SUMMARY OF TESTS - SHEET I

HEAT	SLAB Number	SLAB Thickness	WELD	SAMPLE	TENSILE STRENGTH Yield psi	TENSILE STRENGTH Ultimate psi	% ELONG. 8"	% ELONG. 2"	% Reduct. Area	LOCATION TENSILE FAILURE	FATIGUE TEST Stress psi	FATIGUE TEST Cycles	LOCATION FATIGUE FAILURE	BENDS TYPE Free	BENDS TYPE Guide	BENDS % Elong. or ° Bend	BENDS Location Bend Failure	CHARPY IMPACT-ft Parent Metal W.R.	CHARPY IMPACT-ft Parent Metal A.R.	CHARPY IMPACT-ft HAZ	CHARPY IMPACT-ft WM	ROCKWELL "C" HARDNESS PM	ROCKWELL "C" HARDNESS HAZ	ROCKWELL "C" HARDNESS WM	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	B	Ti	REMARKS
74P577	147682	1/2"	none	1A	125,600	132,700		23	48	(Strap)				cold		180°	none	120	55						0.16	0.86	0.011	0.01	0.21	0.31	0.92	0.47	0.46	0.05			
					116,300	127,200	11.0		45	(Strap)				cold		180°	none	144	59																		
					118,300	130,800	9.5		42	(Strap)				cold		180°	none	124	68																		
745022	W45451	1"	none	1B	123,500	128,800		19	54	(.505)	64,500	788,000		cold		180°	none	89	32						0.15	0.76	0.013	0.01	0.26	0.34	0.87	0.48	0.54	0.03			
					123,000	127,600	11		37	(Strap)	69,000	189,000		cold		180°	none	117	24																		
					120,300	128,100	11.5		38	(Strap)	60,250	1,103,000		cold		180°	none	106	34																		
					116,100	122,800		41	57	(Strap)	57,500	2,849,000	grip section																								
					114,500	123,400		42	58	(Strap)	56,600	3,050,000	grip section																								
											58,920	1,800,000	grip section																								
67P599	150687	1 1/2"	none	1C	91,600	102,100		23	61	(.505)	69,000	69,070		cold		180°	none	195	29						0.15	0.77	0.010	0.01	0.20	0.36	0.86	0.44	0.47	0.03			
					96,000	106,000	14		50	(Bar)	60,250	225,130		cold		180°	none	180	29																		
					97,500	106,100	14		53	(Bar)	50,200	1,480,420		cold		180°	none	165	25																		
					90,000	100,300		39	49	(Strap)	49,500	2,810,670	grip section						28																		
					90,600	102,800		48	61	(Strap)	49,000	5,344,184	grip section						26																		
											54,700	829,000							25																		
											49,500	2,428,000	grip section																								
Solid	weld metal		A.O.Smith S.W.91	2		112,500		18	31	(.505)															0.06	0.90	0.013	0.01	0.30	0.10	5.33	0.04	0.55	nil		>0.01	Manual Low Hydrogen
74P577	147682	1/2"	A.O.Smith S.W.91	2A		116,000		16	28	H.A.Z.				Face		38.5%	Weld Metal			24	57	25	22	21													Voids and inclusion are indicated by Max. Dimension (2) => 0.05" (3) => 0.25"
						119,200		11.5	9	H.A.Z. (2)				Face		43.7%	Weld Metal			31	58																
																				35	60																
																				45	60																
																				33	57																
745022	W45451	1"	A.O.Smith S.W.91	2B	109,000	120,500		12	17	H.A.Z.	55,310	8,000	W.M.(3)	Face		25.6%	Heat Zone			33	78	26	29	24.5													
					111,400	122,900		19	25	H.A.Z. (3)	45,300	231,000	W.M.(2)	Face		26.9%	Heat Zone			32	70																
											39,750	851,000	W.M.		Side	180°	none			30	75																
											36,100	3,200,000	grip section		Side	180°	none			30	60																
											37,900	2,194,000	W.M.							30	63																
																				30	67																
																				39	65																
																				33	65																
																				33	50																

