FLYING BEAR

Morane-Saulnier G

Assembly instructions

Morane-Saulnier G

The two seat Morane-Saulnier type G and its sibling, the one seat type H, were pre-WW1 monoplane designs, that first flew in 1912 and developed from earlier racing monoplanes by Léon Morane and Raymond Saulnier. They became highly popular in the years before the outbreak of World War 1 and were produced in, for its time, large numbers, mostly in France.

The types were sporting successes. In April 1913, the famous French pilot Roland Garros took second place in the inaugural Schneider Cup in a floatplane version. In June 1913, Claude Grahame-White flew 500 km in one day.
On 28 September the same year, Lord Carbery won the short takeoff prize and Edmond Audemars won the maneuverability prize. In October Garros reached "best speed", 127.7 km/h, as well as highest altitude 2100 m

The types were built under licence in some countries outside France, in Russia under the name Duks, in Great Britain under the name Grahame-White type XIV, in Germany as Pfalz E1-3 and in Sweden as Thulin B.

Powerplant varied from a 50 hp Gnome, to the 160 hp Oberursal in the Pfalz EIII.
Most Thulin B:s were initaially fitted with the 50 hp Gnome but were soon upgraded with 90 hp Thulin A engines.
The most common engines though, were the 80 hp LeRhone 9C and the 80 hp Gnome Lambda.

When WW1 broke out in 1914 most Morane-Saulnier G/H:s ended up as trainers. They were more or less obsolete as war planes, lacking both speed and agility, as well as the structural strength needed for frontline service.
However, the German Pfalz machines were all armed and used as fighters, using synchronized Spandau machine guns.
The first variant, the E1, was later developed with more powerful engines as well as heavier armament.
The Pfalz E IV was fitted with an inline Mercedes 100 hp engine.

In Russia the Duks variants saw extensive action and a vareiety of different armaments were used, from machine guns, bombs and even grappling hooks fitted with explosives.

Some French aircraft, mainly type H:s, were armed with 8 mm machine guns. Only a few were built and none entered frontline service.

Some Swedish Thulin B:s equipped with floats were used to patrol the coast line. One of these, a civilian one and Dr Thulin's personal aircraft, has survived and can be seen at Malmö City Museum, Scania, Sweden.
This aircraft had a long and eventful service life.
Dr Thulin used it for patrols along the coast in cooperation with the Navy and both for he and some from his staff used it for joyrides as well as travels all across the country.

Another Thulin B, once again flown by Dr Thulin, was involved in a search and resque operation over the frozen Baltic Sea in February 1916 after two Finnish ships had got stuck in the ice. Thulin later managed to locate the two ships despite almost becoming a victim himself after the aircraft suffered engine problems, resulting in a forced landing followed by repairs.

Nils Kindberg of the Swedish Army Flying Corps

Morane-Saulnier G (2-seater) LeRhone 9C

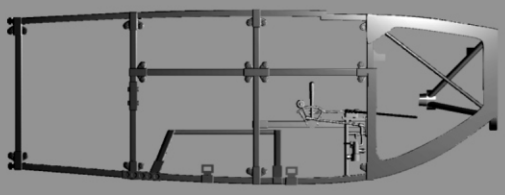
Length:	6,3 m	**Height**: 2,7 m.	
Weight:	645 kg	**Speed**: 120 km/h	
Span:	10,2 m	**Wing area:** 16 m^2	

Morane-Saulnier H (1-seater) LeRhone 9C

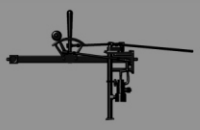
Length:	6,3 m	**Height**: 2,7 m.	
Weight:	444 kg	**Speed**: 120 km/h	
Span:	9,2 -10,2m	**Wing area:** 14 - 16m^2	(sea-planes needed bigger wings)

Parts - Morane-Saulnier G

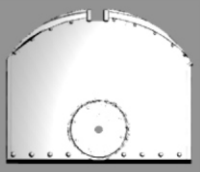
1 Frame



2 Throttle



3 Engine firewall



4 Oil pump

5 Magneto

6 Axle stop

7 Carburettor

8 Tank

9 Dashboard

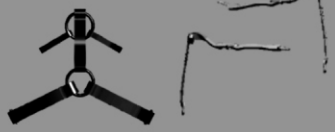
10 Tachometer
11 Fuel gauge
12 Pulsometer
13 Ignition switch
14 Bank ind.

15 Compass
16 Clock
17 Air speed indicator
18 Altitude indicator
19 Stop watch

20 Tachometer drive

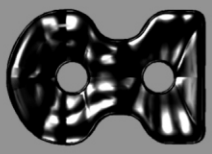
21 Hand air pump

22 25 26 Seatbelts



23 Seat base

24 Cushion



27 Extra Tank

28 Fuselage

29 30 Inspection doors

31 Air intake

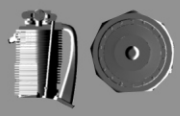
32 Floor

33 34 35 Controls

36 Landing gear

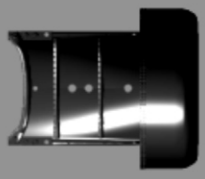
37 38 39 Wheels

40 42 44 Cylinder
41 43 45 Block



Extra Control horns

46 Cowl front Turtledeck



47 48 Exhaust gas cowls

49 50 Logotypes

51 52 Wings

53 Wing rigging attachements

54 Elevator

55 Elevator brackets

56 Tail skid

57 Rudder

58 Filler caps

59 Fuel indicator

60 Wind screen

61 Rigging strut

62 Propeller

63 Front propeller boss

64 Foot step

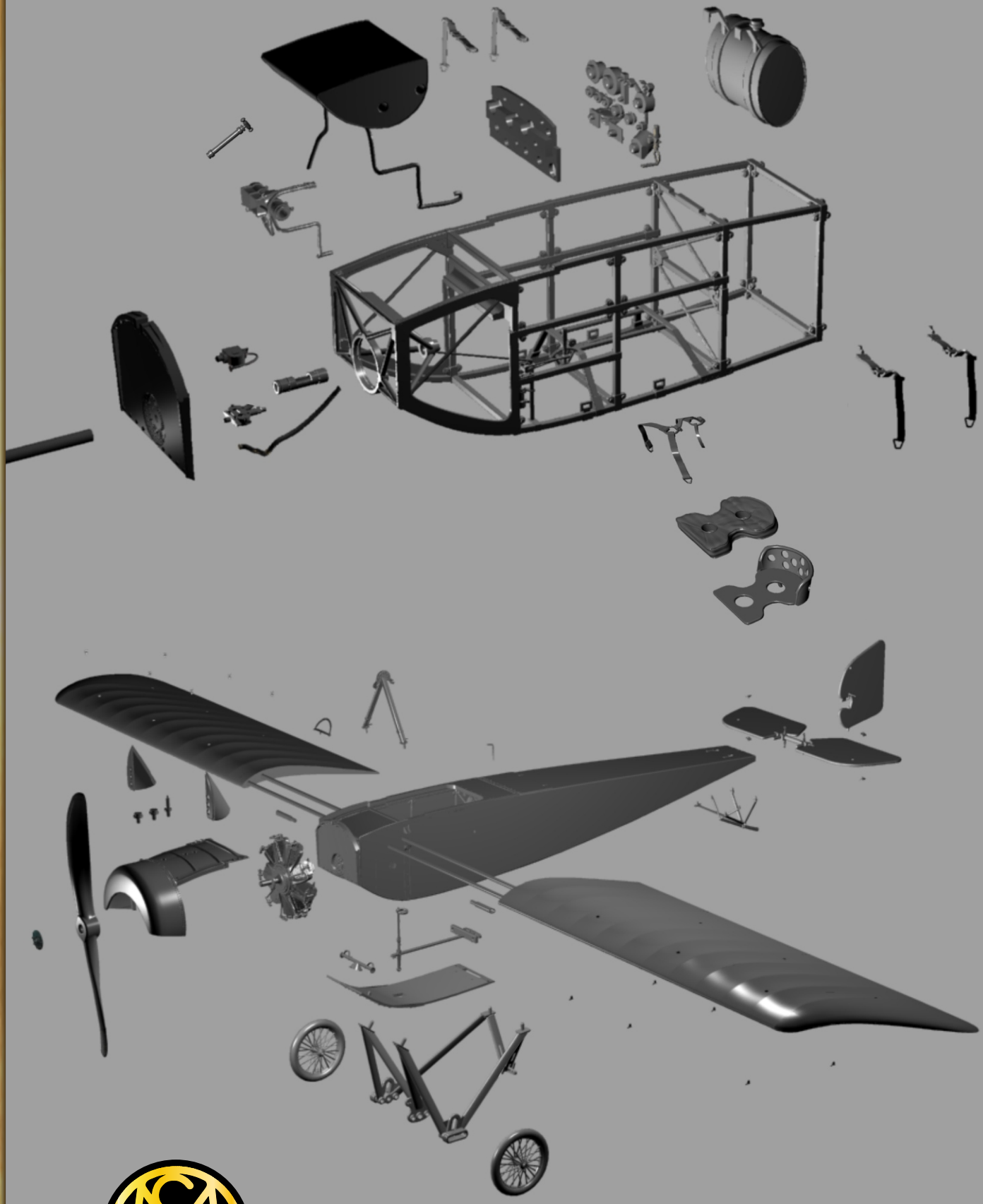
65 Tank ventilation

66 67 Turnbuckles

68 Ski

67 Ski bracket

Exploded views



The model

This Morane-Saulnier G model contain parts and decals to build one of six versions. Turnbuckles are included for those who want to use them. Some, very small parts have a number of extras, should some get lost. Plastic material is subject to some shrinking especially notable in hole dimensions, meaning they often need some drilling before assembly. Dry fit or measure often to avoid assembly issues.

All parts in this kit are 3D-printed resin and most are still connected to their printing supports. These must all be carefully removed by using a **sharp** snipper. Resin printing is done in layers 0,01-0,05 mm, sometimes causing a visible layering effect which may require some sanding.

Resin parts may warp if not stored correctly. Ensure that the parts are stored on their build trees, preferably in the box, until ready to be used. A warped part can be restored to its correct shape by dipping in hot water and bending into to its correct shape before assembly.
To avoid warping the model from heat, **do not** leave your finished model in strong sunlight or in very varm conditions.

22 Assembly step
100 Part number
11 Decal number

Do not glue | Drill | Attention | Assembly order
Remove | Choose | Colour | Build option

	Colour guide	Tamiya	Vallejo			Tamiya	Vallejo			Tamiya	Vallejo
a	aluminium	XF16	71.062	g	dark green	XF81	71.324	o	metal	XF56	71.065
b	black	X18	71.057	h	grey	XF54	71.051	q	"glass"		
c	copper	XF6	71.068	i	dark grey	XF63	71.055	s	skin tone	XF7	71.003
d	dark leather	XF64	70.871	l	light wood	XF59	71.077	y	yellow white	XF60	71.132
e	brass	X31	71.067	m	mahogony	XF68	71.036	w	white	XF2	71.001

Note: It is advised not to paint mating surfaces. Play between parts has been kept to a minimum, meaning several layers of paint may cause problems further down in the assembly.

Instrument Decals


1 Stop watch


2 Altitude meter


3 Airspeed indicator


4 Clock


5 Compass


6 Tachometer

Assembly: **Read instructions carefully before starting the assembly.**

Before start: Dry fit parts often, especially holes may need to be drilled out slightly before assembly.

Glue: Use cyanoacrylate glue (CA) or epoxy glue. in some cases white glue works fine too.

Caution: Always care for good ventilation when working with glue and paint. Resin dust is harmful.Do not breathe in CA fumes or resin sanding dust.

Decals: Cut out decals and soak in warm water for 15 seconds. Slide the decal off its backing paper onto a gloss painted surface.

