RV-4 # N173CW
05-1736
installed 5/28/09
[redacted]

EF-400 ELECTRIC FLAP INSTALLATION

The EF-400 Electric Flap kit may be installed either as original equipment in a new RV-4 or as a retro-fit to an existing aircraft. If the installation is a retro-fit, it will require alterations to the airframe and existing flap system.

1. Remove the floor panel in the rear cockpit. Disconnect and remove the existing flap actuating mechanism.

2. If a manual flap installation is being changed, the Wd-406 flap actuator is modified as shown in DWG EF4-2. Saw off the Wd-406C arm bracket that holds the manual flap handle (DWG EF4-1) and file any stub away until the remaining tube is smooth. Weld the Wd-406D bracket to the end of the Wd-406G tube. File the other end of the Wd-406G tube to fit the Wd-406 actuator. Tack weld the Wd-406G tube in place as shown on DWG EF4-2 and double check its position. It may be necessary to reposition it before completing the weld. When the Wd-406G is accurately in position, finish welding it in place, then fabricate and fit the Wd-406F finger patch and weld it in place.

3. Install the Wd-406 flap actuator (whether new or modified) in the fuselage. Position the EF-406 plastic guide blocks over the floor ribs and around the WD-406 actuator. Use them to locate the position of the K-1000-3 platenuts that will be installed in the floor ribs. Install these platenuts to receive the AN3-20A bolts that hold the EF-406 guide blocks in place.

4. Install the EF-405 angle in the position shown in DWG. EF4-3. Drill and cleco this angle to the floor skin and the F-414 rib.

5. Drill a 3/16 in. hole through the large end of the A-406 bracket in the position shown in Dwg. EF4-4.

6. Temporarily bolt the A-406 bracket to the actuator.

7. Fabricate and assemble the EF-401 bars as shown on Dwg. EF4-4 and EF4-3.

8. Assemble the EF-403 angles per DWG. EF4-3. Also attach the EF-404 Rod End Link assembly to the EF-401 bars. Attach the bearing end of the actuator to the EF-401 assembly.

9. Slip this assembly into the fuselage and position approximately as shown in DWG EF4-1.

10. Slide the EF-402 guide block into position over the actuator shaft, resting on the fuselage floor skin.

11. The lower angle of the EF-403 assembly should be resting on the floor and positioned with the center of the bolt hole at 17 3/4 in. from the rear web of the F-404 bulkhead. See DWGS EF4-1 and EF4-3.

12. Drill two #30 holes through the upper EF-403 angle into the seat rib. Cleco in place.

13. Position the A-406 bracket so that the center of the bolt hole is 5 1/8 in. from the F-404 bulkhead (DWG EF4-1). Leave 3/8" between the A-406 bracket and the floor so that there is enough space for the AN365-1032 nut and bolt end.

14. Mark the 3/16 hole positions through the A-406 bracket onto the EF-405 angle. Remove the angle and drill. If you have a right angle drill, drilling can be accomplished in place.

15. Re-install the EF-405 angle and A-406 bracket.

16. Install the wire harness and EF-407 switch. We suggest routing the harness through the center control column opening in Bulkhead F-404, forward through Bulkhead F-402, left to the side, and then up the forward side of the bulkhead and to the instrument panel. The EF-407 switch should be installed in the lower left corner of the instrument panel so that it is within easy reach of the throttle hand.

17. Wire the flap control switch into the electrical system as shown in schematic.

18. Connect the electrical terminals to the flap actuator motor.

19. Move the switch to the "Flaps up" position which will extend the actuator to its full length. The actuator is designed such that the motor will disengage at either end of the travel. Just hold the momentary switch until the actuator stops moving. No travel limit switch is needed.

20. Run the flap motor until the EF-401 bar assembly is perpendicular to the centerline of the fuselage. Mark this position, then check both the extended and retracted position of the actuator. Forward and aft movement should be the same relative to the perpendicular centerline of the bar assembly. Adjust the position of the EF-403 assembly until this is so, then drill the remainder of the rivet holes in the EF-403 mount angles and rivet them in place.

