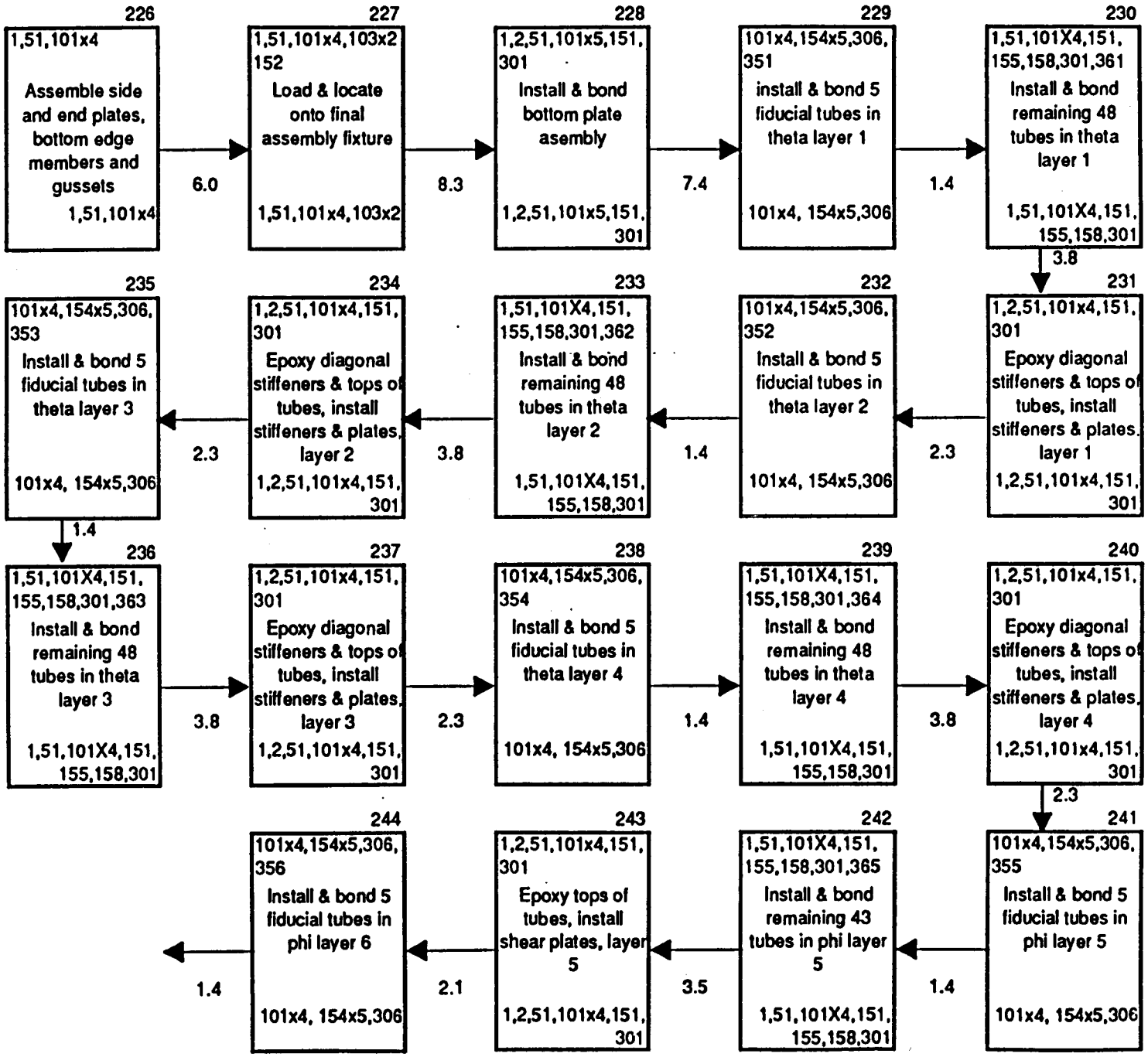
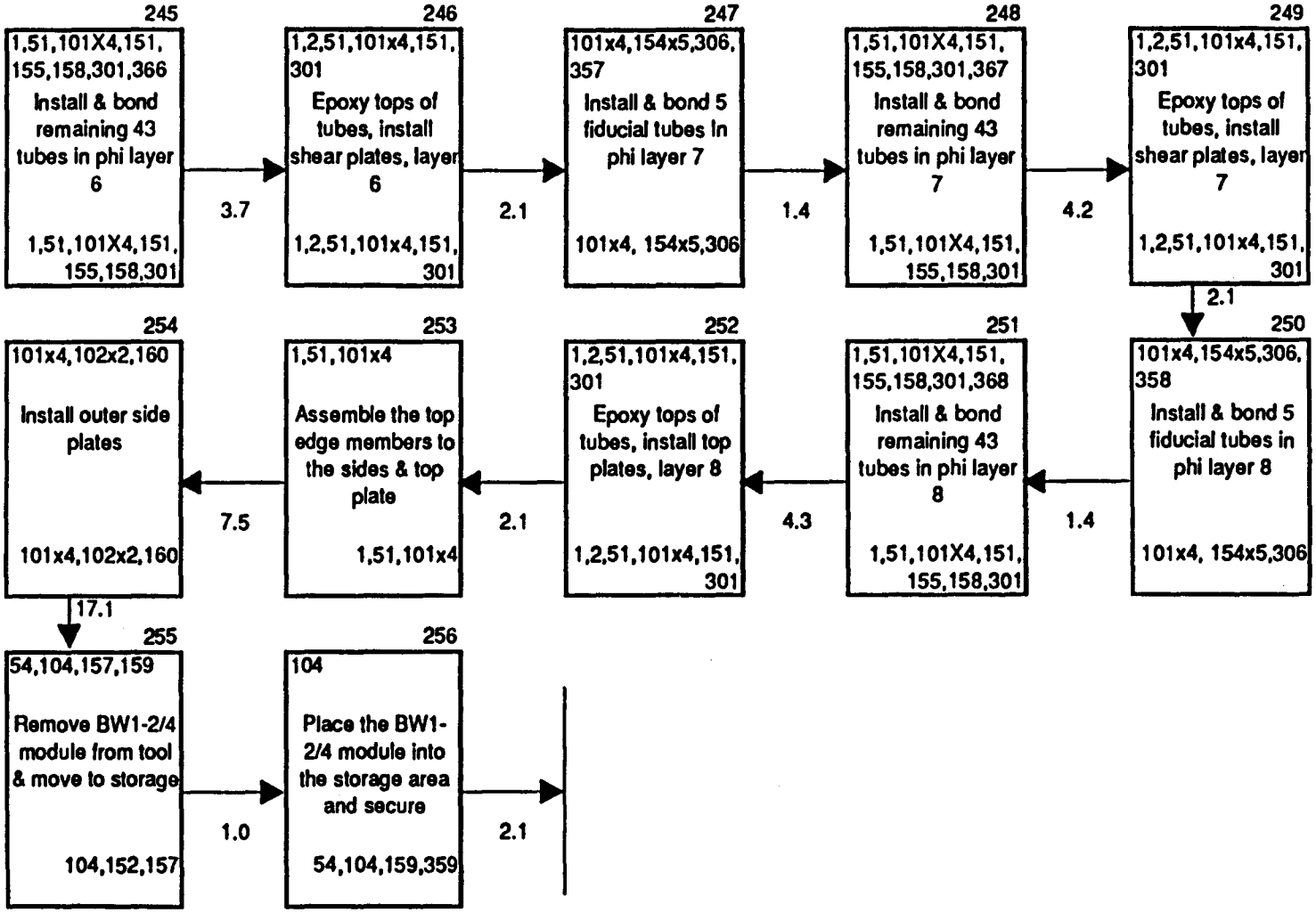
005

BW1-2/4 MODULE, 14 UNITS, Activity #52



BW1-2/4 MODULE, 14 UNITS, Activity #52



007

Activity 52 BW1-2/4 BWT

Resource	1	Sling	Allocated	21	Deallocated	21	Difference	0
Resource	2	Vacuum Sling	Allocated	9	Deallocated	9	Difference	0
Resource	51	LitHoist AsyBld	Allocated	21	Deallocated	21	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	123	Deallocated	123	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	103	Alignment Tech	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	17	Deallocated	17	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	40	Deallocated	40	Difference	0
Resource	155	Tube Strongback	Allocated	16	Deallocated	16	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	8	Deallocated	8	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	17	Deallocated	17	Difference	0
Resource	306	15min Glue Disp	Allocated	8	Deallocated	8	Difference	0
Resource	351	5 BW1 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	352	5 BW1 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	353	5 BW1 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	354	5 BW1 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	355	5 BW1 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	356	5 BW1 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	357	5 BW1 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	358	5 BW1 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	359	MBW1-2/4 Module	Allocated	0	Deallocated	1	Difference	-1
Resource	361	48 BW1 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource	362	48 BW1 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource	363	48 BW1 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource	364	48 BW1 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource	365	43 BW1 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	366	43 BW1 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	367	43 BW1 Phi 7 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	368	43 BW1 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1

O.A. 226

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	0	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	0	4.00	2
4	Finish O.A.	0	1,51,101x4	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	5.50	
		TOTAL HOURS	6.00	

600

O.A. 227

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.00	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify the alignment of the "box"	103x2	103x2	0.25	5
7					
8					
9					
10					

010

	1,51,101x4,103x2	1,51,101x4,103x2
RESOURCES	152	

TOTAL SPAN 6.25

TOTAL HOURS 8.25

O.A. 228

Install & bond bottom plate asembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply epoxy to bottom edge member at bottom plate interface	1,2,51,101x5,151, 301	0	0.60	1
2	Apply epoxy to one side of the doubler strips and locate in tool	0	0	0.60	2
3	Load the sections of bottom plates and position, place bonding weights	0	1,2,51,101x5,151, 301	4.00	3
4	Allow epoxy to set-up	0	0	1.00	4
5	Remove bonding weights	1,51,101x2	1,51,101x2	1.20	5
6					
7					
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 7.40

TOTAL HOURS 7.40

011

O.A. 229

Install & bond 5 fiducial tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	351, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
351

TOTAL SPAN 1.34

TOTAL HOURS 1.39

012

O.A. 230

Install & bond remaining 48 tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,361	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,361	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

013

O.A. 231

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.30

TOTAL HOURS 2.30

014

O.A. 232

Install & bond 5 fiducial tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	352, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
352

TOTAL SPAN 1.34

TOTAL HOURS 1.39

015

O.A. 233

Install & bond remaining 48 tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,362	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,362	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

016

O.A. 234

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.30

TOTAL HOURS 2.30

017

O.A. 235

Install & bond 5 fiducial tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	353, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, put in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
353

TOTAL SPAN 1.34

TOTAL HOURS 1.39

018

O.A. 236

Install & bond remaining 48 tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,363	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,363	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

019

O.A. 237

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.30

TOTAL HOURS 2.30

020

O.A. 238

Install & bond 5 fiducial tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	354, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 354 101x4, 154x5,306

TOTAL SPAN 1.34

TOTAL HOURS 1.39

021

O.A. 239

Install & bond remaining 48 tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,364	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,364	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

022

O.A. 240

Epoxy diagonal stiffeners & tops of tubes, Install stiffeners & plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.30

TOTAL HOURS 2.30

023

O.A. 241

Install & bond 5 fiducial tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	355, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	355	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

024

O.A. 242

Install & bond remaining 43 tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,365	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,365	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.51

025

O.A. 243

Epoxy tops of tubes, install shear plates, layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151, 301	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
RESOURCES		1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

026

O.A. 244

Install & bond 5 fiducial tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	356, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES	101x4,154x5,306, 356	101x4, 154x5,306

TOTAL SPAN 1.34

TOTAL HOURS 1.39

027

O.A. 245

Install & bond remaining 43 tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,366	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,366	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.71

028

O.A. 246

Epoxy tops of tubes, install shear plates, layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151, 301	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
RESOURCES		1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

029

O.A. 247

Install & bond 5 fiducial tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	357, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES	101x4,154x5,306, 357	101x4, 154x5,306

TOTAL SPAN 1.34

TOTAL HOURS 1.39

030

O.A. 248

Install & bond remaining 43 tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,367	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyone load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,367	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.21

031

O.A. 249

Epoxy tops of tubes, install shear plates, layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151, 301	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
RESOURCES		1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

032

O.A. 250

Install & bond 5 fiducial tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	358, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	358	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

033

O.A. 251

Install & bond remaining 43 tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,368	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyfour load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,368	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.31

034

O.A. 252

Epoxy tops of tubes, install top plates, layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151, 301	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

035

O.A. 253

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	0.50	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	4.00	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	7.50	
		TOTAL HOURS	7.50	

036

O.A. 254

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x4	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	3.39	2
3	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.69	2
4	De-allocate resources	0	101x4	0.00	3
5	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	102x2	0	0.68	4
6	Preform inline mfg electrical test, hook-up test tool (computer) and run test	160	102x2,160	3.38	5
7	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	2.00	6
8	Bolt the side plates to the assembly	0	101x4	6.00	7
9					
10					

RESOURCES 101x4,102x2,160 101x4,102x2,160

TOTAL SPAN 15.45

TOTAL HOURS 17.14

037

O.A. 255

Remove BW1-2/4 module from tool & move to storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW1 module and remove from the tool	159	0	0.20	3
4	Move the module to the storage area and place on the rotation/insertion tool	0	0	0.20	4
5	Place the spreader back into the storage area	0	104,152,157	0.20	5
6					
7					
8					
9					
10					
	RESOURCES	54,104,157,159	104,152,157		

TOTAL SPAN 1.00

TOTAL HOURS 1.00

038

O.A. 256

Place the BW1-2/4 module into the storage area and secure

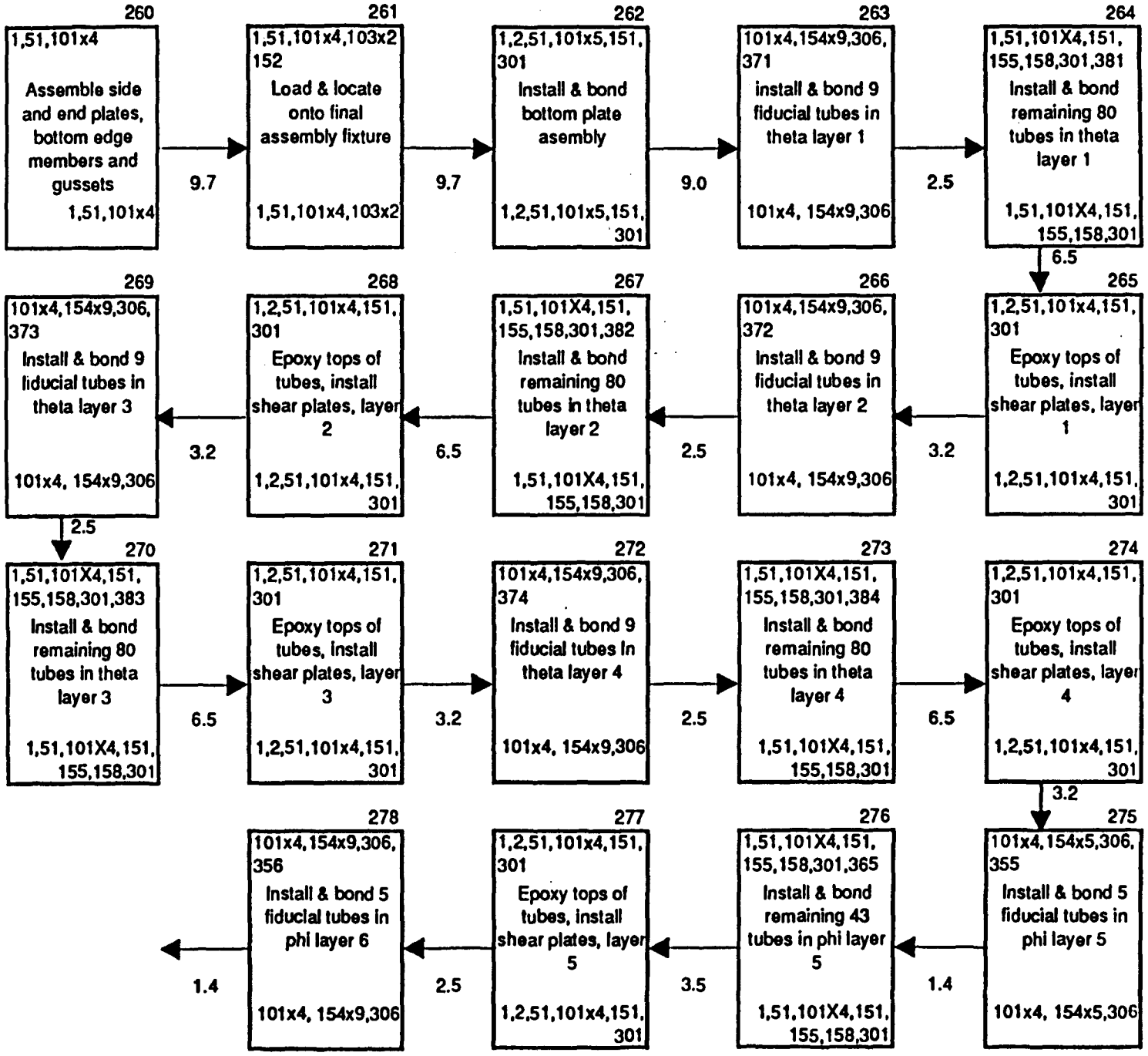
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Roll module past interance flats on the rails and clamp in position	104	0	0.10	1
2	Replace interance flats with full round rail sections	0	0	0.20	2
3	Rotate the BW1 module 180 deg.	0	0	0.50	3
4	Line up the tool with the storage rails and secure	0	0	0.50	4
5	Roll tranfer the module onto the storage rails	0	0	0.20	5
6	Detach the rotation tool from the storage rails & rotate 180 deg.	0	0	0.50	6
7	Place rotation tool in storage	0	54,104,159,359	0.10	7
8					
9					
10					

RESOURCES	104	54,104,159,359	
		TOTAL SPAN	2.10
		TOTAL HOURS	2.10

039

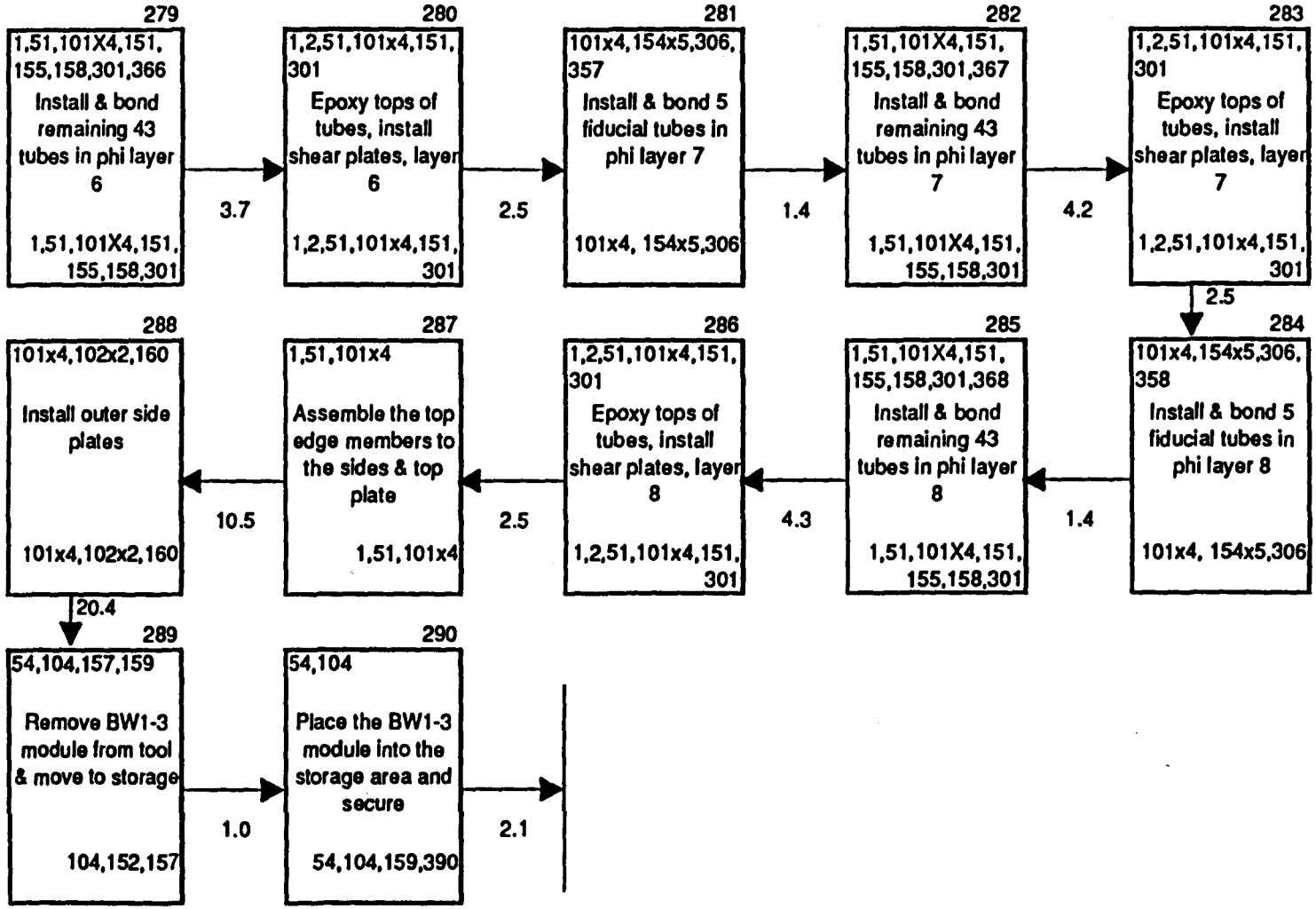
040

BW1-3 CENTER, 7 UNITS, Activity #53



041

BW1-3, 7 UNITS, Activity #53



042

Activity 53 BW1-3 BWT Prod

Resource	1	Sling	Allocated	21	Deallocated	21	Difference	0
Resource	2	Vacuum Sling	Allocated	9	Deallocated	9	Difference	0
Resource	51	LitHoist AsyBld	Allocated	21	Deallocated	21	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	2	Deallocated	2	Difference	0
Resource	101	Worker	Allocated	123	Deallocated	123	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	103	Alignment Tech	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	17	Deallocated	17	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	56	Deallocated	56	Difference	0
Resource	155	Tube Strongback	Allocated	16	Deallocated	16	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	8	Deallocated	8	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	17	Deallocated	17	Difference	0
Resource	306	15min Glue Disp	Allocated	8	Deallocated	8	Difference	0
Resource	355	5 BW1 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	356	5 BW1 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	357	5 BW1 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	358	5 BW1 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	365	43 BW1 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	366	43 BW1 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	367	43 BW1 Phi 7 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	368	43 BW1 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	371	9 BW1 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	372	9 BW1 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	373	9 BW1 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	374	9 BW1 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	381	80 BW1 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource	382	80 BW1 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource	383	80 BW1 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource	384	80 BW1 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource	390	MBW1-3 Module	Allocated	0	Deallocated	1	Difference	-1

O.A. 260

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	2.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	0	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	0	6.70	2
4	Finish O.A.	0	1,51,101x4	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	9.20	
		TOTAL HOURS	9.70	

044

O.A. 261

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	3.40	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify the alignment of the "box"	103x2	103x2	0.25	5
7					
8					
9					
10					