Recommended tools:

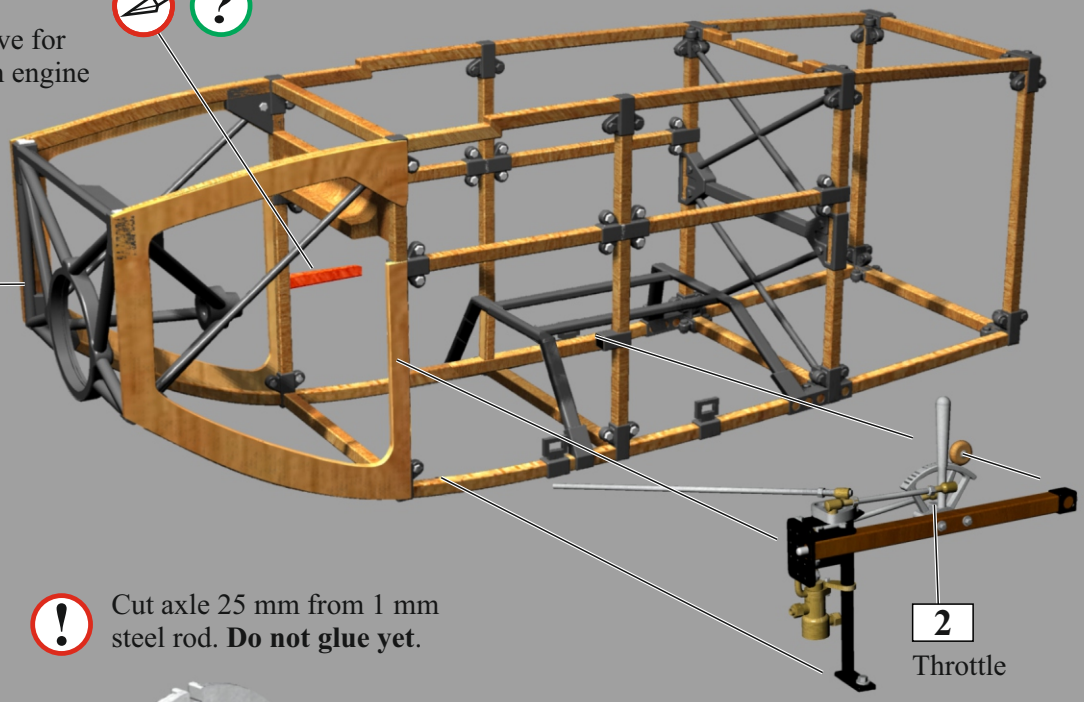
Knifes	Files	Sanding sticks	Slow and fast CA-glue
Tweezers	Drill bits	Calipers	Side cutter/snipper
Pliers	Clamps	Tape	Small scissors

Extras: For tips on suitable aftermarket parts, check the web page for guidance; **www.flyingbear.se**

1

Frame

Remove for Thulin engine



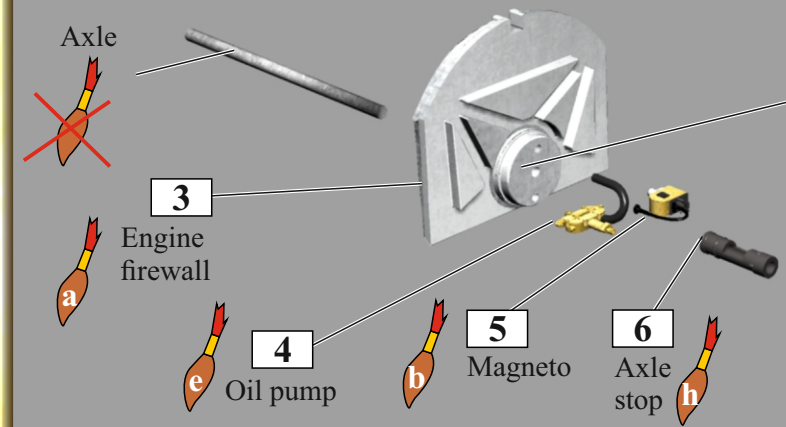
1 Frame

2 Throttle

2

Parts to firewall and firewall to frame

Cut axle 25 mm from 1 mm steel rod. **Do not glue yet**.



Axle

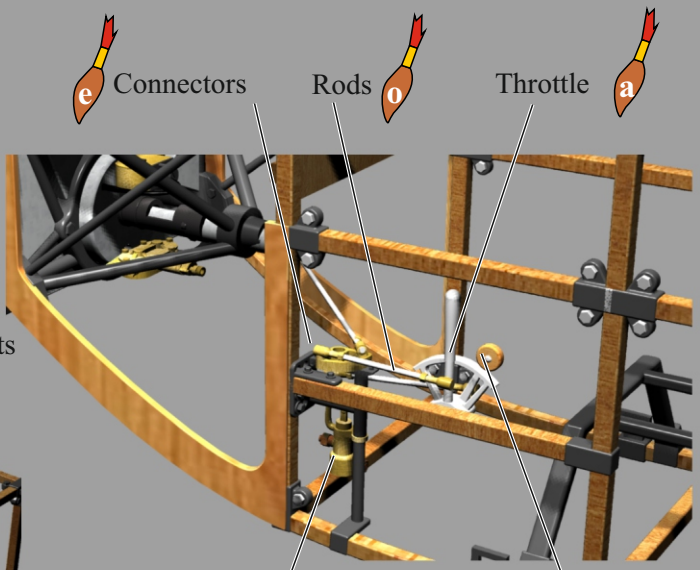
3 Engine firewall

4 Oil pump

5 Magneto

6 Axle stop

Drill to make axle run smothly (but without play)



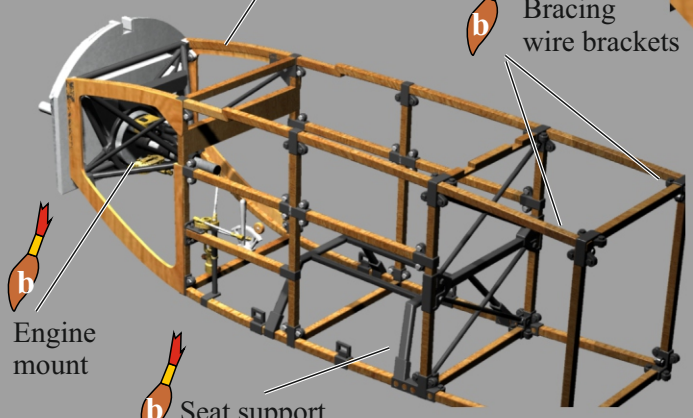
e Connectors

o Rods

a Throttle

l Wooden frame

b Bracing wire brackets



b Engine mount

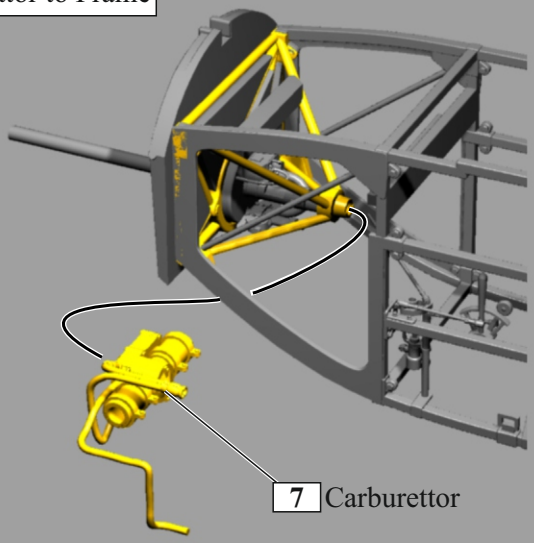
b Seat support

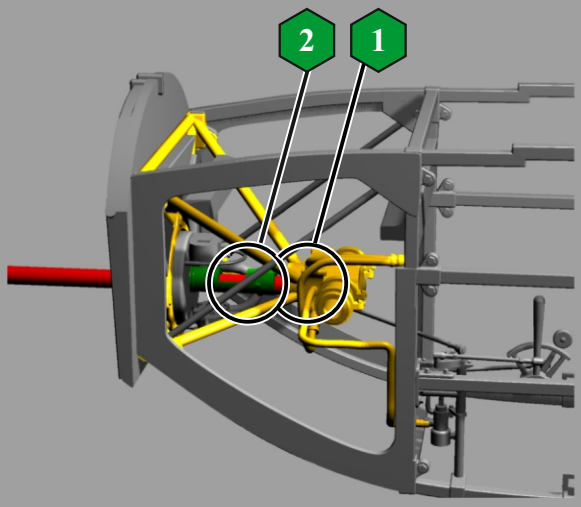
Fuel valve e or o

l Handle

3

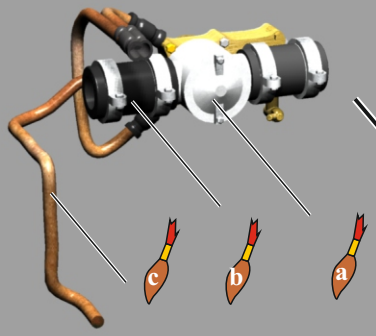
Carburettor to Frame



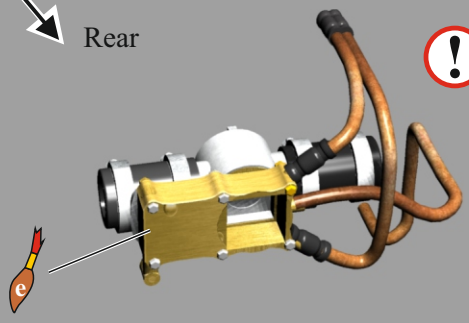


! 1 Before glueing, put a small drop of oil or grease on the rear axle tip.
Align carburettor horisontally and glue it to the engine mount.

2 Glue axle to axle stop using the slot in the axle stop.



Rear

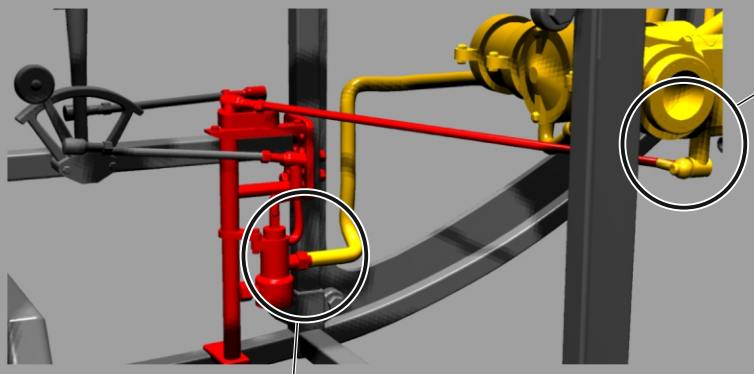


! The intake pipes, page 12 step 15, can be assembled already at this stage.

Front

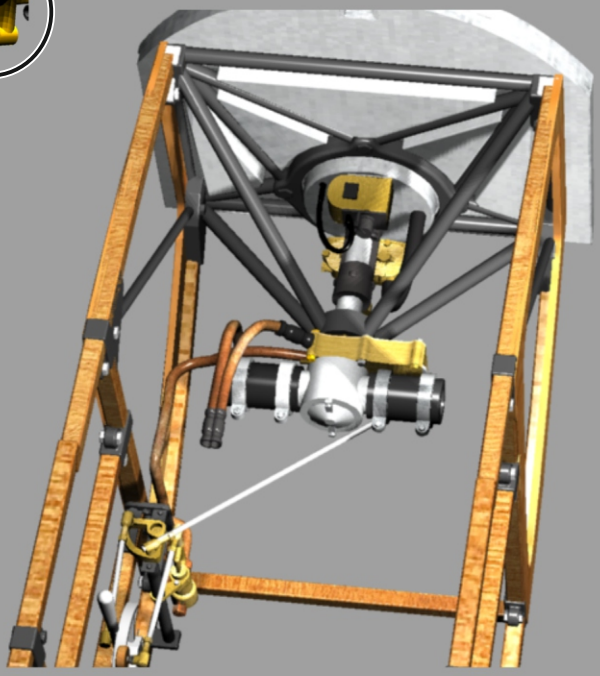
4

Connect parts

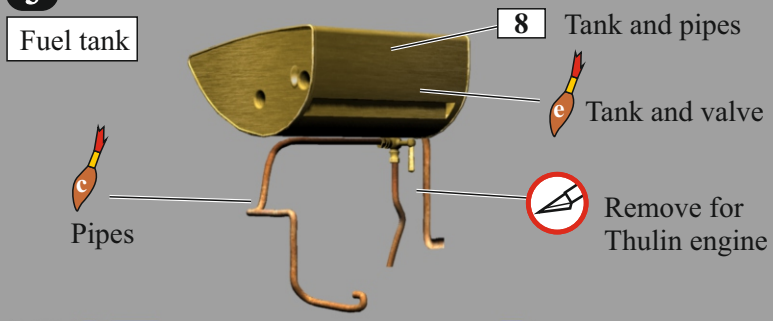


! Connect rod between fuel valve and carburettor shutter

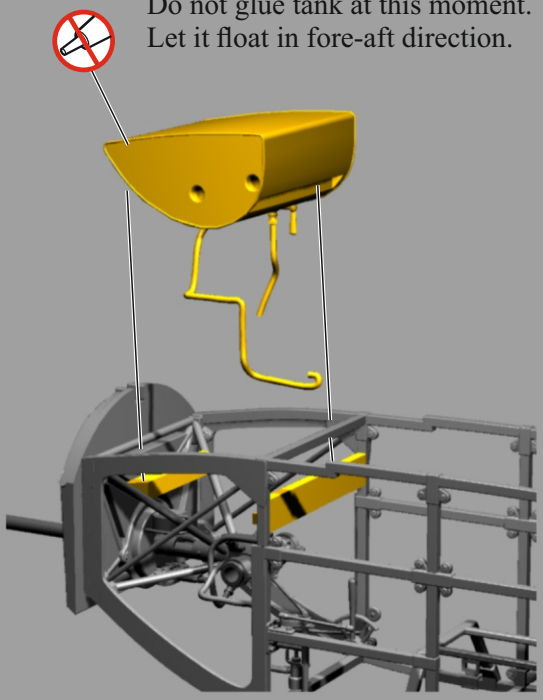
! Connect pipe from carburettor to fuel valve

