



**Pre-Paint>Fuselage>Empennage>Fit NACA0012 tail fin**

Issue Revision Table

Issue	Date:	Change(s):	Issued by:
2	16/11/2021	Adopt "Section Only" Manual System, Add Issue Revision Table and model applicability. Install static probe before fitting Vertical fin Remove all reference to 'old fin' installation instructions NACA0012 only	AS

Model Applicability

Aircraft Model	J-160	J-170	J-230	J-430
Document Applicability			Yes	Yes

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***Pre-Paint>Fuselage>Empennage>Fit NACA0012 tail fin***

**Objectives of this task:**

Fit the vertical tail fin to the fuselage, including fitting the static probe, static tube, optional strobe light wiring and the VHF antenna coax cable.

This is a complex task and you should note that the final fitting, which entails the use of epoxy resin and flock to bond the fin to the fuselage. This task will take most of a day.

You will need at least 1, preferably 2, other people to help you with the final fitting of the vertical tail fin – do **not** try to do it by yourself.



**Materials and equipment required:**

- Card # 3J 'Rudder' for the VHF antenna
- Epoxy resin and flock
- 5-minute Araldite and flock
- Plumb bob and string line
- Builders level
- Self-tapping screws

Note that the following procedure described is for the installation of a NACA0012 profile fin only. Older flat section fins require addition glass reinforcing step that do not apply to the Broad sectioned NACA0012 fin, ensure you have identified which fin was included in your kit.

2A128A0D is the NACA0012 fin, all others are older and require additional reinforcement instructions. Which are not provided in this procedure.

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**Prepare the vertical fin**



Start by laying the vertical fin on its side and drilling out the marked inspection hole on the left-hand side with a hole saw.

Turn the vertical fin over and cut out the marked slot for the rudder cable: drill each end of the slot then use a jigsaw to join the two holes.

Remove any burrs – the exact sizing of the hole and slot will

be finalized once the vertical fin has been fitted into place.



Using a round file, enlarge the static probe mount hole in the top front of the vertical fin – it needs to be large enough to pass the static tube and draw wire through easily. The finished hole size is not critical. Take care not to file through the pre-installed drawstring: for this reason using a drill is not recommended. If fitting the optional strobe to the top of the fin then you should fit the mounting base now: flock the base to the forward top of the fin and screw in place.

**Pull the static tube and the electrical cables through the fin**

Lay the vertical fin beside the fuselage on trestles set at the same height as the fin mounting stub. Lay the strake across the mounting stub.

Locate the drawstrings inside the fin that will be used for the electrical cables and the static tube. Tie a length of wire to the static tube drawstring and pull it through – the friction of the static tube being pulled may cause a drawstring to break.



The static tube and the strobe cable (if fitted) run through the front hole and the VHF antenna cable runs through the rear hole as shown in the photo at right.

Tie the draw wire to the static tube and strobe cable (if



fitted) and the drawstring to the VHF antennae cable. The photos above show the recommended method: loop the draw wire or string around the tube or cable to be pulled then tape the end of the draw wire or string so that when it is pulled it will tighten the knot. Tape the end of the tube or cable to be pulled to streamline it and avoid it catching on anything. Cloth tape is stronger than masking tape and is recommended for this purpose.



Pull the static tube/strobe wiring and VHF cable up through the fin and out of their respective holes, then tie a knot or tape a mixing stick across the end of each tube or cable at right angles to prevent them slipping back inside the fin.

**Test fit the vertical fin**

Fit a 6G self-tapping screw to each side rear of the fuselage stub at the bottom of the joggle – the intention here is to prevent the back of the fin from being able to slip down further than the joggle at the back. These screws will be removed once the fin has been flocked and pop riveted in position prior to being glassed.

Tape the rudder cable threads then push the cable forwards until it can be tucked inside the slot in the mounting stub.

Lift the fin up over the mounting stub and slide down into place.