21. Position the EF-402 Guide Block and drill holes through the bottom skin. Temporarily install bolts and nuts to hold the block in place.

22. Clamp the flaps in their full up position.

23. Measure the distance from the center hole in EF-401 to the holes in the Wd-406EF Flap Actuator weldment. Cut the EF-404 threaded rod to a length 1 1/2 in. less than that distance.

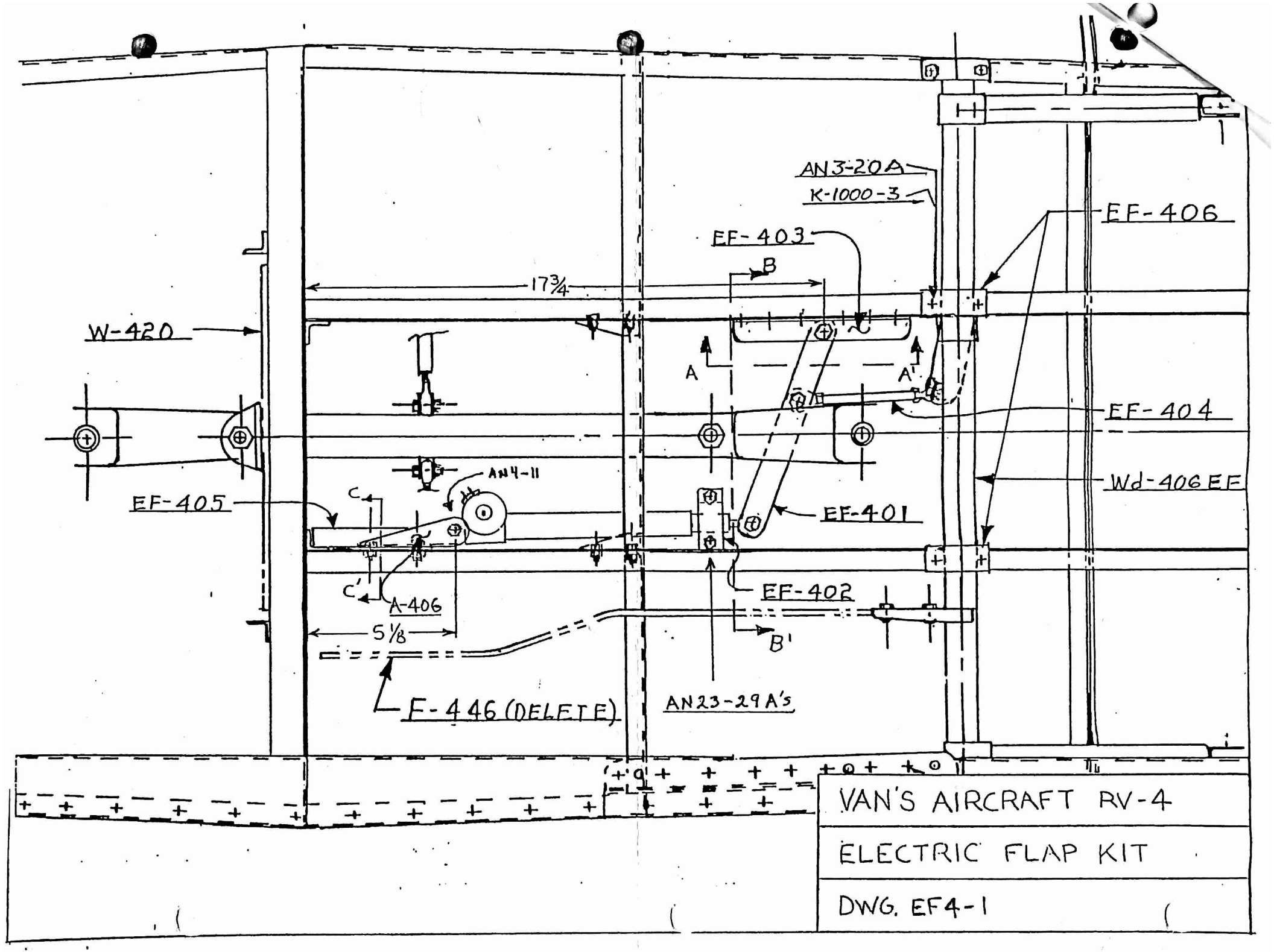
24. Assemble the rod ends and jam nuts on the threaded rod and temporarily bolt the assembly in place.