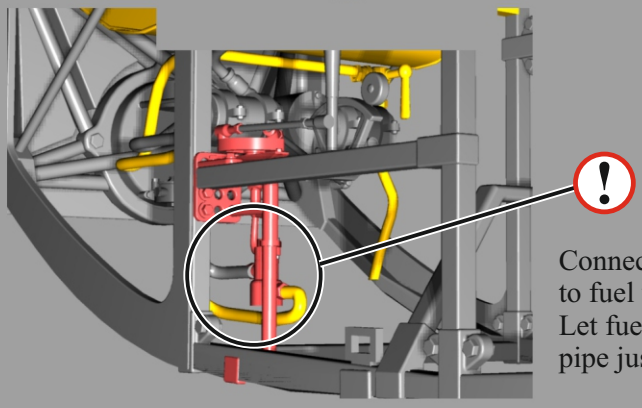


5 Fuel tank



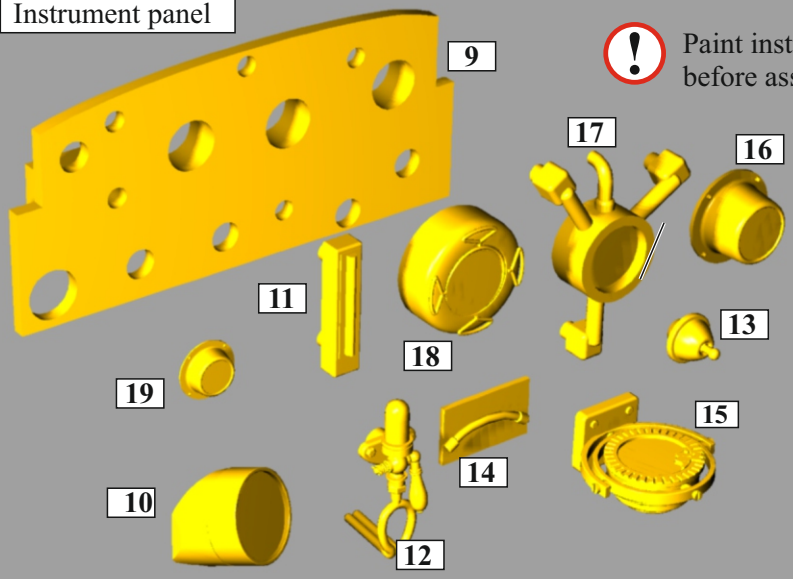
Do not glue tank at this moment.
Let it float in fore-aft direction.





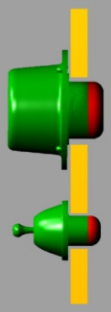
Connect fuel pipe
to fuel valve.
Let fuel drainage
pipe just point down.

6 Instrument panel



Paint instruments
before assembly.

Cut flush



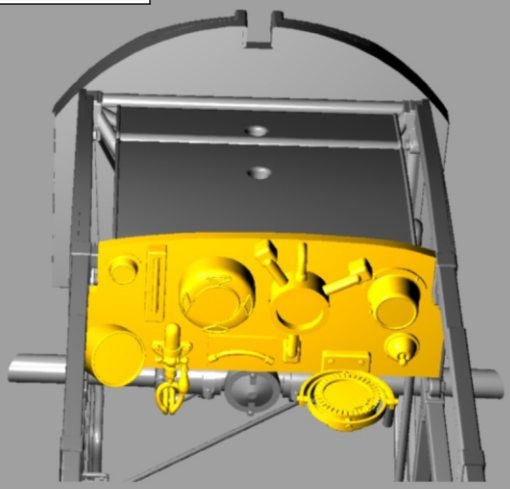
9. Dashboard
10. Tachometer
11. Fuel gauge
12. Pulsometer
13. Ignition switch
14. Bank indicator
15. Compass
16. Clock
17. Airspeed indicator
18. Altitude meter
19. Stopwatch

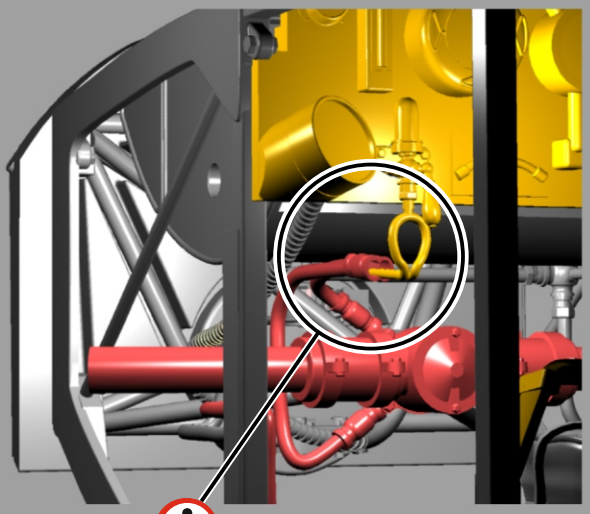
Instrument panels in Morane-Saulnier G/H:s often looked very different. Some were sparsly instrumented others, often those in military use, had more instruments.
Military aircraft normally had a map case.

The example in this model showa a Thulin B from Thulins Flying School.

7

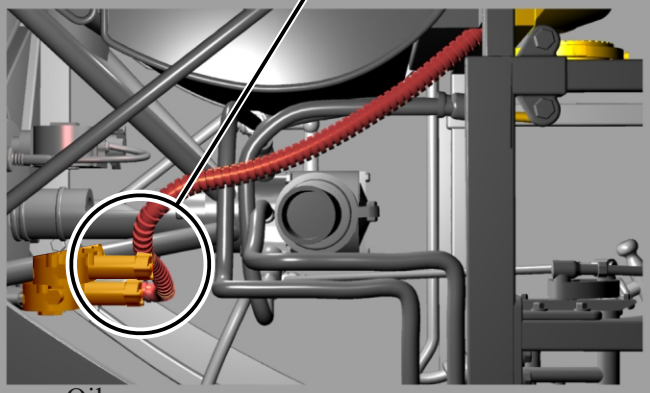
Connections



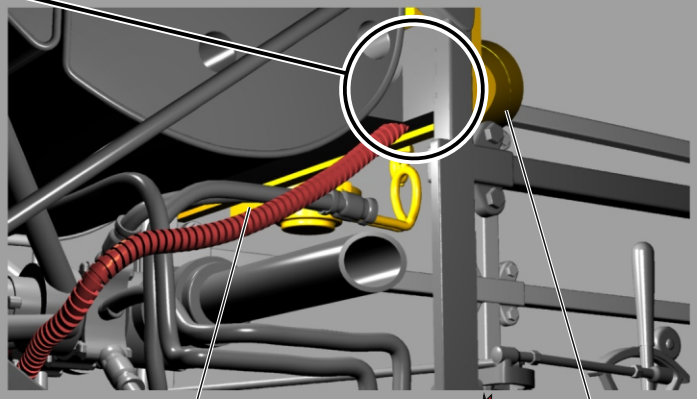


Connect Tachometer drive with Oil pump and Tachometer

Connect pipes from carburettor to pulsometer (some parts deleted for clarity)

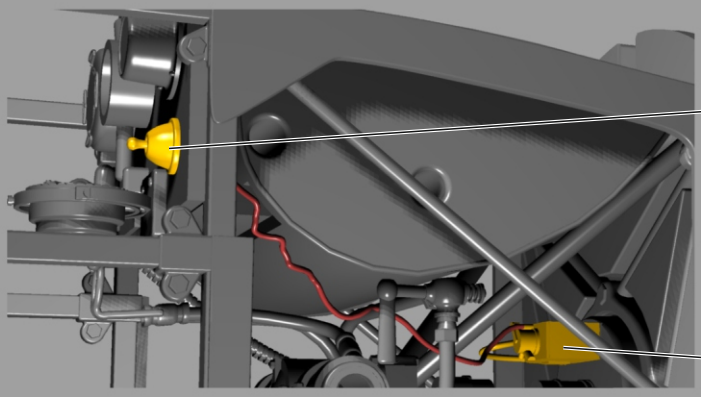


Oil pump



20 Tachometer drive

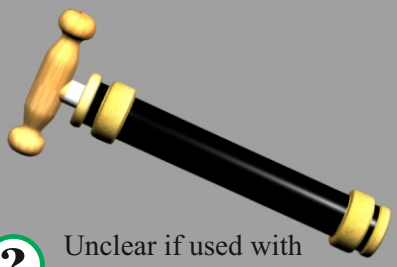
Tachometer



Ignition Switch

Electrical cable between Ignition Switch and Magneto (material not included)

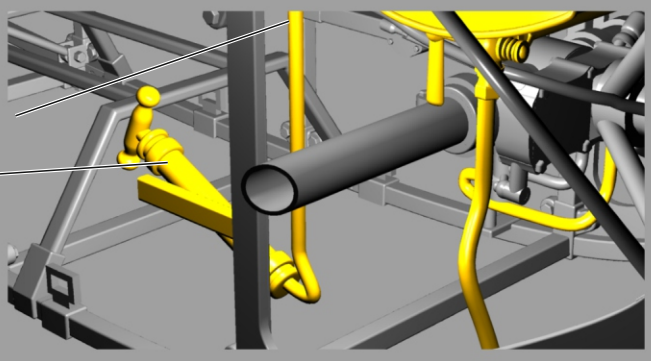
Magneto



Unclear if used with Thulin engines

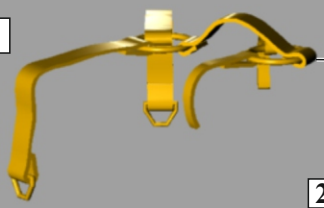
Tank air pressure pipe

21 Manual air pressure pump

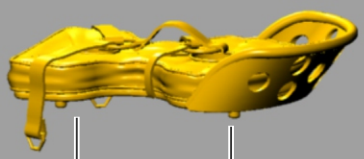


8

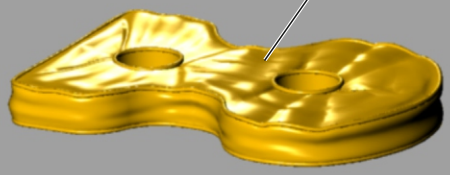
Seat



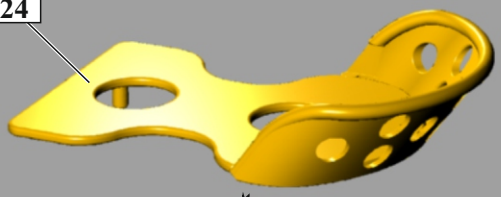
22 Upper Seat belt

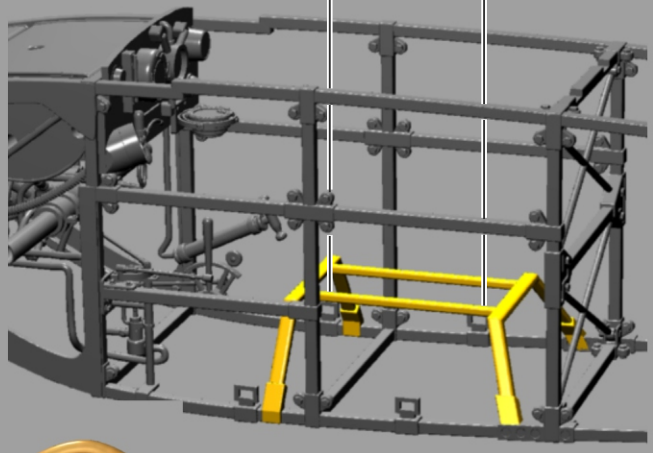


23 Cushion



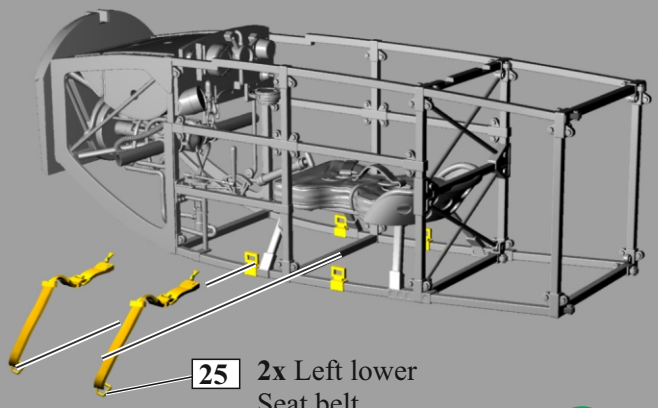
Seat 24



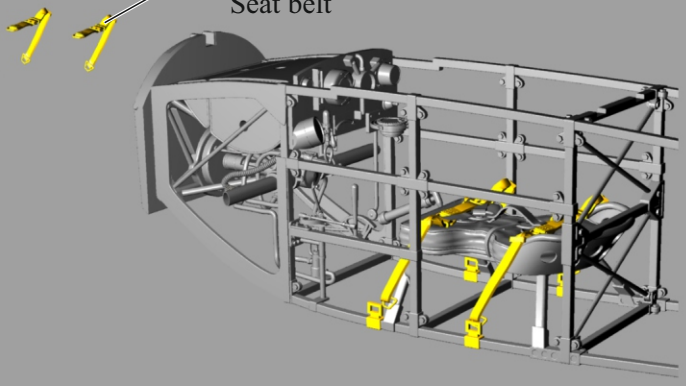


9

Seat belts



26 **2x** Right lower Seat belt

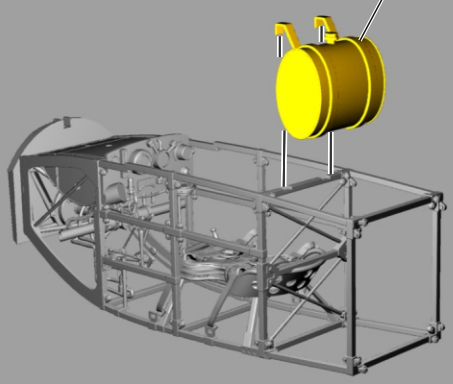


25 **2x** Left lower Seat belt

10

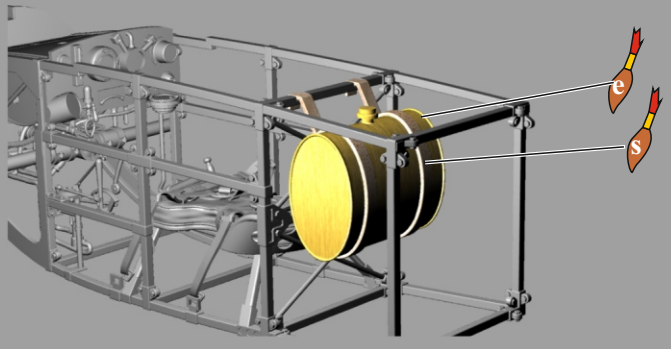
Extra tank

Extra tank 27



? The Extra tank was not always installed.

