

# LAMPIRAN

**LAMPIRAN A**  
*Data Anthropometry* Orang Dewasa Di  
Indonesia

## 1. DATA ANTHROPOMETRY

*Anthropometry* Masyarakat Indonesia yang didapat dari interpolasi masyarakat British dan Hongkong (Pheasant,1996) terhadap masyarakat Indonesia (Summa'mur, 1989) serta istilah dimensionalnya dari (Nurmianto, 1991a; 1991b)

No	Dimensi Tubuh	Pria				Wanita			
		5%	X	95%	S.D	5%	X	95%	S.D
1	Tinggi tubuh posisi berdiri tegak	1.532	1.632	1.732	61	1.464	1.563	1.662	60
2	Tinggi mata	1.425	1.52	1.615	58	1.35	1.446	1.542	58
3	Tinggi bahu	1.247	1.338	1.429	55	1.184	1.272	1.361	54
4	Tinggi siku	932	1.003	1.074	43	886	957	1.028	43
5	Tinggi genggam tangan pada posisi relaks kebawah	655	718	782	39	646	708	771	38
6	Tinggi badan pada posisi duduk	809	864	919	33	775	834	893	36
7	Tinggi mata pada posisi duduk	694	749	804	33	666	721	776	33
8	Tinggi bahu pada posisi duduk	523	572	621	30	501	550	599	30
9	Tinggi siku pada posisi duduk	181	231	282	31	175	229	283	33
10	Tebal paha	117	140	163	14	115	140	165	15
11	Jarak dari pantat ke lutut	500	545	590	27	488	537	586	30
12	Jarak dari lipat lutut (popliteal) ke pantat	405	450	495	27	488	537	586	30
13	Tinggi lutut	448	496	544	29	428	472	516	27
14	Tinggi lipat lutut (popliteal)	361	403	445	26	337	382	428	28
15	Lebar bahu	382	424	466	26	342	385	428	26
16	Lebar panggul	291	331	371	24	298	345	392	29
17	Tebal dada	174	212	250	23	178	228	278	30
18	Tebal perut	174	228	282	33	175	231	287	34
19	Jarak dari siku ke ujung jari	405	439	473	21	374	409	444	21
20	Lebar kepala	140	150	160	6	135	140	157	7
21	Panjang tangan	161	176	191	9	153	168	183	9
22	Lebar tangan	71	79	87	5	64	71	78	4
23	Jarak bentang dari ujung jari tangan kiri ke kanan	1.52	1.663	1.806	87	1.4	1.532	1.646	75
24	Tinggi pegangan tangan pada posisi tangan vertikal ke atas dan berdiri tegak	1.795	1.923	2.051	78	1.713	1.841	1.969	79
25	Tinggi pegangan tangan pada posisi tangan vertikal ke atas dan duduk	1.065	1.169	1.273	63	945	1.03	1.115	52
26	Jarak genggam tangan ke punggung pada posisi tangan ke depan	649	708	767	37	610	661	712	31

*Anthropometry* telapak tangan orang Indonesia yang didapat dari interpolasi data Pheasant (1986) Suma'mur (1989) dan Nurmiyanto (1991)

No	Dimensi Tubuh	Pria				Wanita			
		5 th	50 th	95 th	S.D	5 th	50 th	95 th	S.D
1	Panjang Tangan	163	176	189	8	155	168	181	8
2	Panjang telapak tangan	92	100	108	5	87	94	101	4
3	Panjang ibu jari	45	48	51	2	42	45	48	2
4	Panjang jari telunjuk	62	67	72	3	60	65	70	3
5	Panjang jari tengah	70	77	84	4	69	74	79	3
6	Panjang jari manis	62	67	72	3	59	64	69	3
7	Panjang jari kelingking	48	51	54	2	45	48	51	2
8	Lebar ibu jari	19	21	23	1	16	18	20	1
9	Tebal ibu jari	19	21	23	1	15	17	19	1
10	Lebar jari telunjuk	18	20	22	1	15	17	19	1
11	Tebal jari telunjuk	16	18	20	1	13	15	17	1
12	Lebar telapak tangan (metacarpal)	74	81	88	4	68	73	78	3
13	Lebar telapak tangan (sampai ibu jari)	88	98	108	6	82	89	96	4
14	Lebar telapak tangan (minimum)	68	75	82	4	64	59	74	3
15	Tebal telapak tangan (metacarpal)	28	31	34	2	25	27	29	1
16	Tebal telapak tangan (sampai ibu jari)	41	48	47	2	41	44	47	2
17	Diameter genggam (maksimum)	45	48	51	2	43	46	49	2
18	Lebar maksimum (ibu jari ke jari kelingking)	177	192	206	9	169	184	109	9
19	Lebar fungsional maksimum (ibu jari ke jari lain)	122	132	142	6	113	123	134	6
20	Segi empat minimum yang dapat dilewati telapak tangan	57	62	67	3	51	56	61	3

*Anthropometry* kepala orang Indonesia yang didapat dari interpolasi data Pheasant (1986) Suma'mur (1989) dan Nurmiyanto (1991)

No	Dimensi Tubuh	Pria				Wanita			
		5 th	50 th	95 th	S.D	5 th	50 th	95 th	S.D
1	Panjang Kepala	166	176	186	6	158	168	178	6
2	Lebar Kepala	132	140	148	5	121	129	137	5
3	Diameter Maksimum dari Daggu	217	230	243	8	198	209	221	7
4	Daggu ke Puncak Kepala	192	203	215	7	185	196	208	7
5	Telinga ke Puncak Kepala	70	77	84	4	69	74	79	3
6	Telinga ke Belakang Kepala	62	67	72	3	59	64	69	3
7	Antara Dua Telinga	48	51	54	2	45	48	51	2
8	Mata ke Puncak Kepala	19	21	23	1	16	18	20	1
9	Mata ke Belakang Kepala	19	21	23	1	15	17	19	1
10	Antara Dua Pupil Mata	18	20	22	1	15	17	19	1
11	Hidung ke Puncak Kepala	16	18	20	1	13	15	17	1
12	Hidung ke Belakang Kepala	74	81	88	4	68	73	78	3
13	Mulut ke Puncak Kepala	88	98	108	6	82	89	96	4
14	Lebar Mulut	68	75	82	4	64	59	74	3


*Anthropometry* kaki orang Indonesia yang didapat dari interpolasi data Dempster (1955), Reynolds (1978), dan Nurmiyanto (1991)

No	Dimensi Tubuh	Pria				Wanita			
		5 th	50 th	95 th	S.D	5 th	50 th	95 th	S.D
1	Panjang Telapak Kaki	230	248	266	11	212	230	248	11
2	Panjang Telapak Lengan Kaku	165	178	191	8	158	171	184	8
3	Panjang Kaki sampai Jari Kelingking	186	201	216	9	178	191	204	8
4	Lebar Kaki	82	89	96	4	81	88	95	4
5	Lebar Tangkai Kaki	61	66	71	3	49	54	59	3
6	Tinggi Mata Kaki	61	66	71	3	59	64	69	3
7	Tinggi Bagian Tengah Telapak Kaki	68	76	82	4	64	69	74	3
8	Jarak Horisontal Tangkai Mata Kaki	49	52	55	2	46	49	52	2

**LAMPIRAN B**  
**Validitas Oleh Bengkel Bagong Speed**


## DATA PENUNJANG PERANCANGAN DARI BENGKEL

No	Nama Data	Jenis Data	Keterangan
1	Sudut antara alas kursi dengan sandaran	15°	-
2	Tebal busa sandaran	7 cm	-
3	Sambungan sespan	di 3 titik	Dapat dilihat pada bab 6 poin 6.3
4	Letak ban sespan	sejajar dengan sumbu ban belakang motor	-
5	Lebar sespan	lebar pijakan kaki motor Honda Beat	-
6	Posisi motor saat pemasangan sespan	tegak lurus, center	-
7	Pembuatan rangka sespan	Dag frame dan main frame	-
8	Penambahan shockbreker	Sejajar dengan shockbreker sebelah kiri motor	-

