

# Ergonomics REBA Investigation on Home Sewing Machine Worker and Providing Safe REBA Value for Working

Mr. S.M. Dharshan<sup>1</sup>, Mr. C. Dhivyan<sup>2</sup>, . Mr. V. Harish<sup>3</sup>, Mr. R. Gurumoorthy<sup>4</sup>

<sup>1,2,3,4</sup> Student, Department of Mechanical Engineering, Sri Ramakrishna Institute of Technology, Coimbatore, India

<sup>1</sup>dharshansm99@gmail.com, <sup>2</sup>dhivyanchandran1999@gmail.com, <sup>3</sup>harsha03032000@gmail.com, <sup>4</sup>moorthyg408@gmail.com

## ABSTRACT

In this modern and technology era, all possibilities of job working are concluded with machinery. Though machines take over all the jobs, humans hold jobs along with them. The jobs done by humans are mostly traditional approach. In the mean area of the traditional approach, humans tend to work with more physique involvement. There emerges the requirement of Rapid Entire Body Assessment (REBA). It is conducted over a working job done by a human, where the physique feels injury. Here a worker's job carried out with a traditional approach, i.e. homemaker sewing machine is analyzed. Throughout the analysis, the worker's comments about the work are taken into consideration. With consideration, further worksheet analysis is made with the REBA worksheet and the value and injury factor is defined. Finally, calculating the safe REBA value which is reduced injury or injury-free working posture is proposed.

## Keywords

traditional work, REBA, injury analysis, posture, safe value

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## Introduction

Whether being ergonomics pro or you're new to the work, it helps every once in a while to take a wide view of what ergonomics is and how its fundamental principles can be useful. At very least, it will be able to explain ergonomics is in communal setting. At absolute best, you begin to envision, however deeply the sector of applied science impacts your world at work, at home, and therefore the places in between. According to the International ergonomic Association, the definition of ergonomic (or human factors) is that the study attached the thoughtful of communications amid humans and completely different elements of a structure, and so the job that apply model, values, information ways in which to design to enhance human existence and complete structure act. The word ergonomics comes from the Greek word "ergon" that suggests work and "nomos" that suggests laws. The good ergonomic vogue removes incompatibilities between the work and so the worker and creates associate degree optimum work surroundings. Engineering attracts many disciplines to optimize the interaction between the work surroundings and so the worker.

As of discussion regarding ergonomics, it's the key to think about the space to spot the injury in with the work embedded with human consciousness and to advocate steps to eliminate injury. Rapid Entire Body Assessment (REBA) in standings of its growth, claims, strength, and boundaries. The analysis disclosed REBA's suitability for comfortable property valuation of jobs in varied skilled situations, as well as industrial and health care jobs, construction, sawmill tasks, grocery stock business, food-business, computer-based jobs, packing, faculty factory, Odonatological services, and for firefighters and emergency medical technicians. Face rationality is recognized in 2 stages, in terms of cooccurring rationality, many revisions used REBA to match the outcomes with alternative experimental and straight ways so the extent of traditionalism between the 2 is

defined [1]. During past decades, to evaluate the chance influences of work-related musculoskeletal disorders (WMSDs), monumental empirical ways are established. Rapid Entire Body Assessment (REBA) and Quick Exposure Check (QEC) are the 2 common ways in respected field. The learning aims to check ergonomic risk assessment outputs from QEC and REBA in of the agreement within the distribution of body loading values supported the analysis of operating postures [2]. The investigation done in Tehran Pars-electric factory to avoid tempting WMSDs. Rapid entire body assessment (REBA) is agreed out to assess muscular masses on labors due to positions, replication also power. Nordic musculoskeletal questionnaire (NMQ) was also used to obtain the occurrence of whole-body complaints [3]. The common activity downside of the staff is contractile organ complaints in India. Presently, the effort is actuality applied physically in maximum of the small-scale businesses so, problems of work-connected contractile organ complaints and damage in several physique spots are of high importance. Body property analysis tool, rapid upper limb assessment (RULA) and rapid entire body assessment (REBA) was practically used for valuation that shows that the staff is operating on top of the safe boundary. The study sheds light-weight on position examination of the staff within the small-scale business [4]. The analysis of the postural perspective of staff throughout the communication with workplace's parts and dealing setting is crucial with the analysis and interruption of biomechanical overwork danger in workplaces. RULA (Rapid Upper Limb Assessment) and REBA (Rapid Entire Body Assessment) area unit the 2 best strategies for bodily property risk assessment within the geographic point [5]. Mainly to define the warmth of Rapid entire body assessment and credentials of unresponsive and sensitive posture zones. The inquisitive learning and understanding examination of REBA provide deeper visions into the practice used for the valuation of positions. A complete factorial vogue, that divided into elements employing a forward method to contact the warmth. Posture

