

Bearhawk #164 “Three Sigma” Checkout Report

Date: 18 Feb 08

Objective: Fill Oil Sump. Calibrate Oil Dipstick

Background: Engine has not had oil in it since the overhaul. Engine was originally installed on a tricycle gear twin (suspected Piper Aztec), so it is suspected that the markings on the oil dipstick will be out of calibration in the tail dragger orientation.

Procedure:

1. Install oil filter and safety wire.
2. Confirm all oil lines torqued and marked with inspection lacquer.
3. Measure position of marks on dipstick from end of dipstick.
4. Add one quart of straight mineral oil, allow time for oil to settle in sump.
5. Measure position of oil on dipstick from end of dipstick.
6. Repeat steps 4-5 until 12 quarts of oil have been added.

Results:

Oil filter installed per instructions printed on filter. Oil filter gasket oiled before installation. Oil filter torqued to 200 in-lbs (16.7 ft-lbs, range 16-18 ft-lbs). This torque required 3/4 turn after gasket made contact with seat, the same as automotive oil filters. Safety wire installed on oil filter.

All oil connections were marked with inspection lacquer, with the exception of the pipe thread on the fitting where the oil leaves the accessory case to go to the oil cooler. The flared connection on this fitting was marked with inspection lacquer. As these fittings were torqued before installation of the hoses, this fitting is assumed to have been properly torqued and the lack of inspection lacquer was an oversight.

Oil Dipstick Markings

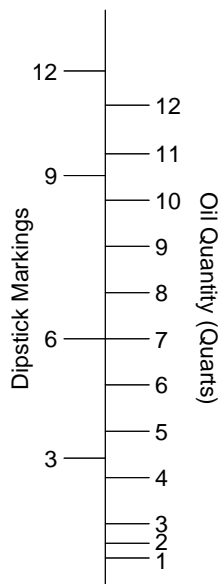
Quarts	Distance From End (inches)
3	1-1/8
6	2-5/32
9	3-9/16
12	4-15/32

Oil Dipstick Calibration

Quarts	Distance From End (inches)
1	1/4
2	3/8
3	9/16

4	15/16
5	1-3/8
6	1-3/4
7	2-1/8
8	2-9/16
9	3
10	3-1/2
11	3-3/4
12	4-1/8

Because the oil had very little color to it (almost transparent) there was a reasonable amount of uncertainty in the readings. Analysis of the distribution indicated a reasonable rate of 0.4 inches/quart after the initial three quarts. The resulting calibration chart is shown here.



I'm not sure the dipstick would be accurate for this engine in any attitude, but if you ignore the numbers and just considered them tick marks, the dipstick can be used with the calibration chart above to determine the oil quantity with reasonable precision.

The figure above has been added to the Pilot's Operating Handbook (POH) and checklist.

Conclusions: The dipstick has been calibrated as shown above.

Recommendations: Mark oil cooler line fitting at accessory case with inspection lacquer.