

Material Handler Operator Safety Training



ISRI

Voice of the Recycling Industry™

Institute of
Scrap Recycling
Industries, Inc.

This training manual is designed to assist supervisors and managers in the training of their material handler operators. The guidelines set forth in this training manual are known safety regulations transcribed from written OSHA and the American Society of Mechanical Engineers (ASME) standards. Failure to follow these regulations may result in damage to the equipment or injury to personnel.

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Special thanks to Caterpillar, Liebherr, and Sennebogen for the use of their photographs in this Safety guidebook.

Material Handler Operator Safety Training

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Introduction

The purpose of this program is to help make equipment safety training consistent throughout the scrap recycling industry. This program may serve as a foundation for a company's material handler written safety program and it should help ISRI members achieve compliance with Industry and Federal regulations. The primary purpose is to help educate owners, users, operators, maintenance personnel, and safety professionals about the hazards associated with operating material handlers in the scrap recycling industry.

This training manual is designed to assist supervisors and managers in the training of their material handler operators. Material handler operators, like any other mobile equipment operator, have a responsibility to safely operate the equipment that they have been assigned to. This manual offers information and guidance in the development of a comprehensive mobile equipment safety program for your recycling facility. The guidelines laid out in this training manual are based upon safety regulations transcribed from written OSHA and ASME

standards. It is important that the user of this manual follow ALL applicable standards that apply to the machine that they are operating. Along with OSHA and ASME standards the user should abide by any state, local, company, and equipment manufacturer standards and guidelines. Failure to do so may result in damage to the equipment or injury to personnel.

This training is designed to teach important safety practices to material handler operators and those individuals who work around this type of heavy equipment. This book is to be used in conjunction with hands-on practical training and the OEM operator's manual. It is NOT meant to replace them nor is it meant to create new standards.

This manual will teach material handler operators and those working around material handlers about the potential dangers involved with the equipment. It is through training, education, and experience that you will gain the knowledge needed to work safe and smart. This training should be considered part of this process.

Chapter ONE

Objectives

1. Understand the importance of OSHA and ASME regulations.
 2. Identify the different types of material handlers in operation at their plant.
 3. Identify parts of machinery.
-

Regs and Terms

While we don't find a specific regulation within the OSHA code of federal regulations that addresses the material handler in the scrap industry itself, there is one consensus standard known as ASME B30.25. This important document includes provisions that apply to the construction, installation, operation, inspection, and maintenance of scrap and material handlers. A material handler is a machine consisting of a base, a revolving upper structure with operator's station, and a front for lifting scrap or other materials. It uses attachments such as magnets or grapples, and any variations thereof in which the equipment retains the same fundamental characteristics. In chapter 1 of the ASME B30.25 standard it specifically addresses the construction and characteristics of the machine. In chapter 2 of the ASME B30.25 standard the inspection, testing, and maintenance requirements are found. And in

chapter 3 of the ASME B30.25 standard you will find the requirements for safe operation. These include owner, user, and operator requirements and qualifications.

For the operator training on this equipment we will rely on the ASME B30.25 consensus standard as the foundation for scrap and material handler operator training. This standard along with all local, state, company, and manufacturer guidelines should be followed as part of your material handler operator safety program.

It is important for owners, users, and operators of material handlers to understand the terms used to describe the various parts of the machinery. The following terms and definitions will help you to better understand the many parts of your machine.

Definitions¹

Types of Scrap and Material Handlers

Crawler handler: mounted on a base, equipped with crawler tracks for travel (see Fig. 1a).

Pedestal-mounted handler: mounted on a pedestal base (see Fig. 1c on page 7).

Rail-mounted handler: mounted on a base, equipped for travel on a railroad track.

Wheel-mounted handler: mounted on a base, equipped with axles and rubber-tired wheels for travel, a power source, and having a single control station for driving and operating (see Fig. 4d and 4e on page 25).

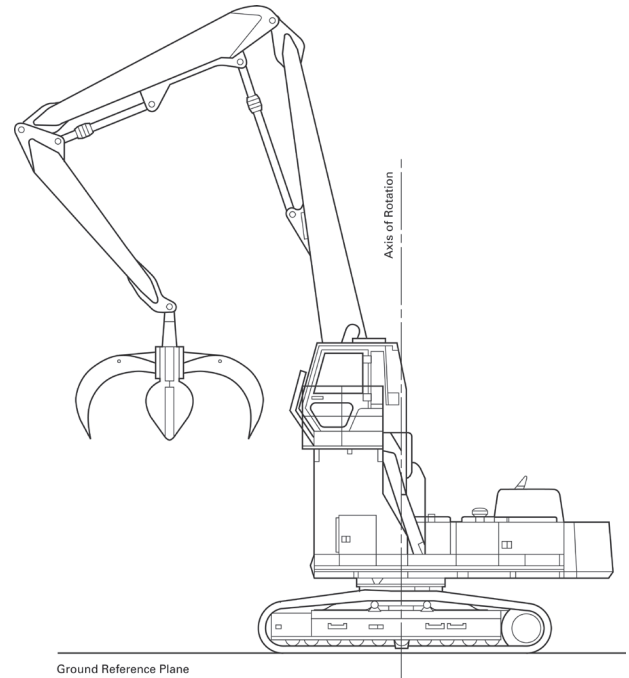


Figure 1a

General Terms

Arm cylinder(s): the hydraulic cylinder(s) that moves the arm in relation to the boom.

Arm (stick): the second section of a front, on end of which is attached to the boom.

Attachment: an accessory like a magnet or grapple that is affixed to the second or third member of a front.

Axis of rotation: the vertical axis around which the handler upper-structure rotates.

Base (mounting): the structure on which the rotating upper-structure handler is mounted.

Boom: first section of a front, one end of which is attached to the upper-structure.

Boom cylinder(s): the hydraulic cylinder(s) that move(s) the boom vertically in relation to the upper-structure.

Brake: a device used for retarding or stopping motion.

Cab: a weatherproof housing that covers the operator's station.

Counterweight: weight used to supplement the weight of the handler in providing stability for handling loads.

General Terms

Daily: a work shift consisting of a period of 10 hr or less usage within a 24-hr period.

