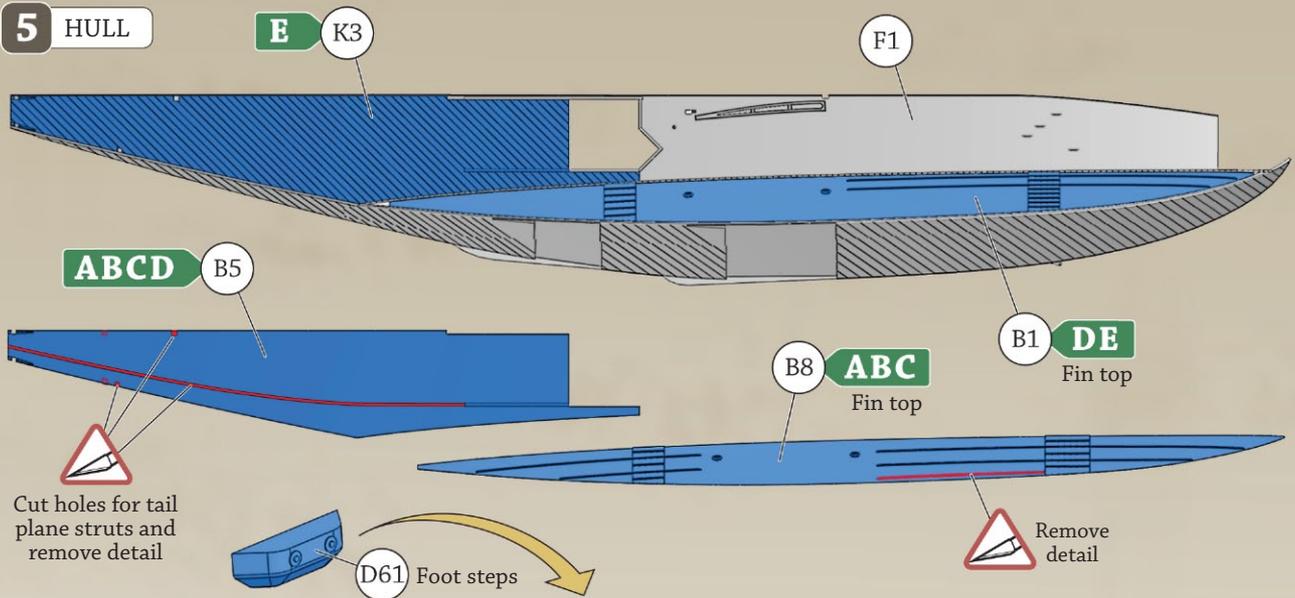
0.15mm  Engines

0.15mm  Ailerons,  
elevators & rudder

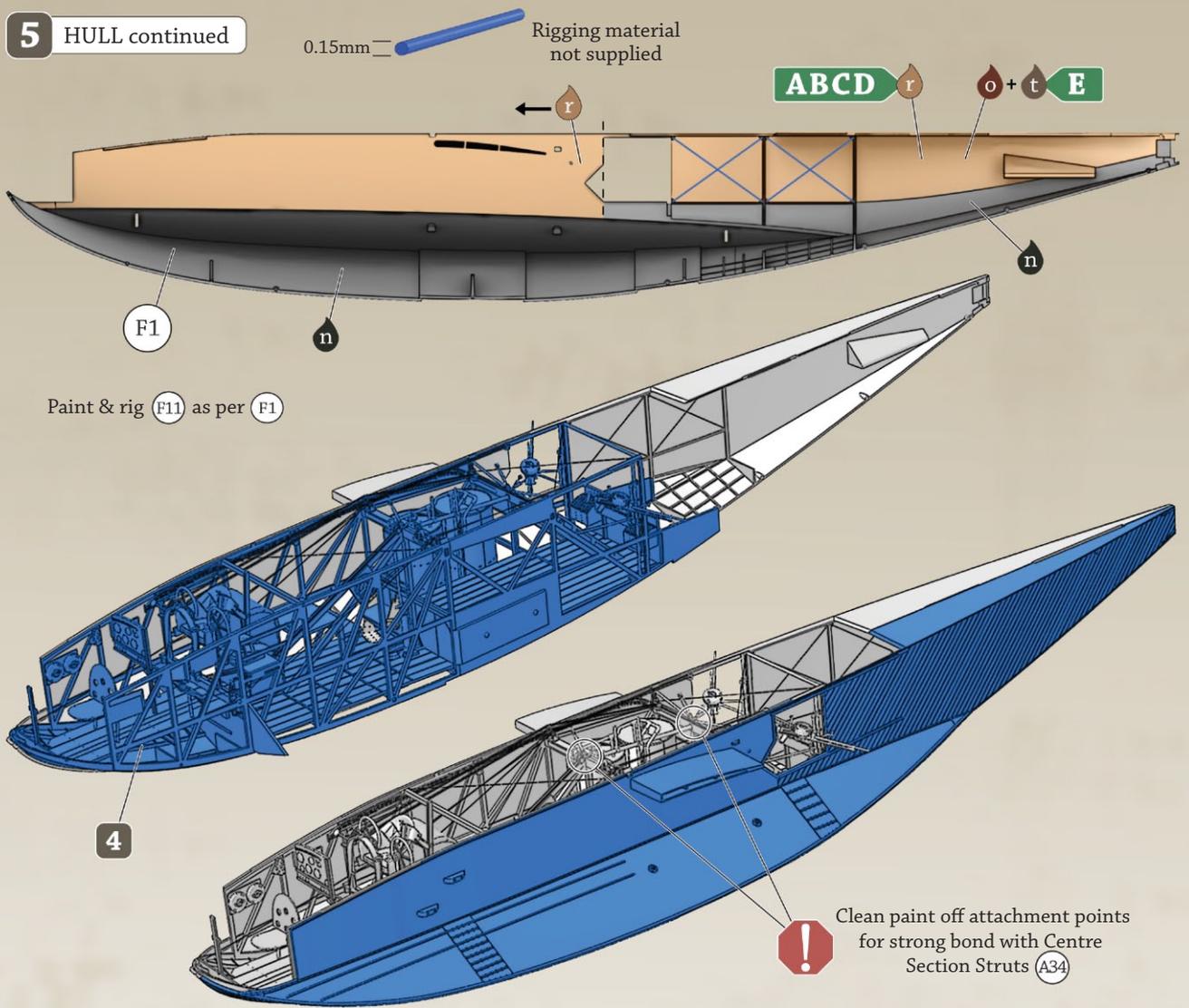
0.15mm  Bracing



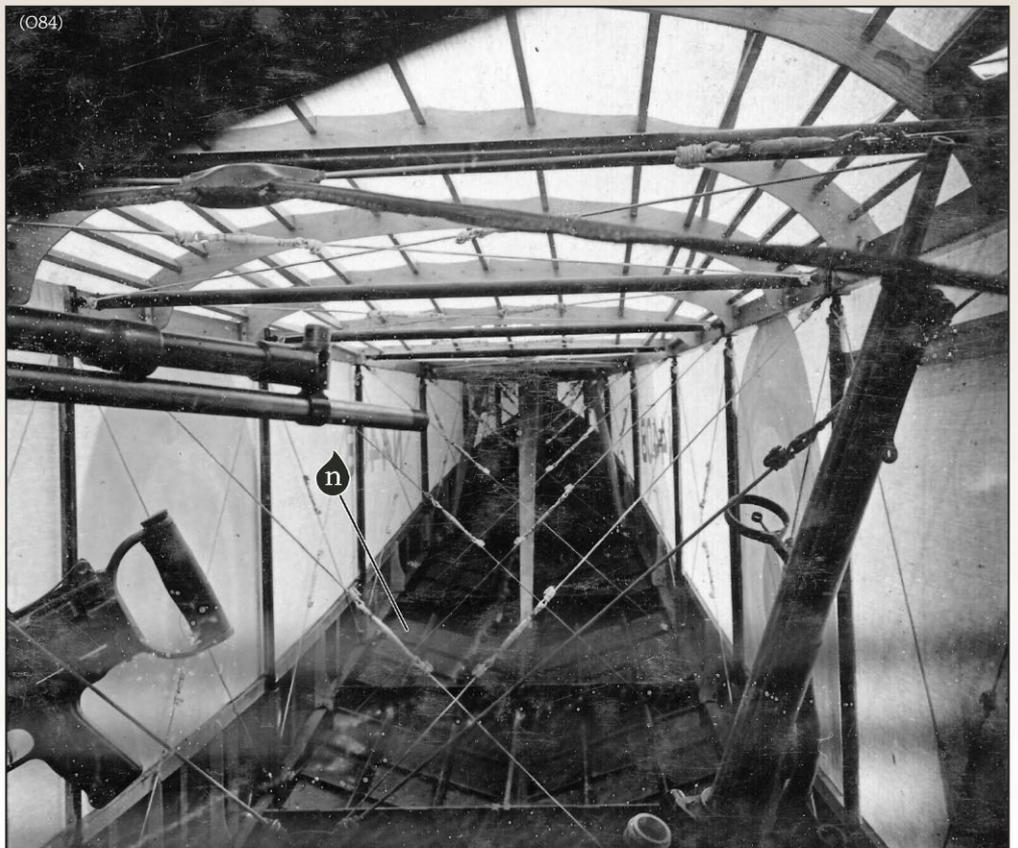
**5 HULL**



5 HULL continued



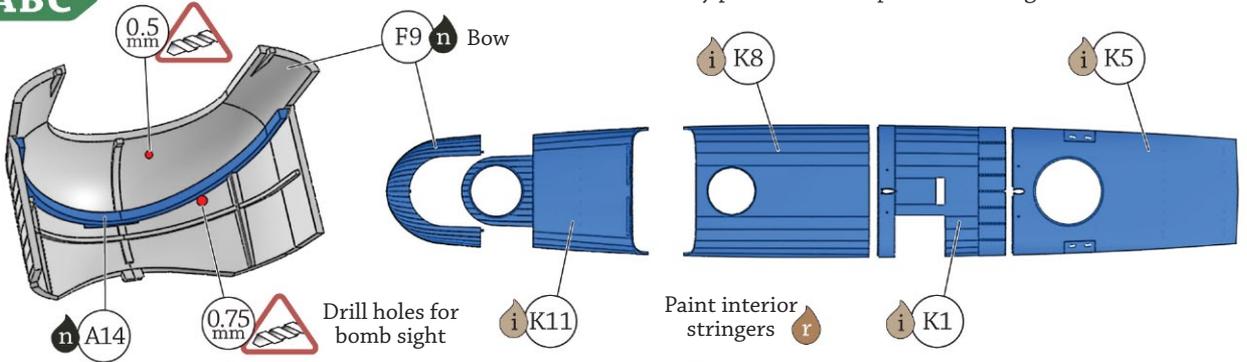
The inside of the rear hull from early production Felixstowe F.3 (not F.2a) N4408. Note the 2 side mounted Lewis guns and the upper gun dangling upside down from its mounting. The rear hull sides of N4408 are obviously CDL while on late production F.2a they were wooden. The bottom of the hull and washboards have received a coat of protective black bituminous tar based paint. Unlike the F.2a, the tapering top coaming of the F.3 extended all the way to the leading edge of the fin. It appears that much of the internal bracing cables have been painted, possibly in bright colours to make them more visible and/or to resist corrosion. Note the substantial padding applied to the 'X' bracing cables beneath the aft cockpit hatch.



**6 HULL DETAILS**

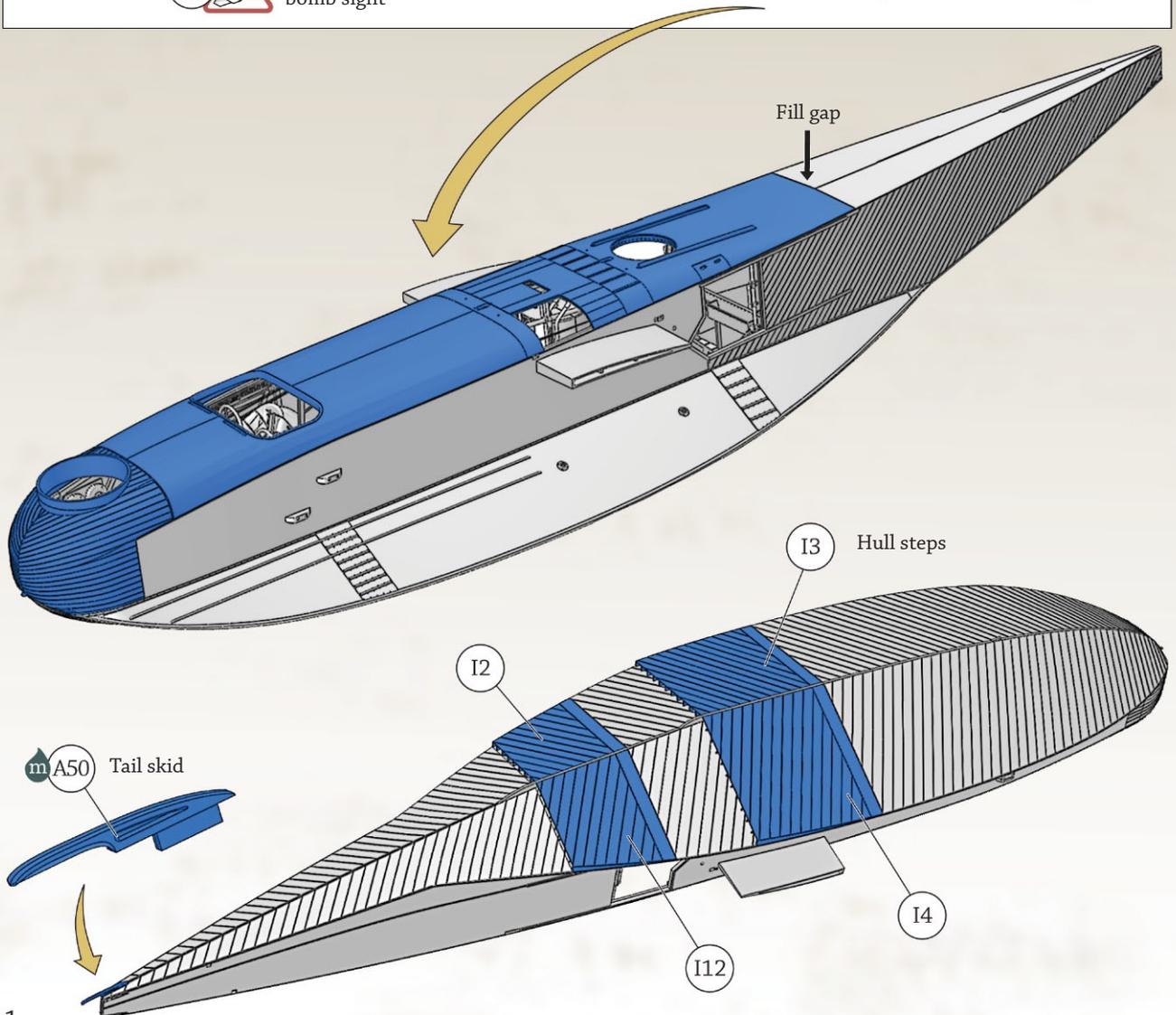
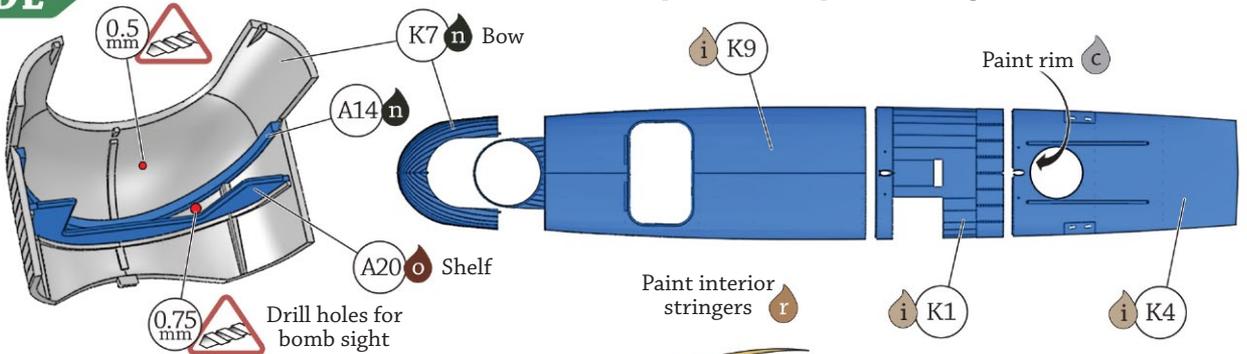
**ABC**

