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# Solutions

## The Eight Principles

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# Of Movement and Handling of Loads

1 Assess the Load – Task, Individual, Load, Environment

2 Broad stable bases

3 Bend the knees

4 Back straight (Not necessarily vertical)

5 Firm grips with palm of hand – Palmer grip

6 Arms in line with trunk

7 Weight close to centre of gravity

8 Turn feet in direction of movement



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## **The 20 Basic Manual Handling Rules**

These rules have been developed for you to work through and use when doing manual handling tasks. This information is provided to help minimise the risk of injury.

### **1. Place or Store Heavy Objects at Waist Level**

Try to avoid picking up heavy objects from the floor. If the load is difficult to slide or tip over on its edge, it is too heavy to lift and you need to manage the risk.

### **2. Use Good Lifting Techniques**

Use the following steps to help lift safely:

- Keep the load in close to your body.
- Lift smoothly – avoid sudden jerks.
- Use semi – squat lifting posture – this new approach has replaced the previous recommendation method of crouching – down and keeping your back straight – the idea is to half bend your knees and half bend your back to get down to the load.
- Spread your feet apart to provide a good stable base of support.

### **3. Watch where you are going when carrying a load**

- Walk forward.
- Make sure you can see past the load.
- If you need to carry a load down steps, make sure you can see where you are placing your feet.
- If you cannot see properly, you need to manage the risk.

### **4. Move Your Feet to Turn**

- Straighten up first and then step around or swivel on the balls of your feet.
- If you twist your back when it is bent, you will greatly increase your risk of injury.

### **5. Make Sure you have a Good Grip on your load and that it will not Fall apart and has No Sharp Edges.**

- Many injuries are caused by people trying to re-grasp a slipping load.
- Many injuries are caused by people trying to recover a falling load.
- If a load is slipping or falling, get your feet out of the load and let it fall.
- If you are routinely carrying or handling heavy objects you will need to manage the risk.
- If you are routinely carrying or handling objects with rough surfaces or sharp edges you will need to manage the risk.

### **6. Team Lifting Requires a Risk Assessment**

- If the load is so heavy that you need help, then you need to manage the risk.
- If there is no visible option other than team lifting, the team needs to have procedures and training and must be physically matched.

## **7. Prepare for the moving of the Load**

- Clear an area near waist height to place the load when you put it down.
- Clear the path you will take in advance.
- Identify any obstructions that cannot be cleared.
- If there is no clear path, you need to manage the risk.

## **8. Wear the Right Clothing or Protective Gear when you handle loads**

- Wear clothing that allows you to crouch down without embarrassment.
- Wear safety shoes if handling heavy loads.
- Wear old clothes or protective work-wear when handling dirty loads.
- Holding dirty objects away from your body increases the risk of injuries.

## **9. Balance the load by carrying loads in both hands**

- One handles loads like suitcases or carry bags, should be balanced by carrying one of each on both sides of the body.

## **10. Remember the “8 Second” Rule**

- If it takes more than “8 seconds” to make an adjustment or to get the right tool, people will make do with what they have.
- If trolleys, lifting aids, or load shifting equipment are needed to minimize the risk, make sure they are nearby when required.

## **11. Set yourself a Comfortable Work Posture**

- Set up your work height so you are upright when standing.
- Set up your work area so you can easily reach things.
- If you are undertaking sustained overhead work, or work involving other awkwardly postures you need to manage the risk.
- If you have to apply a large force when you are awkwardly positioned you are more likely to damage small muscles.
- Adjust the backrest on your chair to provide lumbar support for your lower back.
- If you have an adjustable work station-adjust it to suit your individual needs.

## **12. Muscle and Joint Movement**

- Take a short break about every 30 minutes of sustained sitting
- All you have to do is stand up and take a few steps

## **13. Stop physical work if you are tired or fatigued**

- If you are tired and fatigued from hard physical work you are more likely to trip or stumble or make an error.

- If your hands are tired and weak you are likely to drop things.

#### **14. Be Alert to the possible onset of Overuse Syndrome**

- The cause of most overuse syndrome problems is a combination of “Too Hard, Too Often and Too Long”.
- If you are continually applying forces with your fingers, hands, arms, feet or legs, you need to manage the risk.
- Listen to your body – report all sharp pains or recurring pains.