Designated person: a person selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

Front: consists of two or three structural members actuated by hydraulic cylinders that are affixed to the upper structure for mounting the attachment.

Jib: third section of a front, one end of which is attached to the arm.

Jib cylinder(s): the hydraulic cylinder(s) that move(s) the jib in relation to the arm.

Lift capacity: ratings in pounds (kilograms) established by the manufacturer or assembler/modifier.

Monthly: a period of 200 hr or less usage within a 30-day period.

Outriggers: extendable or fixed members attached to the mounting base that are used to raise, level, and support the handler.

Qualified person: a person who, by possession of a recognized degree in an applicable field, or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

Scrap: metals, paper, plastic, glass, rubber, or textiles that are diverted, collected, sorted, shredded, sheared, baled, chipped, separated, sized, or otherwise processed for use in making new products.

Side loading: a non-vertical load applied to the vertical plane of the front.

Stick: the second section of a front, one end of which is attached to the boom.

Structural competence: the ability of the handler and its components to withstand the stresses imposed by the applied loads.

Swing: rotation of the upper structure for movement of loads in a horizontal direction about the axis of rotation.

Three points of support: features of an access system that permits a person to use two hands and one foot, or two feet and one hand while ascending, descending, or moving about on the handler.

Travel: the movement of the handler under its own power from one location to another.

Upper-structure: the rotating frame structure of the handler and the operating machinery mounted thereon.

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Parts of the Machine

While we don't find a specific regulation within the OSHA code of federal regulations that addresses the material handler in the scrap industry itself, there is a consensus standard known as ASME B30.25. This important document includes provisions that apply to the construction, installation, operation, inspection, and maintenance of scrap and material handlers. A material handler is a machine consisting of a base, a revolving upper structure with operator's station, and a front for lifting scrap or other materials. It uses attachments such as a magnet or grapple.

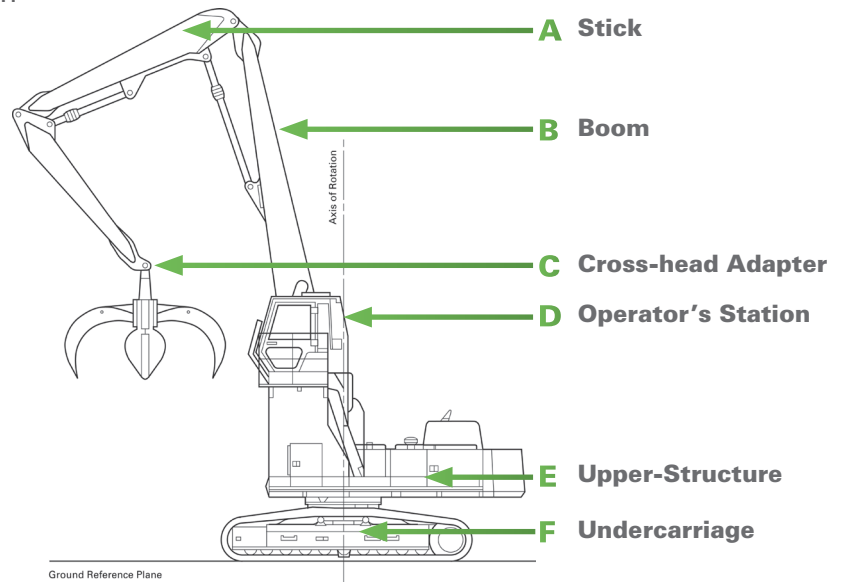


Figure 1b

Getting to know the Equipment

As an operator or supervisor of this equipment you need to become familiar with key terms and areas on a material handler. Figure 1b highlights these key areas. Within each of these areas you will find many more important inspection points, most of which we will talk about later in this course. For now learning these key areas will help you build a foundation as your knowledge becomes more familiar with material handlers.

Starting at the top of figure 1b you see the **stick** (A) and the **boom** (B). This drawing shows a machine with a three-piece front. The third piece is known as the jib. At the end of the jib you find the **cross-head adapter** (C). The **operator's station** (D) is part of the **upper-structure** (E) of the machine. The material handler rests on the **undercarriage** (F), which

consists of (in the case of figure 1b) a turntable and frame which the tracks attach to. You will also find many other types of material handlers in use in recycling facilities. The model shown in Figure 1c is a pedestal mounted unit.

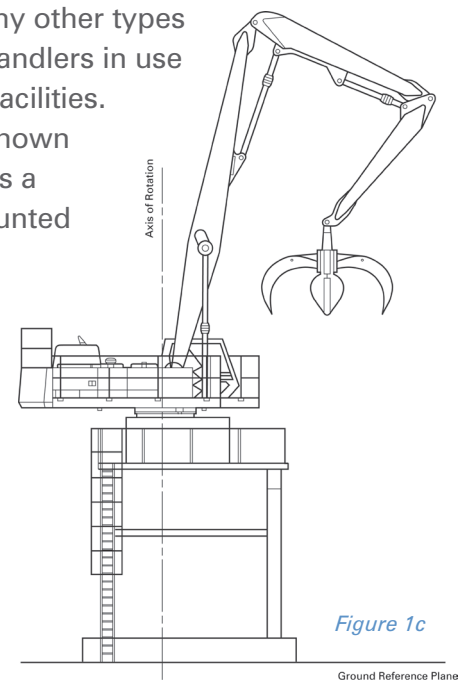


Figure 1c

Chapter TWO

Objectives

1. Understand the operator's role with plant safety.
 2. Identify safety messages and understand their meaning.
 3. Understand the "circle of safety" and how it relates to the operator and others in the area.
 4. Identify the different types of distractions that present themselves to a material handler operator.
-

Safely or Not at All™!

A material handler is a purpose built machine that is designed to pick up and place different types and shapes of material into piles, shipping containers, rail cars, shredders, balers, shears, or ships. Material handlers are commonly found at scrap recycling facilities where they are used to move the scrap materials from place to place. They vary in size from very large to small. And they typically use a magnet or grapple to pick up and move the scrap materials that the equipment operator has been assigned to process. For safe operation of a

material handler, you must be a qualified and authorized operator. As a responsible operator you must clearly understand the operator's manual and be trained both in the classroom and on the machine you will be operating. You must know and follow all of the safety rules and policies that apply to your company. Finding the best operators and making sure that they are qualified to safely and efficiently run the equipment is an important part of your company's operations, maintenance, and safety programs.

