

Table S1: Intervertebral rotation ranges around a dorsoventral axis expressed in raw Euler angles (degrees).

	savannah01	savannah02	savannah03	tegu03	tegu05	tegu06
vert1-2	4.5	0	7.5	NA	NA	NA
vert2-3	6.1	7.6	11.2	NA	NA	NA
vert3-4	11.7	9.6	5.5	7.1	8.5	8.2
vert4-5	5.3	5.8	6.7	8.3	8.3	9.6
vert5-6	6.7	9.6	7.8	5.6	6.3	7.5
vert6-7	7	9.6	7.4	7.3	10.3	4.3
vert7-8	5.8	7.1	9.2	5.8	7.6	0.0
vert8-9	7.8	9.1	12.9	NA	NA	NA
vert9-10	8.3	8.8	10.3	NA	NA	NA
vert10-11	11.9	9.6	6.6	NA	NA	NA

Table S2: Rotations in degrees of vertebral ribs V1-3 at the costovertebral joints for savannah01, savannah02, and savannah03.

	V1			V2			V3		
	sav01	sav02	sav03	sav01	sav02	sav03	sav01	sav02	sav03
Pump Handle (X axis)¹									
max	1.00	8.37	10.25	-23.17	-6.45	8.69	-16.89	-0.99	7.31
min	-10.95	-3.83	3.45	-31.71	-17.73	-0.26	-29.94	-13.74	-7.55
magnitude ²	11.95	12.20	6.80	8.54	11.28	8.95	13.05	12.75	14.86
Caliper Motion (Y axis)¹									
max	-4.02	1.03	-6.98	-0.94	3.33	-11.27	-5.73	8.76	-4.66
min	-12.37	-19.19	-15.28	-5.66	-18.65	-19.52	-11.20	-23.09	-16.64
magnitude ²	8.35	20.21	8.30	4.71	21.99	8.25	5.47	31.85	11.98
Bucket Handle (Z axis)¹									
max	-22.09	-17.33	2.64	-31.30	-17.93	1.67	-37.09	-14.53	-4.61
min	-29.22	-23.78	-5.53	-37.68	-24.67	-14.72	-48.03	-31.14	-17.88
magnitude ²	7.13	6.45	8.17	6.38	6.74	16.39	10.94	16.61	13.28

¹Axes of rotation are illustrated in figure 3²Magnitude is defined as the difference in degrees between the maximum and minimum as seen in the table

Table S3: Rotations in degrees of vertebral ribs V2-3 at the costovertebral joints for tegu03, tegu05, and tegu06.

	V2			V3		
	tegu03	tegu05	tegu06	tegu03	tegu05	tegu06
Pump Handle (X axis)¹						
max	-26.32	5.39	9.74	-9.00	10.38	-8.40
min	-35.25	-2.00	-12.90	-22.05	-1.49	-28.55
magnitude ²		8.93	7.38	22.63	13.05	11.87
Caliper Motion (Y axis)¹						
max	9.39	1.29	12.97	12.94	1.18	12.38
min	3.20	-8.41	-2.15	-1.63	-7.21	-2.27
magnitude ²	6.19	9.70	15.11	14.57	8.40	14.66
Bucket Handle (Z axis)¹						
max	-6.53	7.73	0.73	6.83	-18.67	4.68
min	-18.76	-10.69	-24.18	-9.80	-36.67	-14.36
magnitude ²	12.23	18.43	24.91	16.63	18.00	19.04

Table S4: Rotations in degrees of floating ribs F1-4 at the costovertebral joints for savannah01, savannah02, and savannah03.

	F1			F2			F3			F4		
	sav01	sav02	sav03	sav01	sav02	sav03	sav01	sav02	sav03	sav01	sav02	sav03
Pump Handle (X axis)¹												
max	-15.69	-0.13	8.17	-19.76	-3.89	0.46	-25.60	-3.99	-3.16	-26.51	-7.77	-4.13
min	-22.26	-9.78	-11.41	-31.79	-16.43	-9.36	-39.28	-14.34	-15.27	-35.74	-19.91	-14.79
magnitude ²	6.57	9.65	19.58	12.03	12.54	9.82	13.67	10.34	12.12	9.22	12.14	10.66
Caliper Motion (Y axis)¹												
max	-7.60	7.69	-4.52	-7.07	12.16	2.60	-4.68	11.49	7.37	-1.63	10.49	9.19
min	-11.86	-13.36	-14.55	-12.44	-10.56	-6.02	-7.82	-9.42	-2.90	-5.67	-9.20	-1.85
magnitude ²	4.27	21.05	10.03	5.36	22.72	8.62	3.14	20.91	10.27	4.04	19.69	11.05
Bucket Handle (Z axis)¹												
max	-31.30	-19.46	-5.97	-32.90	-18.24	-8.77	-33.63	-18.30	-12.87	-26.72	-13.83	-11.50
min	-38.42	-26.48	-18.39	-37.77	-29.72	-24.41	-39.81	-30.88	-30.76	-34.06	-28.81	-32.33
magnitude ²	7.12	7.02	12.42	4.87	11.49	15.64	6.17	12.58	17.88	7.34	14.97	20.82