  
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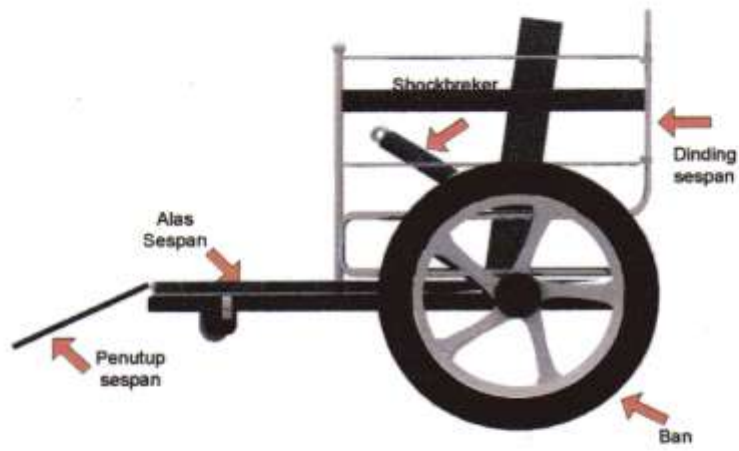
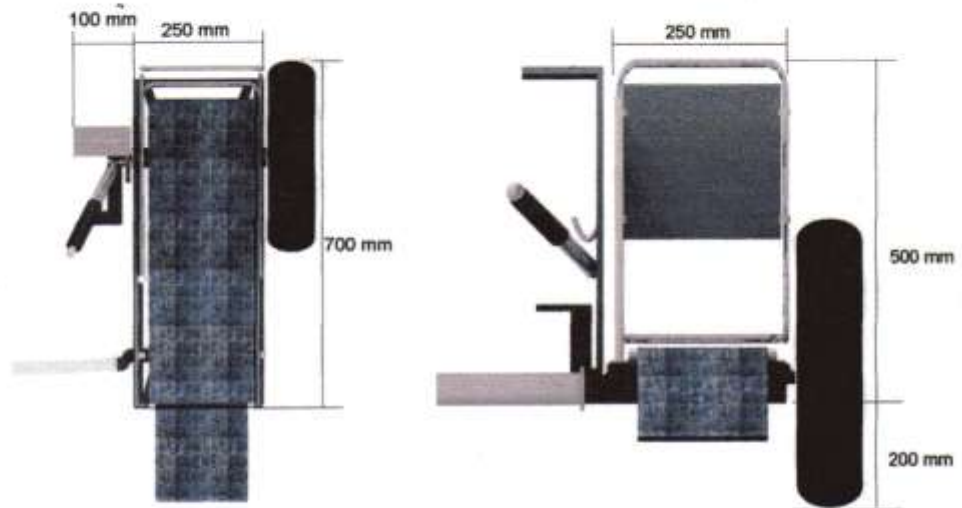
## DATA BAHAN DAN HARGA

No	Nama Bahan	Jumlah/unit	Satuan	Harga/Satuan (Rp)	Harga Total (Rp)
1	Galvarnis				
	Pipa	3	Batang	Rp 55.000	<b>Rp 165.000</b>
	Kotak	2	Batang	Rp 78.000	<b>Rp 156.000</b>
	Plat	1/2	Lembar	Rp 350.000	<b>Rp 175.000</b>
2	Plat Bordes	1	Lembar	Rp 450.000	<b>Rp 450.000</b>
3	Baut	15	Buah	Rp 2.000	<b>Rp 30.000</b>
4	Shockbreker	1	Buah	Rp 120.000	<b>Rp 120.000</b>
5	Ban	1	Buah	Rp 300.000	<b>Rp 300.000</b>
6	Kulit sintesis	5	Lembar	Rp 65.000	<b>Rp 325.000</b>
7	Pengunci	4	Buah	Rp 12.000	<b>Rp 48.000</b>
8	Box	1	Buah	Rp 200.000	<b>Rp 200.000</b>
9	Ongkos Pengerjaan Kursi	-	-	-	<b>Rp 200.000</b>
10	Ongkos Pengerjaan	-	-	-	<b>Rp1.000.000</b>
				<b>TOTAL</b>	<b>Rp3.169.000</b>

  
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## RANCANGAN SESPAN



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## RANCANGAN SESPAN



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**LAMPIRAN C**  
**RULA Worksheet**

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# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

**A. Arm & Wrist Analysis**

**Step 1: Locate Upper Arm Position**  

 Final Upper Arm Score = 3

**Step 1a: Adjust...**  
 If shoulder is twisted: +1  
 If arm is abducted: +1  
 If arm is supinated/pronated: +1

**Step 2: Locate Lower Arm Position**  

 Final Lower Arm Score = 1

**Step 2a: Adjust...**  
 If arm is abducted across midline of the body: +1  
 If arm out to side of body: +1

**Step 3: Locate Wrist Position**  

 Final Wrist Score = 3

**Step 3a: Adjust...**  
 If wrist is bent from the middle: +1

**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range = 1;  
 If twist at or near end of range = 2

**Step 5: Look-up Posture Score in Table A**  
 Use a value from steps 1, 2, 3 & 4 to locate Posture Score in Table A.

**Step 6: Add Muscle Use Score**  
 If posture rarely static (i.e. hold for longer than 1 minute) or if motion repeatedly occurs at least per minute: +1

**Step 7: Add Force/load Score**  
 If load less than 2 kg (unilateral): +1;  
 If 2 kg to 10 kg (unilateral): +1;  
 If 2 kg to 10 kg (bilateral or stacked): +2;  
 If more than 10 kg (load or repeated or stacks): +3

**Step 8: Find Row in Table C**  
 The combination score from the Arm/wrist analysis is used to find the column on Table C.

**B. Neck, Trunk & Leg Analysis**

**Step 9: Locate Neck Position**  

 Final Neck Score = 2

**Step 9a: Adjust...**  
 If neck is twisted: +1; If neck is side-bending: +1

**Step 10: Locate Trunk Position**  

 Final Trunk Score = 2

**Step 10a: Adjust...**  
 If trunk is twisted: +1; If trunk is side-bending: +1

**Step 11: Legs**  
 If legs A/bent supported and full/medial: +1;  
 If not: +2

**Table A**

Upper Arm	Lower Arm	Wrist	Muscle Use	Force/Load	Final Score
1	1	1	1	1	1
1	1	2	1	1	2
1	1	3	1	1	3
1	2	1	1	1	2
1	2	2	1	1	3
1	2	3	1	1	4
1	3	1	1	1	3
1	3	2	1	1	4
1	3	3	1	1	5
2	1	1	1	1	2
2	1	2	1	1	3
2	1	3	1	1	4
2	2	1	1	1	3
2	2	2	1	1	4
2	2	3	1	1	5
2	3	1	1	1	4
2	3	2	1	1	5
2	3	3	1	1	6
3	1	1	1	1	3
3	1	2	1	1	4
3	1	3	1	1	5
3	2	1	1	1	4
3	2	2	1	1	5
3	2	3	1	1	6
3	3	1	1	1	5
3	3	2	1	1	6
3	3	3	1	1	7

**Table B**

Neck	Trunk	Legs	Final Score
1	1	1	1
1	2	1	2
1	3	1	3
1	4	1	4
2	1	1	2
2	2	1	3
2	3	1	4
2	4	1	5
3	1	1	3
3	2	1	4
3	3	1	5
3	4	1	6
4	1	1	4
4	2	1	5
4	3	1	6
4	4	1	7
5	1	1	5
5	2	1	6
5	3	1	7
5	4	1	8

**Table C**

Final Score	1	2	3	4	5	6	7
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1

**Final Score**

Final Score = 3 + 0 + 0 = 3

**Final Score**

Final Score = 2 + 0 + 0 = 2

**Table A**

Use a value from steps 1, 2, 3 & 4 to locate Posture Score in Table A.