25. Disconnect the F-447 Flap Push Rod shown on EF4-2.

26. Activate the switch and run the actuator through its full travel. Verify that the flap mechanism moves freely through its full range.

27. With the actuator in its fully extended position and the flaps held in their retracted position, re-attach the F-447 flap push rod. Adjust the EF-404 link as necessary to coordinate the positions of the flaps and the actuator motor.

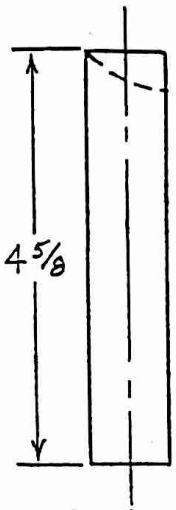
28. Activate the switch and slowly move the flaps down. Pause frequently to check that there is no interference or binding. Repeat the flap extension/retraction cycle several times and further adjust the EF-404 link if needed to set the retracted position. Reinstall the floor panel and double check flap operation.



VAN'S AIRCRAFT RV-4

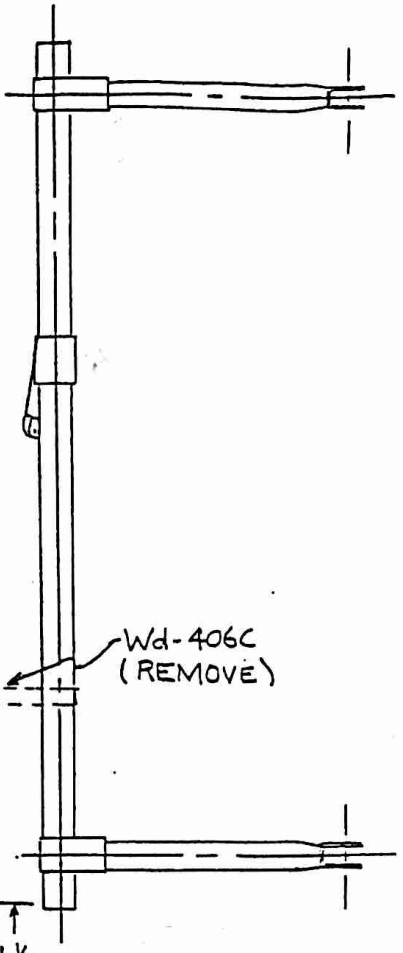
ELECTRIC FLAP KIT

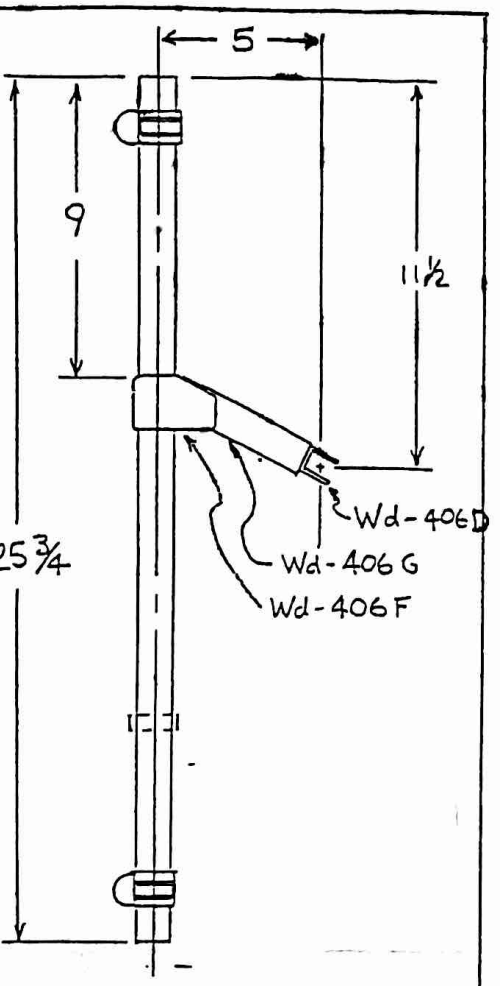
DWG. EF4-1

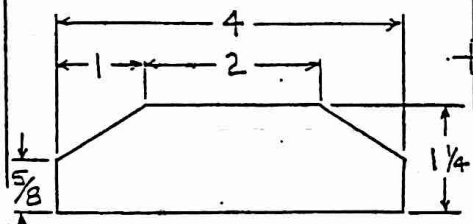


Wd-406 G

7/8 x .049 4130 STEEL
SCALE: 1/2 FULL

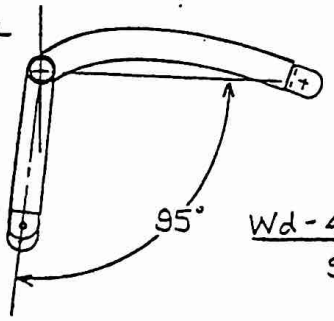




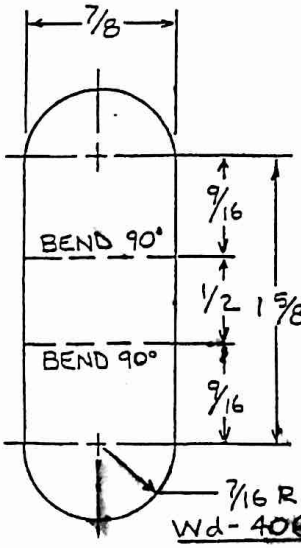


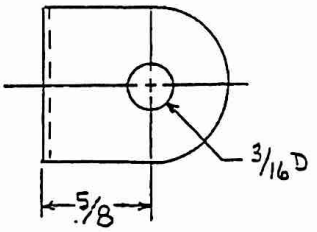