	1,51,101x4,103x2	1,51,101x4,103x2
RESOURCES	152	

TOTAL SPAN 6.25

TOTAL HOURS 9.65

045

O.A. 262

Install & bond bottom plate asembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply epoxy to bottom edge member at bottom plate interface	1,2,51,101x5,151, 301	0	1.00	1
2	Apply epoxy to one side of the doubler strips and locate in tool	0	0	1.00	2
3	Load the sections of bottom plates and position, place bonding weights	0	1,2,51,101x5,151, 301	4.00	3
4	Allow epoxy to set-up	0	0	1.00	4
5	Remove bonding weights	1,51,101x2	1,51,101x2	2.00	5
6					
7					
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 9.00

TOTAL HOURS 9.00

046

O.A. 263

Install & bond 9 fiducial tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	371, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
371

TOTAL SPAN 2.40

TOTAL HOURS 2.48

047

O.A. 264

Install & bond remaining 80 tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,381	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p.
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,381	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

048

O.A. 265

Epoxy tops of tubes, install shear plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 3.20

TOTAL HOURS 3.20

049

O.A. 266

Install & bond 9 fiducial tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	372, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
372

TOTAL SPAN 2.40

TOTAL HOURS 2.48

050

O.A. 267

Install & bond remaining 80 tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,382	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,382	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

051

O.A. 268

Epoxy tops of tubes, install shear plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			
			TOTAL SPAN	3.20		
			TOTAL HOURS	3.20		

052

O.A. 269

Install & bond 9 fiducial tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	373, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
373

TOTAL SPAN 2.40

TOTAL HOURS 2.48

053

O.A. 270

Install & bond remaining 80 tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,383	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p.
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,383	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

054

O.A. 271

Epoxy tops of tubes, install shear plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 3.20

TOTAL HOURS 3.20

055

O.A. 272

Install & bond 9 fiducial tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	374, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
374

TOTAL SPAN 2.40

TOTAL HOURS 2.48

056

O.A. 273

Install & bond remaining 80 tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,384	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,384	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

057

O.A. 274

Epoxy tops of tubes, install shear plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 3.20

TOTAL HOURS 3.20

058

O.A. 275

Install & bond 5 fiducial tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	355, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
355

TOTAL SPAN 1.33

TOTAL HOURS 1.37

059

O.A. 276

Install & bond remaining 43 tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,365	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,365	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.51

060

O.A. 277

Epoxy tops of tubes, install shear plates, layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the tubes (5 passes)	1,2,51,101x4,301	301	0.83	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.53

TOTAL HOURS 2.53

O.A. 278

Install & bond 5 fiducial tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	356, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
356

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 279

Install & bond remaining 43 tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,366	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,366	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.71

063

O.A. 280

Epoxy tops of tubes, install shear plates, layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the tubes (5 passes)	1,2,51,101x4,301	301	0.83	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			
			TOTAL SPAN	2.53		
			TOTAL HOURS	2.53		

064

O.A. 281

Install & bond 5 fiducial tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	357, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

. RESOURCES 101x4,154x5,306, 101x4, 154x5,306
357

TOTAL SPAN 1.33

TOTAL HOURS 1.37

065

O.A. 282

Install & bond remaining 43 tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,367	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyone load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,367	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.21

066

O.A. 283

Epoxy tops of tubes, install shear plates, layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the tubes (5 passes)	1,2,51,101x4,301	301	0.83	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			
			TOTAL SPAN	2.53		
			TOTAL HOURS	2.53		

067

O.A. 284

Install & bond 5 fiducial tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	358, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
358

TOTAL SPAN 1.33

TOTAL HOURS 1.37

068

O.A. 285

Install & bond remaining 43 tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,368	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyfour load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,368	1,51,101X4,151, 155,158,301

TOTAL SPAN	2.48
TOTAL HOURS	4.31

O.A. 286

Epoxy tops of tubes, install shear plates, layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the tubes (5 passes)	1,2,51,101x4,301	301	0.83	1	
2	Load the top plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES 1,2,51,101x4,151, 1,2,51,101x4,151,

TOTAL SPAN 2.53

TOTAL HOURS 2.53

070

O.A. 287

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	0.84	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	6.70	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	10.54	
		TOTAL HOURS	10.54	

071

O.A. 288

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x4	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	4.58	2
3	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	2.29	2
4	De-allocate resources	0	101x4	0.00	3
5	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	102x2	0	0.92	4
6	Preform inline mfg electrical test, hook-up test tool (computer) and run test	160	102x2,160	4.58	5
7	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	2.00	6
8	Bolt the side plates to the assembly	0	101x4	6.00	7
9					
10					

RESOURCES 101x4,102x2,160 101x4,102x2,160

TOTAL SPAN 18.08

TOTAL HOURS 20.37

072

O.A. 289

Remove BW1-3 module from tool & move to storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW1 module and remove from the tool	159	0	0.20	3
4	Move the module to the storage area and place on the rotation/insertion tool	0	0	0.20	4
5	Place the spreader back into the storage area	0	54,104,152,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES 54,104,157,159 104,152,157

TOTAL SPAN 1.00

TOTAL HOURS 1.00

073

O.A. 290

Place the BW1-3 module into the storage area and secure

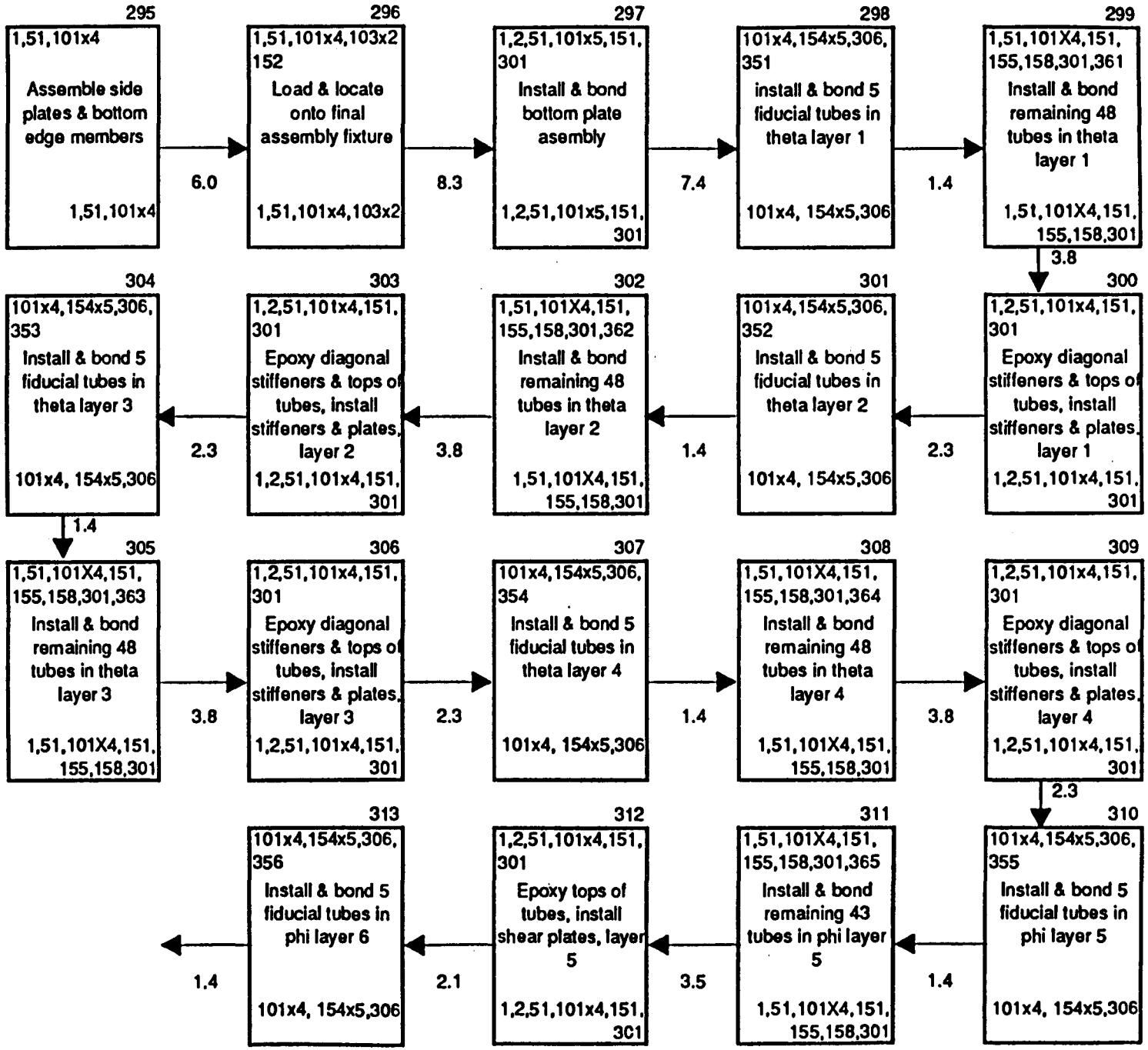
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Roll module past interance flats on the rails and clamp in position	54,104	0	0.10	1
2	Replace interance flats with full round rail sections	0	0	0.20	2
3	Rotate the BW1 module 180 deg.	0	0	0.50	3
4	Line up the tool with the storage rails and secure	0	0	0.50	4
5	Roll tranfer the module onto the storage rails	0	0	0.20	5
6	Detach the rotation tool from the storage rails & rotate 180 deg.	0	0	0.50	6
7	Place rotation tool in storage	0	54,104,159,390	0.10	7
8					
9					
10					
	RESOURCES	54,104	54,104,159,390		
			TOTAL SPAN	2.10	
			TOTAL HOURS	2.10	

074

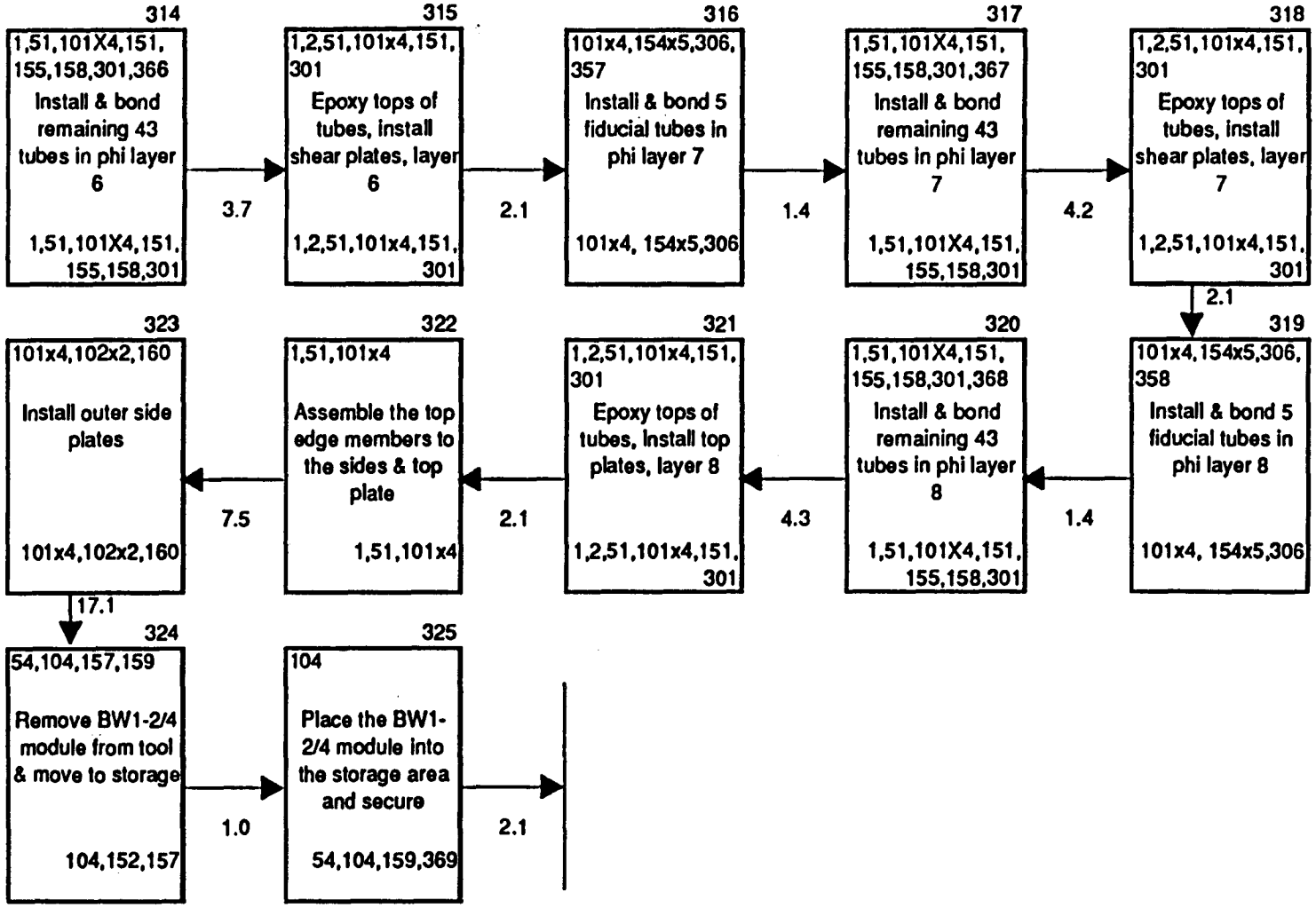
075

BW1 Production Activity = 54 BW1-2/4-5 OAs = 295-325 Functions = 605-785

BW1-2/4-Oct 5 End Modules, 2 UNITS, Activity #54



BW1-2/4-Oct 5 End Module, 2 UNITS, Activity #54



Activity 54 BW1-2/4-5

Resource 1	Sling	Allocated	21	Deallocated	21	Difference	0
Resource 2	Vacuum Sling	Allocated	9	Deallocated	9	Difference	0
Resource 51	LitHoist AsyBld	Allocated	21	Deallocated	21	Difference	0
Resource 54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource 101	Worker	Allocated	123	Deallocated	123	Difference	0
Resource 102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource 103	Alignment Tech	Allocated	2	Deallocated	2	Difference	0
Resource 104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource 151	Bonding Weights	Allocated	17	Deallocated	17	Difference	0
Resource 152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource 154	FidTubeStrgback	Allocated	40	Deallocated	40	Difference	0
Resource 155	Tube Strongback	Allocated	16	Deallocated	16	Difference	0
Resource 157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource 158	TubeBondingRack	Allocated	8	Deallocated	8	Difference	0
Resource 159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource 160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource 301	1hr AdhesivDisp	Allocated	17	Deallocated	17	Difference	0
Resource 306	15min Glue Disp	Allocated	8	Deallocated	8	Difference	0
Resource 351	5 BW1 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource 352	5 BW1 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource 353	5 BW1 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource 354	5 BW1 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource 355	5 BW1 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource 356	5 BW1 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource 357	5 BW1 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource 358	5 BW1 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource 361	48 BW1 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource 362	48 BW1 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource 363	48 BW1 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource 364	48 BW1 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource 365	43 BW1 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource 366	43 BW1 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource 367	43 BW1 Phi 7 Tu	Allocated	1	Deallocated	0	Difference	1
Resource 368	43 BW1 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource 369	MBW1-2/4-OCT 5	Allocated	0	Deallocated	1	Difference	-1

O.A. 295

Assemble side plates & bottom edge members

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	0	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	0	4.00	2
4	Finish O.A.	0	1,51,101x4	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	5.50	
		TOTAL HOURS	6.00	

079

O.A. 296

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.00	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify the alignment of the "box"	103x2	103x2	0.25	5
7					
8					
9					
10					

	1,51,101x4,103x2	1,51,101x4,103x2
RESOURCES	152	

TOTAL SPAN 6.25

TOTAL HOURS 8.25

080

O.A. 297

Install & bond bottom plate asembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply epoxy to bottom edge member at bottom plate interface	1,2,51,101x5,151, 301	0	0.60	1
2	Apply epoxy to one side of the doubler strips and locate in tool	0	0	0.60	2
3	Load the sections of bottom plates and position, place bonding weights	0	1,2,51,101x5,151, 301	4.00	3
4	Allow epoxy to set-up	0	0	1.00	4
5	Remove bonding weights	1,51,101x2	1,51,101x2	1.20	5
6					
7					
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 7.40

TOTAL HOURS 7.40

081

O.A. 298

install & bond 5 fiducial tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	351, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
351

TOTAL SPAN 1.34

TOTAL HOURS 1.39

082

O.A. 299

Install & bond remaining 48 tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,361	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,361	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

083

O.A. 300

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN	2.30
TOTAL HOURS	2.30

084

O.A. 301

Install & bond 5 fiducial tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	352, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
352

TOTAL SPAN 1.34

TOTAL HOURS 1.39

085

O.A. 302

Install & bond remaining 48 tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,362	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,362	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

O.A. 303

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.30

TOTAL HOURS 2.30

087

O.A. 304

Install & bond 5 fiducial tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	353, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
353

TOTAL SPAN 1.34

TOTAL HOURS 1.39

088

O.A. 305

Install & bond remaining 48 tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,363	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p.
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,363	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

O.A. 306

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.30

TOTAL HOURS 2.30

060

O.A. 307

Install & bond 5 fiducial tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	354, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 354 101x4, 154x5,306

TOTAL SPAN 1.34

TOTAL HOURS 1.39

091

O.A. 308

Install & bond remaining 48 tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,364	0	0.40	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.40	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,364	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.73

TOTAL HOURS 3.80

092

O.A. 309

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x2,301	0	0.88	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x2,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.30

TOTAL HOURS 2.30

093

O.A. 310

Install & bond 5 fiducial tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	355, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	355	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

094

O.A. 311

Install & bond remaining 43 tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,365	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,365	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.51

095

O.A. 312

Epoxy tops of tubes, install shear plates, layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151,	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.12

TOTAL HOURS 2.12

O.A. 313

Install & bond 5 fiducial tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	356, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	Allocate	De-Allocate
	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	356	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

097

O.A. 314

Install & bond remaining 43 tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,366	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,366	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.71

098

O.A. 315

Epoxy tops of tubes, install shear plates, layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151,	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.12

TOTAL HOURS 2.12

099

O.A. 316

Install & bond 5 fiducial tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	357, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	357	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

100

O.A. 317

Install & bond remaining 43 tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,367	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyone load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,367	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.21

101

O.A. 318

Epoxy tops of tubes, install shear plates, layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151,	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

102

O.A. 319

Install & bond 5 fiducial tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	358, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.84	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

	101x4,154x5,306,	101x4, 154x5,306
RESOURCES	358	

TOTAL SPAN 1.34

TOTAL HOURS 1.39

O.A. 320

Install & bond remaining 43 tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,368	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyfour load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,368	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.31

O.A. 321

Epoxy tops of tubes, install top plates, layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,101x4,151,	301	0.42	1	n/s
2	Load the shear plates and position, place bonding weights	0	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.12

TOTAL HOURS 2.12

O.A. 322

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	0.50	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	4.00	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	7.50	
			TOTAL HOURS	7.50	

106

O.A. 323

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x4	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	3.39	2
3	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.69	2
4	De-allocate resources	0	101x4	0.00	3
5	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	102x2	0	0.68	4
6	Preform inline mfg electrical test, hook-up test tool (computer) and run test	160	102x2,160	3.38	5
7	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	2.00	6
8	Bolt the side plates to the assembly	0	101x4	6.00	7
9					
10					

RESOURCES 101x4,102x2,160 101x4,102x2,160

TOTAL SPAN 15.45

TOTAL HOURS 17.14

O.A. 324

Remove BW1-2/4 module from tool & move to storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW1 module and remove from the tool	159	0	0.20	3
4	Move the module to the storage area and place on the rotation/insertion tool	0	0	0.20	4
5	Place the spreader back into the storage area	0	104,152,157	0.20	5
6					
7					
8					
9					
10					
	RESOURCES	54,104,157,159	104,152,157		
			TOTAL SPAN	1.00	
			TOTAL HOURS	1.00	