values were additionally noted including instant jumps [6]. Most of the workers in Palm Plantations do not point the ergonomic consciousness as important for his or her security and healthiness. Still they are handling physical tools and are subsequently visible to ergonomic risk influences. The study is made in to judge operating positions throughout harvest home feather palm recent fruit bunches. Rapid Entire Body Assessment is employed to judge danger operating positions and actions equivalent to the work. From the investigation, it's unconcealed, the majority of the feather palm staff were suffering from muscular complaints particularly on either hand sides [7].

### Literature survey

**(Dima Al Madani 2016):** REBA is considered as one of the most widespread and commonly used experimental ergonomic assessment tools in numerous industries and services. More than a few studies have been reviewed to provide a summary of this method's progress, claims, proof, and boundaries so far.

**(Motamedzade et al. 2011):** There is a noteworthy association between the two methods. They use a sturdy association in detecting risk high works and defining the probable risk for the occurrence of WMSDs. Hence, REBA and QEC methods are suggested for the calculating of work-related musculoskeletal complaints risk influences under industries.

**(Moussavi. S.A and Mirzaei. R 2012):** Associated with medicine researches on chronic diseases, like malignancies and coronary heart diseases, the medical specialty of system disorders contains a comparatively short custom. Attention during this space of analysis had been multiplied solely throughout the past twenty years, though a number of the study data, back to the Fifties. Single clarification is solely throughout the former twenty years, muscular sicknesses have begun to be thought of as significant communal ill-health.

**(Ansari and Sheik 2014):** The analysis of body position has been meted out for the explicit producing element by REBA and RULA tools, that has resulted in as a big part of the employee's square measure operating in rough and painful postures as found by study. This is often thanking scarcity of ergonomic data and consciousness in a very small business. Consequently, the employees square measure beneath sensible to high danger of muscular organ complaints as determined from risk levels.

**(Cremasco. M.M et al. 2019):** Investigation on RULA shows methods that appropriate for the valuation of position overload in the connection between machine and human is related to a physically fed wood-chipper, more than the REBA process because it exposed indices that matched to a higher level of risk for all the works detected, autonomously of the shape, size, therefore, it would be a high preventive technique to protect worker's health.

**(Joshi.M and Deshpande. V 2020):** The onward method is tailed for breaking down the values at stages to reduce the difficulty of handling huge position groupings. The warmth study specified that there are many insensitive position regions which do not modify the dependent values when independent values of body followers are changed. Few jumps in different values are also noticed. The reasoning for

the same position value and value jumps is not accessible in the literature which can be recognized as a research break.

**(Nawi. N.S.M et al. 2013):** Development of working position needs to be done by refining all aspects related to physical capacity such as by reducing the capability on the back, neck, shoulder/arm, and also hand/wrist. For repetition, it is highly associated to user skills, which can be improved with suitable training.

## Methodology

### Introduction

The development of REBA was to evaluate the risk of musculoskeletal disorders (MSD) rapidly which is done according to certain jobs is used to systematically analyze both lower and upper parts of the musculoskeletal system. A worksheet of a one page is used to estimate based on body elevation, extension, position, motion types, repetition, and coupling.

### WHY REBA?

1. Various musculoskeletal jobs can be analyzed by a simple postural analysis system
  2. The body is divided into segments for an individual evaluation concerning posture and movements
  3. Scoring is provided for muscular activity caused by frequently changing, improper posture
  4. Coupling is the most important valuation of handling load
  5. Provide the action level with urgency indication
  6. Provides minimal time, effort, and requirement
- On analyzing jobs, the result is a numerical value which provides the injury level and action of urgency required. Table 3.1 provides the color variation of different levels of injury.

Value	Level of MSD Risk
1	Negligible risk, no action required
2-3	Low risk, change may be needed
4-7	Medium risk, further investigation, change soon
8-10	High risk, investigate and implement soon
11+	Very high risk, implement change

**Table 3.1** MSD Risk Level

The assessment is started by an interview with the worker being evaluated to acquire knowledge of the work task, observing while working, and posture exposure and movements according to several work cycles. The posture selection for evaluating based on

1. The critical posture of the job or the task
2. Does the posture is maintained for a long time
3. While jobs where the highest load occur. Being conducted quickly multiple postures with repetition can be evaluated in a short time.

