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4th Part of Report No. A.& A.E.E./814;a

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Corsair F. Mk.II JT.259 & JT.257
(Double Wasp 2800-8)

Handling trials

This report deals with the aircraft (or equipment) as tested. Action to remedy defects, or decisions to accept items not in strict compliance with the specification, are matters for decision and action by the Ministry of Aircraft Prodn

A.& A.E.E. ref:- CTO/AS.83/2.
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Period of tests:- November 1943 - January 1944.

Progress of issue of report

Report No.	Title
1st Part of A.& A.E.E./814,a.	JT.259 - Tests to determine the aftmost acceptable C.G. position.
2nd -do-	JT.259 - Flame damping trials with two groups of three exhaust pipes.
3rd -do-	JT.257 - Carbon monoxide contamination tests.

1. Summary.

The results of tests to determine the aftmost acceptable centre of gravity position on the Corsair F. Mk.II were reported in the 1st part of this report. The present report gives comments on the layout of the cockpit and on the handling characteristics which were not covered by the previous report.

A full report on the Corsair F. Mk.I was given in the 6th part of Report No. A.& A.E.E./814. The Mk.I and Mk.II were similar in behaviour. The present report is mainly confined to the differences between the two.

2. Condition of aircraft relevant to tests made.

2.1. General. The principal external features of the aircraft which were common to both JT.259 and JT.257 were:-

The wing span was reduced by 1'6" compared with the Corsair I, by fitting modified wing tips.
3 x 0.5 inch guns in each wing with muzzles and ejection chutes sealed.
Intakes for engine, oil cooler and intercooler in leading edge of wing.
Windscreen and sliding hood modified from those on Corsair I aircraft. These are shown in the photographs attached to the 1st Part of this Report.
3 stub exhausts on each side of engine forward of wing.
Wireless mast forward of cockpit with aerial.
I.F.F. aerials between fuselage and tailplane.
Retractable tailwheel.
Arrestor hook at tail.

In addition JT.257 had air scoops on each side and an extractor under the fuselage, fitted in connection with carbon monoxide contamination tests.

Details of the internal layout of the cockpit where this differs from that on the Corsair I, are given in para. 4.

2.2. Weights and loading data. JT.259 was flown at the following loadings:-

Weight lb.	CG posn. ins aft of the horizontal reference line	
	With u/c down	With u/c up
(a) 10,325	96.3	97.6
(b) 11,880	100.2	101.3
(c) 12,070	101.2	102.3

/Loading

Courtesy Neil Stirling

Loading (b) is that obtained when the aircraft is carrying the short range fighter load. The practical centre of gravity range with undercarriage down is from 96.5 inches to 100.2 inches aft of the horizontal reference line or 101.2 inches including the 1% S.M.C. aft extension. Thus the above three loadings correspond approximately to the forward, aft and extended aft limits of the range.

JT.257 was flown at the following loading:

	Weight lb.	CG position. ins aft of the horizontal reference line	
		With u/c down	With u/c up
(d)	11,870	100.1	101.2

i.e. at the short range fighter load.

3. Scope of tests.

The tests on JT.259 covered layout of cockpit and the handling qualities on the ground and in the air.

Night flying trials were made on JT.257.

4. Results of tests.

4.1. Cockpit layout. The cockpit layout was similar to that on the Corsair I apart from the following points:

(a) Seating position and hood. The seat has been raised compared with the Mk.I and moved forward slightly. At the same time the windscreen has been raised and the hood shape also modified. It is obvious that some improvement in view forward must have resulted from these two changes, but the improvement was not very noticeable to the pilot. When taxying it was not possible to see directly forward owing to the tail down attitude. The view forward and downward for landing was still poor.

Three rear view mirrors were fitted inside the hood, one at the top and one at each side. These gave some view to the rear, but also added to the obstructions to view forward caused by the thick members of the hood and windscreen.

The view upwards and to the rear was considerably obstructed by a large metal panel at the top rear of the hood.

The hood operating lever was mounted on the forward framework of the hood on the left hand side of the cockpit. Forward or backward pressure on this lever raised the locking catches and the hood was then free to move. This arrangement was an improvement on that fitted on the Corsair I.

With the hood open, there was considerably more draught in the cockpit than on the Mk.I, the aircraft was more draughty than desirable even at slow speeds on the approach glide.

(b) Control column. The control column was slightly longer than on the Corsair Mk.I owing to the raised and more forward position of the seat, the equivalent position of the control column relative to the pilot was similar to that on the Mk.I, and the comments made in the report on Mk.I still apply.