#### **15. Warm up your Body**

- Athletes would not even contemplate putting their bodies under stress without warming up first.
- Warming up stretching exercises can be beneficial at work.
- Try to do some lighter physical work before starting with heavy work.

#### **16. Tone up your body**

- Working out at the gym or an exercise routine at home will not allow you to lift heavier loads at work but will provide you with a bigger safety margin if something goes wrong.

#### **17. Remain Calm when things are not working as they should**

- Injuries occur when people get angry and try to use brute force to dislodge jammed objects.
- There is always a reason why something is stuck – try to work it out.
- When a tree stump will not pull out, look for the remaining root.
- When a bracket will not release, look for that hidden screw.

#### **18. Keep all tools Sharp and in Good Condition**

- It is the worn teeth on a wrench that can suddenly give way and cause injury.
- It is the blunt blade which causes overuse injuries and stab wounds.
- It is the worn wheel on a trolley, which requires the user to force it round corners, which causes a strained muscle.

#### **19. Bend the Tool – not the wrist**

- Awkward bent wrist postures reduce your ability to grip power tools causing possible overuse injuries and an increased chance of mistakes.
- It is usually possible to obtain a tool, which will allow a good neutral wrist posture.

#### **20. Always Look for a Better Way of doing things**

- It is possible to put a shelf outside the door so you can put down the load before you open the door.
- Can you get the materials supplied in smaller packages?

- Is there a lighter tool, which will still do the job?
- Would a small trolley help?
- Is there a safe and better way?

#### **How do you know if something is too heavy to lift?**

- Test the weight before you try to lift the object by crouching down and trying to turn it or tip it on its edge. Do not use your feet to slide or test the weight.
- If the object will not slide easily on the carpet or it is too heavy to tip, it is too heavy to lift.
- Any load that feels heavier than a box of 5 reams of photocopier paper is starting to become “too heavy” and you need to **manage the risk**.
- Any load that you would not like your partner to lift, you should not lift yourself or expect anyone else to lift.

#### *General Information*

- Did you know a 2-litre container of milk weighs 2Kg?
  - A 4 litre wine cask weighs 4Kg?
  - A box of 5 reams of photocopy paper weighs about 13Kg?
  - A computer monitor weighs about 13Kg to 18Kg?
  - Some purchased items will have the weight printed on the carton or will have a “Heavy” label.
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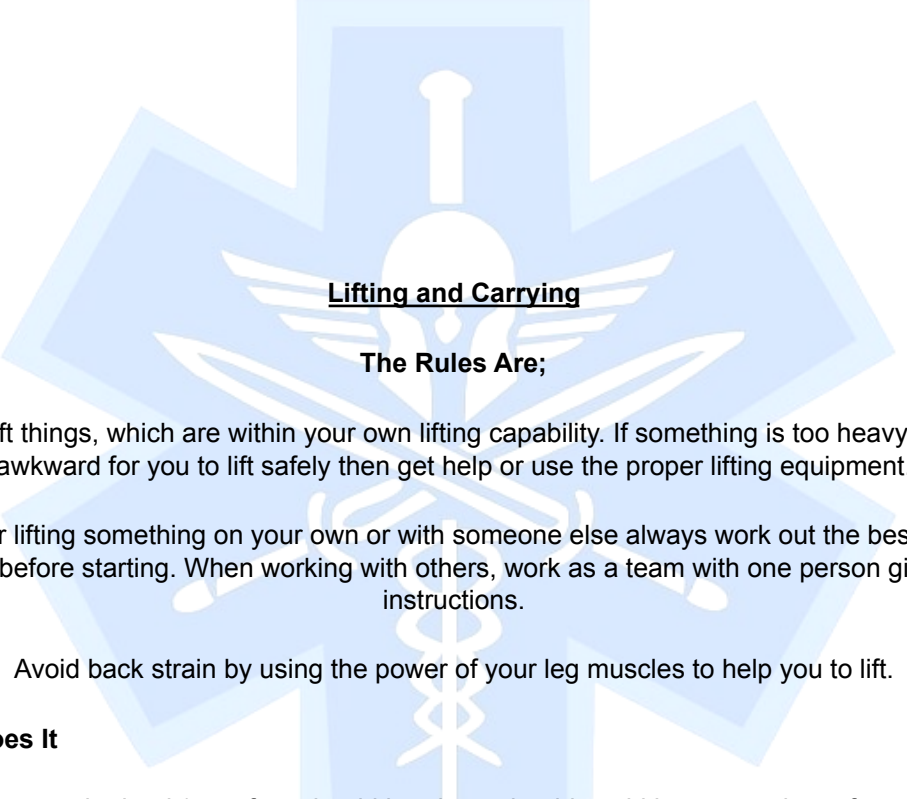
#### **Give Staff Members using safe work a pat on the back!**