Take care that the join to the fuselage at the front of the strake is smooth and even, so that there is one continuous line along the entire length of the strake – if there is any discontinuity it will look extremely disappointing when paint is applied so take care to get it exactly right at this time.

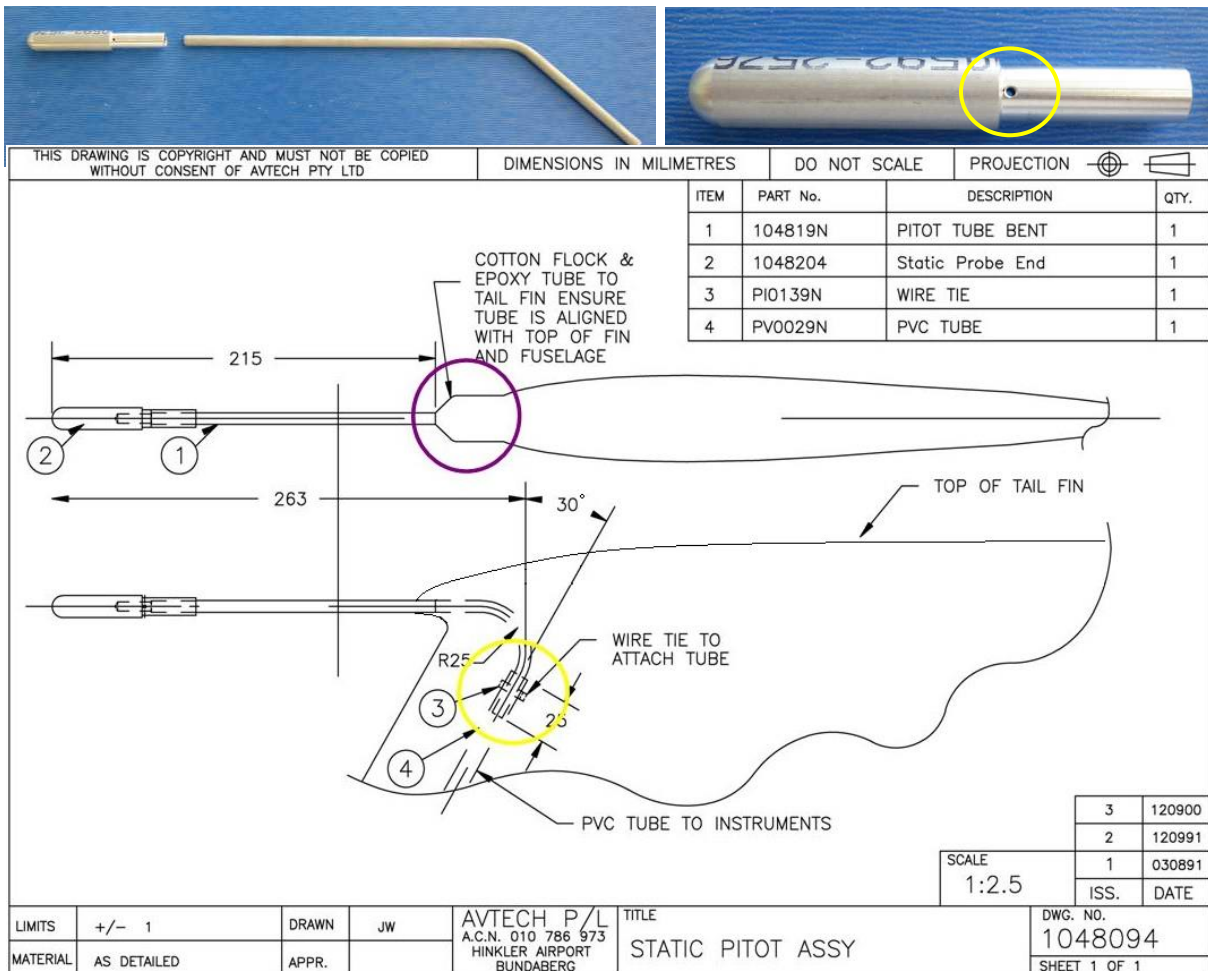
When you are satisfied that the fin will fit correctly, remove it from the mounting stub and lay it back on the trestles.