Wd-406F PATCH

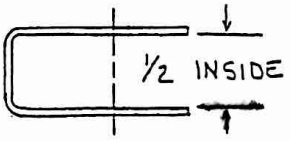
.050 4130 STEEL
SCALE: 1/2 FULL



Wd-406 EF (MODIFIED Wd-406)
SCALE: 1/5 FULL







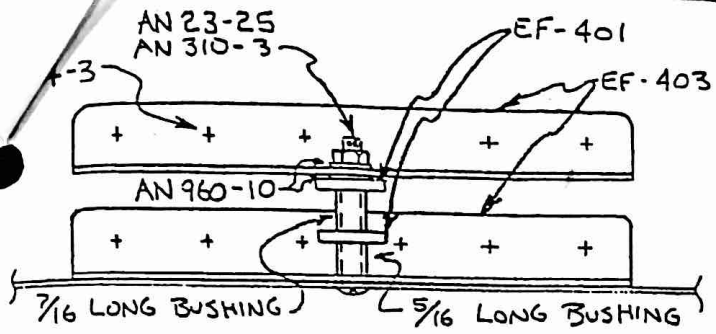
Wd-406D END

.030 4130 STEEL; SCALE: FULL SIZE

VAN'S AIRCRAFT RV-4

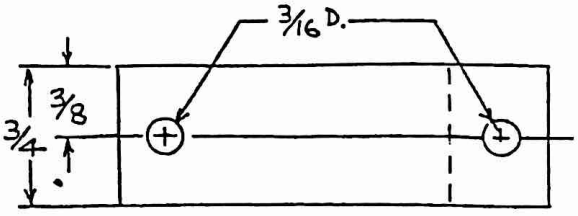
ELECTRIC FLAP KIT

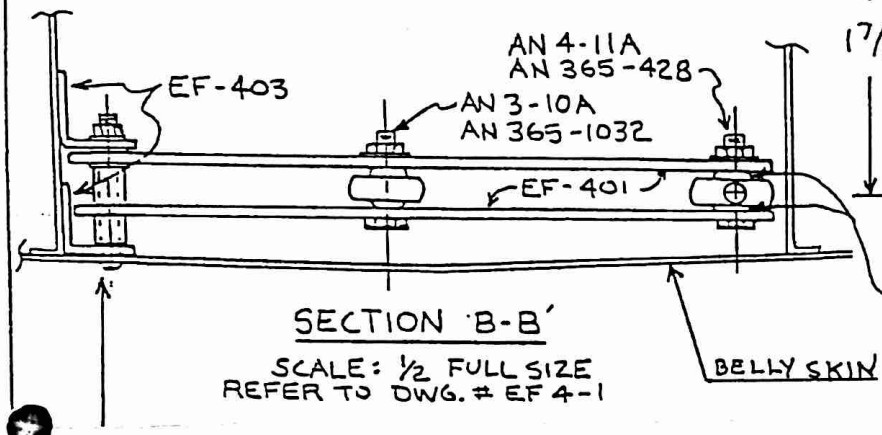
DWG. EF 4-2



SECTION A-A'

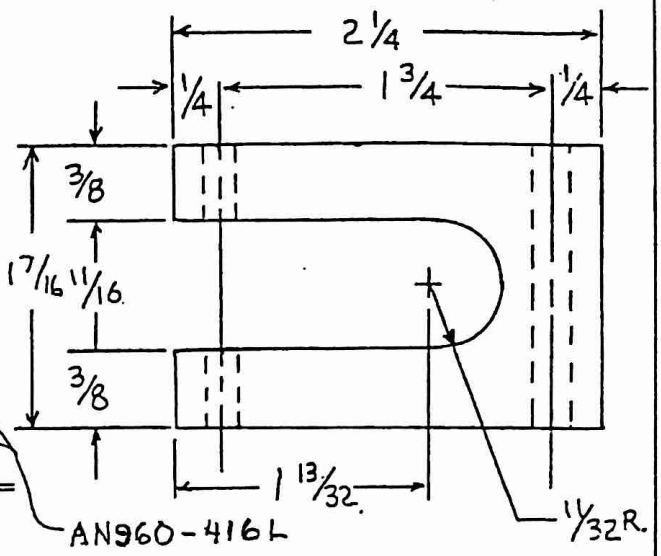
SCALE: 1/2 FULL
REFER TO DWG.# EF 4-1





SECTION B-B'

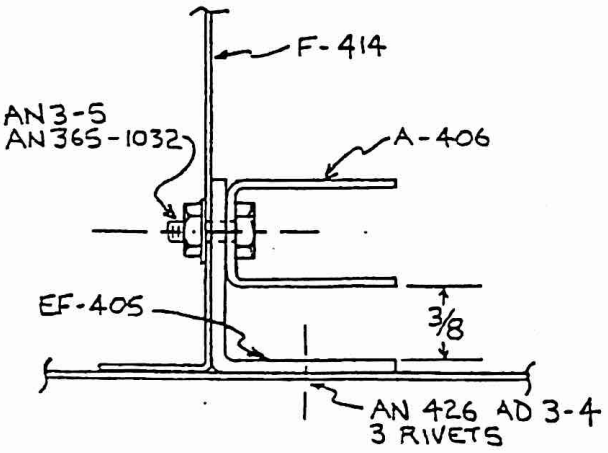
SCALE: 1/2 FULL SIZE
REFER TO DWG.# EF 4-1



