



ANALYZED

A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT: C105

REPORT NO. 7/0554/12

FILE NO.

NO. OF SHEETS 15

TITLE:

PRELIMINARY INVESTIGATION

CENTRE FUSELAGE TORSION

~~CONFIDENTIAL~~

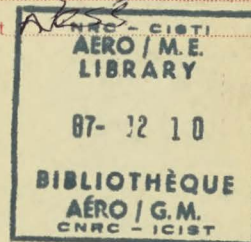
Classification cancelled / Changed to UNCLASS

By authority of ARS

Date 30 Sept 96

Signature [Signature]

Unit / Rank / Appointment ARS



PREPARED BY S. K. HARLEY

DATE MAR / 85

CHECKED BY

DATE

SUPERVISED BY

DATE

APPROVED BY

DATE

ISSUE NO.	REVISION NO.	REVISED BY	APPROVED BY	DATE	REMARKS
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AVRO AIRCRAFT LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT

REPORT No 7/0554/12

SHEET No 1

AIRCRAFT:

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INTRODUCTION

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THIS REPORT IS A PRELIMINARY INVESTIGATION OF THE TORSION LOADS IN THE CENTRE FUSELAGE IN THE MISSILE BAY AREA, AND THE MANNER IN WHICH THE TORSION MAY BE REACTED.

A TYPICAL SECTION BETWEEN STN 255 & STN 332 IS CHOSEN. A TORQUE DISTRIBUTION IS FOUND, AND SHEARS IN THE BUTTS AND SKIN DUE TO THE MAXIMUM TORSION CASE ARE COMPUTED.

THE EFFECT OF TORQUE ON THE TOP SKIN CUTOUT BETWEEN STN 303.5 & 315 IS EXAMINED.

A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 710552-12

SHEET NO. 7

AIRCRAFT:

PREPARED BY

DATE

S. YOUNG

FEB 11/53

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DATE

DUCT KINK LOADS - ULT FACTOR 1.365

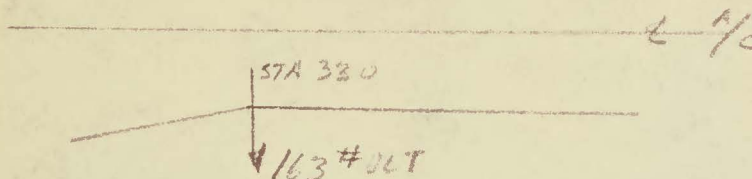
GROUND SUCTION CASE

ULT SUCTION = -4.1365 PSI

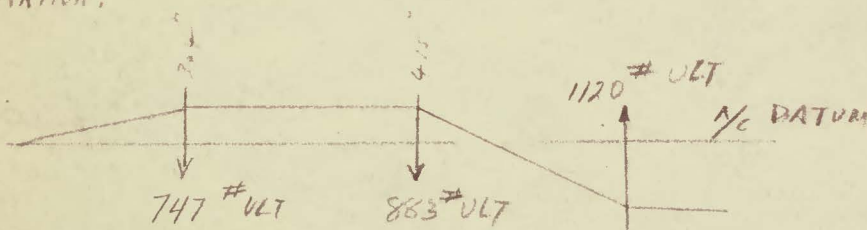
KINK LOADS ARE $\frac{-4.1365 \text{ PSI ULT}}{+31.9 \text{ PSI ULT}} = -.171 \text{ OF}$

MAX PRESSURE KINK LOADS.

PLAN:



ELEVATION:





AVRO AIRCRAFT LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT

AIRCRAFT: C108

REPORT NO. 710554/12

SHEET NO. 13

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FROM P. 8, MAX TORQUE = 1.8525×10^6 IN LB

$$\therefore T_2 = .06125 \times 1.8525 \times 10^6 = .11346 \times 10^6 \text{ IN-LB}$$

$$\& T_1 = .877 \times 1.8525 \times 10^6 = 1.6246 \times 10^6 \text{ IN-LB}$$

DUCT AREA = 1020 IN^2 [P.12]

\therefore DUCT SHEAR FLOW DUE TO TORSION

$$q_2 = \frac{.11346 \times 10^6}{2 \times 1020} = \underline{55.6 \text{ LB/IN}} \text{ WT}$$

FUSELAGE AREA = 4968 IN^2 [P.12]

\therefore SKIN SHEAR DUE TO TORSION

$$q_1 = \frac{1.6246 \times 10^6}{2 \times 4968} = \underline{164 \text{ LB/IN}} \text{ WT}$$

A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7/0554/12

SHEET NO. 14

AIRCRAFT:

C105

TORQUE
STH. 255" - 485"

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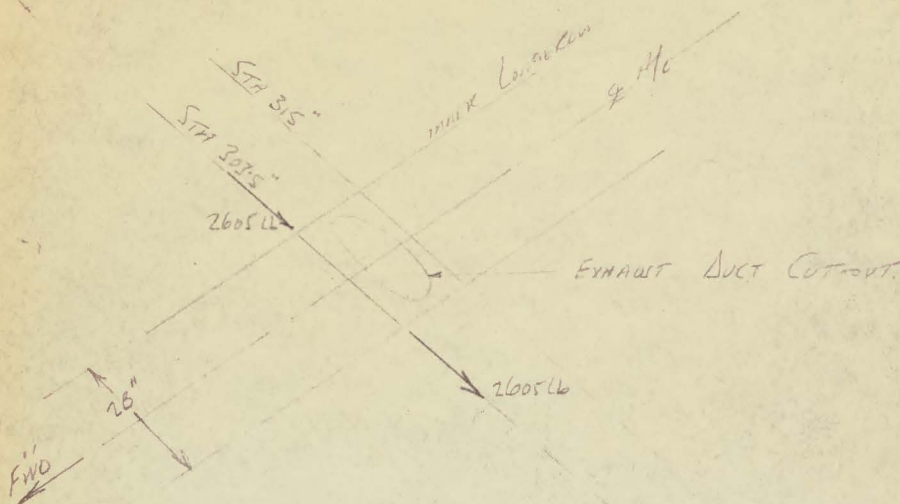
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STH 303.5" - 315"

H CUT-OUT EXISTS OVER THIS REGION
BETWEEN TOP INNER LONGERONS



MAX. TORQUE = 185,250 in LL ULT.

ASSUME OUTER SKIN EFFECTIVE ONLY

$$A = 4968 \text{ in}^2$$

$$q = \frac{T}{2A} = \frac{185250}{2 \times 4968} = 186 \text{ LL/in ULT.}$$

TORQUE LOAD BETWEEN LONGERONS

$$P_T = q \times 28"$$

$$= 186 \times 28 = 5,210 \text{ LL ULT}$$

$$= 2605 \text{ LL ULT / SIDE}$$

NOTE! THIS IS DUE TO TORQUE ONLY.