Whine using REBA, either left or right side is considered during the assessment. after concluding with the worker then it is considered if each side is to be evaluated.

**Fig 3.1** represents the REBA worksheet with angular direction representation.

**REBA Employee Assessment Worksheet**

Permission granted by Dr Lynn McAnatomy to convert the paper based format to an Excel spreadsheet version.

**A. Neck, Trunk and Leg Analysis**

**Step 1: Locate Neck Position**

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

**Step 2: Locate Trunk Position**

**Step 2a: Adjust...**  
If trunk is twisted: +1  
If trunk is side bending: +1

**Step 3: Legs**

**Step 4: Look-up Posture Score in Table A**  
Using values from steps 1-3 above, locate score in Table A.

**Step 5: Add Force/Load Score**  
If Load < 5kgs: +0  
If Load is 5 to 10kgs: +1  
If Load > 22lbs: +2  
Adjust: If shock or rapid build up of force add +1

**Step 6: Score A, Find Row in Table C**  
Add values from steps 4 & 5 to obtain Score A. Find row in Table C.

**Scoring:**  
1 = Negligible risk  
2 or 3 = low risk, change may be needed  
4 to 7 = medium risk, further investigation, change soon  
8 to 10 = high risk, investigate & implement change  
11+ = very high risk, implement change

**B: Arms and Wrist Analysis**

**Step 7: Locate Upper Arm Position:**

**Step 7a: Adjust...**  
If shoulder is raised: +1  
If upper arm is abducted: +1  
If arm is supported or leaning: -1

**Step 8: Locate Lower Arm Position:**

**Step 9: Locate Wrist Position:**

**Step 9a: Adjust...**  
If wrist is bent from midline or twisted: Add +1

**Step 10: Look-up Posture Score in Table B:**  
Using values from steps 7-9 above, locate score in Table B.

**Step 11: Add Coupling Score**  
Well fitted handles and mid range power grip: good: +0  
Acceptable but not ideal hold or coupling: acceptable with another body part: fair: +1  
Hand hold not acceptable but possible: poor: +2  
No handles, awkward, unsafe with any body part, Unacceptable: +3

**Step 12: Score B, Find column in Table C**  
Add values from steps 10 & 11 to obtain Score B. Find Column in Table C and match with Score A row from step 6 to obtain Table C score.

**Step 13: Activity Score**  
+1 1 or more body parts are held longer than a minute (static)  
+1 Repeated small range actions (more than 4x per minute)  
+1 Action causes rapid large range change in postures or unstable base

**Table A: Neck, Trunk and Leg Analysis**

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

**Table B: Arms and Wrist Analysis**

Upper Arm	Lower Arm	Wrist
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6

**Table C: Final REBA Score**

Score A	Score B	Final REBA Score
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12

**Fig 3.1** REBA worksheet

### Determining body position selection

The REBA assessment usually requires you to determine six various postural body positions. In several cases, the angular position during the job while observing. In this case, taking pictures of the jobs is a helpful way to determine the angular postures.

### Neck trunk and leg analysis

The value of neck position lies between 1 to 3. The value depends on the angular degree of neck bending and augmentation, alongside any changes for neck winding or side bowing (lateral bending). Neck bending is the change of jaw towards the chest from a normal neck position. Neck augmentation is a change of back from the chest (backward) from the normal neck position.

The value of the trunk is between 1 to 5. The value depends on the change of truck bending or augmentation, alongside any change for winding or side bowing of the trunk on the backside. Trunk bending is said as the forward

action(anterior) of the trunk (toe touching). Trunk flexion is said to be regressive action (posterior)of the trunk.

The value of the leg is between 1 to 4. The value depends on unilateral or bilateral bearing weight over legs, alongside any changes in the degree of knee bending. Knee bending can be said as bending or reducing the augmentation between tibia bones and femur of knee joint limbs.

### Force/ Load analysis

The value of force or load acting is between 0 to 2. For selecting the force or load section, the load or force required for performing the task is defined. In such cases, the load or force acting can be obtained by the general work procedure values. In other cases, if necessary, the force or load measuring gauge can be also used to determine the exact load or weight lifter or moved.

