

LANCAIR 320

Issue 2			
Revision A	New format. Links to service bulletins and modifications.	Dated 15/6/11	JV

Section 1 - Introduction1.1 UK contact

There is no UK importer/agent.

The manufacturer may be contacted as follows:

Lancair International
250 SE Timber Ave
Redmond
OR 97756
USA

Tel: +1 541 923 2244
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Website: www.lancair.com

1.2 Description

The Lancair 320 is a two-seat low-wing monoplane available in kit form for amateur construction. The type has been developed from the Lancair 200/235 design which has now been discontinued. The Lancair 320 is of conventional layout with a retractable electro-hydraulic undercarriage. The airframe is built almost entirely from pre-moulded composite sandwich components which are subsequently bonded together by the builder. The main difference between the 200/235 and 320 versions is that the Lancair 320 is fitted with a Lycoming O-320 or IO-320 engine in place of the Continental O-200 or Lycoming O-235. The undercarriage legs are extended to provide adequate propeller ground clearance with a larger diameter propeller fitted, and the cockpit width and height increased. The standard propeller is the constant speed Hartzell HC-F2YL-1F or Hoffman HO-V7 2L2. Note that the only propeller(s) approved for an individual aircraft are those listed on the individual aircraft's Operating Limitations document or in the PTL/1 (Propeller Type List) for the type.

The original Lancair 320 kit built in the UK was found to lack longitudinal stability as first built. The aircraft was subsequently modified by incorporating a modification package developed by Avtek Pty of Australia, which was developed to bring the Lancair 320 to a standard which would satisfy the Australian authorities with the handling characteristics. The modification involves adding extensions to the tailplane to increase its span, new elevators of greater span to match the modified tailplane, and incorporating an elevator anti-balance tab/trim tab to provide a more positive form of trimmer and greater stick force gradients. The modification package is supplied as a kit of composite parts and hardware, drawings and building notes.

Later examples have been built with the larger Lancair 320 type tailplane supplied by the factory. This is now the factory standard tailplane for the 320 and 360 model.

Over the years the design has developed incrementally, with the following changes being most significant:

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- Extended engine mount, moving engine forward approximately 5"
- Extended engine cowls to suit the new engine position
- Removable wing tip extensions
- Lancair 360 tailplane assembly
- 'Torque tube' type flap control system
- Increased max take off weight of 1785 lbs subject to revised main gear overcentre links GM003-3-A or B being fitted - standard with all kits delivered after 10/93.
- Revised cg range of 22.8 to 28.6" aft of datum with extended engine mount

Later kits, including all these changes are designated Lancair 320 Mk II. All these changes are accepted by LAA.

Lancair suggest a V_{NE} of 270mph and describe the aircraft as aerobatic. Due to the lack of the appropriate data, the aircraft has not been cleared for aerobatics in the UK and the V_{NE} has been restricted to 248 mph to provide an increased safety margin.

Section 2 – Mandatory information for owners, operators and inspectors**2.1 Fast Build Kit 51% Compliance**

The standard kit has been cleared by the LAA as compliant with the 51% rule at this time.

2.2 Build Manual

Lancair International provides a comprehensive build manual in several separate binders.

2.3 Build Inspections

Build inspection schedule 'Lancair'.
Inspector approval codes A-A or A-C1. Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

Lancair International provides a comprehensive Pilot's Manual.

2.5 Mandatory Permit Directives

None applicable specifically to this aircraft type.

Also check the LAA website for MPDs that are non-type specific (TL2.22).

2.6 LAA Required Modifications (including LAA issued AILs, SBs, etc)

Standard LAA modifications for the Lancair 320 must be incorporated as follows:

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<i>Reference</i>	<i>Description</i>
PFA MOD 1 issue 2	Inboard lap belt attachment reinforcement
PFA MOD 2 issue 2	Outboard lap belt attachment reinforcement
PFA MOD 3 issue 2	Shoulder harness attachment reinforcement
PFA MOD 6 part A	Earthing fuel tank filler

LAA do not require any further modifications other than those classified as mandatory service bulletins by Lancair International (see section 3.3).

2.7 Additional engine operating limitations to be placarded (or shown by instrument markings)

(Refer to the engine manufacturer's latest documentation for the definitive parameter values.)

2.8 Control surface deflections

Ailerons (original)	Up: TBD Down: TBD
Elevators	Up: TBD Down: TBD
Elevator tab	Up: TBD Down: TBD
Rudder	Left: TBD Right: TBD
Flap	Down: TBD

2.9 Operating Limitations and Placards

(Note that the wording on an individual aircraft's Operating Limitations document takes precedence, if different.)

