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Watertown Arsenal Laboratory
Report Number 640/151
Problem Number D-13.3

9 February 1945

WELDING OF ARMOR

Summary of Ballistic Shock Test Results for
1 Inch and 3/4 Inch Homogeneous Armor "H" Plates Welded with
Austenitic Electrodes and Tested at Aberdeen Proving Ground
During the Period of 1 April 1943 Through 31 March 1944

OBJECT

To tabulate firing record data for subject plates and to present a comparison of ballistic shock performance of plates made with various materials and welding procedures.

SUMMARY

1. Data from Aberdeen Proving Ground firing records for 113 welded armor "H" plates have been tabulated on the accompanying charts and tables.
2. No correlation is evident between chemical composition of either weld or plate metals and amount of ballistic cracking. Steel quality (cleanliness and directional properties) of rolled armor appears to affect the amount of both weld and plate cracking. The amount of plate cracking in cast armor "H" plates was excessive indicating inadequate hardenability or poor heat treating practice for the majority of the cast armor compositions.
4. No single joint design or welding procedure variable appeared to affect the ballistic cracking significantly.
5. Seven Unionmelt plates included in the rolled 3/4 inch thick armor group showed lower average ballistic cracking than the 3/4 inch thick hand welded plates. However, due to inconsistencies in cracking for successive impacts all but one of these plates was judged no-test or unsatisfactory by Aberdeen Proving Ground. The satisfactory plate was welded with one Unionmelt pass and seven hand passes.

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INTRODUCTION

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This is the eighth of a series of reports presenting tabulation of ballistic shock test results and welding procedure variables for "H" plates welded by commercial fabricators. A previous report (WAL 640/89) dealt with "H" plates of 1 inch and 3/4 inch thicknesses which were welded with austenitic electrodes and tested at Aberdeen Proving Ground during the period of 1 October 1942 through 31 March 1943. The present tabulation includes all firing records received by this arsenal for "H" plates of 1 inch and 3/4 inch thicknesses which were welded with austenitic electrodes and tested at Aberdeen Proving Ground between 1 April 1943, and 1 April 1944.

Data from 113 firing records are tabulated on the charts of Appendix A. An index of fabricators, armor manufacturers and electrode manufacturers is given in Table I. A summary of current ballistic shock test specification requirements and a key to tabulation methods and symbols used in this report are included in Appendix A.

GENERAL COMMENTS

For the purpose of this report all cracking in weld metal or armor plate within 1/8 inch of the edge of weld is included as weld cracking and the remainder as plate cracking. The average weld and plate cracking have been tabulated in terms of the severity of the ballistic test (Table II) but the results do not provide a basis for corrections or allowances for variations in number or velocity of impacts on any one test plate. If the distance from the center of impact to the center of weld is greater than 2 inches for tests made with 75 mm. projectile or than 1-3/4 inches for tests made with the 57 mm. projectile, the impact is not considered as a fair impact with respect to the weld.

In Tables III through XV changes in the more important variables introduced by welding materials and procedures are compared on the basis of average weld and plate cracking. The number of rounds outside specification limits for velocity and location are listed and may be taken into consideration in comparing effects of armor and welding variables. The effect of including these rounds is to lower the average cracking, but a considerable amount of cracking was caused by unfair rounds and since the proportion of fair to unfair rounds is about the same for any group of plates, the averages as shown appear to be suitable for indicating the more important effects of welding materials and procedures on ballistic performance.

HAND WELDED, 1 INCH THICK ROLLED ARMOR "H" PLATES

Tables III through VIII show comparisons of average cracking per round for these plates in terms of welding fabricator, armor manufacturer and processing, electrode, joint design, welding procedure, and radiographic soundness data.

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The performance of "H" plates welded by any one fabricator (Table III) is dependent upon armor and electrodes used as well as welding procedure and inspection control. Plates welded from Great Lakes and Youngstown armor plate show higher average plate cracking than those welded from Jones and Laughlin armor which is an indication of better quality of the latter steel (cleanliness and directional properties). The number of plates tested with Republic armor is insufficient to indicate its quality. In previous tabulations the amount of weld cracking has been correlated with steel quality, but the amount of weld cracking for plates welded with Jones and Laughlin armor is exceptionally high here, probably because a large portion of these plates was welded by one fabricator with a particular welding procedure and all of these plates performed poorly. No correlation is evident between amount of ballistic cracking and chemical composition of either weld or plate metal.

The majority of these plates were welded with a 60° included angle double V joint preparation. There are an insufficient number of plates with other joint preparations to draw comparisons. Most of the plate edge preparation was by flame cutting and grinding, but plates which were welded as flame cut showed no greater average weld cracking. Root gap width, which varied only from 3/16 to 3/8 inch, had no significant influence on ballistic performance.

The total number of passes used in completing the weld varied from 6 to 15 but no effect of this variation on ballistic performance is evident. The use of straight weave versus bead deposition techniques for root, body and crown of welds are compared. It has been demonstrated¹ that fusion zone cracking which is the most common type of failure in hand welded plates may be minimized by employing a welding technique which breaks the continuity of the fusion line, i.e. depositing a heavy, wide crown. It is probable that this may be done with either a full weave or annealing bead technique, though perhaps more easily with the latter method. Unfortunately the firing record data are inadequate to determine the joint geometry and no trends are established in these tabular comparisons.

No advantage is shown for the use of preheat. Radiographic unsoundness is associated with a slight increase in ballistic cracking of the welds.

HAND WELDED, 1 INCH THICK CAST ARMOR "H" PLATES

These plates were tested with the 57 mm. T-1 projectile. The allowable weld cracking for a striking velocity of 975 f/s is 6 inches as opposed to 17 inches for 1 inch thick rolled armor "H" plates tested with the 75 mm. projectile at 725 f/s striking velocity. As shown in Table II the proportion of plate to weld cracking is very high for the cast armor "H" plates indicating insufficient alloy or inadequate heat treatment of the armor. Notches and residual stresses unavoidably introduced by welding promote cracking in a welded "H" plate under a ballistic shock which would not affect unwelded plate. Table IX shows the ballistic performance of plates welded with various armor types. One plate welded from Symington Gould armor performed exceptionally well.

It is impossible to obtain a fair test of the weld because of the excessive plate cracking, and tabular comparison of the electrode, joint design, and welding procedure variables revealed no significant effects.

1. Watertown Arsenal Laboratory Report No. WAL 640/140 "Welding of Armor - .40% C Experimental 1-1/2 Inch Thick Rolled Homogeneous Armor Plate", 9 November 1944.

HAND WELDED, 3/4 INCH THICK ROLLED ARMOR "H" PLATES

Tables X through XV show comparisons of average cracking per round for these plates in terms of welding fabricator, armor manufacturer, and processing, electrode, joint design, welding procedure, and radiographic data. Three "H" plates welded with Jones and Laughlin armor plate performed exceptionally well. Two plates welded with Youngstown armor of very similar chemical composition to the Jones and Laughlin armor showed very much greater cracking in both weld and plate an indication of the influence of steel quality. No correlation is evident between amount of ballistic cracking and chemical composition of either plate or weld metal.

A single V 45° included angle joint preparation was used for 21 plates and a double bevel 60° included angle for 16 plates. No significant advantage is shown for either type joint. Plates with bevel prepared by flame cutting and grinding showed no advantage over those prepared by flame cutting alone.

Variation of root gap from 3/32 to 1/4 inch had no effect. One plate with root faces buttered to give a total root gap of 3/4 inch performed poorly.

All plates were welded with a single bead at the root. Variations in the total number of passes or in use of beads versus weaves in body and crown of welds was without effect. Radiographic unsoundness is associated with an increase in ballistic cracking.

UNIONMOLT WELDED, 3/4 INCH THICK ROLLED ARMOR "H" PLATES

Seven Unionmolt welded plates were submitted by Fisher Tank Division of General Motors Corporation. Two plates had no hand welding, one Unionmolt pass being deposited in each side of the double bevel. The remaining five plates were hand welded from one side and a single Unionmolt pass was deposited from the opposite side. By Aberdeen decision only one of these plates was judged satisfactory, two had cracking in excess of the specified limit and four including the two all Unionmolt were judged no test because of inconsistent performance on successive impacts. There are no differences in armor, electrodes, joint design, or welding procedure, sufficient to explain the differences in performance. Only one plate failed to meet the radiographic requirements. The inconsistency in ballistic performance are believed to be due to local differences in joint geometry not indicated by firing record data and to differences in eccentricity (distance from center of impact to center of weld). Nevertheless, the average weld cracking for the Unionmolt welded plates was less than the average cracking for the 3/4 inch thick hand welded rolled armor "H" plates.



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TABLE I

Index to Plates

Hand Welded 1 Inch Thick Rolled "H" Plates

<u>Chart No.</u>	<u>No. of Plates</u>	<u>Fabricator</u>	<u>Armor Mfr.</u>	<u>Electrode Mfr.</u>
1-2	2	American Car and Foundry	Jones & Laughlin	McKay
3	1	Buick Motor Division	Republic	Crucible
4-11	19	Cadillac	Great Lakes Youngstown Jones & Laughlin	McKay Crucible Page Harnischfeger
12	2	Chain Belt Co.	Great Lakes	Page
13	1	Federal Machine	Republic	Harnischfeger
14	1	Heil Company	Jones & Laughlin	Harnischfeger
15-16	2	Ilco Ordnance	Republic Carnegie-Illinois	Harnischfeger Crucible
17	1	Kalamazoo	Kalamazoo	Crucible
18	1	Southern Calif. Division G.M.C.	Great Lakes	McKay
19-24	12	Ternstedt Mfg.	Great Lakes Jones & Laughlin	McKay Reid-Avery Alloy Rods Page Steel

Hand Welded 1 Inch Thick Cast Armor "H" Plates

25	1	American Type Foundry	Symington-Gould	Metal & Thermit
26-31	14	Cadillac Motor Car Division	McConway Torley Hughes Tool Utility	McKay Harnischfeger Crucible Page Reid-Avery
32	2	Kay Brunner Steel Products	Utility Electric Steel Foundry	McKay
33-37	7	Ternstedt	McConway & Torley	McKay Lincoln Alloy Rods Hollup Page

TABLE I (Cont'd)

Hand Welded 3/4 Inch Thick Rolled Armor "H" Plates

<u>Chart No.</u>	<u>No. of Plates</u>	<u>Fabricator</u>	<u>Armor Mfr.</u>	<u>Electrode Mfr.</u>
38-42	11	Buick Motor	Standard Steel Youngstown Great Lakes Jones & Laughlin	Harnischfeger
43-44	5	Chevrolet Motor	Chevrolet Forge	Lincoln Crucible Crucible Arcos Reid-Avery Page Metal & Thermit
45-54	22	Ford Motor Co.	Ford Motor Co.	
55	1	Standard Ray Equip. Mfg. Co.	Carnegie-Illinois	Hollup

Unionmelt 3/4 Inch Thick Rolled Armor "H" Plates

56-59	7	Fisher Tank	Jones & Laughlin	Allegheny Ludlum McKay Linde Air Products Lincoln
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TABLE II

Ballistic Severity Data - 1 Inch Thick

Velocity f/s	1st Round			2nd Round			3rd Round			4th Round			5th Round			6th Round		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Projectile - 75 mm. T21 - Rolled "H" Plates																		
0 - 2"																		
Velocity Lost				1	18.0	0												
700 - 750*	20	11.8	.3	18	13.7	1.2	8	13.1	.4	2	10.5	0						
751 - 800	18	9.8	3.1	12	11.1	2.1	5	15.1	1.4	1	24.0	0						
801 - 852							2	15.9	0	1	18.3	0						

2 - 4"

700 - 750*

751 - 800

Over 4"

700 - 750*				1	0	0												
751 - 800	3	4.0	4.7	5	0	0												
Over 4"	1	0	0															

Projectile - 57 mm. T1 - Cast "H" Plates

0 - 1-3/4"

Below 950

950 - 1000*

1001 - 1050

1051 - 1100

1101 - 1150

Below 950	3	2.9	4.4	2	3.1	6.8	1	8.3	11.3									
950 - 1000*	7	4.3	6.7	11	5.8	3.5	11	7.9	4.2	4	6.3	.4	3	5.5	7.2			
1001 - 1050	4	2.8	2.9	3	2.9	7.4	5	5.9	5.9	2	3.8	10.9						
1051 - 1100	2	3.0	33.1	2	1.6	0	3	2.2	3.4	1	1.3	0						
1101 - 1150										3	9.0	0						

1-3/4 - 3"

Below 950

951 - 1000

1001 - 1050

Below 950	1	0	10.8				1	0	26.0									
951 - 1000	3	0	3.6	2	0	12.4				2	1.3	3.6				1	8.2	5.0
1001 - 1050	3	0	5.3	1	0	14.8												

Over 3"

950 - 1000

1001 - 1050

950 - 1000	1	0	0															
1001 - 1050				1	0	.8												

* Specified velocity range

A = Number of Rounds

B = Average Weld Cracking

C = Average Plate Cracking

TABLE II (Cont'd)

Ballistic Severity Data - 3/4 Inch Thick

Velocity f/s	<u>1st Round</u>			<u>2nd Round</u>			<u>3rd Round</u>			<u>4th Round</u>			<u>5th Round</u>			<u>6th Round</u>			<u>7th Round</u>			<u>8th Round</u>		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

Projectile - 57 mm. T1 - Rolled "H" Plates

0 - 1-3/4"																								
Velocity Lost	1	9.5	2.5				1	6.0	0															
Below 775	1	8.6	0	2	5.8	0	1	3.0	9.8							1	15.0	8.0						
776 - 825*	23	9.4	2.9	24	10.5	2.1	17	10.3	1.6	6	13.3	3.5	1	11.0	0	3	10.1	5.8				1	13.0	0
826 - 875	4	7.3	7.6	1	10.6	2.4	1	10.0	7.0	1	12.5	2.8	2	14.1	5.1									

1-3/4 - 3"

Below 775	1	0	0				1	5.3	2.3															
776 - 825	5	0	0	8	1.5	1.1	6	2.1	.3	3	1.1	0	3	1.6	.7									
826 - 875										1	1.0	0												

Over 3"

Below 775										1	1.8	0												
775 - 825	3	2.6	2.9	5	.5	1.7	3	.9	1.5	4	.3	0							1	0	0			

Projectile - 57 mm. T1 - Unionmelt Rolled "H" Plates

0 - 1-3/4"

Below 775	1	6.3	1.9																					
776 - 825*	4	7.9	1.1	4	6.4	4.7	6	10.7	3.3	4	5.8	8.8	1	22.3	0									

1-3/4 - 3"

775 - 825	1	0	0	1	0	0	1	0	0	1	0	0				1	0	0						
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Over 3"

775 - 825	1	0	0	2	0	0				1	0	0	1	0	0				1	0	10.8			
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* Specified velocity range

A = Number of Rounds

B = Average Weld Cracking

C = Average Plate Cracking

TABLE III

Fabricators of Hand Welded 1 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>Armor Fabricator</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Weld Crkg./Rd.</u>	<u>Av. Plate Crkg./Rd.</u>	<u>Remarks</u>
American Car & Foundry	2	6	4.8	0	5 rounds above specified velocity 3 rounds outside 2 inch limit
Buick Motor	1	3	16.5	1.25	
Cadillac	19	41	9.8	2.6	5 rounds outside 2 inch limit 15 rounds above specified velocity
Chain Belt Company	2	5	10.7	.15	5 rounds above specified velocity 1 round outside 2 inch limit
Federal Machine & Welder Company	1	2	17.4	0	
Heil Company	1	3	5.5	0	
Ilco Ordnance Company	2	5	10.5	0	5 rounds above specified velocity
Kalamazoo Stove & Furnace Company	1	4	6.7	0	4 rounds above specified velocity 1 round outside 2 inch limit
Southern California Div. of General Motors	1	1	25.0	20.8	1 round above specified velocity
Turnstedt Division of General Motors	11	20	16.9	.5	1 round outside 2 inch limit

Armor Data for Hand Welded 1 Inch Thick Rolled Homogeneous Armor "H" Plates

[illegible]

TABLE IV (Cont'd)

Manufacturer	Type	Chemical Composition	°F.	Heat Treatment		BHN	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld	Plate	Remarks
				Hold (hrs.)	Quench						
Republic Steel	RI	.30 C	1600	1-1/2	Water	255	1	2	17.4	0	
	Below .31 C	1.43 Mn .22 Si .87 Cr .72 Ni .26 Mo	1000	1-1/2	Air						
Youngstown Sheet & Tube	RIII	.25 - .26 C	1600	1/2	Water	321-	4	10	9.0	2.1	4 rds. above specified velocity 1 rd. outside 2 inch limit
		1.44 - 1.50 Mn .18 - .21 Si .26 - .30 Mo	875	2-1/2	Air	341					

TABLE VIII

Radiographic Data for Hand Welded 1 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>Radiographic Results</u>	<u>Projectile</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd.</u> <u>Weld Plate</u>	<u>Remarks</u>
Passed	75 mm. T21	32	76	11.15" 1.24"	33 rds. above specified velocity 11 rds. outside 2 inch limit
Failed	75 mm. T21	11	22	10.34 2.09	14 rds. above specified velocity

TABLE V

Electrode Data for Hand Welded 1 Inch Thick holed Homogeneous Armor "H" Plates

[illegible]

TABLE V (Cont'd)

<u>Electrode Mfr.</u>	<u>Brand</u>	<u>Weld Metal Composition</u>	<u>Coating</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld</u>	<u>Plate</u>	<u>Remarks</u>
Page Steel & Wire Company		.11 - .15 C 3.60 - 4.0 Mn .32 - .43 Si 20.10 - 22.32 Cr 9.6 - 10.25 Ni .29 - .85 Mo	Lime	13	28	16.43	.44	6 rds. above specified velocity 2 rds. outside 2 inch limit
		.158 C 1.94 Mn .22 Si 19.41 Cr 10.96 Ni 1.78 Mo	Lime	2	5	10.65	.18	5 rds. above specified velocity 1 rd. outside 2 inch limit

TABLE VI

Joint Design Data for Hand Welded 1 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>Angle of Bevel</u>	<u>Projectile</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld Plate</u>		<u>Remarks</u>
30° DW	75 mm. T21	1	2	17.37"		
45° K	75 mm. T21	1	4	11.56	.94"	4 rds. above specified velocity
45° DW	75 mm. T21	4	8	9.42	2.68	4 rds. above specified velocity
54° DW	75 mm. T21	2	5	10.45	0	5 rds. above specified velocity
60° DW	75 mm. T21	34	80	11.21	1.60	35 rds. above specified velocity 11 rds. outside 2 inch limit
<u>Root Gap</u>	<u>Projectile</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld Plate</u>		<u>Remarks</u>
3/16"	75 mm. T21	12	28	11.05"	4.08"	23 rds. above specified velocity 4 rds. outside 2 inch limit
1/4	75 mm. T21	20	40	12.06	.63	13 rds. above specified velocity 5 rds. outside 2 inch limit
9/32	75 mm. T21	7	20	11.01	.29	2 rds. outside 2 inch limit
5/16	75 mm. T21	2	5	8.00	.17	5 rds. above specified velocity 1 rd. outside 2 inch limit
5/16 - 3/8	75 mm. T21	1	3	13.08	0	3 rds. above specified velocity