108

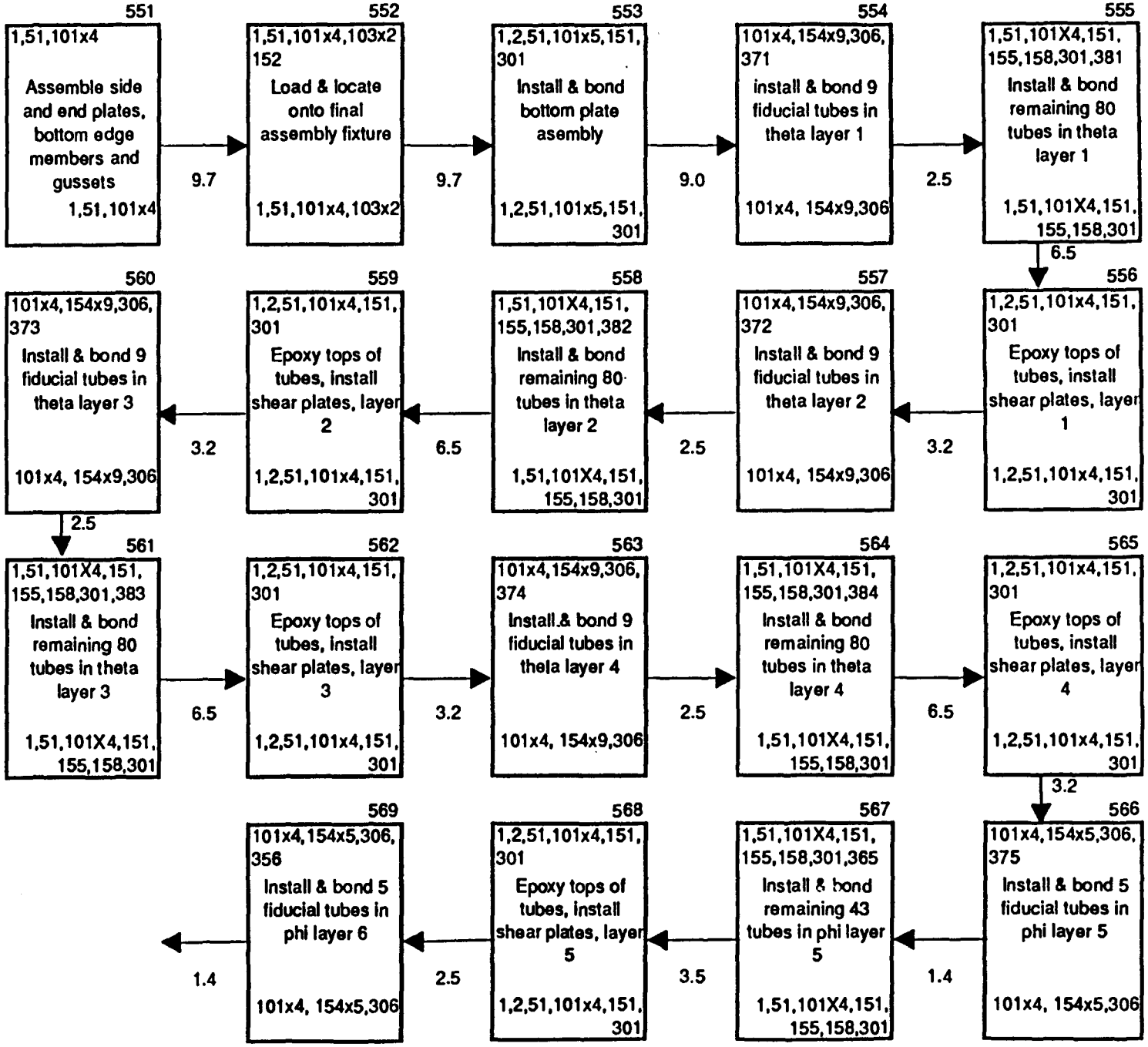
O.A. 325

Place the BW1-2/4 module into the storage area and secure

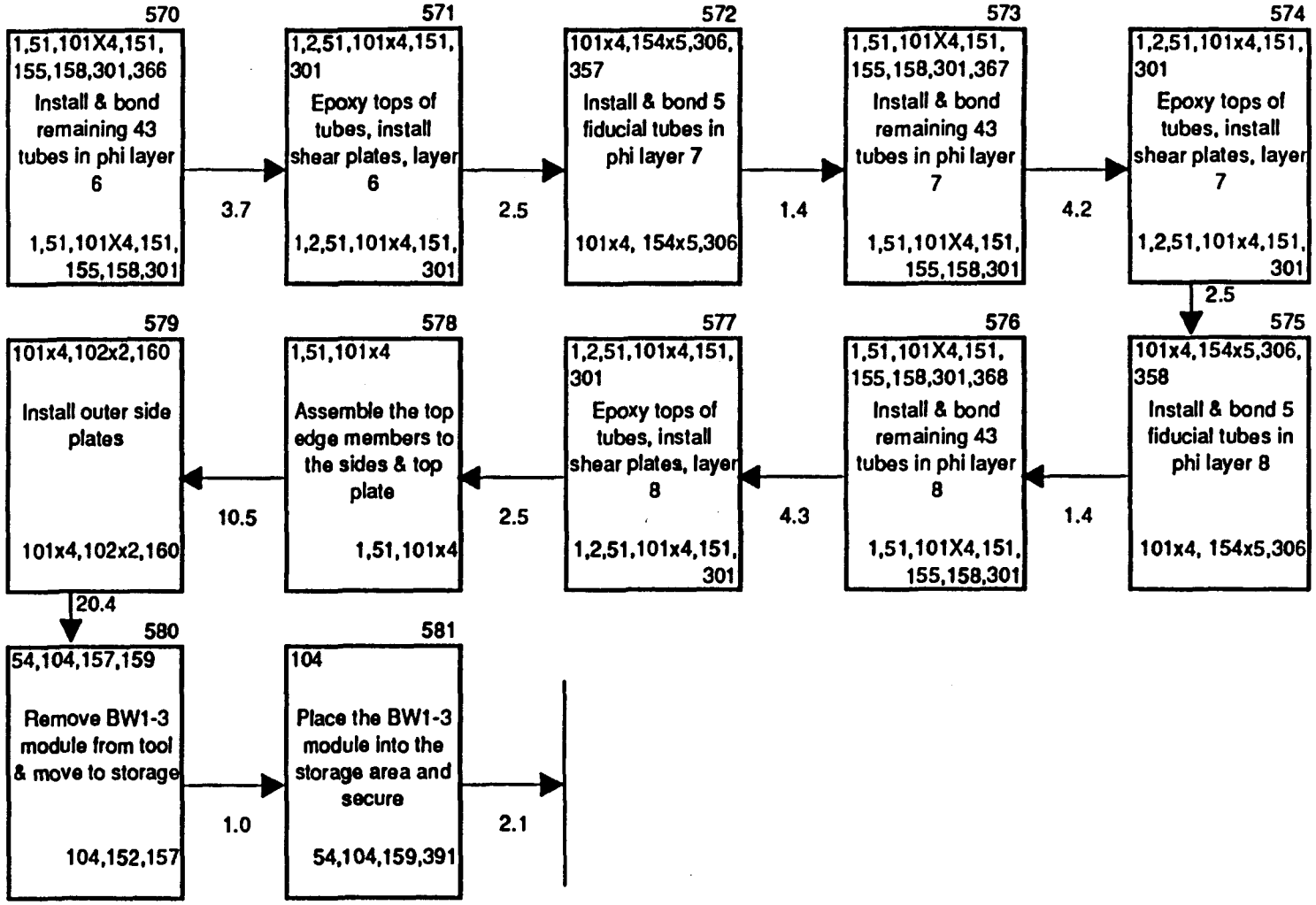
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Roll module past interance flats on the rails and clamp in position	104	0	0.10	1
2	Replace interance flats with full round rail sections	0	0	0.20	2
3	Rotate the BW1 module 180 deg.	0	0	0.50	3
4	Line up the tool with the storage rails and secure	0	0	0.50	4
5	Roll tranfer the module onto the storage rails	0	0	0.20	5
6	Detach the rotation tool from the storage rails & rotate 180 deg.	0	0	0.50	6
7	Place rotation tool in storage	0	54,104,159,369	0.10	7
8					
9					
10					

RESOURCES	104	54,104,159,369		
		TOTAL SPAN	2.10	
		TOTAL HOURS	2.10	

BW1-3-Oct 5 CENTER, 1 UNIT, Activity #55



BW1-3-Oct 5 Center, 1 UNIT, Activity #55



Activity 55 BW1-3-5 Prod

Resource	1	Sling	Allocated	21	Deallocated	21	Difference	0
Resource	2	Vacuum Sling	Allocated	9	Deallocated	9	Difference	0
Resource	51	LitHoist AsyBld	Allocated	21	Deallocated	21	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	123	Deallocated	123	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	103	Alignment Tech	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	17	Deallocated	17	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	56	Deallocated	56	Difference	0
Resource	155	Tube Strongback	Allocated	16	Deallocated	16	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	8	Deallocated	8	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	17	Deallocated	17	Difference	0
Resource	306	15min Glue Disp	Allocated	8	Deallocated	8	Difference	0
Resource	355	5 BW1 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	356	5 BW1 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	357	5 BW1 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	358	5 BW1 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	365	43 BW1 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	366	43 BW1 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	367	43 BW1 Phi 7 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	368	43 BW1 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	371	9 BW1 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	372	9 BW1 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	373	9 BW1 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	374	9 BW1 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	381	80 BW1 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource	382	80 BW1 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource	383	80 BW1 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource	384	80 BW1 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource	391	MBW1-3-OCT 5 Mo	Allocated	0	Deallocated	1	Difference	-1

O.A. 551

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	2.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	0	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	0	6.70	2
4	Finish O.A.	0	1,51,101x4	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	9.20	
		TOTAL HOURS	9.70	

O.A. 552

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	3.40	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify the alignment of the "box"	103x2	103x2	0.25	5
7					
8					
9					
10					

	1,51,101x4,103x2	1,51,101x4,103x2
RESOURCES	152	

TOTAL SPAN 6.25

TOTAL HOURS 9.65

O.A. 553

Install & bond bottom plate asembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply epoxy to bottom edge member at bottom plate interface	1,2,51,101x5,151, 301	0	1.00	1
2	Apply epoxy to one side of the doubler strips and locate in tool	0	0	1.00	2
3	Load the sections of bottom plates and position, place bonding weights	0	1,2,51,101x5,151, 301	4.00	3
4	Allow epoxy to set-up	0	0	1.00	4
5	Remove bonding weights	1,51,101x2	1,51,101x2	2.00	5
6					
7					
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 9.00

TOTAL HOURS 9.00

O.A. 554

install & bond 9 fiducial tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	371, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 371 101x4, 154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 555

Install & bond remaining 80 tubes in theta layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,381	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,381	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

O.A. 556

Epoxy tops of tubes, install shear plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 3.20

TOTAL HOURS 3.20

O.A. 557

Install & bond 9 fiducial tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	372, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
372

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 558

Install & bond remaining 80 tubes in theta layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,382	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,382	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

O.A. 559

Epoxy tops of tubes, install shear plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			
			TOTAL SPAN	3.20		
			TOTAL HOURS	3.20		

O.A. 560

Install & bond 9 fiducial tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	373, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 373 101x4, 154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 561

Install & bond remaining 80 tubes in theta layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,383	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,383	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

124

O.A. 562

Epoxy tops of tubes, install shear plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			
			TOTAL SPAN	3.20		
			TOTAL HOURS	3.20		

125

O.A. 563

Install & bond 9 fiducial tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	374, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4, 154x9,306
374

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 564

Install & bond remaining 80 tubes in theta layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,384	0	0.67	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.67	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.33	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,384	1,51,101X4,151, 155,158,301

TOTAL SPAN 4.60

TOTAL HOURS 6.47

127

O.A. 565

Epoxy tops of tubes, install shear plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the	1,2,51,101x4,301	301	1.50	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 3.20

TOTAL HOURS 3.20

O.A. 566

Install & bond 5 fiducial tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	355, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
375

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 567

Install & bond remaining 43 tubes in phi layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,365	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,365	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.51

O.A. 568

Epoxy tops of tubes, install shear plates, layer 5

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the	1,2,51,101x4,301	301	0.83	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.53

TOTAL HOURS 2.53

O.A. 569

Install & bond 5 fiducial tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	356, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
356

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 570

Install & bond remaining 43 tubes in phi layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,366	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,366	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 3.71

O.A. 571

Epoxy tops of tubes, install shear plates, layer 6

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the	1,2,51,101x4,301	301	0.83	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301			

TOTAL SPAN 2.53

TOTAL HOURS 2.53

134

O.A. 572

Install & bond 5 fiducial tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	357, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 101x4, 154x5,306
357

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 573

Install & bond remaining 43 tubes in phi layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,367	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyone load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,367	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.21

O.A. 574

Epoxy tops of tubes, install shear plates, layer 7

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the	1,2,51,101x4,301	301	0.83	1
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301		
			TOTAL SPAN	2.53	
			TOTAL HOURS	2.53	

137

O.A. 575

Install & bond 5 fiducial tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	358, 154x5	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.25	6	
8	De-allocate resources	0	154x5	0.00	7	
9						
10						

RESOURCES 101x4,154x5,306, 358 101x4, 154x5,306

TOTAL SPAN 1.33

TOTAL HOURS 1.37

138

O.A. 576

Install & bond remaining 43 tubes in phi layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,368	0	0.36	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.36	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.79	3	n/p
5	Apply epoxy and install the twentyfour load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
9						
10						

RESOURCES	1,51,101X4,151, 155,158,301,368	1,51,101X4,151, 155,158,301

TOTAL SPAN 2.48

TOTAL HOURS 4.31

139

O.A. 577

Epoxy tops of tubes, install shear plates, layer 8

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply beads of epoxy in between the tubes (5 passes) and to the tops of the	1,2,51,101x4,301	301	0.83	1
2	Load the top plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES 1,2,51,101x4,151, 1,2,51,101x4,151,

TOTAL SPAN 2.53

TOTAL HOURS 2.53

O.A. 578

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	0.84	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	6.70	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		

TOTAL SPAN 10.54

TOTAL HOURS 10.54

141

O.A. 579

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x4	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	4.58	2
3	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	2.29	2
4	De-allocate resources	0	101x4	0.00	3
5	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	102x2	0	0.92	4
6	Preform inline mfg electrical test, hook-up test tool (computer) and run test	160	102x2,160	4.58	5
7	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	2.00	6
8	Bolt the side plates to the assembly	0	101x4	6.00	7
9					
10					

RESOURCES 101x4,102x2,160 101x4,102x2,160

TOTAL SPAN 18.08

TOTAL HOURS 20.37

142

O.A. 580

Remove BW1-3 module from tool & move to storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW1 module and remove from the tool	159	0	0.20	3
4	Move the module to the storage area and place on the rotation/insertion tool	0	0	0.20	4
5	Place the spreader back into the storage area	0	104,152,157	0.20	5
6					
7					
8					
9					
10					
	RESOURCES	54,104,157,159	104,152,157		

TOTAL SPAN 1.00

TOTAL HOURS 1.00

143

O.A. 581

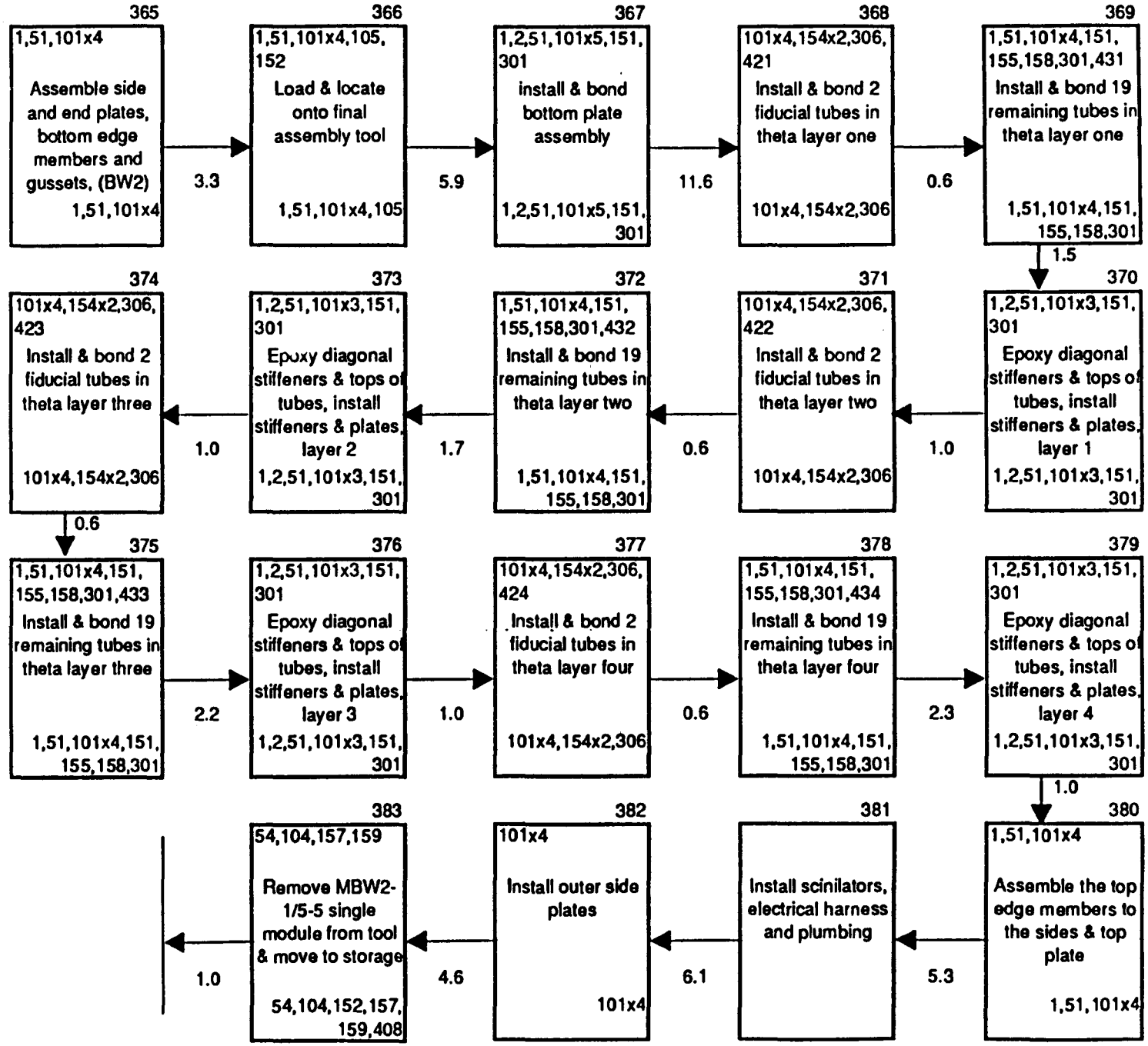
Place the BW1-3 module into the storage area and secure

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Roll module past interance flats on the rails and clamp in position	104	0	0.10	1
2	Replace interance flats with full round rail sections	0	0	0.20	2
3	Rotate the BW1 module 180 deg.	0	0	0.50	3
4	Line up the tool with the storage rails and secure	0	0	0.50	4
5	Roll tranfer the module onto the storage rails	0	0	0.20	5
6	Detach the rotation tool from the storage rails & rotate 180 deg.	0	0	0.50	6
7	Place rotation tool in storage	0	54,104,159,391	0.10	7
8					
9					
10					
	RESOURCES	104	54,104,159,391		
			TOTAL SPAN	2.10	
			TOTAL HOURS	2.10	

144

BW2 Production Activity = 61 BW2-1/5-5 Prod OAs = 365-383 Functions = 900-1008

BW2-1/5-Oct 5 Module, 2 Units, Activity 61



Activity 61 BW2-1/5-5 Prod

Resource	1	Sling	Allocated	14	Deallocated	14	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	15	Deallocated	15	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	80	Deallocated	80	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	8	Deallocated	8	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	408	MBW2-1/5-OCT 5	Allocated	0	Deallocated	1	Difference	-1
Resource	421	2 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	422	2 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	423	2 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	424	2 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	431	19 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	432	19 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	433	19 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	434	19 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1

O.A. 365

Assemble side and end plates, bottom edge members and gussets, (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	1.30	3
4	Finish O.A.	0	0	0.00	4
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	3.30	
		TOTAL HOURS	3.30	

O.A. 366

Load & locate onto final assembly tool

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	0.65	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	4.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify plate alignment	105	105	0.25	5
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	5.25
TOTAL HOURS	5.90

O.A. 367

install & bond bottom plate assembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	1.30	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	1.30	2
4	Load sections of bottom plates and position, place bonding weights	0	0	6.00	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 9.00

TOTAL HOURS 11.60

O.A. 368

Install & bond 2 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	421	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 421 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 369

Install & bond 19 remaining tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,431	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,431	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 1.51

O.A. 370

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 371

Install & bond 2 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	422	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 422 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 372

Install & bond 19 remaining tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,432	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,432	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 1.71

O.A. 373

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 374

Install & bond 2 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	423	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 423 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 375

Install & bond 19 remaining tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,433	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,433	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 2.21

O.A. 376

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 377

Install & bond 2 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	424	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 424 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 378

Install & bond 19 remaining tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,434	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,434	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 2.31

O.A. 379

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the top plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 380

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	1.29	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	5.29	
			TOTAL HOURS	5.29	

O.A. 381

Install scinilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.50	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	1.29	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	0.70	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	0.35	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (48 panels)	2,51,101x4	2,51,101x4	2.00	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	1.40	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	0.35	7
11	De-allocate resources	0	102x2,160	0.00	8

RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160	
		TOTAL SPAN	5.19
		TOTAL HOURS	6.09

O.A. 382

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	3.00	1
2	Bolt the side plates to the assembly	0	101x4	1.62	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	4.62	
			TOTAL HOURS	4.62	

O.A. 383

Remove MBW2-1/5-5 single module from tool & move to storage

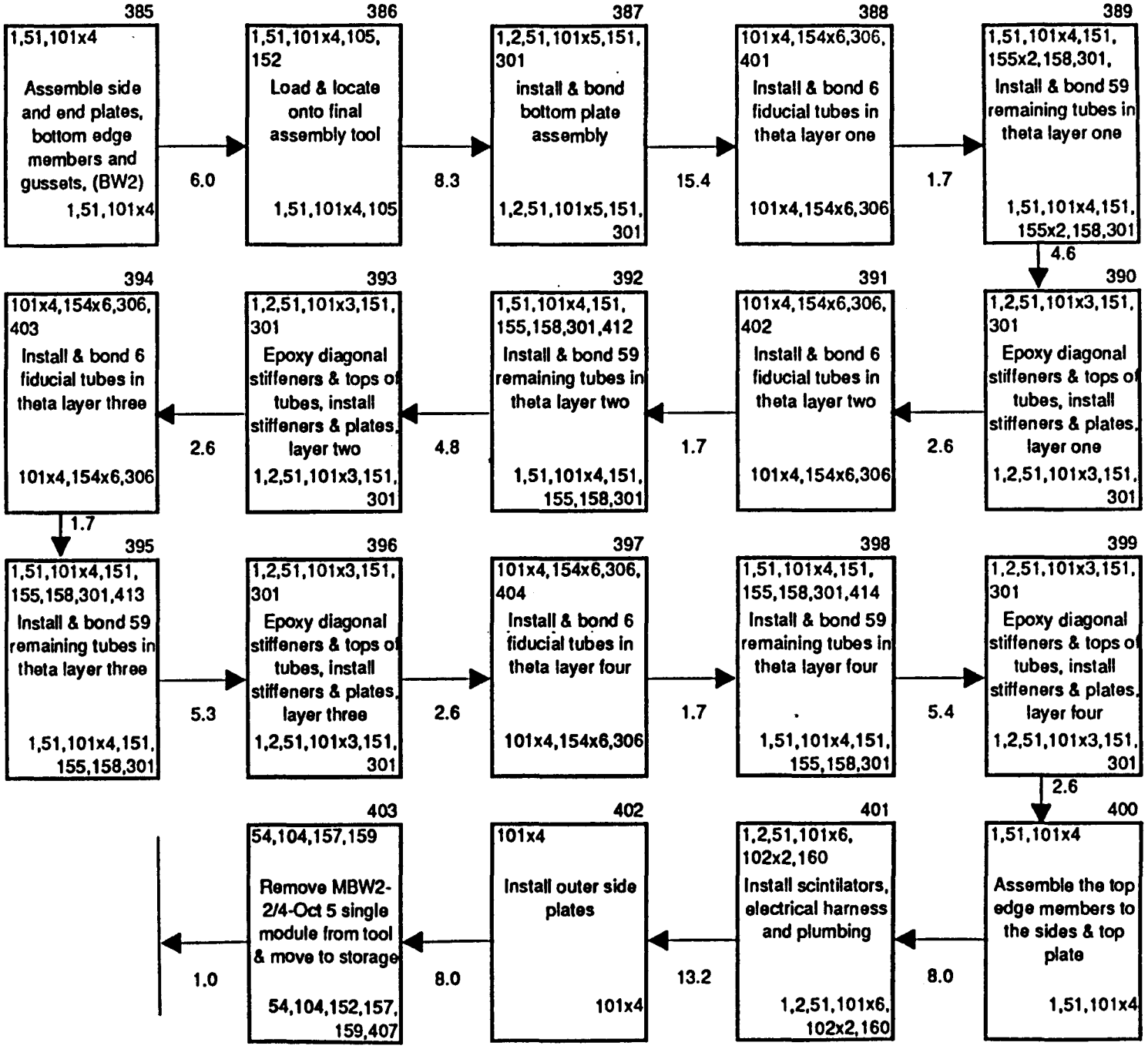
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW2 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159	0.20	4
5	Place the spreader back into the storage area	0	54,104,157,408	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,408

TOTAL SPAN	1.00
TOTAL HOURS	1.00

BW2 Production Activity = 62 BW2-2/4-5 Prod OAs = 385-403 Functions = 1030-1138

BW2-2/4-Oct 5 Module, 2 Units, Activity #62



Activity 62 BW2-2/4-5 Prod

Resource	1	Sling	Allocated	14	Deallocated	14	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	15	Deallocated	15	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	80	Deallocated	80	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	24	Deallocated	24	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	401	6 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	402	6 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	403	6 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	404	6 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	407	MBW2-2/4-OCT 5	Allocated	0	Deallocated	1	Difference	-1
Resource	411	59 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	412	59 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	413	59 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	414	59 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1

O.A. 385

Assemble side and end plates, bottom edge members and gussets, (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	4.00	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	6.00	
		TOTAL HOURS	6.00	

O.A. 386

Load & locate onto final assembly tool

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.00	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify plate alignment	105	105	0.25	5
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	6.25
TOTAL HOURS	8.25

O.A. 387

Install & bond bottom plate assembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	2.20	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	2.20	2
4	Load sections of bottom plates and position, place bonding weights	0	0	8.00	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301	
		TOTAL SPAN	11.00
		TOTAL HOURS	15.40

O.A. 388

Install & bond 6 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	401	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 401 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

173

O.A. 389

Install & bond 59 remaining tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,411	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 411	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.35

TOTAL HOURS 4.64

174

O.A. 390

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembl	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 391

Install & bond 6 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	402	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 402 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 392

Install & bond 59 remaining tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,412	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,412	1,51,101x4,151, 155,158,301

TOTAL SPAN	3.35
TOTAL HOURS	4.84

O.A. 393

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 394

Install & bond 6 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	403	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 403 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 395

Install & bond 59 remaining tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,413	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,413	1,51,101x4,151, 155,158,301

TOTAL SPAN 3.35

TOTAL HOURS 5.34

O.A. 396

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 397

Install & bond 6 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	404	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 404 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 398