- When you enter an office or work area, which is set up safely – comment positively to the staff member who has taken the effort to use safe work practices.
  - When you see someone making a load lighter, or lifting and handling a load safely, congratulate him/her on using safe work practices.
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#### *Safety Hint*

Comment positively to staff members who are using safe work practices. By congratulating staff members and recognising and using safe work practices you will be helping to improve the safety culture. **Thank you.**

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## **Lifting and Carrying**

### **The Rules Are;**

Only lift things, which are within your own lifting capability. If something is too heavy or too awkward for you to lift safely then get help or use the proper lifting equipment.

Whether lifting something on your own or with someone else always work out the best way to move it before starting. When working with others, work as a team with one person giving the instructions.

Avoid back strain by using the power of your leg muscles to help you to lift.

### **Easy Does It**

Stand close to the load (your feet should be about shoulder width apart and one foot slightly in front of the other where possible) Bend your knees. Your body should be relaxed and not tense. Lower your hands to the object and make the best use of the palms of your hands to grip the object. With your head as straight and vertical as practicable keep your elbows close to your body, and then lift by straightening your legs and knees while keeping the load close to your body.

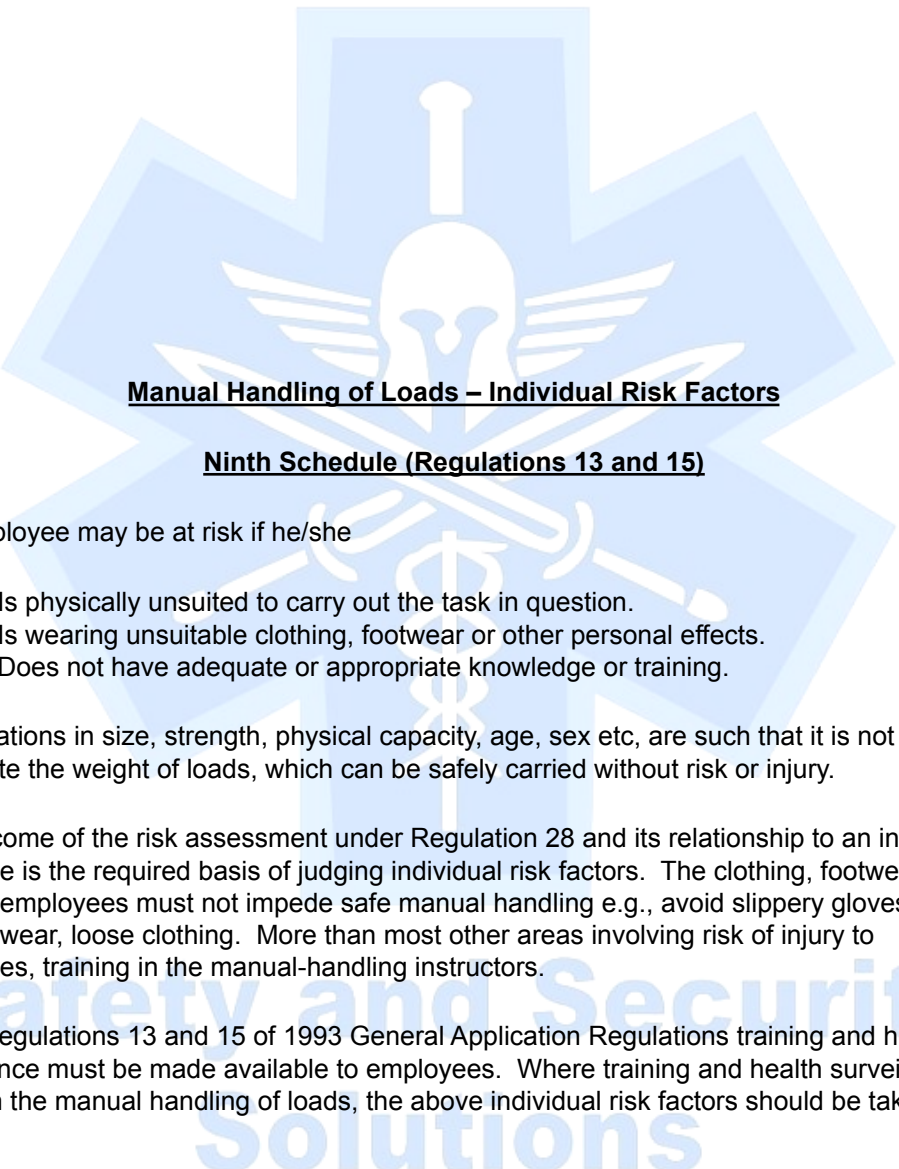
Use gloves or other protection when lifting rough or sharp edged items.