### Upper and lower arm and wrist analysis

The value of the upper arm spot is between 1 to 6. The value depends on the change in shoulder bending or augmentation,



alongside a change in the shoulder from being raised or downed. Shoulder bending can be defined as the anterior (forward) action of the upper arm. Shoulder augmentation can be defined as the posterior (backward) action of the upper arm. Shoulder seizure can be defined as sideway action of the upper arm acting away from the physique.

The value of lower arms is 1 or 2. The value depends on the change of elbow bending or augmentation. Generally, when the upper arm tends to support the lower arm in perpendicular action, the action is typically done in the raising direction and then retarded lower arms.

The value of the wrist position is between 1 to 3. The value depends on the change in wrist bending and augmentation, alongside the change result in +1 in case of winding. The work of the wrist is mostly tail end and loaded. The action depends on the lower arm extension.

### Coupling analysis

The value of coupling is between 0 to 3. Good is selected when mid-range power grip is provided with a well-fitting handle, the fair is selected when accepting but not ideal handling or accepting couple with any other part of the body, poor is selected when a hold is not acceptable but the possibility is in the range and if no grips and unacceptable, uncooperative and insecure with any part of the physique.

### Activity value

To get an activity value, check any of the below condition apply

1. For a long time, i.e. longer than one minute one or more body held.
2. In there any repeated actions (excess to 4x/minute)
3. If there is any action that causes a large range in posture change or unstable base.

The value if the activity is either 0 or 1.

### Valuation result

After all consideration, entries are selected, the calculate button is pressed for the result of the assessment. The ErgoPlus REBA calculator will display the overall REBA value and the factor of risks. The REBA value represents the MSD risk level for the work being valued. The maximum REBA value is 15 and the minimum REBA value is 1. The aim of the calculation is to achieve a REBA value of 4 or 5. Moreover, the risk index answers to the question- "how significant is the risk", "how long the risk is being there", "is the risk can be eliminated or reduced", "can safe value can be defined". Therefore, the goal is to develop a job to a low-risk factor.

At the end of the assessment, the injury risk cause is identified in a short period starting with visual consideration and then by worksheet consideration.

### Method description

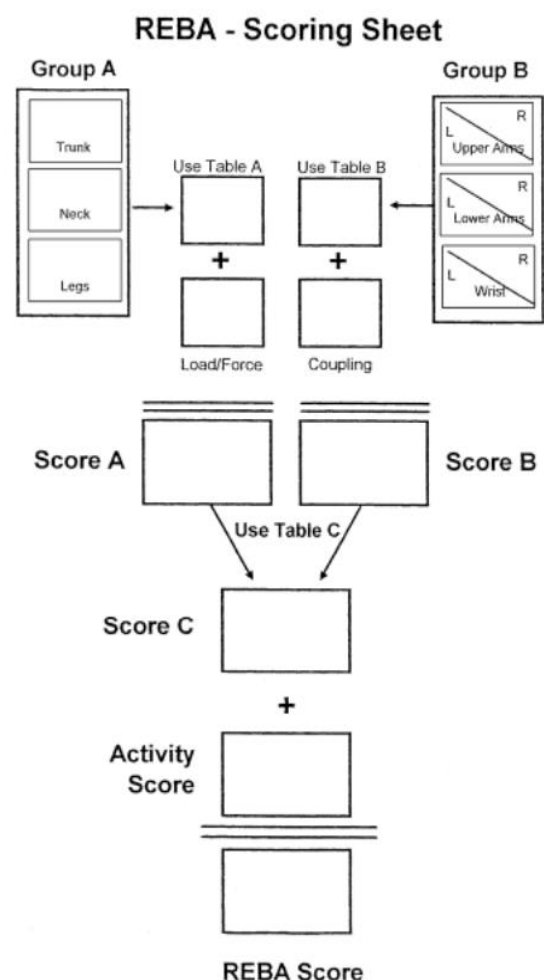
REBA method is used to analyze body postures by articular changes in angle measurements, by observed load or force is being acted and the movements and the frequency of changes in postural. Fig 3.2 shows the REBA scoring sheet. Change in the postural, change in the angle frequency thus change in the table values.

REBA is done in the segmentation process, that is table A and table B. Each table considers the individual physique parts and then concluded.

Assembly A consists of the trunk, neck, legs which combinedly form the table A value. The parts are individually examined by visual consideration and worksheet consideration. During the exam, the angular changes are properly defied and the correct REBA value is identified.

Assembly B consists of the upper arm, lower arm, and wrist which combinedly forms table B. The parts are individually examined by visual consideration and worksheet consideration. During the exam, the angular changes are properly defied and the correct REBA value is identified.