! Drill 3 mm hole in the fuselage if the Extra tank is installed. Position is marked on the inside of the fuselage.

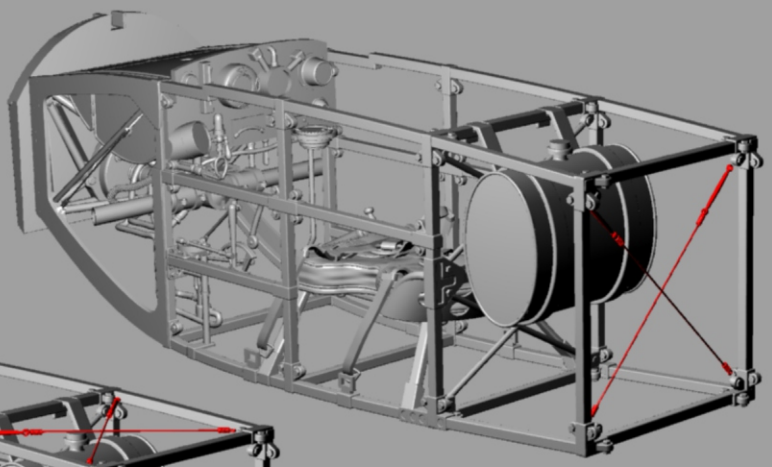


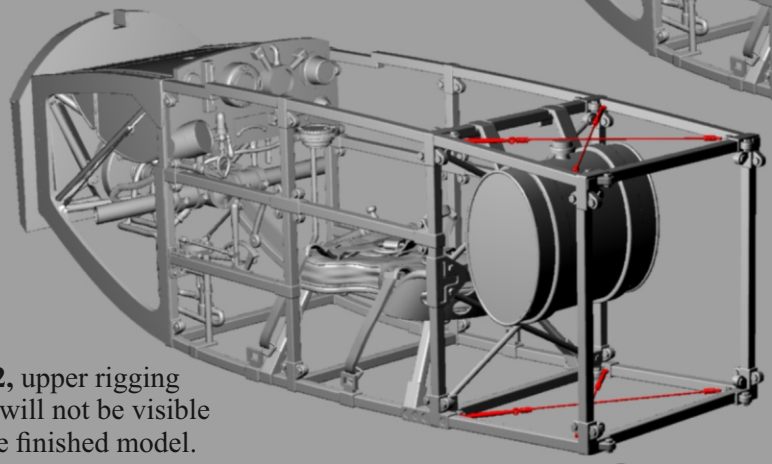
11 Fuselage bracing wires

1

Use medium rigging line 0,1-0,15 mm

Step1, These lines will hardly be visible on the finished model.



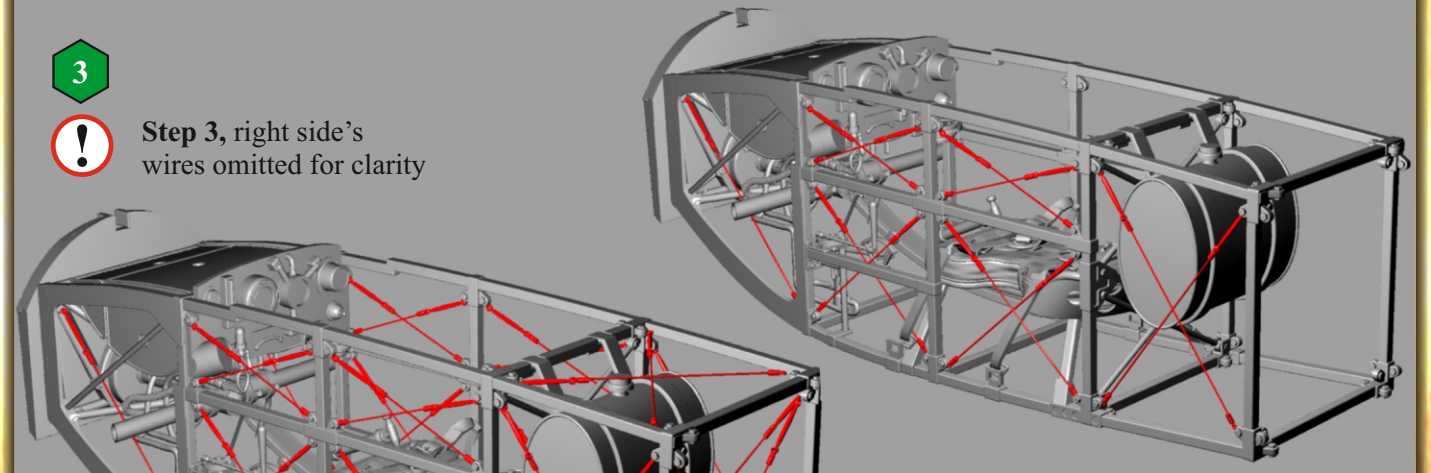


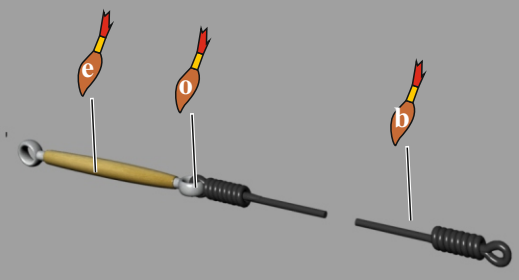
2

Step2, upper rigging lines will not be visible on the finished model.

3

Step 3, right side's wires omitted for clarity



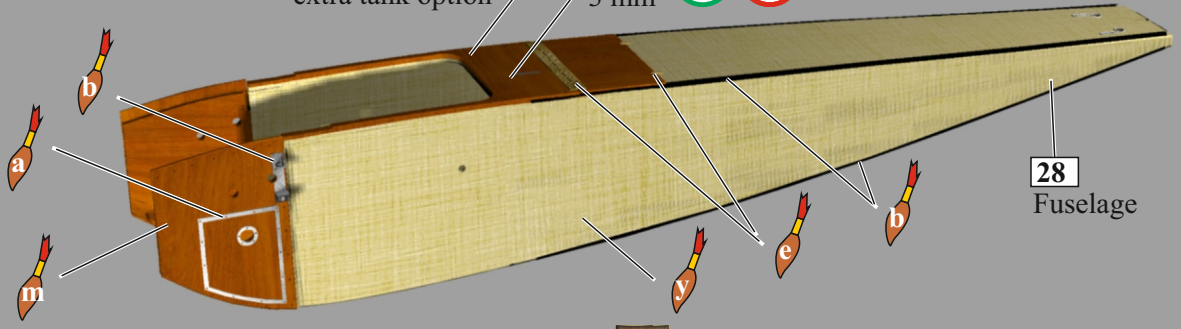


12 Painting the fuselage

Drill holes for extra tank option

0,5 mm

3 mm

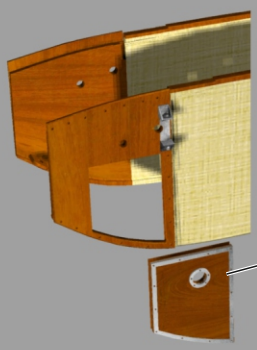


28 Fuselage

13

Inspection doors - optional

The interior at the front can be shown by carefully removing the inspection doors from the fuselage.

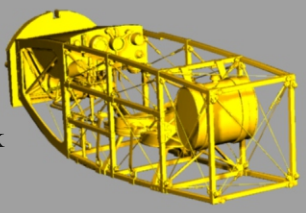


29 30 Extra Inspection doors for possible later use

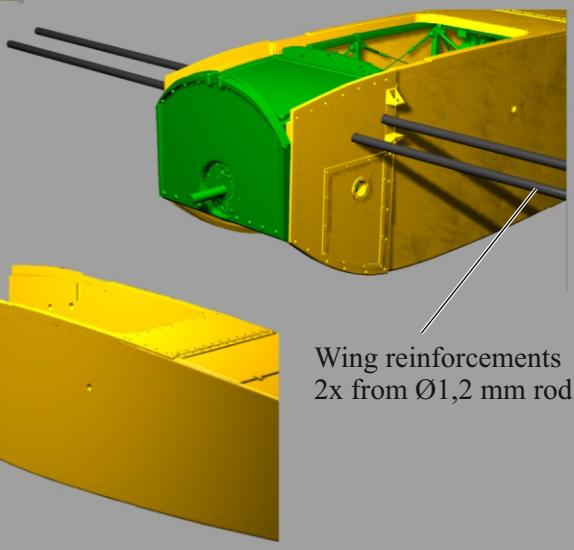
14

Frame into Fuselage

Glue frame to fuselage at the front end only and at the sides only after dry-fitting to turtledeck



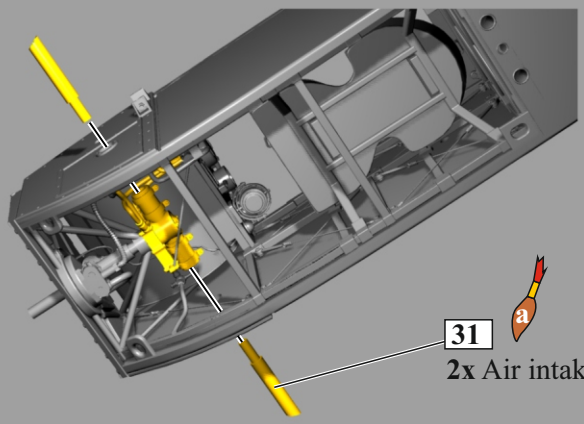
With the wings' reinforcement rods through Fuselage halves and Tank in place, the Tank can be glued to the frame. When cured, the rods can be temporarily removed.



Wing reinforcements 2x from Ø1,2 mm rod

15

Air intake pipes

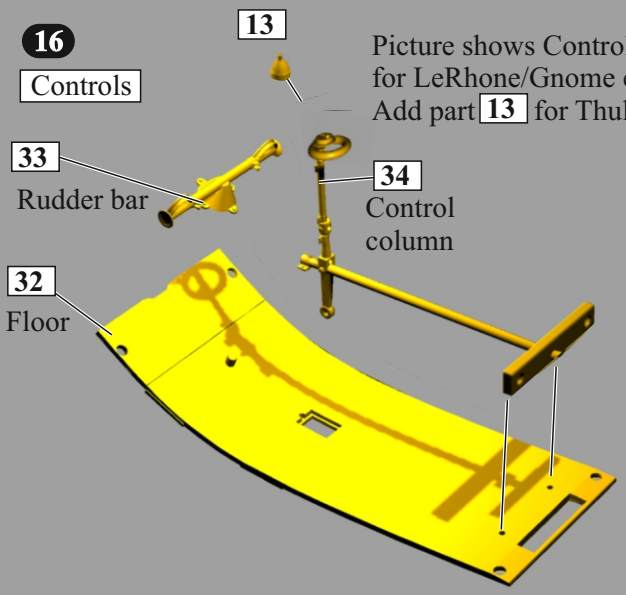


31 **2x** Air intake pipes

Stick Air intake pipes into the Carburettor. Precheck hole-sizes in the fuselage. Drill out if necessary.

16

Controls



13 Picture shows Control column for LeRhone/Gnome engines Add part 13 for Thulin engine

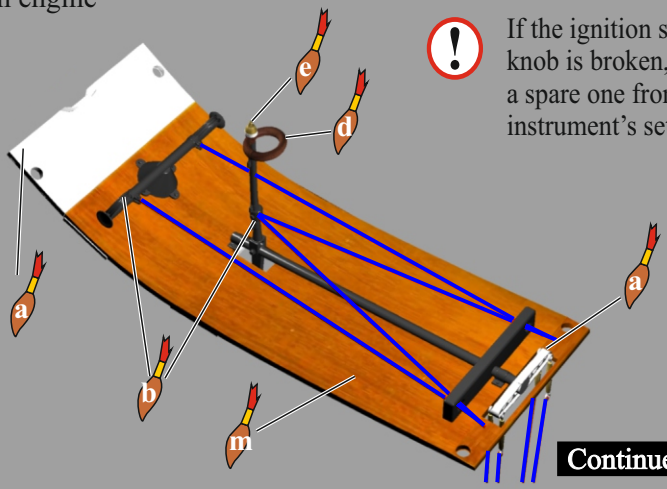
33 Rudder bar

34 Control column

32 Floor

Use medium rigging line Ø 0,1-0,15 mm

If the ignition switch knob is broken, use a spare one from the instrument's set.