Converted early production cockpit and coaming details

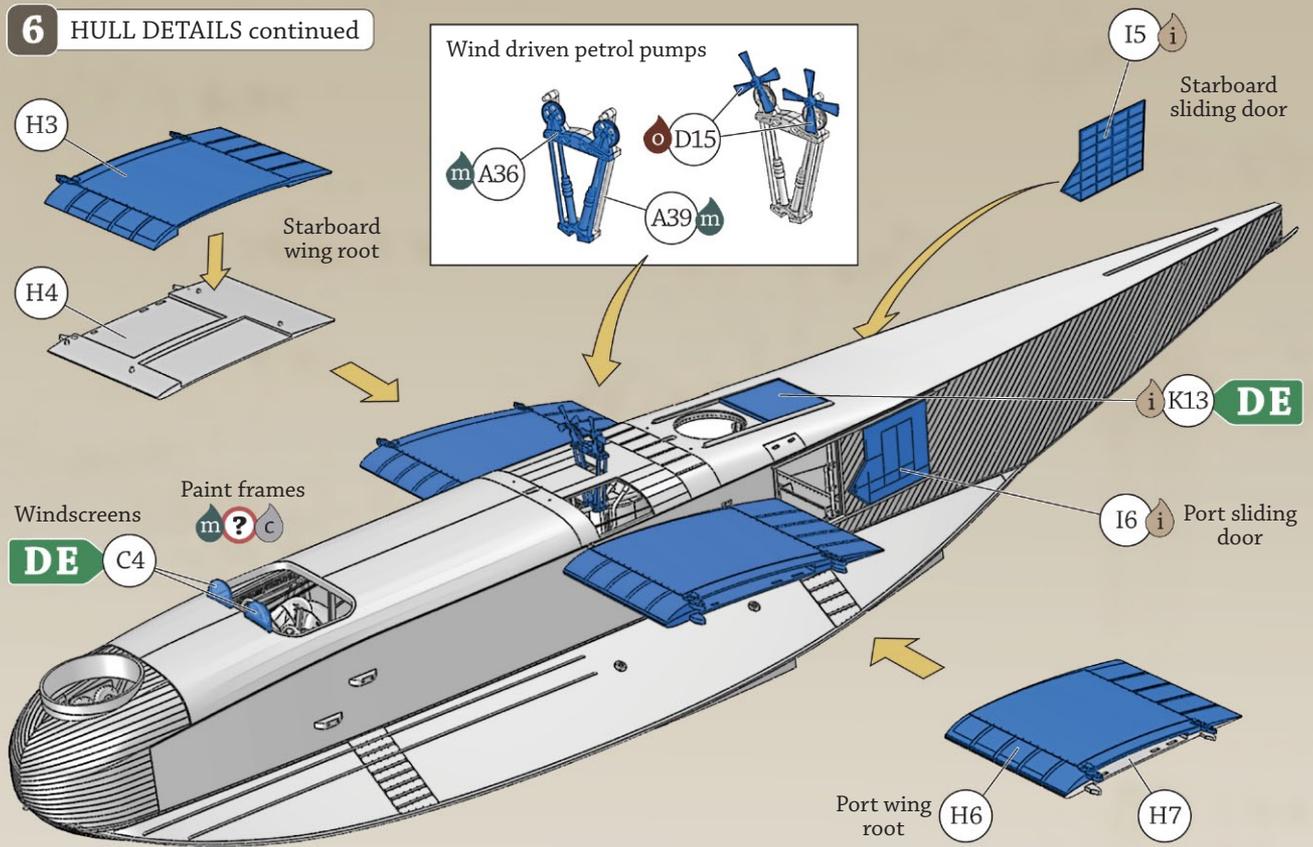


**DE**

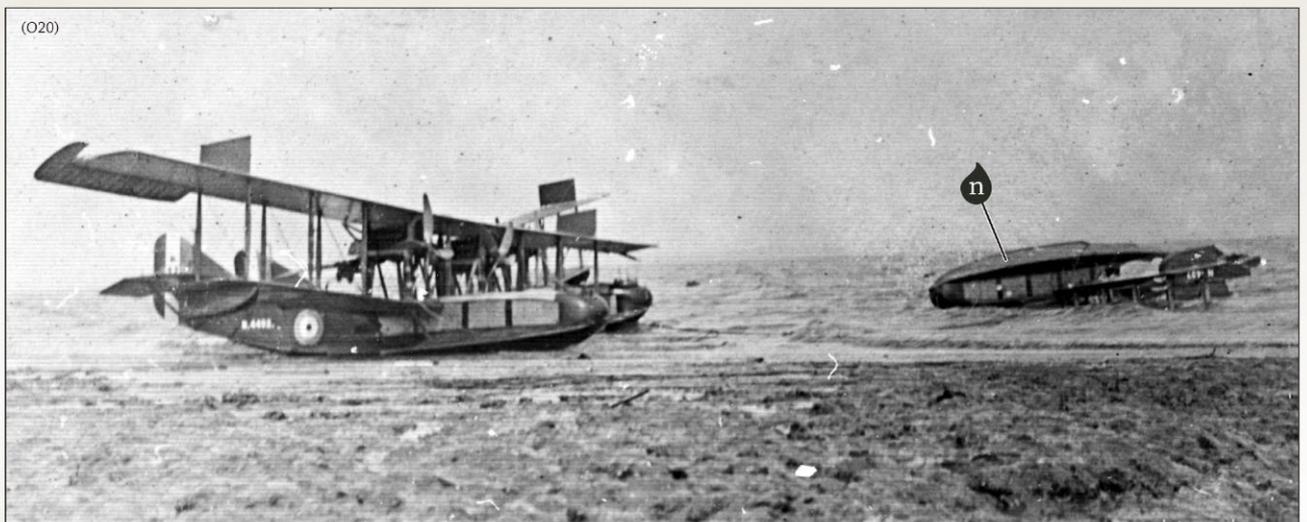
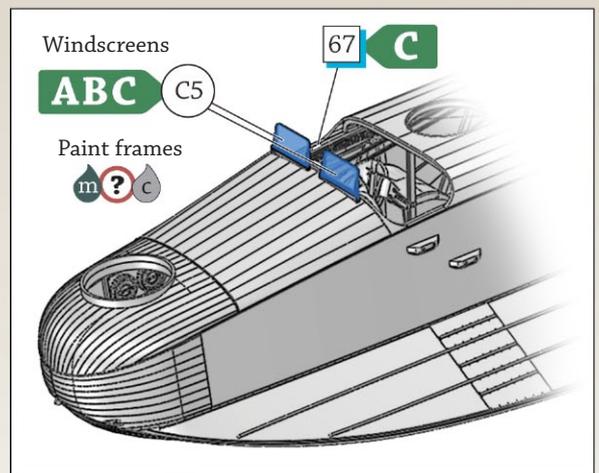
Late production cockpit and coaming details



**6 HULL DETAILS continued**



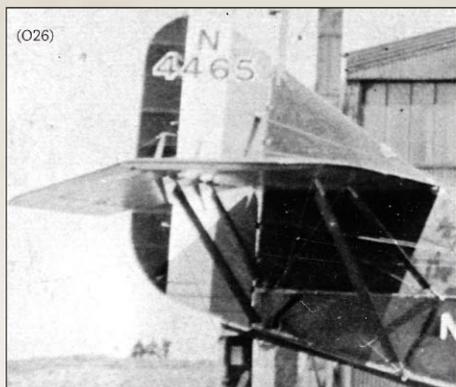
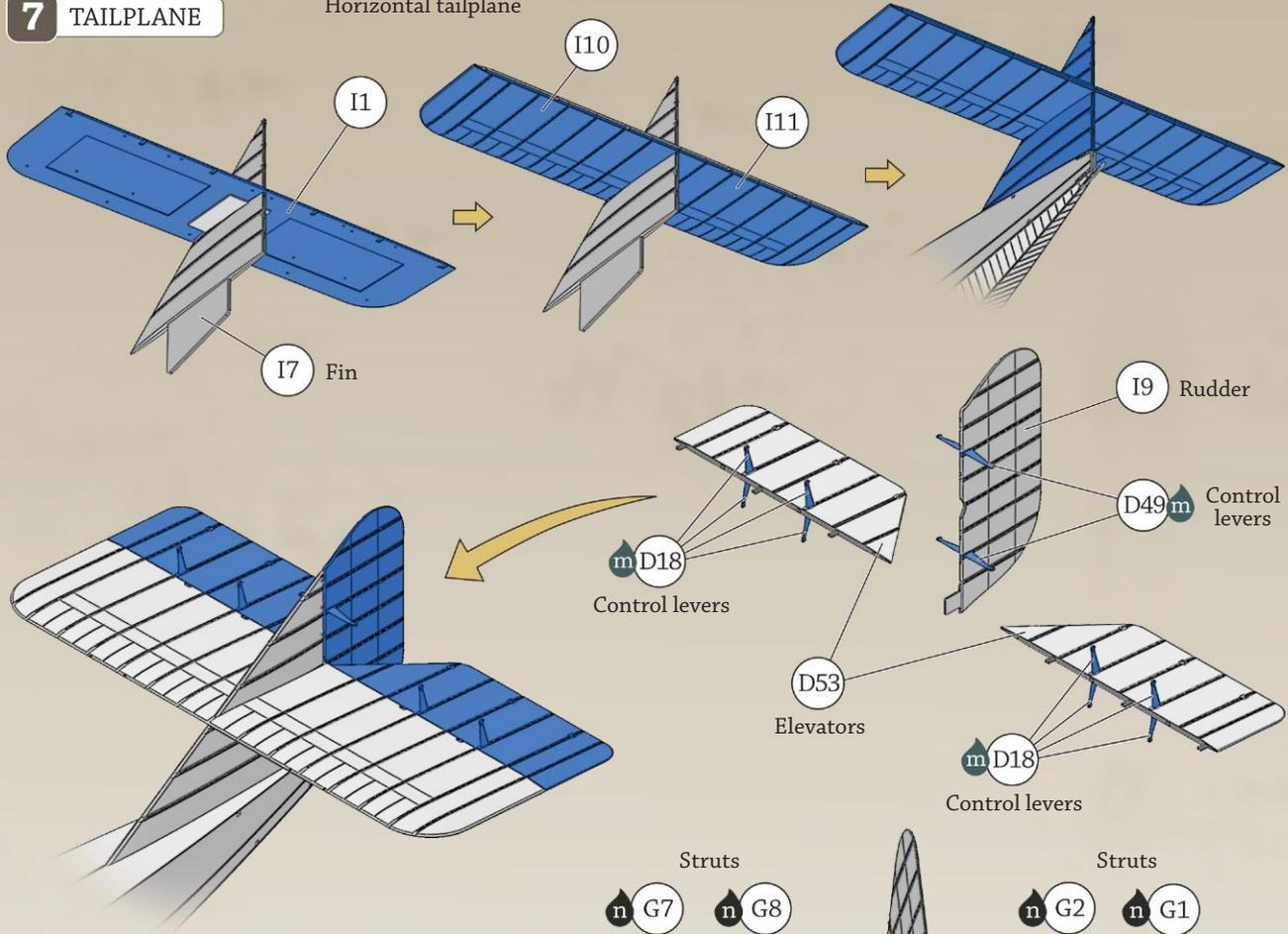
Cockpit coaming detail from converted early production Felixstowe F.2a N4297 **B2**. Note the petrol pumps, square hatch for the engineer, Scarff ring on the rear coaming and smaller Scarff ring on the bow.



Three unidentified late production Felixstowe F.2a, one of which is looking decidedly the worse for wear, that all appear to be from a production order placed with May, Harden & May (numbers N4480 to N4504). Note the open cockpit and balanced ailerons on the closest boat and dark hull bottoms.

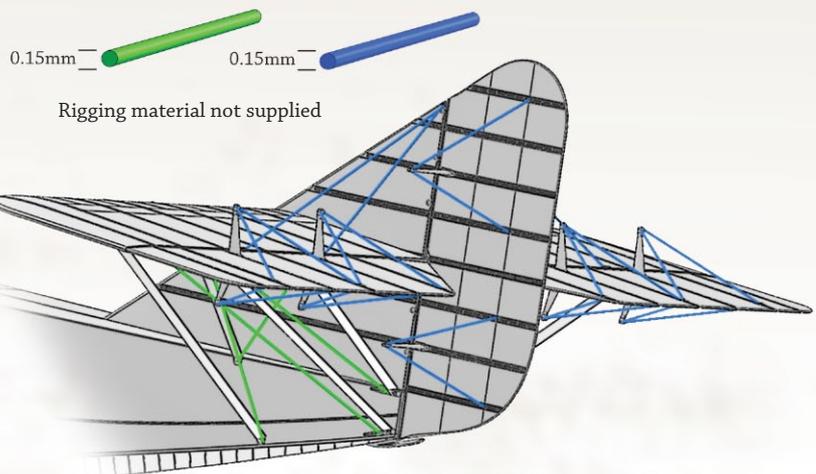
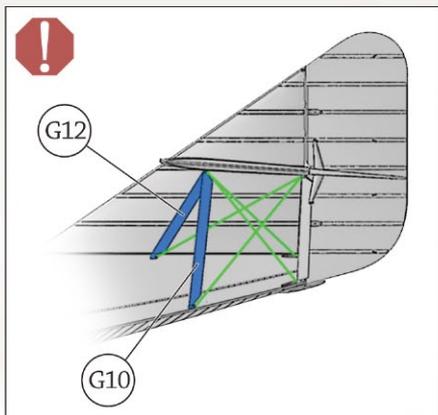
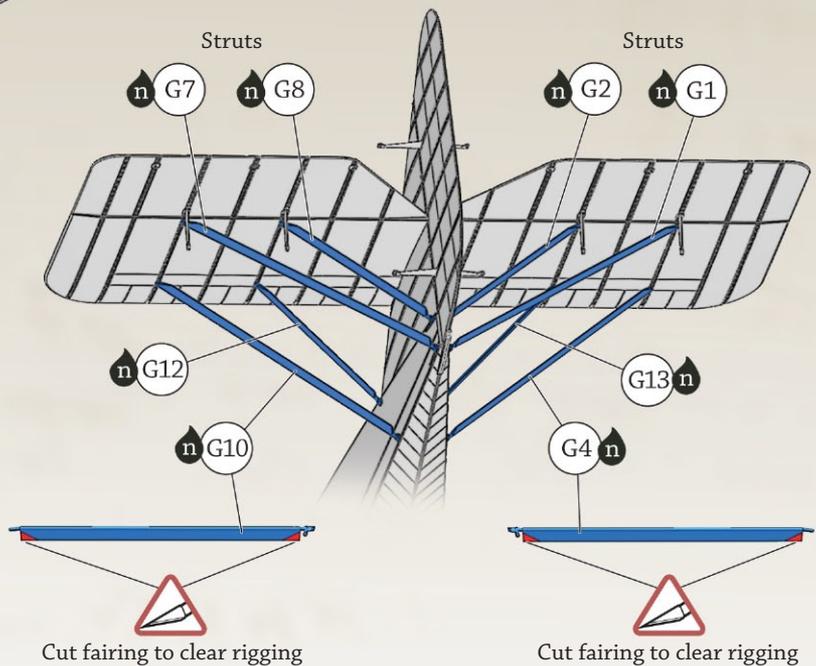
**7 TAILPLANE**

Horizontal tailplane

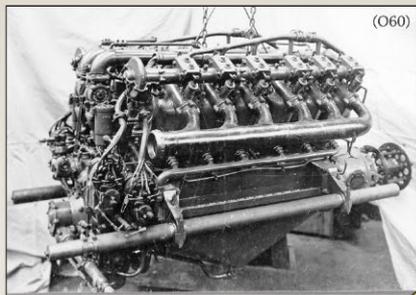
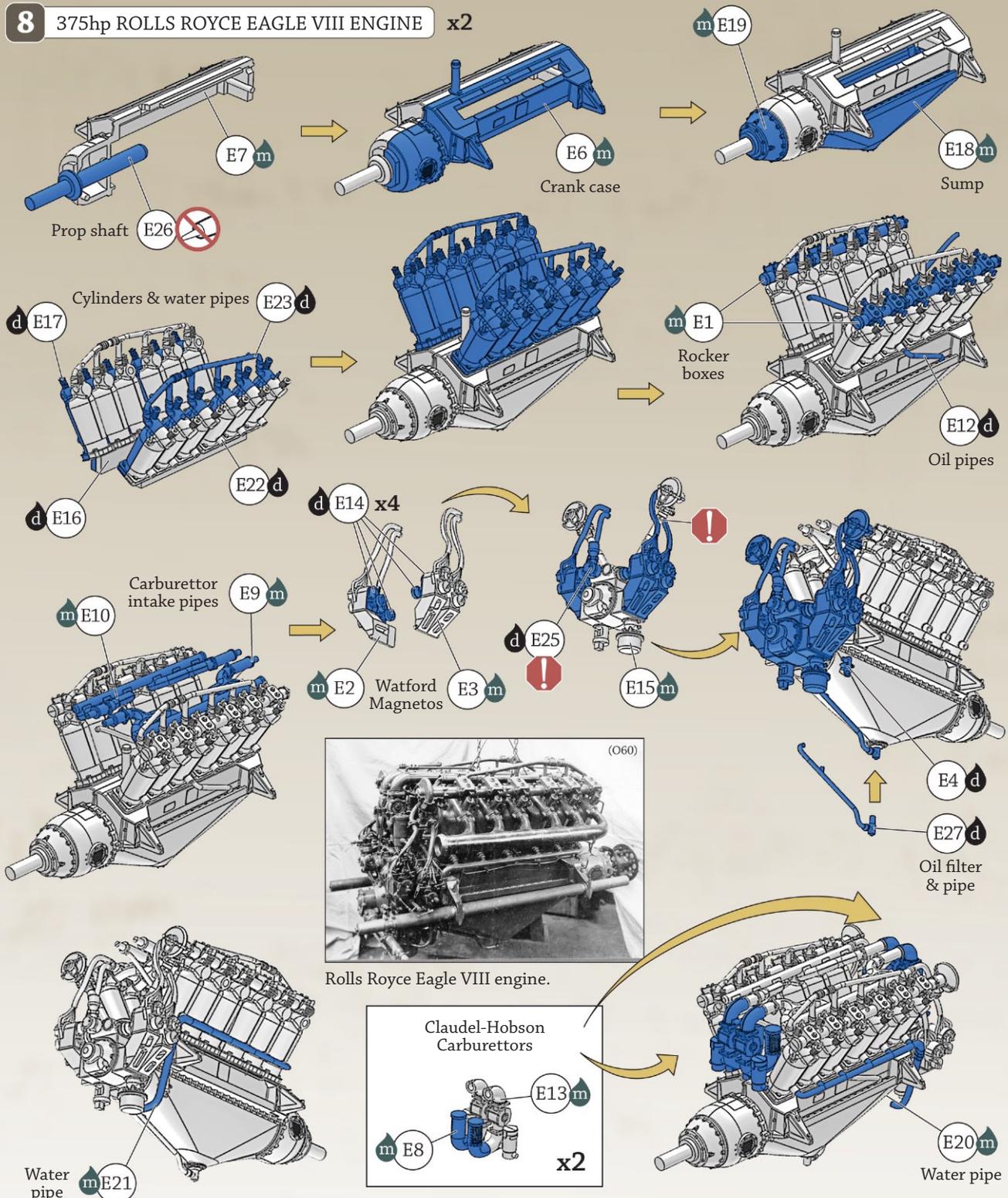


