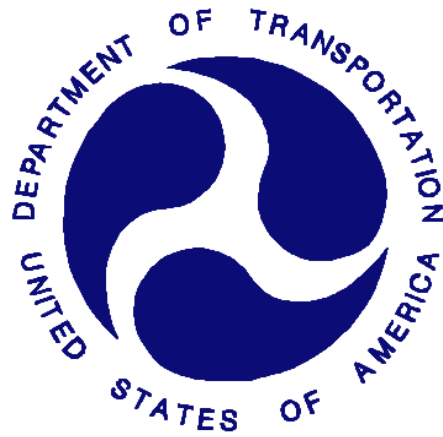


**Vehicle Research and Test Center  
FMVSS 213 Testing  
CRABI 12 Month Old**

**Prepared By:  
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**Summary Report**

**October – November 2018**

**Prepared For  
Vehicle Research and Test Center  
P. O. Box 37  
East Liberty, OH 43319**

**SECTION 1**  
**PURPOSE AND SUMMARY FOR 12 MONTH OLD CRABI**

The purpose of this test was to evaluate the CRS performance data in a frontal FMVSS 213 test condition. The durability and repeatability of three other manufactured foams were tested and analyzed on the FMVSS 213 frontal buck.

**SUMMARY**

A CRABI 12 month old dummy (serial number 094) was secured in the left rear occupant position (position 4 or P4) in a rearward facing child restraint system (CRS). The CRABI 12 month old was instrumented with head, chest, and pelvic triaxial accelerometers, and upper neck, and lumbar force and moment load cells. During this test series the dummy was restrained with lower anchors only (LA Only).

Section 2 contains the testing performed in October – November 2018. Section 3 contains the dummy certification information.

**SECTION 2**  
**REARWARD FACING CRS TEST SUMMARY**

**TEST DUMMY INFORMATION**

Description	Position # 4 CRS
ATD Type/Serial No.	CRABI 12 Month Old/094
Restrain System	LA Only
CRS Direction	Rearward Facing
Foam Cushion	CENT_1, PF_1, LEAR_1, WB

**CAMERA POSITIONING FARO MEASUREMENTS**

Description	Units	X	Y	Z
Origin	mm	0.00	0.00	0.00
N5 Driver Front	mm	1900.66	346.17	-486.70
N3 Driver Side	mm	428.43	-911.77	-387.87

**DUMMY POSITIONING**

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181023-1

VRTC Test Number: FR\_FM\_01



**DUMMY POSITIONING FARO MEASUREMENTS**

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.55	352.12	-681.88
CRS Bottom Center	mm	110.95	352.72	-415.68
CRS Top of the Base	mm	120.18	353.99	-299.13
Top of CRS	mm	713.78	351.83	-655.07
CRS Center of Handle	mm	781.80	353.57	-649.12
Top of Head	mm	598.02	352.01	-668.52
Bridge of Nose	mm	509.95	352.43	-629.18
Head CG Outboard	mm	566.34	289.49	-604.90
Chest Clip	mm	466.97	351.90	-521.01
Buckle	mm	319.76	354.37	-407.43
CRS mid height	mm	698.99	351.21	-483.61
CRS Base Center	mm	643.54	352.53	-246.43
CRS Side Handle	mm	438.24	128.14	-445.50
Center of Seat Frame Bottom	mm	619.87	350.61	-102.59
Target 2 - Seat Base H-Point	mm	404.50	198.76	-350.16
Target 3 - Seat Base Side	mm	158.00	193.01	-299.08
Target 1 - Seat Side Upper	mm	640.72	216.10	-491.49
Target 4 - Seat Side Lower	mm	544.28	195.32	-230.14

**DUMMY INJURY**

HIC (36 ms)	639
Chest Clip (3 ms)	46.06 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181024-1

VRTC Test Number: FR\_FM\_03



### DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.35	352.31	-682.17
CRS Bottom Center	mm	117.03	350.60	-417.94
CRS Top of the Base	mm	127.46	350.90	-308.15
Top of CRS	mm	726.25	353.94	-642.63
CRS Center of Handle	mm	799.97	351.76	-634.72
Top of Head	mm	620.05	351.48	-668.75
Bridge of Nose	mm	532.61	351.81	-631.42
Head CG Outboard	mm	587.25	289.55	-608.51
Chest Clip	mm	483.98	349.90	-520.97
Buckle	mm	333.35	350.17	-407.11
CRS mid height	mm	712.04	352.57	-478.29
CRS Base Center	mm	645.00	349.88	-244.80
CRS Side Handle	mm	450.46	126.90	-448.33
Center of Seat Frame Bottom	mm	619.81	349.93	-103.08
Target 2 - Seat Base H-Point	mm	415.71	196.11	-349.21
Target 3 - Seat Base Side	mm	165.85	189.71	-313.10
Target 1 - Seat Side Upper	mm	652.18	214.87	-487.10
Target 4 - Seat Side Lower	mm	550.85	192.03	-226.64