### **Watch How You Go**

Watch where you are going. Don't carry a load, which will prevent you from seeing where you are putting your feet or what you may be bumping into.

Watch your fingers and toes and those of your helpers when putting a load down.





## **Manual Handling of Loads – Individual Risk Factors**

### **Ninth Schedule (Regulations 13 and 15)**

The employee may be at risk if he/she

- Is physically unsuited to carry out the task in question.
- Is wearing unsuitable clothing, footwear or other personal effects.
- Does not have adequate or appropriate knowledge or training.

The variations in size, strength, physical capacity, age, sex etc, are such that it is not possible to indicate the weight of loads, which can be safely carried without risk or injury.

The outcome of the risk assessment under Regulation 28 and its relationship to an individual employee is the required basis of judging individual risk factors. The clothing, footwear etc worn by employees must not impede safe manual handling e.g., avoid slippery gloves; very light footwear, loose clothing. More than most other areas involving risk of injury to employees, training in the manual-handling instructors.

Under Regulations 13 and 15 of 1993 General Application Regulations training and health surveillance must be made available to employees. Where training and health surveillance bears on the manual handling of loads, the above individual risk factors should be taken into account.

The following should also be considered when assessing the capacity of the individual employee to manually handle goods;

#### **Before starting manual handling;**

- Has the employee any previous experience of training?
- Has the employee had any back pain in the past?
- Has the employee any reservations about his/her lifting ability?
- Are employees generally fit?

- Do they appear physically fit?
- Do they appear physically capable of doing the manual handling jobs assigned to them?

**For employees during manual handling;**

- Do employees experience any pains or other discomfort during or after manual handling?
- Has back pain been a cause of absenteeism?
- Does any employee walk or hold him/herself in a manner, which might suggest back discomfort?

If the employee has any doubt about any of the above issues reference should be made to a competent doctor for further assessment.

**Manual Handling Hazard Identification Checklist**

Description of Work Location	
Dare	
Task Description	
Assessed by	
Employees/Safety Representative(s)	