Take Control of Your Safety

Because your company values safety, **it is your job to know, understand, and follow all of the safety policies that are in place at your work location.** Many companies hold “tool box” talks or mini safety meetings at the beginning of each shift. These meetings most often cover safety issues or operational

concerns that employees, supervision, or management are having at the time. This is a good time for you to bring up any safety issues that you can think of. It is important to get these issues resolved. And most times this can be accomplished simply by making others aware of the problem in the first place.



Figure 2a



Figure 2b



Figure 2c



Figure 2d

Safety Messages

As an operator, mechanic, or someone who works around material handlers you must be aware of the many important safety messages that are often found on the equipment and in the operator’s manual. Shown above are a few of these symbols and their meanings. These important messages are designed to inform

you and others who work with or around the equipment of the potential hazards that are present.

It is your responsibility to pay close attention to the OEM operator’s manual and safety stickers that will be on the material handler.

The Three Point Rule

When climbing up/down, or on/off of the material handler it is the responsibility of the person climbing on or off of the machine to always use all of the steps, grab irons, and hand rails. The **three point rule**, a method where the person is safely climbing up/down, or on/off of something ensures that at least two hands and one foot, or two feet and one hand remain in contact with the steps, grab irons, or hand rails at all times. Sticking by this rule 100% of the time will reduce accidents and injuries caused by slips, trips, and falls while ascending or descending equipment.

Before climbing on the machine to operate it you will do a pre-operational inspection or a safety walk around to note the condition of the material handler as well as the condition of the surrounding area. The model daily pre-operational inspection sheet found on page 16 covers the main sections of a material handler. These terms are important for owners, users, and operators to know and understand.

Any time an operator is going to climb into the cab to operate a piece of equipment they should do a complete 360 degree tour around the machine. We call this the **“circle of safety”** (figure 2f). This walk around the machine will help to assure an operator, supervisor, or maintenance person that there are no people, vehicles, scrap, or other hazards in the area. This area around the machine is also known as a “NO GO ZONE.” It is known as a “NO GO ZONE” because an operator who is in the cab has significant blind spots. And



Figure 2e

these blind spots can be hazardous if they are not understood by people on the ground, truck drivers, other equipment operators, and even visitors to the plant. An operator has to maintain control of their work area at all times. This means that they should never allow anyone to enter their work zone unless they personally invite them to do so. As an operator you always want people to respect your operating radius. This important safety lesson cannot be overlooked.



Figure 2f

Safe Surroundings

When inspecting the material handler it is important to be sure that you are in a safe location. Be sure to check your surroundings and ensure that there are no hazards such as other moving equipment nearby, a mobile shear at work that could send material flying toward

you, a cast breaking operation, or other hazards such as overhead power lines, or railroad operations. By taking these precautions you will help to ensure your safety while you do the equipment inspection.

Distractions

As the person given the responsibility to safely operate the material handler you have to be sure to do so without any distractions. Modern technology like smart phones allow people to listen to music, send instant text messages to one another, and make phone calls. These

things should **NEVER** interfere with the safe operations of heavy equipment. You have to remain focused on the job in front of you and be sure to practice good safety habits at all times.

Quiz Yourself

1. The proper term for the action seen below is:
 - A. Climbing the ladder
 - B. Accessing the cab
 - C. The three point rule
 - D. Ascending to the operator's station



2. Where can an operator find safety messages?

3. Who is responsible for the machine operator's safety?

4. Why is the "circle of safety" an important part of an operator's job?

5. By doing a 360 degree walk around a material handler what can be seen by an operator?

Chapter THREE

Objectives

1. Understand the importance of the pre-operational inspection.
 2. Understand the importance of properly filling out a pre-operational inspection sheet.
 3. Identify attachment types and their uses.
 4. Identify inspection points on material handler attachments.
 5. Know the hazards associated with electricity and hydraulic pressure.
-

Pre-Operational Inspection

Why do we inspect the machine?

The pre-use or pre-operational inspection may very well be the most important thing that you do as part of your daily routine. Due to the size and mechanical make-up of this machine it is extremely important that owners, managers, supervisors, and operators understand the importance of this step. Because the operator is the person sitting in the seat for a good part of the day they must be the person that inspects the machine to ensure that it is safe for operation. Material handler operators should always do a “walk-around” inspection before entering the cab to begin working with the machine. There are many reasons for an operator to do this. Most importantly, it is a **“Best Practice” for safe mobile equipment operations**. This “walk-around” inspection will also help an operator to understand the **set-up**

of their machine, the ground conditions, the overhead and lateral hazard possibilities, the possibility of any people or other equipment in the area, and the possibility of any scrap of other material that may be fouling the work area and travel area of the material handler. It is the responsibility of a material handler operator to know his/her surroundings and to be able to make an educated decision about the safety of the location, condition, and operation of the equipment.

What to look for

The operator should be familiar with and know where to check all fluid levels like hydraulic oil, motor oil, swing gear oil, antifreeze or coolant, and any other manufacturer recommended fluid

Pre-Operational Inspection

check points. The operator is also responsible for checking the condition of the machine undercarriage, the turntable, as well as all steps, ladders, and grab irons. They must also look closely at the boom and stick condition. A good operator is looking for the possibility of cracks or distortion in the steel which makes up the boom/stick portion of the machine. The operator will also look over the condition of all hydraulic cylinders and hoses as well as the cross head adapter. **The importance of this pre-operational inspection cannot be stressed enough.** The operator must understand that the machine is an important company asset and must be treated as such. Most importantly the operator must understand that it is their body in the seat of the machine so they will want a safe and reliable piece of equipment to operate.

Any deficiencies or problems that are seen during this pre-operational inspection must be noted on an inspection sheet (see fig 3a) or communicated to the supervisor of the material handler operator. This communication process will help the company to track the

life and reliability of the machine. It will help to note issues with the machine that have been addressed or need to be addressed. And it will also help the maintenance personnel prioritize any necessary issue(s) that need to be addressed.