TABLE VII

Welding Procedure for Hand Welded 1 Inch Thick Rolled Homogeneous Armor "H" Plates

No. of Passes	Projectile	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld Plate		Remarks
6	75 mm. T21	12	22	15.86"	.75"	8 rds. above specified velocity 1 rd. outside 2 inch limit
8	75 mm. T21	9	17	9.65	5.43	9 rds. above specified velocity 2 rds. outside 2 inch limit
9	75 mm. T21	1	3	16.50	1.25	
10	75 mm. T21	9	23	8.71	1.59	15 rds. above specified velocity 3 rds. outside 2 inch limit
12	75 mm. T21	6	16	12.11	.19	1 rd. outside 2 inch limit
13	75 mm. T21	1	4	6.69	0	4 rds. above specified velocity 1 rd. outside 2 inch limit
14	75 mm. T21	4	11	8.70	.08	8 rds. above specified velocity
15	75 mm. T21	1	2	13.12	0	2 rds. above specified velocity
Root Deposition Type	Projectile	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld Plate		Remarks
I Single Bead	75 mm. T21	1	3	16.50"	1.25"	
II Two Beads	75 mm. T21	40	91	11.1	1.1	47 rds. above specified velocity 8 rds. outside 2 inch limit

TABLE VII (Cont'd)

Body Deposition Type	Projectile	No. of Plates	No. of Rounds	Av. Crkg./Rd.		Remarks
				Weld	Plate	
I Layers only	75 mm. T21	39	89	11.15"	1.72"	46 rds. above specified velocity 11 rds. outside 2 inch limit
II Beads only	75 mm. T21	1	2	17.50	0	
III Layer and Beads	75 mm. T21	3	7	11.21	0	7 rds. above specified velocity 1 rd. velocity lost
Crown Deposition Type						
I Single crown	75 mm. T21	22	59	10.04	.75	29 rds. above specified velocity 4 rds. outside 2 inch limit
II and III Multiple crown	75 mm. T21	20	35	13.3	2.9	18 rds. above specified velocity 4 rds. outside 2 inch limit
Preheat °F.						
70 - 100	75 mm. T21	40	87	11.55	1.71	45 rds. above specified velocity 1 rd. velocity lost 10 rds. outside 2 inch limit
120	75 mm. T21	1	3	5.50	0	
200	75 mm. T21	1	1	36.00	0	
400	75 mm. T21	1	4	6.69	0	4 rds. above specified velocity 1 rd. outside 2 inch limit

TABLE IX

Armor Data for Hand Welded 1 Inch Thick Cast Homogeneous Armor "H" Plates

Mfr.	Type	Chemical Composition	°F.	Heat Treatment		BHN	No. of Plates	No. of Rounds	Av. Crkg./Rd.		Remarks
				Hold (Hrs.)	Quench				Weld	Plate	
Hughes Tool Co.	I	.23 - .38 C	1900	10	Water	217-	9	39	3.36"	3.16"	13 rds. above spec. vel. 11 rds. outside 1-3/4" limit
	Mn-Cr	.73 - 1.11 Mn	1650	1 - 4	Water	351					
	Mo-Ni	.32 - .42 Si	1000-								
		.32 - .44 Cr	1200	2 - 4	Air						
		.89 - 1.10 Ni									
		.36 - .54 Mo									
McConway & Torley	III	.28 - .30 C	1800	4	Air	295	4	15	4.65	6.36	12 rds. above spec. vel. 3 rds. outside 1-3/4" limit
	Mn-Mo	1.26 - 1.65 Mn	1650	4	Water						
		.44 - .57 Si	1060-								
		.46 - .47 Mo	1160	4	Water						
	II	.20 - .34 C	1800	4	Air	298-	5	13	6.79	6.41	
	Mn-Cr-	1.46 - 1.65 Mn	1250	2	Water	321					
	Mo	.46 - .47 Si	1600	4	Water						
		.48 - .54 Cr	1050	4	Water						
		.31 - .39 Mo									
	II	.30 C	1860	7	Air	293-	1	3	2.00	0	1 rd. above spec. vel.
	Mn-Cr-	1.40 Mn	1700	5-1/4	Water	302					
	Mo	.38 Si	1020	6-1/4	Water						
		.47 Cr									
		.31 Mo									
Utility Steel	I	.29 - .33 C	1850	6	Furnace	302-	2	6	3.00	17.22	2 rds. above spec. vel. 2 rds. outside 1-3/4" limit
	Mn-Cr	.99 - 1.13 Mn	1250	6	Furnace	321					
	Mo-Ni	.45 - .65 Si	1600	2	Water						
		.46 - .69 Cr	1040	6	Air						
		.46 - .57 Ni									
		.23 - .29 Mo									

TABLE IX (Cont'd)

<u>Mfr.</u>	<u>Type</u>	<u>Chemical Composition</u>	<u>°F.</u>	<u>Heat Treatment</u>		<u>BHN</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd.</u>		<u>Remarks</u>
				<u>Hold (Hrs.)</u>	<u>Quench</u>				<u>Weld</u>	<u>Plate</u>	
Utility Steel (Cont'd)	III Mn-Mo	.24 C 1.62 Mn 1.10 Si .16 Cr .32 Ni .63 Mo	1650 1200	5 3	Water Air	363- 302	1	1	0"	51.75"	1 rd. above spec. vel.
WehrSteel	I Mn-Cr Mo-Ni	.29 - .34 C .79 - 1.04 Mn .30 - .52 Si .61 - .86 Cr .54 - .95 Ni .30 - .42 Mo	1750 1575 1050	4 6 6	Air Water Air	258- 290	2	7	6.6		1 rd. outside 1-3/4" limit 1 rd. above spec. vel.

TABLE X

Fabricators of Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>Armor Fabricator</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld</u>	<u>Plate</u>	<u>Remarks</u>
Buick Motor	11	35	5.8"	1.9"	11 rds. outside 1-3/4" limit 4 rds. above specified velocity
Chevrolet Motor	5	18	8.9	.99	6 rds. outside 1-3/4" limit 1 rd. above specified velocity
Ford Motor	22	77	7.2	2.4	8 rds. above specified velocity 28 rds. outside 1-3/4" limit
Standard Railway	1	3	7.1	.3	1 rd. outside 1-3/4" limit

Armor Data for Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

Mfg.	Type	Chemical Composition	S.F.	Heat Treatment Hold (hrs.) Quench	BHN	No. of Plates	No. of Rounds	Avg. Crkg./Rd. Weld	Plate	Remarks
Carnegie-Illinois	I Mn-Ni Cr-Mo	.26 C 1.06 Mn .19 Si .045 Cr .91 Ni .42 Mo	1625 880	1 2		332- 332	1 3	7.1"	.3"	1 rd. above specified velocity 1 rd. outside 1-3/4 inch limit
Ford Motor	II Mn-Cr-Mo	.25 .. .29 C 1.22-1.49 Mn .23 .. .30 Si .48 .. .72 Cr .05 - .11 Ni .31 - .45 Mo .0013 B	1650 950 1100	1-3/4 - 3 2-1/2 4	- Water Air	321- 341	22 77	7.18	2.39	29 rds. outside 1-3/4" limit 1 rd. below specified velocity 5 rds. above specified velocity
Great Lakes	IV Mn-Cr-Mo-Si	.27 - .32 C .76 - .90 Mn .69 - .76 Si .56 - .68 Cr .14 - .21 Mo .09 Zr	1600- 1650 900 1000	1/2 - 1 1-1/2 - 4	Water Air	311- 363	11 35	6.4	1.4	6 rds. outside 1-3/4 inch limit 1 rd. above specified velocity
Jones & Laughlin	III Mn-Mo	.26 C 1.69 Mn .21 Si .36 Mo	1650 900	1/2 1-1/2	Water Air	341- 352	3 13	2.3	.3	3 rds. outside 1-3/4 inch limit 2 rds. above specified velocity
Youngstown Sheet & Tube	III Mn-Mo	.23 C 1.42 Mn .20 Si .31 Mo	1625	1/2	Water	364- 321	2 5	7.6	5.7	2 rds. outside 1-3/4 inch limit

TABLE XII

Electrode Data for Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

Electrode Manufacturer	Brand	Weld Metal Composition	Coating	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld	Plate	Remarks
Arcos Mfg. Corporation	Chromang	.07 - .11 C 3.26 - 3.88 Mn .26 - .69 Si 16.6 - 19.55 Cr 8.9 - 10.06 Ni .41 - .62 Mo	Titania	7	28	7.5"	1.2"	3 rds. above specified velocity
Crucible Steel Reziatal Corporation		.10 - .15 C 3.93 - 4.90 Mn .21 - .35 Si 19.3 - 20.1 Cr 9.5 - 10.4 Ni .77 - 1.25 Mo	Titania	8	21	5.0	2.6	3 rds. above specified velocity 4 rds. outside 1-3/4" limit
		.08 C 1.82 Mn 20.14 Cr 9.96 Ni 2.00 Mo		2	7	5.86	2.56	8 rds. outside 1-3/4" limit 3 rds. above specified velocity
Harnischfeger	AW3-C	.08 C 3.30 Mn .46 Si 19.86 Cr 10.74 Ni .80 Mo	Lime	2	7	2.28	.36	2 rds. outside 1-3/4" limit
	AW3	.11 C 1.25 Mn .42 Si 19.36 Cr 10.67 Ni 1.36 Mo	Lime	5	16	5.82	2.28	7 rds. outside 1-3/4" limit 3 rds. above specified velocity

TABLE XII (Cont'd)

Electrode Manufacturer	Brand	Weld Metal Composition	Coating	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld	Plate	Remarks
Hollup	Armorod	.079 C 3.41 Mn .32 Si 17.7 Cr 12.6 Ni 1.64 Mo	Mineral	1	3	7.07"	.25"	1 rd. outside 1-3/4" limit
Lincoln Electric	ARW-1	.06 C 4.85 Mn .79 Si 20.20 Cr 9.7 Ni	Titania	3	12	9.04	1.48	5 rds. outside 1-3/4" limit
Metal & Thermit	Murex	.07 C 4.22 Mn .30 Si 19.7 Cr 9.46 Ni	Lime	1	4	9.12	2.12	
Page Steel & Wire Company		.95 - .104 C 3.58 - 4.08 Mn .23 - .40 Si 20.46 - 20.87 Cr 9.74 - 10.12 Ni .61 - .66 Mo	Titania	3	15	6.15	2.76	7 rds. outside 1-3/4" limit 2 rds. above specified velocity 1 rd. below specified velocity
Reid-Avery	Racolley	5.74 - 6.35 Mn .42 - .46 Si 18.10 - 19.38 Cr 9.96 - 10.28 Ni .56 - .65 Mo	Lime	2	5	10.10	2.10	
	Raco	2.00 Mn .40 Si 18.79 Cr 10.60 Ni 2.20 Mo	Titania	1	3	9.00	5.25	1 rd. outside 1-3/4" limit

TABLE XIII

Joint Design Data for Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

Angle of Bevel	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld	Plato	Remarks
45° SV	21	74	7.26"	2.47"	9 rds. above specified velocity 25 rds. outside 1-3/4" limit
60° DV	16	55	6.65	1.51	17 rds. outside 1-3/4" limit 3 rds. above specified velocity
60° SV	1	3	5.25	.83	1 rd. outside 1-3/4" limit
70° DV	1	3	7.08	.25	1 rd. outside 1-3/4" limit

Root Gap	No. of Plates	No. of Rounds	Av. Crkg./Rd. Weld	Plato	Remarks
3/32"	1	5	6.30"	2.30"	3 rds. outside 1-3/4" limit
5/32"	4	13	6.58	2.80	4 rds. outside 1-3/4" limit
3/16"	15	47	8.82"	1.61"	14 rds. outside 1-3/4" limit 3 rds. above specified velocity
5/16"	11	37	6.00	1.84	12 rds. outside 1-3/4" limit 5 rds. above specified velocity
3/16" - 1/4"	1	3	5.25	.82	1 rd. outside 1-3/4" limit
1/4"	5	21	6.3	2.8	9 rds. outside 1-3/4" limit 4 rds. above specified velocity
3/4" (Root faces buttered with 5/32" electrode)	1	4	9.12	2.12	2 rds. outside 1-3/4" limit

TABLE XIV

Welding Procedures for Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>No. of Passes</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld</u>	<u>Plate</u>	<u>Remarks</u>
3	3	12	9.04"	1.43"	5 rds. outside 1-3/4" limit
4	11	41	4.64	1.78	17 rds. outside 1-3/4" limit 4 rds. above specified velocity
5	2	6	6.96	0	1 rd. above specified velocity 1 rd. outside 1-3/4" limit
6	3	12	4.68	2.53	5 rds. outside 1-3/4" limit 1 rd. above specified velocity
7	7	18	9.06	2.44	2 rds. outside 1-3/4" limit 1 rd. above specified velocity
8	2	6	6.54	3.29	2 rds. above specified velocity 3 rds. outside 1-3/4" limit
9	4	13	11.19	1.67	4 rds. outside 1-3/4" limit 2 rds. above specified velocity
10	6	22	7.28	2.72	3 rds. above specified velocity 9 rds. outside 1-3/4" limit
12	1	3	7.08	.25	1 rd. outside 1-3/4" limit
<u>Root Deposition Type</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. Weld</u>	<u>Plate</u>	<u>Remarks</u>
I Single bead	39	133	7.07"	2.01"	47 rds. outside 1-3/4" limit 14 rds. above specified velocity

TABLE XIV (Cont'd)

Body Deposition Type	No. of Plates	No. of Rounds	Av. Crkg./Rd.		Remarks
			Weld	Plate	
I Layers only	25	87	6.28"	1.84"	10 rds. above specified velocity 32 rds. outside 1-3/4" limit
III Layers and beaks	14	46	8.56	2.33	15 rds. outside 1-3/4" limit 4 rds. above specified velocity
<u>Crown Deposition</u>					
I Single crown	18	63	6.59	1.60	23 rds. outside 1-3/4" limit 6 rds. above specified velocity
II & III Multiple crown	21	70	7.57	2.30	23 rds. outside 1-3/4" limit 10 rds. above specified velocity

TABLE XV

Radiographic Data for Hand Welded 3/4 Inch Thick Rolled Homogeneous Armor "H" Plates

<u>Radiographic Results</u>	<u>No. of Plates</u>	<u>No. of Rounds</u>	<u>Av. Crkg./Rd. "Weld" "Plate"</u>		<u>Remarks</u>
Passed	36	123	6.79"	1.97"	43 rds. outside 1-3/4" limit 16 rds. above specified velocity
Failed	3	10	10.55	2.45	3 rds. outside 1-3/4" limit

APPENDIX A

1. Key to tabulation method and symbols.
2. Specification requirements for H plates welded with austenitic electrodes.
3. Tabulation of firing record data for subject H plates.

KEY TO TABULATION METHOD AND SYMBOLS

1. Identification of Test

Information in the first column identifies the test.

2. Armor Data

A. Plate Thicknesses

Plates in this tabulation are of 1 inch and 3/4 inch thick homogeneous armor.

B. Type Armor

Armor compositions are typed as follows:

Typical Analyses

R (Rolled)

	Type	C	Mn	Si	Cr	Mo	Ni	Zr
I	Mn-Ni-Cr-Mo	.26	1.15	.20	.60	.20	1.00	
II	Mn-Cr-Mo	.27	1.30	.25	.55	.42		
III	Mn-Mo	.25	1.60	.22	—	.37		
IV	Mn-Cr-Mo-Si	.27	.86	.79	.62	.17		.09
V	Special	(noted in tabulation)						

C (Cast)

I	Mn-Ni-Cr-Mo	.32	.80	.35	.55	.40	.45	
II	Mn-Cr-Mo	.28	1.55	.45	.40	.12		
III	Mn-Mo	.30	1.58	.40	—	.30		
IV	Special	(noted in tabulation)						

C. Carbon Content

Carbon content is listed as given.

D. Brinell Hardness Number (BHN)

The Brinell hardness numbers on both the front and back of plate are tabulated.

E. Process

This refers to the melting practice and is given as basic open hearth (B.O.H.), acid open hearth (A.O.H.), basic electric (B. Elec.), and acid electric (A. Elec.).

F. Heat Treatment

The temperature, time of hold, and type of quench and draw are given in the firing record.

3. Electrode Data

These data are listed as given in each firing record.

A. Type

Since alloys are sometimes added in the coating, electrodes are typed according to the chemical analysis of the weld metal when given. The types are as follows:

A (Austenitic)

I Mn-Mo Modified 18/8 (Cr-Ni-Fe alloy)
Weld Analysis - at least 1% Mn and .3% Mo.

II Mn Modified 18/8 (Cr-Ni-Fe alloy)
Weld Analysis - at least 1% Mn and less than .5% Mo.

III Mo Modified 18/8 (Cr-Ni-Fe alloy)
Weld Analysis - at least .3% Mo and less than 1% Mn.

B. Current and Polarity

These are to be tabulated as DC straight (str.), DC reversed (rev.) or AC.

4. Joint Design

A. Groove, etc.

This item notes the type of groove - single vee (SV) bevel or double vee (DV) bevel - the included angle, and the width of the root face (RF).

B. Root Gap

This is the distance in inches between the plates as set up for welding.

C. Plate Preparation

This indicates whether the plate edges to be welded together were flame cut, ground, machined, buttered, etc.

5. Welding Procedure

A. Backing

Backing if used, i.e. back-up bar, chill, filler, and spacer strip is noted.

B. Deposition

Figure 1 shows how the weld is broken up into root, body, and crown types. The size electrode is noted with the number of passes, type of passes, and the current and voltage. Passes are divided into two kinds: (a) layer, if the pass bridges the gap; and (b) bead, if the pass does not bridge the gap. SB designates seal bead.

C. Total Welding Time and Interpass Temperature

These are listed as given.

D. Remarks

Any comments on chipping, grinding, or other special techniques used, not noted above but which might affect ballistic properties of welded armor plate, are noted under "remarks".

6. Heat

Preheat and postheat of weldment are tabulated.

7. Ballistic Results

The type projectile used in testing is noted for each plate. Hits, velocity, and location of each, cracking and remarks on cracking, are recorded. Symbols used are as follows:

H.	-	impact number
F/S	-	feet per second
L.L.	-	left leg
R.L.	-	right leg
C.B.	-	cross bar
LOC.	-	location
R.	-	right of
L.	-	left of
X	-	on weld
U	-	above
D	-	below
IMP	-	running from or through impact
O	-	not running from or through impact

Types of cracking:

I	-	Weld (including weld, fusion zone, and heat-affected zone cracking within 1/8 inch from weld)
IV	-	Star plate cracking
V	-	Linear plate cracking

Cracking is measured on the back of the plate.

8. The remarks on cracking and results of radiographic examination are recorded in the last column. P signifies the welded plate passed radiographic inspection, and F that it failed.

SPECIFICATION REQUIREMENTS FOR "H" PLATES
WELDED WITH AUSTENITIC ELECTRODES

From 3 May 1944, to the present, the following requirements have been in effect (as abstracted from Specification AXS-497, Rev. 5, 15 December 1943).

"F-3. Ballistic tests. Test plates required by paragraph F-2a(1)a shall be supported solidly on each of the two sides parallel to the longest welds and with these welds upright. The plate shall be tested for compliance with the requirements of Table II.