Install & bond 59 remaining tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,414	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,414	1,51,101x4,151, 155,158,301

TOTAL SPAN	3.35
TOTAL HOURS	5.44

O.A. 399

Epoxy diagonal stiffeners & tops of tubes, Install stiffeners & plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the top plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 400

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	4.00	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	8.00	
		TOTAL HOURS	8.00	

O.A. 401

Install scintilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.50	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	2.16	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	2.17	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.08	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (48 panels)	2,51,101x4	2,51,101x4	4.00	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	2.17	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	1.08	7
11	De-allocate resources	0	102x2,160	0.00	8

RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160	
		TOTAL SPAN	8.84
		TOTAL HOURS	13.16

O.A. 402

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	3.00	1
2	Bolt the side plates to the assembly	0	101x4	5.00	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	8.00	
			TOTAL HOURS	8.00	

O.A. 403

Remove MBW2-2/4-Oct 5 single module from tool & move to storage

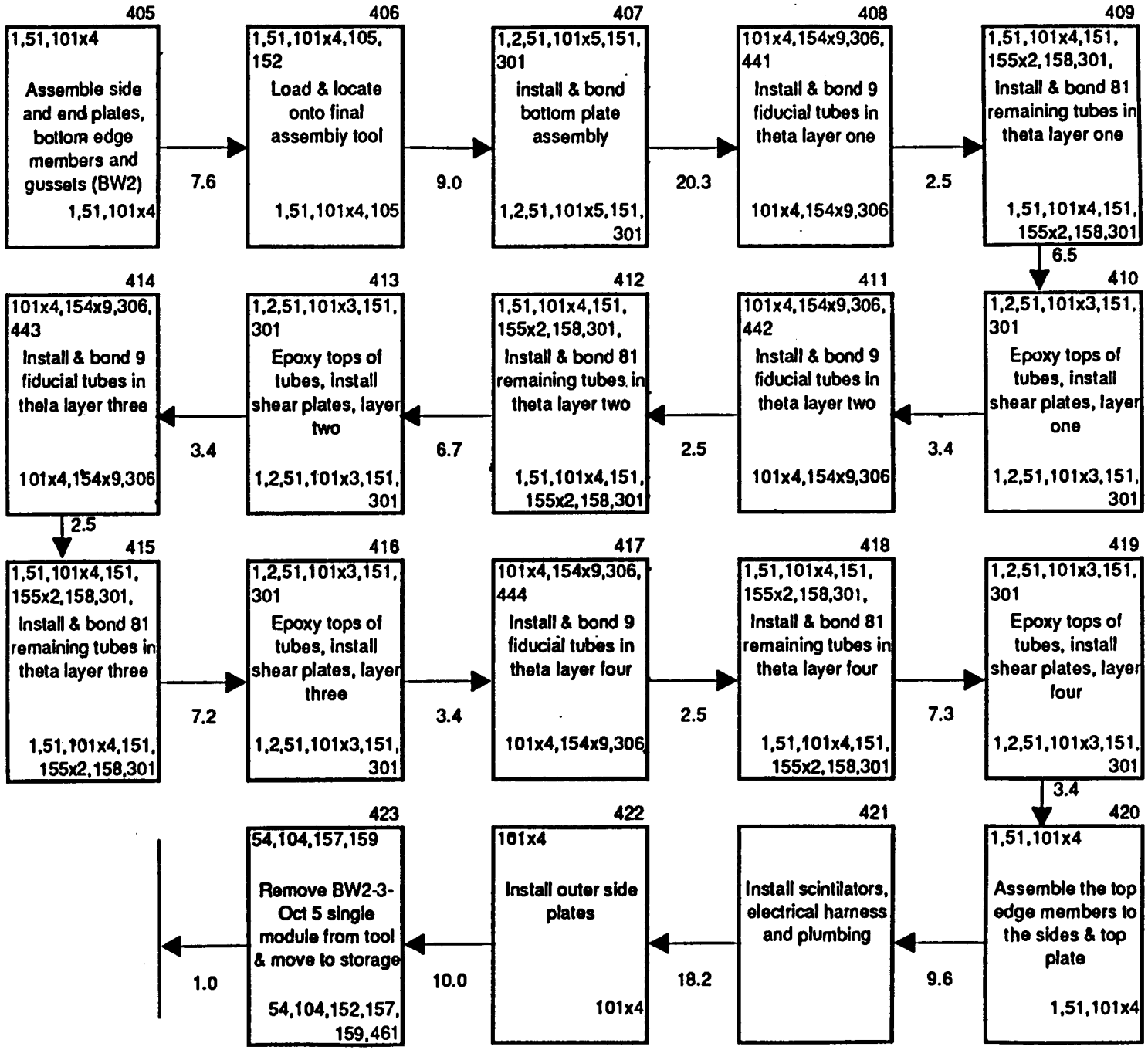
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW2 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,407	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,407

TOTAL SPAN	1.00
TOTAL HOURS	1.00

BW2 Production Activity = 63 BW2-3-5 Prod OAs = 405-423 Functions = 1170-1277

BW2-3-Oct 5 Module, 1 Unit, Activity #63



Activity 63 BW2-3-5 Prod

Resource	1	Sling	Allocated	14	Deallocated	14	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	15	Deallocated	15	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	84	Deallocated	84	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	36	Deallocated	36	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	441	9 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	442	9 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	443	9 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	444	9 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	451	81 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	452	81 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	453	81 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	454	81 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1
Resource	461	MBW2-3-OCT5 Mod	Allocated	0	Deallocated	1	Difference	-1

O.A. 405

Assemble side and end plates, bottom edge members and gussets (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	5.56	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	7.06
			TOTAL HOURS	7.56

O.A. 406

Load & locate onto final assembly tool

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.00	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.78	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	2
4	De-allocate resource	0	101x4	0.00	3
5	Verify plate alignment	105	105	0.25	4
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	6.25
TOTAL HOURS	9.03

O.A. 407

install & bond bottom plate assembly

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	3.10	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	3.10	2
4	Load sections of bottom plates and position, place bonding weights	0	0	11.12	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Cure epoxy	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 14.12

TOTAL HOURS 20.32

O.A. 408

Install & bond 9 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	441, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 441 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 409

Install & bond 81 remaining tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,451	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 451	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

O.A. 410

Epoxy tops of tubes, install shear plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

O.A. 411

Install & bond 9 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	442, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 442 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 412

Install & bond 81 remaining tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,452	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 452	1,51,101x4,151, 155x2,158,301

TOTAL SPAN	4.66
TOTAL HOURS	6.74

O.A. 413

Epoxy tops of tubes, install shear plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

200

O.A. 414

Install & bond 9 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	443, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 443 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 415

Install & bond 81 remaining tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,453	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 453	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 5.86

TOTAL HOURS 7.24

O.A. 416

Epoxy tops of tubes, install shear plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2 n/s
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301		
			TOTAL SPAN	3.37	
			TOTAL HOURS	3.37	

O.A. 417

Install & bond 9 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes and stiffbacks	444, 154x9	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 444 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 418

Install & bond 81 remaining tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,454	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 454	1,51,101x4,151, 155x2,158,301

TOTAL SPAN	5.86
TOTAL HOURS	7.34

O.A. 419

Epoxy tops of tubes, install shear plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2 n/s
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301		
			TOTAL SPAN	3.37	
			TOTAL HOURS	3.37	

206

O.A. 420

Assemble the top edge members to the sides & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	5.56	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	9.56	
		TOTAL HOURS	9.56	

O.A. 421

Install scintilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.70	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	3.00	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	3.00	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.50	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (66 panels)	2,51,101x4	2,51,101x4	5.50	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop with in design specifications	0	0	3.00	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence to verify all connections	0	0	1.50	7
11	De-allocate resources	0	102x2,160	0.00	8
	RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160		
			TOTAL SPAN	11.50	
			TOTAL HOURS	18.20	

208

O.A. 422

Install outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	3.00	1
2	Bolt the side plates to the assembly	0	101x4	7.00	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	10.00	
			TOTAL HOURS	10.00	

209

O.A. 423

Remove BW2-3-Oct 5 single module from tool & move to storage

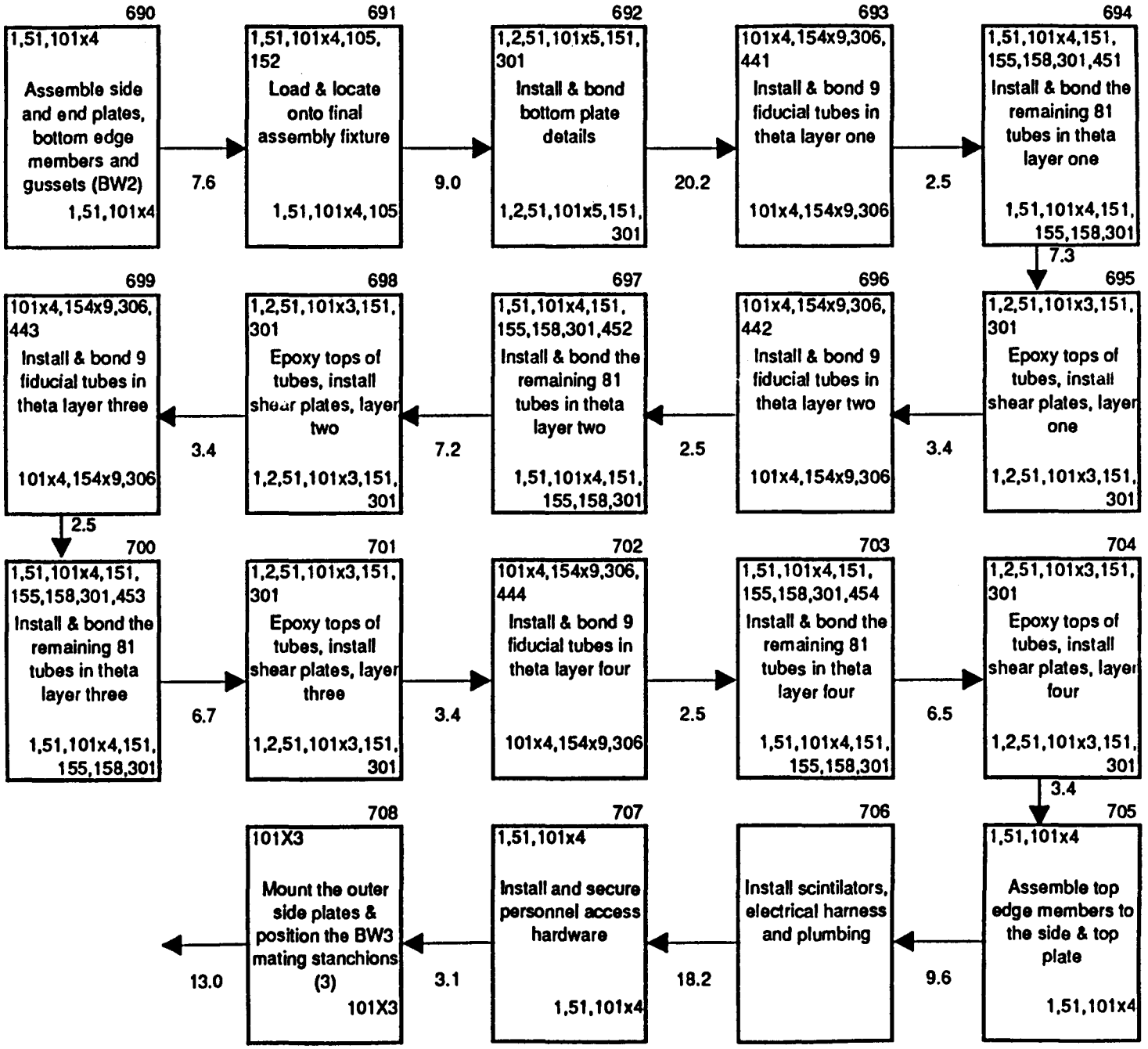
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW2 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,461	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,461

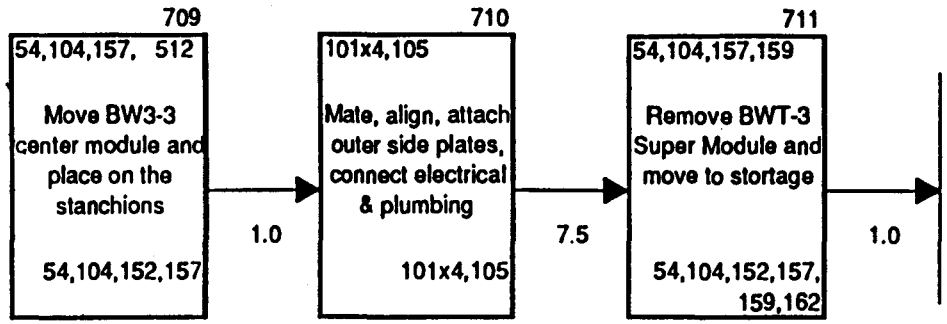
TOTAL SPAN	1.00
TOTAL HOURS	1.00

BW2 Production Activity = 65 BW2-3 BWT Prod OAs = 690-711 Functions = 2950-3064

BW2-3 Center, Mate BW3-3 = BWT-3, 7 Units, Activity #65



BW2-3 Center Mate BW3-3 = BWT-3, 7 Units, Activity #65



Activity 65 BW2-3 BWT Prod

Resource	1	Sling	Allocated	15	Deallocated	15	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	16	Deallocated	16	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	2	Deallocated	2	Difference	0
Resource	101	Worker	Allocated	91	Deallocated	91	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	105	Alignment Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	2	Difference	-1
Resource	154	FidTubeStrgback	Allocated	36	Deallocated	36	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	157	Mod Sprder Beam	Allocated	2	Deallocated	2	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	162	MBWT-3 Ctr SM	Allocated	0	Deallocated	1	Difference	-1
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	441	9 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	442	9 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	443	9 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	444	9 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	451	81 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	452	81 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	453	81 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	454	81 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1
Resource	512	MBW3-3 Cen Rdy	Allocated	1	Deallocated	0	Difference	1

O.A. 690

Assemble side and end plates, bottom edge members and gussets (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	5.56	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	7.06	
		TOTAL HOURS	7.56	

O.A. 691

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.00	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.78	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	2
4	De-allocate resource	0	101x4	0.00	3
5	Verify plate alignment	105	105	0.25	4
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	6.25
TOTAL HOURS	9.03

O.A. 692

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	3.06	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	3.06	2
4	Load sections of bottom plates and position, place bonding weights	0	0	11.12	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 14.12

TOTAL HOURS 20.24

O.A. 693

Install & bond 9 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	441,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 441 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 694

Install & bond the remaining 81 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,451	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,451	1,51,101x4,151, 155,158,301

TOTAL SPAN	3.86
TOTAL HOURS	7.34

219

O.A. 695

Epoxy tops of tubes, install shear plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

220

O.A. 696

Install & bond 9 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	442,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4,154x9,306
442

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 697

Install & bond the remaining 81 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,452	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,452	1,51,101x4,151, 155,158,301

TOTAL SPAN	4.66
TOTAL HOURS	7.24

O.A. 698

Epoxy tops of tubes, install shear plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

223

O.A. 699

Install & bond 9 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	443,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES	101x4,154x9,306, 443	101x4,154x9,306

TOTAL SPAN	2.40
TOTAL HOURS	2.48

224

O.A. 700

Install & bond the remaining 81 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,453	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,453	1,51,101x4,151, 155,158,301

TOTAL SPAN	4.66
TOTAL HOURS	6.74

O.A. 701

Epoxy tops of tubes, install shear plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

O.A. 702

Install & bond 9 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	444,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.45	6	
8	De-allocate resources	0	154x9	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 444 101x4,154x9,306

TOTAL SPAN 2.48

TOTAL HOURS 2.48

O.A. 703

Install & bond the remaining 81 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,454	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	n/p
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,454	1,51,101x4,151, 155,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

O.A. 704

Epoxy tops of tubes, install shear plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (10 passes) and to the tops of the tubes (10 passes)	1,2,51,101x4,301	301	1.67	1	
2	Load the shear plates and position, place bonding weights	151	1,2,51,101x4,151	1.70	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	3.37		
			TOTAL HOURS	3.37		

229

O.A. 705

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	5.56	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	9.56	
			TOTAL HOURS	9.56	

230

O.A. 706

Install scintilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.70	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	3.00	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	3.00	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.50	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (66 panels)	2,51,101x4	2,51,101x4	5.50	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	3.00	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	1.50	7
11	De-allocate resources	0	102x2,160	0.00	8
	RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160		
			TOTAL SPAN	11.50	
			TOTAL HOURS	18.20	

O.A. 707

Install and secure personnel access hardware

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the per assembled scafolding from storage and locate on the module	1,51,101x3	1,51	0.30	1
2	Fasten the scafolding to the module	101	0	1.40	2
3	Attach the other personell and material handling equipment	0	101x4	1.40	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	3.10	
			TOTAL HOURS	3.10	

232

O.A. 708

Mount the outer side plates & position the BW3 mating stanchions (3)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x3	0	3.00	1
2	Bolt the side plates to the BW2 assembly	0	0	6.95	2
3	Position the module mating stanchions	0	101x3	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101X3	101X3		
			TOTAL SPAN	12.95
			TOTAL HOURS	12.95

233

O.A. 709

Move BW3-3 center module and place on the stanchions

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Attach the module spreader beam to the next available BW3 mid, remove from its work station and load onto the SM mating stanchions	54,104,157, 512	54,104,152,157	1.00	1
2					
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	54,104,157, 512	54,104,152,157		

TOTAL SPAN 1.00

TOTAL HOURS 1.00

O.A. 710

Mate, align, attach outer side plates, connect electrical & plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Align the BW2 and BW3	105	105	0.50	1
2	Bolt the side plates to the BW3 and torque the bolts on the BW2 and BW3	101x4	101x4	6.95	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4,105	101x4,105		
			TOTAL SPAN	7.45	
			TOTAL HOURS	7.45	

O.A. 711

Remove BWT-3 Super Module and move to stortage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW super module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,162	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

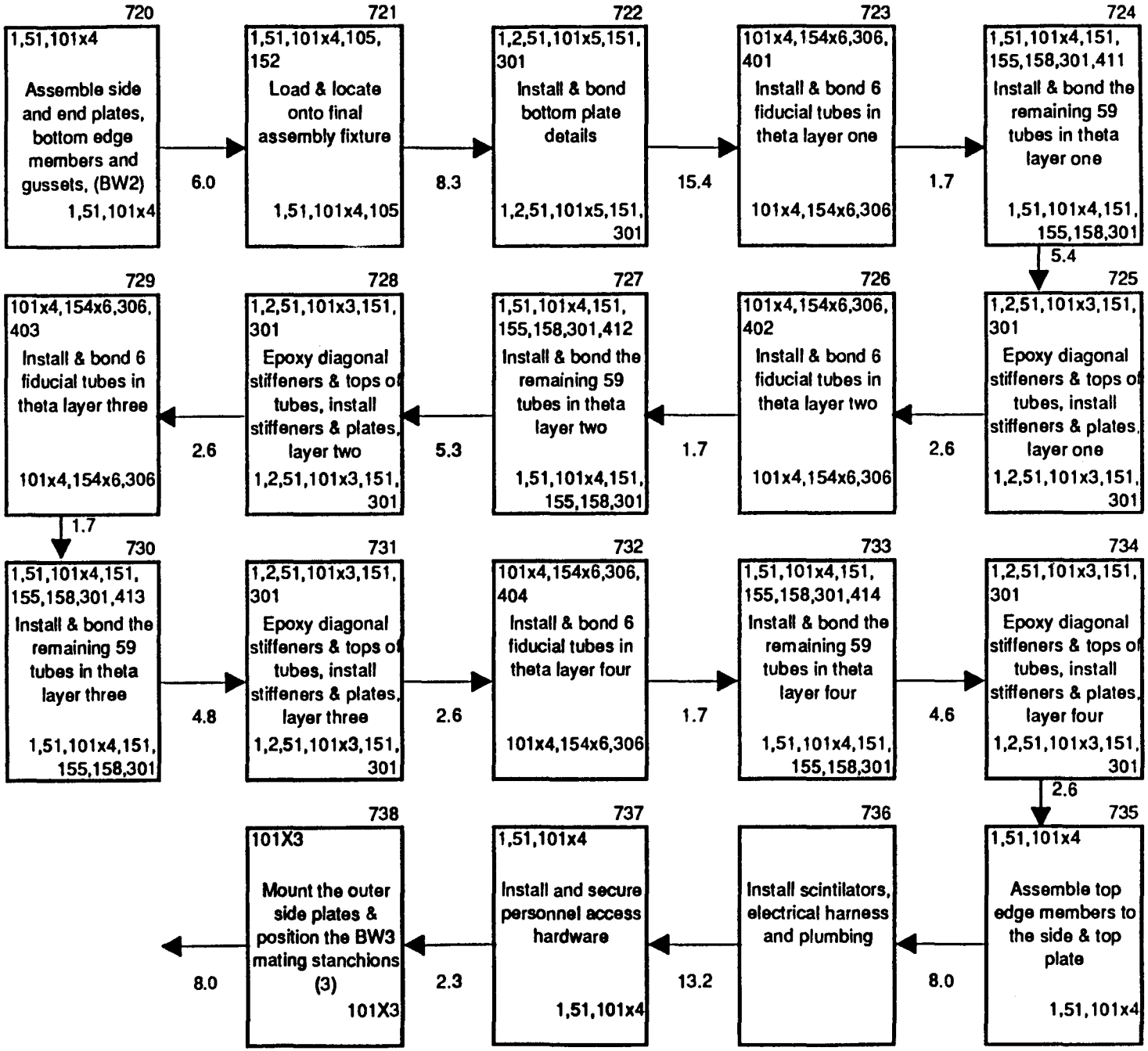
RESOURCES	54,104,157,159	54,104,152,157, 159,162

TOTAL SPAN	1.00
TOTAL HOURS	1.00

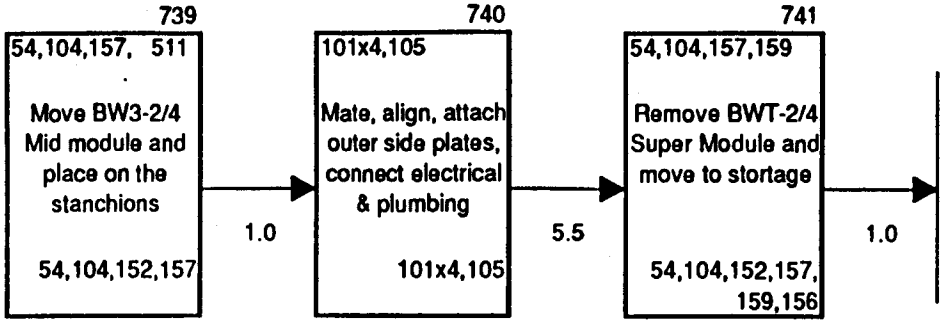
236

237

BW2-2/4 Mid, Mate BW3-2/4 = BWT-2/4, 14 Units, Activity # 66



BW2-2/4 Mid Mate BW3-2/4 = BWT-2/4, 14 Units, Activity #66



Activity 66 BW2-2/4 BWT Prd

Resource	1	Sling	Allocated	15	Deallocated	15	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	16	Deallocated	16	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	2	Deallocated	2	Difference	0
Resource	101	Worker	Allocated	87	Deallocated	87	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	105	Alignment Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	2	Difference	-1
Resource	154	FidTubeStrgback	Allocated	24	Deallocated	24	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	156	MBWT-2/4 Mid SM	Allocated	0	Deallocated	1	Difference	-1
Resource	157	Mod Sprder Beam	Allocated	2	Deallocated	2	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	401	6 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	402	6 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	403	6 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	404	6 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	411	59 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	412	59 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	413	59 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	414	59 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1
Resource	511	MBW3-2/4 MidRdy	Allocated	1	Deallocated	0	Difference	1