PM = Parent Metal, WR = With Roll, AR = Across Roll, HAZ = Heat Affected Zone, WM = Weld Metal (2) minor porosity & inclusions (3) major porosity & inclusions

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SUMMARY OF TESTS - SHEET 2

HEAT	SLAB Number	SLAB Thickness	WELD	SAMPLE	TENSILE STRENGTH Yield psi	TENSILE STRENGTH Ultimate psi	% ELONG. 8"	% ELONG. 2"	% Reduct of Area	LOCATION TENSILE FAILURE	FATIGUE TEST Stress psi	FATIGUE TEST Cycles	LOCATION FATIGUE FAILURE	BENDS TYPE Free	BENDS TYPE Guide	BENDS % Elong. or ° Bend	BENDS Location Bend Failure	CHARPY IMPACT °F Parent Metal W.R.	CHARPY IMPACT °F Parent Metal A.R.	CHARPY IMPACT °F HAZ	CHARPY IMPACT °F WM	ROCKWELL "C" HARDNESS PM	ROCKWELL "C" HARDNESS HAZ	ROCKWELL "C" HARDNESS WM	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	B	Ti	REMARKS
67P599	150687	1½"	A.O.Smith S.W. 91	2C	86,800 80,400	97,000 90,700		35 35	40 50	H.A.Z.(2) H.A.Z.	34,600 50,200 47,500 40,000 39,130	10,097,000 248,000 349,000 1,934,000 664,000	H.A.Z. H.A.Z. H.A.Z. W.M. H.A.Z.	Face Face	Side Side	45.3% 78.6% 180° 60°	Heat Zone Heat Zone none Weld Metal			117 123 147 109 127 122 141 106	49 95 95 45 70 68 62 54	21 22	25 27	23 22														
Solid Weld Metal			Airco 353 E-10016	3		102,500		23.5	50	(.505)															0.05	0.77	0.010	0.01	0.41	0.10	1.75	0.05	0.42	0.13		>0.01	Manual Low Hydrogen
74P577	147,682	1/2"	Airco 353	3A	93,000?	119,500 122,000		13 13	20 16	H.A.Z.(2) H.A.Z.(2)				Face Face		29.7% 37.9%	Heat Zone Heat Zone			36 37 40 33	38 27 30 48 42	26	29	24													
74S022	W45451	1"	Airco 353	3B	95,000 107,200	110,900 123,300		20 20	33 28	W.M. W.M.(2)	39,750 42,750 32,900 36,670 34,720	134,000 101,500 11,473,000 1,163,000 383,000	W.M. (2) W.M. (2) W.M. (2) W.M. (2) W.M. (2)	Face Face	Side Side	44.1 44.0 180° 180°	Weld Metal Heat Zone none none			85 106 80 80 98 110 82 90 140	45 57 86 50 45 54 56 58 54 50	27	26	24														Numerous fine pinholes and inclusions
67P599	150687	1½"	Airco 353	3C	83,700 85,700	95,300 97,400		37 36	63 60	P.M. P.M.	59,920 50,230 45,280 37,910 32,900	75,000 33,500 258,000 343,000 620,000	H.A.Z. W.M. (2) H.A.Z.(2) W.M.(2) H.A.Z.	Face Face	Side Side	32.8% 44.0% 180° 180°	Heat Zone Heat Zone none none			125 40 135 142 120 120 115 124	92 44 63 50 54 65 65	20 21	25 25	24 24														
Solid Weld Metal			Union Melt 366 rod #80 Melt (2x65 Mesh)			102,000		17.5	25	(.505)															0.05	0.70	0.010	–	0.51	0.11	1.75	0.16	0.80	0.15		0.02	Automatic Submerged Arc