TABLE II

Thickness of shock test plate, inches	Type of homogeneous armor	Projectile	Striking velocity f/s, plus or minus 25 f/s	Allowable weld crack- ing, inches, maximum
1-1/2	rolled	75 mm. T21	1200	15
1-1/2	cast	"	1050	10
1	rolled	"	725	17
1	cast	57 mm. T1	975	6
3/4	rolled	"	800	12
1/2	rolled	37 mm. H.E. M54	2525	12
3/8	rolled	"	2025	15
1/4	rolled	"	1625	12

"F-3a. Cracks in the armor parallel to the weld and within 1/8 inch of the edge of the weld shall be considered in the total weld cracking.

"F-3b. All impact velocities specified for cast homogeneous armor are subject to variation depending on the actual armor thickness. This variation shall be based on the velocities specified for testing primary armor and results in velocity of 6 f/s for each increase of 0.01 inch in armor thickness.

"F-3c. Cracking of the plate outside a circle of 6 inches radius, the center of which is the center of impact, or plate cracks greater than 6 inches in length not passing through the point of impact shall be considered cause for reporting "no test". Other types of armor cracking which indicate that the test of the welding procedure is insufficient may also be cause for reporting "no test". The phrase "no test" is defined as that condition existing when the results of the ballistic test are such that it is impossible to arrive at a decision as to the acceptability of the welding procedure.

"F-3d. The impact of the 75 mm. proof projectile T21 or the 57 mm. proof projectile T1 shall touch the edge of the weld to be considered as conforming to the requirements of the test.

"F-3e. The impact of the 37 mm. H.E. projectile M54 shall be within 1-3/4 inches of the weld as measured from the center of the impact to the center of the weld to be considered as conforming to the requirements of the test.

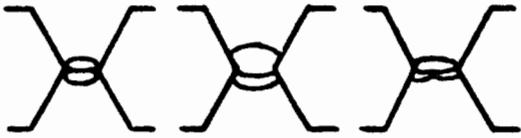
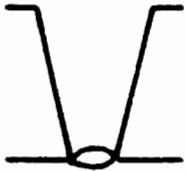
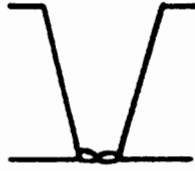
"F-3f. Impacts, the edges of which are more than 2 inches from the edge of the crossbar weld, which cause cracking in the crossbar either on the front or back of the plate, which is not an extension of cracking a leg weld, shall be cause for rejection of the welding procedure.

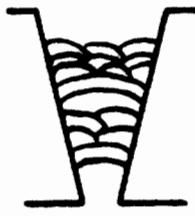
"F-3g. Any inconsistency in the quality of the welding procedure revealed by impact on a ballistic test plate may be considered cause for reporting "no test" at the discretion of the proof officer.

"F-3h. Any length of weld cracking revealed as a result of an impact outside the acceptable limits for impacts shall be cause for rejection of the welding procedure.

"F-3i. Impacts less than 6 inches from the top or bottom edge of the plate, which cause excessive weld cracking, shall be considered as not conforming to the requirements of the test. If, however, the cracking is not excessive and the requirements referred to in paragraph F-3d are met, the impact will be considered acceptable.

"F-3j. Thicknesses not covered by Table II shall be tested as directed by the Chief of Ordnance.

Root types	Type I	Type II
Double V bevel	 Single root bead at center of root	 More than one bead at root etc.
Single V bevel	 Single bead bridging root gap	 More than one bead bridging root gap etc.

Body types	Type I	Type II	Type III	Type IV	Type V
Double V bevel	 Layers only	 Beads only	 Layers & beads	Unionmelt	Special
Single V bevel	 Layers only	 Beads only	 Layers & beads	Unionmelt	Special

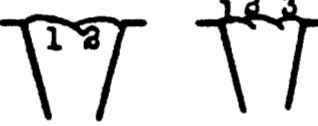
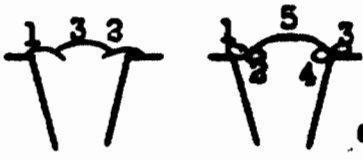
Crown types	Type I	Type II	Type III
Double V & Single V Bevel	 Single Crown Single pass bridges gap	 Multiple Crown Last bead touches parent metal	 Multiple Crown Last bead does not touch parent metal etc.

Fig. 1 Weld Metal Deposition Types

[illegible]

ITEM NO. BY	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS							REMARKS ON CRACKING	
						#	VEL.	LOCATION OF B			CRACKING			RADIOGRAPHIC RESULTS, ETC.
FACTURED INFS. ICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SWH E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST		F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT	
5 1 1 In Company an Car ary Co.	A. 1" B. R III 1.79mm .2181 .0178 .016P .32Mo C. .26C D. Face 321-323 Back 321-325 E. B.O.H. F. 1625 F 1 hr- 9 min. water 975 F 3 hrs. air	A. A I B. Armorloy A 5 C. D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting Grinding	A. Copper B. 1. II 3/16" 1a 140-150 26-30 1a 165-190 26-30 2. I 1/4" 1a 250-280 26-30 1a 250-270 26-30 3. II 1/4" 5b 250-270 26-30 1b 260-275 26-30 C. 4 hrs. 50 minutes 95-180°F D. Grinding time 45 minutes.	A. None B. None	1 2 3	752 788 787	2 1/2" R 2 1/2" L 2 1/2" R	5 1/2" U 6- 5/8" D 6" U	- - IMP	- - I	- - 21"	P	

2.

LOCATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACK
RECORD NO. TEST	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. BHN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING PASSES B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. CROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	N	VEL.	LOCATION OF H			CRACKING			RADIOGRAPHIC RESULTS
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT	
359 /44 Public Steel Corp. able Steel Co. Motor Division	A. 1" B. R I 1.04Mn .27S1 .023S .012P .45Cr .44Ni .14Mo C. .34C D. Face 352 Back 352 E. B.O.H. F. 1650° F 2 hrs. water 800° F 3 hrs. water	A. A I .11-.16C 3.78-4.32 Mn .33-.36Si .008-.022S .008-.030P 18.7-21.0 Cr 9.4-9.5Ni .98-1.05Mo B. Armorize Mn C. TiO ₂ D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Not given B. 1. I 5/32" 1a 130 20 2. I 1/4" 2a 230 26 5/32" 1a 175 24 3. II 5/32" 2b 140 24 1/4" 3b 230-250 26-28 C. 11-1/2 hours 80°-220° F D. Grinding time 1 hour.	A. None B. None	1 2 3	721 739 724		1- 7/8" 9- L 1/8" 1 1/4" L X					F crossbar unacceptable, two 1/4" cracks and one 3/8" hairline crack. IMP I 13 1/2" IMP V 3 1/2" IMP I 36" 53 1/2"

3.

[illegible]

IDENTIFICATION	ANNEAL DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANNEAL MANUFACTURER E. ELECTRODE MPN. F. ANNEAL FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF B	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							F/S	L-L	R-L	C-B	LOC.	TYPE	AMT			
A. AD 370 B. 4/6/43 C. 140 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .083% .0781 D. .0248 .020P E. .02Cr .17Mo F. 27C D. 321 Core E. 311 Surface F. 1650°F 1 1/2 hrs. water 970°F 1 1/2 hrs. air	A. A II B. .09-.10C C. 4.80-4.85Mn D. .55-.66Si E. .008-.025S F. .020-.025P G. 17.90-20.10 H. 9.75-10.20 I. .08-.15Mo J. --- K. --- L. D. AC-REV	A. 60° DV B. 3/16" C. Flame cutting. Grinding.	A. Not given B. 1. II 5/32" 2a 135 25 2. I 3/16" 2a 165 25 3. II 5/32" 4b 140 25 1/4" 2b 240 25 C. 3 hrs. 10 min. 650°F-1400°F D. Chipping time 1 hour 1 min.	A. None B. None	1 2 3	756 767 782	1-7/8" L R R	2 1/2" U 5" D 6 1/2" U	IMP I IMP I	I I I	5" 12"		F Plate is not acceptable due to excess incomplete fusion		
A. AD 451 B. 5/16/43 C. 151 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .091% .0881 D. .0538 .023P E. .02Cr .26Mo F. .02Cr G. 20.20-20.75 H. 10.10-10.30 I. 105-190°F J. 1 hr. K. water L. 980°F 1 hr. M. air	A. A II B. .12-.15C C. 4.50-4.55Mn D. .54-.50Si E. .012-.015S F. .025P G. 20.20-20.75 H. 10.10-10.30 I. 105-190°F J. 1 hr. K. water L. 980°F 1 hr. M. air	A. 60° DV B. 3/16" C. Flame cutting. Grinding.	A. Not given B. 1. II 5/32" 2a 135 25 2. I 3/16" 2a 160 25 3. I 1/4" 2a 240 25 1/4" 2a 240 25 C. 3 hrs. 31 min. 105-190°F D. Chipping time 1 hr. 25 min.	A. None B. None	1 2	794 716	2 1/2" L R	5 1/2" U 5" D O V	IMP I IMP I O V	I I I I I V	12" 14" 9"		P		
A. AD 455 B. 6/17/43 C. 113 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .083% .0851 D. .0178 .023P E. .02Cr .11Ni F. .02Cr G. 21.00-21.55 H. 9.62-10.20 I. .07-.15Mo J. --- K. --- L. D. AC-REV	A. A II B. .09-.12C C. 4.65-4.68Mn D. .55-.64Si E. .027-.025S F. .020-.025P G. 21.00-21.55 H. 9.62-10.20 I. .07-.15Mo J. --- K. --- L. D. AC-REV	A. 60° DV B. --- C. Flame cutting. Grinding	A. Not given B. 1. II 3/16" 2a 190 25 2. I 1/4" 2a 240 25 3. I 5/16" 2a 260 25 C. 2 hrs. 6 minutes 105-205°F D. Chipping time 1 hour 2 min.	A. None B. None	1 2	768 761	1-5/8" R	3 1/2" U 2 1/2" U	IMP I IMP I O I	I I I I I V	10" 7" 4" 21"		F Plate is not acceptable due to the excessive cracking in welds.		

5.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
						S	VEL.	LOC.	CRACKING	CRACKING	CRACKING	CRACKING	CRACKING	CRACKING	CRACKING	
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE INFO. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACK B. DEPOSITION SIDE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT.	RADIOGRAPHIC RESULTS, ETC.			
A. AD 709 B. 6/26/43 C. 156 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .01Mn .7681 D. .025S .023P E. .00Cr .26Mo F. .08Zr G. .26C H. Surface 341 I. Core 388 J. 1625°F ± hr water K. 980°F ± hr air	A. A II B. .15-.16C C. 4.50-4.55Mn D. .34-.50Si E. .01S-.016S F. .025P G. 20.20-20.75 H. Cr I. 10.10-10.30 J. Ni K. B. Armorloy L. C. Lime M. D. DC-REV	A. 60° DV B. 3/16" C. Flame Cutting Grinding	A. Not given B. 1. II 5/32" 2a 140 25 2. I 3/16" 2a 160 25 3. I 1/4" 2a 240 25 C. 2 hrs. 11 minutes 70-195°F D. Chipping time 1 hr. 9 min.	A. None B. None	1	774		2" R	4" U	IMP	I	94"	P		
A. AD 709 B. 6/26/43 C. 157 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .01Mn .7681 D. .025S .023P E. .00Cr .26Mo F. .08Zr G. .26C H. Surface 341 I. Core 388 J. 1625°F ± hr water K. 980°F ± hr air	A. A II B. .15-.16C C. 4.50-4.55Mn D. .34-.50Si E. .01S-.016S F. .025P G. 20.20-20.75 H. Cr I. 10.10-10.30 J. Ni K. B. Armorloy L. C. Lime M. D. DC-REV	A. 60° DV B. 3/16" C. Flame Cutting Grinding	A. Not given B. 1. II 5/32" 2a 140 25 2. I 3/16" 2a 165 25 3. I 1/4" 2a 240 25 C. 2 hrs. 46 minutes 70-190°F D. Chipping time 1 hr. 6 min.	A. None B. None	1	789		1 1/2" R	3" U	IMP	I	94"	P		
A. AD 725 B. 7/6/43 C. 161 D. Great Lakes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. R IV C. .01Mn .7681 D. .025S .023P E. .00Cr .26Mo F. .08Zr G. .26C H. Surface 341 I. Core 388 J. 1625°F ± hr water K. 980°F ± hr air	A. A II B. .15-.16C C. 4.50-4.55Mn D. .34-.50Si E. .01S-.016S F. .025P G. 20.20-20.75 H. Cr I. 10.10-10.30 J. Ni K. B. Armorloy L. C. Lime M. D. DC-REV	A. 60° DV B. 3/16" C. Flame Cutting Grinding	A. Not given B. 1. II 5/32" 2a 125-135 35 2. I 3/16" 2a 165 30 3. I 1/4" 2a 210-220 30 C. 3 hrs. 28 minutes 80-160°F D. Chipping time 1 hr 22 min.	A. None B. None	1	790		1 3/8" L	4" U	IMP	I	6"	P		

6.

IDENTIFICATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE INFO. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. ENH E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF S				CRACKING				RADIOGRAPHIC RESULTS, ETC.
								L.L.	S.L.	C.B.	LOC.	TYPE	LEN.			
A. AD 792 B. 8/19/45 C. 166 D. Youngstown E. Crucible Steel F. Cadillac Motor Car Division	A. 1" B. R III 1.44% .2181 .0138 .025P .28Mo (.28C D. Core 321 Surface 332 E. F. 1600°F ± hr water 875°F 2 1/2 hrs. air	A. A II .05-.06C 1.74-1.76Mn .2281-.41 18.96-19.66 Cr 10.32-10.34 Ni 2.16-2.27Mo B. Armorise C. TiO ₂ D. AC	A. 45° DV B. 1/4" C. Flame cutting Grinding	A. Not given B. 1. II 3/16" 2a 190 25 2. I 1/4" 4a 265 25 3. I 5/16" 2a 370 27 C. None given. 112-212°F D. " "	A. None B. None	1 2	760 777	1" L		4 1/2" D 5- 5/8" 7/8 L U	IMP I IMP V IMP V	16 1/2" 11" 4 1/2"		F x-bar 3/8" crack Not acceptable		
A. AD 792 B. 8/19/45 C. 167 D. Youngstown E. Crucible Steel F. Cadillac Motor Car Division	A. 1" B. R III 1.44% .2181 .28Mo C. 28C D. Core 321 Surface 332 E. F. 1600°F ± hr water 875°F 2 1/2 hrs. air	A. A II .05-.06C 1.74-1.76Mn .22-.4181 18.96-19.66 Cr 10.32-10.34 Ni B. Armorise C. TiO ₂ D. AC	A. 45° DV B. 1/4" C. Flame Cutting Grinding	A. Not given B. 1. II 3/16" 2a 190 25 2. I 1/4" 4a 265 25 3. I 5/16" 2a 370 27 C. None given. 105-210°F D. " "	A. None B. None	1 2	757 752	1 1/2" L	1" R 1" U	9" D	IMP I IMP I IMP V	15 1/2" 10" 2 1/2"		F x-bar 1/8" crack Unacceptable due to cracking.		

7.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CATHODE CURRENT D. SIZE E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. POSITION SIZE EL. DO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S				CRACKING			RADIOGRAPHIC RESULTS, ETC.	
							P/S	L.L.	S.L.	C.B.	LOC.	TYPE	ENT			
A. AD 807 B. 9/28/45 C. 185 D. Jones & Laughlin E. Sage Steel F. Cadillac Motor Car Division	A. 1" B. R III C. 1.71In .2181 .0125 .025P .45% D. .54C E. Face 321 Core 340 F. 1650°F 1 hr water 970°F 1 1/2 hr air	A. A I .145-.16C B. 80-890Pa .32-.3851 .0125 .025P 21.6v 21.71Cr 8.6%Ni .66-.76% B. C. Line D. DC-REV	A. 60° DV B. 9/32" C. Flame cutting. Grinding.	A. Not given B. 1. II 5/16" 2a 165 30 2. I 5/16" 4a 165 30 3. II 5/32" 2b 225 30 1/4" 2b 225 30 Two beads not given. C. 4 hours 21 minutes. 80°-140°F D. Chipping time 1 hr 20 min.	A. None B. None	1 2 3 4	727 740 715 718		1 1/8" R 1 1/8" R	1 1/8" R 1 1/8" R	1 1/8" R 1 1/8" R	1 1/8" R 1 1/8" R	I I I I	14-1/8" P 14-1/8" P 14-1/8" P 14-1/8" P		
A. AD 807 B. 9/28/45 C. 185 D. Jones & Laughlin E. Sage Steel F. Cadillac Motor Car Division	A. 1" B. R III C. 1.71In .2181 .0125 .025P .45% D. .54C E. Face 321 Core 340 F. 1650°F 1 hr water 970°F 1 1/2 hr air	A. A I .145-.16C B. 80-890Pa .32-.3851 .0125 .025P 21.6v 21.71Cr 8.6%Ni .66-.76% B. C. Line D. DC-REV	A. 60° DV B. 9/32" C. Flame cutting. Grinding.	A. Not given B. 1. II 5/16" 2a 165 30 2. I 5/16" 4a 165 30 3. II 5/32" 2b 140 30 1/4" 2b 225 30 Two beads not given. C. 4 hours 2 minutes. 80°-140°F D. Chipping time 1 hour 30 min.	A. None B. None	1 2	745 745	1 1/8" L	1 1/8" L	1 1/8" L	1 1/8" L	I I	I I	14-1/8" P 14-1/8" P 14-1/8" P 14-1/8" P		

8.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FIRMING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF S			CRACKING		RADIOGRAPHIC RESULTS, ETC.	
								L.L.	R.L.	C.S.	LOC.	TYPE	AMT	
A. AD 941 B. 10/20/43 C. 189 D. Youngstown E. Furnaschfeger F. Cadillac Motor Car Division	A. 1" B. R III C. 1.50% .1881 .0228 .015P .02Cr .30Mo C. .25C D. Face 321 Back 341 E. F. 1600°F 1/2 hr water 975°F 2 1/2 hrs water	A. A I .12-.14C 2.13-3.50% Mn .36-.63Si .015-.025S .015-.025P 20.00- 21.32Cr 8.90-10.8% Ni .10-.65Mo B. Grade V C. D. DC-REV	A. 60° DV B. 9/32" C. Flame cutting Grinding.	A. Not given B. 1. II 5/32" 2a 135 24 2. I 3/16" 2a 185 24 1/4" 2a 240 24 3. II 5/32" 4b 135 24 1/4" 2b 240 24 C. 3.42 hours 90°-190°F D. Grinding time 1.67 hours.	A. None B. None	1 2 3	745 717 727	2° 1 1/2° 1 1/2°	6 1/2° D 3/8° U	- - IMP I	- - I	- 15 1/2 8 3	P 26 1/2	
A. A 10918 B. 11/11/43 C. 504 D. Jones & Laughlin E. Page Steel Wire F. Cadillac Motor Car Division	A. 1" B. R III C. .93% Mn .9781 .24S .020P .02Cr .17Mo .07Zr C. .27C D. Face 341 Back 365 E. F. 1650°F 1/2 hr water 970°F 1 1/2 hrs air 1650°F 1/2 hr water 970°F 1 1/2 hrs air	A. A I .11-.13C 3.81-3.95% Mn .35-.42Si .011S .025P 21.57-22.32 Cr 9.84-9.95% Ni .65-.65Mo B. DC-REV	A. 60° DV B. 9/32" C. Flame cutting Grinding.	A. Not given B. 1. II 5/16" 2a 190 25 2. I 1/4" 2a 280 25 5/32" 2a 150 25 3. II 1/4" 8b 280 25 C. 2.50 hours 70°-180°F D. Grinding time 1.28 hours.	A. None B. None	1 2 3	741 729 719	1 1/2° 1 1/2° 1 1/2°	7- 7/8° U 6- 1/8° D 5 1/2° R D	- - IMP I IMP I	- - I I	- 11-5/8° 9 20-5/8°	P	
A. A 11222 B. 12/5/43 C. 171 D. Jones & Laughlin E. Crucible Steel F. Cadillac Motor Car Division	A. 1" (98.5°) B. R III C. 1.80% Mn .2581 .0218 .015P .40Mo C. .29C D. Face 341 Back 365 E. F. 1650°F 1/2 hr water 970°F 1 1/2 hrs air	A. A I .12-.15C 3.62-4.21% Mn .31-.38Si 9.61-9.86% Ni 19.22- 19.78Cr .78-.85Mo B. Resistal C. T10 D. AC-STR	A. 45° DV B. 1/4" C. Flame cutting	A. Copper B. 1. II 5/16" 2a 180 25 2. I 1/4" 2a 280 25 5/16" 2a 320 25 3. I 5/16" 2a 320 25 C. 112°-212°F D.	A. None B. None	1 2	727 741	1 1/2° 1°	6° U L D	IMP I IMP I O I	I I I	14 1/2 12 1/2 -5/8°	P Small amount of slag 3-5/16° 10.	