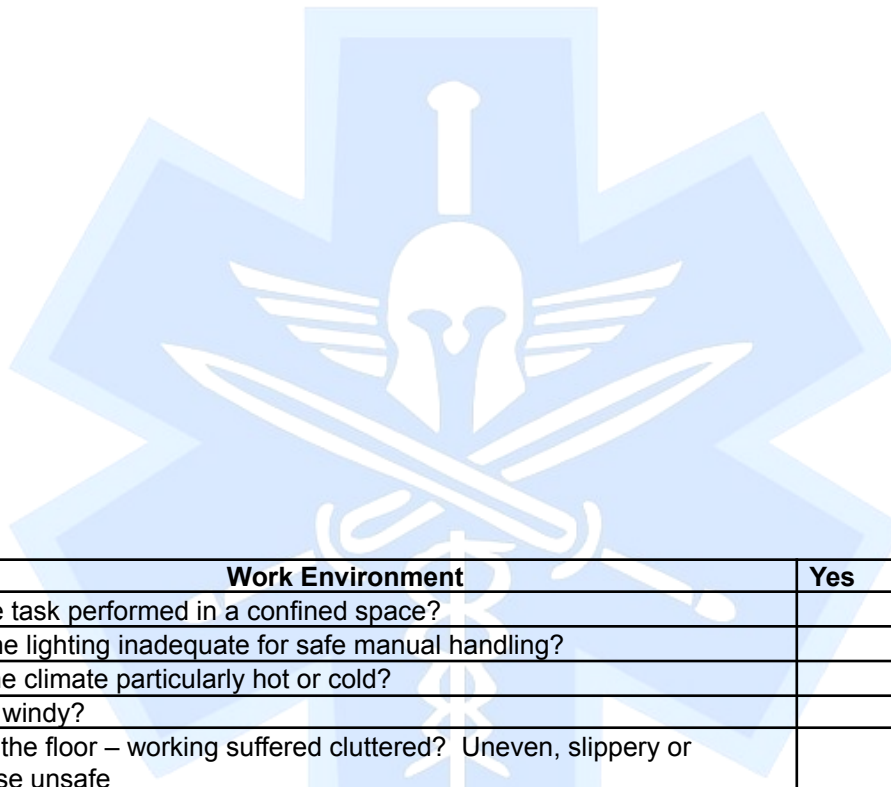
**The existence of any of the following key risk factors, that is, a Yes answer, indicates the need for further assessment**

<b>1. Is weight a risk factor</b>	<b>Yes</b>	<b>No</b>
(a) More than 5kg and handled from a seated position?		
(b) More than 16kg and handled in a working posture other than seated?		
(c) More than 55kg?		

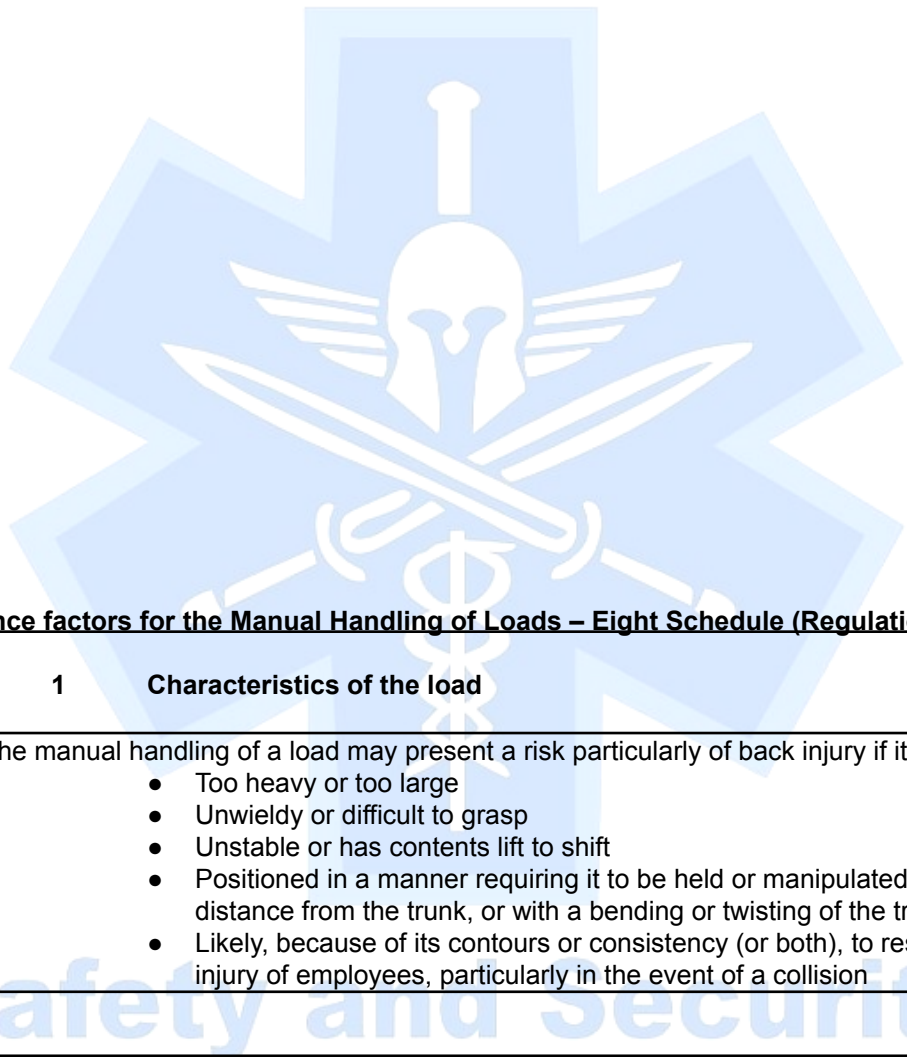
*Note; Weight is not used to prescribe absolute limits, but is one of the important factors to be considered when assessing and controlling the risk*