PM = Parent Metal, WM = Weld Metal, WR = With Roll, AR = Across Roll, HAZ = Heat Affected Zone (2) minor porosity & inclusions (3) major porosity & inclusions

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SUMMARY OF TESTS - SHEET 3

HEAT	SLAB Number	SLAB Thickness	WELD	SAMPLE	TENSILE STRENGTH Yield psi	TENSILE STRENGTH Ultimate psi	% ELONG. 8"	% ELONG. 2"	% Reduct. of Area	LOCATION TENSILE FAILURE	FATIGUE TEST Stress psi	FATIGUE TEST Cycles	LOCATION FATIGUE FAILURE	BENDS TYPE Free	BENDS TYPE Guide	BENDS % Elong. or ° Bend	BENDS Location Bend Failure	CHARPY IMPACT-ft Parent Metal W.R.	CHARPY IMPACT-ft Parent Metal A.R.	CHARPY IMPACT-ft HAZ	CHARPY IMPACT-ft WM	ROCKWELL "C" HARDNESS PM	ROCKWELL "C" HARDNESS HAZ	ROCKWELL "C" HARDNESS WM	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	B	Ti	REMARKS
74P577	147682	1/2"	Union Melt #866	4A	93,000 92,800	115,000 113,200		18 23	24 35	W.M. H.A.Z.				Face Face		41.3% 48 %	Weld Metal Weld Metal			31 35 25 55 100 170 60 135	30 24 30 32 34 30	23	23	22													
745022	W45451	1"	Union Melt #866	4B	99,300 103,800	115,000 116,000		18 17	26 21	W.M. W.M.	50,240 59,900 45,300 44,100 42,200	372,000 152,000 203,000 499,000 948,000	H.A.Z. W.M. H.A.Z. H.A.Z. H.A.Z.	Face Face	Side Side	39.3% 43.8% 180° 180°	Weld Metal Weld Metal none none			23 22 28 27 17 23 20 19	35 38 40 34 24 37 38 35	27	26	20													
67P599	150687	1½"	Union Melt #866	4C	67,900 90,000	78,900 102,500		18 35	34 41	W.M.(3) H.A.Z.	40,000 37,290 43,500 50,200 44,600	285,000 130,000 9,605,000 260,000 754,000	W.M.(2) H.A.Z.(2) Grip Section H.A.Z. W.M.(2)	Face Face	Side Side	49.3% 45.3% 180° 180°	Weld Metal Weld Metal none none			137 138 39 36 144 38 174 85	23 30 21 35 30 22 40 23	20 19	22 23	22 22													
Solid Weld Metal			Aircomatic A632 rod (98% Argon - 2% Oxygen gas shield)	5		122,000		26	58	(.505)															0.05	1.17	0.012	-	0.29	0.24	1.22	0.16	0.50	0.20		>0.01	Automatic inert gas shielded arc.
74P577	150687	1/2"	Aircomatic A632	5A		126,500 122,000		12 13	10 13	H.A.Z. H.A.Z.				Face Face		59.5% 25 %	Weld Metal Heat Zone			35 30 30 35 35	87 68 92 84 94	27	23	23													
745022	W45451	1"	Aircomatic A632	5B	102,300 104,000	125,200 121,800		23 25	27 29	H.A.Z. H.A.Z.	44,050 55,300 42,800 42,200 59,900	283,000 1,163,000 1,238,000 2,015,000 210,000	H.A.Z. H.A.Z. H.A.Z. H.A.Z. H.A.Z.	Face Face	Side Side	28.8% 38.2% 180° 180°	Heat Zone Heat Zone none none			36 34 39 35 35 34 30 28	102 85 85 90 85 87 88 93	27	30	24													

PM = Parent Metal, WM = Weld Metal, WR = With Roll, AR = Across Roll, H A Z = Heat Affected Zone

(2) minor porosity & inclusions (3) major porosity & inclusions

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