### DUMMY INJURY

HIC (36 ms)	636
Chest Clip (3 ms)	41.36 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181026-1

VRTC Test Number: FR\_FM\_05



## DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.72	352.02	-682.16
CRS Bottom Center	mm	113.97	351.94	-414.19
CRS Top of the Base	mm	118.65	352.20	-300.56
Top of CRS	mm	706.17	354.56	-647.12
CRS Center of Handle	mm	778.33	354.40	-643.58
Top of Head	mm	598.09	352.69	-669.99
Bridge of Nose	mm	509.75	351.49	-628.00
Head CG Outboard	mm	568.35	291.81	-604.00
Chest Clip	mm	465.04	351.61	-519.34
Buckle	mm	319.04	351.31	-401.24
CRS mid height	mm	699.89	354.48	-474.94
CRS Base Center	mm	640.53	352.66	-249.84
CRS Side Handle	mm	439.41	129.70	-447.95
Center of Seat Frame Bottom	mm	618.85	350.22	-104.49
Target 2 - Seat Base H-Point	mm	407.73	197.43	-351.32
Target 3 - Seat Base Side	mm	158.90	191.56	-307.51
Target 1 - Seat Side Upper	mm	638.75	217.62	-485.21
Target 4 - Seat Side Lower	mm	535.10	192.49	-228.46

## DUMMY INJURY

HIC (36 ms)	590
Chest Clip (3 ms)	44.13 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181030-1

VRTC Test Number: FR\_FM\_07



## DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.53	352.41	-682.05
CRS Bottom Center	mm	118.99	349.37	-420.65
CRS Top of the Base	mm	125.66	350.61	-302.46
Top of CRS	mm	715.10	348.66	-648.07
CRS Center of Handle	mm	764.57	350.78	-681.77
Top of Head	mm	603.51	350.23	-671.07
Bridge of Nose	mm	519.65	350.28	-628.73
Head CG Outboard	mm	577.82	289.38	-603.50
Chest Clip	mm	464.93	352.17	-509.67
Buckle	mm	327.66	351.62	-407.14
CRS mid height	mm	706.79	350.47	-473.76
CRS Base Center	mm	646.95	351.14	-241.13
CRS Side Handle	mm	450.33	126.52	-447.20
Center of Seat Frame Bottom	mm	619.60	349.79	-102.58
Target 2 - Seat Base H-Point	mm	399.90	196.87	-341.16
Target 3 - Seat Base Side	mm	148.95	194.66	-305.61
Target 1 - Seat Side Upper	mm	625.36	203.59	-483.99
Target 4 - Seat Side Lower	mm	528.77	190.60	-228.55

## DUMMY INJURY

HIC (36 ms)	671
Chest Clip (3 ms)	43.77 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181030-2

VRTC Test Number: FR\_FM\_09



### DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.67	352.20	-682.14
CRS Bottom Center	mm	122.09	351.81	-425.49
CRS Top of the Base	mm	123.61	350.48	-295.53
Top of CRS	mm	712.48	351.84	-642.79
CRS Center of Handle	mm	763.35	351.60	-680.95
Top of Head	mm	609.19	349.50	-671.58
Bridge of Nose	mm	524.47	349.58	-632.53
Head CG Outboard	mm	580.65	290.12	-605.91
Chest Clip	mm	471.05	349.87	-514.55
Buckle	mm	326.99	351.42	-399.78
CRS mid height	mm	707.46	351.41	-473.64
CRS Base Center	mm	648.23	351.57	-241.99
CRS Side Handle	mm	444.99	127.98	-441.80
Center of Seat Frame Bottom	mm	618.86	350.60	-104.38
Target 2 - Seat Base H-Point	mm	408.33	197.80	-338.36
Target 3 - Seat Base Side	mm	161.91	190.39	-299.09
Target 1 - Seat Side Upper	mm	623.26	204.44	-479.99
Target 4 - Seat Side Lower	mm	544.87	193.30	-225.15

### DUMMY INJURY

HIC (36 ms)	673
Chest Clip (3 ms)	44.92 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181031-1

VRTC Test Number: FR\_FM\_11



### DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.37	352.41	-682.12
CRS Bottom Center	mm	122.86	352.09	-423.06
CRS Top of the Base	mm	126.43	350.47	-302.36
Top of CRS	mm	716.60	350.26	-637.58
CRS Center of Handle	mm	770.25	353.03	-676.24
Top of Head	mm	612.81	352.50	-673.33
Bridge of Nose	mm	526.88	351.04	-633.07
Head CG Outboard	mm	585.36	291.76	-607.87
Chest Clip	mm	467.94	351.50	-511.70
Buckle	mm	333.19	351.80	-401.74
CRS mid height	mm	710.45	351.30	-469.47
CRS Base Center	mm	650.10	350.15	-239.67
CRS Side Handle	mm	450.24	128.58	-446.96
Center of Seat Frame Bottom	mm	619.84	349.86	-102.73
Target 2 - Seat Base H-Point	mm	403.63	198.13	-338.14
Target 3 - Seat Base Side	mm	154.44	192.82	-309.04
Target 1 - Seat Side Upper	mm	632.86	207.01	-486.76
Target 4 - Seat Side Lower	mm	538.23	189.54	-229.39