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIDING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MPOR. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. DEN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. ROOT TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							F/S	L.L.	R.L.	C.D.	LOC.	TYPE	AMT			
A. A 11222 B. 12/3/43 C. 172 D. Jones & Laughlin E. Crucible Steel F. Cadillac Motor Car Division	A. 1" B. R III C. 1.68% .2581 .0218 .015P .40Mo D. .29C E. 29C F. 1650°F ± hr water 970°F 1½ hrs. air	A. A I B. .11-.15C C. 3.52-4.21Mn .31-.36Si 9.61-9.85W 19.41- 19.72Cr .78-.85Mo B. Resistal C. TiO ₂ D. AC-STR	A. 45° DV B. 1/4" C. Flame cutting.	A. Copper B. 1. II 3/16" 2a 180 23 2. I 1/4" 2a 260 25 5/16" 2a 320 28 3. I 5/16" 2a 320 28 C. 110°-210°F D.	A. None B. None	1 2	713 723	1/4" 1/4"	6" 5"	U D	IMP O	I I	6" 14"	P		

11.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE INFO. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SW E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	S	VEL. F/S	LOCATION OF S L.L. R.L. C.B.	CRACKING LOC. TYPE INT	RADIOGRAPHIC RESULTS, ETC.				
A. AD 458 B. 6/4/43 C. CB 5 D. Great Lakes E. Page Steel & Wire F. Chain Belt Co.	A. 1" B. R IV C. .85Mn .65Si .0288 .021P .64Cr .16Mo C. .25 D. Face 337 Back 337 E. BCH F. 1625°F 1½ hrs water 1050°F 1½ hrs Draw	A. A I .158C 1.94Mn .22Si 19.41Cr 10.96Ni 1.78Mo B. 308 Moly C. Lime D. DC-REV	A. 60° DV B. ¼" C. Machining	A. Copper B. 1. II 3/16" 2b 160 22 2. III 3/16" 1a 165 22 3/16" 4b 165 22 1/4" 4b 200 22 3. III 1/4" 4b 210 22 C. 15.4 hrs. 106°F-225°F D. Chipping time 2.5 hrs.	A. None B. None	1 2	753 777	X ¼" R	4"D 5½" U IMP I O I	I I	94" 15" 12" 264"	F Plate is unacceptable due to excessive cracking in crossbar.		
A. AD 721 B. 7/2/43 C. 6 D. Great Lakes E. Page Steel & Wire F. Chain Belt Co.	A. 1" B. R IV C. .85Mn .65Si .0288 .021P .64Cr .16Mo C. .25 D. Face 337 Back 337 E. BCH F. 1625°F 1½ hrs water 1050°F 1½ hrs Draw	A. A I .158C 1.94Mn .22Si 19.41Cr 10.96Ni 1.78Mo B. 308 Moly C. Lime D. DC-REV	A. 60° DV B. 5/16" C. Machining	A. Copper B. 1. II 5/32" 2b 140 22 3/16" 1b 170 22 2. I 1/4" 5a 200-210 22 3. III 1/4" 6b 200 22 C. 16.7 hours 110°F-190°F D. Grinding time 3.1 hrs.	A. None B. None	1 2 3	772 783 770	X 3-5/8" R 1-5/8" L	7½" D 5-7/8" U 7½" D IMP I IMP V	I I	13" 7/8" 14" 27-7/8"	P		

12.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCESSES	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #				CRACKING			RADIOGRAPHIC RESULTS	
							F/S	L.L.	S.L.	C.B.	LOC.	TYPE	SIZE			
A. AD 885 B. 10/16/45 C. 47 D. Republic Steel Corp. E. Harnischfeger Corp. F. Federal Machine & Welder Co.	A. 1" B. R I C. 1.45% .2281 D. .0245 .018P E. .87Cr .72Mn F. .28% C. .30C D. Face 255 Back 255 E. Elec Basic F. 1600°F 1 1/4 hrs water 1000°F 1 1/4 hrs air	A. A V B. .08-.12C C. 1.60-6.90 D. Mn E. .27-.55Si F. 18.8-19.8 Cr G. 9.39-10.7 W H. .71-1.85Nb I. Smooth Arc J. AW 5-C K. Titanium L. DC-REV	A. 30° DV B. 3/16" C. Machining. Flame cutting	A. Copper B. 1. II 5/32" 1a 185 22-24 3/16" 1a 185 24-26 2. I 1/4" 2a 240 26-28 3. I 1/4" 2a 240 26-28 C. 2 hours 30 minutes. 115°-212° D. Grinding time 30 minutes.	A. None B. None	1 2	742 741	1" L	4" R 11" U	5 1/2" D	IM IM	I I	17-8/8" P 15 1/2" 1-1/8" 24 1/2"			

[illegible]

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCESSES	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIBRO RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, SEAT FACE B. SEAT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. SEAT TYPE 2. SEAT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #				CRACKING			RADIOGRAPHIC RESULTS, ETC.	
							F/S	L.L.	S.L.	C.S.	LOC.	TYPE	ENT			
A. AD 714 B. 6/29/43 C. 25 D. Republic Steel Company Carnegie Illinois E. Harnischfeger F. Ilco Ordnance Company	A. 1" B. R I Republic .70Mn .22S1 .02S .017P .78Cr .02Mn .45Mn C. .27 D. Face 280 Back 280 E. BOW F. 1610°F 1 hr water 350°F 1 1/2 hrs. water A. 1" B. R I Carnegie 1.10Mn .10S1 .014S .016P .77Cr .07Mn .21Mn C. .27 D. Face 332 Back 332 E. BOW F. 1600°F 1 hr water 1040°F 1 1/2 hrs. water	A. A I B. AW-6A .08-.11C 1.47-1.94Mn .37-.64Si 18.6-19.6Cr 9.5-10.1Mn 1.68-2.10Mn C. Lime D. DC REV	A. 54° DV B. 5/16" C. Flame cutting Grinding	A. Copper Chill B. 1. II 1/4" 2a 265 28 2. III 5/16" 2a 365 30 3. III 1/4" 4b 265 28 5/16" 4b 175 25 5/16" 2b 365 30 C. 3 hrs. 10 mins. 70°F-210°F D. Chipping 4 hrs. 29 mins.	A. None B. None	1 2	784 786		2° 1° R R	54° 34° U D	- IMP	- I	- 15°	P		

15.

[illegible]

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING	PREHEAT	WELD	WELDING RESULTS										REMARKS ON CRACKING																																																																																																																																																																																																																																																																																																																																																																																																												
A. FIRMING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE IN. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. ROOT TYPE C. TOTAL WELDING TIME & AFTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	A. PRE B. POST	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL.	1. VEL. 2. VEL

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. PIPING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SWS E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE IN. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF S				CRACKING				RADIOGRAPHIC RESULTS, ETC.
								L.L.	B.L.	C.B.	LOC.	TYPE	ANY			
A. AD 405 B. 4/30/43 C. 40 D. Great Lakes Steel Co. E. McKay Rod Co. F. Southern Cal. Division of General Motors	A. 1" B. R IV C. .94Mn .0681 .027S .044P .51Cr .80Mo .11Zr D. .51 E. Face SS1 Back 341 F. 1650° F 2 hrs. water 1000° F 3 hrs. air	A. A II B. Armorloy C. 3/16" .10C 4.16Mn .43Si .018 .08P 20.22Cr 10.14Ni 1/4" .12C 4.16Mn .69Si .0118 .052P 19.56Cr 9.71Ni C. Line D. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding	A. Copper B. 1. II 3/16" 1a 180 24 3/16" 1a 180 24 2. I 1/4" 1a 245 25 1/4" 1a 245 25 3. II 1/4" 4b 245 25 1/4" 2b 245 25 C. 3 hrs. 35 minutes D. Left leg and cross bar section recorded as same; with Sb on crown.	A. None B. None	1	796	14"	54"	IMP R U	IMP V	I V	25" 208" 454"	F Plate is unaccept- able because of excessive amount of cracking in x bar.		

18.

IDENTIFICATION	ANNEAL DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FIDING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANNEAL MANUFACTURER E. ELECTRODE NUMBER F. ANNEAL PREPARATION	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	S	VEL.	LOCATION OF S			CRACKING			RADIOGRAPHIC RESULTS, ETC.
							P/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT	
A. AD 410 B. 4/24/48 C. TH 110 D. Great Lakes Steel Corp. E. McKay Reid-Avery. Alloy Rods. F. Ternstedt Mfg. Division	A. 1" B. R IV .94Mn .81Si .0228 .005P .70Cr .22Mo .06Cr C. .58C D. Face 300 Back 300 E. 600°F ± hr. water 800°F 1½ hr. air	A. I McKay B. Armco A 5 .12C 3.5-4.5Ph .80Si max 18.0-21.0 Cr 9.2-10.2 Mn C. Line D. A. I Reid & Avery B. 18-8-B .07-.12C 3.5-4.5Ph .78Si max .065P .06P max 18.0-20.0 Cr 8.5-10.5 Mn C. Ti + Mn D. A. I Alloy Co B. Armco .06-.12C 3.5-4.5Ph .85-.70Si .06P .005 18.0-21.0 Cr 8.5-10.5 Mn C. Ti base D.	A. 45° K B. 3/16" C. Flame softening.	A. Copper B. 1. II 3/16" 1a 190 25 3/16" 1a 190 25 2. I 1/4" 1a 280 27 1/4" 1a 280 27 3. III 3/16" 4b - - - 3/16" 2b 400 80 C. 10 hours 90°F-160°F D.	A. None B. None	1 788 2 778 3 785 4 785	1 1/2" L 5/8" L 3/4" R 1 1/2" L	6 1/2" U 6 1/2" D 4 1/2" D 7" U	IMP I IMP I IMP V IMP I	I I I I I I I I	12" 9 1/2" 38" 24" 50"	P		

19.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACKING	
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MPN. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S			CRACKING		RADIOGRAPHIC RESULTS, ETC.		
							F/S	L.L.	B.L.	C.B.	LOC.	TYPE	AMT		
A. AD 870 B. 9/7/43 C. TH 111 D. Jones & Laughlin E. Page Steel & Wire F. Ternstedt Mfg. Division.	A. 1" B. R III 1.48% .22S1 .0148 .019P .42Mo C. .24 D. Face 321 Back 317 E. BOH F. 1625°F 2 hrs. water 875°F 3 hrs. air	A. A1 Page Allegheny .13-.14C .02-.03S .01P 3.48-3.80Mn 20.10Cr .19-.24Si 9.64-10.25Ni .29-.35Mo B. Page C. Lime + Mn D. DC-REV	A. 60° DV B. 1/4" set-up 3/16" C. Flame cutting Grinding	A. Copper B. 1. II 3/16" 2a 180-190 25 2. I 1/4" 2a 265 28 3. I 5/16" 2a 340 3' C. 9 hours 80°F-130°F D.	A. None B. None	1	763		1 1/2" R	6" U	IMP	I	23"	P	
						2	769	1 1/4" L		7" D	IMP	I	14-5/8"		
											IMP	V	4"		
											IMP	V	2 1/2"	44-1/8"	
A. AD 870 B. 9/7/43 C. TH 115 D. Great Lakes Steel Corp. E. Page Steel & Wire F. Ternstedt Mfg. Division.	A. 1" B. R IV .94Mn .72Si .0208 .020P .24Mo .07Zr C. .26 D. Face 306 Back 307 E. BOH F. 1625°F 2 hrs. water 980°F 3 hrs. air	A. A I .14-.15C .028.01P 3.48-3.80Mn 20.10Cr .19-.24Si 9.64-10.25Ni .29Mo B. Page C. Lime + Mn D. DC-REV	A. 60° DV B. 1/4" set-up 3/16" C. Flame cutting Grinding	A. Copper B. 1. II 3/16" 1a 180 25 3/16" 1a 190 25 2. I 1/4" 2a 265 28 3. I 5/16" 2a 340 32 C. 9 hours 75°F-135°F D.	A. None B. None	1	764	1 1/8" R		6 1/2" D	IMP	I	15 1/2"	P	
						2	771		2-1/8" L	6" U	-	-	-		
						3	776	1 1/4" R		5 1/2" D	IMP	I	19"	37 1/2"	

20.

IDENTIFICATION	ABROR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS							REMARKS ON CRACKING	
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE SPEC. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. BEY E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	H	VEL.	LOCATION OF B			CRACKING		RADIOGRAPHIC RESULTS, ETC.	
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT	
A. A 11821 B. 1/12/44 C. 123 D. Jones & Laughlin E. Page Steel & Wire F. Ternstedt	A. 1" B. R III 1.53Mn .1981 .016S .024P .34Mo C. .26C D. Face 341 Back 335 E. B.O.H. F. 1650°F 1 hr. water 850°F 1 1/2 hrs. water	A. A I .13-.14C .02-.023S .01-.02P 3.48-4.0 Mn 20.10Cr .24-.37Si 9.78- 10.24Ni .29-.60Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 155 24 2. I 1/4" 2a 240 27 3. I 5/16" 2a 350 31 C. 6-1/2 hours 200°-250°F D. Chipping time 20 minutes.	A. 200°F B. None	1	711	7/8"	6 1/2"	L U	IMP	I	36"	P
A. A 11821 B. 1/12/44 C. 124 D. Jones & Laughlin E. Page F. Ternstedt	A. 1" B. R III 1.53Mn .1981 .016S .024P .34Mo C. .26C D. Face 342 Back 344 E. B.O.H. F. 1650°F 1 hr. water 850°F 1 1/2 hrs. water	A. A I .13-.14C 3.77-4.0 Mn .007-.023 S .02P 20.1- 20.34Cr .20-.37Si 9.78- 10.24Ni .55-.60Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 160 24 2. I 1/4" 2a 240 27 3. I 5/16" 2a 350 31 C. 7 hours. 80°-120°F D. Grinding time 20 minutes.	A. None B. None	1	710	1"	6 1/2"	R D	IMP	I	36"	P

21.

IDENTIFICATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE SPEC. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. S&W E. PROCESS F. SEAT TREATMENT TEMP. TIME SOURCE	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. BODY TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S			CRACKING			RADIOGRAPHIC RESULTS, ETC.
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	INT	
A. A 12058 B. 1/22/44 C. 129 D. Great Lakes Steel Corp. E. Page F. Ternstedt	A. 1" B. R IV .85Mn .08S1 .0208 .020P .62Cr .20Mo C. .27C D. Face 343 Back 341 E. B.O.H. F. 1625 F 1/2 hr. water 950 F 1 1/2 hr. water	A. A I .13-.16C 3.77-4.0Mn .007-.025S .02P 20.1-20.36Cr .20-.3781 9.78-10.22Ni .55-.60Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 155-165 24-25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 330 31 C. 6 hours 80°F-120°F D. Grinding time 20 minutes.	A. None B. None	1 2	782 729	1-3/8" R	9/16" U 7/8" 9/16" L D		IMP IMP	I I	17-1/16" 19"	P 36-1/16"
A. A 12058 B. 1/22/44 C. 150 D. Great Lakes Steel Corp. E. McRay Company F. Ternstedt	A. 1" B. R IV .85Mn .08S1 .0208 .020P .62Cr .20Mo C. .27C D. Face 339 Back 341 E. B.O.H. F. 1625 F 1/2 hr. water 950 F 1 1/2 hr. water	A. A I .12-.16C .016-.022S .017-.018P 4.16-4.65Mn 19.50-20.08 Cr .51-.56S1 9.65-10.22Ni .01-.06Mo B. Armortloy A-5 C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 155-170 24-25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 320 31 C. 6 hours 80°F-120°F D. Grinding time 25 minutes.	A. None B. None	3 4	784 722	1/2" L	7-1/8" U 9-7/8" D	X	IMP IMP	I I	10-5/8" 18"	P 28-5/8"
A. A 12058 B. 2/1/44 C. 153 D. Jones & Laughlin E. Page F. Ternstedt	A. 1" B. R III 1.72Mn .10S1 .0198 .016P .32Mo C. .28C D. Face 331 Back 331 E. B.O.H. F. 1650 F 1/2 hr. water 900 F 1 1/2 hr. water	A. A I .13-.14C .02-.025S .01-.02P 3.48-4.0Mn 20.1Cr .24-.3781 9.78-10.25 Ni .29-.60Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 160-190 24 2. I 1/4" 2a 290-300 27 3. I 5/16" 2a 375-400 32 C. 6 hours 80°-160°F D. Grinding time 20 minutes.	A. None B. None	3	785	1/2" R	9/16" U		IMP	I	22 1/2"	P

22.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCESSES	HEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SMC E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF B			CRACKING			RADIOGRAPHIC RESULTS, ETC.		
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	ENT			
A. A 12297 B. 2/1/44 C. 154 D. Jones & Laughlin E. Page F. Tested	A. 1" B. R III 1.72Mn .1981 .019S .016P .32Mo C. .28C D. Face 351 Back 351 E. B.O.H. F. 1650 F 1/2 hr. water 900 F 1 1/2 hrs water	A. A I .13-.14C .02-.025S .01-.02P 3.48-4.0Mn 20.1Cr .24-.3781 9.78-10.28 Ni .29-.60Mo B. Page C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 180-190 2a 2. I 1/4" 2a 290-300 27 3. I 5/16" 2a 375-400 32 C. 8 hours. 80°F-160°F. D. Grinding time 20 minutes.	A. None B. None	3	726	1/2"	9/16"	U	IMP	I	284"	P		
A. A 12569 B. 2/18/44 C. 159 D. Jones & Laughlin E. Page F. Tested	A. 1" B. R III 1.72Mn .1981 .019P .016S .32Mo C. .28C D. Face 321 Back 321 E. B.O.H. F. 1650 F 1/2 hr. water 900 F 1 1/2 hrs water	A. A I .13-.14C 3.77-4.0Mn .24-.3781 .02-.025S .02P 30.1Cr 9.78-10.24 Ni .50-.60Mo B. Page C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 190-200 25 2. II 3/16" 4b 190-200 25 3. II 3/16" 4b 190-200 25 1/4" 2b 290-300 28 C. - - - D. - - -	A. None B. None	3	718	1/2"	9/16"	U	IMP	I	144"	F		
						4	714	5/8"	9/16"	D	IMP	I	208"	Incomplete fusion and slag.		
													35"			