Tailplane detail from Felixstowe F.2a N4465

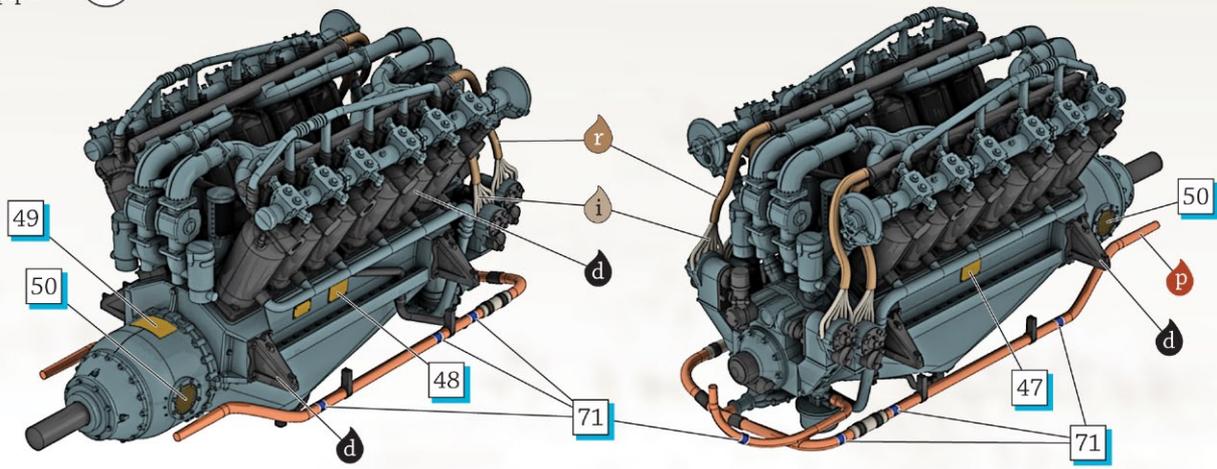
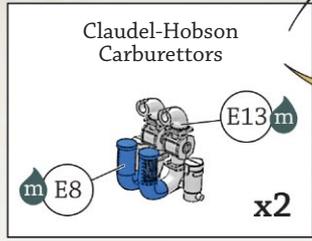
**E**



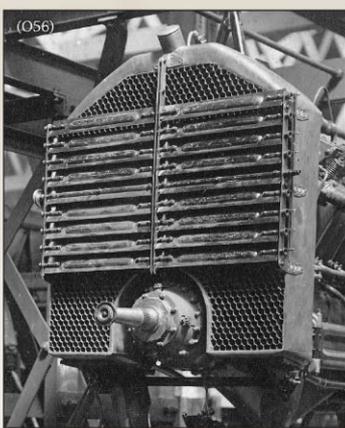
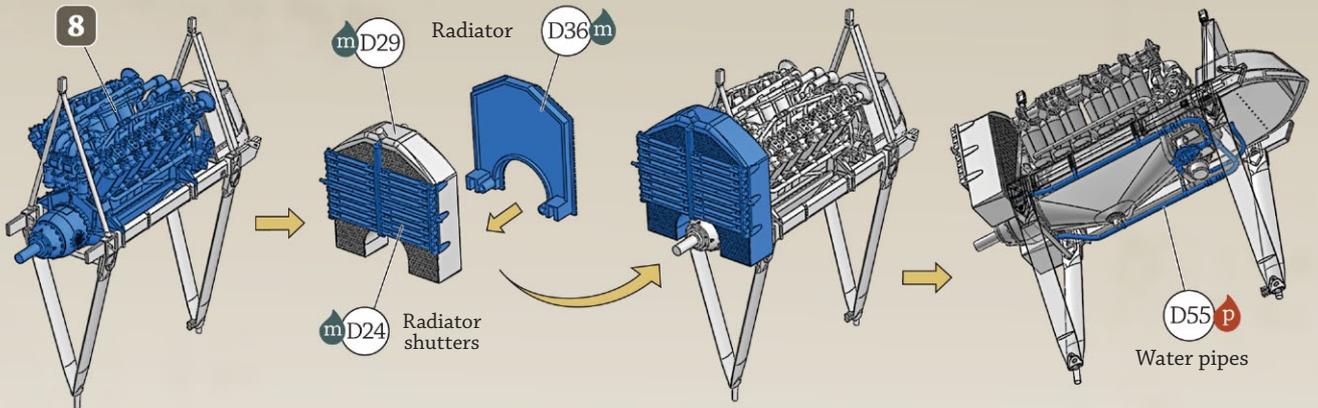
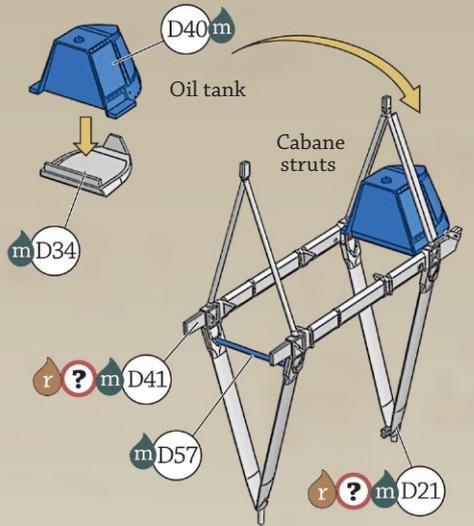
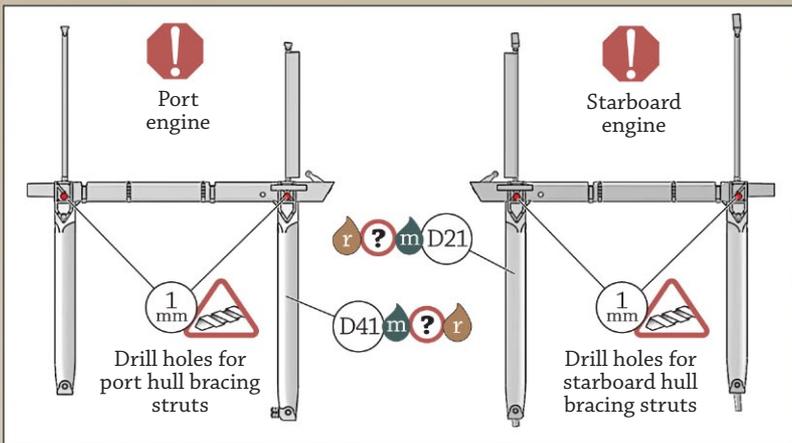
**8** 375hp ROLLS ROYCE EAGLE VIII ENGINE x2



Rolls Royce Eagle VIII engine.

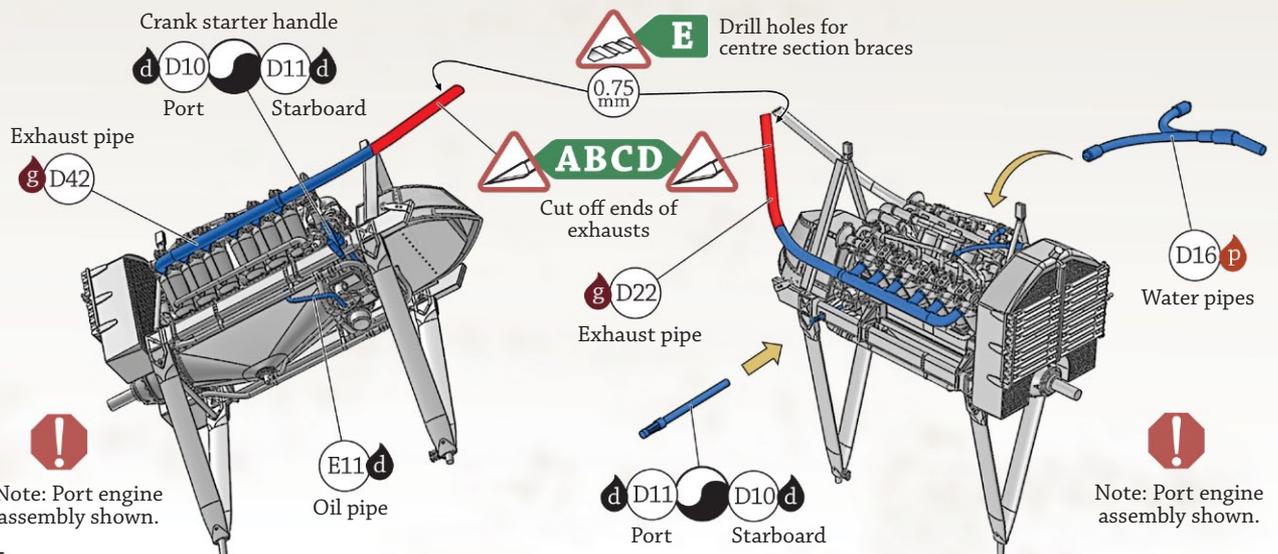
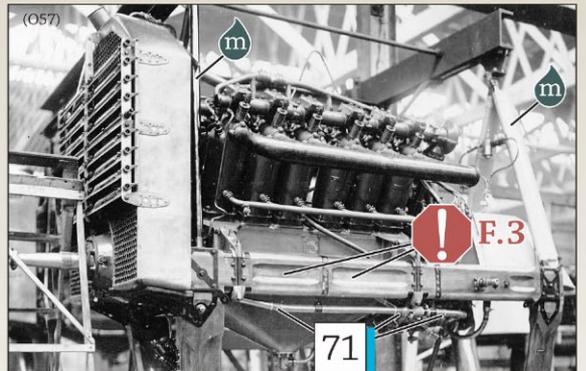


9 ENGINE BEARERS & CABANE STRUTS x2

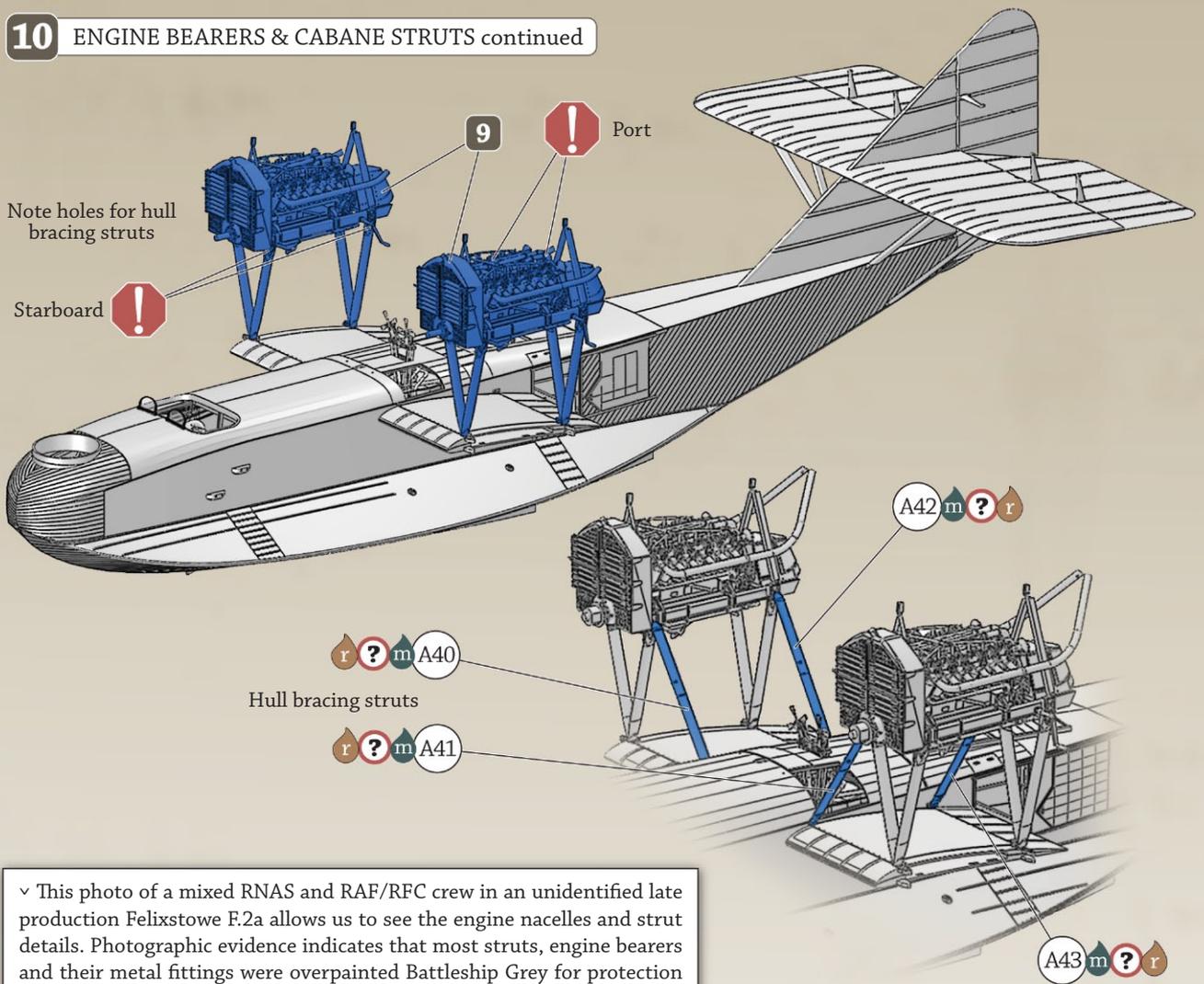


< These photos of a Felixstowe F.3 (not F.2a) port engine nacelle show many useful detail pertinent for the F.2a. Note the pulley for adjusting the shutters (D24).

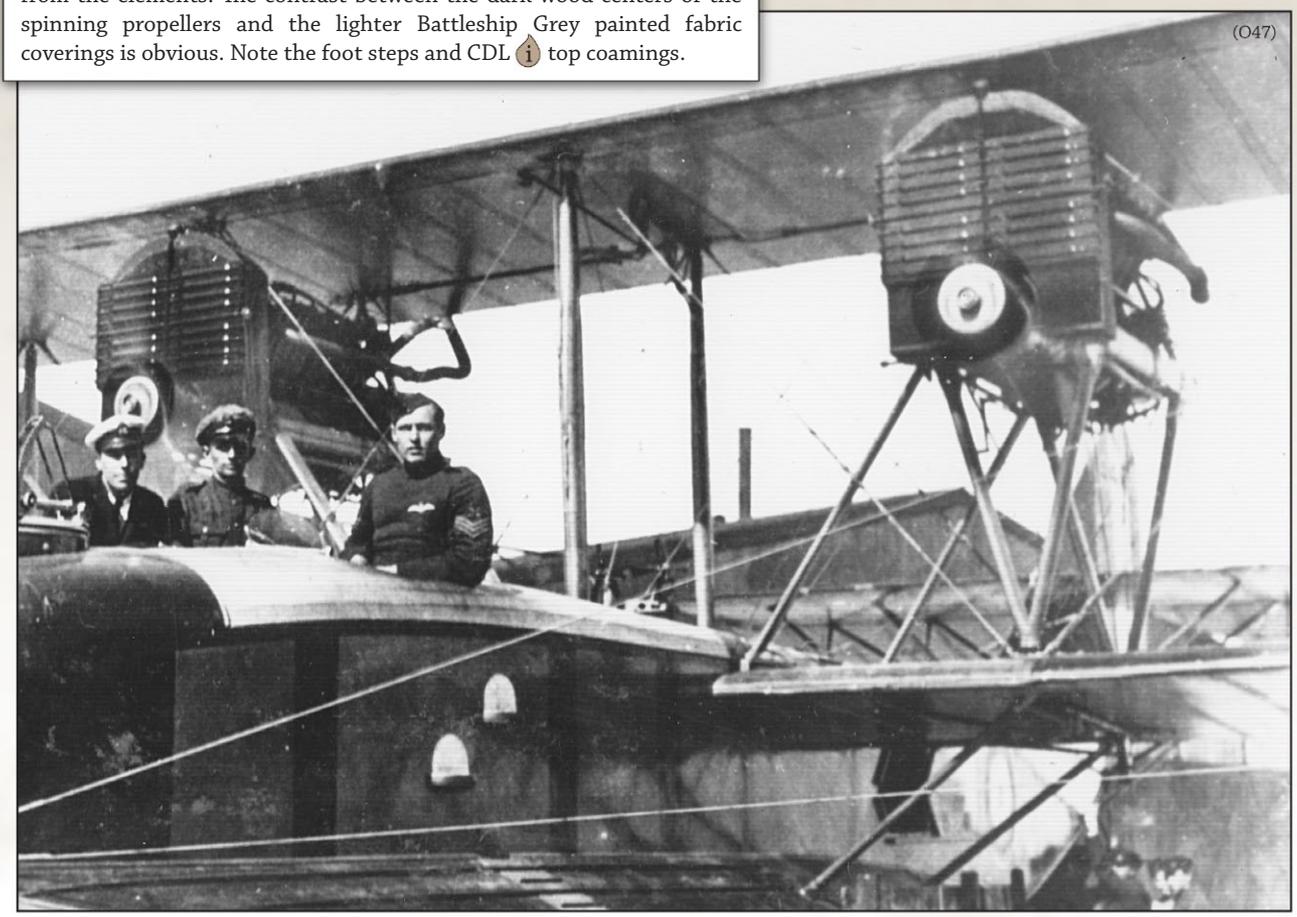
> The upper 'A' struts are steel tubes and the rear ones have wooden fairings wrapped with fabric. Note the blue bands [71] painted around the water pipes. Similar red bands [70] were painted around the petrol pipes. The extremely long petrol lines on Felixstowe boats were a constant cause for concern, with many an engineer having to venture out on the wings to repair a leaking pipe, sometimes while in flight! The F.3 engine nacelle differs slightly from the F.2a in that the engine bearers feature routing and do not protrude beyond the rear struts.