Inspection sheet example

The inspection sheet is an important link between the operator, maintenance, and management. Because the operator is responsible for machine safety and condition he/she should completely fill out the sheet noting any deficiencies found on the equipment.

At times you may find deficiencies that could be safety issues. If this is the case you should immediately notify your supervisor to review the situation.

Your facility will most likely have a similar version of these pre-operational inspection sheets. The inspection sheet can often be found in the operator's manual too.

Pre-Operational Inspection

Material Handler Pre-Operational Inspection

Date: _____

Unit Number: _____

Hour Meter Reading: _____

Operator Name: _____

What Are You Inspecting?	What Are You Looking For?	Operator Comments
From The Ground		
Mag/Grapple	Excessive Wear or Damage, Cracks	
Mag/Grapple Connections	Excessive Wear, Damage, Leaks	
Mag Chains/Shackles/Pins	Excessive Wear or Damage	
Cross Head Adapter	Excessive Wear, Damage, Cracks	
Stick, Cylinders	Damage, Cracks	
Boom, Cylinders	Wear, Damage, Leaks	
Underneath of Machine	Leaks, Damage	
Counterweight & Bolts	Tightness, Damage	
Carbody	Cracks, Damage	
Undercarriage	Wear, Damage, Tension	
Steps and Handholds	Condition and Cleanliness	
Batteries & Hold Downs	Cleanliness, Loose Bolts & Nuts	
Air Filter	Restriction Indicator	
Fire Extinguisher	Charge, Type, Damage	
Lights	Damage	
Mirrors	Damage	
Overall Machine	Loose or Missing Nuts & Bolts, Loose Guards, Cleanliness	
Engine Compartment		
Swing Gear Oil	Fluid Level	
Engine Oil	Fluid Level	
Engine Coolant	Fluid Level	
Radiator/Oil Cooler/Condenser	Fin Blockage, Leaks	
Hydraulic Tank/Pump	Fluid Level, Damage, Leaks	
Fuel Tank	Fuel Level, Damage, Leaks	
Inside the Cab		
Seat	Adjustment	
Seat Belt and Mounting	Damage, Wear, Adjustment	
Windshield Wipers & Washers	Wear, Damage, Fluid Level	
Overall Cab Interior	Cleanliness	
Comments		

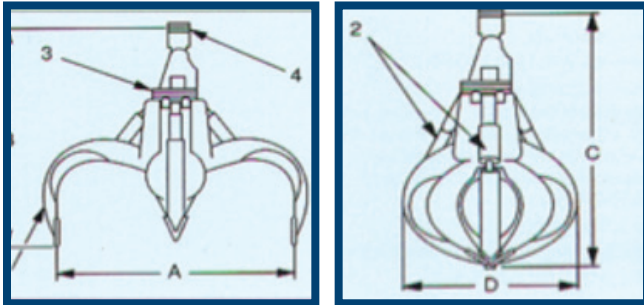
Figure 3a

Pre-Operational Inspection

Attachments

The material handler is designed to work with a magnet or a grapple. Whichever work implement your company chooses to place on

Typical 4-Tine Grapple (Orange Peel) *Figure 3b*



1. Grapple Tines 2. Grapple Cylinders
3. 360° Grapple Rotator 4. Mounting Pin

the cross-head adapter or “tip” of the machine you are operating it is part of **your job** to understand how to use it safely and efficiently. The more care that is given to these implements the longer they will last.

It is a best and safe practice of a good operator to inspect the cross-head adapter, magnet, or grapple along with the rest of the machine on a daily basis. Before you inspect these important areas be sure that all possibility of any stored energy has been released. Stored energy that is potentially hazardous includes electrical, hydraulic, and gravity. Be safe and note that the grapple or magnet is on the ground or on a cradle and that they are de-energized.

Daily Inspection Points

A material handler is a machine, or system that is comprised of many moving parts. Many of these parts rely on each other to make the system function smoothly and safely. If any parts of the system are overlooked or not maintained according to the manufacturer’s recommendations you have the potential for a premature failure with your machine. Because of this the operator has to realize the importance that must be placed on this routine task.

When you start your inspection pick a beginning spot that will be easy to recreate every day. Most operators begin looking at the implement (magnet or grapple) that is at the tip of the stick.



Figure 3c

Implement inspection

As you look over a magnet be sure to check all of the pins and connectors that hold it to the cross head adapter. This includes the bridle chain, master link, and shackle. Also be sure that the electrical line that energizes the magnet is in good condition. Any exposed wires can cause a short in the electrical system which can result in unnecessary down time. If you

Pre-Operational Inspection

are using a grapple as your implement be sure to thoroughly look it over for structural integrity. Making sure that there are no broken finger tips, missing connector pins or bolts, and that the hydraulic lines and cylinders are in good condition. These areas, whether on a magnet or a grapple, will experience a lot of wear throughout their life as integral parts of the machine's lifting system. If any one of these parts fail there is a possibility that the heavy magnet, or grapple, could come off of the machine. So do your part and keep a sharp eye on these areas. Be sure to note any mechanical or safety issues on your daily inspection report. And always notify your supervisor if you think that the issue needs their attention.

Boom, stick, cross-head adapter

After your thorough inspection of the material handler's implement you should look over the cross head adapter. This important piece of the equipment is what holds the magnet or grapple system to the machine. Look this area over for any cracks or deformations and be sure that if there are any grease fittings on your cross head adapter that they get greased according to the manufacturer's recommendations. Next you will look up from the cross head adapter and see the tip of the stick. The stick is the second piece of the machine's front section. Most material handlers consist of a 2-piece front combination. These pieces are called the boom (which is the

part closest to the machine's body) and the stick (which is connected to the boom). Some material handlers you encounter might have 3-piece fronts that consist of a boom, stick, jib combination, but most often you will see a 2-piece front like the one shown here (figure 3d).