	<b>Yes</b>	<b>No</b>
2. For pushing, pulling or other application of forces, are large push/pulling forces involved?		
3. Is the load difficult or awkward to handle, for example due to its size, shape, temperature, instability or unpredictable?		
4. Is it difficult or unsafe to get adequate grip of the load?		

<b>During Manual Handling</b>	<b>Yes</b>	<b>No</b>
5. Is there frequent or prolonged bending down where the hands pass below mid – thigh height?		
6. Is there frequent or prolonged reaching above the head?		
7. Is there frequent or prolonged bending due to extended reach forward?		
8. Is there frequent or prolonged twisting of the back?		



<b>Work Environment</b>	<b>Yes</b>	<b>No</b>
9. Is the task performed in a confined space?		
10. Is the lighting inadequate for safe manual handling?		
11. Is the climate particularly hot or cold?		
12. Is it windy?		
13. Are the floor – working surfaces cluttered? Uneven, slippery or otherwise unsafe		
14. Are awkward postures assumed frequently or over prolonged periods, that is, postures that are not forward facing and upright?		
15. Is the manual handling performed frequently or for long time periods by the employee?		
16. Are the loads moved or carried over long distances?		
17. Is the employee new to this work or returning from an extended period away from work?		
18. Are these physical factors e.g. Height, body size, disabilities, etc.		
19. Does the employee's clothing or personal protective equipment interfere with the manual handling performance?		
20. Is the employee's informed of the hazards and trained in the appropriate manual handling techniques?		



**Reference factors for the Manual Handling of Loads – Eight Schedule (Regulations 28)**

**1 Characteristics of the load**

The manual handling of a load may present a risk particularly of back injury if it is:

- Too heavy or too large
- Unwieldy or difficult to grasp
- Unstable or has contents lift to shift
- Positioned in a manner requiring it to be held or manipulated at a distance from the trunk, or with a bending or twisting of the trunk, or
- Likely, because of its contours or consistency (or both), to result in injury of employees, particularly in the event of a collision

Where the above manual handling hazards and a risk particularly of back injury has been identified, the control measures necessary to reduce the risk may be evident from the answers to the following questions;

- (a) Can the load be made lighter by being packaged in smaller containers or packages?
- (b) Can the load be made less bulky, so that it can be handled closer to the employee's body?
- (c) Can the shape or surface texture of the load be changed to make it easier to grip?
- (d) Could the surface be cleaner or cooler, or the edges less sharp, so that the employee can hold the load against the body?

- (e) Can handles be provided, or some type of sling is used to move the load?
- (f) Is the load designed, or the material packaged so that it will not shift unexpectedly while it is being moved?

**Note that particular attention should be paid to the handling of live animals and humans.**

Persons or animals can either hinder or aid the manual handler (e.g. co – operative patients as against un co – operative). Animals or patients that are un co – operative should not be lifted at all (if possible) a hoist should be used or some method of mechanical aid because they would be a dead weight.