EF-402 GUIDE BLOCK

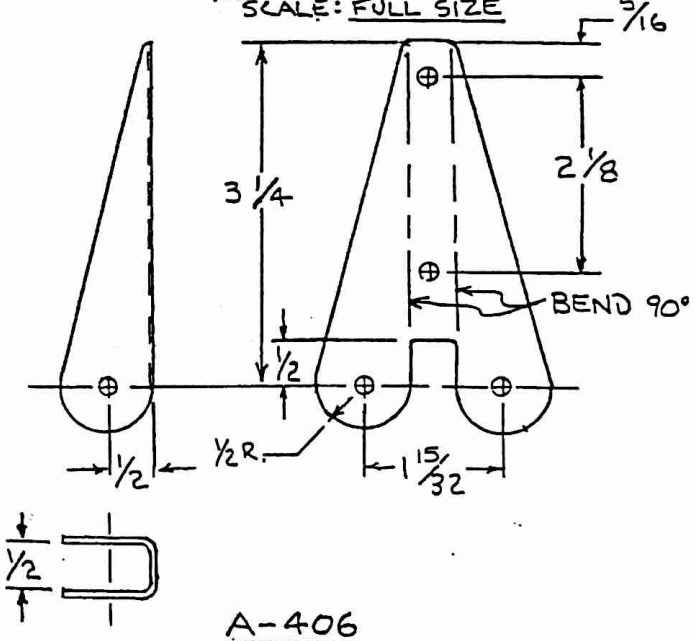
3/4 UHMW PLASTIC
SCALE: FULL SIZE

AN23-25



SECTION C-C'