When you inspect the boom and stick you should look for any cracks or deformations in the structure. Note the condition of the



Figure 3d

hydraulic cylinders. And be sure to look at all of the connectors that hold the cylinders in place. Also be sure to note any rust trails. Rust trails are often good indicators that there may be a crack nearby. If you spot any areas like this you will want to inspect that section closer to investigate the reason for the rust trail.

Pre-Operational Inspection

Undercarriage and turntable

While you are still on the ground you can inspect the condition of the undercarriage, frame, and the machine's turntable. Be sure to look for any cracks, deformations, and loose or missing pins or bolts. Your machine might be a wheeled unit, a pedestal mounted unit, or it could be set up on tracks. No matter what type of base your machine is set-up upon that base must be inspected daily. Remember that you are putting your body in the seat of this machine so you will always want a safe and reliable place to do your work.

Fluid check points

One of the things you will most likely check at elevated areas of the machine will be fluid levels. These critical areas should be checked every shift. They include the motor oil level, hydraulic oil level, coolant level, and swing gear oil level. It is important that you consult

the operator's manual for the machine that you are assigned to as some material handler manufacturers will recommend a specific set-up or boom and stick position when you check the hydraulic fluid level. The operator's manual will also give you guidance on how to read the different sight glasses and dip sticks found within the machinery.

Safety

Always keep safety in mind when you do the pre-operational inspection. During the inspection process you will find yourself climbing up and down on the machine as well as reaching into compartments to pull out dipsticks. As a professional equipment operator it is part of your job to take care of the equipment. And it is your job to take care of yourself. This means that you should always go home in the same condition that you came in to work, healthy and whole.

Quiz Yourself

1. The pre-operational inspection should be done:

- A. During the lunch break
- B. At the end of the shift
- C. At the start of the shift
- D. When time permits

2. Who benefits from equipment that is in good/safe condition?

3. What can an operator see if he/she walks completely (360 degrees) around the machine?

4. The cross-head adapter should be inspected on a _____ basis?

- A. Daily
- B. Weekly
- C. Monthly
- D. Annual

5. The control of hazardous energy is also known as? _____
Name the sources of hazardous energy on a material handler.

6. Name four inspection points on a magnet or a grapple.

Chapter FOUR

Objectives

1. Identify potential hazards and how they can affect safety.
 2. Identify safe vs. un-safe set up conditions.
 3. Understand how to read a load chart.
 4. Identify NO GO ZONES around the equipment.
 5. Determine how to maximize efficiency when setting up the material handler for duty cycle work.
 6. Understand what clear communications are.
 7. Identify internationally recognized hand signals.
-

Machine Operation

In the Cab

With the inspection of the material handler complete it is time to get to work. You will most likely be assigned a specific working location for your piece of equipment. At times your material handler will already be located in an area where it needs to be. While at other times you will be required to travel the machine to another area of the facility. **Keep in mind that as the operator, or person in control of the machine, you are responsible to operate safely and smoothly at all times.** When traveling the material handler it is important to watch for people, other vehicles, potholes, and any lateral and overhead hazards that could be in your way.

Before traveling or picking up scrap with the material handler the operator must be sure that they are properly situated in the cab. They must set the seat up to comfortably fit their body. And they must wear the provided seat belt at all times while operating the equipment. After starting the machine and warming it up according to the manufacturer's guidelines the operator should test the controls to be sure that they all function properly.

Set up considerations

When setting up to begin working you may be feeding a baler, shredder, or shear or you may find yourself loading a truck, railcar, or barge. No matter what it is that you will be working

Machine Operation

with it is important that your set up be safe for the job. The ground conditions must always be considered. Uneven ground can cause the material handler to be off balance. Keep in mind that rain, snow, ice, loose gravel, soft ground slope, etc., can change the operating capabilities of your machine. In order for the material handler to function at its best it is important to follow the manufacturer’s recommendations with your set up.

To maximize the efficiency with the material handler an operator will want to move the maximum amount of material in the minimum amount of time. This does not mean that the operator should push to be the “fastest” at the plant. It means that the operator will set his/her material handler up at such an angle that their range of motion is minimized. Be sure to keep safety in mind when setting up to move material. It is important that the operator has the best possible line of sight available to them.

Understanding load charts

All equipment has limitations. Some machines may be stronger than others, but they all have limitations nonetheless. We could say this about people too. So you must understand that when it comes to lifting with material handlers if you exceed the capacity of the machine you will most likely do one of the following: tip it over or compromise the structural integrity of the machine.

Manufacturers of material handlers typically place a sticker or placard in the operator’s cab.

This sticker or placard is known as a load chart (see figure 4a) and it must be in a location that is accessible to the operator while they are at the controls. This load chart is usually found to be in the Metric system (kilograms and meters) and the U.S. Customary equivalent (pounds and feet).

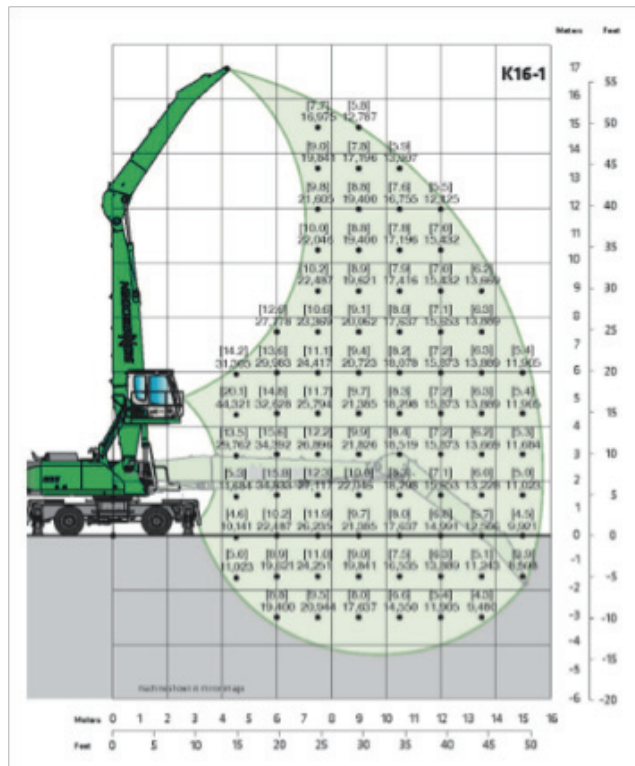


Figure 4a

The lift capacity shown on the load chart does not include the weight of the magnet or attaching hardware such as magnet bridle chains, shackles, or other attachment hardware. The weight plus the magnet payload shall not exceed the lift capacity values on the load chart. Also, keep in mind that changing conditions such as slopes, wind, ice, mud, soft ground, and type of load will affect the capacity and operating characteristics of your machine.

