



FLIGHT TEST CHECKS

AUTO-PILOT ALTITUDE HOLD INSTALLATIONS

LAA/FT- APAH
Issue 5

A/C Type:

Reg:

Date:

Altitude Hold Make/Model:

Note: *Valid PFRC issued by LAA Engineering required prior to flight.*

Circle SAT (Satisfactory) or UNSAT as appropriate.

1. Check the operation of the break-out system and both of the altitude hold disengage switches required.

SAT	UNSAT	Comments:
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2. Check that the correct system loop gain is set by ensuring that the system operates at a suitable rate but does not jitter.

SAT	UNSAT	Comments:
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3. Check that the system, when engaged, does not induce airframe vibrations or flutter at airspeeds up to 1.1 x maximum cruise speed, but not exceeding V_{NE} .

SAT	UNSAT	Comments:
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4. Check that the system is able to maintain altitude in normal use through light to moderate turbulence and, where a wing leveller is also fitted, it is able to hold altitude in rate one turns commanded by the wing leveller.

SAT	UNSAT	Comments:
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5. Check that with the servo, at maximum deflection obtainable, by use of the auto-pilot climb or descent control if fitted, either in normal use or in the event of a malfunction (simulated servo runaway) the pitch response is not excessive and does not cause extreme deviations in the flight path assuming that corrective action begins within a reasonable time. From level flight, if corrective action is taken four seconds after initiation of the simulated runaway, pitch change should not at any time exceed 20 degrees. To be checked at a representative range of different airspeeds / power settings and in pitch-up and pitch-down direction.

SAT	UNSAT	Comments:
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6. If automatic pitch trim control is fitted, check that the pitch trim system operates correctly to relieve loads on the altitude hold servo.

SAT	UNSAT	Comments:
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7. Where no automatic pitch trim is fitted, check at a representative range of airspeeds that, before both trim nose-up and trim nose-down indicators reach their respective limits, the altitude hold system slips or automatically disengages. Comment on the resulting stick-free pitch rate upon auto-pilot disengagement and the out-of-trim force required to prevent excessive pitch rate.

SAT	UNSAT	Comments:
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8. Where no automatic pitch trim is fitted, from a trimmed airspeed of $V_{S1} \times 2$ and following gradual reduction of power, check that the altitude hold system will slip or automatically disengage to prevent the airspeed from decaying to $V_{S1} \times 1.2$. Note the minimum airspeed reached at auto-pilot slip/disengagement and comment on the resulting stick-free pitch rate and out-of-trim force required to prevent excessive pitch rate.

SAT	UNSAT	V _{S1} x 2 = kts/mph	Observed Min speed = kts/mph
		Comments:	

9. If fitted, check the correct operation and effectiveness of the audible altitude hold automatic disengage warning horn.

SAT	UNSAT	Comments:
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10. Where automatic climb and descent mode with vertical speed value selection is fitted, check that a representative range of rates of climb and descent achieved and maintained are within 20% of that selected.

SAT	UNSAT	Comments:
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11. Where pre-programmable airspeed limit protection is available, when selecting the maximum vertical speed setting, check that the maximum climb or descent rate is limited to an airspeed of no less than $1.5 \times V_{S1}$ (stall speed, flaps up) in the climb and no more than $0.9 \times V_{NE}$ in the descent.

SAT	UNSAT	Maximum Vertical Speed Selectable = _____ fpm
		V _{S1} = _____ kts/mph. Observed Min climb speed = _____ kts/mph.
		V _{NE} = _____ kts/mph. Observed Max descent speed = _____ kts/mph.
Comments:		

12. Where automatic climb and descent mode *without* pre-programmable airspeed limit protection is fitted, check that when the maximum vertical speed setting is selected, from normal trimmed cruise speed and with full power applied, the aircraft will not slow to less than $1.5 \times V_{S1}$ in the climb nor when at idle power the aircraft will not accelerate to more than $0.9 \times V_{NE}$ in the descent.

SAT	UNSAT	$V_{S1} = \underline{\hspace{2cm}}$ kts/mph. Observed Min climb speed = $\underline{\hspace{2cm}}$ kts/mph.
		$V_{NE} = \underline{\hspace{2cm}}$ kts/mph. Observed Max descent speed = $\underline{\hspace{2cm}}$ kts/mph.
Comments:		

13. Where automatic altitude capture mode is fitted, check that the altitude at which the aircraft levels and maintains is within ± 100 feet of that selected.

SAT	UNSAT	Comments:
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14. Check that radio transmissions from installed avionics do not affect servo operation.

SAT	UNSAT	Comments:
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15. I certify that I have flown the above aircraft and that the above checks have been carried out to my satisfaction.

Name:	Signed:	Date:	Licence No.:
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Once completed, send this form to LAA Engineering.

Important note: *Following conclusion of satisfactory flight test, the modified aircraft must not be flown until issue of modification final approval.*