10 ENGINE BEARERS & CABANE STRUTS continued



∨ This photo of a mixed RNAS and RAF/RFC crew in an unidentified late production Felixstowe F.2a allows us to see the engine nacelles and strut details. Photographic evidence indicates that most struts, engine bearers and their metal fittings were overpainted Battleship Grey for protection from the elements. The contrast between the dark wood centers of the spinning propellers and the lighter Battleship Grey painted fabric coverings is obvious. Note the foot steps and CDL top coamings.



**11 CENTRE SECTION**

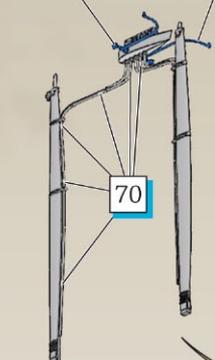
Carefully remove 



A34 m ? r

Centre section struts

A6 Petrol pipes A7 p



70

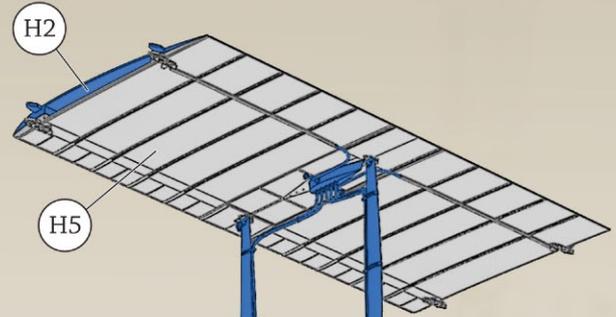
Upper centre section & 25 gallon gravity petrol tank



H2

1 mm  ? AD ?  1 mm

Drill holes for exhaust braces

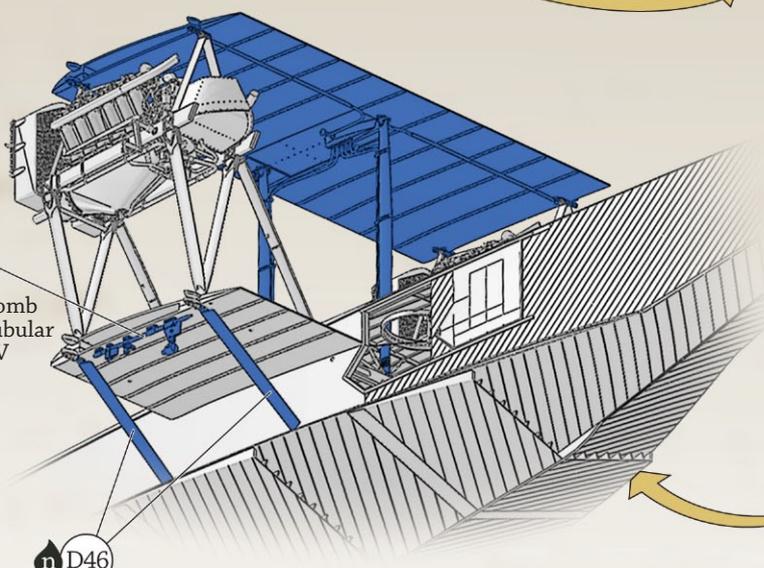


H2

H5

 Clean paint off attachment points for strong bond

d D43  
230lb Bomb Carrier Tubular Mk.IV



n D46  
Side struts

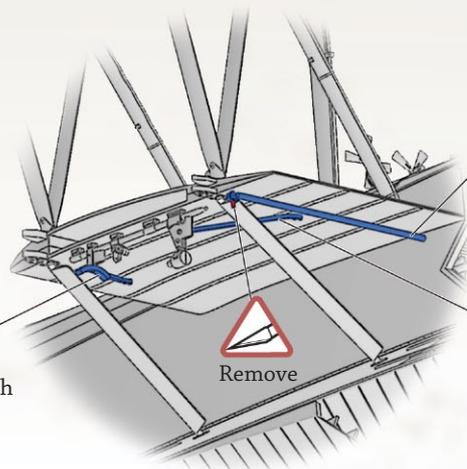
d D43 230lb Bomb Carrier Tubular Mk.IV

D47 n  
Side struts

Bomb release cable tubing

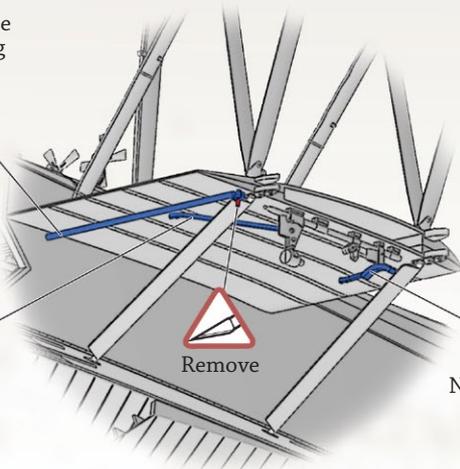
d D58

d A11  
Nose crutch



 Remove

d D60  
Braces

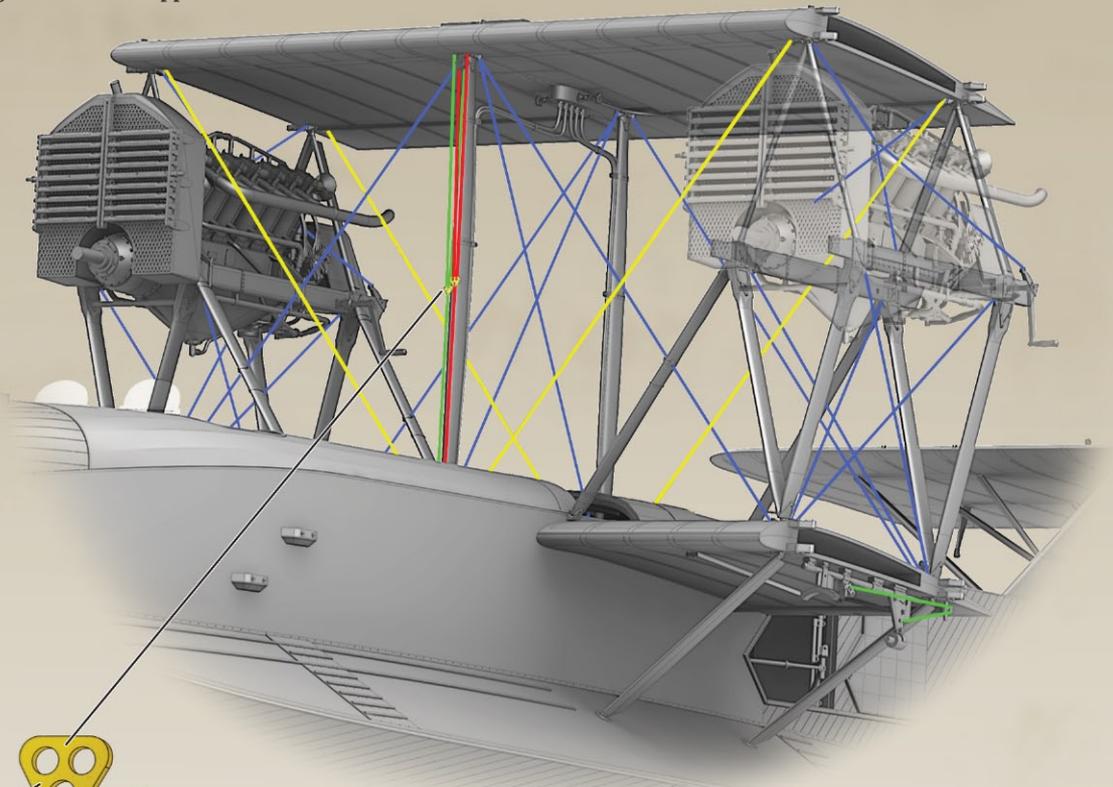


 Remove

A10 d  
Nose crutch

# CENTRE SECTION AND ENGINE RIGGING GUIDE

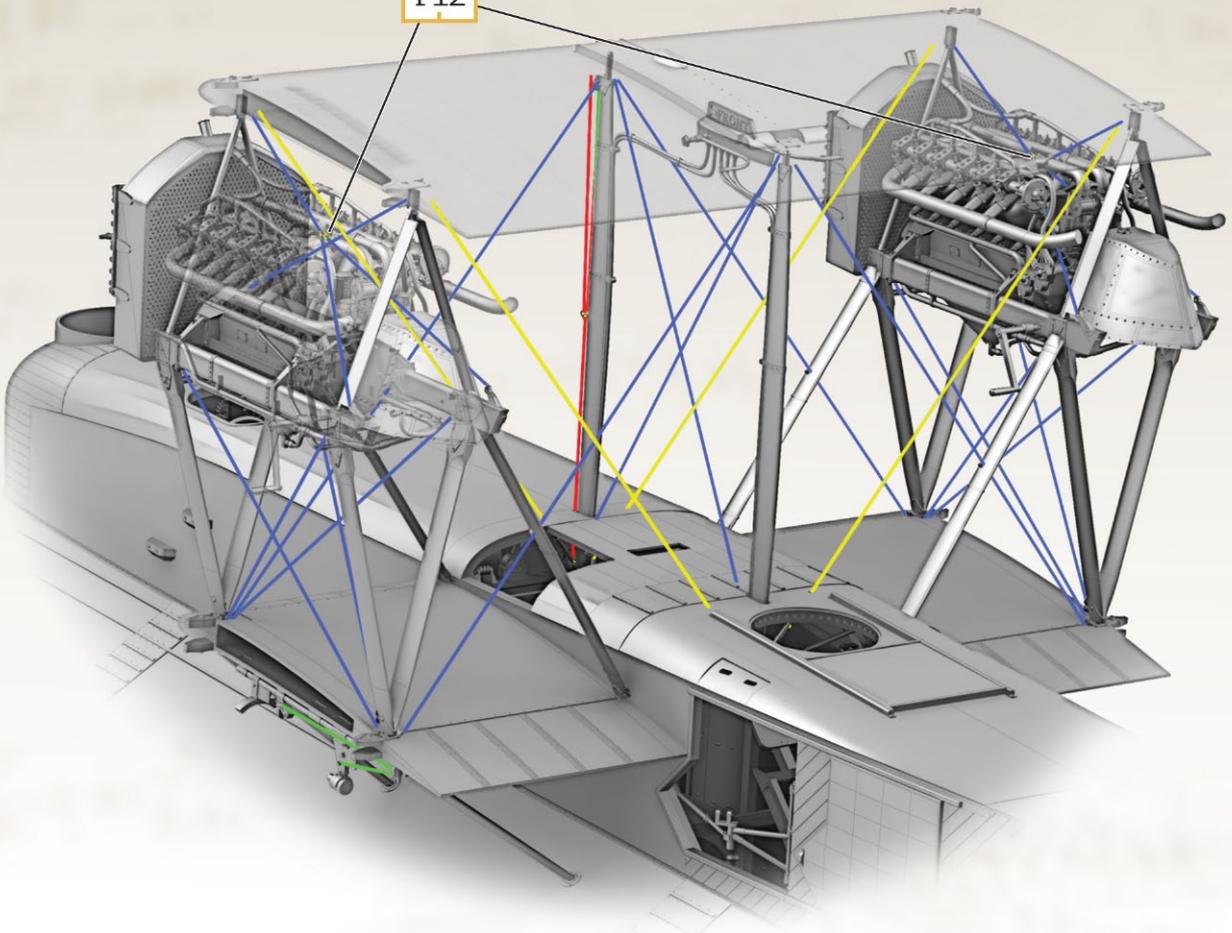
Rigging material not supplied



P12

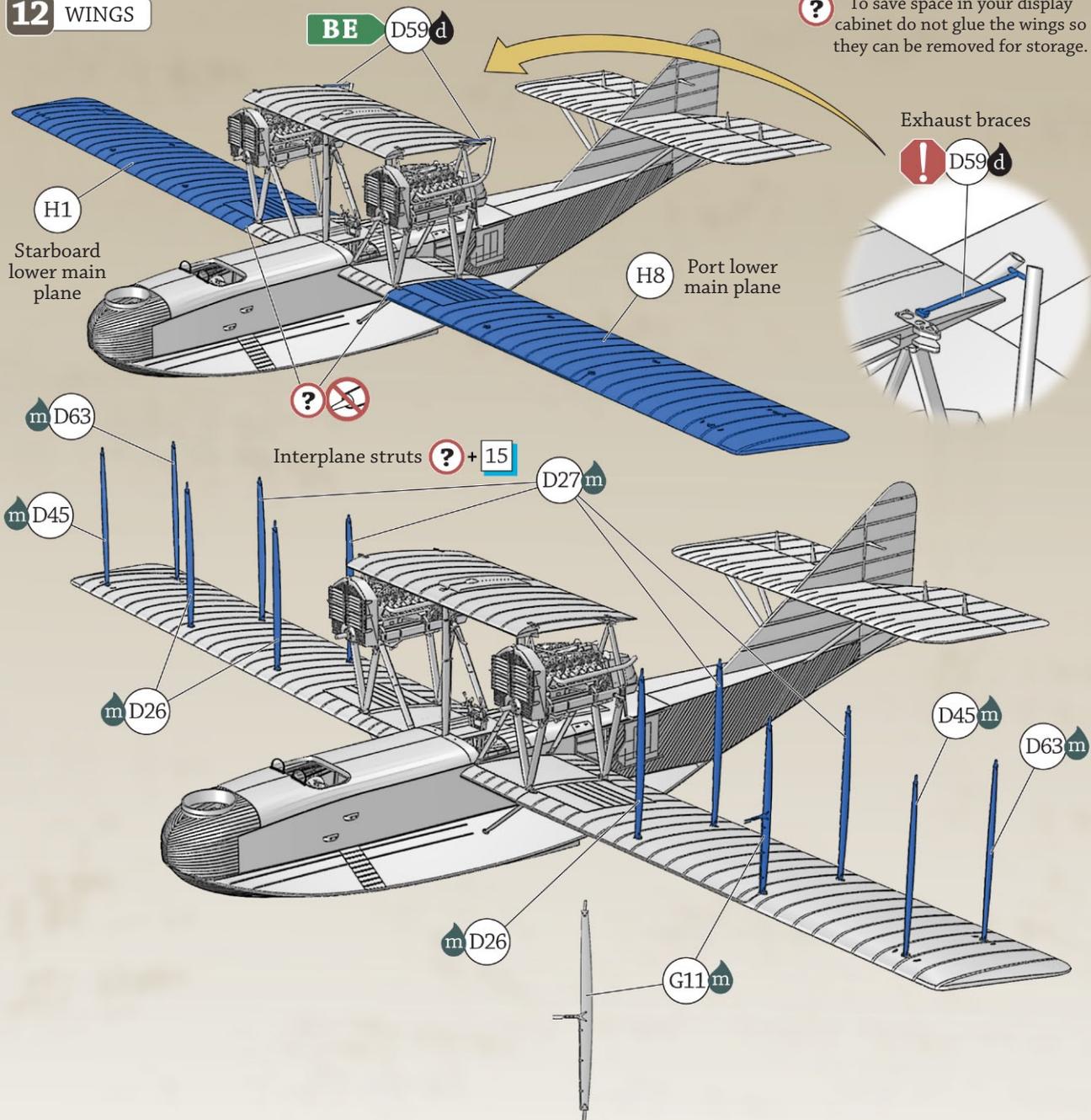


P12



# 12 WINGS

? To save space in your display cabinet do not glue the wings so they can be removed for storage.

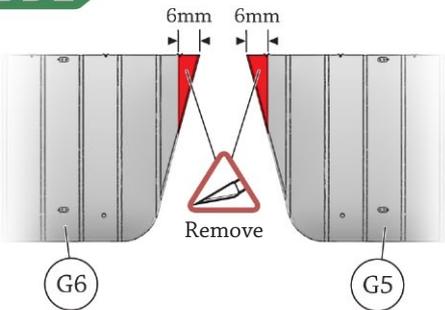


SE Saunders built Felixstowe F.2a N4083 is from the same production order as **D** and is being towed on a lighter. The lighter was another John Porte design and was essentially a mini dry dock intended to massively increase the range of the flying boats by allowing them to be towed well out to sea before taking off on patrol. Another view of this 'XXX' dazzle painted boat can be seen in the photo of N4545 on page 29.