Machine Operation

To better understand how to use the load chart let's cover a few terms that are important to the operation of a material handler.

The term load point height is used to describe the distance from ground level to the tip of the stick of the machine (see figure 4a)

Maximum reach is the farthest distance that the implement (magnet or grapple) can reach out to under normal operating conditions.

The term load radius means, "the distance from the centerline of rotation to the center of the implement (magnet or grapple) when a load is attached to it" (see figure 4a).

The operator of a material handler must be able to demonstrate an understanding of the machine's load capacity chart. Knowing this information will help an operator to understand the possibilities and limitations of the equipment that they are working with.

Control of work area

While operating the material handler the operator must have control of the work area. This means that no one should be allowed to come within 50 feet of the operating radius of the machine. Operators of material handlers have significant blind spots that must be respected by anyone who may come near the machine. These hazard areas must be communicated to all company personnel, contractors, and customers who might be at

Material Handler

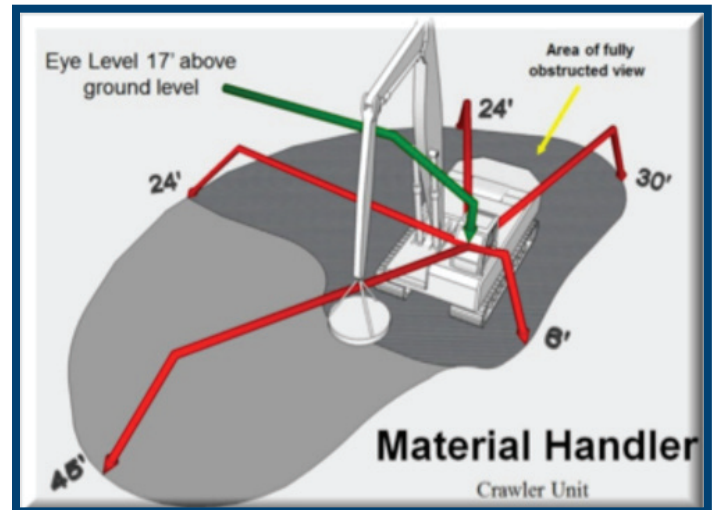


Figure 4b

Material Handler

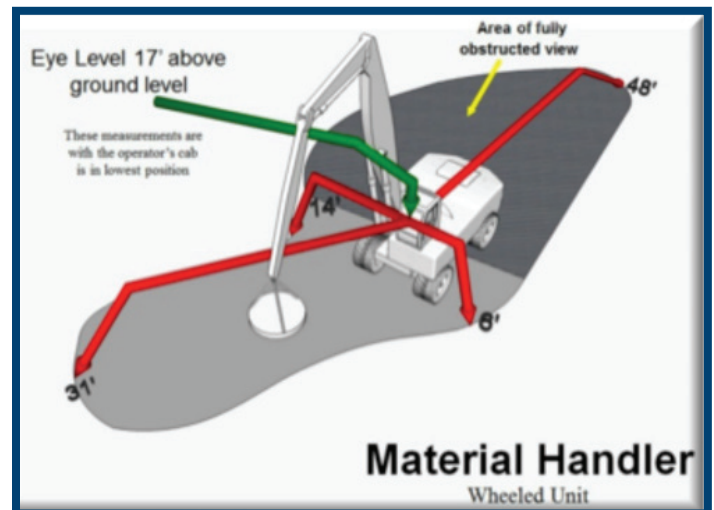


Figure 4c

your scrap processing facility. **No one should ever enter the pre-determined work zone around a material handler until they are recognized and invited to do so by the operator.**

Machine Operation

As a material handler operator you should already know that you have areas around your equipment that may be blocking your view to the side or rear of the machine. In figures 4b and 4c you will see examples of how these blind spots or **NO GO ZONES** can affect the vision of the operator. It becomes quite important not only for the operators of mobile equipment to understand these hazard areas but now we can see that all personnel who may come near the equipment must know what the operator sees and/or doesn't see. Those personnel who may come onto a recycling facility's property should be trained to recognize how to act/react around mobile equipment. Heavy equipment operators are taught to expect personnel who are trying to get their attention to either call them on the radio or to wave them down with hand signals. Only after the material handler operator has given the OK and invited the person signaling them to come into or around the area should the person signaling them start to move. And after the person has moved through the area as a courtesy they should always give a radio contact or hand signal to let the equipment operator know that they have cleared the area.

Feeding, Loading, Unloading, Relaying

Special attention must be paid to safety when the material handler is in operation. The operator is responsible for the safety of themselves, the equipment, and of the area surrounding the machine. These purpose built machines can be used for feeding, loading, unloading, or relaying various materials to many types of processing equipment or transportation vehicles (such as trucks, rail cars, or barges). At



Figure 4d



Figure 4e

each of the areas there may be other equipment (mobile or stationary), people, or other potential hazards (i.e., blind spots, potholes, soft ground, scrap material, any overhead or lateral hazards, etc.) that could foul the operation. Because of this it is important that material handler operators be trained to recognize potential hazards that might arise during their normal daily operations.

Prior to operating the material handler the operator must be sure that they have done a pre-operational inspection. During this inspection the operator will be assessing the

Machine Operation

surroundings for any of the above mentioned hazards. If any are noted it is important for the operator to inform their area supervisor of these hazards.

When setting the machine up to load, unload, feed, or relay scrap material it is always recommended that the operator do so in a manner that will be **most efficient** for the operations (see figure 4d). This means that material handler operators and their supervisors should assess the working area and come up with the most logical set up for the work to be done.

When handling long and irregular loads be careful to maintain clearance between the cab and the load (see figure 4e). Loads like

this can come back and strike the operator’s cab or elsewhere on the machine causing serious damage to the equipment or injury to personnel.

