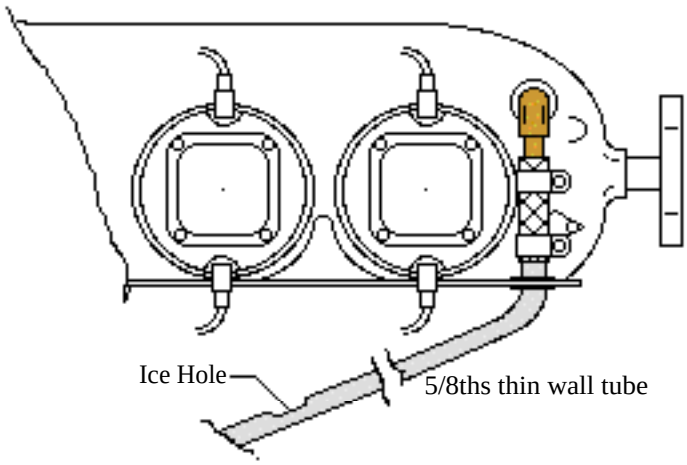
Breather Modification

For the Continental C-85, C-90 and the O-200 engines

The Hint:

We did a great deal of research about the cause and possible cures of the oil smear on the belly from the breather fumes. Nearly every owner had the problem and wanted to help to find a cure, even if the loss of oil was small since only a tiny amount of oil makes a big mess on the belly when combined with airfield dust. There was a hint in an old International 120/140 Association newsletter that Continental had done a breather oil loss "cure" on the O-200's, but it wasn't explained, there was no part number listed, and so it was another of the dead ends--------for a while.



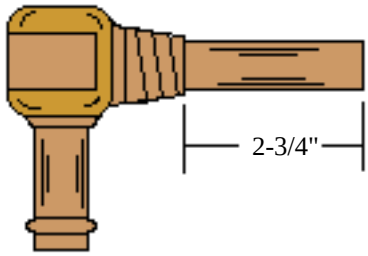
The "Normal" installation, as built. showing stylized engine case, baffling, and breather tube.

At an FAA-sponsored seminar for maintenance mechs, the west coast Continental tech rep was an attendee and I waylaid him during a very boring presentation by a lawyer. I learned that the Continental rep had been a Cessna 140 owner and so I asked him about the O-200 "cure" for oil loss correction we had heard about which might be applicable to the C engines as well. He was unaware of a change, but promised to find out and let me know. Meanwhile, I had seen the newsletter notes about other solutions from members, and investigated some of those; one of those ideas a friend used was to run the breather hose, not tube, up and over the engine so as to have some runback of the oil. A letter to the Continental rep as a reminder got results. The answer, the blueprint, and the Continental part number of their "cure" came along, with the shocking price of the modified part. In 1988, the list price was $142.83. In 2000, I have not asked. (And then I did ask.....as of 12 April '00, the price is $237.67 and they are in stock! and April of 2003, only $291.01)

Cessna's Cure:

Their cure was to modify the brass right angle breather tube fitting (part number AN 842-10) which screws into the top right hand corner of the engine (see sketches below) and attaches to the hose leading to the breather tube; the modification is to attach a tube to the end of the fitting which goes in the engine....see the sketch. The purpose of displacing the pickup opening of the fitting is to "hide" the opening from the droplets of oil flung by the cam and the front gearing. We ended up making the separator sketched. It does the job so well that many members have changed to the modified fitting and all have been satisfied with the results.

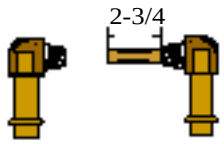
Continental's cure for breather oil loss is to modify the AN 842-10 breather fitting about as shown. The part may be used on any of the C-85/C-90 or O-200 engines.



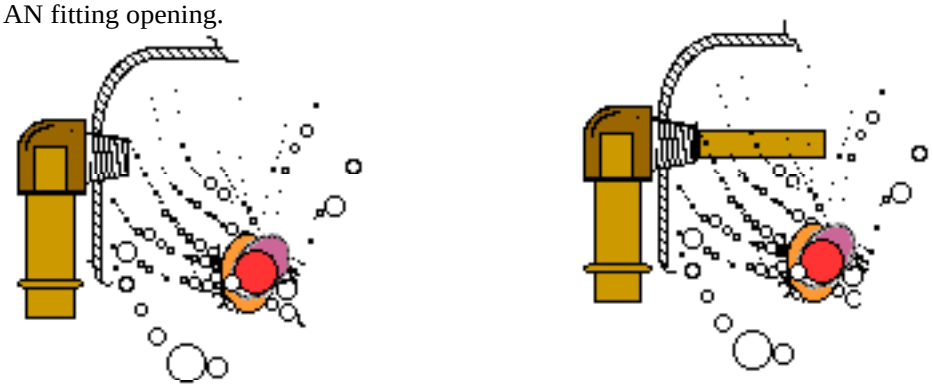
This part is available from Continental under a special part number, but is found in few of their parts lists. Add the brass tube and secure by brazing or silver soldering.

The Continental assembly (the two pieces joined) number is **633182,** but the Continental rep could not find it in the parts catalog. It is made up of the usual AN 842-10 fitting and the new tube; the new tube's part number is 633250 but it isn't in the parts catalog either. It is recommended that you have one made and sanctioned by the A&I versus buying it from Continental because the price was thought to be outrageous even by the Continental rep who got the information for me.