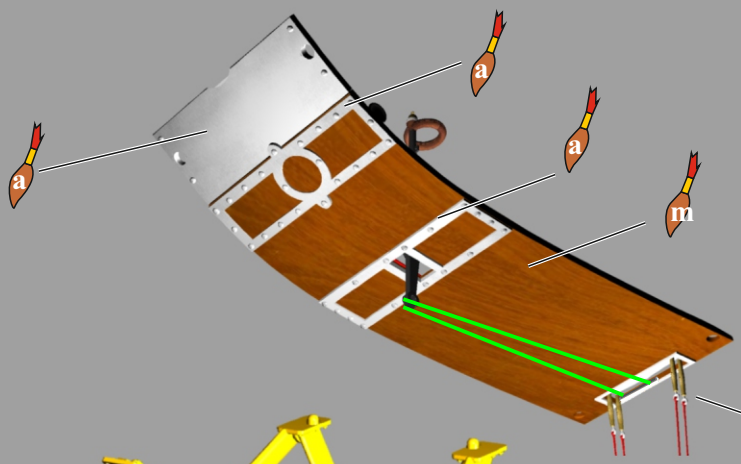


Continued

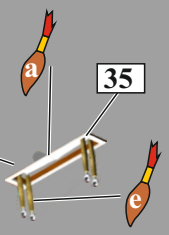
16

Controls

Continued

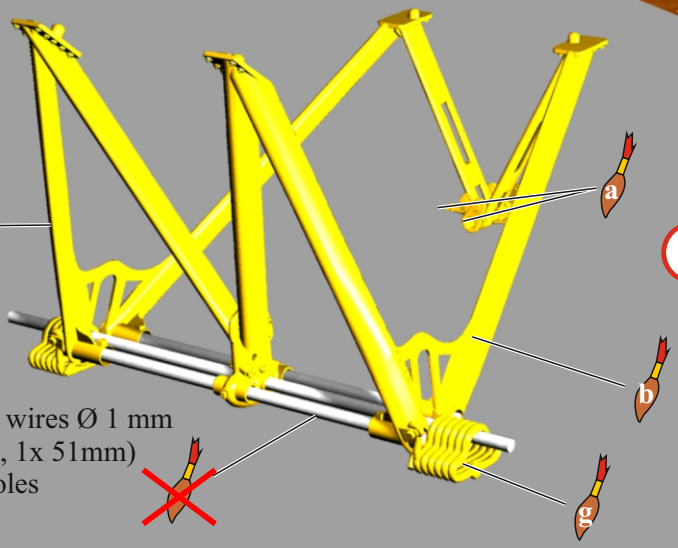


Attach and rig part **35** at stage **25**, page 18.



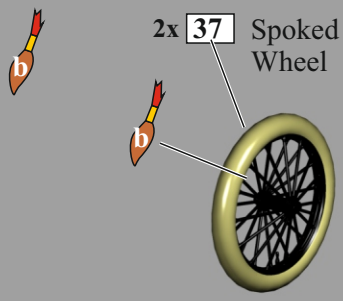
17

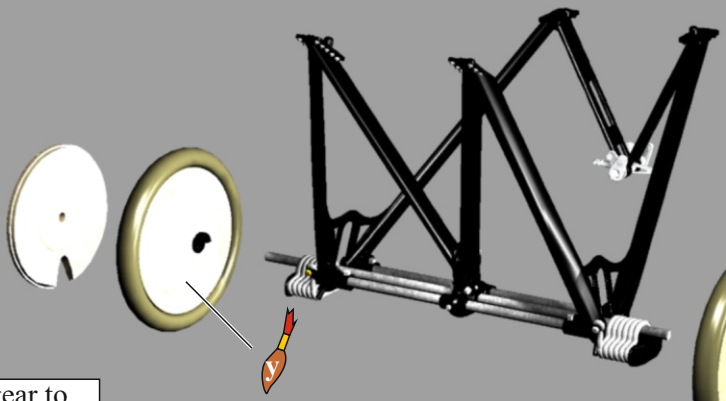
Landing gear

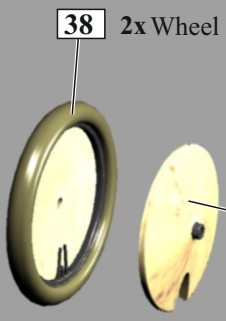


Pull piano wires Ø 1 mm (2x 43mm, 1x 51mm) through holes

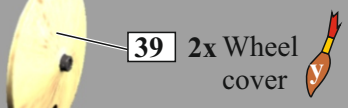
Drill out rigging holes in the landing gear depending on the desired type of rigging. See rigging diagram on page 18





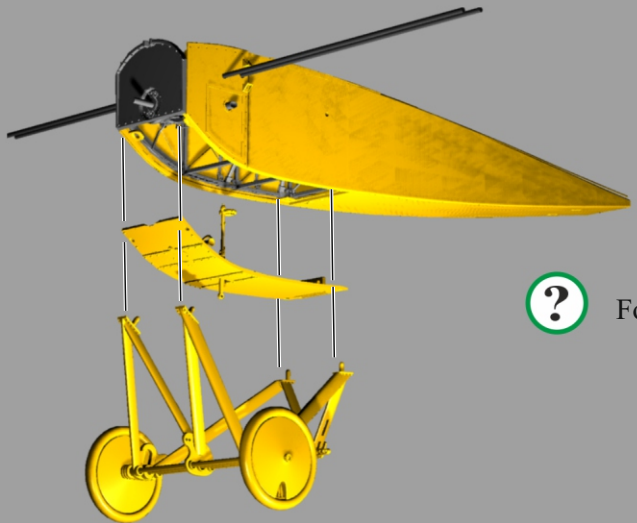


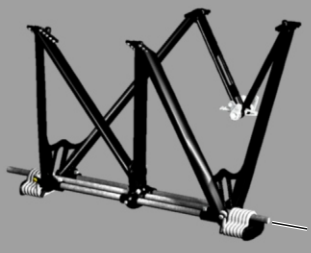
Tire's colour could differ from almost black to pale grey-yellow.