Every ranging position corresponds to assessed body areas, that are associated to the value. The value corresponds to the value that gets greater as the distance since the neural usual section location raises.



totally holds 36 combinations of positions for the assembly and dropping to 9 prospect value to which addition of coupling value is made.

Value A and B are combined to table C to provide a possibility of 144 groupings and lastly to the REBA value an activity value is further. The activity value defines any posture that lasts for more than a minute and if recurrence occurs higher than 4 times per minute or huge quick changes in positions or else stable less base.

A procedure is specifically used to consider completely those influences and a REBA value is calculated, the value is a numeral sandwiched between 1 and 15. Thus, REBA value defines the REBA action level and also represents whether an action is essential and if compulsory. The risk factor, action urgency, and necessary are shown in table 3.2.

REBA action levels			
Action level	REBA value	Risk level	Action
0	1	Negligible	Not necessary
1	2-3	Low	May be necessary
2	4-7	Medium	Necessary
3	8-10	High	Necessary soon
4	11-15	Very high	Necessary now

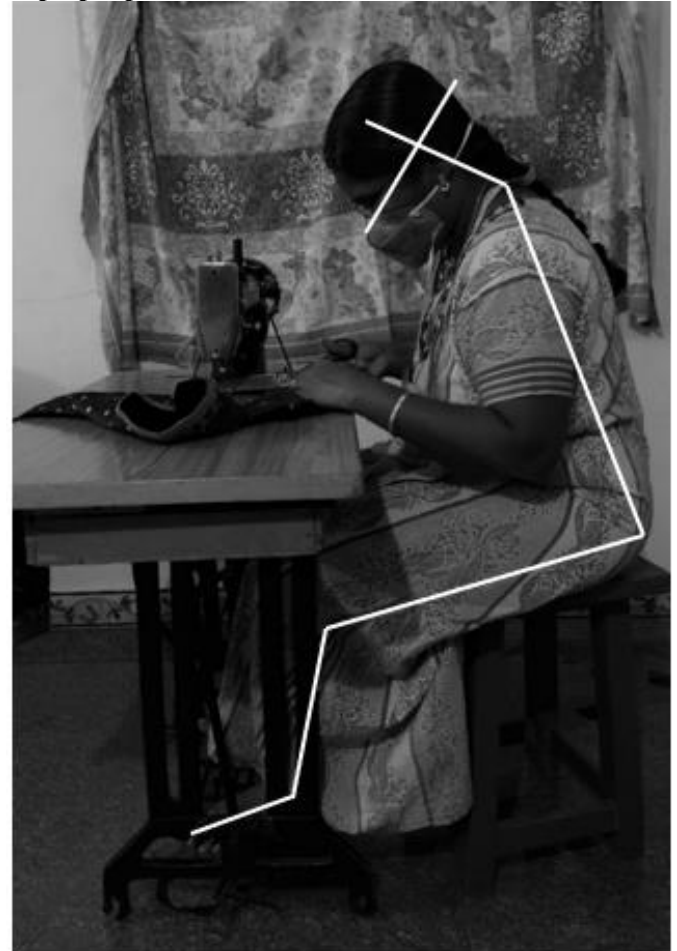
**Table 3.2** action levels

The process is sometimes repeated when there is a change of task owing to involvement or switch measures, a new value is calculated, which is then related with the previous REBA value to monitor the change occurred.

### Method Implementation

Herewith an example to REBA, considered a home maker's sewing machine job. It is considered because it holds the working of all REBA worksheet. Starting with the neck the job requires the entire bodywork till the legs. On further initial REBA calculation of visual consideration is made first and the worksheet consideration is done next. As said either the left or right side of the work physique is considered for the calculation. REBA is valuable in finding the improper posture of working job as a fragment of risk assessment. The posture is imaged and the theoretical angle is calculated, the theoretical angle calculation is represented with white lines in the imaged line over the improper posture image and recommended posture image. Then the REBA values are obtained and then compared.