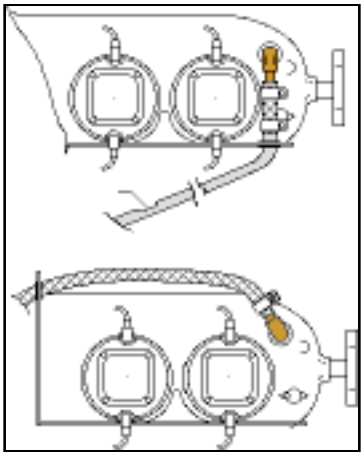
The sketches tell the story. The tube is copper or brass or steel (steel per the sketch I got from the Continental rep), with its OD machined to fit inside the bored out portion of the AN 842-10. The difference in OD of the pipe and the ID of the fitting should match the process used to join them...about five thousandths for brazing. Brazing is known to be compatible with the other materials of the engine.



There is a Cessna part number for this assembly. Most users have the A&X create one by silver soldering or brazing a brass tube into the AN fitting after matching the tube OD and the AN fitting opening.

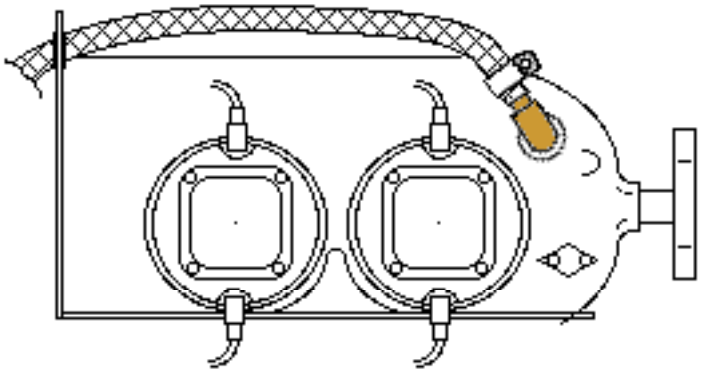


On the left, a stylized view of the oil droplets flung toward the opening of the breather's AN fitting. some of the droplets are captured in the fitting and are blown out the breather and on to the belly. On the right, the extension is shown and indicates how its opening is not subjected to the ingestion of the droplets of oil.



The next figure shows the "over the top" method using a hose as so often mentioned. This can be combined with the extended part. In the first figure based on the usual breather tube, I showed the recommended "ice hole" in the tube which is meant to allow bypass of the crankcase pressure in the event the end of the breather tube becomes plugged with ice. The combustion process creates water, part of which enters the crankcase by way of ring blowby. If the end of the breather tube is subjected to freezing air, an ice plug can form, leading to oil loss via the prop seal. The ice hole in the metal tube is usually at the point nearest the hottest exhaust item it passes (easy for 150 mufflers). The over the top hose should have an ice hole, too, and the best? place for it is behind the vertical baffling.

With the extension and the hose, two things combine to reduce the amount of oil loss; when the droplets impact something such as the 90 degree bend of the elbow or the inside of the tube, they coalesce and stick to the walls and drain back inside the engine.



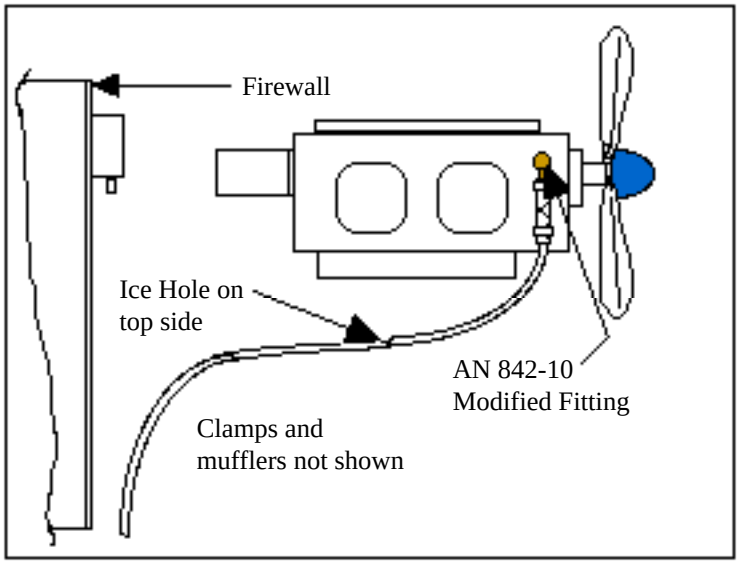
Hose over the top. The oil which condenses on the walls of the rising portion will return to the crankcase. Also needs ice hole, preferably behind the vertical baffle.

For those who wonder about such things as the effects of the angle of cut of the breather tube end, which way it faces, where it is positioned relative to the cowl's bottom lip, whether inside the cowl or outside, whether one exposure will create a vacuum (it can) or an unwanted pressure (it can) and all such things...it seems to work best with a straight or slightly slanted as suggested in the sketch.

Resistance to..the TRUTH:

I assisted another member, in Alaska, with the information in a prior version of this article and he went to the "know-it-all" local FBO, who grandly pontificated while leaning on a brand new O-200: "nonsense, there is no such thing". This is otherwise known as "why make a free call to the factory to find out?" or "why take the time to unscrew the elbow from the engine I am leaning on..the new knowledge might hurt my head", or "how can a customer, a CUSTOMER, know something I don't know?". When told of this rejection of facts based on "knowledge of all things", I made the call to the factory the FBO should have made. There, a lady with a lovely voice told me the parts were in stock, they are called out in the O-200 parts list (new type) and the price. While updating this, I called and again found a very accommodating lady who took about five seconds to look up the part, **633182,** elbow, and stated the price is the $291.01. April 2003.

Make the change to the modified elbow. It makes a difference!



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