23.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE INFO. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED B. ANGLE, ROOT FACE C. ROOT GAP D. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S			CRACKING			RADIOGRAPHIC RESULTS, ETC.
							F/S	L.L.	B.L.	C.D.	LOC.	TYPE	AMT	
A. A12868 B. 3/13/44 C. 141 D. Jones & Laughlin E. Alloy Rod Co. F. Ternstedt Mfg. Co.	A. 1" B. R III 1.72Mn .1081 .016P .016S .32Mo Tr. B C. .28C D. Face 317 Back 319 E. R.O.H. F. 1650° F 1 hr. water 925° F 1 1/2 hrs. water	A. A I .14-.15C 3.46Mn .27-.36Si .015-.016S .012-.015P 18.92-19.48 Cr 9.22-10.42 Ni .56-.62Mo B. Armowarc C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting.	A. Copper B. 1. II 3/16" 2a 180-190 24 2. I 1/4" 2a 270-290 27 3. I 5/16" 2a 370-390 32 C. - - - 80°-160° F D. - - -	A. None B. None	1 2 3	735 744 725	2" L 1 1/2" R 1 1/2" L	7" U 7 1/2" D 8" D	- - O	- I I	- 16" 16 1/2"	F 1-1/2" cracking.	
A. A12868 B. 2/18/44 C. 136 D. Jones & Laughlin E. Page F. Ternstedt Mfg. Co.	A. 1" B. R III 1.72Mn .1081 .016P .016S .32Mo C. .28C D. Face 325 Back 335 E. R.O.H. F. 1650° F 1 hr. water 900° F 1 1/2 hrs. water	A. A I .15-.14C .02 S .01-.02P 3.46-4.0Mn 20.1Cr .24-.37Si 9.78-10.25 Ni .29-.60Mo B. Page C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame grinding.	A. Copper B. 1. II 3/16" 2a 180-190 28 2. I 1/4" 2a 290-300 28 3. I 5/16" 2a 390-400 32 C. 8 hours. 90°-140° F D. Grinding time 25 minutes.	A. None B. None	1 2	716 734	5/8" R 1 1/2" R	8 1/2" U 8 1/2" D	- I	I I	12 1/2" 17-1/8" 5/8"	P 30°	

24.

IDENTIFICATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE SPEC. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S				CRACKING		RADIOGRAPHIC RESULTS, ETC.
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT	
A. A 12836 B. 3/7/44 C. 2 D. Symington Gould Corp. E. Metal & Thermit Corp. F. American Type Founders	A. 1" B. Cast II 1.40% .38S1 .013S .016P .47Cr .31Mo C. .30C D. Face 293 Back 302 E. Elec Basic F. 1880°F 7 hrs. air 1700°F 5 1/2 hrs. water 1020°F 6 1/2 hrs. water	A. A I .14C 4.06% .39S1 .03S .03P 19.45Cr 10.01Mn .60Mo B. Murex C. Lime D. AC-STR	A. 60° DV B. 3/16" C. Machining	A. Not given B. 1. I 5/32" 1a 155 26 2. II 5/32" 4b 155 26 3. II 3/16" 4b 170 28 C. 10-1/2 hours 90°-150°F D. ---	A. None B. None	1 2 3	1016 976 967	1- 1/8" R 3/8" 11 1/2" D 9" U L	9- 3/8" U IMF I - - - IMF I 5 1/2" 6"				P Small amount of porosity and slag.	57mm Proof Projectile TI

25.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							V/S	L.L.	S.L.	C.B.	LOC.	TYPE	AMT.			
A. AD 370 B. 4/6/43 C. 117 D. McConway Torley E. McKay Company F. Cadillac Motor Car Division	A. 1.16" B. C III C. 1.28% .57S1 D. .018S .025P E. .10N1 .46Mo F. 321 Core 301 Surface G. 1800°F 5 hrs. air cooled 1650°F 4 hrs. air cooled 1050°F 2 1/2 hrs. water	A. A II B. .09-.10C C. 4.80-4.85% D. .55-.66S1 E. .009-.023S F. .020-.025P G. 17.90-20.10 H. 9.75-10.20 I. .08-.15Mo J. N1 K. B. L. C. M. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding.	A. Not given. B. 1. II 5/32" 2a 135 25 2. I 1/4" 2a 240 25 3. II 5/32" 4b 135 25 3/16" 2b 180 25 C. 2 hrs. 34 minutes 70°-200°F D. Chipping time 55 minutes.	A. None B. None	1 2 3 4	1075 1075 1085 1112	1 1/2" 5/8" 3/8" 1"	9/16" 7/8" 6/16" 6/16"	IMP IMP IMP IMP	I IV IV I	6" 3 1/2" 5-7/8" 4 1/2"	F 3 1/2" x 4" section broke out. Plate is not acceptable due to excessive cross bar cracking. 41-5/8"			
A. AD 370 B. 4/6/43 C. 121 D. Hughes E. McKay Co. F. Cadillac Motor Car Division	A. 1.10" B. C I C. .80% .42S1 D. .022S .025P E. .41Cr 1.10N1 F. .54Mo G. .28C H. 321 Core I. 321 Surface J. 1800°F 10 hrs. water K. 1650°F 2 hrs. water L. 1000°F 4 hrs.	A. A II B. .09-.10C C. 4.80-4.85% D. .55-.66S1 E. .009-.023S F. .020-.025P G. 17.90-20.10 H. 9.75-10.20 I. .08-.15Mo J. N1 K. B. L. C. M. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding.	A. Not given. B. 1. II 5/32" 2a 130 25 2. I 3/16" 2a 175 25 3. II 3/16" 4b 180 25 1/4" 2b 240 25 C. 3 hrs. 55°F-180°F. D. Chipping time 1 hr. 1 min.	A. None B. None	1 2 3 4	1041 1066 1082 1124	1 1/2" X 1 1/8" 3/8"	7/8" 9/16" 9/16" 9/16"	IMP IMP IMP IMP	I I I I	3" 3 1/2" 3 1/2" 8 1/2"	F Plate is not acceptable due to excessive cracking. 15 1/2"			
A. AD 366 B. 4/3/43 C. 134 D. Hughes E. McKay Company F. Cadillac Motor Car Division	A. 1" B. C I C. .79% .58S1 D. .021S .025P E. .43Cr 1.08N1 F. .47Mo G. .28C H. 340 Core I. 351 Surface J. 1650°F 4 hrs. water K. 1200°F 2 hrs. air	A. A II B. .09-.10C C. 4.80-4.85% D. .55-.66S1 E. .009-.023S F. .025P G. 17.90-20.10 H. 9.75-10.10 I. .08-.15Mo J. N1 K. B. L. C. M. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding	A. Not given. B. 1. II 5/32" 2a 140 25 2. I 3/16" 2a 180 25 3. II 5/32" 4b 140 25 1/4" 2b 280 25 C. 2 hrs. 51 minutes 80-185°F D. Chipping time 29 minutes.	A. None B. None	1 2 3 4	975 975 1035 1055	2" X 5/8" 1 1/2"	7/8" 9/16" 9/16" 7/8"	IMP IMP IMP IMP	I I I I	5 1/2" 10 1/2" 7 1/2" 23	F This plate was ground out and repaired. Plate is not acceptable.			

26.

IDENTIFICATION	ANNEAL DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FINDING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANNEAL MANUFACTURER E. ELECTRODE SPEC. F. ANNEAL FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF S			CRACKING			BALLISTIC RESULTS, ETC.
								L.L.	R.L.	C.B.	LOC.	TYPE	INT.	
A. AD 355 B. 4/3/43 C. 137 D. Utility E. McWay Company F. Cadillac Motor Car Division	A. 1.23" B. C III 1.62Mn 1.10Si .026S .058P .16Cr .32Ni .65Mo C. .24C D. 365 Core 302 Surface E. F. 1650° F 5 hrs. water 1200° F 3 hrs. air	A. A II .08C 4.80Mn .42Si .024S .026P 20.40Cr 10.10Ni B. Armortloy C. D. DC-REV	A. 60° DV B. C. Flame cutting. Grinding	A. Not given. B. 1. II 5/32" 2a 135 25 2. I 3/16" 2a 180 25 3. I 1/4" 2a 280 25 C. 3 hrs. 30 minutes 96-140° F. D. Chipping time 27 minutes.	A. None B. None	1	1078	1-7/8" L		3-5/8" D	IMP	IV	513"	P Sound welds Few scattered inclusions.
														57mm Proof Projectile T1
A. AD 355 B. 4/3/43 C. 138 D. Hughes E. McWay Company F. Cadillac Motor Car Division	A. .99" B. C I 1.11Mn .40Si .026S .037P .33Cr .98Ni .45Mo C. .28C D. 217 Core 219 Surface E. F. 1650° F water 1200° F air	A. A II .08C 4.80Mn .42Si .024S .026P 20.40Cr 10.10Ni B. Armortloy C. D. DC-REV	A. 60° DV B. C. Flame cutting. Grinding.	A. Not given B. 1. II 5/32" 2a 135 25 2. I 3/16" 1a 165 25 3. II 5/32" 2a 135 25 5. II 5/32" 4b 135 25 1/4" 2b 240 25 C. 2 hrs. 50 minutes 75-145° F. D. Chipping time 1 hr. 10 min.	A. None B. None	1 2 3 4	967 980 1058 1094	1" L 1 1/2" L X 1 1/2" L		98" U 4 1/2" D 4"U D 4 1/2" D	IMP	I	1 1/2" 1 1/2" 2 1/2"	P Sound weld.
														57mm Proof Projectile T1
A. AD 904 B. 9/28/43 C. 132 D. Hughes E. Harnischfeger F. Cadillac Motor Car Division	A. .99" B. C I .91Mn .56Si .021S .058P .34Cr .97Ni .44Mo C. .28C D. 331 Face 340 Back E. F. 1600° F 5 hrs. furnace 1650° F 1 hr. water 1200° F 2 hrs. air 1650° F 1 hr. water 1000° F 4 hrs. air	A. A II Harnischfeger .12C 3.55Mn .65Si .013S .026P 21.25Cr 10.0Ni .10Mo B. C. D. DC REV A. A II McWay .13C 4.55Mn .34Si .016S .026P 20.80Cr 10.50Ni B. C. D. DC-REV	A. 60° DV B. C. Flame cutting. Grinding.	A. Copper B. 1. II 5/32" 2a 135 25 2. I 3/16" 2a 185 25 3. II 5/32" 4b 135 25 1/4" 2b 225 25 C. 2 hrs. 29 minutes 85-150° F D. Chipping time 1 hr. 8 mins.	A. None B. None	1 2 3 4	1009 976 995 970	2 1/2" R 7/8" R 1" L 7/8" L	8 1/2" D 6"U U 4 1/2" U 0 V 9-3/8" D	IMP	IV	10-6/8" F 8-1/8" 6 1/2" 5-2/8"	Welds are not acceptable due to cracking.	
														57mm Proof Projectile T1

27.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE MPN. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SWH E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF B	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	ANT			
A. AD 904 B. 9/28/43 C. 185 D. Hughes Tool E. Page F. Cadillac Motor Car Division	A. 1" B. C I .73Mn .34Si .0218 .027P .44Cr .96Ni .37Mo C. .28C D. Face 340 Back 331 E. F. 1650°F 1 hr. water 1000°F 4 hrs. air	A. A I .145-.15C 3.60- 3.90Mn .32-.36Si .015S .025P 21.66- 21.71Cr 9.6- 9.68Ni .66- .76Mo B. C. Lime D. DC-REV	A. 60° DV B. 9/32" C. Flame cutting. Grinding.	A. Not given B. 1. II 3/16" 2a 165 30 2. I 3/16" 4a 170 30 3. II 5/32" 2b 140 30 1/4" 2b 225 30 Two beads not given. C. 3 hours 57 minutes. 85-135°F D. Chipping time 1 hour 21 mins.	A. None B. None	1 980 2 987 3 985 4 986 5 981	2" L 1 1/2" L 1 1/2" L 2" R 1-3/8" L	1 1/2" U 14 1/2" U 9-5/8" D 8" D 7 1/2" U	IMP I IMP IV IMP I IMP I IMP IV	3" 5" 4 1/2" 5-7/8" 2-5/8" 13-1/8"				F. Welds are not acceptable due to excessive incom- plete infusion.		
							57mm	Proof	Projectile	11						
A. AD 907 B. 9/28/43 C. 184 D. Hughes Tool E. Page F. Cadillac Motor Car Division	A. 1" B. C I .91Mn .36Si .0218 .025P .34Cr .97Ni .44Mo C. .28C D. Face 340 Back 340 E. F. 1650°F 1 hr. water 1000°F 4 hrs. air	A. A I .145-.15 C 3.60- 3.90Mn .32-.36Si .015S .025P 21.6- 21.71Cr 9.6- 9.68Ni .66-.76Mo B. C. D. DC-REV	A. 60° DV B. 9/32" C. Flame cutting. Grinding.	A. Not given B. 1. II 3/16" 2a 165 30 2. I 3/16" 4a 165 30 3. II 5/32" 2b 140 30 1/4" 2b 225 30 Two beads not given C. 4 hours 11 minutes. 80-140°F D. Chipping time 1 hr. 22 mins.	A. None B. None	1 985 2 987 3 985 4 986	2 1/2" R 1 1/2" R 1 1/2" L 1 1/2" L	4 1/2" D 12 1/2" U 4" U 8" D	- IMP I IMP IV IMP I	- 4 1/2" 6-7/8" 11 30-5/8"				P		
							57mm	Proof	Projectile	11						

29.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS							REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MPAS. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.			
							F/S	L.L. R.L. C.S.	LOC. TYPE AMT				
A. AD 941 B. 10/20/43 C. 187 D. Hughes Tool E. Harmschfeger F. Cadillac Motor Car Division.	A. 1" (1.05") B. Cast I .85Mn .41Si .024S .032P .32Cr .80Ni .43Mo C. .25C D. Surface 331 Core 321 E. F. 1650° F 1 hr. water 1200° F 2 hrs. air 1650° F 1 hr. water 1000° F 4 hrs air	A. A I .12-.14C 2.13-3.59 Mn .36-.63Si .013-.015S .025P 20.00-21.32Cr 8.90-10.8Ni .10-.68Mo B. C. D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting. Grinding.	A. Not given. B. 1. II 5/32" 2a 135 24 2. I 3/16" 2a 185 24 1/4" 2a 240 24 3. II 3/16" 4b 185 24 1/4" 2b 240 24 C. 3.59 hours 90°-205° F. D. Grinding time 1.14 hours.	A. None B. None	1	994	3 1/8" L 3-1/8" U	- - -	P			
						2	997	2 1/4" L 4 1/4" D	IMP IV 98"				
						3	1000	1 1/2" R 3 1/2" U	IMP I 14"				
									IMP IV 72"				
						4	994	3/8" L 9" D	IMP I 8"				
									IMP V 14"				
						5	999	1 1/2" L 13-3/8" U	IMP I 4-5/8"				
									IMP IV 8 1/2"				
						c	993	3 1/4" L 10 1/4" D	IMP IV 8 1/2"				
									O V 5"				
									55"				
							57mm Proof Projectile FI						
A. A 10908 B. 11/8/43 C. 199 D. Hughes Tool E. Harmschfeger F. Cadillac Motor Car Division.	A. 1" B. Cast I .82Mn .32Si .028S .028P .32Cr .97Ni .36Mo C. .38C D. Surface 341 Core 321 E. F. 1650° F 1 hr. water 1200° F 2 hrs. air 1650° F 1 hr. water 1000° F 4 hrs. air	A. A I .12-.14C 2.13-3.59Mn .36-.63Si .015-.025S .013-.025P 20.00-21.32Cr 8.90-10.8Ni .10-.68Mo B. C. D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting. Grinding.	A. Not given B. 1. II 5/32" 2a 135 25 2. I 3/16" 2a 185 25 1/4" 2a 240 25 3. II 5/32" 4b 155 25 1/4" 2b 240 25 C. 3.75 hours. 90°-185° F D. Grinding time 2.75 hours.	A. None B. None	1	900	2-3/8" L 8 1/2" U	IMP IV 102"	P			
						2	1024	1-1/8" L 3 1/4" D	IMP I 3-7/16"				
						3	1020	X 3 1/4" D	IMP I 4"				
									O I 2"				
									20-15/16"				
							57mm Proof Projectile FI						

30.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	TEST	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FILING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
F/F	L.L.	S.L.	C.B.	LOC.	TYPE	INT.										
A. A 10970 B. 11/26/45 C. 202 D. McCoway & Torley E. McRay Company F. Cadillac Motor Car Division	A. 1" (.95") B. Cast II 1.60Pb .47Si .0218 .025P .50Cr Tr.Ni .20Mo C. .34C D. Face 302 Back 311 E. 1800°F 4 hrs. air 1250°F 2 hrs. water 1600°F 4 hrs. water 1050°F 4 hrs. water	A. A I .12-.13C 3.95-4.28 Mn .44-.54Si .009-.012S .025P 20.50-20.75Cr 9.50-9.65Ni .65-.70Mo B. C. Line D. DC-REV	A. 60° DV B. 3/16" C. Flame cutting. Grinding.	A. Not given. B. 1. II 3/16" 2a 185 25 2. I 1/4" 2a 240 25 3. II 5/32" 4b 340 25 1/4" 2b 230 25 C. 2.59 hours 100°-140°F D. Grinding time 2 hours.	A. None B. None	1	921	4° L	7 1/2" U	IHP	I	2 1/2"	P Small amount of slag and porosity.			
						2	946	7/8" L	4° D	IHP	IV	1 1/2"				
						3	946	1 1/2" R	6 1/2" D	IHP	I	8 1/2"				
										IHP	IV	11 1/2"				
57mm Free Projectile T1																
A. A 11270 B. 12/9/45 C. 214 D. McCoway & Torley E. McRay Company F. Cadillac Motor Car Division	A. 1" (.95") B. Cast II 1.60Pb .28Si .0225 .025P .54Cr Tr.Ni .31Mo .008S C. .33C D. Face 321 Back 311 E. 1800°F 4 hrs. air 1250°F 2 hrs. water	A. A I .12-.13C 3.95-4.28Mn .44-.54Si .009-.012S .025P 20.50-20.75Cr 9.50-9.65Ni .65-.70Mo B. C. Line D. DC-REV	A. 60° DV B. 3/32" C. Flame cutting. Grinding.	A. Not given B. 1. II 3/16" 2a 185 27 2. I 1/4" 2a 240 27 3. II 5/32" 2a 135 27 1/4" 4b 240 27 C. 2.72 hours 75°-175°F D. Grinding time .67 mins.	A. None B. None	2	976	X	10-7/8" U	IHP	I	6"	P Small amount of slag.			
						3	964	X	7 1/2" D	IHP	I	6 1/2"				
						4	965	X	6 1/2" U	IHP	I	4 1/2"				
										IHP	IV	11 1/2"				
57mm Free Projectile T1																
A. A 11511 B. 12/16/45 C. 215 D. McCoway & Torley E. Reid-Avery F. Cadillac Motor Car Division	A. 1" (.97") B. Cast II 1.45Pb .46Si .0245 .025P .54Cr Tr.Ni .31Mo C. .30C D. Face 302 Back 302 E. 1800°F 4 hrs. water 1250°F 2 hrs. water	A. A I .14-.16C 4.04-5.41Mn .29-.50Si .009-.012S .025P 19.82-19.78 Cr 9.04-9.05Ni .70-.75Mo B. C. Line D. DC-REV	A. 60° DV B. 3/32" C. Flame cutting. Grinding.	A. Not given. B. 1. II 3/16" 2a 185 25 2. I 1/4" 2a 240 25 3. II 1/4" 4b 240 25 5/32" 2b 135 25 C. 2.75 hours 70°-340°F D. Grinding time 1.19 hours.	A. None B. None	1	945	4° L	10 1/2" U	IHP	I	4 1/2"	P Welds unacceptable due to cracking.			
						2	942	1" L	7 1/2" D	IHP	I	4"				
										IHP	IV	10 1/2"				
												18"				
57mm Free Projectile T1																