### Improper posture and calculation

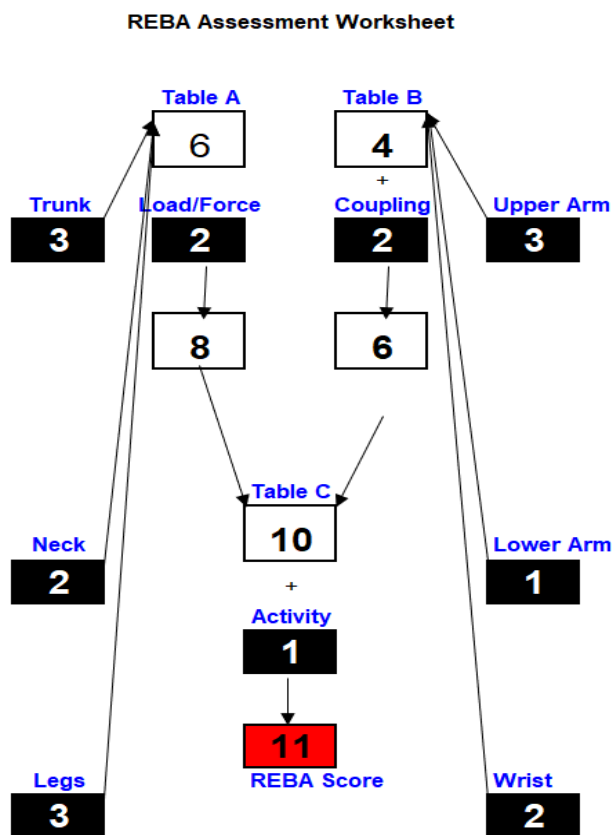


**Fig 4.1** improper posture

Fig 4.1 shows the improper posture of the homemaker sewing machine with a traditional approach. The improper posture of the sewing machine is taken into consideration by the imagining process. The image is further referred to for angular description. In fig 4.1 the angle of the trunk is between  $30^{\circ}$  and  $60^{\circ}$ , which projects the value of 3. This is because the trunk has to be bend to monitor the stitching area uninterruptedly. The trunk mostly works at that particular angle in the improper posture.

The angle of the neck is between  $20^{\circ}$  and  $40^{\circ}$ , which projects the value of 2. As taken in the consideration of the trunk the next has to be bent further from the normal axis to get the visual of the stitching area, even the trunk helps to monitor the area next requires to get the visual of the area.

A value for the leg, the leg is segmented into two, work is done with both the legs so it projects the value of 1; there it projects an angular working between  $30^{\circ}$  to  $60^{\circ}$  because of bending which projects the value of +2. In sewing machining of the traditional approach, both legs are used to operate the pedal at the end(foot). The acting force or load is more than 10kg i.e. scissors used to cut the cloth and threads and the foot is used for a pedal with a certain load acting on the footrest. This load acting project a value of 2.



**Fig 4.2** REBA value of improper posture

A assembly (trunk, neck, legs), with these three positions values it projects the table A values as 6. To table A values the load acting values 2 is added. Final values equal to 8.

In the image captured the left arm is visible, the value projection of the limb noted. It is assumed, the right arm too in a parallel situation to left arm. Popularly in the sewing machine, both hands work almost in a similar position, it is depended on the design structure of the sewing machine.

The angle of the upper arm position is between  $45^{\circ}$  to  $90^{\circ}$ , which projects the value of 3. Given this, the lower arm working position angle is between  $0^{\circ}$  to  $60^{\circ}$ , which yields the value 1. The angle of the lower arm doesn't change as much as the upper arm. The wrist action is extended to fingers for gripping, scissors, for the value projection is 2.

Coupling to the work defined as poor with this instance. Because of the height variation of the workbench to the sitting area, it is uncomfortable to operate the scissors.

B assembly (upper arm, lower arm, wrist), with these three positions values it projects the table A values as 4. To table A values the coupling values 2 are added. Final values equivalent to 6.

Value A and B combine forms table value C. That is table A and B values are arrived into table C to produce value C. The generated value is 10.

Finally, the activity value 1 is added. The activity value is 1 because there is a recurring, motionless, or abrupt large change in the working position. The value is combined to the value C.

The concluding REBA value for the work job selected is 10 shown in fig 4.2. With help of the REBA value calculated the risk level is identified. Risk identified is a very-high risk which indicates a necessary action is needed to be taken

now to reduce the injury-causing or to reduce the injury caused.

### OPTIONAL POSTURE and CALCULATION



**Fig 4.3** optional posture approach

The optional posture of working in the sewing machine is taken into consideration by the imaging process is shown in fig 4.3. The image is further referred to for angular description. In the fig, the angle of the trunk is between  $0^{\circ}$  and  $60^{\circ}$ , which projects the value of 2. This is because the variation between the workbench and the sitting area is reduced and almost parallel. In this trunk has not to be bend as much as in improper posturer to monitor the stitching area uninterruptedly. The trunk mostly works in that particular angle in the recommended posture.