## **2 Physical Effort Required**

A physical effort may present a risk particularly of back injury if it is;

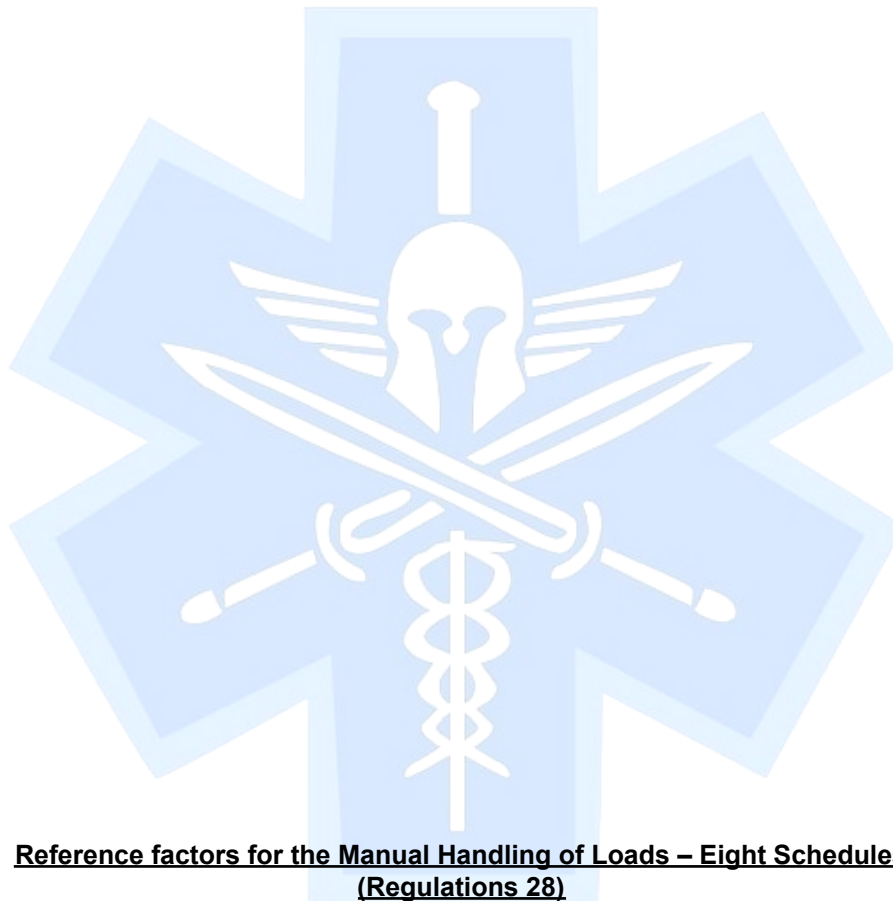
- Too strenuous
- Only achieved by a twisting movement of the trunk
- Likely to result in a sudden movement of the load, or
- Made with the body in an unusual posture.

Where the physical efforts required poses a risk of injury the following control measures should be helpful in reducing it;

**Lifting and lowering forces can be reduced by;**

- (a) Using lifting tables, forklifts, cranes, hoists, balancers, drum and barrel dumpers, work dispensers, elevating conveyors and similar aids, raising the work level, lowering the position of the employee and using gravity dumps and chutes;
- (b) Reducing the weight involved by reducing load size (specifying to suppliers, for example, in regard to size of

- packaging), reducing the number of objects lifting and lowered at one time;
- (c) Reducing the extent of the holding position away from the body by changing the object shape, providing suitable grips or handles, providing greater access to the load and improving workplace layout; and
  - (d) Converting to the pushing or pulling.



**Reference factors for the Manual Handling of Loads – Eight Schedules  
(Regulations 28)**

**Pushing and pulling forces can be reduced by;**

- (a) Eliminating the need to push or pull by using powered conveyors, powered trucks, movers, slides, rollers or chutes;
- (b) Using non powered conveyors, air bearings, ball castor tables, monorails and similar aids, four wheeled hand trucks, hand trolleys with good bearings and large diameter wheels or castors;
- (c) Appropriate to the particular surfaces, providing good maintenance of equipment and floor surfaces on which mechanical pushers or pullers are used; and
- (d) Reducing the distance of push or pull by improving work area layout, relocating production or storage area or similar changes in the system of work.