O.A. 720

Assemble side and end plates, bottom edge members and gussets, (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	4.00	3
4	Finish O.A.	0	0	0.00	4
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	6.00	
		TOTAL HOURS	6.00	

O.A. 721

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.00	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	5.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify plate alignment	105	105	0.25	5
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	6.25
TOTAL HOURS	8.25

O.A. 722

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	2.20	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	2.20	2
4	Load sections of bottom plates and position, place bonding weights	0	0	8.00	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 11.00

TOTAL HOURS 15.40

243

O.A. 723

Install & bond 6 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	401	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 401 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 724

Install & bond the remaining 59 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,411	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations.	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,411	1,51,101x4,151, 155,158,301

TOTAL SPAN	3.35
TOTAL HOURS	5.44

245

O.A. 725

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 726

Install & bond 6 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	402	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 402 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 727

Install & bond the remaining 59 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,412	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,412	1,51,101x4,151, 155,158,301

TOTAL SPAN 3.35

TOTAL HOURS 5.34

O.A. 728

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 729

Install & bond 6 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	403	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES 101x4,154x6,306, 403 101x4,154x6,306

TOTAL SPAN 1.60

TOTAL HOURS 1.65

O.A. 730

Install & bond the remaining 59 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,413	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,413	1,51,101x4,151, 155,158,301

TOTAL SPAN 3.35

TOTAL HOURS 4.84

O.A. 731

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.58

TOTAL HOURS 2.58

O.A. 732

Install & bond 6 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	404	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x6	0	0.30	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.05	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.00	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x6	0.30	6	
8						
9						
10						

RESOURCES	101x4,154x6,306, 404	101x4,154x6,306

TOTAL SPAN	1.60
TOTAL HOURS	1.65

O.A. 733

Install & bond the remaining 59 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,414	0	0.49	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.49	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.46	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.80	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	n/p
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.40	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,414	1,51,101x4,151, 155,158,301

TOTAL SPAN 3.35

TOTAL HOURS 4.64

O.A. 734

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.08	1	
2	Apply epoxy to the tops of the tubes (6 passes)	1,2,51,151	301	0.50	2	n/s
3	Load the top plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN	2.58
TOTAL HOURS	2.58

O.A. 735

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	4.00	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	8.00	
		TOTAL HOURS	8.00	

O.A. 736

Install scintilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.50	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	2.16	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	2.17	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	1.08	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (48 panels)	2,51,101x4	2,51,101x4	4.00	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	2.17	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	1.08	7
11	De-allocate resources	0	102x2,160	0.00	8
	RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160		
			TOTAL SPAN	8.84	
			TOTAL HOURS	13.16	

O.A. 737

Install and secure personnel access hardware

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the per assembled scafolding from storage and locate on the module	1,51,101x3	1,51	0.30	1
2	Fasten the scafolding to the module	101	0	1.00	2
3	Attach the other personell and material handling equipment	0	101x4	1.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	2.30	
			TOTAL HOURS	2.30	

O.A. 738

Mount the outer side plates & position the BW3 mating stanchions (3)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x3	0	3.00	1
2	Bolt the side plates to the BW2 assembly	0	0	5.00	2
3	Position the module mating stanchions	0	101x3	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101X3	101X3	
		TOTAL SPAN	8.00
		TOTAL HOURS	8.00

O.A. 739

Move BW3-2/4 Mid module and place on the stanchions

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Attach the module spreader beam to the next available BW3 mid, remove from its work station and load onto the SM mating stanchions	54,104,157, 511	54,104,152,157	1.00	1
2					
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	54,104,157, 511	54,104,152,157		

TOTAL SPAN 1.00

TOTAL HOURS 1.00

O.A. 740

Mate, align, attach outer side plates, connect electrical & plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Align the BW2 and BW3	105	105	0.50	1
2	Bolt the side plates to the BW3 and torque the bolts on the BW2 and BW3	101x4	101x4	5.00	2
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101x4,105	101x4,105	
		TOTAL SPAN	5.50
		TOTAL HOURS	5.50

O.A. 741

Remove BWT-2/4 Super Module and move to stortage

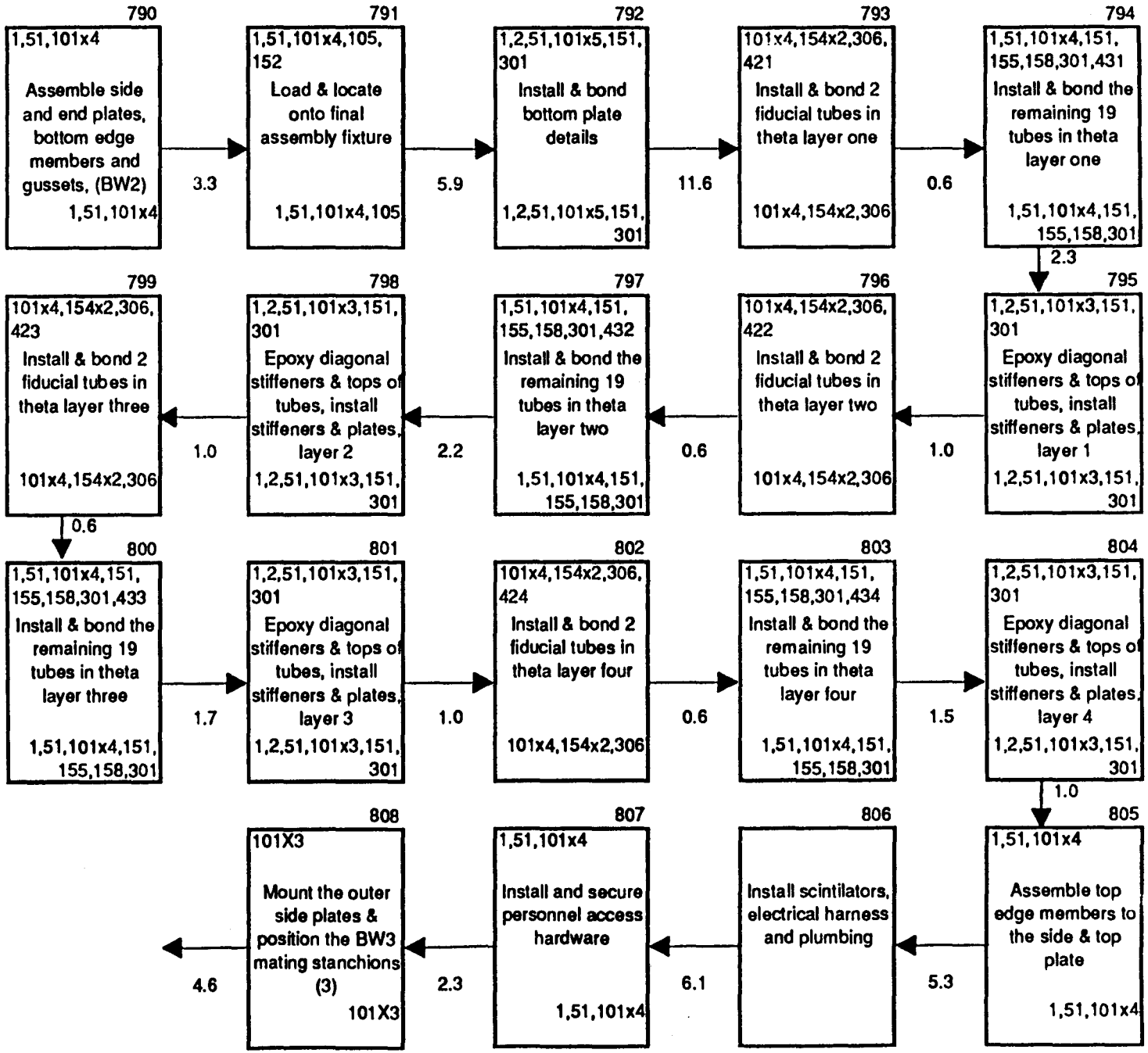
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW super module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,156	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,156
	TOTAL SPAN	1.00
	TOTAL HOURS	1.00

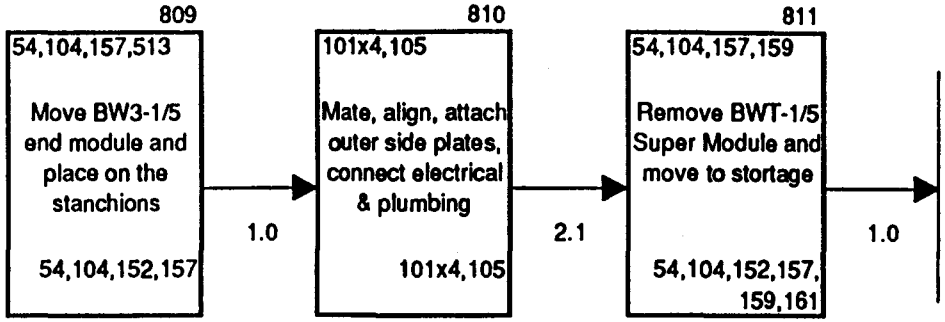
262

BW2 Production Activity = 67 BW2-1/5 BWT Prd OAs = 790-811 Functions = 3250-3365

BW2-1/5 End, Mate BW3-1/5 = BWT-1/5, 14 Units, Activity #67



BW2-1/5 End Mate BW3-1/5 = BWT-1/5, 14 Units, Activity #67



Activity 67 BW2-1/5 BWT Prd

Resource	1	Sling	Allocated	15	Deallocated	15	Difference	0
Resource	2	Vacuum Sling	Allocated	6	Deallocated	6	Difference	0
Resource	51	LitHoist AsyBld	Allocated	16	Deallocated	16	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	2	Deallocated	2	Difference	0
Resource	101	Worker	Allocated	87	Deallocated	87	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	2	Deallocated	2	Difference	0
Resource	105	Alignment Crew	Allocated	2	Deallocated	2	Difference	0
Resource	151	Bonding Weights	Allocated	9	Deallocated	9	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	2	Difference	-1
Resource	154	FidTubeStrgback	Allocated	8	Deallocated	8	Difference	0
Resource	155	Tube Strongback	Allocated	8	Deallocated	8	Difference	0
Resource	157	Mod Sprder Beam	Allocated	2	Deallocated	2	Difference	0
Resource	158	TubeBondingRack	Allocated	4	Deallocated	4	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	161	MBWT-1/5 End SM	Allocated	0	Deallocated	1	Difference	-1
Resource	301	1hr AdhesivDisp	Allocated	9	Deallocated	9	Difference	0
Resource	306	15min Glue Disp	Allocated	4	Deallocated	4	Difference	0
Resource	421	2 BW2 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	422	2 BW2 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	423	2 BW2 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	424	2 BW2 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	431	19 BW2 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	432	19 BW2 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	433	19 BW2 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	434	19 BW2 Theta4 T	Allocated	1	Deallocated	0	Difference	1
Resource	513	MBW3-1/5 EndRdy	Allocated	1	Deallocated	0	Difference	1

O.A. 790

Assemble side and end plates, bottom edge members and gussets, (BW2)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.50	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.50	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	1.30	3
4	Finish O.A.	0	0	0.00	4
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	3.30	
		TOTAL HOURS	3.30	

O.A. 791

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x3,152	1,51	1.00	1
2	Allocate resource	101	0	0.00	2
3	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	0.65	3
4	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	0	4.00	3
5	De-allocate resource	0	101x4	0.00	4
6	Verify plate alignment	105	105	0.25	5
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN 5.25

TOTAL HOURS 5.90

O.A. 792

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	1.30	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	1.30	2
4	Load sections of bottom plates and position, place bonding weights	0	0	6.00	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.00	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 9.00

TOTAL HOURS 11.60

O.A. 793

Install & bond 2 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	421	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 421 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 794

Install & bond the remaining 19 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,431	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,431	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.09

TOTAL HOURS 2.31

O.A. 795

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 1

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 796

Install & bond 2 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	422	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 422 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 797

Install & bond the remaining 19 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,432	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,432	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 2.21

O.A. 798

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 2

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 799

Install & bond 2 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	423	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 423 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 800

Install & bond the remaining 19 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,433	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,433	1,51,101x4,151, 155,158,301

TOTAL SPAN 1.08

TOTAL HOURS 1.71

O.A. 801

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 3

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 802

Install & bond 2 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	424	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x2	0	0.10	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.02	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x2	0.10	6	
8						
9						
10						

RESOURCES 101x4,154x2,306, 424 101x4,154x2,306

TOTAL SPAN 0.53

TOTAL HOURS 0.55

O.A. 803

Install & bond the remaining 19 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,434	0	0.16	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.16	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	0.79	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.27	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	n/p
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.13	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155,158,301,434	1,51,101x4,151, 155,158,301

TOTAL SPAN	1.08
TOTAL HOURS	1.51

O.A. 804

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer 4

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.35	1	
2	Apply epoxy to the tops of the tubes (2 passes)	1,2,51,151	301	0.17	2	n/s
3	Load the top plates and position, place bonding weights	0	1,2,51,101x3,151	0.50	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.02

TOTAL HOURS 1.02

O.A. 805

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.00	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	1.29	2
3	Using the tool reference locate and mount the three sets of Lee bearings	0	101x4	3.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		

TOTAL SPAN 5.29

TOTAL HOURS 5.29

282

O.A. 806

Install scintilators, electrical harness and plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Move pre-assembled structural frame from staging area, locate on the module and secure	1,51,101x3	1,51,101x3	0.50	1
2	Allocate resources	101x6	0	0.00	2
3	Install scintilator wiring harness and secure to the module asembly	0	0	1.29	3
4	Install gas manafolds and connect Tygon tubeing to the drift tubes	0	0	0.70	3
5	Locate & secure the wiring harness, connect the leads to the drift tubes	0	0	0.35	3
6	De-allocate resources	0	101x6	0.00	4
7	Mount and connect the scintilators (48 panels)	2,51,101x4	2,51,101x4	2.00	5
8	Allocate resources	102x2,160	0	0.00	6
9	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	1.40	7
10	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	0.35	7
11	De-allocate resources	0	102x2,160	0.00	8

RESOURCES	1,2,51,101x6, 102x2,160	1,2,51,101x6, 102x2,160	
		TOTAL SPAN	5.19
		TOTAL HOURS	6.09

283

O.A. 807

Install and secure personnel access hardware

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the per assembled scafolding from storage and locate on the module	1,51,101x3	1,51	0.30	1
2	Fasten the scafolding to the module	101	0	1.00	2
3	Attach the other personell and material handling equipment	0	101x4	1.00	3
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		

TOTAL SPAN 2.30

TOTAL HOURS 2.30

284

O.A. 808

Mount the outer side plates & position the BW3 mating stanchions (3)

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x3	0	3.00	1
2	Bolt the side plates to the BW2 assembly	0	0	1.62	2
3	Position the module mating stanchions	0	101x3	3.00	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101X3	101X3		
		TOTAL SPAN	4.62	
		TOTAL HOURS	4.62	

285

O.A. 809

Move BW3-1/5 end module and place on the stanchions

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Attach the module spreader beam to the next available BW3 mid, remove from its work station and load onto the SM mating stanchions	54,104,157,513	54,104,152,157	1.00	1
2					
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	54,104,157,513	54,104,152,157		
			TOTAL	1.00	

286

O.A. 810

Mate, align, attach outer side plates, connect electrical & plumbing

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Align the BW2 and BW3	105	105	0.50	1
2	Bolt the side plates to the BW3 and torque the bolts on the BW2 and BW3	101x4	101x4	1.62	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4,105	101x4,105		
			TOTAL	2.12	

287

O.A. 811

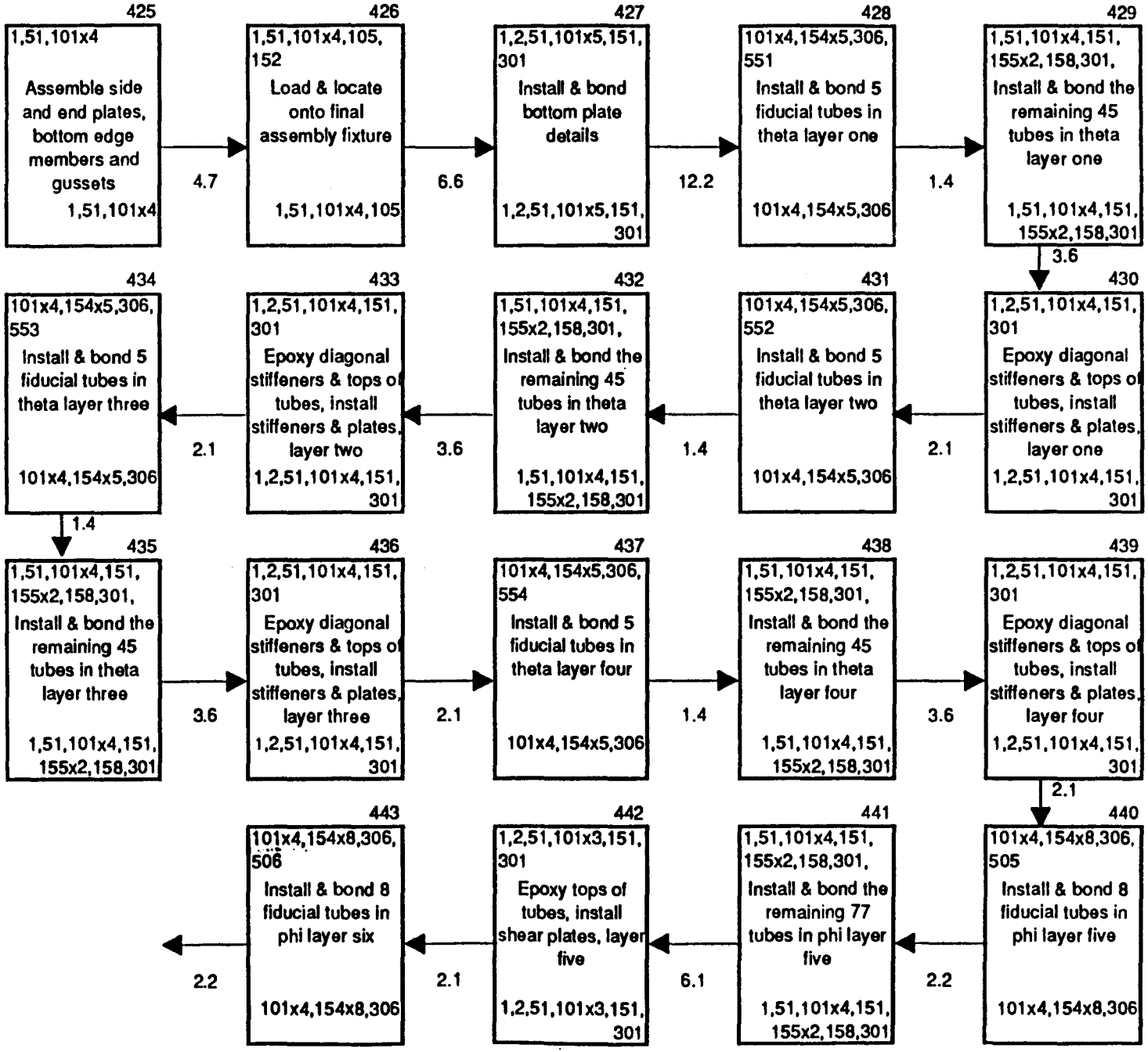
Remove BWT-1/5 Super Module and move to stortage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW super module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,161	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

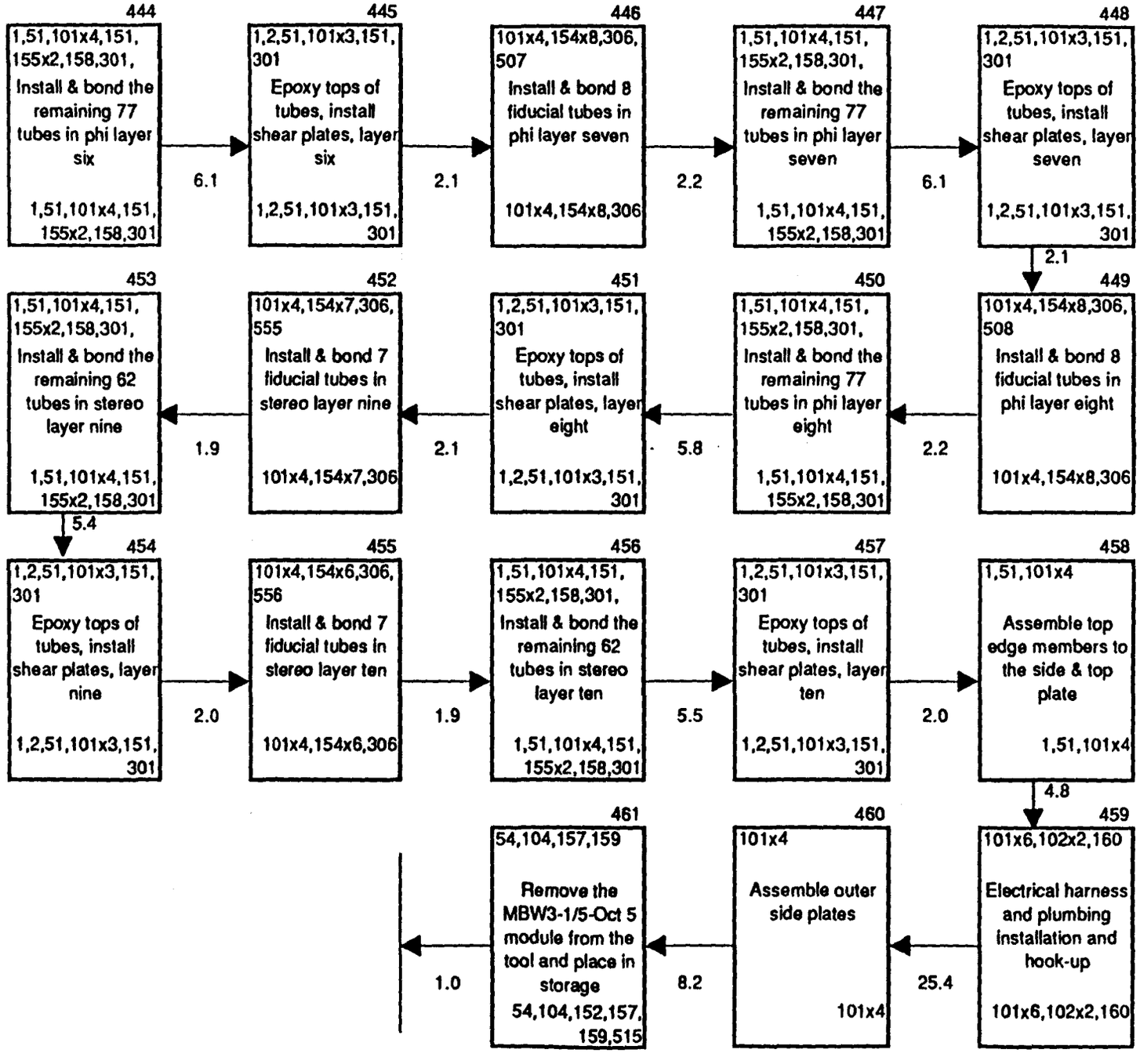
RESOURCES	54,104,157,159	54,104,152,157, 159,161