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**NACA 0012 FIN - Fit the static probe assembly**

Before permanently installing the vertical fin into the fuselage it is convenient to first fit the static to the fin while it remains easily accessible.

Assemble the static probe: using a drop of Loctite fit the bullet-nose end to the static tube, making sure that the vent hole (circled) will be horizontal when the static probe is installed.



Put a smear of super glue around the base of the static tube then slide the PVC tube over the base of the static tube by at least 25mm and fix firmly in place with 2 lock wire ties.

Take particular care that the PVC tube is well secured to the static tube because once the static probe assembly has been flocked in place there will be no access for repair work.

Push the static probe assembly back into the hole at the front top of the vertical fin so that the static probe assembly is parallel with the top of the vertical fin and centred laterally in the fin.

Secure the static probe assembly in place with 5-minute Araldite and hold it in place while the Araldite dries. Mix up a batch of resin and coat the area around the base of the static probe assembly, and then add some flock to make a firm mix and shape around the base of the static probe assembly to form a smooth transition from the static probe to the fin. Leave to cure overnight and then sand to a smooth tapered finish.

**Level the aircraft**

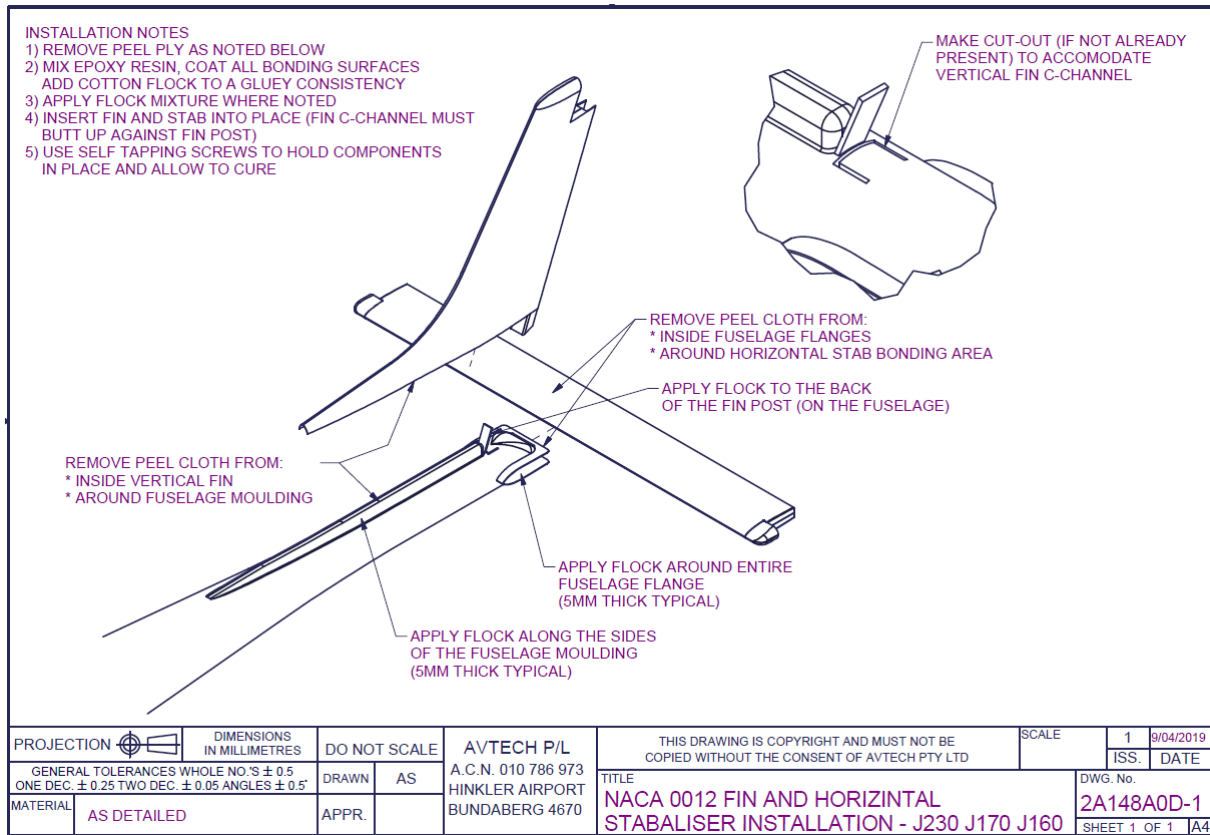


Because the correct alignment of the vertical fin is particularly important the aircraft should be fixed in a “wings level” attitude prior to the final fit.

Place a 3” block on the top of each front wing mounting lug and place a spirit level across the top of the cabin so that it rests on both blocks.

Pack the main wheels as required to level the aircraft.

**NACA0012 Fin – fitting vertical fin (flock only)**

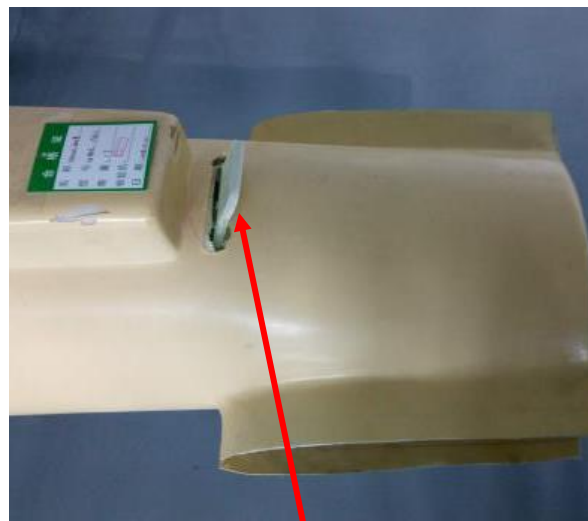


A drawing is provided above for reference, it also includes details relevant to the horizontal stabiliser installation (with rear fuselage flange only).

Note that two versions of the fuselage have the same 'flock only' vertical fin installation requirements. These are illustrated below. The instructions for installation are identical.



