

O T T A W A

October 30th, 1941.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1112.

Examination of a Welded Steel Section
from the Undercarriage of an Anson Aircraft.

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BUREAU OF MINES
DIVISION OF METALLIC MINERALS
—
ORE DRESSING AND
METALLURGICAL LABORATORIES



CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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from the Undercarriage of an Anson Aircraft.

Source of Material and Object of Investigation:

On October 28th, 1941, Flight Lieutenant A. J. Smith, of the Department of National Defence (Air Services), Ottawa, Ontario, brought in a welded section of the undercarriage of an ANSON aircraft for examination. The material was stated to have been manufactured to Specification D.T.D. 124-A.

It was requested that the steel be examined

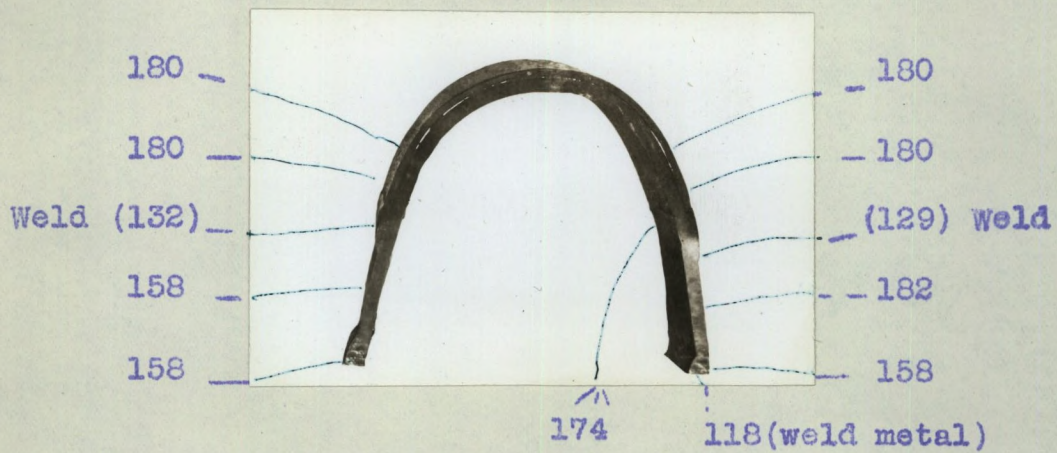
(Source of Material and Object of Investigation, cont'd) -

to this specification in order to determine the effect of the weld on the properties of the parent metal.

Hardness Tests:

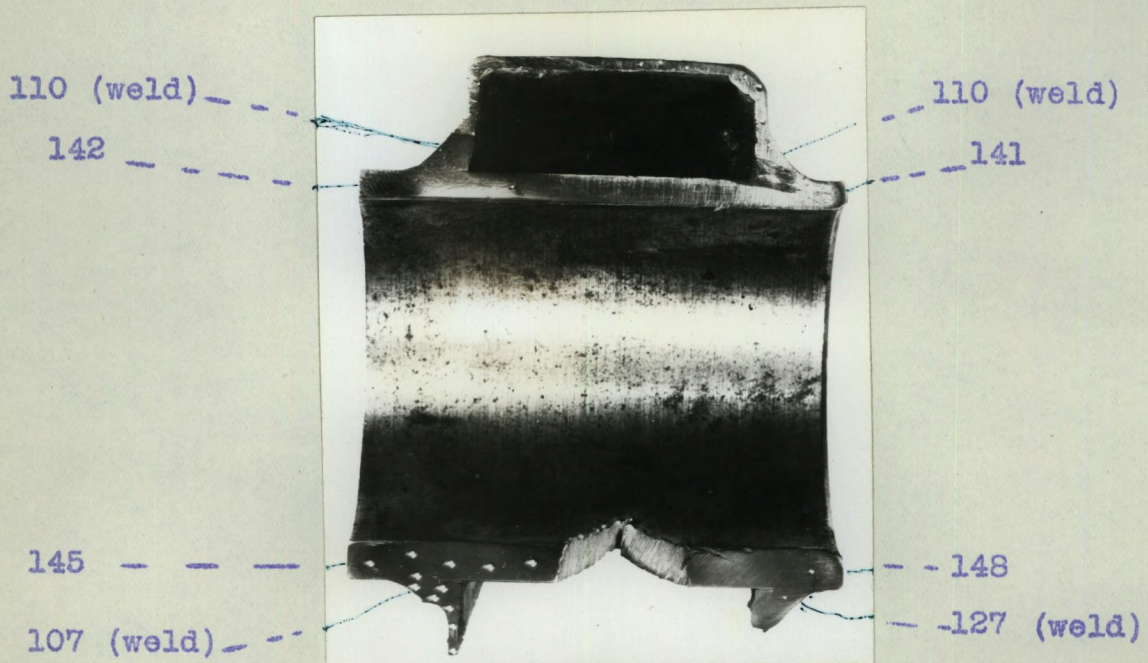
The hardness of the metal was determined by the Vickers method (10-kilogram load) and the following results were obtained:

Figure 1.



Approximately 7/8 size.

Figure 2.



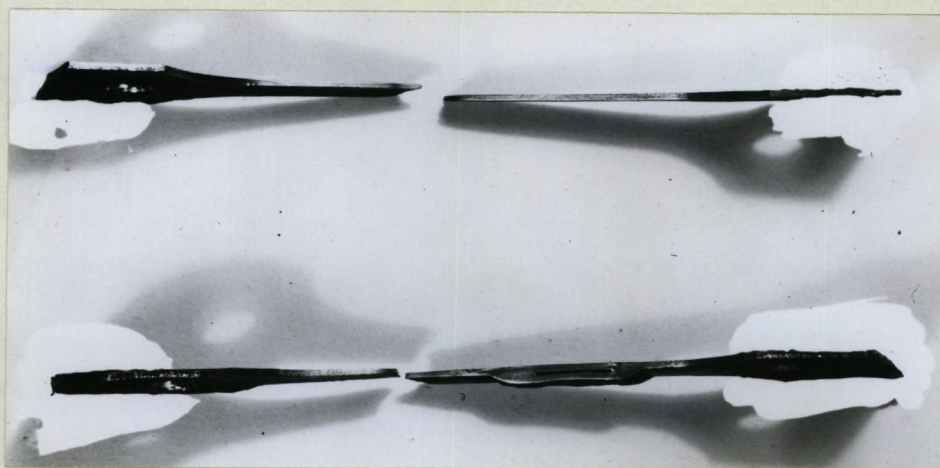
Approximately to size.

Chemical Composition:

	<u>Specification</u>	<u>Found</u>
Carbon, per cent -	0.25 max.	0.24
Manganese, per cent -	1.75 max.	1.58

Physical Properties:

Figure 3.



To size.

The above photograph shows the location of the break in the parent metal of the welded and unwelded tensile test specimens. The following results were obtained:

<u>Specimen</u>		<u>Ultimate stress, p.s.i.</u>	<u>Yield point, p.s.i.</u>	<u>Elongation, per cent in 2 inches</u>	<u>Bend test</u>
SPECIFICATION	-	67,200	none	20.0	-
Parent metal	-	72,800	56,900	30.0	Passed
Welded metal	-	72,500	57,600	12.0 [⊗]	

[⊗] Welded section in the gauge length.

Microscopic Examination:

The photomicrograph shown below (Figure 4) indicates that the structure of the weld is normal for this type of material. There is no evidence of the presence of any martensitic constituent.

Figure 4.



X100, etched in
2 per cent Nital.

Discussion of Results:

The survey made of the hardness of the material at and adjacent to the weld showed that the steel conforms very closely to Section II, Clause 8, of the specification. In addition, the microscopic examination showed that the material was free from any embrittling constituent.

The carbon and manganese contents of the steel were found to be within the specified limits. The physical properties were also found to be satisfactory.

Conclusion:

From the results of the examination of this specimen it may be concluded that the physical properties are not impaired in any way by the welds.

If this specimen is representative, then the welded sections may be considered to be quite satisfactory.

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