The angle of the neck is between  $1^{\circ}$  and  $20^{\circ}$ , which projects the value of 1. As taken in the consideration of the trunk the next has to be bent further from the normal axis to get the visual of the stitching area, even the trunk helps to monitor the area next requires to get the visual of the area. As comparing to improper posture on the recommended posture there is no need to bend the neck as much because of the reduced variation to the workbench and the sitting area.

A value for the leg, the leg is segmented into two, both the legs are placed idle under the certain exception, so it projects the value of 1; there it projects angular working



between  $0^0$  to  $30^0$  and its projects value of +1 because there is not much bending during the work. In sewing machining of the traditional approach, both legs are used to operate the pedal at the end(foot). In this recommended posture there is no more peal working. It is installed by an electric motor shown in figure 4.3. Hence not much work for the foot. The acting force or load is between 5kg and 10kg i.e. scissors used to cut the cloth and a single foot is used to power up the motor. This load acting project a value of 1.

In the traditional way of sewing, there are no power motors. Then to the recommended posture, the work is updated with an electrical power motor. The motor helps in transmitting the power to run the wheel to sew. Hence by reducing the variation between the workbench and the sitting area the aslope and the angle is reduced and comfortability is provided. Next to that by the installation of an electric motor the work of the foot is immobilized.

A assembly (trunk, neck, legs), with these three positions values it projects the table A values as 3. To table A values the load acting values 1 is added. Final values equal to 4.

#### REBA Assessment Worksheet

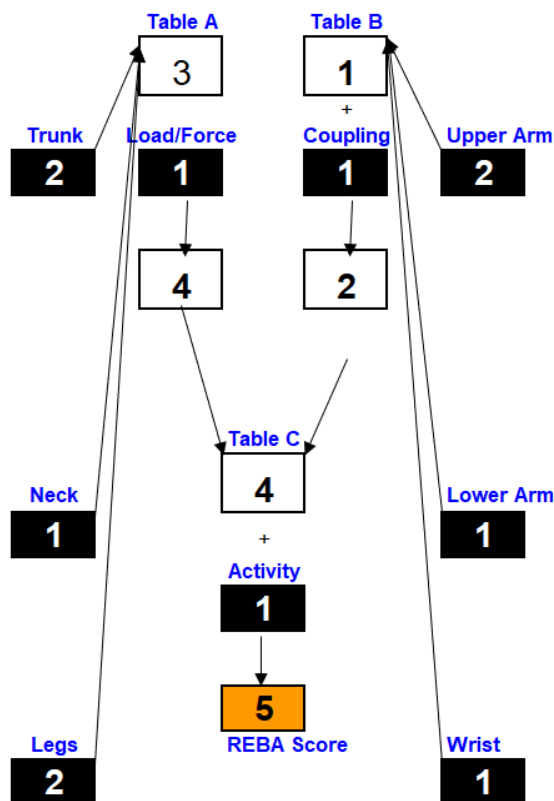


Fig 4.4 REBA value of recommended posture

In the image captured the left arm is visible, the value projection of the limb noted. It is assumed, the right arm too in a parallel situation to left arm. Popularly in the sewing machine, both hands work almost in a similar position, it is depended on the design structure of the sewing machine.

The angle of the upper arm position is between  $20^0$  to  $60^0$ , which projects the value of 2. Given this, the lower arm working position angle is between  $0^0$  to  $60^0$ , which yields the value 1. The angle of the lower arm doesn't change as much as the upper arm. The wrist action is extended to fingers for gripping, scissors, for the value projection is 1. This is

because of the reduction in variation. Therefore, there is no more high effort to pick and use the scissors.

Coupling to the work defined as fair at this instance. Because of the height variation of the workbench to the sitting area is found to be comfortable to operate the scissors.

The B assembly (upper arm, lower arm, wrist), with these three positions values it projects the table A values as 1. To table A values the coupling value 1 is added. Final values equal to 2.

Value A and B combine forms table C. That is table A and B values are arrived into table C to produce value C. The generated value is 4.

Finally, the activity value 1 is added. The activity value is 1 because there is a recurring, motionless, or abrupt large change in the working position. The value is combined to the value C.

The concluding Reba value for the work job selected stays 5 shown in fig 4.4. With help of the REBA value calculated the risk level is identified. Risk identified is a medium risk which indicates a partial necessary action is needed to be taken as now to eliminate the injury happened.