Fin post is integral with fuselage moulded stub



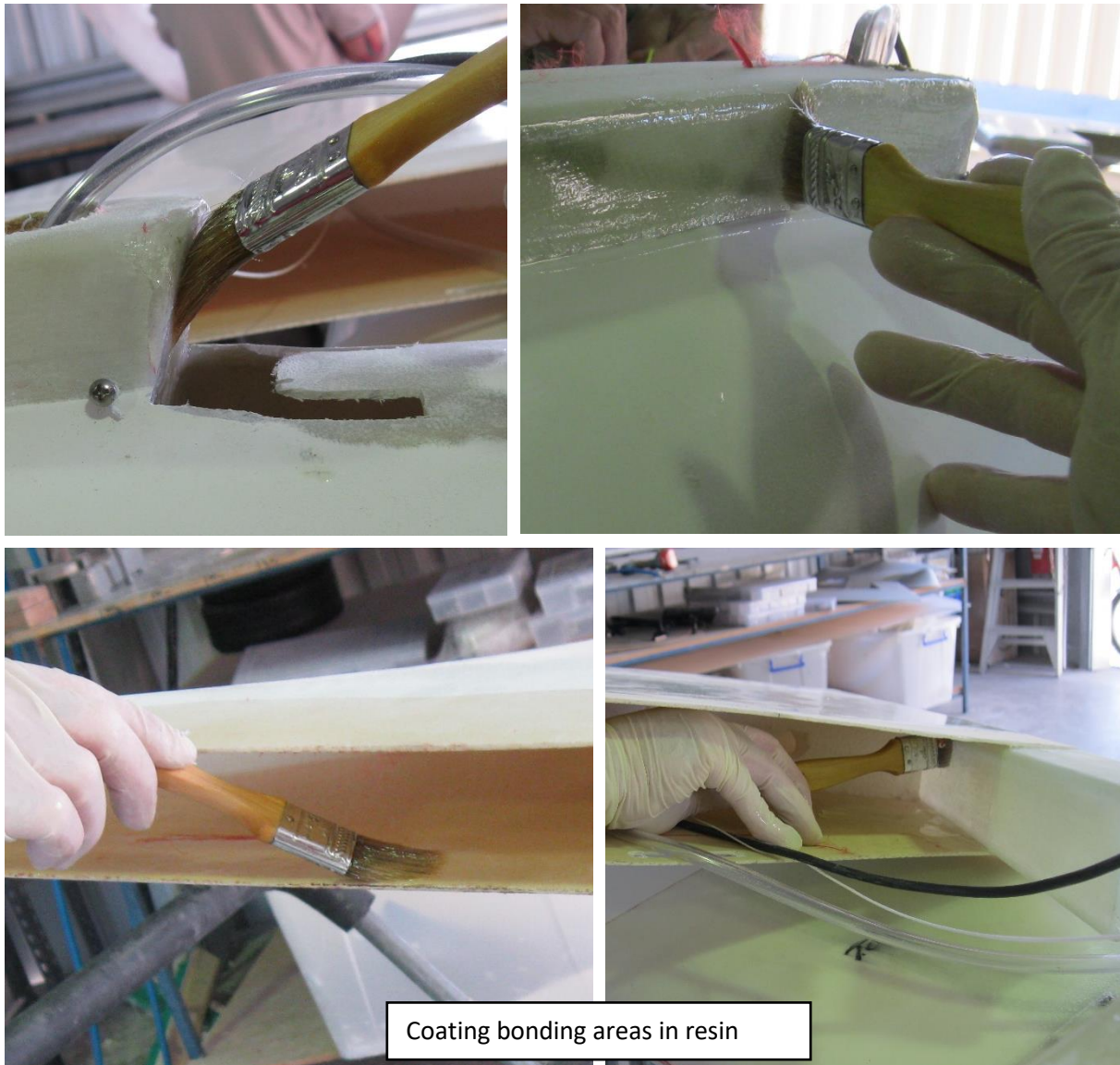
Fin post is exposed outside fuselage moulded stub

You will need 2 other people to help you position and final fit the vertical fin. Allow at least 4 hours for this task.

Remove the peel cloth from both sides of the fuselage and the mounting stub. Remove any peel cloth from the fin post (either exposed or integral) and from the inside and outside of the vertical fin. Use a scraper to remove any edge strips of the peel cloth that have not peeled off cleanly. Lightly sand the inner surface of the vertical fin, the outer surfaces of the mounting stub and fin post and the back of the fin channel (where it will bond to the fin post).

Ensure there is a C shaped cut out present in the fuselage (just behind the fin post). If not the mark and cut one out so that the C-channel of the fin can slide down into it.

Mix a batch of resin and carefully brush coat all surfaces to be joined in this step. Add flock and mix, then apply a 3 – 5mm coat of flock to one side of all surfaces to be joined in this step: both sides of the mounting stub and the back of the fin post (on the fuselage).