TOTAL 1.00

BW3-1/5-Oct 5 Single End, 2 Units, Activity #71



BW3-1/5-Oct 5 Single End, 2 Units, Activity #71



Activity 71 BW3-1/5-5 Prod

Resource	1	Sling	Allocated	25	Deallocated	25	Difference	0
Resource	2	Vacuum Sling	Allocated	11	Deallocated	11	Difference	0
Resource	51	LitHoist AsyBld	Allocated	25	Deallocated	25	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	139	Deallocated	139	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	21	Deallocated	21	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	66	Deallocated	66	Difference	0
Resource	155	Tube Strongback	Allocated	20	Deallocated	20	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	10	Deallocated	10	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	21	Deallocated	21	Difference	0
Resource	306	15min Glue Disp	Allocated	10	Deallocated	10	Difference	0
Resource	505	7 BW3 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	506	7 BW3 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	507	7 BW3 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	508	7 BW3 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	515	MBW3-1/5-OCT 5	Allocated	0	Deallocated	1	Difference	-1
Resource	525	77 BW3 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	526	77 BW3 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	527	77 BW3 Phi7 Tub	Allocated	1	Deallocated	0	Difference	1
Resource	528	77 BW3 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	551	5 BW3 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	552	5 BW3 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	553	5 BW3 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	554	5 BW3 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	555	6 BW3 Stero 9 T	Allocated	1	Deallocated	0	Difference	1
Resource	556	6 BW3 Ster 10 T	Allocated	1	Deallocated	0	Difference	1
Resource	557	45 BW3 Theta1 T	Allocated	1	Deallocated	0	Difference	1
Resource	558	45 BW3 Theta2 T	Allocated	1	Deallocated	0	Difference	1
Resource	559	45 BW3 Theta3 T	Allocated	1	Deallocated	0	Difference	1
Resource	560	45 BW3 Theta4 T	Allocated	1	Deallocated	0	Difference	1
Resource	561	63 BW3 Ster9 T	Allocated	1	Deallocated	0	Difference	1
Resource	562	63 BW3 Ster10 T	Allocated	1	Deallocated	0	Difference	1

O.A. 425

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.17	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.44	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	3.11	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	4.28
			TOTAL HOURS	4.72

O.A. 426

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	0.84	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	1.55	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	101x4	3.92	2
4	Verify the alignment of the "box"	105	105	0.25	3
5					
6					
7					
8					
9					
10					

RESOURCES 1,51,101x4,105, 1,51,101x4,105

TOTAL SPAN 5.01

TOTAL HOURS 6.56

O.A. 427

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	1.71	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	1.71	2
4	Load sections of bottom plates and position, place bonding weights	0	0	6.22	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Cure epoxy	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	1.55	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 8.77

TOTAL HOURS 12.19

O.A. 428

Install & bond 5 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	551	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x5	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x5	0.25	6	
8						
9						
10						

RESOURCES	101x4,154x5,306, 551	101x4,154x5,306

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 429

Install & bond the remaining 45 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,557	0	0.38	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.38	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.88	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 557	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 2.59

TOTAL HOURS 3.64

O.A. 430

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.83	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.80	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.05

TOTAL HOURS 2.05

298

O.A. 431

Install & bond 5 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	552	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x5	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x5	0.25	6	
8						
9						
10						

RESOURCES 101x4,154x5,306, 552 101x4,154x5,306

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 432

Install & bond the remaining 45 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,558	0	0.38	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.38	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.88	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 558	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 2.59

TOTAL HOURS 3.64

O.A. 433

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.83	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.80	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.05

TOTAL HOURS 2.05

301

O.A. 434

Install & bond 5 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	553	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x5	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x5	0.25	6	
8						
9						
10						

RESOURCES 101x4,154x5,306, 553 101x4,154x5,306

TOTAL SPAN 1.33

TOTAL HOURS 1.37

302

O.A. 435

Install & bond the remaining 45 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,559	0	0.38	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.38	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.88	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 559	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 2.59

TOTAL HOURS 3.64

303

O.A. 436

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.83	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.80	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.05

TOTAL HOURS 2.05

304

O.A. 437

Install & bond 5 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	554	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4,154x5	0	0.25	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.04	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	0.83	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4,154x5	0.25	6	
8						
9						
10						

RESOURCES 101x4,154x5,306, 554 101x4,154x5,306

TOTAL SPAN 1.33

TOTAL HOURS 1.37

O.A. 438

Install & bond the remaining 45 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,560	0	0.38	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.38	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	1.88	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.67	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.33	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 560	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 2.59

TOTAL HOURS 3.64

306

O.A. 439

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	0.83	1	
2	Apply epoxy to the tops of the tubes (5 passes)	1,2,51,151	301	0.42	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	0.80	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x4,151, 301	1,2,51,101x4,151, 301

TOTAL SPAN 2.05

TOTAL HOURS 2.05

O.A. 440

Install & bond 8 fiducial tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	505,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 505 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 441

Install & bond the remaining 77 tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,525	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 525	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

309

O.A. 442

Epoxy tops of tubes, install shear plates, layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

O.A. 443

Install & bond 8 fiducial tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	506,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 506 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 444

Install & bond the remaining 77 tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,526	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 526	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

312

O.A. 445

Epoxy tops of tubes, install shear plates, layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

O.A. 446

Install & bond 8 fiducial tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	507,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 507 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 447

Install & bond the remaining 77 tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,527	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 527	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

O.A. 448

Epoxy tops of tubes, install shear plates, layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

316

O.A. 449

Install & bond 8 fiducial tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	508,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 508 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 450

Install & bond the remaining 77 tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,528	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 528	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.85

TOTAL HOURS 5.76

318

O.A. 451

Epoxy tops of tubes, install shear plates, layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

O.A. 452

Install & bond 7 fiducial tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	101,555	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x3,154x7	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.35	6	
8	De-allocate resources	0	154x7	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 555 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

320

O.A. 453

Install & bond the remaining 62 tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,561	0	0.52	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.52	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.58	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 561	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.10

TOTAL HOURS 5.39

O.A. 454

Epoxy tops of tubes, install shear plates, layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the	101x3,301	301	1.17	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

322

O.A. 455

Install & bond 7 fiducial tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	556,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x7	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	101x4	0.35	6	
8	De-allocate resources	0	154x7	0.00	7	
9						
10						

RESOURCES 101x4,154x6,306, 556 101x4,154x6,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

323

O.A. 456

Install & bond the remaining 62 tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,562	0	0.52	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.52	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.58	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 562	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.10

TOTAL HOURS 5.49

O.A. 457

Epoxy tops of tubes, install shear plates, layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the tubes (7 passes)	101x3,301	301	1.17	1	n/s
2	Load the top plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

O.A. 458

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	0.93	1
2	Install bolts thru edge members into side plates and torque bolts	101	101x4	3.89	2
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	4.82	
		TOTAL HOURS	4.82	

326

O.A. 459

Electrical harness and plumbing installation and hook-up

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x6	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	5.65	2
3	Locate & secure the tube wiring harness, connect the leads to the drift tubes	0	0	2.83	2
4	De-allocate resources	0	101x6	0.00	3
5	Allocate resources	102x2,160	0	0.00	4
6	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	11.30	5
7	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	5.65	5
8	De-allocate resources	0	102x2,160	0.00	6
9					
10					

RESOURCES 101x6,102x2,160 101x6,102x2,160

TOTAL SPAN 16.95

TOTAL HOURS 25.43

O.A. 460

Assemble outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	3.06	1
2	Bolt the side plates to the assembly	0	101x4	5.09	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	8.15	
			TOTAL HOURS	8.15	

O.A. 461

Remove the MBW3-1/5-Oct 5 module from the tool and place in storage

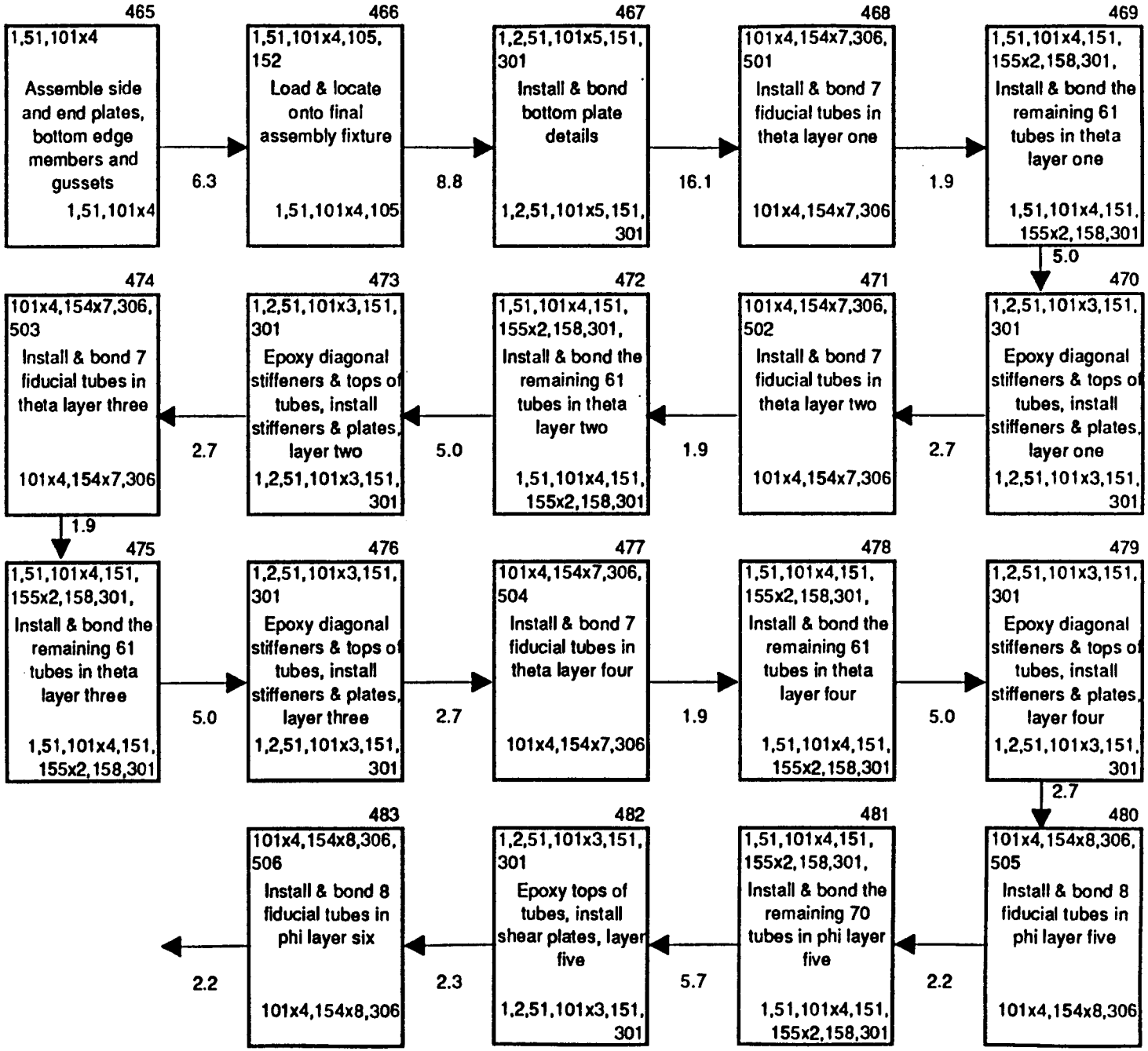
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW3 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,515	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,515	
		TOTAL SPAN	1.00
		TOTAL HOURS	1.00

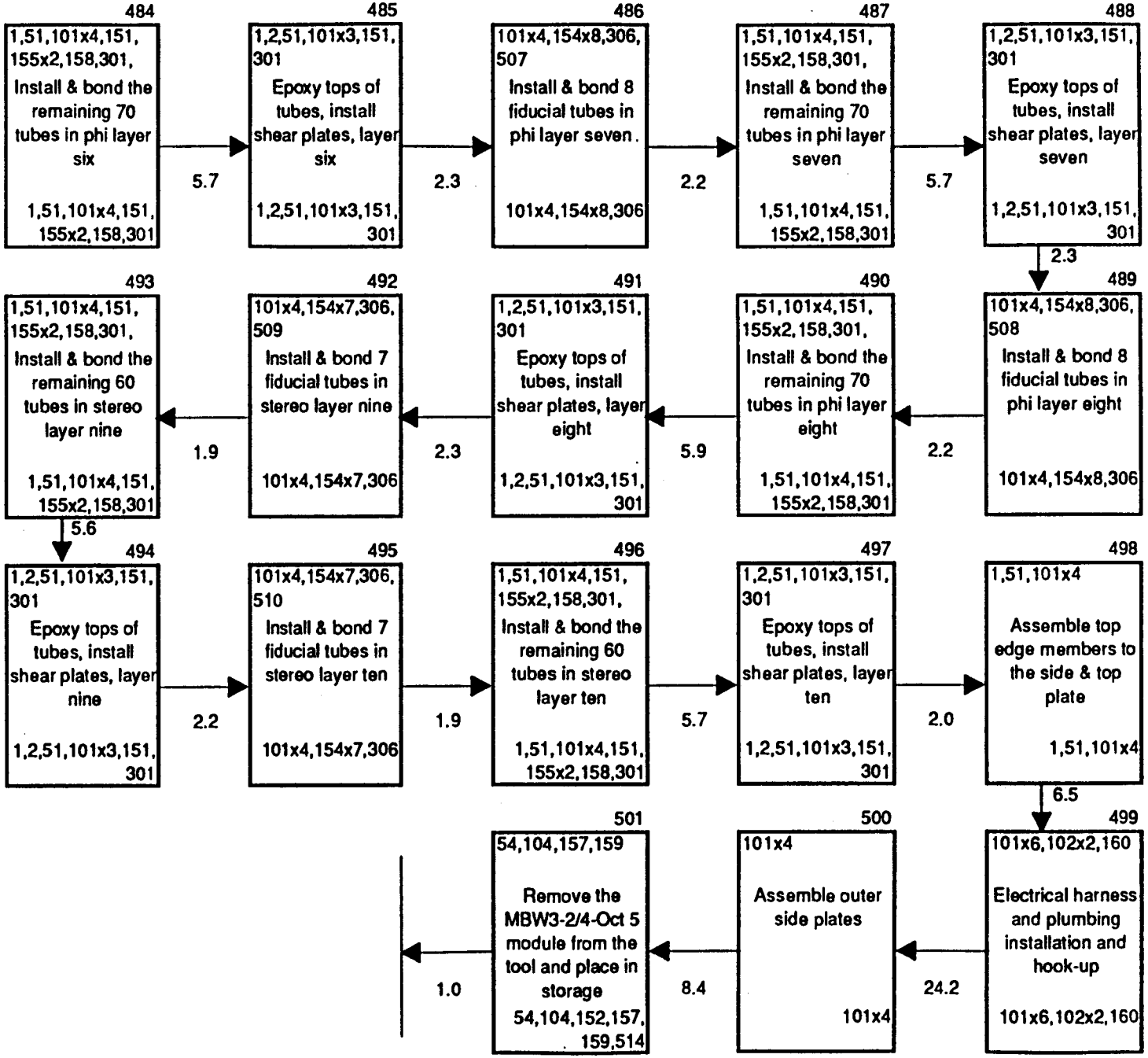
330

BW3 Production Activity = 72 BW3-2/4-5 Prod OAs = 465-501 Functions = 1530-1738

BW3-2/4-Oct 5 Single Middle, 2 Units, Activiyt #72



BW3-2/4-Oct 5 Single Middle, 2 Units, Activity #72



332

Activity 72 BW3-2/4-5 Prod

Resource	1	Sling	Allocated	25	Deallocated	25	Difference	0
Resource	2	Vacuum Sling	Allocated	11	Deallocated	11	Difference	0
Resource	51	LitHoist AsyBld	Allocated	25	Deallocated	25	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	139	Deallocated	139	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	21	Deallocated	21	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	74	Deallocated	74	Difference	0
Resource	155	Tube Strongback	Allocated	20	Deallocated	20	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	10	Deallocated	10	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	21	Deallocated	21	Difference	0
Resource	306	15min Glue Disp	Allocated	10	Deallocated	10	Difference	0
Resource	501	7 BW3 Th 1 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	502	7 BW3 Th 2 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	503	7 BW3 Th 3 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	504	7 BW3 Th 4 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	505	7 BW3 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	506	7 BW3 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	507	7 BW3 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	508	7 BW3 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	509	7 BW3 Str9 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	510	7BW3 Str 10 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	514	MBW3-2/4-OCT 5	Allocated	0	Deallocated	1	Difference	-1
Resource	521	77 BW3 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource	522	77 BW3 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource	523	77 BW3 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource	524	77 BW3 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource	525	77 BW3 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	526	77 BW3 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	527	77 BW3 Phi7 Tub	Allocated	1	Deallocated	0	Difference	1
Resource	528	77 BW3 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	529	77 BW3 Streo9 T	Allocated	1	Deallocated	0	Difference	1
Resource	530	77 BW3 Str 10 T	Allocated	1	Deallocated	0	Difference	1

O.A. 465

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.58	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.53	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	4.20	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	5.78	
		TOTAL HOURS	6.31	

O.A. 466

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.10	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.10	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	101x4	5.30	2
4	Verify the alignment of the "box"	105	105	0.25	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	6.65
TOTAL HOURS	8.75

335

O.A. 467

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	2.31	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	2.31	2
4	Load sections of bottom plates and position, place bonding weights	0	0	8.40	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Cure epoxy	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.10	5
8					
9					
10					
	RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301		

TOTAL SPAN 11.50

TOTAL HOURS 16.12

336

O.A. 468

Install & bond 7 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	501,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 501 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

337

O.A. 469

Install & bond the remaining 61 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,521	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 521	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

O.A. 470

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

339

O.A. 471

Install & bond 7 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	502,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 502 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

340

O.A. 472

Install & bond the remaining 61 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,522	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 522	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

341

O.A. 473

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

342

O.A. 474

Install & bond 7 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	503,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 503 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 475

Install & bond the remaining 61 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,523	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 523	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

O.A. 476

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

O.A. 477

Install & bond 7 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	504,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 504 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

346

O.A. 478

Install & bond the remaining 61 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,524	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 524	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

347

O.A. 479

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

348

O.A. 480

Install & bond 8 fiducial tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	505,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 505 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 481

Install & bond the remaining 70 tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,525	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 525	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

350

O.A. 482

Epoxy tops of tubes, install shear plates, layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and lo the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.33
		TOTAL HOURS	2.33

O.A. 483

Install & bond 8 fiducial tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	506,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 506 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 484

Install & bond the remaining 70 tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,526	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 526	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

353

O.A. 485

Epoxy tops of tubes, install shear plates, layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

O.A. 486

Install & bond 8 fiducial tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	507,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 507 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 487

Install & bond the remaining 70 tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,527	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 527	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

356

O.A. 488

Epoxy tops of tubes, install shear plates, layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.33
		TOTAL HOURS	2.33

O.A. 489

Install & bond 8 fiducial tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	508,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 508 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 490

Install & bond the remaining 70 tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,528	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 528	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.88

O.A. 491

Epoxy tops of tubes, install shear plates, layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

360

O.A. 492

Install & bond 7 fiducial tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	509,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 509 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 493

Install & bond the remaining 60 tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,529	0	0.50	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.50	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.50	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
9					3	
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 529	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.47

TOTAL HOURS 5.60

O.A. 494

Epoxy tops of tubes, install shear plates, layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the	101x3,301	301	1.17	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.17

TOTAL HOURS 2.17

363

O.A. 495

Install & bond 7 fiducial tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	510,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 510 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

364

O.A. 496

Install & bond the remaining 60 tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,530	0	0.50	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.50	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.50	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 530	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.47

TOTAL HOURS 5.70

O.A. 497

Epoxy tops of tubes, install shear plates, layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the	101x3,301	301	1.17	1	n/s
2	Load the top plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

O.A. 498

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.26	1
2	Install bolts thru edge members into side plates and torque bolts	101	101x4	5.25	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	6.51	
			TOTAL HOURS	6.51	

367

O.A. 499

Electrical harness and plumbing installation and hook-up

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x6	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	3.94	2
3	Locate & secure the tube wiring harness, connect the leads to the drift tubes	0	0	2.55	2
4	De-allocate resources	0	101x6	0.00	3
5	Allocate resources	102x2,160	0	0.00	4
6	Preform inline mfg leak test, pressurize the complet system, verify pressure drop with in design specifications	0	0	11.83	5
7	Preform inline mfg electrical test, hook test tool (computer) and run test sequence to verify all connections	0	0	5.92	5
8	De-allocate resources	0	102x2,160	0.00	6
9					
10					

RESOURCES 101x6,102x2,160 101x6,102x2,160

TOTAL SPAN 15.77

TOTAL HOURS 24.24

368

O.A. 500

Assemble outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	3.15	1
2	Bolt the side plates to the assembly	0	101x4	5.25	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	8.40	
			TOTAL HOURS	8.40	

363

O.A. 501

Remove the MBW3-2/4-Oct 5 module from the tool and place in storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW3 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,514	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

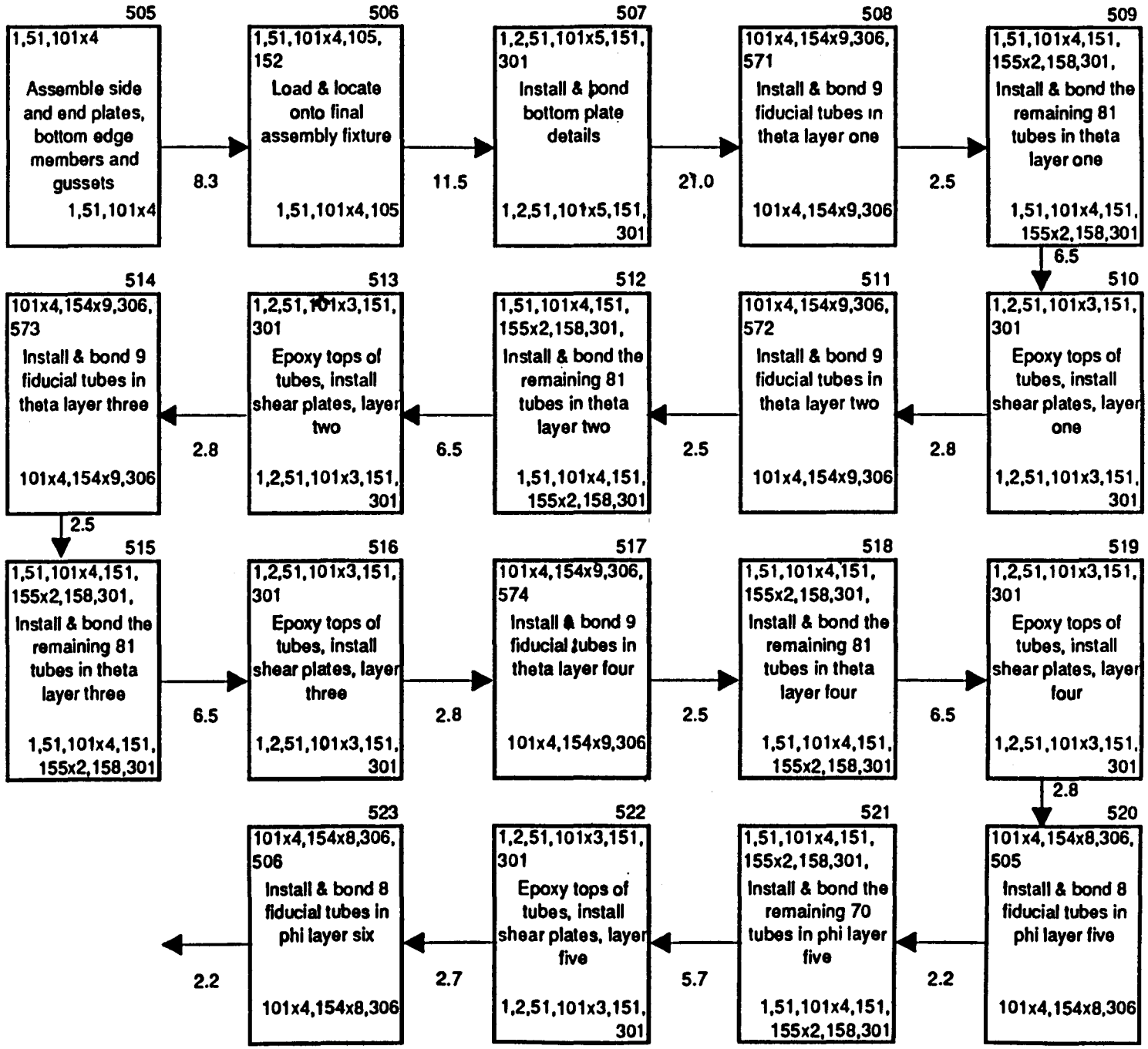
RESOURCES	54,104,157,159	54,104,152,157, 159,514	
		TOTAL SPAN	1.00
		TOTAL HOURS	1.00