¹Axes of rotation are illustrated in figure 3

²Magnitude is defined as the difference in degrees between the maximum and minimum as seen in the table

Table S5: Rotations in degrees of floating ribs F5-8 at the costovertebral joints for savannah01, savannah02, and savannah03.

	F5			F6			F7			F8		
	sav01	sav02	sav03	sav01	sav02	sav03	sav01	sav02	sav03	sav01	sav02	sav03
Pump Handle (X axis)¹												
max	-22.33	-7.71	-2.74	-16.64	-6.91	5.37	-9.08	-9.76	7.99	3.33	-8.52	10.19
min	-32.05	-16.54	-10.96	-24.53	-13.73	-6.61	-12.35	-20.18	-8.20	-11.03	-22.32	-4.55
magnitude ²	9.72	8.83	8.22	7.90	6.82	11.99	3.27	10.42	16.19	14.36	13.80	14.74
Caliper Motion (Y axis)¹												
max	-0.34	11.52	11.99	0.02	9.55	9.65	8.20	8.70	6.47	11.87	14.98	5.87
min	-5.08	-8.35	-0.42	-5.72	-10.74	-2.92	2.12	-11.12	-5.49	1.44	-5.51	-5.04
magnitude ²	4.73	19.87	12.41	5.74	20.30	12.58	6.09	19.82	11.96	10.42	20.48	10.90
Bucket Handle (Z axis)¹												
max	-20.90	-14.98	-8.56	-20.71	-10.86	-10.95	-8.12	-11.12	-8.50	-7.40	-10.90	-5.70
min	-33.75	-27.49	-28.22	-31.03	-24.62	-24.06	-19.11	-22.64	-22.18	-19.31	-24.61	-22.17
magnitude ²	12.85	12.51	19.66	10.32	13.76	13.12	11.00	11.52	13.68	11.91	13.71	16.47

¹Axes of rotation are illustrated in figure 3

²Magnitude is defined as the difference in degrees between the maximum and minimum as seen in the table

Table S6: Rotations in degrees of floating ribs F1-5 at the costovertebral joints for tegu03, tegu05, and tegu06.

	X1			X2			X3			F1			F2		
	teg03	teg05	teg06	teg03	teg05	teg06	teg03	teg05	teg06	teg03	teg05	teg06	teg03	teg05	teg06
Pump Handle (X axis)¹															
max	-7.71	9.49	-7.39	-6.10	9.80	-8.18	-8.56	-2.05	-12.49	-6.44	4.13	-18.25	-2.17	8.90	-
min	-24.33	-2.83	-35.20	-26.70	-7.96	-32.10	-22.39	-23.13	-30.19	-20.85	-11.57	-34.56	-	-5.69	-
magnitude ²	16.63	12.32	27.81	20.60	17.77	23.92	13.84	21.08	17.70	14.40	15.70	16.32	13.54	14.59	18.90
Caliper Motion (Y axis)¹															
max	7.40	-0.93	8.53	8.46	-4.90	2.83	4.87	-3.32	-2.03	3.24	-6.06	-1.15	-8.58	0.99	-1.63
min	-5.55	-8.84	-6.08	-9.89	-12.79	-7.69	-11.33	-11.43	-7.67	-11.71	-12.54	-9.27	-	-5.81	-
magnitude ²	12.95	7.91	14.61	18.35	7.89	10.51	16.19	8.11	5.64	14.95	6.48	8.13	7.82	6.80	16.19
Bucket Handle (Z axis)¹															
max	3.56	-18.61	3.73	7.20	-19.81	3.91	9.45	-26.36	5.97	12.16	-19.44	9.49	13.13	-	-
min	-6.86	-39.58	-12.88	-6.15	-37.70	-8.28	-2.78	-38.84	-5.27	-4.08	-33.10	-6.92	-2.63	28.26	-7.29
magnitude ²	10.42	20.98	16.61	13.35	17.89	12.20	12.23	12.48	11.24	16.25	13.67	16.41	15.76	17.64	19.59