### DUMMY INJURY

HIC (36 ms)	623
Chest Clip (3 ms)	58.88 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181031-2

VRTC Test Number: FR\_FM\_13



### DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.49	352.14	-682.19
CRS Bottom Center	mm	121.13	350.12	-428.31
CRS Top of the Base	mm	125.24	349.51	-302.31
Top of CRS	mm	712.69	349.16	-634.26
CRS Center of Handle	mm	767.66	348.91	-679.94
Top of Head	mm	614.43	350.93	-674.72
Bridge of Nose	mm	529.01	349.82	-636.40
Head CG Outboard	mm	584.65	286.60	-609.47
Chest Clip	mm	465.19	351.86	-511.49
Buckle	mm	334.42	351.17	-405.26
CRS mid height	mm	708.30	349.35	-468.93
CRS Base Center	mm	645.97	350.97	-239.56
CRS Side Handle	mm	444.04	126.19	-445.01
Center of Seat Frame Bottom	mm	619.90	350.75	-102.98
Target 2 - Seat Base H-Point	mm	401.50	195.38	-339.61
Target 3 - Seat Base Side	mm	152.98	192.57	-305.16
Target 1 - Seat Side Upper	mm	623.14	201.02	-478.08
Target 4 - Seat Side Lower	mm	534.48	189.24	-225.05

### DUMMY INJURY

HIC (36 ms)	662
Chest Clip (3 ms)	46.15 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181101-1

VRTC Test Number: FR\_FM\_15



### DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.40	352.26	-682.36
CRS Bottom Center	mm	122.33	349.67	-421.29
CRS Top of the Base	mm	129.11	350.72	-301.90
Top of CRS	mm	709.31	353.65	-642.34
CRS Center of Handle	mm	785.06	351.81	-649.71
Top of Head	mm	611.63	350.18	-669.70
Bridge of Nose	mm	525.22	349.20	-630.11
Head CG Outboard	mm	583.12	289.82	-602.49
Chest Clip	mm	472.38	351.31	-514.57
Buckle	mm	327.52	350.55	-404.61
CRS mid height	mm	708.30	351.53	-475.21
CRS Base Center	mm	651.73	351.51	-241.06
CRS Side Handle	mm	450.63	129.47	-447.52
Center of Seat Frame Bottom	mm	620.05	350.83	-102.93
Target 2 - Seat Base H-Point	mm	406.65	198.70	-337.77
Target 3 - Seat Base Side	mm	149.57	196.44	-305.76
Target 1 - Seat Side Upper	mm	629.97	209.70	-483.75
Target 4 - Seat Side Lower	mm	534.92	193.48	-229.75

### DUMMY INJURY

HIC (36 ms)	631
Chest Clip (3 ms)	41.22 g

## DUMMY POSITIONING

CRS: Britax B-Safe 35 – Rearward Facing Infant – LA Only

TRC Test Number: S181101-2

VRTC Test Number: FR\_FM\_17



## DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Z-Point	mm	0.00	0.00	0.00
Center of Seat Frame Back	mm	-118.76	352.19	-681.94
CRS Bottom Center	mm	128.50	350.19	-426.15
CRS Top of the Base	mm	124.75	351.90	-301.44
Top of CRS	mm	719.86	350.48	-643.94
CRS Center of Handle	mm	770.28	349.55	-679.55
Top of Head	mm	619.70	350.79	-677.22
Bridge of Nose	mm	531.23	348.03	-640.28
Head CG Outboard	mm	588.60	287.39	-613.50
Chest Clip	mm	465.91	350.94	-511.11
Buckle	mm	339.57	350.31	-407.17
CRS mid height	mm	710.61	349.19	-472.00
CRS Base Center	mm	650.29	350.00	-238.84
CRS Side Handle	mm	449.21	129.63	-445.05
Center of Seat Frame Bottom	mm	619.59	349.98	-102.73
Target 2 - Seat Base H-Point	mm	410.52	198.45	-340.75
Target 3 - Seat Base Side	mm	160.33	193.75	-306.54
Target 1 - Seat Side Upper	mm	637.07	208.13	-486.56
Target 4 - Seat Side Lower	mm	523.31	189.99	-224.41

## DUMMY INJURY

HIC (36 ms)	590
Chest Clip (3 ms)	44.21 g

**SECTION 3**  
**DUMMY CALIBRATION DATA**