370

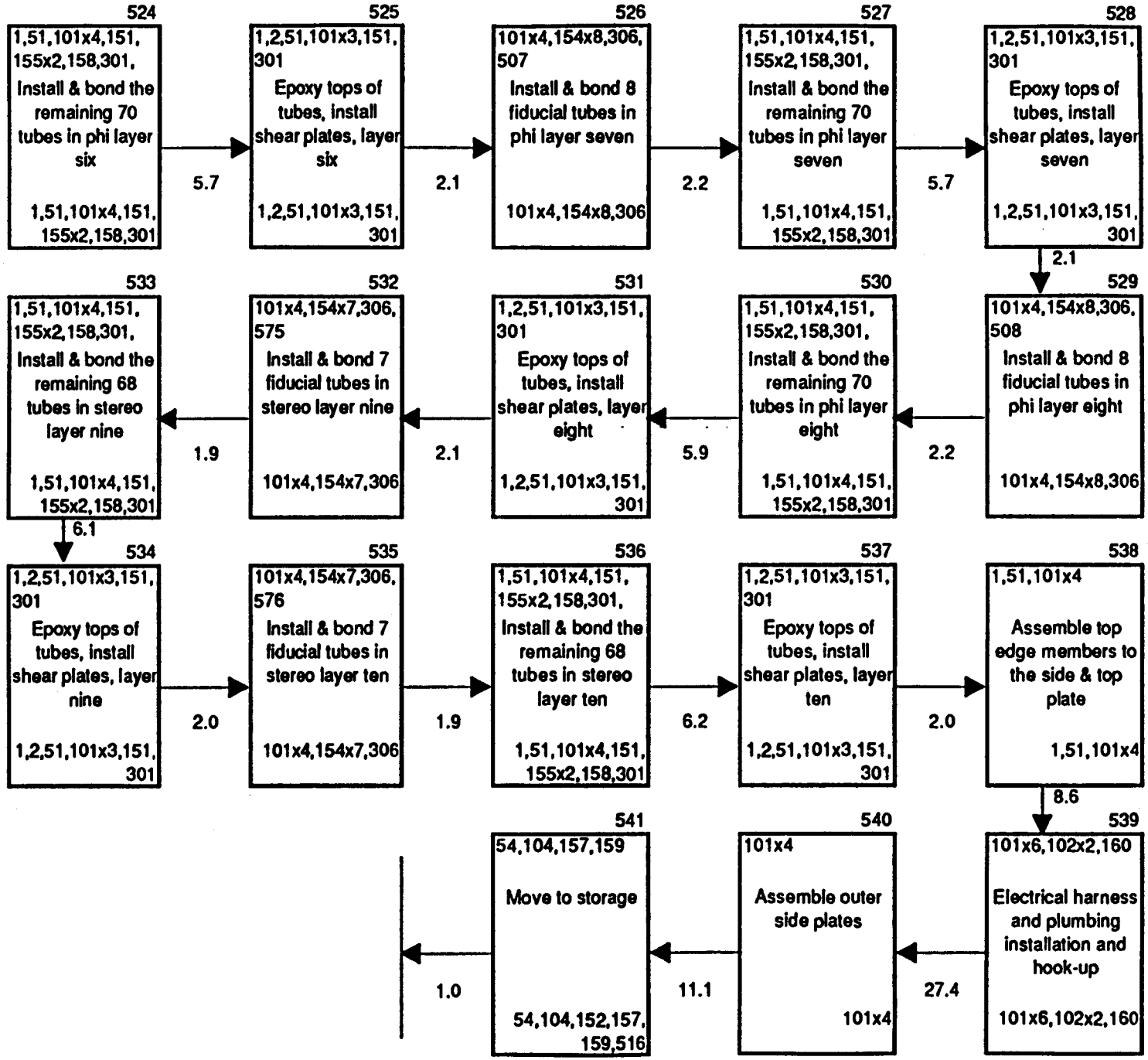
371

BW3 Production Activity = 73 BW3-3-5 Prod OAs = 505-541 Functions = 1775-1979

BW3-3-Oct 5 Single Center, 1 Unit, Activity #73



BW3-3-Oct 5 Single Center, 1 Unit, Activity #73



373

Activity 73 BW3-3-5 Prod

Resource	1	Sling	Allocated	25	Deallocated	25	Difference	0
Resource	2	Vacuum Sling	Allocated	11	Deallocated	11	Difference	0
Resource	51	LitHoist AsyBld	Allocated	25	Deallocated	25	Difference	0
Resource	54	HvyHoist AsyBld	Allocated	1	Deallocated	1	Difference	0
Resource	101	Worker	Allocated	139	Deallocated	139	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	104	Rigger Crew	Allocated	1	Deallocated	1	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	21	Deallocated	21	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	1	Difference	0
Resource	154	FidTubeStrgback	Allocated	82	Deallocated	82	Difference	0
Resource	155	Tube Strongback	Allocated	20	Deallocated	20	Difference	0
Resource	157	Mod Sprder Beam	Allocated	1	Deallocated	1	Difference	0
Resource	158	TubeBondingRack	Allocated	10	Deallocated	10	Difference	0
Resource	159	BWTRotationTool	Allocated	1	Deallocated	1	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	21	Deallocated	21	Difference	0
Resource	306	15min Glue Disp	Allocated	10	Deallocated	10	Difference	0
Resource	505	7 BW3 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	506	7 BW3 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	507	7 BW3 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	508	7 BW3 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	516	MBW3-3- OCT 5	Allocated	0	Deallocated	1	Difference	-1
Resource	525	77 BW3 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	526	77 BW3 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	527	77 BW3 Phi7 Tub	Allocated	1	Deallocated	0	Difference	1
Resource	528	77 BW3 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	571	9 BW3 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	572	9 BW3 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	573	9 BW3 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	574	9 BW3 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	575	7 BW3 Stereo9 T	Allocated	1	Deallocated	0	Difference	1
Resource	576	7 BW3 Stereo10T	Allocated	1	Deallocated	0	Difference	1
Resource	577	81 BW3 Theta 1T	Allocated	1	Deallocated	0	Difference	1
Resource	578	81 BW3 Theta 2T	Allocated	1	Deallocated	0	Difference	1
Resource	579	81 BW3 Theta 3T	Allocated	1	Deallocated	0	Difference	1
Resource	580	81 BW3 Theta 4T	Allocated	1	Deallocated	0	Difference	1
Resource	581	72 BW3 Stereo9T	Allocated	1	Deallocated	0	Difference	1
Resource	582	72 BW3 Stere10T	Allocated	1	Deallocated	0	Difference	1

O.A. 505

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	2.09	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.70	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	5.54	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	7.63	
		TOTAL HOURS	8.33	

O.A. 506

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.45	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.77	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	101x4	7.00	2
4	Verify the alignment of the "box"	105	105	0.25	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4,105, 152	1,51,101x4,105

TOTAL SPAN	8.70
TOTAL HOURS	11.47

O.A. 507

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151,	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	3.05	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	3.05	2
4	Load sections of bottom plates and position, place bonding weights	0	0	11.09	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Cure epoxy	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.77	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 14.86

TOTAL HOURS 20.96

O.A. 508

Install & bond 9 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	571,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 571 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 509

Install & bond the remaining 81 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,577	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 577	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

373

O.A. 510

Epoxy tops of tubes, install shear plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.32	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.82
		TOTAL HOURS	2.82

O.A. 511

Install & bond 9 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	572,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 572 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 512

Install & bond the remaining 81 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,578	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 578	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

O.A. 513

Epoxy tops of tubes, install shear plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.32	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.82
		TOTAL HOURS	2.82

383

O.A. 514

Install & bond 9 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	573,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 573 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

384

O.A. 515

Install & bond the remaining 81 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,579	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 579	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

O.A. 516

Epoxy tops of tubes, Install shear plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.32	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.82
		TOTAL HOURS	2.82

O.A. 517

Install & bond 9 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	574,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 574 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

387

O.A. 518

Install & bond the remaining 81 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,580	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 580	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

O.A. 519

Epoxy tops of tubes, install shear plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.32	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.82

TOTAL HOURS 2.82

389

O.A. 520

Install & bond 8 fiducial tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	505,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 505 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

390

O.A. 521

Install & bond the remaining 70 tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,525	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 525	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

O.A. 522

Epoxy tops of tubes, install shear plates, layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.32	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.65

TOTAL HOURS 2.65

O.A. 523

Install & bond 8 fiducial tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	506,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy lo the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 506 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 524

Install & bond the remaining 70 tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,526	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 526	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

394

O.A. 525

Epoxy tops of tubes, install shear plates, layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.13

TOTAL HOURS 2.13

395

O.A. 526

Install & bond 8 fiducial tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	507,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 507 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 527

Install & bond the remaining 70 tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,527	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 527	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.03

TOTAL HOURS 5.68

397

O.A. 528

Epoxy tops of tubes, install shear plates, layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.13

TOTAL HOURS 2.13

398

O.A. 529

Install & bond 8 fiducial tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	508,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 508 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 530

Install & bond the remaining 70 tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,528	0	0.58	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.58	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.92	3	n/p
5	Apply epoxy and install the six load distributors at specified locations	0	0	0.20	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 528	1,51,101x4,151, 155x2,158,301

TOTAL SPAN	3.85
TOTAL HOURS	5.88

400

O.A. 531

Epoxy tops of tubes, install shear plates, layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.13

TOTAL HOURS 2.13

O.A. 532

Install & bond 7 fiducial tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	575,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 575 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

402

O.A. 533

Install & bond the remaining 68 tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,581	0	0.57	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.57	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.83	3	n/p
5	Apply epoxy and install the twenty one load distributors at specified locations	0	0	0.70	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 581	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.87

TOTAL HOURS 6.07

403

O.A. 534

Epoxy tops of tubes, install shear plates, layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the	101x3,301	301	1.17	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

404

O.A. 535

Install & bond 7 fiducial tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	576,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 576 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

405

O.A. 536

Install & bond the remaining 68 tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,582	0	0.57	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.57	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.83	3	n/p
5	Apply epoxy and install the twenty four load distributors at specified locations	0	0	0.80	3	n/p
6	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
7	De-allocate resources	0	1,51,155x2,301	0.00	4	
8	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 582	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.87

TOTAL HOURS 6.17

406

O.A. 537

Epoxy tops of tubes, install shear plates, layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the	101x3,301	301	1.17	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

407

O.A. 538

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.66	1
2	Install bolts thru edge members into side plates and torque bolts	101	101x4	6.93	2
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	8.59	
		TOTAL HOURS	8.59	

O.A. 539

Electrical harness and plumbing installation and hook-up

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x6	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	4.57	2
3	Locate & secure the tube wiring harness, connect the leads to the drift tubes	0	0	2.28	2
4	De-allocate resources	0	101x6	0.00	3
5	Allocate resources	102x2,160	0	0.00	4
6	Preform inline mfg leak test, pressurize the complet system, verify pressure drop with in design specifications	0	0	13.70	5
7	Preform inline mfg electrical test, hook test tool (computer) and run test sequence to verify all connections	0	0	6.85	5
8	De-allocate resources	0	102x2,160	0.00	6
9					
10					

RESOURCES 101x6,102x2,160 101x6,102x2,160

TOTAL SPAN 18.27

TOTAL HOURS 27.40

O.A. 540

Assemble outer side plates

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the side plates from staging area and locate in the final assembly tool	101x4	0	4.16	1
2	Bolt the side plates to the assembly	0	101x4	6.93	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	101x4	101x4		
			TOTAL SPAN	11.09	
			TOTAL HOURS	11.09	

410

O.A. 541

Move to storage

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove all tooling pins and other attachment devises	104	0	0.20	1
2	Remove the module spreader beam from storage and move to the work station	54,157	0	0.20	2
3	Attach the spreader drops to the BW3 module and remove from the tool	0	152	0.20	3
4	Move the module to the storage area, place on the rotation/insertion tool and roll transfer into the module storage area	159	159,516	0.20	4
5	Place the spreader back into the storage area	0	54,104,157	0.20	5
6					
7					
8					
9					
10					

RESOURCES	54,104,157,159	54,104,152,157, 159,516

TOTAL SPAN 1.00

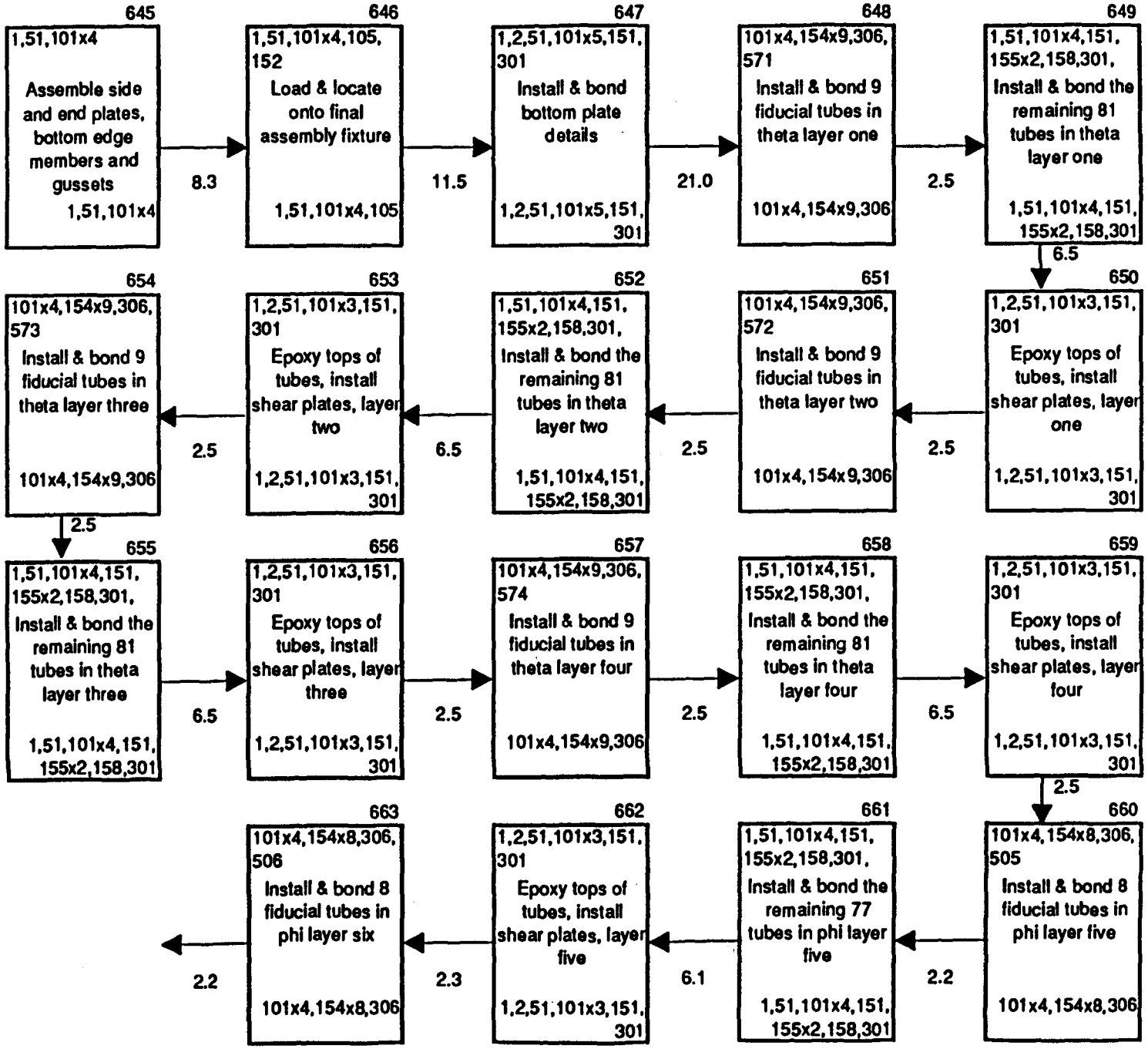
TOTAL HOURS 1.00

411

412

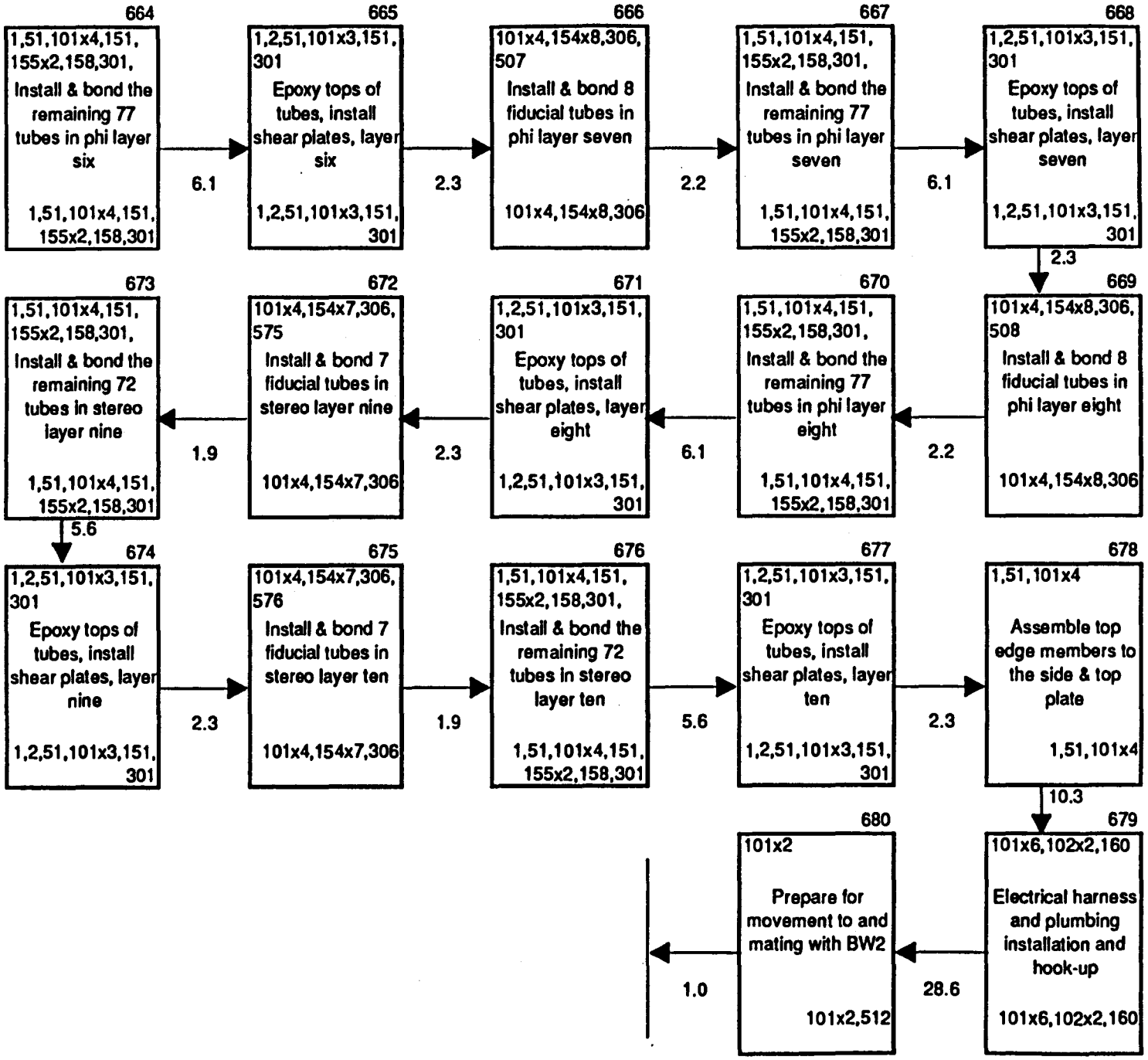
3W3 Production Activity = 75 BW3-3 BWT Prod OAs = 645-680 Functions = 2700-2896

BW3-3 Center, Mate BW2-3 = BWT, 7 Units, Activity #75



413

BW3-3 Center, Mate BW2-3 = BWT, 7 Units, Activity #75



Activity 75 BW3-3 BWT Prod

Resource	1	Sling	Allocated	25	Deallocated	25	Difference	0
Resource	2	Vacuum Sling	Allocated	11	Deallocated	11	Difference	0
Resource	51	LitHoist AsyBld	Allocated	25	Deallocated	25	Difference	0
Resource	101	Worker	Allocated	137	Deallocated	137	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	21	Deallocated	21	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	0	Difference	1
Resource	154	FidTubeStrgback	Allocated	82	Deallocated	82	Difference	0
Resource	155	Tube Strongback	Allocated	20	Deallocated	20	Difference	0
Resource	158	TubeBondingRack	Allocated	10	Deallocated	10	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	21	Deallocated	21	Difference	0
Resource	306	15min Glue Disp	Allocated	10	Deallocated	10	Difference	0
Resource	505	7 BW3 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	506	7 BW3 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	507	7 BW3 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	508	7 BW3 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	512	MBW3-3 Cen Rdy	Allocated	0	Deallocated	1	Difference	-1
Resource	525	77 BW3 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	526	77 BW3 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	527	77 BW3 Phi7 Tub	Allocated	1	Deallocated	0	Difference	1
Resource	528	77 BW3 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	571	9 BW3 Theta 1 T	Allocated	1	Deallocated	0	Difference	1
Resource	572	9 BW3 Theta 2 T	Allocated	1	Deallocated	0	Difference	1
Resource	573	9 BW3 Theta 3 T	Allocated	1	Deallocated	0	Difference	1
Resource	574	9 BW3 Theta 4 T	Allocated	1	Deallocated	0	Difference	1
Resource	575	7 BW3 Stereo9 T	Allocated	1	Deallocated	0	Difference	1
Resource	576	7 BW3 Stereo10T	Allocated	1	Deallocated	0	Difference	1
Resource	577	81 BW3 Theta 1T	Allocated	1	Deallocated	0	Difference	1
Resource	578	81 BW3 Theta 2T	Allocated	1	Deallocated	0	Difference	1
Resource	579	81 BW3 Theta 3T	Allocated	1	Deallocated	0	Difference	1
Resource	580	81 BW3 Theta 4T	Allocated	1	Deallocated	0	Difference	1
Resource	581	72 BW3 Stereo9T	Allocated	1	Deallocated	0	Difference	1
Resource	582	72 BW3 Stere10T	Allocated	1	Deallocated	0	Difference	1

O.A. 645

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	2.09	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.70	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	5.54	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	7.63	
		TOTAL HOURS	8.33	

O.A. 646

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.45	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.77	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	101x4	7.00	2
4	Verify plate alignment	105	105	0.25	3
5					
6					
7					
8					
9					
10					

RESOURCES 1,51,101x4,105, 1,51,101x4,105

TOTAL SPAN 8.70

TOTAL HOURS 11.47

A17

O.A. 647

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	3.05	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	3.05	2
4	Load sections of bottom plates and position, place bonding weights	0	0	11.09	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.77	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 14.86

TOTAL HOURS 20.96

O.A. 648

Install & bond 9 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	571,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 571 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