**13** WINGS continued

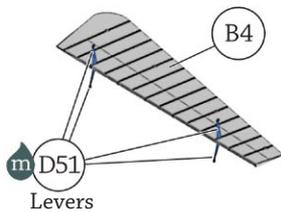
**BDE**

Cut for balanced ailerons

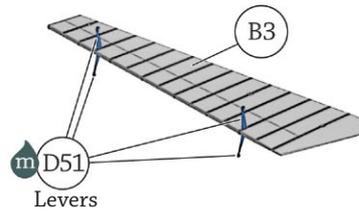


**AC**

Starboard early unbalanced aileron

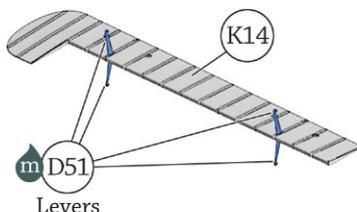


Port early unbalanced aileron

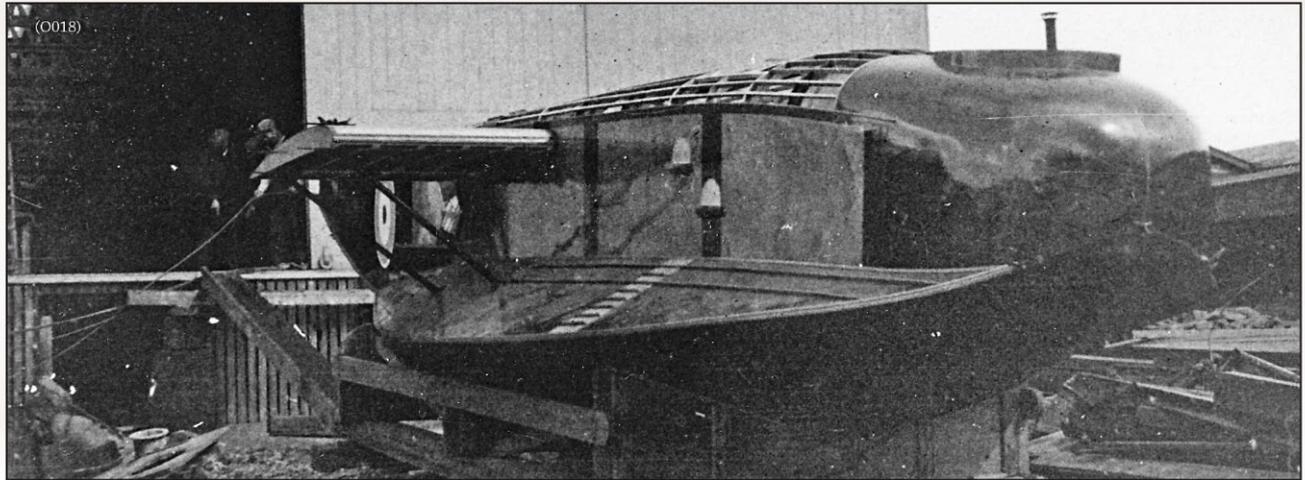
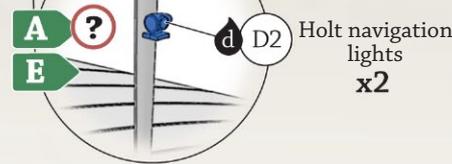
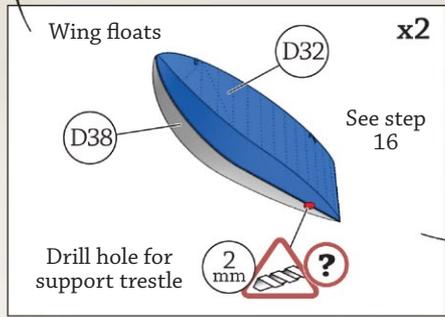
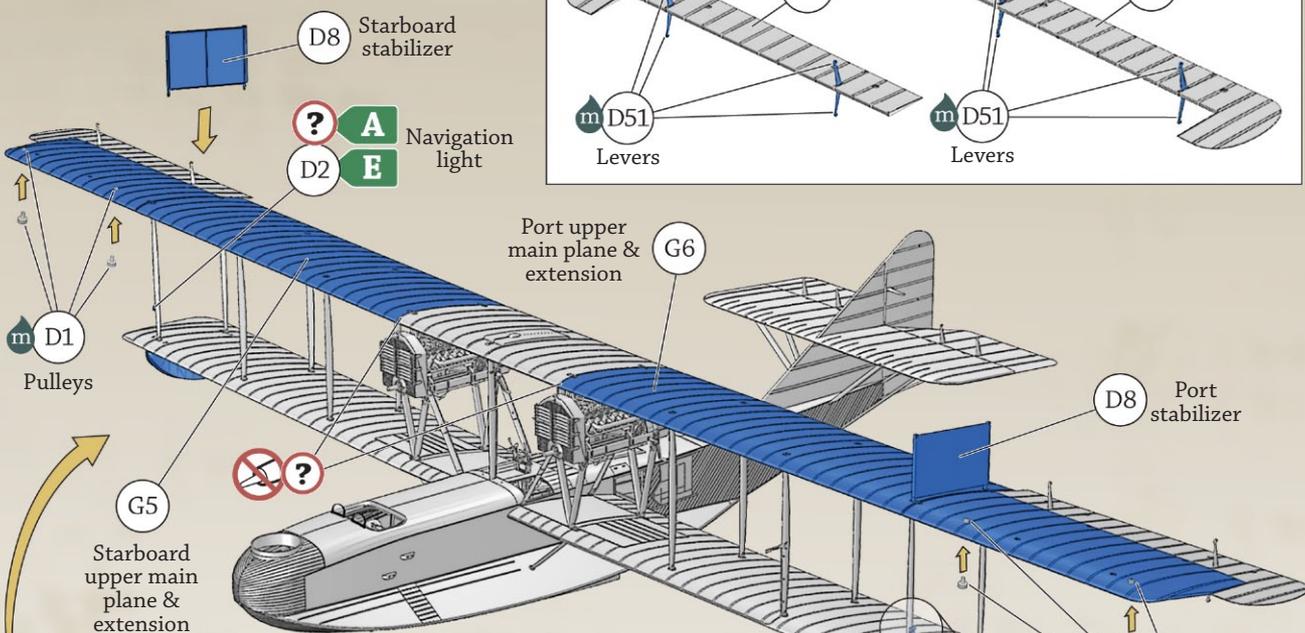
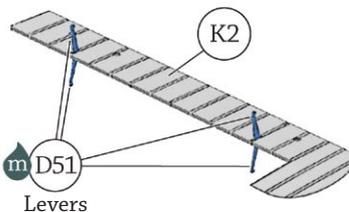


**BDE**

Starboard late balanced aileron

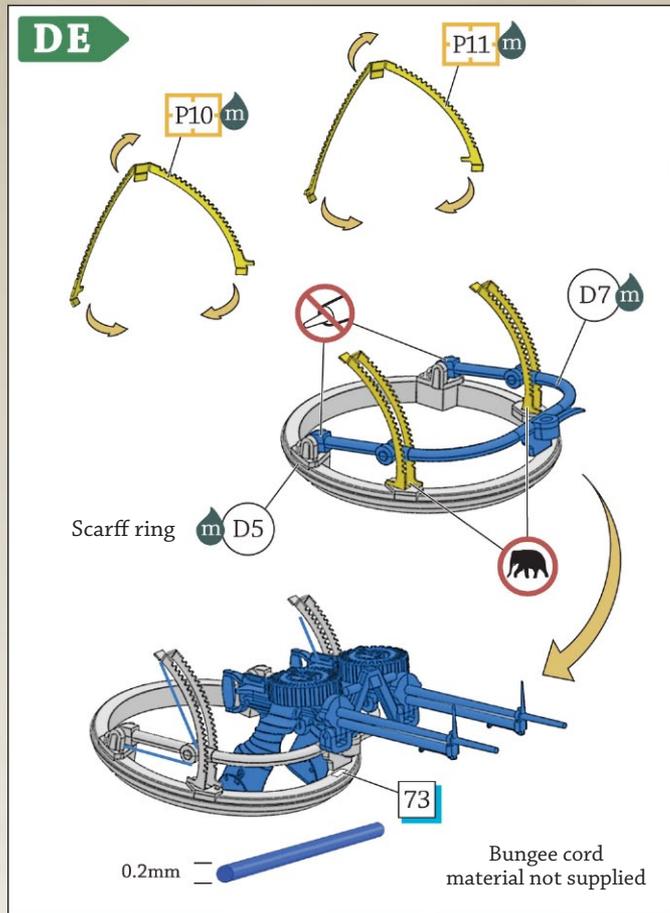
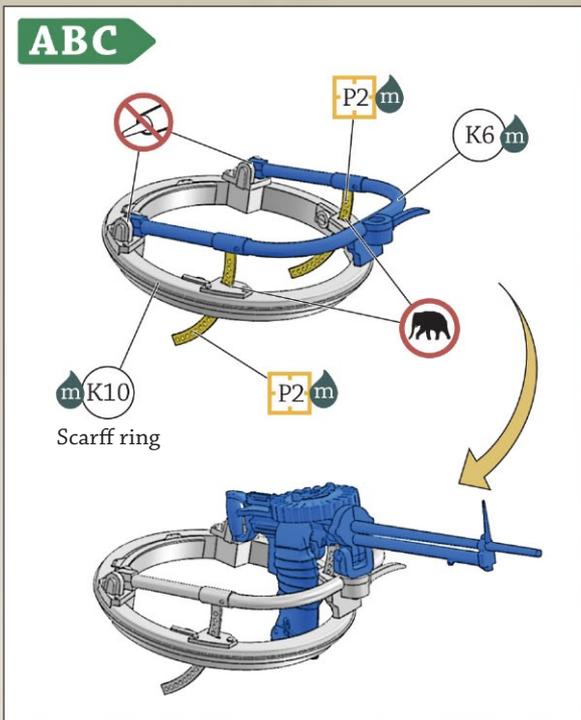
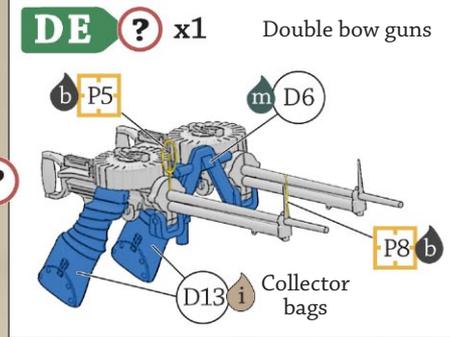
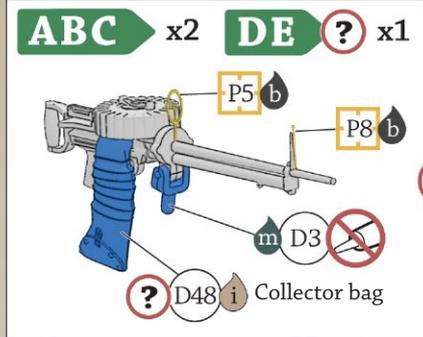
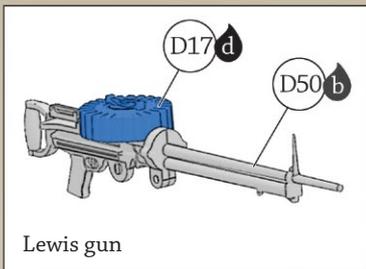


Port late balanced aileron

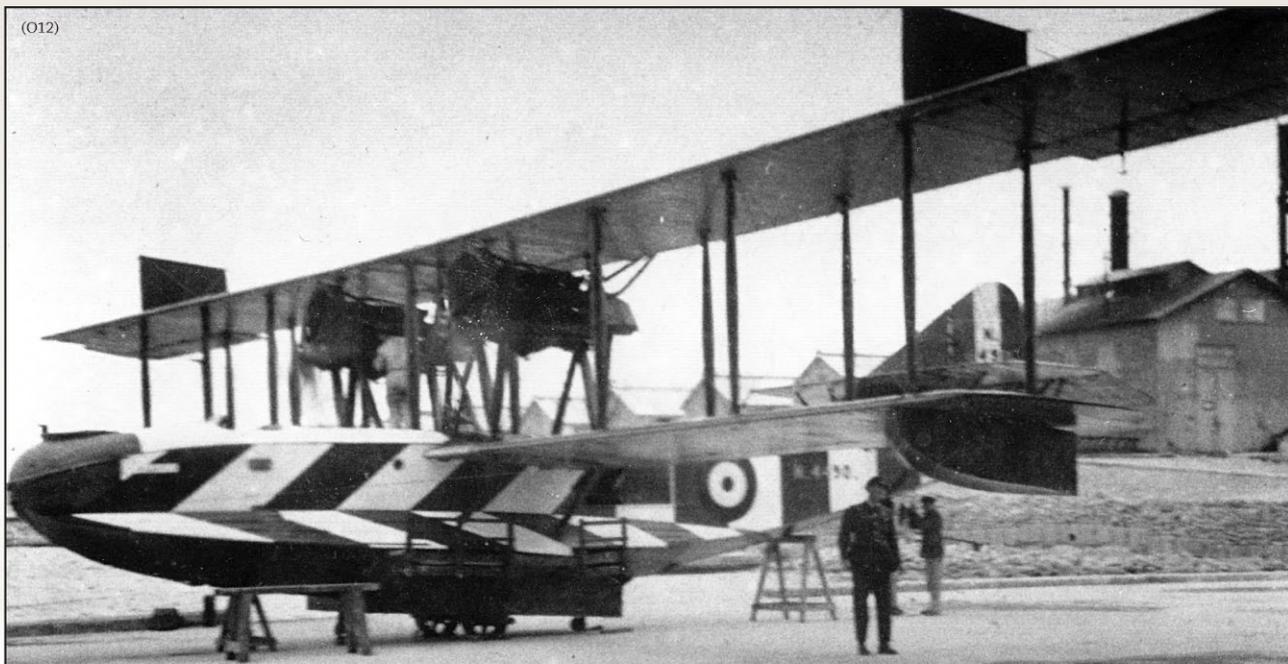


SE Saunders built late production Felixstowe F.2a hull, possibly from the same production order as **E**.

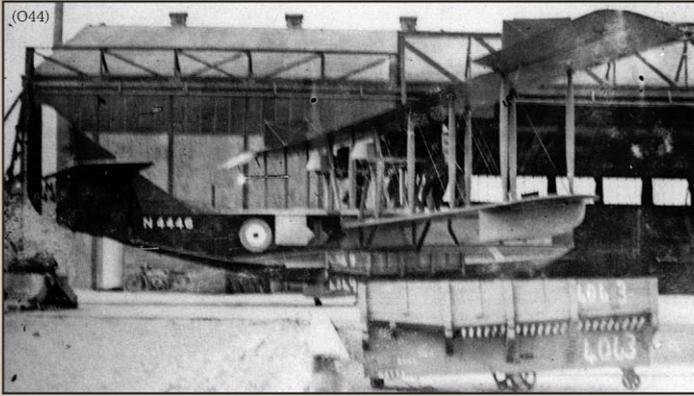
**14** ARMAMENT



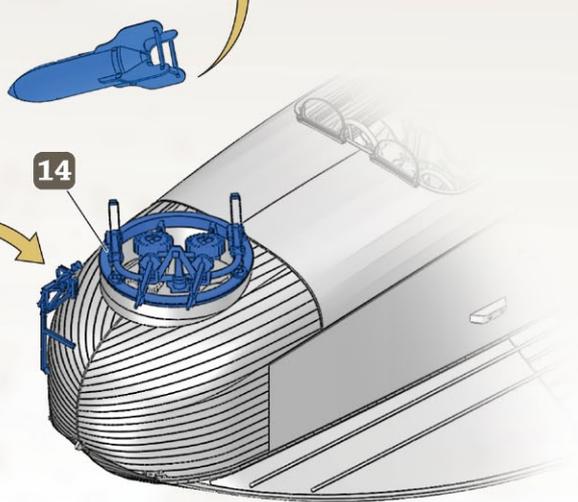
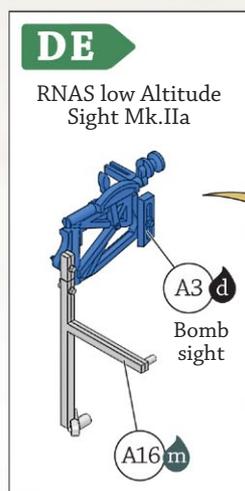
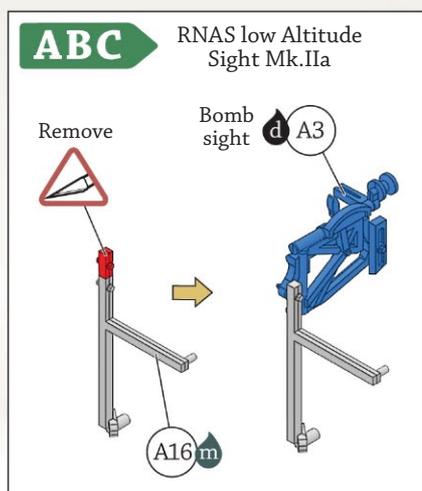
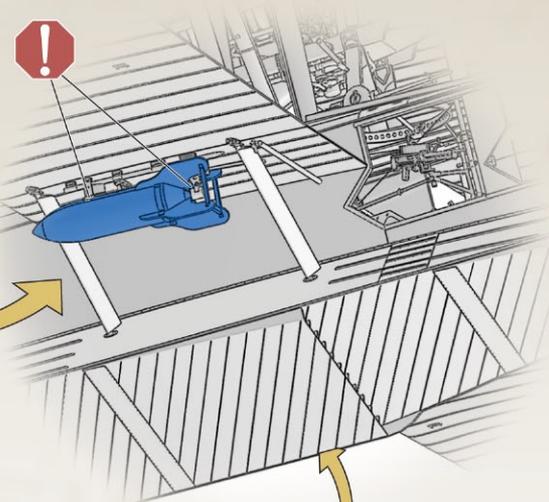
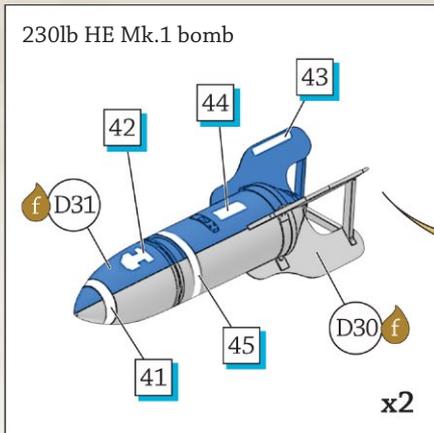
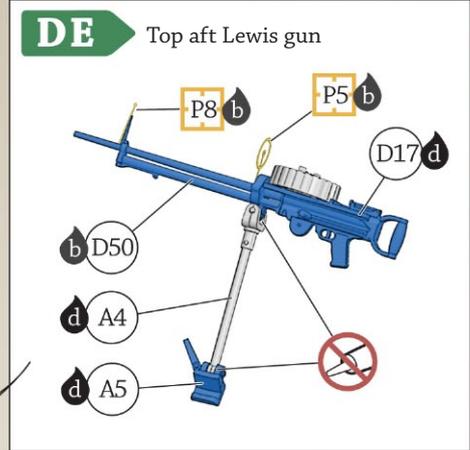
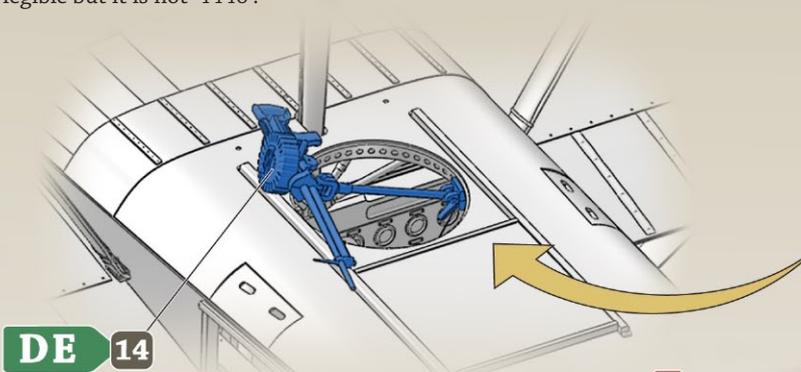
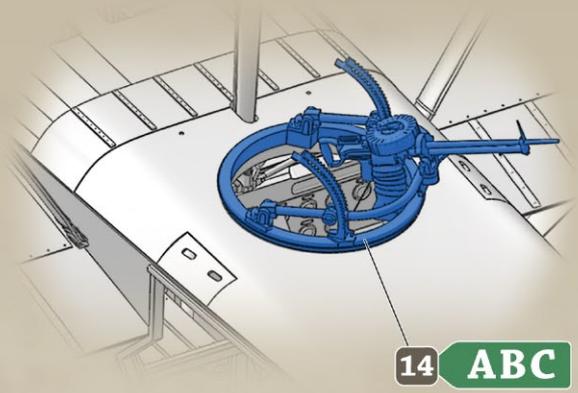
∨ This attractively painted late production Felixstowe F.2a is thought to be N4490 and from the same production order as the 3 boats shown on page 12. N4490 was delivered to Felixstowe in January 1919 before serving with 267 Sqn RAF at Calafra in Malta by May 1921 where it was named 'Aquila'.