The recommended posture is defined with a medium risk level. If the job is not done continually the risk is identified to be low because of low working time. If the work is done for much time it is advised to take a break during the work. The recommended posture is finally identified with a medium risk level.

## Conclusion

**Discussion:** As monitored and analyzed both the incorrect posture and optional posture, the injury caused in the incorrect posture is analyzed under rapid entire body assessment by individual body parts accordingly. As explained in the incorrect posture of individual body parts under REBA, identified as each body part is working in certain angular directions and the yield value is identified. The yield value is obtained by two segments valuation, i.e. value A and value B and further th consolidated value us added to the activity value provides the final REBA value.

Next to it, the recommended posture is analyzed, in this, the safe access to the selected job is determined by the same two segmentation process and the safe REBA value is calculated and described. By concluding the safe value is defined for the sewing job working.

**Comparison:** The same procedure for scoring is used in both figure 4.1 and 4.3, and the harm REBA value is 11 and the safe REBA value is 5. The safe REBA value is characterized as a medium risk level, with the necessary action needed to control the dangers. One instant control measure is to raise the bed altitude or lower the sitting height and further an electric motor is installed, it could reduce the working of the dual leg to a single leg and facilitate this action. This is because the electric motor is pedal actuated and can be done with a single leg. Apart from all these modifications, some other factors promote the risk factor such as collaboration of worker, a worker size ratio to workstation area, atmospheric surrounding, and operations handled manually. Next to them, the availability of resources and equipment, the ability of the worker identifies

the task when the work is outside the worker's ability and stand for help.

**Result:** As a result of ergonomics REBA assessment, the ultimate aim is achieved in the means of identifying the injury and implementing action and also recommending the safe REBA value of working to eliminate or reduce the injury.

injury caused or injury to be caused is identified and eliminated by proper action implementation. This providence helps manage the workers to work with safe manners.

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REBA Assessment Worksheet

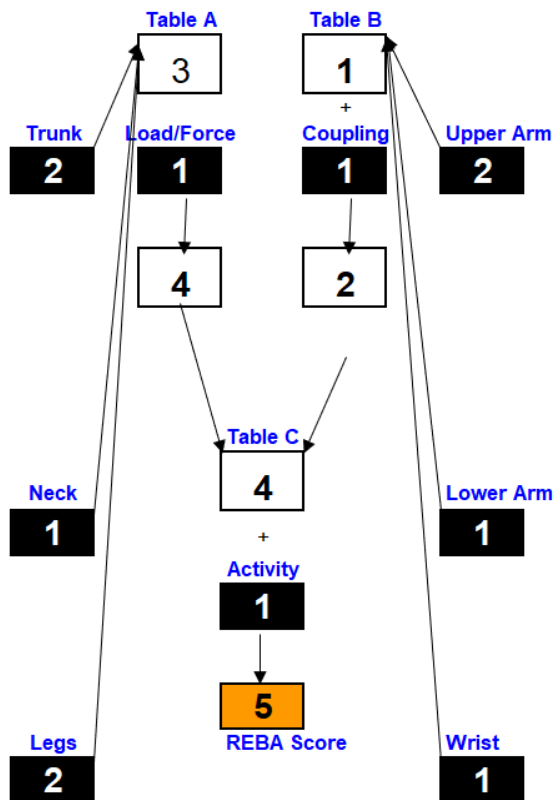


Fig 5.1 safe REBA value

For the work job selected, the recommendation is to match the workbench and the sitting area. The improper matching influence the factor creating an injury and further increasing it. Next to decreasing the variation implementing any modifications or installations. Then here electric powered motor is being installed to reduce the working of the leg hence by reducing the injury for the long-term workers and safe working approach to the beginners.

Fig 5.1 describes the reduced injury level of the selected working and also it can be used as the safest working value to start the job by the beginners. Thus, the aim of the assessment is achieved.

**Conclusion:** By the end of the assessment of incorrect and recommended posture, the causing injury and injury to caused is calculated. Calculations are made with dual segmentation and added to the activity to identify the REBA values and provide the necessary action to be implemented. For the recommended posture, the safe angular direction of working is provided employing the same two segmentation calculations and safe REBA values are calculated.

Although all ergonomic risk investigation tools have a bias, if the tools are used appropriately, these biases can be predictable or considered in the clarification of the total outcomes. Thus, by commencing the safe REBA values,