LAA TYPE ACCEPTANCE DATA SHEET
TADS 232
MURPHY REBEL

Issue 5	MOD/232/004 up-issued Minor editorial changes.	Dated 29/3/19	JV
Revision A	Addition of Safety Spot articles	Dated 24/4/20	MR
Revision B	Contact details amended	Dated 16/9/20	JH

This TADS is intended as a summary of available information about the type and should be used during the build, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete as possible, other sources may contain more up to date information, e.g. the manufacturer's website.

Section 1 contains general information about the type.
Section 2 contains information about the type that is **MANDATORY** and must be complied with.
Section 3 contains advisory information that owners and inspectors should review to help them maintain the aircraft in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 - Introduction

1.1 UK contact

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The manufacturer may be contacted using the following details:

Murphy Aircraft Manufacturing Ltd, #1-8155 Aitken Road, Chilliwack, British Columbia, B2R 4H5, Canada.

Tel: 00 1 604 792 5855
Email: murtech@murphyair.com
Website: www.murphyair.com

1.2 Description

The Rebel is a high-wing, strut-braced monoplane of all-metal construction. It is designed to be able to carry three people, when a suitably powerful engine is fitted, but the LAA have to date only cleared it as a two-seater. Suitable powerplants as a two-seater include the Rotax 912-UL, 912-ULS, Lycoming O-235 and Lycoming O-320.

The aircraft is of conventional riveted 6061-T6 sheet aluminium alloy semi-monocoque construction. The aircraft utilises a conventional semi-monocoque 6061-T6 sheet aluminium alloy fuselage of approximately square cross-section with quarter-round corners, with a minimum number of parts. The enclosed cockpit seats two side-by-side, with an optional third seat mounted to the rear, facing rearwards. Large forward-hinged cockpit doors are fitted on each side of the cockpit, each door having a window that can be opened in flight. Doors are opened either from inside the cockpit or externally. The

tailwheel undercarriage uses a tripod-type main gear using external bungees in tension to provide the springing, and is essentially identical to that used on the Renegade Spirit type aircraft also manufactured by Murphy. A steerable tailwheel is fitted to the cantilever steel rod tailspring. Independent wheel braking is available using toe operated hydraulic drum brakes. The wings are of conventional, three-spar, semi-monocoque riveted aluminium alloy construction, with a single streamlined aluminium alloy strut bracing each wing panel. Conventional ailerons and flaps of aluminium sheet construction, fabric covered, are fitted, operated by a system of pushrods, torque tubes and bellcranks. Lowering of the flaps also causes the ailerons to droop for increased flap effect, via a mixer system. Tail surfaces are of all metal construction, the tailplane being strut braced. The unbalanced elevators and rudder are cable operated.

Fuel is contained in two integral tanks within the inboard bays of the wing roots, gravity feeding to the engine driven fuel pump via a three-way selector valve. Sight tube type fuel gauges are fitted in each wing root.

The Rebel is an SEP Aeroplane, it cannot be cleared as a microlight.
A lightweight variant of the Rebel, called the Maverick, is a microlight.

Section 2 – Mandatory information for owners, operators and inspectors

2.1 Fast Build Kit 51% Compliance

The Rebel has only been cleared by the LAA as a slow-build kit which is supplied in the form of unassembled components. In this form it easily meets the 51% rule.

2.2 Build Manual

Supplied by Murphy with kit.

2.3 Build Inspections

Build inspection schedule 2 (metal aircraft).
Inspector approval codes A-A, A-M or K. Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

Supplied by Murphy, can be downloaded from Murphy website (check website for current version).