**15** ARMAMENT continued

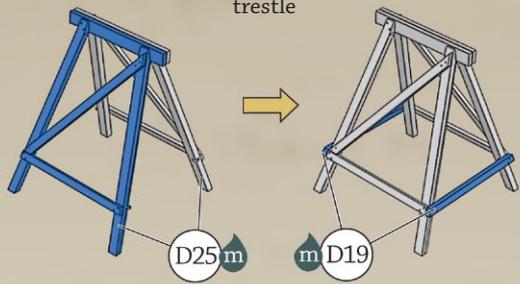


Felixstowe F.2a N4446 is from the same production order as **E** and was still at SE Saunders at the end of January 1919. Note the beaching trolley in the foreground marked '4063' possibly intended for Curtiss H.16 N4063. The number on the beaching trolley under N4446 is not legible but it is not '4446'.



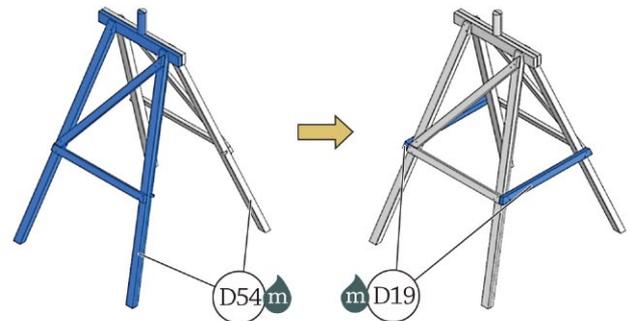
**16** ACCESSORIES

Aft hull trestle

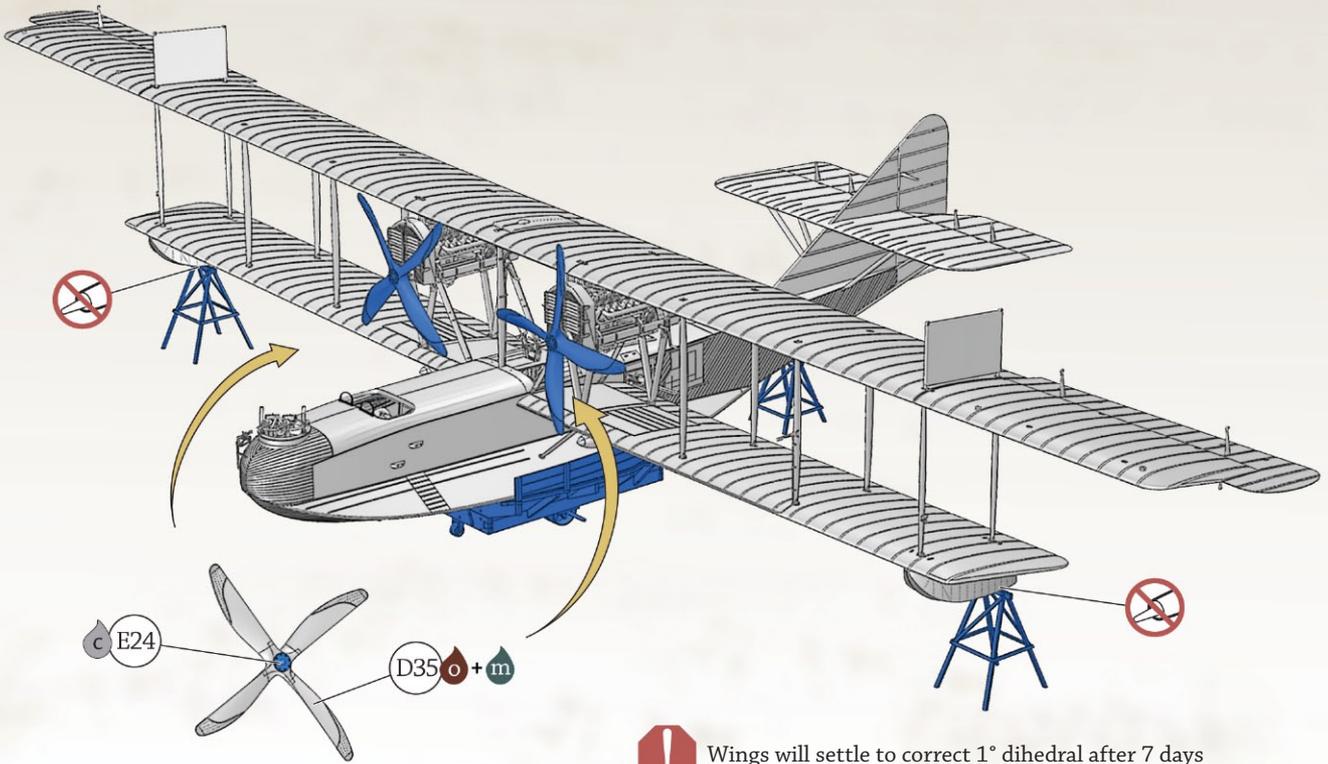
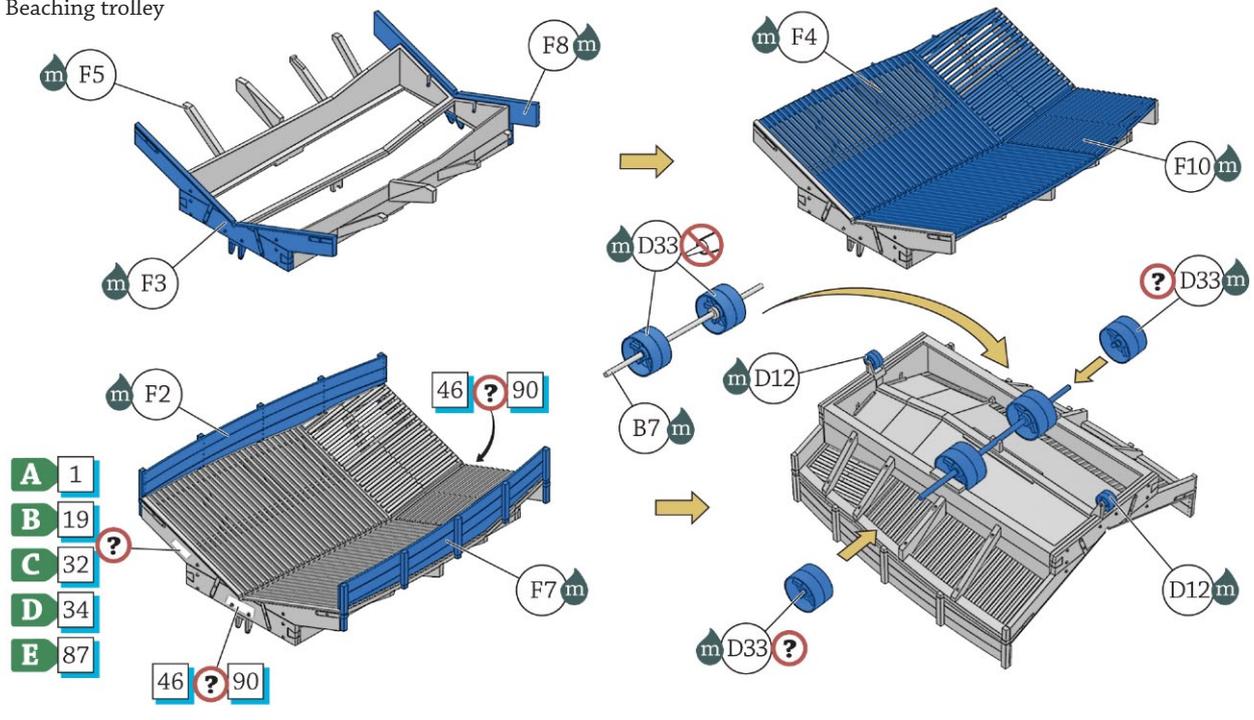