**Table B**

Use a value from steps 5, 6 & 7 to locate Posture Score in Table B.

**Table C**

The combination score from the Arm/wrist analysis is used to find the column on Table C.

Subject: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_ Scorer: \_\_\_\_\_

**FINAL SCORE: 1 or 2 = Acceptable; 3 or 4 investigate further and change soon; 5 or 6 investigate further and change soon; 7 investigate and change immediately**

# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**

**Step 1a: Adjust...**  
 If shoulder is raised: +1  
 If upper arm is abducted: +1  
 If arm is supported or pivoted: is bearing: -1

**Step 2: Locate Lower Arm Position**

**Step 2a: Adjust...**  
 If arm is bearing direct weight of the body: +1  
 If arm is to side of body: +1

**Step 3: Locate Wrist Position**

**Step 3a: Adjust...**  
 If wrist is bent from the straight: +1  
**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range: +1  
 If wrist is at or near end of range: +2

**Step 5: Look-up Posture Score in Table A**  
 Use values from steps 1, 2, 3 & 4 to locate Posture Score in Table A.

**Step 6: Add Muscle Use Score**  
 If posture mainly static (i.e., held for longer than 1 minute): 0  
 If action repeatedly occurs 4 times per minute or more: +1  
**Step 7: Add Force/load Score**  
 If load is less than 2 kg (4.4 lbs): 0  
 If 2 kg to 10 kg (4.4 to 22 lbs): +1  
 If 10 kg to 20 kg (22 to 44 lbs): +2  
 If more than 20 kg load or repeated or awkward: +3

**Step 8: Find Row in Table C**  
 The combined score from the Arm/Wrist analysis is used to find the row on Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**

**Step 9a: Adjust...**  
 If neck is forward: +1  
 If neck is side-bending: +1

**Step 10: Locate Trunk Position**

**Step 10a: Adjust...**  
 If trunk is twisted: +1  
 If trunk is side-bending: +1

**Step 11: Legs**  
 If legs & feet supported and subsequent: +1  
 If not: +2

**Final Scores:**  
 Final Neck Score: 2  
 Final Trunk Score: 2  
 Final Leg Score: 1

**Trunk Posture Score**

Neck	Legs	Trunk	Legs	Trunk	Legs
1	1	1	1	1	1
1	1	1	1	2	1
1	1	1	2	1	1
1	1	1	2	2	1
1	1	1	2	2	2
1	1	1	3	1	1
1	1	1	3	2	1
1	1	1	3	2	2
1	1	1	3	3	1
1	1	1	3	3	2
1	1	2	1	1	1
1	1	2	1	2	1
1	1	2	1	2	2
1	1	2	2	1	1
1	1	2	2	2	1
1	1	2	2	2	2
1	1	2	3	1	1
1	1	2	3	2	1
1	1	2	3	2	2
1	1	2	3	3	1
1	1	2	3	3	2
1	2	1	1	1	1
1	2	1	1	2	1
1	2	1	1	2	2
1	2	1	2	1	1
1	2	1	2	2	1
1	2	1	2	2	2
1	2	1	3	1	1
1	2	1	3	2	1
1	2	1	3	2	2
1	2	1	3	3	1
1	2	1	3	3	2
1	2	2	1	1	1
1	2	2	1	2	1
1	2	2	1	2	2
1	2	2	2	1	1
1	2	2	2	2	1
1	2	2	2	2	2
1	2	2	3	1	1
1	2	2	3	2	1
1	2	2	3	2	2
1	2	2	3	3	1
1	2	2	3	3	2
1	2	3	1	1	1
1	2	3	1	2	1
1	2	3	1	2	2
1	2	3	2	1	1
1	2	3	2	2	1
1	2	3	2	2	2
1	2	3	3	1	1
1	2	3	3	2	1
1	2	3	3	2	2
1	2	3	3	3	1
1	2	3	3	3	2
1	3	1	1	1	1
1	3	1	1	2	1
1	3	1	1	2	2
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1	3	2	1	1	1
1	3	2	1	2	1
1	3	2	1	2	2
1	3	2	2	1	1
1	3	2	2	2	1
1	3	2	2	2	2
1	3	2	3	1	1
1	3	2	3	2	1
1	3	2	3	2	2
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1	3	2	3	3	2
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1	3	3	2	2	1
1	3	3	2	2	2
1	3	3	3	1	1
1	3	3	3	2	1
1	3	3	3	2	2
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1	3	3	3	3	2
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2	2	1	2	2	2
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2	2	2	2	1	1
2	2	2	2	2	1
2	2	2	2	2	2
2	2	2	3	1	1
2	2	2	3	2	1
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2	2	2	3	3	1
2	2	2	3	3	2
2	2	3	1	1	1
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2	2	3	1	2	2
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2	2	3	3	3	1
2	2	3	3	3	2
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2	3	3	2	1	1
2	3	3	2	2	1
2	3	3	2	2	2
2	3	3	3	1	1
2	3	3	3	2	1
2	3	3	3	2	2
2	3	3	3	3	1
2	3	3	3	3	2
3	1	1	1	1	1
3	1	1	1	2	1
3	1	1	1	2	2
3	1	1	2	1	1
3	1	1	2	2	1
3	1	1	2	2	2
3	1	1	3	1	1
3	1	1	3	2	1
3	1	1	3	2	2
3	1	1	3	3	1
3	1	1	3	3	2
3	1	2	1	1	1
3	1	2	1	2	1
3	1	2	1	2	2
3	1	2	2	1	1
3	1	2	2	2	1
3	1	2	2	2	2
3	1	2	3	1	1
3	1	2	3	2	1
3	1	2	3	2	2
3	1	2	3	3	1
3	1	2	3	3	2
3	1	3	1	1	1
3	1	3	1	2	1
3	1	3	1	2	2
3	1	3	2	1	1
3	1	3	2	2	1
3	1	3	2	2	2
3	1	3	3	1	1
3	1	3	3	2	1
3	1	3	3	2	2
3	1	3	3	3	1
3	1	3	3	3	2
3	2	1	1	1	1
3	2	1	1	2	1
3	2	1	1	2	2
3	2	1	2	1	1
3	2	1	2	2	1
3	2	1	2	2	2
3	2	1	3	1	1
3	2	1	3	2	1
3	2	1	3	2	2
3	2	1	3	3	1
3	2	1	3	3	2
3	2	2	1	1	1
3	2	2	1	2	1
3	2	2	1	2	2
3	2	2	2	1	1
3	2	2	2	2	1
3	2	2	2	2	2
3	2	2	3	1	1
3	2	2	3	2	1
3	2	2	3	2	2
3	2	2	3	3	1
3	2	2	3	3	2
3	2	3	1	1	1
3	2	3	1	2	1
3	2	3	1	2	2
3	2	3	2	1	1
3	2	3	2	2	1
3	2	3	2	2	2
3	2	3	3	1	1
3	2	3	3	2	1
3	2	3	3	2	2
3	2	3	3	3	1
3	2	3	3	3	2
3	3	1	1	1	1
3	3	1	1	2	1
3	3	1	1	2	2
3	3	1	2	1	1
3	3	1	2	2	1

# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**

**Step 1a: Adjust...**  
 If shoulder is abducted: +1  
 If upper arm is abducted: +1  
 If arm is supported or rests on a leaning: -1

**Step 2: Locate Lower Arm Position**

**Step 2a: Adjust...**  
 If arm is working across midline of the body: +1  
 If arm out to side of body: +1

**Step 3: Locate Wrist Position**

**Step 3a: Adjust...**  
 If wrist is bent from the midline: +1

**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range: +1  
 If wrist at or near end of range: +2

**Step 5: Look-up Posture Score in Table A**  
 Use values from steps 1, 2, 3 & 4 to locate Posture Score in Table A.

**Step 6: Add Muscle Use Score**  
 If posture mainly static (i.e., held for longer than 1 minute) or if action repeatedly occurs 4 times per minute or more: +1

**Step 7: Add Force/load Score**  
 If load less than 2.5 kg (unintentionally): +0  
 If 2.5 kg to 10 kg (intentionally): +1  
 If 10 kg to 15 kg (static or repetitive): +2  
 If more than 15 kg (static or repetitive or erratic): +3

**Step 8: Find Row in Table C**  
 The completed scores from the Arm/Wrist analysis is used to find the row on Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**

**Step 9a: Adjust...**  
 If neck is twisted: +1  
 If neck is side-bending: +1

**Step 10: Locate Trunk Position**

**Step 10a: Adjust...**  
 If trunk is twisted: +1  
 If trunk is side-bending: +1

**Step 11: Legs**  
 If legs are supported and abducted: +1  
 If not: +2

**Step 12: Look-up Posture Score in Table B**  
 Use values from steps 9, 10 & 11 to locate Posture Score in Table B.

**Step 13: Add Muscle Use Score**  
 If posture mainly static or if action (flexion or motion): +1

**Step 14: Add Force/load Score**  
 If load less than 2.5 kg (unintentionally): +0  
 If 2.5 kg to 10 kg (intentionally): +1  
 If 10 kg to 15 kg (static or repetitive): +2  
 If more than 15 kg (static or repetitive or erratic): +3

**Step 15: Find Column in Table C**  
 The completed scores from the Neck & Leg analysis is used to find the column on Chart C.

## SCORES

Upper Arm	Lower Arm	Wrist	1	2	3	4
1	1	1	1	2	3	3
1	2	2	2	3	3	3
1	3	3	3	3	3	3
1	4	4	3	3	3	3
2	1	1	2	3	3	3
2	2	2	3	3	3	3
2	3	3	3	3	3	3
2	4	4	3	3	3	3
3	1	1	3	3	3	3
3	2	2	3	3	3	3
3	3	3	3	3	3	3
3	4	4	3	3	3	3
4	1	1	3	3	3	3
4	2	2	3	3	3	3
4	3	3	3	3	3	3
4	4	4	3	3	3	3

Neck	Trunk	Legs	1	2	3	4	5	6
1	1	1	1	2	3	4	5	6
1	2	2	2	3	3	4	5	6
1	3	3	3	3	3	4	5	6
1	4	4	3	3	3	4	5	6
2	1	1	2	3	4	5	6	6
2	2	2	3	3	4	5	6	6
2	3	3	3	3	4	5	6	6
2	4	4	3	3	4	5	6	6
3	1	1	3	3	4	5	6	6
3	2	2	3	3	4	5	6	6
3	3	3	3	3	4	5	6	6
3	4	4	3	3	4	5	6	6
4	1	1	3	3	4	5	6	6
4	2	2	3	3	4	5	6	6
4	3	3	3	3	4	5	6	6
4	4	4	3	3	4	5	6	6

Posture Score A	Muscle Use Score	Force/load Score	1	2	3	4	5	6	7	8	9	10
1	1	1	1	2	3	4	5	6	7	8	9	10
1	2	2	2	3	3	4	5	6	7	8	9	10
1	3	3	3	3	3	4	5	6	7	8	9	10
1	4	4	3	3	3	4	5	6	7	8	9	10
2	1	1	2	3	4	5	6	7	8	9	9	10
2	2	2	3	3	4	5	6	7	8	9	9	10
2	3	3	3	3	4	5	6	7	8	9	9	10
2	4	4	3	3	4	5	6	7	8	9	9	10
3	1	1	3	3	4	5	6	7	8	9	9	10
3	2	2	3	3	4	5	6	7	8	9	9	10
3	3	3	3	3	4	5	6	7	8	9	9	10
3	4	4	3	3	4	5	6	7	8	9	9	10
4	1	1	3	3	4	5	6	7	8	9	9	10
4	2	2	3	3	4	5	6	7	8	9	9	10
4	3	3	3	3	4	5	6	7	8	9	9	10
4	4	4	3	3	4	5	6	7	8	9	9	10

Final Upper Arm Score = 2

Final Lower Arm Score = 1

Final Wrist Score = 1

Final Posture Score in Table A = 2

Final Muscle Use Score = 6

Final Force/load Score = 0

Final Neck & Leg Score = 2

Final Score = 2

Subject: \_\_\_\_\_

Company: \_\_\_\_\_

Department: \_\_\_\_\_

Date: \_\_\_/\_\_\_/\_\_\_

Score: \_\_\_\_\_

**FINAL SCORE: 1 or 2 = Acceptable; 3 or 4 investigate further; 5 or 6 investigate further and change soon; 7 investigate and change immediately**

# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**  
  
 Step 1a: Adjust...  
 If shoulder is relaxed +1; If upper arm is abducted +1; If arm is supported or pinched is leaning -1

**Step 2: Locate Lower Arm Position**  
  
 Step 2a: Adjust...  
 If wrist is flexed +1; If wrist is extended +1; If arm is working across middle of the body +1; If arm out to side of body -1

**Step 3: Locate Wrist Position**  
  
 Step 3a: Adjust...  
 If wrist is bent from the midline +1

**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range +1; If bent at or near end of range +2

**Step 5: Look-up Posture Score in Table A**  
 Use values from steps 1, 2, & 4 to locate Posture Score in Table A.

**Step 6: Add Muscle Use Score**  
 If posture rarely static: r.a. hold for longer than 1 minute etc. If action repeatedly occurs 4 times per minute or more: +1; Muscles under strain: +2

**Step 7: Add Force/load Score**  
 If hand force less than 2 kg (palm-side): +1; 2-5 kg to 10 kg (palm-side): +2; 5-10 kg to 15 kg (palm-side or non-palm-side): +3; If more than 10 kg load or repeated or awkward: +3

**Step 8: Find Row in Table C**  
 The scores from the Arm/Wrist analysis is used to find the row on Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**  
  
 Step 9a: Adjust...  
 If neck is twisted +1; If neck is side-bending +1

**Step 10: Locate Trunk Position**  
  
 Step 10a: Adjust...  
 If trunk is twisted +1; If trunk is side-bending +1

**Step 11: Legs**  
  
 If legs & feet supported and balanced +1; If not: -1

## SCORES

Upper Arm	Lower Arm	Wrist	Wrist Twist	Final Arm Score
1	1	1	1	1
1	1	2	1	2
1	1	3	1	3
1	2	1	1	2
1	2	2	1	3
1	2	3	1	4
1	3	1	1	3
1	3	2	1	4
1	3	3	1	5
1	4	1	1	4
1	4	2	1	5
1	4	3	1	6
1	5	1	1	5
1	5	2	1	6
1	5	3	1	7
2	1	1	1	2
2	1	2	1	3
2	1	3	1	4
2	2	1	1	3
2	2	2	1	4
2	2	3	1	5
2	3	1	1	4
2	3	2	1	5
2	3	3	1	6
2	4	1	1	5
2	4	2	1	6
2	4	3	1	7
2	5	1	1	6
2	5	2	1	7
2	5	3	1	8
3	1	1	1	3
3	1	2	1	4
3	1	3	1	5
3	2	1	1	4
3	2	2	1	5
3	2	3	1	6
3	3	1	1	5
3	3	2	1	6
3	3	3	1	7
3	4	1	1	6
3	4	2	1	7
3	4	3	1	8
3	5	1	1	7
3	5	2	1	8
3	5	3	1	9