419

O.A. 649

Install & bond the remaining 81 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,577	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 577	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

420

O.A. 650

Epoxy tops of tubes, install shear plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the tubes (9 passes)	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.50

TOTAL HOURS 2.50

421

O.A. 651

Install & bond 9 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	572,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4,154x9,306
572

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 652

Install & bond the remaining 81 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,578	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 578	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

423

O.A. 653

Epoxy tops of tubes, install shear plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.50

TOTAL HOURS 2.50

O.A. 654

Install & bond 9 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	573,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 101x4,154x9,306
573

TOTAL SPAN 2.40

TOTAL HOURS 2.48

425

O.A. 655

Install & bond the remaining 81 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,579	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 579	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

426

O.A. 656

Epoxy tops of tubes, install shear plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.50

TOTAL HOURS 2.50

427

O.A. 657

Install & bond 9 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	574,101x4	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	154x9	0	0.45	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.08	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.50	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x9	0.45	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x9,306, 574 101x4,154x9,306

TOTAL SPAN 2.40

TOTAL HOURS 2.48

O.A. 658

Install & bond the remaining 81 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,580	0	0.68	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.68	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.38	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.20	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.60	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 580	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.66

TOTAL HOURS 6.54

423

O.A. 659

Epoxy tops of tubes, install shear plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (9 passes) and to the tops of the	101x3,301	301	1.50	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.50

TOTAL HOURS 2.50

430

O.A. 660

Install & bond 8 fiducial tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	505,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 505 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

431

O.A. 661

Install & bond the remaining 77 tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,525	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.06	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 525	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.08

432

O.A. 662

Epoxy tops of tubes, install shear plates, layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

433

O.A. 663

Install & bond 8 fiducial tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	506,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 506 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

434

O.A. 664

Install & bond the remaining 77 tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,526	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.06	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 526	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.08

O.A. 665

Epoxy tops of tubes, install shear plates, layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

O.A. 666

Install & bond 8 fiducial tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	507,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 507 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

437

O.A. 667

Install & bond the remaining 77 tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,527	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.06	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 527	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.08

O.A. 668

Epoxy tops of tubes, install shear plates, layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

433

O.A. 669

Install & bond 8 fiducial tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	508,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 508 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

440

O.A. 670

Install & bond the remaining 77 tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,528	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.06	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 528	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.08

O.A. 671

Epoxy tops of tubes, install shear plates, layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

442

O.A. 672

Install & bond 7 fiducial tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	575,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 575 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

443

O.A. 673

Install & bond the remaining 72 tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,581	0	0.60	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.60	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 581	1,51,101x4,151, 155x2,158,301

TOTAL SPAN	4.07
TOTAL HOURS	5.60

O.A. 674

Epoxy tops of tubes, install shear plates, layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.33
		TOTAL HOURS	2.33

O.A. 675

Install & bond 7 fiducial tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	576,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 576 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 676

Install & bond the remaining 72 tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,582	0	0.60	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.60	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.00	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 582	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.07

TOTAL HOURS 5.60

447

O.A. 677

Epoxy tops of tubes, install shear plates, layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	1.00	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.33

TOTAL HOURS 2.33

O.A. 678

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.66	1
2	Install bolts thru edge members into side plates and torque bolts	101	0	6.93	2
3	Assemble the top corner clips (4 places)	0	101x4	1.66	3
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	10.25	
		TOTAL HOURS	10.25	

443

O.A. 679

Electrical harness and plumbing installation and hook-up

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x6	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	4.76	2
3	Locate & secure the tube wiring harness, connect the leads to the drift tubes	0	0	2.38	2
4	De-allocate resources	0	101x6	0.00	3
5	Allocate resources	102x2,160	0	0.00	4
6	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	14.30	5
7	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	7.15	5
8	De-allocate resources	0	102x2,160	0.00	6
9					
10					

RESOURCES 101x6,102x2,160 101x6,102x2,160

TOTAL SPAN 19.06

TOTAL HOURS 28.59

450

O.A. 680

Prepare for movement to and mating with BW2

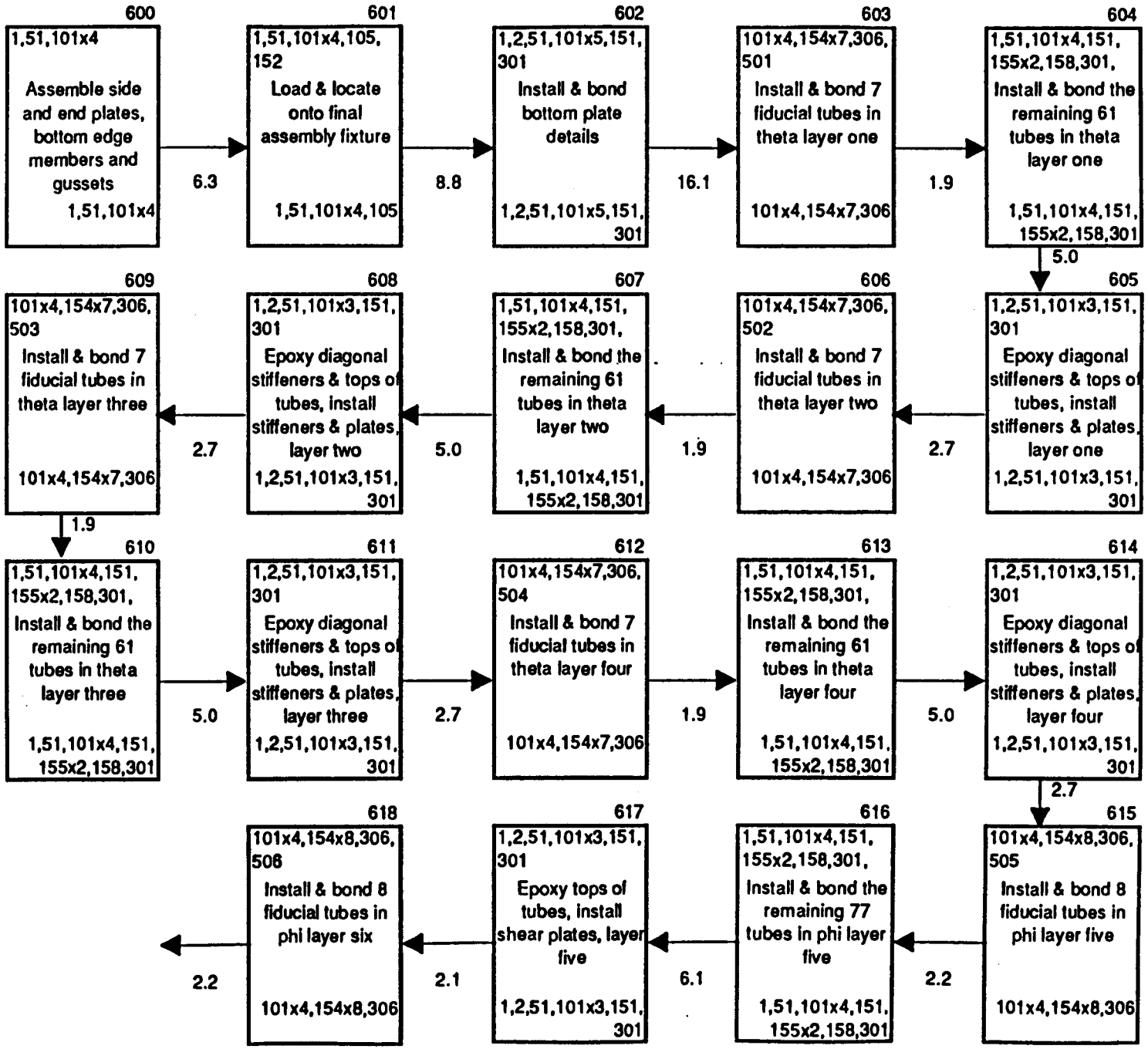
FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Attach temporary hoisting hardware	101x2	101x2, 512	1.00	1
2					
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101x2	101x2,512		
		TOTAL SPAN	1.00	
		TOTAL HOURS	1.00	

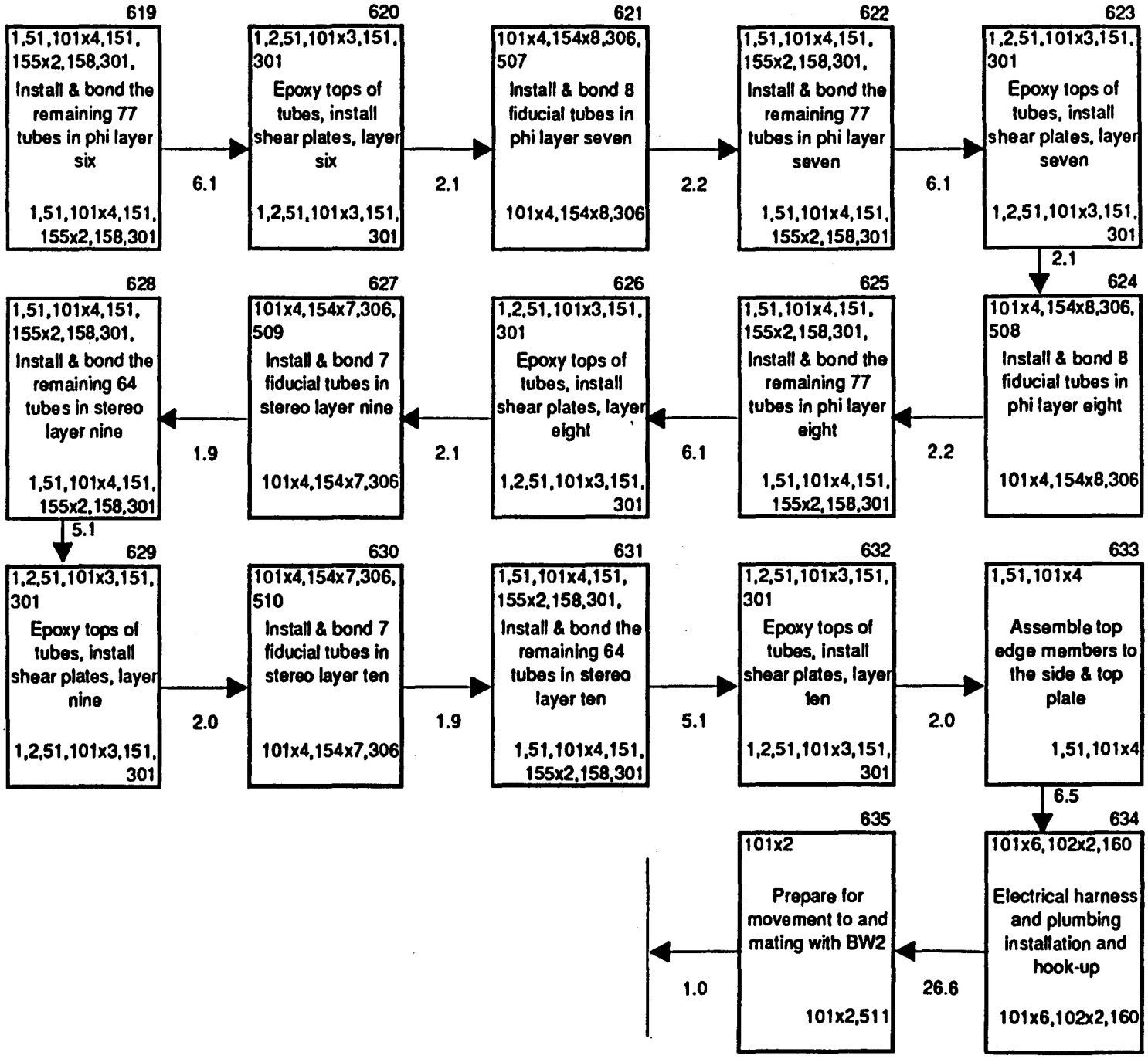
452

BW3 Production Activity = 76 BW3-2/4 BWT Prd OAs = 600-635 Functions = 2450-2649

BW3-2/4 Middle, Mate BW2-2/4 = BWT, 14 Units, Activity #76



BW3-2/4 Middle, Mate BW2-2/4 = BWT, 14 Units, Activity #76



Activity 76 BW3-2/4 BWT Prd

Resource	1	Sling	Allocated	25	Deallocated	25	Difference	0
Resource	2	Vacuum Sling	Allocated	11	Deallocated	11	Difference	0
Resource	51	LitHoist AsyBld	Allocated	25	Deallocated	25	Difference	0
Resource	101	Worker	Allocated	137	Deallocated	137	Difference	0
Resource	102	Test Engineer	Allocated	2	Deallocated	2	Difference	0
Resource	105	Alignment Crew	Allocated	1	Deallocated	1	Difference	0
Resource	151	Bonding Weights	Allocated	21	Deallocated	21	Difference	0
Resource	152	FinalAssblyTool	Allocated	1	Deallocated	0	Difference	1
Resource	154	FidTubeStrgback	Allocated	74	Deallocated	74	Difference	0
Resource	155	Tube Strongback	Allocated	20	Deallocated	20	Difference	0
Resource	158	TubeBondingRack	Allocated	10	Deallocated	10	Difference	0
Resource	160	BW1TestComputer	Allocated	1	Deallocated	1	Difference	0
Resource	301	1hr AdhesivDisp	Allocated	21	Deallocated	21	Difference	0
Resource	306	15min Glue Disp	Allocated	10	Deallocated	10	Difference	0
Resource	501	7 BW3 Th 1 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	502	7 BW3 Th 2 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	503	7 BW3 Th 3 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	504	7 BW3 Th 4 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	505	7 BW3 Phi 5 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	506	7 BW3 Phi 6 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	507	7 BW3 Phi 7 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	508	7 BW3 Phi 8 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	509	7 BW3 Str9 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	510	7BW3 Str 10 F/T	Allocated	1	Deallocated	0	Difference	1
Resource	511	MBW3-2/4 MidRdy	Allocated	0	Deallocated	1	Difference	-1
Resource	521	77 BW3 Theta 1	Allocated	1	Deallocated	0	Difference	1
Resource	522	77 BW3 Theta 2	Allocated	1	Deallocated	0	Difference	1
Resource	523	77 BW3 Theta 3	Allocated	1	Deallocated	0	Difference	1
Resource	524	77 BW3 Theta 4	Allocated	1	Deallocated	0	Difference	1
Resource	525	77 BW3 Phi 5 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	526	77 BW3 Phi 6 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	527	77 BW3 Phi7 Tub	Allocated	1	Deallocated	0	Difference	1
Resource	528	77 BW3 Phi 8 Tu	Allocated	1	Deallocated	0	Difference	1
Resource	529	77 BW3 Streo9 T	Allocated	1	Deallocated	0	Difference	1
Resource	530	77 BW3 Str 10 T	Allocated	1	Deallocated	0	Difference	1

O.A. 600

Assemble side and end plates, bottom edge members and gussets

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove side plates (4) from storage and place in vertical support rack	1,51,101x4	0	1.58	1
2	Remove bottom edge details from storage and place on side plate edge	0	1,51	0.53	2
3	Install bolts thru edge members into side plates and torque bolts	0	101x4	4.20	2
4	Finish O.A.	0	0	0.00	3
5					
6					
7					
8					
9					
10					

RESOURCES	1,51,101x4	1,51,101x4		
		TOTAL SPAN	5.78	
		TOTAL HOURS	6.31	

O.A. 601

Load & locate onto final assembly fixture

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	move the plates (4) from the vertical support rack to the final assembly tool	1,51,101x4,152	1,51	1.10	1
2	Pin the plates thru the tooling holes to the tool side suports and secure	0	0	2.10	2
3	Assemble the sides into "box" using the corner plates (4 places) and bolts	0	101x4	5.30	2
4	Verify plate alignment	105	105	0.25	3
5					
6					
7					
8					
9					
10					

457

RESOURCES 1,51,101x4,105, 1,51,101x4,105

TOTAL SPAN 6.65

TOTAL HOURS 8.75

O.A. 602

Install & bond bottom plate details

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	1,2,51,101x5,151, 301	0	0.00	1
2	Apply epoxy to the bottom edge members at bottom plate interface	0	0	2.31	2
3	Apply epoxy to one side of the doubler strips and locate in tool	0	0	2.31	2
4	Load sections of bottom plates and position, place bonding weights	0	0	8.40	2
5	De-allocate resources	0	1,2,51,101x5,301	0.00	3
6	Allow epoxy to set-up	0	0	1.00	4
7	Remove bonding weights	1,51,101x2	1,51,101x2,151	2.10	5
8					
9					
10					

RESOURCES	1,2,51,101x5,151, 301	1,2,51,101x5,151, 301

TOTAL SPAN 11.50

TOTAL HOURS 16.12

45a

O.A. 603

Install & bond 7 fiducial tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	501,154x/	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 501 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 604

Install & bond the remaining 61 tubes in theta layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,521	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 521	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

460

O.A. 605

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer one

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

O.A. 606

Install & bond 7 fiducial tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	502,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 502 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

462

O.A. 607

Install & bond the remaining 61 tubes in theta layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,522	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 522	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

463

O.A. 608

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer two

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

464

O.A. 609

Install & bond 7 fiducial tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	503,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 503 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 610

Install & bond the remaining 61 tubes in theta layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,523	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 523	1,51,101x4,151, 155x2,158,301

TOTAL SPAN	3.52
TOTAL HOURS	4.96

O.A. 611

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer three

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

46

O.A. 612

Install & bond 7 fiducial tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	504,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 504 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 613

Install & bond the remaining 61 tubes in theta layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,524	0	0.51	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.51	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.54	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 524	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.52

TOTAL HOURS 4.96

O.A. 614

Epoxy diagonal stiffeners & tops of tubes, install stiffeners & plates, layer four

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply epoxy to the diagonal stiffeners and place into the assembly	101x3,301	0	1.13	1	
2	Apply epoxy to the tops of the tubes (7 passes)	1,2,51,151	301	0.58	2	n/s
3	Load the shear plates and position, place bonding weights	0	1,2,51,101x3,151	1.00	3	n/s
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.71

TOTAL HOURS 2.71

470

O.A. 615

Install & bond 8 fiducial tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	505,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 101x4,154x8,306
505

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 616

Install & bond the remaining 77 tubes in phi layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,525	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 525	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

472

O.A. 617

Epoxy tops of tubes, install shear plates, layer five

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

473

O.A. 618

Install & bond 8 fiducial tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	506,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 506 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 619

Install & bond the remaining 77 tubes in phi layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,526	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 526	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

O.A. 620

Epoxy tops of tubes, install shear plates, layer six

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301	
		TOTAL SPAN	2.13
		TOTAL HOURS	2.13

O.A. 621

Install & bond 8 fiducial tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	507,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 507 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

O.A. 622

Install & bond the remaining 77 tubes in phi layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,527	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 527	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

O.A. 623

Epoxy tops of tubes, install shear plates, layer seven

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.13

TOTAL HOURS 2.13

O.A. 624

Install & bond 8 fiducial tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	508,154x8	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.40	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.07	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.33	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x8	0.40	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x8,306, 508 101x4,154x8,306

TOTAL SPAN 2.13

TOTAL HOURS 2.20

48U

O.A. 625

Install & bond the remaining 77 tubes in phi layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,528	0	0.64	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.64	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	3.21	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	1.07	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.53	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 528	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 4.38

TOTAL HOURS 6.09

O.A. 626

Epoxy tops of tubes, install shear plates, layer eight

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (8 passes) and to the tops of the tubes (8 passes)	101x3,301	301	1.33	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 2.13

TOTAL HOURS 2.13

482

O.A. 627

Install & bond 7 fiducial tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	509,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 509 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

483

O.A. 628

Install & bond the remaining 64 tubes in stereo layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,529	0	0.53	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.53	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.67	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 529	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.67

TOTAL HOURS 5.13

484

O.A. 629

Epoxy tops of tubes, install shear plates, layer nine

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the tubes (7 passes)	101x3,301	301	1.17	1 n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2 n/s
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301

TOTAL SPAN 1.97

TOTAL HOURS 1.97

485

O.A. 630

Install & bond 7 fiducial tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Allocate tubes	510,154x7	0	0.00	1	
2	Attach fiducial strong back to drift cell tubes	101x4	0	0.35	2	
3	Allocate resources	306	0	0.00	3	
4	Apply epoxy to the tubes	0	0	0.06	4	n/p
5	Insert tubes into the side plates, pin in place and cure epoxy	0	0	1.17	4	n/p
6	De-allocate resources	0	306	0.00	5	
7	Remove strongbacks and store	0	154x7	0.35	6	
8	De-allocate resources	0	101x4	0.00	7	
9						
10						

RESOURCES 101x4,154x7,306, 510 101x4,154x7,306

TOTAL SPAN 1.87

TOTAL HOURS 1.93

O.A. 631

Install & bond the remaining 64 tubes in stereo layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Attach standard strongback to the drift cell tube	101x4,155x2,530	0	0.53	1	
2	Allocate resources	1,51,151,158,301	0	0.00	2	
3	Apply epoxy to the tube	0	0	0.53	3	n/p
4	Insert tube into side plates, pin in position, remove strongback	0	0	2.67	3	n/p
5	Position the alignment racks, pull vacuum, add weight and cure	0	0	0.93	3	n/p
6	De-allocate resources	0	1,51,155x2,301	0.00	4	
7	Release the vacuum, remove the weights and the alignment racks	0	101x4,151,158	0.47	5	
8						
9						
10						

RESOURCES	1,51,101x4,151, 155x2,158,301, 530	1,51,101x4,151, 155x2,158,301

TOTAL SPAN 3.67

TOTAL HOURS 5.13

O.A. 632

Epoxy tops of tubes, install shear plates, layer ten

FUNCTION		Allocate	De-Allocate	TIME	SEQ	
1	Apply beads of epoxy in between the tubes (7 passes) and to the tops of the tubes (7 passes)	101x3,301	301	1.17	1	n/s
2	Load the shear plates and position, place bonding weights	1,2,51,151	1,2,51,101x3,151	0.80	2	n/s
3						
4						
5						
6						
7						
8						
9						
10						
	RESOURCES	1,2,51,101x3,151, 301	1,2,51,101x3,151, 301			
			TOTAL SPAN	1.97		
			TOTAL HOURS	1.97		

488

O.A. 633

Assemble top edge members to the side & top plate

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Remove the top edge details from storage and place on side plate edge	1,51,101x3	1,51	1.26	1
2	Install bolts thru edge members into side plates and torque bolts	101	101x4	5.25	2
3					
4					
5					
6					
7					
8					
9					
10					
	RESOURCES	1,51,101x4	1,51,101x4		
			TOTAL SPAN	6.51	
			TOTAL HOURS	6.51	

489

O.A. 634

Electrical harness and plumbing installation and hook-up

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Allocate resources	101x6	0	0.00	1
2	Install gas manafolds and connect Tygon tubing to the drift tubes	0	0	5.92	2
3	Locate & secure the tube wiring harness, connect the leads to the drift tubes	0	0	2.95	2
4	De-allocate resources	0	101x6	0.00	3
5	Allocate resources	102x2,160	0	0.00	4
6	Preform inline mfg leak test, pressurize the complet system, verify pressure drop	0	0	11.83	5
7	Preform inline mfg electrical test, hook test tool (computer) and run test sequence	0	0	5.92	5
8	De-allocate resources	0	102x2,160	0.00	6
9					
10					

RESOURCES 101x6,102x2,160 101x6,102x2,160

TOTAL SPAN 17.75

TOTAL HOURS 26.62

O.A. 635

Prepare for movement to and mating with BW2

FUNCTION		Allocate	De-Allocate	TIME	SEQ
1	Attach temporary hoisting hardware	101x2	101x2,511	1.00	1
2					
3					
4					
5					
6					
7					
8					
9					
10					

RESOURCES	101x2	101x2,511	
		TOTAL SPAN	1.00
		TOTAL HOURS	1.00