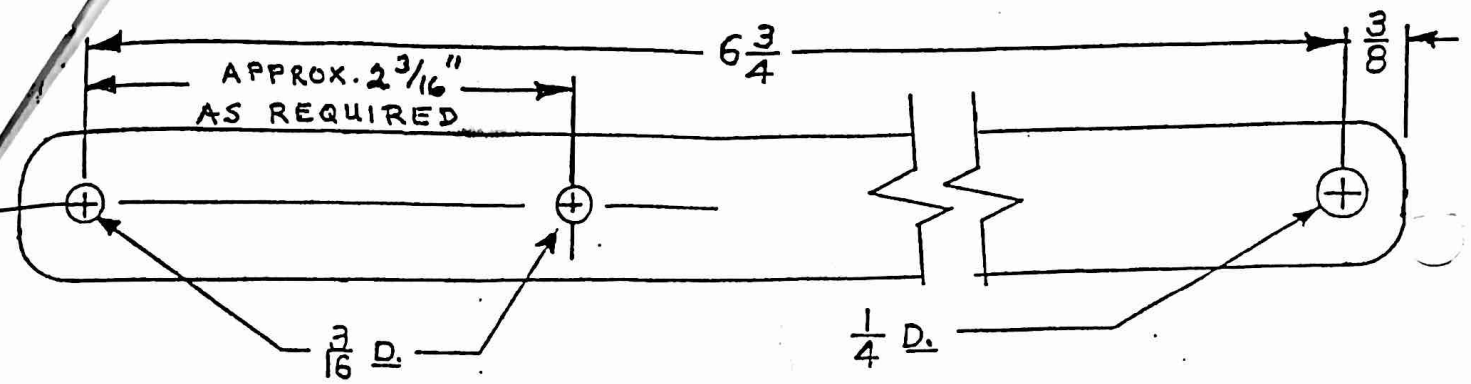
SCALE: FULL SIZE
REFER TO DWG.# EF 4-1



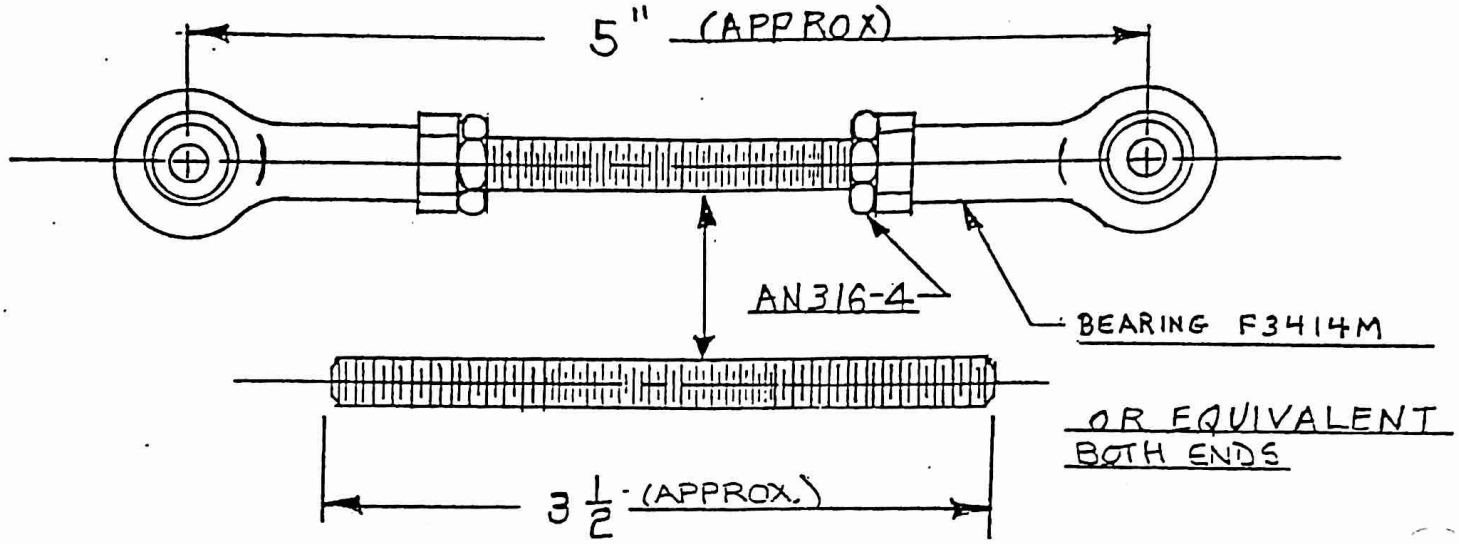
A-406

.050 4130 STEEL
SCALE: 1/2 FULL

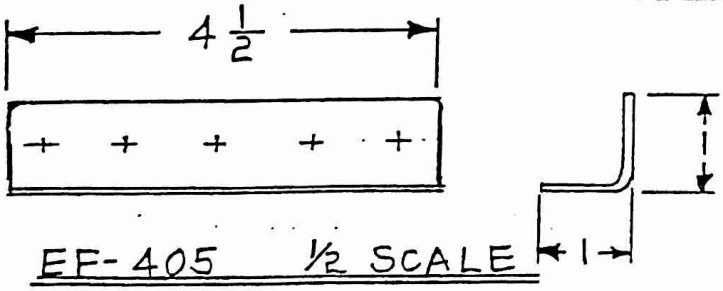
VAN'S AIRCRAFT RV-4
ELECTRIC FLAP KIT
DWG. EF 4-3



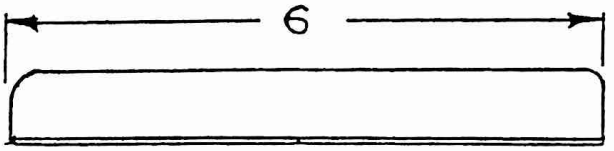
EF-401 BAR. FULL SCALE
3/4 x .125 6061-T6 2 REQD.



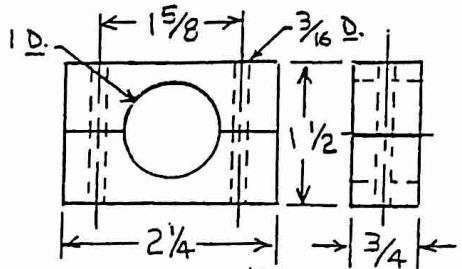
EF-404 FULL SCALE
1/4 D. 4130 THREADED ROD



EF-405 1/2 SCALE
1 x 1 x .063 6061-T6



EF-403 1/2 SCALE
3/4 x 3/4 x .063 6061-T6
2 REQD.



EF-406 1/2 SCALE
3/4 THICK UHMW PLASTIC

VAN'S AIRCRAFT RV-4
ELECTRIC FLAP KIT
DWG. EF4-4