Neck	Trunk	Legs	Final Neck, Trunk & Leg Score
1	1	1	1
1	1	2	2
1	1	3	3
1	2	1	2
1	2	2	3
1	2	3	4
1	3	1	3
1	3	2	4
1	3	3	5
1	4	1	4
1	4	2	5
1	4	3	6
1	5	1	5
1	5	2	6
1	5	3	7
2	1	1	2
2	1	2	3
2	1	3	4
2	2	1	3
2	2	2	4
2	2	3	5
2	3	1	4
2	3	2	5
2	3	3	6
2	4	1	5
2	4	2	6
2	4	3	7
2	5	1	6
2	5	2	7
2	5	3	8
3	1	1	3
3	1	2	4
3	1	3	5
3	2	1	4
3	2	2	5
3	2	3	6
3	3	1	5
3	3	2	6
3	3	3	7
3	4	1	6
3	4	2	7
3	4	3	8
3	5	1	7
3	5	2	8
3	5	3	9

Final Arm Score	Final Neck, Trunk & Leg Score	Final Posture Score
1	1	1
1	2	2
1	3	3
1	4	4
1	5	5
1	6	6
1	7	7
1	8	8
1	9	9
2	1	2
2	2	3
2	3	4
2	4	5
2	5	6
2	6	7
2	7	8
2	8	9
2	9	10
3	1	3
3	2	4
3	3	5
3	4	6
3	5	7
3	6	8
3	7	9
3	8	10
3	9	11
3	10	12

Final Arm Score = 2

Final Neck, Trunk & Leg Score = 1

Final Posture Score = 2

Final Arm Score + Final Neck, Trunk & Leg Score = 2 + 0 = 2

Final Posture Score + Final Arm Score = 2 + 0 = 2

Final Neck, Trunk & Leg Score + Final Posture Score = 1 + 0 = 1

Final Neck, Trunk & Leg Score + Final Posture Score + Final Arm Score = 1 + 0 + 1 = 2

**Final Score = 2**

Final Neck, Trunk & Leg Score = 3

Final Posture Score = 1

Final Arm Score = 2

Final Neck, Trunk & Leg Score + Final Posture Score = 3 + 0 = 3

Final Posture Score + Final Arm Score = 1 + 0 = 1

Final Neck, Trunk & Leg Score + Final Posture Score + Final Arm Score = 3 + 0 + 1 = 4

**Final Score = 4**

Subject: \_\_\_\_\_ Department: \_\_\_\_\_ Scorer: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

FINAL SCORE: 1 or 2 = Acceptable; 3 or 4 investigate further; 5 or 6 investigate further and change soon; 7 investigate and change immediately

# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**

**Step 1a: Adjust...**  
 If shoulder is raised +1  
 If outer arm is abducted +1  
 If arm is supported or person is leaning -1

**Step 2: Locate Lower Arm Position**

**Step 2a: Adjust...**  
 If arm is working within outline of the body +1  
 If arm out to side of body -1

**Step 3: Locate Wrist Position**

**Step 3a: Adjust...**  
 If wrist is bent from the midline +1  
**Step 4: Wrist Twist**  
 If wrist is twisted (in mid-range) = 1;  
 If wrist at or near end of range = 2

**Step 5: Look-up Posture Score in Table A**  
 Use table from steps 1, 2, 3 & 4 to locate Posture Score A

**Step 6: Add Muscle Use Score**  
 If posture nearly static (i.e., held for longer than 1 minute) or if action repeatedly occurs 4 times per minute or more: +1  
**Step 7: Add Force/load Score**  
 If load is more than 20 kg (44 lbs) (intermittent): +1;  
 If 2 kg to 20 kg (intermittent): +1;  
 If 2 kg to 30 kg (static or repeated): +2;  
 If more than 10 kg load or repeated or shocks: +3

**Step 8: Find Row in Table C**  
 The completed scores from the RULA Arm & Wrist analysis is used to find the row on Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**