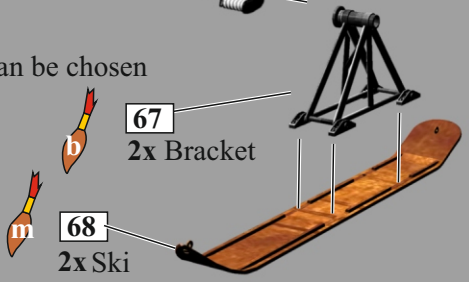
18

Landing gear to floor and fuselage





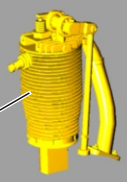
For Thulin B skis kan be chosen



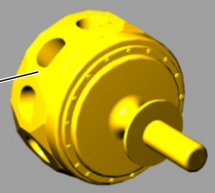
19

Engine

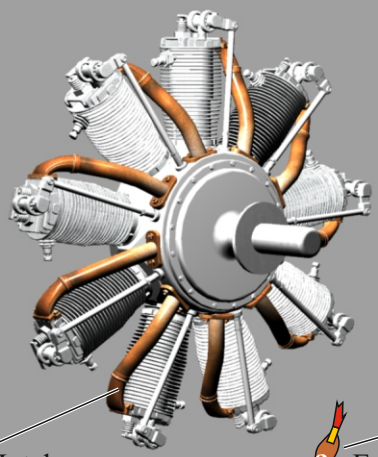
LeRhone 9C
80 hp



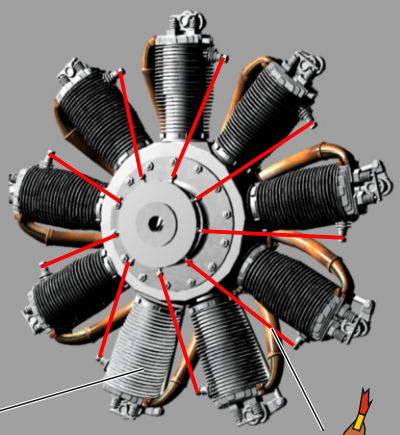
9x **40** Cylinder



41 Engine centre



c Intake pipes

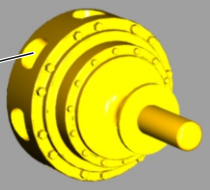


a Engine

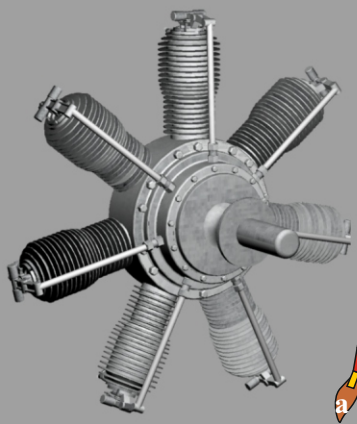
Ignition a or b cables

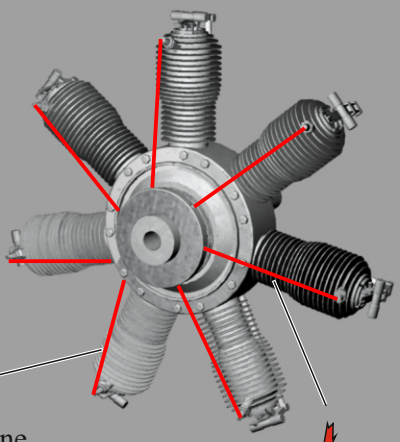
Gnome Lambda
80 hp

7x **42** Cylinder



43 Engine centre

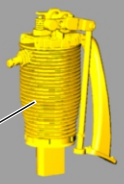




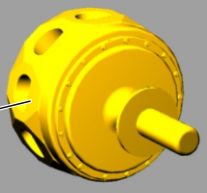
a Engine

Ignition a or b cables

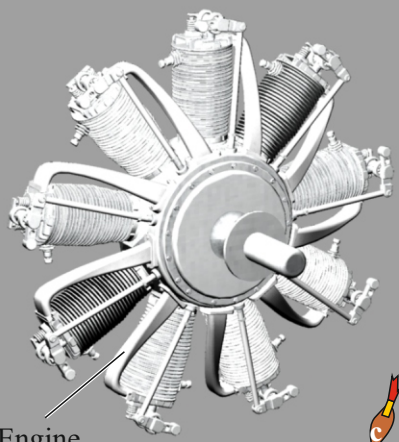
Thulin A
90 hp



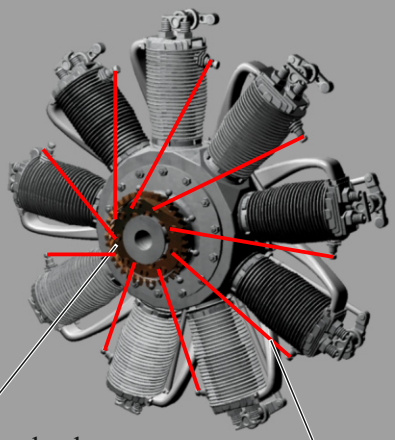
9x **44** Cylinder



45 Engine centre



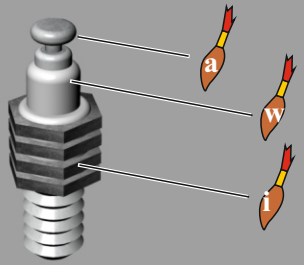
a Engine



c Starter wheel cogs

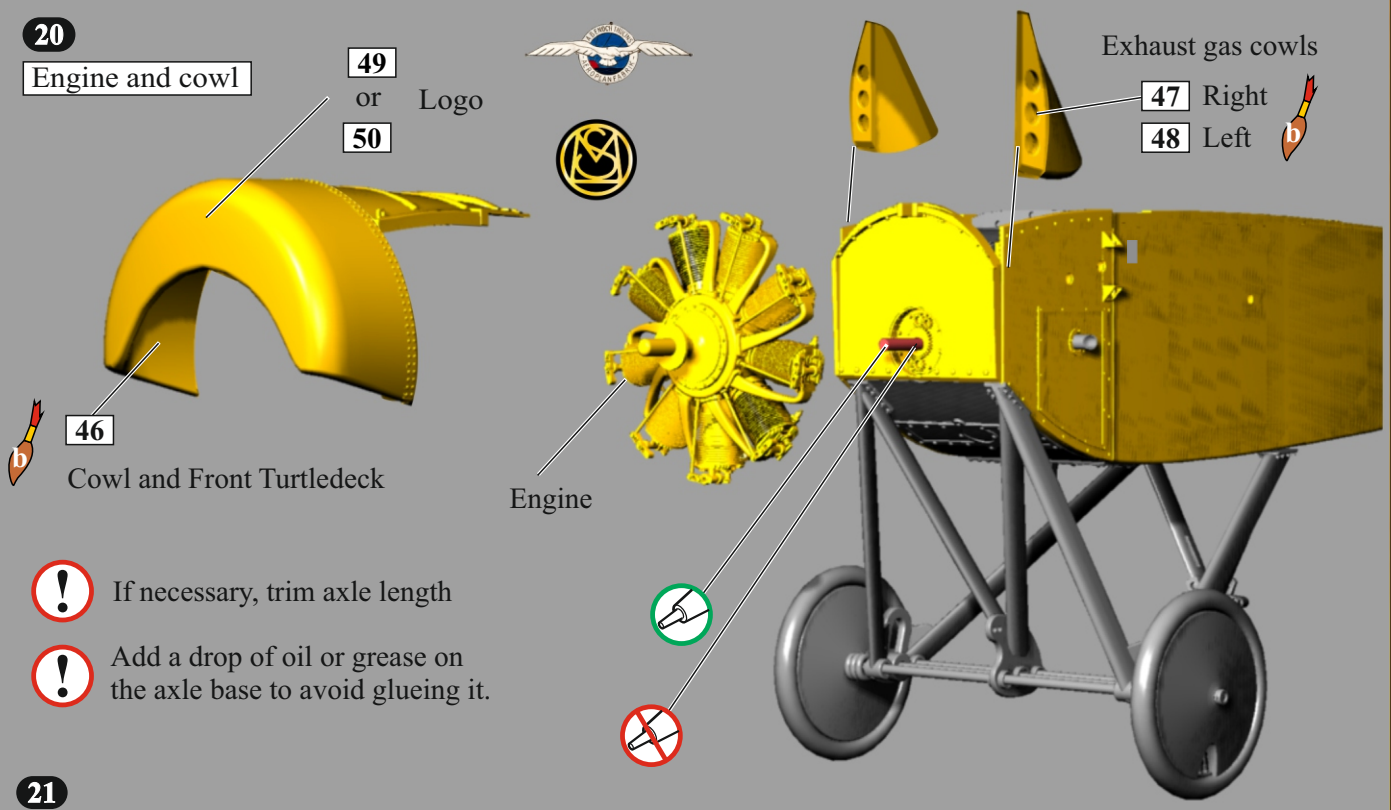
Ignition a or b cables

Drill out engine's centre hole to fit axle



The most common engines powering the Morane-Saulnier G (and H) were the 80 hp LeRhone 9 C and the 80 hp Gnome Lambda.
A 60 hp version of the LeRhone was also common, especially in training aircraft.
The Thulin B version of the Morane-Saulnier G were powered by a 90 hp Thulin A or initially in some cases a 50 hp Thulin E engine.

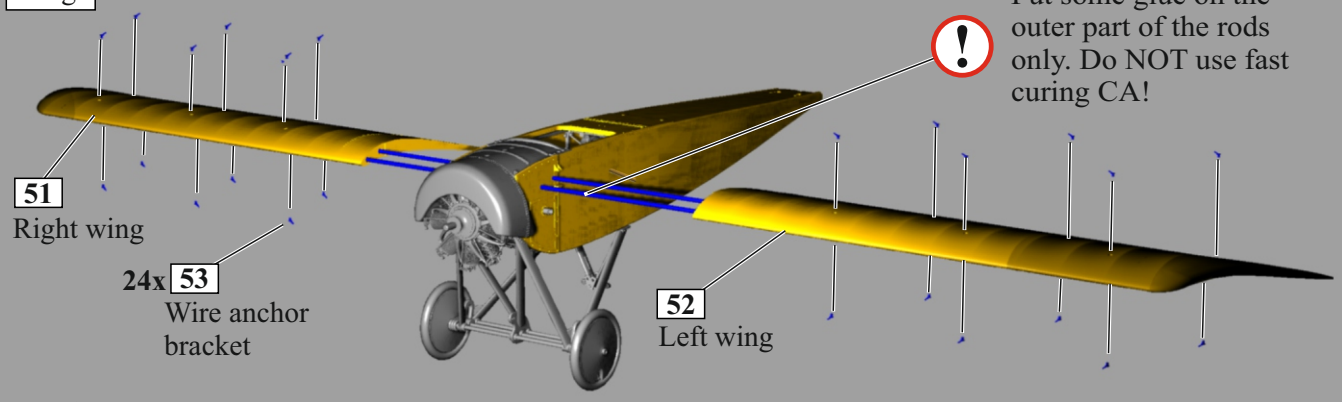
20 Engine and cowl



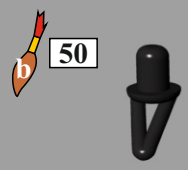
If necessary, trim axle length

Add a drop of oil or grease on the axle base to avoid glueing it.

21 Wings



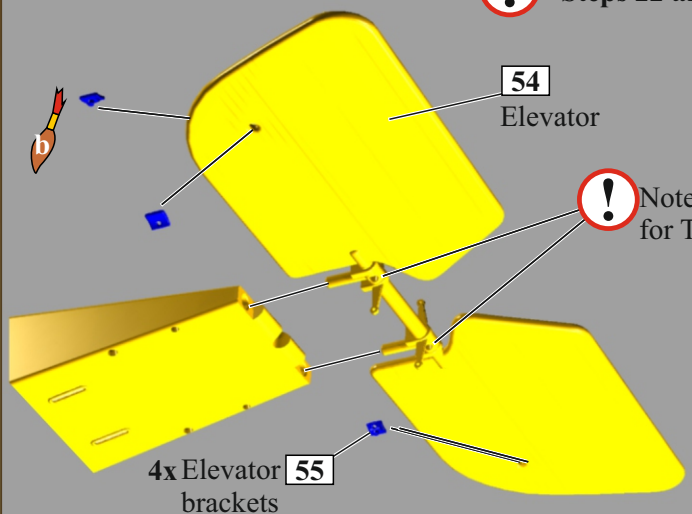
Put some glue on the outer part of the rods only. Do NOT use fast curing CA!

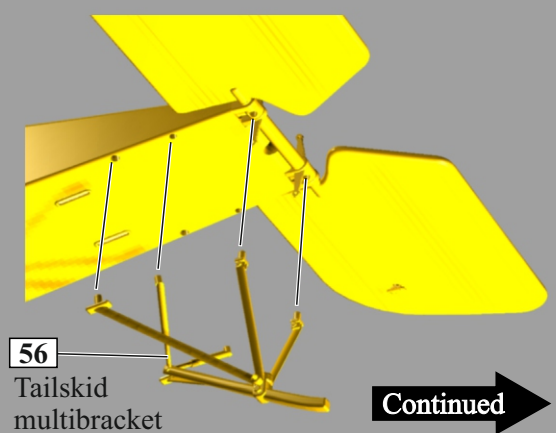


Drill wire anhor brackets very carefully using a 0,2-0,3 mm drill after painting and before assembly. Assemble after wing has been painted/decalled. ”Masking” during painting can be done by pulling a thin fishing line through the opening in the bracket

22 Tailplanes

Rigging the lower part of the model may be easier if done before **Steps 22 and 23**, since the model may then rest on its back.





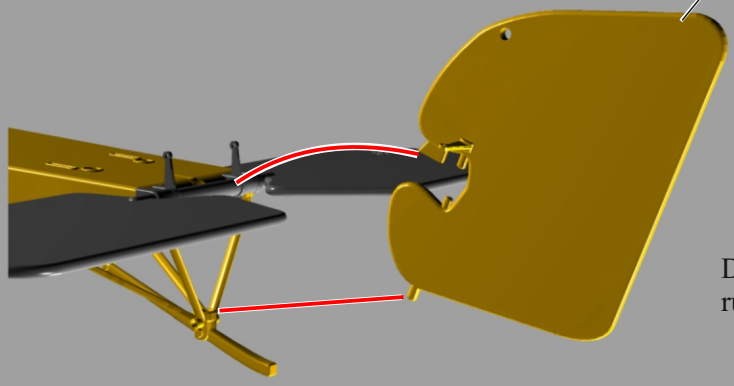
Continued

22

Tailplanes

Continued

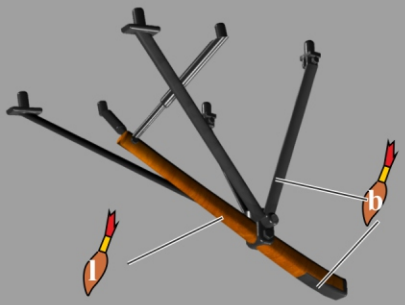
Put rudder's lower tab in position, then rotate upper part forward

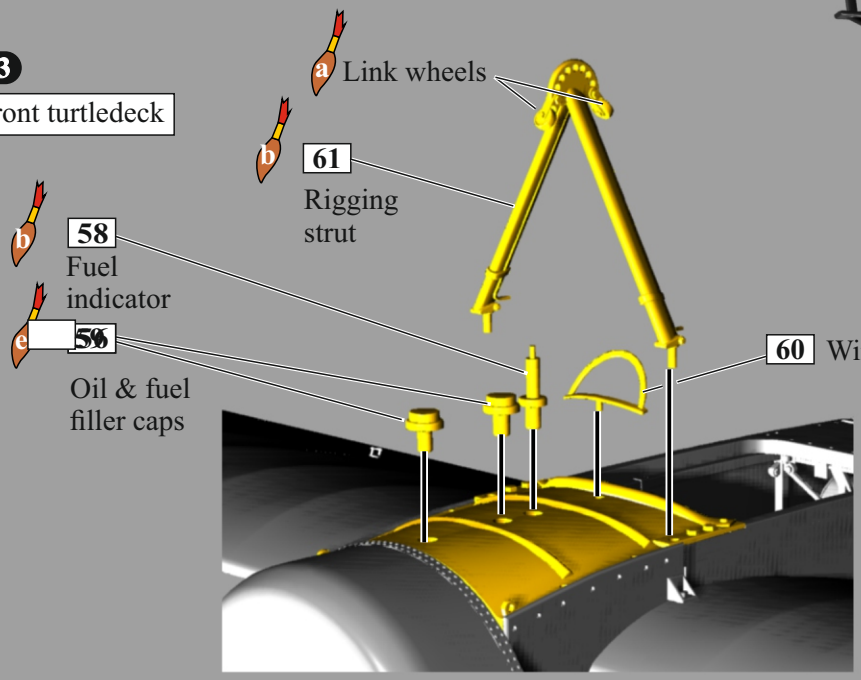


Due to tensions in the fabric, the rear edge of the rudder was often bent inwards after som time in use