Wing tip float trestles

x2

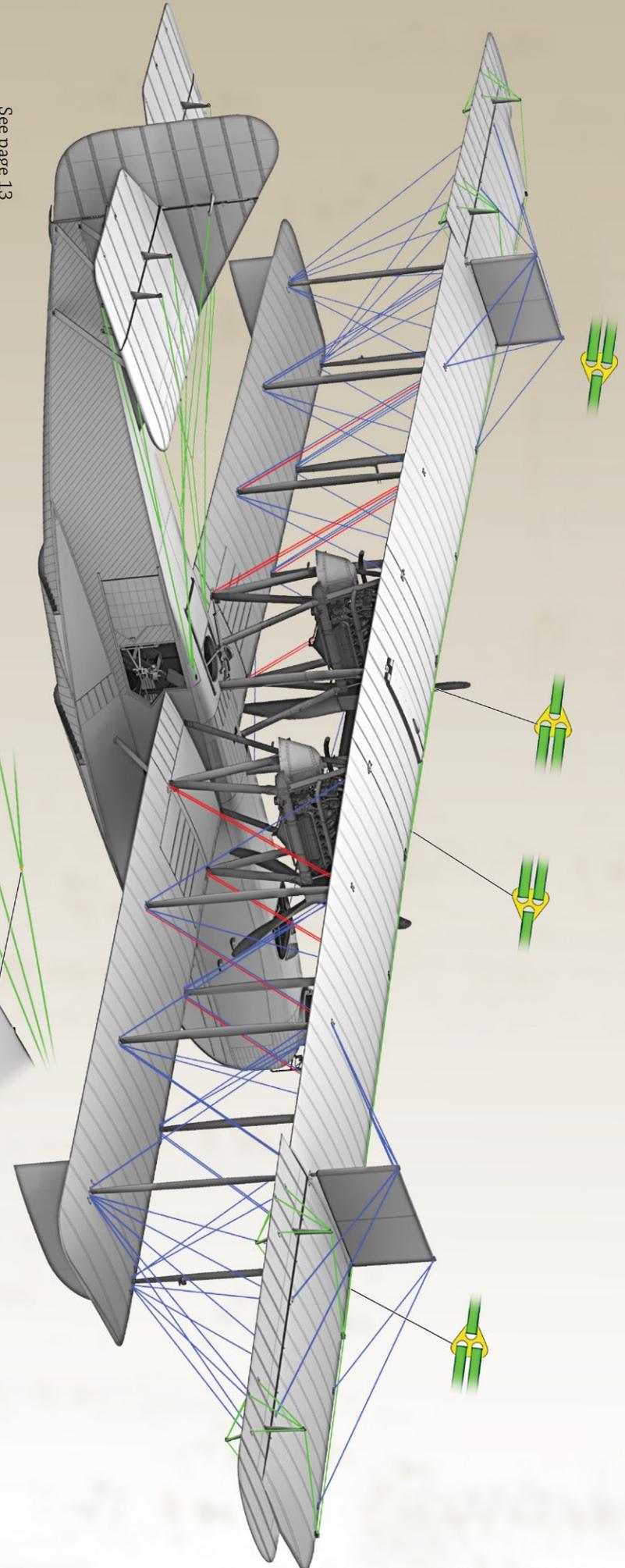


Beaching trolley



Counter-clockwise rotating propellers

**!** Wings will settle to correct 1° dihedral after 7 days

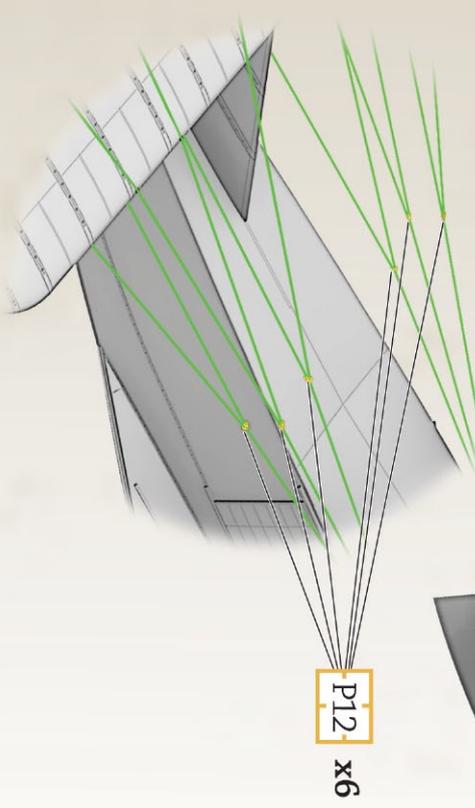


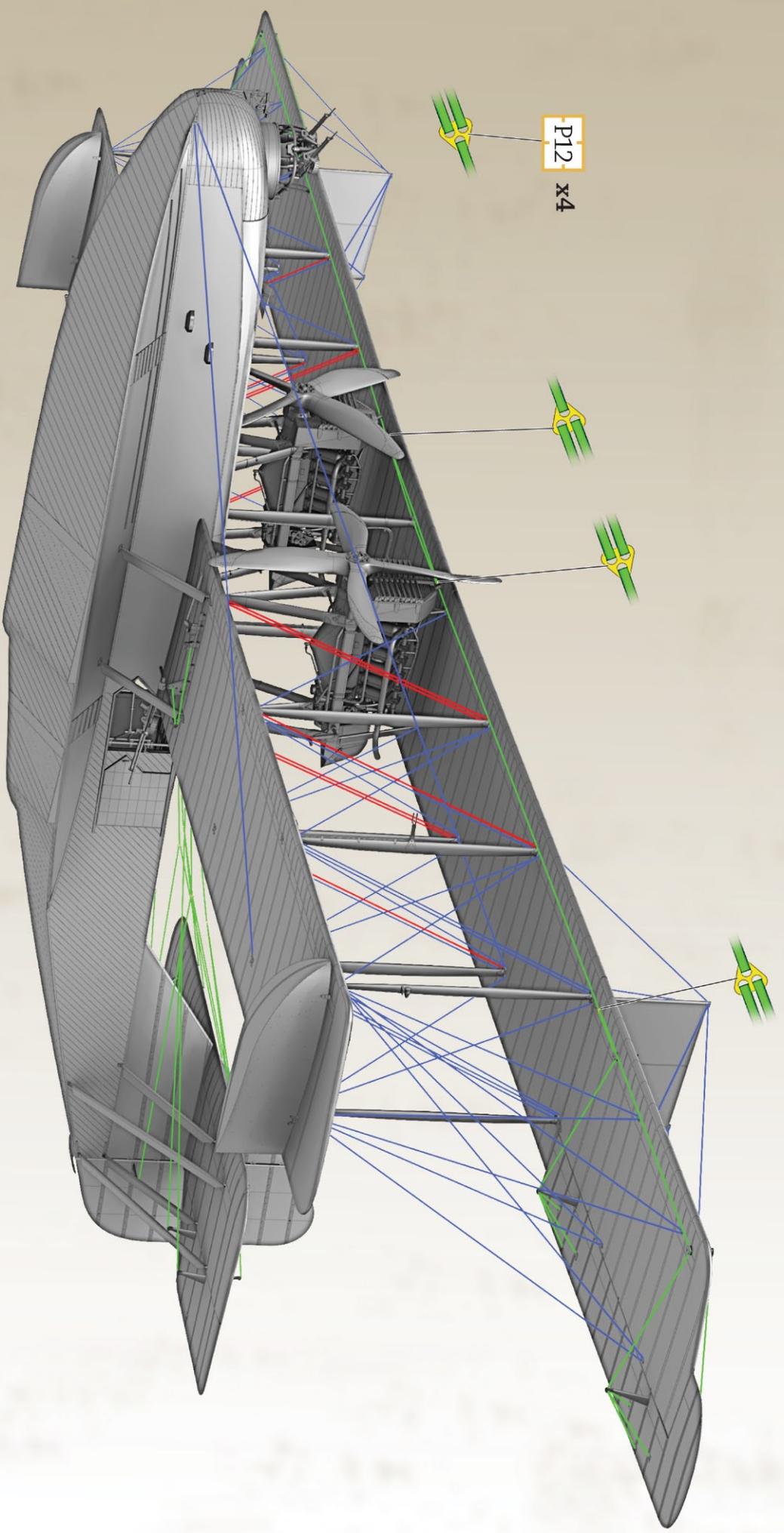
See page 13

0.15mm  Control cables

0.15mm  Bracing

0.2mm  Bracing



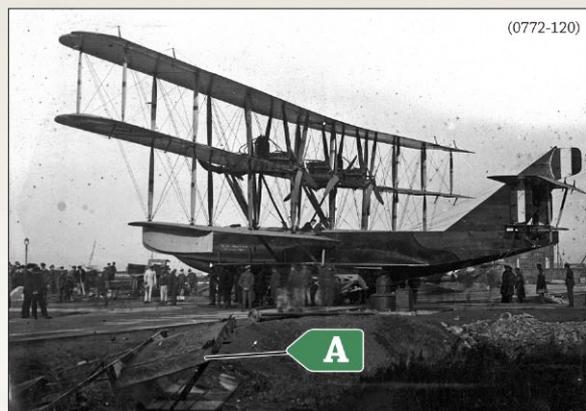
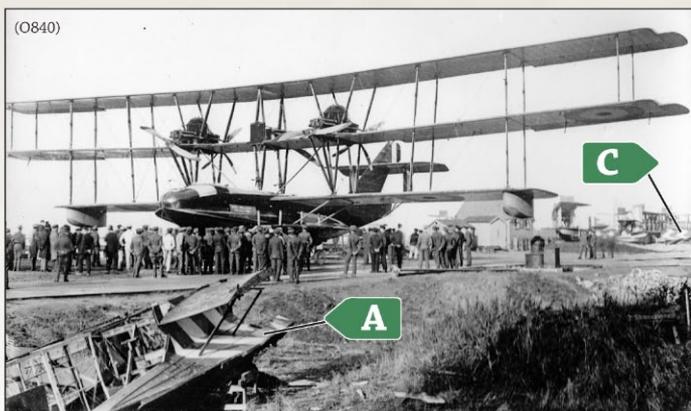
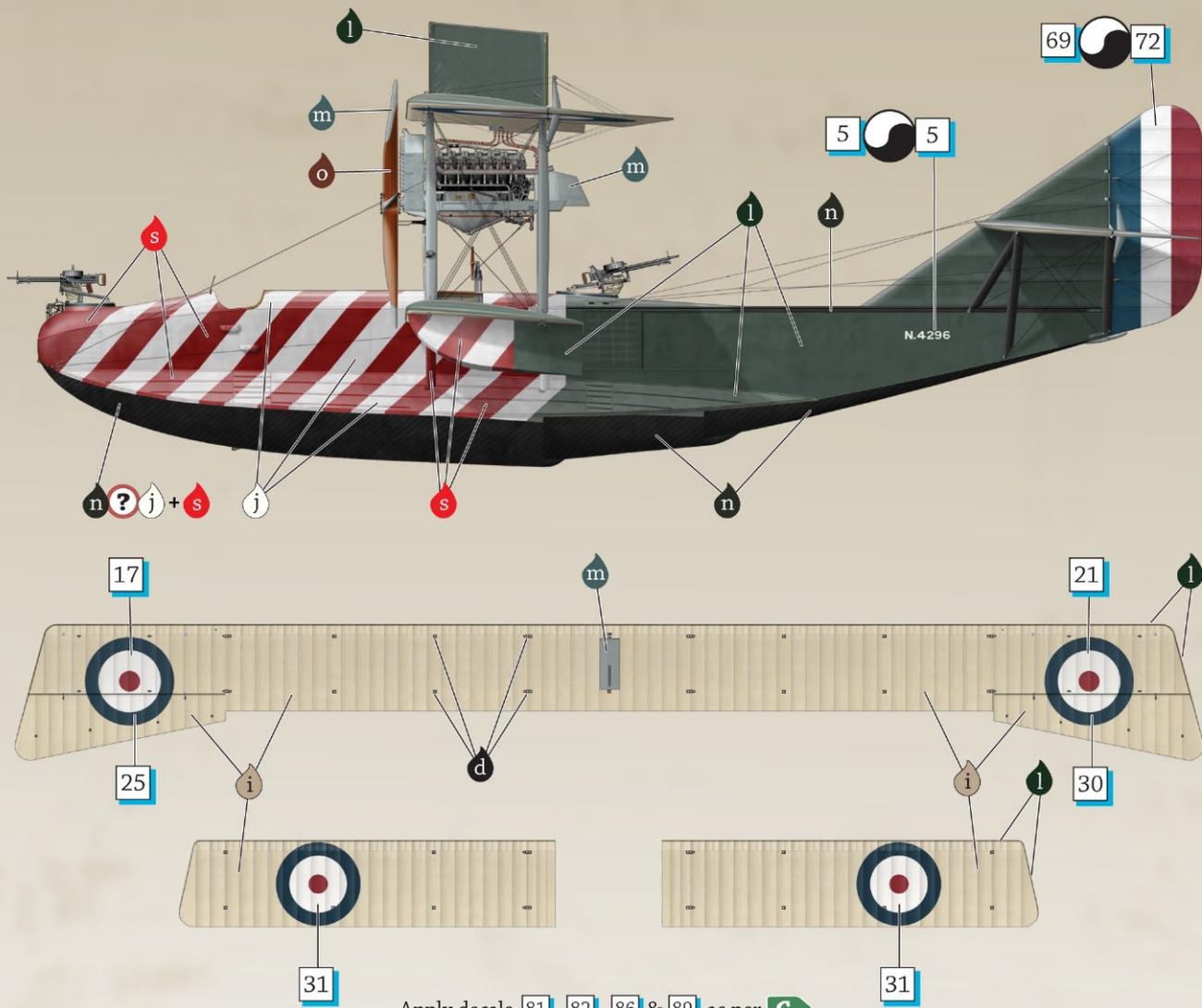


P12  
x4

See page 18

- 0.15mm  Control cables
- 0.15mm  Bracing
- 0.2mm  Bracing

**A** Felixstowe F.2a N4296, SE Saunders built, Felixstowe, Late 1918

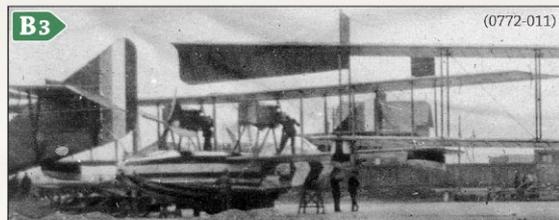


The sole 5 engine Felixstowe Fury “Porte Super Baby” dwarfs the derelict hull in the foreground which we believe is the remains of F.2a N4296. A photo of F.2a N4296 being loaded onto a lighter for transport after being damaged in a crash can be found in Windsock Datafile 82 which confirms the diagonally striped forward hull and darker rear section. Felixstowe F.2a N4296 was from a production order for 30 boats placed with SE Saunders Ltd (numbers N4280 to N4309) and was delivered to Felixstowe on 11 May 1918. It was originally an early production machine which was converted to late open top configuration by removing the glazed cabin and modifying the coamings, although it retained the early unbalanced ailerons when photographed. The practice of painting additional cockades under the top wing appears to have been limited to boats stationed at Felixstowe in late 1918. Unusually the port propeller blades remain stained with only their brass tips painted Battleship Grey **m** while the starboard propeller appears to be finished as per the usual doped on fabric practice. These photos, taken some time after 31 October 1918 when the Fury was delivered to Felixstowe, would tend to indicate that N4296 was well and truly wrecked before being deleted in December 1918.

**B2** Felixstowe F.2a N4297, SE Saunders built, Felixstowe, November 1918



> These 2 photos are believed to show N4297 after having its cockades repainted on the ailerons and upper surface of the starboard top wing.



^ SE Saunders built Felixstowe F.2a N4297 is from the same production order as **A** and was delivered to Felixstowe on 18 May 1918 complete with a glazed cabin and unbalanced ailerons as seen in the photo opposite. By the following month N4297 had been converted to open top configuration and had balanced ailerons fitted as well as being painted in the stripe & zigzag dazzle scheme seen here. Note that the port wing retains a partial large cockade from its earlier unbalanced aileron configuration and the new balanced ailerons have not had their cockades applied yet. On the evening of 4 July 1918 N4297 was on patrol with F.2a N4513 and F.2a N4540 when they were attacked near North Hinder by 4 Hansa-Brandenburg W.29 seaplanes led by Friedrich Christiansen. In the ensuing battle N4513 claimed one W.29 as shot down then was forced down itself with one crewman killed and 4 wounded, it would eventually sink while being towed back to England. Felixstoves N4297 and N4540 were credited as Christiansen's 8th and 9th victories although both made it back to England and were repaired. Felixstowe F.2a N4297 was still at Felixstowe at the end of January 1919.



B2



B1



(00001)

D59

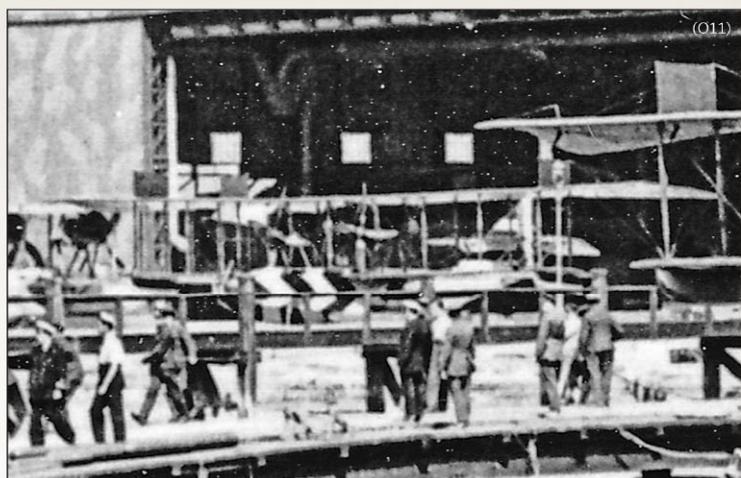
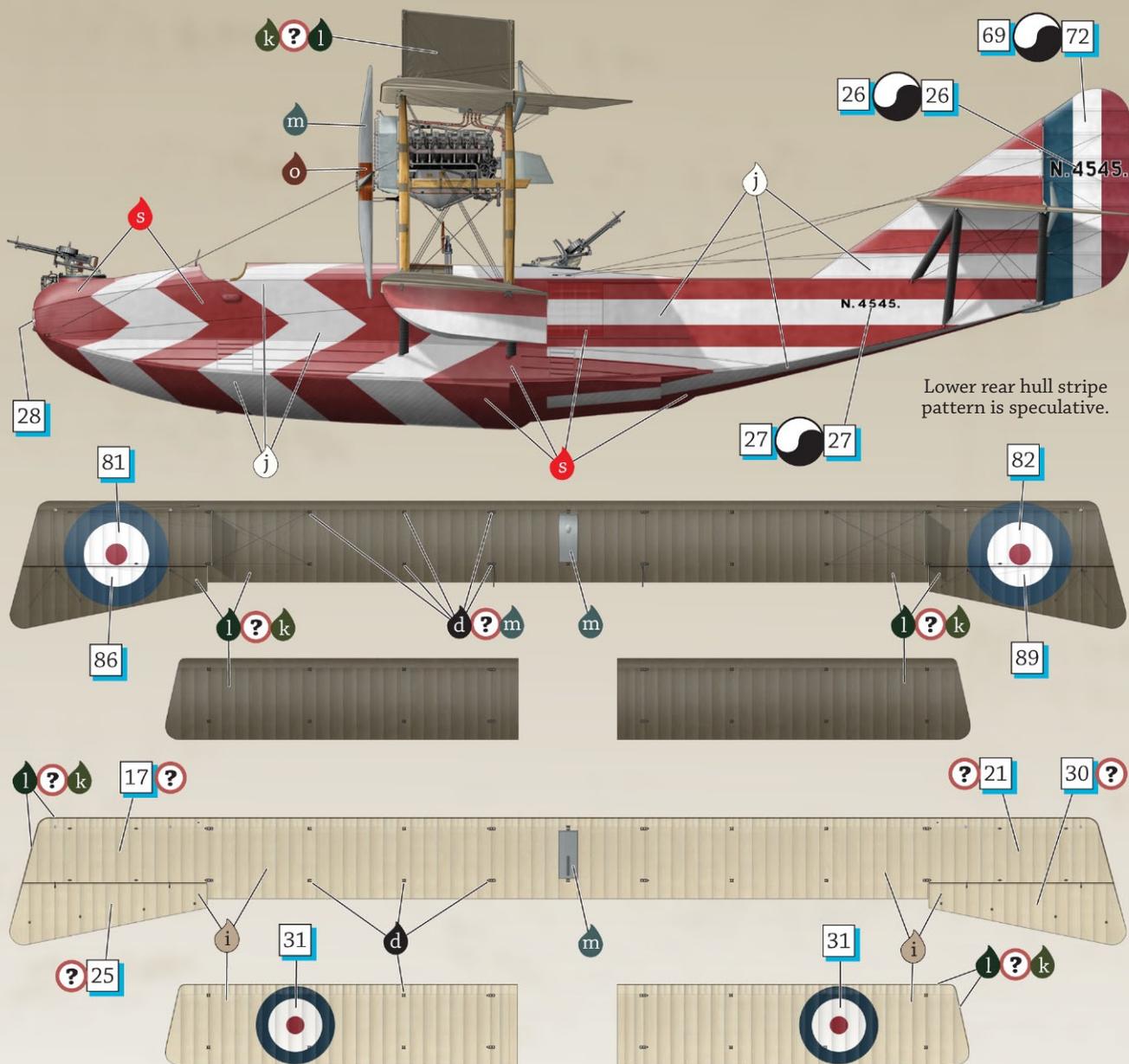
20



Close up of Felixstowe F.2a N4297 in flight. Note the number '3' 20 on the bow, 3 white lines 91 on the inner port top wing and how the braces D59 are still fixed to the top wing centre section despite having the exhaust pipe shortened. The starboard top wing does not have a cockade indicating that it has been recently replaced or possibly just freshly repainted.

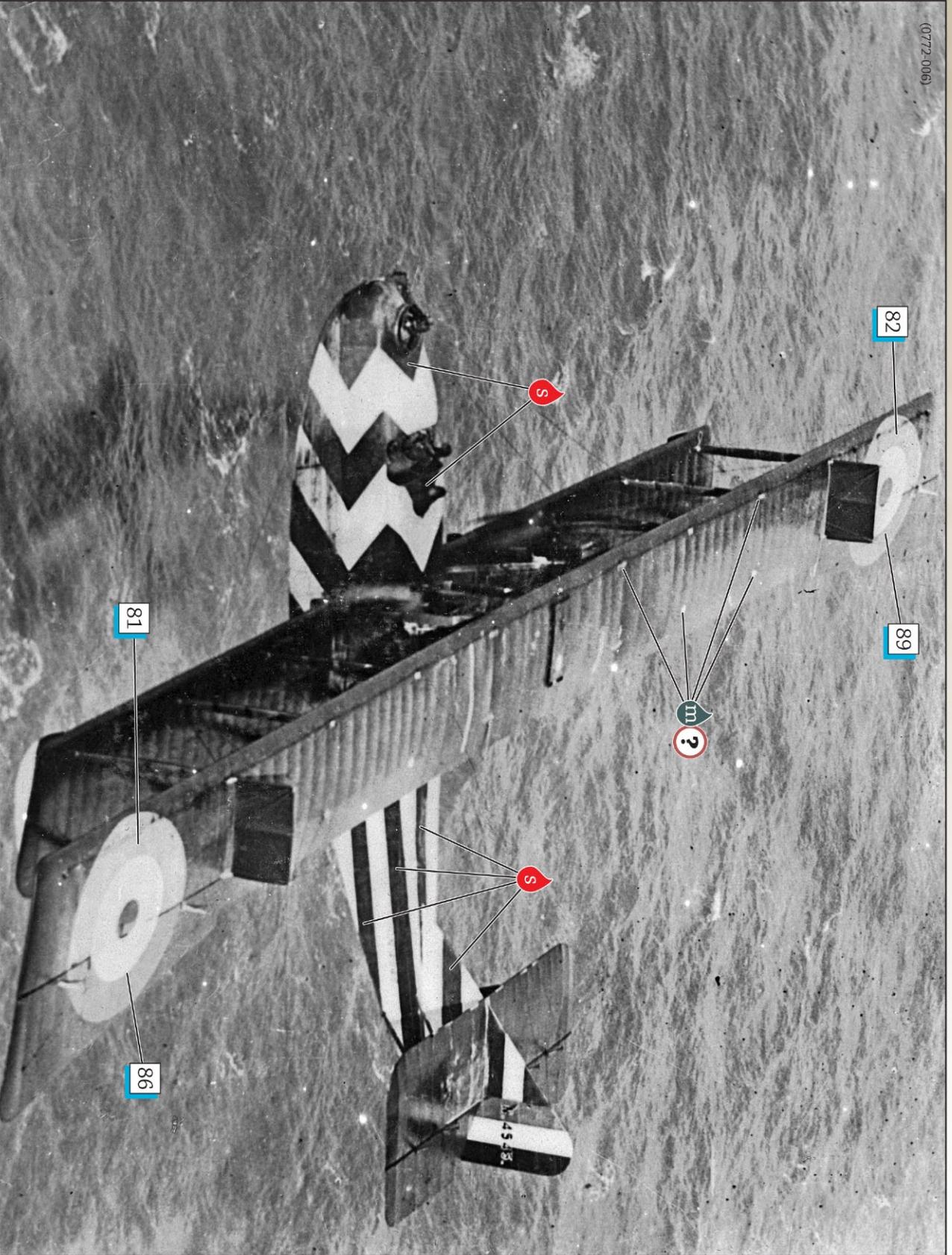
(0772-007)