**Step 9a: Adjust...**  
 If neck is bent: +1; If neck is side-bending: +1

**Step 10: Locate Trunk Position**

**Step 10a: Adjust...**  
 If trunk is twisted: +1; If trunk is side-bending: +1

**Step 11: Legs**  
 If legs & feet supported and balanced: +1;  
 If not: +2

**Table A**

Upper Arm	Lower Arm	Wrist	Muscle Use	Force/Load
1	1	1	1	1
1	1	2	1	1
1	1	3	1	1
1	1	4	1	1
1	1	5	1	1
1	1	6	1	1
1	1	7	1	1
1	1	8	1	1
1	1	9	1	1
1	2	1	1	1
1	2	2	1	1
1	2	3	1	1
1	2	4	1	1
1	2	5	1	1
1	2	6	1	1
1	2	7	1	1
1	2	8	1	1
1	2	9	1	1
1	3	1	1	1
1	3	2	1	1
1	3	3	1	1
1	3	4	1	1
1	3	5	1	1
1	3	6	1	1
1	3	7	1	1
1	3	8	1	1
1	3	9	1	1
1	4	1	1	1
1	4	2	1	1
1	4	3	1	1
1	4	4	1	1
1	4	5	1	1
1	4	6	1	1
1	4	7	1	1
1	4	8	1	1
1	4	9	1	1
1	5	1	1	1
1	5	2	1	1
1	5	3	1	1
1	5	4	1	1
1	5	5	1	1
1	5	6	1	1
1	5	7	1	1
1	5	8	1	1
1	5	9	1	1
1	6	1	1	1
1	6	2	1	1
1	6	3	1	1
1	6	4	1	1
1	6	5	1	1
1	6	6	1	1
1	6	7	1	1
1	6	8	1	1
1	6	9	1	1
1	7	1	1	1
1	7	2	1	1
1	7	3	1	1
1	7	4	1	1
1	7	5	1	1
1	7	6	1	1
1	7	7	1	1
1	7	8	1	1
1	7	9	1	1
1	8	1	1	1
1	8	2	1	1
1	8	3	1	1
1	8	4	1	1
1	8	5	1	1
1	8	6	1	1
1	8	7	1	1
1	8	8	1	1
1	8	9	1	1
1	9	1	1	1
1	9	2	1	1
1	9	3	1	1
1	9	4	1	1
1	9	5	1	1
1	9	6	1	1
1	9	7	1	1
1	9	8	1	1
1	9	9	1	1
2	1	1	1	1
2	1	2	1	1
2	1	3	1	1
2	1	4	1	1
2	1	5	1	1
2	1	6	1	1
2	1	7	1	1
2	1	8	1	1
2	1	9	1	1
2	2	1	1	1
2	2	2	1	1
2	2	3	1	1
2	2	4	1	1
2	2	5	1	1
2	2	6	1	1
2	2	7	1	1
2	2	8	1	1
2	2	9	1	1
2	3	1	1	1
2	3	2	1	1
2	3	3	1	1
2	3	4	1	1
2	3	5	1	1
2	3	6	1	1
2	3	7	1	1
2	3	8	1	1
2	3	9	1	1
2	4	1	1	1
2	4	2	1	1
2	4	3	1	1
2	4	4	1	1
2	4	5	1	1
2	4	6	1	1
2	4	7	1	1
2	4	8	1	1
2	4	9	1	1
2	5	1	1	1
2	5	2	1	1
2	5	3	1	1
2	5	4	1	1
2	5	5	1	1
2	5	6	1	1
2	5	7	1	1
2	5	8	1	1
2	5	9	1	1
2	6	1	1	1
2	6	2	1	1
2	6	3	1	1
2	6	4	1	1
2	6	5	1	1
2	6	6	1	1
2	6	7	1	1
2	6	8	1	1
2	6	9	1	1
2	7	1	1	1
2	7	2	1	1
2	7	3	1	1
2	7	4	1	1
2	7	5	1	1
2	7	6	1	1
2	7	7	1	1
2	7	8	1	1
2	7	9	1	1
2	8	1	1	1
2	8	2	1	1
2	8	3	1	1
2	8	4	1	1
2	8	5	1	1
2	8	6	1	1
2	8	7	1	1
2	8	8	1	1
2	8	9	1	1
2	9	1	1	1
2	9	2	1	1
2	9	3	1	1
2	9	4	1	1
2	9	5	1	1
2	9	6	1	1
2	9	7	1	1
2	9	8	1	1
2	9	9	1	1
3	1	1	1	1
3	1	2	1	1
3	1	3	1	1
3	1	4	1	1
3	1	5	1	1
3	1	6	1	1
3	1	7	1	1
3	1	8	1	1
3	1	9	1	1
3	2	1	1	1
3	2	2	1	1
3	2	3	1	1
3	2	4	1	1
3	2	5	1	1
3	2	6	1	1
3	2	7	1	1
3	2	8	1	1
3	2	9	1	1
3	3	1	1	1
3	3	2	1	1
3	3	3	1	1
3	3	4	1	1
3	3	5	1	1
3	3	6	1	1
3	3	7	1	1
3	3	8	1	1
3	3	9	1	1
3	4	1	1	1
3	4	2	1	1
3	4	3	1	1
3	4	4	1	1
3	4	5	1	1
3	4	6	1	1
3	4	7	1	1
3	4	8	1	1
3	4	9	1	1
3	5	1	1	1
3	5	2	1	1
3	5	3	1	1
3	5	4	1	1
3	5	5	1	1
3	5	6	1	1
3	5	7	1	1
3	5	8	1	1
3	5	9	1	1
3	6	1	1	1
3	6	2	1	1
3	6	3	1	1
3	6	4	1	1
3	6	5	1	1
3	6	6	1	1
3	6	7	1	1
3	6	8	1	1
3	6	9	1	1
3	7	1	1	1
3	7	2	1	1
3	7	3	1	1
3	7	4	1	1
3	7	5	1	1
3	7	6	1	1
3	7	7	1	1
3	7	8	1	1
3	7	9	1	1
3	8	1	1	1
3	8	2	1	1
3	8	3	1	1
3	8	4	1	1
3	8	5	1	1
3	8	6	1	1
3	8	7	1	1
3	8	8	1	1
3	8	9	1	1
3	9	1	1	1
3	9	2	1	1
3	9	3	1	1
3	9	4	1	1
3	9	5	1	1
3	9	6	1	1
3	9	7	1	1
3	9	8	1	1
3	9	9	1	1

**Table B**

Neck	Trunk	Legs	Posture B Score
1	1	1	1
1	2	1	2
1	3	1	3
1	4	1	4
1	5	1	5
1	6	1	6
1	7	1	7
1	8	1	8
1	9	1	9
2	1	1	10
2	2	1	11
2	3	1	12
2	4	1	13
2	5	1	14
2	6	1	15
2	7	1	16
2	8	1	17
2	9	1	18
2	10	1	19
2	11	1	20
2	12	1	21
2	13	1	22
2	14	1	23
2	15	1	24
2	16	1	25
2	17	1	26
2	18	1	27
2	19	1	28
2	20	1	29
2	21	1	30
2	22	1	31
2	23	1	32
2	24	1	33
2	25	1	34
2	26	1	35
2	27	1	36
2	28	1	37
2	29	1	38
2	30	1	39
2	31	1	40
2	32	1	41
2	33	1	42
2	34	1	43
2	35	1	44
2	36	1	45
2	37	1	46
2	38	1	47
2	39	1	48
2	40	1	49
2	41	1	50
2	42	1	51
2	43	1	52
2	44	1	53
2	45	1	54
2	46	1	55
2	47	1	56
2	48	1	57
2	49	1	58
2	50	1	59
2	51	1	60
2	52	1	61
2	53	1	62
2	54	1	63
2	55	1	64
2	56	1	65
2	57	1	66
2	58	1	67
2	59	1	68
2	60	1	69
2	61	1	70
2	62	1	71
2	63	1	72
2	64	1	73
2	65	1	74
2	66	1	75
2	67	1	76
2			



# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**

**Step 1a: Adjust...**  
 If shoulder is raised: +1  
 If upper arm is abducted: +1  
 If arm is supported or person is leaning: -1

**Step 2: Locate Lower Arm Position**

**Step 2a: Adjust...**  
 If arm is supporting person's weight: +1  
 If arm is not to side of body: +1

**Step 3: Locate Wrist Position**

**Step 3a: Adjust...**  
 If arm is bent from the middle: +1  
**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range = 1;  
 If twist is at or near end of range = 2

**Step 5: Look-up Posture Score in Table A**  
 Use values from steps 1, 2, 3, 4 to locate Posture Score in Table A.

**Step 6: Add Muscle Use Score**  
 If posture mainly static (i.e., hold for longer than 1 minute): 0  
 If action repeatedly occurs 4 times per minute or more: +1  
**Step 7: Add Forceload Score**  
 If load is 2 to 5 kg (4.4 to 11.0 lbs): 0  
 If 2 kg to 10 kg (4.4 to 22.0 lbs) on repetitive: +2  
 If 5 kg to 10 kg (11.0 to 22.0 lbs) on occasional: +1  
 If more than 10 kg load or repeated at blocks: +3

**Step 8: Find Row in Table C**  
 The combined score from the Arm/Wrist analysis is used to find the row on Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**

**Step 9a: Adjust...**  
 If neck is bent: +1; If neck is side-bending: +1

**Step 10: Locate Trunk Position**

**Step 10a: Adjust...**  
 If trunk is bent: +1; If trunk is side-bending: +1

**Step 11: Legs**  
 If legs & feet supported and balanced: +1  
 If not: -2

**Step 12: Look-up Posture Score in Table B**  
 Use values from steps 9, 10 & 11 to locate Posture Score in Table B.

**Step 13: Add Muscle Use Score**  
 If posture mainly static: 0  
 If action repeatedly occurs 4 times per minute or more: +1

**Step 14: Add Forceload Score**  
 If load less than 2 kg (4.4 lbs): 0  
 If 2 kg to 10 kg (4.4 to 22.0 lbs) on repetitive: +2  
 If 5 kg to 10 kg (11.0 to 22.0 lbs) on occasional: +1  
 If more than 10 kg load or repeated at blocks: +3

**Step 15: Find Column in Table C**  
 The combined score from the Neck/Trunk & Leg analysis is used to find the column on Table C.