Coating bonding areas in resin





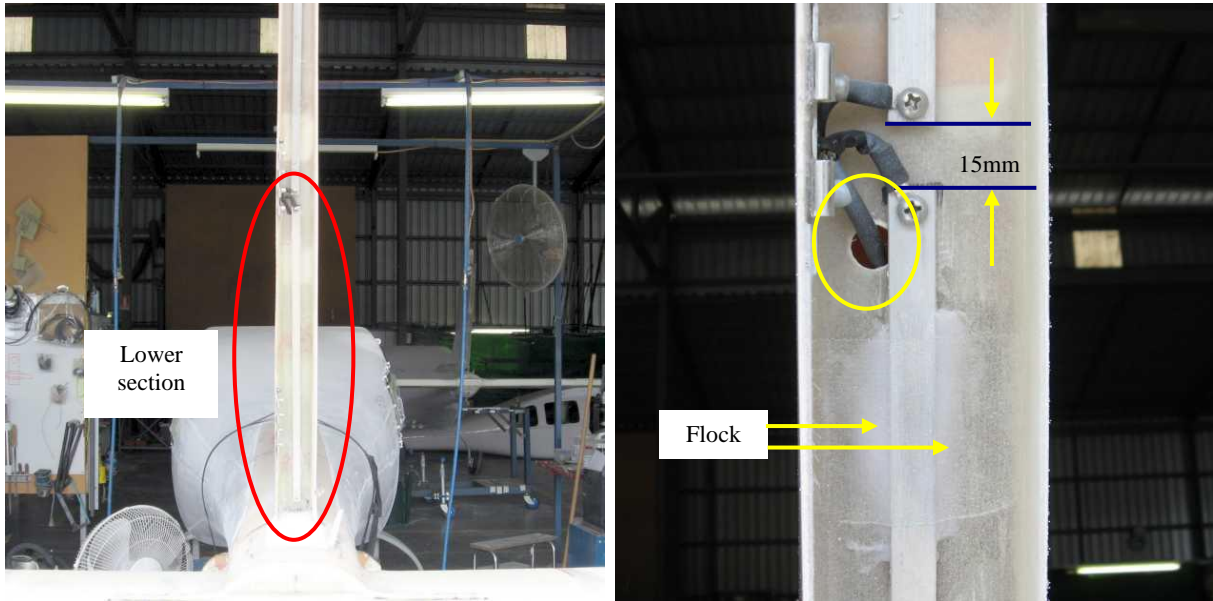
Slide the pitot tube and other lines or wires down through the access hole in the top of the fuselage stub, then install the fin prising the two skin apart so that all the flock is not pushed out of the joint. Once in place let go and let the skins come back together around the fuselage moulding. Ensure the inside of the fin C-channel is hard up against the fuselage fin post.

Install a countersunk rivet either side of the front of the strake.

Use self-tapping screws along the sides of the fin and through the rear of the fin C-channel to hold the fin in place and pull the skin in tight against the fuselage (Note that using an aluminium angle style clamping method will not work because the NACA0012 fin is curved rather than flat).

Check alignment of the Fin either using a plumb bomb from the top or running a measuring tape from the top of the fin diagonally to each tip of the stabiliser (note that the second method relies on accurately positioning the stabiliser in the first place).

**NACA 0012 FIN - Fit the VHF Antenna**



Ensure that the VHF coax cable exit hole is on the hinge (left-hand) side of the vertical fin – elongate the hole with a file if it is not. Sand the back of the lower section of the VHF antenna and place it so that it is exactly 15mm below the upper section and fix it in place with 5-minute Araldite.

Note that the factory fitted upper section of the antenna has been offset slightly to the left to allow for rudder movement: keep the lower section of the antenna exactly in line vertically with the upper section. Ensure that the threaded hole for the electrical connection is at the top of the lower section as shown above right.

Mix some resin and lay up 2 pieces of glass fibre cloth across each section of the antenna in 3 places, using flock to fill the gaps at each side of the antenna before placing the cloth. Leave overnight to cure.

Next day, shorten the VHF coax cable to length, and fit ferrite toroids, crimp 4.5mm electrical ring terminal connectors to the inner cable and the outer coax sheath and fit heat shrink tubing over the terminal joins, as shown in the sketch below.

Screw the inner cable to the TOP section and the braided coax sheath to the LOWER section. Tuck any excess cable back into the vertical fin and seal completely with silicone sealant.

This completes the *Pre-Paint>Fuselage>Empennage>Fit vertical fin* task.