23

Front turtledeck

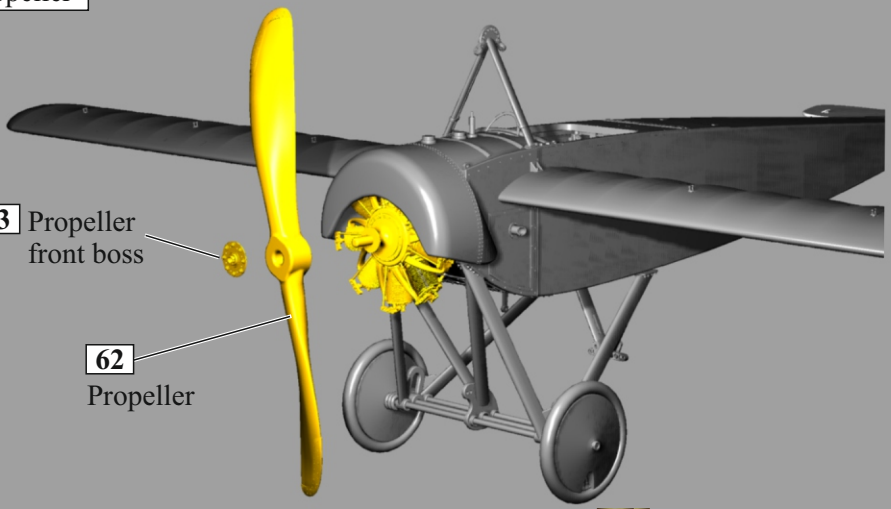


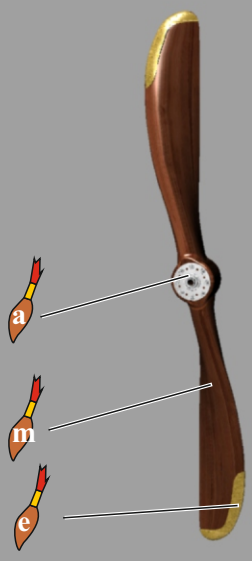


Drill 0,3-0,5 holes in the Rigging post before assembly

24

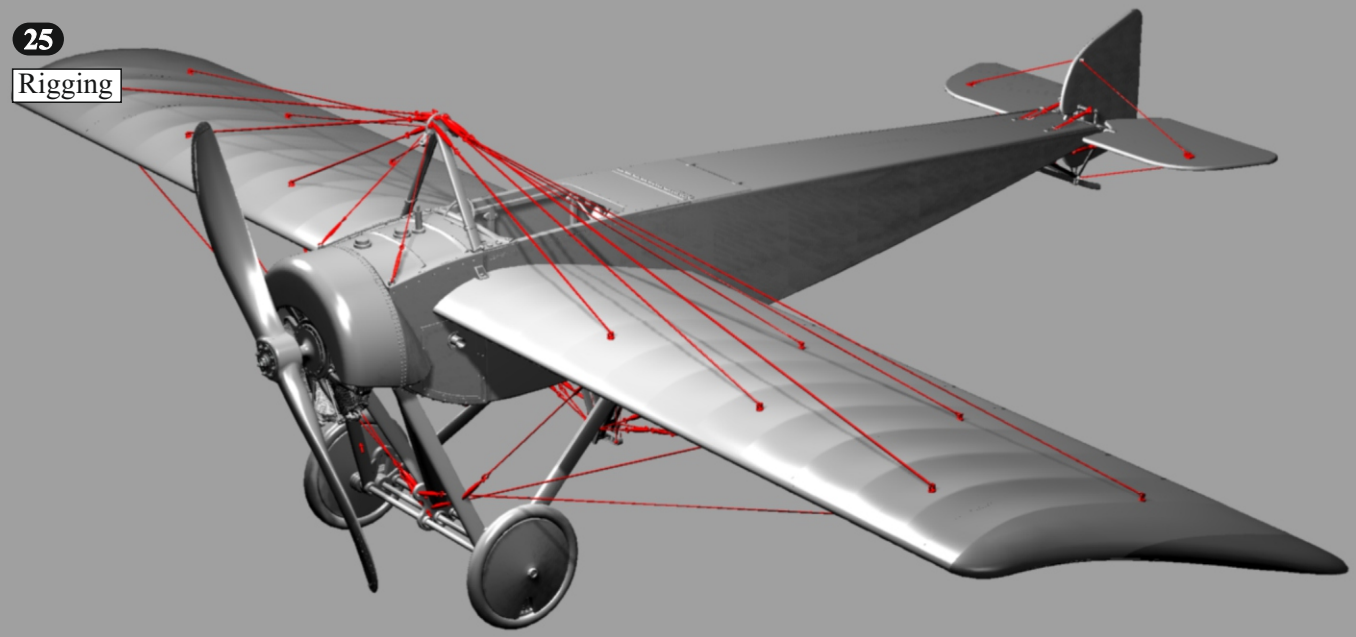
Propeller





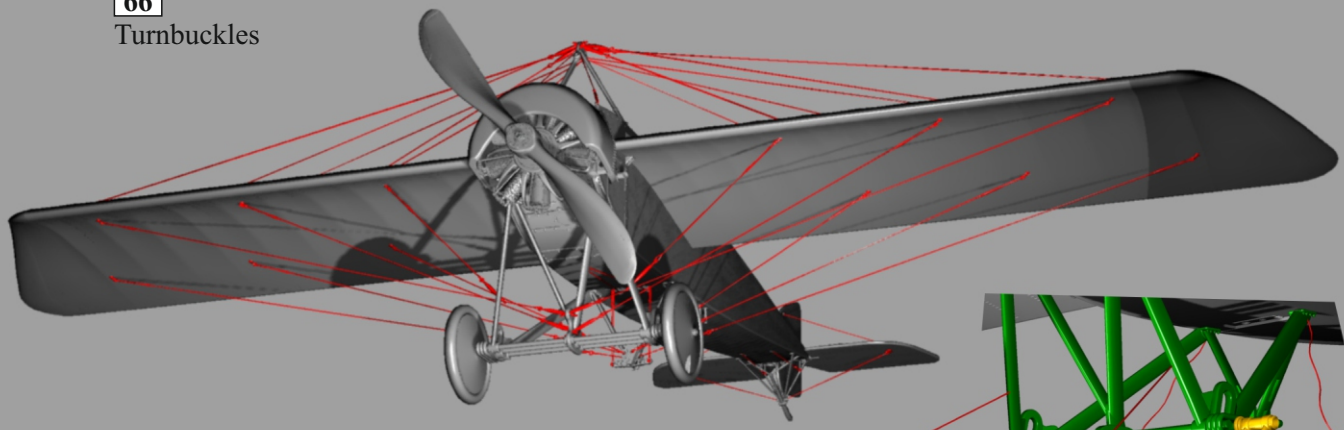
25

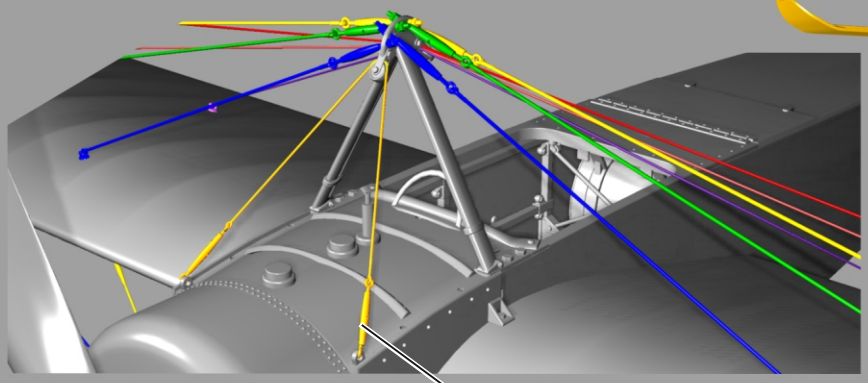
Rigging

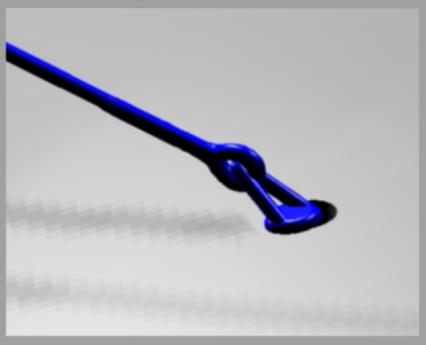


66

Turnbuckles

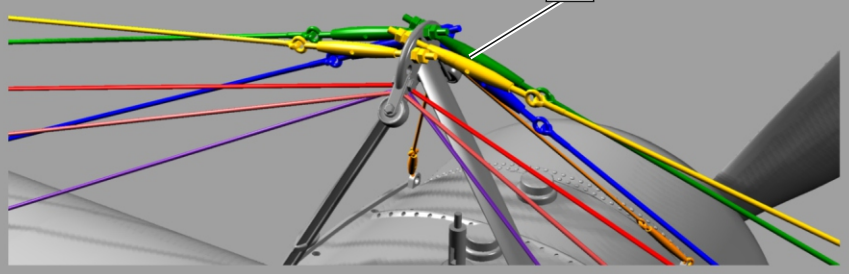


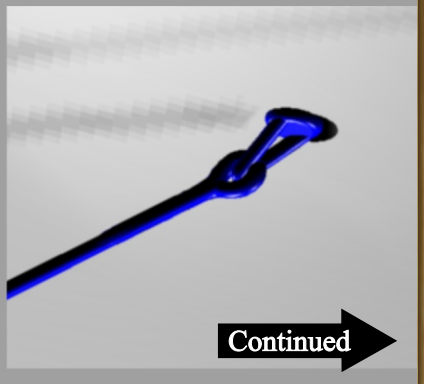




66 Turnbuckles

67 Turnbuckles



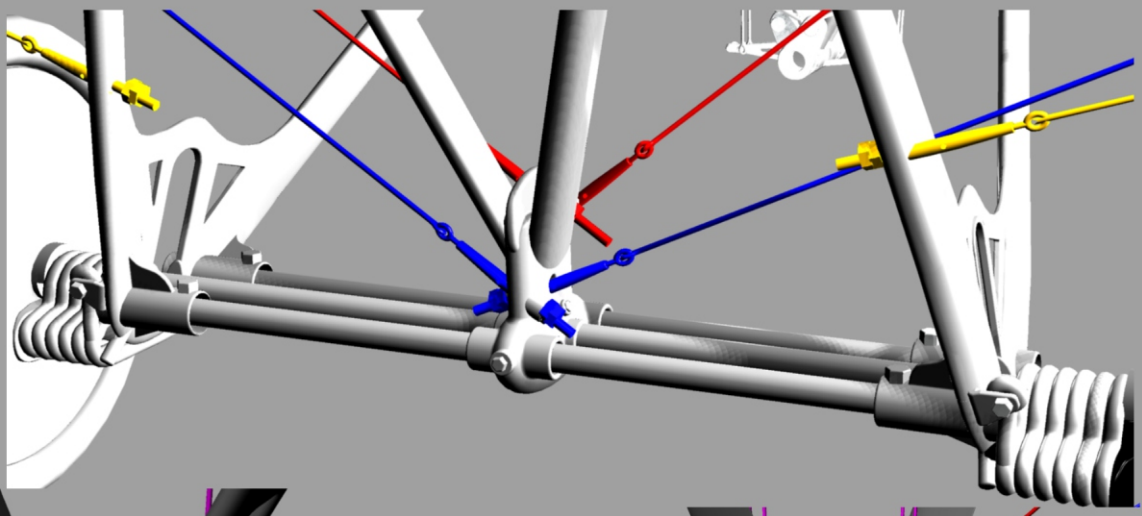


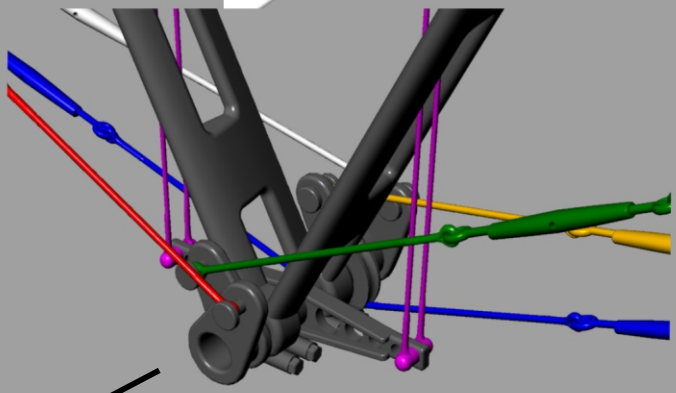
Continued

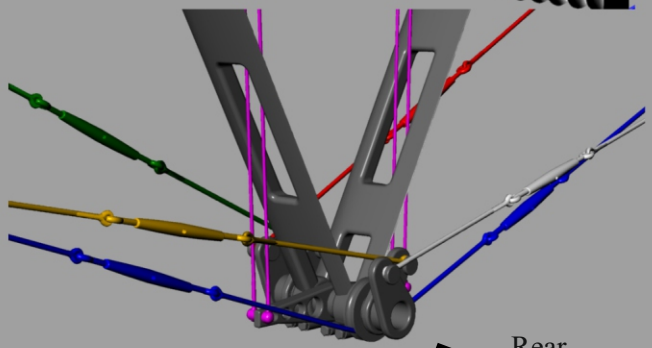
25

Rigging

Continued

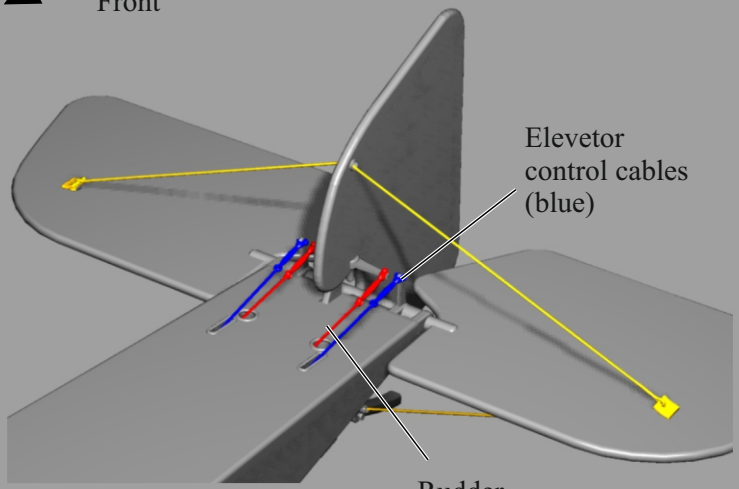


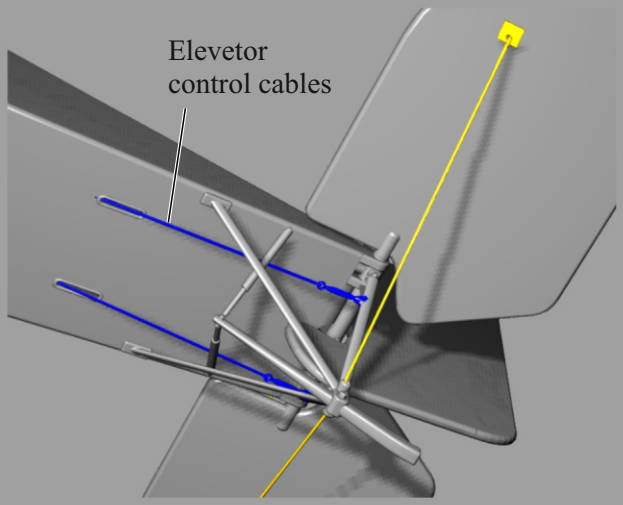




Front

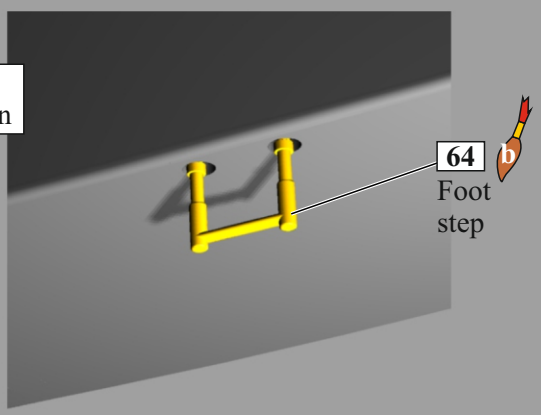
Rear

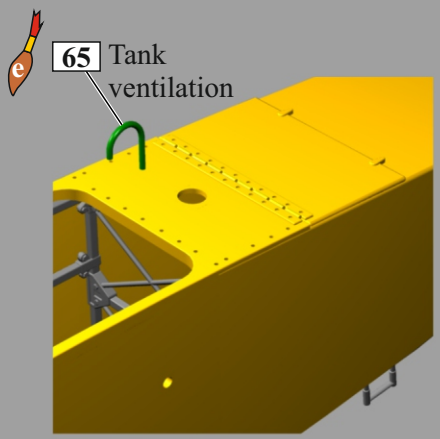


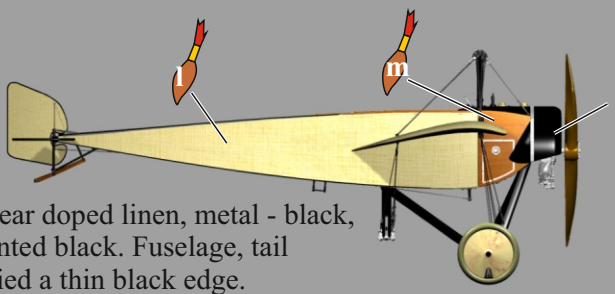


26

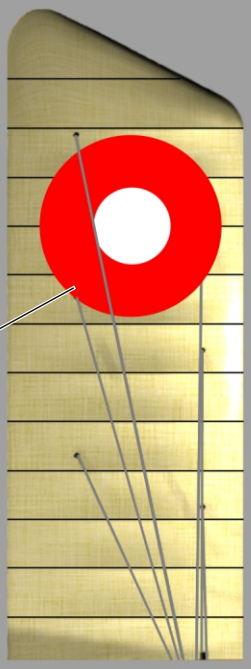
Foot step and
Tank ventilation

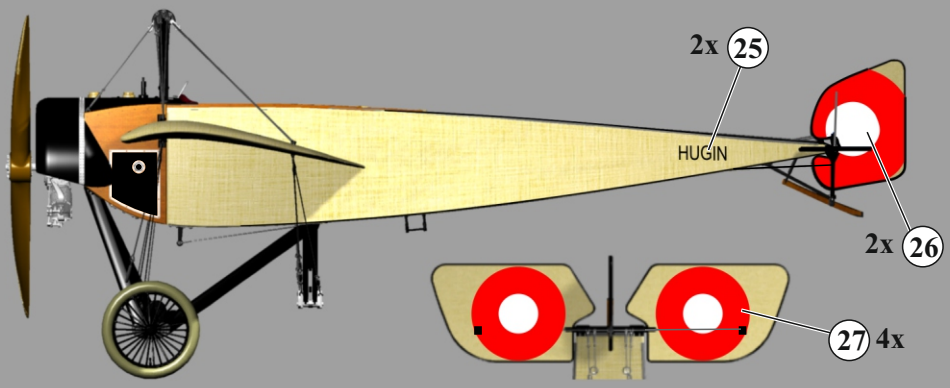




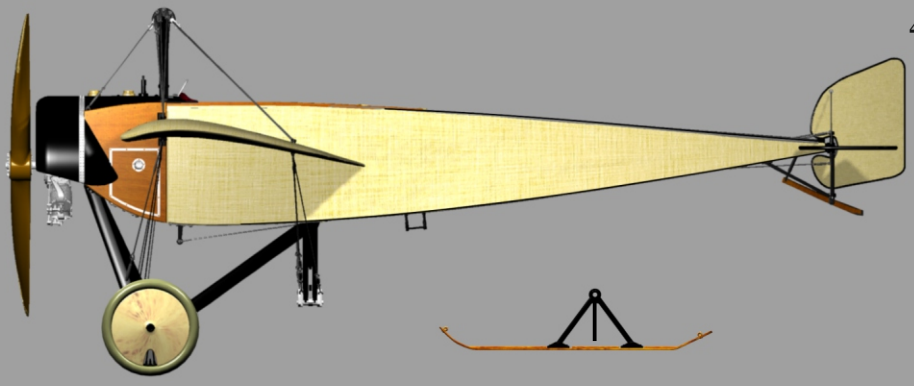


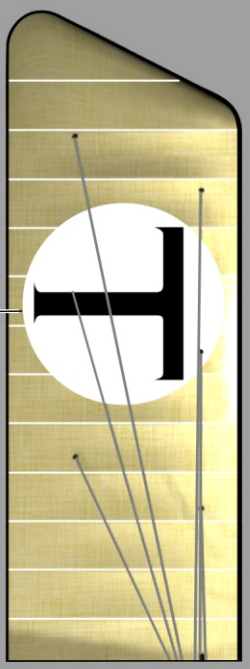
Basic colour scheme: Fabric - clear doped linen, metal - black, wood - varnished sometimes painted black. Fuselage, tail surfaces and often the wings carried a thin black edge.
Wing ribs - black.Tire's colour could differ from almost black to light grey-yellow,