1. Maximum number of occupants authorised to be carried: Two
2. The aircraft must be operated in compliance with the following operating limitations, which shall be displayed in the cockpit by means of placards or instrument markings:
 - 2.1 Aerobatic Limitations
Aerobatic manoeuvres are prohibited.
Intentional spinning is prohibited.
 - 2.2 Loading Limitations (short engine mount)
Maximum Total Weight Authorised: 1685 lb
CG Range: 26.03 inches to 30.30 inches aft of datum

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Datum Point is: rear face of the firewall

Loading Limitations (extended engine mount)
CG Range: 22.8 inches to 28.6 inches aft of datum
Datum Point is: rear face of the firewall, FS0.0

Loading Limitations (increased MTOW – extended engine mount and revised over-centre links GM003-3-A or –B must be fitted)
Maximum Total Weight Authorised: 1785 lb
Maximum Landing Weight: 1685 lb

- 2.3 Engine Limitations
Maximum Engine RPM: 2700
- 2.4 Airspeed Limitations
Maximum Indicated Airspeed (V_{NE}): 248 mph
Max Indicated Airspeed Flaps Extended: 115 mph
Maximum Indicated Airspeed Undercarriage extended: 140 mph
- 2.5 Other Limitations
The aircraft shall be flown by day and under Visual Flight Rules only.
Smoking in the aircraft is prohibited.

Additional Placards:

“Occupant Warning - This Aircraft has not been Certificated to an International Requirement”

A fireproof identification plate must be fitted to fuselage, engraved or stamped with aircraft's registration letters.

2.10 Maximum permitted empty weight

Not applicable.

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

Lancair International provides a comprehensive Operator's Manual.

3.2 Standard Options

See section 1.2 above.

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

The list below is believed to be correct at time of publishing: please check the Lancair International website for up to date information (www.lancair.com).

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<i>Ref</i>	<i>Date</i>	<i>Description</i>	<i>Factory compliance status</i>	<i>Applicability</i>
SB001	23/10/90	Nose wheel style	Mandatory	Lancair 320
SB002	19/10/90	Fuel tank sealing	Advisory	Lancair 235 & 320
SB003	27/11/90	Hydraulic hose fittings	Advisory	All Lancair models
SB004	1/3/91	Mixing and shelf life of Hysol 9339 adhesive	Advisory	All Lancair models
SB005	9/4/91	Shell DPL-862 resin, TETA curing agent	Advisory	All Lancair models
SB006	19/4/91	Fast-build nose gear tunnel	Mandatory	Lancair 320
SB009	5/12/92	Oleo nose gear struts	Recommended	Lancair 235 & 320
SB010	29/12/92	Lower rudder attachment pin	Mandatory	Lancair 200, 235, 320 & 360
SB012	4/2/93	Epoxy laminating resin systems and mixing	Advisory	All Lancair models
SB013	25/9/99	Matco brake master cylinders, MC-3 cylinder shafts	Advisory	All Lancair models
SB014	9/93	Main gear overcenter links	Advisory	Lancair 200, 235, 320 & 360
SB015	30/9/93	Stub wing attachment process	Advisory	Lancair 320
SB016	1/1/94	Rivets: AN470AD	Mandatory	Lancair 235, 320 & 360
SB018	7/7/94	Rudder pivots	Mandatory	Lancair 320 & 360
SB019	1/7/94	Matco brake master cylinders MC-5	Advisory	Lancair 320 & 360
SB023	12/10/94	Nose gear door	Recommended	(not stated)
SB024	14/12/94	Matco brake plate alignment	Advisory	Lancair 320 & 360
SB032	1/5/97	Elevator and rudder counterbalances	Advisory	All Lancair models
SB041	19/11/97	Control tubes	Mandatory	All Lancair models
SB043	14/5/98	Nose struts	Mandatory	All Lancair models
SB050	5/9/99	Main gear reinforcement	Mandatory	Lancair 200, 235, 320 & 360
SB057	23/8/01	Nose gear struts	Mandatory	All Lancair models
SB067	8/8/03	Nose gear strut clamp	Mandatory	Lancair IVP, IV, ES, 320, 360 & Legacy
SB069	21/8/07	Ram air butterfly plate	Mandatory	All Lancair models

3.4 Special Inspection Points

Note that there are many service bulletins applicable to this aircraft type some of which include important safety issues and design updates. Access to a full set of bulletins is essential.

Nose gear shimmy and subsequent failure has been experienced on an aircraft fitted with an old-style nose gear oleo (rather than the later Australian manufactured item by ESCO). Nose gear oleos should be checked to make sure that they're of the later pattern.

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3.5 Special Test Flying Issues

The aircraft has been flight tested both with and without the wing tip extensions fitted, and considered typical of type and adequate for the issue of a Permit to Fly for day VFR operation although in common with other Lancairs tested it did not show positive lateral stability in steady heading side slips in the landing configuration. The rate of roll with wing tip extensions fitted was satisfactory, being approximately 60 degrees per second at 120 knots. The only significant handling change with the wing tip extensions fitted was that the lateral wing wander at the stall was much more damped. Performance was satisfactory at the increased maximum take off weight of 1785 Lbs and handling improved by the more forward centre of gravity range on the later version with the extended engine mount.

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com