O-320 manual version, at 25/11/11
O-235 manual version, at 25/11/11

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)

MOD/232/001	Addition of elevator cable pulleys at rear of seat, replacing fairleads (now included in latest kit)
MOD/232/002	Extended pitot tube required if ASI readings inaccurate
MOD/232/003	Reinforced vertical tailpost attachment
MOD/232/004 issue 3	Inspection of tailplane strut-ends for cracks (see also LAA/AWA/19/10)

The following modifications are mandatory for operating at 1650 lbs max gross weight (optional for operating at 1450 lbs):

1. Streamlined extruded struts not flattened tube type
2. Elevator and rudder must be aluminium covered not fabric
3. Main landing gear down tubes must be 1.25" square tubing
4. There must be leading edge wing rib 6" from the root rib on each wing
5. The windshield must be formed, not flat-wrap Lexan
6. Cast-type Matco wheels, fitting to SG-12 axle and spring gear (not the spun Matco wheels)

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

Notes:

- Refer to the engine manufacturer's latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.

2.8 Control surface deflections

Ailerons	Up: 20 Down: 15°
Elevators	Up: 25° Down: 25°
Elevator tab	TBC
Rudder	Left: 25° Right: 25°
Flap	TBC

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
Maximum Total Weight Authorised: 1450 lbs (some examples 1650 lbs)
CG Range: 10.85" to 19.7" aft of datum (see bulletin 041096RB)
Datum Point is: leading edge of wing.

2.3 Engine Limitations
Maximum Engine RPM: 5800 (Rotax 912-UL/-ULS), 2800 (Lycoming O-235), 2700 (Lycoming O-320)
Maximum continuous engine RPM: 5500 (Rotax 912-UL/-ULS)

2.4 Airspeed Limitations
Maximum Indicated Airspeed (V_{NE}): 143 mph
Max Indicated Airspeed Flaps Extended: 80 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

Supplied by Murphy, can be downloaded from Murphy website (check website for current version).

Maintenance manual dated "6/26/2001"

3.2 Standard Options

- Cantilever leg undercarriage or bungee sprung undercarriage
- Pre-moulded wrap-around windscreen

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

In the absence of any over-riding LAA classification, inspections and modifications published by the manufacturer should be satisfied according to the recommendation of

the manufacturer. It is the owner's responsibility to be aware of and supply such information to their Inspector.

Ref	*Date*	*Description*	*Factory compliance status*
080520Reb	9/5/2000	Vertical tailpost attachment – reinforcement	High urgency
041099RB	4/10/1999	Tailwheel attachment bolt to be threadlocked	Requirement
051198RB	11/5/1998	Spring gear attachment – bolt torque important	Requirement
041196RB	11/4/1996	Welded wing tanks – wing skin integrity	Information
041096RB	10/4/1996	Weight and CG limits	Information
062695RB	26/6/1995	Drilling holes in bungee gear legs – location important	Information
070395RB	3/7/1995	Fuel system update – sight gauges	Recommended
071095RB	10/7/1995	Gross weight increase on floats	Information
110520Reb	18/4/1995	Uprated elevator trim horn	Medium urgency

Refer to Murphy website where bulletins can be downloaded.

3.4 Special Inspection Points

- Creasing of firewall at upper engine attachments following heavy landing.
- With cantilever spring legs, distortion around leg attachments following heavy landing.
- Damage to cabin roof around mounting bracket for aileron/flap controls if aircraft left outside in wind with controls slamming.
- Damage to tailcone wrap in vicinity of tailspring attachment bolts.

3.5 Operational Issues

The following *Safety Spot* articles are relevant to Murphy Rebel aircraft:

Light Aviation Jun 2018 *Murphy Rebel: Loss of control during landing*

A Rebel aircraft suffered damage following a groundloop incident, the article notes 'stiff' wheel bearings and their part in the groundloop.

Light Aviation Jun 2012 Murphy Rebel Elite: Throttle cable failure

An emergency landing had to be made when a Murphy Rebel fitted with a Wilksch WAM 120 diesel suffered a failure on the throttle cable. This failure and the design of the injection jump put the engine into idle.

Light Aviation Nov 2011 *Murphy Rebel: Tailplane strut end*

A Murphy Rebel tailplane lower strut failed in a similar manner to one which failed a few years prior. Article discusses the various reasons and inspection points.

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