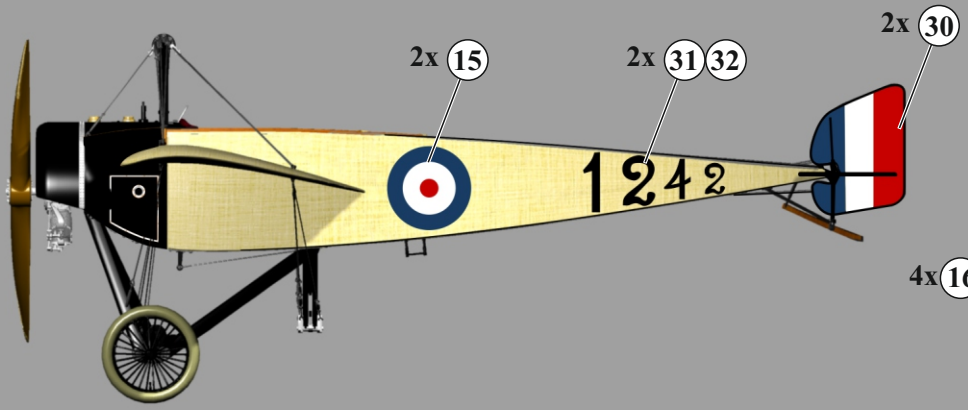


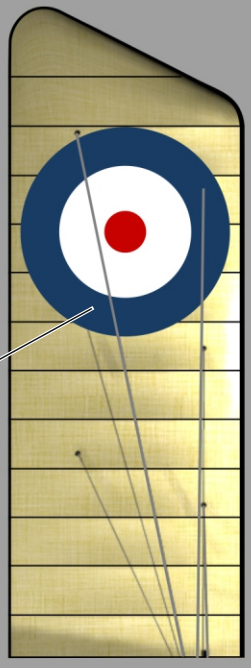
One of two Thulin B:s of the Danish Army Airforce. The were named "Hugin" and "Munin"after the ravens of Odin.



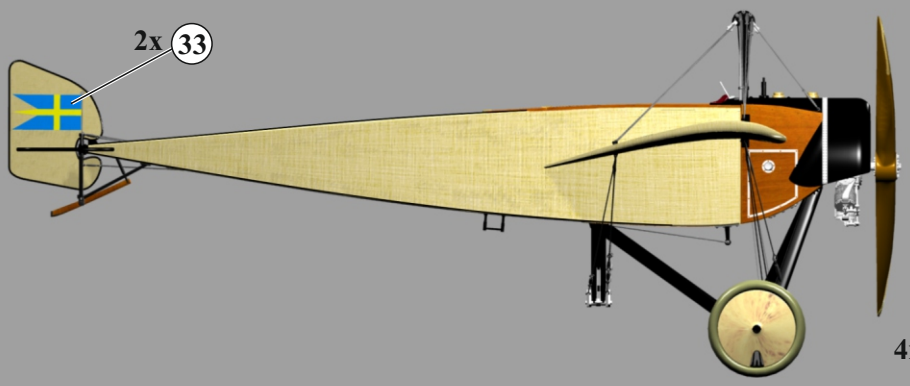


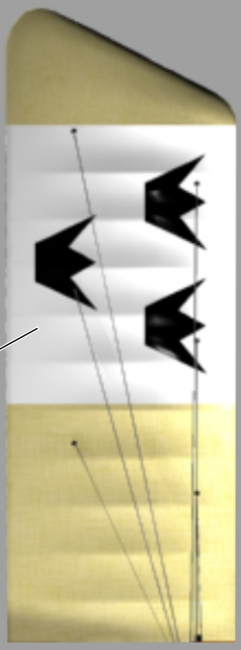
A Thulin B of Thulin's Flying School, where many aircraft used different T-markings. Skis were used during a search and resque operation over the Baltic Sea in February 1916.



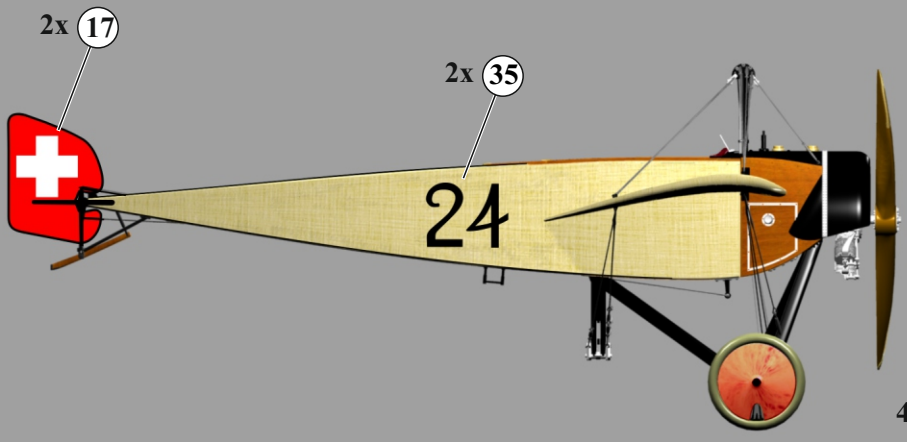


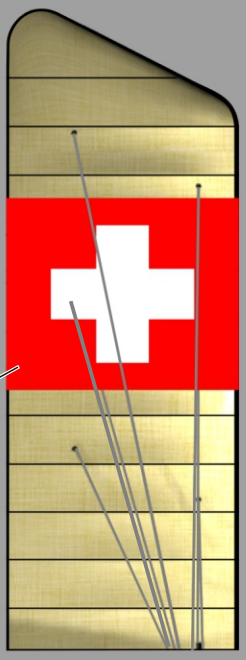
A Graham-White Type XIV of No 2 Squadron Royal Naval Air Service. Eastchurch airfield, Kent, December 1914



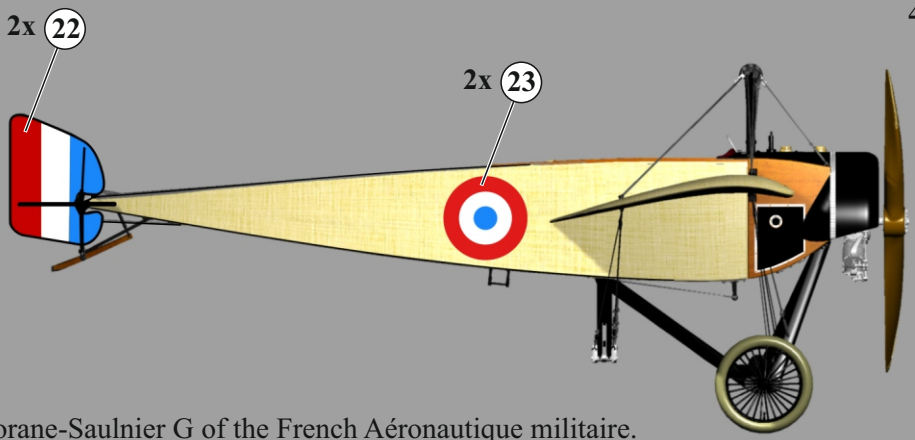


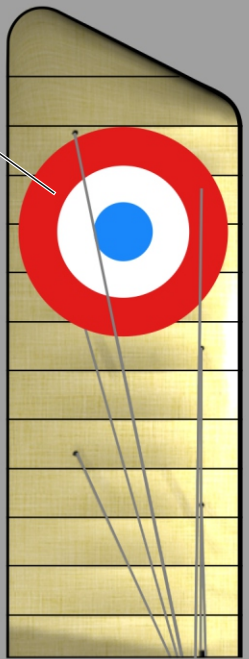
Morane-Saulnier G of the Swedish Army Flying Corps. This was the same aircraft that was brought to Sweden Dr Thulin and Lt Ask in April 1915.





Morane-Saulnier G of the Swiss Airforce based at Dübendorf 1914.
Photos show a darker colour on the wheel covers, although not as dark as the national markings. It may have been another colour than red.
One photo show wheels without covers





Morane-Saulnier G of the French Aéronautique militaire.
Somme, France, Oktober 1914.
This aircraft was armed with a Hotskiss machine gun for some time for trials.