Communications

Giving and receiving good clear communications is the most important thing that you will do at your job. As a material handler operator or a supervisor of this equipment it is your job to communicate clearly. If the message sent to you is not understood then it is your responsibility to ask for the

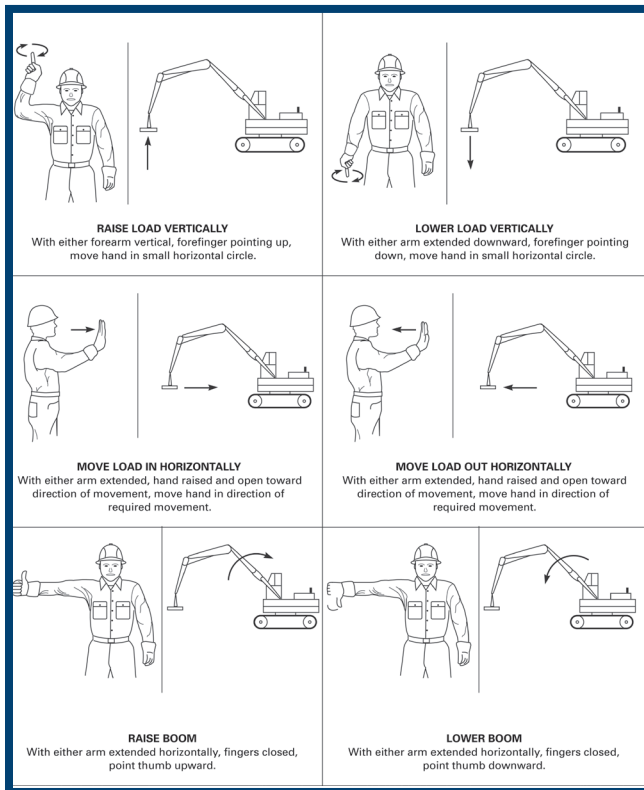


Figure 4f

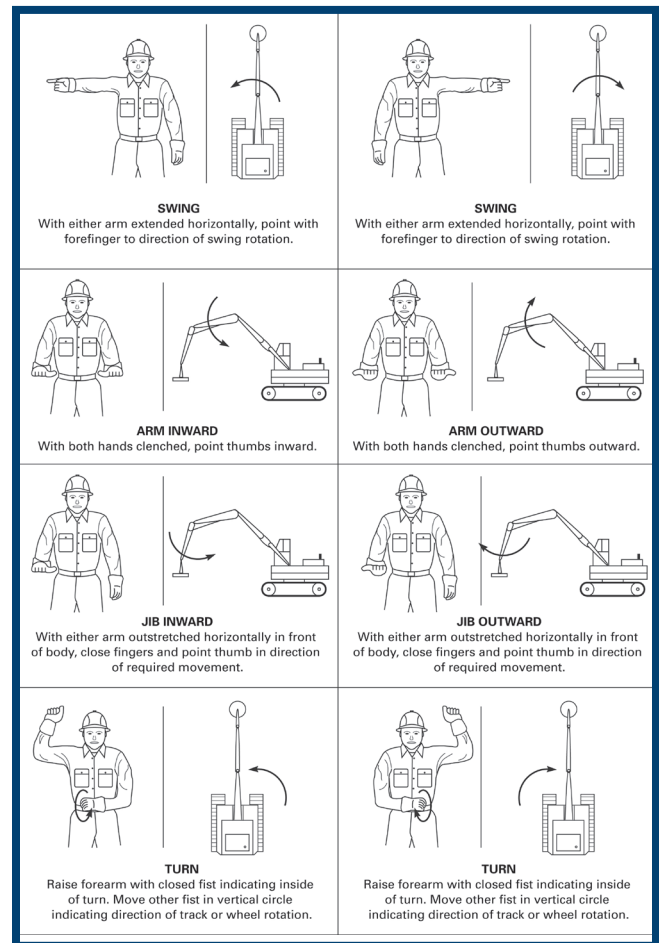


Figure 4g

Machine Operation

sender to clearly repeat it back to you until it is understood.

In your daily operations you will most likely communicate verbally to those you work with. If you have to communicate with others at a distance you might use a radio or you might use hand signals. As a material handler operator you must understand and know how to interpret the hand signal messages that are given to you.

Internationally recognized hand signals

As a material handler operator it is your responsibility to know and understand the internationally recognized hand signals for this equipment. These hand signals can be typically found within the operator’s manual that came with the equipment. Below you will see a chart of the internationally recognized hand signals (see figures 4f-h). These hand signals have been set forth by the ASME B30.25 consensus standard. When communicating with other personnel, whether they use a radio or hand signals, it is important that this communication between you (the material handler operator) and them (anyone else) is completely clear. If the message is not completely clear then it is your (the material handler operator’s) responsibility to make it known that you did not understand the given

