C177B Oil Change Procedure

Tools and Supplies Needed:
Crecsent wrench
3/8 socket and 3/8 end wrench
Wire wrap tool an wire
Phillips screwdriver and phillips stubby
Wire cutter
Oil drain pan
Funnel
Rags
Container for screws
Punch
Headlamp
Four hands (reinstalling the cowl is a two-person job)

Procedure:
1. Warm the engine oil. A quick flight to the "Y" and back is an efficient way to do this. High power ground runs are not recommended.
2. Remove Cowl:
    a. Remove screws connecting the fronts of the cowl halves. Note location of screws with white plastic washers.
    b. Undo all ¼ turn fasteners on top cowl. These fasteners run along the joint with the lower cowl on both sides, and along the firewall at the back.
    c. Lift the top cowl off and set aside.
    d. Locate the landing light wires on the left side of the engine compartment. There are two bullet connectors that you should find secured with a zip tie. Remove the zip tie and disconnect the leads.
    e. Disconnect the cowl flap pushrods from the cowl flaps. Put the fasteners back in place on the disconnected pushrods to prevent losing them.
    f. Undo the ¼ turn fasteners that secure the lower cowl to the firewall. The requires two people. Someone should support the cowl while the fasteners are undone.
    g. Set the lower cowl aside.
3. Drain the oil:
    a. Place a bucket underneath the oil drain hose at the bottom of the oil sump.
    b. Open the quick drain valve to start the oil draining. (twist and push per the diagram on the valve.)
    c. Note how the blue anodized oil cooler drain cap is safety wired so that you can correctly replace the wire when the cap is reinstalled. The cap is on the right side of the engine compartment.
    d. Remove the safety wire on oil cooler drain cap. Place a catch pan underneath the oil cooler drain and remove the cap to drain the oil from the cooler.
    e. To expedite draining, punch a hole in the oil filter to allow air into the system.
    f. Allow all the oil to drain completely from the oil cooler and the engine sump.

g. While the oil is draining, do a general "under the hood" condition check.
    i. Wipe down lower cowl to remove oil and grime.
    ii. Inspect the engine for oil leaks.
    iii. Check the condition of the nosewheel strut and firewall for leaks or damage.

4. Replace oil filter:
    a. Note how the oil filter is safety wired so that you can replace the safety wire on the new filter. Then remove the safety wire.
    b. Place tape over the hole in the oil cooler, then unscrew the filter to remove. You can cut off the bottom of an oil bottle and hold it under the filter to catch the small amount of oil that escapes when you remove the filter.
    c. Mark the new filter with the tail number and tach time.
    d. Lubricate the gasket with Dow Corning DC4 lubricant. (This lubricant is designed and marked as an electrical insulating compound, but it is the correct lubricant for this application.)
    e. Clean the filter mounting flange on the engine.
    f. Install the new filter. The torque spec for a Tempest brand filter is 17 ft-lb. However, in practice, it is very difficult to use a torque wrench in this space, and per Steve Bunch's instructions, the spec is not critical, so you can estimate. Note, however, that this is quite a bit more torque than you'd typically use on an automotive filter.
    g. Install new safety wire on the filter.

5. Fill with fresh oil:
    a. Clean the oil cooler drain cap, and reinstall with new safety wire.
    b. Close the quick drain valve.
    c. Fill with 7 qts of Philips XC 20W50 Oil.
    d. Check for leaks.

6. Reassemble the cowls:
    a. Install the lower cowl. (reverse of removal)
    b. Reattach the landing light leads and zip-tie to secure.
    c. Reconnect the cowl flap pushrods.
    d. Pre-close checklist:
        i. Oil filter safety wired?
        ii. Oil cooler drain cap installed and safety wired?
        iii. Fresh oil added?
        iv. Landing light connected?
        v. Cowl flap pushrods connected?
    e. Install upper cowl. It is the reverse of removal, but a royal pain and a two person job.