31.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
						#	VEL.	LOCATION OF S				CRACKING		RADIOGRAPHIC RESULTS, ETC.		
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MFG. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT.				
A. AD 438 B. 5/18/43 C. KB 8 D. Utility Elec. Steel Foundry E. McKay Co. F. Kay Brunner Steel Products	A. .97 B. C.H. I 1.13Mn .65Si .054S .052P .69Cr .46Ni .23Mo C. .33 D. Face 311 Back 321 E. B.Elqc. F. 1850 F 6 hrs. furnace 1250 F 6 hrs. furnace 1600 F 2 hrs. water 1040 F 6 hrs. air	A. A II .106-.11C 4.11-4.52 .517-.6381 20.01-20.27 Cr 9.87-10.23Ni B. Armoloy A 5 C. Lime D. DC-REV	A. 90° DV B. 4" C. Flame cutting Grinding	A. Copper B. 1. I 5/32" 1a 120 25-30 2. III 3/16" 1a 160 25-30 5/32" 1a 125 25-30 3/16" 10b 170 25-30 3. III 3/16" 4b 180 25-30 1/4" 2b 210 35-40 C. 7 hrs. 4 min. 120° F-220° Grinding time 5 hrs. 16 mins. in root pass. D. 3 more beads in body of one than the others.	A. None B. None	1 2 3	961 960 949	1" R 3" R 2 1/4" R	4 1/2" D 4"U 10 1/2" D	IMP IV IMP IV IMP IV	16" 15" 26-1/8"	57-1/8"			P	
A. AD 909 B. 9/30/43 C. KB 10 D. Utility Elec. Steel Foundry E. McKay Co. F. Kay Brunner Steel Products	A. 1" B. C.H. I .99Mn .45Si .053S .052P .46Cr .57Ni .29Mo C. .29 D. Face 302 Back 321 E. B.Elqc. F. 1850 F 6 hrs. furnace 1250 F 6 hrs. furnace 1600 F 2 hrs. water Draw 6 hrs. air	A. A II .12C 4.24-4.51Mn .40-.51Si 19.40-19.90 Cr 9.74-10.05 M1 B. Armoloy A 5 C. Lime D. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding	A. Copper B. 1. I 5/32" 1a 125 25 2. III 5/32" 1a 125 25 3/16" 2a 160 25 3/16" 4b 175 35 3. III 3/16" 4b 175 35 3/16" 2b 175 35 C. 9 hours 9 mins. 100° F-175° F Grinding time 3 hrs. 14 mins. in root pass.	A. 125° 140° B. None	1 2 3	978 1022 1008	1- 9/16" L 3- 7/8" U	X 7 1/2" D 7/8" U	IMP I IMP IV IMP I IMP IV	7 1/2" 9 1/2" 8" 12" 24 1/2" 64 1/2"	7/8"			P	

32.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
						A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING			RADIOGRAPHIC RESULTS, ETC.	
								F/S	L.L.	R.L.	C.S.	LOC.	TYPE	AMT.
A. AD 411 B. 4/24/48 C. TH-108 D. McConway & Torley E. McKay Co. F. Ternstedt Mfg. Division	A. 1.14" B. C.H. III C. 1.81Mn D. .8881 .0568 E. .041P .47Mo F. 1800°F 4 hrs. 1600°F 4 hrs. 1080°F 4 hrs. water	A. A1 McKay B. .12C C. 3.5-4.5Mn D. .8081 max E. 19.0-21.0Cr F. 9.2-10.8Ni G. Armoweld H. A 5 I. Lime J. DC-REV K. A1 Lincoln L. .08-.10C M. 3.5-4.5Mn N. .38-.7081 O. .008 .05P P. 19.0-21.0Cr Q. 8.5-10.0Ni R. Armoweld S. Lime T. Titania U. DC-REV V. A1 Alloy W. .08-.12C X. 3.5-4.5Mn Y. .38-.7081 Z. .008 .05P AA. 19.0-21.0Cr AB. 8.5-10.0Ni AC. Armoweld AD. T1 AE. DC-REV	A. 80° DV B. 3/16" C. Flame cutting, Grinding.	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE IMP. V. 1. 80° DV 2. 3/16" 3. 1/4" 4. 5/16" C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS E. 9 hours 70°F-170°F	A. None B. None	1 2 3 4	1050 1050 1060 1060	2 1/2" 2- 1/2" 4"	58" 61" 48" 78"	IMP IMP IMP IMP	V IV I V	14 1/2" 9" 4 1/2" 21 1/2"	50 1/2"	Welds are acceptable Cracks are present in plate. Borderline case.
														57mm Proof Projectile T1

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING		
FIRING RECORD NO. DATE OF TEST PLATE NO. ANODE MANUFACTURER ELECTRODE MFG. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.								
F/S	L.L.	R.L.	C	B.	LOC.	TYPE	AMT											
A. A 11821 B. 1/12/44 C. 128 D. Wehr Steel E. Page Steel & Wire McKay Co. F. Ternstedt	A. 1" B. Cast I .79-.88% .49-.52% .051-.055 .026-.028P .54-.61Cr .58-.71Mn .32-.38Mo C. .29-.31C D. Pace 284-276 Back 287-290 E. Elec. Acid F. 1780° F 4 hrs. air 1575° F 6 hrs. water 1080° F 6 hrs. air	A. A I .07-.15C 3.5-4.65% .51-.78% 16.0-20.0Cr 8.5-10.5Ni -1.25Mo B. Armorloy A-5 C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding	A. Copper B. 1. II 3/16" 2a 155-170 24-25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 340 32 C. 8 hours. 80° F - 140° F D. Grinding time 30 minutes	A. None B. None	1	1001	3" L	11 1/2" U	IMP IV	4 1/2"						P	
						2	979	1- 5/8" L	8" D	7/8" D	IMP I	2"						9 1/2"
						3	968	1 1/2" L	9 1/2" U	IMP I	10 1/2"						4 1/2"	
						4	964	1 1/2" R	8" D	IMP I	8 1/2"						39 1/2"	
57mm Proof Projectile T1																		
A. A 12067 B. 1/22/44 C. 116 D. McConway & Torley E. Page F. Ternstedt	A. 1" B. Cast III 1.50-1.65% .44-.55% .027-.028 .055-.058P .46Mo C. .28-.30C D. Pace 300 Back 311 E. Elec. Acid F. 1800° F 4 hrs. air 1600° F 4 hrs. water 1180° F 4 hrs. water	A. A I .15-.16C .007-.008 .01-.02P 3.54-5.04% 20.1-20.36Cr .19-.22Si 9.64-11.22Ni .26-.35Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding.	A. Copper B. 1. II 3/16" 2a 190 25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 300 30 C. 10 hours 70°-120° F D. —	A. None B. None	1	947	2 1/2" L	7- 5/8" U	IMP I	4"						F	
						2	967	1 1/2" L	7- 1/8" D	IMP I	5 1/2"						7 1/2"	
						3	965	1 1/2" R	8 1/2" D	IMP I	20 1/2"						8 1/2"	
57mm Proof Projectile T1																		

35.

IDENTIFICATION	ANNEAL DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. VISING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE MPN. F. ANNEAL FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. RHN E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VOL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							F/S	L.L.	R.L.	C.D.	LOC.	TYPE	INT.			
A. A 11621 B. 1/12/44 C. 125 D. Wehr Steel E. Page-Allegheny F. Ternstedt Mfg. Co.	A. 1" B. Cast I .81-1.04Mn .080-.0826 .024-.028P .30-.3961 .77-.86Cr .71-.96Ni .30-.42Mo C. .31-.34C D. Face 258 Back 290 E. Elec. Acid F. 1750° F 4 hrs. air 1575° F 6 hrs. water 1050° F 6 hrs. air	A. A I .13-.14C .02-.0238 .01-.02P 3.48-4.0Mn 20.1Cr .24-.37Si 9.78-10.25 Ni .29-.60Mo B. Page C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding	A. Copper B. 1. II 3/16" 2a 155-165 24-25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 330 31 C. 8 hours 80°-140° F D. Grinding time 1/2 hr.	A. None B. None	8 9 10	979 965 971	1-3/8" L 8 1/4" IMP IV 10 1/2" IMP I 7 1/2" V 14 1/2" IMP V 30 1/2"							P 0 1/2" 11 1/2" 2 1/2" 14 1/2" 2 1/2" 30 1/2"	
A. A 12306 B. 2/4/44 C. 132 D. McConway & Torley E. McKay Company F. Ternstedt Mfg. Co.	A. 1" (.97") B. Cast II 1.46-1.49Mn .48-.47Si .0288 .036-.037P .46Cr .55-.36Mo C. .31-.32C D. Face 298 Back 295 E. Elec. Acid F. 1800° F 4 hrs. air 1250° F 2 hrs. water 1600° F 4 hrs. water 1050° F 4 hrs. water	A. A I .017-.018P .12-.15C .016-.0228 4.18-4.65Mn 19.50-20.08 Cr .51-.55Si 9.65-10.22 Ni .01-.63Mo B. Armory A-5 C. Line D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting. Grinding	A. Copper B. 1. II 3/16" 2a 180-200 24 2. I 1/4" 2a 200-300 27 3. I 5/16" 2a 375-400 32 C. 8 hours 80°-160° F D. Grinding time 1/2 hour.	A. None B. None	3 4	981 969	5/8" 7 1/4" R D IMP I 1" 11" IMP IV L U IMP I IMP I O V 34"							P 9" 6" 11 1/2" 4 1/2" 3 1/2" 34"	Small amount of slag.

36.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	DETAILS	PROCESSING	PROOF	ALL TESTS RESULTS								REMARKS OR COMMENTS
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARROW MANUFACTURER E. ELECTRODE MPN. F. ARROW FABRICATOR	A. PLATE THICKNESS B. TYPE C. CATHODE CURRENT D. WIRE E. PROCESS F. TEST TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. ROOT TYPE C. TOTAL WELDING TIME & INTER PAUSE TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #			CRACKING			METALLURGICAL RESULTS, ETC.	
							F/S	L.L.	R.L.	C.D.	LOC.	TYPE	ENT		
A. A 12568 B. 2/18/44 C. 131 D. McConway & Torley E. Page-Allegheny F. Ternstedt Mfg. Co.	A. 1" B. Cast II 1.51-1.62Mn .4781-.0288 .056P .52-.53Cr .56-.58Mo C. .32-.34C D. Face 311 Back 315 E. Elec. Acid F. 1800° F 4 hrs. air 1250° F 2 hrs. water 1600° F 4 hrs. water 1060° F 4 hrs. water	A. A I .13-.16C 3.77-.0238 .007-.0238 .02CP 20.1-20.36 Cr .20-.3781 9.78-10.24 Ni .55-.60Mo B. Page C. Lime D. DC-REV	A. 60° DV B. 1/4" C. Flame cutting Grinding	A. Copper B. 1. II 3/16" 2a 155-170 24-25 2. I 1/4" 2a 240 27 3. I 5/16" 2a 320 30 C. 8 hours. 80°-160° F D. Grinding time 1/2 hour.	A. None B. None	1	789		2"	73"	U	IMP	I	12"	P
						2	850	X		6"		IMP	IV	2"	-
						3	989		1"	94"	D	IMP	I	5-7/16"	74"
						4	775		R		D	IMP	I	18"	42"
												IMP	V	30-3/16"	
												57mm Proof	Projectile	11	

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	BRAT	BALLISTIC RESULTS	REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPON. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME SEQUENCE	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	# VEL. LOCATION OF B CHUCKING RADIOGRAPHIC REPORTS, ETC.	
						F/S L.L. R.L. C.B. LOC. TYPE INCH	
A. AD 368 B. 4/21/48 C. D 18 D. Great Lakes Steel Corp. E. Harnischfeger F. Buick Motor Division	A. 3/4" B. R IV .08% Mn .026S .015P .66Cr .21Mo C. .27C D. Face 341-565 Back 341-363 E. B.O.H. F. 1650°F ± hr. water 900°F ± hr. air	A. AII AWS .11C 1.54 Mn .46Si .011S .029P 20.86Cr 10.39Ni 1.68Mo .05V .07Cu B. AWS C. D. DC-REV A. AI AWS .12C 3.76Mn .41Si .008S .056P 20.88Cr 9.71Ni .70Mo .06V .10Cu B. AWS C. D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given. B. 1. I 1/4" 1a 235 34 2. I 3/16" 1a 195 32 3. I 1/4" 2a 200 33 C. 1 hr. 25± minutes 75-210°F D. Grinding time 7 minutes.	A. None B. None	1 854 4" R 5" D IMP I 4 1/2" 2 800 4" L 6" U IMP I 10 1/2" 3 791 4" L 5 1/2" U IMP I 20 1/2" O I 1"	P
A. AD 368 B. 4/21/48 C. D 19 D. Jones & Laughlin Co. E. Harnischfeger Corp. F. Buick Motor Division	A. 3/4" B. R III 1.66% Mn .21Si .018P .36% Mo C. .28C D. Face 341 Back 341 E. F. 1650°F ± hr. water 900°F ± hr. air	A. AII AWS .11C 1.54Mn .46Si .011S .029P 20.84Cr 10.39Ni 1.68Mo .05V .07Cu B. AWS C. Line D. DC-REV A. AI AWS .12C 3.76Mn .41Si .056P .008S 20.88Cr 9.71Ni .70Mo .06V .10Cu B. AWS C. Line D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given B. 1. I 1/4" 1a 230 35 2. I 3/16" 1a 185 31 3. I 1/4" 2a 230 35 C. 1 hr. 28 minutes 75-220°F D. Grinding time 3 1/2 mins.	A. None B. None	1 796 1-7/8" L 5 1/2" U - - - 2 788 1-7/8" R 6 1/2" D - - - 3 801 3" R 4" U - - - 4 802 1-13/16" R 4" D - - - 5 812 1" L 5 1/2" U IMP I 11"	P Plate is acceptable for soundness.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIDING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE INFO. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. WEN E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #				CRACKING				RADIOGRAPHIC RESULTS, ETC.
							T/B	L.L.	R.L.	C.B.	LOC.	TYPE	INT			
A. AD 414 B. 5/7/43 C. D 20 D. Great Lakes Steel Corp. E. Harnischfeger Corp. F. Buick Motor Division	A. 3/4" B. R IV C. .08Mn .75Si .025S .015P .68Cr .21Mo C. .27C D. Face 341-665 Back 341-665 E. F. 1650°F ± hr. water 900°F ± hr. air	A. A II .11C 1.25Mn .42Si .012S .025P 19.36Cr 10.67Ni 1.36Mo B. AWS C. D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given. B. 1. I 1/4" 1a 235 31 2. I 3/16" 1a 170 25 3. I 1/4" 2a 195 26-29 C. 92 minutes 80-200°F D. Grinding time 8 minutes.	A. None B. None	1 2	785 785	X R	7 1/2" 1 1/2"	IMP U	I O	I I	20° 24° 444	P		

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	GRAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE INFO. F. ANODE PREPARATION	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.						
							F/S	L.L.	R.L.	C.D.	LOC.	TYPE	AMT			
A. AD 454 B. 6/2/45 C. D 22 D. Jones & Laughlin E. Harnischfeger Corp. F. Buick Motor Division	A. 3/4" B. R III 1.69% .2181 .0118 .018P .38Mo C. .28C D. Face 341 Back 341 E. F. 1650°F ± hr. water 920°F 1½ hr. air	A. A II .11C 1.25% Mn .4281 .0128 .022P 19.36Cr 10.67Ni 1.36Mo B. AWS C. Line D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given. B. 1. I 1/4" 1a 235 33 2. I 3/16" 1a 190 30 3. I 1/4" 2a 220 32 C. 69 minutes 80-210°F. D. Chipping time 6 minutes.	A. None B. None	1 2 3 4	808 785 639 849	7/8" 1 1/8" 1 1/8" 2 1/8"	3/8" 7/8" 1 1/8" 5/8"	IMP IMP IMP IMP	I I V I	6" 6 1/2" 2" 1"	P			
57mm Proof Projectile FI																
A. AD 454 B. 6/2/45 C. D 22 D. Jones & Laughlin E. Harnischfeger Corp. F. Buick Motor Division	A. 3/4" B. R III 1.69% .2181 .0118 .018P .38Mo C. .28C D. Face 382 Back 382 E. F. 1650°F ± hr. water 920°F 1½ hr. air	A. A I .08C 3.30% Mn .4681 .0108 .022P 19.60Cr 10.74Ni .80Mo .08V .08Cu B. AWS-C C. Line D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given. B. 1. I 1/4" 1a 215 29 2. I 3/16" 1a 170 25 3. I 1/4" 1a 195 26 1/4" 1a 215 27 C. 1 hr. 27½ minutes 80-205°F D. Grinding time 5 minutes	A. None B. None	1 2 3 4	806 802 798 788	1-3/8" L 3" 1-7/8"	6 1/8" 1 1/2" 1 1/2" 7"	IMP IMP IMP IMP	I V - I	3" 2 1/2" - 2"	P	Fine star-shaped crater cracks. X-ray 1/2" of cracking.		
57mm Proof Projectile FI																
A. AD 454 B. 6/2/45 C. D 24 D. Great Lakes Steel Corp. E. Harnischfeger Corp. F. Buick Motor Division	A. 3/4" B. R IV .78% .7681 .0285 .018P .58Cr .15Mo C. .28C .08Zr D. Face 341-682 Back 341-682 E. B.O.H. F. 1650°F ± hr. water 920°F 1½ hr. air	A. A I .08C 3.30% Mn .4681 .0108 .022P 19.60Cr 10.74Ni .80Mo .08V .08Cu B. AWS-C C. Line D. DC-REV	A. 60° DV B. 5/16" C. Flame cutting Grinding	A. Not given. B. 1. I 1/4" 1a 240 34 2. I 3/16" 1a 190 31 3. I 1/4" 2a 240-250 35 C. 69 minutes 75-200°F D. Grinding time 5 minutes.	A. None B. None	1 2 3	799 781 790	8-7/8" 1/8" L	7/8" 4 1/2" 5 1/2"	IMP - IMP	I - I	7 1/2" - 3 1/2"	P	Two fine star-shaped crater cracks at crossbar. Opening 1 1/2" x 8 1/2" on third round.		
57mm Proof Projectile FI																