**Carrying forces can be reduced by;**

- (a) Converting to pushing or pulling, by use of conveyors, air bearings, ball castor tables, monorails, slides, chutes, and similar aids, forklifts, two or four wheel hand trucks, trolleys and similar equipment.
- (b) Reducing the capacity of containers, container load and the number of objects carried at the one time and
- (c) Reducing carry transport distance by improving work area layout, relocating storage or production area, or similar changes in the system of work.

**Holding forces can be reduced by;**

- (a) Reducing the weight or size of the load
- (b) Reducing holding time
- (c) Eliminating holding by using, for example, jigs and fixtures, and
- (d) Using mechanical loading and unloading

**Principals involved in minimizing the risk of injury when applying force includes**

- (a) Pushing/pulling is more efficient if applied at or around waist level
- (b) Pushing in/ pulling out is stronger than left/right (across the body), and
- (c) For manual handling, significantly higher push/pull forces are possible standing rather than seated and the use of body weight in pushing/pulling is preferred.

**Twisting movements can be reduced by;**

- (a) Positioning all tools and materials in front of the employee;
- (b) Using conveyors, chutes, slides or turntables to change the materials flow direction;
- (c) Providing adjustable swivel chairs;
- (d) Providing sufficient work space for the employee's whole body to turn; and
- (e) Improving the layout of the work area.

**Reaching motions can be reduced by;**

- (a) Positioning tools and machine controls close to the employee;
- (b) Positioning materials, work pieces and other heavy loads as near the employee as possible;
- (c) Enabling the load handled to be kept close to the body;
- (d) Reducing load or container size, and
- (e) Enabling the employee to walk around the load or to rotate it.

**Bending movements can be reduced by;**

- (a) Using lift tables, work dispensers and similar mechanical aids;
- (b) Raising the work level;
- (c) Positioning all material at work level;
- (d) Keeping materials at work level, for example, avoid lowering objects which must be lifted later, and
- (e) Eliminating large horizontal reaches.



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**References factors for the Manual Handling of Loads – Eight Schedule (Regulations 28)**

## **3 Characteristics of the Working Environment**

The characteristics of the working environment may increase a risk particularly of back injury if;

- There is not enough room, in particular vertically, to carry out the activity,
- The floor is uneven, thus presenting tripping hazards, or is slippery in relation to the employee's footwear.

Factors in the work environment, which influence risk, include climate, lighting, space, floors and other surfaces underfoot – clear path way.



Housekeeping and footwear are associated factors that have particular relevance for risk of slips, trips, and falls while handling loads.

Answering YES to any of the following questions indicates an increased risk of injury particularly back injury;

- (a) Are the floors and surfaces underfoot uneven or slippery?
- (b) Are there different floor levels in the workplace?
- (c) Is the workplace untidy with a lack of attention to housekeeping details?
- (d) Are there extremes of heat, cold, wind or humidity?
- (e) Are there high levels of fumes, dusts, gases or vapours?
- (f) Is there excessive vibration?
- (g) Is the task performed in a confined space?
- (h) Is the lighting adequate?

#### **4 Requirements of the Activity**

The activity may present a risk particularly of back injury if it entails one or more of the following requirements

- Over frequent or over prolonged physical effort involving in particular the spine,
- An insufficient bodily rest or recovery period,
- Excessive lifting, lowering or carrying distances, or
- A rate of work imposed by a process, which cannot be altered by the employee.



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The risk of injury increased with the increased frequency, repetition and duration of manual handling activity by any one employee in a work period. How often, and for how long, a task is performed are key factors to be considered.

Problems with frequency and duration are not restricted to lifting or lowering of loads. Pushing, pulling, carrying and holding of loads can also be a problem if performed frequently or for prolonged periods. There are several factors, which influence a person's ability to continue prolonged exertion. These include available energy reserves, the employee's physical fitness and relative workload, (i.e. the proportion of the employee's physical capacity engaged by the task)

Distances over which loads are manually handled should be as short as possible. The longer the distance the lighter the load that can be carried without increased risk.

If the load is located above the employee's shoulder height or below mid-length height or otherwise requires extended reach, then the risk of injury is increased. An increase also occurs when a load must be manoeuvred to be placed accurately into position.

Where a process is dictating the pace of manual handling as well as there being continuous and repeated movements the employee may be exposed to the risk of upper pains and discomfort.



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