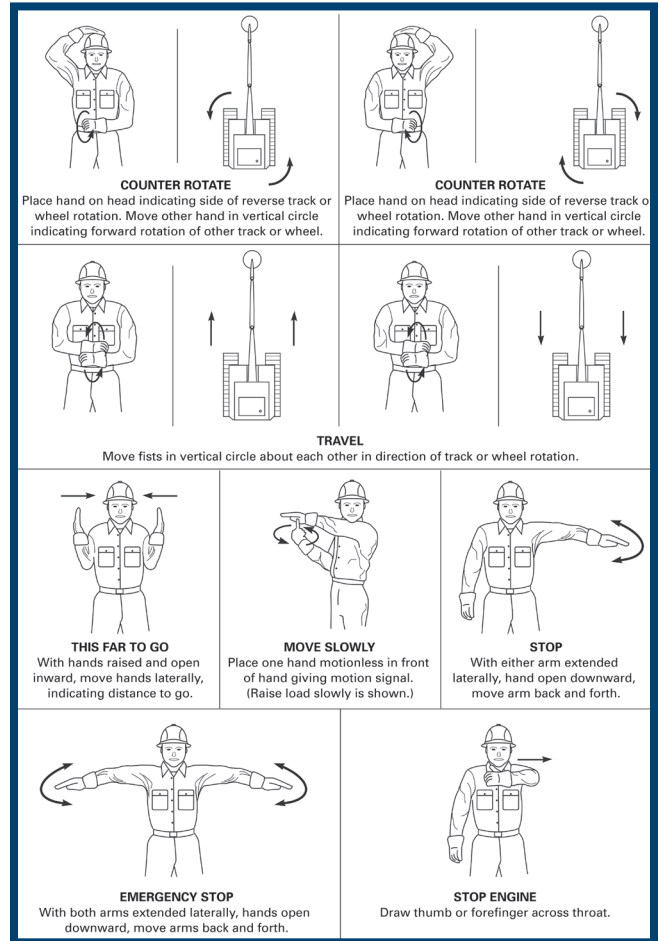


Figure 4h

hand signal or verbal command. As the person at the operator’s control station it is critical to note and understand that you are in charge of the operation and responsible for the safety of yourself, the equipment, and the surrounding area.

Quiz Yourself

1. What is the best type of ground to be set up on?
 - A. Rocky surfaces
 - B. Sloped surfaces
 - C. Soft surfaces
 - D. Even surfaces
2. Who is responsible for controlling the work area around the material handler?
 - A. Plant manager
 - B. Supervisor
 - C. Site safety manager
 - D. Operator
3. The _____ of your set up can help to maximize the efficiency of the machine operator?
4. What can an operator see if he/she walks completely (360 degrees) around the machine?

5.  What hand signal is being shown here?

6.  What hand signal is being shown here?

7.  What hand signal is being shown here?

8. What is the best method to get an operator's attention if you want to pass near a material handler?

Chapter FIVE

Objectives

1. Identify potential hazards associated with shutting down a material handler.
 2. Identify how to determine the cool down time needed before shutting off machine.
 3. Learn the importance of “lining up” the material handler before exiting the cab.
 4. Understand the importance of good equipment care.
 5. Be able to show how good equipment care leads to safe machine operation.
 6. Identify key areas that the operator is responsible for.
-

Shut Down & Equipment Care

Learning how to safely operate a material handler requires a dedicated individual who will put forth the time and effort needed to learn all parts of the job. In order to become a professional you must realize that being a good operator is not only about learning how to work the controls. It is also about learning how to care for the equipment that you are assigned to.

Parking and Shut-down

Before you shut the machine down be sure that it is parked in an area free of any hazards. These hazards could include being too close to a scrap pile that might shift or catch fire. They could also include being too close to overhead power lines. The important thing to note is that it is your responsibility to safely park the machine when you are going on a break or at the end of your shift. And be sure that your implement (magnet or grapple) is on the ground in a safe area. In the case of a magnet be sure that it is stored in such a way to keep it off of the surface of the ground. This is usually done by placing it on a small pile of scrap or in such a way to keep the bottom plate of the magnet free from pulling moisture from the ground.

Before turning off the key be sure that you have idled the throttle down slowly and allowed the machine to cool down properly. Shutting the machine off prematurely can cause unnecessary wear on some of the machines components. Consult your operator’s manual for the manufacturers recommendation on how much time is necessary for cool down at the end of the shift.

Exiting the cab

Once you are satisfied that the machine is properly shut down you are ready to exit the cab. Be sure to do so with your safety in mind. If you line your material handler up properly with the undercarriage you will see that the ladders, steps, and grab irons are easily

Shut Down & Equipment Care

accessible. When climbing off of your machine it is important to use the **3-point rule** (making three points of contact at all times with your hands and feet) at all times.

Equipment Care

As an owner, user, or operator of a material handler you know the importance of equipment uptime. This machine is an important part of your operation and it is needed to move material and fulfill customer commitments. If the mobile equipment fleet is not in its best condition, then the whole operation can suffer, slow down, and at times come to a halt.

Clean Equipment

All owners and operators want their equipment to be reliable. And the basis of reliable equipment is as simple as keeping it clean, or in a condition where the eyes can properly inspect it. This means as the operator you must be diligent with housekeeping both on the inside (cab area) and the rest of the machine. Good housekeeping cannot be stressed enough. The main reason that you keep the equipment clean is to inspect it thoroughly. And as the person inspecting the equipment you are doing this to detect any possible mechanical or safety issues that need to be corrected. Without clean equipment it is not possible to properly detect issues that need to be corrected. An easy way to remember the reasons for good housekeeping is the saying – **“we clean to inspect, we inspect to detect, we detect to correct, and we correct to perfect.”**

Operator Responsibilities

So far as the operator you have learned that you are responsible for safely operating the material handler, the condition of the material handler, as well as looking out for the safety of personnel that could be in the area. You must be able to recognize all potential hazards that could pose a threat to safe equipment operations. You must be able to understand how to read a load chart and recognize any hand signals that are given to you. And of course, you must know how to operate the material handler in a smooth and controlled manner that will maximize efficiency and production at the facility you are working at.

In order to be the best you can be at your job as a material handler operator you will need to practice and get to know the equipment. You have to be able to communicate clearly with those individuals that rely on you. You must know how to operate all of the controls on your machine. You need to know the load capacity, speed ranges, braking and steering characteristics, turning radius, and operating characteristics of your machine. All of the items listed in this manual and your operator’s manual will become second nature to you as you spend more time in the seat of a material handler. Remember to operate safely at ALL times and to make operational safety one of your core values. **It is now your job to get busy learning how to operate a material handler safely and to the best of your ability at all times!**

Quiz Yourself

1. When shutting the machine down what is the importance of keeping the magnet off of the surface of the ground?

- A. It could crack the bottom plate
- B. It will get rusty
- C. It could soak up moisture
- D. It could loosen the pins

2. Name the potential hazards that could be encountered during the shut-down of a material handler.

3. What is the importance of "lining up" the machine before climbing off of it?

4. When doing a pre-operational inspection why is equipment cleanliness important?

- A. It will help you recognize trouble spots
- B. It will make the machine trouble free
- C. It will show that you are a good operator
- D. It ensures that the machine is running well

Why is it important to have clean equipment?

Name four operator responsibilities.

Notes

Notes



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