**C** Felixstowe F.2a N4545, AMC/May, Harden & May built, 230 Sqn RAF, Felixstowe, August 1918



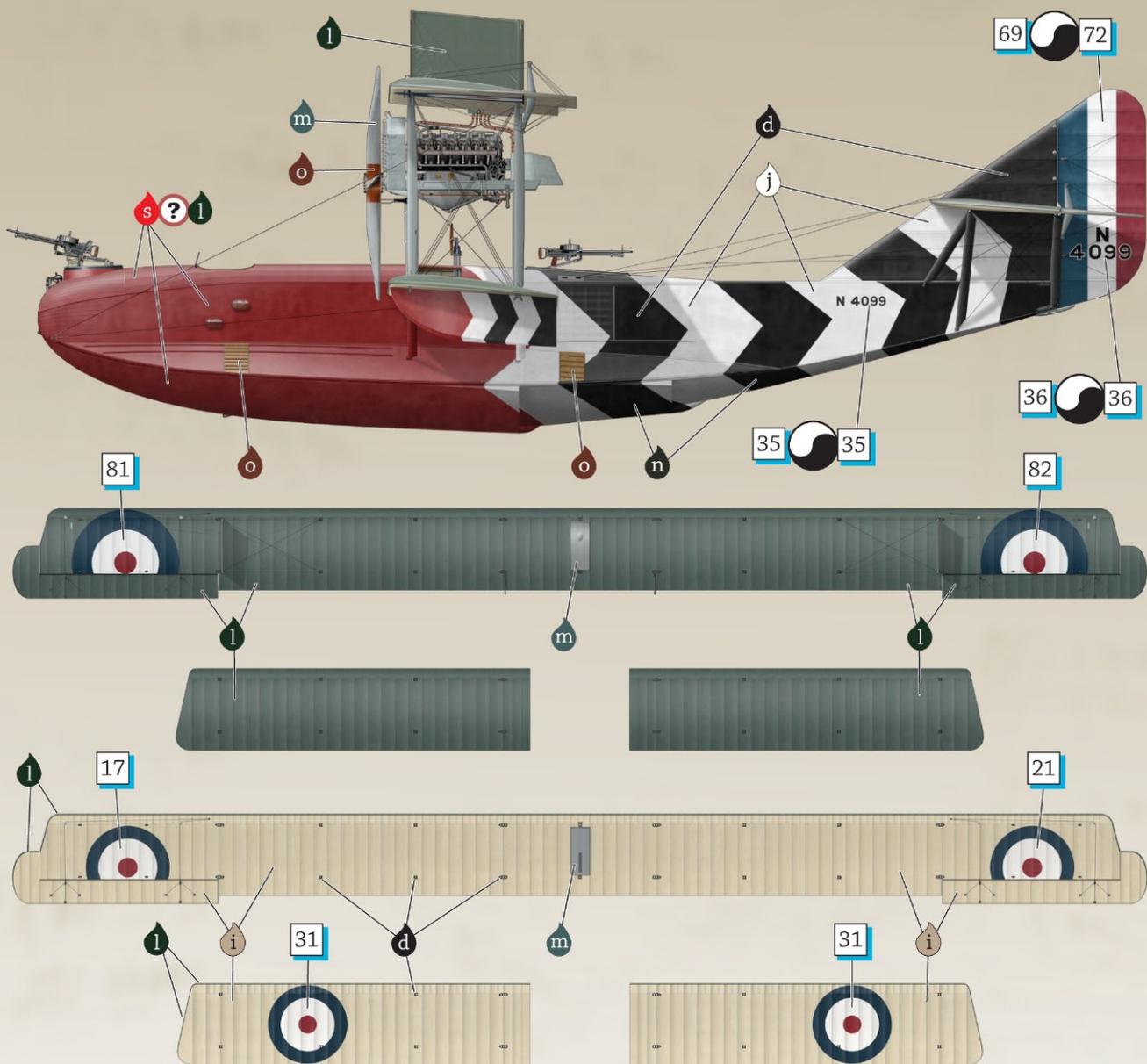
Felixstowe F.2a N4545 was from a production order placed with the Aircraft Manufacturing Co Ltd/May, Harden & May (numbers N4530 to N4554). It was delivered to 230 Sqn at Felixstowe on 8 July 1918 and it was probably while there that it was converted to the open top configuration seen here. The undersides of the top wings do not appear to have received their additional cockades at the time the photo above left (O11) was taken. It is entirely likely that the unbalanced ailerons had been replaced by the time the photo above right (O840) was taken. N4545 was still on strength at Felixstowe at the end of January 1919. The rear hull and tailplane of 'XXX' dazzle painted F.2a N4083 as seen on page 19 can be seen in the foreground of the photo on the right.

(0772-006)

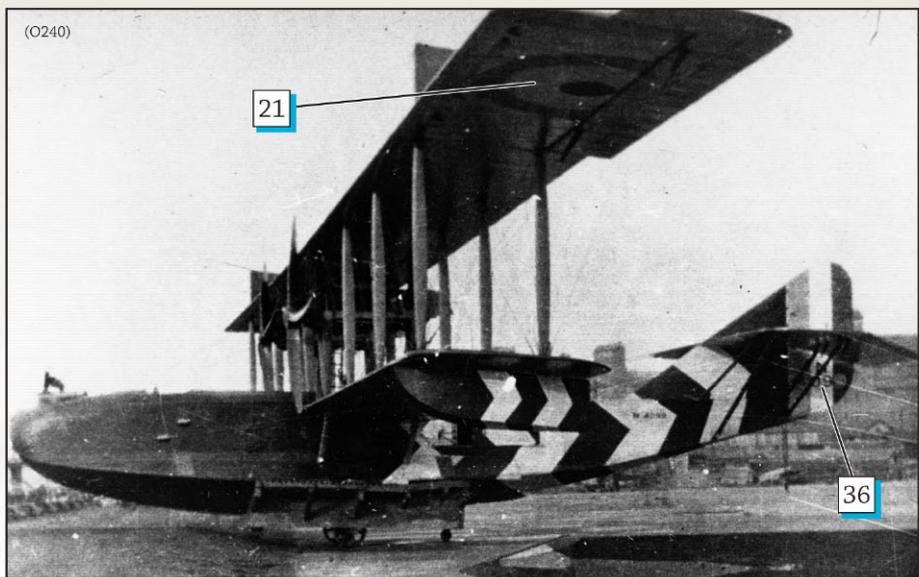


A famous in flight photo of Felixstowe F.2a N4545 showing its distinctive zigzag & stripe dazzle scheme and characteristically dark upper surfaces of the wings and tailplane. The red and white colours of the dazzle scheme are unconfirmed but are logical based on knowledge of the paints that were readily available to the crew and comparison to the red and white rudder stripes. Note the pale colour of the aileron control horns and various metal fittings on the top wing indicating that they were painted Battleship Grey .

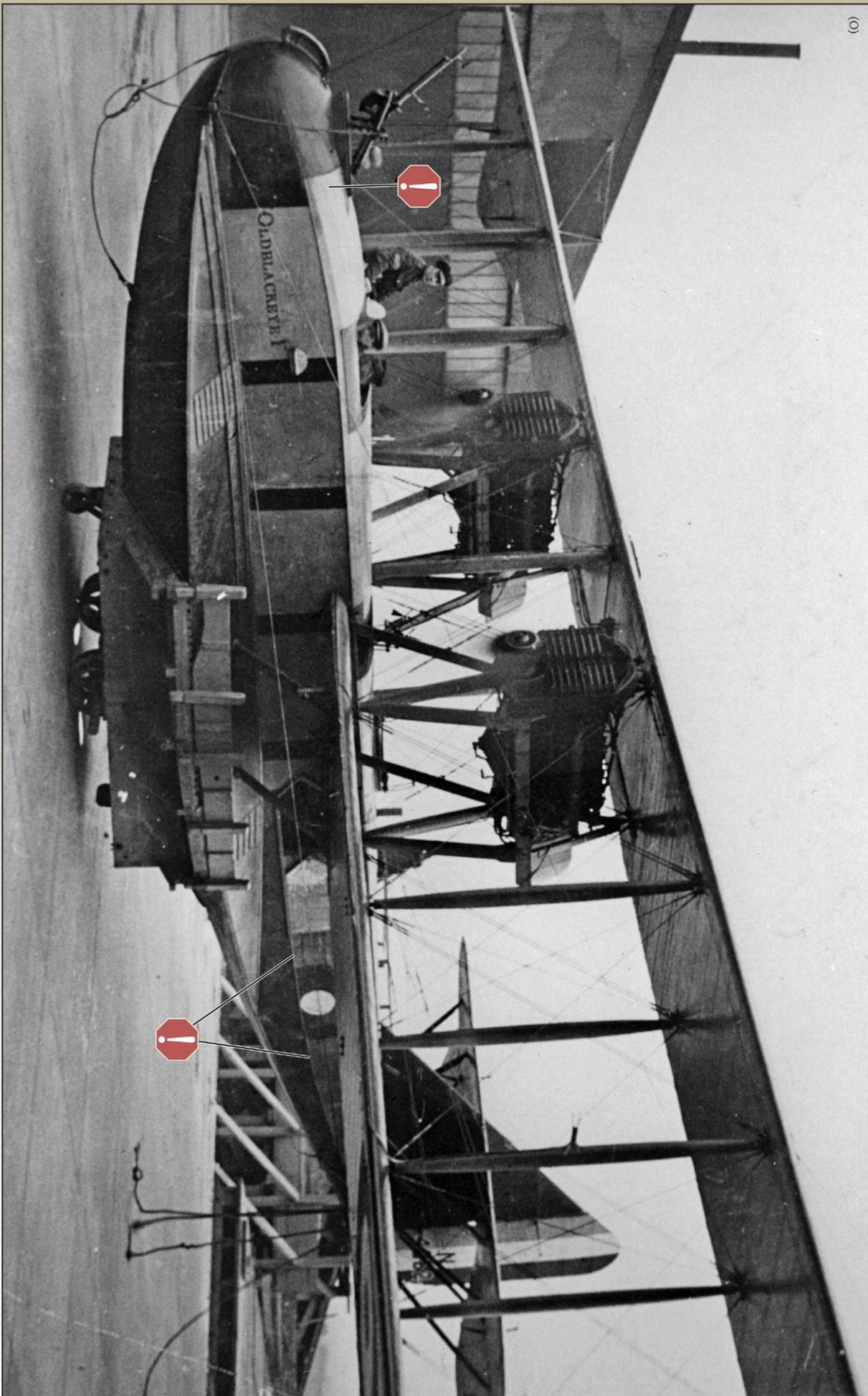
**D** Felixstowe F.2a N4099, SE Saunders built, Felixstowe, Late 1918



Felixstowe F.2a N4099 is from a production order for 20 boats placed with SE Saunder Ltd (numbers N4080 to N4099) and was delivered to Felixstowe in mid October 1918 with the 'late' open top cockpit configuration seen here. The partial large cockade visible under the port top wing indicates that despite being built to 'late' specifications N4099 was delivered with unbalanced ailerons that have recently been replaced with balanced items. N4099 was involved in a 'propeller accident' which injured Sgt Shales and was still on strength at Felixstowe at the end of January 1919. It remained in service until 1924 at which time it was stationed at Calshot but was completely wrecked in a crash at Solent which killed the Wireless Operator. The colours of the dark front and zigzag rear hull are unconfirmed but again based on readily available paint stocks it would seem likely that the front is red (or possibly dark green?) and the rear is black and white.







SE Saunders built Felixstowe F2a N4082 or N4282 'OLDBLACKEYE 1' is seen here in United States Naval Air Service markings at Killingsholme. Note the US cockade on the fabric covered rear hull, early unbalanced ailerons and how the cockpit coaming extends over the rear of the bow planking. It is not unusual to see USNAs Felixstowe F2a with both front and rear Scarff rings.



Two photos of 2nd Lt Wilkie (St.Thomas WI) at Felixstowe posing in front of an open top F.2a which, if the serial number applied to the beaching trolley is to be believed, is SE Saunders built F.2a N4298 from the same production order as **A** & **B**. If it is actually N4298, which we are skeptical about, it would appear that it was converted to open top configuration at a much later date than N4296 **A** & N4297 **B** utilising the production top coaming specifications. Note the 230lb Bomb Carrier Tubular Mk.IV, fabric wrapped Battleship Grey propeller blades and single foot step on the side of the hull.



### 3-D Modelling by Jason McAdam

From a very early age Jason has embraced his creative side, whether it be through drawing or modelling. This creative nature was strongly grafted with a passion for transportation design, whether it be by land, air or sea.

Having graduated with an honours degree in Industrial Design Jason has gone on to develop his skills further in his design work with Weta Digital. While at Weta, Jason has continued to push the boundaries of software technologies and applications, with a keen eye for detail. This passion for design comes hand in hand with a love of sport and recreation, with motorbike riding being among the more popular of pass times.



### Box Art by Steve Anderson

Steve Anderson is an avid historian of military aviation, with a special interest in the many beautiful biplanes and triplanes of World War I. The aircraft and battles of famous World War I aces such as Baron Manfred von Richthofen (better known as the "Red Baron"), James McCudden, Raoul Lufbery, Ernst Udet, Werner Voss, and other pioneers of dogfighting are among Steve's favorite subjects.

An Artist Fellow of the American Society of Aviation Artists, Steve creates works that reflect scrupulous attention to historically accurate detail, from the colorful markings on the fuselages to the time of day of an actual battle.

Visit Steve's website at: [www.anderson-art.com](http://www.anderson-art.com).



### Profile Art by Ronny Bar

Ronny Bar developed a keen interest in airplanes from an early age, living close at the El Palomar Air Force Base in Buenos Aires. He first flew in the back seat of a T-34 Mentor trainer at the age of ten, and was soon drawing airplanes and

building models: Spitfires and Messerschmitt first... Camels and Fokkers later.

He became a successful bass player with a career lasting over 35 years in several Rock bands, recording ten albums (one of them being a National hit selling more than 100,000 copies) and performing countless concerts, TV shows and tours all over Argentina.

Now retired from the R'n'R scene, his interest returned to his early passion: Aviation Artwork. Visiting the WW1 aircraft collection at Hendon focused his already growing interest for that historic period. His artwork is regularly appearing in journals and publications like Windsock Worldwide, Windsock Datafiles, Cross & Cockade and Over the Front.

Visit Ronny's website at: [www.ronnybarprofiles.com](http://www.ronnybarprofiles.com)



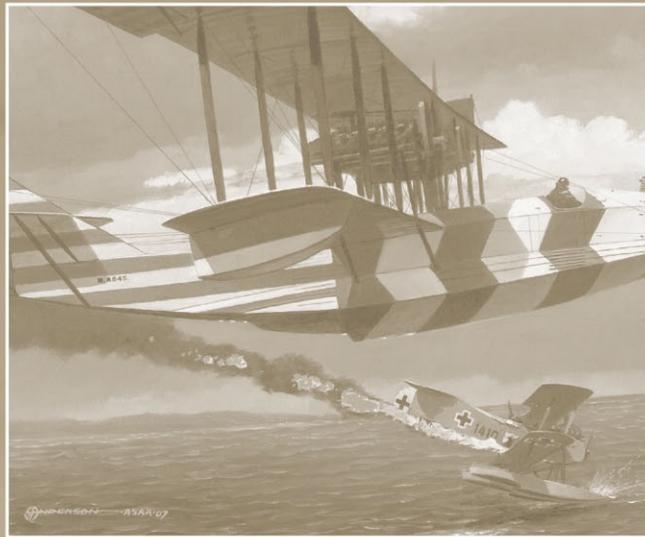
### Project Co-ordinator, Richard Alexander

A native of Wellington New Zealand, Richard Alexander has a long term interest in military history, race cars & local drivers from motor sports golden era of the '60's. Other interests include mountain biking, scotch and cigars.

An accomplished modeller Richard's models have twice been awarded Best Overall in Show at IPMS(NZ) National Conventions and earned him the inaugural TamiyaCon(NZ) Master Modeller award (along with the associated trip to Japan) in 2001. Many of his works are in private collections around the world, though he no longer accepts commissions.

Richard has been in the model and hobby industry since 1991 and brings with him a keen eye for detail and a passion for ensuring our models are enjoyable to build. So if there is anything you don't like about this model, you can blame him.

If you have any questions about this model, comments, requests or suggestions, Richard is contactable at [richard@wingnutwings.com](mailto:richard@wingnutwings.com)



32066	1/32 Felixstowe F.2a Late	Qty
0132050A	A parts	1
0132050B	B parts	1
0132050C	C parts	1
0132050D	D parts	2
132E0022	E parts RR Eagle engine	2
0132050F	F parts	1
0132050G	G parts	1
0132050H	H parts	1
0132050I	I parts	1
0132066K	K parts	1
0132050P	Photo-etched metal parts	1
7132066	Instructions	1
9132066a	Decals	1
9132066b	Decals	1
9132066c	Decals	1

If you have any damaged or missing parts please contact [help@wingnutwings.com](mailto:help@wingnutwings.com) for assistance.



32016 - 1/32 Sopwith Pup RNAS



32036 - Hansa-Brandenburg W.12 Early



32035 - 1/32 AMC DH.9

Also available from  
[www.wingnutwings.com](http://www.wingnutwings.com)

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