(c) Undercarriage control lever. The undercarriage control lever was placed in the same position as on the Corsair I. An additional lock was fitted to the lever to prevent inadvertent retraction on the ground. This consisted of a spring loaded metal strip which had to be held back whilst at the same time the knob on the lever was pulled out and the lever moved to the up position. This was extremely difficult to operate.

/(d)

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(d) Gill control. The control lever for moving the engine cowling gills was longer than on the Corsair I and operation was as a result easier.

(e) Cockpit illumination. The cockpit was illuminated by four ultra-violet lamps in the cockpit. Two faced forward and illuminated the main instrument panel, and the other two were low down on each side and illuminated the trimmers and the main switchboard. The lighting of the instrument panel was very good. With the lamps dimmed as much as was possible, the lighting was still rather bright and likely to have an adverse effect on the pilot's night vision.

The trimmers, flap and undercarriage indicators were all easily seen. On the starboard side, the luminous topsto the electrical switches were also visible excepting where they were obscured by part of the radio equipment. The resistances for controlling the ultra-violet lighting were completely obscured by this radio equipment and this made control of the lighting more difficult.

In addition to the ultra-violet lighting, an ordinary white light, high up on the panel, was provided for illuminating the chartboard. This light tended to dazzle the pilot, whilst casting a shadow on the instrument panel.

During tests the main cockpit light switch was inadvertently knocked off. This switch controls the 4 ultra-violet lights and also the white light. On switching on again, only the white light came on. It was subsequently discovered that to make the ultra-violet lamps work, it was necessary to turn the resistances controlling the lights, full off, before remaking the circuit, and then to allow a period for the lamps to warm up. It is considered that this point should be stressed in any instructions to pilots as without the ultra-violet lights, there is no illumination for the instrument panel.

4.2. Handling and flying qualities. The handling qualities were in general the same as on the Corsair I (See 6th Part of Report No. A.& A.E.E./814). The following additional comments are made. Unless otherwise stated the comments apply equally to all loadings.

4.21. Take-off, stability, control characteristics and general.

Manoeuvreability - As on Corsair I.

4.22. Stalling characteristics. Stalling speed -

flaps and undercarriage	up	96 mph ASI
" " "	down	83 mph ASI.

With flaps and undercarriage either up or down the stalling characteristics were similar to those on the Mk.I, but the nose and right wing dropped slightly more sharply at the stall.

4.23. Dives. At loading (b) the aircraft was dived at full throttle to the limiting diving speed of 460 mph ASI. It was not possible to reach this speed without trimming into the dive, the control force becoming excessive at speeds above about 400 mph ASI. In addition, owing to the heaviness of the elevator control, it was very difficult to increase the angle of dive once a high speed had been reached. To reach a speed of 460 mph ASI it was necessary to trim the aircraft nose heavy as soon as the dive was entered and to push the aircraft into a steep dive. Even so the angle of dive tended to decrease before the limiting speed was reached. The aircraft was otherwise steady in the dive, but all controls were very heavy and almost immovable at the limiting speed.

On releasing the control column, the aircraft started to recover quickly. With the aircraft partly trimmed into the dive, there was no tendency for excessive accelerations to be reached. At slower speeds with the aircraft trimmed into the dive, a heavy pull force was required to effect recovery.

4.24. Approach and landing. Approach and landing were the same as on the Corsair I, there being little improvement in view.

It was reported on the Corsair I, that there was a series of loud bangs from the rear of the fuselage after touch down. It has been found that this

/was

was caused by the sudden full extension of the tail oleo as the tail lifted during the run. Thus although the noise made was alarming this feature is not considered to be very serious.

4.25. Night flying. These tests were made on JT.257 at loading (d). The aircraft was flown at night in connection with flame damping trials. The night was clear except for smoke haze, and with the moon in the second quarter. The flights were made using the airfield boundary lights and Drem lights only.

Take-off was straightforward. With the tail down the view of the lights was bad. The tail came up quickly, however, and a satisfactory view was then obtained.

In flight the handling characteristics were satisfactory for night operation. There were no reflections of the flying instruments in the windscreen, but the sliding hood reflected the moon, particularly when it was on the beam.

The framework of the windscreen was thick and caused considerable obstruction to the view forward. This obstruction was accentuated by the glass of the reflector sight, mounted high up on the armoured glass, which made the top half of the windscreen darker to see through and the bottom edge of the glass gave a false horizon.

The approach to the landing strip was made along a curved path, and provided this was done a reasonably good view of the Drem lights was obtained. Landing was straightforward but after touch down when the tail went down, the view forward was very bad and it was very difficult to keep the aircraft straight on the landing strip.

5. Conclusions.

The handling characteristics on the Corsair II show no appreciable difference from those on the Corsair I.

The modified cockpit hood and raised seating position has effected little improvement in the view forward for take-off and landing. The view for landing remains bad.

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