42.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FILING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. DO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S			CRACKING	RADIOGRAPHIC RESULTS, ETC.		
							F/S	L.L.	R.L.	C.S.	LOC.	TYPE	REV	
A. AD 375 B. 4/2, 3/43 C. KW 194F D. Chevrolet Forge E. Lincoln Elec. Company F. Chevrolet Motor Co.	A. 3/4" B. R V .90Ph .78S1 .015S .051P .68Cr .21Mo C. 32C D. Face 321-541 Back E. BOH F. 1600° F 52 min. water 1000° F 4 hrs. air	A. A I .06C 4.86Ph .78S1 .011S .010P 20.2Cr 9.7Ni Mo Nil B. ANW-1 C. T1 O D. DC-REV	A. 60° DV B. 3/32" C. Flame cutting Grinding	A. Not given B. 1. I 5/32" 1a 120 24-25 2. I 5/32" 1a 170 24-25 3. I 1/4" 1a 280 26-28 C. 12 1/2 hrs. 100° F-180° F D. Chipping time-none Peening	A. None B. None	1 2 3 4 5	813 800 782 795 790	4 1/2" R 2 1/2" R 2 1/2" L	10° D 11 1/2" U 9 1/2" D 7" U 6" D	- - - - -	- - - - -	- - - - -	F 4" longitudinal crack in crossbar. 12" 5" 14 1/2" 4 1/2" 4 1/2" 2" 45"	
A. AD 701 B. 6/22/43 C. KW 211F D. Chevrolet Forge E. Lincoln Elec. Company F. Chevrolet Motor Company	A. 3/4" B. R V .90Ph .78S1 .014S .028P .61Cr .19Mo C. .30 D. Face 311 Back 321 E. B.O.H. F. 1600° F 52 min. water 850° F 4 hrs. air	A. A II .06C 4.86Ph .78S1 .011S .010P 20.2Cr 9.7Ni Mo Nil B. ANW 1 1/2 C. T1 O D. DC-REV	A. 60° DV 3/32" B. 3/16" C. Flame Cutting Grinding	A. Not given B. 1. I 5/32" 1a 110-140 24-25 2. I 5/32" 1a 110-140 24-25 3. I 1/4" 1a 190-250 26-28 C. 10 hours 80° F-140° F D. Peening.	A. None B. None	1 2 3 4	804 803 801 801	1 1/2" L 3 1/2" L 3 1/2" L 1 1/2" I	7 1/2" U 10 1/2" D 5 1/2" U 6 1/2" U	10° I 0 I 0 I 16 1/2" I 3 1/2" V 3 1/2" 32"	P 2 1/2" 1" 16 1/2" 4" 3 1/2" 32"	57mm Proof Projectile T1		

49.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRENO NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MPN. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. MPN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & ENTER PASS TEMPERATURE D. REMARKS	A. PHE B. POST	#	VEL. F/S	LOCATION OF S L.L. R.L. C.D.	CRACKING LOC. TYPE LEN	RADIOGRAPHIC RESULTS, ETC.						
A. AD 771 B. 7/31/43 C. KW 209 F D. Chevrolet Forge E. Lincoln Elec. F. Chevrolet Motor Company	A. 3/4" B. R V C. .90Mn .73S1 .014S .028P .61Cr .12Mo C. .30C D. Face 311 Back 321 E. B.O.H. F. 1600° F 52 min water 950° F 4 hrs. air	A. A I .06C 4.05Mn .73S1 .011S .010P 20.2Cr 9.7Ni Mo Nil B. ARM 1 C. T10 2 D. DC-REV	A. 60° DV 3/32" B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 5/32" 1a 110-140 24-25 2. I 5/32" 1a 110-140 24-25 3. I 1/4" 1a 190-250 26-28 C. 9 hours 100-150° F D. Reening	A. None B. None	1 2 3	798 784 791	3° R 1° L 14° L	5° U 15° D 16° D	IMP IMP IMP	I V I	11 1/2° 3° 16 1/2° 20° 50 1/2°	F Total of 24° of weld cracks in crossbar.			
A. A 12594 B. 2/25/44 C. KW 250 F D. Chevrolet Forge E. Crucible Steel Corp. F. Chevrolet Motor Company	A. 3/4" B. R IV C. 1.01Mn .06S1 .021S .018P .05Cr .12Mo .07Zr .0021S C. .28C D. Face 321 Back 321 E. B.O.H. F. 1600° F 52 min water 950° F 3 hrs. air	A. A I .10C 4.05Mn .48S1 .025S .026P 20.1Cr 10.4Ni 1.25Mo B. Armotize Mn C. T10 2 D. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 5/32" 1a 130 22 5/32" 2a 170 26 3. I 1/4" 1a 225 30 1/4" 2a 235 32 C. 12 hours. 70°-100° F D. Grinding time, none.	A. None B. None	1 2 3 4	851 854 791 790	1 1/2° R 2 1/2° R X	7 1/2° U 11° D 11° D 5° D	IMP IMP IMP IMP	I I I I	- - - - 9 1/2° 10 1/2°	P 57ms Proof Projectile T1			
A. A 12594 B. 2/25/44 C. KW 251 F D. Chevrolet Forge E. Crucible Steel Corp. F. Chevrolet Motor Company	A. 3/4" B. R IV C. .95Mn .76S1 .025S .025P .07Cr .14Mo C. .28C D. Face 331 Back 331 E. B.O.H. F. 1600° F 52 min water 975° F 3 hrs. air	A. A I .10C 4.05Mn .48S1 .025S .026P 20.1Cr 10.4Ni 1.25Mo B. Armotize Mn C. T10 2 D. DC-REV	A. 60° DV B. 3/16" C. Flame cutting Grinding	A. Not given. B. 1. I 5/32" 1a 110 18 3/16" 1a 190 24 5/32" 1a 160 22 3. I 1/4" 2a 220 26 C. 11 1/2 hours. 70°-160° F D. Grinding time, none.	A. None B. None	8 9	782 801	1° L 1 1/2° R	8° U 9° D	IMP IMP	I I	16 1/2° 17 1/2° 34°	P 57ms Proof Projectile T1			

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FISHING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S				CRACKING		RADIOGRAPHIC RESULTS, ETC.		
							F/S	L.L.	S.L.	C.D.	LOC.	TYPE	ANT			
A. AD 364 B. 4/8/43 C. 11 D. Ford Motor Co. E. Crucible Steel F. Ford Motor Co.	A. 3/4" B. R II C. 1.40% D. .3081 .0208 E. .020P .72Cr F. .07Ni .42Mo C. .27 D. Face 331 Back 331 E. B.O.H. F. 1650 F 3 hrs. spray quench 1050 F 4 hrs. air	A. A I B. Resistal C. Titanium D. DC-REV	A. 60° 8V B. 3/16" to 1/4" C. Flame Cutting Grinding	A. Not given B. 1. I 5/32" 1a 100 20 2. I 3/16" 3a 180 23 3. II 3/16" 2b 180-200 23 Seal bead 3/16" 1a 180-190 23 C. 11 hrs. 80°F-280°F D. Edges of 12" x 18" plates were buttered. All crater cracks ground out. Chipping 45 mins.	A. 100° B. None	1 2 3	797 804 777	3" L 4" U 2" R	7" D IMP IMP	IMP V I	I V I	9" 2" 4"	P Sound weld.			
							57mm Proof Projectile						18"			
A. AD 434 B. 5/18/43 C. 205 D. Ford Motor Co. E. Crucible Steel F. Ford Motor Co.	A. 3/4" B. R II C. 1.23% D. .2481 .0225 E. .022P .55Cr F. .07Ni .30Mo C. .26 D. Face 311 Back 311 E. B.O.H. F. 1650 F 2 1/2 hrs. water 1050 F 3 1/2 hrs. air	A. A I B. .08C C. 1.82% D. 20.14Cr E. .95Ni F. .00Mo B. Resistal C. TiO ₂ D. DC-REV	A. 45° 8V B. 1/4" C. Flame cutting	A. Copper B. 1. I 1/4" 1a 350 35 2. I 1/4" 1a 350 35 5/16" 1a 400 39 3. II 1/4" 5b 350 35 Seal beads 3/16" 2b 175 25 C. 7 hours 200°F-240°F D. Chipping time 1/2 hour.	A. None B. None	1 2 3 4 5	819 789 782 886 889	3" L 2" R 2 1/4" R 2 1/2" L 2" R	4 1/2" U 9" D 3" D 4" D 6 1/2" U	- - IMP IMP IMP	- - I V I V	9" 5 1/2" 12" 2" 7 1/2" 10 1/2" 40"	P 2" intermittent incomplete fusion in root end.			
							57mm Proof Projectile									

45.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FILING NUMBER NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MFG. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. RHN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF #			CRACKING			RADIOGRAPHIC RESULTS, ETC.		
							7/8	L.L.	S.L.	C.B.	LOC.	TYPE	AVT			
A. AD 487 B. 6/4/48 C. W 166 D. Ford Motor Co. E. Arcos Corp. F. Ford Motor Co.	A. 1/2" B. R II C. 1.31Mn .2681 .0258 .022P .68Cr .06Ni .45Mo C. .26 D. Face 341 Back 341 E. B.O.H. F. 1650° F 3 hrs. spray quench 1100° F 4 hrs. air	A. I .07C 3.26Mn .2681 .0065 .042P 16.6Cr 9.72Ni .58Mo B. Chromang C. Titania D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. 1/4" Copper B. 1. I 5/32" 1a 160 25 2. III 3/16" 1a 205 25 3/16" 4b 205 25 3. II 3/16" 2b 205 25 Seal bead #0 3/16" 1b 205 25 C. 4 hrs. 20 min. 172° F-232° F D. Chipping time 2 hrs.	A. None B. None	1 2 3	808 807 798	1 1/2" L 2 1/2" R 3 1/2" R	7° D 6 1/2" U 8 1/2" D	IMP IMP IMP	I I I	15° 5° 15° 31 1/2°	P Welds are sound. Plate only 34" long.			
							57mm Proof				Projectile	F1				
A. AD 487 B. 6/4/48 C. W 161 D. Ford Motor Co. E. Arcos Mfg. Co. F. Ford Motor Co.	A. 1/2" B. R II C. 1.31Mn .2681 .0258 .022P .68Cr .06Ni .45Mo C. .26 D. Face 351 Back 351 E. B.O.H. F. 1650° F 2 1/2 hrs. spray quench 1020° F 3 1/2 hrs. air	A. II .09C 3.26Mn .2681 .0065 .042P 16.6Cr 6.9Ni B. Chromang C. Titania D. DC-REV	A. 45° SV B. 1/4" C. Flame cutting Grinding	A. 1/4" Copper B. 1. I 5/16" 1a 210 22 2. III 1/4" 1a 285 22 1/4" 2b 285 22 3. III 1/4" 2b 285 22 Seal bead #7 5/16" 1a 210 22 C. 3-1/3 hrs. 185° F-265° F D. Chipping time 1-1/3 hrs.	A. None B. None	1 2 3	808 798 798	1 1/2" L 1 1/2" R X	10° D 7° U 7° D	IMP - IMP IMP	I - I I	12° - 16° 2 1/2° 30 1/2°	P Two 1/2" cracks in root gap.			
							57mm Proof				Projectile	F1				

46.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING
A. FILING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MPN. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. DEN E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROOVE TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	BALLISTIC RESULTS, ETC.				
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AWT	
A. AD 880 B. 8/31/43 C. 49C D. Ford Motor Co. E. Crucible Steel Company F. Ford Motor Co.	A. 3" B. R II 1.44Mn .28Si .022S .018P .57Cr .06Ni .33Mo C. .285C D. Face 321 Back 331 E. B.O.F. F. 1650 F 1 1/2 hr. spray 1030 F 2 1/2 hr. air	A. A I .106C 4.90Mn .35Si 19.32Cr 10.24Ni .77Mo B. ReziSteel C. Titanium D. DC-REV	A. 45° SV B. 1/4" C. Flame cutting Grinding	A. Copper B. 1. I 3/16" 1a 180 24 2. III 3/16" 2b 180 23 1/4" 1a 240 25 1/4" 2b 224 25 3. III 1/4" 1b 210 24 1/4" 2b 230 24 Seal bead 3/16" 1a 170 23 C. 13 hrs. 90° F-180° F D. Chipping time 1 hr. 1 min.	A. None B. None	1 2 3	748 851 794	1 1/2" L 2" L 2" L	4" D 4" U 4" U	IMP IMP IMP IMP IMP IMP	I I I V I V	64" 2 1/2" 30" 28" 11 1/2" 2 1/2" 250" 71"	P	
A. AD 880 B. 9/14/43 C. W 255 D. Ford Motor Co. E. Reid Avery F. Ford Motor Co.	A. 3" B. R II 1.33Mn .23Si .0178 .018P .07Ni .34Mo C. .28C D. Face 321 Back 321 E. B.O.F. F. 1650 F 1 1/2 hr. spray 1020 F 2 1/2 hr. air	A. A I 2.00Mn .40Si 18.79Cr 10.60Ni 2.20Mo B. Baco C. TiO ₂ D. DC-REV	A. 45° EV 1/8" B. 1/4" C. Flame cutting Grinding	A. Copper B. 1. I 1/4" 1a 225 24 2. III 1/4" 1a 240 24 1/4" 1b 270 24 1/4" 1b 260 24 3. II 1/4" 2b 250-260 24 Seal bead 1/4" 1a 250 24 C. Chipping time 1-1/8 hours.	A. None B. None	1 2 3	822 790 788	3 1/2" R 1 1/2" R 1 1/2" L	4" D 3" U 1 1/2" U	- - IMP IMP IMP IMP	- - I V I V	- - 6" 6 1/2" 3 1/2" 9 1/2" 24-2 1/2"	P	

48.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING	
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE TYPES F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. RHN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE CL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOC. IN OF D L.L. R.L. C.B.	CRACKING LOC. TYPE	4th	5th	6th	7th	8th	9th	10th	RADIOGRAPHIC RESULTS, ETC.
A. AD 883 B. 9/14/43 C. 65C D. Ford Motor Co. E. Crucible Steel Company F. Ford Motor Co.	A. 1/2" B. R II 1.23Mn .26C1 .026S .023P .50Cr .08N1 .31Mo .012B C. .26C D. Face 321 Back 321 E. B.O.H. F. 1650 F spray 1020 F air	A. A I .105C 4.40Mn .3581 19.32Cr 10.24Ni .77Mo B. Rezistal C. Titania D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 1a 120 23 2. I 3/16" 1a 170 23 1/4" 2a 260 25 3. II 1/4" 2b 260 25 Two seal beads- 5/32" 1a 150 24 3/16" 1a 180 24 C. 1/2 hrs. 90° F-200° F D. Root bead pass ground out. Step back of weld sequence used.	A. None B. None	1	810	3/8" R	IMP D	I 14° V 4 1/2°							P
57mm Proof Projectile T1																	
A. AD 885 B. 9/14/43 C. 65C D. Ford Motor Co. E. Crucible Steel Company F. Ford Motor Co.	A. 1/2" B. R II 1.23Mn .26C1 .026S .023P .50Cr .08N1 .31Mo .012B C. .26C D. Face 321 Back 321 E. B.O.H. F. 1650 F 1 1/2 hrs. spray 1020 F 2 1/2 hrs. air	A. A I .105C 4.40Mn .3581 19.32Cr 10.24Ni .77Mo B. Rezistal C. Titanium D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 1a 120 23 2. III 3/16" 1a 200 24 1/4" 1a 280 25 1/4" 2b 280 25 3. II 1/4" 3b 240 25 Two seal beads 3/16" 2a 180 24 C. 7 hours 90° F-200° F D. Chipping time 135 mins. Step back method of weld sequence used. Root bead pass ground out.	A. None B. None	1	808	3/8" R	IMP D	I 7 1/2° V 6 1/2°							P
57mm Proof Projectile T1																	
A. AD 886 B. 9/28/43 C. 65C D. Ford Motor Co. E. Argon Corp. F. Ford Motor Co.	A. 1/2" B. R II 1.23Mn .26C1 .026S .023P .50Cr .08N1 .31Mo .00198 C. .26C D. Face 321 Back 321 E. B.O.H. F. 1650 F 1 1/2 hrs. spray 1020 F 2 1/2 hrs. air	A. A I .114C 3.88Mn .6981 19.55Cr 10.08Ni .41Mo B. Chromang C. Lime D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 2a 130 23 2. III 3/16" 1a 180 24 1/4" 2a 280 25 1/4" 2b 280 25 3. II 1/4" 3b 280 25 Seal bead - 3/16" 1a 180 24 C. 7 hours 45 minutes. 90° F - 200° F D. Chipping time 2 hours 20 minutes. Step back method of weld sequence used. Back of beads ground out.	A. None B. None	1	511	1 1/2" L	7 1/2" D	- - -							P
57mm Proof Projectile T1																	
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IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDS	PROCEDURE	WELD	BALLISTIC RESULTS							REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE INFO. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SWG E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	MAGNIFICATION RESULTS, ETC.				
							F/S	L.L. R.L. C.B.	LOC. TYPE	ANY				
A. AD 980 B. 10/7/45 C. 78C D. Ford Motor Company E. Crucible Steel Corp. F. Ford Motor Company	A. 3/4" B. R II 1.22% .2581 .0225 .021P .50Cr .06Ni .35Mo .0013S C. .28C D. Face 351 Back 351 E. B.O.H. F. 1650 F 2 hrs. spray 950 F 2 1/2 hrs. air	A. A I .106C 4.40% Mn .3581 19.32Cr 10.24Ni .77Mo B. Resistal C. Titania D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting. Grinding	A. Not given B. 1. I 3/16" 1a 150 25 2. III 1/4" 2a 255 25 1/4" 2b 250 25 3. II 1/4" 3b 250 25 Two seal beads - 3/16" 2b 180-190 25-24 C. 7 1/2 hours 80°-200°F D. Grinding time 3 hours.	A. None B. None	1 797	5 1/2"	1° R 1° U	IMP V	7 1/2"		1st round was an armor piercing projectile instead of a proof projectile. This was an error and resulted in the cracking.		
						2 768	1° L	14° D	IMP I	9 1/2"		P		
						3 808	4 1/2"	9 1/2"	U	-	-	-	Small amount of slag.	
						4 795	5 1/2"	5° U	-	-	-	-		
										17 1/2"				
													57mm Proof Projectile FI.	
A. A 10901 B. 11/2/45 C. 95C D. Ford Motor Company E. Page Steel & Wire Company F. Ford Motor Company	A. 3/4" B. R II 1.33% .2581 .0178 .018P .51Cr .07Ni .34Mo .0013S C. .28C D. Face 351 Back 351 E. B.O.H. F. 1650 F 1 1/2 hrs. water 1020 F 2 1/2 hrs. air	A. A I .104C 3.56% Mn .2581 20.67Cr 9.67Ni .62Mo B. Page C. Titania D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting. Grinding.	A. Not given B. 1. I 3/16" 1a 255 25 2. III 3/16" 1a 190 24 1/4" 1a 250 25 1/4" 2b 250 25 3. II 1/4" 3b 270 25 Two seal beads - 3/16" 2a 190 24 C. 8-1/2 hours 80°-180°F D. Grinding time 1 1/2 hours. Pin hole ground out. Step back method of weld sequences used.	A. yes B. None	1 857	3 1/2"	10 1/2" D	IMP V	12 1/2"		P		
						2 800	3 1/2"	4° U	-	-	-	-		
						3 800	3 1/2"	5° U	-	-	-	-		
						4 684	2-5/8"	15 1/2" D	O	I	15"			
						5 650	4 1/2"	3 1/2" D	IMP I	20 1/2"				
						6 775	3 1/2"	3 1/2" U	IMP I	15"				
										8 1/2"				
													57mm Proof Projectile FI.	