**SCORES**

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20

Step 9	Step 10	Step 11	Step 12
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20

Step 8	Step 15	Step 13	Step 14	Step 15
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
10	10	10	10	10
11	11	11	11	11
12	12	12	12	12
13	13	13	13	13
14	14	14	14	14
15	15	15	15	15
16	16	16	16	16
17	17	17	17	17
18	18	18	18	18
19	19	19	19	19
20	20	20	20	20

**Final Score**

Subject: \_\_\_\_\_ Department: \_\_\_\_\_ Scorer: \_\_\_\_\_

Date: / /

FINAL SCORE: 1 or 2 = Acceptable; 3 or 4 investigate further and change soon; 5 or 6 investigate further and change immediately

# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**  
 Step 1a: Adjust...  
 Step 2: Locate Lower Arm Position  
 Step 2a: Adjust...  
 Step 3: Locate Wrist Position

**Step 3a: Adjust...**  
**Step 4: Wrist Twist**  
**Step 5: Look-up Posture Score in Table A**  
**Step 6: Add Muscle Use Score**  
**Step 7: Add Force/load Score**  
**Step 8: Find Row in Table C**

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**  
**Step 9a: Adjust...**  
**Step 10: Locate Trunk Position**  
**Step 10a: Adjust...**  
**Step 11: Legs**

**Step 12: Look-up Posture Score in Table B**  
**Step 13: Add Muscle Use Score**  
**Step 14: Add Force/load Score**  
**Step 15: Find Column in Table C**

### SCORES

**Table A**

Upper Arm	Lower Arm	Wrist		
		1	2	3
1	1	1	1	1
1	2	1	1	1
1	3	1	1	1
2	1	1	1	1
2	2	1	1	1
2	3	1	1	1
3	1	1	1	1
3	2	1	1	1
3	3	1	1	1
4	1	1	1	1
4	2	1	1	1
4	3	1	1	1
5	1	1	1	1
5	2	1	1	1
5	3	1	1	1

**Table B**

Neck	Trunk Posture Score		
	1	2	3
1	1	1	1
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	1	1	1
10	1	1	1
11	1	1	1
12	1	1	1

**Table C**

Final Wrist & Arm Score	Final Neck, Trunk & Leg Score		
	1	2	3
1	1	1	1
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	1	1	1
10	1	1	1
11	1	1	1
12	1	1	1

**Final Score**

Final Wrist & Arm Score: 2  
 Final Neck, Trunk & Leg Score: 2  
**Final Score: 4**

Subject: \_\_\_\_\_ Department: \_\_\_\_\_  
 Company: \_\_\_\_\_ Scorer: \_\_\_\_\_  
 Date: / /

FINAL SCORE: 1 or 2 = Acceptable; 3 or 4 investigate further; 5 or 6 investigate further and change soon; 7 investigate and change immediately



# RULA Employee Assessment Worksheet

Complete this worksheet following the step-by-step procedure below. Keep a copy in the employee's personnel folder for future reference.

### A. Arm & Wrist Analysis

**Step 1: Locate Upper Arm Position**  
 0° to 15° = 0  
 15° to 30° = 1  
 30° to 45° = 2  
 45° to 60° = 3  
 60° to 75° = 4  
 75° to 90° = 5  
 90° to 105° = 6  
 105° to 120° = 7  
 120° to 135° = 8  
 135° to 150° = 9  
 150° to 165° = 10  
 165° to 180° = 11  
 180° to 195° = 12  
 195° to 210° = 13  
 210° to 225° = 14  
 225° to 240° = 15  
 240° to 255° = 16  
 255° to 270° = 17  
 270° to 285° = 18  
 285° to 300° = 19  
 300° to 315° = 20  
 315° to 330° = 21  
 330° to 345° = 22  
 345° to 360° = 23

**Step 1a: Adjust...**  
 If shoulder is raised: +1  
 If elbow arm is abducted: +1  
 If arm is suspended or person is kneeling: -1

**Step 2: Locate Lower Arm Position**  
 0° to 15° = 0  
 15° to 30° = 1  
 30° to 45° = 2  
 45° to 60° = 3  
 60° to 75° = 4  
 75° to 90° = 5  
 90° to 105° = 6  
 105° to 120° = 7  
 120° to 135° = 8  
 135° to 150° = 9  
 150° to 165° = 10  
 165° to 180° = 11  
 180° to 195° = 12  
 195° to 210° = 13  
 210° to 225° = 14  
 225° to 240° = 15  
 240° to 255° = 16  
 255° to 270° = 17  
 270° to 285° = 18  
 285° to 300° = 19  
 300° to 315° = 20  
 315° to 330° = 21  
 330° to 345° = 22  
 345° to 360° = 23

**Step 2a: Adjust...**  
 If arm is working towards middle of the body: +1  
 If arm out to side of body: +1

**Step 3: Locate Wrist Position**  
 0° to 15° = 0  
 15° to 30° = 1  
 30° to 45° = 2  
 45° to 60° = 3  
 60° to 75° = 4  
 75° to 90° = 5  
 90° to 105° = 6  
 105° to 120° = 7  
 120° to 135° = 8  
 135° to 150° = 9  
 150° to 165° = 10  
 165° to 180° = 11  
 180° to 195° = 12  
 195° to 210° = 13  
 210° to 225° = 14  
 225° to 240° = 15  
 240° to 255° = 16  
 255° to 270° = 17  
 270° to 285° = 18  
 285° to 300° = 19  
 300° to 315° = 20  
 315° to 330° = 21  
 330° to 345° = 22  
 345° to 360° = 23

**Step 3a: Adjust...**  
 If wrist is bent from the middle: +1

**Step 4: Wrist Twist**  
 If wrist is twisted in mid-range = 1  
 If wrist at or near end of range = 2

**Step 5: Look-up Posture Score in Table A**  
 Use values from steps 1, 2, 3 & 4 to locate Posture Score in Table A

**Step 6: Add Muscle Use Score**  
 If posture nearly static (i.e., held for longer than 1 minute):  
 If action repeatedly occurs 4 times per minute or more: +1  
 If action occurs 2-3 times per minute: +2  
 If action occurs 1-2 times per minute: +3  
 If action occurs less than 1 time per minute: +4

**Step 7: Add Force/load Score**  
 If force less than 2 kg (approximately): -2  
 If 2 kg to 5 kg (approximately): +1  
 If 5 kg to 10 kg (approximately): +2  
 If more than 10 kg load or equivalent to statics: +3

**Step 8: Find Row in Table C**  
 The score from steps 5 through 7 is used to find the row in Table C. The score from step 8 is used to find the column in Table C.

### B. Neck, Trunk & Leg Analysis

**Step 9: Locate Neck Position**  
 0° to 15° = 0  
 15° to 30° = 1  
 30° to 45° = 2  
 45° to 60° = 3  
 60° to 75° = 4  
 75° to 90° = 5  
 90° to 105° = 6  
 105° to 120° = 7  
 120° to 135° = 8  
 135° to 150° = 9  
 150° to 165° = 10  
 165° to 180° = 11  
 180° to 195° = 12  
 195° to 210° = 13  
 210° to 225° = 14  
 225° to 240° = 15  
 240° to 255° = 16  
 255° to 270° = 17  
 270° to 285° = 18  
 285° to 300° = 19  
 300° to 315° = 20  
 315° to 330° = 21  
 330° to 345° = 22  
 345° to 360° = 23

**Step 9a: Adjust...**  
 If neck is bent: +1  
 If neck is sub-tilting: +1

**Step 10: Locate Trunk Position**  
 0° to 15° = 0  
 15° to 30° = 1  
 30° to 45° = 2  
 45° to 60° = 3  
 60° to 75° = 4  
 75° to 90° = 5  
 90° to 105° = 6  
 105° to 120° = 7  
 120° to 135° = 8  
 135° to 150° = 9  
 150° to 165° = 10  
 165° to 180° = 11  
 180° to 195° = 12  
 195° to 210° = 13  
 210° to 225° = 14  
 225° to 240° = 15  
 240° to 255° = 16  
 255° to 270° = 17  
 270° to 285° = 18  
 285° to 300° = 19  
 300° to 315° = 20  
 315° to 330° = 21  
 330° to 345° = 22  
 345° to 360° = 23

