

# INSPECTION CHECKS

## AUTO-PILOT (PITCH) INSTALLATIONS (CS 23.1329 + 23.779 and AC 23-17C, 23.1329 refer)

**LAA/IC-APP**  
Issue 6

A/C Type:

Reg:

LAA Mod No.

Auto-pilot (Pitch) Make & Model:

1. Check the force required at the centre of the stick grip for the pilot to overcome the pitch servo. It must be possible to quickly and positively overcome the servo. The force must be adjusted to the minimum value possible to prevent servo clutch-slip in moderate turbulence. For aircraft with light stick forces, this force is likely to be as low as 1 or 2 lbs. Refer to table in Appendix for recommended initial set-up data.

SAT	UNSAT	a) Aft stick force to keep elevator level, (A/P off). (a/c with elevators not fully mass balanced).	lbs / kg
		b) Aft stick force at clutch slip (A/P on).	lbs / kg
		c) Net aft stick force at clutch slip. (b - a)	lbs / kg

2. Check that each manual control and switch for the altitude hold is easily accessible to the pilot in flight. Check that each control operates in the natural sense and that each control is marked as to function and sense.

SAT	UNSAT	Comments:
-----	-------	-----------

3. A switch must be provided to quickly disengage the altitude hold in flight e.g. in the event of a malfunction. In the case of a dual control aeroplane, a disengage switch must be easily accessible to both pilots in flight.

SAT	UNSAT	Comments:
-----	-------	-----------

4. If the maximum force required to overpower the servo is greater than that which can comfortably be applied with one finger, the disengage switch(es) for the auto-pilot (pitch) must be mounted on the stick grip(s).

SAT	UNSAT	Comments:
-----	-------	-----------

5. An alternative control to that specified in 3. and 4. above must be provided, e.g. a clearly marked and easily accessible circuit breaker.

SAT	UNSAT	Comments:
-----	-------	-----------

6. For auto-pilots designed to command servo disengagement following pilot applied force to the controls, an aural 'auto-pilot disengaged' warning feature must be activated. Record the type of warning (horn, voice, etc.) and whether through the headphones, speaker, horn, etc.

SAT	UNSAT	Comments:
-----	-------	-----------

7. Check that the maximum servo travel either in normal use or following a malfunction (servo runaway) cannot cause undue loads or travel in the control system or the control stops or cause over-centre geometric lock which could jam the system.

SAT	UNSAT	Comments:
-----	-------	-----------

8. There must be a clear indication (e.g. a warning light) showing the selected mode of operation. Selector switch position is not by itself adequate. In the case of a dual control aeroplane, the indication must be clearly visible to both pilots.

SAT	UNSAT	Comments:
-----	-------	-----------

9. Check that each part of the linkage connecting the servo permanently to the flight control system complies with normal requirements for flying control systems with regard to integrity, locking of bolts, strength, freedom from possibility of jamming etc. – specifically, ensure that the servo arm/pulley retaining bolts are installed using thread locking compound unless another acceptable bolt retaining method is employed.

SAT	UNSAT	Comments:
-----	-------	-----------

10. Check the elevators move in the correct sense and with the correct range of movement stop to stop.

SAT	UNSAT	Comments:
-----	-------	-----------

11. Check the possibility of the servo being coupled up the wrong way round during maintenance is remote (e.g. it should not be possible to install the servo arm at 180 degrees to its normal position and electrical plugs and sockets should be suitably polarised to ensure correct orientation).

SAT	UNSAT	Comments:
-----	-------	-----------

12. Placard to be fitted clearly in view of the pilot, stating:  
**'ENGAGEMENT OF AUTO-PILOT BELOW 1000 FT AGL PROHIBITED'**.

SAT	UNSAT	Comments:
-----	-------	-----------

I certify that the above checks have been carried out to my satisfaction.

Name:	Signed:	Insp. No.:	Date:
-------	---------	------------	-------

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

**Duplicate inspections:**

Details of work carried out affecting the pitch control system during auto-pilot installation	1 <sup>st</sup> Inspection by LAA Inspector	2 <sup>nd</sup> Inspection *
	Signature:	Signature:
	Insp. No.:	Authority*:
	Date:	Date:

\*Note: The 2<sup>nd</sup> inspection may only be carried out by another LAA Inspector, an LAA member/owner/pilot of the aircraft (full pilot's licence no. required as the authority) or a suitably licenced engineer. (Refer to Procedures section of Inspector's manual SPARS and TL 2.04: 'Certification of Maintenance' for full details).

## Appendix

Recommended servo clutch slip set-up data

Aircraft Type	Net stick force at clutch slip (see insp. item 1).	
	lbs	kgs
Alpi Pioneer 300	4 - 4.5	1.8 - 2
Bristell NG5 Speed Wing	1 - 1.5	0.5 - 0.7
CZAW SportCruiser	1 - 1.5	0.5 - 0.7
Europa	4.5 - 5	2 - 2.25
Rutan Long-EZ	3 - 3.5	1.4 - 1.6
Tecnam Sierra	4.5 - 5	2 - 2.25
Vans RV-6	3 - 3.5	1.4 - 1.6
Vans RV-7	3 - 3.5	1.4 - 1.6
Vans RV-8	4 - 4.5	1.8 - 2
Vans RV-9	4 - 4.5	1.8 - 2
Vans RV 10	3.5 - 4	1.6 - 1.8