50.

IDENTIFICATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE MPGS. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SWN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF R	CRACKING	ANTICORROSIVE RESULTS						
							F/S	L.L.	S.L.	C.B.	LOC.	TYPE	AWT			
A. AD 946 B. 10/20/43 C. W 271 D. Ford Motor Co. E. Page Steel & Wire Company F. Ford Motor Co.	A. 3/4" B. R II 1.33Mn .23Si .017S .018P .51Cr .07Ni .34Mo .0013B C. .28C D. Face 331 Back 331 E. B.O.H. F. 1650 F 1 1/2 hrs spray 1020 F 2 1/2 hrs air	A. A I .96C 4.08Mn .40Si 22.46Cr 9.74Ni .68Mo B. Page C. Line D. DC-REV	A. 45° SV B. 5/32" C. Flame cutting Grinding	A. Copper B. 1. I 3/16" 1a 165 24 2. I 1/4" 2a 240 24 3. II 1/4" 2b 240 24 Seal bead - 1/4" 1a 240 24 C. 2 hours 42 minutes. 80°-150° F D. Grinding time 1 hour 10 mins.	A. None B. None	1 2 3 4 5 6	803 813 805 807 783 784	1" R 4" R 3" R 3" L 2 1/2" L 1 1/2" L	5 1/2" U 4 1/2" D 3 1/2" U 11" D 11" U 9 1/2" U	IMP IMP IMP - - IMP	I V V - - I	8" 5 1/2" 6 1/2" - - 15 1/2"				P 39 1/2"
A. A 10905 B. 11/4/43 C. 72C D. Ford Motor Co. E. Reid-Avery Co. F. Ford Motor Co.	A. 3/4" B. R II 1.23Mn .28Si .028P .028S .08Ni .31Mo .0013B C. .25C D. Face 331 Back 331 E. B.O.H. F. 1650 F 1 1/2 hrs spray 1020 F 2 1/2 hrs air	A. A I 5.74Mn .42Si 19.38Cr 10.26Ni .56Mo B. Raccolloy C. Line D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 1a 140 23 2. I 3/16" 1a 160 25 3. II 1/4" 1a 220 26 5. II 1/4" 2b 260 26 Two seal beads - 5/32" 1a 150 23 3/16" 1a 180 24 C. 6 1/2 hours. 80° F-160° F D. Grinding time 2 hours.	A. None B. None	1 2 3	738 805 820	1 1/2" L 1 1/2" L 1 1/2" L	5 1/2" D 7 1/2" U 5 1/2" D	- IMP IMP	- I I	- 8" 13				P 27 1/2"

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
FIRING RECORD NO. DATE OF TEST PLATE NO. ANODE MANUFACTURER ELECTRODE SPEC. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SSB E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF B L.L. S.L. C.B.	CRACKING LOC. TYPE ANT	RADIOGRAPHIC RESULTS, ETC.						
A. A 10806 B. 11/4/45 C. 90C D. Ford Motor Co. E. Crucible Steel Co. F. Ford Motor Co.	A. 3/4" B. R II 1.24Mn .2581 .0208 .020P .46Cr .07N1 .31Mo .0013B C. .28C D. Face 341 Back 341 E. B.O.H. F. 1650 F 2 hrs. spray 900 F 2 1/2 hrs. air	A. A I .12C .29S1 3.95Mn 20.13Cr 9.78Ni .81Mo B. Resistal C. Titania D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 1a 130 23 2. III 3/16" 1a 190 24 1/4" 1a 270 25 1/4" 2b 270 25 3. II 1/4" 3b 270 25 Two seal beads 3/16" 180 24 C. 11 hours. 90°F-190°F D. Grinding time 2 1/2 hours. Step back method of weld sequence used. Arc blow on all passes.	A.yes B.None	1 2	805 798	1" R 3" L	10" U 4" D IMP IMP IMP O	I V I V I V	9" 3 1/2" 14" 3" 2 1/2" 32 1/2"	P 3/16" incomplete fusion.				
A. A 10810 B. 11/8/45 C. W 280 D. Ford Motor Co. E. Crucible Steel Co. F. Ford Motor Co.	A. 3/4" B. R II 1.33Mn .25S1 .0178 .018P .81Cr .07N1 .84Mo .0013B C. .28C D. Face 321 Back 321 E. B.O.H. F. 1650 F 1 1/2 hrs. spray 1020 F 2 1/2 hrs. air	A. A I .15C 4.44Mn .21Si 20.04Cr 9.54Ni .82Mo B. Resistal C. Titania D. DC-REV	A. 45° SV B. 5/32" C. Flame cutting Grinding.	A. Copper B. 1. I 3/16" 1a 175 23 2. I 1/4" 2a 240 23 1/4" 2b 240 23 3. II 1/4" 2b 240 23 One seal bead- 1/4" 240 23 C. 2 hours 55 minutes. 60°F-190°F D. Grinding time 1 hour 30 mins.	A.None B.None	1 2	858 746	1" W 1" R	5 1/2" U 6 1/2" D IMP IMP	I V I	7 1/2" 14 1/2" 2" 24"	P W-280 replaces plate W-268 that failed at X-ray.				
A. A 10809 B. 11/8/45 C. 100C D. Ford Motor Co. E. Arcos Corp. F. Ford Motor Co.	A. 3/4" B. R II 1.33Mn .25S1 .0178 .018P .81Cr .07N1 .84Mo .0013B C. .28C D. Face 351 Back 351 E. B.O.H. F. 1650 F 1 1/2 hr. spray 1020 F 2 1/2 hrs. air	A. A I .114C 3.88Mn .68Si 19.55Cr 10.08Ni .41Mo B. Chromang C. Lime D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting. Grinding	A. Not given B. 1. I 3/16" 1a 130 23 2. I 3/16" 1a 190 24 1/4" 2a 280-270 25 3. II 1/4" 3b 260 25 Two seal beads- 5/32" 1a 130 23 3/16" 1a 190 24 C. 6 1/2 hours 90°-180°F D. Grinding time 1 1/2 hours. Back step method of weld sequence used. Tack welds on both sides. Arc blow on all passes.	A.yes B.None	1 2	863 798	X X	6 1/2" U 6 1/2" D IMP IMP	I I I	17" 16" 38"	P				

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IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS								REMARKS ON CRACKING	
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE SPEC. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. DEN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROUND TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL. F/S	LOCATION OF #			CRACKING			RADIOGRAPHIC RESULTS, ETC.	
								L.L.	S.L.	C.B.	LOC.	TYPE	AMT		
A. 10889 B. 11/26/45 C. 115C D. Ford Motor Co. E. Arcos Corp. F. Ford Motor Co.	A. 5/4" B. R II C. 1.35% .2281 .0178 .018P .51Cr .07Ni .34Mo .0013B C. .28C D. Face S21 Back S21 E. B.O.H. F. 1650°F 1 1/2 hrs spray 1020°F 2 1/2 hrs air	A. A I .114C 3.68% .6981 19.55Cr 10.05Ni .41Mo B. Chromang C. Lime D. DC-REV	A. 45° SV B. 1/4" C. Flame cutting Grinding	A. None B. 1. I 3/16" 1a 160 25 2. III 1/4" 1a 240 25 3/16" 1a 160 25 1/4" 2b 250 25 1/4" 5b 250 25 One seal bead - 3/16" 1a 160 25" C. 8 hours. 100°F - 190°F D. Grinding time 1 1/2 hours. Step back method of weld sequence used.	A. Yes B. None	1	lost	14"		5"	U	IMP	I	94"	P
						2	782		4"R	5 1/2"	D	IMP	I	154"	
						3	636	3 1/2"	L	4 1/2"		-	-	4"	
						4	812	I		9 1/2"	D	IMP	I	194"	
												IMP	V	64"	
															57mm Proof Projectile T1
A. A11807 B. 12/16/45 C. W 208 D. Ford Motor Co. E. Weld Avery Co. F. Ford Motor Co.	A. 5/4" B. R II C. 1.35% .2281 .0178 .018P .51Cr .07Ni .34Mo .0013B C. .28C D. Face S41 Back S41 E. B.O.H. F. 1650°F 1 1/2 hrs spray 1020°F 2 1/2 hrs air	A. A I 6.35% .4681 18.10Cr 9.98Ni .65Mo B. Raco C. Lime D. DC-REV	A. 45° SV B. 3/16" C. Flame cutting Grinding	A. Copper B. 1. I 5/32" 2a 145 24 2. III 3/16" 1a 170 24 1/4" 2b 245 25 3. II 1/4" 2b 240 25 One seal bead - 3/16" 2a 170 24 C. 3 hours 8 minutes. 95°-170°F D. Grinding time 1 hour 40 mins.	A. None B. None	1	825		4"R	8 1/2"	U	IMP	I	154"	P
						2	784		4"R	9"	D	IMP	V	4"	
												IMP	I	144"	
														354"	
															57mm Proof Projectile T1

53.

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	SEAT	BALLISTIC RESULTS										REMARKS ON CRACKING			
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MFG. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. DEN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. ROOT TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	RADIOGRAPHIC RESULTS, ETC.									
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	INT						
A. A 11558 B. 12/29/43 C. 124C D. Ford Motor Co. E. Metal Thermit Corp. F. Ford Motor Co.	A. 3/4" B. R II 1.33Mn .23S1 .0178 .018P .51Cr .07Ni .34Mo C. .28C D. Face 331 Back 331 E. B.O.H. F. 1650 F 1 1/2 hrs spray 1020 F 2 1/2 hrs air	A. A II .07C 4.22Mn .3081 .0088 .007P 19.7Cr 9.46Ni .06Mo B. Murex C. Lime D. DC-REV	A. 45° SV B. 3/4" C. Flame cutting Grinding	A. Not given B. 1. I 3/16" 1a 110 24 2. III 3/16" 1a 180 25 1/4" 1a 230 25 1/4" 2b 230 25 3. III 3/16" 2b 170 25 1/4" 1b 220-250 Seal bead-3/16" 1a 190 25 C. 6 1/2 hrs. 90°-190°F D. Grinding time 1 1/2 hours. Root face of plates buttered with 5/32" electrode 115 24 before set up and tacked.	A. None B. None	1 2 3 4	763 775 797 821	2 1/2" R 3 1/2" R 2 1/2" R 1 1/2" L	10 1/2" D 4 1/2" U 9 1/2" U 2 1/2" U	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	P 17° 11° 10 1/2° 68° 45°			
						57mm	Proof	Projectile	T										
A. A 11800 B. 1/8/44 C. W 299 D. Ford Motor Co. E. Page Steel & Wire F. Ford Motor Co.	A. 3/4" B. R II 1.23-1.33Mn .25-.28S1 .021-.026S .023-.025P .50-.60Cr .05-.08Ni .31-.45Mo .001S C. .28-.29C D. Face 321-331 Back 321-331 E. B.O.H. F. 1650 F 1 1/2 hrs spray 1020 F 2 1/2 hrs air	A. A I .101C 3.81Mn .24S1 20.51Cr 10.12Ni .65Mo B. Page- Allegheny C. Titania D. DC-REV	A. 45° SV B. 5/32" C. Flame cutting Grinding	A. Copper B. 1. I 5/32" 1a 140 25 2. III 3/16" 1a 190 25 1/4" 1a 290 25 3/16" 2b 190 25 3. I 1/4" 1a 295 25 Seal bead- 1/4" 1a 290 25 C. 3 hours 8 minutes 98°F-190°F D. Grinding time 2 hours 45 mins.	A. None B. None	1 2	806 807	1" L 1 1/2" L	9 1/2" U 9" D	IMP I IMP V IMP I IMP V	16° 1° 13° 44°	364°							
						57mm	Proof	Projectile	T										

54.

IDENTIFICATION	ARMOR DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	BRAZ	RADIOLOGIC RESULTS	REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ARMOR MANUFACTURER E. ELECTRODE SPEC. F. ARMOR FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. DEN E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING PASSES B. DEPOSITION SIZE CL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROWN TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	# VEL. LOCATION OF # CRACKING RADIOGRAPHIC RESULTS ETC.	
	F/S	L.L.	R.L.	C.D.	LOC.	TYPE	AWT
A. AD 409 B. 4/30/43 C. F 4 D. Carnegie-Ill. E. Hollup Corp. F. Standard Rwy. Equip. Mfg. Co.	A. 3/4" B. R I 1.06Mn .19Si .024S .018P .45Cr .95Ni .42Mo C. .2% D. Face 332 Back 332 E. Elec Acid F. 1425°F 1 hr. water 680°F 2 hrs. air	A. I .079C 3.41Mn .32Si 17.7Cr 12.6Ni 1.64Mo B. Armored C. Mineral D. DC-REV	A. 70° DV B. 5/32" C. Flame cutting.	A. None B. 1. I 5/32" 2a 130 23 2. III 5/32" 4b 140 24 3. III 5/32" 6b 140 24 C. 10 hours 130°F - 280°F D. Grinding on root pass.	A. 70° F B. None	1 788 X 6" IMP I 11"	P Welds are sound.
						2 820 2 1/2" L 4 1/2" U - - -	
						3 800 7/8" L 4 3/4" D IMP I 9 1/2"	
						O I 1 1/2"	
						IMP V 22"	
						57mm Proof Projectile FI	

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING PROCEDURE	HEAT	BALLISTIC RESULTS										REMARKS ON CRACKING
A. FIRING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE SPEC. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. SIZE E. PROCESS F. HEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. DO. TYPE AND V. 1. ROOT TYPE 2. ROOT TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF S	CRACKING	PHOTOGRAPHIC RESULTS, ETC.						
							7/8	L.L.	R.L.	C.B.	LOC.	TYPE	AVT			
A. AD 905 B. 9/28/43 C. U 37 D. Jones & Laughlin E. Linde Air Products F. Fisher Tank Division	A. 1/2" B. R III 1.59% .0351 .0078 .013P .45Mo C. .28C D. Pace 352 Back 352 E. F.	A. A II .22C 9.00% .66S1 .0178 .038P 15.6Cr 16.5Ni B. Oxweld #42 C. Bare D. AC McKay A. A I .23C 5.66% .80S1 .0078 .025P 11.36Cr 9.87Ni .45Mo B. A-5 C. Bare D. DC-REV	A. 90° DV one side 60° other B. 3/16" C. Flame cutting Grinding	A. Copper B. one side - 1. I 3/16" 1a 160 21 2. II 3/16" 2b 175 21 3. II 3/16" 4b 180 21 other side - 1/4" - 740-760 C. 1 hour 13 minutes. 100-200° 340-560° D. Grinding time 55 minutes. Weld reinforcement ground off	A. None B. None	1 2 3 4	789 783 799 795	1/4" 1/4" 1/4" 1/4"	14° 14° 8° 8°	IMP IMP IMP IMP	I I I I	13 1/2° 8° 11° 14°	P 3 1/2° 11° 14°			
A. AD 881 B. 9/14/45 C. U 41 D. Jones & Laughlin E. Linde Air Products F. Fisher Tank Division	A. 3/4" B. R III 1.75% .2281 .0185 .014P .45Mo C. .28C D. Pace 341 Back 341 E. F. 1650° F 1 hr. water 980° F 1 1/2 hrs. air	A. A I .28C 5.08% .80S1 .0088 .024P 6.4Cr 10.3Ni .41Mo B. Oxweld #42 C. Bare D. AC	A. 60° DV one side 90° other B. 3/16" C. Flame cutting Grinding	A. Copper B. one side 1/4" UMia 810 30 other side 1/4" UMia 740 30 C. 28 minutes. D. Grinding time 20 minutes. Weld reinforcement ground off.	A. None B. None	1 2 3 4 5	764 816 818 811 795	1 1/4" 3/4" 2 1/4" 2 1/4" 1/4"	8 1/2° 8° 8° 8° 25 1/2°	IMP IMP IMP IMP IMP	I I I I I	17 1/2° 17° 17° 17° 17°	P 12° Crossbar - small amount of slag. 45° 30°			

IDENTIFICATION	ANODE DATA	ELECTRODE DATA	JOINT DESIGN	WELDING	PROCEDURE	REMARKS	RADIOGRAPHIC RESULTS										REMARKS ON CRACKING
A. FISHING RECORD NO. B. DATE OF TEST C. PLATE NO. D. ANODE MANUFACTURER E. ELECTRODE MFG. F. ANODE FABRICATOR	A. PLATE THICKNESS B. TYPE C. CARBON CONTENT D. RHN E. PROCESS F. SEAT TREATMENT TEMP. TIME QUENCH	A. TYPE B. TRADE NAME C. COATING D. CURRENT & POLARITY	A. GROOVE, INCLUDED ANGLE, ROOT FACE B. ROOT GAP C. PLATE PREPARATION	A. BACKING B. DEPOSITION SIZE EL. NO. TYPE AMP. V. 1. ROOT TYPE 2. BODY TYPE 3. GROW TYPE C. TOTAL WELDING TIME & INTER PASS TEMPERATURE D. REMARKS	A. PRE B. POST	#	VEL.	LOCATION OF R				CRACKING				RADIOGRAPHIC RESULTS, FIG.	
							F/S	L.L.	R.L.	C.B.	LOC.	TYPE	AMT				
A. AD 989 B. 11/8/43 C. U 40 D. Republic Steel Corp. E. Linde Air Products F. Fisher Tank Division	A. 3/4" B. R III C. 1.58% Mn .0081% C D. .0078% .0138% P E. .45% Mo F. .26% C D. Face 321 Back 321 E. F. F.	A. A I B. .26C C. 5.09% Mn D. 6481 E. .0078% C F. .0049% P G. 11.5% Cr H. 10.6% Ni I. .33% Mo J. B. 42 K. C. Bare L. D. AC	A. 60° DV one side B. 90° - - other C. 3/16" D. Flame cutting. Grinding.	A. Copper B. - one side C. 1/4" 840 32 D. - other side E. 1/4" 700-780 31-63 F. 30 minutes. 270°F - 400°F G. Grinding time 38 minutes	A. None J. None	1 2 3	817 800 804	1° 1° 1°	1° 1° 1°	6 1/2° 6- 3/8°	U D U	IMP IMP IMP	I V V	15° 7° 14° 25° 6° 50°	F Small crack. Moderate amount of slag.		
							57mm	Proof	Projectile	F1							

59.