**Step 10a: Adjust...**  
 If trunk is bent: +1  
 If trunk is sub-tilting: +1

**Step 11: Legs**  
 If legs A & B supported and balanced: 0  
 If not: +2

### SCORES

**Table A**

Upper Arm	Lower Arm	Wrist	Muscle Use	Force/load
0	0	0	0	0
0	0	1	0	0
0	0	2	0	0
0	0	3	0	0
0	0	4	0	0
0	0	5	0	0
0	0	6	0	0
0	0	7	0	0
0	0	8	0	0
0	0	9	0	0
0	0	10	0	0
0	0	11	0	0
0	0	12	0	0
0	0	13	0	0
0	0	14	0	0
0	0	15	0	0
0	0	16	0	0
0	0	17	0	0
0	0	18	0	0
0	0	19	0	0
0	0	20	0	0
0	0	21	0	0
0	0	22	0	0
0	0	23	0	0
0	1	0	0	0
0	1	1	0	0
0	1	2	0	0
0	1	3	0	0
0	1	4	0	0
0	1	5	0	0
0	1	6	0	0
0	1	7	0	0
0	1	8	0	0
0	1	9	0	0
0	1	10	0	0
0	1	11	0	0
0	1	12	0	0
0	1	13	0	0
0	1	14	0	0
0	1	15	0	0
0	1	16	0	0
0	1	17	0	0
0	1	18	0	0
0	1	19	0	0
0	1	20	0	0
0	1	21	0	0
0	1	22	0	0
0	1	23	0	0
0	2	0	0	0
0	2	1	0	0
0	2	2	0	0
0	2	3	0	0
0	2	4	0	0
0	2	5	0	0
0	2	6	0	0
0	2	7	0	0
0	2	8	0	0
0	2	9	0	0
0	2	10	0	0
0	2	11	0	0
0	2	12	0	0
0	2	13	0	0
0	2	14	0	0
0	2	15	0	0
0	2	16	0	0
0	2	17	0	0
0	2	18	0	0
0	2	19	0	0
0	2	20	0	0
0	2	21	0	0
0	2	22	0	0
0	2	23	0	0
0	3	0	0	0
0	3	1	0	0
0	3	2	0	0
0	3	3	0	0
0	3	4	0	0
0	3	5	0	0
0	3	6	0	0
0	3	7	0	0
0	3	8	0	0
0	3	9	0	0
0	3	10	0	0
0	3	11	0	0
0	3	12	0	0
0	3	13	0	0
0	3	14	0	0
0	3	15	0	0
0	3	16	0	0
0	3	17	0	0
0	3	18	0	0
0	3	19	0	0
0	3	20	0	0
0	3	21	0	0
0	3	22	0	0
0	3	23	0	0
0	4	0	0	0
0	4	1	0	0
0	4	2	0	0
0	4	3	0	0
0	4	4	0	0
0	4	5	0	0
0	4	6	0	0
0	4	7	0	0
0	4	8	0	0
0	4	9	0	0
0	4	10	0	0
0	4	11	0	0
0	4	12	0	0
0	4	13	0	0
0	4	14	0	0
0	4	15	0	0
0	4	16	0	0
0	4	17	0	0
0	4	18	0	0
0	4	19	0	0
0	4	20	0	0
0	4	21	0	0
0	4	22	0	0
0	4	23	0	0
0	5	0	0	0
0	5	1	0	0
0	5	2	0	0
0	5	3	0	0
0	5	4	0	0
0	5	5	0	0
0	5	6	0	0
0	5	7	0	0
0	5	8	0	0
0	5	9	0	0
0	5	10	0	0
0	5	11	0	0
0	5	12	0	0
0	5	13	0	0
0	5	14	0	0
0	5	15	0	0
0	5	16	0	0
0	5	17	0	0
0	5	18	0	0
0	5	19	0	0
0	5	20	0	0
0	5	21	0	0
0	5	22	0	0
0	5	23	0	0
0	6	0	0	0
0	6	1	0	0
0	6	2	0	0
0	6	3	0	0
0	6	4	0	0
0	6	5	0	0
0	6	6	0	0
0	6	7	0	0
0	6	8	0	0
0	6	9	0	0
0	6	10	0	0
0	6	11	0	0
0	6	12	0	0
0	6	13	0	0
0	6	14	0	0
0	6	15	0	0
0	6	16	0	0
0	6	17	0	0
0	6	18	0	0
0	6	19	0	0
0	6	20	0	0
0	6	21	0	0
0	6	22	0	0
0	6	23	0	0
0	7	0	0	0
0	7	1	0	0
0	7	2	0	0
0	7	3	0	0
0	7	4	0	0
0	7	5	0	0
0	7	6	0	0
0	7	7	0	0
0	7	8	0	0
0	7	9	0	0
0	7	10	0	0
0	7	11	0	0
0	7	12	0	0
0	7	13	0	0
0	7	14	0	0
0	7	15	0	0
0	7	16	0	0
0	7	17	0	0
0	7	18	0	0
0	7	19	0	0
0	7	20	0	0
0	7	21	0	0
0	7	22	0	0
0	7	23	0	0
0	8	0	0	0
0	8	1	0	0
0	8	2	0	0
0	8	3	0	0
0	8	4	0	0
0	8	5	0	0
0	8	6	0	0
0	8	7	0	0
0	8	8	0	0
0	8	9	0	0
0	8	10	0	0
0	8	11	0	0
0	8	12	0	0
0	8	13	0	0
0	8	14	0	0
0	8	15	0	0
0	8	16	0	0
0	8	17	0	0
0	8	18	0	0
0	8	19	0	0
0	8	20	0	0
0	8	21	0	0
0	8	22	0	0
0	8	23	0	0
0	9	0	0	0
0	9	1	0	0
0	9	2	0	0
0	9	3	0	0
0	9	4	0	0
0	9	5	0	0
0	9	6	0	0
0	9	7	0	0
0	9	8	0	0
0	9	9	0	0
0	9	10	0	0
0	9	11	0	0
0	9	12	0	0
0	9	13	0	0
0	9	14	0	0
0	9	15	0	0
0	9	16	0	0
0	9	17	0	0
0	9	18	0	0
0	9	19	0	0
0	9	20	0	0
0	9	21	0	0
0	9	22	0	0
0	9	23	0	0
0	10	0	0	0
0	10	1	0	0
0	10	2	0	0
0	10	3	0	0
0	10	4	0	0
0	10	5	0	0
0	10	6	0	0
0	10	7	0	0
0	10	8	0	0
0	10	9	0	0
0	10	10	0	0
0	10	11	0	0
0	10	12	0	0
0	10	13	0	0
0	10	14	0	0
0	10	15	0	0
0	10	16	0	0
0	10	17	0	0
0</				

## **DATA PENULIS**

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Nilai Tugas Akhir : A  
Tanggal USTA : 27 Juli 2011

## KOMENTAR DOSEN PENGUJI

Nama Mahasiswa : Paulina Triyuanita Sesarina Suling  
NRP : 0723029  
Judul Tugas Akhir : Rekayasa dan Analisis Sepeda Motor Matic Untuk  
Penyandang Cacat Kaki Dalam Berkendara Dengan  
Aman Dan Nyaman Ditinjau Dari Segi Ergonomi

Komentar-komentar Dosen Penguji :

1. Apa buktinya bahwa pengait pada sespan yang dirancang dapat digunakan untuk semua jenis tongkat.
2. Buktikan bahwa rel box saat dimundurkan masih masuk dalam jangkauan tangan.
3. Box isinya apa saja? Bagaimana jika jas hujan tidak dipakai apakah tas bisa tetap disimpan dalam box?
4. Apa bedanya memiliki tungkai dan tidak?
5. Tambahkan fleksibilitas dan kurangi sensitivitas.